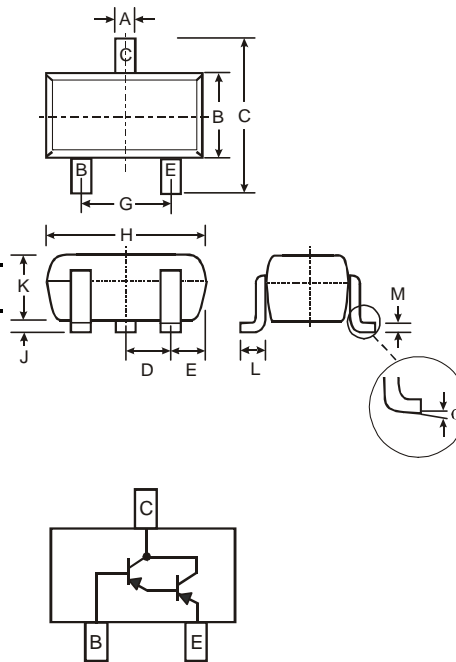


Features

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (MMSTA13/MMSTA14)
- Ultra-Small Surface Mount Package
- Ideal for Medium Power Amplification and Switching
- High Current Gain
- **Lead Free/RoHS Compliant (Note 2)**
- **"Green" Device (Note 3 and 4)**



| 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 |
| α | 0° | 8° |
| All Dimensions in mm | | |

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).
- MMSTA63 Marking K2E, K3E, See Page 3
- MMSTA64 Marking K3E, See Page 3
- Ordering & Date Code Information: See Page 3
- Weight: 0.006 grams (approximate)

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

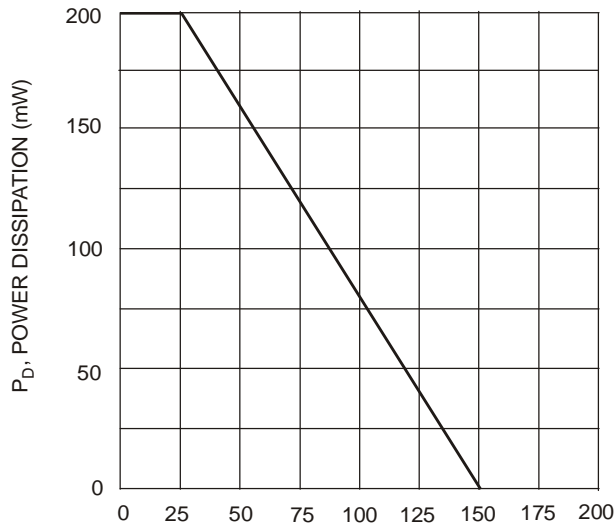
| Characteristic | Symbol | Value | Unit |
|--|-----------------|-------------|--------------------|
| Collector-Base Voltage | V_{CBO} | -30 | V |
| Collector-Emitter Voltage | V_{CEO} | -30 | V |
| Emitter-Base Voltage | V_{EBO} | -10 | V |
| Collector Current - Continuous | I_C | -500 | mA |
| Power Dissipation (Note 1) | P_d | 200 | mW |
| Thermal Resistance, Junction to Ambient (Note 1) | $R_{\theta JA}$ | 625 | $^\circ\text{C/W}$ |
| 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. 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
 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.

Electrical Characteristics @T_A = 25°C unless otherwise specified

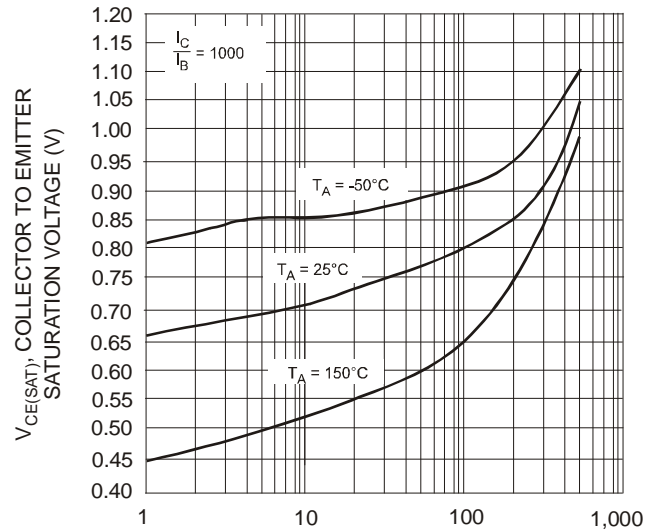
| Characteristic | Symbol | Min | Max | Unit | Test Condition |
|--------------------------------------|--|-----------------|-------------------------------------|------|--|
| OFF CHARACTERISTICS (Note 5) | | | | | |
| Collector-Emitter Breakdown Voltage | V _{(BR)CEO} | -30 | — | V | I _C = -100μA, V _{BE} = 0V |
| Collector Cutoff Current | I _{CBO} | — | -100 | nA | V _{CB} = -30V, I _E = 0 |
| Emitter Cutoff Current | I _{EBO} | — | -100 | nA | V _{EB} = -10V, I _C = 0 |
| ON CHARACTERISTICS (Note 5) | | | | | |
| DC Current Gain | MMSTA63 MMSTA64 MMSTA63 MMSTA64 | h _{FE} | 5,000 10,000 10,000 20,000 | — | I _C = -10mA, V _{CE} = -5.0V I _C = -10mA, V _{CE} = -5.0V I _C = -100mA, V _{CE} = -5.0V I _C = -100mA, V _{CE} = -5.0V |
| Collector-Emitter Saturation Voltage | V _{CE(SAT)} | — | -1.5 | V | I _C = -100mA, I _B = -100μA |
| Base-Emitter Saturation Voltage | V _{BE(SAT)} | — | -2.0 | V | I _C = -100mA, V _{CE} = -5.0V |
| SMALL SIGNAL CHARACTERISTICS | | | | | |
| Current Gain-Bandwidth Product | f _T | 125 | — | MHz | V _{CE} = -5.0V, I _C = -10mA, f = 100MHz |

Notes: 5. Short duration pulse test used to minimize self-heating effect.



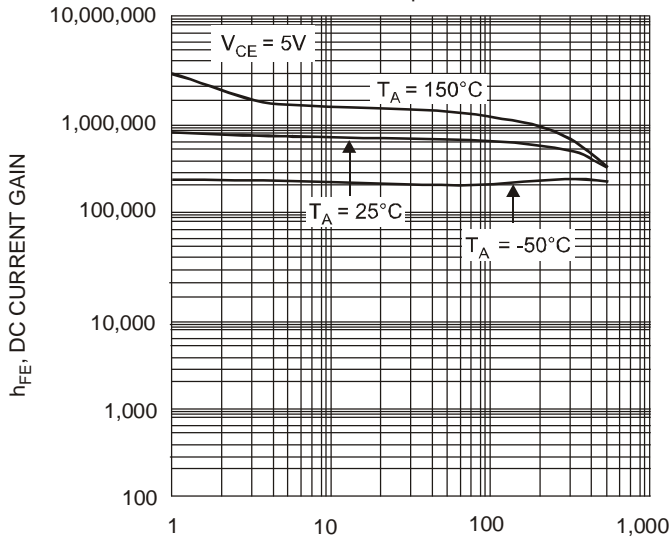
T_A, AMBIENT TEMPERATURE (°C)

Fig. 1, Max Power Dissipation vs. Ambient Temperature



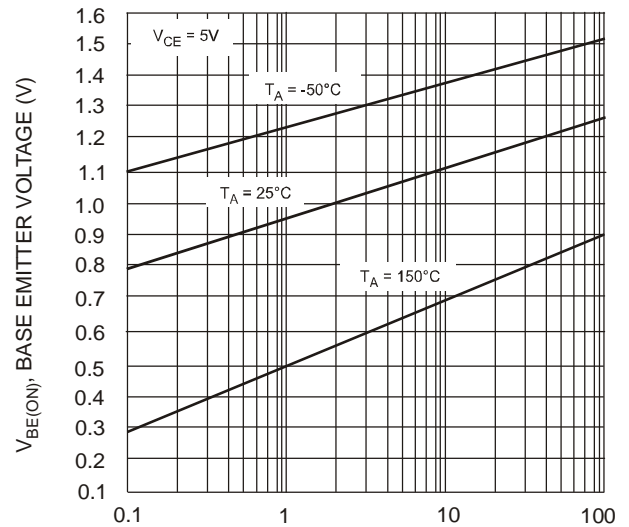
I_C, COLLECTOR CURRENT (mA)

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



I_C, COLLECTOR CURRENT (mA)

Fig. 3, DC Current Gain vs. Collector Current



I_C, COLLECTOR CURRENT (mA)

Fig. 4, Base Emitter Voltage vs. Collector Current

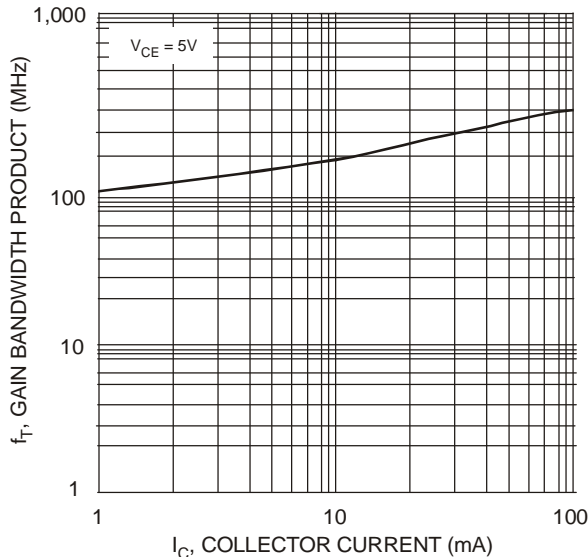


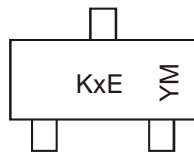
Fig. 5, Gain Bandwidth Product vs. Collector Current

Ordering Information (Note 4 & 6)

| Device | Packaging | Shipping |
|-------------|-----------|------------------|
| MMSTA63-7-F | SOT-323 | 3000/Tape & Reel |
| MMSTA64-7-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



KxE = Product Type Marking Code, e.g. K2E = MMSTA63
 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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