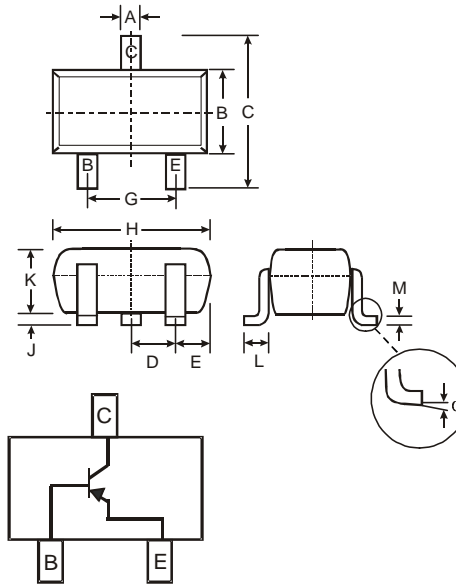


Features

- Epitaxial Planar Die Construction
- Complementary NPN Type Available (MMSTA05/MMSTA06)
- 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).
- MMSTA55 Marking K2H, K2G (See Page 3)
- MMSTA56 Marking K2G (See Page 3)
- Ordering & Date Code 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 |
| α | 0° | 8° |
| All Dimensions in mm | | |

Maximum Ratings @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | MMSTA55 | MMSTA56 | Unit |
|--|-----------------------------------|-------------|---------|------|
| Collector-Base Voltage | V _{CB0} | -60 | -80 | V |
| Collector-Emitter Voltage | V _{CEO} | -60 | -80 | V |
| Emitter-Base Voltage | V _{EBO} | -4.0 | | V |
| Collector Current - Continuous (Note 1) | I _C | -500 | | mA |
| Power Dissipation (Note 1) | P _d | 200 | | mW |
| Thermal Resistance, Junction to Ambient (Note 1) | R _{θJA} | 625 | | °C/W |
| Operating and Storage Temperature Range | T _i , T _{STG} | -55 to +150 | | °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-Base Breakdown Voltage | MMSTA55 MMSTA56 | V _{(BR)CBO} | -60 -80 | — | V I _C = -100μA, I _E = 0 |
| Collector-Emitter Breakdown Voltage | MMSTA55 MMSTA56 | V _{(BR)CEO} | -60 -80 | — | V I _C = -1.0mA, I _B = 0 |
| Emitter-Base Breakdown Voltage | | V _{(BR)EBO} | -4.0 | — | V I _E = -100μA, I _C = 0 |
| Collector Cutoff Current | MMSTA55 MMSTA56 | I _{CBO} | — | -100 | nA V _{CB} = -60V, I _E = 0 V _{CB} = -80V, I _E = 0 |
| Collector Cutoff Current | MMSTA55 MMSTA56 | I _{CEX} | — | -100 | nA V _{CE} = -60V, I _{BO} = 0V V _{CE} = -80V, I _{BO} = 0V |
| ON CHARACTERISTICS (Note 5) | | | | | |
| DC Current Gain | | h _{FE} | 100 | — | I _C = -10mA, V _{CE} = -1.0V I _C = -100mA, V _{CE} = -1.0V |
| Collector-Emitter Saturation Voltage | | V _{CE(SAT)} | — | -0.25 | V I _C = -100mA, I _B = -10mA |
| Base-Emitter Saturation Voltage | | V _{BE(SAT)} | — | -1.2 | V I _C = -100mA, V _{CE} = -1.0V |
| SMALL SIGNAL CHARACTERISTICS | | | | | |
| Current Gain-Bandwidth Product | | f _T | 50 | — | MHz V _{CE} = -1.0V, I _C = -100mA, f = 100MHz |

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

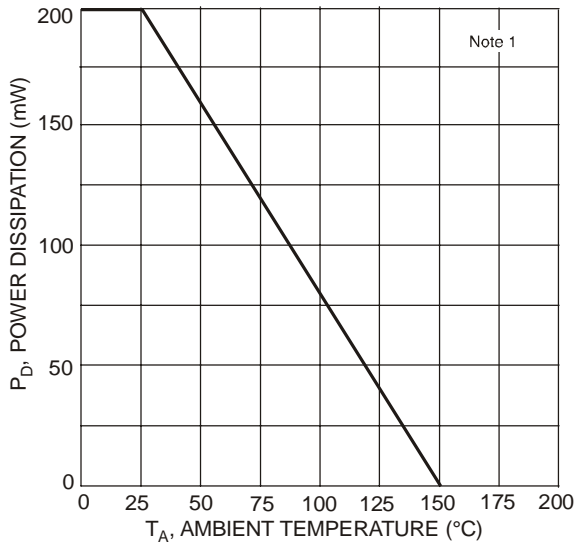


Fig. 1, Max Power Dissipation vs. Ambient Temperature

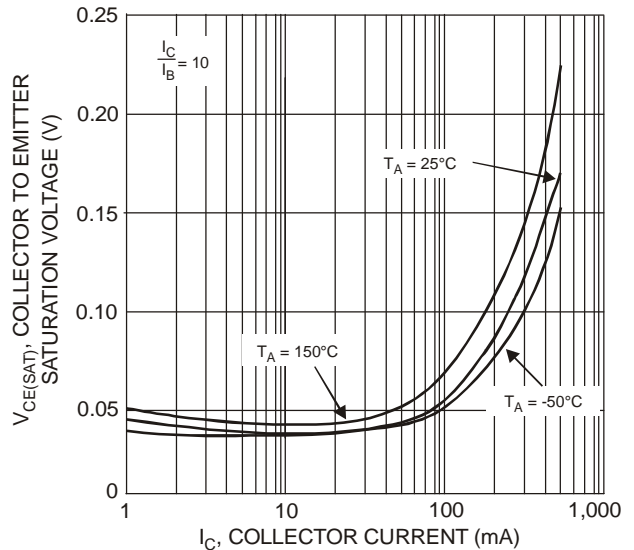


Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current

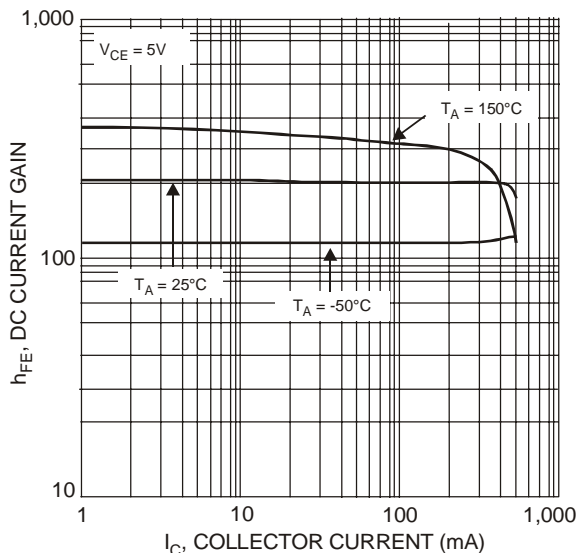


Fig. 3, DC Current Gain vs. Collector Current

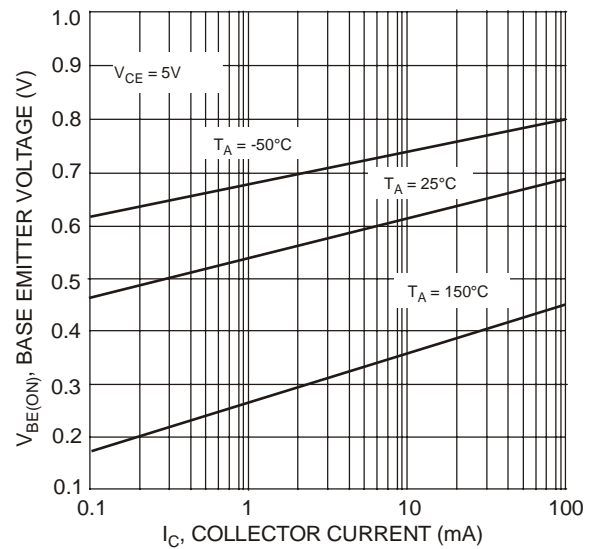


Fig. 4 Base Emitter Voltage vs. Collector Current

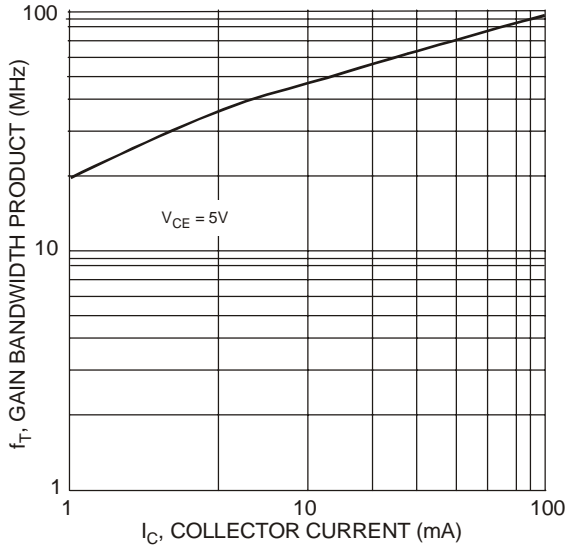


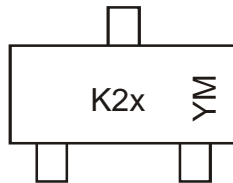
Fig. 5 Gain Bandwidth Product vs. Collector Current

Ordering Information (Notes 4 and 6)

| Device | Packaging | Shipping |
|-------------|-----------|------------------|
| MMSTA55-7-F | SOT-323 | 3000/Tape & Reel |
| MMSTA56-7-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



K2x = Product Type Marking Code, e.g. K2H = MMSTA55
 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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