

Epitaxial-Base Silicon N-P-N VERSAWATT Transistors

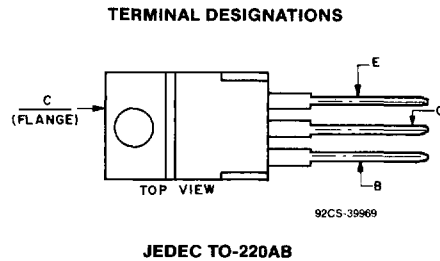
For Power-Amplifier and
High-Speed-Switching Applications

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.



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POWER TRANSISTORS

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

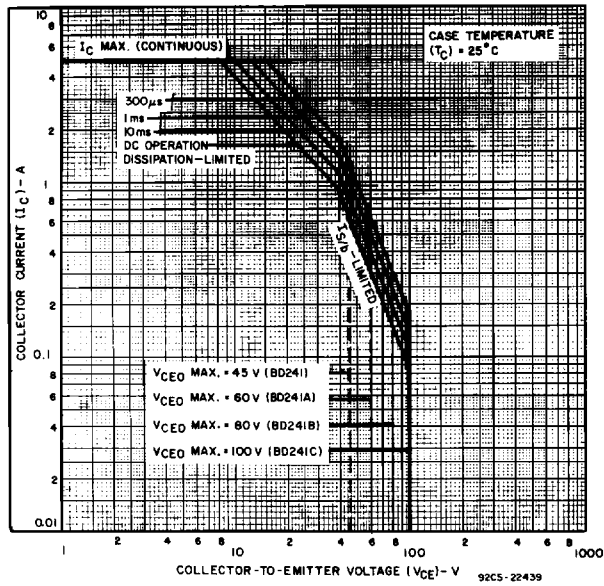


Fig. 1— Maximum safe operating areas for all types.

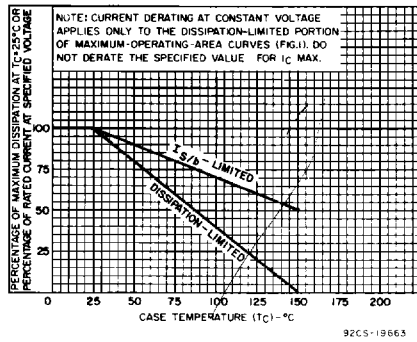


Fig. 2— Derating curves for all types.

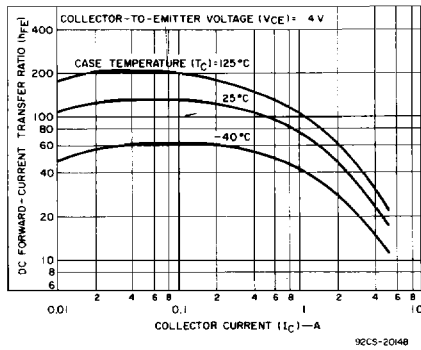


Fig. 3 — Typical dc beta characteristics for all types.