

Darlington Power Transistor

DPAK For Surface Mount Application

... for general purpose power and switching output or driver stages in applications such as switching regulators, converters, and power amplifiers.

- Lead Formed for Surface Mount Application in Plastic Sleeves (No Suffix)
- Straight Lead Version in Plastic Sleeves ("–1" Suffix)
- Lead Formed Version in 16 mm Tape and Reel for Surface Mount ("T4" Suffix)
- Electrically Similar to Popular D44E3 Device
- High DC Gain — 1000 Min @ 5.0 Adc
- Low Sat. Voltage — 1.5 V @ 5.0 Adc
- Compatible With Existing Automatic Pick & Place Equipment

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	80	Vdc
Emitter–Base Voltage	V_{EB}	7	Vdc
Collector Current — Continuous	I_C	10	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	20 0.16	Watts W/ $^\circ\text{C}$
Total Power Dissipation (1) @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	1.75 0.014	Watts W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–55 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

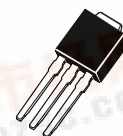
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	6.25	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient (1)	$R_{\theta JA}$	71.4	$^\circ\text{C}/\text{W}$
Lead Temperature for Soldering	T_L	260	$^\circ\text{C}$

(1) These ratings are applicable when surface mounted on the minimum pad size recommended.

MJD44E3*

*Motorola Preferred Device

**NPN DARLINGTON
 SILICON
 POWER TRANSISTOR
 10 AMPERES
 80 VOLTS
 20 WATTS**

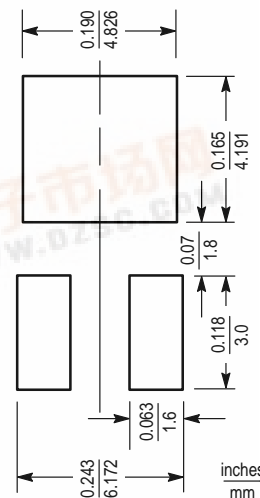


CASE 369–07



CASE 369A–13

MINIMUM PAD SIZES RECOMMENDED FOR SURFACE MOUNTED APPLICATIONS



MJD44E3

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector Cutoff Current ($V_{CE} = \text{Rated } V_{CEO}, V_{BE} = 0$)	I_{CES}	—	—	10	μA
Emitter Cutoff Current ($V_{EB} = 7 \text{ Vdc}$)	I_{EBO}	—	—	1	μA

ON CHARACTERISTICS

Collector–Emitter Saturation Voltage ($I_C = 5 \text{ Adc}, I_B = 10 \text{ mAdc}$) ($I_C = 10 \text{ Adc}, I_B = 20 \text{ mAdc}$)	$V_{CE(sat)}$	— —	— —	1.5 2	Vdc
Base–Emitter Saturation Voltage ($I_C = 5 \text{ Adc}, I_B = 10 \text{ mAdc}$)	$V_{BE(sat)}$	—	—	2.5	Vdc
DC Current Gain ($V_{CE} = 5 \text{ Vdc}, I_C = 5 \text{ Adc}$)	h_{FE}	1000	—	—	—

DYNAMIC CHARACTERISTICS

Collector Capacitance ($V_{CB} = 10 \text{ Vdc}, f_{test} = 1 \text{ MHz}$)	C_{cb}	—	—	130	pF
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SWITCHING TIMES

Delay and Rise Times ($I_C = 10 \text{ Adc}, I_{B1} = 20 \text{ mAdc}$)	$t_d + t_r$	—	0.6	—	μs
Storage Time ($I_C = 10 \text{ Adc}, I_{B1} = I_{B2} = 20 \text{ mAdc}$)	t_s	—	2	—	μs
Fall Time ($I_C = 10 \text{ Adc}, I_{B1} = I_{B2} = 20 \text{ mAdc}$)	t_f	—	0.5	—	μs

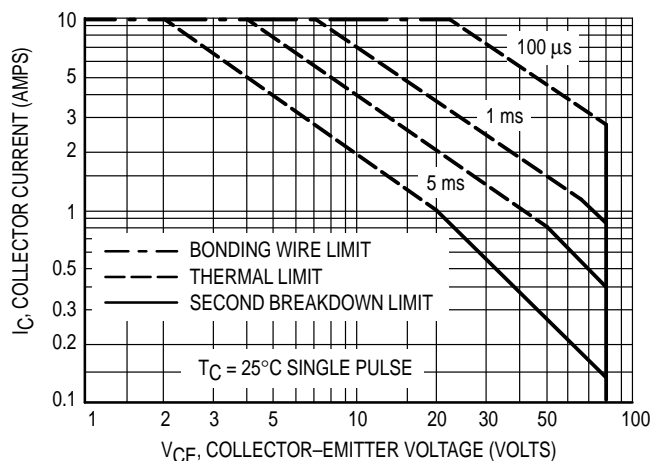


Figure 1. Maximum Forward Bias Safe Operating Area

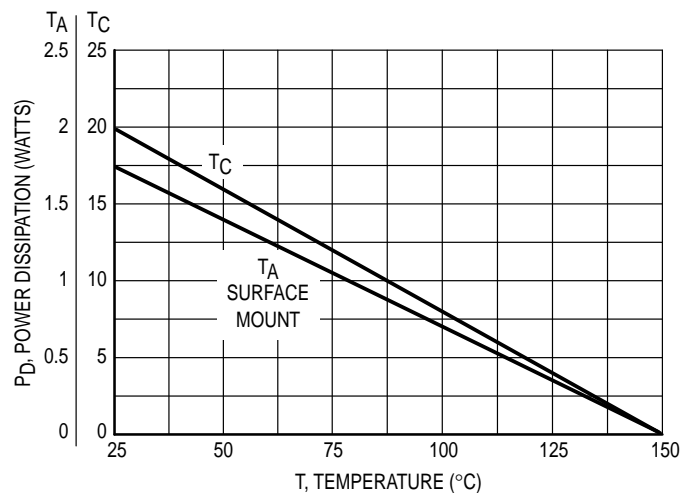



Figure 2. Power Derating

MJD44E3

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How to reach us:

USA/EUROPE/Locations Not Listed: Motorola Literature Distribution;
P.O. Box 5405, Denver, Colorado 80217. 303-675-2140 or 1-800-441-2447

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, 6F Seibu-Butsuryu-Center,
3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 81-3-3521-8315

Mfax™: RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609
– US & Canada ONLY 1-800-774-1848

ASIA/PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

INTERNET: <http://www.mot.com/SPS/>



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