

# Epitaxial-Base Silicon P-N-P VERSAWATT Transistors

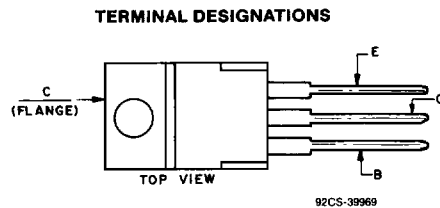
For Power-Amplifier and  
High-Speed-Switching Applications

**Features:**

- 40 W at 25°C case temperature
- 5-A rated collector current
- Min.  $f_T$  of 3 MHz at 10 V, 500 mA
- Complements of n-p-n types BD241, BD241A, BD241B, and BD241C

Types BD242, BD242A, BD242B, and BD242C are epitaxial-base silicon p-n-p transistors; they differ only in their voltage ratings. These devices are intended for a wide variety of switching and amplifier applications such as series and shunt regulators, and driver and output stages of high-fidelity amplifiers. The BD242-series power transistors are complements of the devices in the BD241 series. (The BD241-series devices are described in File No. 671.)

All types utilize the JEDEC TO-220AB (VERSAWATT) plastic package.



JEDEC TO-220AB

**MAXIMUM RATINGS, Absolute-Maximum Values:**

	BD242	BD242A	BD242B	BD242C		
<b>COLLECTOR-TO-EMITTER VOLTAGE:</b>						
With external base-to-emitter resistance ( $R_{BE}$ ) = 100 $\Omega$ . . . . .	$V_{CER}$	-55	-70	-90	-115	V
With base open . . . . .	$V_{CEO}$	-45	-60	-80	-100	V
<b>EMITTER-TO-BASE VOLTAGE . . . . .</b>	$V_{EBO}$	-5	-5	-5	-5	V
<b>CONTINUOUS COLLECTOR CURRENT . . . . .</b>	$I_C$	-5	-5	-5	-5	A
<b>CONTINUOUS BASE CURRENT . . . . .</b>	$I_B$	-1	-1	-1	-1	A
<b>TRANSISTOR DISSIPATION: <math>P_T</math></b>						
At case temperatures up to 25°C . . . . .		40	40	40	40	W
At ambient temperatures up to 25°C . . . . .		2	2	2	2	W
At case temperatures above 25°C . . . . .		← See Fig. 2 →				
<b>TEMPERATURE RANGE:</b>						
Storage & Operating (Junction) . . . . .		← -65 to 150 →				°C
<b>LEAD TEMPERATURE (During Soldering):</b>						
At distance 1/8 in. (3.17 mm) from case for 10 s max. . . . .		← 235 →				°C

# BD242, BD242A, BD242B, BD242C

**ELECTRICAL CHARACTERISTICS** at Case Temperature ( $T_C$ ) = 25°C

CHARACTERISTIC	SYMBOL	TEST CONDITIONS				LIMITS								UNITS	
		VOLTAGE V dc		CURRENT A dc		BD242		BD242A		BD242B		BD242C			
		V <sub>CE</sub>	V <sub>BE</sub>	I <sub>C</sub>	I <sub>B</sub>	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.		
Collector Cutoff Current: With base open	I <sub>CEO</sub>	-30 -60			0 0	-	-0.3	-	-0.3	-	-0.3	-	-	-0.3	mA
With base-to-emitter junction short-circuited	I <sub>CES</sub>	-45 -60 -80 -100	0 0 0 0			-	-0.2	-	-	-	-	-	-	-0.2	
Emitter Cutoff Current	I <sub>EBO</sub>		5	0		-	-1	-	-1	-	-1	-	-1	mA	
Collector-to-Emitter Breakdown Voltage: With base open	V <sub>BR(CEO)</sub>			-0.03 <sup>a</sup>	0	-45	-	-60	-	-80	-	-100	-	V	
DC Forward-Current Transfer Ratio	h <sub>FE</sub>	-4 -4		-1 <sup>a</sup> -3 <sup>a</sup>		25 10	-	25 10	-	25 10	-	25 10	-		
Base-to-Emitter Voltage	V <sub>BE</sub>	-4		-3 <sup>a</sup>		-	-1.8	-	-1.8	-	-1.8	-	-1.8	V	
Collector-to-Emitter Saturation Voltage	V <sub>CE(sat)</sub>			-3 <sup>a</sup>	-0.6	-	-1.2	-	-1.2	-	-1.2	-	-1.2	V	
Common-Emitter Small-Signal Short- Circuit Forward- Current Transfer Ratio (f = 1 kHz)	h <sub>fe</sub>	-10		-0.5		20	-	20	-	20	-	20	-		
Magnitude of Common Emitter Small-Signal Short-Circuit Forward- Current Transfer Ratio (f = 1 MHz)	h <sub>fe</sub>	-10		-0.5		3	-	3	-	3	-	3	-		
Thermal Resistance: Junction-to-Case	R <sub>θJC</sub>					-	3.125	-	3.125	-	3.125	-	3.125	°C/W	
Junction-to-Ambient	R <sub>θJA</sub>					-	62.5	-	62.5	-	62.5	-	62.5		

<sup>a</sup>Pulsed: Pulse duration = 300 μs, duty factor = 2%.

**2**  
POWER TRANSISTORS

# BD242, BD242A, BD242B, BD242C

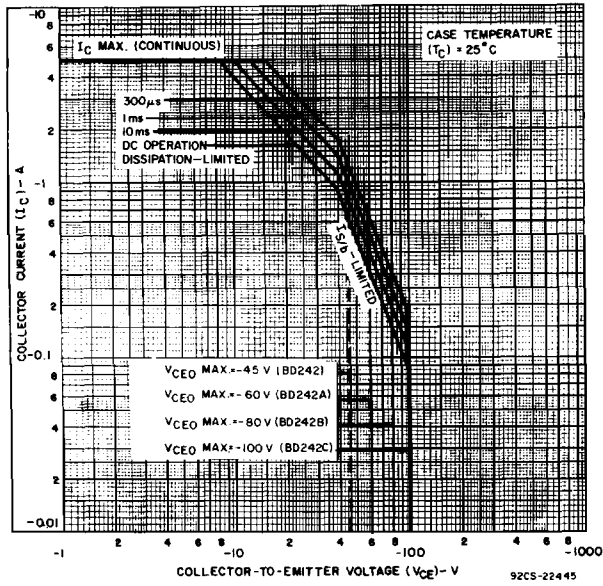


Fig. 1— Maximum safe operating areas for all types.

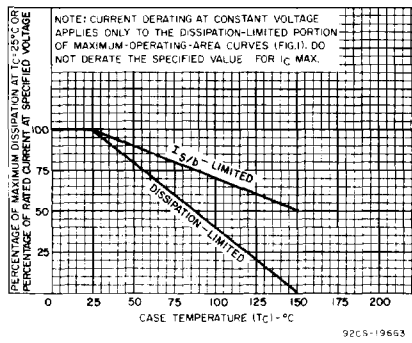


Fig. 2— Derating curves for all types.

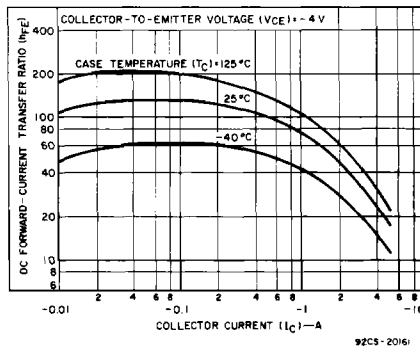


Fig. 3 — Typical dc beta characteristics for all types.