



Micro Commercial Components

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# MMDT3904

## 200mW Plastic-Encapsulate Transistors

### Features

- Case Material: Molded Plastic. UL Flammability Classification Rating 94-0 and MSL Rating 1
- Collector Current:  $I_C=0.2A$
- Epitaxial planar die construction
- Ideal for low power amplification and switching
- Marking: K6N

### Maximum Ratings

| Symbol     | Rating                           | Rating      | Unit          |
|------------|----------------------------------|-------------|---------------|
| $P_C$      | Power dissipation <sup>(1)</sup> | 200         | mW            |
| $R_{THJA}$ | Thermal Resistance               | 625         | $^{\circ}C/W$ |
| $T_J$      | Junction Temperature             | -55 to +150 | $^{\circ}C$   |
| $T_{STG}$  | Storage Temperature              | -55 to +150 | $^{\circ}C$   |

### Electrical Characteristics @ 25 $^{\circ}C$ Unless Otherwise Specified

| Symbol | Parameter | Min | Max | Units |
|--------|-----------|-----|-----|-------|
|--------|-----------|-----|-----|-------|

#### OFF CHARACTERISTICS

|               |  |     |    |      |
|---------------|--|-----|----|------|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage<br>( $I_C=1.0mA$ , $I_B=0$ ) | 40  |    | Vdc  |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage<br>( $I_C=10\mu A$ , $I_E=0$ )  | 60  |    | Vdc  |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage<br>( $I_E=10\mu A$ , $I_C=0$ )    | 5.0 |    | Vdc  |
| $I_{EBO}$     | Emitter Cutoff Current<br>( $V_{EB}=5V$ , $I_C=0$ )              |     | 50 | nAdc |
| $I_{CEO}$     | Collector Cutoff Current<br>( $V_{CE}=30V$ , $I_B=0$ )           |     | 50 | nAdc |
| $I_{CBO}$     | Collector Cutoff Current<br>( $V_{CB}=30V$ , $I_E=0$ )           |     | 50 | nAdc |

#### ON CHARACTERISTICS

|               |  |           |      |     |
|---------------|--|-----------|------|-----|
| $h_{FE}$      | DC Current Gain*<br>( $I_C=10mA$ , $V_{CE}=1.0V$ ,<br>$I_C=50mA$ , $V_{CE}=1.0V$ ) | 100<br>60 | 300  |     |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage<br>( $I_C=50mA$ , $I_B=5.0mA$ )               |           | 0.3  | Vdc |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage<br>( $I_C=50mA$ , $I_B=5.0mA$ )                    |           | 0.95 | Vdc |

#### SMALL-SIGNAL CHARACTERISTICS

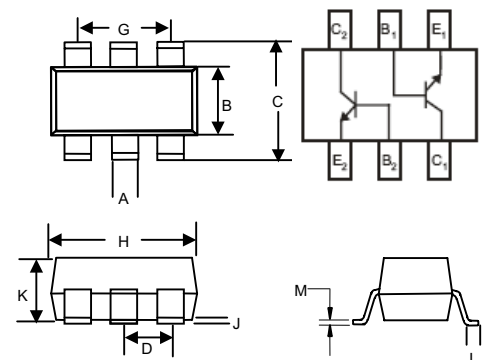
|           |  |     |     |     |
|-----------|--|-----|-----|-----|
| $f_r$     | Current Gain-Bandwidth Product<br>( $I_C=10mA$ , $V_{CE}=20V$ , $f=100MHz$ ) | 300 |     | MHz |
| $C_{obo}$ | Output Capacitance<br>( $V_{CB}=5.0V$ , $I_E=0$ , $f=1.0MHz$ )               |     | 4.0 | pF  |

#### SWITCHING CHARACTERISTICS

|       |              |                                  |     |    |
|-------|--------------|----------------------------------|-----|----|
| $t_d$ | Delay Time   | $(V_{CC}=3.0V$ , $V_{BE}=0.5V$ ) | 35  | ns |
| $t_r$ | Rise Time    | $I_C=10mA$ , $I_{B1}=1.0mA$      | 35  | ns |
| $t_s$ | Storage Time | $(V_{CC}=3.0V$ , $I_C=10mA$ )    | 200 | ns |
| $t_f$ | Fall Time    | $I_{B1}=I_{B2}=1.0mA$            | 50  | ns |

Note: 1. Valid provided that terminals are kept at ambient temperature.

### SOT-363



| DIM | INCHES |      | MM          |      | NOTE |
|-----|--------|------|-------------|------|------|
|     | MIN    | MAX  | MIN         | MAX  |      |
| A   | .006   | .014 | 0.15        | 0.35 |      |
| B   | .045   | .053 | 1.15        | 1.35 |      |
| C   | .085   | .096 | 2.15        | 2.45 |      |
| D   | .026   |      | 0.65Nominal |      |      |
| G   | .047   | .055 | 1.20        | 1.40 |      |
| H   | .071   | .087 | 1.80        | 2.20 |      |
| J   | ---    | .004 | ---         | 0.10 |      |
| K   | .035   | .043 | 0.90        | 1.10 |      |
| L   | .010   | .018 | 0.26        | 0.46 |      |
| M   | .003   | .006 | 0.08        | 0.15 |      |



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## Ordering Information

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

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