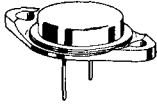


TYPE	MATERIAL	POLARITY	REPLACE- MENT	PAGE NUMBER	USE	MAXIMUM RATINGS					ELECTRICAL CHARACTERISTICS									
						P <sub>D</sub> @ 25°C	T <sub>J</sub> °C	V <sub>CB</sub> (volts)	V <sub>CE</sub> — (volts)	Subscript	h <sub>FE</sub> @ I <sub>C</sub>		V <sub>CE(SAT)</sub> @ I <sub>C</sub>		h <sub>FE</sub>	Subscript	f <sub>m</sub> Units	Subscript		
											(min)	(max)	Units	(volts)					Units	
2N1136B	G	P	2N1543	7-64	LPA		100	100	75	R	50	100	3.0A	1.0	3.0A			4.0K	F	
2N1137	G	P	2N1544	7-64	LPA		100	60	25	O	75	150	3.0A	1.0	3.0A					
2N1137A	G	P	2N1547	7-64	LPA		100	90	55	O	75	150	3.0A	1.0	3.0A					
2N1137B	G	P	2N1548	7-64	LPA		100	100	65	O	75	150	3.0A	1.0	3.0A					
2N1138	G	P	2N1545	7-64	LPA		100	60	25	O	100	200	3.0A	1.0	3.0A					
2N1138A	G	P	2N1547	7-64	LPA		100	90	55	O	100	200	3.0A	1.0	3.0A					
2N1138B	G	P	2N1548	7-64	LPA		100	100	65	O	100	200	3.0A	1.0	3.0A					
2N1139	S	N	2N835	8-54	HSS	6.6M	A	175	15	15	O	20	200	10M	0.7	10M		100M	T	
2N1141	G	P		9-19	RFA	750M	C	100	35		10		10M	2.0	50M		12	E		
2N1141A	G	P			RFA	750M	C	160	35	25	S	15		10M	2.0	50M	0.94	B	500M	T
2N1142	G	P		9-19	RFA	750M	C	100	30		10		10M	2.0	50M	0.98	B	600M	T	
2N1142A	G	P			RFA	750M	C	100	30	25	S	15		10M	2.0	50M	0.94	B	400M	T
2N1143	G	P		9-19	RFA	750M	C	100	25		10		10M	2.0	50M	0.98	B	480M	T	
2N1143A	G	P			RFA	750M	C	100	30	25	S	15		10M	2.0	50M	0.94	B	400M	T
2N1144	G	P	2N321	6-6	APC	175M	A	85	16	16	R	34	90	20M					4.0M	B
2N1145	G	P	2N1414	6-33	APC	175M	A	85	16	16	R	25	90	20M					1.0M	B
2N1146	G	P			PMS	87W	C	95	40	20	O	60	150	5.0A	1.0	15A			0.15M	E
2N1146A	G	P			PMS	87W	C	95	60	30	O	60	150	5.0A	1.0	15A			0.15M	E
2N1146B	G	P			PMS	87W	C	95	80	40	O	60	150	5.0A	1.0	15A			0.15M	E
2N1146C	G	P			PMS	87W	C	95	100	50	O	60	150	5.0A	1.0	15A			0.15M	E
2N1147	G	P			PMS	87W	C	95	40	20	O	60	150	5.0A	1.0	15A			0.15M	E
2N1147A	G	P			PMS	87W	C	95	60	30	O	60	150	5.0A	1.0	15A			0.15M	E
2N1147B	G	P			PMS	87W	C	95	80	40	O	60	150	5.0A	1.0	15A			0.15M	E
2N1147C	G	P			PMS	87W	C	95	100	50	O	60	150	5.0A	1.0	15A			0.15M	E
2N1149	S	N			AFA	150M	A	175	45		9.0	20	25M			0.9	B	4.0M	B	
2N1150	S	N			AFA	150M	A	175	45		18	40	25M			0.948	B	5.0M	B	
2N1151	S	N			AFA	150M	A	175	45		18	90	25M			0.948	B	8.0M	B	
2N1152	S	N			AFA	150M	A	175	45		36	90	25M			0.973	B	6.0M	B	
2N1153	S	N			AFA	150M	A	175	45		76	333	25M			0.987	B	7.0M	B	
2N1154	S	N			AFA	750M	C	150	50		9.0		60M			0.9	B	60M	B	
2N1155	S	N			AFA	750M	C	150	80		9.0		50M			0.9	B	50M	B	
2N1156	S	N			AFA	750M	C	150	120		9.0		40M			0.9	B	40M	B	
2N1157	G	P	MP501	7-210	PMS	187W	J	100	60	45	O	38	84	10A	0.8	40A			75K	T
2N1157A	G	P	MP502	7-210	PMS	187W	J	100	80	50	O	38	84	10A	0.8	40A			75K	T
2N1159	G	P	2N1143	9-19	RFA	60M	A	100	20	20	S						5.7	E		
2N1158A	G	P	2N1142	9-19	RFA	75M	A	100	20	20	S						9.0	E		
2N1159	G	P	2N3616	7-118	PMS	35W	C	95	80	60	O	30	75	3.0A	1.0	3.0A				
2N1160	G	P	2N3616	7-118	PMS	35W	C	95	80	60	O	20	50	5.0A	1.0	5.0A				
2N1162	G	P		7-53	PMS	90W	C	100	50	35	S	15	65	25A	0.8	25A			1.0K	E
2N1162A	G	P		7-53	PMS	90W	C	100	50	35	S	15	65	25A	0.8	25A			3.0K	E
2N1163	G	P		7-53	PMS	90W	C	100	30	35	S	15	65	25A	0.8	25A			1.0K	E
2N1163A	G	P		7-53	PMS	90W	C	100	30	35	S	15	65	25A	0.8	25A			3.0K	E
2N1164	G	P		7-53	PMS	90W	C	100	80	60	S	15	65	25A	0.8	25A			1.0K	E
2N1164A	G	P		7-53	PMS	90W	C	100	80	60	S	15	65	25A	0.8	25A			3.0K	E
2N1164C	G	P		7-53	PMS	90W	C	100	80	60	S	15	65	25A	0.8	25A			1.0K	E
2N1165A	G	P		7-53	PMS	90W	C	100	80	60	S	15	65	25A	0.8	25A			3.0K	E
2N1166	G	P		7-53	PMS	90W	C	100	100	75	S	15	65	25A	0.8	25A			1.0K	E
2N1166A	G	P		7-53	PMS	90W	C	100	100	75	S	15	65	25A	0.8	25A			3.0K	E
2N1167	G	P		7-53	PMS	90W	C	100	100	75	S	15	65	25A	0.8	25A			1.0K	E
2N1167A	G	P		7-53	PMS	90W	C	100	100	75	S	15	65	25A	0.8	25A			3.0K	E
2N1168	G	P	2N3614	7-118	LPA	45W	C	95	50	30	O	20								
2N1169	G	P			BMS	120M	A	71	40	20	O	20		200M	0.3	200M			4.5M	B
2N1170	G	N			BMS	120M	A	71	40	20	O	20		200M	0.3	200M			4.5M	B
2N1171	G	P			PMS	170M	A	85	30	12	O	30		30M					10M	B
2N1172	G	P	2N2137	7-78	PMS	95	A	40	30		O	30	90	100M						
2N1173	G	N			MSS	0.25W	A	100	35	20	O	50	200	10M	0.075	10M	50	E		
2N1174	G	P			MSS	0.25W	A	100	35	20	O	50	200	10M	0.075	10M	50	E		
2N1175	G	P		6-33	AFA	200M	A	85	35	25	R	70	140	20M					1.5M	B
2N1176	G	P	2N1189	6-28	AFA	0.3W	C	85	10	10	R				0.3	0.1A	20	E		
2N1177	G	P	2N2957	8-173	RFA	80M	A	71	30		R	33		10M			190	E	1.7M	B
2N1178	G	P	2N2955	8-173	RFA	80M	A	71	30		R	33		10M			30	E	0.75M	B
2N1179	G	P	2N2956	8-173	RFA	80M	A	71	30		R	33		10M			30	E	0.75M	B
2N1180	G	P	2N2956	8-173	RFA	80M	A	71	30		R	33		10M			30	E	0.75M	B
2N1182	G	P	2N2140	7-78	PMS	106W	C	100	50	20	O	30	85	0.5A	0.9	2.0A			5.0K	E
2N1183	G	P	2N2140	7-78	PMS	187W	C	100	45	20	O	20	60	400M	0.5	400M			500K	B
2N1183A	G	P	2N2140	7-78	PMS	7.5W	C	100	60	30	O	20	60	400M	0.5	400M			500K	B
2N1183B	G	P	2N2141	7-78	PMS	7.5W	C	100	80	40	O	20	60	400M	0.5	400M			500K	B
2N1184	G	P	2N2144	7-78	PMS	7.5W	C	100	45	20	O	40	120	400M	0.5	400M			500K	B
2N1184A	G	P	2N2145	7-78	PMS	7.5W	C	100	60	30	O	40	120	400M	0.5	400M			500K	B
2N1184B	G	P	2N2146	7-78	PMS	7.5W	C	100	80	40	O	40	120	400M	0.5	400M			500K	B
2N1185	G	P		6-25	AFA	200M	A	100	45	30	R	130		10M			190	E	1.7M	B
2N1186	G	P		6-25	AFA	200M	A	100	60	45	R	33		10M			30	E		

**2N1162** thru **2N1167** (GERMANIUM)  
**2N1162A** thru **2N1167A**  
**2N1165** JAN AVAILABLE

$V_{CB} = 50-100 \text{ V}$   
 $I_C = 25 \text{ A}$   
 $P_D = 106 \text{ W}$



PNP germanium power transistors for switching and amplifier applications in high reliability equipment.

**CASE 3,4**  
 (TO-3,41)

TO-3 package (without lugs)  
 even numbered types.

TO-41 package (with lugs)  
 odd numbered types.

**MAXIMUM RATINGS**

Apply also to standard, non-A series

Rating	Symbol	2N1162A 2N1163A	2N1164A 2N1165A	2N1166A 2N1167A	Units
Collector-Base Voltage	$V_{CB}$	50	80	100	Vdc
Collector-Emitter Voltage	$V_{CES}$	35	60	75	Vdc
Emitter-Base Voltage	$V_{EB}$	25	40	50	Vdc
Total Device Dissipation @ 25°C Derate above 25°C	$P_D$	106 1.25			Watts W/°C
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +110			°C

**2N1162 thru 2N1167 (continued)**

**GROUP A ELECTRICAL CHARACTERISTICS (T<sub>c</sub> = 25°C unless otherwise noted)**

Characteristic	Symbol	Min	Typ	Max	Unit
Collector Cutoff Current (V <sub>CB</sub> = BV <sub>CBO(max)</sub> , I <sub>E</sub> = 0)	I <sub>CBO1</sub>	—	3	15	mA
Collector Cutoff Current (V <sub>CB</sub> = 2 V, I <sub>E</sub> = 0)	I <sub>CBO</sub>	—	125	225	μA
(V <sub>CB</sub> = 15 V, I <sub>E</sub> = 0, T <sub>C</sub> = 90°C) 2N1162A-3A*		—	10	20	mA
(V <sub>CB</sub> = 30 V, I <sub>E</sub> = 0, T <sub>C</sub> = 90°C) 2N1164A-7A*		—	10	20	mA
Collector-Emitter Breakdown Voltage** (I <sub>C</sub> = 500 mA, V <sub>EB</sub> = 0)	BV <sub>CES</sub> **	35	—	—	Vdc
2N1162A-3A*		60	—	—	
2N1164A-5A*		75	—	—	
2N1166A-7A*					
Emitter Cutoff Current (V <sub>EB</sub> = 12 V, I <sub>C</sub> = 0)	I <sub>EBO</sub>	—	0.5	1.2	mA
DC Forward Current Gain (V <sub>CE</sub> = 1 V, I <sub>C</sub> = 25 A)	h <sub>FE1</sub>	15	25	—	—
(V <sub>CE</sub> = 2 V, I <sub>C</sub> = 5 A)	h <sub>FE</sub>	—	65	125	—
Collector-Emitter Saturation Voltage (I <sub>C</sub> = 25 A, I <sub>B</sub> = 1.6 A)	V <sub>CE(sat)</sub>	—	0.3	0.8	volts
Base-Emitter Saturation Voltage (I <sub>C</sub> = 25 A, I <sub>B</sub> = 1.6 A)	V <sub>BE(sat)</sub>	—	0.7	1.7	volts
Common Emitter-Cutoff Frequency (V <sub>CE</sub> = 2 V, I <sub>C</sub> = 2 A)	f <sub>αe</sub>	—	4	—	kHz

\*Characteristics apply also to corresponding, non-A type numbers

\*\*Sweep Method: 1/2 cycle sine wave, 60 Hz

**SWITCHING CHARACTERISTICS (Typical)**

Saturated Collector Current	Pulsed Drive Base Current		Response times in μs		
	On	Off	t <sub>d</sub> + t <sub>r</sub>	t <sub>s</sub>	t <sub>f</sub>
5 amp	330 mA	100 mA	11	5	17
10 amp	660 mA	200 mA	15	4	20
25 amp	1650 mA	500 mA	19	3	18

**FIGURE 1 — POWER TEMPERATURE DERATING CURVE**

