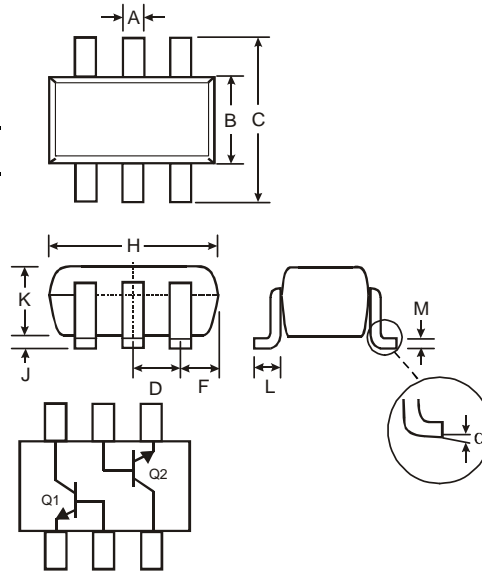


**Features**

- Epitaxial Planar Die Construction
- Ideal for Medium Power Amplification and Switching
- **Lead Free/RoHS Compliant (Note 3)**
- "Green" Device, Note 4 and 5

**Mechanical Data**

- Case: SOT-26
- Case Material: Molded Plastic, "Green" Molding Compound, Note 5. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminal Connections: See Diagram
- Terminals: Finish - Matte Tin Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Copper leadframe).
- Marking Information: K3M, See Page 3
- Ordering & Date Code Information: See Page 3
- Weight: 0.008 grams (approximate)



| SOT-26               |       |      |      |
|----------------------|-------|------|------|
| Dim                  | Min   | Max  | Typ  |
| A                    | 0.35  | 0.50 | 0.38 |
| B                    | 1.50  | 1.70 | 1.60 |
| C                    | 2.70  | 3.00 | 2.80 |
| D                    | —     | —    | 0.95 |
| F                    | —     | —    | 0.55 |
| H                    | 2.90  | 3.10 | 3.00 |
| J                    | 0.013 | 0.10 | 0.05 |
| K                    | 1.00  | 1.30 | 1.10 |
| L                    | 0.35  | 0.55 | 0.40 |
| M                    | 0.10  | 0.20 | 0.15 |
| $\alpha$             | 0°    | 8°   | —    |
| All Dimensions in mm |       |      |      |

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

| Characteristic                                   | Symbol          | Value       | Unit               |
|--|-----------------|-------------|--------------------|
| Collector-Base Voltage                           | $V_{CB0}$       | 300         | V                  |
| Collector-Emitter Voltage                        | $V_{CEO}$       | 300         | V                  |
| Emitter-Base Voltage                             | $V_{EBO}$       | 6.0         | V                  |
| Collector Current (Note 1) (Note 2)              | $I_C$           | 500         | mA                 |
| Power Dissipation (Note 1)                       | $P_d$           | 300         | mW                 |
| Thermal Resistance, Junction to Ambient (Note 1) | $R_{\theta JA}$ | 417         | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range          | $T_j, T_{STG}$  | -55 to +150 | $^\circ\text{C}$   |

- 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. When operated under collector-emitter saturation conditions within the safe operating area defined by the thermal resistance rating ( $R_{\theta JA}$ ), power dissipation rating ( $P_d$ ) and power derating curve (Figure 1).
  3. No purposefully added lead.
  4. 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).
  5. 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.

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

| Characteristic                       | Symbol               | Min            | Max | Unit | Test Condition  |
|--------------------------------------|----------------------|----------------|-----|------|---|
| <b>OFF CHARACTERISTICS (Note 6)</b>  |                      |                |     |      |   |
| Collector-Base Breakdown Voltage     | V <sub>(BR)CBO</sub> | 300            | —   | V    | I <sub>C</sub> = 100μA, I <sub>E</sub> = 0  |
| Collector-Emitter Breakdown Voltage  | V <sub>(BR)CEO</sub> | 300            | —   | V    | I <sub>C</sub> = 1.0mA, I <sub>B</sub> = 0  |
| Emitter-Base Breakdown Voltage       | V <sub>(BR)EBO</sub> | 6.0            | —   | V    | I <sub>E</sub> = 100μA, I <sub>C</sub> = 0  |
| Collector Cutoff Current             | I <sub>CBO</sub>     | —              | 100 | nA   | V <sub>CB</sub> = 200V, I <sub>E</sub> = 0  |
| Collector Cutoff Current             | I <sub>EBO</sub>     | —              | 100 | nA   | V <sub>CE</sub> = 6.0V, I <sub>C</sub> = 0  |
| <b>ON CHARACTERISTICS (Note 6)</b>   |                      |                |     |      |   |
| DC Current Gain                      | h <sub>FE</sub>      | 25<br>40<br>40 | —   | —    | I <sub>C</sub> = 1.0mA, V <sub>CE</sub> = 10V<br>I <sub>C</sub> = 10mA, V <sub>CE</sub> = 10V<br>I <sub>C</sub> = 30mA, V <sub>CE</sub> = 10V |
| Collector-Emitter Saturation Voltage | V <sub>CE(SAT)</sub> | —              | 0.5 | V    | I <sub>C</sub> = 20mA, I <sub>B</sub> = 2.0mA   |
| Base-Emitter Saturation Voltage      | V <sub>BE(SAT)</sub> | —              | 0.9 | V    | I <sub>C</sub> = 20mA, I <sub>B</sub> = 2.0mA   |
| <b>SMALL SIGNAL CHARACTERISTICS</b>  |                      |                |     |      |   |
| Output Capacitance                   | C <sub>cb</sub>      | —              | 3.0 | pF   | V <sub>CB</sub> = 20V, f = 1.0MHz, I <sub>E</sub> = 0   |
| Current Gain-Bandwidth Product       | f <sub>T</sub>       | 50             | —   | MHz  | V <sub>CE</sub> = 20V, I <sub>C</sub> = 10mA,<br>f = 100MHz   |

Notes: 6. Short duration pulse test used to minimize self-heating effect.

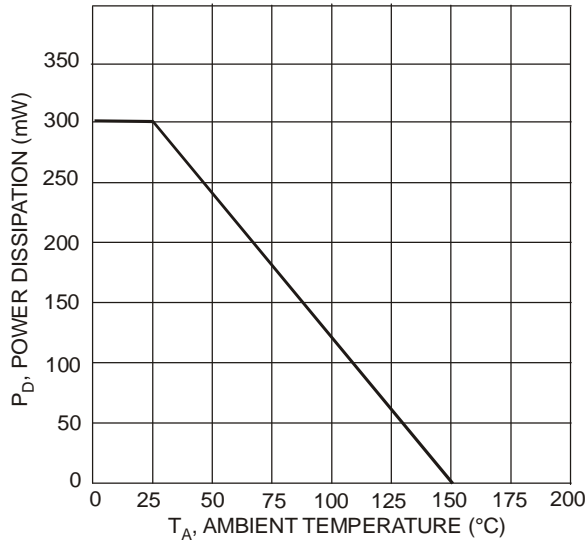


Fig. 1, Max Power Dissipation vs. Ambient Temperature

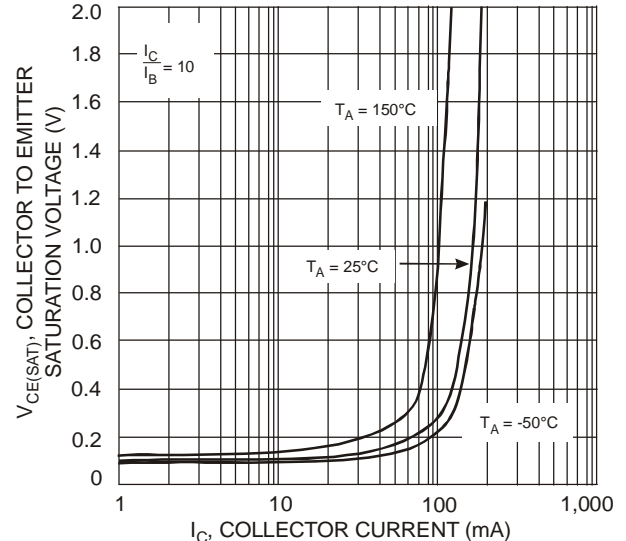


Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current

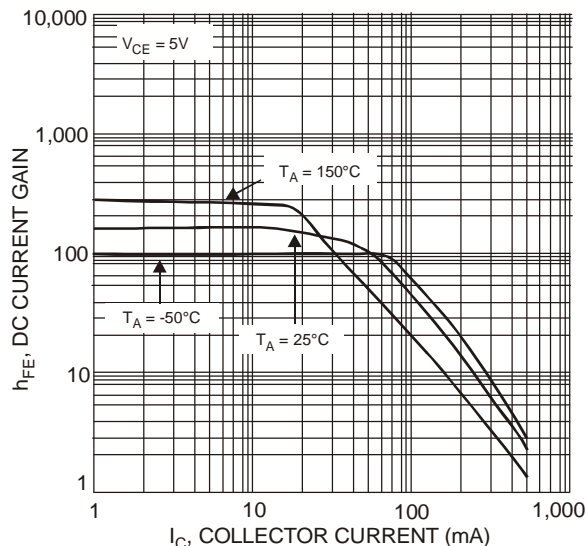


Fig. 3, DC Current Gain vs. Collector Current

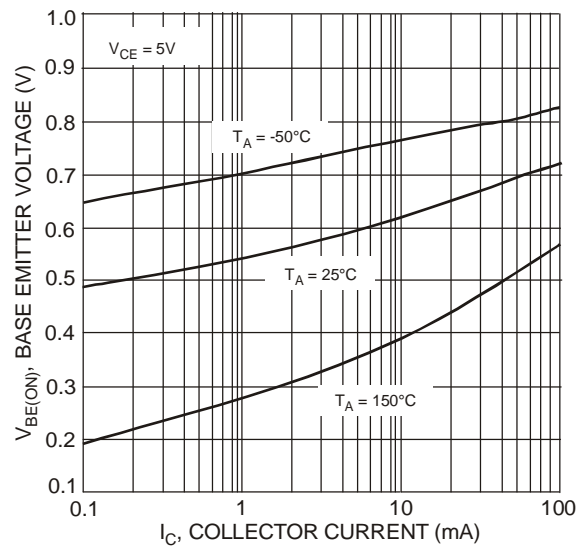
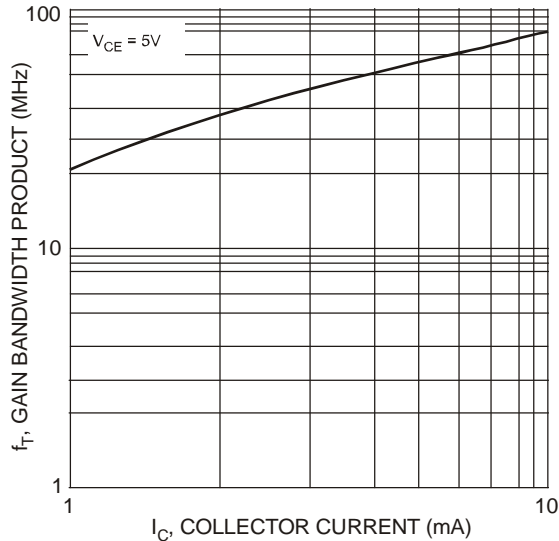


Fig. 4, Base Emitter Voltage vs. Collector Current



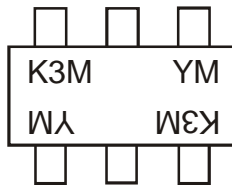
$I_C$ , COLLECTOR CURRENT (mA)  
Fig. 5. Gain Bandwidth Product vs. Collector Current

## Ordering Information (Note 5 & 7)

| Device      | Packaging | Shipping         |
|-------------|-----------|------------------|
| MMDTA42-7-F | SOT-26    | 3000/Tape & Reel |

Notes: 7. 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: P = 2003  
 M = Month ex: 9 = September

### Date Code Key

| Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|------|------|
| Code | 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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