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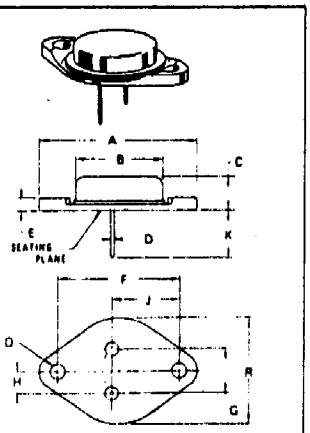
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MJ10015
MJ10016

50 AMPERE

NPN SILICON POWER DARLINGTON TRANSISTORS

400 and 500 VOLTS
250 WATTS



STYLE 1
PIN 1 BASE
2 EMITTER
CASE COLLECTOR

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	38.35	39.37	1.510	1.550
B	19.05	21.08	0.750	0.830
C	8.26	9.02	0.325	0.355
D	1.45	1.68	0.057	0.063
E	–	3.43	–	0.135
F	–	29.90	–	1.177
G	29.90	30.40	1.177	1.197
H	10.67	11.18	0.420	0.440
J	5.21	5.72	0.205	0.225
K	16.64	17.15	0.655	0.675
L	11.18	12.19	0.440	0.480
Q	3.84	4.09	0.151	0.161
R	24.89	26.67	0.980	1.050

(TO-3 TYPE)

MAXIMUM RATINGS

Rating	Symbol	MJ10015	MJ10016	Unit
Collector-Emitter Voltage	V_{CEO}	400	500	Vdc
Collector-Emitter Voltage	V_{CEV}	600	700	Vdc
Emitter Base Voltage	V_{EB}	8.0		Vdc
Collector Current – Continuous – Peak (1)	I_C I_{CM}	50 75		Adc
Base Current – Continous – Peak (1)	I_B I_{BM}	10 15		Adc
Total Power Dissipation @ T_C = 25°C @ T_C = 100°C Derate above 25°C	P_D	250 143 1.43		Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.7	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds	T_L	275	°C

(1) Pulse Test: Pulse Width = 5 ms, Duty Cycle ≤ 10%

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS (1)						
Collector-Emitter Sustaining Voltage (Table 1) (I_C = 100 mA, I_B = 0, V_{clamp} = Rated V_{CEO})	MJ10015 MJ10016	$V_{CEO(sus)}$	400 500	– –	– –	Vdc
Collector Cutoff Current (V_{CEV} = Rated Value, $V_{BE(off)}$ = 1.5 Vdc)		I_{CEV}	–	–	0.25	mAdc
Emitter Cutoff Current (V_{EB} = 2.0 Vdc, I_C = 0)		I_{EBO}	–	–	350	mAdc
SECOND BREAKDOWN						
Second Breakdown Collector Current with Base Forward Biased		$I_{S/b}$	See Figure 7			
Clamped Inductive SOA with Base Reverse Biased		RBSOA	See Figure 8			
ON CHARACTERISTICS (1)						
DC Current Gain (I_C = 20 Adc, V_{CE} = 5.0 Vdc) (I_C = 40 Adc, V_{CE} = 5.0 Vdc)		h_{FE}	25 10	– –	– –	–
Collector-Emitter Saturation Voltage (I_C = 20 Adc, I_B = 1.0 Adc) (I_C = 50 Adc, I_B = 10 Adc)		$V_{CE(sat)}$	– –	– –	2.2 5.0	Vdc
Base-Emitter Saturation Voltage (I_C = 20 Adc, I_B = 1.0 Adc)		$V_{BE(sat)}$	–	–	2.75	Vdc
Diode Forward Voltage (2) (I_F = 20 Adc)		V_f	–	2.5	6.0	Vdc
DYNAMIC CHARACTERISTIC						
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f_{test} = 100 kHz)		C_{ob}	–	–	750	pF
SWITCHING CHARACTERISTICS						
Resistive Load (Table 1)						
Delay Time	(V_{CC} = 250 Vdc, I_C = 20 A, I_{B1} = 1.0 Adc, $V_{BE(off)}$ = 5 Vdc, t_p = 25 μs Duty Cycle ≤ 2%).	t_d	–	0.14	0.3	μs
Rise Time		t_r	–	0.3	1.0	μs
Storage Time		t_s	–	0.8	2.5	μs
Fall Time		t_f	–	0.3	1.0	μs
Inductive Load, Clamped (Table 1)						
Storage Time	(I_C = 20 A(pk), V_{clamp} = 250 V, I_{B1} = 1.0 A, $V_{BE(off)}$ = 5.0 Vdc)	t_{sv}	–	1.0	2.5	μs
Crossover Time		t_c	–	0.36	1.0	μs

(1) Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2%.
(2) The internal Collector-to-Emitter diode can eliminate the need for an external diode to clamp inductive loads. Tests have shown that the Forward Recovery Voltage (V_f) of this diode is comparable to that of typical fast recovery rectifiers.