

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

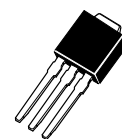
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	6.25	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient (1)	$R_{\theta JA}$	71.4	$^\circ\text{C/W}$
Lead Temperature for Soldering	T_L	260	$^\circ\text{C}$

(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**

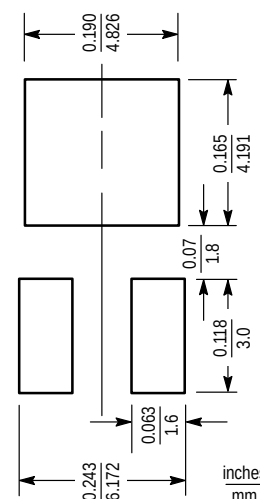


CASE 369–07



CASE 369A–13

MINIMUM PAD SIZES RECOMMENDED FOR SURFACE MOUNTED APPLICATIONS



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

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

Characteristic	Symbol	Min	Typ	Max	Unit
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

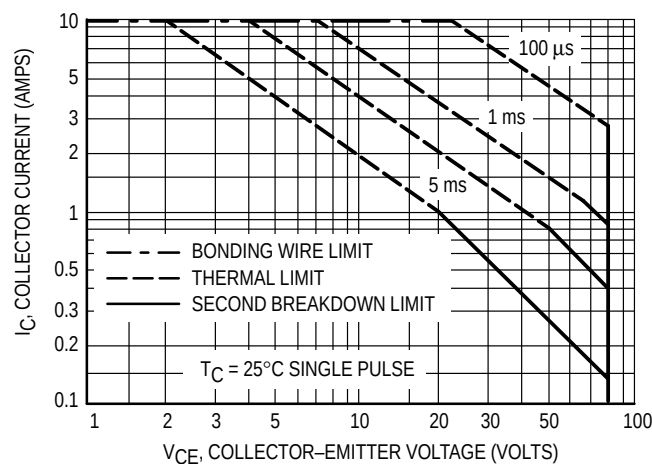
Collector–Emitter Saturation Voltage ($I_C = 5 \text{ Adc}, I_B = 10 \text{ mAdc}$) ($I_C = 10 \text{ Adc}, I_B = 20 \text{ mAdc}$)	$V_{CE(\text{sat})}$	— —	— —	1.5 2	Vdc
Base–Emitter Saturation Voltage ($I_C = 5 \text{ Adc}, I_B = 10 \text{ mAdc}$)	$V_{BE(\text{sat})}$	—	—	2.5	Vdc
DC Current Gain ($V_{CE}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

DYNAMIC CHARACTERISTICS

Collector Capacitance ($V_{CB} = 10 \text{ Vdc}, f_{\text{test}} = 1 \text{ MHz}$)	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**

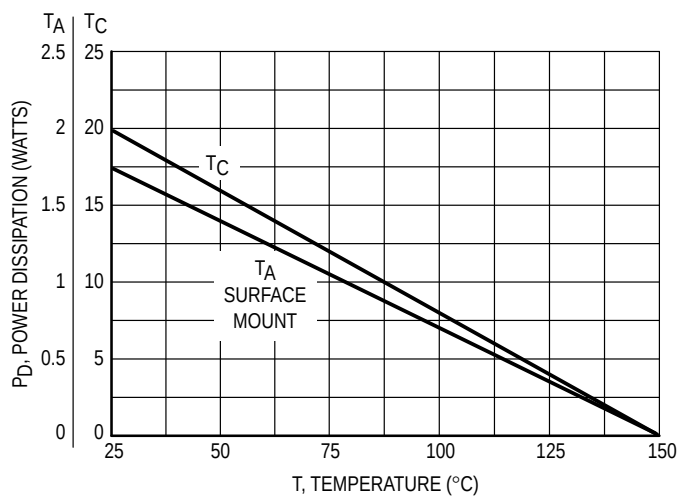
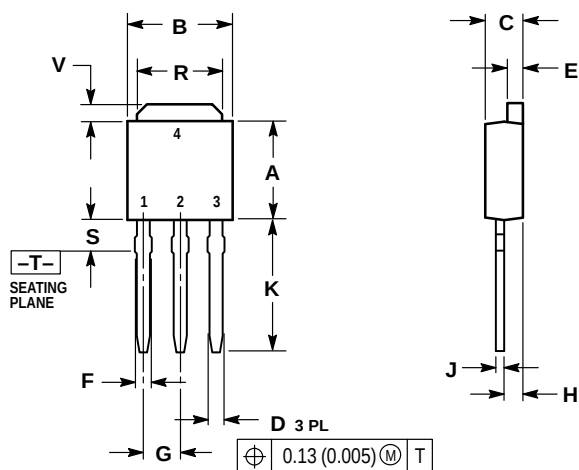


Figure 2. Power Derating

PACKAGE DIMENSIONS



NOTES:

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

DIM	INCHES		MILLIMETERS	
	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:

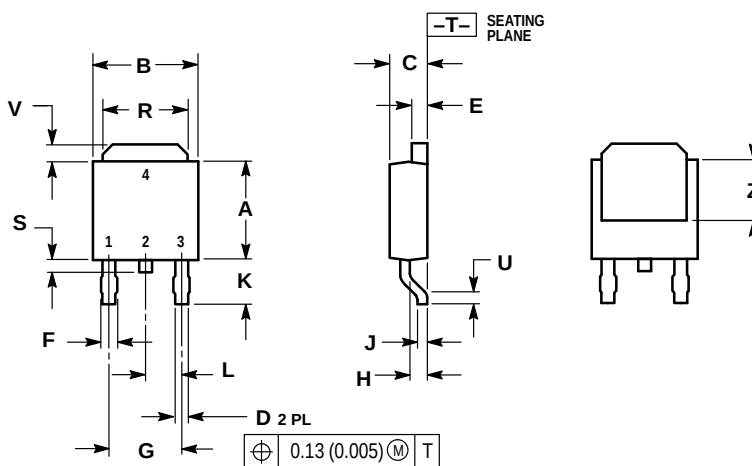
- PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

STYLE 4:

- PIN 1. CATHODE
2. ANODE
3. GATE
4. ANODE

STYLE 5:

- PIN 1. GATE
2. ANODE
3. CATHODE
4. ANODE

CASE 369-07
ISSUE K

NOTES:

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

DIM	INCHES		MILLIMETERS	
	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	0.180 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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