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[Micro Commercial Components \(MCC\)](#)
[MMBTA13-TP](#)

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sales@integrated-circuit.com



Micro Commercial Components
 20736 Marilla Street Chatsworth
 CA 91311
 Phone: (818) 701-4933
 Fax: (818) 701-4939

MMBTA13 MMBTA14

NPN Darlington Amplifier Transistor

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 |
|--------|-----------|-----|-----|-------|
|--------|-----------|-----|-----|-------|

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 |

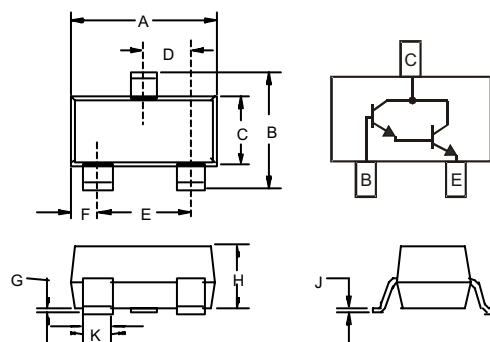
SMALL-SIGNAL CHARACTERISTICS

| | | | | |
|-----------|--|-----|-----|-----|
| 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

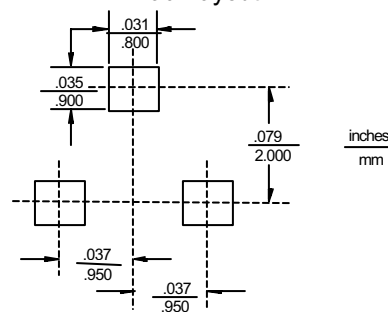
| | | | | |
|-------|--------------|--|-----|----|
| t_d | Delay Time | ($V_{CC}=30\text{Vdc}$, $V_{BE}=0.5\text{Vdc}$) | 10 | ns |
| t_r | Rise Time | ($I_C=150\text{mAdc}$, $I_B=15\text{mAdc}$) | 25 | ns |
| t_s | Storage Time | ($V_{CC}=30\text{Vdc}$, $I_C=150\text{mAdc}$) | 225 | ns |
| t_f | Fall Time | ($I_B=I_{B2}=15\text{mAdc}$) | 60 | ns |

SOT-23



| DIM | DIMENSIONS | | | | NOTE |
|-----|------------|-------|------|------|------|
| | INCHES | | MM | | |
| 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



**MMBTA13
MMBTA14**



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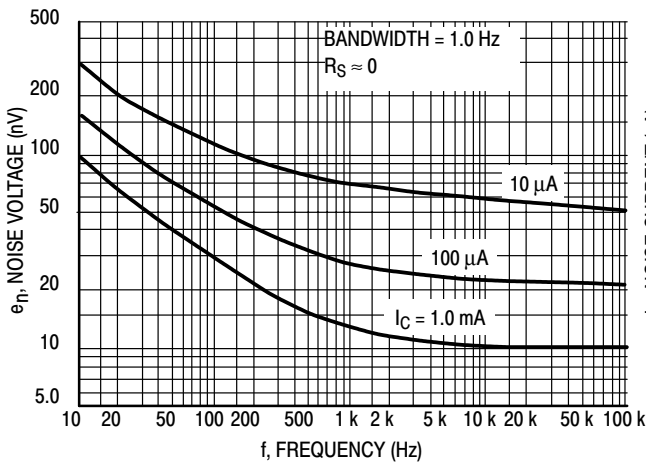


Figure 2. Noise Voltage

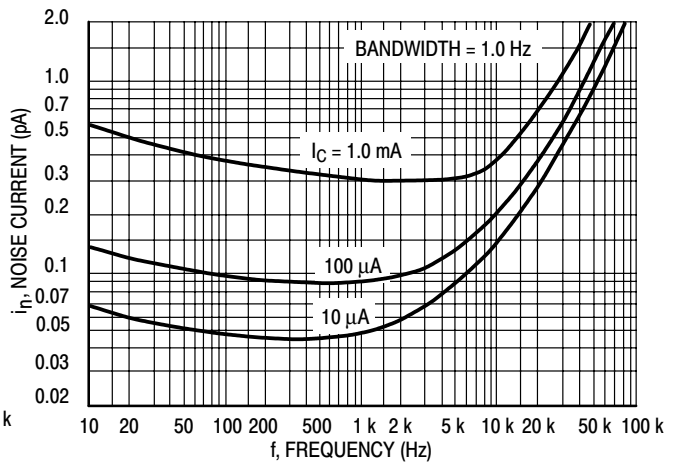


Figure 3. Noise Current

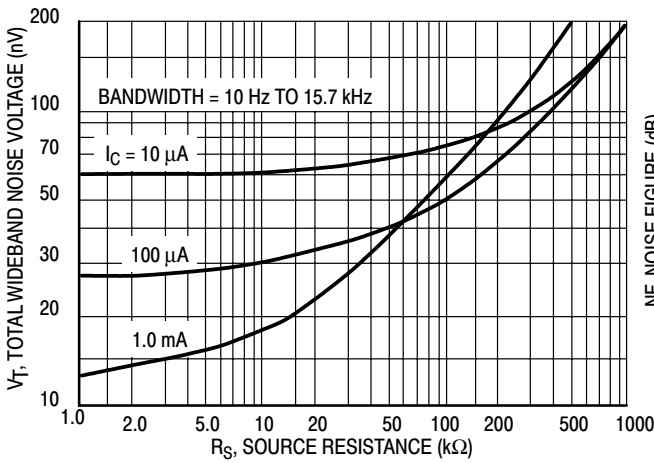


Figure 4. Total Wideband Noise Voltage

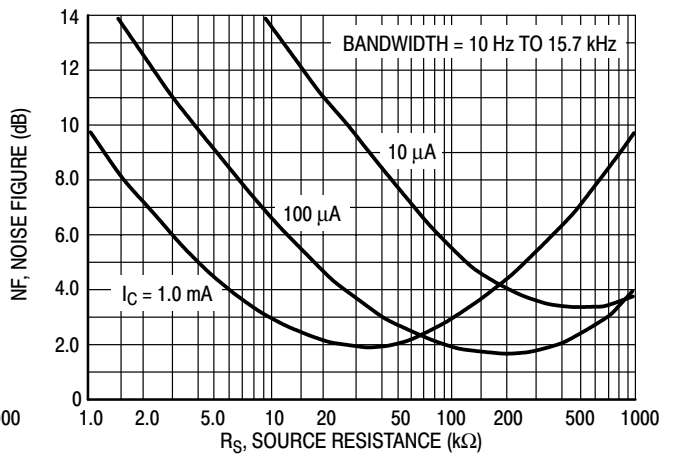


Figure 5. Wideband Noise Figure

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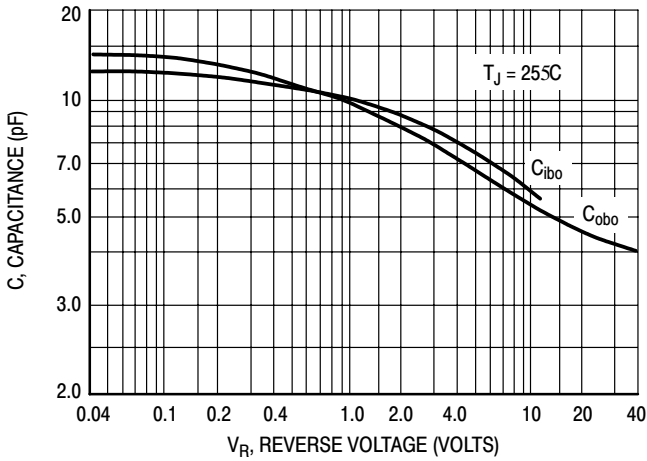


Figure 6. Capacitance

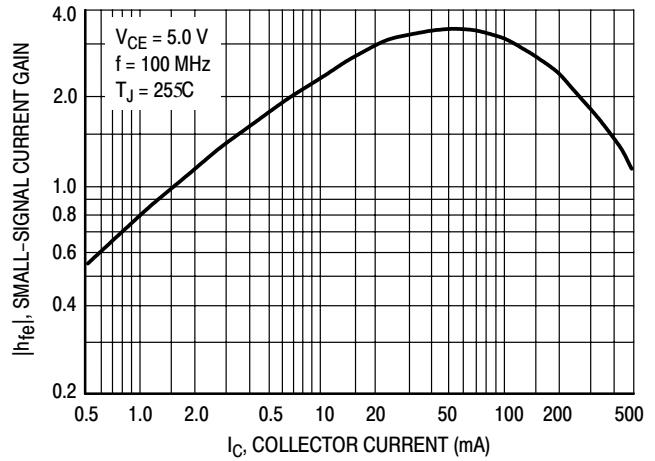


Figure 7. High Frequency Current Gain

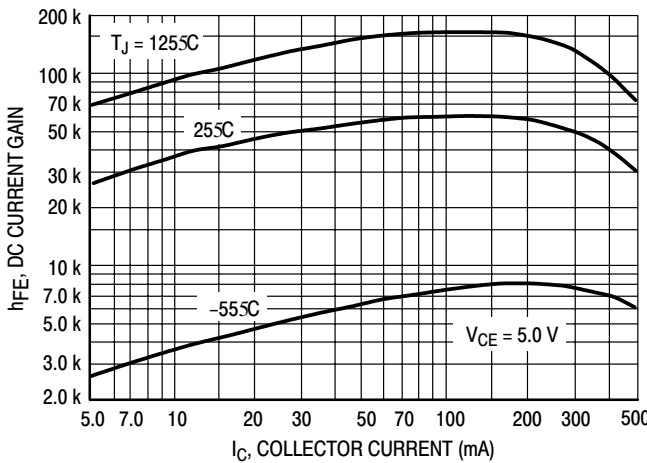


Figure 8. DC Current Gain

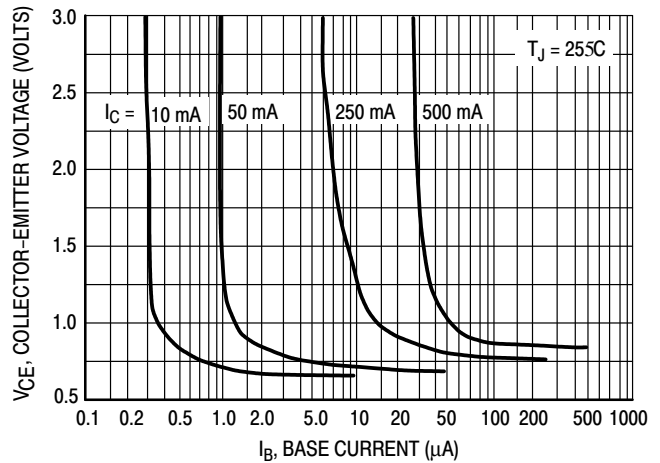


Figure 9. Collector Saturation Region

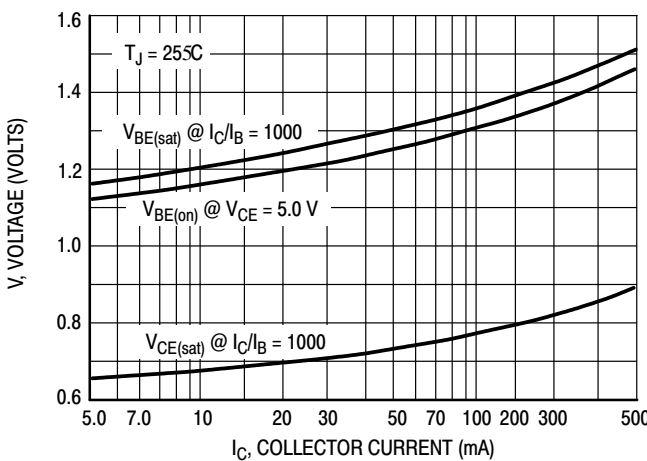


Figure 10. "On" Voltages

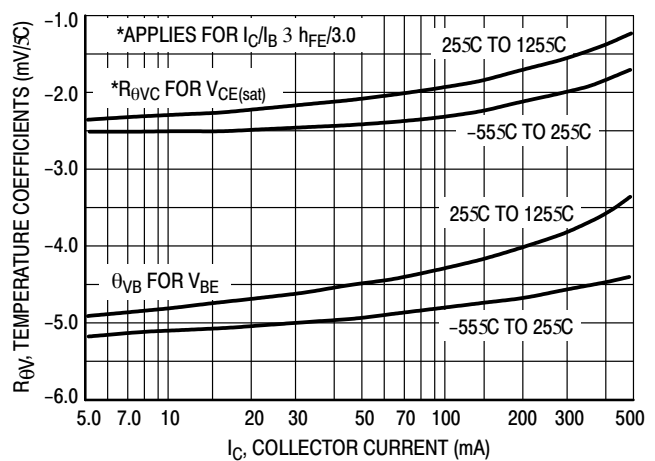


Figure 11. Temperature Coefficients

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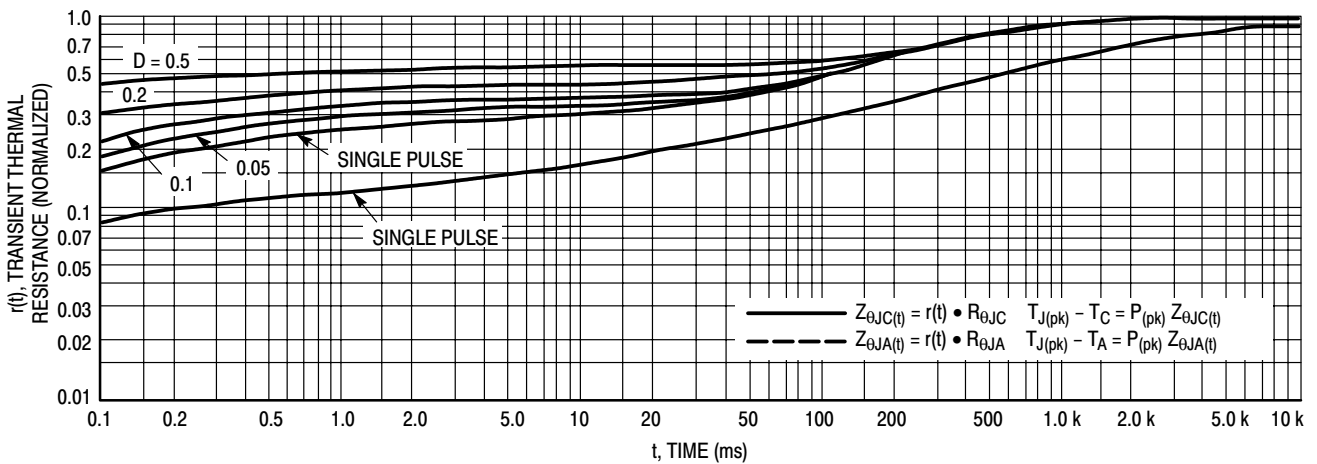


Figure 12. Thermal Response

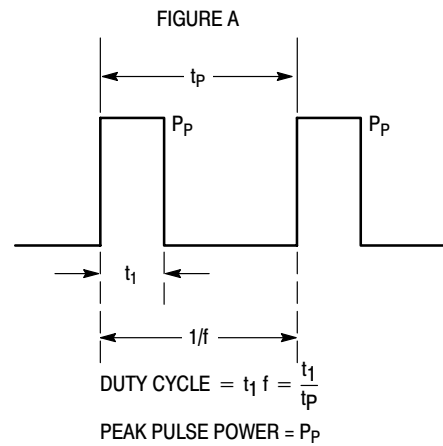
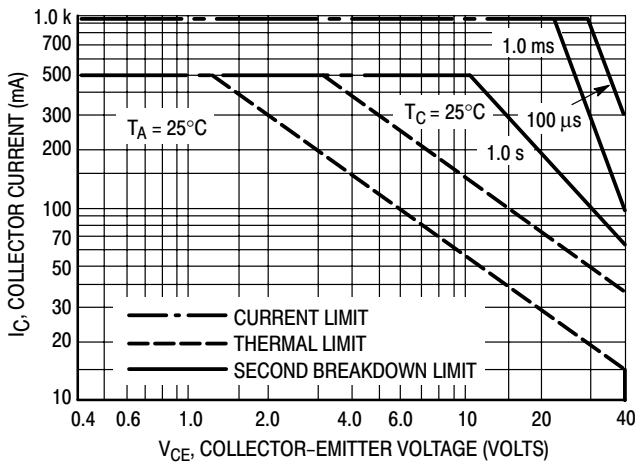


Figure 13. Active Region Safe Operating Area Design Note: Use of Transient Thermal Resistance Data



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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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