BD142

File Number **701**

High-Power Silicon N-P-N Transistor

General-Purpose Device
For Commercial Use

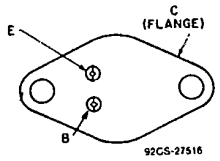
Features:

- *Maximum-safe-area-of-operation curves*
- *Low saturation voltage*
- *High dissipation rating*

Applications:

- *Series and shunt regulators*
- *High-fidelity amplifiers*
- *Power-switching circuits*
- *Solenoid drivers*
- *12-V audio and inverter circuits*

TERMINAL DESIGNATIONS



JEDEC TO-204AA

The RCA-BD142 is a silicon n-p-n transistor intended for a wide variety of intermediate-power and high-power applications. It is especially suited for use in audio and inverter circuits at 12 volts.

This type is supplied in the steel JEDEC TO-204AA hermetic package.

MAXIMUM RATINGS, *Absolute-Maximum Values:*

COLLECTOR-TO-BASE VOLTAGE	V_{CBO}	50	V
COLLECTOR-TO-EMITTER SUSTAINING VOLTAGE:			
With base open	$V_{CEO(sus)}$	45	V
With base reverse bias V_{BE} = −1.5 V	$V_{CEV(sus)}$	50	V
EMITTER-TO-BASE VOLTAGE	V_{EBO}	7	V
CONTINUOUS COLLECTOR CURRENT	I_C	15	A
CONTINUOUS BASE CURRENT	I_B	7	A
TRANSISTOR DISSIPATION:	P_T		
At case temperatures up to 25°C		117	W
At case temperatures above 25°C		See Figs. 1 & 2	
TEMPERATURE RANGE:			
Storage and Operating (Junction)		−65 to +200	°C
PIN TEMPERATURE (During Soldering):			
At distances ≥ 1/32 in. (0.8 mm) from seating plane for 10 s max.		235	°C

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ELECTRICAL CHARACTERISTICS, *At Case Temperature (T_C) = 25°C Unless Otherwise Specified.*

CHARACTERISTIC	SYMBOL	TEST CONDITIONS					LIMITS		UNITS
		VOLTAGE V dc			CURRENT A dc				
		V_{CE}	V_{EB}	V_{BE}	I_C	I_B	MIN.	MAX.	
Collector Cutoff Current: With base-emitter junction reverse-biased	I_{CEV}	40		−1.5			–	2	mA
Emitter Cutoff Current	I_{EBO}		7				–	1	mA
Collector-to-Emitter Sustaining Voltage: With base open	$V_{CEO(sus)}$				0.2	0	45	–	V
With base-emitter junction reverse-biased	$V_{CEV(sus)}$			−1.5	0.1		50	–	
DC Forward Current Transfer Ratio	h_{FE}	4			4[a]		12.5	160	
Base-to-Emitter Voltage	V_{BE}	4			4[a]		–	1.5	V
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$				4[a]	0.4	–	1.1	V
Common-Emitter, Small-Signal, Short-Circuit, Forward Current Transfer Ratio (f = 1 kHz)	h_{fe}	4			1		10	–	
Magnitude of Common-Emitter, Small-Signal, Short-Circuit, Forward Current Transfer Ratio (f = 0.4 MHz)	$\lvert h_{fe} \rvert$	4			1		2	–	
Gain-Bandwidth Product	f_T	4			1		800	–	kHz
Forward-Bias Second-Breakdown Collector Current (t ≥ 1 s)	$I_{S/b}$	39					3	–	A
Thermal Resistance (Junction-to-Case)	$R_{\theta JC}$						–	1.5	°C/W

[a] Pulsed: Pulse duration = 300 μs, duty factor = 2%.

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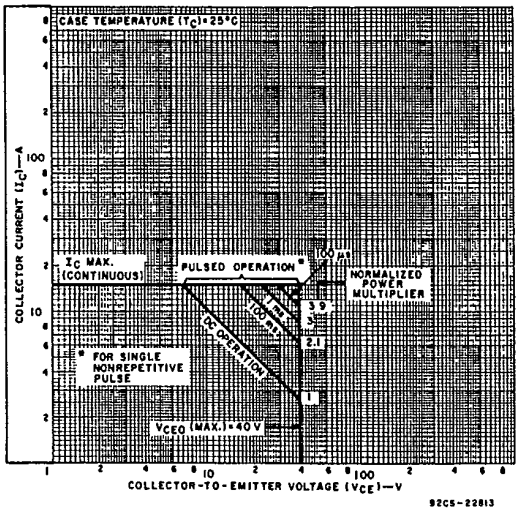

Fig. 1 — Maximum safe area of operation.

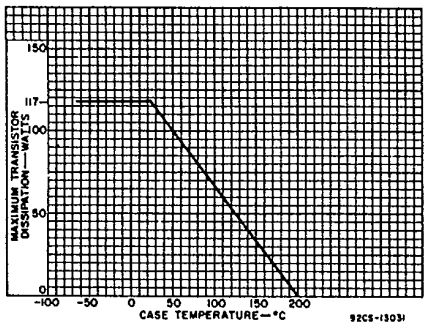

Fig. 2 — Dissipation derating curve.

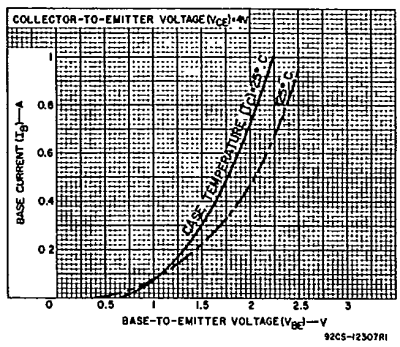

Fig. 3 — Typical input characteristics.

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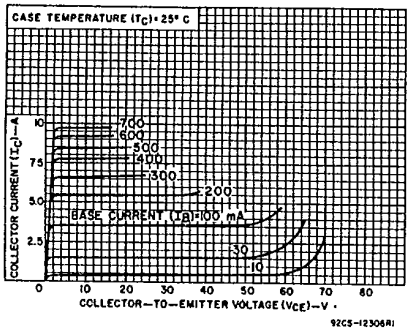

Fig. 4 — Typical output characteristics.

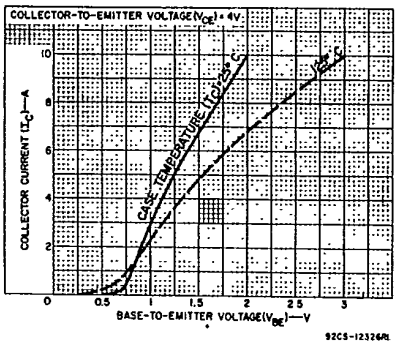

Fig. 5 — Typical transfer characteristics.

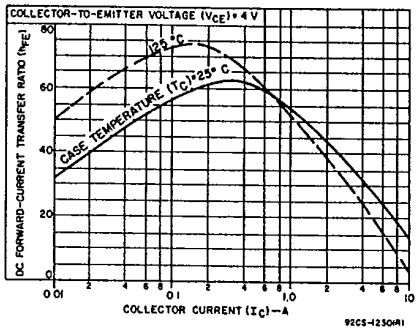

Fig. 6 — Typical dc-beta characteristics.