Transistor

- **Bipolar Transistor** 

  - Quick Reference by Package
  - Quick Reference Table by Function / Application
- **Field Effect Transistor** 

  - Small Signal FET
  - Power MOS FET
- Transistor with Internal Resistor
- Transistor for Array
- Transistor Array

Quick Reference by Package

- TO-92 Type Transistor
- SST Type Transistor
- SP-8 Type Transistor
- MP-3 Type Transistor
- MP-5(TO-126) Type Transistor
- MP-25(TO-220) Type Transistor
- MP-40 Type Transistor
- MP-45, MP-45F (TO-220 Insulated Type) Transistor
- MP-80 Type Transistor
- MP-10 Type Transistor
- Mini-Mold Transistor
- Power Mini-Mold Transistor
- MP-2 Type Transistor
- MP-3 Type(SC-63) Transistor
- Small Mini-Mold Transistor
- Ultra Small Mini-Mold Transistor

Quick Reference Table
by Function / Application

Small Signal Transistor

Power Transistor

- Low $V_{CE(sat)}$ Transistor
- High h_{FE} Transistor
- Low Voltage, High Speed Switching Transistor
- High Voltage , High Speed Switching Transistor
- Audio Frequency Amplification Transistor
- High Frequency Amplification Transistor
- Darlington Transistor

Small Signal FET

- 2SK Type(MOS Type)
- 2SJ Type(MOS Type)

Power MOS FET

- 2SK Type
- 2SJ Type
- Low Voltage Power MOS FET(N-3L Series)
- Low Voltage Power MOS FET(N4-L Series / N5-L Series)
- Low Voltage Power MOS FET(N6-L Series)
- High Voltage Power MOS FET(N3-H Series)
- High Voltage Power MOS FET(N4-H Series / P4-H Series)
- 8-pin SOP Type Power MOS FET
- Power SOP8 Series
- 8-pin TSSOP Type Power MOS FET
- 8-pin TSSOP Type Power MOS FET

Transistor with Internal Resistor

Equivalent Circuit

Product List

- AA1[ ], AN1[ ], BA1[ ], BN1[ ] Series(TO-92, SST)
- AB1[ ], AP1[ ], BB1[ ],BP1[ ] Series(TO-92, SST)
- AQ1[ ] Series(TO-92)
- AD1[ ], AD2[ ], AR1[ ] Series(TO-92)
- CE1[ ], CE2[ ] Series(SP-8)
- FA1[ ], FN1[ ], GA1[ ], GN1[ ] Series(SC-59, SC-70)
- FB1[ ] Series(SC-59)
- HD1[ ], HD2[ ], HR1[ ] Series(SOT-89)
- HQ1[ ] Series(SOT-89)

Transistor for Array

- Equivalent Circuit
- Product List
  - Bipolar Transistor
  - MOS FET

Transistor Array

- Signal Transistor Array
  - Signal Transistor Array(Monolithic)
- Power Transistor Array
  - Power Transistor Array(Multi-chip, 4 Circuits)
- Power MOS FET Array
  - Power MOS FET Array(Multi-chip, 4 Circuits)
- Monolithic MOS FET Array
  - Power MOS FET Array(Monolithic)

Diode

Zener Diode

- Zener Diode Quick Reference

Noise Clipping Diode

- Surface-Mount Type Quick Reference
- Surface-Mount Type(Low Capacitance) Quick Reference
- Through Hole Type Quick Reference

Thyristor

- SCR
- TRIAC

Transistor

Quick Reference

Package

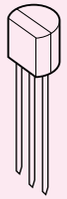
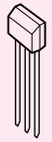
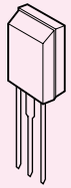
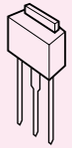
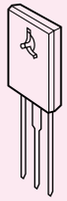
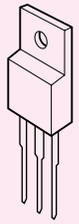
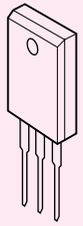
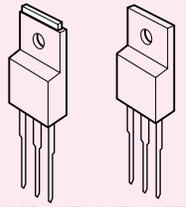
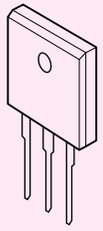
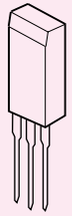
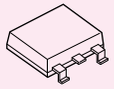
- Bipolar Transistor
- Power MOS FET
  - Package - $R_{DS(ON)}$
  - 8-pin SOP Type
  - 8-pin TSSOP Type

Function/Application

- Bipolar Transistor
- MOS FET
  - V_{DSS} - $I_{D(DC)}$ (Small Signal MOS FET)
    - 4V Gate Driven Series
    - 2.5V Gate Driven Series
    - 1.5V Gate Driven Series
  - V_{DSS} - $I_{D(DC)}$ (Power MOS FET)

ROAD MAP

Package(Bipolar Transistor)

 TO-92	 SST	 SP-8	 MP-3
 MP-5 (TO-126)	 MP-25 (TO-220)	 MP-40	 MP-45, MP-45F (MP-25 Insulated type)
 MP-80	 MP-10	 Mini mold SC-59	 Power mini mold SC-62
 MP-2 SC-84	 MP-3	 Small mini mold SC-70	 Ultra small mini mold

ROAD MAP

Quick Reference

Function/Application(Bipolar Transistor)

- Low $V_{CE(sat)}$ Transistor
- High h_{FE} Transistor
- Low Voltage, High Speed Switching Transistor
- High Voltage, High Speed Switching Transistor
- Audio Frequency Amplification Transistor
- High Frequency Amplification Transistor
- Darlington Transistor

ROAD MAP

4 V Gate-Driven Series MAP

($R_{DS(on)MAX}$*/Package)

$I_{D(DC)}$(A) \ V_{DSS}(V)	30	50	60	100
0.1		2SK1132 (50 Ω / SST) , 2SK1133 (50 Ω / SC-59) 2SJ165 (50 Ω / SST) , 2SJ166 (50 Ω / SC-59)		2SK1589 (30 Ω / SC-59) , 2SJ209 (100 Ω / SC-59)
0.2	2SK1582 (5.0 Ω / SC-59) , 2SJ204 (13 Ω / SC-59)		2SK1590 (6.0 Ω / SC-59) , 2SJ210 (15 Ω / SC-59)	2SK1591 (8.0 Ω / SC-59) , 2SJ211 (30 Ω / SC-59)
0.5	2SK679A (1.0 Ω / TO-92) , 2SK1584 (2.0 Ω / SC-62) 2SJ206 (4.0 Ω / SC-62)		2SK1592 (2.5 Ω / SC-62) , 2SK2109 (1.0 Ω / SC-62) 2SJ212 (1.5 Ω/SC-62)	2SK1484 (1.2 Ω / TO-92) , 2SK1593 (6.0 Ω / SC-62) 2SK2110 (1.5 Ω / SC-62) 2SJ198 (2.5 Ω / TO-92) , 2SJ213 (5.0 Ω / SC-62)
1.0	2SK680A (1.0 Ω / SC-62) , 2SK681A (1.0 Ω / SP-8) 2SK1586 (1.0 Ω / SC-62) 2SJ178 (1.5 Ω / TO-92) , 2SJ180 (1.5 Ω / SP-8)		2SK1272 (1.0 Ω / TO-92) , 2SK2111 (0.6 Ω / SC-62) 2SJ196 (1.5 Ω / TO-92)	2SK1485 (1.2 Ω / SC-62) , 2SK2112 (1.2 Ω / SC-62) 2SJ199 (2.5 Ω / SC-62)
1.5	2SK1482 (0.8 Ω / TO-92) , 2SJ179 (1.5 Ω / SC-62)		2SK1274 (1.0 Ω / SP-8) 2SJ197 (1.5 Ω / SC-62) , 2SJ353 (0.68 Ω / SP-8)	2SK2070 (0.45 Ω / SP-8)
2.0	2SK1483 (0.8 Ω / SC-62) , 2SJ355 (0.6 Ω / SC-62)		2SK1273 (1.0 Ω / SC-62) , 2SJ356 (0.95 Ω / SC-62)	2SK2055 (0.45 Ω / SC-84)
3.0	2SJ357 (0.35 Ω / SC-84)		2SK2054 (0.25 Ω / SC-84) , 2SJ358 (0.4 Ω / SC-84)	
4.0			2SK2857 (0.22 Ω / SC-62)	
5.0	2SK2157 (0.15 Ω / SC-84) , 2SJ411 (0.24 Ω / SP-8)			

*: V_{GS} = 4 V

ROAD MAP

2.5 V Gate-Driven Series MAP

($R_{DS(on)MAX}$*/Package)

$I_{D(DC)}$(A) \ V_{DSS}(V)	16	30	50
0.1	2SK1580 (15 Ω / SC-70)，2SJ202 (100 Ω / SC-70)	2SK1656 (45 Ω / SST)，2SK1657 (45 Ω / SC-59) 2SK1658 (45 Ω / SC-70)，2SK1824 (13 Ω / Ultra Super Mini) 2SK2858 (15 Ω / SC-70) 2SJ243 (100 Ω / Ultra Super Mini)，2SJ463A (60 Ω / SC-70)	2SK1398 (40 Ω / SST)，2SK1399 (40 Ω / SC-59) 2SK2090 (40 Ω / SC-70) 2SJ184 (40 Ω / SST)，2SJ185 (40 Ω / SC-59) 2SJ460 (100 Ω / SST)，2SJ461 (100 Ω / SC-59)
0.2	2SK1581 (5.0 Ω / SC-59)，2SJ203 (23 Ω / SC-59)		
0.5	2SK1583 (2.0 Ω / SC-62)，2SJ205 (5.0 Ω / SC-62)		
1.0	2SK1585 (1.2 Ω / SC-62)，2SJ207 (4.0 Ω / SC-62)		
2.0	2SK1587 (0.8 Ω / SC-62)，2SJ208 (3.0 Ω / SC-62)		
2.5	2SJ462 (0.29 Ω / SC-84)		
3.0	2SK1588 (0.5 Ω / SC-62)		

*: V_{GS} = 2.5 V

ROAD MAP

1.5 V Gate-Driven Series MAP

($R_{DS(on)MAX}$*/Package)

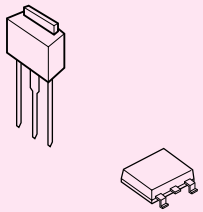
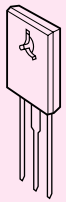
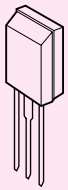
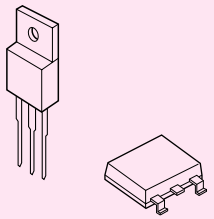
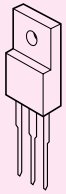
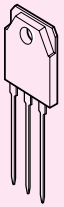
V_{DSS}(V) / $I_{D(DC)}$(A)	16	50	60
0.1	2SK1958 (50 Ω/SC-70)	2SK2158 (50 Ω/SC-59) , 2SK2541 (50 Ω/SST)	2SK2159 (0.7 Ω/SC-62)
2.0	2SK1959 (3.2 Ω/SC-62)		
3.0	2SK1960 (0.8 Ω/SC-62)		
5.0	2SK2053 (0.4 Ω/SC-84)		

*: V_{GS} = 1.5 V

ROAD MAP

Power MOS FET

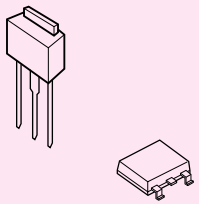
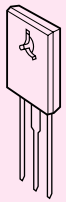
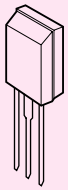
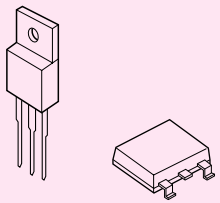
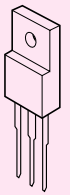
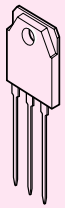
Package – $R_{DS(on)}$ MAP

Package Type						
$R_{DS(on)MAX}$ (Ω) V_{GS} = 10 V	TO-251/252 (MP-3)	TO-126 (MP-5)	MP-10	TO-220AB/263 (MP-25)	Isolated TO-220 (MP-45F)	TO-3P (MP-88)
up to 70 m	○	—	○	○	○	○
up to 270 m	○	○	○	○	○	○
up to 900 m	○	○	○	○	○	○
up to 2.4	—	—	—	○	○	○
up to 7.5	○	—	—	○	○	○

ROAD MAP

Package – $R_{DS(on)}$ MAP

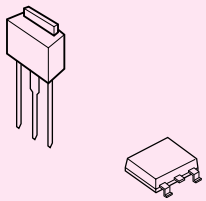
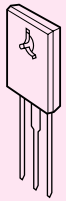
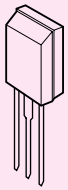
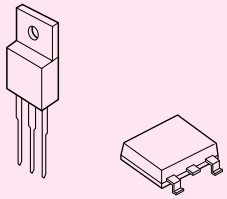
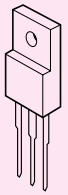
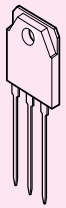
(V_{DSS}/$I_{D(DC)}$)

Package Type						
$R_{DS(on)MAX}$ (Ω) V_{GS} = 10 V	TO-251/252 (MP-3)	TO-126 (MP-5)	MP-10	TO-220AB/263 (MP-25)	Isolated TO-220 (MP-45F)	TO-3P (MP-88)
9 m				2SK2499 (60 V / 50 A)	2SK2498 (60 V / 50 A)	2SK2515 (60 V / 50 A)
15 m				2SK2513 (60 V / 45 A)	2SK2512 (60 V / 45 A)	2SK2514 (60 V / 50 A)
18 m						2SK1749 (60 V / 50 A)
20 m				2SK2941 (30 V / 35 A)	2SK2510 (60 V / 40 A) 2SK1596 (30 V / 40 A)	
27 m					2SK1294 (60 V / 40A) 2SK2409 (60 V / 40 A) 2SK2724 (60 V / 35 A)	2SK2511 (60 V / 40 A)
30 m						2SJ331 (–60 V / –30 A)
40 m				2SK2411 (60 V / 30 A)	2SK2410 (60 V / 30 A) 2SK2723 (60 V / 25 A)	
45 m			2SK1851 (60 V / 15A)		2SK1290 (60 V / 25 A) 2SK1594 (30 V / 20 A)	
50 m					2SJ330 (–60 V / –20 V) 2SK1295 (100 V / 30 A)	2SK1122 (100 V / 40A)
60 m				2SJ328 (–60 V / –20 A)	2SJ329 (–60 V / –15 A)	
70 m	2SK2414 (60 V / 10 A)		2SK1850 (60 V / 10 A) 2SK2413 (60 V / 10 A)	2SK1287 (60 V / 15 A)	2SK1286 (60 V / 15 A) 2SK2412 (60 V / 20 A)	2SK1123 (60 V / 40 A)

ROAD MAP

Package – $R_{DS(on)}$ MAP

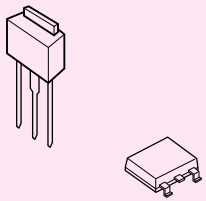
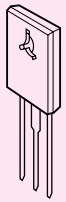
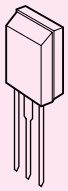
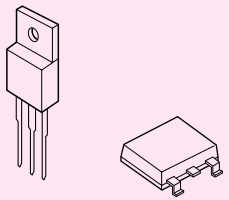
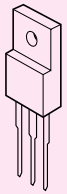
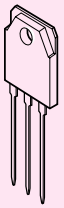
(V_{DSS}/$I_{D(DC)}$)

Package Type						
$R_{DS(on)MAX}$ (Ω) V_{GS} = 10 V	TO-251/252 (MP-3)	TO-126 (MP-5)	MP-10	TO-220AB/263 (MP-25)	Isolated TO-220 (MP-45F)	TO-3P (MP-88)
80 m			2SK1853 (100 V / 15 A)	2SK1293 (100 V / 30 A)	2SK1292 (100 V / 20 A) 2SK2461 (100 V / 20 A)	
100 m	2SK2415 (60 V / 8 A)			2SJ302 (–60 V / –16 A)	2SJ303 (–60 V / –14 A)	
110 m	2SJ325 (–30 V / –4 A) 2SK1748 (60 V / 8 A)					
120 m					2SK2131 (150 V / 15 A)	2SK1492 (250 V / 35 A)
140 m					2SK2462 (100 V / 15 A)	
150 m			2SK1852 (100 V / 10 A)	2SK1289 (100 V / 20 A)	2SK1288 (100 V / 15 A)	2SK1491 (250 V / 25 A)
170 m	2SJ327 (–60 V / –4 A)					
180 m	2SK1282 (60 V / 3 A)	2SK1283 (60 V / 3 A)		2SK2136 (200 V / 20 A)	2SK2135 (200 V / 14 A)	
250 m	2SJ324 (–30 V / –2A)					2SK1499 (450 V / 25 A) 2SK2371 (450 V / 25 A)
260 m				2SK2133 (250 V / 16 A)	2SK2341 (250 V / 11 A)	
270 m						2SK1500 (500 V / 25 A) 2SK2372 (500 V / 25 A)

ROAD MAP

Package – $R_{DS(on)}$ MAP

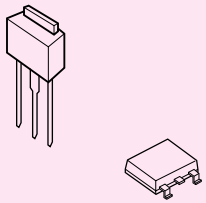
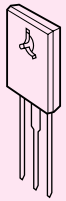
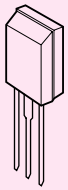
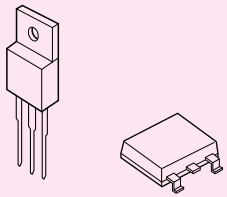
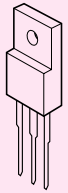
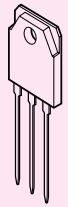
(V_{DSS}/$I_{D(DC)}$)

Package Type						
$R_{DS(on)MAX}$ (Ω) V_{GS} = 10 V	TO-251/252 (MP-3)	TO-126 (MP-5)	MP-10	TO-220AB/263 (MP-25)	Isolated TO-220 (MP-45F)	TO-3P (MP-88)
320 m	2SK1284 (100 V / 3 A)	2SK1285 (100 V / 3 A)				
350 m						2SK1497 (450 V / 20 A) 2SK2369 (450 V / 20 A)
370 m	2SJ326 (–60 V / –2 A)					
400 m				2SK2134 (200 V / 13 A)		2SK1498 (500 V / 20 A) 2SK2370 (500 V / 20 A)
500 m				2SK2365 (450 V / 10 A)	2SK2363 (450 V / 8 A)	2SK1756 (450 V / 15 A) 2SK2367 (450 V / 15 A)
600 m				2SK2366 (500 V / 10 A)	2SK2234 (500 V / 8 A) 2SK2364 (500 V / 8 A)	2SK1757 (500 V / 15 A) 2SK1784 (450 V / 12 A) 2SK2368 (500 V / 15 A)
650 m	2SK1954 (180 V / 4 A)		2SK2132 (180 V / 4A)			
700 m						2SK1785 (500 V / 12 A)
800 m					2SJ449 (–250 V / –6A)	
900 m				2SK1495 (450 V / 7 A) 2SK2359 (450 V / 7A)	2SK1992 (450 V / 6A) 2SK2357 (450 V / 6 A)	2SK1752 (450 V / 10A) 2SK2361 (450 V / 10 A)

ROAD MAP

Package – $R_{DS(on)}$ MAP

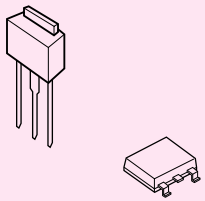
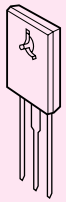
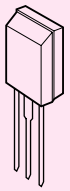
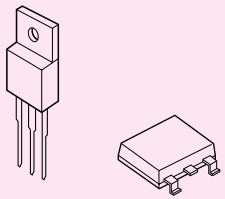
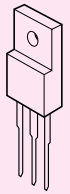
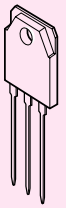
(V_{DSS}/$I_{D(DC)}$)

Package Type						
$R_{DS(on)MAX}$ (Ω) V_{GS} = 10 V	TO-251/252 (MP-3)	TO-126 (MP-5)	MP-10	TO-220AB/263 (MP-25)	Isolated TO-220 (MP-45F)	TO-3P (MP-88)
1				2SK1496 (500 V / 7 A) 2SK2360 (500 V / 7 A)	2SK1993 (500 V / 6 A) 2SK2358 (500 V / 6 A)	2SK1753 (500 V / 10 A) 2SK2362 (500 V / 10 A) 2SK2477 (800 V / 10 A)
1.1					2SK2141 (600 V / 6 A)	
1.2						2SK1796 (900 V / 10 A) 2SK2488 (900 V / 10 A)
1.4				2SK1750 (450 V / 5 A) 2SK2355 (450 V / 5 A)	2SK1990 (450 V / 4.5 A) 2SK2353 (450 V / 4.5 A)	
1.5				2SK1751 (500 V / 5 A) 2SK2140 (600 V / 7 A) 2SK2356 (500 V / 5 A)	2SK1991 (500 V / 4.5 A) 2SK2139 (600 V / 5 A) 2SK2354 (500 V / 4.5 A)	
1.6						2SK1795 (900 V / 8 A) 2SK2487 (900 V / 8 A)
2					2SJ448 (–250 V / –4 A)	2SK1502 (900 V / 7A) 2SK2486 (900 V / 7 A)
2.4				2SK2138 (600 V / 5 A)	2SK2137 (600 V / 4 A)	

ROAD MAP

Package – $R_{DS(on)}$ MAP

(V_{DSS}/$I_{D(DC)}$)

Package Type						
$R_{DS(on)MAX}$ (Ω) V_{GS} = 10 V	TO-251/252 (MP-3)	TO-126 (MP-5)	MP-10	TO-220AB/263 (MP-25)	Isolated TO-220 (MP-45F)	TO-3P (MP-88)
2.8				2SK1493 (450 V / 3 A) 2SK2484 (900 V / 5 A)	2SK1988 (450 V / 2.5 A) 2SK2275 (900 V / 3.5 A) 2SK2483 (900 V / 3.5 A)	2SK1794 (900 V / 6 A) 2SK2485 (900 V / 6 A)
3				2SK1494 (500 V / 3 A)	2SK1989 (500 V / 2.5 A)	
4				2SK1501 (900 V / 4A) 2SK2481 (900 V / 4 A)	2SK1995 (900 V / 3A) 2SK2480 (900 V / 3 A)	2SK1760 (900 V / 5 A) 2SK2482 (900 V / 5 A)
4.2					2SK1758 (600 V / 2 A)	
5	2SK2040 (600 V/2A)				2SK1953 (600 V / 2 A) 2SK2476 (800 V / 3 A)	
7.5				2SK1793 (900 V / 3 A) 2SK2479 (900 V / 3 A)	2SK1994 (900 V / 2 A) 2SK2478 (900 V / 2 A)	

ROAD MAP

Power MOS FET

V_{DSS} - $I_{D(DC)}$ MAP

$I_{D(DC)}$(A) \ V_{DSS}(V)	up to 150	up to 500	up to 900
up to 4.5	○	○	○
up to 13	○	○	○
up to 35	○	○	—
up to 50	○	—	—

ROAD MAP

V_{DSS} - $I_{D(DC)}$ MAP

($R_{DS(on)MAX}$*/Package)

$I_{D(DC)}$(A) \ V_{DSS}(V)	30	60	100	150
2	2SJ324 (0.25 Ω / TO-251, 252)	2SJ326 (0.37 Ω / TO-251, 252)		
2.5				
3		2SK1282 (0.18 Ω / TO-251, 252) 2SK1283 (0.18 Ω / TO-126)	2SK1284 (0.32 Ω / TO-251, 252) 2SK1285 (0.32 Ω / TO-126)	
3.5				
4	2SJ325 (0.11 Ω / TO-251, 252)	2SJ327 (0.17 Ω / TO-251, 252)		
4.5				

*: V_{GS} = 10 V

ROAD MAP

V_{DSS} - $I_{D(DC)}$ MAP

($R_{DS(on)MAX}$*/Package)

$I_{D(DC)}$(A) \ V_{DSS}(V)	180	200	250	450	500
2					
2.5				2SK1988 (2.8 Ω / Isolated TO-220)	2SK1989 (3.0 Ω / Isolated TO-220)
3				2SK1493 (2.8 Ω / TO-220AB, 263)	2SK1494 (3.0 Ω / TO-220AB, 263)
3.5					
4	2SK1954 (0.65 Ω TO-251, 252) 2SK2132 (0.65 Ω/MP-10)		2SJ448 (2.0 Ω / Isolated TO-220)		
4.5				2SK1990 (1.4 Ω / Isolated TO-220) 2SK2353 (1.4 Ω / Isolated TO-220)	2SK1991 (1.5 Ω / Isolated TO-220) 2SK2354 (1.5 Ω / Isolated TO-220)

*: V_{GS} = 10 V

ROAD MAP

V_{DSS} - $I_{D(DC)}$ MAP

($R_{DS(on)MAX}$*/Package)

$I_{D(DC)}$(A) \ V_{DSS}(V)	600	700	800	900
2	2SK1758 (4.2 Ω / Isolated TO-220) 2SK1953 (5.0 Ω / Isolated TO-220) 2SK2040 (5.0 Ω / TO-251, 252)			2SK1994 (7.5 Ω / Isolated TO-220) 2SK2478 (7.5 Ω / Isolated TO-220)
2.5				
3			2SK2476 (5.0 Ω / Isolated TO-220)	2SK1793 (7.5 Ω / TO-220AB, 263) 2SK1995 (4.0 Ω / Isolated TO-220) 2SK2479 (7.5 Ω / TO-220AB, 263) 2SK2480 (4.0 Ω / Isolated TO-220)
3.5				2SK2275 (2.8 Ω / Isolated TO-220) 2SK2483 (2.8 Ω / Isolated TO-220)
4	2SK2137 (2.4 Ω / Isolated TO-220)			2SK1501 (4.0 Ω / TO-220AB, 263) 2SK2481 (4.0 Ω / TO-220AB, 263)
4.5				

*: V_{GS} = 10 V

ROAD MAP

V_{DSS} - $I_{D(DC)}$ MAP

($R_{DS(on)MAX}$*/Package)

$I_{D(DC)}$(A) \ V_{DSS}(V)	30	60	100	150
5				
6				
7				
8		2SK1748 (0.11 Ω / TO-251, 252) 2SK2415 (0.1 Ω / TO-251, 252)		
10		2SK1850 (0.07 Ω / MP-10) 2SK2413 (0.07 Ω / MP-10) 2SK2414 (0.07 Ω / TO-251, 252)	2SK1852 (0.15 Ω / MP-10)	
11				
12				
13				

*: V_{GS} = 10 V

ROAD MAP

V_{DSS} - $I_{D(DC)}$ MAP

($R_{DS(on)MAX}$*/Package)

$I_{D(DC)}$(A) \ V_{DSS}(V)	180	200	250	450	500
5				2SK1750 (1.4 Ω / TO-220AB, 263) 2SK2355 (1.4 Ω / TO-220AB, 263)	2SK1751 (1.5 Ω / TO-220AB, 263) 2SK2356 (1.5 Ω / TO-220AB, 263)
6			2SJ449 (0.8 Ω / Isolated TO-220)	2SK1992 (0.9 Ω / Isolated TO-220) 2SK2357 (0.9 Ω / Isolated TO-220)	2SK1993 (1.0 Ω / Isolated TO-220) 2SK2358 (1.0 Ω / Isolated TO-220)
7				2SK1495 (0.9 Ω / TO-220AB, 263) 2SK2359 (0.9 Ω / TO-220AB, 263)	2SK1496 (1.0 Ω / TO-220AB, 263) 2SK2360 (1.0 Ω / TO-220AB, 263)
8				2SK2363 (0.5 Ω / Isolated TO-220)	2SK2234 (0.6 Ω / Isolated TO-220) 2SK2364 (0.6 Ω / Isolated TO-220)
10				2SK1752 (0.9 Ω / TO-3P) 2SK2361 (0.9 Ω / TO-3P) 2SK2365 (0.5 Ω / TO-220AB, 263)	2SK1753 (1.0 Ω / TO-3P) 2SK2362 (1.0 Ω / TO-3P) 2SK2366 (0.6 Ω / TO-220AB, 263)
11			2SK2341 (0.26 Ω / Isolated TO-220)		
12				2SK1784 (0.6 Ω / TO-3P)	2SK1785 (0.7 Ω / TO-3P)
13		2SK2134 (0.4 Ω / TO-220AB, 263)			

*: V_{GS} = 10 V

ROAD MAP

V_{DSS} - $I_{D(DC)}$ MAP

($R_{DS(on)MAX}$*/Package)

$I_{D(DC)}$(A) \ V_{DSS}(V)	600	700	800	900
5	2SK2138 (2.4 Ω / TO-220AB, 263) 2SK2139 (1.5 Ω / Isolated TO-220)			2SK1760 (4.0 Ω / TO-3P) 2SK2482 (4.0 Ω / TO-3P) 2SK2484 (2.8 Ω / TO-220AB, 263)
6	2SK2141 (1.1 Ω / Isolated TO-220)			2SK1794 (2.8 Ω / TO-3P) 2SK2485 (2.8 Ω / TO-3P)
7	2SK2140 (1.5 Ω / TO-220AB, 263)			2SK1502 (2.0 Ω / TO-3P) 2SK2486 (2.0 Ω / TO-3P)
8				2SK1795 (1.6 Ω / TO-3P) 2SK2487 (1.6 Ω / TO-3P)
10			2SK2477 (1.0 Ω / TO-3P)	2SK1796 (1.2 Ω / TO-3P) 2SK2488 (1.2 Ω / TO-3P)
11				
12				
13				

*: V_{GS} = 10 V

ROAD MAP

V_{DSS} - $I_{D(DC)}$ MAP

($R_{DS(on)MAX}$*/Package)

$I_{D(DC)}$(A) \ V_{DSS}(V)	30	60	100	150
14		2SJ303 (0.1 Ω / Isolated TO-220)		
15		2SK1286 (0.07 Ω / Isolated TO-220) 2SK1287 (0.07 Ω / TO-220AB, 263) 2SK1851 (0.045 Ω / MP-10) 2SJ329 (0.06 Ω / Isolated TO-220)	2SK1288 (0.15 Ω / Isolated TO-220) 2SK2462 (0.14 Ω / Isolated TO-220) 2SK1853 (0.08 Ω / MP-10)	2SK2131 (0.12 Ω/Isolated TO-220)
16		2SJ302 (0.1 Ω / TO-220AB, 263)		
20	2SK1594 (0.08 Ω / Isolated TO-220)	2SK2412 (0.07 Ω / Isolated TO-220) 2SJ328 (0.06 Ω / TO-220AB, 263) 2SJ330 (0.05 Ω / Isolated TO-220)	2SK1289 (0.15 Ω / TO-220AB, 263) 2SK1292 (0.08 Ω / Isolated TO-220) 2SK2461 (0.08 Ω / Isolated TO-220)	
25		2SK1290 (0.045 Ω / Isolated TO-220) 2SK2723 (0.04 Ω / Isolated TO-220)		
30		2SJ331 (0.03 Ω / TO-3P) 2SK2410 (0.04 Ω / Isolated TO-220) 2SK2411 (0.04 Ω / TO-220AB, 263)	2SK1293 (0.08 Ω / TO-220AB, 263) 2SK1295 (0.05 Ω / Isolated TO-220)	
35	2SK2941 (0.02 Ω / TO-220AB, 263)	2SK2724 (0.027 Ω / Isolated TO-220)		

*: V_{GS} = 10 V

ROAD MAP

V_{DSS} - $I_{D(DC)}$ MAP

($R_{DS(on)MAX}$*/Package)

$I_{D(DC)}$(A) \ V_{DSS}(V)	180	200	250	450	500
14		2SK2135 (0.18 Ω / Isolated TO-220)			
15				2SK1756 (0.5 Ω / TO-3P) 2SK2367 (0.5 Ω / TO-3P)	2SK1757 (0.6 Ω / TO-3P) 2SK2368 (0.6 Ω / TO-3P)
16			2SK2133 (0.26 Ω / TO-220AB, 263)		
20		2SK2136 (0.18 Ω / TO-220AB, 263)		2SK1497 (0.35 Ω / TO-3P) 2SK2369 (0.35 Ω / TO-3P)	2SK1498 (0.4 Ω / TO-3P) 2SK2370 (0.4 Ω / TO-3P)
25			2SK1491 (0.15 Ω / TO-3P)	2SK1499 (0.25 Ω / TO-3P) 2SK2371 (0.25 Ω / TO-3P)	2SK1500 (0.27 Ω / TO-3P) 2SK2372 (0.27 Ω / TO-3P)
30					
35			2SK1492 (0.12 Ω / TO-3P)		

*: V_{GS} = 10 V

ROAD MAP

V_{DSS} - $I_{D(DC)}$ MAP

($R_{DS(on)MAX}$*/Package)

$I_{D(DC)}$(A) \ V_{DSS}(V)	30	60	100	150
40	2SK1596 (0.02 Ω / Isolated TO-220)	2SK1123 (0.027 Ω / TO-3P) 2SK1294 (0.027 Ω / Isolated TO-220) 2SK2409 (0.027 Ω / Isolated TO-220) 2SK2510 (0.02 Ω / Isolated TO-220) 2SK2511 (0.027 Ω / TO-3P)	2SK1122 (0.05 Ω / TO-3P)	
45		2SK2512 (0.015 Ω / Isolated TO-220) 2SK2513 (0.015 Ω / TO-220AB, 263)		
50		2SK1749 (0.018 Ω / TO-3P) 2SK2498 (0.009 Ω / Isolated TO-220) 2SK2499 (0.009 Ω / TO-220AB, 263) 2SK2514 (0.015 Ω / TO-3P) 2SK2515 (0.009 Ω / TO-3P)		

*: V_{GS} = 10 V

ROAD MAP

8-pin SOP Type Power MOS FET MAP

On-Resistance $R_{DS(on)MAX}$(mΩ) @V_{GS} = 10 V	Drain to source voltage V_{DSS} (V)	
	20	30
up to 90		μPA1750 (P-ch Dual)
up to 70		μPA1710 (P-ch Single) μPA1710A (P-ch Single) μPA1754 (N-ch Dual)
up to 50		μPA1713 (P-ch Single)
up to 40	μPA1752 (N-ch Dual)*	μPA1711 (P-ch Single)
up to 30	μPA1753 (N-ch Dual)* μPA1756 (N-ch Dual)*	μPA1751 (N-ch Dual) μPA1714 (P-ch Single) μPA1755 (N-ch Dual) μPA1758 (N-ch Dual)*
up to 20	μPA1701 (N-ch Single)* μPA1701A (N-ch Single) μPA1757 (N-ch Dual)*	μPA1700 (N-ch Single) μPA1700A (N-ch Single) μPA1712 (P-ch Single) μPA1705 (N-ch Single)*
up to 10		μPA1702 (N-ch Single) μPA1703 (N-ch Single) μPA1704 (N-ch Single) μPA1706 (N-ch Single) μPA1707 (N-ch Single) μPA1715 (N-ch Single)

*: 2.5 V drive is possible. Otherwise 4 V drive is possible.

ROAD MAP

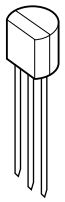
8-pin TSSOP Type Power MOS FET MAP

On-Resistance $R_{DS(on)MAX.}$(mΩ) @V_{GS} = 4.5 V	Drain to source voltage V_{DSS} (V)		
	12	20	30
up to 210		μPA1851 (P-ch Dual)	
up to 190			μPA1853 (P-ch Dual)
up to 115	μPA1850 (P-ch Dual)		
up to 75		μPA1811 (P-ch Single)	μPA1812 (P-ch Single)
up to 60	μPA1854 (P-ch Dual) μPA1810 (P-ch Single)		
up to 40		μPA1852 (N-ch Dual)	μPA1800 (N-ch Single)
up to 30			μPA1814 (P-ch Single)★
up to 25	μPA1813 (P-ch Single)	μPA1801 (N-ch Single) μPA1855 (N-ch Dual)★ μPA1802 (N-ch Single) μPA1815 (P-ch Single)★	μPA1803 (N-ch Single)★

★ : Under Development

ROAD MAP

Quick Reference by Package



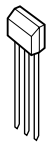
TO–92

■ TO-92 Type Transistor

V_{CEO} (V) / I_C (A)	~15	~30	~50	~70	~100	~150	~200	~250	~400
~20 m		2SC1674							
~50 m	2SA1206**					2SA988 2SA992 2SC1841 2SC1845			
~100 m			2SA733 2SA987 2SA990 2SC945 2SC1840 2SC1842 2SC1843 AA1[ ] AN1[ ]		2SA675[1)]		2SA1376 2SA1376A 2SC3478 2SC3478A	2SA1544	
~200 m	2SC2901**		2SC3622* (150 mA) 2SC3622A* (150 mA)						
~500 m			2SC3615* (300 mA)	2SA953 2SC2002	2SA954 2SC2003				2SA1625
~1.0		2SA952 2SC2001 2SC3616* (25 V/ 700 mA) AB1[ ] (25 V/ 700 mA) AP1[ ] (25 V/ 700 mA)	2SB1116 2SD1616	AD1[ ] AD2[ ]*** AR1[ ] 2SB1116A (60 V) 2SD1616A (60 V)*** 2SD1701 (60 V)	2SD1698 (80 V)				
~2.0		2SD1513 (16 V/2.0 A) 2SB1068 (16 V/2.0 A) AQ1[ ] (20 V/2.0 A)							
~3.0		2SB1300 (16 V/3 A)							

1) V_{CES} ☐ : Darlington transistor, ∗: High h_{FE} transistor, ∗∗: High speed switching, ∗∗∗: Contains internal zener diode

Quick Reference by Package



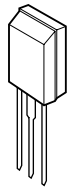
SST

■ SST Type Transistor

I_C (A) \ V_{CEO} (V)	~15	~20	~30	~50	~120
~20 m	2SC2786		2SC2787		
~50 m	2SA1459**				2SC2784
~100 m				2SA1175 2SC2785 2SC3623* BA1[ ] BN1[ ]	
~200 m	2SC3732**			2SA1458** (40 V) 2SC3623A* (150 mA) 2SC3731** (40 V)	
~700 m		2SB810 2SD1020	BB1[ ] (25 V) BP1[ ] (25 V)		

*: High h_{FE} transistor, **: High speed switching

Quick Reference by Package



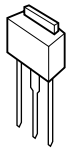
SP–8

■ SP-8 Type Transistor

V_{CEO} (V) / I_C (A)	~16	~25	~50	~80	~140	~160	~300	~400	~600
~50 m					2SA915 2SC1940	2SA916 2SC1941			
~200 m							2SC3209 2SC4000 (250 V/ 100 mA)		
~500 m					2SA1221 2SC2958	2SA1222 2SC2959			
~700 m			2SB605 2SD571 2SC2721						
~1.0		2SB564 2SD471	2SA1460** 2SB734 2SC3733** 2SD774 2SD1582*	2SB984 2SB1093 2SD1312 2SD1579 2SD1697 (800 mA) 2SD1700*** (60 V/ 800 mA) 2SD1843*** (60 V)					2SA1627
~2.0	2SB733 2SD773	2SD1581*	2SD2463	2SD1779* (60 V) 2SD1780* (60 V) CE1[ ]*** (60 V) CE2[ ]* (60 V)				2SA1626	
~3.0		2SB1117			2SB1318 (100 V)				
~5.0		2SA1897							

□: Darlington transistor, *: High h_{FE} transistor, **: High speed switching, ***: Internal zener diode

Quick Reference by Package



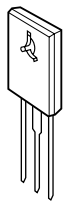
MP–3

■ MP-3 Type Transistor

$I_{C(DC)}$ (A) \ V_{CEO} (V)	~20	~40	~60	~100	~150	~300	~400	~600
~0.5							2SA1400 2SC3588	
~1.0			2SB963 2SD1286					2SA1413 2SC3632
~2.0	2SD1583	2SD992	2SD1164		2SB768 2SD1033	2SC2885 2SC2946	2SA1412 2SC3631	
~3.0		2SB962 ◎	2SD1584 2SB1261 ◎ 2SD1899 ◎					
~5.0			2SA1385 ◎ 2SC3518 ◎ 2SA1648 ◎	2SA1647 ◎ 2SC4331 ◎			2SC4346	
~10	2SA1615 ◎	2SA1649 ◎						

▭ : Darlington transistor, (: Complementary pair, ○: Single High h_{FE}, ◎: Low V_{CE}(sat)

Quick Reference by Package



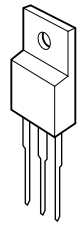
MP–5
(TO–126)

■ MP-5 (TO-126) Type Transistor

$I_{C(DC)}$ (A) \ V_{CEO} (V)	~45	~60	~80	~120	~160	~300	~400	~600
~1.0						2SA1546 2SC4001		
~0.5						2SC2688	2SA1156 2SC2752	
~1.0		2SD1630 *		2SD415				2SA1486 2SC3840
~2.0	2SD1695 *	2SB794 2SD985	2SB795 2SD986	2SC2690	2SC2690A			
~3.0	2SD794 2SB772 ◎ 2SD882 ◎	2SD794A 2SB1150 * 2SD1693 * 2SD1694 ○ 2SB1217 ◎ 2SD1818 ◎		2SB1149 2SD1692 2SC4342				
~5.0		2SB1151 ◎ 2SD1691 ◎						

▭ : Darlington transistor, (: Complementary pair, *: Internal zener diode between C-B, ◎ : Low $V_{CE(sat)}$,
○ : Single Hight h_{FE}

Quick Reference by Package



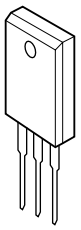
MP–25
(TO–220)

■ MP-25 (TO-220) Type Transistor

$I_{C(DC)}$ (A) \ V_{CEO} (V)	~40	~60	~80	~100	~150	~300	~400
~0.5						2SC1505	
~2.0				2SA1008 2SC2331	2SB546A 2SD401A	2SA1009	2SA1009A 2SC2333
~5.0		2SA1069	2SA1069A	2SB601 2SD560 2SC2517			2SC2518
~7.0	2SA1129	2SB707	2SB708	2SA1010 2SC2334 2SA1645 ◎			2SC2335
~7.0				2SA1646 ◎			

▭ : Darlington transistor, 〔: Complementary pair, ∗: Internal zener diode between C-B, ◎: Low $V_{CE(sat)}$

Quick Reference by Package



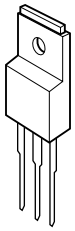
MP–40

■ MP-40 Type Transistor

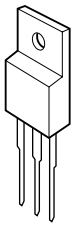
V_{CEO} (V) / $I_{C(DC)}$ (A)	~60	~100	~400
~5.0	2SD1392*	2SD1308	
~7.0	2SC4305		2SC3158
~8.0		2SD1309	
~10		2SA1261 2SC3157 2SC4350	2SC3159

▭ : Darlington transistor, (: Complementary pair, ∗: Internal zener diode between C-B

Quick Reference by Package



MP–45
(MP-25 Insulated type)



MP–45F
(MP-25 Insulated type)

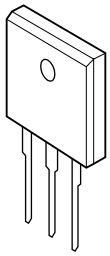
■ MP-45, MP-45F (TO-220 Insulated Type) Transistor

V_{CEO} (V) / Package / $I_{C(DC)}$ (A)	~60		~100		~300	~400
	MP-45	MP-45F	MP-45	MP-45F	MP-45	MP-45
~2.0			2SA1395 2SC3567			2SC3569
~3.0	2SB1094 2SD1585 2SD1593 ○	2SB1453 2SD2164 ○				
~5.0	2SA1394 2SA1441 ◎ 2SC3691 ◎ 2SC4351 *	2SA1741 ◎ 2SC4549 ◎	2SB1098 2SD1589 2SA1650 ◎	2SB1430 2SD2161	2SD1592	2SC3570
~6.0			2SD1594 ○	2SD2165 ○		
~7.0	2SB1097 2SD1588 2SA1442 ◎ 2SC3692 ◎	2SA1742 ◎ 2SC4550 ◎	2SC4062 ○	2SC4553 ○		2SC3571
~8.0			2SB1099 2SD1590	2SB1431 2SD2162		
~10	2SA1443 ◎ 2SC3693 ◎	2SA1743 ◎ 2SC4551 ◎	2SA1396 2SC3568 2SA1652 ◎ 2SC4336 ◎ 2SA1720 2SB1100 2SD1591	2SB1432 2SD2163		2SC3572
~15	2SA1444 ◎ 2SC3694	2SA1744 ◎ 2SC4552 ◎	2SC4063 ○	2SC4554 ○		

▭ : Darlington transistor, (: Complementary pair, * : Internal zener diode between C-B, ◎ : Low $V_{CE(sat)}$,
○ : Single High h_{FE}

Quick Reference by Package

■ MP-80 Type Transistor

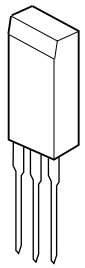


MP–80

$I_{C(DC)}$ (A) \ V_{CEO} (V)	~100	~400
~5.0	2SC2908	
~1.0	2SB897 2SD1210	2SC2749
~15	2SC2750 2SD1296	2SC2751

□: Darlington transistor, ∗: MP-88

Quick Reference by Package



MP–10

■ MP-10 Type Transistor

V_{CEO} (V) / $I_{C(DC)}$ (A)	~60	~100
2.5		2SC4814 ○
~5	〔 2SA1843 ◎ 2SC4815 ◎	〔 2SA1840 2SC4810 2SA1845 ◎
~7		2SC4813 ○
~8		〔 2SA1841 2SC4811
~10		2SA1847 ◎

□: Darlington transistor, 〔: Complementary pair, ○: Low V_{CE}(sat) High h_{FE}, ◎: Low V_{CE}(sat)

Quick Reference by Package

Mini mold
SC-59

■ Mini-Mold Transistor

V_{CEO} (V) / I_C (mA)	~15	~20	~30	~40	~50	~60	~80	~120	~200	~300
~20		2SC2223								2SD2383
~30				2SA1226						
~50	2SA1462		2SC1009A					2SA811A 2SA1247 2SC1622A 2SC3115	2SC1653 (130 V) 2SC1654 (160 V)	
~100					2SA812 2SC1623 FA1[ ] FN1[ ]				2SA1330 2SC3360	
~150					2SC3624 2SC3624A					
~200	2SC3735	2SC1621		2SA1461 2SC3734						
~300						2SB736 2SD780	2SB736A 2SD780A			
~500				2SA1464 2SC3739						
~700			2SB624 (–25 V) 2SD596 (25 V) FB1[ ] (25 V) FP1[ ] (–25 V)							

Quick Reference by Package

Power mini mold
SC-62

■ Power Mini-Mold Transistor

V_{CEO} (V) / I_C (A)	~20	~25	~50	~60	~80	~100	~120	~140	~300
~50 m								2SA1173 2SC2780	
~200 m									2SC3554
~300 m			2SC3617		2SB800 2SD1001				
~0.7		2SC3618	2SB799 2SD1000			2SB805 2SD1006	2SB806 2SD1007		
~1.0		2SB798 2SD999	2SA1463 2SB1115 2SC3736 2SD1615 2SD1702	2SB1115A 2SD1615A HD1[ ] HD2[ ] HR1[ ]	2SB804 2SD1005 2SD1699				
~2.0	2SB1114 2SD1614 HQ1[ ]	2SD1950							
~3.0	2SB1628			2SB1572 2SD2403					
~5.0			2SB1571 2SD2402						

: Darlington connection

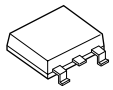
Quick Reference by Package

MP-2
SC-84

■ MP-2 Type Transistor

V_{CEO} (V) / I_C (A)	~60	~600
~1.0		2SA1871 2SC4942
~5.0	2SB1578 2SD2425	

Quick Reference by Package



MP-3

■ MP-3 Type (SC-63) Transistor

V_{CEO} (V) / I_C (A)	~20	~30	~45	~60	~200	~400	~600
~0.5						2SA1400-Z 2SC3588-Z	
~1.0				2SB963-Z 2SD1286-Z			2SA1413-Z 2SC3632-Z
~2.0	2SD1583-Z			2SD1164-Z (1.5 A)	2SB768 (150 V) 2SD1033 (150 V) 2SC2946(1)	2SA1412-Z 2SC3631-Z	
~3.0		2SB962-Z		2SB1261-Z 2SD1584-Z 2SD1899-Z			
~5.0				2SA1385-Z 2SC3518-Z			
~10	2SA1615-Z						

: Darlington connection

Quick Reference by Package

Small mini mold
SC-70

■ Small Mini-Mold Transistor

V_{CEO} (V) / I_C (mA)	~15	~20	~30	~40	~50	~120
~20		2SC4178				
~50	2SA1610		2SC4179			2SA1612 2SC4180
~100					2SA1611 2SC4177 GA1[ ] GN1[ ]	
~150					2SC4181	
~200	2SC4176	2SC4175				
~500			2SB1475 (–25 V) 2SD2228 (25 V)	2SA1608 2SC4173		

Quick Reference by Package

■ Ultra Small Mini-Mold Transistor

I_C (mA) \ V_{CEO} (V)	~50
~100	2SA1836 2SC4783

Ultra small mini mold

Quick Reference Table by Function/Application

Small Signal Transistor

■ **Small Signal Transistor (1/2)**

	TO-92	SP-8	SST	SMALL MINI MOLD	MINI MOLD	POWER MINI
FM/FM RF RF/MIX/CON	2SC1674		2SC2786	2SC4178	2SC2223	
FM AM/FM/AM MIX/OSC/IF			2SC2787	2SC4179	2SC1009A	
Audio Frequency Amplification	2SA733		2SA1175	2SA1611	2SA812	
	2SA987				(2SA812)	
	2SA988			2SA1612	2SA811A	
	2SC945		2SC2785	2SC4177	2SC1623	
	2SC1840				(2SC1623)	
	2SC1841				2SC1622A	
	2SC3622/A		2SC3623/A	2SC4181	2SC3624/A	
Low Noise Amplification	2SA992		2SA1174		2SA1247	
	2SC1845		2SC2784		2SC3115	
Driver Output	2SA952		2SB810		2SB624	
	2SA953				2SB736	
	2SA954				2SB736A	2SB800
	2SA1376				2SA1330	
		2SB564	2SB811			2SB798
		2SB605				2SB799
	2SB1068					2SB1114
	2SB1116					2SB1115
	2SB1116A					2SB1115A
	2SC2001		2SD1020		2SD596	
	2SC2002				2SD780	
	2SC2003				2SD780A	2SD1001
	2SC3478				2SC3360	
		2SC1940			2SC1653	2SC2780
		2SC1941			2SC1654	
		2SC3209				2SC3554
	2SC3615					2SC3617
	2SC3616					2SC3618
		2SD471				2SD999
		2SD571				2SD1000
	2SD1513					2SD1614
	2SD1616					2SD1615
	2SD1616A					2SD1615A
	2SD1698	2SD1697				2SD1699
	2SD1701	2SD1700				2SD1702
		2SD1581				2SD1950

Quick Reference Table by Function/Application

Small Signal Transistor

■ **Small Signal Transistor (2/2)** ◁

	TO-92	SP-8	SST	SMALL MINI MOLD	MINI MOLD	POWER MINI
Switching	2SA1206		2SA1459	2SA1610	2SA1462	
				2SA1608	2SA1464	
		2SA1460				2SA1463
			2SA1458		2SA1461	
				2SC4173	2SC3739	
	2SC2901		2SC3732	2SC4176	2SC3735	
		2SC3733				2SC3736
			2SC3731		2SC3734	

Quick Reference Table by Function/Application

Power Transistor

■ Low $V_{CE(sat)}$ Transistor

Characteristics V_{CEO}, $I_{C(DC)}$	SP-8	MP-2	MP-3	MP-5 (TO-126)	MP-25	MP-10	MP-45	MP-45F
16 V, 3 A		2SB1581						
20 V, 10 A	2SA1897 (5A)		2SA1615					
25 V, 3 A	2SB1117							
30 V, 3 A			2SB962	2SB772 2SD882				
30 V, 10 A			2SA1649					
60 V, 3 A			2SB1261 2SD1899	2SB1217 2SD1818				
60 V, 5 A		2SB1578 2SD2425	2SA1385 2SC3518	2SB1151 2SD1691		2SA1843 2SC4815		
			2SA1648				2SA1441 2SC3691	2SA1741 2SC4549
60 V, 7 A							2SA1442 2SC3692	2SA1742 2SC4550
60 V, 10 A							2SA1443 2SC3693	2SA1743 2SC4551
60 V, 15 A							2SA1444 2SC3694	2SA1744 2SC4552
100 V, 5 A			2SA1647 2SC4331			2SA1845	2SA1650	
100 V, 7 A					2SA1645			
100 V, 10 A						2SA1847	2SA1652 2SC4336	

Quick Reference Table by Function/Application

Power Transistor

■ High h_{FE} Transistor

Characteristics V_{CEO}, $I_{C(DC)}$	SP-8	MP-3	MP-5 (TO-126)	MP-10	MP-45	MP-45F
20 V, 2 A		2SD1583				
25 V, 2 A	2SD1581					
50 V, 1 A	2SD1582					
60 V, 3 A		2SD1584	2SD1694		2SD1593	2SD2164
100 V, 2.5 A				2SC4814*		
100 V, 6 A					2SD1594	2SD2165
100 V, 7.5 A				2SC4813*	2SC4062	2SC4553*
100 V, 15 A					2SC4063	2SC4554*

*: Low VCE(sat) & High hFE

Quick Reference Table by Function/Application

Power Transistor

■ Low Voltage, High Speed Switching Transistor

Characteristics V_{CEO}, $I_{C(DC)}$	SP-8	MP-25	MP-45	MP-80
45 V, 1 A	2SA1460 2SC3733			
60 V, 5 A		2SA1069	2SA1394	
100 V, 2 A		2SA1008 2SC2331	2SA1395 2SC3567	
100 V, 5 A		2SC2517		
100 V, 7 A		2SA1010 2SC2334		
100 V, 10			2SA1396 2SC3568	
100 V, 15 A				2SC2750

Quick Reference Table by Function/Application

Power Transistor

■ High Voltage, High Speed Switching Transistor

Characteristics V_{CEO}, $I_{C(DC)}$	MP-3	MP-5 (TO-126)	MP-25 (TO-220)	MP-40	MP-45	MP-80
200 V, 2 A	2SC2885 2SC2946 2SC2946(1)					
350 V, 2 A			2SA1009			
400 V, 0.5 A	2SA1400 2SC3588	2SA1156 2SC2752				
400 V, 2 A	2SC3631		2SA1009A 2SC2333		2SC3569	
400 V, 5 A	2SC4346		2SC2518		2SC3570	
400 V, 7 A				2SC3158	2SC3571	
400 V, 10 A				2SC3159	2SC3572	2SC2749
400 V, 15 A						2SC2751
600 V, 2 A	2SA1413 2SC3632	2SA1486 2SC3840				

Quick Reference Table by Function/Application

Power Transistor

■ Audio Frequency Amplification Transistor

Characteristics V_{CEO}, $I_{C(DC)}$	MP-3	MP-5 (TO-126)	MP-25 (TO-220)	MP-45
45 V, 3 A		2SD794		
60 V, 3 A		2SD794A		2SB1094 2SD1585
60 V, 7 A			2SB707	2SB1097 2SD1588
80 V, 0.8 A		2SD414		
80 V, 7 A			2SB708	
100 V, 0.8 A		2SD415		
150 V, 2 A	2SB768 2SD1033		2SB546A 2SD401A	

Quick Reference Table by Function/Application

Power Transistor

■ High Frequency Amplification Transistor

Characteristics V_{CEO}, $I_{C(DC)}$	SP-8	MP-5 (TO-126)	MP-25 (TO-220)
40 V, 7 A			2SA1129
120 V, 1.2 A		2SC2690	
160 V. 1.2 A		2SC2690A	
250 V, 0.1 A	2SC4000	〔 2SA1546 2SC4001	
300 V, 0.2 A	2SC2802	2SC2688	2SC1505

Quick Reference Table by Function/Application

Power Transistor

■ Darlington Transistor

Characteristics V_{CEO}, $I_{C(DC)}$	SP-8	MP-3	MP-5 (TO-126)	MP-25 (TO-220)	MP-10	MP-40	MP-45	MP-45F	MP-80
31 V, 2 A	2SD2463*		2SD1695*						
60 V, 0.8 A	2SD1700*								
60 V, 1 A	2SD1843	2SB963 2SD1286	2SD1630*						
60 V, 1.5 A		2SD1164	2SB794 2SD985						
60 V, 3 A			2SB1150* 2SD1693*						
60 V, 5 A						2SD1392*	2SC4351◎		
80 V, 0.8 A	2SD1697								
80 V, 1.5 A	2SB1093 2SD1579		2SB795 2SD986						
100 V, 3 A			2SB1149 2SD1692 2SC4342◎						
100 V, 5 A				2SB601 2SD560	2SA1840 2SC4810	2SD1308	2SB1098◎ 2SD1589◎	2SB1430 2SD2161	
100 V, 8 A					2SA1841 2SC4811	2SD1309	2SB1099 2SD1590	2SB1431 2SD2162	
100 V, 10 A							2SA1720◎ 2SB1100 2SD1591	2SB1432 2SD2163	2SB897 2SD1210
100 V, 15 A									2SD1296
100 V, 25 A									2SD1297
300 V, 5 A							2SD1592		

◎: High speed darlington transistor, *: Internal zener diode between C-B

Field Effect Transistor

Small Signal FET

■ **2SK type (MOS type) (1/2)** ▷

Part number	Package	Absolute maximum rating (T_A = 25 °C)				Electrical characteristics (T_A = 25 °C)							Applications
		V_{DSS} (V)	I_D		P_T (W)	$\|y_{fs}\|$ (S)			$R_{DS(on)}$ (Ω)				
			DC (A)	Pulse (A)		V_{DS} (V)	I_D (A)	MIN.	V_{GS} (V)	I_D (A)	TYP.	MAX.	
2SK679A	TO-92	30	±0.5	±1.5	0.75	10	0.5	0.4	4	0.5	0.6	1.0	Switching
2SK680A	SC-62	30	±1.0	±2.0	1.0	10	0.5	0.4	4	0.5	0.6	1.0	
2SK681A	SP-8	30	±1.0	±2.0	1.0	10	0.5	0.4	4	0.5	0.6	1.0	
2SK1132	SST	50	0.1	0.2	0.25	5	0.02	0.03	4	0.02	30	50	
2SK1133	SC-59	50	0.1	0.2	0.2	5	0.02	0.03	4	0.02	30	50	
2SK1272	TO-92	60	±1.0	±2.0	0.75	10	0.5	0.4	4	0.5	—	1.0	
2SK1273	SC-62	60	±2.0	±4.0	2.0	10	0.5	0.4	4	0.5	—	1.0	
2SK1274	SP-8	60	±1.5	±3.0	1.0	10	0.5	0.4	4	0.5	—	1.0	
2SK1398	SST	50	0.1	0.2	0.25	3	0.01	0.02	2.5	0.005	20	40	
2SK1399	SC-59	50	0.1	0.2	0.2	3	0.01	0.02	2.5	0.005	20	40	
2SK1482	TO-92	30	±1.5	±3.0	0.75	10	0.5	0.4	4	0.5	0.19	0.8	
2SK1483	SC-62	30	±2.0	±4.0	2.0	10	0.5	0.4	4	0.5	0.19	0.8	
2SK1484	TO-92	100	±0.5	±1.0	0.75	10	0.5	0.4	4	0.5	0.62	1.2	
2SK1485	SC-62	100	±1.0	±2.0	2.0	10	0.5	0.4	4	0.5	0.62	1.2	
2SK1580	SC-70	16	0.1	0.2	0.15	3	0.01	0.02	2.5	0.001	9	15	
2SK1581	SC-59	16	0.2	0.4	0.2	3	0.01	0.02	2.5	0.001	3.2	5	
2SK1582	SC-59	30	0.2	0.4	0.2	5	0.01	0.02	4	0.01	2.2	5	
2SK1583	SC-62	16	±0.5	±1.0	2.0	5	0.3	0.4	2.5	0.3	1.2	2.0	
2SK1584	SC-62	30	±0.5	±1.0	2.0	5	0.3	0.4	2.5	0.3	1.2	2.0	
2SK1585	SC-62	16	±1.0	±2.0	2.0	5	0.5	0.4	2.5	0.5	0.8	1.2	
2SK1586	SC-62	30	±1.0	±2.0	2.0	5	0.5	0.4	4	0.5	—	1.0	
2SK1587	SC-62	16	±2.0	±4.0	2.0	5	1.0	0.4	2.5	1.0	0.55	0.8	
2SK1588	SC-62	16	±3.0	±6.0	2.0	3	1.0	0.4	2.5	1.0	0.34	0.5	
2SK1589	SC-59	100	0.1	0.2	0.2	5	0.01	0.02	4	0.01	19	30	
2SK1590	SC-59	60	0.2	0.4	0.2	5	0.01	0.02	4	0.01	3.2	6	
2SK1591	SC-59	100	0.2	0.4	0.2	5	0.01	0.02	4	0.01	5.8	8	
2SK1592	SC-62	60	±0.5	±1.0	2.0	10	0.5	0.4	4	0.5	1.6	2.5	
2SK1593	SC-62	100	±0.5	±1.0	2.0	10	0.5	0.4	4	0.5	4.0	6.0	
2SK1656	SST	30	0.1	0.2	0.25	3	0.01	0.02	2.5	0.01	25	45	
2SK1657	SC-59	30	0.1	0.2	0.2	3	0.01	0.02	2.5	0.01	25	45	
2SK1658	SC-70	30	0.1	0.2	0.15	3	0.01	0.02	2.5	0.01	25	45	
2SK1824	3-pin ultra super mini	30	0.1	0.2	0.2	3	0.01	0.02	2.5	0.001	7	13	
2SK1958	SC-70	16	0.1	0.2	0.15	3	0.01	0.02	1.5	0.001	30	50	
2SK1959	SC-62	16	±2.0	±4.0	2.0	3	1.0	1.0	1.5	0.05	0.08	0.8	
2SK1960	SC-62	16	±3.0	±6.0	2.0	3	1.5	2.0	1.5	0.1	0.35	0.8	
2SK2053	MP-2	16	±5	±10	2.0	3	2.5	0.4	1.5	0.5	0.2	0.4	
2SK2054	MP-2	60	±3	±6	2.0	10	1.5	2.0	4	1.5	0.18	0.25	

Field Effect Transistor

Small Signal FET

■ **2SK type (MOS type) (2/2)** ◁

Part number	Package	Absolute maximum rating (T_A = 25 °C)				Electrical characteristics (T_A = 25 °C)							Applications
		V_{DSS} (V)	I_D		P_T (W)	$\|y_{fs}\|$ (S)			$R_{DS(on)}$ (Ω)				
			DC (A)	Pulse (A)		V_{DS} (V)	I_D (A)	MIN.	V_{GS} (V)	I_D (A)	TYP.	MAX.	
2SK2055	MP-2	100	±2	±4	2.0	10	1.0	2.0	4	1.0	0.28	0.45	Switching
2SK2070	SP-8	100	±1	±2	2.0	10	1.0	2.0	4	1.0	0.28	0.45	
2SK2090	SC-70	50	±0.1	±0.2	0.15	3	0.01	0.02	2.5	0.01	20	40	
2SK2109	SC-62	60	±0.5	±1.0	2.0	10	0.3	0.4	4	0.3	0.55	1.5	
2SK2110	SC-62	100	±0.5	±1.0	2.0	10	0.3	0.4	4	0.3	0.90	2.0	
2SK2111	SC-62	60	±1.0	±2.0	2.0	10	0.5	0.4	4	0.5	0.35	1.0	
2SK2112	SC-62	100	±1.0	±2.0	2.0	10	0.5	0.4	4	0.5	0.67	1.5	
2SK2157	MP-2	30	±5	±10	2.0	10	2.5	2.0	4	2.5	0.08	0.15	
2SK2158	SC-59	50	0.1	0.2	0.2	3	0.01	0.02	1.5	0.001	21	50	
2SK2159	SC-62	60	±2	±4	2.0	10	1.0	0.4	1.5	0.1	0.26	0.7	
2SK2541	SST	50	±0.1	±0.2	0.2	3	0.01	0.02	1.5	0.001	21	50	
2SK2857★	SC-62	60	±4	±16	2.0	10	1	1	4	1.5	0.15	0.22	
2SK2858★	SC-70	30	±0.1	±0.4	0.15	3	0.01	0.02	2.5	0.001	10	15	

★: Under development

Field Effect Transistor

Small Signal FET

■ 2SJ type (MOS type)

Part number	Package	Absolute maximum rating (T_A = 25 °C)				Electrical characteristics (T_A = 25 °C)							Applications
		V_{DSS} (V)	I_D		P_T T_C = 25 °C (W)	$\|y_{fs}\|$ (S)			$R_{DS(on)}$ (Ω)				
			DC (A)	Pulse (A)		V_{DS} (V)	I_D (A)	MIN.	V_{GS} (V)	I_D (A)	TYP.	MAX.	
2SJ165	SST	−50	∓0.1	∓0.2	0.25	−5	−0.02	0.03	−4	−0.02	22	50	Switching
2SJ166	SC-59	−50	∓0.1	∓0.2	0.2	−5	−0.02	0.03	−4	−0.02	22	50	
2SJ178	TO-92	−30	∓1.0	∓2.0	0.75	−10	−0.5	0.4	−4	−0.5	—	1.5	
2SJ179	SC-62	−30	∓1.5	∓3.0	2.0	−10	−0.5	0.4	−4	−0.5	—	1.5	
2SJ180	SP-8	−30	∓1.0	∓2.0	1.0	−10	−0.5	0.4	−4	−0.5	—	1.5	
2SJ184	SST	−50	∓0.1	∓0.2	0.25	−5	−0.02	0.02	−2.5	−0.05	25	40	
2SJ185	SC-59	−50	∓0.1	∓0.2	0.2	−5	−0.02	0.02	−2.5	−0.05	25	40	
2SJ196	TO-92	−60	∓1.0	∓2.0	0.75	−10	−0.5	0.4	−4	−0.5	0.89	1.5	
2SJ197	SC-62	−60	∓1.5	∓3.0	2.0	−10	−0.5	0.4	−4	−0.5	0.89	1.5	
2SJ198	TO-92	−100	∓0.5	∓1.0	0.75	−10	−0.5	0.4	−4	−0.5	1.7	2.0	
2SJ199	SC-62	−100	∓1.0	∓2.0	2.0	−10	−0.5	0.4	−4	−0.5	1.7	2.0	
2SJ202	SC-70	−16	∓0.1	∓0.2	0.15	−3	−0.01	0.02	−2.5	−0.001	—	60	
2SJ203	SC-59	−16	∓0.2	∓0.4	0.2	−3	−0.01	0.02	−2.5	−0.001	16	20	
2SJ204	SC-59	−30	∓0.2	∓0.4	0.2	−3	−0.01	0.02	−2.5	−0.001	8.8	15	
2SJ205	SC-62	−16	∓0.5	∓1.0	2.0	−5	−0.3	0.4	−2.5	−0.3	2.2	5.0	
2SJ206	SC-62	−30	∓0.5	∓1.0	2.0	−5	−0.3	0.4	−2.5	−0.3	2.8	3.0	
2SJ207	SC-62	−16	∓1.0	∓2.0	2.0	−5	−0.5	0.4	−2.5	−0.5	1.5	2.0	
2SJ208	SC-62	−16	∓2.0	∓4.0	2.0	−5	−1.0	0.4	−2.5	−1.0	0.6	1.5	
2SJ209	SC-59	−100	∓0.1	∓0.2	0.2	−5	−0.01	0.02	−4	−0.01	60	100	
2SJ210	SC-59	−60	∓0.2	∓0.4	0.2	−5	−0.01	0.02	−4	−0.01	10	15	
2SJ211	SC-59	−100	∓0.2	∓0.4	0.2	−5	−0.01	0.02	−4	−0.01	18	30	
2SJ212	SC-62	−60	∓0.5	∓1.0	2.0	−10	−0.5	0.4	−4	−0.5	1.8	4.0	
2SJ218	SC-62	−100	∓0.5	∓1.0	2.0	−10	−0.5	0.4	−4	−0.5	2.7	5.0	
2SJ243	3-pin ultra super mini	−30	∓0.1	∓0.2	0.2	−3	−0.01	0.02	−2.5	−0.0005	55	100	
2SJ353	SP-8	−60	∓1.5	∓3.0	1.0	−10	−1	1.0	−4	−0.8	0.58	0.68	
2SJ355	SC-62	30	2	4	2.0	−10	−1	1.0	4.0	1.0	0.50	0.60	
2SJ356	SC-62	60	2	4	2.0	−10	−1	1.0	4.0	1.0	0.65	0.95	
2SJ357	MP-2	30	3	6	2.0	−10	−1	1.8	4.0	1.5	0.23	0.35	
2SJ358	MP-2	60	3	6	2.0	−10	−1	1.8	4.0	1.5	0.29	0.40	
2SJ411	SP-8	−30	∓ 5	∓20	1.0	−10	− 2.5	3.0	−4	−2.5	0.096	0.24	
2SJ460	SST	−50	∓ 0.1	∓0.2	0.25	−3	− 0.01	0.01	−2.5	−0.003	75	100	
2SJ461	SC-59	−50	∓ 0.1	∓0.2	0.2	−3	− 0.01	0.01	−2.5	−0.003	75	100	
2SJ462	MP-2	−12	∓ 2.5	∓5.0	2.0	−3	−1	1.5	−2.5	−0.5	0.23	0.3	
2SJ463A	SC-70	−30	∓ 0.1	∓0.4	0.15	−3	− 0.01	0.02	−2.5	−0.001	23	60	

Field Effect Transistor

Power MOS FET

■ **2SK type (1/4)** ▷

Part number	Package	Absolute maximum rating (T_A = 25 °C)				Electrical characteristics (T_A = 25 °C)							Applications
		V_{DSS} (V)	I_D		P_T T_C = 25 °C (W)	$\|y_{fs}\|$ (S)			$R_{DS(on)}$ (Ω)				
			DC (A)	Pulse (A)		V_{DS} (V)	I_D (A)	MIN.	V_{GS} (V)	I_D (A)	TYP.	MAX.	
2SK1059	MP-3	60	±5	±20	20	10	3.0	4	4	3.0	0.15	0.22	Switching
2SK1060	MP-3	100	±5	±20	20	10	3.0	4	4	3.0	0.22	0.38	
2SK1122	MP-88	100	±40	±160	100	10	20	12	4	20	0.05	0.07	
2SK1123	MP-88	60	±40	±160	100	10	20	12	4	20	0.03	0.05	
2SK1198	MP-45	700	±2	±8	35	10	1.0	1	10	1.0	2.5	3.2	
2SK1271	MP-88	1400	±5	±10	150	20	3.0	1.5	10	3.0	3.5	4.0	
2SK1282	MP-3	60	±3	±12	20	10	2.0	2.4	4	2.0	0.2	0.3	
2SK1283	MP-5	60	±3	±12	20	10	2.0	2.4	4	2.0	0.2	0.3	
2SK1284	MP-3	100	±3	±12	20	10	2.0	2.4	4	2.0	0.32	0.45	
2SK1285	MP-5	100	±3	±12	20	10	2.0	2.4	4	2.0	0.32	0.45	
2SK1286	MP-45F	60	±15	±60	35	10	8.0	7	4	8.0	0.075	0.095	
2SK1287	MP-45F	100	±15	±60	35	10	8.0	7	4	8.0	0.12	0.14	
2SK1288	MP-25	100	±20	±80	60	10	8.0	7	4	8.0	0.12	0.14	
2SK1289	MP-45F	60	±25	±100	35	10	15	12	4	15	0.045	0.06	
2SK1290	MP-25	60	±30	±120	60	10	15	12	4	15	0.045	0.06	
2SK1292	MP-45F	100	±20	±100	35	10	15	12	4	15	0.07	0.085	
2SK1293	MP-25	100	±30	±120	60	10	15	12	4	15	0.07	0.085	
2SK1294	MP-45F	60	±40	±160	35	10	20	12	4	20	0.03	0.05	
2SK1295	MP-45F	100	±30	±160	35	10	20	12	4	20	0.06	0.075	
2SK1491	MP-88	250	±25	±100	120	10	13	7.0	10	13	0.12	0.15	
2SK1492	MP-88	250	±35	±140	140	10	18	10	10	18	0.08	0.1	
2SK1493	MP-25	450	±3.0	±12	50	10	2.0	1.0	10	2.0	2.2	2.8	
2SK1494	MP-25	500	±3.0	±12	50	10	2.0	1.0	10	2.0	2.4	3.0	
2SK1495	MP-25	450	±7.0	±28	50	10	4.0	3.0	10	4.0	0.7	0.9	
2SK1496	MP-25	450	±7.0	±28	50	10	4.0	3.0	10	4.0	0.8	1.0	
2SK1497	MP-88	450	±20	±80	130	10	10	7.5	10	10	0.28	0.35	
2SK1498	MP-88	500	±20	±80	130	10	10	7.5	10	10	0.32	0.40	
2SK1499	MP-88	450	±25	±100	160	10	13	8.0	10	13	0.20	0.25	
2SK1500	MP-88	500	±25	±100	160	10	13	8.0	10	13	0.22	0.27	
2SK1501	MP-25	900	±4.0	±8.0	70	10	2.0	1.0	10	2.0	2.8	4.0	
2SK1502	MP-88	900	±7.0	±14	120	10	4.0	2.0	10	4.0	1.7	2.0	
2SK1594	MP-45F	30	±20	±80	30	10	10	7.0	4	10	0.05	0.08	
2SK1596	MP-45F	30	±40	±160	35	10	20	20	4	20	0.02	0.03	
2SK1748	MP-3	60	±8.0	±32	20	10	4.0	5.0	4	4.0	0.11	0.16	
2SK1749	MP-88	60	±50	±200	150	10	25	20	4	25	0.022	0.025	
2SK1750	MP-25	450	±5.0	±20	50	10	2.5	1.0	10	2.5	1.1	1.4	
2SK1751	MP-25	500	±5.0	±20	50	10	2.5	1.0	10	2.5	1.2	1.5	
2SK1752	MP-88	450	±10	±40	100	10	5.0	3.5	10	5.0	0.7	0.9	

Field Effect Transistor

Power MOS FET

■ **2SK type (2/4)**

Part number	Package	Absolute maximum rating (T_A = 25 °C)				Electrical characteristics (T_A = 25 °C)							Applications
		V_{DSS} (V)	I_D		P_T T_C = 25 °C (W)	$\|y_{fs}\|$ (S)			$R_{DS(on)}$ (Ω)				
			DC (A)	Pulse (A)		V_{DS} (V)	I_D (A)	MIN.	V_{GS} (V)	I_D (A)	TYP.	MAX.	
2SK1753	MP-88	500	±10	±40	100	10	5.0	3.5	10	5.0	0.8	1.0	Switching
2SK1756	MP-88	450	±15	±60	120	10	8.0	5.0	10	8.0	0.4	0.5	
2SK1757	MP-88	500	±15	±60	120	10	8.0	5.0	10	8.0	0.5	0.6	
2SK1758	MP-45F	600	±2.0	±8.0	30	10	1.0	0.5	10	1.0	2.8	4.2	
2SK1760	MP-88	900	±5.0	±10	100	20	3.0	1.0	10	3.0	3.1	4.0	
2SK1784	MP-88	450	±12	±48	100	10	6.0	1.5	10	6.0	0.5	0.6	
2SK1785	MP-88	500	±12	±48	100	10	6.0	1.5	10	6.0	0.6	0.7	
2SK1793	MP-25	900	±3.0	±6.0	75	20	2.0	0.8	10	2.0	6.2	7.5	
2SK1794	MP-88	900	±6.0	±12	100	20	3.0	2.0	10	3.0	1.8	2.8	
2SK1795	MP-88	900	±8.0	±16	140	20	4.0	1.0	10	4.0	1.3	1.6	
2SK1796	MP-88	900	±10	±20	150	20	5.0	1.5	10	5.0	1.0	1.2	
2SK1850	MP-10	60	±10	±40	1.8	10	5.0	7.0	4	5.0	0.08	0.095	
2SK1851	MP-10	60	±15	±60	1.8	10	7.5	12	4	7.5	0.045	0.06	
2SK1852	MP-10	100	±10	±40	1.8	10	5.0	7.0	4	5.0	0.15	0.2	
2SK1853	MP-10	100	±15	±60	1.8 *	10	7.5	12	4	7.5	0.08	0.1	
2SK1953	MP-45F	600	±2.0	±6.0	25 *	20	1.0	0.5	10	1.0	4.2	5.0	
2SK1954	MP-3	180	±4.0	±16	20 *	10	2.0	0.5	10	2.0	0.5	0.65	
2SK1988	MP-45F	450	±2.5	±10	30 *	10	1.5	0.9	10	1.5	2.2	2.8	
2SK1989	MP-45F	500	±2.5	±10	30	10	1.5	0.9	10	1.5	2.4	3.0	
2SK1990	MP-45F	450	±4.5	±18	30	10	2.5	1.5	10	2.5	1.1	1.4	
2SK1991	MP-45F	500	±4.5	±18	30	10	2.5	1.5	10	2.5	1.2	1.5	
2SK1992	MP-45F	450	±6.0	±24	35	10	3.0	2.8	10	3.0	0.7	0.9	
2SK1993	MP-45F	500	±6.0	±24	35	10	3.0	2.8	10	3.0	0.8	1.0	
2SK1994	MP-45F	900	±2.0	±4.0	30	20	1.0	0.6	10	1.0	6.2	7.5	
2SK1995	MP-45F	900	±3.0	±6.0	35	20	2.0	1.0	10	2.0	3.2	4.0	
2SK2040	MP-3	600	±2.0	±6.0	20	20	1.0	0.5	10	1.0	4.2	5.0	
2SK2131	MP-45F	150	±15	±60	35	10	8.0	10	10	8.0	0.1	0.12	
2SK2132	MP-10	180	±4	±16	1.8	10	2.0	0.5	10	2.0	0.52	0.65	
2SK2133	MP-25	250	±16	±64	75	10	8.0	4.0	10	8.0	0.21	0.26	
2SK2134	MP-25	200	±13	±52	70	10	7.0	2	10	7.0	0.32	0.4	
2SK2135	MP-45F	200	±14	±56	35 *	10	7.0	4	10	7.0	0.14	0.18	
2SK2136	MP-25	200	±20	±80	75	10	10	4	10	10	0.14	0.18	
2SK2137	MP-45F	600	±4	±16	30	10	20	1	10	2.0	2.0	2.4	
2SK2138	MP-25	600	±5	±20	70	10	2.5	1	10	2.5	2.0	2.4	
2SK2139	MP-45F	600	±5	±20	35	10	2.5	1.5	10	2.5	1.25	1.5	
2SK2140	MP-25	600	±7	±28	75	10	3.5	1.5	10	3.5	1.25	1.5	
2SK2141	MP-45F	600	±6	±24	40	10	3.0	2.0	10	3.0	0.9	1.1	
2SK2234	MP-45F	500	±8	±32	40	10	4.0	3.0	10	4.0	0.5	0.6	
2SK2275	MP-45F	900	±3.5	±7.0	35	20	2.0	4.0	10	2.0	2.4	2.8	
2SK2341	MP-45F	250	±11	±44	35	10	6.0	3.0	10	6.0	0.21	0.26	

*: T_A = 25°C

Field Effect Transistor

Power MOS FET

■ **2SK type (3/4)**

Part number	Package	Absolute maximum rating (T_A = 25 °C)				Electrical characteristics (T_A = 25 °C)							Applications
		V_{DSS} (V)	I_D		P_T T_C = 25 °C (W)	$\|y_{fs}\|$ (S)			$R_{DS(on)}$ (Ω)				
			DC (A)	Pulse (A)		V_{DS} (V)	I_D (A)	MIN.	V_{GS} (V)	I_D (A)	TYP.	MAX.	
2SK2353	MP-45F	450	±4.5	±18	30	10	2.5	1.0	10	2.5	1.0	1.4	Switching
2SK2354	MP-45F	500	±4.5	±18	30	10	2.5	1.0	10	2.5	1.1	1.5	
2SK2355	MP-25	450	±5.0	±20	50	10	2.5	1.0	10	2.5	1.0	1.4	
2SK2356	MP-25	500	±5.0	±20	50	10	2.5	1.0	10	2.5	1.1	1.5	
2SK2357	MP-45F	450	±6.0	±24	35	10	3.0	3.0	10	3.0	0.7	0.9	
2SK2358	MP-45F	500	±6.0	±24	35	10	3.0	3.0	10	3.0	0.8	1.0	
2SK2359	MP-25	450	±7.0	±28	75	10	4.0	3.0	10	4.0	0.7	0.9	
2SK2360	MP-25	500	±7.0	±28	75	10	4.0	3.0	10	4.0	0.8	1.0	
2SK2361	MP-88	450	±10	±40	100	10	5.0	3.0	10	5.0	0.7	0.9	
2SK2362	MP-88	500	±10	±40	100	10	5.0	3.0	10	5.0	0.8	1.0	
2SK2363	MP-45F	450	±8.0	±32	35	10	5.0	4.0	10	5.0	0.4	0.5	
2SK2364	MP-45F	500	±8.0	±32	35	10	5.0	4.0	10	5.0	0.5	0.6	
2SK2365	MP-25	450	±10	±40	75	10	6.0	3.0	10	6.0	0.4	0.5	
2SK2366	MP-25	500	±10	±40	75	10	6.0	3.0	10	6.0	0.5	0.6	
2SK2367	MP-88	450	±15	±60	120	10	8.0	5.0	10	8.0	0.4	0.5	
2SK2368	MP-88	500	±15	±60	120	10	8.0	5.0	10	8.0	0.5	0.6	
2SK2369	MP-88	450	±20	±80	120	10	10	7.5	10	10	0.3	0.35	
2SK2370	MP-88	500	±20	±80	120	10	10	7.5	10	10	0.32	0.4	
2SK2371	MP-88	450	±25	±100	160	10	13	8.0	10	13	0.2	0.25	
2SK2372	MP-88	500	±25	±100	160	10	13	8.0	10	13	0.22	0.27	
2SK2409	MP-45F	60	±40	±160	35	10	20	20	4	20	0.03	0.05	
2SK2410	MP-45F	60	±30	±120	35	10	15	15	4	15	0.04	0.06	
2SK2411	MP-25	60	±30	±120	75	10	15	15	4	15	0.04	0.06	
2SK2412	MP-45F	60	±20	±80	30	10	10	7	4	10	0.067	0.095	
2SK2413	MP-10	60	±10	±40	1.8 *	10	5	7	4	10	0.07	0.095	
2SK2414	MP-3	60	±10	±40	20	10	5	7	4	10	0.07	0.095	
2SK2415	MP-3	60	±8.0	±32	20	10	4	5	4	4	0.1	0.15	
2SK2461	MP-45F	100	±20	±80	35	10	10	12	4	10	0.07	0.1	
2SK2462	MP-45F	100	±15	±60	30	10	8	7	4	8	0.12	0.17	
2SK2476	MP-45F	800	±3.0	±9.0	40	20	2	1	10	2	3.4	5.0	
2SK2477	MP-88	800	±10	±30	150	20	5	3.5	10	5	0.65	1.0	
2SK2478	MP-45F	900	±2.0	±8.0	30	20	1	0.6	10	1	5.0	7.5	
2SK2479	MP-25	900	±3.0	±8.0	70	20	2	0.8	10	2	5.6	7.5	
2SK2480	MP-45F	900	±3.5	±12	35	20	2	1	10	2	3.2	4.0	
2SK2481	MP-25	900	±4.0	±12	70	20	2	1	10	2	3.2	4.0	
2SK2482	MP-88	900	±5.0	±12	100	20	3	1	10	3	3.2	4.0	
2SK2483	MP-45F	900	±3.5	±10.5	40	20	2	1	10	2	2.2	2.8	
2SK2484	MP-25	900	±5.0	±10	75	20	3	2	10	3	2.2	2.8	
2SK2485	MP-88	900	±6.0	±12	100	20	3	2	10	3	2.2	2.8	

*: T_A = 25°C

Field Effect Transistor

Power MOS FET

■ **2SK type (4/4)** ◁

Part number	Package	Absolute maximum rating (T_A = 25 °C)				Electrical characteristics (T_A = 25 °C)							Applications
		V_{DSS} (V)	I_D		P_T T_C = 25 °C (W)	$\|y_{fs}\|$ (S)			$R_{DS(on)}$ (Ω)				
			DC (A)	Pulse (A)		V_{DS} (V)	I_D (A)	MIN.	V_{GS} (V)	I_D (A)	TYP.	MAX.	
2SK2486	MP-88	900	±7.0	±18	120	20	4	2.5	10	4	1.4	2.0	Switching
2SK2487	MP-88	900	±8.0	±20	140	20	4	3.0	10	4	1.1	1.6	
2SK2488	MP-88	900	±10	±30	150	20	5	6	10	5	1.0	1.2	
2SK2498	MP-45F	60	±50	±200	35	10	25	20	4	25	0.011	0.014	
2SK2499	MP-25	60	±50	±200	75	10	25	20	4	25	0.011	0.014	
2SK2510	MP-45F	60	±40	±160	35	10	20	13	4	20	0.024	0.03	
2SK2511	MP-88	60	±40	±160	80	10	20	10	4	20	0.032	0.04	
2SK2512	MP-45F	60	±45	±180	35	10	23	15	4	23	0.016	0.023	
2SK2513	MP-25	60	±45	±180	75	10	23	15	4	23	0.016	0.023	
2SK2514	MP-88	60	±50	±200	150	10	25	15	4	25	0.016	0.023	
2SK2515	MP-88	60	±50	±200	150	10	25	20	4	25	0.011	0.014	
2SK2723	MP-45F	60	±25	±100	25	10	13	8	4	13	0.045	0.06	
2SK2724	MP-45F	60	±35	±140	30	10	18	10	4	18	0.033	0.04	
2SK2826	MP-25	60	±70	±280	100	10	35	20	4	35	0.007	0.0105	
2SK2941	MP-25	30	±35	±140	60	10	18	8	4	18	0.022	0.033	
2SK2981	MP-3	30	±20	±80	20	10	10	6	4.5	10	0.030	0.040	
2SK2982	MP-3	30	±30	±120	30	10	15	8	4.5	15	0.013	0.0165	
2SK2983	MP-25	30	±30	±120	50	10	15	9	4.5	15	0.018	0.027	
2SK2984	MP-25	30	±40	±160	60	10	20	18	4.5	20	0.0085	0.013	
2SK3055	MP-45F	60	±30	±120	25	10	15	8.0	4	15	0.042	0.06	
2SK3056	MP-25	60	±32	±128	34	10	16	8.0	4	16	0.042	0.06	
2SK3057	MP-45F	60	±45	±180	30	10	23	13	4	23	0.021	0.03	
2SK3058	MP-25	60	±55	±220	58	10	28	13	4	28	0.021	0.03	
2SK3059	MP-45F	60	±50	±200	30	10	25	15	4	25	0.016	0.023	
2SK3060★	MP-25	60	±70	±280	70	10	35	15	4	35	0.016	0.023	
2SK3061	MP-45F	60	±70	±280	35	10	35	20	4	35	0.0098	0.014	
2SK3062	MP-25	60	±70	±280	100	10	35	20	4	35	0.0098	0.014	

★: Under development

Field Effect Transistor

Power MOS FET

■ **2SJ type**

Part number	Package	Absolute maximum rating (T_A = 25 °C)				Electrical characteristics (T_A = 25 °C)							Applications
		V_{DSS} (V)	I_D		P_T T_C = 25 °C (W)	$\|y_{fs}\|$ (S)			$R_{DS(on)}$ (Ω)				
			DC (A)	Pulse (A)		V_{DS} (V)	I_D (A)	MIN.	V_{GS} (V)	I_D (A)	TYP.	MAX.	
2SJ128	MP-3	−100	∓2	∓8	20	−10	−1	1	−4	−0.8	1.1	1.5	Switching
2SJ132	MP-3	−30	∓2	∓8	20	−10	−1	1	−4	−0.8	0.47	0.6	
2SJ133	MP-3	−60	∓2	∓8	20	−10	−1	1	−4	−0.8	0.7	1.3	
2SJ134	MP-25	−100	∓6	∓24	40	−10	−3.5	1	−4	−3.5	0.5	0.9	
2SJ135	MP-45	−100	∓5	∓20	30	−10	−3.5	1	−4	−3.5	0.5	0.9	
2SJ136	MP-25	−60	∓12	∓48	40	−10	−6.5	2	−4	−6.5	0.45	0.5	
2SJ137	MP-45	−60	∓10	∓40	30	−10	−6.5	2	−4	−6.5	0.45	0.5	
2SJ138	MP-25	−100	∓12	∓48	60	−10	−6.5	2	−4	−6.5	0.3	0.45	
2SJ139	MP-45	−100	∓10	∓40	35	−10	−6.5	2	−4	−6.5	0.3	0.45	
2SJ140	MP-25	−60	∓19	∓76	60	−10	−10	5	−4	−8	0.3	0.4	
2SJ141	MP-45	−60	∓13	∓52	35	−10	−10	5	−4	−8	0.3	0.4	
2SJ142	MP-45	−100	∓13	∓52	35	−10	−10	5	−4	−8	0.25	0.3	
2SJ143	MP-45	−60	∓16	∓64	35	−10	−10	5	−4	−10	0.22	0.25	
2SJ302	MP-25	− 60	∓16	∓64	75	−10	−8	6.0	−4	−6	0.13	0.24	
2SJ303	MP-45F	− 60	∓14	∓56	35	−10	−7	5.0	−4	−6	0.13	0.24	
2SJ324	MP-3	−30	∓2.0	∓8.0	20	−10	−1.0	1.0	−4	−0.8	0.40	0.52	
2SJ325	MP-3	−30	∓4.0	∓16	20	−10	−2.0	3.0	−4	−1.6	0.15	0.24	
2SJ326	MP-3	−60	∓2.0	∓8.0	20	−10	1.0	1.0	−4	−0.8	0.5	0.68	
2SJ327	MP-3	−60	∓4.0	∓16	20	−10	2.0	3.0	−4	−1.6	0.22	0.34	
2SJ328	MP-25	−60	∓20	∓80	75	−10	−10	8.0	−4	−8	0.085	0.11	
2SJ329	MP-45F	−60	∓15	∓60	35	−10	−8	8.0	−4	−6	0.085	0.11	
2SJ330	MP-45F	−60	∓20	∓80	35	−10	−10	10	−4	−8	0.065	0.09	
2SJ331	MP-88	−60	∓30	∓120	150	−10	−15	15	−4	−12	0.04	0.055	
2SJ448	MP-45F	−250	∓4	∓16	30	−10	−2	1	−10	−2	1.5	2.0	
2SJ449	MP-45F	−250	∓6	∓24	35	−10	−3	2	−10	−3	0.55	0.8	
2SJ492	MP-25	−60	∓20	∓80	70	−10	−10	5.0	− 4	−10	0.12	0.19	
2SJ493	MP-45F	−60	∓16	∓64	30	−10	−8	5.0	− 4	−8	0.12	0.19	
2SJ494	MP-45F	−60	∓20	∓80	35	−10	−10	8	−4	−10	0.061	0.088	
2SJ495	MP-45F	−60	∓30	∓120	35	−10	−15	12	−4	−15	0.038	0.056	

Field Effect Transistor

Power MOS FET

■ Low Voltage Power MOS FET (N3-L series)

DC drain current $I_{D(DC)}$ (A)	Drain to source voltage V_{DSS} (V)			Package
	30	60	100/[150]	
~ 4.0	△ 2SJ324 (0.25/0.52) △ 2SJ325 (0.11/0.24)	△ 2SK1282 (0.18/0.24) ◇ 2SK1283 (0.18/0.24) △ 2SJ326 (0.37/0.68) △ 2SJ327 (0.17/0.34)	△ 2SK1284 (0.32/0.40) ◇ 2SK1285 (0.32/0.40)	△ : MP-3 ◇ : MP-5 ○ : MP-25 ● : MP-45F ◎ : MP-10 ⧈ : MP-88
~ 8.0		◎ 2SK1748 (0.11/0.16)		
~ 10		◎ 2SK1850 (70 m/95 m)	◎ 2SK1852 (0.15/0.20)	
~ 15		2SK1851 (45 m/60 m) ● 2SK1286 (70 m/95 m) ● 2SJ303 (0.1/0.24) ● 2SJ329 (60 m/0.11)	◎ 2SK1853 (80 m/0.10) ● 2SK1288 (0.15/0.20) [● 2SK2131 (0.12/0.20)]	
~ 20	● 2SK1594 (50 m/80 m)	○ 2SK1287 (70 m/95 m) ○ 2SJ302 (0.1/0.24) ○ 2SJ328 (60 m/0.11) ● 2SJ330 (50 m/90 m)	○ 2SK1289 (0.15/0.20) ● 2SK1292 (80 m/0.10)	
~ 25		● 2SK1290 (45 m/60 m)		
~ 30		⧈ 2SJ331 (30 m/55 m)	○ 2SK1293 (80 m/0.10) ● 2SK1295 (50 m/70 m)	
~ 40	● 2SK1596 (20 m/30 m)	● 2SK1294 (27 m/50 m) ⧈ 2SK1123 (27 m/50 m)	⧈ 2SK1122 (50 m/70 m)	
~ 50		⧈ 2SK1749 (18 m/25 m)		

( ): $R_{DS(on)\ MAX}$ (Ω) (@V_{GS} = 10 V/V_{GS} = 4 V)

Field Effect Transistor

Power MOS FET

■ Low Voltage Power MOS FET (N4-L series/N5-L series)

DC drain current $I_{D(DC)}$ (A)	Drain to source voltage V_{DSS} (V)			Package
	30	60	100	
8.0		△ 2SK2415 (0.1/0.15)		△: MP-3 ◇: MP-5 ○: MP-25 ●: MP-45F ◎: MP-10 ⧈: MP-88
10		◎ 2SK2413 (70 m/95 m) △ 2SK2414 (70 m/95 m)		
15			● 2SK2462 (0.14/0.17)	
20		● 2SK2412 (70 m/95 m) ○ 2SJ492 (0.1/0.19)* ● 2SJ494 (50 m/88 m)*	● 2SK2461 (80 m/0.1)	
25		● 2SK2723 (40 m/60 m)*		
30		● 2SK2410 (40 m/60 m) ○ 2SK2411 (40 m/60 m) ● 2SJ495 (30 m/56m)*		
35	○ 2SK2941 (20 m/33 m)*	● 2SK2724 (27 m/40 m)*		
40		● 2SK2409 (27m/40 m) ● 2SK2510 (20 m/30 m)* ⧈ 2SK2511 (27 m/40 m)*		
45		● 2SK2512 (15 m/23 m)* ○ 2SK2513 (15 m/23 m)*		
50		● 2SK2498 (9 m/14 m)* ○ 2SK2499 (9 m/14 m)* ⧈ 2SK2514 (15 m/23 m)* ⧈ 2SK2515 (9 m/14 m)*		

( ): $R_{DS(on)\ MAX}$ (Ω) (@V_{GS} = 10 V)
* : N5-L series

Field Effect Transistor

Power MOS FET

■ Low Voltage Power MOS FET (N6-L series)

DC drain current $I_{D(DC)}$ (A)	Drain to source voltage V_{DSS} (V)		Package
	30	60	
to 20	△ 2SK2981 (27 m/40 m)*		△ : MP-3 ○ : MP-25 ● : MP-45F
to 30	△ 2SK2982 (12.5 m/16.5 m)* ○ 2SK2983 (20 m/27 m)*	● 2SK3055 (40 m/60 m)	
to 40	○ 2SK2984 (10 m/13 m)*	○ 2SK3056 (40 m/60 m)	
to 50		● 2SK2057 (20 m/30 m) ● 2SK3059 (15 m/23 m)	
to 60		○ 2SK2058 (20 m/30 m)	
to 70		● 2SK3061 (9 m/14 m) ○ 2SK3062 (9 m/14 m) ○ 2SK2826 (6.5 m/10.5 m)	

( ): $R_{DS(on)\ MAX}$ (Ω) (@V_{GS} = 10 V/V_{GS} = 4 V)
* : (@V_{GS} = 10 V/V_{GS} = 4.5 V)

Field Effect Transistor

Power MOS FET

■ High Voltage Power MOS FET (N3-H series)

DC drain current $I_{D(DC)}$ (A)	Drain to source voltage V_{DSS} (V)					Package
	250	450	500	600	900	
2.0				● 2SK1758 (4.2)	● 2SK1994 (7.5)	△ : MP-3 ○ : MP-25 ● : MP-45F ⧈ : MP-88
2.5		● 2SK1988 (2.8)	● 2SK1989 (3.0)			
3.0		○ 2SK1493 (2.8)	○ 2SK1494 (3.0)		○ 2SK1793 (7.5) ● 2SK1995 (4.0)	
3.5					● 2SK2275 (2.8)	
4.0					○ 2SK1501 (4.0)	
4.5		● 2SK1990 (1.4)	● 2SK1991 (1.5)			
5.0		○ 2SK1750 (1.4)	○ 2SK1751 (1.5)		⧈ 2SK1760 (4.0)	
6.0		● 2SK1992 (0.9)	● 2SK1993 (1.0)		⧈ 2SK1794 (2.8)	
7.0		○ 2SK1495 (0.9)	○ 2SK1496 (1.0)		⧈ 2SK1502 (2.0)	
8.0			● 2SK2234 (0.6)		⧈ 2SK1795 (1.6)	
10		⧈ 2SK1752 (0.9)	⧈ 2SK1753 (1.0)		⧈ 2SK1796 (1.2)	
12		⧈ 2SK1784 (0.6)	⧈ 2SK1785 (0.7)			
15		⧈ 2SK1756 (0.5)	⧈ 2SK1757 (0.6)			
20		⧈ 2SK1497 (0.35)	⧈ 2SK1498 (0.4)			
25	⧈ 2SK1491 (0.15)	⧈ 2SK1499 (0.25)	⧈ 2SK1500 (0.27)			
35	⧈ 2SK1492 (0.10)					

( ): $R_{DS(on)\ MAX}$ (Ω) (@V_{GS} = 10 V)

Field Effect Transistor

Power MOS FET

■ High Voltage Power MOS FET (N4-H series/P4-H series)

DC drain current $I_{D(DC)}$ (A)	Drain to source voltage V_{DSS} (V)						Package
	[180]/200	250	450	500	600	[800]/900	
2.0					● 2SK1953 (5.0) △ 2SK2040 (5.0)	● 2SK2478 (7.5)	△ : MP-3 ○ : MP-25 ◎ : MP-10 ● : MP-45F ⊡ : MP-88
3.0						[● 2SK2476 (5.0)] ○ 2SK2479 (7.5) ● 2SK2480 (4.0)	
4.0	[△ 2SK1954 (0.65) ◎ 2SK2132 (0.65)]	● 2SJ448 (2.0)			● 2SK2137 (2.4)	○ 2SK2481 (4.0) ● 2SK2483 (2.8) (3.5 A)	
4.5			● 2SK2353 (1.4)	● 2SK2354 (1.5)			
5.0			○ 2SK2355 (1.4)	○ 2SK2356 (1.5)	○ 2SK2138 (2.4) ● 2SK2139 (1.5)	⊡ 2SK2482 (4.0) ○ 2SK2484 (2.8)	
6.0		● 2SJ449 (0.8)	● 2SK2357 (0.9)	● 2SK2358 (1.0)	● 2SK2141 (1.1)	⊡ 2SK2485 (2.8)	
7.0			○ 2SK2359 (0.9)	○ 2SK2360 (1.0)	○ 2SK2140 (1.5)	⊡ 2SK2486 (2.0)	
8.0			● 2SK2363 (0.5)	● 2SK2364 (0.6)		⊡ 2SK2487 (1.6)	
10			⊡ 2SK2361 (0.9) ○ 2SK2365 (0.5)	⊡ 2SK2362 (1.0) ○ 2SK2366 (0.6)		[⊡ 2SK2477 (1.0)] ⊡ 2SK2488 (1.2)	
11		● 2SK2341 (0.26)					
13	○ 2SK2134 (0.4)						
14	● 2SK2135 (0.18)						
15			⊡ 2SK2367 (0.5)	⊡ 2SK2368 (0.6)			
16		○ 2SK2133 (0.26)					
20	○ 2SK2136 (0.18)		⊡ 2SK2369 (0.35)	⊡ 2SK2370 (0.4)			
25			⊡ 2SK2371 (0.25)	⊡ 2SK2372 (0.27)			

( ): $R_{DS(on)\ MAX}$ (Ω) (@V_{GS} = 10 V)

Field Effect Transistor

Power MOS FET

■ 8-pin SOP Type Power MOS FET

On-Resistance R_{DS} (on) (mΩ) (TYP.) @V_{GS} = 10 V	Drain to source voltage V_{DSS} (V)	
	20	30
~90		μPA1750 (P-ch Dual)
~70		μPA1710 (P-ch Single) μPA1710A (P-ch Single) μPA1754 (N-ch Dual)
~50		μPA1713 (P-ch Single)
~40	μPA1752 (N-ch Dual)*	μPA1711 (P-ch Single)
~30	μPA1753 (N-ch Dual)* μPA1756 (N-ch Dual)*	μPA1751 (N-ch Dual) μPA1714 (P-ch Single) μPA1755 (N-ch Dual) μPA1758 (N-ch Dual)*
~20	μPA1701 (N-ch Single)* μPA1701A (N-ch Single) μPA1757 (N-ch Dual)*	μPA1700 (N-ch Single) μPA1700A (N-ch Single) μPA1712 (P-ch Single) μPA1705 (N-ch Single)*
~10		μPA1702 (N-ch Single) μPA1703 (N-ch Single) μPA1704 (N-ch Single) μPA1706 (N-ch Single) μPA1707 (N-ch Single) μPA1715 (P-ch Single)

*: 2.5 V drive is possible. Otherwise 4 V drive is possible.

Field Effect Transistor

Power MOS FET

■ Power SOP8 series

Part number	Configuration	Absolute maximum rating (T_A = 25 °C)				Electrical characteristics (T_A = 25 °C)				Applications
		V_{DSS} (V)	I_D		P_T T_C = 25 °C (W)	$R_{DS(on)}$ (Ω)				
			DC (A)	Pulse (A)		V_{GS} (V)	I_D (A)	TYP.	MAX.	
μPA1700	N-ch Single	30	±7	±28	2.0*1	4	3.5	0.040	0.050	Switching
μPA1700A	N-ch Single	30	±7	±28	2.0*1	4	3.5	0.028	0.05	
μPA1701	N-ch Single	20	±7	±28	2.0*1	2.5	3.5	0.03	0.04	
μPA1701A	N-ch Single	20	±7	±28	2.0*1	2.5	3.5	0.026	0.04	
μPA1702	N-ch Single	30	±8	±32	2.0*1	4	4	0.018	0.025	
μPA1703	N-ch Single	30	±10	±40	2.0*1	4	5.0	0.012	0.017	
μPA1704	N-ch Single	30	±10	±40	2.0*1	2.5	5.0	0.0125	0.016	
μPA1705	N-ch Single	30	±7	±28	2.0*1	4.5	3.5	0.031	0.04	
μPA1706	N-ch Single	30	±13	±52	2.0*1	4	7.0	0.008	0.012	
μPA1707	N-ch Single	30	±10	±40	2.0*1	4	5.0	0.014	0.021	
μPA1710	P-ch Single	−30	∓5	∓20	2.0*1	−4	−2.5	0.11	0.16	
μPA1710A	P-ch Single	−30	∓5	∓20	2.0*1	−4	−2.0	0.091	0.16	
μPA1711	P-ch Single	−30	∓7	∓28	2.0*1	−4	−3.5	0.049	0.07	
μPA1712	P-ch Single	−30	∓8	∓32	2.0*1	−4	−4.0	0.027	0.048	
μPA1713★	P-ch Single	30	∓5	∓20	2.0*1	−4	2.5	0.10	0.16	
μPA1714★	P-ch Single	−30	∓7	∓28	2.0*1	−4	3.5	0.049	0.07	
μPA1715★	P-ch Single	−30	∓11	∓44	2.0*1	–4.5	–6.0	0.012	0.017	
μPA1750	P-ch Dual	−30	∓3.5	∓14	2.0*2	−4	−1.8	0.125	0.18	
μPA1751	N-ch Dual	30	±5	±20	2.0*2	4	2.5	0.044	0.064	
μPA1752	N-ch Dual	20	±5	±20	2.0*2	2.5	2.5	0.042	0.061	
μPA1753	N-ch Dual	20	±6	±24	2.0*2	2.5	3.0	0.028	0.04	
μPA1754	N-ch Dual	30	±7	±28	2.0*2	4	3.5	0.029	0.053	
μPA1755★	N-ch Dual	−30	±7	±28	2.0*2	4.5	3.5	0.028	0.045	
μPA1756	N-ch Dual	30	±6	±24	2.0*2	2.5	3.0	0.028	0.04	
μPA1757	N-ch Dual	20	±7	±28	2.0*2	2.5	3.5	0.022	0.032	
μPA1758	N-ch Dual	30	±6	±24	2.0*2	2.5	3.0	0.026	0.04	

∗1: T_A = 25°C, Mounted on ceramic substrate of 1200 mm² × 0.7 mm

∗2: T_A = 25°C, 2 circuits, Mounted on ceramic substrate of 2000 mm² × 1.1 mm

★: Under development

Field Effect Transistor

Power MOS FET

■ 8-pin TSSOP Type Power MOS FET

On-Resistance $R_{DS}(on)$ (mΩ) (MAX.) @V_{GS} = 4.5 V	Drain to source voltage V_{DSS} (V)		
	12	20	30
~210		μPA1851 (P-ch Dual)	
~190			μPA1853 (P-ch Dual)
~115	μPA1850 (P-ch Dual)		
~75		μPA1811 (P-ch Single)	μPA1812 (P-ch Single)
~60	μPA1854 (P-ch Dual) μPA1810 (P-ch Single)		
~40		μPA1852 (N-ch Dual)	μPA1800 (N-ch Single)
~30			μPA1814 (P-ch Single)★
~25	μPA1813 (P-ch Single)	μPA1801 (N-ch Single) μPA1855 (N-ch Dual)★ μPA1802 (N-ch Single) μPA1815 (P-ch Single)★	μPA1803 (N-ch Single)★

★: Under development

Field Effect Transistor

Power MOS FET

■ 8-pin TSSOP Type Power MOS FET

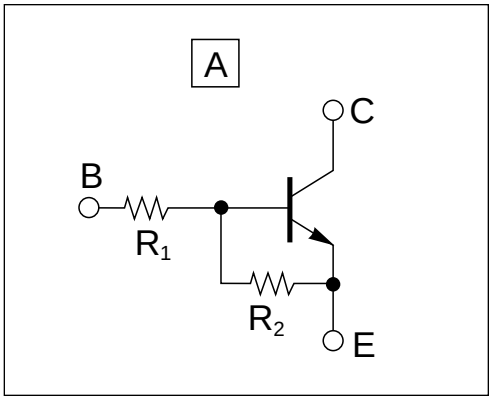
Part number	Configuration	Absolute maximum rating (T_A = 25 °C)				Electrical characteristics (T_A = 25 °C)				Applications
		V_{DSS} (V)	V_{GSS} (V)	$I_{D(DC)}$ (A)	P_T* (W)	$R_{DS(on)}$ (mΩ) MAX.				
						V_{GS} = 2.5 V	V_{GS} = 4 V	V_{GS} = 4.5 V	V_{GS} = 10 V	
μPA1800	N-ch Single	30	±20	±5	2	–	45	39	27	Switching
μPA1801	N-ch Single	20	±8	±6	2	34	25	24	–	
μPA1802	N-ch Single	20	±12	±7	2	32	25	23	–	
μPA1803★	N-ch Single	30	±20	±7	2	–	–	21	14	
μPA1810	P-ch Single	−12	−10/+5	±4	2	100	60	55	–	
μPA1811	P-ch Single	−20	−12/+5	±4	2	120	80	75	–	
μPA1812	P-ch Single	−30	−20/+5	±5	2	–	90	70	40	
μPA1813	P-ch Single	−12	−10/+5	±5	2	40	30	25	–	
μPA1814★	P-ch Single	−30	−20/+5	±7	2	–	–	30	19	
μPA1815★	P-ch Single	−20	−12/+3	±7	2	30	23	22	–	
μPA1850	P-ch Dual	−12	−10/+5	±2.5	2	200	130	115	–	
μPA1851	P-ch Dual	−20	−20/+5	±2.5	2	–	250	210	105	
μPA1852	N-ch Dual	20	±12	±5	2	60	45	40	–	
μPA1853	P-ch Dual	−30	−20/+5	±2.5	2	–	220	190	85	
μPA1854	P-ch Dual	−12	−10/+5	±2.5	2	105	70	60	–	
μPA1855★	N-ch Dual	20	±12	±6	2	29	24	23	–	

★: Under development

∗: Mounted on ceramic substrate of 50 $cm^2 \times 1.1$ mm

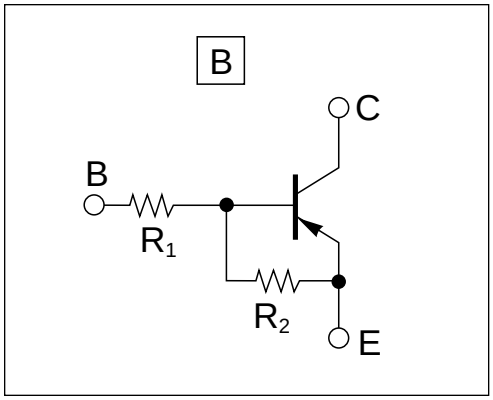
Transistor with Internal Resistor

■ **Equivalent circuit**



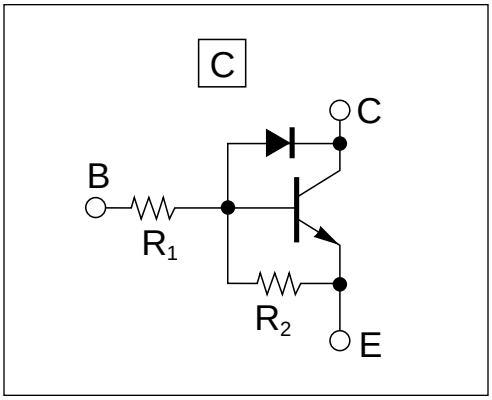
Transistor with Internal Resistor

■ **Equivalent circuit**



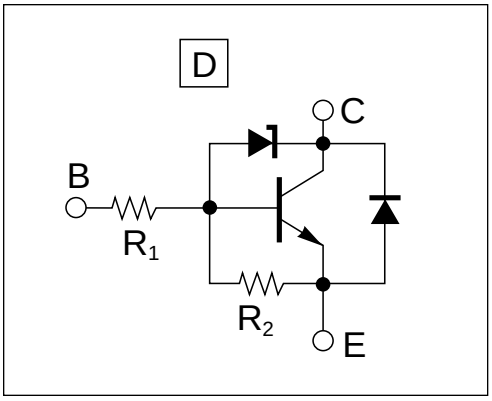
Transistor with Internal Resistor

■ **Equivalent circuit**



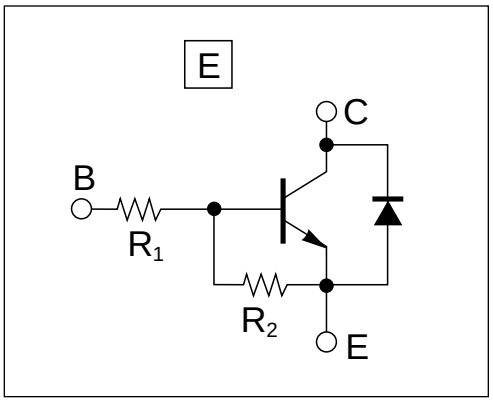
Transistor with Internal Resistor

■ **Equivalent circuit**



Transistor with Internal Resistor

■ **Equivalent circuit**



Transistor with Internal Resistor

■ AA1[ ], AN1[ ], BA1[ ], BN1[ ] series (TO-92, SST)

Part number		Equivalent circuit and applications	Absolute maximum ratings (T_A = 25 °C)						Electrical characteristics (T_A = 25 °C)					
TO-92	SST		V_{CBO} (V)	V_{CEO} (V)	V_{EBO} (V)	I_C (mA)	P_T (mW)	T_j (°C)	R_1 (kΩ)	R_2 (kΩ)	h_{FE}	V_{CE} (V)	I_C (mA)	Remarks
AA1A4M	**BA1A4M**	Refer to equivalent circuit A Switching	60	50	10	100	250	150	10	10	35 to 100	5.0	5.0	
AA1A4P	**BA1A4P**		60	50	5	100	250	150	10	47	35 to 340	5.0	5.0	
AA1F4M	**BA1F4M**		60	50	10	100	250	150	22	22	60 to 195	5.0	5.0	
AA1F4N	**BA1F4N**		60	50	5	100	250	150	22	47	85 to 340	5.0	5.0	
AA1L4M	**BA1L4M**		60	50	10	100	250	150	47	47	85 to 340	5.0	5.0	
AA1L4L	**BA1L4L**		60	50	15	100	250	150	47	22	60 to 195	5.0	5.0	
AA1L3Z	**BA1L3Z**		60	50	5	100	250	150	4.7	–	135 to 600	5.0	5.0	
AA1A4Z	**BA1A4Z**		60	50	5	100	250	150	10	–	135 to 600	5.0	5.0	
AA1F4Z	**BA1F4Z**		60	50	5	100	250	150	22	–	135 to 600	5.0	5.0	
AA1L4Z	**BA1L4Z**		60	50	5	100	250	150	47	–	135 to 600	5.0	5.0	
AA1L3M	**BA1L3M**		60	50	10	100	250	150	4.7	4.7	20 to 80	5.0	5.0	
AA1L3N	**BA1L3N**		60	50	5	100	250	150	4.7	10	35 to 100	5.0	5.0	
AA1A3Q	**BA1A3Q**		60	50	5	100	250	150	1.0	10	35 to 100	5.0	5.0	
AN1A4M	**BN1A4M**	Refer to equivalent circuit B	–60	–50	–10	–100	250	150	10	10	35 to 100	–5.0	–5.0	
AN1A4P	**BN1A4P**		–60	–50	–5	–100	250	150	10	47	85 to 340	–5.0	–5.0	
AN1F4M	**BN1F4M**		–60	–50	–10	–100	250	150	22	22	60 to 195	–5.0	–5.0	
AN1F4N	**BN1F4N**		–60	–50	–5	–100	250	150	22	47	85 to 340	–5.0	–5.0	
AN1L4M	**BN1L4M**		–60	–50	–10	–100	250	150	47	47	85 to 340	–5.0	–5.0	
AN1L4L	**BN1L4L**		–60	–50	–15	–100	250	150	47	22	60 to 195	–5.0	–5.0	
AN1L3Z	**BN1L3Z**		–60	–50	–5	–100	250	150	4.7	–	135 to 600	–5.0	–5.0	
AN1A4Z	**BN1A4Z**		–60	–50	–5	–100	250	150	10	–	135 to 600	–5.0	–5.0	
AN1F4Z	**BN1F4Z**		–60	–50	–5	–100	250	150	22	–	135 to 600	–5.0	–5.0	
AN1L4Z	**BN1L4Z**		–60	–50	–5	–100	250	150	47	–	135 to 600	–5.0	–5.0	
AN1L3M	**BN1L3M**		–60	–50	–10	–100	250	150	4.7	4.7	20 to 80	–5.0	–5.0	
AN1L3N	**BN1L3N**		–60	–50	–5	–100	250	150	4.7	10	35 to 100	–5.0	–5.0	
AN1A3Q	**BN1A3Q**		–60	–50	–5	–100	250	150	1.0	10	35 to 100	–5.0	–5.0	

Transistor with Internal Resistor

■ AB1[ ], AP1[ ], BB1[ ], BP1[ ] series (TO-92, SST)

Part number		Equivalent circuit and applications	Absolute maximum ratings (T_A = 25 °C)							Electrical characteristics (T_A = 25 °C)					
			V_{CBO}	V_{CEO}	V_{EBO}	I_C	P_T (mW)		T_j	R_1	R_2	h_{FE}	V_{CE}	I_C	Re-
TO-92	SST		(V)	(V)	(V)	(A)	TO-92	SST	(°C)	(kΩ)	(kΩ)		(V)	(A)	marks
AB1A4A	**BB1A4A**	Refer to equivalent circuit A Switching	30	25	10	0.7	750	250	150	–	10	300 ~	2.0	0.5	
AB1L2Q	**BB1L2Q**		30	25	10	0.7	750	250	150	0.47	4.7	300 ~	2.0	0.5	
AB1A3M	**BB1A3M**		30	25	10	0.7	750	250	150	1.0	1.0	100 ~	2.0	0.5	
AB1F3P	**BB1F3P**		30	25	10	0.7	750	250	150	2.2	10	300 ~	2.0	0.5	
AB1J3P	**BB1J3P**		30	25	10	0.7	750	250	150	3.3	10	300 ~	2.0	0.5	
AB1L3N	**BB1L3N**		30	25	10	0.7	750	250	150	4.7	10	300 ~	2.0	0.5	
AB1A4M	**BB1A4M**		30	25	10	0.7	750	250	150	10	10	300 ~	2.0	0.5	
AP1A4A	**BP1A4A**	Refer to equivalent circuit B Switching	–25	–25	–10	–0.7	750	250	150	–	10	100 ~	–2.0	–0.5	
AP1L2Q	**BP1L2Q**		–25	–25	–10	–0.7	750	250	150	0.47	4.7	100 ~	–2.0	–0.5	
AP1A3M	**BP1A3M**		–25	–25	–10	–0.7	750	250	150	1.0	1.0	100 ~	–2.0	–0.5	
AP1F3P	**BP1F3P**		–25	–25	–10	–0.7	750	250	150	2.2	10	100 ~	–2.0	–0.5	
AP1J3P	**BP1J3P**		–25	–25	–10	–0.7	750	250	150	3.3	10	100 ~	–2.0	–0.5	
AP1L3N	**BP1L3N**		–25	–25	–10	–0.7	750	250	150	4.7	10	100 ~	–2.0	–0.5	
AP1A4M	**BP1A4M**		–25	–25	–10	–0.7	750	250	150	10	10	100 ~	–2.0	–0.5	

Transistor with Internal Resistor

■ AQ1[ ] series (TO-92)

Part number	Equivalent circuit and applications	Absolute maximum ratings (T_A = 25 °C)						Electrical characteristics (T_A = 25 °C)					
TO-92		V_{CBO} (V)	V_{CEO} (V)	V_{EBO} (V)	I_C (A)	P_T (mW)	T_j (°C)	R_1 (kΩ)	R_2 (kΩ)	h_{FE}	V_{CE} (V)	I_C (A)	Remarks
AQ1A4A	Refer to equivalent circuit B Switching	–20	–20	–10	–2.0	750	150	–	10	150 ~	–2.0	–1.0	
AQ1F2Q		–20	–20	–10	–2.0	750	150	0.22	2.2	150 ~	–2.0	–1.0	
AQ1L2N		–20	–20	–10	–2.0	750	150	0.47	1.0	150 ~	–2.0	–1.0	
AQ1L2Q		–20	–20	–20	–10	750	150	0.47	4.7	150 ~	–2.0	–1.0	
AQ1A3M		–20	–20	–10	–2.0	750	150	1.0	1.0	150 ~	–2.0	–1.0	
AQ1F3M		–20	–20	–10	–2.0	750	150	2.2	2.2	150 ~	–2.0	–1.0	
AQ1F3P		–20	–20	–10	–2.0	750	150	4.7	10	150 ~	–2.0	–1.0	

Transistor with Internal Resistor

■ AD1[ ], AD2[ ], AR1[ ] series (TO-92)

Part number	Equivalent circuit and applications	Absolute maximum ratings (T_A = 25 °C)						Electrical characteristics (T_A = 25 °C)					
TO-92		V_{CBO} (V)	V_{CEO} (V)	V_{EBO} (V)	I_C (A)	P_T (mW)	T_j (°C)	R_1 (kΩ)	R_2 (kΩ)	h_{FE}	V_{CE} (V)	I_C (A)	Remarks
AD1A3M	Refer to equivalent circuit A Switching	80	60	10	1.0	750	150	1.0	1.0	200 ~	2.0	0.5	
AD1F3P		80	60	10	1.0	750	150	2.2	10	300 ~	2.0	0.5	
AD1L3N		80	60	10	1.0	750	150	4.7	10	300 ~	2.0	0.5	
AD1A4M		80	60	10	1.0	750	150	10	10	300 ~	2.0	0.5	
AD1L2Q		80	60	10	1.0	750	150	0.47	4.7	300 ~	2.0	0.5	
AD1F2Q		80	60	10	1.0	750	150	0.22	2.2	300 ~	2.0	0.5	
AD1A4A		80	60	10	1.0	750	150	–	10	300 ~	2.0	0.5	
AD2A3M	Refer to equivalent circuit C Switching	60 ±10	60 ±10	10	1.0	750	150	1.0	1.0	200 ~	2.0	0.5	
AD2F3P		60 ±10	60 ±10	10	1.0	750	150	2.2	10	300 ~	2.0	0.5	
AD2L3N		60 ±10	60 ±10	10	1.0	750	150	4.7	10	300 ~	2.0	0.5	
AD2A4M		60 ±10	60 ±10	10	1.0	750	150	10	10	300 ~	2.0	0.5	
AD2L2Q		60 ±10	60 ±10	10	1.0	750	150	0.47	4.7	300 ~	2.0	0.5	
AD2F2Q		60 ±10	60 ±10	10	1.0	750	150	0.22	2.2	300 ~	2.0	0.5	
AD2A4A		60 ±10	60 ±10	10	1.0	750	150	–	10	300 ~	2.0	0.5	
AR1A3M	Refer to equivalent circuit B Switching	–60	–60	–10	–1.0	750	150	1.0	1.0	100 ~	–2.0	–0.5	
AR1F3P		–60	–60	–10	–1.0	750	150	2.2	10	100 ~	–2.0	–0.5	
AR1L3N		–60	–60	–10	–1.0	750	150	4.7	10	100 ~	–2.0	–0.5	
AR1A4M		–60	–60	–10	–1.0	750	150	10	10	100 ~	–2.0	–0.5	
AR1L2Q		–60	–60	–10	–1.0	750	150	0.47	4.7	100 ~	–2.0	–0.5	
AR1F2Q		–60	–60	–10	–1.0	750	150	0.22	2.2	100 ~	–2.0	–0.5	
AR1A4A		–60	–60	–10	–1.0	750	150	–	10	100 ~	–2.0	–0.5	

Transistor with Internal Resistor

■ CE1[ ], CE2[ ] series (SP-8)

Part number	Equivalent circuit and applications	Absolute maximum ratings (T_A = 25 °C)						Electrical characteristics (T_A = 25 °C)				
SP-8		V_{CBO} (V)	V_{CEO} (V)	V_{EBO} (V)	I_C (A)	P_T (W)	T_j (°C)	R_1 (kΩ)	R_2 (kΩ)	h_{FE}	V_{CE} (V)	I_C (A)
CE1A3Q	Refer to D	60 ±10	60 ±10	15	±2.0	1.0	150	1.0	10	1000 to 3000	5.0	1.0
CE1F3P		60 ±10	60 ±10	15	±2.0	1.0	150	2.2	10	1000 to 3000	5.0	1.0
CE1N2R		60 ±10	60 ±10	15	±2.0	1.0	150	0.68	10	1000 to 3000	5.0	1.0
CE2A3Q	Refer to E	60	60	15	±2.0	1.0	150	1.0	10	1000 to 3000	5.0	1.0
CE2F3P		60	60	15	±2.0	1.0	150	1.0	10	1000 to 3000	5.0	1.0

Transistor with Internal Resistor

■ FA1[ ], FN1[ ], GA1[ ], GN1[ ] series (SC-59, SC-70)

Part number		Equivalent circuit and applications	Absolute maximum ratings (T_A = 25 °C)						Electrical characteristics (T_A = 25 °C)					
			V_{CBO}	V_{CEO}	V_{EBO}	I_C	P_T	T_j	R_1	R_2	h_{FE}	V_{CE}	I_C	Remarks
SC-59	SC-70		(V)	(V)	(V)	(mA)	(mW)	(°C)	(kΩ)	(kΩ)		(V)	(mA)	
FA1A4M	**GA1A4M**	Refer to equivalent circuit A Switching	60	50	10	100	200 (SC-59) 150 (SC-70)	150	10	10	35 to 100	5.0	5.0	
FA1A4P	**GA1A4P**		60	50	5	100		150	10	47	35 to 340	5.0	5.0	
FA1F4M	**GA1F4M**		60	50	10	100		150	22	22	60 to 195	5.0	5.0	
FA1F4N	**GA1F4N**		60	50	5	100		150	22	47	85 to 340	5.0	5.0	
FA1L4M	**GA1L4M**		60	50	10	100		150	47	47	85 to 340	5.0	5.0	
FA1L4L	**GA1L4L**		60	50	15	100		150	47	22	60 to 195	5.0	5.0	
FA1L3Z	**GA1L3Z**		60	50	5	100		150	4.7	–	135 to 600	5.0	5.0	
FA1A4Z	**GA1A4Z**		60	50	5	100		150	10	–	135 to 600	5.0	5.0	
FA1F4Z	**GA1F4Z**		60	50	5	100		150	22	–	135 to 600	5.0	5.0	
FA1L4Z	**GA1L4Z**		60	50	5	100		150	47	–	135 to 600	5.0	5.0	
FA1L3M	**GA1L3M**		60	50	10	100		150	4.7	4.7	20 to 80	5.0	5.0	
FA1L3N	**GA1L3N**		60	50	5	100		150	4.7	10	35 to 100	5.0	5.0	
FA1A3Q	**GA1A3Q**		60	50	5	100		150	1.0	10	35 to 100	5.0	5.0	
FN1A4M	**GN1A4M**	Refer to equivalent circuit B Switching	–60	–50	–10	–100	200 (SC-59) 150 (SC-70)	150	10	10	35 to 100	–5.0	–5.0	
FN1A4P	**GN1A4P**		–60	–50	–5	–100		150	10	47	85 to 340	–5.0	–5.0	
FN1F4M	**GN1F4M**		–60	–50	–10	–100		150	22	22	60 to 195	–5.0	–5.0	
FN1F4N	**GN1F4N**		–60	–50	–5	–100		150	22	47	85 to 340	–5.0	–5.0	
FN1L4M	**GN1L4M**		–60	–50	–10	–100		150	47	47	85 to 340	–5.0	–5.0	
FN1L4L	**GN1L4L**		–60	–50	–15	–100		150	47	22	60 to 195	–5.0	–5.0	
FN1L3Z	**GN1L3Z**		–60	–50	–5	–100		150	4.7	–	135 to 600	–5.0	–5.0	
FN1A4Z	**GN1A4Z**		–60	–50	–5	–100		150	10	–	135 to 600	–5.0	–5.0	
FN1F4Z	**GN1F4Z**		–60	–50	–5	–100		150	22	–	135 to 600	–5.0	–5.0	
FN1L4Z	**GN1L4Z**		–60	–50	–5	–100		150	47	–	135 to 600	–5.0	–5.0	
FN1L3M	**GN1L3M**		–60	–50	–10	–100		150	4.7	4.7	20 to 80	–5.0	–5.0	
FN1L3N	**GN1L3N**		–60	–50	–5	–100		150	4.7	10	35 to 100	–5.0	–5.0	
FN1A3Q	**GN1A3Q**		–60	–50	–5	–100		150	1.0	10	35 to 100	–5.0	–5.0	

Transistor with Internal Resistor

■ FB1[ ] series (SC-59)

Part number	Equivalent circuit and applications	Absolute maximum ratings (T_A = 25 °C)						Electrical characteristics (T_A = 25 °C)					
		V_{CBO} (V)	V_{CEO} (V)	V_{EBO} (V)	I_C (A)	P_T (mW)	T_j (°C)	R_1 (kΩ)	R_2 (kΩ)	h_{FE}	V_{CE} (V)	I_C (A)	Remarks
FB1A4A	Refer to equivalent circuit [A] Switching	30	25	10	0.7	200	150	–	10	300	2.0	0.5	
FB1L2Q		30	25	10	0.7		150	0.47	4.7	300	2.0	0.5	
FB1A3M		30	25	10	0.7		150	1.0	1.0	100	2.0	0.5	
FB1F3P		30	25	10	0.7		150	2.2	10	300	2.0	0.5	
FB1J3P		30	25	10	0.7		150	3.3	10	300	2.0	0.5	
FB1L3N		30	25	10	0.7		150	4.7	10	300	2.0	0.5	
FB1A4M		30	25	10	0.7		150	10	10	300	2.0	0.5	
FP1A4A	Refer to equivalent circuit [B] Switching	–25	–25	–10	–0.7	200	150		10	100	–2.0	–0.5	
FP1L2Q		–25	–25	–10	–0.7		150	0.47	4.7	100	–2.0	–0.5	
FP1A3M		–25	–25	–10	–0.7		150	1.0	1.0	100	–2.0	–0.5	
FP1F3P		–25	–25	–10	–0.7		150	2.2	10	100	–2.0	–0.5	
FP1J3P		–25	–25	–10	–0.7		150	3.3	10	100	–2.0	–0.5	
FP1L3N		–25	–25	–10	–0.7		150	4.7	10	100	–2.0	–0.5	
FP1A4M		–25	–25	–10	–0.7		150	10	10	100	–2.0	–0.5	

Transistor with Internal Resistor

■ HD1[ ], HD2[ ], HR1[ ] series (SOT-89)

Part number	Equivalent circuit and applications	Absolute maximum ratings (T_A = 25 °C)						Electrical characteristics (T_A = 25 °C)					
		V_{CBO} (V)	V_{CEO} (V)	V_{EBO} (V)	I_C (A)	P_T (mW)	T_j (°C)	R_1 (kΩ)	R_2 (kΩ)	h_{FE}	V_{CE} (V)	I_C (A)	Remarks
HD1A3M	Refer to equivalent circuit A Switching	80	60	10	1.0	2.0	150	1.0	1.0	200	2.0	0.5	
HD1F3P		80	60	10	1.0		150	2.2	10	300	2.0	0.5	
HD1L3N		80	60	10	1.0		150	4.7	10	300	2.0	0.5	
HD1A4M		80	60	10	1.0		150	10	10	300	2.0	0.5	
HD1L2Q		80	60	10	1.0		150	0.47	4.7	300	2.0	0.5	
HD1F2Q		80	60	10	1.0		150	0.22	2.2	300	2.0	5.0	
HD1A4A		80	60	10	1.0		150	–	10	300	2.0	0.5	
HD2A3M	Refer to equivalent circuit C Switching	60±10	60±10	10	1.0	2.0	150	1.0	1.0	200	2.0	0.5	
HD2F3P		60±10	60±10	10	1.0		150	2.2	10	300	2.0	0.5	
HD2L3N		60±10	60±10	10	1.0		150	4.7	10	300	2.0	0.5	
HD2A4M		60±10	60±10	10	1.0		150	10	10	300	2.0	0.5	
HD2L2Q		60±10	60±10	10	1.0		150	0.47	4.7	300	2.0	0.5	
HD2F2Q		60±10	60±10	10	1.0		150	0.2	2.2	300	2.0	0.5	
HD2A4A		60±10	60±10	10	1.0		150	–	10	300	2.0	0.5	
HR1A3M	Refer to equivalent circuit B Switching	–60	–60	–10	–1.0	2.0	150	1.0	1.0	100	–2.0	–0.5	
HR1F3P		–60	–60	–10	–1.0		150	2.2	10	100	–2.0	–0.5	
HR1L3N		–60	–60	–10	–1.0		150	4.7	10	100	–2.0	–0.5	
HR1A4M		–60	–60	–10	–1.0		150	10	10	100	–2.0	–0.5	
HR1L2Q		–60	–60	–10	–1.0		150	0.47	4.7	100	–2.0	–0.5	
HR1F2Q		–60	–60	–10	–1.0		150	0.22	2.2	100	–2.0	–0.5	
HR1A4A		–60	–60	–10	–1.0		150	–	10	100	–2.0	–0.5	

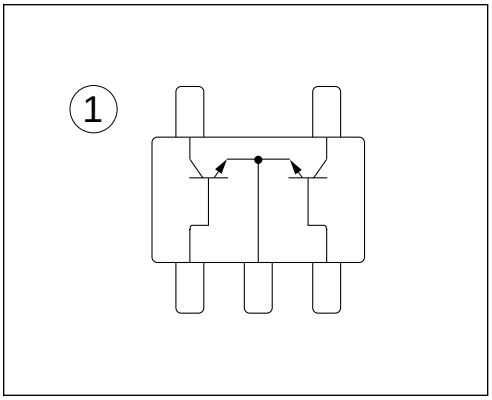
Transistor with Internal Resistor

■ HQ1[ ] series (SOT-89)

Part number	Equivalent circuit and applications	Absolute maximum ratings (T_A = 25 °C)						Electrical characteristics (T_A = 25 °C)					
		V_{CBO} (V)	V_{CEO} (V)	V_{EBO} (V)	I_C (A)	P_T (mW)	T_j (°C)	R_1 (kΩ)	R_2 (kΩ)	h_{FE}	V_{CE} (V)	I_C (A)	Remarks
HQ1A4A	Refer to equivalent circuit B Switching	–20	–20	–10	–2.0	2.0	150	–	10	150	–2.0	–1.0	
HQ1F2Q		–20	–20	–10	–2.0		150	0.22	2.2	150	–2.0	–1.0	
HQ1L2N		–20	–20	–10	–2.0		150	0.47	1.0	150	–2.0	–1.0	
HQ1L2Q		–20	–20	–20	–10		150	0.47	4.7	150	–2.0	–1.0	
HQ1A3M		–20	–20	–10	–2.0		150	1.0	1.0	150	–2.0	–1.0	
HQ1F3M		–20	–20	–10	–2.0		150	2.2	2.2	150	–2.0	–1.0	
HQ1F3P		–20	–20	–10	–2.0		150	4.7	10	150	–2.0	–1.0	

Transistor for Array

Equivalent Circuit



Transistor for Array

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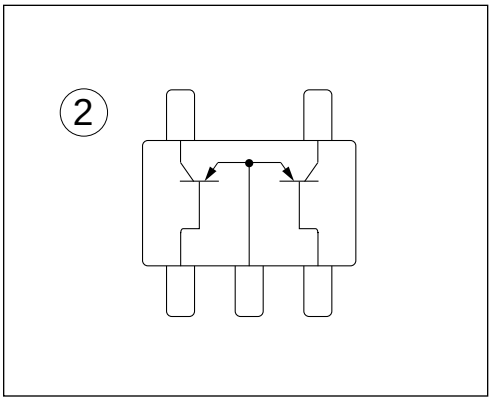

Transistor for Array

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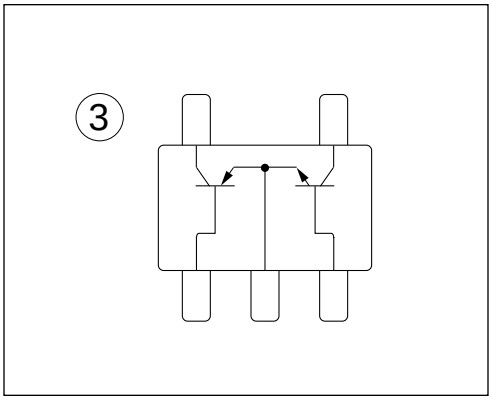

Transistor for Array

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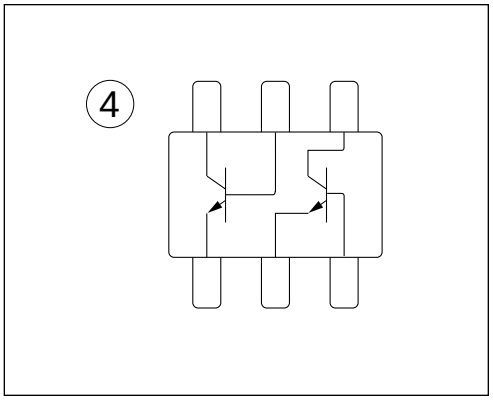

Transistor for Array

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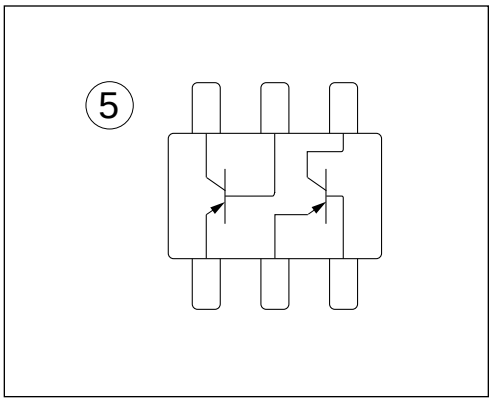
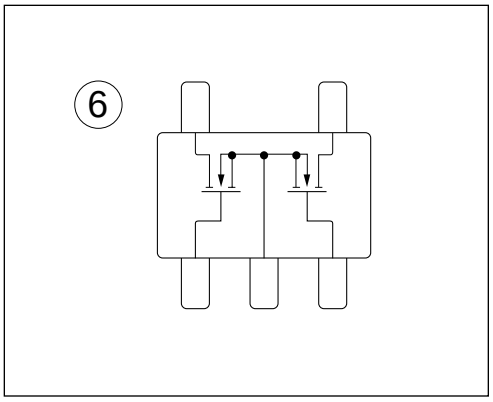


Transistor for Array

Equivalent Circuit



Transistor for Array

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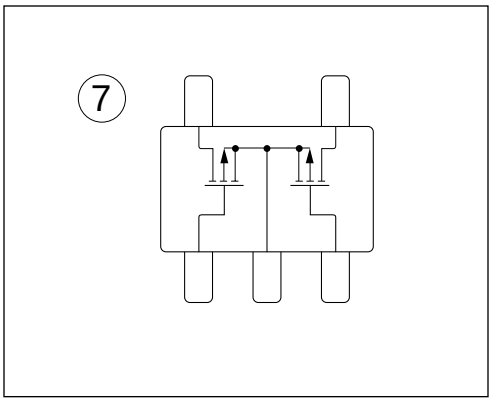
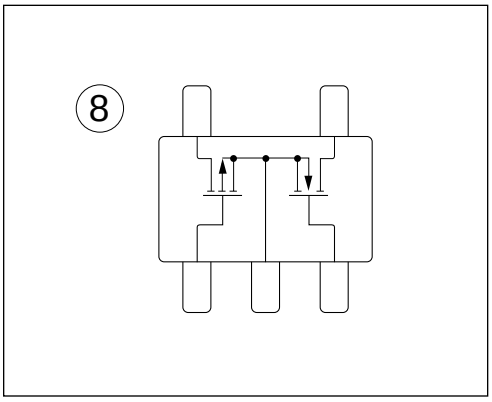


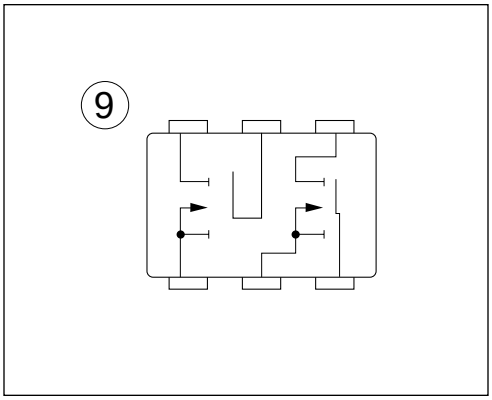
Transistor for Array

Equivalent Circuit



Transistor for Array

Equivalent Circuit



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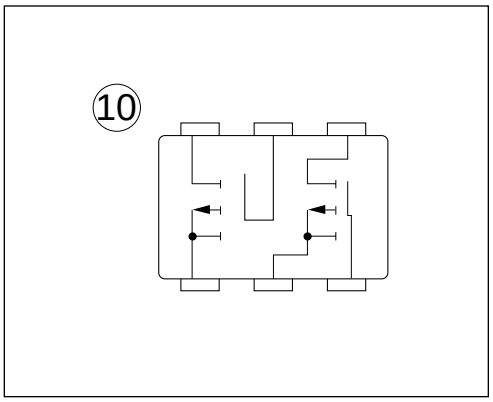

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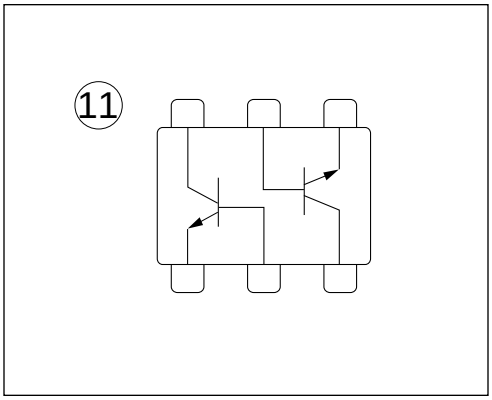

Transistor for Array

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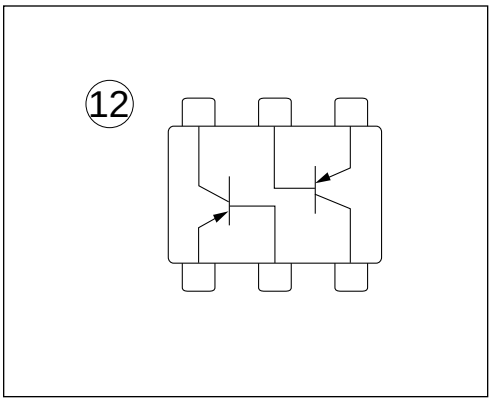

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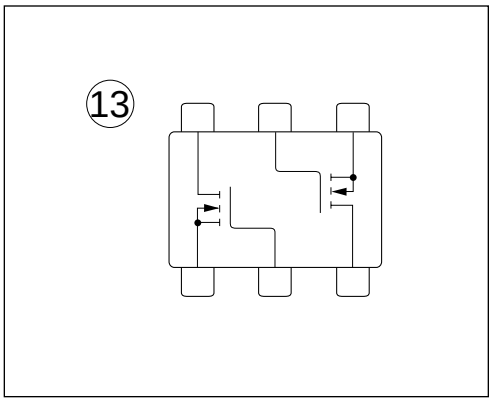

Transistor for Array

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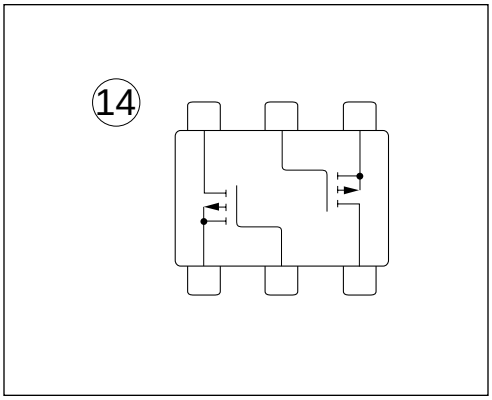

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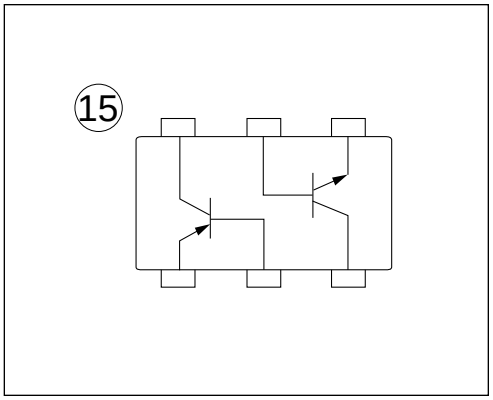

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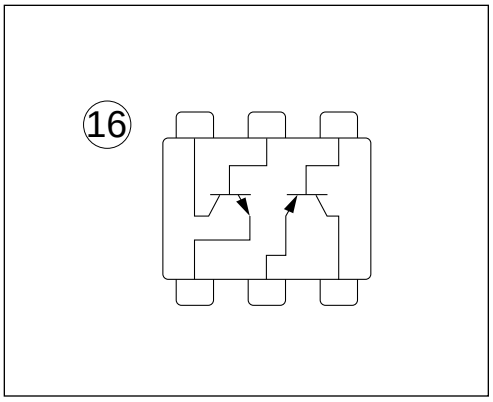

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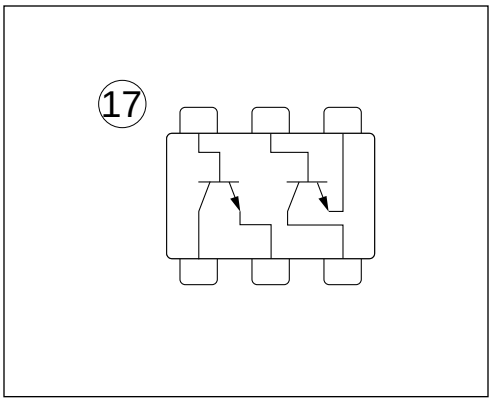

Transistor for Array

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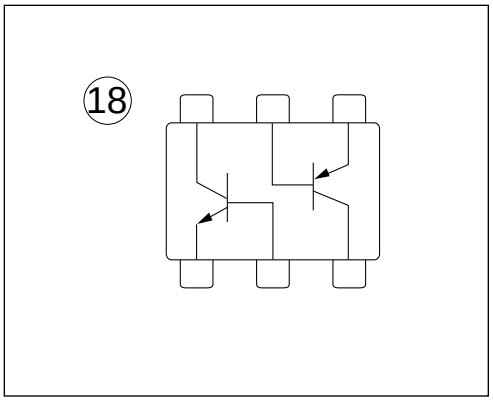


Transistor for Array

■ Bipolar Transistor

Part number	Equivalent circuit	V_{CEO} (V)	$I_{C(DC)}$ (mA)	P_T* (mW)	h_{FE}	V_{CE} (V)	I_C (mA)	Package
μPA570T	①	50	100	200		6	1	• 5-pin Super Mini-Mold SC-88A
μPA571T	②	−50	−100	200		−6	−1	
μPA574T	③	50/−50	100/−100	300		6/−6	1/−1	
μPA670T	⑪	50	100	200		6	1	• 6-pin Super Mini-Mold SC-88
μPA671T	⑫	−50	−100	200		−6	−1	
μPA500T	①	50	100	300	90 to 600	6	1	• 5-pin Mini-Mold SC-74A
μPA501T	②	−50	−100	300		−6	−1	
μPA504T	③	50/−50	100/−100	300		6/−6	1/−1	
μPA600T	④	50	100	300		6	1	• 6-pin Mini-Mold SC-74
μPA601T	⑤	−50	−100	300		−6	−1	
μPA604T	⑪	50	100	300		6	1	
μPA605T	⑫	−50	−100	300		−6	−1	
μPA608T	⑮	50 −16	100 −500	300	90 to 600 110 to 400	6 −1	1 −100	
μPA609T	⑯	40 −40	500 −500	300	75 to 300 75 to 300	1 −1	150 −150	
μPA673T	⑰	15	200	200	82 to 180	6	1	• 6-pin Super Mini-Mold SC-88
μPA674T	⑱	15 −15	200 −50	200	40 to 200 50 to 150	1 −1	10 −10	

*: Total

Transistor for Array

■ MOS FET

Part number	Equivalent circuit	V_{DSS} (V)	$I_{D(DC)}$ (mA)	P_T* (mW)	$R_{DS\ (on)}$ (Ω) MAX	V_{GS} (V)	I_D (mA)	Package
μPA572T	⑥	30	100	200	13	2.5	10	• 5-pin Super Mini-Mold SC-88A
μPA573T	⑦	–30	–100	200	60	–2.5	–10	
μPA502T	⑥	50	100	300	30	4	10	
μPA503T	⑦	–50	–100	300	100	–4	–10	• 5-pin Mini-Mold SC-74A
μPA505T	⑧	50/–50	100/–100	300	30/100	4/–4	10/–10	
μPA602T	⑨	50	100	300	30	4	10	• 6-pin Mini-Mold SC-74
μPA603T	⑩	–50	–100	300	100	–4	–10	
μPA606T	⑬	50	100	300	30	4	10	
μPA607T	⑭	–50	–100	300	100	–4	–10	
μPA610TA	⑩	–30	–100	300	60	–2.5	–1	
μPA611TA	⑨	30	100	300	15	2.5	1	
μPA672T	⑬	50	100	200	40	2.5	10	• 6-pin Super Mini-Mold SC-88

*: Total

Transistor Array

■ Signal transistor array

Part number	Number of circuits				Output voltage V_O (V)	Output current I_O (mA/Unit)	Surge absorber diode	Input impedance	Ative level		Input/output relationship		Output current relationship		Remarks	Number of pins
	5	6	7	8					"H"	"L"	Inverter type	Non-iverter type	Source type	Sink type		
μPA80C, GR			○		60	50	–	20 kΩ		○	○		○		Darlington	16
μPA81C			○		45	400*2	–	20 kΩ	○		○			○	FIP driver	18
μPA2001C, GR			○		60	500	○	–	○		○			○	Darlington	16
μPA2002C, GR			○		60	500	○	7VZDi +10.5 kΩ	○		○			○	Darlington	16
μPA2003C, GR			○		60	500	○	2.7 kΩ	○		○			○	Darlington	16
μPA2004C, GR			○		60	500	○	10.5 kΩ	○		○			○	Darlington	16
μPA2981C				○	50	500	○	3 kΩ	○			○	○		Darlington output stage	18
μPA2982C				○	50	500	○	8.5 kΩ	○			○	○		Darlington output stage	18
μPA2987C			○		50	500	○	3 kΩ	○			○	○		Darlington output stage	16

*1: PW ≦ 30 ms, duty cycle ≦ 10% (7 circuits operation)
*2: PW ≦ 10 ms, duty cycle ≦ 10% (7 circuits operation)

Transistor Array

■ Signal transistor array (Monolithic)

I_O (mA) / V_O (V)	500
50	μPA2981 μPA2982 μPA2987
60	μPA2001 μPA2002 μPA2003 μPA2004

Transistor Array

■ Power transistor array

Part number	Number of circuits	Collector-emitter voltage V_{CE} (V)	Collector current I_C (A)	Surge absorber diode	Input impedance	Output current relationship		Remarks	Number of pins
						Source type	Sink type		
μPA1428AH	4	60 ±10	±2.0	○	–		○	Darlington	10
μPA1434H	4	60	3.0	–	–		○	High beta	10
μPA1436AH	4	100	±3.0	–	–		○	Darlington	10
μPA1437H	4	–100	∓3.0	–	–	○		Darlington	10
μPA1453H	4	–60	5.0	–	–	○		Low $V_{CE(sat)}$	10
μPA1454H	4	100	5.0	–	–		○	High beta	10
μPA1456H	4	100	±5.0	–	–		○	Darlington	10
μPA1458H	4	60 ±10	±5.0	○	–		○	Darlington	10
μPA1476H	4	100 ±15	±2.0	○	–		○	Darlington	10
μPA1478H	4	31 ±4	±2.0	○	–		○	Darlington	10

Transistor Array

■ Power transistor array (Multi-chip, 4 circuits)

V_{CEO} (V) \ $I_{C(DC)}$ (A)	Polarity	2.0	3.0	5.0
30	NPN	μPA1478H ○		
	PNP			
60	NPN	μPA1428AH ○	μPA1434H ●	μPA1458H ○
	PNP			μPA1453H ☆
100	NPN	μPA1476H ○	μPA1436AH	μPA1454H ● μPA1456H
	PNP		μPA1437H	

○ : with Zenner Diode ☆ : Low $V_{CE(sat)}$ ● : Single High h_{FE}

Transistor Array

■ Power MOS FET array

Part number	Number of circuits			V_{DSS} (V)	I_D (A/Unit)	Surge absorber diode	4 V driving	Active level		Input/output relationship		Output current relationship		Number of pins
	4	7	8					"H"	"L"	Inverter type	Non-inverter type	Source type	Sink type	
μPA1500BH	○			60	±3	○	○	○		○			○	12
μPA1501H	○			120	±3	○	○	○		○			○	12
μPA1520BH	○			30	±2	–	○	○		○			○	10
μPA1522H	○			60	±2	–	○	○		○			○	10
μPA1523BH	○			–60	∓2	–	○		○		○	○		10
μPA1524H	○			80	±2	–	○	○		○			○	10
μPA1526H	○			100	±2	–	○	○		○			○	10
μPA1527H	○			–100	∓2	–	○		○		○	○		10
μPA1550H	○			30	±5	–	○	○		○			○	10
μPA1552BH	○			60	±5	–	○	○		○			○	10
μPA1556AH	○			100	±5	–	○	○		○			○	10
μPA1572BH	○			60	±2	–	○	○		○			○	10
μPA1576H	○			100	±2	–	○	○		○			○	10

Transistor Array

■ Power MOS FET array (Multi-chip, 4 circuits)

$I_{D\,(DC)}$ (A) / V_{DSS} (V)	2.0	3.0	5.0
30	• μPA1520BH (0.25)		• μPA1550H (0.15)
60	• μPA1522H (0.35) • μPA1572BH (0.8) • <u>μPA1523BH</u> (1.3)	• μPA1500BH (0.24)	• μPA1552BH (0.24)
80	• μPA1524H (1.0)		
100	• μPA1526H (0.6) • μPA1576H (1.5) • <u>μPA1527H</u> (1.5)		• μPA1556AH (0.33)
120		• μPA1501H (0.53)	

( ): $R_{DS(on)}$ (@V_{GS} = 4 V) [Ω MAX.] Underlined: P-channel

Transistor Array

■ Monolithic MOS FET array

Part number	Number of circuits			V_{DSS} (V)	I_D (A/Unit)	Surge absorber diode	4 V driving	Active level		Input/output relationship		Output current relationship		Number of pins
	4	7	8					"H"	"L"	Inverter type	Non-inverter type	Source type	Sink type	
μPA1600CX/GS			○	30	0.5	–	○	○		○			○	20
μPA1601CX/GS		○		30	0.43	–	○	○		○			○	16
μPA1602CX/GS		○		30	0.43	–	○		○		○		○	16
μPA1603CX	○			30	0.87	○	○	○		○			○	16
μPA1604CX	○			30	0.87	○	○		○		○		○	16

Transistor Array

■ Power MOS FET array (Monolithic)

$I_{D(DC)}$ (A) / V_{DSS} (V)	0.43	0.5	0.87
30	• μPA1601 (5.3 Ω, 7CH) (DIP, SOP) • μPA1602 (5.3 Ω, 7CH) (DIP, SOP)	• μPA1600 (4.0 Ω, 8CH) (DIP, SOP)	• μPA1603 (1.3 Ω, 4CH) (DIP, SOP)

Zener Diode

■ Zener Diode Quick Reference (1/2)

Vz (V)	P (W)							
TYP.	0.15		0.2				1.0	
2.0		RD2.0UM	RD2.0M	RD2.0MW	RD2.0S		RD2.0P	
2.2		RD2.2UM	RD2.2M	RD2.2MW	RD2.2S		RD2.2P	
2.4		RD2.4UM	RD2.4M	RD2.4MW	RD2.4S		RD2.4P	
2.7		RD2.7UM	RD2.7M	RD2.7MW	RD2.7S		RD2.7P	
3.0		RD3.0UM	RD3.0M	RD3.0MW	RD3.0S		RD3.0P	
3.3		RD3.3UM	RD3.3M	RD3.3MW	RD3.3S		RD3.3P	
3.6		RD3.6UM	RD3.6M	RD3.6MW	RD3.6S		RD3.6P	
3.9		RD3.9UM	RD3.9M	RD3.9MW	RD3.9S		RD3.9P	
4.3		RD4.3UM	RD4.3M	RD4.3MW	RD4.3S		RD4.3P	
4.7	RD4.7UJ	RD4.7UM	RD4.7M	RD4.7MW	RD4.7S	RD4.7SL	RD4.7P	RD4.7FM
5.1	RD5.1UJ	RD5.1UM	RD5.1M	RD5.1MW	RD5.1S	RD5.1SL	RD5.1P	RD5.1FM
5.6	RD5.6UJ	RD5.6UM	RD5.6M	RD5.6MW	RD5.6S	RD5.6SL	RD5.6P	RD5.6FM
6.2	RD6.2UJ	RD6.2UM	RD6.2M	RD6.2MW	RD6.2S	RD6.2SL	RD6.2P	RD6.2FM
6.8	RD6.8UJ	RD6.8UM	RD6.8M	RD6.8MW	RD6.8S	RD6.8SL	RD6.8P	RD6.8FM
7.5	RD7.5UJ	RD7.5UM	RD7.5M	RD7.5MW	RD7.5S	RD7.5SL	RD7.5P	RD7.5FM
8.2	RD8.2UJ	RD8.2UM	RD8.2M	RD8.2MW	RD8.2S	RD8.2SL	RD8.2P	RD8.2FM
9.1	RD9.1UJ	RD9.1UM	RD9.1M	RD9.1MW	RD9.1S	RD9.1SL	RD9.1P	RD9.1FM
10	RD10UJ	RD10UM	RD10M	RD10MW	RD10S	RD10SL	RD10P	RD10FM
11	RD11UJ	RD11UM	RD11M	RD11MW	RD11S	RD11SL	RD11P	RD11FM
12	RD12UJ	RD12UM	RD12M	RD12MW	RD12S	RD12SL	RD12P	RD12FM
13	RD13UJ	RD13UM	RD13M	RD13MW	RD13S	RD13SL	RD13P	RD13FM
15	RD15UJ	RD15UM	RD15M	RD15MW	RD15S	RD15SL	RD15P	RD15FM
16	RD16UJ	RD16UM	RD16M	RD16MW	RD16S	RD16SL	RD16P	RD16FM
18	RD18UJ	RD18UM	RD18M	RD18MW	RD18S	RD18SL	RD18P	RD18FM
20	RD20UJ	RD20UM	RD20M	RD20MW	RD20S	RD20SL	RD20P	RD20FM
22	RD22UJ	RD22UM	RD22M	RD22MW	RD22S	RD22SL	RD22P	RD22FM
24	RD24UJ	RD24UM	RD24M	RD24MW	RD24S	RD24SL	RD24P	RD24FM
27	RD27UJ	RD27UM	RD27M	RD27MW	RD27S	RD27SL	RD27P	RD27FM
30	RD30UJ	RD30UM	RD30M	RD30MW	RD30S	RD30SL	RD30P	RD30FM
33	RD33UJ	RD33UM	RD33M	RD33MW	RD33S	RD33SL	RD33P	RD33FM
36	RD36UJ	RD36UM	RD36M	RD36MW	RD36S	RD36SL	RD36P	RD36FM
39	RD39UJ	RD39UM	RD39M	RD39MW	RD39S	RD39SL	RD39P	RD39FM
43			RD43M		RD43S		RD43P	RD43FM
47			RD47M		RD47S		RD47P	RD47FM
51					RD51S		RD51P	RD51FM
56					RD56S		RD56P	
62					RD62S		RD62P	
68					RD68S		RD68P	
75					RD75S		RD75P	
82					RD82S		RD82P	
91					RD91S		RD91P	
100					RD100S		RD100P	
110					RD110S		RD110P	
120					RD120S		RD120P	
Package	2-pin ultra mini-mold		Mini-mold (SC-59)		2-pin super mini-mold		Power mini-mold (SC-62)	2-pin power mini-mold
	Low noise	General Purpose			General Purpose	Low noise		

Zener Diode

■ Zener Diode Quick Reference (2/2)

V_Z (V)	P (W)				
TYP.	0.25	0.4	0.4	0.5	1.0
2.0	RD2.0HS		RD2.0ES	RD2.0E	RD2.0F
2.2	RD2.2HS		RD2.2ES	RD2.2E	RD2.2F
2.4	RD2.4HS		RD2.4ES	RD2.4E	RD2.4F
2.7	RD2.7HS		RD2.7ES	RD2.7E	RD2.7F
3.0	RD3.0HS		RD3.0ES	RD3.0E	RD3.0F
3.3	RD3.3HS		RD3.3ES	RD3.3E	RD3.3F
3.6	RD3.6HS		RD3.6ES	RD3.6E	RD3.6F
3.9	RD3.9HS		RD3.9ES	RD3.9E	RD3.9F
4.3	RD4.3HS		RD4.3ES	RD4.3E	RD4.3F
4.7	RD4.7HS	RD4.7JS	RD4.7ES	RD4.7E	RD4.7F
5.1		RD5.1JS	RD5.1ES	RD5.1E	RD5.1F
5.6		RD5.6JS	RD5.6ES	RD5.6E	RD5.6F
6.2		RD6.2JS	RD6.2ES	RD6.2E	RD6.2F
6.8		RD6.8JS	RD6.8ES	RD6.8E	RD6.8F
7.5		RD7.5JS	RD7.5ES	RD7.5E	RD7.5F
8.2		RD8.2JS	RD8.2ES	RD8.2E	RD8.2F
9.1		RD9.1JS	RD9.1ES	RD9.1E	RD9.1F
10		RD10JS	RD10ES	RD10E	RD10F
11		RD11JS	RD11ES	RD11E	RD11F
12		RD12JS	RD12ES	RD12E	RD12F
13		RD13JS	RD13ES	RD13E	RD13F
15		RD15JS	RD15ES	RD15E	RD15F
16		RD16JS	RD16ES	RD16E	RD16F
18		RD18JS	RD18ES	RD18E	RD18F
20		RD20JS	RD20ES	RD20E	RD20F
22		RD22JS	RD22ES	RD22E	RD22F
24		RD24JS	RD24ES	RD24E	RD24F
27		RD27JS	RD27ES	RD27E	RD27F
30		RD30JS	RD30ES	RD30E	RD30F
33		RD33JS	RD33ES	RD33E	RD33F
36		RD36JS	RD36ES	RD36E	RD36F
39		RD39JS	RD39ES	RD39E	RD39F
43				RD43E	RD43F
47				RD47E	RD47F
51				RD51E	RD51F
56				RD56E	RD56F
62				RD62E	RD62F
68				RD68E	RD68F
75				RD75E	RD75F
82				RD82E	RD82F
91				RD91E	
100				RD100E	
110				RD110E	
120				RD120E	
Package	DO-34	DO-34	DO-34	DO-35	DO-41

Noise Clipping Diode

■ Surface-Mount Type Quick Reference

V_{BR} (V)	P (W)					Application
TYP.	0.15	0.2				
3.3	NNCD3.3C	NNCD3.3D	NNCD3.3E	NNCD3.3F	NNCD3.3G	• E.S.D. protection • Surge absorber
3.6	NNCD3.6C	NNCD3.6D	NNCD3.6E	NNCD3.6F	NNCD3.6G	
3.9	NNCD3.9C	NNCD3.9D	NNCD3.9E	NNCD3.9F	NNCD3.9G	
4.3	NNCD4.3C	NNCD4.3D	NNCD4.3E	NNCD4.3F	NNCD4.3G	
4.7	NNCD4.7C	NNCD4.7D	NNCD4.7E	NNCD4.7F	NNCD4.7G	
5.1	NNCD5.1C	NNCD5.1D	NNCD5.1E	NNCD5.1F	NNCD5.1G	
5.6	NNCD5.6C	NNCD5.6D	NNCD5.6E	NNCD5.6F	NNCD5.6G	
6.2	NNCD6.2C	NNCD6.2D	NNCD6.2E	NNCD6.2F	NNCD6.2G	
6.8	NNCD6.8C	NNCD6.8D	NNCD6.8E	NNCD6.8F	NNCD6.8G	
7.5	NNCD7.5C	NNCD7.5D	NNCD7.5E	NNCD7.5F	NNCD7.5G	
8.2	NNCD8.2C	NNCD8.2D	NNCD8.2E	NNCD8.2F		
9.1	NNCD9.1C	NNCD9.1D	NNCD9.1E	NNCD9.1F		
10	NNCD10C	NNCD10D	NNCD10E	NNCD10F		
11	NNCD11C	NNCD11D	NNCD11E	NNCD11F		
12	NNCD12C	NNCD12D	NNCD12E	NNCD12F		
27					NNCD27G	
Package	2-pin ultra mini-mold	2-pin super mini-mold	3-pin mini-mold (SC-59)		5-pin mini-mold (SC-74A quarto)	
			Single	Twin		

Noise Clipping Diode

■ Surface-Mount Type (Low Capacitance) Quick Reference

V_{BR} (V)	P (W)		Application
TYP.	0.2		
5.6	NNCD5.6LG	NNCD5.6LH	• E.S.D. protection
6.2	NNCD6.2LG	NNCD6.2LH	
6.8	NNCD6.8LG	NNCD6.8LH	
Package	5-pin mini-mold (SC-74A quad)	5-pin super mini-mold (SC-88A quad)	

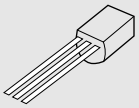
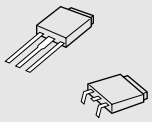
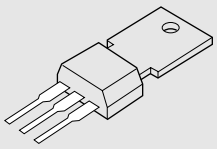
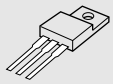
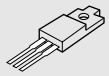
Noise Clipping Diode

■ Through Hole Type Quick Reference

V_{BR} (V)	P (W)		Application
TYP.	0.4	0.5	
3.3	NNCD3.3A	NNCD3.3B	• E.S.D. protection • Surge absorber
3.6	NNCD3.6A	NNCD3.6B	
3.9	NNCD3.9A	NNCD3.9B	
4.3	NNCD4.3A	NNCD4.3B	
4.7	NNCD4.7A	NNCD4.7B	
5.1	NNCD5.1A	NNCD5.1B	
5.6	NNCD5.6A	NNCD5.6B	
6.2	NNCD6.2A	NNCD6.2B	
6.8	NNCD6.8A	NNCD6.8B	
7.5	NNCD7.5A	NNCD7.5B	
8.2	NNCD8.2A	NNCD8.2B	
9.1	NNCD9.1A	NNCD9.1B	
10	NNCD10A	NNCD10B	
11	NNCD11A	NNCD11B	
12	NNCD12A	NNCD12B	
Package	DO-34	DO-35	

Thyristor

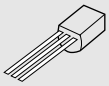
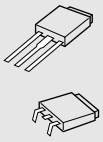
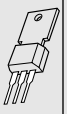
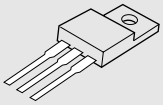
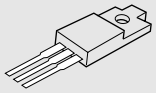
■ SCR

Package / Electrical characteristics		 SOT-89	 TO-92			 MP-3			 TO-202AA					 MP–25		 MP–45C	
		SOT-89	TO-92			MP-3			TO-202AA					TO-220AB		TO-220-like insulated type	
$I_{T(RMS)}$ (A)		0.47	0.47			4.7	8	12.6	4	4	4	4.7	4.7	8	12.6	8	12.6
$I_{T(AV)}$ (A)		0.3	0.3			3	5	8	2	2	2.5	3	3	5	8	5	8
I_{TSM} (A)		6	8			40	65	80	20	20	45	65	65	80	100	80	100
T_j (°C)		125	125			125			125					125		125	
V_{DRM} V_{RRM} (V)	200	03P2J	03P2M	–	–	–	–	–	–	2S2M	–	–	–	–	8P2M	–	8P2SM
	400	03P4J	03P4M	03P4MF*1	03P4MG	3P4J 3P4J-Z	5P4J 5P4J-Z	8P4J 8P4J-Z	2P4M	2S4M	2V5P4M	3P4MH	3S4M	5P4M	8P4M	5P4SM	8P4SM
	500	03P5J	–	–	03P5MG	–	–	–	2P5M	–	–	3P5MH	–	5P5M	–	–	–
	600	–	–	–	03P6MG	–	5P6J 5P6J-Z	–	2P6M	–	–	3P6MH	–	5P6M	–	5P6SM	–
I_{GT} (mA)		0.2	0.2	100 μA	3-50 μA	0.1	0.2	10	0.2	0.3	0.1	0.2	30	10	10	10	10
tq (TYP.) (μs)		25	25	40	60	30	80	50	30	15*2	80	80	5*2	50	100	50	100

*1: V_{RRM} = 5 V
*2: indicates MAX.

Thyristor

■ TRIAC

Package / Electrical characteristics		SOT-89	TO-92		MP-3		TO-202AA	TO-220AB					TO-220AB-like insulated type					
								 MP–25					 MP–45C					
$I_{T(RMS)}$ (A)		1.0	0.8	1.0	3	5	3	5	8	10	12	16	3	5	8	10	12	16
$I_{TSM(50\ Hz)}$ (A)		7.0	7	9	30	50	30	50	80	80	100	150	30	50	80	80	100	150
T_j (°C)		125	125		125		125	125					125					
V_{DRM} V_{RRM} (V)	400	AC01DJM	AC0V 8DGM	AC01 DGM	AC03 DJM AC03 DJM-Z	AC05 DJM AC05 DJM-Z	AC03 DGM	AC05 DGM	AC08 DGM	AC10 DGM	AC12 DGM	AC16 DGM	AC03 DSM	AC05 DSM	AC08 DSM	AC10 DSM	AC12 DSM	AC16 DSM
	500	–	–	–	–	–	AC03 EGM	AC05 EGM	AC08 EGM	AC10 EGM	AC12 EGM	AC16 EGM	–	AC05 ESM	AC08 ESM	AC10 ESM	AC12 ESM	–
	600	–	–	–	AC03 FJM AC03 FJM-Z	AC05 FJM AC05 FJM-Z	AC03 FGM	AC05 FGM	AC08 FGM	AC10 FGM	AC12 FGM	AC16 FGM	AC03 FSM	AC05 FSM	AC08 FSM	AC10 FSM	AC12 FSM	AC16 FSM
I_{GT} (mA)	I	5	5	3	12	10	12	10	20	20	20	30	12	10	20	20	20	30
	II	10	10	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	III	5	5	3	12	10	12	10	20	20	20	30	12	10	20	20	20	30
	IV	10	10	3	12	10	12	10	20	20	20	30	12	10	20	20	20	30
$(dv/dt)_C$ (V/μs)	MIN.	0.5	1	0.5	5	5	5	5	10	10	10	10	5	5	10	10	10	10