

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

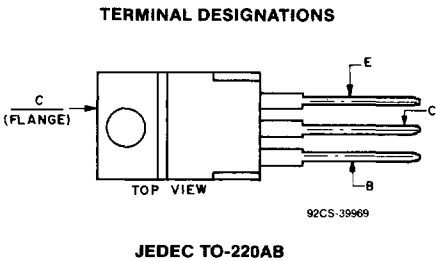
For Power-Amplifier and
High-Speed-Switching Applications

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	
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	5	5	5	5	A
CONTINUOUS BASE CURRENT	I_B	1	1	1	1	A
TRANSISTOR DISSIPATION: P_T						
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				
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

BD241, BD241A, BD241B, BD241C

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

CHARACTERISTIC	SYMBOL	TEST CONDITIONS				LIMITS								UNITS	
		VOLTAGE V dc		CURRENT A dc		BD241		BD241A		BD241B		BD241C			
		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		1 ^a 3 ^a		25 10	—	25 10	—	25 10	—	25 10	—		
Base-to-Emitter Voltage	V _{BE}	4		3 ^a		—	1.8	—	1.8	—	1.8	—	1.8	V	
Collector-to-Emitter Saturation Voltage	V _{CE(sat)}			3 ^a	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 _{fe}	10		0.5		20	—	20	—	20	—	20	—		
Magnitude of Common Emitter Small-Signal Short-Circuit Forward- Current Transfer Ratio (f = 1 MHz)	h _{fe}	10		0.5		3	—	3	—	3	—	3	—		
Thermal Resistance: Junction-to-Case	R _{θJC}					—	3.125	—	3.125	—	3.125	—	3.125	°C/W	
Junction-to-Ambient	R _{θJA}					—	62.5	—	62.5	—	62.5	—	62.5		

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

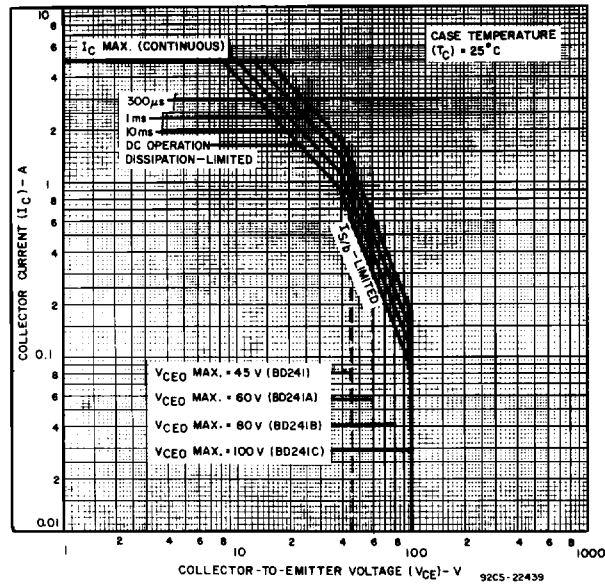


Fig. 1—Maximum safe operating areas for all types.

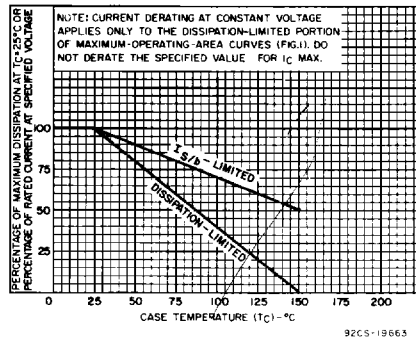


Fig. 2—Derating curves for all types.

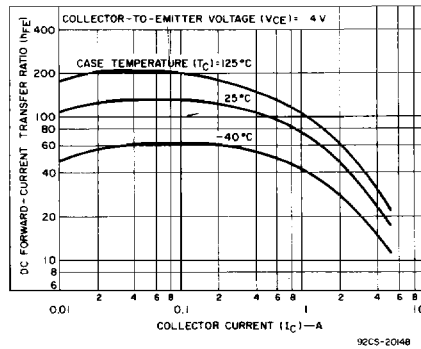


Fig. 3—Typical dc beta characteristics for all types.