



DATA SHEET

MMBT4401W

NPN GENERAL PURPOSE SWITCHING TRANSISTOR

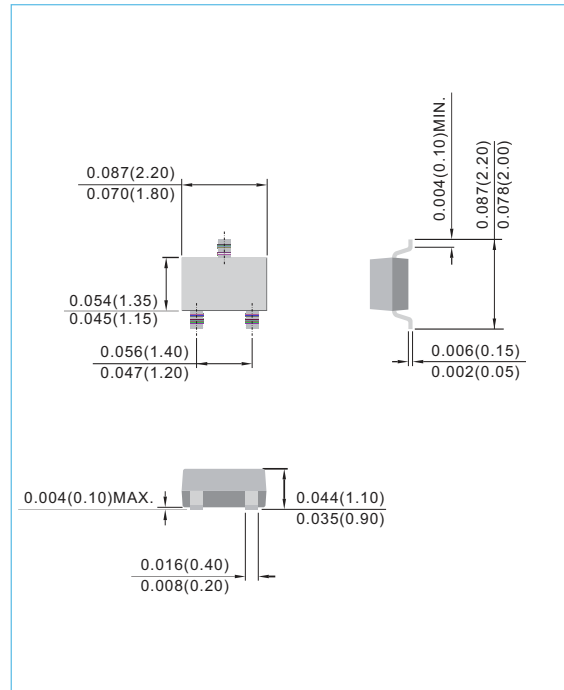
| | | | | | |
|----------------|----------|--------------|-------|----------------|-----------------|
| VOLTAGE | 40 Volts | POWER | 225mW | SOT-323 | Unit : inch(mm) |
|----------------|----------|--------------|-------|----------------|-----------------|

FEATURES

- NPN epitaxial silicon, planar design
- Collector-emitter voltage $V_{CE} = 40V$
- Collector current $I_C = 600mA$
- Lead free in comply with EU RoHS 2011/65/EU directives
- Green molding compound as per IEC61249 Std. . (Halogen Free)

MECHANICAL DATA

- Case: SOT-323
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx Weight: 0.0048 gram
- Marking: M4A



ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | Value | UNIT |
|--------------------------------|-----------|-------|------|
| Collector - Emitter Voltage | V_{CEO} | 40 | V |
| Collector - Base Voltage | V_{CBO} | 60 | V |
| Emitter - Base Voltage | V_{EBO} | 6.0 | V |
| Collector Current - Continuous | I_C | 600 | mA |

THERMAL CHARACTERISTICS

| PARAMETER | SYMBOL | Value | UNIT |
|--|-----------------|------------|------|
| Max Power Dissipation (Note 1) | P_{TOT} | 225 | mW |
| Storage Temperature | T_{STG} | -55 to 150 | °C |
| Junction Temperature | T_J | -55 to 150 | °C |
| Thermal Resistance , Junction to Ambient | $R_{\theta JA}$ | 556 | °C/W |

Note 1: Transistor mounted on FR-4 board 70 x 60 x 1mm.



ELECTRICAL CHARACTERISTICS ($T_J = 25^{\circ}\text{C}$, unless otherwise noted)

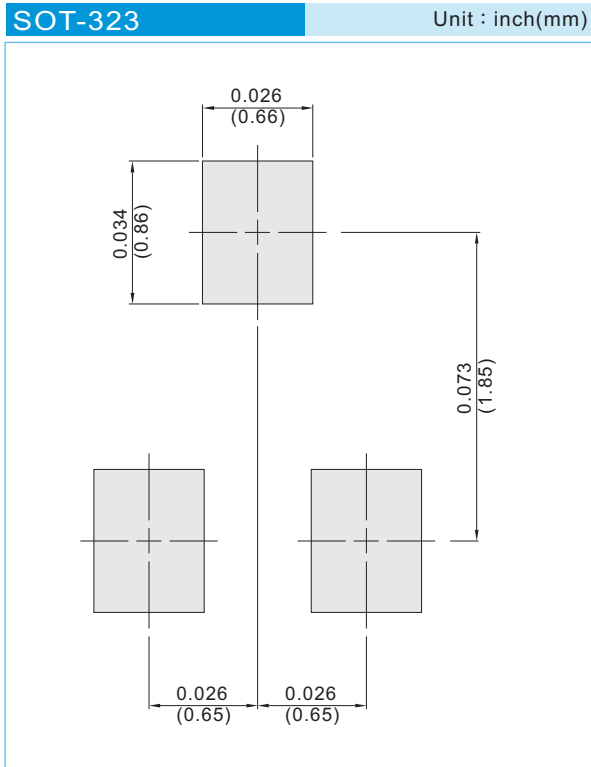
| PARAMETER | SYMBOL | Test Condition | MIN. | TYP. | MAX. | UNIT |
|--|---------------|---|------|------|------|------|
| Collector - Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C=1.0\text{mA}$, $I_B=0$ | 40 | - | - | V |
| Collector - Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C=100\mu\text{A}$, $I_E=0$ | 60 | - | - | V |
| Emitter - Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E=100\mu\text{A}$, $I_C=0$ | 6.0 | - | - | V |
| Base Cutoff Current | I_{BL} | $V_{CE}=35\text{V}$, $V_{EB}=0.4\text{V}$ | - | - | 100 | nA |
| Collector Cutoff Current | I_{CEX} | $V_{CE}=35\text{V}$, $V_{EB}=0.4\text{V}$ | - | - | 100 | nA |
| DC Current Gain | h_{FE} | $I_C=0.1\text{mA}$, $V_{CE}=1.0\text{V}$ | 20 | - | - | |
| | | $I_C=1.0\text{mA}$, $V_{CE}=1.0\text{V}$ | 40 | - | - | |
| | | $I_C=10\text{mA}$, $V_{CE}=1.0\text{V}$ | 80 | - | - | |
| | | $I_C=150\text{mA}$, $V_{CE}=1.0\text{V}$ | 100 | - | 300 | |
| | | $I_C=500\text{mA}$, $V_{CE}=2.0\text{V}$ | 40 | - | - | |
| Collector - Emitter Saturation Voltage | $V_{CE(SAT)}$ | $I_C=150\text{mA}$, $I_B=15\text{mA}$ | - | - | 0.4 | V |
| | | $I_C=500\text{mA}$, $I_B=50\text{mA}$ | - | - | 0.75 | |
| Base - Emitter Saturation Voltage | $V_{BE(SAT)}$ | $I_C=150\text{mA}$, $I_B=15\text{mA}$ | 0.75 | - | 0.95 | V |
| | | $I_C=500\text{mA}$, $I_B=50\text{mA}$ | - | - | 1.2 | |
| Collector - Base Capacitance | C_{CBO} | $V_{CB}=5\text{V}$, $I_E=0$, $f=1\text{MHz}$ | - | - | 6.5 | pF |
| Emitter - Base Capacitance | C_{EBO} | $V_{CB}=0.5\text{V}$, $I_C=0$, $f=1\text{MHz}$ | - | - | 30 | pF |
| Current Gain – Bandwidth Product | F_T | $I_C=20\text{mA}$, $V_{CE}=10\text{V}$, $f=100\text{MHz}$ | 250 | - | - | MHz |
| Delay Time | t_d | $V_{CC}=30\text{V}$, $V_{BE}=2.0\text{V}$, $I_C=150\text{mA}$, $I_B=15\text{mA}$ | - | - | 15 | ns |
| Rise Time | t_r | $V_{CC}=30\text{V}$, $V_{BE}=2.0\text{V}$, $I_C=150\text{mA}$, $I_{B1}=15\text{mA}$ | - | - | 20 | ns |
| Storage Time | t_s | $V_{CC}=30\text{V}$, $I_C=150\text{mA}$, $I_{B1}=I_{B2}=15\text{mA}$ | - | - | 225 | ns |
| Fall Time | t_f | $V_{CC}=3\text{V}$, $I_C=10\text{mA}$, $I_{B1}=I_{B2}=15\text{mA}$ | - | - | 30 | ns |

ELECTRICAL CHARACTERISTICS CURVES

All Curves TBD



MOUNTING PAD LAYOUT



ORDER INFORMATION

- Packing information
 - T/R - 12K per 13" plastic Reel
 - T/R - 3K per 7" plastic Reel



Part No_packing code_Version

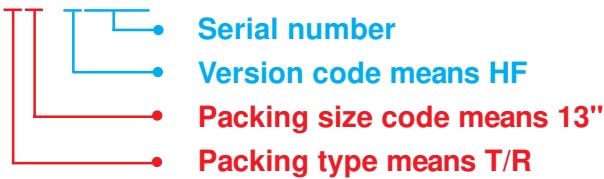
MMBT4401W_R1_00001

MMBT4401W_R2_00001

For example :

RB500V-40_R2_00001

Part No.



| Packing Code XX | | | | Version Code XXXXX | | |
|--------------------------------------|----------------------|----------------------------------|----------------------|---------------------------|----------------------|---------------------------------------|
| Packing type | 1 st Code | Packing size code | 2 nd Code | HF or RoHS | 1 st Code | 2 nd ~5 th Code |
| Tape and Ammunition Box (T/B) | A | N/A | 0 | HF | 0 | serial number |
| Tape and Reel (T/R) | R | 7" | 1 | RoHS | 1 | serial number |
| Bulk Packing (B/P) | B | 13" | 2 | | | |
| Tube Packing (T/P) | T | 26mm | X | | | |
| Tape and Reel (Right Oriented) (TRR) | S | 52mm | Y | | | |
| Tape and Reel (Left Oriented) (TRL) | L | PANASERT T/B CATHODE UP (PBCU) | U | | | |
| FORMING | F | PANASERT T/B CATHODE DOWN (PBCD) | D | | | |



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