

SYMBOLS & CODES EXPLAINED

IN TYPE No. CROSS-INDEX & TECHNICAL SECTIONS

- Δ } Indicators of separate manufacturers producing same type number (non-JEDEC) whose characteristics are not the same.
- \square } This manufacturer-identifying symbol (assigned by D.A.T.A.) is an integral part of the type number (in Type No. Cross Index, Technical Data Sections) to avoid the possibility of confusing the devices of one manufacturer with the devices of others.
- $\%$ } Technical Data Sections)
- RT ... Replacement Type; consult manufacturer.

SYMBOLS & CODES COMMON TO MORE THAN ONE TECHNICAL SECTION

LINE No.

- ∇ - New Type
- \blacklozenge - Revised Specifications
- # - Non-JEDEC Type manufactured outside U.S.A.

TYPE No.

- \dagger - Switching type, also listed in Section 12
- \emptyset - Chopper, also listed in Section 13, Category 10
- * - These types also included elsewhere with other characteristics. See Type No. Cross Index for alternate line no.
- \S - Radiation Resistant Devices, also listed in Section 13, Category 13.

STRUCTURE (All Sections)

- A - Alloy Except 6 & 7)
- AN - Annular
- D - Diffused or drift
- DM - Diffused mesa
- E - Epitaxial
- EA - Epitaxial annular
- EM - Epitaxial mesa
- F - Fused
- G - Grown
- GA - Gallium Arsenide
- H - Hometaxial
- MA - Mico alloy
- MD - Micro alloy diffused
- ME - Mesa
- MOS - Metal oxide silicon
- PA - Precision alloy
- PC - Point contact
- PD - Precision alloy diffused
- PE - Planar epitaxial
- PL - Planar
- S - Surface barrier
- * - Matched pair
- Δ - Switching, other uses
- \square - Chopper, other uses
- \emptyset - Noise figure 8db or below
- \dagger - Plastic package
- $\%$ - Overlay

2. GERMANIUM PNP 3. GERMANIUM NPN 4. SILICON PNP 5. SILICON NPN -- Low Power Transistors

LINE No.	TYPE No.	1. MAX. COLL. DISS. @25°C (W)	2. DERATE IN FREE AIR W/C (Hz)	3. M E X P (V)	4. ABS. MAX. RATINGS @25°C (V)	5. BV _{ceo} (V)	6. BV _{ce0} (V)	7. BV _{ebo} (V)	8. I _{co} (A)	9. I _{cb0} @MAX V _{cb} (A)	10. TYPICAL h _{FE} PARAMETERS				11. h _{oe} (mhos)	12. COMMON EMITTER			13. C _{ob} (F)	14. STRUC-TURE	15. DWG # s/a TO200 Ser.	16. I _C (A)	17. I _B (A)	18. I _{CE} (A)	19. I _{CE} (A)	20. I _{CE} (A)
											10. h _{fe}	11. h _{ie}	12. h _{re}	13. h _{re}		14. h _{ob}	15. h _{ib}	16. h _{rb}								

\emptyset - With infinite heat sink
Following symbols indicate temperature at which derating starts:

\dagger - 40°C	\square - 60°C	\S - 100°C
* - 45°C	\S - 70°C	\blacklozenge - Min.
# - 50°C	Δ - 85°C	

\dagger - f_{ae}
 \S - Gain bandwidth product (f_t)
* - Maximum frequency of oscillation
 \emptyset - Figure of merit (frequency for unity power gain)
 Δ - Minimum
 \square - Maximum

\emptyset - With infinite heat sink

* - 50-65°C	A - Ambient
\emptyset - 70-80°C	C - Case
# - 85-100°C	J - Junction
\blacklozenge - 110-125°C	S - Storage
\dagger - 130-135°C	
\S - 140-165°C	
$\$$ - 170-200°C	
∇ - Over 200°C	

\emptyset - I_C Δ - I_B

\emptyset - V_{CE}

\emptyset - At $V_{CB} < \text{Max. } V_{CB}$ (See Mfr. Spec.)
- I_{CEX} $\$$ - Typical
 \S - I_{CES} * - I_{CER}
 \dagger - At Temp. $> 25^\circ\text{C}$ Δ - I_{CEO}
 \blacklozenge - At Temp. 25°C Case

11-13: b - h parameters are h_{ob}, h_{ib}, h_{rb}
 \square - Maximum

10: \dagger - h_{FE} Δ - Minimum
- Pulsed \square - Maximum
 \S - h_{FC}
* - Available in selected ranges

\square - Maximum $\$$ - C_{cb} \dagger - C_{re}

$\$$ - Tetrode
- Radiation Resistant Device (Also See Above)

- BV_{CEX} or punch-through
 \emptyset - BV_{CES} \square - $BV_{ceo(sus)}$
 \S - BV_{CER} * - Pulsed
 $\$$ - Indicates min. values given for $BV_{cbo}, BV_{ceo},$ and $BV_{ebo}.$

4. SILICON PNP - LOW POWER TRANSISTORS

IN ORDER OF (1) MAX COLLECTOR DISSIPATION
(2) fab & (3) TYPE No.

LINE No.	TYPE No.	1 MAX. COLL. DISS. @ 25°C (W)	2 f (Hz)	DERATE IN FREE AIR W/C	T M E A M P	ABS MAX RATINGS @ 25°C				MAX. I _{cb0} @ V _{cb} (A)	TYPICAL 'h' PARAMETERS			COMMON EMITTER			Cob (F)	STRUC TURE	DWG # Y200 s/a TO200 Ser.	# C O A D E		
						V _{cb0} (V)	V _{ce0} (V)	V _{be0} (V)	I _c (A)		V _{cb} (V)	I _e (A)	h _{fe}	hoe (mhos)	hie (Ω)	hre (X.0001)						
1	USAF515ES046MT	250m	100MΔ	1.4m	Δ	20	25	5.0	100m	10n0	100	10	30	Δ	1.0uZb	32	20	8.0pZ	FE*	X34		
2	MT869	250m	160MΔ	1.7m	Δ	25		5.0	100m	0.1u0	5.00	10m	20	Δ			9.0pZ	FE	u13			
3	MT995	250m	160MΔ	1.7m	Δ	20		4.0	50m	0.0u	1.00	20m	35	Δ			10pZ	FE	u13			
4	MT726	250m	180MΔ	1.7m	Δ	25		5.0	100m	0.0u	1.00	10m	15	Δ			5.0p	FE	u13			
5#	2SA402	250m	200MΔ	60	Δ	35	30		100m	1.0u	6.00	2.0m	200	Δ			6.0p	PL	TO18			
6#	AT331	250m	200MΔ	2.5m	Δ	20	20	4.0	250m	5.0u	2.00	150m	35	#Δ			25p	PL				
7#	AT332	250m	200MΔ	2.5m	Δ	60	50	4.0	500m	5.0u	2.00	150m	35	#Δ			25p	PL				
8#	AT333	250m	200MΔ	2.5m	Δ	90	80	4.0	500m	5.0u	2.00	150m	35	#Δ			25p	PL				
9	MD3133F*	250m	200MΔ	1.4m	Δ	50	35	4.0	600m	0.5u0	100	150m	40	#Δ			10pZ	ANΔ	TO89			
10	MD3134F*	250m	200MΔ	1.4m	Δ	50	35	4.0	600m	0.5u0	100	150m	100	#Δ			10pZ	ANΔ	TO89			
11	MT2411	250m	200MΔ	1.7m	Δ	25		5.0	100m	0.1u	5.00	10m	20	Δ			3.7p	FE	u13			
12	MT2412	250m	200MΔ	1.7m	Δ	25		5.0	100m	0.1u	5.00	10m	40	Δ			3.7p	FE	u13			
13#	BSS221	250m	400MΔ	2.5m	Δ	12	12	4.0	200m	80nΔ	5.00	30m	30	Δ			6.0pZ	PE†	X55c	A		
14	ME82011	250m	800MΔ	2.0m	Δ	12	12	4.0	100m	1.0u	5.00	15m	80				2.5p	PE†	R97b			
15#	2S021	300m			Δ	80		4.0			100	10m	25	†				PE				
16#	BC261	300m		2.0m	Δ	45	45	5.0	100m	50n	5.00	2.0m	125	Δ*				PE	R64b	A0		
17#	BC263	300m		2.0m	Δ	20	20	5.0	100m	50n	5.00	2.0m	125	Δ*				PE	R64b	A0		
18	NS1863	300m		1.7m	Δ	30	30	20		1.0u0	6.00	1.0m	50	Δ				DE	TO46	A0		
19	NS1864	300m		1.7m	Δ	50	50	35		1.0u0	6.00	1.0m	50	Δ				DE	TO46	A0		
20	ST8709	300m		1.6m	Δ	50	30	5.0		2.0n0	5.00	10m	80	Δ			10p	FE	TO18	∅		
21#	2S3210	300m	.10MΔ		Δ	40	40	20	100m			10m	10	Δ				A	R51			
22#	2S3220	300m	.15MΔ		Δ	40	40	20	100m			10m	15	Δ				A	R51			
23#	2S3221	300m	.15MΔ		Δ	15	15	10	100m			10m	15	Δ				A	R51			
24#	2CY31	300m	2.5MΔ	1.7m	Δ	64	64	45	100m	20u	6.00	1.0m	25	Δ			80pZ	A	TO5			
25#	2S3230	300m	2.5MΔ		Δ	25	25	10	100m			10m	25	Δ				A	R51			
26#	2S022	300m	3.0MΔ		Δ	40	30				100	10m	33	†				A				
27#	2CY32	300m	4.0MΔ	1.7m	Δ	64	64	45	100m	20u	6.00	1.0m	35	Δ			80pZ	A	TO5			
28#	2S3240	300m	4.0MΔ		Δ	15	15	10	100m			10m	40	Δ				A	R51			
29#	2CY34	300m	6.0MΔ	1.7m	Δ	32	32	16	100m	20u	6.00	1.0m	25	Δ			80pZ	A	TO5			
30#	2S023	300m	8.0MΔ		Δ	40	30				100	10m	60	†				A				
31#	2S3021	300m	.80MΔ	1.7m	Δ	15	15	10	100m	10u	6.00	10m	11		17u	800	2.7	40p	A0	ZA11		
32#	2S3040	300m	3.5MΔ	1.7m	Δ	15	15	10	100m	10u	6.00	10m	39		78u	3.2k	8.4	40p	A0	ZA11		
33	ST8700	300m	3.0MΔ	1.6m	Δ	50	30	5.0		2.0n0	5.00	100u	40	Δ	1.0uZb	32		10pZ	PE	TO18		
34#	ZT153	300m	3.0MΔ	2.4m	Δ	35	35	25	500m	10u	6.00	10m	35	†			5.0p	FE	TO18			
35#	ZT154	300m	3.0MΔ	2.4m	Δ	45	45	25	500m	10u	6.00	10m	50	†			5.0p	FE	TO18			
36	2N1131A/51†	300m	5.0MΔ	2.0m	Δ	60	40	5.0	600m	500n0	100	150m	20	#Δ	1.0uZb	35	8.0	30pZ	PE	TO51	A	
37	2N1132/51	300m	6.0MΔ	2.0m	Δ	50	35	5.0	600m	1.0u0	100	150m	30	#Δ	1.0uZb	35	8.0	45pZ	PE	TO51	A0	
38	2N1132B/51†	300m	6.0MΔ	1.6m	Δ	70	45	6.0	600m	1.0u0	100	150m	30	#Δ	1.0uZb	35	8.0	30pZ	PE	TO51	A0	
39	2N2927/51	300m	100MΔ	1.7m	Δ	25	25	4.0	500m	0.2u0	1.00	50m	30	Δ	1.2mZ	1.5kZ	26	20pZ	PE	TO51		
40#	2SA604	300m	100MΔ	2.4m	Δ	120	100	5.0	30m	1.0u#	3.00	1.0m	40	Δ			5pZ	PE	TO18	A0		
41#	2SA605	300m	100MΔ	2.4m	Δ	180	160	6.0	50m	50n	3.00	1.0m	50	Δ			5.0pZ	PE	TO18	A0		
42	A170	300m	100MΔ	2.0m	Δ	40	20	5.0	100m	5.0u	2.00	40m	40	Δ			5.0p†	PL	TO18	A0		
43	GI3702	300m	100MΔ	3.0m	Δ	40	25	5.0		10u0	5.00	50m	60	Δ			12pZ	PE	R97d			
44	GI3703	300m	100MΔ	3.0m	Δ	50	30	5.0		10u0	5.00	50m	30	#Δ			12pZ	PE	R97d			
45	ST8704	300m	100MΔ	1.6m	Δ	45	30	6.0		10n0	5.00	500u0	60	Δ			10p	PE	TO18	∅		
46	ST8705	300m	100MΔ	1.6m	Δ	45	30	6.0		10n0	5.00	500u0	150	Δ			10p	PE	TO18	∅		
47	TE3702	300m	100MΔ	3.0m	Δ	40	25	5.0	200m	100n0	5.00	50m	300	#Δ			12pZ	PE	TO106			
48	TE3703	300m	100MΔ	3.0m	Δ	50	30	5.0	200m	100n0	5.00	50m	150	#Δ			12pZ	PE	TO106			
49	TE5448	300m	100M	2.3m	Δ	50	30	5.0	200m	100n	5.0	50m	30	Δ			12†	PE	TO106	A		
50	2N2800/51†	300m	120MΔ	1.7m	Δ	50	35	5.0	800m	10u	100	150m	30	Δ			25p	E	TO51			
51	2N2801/51†	300m	120MΔ	1.7m	Δ	50	35	5.0	10u	100	100	150m	75	Δ			25p	E	TO51			
52	A171	300m	130MΔ	2.0m	Δ	30	20	5.0	100m	5.0u	2.00	100m	100	Δ			5.0p†	PL	TO18	A0		
53#	BC157VI	300m	130MΔ	2.4m	Δ	45	45	5.0	100m	5.0u	2.00	100m	100	Δ		20u	1.2k	2.5	6.0pZ	PE†	MM10	A
54#	BC158VI	300m	130MΔ	2.4m	Δ	25	25	5.0	100m	5.0u	2.00	100m	100	Δ		20u	1.2k	2.5	6.0pZ	PE†	MM10	A
55	2N2391	300m	140MΔ	2.0m	Δ	25	20	5.0	50m	10u	100	10m	15	Δ			5.0pZ	PE	u25	A		
56	2N2392	300m	140MΔ	2.0m	Δ	25	20	5.0	50m	10u	100	10m	30	Δ			5.0pZ	PE	u25	A		
57	2N3081/51	300m	150MΔ	1.7m	Δ	70	50	6.0	600m	0.1u0	100	150m	30	Δ			13pZ	PE	TO51	A		
58#	V205†	300m	160MΔ	2.0m	Δ	15	10	3.0		0.2u5	1.00	20m	55	#			8.0p	DPE	TO18	A		
59#	AT410	300m	200MΔ	2.4m	Δ	30	30	5.0	500m	200n0	100	150m	30	Δ			8.0pZ	PE	MM12aD			
60#	AT412	300m	200MΔ	2.4m	Δ	45	45	5.0	500m	200n	100	150m	30	Δ			8.0pZ	PE	MM12aD			
61#	AT413	300m	200MΔ	2.4m	Δ	45	45	5.0	500m	200n	100	150m	100	Δ			8.0pZ	PE	MM12aD			
62#	AT414	300m	200MΔ	2.4m	Δ	30	30	5.0	500m	200n	100	150m	100	Δ			8.0pZ	PE	MM12aD			
63#	AT415	300m	200MΔ	2.4m	Δ	30	30	5.0	500m	200n	100	150m	30	Δ			8.0pZ	PE	MM12aD			
64#	AT416	300m	200MΔ	2.4m	Δ	45	45	5.0	500m	200n	100	150m	30	Δ			8.0pZ	PE	MM12aD			
65#	AT417	300m	200MΔ	2.4m	Δ	45	45	5.0	500m	200n	1.00	50m	100	Δ			8.0pZ	PE	MM12aD			
66#	AT418	300m	200M	2.4m	Δ	30	30	5.0	500m	200n0	1.00	50m	100	#Δ			8.0pZ	PE	MM12aA			
67#	AT419	300m	200M	2.4m	Δ	30	30	5.0	500m	200n0	100	150m	90	#Δ			8.0pZ	PE	MM12aA			
68#	BC212VI	300m	200MΔ	2.5m	Δ	60	50	5.0	200m	15n0	5.00	2.0m	100		10u	1.2k	1.0	6.0pZ	PE	X64a	A	
69#	BC214LA†	300m	200MΔ	2.4m	Δ	45	30	5.0	200m	15n0	5.00	2.0m	300	Δ			10pZ	PE	TO92	B		
70#	BCW52	300m	200MΔ		Δ	50	30	5.0	200m			20m	150	Δ			5.0pZ	PE	X55c			
71#	BFS32	300m	200M	2.4m	Δ	45	45	5.0	200m	20n	100	50m	30	Δ			10p	PE	u34			
72#	BFS33	300m	200M	2.4m	Δ	45	45	5.0	200m	20n	100	2.0m	60	Δ			10p	PE	u34			
73#	BFS34	300m	200M	2.4m	Δ	45	30	5.0	200m	20n	100	2.0m	100	Δ			10p	PE	u34			
74	GI3644†	300m	200MΔ	3.0m	Δ	45	45	5.0		0.3u5	100	150m	100	Δ			8pZ					