- Designed for Complementary Use with the BD250 Series
- 125 W at 25°C Case Temperature
- 25 A Continuous Collector Current
- 40 A Peak Collector Current
- Customer-Specified Selections Available

# SOT-93 PACKAGE (TOP VIEW) B 1 C 2 3

Pin 2 is in electrical contact with the mounting base.

MDTRAA

# absolute maximum ratings at 25°C case temperature (unless otherwise noted)

RATING			VALUE	UNIT
	BD249		55	
Collector-emitter voltage ( $R_{BE}$ = 100 $\Omega$ )	BD249A	V	70	V
	BD249B	V <sub>CER</sub>	90	V
	BD249C		115	
	BD249		45	
Collector-emitter voltage (I <sub>C</sub> = 30 mA)	BD249A	V	60	V
	BD249B	V <sub>CEO</sub>	80	
	BD249C		100	
Emitter-base voltage	V <sub>EBO</sub>	5	V	
Continuous collector current	I <sub>C</sub>	25	Α	
Peak collector current (see Note 1)	I <sub>CM</sub>	40	Α	
Continuous base current			5	Α
Continuous device dissipation at (or below) 25°C case temperature (see Note 2)			125	W
Continuous device dissipation at (or below) 25°C free air temperature (see Note 3)			3	W
Unclamped inductive load energy (see Note 4)			90	mJ
Operating junction temperature range	Tj	-65 to +150	°C	
Storage temperature range	T <sub>stg</sub>	-65 to +150	°C	
Lead temperature 3.2 mm from case for 10 seconds	T <sub>L</sub>	250	°C	

NOTES: 1. This value applies for  $t_p \le 0.3$  ms, duty cycle  $\le 10\%$ .

- 2. Derate linearly to 150°C case temperature at the rate of 1 W/°C.
- 3. Derate linearly to 150°C free air temperature at the rate of 24 mW/°C.
- 4. This rating is based on the capability of the transistor to operate safely in a circuit of: L = 20 mH,  $I_{B(on)}$  = 0.4 A,  $R_{BE}$  = 100  $\Omega$ ,  $V_{BE(off)}$  = 0,  $R_S$  = 0.1  $\Omega$ ,  $V_{CC}$  = 20 V.



# BD249, BD249A, BD249B, BD249C NPN SILICON POWER TRANSISTORS

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# electrical characteristics at 25°C case temperature

PARAMETER		TEST CONDITIONS			MIN	TYP	MAX	UNIT	
V <sub>(BR)CEO</sub>	Collector-emitter breakdown voltage	20 1	1 0	BD249 BD249A	45 60			V	
		breakdown voltage	(see Note 5)	$I_C = 30 \text{ mA}$ $I_B = 0$ (see Note 5)	BD249B BD249C	80 100			V
		V <sub>CE</sub> = 55 V	V <sub>BE</sub> = 0	BD249			0.7		
	Collector-emitter	$V_{CE} = 70 V$	$V_{BE} = 0$	BD249A			0.7	mA	
ICES	cut-off current	V <sub>CE</sub> = 90 V	$V_{BE} = 0$	BD249B			0.7	ША	
		V <sub>CE</sub> = 115 V	$V_{BE} = 0$	BD249C			0.7		
1	Collector cut-off	V <sub>CE</sub> = 30 V	$I_B = 0$	BD249/249A			1	mA	
ICEO	current	$V_{CE} = 60 \text{ V}$	$I_B = 0$	BD249B/249C			1	IIIA	
I <sub>EBO</sub>	Emitter cut-off current	V <sub>EB</sub> = 5 V	I <sub>C</sub> = 0				1	mA	
	Forward current transfer ratio	V <sub>CE</sub> = 4 V	I <sub>C</sub> = 1.5 A		25				
h <sub>FE</sub>		transfer ratio	-	$I_C = 15 A$	(see Notes 5 and 6)	10			
		V <sub>CE</sub> = 4 V	$I_C = 25 A$		5				
V <sub>CE(sat)</sub>	Collector-emitter	I <sub>B</sub> = 1.5 A	$I_C = 15 A$	(see Notes 5 and 6)			1.8	V	
* CE(Sal)	saturation voltage	I <sub>B</sub> = 5 A	$I_C = 25 A$				4	•	
V <sub>BE</sub>	Base-emitter	V <sub>CE</sub> = 4 V	$I_C = 15 A$	(see Notes 5 and 6)			2	V	
- BE	voltage	V <sub>CE</sub> = 4 V	$I_{\rm C} = 25  {\rm A}$				4	_	
h <sub>fe</sub>	Small signal forward current transfer ratio	V <sub>CE</sub> = 10 V	I <sub>C</sub> = 1 A	f = 1 kHz	25				
h <sub>fe</sub>	Small signal forward current transfer ratio	V <sub>CE</sub> = 10 V	I <sub>C</sub> = 1 A	f = 1 MHz	3				

NOTES: 5. These parameters must be measured using pulse techniques,  $t_p$  = 300  $\mu s$ , duty cycle  $\leq$  2%.

# thermal characteristics

PARAMETER			TYP	MAX	UNIT
$R_{\theta JC}$	Junction to case thermal resistance			1	°C/W
$R_{\theta JA}$	Junction to free air thermal resistance			42	°C/W

# resistive-load-switching characteristics at 25°C case temperature

	PARAMETER	TEST CONDITIONS †			MIN	TYP	MAX	UNIT
t <sub>on</sub>	Turn-on time	I <sub>C</sub> = 5 A	$I_{B(on)} = 0.5 A$	$I_{B(off)} = -0.5 A$		0.3		μs
t <sub>off</sub>	Turn-off time	$V_{BE(off)} = -5 V$	$R_L = 5 \Omega$	$t_p = 20 \ \mu s, \ dc \le 2\%$		0.9		μs

<sup>&</sup>lt;sup>†</sup> Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

# PRODUCT INFORMATION

<sup>6.</sup> These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts.

# TYPICAL CHARACTERISTICS

# 

Figure 1.

# **COLLECTOR-EMITTER SATURATION VOLTAGE**

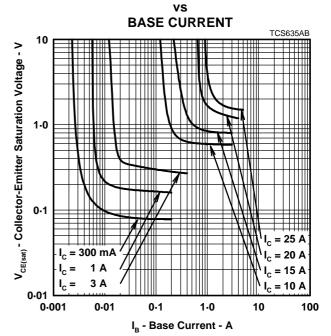
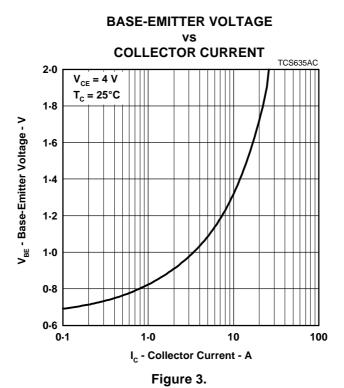
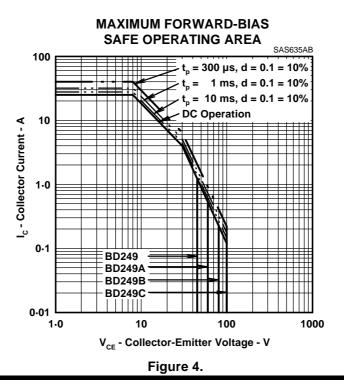


Figure 2.



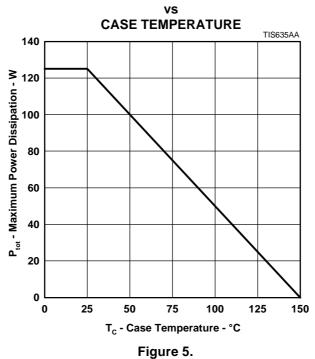


# **MAXIMUM SAFE OPERATING REGIONS**



# THERMAL INFORMATION

# **MAXIMUM POWER DISSIPATION**



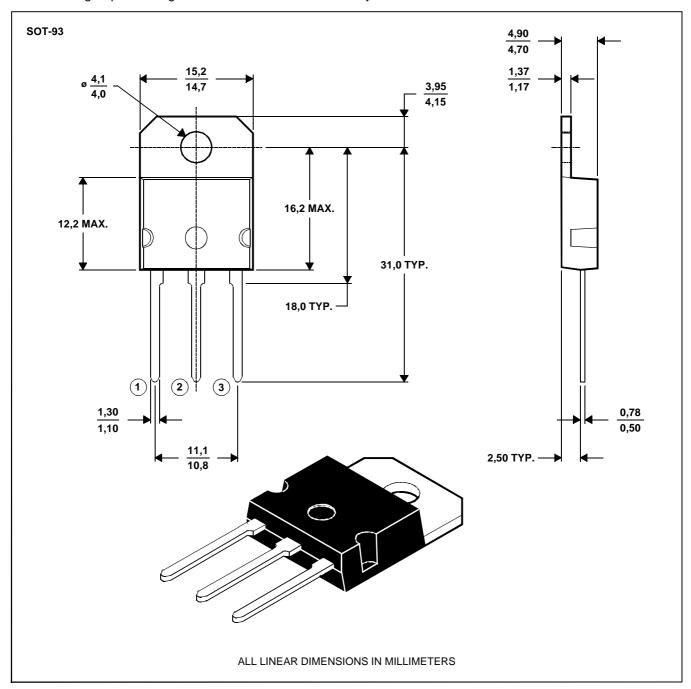
# PRODUCT INFORMATION

# **MECHANICAL DATA**

# **SOT-93**

# 3-pin plastic flange-mount package

This single-in-line package consists of a circuit mounted on a lead frame and encapsulated within a plastic compound. The compound will withstand soldering temperature with no deformation, and circuit performance characteristics will remain stable when operated in high humidity conditions. Leads require no additional cleaning or processing when used in soldered assembly.



NOTE A: The centre pin is in electrical contact with the mounting tab.

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# BD249, BD249A, BD249B, BD249C NPN SILICON POWER TRANSISTORS

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