

File Number 671

**BD241, BD241A, BD241B, BD241C**

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

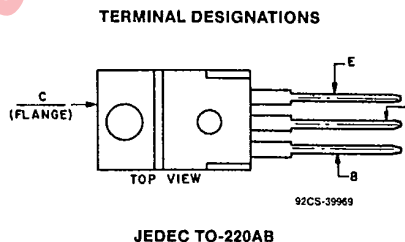
For Power-Amplifier and  
High-Speed-Switching Applications

*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 p-n-p types BD242, BD242A, BD242B, and BD242C

Types BD241, BD241A, BD241B, and BD241C are epitaxial-base silicon n-p-n 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 BD241-series power transistors are complements of the devices in the BD242 series. (The BD242-series devices are described in File No. 672.)

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



MAXIMUM RATINGS, *Absolute-Maximum Values:*

	BD241	BD241A	BD241B	BD241C		
<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

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Pro Electron Power Transistors

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

CHARACTERISTIC	SYMBOL	TEST CONDITIONS				LIMITS								UNITS
		VOLTAGE V <sub>dc</sub>		CURRENT A <sub>dc</sub>		BD241		BD241A		BD241B		BD241C		
		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			0	-	0.3	-	0.3	-	-	-	-	mA
		60			0	-	-	-	-	-	0.3	-	0.3	
With base-to-emitter junction short-circuited	I <sub>CES</sub>	45	0			-	0.2	-	-	-	-	-	-	mA
		60	0			-	-	-	0.2	-	-	-	-	
		80	0			-	-	-	-	-	0.2	-	-	
		100	0			-	-	-	-	-	-	-	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		1 <sup>a</sup>		25	-	25	-	25	-	25	-	
		4		3 <sup>a</sup>		10	-	10	-	10	-	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%.

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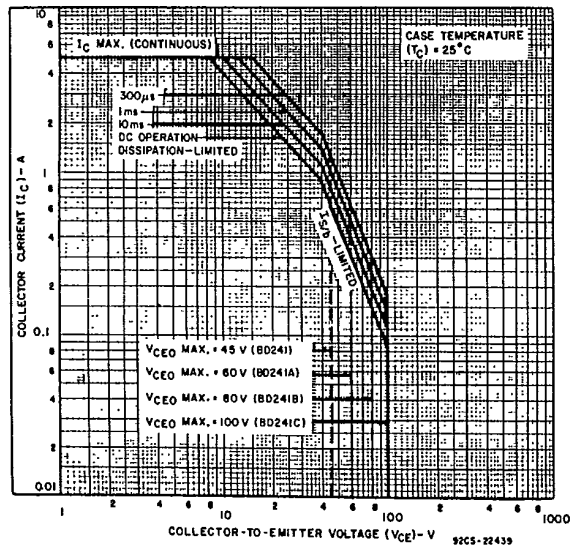


Fig. 1— Maximum safe operating areas for all types.

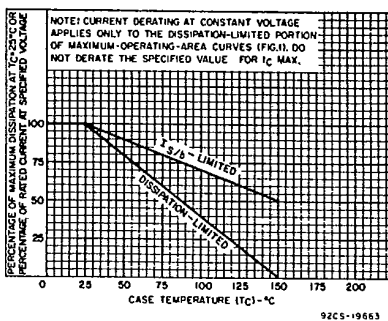


Fig. 2— Derating curves for all types.

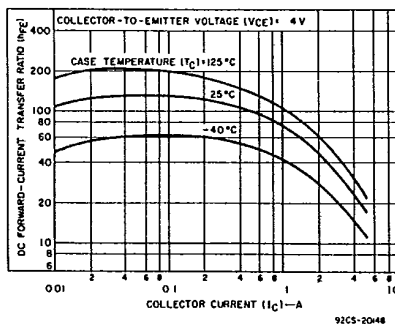


Fig. 3— Typical dc beta characteristics for all types.