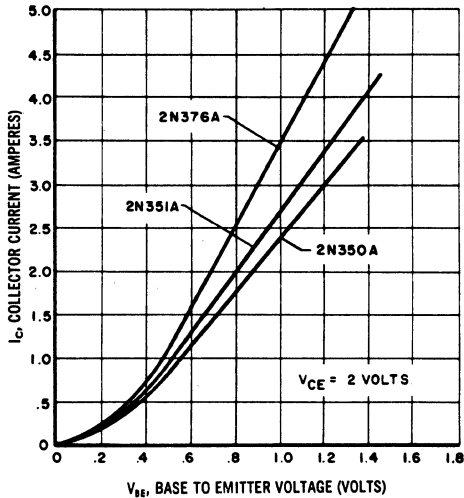
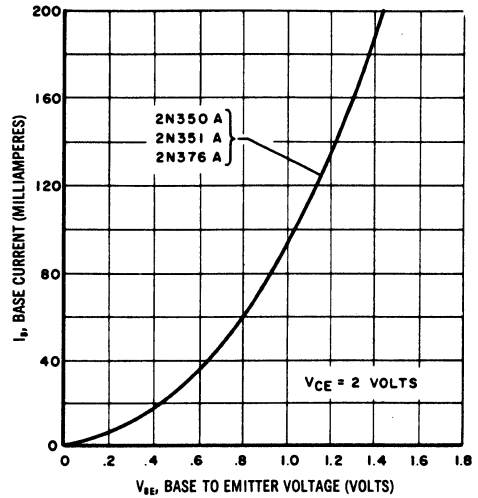


2N350A, 2N351A, 2N376A (continued)

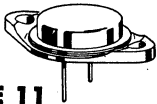
OUTPUT CURRENT versus
EMITTER-DRIVE VOLTAGE



INPUT CURRENT versus
EMITTER-DRIVE VOLTAGE



2N375 (GERMANIUM) 2N618 2N1359 2N1360 2N1362 thru 2N1365



CASE 11
(TO-3)

PNP germanium power transistors for general purpose switching and amplifier applications.

MAXIMUM RATINGS

Rating	Symbol	2N1359 2N1360	2N375 2N618	2N1362 2N1363	2N1364 2N1365	Unit
Collector-Emitter Voltage	V_{CES}	40	60	75	100	Vdc
Collector-Base Voltage	V_{CB}	50	80	100	120	Vdc
Emitter-Base Voltage	V_{EB}	25	40	50	60	Vdc
Collector Current-Continuous Peak	I_C	3.0 10				Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	106 1.25				Watts $\text{W}/^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +110				$^\circ\text{C}$

THERMAL CHARACTERISTICS

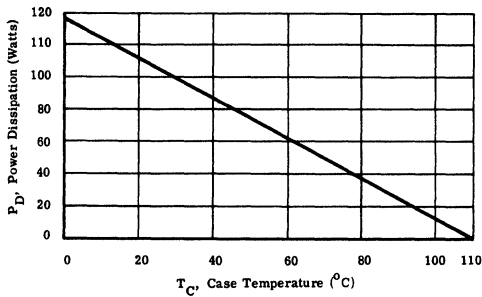
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	0.8	$^\circ\text{C}/\text{W}$

2N375, 2N618, 2N1359, 2N1360, 2N1362 thru 2N1365 (continued)
ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Types	Symbol	Minimum	Typical	Maximum	Unit
Collector-Base Cutoff Current ($V_{CB} = 40\text{ V}, I_E = 0$) ($V_{CB} = 50\text{ V}, I_E = 0$) ($V_{CB} = 60\text{ V}, I_E = 0$) ($V_{CB} = 80\text{ V}, I_E = 0$) ($V_{CB} = 75\text{ V}, I_E = 0$) ($V_{CB} = 100\text{ V}, I_E = 0$) ($V_{CB} = 100\text{ V}, I_E = 0$) ($V_{CB} = 120\text{ V}, I_E = 0$)	2N1359, 2N1360 2N375, 2N618 2N1362, 2N1363 2N1364, 2N1365	I_{CBO}	-- --	-- --	3.0 20.0 3.0 20.0 3.0 20.0 3.0 20.0	mA
Collector-Base Cutoff Current at $T_c = +90^\circ\text{C}$ $V_{CB} = 1/2\text{ BV}_{CES}$ rating		I_{CBO}	--	--	20	mA
Emitter-Base Cutoff Current ($V_{EB} = 12\text{ V}, I_C = 0$) ($V_{EB} = 25\text{ V}, I_C = 0$) ($V_{EB} = 50\text{ V}, I_C = 0$) ($V_{EB} = 60\text{ V}, I_C = 0$)	2N1359, 2N1360 2N1362, 2N1363 2N1364, 2N1365	I_{EBO}	-- -- --	-- -- --	0.5 20 20 20	mA
Collector-Emitter Breakdown Voltage $I_C = 500\text{ mA}, V_{EB} = 0$	2N1359, 2N1360 2N375, 2N618 2N1362, 2N1363 2N1364, 2N1365	BV_{CES}	40 60 75 100	-- -- -- --	-- -- -- --	Vdc
DC Current Transfer Ratio ($V_{CE} = 4\text{ V}, I_C = 1.0\text{ A}$) ($V_{CE} = 4\text{ V}, I_C = 1.0\text{ A}$)	2N1359, 375, 1362, 64 2N1360, 618, 1363, 65 2N1359, 375, 1362, 64 2N1360, 618, 1363, 65	h_{FE}	35 60 15 20	55 90 22 35	90 140 -- --	--
Transconductance ($V_{CE} = 4\text{ V}, I_C = 1.0\text{ A}$)	2N375 2N618 2N1359, 2N1362, 2N1364 2N1360, 2N1363, 2N1365	g_{FE}	0.8 1.0 0.8 1.0	1.25 1.6 1.25 1.6	2.2 2.5 -- --	mhos
Frequency Cutoff ($V_{CE} = 4\text{ V}, I_C = 1\text{ A}$) ($V_{CE} = 4\text{ V}, I_C = 1\text{ A}$) ($V_{CE} = 4\text{ V}, I_C = 3\text{ A}$) ($V_{CE} = 4\text{ V}, I_C = 3\text{ A}$)	2N375 2N618 2N1359, 2N1362, 2N1364 2N1360, 2N1363, 2N1365	$f_{\alpha e}$	5.0 5.0 7.0 5.0	8.5 8.5 10 8.5	-- -- -- --	kHz
Collector Saturation Voltage ($I_C = 2.0\text{ A}, I_B = 200\text{ mA}$)	2N1359, 375, 1362, 64 2N1360, 618, 1363, 65	$V_{CE(sat)}$	-- --	0.4 0.3	1.0 0.8	Vdc
Base-Emitter Drive Voltage ($I_C = 2.0\text{ A}, I_B = 200\text{ mA}$)	2N1359, 375, 1362, 64 2N1360, 618, 1363, 65	V_{BE}	-- --	0.7 0.6	-- --	Vdc
Collector-Emitter Punch- Through Voltage ($V_{CB} = 50\text{ V}, I_C = 0$) ($V_{CB} = 100\text{ V}, I_C = 0$) ($V_{CB} = 120\text{ V}, I_C = 0$)	2N1359, 2N1360 2N1362, 2N1363 2N1364, 2N1365	V_{EBF}	-- -- --	-- -- --	1.25 1.25 1.25	Vdc

2N375 (continued)

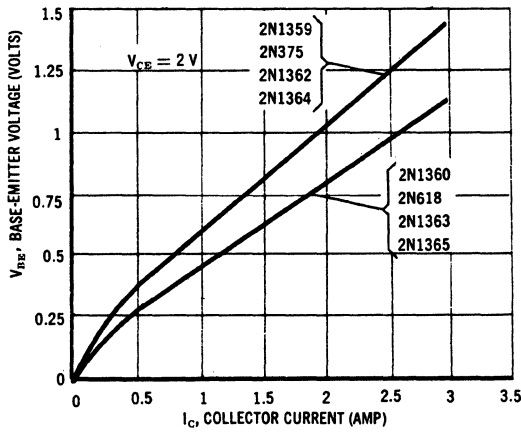
POWER-TEMPERATURE DERATING CURVE



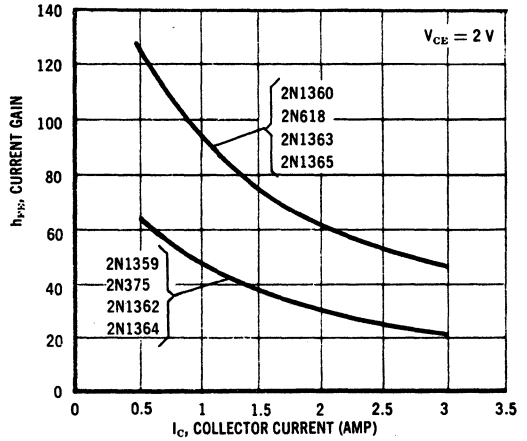
The maximum continuous power is related to maximum junction temperature, by the thermal resistance factor. For d.c. or frequencies below 25 cps the transistor must be operated within the constant $P_D = V_c \times I_c$ hyperbolic curve. This curve has a value of 106 Watts at case temperatures of 25°C and is 0 Watts at 110°C with a linear relation between the two temperatures such that

$$P_D \text{ allowable} = \frac{110^\circ - T_c}{0.8}$$

BASE-EMITTER VOLTAGE versus COLLECTOR CURRENT



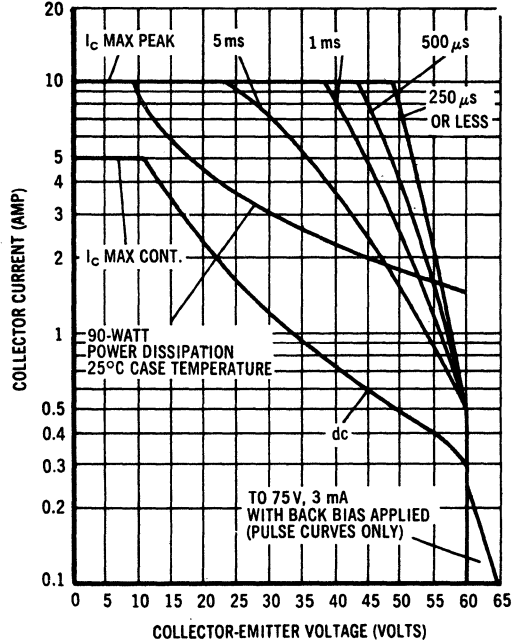
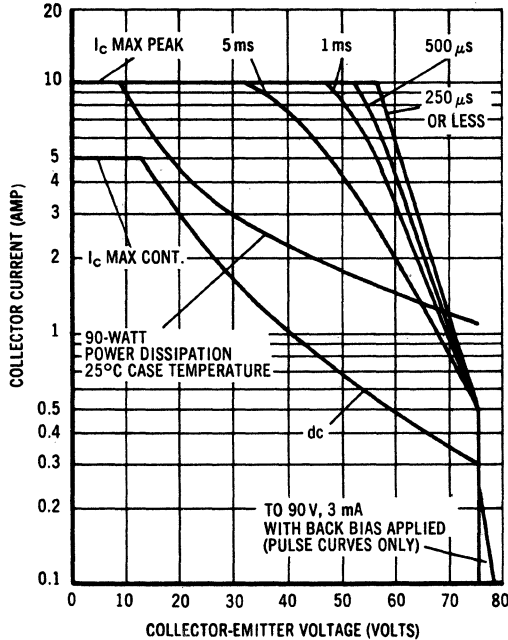
CURRENT GAIN versus COLLECTOR CURRENT



2N1362, 2N1363

SAFE OPERATING AREAS

2N375, 2N618



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 excursions 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.