

TIP115, TIP116, TIP117

File Number 1387

2-Ampere P-N-P Darlington Power Transistors

For Low and Medium Frequency Power Switching, Hammer Driver, Audio Amplifier, and Series and Shunt Regulator Applications

Features:

- Operates from IC without predriver
- Gain of 1000 at 1A
- Low leakage at high temperatures
- Designed for complementary use with TIP110, TIP111 and TIP112
- Hard glass passivation
- Wire-bonded construction

The RCA-TIP115, TIP116, and TIP117 series are monolithic p-n-p silicon Darlington transistors designed for low and medium frequency power applications. The construction of these devices provides good forward-bias second-breakdown capability; their high gain makes it possible for them to be driven directly from integrated circuits.

These devices are supplied in the JEDEC TO-220AB (VER-SAWATT) plastic package.

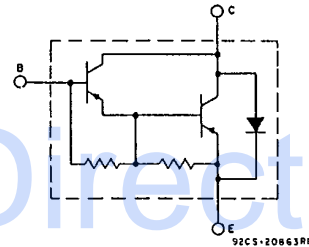
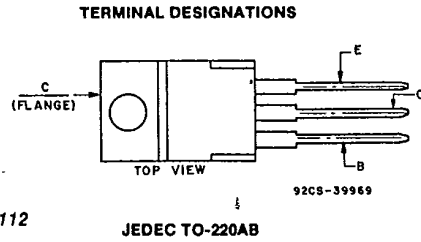


Fig. 1 - Schematic diagram for all types.

MAXIMUM RATINGS, Absolute Maximum Values:

	TIP115	TIP116	TIP117	UNITS
V _{CEO}	60	80	100	V
V _{CEO(sus)}	60	80	100	V
V _{EB0}		5		V
I _C		2		A
I _{CM}		4		A
I _B		0.05		A
P _T :				
T _C up to 25°C		50		W
T _C above 25°C		0.4		W/°C
Derate linearly at				
T _{stg} , T _J		-65 to 150		°C
T _L				
At distance 1/8 in. (3.17 mm) from case for 10 s max.		280		°C

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ELECTRICAL CHARACTERISTICS, At Case Temperature (Tc) = 25°C

CHARACTERISTIC	TEST CONDITIONS				LIMITS						UNITS	
	Voltage V dc		Current A dc		TIP115		TIP116		TIP117			
	Vce	Vbe	Ic	Ib	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.		
Icbo Ie = 0	-60 ^a -80 ^a -100 ^a	—	—	—	—	-1	—	—	—	—	—	mA
Iceo	-30 -40 -50	—	—	0	—	-2	—	—	—	—	—	
Iebo	—	5	0	—	—	-2	—	-2	—	-2	mA	
Vce(sus)	—	—	-0.03 ^b	0	-60	—	-80	—	-100	—	—	V
hFE	-4 -4	—	-1 ^b -2 ^b	—	1000 500	—	1000 500	—	1000 500	—	—	—
VBE	-4	—	-2 ^b	—	—	-2.8	—	-2.8	—	-2.8	—	V
Vce(sat)	—	—	-2 ^b	-0.008	—	-2.5	—	-2.5	—	-2.5	—	V
Cobo	-10 ^a	—	—	—	—	100	—	100	—	100	—	pF
hfe f = 1.0 MHz	-10	—	-0.75	—	25 TYP.		25 TYP.		25 TYP.		—	—
Is/b t ± 0, 5 s non-rep. pulse	-40	—	—	—	-1.25	—	-1.25	—	-1.25	—	—	A
RθJC	—	—	—	—	—	2.5	—	2.5	—	2.5	—	°C/W
RθJA	—	—	—	—	—	62.5	—	62.5	—	62.5	—	

^a Vcb value.

^b Pulsed: Pulsed duration = 300 μs, duty factor ≤ 2%.

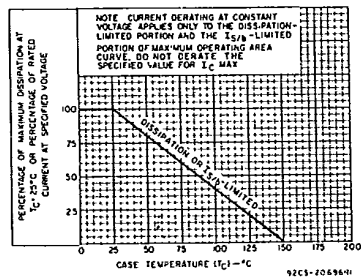


Fig. 2 - Derating curve for all types.

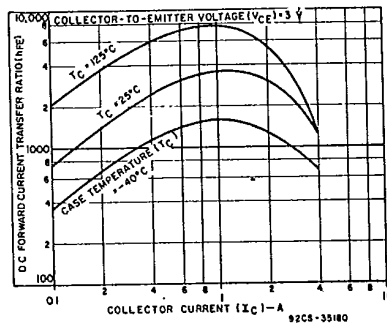


Fig. 3 - Typical dc-beta characteristics for all types.

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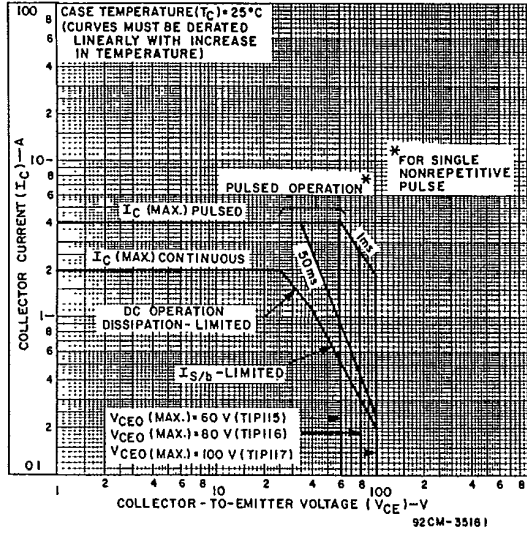


Fig. 4 - Maximum operating areas for all types ($T_c = 25^\circ C$).

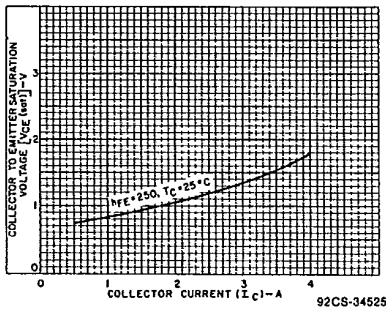


Fig. 5 - Typical saturation characteristics for all types.

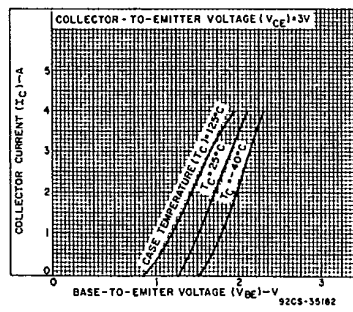


Fig. 6 - Typical transfer characteristics for all types.

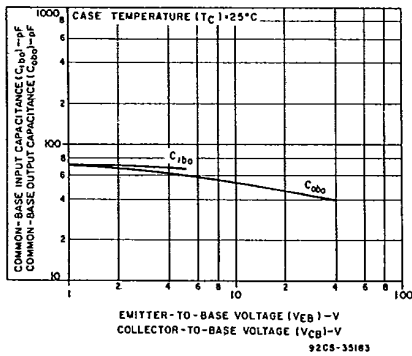


Fig. 7 - Typical common-base input (C_{ibo}) or output (C_{obo}) capacitance characteristic (all types).

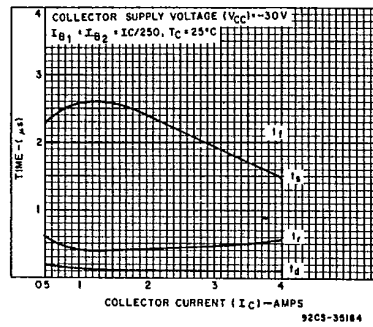


Fig. 8 - Typical saturated switching characteristics (all types).

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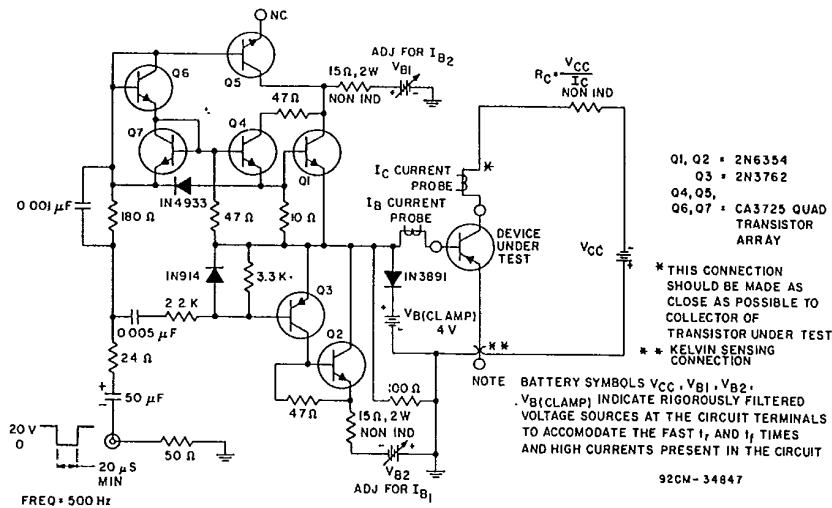


Fig. 9 - Circuit for measuring switching times.

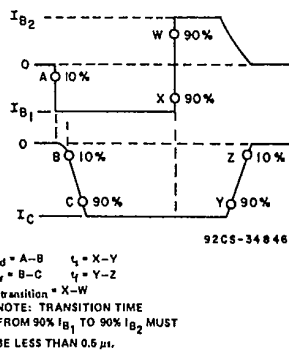


Fig. 10 - Phase relationship between input and output currents showing reference points for specification of switching times.