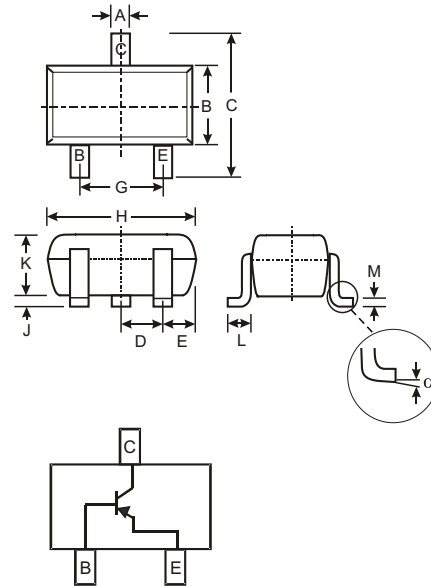


Features

- Epitaxial Planar Die Construction
- Complementary NPN Type Available (MMSTA05/MMSTA06)
- Ideal for Medium Power Amplification and Switching
- Ultra-Small Surface Mount Package
- Also Available in Lead Free Version

Mechanical Data

- Case: SOT-323, Molded Plastic
- Case Material - UL Flammability Rating 94V-0
- Moisture sensitivity: Level 1 per J-STD-020A
- Terminals: Solderable per MIL-STD-202, Method 208
- Also Available in Lead Free Plating (Matte Tin Finish). Please see Ordering Information, Note 4, on Page 2
- Terminal Connections: See Diagram
- MMSTA55 Marking K2H, K2G (See Page 2)
- MMSTA56 Marking K2G (See Page 2)
- Ordering & Date Code Information: See Page 2
- Weight: 0.006 grams (approx.)



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

| Characteristic | Symbol | MMSTA55 | MMSTA56 | Unit |
|--|-----------------|-------------|---------|------------------|
| Collector-Base Voltage | V_{CBO} | -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) | $R_{\theta JA}$ | 625 | | K/W |
| Operating and Storage and Temperature Range | T_j, T_{STG} | -55 to +150 | | $^\circ\text{C}$ |

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>.

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

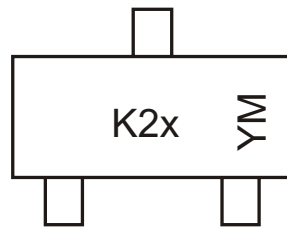
| Characteristic | Symbol | Min | Max | Unit | Test Condition |
|--------------------------------------|--------------------|---------------|------------|-------|--|
| OFF CHARACTERISTICS (Note 2) | | | | | |
| Collector-Base Breakdown Voltage | MMSTA55 MMSTA56 | $V_{(BR)CBO}$ | -60 -80 | — | V $I_C = -100\mu\text{A}, I_E = 0$ |
| Collector-Emitter Breakdown Voltage | MMSTA55 MMSTA56 | $V_{(BR)CEO}$ | -60 -80 | — | V $I_C = -1.0\text{mA}, I_B = 0$ |
| Emitter-Base Breakdown Voltage | | $V_{(BR)EBO}$ | -4.0 | — | V $I_E = -100\mu\text{A}, I_C = 0$ |
| Collector Cutoff Current | MMSTA55 MMSTA56 | I_{CBO} | — | -100 | nA $V_{CB} = -60\text{V}, I_E = 0$ $V_{CB} = -80\text{V}, I_E = 0$ |
| Collector Cutoff Current | MMSTA55 MMSTA56 | I_{CEX} | — | -100 | nA $V_{CE} = -60\text{V}, I_{BO} = 0\text{V}$ $V_{CE} = -80\text{V}, I_{BO} = 0\text{V}$ |
| ON CHARACTERISTICS (Note 2) | | | | | |
| DC Current Gain | | h_{FE} | 100 | — | — $I_C = -10\text{mA}, V_{CE} = -1.0\text{V}$ $I_C = -100\text{mA}, V_{CE} = -1.0\text{V}$ |
| Collector-Emitter Saturation Voltage | | $V_{CE(SAT)}$ | — | -0.25 | V $I_C = -100\text{mA}, I_B = -10\text{mA}$ |
| Base-Emitter Saturation Voltage | | $V_{BE(SAT)}$ | — | -1.2 | V $I_C = -100\text{mA}, V_{CE} = -1.0\text{V}$ |
| SMALL SIGNAL CHARACTERISTICS | | | | | |
| Current Gain-Bandwidth Product | | f_T | 50 | — | MHz $V_{CE} = -1.0\text{V}, I_C = -100\text{mA},$ $f = 100\text{MHz}$ |

Ordering Information (Note 3)

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

- Notes:
- Short duration test pulse used to minimize self-heating effect.
 - For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.
 - For Lead Free version (with Lead Free terminal finish) part number, please add "-F" suffix to part number above.
Example: MMSTA56-7-F.

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 |
| Code | J | K | L | M | N | P | R | S | T | U | V | W |
| Month | Jan | Feb | March | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

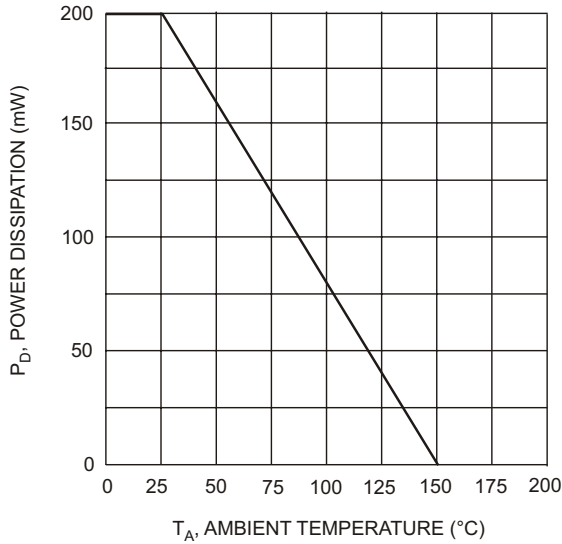


Fig. 1, Max Power Dissipation vs Ambient Temperature

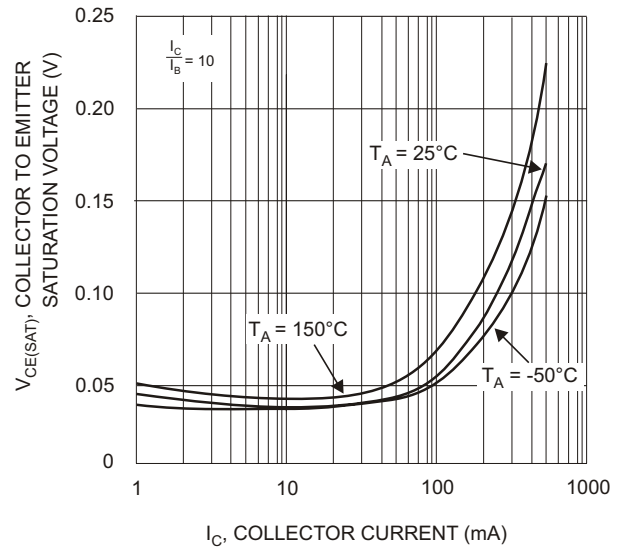


Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current

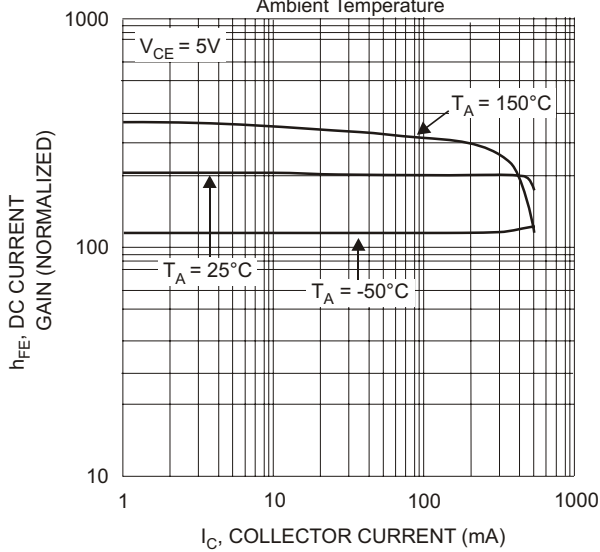


Fig. 3, DC Current Gain vs Collector Current

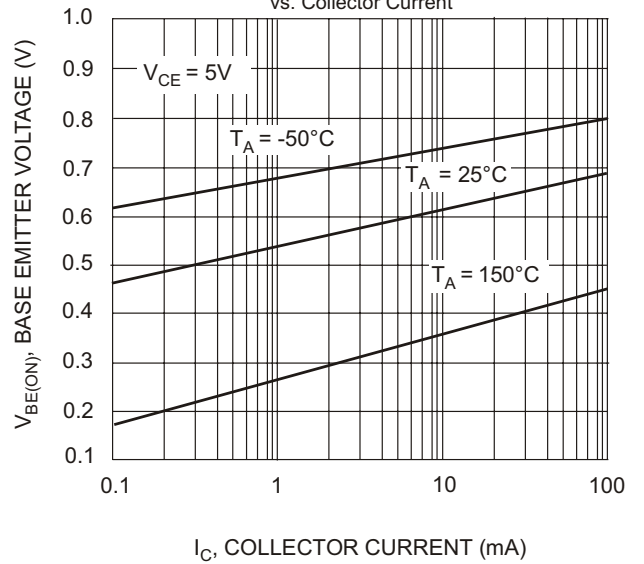


Fig. 4, Base Emitter Voltage vs. Collector Current

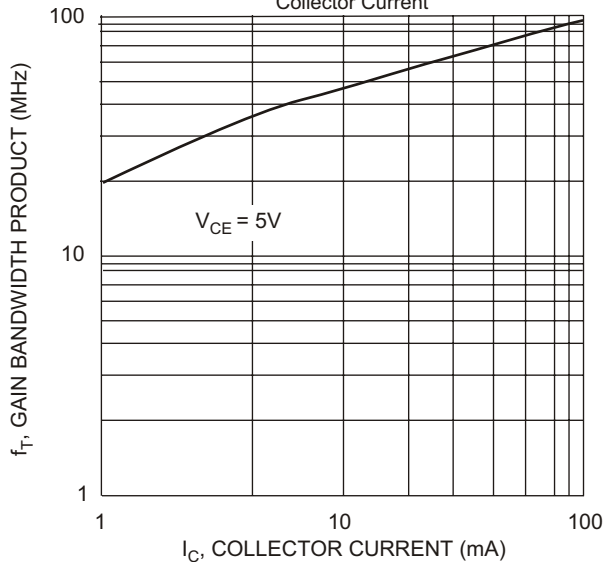


Fig. 5 Gain Bandwidth Product vs. Collector Current