





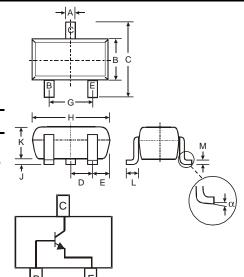
NPN SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

- **Epitaxial Planar Die Construction**
- Complementary PNP Type Available (MMSTA92)
- Ideal for Low Power Amplification and Switching
- Ultra-Small Surface Mount Package
- Lead Free/RoHS Compliant (Note 2)
- "Green" Device (Note 3 and 4)

Mechanical Data

- Case: SOT-323
- Case Material: Molded Plastic, "Green" Molding Compound, Note 4. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminal Connections: See Diagram
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Marking Information: K3M, See Page 3
- Ordering & Date Code Information: See Page 3
- Weight: 0.006 grams (approximate)



| | SOT-323 | | | | | | | | | |
|---------|----------|--------|--|--|--|--|--|--|--|--|
| Dim | Min | Max | | | | | | | | |
| Α | 0.25 | 0.40 | | | | | | | | |
| В | 1.15 | 1.35 | | | | | | | | |
| С | 2.00 | 2.20 | | | | | | | | |
| D | 0.65 N | ominal | | | | | | | | |
| Е | 0.30 | 0.40 | | | | | | | | |
| G | 1.20 | 1.40 | | | | | | | | |
| Н | 1.80 | 2.20 | | | | | | | | |
| J | 0.0 | 0.10 | | | | | | | | |
| K | 0.90 | 1.00 | | | | | | | | |
| L | 0.25 | 0.40 | | | | | | | | |
| M | 0.10 | 0.18 | | | | | | | | |
| α | 0° | 8° | | | | | | | | |
| All Din | nensions | in mm | | | | | | | | |

Maximum Ratings $@T_A = 25^{\circ}C$ unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Collector-Base Voltage | V _{CBO} | 300 | V |
| Collector-Emitter Voltage | V _{CEO} | 300 | V |
| Emitter-Base Voltage | V _{EBO} | 6.0 | V |
| Collector Current (Note 1) | Ic | 200 | mA |
| Power Dissipation (Note 1) | P_d | 200 | mW |
| Thermal Resistance, Junction to Ambient (Note 1) | $R_{	hetaJA}$ | 625 | °C/W |
| Operating and Storage Temperature Range | T _j , T _{STG} | -55 to +150 | °C |

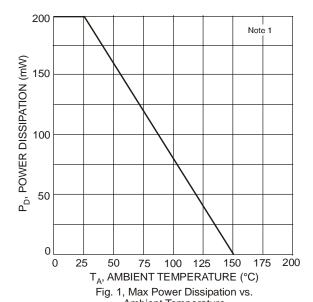
Electrical Characteristics @TA = 25°C unless otherwise specified

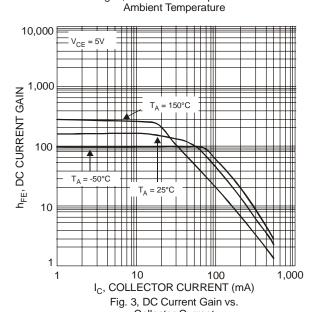
| a | | | | | T 10 1111 |
|--------------------------------------|----------------------|-----|-----|------|---|
| Characteristic | Symbol | Min | Max | Unit | Test Condition |
| OFF CHARACTERISTICS (Note 5) | | | | | |
| Collector-Base Breakdown Voltage | V _{(BR)CBO} | 300 | | ٧ | $I_C = 100 \mu A, I_E = 0$ |
| Collector-Emitter Breakdown Voltage | V _{(BR)CEO} | 300 | _ | V | $I_C = 1.0 \text{mA}, I_B = 0$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | 6.0 | _ | V | $I_E = 100 \mu A, I_C = 0$ |
| Collector Cutoff Current | I _{CBO} | | 100 | nA | $V_{CB} = 200V, I_E = 0$ |
| Collector Cutoff Current | I _{EBO} | | 100 | nA | $V_{CE} = 6.0V, I_{C} = 0$ |
| ON CHARACTERISTICS (Note 5) | | | | | |
| | | 25 | | | $I_C = 1.0 \text{mA}, V_{CE} = 10 \text{V}$ |
| DC Current Gain | h _{FE} | 40 | _ | _ | $I_C = 10mA, V_{CE} = 10V$ |
| | | 40 | | | $I_C = 30 \text{mA}, V_{CE} = 10 \text{V}$ |
| Collector-Emitter Saturation Voltage | V _{CE(SAT)} | | 0.5 | ٧ | $I_C = 20 \text{mA}, I_B = 2.0 \text{mA}$ |
| Base-Emitter Saturation Voltage | V _{BE(SAT)} | | 0.9 | V | $I_C = 20mA$, $I_B = 2.0mA$ |
| SMALL SIGNAL CHARACTERISTICS | | | | | |
| Output Capacitance | C_{cb} | | 3.0 | pF | $V_{CB} = 20V, f = 1.0MHz, I_E = 0$ |
| Current Gain-Bandwidth Product | f _T | 50 | | MHz | V _{CE} = 20V, I _C = 10mA, f = 100MHz |

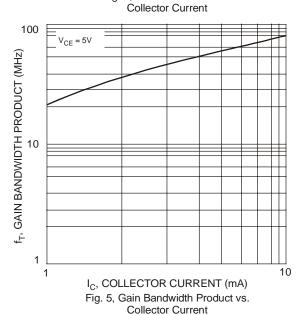
Notes:

- 1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.
- 2. No purposefully added lead.
- 3. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
- Product manufactured with Date Code 0627 (week 27, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0627 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.
- 5. Short duration pulse test used to minimize self-heating effect.









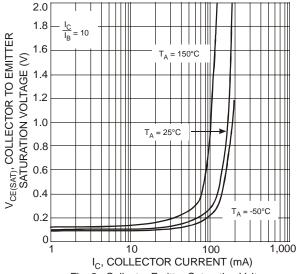


Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current

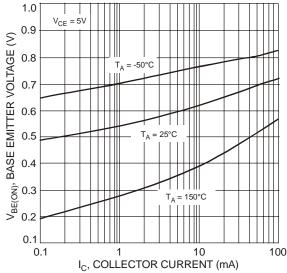


Fig. 4, Base Emitter Voltage vs. Collector Current

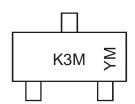


Ordering Information (Note 4 & 6)

| Device | Packaging | Shipping | | | |
|-------------|-----------|------------------|--|--|--|
| MMSTA42-7-F | SOT-323 | 3000/Tape & Reel | | | |

6. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



K3M= Product Type Marking Code YM = Date Code Marking Y = Year ex: N = 2002 M = Month ex: 9 = September

Date Code Key

| F | Year | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | Code | J | K | L | М | N | Р | R | S | Т | U | V | W | Χ | Υ | Z |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | N | D |

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