

Features

- Complementary NPN Type Available MMDT2222A
- Halogen Free. "Green" Device (Note 1)
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

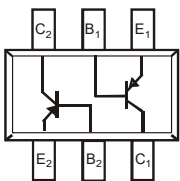
Maximum Ratings @ 25°C Unless Otherwise Specified

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C

| Parameter | Symbol | Rating | Unit |
|-----------------------------|-----------|--------|------|
| Collector-Base Voltage | V_{CBO} | -60 | V |
| Collector-Emitter Voltage | V_{CEO} | -60 | V |
| Emitter-Base Voltage | V_{EBO} | -5 | V |
| Collector Current | I_C | -600 | mA |
| Collector Power Dissipation | P_C | 200 | mW |

Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

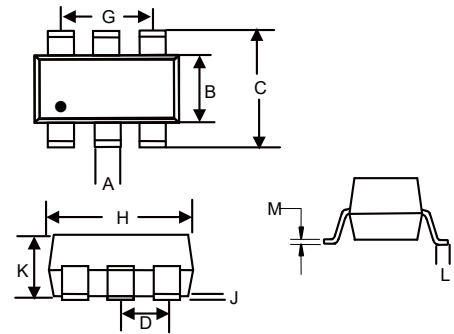
Internal Structure



Marking: K2F

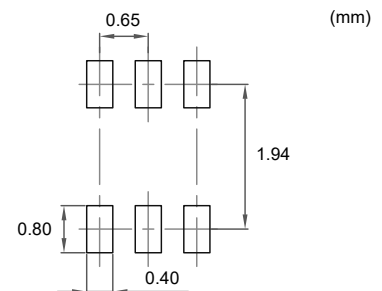
PNP Plastic Encapsulate Transistors

SOT-363



| DIM | INCHES | | MM | | NOTE |
|-----|--------|-------|------|------|------|
| | MIN | MAX | MIN | MAX | |
| A | 0.006 | 0.014 | 0.15 | 0.35 | |
| B | 0.045 | 0.053 | 1.15 | 1.35 | |
| C | 0.079 | 0.096 | 2.00 | 2.45 | |
| D | 0.026 | | 0.65 | | TYP. |
| G | 0.047 | 0.055 | 1.20 | 1.40 | |
| H | 0.071 | 0.087 | 1.80 | 2.20 | |
| J | ---- | 0.004 | ---- | 0.10 | |
| K | 0.031 | 0.043 | 0.80 | 1.10 | |
| L | 0.010 | 0.018 | 0.26 | 0.46 | |
| M | 0.003 | 0.006 | 0.08 | 0.15 | |

Suggested Solder Pad Layout



Electrical Characteristics @ 25°C Unless Otherwise Specified

| Parameter | Symbol | Min | Typ | Max | Units | Conditions |
|--------------------------------------|---------------|-----|-----|------|-------|--|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | -60 | | | V | $I_C = -10\mu A, I_E = 0$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | -60 | | | V | $I_C = -10mA, I_B = 0$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | -5 | | | V | $I_E = -10\mu A, I_C = 0$ |
| Collector-Base Cutoff Current | I_{CBO} | | | -10 | nA | $V_{CB} = -50V, I_E = 0$ |
| Collector Cutoff Current | I_{CEX} | | | -50 | nA | $V_{CE} = -30V, V_{BE} = 0.5V$ |
| Emitter-Base Cutoff Current | I_{EBO} | | | -10 | nA | $V_{EB} = -5V, I_C = 0$ |
| DC Current Gain ^(Note2) | $h_{FE(1)}$ | 75 | | | | $V_{CE} = -10V, I_C = -0.1mA$ |
| | $h_{FE(2)}$ | 100 | | | | $V_{CE} = -10V, I_C = -1mA$ |
| | $h_{FE(3)}$ | 100 | | | | $V_{CE} = -10V, I_C = -10mA$ |
| | $h_{FE(4)}$ | 100 | | 300 | | $V_{CE} = -10V, I_C = -150mA$ |
| | $h_{FE(5)}$ | 50 | | | | $V_{CE} = -10V, I_C = -500mA$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | | -0.4 | V | $I_C = -150mA, I_B = -15mA$ |
| | | | | -1.6 | V | $I_C = -500mA, I_B = -50mA$ |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | | | -1.3 | V | $I_C = -150mA, I_B = -15mA$ |
| | | | | -2.6 | V | $I_C = -500mA, I_B = -50mA$ |
| Transition Frequency | f_T | 200 | | | MHz | $V_{CE} = -20V, I_C = -50mA, f = 100MHz$ |
| Output Capacitance | C_{cbo} | | | 8 | pF | $V_{CB} = -10V, I_E = 0, f = 1MHz,$ |
| Input Capacitance | C_{ibo} | | | 30 | pF | $V_{EB} = -2V, I_C = 0, f = 1MHz,$ |
| Delay Time | t_d | | | 10 | ns | $V_{CC} = -3V, I_C = -150mA$ |
| Rise Time | t_r | | | 40 | ns | $I_{B1} = -15mA$ |
| Storage Time | t_s | | | 225 | ns | $V_{CC} = -3V, I_C = -150mA$ |
| Fall Time | t_f | | | 60 | ns | $I_{B1} = I_{B2} = -15mA$ |

Note: 2. Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2.0\%$

Curve Characteristics

Fig. 1 - Static Characteristics

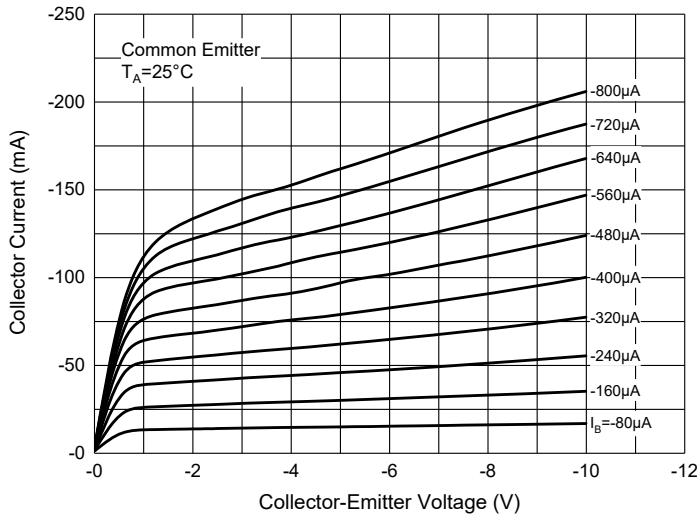


Fig. 2 - DC Current Gain Characteristics

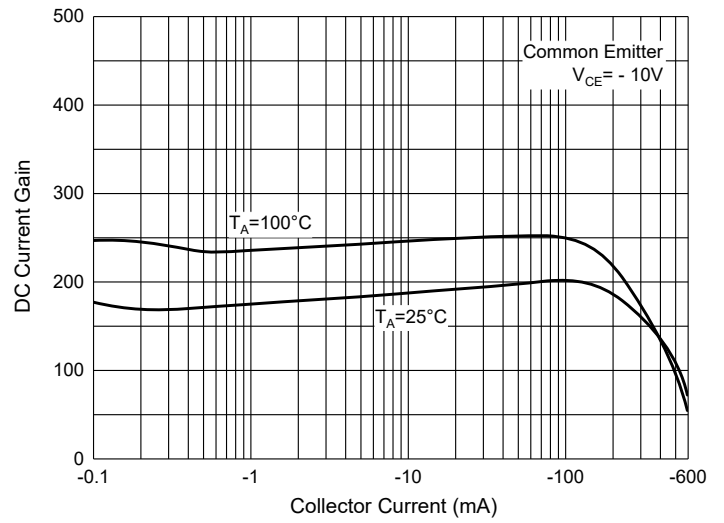


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

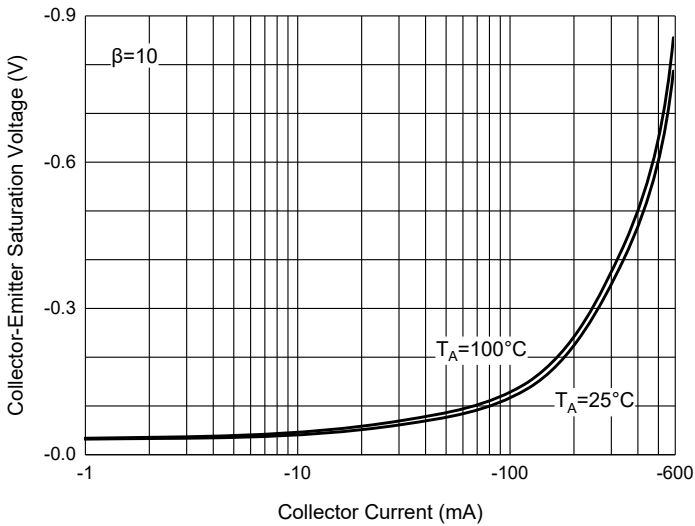


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

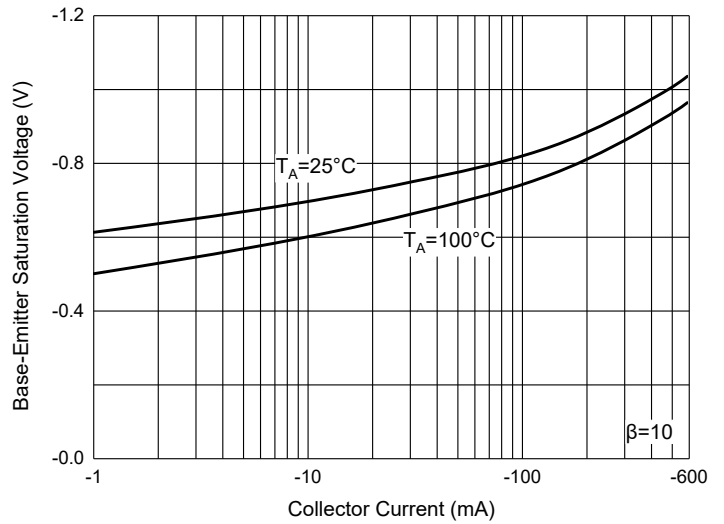


Fig. 5 - Base-Emitter Voltage Characteristics

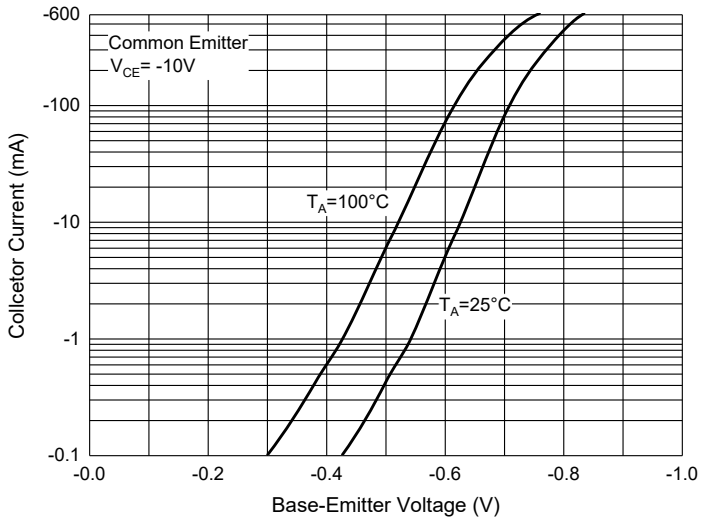
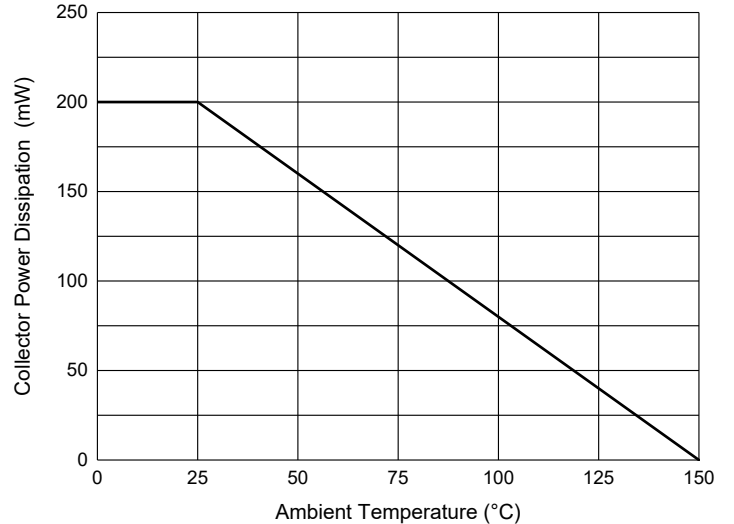


Fig. 6 - Collector Power Derating Curve



Ordering Information

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

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