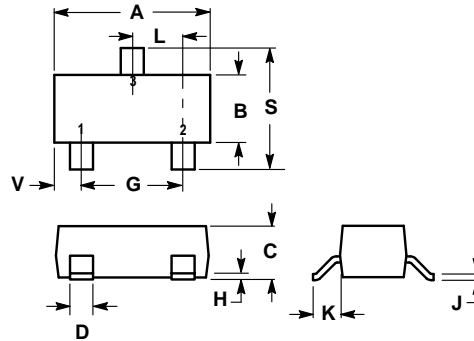
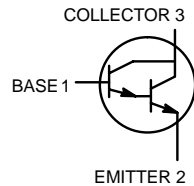
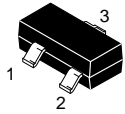


RoHS Compliant Product

A suffix of "-C" specifies halogen & lead-free



SOT-23		
Dim	Min	Max
A	2.800	3.040
B	1.200	1.400
C	0.890	1.110
D	0.370	0.500
G	1.780	2.040
H	0.013	0.100
J	0.085	0.177
K	0.450	0.600
L	0.890	1.020
S	2.100	2.500
V	0.450	0.600
All Dimension in mm		

FEATURES

Power dissipation

$P_{CM} : 0.3W$ ($T_{amb}=25^{\circ}C$)

Collector current

$I_{CM} : 0.3A$

Collector-base voltage

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

Operating and storage junction temperature range

$T_J, T_{stg} : -55^{\circ}C$ to $+150$

ELECTRICAL CHARACTERISTICS ($T_{amb}=25^{\circ}C$ 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 10000		
	$h_{FE(2)}$ *	$V_{CE} = 5V, I_C = 100mA$	MMBTA13 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 $\leq 300 \mu s$, duty cycle $\leq 2\%$.

Marking : MMBTA13:K2D; MMBTA14: K3D

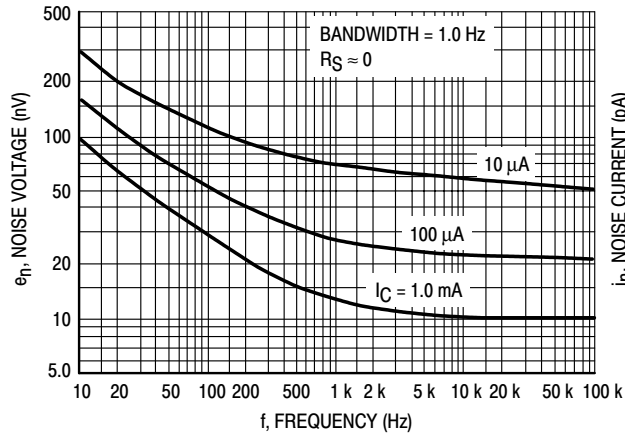


Figure 1. Noise Voltage

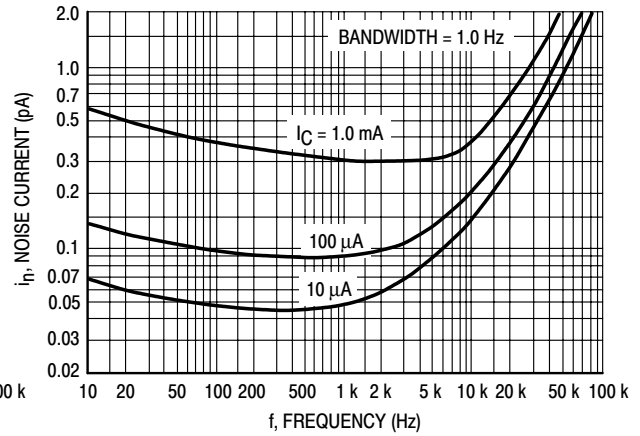


Figure 2. Noise Current

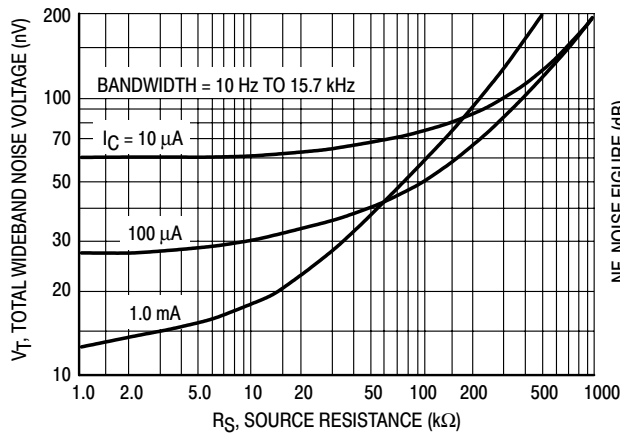


Figure 3. Total Wideband Noise Voltage

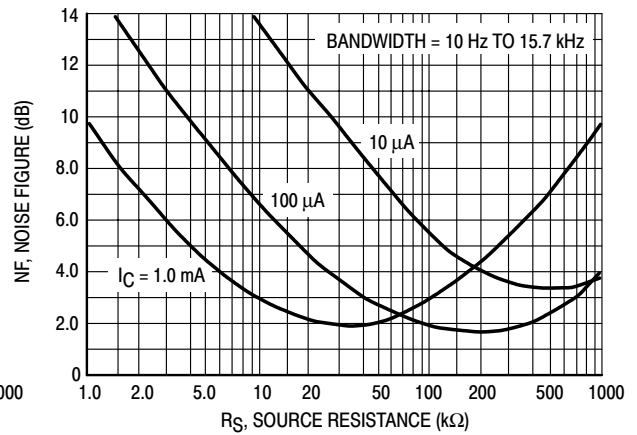


Figure 4. Wideband Noise Figure

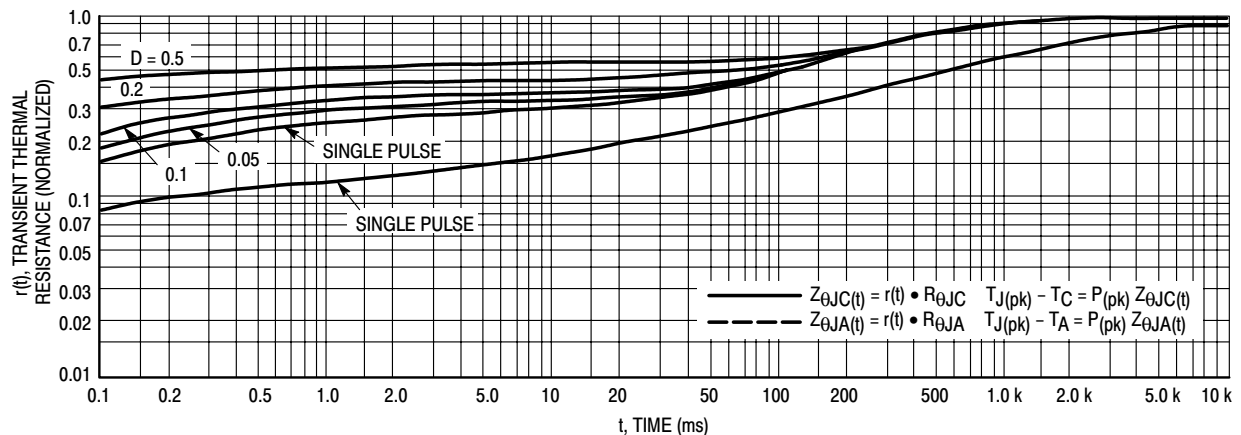


Figure 5. Thermal Response

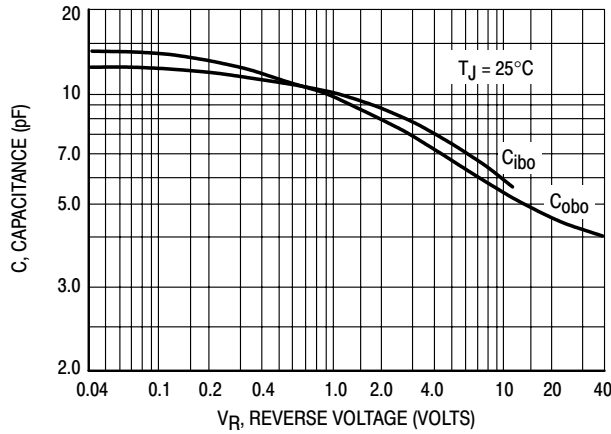


Figure 6. Capacitance

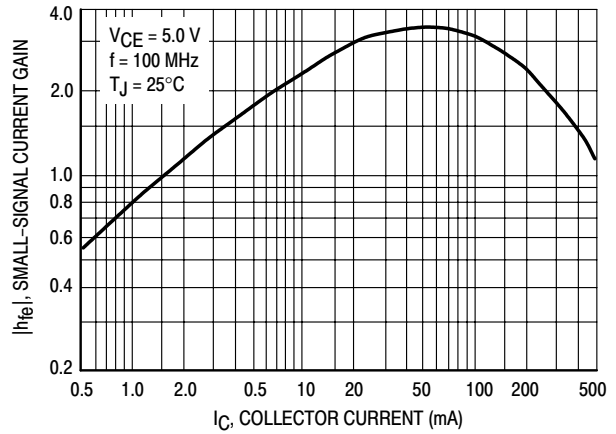


Figure 7. High Frequency Current Gain

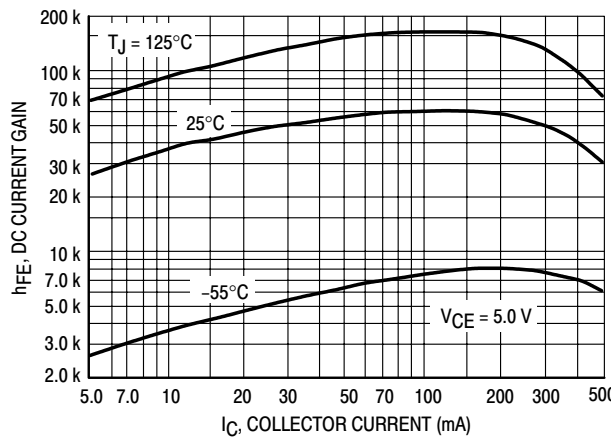


Figure 8. DC Current Gain

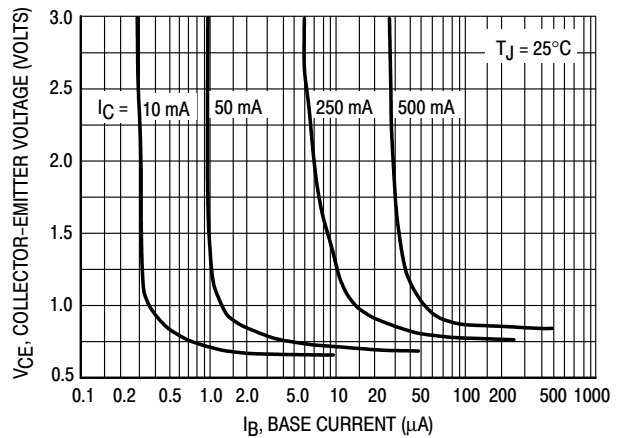


Figure 9. Collector Saturation Region

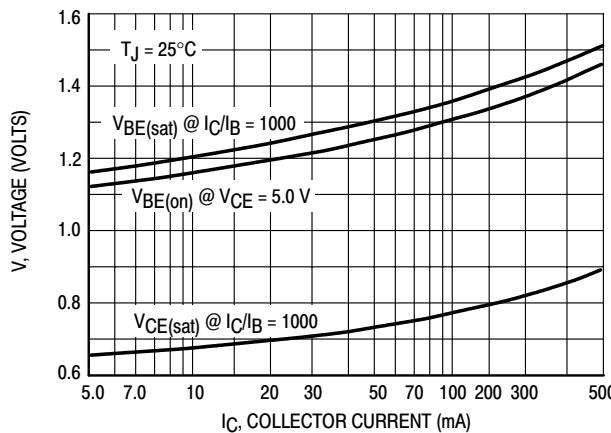


Figure 10. "On" Voltages

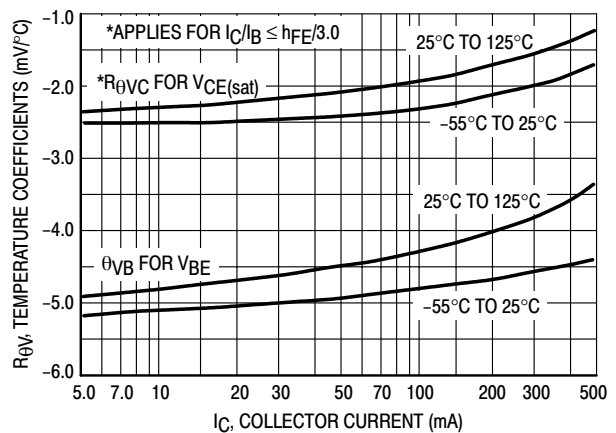


Figure 11. Temperature Coefficients