

T-33-29

8-Ampere N-P-N Darlington Power Transistors

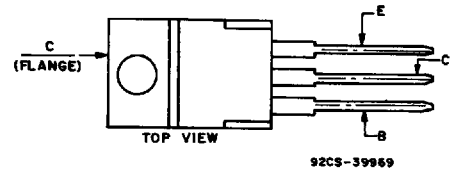
80, 100, 120 Volts, 60 Watts
 Gain of 1000 at 5 A (2N6530, 2N6532)
 Gain of 1000 at 3 A (2N6533)
 Gain of 500 at 3 A (2N6531)

Features:

- Operate from IC without predriver
- Low leakage at high temperature
- Power switching
- Hammer drivers
- Series and shunt regulators
- Audio amplifiers

Applications:

TERMINAL DESIGNATIONS



JEDEC TO-220AB

The 2N6530, 2N6531, 2N6532, and 2N6533* are monolithic n-p-n silicon Darlington transistors designed for power applications at low and medium frequencies. The construction of these devices provides good forward-bias second-breakdown characteristics. Their high gain allows them to be driven directly from integrated circuits.

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

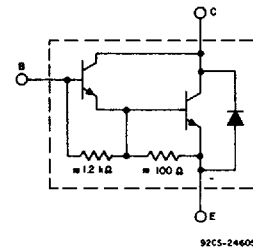


Fig. 1—Schematic diagram for all types.

MAXIMUM RATINGS, Absolute-Maximum Values:

	2N6530	2N6531	2N6532	2N6533	
*V _{CBO}	80	100	100	120	V
V _{CER(sus)} R _{BE} = 100 Ω	80	100	100	120	V
V _{CEO(sus)}	80	100	100	120	V
*V _{CEV(sus)} V _{BE} = -1.5 V	80	100	100	120	V
*V _{EBO}	5	5	5	5	V
*I _C	8	8	8	8	A
I _{CM}	15	15	15	15	A
*I _B	0.25	0.25	0.25	0.25	A
*P _T Up to 25°C	65	65	65	65	W
Above 25°C	See Fig. 3				
*T _J , T _{stg}	-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

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CHARACTERISTIC SYMBOL	TEST CONDITIONS				LIMITS				UNITS
	VOLTAGE V _{dc}		CURRENT A _{dc}		2N6530		2N6531		
	V _{CE}	V _{BE}	I _C	I _B	Min.	Max.	Min.	Max.	
I _{CEO}	80 100			0 0	— —	1 —	— —	— 1	mA
* I _{CEV}	80 100	-1.5 -1.5			— —	0.5 —	— 0.5		
* T _C = 125°C	80 100	-1.5 -1.5			— —	5 —	— 5		
I _{EBO}		-5	0		—	5	—	5	
* h _{FE}	3 3 3		5 ^a 3 ^a 8 ^a		1,000 — 100	10,000 — 5,000	— 500 100	— 10,000 5,000	
V _{CEO(sus)}			0.2	0	80 ^b	—	100 ^b	—	V
V _{CER(sus)} R _{BE} = 100 Ω			0.2		80 ^b	—	100 ^b	—	
* V _{CEV(sus)}		-1.5	0.2		80 ^b	—	100 ^b	—	
V _{BE}	3 3 3		5 ^a 3 ^a 8 ^a		— — —	2.8 — 4.5*	— — —	— 2.8 4.5*	V
V _{CE(sat)}			3 ^a 5 ^a 8 ^a	0.006 0.01 0.08	— — —	— 2 3*	— — —	3 — 3*	V
V _F			5 ^a 8 ^a		— —	— 5	— —	4 —	V
h _{fe} f = 1 kHz	5		1		1,000	—	1,000	—	
* h _{fe} f = 1 MHz	5		1		20	—	20	—	
C _{obo} V _{CB} = 10 V f = 1 MHz					—	200	—	200	pF
* I _{S/b} t = 0.5 s, nonrep.	24				2.7	—	2.7	—	A
R _{θJC}					—	1.92	—	1.92	°C/W

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

^a Pulsed, pulse duration = 300 μs, duty factor ≤ 2%.^b CAUTION: Sustaining voltages V_{CEO(sus)}, V_{CER(sus)}, and V_{CEV(sus)} MUST NOT be measured on a curve tracer.POWER
TRANSISTORS

ELECTRICAL CHARACTERISTICS, At Case Temperature (T_C) = 25°C unless otherwise specified

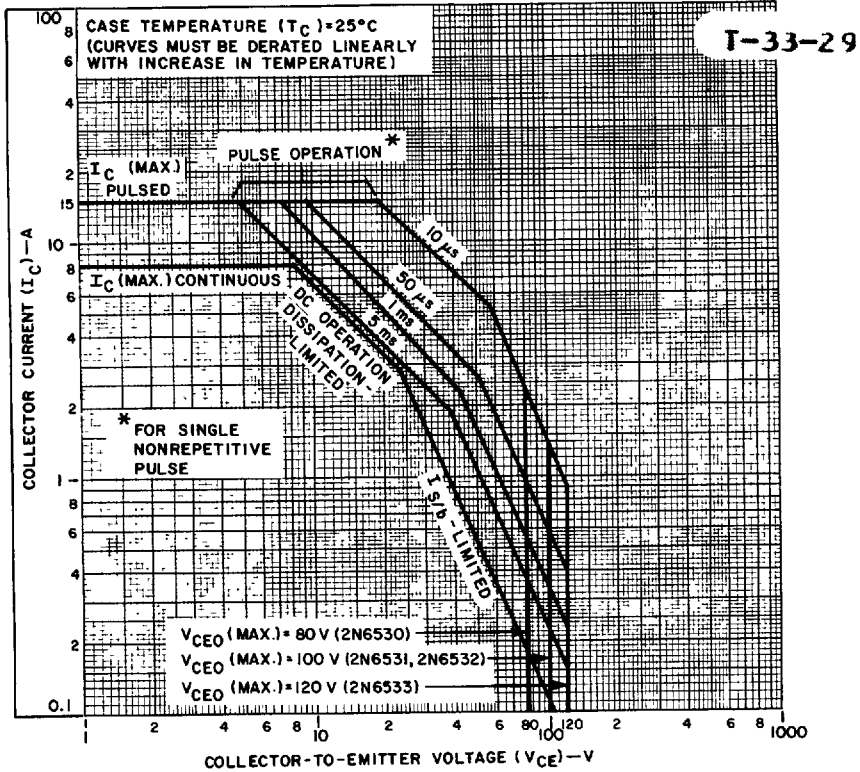
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CHARACTERISTIC SYMBOL	TEST CONDITIONS				LIMITS				UNITS
	VOLTAGE V dc		CURRENT A dc		2N6532		2N6533		
	V _{CE}	V _{BE}	I _C	I _B	Min.	Max.	Min.	Max.	
I _{CEO}	120 100			0 0	— —	— 1	— —	1 —	mA
* I _{CEV}	120 100	-1.5 -1.5			— —	— 0.5	— —	0.5 —	
* T _C = 125°C	120 100	-1.5 -1.5			— —	— 5	— —	5 —	
I _{EBO}		-5	0		—	5	—	5	mA
* h _{FE}	3 3 3		3 ^a 5 ^a 8 ^a		— 1,000 100	— 10,000 5,000	1,000 — 100	10,000 — 5,000	
V _{CEO(sus)}			0.2	0	100 ^b	—	120 ^b	—	V
V _{CER(sus)} R _{BE} = 100 Ω			0.2		100 ^b	—	120 ^b	—	
* V _{CEV(sus)}		-1.5	0.2		100 ^b	—	120 ^b	—	
V _{BE}	3 3 3		3 ^a 5 ^a 8 ^a		— — —	— 2.8 4.5*	— — —	2.8 — 4.5*	V
V _{CE(sat)}			3 ^a 5 ^a 8 ^a	0.006 0.01 0.08	— — —	— 2 3*	— — —	2 — 3*	V
V _F			5 ^a 8 ^a		— —	— 5	— —	4 —	V
h _{fe} f = 1 kHz	5		1		1,000	—	1,000	—	
* h _{fe} f = 1 MHz	5		1		20	—	20	—	
C _{obo} V _{CB} = 10 V f = 1 MHz					—	200	—	200	pF
* I _{S/b} t = 0.5 s, nonrep.	24				2.7	—	2.7	—	A
R _{θJC}					—	1.92	—	1.92	°C/W

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^b CAUTION: Sustaining voltages V_{CEO(sus)}, V_{CER(sus)}, and V_{CEV(sus)} MUST NOT be measured on a curve tracer.



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Fig. 2—Maximum operating areas for all types at case temperature of 25°C.

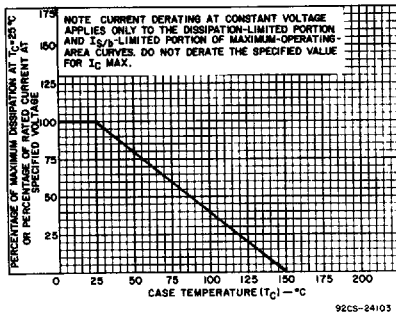


Fig. 3—Dissipation derating curve for all types.

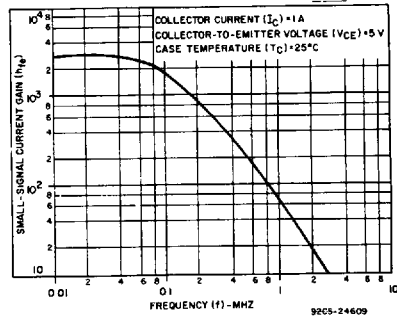


Fig. 4 — Typical small-signal current gain for all types.

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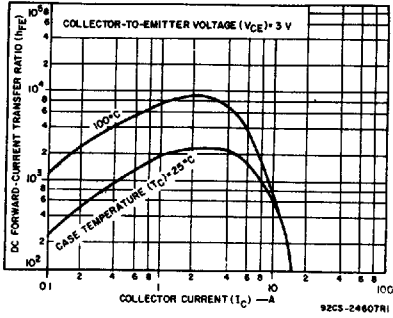


Fig. 5 — Typical dc beta characteristics for all types.

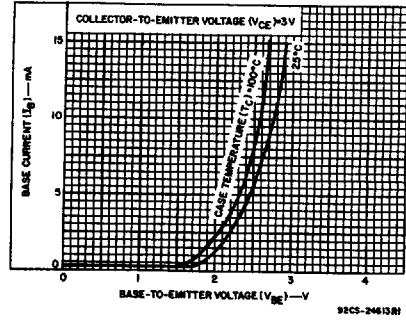


Fig. 6 — Typical input characteristics for all types.

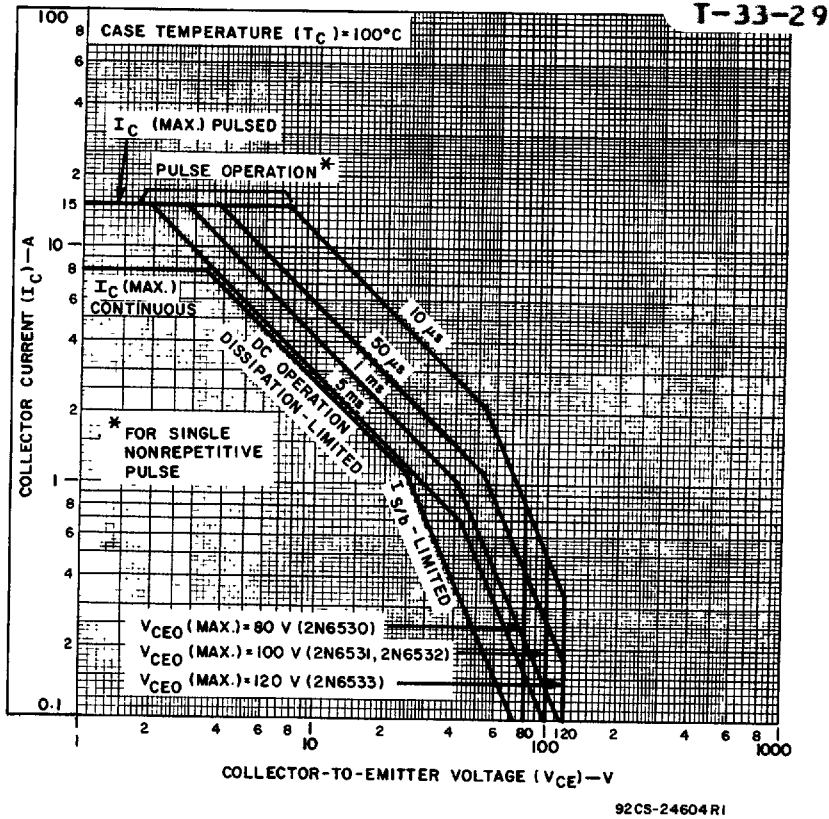


Fig. 7 — Maximum operating areas for all types at case temperature of 100°C .

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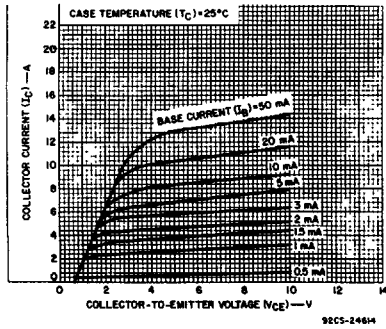


Fig. 8 — Typical output characteristics for all types.

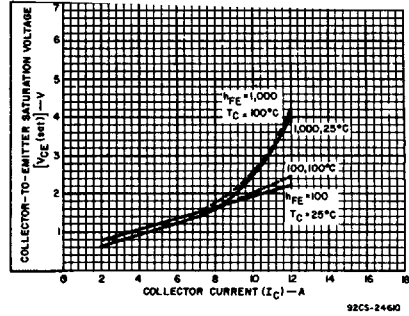


Fig. 9 — Typical saturation characteristics for all types.

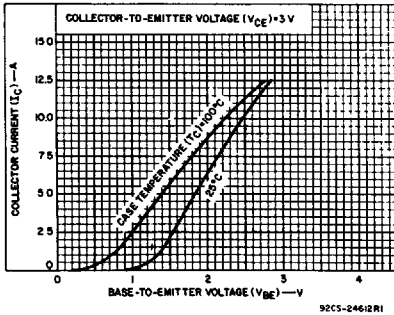


Fig. 10 — Typical transfer characteristics for all types.

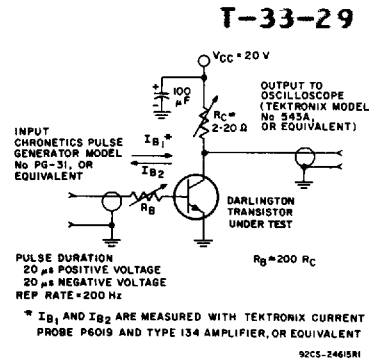


Fig. 11 — Circuit used to measure saturated switching-times.

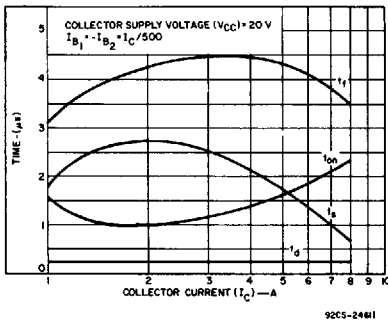


Fig. 12 — Typical saturated switching-time characteristics for all types.

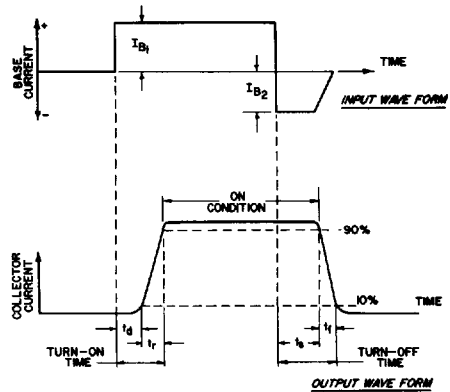


Fig. 13 — Phase relationship between input current and output current, showing reference points for specification of switching-times.

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