2N965 (GERMANIUM)
2N966

For Specifications, See 2N960 Data.

2N967 (GERMANIUM)

For Specifications, See 2N963 Data.

2N968 thru 2N975 (GERMANIUM)

CASE 22
(TO-18)

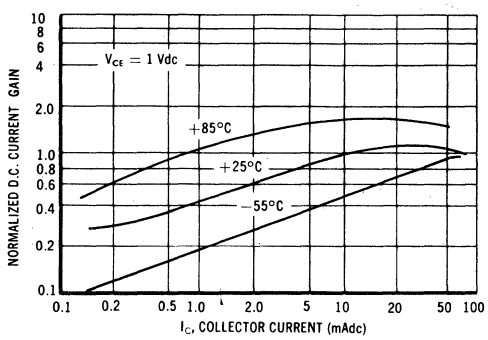
Collector connected to case

PNP germanium mesa transistors for high-speed switching applications.

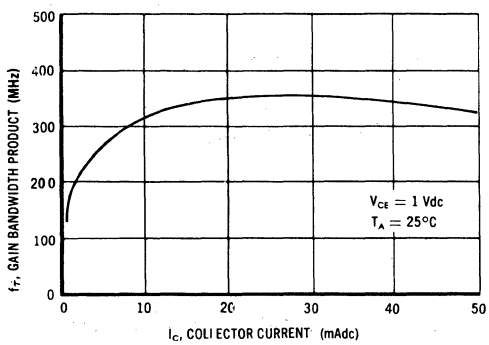
MAXIMUM RATINGS

Rating	Symbol	2N968 2N972	2N969 2N973	2N970 2N974	2N971 2N975	Unit
Collector-Emitter Voltage	V_{CES}	15	12	12	7.0	Vdc
Collector-Base Voltage	V_{CB}	15	12	12	7.0	Vdc
Emitter-Base Voltage	V_{EB}	2.5	2.0	1.25	1.25	Vdc
Total Device Dissipation @ $T_A = 25^oC$ Derate above 25^oC	P_D	150 2.0				mW $mW/^oC$
Total Device Dissipation @ $T_C = 25^oC$ Derate above 25^oC	P_D	300 4.0				mW $mW/^oC$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +100				^oC

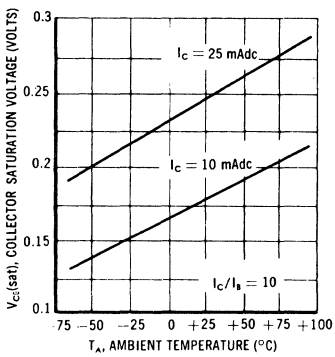
NORMALIZED D.C. CURRENT GAIN versus COLLECTOR CURRENT



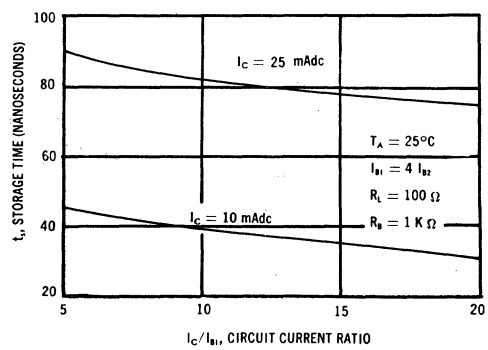
CURRENT GAIN-BANDWIDTH PRODUCT (f_T) versus COLLECTOR CURRENT



COLLECTOR SATURATION VOLTAGE versus AMBIENT TEMPERATURE



STORAGE TIME versus CIRCUIT CURRENT RATIO



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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	2N968, 2N972	BV_{CBO}	15	25	-	Vdc
	2N969, 2N970, 2N973, 2N974		12	20	-	
	2N971, 2N975		7.0	15	-	
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)	2N968, 2N972	BV_{EBO}	2.5	-	-	Vdc
	2N969, 2N973		2.0	-	-	
	2N970, 2N974		1.25	-	-	
	2N971, 2N975		1.25	-	-	
Collector Cutoff Current (V_{CE} = 15 Vdc, V_{BE} = 0)	2N968, 2N972	I_{CES}	-	-	100	μAdc
(V_{CE} = 12 Vdc, V_{BE} = 0)	2N969, 2N970, 2N973, 2N974		-	-	100	
(V_{CE} = 7 Vdc, V_{BE} = 0)	2N971, 2N975		-	-	100	
Collector Cutoff Current (V_{CB} = 6 Vdc, I_E = 0)		I_{CBO}				μAdc
	2N968, 2N969, 2N970,		-	-	3.0	
	2N972, 2N973, 2N974		-	-	3.0	
	2N971, 2N975		-	-	10	

ELECTRICAL CHARACTERISTICS (continued)

Characteristic		Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				
(I_C = 10 mAdc, V_{CE} = 0.5 Vdc)	2N968, 2N969, 2N970, 2N971		17	35	-	
	2N972, 2N973, 2N974, 2N975		40	75	-	
(I_C = 25 mAdc, V_{CE} = 0.7 Vdc)	2N968, 2N969, 2N970, 2N971		20	40	-	
	2N972, 2N973, 2N974, 2N975		40	85	-	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$				Vdc
(I_C = 10 mAdc, I_B = 1 mAdc)			-	0.19	0.25	
(I_C = 25 mAdc, I_B = 1.5 mAdc)			-	0.25	0.5	
Base-Emitter Saturation Voltage		$V_{BE(sat)}$				Vdc
(I_C = 10 mAdc, I_B = 1 mAdc)	2N968, 2N969, 2N972, 2N973		0.30	0.39	0.55	
	2N970, 2N971, 2N974, 2N975		0.30	0.43	0.65	
(I_C = 25 mAdc, I_B = 1.5 mAdc)	2N968, 2N969, 2N972, 2N973		-	0.45	0.80	
	2N970, 2N971, 2N974, 2N975		-	0.60	1.0	
DYNAMIC CHARACTERISTICS						
Current-Gain — Bandwidth Product (I_E = 10 mAdc, V_{CB} = 1 Vdc, f = MHz)		f_T	250	320	-	MHz
Collector Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 1 MHz)		C_{ob}	-	4.0	9.0	pF
Emitter Transition Capacitance (V_{EB} = 1 Vdc, I_C = 0)		C_{Te}	-	3.5	-	pF
Turn-On Time ($V_{BE(off)}$ = 1.25 Vdc, I_C = 10 mAdc, I_{B1} = 1 mA)		t_{on}				ns
	2N968, 2N969, 2N972, 2N973		-	50	75	
	2N970, 2N971, 2N974, 2N975		-	65	100	
Turn-Off Time (I_C = 10 mAdc, I_{B1} = 1 mAdc, I_{B2} = 0.25 mAdc)		t_{off}				ns
	2N968, 2N969		-	70	150	
	2N972, 2N973		-	75	175	
	2N970, 2N971, 2N974, 2N975		-	100	275	
Total Control Charge		Q_T				pC
(I_C = 10 mAdc, I_B = 1 mAdc)	2N968, 2N969, 2N972, 2N973		-	75	100	
	2N970, 2N971, 2N974, 2N975		-	80	150	
(I_C = 25 mAdc, I_B = 1.5 mAdc)	2N968, 2N969, 2N972, 2N973		-	90	175	
	2N970, 2N971, 2N974, 2N975		-	175	300	