File Number 1152

2N6576, 2N6577, 2N6578

15-Ampere N-P-N Darlington Power Transistors

60, 90, 120 Volts, 120 Watts
Gain of 2000 at 4 A

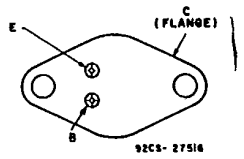
Features:

- Operates from IC without predriver
- Low leakage at high temperature

Applications:

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

TERMINAL DESIGNATIONS



JEDEC TO-204AA

The 2N6576, 2N6577, and 2N6578 are monolithic n-p-n 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.

All types utilize the steel JEDEC TO-204AA/ TO-3 hermetic package.

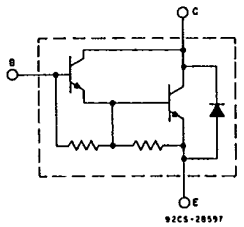


Fig. 1 – Schematic diagram for all types.

MAXIMUM RATINGS, *Absolute-Maximum Values:*

		2N6576	2N6577	2N6578	
*	V_{CBO}	60	90	120	V
*	$V_{CEO(sus)}$	60	90	120	V
*	V_{EBO}		7		V
*	I_C		15		A
	I_{CM}		30		A
*	I_B		0.25		A
*	P_T				
	$T_C \leq 25°C$		120		W
	$T_C > 25°C$		See Fig. 2		
*	T_{stg}, T_J		−65 to 200		°C
*	T_L				
	At distances ≥ 1/32 in. (0.8 mm) from seating plane for 10 s max.		235		°C

* In accordance with JEDEC registration data.

2N6576, 2N6577, 2N6578

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: 2N6576		LIMITS: 2N6577		LIMITS: 2N6578		UNITS
		V_{CE}	V_{EB}	V_{BE}	I_C	I_B	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
*	I_{CBO}	60[a]					–	0.5	–	–	–	–	
		90[a]					–	–	–	0.5	–	–	
		120[a]					–	–	–	–	–	0.5	
*	I_{CEO}	60				0	–	1	–	–	–	–	
		90				0	–	–	–	1	–	–	
		120				0	–	–	–	–	–	1	mA
	I_{CER} R_{BE} = 10K	60					–	5	–	–	–	–	
		90					–	–	–	5	–	–	
*	T_C=150°C	120					–	–	–	–	–	5	
	I_{CEX}	60		–1.5			–	5	–	–	–	–	
	T_C=175°C	90		–1.5			–	–	–	5	–	–	
		120		–1.5			–	–	–	–	–	5	
*	I_{EBO}		7		0		–	7.5	–	7.5	–	7.5	mA
*	$V_{CEO(sus)}$				0.2[b]	0	60	–	90	–	120	–	V
*	h_{FE}	3			0.4[b]		200	–	200	–	200	–	
		3			4[b]		2000	20000	2000	20000	2000	20000	
		3			10[b]		500	5000	500	5000	500	5000	
		4			15[b]		100	–	100	–	100	–	
*	$V_{BE(sat)}$			10	0.1[b]		–	3.5	–	3.5	–	3.5	V
				15	0.15[b]		–	4.5	–	4.5	–	4.5	
*	$V_{CE(sat)}$				10[b]	0.1	–	2.8	–	2.8	–	2.8	
					15[b]	0.15	–	4	–	4	–	4	V
	V_F				–15		–	4.5	–	4.5	–	4.5	
*	h_{fe} f=1 MHz	3			3		4	40	4	40	4	40	
*	t_d[c]				10	0.1	–	0.15	–	0.15	–	0.15	
*	t_r[c]				10	0.1	–	1	–	1	–	1	
*	t_s[c]				10	0.1[d]	–	2	–	2	–	2	μs
*	t_f[c]				10	0.1[d]	–	7	–	7	–	7	
	$I_{S/b}$ t=1 s, non rep.	20					6	–	6	–	6	–	A
	$R_{\theta JC}$						–	1.46	–	1.46	–	1.46	°C/W

* In accordance with JEDEC registration data.

[a] V_{CB} value.

[b] Pulsed: Pulse duration = 300 μs, duty factor = 1.8%.

[c] V_{CC} = 30 V, t_p = 300 μs, duty cycle = 2%.

[d] $I_{B_1} = -I_{B_2}$.

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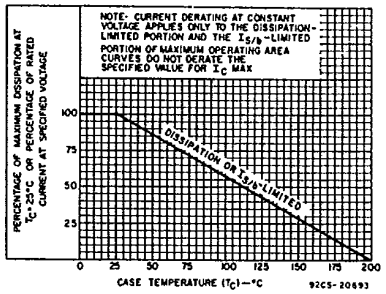

Fig. 2 — Derating curves for all types.

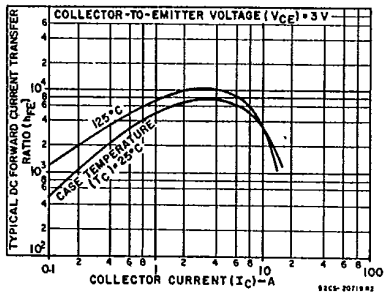

Fig. 3 — Typical dc-beta characteristics for all types.

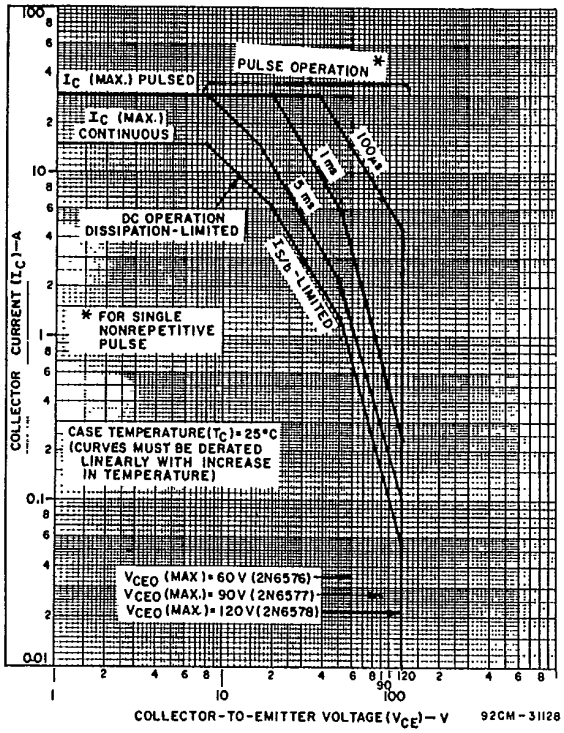

Fig. 4 — Maximum operating areas for all types.

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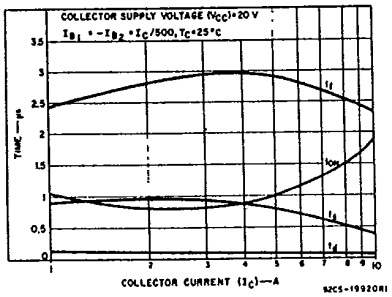

Fig. 5 — Typical saturated switching time characteristics for all types.

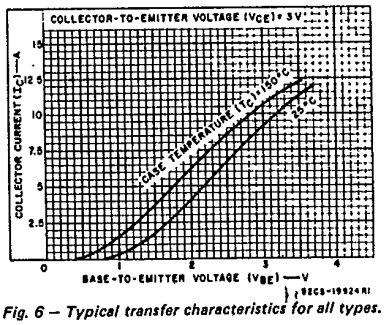

Fig. 6 — Typical transfer characteristics for all types.

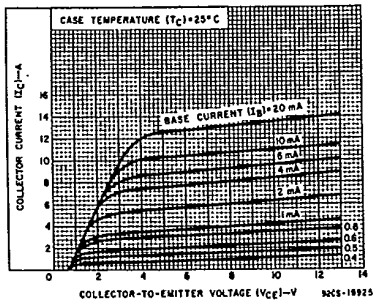

Fig. 7 — Typical output characteristics for all types.

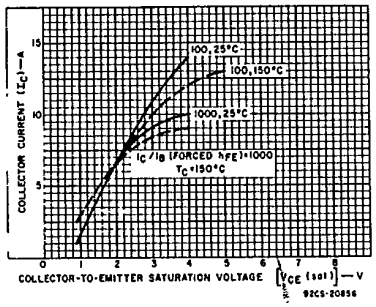

Fig. 8 — Typical saturation characteristics for all types.

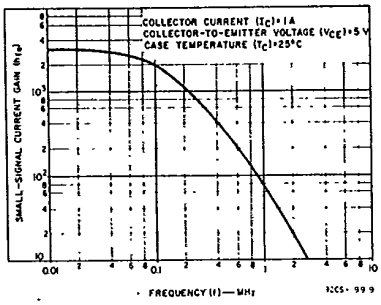

Fig. 9 — Typical small-signal gain for all types.

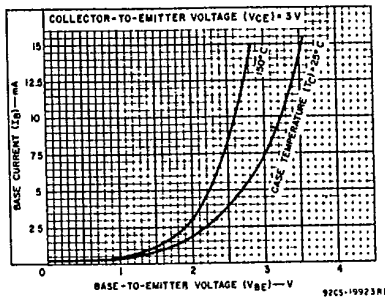

Fig. 10 — Typical input characteristics for all types.

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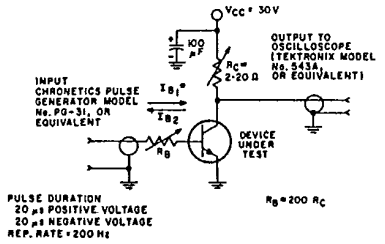

Fig. 11 – Circuit used to measure saturated-switching times.