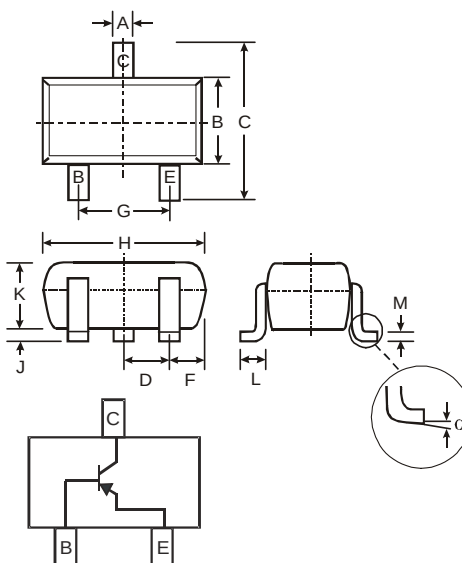


## Features

- Epitaxial Planar Die Construction
- Complementary NPN Type Available (MMST4124)
- Ideal for Medium Power Amplification and Switching
- Ultra-Small Surface Mount Package
- **Lead Free/RoHS Compliant (Note 2)**
- "Green" Device (Notes 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: See Page 3
- Ordering Information: See Page 3
- Weight: 0.006 grams (approximate)



| SOT-323              |              |      |
|----------------------|--------------|------|
| Dim                  | Min          | Max  |
| A                    | 0.25         | 0.40 |
| B                    | 1.15         | 1.35 |
| C                    | 2.00         | 2.20 |
| D                    | 0.65 Nominal |      |
| E                    | 0.30         | 0.40 |
| G                    | 1.20         | 1.40 |
| H                    | 1.80         | 2.20 |
| J                    | 0.0          | 0.10 |
| K                    | 0.90         | 1.00 |
| L                    | 0.25         | 0.40 |
| M                    | 0.10         | 0.18 |
| $\alpha$             | 0°           | 8°   |
| All Dimensions in mm |              |      |

## Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                                   | Symbol                            | Value       | Unit |
|--------------------------------------------------|-----------------------------------|-------------|------|
| Collector-Base Voltage                           | V <sub>CBO</sub>                  | -25         | V    |
| Collector-Emitter Voltage                        | V <sub>CEO</sub>                  | -25         | V    |
| Emitter-Base Voltage                             | V <sub>EBO</sub>                  | -4.0        | V    |
| Collector Current - Continuous (Note 1)          | I <sub>C</sub>                    | -200        | mA   |
| Power Dissipation (Note 1)                       | P <sub>d</sub>                    | 200         | mW   |
| Thermal Resistance, Junction to Ambient (Note 1) | R <sub>θJA</sub>                  | 625         | °C/W |
| Operating and Storage Temperature Range          | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

## Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                       | Symbol               | Min       | Max      | Unit | Test Condition                                                                                      |
|--------------------------------------|----------------------|-----------|----------|------|-----------------------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS (Note 5)</b>  |                      |           |          |      |                                                                                                     |
| Collector-Base Breakdown Voltage     | V <sub>(BR)CBO</sub> | -25       | —        | V    | I <sub>C</sub> = -10μA, I <sub>E</sub> = 0                                                          |
| Collector-Emitter Breakdown Voltage  | V <sub>(BR)CEO</sub> | -25       | —        | V    | I <sub>C</sub> = -1.0mA, I <sub>B</sub> = 0                                                         |
| Emitter-Base Breakdown Voltage       | V <sub>(BR)EBO</sub> | -4.0      | —        | V    | I <sub>E</sub> = -10μA, I <sub>C</sub> = 0                                                          |
| Collector Cutoff Current             | I <sub>CBO</sub>     | —         | -50      | nA   | V <sub>CB</sub> = -20V, I <sub>E</sub> = 0V                                                         |
| Emitter Cutoff Current               | I <sub>EBO</sub>     | —         | -50      | nA   | V <sub>EB</sub> = -3.0V, I <sub>C</sub> = 0V                                                        |
| <b>ON CHARACTERISTICS (Note 5)</b>   |                      |           |          |      |                                                                                                     |
| DC Current Gain                      | h <sub>FE</sub>      | 120<br>60 | 360<br>— | —    | I <sub>C</sub> = -2.0mA, V <sub>CE</sub> = -1.0V<br>I <sub>C</sub> = -50mA, V <sub>CE</sub> = -1.0V |
| Collector-Emitter Saturation Voltage | V <sub>CE(SAT)</sub> | —         | -0.40    | V    | I <sub>C</sub> = -50mA, I <sub>B</sub> = -5.0mA                                                     |
| Base-Emitter Saturation Voltage      | V <sub>BE(SAT)</sub> | —         | -0.95    | V    | I <sub>C</sub> = -50mA, I <sub>B</sub> = -5.0mA                                                     |
| <b>SMALL SIGNAL CHARACTERISTICS</b>  |                      |           |          |      |                                                                                                     |
| Output Capacitance                   | C <sub>obo</sub>     | —         | 4.5      | pF   | V <sub>CB</sub> = -5.0V, f = 1.0MHz, I <sub>E</sub> = 0                                             |
| Input Capacitance                    | C <sub>ibo</sub>     | —         | 10       | pF   | V <sub>EB</sub> = -0.5V, f = 1.0MHz, I <sub>C</sub> = 0                                             |
| Small Signal Current Gain            | h <sub>fe</sub>      | 120       | 480      | —    | V <sub>CE</sub> = 1.0V, I <sub>C</sub> = -2.0mA, f = 1.0kHz                                         |
| Current Gain-Bandwidth Product       | f <sub>T</sub>       | 250       | —        | MHz  | V <sub>CE</sub> = -20V, I <sub>C</sub> = -10mA, f = 100MHz                                          |
| Noise Figure                         | NF                   | —         | 4.0      | dB   | V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -100μA, R <sub>S</sub> = 1.0kΩ, f = 1.0kHz                |

- Note:
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](http://www.diodes.com/products/lead_free/index.php).
  4. 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.

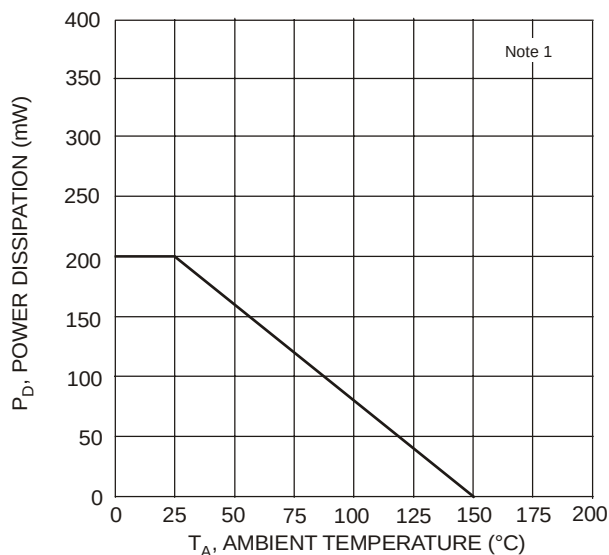


Fig. 1, Max Power Dissipation vs. Ambient Temperature

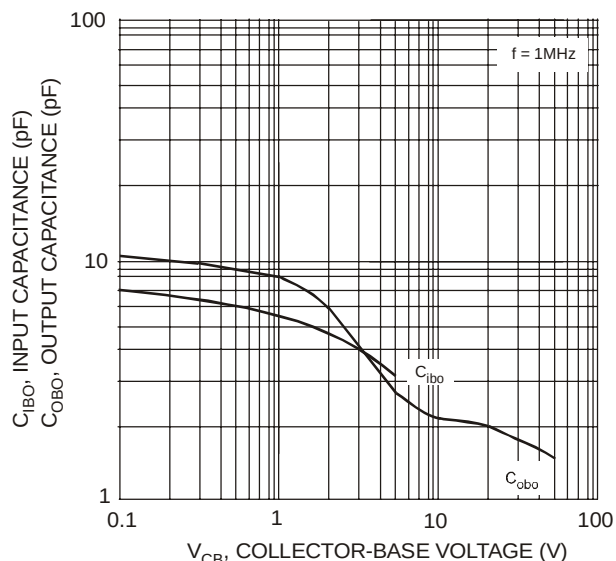


Fig. 2, Input and Output Capacitance vs. Collector-Base Voltage

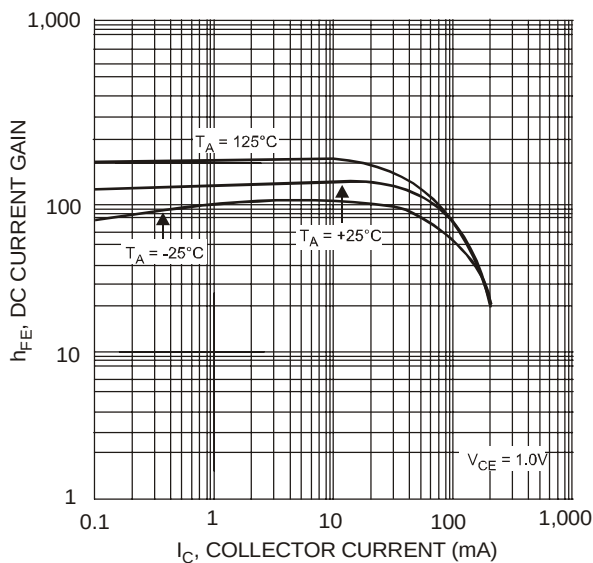


Fig. 3, Typical DC Current Gain vs. Collector Current

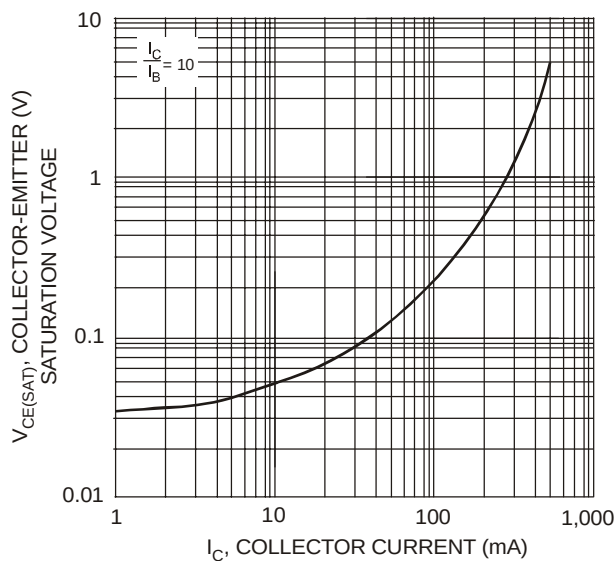


Fig. 4, Typical Collector-Emitter Saturation Voltage vs. Collector Current

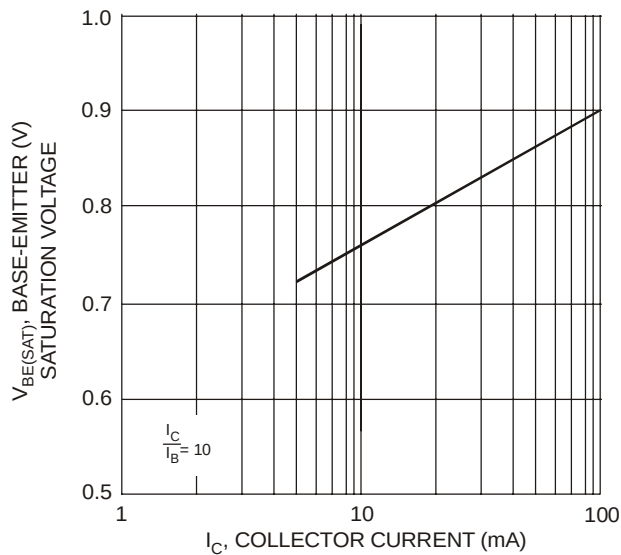


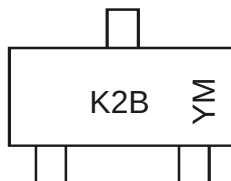
Fig. 5, Typical Base-Emitter Saturation Voltage vs. Collector Current

## Ordering Information (Notes 4 and 6)

| Device       | Packaging | Shipping         |
|--------------|-----------|------------------|
| MMST4126-7-F | SOT-323   | 3000/Tape & Reel |

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

## Marking Information



K2B = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year ex: N = 2002  
 M = Month ex: 9 = September

### Date Code Key

| Year | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | J    | K    | L    | M    | N    | P    | R    | S    | T    | U    | V    | W    | X    | Y    | Z    |

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

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