MJD44E3*

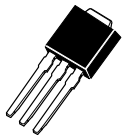
*Motorola Preferred Device

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

NPN DARLINGTON SILICON POWER TRANSISTOR 10 AMPERES 80 VOLTS 20 WATTS



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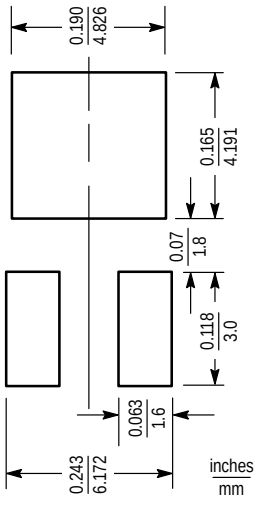
CASE 369A–13

MINIMUM PAD SIZES RECOMMENDED FOR SURFACE MOUNTED APPLICATIONS



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°C Derate above 25°C	P_D	 20 0.16	 Watts W/°C
Total Power Dissipation (1) @ T_A = 25°C Derate above 25°C	P_D	 1.75 0.014	 Watts W/°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	$R_{\theta JC}$	6.25	°C/W
Thermal Resistance, Junction to Ambient (1)	$R_{\theta JA}$	71.4	°C/W
Lead Temperature for Soldering	T_L	260	°C

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

Preferred devices are Motorola recommended choices for future use and best overall value.

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector Cutoff Current (V_{CE} = Rated V_{CEO}, V_{BE} = 0)	I_{CES}	—	—	10	μA
Emitter Cutoff Current (V_{EB} = 7 Vdc)	I_{EBO}	—	—	1	μA
ON CHARACTERISTICS					
Collector–Emitter Saturation Voltage (I_C = 5 Adc, I_B = 10 mAdc) (I_C = 10 Adc, I_B = 20 mAdc)	$V_{CE(sat)}$	 — —	 — —	 1.5 2	Vdc
Base–Emitter Saturation Voltage (I_C = 5 Adc, I_B = 10 mAdc)	$V_{BE(sat)}$	—	—	2.5	Vdc
DC Current Gain (V_{CE} = 5 Vdc, I_C = 5 Adc)	h_{FE}	1000	—	—	—
DYNAMIC CHARACTERISTICS					
Collector Capacitance (V_{CB} = 10 Vdc, f_{test} = 1 MHz)	C_{cb}	—	—	130	pF
SWITCHING TIMES					
Delay and Rise Times (I_C = 10 Adc, I_{B1} = 20 mAdc)	$t_d + t_r$	—	0.6	—	μs
Storage Time (I_C = 10 Adc, I_{B1} = I_{B2} = 20 mAdc)	t_s	—	2	—	μs
Fall Time (I_C = 10 Adc, I_{B1} = I_{B2} = 20 mAdc)	t_f	—	0.5	—	μs

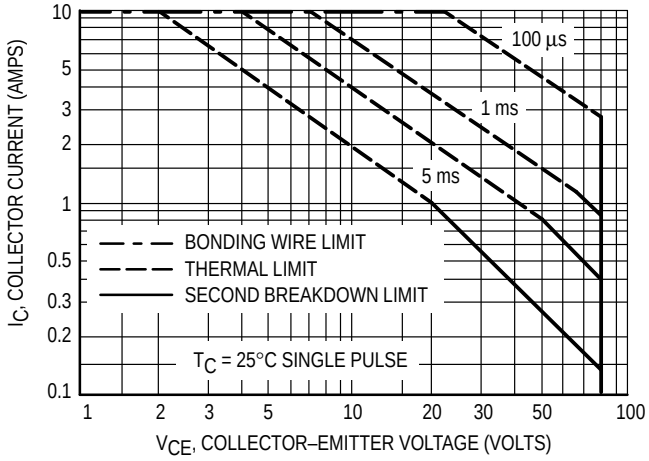


Figure 1. Maximum Forward Bias Safe Operating Area

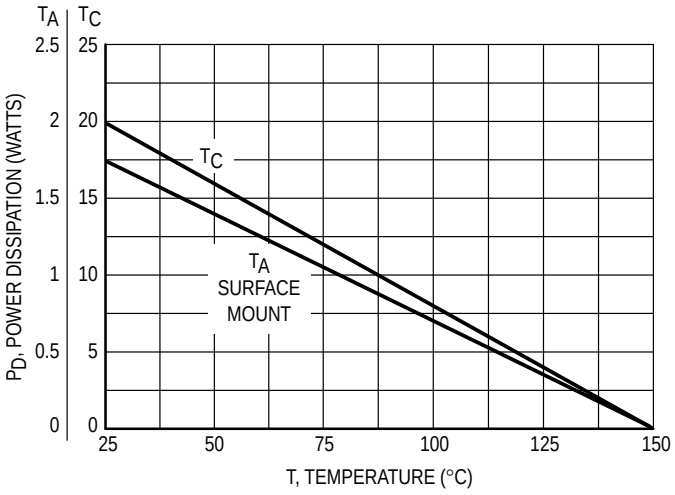
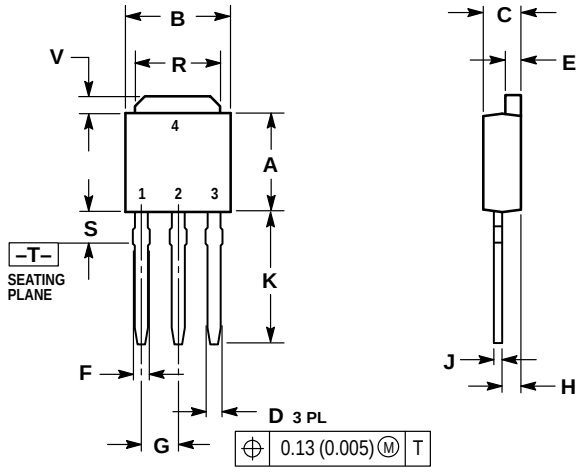


Figure 2. Power Derating

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.235	0.250	5.97	6.35
B	0.250	0.265	6.35	6.73
C	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
E	0.033	0.040	0.84	1.01
F	0.037	0.047	0.94	1.19
G	0.090 BSC		2.29 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.350	0.380	8.89	9.65
R	0.175	0.215	4.45	5.46
S	0.050	0.090	1.27	2.28
V	0.030	0.050	0.77	1.27

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

STYLE 2:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

STYLE 3:
PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

STYLE 4:
PIN 1. CATHODE
2. ANODE
3. GATE
4. ANODE

STYLE 5:
PIN 1. GATE
2. ANODE
3. CATHODE
4. ANODE

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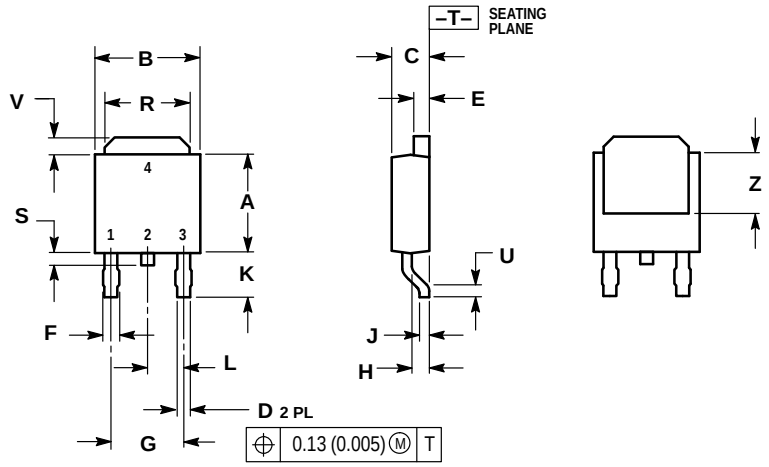

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B	0.250	0.265	6.35	6.73
C	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
E	0.033	0.040	0.84	1.01
F	0.037	0.047	0.94	1.19
G	0.180 BSC		4.58 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.102	0.114	2.60	2.89
L	0.090 BSC		2.29 BSC	
R	0.175	0.215	4.45	5.46
S	0.020	0.050	0.51	1.27
U	0.020	—	0.51	—
V	0.030	0.050	0.77	1.27
Z	0.138	—	3.51	—

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

STYLE 2:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

STYLE 3:
PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

STYLE 4:
PIN 1. CATHODE
2. ANODE
3. GATE
4. ANODE

STYLE 5:
PIN 1. GATE
2. ANODE
3. CATHODE
4. ANODE

CASE 369A–13
ISSUE W

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