

**SOT-23 BIPOLAR TRANSISTORS
TRANSISTOR(NPN)**

FEATURES

- * Power dissipation
 P_{CM} 0.3 W($T_{amb}=25^{\circ}C$)
- * Collector current
 I_{CM} 0.3 A
- * Collector-base voltage
 $V_{(BR)CBO}$: 30 V
- * Operating and storage junction temperature range
 T_J, T_{stg} : $-55^{\circ}C$ to $+150^{\circ}C$

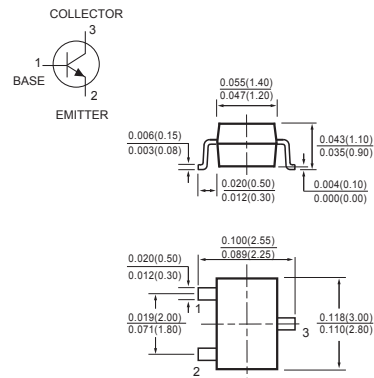
MECHANICAL DATA

- * Case: Molded plastic
- * Epoxy: UL 94V-O rate flame retardant
- * Lead: MIL-STD-202E method 208C guaranteed
- * Mounting position: Any
- * Weight: 0.008 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at $25^{\circ}C$ ambient temperature unless otherwise specified.
Single phase, half wave, 60 Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

SOT-23



MAXIMUM RATINGS (@ $T_A = 25^{\circ}C$ unless otherwise noted)

RATINGS	SYMBOL	VALUE	UNITS
Max. Steady State Power Dissipation ⁽¹⁾ @ $T_A=25^{\circ}C$ Derate above $25^{\circ}C$	P_D	300	mW
Max. Operating Temperature Range	T_J	150	$^{\circ}C$
Storage Temperature Range	T_{STG}	-55 to +150	$^{\circ}C$

ELECTRICAL CHARACTERISTICS (@ $T_A = 25^{\circ}C$ unless otherwise noted)

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	-	-	417	$^{\circ}C/W$

Notes: 1. Alumina=0.4*0.3*0.024in.99.5% alumina
2. "Fully ROHS Compliant", "100% Sn plating (Pb-free)".

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

Chatacteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 100\mu\text{Adc}$, $V_{BE} = 0$)	$V_{(BR)CES}$	30	-	Vdc
Collector Cutoff Current ($V_{CB} = 30\text{Vdc}$, $I_E = 0$)	I_{CBO}	-	100	nVdc
Emitter Cutoff Current ($V_{EB} = 10\text{Vdc}$, $I_C = 0$)	I_{EBO}	-	100	nVdc

ON CHARACTERISTICS(1)

DC Current Gain ($I_C = 10\text{mAdc}$, $V_{CE} = 5.0\text{Vdc}$) ($I_C = 100\text{mAdc}$, $V_{CE} = 5.0\text{Vdc}$)	h_{FE}	5000 10,000	- -	-
Collector-Emitter Saturation Voltage ($I_C = 100\text{mAdc}$, $I_B = 0.1\text{mAdc}$)	$V_{CE(sat)}$	-	1.5	Vdc
Base-Emitter On Voltage ($I_C = 100\text{mAdc}$, $V_{CE} = 5.0\text{Vdc}$)	V_{BE}	-	2.0	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current-Gain-Bandwidth Product (2) ($I_C = 10\text{mAdc}$, $V_{CE} = 5.0\text{Vdc}$, $f = 100\text{MHz}$)	f_T	125	-	MHz
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Notes : 1. Pulse Test: Pulse Width≤300ms,Duty Cycle≤2.0%
2. $f_T = |h_{fe}| \cdot f_{test}$

RATING AND CHARACTERISTICS CURVES (MMBTA13)

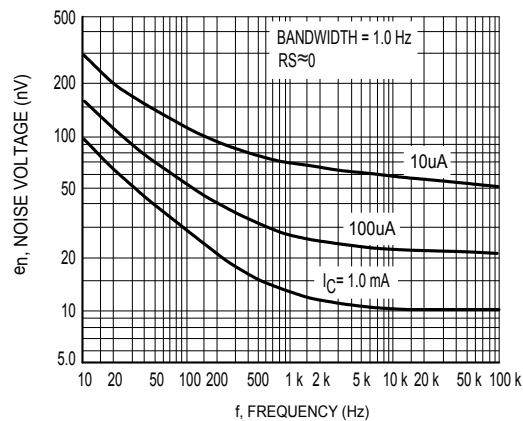


Figure 1 Noise Voltage

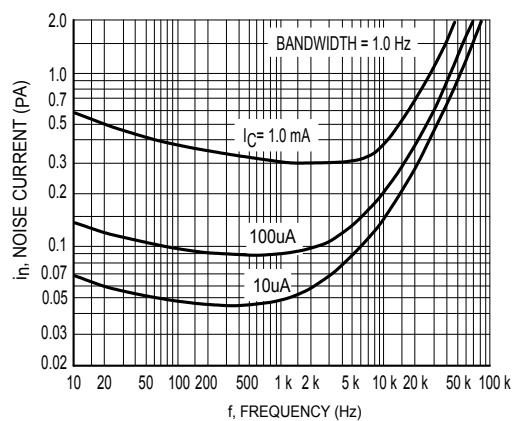


Figure 2 Noise Current

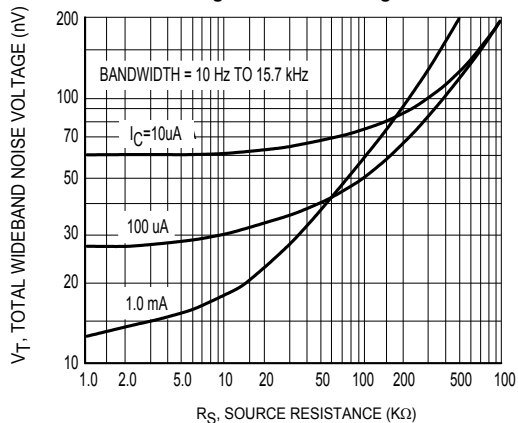


Figure 3. Total Wideband Noise Voltage

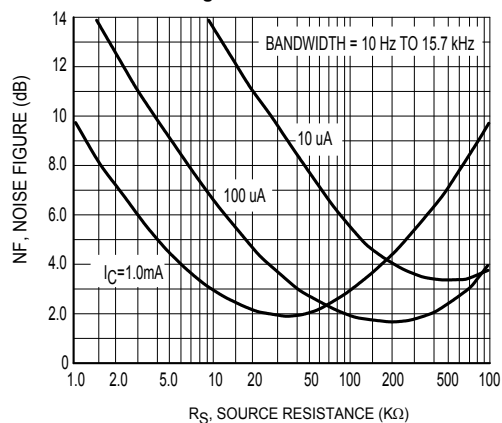


Figure 4 Wideband Noise Figure

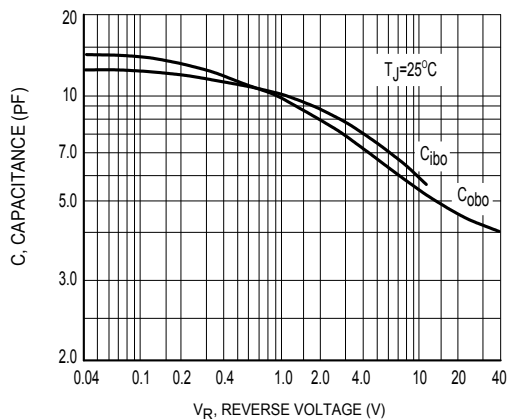


Figure 5 Capacitance

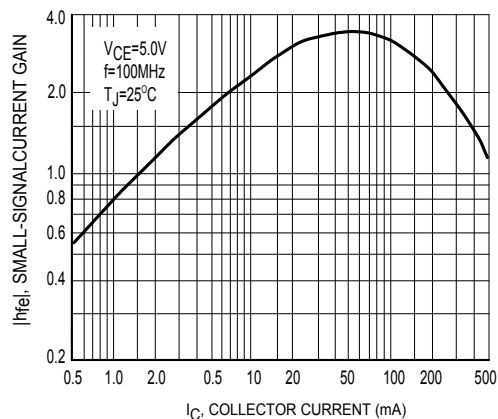
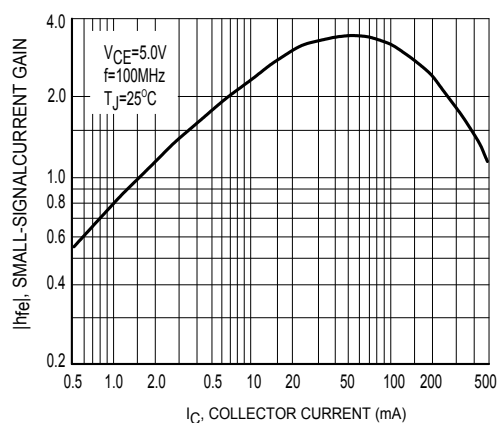
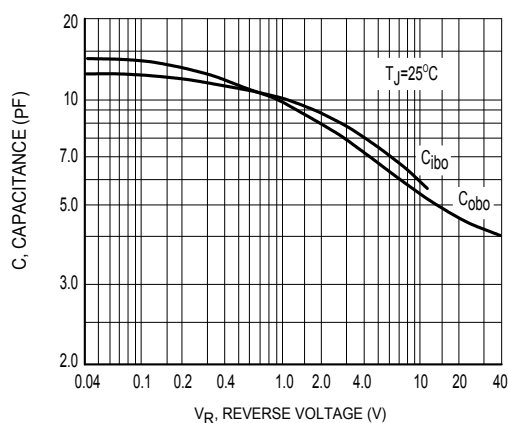
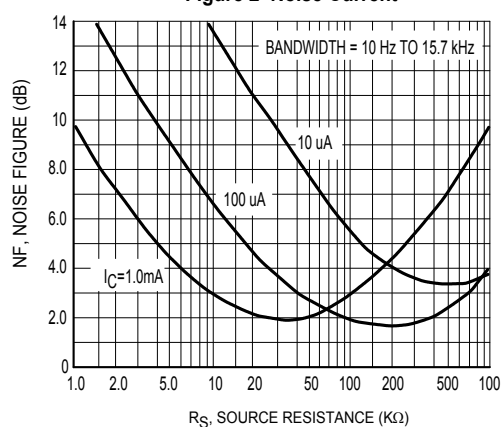
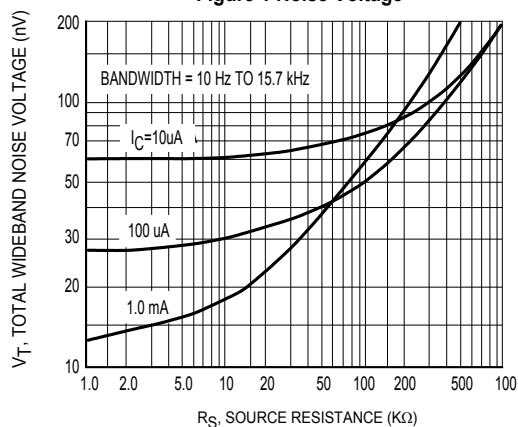
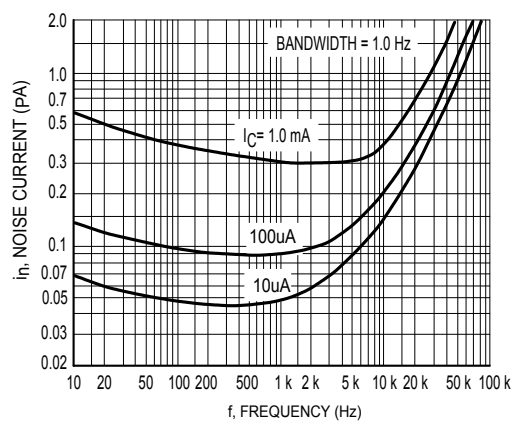
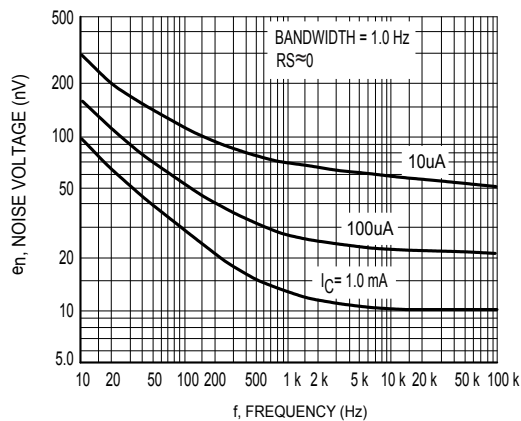


Figure 6 High Frequency Current Gain

RATING AND CHARACTERISTICS CURVES (MMBTA13)



RATING AND CHARACTERISTICS CURVES (MMBTA13)

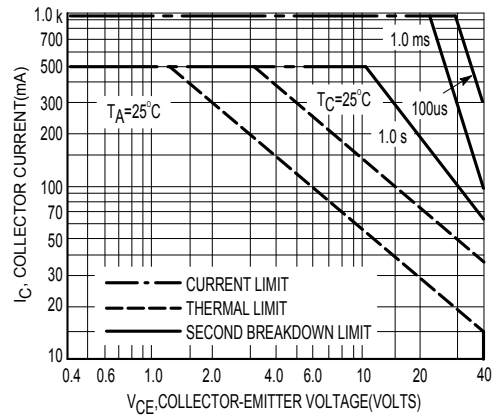


Figure 12 Active Region Safe Operating Area

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