

Epitaxial-Base Silicon P-N-P VERSAWATT Transistors

For Power-Amplifier and
High-Speed-Switching Applications

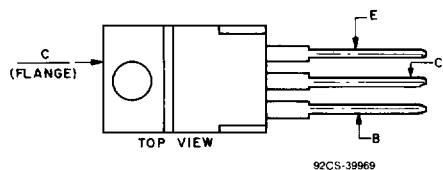
Features:

- 30 W at 25°C case temperature
- 4-A rated collector current
- Min. f_T of 3 MHz at 10 V, 200 mA
- Complements of n-p-n types BD239, BD239A, BD239B, and BD239C

Types BD240, BD240A, BD240B, and BD240C 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 BD240-series power transistors are complements of the devices in the BD239 series. (The BD239-series devices are described in File No. 669.)

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

TERMINAL DESIGNATIONS



JEDEC TO-220AB

MAXIMUM RATINGS, Absolute-Maximum Values:

	BD240	BD240A	BD240B	BD240C		
COLLECTOR-TO-EMITTER VOLTAGE:						
With external base-to-emitter resistance (R_{BE}) = 100 Ω	V_{CER}	-55	-70	-90	-115	V
With base open	V_{CEO}	-45	-60	-80	-100	V
EMITTER-TO-BASE VOLTAGE	V_{EBO}	-5	-5	-5	-5	V
CONTINUOUS COLLECTOR CURRENT	I_C	-4	-4	-4	-4	A
CONTINUOUS BASE CURRENT	I_B	-1	-1	-1	-1	A
TRANSISTOR DISSIPATION:						
At case temperatures up to 25°C	P_T	30	30	30	30	W
At ambient temperatures up to 25°C		2	2	2	2	W
At case temperatures above 25°C		← See Fig. 2 →				
TEMPERATURE RANGE:						
Storage & Operating (Junction)		← -65 to 150 →				°C
LEAD TEMPERATURE (During Soldering):						
At distance 1/8 in. (3.17 mm) from case for 10 s max.		← 235 →				°C

BD240, BD240A, BD240B, BD240C

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

CHARACTERISTIC	SYMBOL	TEST CONDITIONS				LIMITS								UNITS
		VOLTAGE V dc		CURRENT A dc		BD240		BD240A		BD240B		BD240C		
		V _{CE}	V _{BE}	I _C	I _B	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
Collector Cutoff Current: With base open	I _{CEO}	-30 -60			0 0	- -	-0.3 -	- -	-0.3 -	- -	-0.3 -	- -	-0.3 -	mA
With base-to-emitter junction short-circuited	I _{CES}	-45 -60 -80 -100	0 0 0 0			- - - -	-0.2 - - -	- - - -	- - - -	- - - -	-0.2 - - -	- - - -0.2		
Emitter Cutoff Current	I _{EBO}		5	0		-	-1	-	-1	-	-1	-	-1	mA
Collector-to-Emitter Breakdown Voltage: With base open	V _{BR(CEO)}			-0.03 ^a	0	-45	-	-60	-	-80	-	-100	-	V
DC Forward-Current Transfer Ratio	h _{FE}	-4 -4		-0.2 ^a -1 ^a		40 15	- -	40 15	- -	40 15	- -	40 15	- -	
Base-to-Emitter Voltage	V _{BE}	-4		-1 ^a		-	-1.3	-	-1.3	-	-1.3	-	-1.3	V
Collector-to-Emitter Saturation Voltage	V _{CE(sat)}			-1 ^a	-0.2	-	-0.7	-	-0.7	-	-0.7	-	-0.7	V
Common-Emitter Small-Signal Short- Circuit Forward- Current Transfer Ratio (f = 1 kHz)	h _{fe}	-10		-0.2		20	-	20	-	20	-	20	-	
Magnitude of Common Emitter Small-Signal Short-Circuit Forward- Current Transfer Ratio (f = 1 MHz)	h _{fe}	-10		0.2		3	-	3	-	3	-	3	-	
Thermal Resistance: Junction-to-Case	R _{θJC}					-	4.17	-	4.17	-	4.17	-	4.17	°C/W
Junction-to-Ambient	R _{θJA}					-	62.5	-	62.5	-	62.5	-	62.5	

^aPulsed: Pulse duration = 300 μs, duty factor = 2%.

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POWER TRANSISTORS

BD240, BD240A, BD240B, BD240C

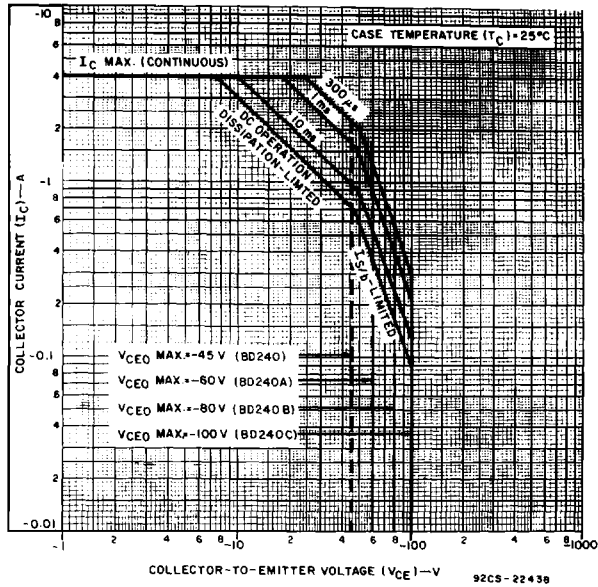


Fig. 1— Maximum safe operating areas for all types.

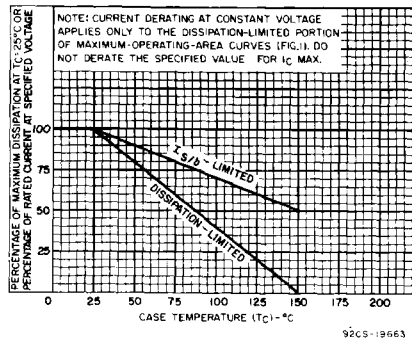


Fig. 2— Derating curves for all types.

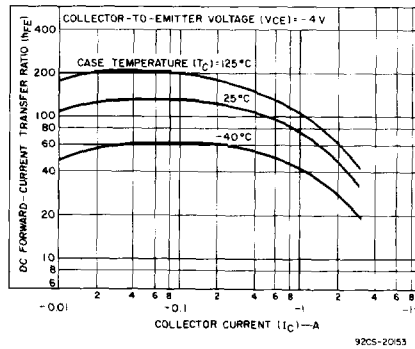


Fig. 3— Typical dc beta characteristics for all types.