

ALPHANUMERIC INDEX — CROSS-REFERENCE (Continued)

Industry Part Number	Motorola Direct Replacement	Motorola Similar Replacement	Page Number	Industry Part Number	Motorola Direct Replacement	Motorola Similar Replacement	Page Number
BD807	BD807		3-316	BD938	BD242B		3-282
BD808	BD808		3-318	BD939	BD241C		3-282
BD809	BD809		3-316	BD940	BD242C		3-282
BD810	BD810		3-318	BD941		MJE15030	3-972
BD813		MJE181	3-862	BD942		MJE15031	3-972
BD814		MJE171	3-862	BD943		2N6122	3-154
BD815		MJE182	3-862	BD944		2N6125	3-154
BD816		MJE172	3-862	BD945		2N6122	3-154
BD817		MJE243	3-870	BD946		2N6125	3-154
BD818		MJE253	3-870	BD947		2N6122	3-154
BD825		MJE181	3-862	BD948		2N6125	3-154
BD826		MJE171	3-862	BD949		2N6122	3-154
BD827		MJE182	3-862	BD950		2N6125	3-154
BD828		MJE172	3-862	BD951		2N6123	3-154
BD829		MJE243	3-870	BD952		2N6125	3-154
BD830		MJE253	3-870	BD953	BD241C		3-282
BD833	BD785		3-304	BD954	BD242C		3-282
BD834	BD786		3-304	BD955		MJE15030	3-972
BD835	BD787		3-304	BD956		MJE15031	3-972
BD836	BD788		3-304	BD957		BD777	3-302
BD837	BD789		3-308	BD977		BD777	3-302
BD838	BD790		3-308	BD978	BD778		3-302
BD839		BD790	3-308	BD979	BD779		3-302
BD861	BD675		3-298	BD980	BD780		3-302
BD862	BD676		3-300	BDT29	TIP29		3-1071
BD863	BD677		3-298	BDT29A	TIP30		3-1071
BD864	BD678		3-300	BDT29B	TIP29B		3-1071
BD865	BD679		3-298	BDT29C	TIP29C		3-1071
BD866	BD680		3-300	BDT30	TIP30A		3-1071
BD875	BD775		—	BDT30B	TIP30B		3-1071
BD876	BD776		3-302	BDT30C	TIP30C		3-1071
BD877	BD777		3-302	BDT31	TIP31		3-1073
BD878	BD778		3-302	BDT31A	TIP31A		3-1073
BD879	BD779		3-302	BDT31B	TIP31B		3-1073
BD880	BD780		3-302	BDT31C	TIP31C		3-1073
BD895	BD895		3-320	BDT32	TIP32		3-1073
BD895A	BD895A		3-320	BDT32A	TIP32A		3-1073
BD896	BD896		3-322	BDT32B	TIP32B		3-1073
BD896A	BD896A		3-322	BDT32C	TIP32C		3-1073
BD897	BD897		3-320	BDT41	TIP41		3-1083
BD897A	BD897A		3-320	BDT41A	TIP41A		3-1083
BD898	BD898		3-322	BDT41B	TIP41B		3-1083
BD898A	BD898A		3-322	BDT41C	TIP41C		3-1083
BD899	BD899		3-320	BDT42	TIP42		3-1083
BD899A	BD899A		3-320	BDT42A	TIP42A		3-1083
BD900	BD900		3-322	BDT42B	TIP42B		3-1083
BD900A	BD900A		3-322	BDT42C	TIP42C		3-1083
BD901	BD901		3-320	BDT60	TIP125		3-1098
BD902	BD902		3-322	BDT60A	TIP126		3-1098
BD905	N26486		—	BDT60B	TIP127		3-1098
BD906	2N6489		3-207	BDT60C	BDX53D		3-338
BD907	2N6487		3-207	BDT61	TIP120		3-1098
BD908	2N6490		3-207	BDT61A	TIP121		3-1098
BD909	2N6488		3-207	BDT61B	TIP122		3-1098
BD910	2N6491		3-207	BDT61C	BDX53D		3-338
BD933	BD241		3-282	BDT62	BDW45		3-328
BD934	BD242		3-282	BDT62A	BDW46		3-328
BD935	BD241A		3-282	BDT62B	BDW47		3-328
BD936	BD242A		3-282	BDT62C	BDW48		3-328
BD937	BD241B		3-282	BDT63	BDW40		3-328

*Consult Motorola if a direct replacement is necessary.

ALPHANUMERIC INDEX — CROSS-REFERENCE (Continued)

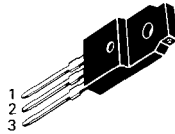
Industry Part Number	Motorola Direct Replacement	Motorola Similar Replacement	Page Number	Industry Part Number	Motorola Direct Replacement	Motorola Similar Replacement	Page Number
BDT63A	BDW41		3-328	BDW51C	2N5882		3-123
BDT63B	BDW42		3-328	BDW52	2N3791		3-56
BDT63C	BDW43		3-328	BDW52A	2N3792		3-56
BDT64	BDW44		3-328	BDW52B	2N3792		3-56
BDT64A	BDW45		3-328	BDW52C	2N5880		3-123
BDT64B	BDW46		3-328	BDW53	TIP120		3-1098
BDT64C	BDW47		3-328	BDW53A	TIP120		3-1098
BDT65	BDW40		3-328	BDW53B	TIP121		3-1098
BDT65A	BDW41		3-328	BDW53C	BDX53C		3-338
BDT65B	BDW42		3-328	BDW53D	BDX53D		3-338
BDT65C	BDW43		3-328	BDW54	TIP125		3-1098
BDT91	BD807		3-316	BDW54A	TIP125		3-1098
BDT92	BD808		3-318	BDW54B	TIP126		3-1098
BDT93	BD809		3-316	BDW54C	BDX54C		3-338
BDT94	BD810		3-318	BDW54D	BDX54D		3-338
BDV64	BDV64		3-324	BDW55	BD135		3-258
BDV64A	BDV64A		3-324	BDW56	BD136		3-260
BDV64B	BDV64B		3-324	BDW57	BD137		3-258
BDV64C		BDV64B	3-324	BDW58	BD138		3-260
BDV65	BDV65		3-324	BDW59	BD139		3-258
BDV65A	BDV65A		3-324	BDW60	BD140		3-260
BDV65B	BDV65B		3-324	BDW63	BDX53		3-338
BDV65C		BDV65B	3-324	BDW63A	BDX53A		3-338
BDV66C	MJH11018		3-1034	BDW63B	BDX53B		3-338
BDV66C	MJH11017		3-1034	BDW63C	BDX53C		3-338
BDV66D	MJH11019		3-1034	BDW63D	BDX53D		3-338
BDV67D	MJH11020		3-1034	BDW64	BDX54		3-338
BDV91	MJE3055T		3-904	BDW64A	BDX54A		3-338
BDV92	TIP34B		3-1077	BDW64B	BDX54B		3-338
BDV93	TIP34C		3-1077	BDW64C	BDX54C		3-338
BDV94	TIP2955		3-1108	BDW73	BD895		3-320
BDV95	TIP33B		3-1077	BDW73A	BD897		3-320
BDV96	TIP33C		3-1077	BDW73B	BD899		3-320
BDW21	2N3714		3-26	BDW73C	BD901		3-320
BDW21A	2N3714		3-26	BDW73D	BDX33D		3-334
BDW21B	2N3714		3-26	BDW74	BD896		3-322
BDW21C		2N5882	3-123	BDW74A	BD898		3-322
BDW22	2N3789		3-56	BDW74B	BD900		3-322
BDW22A	2N3789		3-56	BDW74C	BD902		3-322
BDW22B	2N3790		3-56	BDW74D	BDX34D		3-334
BDW22C	2N5880		3-123	BDW83	BDV65		3-324
BDW23	BDX53		3-338	BDW83A	BDV65		3-324
BDW23A	BDX53A		3-338	BDW83B	BDV65A		3-324
BDW23B	BDX53B		3-338	BDW83C	BDV65B		3-324
BDW23C	BDX53C		3-338	BDW84	BDV64		3-324
BDW24	BDX54		3-338	BDW84A	BDV64		3-324
BDW24A	BDX54A		3-338	BDW84B	BDV64A		3-324
BDW24B	BDX54B		3-338	BDW84C	BDV64B		3-324
BDW24C	BDX54C		3-338	BDW93	BDW39		3-328
BDW39	BDW39		3-328	BDW93A	BDW40		3-328
BDW40	BDW40		3-328	BDW93B	BDW41		3-328
BDW41	BDW41		3-328	BDW93C	BDW42		3-328
BDW42	BDW42		3-328	BDW94	BDW44		3-328
BDW44	BDW44		3-328	BDW94A	BDW45		3-328
BDW45	BDW45		3-328	BDW94B	BDW46		3-328
BDW46	BDW46		3-328	BDW94C	BDW47		3-328
BDW47	BDW47		3-328	BDX10	2N3055A		3-9
BDW51	2N3715		3-26	BDX10-4	2N3055A		3-9
BDW51A	2N3715		3-26	BDX10-6	2N3055A		3-9
BDW51B	2N3716		3-26	BDX10-7	2N3055A		3-9

*Consult Motorola if a direct replacement is necessary.

TABLE 5 — PLASTIC TO-220 (continued)

I _C Cont Amps Max	V _{CEO} (sus) Volts Min	Device Type		h _{FE} Min/Max	@ I _C Amp	Resistive Switching			f _T MHz Min	P _D (Case) Watts @ 25°C
		NPN	PNP			t _s μs Max	t _f μs Max	@ I _C Amp		
10	60	D44H7	D45H7	20 min	4					50
		D44H8	D45H8	40 min	4					50
			D45H9	40 min	4					50
		MJE2801T		25/100	3					75
		MJE3055T	MJE2955T	20/70	4					75
		2N6387##	2N6667##	1k/20k	5				20#	65
		SE9300##	SE9400##	1k min	4				1#	70
	80	BDX33B##	BDX34B##	750 min	3				3	70
		BD809	BD810	15 min	4				1.5	90
		D44E3##		1000 min	5	2 typ	0.5 typ	10		50
			D45H12	40 min	4					50
		2N6388##	2N6668##	1k/20k	5				20#	65
		D44H10	D45H10	20 min	4	0.5 typ	0.14 typ	5	50 typ	50
12	300	D44H11	D45H11	40 min	4	0.5 typ	0.14 typ	5	50 typ	50
		SE9301##	SE9401##	1k min	4				1#	70
		BDX33C##	BDX34C##	750 min	3				3	70
		SE9302##	SE9402##	1k min	4				1#	70
		MJE13008		6/30	8	3	0.7	8	4	100
		MJE13009		6/30	8	3	0.7	8	4	100
	400	D44VH1	D45VH1	20 min	4	0.7	0.09	8	50 typ	83
		2N6486	2N6489	20/150	5	0.6 typ	0.3 typ	5	5	75
		BDW39	BDW44	1 k min	5	1 typ	1.5 typ	5	4	85
		D44VH4	D45VH4	20 min	4	0.5	0.09	8	50 typ	83
		2N6487	2N6490	20/150	5	0.6 typ	0.3 typ	5	5	75
		BDW40	BDW45	1 k min	5	1 typ	1.5 typ	5	4	85
15	30	D44VH7		20 min	4	0.5	0.09	8	50 typ	85
		2N6488	2N6491	20/150	5	0.6 typ	0.3 typ	5	5	75
		BDW41	BDW46	1 k min	5	1 typ	1.5 typ	5	4	85
		D44VH10	D45VH10	20 min	4	0.5	0.09	8	50 typ	83
		BDW42	BDW47	1 k min	5	1 typ	1.5 typ	5	4	85
		BDW43	BDW48	1 k min	5	1 typ	1.5 typ	5	4	85

|h_{FE}| @ 1 MHz, ## Darlington

TABLE 6 — PLASTIC Full Pak (TO-220 Type)

CASE 221C-02

I _C Cont Amps Max	V _{CEO} (sus) Volts Min	Device Type		h _{FE} Min/Max	@ I _C Amp	Resistive Switching			f _T MHz Min	P _D (Case) Watts @ 25°C
		NPN	PNP			t _s μs Max	t _f μs Max	@ I _C Amp		
1	250	MJF47		30/150	0.3	2 typ	0.17 typ	0.3	10	28
5	100	MJF122##	MJF127##	2000 min	3	1.5 typ	1.5 typ	3	4#	28
8	80		MJF6107	30/90	2	0.5 typ	0.13 typ	2	4	35
	100	MJF102##	MJF107##	3000 min	3	1.5 typ	1.5 typ	3	4#	35
	150	MJF15030	MJF15031	40 min	3	1 typ	0.15 typ	3	30	35
10	60	MJF3055	MJF2955	20/100	4				2	40

|h_{FE}| @ 1 MHz, ## Darlington

MOTOROLA SEMICONDUCTOR TECHNICAL DATA

**BD805
BD807
BD809**

PLASTIC HIGH POWER SILICON NPN TRANSISTOR

... designed for use in high power audio amplifiers utilizing complementary or quasi complementary circuits.

- DC Current— $h_{FE} = 30$ (Min) @ $I_C = 2.0$ Adc
- BD 805, 807, 809 are complementary with BD 806, 808, 810

**10 AMPERE
POWER TRANSISTOR**

NPN SILICON

**45, 60, 80 VOLTS
90 WATTS**

MAXIMUM RATINGS

Rating	Symbol	Type	Value	Unit
Collector-Emitter Voltage	V_{CEO}	BD805 BD807 BD809	45 60 80	Vdc
Collector-Base Voltage	V_{CBO}	BD805 BD807 BD809	55 70 80	Vdc
Emitter-Base Voltage	V_{EBO}		5	Vdc
Collector Current	I_C		10.0	Adc
Base Current	I_B		6.0	Adc
Total Device Dissipation Derate above 25°C	P_D		90 720	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}		55 to +150	°C

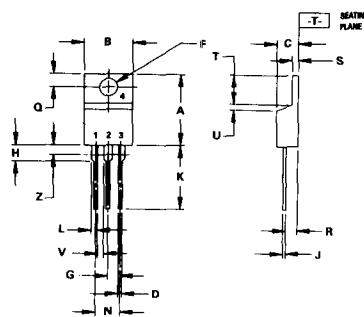
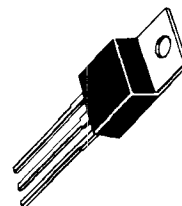
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	1.39	°C/W

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Type	Min	Max	Unit
Collector-Emitter Sustaining Voltage* ($I_C = 0.2$ Adc, $I_B = 0$)	BV_{CEO}	BD805 BD807 BD809	45 60 80	—	Vdc
Collector Cutoff Current ($V_{CB} = 55$ Vdc, $I_E = 0$) ($V_{CB} = 70$ Vdc, $I_E = 0$) ($V_{CB} = 80$ Vdc, $I_E = 0$)	I_{CBO}	BD805 BD807 BD809	—	1.0 1.0 1.0	mA
Emitter Cutoff Current ($V_{BE} = 5.0$ Vdc, $I_C = 0$)	I_{EBO}		—	2.0	mA
DC Current Gain ($I_C = 2$ A, $V_{CE} = 2$ V) ($I_C = 4$ A, $V_{CE} = 2$ V)	h_{FE}		30 15	—	
Collector-Emitter Saturation Voltage* ($I_C = 4$ Adc, $I_B = 0.4$ Adc)	$V_{CE(sat)}$		—	1.1	Vdc
Base-Emitter On Voltage* ($I_C = 4$ Adc, $V_{CE} = 2.0$ Vdc)	$V_{BE(on)}$		—	1.6	Vdc
Current Gain-Bandwidth Product ($I_C = 1.0$ Adc, $V_{CE} = 10$ Vdc, $f = 1.0$ MHz)	f_T		15	—	MHz

* Pulse Test. Pulse Width ≤ 300 μ s. Duty Cycle $\leq 2.0\%$.



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1987.
 2. CONTROLLING DIMENSION: INCH.
 3. DIM Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	14.48	15.75	0.570	0.620
B	9.65	10.28	0.380	0.405
C	4.07	4.92	0.160	0.190
D	0.64	0.88	0.025	0.035
F	3.61	3.73	0.142	0.147
G	2.42	2.66	0.095	0.105
H	2.90	3.93	0.110	0.155
J	0.45	0.71	0.018	0.028
K	12.70	14.27	0.500	0.562
L	1.15	1.39	0.045	0.055
N	4.83	5.33	0.190	0.210
Q	2.54	3.04	0.100	0.120
R	2.04	2.79	0.080	0.110
S	1.15	1.39	0.045	0.055
T	5.97	6.47	0.235	0.255
U	0.00	1.27	0.000	0.050
V	1.15	—	0.045	—
Z	—	2.04	—	0.080

STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

**CASE 221A-04
TO-220AB**

BD805, BD807, BD809

FIGURE 1 — ACTIVE REGION DC
SAFE OPERATING AREA

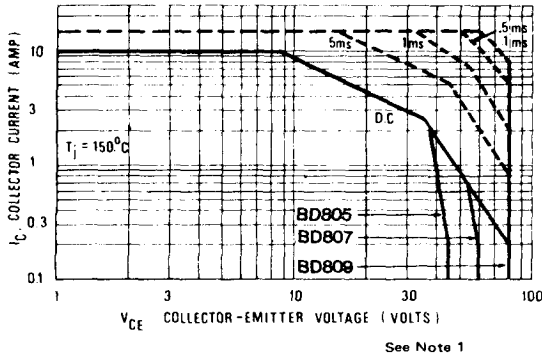


FIGURE 2 — POWER-TEMPERATURE
DERATING CURVE

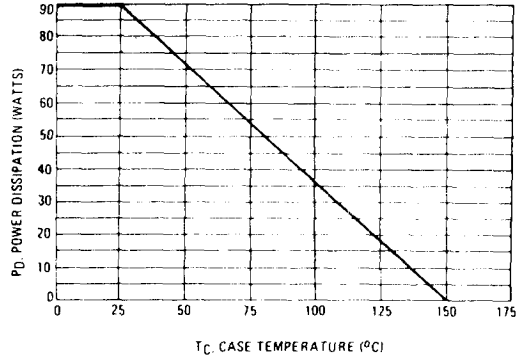


FIGURE 3 — "ON" VOLTAGES

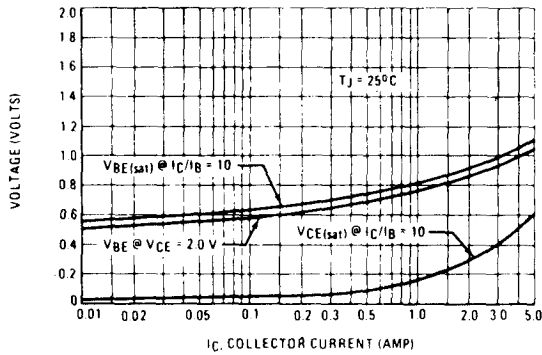


FIGURE 4 — CURRENT GAIN

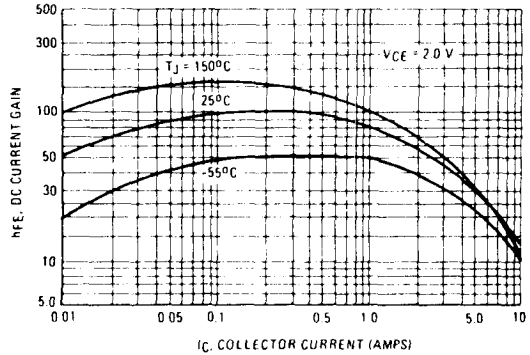
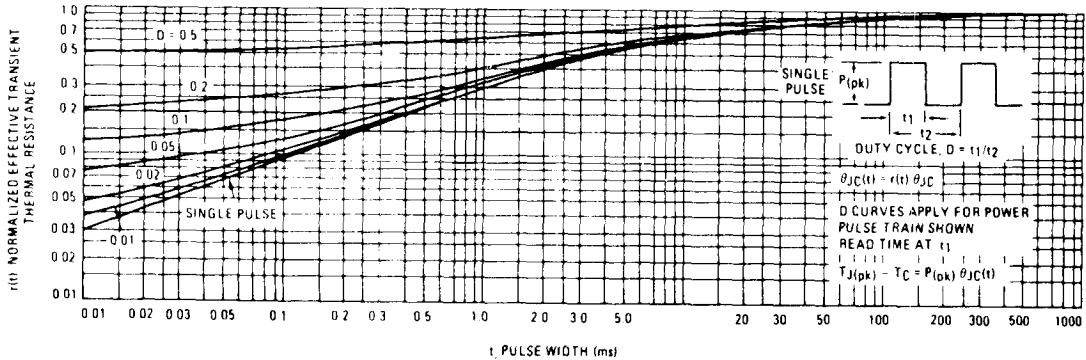


FIGURE 5 — THERMAL RESPONSE



Note 1:

There are two limitations on the power handling ability of a transistor, average junction temperature and second breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation, i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 1 is based on $T_J(pk) = 150^\circ\text{C}$; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_J(pk) \leq 150^\circ\text{C}$. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown. (See AN-415)