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GIANT CHART OF RADIO, ELECTRONIC, SEMICONDUCTOR & LOGIC SYMBOLS

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KEY TO SYMBOLS

INTRODUCTION

The object of preparing this chart is to enable the reader to identify the most commonly used symbols in electronic circuit diagrams be they of British, U.S.A, European or Japanese etc. origin.

This chart in no way sets itself as a standard and any reader who wishes to prepare drawings to a standard specification must consult the specific standard; in this country BS3939 which is available from the British Standards Institute. *All other countries have standards which are similar.*

KEY

1. *Crossing of conductors, no electrical connection*
2. *Crossing of conductors, no electrical connection (alternative)*
3. Joining of conductors, electrical connection
4. Common point connection
5. Earth
6. Clean or Noiseless earth
7. Chassis
8. Terminal or tag
9. Bolted terminal or tag
10. Plug-male
11. Socket-female
12. Co-axial plug
13. Co-axial socket
14. Typical jack socket
15. Link normally closed
16. Link normally closed with bolt contacts
17. Hinged link normally open
18. Fuse general symbol
19. Fuse - thick side indicates supply line
20. Fuse general symbol (alternative)
21. Fuse general symbol, with bolt terminals
22. *Fuse with alarm contact*
23. *Fuse with alarm contact (alternative)*
24. *Aerial general symbol*
25. *Dipole aerial*
26. *Folded dipole aerial*
27. *Frame aerial*
28. Frame aerial (alternative)
29. Ferrite rod aerial
30. Ferrite rod aerial with variable core
31. Ferrite rod aerial with pre-set core
32. Electric bell
33. Electric buzzer
34. Electric siren
35. Electric horn
36. Indicator general symbol
37. Indicator with alarm contacts
38. Solenoid operated flag indicator
39. Signal lamp general symbol
40. Electroluminescent device e.g. LED
41. Light operated electroluminescent device e.g. LDR
42. Filament lamp
43. Cold cathode discharge lamp e.g. neon lamp
44. Discharge lamp general symbol
45. Hot cathode discharge lamp e.g. fluorescent tube
46. Alternating voltage or current (AC) - low frequency
47. Alternating voltage or current (AC) - medium frequency
48. Alternating voltage or current (AC) - high frequency
49. *Cell (+ ve. sign optional)*
50. *Battery (+ve. sign optional)*
51. *Battery (alternative) (+ ve. sign optional)*
52. Capacitor general symbol
53. Polorised capacitor
54. Polarised electrolytic capacitor
55. Non-polarised electrolytic capacitor
56. Variable capacitor general symbol
57. Pre-set variable capacitor
58. Variable differential capacitor
59. Variable split stator capacitor
60. Fixed resistor
61. Fixed resistor (alternative)
62. Variable resistor
63. Variable resistor (alternative)
64. Variable resistor (alternative)
65. Variable resistor (alternative)
66. Pre-set variable resistor
67. Pre-set variable resistor (alternative)
68. Temperature compensating resistor
69. Temperature compensating resistor (alternative)
70. Carbon pile resistor
71. Liquid resistor
72. Protective fusible resistor
73. Non-reactive resistor
74. Tapped resistor
75. Tapped resistor (alternative)
76. Heater
77. Heater (alternative)
78. Oscillating crystal
79. Inductive winding e.g. choke or coil
80. *Inductive winding (alternative)*
81. *Inductive winding (alternative)*
82. *Tapped inductive winding*
83. Inductive winding with dust core
84. Air core transformer
85. Magnetic core transformer
86. Transformer with tapped secondary windings
87. Transformer with separate secondary windings
88. Transformer with adjustable magnetic core e.g. I.F. Transformer
89. General indicating instrument e.g. meter
90. Ammeter
91. Microammeter
92. Milliammeter
93. Voltmeter
94. Wattmeter
95. Watt hour meter
96. Ampere-hour meter
97. Volt-ammeter
98. Power factor meter
99. Power factor meter (alternative)
100. Phasemeter
101. Frequency meter
102. Frequency meter (alternative)
103. Ohmmeter
104. Ohmmeter (alternative)
105. *Synchroscope*
106. *Synchroscope (alternative)*
107. *Wavemeter*
108. Oscilloscope
109. Oscilloscope (alternative)
110. Double voltmeter
111. Differential voltmeter
112. Galvenometer
113. Galvenometer (alternative)
114. Tachometer
115. Pyrometer or thermometer
116. Elapsed time meter
117. Volume unit meter
118. Current direction meter
119. Var meter
120. Noise meter
121. Decibel meter
122. Valve volt meter
123. Recording instrument (insert symbol as used in 90-122 to indicate measured quantity)
124. Integrating instrument (insert symbol as used in 90-122 to indicate measured quantity)
125. Clock general symbol
126. Impulse clock
127. Synchronous clock
128. Master clock
129. Electric wind clockwork clock
130. Time switch
131. Telemetering receiver
132. Telemetering transmitter
133. Loudspeaker general symbol
134. Loudspeaker - moving coil
135. Loudspeaker - moving coil (alternative)
136. Microphone general symbol
137. Microphone - moving coil
138. Microphone - condensor
139. Microphone - crystal
140. Microphone - stereo
141. Handset
142. Earphone general symbol
143. Earphone - moving coil
144. Earphone - crystal
145. Headset
146. Loudspeaker microphone
147. Record pickup - crystal-mono
148. Record pickup - crystal-mono (alternative)
149. Record pickup - moving coil - mono
150. Record pickup - moving coil - mono (alternative)
151. Record pickup - moving iron - mono
152. Record pickup - crystal - stereo
153. Record pickup - moving coil - stereo
154. Record pickup - moving iron - stereo
155. Magnetic playback head - mono e.g. Tape recorder
156. Magnetic record head - mono e.g. Tape recorder
157. Magnetic erase head - mono e.g. Tape recorder
158. Combined magnetic playback, record and erase head - mono
159. Magnetic playback head - stereo
160. Magnetic record head - stereo
161. Magnetic erase head - stereo
162. Combined magnetic playback, record and erase head - stereo
163. Hydrophone
164. Magnetic playback head (alternative)
165. Magnetic record head (alternative)
166. Magnetic record/playback head (alternative)
167. Magnetic erase head (alternative)
168. Single pole single throw (S.P.S.T.) switch
169. Single pole double throw (S.P.D.T.) switch
170. Double pole single throw (D.P.S.T.) switch
171. Double pole double throw (D.P.D.T.) switch
172. Typical multi-position rotary switch
173. Typical relay
174. Relay coil
175. Relay coil (alternative)
176. Telegraphers morse key
177. Diode-directly heated
178. Diode-indirectly heated
179. Triode
180. Tetrode
181. Beam Tetrode
182. Pentode
Typical components of valve:-
a = anode
e = envelope
c = cathode
h = heater (filament)
x = suppressor grid
y = screen grid
z = control grid
183. Hexode
184. Heptode
185. Octode
186. Nonode
187. Twin diode
188. Twin triode
189. Twin tetrode
190. Twin Pentode
191. Diode pentode
192. Triode pentode
193. Triode hexode
194. Triode heptode
195. Typical cathode ray tuning indicator e.g. magic eye
x = fluorescent target
196. Typical cathode ray tube
x = X plates
y = Y plates
a, b, c = focussing electrodes
d = intensity modulating electrode
c = cathode
h = heater
197. Typical cathode ray tube (alternative)
198. Gas filled diode - black spot indicates gas filled envelope this can also apply to all other valve diagrams when gas filled.
199. Typical geiger tube
200. Mercury arc rectifier
201. Typical vidicon type TV camera tube a = photo conductive storage electrode
202. Typical image-orthicon type TV camera tube
a = photo cathode
b = image accelerator
c = mesh
d = target
e = decelerator
f = field mesh
g = deflector coils
h = wall anode
i = persuader
j = alignment coil
k = gun anode
l = dynodes
m = electron multiplier anode
n = heater
o = cathode
p = control grid
q = focus coils
r = external heater
203. Typical photo electron multiplier tube
204. Klystron - simplified symbol
a = collector
b = resonator
c = gun
205. Reflex Klystron - simplified symbol
a = reflector
b = resonators
c = gun
206. Magnatron
With reference to symbols 207 - 240 inclusive
a = anode
c = cathode
g, g1, g2 = gate(s)
207. p.n. junction diode
208. p.n. junction diode (alternative)
209. Temperature dependent p.n. junction diode
210. Varactor diode
211. Varactor diode (alternative)
212. Tunnel diode
213. Tunnel diode (alternative)
214. Zener diode
215. Zener diode (alternative)
216. Zener diode (alternative)
217. Zener diode (alternative)
218. Clipper diode
219. Backwards diode
220. Varistor
221. Shockley diode
222. Bilateral diode switch
223. Photo diode general symbol
224. Photo sensitive diode
225. Photo emmisive diode
226. Thyrector
227. Thyristor general symbol
228. Reverse blocking diode thyristor
229. Reverse conducting diode thyristor
230. Bi-directional diode thyristor
231. Reverse blocking triode thyristor n-gate
232. Reverse blocking triode thyristor n-gate (alternative)
233. Reverse blocking triode thyristor p-gate
234. Reverse blocking triode thyristor p-gate(alternative)
235. Reverse conducting triode thyristor n-gate
236. Reverse conducting triode thyristor p-gate
237. Turn off triode thyristor n-gate
238. Turn off triode thyristor p-gate
239. Reverse blocking tetrode thyristor e.g. gate controlled switch
240. Bi-directional triode thyristor

With reference to symbols 241-278 inclusive, 283 and 284
e, e1, e2 = emitter(s) - source
c, c1, c2 = collector(s)-drain
b, b1, b2 = base(s)
g, g1, g2 = gate(s)
p = pressure input
s = substrate

241. p-n-p Bipolar transistor
242. p-n-p Bipolar transistor with collector connected to envelope
243. n-p-n Bipolar transistor
244. n-p-n Bipolar transistor with collector connected to envelope
245. Dual p-n-p Bipolar transistor
246. Dual n-p-n Bipolar transistor
247. *p-n-p Avalanche transistor*
248. *n-p-n Avalanche transistor*
249. *Unijunction transistor with p-type base*
250. *Unijunction transistor with n-type base*
251. n-p-n transistor with transverse biased base
252. *n-p-n transistor with transverse biased base (alternative)*
253. *Piezo electic n-p-n Bipolar transistor*
254. Multimeter n-p-n Bipolar transistor
255. p-n-i-p transistor with ohmic connection to i region
256. p-n-i-n transistor with ohmic connection to i region
257. JUGFET juncion field effect transistor with n-type channel
258. JUGFET with n-type channel (alternative)
259. JUGFET with p-type channel
260. JUGFET with p-type channel (alternative)
261. IGFET insulated field effect transistor with p-type channel
262. *IGFET with n-type channel*
263. IGFET with n-type channel substrate brought out
264. IGFET with p-type channel with substrate internally connected to emitter
265. Dual IGFET with n-type channel
266. Dual IGFET with p-type channel
267. IGFET depletion type single-gate n-channel; 3 terminal
268. IGFET depletion type single-gate p-channel; 3 terminal
269. IGFET depletion type single-gate n-channel with substrate connected to emitter; 3-terminal
270. IGFET depletion type single-gate p-channel with substrate brought out; 4-channel
271. *IGFET depletion type two-gate p-channel with substrate brought out; 5-terminal*
272. IGFET depletion type two-gate n-channel with substrate internally connected to emitter; 4-terminal
273. IGFET dual depletion type n-channel
274. IGFET dual depletion type p-channel
275. IGFET enchancement type single gate p-channel with substrate brought out; 4-terminal
276. IGFET enchancement type, two-gate, n-channel with substrate brought out, 5 terminal
277. p-n-p photo device
278. n-p-n photo device
279. Photo conductive device
280. Photo conductive device (alternative)
281. Photo voltaic cell
a = anode
c = cathode
282. Photo voltaic cell (alternative)
a = anode
c = cathode
283. n-p-n photo transistor
284. p-n-p photo transistor
285. solar battery
286. Hall effect generator
Va = applied voltage
Vh = hall voltage
287. Hall effect generator (alternative)
Va = applied voltage
Vh = hall voltage
288. Thermistor
289. Thermistor (alternative)
290. Thermistor (alternative)
291. Thermistor (alternative)
292. Indirectly heated thermistor
293. Basic gate symbol with one input and one output
294. Basic gate symbol with one input and two outputs
295. Basic gate symbol with two inputs and one output
296. Basic gate symbol with multi-input and one output
297. Basic gate symbol with multi-input and one output (alternative)
298. Basic gate symbol with multi-input and one output (alternative)
299. Basic gate symbol with two input and two outputs one of which is negated
300. Basic gate symbol with two inputs one of which is negated and two outputs
301. Basic gate symbol with two inputs one of which is negated and two outputs one of which is negated
302. Threshold element (figure indicates minimum number of I/P signals = 1 for O/P signal = 1)
303. AND Gate (O/P signal 1 when all I/P signals = 1)
Function P = A. B. C
304. AND Gate (Alternative)
305. AND Gate (Alternative)
306. OR Gate (O/P signal = 1 when one or more I/P signals = 1)
Function P = A+B+C
307. OR Gate (alternative)
308. OR Gate (alternative)
309. NOR Gate (O/P signal = O when one or more I/P signals = 1) Function $P = \overline{A+B+C}$
310. NOR Gate (alternative)
311. NOR Gate (alternative)
312. NAND Gate (O/P signal = O when all I/P signals = 1) Function $P = \overline{A.B.C}$
313. NAND Gate (alternative)
314. NAND Gate (alternative)
315. Identity Element (O/P signal = 1 when all I/P signals equal)
316. M and only M element (O/P signal = 1 when M and only M of I/P signals = 1)
317. Exclusvie OR Gate (O/P signal = 1 when one only I/P signal = 1)
Function $P = A \oplus B = \bar{A}B + A\bar{B}$
318. Exclusive NOR Gate (alternative)
319. Expandable OR Gate
320. Negater - NOT Gate (O/P Signal = 1 when I/P Signal = O and converse)
321. NOT Gate (alternative)
322. NOT Gate (alternative)
323. NOT Gate (alternative)
324. Linear Gate
325. Basic gate symbol with inhibited input
326. Basic gate symbol with negated inhibited input
327. AND/NAND Gate.
Function P = A. B. C
Function P1 = $\overline{A.B.C}$
328. OR/NOR Gate.
Function P = A+B+C
Function P1 = $\overline{A+B+C}$
329. Gate Expander
330. Output pull up Node
331. Amplifier general symbol
V1 = AVo
332. Operational Amplifier
Vo = f(Va-Vb)
333. Typical Integrated Circuit (IC) symbol

BLOCK DIAGRAMS :-

334. Amplifier
335. Detector
336. Modulator
337. Balanced modulator
338. Fixed attenuator
339. Variable Attenuator
340. Signal Compressor
341. Signal Expander
342. Equaliser
343. Phase corrector
344. Signal Distorter
345. Limiter
346. *Discriminator*
347. *Bass pass filter*
348. *Treble pass filter*
349. *Band pass filter*
350. Band stop filter
351. Transposer
352. Frequency convertor
353. AC to DC convertor
354. Frequency divider
355. Potential divider
356. Balanced transformer
357. Artificial balanced line
358. Isolator
359. Flip-Flop
360. Signal suppressor
361. Amplifier with emphasis
362. Amplifier with de-emphasis
363. Amplifier with limited response
364. Multi stage amplifier
365. D.C. amplifier
366. Signal coupler
367. Relay package
368. Oscilloscope
369. Resistive splitter
370. Oscillator
371. Saw tooth generator
372. Square wave generator
373. Signal generator with variable frequency
374. *Crystal generator*
375. *Transmitter*
376. *Receiver*
377. *Recording instrument*
378. Input
379. Output

NOTES

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