- Designed for Complementary Use with the BD241 Series
- 40 W at 25°C Case Temperature
- 3 A Continuous Collector Current
- 5 A Peak Collector Current
- Customer-Specified Selections Available

# 

**TO-220 PACKAGE** 

Pin 2 is in electrical contact with the mounting base.

MDTRACA

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

RATING	SYMBOL	VALUE	UNIT	
	BD242		-55	
Collector-emitter voltage ( $R_{BE} = 100 \Omega$ )	BD242A	\/	-70	V
	BD242B	V <sub>CER</sub>	-90	٧
	BD242C		-115	
	BD242		-45	V
Collector-emitter voltage (I <sub>C</sub> = -30 mA)	BD242A	\/	-60	
Conector-enniter voltage (IC = -30 IIIA)	BD242B	V <sub>CEO</sub>	-80	
	BD242C		-100	
Emitter-base voltage	V <sub>EBO</sub>	-5	V	
Continuous collector current			-3	Α
Peak collector current (see Note 1)			-5	Α
Continuous base current			-1	Α
Continuous device dissipation at (or below) 25°C case temperature (see Note 2)			40	W
Continuous device dissipation at (or below) 25°C free air temperature (see Note 3)			2	W
Unclamped inductive load energy (see Note 4)			32	mJ
Operating junction temperature range			-65 to +150	°C
Storage temperature range			-65 to +150	°C
Lead temperature 3.2 mm from case for 10 seconds			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 0.32 W/°C.
- 3. Derate linearly to 150°C free air temperature at the rate of 16 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.



# BD242, BD242A, BD242B, BD242C PNP SILICON POWER TRANSISTORS

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# electrical characteristics at 25°C case temperature

PARAMETER			TEST CONDITION	ONS	MIN			UNIT
V <sub>(BR)CEO</sub>	Collector-emitter breakdown voltage	I <sub>C</sub> = -30 mA (see Note 5)	I <sub>B</sub> = 0	BD242 BD242A BD242B BD242C	-45 -60 -80 -100			V
I <sub>CES</sub>	Collector-emitter cut-off current	$V_{CE} = -55 \text{ V}$ $V_{CE} = -70 \text{ V}$ $V_{CE} = -90 \text{ V}$ $V_{CE} = -115 \text{ V}$	$V_{BE} = 0$ $V_{BE} = 0$ $V_{BE} = 0$ $V_{BE} = 0$	BD242 BD242A BD242B BD242C			-0.2 -0.2 -0.2 -0.2	mA
I <sub>CEO</sub>	Collector cut-off current	V <sub>CE</sub> = -30 V V <sub>CE</sub> = -60 V	$I_{B} = 0$ $I_{B} = 0$	BD242/242A BD242B/242C			-0.3 -0.3	mA
I <sub>EBO</sub>	Emitter cut-off current	V <sub>EB</sub> = -5 V	I <sub>C</sub> = 0				-1	mA
h <sub>FE</sub>	Forward current transfer ratio	$V_{CE} = -4 V$ $V_{CE} = -4 V$	$I_C = -1 A$ $I_C = -3 A$	(see Notes 5 and 6)	25 10			
V <sub>CE(sat)</sub>	Collector-emitter saturation voltage	I <sub>B</sub> = -0.6 A	I <sub>C</sub> = -3 A	(see Notes 5 and 6)			-1.2	V
$V_{BE}$	Base-emitter voltage	V <sub>CE</sub> = -4 V	I <sub>C</sub> = -3 A	(see Notes 5 and 6)			-1.8	V
h <sub>fe</sub>	Small signal forward current transfer ratio	V <sub>CE</sub> = -10 V	I <sub>C</sub> = -0.5 A	f = 1 kHz	20			
h <sub>fe</sub>	Small signal forward current transfer ratio	V <sub>CE</sub> = -10 V	I <sub>C</sub> = -0.5 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			MAX	UNIT
R <sub>0JC</sub> Junction to case thermal resistance			3.125	°C/W
R <sub>θJA</sub> Junction to free air thermal resistance			62.5	°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> = -1 A	$I_{B(on)} = -0.1 A$	$I_{B(off)} = 0.1 A$		0.2		μs
t <sub>off</sub>	Turn-off time	$V_{BE(off)} = 3.7 V$	$R_L = 20 \Omega$	$t_p = 20 \ \mu s, \ dc \le 2\%$		0.3		μs

 $<sup>^{\</sup>dagger} \ \ \mbox{Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.}$ 

## PRODUCT INFORMATION

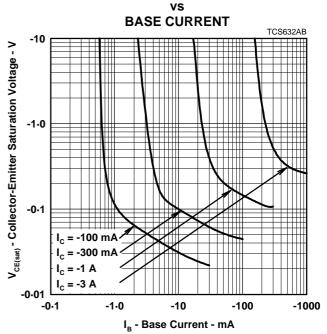
<sup>6.</sup> These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts.

#### TYPICAL CHARACTERISTICS

# **TYPICAL DC CURRENT GAIN COLLECTOR CURRENT** TCS632AH 1000 T<sub>C</sub> = 25°C V<sub>CE</sub> = -4 V $t_n = 300 \mu s$ , duty cycle = 80°C h<sub>FE</sub> - DC Current Gain 100 10 -0-01 -0-1 -1-0 -10 I<sub>C</sub> - Collector Current - A

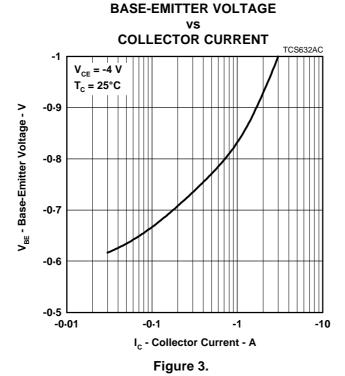
Figure 1.

# **COLLECTOR-EMITTER SATURATION VOLTAGE**



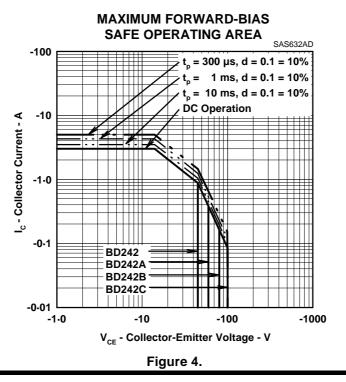
## Figure 2.

#### -





#### **MAXIMUM SAFE OPERATING REGIONS**



## THERMAL INFORMATION

**MAXIMUM POWER DISSIPATION** 

# **CASE TEMPERATURE** TIS631AA 50 P<sub>tot</sub> - Maximum Power Dissipation - W 40 30 20

Figure 5.

T<sub>C</sub> - Case Temperature - °C

#### PRODUCT INFORMATION

10

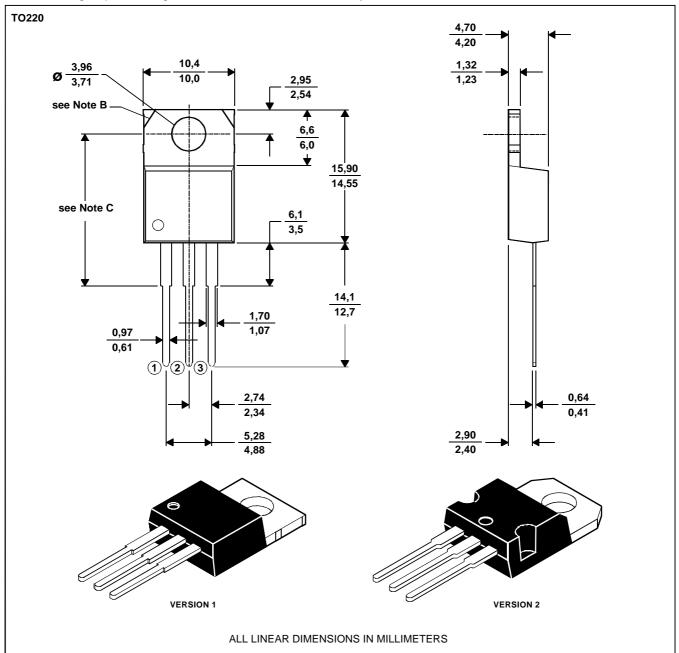
0 0

#### **MECHANICAL DATA**

#### **TO-220**

# 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.



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

B. Mounting tab corner profile according to package version.
C. Typical fixing hole centre stand off height according to package version.
Version 1, 18.0 mm. Version 2, 17.6 mm.

MDXXBE



# BD242, BD242A, BD242B, BD242C PNP SILICON POWER TRANSISTORS

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