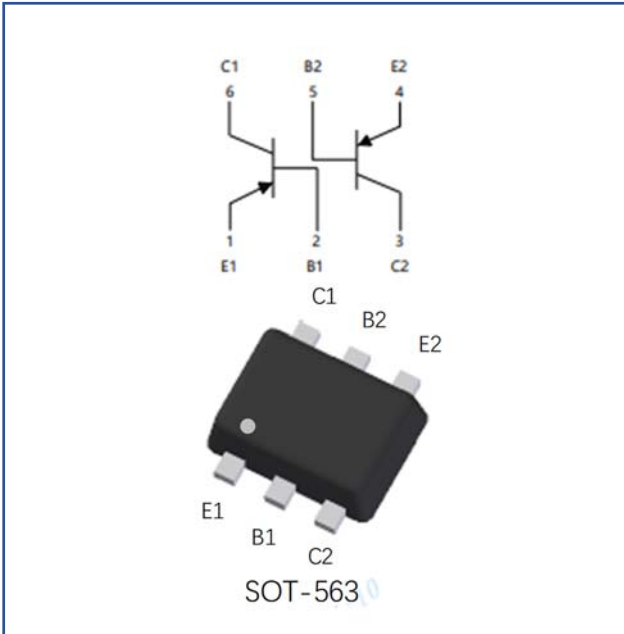


Dual PNP Small Signal Transistor



Features

- Moisture sensitivity level 1
- Halogen free and RoHS compliant
- Surface mount package ideally suited for automatic Insertion

Application

- Signal amplification
- Switching circuit

Mechanical data

- **Package:** SOT-563
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102

■ Maximum Ratings (Ta=25°C Unless otherwise specified)

| Item | Symbol | Unit | Conditions | Value |
|---------------------------|-----------|------|---------------------------|-------------|
| Device marking code | | | | KAR |
| Collector-base voltage | V_{CBO} | V | $I_C = -10\mu A, I_E = 0$ | -40 |
| Collector-emitter voltage | V_{CEO} | V | $I_C = -1mA, I_B = 0$ | -40 |
| Emitter-base voltage | V_{EBO} | V | $I_E = -10\mu A, I_C = 0$ | -5 |
| Collector current | I_C | mA | | -200 |
| Power dissipation | P_D | mW | | 150 |
| Junction temperature | T_J | °C | | -55 to +150 |
| Storage temperature | T_{STG} | °C | | -55 to +150 |



MMDT3906V

RoHS
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■ Electrical Characteristics (T_a=25°C Unless otherwise specified)

| Item | Symbol | Unit | Conditions | Min | Typ | Max |
|--------------------------------------|-----------------------|------|---|-------|-----|-------|
| Collector-base breakdown voltage | V _{(BR)CBO} | V | I _C =-10μA, I _E =0 | -40 | | |
| Collector-emitter breakdown voltage | V _{(BR)CEO} | V | I _C =-1mA, I _B =0 | -40 | | |
| Emitter-base breakdown voltage | V _{(BR)EBO} | V | I _E =-10μA, I _C =0 | -5 | | |
| Collector-base cut-off current | I _{CB0} | nA | V _{CB} =-40V, I _E =0 | | | -100 |
| Collector cutoff current | I _{CEX} | nA | V _{CE} =-30V, V _{EB(OFF)} =-3V | | | -50 |
| Emitter-base cut-off current | I _{EBO} | nA | V _{EB} =-5V, I _C =0 | | | -100 |
| DC current gain | h _{FE1} | | V _{CE} =-1V, I _C =-0.1mA | 40 | | |
| | h _{FE2} | | V _{CE} =-1V, I _C =-1mA | 70 | | |
| | h _{FE3} | | V _{CE} =-1V, I _C =-10mA | 100 | | 300 |
| | h _{FE4} | | V _{CE} =-1V, I _C =-50mA | 60 | | |
| | h _{FE5} | | V _{CE} =-1V, I _C =-100mA | 30 | | |
| Collector-emitter saturation voltage | V _{CE(sat)1} | V | I _C =-10mA, I _B =-1mA | | | -0.25 |
| | V _{CE(sat)2} | V | I _C =-50mA, I _B =-5mA | | | -0.4 |
| Base-emitter saturation voltage | V _{BE(sat)1} | V | I _C =-10mA, I _B =-1mA | -0.65 | | -0.85 |
| | V _{BE(sat)2} | V | I _C =-50mA, I _B =-5mA | | | -0.95 |
| Collector-base Output Capacitance | Cob | pF | V _{CB} =-5.0Vdc, f=1.0MHz, I _E =0 | | | 4.5 |
| Transition frequency | f _T | MHz | V _{CE} =-20V, I _C =-10mA, f=100MHz | 250 | | |
| Noise figure | N _F | dB | V _{CE} =-5V, I _C =-0.1mA, f=1kHz, R _s =1KΩ | | | 4 |
| Delay time | t _d | ns | V _{CC} =-3V, I _C =-10mA, V _{BE} =-0.5V, I _{B1} =-1mA | | | 35 |
| Rise time | t _r | ns | | | | 35 |
| Storage time | t _s | ns | V _{CC} =-3V, I _C =-10mA, I _{B1} =-I _{B2} =-1mA | | | 225 |
| Fall time | t _f | ns | | | | 75 |



■ Thermal Characteristics

| Parameter | Symbol | Unit | Value |
|---|------------------------|---------------|-------|
| Thermal resistance, junction-to-ambient | $R_{\theta J-A}^{(1)}$ | $^{\circ}C/W$ | 833 |
| Thermal resistance, junction-to-case | $R_{\theta J-C}^{(1)}$ | $^{\circ}C/W$ | 667 |

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 25.4mm*25.4mm copper pad areas

■ Characteristics

Fig 1: Static Characteristics

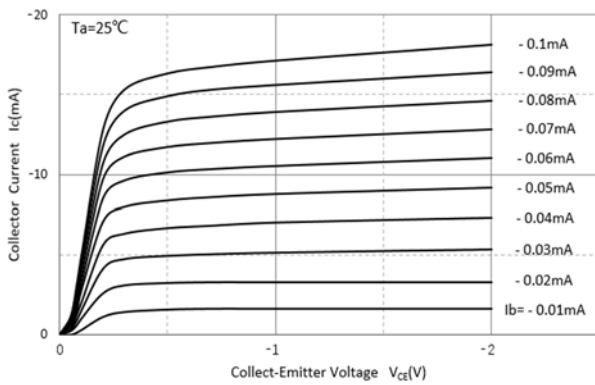


Fig 2: DC Current Gain

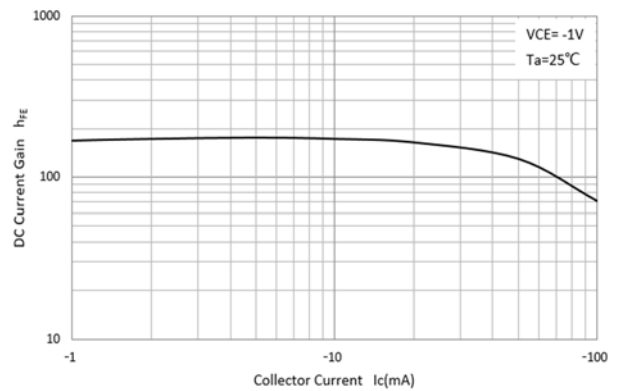


Fig 3: Collector-Emitter Saturation Voltage

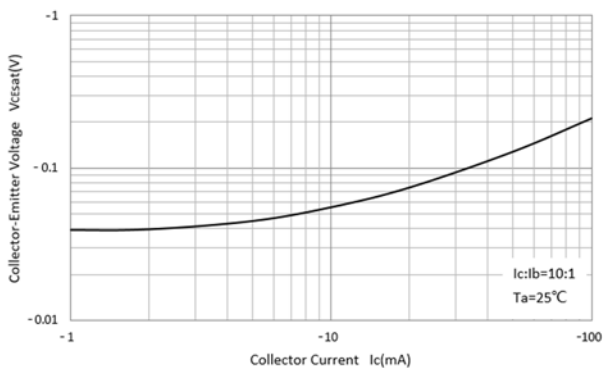


Fig 4: Base-Emitter Saturation Voltage

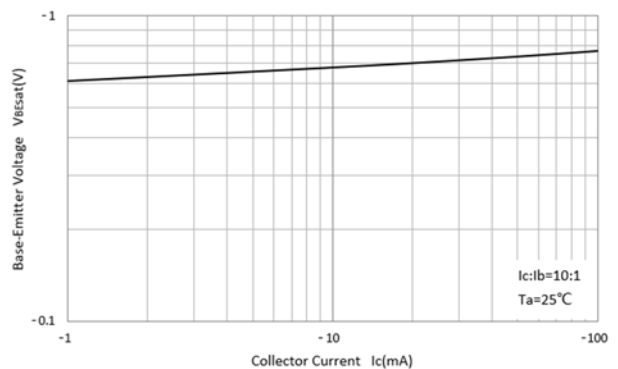




Fig 5: Base-Emitter Voltage

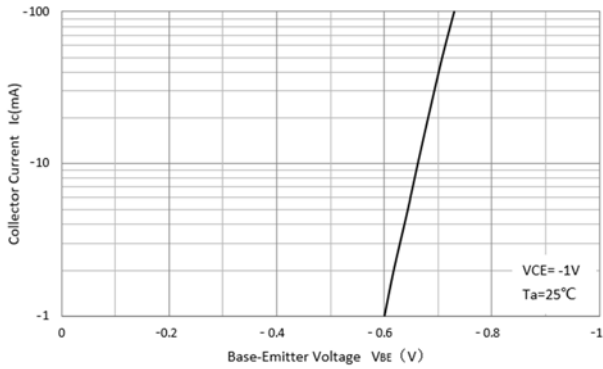


Fig 6: Cob/Cib- V_{CB}/V_{EB}

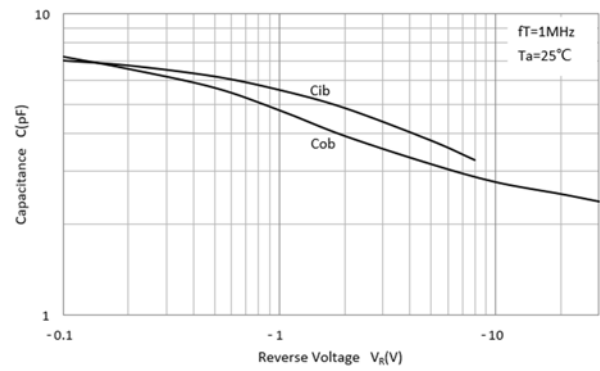
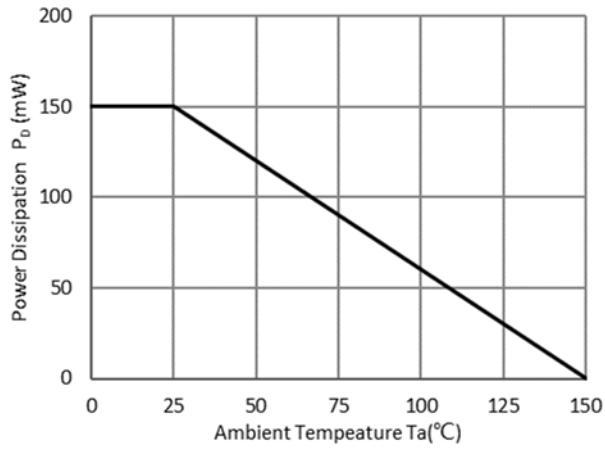


Fig 7: P_D - T_a Curve





MMDT3906V

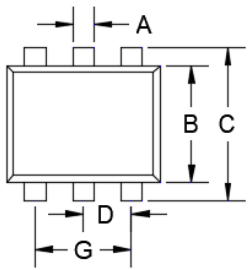
RoHS
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Ordering Information

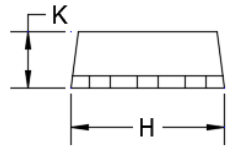
| Preferred P/N | Packing code | Unit weight(g) | Minimum package(pcs) | Inner box quantity(pcs) | Outer carton quantity(pcs) | Delivery mode |
|---------------|--------------|--------------------|----------------------|-------------------------|----------------------------|---------------|
| MMDT3906V | F2 | Approximate 0.0035 | 3000 | 30000 | 120000 | 7" reel |

Outline Dimensions

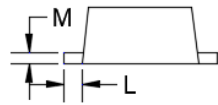
SOT-563



TOP VIEW



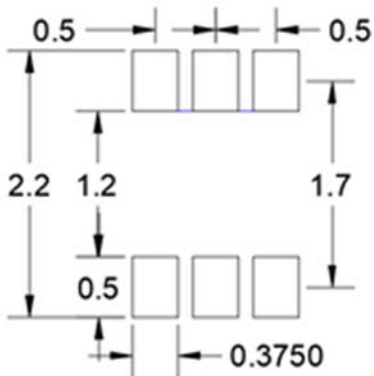
SIDE VIEW



SIDE VIEW

| DIM | DIMENSIONS | | | |
|-----|------------|-------|-------|-------|
| | INCHES | | MM | |
| | MIN | MAX | MM | MAX |
| A | 0.006 | 0.011 | 0.150 | 0.300 |
| B | 0.043 | 0.051 | 1.100 | 1.300 |
| C | 0.059 | 0.067 | 1.500 | 1.700 |
| D | 0.016 | 0.024 | 0.400 | 0.600 |
| G | 0.035 | 0.043 | 0.900 | 1.100 |
| H | 0.059 | 0.067 | 1.500 | 1.700 |
| K | 0.021 | 0.026 | 0.550 | 0.650 |
| L | 0.004 | 0.011 | 0.100 | 0.300 |
| M | 0.004 | 0.007 | 0.100 | 0.180 |

Suggested Pad Layout



UNIT:mm



Disclaimer

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