



SOT-23 Plastic-Encapsulate Transistors

MMBTA13 , 14 TRANSISTOR (NPN)

FEATURES

Power dissipation

$$P_{CM} : 0.3W (T_{amb}=25)$$

Collector current

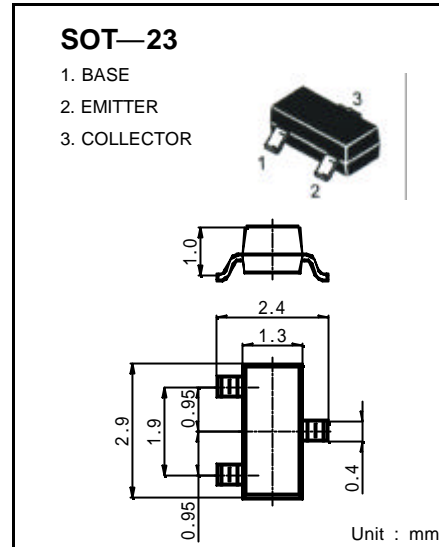
$$I_{CM} : 0.3A$$

Collector-base voltage

$$V_{(BR)CBO} : 30V$$

Operating and storage junction temperature range

$$T_J , T_{stg} : -55 \text{ to } +150$$



ELECTRICAL CHARACTERISTICS ($T_{amb}=25$ unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 100 \mu A , I_E = 0$	30		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 100 \mu A , I_B = 0$	30		V
Collector-emitter breakdown voltage	$V_{(BR)EBO}$	$I_E = 100 \mu A , I_C = 0$	10		V
Collector cut-off current	I_{CBO}	$V_{CB} = 30V , I_E = 0$		0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 10V , I_C = 0$		0.1	μA
DC current gain	$h_{FE(1)}$ *	$V_{CE} = 5V , I_C = 10mA$	MMBTA13 5000		
	$h_{FE(2)}$ *	$V_{CE} = 5V , I_C = 100mA$	MMBTA13 10000 MMBTA14 20000		
Collector-emitter saturation voltage	$V_{CE(sat)}$ *	$I_C = 100mA , I_B = 0.1mA$		1.5	V
Base-emitter voltage	V_{BE} *	$V_{CE} = 5V , I_C = 100mA$		2.0	V
Transition frequency	f_T	$V_{CE} = 5V , I_C = 10mA$ $f = 100MHz$	125		MHz

* Pulse Test : pulse width 300 μs , duty cycle 2%.

Marking : MMBTA13:1M ; MMBTA14 : 1N

Typical Characteristics

MMBTA13/14

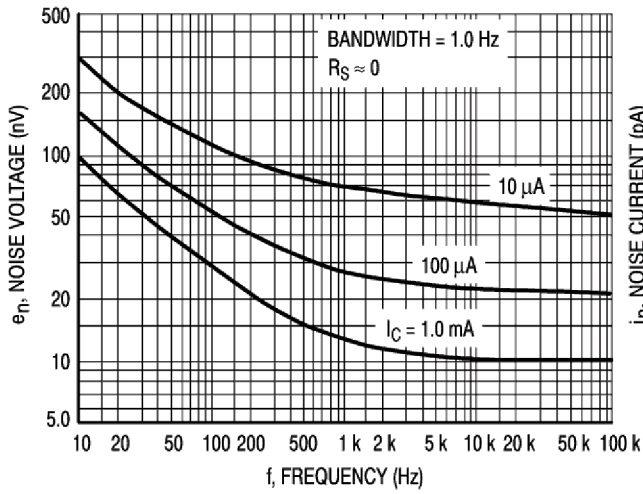


Figure 2. Noise Voltage

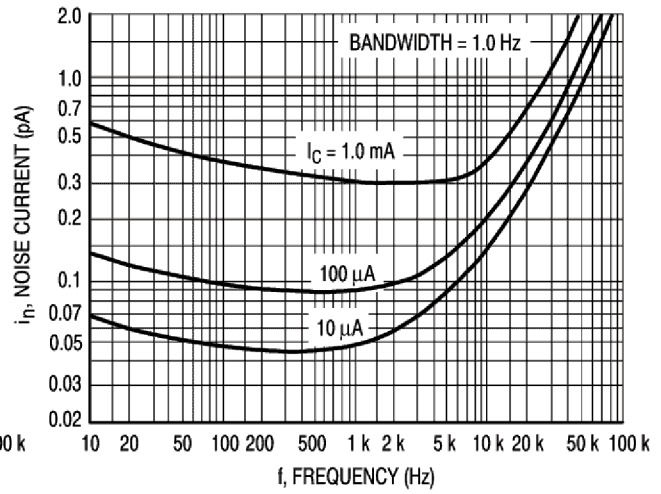


Figure 3. Noise Current

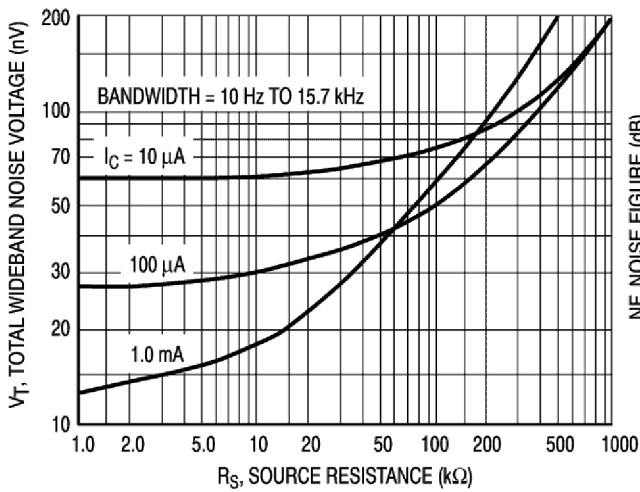


Figure 4. Total Wideband Noise Voltage

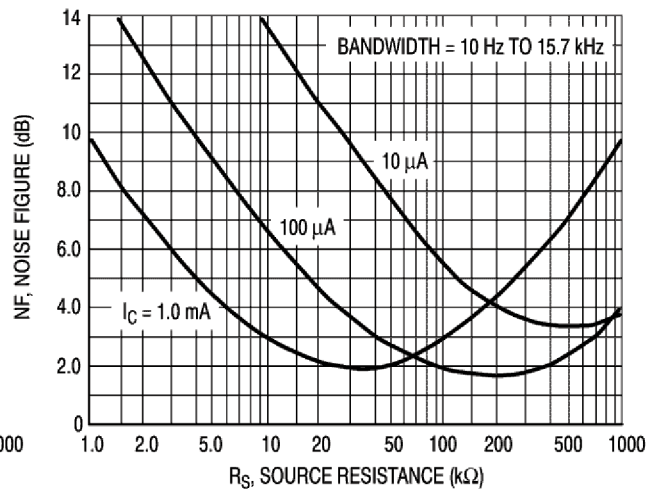


Figure 5. Wideband Noise Figure

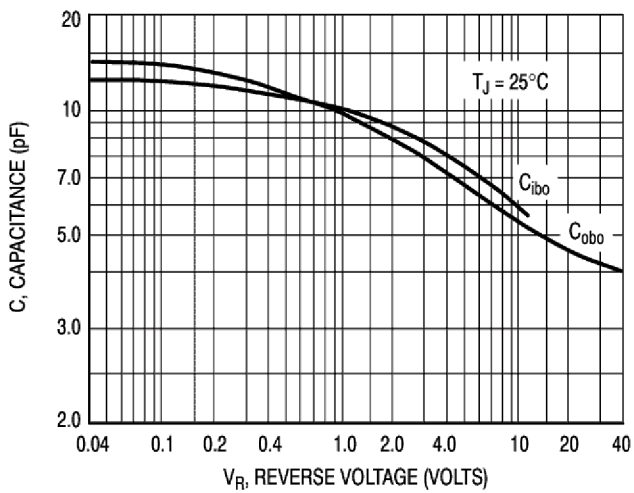


Figure 6. Capacitance

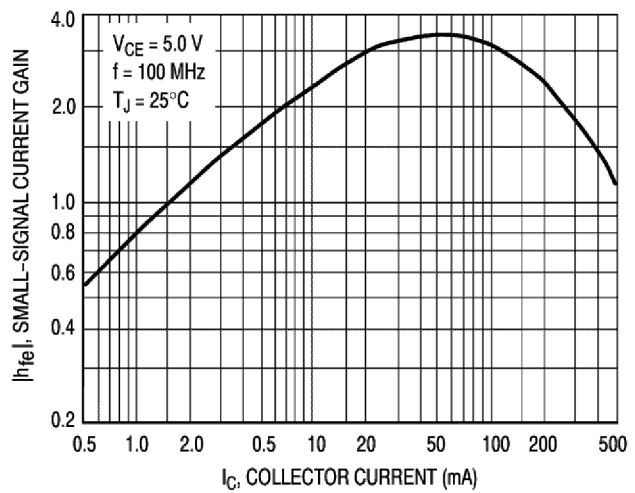


Figure 7. High Frequency Current Gain

Typical Characteristics

MMBTA13/14

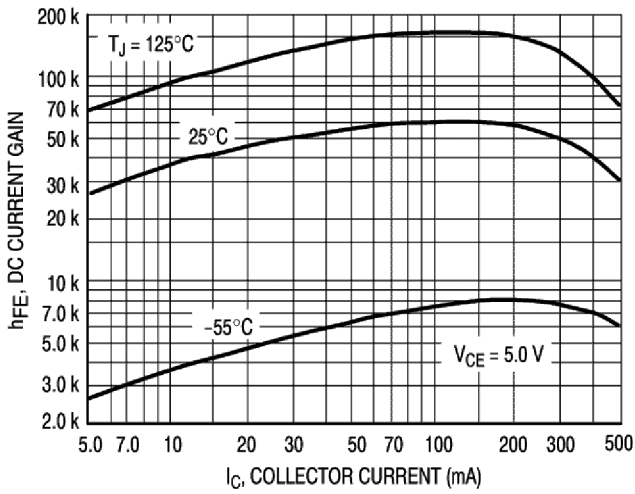


Figure 8. DC Current Gain

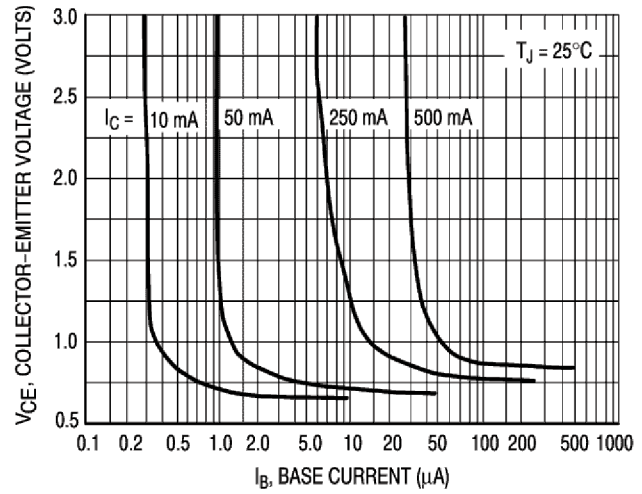


Figure 9. Collector Saturation Region

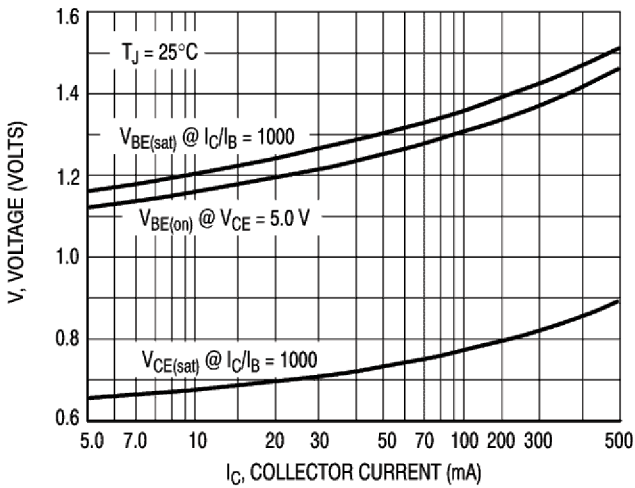


Figure 10. "On" Voltages

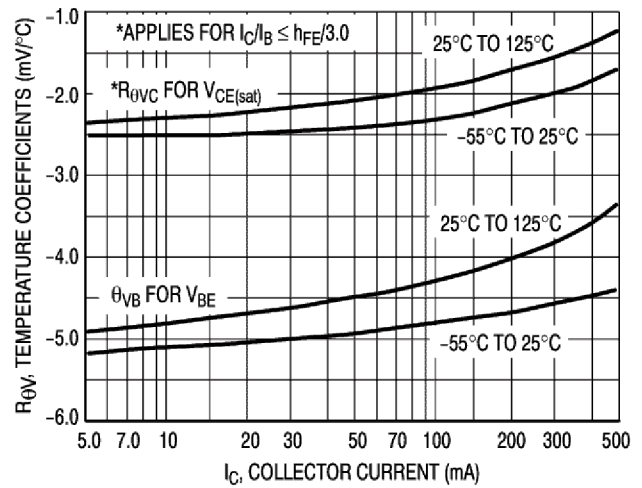


Figure 11. Temperature Coefficients

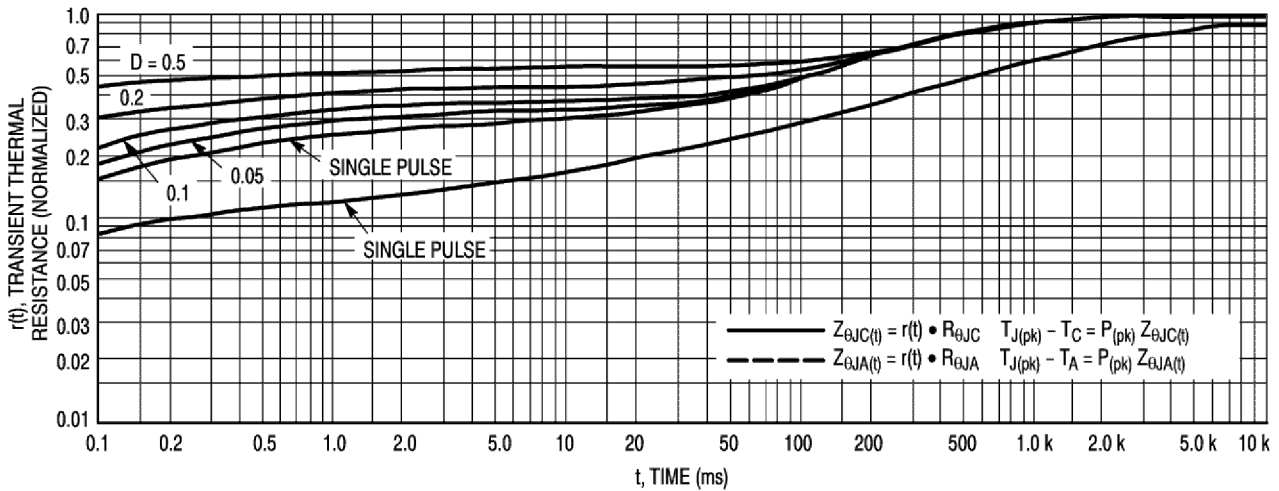
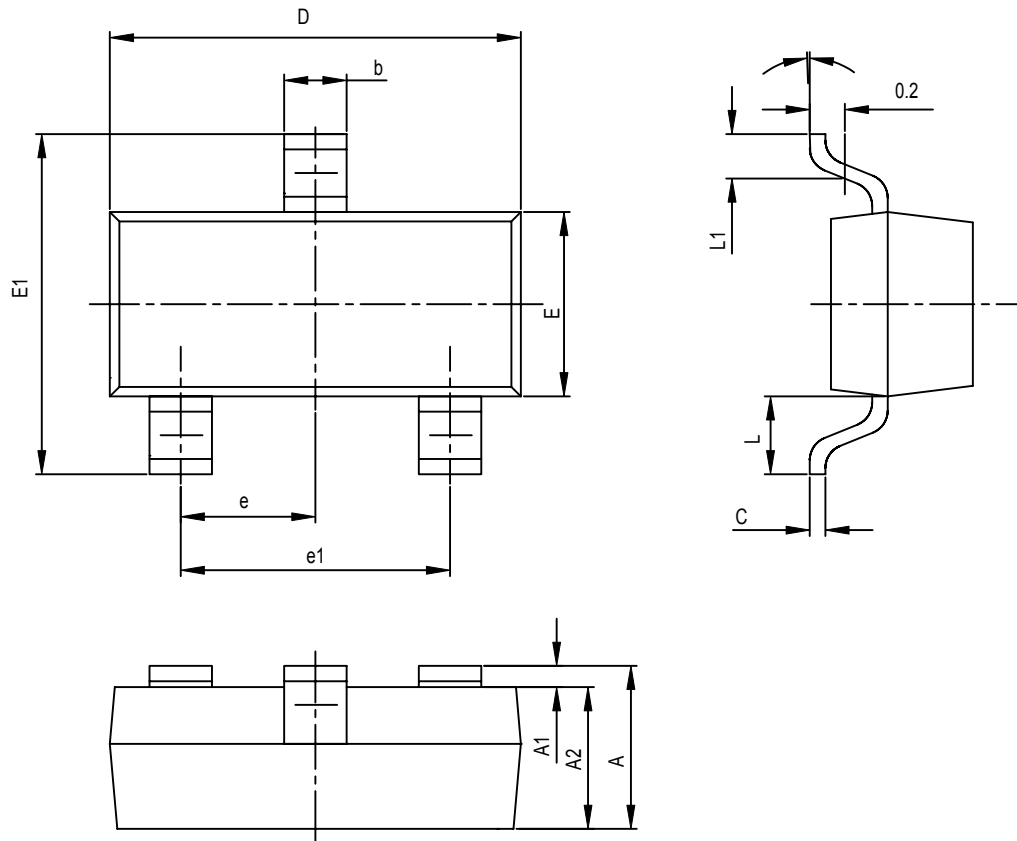


Figure 12. Thermal Response

SOT-23 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950TPY		0.037TPY	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.022REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°