2N173 (GERMANIUM)

For Specifications, See 2N277 Data.

2N174 (GERMANIUM)
2N1100
2N1358, A

CASE 5
(TO-36)

PNP germanium power transistors. Power dissipation and junction temperature ratings exceed those of EIA registration.

MAXIMUM RATINGS

Rating	Symbol	2N174	2N1100	2N1358	Unit
Collector-Base Voltage	V_{CB}	80	100	80	Vdc
Emitter-Base Voltage	V_{EB}	60	80	60	Vdc
Emitter Current (Continuous)	I_E	15	15	15	Amp
Base Current (Continuous)	I_B	4.0	4.0	4.0	Amp
Junction and Storage Temperature	T_J, T_{stg}	-65 to +110			°C
Thermal Resistance, Junction to Case	θ_{JC}	0.5			°C/W

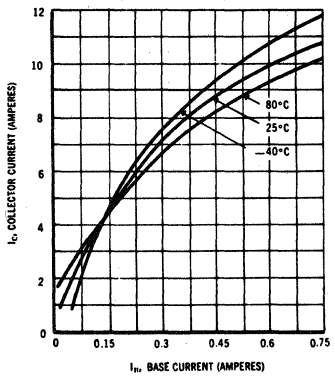
2N174, 2N1100, 2N1358 (continued)

ELECTRICAL CHARACTERISTICS

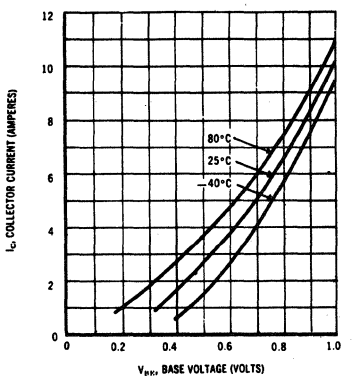
Characteristic		Symbol	Minimum	Typical	Maximum	Unit
Collector-Base Cutoff Current		I_{CBO}				μA
(V_{CB} = 2 volts)	2N174		-	100	-	
	2N1100		-	100	-	
	2N1358		-	100	200	
Collector-Base Cutoff Current		I_{CBO}				mA
(V_{EB} = 1.5 volts, V_{CB} = 80 volts)	2N174		-	2.0	8.0	
100	2N1100		-	2.0	8.0	
80	2N1358		-	2.0	8.0	
Emitter-Base Cutoff Current		I_{EBO}				mA
(V_{EB} = 60 volts)	2N174		-	1.0	8.0	
80	2N1100		-	1.0	8.0	
60	2N1358		-	1.0	8.0	
Collector-Base Cutoff Current		I_{CBO}				mA
(V_{CB} = 80 volts, 71°C)	2N174		-	-	15	
100	2N1100		-	-	15	
60	2N1358		-	4.0	6.0	
Emitter-Base Cutoff Current		I_{EBO}				mA
(V_{EB} = 30 volts, 71°C)	2N1358		-	4.0	6.0	
Collector-Emitter Voltage		BV_{CES}*				Vdc
(I_C = 300 mA, V_{EB} = 0)	2N174		70	-	-	
	2N1100		80	-	-	
	2N1358		70	-	-	
Collector-Emitter Voltage		BV_{CEO}*				Vdc
(I_C = 1.0 amp, I_B = 0)	2N174		55	-	-	
1.0 amp, I_B = 0	2N1100		65	-	-	
300 mA, I_B = 0	2N1358		40	-	-	
Floating Potential		V_{EBF}				volt
(I_E = 0, V_{CB} = 80 volts)	2N174		-	-	1.0	
100	2N1100		-	-	1.0	
80	2N1358		-	0.15	1.0	
Current Gain		h_{FE}				-
(I_C = 1.2 amp, V_{CB} = 2 volts)	2N1358		40	55	80	
(I_C = 5 amp, V_{CB} = 2 volts)	2N174		25	-	50	
	2N1100		25	-	50	
	2N1358		25	35	-	
(I_C = 12 amp, V_{CB} = 2 volts)	2N174		-	20	-	
	2N1100		-	20	-	
Base-Emitter Voltage		V_{BE}				Vdc
(I_C = 1.2 amp, V_{CB} = 2 volts)	2N1358		-	0.35	0.5	
(I_C = 5 amp, V_{CB} = 2 volts)	2N174		-	0.65	0.9	
	2N1100		-	0.65	0.9	
	2N1358		-	0.65	0.9	
Saturation Voltage		$V_{CE(sat)}$				Vdc
(I_C = 12 amp, I_B = 2 amp)	2N174		-	0.3	0.9	
	2N1100		-	0.3	0.7	
	2N1358		-	0.3	0.7	
Common-Emitter Cutoff Frequency		$f_{\alpha e}$				kHz
(I_C = 5 amp, V_{CE} = 6 volts)	2N174		-	10	-	
	2N1100					
Common-Base Cutoff Frequency		$f_{\alpha b}$				kHz
(I_E = 1 amp, V_{CB} = 12 volts)	2N1358		100	-	-	
Rise Time ("on" I_C = 12 Adc, I_B = 2 Adc, V_{CE} = 12 volts)		t_r	-	15	-	μs
Fall Time ("off" I_C = 0, V_{EB} = -6 volts, R_{EB} = 10 ohms)		t_f	-	15	-	μs

* In order to avoid excessive heating of the collector junction, perform test by the sweep method.

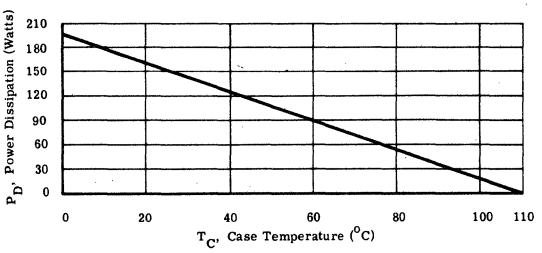
CURRENT TRANSFER CHARACTERISTICS



TRANSCONDUCTANCE CHARACTERISTICS



POWER-TEMPERATURE DERATING CURVE

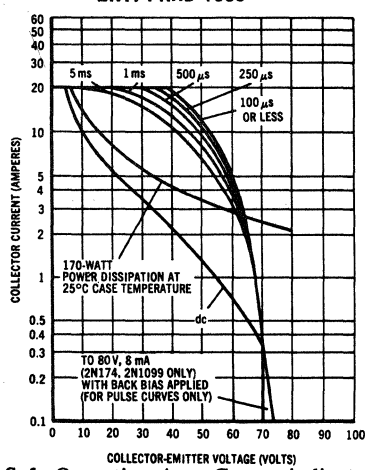


The maximum continuous power is related to maximum junction temperature by the thermal resistance factor.

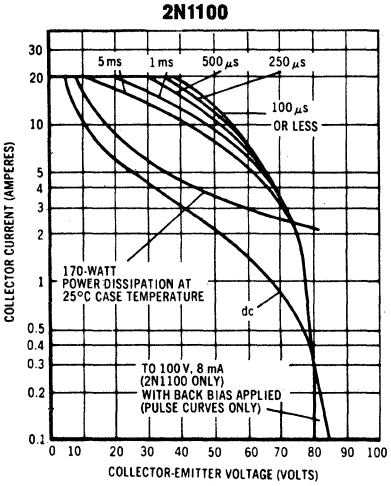
This curve has a value of 150 Watts at case temperatures of 25°C and is 0 Watts at 110°C with a linear relation between the two temperatures such that:

$$\text{allowable } P_D = \frac{110° - T_c}{0.5}$$

2N174 AND 1358



2N1100



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.