

RCA

**ALL-DIFFUSED SILICON
THYRISTORS**

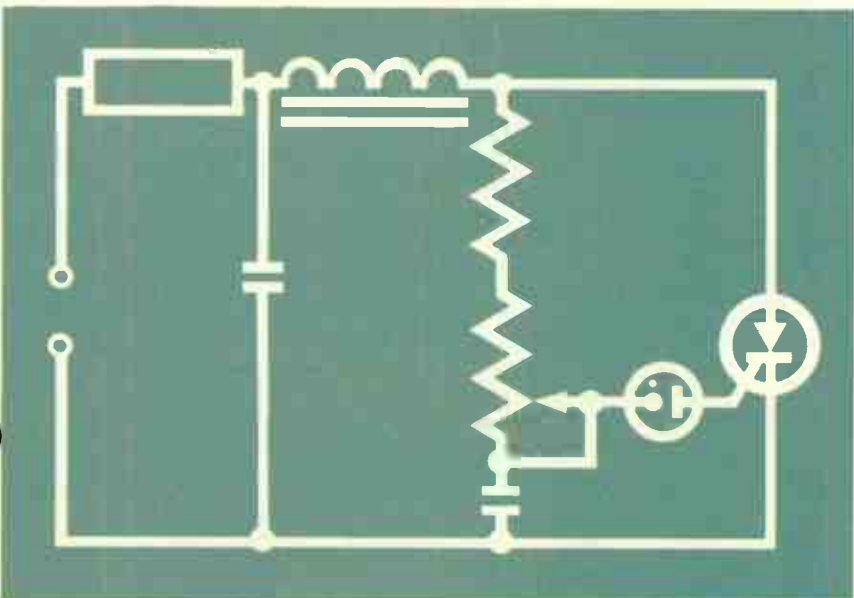
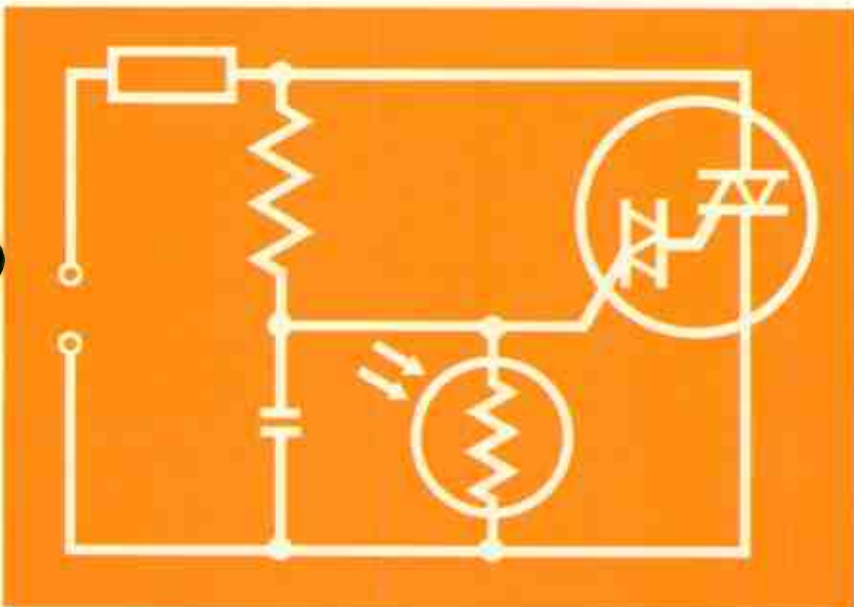
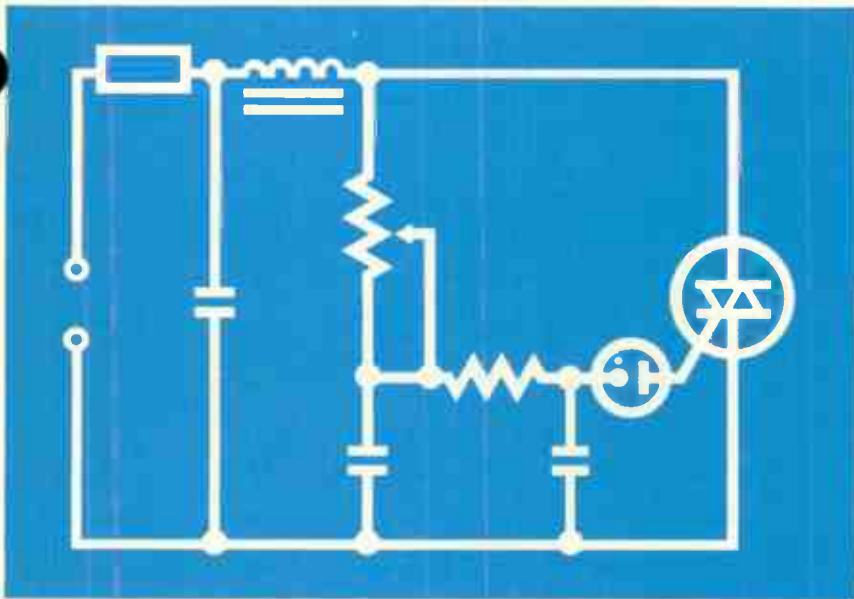
TRIACS

SENSITIVE-GATE TRIACS

SILICON CONTROLLED-RECTIFIERS

PULSE-MODULATOR SCR's

FAST-SWITCHING SCR's



RADIO CORPORATION OF AMERICA

ELECTRONIC COMPONENTS AND DEVICES, HARRISON, N.J. 07029

BOOKLET SCR-500A
Supersedes SCR-500

POWER CONTROL CAPABILITIES

WATTS	50					100				
	6	7	8	9	10	11	12	13	14	15
2-Ampere SCR's	[Orange bar]									
2.5-Ampere Triacs	[Orange bar]									
5-Ampere SCR's	[Orange bar]									
6-Ampere Triacs	[Orange bar]									
7-Ampere SCR's	[Orange bar]									
12.5-Ampere SCR's	[Orange bar]									
15-Ampere Triacs	[Orange bar]									
35-Ampere SCR's	[Orange bar]									



Press-Fit



TO-66
With Heat
Radiator



TO-48



TO-5
With Heat
Radiator



1/4''-Stud

INITIAL SELECTION GUIDE FOR RCA SILICON CONTROLLED-RECTIFIERS

RCA'S Economy Line of	RMS On-State Current at Indicated Temperature	For Low-Voltage Operation - Forward and Reverse 100 V	For 120-Volt Line Operation 200 V	For 240-Volt Line Operation 400 V	For High-Voltage Operation Rating- 600 V	Package	Typical Applications for RCA SCR's in the Control of Half-Wave and Full-Wave AC Loads
Low-Current SCR's	2 A @ T _{FA} = 25° C	-	2N3528	2N3529	2N4102	TO-8	<ul style="list-style-type: none"> • DC Power Supplies • Lamp Drivers
Medium-Current SCR's	5 A @ T _C = 75° C	-	2N3228 ^a	2N3525 ^a	2N4101 ^a	TO-66	<ul style="list-style-type: none"> • Speed Control of Small Appliances and Portable Tools
	7 A @ T _C = 60° C	-	40378 ^a	40379 ^a	-	"Low-Profile" 2-Lead Modified TO-5	<ul style="list-style-type: none"> • Solenoid Controls • Heat Controls • Pulsing Circuits
	12.5 A @ T _C = 80° C	2N3668	2N3669	2N3670	2N4103	TO-3	<ul style="list-style-type: none"> • DC Power Supplies • DC Motors • Street Light Controls • AC Motor Controls • Battery Chargers • Pulse Firing Circuits
High-Current SCR's	35 A @ T _C = 65° C	2N3870	2N3871	2N3872	2N3873	Press-Fit	<ul style="list-style-type: none"> • Electric Vehicles • Theater Lighting Controls • Static Contactors • DC Power Supplies • DC Motor Speed Control
	35 A @ T _C = 65° C	2N3896	2N3897	2N3898	2N3899	1/4''-Stud	<ul style="list-style-type: none"> • AC Motor Control • Street Light Control • Industrial and Residential Heat Controls

RCA THYRISTORS ...



INTRODUCTION

This revised booklet contains tabulated data describing RCA's extensive line of reverse blocking and bidirectional **Silicon Triode Thyristors**. The breadth of this line, well over 70 different Triacs and SCR's, allows the user the widest choice of current ratings, performance characteristics, and package design to meet the needs of almost all home and industrial power-control and power-switching applications.

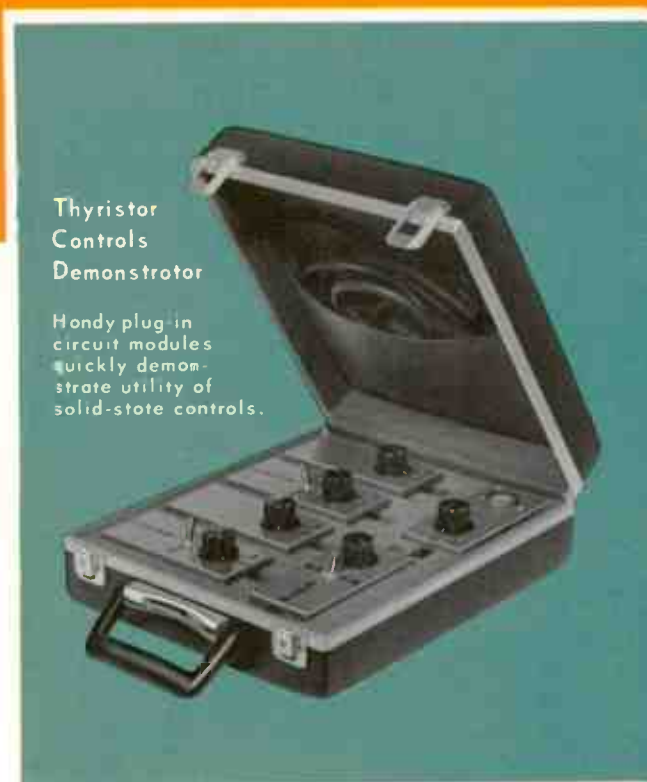
RCA Triacs are available having rms on-state current ratings of 2.5 to 15 amperes and off-state voltages of up to 400 volts. RCA SCR's have rms on-state current ratings from 2 to 35 amperes and off-state voltages of up to 600 volts. Each thyristor type is designed for systems requiring the ultimate in performance capability and low cost, and each is conservatively rated to insure long-term reliability and to allow operation at full current and voltage ratings.

RCA is prepared to show you how to design an economical control for your appliances. . . and it will take two minutes in your own office. With the unique Thyristor Controls Demonstrator, your RCA Sales Representative can easily illustrate the advantages of a full complement of low cost SCR and Triac circuits designed specifically for appliances. . . and explain how they can improve your appliance. Included in the Demonstrator are half-wave controls with or without regulation, full-wave circuits with single or double-time constant control, and a photocell-activated circuit.

Expert thyristor engineers are ready to help select or design to your specifications the thyristor that is most suitable for your application. Additional information is available from **RCA, Product Marketing, Somerville, N. J.**, and from the Equipment Sales Offices listed on page 21.

...for the control of
Full-Wave and
Half-Wave
AC loads

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Thyristor
Controls
Demonstrator

Handy plug-in
circuit modules
quickly demon-
strate utility of
solid-state controls.

RCA THYRISTORS

CONTENTS

	PAGE
TRIACS	6, 7
SCR's	8, 9, 10, 11
FAST-SWITCHING SCR's	12, 13
PULSE-MODULATOR SCR	12, 13
THYRISTORS HAVING FACTORY- ATTACHED HEAT RADIATORS	14
DIMENSIONAL OUTLINES AND MOUNTING METHODS	14, 15, 16, 17, 18
AVAILABLE THYRISTOR PUBLICATIONS	19
DEFINITIONS OF TRIAC AND SCR TERMS AND SYMBOLS	20
SALES OFFICES	21



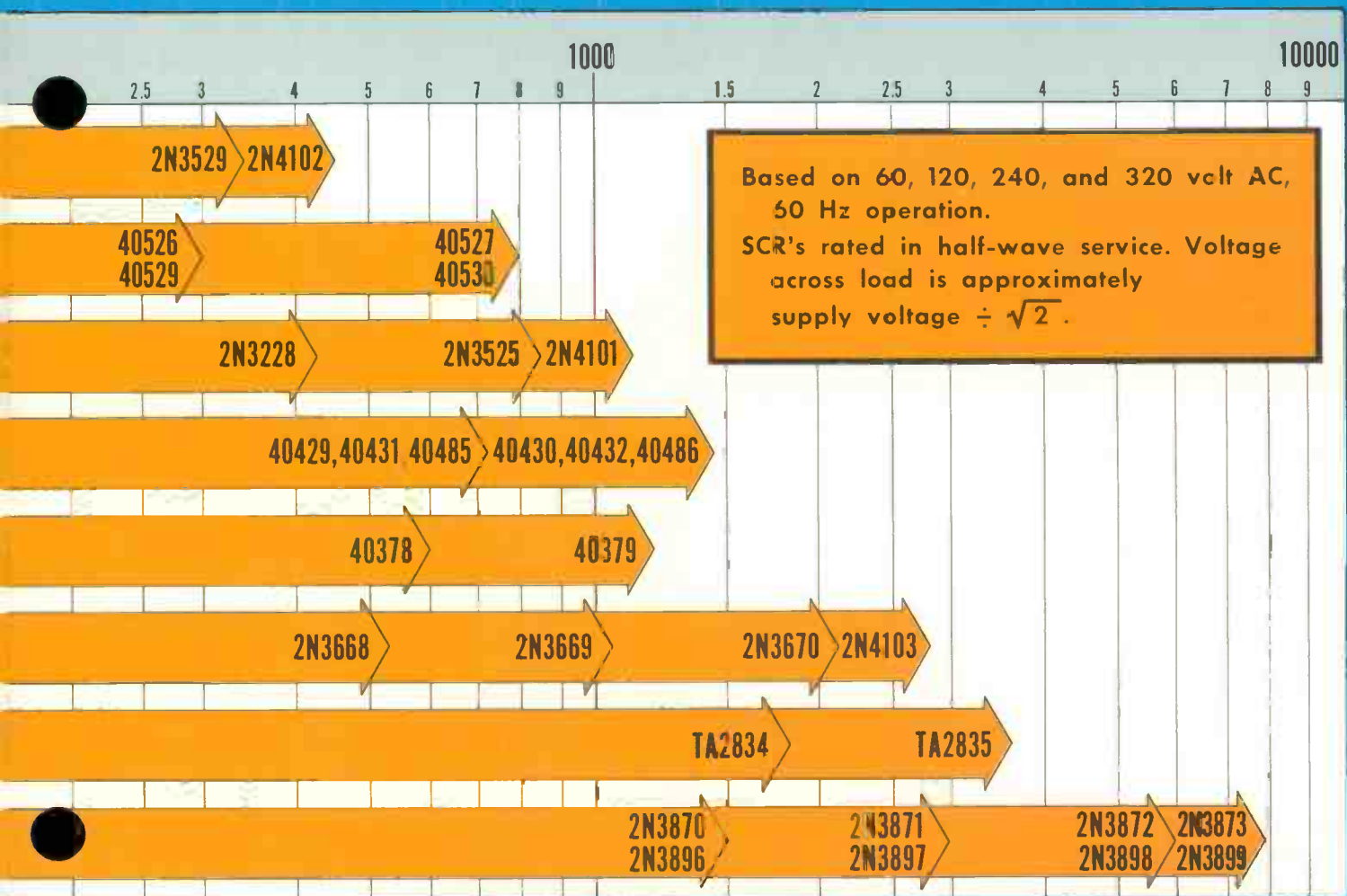
INITIAL SELECTION GUIDE FOR RCA TRIACS

RCA's Economy Line of	RMS On-State Current at Indicated Temperature	For Low-Voltage Operation — Repetitive Peak Off-State Voltage — 100 V	For 120-Volt Line Operation 200 V	For 240-Volt Line Operation Voltage Rating— 400 V	Package	Typical Applications for RCA Triacs in the Control of Full-Wave AC Loads
Low-Current Triacs	2.5 A @ T _C = 60° C	40525 ^a	40526 ^a	40527 ^a	3-Lead Modified TO-5	<ul style="list-style-type: none"> ● Light Dimmers ● Heat Controls ● Universal Motors ● Street Light Controls ● DC Power Supplies ● AC Motor Controls ● AC Switches ● Solenoid or Relay Controls
	2.5 A @ T _C = 70° C	40528 ^a	40529 ^a	40530 ^a	3-Lead Modified TO-5	
Medium-Current Triacs	6 A @ T _C = 75° C	—	40429 ^a	40430 ^a	TO-66	
	6 A @ T _C = 75° C	—	40431 ^a Have Integral Trigger	40432 ^a	2-Lead Modified TO-5	
	6 A @ T _C = 75° C	—	40485 ^a	40486 ^a	2-Lead Modified TO-5	
High-Current Triacs	15 A @ T _C = 70° C	—	TA2834 ^b	TA2835 ^b	TO-66	

^a Available with factory-attached heat radiator. See page 14.

^b This developmental-type device is intended for engineering evaluation. The type designation and data are subject to change unless otherwise arranged. No obligations are assumed for notice of change or future manufacture of this device.

OF RCA THYRISTORS



Other RCA SCR's	RMS On-State Current at Indicated Temperature	Forward and Reverse Voltage Rating				Package	Typical Applications for RCA SCR's
	16 A @ T _C = 80° C	25 V to 500 V					
	25 A @ T _C = 65° C	25 V to 600 V				TO-48	<ul style="list-style-type: none"> Theater Lighting Controls DC Power Supplies DC Motor Speed Control AC Motor Control Industrial and Residential Heat Controls
						TO-48	

RCA Fast-Switching SCR's	RMS On-State Current at Indicated Temperature	Forward and Reverse Voltage Rating				Package	Typical Applications
		100 V	200 V	400 V	600 V		
	5 A @ T _C = 60° C	TA2652 ^b	TA2653 ^b	TA2654 ^b	TA2655 ^b	TO-66	<ul style="list-style-type: none"> Inverters Choppers Pulse Modulators Deflection Circuits Ultrasonic Generators High Frequency Generation Regulated Power Supplies

RCA Pulse-Modulator SCR	Maximum Puls. Current	Max. Av. Power Dissipation	Forward and Reverse Voltage Rating	Type	Package	Typical Applications
	900 A	30 W	600 V	40216	TO-48	

SILICON BIDIRECTIONAL THYRISTORS

MAXIMUM RATINGS

Type	Repetitive Peak Off-State Voltage V_{DRM} V	RMS On-State Current at Indicated Temperature $I_T(RMS)$ A	Peak Surge (Non-Repetitive) On-State Current I_{TSM} A	Operating Temperature Range (case) T_C °C
LOW-CURRENT SENSITIVE-GATE TYPES				
40525, 40526, 40527 40528, 40529, 40530 2.5-Ampere Types 3-Lead Modified TO-5 Package				
40525	100	2.5 A @ $T_C = 60^\circ C$	25	-40 to 90
40526	200			
40527	400	2.5 A @ $T_C = 70^\circ C$	25	-40 to 100
40528	100			
40529	200			
40530	400			
MEDIUM-CURRENT TYPES				
40429, 40430 6-Ampere Types TO-66 Package				
40429	200	6 A @ $T_C = 75^\circ C$	80	-40 to 100
40430	400			
40431, 40432				
6-Ampere Types 2-Lead Modified TO-5 Package				
40431	200	6 A @ $T_C = 75^\circ C$	100	-40 to 100
40432	400			
40485, 40486				
6-Ampere Types 2-Lead Modified TO-5 Package				
40485	200	6 A @ $T_C = 75^\circ C$	100	-40 to 100
40486	400			
HIGH-CURRENT TYPES				
TA2834, TA2835 15-Ampere Types TO-66 Package				
TA2834	200	15 A @ $T_C = 70^\circ C$	100	-40 to 100
TA2835	400			

These six devices, which have the most sensitive gate characteristics of any triacs in the industry, represent a major advance in full-wave solid-state controls. Their low-cost, low-current ratings, and high gate sensitivity make the use of

The TO-66 package utilized by these two triacs is readily adaptable to conventional heat-sinking methods. The 40429 is for 120-volt line and the 40430 is for 240-volt line opera-

These two triacs have a trigger diode incorporated in the device package thereby making these triacs ideal for use as economical full-wave ac silicon switches requiring only the

These two devices, like the 40431 and 40432, have the highest surge-current rating of any 6-ampere triac now available. They also utilize a tin-plated 2-lead modified TO-5 package

The high current ratings of these two triacs extends RCA's triac power-control capability up to 3600 watts. The TA2834 controls up to 1800 watts at 120 volts ac, 60 Hz while the

The terms and symbols shown on these pages are defined on page 20.

CHARACTERISTICS AT $T_C = 25^{\circ}\text{C}$, UNLESS OTHERWISE SHOWN

Typical DC Holding Current I_H mA (dc)	Typical Critical Rate of Applied Commutating Voltage Comm. dv/dt $\text{V}/\mu\text{s}$	Typical Critical Rate of Rise of Off-State Voltage Critical dv/dt $\text{V}/\mu\text{s}$	Maximum DC Gate-Trigger Current I_{GT} mA (dc)	Maximum DC Gate-Trigger Voltage V_{GT} V (dc)	Type
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these triacs an affordable feature for many appliances in the home. Types 40528, 40529, and 40530 differ from the 40525, 40526, and 40527 in that they have higher dv/dt capability and higher gate trigger-current requirements.

LOW-CURRENT SENSITIVE-GATE TYPES

40525, 40526, 40527
40528, 40529, 40530

2.5-Ampere Types

3-Lead Modified TO-5 Package

2	—	$5 \text{ V}/\mu\text{s} @ T_C = 90^{\circ}\text{C}$	3	2.2	40525 40526 40527
6.5	—	$10 \text{ V}/\mu\text{s} @ T_C = 100^{\circ}\text{C}$	10	2.2	40528 40529 40530

tion. The high gate sensitivity in all firing modes allows these two devices to be readily controlled by economical transistorized circuits.

MEDIUM-CURRENT TYPES

40429, 40430

6-Ampere Types

TO-66 Package

10	$5 \text{ V}/\mu\text{s} @ T_C = 75^{\circ}\text{C}$	$30 \text{ V}/\mu\text{s} @ T_C = 100^{\circ}\text{C}$ $20 \text{ V}/\mu\text{s} @ T_C = 100^{\circ}\text{C}$	25	2.2	40429 40430
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addition of a resistor and capacitor to complete the trigger circuit. The modified TO-5 packages used by these devices are tin-plated to facilitate direct soldering to heat sinks.

40431, 40432

6-Ampere Types

2-Lead Modified TO-5 Package

10	$5 \text{ V}/\mu\text{s} @ T_C = 75^{\circ}\text{C}$	$30 \text{ V}/\mu\text{s} @ T_C = 100^{\circ}\text{C}$ $20 \text{ V}/\mu\text{s} @ T_C = 100^{\circ}\text{C}$	Minimum gate trigger capacity, $0.1 \mu\text{F}$		40431 40432
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that lends itself to economical mounting. The 40485 controls up to 720 watts at 120 volts ac, 60 Hz and the 40486 controls up to 1440 watts at 240 volts ac, 60 Hz.

40485, 40486

6-Ampere Types

2-Lead Modified TO-5 Package

10	$5 \text{ V}/\mu\text{s} @ T_C = 75^{\circ}\text{C}$	$30 \text{ V}/\mu\text{s} @ T_C = 100^{\circ}\text{C}$ $20 \text{ V}/\mu\text{s} @ T_C = 100^{\circ}\text{C}$	25	2.2	40485 40486
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TA2835 controls up to 3600 watts at 240 volts ac, 60 Hz. These two devices have uniform gate sensitivity in all four operating modes and utilize the popular TO-66 package.

HIGH-CURRENT TYPES

TA2834, TA2835

15-Ampere Types

TO-66 Package

10	$10 \text{ V}/\mu\text{s} @ T_C = 70^{\circ}\text{C}$	$40 \text{ V}/\mu\text{s} @ T_C = 100^{\circ}\text{C}$ $30 \text{ V}/\mu\text{s} @ T_C = 100^{\circ}\text{C}$	25	2.2	TA2834 TA2835
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SILICON CONTROLLED-RECTIFIERS

MAXIMUM RATINGS

Type	Peak Reverse Voltage		Repetitive Peak Off-State Voltage V_{DRM} V	On-State Current at Indicated Temp.		Peak Surge (Non-Repetitive) On-State Current I_{TSM} A	Critical Rate of Rise of On-State Current Crit. di/dt A/ μ S
	Non-Repetitive V_{RSM} V	Repetitive V_{RRM} V		Av. Value $I_{T(AV)}$ A	RMS Value $I_{T(RMS)}$ A		

LOW-CURRENT TYPES
2N3528, 2N3529, 2N4102
 2-Ampere Types
 TO-8 Package

The TO-8 package of these three SCR's make them readily adaptable for printed-circuit board and socket mounting. The 2N3528

2N3528	330	200	600	1.3 A @	2 A @	60	200
2N3529	660	400	600	$T_{FA} =$	$T_{FA} =$		
2N4102	700	600	700	25° C	25° C		

MEDIUM-CURRENT TYPES
2N3228, 2N3525, 2N4101
 5-Ampere Types
 TO-66 Package

Announced in 1964, this family represents the industry's first truly low-cost SCR. Today, the 2N3228 is considered as the standard for control of half-wave loads of up to 425 watts at

2N3228	330	200	600	3.2 A @	5 A @	60	200
2N3525	660	400	600	$T_C =$	$T_C =$		
2N4101	700	600	700	75° C	75° C		

40378, 40379
 7-Ampere Types
 "Low-Profile"
 2-Lead Modified TO-5 Package

Electrically similar to the 2N3228, these devices are packaged in a "low-profile" modified TO-5 case. With their small size and high performance capability, they are particularly use-

40378	330	200	600	4.5 A @	7 A @	80	-
40379	660	400		$T_C =$	$T_C =$		
				60° C	60° C		

2N3668, 2N3669
2N3670, 2N4103
 12.5-Ampere Types
 TO-3 Package

These four devices extend the range of power to the kilowatt and above region while still retaining the low-cost package concept. For this medium-current range, these SCR's offer the

2N3668	150	100	600	8 A @	12.5 A @	200	200
2N3669	330	200	600				
2N3670	660	400	600	$T_C =$	$T_C =$		
2N4103	700	600	700	80° C	80° C		

The terms and symbols shown on these pages are defined on page 20.

CHARACTERISTICS AT $T_C = 25^{\circ}C$, UNLESS OTHERWISE SHOWN

	Minimum Breakover Voltage @ $T_C = 100^{\circ}C$ $V_{(BO)}$ V	Maximum DC Gate-Trigger Current I_{GT} mA (dc)	Maximum DC Gate-Trigger Voltage V_{GT} V (dc)	Typical DC Holding Current I_H mA (dc)	Typical Critical Rate of Rise of Off-State Voltage @ $T_C = 100^{\circ}C$ Critical dv/dt $V/\mu s$	Type
controls half-wave loads of up to 170 watts at 120 volts ac, 60 Hz and the 2N3529 controls up to 340 watts at 240 volts ac, 60 Hz.						LOW-CURRENT TYPES 2N3528, 2N3529, 2N4102 2-Ampere Types TO-8 Package
	200					2N3528
	400	15	2	10	200	2N3529
	600					2N4102
120 volts ac, 60 Hz and the 2N3525 for loads of up to 850 watts at 240 volts ac, 60 Hz. The TO-66 package of these SCR's is easily adapted to heat sinking to provide operation at full rating.						MEDIUM-CURRENT TYPES 2N3228, 2N3525, 2N4101 5-Ampere Types TO-66 Package
	200					2N3228
	400	15	2	10	200	2N3525
	600					2N4101
ful in systems where space is at a premium such as in portable tools, and in speed and heat controls. The modified TO-5 package of these devices is tin-plated to facilitate direct soldering.						40378, 40379 7-Ampere Types "Low-Profile" 2-Lead Modified TO-5 Package
	200					40378
	400	15	2	12	200	40379
greatest cost advantage for both single and three-phase service. In addition, the power control capability of these devices matches the power limits of electrical outlets in the home.						2N3668, 2N3669 2N3670, 2N4103 12.5-Ampere Types TO-3 Package
	100					2N3668
	200					2N3669
	400	40	2	25	100	2N3670
	600					2N4103

SILICON CONTROLLED-RECTIFIERS

MAXIMUM RATINGS

Type	Peak Reverse Voltage		Repetitive Peak Off-State Voltage V_{DRM} V	On-State Current at Indicated Temp.		Peak Surge (Non-Repetitive) On-State Current I_{TSM} A	Critical Rate of Rise of On-State Current Crit. di/dt A/ μ s
	Non-Repetitive V_{RSM} V	Repetitive V_{RRM} V		Av. Value $I_T(AV)$ A	RMS Value $I_T(RMS)$ A		

HIGH-CURRENT TYPES

2N3870, 2N3871, 2N3872, 2N3873

35-Ampere Types

Press-Fit Package

These high-current SCR's can control loads up to 12 kW in full-wave applications or up to 6 kW in half-wave applications at 240 volts ac, 60 Hz. Their high power capability and low

2N3870	150	100	700	22 A	35 A	350	200
2N3871	330	200		@	@		
2N3872	660	400		$T_C =$	$T_C =$		
2N3873	700	600		65° C	65° C		

2N3896, 2N3897, 2N3898, 2N3899

35-Ampere Types

1/4"-Stud Package

These devices are electrically identical with the 2N3870-series but differ in that they are supplied in stud-mounted packages. This series is electrically superior to the 2N681

2N3896	150	100	700	22 A	35 A	350	200
2N3897	330	200		@	@		
2N3898	660	400		$T_C =$	$T_C =$		
2N3899	700	600		65° C	65° C		

ADDITIONAL RCA SCR's

2N1842A THROUGH 2N1850A

16-Ampere Types

TO-48 Package

2N1842A	35	25	600	10 A @	16 A @	125	-
through	to	to		$T_C =$	$T_C =$		
2N1850A	600	500		80° C	80° C		

2N681 THROUGH 2N690

25-Ampere Types

TO-48 Package

2N681	35	25	25	16 A @	25 A @	150	-
through	to	to	to	$T_C =$	$T_C =$		
2N690	720	600	600	65° C	65° C		

The terms and symbols shown on these pages are defined on page 20.

CHARACTERISTICS AT $T_C = 25^{\circ}\text{C}$, UNLESS OTHERWISE SHOWN

Minimum Breakover Voltage @ $T_C = 100^{\circ}\text{C}$ $V_{(BO)}$ V	Maximum DC Gate-Trigger Current I_{GT} mA (dc)	Maximum DC Gate-Trigger Voltage V_{GT} V (dc)	Typical DC Holding Current I_H mA (dc)	Typical Critical Rate of Rise of Off-State Voltage @ $T_C = 100^{\circ}\text{C}$ Critical dv/dt $V/\mu\text{s}$	Type
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cost make these devices especially attractive for use in heavy-duty industrial space heater, oven, furnace controls, dc motor controls, and high-current lamp dimmers.

HIGH-CURRENT TYPES
2N3870, 2N3871, 2N3872, 2N3873
35-Ampere Types
Press-Fit Package

100	40	2	20	100	2N3870
200					2N3871
400					2N3872
600					2N3873

and 2N1842A series and can control the same or higher load levels at reduced cost.

2N3896, 2N3897, 2N3898, 2N3899
35-Ampere Types
1/4"-Stud Package

100	40	2	20	100	2N3896
200					2N3897
400					2N3898
600					2N3899

CHARACTERISTICS AT $T_C = 125^{\circ}\text{C}$, UNLESS OTHERWISE SHOWN

2N1842A THROUGH 2N1850A
16-Ampere Types
TO-48 Package

25 to 500	45	3.7 V @ $T_C =$ -65°C	8	—	2N1842A through 2N1850A
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2N681 THROUGH 2N690
25-Ampere Types
TO-48 Package

25 to 600	25	3 V @ $T_C =$ -65°C	15	—	2N681 through 2N690
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SILICON CONTROLLED-RECTIFIERS

MAXIMUM RATINGS

Type	Peak Reverse Voltage		Repetitive Peak Off-State Voltage V_{DRM} V	On-State Current at Indicated Temp.		Peak Surge (Non-Repetitive) On-State Current I_{TSM} A	Critical Rate of Rise of On-State Current Crit. di/dt A/ μ s
	Non-Repetitive V_{RSM} V	Repetitive V_{RRM} V		Av. Value $I_{T(AV)}$ A	RMS Value $I_{T(RMS)}$ A		

FAST-SWITCHING TYPES

TA2652, TA2653, TA2654, TA2655

5-Ampere Types

TO-66 Package

These devices are designed specifically for power switching and inverter applications where their fast switching characteristics – maximum turn-on and turn-off times of 1.2

TA2652	150	100	500	3.2 A @ $T_C =$ 60° C	5 A @ $T_C =$ 60° C	50	200
TA2653	250	200	500				
TA2654	500	400	750				
TA2655	750	600	750				

PULSE-MODULATOR TYPE

40216

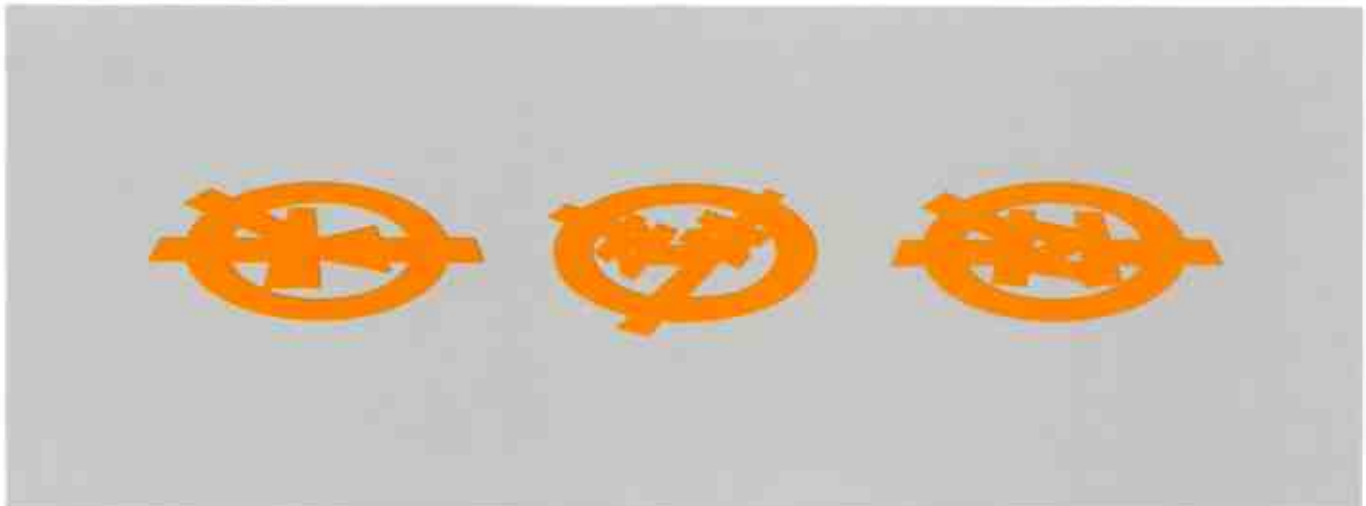
Peak Pulse Current of 900 Amperes

TO-48 Package

The unique switching capabilities of this SCR permits the design of solid-state high-current pulse circuitry. RCA leader-

40216	720	600	600	Peak Pulse Current of up to 900 Amperes	—	—
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The terms and symbols shown on these pages are defined on page 20.



CHARACTERISTICS AT $T_C = 25^{\circ}\text{C}$, UNLESS OTHERWISE SHOWN

Minimum Breakover Voltage @ $T_C = 100^{\circ}\text{C}$ $V_{(BO)}$ V	Maximum DC Gate-Trigger Current I_{GT} mA (dc)	Maximum DC Gate-Trigger Voltage V_{GT} V (dc)	Maximum Turn-Off Time t_q μs	Typical Critical Rate of Rise of Off-State Voltage Critical dv/dt $\text{V}/\mu\text{s}$	Type
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μs and $6 \mu\text{s}$ – and their high di/dt and dv/dt capabilities are desirable. These characteristics place these devices well ahead of most application requirements.

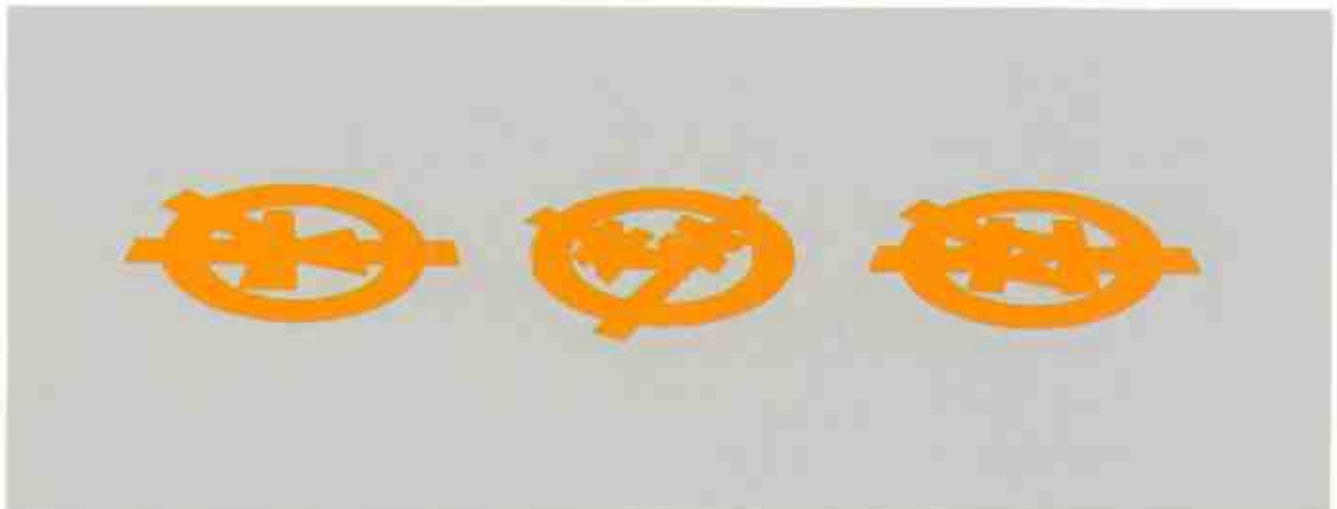
FAST-SWITCHING TYPES
TA2652, TA2653, TA2654, TA2655
 5-Ampere Types
 TO-66 Package

100	30	4	$6 \mu\text{s}$ @ $T_C = 80^{\circ}\text{C}$	$200 \text{ V}/\mu\text{s}$ @ $T_C = 100^{\circ}\text{C}$	TA2652
200					TA2653
400					TA2654
600					TA2655

ship with this device opens up an entire new field of solid-state radar design in both military and commercial applications.

PULSE-MODULATOR TYPE
40216
 Peak Pulse Current of 900 Amperes
 TO-48 Package

600 V @ $T_C = 125^{\circ}\text{C}$	80	2	$40 \mu\text{s}$ @ $T_C = 80^{\circ}\text{C}$	$50 \text{ V}/\mu\text{s}$ @ $T_C = 125^{\circ}\text{C}$	40216
--	----	---	--	---	-------



RCA Thyristors with Factory-Attached Heat Radiators

Triac With Heat Radiator	Triac Without Heat Radiator
40502	40429
40503	40430
40509	40485
40510	40486
40511	40431
40512	40432
40531	40525
40532	40526
40533	40527
40534	40528
40535	40529
40536	40530

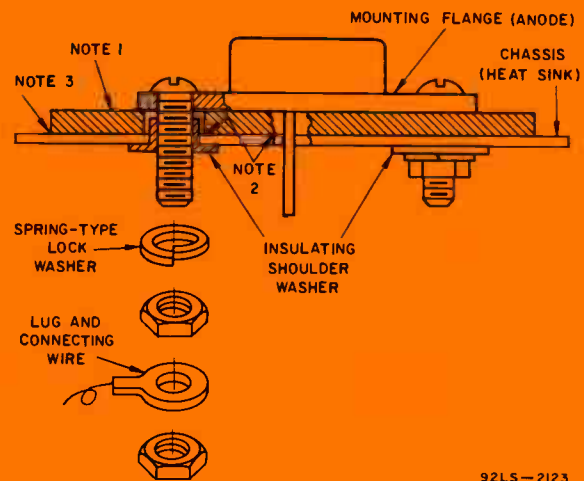
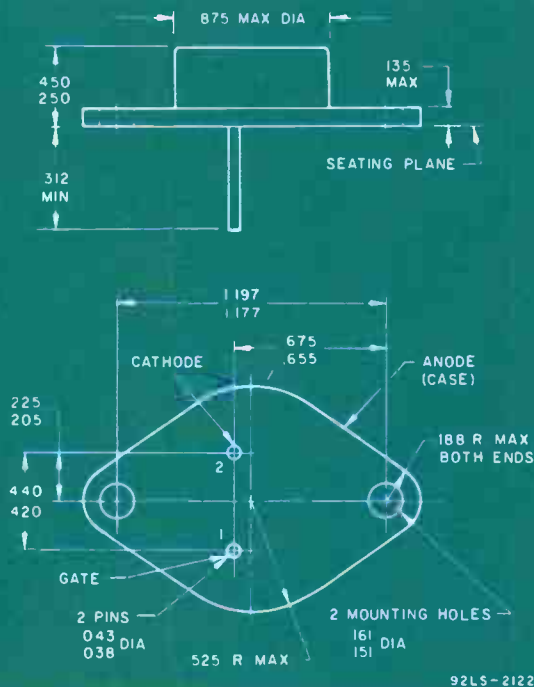
SCR With Heat Radiator	SCR Without Heat Radiator
40504	2N3228
40505	2N3525
40506	2N4101
40507	40378
40508	40379



Dimensional Outlines and Mounting Hardware for RCA Thyristors

TO-3 PACKAGE

RCA TYPES 2N3668, 2N3669, 2N3670, and 2N4103



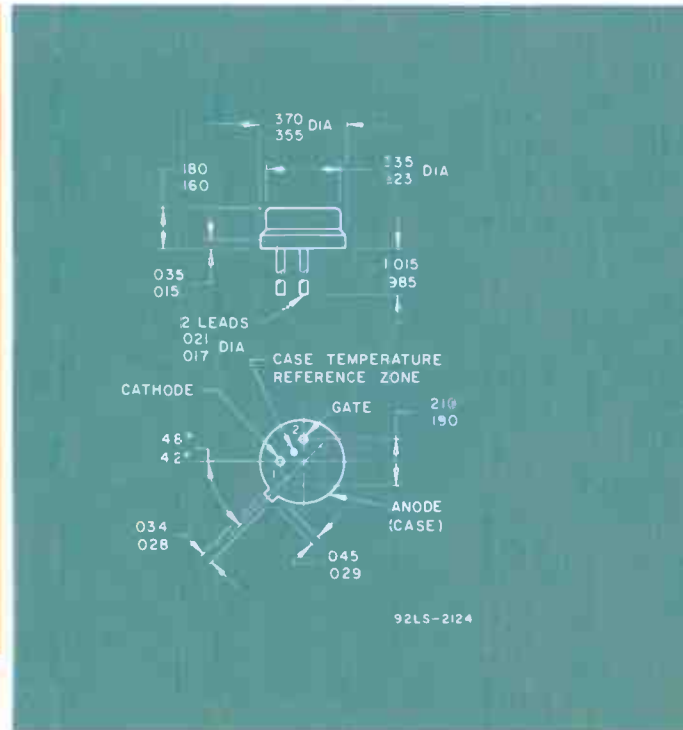
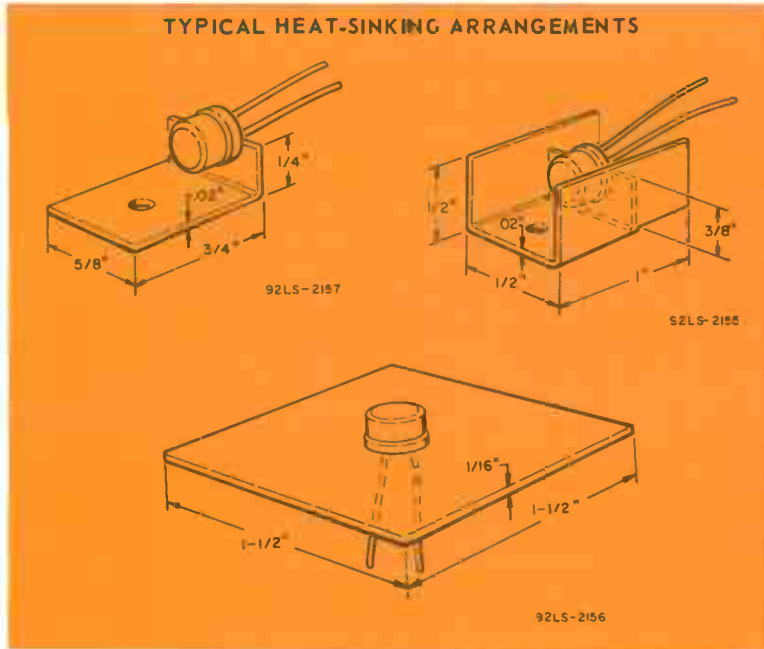
- NOTE 1: 0.002" mica insulator or anodized aluminum insulator (drilled or punched with burrs removed).
- NOTE 2: Remove burrs from chassis holes.
- NOTE 3: Dow Corning 340 silicon heat sink compound, or equivalent.

DIMENSIONS IN INCHES

Dimensional Outlines and Mounting Hardware for RCA Thyristors

"LOW-PROFILE" 2-LEAD MODIFIED TO-5 PACKAGE

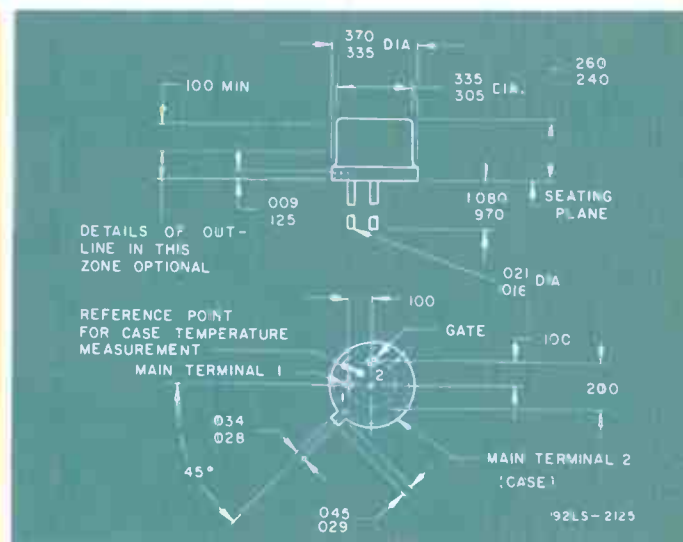
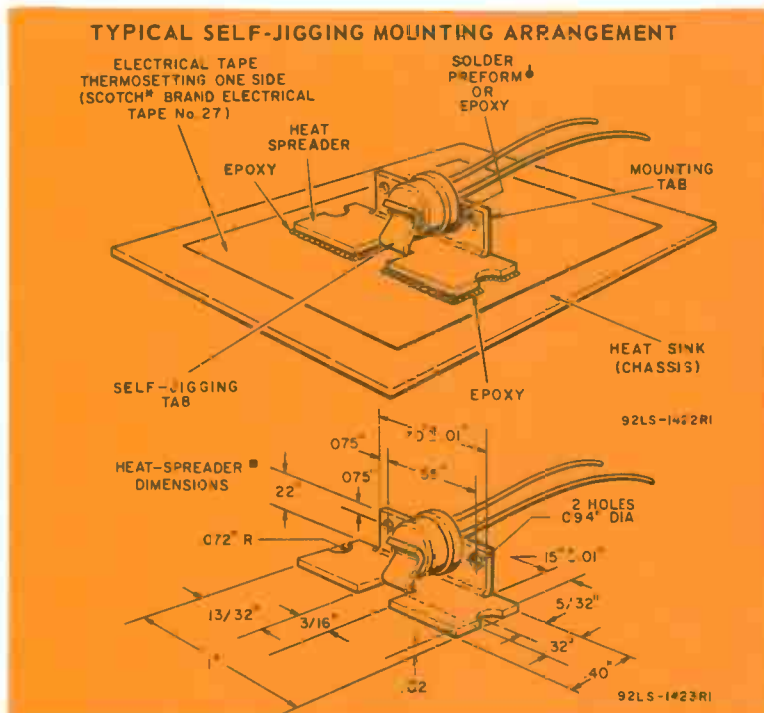
RCA TYPES 40378 and 40379



FOR DIRECT SOLDERING TO HEAT SINK, USE 60-40 SOLDER SOCKETS: CINCH-JONES NO.2TS, GRAYHILL NO.22-11, or EQUIVALENT

2-LEAD MODIFIED TO-5 PACKAGE

RCA TYPES 40431, 40432, 40485, and 40486



*Products of Minnesota Mining & Mfg. Co., St. Paul, Minnesota.

†Solder preforms are available from RCA as Part No. NR184A and from the Kester Solder Co., Newark, N.J. 07105 as Part No. KSFD-375005, or equivalent.

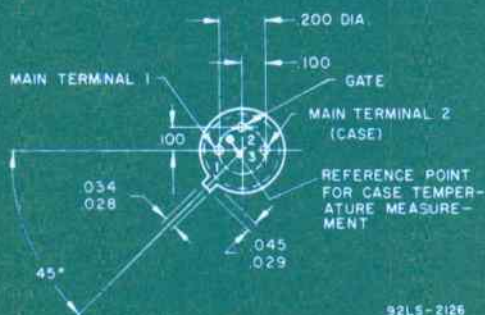
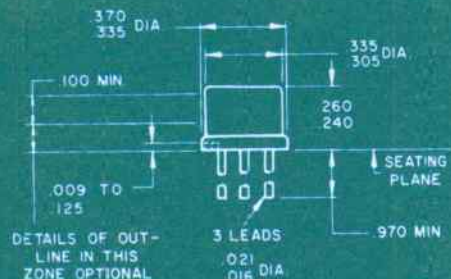
‡This heat spreader is available from RCA as Part No. NR166B and from the General Stamping Co., Inc., Denville, N.J. 07834 as Part No. 14-110, or equivalent.

DIMENSIONS IN INCHES

Dimensional Outlines and Mounting Hardware for RCA Thyristors

3-LEAD MODIFIED TO-5 PACKAGE

RCA TYPES 40525, 40526, 40527, 40528, 40529, and 40530



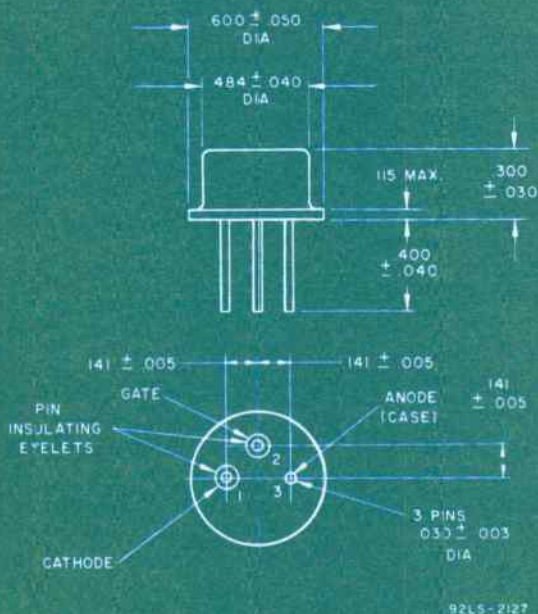
FOR DIRECT SOLDERING TO HEAT SINK, USE 60-40 SOLDER

SOCKETS: CINCH-JONES NO.2TS, GRAYHILL NO. 22-11, or EQUIVALENT

For additional methods of heat sinking TO-5 and modified TO-5 packages, see brochure SCR-501 described on page 19.

TO-8 PACKAGE

RCA TYPES 2N3528, 2N3529, and 2N4102



SOCKETS: BARNES DEVELOPMENT CO. PART NO.M513

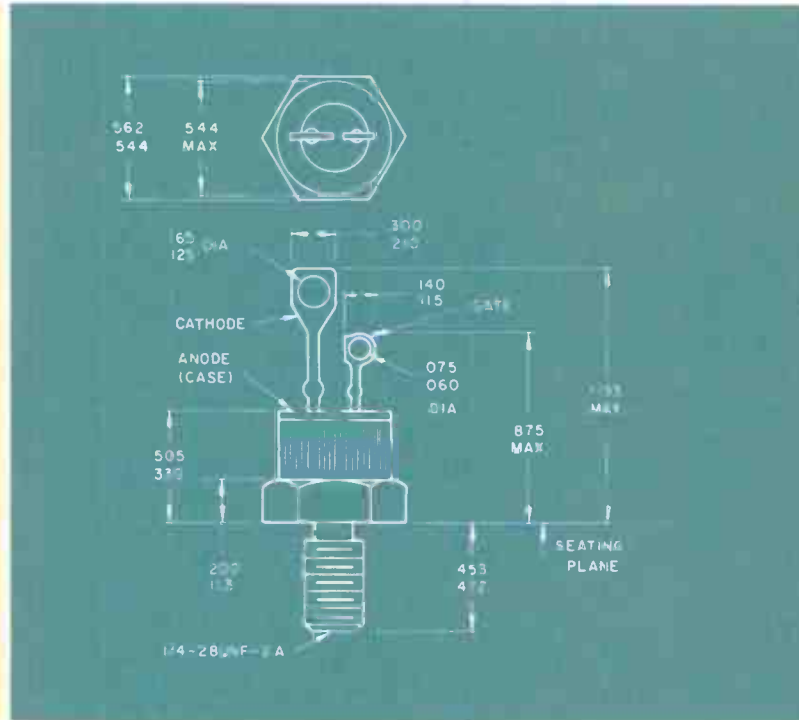
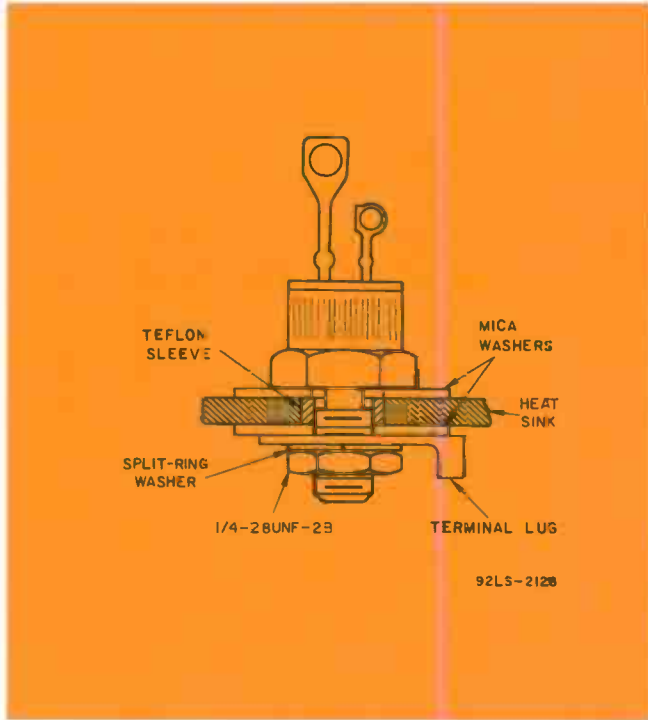
NUGENT ELECTRONICS PART NO.N5503-6, or EQUIVALENT

DIMENSIONS IN INCHES

Dimensional Outlines and Mounting Hardware for RCA Thyristors

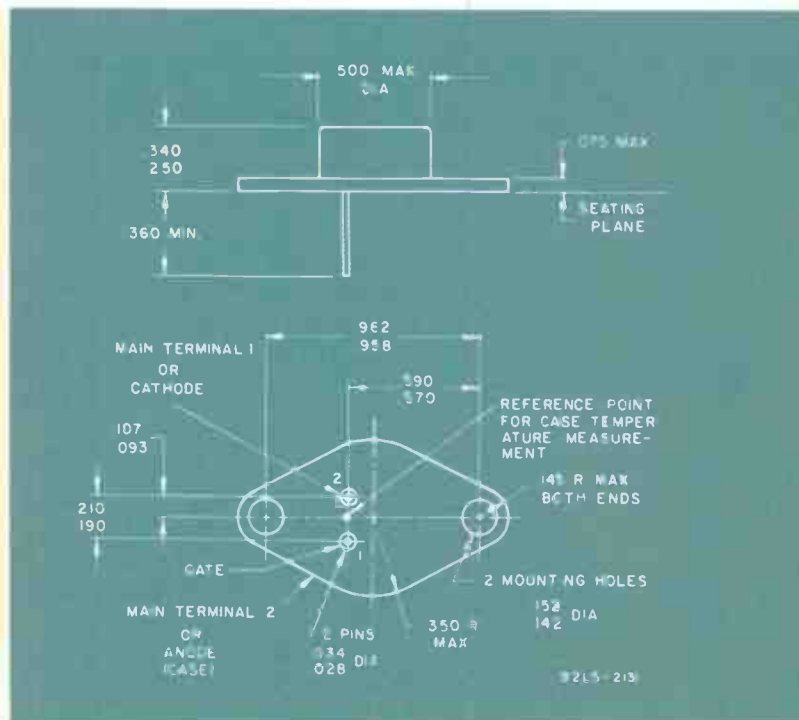
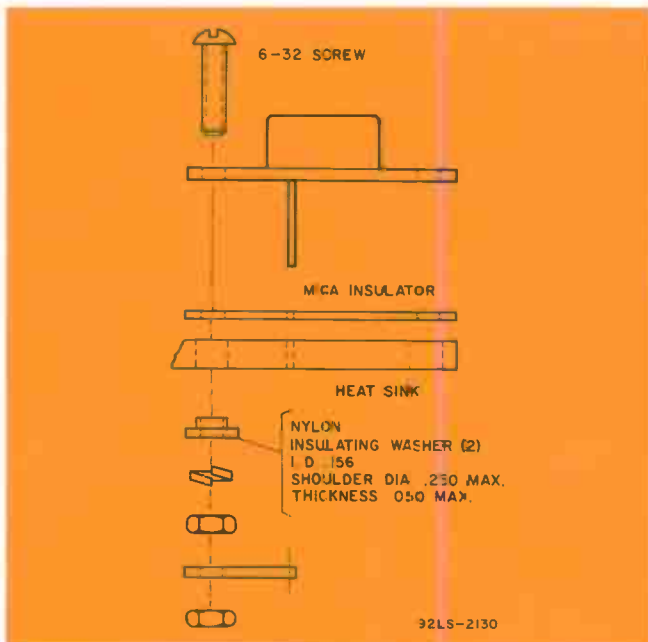
TO-48 PACKAGE

RCA TYPES 2N681-2N690, 2N1842A-2N1850A, and 40216



TO-66 PACKAGE

RCA TYPES 2N3228, 2N3525, 2N4101, 40429, 40430, TA2652, TA2653, TA2654, TA2655, TA2834, and TA2835



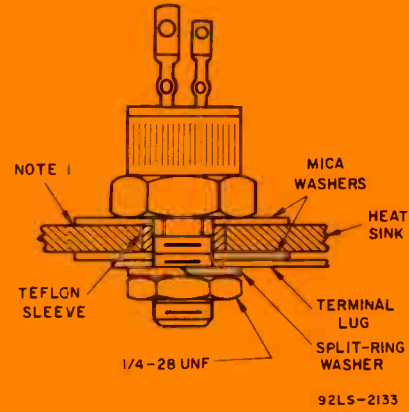
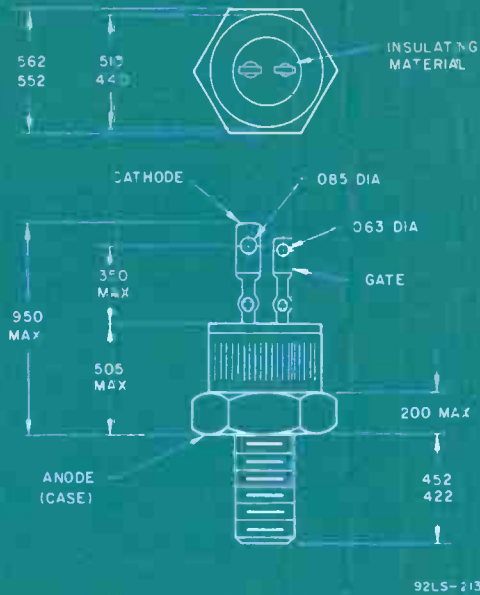
SOCKET: UID ELECTRONICS PART NO. P.TS-4, or EQUIVALENT

DIMENSIONS IN INCHES

Dimensional Outlines and Mounting Hardware for RCA Thyristors

1/4"-STUD PACKAGE

RCA 2N3896, 2N3897, 2N3898, and 2N3899

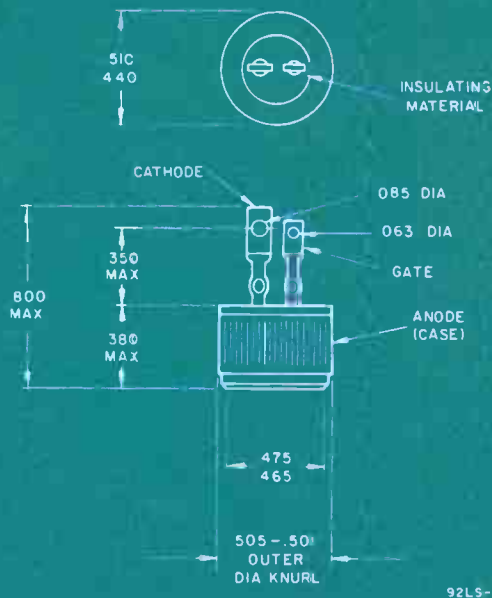


NOTE 1: Dow Corning 340 silicon heat sink compound, or equivalent.

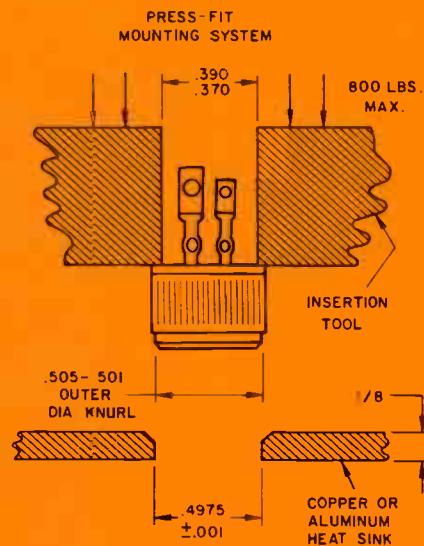
NOTE 2: The recommended torque is 26 to 36 inch-pounds applied to a 1/4-28 UNF-2B hex nut assembled on thread. The applied torque during installation should not exceed 50 inch-pounds.

PRESS-FIT PACKAGE

RCA TYPES 2N3870, 2N3871, 2N3872, and 2N3873



PRESS-FIT MOUNTING SYSTEM

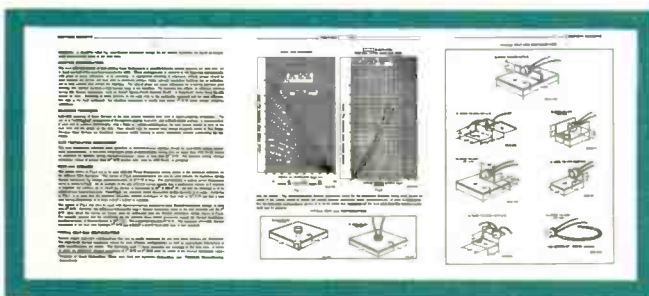


DIMENSIONS IN INCHES

Publications on RCA Thyristors, Rectifiers, and Rectifier Stacks and Bridges

Heat-Sink Guidance for RCA THYRISTORS Using TO-5 and "Modified TO-5" Packages – SCR-501

This 6-page brochure provides fundamental information on the heat sinking requirements of 2-lead and 3-lead TO-5 thyristors and contains drawings illustrating 12 easily fabricated heat-sinking systems. Typical thermal resistance values for each mounting method are included.



TECHNICAL BULLETINS

Authorized information on these thyristors, stack lines, and on RCA semiconductor rectifier products. Be sure to mention type number of bulletin desired.

RELIABILITY REPORTS

SMR-3 "20-Ampere, Diffused-Junction Silicon Power Rectifier"

SMR-4 "High-Voltage Silicon Rectifier Assemblies"

SMR-6 "Thermal Fatigue Test Results for 12-, 20- and 40-Ampere Silicon Power Rectifiers"

REPRINTS

ST-2055A "Thermal Impedance of Silicon Rectifiers"

ST-2307 "Analysis of Leak Detection in Industrial Silicon Rectifiers"

CATALOGS

Contain concise data on the different RCA Industrial Semiconductor Product lines.

DATABOOK – SPD-100 (Replaces HB-10)

APPLICATION NOTES

SMA-4 "Peak Current Considerations for RCA Silicon Rectifier Applications"

SMA-15 "Application of RCA Silicon Rectifiers to Capacitive Loads"

SMA-16 "Circuit Factor Charts for Use in Applications with RCA Silicon Controlled Rectifiers"

SMA-19 "Peak Current Considerations for RCA Silicon Controlled Rectifier Applications"

SMA-29 "RCA 40216 Silicon Controlled Rectifier—Design Considerations and Device Data for Use in High-Current Pulse Application"

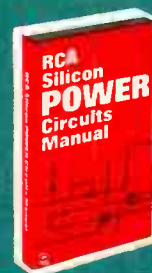
SMA-38 "Application of RCA SCR's to Speed Control of Universal Motors"

SMA-39 "Gate Parameters of RCA SCR's for Trigger Circuit Design"

MANUAL – SP-50

RCA Silicon Power Circuits Manual – SP-50

This 416 page manual provides design information for a broad range of power circuits using RCA silicon transistors, rectifiers, and thyristors.



For further information on RCA literature, write, RCA Commercial Engineering, Electronic Components and Devices, Harrison, N.J. 07029

Triac Terms and Symbols

These terms and symbols follow the latest recommended standards of JEDEC. For convenience, formerly used symbols have been cross-referenced to the new standards.

PRINCIPAL VOLTAGE DEFINITIONS

Principal Voltage is the voltage between the main terminals. The principal voltage is called positive when the potential of main terminal 2 is higher than the potential of main terminal 1.

Repetitive Peak Off-State Voltage – V_{DRM} (Formerly V_{BOM}) – The maximum instantaneous value of principal voltage which may be applied to the thyristor, including all repetitive transient voltages, which will not switch the thyristor from the off-state to the on-state at specified conditions of thyristor junction temperature and gate bias.

Critical Rate of Rise of Off-State Voltage – Critical dv/dt – The value of the exponential rate of rise of principal voltage below which switching from the off-state to the on-state will not occur, and above which switching may occur, under stated conditions. This rate of rise is defined as follows:

$$dv/dt = \frac{0.63 V_{DRM}}{t}$$

where t is the time required for the principal voltage to rise from zero to 0.63 of V_{DRM} .

Critical Rate of Applied Commutating Voltage – Commutating dv/dt – The maximum instantaneous rate of rise of principal voltage that occurs during commutation which will not cause the thyristor to switch to the on-state.

PRINCIPAL CURRENT DEFINITIONS

Principal Current is the current that flows through the main terminals.

RMS On-State Current – $I_{T(RMS)}$ (Formerly I_{ON}) – The RMS value of the principal current when the thyristor is in the on-state.

Surge (Non-Repetitive) On-State Current – I_{TSM} (Formerly i_{SM}) – An overload on-state current of specific time duration, waveshape, and peak value which may be conducted through the thyristor for one full cycle from a 60 Hz supply in a single-phase circuit with a resistive load. The thyristor shall be operating within its specified operating voltage, rms current, gate power, and temperature ratings prior to the surge current. The surge current may be repeated after sufficient time has elapsed for the device to return to pre-surge thermal equilibrium conditions.

DC Holding Current – I_H (Formerly I_{HOX}) – The minimum principal current required to maintain the thyristor in the on-state with the gate open for a specified case temperature.

GATE DEFINITIONS

DC Gate-Trigger Current – I_{GT} – The minimum gate current which will switch a thyristor from the off-state to the on-state under specified conditions of principal voltage and case temperature.

DC Gate-Trigger Voltage – V_{GT} – The gate voltage required to produce the gate trigger current necessary to switch a thyristor from the off-state to the on-state for specified conditions of principal voltage and case temperature.

Silicon Controlled-Rectifier Terms and Symbols

PRINCIPAL VOLTAGE DEFINITIONS

Principal Voltage is the voltage between the main terminals. The principal voltage is called positive when the anode potential is higher than the cathode potential, and called negative when the anode potential is lower than the cathode potential.

Non-Repetitive Peak Reverse Voltage – V_{RSM} [Formerly v_{RM} (non-rep)] – The maximum instantaneous value of any non-repetitive transient reverse voltage which occurs across a thyristor.

Repetitive Peak Reverse Voltage – V_{RRM} [Formerly $v_{RM}(\text{rep})$] – The maximum instantaneous value of reverse voltage which occurs across the thyristor, including all repetitive transient voltages, but excluding all non-repetitive transient voltages.

Repetitive Peak Off-State Voltage – V_{DRM} [Formerly v_{FBO} (rep)] – The maximum instantaneous value of the off-state voltage which occurs across a thyristor, including all repetitive transient voltages, but excluding all non-repetitive voltages.

Breakover Voltage – $V_{(BO)}$ (Formerly v_{BO}) – The value of positive anode voltage at which the thyristor may switch into the on-state when the gate is open.

Critical Rate of Rise of Off-State Voltage – Critical dv/dt – The value of the rate of rise of principal voltage below which switching from the off-state to the on-state will not occur and above which switching will occur.

PRINCIPAL CURRENT DEFINITIONS

Principal Current is the current that flows through the main terminals.

Average On-State Current – $I_{T(AV)}$ (Formerly I_{FAV}) – The average dc value of the principal current when the thyristor is in the on-state.

RMS On-State Current – $I_{T(RMS)}$ (Formerly I_{FRMS}) – The rms value of the principal current when the thyristor is in the on-state.

Surge (Non-Repetitive) On-State Current – I_{TSM} [Formerly i_{FM} (surge)] – A greater than normal on-state current of short-time duration and specified waveshape.

Critical Rate of Rise of On-State Current – Critical di/dt – The maximum rate of change of the principal current which may be imposed on the thyristor immediately after it is switched by the gate from the off-state to the on-state.

Holding Current – I_H (Formerly i_{HO}) – The minimum principal current required to maintain the thyristor in the on-state following the conduction of steady-state on-state current.

GATE DEFINITIONS

Gate Trigger Current – I_{GT} – The minimum gate current required to switch a thyristor from the off-state to the on-state.

Gate Trigger Voltage – V_{GT} – The gate voltage required to produce the gate current.

MISCELLANEOUS

Circuit-Commutated Turn-Off Time – t_q (Formerly t_{off}) – The time interval between the instant when the principal current has decreased to zero after external switching of the principal voltage circuit, and the instant when the thyristor is capable of supporting a specified principal voltage without turning on.

RCA Sales Offices

EQUIPMENT

CALIFORNIA		
6363 Sunset Blvd., Hollywood, Calif. 90028	(213) 461-9171	
4546 El Camino Real, Los Altos Calif. 94022	(415) 948-8996	
7969 Engineer Rd., Suite 216, San Diego, Calif. 92111	(714) 279-0420	
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MISSOURI		
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(Metropolitan Phila.):		
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(Metropolitan NYC:)		
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1621 Euclid Ave., 1600 Keith Bldg., Cleveland, Ohio 44115	(216) 241-3450	
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GOVERNMENT

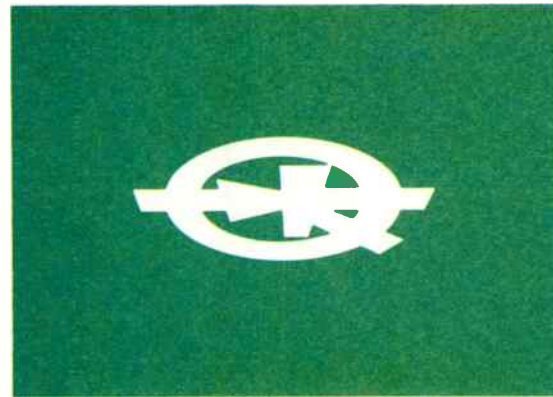
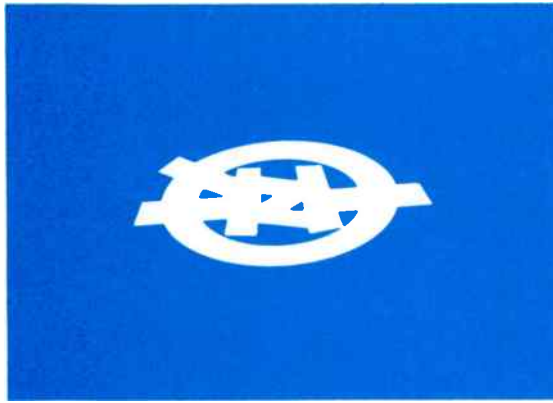
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731 James St., Room 206, Syracuse, N.Y. 13203	(315) 479-8134	
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Central & Terminal Aves., Clark, N.J. 07066	(201) 362-1000	
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CANADA		
1001 Lenoir Street, Montreal 30, Quebec	(514) 933-7551	
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EUROPE		
118 Rue du Rhone, Geneva, Switzerland	35 75 00 to 09	
Cable: RADIOCORP		
FAR EAST		
415 Prince's Building, Chater Road Hong Kong	239529 239522	
Cable: RADIOINTER		



RCA Thyristors are Available from Your  Industrial Semiconductor Distributor

Diacs

Triacs

Sensitive-Gate Triacs

Silicon Controlled-Rectifiers

Pulse-Modulator SCR's

Fast-Switching SCR's

Including Thyristor

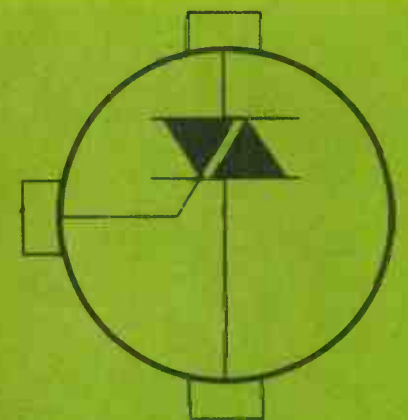
Cross-Reference Directory

RCA **THYRISTORS**

Quick-Reference Guide

For Industrial
and Commercial Equipment

RCA Electronic
Components



INTRODUCTION

This booklet provides quick-reference data on RCA's broad line of Thyristors—Triacs, Silicon Controlled Rectifiers (SCR's), and Diacs. These devices are available in a wide variety of voltage and current ratings and in many package styles.

CURRENT RATINGS:

- Triacs: Up to 40 amperes (rms)
- SCR's: Up to 35 amperes (rms)

PACKAGE STYLES:

Press-fit, stud (1/4 in.), TO-3, modified TO-5, TO-8, TO-66, and silicone plastic

Features

RCA Triacs and SCR's provide:

- Devices for Power-Switching Applications Up to 10 kW
- Full-Cycle Surge (Inrush) Currents Up to 350 A (pk)
- Reliable Blocking at Elevated Temperatures

Made possible by RCA's shorted (shunted) emitter design

- High Static dv/dt Ratings To help minimize false firing
- High Commutation dv/dt Ratings For better triac circuit designs utilizing resistive or inductive loading

- Fast Switching SCR's

For TV deflection and fast-switching applications

- High Switching Current 900 A (pk) SCR's

For pulse applications (radar, laser power supplies)

Applications

RCA TRIACS . . . TYPICAL APPLICATIONS

- | | |
|----------------------------|----------------------------|
| • Relay Controls | • Light Dimmers |
| • Lamp Switches/Drivers | • Photocopier Applications |
| • Heating Controls | • Display Light Controls |
| • AC Motor Controls | • AC Switches |
| • Universal Motor Controls | • Welding Controls |

RCA SCR's . . . TYPICAL APPLICATIONS

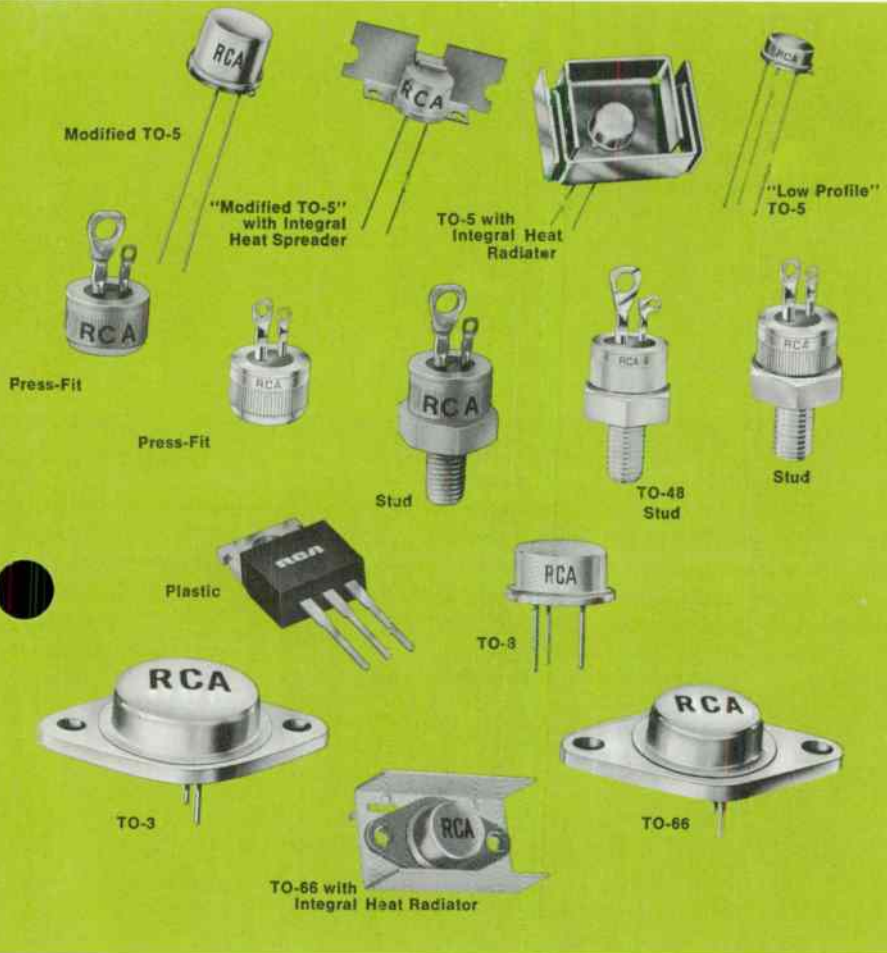
- | | |
|--|--|
| • Radar Modulators (RCA-40216) | • Universal or DC Motor Controls |
| • Gas/Fuel-Oil Igniters | • Lamp Drivers |
| • Ignition Systems for Internal Combustion Engines | • Solenoid or Relay Controls |
| • Inverters | • Heating Controls |
| • DC Power Supplies | • TV Deflection and Fast-Switching Applications (RCA-40640 or 40641) |
| • Choppers | |

THYRISTOR QUICK- REFERENCE GUIDE

Information furnished by RCA is believed to be accurate and reliable. However, no responsibility is assumed by RCA for its use; nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of RCA.

11-68

Printed in U.S.A.



CONTENTS

QUICK-SELECTION CHARTS

RCA TRIACS 4

RCA SCR's 5

RATINGS and CHARACTERISTICS

RCA TRIACS 6

RCA SCR's & DIACS 7

CROSS-REFERENCE GUIDE

TRIACS 8

SCR's 9

DEFINITIONS OF TERMS AND SYMBOLS 10, 11

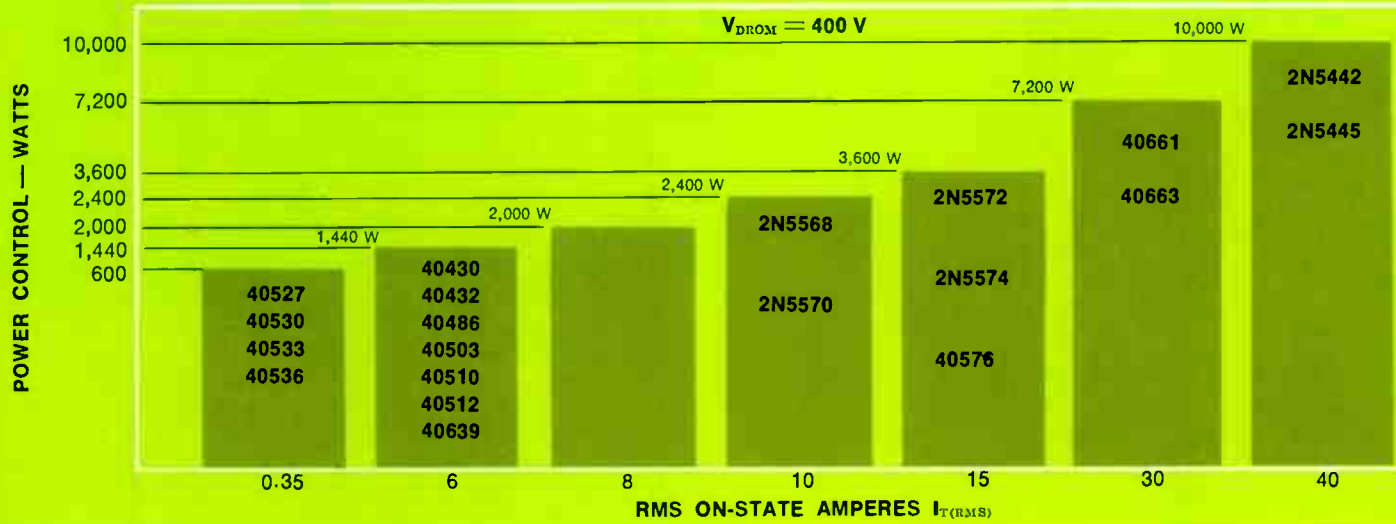
APPLICATION NOTES 11

RCA SALES OFFICES 12

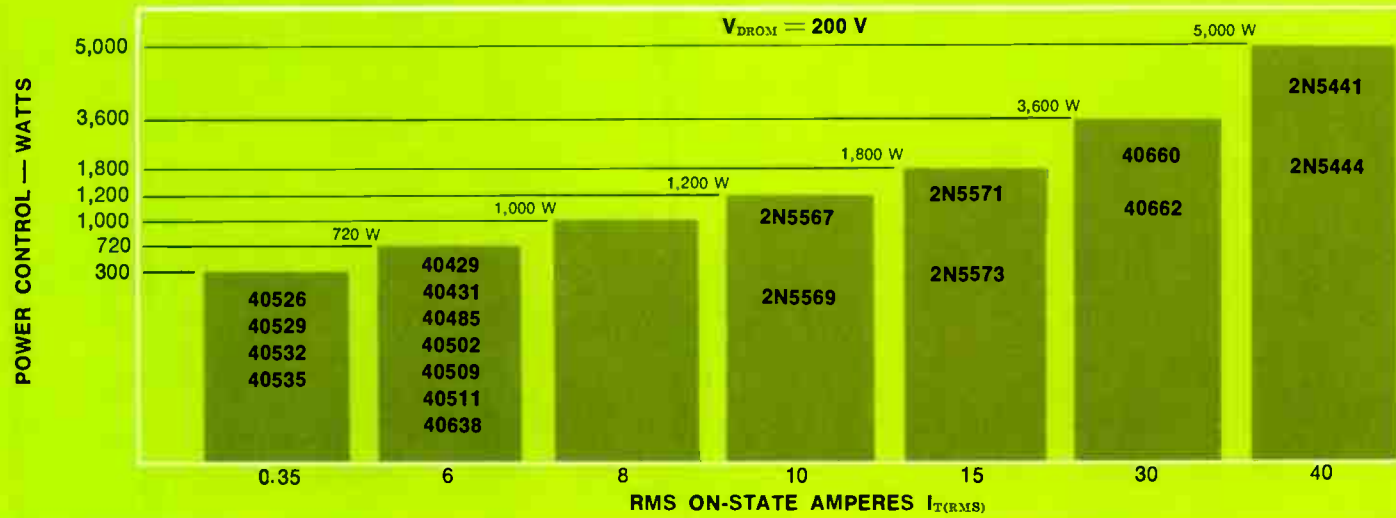
For additional data on any of the devices described in this booklet consult any of the RCA Sales Offices listed on the back cover of the booklet, your nearest RCA Distributor, or write directly to Commercial Engineering, RCA Electronic Components, 415 South Fifth St., Harrison, New Jersey 07029.

Triac Quick-Selection Charts

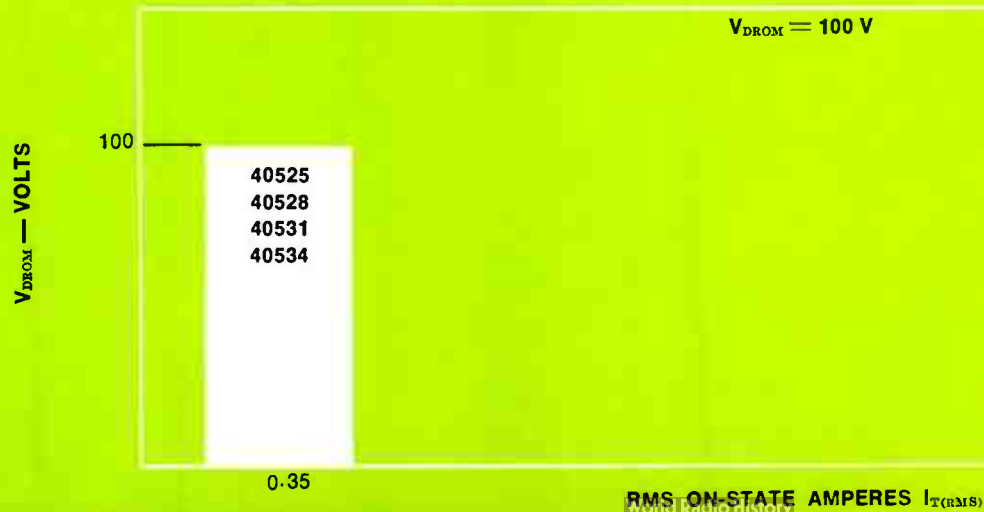
240-V LINE OPERATION



120-V LINE OPERATION

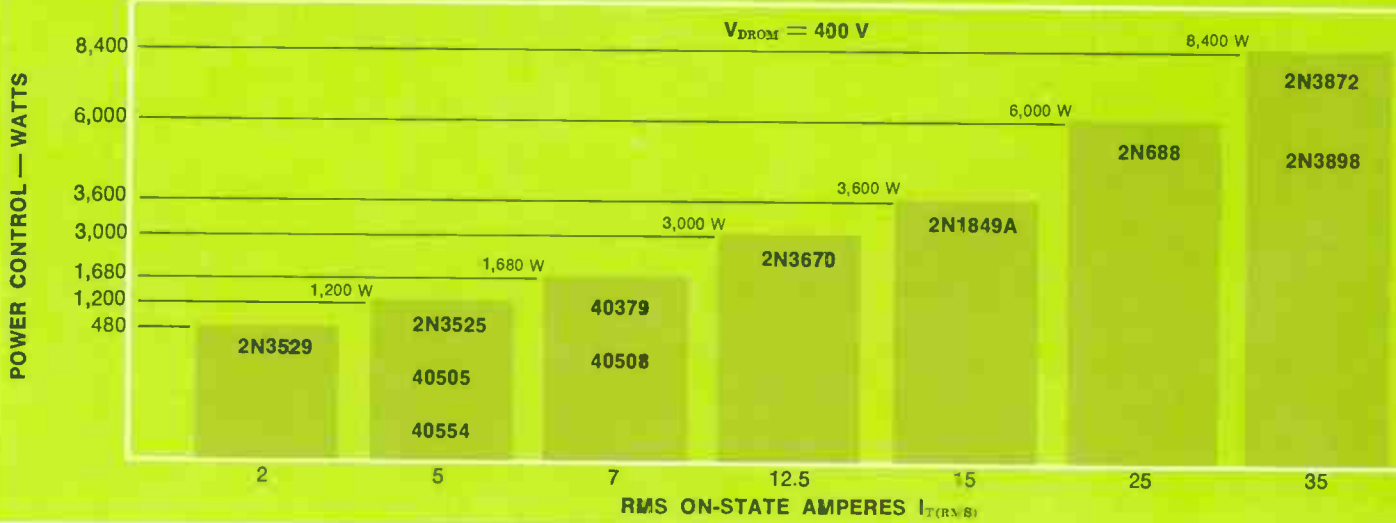


LOW-VOLTAGE OPERATION

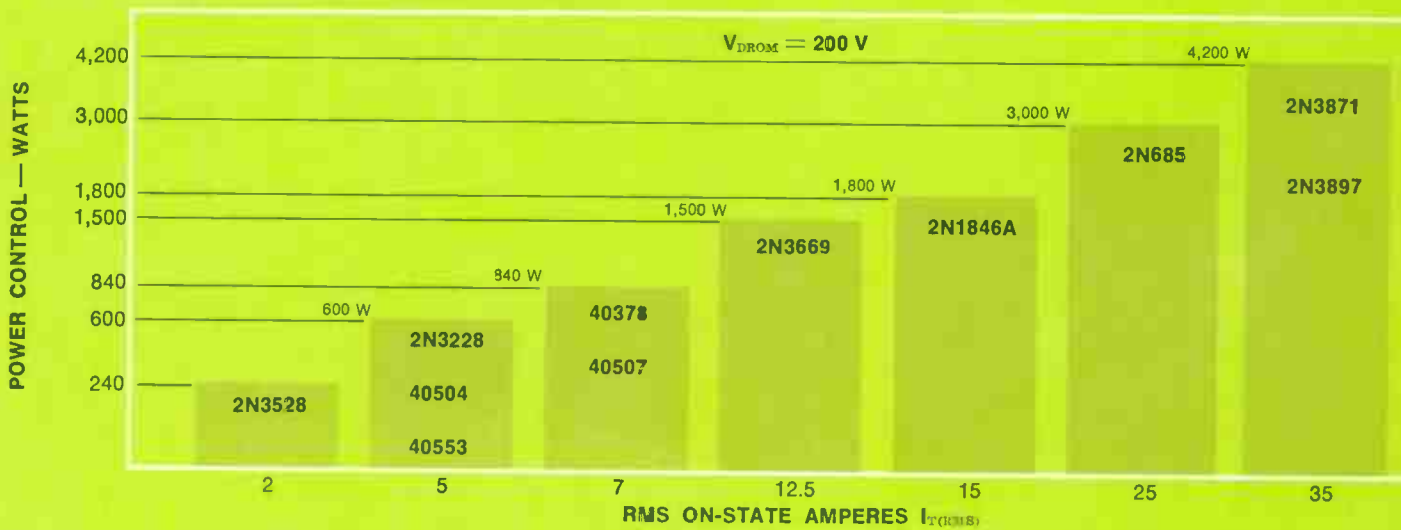


SCR Quick-Selection Charts

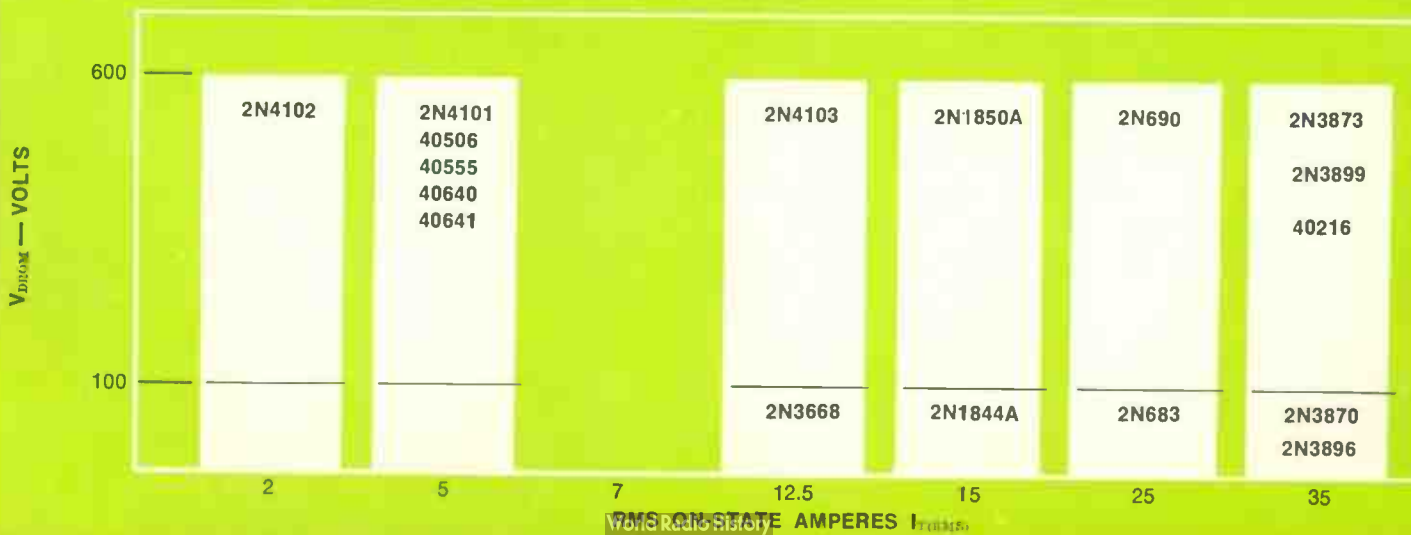
240-V LINE OPERATION



120-V LINE OPERATION



LOW/HIGH VOLTAGE OPERATION



RCA TRIACS... Ratings and Characteristics

RCA Type	Maximum Ratings					Characteristics					Package	RCA DATABOOK BULLETIN FILE NO.	
	V _{DRM} V	I _{T(RMS)} A		I _{TSM} (one cycle) A	T _J °C	COMMUTATION dv/dt (T _J =100°C) V/μs		STATIC dv/dt (T _J =100°C) V/μs		I _{GT} max. (T _C =25°C) mA			
		at T _C °C	Min.			Typ.	Min.	Typ.					
RCA JEDEC 2N-SERIES TYPES	2N5441	200	40	70	300	110	5	30	50	200	80	Press-Fit	337
	2N5442	400	40	70	300	110	5	30	30	150	80	Press-Fit	337
	2N5444	200	40	65	300	110	5	30	50	200	80	Stud (1/4 in.)	337
	2N5445	400	40	65	300	110	5	30	30	150	80	Stud (1/4 in.)	337
	2N5567	200	10	85	100	100	2	5	30	150	40	Press-Fit	
RCA JEDEC 2N-SERIES TYPES	2N5568	400	10	85	100	100	2	5	20	100	40	Press-Fit	
	2N5569	200	10	85	100	100	2	5	30	150	40	Stud (1/4 in.)	
	2N5570	400	10	85	100	100	2	5	20	100	40	Stud (1/4 in.)	
	2N5571	200	15	80	100	100	2	10	30	150	80	Press-Fit	
	2N5572	400	15	80	100	100	2	10	20	100	80	Press-Fit	
RCA JEDEC 2N-SERIES TYPES	2N5573	200	15	80	100	100	2	10	30	150	80	Stud (1/4 in.)	
	2N5574	400	15	80	100	100	2	10	20	100	80	Stud (1/4 in.)	
	40429	200	6	75	100	100	3	10	30	150	40	TO-66	351
	40430	400	6	75	100	100	3	10	20	200	40	TO-66	351
	40431*	200	6	75	100	100	—	5	—	30	*	Modified TO-5	257
RCA JEDEC 2N-SERIES TYPES	40432*	400	6	75	100	100	—	5	—	20	*	Modified TO-5	257
	40485	200	6	75	100	100	3	10	30	150	40	Modified TO-5	352
	40486	400	6	75	100	100	3	10	20	100	40	Modified TO-5	352
	40502	200	6	47†	100	100	3	10	30	150	40	TO-66 w/Rad.	351
	40503	400	6	47†	100	100	3	10	20	200	40	TO-66 w/Rad.	351
RCA JEDEC 2N-SERIES TYPES	40509	200	5.7	25†	100	100	3	10	30	150	40	Mod. TO-5 w/Rad.	352
	40510	400	5.7	25†	100	100	3	10	20	100	40	Mod. TO-5 w/Rad.	352
	40525	100	2.5	60	25	90	—	—	—	5	3	Modified TO-5	261
	40526	200	2.5	60	25	90	—	—	—	5	3	Modified TO-5	261
	40527	400	2.5	60	25	90	—	—	—	5	3	Modified TO-5	261
RCA TYPES	40528	100	2.5	70	25	100	—	—	—	10	10	Modified TO-5	261
	40529	200	2.5	70	25	100	—	—	—	10	10	Modified TO-5	261
	40530	400	2.5	70	25	100	—	—	—	10	10	Modified TO-5	261
	40531	100	2.5	46†	25	90	—	—	—	5	3	Mod. TO-5 w/Rad.	262
	40532	200	2.5	46†	25	90	—	—	—	5	3	Mod. TO-5 w/Rad.	262
RCA TYPES	40533	400	2.5	46†	25	90	—	—	—	5	3	Mod. TO-5 w/Rad.	262
	40534	100	2.5	56†	25	100	—	—	—	10	10	Mod. TO-5 w/Rad.	262
	40535	200	2.5	56†	25	100	—	—	—	10	10	Mod. TO-5 w/Rad.	262
	40536	400	2.5	56†	25	100	—	—	—	10	10	Mod. TO-5 w/Rad.	262
	40511*	200	5.7	25†	100	100	—	5	—	30	*	Mod. TO-5 w/Rad.	263
RCA TYPES	40512*	400	5.7	25†	100	100	—	5	—	20	*	Mod. TO-5 w/Rad.	263
	40575	200	15	70	100	100	—	10	—	40	80	TO-66	300
	40576	400	15	70	100	100	—	10	—	40	80	TO-66	300
	40660	200	30	65	300	100	3	20	40	200	80	Press-Fit	357
	40661	400	30	65	300	100	3	20	25	150	80	Press-Fit	357
RCA TYPES	40662	200	30	60	300	100	3	20	40	200	80	Stud (1/4 in.)	357
	40663	400	30	60	300	100	3	20	25	150	80	Stud (1/4 in.)	357
	40638	200	6	58	100	100	3	10	30	150	40	Heat Spreader	352
	40639	400	6	58	100	100	3	10	20	100	40	Heat Spreader	352
RCA DEV. TYPES	TA7364	200	8	80	100	100	4	10	—	40	80	Plastic	
	TA7365	400	8	80	100	100	4	10	—	30	80	Plastic	

RCA SCR's... Ratings and Characteristics

RCA Type	Maximum Ratings					Characteristics				Package	RCA DATABOOK BULLETIN FILE NO.
	V _{DOM} V	I _{T(RMS)} A		I _{TSM} (one cycle) A	T _J °C	STATIC [■] dv/dt (T _J =100°C) V/μs		I _{GT} max. (T _C =25°C) mA			
		at T _C °C	A			Min.	Typ.				
2N681	25	25	65	150	125	—	—	25*	TO-48	96	
2N682	50	25	65	150	125	—	—	25*	TO-48	96	
2N683	100	25	65	150	125	—	—	25*	TO-48	96	
2N684	150	25	65	150	125	—	—	25*	TO-48	96	
2N685	200	25	65	150	125	—	—	25*	TO-48	96	
2N686	250	25	65	150	125	—	—	25*	TO-48	96	
2N687	300	25	65	150	125	—	—	25*	TO-48	96	
2N688	400	25	65	150	125	—	—	25*	TO-48	96	
2N689	500	25	65	150	125	—	—	25*	TO-48	96	
2N690	600	25	65	150	125	—	—	25*	TO-48	96	
2N1842A	25	15	80	125	125	—	—	45*	TO-48	28	
2N1843A	50	15	80	125	125	—	—	45*	TO-48	28	
2N1844A	100	15	80	125	125	—	—	45*	TO-48	28	
2N1845A	150	15	80	125	125	—	—	45*	TO-48	28	
2N1846A	200	15	80	125	125	—	—	45*	TO-48	28	
2N1847A	250	15	80	125	125	—	—	45*	TO-48	28	
2N1848A	300	15	80	125	125	—	—	45*	TO-48	28	
2N1849A	400	15	80	125	125	—	—	45*	TO-48	28	
2N1850A	500	15	80	125	125	—	—	45*	TO-48	28	
2N3228	200	5	75	60	100	10	200	15	TO-66	114	
2N3525	400	5	75	60	100	10	200	15	TO-66	114	
2N3528	200	2	25†	60	100	10	200	15	TO-8	114	
2N3529	400	2	25†	60	100	10	200	15	TO-8	114	
2N3668	100	12.5	80	200	100	10	100	40	TO-3	116	
2N3669	200	12.5	80	200	100	10	100	40	TO-3	116	
2N3670	400	12.5	80	200	100	10	100	40	TO-3	116	
2N3870	100	35	65	350	100	10	100	40	Press-Fit	94	
2N3871	200	35	65	350	100	10	100	40	Press-Fit	94	
2N3872	400	35	65	350	100	10	100	40	Press-Fit	94	
2N3873	600	35	65	350	100	10	100	40	Press-Fit	94	
2N3896	100	35	65	350	100	10	100	40	¼" Stud	94	
2N3897	200	35	65	350	100	10	100	40	¼" Stud	94	
2N3898	400	35	65	350	100	10	100	40	¼" Stud	94	
2N3899	600	35	65	350	100	10	100	40	¼" Stud	94	
2N4101	600	5	75	60	100	10	200	15	TO-66	114	
2N4102	600	2	25†	60	100	10	200	15	TO-8	114	
2N4103	600	12.5	80	200	100	10	100	40	TO-3	116	
40216	600	900 pk	65	—	125	20	50	80	TO-48	247	
40378	200	7	60	80	100	10	200	15	2-lead, low profile	98	
40379	400	7	60	80	100	10	200	15	2-lead, low profile	98	
40504	200	5	42†	60	100	10	200	15	TO-66 w/Rad.	266	
40505	400	5	42†	60	100	10	200	15	TO-66 w/Rad.	266	
40506	600	5	42†	60	100	10	200	15	TO-66 w/Rad.	266	
40507	200	7	25†	80	100	10	200	15	Mod. TO-5 w/Rad.	265	
40508	400	7	25†	80	100	10	200	15	Mod. TO-5 w/Rad.	265	
40553	200	5	60	80	100	100	250	40	TO-66	306	
40554	400	5	60	80	100	100	250	40	TO-66	306	
40555	600	5	60	80	100	100	250	40	TO-66	306	
40640	600	5	60	80	100	—	—	30	TO-66	354	
40641	600	5	60	80	100	—	—	30	TO-66	354	

RCA JEDEC 2N-SERIES TYPES

RCA TYPES

RCA DIACS... Ratings and Characteristics

RCA Type	Maximum Ratings		Characteristics				Package	RCA DATABOOK BULLETIN FILE NO.
	I _{TRM} (repetitive) (Pulse duration = 30μs duty factor = 0.004) A	T _J °C	V _(BO) (Breakover Voltage) V			Breakover Symmetry V		
			Min.	Typ.	Max.			
1N5411	2	100	29	32	35	±3	DO-26	328
40583	2	100	27	32	37	±3	DO-26	329

*At T_C = +125°C ■ Critical Rate-of-Rise of Off-State Voltage † Ambient Temperature (T_A)

See RCA Technical Bulletins for additional ratings and characteristics.

THYRISTOR CROSS- REFERENCE DIRECTORY

This directory includes more than 175 popular industry thyristors and RCA's nearest types.

Other manufacturers' types having current ratings of 40 amperes rms and below are listed in alpha-numeric sequence for ease of selection.

In most cases, the nearest RCA type is shown on the basis of electrical similarity and not necessarily package design. Consequently, this directory should be used primarily for selection purposes and NOT AS A DIRECT REPLACEMENT GUIDE.

TRIACS		
Other Manufacturer's Devices		Nearest RCA Types
Type No.	Package	
2N5273 2N5274	Stud (1/4 in.) Stud (1/4 in.)	40662 40663
C20 C22	Press-Fit Stud (1/4 in.)	40429, 40485, 2N5567 40429, 40485, 2N5569
GBS-201A GBS-201E GBS-203E GBS-266E GBS-401A	TO-5 TO-66 TO-66 TO-66 TO-5	40526 ^d , 40529 ^e 40575, 2N5567, 2N5569 40526 ^d , 40529 ^e 40429, 40485 40527, 40530
GBS-403E GBS-410E GBS-466E	TO-66 TO-66 TO-66	40527, 40530 40576, 2N5568, 2N5570 40430, 40486
MAC1-4 MAC1-6 MAC2-4 MAC2-6 MAC3-4	ELF (Press-Fit) ELF (Press-Fit) ELF (Stud) ELF (Stud) ELF (3-lead)	40429 ^c , 40485 ^c , 2N5567 ^c 40430 ^c , 40486 ^c , 2N5568 ^c 40429 ^c , 40485 ^c , 2N5569 ^c 40430 ^c , 40486 ^c , 2N5570 ^c 40429 ^c , 40485 ^c , 2N5567 ^c , 2N5569 ^c
MAC3-6	ELF (3-lead)	40430 ^c , 40486 ^c , 2N5568 ^c , 2N5570 ^c
Q-2003 Q-2003T (w/trigger) Q-2005 Q-2005T (w/trigger) Q-2010	Swage-Fit Swage-Fit Swage-Fit Swage-Fit Swage-Fit	40526 ^d , 40529 ^e 40431 40429, 40485, 2N5567, 2N5569 40431 40575, 2N5567, 2N5569
Q-2015 Q-4003 Q-4003T (w/trigger) Q-4005 Q-4005T (w/trigger)	Swage-Fit Swage-Fit Swage-Fit Swage-Fit Swage-Fit	40575, 2N5571, 2N5573 40527, 40530 40432 40430, 40486, 2N5568, 2N5570 40432

Other Manufacturer's Device		Nearest RCA Types
Type No.	Package	
Q-4010 Q-4015	Swage-Fit Swage-Fit	40576, 2N5568, 2N5570 40576, 2N5572, 2N5574
SC35A SC35B SC35D SC35F SC36A	Stud (1/4 in.) Stud (1/4 in.) Stud (1/4 in.) Stud (1/4 in.) Press-Fit	40429, 40485, 2N5569 40429, 40485, 2N5569 40430, 40486, 2N5570 40429, 40485, 2N5569 40429, 40485, 2N5567
SC36B SC36D SC36F SC40A SC40B	Press-Fit Press-Fit Press-Fit Stud (1/4 in.) Stud (1/4 in.)	40429, 40485, 2N5567 40430, 40486, 2N5568 40429, 40485, 2N5567 40429, 40485, 2N5569 40429, 40485, 2N5569
SC40D SC40F SC41A SC41B SC41D	Stud (1/4 in.) Stud (1/4 in.) Press-Fit Press-Fit Press-Fit	40430, 40486, 2N5570 40429, 40485, 2N5569 40429, 40485, 2N5567 40429, 40485, 2N5567 40430, 40486, 2N5568
SC41F SC45A SC45B SC45D SC45F	Press-Fit Stud (1/4 in.) Stud (1/4 in.) Stud (1/4 in.) Stud (1/4 in.)	40429, 40485, 2N5567 40575, 2N5569 40575, 2N5569 40576, 2N5570 40575, 2N5569
SC46A SC46B SC46D SC46F SC50A	Press-Fit Press-Fit Press-Fit Press-Fit Stud (1/4 in.)	40575, 2N5567 40575, 2N5567 40576, 2N5568 40575, 2N5567 40575, 2N5573
SC50B SC50D SC50F SC51A SC51B	Stud (1/4 in.) Stud (1/4 in.) Stud (1/4 in.) Press-Fit Press-Fit	40575, 2N5573 40576, 2N5574 40575, 2N5573 40575, 2N5571 40575, 2N5571
SC51D SC51F	Press-Fit Press-Fit	40576, 2N5572 40575, 2N5571

SCR's

Other Manufacturer's Device		Nearest RCA Types
Type No.	Package	
2N683 2N685 2N688 2N690 2N1597	TO-48 TO-48 TO-48 TO-48 TO-5	2N3870, 2N3896, 2N683 2N3871, 2N3897, 2N685 2N3872, 2N3898, 2N688 2N3873, 2N3899, 2N690 2N3528, 40378
2N1599 2N1601 2N1602 2N1604 2N1772	TO-5 TO-64 TO-64 TO-64 TO-64	2N3529b, 40379 2N3668 2N3228, 40378, 2N3669 2N3525, 40379, 2N3670 2N3668
2N1772A 2N1774 2N1774A 2N1777 2N1777A	TO-64 TO-64 TO-64 TO-64 TO-64	2N3668 2N3228, 40378, 2N3669 2N3228, 40378, 2N3669 2N3525, 40379, 2N3670 2N3525, 40379, 2N3670
2N1844A 2N1846A 2N1849A 2N1850A 2N2326	TO-48 TO-48 TO-48 TO-48 TO-5	2N3870, 2N3896, 2N1844A 2N3871, 2N3897, 2N1846A 2N3872, 2N3898, 2N1849A 2N3873, 2N3899, 2N1850A 2N3528, 40378
2N2348 2N2575 2N2576 2N2578 2N2619	TO-5 TO-41 TO-41 TO-41 TO-64	2N3528, 40378 2N3870, 2N3896 2N3871, 2N3897 2N3872, 2N3898 2N4101, 2N4103
2N3269 2N3270 2N3272 2N3562 2N3755	TO-59 TO-59 TO-59 TO-5 TO-48	2N3668 40378, 2N3669 40379, 2N3670 2N3528, 40378 2N3871, 2N3897
2N3757 2N3579 2N3936 2N3937 2N3939	TO-48 TO-48 TO-64 TO-64 TO-64	2N3872, 2N3898 2N3873, 2N3899 2N3668 2N3228, 40378, 2N3669 2N3525, 40379, 2N3670
2N4316 2N4317 2N4319 2N4442 2N4443	TO-66 TO-66 TO-66 Flat-Pack Plastic Flat-Pack Plastic	2N3668 2N3228, 40378, 2N3669 2N3525, 40379, 2N3670 2N3228, 40378, 2N3669 2N3525, 40379, 2N3670
2N4444	Flat-Pack Plastic	2N4101, 2N4103
C10D C11B C11D C11M	TO-64 TO-64 TO-64 TO-64	2N3670 2N3669 40379, 2N3670 2N4103
C15B C15D C20B C20D C22B C22D	TO-64 TO-64 Press-Fit on Stud Press-Fit on Stud Press-Fit Press-Fit	2N3669 2N3670 2N3669 40379, 2N3670 40378, 2N3669 40379, 2N3670
C32A C32B C32D C33A C33B	Press-Fit Press-Fit Press-Fit Press-Fit Press-Fit	2N3896 2N3897 2N3898 2N3896 2N3897

Other Manufacturer's Device		Nearest RCA Types
Type No.	Package	
C33D C35A C35B C35D C35M	Press-Fit TO-48 TO-48 TO-48 TO-48	2N3898 2N3870, 2N3896 2N3871, 2N3897 2N3872, 2N3898 2N3873, 2N3899
C36A C36B C36D C37A C37B	TO-48 TO-48 TO-48 TO-48 TO-48	2N3870, 2N3896 2N3871, 2N3897 2N3872, 2N3898 2N3870, 2N3896 2N3871, 2N3897
C37D C37M C38A C38B C38D	TO-48 TO-48 TO-48 TO-48 TO-48	2N3872, 2N3898 2N3873, 2N3899 2N3870, 2N3896 2N3871, 2N3897 2N3872, 2N3898
C106B C135A C135B C135D C135M	Flat-Pack Plastic TO-48 TO-48 TO-48 TO-48	2N3528, 2N3228, 40378 2N3870, 2N3896 2N3871, 2N3897 2N3872, 2N3898 2N3873, 2N3899
MCR649-3 MCR649-4 MCR649-6 MCR808-3 MCR808-4	TO-41 TO-41 TO-41 Press-Fit Press-Fit	2N3870, 2N3896 2N3871, 2N3897 2N3872, 2N3898 2N3870, 2N3896 2N3871, 2N3897
MCR808-6 MCR1304-3 MCR1304-4 MCR1304-6 MCR1305-3	Press-Fit Modified TO-5 Modified TO-5 Modified TO-5 Modified TO-5	2N3872, 2N3898 2N3668 2N3228, 40378, 2N3669 2N3525, 40379, 2N3670 2N3668
MCR1305-4 MCR1305-6 MCR1308-3 MCR1308-4 MCR1308-6	Modified TO-5 Stud Modified TO-5 Stud Press-Fit on Stud Press-Fit on Stud Press-Fit on Stud	2N3228, 40378, 2N3669 2N3525, 40379, 2N3670 2N3870, 2N3896 2N3871, 2N3897 2N3872, 2N3898
MCR1604-3 MCR1604-4 MCR1604-6 MCR1605-3 MCR1605-4	TO-5 TO-5 Modified TO-5 Modified TO-5 Modified TO-5	2N3668 2N3228, 40378, 2N3669 2N3525, 40379, 2N3670 2N3668 2N3228, 40378, 2N3669
MCR1605-6 MCR2304-3 MCR2304-4 MCR2304-6 MCR2305-3	Modified TO-5 Press-Fit Press-Fit Press-Fit Press-Fit on Stud	2N3525, 40379, 2N3670 2N3668 2N3228, 40378, 2N3669 2N3525, 40379, 2N3670 2N3668
MCR2305-4 MCR2305-6 MCR2604-3 MCR2604-4 MCR2604-6	Press-Fit on Stud Press-Fit on Stud Press-Fit with Lead Press-Fit with Lead Press-Fit with Lead	2N3228, 40378, 2N3669 2N3525, 40379, 2N3670 2N3668 2N3228, 40378, 2N3669 2N3525, 40379, 2N3670
MCR2605-3 MCR2605-4 MCR2605-6	Press-Fit with Lead Press-Fit with Lead Press-Fit with Lead	2N3668 2N3228, 40378, 2N3669 2N3525, 40379, 2N3670
T1151 T1152 T1154 T13038 T13039	Stud Stud Stud TO-48 TO-48	2N3870, 2N3896 2N3871, 2N3897 2N3872, 2N3898 2N3870, 2N3896 2N3871, 2N3897
T13041 T1C11 T1C12 T1C14	TO-48 TO-3 TO-3 TO-3	2N3872, 2N3898 2N3668 2N3228, 40378, 2N3669 2N3525, 40379, 2N3670

a Trigger volts b Also available having 600V rating (type 2N4102). c Choice depends upon specific current and package requirements.
 d Also available with 100-V rating (type 40525). e Also available with 100-V rating (type 40528).

TRIACS ... Definitions of Terms and Symbols

These terms and symbols follow the latest recommended standards of JEDEC. For convenience, formerly used symbols have been cross-referenced to the new standards.

Triac — A three-terminal, bidirectional-triode thyristor which switches only for positive or negative voltages between Main Terminal 1 and Main Terminal 2.

PRINCIPAL VOLTAGE DEFINITIONS

Repetitive Peak Off-State Voltage — V_{DROM} (Formerly V_{ROM}) — The maximum instantaneous value of principal off-state voltage which may be applied to the thyristor, including all repetitive transient voltages, which will not switch the thyristor from the off-state to the on-state with the gate open and at specified conditions of thyristor junction temperature.

Instantaneous Off-State Voltage — V_D (Formerly V_{BX}) — The instantaneous value of principal voltage, positive or negative, applied between main terminals 1 and 2 when the thyristor is in the off-state.

Instantaneous On-State Voltage — V_T (Formerly V_{AA}) — The instantaneous value of principal voltage, positive or negative, when the thyristor is in the on-state at a given instantaneous current.

Critical Rate-of-Rise of Off-State Voltage — Critical dv/dt — The value of the exponential rate of rise of principal voltage below which switching from the off-state to the on-state will not occur, and above which switching may occur, under specified conditions. This rate of rise is defined as follows:

$$dv/dt = \frac{0.63 V_{DROM}}{t}$$

where t is the time required for the principal voltage to rise from zero to 0.63 of V_{DROM} .

Critical Rate of Applied Commutating Voltage — Commutating dv/dt — The instantaneous rate of rise of principal voltage occurring during commutation which will not cause the thyristor to switch to the on-state under specified conditions.

PRINCIPAL CURRENT DEFINITIONS

RMS On-State Current — $I_{t(RMS)}$ (Formerly I_{ON}) — The RMS value of the principal current when the thyristor is in the on-state.

Instantaneous On-State Current — I_T (Formerly i_{AA}) — The instantaneous value of principal current when the thyristor is in the on-state.

Peak Surge (Non-Repetitive) On-State Current — I_{TSM} (Formerly i_{SM}) — An overload on-state current of specific time duration, and peak value, which may be conducted through the thyristor for one full cycle from an AC supply in a single-phase circuit with a resistive load. The thyristor shall be operating within its specified operating voltage, RMS current, gate power, and temperature ratings prior to the surge current. The surge current may be repeated after sufficient time has elapsed for the device to return to pre-surge thermal equilibrium conditions.

Peak Off-State Current — I_{DROM} (Formerly I_{ROM}) — The current which flows through the main terminals when the thyristor is in the off-state and when the principal voltage is V_{DROM} under specified conditions of junction temperature and with the gate open.

DC Holding Current — I_{HO} (Formerly I_{HOX}) — The minimum principal current required to maintain the thyristor in the on-state, with gate open, for a specified temperature.

GATE DEFINITIONS

DC Gate-Trigger Current — I_{GT} — The minimum gate current which will switch a thyristor from the off-state to the on-state under specified conditions of principal voltage and case temperature.

DC Gate-Trigger Voltage — V_{GT} — The gate voltage required to produce the gate-trigger current necessary to switch a thyristor from the off-state to the on-state for specified conditions of principal voltage and case temperature.

Peak Gate-Trigger Current — I_{GTM} — The maximum gate-trigger current, positive or negative, which is allowed in switching a thyristor from the off-state to the on-state for a specified time duration.

Peak Gate Power Dissipation — P_{GM} — The maximum power which may be dissipated between the gate and main terminal 1 for a specified time duration.

Average Gate Power Dissipation — $P_{G(AV)}$ — The value of gate power which may be dissipated between the gate and main terminal 1 averaged over a full cycle.

MISCELLANEOUS

Principal Voltage is the voltage between the main terminals. The principal voltage is called positive when the potential of main terminal 2 is higher than the potential of main terminal 1.

Principal Current is the current that flows through both main terminals.

Gate-Controlled Turn-On Time — t_{gt} (Formerly t_{on}) — The time interval between the 10 percent point at the beginning of the gate-trigger voltage pulse and the instant when the principal current has risen to the 90 percent point of its peak value during switching of the thyristor from the off-state to the on-state by a gate pulse.

Load Resistance — R_L — The value of fixed resistance connected in series with a main terminal of the thyristor and the power source.

Thermal Resistance, Junction to Case — θ_{J-C} — The temperature difference between the thyristor junction and the thyristor case divided by the power dissipation causing the temperature difference under conditions of thermal equilibrium.

SCR's...Definitions and Symbols

These terms and symbols follow the latest recommended standards of JEDEC. For convenience, formerly used symbols have been cross-referenced to the new standards.

SCR — A three-terminal, reverse-blocking-triode thyristor which switches only for positive anode-to-cathode voltages and exhibits a reverse blocking state for negative anode-to-cathode voltages.

Non Repetitive Peak Reverse Voltage (Open Gate) — V_{RSOM} [Formerly V_{RM} (non-rep)] — The maximum instantaneous value of any non-repetitive transient reverse voltage which occurs across a thyristor whose gate is open.

Repetitive Peak Reverse Voltage (Open Gate) — V_{RRM} [Formerly V_{RM} (rep)] — The maximum instantaneous value of the reverse voltage which may be applied across a thyristor, including all repetitive transient voltages, but excluding all non-repetitive transient voltages, when the gate is open.

Repetitive Peak Off-State Voltage (Open Gate) — V_{DROM} [Formerly $V_{DROM(rep)}$] — The maximum instantaneous value of the off-state voltage which may be applied across a thyristor (when the gate is open), including all repetitive transient voltages, but excluding all non-repetitive transient voltages.

Average On-State Current — $I_{T(AV)}$ (Formerly I_{FAV}) — The principal current, DC value with alternating component, when a thyristor is in the on-state.

RMS On-State Current — $I_{T(RMS)}$ (Formerly I_{FRMS}) — The principal current, total RMS value (at rated conditions), when a thyristor is in the on-state.

Surge (Non-Repetitive) On-State Current — I_{TSM} [Formerly i_{FM} (surge)] — An on-state current of short-time duration and specified waveshape.

RMS Surge (Non-Repetitive) On-State Current — $[I_{TSM}]^2 t$ (Formerly $I^2 t$) — Total RMS value times the interval during which the current is flowing, of an on-state current of short-time duration and specified waveshape.

Rate of Change of On-State Current — di_T/dt (Formerly di/dt) — The maximum value of the rate-of-rise of on-state current which a thyristor can withstand without deleterious effect.

Peak On-State or Off-State Gate Power Dissipation — P_{GM} — The peak instantaneous power dissipated between gate and cathode, of a reverse blocking thyristor, for a specified time.

Average On-State or Off-State Gate Power Dissipation — $P_{G(AV)}$ — The average power dissipated between gate and cathode of a reverse blocking thyristor.

Instantaneous Forward Breakover Voltage (Open Gate) — $V_{F(BRO)}$ (Formerly V_{BOO}) — The instantaneous principal voltage at the break-over point with the gate open.

Peak Off-State Current (Open Gate) — I_{DOM} (Formerly I_{FROM}) — The maximum principal current when a thyristor is in the off-state.

Repetitive Peak Reverse Current (Open Gate) — I_{RRM} (Formerly I_{RROM}) — The peak instantaneous reverse current when the thyristor is in the reverse blocking state.

Instantaneous On-State Voltage — v_T (Formerly v_T) — The instantaneous principal voltage when the thyristor is in the on-state.

Average Trigger Current — I_{GT} — The minimum gate current, DC value, required to switch a thyristor from the off-state to the on-state.

Average Trigger Voltage — V_{GT} — The minimum gate-to-cathode voltage, DC value, required to produce the gate trigger current.

Instantaneous Holding Current — i_H (Formerly i_{HOO}) — The instantaneous minimum principal current required to maintain the thyristor in the on-state.

Instantaneous On-State Current — I_T (Formerly i_{AA}) — The instantaneous value of the principal current for a positive anode-to-cathode voltage.

Critical Rate of Applied Forward Voltage — Critical dv/dt — The minimum value of the rate of applied forward voltage which will cause the thyristor to switch from the off-state to the on-state under specified conditions. This rate-of-rise is defined as follows:

$$dv/dt = \frac{0.63 V_{DROM}}{t}$$

where t is the time required for the principal voltage to rise from zero to 0.63 of V_{DROM} .

Gate Controlled Turn-On Time — t_{RT} (Formerly t_{on}) — The time interval between a specified point at the beginning of the gate pulse and the instant when the principal voltage has dropped to a specified low value (or current has risen to a specified high value) during switching of a thyristor from off-state to the on-state by a gate pulse.

Circuit Commutated Turn-Off Time — t_q (Formerly t_{off}) — The time interval between the instant when the principal current has decreased to zero after external switching of the principal voltage circuit and the instant when the thyristor is capable of supporting a specified principal voltage without turning on.

MISCELLANEOUS

Principal Voltage is the voltage between cathode and anode terminals. The principal voltage is called positive when the potential of the anode is higher than the potential of the cathode.

Principal Current is the current that flows through both the cathode and anode terminals.

Load Resistance — R_L — The value of fixed resistance connected in series with the anode of the thyristor and the power source.

Thermal Resistance, Junction-to-Case — θ_{J-C} — The temperature difference between the thyristor junction and the thyristor case divided by the power dissipation causing the temperature difference under conditions of thermal equilibrium.

APPLICATION INFORMATION for RCA Thyristors (SCR's and TRIACS)

- AN-3418 Design Considerations for the RCA-40216 Silicon Controlled Rectifier in High-Current Pulse Applications
- AN-3469 Application of RCA Silicon Controlled Rectifiers to the Control of Universal Motors
- AN-3551 Circuit Factor Charts for Use in Applications with RCA Thyristors (SCR's and TRIAC's)
- AN-3697 TRIAC Power-Control Applications
- AN-3778 Light Dimmers using TRIAC's
- AN-3822 Thermal Considerations in Mounting of RCA Thyristors

- KM-71 RCA Silicon Controlled Rectifier Experimenter's Manual
- SC-13 RCA Transistor Manual
- SP-50 RCA Silicon Power Circuits Manual
- ST-2855 Electronic Heat Controls for Appliances and Domestic Heating
- ST-3492 Commutating dv/dt and its Relationship to Bidirectional Triode Thyristor Operation in Full-Wave AC Power-Control Circuits
- ST-3693 Device Developments and Applications of RCA Thyristors

Product Guide

Guide to RCA Semiconductor Products

Transistors

Rectifiers

Photocells

Thyristors (SCR'S and Triacs)

Integrated Circuits

TABLE OF CONTENTS

SEMICONDUCTOR DEVICES 4-29

• Transistors

AUDIO FREQUENCY (AF) APPLICATIONS — LINEAR OPERATION

Small-Signal Types — Class A

Silicon

n-p-n — P_T : to 5 W Chart 1 4

Germanium

p-n-p — P_T : to 165 mW Chart 2 5

n-p-n — P_T : to 20 mW Chart 3 5

Power Types — Class A, AB, B

Silicon

n-p-n — P_T : to 7 W Chart 4 6

n-p-n — P_T : above 7 to 29 W Chart 5 7

n-p-n — P_T : above 29 to 150 W Chart 6 8

p-n-p — P_T : to 7 W Chart 7 9

Germanium

n-p-n — P_T : to 100 mW Chart 8 9

p-n-p/n-p-n (complementary symmetry types) — P_T : to 300 mW Chart 9 9

p-n-p — P_T : to 30 W Chart 10 10

High-Voltage Types

Germanium

p-n-p — $V_{CB0(peak)}$: -100 to -320 V Chart 11 10

Silicon

n-p-n — V_{CB0} : 120 to 500 V Chart 12 11

RADIO FREQUENCY (RF) APPLICATIONS — LINEAR and CLASS C OPERATION

Small-Signal Types

MOS (Field-Effect) Silicon — N Channel

SINGLE INSULATED GATE

$G_{ps}(typ)$: to 25.8 dB Chart 13 12

DUAL INSULATED GATE

$G_{ps}(typ)$: to 18 dB Chart 14 12

Silicon

n-p-n (VHF-HF) — f_T : to 700(typ) MHz Chart 15 12

n-p-n (UHF-VHF) — f_T : to 1200(min) MHz Chart 16 13

Germanium

p-n-p — f_T (typ): to 132 MHz Chart 17 14

Power Types

Silicon (feature "overlay" construction)

n-p-n — $P_{OE}(min)$: 0.01 to 30 W Chart 18 15

SWITCHING AND PULSE APPLICATIONS — COMPUTER and POWER

Computer (Low-Level) Types

Medium-Speed Switching

Silicon

n-p-n — f_T (min): to 175 MHz Chart 19 16

p-n-p — f_T (min): to 60 MHz Chart 20 16

High-Speed Logic Switching

Silicon

n-p-n — f_T (min): 200 to 600 MHz Chart 21 17

High-Voltage Types

Silicon-High-Current Types (high-speed, memory driver)

n-p-n — f_T (min): 250 to 600 MHz Chart 22 17

page(s)

page(s)

SWITCHING AND PULSE APPLICATIONS — cont'd

Chopper and Multiplex Service

MOS (Field-Effect) Silicon — N Channel

SINGLE INSULATED GATE — 150 mW Chart 23 17

Low- and Medium-Speed Logic Switching

Germanium

p-n-p — f_T (min): to 50 MHz Chart 24 18

n-p-n — $f_{HFB}(min)$: to 15 MHz Chart 25 18

High-Voltage Types

Germanium

p-n-p — $V_{CB0(max)}$: to -105 V Chart 26 18

Power Types

Low-Speed Switching Operation

Silicon

n-p-n — P_T : to 8.75 W Chart 27 19

n-p-n — P_T : above 8.75 to 75 W Chart 28 20

n-p-n — P_T : above 75 to 150 W Chart 29 21

p-n-p — P_T : to 7 W Chart 30 21

Germanium

p-n-p — P_T : to 30 W Chart 31 22

High-Voltage Types

Silicon

n-p-n — $V_{CE0(max)}$: 120 to 350 V Chart 32 22

• Diodes

TUNNEL DIODES Chart 33 23

GERMANIUM DIODES

Damper Types — For TV Applications Chart 34 23

Compensating Types — For Temperature and Voltage Variations Chart 35 23

• Rectifiers

SILICON RECTIFIERS

Consumer, Low-Power Industrial, and Military Applications

$I_{F(AV)}$: to 2A Chart 36 24

High-Power Industrial and Military Applications

$I_{F(AV)}$: above 2 to 40A Chart 37 25

SILICON RECTIFIER STACKS

For High Voltage Applications

$V_{RM(rep)}$: 1265 to 12,000 V Chart 38 26

SILICON RECTIFIER BRIDGES — FULL-WAVE TYPES

For High Current Applications —

Single-Phase Operation

$I_{F(AV)}$: to 70A Chart 39 27

Three-Phase Operation

$I_{F(AV)}$: to 92A Chart 40 27

SILICON RECTIFIERS — Plug-In Types for

Electron-Tube Replacements Chart 41 27

• Thyristors

TRIACS — GATED BIDIRECTIONAL

$I_{T(RMS)}$: to 15A Chart 42 28

SILICON CONTROLLED RECTIFIERS

I_{TRM} : to 900A (Pulse Type) Chart 43 28

$I_{T(RMS)}$: to 35A Chart 44 29

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TABLE OF CONTENTS (continued)

	page(s)		page(s)
INTEGRATED CIRCUITS	30-33		
• Linear Applications			
DC, AF Amplifier	Chart 45	30	
Multipurpose Wide-Band Power Amplifier	Chart 45	30	
Video and Wide-Band Amplifiers	Chart 45	30	
IF, RF Amplifiers	Chart 45	30	
Differential/Cascode Amplifiers	Chart 45	30	
FM IF Amplifiers	Chart 46	31	
FM IF Amplifiers/Discriminators/ AF Amplifiers	Chart 46	31	
Transistor and Diode Arrays	Chart 46	31	
Ultra-High-Gain Wide-Band Amplifier Arrays	Chart 46	31	
Dual Darlington Arrays	Chart 46	31	
Operational Amplifiers	Chart 47	32	
• Digital Applications			
Ultra-High- and High-Speed ECCSL Circuits ..	Chart 48	33	
Low-Power DTL Circuits	Chart 48	33	
RCA PROTOTYPES WITH ASSOCIATED ATTACHED-RADIATOR OR FLANGE TYPES..	Chart 49	34	
RCA TYPES SUPPLIED WITH MOUNTING HARDWARE	Chart 50	34	
RCA PROTOTYPES WITH ASSOCIATED HIGH-RELIABILITY TYPES	Chart 51	34	
RCA TYPES OFFERING MILITARY-TYPE RELIABILITY CONTROL	Chart 52	34	
RECOMMENDED RCA TRANSISTOR PAIRS FOR COMPLEMENTARY-SYMMETRY APPLICATIONS	Chart 53	34	
RCA MILITARY SPECIFICATION TYPES		35	
Transistors and Rectifiers	Chart 54	35	
PHOTOCELLS — SOLID-STATE PHOTO- CONDUCTIVE DEVICES		35	
Broad-Area Cadmium-Sulfide Types (5100Å) Glass-Metal (1" dia., TO-8, TO-5, TO-18)	Chart 55	35	
Glass-Metal Dual-Element (TO-5)	Chart 55	35	
Broad-Area Cadmium Sulfo-Selenide Types (6150Å) Glass-Metal (1" dia., TO-8, TO-5, TO-18)	Chart 55	35	
OUTLINES		36-37	
INDEX		38-42	
SYMBOLS—FOR SEMICONDUCTOR DEVICES....		43	

The RCA PRODUCT GUIDE has a two-fold function. It may be used independently as a handy quick-reference and selection guide and is an integral part of the RCA SEMICONDUCTOR PRODUCTS DATABOOK (SPD-100).

HOW TO USE THE PRODUCT GUIDE

If you are looking for DATA ON A SPECIFIC TYPE NUMBER

REFER TO INDEX. Locate the desired number which is listed in numerical-alphabetical-numerical order.

NOTE THE CHART NO. AND LINE NO. for reference to data for the specific type contained in the PRODUCT GUIDE.

NOTE THE DATA-SHEET FILE NO. for quick reference to the individual Data Sheets.

If you are looking for a TYPE FOR A SPECIFIC APPLICATION

REFER TO THE TABLE OF CONTENTS. Locate the appropriate Selection Chart in one of the three major categories (Audio Frequency — Radio Frequency — Switching and Pulse). Separate charts are provided for integrated circuits, rectifiers, diodes, thyristors, and photocells.

REFER TO THE SPECIFIC CHART for a selected list of RCA types arranged in order of a significant rating or characteristic. For complete data on a specific type, under consideration, note the DATABOOK FILE No. and refer to the Data Sheet(s) in the RCA SEMICONDUCTOR PRODUCTS DATABOOK.

AUDIO FREQUENCY

small-signal types

TRANSISTORS

for LINEAR OPERATION

CHART **1**

Data given at 25°C; for higher temperatures, see data sheets

P_T (T_A): to 1 W
(T_C): to 5 W

RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS					CHARACTERISTICS						LINE NO
				P_T		V_{CBO}	V_{CEO}	I_C	h_{fe}		h_{FE}		NF at 1kHz max dB	f_T min MHz	
				T_A W	T_C W				min	I_C mA	min	I_C mA			
40231	71	[low noise high-dissipation high beta]	TO-104	0.5	1	18	18	0.1	55	2	—	—	2.8 ^a	60 ^f	1
40232	71		TO-104	0.5	1	18	18	0.1	90	2	—	—	2.8 ^a	60 ^f	2
40233	71		TO-104	0.5	1	18	18	0.1	90	2	—	—	2 ^a	60 ^f	3
40234	71-107		TO-104	0.5	1	18	18	0.1	35	2	—	—	2.8 ^a	60 ^f	4
2N718A	36	low noise	TO-18	0.5	1.8	75	32	1	35	5	40	150 ^e	12	60	5
2N720A	36	low noise	TO-18	0.5	1.8	120	80	1	45	5	40	150 ^e	—	50	6
2N2895	143	[military and industrial]	TO-18	0.5	1.8	120	65	1	50	5	40	150 ^e	8	120	7
2N2896	143		TO-18	0.5	1.8	140	90	1	50	5	60	150 ^e	—	120	8
2N2897	143		TO-18	0.5	1.8	60	45	1	50	5	50	150 ^e	—	100	9
40084	40	low noise	TO-18	0.5	1.8	60	40 ^d	1	5 ^b	50	50	150 ^e	8	100	10
2N4074	221	[hi peak current]	TO-104	0.5	2	40	40	0.3	75	10	50	100	—	50	11
2N5183	291		TO-104	0.5	2	18	18	1	70	10	40	300	—	125	12
40397	221		TO-104	0.5	2	25	25	0.2	165	10	100	100	—	50	13
40398	221		TO-104	0.5	2	25	25	0.2	75	10	50	100	—	50	14
40399	221		TO-104	0.5	2	18	18	0.2	165	10	100	100	—	50	15
40400	221	[high-voltage breakdown capability]	TO-104	0.5	2	18	18	0.2	75	10	50	100	—	50	16
2N3241A	221		TO-104	0.5	2	30	25	r	100	10	100	10	2.5 ^a	175 ^f	17
2N3242A	221		TO-104	0.5	2	40	40	r	125	10	125	10	2 ^a	175 ^f	18
2N697	16		TO-5	0.6	2	60	40 ⁿ	0.5	2.5 ^b	50	40	150 ^e	—	50	19
2N699	22	TO-5	0.6	2	120	80 ⁿ	1	35	1	40	150 ^e	—	50	20	
40450	221	[very low noise]	J	1	2	30	25	r	100	10	100	10	2.5 ^a	175 ^f	21
40451	221		J	1	2	40	40	r	125	10	125	10	2 ^a	175 ^f	22
40452	221		J	1	2	40 ^z	40	0.3	75	10	50	100	—	50	23
40453	221		J	1	2	25 ^z	25	0.2	165	10	100	100	—	50	24
40454	221		J	1	2	25 ^z	25	0.2	75	10	50	100	—	50	25
40455	221	[integral radiator version of 2N3241A, 2N3242A, 2N4074, 40397, 40398, 40399, 40400 respectively]	J	1	2	18 ^z	18	0.2	165	10	100	100	—	50	26
40456	221		J	1	2	18 ^z	18	0.2	75	10	50	100	—	50	27
40458	224	[ind. version of 2N3241A family]	TO-104	0.5	2	60	40	1	75	10	100	10	—	150	28
40459	224		J	1	2	60	40	1	75	10	100	10	—	150	29
2N1613	106		TO-5	0.8	3	75	50 ⁿ	1	30	1	40	150	12	60	30
2N1711	26	low noise	TO-5	0.8	3	75	50 ⁿ	1	70	5	100	150	8	70	31
2N1893	34		TO-5	0.8	3	120	80 ^d	0.5	45	5	40	150	—	50	32
2N2102	106		TO-5	1	5	120	65 ^d	1	40	1	40	150	6	120	33
2N2270	24		TO-5	1	5	60	45 ^d	1	30	5	50	150	6	60	34
2N2405	34		TO-5	1	5	120	90 ^d	1	50	5	60	150	6	120	35
2N3053	145	low leakage	TO-5	1	5	60	40 ^d	0.7	5 ^b	50	50	150	—	100	36

^a Typical value at 10kHz

ⁿ $V_{CE(sus)}$

^b At 20MHz

^r Limited by dissipation

^d $V_{CE0(sus)}$

^z V_{CEV}

^e Pulsed

^f Typical value

- for:
- Audio amplifiers
 - Direct-coupled amplifiers
 - Driver stages

- Preamplifiers
- Video amplifiers
- Voltage amplifiers

TRANSISTORS

AUDIO FREQUENCY

small-signal types

for LINEAR OPERATION

$P_T (T_A)$: to 165 mW

Data given at 25°C; for higher temperatures, see data sheets

CHART 2

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS			CHARACTERISTICS						
					P_T <small>at T_A mW</small>	V_{CBO} V	I_C mA	h_{fe}			NF <small>max dB</small>	f_{hfb}		
								<small>at 1kHz min</small>	I_C mA	V_{CE} V		<small>typ MHz</small>	I_C mA	V_{CB} V
1	2N175 [†]	14	[Use 2N2613]	TO-40	50	-10	-2	—	—	—	6	0.85	-0.5	-4
2	2N220 [†]	14		TO-1	50	-10	-2	—	—	—	6	0.85	-0.5	-4
3	2N591	82	low noise	TO-1	85	-32	-40	40	-2	-12	—	—	—	—
4	2N2613	51		TO-1	120	-30	-50	120	-0.5	-4	4	10	-0.5	-4.5
5	2N2614	51	TO-1	120	-40	-50	100	-1	-6	—	10	-1	-12	
6	2N2953	65	high gain Use 40490	TO-1	120	-30	-150	200	-10	-10	—	10	-1	-12
7	40263 [‡]	79		TO-1	120	-20	-50	100	-1	-6	—	10	-1	-6
8	40395	107	high beta	TO-1	120	-20	-50	170	-1	-6	—	10	-1	-6
9	40359	208		TO-1	120	-20	-50	40	-1	-6	—	10	-1	-6
10	40490	253		TO-1	120	-20	-20	170	-1	-6	—	10	-1	-6
11	40329	97	[Use 2N217]	TO-1	125	-25	-100	75	-10	-10	—	1.5	-1	-6
12	2N104 [†]	14		TO-40	150	-30	-50	44 [†]	-1	-6	—	0.7	-0.2	-3
13	2N215 [†]	14	Use 2N406	TO-1	150	-30	-50	44 [†]	-1	-6	—	0.7	-0.2	-3
14	2N405 [†]	14		TO-40	150	-20	-35	—	—	—	—	0.65	-1	-6
15	2N406	59	TO-1	150	-20	-35	—	—	—	—	0.65	-1	-6	
16	2N109 [†]	14	Use 2N217	TO-40	165	-35	-150	50	-1	-6	—	—	—	—
17	2N217	52		TO-1	165	-35	-150	50	-1	-6	—	—	—	—

Germanium

P-N-P

Small-Signal
Types

Class A

[†] Typical value

[‡] For new equipment design, refer to type given in FEATURES column.

[‡] Not recommended for new equipment design.

$P_T (T_A)$: to 20 mW

Data given at 25°C; for higher temperatures, see data sheets

CHART 3

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS			CHARACTERISTICS						
					P_T <small>T_A mW</small>	V_{CBO} V	I_C mA	h_{fe}			NF <small>max dB</small>	f_{hfb}		
								<small>at 1kHz typ</small>	I_C mA	V_{CE} V		<small>typ MHz</small>	I_C mA	V_{CB} V
1	2N1010 [†]	14	Use 2N2613-PNP or 40233-NPN	TO-1	20	10	2	35	0.3	3.5	3	2	0.3	3.5

Germanium

N-P-N

Small-Signal
Type
Class A

[†] For new equipment design, refer to type given in FEATURES column.

- for:
- Hearing aids
 - High-fidelity amplifiers
 - Microphone preamplifiers
 - Preamplifiers
 - Tape recorders

AUDIO FREQUENCY

power types

TRANSISTORS

for LINEAR OPERATION

CHART 4

Data given at 25°C; for higher temperatures, see data sheets

P_T (T_C): up to 7 W
 P_T (T_A): up to 3.8 W

Silicon

N-P-N

Power Types

Class A-AB-B

RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS					CHARACTERISTICS					LINE NO
				P _T		V _{CB0} V	V _{CEO} V	I _C A	hFE			f _T		
				T _C or T _M F W	T _A W				I _C min	I _C mA	V _{CE} V	typ MHz	min MHz	
40354	113	low noise low leakage	TO-104	—	0.5	—	150	0.05	55	10	10	100	50	1
40355	113		J	—	1	—	150	0.05	typ.	10	10	100	50	2
40407	219		TO-5	—	1	—	50 ^d	0.7	40	1	10	100	—	3
40408	219		TO-5	—	1	—	90 ^d	0.7	40	10	4	100	—	4
2N2895	143		TO-18	1.8	0.5	120	65 ^d	1	40	150°	10	—	120	5
2N2896	143	very low noise	TO-18	1.8	0.5	140	90 ^d	1	60	150°	10	—	120	6
2N2897	143		TO-18	1.8	0.5	60	45 ^d	1	50	150°	10	—	100	7
40084	40		TO-18	1.8	0.5	60	40	1	50	150°	10	—	100	8
2N3241A	221	integral radiator version of 2N3241A, 2N3242A, 2N4074, 40397, 40398, 40399, 40400 respectively	TO-104	2	0.5	30	25	r	100	10	10	175	—	9
2N3242A	221		TO-104	2	0.5	40	40	r	125	10	10	175	—	10
2N697	16	low leakage low saturation voltage exceptionally linear transfer characteristics	TO-5	2	0.6	60	40 ^j	0.5	40	150°	10	—	50	11
2N699	22		TO-5	2	0.6	120	80 ⁿ	1	40	150°	10	—	50	12
2N4074	221		TO-104	2	0.5	—	40	0.3	50	100	1	80	50	13
40397	221		TO-104	2	0.5	—	25	0.2	100	100	1	80	50	14
40398	221		TO-104	2	0.5	—	25	0.2	50	100	1	80	50	15
40399	221	[very low noise] integral radiator version of 2N3241A, 2N3242A, 2N4074, 40397, 40398, 40399, 40400 respectively	TO-104	2	0.5	—	18	0.2	100	100	1	80	50	16
40400	221		TO-104	2	0.5	—	18	0.2	50	100	1	80	50	17
40450	221		J	2	1	30	25	r	100	10	10	175	—	20
40451	221		J	2	1	40	40	r	125	10	10	175	—	21
40452	221		J	2	1	40 ^r	40	0.3	50	100	1	80	50	22
40453	221		J	2	1	25 ^r	25	0.2	100	100	1	80	50	23
40454	221	J	2	1	25 ^r	25	0.2	50	100	1	80	50	24	
40455	221	J	2	1	18 ^r	18	0.2	100	100	1	80	50	25	
40456	221	J	2	1	18 ^r	18	0.2	50	100	1	80	50	26	
2N1613	106	TO-5	3	0.8	75	50 ⁿ	1	40	150°	10	—	60	28	
2N1711	26	low-noise type hometaxial base; greater power handling capability; freedom from second breakdown	TO-5	3	0.8	75	50 ⁿ	1	100	150°	10	—	70	29
2N1893	34		TO-5	3	0.8	120	80 ^d	0.5	40	150°	10	—	50	30
2N1479	135		TO-5	5	—	60	40 ^d	1.5	20	200	4	1.3	—	31
2N1480	135		TO-5	5	—	100	55 ^d	1.5	20	200	4	1.3	—	32
2N1481	135		TO-5	5	—	60	40 ^d	1.5	35	200	4	1.3	—	33
2N1482	135		TO-5	5	—	100	55 ^d	1.5	35	200	4	1.3	—	34
2N1700	141		TO-5	5	—	60	40 ^d	1	20	100	4	1.3	—	35
2N2102	106		TO-5	5	1	120	65 ^d	1	40	150°	10	—	120	36
2N2270	24		TO-5	5	1	60	45 ^d	1	50	150°	10	—	60	37
2N2405	34		TO-5	5	1	120	90 ^d	1	60	150°	10	—	120	38
2N3053	145	economical high-quality performance in audio amplifiers	TO-5	5	1	60	40 ^d	0.7	50	150°	10	—	100	39
40309	78		TO-5	5	1	—	18 ^d	0.7	70	50	4	100	—	40
40311	78		TO-5	5	1	—	30 ^d	0.7	70	50	4	100	—	41
40314	78		TO-5	5	1	—	40 ^d	0.7	70	50	4	100	—	42
40315	78		TO-5	5	1	—	35 ^d	0.7	70	50	4	100	—	43
40317	78	high-reliability	TO-5	5	1	—	40 ^d	0.7	40	10	4	—	—	44
40320	78		TO-5	5	1	—	40 ^d	0.7	40	10	4	—	—	45
40321	78		TO-5	5	1	—	300 ^c	1	25	20	10	—	—	46
40323	78		TO-5	5	1	—	18 ^d	0.7	70	50	4	100	—	47
40326	78		TO-5	5	1	—	40 ^d	0.7	40	10	4	—	—	48
40327	78	40538 pnp complt	TO-5	5	1	—	300 ⁿ	1	40	20	10	—	—	49
40360	78		TO-5	5	1	—	70 ^d	0.7	40	10	4	100	—	50
40361	78		TO-5	5	1	—	70 ⁿ	0.7	70	50	4	100	—	51
40366	215		TO-5	5	1	120	65 ^d	1	40	150°	10	—	—	52
40367	215		TO-5	5	1	100	55 ^d	1.5	35	200	4	—	—	53
40385	215	integral mounting flange	TO-5	5	1	450	350 ^d	1	40	20	10	—	—	54
40539	303		TO-5	5	1	—	55 ⁿ	0.7	15	500 ^c	4	100	—	54a
40409	219		D	—	3	—	90 ⁿ	0.7	50	150	4	100	—	55
40389	145		D	—	3.5	60	40 ^d	0.7	50	150°	10	—	100	56
40390	64		D	—	3.5	300	250 ^d	1	40	20	10	—	15	57
40392	145	integral mounting flange	C	7	—	60	40 ^d	0.7	50	150°	10	—	100	58
40544	303		C	7	—	—	50 ⁿ	0.7	35	50	4	100	—	59

^d V_{CEO(sus)} ^e Pulsed ^j V_{CEr} ⁿ V_{CEr(sus)} ^r Limited by dissipation ^z V_{CEV}

- for: • AF amplifiers • Inverters • Output stages • Pulse amplifiers • Regulators
• Driver stages • Oscillators • Predriver stages • Push-pull stages • Servo amplifiers

TRANSISTORS

AUDIO FREQUENCY

power types

for LINEAR OPERATION

CHART 5

P_T (T_c): above 7 to 29 W
(T_A): 3.5 to 5.8 W

Data given at 25°C; for higher temperatures, see data sheets

LINE NO.	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS				CHARACTERISTICS						
					P _T		V _{CB0} V	V _{CEO} V	I _c A	hFE			f _T		
					T _c or T _M F W	T _A W				I _c mA	V _{CE} V	typ MHz	min MHz		
1	40423	117	[for printed-circuit boards]	E	—	3.8	300	300 ^k	0.15	50	50	10	25	—	
2	40425	79-117		E	—	3.8	300	300 ^m	0.15	30	30	10	25	—	
3	40427	117		E	—	3.8	300	300 ^k	0.15	20	20	10	25	—	
4	40491	253		E	—	3.8	300	300	0.15	30	50	10	25	—	
5	40422	117		TO-66	8	—	300	300 ^k	0.15	50	50	10	25	—	
6	40424	79-117	[line-operated TV audio output]	TO-66	8	—	300	300 ^m	0.15	30	30	10	25	—	
7	40426	117		TO-66	8	—	300	300 ^k	0.15	20	20	10	25	—	
7a	40546	305		TO-66	8	—	—	250 ^k	0.15	50	50	10	25	—	
7b	40547	305		TO-66	8	—	—	250 ^k	0.15	20	50	10	25	—	
8	40347	88		TO-5	8.75	1	60	40	1.5	20	450	4	1.1	—	
9	40348	88		TO-5	8.75	1	90	65	1.5	30	300	4	1.1	—	
10	40349	88		TO-5	8.75	1	160	140	1.5	25	150	4	1.1	—	
11	40347V1	88		[for printed-circuit boards]	D	—	4.4	60	40	1.5	20	450	4	1.1	—
12	40348V1	88			D	—	4.4	90	65	1.5	30	300	4	1.1	—
13	40349V1	88			D	—	4.4	160	140	1.5	25	150	4	1.1	—
14	2N3439	64	TO-5		10	1	450	350 ^d	1	40	20	10	—	15	
15	2N3440	64	TO-5	10	1	300	250 ^d	1	40	20	10	—	15		
16	2N4063	64	[integral flange]	C	10	—	450	350 ^d	1	40	20	10	—	15	
17	2N4064	64		C	10	—	300	250 ^d	1	40	20	10	—	15	
18	40346	211		TO-5	10	1	—	175 ^j	1	25	10	10	—	10	
19	40412	211		TO-5	10	1	—	250	1	40	30	20	—	10	
20	40347V2	88		C	11.7	—	60	40	1.5	20	450	4	1.1	—	
21	40348V2	88	[hometaxial base integral flange]	C	11.7	—	90	65	1.5	30	300	4	1.1	—	
22	40349V2	88		C	11.7	—	160	140	1.5	25	150	4	1.1	—	
23	2N4296	201		TO-66	20	2	350	250	1	50	50	10	—	20	
24	2N4297	201		TO-66	20	2	350	250	1	75	50	10	—	20	
25	2N4298	201		TO-66	20	2	500	350	1	25	50	10	30	20	
26	2N4299	201		TO-66	20	2	500	350	1	50	50	10	30	20	
27	40250V1	112	[for printed-circuit boards]	E	—	5.8	50	40	4	25	1.5A	4	1.2	—	
28	40372	145		E	—	5.8	90	55 ^d	4	25	0.5	4	1.2	—	
29	40373	146		E	—	5.8	160	140	3	20	0.5	4	1.2	—	
30	40374	138		E	—	5.8	250	175 ^d	2	10	1	10	—	15	
31	40375	299		E	—	5.8	120	50 ^d	7	50	500	5	—	60	
32	2N1483	137	[hometaxial base greater current handling capability; freedom from second breakdown]	TO-8	25	—	60	40 ^d	3	20	750	4	1.2	—	
33	2N1484	137		TO-8	25	—	100	55 ^d	3	20	750	4	1.2	—	
34	2N1485	137		TO-8	25	—	60	40 ^d	3	35	750	4	1.2	—	
35	2N1486	137		TO-8	25	—	100	55 ^d	3	35	750	4	1.2	—	
36	2N1701	141	[high reliability hometaxial base]	TO-8	25	—	60	40 ^d	2.5	20	300	4	1.2	—	
37	2N3441	146		TO-66	25	—	160	140 ^d	3	20	500	4	1.2	—	
38	40368	215		TO-8	25	—	100	55	3	35	750	4	1.2	—	
39	2N3054	145		TO-66	29	—	90	55 ^d	4	25	500	4	1.2	—	
40	40250	112		TO-66	29	—	50	40	4	25	1.5A	4	1.2	—	
41	40310	78	[economical high-quality performance in audio amplifiers]	TO-66	29	—	—	35 ^d	4	20	1A	2	1.2	—	
42	40312	78		TO-66	29	—	—	60 ⁿ	4	20	1A	2	1.2	—	
43	40316	78		TO-66	29	—	—	40 ⁿ	4	20	1A	2	1.2	—	
44	40324	78		TO-66	29	—	—	35 ^d	4	20	1A	2	1.2	—	

Silicon

N-P-N

Power Types

Class A-AB-B

^d V_{CE0}(sus) ^e Pulsed ^j V_{CER} ^k V_{CEX}(sus) ^m V_{CEX} ⁿ V_{CER}(sus)

- for:
- DC amplifiers
 - Inverters
 - Oscillators
 - Push-pull stages
 - Driver stages
 - Mobile radio AF amplifiers
 - Portable communications
 - Servo amplifiers
 - High-fidelity amplifiers
 - Operational amplifiers
 - AF stages
 - Ultrasonic equipment

AUDIO FREQUENCY

power types

TRANSISTORS

for LINEAR OPERATION

CHART 6

Data given at 25°C; for higher temperatures, see data sheets

P_T (Tc): above 29 to 150 W

Silicon

N-P-N

Power Types

Class A-AB-B

RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS				CHARACTERISTICS					LINE NO.
				PT <small>Tc or TMF W</small>	VCBO <small>V</small>	VCEO <small>V</small>	Ic <small>A</small>	hFE			ft		
								min	Ic <small>A</small>	VCE <small>V</small>	typ <small>MHz</small>	min <small>MHz</small>	
2N3583	138		TO-66	35	250	175 ^d	2	10	10	10	—	15	1
2N3584	138		TO-66	35	375	250 ^d	2	25	1	10	—	15	2
2N3585	138		TO-66	35	500	300 ^d	2	25	1	10	—	15	3
2N3878	299		TO-66	35	120	50 ^d	7	50	0.5	5	—	60	4
2N3879	299		TO-66	35	120	75 ^d	7	40	0.5	5	—	60	5
2N4240	138		TO-66	35	500	300 ^d	2	30	0.75	10	—	15	6
40313	78	economical high-quality performance in audio amplifiers	TO-66	35	—	300 ⁿ	2	40	0.5	10	—	—	7
40318	78		TO-66	35	—	300 ⁿ	2	50	0.5	10	—	—	8
40322	78		TO-66	35	—	300 ⁿ	2	75	0.5	10	—	—	9
40328	78		TO-66	35	—	300 ⁿ	2	20	1	10	—	—	10
40364	78		TO-66	35	—	60 ⁿ	7	35	0.5	5	15	—	11
40464 ^u	237	high min. beta of 50 at 2A	TO-3	40	35	35	5	40	1	1	—	2	12
40465 ^u	237		TO-3	40	40	40	5	70	1	1	—	3	13
40466 ^u	237		TO-3	40	50	50	5	70	1	1	—	3	14
2N4395 ^u	234		TO-3	62.5	60	40	5	75	1	1	7	4	15
2N4396 ^u	234		TO-3	62.5	80	60	5	60	1	1	7	4	16
2N1487	139	hometaxial base greater current handling capability; freedom from second breakdown	TO-3	75	60	40 ^d	6	15	1.5	4	1	—	17
2N1488	139		TO-3	75	100	55 ^d	6	15	1.5	4	1	—	18
2N1489	139		TO-3	75	60	40 ^d	6	25	1.5	4	1	—	19
2N1490	139		TO-3	75	100	55 ^d	6	25	1.5	4	1	—	20
2N1702	141		TO-3	75	60	40	5	15	0.8	4	1	—	21
40369	215	silicone plastic case; mounts in TO-3 socket	TO-3	75	100	55	6	25	1.5	4	1	—	22
2N5034	244		T	83	55	40 ^d	6	20	2.5 ^e	4	—	0.8	23
2N5036	244		T	83	70	50 ^d	8	20	2.5 ^e	4	—	0.8	24
40514	244		T	83	—	45 ^e	6	20	2.5 ^e	4	—	0.8	25
2N5035	244		silicone-plastic case; for printed circuits	U	83	55	40 ^d	6	20	2.5 ^e	4	—	0.8
2N5037	244	U		83	70	50 ^d	8	20	2.5 ^e	4	—	0.8	27
40513	244	U		83	—	45 ⁿ	6	20	2.5 ^e	4	—	0.8	28
40542	304	silicone plastic case fits TO-3 socket	T	83	—	50 ⁿ	6	20	2.5 ^e	4	—	0.8	28a
40543	304		T	83	—	60 ⁿ	8	20	3 ^e	4	—	0.8	28b
2N3263	54		L	84	150	90 ^d	25	25	15 ^e	3	—	20	29
2N3264	54	L	84	120	60 ^d	25	20	15 ^e	3	—	20	30	
2N4347	207	hometaxial base	TO-3	100	140	120	5	20	2	4	0.8	—	31
2N3055	145		TO-3	115	100	60 ^d	15	20	4	4	1	—	32
40363	78		TO-3	115	—	70 ⁿ	15	20	4	4	1	—	33
2N3442	207	hometaxial base	TO-3	117	160	140	10	20	3	4	0.8	—	34
40251	112		TO-3	117	50	40	15	15	8	4	1	—	35
40325	78	hometaxial base aerospace-MIL-ind	TO-3	117	—	35 ^d	15	12	8	4	1	—	36
2N4348	213		TO-3	120	140	120	10	15	5	4	0.7	—	37
2N3265	54		TO-63	125	150	90 ^d	25	25	15 ^e	3	—	20	38
2N3266	54		TO-63	125	120	60 ^d	25	20	15 ^e	3	—	20	39
2N2015	12		TO-36	150	100	50 ^d	10	15	5	4	1	—	40
2N2016	12	hometaxial base greater current capability; freedom from second breakdown	TO-36	150	130	65 ^d	10	15	5	4	1	—	41
2N2338	141		TO-36	150	60	40 ^d	7.5	15	3	4	1	—	42
2N3771	140		TO-3	150	50	40	15	15	15 ^e	4	1	—	43
2N3772	140		TO-3	150	100	60	10	15	10 ^e	4	0.9	—	44
2N3773	213		TO-3	150	160	140	16	15	8 ^e	4	0.7	—	45
40411	219	TO-3	150	—	90 ⁿ	30	35	4	4	0.7	—	46	

^d V_{CEO(sus)}

^e Pulsed

ⁿ V_{CE(sus)}

^u Not recommended for new equipment design.

- for:
- DC amplifiers
 - Oscillators
 - Push-pull stages
 - Servo amplifiers
 - Drivers
 - Output power stages
 - Regulators — current, series, shunt, voltage
 - High-fidelity amplifiers
 - Public-address amplifiers

TRANSISTORS

AUDIO FREQUENCY

power types

for LINEAR OPERATION

$P_T (T_c)$: up to **7 W**

Data given at 25°C; for higher temperatures, see data sheets

CHART **7**

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS					CHARACTERISTICS				
					P_T		V_{CBO}	V_{CEO}	I_C	h_{FE}		f_T		
					T_c W	T_A W				V	V	A	min	I_C mA
1	40319	78	audio driver audio output	TO-5	5	1	-40 ^d	-40	-0.7	35	-50	-4	100	—
2	40362	78		TO-5	5	1	—	-70 ⁿ	-0.7	35	-50	-4	100	—
2a	40537	302		TO-5	5	1	—	-55 ⁿ	-0.7	50	-50	-4	100	—
2b	40538	302		TO-5	5	1	—	-55 ⁿ	-0.7	15	-500 ^e	-4	100	—
3	40406	219		TO-5	5	1	-50 ^d	-50	-0.7	20	-0.1	-10	100	—
4	40410	219	[for printed circuit boards]	D	—	3	—	-90 ⁿ	-0.7	50	-150	-4	100	—
5	40391	216		D	—	3.5	-60	-40	-1	50	-150	-10	—	60
6	2N4036	216	integral flange	TO-5	7	1	-90	-65	-1	40	-150	-10	—	60
7	2N4037	216		TO-5	7	1	-60	-40	-1	50	-150	-10	—	60
8	2N4314	216		TO-5	7	1	-90	-65	-1	50	-150	-10	—	60
9	40394	216		C	7	1	-60	-40	-1	50	-150	-10	—	60

Silicon

P-N-P

Power
Types

Class
A-AB

^d $V_{CE0(sus)}$

ⁿ $V_{CEr(sus)}$

FOR RECOMMENDED RCA N-P-N COMPLEMENTARY-SYMMETRY TYPES, SEE CHART 53.

for: • Driver stages

$P_T (T_A)$: up to **100 mW**

Data given at 25°C; for higher temperatures, see data sheets

CHART **8**

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS			CHARACTERISTICS				
					P_T	V_{CBO}	I_C	h_{FE}		G_{PE}	I_{CBO}	
								T_A mW	V			mA
1	2N647	108		TO-1	100	25	100	70	50	1	54	14
2	2N649	108		TO-1	100	20	100	65	50	1	54	14

Germanium

N-P-N

Power
Types

Class
A-AB-B

FOR RECOMMENDED RCA P-N-P COMPLEMENTARY-SYMMETRY TYPES, SEE CHART 53.

$P_T (T_c)$: up to **300 mW**

Data given at 25°C; for higher temperatures, see data sheets

CHART **9**

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS			CHARACTERISTICS				
					P_T	V_{CBO}	I_C	$V_{CE} (sat)$		h_{FE}		I_{CBO}
								T_c mW	V	A	max V	
1	40396	107	[matched pair I—PNP type I—NPN type]	TO-1	300	-18	-0.5	-0.5	-250	30	-250	-14
2	40396	107		TO-1	300	18	0.5	0.5	250	30	250	14

Germanium

P-N-P N-P-N

Complementary
Symmetry
Power Types

for: • AF output-amplifier stages

AUDIO FREQUENCY

power types

for LINEAR OPERATION

TRANSISTORS

CHART 10

Data given at 25°C; for higher temperatures, see data sheets

$P_T (T_c)$: 0.65 to 30 W

Germanium

P-N-P

Power Types

Class A-AB-B

RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS					CHARACTERISTICS				
				P_T		V_{CBO} V	V_{CEO} V	I_c A	h_{FE}			f_T	
				T_c or T_{MF} W	T_A W				min	I_c A	V_{CE} V	typ MHz	min MHz
40253 ^o	73	Use 2N408	TO-1	0.65	0.125	-25	-25	-0.5	50	-0.4	-1	1	—
2N407	14		TO-40	—	0.15	-20	-18	-70	65 ^f	-0.05	-1	—	—
2N408	59		TO-1	—	0.15	-20	-18	-70	65 ^f	-0.05	-1	—	—
2N270	62		TO-7	—	0.275	-25	—	-0.75	70 ^f	-0.15	-1	1	—
2N1183	4		TO-8	—	7.5	1	-45	-20	-3	20	-0.4	-2	—
2N1183A	4		TO-8	7.5	1	-60	-30	-3	20	-0.4	-2	—	—
2N1183B	4		TO-8	7.5	1	-80	-40	-3	20	-0.4	-2	—	—
2N1184	4		TO-8	7.5	1	-45	-20	-3	40	-0.4	-2	—	—
2N1184A	4		TO-8	7.5	1	-60	-30	-3	40	-0.4	-2	—	—
2N1184B	4		TO-8	7.5	1	-80	-40	-3	40	-0.4	-2	—	—
2N176 ^o	14		Use 2N2869/ 2N301 extended freq. range low-distortion	TO-3	10	—	-40	—	-3	63 ^f	-0.5	-2	—
2N351 ^o	14	TO-3		10	—	-40	—	-3	65 ^f	-0.7	-2	—	—
2N376 ^o	14	TO-3		10	—	-40	—	-3	78 ^f	-0.7	-2	—	—
2N2147	204	TO-3		12.5	—	-75	-50	-5	100	-1	-1	4	3
2N2148	204	TO-3		12.5	—	-60	-40	-5	60	-1	-1	3	2
40022	69	AF high-fidelity $I_c = 5A$ 25-watt output	TO-3	12.5	—	-32	-32 ^l	-5	38	-1	-2	0.3	—
40050	67		TO-3	12.5	—	-40	-40	-5	50	-1	-2	0.5	—
40051	67		TO-3	12.5	—	-50	-50	-5	50	-1	-2	0.5	—
40254	69		TO-3	12.5	—	-32	-32 ^l	-5	30	-1	-2	0.3	—
40421	115		TO-3	12.5	—	-75	-50	-5	62	-1	-2	2	—
40462	220	low idling current AF high-fidelity	TO-3	12.5	—	-40	-40	-5	50	-1	-2	0.6	—
2N2869/ 2N301	53		TO-3	30	—	-60	-50	-10	50	-1	-2	0.45	0.2
2N2870/ 2N301A	53		TO-3	30	—	-80	-50	-10	50	-1	-2	0.45	0.2
2N1905	17	high linear beta high voltage	TO-3	30	—	-100	-50	-6	50	-1	-2	4	2
2N1906	17		TO-3	30	—	-130	-60	-6	75	-1	-2	5	3

^f Typical value

^l For new equipment design, refer to type given in FEATURES column.

^j V_{CEr}

^o Not recommended for new equipment design.

- for:
- Automobile radio AF output
 - High-fidelity amplifiers
 - Mobile communications AF output
 - Output amplifiers
 - Phonograph amplifiers
 - Ultrasonic oscillators
 - Wide-band amplifiers

AUDIO FREQUENCY

high-voltage types

for LINEAR OPERATION

CHART 11

Data given at 25°C; for higher temperatures, see data sheets

V_{CBO} (peak): to -320 V

Germanium

P-N-P

High-Voltage Types

RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS			CHARACTERISTICS		
				V_{CBO} peak V	P_T T_{MF} at 55°C W	I_c A	V_{CE} (sat)		T_A (opr) max °C
							max V	I_c A	
2N3732	205,206	transistor complement for TV deflection systems	TO-3	-100	3	-3	-2	-0.7	85
2N3730	205,206		TO-3	-200	10	-3	-2	-0.7	85
40440	205		TO-3	-200	5	-10	-0.75	-6	85
2N3731	205		TO-3	-320	5	-10	-1.5	-6	85
2N4346	206		TO-3	-320	5	-10	-0.75	-6	85
40439	205		TO-3	-320	5	-10	-1.5	-6	85

- for:
- High-energy deflection
 - Horizontal drivers
 - Horizontal output amplifiers
 - Incandescent-lamp indicators
 - Indicator counters
 - Neon indicators
 - Relays
 - TV applications
 - Vertical output amplifiers

V_{CB0}: 120 to 500 V

Data given at 25°C; for higher temperatures, see data sheets

CHART **12**

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS			CHARACTERISTICS					
					V _{CB0} V	P _T		I _C A	h _{FE}			C _{ob0} max pF	f _T min MHz
						T _C or T _{MF} W	T _A W		I _C min	I _C mA	V _{CE} V		
1	2N2102	106	low noise	TO-5	120	5	1	1	10	0.01	10	15	120
2	2N2405	34		TO-5	120	5	1	1	35	10	10	15	120
3	2N3264	54	[aerospace, MIL and industrial]	L	120	84	—	25	20	15A°	3	—	20
4	2N3266	54		TO-63	120	125	—	25	20	15A°	3	—	20
5	2N3878	299		TO-66	120	35	—	7	50	500	5	175	60
6	2N3879	299		TO-66	120	35	—	7	40	500	5	175	60
7	2N4390	225		TO-104	120	—	0.5	r	20	20	1	C _{cb} =6	50
8	2N5184	292		TO-104	120 ^p	—	0.5	0.05	10	50	10	C _{cb} =	50
9	2N5185	292	integral heat sink	J	120 ^p	—	1	0.05	10	50	10	[3.5]	50
10	40366	215		TO-5	120	5	1	1	10	0.01	10	15	—
11	40375	299	for printed ckts.	E	120	—	5.8	1	50	500	5	175	60
12	2N2016	12		TO-36	130	150	—	10	15	5A	4	400	1 ^f
13	2N4347	207	[hometaxial base]	TO-3	140	100	—	5	20	2A	4	—	0.8 ^f
14	2N4348	213		TO-3	140	120	—	10	15	5A	4	—	0.7 ^f
15	2N3263	54	[aerospace, MIL and industrial]	L	150	84	—	25	25	15A°	3	—	20
16	2N3265	54		TO-63	150	125	—	25	25	15A°	3	—	20
17	2N4068	109	[wide-band amplifier]	TO-104	150	—	0.5	0.2	30	30	10	3.5	50
18	2N4069	109		J	150	—	1	0.2	30	30	10	3.5	50
19	40354	113		TO-104	150 ^p	—	0.5	0.05	55 ^f	10	10	—	50
20	40355	113	integral heat sink	J	150 ^p	—	1	0.05	55 ^f	10	10	—	50
21	2N3441	146		TO-66	160	29	—	3	20	500	4	—	1.2 ^f
22	2N3442	207	[hometaxial base]	TO-3	160	117	—	10	20	3A	4	—	0.8 ^f
23	2N3773	213		TO-3	160	150	—	30	15	8A°	4	—	0.7 ^f
24	40349	88		TO-5	160	5	1	1	25	150	4	—	1 ^f
25	40373	146	[for printed circuits]	E	160	29	5.8	3	20	500	4	—	1.2 ^f
26	40349V1	88		D	160	—	4.4	1.5	25	150	4	—	1 ^f
27	40349V2	88	integral flange	C	160	11.7	—	1.5	25	150	4	—	1 ^f
28	40346	211		TO-5	175	5	1	1	25	10	10	—	10
29	2N3583	138		TO-66	250	35	—	2	40	100	10	120	15
30	40374	138	for printed ckts.	E	250	35	5.8	2	40	100	10	120	15
31	2N3440	64		TO-5	300	10	1	1	40	20	10	10	15
32	2N4064	64	integral flange	C	300	10	—	1	40	20	10	10	15
33	40390	64	for printed ckts.	D	300	—	3.5	1	40	20	10	10	15
34	40422	117		TO-66	300	8	—	0.15	50	50	10	—	25 ^f
35	40423	117		E	300	—	3.8	0.15	50	50	10	—	25 ^f
36	40424	79, 117	high voltage high f _T	TO-66	300	8	—	0.15	30	50	10	5	25 ^f
37	40425	79, 117	low feedback capacitance	E	300	—	3.8	0.15	30	50	10	typ	25 ^f
38	40426	117		TO-66	300	8	—	0.15	20	50	10	—	25 ^f
39	40427	117		E	300	—	3.8	0.15	20	50	10	—	25 ^f
40	2N4296	201	[high voltage high speed]	TO-66	350	20	2	1	50	50	10	C _{cb} =	20
41	2N4297	201		TO-66	350	20	2	1	75	50	10	3.8 typ	20
42	2N3584	138		TO-66	375	35	—	2	25	1A	10	120	15
43	2N3439	64		TO-5	450	10	1	1	40	20	10	10	15
44	2N4063	64	integral flange	C	450	10	—	1	40	20	10	10	15
45	40385	215	high reliability	TO-5	450	5	1	1	40	20	10	—	—
46	2N3585	138		TO-66	500	35	—	2	40	100	10	120	15
47	2N4240	138		TO-66	500	35	—	2	30	750	10	120	15
48	2N4298	201	[high voltage high speed]	TO-66	500	20	2	1	25	50	10	C _{cb} =	20
49	2N4299	201		TO-66	500	20	2	1	50	50	10	3.8 typ	20

Silicon
N-P-N

High-Voltage Types
Class A-AB-B

^p Pulsed ^f Typical value ^p V_{CE0} ^f Limited by dissipation

- for:
- AF amplifiers
 - Differential amplifiers
 - Operational amplifiers
 - Public address amplifiers
 - Video amplifiers
 - Controls (industry)
 - High-fidelity amplifiers
 - Oscillators
 - Regulators: series-shunt
 - Wide-band amplifiers
 - Deflection amplifiers
 - Neon indicator drivers
 - Power output amplifiers
 - Servo amplifiers
 - Ultrasonic amplifiers

RADIO FREQUENCY small-signal types

for LINEAR OPERATION

TRANSISTORS

CHART 13

Data given at $T_A = 25^\circ\text{C}$; for higher temperatures, see data sheets

G_{ps} (typ): to 25.8 dB

MOS FET Silicon <small>SINGLE INSULATED GATE</small> N-Channel Small-Signal Types <small>Depletion Types</small>	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	CHARACTERISTICS							MAX. RATINGS			LINE NO					
					G_{ps}		NF		at oper. freq.		g_{fs}		I_{GSS}			C_{rss}		V_{DS} V	I_D mA	P_T mW
					typ	dB	typ	dB	mHz	min	max	typ	pF	min		max	nA			
	3N143	309	Mixer	High- unneu- tralized power gain	TO-72	13.5 ^e	—	100	5000	1	0.12	20	50 ^e	100	1					
	3N139	284	RF Amp		TO-72	14	4	200	3000	1	0.2	35	50 ^e	400	2					
	3N128	309	RF Amp	Low feed- back capa- cittance	TO-72	16	3.5	200	5000	0.05	0.13	20	50 ^e	400	3					
	3N152	314	RF Amp.		TO-72	17	2.5	200	5000	1	0.12	20	50 ^e	400	3a					
	40467	—	RF Amp	TO-72	15	4.5	200	7500 ^f	0.2	0.12	20	50 ^e	400	4						
	3N142	286	RF Amp	Square- law-trans- fer char.	TO-72	24	4	100	4000	1	0.12	20	50 ^e	400	5					
	40468	287	RF Amp		TO-72	24	4	100	7500 ^f	0.2	0.12	20	20	375	6					
	40559	287	Mixer		TO-72	25.8 ^e	—	100	7500 ^f	1	0.12	20	20	400	7					

^eMixer conversion gain ^fPulsed ^fTypical value

for: • Attenuators, variable • Controls, industrial • Electrometers • Mixers • VHF amplifiers

CHART 14

Data given at 25°C ; for higher temperatures, see data sheets

G_{ps} (typ): to 18 dB

MOS FET Silicon <small>DUAL INSULATED GATE</small> N-Channel Small-Signal Types <small>Depletion Types</small>	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	CHARACTERISTICS							MAX. RATINGS			LINE NO					
					G_{ps}		NF		at oper. freq.		g_{fs}		I_{GSS}			C_{rss}		V_{DS} V	I_D mA	P_T mW
					typ	dB	typ	dB	mHz	typ	max	typ	max	typ		max	pF			
	3N140	285	RF Amp	Very low X-modu- lation & feedback capac.	TO-72	18	3.5	200	10000	1	0.03	5.5	20	50 ^e	150	1				
	3N141	285	Mixer		TO-72	18 ^e	—	200	10000	1	0.03	5.5	20	50 ^e	150	2				

^eMixer conversion gain ^ePulsed

for: • CATV & MATV equipment • Mixers • VHF amp. • Receivers: aircraft, communications, CB, marine, TV

CHART 15

Data given at 25°C ; for higher temperatures, see data sheets

f_T (min): to 250 MHz
 f_T (typ): to 700 MHz

Silicon N-P-N Small-Signal VHF-HF Class A-B-C	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	CHARACTERISTICS				TYP. OPER.		MAX. RATINGS		LINE NO	
					f_T		NF		G_{pe}		V_{CBO} V	I_C mA		
					min	typ	max	oper. freq.	dB	oper. freq.				dB
	40354	113	[TV video output]	TO-104	50	100	—	—	—	—	[$V_{CBO} = 150V$]	50	1	
	40355	113		J	50	100	—	—	—	—		50	2	
	2N2270	24		TO-5	60	—	6	1	—	—		60	1A	3
	2N2897	143	mil. & indust. genl. purpose	TO-18	100	—	—	—	—	—	60	1A	4	
	2N3053	145		TO-5	100	—	—	—	—	—	60	700	5	
	40084	40	[low noise genl. purpose]	TO-18	100	—	8	1	—	—	60	1A	6	
	2N2102	106		TO-5	120	—	6	1	—	—	120	1A	7	
	2N2405	34	[genl. purpose in military and industrial equip.]	TO-5	120	—	6	1	—	—	120	1A	8	
	2N2895	143		TO-18	120	—	8	1	—	—	120	1A	9	
	2N2896	143		TO-18	120	—	—	—	—	—	140	1A	10	
	2N5188	295		[Class C service high reliability]	TO-39	250	325	—	—	—	—	60	r	11
	2N5189	296	V		250	—	—	—	—	—	60	r	12	
	2N5181	290	[low noise RF-IF types]	TO-104	—	700	3.5 [†]	200	29.9	200	45	50	13	
	2N5182	290		TO-104	—	700	4.5 [†]	200	29.5	200	45	4	14	
	40469 [‡]	254		RF Amp	TO-104	—	700	3.3 [†]	200	28	200	45	50	15
	40470 [‡]	254		IF Amp	TO-104	—	700	—	—	45.8	44	45	50	16
	40471 [‡]	254		IF Amp	TO-104	—	700	—	—	45.8	44	45	50	17

[†]Typical value

[†]Limited by dissipation

[‡]Not recommended for new equipment design.

for: • Citizens band • Converters • IF-RF amplifiers • Oscillators • Video amplifiers
• Communications • Frequency multipliers • Mixer-Oscillators • TV receivers

f_T (min): above **250 to 1200 MHz**

Data given at 25°C; for higher temperatures, see data sheets

CHART 16

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	CHARACTERISTICS				TYP. OPER.		MAX. RATINGS	
					f_T		NF		G_{pe}		V_{CBO} V	I_C mA
					min MHz	typ MHz	max dB	oper freq MHz	dB	oper freq MHz		
1	40405 ^u	105	Use 40519	TO-52	300	850	—	—	6	240	40 ^a	500
2	40519	278	freq. multiplier	TO-52	300	850	—	—	5.5	240	40 ^a	500
3	2N917	81	[low-noise genl. purpose types]	TO-72	500	—	3.5 ^f	60	11.5	200	30	r
4	2N918	83		TO-72	600	—	6	60	21	200	30	50
5	2N4081 ^u	271		TO-104	600	—	3.5	200	19 ^s	200	40	r
6	2N4397 ^u	272		TO-104	600	—	5	450	11.5 ^s	450	40	r
7	2N5180	289	genl. purp. type	TO-104	650	900	4.5	200	12 ^s	200	30	r
8	2N2708	57	[low-noise high-gain rf ampl. to 500 MHz — very low C_{cb} hi reliab. 2N2708]	TO-72	700	—	7.5	200	15 ^s	200	35	r
9	2N4934	252		TO-104	700	—	3.5	200	18 ^s	200	40	r
10	2N4935	252		TO-104	700	—	3	200	21 ^s	200	50	r
11	2N4936	252		TO-104	700	—	4.5	450	20	450	50	r
12	40295	203		TO-72	700	—	7.5	60	15 ^s	200	35	r
13	2N3478	77	ampl. upto 470MHz	TO-104	750	900	5 ^f	470	12	470	30	r
14	2N4259	200	low C_{cb}	TO-104	750	—	5	450	11.5	450	40	r
15	40238	99	[for TV IF amplifiers]	TO-104	—	800	—	—	45.3	45	45	50
16	40239	99		TO-104	—	800	—	—	45.3	45	45	50
17	40240	99		TO-104	—	800	—	—	45.3	45	45	50
18	40242	95		RF Amp	TO-104	—	—	2.5 ^f	100	38.3	100	45
19	40243	95	Mixer	TO-104	—	—	—	100	37.6 ^o	100	45	50
20	40244	95	Osc	TO-104	—	—	—	—	oscillator	—	45	50
21	40245	95	IF Amp	TO-104	—	—	—	—	51.4	10.7	45	50
22	40246	95	IF Amp	TO-104	—	—	—	—	51.4	10.7	45	50
23	40478	250	RF Amp	TO-104	—	800	2.5 ^f	100	37	100	45	50
24	40479	250	Mixer	TO-104	—	800	—	—	35 ^e	100	45	50
25	40480	250	Osc	TO-104	—	800	—	—	oscillator	—	45	50
26	40481	250	IF Amp	TO-104	—	860	—	—	51	10.7	45	50
27	40482	250	IF Amp	TO-104	—	860	—	—	51	10.7	45	50
28	40472	251	RF Amp	TO-104	—	900	3.3 ^f	200	29.6	200	45	50
29	40473	251	Mixer	TO-104	—	900	—	—	22.7 ^o	200	45	50
30	40474	251	Osc	TO-104	—	900	—	—	oscillator	—	45	50
31	40475	251	IF Amp	TO-104	—	800	—	—	45.6	44	45	50
32	40476	251	IF Amp	TO-104	—	800	—	—	45.6	44	45	50
33	40477	251	IF Amp	TO-104	—	800	—	—	45.6	44	45	50
34	40235	99	RF Amp	TO-104	—	1000	3.3 ^f	216	29.1	216	45	50
35	40236	99	Mixer	TO-104	—	1000	—	—	19 ^o	216	45	50
36	40237	99	Osc	TO-104	—	1000	—	—	oscillator	—	45	50
37	2N3932	101	uhf-vhf	TO-104	750	—	5 ^f	450	11.5 ^s	200	30	r
38	2N3933	101	[low-noise types]	TO-104	750	—	5 ^f	450	14 ^s	200	40	r
39	2N3600	83	[very low noise types]	TO-72	850	—	4.5	200	17 ^s	200	30	r
40	2N2857	61	[very low noise types]	TO-72	1000	—	4.5	450	12.5 ^s	450	30	40
41	2N5179	288	meets Mil. spec.	TO-72	1000	1400	4.5	200	15 ^s	200	20	50
42	40294	202	hi reliab. 2N2857	TO-72	1000	—	4.5	450	12.5 ^s	450	30	40
43	40296	246	hi reliab. 2N3839	TO-72	1000	—	3.4	450	12.5 ^s	450	30	40
44	2N3839	229	low noise	TO-72	1000	—	3.4	450	12.5 ^s	450	30	40
45	40413	258	Similar to 2N2708	Each shipment of the 40413 and 40414 is accompanied by a certified summary of the electrical and environmental tests								
46	40414	259	Similar to 2N2857									
47	40517	276	[meets M.I. specs.]	TO-72	1000	1900	3.4	450	12.5	450	30	40
48	40518	277	[uhf, low noise]	High-reliability version of type 40517.								
49	2N5109	281	overlay type	TO-39	1200	—	3 ^f	200	11 ^s	200	40	400

Silicon

N-P-N

Small-Signal Types

UHF-VHF

Class

A-B-C

^o Mixer conversion gain; rf through if frequency range ^f Typical value ^a V_{CES} ^r Limited by dissipation. ^s Minimum value
^u Not recommended for new equipment design.

- for:
- CATV & MATV amplifiers
 - Citizens band
 - Converters
 - IF-RF amplifiers
 - Oscillators
 - Video amplifiers
 - Communications
 - Frequency multipliers
 - Mixer-Oscillators
 - TV receivers

RADIO FREQUENCY

small-signal types

TRANSISTORS

for LINEAR OPERATION

CHART 17

Data given at 25°C; for higher temperatures, see data sheets

f_T (typ): to 132 MHz
 f_{hfb} (typ): to 140 MHz

Germanium

P-N-P

Small-Signal Types

RCA Type	File No.	Features	Package <small>See Outlines Section</small>	CHARACTERISTICS		TYP. OPER.		MAX. RATINGS			LINE NO.
				f_T typ. MHz	f_{hfb} typ. MHz	G_{pe} dB	<small>oper freq</small> MHz	V_{CBO} V	I_C mA	P_T mW	
2N139 ^a	14	Use 2N1638 or 40262	TO-40	14	4.7	37	0.455	-16	-15	80	1
2N218 ^a	14		TO-1	14	4.7	37	0.455	-16	-15	80	2
2N409 ^a	14		TO-40	14	6.7	37.8	0.455	-13	-15	80	3
2N410 ^a	14		TO-1	14	6.7	37.8	0.455	-13	-15	80	4
2N140 ^a	14		TO-40	16.5	10	32	1	-16	-15	80	5
2N219 ^a	14	Use 2N1639 or 40261	TO-1	16.5	10	32	1	-16	-15	80	6
2N411 ^a	14		TO-40	16.5	10	32	1	-13	-15	80	7
2N412 ^a	14		TO-40	16.5	10	32	1	-13	-15	80	8
40262 ^a	79		TO-1	30	—	56	0.455	-34	-10	80	9
40488	253	complement for line-operated receivers includes 40490, 1 & 5	TO-1	30	—	oscillator		-12	-10	80	10
40489	253		TO-1	30	—	56	0.455	-50	-10	80	11
40487	253		TO-1	40	—	53 ^a	1.5	-50	-10	80	12
40261 ^a	79		TO-1	40	—	53	1.5	-34	-10	80	13
2N274	2		TO-44	—	30	22	12.5	-40	-10	120	14
2N1224	2	TO-33	—	30	22	12.5	-40	-10	120	15	
2N1226	2	Use 2N1524	TO-33	—	30	22	12.5	-60	-10	120	16
2N1395	2		TO-33	—	30	22	12.5	-40	-10	120	17
2N1524	111		TO-1	—	33	54.4	0.455	-24	-10	80	18
2N1525 ^a	14		TO-40	—	33	54.4	0.455	-24	-10	80	19
2N1526	111		TO-1	—	33	48.9	1.5	-24	-10	80	20
2N1527 ^a	14		TO-40	—	33	48.9	1.5	-24	-10	80	21
2N1638	118	Use 2N1632	TO-1	—	40	61.5	0.262	-34	-10	80	22
2N1639	118		TO-1	—	45	37 ^a	1.5	-34	-10	80	23
2N1631 ^a	14		TO-40	—	45	47.7	1.5	-34	-10	80	24
2N1632	111		TO-1	—	45	47.7	1.5	-34	-10	80	25
2N1637	118		TO-1	—	45	47.7	1.5	-34	-10	80	26
2N372 ^a	14	Use 40243	TO-7	132	—	26.2	10	-24	-10	80	27
2N370 ^a	14	Use 40242	TO-7	132	—	17	20	-24	-10	80	28
2N371 ^a	14	Use 40244	TO-7	132	—	osc.	23	-24	-10	80	29
2N1180 ^a	14	Use 40245, 40246	TO-45	—	100	36	10.7	-30	-10	80	30
2N384	2		TO-44	—	100	21	50	-40	-10	120	31
2N1225	2		TO-33	—	100	21	50	-40	-10	120	32
2N1396	2		TO-33	—	100	21	50	-40	-10	120	33
2N1023	2		TO-44	—	120	24	50	-40	-10	120	34
2N1066	2		TO-33	—	120	24	50	-40	-10	120	35
2N1397	2		TO-33	—	120	24	50	-40	-10	120	36
2N1177 ^a	14	Use 40242	TO-45	—	140	14	100	-30	-10	80	37
2N1179 ^a	14	Use 40243	TO-45	—	140	17	100	-30	-10	80	38
2N1178 ^a	14	Use 40244	TO-45	—	140	osc.	120	-30	-10	80	39

^a Mixer conversion gain; rf through if frequency range ^b For new equipment design, refer to type given in FEATURES column.

^a Not recommended for new equipment design.

- for:
- Converters
 - Radio receivers
 - Video circuits
 - IF-RF amplifiers
 - battery operated (portable)
 - line operated
 - Mixer-oscillators
 - automobile (6 & 12 volt)
 - short wave
 - Oscillators

P_{OE} (min): 0.01 to 30 W

Data given at 25°C; for higher temperatures, see data sheets

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	CHARACTERISTICS					MAX. RATINGS	
					P _{OE}		GPE dB	f _T		P _T T _C W	V _{CEV}
					min W	oper freq MHz		min MHz	typ MHz		
1	2N1491	10		TO-5	0.01	70	15	—	380	3	30
2	40404	103	freq. multiplier	TO-52	0.05	86	10	—	700	1	16 ^P
3	40080	301	CB oscillator	TO-39	0.1	27	17	—	350	0.5*	30 ^P
4	2N1492	10		TO-5	0.1	70	15	—	380	3	60
5	40405 ^u	105	Use 40519	TO-52	0.2	172	10	—	850	1	40
6	40081	301	CB driver	TO-39	0.4	27	7	—	350	2	60
7	2N1493	10		TO-5	0.5	70	12	—	380	3	100
8	2N3118	42	class C operation	TO-5	1	50	10	250	—	4	85
9	40577	297	high-reli. 2N3118	TO-5	1	50	18	250	—	3	85
10	2N4427	228	class A,B,C	TO-39	1	175	10	—	800	5	55 ^J
11	40280	68	class C	TO-39	1	175	9	—	550	7	36
12	2N3866	80	class A,B,C	TO-39	1	400	10	—	800	5	30 ^P
13	40578	298	high-reli. 2N3866	TO-39	1	400	10	—	800	5	30 ^P
14	2N5108	280	class B,C—uhf	TO-39	1	1000	5	1200	—	3.5	30 ^P
15	2N5090	270	class A,B,C	TO-60	1.2	400	7.8	500	—	5	30 ^P
16	40290	70	class C—vhf	TO-39	2	135	6	—	500	7	50
17	40291	70	class C—vhf	TO-60	2	135	6	—	500	11.6	50
18	2N3553	92	class A,B,C—uhf	TO-39	2.5	175	10	400	500	7	65
19	40305	144	high-reli. 2N3553	TO-39	2.5	175	10	400	500	7	65
20	2N4012	90	freq. multiplier	TO-60	2.5	1002	4	—	500	11.6	65
21	40082	301	[CB rf output]	TO-39	3	27	9	—	200	5	60
22	40446	301	[integral flange]	W	3	27	—	—	—	10	60
23	2N3375	92	class A,B,C—uhf	TO-60	3	400	5	400	—	11.6	65
24	40279	46	ultra hi-reli. 2N3375	TO-60	3	400	5	400	—	11.6	65
25	40306	144	high-reli. 2N3375	TO-60	3	400	5	400	—	11.6	65
26	40581	301	[CB rf output]	TO-39	3.5	27	—	—	—	5	60
27	40582	301	[integral flange]	W	3.5	27	—	—	—	10	60
28	40281	68	class C	TO-60	4	175	6	—	400	11.6	36
29	2N4440	217	class A,B,C—uhf	TO-60	5	400	—	—	500	11.6	65
30	40292	70	class C—vhf	TO-60	6	135	5	—	300	23.2	50
31	2N2631	32		TO-39	7.5	50	9	—	200	8.75	80
32	2N2876	32		TO-60	10	50	7	—	200	17.5	80
33	2N3733	72	class A,B,C—uhf	TO-60	10	400	6	—	400	23	65
34	2N4932	249	class C—vhf	TO-60	12	88	5.4	—	—	70	50
35	40282	68	class C—vhf	TO-60	12	175	5	—	350	23.2	36
36	2N3632	92	class A,B,C—vhf	TO-60	13.5	175	6	—	400	23	65
37	40307	144	high-reli. 2N3632	TO-60	13.5	175	6	—	400	23	65
38	2N3229	50		TO-60	15	50	9	—	200	17.5	105
39	2N5102	279	class C—vhf	TO-60	15	136	—	—	—	70	100
40	2N5016	255	[class B,C]	TO-60	15	400	5	—	600	30	65
41	2N5017	256	[silicone case]	K	15	400	5	—	600	30	65
42	40444	223	class B,C	TO-60	20	2.5	13	60	—	140	120
43	2N4933	249	class C—vhf	TO-60	20	88	7.6	—	—	70	70
44	2N5071	269	FM comm.	TO-60	24	76	9	—	—	70	65
45	2N5070	268	SSB comm.	TO-60	25 ^(PEP)	30	13	—	—	70	65
46	40340	74	[high-power]	TO-60	25	50	7	—	125	70	60
47	40341	74	class C—vhf	TO-60	30	50	10	—	125	70	70

Silicon

N-P-N

RF

Power

Types

Featuring

"Overlay"

Linear and

Class C

^J V_{CER}

^P V_{CE0}

^u Not recommended for new equipment design.

* T_A = 25°C

- for:
- CATV, MATV
 - Converters
 - Mixers
 - Phased Array Radar
 - Communication equipment—
aerospace, industrial & military amplifiers
 - CW service
 - Oscillators — class C
UHF-VHF
 - RF amplifiers — AM/FM
 - Frequency multipliers
— doublers, triplers
 - Sonde
 - UHF/VHF amplifier

CHART **19**

Data given at 25°C; for higher temperatures, see data sheets

f_T (min): 20 to 175 MHz

	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	CHARACTERISTICS					MAX. RATINGS			LINE NO.	
					f_T min MHz	$V_{CE(sat)}$ max V	C_{obo} max pF	hFE		V_{CBO} V	I_C A	P_T T_c W		
								min	I_C mA					
Silicon N-P-N	2N3263	54	[radial lead flat package]	L	20	0.75	900	25	15A ^e	150	25	84	1	
	2N3264	54		L	20	1.2	900	20	15A ^e	120	25	84	2	
	2N3265	54		TO-63	20	0.75	900	25	15A ^e	150	25	125	3	
	2N3266	54		TO-63	20	1.2	900	20	15A ^e	120	25	125	4	
	2N697	16	MIL spec.	TO-5	50	1.5	35	40	150 ^e	60	0.5	2	5	
	2N699	22		TO-5	50	5	20	40	150 ^e	120	1	2	6	
	2N720A	36		TO-18	50	5	15	40	150 ^e	120	1	1.8	7	
	2N1893	34	MIL & Ind.	TO-5	50	5	15	40	150 ^e	100 ^d	0.5	3	8	
	2N718A	36		TO-18	60	1.5	25	40	150	75	1	1.8	9	
	2N1613	106		TO-5	60	1.5	25	40	150	75	1	3	10	
	2N2270	24		TO-5	60	0.9	15	50	150	60	1	5	11	
	2N3878	299		TO-66	60	2	175	20	4A	120	7	35	12	
	2N3879	299		TO-66	60	1.2	175	20	4A	120	7	35	13	
	2N5202	299		TO-66	60	1.2	175	10	4A	120	4	35	13a	
	40375	299	for printed circuit	E	60	2	175	20	4A	120	7	5.8 ^x	14	
2N1711	26	TO-5		70	1.5	25	100	150	75	1	3	15		
Low-Level Types	2N2897	143	low leakage	TO-18	100	1	15	40	150	60	1	1.8	16	
	2N3053	145		TO-5	100	1.4	15	50	150	60	0.7	5	17	
	40084	40	low noise	TO-18	100	1.4	15	50	150	60	0.15	1.8	18	
	40389	145	for printed circuit	D	100	1.4	15	50	150	60	0.7	3.5 ^x	19	
	40392	145	integral flange	C	100	1.4	15	50	150	60	0.7	7	20	
	Medium-Speed Switching	2N2102	106		TO-5	120	0.5	15	40	150	120	1	5	21
		2N2405	34		TO-5	120	0.5	15	60	150	120	1	5	22
		2N2895	143	[low leakage]	TO-18	120	0.6	15	60	150	120	1	1.8	23
		2N2896	143		TO-18	120	0.6	15	60	150	140	1	1.8	24
		2N5183	291	high I_C (1A max)	TO-104	125	0.5	15	40	300	18	1	2	25
2N3262		56	overlay type	TO-39	150	0.6	C_{cb} = 20 pF	40	500	100	1.5	4	26	
40458		224		TO-104	150	0.3		100	10	60	1	0.5	27	
40459		224	J	150	0.3	100		10	60	1	1	28		
2N3241A		221	[low noise low saturation]	TO-104	175 ^f	0.25		100	10	30	r	2	29	
2N3242A		221		TO-104	175 ^f	0.3		125	10	40	r	2	30	
40450	221	TO-104		175 ^f	0.25	100		10	30	r	2	31		
40451	221	TO-104	175 ^f	0.3	125	10		40	r	2	2	32		

^e Pulsed

^f Typical value

^d V_{CEr}

^r Limited by dissipation.

^x $T_A = 25^\circ C$

CHART **20**

Data given at 25°C; for higher temperatures, see data sheets

f_T (min): to 60 MHz

	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	CHARACTERISTICS					MAX. RATINGS			LINE NO.	
					f_T min MHz	$V_{CE(sat)}$ max V	C_{obo} max pF	hFE		V_{CBO} V	I_C A	P_T T_c W		
								min	V_{CE} V					
Silicon P-N-P	2N4036	216		TO-5	60	0.65	30	40	-150	-10	-90	-1	7	1
	2N4037	216		TO-5	60	1.4	30	50	-150	-10	-60	-1	7	2
	2N4314	216		TO-5	60	1.4	30	50	-150	-10	-90	-1	7	3
	40391	216	for printed circuit integral flange	D	60	1.4	30	50	-150	-10	-60	-1	3.5 ^x	4
	40394	216		C	60	1.4	30	50	-150	-10	-60	-1	7	5

^x $T_A = 25^\circ C$

FOR RECOMMENDED N-P-N COMPLEMENTARY-SYMMETRY TYPES, SEE CHART 53.

- for:
- Computers
 - Digital-logic circuits
 - Memory-core drivers
 - Saturated logic switching
 - Data processing equipment
 - Inverters
 - Pulse amplifiers

TRANSISTORS

COMPUTER SWITCHING & PULSE low-level types

for HIGH-SPEED OPERATION

f_T (min): 200 to 600 MHz

Data given at 25°C; for higher temperatures, see data sheets

CHART **21**

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	CHARACTERISTICS						MAX. RATINGS		Silicon N-P-N Low-Level Types High-Speed Logic Switching
					f_T min MHz	$V_{CE(sat)}$ max V	C_{obo} max pF	hFE		t_{on} max ns	V_{CBO} V	I_C A	
								min	I_C mA				
1	2N706 ^u	9		TO-18	200	0.6	6	20	10 ^e	—	25	—	
2	2N706A ^u	9		TO-18	200	0.6	5	20	10	40	25	50	
3	40217 ^g	14	Use 2N3261	TO-52	200	0.6	6	20	10	—	25	—	
4	40218 ^g	14	Use 2N3261	TO-52	200	0.6	5	20	10	40	25	50	
5	2N3119	44	overlay type	TO-5	250	0.5	6	50	100	40	100	0.5	
6	2N914 ^g	14	Use 2N3261	TO-18	300	0.7	6	30	10	40	40	r	
7	2N834 ^u	35		TO-18	350	0.25	4	25	10	35	40	0.2	
8	40220 ^g	14	Use 2N3261	TO-52	350	0.25	4	25	10	35	40	0.2	
9	2N3011	147		TO-18	400	0.2	4	30	10 ^e	15	30	0.2	
10	2N5186	293	[hi performance + economy + reliabil. control]	TO-52	400	0.3	3	25	10	25	10	0.3	
11	2N5187	294		TO-52	400	0.25	3.5	30	10	18	25	0.5	
12	2N2369A	147	[for military and commercial applications]	TO-18	500	0.2	4	20	100 ^e	12	40	0.2	
13	2N709	45		TO-18	600	0.3	3	20	10 ^e	15	15	r	
14	2N2475	45		TO-18	600	0.4	3	30	20	20	15	r	
15	2N3261	93		TO-52	600	0.35	3.5	40	10	13	40	0.5	

^e Pulsed ^g For new equipment design, refer to type given in FEATURES column. ^r Limited by dissipation. ^u Not recommended for new equipment design.

COMPUTER SWITCHING & PULSE high-voltage types

for HIGH-SPEED OPERATION

f_T (min): 250 to 600 MHz

Data given at 25°C; for higher temperatures, see data sheets

CHART **22**

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	CHARACTERISTICS								MAX. RATINGS		Silicon N-P-N High-Voltage High-Current Types Memory-Driver Applications
					f_T min MHz	$V_{CE(sat)}$ max V	C_{obo} max pF	hFE		t_{on} max ns	t_{off} max ns	V_{CBO} V	P_T T_A W		
								min	I_C mA					V_{CE} V	
1	2N2476	47		TO-5	250	0.75	10	20	150	0.4	25	45	60	0.6	
2	2N2477	47		TO-5	250	0.65	10	40	150	0.4	25	45	60	0.6	
3	2N3512	47		TO-5	250	0.4	10	10	500 ^e	1	30	45	60	0.8	
4	2N5188	295	[hi performance + economy + reliabil. control]	TO-39	250	0.5	10	20	500 ^e	1	35	50	60	0.8	
5	2N5189	296		V	250	1	12	35	500	1	40	70	60	1	
6	2N5262	313	[$t_{on} = 30ns$ at $I_C = 1A$ $t_{off} = 60ns$]	V	250	0.8	12	20	1A ^e	1	30	60	75	1	
7	40283 ^u	85		TO-46	250	0.4	10	10	500 ^e	1	30	45	60	0.4	
8	2N3261	93	[$t_{on} = 9ns$ at $I_C = 0.1A$ $t_{off} = 11ns$]	TO-52	600	0.35	3.5	30	100	1	13	16	40	0.3	

^e Pulsed

^u Not recommended for new equipment design.

- for: • AC and DC latching circuits • Core drivers • Industrial and MIL equipment • Memory drivers
• Computers • Data processing equipment • Line drivers • Saturated switching

C_{rss} (max): 0.25 pF

CHOPPER & MULTIPLEX OPERATION

CHART **23**

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	CHARACTERISTICS $T_A = 25^\circ C$					MAX. RATINGS $T_A = 25^\circ C$			MOS FET Silicon SINGLE INSULATED GATE N-Channel
					C_{rss} max pF	I_{GSS} typ pA	g_{fs} typ μmho	R_{ds}		P_T mW	V_{DS} V	I_D mA	
								on typ Ω	off typ Ω				
1	3N138	283	zero offset voltage	TO-72	0.25	0.1	6000	180	10 ¹¹	400	35	50 ^e	

^e Pulsed

- for: • Choppers • Control circuits • Industrial instrumentation • Multiplex circuits

COMPUTER SWITCHING & PULSE low-level types

for LOW- AND MEDIUM-SPEED OPERATION

TRANSISTORS

CHART 24

Data given at 25°C; for higher temperatures, see data sheets

f_{hfb} (min): to 15 MHz

f_T (min): to 50 MHz

	RCA Type	File No.	Features	Package <small>See Section Outlines</small>	CHARACTERISTICS							MAX. RATINGS	
					f_T min MHz	f_{hfb} min MHz	$V_{CE(sat)}$ max V	C_{obo} max pF	h_{FE} min	h_{FE}		V_{CBO} V	I_C mA
										I_C mA	V_{CE} V		
Germanium P-N-P	2N395 ^u	31		TO-5	—	3	-0.2	20	20	-10	-1	-30	-200
	2N1303	27		TO-5	—	3	-0.2	20	20	-10	-1	-30	-300
	2N404	15		TO-5	—	4	-0.15	20	30	-12	-0.15	-25	-100
	2N404A	15		TO-5	—	4	-0.15	20	30	-12	-0.15	-40	-150
	2N581	15		TO-5	—	4	-0.2 ^a	20	20	-20	-0.3	-18	-100
Low-Level Types	2N396 ^u	31	Use 2N388 (N-P-N)	TO-5	—	5	-0.2	20	30	-10	-1	-30	-200
	2N396A ^p	14		TO-5	—	5	-0.2	20	30	-10	-1	-30	-200
	40403	31		TO-5	—	5	-0.2	20	30	-10	-1	-30	-200
	2N1305	27		TO-5	—	5	-0.2	20	40	-10	-1	-30	-300
	2N414	11		TO-5	—	8	—	11	—	—	—	—	-30
Low- & Medium-Speed Logic Switching	2N397 ^u	31		TO-5	—	10	-0.2	20	40	-10	-1	-30	-200
	2N1307	27		TO-5	—	10	-0.2	20	60	-10	-1	-30	-300
	2N582	15		TO-5	—	14	-0.2	20	40	-24	-0.2	-25	-100
	2N1309	27		TO-5	—	15	-0.2	20	80	-10	-1	-30	-300
	2N1384 ^u	14		TO-11	—	20	—	—	20	-200	-0.5	-30	-500
	2N1300 ^u	19		TO-5	—	25	—	12	30	-10	-0.3	-13	-100
	2N1301 ^u	19		TO-5	—	35	—	12	40	-40	-0.5	-13	-100
	2N1853 ^u	43		TO-5	—	—	-0.2	—	30	-6	-0.4	-18	-100
	2N1854 ^u	43		TO-5	—	40	-0.25	12	40	-20	-0.5	-18	-100
	2N1683	19		TO-5	—	50	—	12	50	-10	-0.3	-13	-100

^u For new equipment design, refer to type given in FEATURES column. ^s Minimum value ^u Not recommended for new equipment design.

CHART 25

Data given at 25°C; for higher temperatures, see data sheets

f_{hfb} (min): to 15 MHz

	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	CHARACTERISTICS						MAX. RATINGS	
					f_{hfb} min MHz	$V_{CE(sat)}$ max V	C_{obo} max pF	h_{FE} min	h_{FE}		V_{CBO} V	I_C mA
									I_C mA	V_{CE} V		
Germanium N-P-N	2N585	1		TO-5	3	0.2	25	20	20	0.2	25	200
	2N1302	25		TO-5	3	0.2	20	20	10	1	25	300
	2N1605	29		TO-5	4	0.15	20	40	20	0.35	25	100
	2N1605A	29		TO-5	4	0.15	20	40	20	0.25	40	100
	2N1090 ^u	1	high current	TO-5	5	0.2	25	30	20	0.2	25	400
Low & Medium Speed Logic Switching	2N388	23		TO-5	5	—	20	60	30	0.5	25	200
	2N388A	23		TO-5	5	—	20	60	30	0.5	40	200
	2N1304	25		TO-5	5	0.2	20	40	10	1	25	300
	2N1091 ^u	1	high current	TO-5	10	0.2	25	40	20	0.2	25	400
	2N1306	25		TO-5	10	0.2	20	60	10	1	25	300
	2N1308	25		TO-5	15	0.2	20	80	10	1	25	300

^u Not recommended for new equipment design. FOR RECOMMENDED RCA P-N-P COMPLEMENTARY-SYMMETRY TYPES, SEE CHART 53.

- for: • Computers • Digital-logic circuits • Inverters • Memory-core drivers • Saturated logic switching
• Data processing equipment • Flip flops • Logic gates • Pulse amplifiers

CHART 26

Data given at 25°C; for higher temperatures, see data sheets

V_{CBO} (max): to -105 V

	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS		CHARACTERISTICS					
					V_{CBO} V	P_T T_A mW	f_T min kHz	h_{FE} min	h_{FE}		h_{fe}	
									I_C mA	V_{CE} V	at 1kHz min	I_C mA
Germanium P-N-P	2N398	49	high-voltage types for "On-Off" control	TO-5	-105	50	20	20	-5	-0.35	—	—
	2N398A	49		TO-5	-105	150	40	20	-5	-0.35	20	1
	2N398B	49		TO-5	-105	250	—	20	-5	-0.25	40	1

for: • On-off high-voltage control applications — indicators: counters — incandescent lamp — neon; relays

TRANSISTORS

POWER SWITCHING & PULSE

power types

for LOW-SPEED OPERATION

P_T (T_C): to 8.75 W
(T_A): to 5.8 W

Data given at 25°C; for higher temperatures, see data sheets

CHART 27

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS				CHARACTERISTICS					
					P _T		V _{CEO} V	I _C A	h _{FE}		V _{CE(sat)} max V	C _{obo} max pF	f _T min MHz	
					T _C W	T _A W			min	I _C mA				
1	40407	219		TO-5	—	1	50	0.7	40	1	—	—	120	
2	40408	219		TO-5	—	1	90	0.7	40	10	1.4	—	100	
3	2N718A	36	[hi typ f _T =100MHz dc to 20MHz]	TO-18	1.8	0.5	32	1	40	150	1.5	25	60	
4	2N720A	36		TO-18	1.8	0.5	80	1	40	150	5	15	50	
5	2N2895	143	[low leakage]	TO-18	1.8	0.5	65	1	60	150	0.6	15	120	
6	2N2896	143		TO-18	1.8	0.5	90	1	60	150	0.6	15	120	
7	2N2897	143		TO-18	1.8	0.5	45	1	40	150	1	15	100	
8	2N697	16		TO-5	2	0.6	40 ^j	0.5	40	150 ^e	1.5	35	100 ^f	
9	2N699	22		TO-5	2	0.6	80 ^j	1	40	150 ^e	5	20	50	
10	2N1613	106		TO-5	3	0.8	50 ^j	1	40	150	1.5	25	60	
11	2N1711	26	[factory-attached heat radiator hometaxial base greater current handling capability; freedom from second breakdown]	TO-5	3	0.8	50 ^j	1	100	150	1.5	25	70	
12	2N1893	34		TO-5	3	0.8	80	0.5	40	150	5	15	50	
13	40409	219		[for printed-circuit board]	D	—	3	90 ⁱ	0.7	50	150	1.4	—	100
14	40389	145		[high voltage]	D	—	3.5	40	0.7	50	150	1.4	15	100
15	40390	64			D	—	3.5	250 ^d	1	40	20	0.5	10	15
16	40346V1	211			D	—	4	175	1	25	10	0.5	—	10
17	40412V1	211			D	—	4	200	1	40	30	—	12	10
18	2N1479	135			TO-5	5	—	40	1.5	20	200	—	150	1.3 ^f
19	2N1480	135			TO-5	5	—	55	1.5	20	200	—	150	1.3 ^f
20	2N1481	135			TO-5	5	—	40	1.5	35	200	—	150	1.3 ^f
21	2N1482	135			TO-5	5	—	55	1.5	35	200	—	150	1.3 ^f
22	2N1700	141			TO-5	5	—	40	1	20	100	—	150	1.3 ^f
23	2N2102	106			TO-5	5	1	65	1	40	150	0.5	15	120
24	2N2270	24			TO-5	5	1	45	1	50	150	0.9	15	60
25	2N2405	34			TO-5	5	1	90	1	60	150	0.5	15	120
26	2N3053	145	[economical high-quality performance]	TO-5	5	1	40	0.7	50	150	1.4	15	100	
27	40309	78		TO-5	5	1	18	0.7	70	50	—	—	100	
28	40311	78		TO-5	5	1	30	0.7	70	50	—	—	100	
29	40314	78		TO-5	5	1	30	0.7	70	50	—	—	100	
30	40315	78		TO-5	5	1	40	0.7	70	50	1.4	—	100	
31	40317	78			TO-5	5	1	40	0.7	40	10	—	—	100
32	40320	78	[high voltage]	TO-5	5	1	40	0.7	40	10	—	—	—	
33	40321	78		TO-5	5	1	300 ^j	1	25	20	—	—	—	
34	40323	78		TO-5	5	1	18	0.7	70	50	—	—	100	
35	40326	78		TO-5	5	1	40	0.7	40	10	—	—	—	
36	40327	78	[high voltage]	TO-5	5	1	300 ^j	1	40	20	—	—	—	
37	40360	78		TO-5	5	1	70	0.7	40	10	1.4	—	100 ^f	
38	40361	78		TO-5	5	1	70 ^j	0.7	70	50	1.4	—	100 ^f	
39	40366	215	[high reliability]	TO-5	5	1	65	1	40	150	0.5	—	—	
40	40367	215		TO-5	5	1	55	1.5	35	200	1.4	—	—	
41	40385	215		TO-5	5	1	350	1	40	20	0.5	—	—	
42	40347V1	88	[attached radiator for printed circuits]	D	—	4.4	40	1	20	450	1	—	—	
43	40348V1	88		D	—	4.4	65	1	30	300	0.75	—	—	
44	40349V1	88		D	—	4.4	140	1	25	150	0.5	—	—	
45	40250V1	112	[for printed-circuit board]	E	—	5.8	40	4	25	1.5A	1.5	—	1.2 ^f	
46	40372	145	[high voltage]	E	—	5.8	55	4	25	500	—	—	1.2 ^f	
47	40374	138		E	—	5.8	175	2	40	100	—	120	15	
48	40375	299		E	—	5.8	50	7	20	4A	2	175	60	
49	40392	145	[integral flange overlay type]	C	7	—	40	0.7	50	150	1.4	15	100	
50	2N3262	56		TO-39	8.75	1	80 ^d	1.5	40	500	4	20	150 ^f	
51	40347	88	[hometaxial base]	TO-5	8.75	1	40	1	20	450	1	—	—	
52	40348	88		TO-5	8.75	1	65	1	30	300	0.75	—	—	
53	40349	88		TO-5	8.75	1	140	1	25	150	0.5	—	—	

Silicon

N-P-N

Power
Types

Low-Speed
Switching

^d V_{CEO(sus)} ^e Pulsed ^f Typical value ^j V_{CEr}

- for:
- Choppers
 - DC-to-DC converters
 - Inverters
 - Regulators
 - Data-processing
 - High-voltage switching
 - Pulse-amplifier circuits
 - Relay controls
 - Saturated switching
 - Solenoid

POWER SWITCHING & PULSE

power types

TRANSISTORS

for LOW-SPEED OPERATION

CHART 28

Data given at 25°C; for higher temperatures, see data sheets

P_T (Tc): above 8.75 to 75 W

	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS			CHARACTERISTICS					LINE NO
					P_T <small>Tc or T_{MF}</small> W	V _{CEO} V	I _c A	h _{FE}		V _{CE(sat)} max V	C _{obo} max pF	f _T min MHz	
								min	I _c A				
Silicon N-P-N	2N3439	64	[high-voltage switching integral flange]	TO-5	10	350 ^d	1	40	0.02	0.5	10	15	1
	2N3440	64		TO-5	10	250 ^d	1	40	0.02	0.5	10	15	2
	2N4063	64		C	10	350 ^d	1	40	0.02	0.5	10	15	3
	2N4064	64		C	10	250 ^d	1	40	0.02	0.5	10	15	4
	40346	211		TO-5	10	175	1	25	0.01	0.5	—	10	5
	40346V2	211	integral flange	C	10	175	1	25	0.01	0.5	—	10	6
	40412	211	[integral flange hometaxial base integral flange]	TO-5	10	250	1	40	0.03	—	12	10	7
	40412V2	211		C	10	250	1	40	0.03	—	12	10	8
	40347V2	88		C	11.7	40	1	20	450	1	—	—	9
	40348V2	88		C	11.7	65	1	30	300	0.75	—	—	10
	40349V2	88	C	11.7	140	1	25	150	0.75	—	—	—	11
	2N4296	201	[high voltage for line-operated equipment P _T = 20W, V _{CB0} to 500V]	TO-66	20	250	1	50	0.05	0.9	—	20	12
	2N4297	201		TO-66	20	250	1	75	0.05	0.75	—	20	13
	2N4298	201		TO-66	20	350	1	25	0.05	0.9	—	20	14
	2N4299	201		TO-66	20	350	1	50	0.05	0.75	—	20	15
2N1483	137	[hometaxial base]	TO-8	25	40	3	20	0.75	—	175	1.2 ^f	16	
2N1484	137		TO-8	25	55	3	20	0.75	—	175	1.2 ^f	17	
2N1485	137		TO-8	25	40	3	35	0.75	—	175	1.2 ^f	18	
2N1486	137		TO-8	25	55	3	35	0.75	—	175	1.2 ^f	19	
2N1701	141		TO-8	25	40	2.5	20	0.3	—	175	1.2 ^f	20	
40368	215	[high reliability hometaxial base for economical high-quality performance in audio amplifiers high-voltage switching]	TO-8	25	55	3	35	0.75	0.75	—	—	21	
2N3441	146		TO-66	25	140	3	20	0.5	1	—	1.2 ^f	22	
2N3054	145		TO-66	29	55	4	25	0.5	1	—	1.2 ^f	23	
40250	112		TO-66	29	40	4	25	1.5	1.5	—	1.2 ^f	24	
40310	78		TO-66	29	35	4	20	1	—	—	1.2 ^f	25	
40312	78		TO-66	29	60 ^c	4	20	1	—	—	1.2 ^f	26	
40316	78		TO-66	29	40 ^c	4	20	1	—	—	1.2 ^f	27	
40324	78		TO-66	29	35	4	20	1	—	—	1.2 ^f	28	
2N3583	138		TO-66	35	175 ^d	2	40	0.1	—	120	15	29	
2N3584	138		TO-66	35	250 ^d	2	25	1	0.75	120	15	30	
2N3585	138	[high-voltage switching]	TO-66	35	300 ^d	2	25	1	0.75	120	15	31	
2N4240	138		TO-66	35	300 ^d	2	30	0.75	1	120	15	32	
2N3878	299	[econom. perf. 100-W pulse capability I _s /I _b = 4A at V _{CE} = 25V]	TO-66	35	50 ^d	7	20	4	2	175	60	33	
2N3879	299		TO-66	35	75 ^d	7	20	4	1.2	175	60	34	
40313	78		TO-66	35	300 ^c	2	40	0.1	—	—	—	35	
40318	78		[high-voltage switching]	TO-66	35	300 ^c	2	40	20	—	—	—	36
40322	78			TO-66	35	300 ^c	2	40	20	—	—	—	37
40328	78	TO-66		35	300 ^c	2	20	1	—	—	—	38	
40364	78	[econom. perf. 100-W pulse capability I _s /I _b = 4A at V _{CE} = 25V]	TO-66	35	60 ^c	7	35	0.5	2	—	15 ^f	39	
40464 ^u	237		TO-3	40	35	5	40	1	0.25 ^f	—	2	40	
40465 ^u	237	[low saturation voltages]	TO-3	40	40	5	70	1	0.25 ^f	—	3	41	
40466 ^u	237		TO-3	40	50	5	70	1	0.25 ^f	—	3	42	
2N4395 ^u	234		TO-3	62.5	40	5	75	1	0.25 ^f	—	4	43	
2N4396 ^u	234		TO-3	62.5	60	5	60	1	0.25 ^f	—	4	44	
2N1487	139		TO-3	75	40 ^d	6	15	1.5	—	200	1 ^f	45	
2N1488	139	[hometaxial base]	TO-3	75	55 ^d	6	15	1.5	—	200	1 ^f	46	
2N1489	139		TO-3	75	40 ^d	6	25	1.5	—	200	1 ^f	47	
2N1490	139		TO-3	75	55 ^d	6	25	1.5	—	200	1 ^f	48	
2N1702	141		TO-3	75	40	5	15	0.8	—	200	1 ^f	49	
40369	215	high reliability	TO-3	75	55	6	25	1.5	1	—	—	50	

^c V_{CE(sus)}

^d V_{CE0(sus)}

^f Typical value

^u Not recommended for new equipment design.

- for:
- Choppers
 - Deflection circuits
 - High-voltage switching
 - Motor controls
 - Regulators
 - Solenoid controls
 - Color difference amplifiers
 - electrostatic
 - Inverters
 - Pulse amplifiers
 - automotive
 - Video amplifiers
 - Converters
 - magnetic
 - Relay controls
 - motor control
 - Wide-band amplifiers

P_T (T_c): above 75 to 150 W

Data given at 25°C; for higher temperatures, see data sheets

CHART **29**

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS			CHARACTERISTICS				
					P_T T_c W	V_{CE0} V	I_c A	h_{FE}		$V_{CE(sat)}$ max V	C_{obo} max pF	f_T typ MHz
								min	I_c A			
1	2N5034	244	hometaxial base silicone plastic case; mounts in TO-3 socket	T	83	40 ^d	6	20	2.5 ^a		—	0.8
2	2N5036	244		T	83	50 ^a	8	20	2.5 ^e		—	0.8
3	40514	244		T	83	45 ^c	6	20	2.5 ^e		—	0.8
4	2N5035	244	hometaxial base silicone plastic case; for printed ckts.	U	83	40 ^d	6	20	2.5 ^e		—	0.8
5	2N5037	244		U	83	50 ^d	8	20	2.5 ^e		—	0.8
6	40513	244	high current	U	83	45 ^c	6	20	2.5 ^e		—	0.8
7	2N3263	54		L	84	90	25	25	15 ^e	0.75	900	20
8	2N3264	54		L	84	60	25	20	15 ^e	1.2	900	20
9	2N4347	207	hometaxial base	TO-3	100	120	5	20	2		—	0.8
10	2N3055	145		TO-3	115	60	15	20	4		—	
11	40363	78	econom. perf. hometaxial base	TO-3	115	70 ^f	15	20	4	1.1	—	
12	2N3442	207		TO-3	117	140	10	20	3		—	0.8
13	40251	112		TO-3	117	40	15	15	8	1.5	—	
14	40325	78		TO-3	117	35	15	12	8	1.5	—	
15	2N4348	213		TO-3	120	120	10	15	5		—	0.7
16	2N3265	54	high current	TO-63	125	90	25	25	15 ^e	0.75	900	20 ^g
17	2N3266	54		TO-63	125	60	25	20	15 ^e	1.2	900	20 ^g
18	2N2015	12	high current	TO-36	150	50	10	15	5	—	400	
19	2N2016	12		TO-36	150	65	10	15	5	—	400	
20	2N2338	141		TO-36	150	40	7.5	15	15	—	400	
21	2N3771	140	hometaxial base	TO-3	150	40	15	15	15	2	—	
22	2N3772	140		TO-3	150	60	10	15	10	—	400	0.9
23	2N3773	213		TO-3	150	140	16	15	8	1.4	—	0.7
24	40411	219		TO-3	150	90 ^f	16	35	4	0.8	—	0.7

Silicon

N-P-N

Power Types

Low-Speed Switching

^a $V_{CE(sus)}$ ^d $V_{CE0(sus)}$ ^e Pulsed ^f V_{CEr} ^g Minimum value

P_T (T_c): to 7 W
 P_T (T_A): to 3.5 W

Data given at 25°C; for higher temperatures, see data sheets

CHART **30**

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS				CHARACTERISTICS				
					P_T		V_{CE0} V	I_c A	h_{FE}		$V_{CE(sat)}$ max V	C_{obo} max pF	f_T min MHz
					T_c W	T_A W			min	I_c mA			
1	40406	219	for printed-circuit board economical high-quality performance	TO-5	—	1	-50	-0.7	30	-0.1	—	—	100
2	40410	219		D	—	3	-90 ^d	-0.7	50	-150	-1.4	—	100
3	40391	216		D	—	3.5	-40 ^d	-1	50	-150 ^e	-1.4	30	60
4	40319	78		TO-5	5	—	-40	-0.7	35	-50	-1.4	—	100
5	40362	78		TO-5	5	—	-70 ^f	-0.7	35	-50	-1.4	—	100
6	40394	216	for printed circuit	D	7	—	-40 ^d	-1	50	-150 ^e	-1.4	30	60

Silicon

P-N-P

Power Types

Low-Speed Switching

^d $V_{CE0(sus)}$ ^e Pulsed ^f V_{CEr} FOR RECOMMENDED RCA N-P-N COMPLEMENTARY-SYMMETRY TYPES, SEE CHART 53.

- for:
- Choppers
 - Deflection circuits
 - High-voltage switching
 - Motor control
 - Regulators
 - Relay controls
 - Converters
 - magnetic
 - Pulse amplifiers
 - automotive
 - Saturated switching
 - DC-to-DC converters
 - electrostatic
 - Inverters
 - motor control
 - Solenoid controls

POWER SWITCHING & PULSE

power types

for LOW-SPEED OPERATION

TRANSISTORS

CHART 31

Data given at 25°C; for higher temperatures, see data sheets

P_T (Tc): to 30 W

Germanium P-N-P Power Types Low-Speed Switching	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS			CHARACTERISTICS				
					P_T Tc or TmF W	V_{CBV} V	I_C A	hFE			fT min MHz	
								V_{BE} V	Ic A	VCE V		
	2N586	7		TO-7	0.25*	-25 ^p	—	-0.25	30	-0.25	-0.5	—
	2N1183	4		TO-8	7.5	-20 ^p	—	-3	20	-0.4	-2	—
	2N1183A	4		TO-8	7.5	-30 ^p	—	-3	20	-0.4	-2	—
	2N1183B	4		TO-8	7.5	-40 ^p	—	-3	20	-0.4	-2	—
	2N1184	4		TO-8	7.5	-20 ^p	—	-3	40	-0.4	-2	—
	2N1184A	4		TO-8	7.5	-30 ^p	—	-3	40	-0.4	-2	—
	2N1184B	4		TO-8	7.5	-40 ^p	—	-3	40	-0.4	-2	—
	2N1905	17	[linear hFE over entire Ic range]	TO-3	30	-100	1.5	-6	50	-1	-2	2
	2N1906	17		TO-3	30	-130	1.5	-6	75	-1	-2	3

^p V_{CE0}

* T_A = 25°C

- for:
- Controls — relay, solenoid
 - Industrial & MIL equipment
 - Inverters
 - Multivibrators
 - Power switching
 - Regulators — current, voltage

POWER SWITCHING & PULSE

power types

for HIGH-VOLTAGE OPERATION

CHART 32

Data given at 25°C; for higher temperatures, see data sheets

V_{CE0} (max): 120 to 350 V

Silicon N-P-N High-Voltage Types	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS			CHARACTERISTICS				
					V _{CE0} V	P_T		fT min MHz	hFE			V _{CE(sat)} max V
						T _M or T _C W	T _A W		min	Ic mA	VCE V	
	2N4347	207	[hometaxial base]	TO-3	120	100	—	0.8 ^f	20	2A	4	1
	2N4348	213		TO-3	120	120	—	0.7 ^f	15	5A	4	1
	2N4390	225	"Nixie tube" driver	TO-104	120	—	0.5	50	20	20	1	0.3
	2N3441	146		TO-66	140	25	—	1.2 ^f	20	500	4	1
	2N3442	207		TO-3	140	117	—	0.8 ^f	20	3A	4	1
	2N3773	213	[hometaxial base]	TO-3	140	150	—	0.7 ^f	15	8A ^e	4	1.4
	40349	88		TO-5	140	8.75	1	1.1 ^f	25	150	4	0.5
	40349V1	88	for printed ckts.	D	140	—	4.4	1.1 ^f	25	150	4	0.5
	40349V2	88	integral flange	C	140	—	—	1.1 ^f	25	150	4	0.5
	40373	146	for printed ckts.	E	140	—	5.8	1.2 ^f	20	500	4	1
	2N4068	109	"Nixie tube" driver	TO-104	150	—	0.5	50	30	30	10	3
	2N4069	109	integral heat sink	J	150	—	1	50	30	30	10	3
	40354	113		TO-104	150	—	0.5	50	55 ^f	10	10	5
	40355	113	integral heat sink	J	150	—	1	50	55 ^f	10	10	5
	2N3583	138		TO-66	175 ^d	35	—	15	10	1A	10	—
	40346	211		TO-5	175 ^e	10	—	10	25	10	10	0.5
	40346V1	211	for printed ckts.	D	175 ^e	—	4	10	25	10	10	0.5
	40346V2	211	integral flange	C	175 ^e	10	—	10	25	10	10	0.5
	40374	138	for printed ckts.	E	175 ^d	—	5.8	15	10	1A	10	—
	2N3440	64		TO-5	250 ^d	10	1	15	40	20	10	0.5
	2N3584	138		TO-66	250 ^d	35	—	15	25	1A	10	0.75
	2N4064	64	integral flange	C	250 ^d	10	—	15	40	20	10	0.5
	40390	64	for printed ckts.	D	250 ^d	—	3.5	15	40	20	10	0.5
	40412	211		TO-5	250 ^e	10	—	10	40	30	20	—
	40412V1	211	for printed ckts.	D	250 ^e	—	4	10	40	30	20	—
	40412V2	211	integral flange	C	250 ^e	10	—	10	40	30	20	—
	2N3585	138		TO-66	300 ^d	35	—	15	25	1A	10	0.75
	2N4240	138		TO-66	300 ^d	35	—	15	30	750	10	1
	2N3439	64		TO-5	350 ^d	10	1	15	40	20	10	0.5
	2N4063	64	integral flange	C	350 ^d	10	—	15	40	20	10	0.5
	40385	215	high reliability	TO-5	350	5	1	15	40	10	10	0.5

^e V_{CE(sus)}

^d V_{CE(sus)}

^e Pulsed

^f Typical value

- for:
- Differential & Operational amplifiers
 - "On-Off" control for — lamps, indicators (computer counters — neon), relays
 - Power switching
 - Solenoid/relay drivers

TUNNEL DIODES

for SWITCHING & MICROWAVE APPLICATIONS

$I_p(\text{typ})$: 5 to 100 mA

CHART **33**

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	CHARACTERISTICS							
					I_p		C max pF ^w	I_p/I_V min	V_{pp}'		t_r typ ps	
					min mA	max mA			min mV	max mV		
1	40561	315	Modified DO-17 axial-lead package	M	4.5	5.5	25	6:1	430	590	1800	Germanium
3	40566	315		M	4.75	5.25	15	8:1	490	560	1200	
4	40571	315		M	4.75	5.25	8	8:1	490	560	600	
5	40562	315		M	9	11	25	6:1	440	600	900	
6	40567	315		M	9.5	10.5	15	8:1	510	580	600	
7	40572	315	new epitaxial inert-area process provides high degree of reliability in production quantities	M	9.5	10.5	8	8:1	510	580	300	TUNNEL DIODES
8	40563	315		M	18	22	30	6:1	460	620	600	
10	40568	315		M	19	21	20	8:1	530	600	400	
11	40573	315		M	19	21	10	8:1	530	600	200	
12	40564	315		M	45	55	40	6:1	530	640	350	Small-Signal Types
14	40569	315		M	47.5	52.5	25	8:1	550	620	200	
15	40574	315		M	47.5	52.5	12	8:1	550	620	100	
16	40565	315		M	90	110	40	6:1	540	650	150	
17	40570	315	M	95	105	25	8:1	560	630	100		

^w Includes case capacitance of 0.8pF

for: • High-speed switching systems • Memory systems • Threshold detectors

DAMPER DIODES

for TV HORIZONTAL DEFLECTION SYSTEMS

CHART **34**

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS				CHARACTERISTICS		Germanium Damper Diodes for TV Horizontal Deflection Systems
					VRM (peak) V	VR (continuous) V	i_{FM} (peak) A	$I_F(AV)$ A	$V_F(AV)$ at $I_F(AV) = 7A$ V	I_R at $V_R = 10V$ μA	
1	40442	205	for transistorized TV deflection	TO-3	200	40	10	7	0.77	150	
2	1N4785	205, 206		TO-3	320	60	10	7	0.77	150	

for: • Damper service • High-energy horizontal deflection systems • Transistorized TV circuits

COMPENSATING DIODES

for TEMPERATURE & VOLTAGE VARIATIONS

CHART **35**

LINE NO	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS			CHARACTERISTICS		Germanium Compensating Diodes for Temperature and Voltage Variations
					i_{FM} (peak) mA	$I_F(AV)$ mA	VRM V	V_F at $T_A = 25^\circ C$ max mV at mA		
1	1N2326	55	TO-1 type case — flexible leads	A	200	100	-1	280	100	
2	40428	115		A	200	100	-0.5	275	80	

for: • Class-B push-pull AF power amplifiers

SILICON RECTIFIERS

for CONSUMER, LOW-POWER INDUSTRIAL AND MILITARY APPLICATIONS

RECTIFIERS

CHART 36

$I_{F(AV)}$: to 2 A

RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS						CHARACTERISTICS		LINE NO		
				FOR CAPACITOR-INPUT FILTER						V _{R(RMS)} V	V _{RM} V		V _{FM} max V	I _{RM(dyn)} max mA
				I _{F(AV)}		I _{FM}		A	°C					
1N3754	39		A	0.125	65	1.3	30			35	100	1	0.3	1
1N3755	39		A	0.125	65	1.3	30	70	200	1	0.3	2		
1N3756	39		A	0.125	65	1.3	30	140	400	1	0.3	3		
40265	79		A	0.125	65	1.3	30	140	400	1	0.4	4		
1N3563	41	insulated case	B	0.3	75	4	35	700	1000	1.2	0.2	5		
1N3196	41	insulated case	B	0.4	75	5	35	560	800	1.2	0.2	6		
1N3256	41	insulated case	B	0.4	75	5	35	560	800	1.2	0.2	7		
1N3193	41		B	0.5	75	6	35	140	200	1.2	0.2	8		
1N3194	41		B	0.5	75	6	35	280	400	1.2	0.2	9		
1N3195	41		B	0.5	75	6	35	420	600	1.2	0.2	10		
1N3253	41	insulated case	B	0.5	75	6	35	140	200	1.2	0.2	11		
1N3254	41		B	0.5	75	6	35	280	400	1.2	0.2	12		
1N3255	41		B	0.5	75	6	35	420	600	1.2	0.2	13		
40495	253		B	0.5	65	5	25	140	400	1.5	0.4	14		
1N5214	245		B	0.6	75	5	50	560	800	1.2	0.2	15		
1N5218	245	insulated case	B	0.6	75	5	50	560	800	1.2	0.2	16		
1N444B	5		DO-I		35	3.5 for resistive or inductive load	15	350	500	1.5	1.75μA	17		
1N445B	5		DO-I		35			420	600	1.5	2μA	18		
1N440B	5		DO-I		50			70	100	1.5	0.3μA	19		
1N441B	5		DO-I		50			140	200	1.5	0.75μA	20		
1N442B	5	flanged-case axial-lead types for military and industrial applications	DO-I	50	for resistive or inductive load			210	300	1.5	1μA	21		
1N443B	5		DO-I	50		280	400	1.5	1.5μA	22				
1N536	3		DO-I	50		35	50	1.1	5μA	23				
1N537	3		DO-I	50		70	100	1.1	5μA	24				
1N538	3		DO-I	50		140	200	1.1	5μA	25				
1N539	3	DO-I	DO-I	50	for resistive or inductive load	210	300	1.1	5μA	26				
1N540	3		DO-I	50		280	400	1.1	5μA	27				
1N547	3		DO-I	50		420	600	1.2	5μA	28				
1N1095	3		DO-I	50		350	500	1.2	5μA	29				
1N1763A	89		DO-I	0.75		75	5	35	280	400	1.2	0.1	30	
1N1764A	89	DO-I	0.75	75	5	35	350	500	1.2	0.1	31			
1N2858A	91	DO-I	0.75	75	5	35	35	50	1.2	0.1	32			
1N2859A	91	DO-I	0.75	75	5	35	70	100	1.2	0.1	33			
1N2860A	91	DO-I	0.75	75	5	35	140	200	1.2	0.1	34			
1N2861A	91	DO-I	0.75	75	5	35	210	300	1.2	0.1	35			
1N2862A	91	DO-I	DO-I	0.75	75	5	35	280	400	1.2	0.1	36		
1N2863A	91		DO-I	0.75	75	5	35	350	500	1.2	0.1	37		
1N2864A	91		DO-I	0.75	75	5	35	420	600	1.2	0.1	38		
1N5211	245		B	0.75	75	6	50	140	200	1.2	0.2	39		
1N5212	245		B	0.75	75	6	50	280	400	1.2	0.2	40		
1N5213	245	for resistive & inductive load I _{F(AV)} = 1 A	B	0.75	75	6	50	420	600	1.2	0.2	41		
1N5215	245		B	0.75	75	6	50	140	200	1.2	0.2	42		
1N5216	245		insulated case	B	0.75	75	6	50	280	400	1.2	0.2	43	
1N5217	245			B	0.75	75	6	50	420	600	1.2	0.2	44	
40266	75			DO-I	2	105	10	35	35	100	3	10	45	
40267	75		DO-I	2	105	10	35	70	200	3	10	46		

for: • DC blocking circuits • Power supplies — Commercial electronic equipment — Hi-Fi amplifier systems
• Magnetic amplifiers — Industrial electronic equipment — Phonographs — TV (color, black-and-white)

$I_{F(AV)}$: above 2 to 40 A

CHART **37**

LINE NO.	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS						CHARACTERISTICS			
					RESISTIVE OR INDUCTIVE LOAD						$V_{R(RMS)}$ V	V_{RM} V	V_{FM} max V	I_{RM} (dyn) max mA
					$I_{F(AV)}$		I_{FM}		A	°C				
					A	at °C	(rep) A	(surge) A						
1	1N1612	18	Available in Reverse-Polarity Versions	DO-4	5	135	15	150	35	50	0.65	1		
2	1N1613	18		DO-4	5	135	15	150	70	100	0.65	1		
3	1N1614	18		DO-4	5	135	15	150	140	200	0.65	1		
4	1N1615	18		DO-4	5	135	15	150	280	400	0.65	1		
5	1N1616	18		DO-4	5	135	15	150	420	600	0.65	1		
6	1N1341B	58		DO-4	6	150	25	160	35	50	0.65	0.45		
7	1N1342B	58		DO-4	6	150	25	160	70	100	0.65	0.45		
8	1N1344B	58		DO-4	6	150	25	160	140	200	0.65	0.45		
9	1N1345B	58		DO-4	6	150	25	160	212	300	0.65	0.45		
10	1N1346B	58		DO-4	6	150	25	160	284	400	0.65	0.45		
11	1N1347B	58		DO-4	6	150	25	160	355	500	0.65	0.45		
12	1N1348B	58		DO-4	6	150	25	160	424	600	0.65	0.45		
13	40108	48		DO-4	10	150	40	140	35	50	0.6	2		
14	40109	48		DO-4	10	150	40	140	70	100	0.6	2		
15	40110	48		DO-4	10	150	40	140	140	200	0.6	1.5		
16	40111	48	Designed to meet stringent mechanical and environmental specifications	DO-4	10	150	40	140	212	300	0.6	1.5		
17	40112	48		DO-4	10	150	40	140	284	400	0.6	1		
18	40113	48		DO-4	10	150	40	140	355	500	0.6	0.85		
19	40114	48		DO-4	10	150	40	140	424	600	0.6	0.75		
20	40115	48		DO-4	10	150	40	140	564	800	0.6	0.65		
21	1N1199A	20	high reliability	DO-4	12	150	50	240	35	50	0.55	3		
22	1N1200A	20		DO-4	12	150	50	240	70	100	0.55	2.5		
23	1N1202A	20		DO-4	12	150	50	240	140	200	0.55	2		
24	1N1203A	20		DO-4	12	150	50	240	212	300	0.55	1.75		
25	1N1204A	20		DO-4	12	150	50	240	284	400	0.55	1.5		
26	1N1205A	20		DO-4	12	150	50	240	355	500	0.55	1.25		
27	1N1206A	20	DO-4	12	150	50	240	424	600	0.55	1			
28	40259	76	Available in Reverse-Polarity Versions	DO-4	12	150	50	250	424	600	0.55	0.6		
29	40208	120		DO-5	18	150	72	250	35	50	0.65	3		
30	40209	120		DO-5	18	150	72	250	70	100	0.65	3		
31	40210	120	Designed to meet stringent mechanical and environmental specifications	DO-5	18	150	72	250	140	200	0.65	2.5		
32	40211	120		DO-5	18	150	72	250	212	300	0.65	2.5		
33	40212	120		DO-5	18	150	72	250	284	400	0.65	2		
34	40213	120		DO-5	18	150	72	250	355	500	0.65	1.75		
35	40214	120	DO-5	18	150	72	250	424	600	0.65	1.5			
36	1N248C	6	Designed to meet stringent mechanical and environmental specifications	DO-5	20	150	90	350	39	55	0.6	3.8		
37	1N249C	6		DO-5	20	150	90	350	77	110	0.6	3.6		
38	1N250C	6		DO-5	20	150	90	350	154	220	0.6	3.4		
39	1N1195A	6		DO-5	20	150	90	350	212	300	0.6	3.2		
40	1N1196A	6		DO-5	20	150	90	350	284	400	0.6	2.5		
41	1N1197A	6		DO-5	20	150	90	350	355	500	0.6	2.2		
42	1N1198A	6	DO-5	20	150	90	350	424	600	0.6	1.5			
43	1N1183A	38	Designed to meet stringent mechanical and environmental specifications	DO-5	40	150	195	800	35	50	0.65	2.5		
44	1N1184A	38		DO-5	40	150	195	800	70	100	0.65	2.5		
45	1N1186A	38		DO-5	40	150	195	800	140	200	0.65	2.5		
46	1N1187A	38		DO-5	40	150	195	800	212	300	0.65	2.5		
47	1N1188A	38	DO-5	40	150	195	800	284	400	0.65	2.2			
48	1N1189A	38	DO-5	40	150	195	800	355	500	0.65	2			
49	1N1190A	38	DO-5	40	150	195	800	424	600	0.65	1.8			

Silicon
DIFFUSED-JUNCTION TYPES
STUD-MOUNTED
Industrial and Military Applications

- for:
- Battery chargers
 - DC motors
 - DC-to-DC converters
 - Electroplating systems
 - Machine-tool controls
 - Magnetic generators
 - Power-Supply equipment for — aerospace, industrial, MIL, generators, mobile transmitters
 - RF generators
 - Welding equipment

SILICON RECTIFIER STACKS high-voltage types

for INDUSTRIAL & MILITARY APPLICATIONS

RECTIFIERS

CHART **38**

$V_{RM(rep)}$: 1265 to 12000 V

	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS						CHARACTERISTICS		LINE NO	
					V_{RM} (rep)	V_{RM} (nonrep) <small>5ms mx. 60-125°C</small>	$V_{R(RMS)}$	$I_F(AV)$ <small>$T_A = 60^\circ$</small>	I_{FM} (rep)	I_{FM} (surge)	at max. rated operating conditions			
					V	V	V	A	A	A	V_{FM}	I_{RM} (dyn)		
	CR101	84	[molded case]	O	1265	1520	895	1	5	20	1.2	0.3	1	
	CR201	86		N	1900	2280	1345	0.4	3	10	1.8	0.1	2	
	CR301	60		P	2400	[2880 at 50-125°C]	1695	5 ^y	—	250	2.4	1.5	3	
	CR311	60		P	2400		1695	9 ^y	—	250	2.4	1.5	4	
	CR321	60		P	2400		1695	12 ^y	—	400	2.4	1.5	5	
	CR331	60	[fin-mounted types]	P	2400	1695	17 ^y	—	400	2.4	1.5	6		
	CR341	60		P	2400	1695	23 ^y	—	850	2.4	1.5	7		
	CR351	60		P	2400	1695	35 ^y	—	850	2.4	1.5	8		
	CR102	84		O	2530	3035	1790	0.925	5	20	2.4	0.3	9	
	CR103	84		O	3165	3800	2240	0.825	5	20	3	0.3	10	
	CR203	86	[molded case]	N	3165	3800	2400	0.4	3	10	3	0.1	11	
	CR302	60		P	3600	[4320 at 50-125°C]	2545	5 ^y	—	250	3.6	1.5	12	
	CR312	60		P	3600		2545	9 ^y	—	250	3.6	1.5	13	
	CR322	60		P	3600		2545	12 ^y	—	400	3.6	1.5	14	
	CR332	60		P	3600	2545	17 ^y	—	400	3.6	1.5	15		
	CR342	60	[fin-mounted types]	P	3600	2545	23 ^y	—	850	3.6	1.5	16		
	CR352	60		P	3600	2545	35 ^y	—	850	3.6	1.5	17		
	CR104	84		[molded case]	O	4430	5315	3130	0.7	5	20	4.2	0.3	18
	CR204	86			N	4800	5760	3395	0.4	3	10	3.6	0.1	19
	CR303	60			P	4800	[5760 at 50-125°C]	3395	5 ^y	—	250	4.8	1.5	20
	CR313	60	[fin-mounted types]	P	4800	3395		9 ^y	—	250	4.8	1.5	21	
	CR323	60		P	4800	3395		12 ^y	—	400	4.8	1.5	22	
	CR333	60		P	4800	3395	17 ^y	—	400	4.8	1.5	23		
	CR343	60		P	4800	3395	23 ^y	—	850	4.8	1.5	24		
	CR353	60		P	4800	3395	35 ^y	—	850	4.8	1.5	25		
	CR105	84	[molded case]	O	5065	6080	3580	0.7	5	20	4.8	0.3	26	
	CR304	60		P	6000	[7200 at 50-125°C]	4240	5 ^y	—	250	6	1.5	27	
	CR314	60		P	6000		4240	9 ^y	—	250	6	1.5	28	
	CR324	60		P	6000		4240	12 ^y	—	400	6	1.5	29	
	CR334	60		P	6000	4240	17 ^y	—	400	6	1.5	30		
	CR344	60	[fin-mounted types]	P	6000	4240	23 ^y	—	850	6	1.5	31		
	CR354	60		P	6000	4240	35 ^y	—	850	6	1.5	32		
	CR106	84		[molded case]	O	6330	7595	4475	0.65	5	20	6	0.3	33
	CR206	86			N	6330	7595	4475	0.4	3	10	6	0.1	34
	CR305	60			P	7200	[8640 at 50-125°C]	5090	5 ^y	—	250	7.2	1.5	35
	CR315	60	[fin-mounted types]	P	7200	5090		9 ^y	—	250	7.2	1.5	36	
	CR325	60		P	7200	5090		12 ^y	—	400	7.2	1.5	37	
	CR335	60		P	7200	5090	17 ^y	—	400	7.2	1.5	38		
	CR107	84		[molded case]	O	7595	9115	5370	0.6	5	20	7.2	0.3	39
	CR208	86			N	8000	9600	5655	0.4	3	10	6	0.1	40
	CR108	84	[fin-mounted types]		O	8230	9875	5820	0.6	5	20	7.8	0.3	41
	CR306	60		P	8400	[10080 at 50-125°C]	5935	5 ^y	—	250	8.4	1.5	42	
	CR316	60		P	8400		5935	9 ^y	—	250	8.4	1.5	43	
	CR109	84		[molded case]	O		9495	11395	6710	0.6	5	20	9	0.3
	CR307	60			P	9600	[11520 at 50-125°C]	6785	5	—	250	9.6	1.5	45
	CR317	60	[fin-mounted types]	P	9600	6785		9 ^y	—	250	9.6	1.5	46	
	CR210	86		[molded case]	N	10000	12000	7070	0.4	3	10	7.2	0.1	47
	CR110	84			O	10130	12155	7160	0.6	5	20	9.6	0.3	48
	CR212	86			N	12000	14400	8485	0.4	3	10	9	0.1	49

^y $T_A = 50^\circ C$

- for:
- Electrostatic precipitators
 - Plate, screen, and bias voltage for electron tubes
 - Radar
 - High-voltage power supplies
 - Power supplies for TV and radio broadcast stations
 - Resistance-welder controls
 - Induction-heating units

RECTIFIERS

SILICON RECTIFIER BRIDGES high-current types

for INDUSTRIAL & MILITARY APPLICATIONS

$I_{F(AV)}$: to 70 A

CHART **39**

LINE NO	RCA Type	Features	Package	$I_{F(AV)}$	$V_{OUT(AV)}$	$V_{R(RMS)}$	SILICON RECTIFIER BRIDGES Single-Phase Full-Wave Types
				A	V	V	
1	CR401	fin-mounted to facilitate natural- and forced-air cooling	P	18	200	222	
2	CR402		P	18	400	444	
3	CR403		P	18	800	888	
4	CR404		P	34	200	222	
5	CR405		P	34	400	444	
6	CR406		P	34	800	888	
7	CR407		P	70	200	222	
8	CR408		P	70	400	444	
9	CR409		P	70	800	888	

$I_{F(AV)}$: to 92 A

CHART **40**

LINE NO	RCA Type	Features	Package	$I_{F(AV)}$	$V_{OUT(AV)}$	$V_{R(RMS)}$	SILICON RECTIFIER BRIDGES Three-Phase Full-Wave Types
				A	V	V	
1	CR501	fin-mounted to facilitate natural- and forced-air cooling	P	24	300	222	
2	CR502		P	24	600	444	
3	CR503		P	46	300	222	
4	CR504		P	46	600	444	
5	CR505		P	92	300	222	
6	CR506		P	92	600	444	

- for:
- Induction heating units
 - Power supplies for TV and radio broadcast stations
 - Radar
 - Resistance-welder controls

PLUG-IN SILICON RECTIFIERS

for INDUSTRIAL & MILITARY APPLICATIONS

CHART **41**

LINE NO	RCA Type	File No.	Features	Package	Replaces Type(s)	SILICON RECTIFIERS Plug-In Types
1	CR273/8008	100	hermetically sealed — needs no warm-up time	Q R S	8008 872, 872A 866, 866A, 3B28, 3B25	
2	CR274/872A	102				
3	CR275/866A/3B28/3B25	104				

These high-voltage diffused-junction types are direct replacements for the mercury-vapor and gas rectifier tubes indicated. Data for the tube-type rectifiers are given in the RCA Transmitting Tube Manual TT-5.

TRIACS

for INDUSTRIAL & MILITARY APPLICATIONS

THYRISTORS

CHART 42

$I_{T(RMS)}$: to 15 A

	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS						CHARACTERISTICS		LINE NO
					ON-STATE CURRENT			GATE POWER		VGT	IGT		
					$I_{T(RMS)}$	I_{TSM}	V_{DROM}	PGM	PG(AV)	$T_C = 25^\circ C$ max V	$T_C = 25^\circ C$ max mA		
A	at T_C	for 1~	W	W	V	mA							
Silicon Triacs	40525	261	low-volt. oper.	TO-5 modified three 1" leads	2.5	60°C	25	100 ^t	10	0.15	2.2	3	1
	40526	261	120-V line oper.		2.5	60°C	25	200 ^t	10	0.15	2.2	3	2
	40527	261	240-V line oper.		2.5	60°C	25	400 ^t	10	0.15	2.2	3	3
	40528	261	low-volt. oper.		2.5	70°C	25	100	10	0.15	2.2	10	4
	40529	261	120-V line oper.		2.5	70°C	25	200	10	0.15	2.2	10	5
	40530	261	240-V line oper.	factory-attached heat radiators with tabs for printed-circuit boards	2.5	70°C	25	400	10	0.15	2.2	10	6
	40531	262			D	2.5	60°C	See type 40525 for data and features.					7
	40532	262			D	2.5	60°C	See type 40526 for data and features.					8
	40533	262			D	2.5	60°C	See type 40527 for data and features.					9
	40534	262			D	2.5	70°C	See type 40528 for data and features.					10
	40535	262			D	2.5	70°C	See type 40529 for data and features.					11
	Gated Bidirectional	40429	230	120-V line oper.	TO-66	6	75°C	100	200	16	0.2	2.2	25
40430		230	240-V line oper.	TO-66	6	75°C	100	400	16	0.2	2.2	25	14
40502		267	factory-attached heat radiators	E	6	75°C	See type 40429 for data and features.					15	
40503		267		E	6	75°C	See type 40430 for data and features.					16	
40485		248	120-V line oper.	TO-5 modified 2 1" leads	6	75°C	100	200	20	0.2	2.2	25	17
40486		248	240-V line oper.		6	75°C	100	400	20	0.2	2.2	25	18
40509		264	factory-attached heat radiators	D	6	75°C	See type 40485 for data and features.					19	
40510		264		D	6	75°C	See type 40486 for data and features.					20	
40575		300	[Con-] 1800W@120V [trols] 3600W@240V	TO-66	15	70°C	100	200	20	0.45	2.5	80	21
40576		300		TO-66	15	70°C	100	400	20	0.45	2.5	80	22
										VGM $T_C = 25^\circ C$ max V	Gate Trigger Cap. min μF		
Integral Trigger Types													
	40431	257	120-V line oper.	TO-5 modified 2 1" leads	6	75°C	100	200	20	0.2	40	0.1	23
	40432	257	240-V line oper.		6	75°C	100	400	20	0.2	40	0.1	24
	40511	263	factory-attached heat radiators	D	6	75°C	See type 40431 for data and features.					25	
	40512	263		D	6	75°C	See type 40432 for data and features.					26	

^t At $T_j = 90^\circ C$

for: • AC load controls: heating — induction motors — lighting — static switching — phase control of AC loads

SILICON CONTROLLED RECTIFIERS

for INDUSTRIAL & MILITARY APPLICATIONS

CHART 43

I_{TRM} : to 900 A

	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS					CHARACTERISTICS		LINE NO		
					I_{TRM}		V_{RSOM}	di/dt	$P_T(AV)$	PGM for 10μs pulse W	$V_{(BO)}$		V_T at 400A & 2μs pt V	
					A	rep rate p/s								base width μS
Silicon Controlled Rectifier Pulse Type	40216	247	pulse applications	TO-48	900	800	16	720	400	30	40	600	14	1

for: • High-Current Pulse Service • Radar Pulse Modulators

$I_T(\text{RMS})$: to 35 A
 $I_T(\text{AV})$: to 22 A

LINE NO.	RCA Type	File No.	Features	Package <small>See Outlines Section</small>	MAX. RATINGS					CHARACTERISTICS			
					I_T			I_{TSM} for 1~	V_{RSOM} V	$V_{(BO)}$		V_{GT} <small>$T_C = 25^\circ\text{C}$ max $V_{(dc)}$</small>	I_{GT} <small>$T_C = 25^\circ\text{C}$ max mA$_{(dc)}$</small>
					(RMS) A	(AV) A	at T			min V	at T_C		
1	2N3528	114	120-V line oper.	TO-8	2	1.3	$T_A = 25^\circ\text{C}$	60	330	200	$T_C = 100^\circ\text{C}$	2	15
2	2N3529	114	240-V line oper.	TO-8	2	1.3		60	660	400		2	15
3	2N4102	114	high voltage	TO-8	2	1.3		60	700	600		2	15
4	2N3228	114	120-V line oper.	TO-66	5	3.2	$T_C = 75^\circ\text{C}$	60	330	200	$T_C = 100^\circ\text{C}$	2	15
5	2N3525	114	240-V line oper.	TO-66	5	3.2		60	660	400		2	15
6	2N4101	114	high voltage	TO-66	5	3.2		60	700	600		2	15
7	40504	266	[factory-attached heat radiators for printed circuits]	E	5	3.2	$T_r = 60^\circ\text{C}$	See type 2N3228 for data and features.					
8	40505	266		E	5	3.2		See type 2N3525 for data and features.					
9	40506	266		E	5	3.2		See type 2N4101 for data and features.					
10	40553	306		TO-66	5	3.2		80	330	200	3.5	40	
11	40554	306	$t_{off} = \text{bus max. high } dv/dt \text{ \& } di/dt \text{ capability}$	TO-66	5	3.2	$T_r = 60^\circ\text{C}$	80	660	400	$T_C = 100^\circ\text{C}$	3.5	40
12	40555	306	TO-66	5	3.2	80		700	600	3.5		40	
13	40378	98	120-V line oper.	H	7	4.5	$T_C = 60^\circ\text{C}$	80	330	200	$T_C = 100^\circ\text{C}$	2	15
14	40379	98	240-V line oper.	H	7	4.5		80	660	400		2	15
15	40507	265	[factory-attached heat radiators]	D	7	4.5		See type 40378 for data and features.					
16	40508	265		D	7	4.5	See type 40379 for data and features.						
17	2N3668	116	low voltage	TO-3	12.5	8	$T_C = 80^\circ\text{C}$	200	150	100	$T_C = 100^\circ\text{C}$	2	40
18	2N3669	116	120-V line oper.	TO-3	12.5	8		200	330	200		2	40
19	2N3670	116	240-V line oper.	TO-3	12.5	8		200	660	400		2	40
20	2N4103	116	high voltage	TO-3	12.5	8		200	700	600		2	40
21	2N1842A ^u	28	Use 2N3870,2N3896	TO-48	16	10	$T_C = 80^\circ\text{C}$	125	35	25	$T_C = 125^\circ\text{C}$	3.7V at $T_C = -65^\circ\text{C}$	45mA at $T_C = +125^\circ\text{C}$
22	2N1843A ^u	28		TO-48	16	10		125	75	50			
23	2N1844A ^u	28	TO-48	16	10	125		150	100				
24	2N1845A ^u	28	TO-48	16	10	125		225	150				
25	2N1846A ^u	28	Use 2N3871,2N3897	TO-48	16	10		125	300	200			
26	2N1847A ^u	28	TO-48	16	10	125		350	250				
27	2N1848A ^u	28	TO-48	16	10	125		400	300				
28	2N1849A ^u	28	Use 2N3872,2N3898	TO-48	16	10		125	500	400			
29	2N1850A ^u	28	Use 2N3873,2N3899	TO-48	16	10		125	600	500			
30	2N681 ^u	96	Use 2N3870,2N3896	TO-48	25	16		$T_C = 65^\circ\text{C}$	150	35			
31	2N682 ^u	96		TO-48	25	16	150		75	50			
32	2N683 ^u	96	TO-48	25	16	150	150		100				
33	2N684 ^u	96	TO-48	25	16	150	225		150				
34	2N685 ^u	96	Use 2N3871,2N3897	TO-48	25	16	150		300	200			
35	2N686 ^u	96	TO-48	25	16	150	350		250				
36	2N687 ^u	96	TO-48	25	16	150	400		300				
37	2N688 ^u	96	Use 2N3872,2N3898	TO-48	25	16	150		500	400			
38	2N689 ^u	96	TO-48	25	16	150	600		500				
39	2N690 ^u	96	Use 2N3873,2N3899	TO-48	25	16	150		720	600			
40	2N3870	94	low voltage	G	35	22	$T_C = 65^\circ\text{C}$	350	150	100	$T_C = 100^\circ\text{C}$	2	40
41	2N3871	94	120-V line	G	35	22		350	330	200		2	40
42	2N3872	94	240-V line	G	35	22		350	660	400		2	40
43	2N3873	94	high voltage	G	35	22		350	700	600		2	40
44	2N3896	94	low voltage	F	35	22		350	150	100		2	40
45	2N3897	94	120-V line	F	35	22		350	330	200		2	40
46	2N3898	94	240-V line	F	35	22		350	660	400		2	40
47	2N3899	94	high voltage	F	35	22	350	700	600	2	40		

**Silicon
Controlled
Rectifiers**

^u For new equipment design, refer to type recommended in FEATURES column.

^u Not recommended for new equipment design.

- for:
- Inverters and Choppers:
 - Phase Control:
 - Switching, static:
 - AC overvoltage protection
 - DC power supply
 - DC chopper
 - AC switch
 - DC motor drive
 - DC-to-DC converter
 - Battery charging regulator
 - Lamp dimming
 - Frequency changer
 - Crowbar
 - Regulated power supply
 - Pulse modulator
 - DC static switch
 - Servo motor drive
 - Universal motor drive
 - Temperature control
 - Three-phase bridge
 - Ultrasonic oscillator

LINEAR TYPES

INTEGRATED CIRCUITS

CHART 45

RCA Type	File No.	Package <small>See Outlines Section Integrated Circuits</small>	MAX. LIMITS		TYPICAL CHARACTERISTICS AT T _A = 25°C							
			Oper. Temp. Range °C	Input Signal Voltage V	Device Dissipation mW	Input Offset Voltage mV	Input Bias Current μA	Gain dB	Common Mode Rejection Ratio at 1kHz dB	-3dB Bandwidth MHz	Impedance	
											Z _{in} kΩ	Z _{out} Ω

DC Amplifier

CA3000	121	TO-5 10-lead	-55 to +125	-2, +2	30	1.4	23	37 at 1kHz	98	0.65	195 at 1kHz	8000 at 1kHz
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AF Amplifier

CA3007	126	TO-5 12-lead	-55 to +125	-2.5, +2.5	30	0.57 unbal.	11	22 at 1kHz	77	0.02	4 at 1kHz	60 at 1kHz
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Multipurpose Wide-Band Power Amplifier

CA3020	238	TO-5 12-lead	-55 to +125	-3, +3	<p style="text-align: center;">TYPICAL VALUES</p> Zero-Sig. Current Drain, 7mA Max. Sig. Current Drain, 47mA Max. Power Output, 550mW Transducer Power Gain, 58dB -3dB Bandwidth, 6MHz Signal-to-Noise Ratio, 70dB Total Harmonic Distortion, 1% Sensitivity, 35mV							
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Video and Wide-Band Amplifiers

CA3001	122	TO-5 12-lead	-55 to +125	-2.5, +2.5	80	1.5	10	19 at 1.75MHz	70	16	50 at 1.75MHz	70 at 1.75MHz																							
CA3021	243				4	Quietest Output Voltage 2.2V	AGC Source Current	56 at 0.5MHz	Noise Figure 4.2	2.4	4	300																							
CA3022	243				12.5	1.9V	0.8 mA	57 at 2.5MHz	4.4	7.5	1.3	120																							
CA3023	243				35	1.3V		53 at 5MHz	6.5	16	0.3	100																							
CA3034	273	TO-5 10-lead [formed]	-55 to +125	-6, +6	<p style="text-align: center;">Includes Phase Detector for AFC Applications</p> <p style="text-align: center;">MAXIMUM RATINGS</p> Device Dissipation, 300 mW Supply Voltage, 15V Input Voltage, 12V p-p				<p style="text-align: center;">TYPICAL VALUES</p> Total Drain, 9mA Input Impedance, 2000Ω																										
CA3034V1																																			
CA3035	274	TO-5 10-lead [formed]	-55 to +125	-0.5, +0.5	<p style="text-align: center;">MAXIMUM RATINGS</p> Device Diss., 300mW Supply Volt., 15V Input Volt., 1V p-p		<p style="text-align: center;">Wide-band-Amplifier (3) Array</p> <table border="1" style="width: 100%;"> <tr> <td>Amp 1</td> <td>44</td> <td>6</td> <td>0.5</td> <td>50</td> <td>270</td> </tr> <tr> <td>Amp 2</td> <td>46</td> <td>—</td> <td>2.5</td> <td>2</td> <td>170</td> </tr> <tr> <td>Amp 3</td> <td>42</td> <td>—</td> <td>2.5</td> <td>0.67</td> <td>100k</td> </tr> <tr> <td>Total</td> <td>132</td> <td></td> <td></td> <td></td> <td>at f = 40kHz</td> </tr> </table>					Amp 1	44	6	0.5	50	270	Amp 2	46	—	2.5	2	170	Amp 3	42	—	2.5	0.67	100k	Total	132				at f = 40kHz
Amp 1		44	6	0.5	50	270																													
Amp 2	46	—	2.5	2	170																														
Amp 3	42	—	2.5	0.67	100k																														
Total	132				at f = 40kHz																														
CA3035V1																																			

IF Amplifier

CA3002	123	TO-5 10-lead	-55 to +125	-3.5, +3.5	55	2.2 unbal.	20	24 at 1.75MHz	—	11	100 at 1.75MHz	70 at 1.75MHz
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RF Amplifiers

CA3004	124	TO-5 12-lead	-55 to +125	-3.5, +3.5	26	1.7	21	12 at 100MHz	98	100	1.2 at 100MHz	2200 at 100MHz
CA3005	125				26	2.6	19	16 at 100MHz	101	100	1.4 at 100MHz	2000 at 100MHz
CA3006	125				26	0.8	19	16 at 100MHz	101	100	1.4 at 100MHz	2000 at 100MHz

Differential/Cascode Amplifiers

CA3028A	311	TO-5 8-lead	-55 to +125	6 P-to-P	56	—	29	17 at 100MHz	—	120	1.4 at 10.7MHz	2950 at 10.7MHz
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LINE NO

Linear Integrated Circuits

Monolithic Silicon

LINE NO.	RCA Type	File No.	Package <small>See Outlines Section Integrated Circuits</small>	TYPICAL CHARACTERISTICS AT $T_A = 25^\circ\text{C}$							
				Max. Input Signal Voltage V	DC Supply Voltage V	Device Dissipation mW	Voltage Gain at 4.5MHz dB	Noise Figure dB	Input Limiting Voltage (knee) μV	Recovered AF Voltage mV	AM Rejection dB

FM IF Amplifiers

1	CA3011	128	TO-5 10-lead	+3, -3	7.5	120	67	8.7	300	Input Impedance: $R_{in} = 3\text{k}\Omega$ $C_{in} = 7\text{pF}$ Output Impedance: $R_{out} = 31.5\text{k}\Omega$ $C_{out} = 4.2\text{pF}$
2	CA3012	128	TO-5 10-lead	+3, -3	7.5 10	120 190	67 —	8.7 —	300 —	

FM IF Amplifiers/Discriminators/AF Amplifiers

3	CA3013	129	TO-5 10-lead	+3, -3	7.5	120	67	8.7	300	188	50	1.8
4	CA3014	129	TO-5 10-lead	+3, -3	7.5 10	120 190	67 —	8.7 —	300 —	188 220	50 —	1.8 —

INTEGRATED-CIRCUIT ARRAYS

RCA Type	File No.	Package	MAXIMUM LIMITS				CHARACTERISTICS AT $T_A = 25^\circ\text{C}$						
			Device Dissipation P_T mW	V_{CE0} (for each transistor) V	I_C (for each transistor) mA	Voltage Limits V	Max. I_{CBO} μA	Typical Values at 1kHz					
								Beta h_{FE}	f_T MHz	h_{fe}	h_{ie} k Ω	h_{oe} μmho	h_{re}

Transistor Arrays — Operating Temperature Range: -55 to $+125^\circ\text{C}$

5	CA3018	235	TO-5 12-lead	300	15	50	—	0.1	67 per unit	400	70 per unit	2.8 per unit	35 per unit	6.5×10^{-4} per unit
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Diode Arrays — Operating Temperature Range: -55 to $+125^\circ\text{C}$

6	CA3019	236	TO-5 10-lead	120	20mW max for any diode	—3 to +12	—	—	—	—	—	—	—	—
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Single Diode Cap., 1.8pF(typ) $I_{R1} = 10\mu\text{A}(\text{max})$
 $V_{F1} = 0.73\text{V}(\text{typ})$ Series Gate Switching
 $V_{R1} = 4\text{V}(\text{min})$ Pedestal Volt., 10mV(typ)

Ultra-High-Gain Wide-Band Amplifier Arrays — Operating Temperature Range: -55 to $+125^\circ\text{C}$

RCA Type	File No.	Package	MAXIMUM LIMITS				TYPICAL VALUES						
			Input Signal Volt., -6, +6V	Device Dissipation, 300mW	Supply Volt., 15V	Input Volt., 1V p-p	Cascade Voltage Gain at 40kHz, 129dB	Noise Figure (Amplifier I), 6dB	Sensitivity, 100 μV				
7	CA3035	274	TO-5 10-lead										
8	CA3035V1	[formed]											

Dual Darlington Arrays — Operating Temperature Range:

9	CA3036	275	TO-5 10-lead	300	15	50	—	0.5	82 at 1mA	200	1300 per pair	82 per pair	108 per pair	2.7×10^{-3} per pair
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- for:
- AF amplifier
 - Cascode amplifier
 - IF amplifier
 - Phase splitter
 - AGC
 - DC amplifier
 - Limiter
 - Product detector
 - Schmitt trigger
 - AM detector
 - Diode gate for
chopper modulator
 - Mixer
 - Push-pull amplifier
 - Sense amplifier
 - Analog switch
 - Modulator
 - RF amplifier
 - Video amplifier

Linear
Integrated
Circuits

Monolithic
Silicon

LINEAR TYPES

INTEGRATED CIRCUITS

CHART 47

Linear
Integrated
Circuits

Monolithic
Silicon

RCA Type	File No.	Package <small>See Outlines Section Integrated Circuits</small>	MAX. LIMITS		TYPICAL CHARACTERISTICS AT T _A = 25°C										
			Oper. Temp. Range C	Input Signal Voltage V	Device Dissipation mW	Input Offset Voltage mV	Input Bias Current μA	Gain at 1kHz dB	Common Mode Rejection Ratio at 1kHz dB	-3dB Bandwidth MHz	Impedance		NF typ dB	Supply Voltage	
											Z _{in} at 1kHz Ω	Z _{out} at 1kHz kΩ		V _{CC}	V _{EE}
Operational Amplifiers															
CA3008	127	14-lead flat	[-55 to +125]	[-4, +1]	40	1.08	5.3	60	94	0.3	14	200	—	6	-6
CA3008 ^{aa}	310				40	0.9	2.5	60	94	0.3	20	160	8.3	6	-6
CA3010	127	TO-5 12-lead	[-55 to +125]	[-4, +1]	30	1.08	5.3	60	94	0.3	14	200	—	6	-6
CA3010A ^{aa}	310				40	0.9	2.5	60	94	0.3	20	160	8.3	6	-6
CA3015	214	TO-5 12-lead	[-55 to +125]	[-8, +1]	175	1.37	9.6	70	103	0.32	7.8	92	—	12	-12
CA3015A ^{aa}	310				175	1	4.7	70	103	0.32	10	85	11	12	-12
CA3016	214	14-lead flat	[-55 to +125]	[-8, +1]	175	1.37	9.6	70	103	0.32	7.8	92	—	12	-12
CA3016A ^{aa}	310				175	1	4.7	70	103	0.32	10	85	11	12	-12
CA3029	239	plastic dual in-line	[0 to +70]	[-4, +1]	30	1.08	5.3	60	94	0.3	14	200	—	6	-6
CA3029A ^{aa}	310				40	0.9	2.5	60	94	0.3	20	160	8.3	6	-6
CA3030	240	plastic dual in-line	[0 to +70]	[-8, +1]	175	1.37	9.6	70	103	0.32	7.8	92	—	12	-12
CA3030A ^{aa}	310				175	1	4.7	70	103	0.32	10	85	11	12	-12
CA3031/702A	241	TO-5 8-lead	[-55 to +125]	[-8, +1.5]	85	2	3	70	85	0.7	25	130	—	12	-6
CA3032/702C	241	TO-5 8-lead	[0 to +70]	[-8, +1.5]	90	5	5	70	80	0.7	20	200	—	12	-6
CA3033	—	ceramic dual in-line TO-116	[-55 to +125]	[-10, +10]	120	2.6	83nA	84	94	0.1	1500	90	—	12	-12
CA3033A ^{aa}	—				290	2.9	103nA	91	103	0.11	1000	90	16	18	-18
CA3037A	310	ceramic dual in-line TO-116	[-55 to +125]	[-4, +1]	40	0.9	2.5	60	94	0.3	20	160	8.3	6	-6
CA3038A	310				175	1	4.7	70	103	0.32	10	85	11	12	-12

^{aa} For the more critical applications in commercial, military, and industrial equipment.

- for:
- Bandpass amplifier
 - Feedback amplifier
 - Multivibrator
 - Oscillator
 - Video amplifier
 - Comparator
 - Modulator driver (balanced)
 - Narrow-band amplifier
 - Scaling adder
 - DC amplifier
 - Servo driver

LINE NO.	RCA Type	File No.	Description	OPERATING CONDITIONS			TYPICAL CHARACTERISTICS — $T_A = 25^\circ\text{C}$													
				Oper. Temp. Range $^\circ\text{C}$	Supply Voltage Range V	Max. Fan-Out Each Output	Logic Levels V	DC Input Current mA	Noise Immunity V	Device Dissipation mW	Propagation Delay (Avg)									
											Speed ns	Load Fan-Out								
Ultra-High-Speed ECCSL* (OR/NOR-Positive Logic) Circuits																				
Designed to Drive 100 Ω Terminated Transmission Lines				at $V_{EE} = -5\text{V}$																
1	CD2150 ^{cc}	308	Dual 4-input gate	+10 to +60	-4.5 to -5.5	6 output connected to -1.6V thru 100 Ω res.	"0" -1.6	0.1	0.33	44 ^{bb} mA	3.6	1+10pF								
2	CD2151 ^{cc}	308	Dual 4-input gate with "Phantom OR"				"1" -0.8													
3	CD2152 ^{cc}	308	8-input gate with "Phantom OR"				0.1						0.33	40 ^{bb} mA	3.6	1+10pF				
4	CD2153 ^{cc}	308	Quadruple 2-input NOR gate				0.1						0.33	35 ^{bb} mA	3.6	1+10pF				
High-Speed ECCSL* (OR/NOR-Positive Logic) Circuits																				
				at $V_{EE} = -5.2\text{V}$																
5	CD2100 ^{cc}	130	Dual 4-input gate	-55 to +125	-4.68 to -5.72	12 output unterminated	"0" -1.55	0.05	0.32	88	5.6	1+10pF								
6	CD2101 ^{cc}	130	Quadruple 2-input NOR gate				"1" -0.75						0.05	0.32	120	5.6	1+10pF			
Low-Power DTL (NAND-Positive Logic) Circuits																				
				at $V_{CC} = +4\text{V}$																
7	CD2200 ^{cc}	132	Dual 4-input gate with input expander node	-55 to +125		6		-0.28	1.2	2.3 per gate	55	6+60pF								
8	CD2200D ^y	307																		
9	CD2201 ^{cc}	132	Quadruple 2-input gate										+3.8 to +6.3	6	"0" +0.1 "1" +3.4	-0.28	1.2	2.3 per gate	55	6+60pF
10	CD2201D ^y	307																		
11	CD2202 ^{cc}	227	Dual 4-input buffer gate with input expander node										25	-0.28	1.2	12 per gate	48	25+250 pF		
12	CD2202D ^y	307																		
13	CD2203 ^{cc}	133	J-K flip-flop with set-reset capability										5	-0.28	1.2	7	126	5+50pF		
14	CD2203D ^y	307																		
15	CD2204 ^{cc}	226	Dual 4-input gate expander										<ul style="list-style-type: none"> capable of expanding fan-in to more than 20 compatible in all respects with inputs of RCA LPDTL series gates operating temperature range -55 to +125$^\circ\text{C}$ low capacitive loading on expanded gate — 4pF typ. forward voltage — 0.72V typ. leakage current — 5nA typ. 							
16	CD2204D ^y	307																		
17	CD2205 ^{cc}	233	Dual 3-input expandable AND/OR/NOT gate										+3.8 to +6.3	6 inverter fan-out	"0" +0.1 "1" +3.4	-0.28	1.2	5	71	6+60pF
18	CD2205D ^y	307																		

^y Utilizes 14-lead metal and ceramic dual in-line package, TO-116.

* ECCSL — Emitter-coupled current-steered logic.

^{bb} Power Supply Current Drain per Chip.

^{cc} Utilizes 14-lead 1/4" x 3/8" ceramic and metal flat package; see Outlines Section, Integrated Circuits, flat pack.

Digital
Integrated
Circuits

Monolithic
Silicon

- for:
- Aerospace and airborne computers
 - High-speed commercial, industrial, and scientific computers
 - Instrumentation and industrial control equipment
 - Military, commercial, and industrial computers
 - Portable military equipment
 - Third generation business computers

RCA MILITARY SPECIFICATION TYPES

**TRANSISTORS
RECTIFIERS**

CHART 54

Designed to meet applicable MIL-S-19500 Military Specification

Line No.	RCA Type	Line No.	RCA Type
1	JAN 1N249B [†]	29	JAN 2N1304
2	JAN 1N250B [†]	30	JAN 2N1305
3	JAN 1N1184 [†]	31	JAN 2N1306
4	JAN 1N1186 [†]	32	JAN 2N1307
5	JAN 1N1188	33	JAN 2N1308
6	JAN 1N1190 [†]	34	JAN 2N1309
7	JAN 1N1198A [†]	35	JAN 2N1412 [●]
8	JAN 1N2135A [†]	36	JAN 2N1479
9	JAN 2N174A [●]	37	JAN 2N1480
10	JAN 2N220 [●]	38	JAN 2N1481
11	JAN 2N384	39	JAN 2N1482
12	JAN 2N388	40	JAN 2N1483
13	JAN 2N398 [●]	41	JAN 2N1484
14	JAN 2N398A	42	JAN 2N1485
15	JAN 2N404	43	JAN 2N1486
16	JAN 2N404A	44	JAN 2N1487
17	JAN 2N918	45	JAN 2N1488
18	JAN TX 2N918	46	JAN 2N1489
19	JAN 2N1183	47	JAN 2N1490
20	JAN 2N1183A	48	JAN 2N1493
21	JAN 2N1183B	49	JAN 2N1853 [●]
22	JAN 2N1184	50	JAN 2N1854 [●]
23	JAN 2N1184A	51	JAN 2N2015
24	JAN 2N1184B	52	JAN 2N2016
25	JAN 2N1224	53	JAN 2N2708
26	JAN 2N1225	54	JAN 2N2857
27	JAN 2N1302	55	JAN TX 2N2857
28	JAN 2N1303	56	JAN 2N3375
		57	JAN 2N3553

For further details on these military specification types, please contact the RCA Sales Offices.

[†] Reverse polarity version available

[●] Limited type ■ Includes mounting hardware

SOLID STATE PHOTOCONDUCTIVE DEVICES

PHOTOCELLS

CHART 55

LINE NO.	RCA Type	Resistance	Voltage	Power Dissip.
		at 2 foot candles kΩ	DC or Peak AC max Volts	Continuous Service Watt

Broad-Area Cadmium-Sulfide Types (5100Å)

GLASS-METAL TYPES

1" Diameter File No. 312

1	SQ2503	30	600	0.75
2	7163	17	600	0.75
3	4448	14	600	0.75
4	4404	9	600	0.75
5	SQ2502	For new equip. design see type 4404.		
6	4453	7	600	0.75
7	4403	3	350	0.75

Modified TO-8 Case

File No. 312

8	SQ2521	14	250	0.35
9	SQ2526	3.6	200	0.35
10	SQ2527	1.8	200	0.35
11	SQ2556	0.85	200	0.35
12	SQ2520	0.85	200	0.35

Modified TO-5 Case

File No. 312

13	SQ2534	8000	300	0.075
14	SQ2529	900	300	0.075
15	SQ2508	58	300	0.075
16	SQ2555	20	200	0.075
17	SQ2519	10	300	0.075
18	SQ2536	3.8	150	0.075
19	SQ2554	2.8	150	0.075

Modified TO-18 Case

File No. 312

20	SQ2535	26	200	0.03
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GLASS-METAL DUAL-ELEMENT TYPES

Modified TO-5 Case

File No. 312

21	SQ2557	120	100	0.075
22	SQ2558	13	100	0.075

Broad-Area Cadmium-Sulfo-Selenide (6150Å)

GLASS-METAL TYPES

1" Diameter

File No. 312

23	SQ2546	0.72	200	0.75
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Modified TO-8 Case

File No. 312

24	SQ2545	0.9	125	0.35
25	SQ2545V1	1.4	200	0.35

Modified TO-5 Case

File No. 312

26	SQ2544	2.4	100	0.075
27	SQ2544V1	6	150	0.075

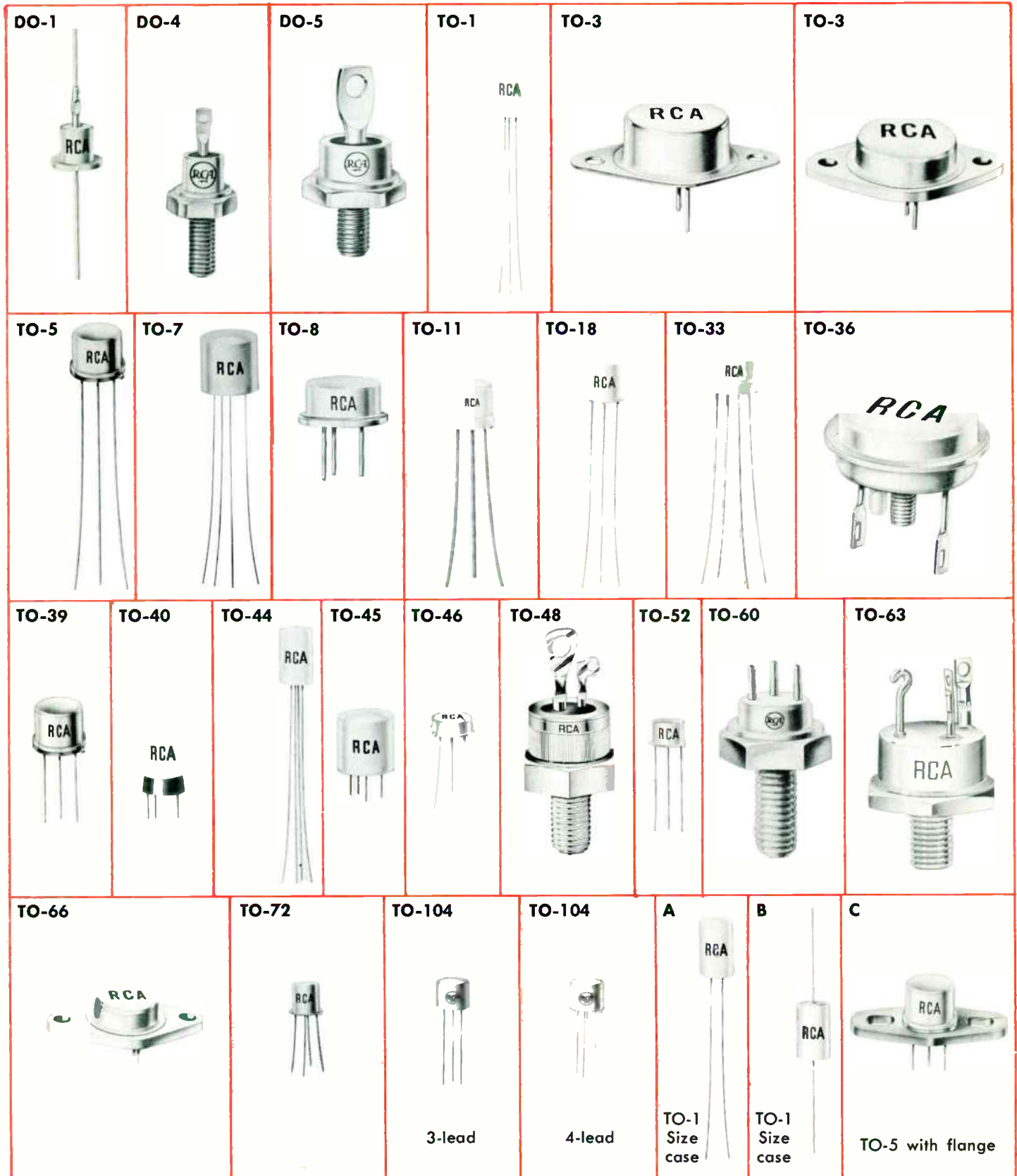
Modified TO-18 Case

File No. 312

28	SQ2543	8	100	0.03
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OUTLINES

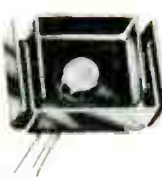








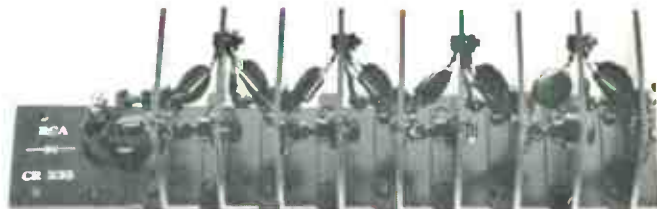



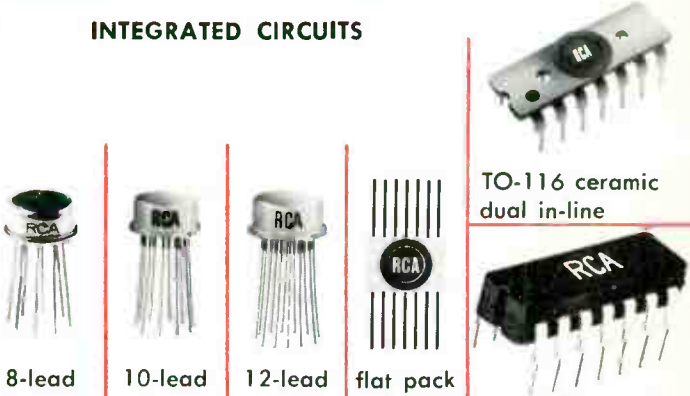



Outlines shown are approximately actual size except where indicated otherwise.



For detailed socket and mounting-hardware information on the devices shown above, refer to the specific data booklet or RCA Technical Publications.

OUTLINES

Outlines shown are approximately actual size except where indicated otherwise.

<p>D</p>  <p>TO-5 with radiator</p>	<p>E</p>  <p>TO-66 with radiator*</p>	<p>F</p>  <p>Press fit</p>	<p>G</p>  <p>Low profile</p>	<p>H</p>  <p>TO-104 with radiator</p>	<p>K</p> 
<p>L</p> 	<p>M</p>  <p>2X actual size</p>	<p>N</p>  <p>1/2 actual size</p>			
<p>O</p>  <p>1/3 actual size</p>		<p>P</p>  <p>1/4 actual size</p>			
<p>Q</p>  <p>1/3 actual size</p>	<p>R</p>  <p>1/3 actual size</p>	<p>S</p>  <p>1/3 actual size</p>	<p>INTEGRATED CIRCUITS</p>  <p>8-lead 10-lead 12-lead flat pack TO-116 ceramic dual in-line plastic dual in-line</p>		
<p>T</p> 	<p>U</p> 	<p>V</p> 	<p>W</p> 		

For detailed socket and mounting-hardware information on the devices shown above, refer to the specific data booklet or RCA Technical Publications.

INDEX

RCA Type No.	Chart No.	Line No.	Class	File No.
1N248C	37	36	R†	6
1N249B	54	1	R*†	—
1N249C	37	37	R†	6
1N250B	54	2	R*†	—
1N250C	37	38	R†	6
1N440B	36	19	R	5
1N441B	36	20	R	5
1N442B	36	21	R	5
1N443B	36	22	R	5
1N444B	36	17	R	5
1N445B	36	18	R	5
1N536	36	23	R	3
1N537	36	24	R	3
1N538	36	25	R	3
1N539	36	26	R	3
1N540	36	27	R	3
1N547	36	28	R	3
1N1095	36	29	R	3
1N1183A	37	43	R†	38
1N1184	54	3	R*†	—
1N1184A	37	44	R†	38
1N1186	54	4	R*†	—
1N1186A	37	45	R†	38
1N1187A	37	46	R†	38
1N1188	54	5	R*	—
1N1188A	37	47	R†	38
1N1189A	37	48	R†	38
1N1190	54	6	R*†	—
1N1190A	37	49	R†	38
1N1195A	37	39	R†	6
1N1196A	37	40	R†	6
1N1197A	38	41	R†	6
1N1198A	{ 37 54 }	{ 42 7 }	R*†	6
1N1199A	37	21	R†	20
1N1200A	37	22	R†	20
1N1202A	37	23	R†	20
1N1203A	37	24	R†	20
1N1204A	37	25	R†	20
1N1205A	37	26	R†	20
1N1206A	37	27	R†	20
1N1341B	37	6	R†	58
1N1342B	37	7	R†	58
1N1344B	37	8	R†	58
1N1345B	37	9	R†	58
1N1346B	37	10	R†	58
1N1347B	37	11	R†	58
1N1348B	37	12	R†	58
1N1612	37	1	R†	18
1N1613	37	2	R†	18
1N1614	37	3	R†	18
1N1615	37	4	R†	18
1N1616	37	5	R†	18
1N1763A	36	30	R	89
1N1764A	36	31	R	89
1N2135A	54	8	R*†	—
1N2326	35	1	D	55
1N2858A	36	32	R	91
1N2859A	36	33	R	91
1N2860A	36	34	R	91
1N2861A	36	35	R	91
1N2862A	36	36	R	91
1N2863A	36	37	R	91
1N2864A	36	38	R	91
1N3128	33	2	TD	30

RCA Type No.	Chart No.	Line No.	Class	File No.
1N3129	33	9	TD	30
1N3130	33	13	TD	30
1N3193	36	8	R	41
1N3194	36	9	R	41
1N3195	36	10	R	41
1N3196	36	6	R	41
1N3253	36	11	R	41
1N3254	36	12	R	41
1N3255	36	13	R	41
1N3256	36	7	R	41
1N3563	36	5	R	41
1N3754	36	1	R	39
1N3755	36	2	R	39
1N3756	36	3	R	39
1N3847			TD	30
1N3848			TD	30
1N3849			TD	30
1N3850			TD	30
1N3851			TD	30
1N3852			TD	30
1N3853			TD	30
1N3854			TD	30
1N3855			TD	30
1N3856			TD	30
1N3857			TD	30
1N3858			TD	30
1N3859			TD	30
1N3860			TD	30
1N4785	34	2	D	205,206
1N5211	36	39	R	245
1N5212	36	40	R	245
1N5213	36	41	R	245
1N5214	36	15	R	245
1N5215	36	42	R	245
1N5216	36	43	R	245
1N5217	36	44	R	245
1N5218	36	16	R	245
2N104§	2	12	T	14
2N109§	2	16	T	14
2N139§	17	1	T	14
2N140§	17	5	T	14
2N174A●	54	9	T*	14
2N175§	2	1	T	14
2N176§	10	11	T	14
2N215§	2	13	T	14
2N217	2	17	T	52
2N218§	17	2	T	14
2N219§	17	6	T	14
2N220§	{ 2 54 }	{ 2 10 }	T	14
2N270	10	4	T	62
2N274	17	14	T	2
2N351§	10	12	T	14
2N370§	17	28	T	14
2N371§	17	29	T	14
2N372§	17	27	T	14
2N376§	10	13	T	14
2N384	{ 17 54 }	{ 31 11 }	T*	2
2N388	{ 25 54 }	{ 6 12 }	T*	23
2N388A	25	7	T	23
2N395§	24	1	T	31

Superseded
by Type
Nos. 40561
through
40574
(File No. 315);
Chart No. 33

RCA Type No.	Chart No.	Line No.	Class	File No.
2N396§	24	6	T	31
2N396A§	24	7	T	14
2N397§	24	11	T	31
2N398	{ 26 54 }	{ 1 13 }	T	49
2N398A	{ 26 54 }	{ 2 14 }	T*	49
2N398B	26	3	T	49
2N404	{ 24 54 }	{ 3 15 }	T*	15
2N404A	{ 24 54 }	{ 4 16 }	T*	15
2N405§	2	14	T	14
2N406	2	15	T	59
2N407§	10	2	T	14
2N408	10	3	T	59
2N409§	17	3	T	14
2N410§	17	4	T	14
2N411§	17	7	T	14
2N412§	17	8	T	14
2N414	24	10	T	11
2N581	24	5	T	15
2N582	24	13	T	15
2N585	25	1	T	1
2N586	31	1	T	7
2N591	2	3	T	82
2N647	8	1	T	108
2N649	8	2	T	108
2N681§	44	30	SCR	96
2N682§	44	31	SCR	96
2N683§	44	32	SCR	96
2N684§	44	33	SCR	96
2N685§	44	34	SCR	96
2N686§	44	35	SCR	96
2N687§	44	36	SCR	96
2N688§	44	37	SCR	96
2N689§	44	38	SCR	96
2N690§	44	39	SCR	96
2N697	{ 4 19 27 }	{ 19 11 5 8 }	T	16
2N699	{ 4 19 27 }	{ 20 12 6 9 }	T	22
2N706	21	1	T	9
2N706A§	21	2	T	9
2N709	21	13	T	45
2N718A	{ 1 19 27 }	{ 5 9 3 }	T	36
2N720A	{ 1 27 }	{ 6 7 4 }	T	36
2N834§	21	7	T	35
2N914§	21	6	T	14
2N917	16	3	T	81
2N918	{ 16 54 54 }	{ 4 17 18 }	T*	83
2N1010§	3	1	T	14
2N1023	17	34	T	2
2N1066	17	35	T	2
2N1090§	25	5	T	1
2N1091§	25	9	T	1
2N1177§	17	37	T	14
2N1178§	17	39	T	14
2N1179§	17	38	T	14
2N1180§	17	30	T	14
2N1183	{ 10 31 54 }	{ 5 2 19 }	T*	4

* Military version available

† Reverse-polarity version available

● Limited type

§ For renewal use only. For types recommended for new equipment design, refer to indicated data charts and/or to Data Bulletin File No. 14.

BR — Bridge Rectifier
D — Diode
IC — Integrated Circuit
MOS — Metal Oxide Semiconductor

PC — Photoconductive Cell
R — Rectifier
SCR — Silicon Controlled Rectifier
SR — Stack Rectifier

T — Transistor
TD — Tunnel Diode
TR — Tunnel Rectifier
TRI — Triac

INDEX (continued)

RCA Type No.	Chart No.	Line No.	Class	File No.
2N1183A	{ 10 31 54 7	{ 6 3 20	T*	4
2N1183B	{ 10 31 54	{ 7 4 21	T*	4
2N1184	{ 10 31 54	{ 8 5 22	T*	4
2N1184A	{ 10 31 54	{ 9 6 23	T*	4
2N1184B	{ 10 31 54	{ 10 7 24	T*	4
2N1224	{ 17 54	{ 15 25	T*	2
2N1225	{ 17 54	{ 32 26	T*	2
2N1226	17	16	T	2
2N1300	24	16	T	19
2N1301	24	17	T	19
2N1302	{ 25 54	{ 2 27	T*	25
2N1303	{ 24 54	{ 2 28	T*	27
2N1304	{ 25 54	{ 8 29	T*	25
2N1305	{ 24 54	{ 9 30	T*	27
2N1306	{ 25 54	{ 10 31	T*	25
2N1307	{ 24 54	{ 12 32	T*	27
2N1308	{ 25 54	{ 11 30	T*	25
2N1309	{ 24 54	{ 14 34	T*	27
2N1384§	24	15	T	14
2N1395	17	17	T	2
2N1396	17	33	T	2
2N1397	17	36	T	2
2N1412●	54	35	T*	—
2N1479	{ 4 27 54	{ 31 18 36	T*	135
2N1480	{ 4 27 54	{ 32 19 37	T*	135
2N1481	{ 4 27 54	{ 33 20 38	T*	135
2N1482	{ 4 27 54	{ 34 21 39	T*	135
2N1483	{ 5 28 54	{ 32 16 40	T*	137
2N1484	{ 5 28 54	{ 33 17 41	T*	137
2N1485	{ 5 28 54	{ 34 18 42	T*	137
2N1486	{ 5 28 54	{ 35 19 43	T*	137
2N1487	{ 6 28 54	{ 17 45 44	T*	139
2N1488	{ 6 28 54	{ 18 46 45	T*	139
2N1489	{ 6 28 54	{ 19 47 46	T*	139
2N1490	{ 6 28 54	{ 20 48 47	T*	139
2N1491	18	1	T	10
2N1492	18	4	T	10
2N1493	{ 18 54	{ 7 48	T*	10
2N1524	17	18	T	111
2N1525§	17	19	T	14
2N1526	17	20	T	111
2N1527§	17	21	T	14
2N1605	25	3	T	29
2N1605A	25	4	T	29
2N1613	{ 1 4 19 27	{ 30 28 10 10	T	106
2N1631§	17	24	T	14
2N1632	17	25	T	111
2N1637	17	26	T	118

RCA Type No.	Chart No.	Line No.	Class	File No.
2N1638	17	22	T	118
2N1639	17	23	T	118
2N1683	24	20	T	19
2N1700	{ 4 27	{ 35 22	T	141
2N1701	{ 5 28	{ 36 20	T	141
2N1702	{ 6 28	{ 21 49	T	141
2N1711	{ 1 19 27	{ 31 15 11	T	26
2N1842A§	44	21	SCR	28
2N1843A§	44	22	SCR	28
2N1844A§	44	23	SCR	28
2N1845A§	44	24	SCR	28
2N1846A§	44	25	SCR	28
2N1847A§	44	26	SCR	28
2N1848A§	44	27	SCR	28
2N1849A§	44	28	SCR	28
2N1850A§	44	29	SCR	28
2N1853§	{ 24 54	{ 18 49	T*	43
2N1854§	{ 24 54	{ 19 50	T*	43
2N1893	{ 1 19 27	{ 32 8 12	T	34
2N1905	{ 10 31	{ 24 8	T	17
2N1906	{ 10 31	{ 25 9	T	17
2N2015	{ 6 29 54	{ 40 18 51	T*	12
2N2016	{ 12 29 54	{ 41 19 52	T*	12
2N2102	{ 1 15 19 27	{ 33 7 21 23	T	106
2N2147	10	14	T	204
2N2148	10	15	T	204
2N2270	{ 1 15 19 27	{ 34 37 11 24	T	24
2N2338	{ 6 29	{ 42 20	T	141
2N2369A	21	12	T	147
2N2405	{ 1 12 15 19 27	{ 35 38 2 8 22 25	T	34
2N2475	21	14	T	45
2N2476	22	1	T	47
2N2477	22	2	T	47
2N2613	2	4	T	51
2N2614	2	5	T	51
2N2631	18	31	T	32
2N2708	{ 16 54	{ 8 53	T*	57
2N2857	{ 16 54	{ 40 54 55	T*	61
2N2869/ 2N301	10	22	T	53
2N2870/ 2N301A	10	23	T	53
2N2876	18	32	T	32
2N2895	{ 1 15 19 27	{ 7 5 23 5	T	143
2N2896	{ 1 15 19 27	{ 8 10 24 6	T	143
2N2897	{ 1 4 19 27	{ 9 7 16 7	T	143
2N2953	2	6	T	65

RCA Type No.	Chart No.	Line No.	Class	File No.
2N3011	21	9	T	147
2N3053	{ 1 15 19 27	{ 36 5 17 26	T	145
2N3054	{ 5 28	{ 39 23	T	145
2N3055	{ 6 29	{ 32 10	T	145
2N3118	18	8	T	42
2N3119	21	5	T	44
2N3228	44	4	SCR	114
2N3229	18	38	T	50
2N3241A	{ 1 4 19	{ 17 9 29	T	221
2N3242A	{ 1 4 19	{ 18 10 30	T	221
2N3261	{ 21 22 19 27	{ 15 8 26 50	T	93
2N3262	{ 6 12 19	{ 29 15 7	T	56
2N3263	{ 6 12 19 29	{ 29 15 1 7	T	54
2N3264	{ 6 12 19 29	{ 30 3 2 8	T	54
2N3265	{ 6 12 19 29	{ 38 16 3 16	T	54
2N3266	{ 6 12 19 29	{ 39 4 4 17	T	54
2N3375	{ 18 54	{ 23 56	T*	92
2N3439	{ 5 12 28 32	{ 14 43 1 29	T	64
2N3440	{ 5 12 28 32	{ 15 31 2 20	T	64
2N3441	{ 5 12 28 32	{ 37 21 22 4	T	146
2N3442	{ 6 12 29 32	{ 34 22 12 5	T	207
2N3478	16	13	T	77
2N3512	22	3	T	47
2N3525	44	5	SCR	114
2N3528	44	1	SCR	114
2N3529	44	2	SCR	114
2N3553	{ 18 54	{ 18 57	T*	92
2N3583	{ 6 12 28 32	{ 1 29 29 15	T	138
2N3584	{ 6 12 28 32	{ 2 42 30 21	T	138
2N3585	{ 6 12 28 32	{ 3 46 31 27	T	138
2N3600	16	39	T	83
2N3632	18	36	T	92
2N3668	44	17	SCR	116
2N3669	44	18	SCR	116
2N3670	44	19	SCR	116
2N3730	11	2	T	{ 205 206 }
2N3731	11	4	T	205
2N3732	11	1	T	{ 205 206 }
2N3733	18	33	T	72
2N3771	{ 6 29	{ 43 21	T	140
2N3772	{ 6 29	{ 44 22	T	140

INDEX (continued)

RCA Type No.	Chart No.	Line No.	Class	File No.	
2N3773	{ 6	45	T	213	
	{ 12	23			
	{ 29	23			
	{ 32	6			
2N3839	16	44	T	229	
2N3866	18	12	T	80	
2N3870	44	40	SCR	94	
2N3871	44	41	SCR	94	
2N3872	44	42	SCR	94	
	44	43	SCR	94	
	{ 6	4	T	299	
{ 12	5				
{ 19	12				
{ 28	33				
2N3878	{ 6	5	T	299	
	{ 12	6			
	{ 19	13			
	{ 28	34			
2N3879	44	44	SCR	94	
2N3897	44	45	SCR	94	
	44	46	SCR	94	
	44	47	SCR	94	
	2N3932	16	37	T	101
	2N3933	16	38	T	101
2N4012	18	20	T	90	
2N4036	{ 7	6	T	216	
	{ 20	1			
2N4037	{ 7	7	T	216	
	{ 20	2			
2N4063	{ 5	16	T	64	
	{ 12	44			
	{ 28	3			
	{ 32	30			
2N4064	{ 5	17	T	64	
	{ 12	32			
	{ 28	4			
	{ 32	22			
2N4068	{ 12	17	T	109	
	{ 32	11			
2N4069	{ 12	18	T	109	
	{ 32	12			
2N4074	{ 1	11	T	221	
2N4081§	16	5	T	271	
2N4101	44	6	SCR	114	
2N4102	44	3	SCR	114	
2N4103	44	20	SCR	116	
2N4240	{ 6	6	T	138	
	{ 12	47			
	{ 28	32			
	{ 32	28			
2N4259	16	14	T	200	
2N4296	{ 5	23	T	201	
	{ 12	40			
2N4297	{ 5	24	T	201	
	{ 12	41			
	{ 28	13			
	{ 32	1			
2N4298	{ 5	25	T	201	
	{ 12	48			
2N4299	{ 5	26	T	201	
	{ 12	49			
2N4314	{ 7	8	T	216	
	{ 20	3			
2N4346	11	5	T	206	
2N4347	{ 6	31	T	207	
	{ 12	13			
	{ 29	9			
	{ 32	1			
2N4348	{ 6	37	T	213	
	{ 12	14			
	{ 29	15			
	{ 32	2			
2N4390	{ 12	7	T	225	
	{ 32	3			
2N4395§	{ 6	15	T	234	
	{ 28	43			
2N4396§	{ 6	16	T	234	
2N4397§	{ 6	16	T	272	
	{ 28	44			
2N4427	18	10	T	228	
2N4440	18	29	T	217	
2N4932	18	34	T	249	
2N4933	18	43	T	249	
2N4934	16	9	T	252	
2N4935	16	10	T	252	
2N4936	16	11	T	252	
2N5016	18	40	T	255	
2N5017	18	41	T	256	

RCA Type No.	Chart No.	Line No.	Class	File No.
2N5034	{ 6	23	T	244
2N5035	{ 29	1	T	244
	{ 6	26		
2N5036	{ 29	4	T	244
	{ 6	24		
2N5037	{ 29	2	T	244
	{ 6	27		
2N5070	{ 29	5	T	244
2N5070	18	45	T	268
2N5071	18	44	T	269
2N5090	18	15	T	270
2N5102	18	39	T	279
2N5108	18	14	T	280
2N5109	16	49	T	281
2N5179	16	41	T	288
2N5180	16	7	T	289
2N5181	15	13	T	290
2N5182	15	14	T	290
2N5183	{ 1	12	T	291
	{ 19	25		
2N5184	12	8	T	292
2N5185	12	9	T	292
2N5186	21	10	T	293
2N5187	21	11	T	294
2N5188	{ 15	11	T	295
	{ 22	4		
2N5189	{ 15	12	T	296
2N5202	{ 22	5	T	299
2N5262	19	13a	T	313
3N128	22	6	T	309
3N138	13	3	MOS	283
3N138	23	1	MOS	283
3N139	13	2	MOS	284
3N140	14	1	MOS	285
3N141	14	2	MOS	285
3N142	13	5	MOS	286
3N143	13	1	MOS	309
3N152	13	3a	MOS	314
4403	55	7	PC	312
4404	55	4	PC	312
4448	55	3	PC	312
4453	55	6	PC	312
7163	55	2	PC	312
40022	10	16	T	69
40050	10	17	T	67
40051	10	18	T	67
40080	18	3	T	301
40081	18	6	T	301
40082	18	21	T	301
40084	{ 1	10	T	40
	{ 4	8		
40108	{ 15	6	R†	48
40109	{ 19	18		
40110	37	13	R†	48
40111	37	14	R†	48
40110	37	15	R†	48
40111	37	16	R†	48
40112	37	17	R†	48
40113	37	18	R†	48
40114	37	19	R†	48
40115	37	20	R†	48
40208	37	29	R†	120
40209	37	30	R†	120
40210	37	31	R†	120
40211	37	32	R†	120
40212	37	33	R†	120
40213	37	34	R†	120
40214	37	35	R†	120
40216	43	1	SCR	247
40217§	21	3	T	14
40218§	21	4	T	14
40220§	21	8	T	14
40231	1	1	T	71
40232	1	2	T	71
40233	1	3	T	71
40234	1	4	T	71,107
40235	16	34	T	99
40236	16	35	T	99
40237	16	36	T	99
40238	16	15	T	99
40239	16	16	T	99
40240	16	17	T	99

RCA Type No.	Chart No.	Line No.	Class	File No.
40242	16	18	T	95
40243	16	19	T	95
40244	16	20	T	95
40245	16	21	T	95
40246	16	22	T	95
40250	{ 5	40	T	112
	{ 28	24		
40250V1	{ 5	27	T	112
	{ 27	45		
40251	{ 6	35	T	112
	{ 29	13		
40253§	10	1	T	73
40254	10	19	T	69
40259	37	28	R	76
40261§	17	13	T	79
40262§	17	9	T	79
40263§	2	7	T	79
40264	—	—	T	14
40265	36	4	T	79
40266	36	45	R	75
40267	36	46	R	75
40279	18	24	T	46
40280	18	11	T	68
40281	18	28	T	68
40282	18	35	T	68
40283§	22	7	T	85
40290	18	16	T	70
40291	18	17	T	70
40292	18	30	T	70
40294	16	42	T	202
40295	16	12	T	203
40296	16	43	T	246
40305	18	19	T	144
40306	18	25	T	144
40307	18	37	T	144
40309	{ 4	40	T	78
	{ 27	27		
40309V1	Same as 40309 except for P _T & θ _{J-A}			
40309V2	Same as 40309 except for P _T & θ _{J-C}			
40310	{ 5	41	T	78
	{ 28	25		
40310V1	Same as 40310 except for P _T & θ _{J-A}			
40311	{ 4	41	T	78
	{ 27	28		
40311V1	Same as 40311 except for P _T & θ _{J-A}			
40311V2	Same as 40311 except for P _T & θ _{J-C}			
40312	{ 5	42	T	78
	{ 28	26		
40313	{ 6	7	T	78
	{ 28	35		
40314	{ 4	42	T	78
	{ 27	29		
40314V1	Same as 40314 except for P _T & θ _{J-A}			
40314V2	Same as 40314 except for P _T & θ _{J-C}			
40315	{ 4	43	T	78
	{ 27	30		
40315V1	Same as 40315 except for P _T & θ _{J-A}			
40315V2	Same as 40315 except for P _T & θ _{J-C}			
40316	{ 5	43	T	78
	{ 28	27		
40317	{ 4	44	T	78
	{ 27	31		
40317V1	Same as 40317 except for P _T & θ _{J-A}			
40317V2	Same as 40317 except for P _T & θ _{J-C}			
40318	{ 6	8	T	78
	{ 28	36		
40319	{ 7	1	T	78
	{ 30	4		
40319V1	Same as 40319 except for P _T & θ _{J-A}			
40319V2	Same as 40319 except for flange			
40320	{ 4	45	T	78
	{ 27	32		
40320V1	Same as 40320 except for P _T & θ _{J-A}			
40320V2	Same as 40320 except for P _T & θ _{J-C}			
40321	{ 4	46	T	78
	{ 27	33		
40321V1	Same as 40321 except for P _T & θ _{J-A}			
40321V2	Same as 40321 except for flange			
40322	{ 6	9	T	78
	{ 28	37		
40323	{ 4	47	T	78
	{ 27	34		

INDEX (continued)

RCA Type No.	Chart No.	Line No.	Class	File No.
40323V1	Same as 40323 except for P _T & θ _{J-A}			
40323V2	Same as 40323 except for P _T & θ _{J-C}			
40324	{ 5 28 } 44	{ 28 36 } 44	T	78
40325	{ 6 29 } 48	{ 28 36 } 44	T	78
40326	{ 4 27 } 35	{ 14 35 } 48	T	78
40326V1	Same as 40326 except for P _T & θ _{J-A}			
40326V2	Same as 40326 except for P _T & θ _{J-C}			
40327	{ 4 27 } 36	{ 49 36 } 48	T	78
40327V1	Same as 40327 except for P _T & θ _{J-A}			
40327V2	Same as 40327 except for flange			
40328	{ 6 28 } 2	{ 10 38 } 11	T	78
40329	{ 2 18 } 46	{ 11 46 } 47	T	97
40340	{ 18 18 } 47	{ 46 47 } 47	T	74
40341	{ 5 12 } 28	{ 18 28 } 16	T	74
40346	{ 5 12 } 28	{ 18 28 } 16	T	211
40346V1	{ 27 28 } 32	{ 17 6 } 18	T	211
40346V2	{ 32 5 } 8	{ 18 8 } 8	T	211
40347	{ 27 5 } 11	{ 51 11 } 42	T	88
40347V1	{ 5 27 } 20	{ 11 42 } 9	T	88
40347V2	{ 5 28 } 9	{ 20 9 } 9	T	88
40348	{ 5 27 } 52	{ 9 12 } 52	T	88
40348V1	{ 5 27 } 43	{ 12 43 } 21	T	88
40348V2	{ 5 28 } 10	{ 10 10 } 10	T	88
40349	{ 12 27 } 32	{ 24 53 } 7	T	88
40349V1	{ 5 12 } 27	{ 13 26 } 44	T	88
40349V2	{ 5 12 } 28	{ 22 11 } 9	T	88
40354	{ 12 15 } 32	{ 19 1 } 13	T	113
40355	{ 12 15 } 32	{ 20 2 } 14	T	113
40359	{ 2 4 } 50	{ 9 37 } 37	T	208
40360	{ 4 27 } 37	{ 50 37 } 37	T	78
40360V1	Same as 40360 except for P _T & θ _{J-A}			
40360V2	Same as 40360 except for P _T & θ _{J-C}			
40361	{ 4 27 } 38	{ 51 38 } 48	T	78
40361V1	Same as 40361 except for P _T & θ _{J-A}			
40361V2	Same as 40361 except for P _T & θ _{J-C}			
40362	{ 7 30 } 5	{ 2 5 } 5	T	78
40362V1	Same as 40362 except for P _T & θ _{J-A}			
40362V2	Same as 40362 except for flange			
40363	{ 6 29 } 11	{ 33 11 } 39	T	78
40364	{ 6 28 } 39	{ 11 39 } 39	T	78
40366	{ 4 12 } 27	{ 52 10 } 39	T	215
40366V1	Same as 40366 except for P _T & θ _{J-A}			
40366V2	Same as 40366 except for P _T & θ _{J-C}			
40367	{ 4 27 } 40	{ 53 40 } 40	T	215
40367V1	Same as 40367 except for P _T & θ _{J-A}			
40367V2	Same as 40367 except for P _T & θ _{J-C}			
40368	{ 5 28 } 6	{ 38 21 } 22	T	215
40369	{ 6 28 } 50	{ 22 50 } 28	T	215
40372	{ 5 27 } 28	{ 28 46 } 28	T	145
40373	{ 5 12 } 32	{ 29 25 } 10	T	146

RCA Type No.	Chart No.	Line No.	Class	File No.
40374	{ 12 27 } 32	{ 30 47 } 19	T	138
40375	{ 5 12 } 19	{ 31 11 } 14	T	299
40378	{ 27 44 } 13	{ 48 13 } 13	SCR	98
40379	{ 44 44 } 14	{ 14 14 } 14	SCR	98
40385	{ 4 12 } 27	{ 54 45 } 41	T	215
40385V1	Same as 40385 except for P _T & θ _{J-A}			
40385V2	Same as 40385 except for flange			
40389	{ 19 27 } 4	{ 19 14 } 57	T	145
40390	{ 12 27 } 32	{ 33 15 } 23	T	64
40391	{ 7 20 } 30	{ 5 4 } 3	T	216
40392	{ 4 19 } 27	{ 58 20 } 49	T	145
40394	{ 7 20 } 30	{ 9 5 } 6	T	216
40395	{ 2 9 } 9	{ 8 1 } 2	T	107
40396	{ 9 9 } 1	{ 1 2 } 13	T	107
40397	{ 1 4 } 14	{ 14 14 } 14	T	221
40398	{ 1 4 } 15	{ 14 15 } 15	T	221
40399	{ 4 4 } 16	{ 16 16 } 17	T	221
40400	{ 1 4 } 17	{ 16 17 } 8	T	31
40403	{ 24 18 } 2	{ 8 2 } 2	T	103
40405§	{ 16 18 } 7	{ 1 5 } 3	T	105
40406	{ 30 30 } 1	{ 3 1 } 3	T	219
40407	{ 4 27 } 1	{ 3 1 } 4	T	219
40408	{ 4 27 } 2	{ 4 2 } 2	T	219
40409	{ 4 27 } 13	{ 55 13 } 13	T	219
40410	{ 7 30 } 2	{ 4 2 } 2	T	219
40411	{ 6 29 } 24	{ 46 24 } 19	T	219
40412	{ 5 28 } 32	{ 19 7 } 24	T	211
40412V1	{ 27 32 } 25	{ 17 25 } 25	T	211
40412V2	{ 28 32 } 26	{ 8 26 } 26	T	211
40413	{ 16 16 } 46	{ 45 46 } 46	T	258
40414	{ 16 10 } 20	{ 46 20 } 20	T	259
40421	{ 10 5 } 5	{ 20 5 } 5	T	115
40422	{ 5 12 } 34	{ 5 34 } 34	T	117
40423	{ 5 12 } 35	{ 1 35 } 35	T	117
40424	{ 5 12 } 36	{ 6 36 } 36	T	{ 79 } 117
40425	{ 5 12 } 37	{ 2 37 } 37	T	{ 79 } 117
40426	{ 5 12 } 38	{ 7 38 } 38	T	117
40427	{ 5 12 } 39	{ 3 39 } 39	T	117
40428	{ 35 35 } 2	{ 2 2 } 2	D	115
40429	{ 42 42 } 13	{ 13 14 } 13	TRI	230
40430	{ 42 42 } 14	{ 14 23 } 14	TRI	230
40431	{ 42 42 } 24	{ 23 24 } 24	TRI	257
40432	{ 42 11 } 6	{ 24 6 } 6	TRI	257
40439	{ 11 11 } 6	{ 6 6 } 6	T	205
40440	{ 11 34 } 1	{ 3 1 } 1	T	205
40442	{ 18 18 } 42	{ 42 42 } 42	D	205
40444	{ 18 18 } 22	{ 42 22 } 22	T	223
40446	{ 18 1 } 21	{ 22 21 } 21	T	301
40450	{ 4 19 } 31	{ 20 31 } 31	T	221

RCA Type No.	Chart No.	Line No.	Class	File No.
40451	{ 1 4 } 19	{ 22 32 } 22	T	221
40452	{ 1 4 } 23	{ 23 22 } 22	T	221
40453	{ 1 4 } 24	{ 24 23 } 23	T	221
40454	{ 1 4 } 25	{ 24 24 } 24	T	221
40455	{ 1 4 } 26	{ 25 25 } 25	T	221
40456	{ 1 4 } 27	{ 26 27 } 27	T	221
40458	{ 1 19 } 27	{ 28 27 } 27	T	224
40459	{ 1 19 } 29	{ 29 28 } 28	T	224
40460	{ 20 10 } 1	{ 1 21 } 21	MOS	231
40462	{ 20 10 } 1	{ 1 21 } 21	T	220
40464§	{ 6 28 } 40	{ 12 40 } 40	T	237
40465§	{ 6 28 } 41	{ 13 41 } 41	T	237
40466§	{ 6 28 } 42	{ 14 42 } 42	T	237
40467	{ 13 13 } 4	{ 4 6 } 6	MOS	—
40468	{ 13 13 } 6	{ 6 6 } 6	MOS	287
40469§	{ 15 15 } 15	{ 15 16 } 16	T	254
40470§	{ 15 15 } 17	{ 16 17 } 17	T	254
40471§	{ 15 16 } 28	{ 17 28 } 28	T	254
40472	{ 16 16 } 29	{ 28 29 } 29	T	251
40473	{ 16 16 } 29	{ 29 29 } 29	T	251
40474	{ 16 16 } 30	{ 30 31 } 31	T	251
40475	{ 16 16 } 31	{ 31 32 } 32	T	251
40476	{ 16 16 } 32	{ 32 33 } 33	T	251
40477	{ 16 16 } 33	{ 33 23 } 23	T	251
40478	{ 16 16 } 23	{ 23 23 } 23	T	250
40479	{ 16 16 } 24	{ 24 25 } 25	T	250
40480	{ 16 16 } 25	{ 25 26 } 26	T	250
40481	{ 16 16 } 26	{ 26 27 } 27	T	250
40482	{ 16 42 } 17	{ 27 17 } 17	TRI	248
40485	{ 42 42 } 17	{ 17 17 } 17	TRI	248
40486	{ 42 17 } 12	{ 18 12 } 12	TRI	248
40487	{ 17 17 } 10	{ 12 10 } 10	T	253
40488	{ 17 17 } 11	{ 10 11 } 11	T	253
40489	{ 17 2 } 10	{ 11 10 } 10	T	253
40490	{ 2 2 } 10	{ 10 10 } 10	T	253
40491	{ 5 36 } 14	{ 4 14 } 14	T	253
40495	{ 42 42 } 15	{ 14 15 } 15	R	253
40502	{ 42 42 } 16	{ 15 16 } 16	TRI	267
40503	{ 42 44 } 7	{ 16 7 } 7	TRI	267
40504	{ 44 44 } 7	{ 7 7 } 7	SCR	266
40505	{ 44 44 } 8	{ 8 9 } 9	SCR	266
40506	{ 44 44 } 15	{ 9 15 } 15	SCR	266
40507	{ 44 44 } 16	{ 15 16 } 16	SCR	265
40508	{ 44 42 } 19	{ 16 19 } 19	SCR	265
40509	{ 42 42 } 19	{ 19 19 } 19	TRI	264
40510	{ 42 42 } 20	{ 20 25 } 25	TRI	264
40511	{ 42 42 } 26	{ 25 26 } 26	TRI	263
40512	{ 42 42 } 26	{ 26 28 } 28	TRI	263
40513	{ 6 29 } 6	{ 28 6 } 6	T	244
40514	{ 6 29 } 25	{ 6 3 } 3	T	244
40517	{ 16 16 } 47	{ 47 48 } 48	T	276
40518	{ 16 16 } 2	{ 48 2 } 2	T	277
40519	{ 16 42 } 1	{ 2 1 } 1	T	278
40525	{ 42 42 } 2	{ 1 2 } 2	TRI	261
40526	{ 42 42 } 3	{ 2 3 } 3	TRI	261
40527	{ 42 42 } 3	{ 3 3 } 3	TRI	261
40528	{ 42 42 } 4	{ 4 5 } 5	TRI	261
40529	{ 42 42 } 6	{ 5 6 } 6	TRI	261
40530	{ 42 42 } 7	{ 6 7 } 7	TRI	261
40531	{ 42 42 } 8	{ 7 8 } 8	TRI	262
40532	{ 42 42 } 9	{ 8 9 } 9	TRI	262
40533	{ 42 42 } 9	{ 9 9 } 9	TRI	262

INDEX (continued)

RCA Type No.	Chart No.	Line No.	Class	File No.
40534	42	10	TRI	262
40535	42	11	TRI	262
40536	42	12	TRI	262
40537	7	2a	T	302
40538	7	2b	T	302
40539	4	54a	T	303
40542	6	28a	T	304
40543	6	28b	T	304
40544	4	59	T	303
40546	5	7a	T	305
40547	5	7b	T	305
40553	44	10	SCR	306
40554	44	11	SCR	306
40555	44	12	SCR	306
40559	13	7	MOS	287
40561	33	1	TD	315
40562	33	5	TD	315
40563	33	8	TD	315
40564	33	12	TD	315
40565	33	16	TD	315
40566	33	3	TD	315
40567	33	6	TD	315
40568	33	10	TD	315
40569	33	14	TD	315
40570	33	17	TD	315
40571	33	4	TD	315
40572	33	7	TD	315
40573	33	11	TD	315
40574	33	15	TD	315
40575	42	21	TRI	300
40576	42	22	TRI	300
40577	18	9	T	297
40578	18	13	T	298
40581	18	26	T	301
40582	18	27	T	301
CA3000	45	1	IC	121
CA3001	45	4	IC	122
CA3002	45	12	IC	123
CA3004	45	13	IC	124
CA3005	45	14	IC	125
CA3006	45	15	IC	125
CA3007	45	2	IC	126
CA3008	47	1	IC	127
CA3008A	47	2	IC	127
CA3010	47	3	IC	127
CA3010A	47	4	IC	310
CA3011	46	1	IC	128
CA3012	46	2	IC	128
CA3013	46	3	IC	129
CA3014	46	4	IC	129
CA3015	47	5	IC	214
CA3015A	47	6	IC	310
CA3016	47	7	IC	214
CA3016A	47	8	IC	310
CA3018	46	5	IC	235
CA3019	46	6	IC	236
CA3020	45	3	IC	238
CA3021	45	5	IC	243
CA3022	45	6	IC	243
CA3023	45	7	IC	243
CA3028A	45	16	IC	311
CA3029	47	9	IC	239
CA3029A	47	10	IC	310
CA3030	47	11	IC	240
CA3030A	47	12	IC	310
CA3031/702A	47	13	IC	241
CA3032/702C	47	14	IC	241
CA3033	47	15	IC	—
CA3033A	47	16	IC	—

RCA Type No.	Chart No.	Line No.	Class	File No.
CA3034	45	8	IC	273
CA3034V1	45	9	IC	273
CA3035	45	10	IC	274
CA3035V1	46	7	IC	274
CA3036	45	11	IC	274
CA3036	46	8	IC	275
CA3037A	47	17	IC	310
CA3038A	47	18	IC	310
CD2100	48	5	IC	130
CD2101	48	6	IC	130
CD2150	48	1	IC	308
CD2151	48	2	IC	308
CD2152	48	3	IC	308
CD2153	48	4	IC	308
CD2200	48	7	IC	132
CD2200D	48	8	IC	307
CD2201	48	9	IC	132
CD2201D	48	10	IC	307
CD2202	48	11	IC	227
CD2202D	48	12	IC	307
CD2203	48	13	IC	133
CD2203D	48	14	IC	307
CD2204	48	15	IC	226
CD2204D	48	16	IC	307
CD2205	48	17	IC	233
CD2205D	48	18	IC	307
CR101	38	1	SR	84
CR102	38	9	SR	84
CR103	38	10	SR	84
CR104	38	18	SR	84
CR105	38	26	SR	84
CR106	38	33	SR	84
CR107	38	39	SR	84
CR108	38	41	SR	84
CR109	38	44	SR	84
CR110	38	48	SR	84
CR201	38	2	SR	86
CR203	38	11	SR	86
CR204	38	19	SR	86
CR206	38	34	SR	86
CR208	38	40	SR	86
CR210	38	47	SR	86
CR212	38	49	SR	86
CR273/8008	41	1	R	100
CR274/872A	41	2	R	102
CR275/866A/3B28	41	3	R	104
CR301	38	3	SR	60
CR302	38	12	SR	60
CR303	38	20	SR	60
CR304	38	27	SR	60
CR305	38	35	SR	60
CR306	38	42	SR	60
CR307	38	45	SR	60
CR311	38	4	SR	60
CR312	38	13	SR	60
CR313	38	21	SR	60

RCA Type No.	Chart No.	Line No.	Class	File No.
CR314	38	28	SR	60
CR315	38	36	SR	60
CR316	38	43	SR	60
CR317	38	46	SR	60
CR321	38	5	SR	60
CR322	38	14	SR	60
CR323	38	22	SR	60
CR324	38	29	SR	60
CR325	38	37	SR	60
CR331	38	6	SR	60
CR332	38	15	SR	60
CR333	38	23	SR	60
CR334	38	30	SR	60
CR335	38	38	SR	60
CR341	38	7	SR	60
CR342	38	16	SR	60
CR343	38	24	SR	60
CR344	38	31	SR	60
CR351	38	8	SR	60
CR352	38	17	SR	60
CR353	38	25	SR	60
CR354	38	32	SR	60
CR401	39	1	BR	60
CR402	39	2	BR	60
CR403	39	3	BR	60
CR404	39	4	BR	60
CR405	39	5	BR	60
CR406	39	6	BR	60
CR407	39	7	BR	60
CR408	39	8	BR	60
CR409	39	9	BR	60
CR501	40	1	BR	60
CR502	40	2	BR	60
CR503	40	3	BR	60
CR504	40	4	BR	60
CR505	40	5	BR	60
CR506	40	6	BR	60
SQ2502	55	5	PC	312
SQ2503	55	1	PC	312
SQ2508	55	15	PC	312
SQ2519	55	17	PC	312
SQ2520	55	12	PC	312
SQ2521	55	8	PC	312
SQ2526	55	9	PC	312
SQ2527	55	10	PC	312
SQ2529	55	14	PC	312
SQ2534	55	13	PC	312
SQ2535	55	20	PC	312
SQ2536	55	18	PC	312
SQ2543	55	28	PC	312
SQ2544	55	26	PC	312
SQ2544V1	55	27	PC	312
SQ2545	55	24	PC	312
SQ2545V1	55	25	PC	312
SQ2546	55	23	PC	312
SQ2554	55	19	PC	312
SQ2555	55	16	PC	312
SQ2556	55	11	PC	312
SQ2557	55	21	PC	312
SQ2558	55	22	PC	312

No data sheets for these types

NOTES

SYMBOLS

GENERAL

θ_{J-A} — thermal resistance, junction-to-ambient air
 θ_{J-C} — thermal resistance, junction-to-case
NF — noise figure
T — temperature
 T_A — ambient temperature

T_C — case temperature
 T_{MF} — mounting-flange temperature
 $t_{on} (t_d + t_r)$ — turn-on time
 t_r — rise time
 $t_{off} (t_s + t_f)$ — turn-off time

TRANSISTORS

C_{cb} — collector-to-base feedback capacitance
 C_{obo} — open-circuit output capacitance (common base)
 f_{hfb} — small-signal short-circuit forward current transfer cutoff frequency (common base)
 f_{hfe} — small-signal short-circuit forward current transfer cutoff frequency (common emitter)
 f_T — frequency at which small-signal forward current transfer ratio (common emitter) extrapolates to unity
 G_{po} — small-signal average power gain (common emitter)
 G_{PE} — large-signal average power gain (common emitter)
 h_{fe} — small-signal short-circuit forward current transfer ratio (common emitter)
 h_{FE} — static forward current transfer ratio (common emitter)
 I_C — collector current, dc
 I_{CBO} — collector cutoff current, dc (emitter open)
 $I_{e/b}$ — second-breakdown current
 P_{OE} — large-signal output power (common emitter)
 P_T — total non-reactive power input, dc, to all terminals (transistor dissipation)
 Q_B — stored base charge

V_{BE} — base-to-emitter voltage, dc
 V_{CB} — collector-to-base voltage, dc
 V_{CBO} — collector-to-base voltage, dc (emitter open)
 V_{CBV} — collector-to-base voltage, dc (with specified voltage between emitter and base)
 V_{CE} — collector-to-emitter voltage, dc
 $V_{CE(sat)}$ — collector-to-emitter saturation voltage, dc
 V_{CEO} — collector-to-emitter voltage, dc (base open)
 $V_{CEO(sus)}$ — collector-to-emitter sustaining voltage, dc (base open)
 V_{CER} — collector-to-emitter voltage, dc (with specified resistor between base and emitter)
 $V_{CER(sus)}$ — collector-to-emitter sustaining voltage, dc (with specified resistor between base and emitter)
 V_{CES} — collector-to-emitter voltage, dc (base short-circuited to emitter)
 V_{CEV} — collector-to-emitter voltage, dc (with specified voltage between base and emitter)
 $V_{CEV(sus)}$ — collector-to-emitter sustaining voltage, dc (with specified voltage between base and emitter)
 V_{CEX} — collector-to-emitter voltage, dc (with specified circuit between base and emitter)
 $V_{CEX(sus)}$ — collector-to-emitter sustaining voltage, dc (with specified circuit between base and emitter)

MOS (FIELD-EFFECT) TRANSISTORS

C_{iss} — small-signal short-circuit input capacitance
 C_{rss} — small-signal short-circuit reverse transfer capacitance
 G_{ps} — power gain
 I_D — drain current
 I_{GBS} — gate leakage current

P_T — total non-reactive power input, dc, to all terminals (transistor dissipation)
 R_{ds} — drain-to-source resistance
 r_{GB} — gate leakage resistance
 V_{DS} — drain-to-source voltage
 g_{fs} — forward transconductance

RECTIFIERS AND DIODES

$I_{F(AV)}$ — forward current, average value
 I_{FM} — forward current, maximum (peak) total value
 $I_{FM(rep)}$ — forward current, repetitive, maximum (peak) total value
 $I_{FM(surge)}$ — forward current, maximum (peak) total value of surge
 I_R — reverse current, dc
 $I_{RM(dyn)}$ — reverse current, dynamic maximum (peak) total value
 V_F — forward voltage drop, dc

$V_{F(AV)}$ — forward voltage drop, average value
 $V_{F(RMS)}$ — forward voltage drop, total rms value
 V_{FM} — forward voltage drop, maximum (peak) total value
 V_R — reverse voltage, dc
 $V_{R(RMS)}$ — reverse voltage, total rms value
 V_{RM} — reverse voltage, maximum (peak) total value
 $V_{RM(rep)}$ — reverse voltage, repetitive, maximum (peak) total value
 $V_{RM(non rep)}$ — reverse voltage, non-repetitive, maximum (peak) total value

THYRISTORS (SCR's and TRIACS)

di/dt — rate of change of forward current
 I_{GT} — gate-trigger current, dc value — no alternating component
 $I_{T(AV)}$ — ON-state current, dc value — with alternating component
 I_{TRM} — ON-state current, repetitive, maximum (peak) total value
 $I_{T(RMS)}$ — ON-state current, total RMS value
 I_{TSM} — ON-state surge current, non repetitive, maximum (peak) total value
 $P_{G(AV)}$ — gate power dissipation, dc value — with alternating component
 P_{GM} — gate power dissipation, maximum (peak) total value

$P_{T(AV)}$ — ON-state dissipation, dc value — with alternating component
 $V_{(BO)O}$ — breakover voltage, dc value — no alternating component
 V_{DROM} — OFF-state voltage, repetitive, maximum (peak) total value
 V_{GM} — gate voltage, maximum (peak) total value
 V_{GT} — gate trigger voltage, dc value — no alternating component
 V_{RSDM} — reverse voltage, non-repetitive, maximum (peak) total value
 V_T — ON-state voltage, instantaneous total value

TUNNEL DIODES AND TUNNEL RECTIFIERS

C — capacitance, includes junction and case capacitance
 I_F — forward current
 I_P — peak-point forward current
 I_P/I_V — peak-point forward current to valley-point forward current ratio

I_R — reverse current
 V_F — forward voltage
 $V_{pp'}$ — forward voltage point, greater than the peak voltage
 V_R — reverse voltage

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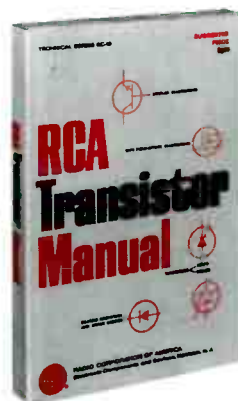
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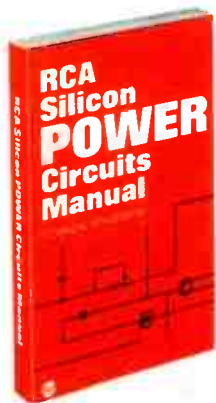


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