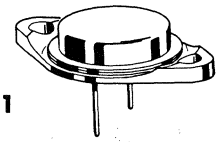
2N3789 thru 2N3792 (SILICON)



CASE 11
(TO-3)

Collector connected to case

PNP silicon power transistors for medium-speed switching and amplifier applications. Complement to NPN type 2N3713 thru 2N3716.

MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

Rating	Symbol	2N3789 2N3791	2N3790 2N3792	Unit
Collector-Base Voltage	V_{CB}	60	80	Volts
Collector-Emitter Voltage	V_{CEO}	60	80	Volts
Emitter-Base Voltage	V_{EB}	7.0	7.0	Volts
Collector Current	I_C	10	10	Amp
Collector Current (Peak)	I_C	10	10	Amp
Base Current (Continuous)	I_B	4.0	4.0	Amp
Power Dissipation	P_D	150	150	Watts
Thermal Resistance	θ_{JC}	1.17	1.17	°C/W
Junction Operating and Storage Temperature Range	T_J, T_{stg}	-65 to +200		°C

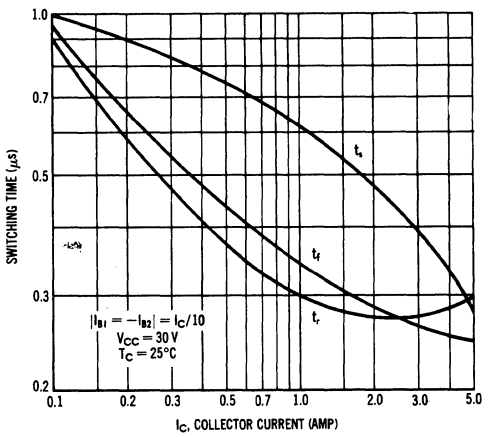
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

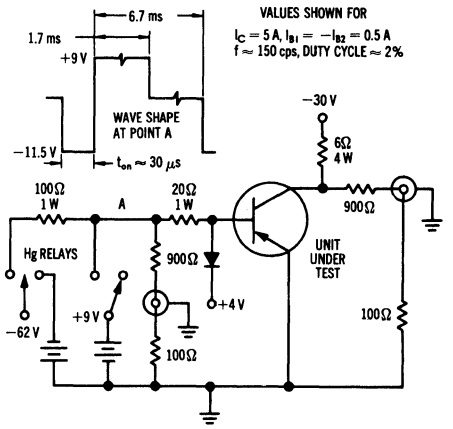
Characteristic		Symbol	Min	Max	Unit
Collector-Emitter Sustaining Voltage* (I_C = 200 mAdc, I_B = 0)	2N3789, 2N3791	$V_{CEO(sus)}$*	60	—	Vdc
	2N3790, 2N3792		80	—	
Collector-Emitter Cutoff Current		I_{CEX}			mAdc
(V_{CE} = 60 Vdc, V_{BE} = -1.5 Vdc)	2N3789, 2N3791		—	1.0	
(V_{CE} = 80 Vdc, V_{BE} = -1.5 Vdc)	2N3790, 2N3792		—	1.0	
(V_{CE} = 60 Vdc, V_{BE} = -1.5 Vdc, T_C = 150°C)	2N3789, 2N3791		—	5.0	
(V_{CE} = 80 Vdc, V_{BE} = -1.5 Vdc, T_C = 150°C)	2N3790, 2N3792		—	5.0	
Emitter-Base Cutoff Current (V_{EB} = 7 Vdc)		I_{EBO}	—	5.0	mAdc
DC Current Gain*		h_{FE}*			—
(I_C = 1 Adc, V_{CE} = 2 Vdc)	2N3789, 2N3790		25	90	
	2N3791, 2N3792		50	150	
(I_C = 3 Adc, V_{CE} = 2 Vdc)	2N3789, 2N3790		15	—	
	2N3791, 2N3792		30	—	
Collector-Emitter Saturation Voltage*		$V_{CE(sat)}$*			Vdc
(I_C = 4 Adc, I_B = 0.4 Adc)	2N3789, 2N3790		—	1.0	
(I_C = 5 Adc, I_B = 0.5 Adc)	2N3791, 2N3792		—	1.0	
Base-Emitter Saturation Voltage*		$V_{BE(sat)}$*			Vdc
(I_C = 4 Adc, I_B = 0.4 Adc)	2N3789, 2N3790		—	2.0	
(I_C = 5 Adc, I_B = 0.5 Adc)	2N3791, 2N3792		—	1.5	
Current Gain — Bandwidth Product (V_{CE} = 10 Vdc, I_C = 0.5 Adc f = 1.0 MHz)		f_T	4.0	—	MHz

*Sweep Test: 1/2 sine wave cycle @ 60 Hz .

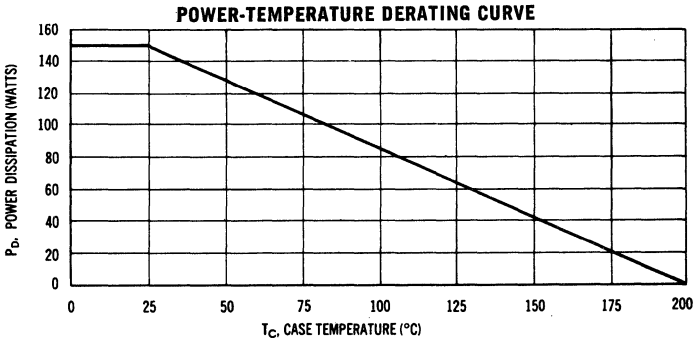
2N3789 thru 2N3792 (continued)

TYPICAL SWITCHING TIMES AND TEST CIRCUIT





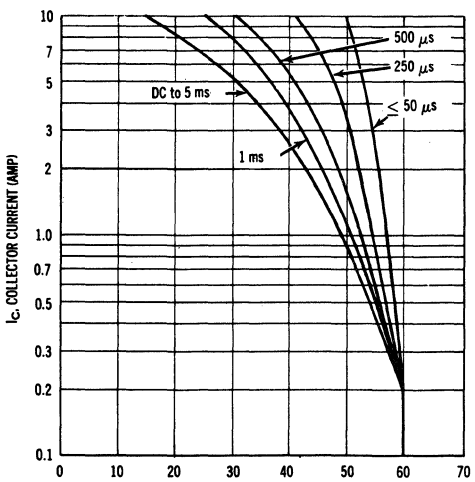
POWER-TEMPERATURE DERATING CURVE



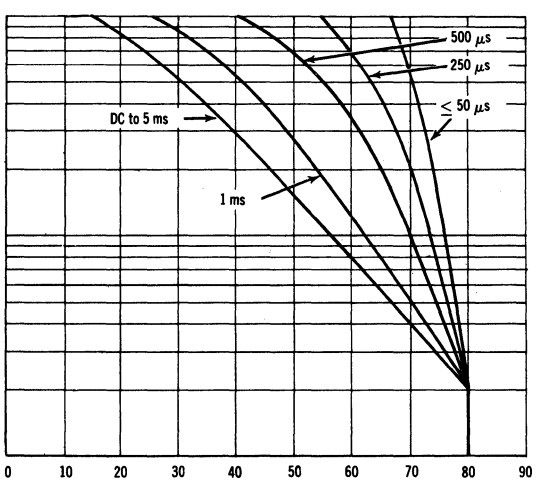
Safe area curves are indicated. Both limits are applicable and must be observed.

ACTIVE-REGION SAFE OPERATING AREAS

2N3789, 2N3791



2N3790, 2N3792



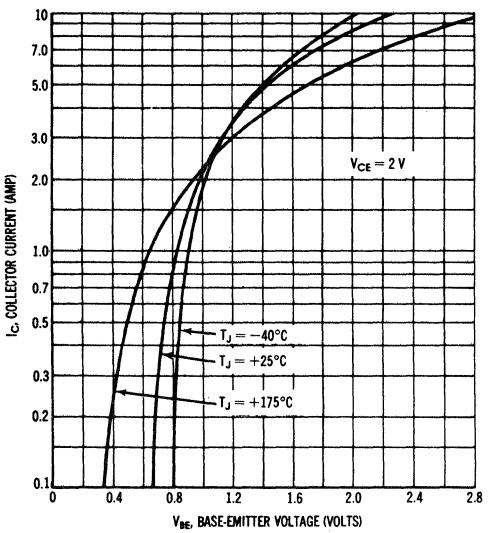
V_{CE}, COLLECTOR-EMITTER VOLTAGE (VOLTS)

The Safe Operating Area Curves indicate I_C - V_{CE} limits below which the device will not go into secondary breakdown. Collector load lines for specific circuits must fall within the applicable Safe Area to avoid causing a collector-emitter short. (Duty cycle of the excursion make no significant change in these safe areas.) To insure operation below the maximum T_J, the power-temperature derating curve must be observed for both steady state and pulse power conditions.

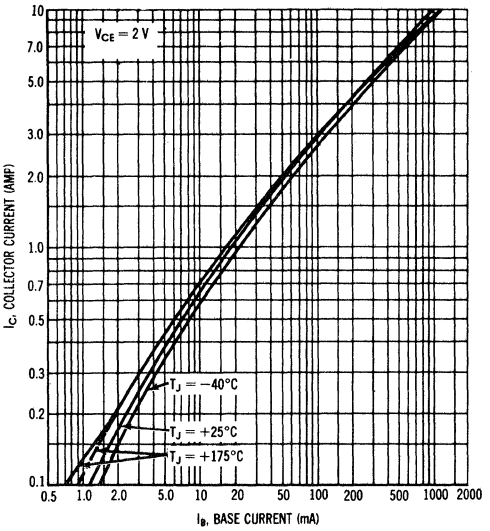
LARGE SIGNAL CHARACTERISTICS – TYPE 2N3789, 2N3790

(PULSE TEST: pulse width ≈ 200 μs, duty cycle ≈ 1%)

TRANSCONDUCTANCE

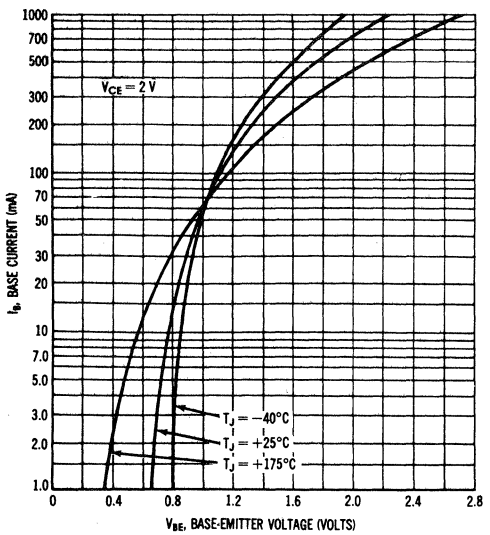


CURRENT GAIN *

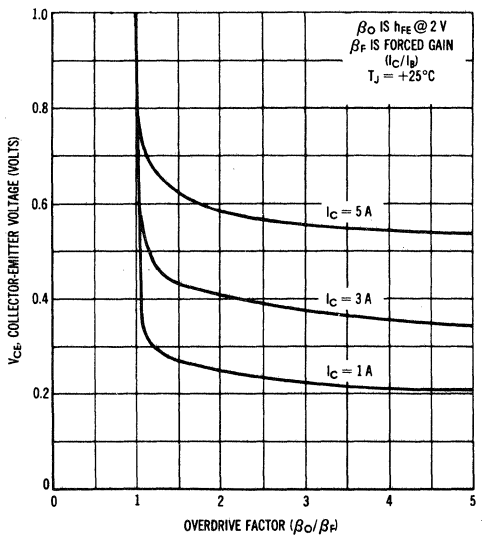


*Dashed line indicates metered base current minus I_{CBO} of the transistor at 175°C.

INPUT ADMITTANCE



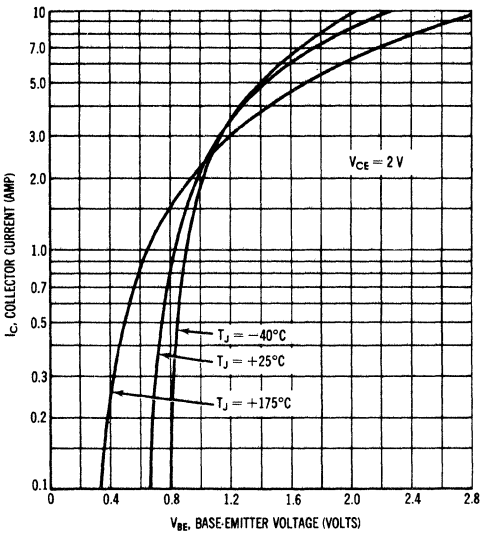
SATURATION REGION



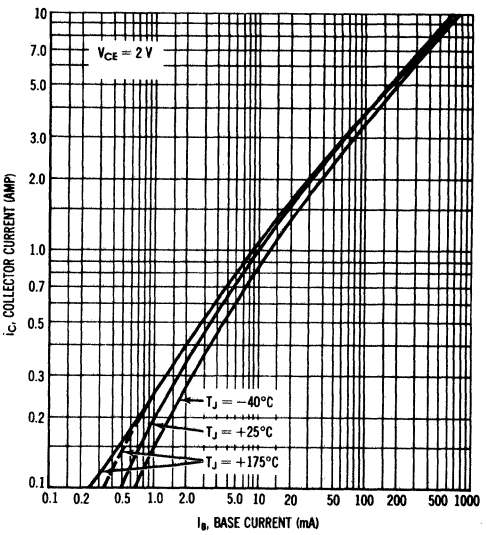
LARGE SIGNAL CHARACTERISTICS – TYPE 2N3791, 2N3792

(PULSE TEST: pulse width ≈ 200 μsec, duty cycle ≈ 1%)

TRANSCONDUCTANCE

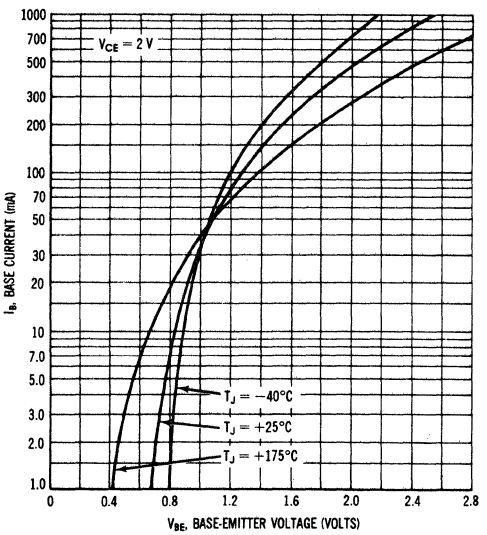


CURRENT GAIN

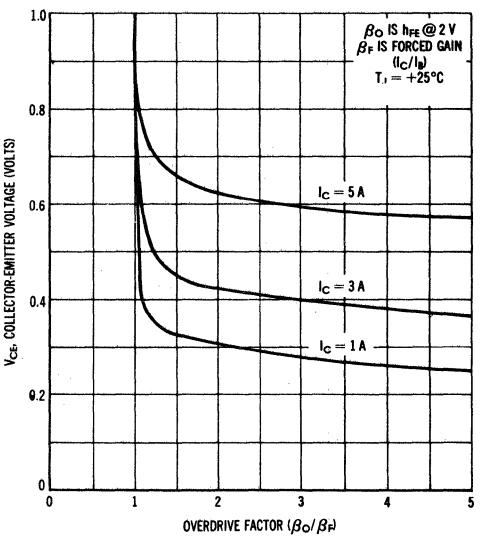


Dashed line indicates metered base current minus I_{CBO} of the transistor at 175°C.

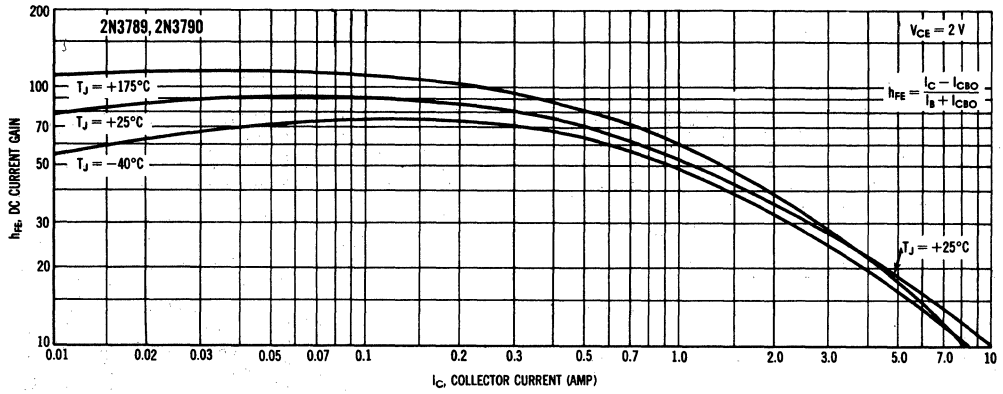
INPUT ADMITTANCE



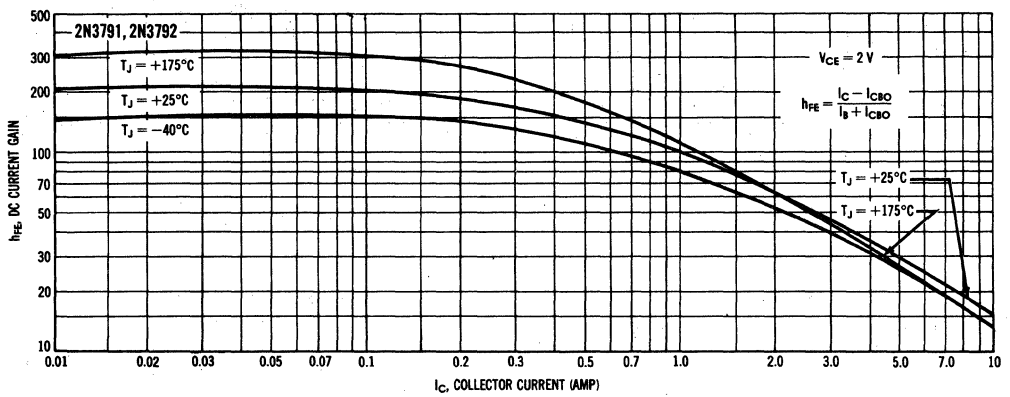
SATURATION REGION



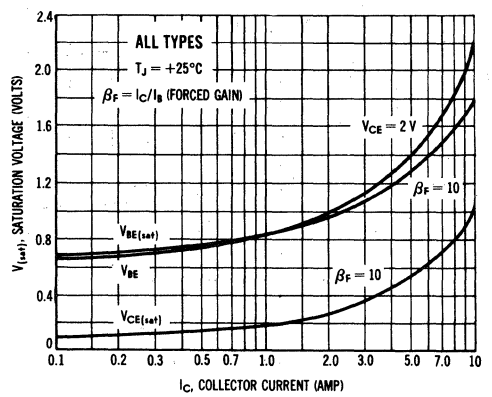
CURRENT GAIN VARIATIONS



CURRENT GAIN VARIATIONS



SATURATION VOLTAGES



TEMPERATURE COEFFICIENTS