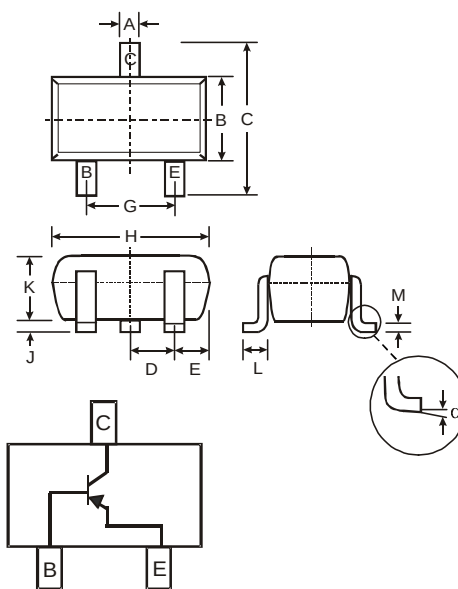


## Features

- 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 |
| $\alpha$             | 0°           | 8°   |
| All Dimensions in mm |              |      |

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

| Characteristic                                   | Symbol                            | MMSTA55     | MMSTA56 | Unit |
|--------------------------------------------------|-----------------------------------|-------------|---------|------|
| Collector-Base Voltage                           | V <sub>CBO</sub>                  | -60         | -80     | V    |
| Collector-Emitter Voltage                        | V <sub>CEO</sub>                  | -60         | -80     | V    |
| Emitter-Base Voltage                             | V <sub>EBO</sub>                  | -4.0        |         | V    |
| Collector Current - Continuous (Note 1)          | I <sub>C</sub>                    | -500        |         | 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   |

- 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](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<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     | MMSTA55<br>MMSTA56 | V <sub>(BR)CBO</sub> | -60<br>-80 | —     | V    | I <sub>C</sub> = -100μA, I <sub>E</sub> = 0                                                         |
| Collector-Emitter Breakdown Voltage  | MMSTA55<br>MMSTA56 | V <sub>(BR)CEO</sub> | -60<br>-80 | —     | 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> = -100μA, I <sub>C</sub> = 0                                                         |
| Collector Cutoff Current             | MMSTA55<br>MMSTA56 | I <sub>CBO</sub>     | —          | -100  | nA   | V <sub>CB</sub> = -60V, I <sub>E</sub> = 0<br>V <sub>CB</sub> = -80V, I <sub>E</sub> = 0            |
| Collector Cutoff Current             | MMSTA55<br>MMSTA56 | I <sub>CEx</sub>     | —          | -100  | nA   | V <sub>CE</sub> = -60V, I <sub>BO</sub> = 0V<br>V <sub>CE</sub> = -80V, I <sub>BO</sub> = 0V        |
| <b>ON CHARACTERISTICS (Note 5)</b>   |                    |                      |            |       |      |                                                                                                     |
| DC Current Gain                      |                    | h <sub>FE</sub>      | 100        | —     | —    | I <sub>C</sub> = -10mA, V <sub>CE</sub> = -1.0V<br>I <sub>C</sub> = -100mA, V <sub>CE</sub> = -1.0V |
| Collector-Emitter Saturation Voltage |                    | V <sub>CE(SAT)</sub> | —          | -0.25 | V    | I <sub>C</sub> = -100mA, I <sub>B</sub> = -10mA                                                     |
| Base-Emitter Saturation Voltage      |                    | V <sub>BE(SAT)</sub> | —          | -1.2  | V    | I <sub>C</sub> = -100mA, V <sub>CE</sub> = -1.0V                                                    |
| <b>SMALL SIGNAL CHARACTERISTICS</b>  |                    |                      |            |       |      |                                                                                                     |
| Current Gain-Bandwidth Product       |                    | f <sub>T</sub>       | 50         | —     | MHz  | V <sub>CE</sub> = -1.0V, I <sub>C</sub> = -100mA,<br>f = 100MHz                                     |

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

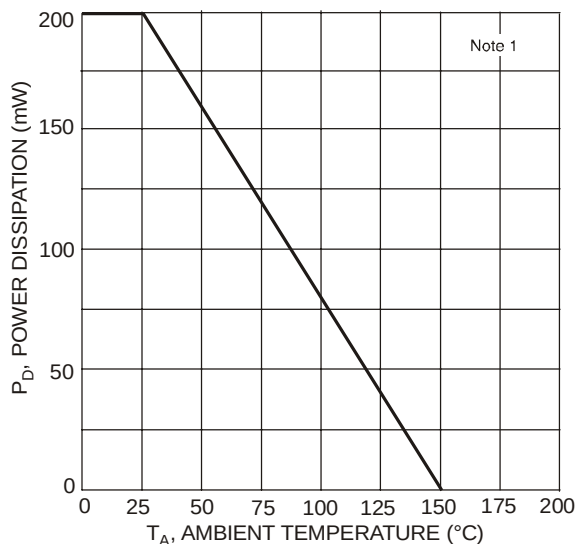


Fig. 1, Max Power Dissipation vs. Ambient Temperature

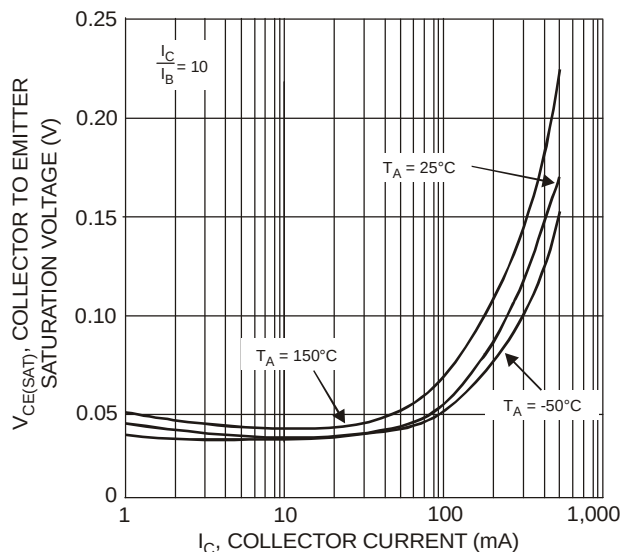


Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current

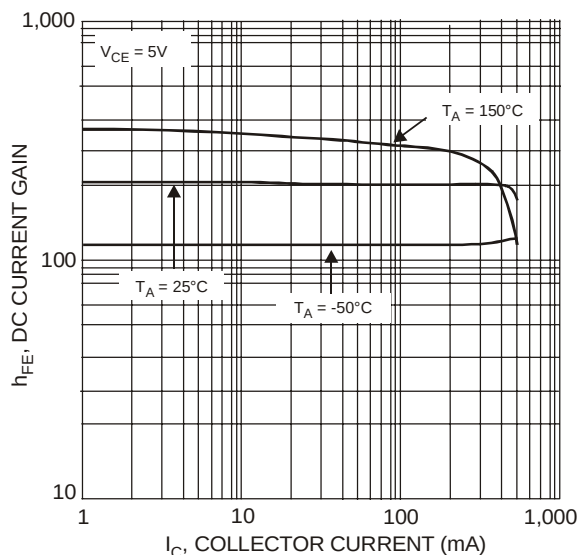


Fig. 3, DC Current Gain vs. Collector Current

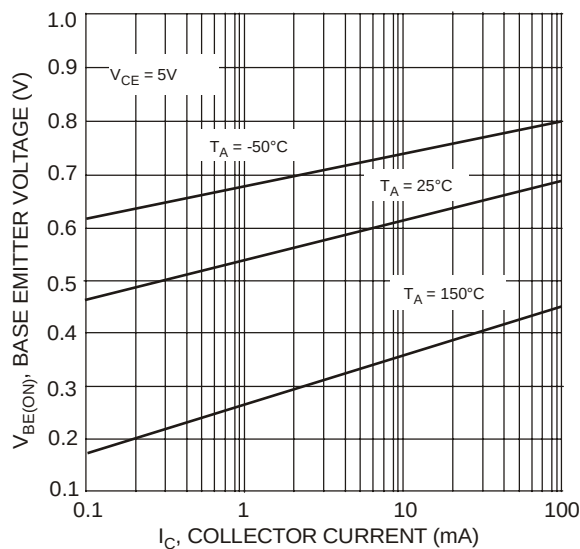
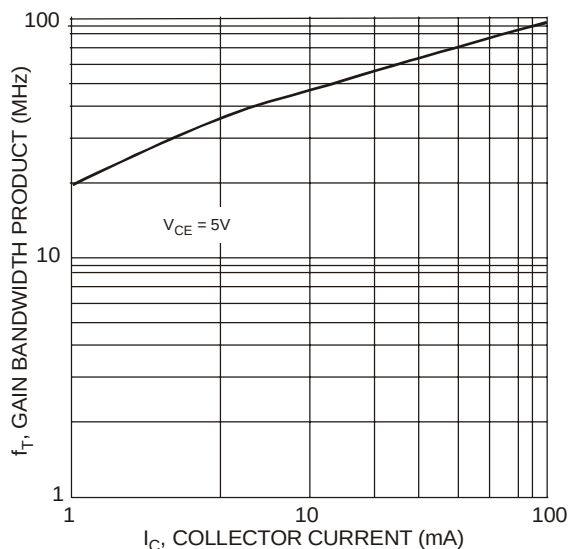


Fig. 4 Base Emitter Voltage vs. Collector Current

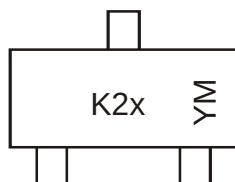


## Ordering Information (Notes 4 and 6)

| 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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- Поставка сложных, дефицитных, либо снятых с производства позиций;
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- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.