Micro Commercial Components
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MMBTA13
MMBTA14

NPN Darlington Amplifier Transistor

Features

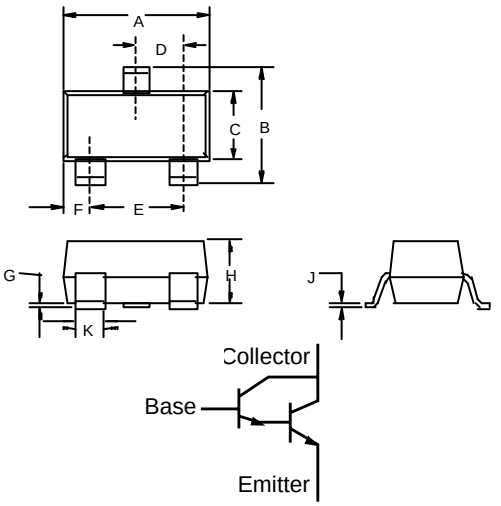
- Operating And Storage Temperatures –55°C to 150°C
- $R_{\theta JA}$ is 556°C/W (Mounted on FR-5 PCB 1.0"x0.75"x0.062")
- Capable of 225mWatts of Power Dissipation
- Marking Code: MMBTA13 ----K2D; MMBTA14 ---- 1N

Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
OFF CHARACTERISTICS				
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage* (I_C=100uAdc, 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}=30Vdc, I_E=0)		100	nAdc
I_{EBO}	Emitter Cutoff Current (V_{EB}=10Vdc, I_C=0)		100	nAdc
ON CHARACTERISTICS				
h_{FE}	DC Current Gain*			
MMBTA13	(I_C=10mAdc, V_{CE}=5.0Vdc)	5000		
MMBTA14		10000		
MMBTA13	(I_C=150mAdc, V_{CE}=1.0Vdc)	10000		
MMBTA14		20000		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage (I_C=100mAdc, I_B=0.1mAdc)		1.5	Vdc
$V_{BE(sat)}$	Base-Emitter Saturation Voltage (I_C=100mAdc,V_{CE}=5.0Vdc)		2.0	Vdc
SMALL-SIGNAL CHARACTERISTICS				
f_T	Current Gain-Bandwidth Product (I_C=10mAdc, V_{CE}=5.0Vdc, f=100MHz)	125		MHz
C_{obo}	Output Capacitance (V_{CB}=10Vdc, I_E=0, f=1.0MHz)		8.0	pF
C_{ibo}	Input Capacitance (V_{BE}=0.5Vdc, I_C=0, f=1.0MHz)		15	pF

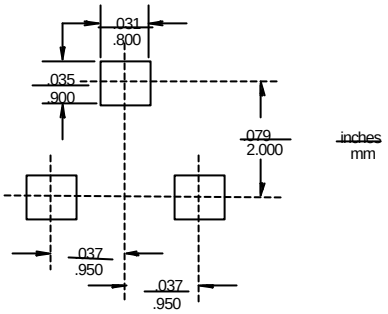
SWITCHING CHARACTERISTICS				
t_d	Delay Time	(V_{CC}=30Vdc, V_{BE}=0.5Vdc	10	ns
t_r	Rise Time	I_C=150mAdc, I_{B1}=15mAdc)	25	ns
t_s	Storage Time	(V_{CC}=30Vdc, I_C=150mAdc	225	ns
t_f	Fall Time	I_{B1}=I_{B2}=15mAdc)	60	ns

SOT-23



DIMENSIONS					
	INCHES		MM		
DIM	MIN	MAX	MIN	MAX	NOTE
A	.110	.120	2.80	3.04	
B	.083	.098	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



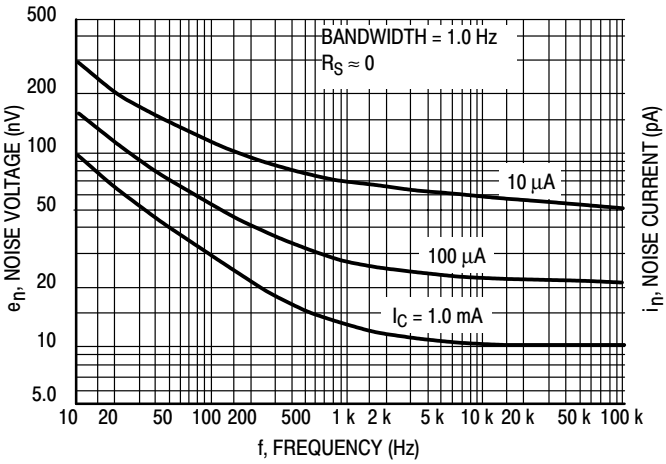


Figure 2. Noise Voltage

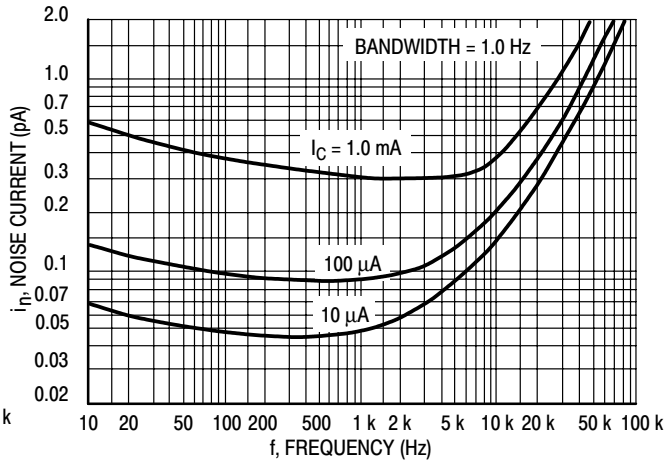


Figure 3. Noise Current

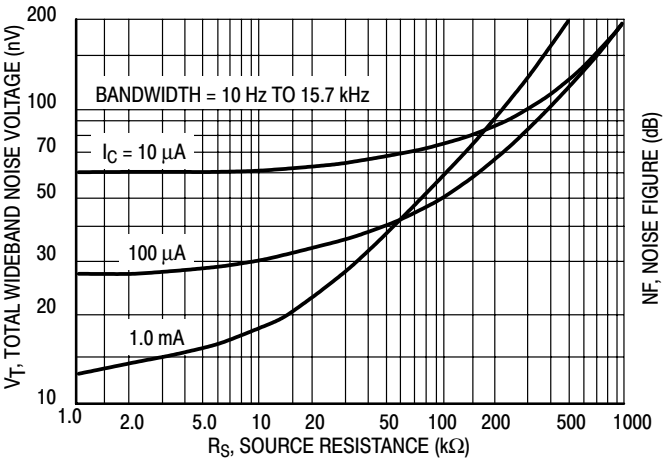


Figure 4. Total Wideband Noise Voltage

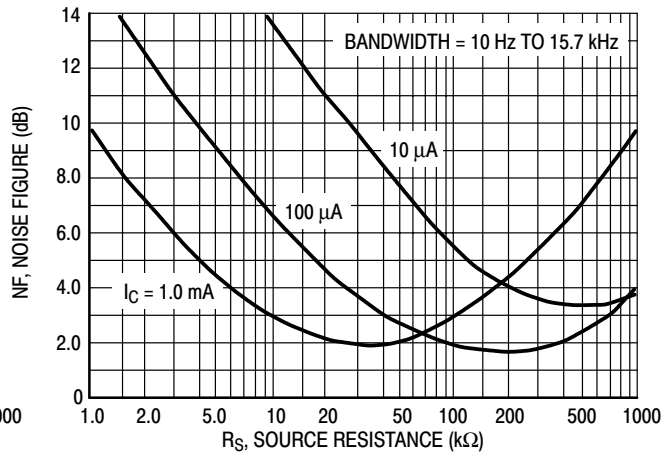


Figure 5. Wideband Noise Figure

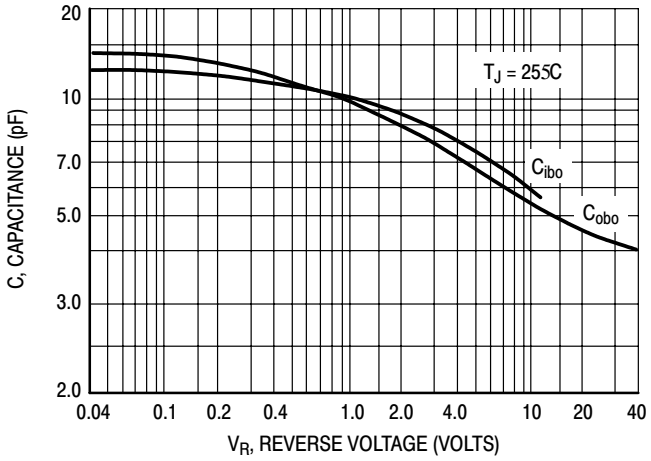


Figure 6. Capacitance

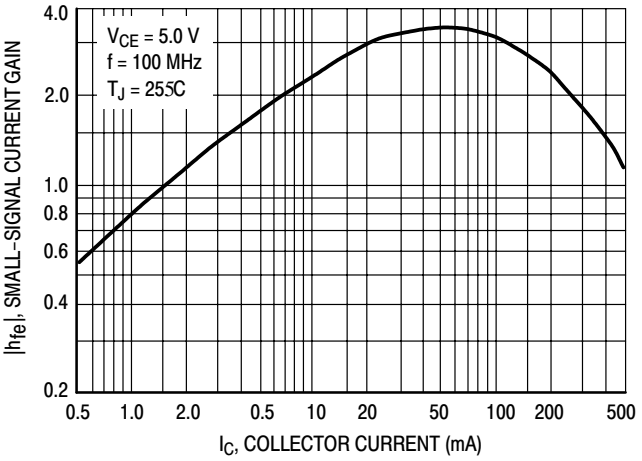


Figure 7. High Frequency Current Gain

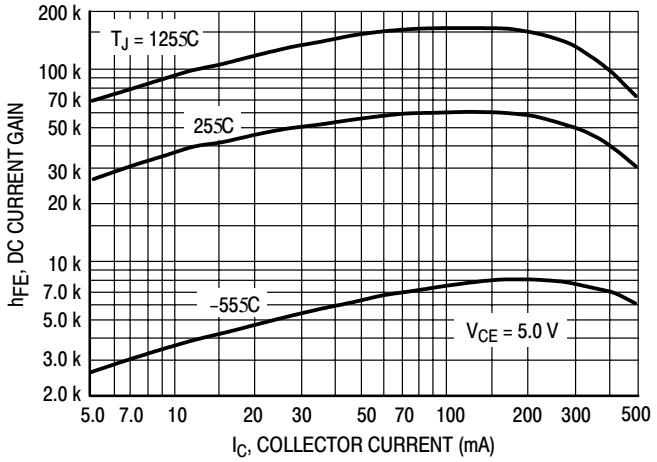


Figure 8. DC Current Gain

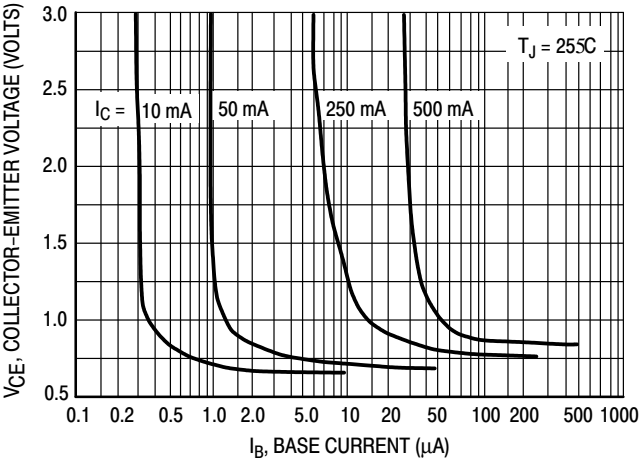


Figure 9. Collector Saturation Region

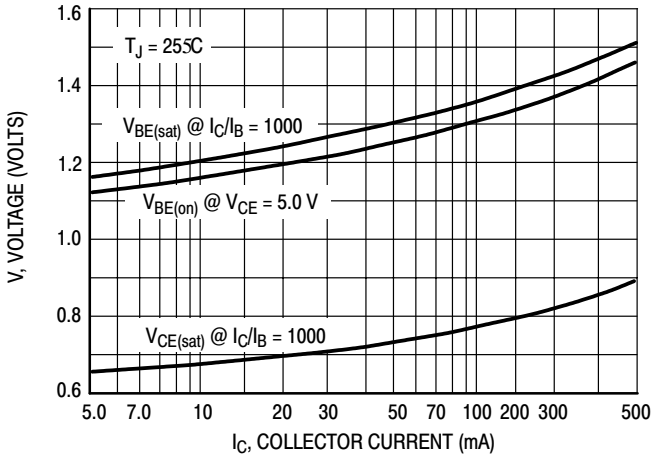


Figure 10. “On” Voltages

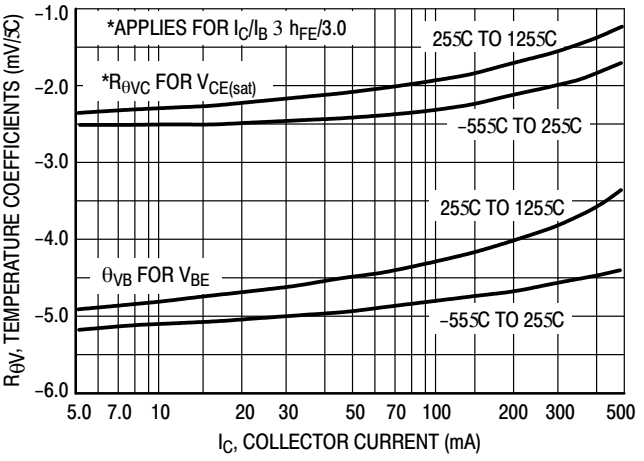


Figure 11. Temperature Coefficients

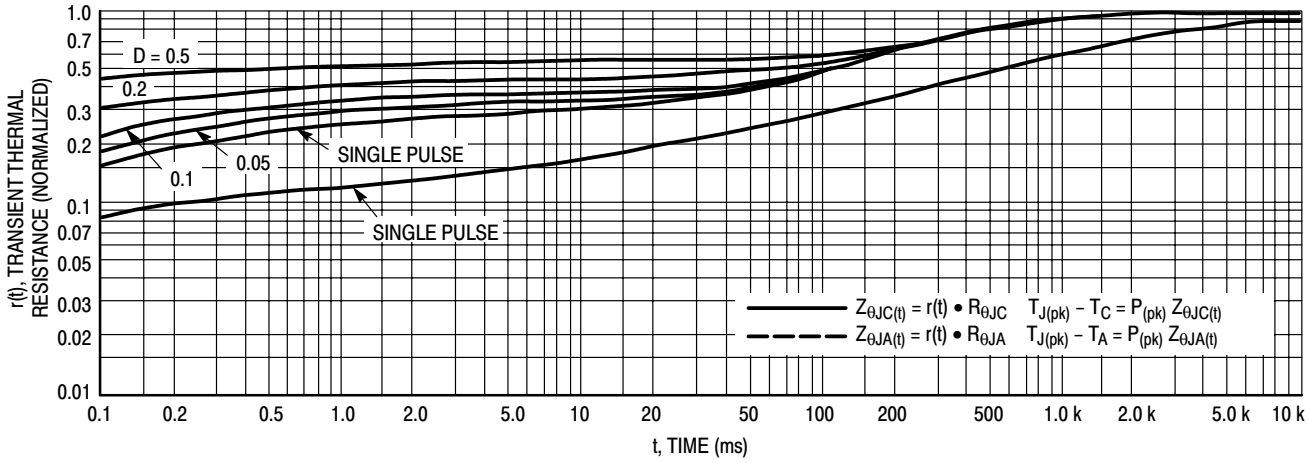


Figure 12. Thermal Response

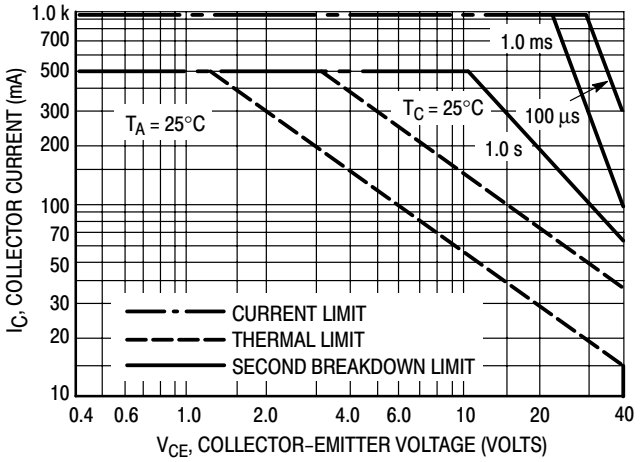
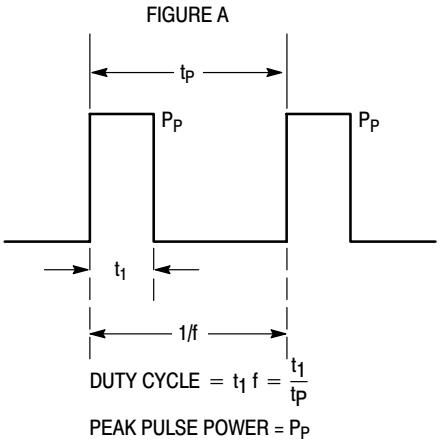


Figure 13. Active Region Safe Operating Area



Design Note: Use of Transient Thermal Resistance Data