10-Ampere P-N-P Darlington Power Transistors

40-60-80 Volts, 65 Watts
Gain of 1000 at 3 A (2N6666)
Gain of 1000 at 5 A (2N6667, 2N6668)

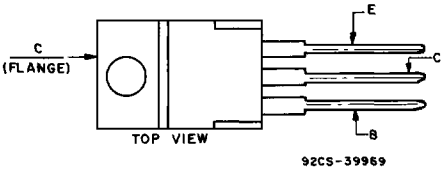
Features:

- **Operates from IC without predriver**

Applications:

- **Power switching**
- **Audio amplifiers**
- **Hammer drivers**
- **Series and shunt regulators**

TERMINAL DESIGNATIONS



JEDEC TO-220AB

The 2N6666, 2N6667 and 2N6668● are monolithic silicon p-n-p Darlington transistors designed for low- and medium-frequency power applications. The high gain of these devices makes it possible for them to be driven directly from integrated circuits. They are complementary to the 2N6386, 2N6387 and 2N6388▲

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

●Formerly RCA Dev. Nos. TA8204, TA8487 and TA8203, respectively.

▲Technical data for 2N6386-2N6388 are given in RCA Bulletin File No. 610.

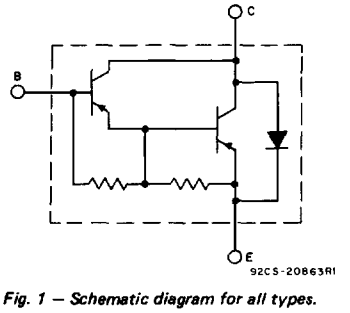


Fig. 1 – Schematic diagram for all types.

MAXIMUM RATINGS, *Absolute-Maximum Values:*

	2N6666	2N6667	2N6668	
* V_{CBO}	–40	–60	–80	V
$V_{CER(sus)}$ R_{BE} = 100 Ω	–40	–60	–80	V
$V_{CEO(sus)}$	–40	–60	–80	V
$V_{CEV(sus)}$ V_{BE} = –1.5 V	–40	–60	–80	V
* V_{EBO}	–5	–5	–5	V
* I_C	–8	–10	–10	A
I_{CM}	–15	–15	–15	A
* I_B	–0.25	–0.25	–0.25	A
* P_T				
$T_C \leq 25^oC$	65	65	65	W
$T_C > 25^oC$ ..... derate linearly	———	0.52	———	W/°C
* T_{stg}, T_J	———	–65 to +150	———	°C
* T_L At distances ≥ 1/8 in. (3.17 mm) from case for 10 s max.	———	235	———	°C

*In accordance with JEDEC registration data format (JS-6 RDF-4).

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

	CHARACTERISTIC SYMBOL	TEST CONDITIONS: VOLTAGE V dc		TEST CONDITIONS: CURRENT A dc		LIMITS: 2N6666		2N6667		2N6668		UNITS
		V_{CE}	V_{BE}	I_C	I_B	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
	I_{CEO}	−80			0	–	–	–	–	–	−1	mA
		−60			0	–	–	–	−1	–	–	
		−40			0	–	−1	–	–	–	–	
*	I_{CEV}	−80	1.5			–	–	–	–	–	−0.3	
		−60	1.5			–	–	–	−0.3	–	–	
		−40	1.5			–	−0.3	–	–	–	–	
	T_C = 125°C	−80	1.5			–	–	–	–	–	−3	
		−60	1.5			–	–	–	−3	–	–	
		−40	1.5			–	−3	–	–	–	–	
	I_{EBO}		5	0		–	−10	–	−10	–	−10	mA
*	V_{CEO}(sus)			−0.2[a]	0	−40	–	−60	–	−80	–	V
	V_{CER}(sus) R_{BE} = 100 Ω			−0.2[a]		−40	–	−60	–	−80	–	
	V_{CEV}(sus)		1.5	−0.2[a]		−40	–	−60	–	−80	–	
	h_{FE}	−3		−3[a]		1000	20,000	–	–	–	–	
*		−3		−5[a]		–	–	1000	20,000	1000	20,000	
		−3		−8[a]		100	–	–	–	–	–	
		−3		−10[a]		–	–	100	–	100	–	
	V_{BE}	−3		−3[a]		–	−2.8	–	–	–	–	V
		−3		−5[a]		–	–	–	−2.8	–	−2.8	
		−3		−8[a]		–	−4.5	–	–	–	–	
		−3		−10[a]		–	–	–	−4.5	–	−4.5	
	V_{CE}(sat)			−3[a]	−0.006[a]	–	−2	–	–	–	–	V
*				−5[a]	−0.01[a]	–	–	–	−2	–	−2	
				−8[a]	−0.08[a]	–	−3	–	–	–	–	
				−10[a]	−0.1[a]	–	–	–	−3	–	−3	
	V_F			8[a]		–	4	–	–	–	–	V
				10[a]		–	–	–	4	–	4	
	h_{fe} f = 1 kHz	−5		−1		1000	–	1000	–	1000	–	
*	$\|h_{fe}\|$ f = 1 MHz	−5		−1		20	–	20	–	20	–	
	$I_{S/b}$ t = 1 s, nonrep.	−20				−3.2	–	−3.2	–	−3.2	–	A
	$R_{\theta JC}$					–	1.92	–	1.92	–	1.92	°C/W

[a]Pulsed: Pulse duration = 300 μs, duty factor = 2%.
*In accordance with JEDEC registration data format (JS-6 RDF-4).

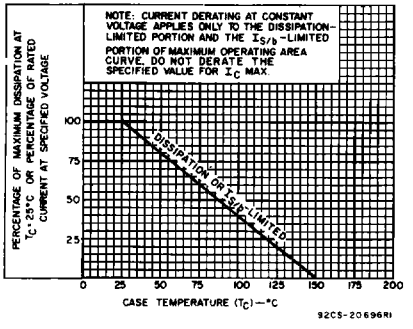


Fig. 2 — Derating curve for all types.

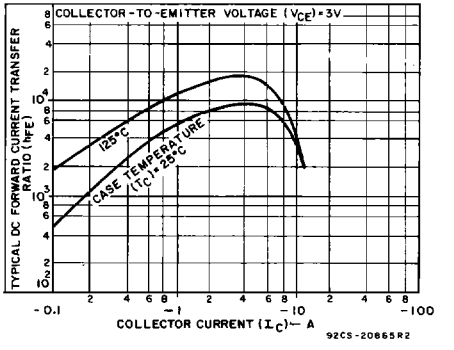


Fig. 3 — Typical dc beta characteristics for all types.

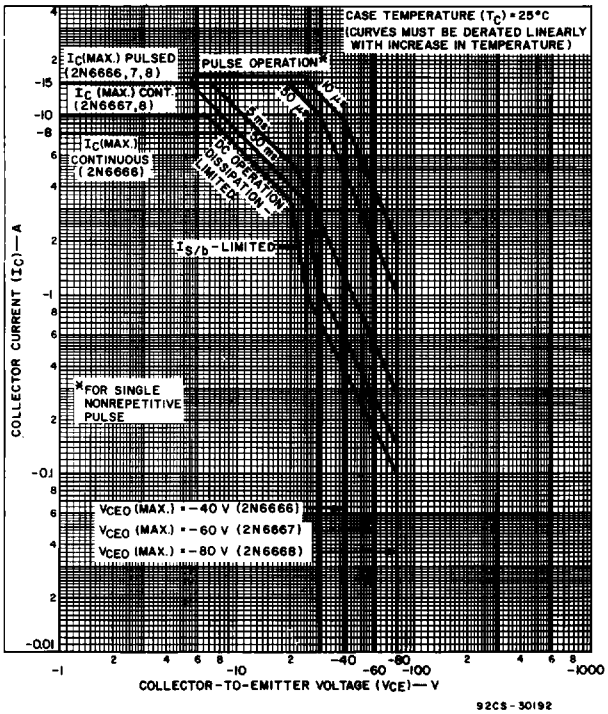


Fig. 4 — Maximum operating areas for all types at T_C = 25° C.

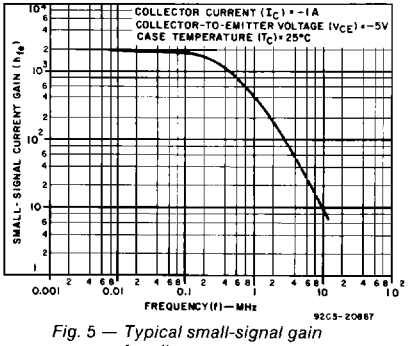


Fig. 5 — Typical small-signal gain for all types.

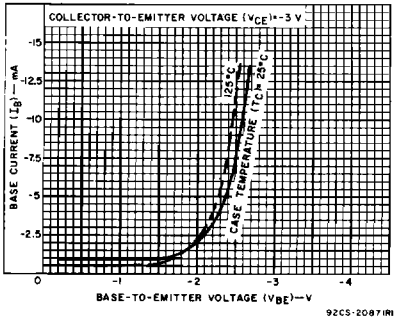


Fig. 6 — Typical input characteristics for all types.

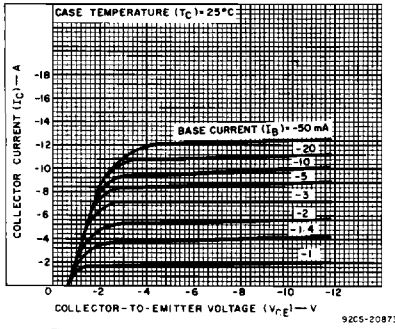


Fig. 7 — Typical output characteristics for all types.

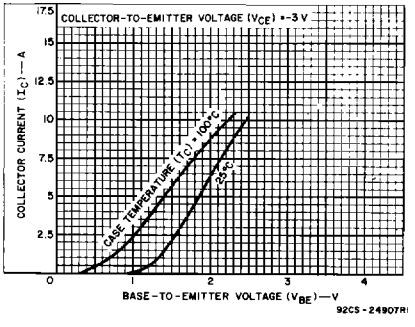


Fig. 8 — Typical transfer characteristics for all types.

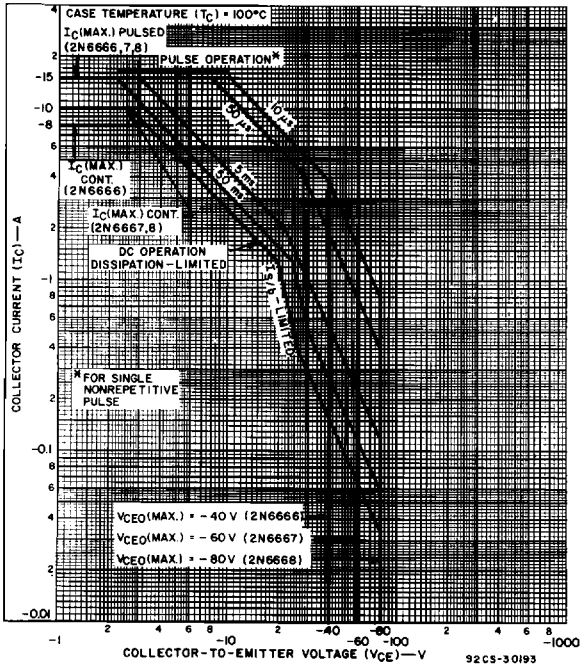


Fig. 9 — Maximum operating areas for all types T_C = 100° C.

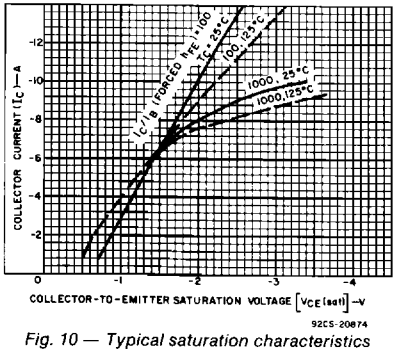


Fig. 10 — Typical saturation characteristics for all types.

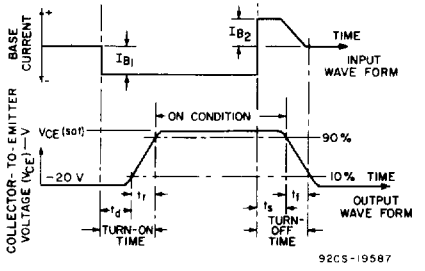


Fig. 11 — Phase relationship between input current and output current showing reference points for specification of switching times.

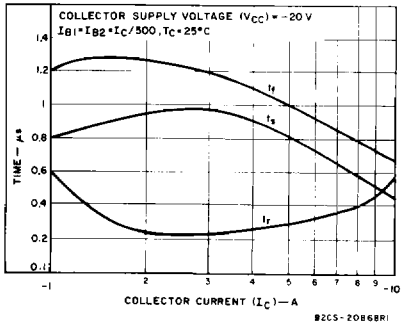


Fig. 12 — Typical saturated switching-time characteristics for all types.

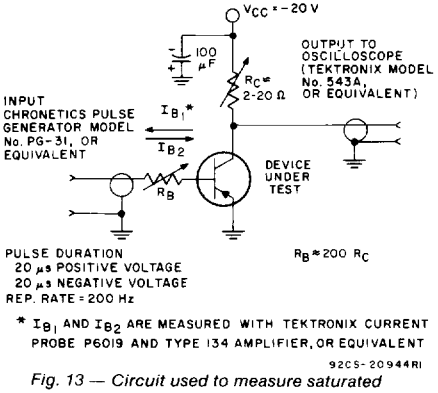


Fig. 13 — Circuit used to measure saturated switching times.