

Epitaxial-Base Silicon P-N-P VERSAWATT Transistors

For Power-Amplifier and
High-Speed-Switching Applications

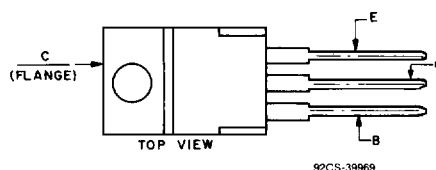
Features:

- 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: P_T						
At case temperatures up to 25°C	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 - - -	-	-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%.

2

POWER
TRANSISTORS

BD240, BD240A, BD240B, BD240C

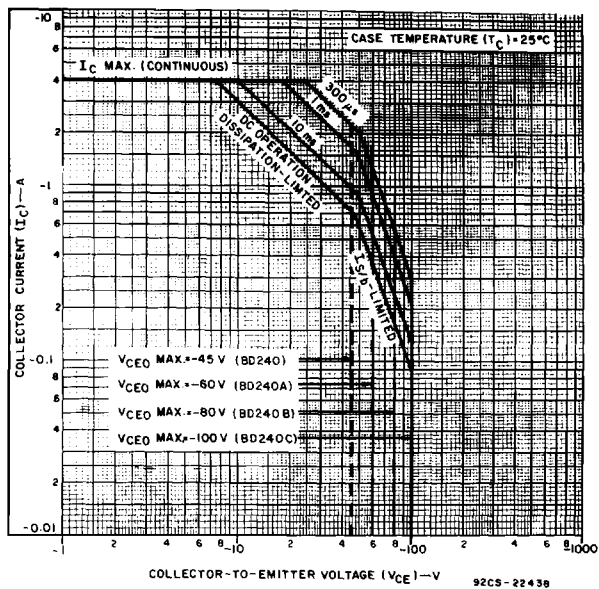


Fig. 1—Maximum safe operating areas for all types.

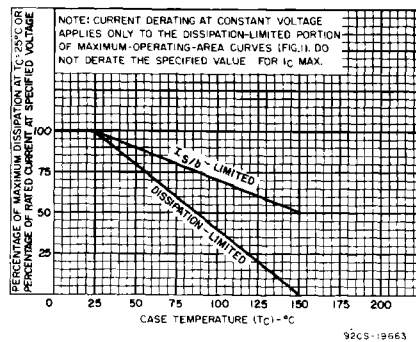


Fig. 2—Derating curves for all types.

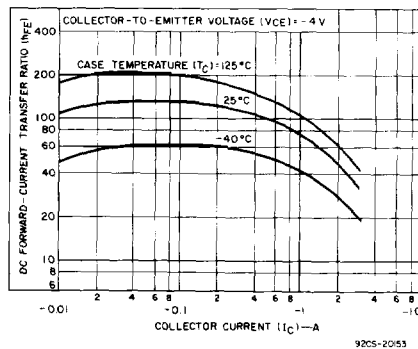


Fig. 3—Typical dc beta characteristics for all types.