

SYMBOLS & CODES EXPLAINED

6. "P" Channel

7. "N" Channel — SILICON FIELD EFFECT TRANSISTORS

LINE No.	TYPE No.	1 MAX. DEVICE DISS @ 25°C (W)	2 MAX. Id=0 (V)	3 MAX. Vds (V)	4 ABS. MAX. BVdss (V)	ABS. MAX. RATINGS @ 25°C		7 MAX. Idss @ Vgs=0 (A)	8 MAX. Igss @ Vgs>Vp (A)	TEST COND.		PARAMETERS @ 25°C		13 Rds (Ω)	14 MAX. Cis (F)	DERATE IN FREE AIR W/°C	15 MAX. TEMP (°C)	STRUCTURE	DWG. Y200 s/s TO200 Ser.	# C A D E
						Id (A)	Ig (A)			Vgs (V)	Vds (V)	gfs (mhos)	Yos							

▼ - Matched Type, also listed in Section 13, Category 6
 ◆ - Phototransistor, also listed in Section 13, Category 7 (See Above Also)

△ - With infinite heat sink
 † - Above 25°C; For additional information, consult manufacturer.

† - VGS (Cut Off)
 △ - VGS (Threshold)
 % - Typical
 # - Minimum

△ - Depletion Mode, Type A
 § - Depletion-Enhancement Mode, Type B
 * - Enhancement Mode, Type C

△ - BV DSO
 † - BV DSX

△ - BV DGO

△ - Typical § - gfg
 † - Pulsed
 % - High Frequency (Vfs)
 □ - YFS

△ - Yis § - Yog
 † - Not given test conditions
 % - Maximum
 * - Pulsed

△ - VGD
 † - VDG

% - Maximum
 △ - Not given at test conditions
 † - RDS(on) at VDS = 0

∅ - ID in mA

△ - IGDO

△ - IDSS @ VGS = 0 and VDS ≈ Vp
 ∅ - VGS > 0
 # - Minimum
 * - Typical
 % - Pulsed

- Ciss (Output Shorted)
 △ - C dgs
 † - C gss
 % - Not given at test conditions
 * - Typical
 □ - C dss
 ∅ - C dgo § - Cigs

STRUCTURE
 D - Diffused
 E - Epitaxial
 Ge - GermaniumPE
 PE - Planar Epitaxial
 PL - Planar
 # - Junction Type
 * - Insulated Gate (MOS Type)
 § - Matched pair or dual
 △ - Switching, other uses
 % - Chopper, Other uses
 † - Noise figure 8db or below
 H - Hometaxial
 § - Tetrode
 % - Insulated Gate (MNOS Type)

A - Ambient J - Junction
 C - Case S - Storage

□ - Phototransistor Device
 △ - Tetrode Device
 % - Composite Type

8. GERMANIUM PNP

9. GERMANIUM NPN

10. SILICON PNP

11. SILICON NPN — High Power Transistors

LINE No.	TYPE No.	1 MIN. DERATE J to C W/°C	2 MAX. FREE AIR @ 25°C (W)	3 Pcm X M P	ABSOLUTE MAX. RATINGS @ 25°C				9 MAX. Icbo @ 25°C (A)	10 MAX. Vcb (V)	BIAS Ic (A)	11 MIN. fae (Hz)	12 MAX. fae (Hz)	13 MAX. SAT. RES. (Ω)	14 tr (s)	STRUCTURE	DWG. Y200 s/s TO200 Ser.	# C A D E
					Ic (A)	Ib (A)	BVcbo (V)	BVceo (V)										

† - 40°C ◆ - 80°C
 * - 45°C § - 100°C
 # - 50°C ∅ - Free Air
 □ - 60°C ∇ - Typical Value
 § - 75°C △ - > 100°C
 Symbols indicate temperature at which derating starts.

∅ - With infinite heat sink
 Following symbols indicate temp at which derating starts:
 † - 40°C □ - 60°C ◆ - 80°C
 * - 45°C § - 70°C ∇ - Pulsed
 # - 50°C § - 100°C % - Min.

* - 50-65°C A - Ambient
 ∅ - 70-80°C C - Case
 # - 85-100°C J - Junction
 ◆ - 110-125°C S - Storage
 † - 130-135°C
 § - 140-165°C
 ∇ - 170-200°C
 ▼ - Over 200°C

∅ - IE § - Minimum
 # - Pulsed or Peak
 † - At temperature 25°C Case

∅ - At VCB < Max. VCB (see mfr. spec.)
 # - ICEX * - Icer △ - ICeO
 § - ICES ◆ - At Temp. 25°C Case
 § - Typical † - At Temp. > 25°C

- BV CEX or punch-through
 ∅ - BV CES * - Pulsed
 § - BV CER □ - BV ceo(SUS)
 § - Minimum

† - At Temp. 25°C Case
 § - Minimum

∅ - IE
 # - Pulsed
 § - Minimum

† - hfe * - Available to selected range narrower than indicated
 # - Pulsed
 ∅ - Typical

□ - Maximum
 ∅ - td + tr = Ton
 § - ts
 # - tf
 † - ts + tf = Toff
 * - Ton + Toff

▼ - Typical Value # - Pulsed

- Rated max. operating frequency
 † - fαb
 § - Gain bandwidth product (fr)
 * - Maximum frequency of oscillation
 ∅ - Figure of merit (frequency for unity power gain)
 △ - Minimum □ - Maximum

§ - Tetrode
 # - Radiation Resistant Device (Also see top of reverse side of card.)

8. GERMANIUM PNP - HIGH POWER TRANSISTORS

IN ORDER OF (1) MIN. DERATING FACTOR
& (2) TYPE No.

LINE No.	TYPE No.	1 MIN. DERATE J to C (W/C)	MAX P _c FREE AIR @ 25°C (W)	M T A E X P	ABSOLUTE MAX. RATINGS @25°C					MAX. hFE		MIN	MAX	fae (Hz)	MAX. SAT. RES. (Ω)	tr (s)	STRUC-TURE	DWG # Y200 s/a TO200	# E A D E	C O D E
					Ic (A)	Ib (A)	BVcbo (V)	BVebo (V)	BVceo (V)	Icbo @ 25°C (A)	Vcb (V)									
1	MP2143A	833m	70 ∅	∅			45	25	30	5.0m	2.0∅	500m	50	100	20k	250m	A	TO41	C∅	
2	MP2144	833m	70 ∅	∅			60	30	45	5.0m	2.0∅	500m	50	100	20k	250m	A	TO41	C∅	
3	MP2144A	833m	70 ∅	∅			60	30	45	5.0m	2.0∅	500m	50	100	20k	250m	A	TO41	C∅	
4	MP2145	833m	70 ∅	∅			75	40	60	5.0m	2.0∅	500m	50	100	20k	250m	A	TO41	C∅	
5	MP2145A	833m	70 ∅	∅			75	40	60	5.0m	2.0∅	500m	50	100	20k	250m	A	TO41	C∅	
6	MP2146	833m	70 ∅	∅			90	45	65	5.0m	2.0∅	500m	50	100	20k	250m	A	TO41	C∅	
7	MP2146A	833m	70 ∅	∅			90	45	65	5.0m	2.0∅	500m	50	100	20k	250m	A	TO41	C∅	
8	2N115	1.0	∅	∅	3.0		32	10	40	1.0m	1.4∅	30	40	80	20k	27	A	TO41	C∅	
9	JAN2N174	1.0	70 ∅	∅			80	60	80	1.5m	2.0∅	1.2	40	80	100k	60m	A	TO6		
10	2N179	1.0	∅	∅	1.0		40	40	40	3.0m	1.2∅	50 ∅	10		1.0		A			
11	2N1315	1.0	∅	∅	3.5		32	10	32	1.0m	6.0	3.5	30	200	300k	125m	A			
12	2N2069	1.0	20 ∅	∅	12		3.0	40	20	30	1.5m	2.0∅	30	200	1.5k	125m	A	TO3	C∅	
13	2N2070	1.0	20 ∅	∅	12		3.0	40	20	30	1.5m	2.0∅	30	200	1.5k	125m	A	TO3	C∅	
14	2N2071	1.0	20 ∅	∅	12		3.0	40	20	30	1.5m	2.0∅	30	200	1.5k	125m	A	TO41	C∅	
15	2N2072	1.0	20 ∅	∅	12		3.0	40	20	30	1.5m	2.0∅	30	200	1.5k	125m	A	TO41	C∅	
16	JAN2N2210	1.0	70 ∅	∅	∅		200m	100	60	80	4.0m	2.0∅	25	50	5.0k	50m	A	MT63a	B∅	
17#	2SB235	1.0	60 ∅	∅	∅		15	15 ∅	80	25	80	10m	25	200	200k	50m	A	TO36		
18#	2SB236	1.0	60 ∅	∅	∅		15	15 ∅	80	25	80	10m	25	200	200k	50m	A	TO36		
19#	2SB237	1.0	60 ∅	∅	∅		15	15 ∅	36	25	36	10m	25	200	200k	50m	A	TO36		
20#	2SB258	1.0	60 ∅	∅	∅		15	120	1.0	1.0	3.5m	5.0	38	280	1.5M		A	AD	TO36	
21#	2SB259	1.0	60 ∅	∅	∅		15	80	1.0	1.0	3.5m	5.0	38	280	1.5M		A	AD	TO36	
22#	2SB260	1.0	60 ∅	∅	∅		15	80	1.0	1.0	3.5m	5.0	38	280	1.5M		A	AD	TO36	
23#	2SB483	1.0	60 ∅	∅	∅		15	80	40	60	5.0m	1.5	10	40	100 ∅	30m	A	TO3		
24#	2SB484	1.0	60 ∅	∅	∅		15	100	40	75	5.0m	1.5	10	40	100 ∅	30m	A	TO3		
25#	2SB485	1.0	60 ∅	∅	∅		15	140	40	85	5.0m	1.5	10	40	100 ∅	30m	A	TO3		
26#	ADY18	1.0	∅	45 ∅	∅	3.0		60	25	15	2.0m	2.0∅	3.0	10	15 ∅	100k	A	MT15		
27	B1110	1.0	60	∅	∅	3.0		60	25	15	2.0m	2.0∅	3.0	10	15 ∅	100k	A	TO3		
28	B102000	1.0	∅	45 ∅	∅	7.0		30	40	2.0m	2.0∅	1.0	40	250	20	A	TO3			
29	B102001	1.0	∅	45 ∅	∅	7.0		30	40	2.0m	2.0∅	1.0	40	250	20	A	TO3			
30	B102002	1.0	∅	45 ∅	∅	7.0		30	40	2.0m	2.0∅	1.0	40	250	20	A	TO3			
31	B102003	1.0	∅	45 ∅	∅	7.0		30	40	2.0m	2.0∅	1.0	40	250	20	A	TO3			
32	B103000	1.0	∅	45 ∅	∅	10		30	40	2.0m	2.0∅	3.0	40	200	12	A	TO3			
33	B103001	1.0	∅	45 ∅	∅	10		30	40	2.0m	2.0∅	3.0	40	200	12	A	TO3			
34	B103002	1.0	∅	45 ∅	∅	10		30	40	2.0m	2.0∅	3.0	40	200	12	A	TO3			
35	B103003	1.0	∅	45 ∅	∅	10		30	40	2.0m	2.0∅	3.0	40	200	12	A	TO3			
36	B103004	1.0	∅	45 ∅	∅	10		30	40	2.0m	2.0∅	3.0	40	200	12	A	TO3			
37	CTP1505	1.0	∅	∅	∅	13		60	45	2.0m	2.0∅	5.0	15	45	13	A				
38	CTP1506	1.0	∅	∅	∅	13		50	35	2.0m	2.0∅	5.0	15	70	13	A				
39	CTP1507	1.0	∅	∅	∅	13		50	35	2.0m	2.0∅	5.0	15	45	13	A				
40	CTP1509	1.0	∅	∅	∅	13		40	30	2.0m	2.0∅	5.0	15	45	13	A				
41	CTP1511	1.0	∅	∅	∅	13		100	75	2.0m	2.0∅	5.0	60	120	13	A				
42	CTP1512	1.0	∅	∅	∅	13		80	60	2.0m	2.0∅	5.0	60	120	13	A				
43	CTP1513	1.0	∅	∅	∅	13		60	40	2.0m	2.0∅	5.0	60	120	13	A				
44	CTP1514	1.0	∅	∅	∅	13		60	40	2.0m	2.0∅	5.0	60	120	13	A				
45#	CTP1545	1.0	1.7 *	∅	∅	25		80	30	40	15m	2.0∅	25	25	4.0k	40m	A	TO3		
46#	CTP1553	1.0	1.7 *	∅	∅	25		100	30	50	20m	2.0∅	25	25	4.0k	40m	A	TO3		
47	H200E	1.0	∅	∅	∅	10		60	30	30	2.0m	2.0∅	5.0	20	400k	10	A	AD		
48	MN21	1.0	∅	∅	∅	3.0		80	40	2.0m	4.0∅	1.0	40	80	280k	50	A			
49	MN28	1.0	∅	∅	∅	3.0		30	30	5.0m	2.0∅	1.0	30	100	2.0	A				
50	MN29	1.0	∅	∅	∅	3.0		30	30	5.0m	2.0∅	1.0	30	100	2.0	A				
51	MN32	1.0	∅	∅	∅	3.0		40	40	3.0m	1.2	50 ∅	30	70	80	A				
52#	OD650	1.0	∅	45 ∅	∅	15	3.0	60	20	25	2.0m	2.0∅	15	10	25	100k	A	MT15		
53#	OD650B	1.0	∅	45 ∅	∅	15	1.0	60	20	25	2.0m	2.0∅	5.0	15	25	100k	A	MT15		
54#	OD651	1.0	∅	45 ∅	∅	15	3.0	60	25	40	2.0m	2.0∅	15	10	15	100k	A	MT15		
55#	OD651A	1.0	∅	45 ∅	∅	15	3.0	60	25	30	2.0m	2.0∅	15	10	25	100k	A	MT15		
56#	V15/15NP	1.0	∅	∅	∅	6.0		15	4.0	5.0	10m	1.5	2.0	15	30	150k	A			
57#	V15/30NP	1.0	∅	∅	∅	6.0		15	4.0	5.0	10m	1.5	2.0	30	60	150k	A			
58#	V30/15NP	1.0	∅	∅	∅	6.0		30	8.0	10	10m	1.5	2.0	15	30	150k	A			
59#	V30/30NP	1.0	∅	∅	∅	6.0		30	8.0	10	10m	1.5	2.0	30	60	150k	A			
60#	XC141	1.0	∅	∅	∅	2.0		40	12	40	3.0m	1.5	1.0	70	70	A				
61#	XC142	1.0	∅	∅	∅	2.0		40	12	40	3.0m	1.5	1.0	70	70	A				
62#	2G220	1.1	∅	∅	∅	10	5.0	40	30	30	2.0m	1.5∅	10	10	12	200k	A	MD4		
63#	2G221	1.1	∅	∅	∅	10	5.0	60	30	30	2.0m	1.5∅	10	10	12	200k	A	MD4		
64#	2G222	1.1	∅	∅	∅	10	5.0	80	30	30	2.0m	1.5∅	10	10	12	200k	A	MD4		
65#	2G223	1.1	∅	∅	∅	15	5.0	40	30	30	2.0m	1.5∅	15	10	12	250k	A	MD4		
66#	2G224	1.1	∅	∅	∅	15	5.0	60	30	30	2.0m	1.5∅	15	10	12	250k	A	MD4		
67#	2G225	1.1	∅	∅	∅	15	5.0	40	30	30	2.0m	1.5∅	15	10	12	250k	A	MD4		
68#	2G226	1.1	∅	∅	∅	20	5.0	40	30	30	2.0m	1.5∅	20	10	12	300k	A	MD4		
69#	2G227	1.1	∅	∅	∅	20	5.0	60	30	30	2.0m	1.5∅	20	10	12	300k	A	MD4		
70#	2G228	1.1	∅	∅	∅	20	5.0	80	30	30	2.0m	1.5∅	20	10	12	300k	A	MD4		
71#	2G229	1.1	∅	∅	∅	25	5.0	40	30	30	2.0m	1.5∅	25	10	12	350k	A	MD4		
72#	2G230	1.1	∅	∅	∅	25	5.0	60	30	30	2.0m	1.5∅	25	10	12	300k	A	MD4		
73#	2G231	1.1	∅	∅	∅	25	5.0	80	30	30	2.0m	1.5∅	25	10	12	300k	A	MD4		
74	2N1029	1.2	∅	∅	∅	15		50	25	20	15m	2.0∅	10	20	60	100m	A	MD16	C∅	
75	2N1029A	1.2	∅	∅	∅	15		60	25	30	15m	2.0∅	10	20	60	100m	A	MD16	C∅	
76	2N1029B	1.2	∅	∅	∅	15		90	25	60	15m	2.0∅	10	20	60	100m	A	MD16	C∅	
77	2N1029C	1.2	∅	∅	∅	15		100	25	70	15m	2.0∅	10	20	60	100m	A	MD16	C∅	
78	2N1030	1.2	∅	∅																