

Features

- Operating And Storage Temperatures -55°C to $+150^{\circ}\text{C}$
- $R_{\theta JA}$ is 556°C/W (Mounted on FR-5 PCB $1.0" \times 0.75" \times 0.062"$)
- Capable of 225mWatts of Power Dissipation
- Halogen free available upon request by adding suffix "-HF"
- Marking: MMBTA13 ---K2D; MMBTA14 ---K3D
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
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OFF CHARACTERISTICS

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage* ($I_C=100\mu\text{Adc}$, $I_B=0$)	30		Vdc
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	30		Vdc
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	10		Vdc
I_C	Collector Current-Continuous	300		mAdc
I_{CBO}	Collector Cutoff Current ($V_{CB}=30\text{Vdc}$, $I_E=0$)		100	nAdc
I_{EBO}	Emitter Cutoff Current ($V_{EB}=10\text{Vdc}$, $I_C=0$)		100	nAdc

ON CHARACTERISTICS

h_{FE}	DC Current Gain*			
MMBTA13 MMBTA14	($I_C=10\text{mAdc}$, $V_{CE}=5.0\text{Vdc}$)	5000 10000		
MMBTA13 MMBTA14	($I_C=150\text{mAdc}$, $V_{CE}=1.0\text{Vdc}$)	10000 20000		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ($I_C=100\text{mAdc}$, $I_B=0.1\text{mAdc}$)		1.5	Vdc
$V_{BE(sat)}$	Base-Emitter Saturation Voltage ($I_C=100\text{mAdc}$, $V_{CE}=5.0\text{Vdc}$)		2.0	Vdc

SMALL-SIGNAL CHARACTERISTICS

f_T	Current Gain-Bandwidth Product ($I_C=10\text{mAdc}$, $V_{CE}=5.0\text{Vdc}$, $f=100\text{MHz}$)	125		MHz
C_{obo}	Output Capacitance ($V_{CB}=10\text{Vdc}$, $I_E=0$, $f=1.0\text{MHz}$)		8.0	pF
C_{ibo}	Input Capacitance ($V_{BE}=0.5\text{Vdc}$, $I_C=0$, $f=1.0\text{MHz}$)		15	pF

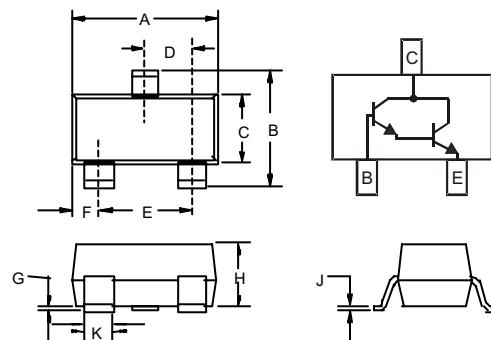
SWITCHING CHARACTERISTICS

t_d	Delay Time	($V_{CC}=30\text{Vdc}$, $V_{BE}=0.5\text{Vdc}$)	10	ns
t_r	Rise Time	($I_C=150\text{mAdc}$, $I_B=15\text{mAdc}$)	25	ns
t_s	Storage Time	($V_{CC}=30\text{Vdc}$, $I_C=150\text{mAdc}$)	225	ns
t_f	Fall Time	($I_B=I_C=15\text{mAdc}$)	60	ns

MMBTA13 MMBTA14

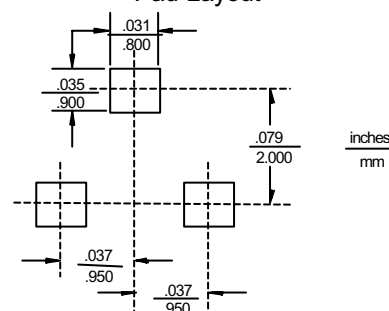
NPN Darlington Amplifier Transistor

SOT-23



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.110	.120	2.80	3.04	
B	.083	.104	2.10	2.64	
C	.047	.055	1.20	1.40	
D	.035	.041	.89	1.03	
E	.070	.081	1.78	2.05	
F	.018	.024	.45	.60	
G	.0005	.0039	.013	.100	
H	.035	.044	.89	1.12	
J	.003	.007	.085	.180	
K	.015	.020	.37	.51	

Suggested Solder Pad Layout



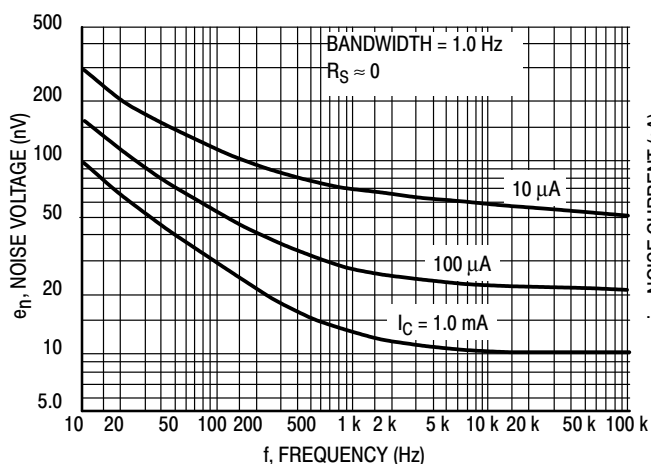


Figure 2. Noise Voltage

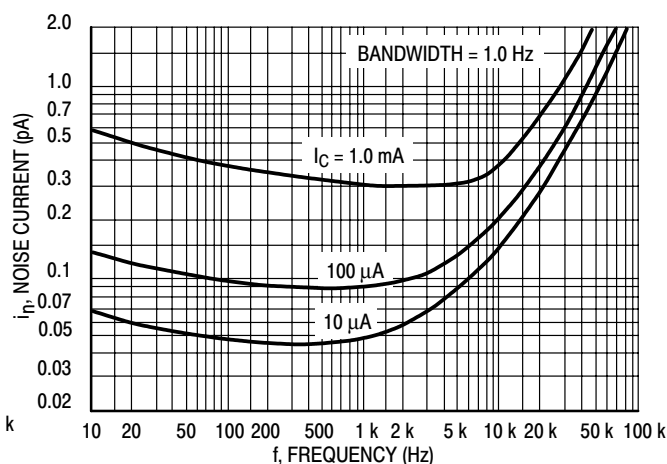


Figure 3. Noise Current

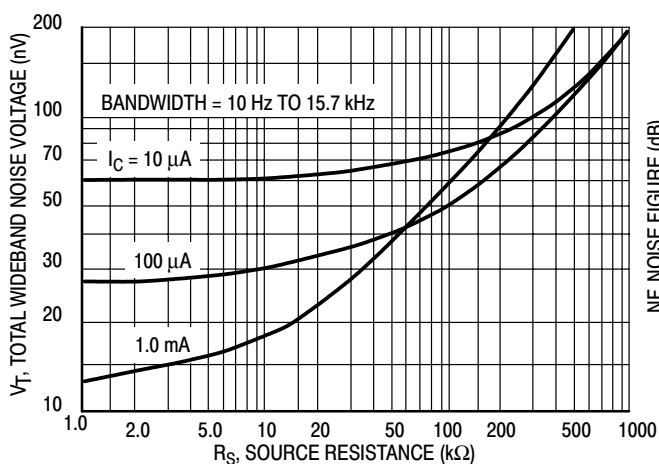


Figure 4. Total Wideband Noise Voltage

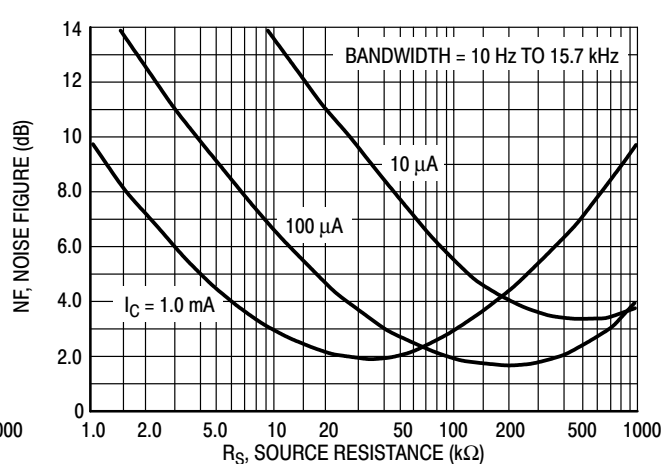


Figure 5. Wideband Noise Figure

MMBTA13 MMBTA14

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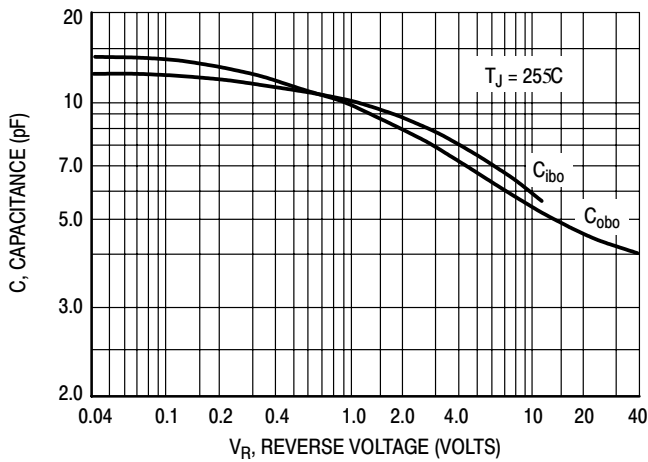


Figure 6. Capacitance

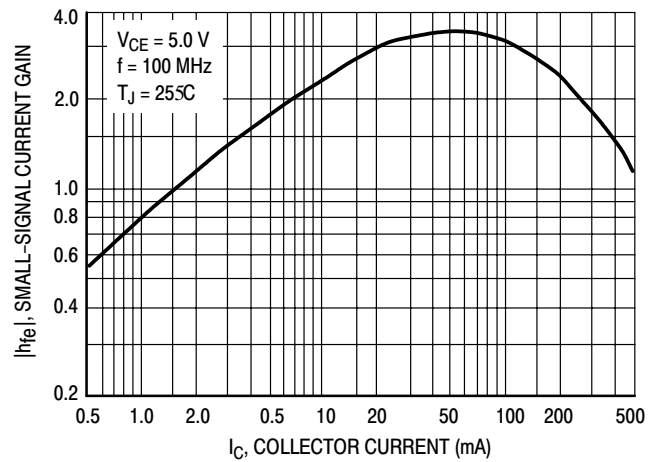


Figure 7. High Frequency Current Gain

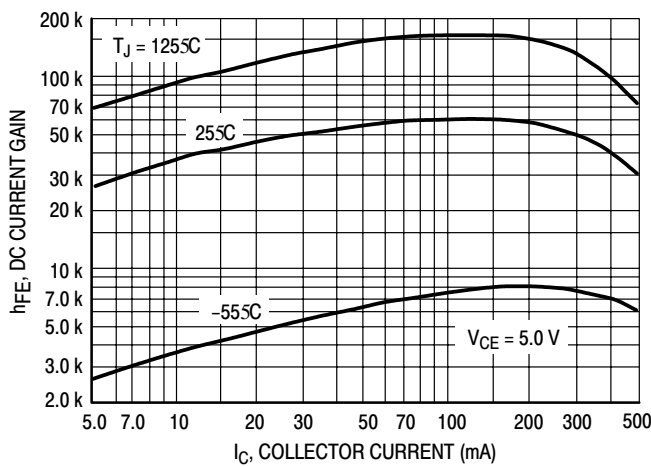


Figure 8. DC Current Gain

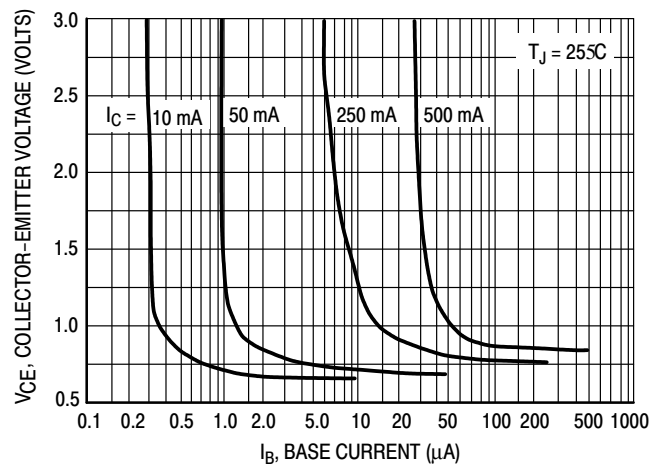


Figure 9. Collector Saturation Region

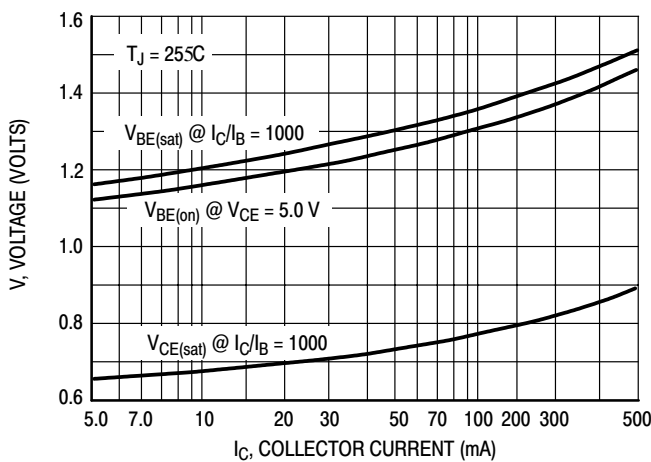


Figure 10. "On" Voltages

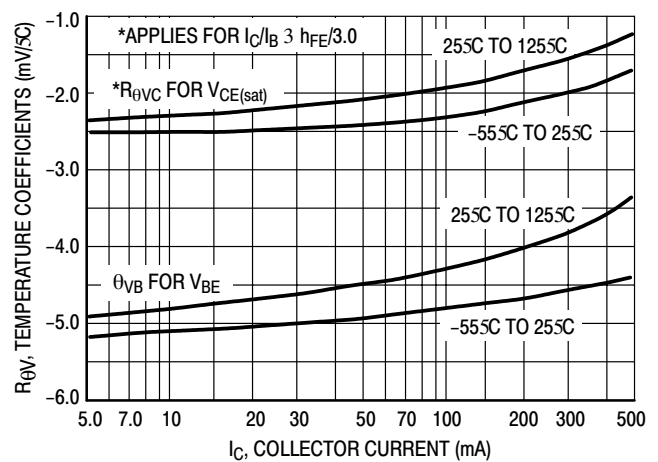


Figure 11. Temperature Coefficients

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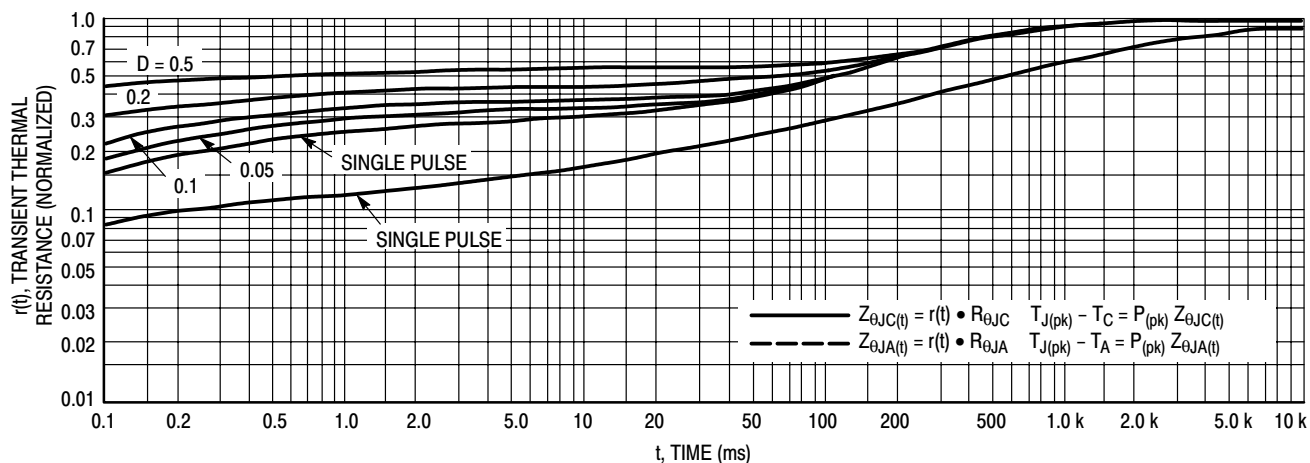


Figure 12. Thermal Response

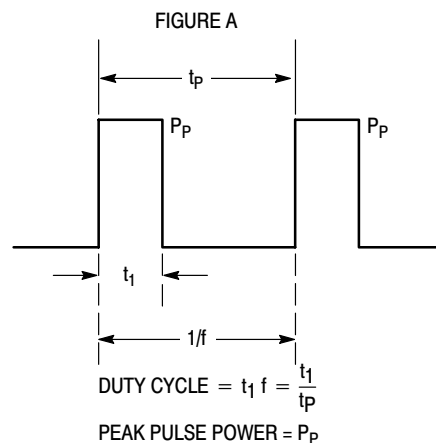
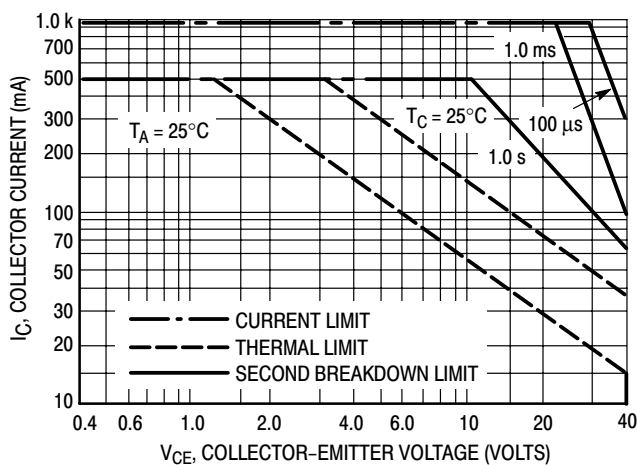


Figure 13. Active Region Safe Operating Area Design Note: Use of Transient Thermal Resistance Data

Ordering Information :

Device	Packing
Part Number-TP	Tape&Reel; 3Kpcs/Reel

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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