

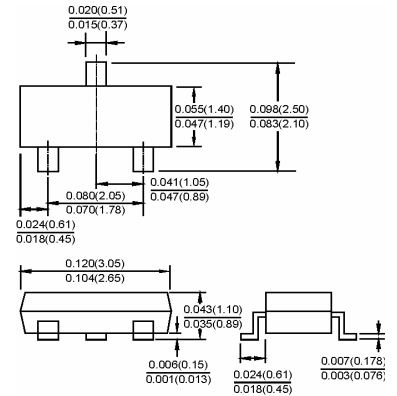
MMBTA13,14

SOT-23 Transistor(NPN)



1. BASE
2. EMITTER
3. COLLECTOR

SOT-23



Dimensions in inches and (millimeters)

Features

- ✧ Darlingon Amplifier

Marking : MMBTA13:K2D; MMBTA14:K3D

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

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	30	V
V_{CEO}	Collector-Emitter Voltage	30	V
V_{EBO}	Emitter-Base Voltage	10	V
I_C	Collector Current -Continuous	0.3	A
P_C	Collector Power Dissipation	350	mW
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	417	$^{\circ}\text{C}/\text{W}$
T_J	Junction Temperature	150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	-55 to +150	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS ($T_{amb}=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=100\mu\text{A}$, $I_E=0$	30		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=100\mu\text{A}$, $I_B=0$	30		V
Collector-emitter breakdown voltage	$V_{(BR)EBO}$	$I_E=100\mu\text{A}$, $I_C=0$	10		V
Collector cut-off current	I_{CBO}^*	$V_{CB}=30\text{V}$, $I_E=0$		0.1	μA
Emitter cut-off current	I_{EBO}^*	$V_{EB}=10\text{V}$, $I_C=0$		0.1	μA
DC current gain	$h_{FE(1)}^*$	$V_{CE}=5\text{V}$, $I_C=10\text{mA}$	MMBTA13 5000		
	$h_{FE(2)}^*$	$V_{CE}=5\text{V}$, $I_C=100\text{mA}$	MMBTA13 10000 MMBTA14 20000		
Collector-emitter saturation voltage	$V_{CE(sat)}^*$	$I_C=100\text{mA}$, $I_B=0.1\text{mA}$		1.5	V
Base-emitter saturation voltage	$V_{BE(sat)}^*$	$I_C=100\text{mA}$, $I_B=0.1\text{mA}$		2	V
Base-emitter voltage	V_{BE}^*	$V_{CE}=5\text{V}$, $I_C=100\text{mA}$		2.0	V
Transition frequency	f_T	$V_{CE}=5\text{V}$, $I_C=10\text{mA}$ $f=100\text{MHz}$	125		MHz
Collector output capacitance	C_{ob}	$V_{CB}=10\text{V}$, $I_E=0$, $f=1\text{MHz}$		12	pF

* Pulse Test : pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

Typical Characteristics

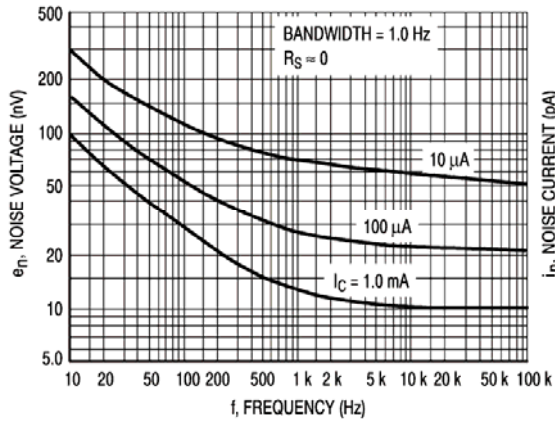


Figure 2. Noise Voltage

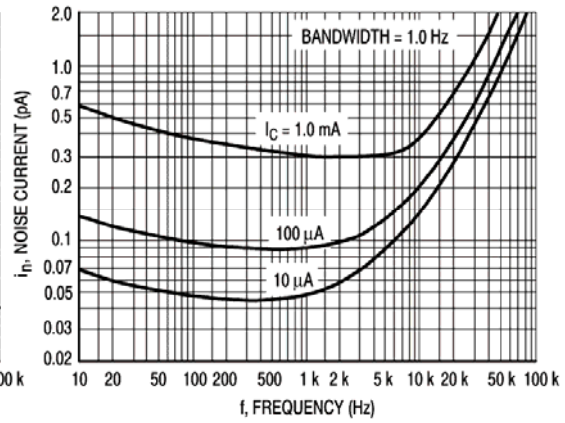


Figure 3. Noise Current

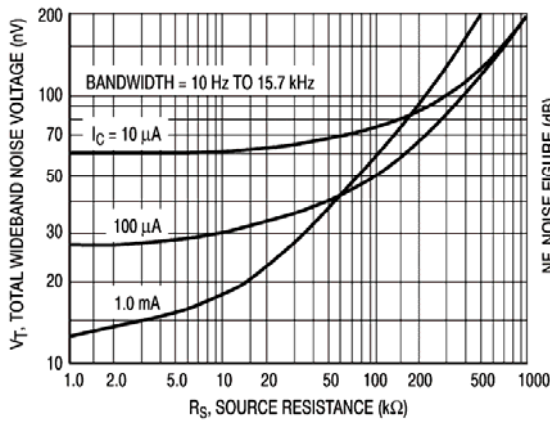


Figure 4. Total Wideband Noise Voltage

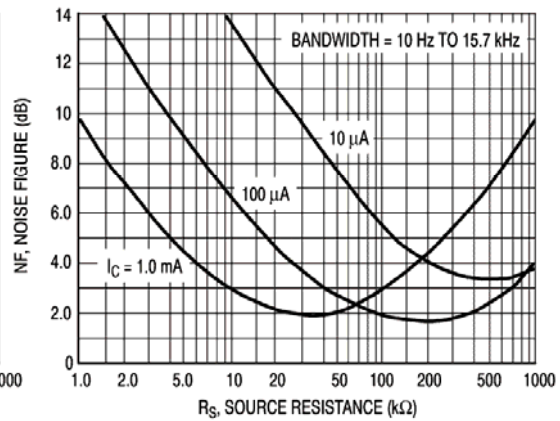


Figure 5. Wideband Noise Figure

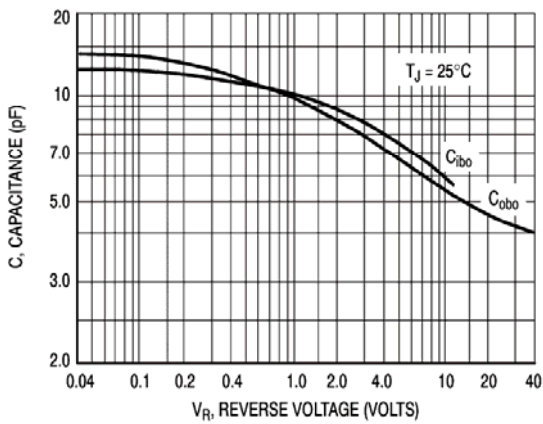


Figure 6. Capacitance

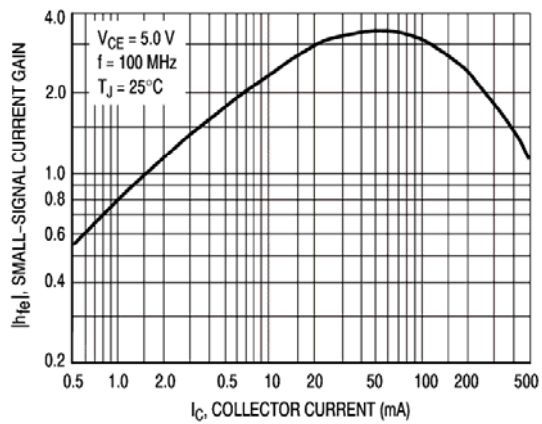


Figure 7. High Frequency Current Gain

Typical Characteristics

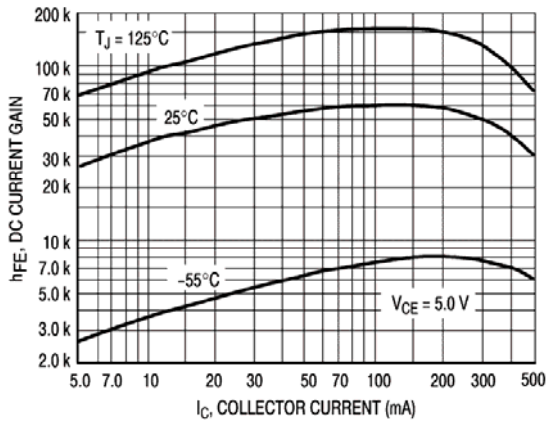


Figure 8. DC Current Gain

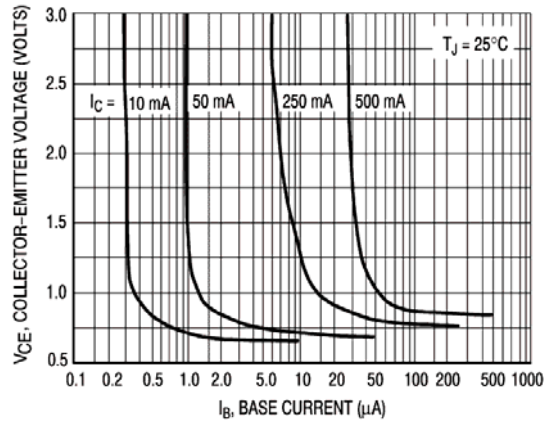


Figure 9. Collector Saturation Region

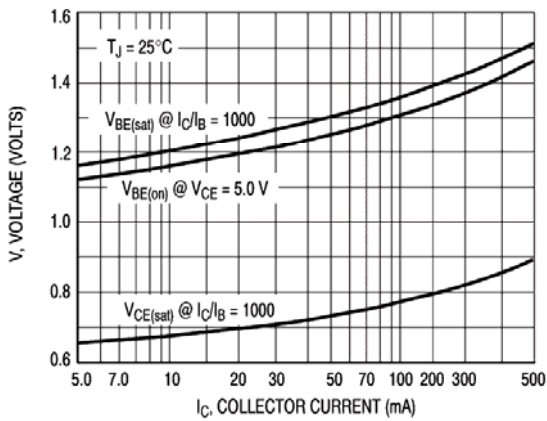


Figure 10. "On" Voltages

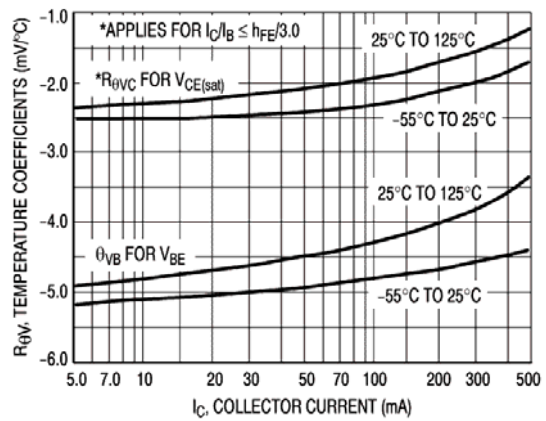


Figure 11. Temperature Coefficients

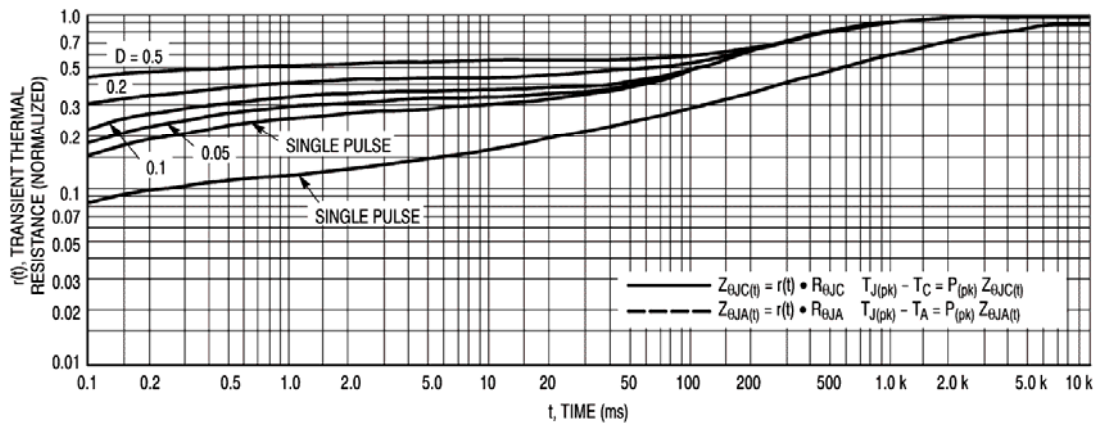


Figure 12. Thermal Response

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