

TL/G/10038-22

DESCRIPTION

Process 67 is a non-overlay, double-diffused, silicon epitaxial device. Complement to Process 12.

APPLICATION

This device is designed for general purpose amplifier and switching applications at currents to 1A and collector voltages up to 70V.

PRINCIPAL DEVICE TYPES

- TO-39 EBC:** 2N4033
- TO-92 EBC:** MPSA56
- TO-116:** MPQA56
- TO-202 EBC:** NSDU56
- TO-226 EBC:** MPSW56
- TO-236:** MMBT56
- TO-237 EBC:** TN4033

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

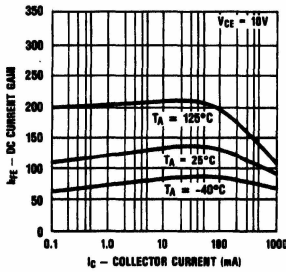
Symbol	Conditions	Min	Typ	Max	Units
t _{ON}	I _C = 500 mA, I _{B1} = 50 mA		35		ns
t _{OFF}	I _C = 500 mA, I _{B2} = 50 mA		250		ns
C _{ob}	V _{CB} = 10V		11	15	pF
C _{ib}	V _{EB} = 0.50V			90	pF
h _{fe}	V _{CE} = 10V, I _C = 50 mA, f = 100 MHz	1	2		
NF (spot)	I _C = 100 μA, R _S = 1k, V _{CE} = 10V, f = 1 kHz		1		dB
h _{FE}	I _C = 0.10 mA, V _{CE} = 10V I _C = 1.0 mA, V _{CE} = 10V I _C = 10 mA, V _{CE} = 10V I _C = 100 mA, V _{CE} = 10V I _C = 500 mA, V _{CE} = 10V	40 45 50 50 35	150	350	
V _{CE(SAT)}	I _C = 150 mA, I _B = 15 mA I _C = 500 mA, I _B = 50 mA			0.2 0.6	V
V _{BE(SAT)}	I _C = 150 mA, I _B = 15 mA I _C = 500 mA, I _B = 50 mA			1.0 1.2	V
BV _{CEO}	I _C = 10 mA	60			V
BV _{CB0}	I _C = 100 μA	70			V
BV _{EBO}	I _E = 10 μA	7			V
I _{CBO}	V _{CB} = 50V			100	nA
I _{EBO}	V _{EB} = 5V			100	nA

Process 67

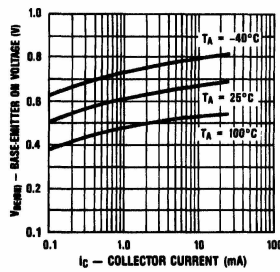
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$) (Continued)

Symbol	Conditions	Min	Typ	Max	Units
$P_{D(\text{max})}$	TO-202	$T_C = 25^\circ\text{C}$	10		W
		$T_A = 25^\circ\text{C}$	2		W
TO-237	$T_C = 25^\circ\text{C}$	2			W
	$T_A = 25^\circ\text{C}$	850			mW
TO-226	$T_A = 25^\circ\text{C}$	1			W
TO-92	$T_A = 25^\circ\text{C}$	600			mW
TO-39	$T_C = 25^\circ\text{C}$	7			W
	$T_A = 25^\circ\text{C}$	1			W
TO-236	$T_C = 25^\circ\text{C}$	350			mW
TO-116	$T_A = 25^\circ\text{C}$				mW
	(Each Device)	500			mW
	(Total Dissipation)	900			mW

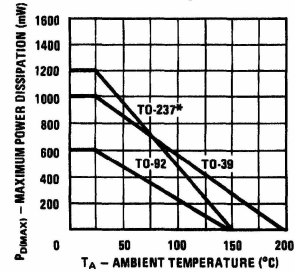
DC Pulsed Current Gain vs Collector Current



Base-Emitter ON Voltage vs Collector Current



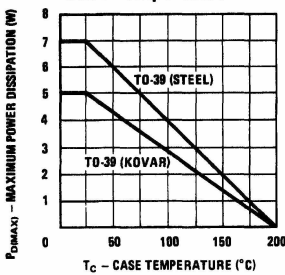
Maximum Power Dissipation vs Ambient Temperature



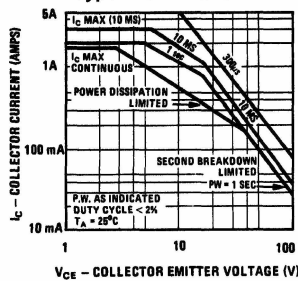
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*One square inch of copper run

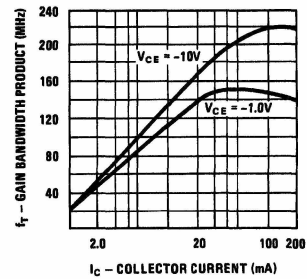
Maximum Power Dissipation vs Case Temperature



Safe Operating Area TO-39 with "Wake Field" Type 296-4 Heat Sink

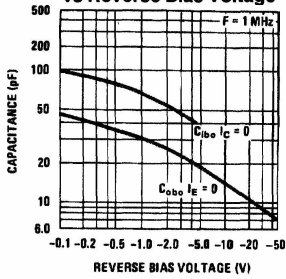


Gain Bandwidth Product vs Collector Current

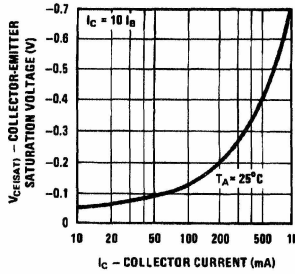


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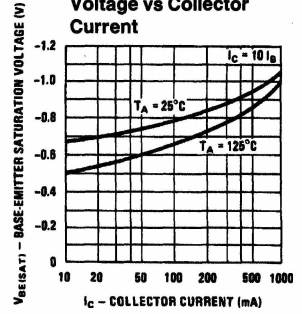
Common Base Open Circuit Input and Output Capacitance vs Reverse Bias Voltage



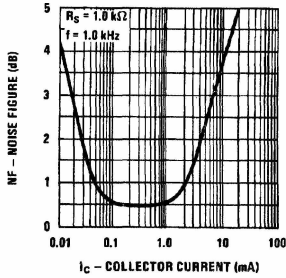
Collector-Emitter Saturation Voltage vs Collector Current



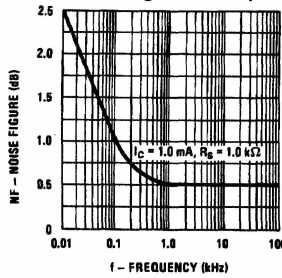
Base-Emitter Saturation Voltage vs Collector Current



Noise Figure vs Collector Current



Noise Figure vs Frequency



Switching Times vs Collector Current



Turn On and Turn Off Times vs Collector Current

