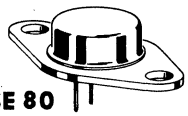
2N3738 (SILICON)
2N3739



CASE 80
(TO-66)

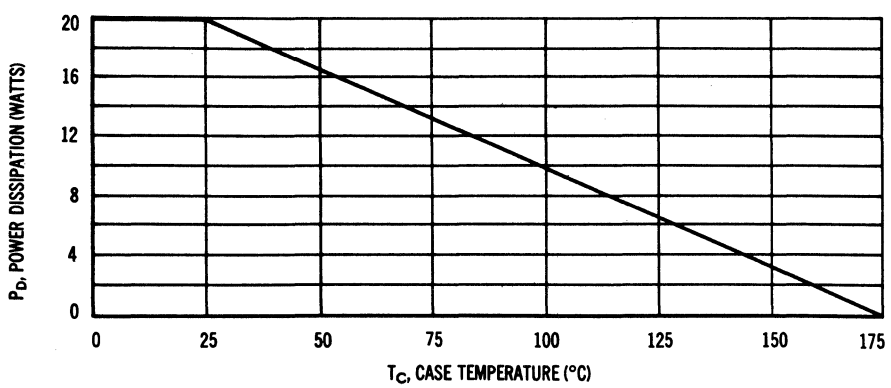
Collector connected to case

High-voltage NPN silicon power transistors, designed for use in line operated equipment such as audio output amplifiers; low-current, high-voltage converters; and AC line relays, featuring excellent dc gain.

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

Rating	Symbol	2N3738	2N3739	Unit
Collector-Base Voltage	V_{CB}	250	325	Vdc
Emitter-Base Voltage	V_{EB}	6.0	6.0	Vdc
Collector-Emitter Voltage	V_{CEO}	225	300	Vdc
Collector Current (Continuous)	I_C	3.0		Adc
Collector Current (Peak)	I_C	3.0		Amp
Base Current	I_B	1.0		Amp
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	20 0.133		Watts W/°C
Thermal Resistance	θ_{JC}	7.5		°C/W
Junction Operating and Storage Temperature Range	T_J, T_{stg}	-65 to +175		°C

POWER-TEMPERATURE DERATING CURVE



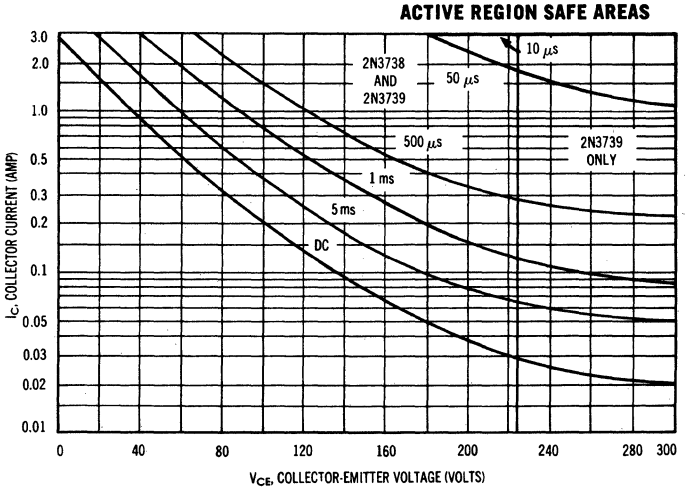
2N3738, 2N3739 (continued)

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage [1] (I_C = 5 mAdc, I_B = 0)	2N3738	$V_{CEO(sus)}$	225	—	Vdc
	2N3739		300	—	
Emitter-Base Cutoff Current (V_{EB} = 6 Vdc)		I_{EBO}	—	0.1	mAdc
Collector Cutoff Current		I_{CEX}			mAdc
(V_{CE} = 250 Vdc, V_{BE} = 1.5 Vdc)	2N3738		—	0.5	
(V_{CE} = 300 Vdc, V_{BE} = 1.5 Vdc)	2N3739		—	0.5	
(V_{CE} = 125 Vdc, V_{BE} = 1.5 Vdc, T_C = 100°C)	2N3738		—	1.0	
(V_{CE} = 200 Vdc, V_{BE} = 1.5 Vdc, T_C = 100°C)	2N3739		—	1.0	
Collector-Emitter Cutoff Current		I_{CEO}			mAdc
(V_{CE} = 125 Vdc, I_B = 0)	2N3738		—	0.25	
(V_{CE} = 200 Vdc, I_B = 0)	2N3739		—	0.25	
Collector-Base Cutoff Current		I_{CBO}			mAdc
(V_{CB} = 250 Vdc, I_E = 0)	2N3738		—	0.1	
(V_{CB} = 325 Vdc, I_E = 0)	2N3739		—	0.1	
ON CHARACTERISTICS					
DC Current Gain [1]		h_{FE}			—
(I_C = 50 mAdc, V_{CE} = 10 Vdc)			30	—	
(I_C = 100 mAdc, V_{CE} = 10 Vdc)			40	200	
(I_C = 250 mAdc, V_{CE} = 10 Vdc)			25	—	
Collector-Emitter Saturation Voltage [1] (I_C = 250 mAdc, I_B = 25 mAdc)		$V_{CE(sat)}$	—	2.5	Vdc
Base-Emitter Voltage [1] (I_C = 100 mAdc, V_{CE} = 10 Vdc)		V_{BE}	—	1.0	Vdc
TRANSIENT CHARACTERISTICS					
Current-Gain—Bandwidth Product (I_C = 100 mAdc, V_{CE} = 10 Vdc, f = 1.0 MHz)		f_T	10	—	MHz
Common Base Output Capacitance (V_{CB} = 100 Vdc, I_C = 0, f = 100 kHz)		C_{ob}	—	20	pF
Small Signal Current Gain (I_C = 100 mAdc, V_{CE} = 20 Vdc, f = 1 kHz)		h_{fe}	35	—	—

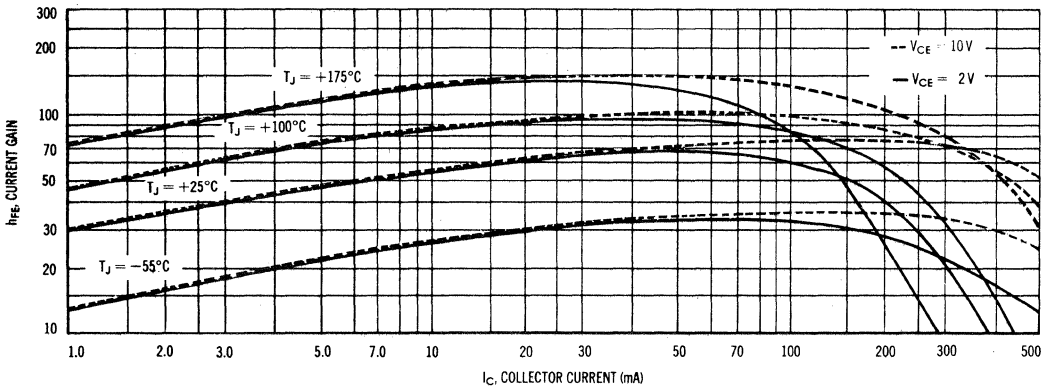
[1]PULSE TEST: PW ≤ 300 μs, Duty Cycle ≤ 2%

ACTIVE REGION SAFE AREAS

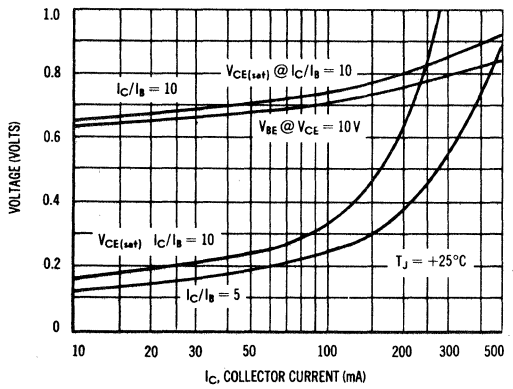


The Safe Operating Area Curves indicate I_C-V_{CE} limits below which the device will not go into secondary breakdown. Collector load lines for specific circuits must fall within the applicable Safe Area to avoid causing a collector-emitter short. (Case temperature and duty cycle of the excursions make no significant change in these safe areas.) The load line may exceed the BV_{CEO} voltage limit only if the collector current has been reduced to 20 mA or less before or at the BV_{CEO} limit; then and only then may the load line be extended to the absolute maximum voltage rating of BV_{CBO}. To insure operation below the maximum T_J, the power-temperature derating curve must be observed for both steady state and pulse power conditions.

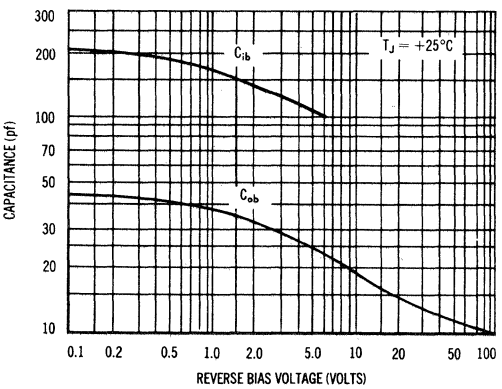
CURRENT GAIN



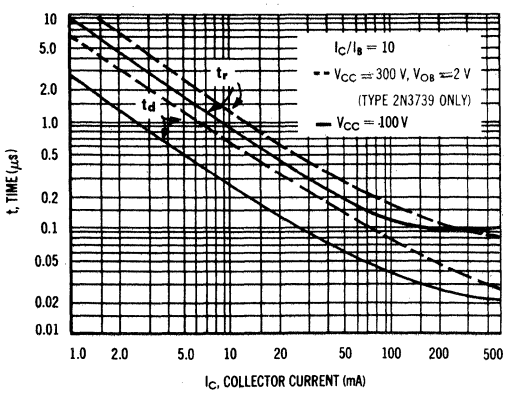
"ON" VOLTAGES



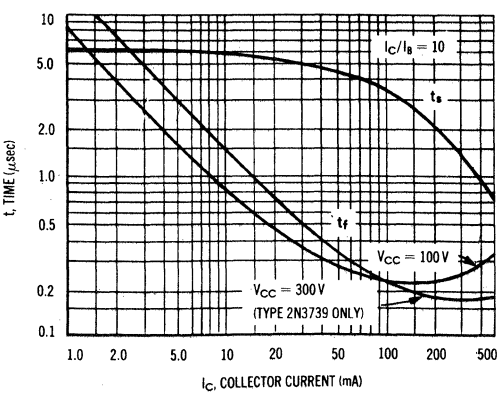
CAPACITANCE



TURN-ON TIME

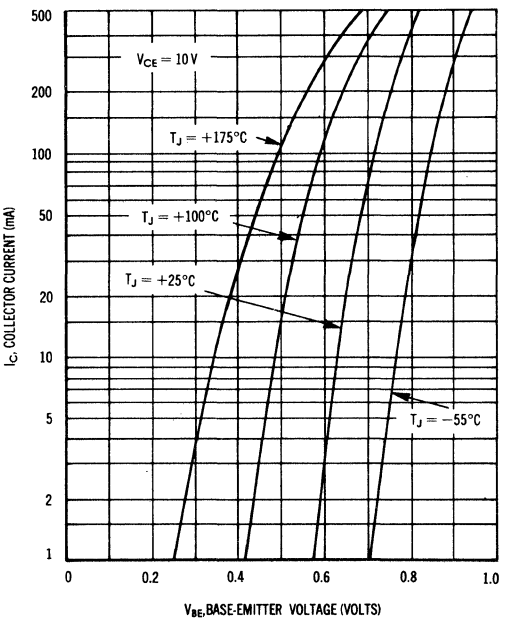


TURN-OFF TIME

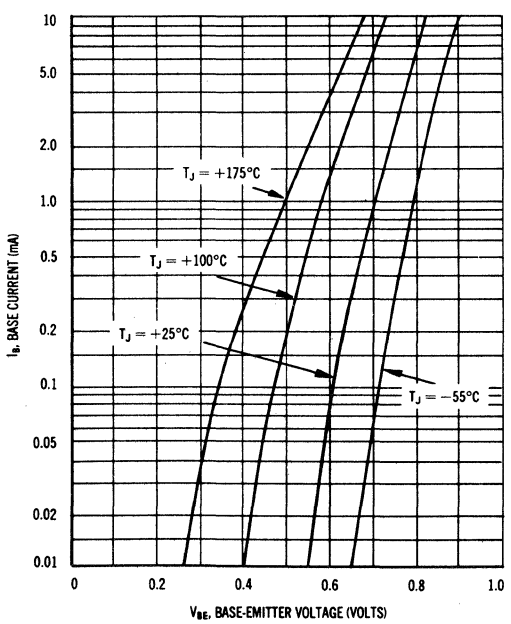


LARGE SIGNAL CHARACTERISTICS

TRANSCONDUCTANCE

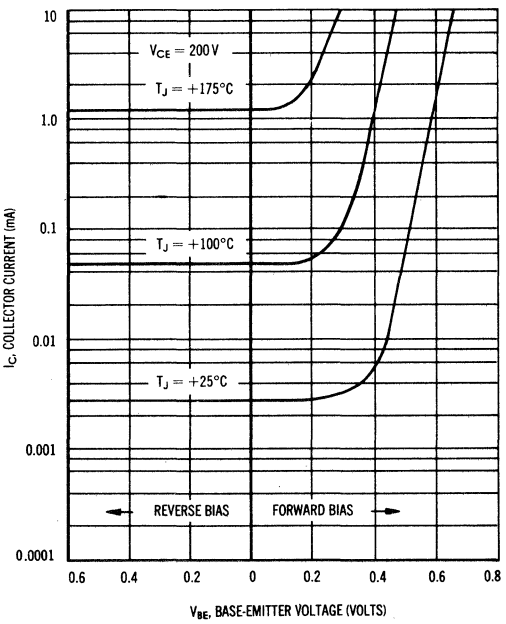


INPUT ADMITTANCE



CUT-OFF CHARACTERISTICS

TRANSCONDUCTANCE



EFFECT OF BASE-EMITTER RESISTANCE