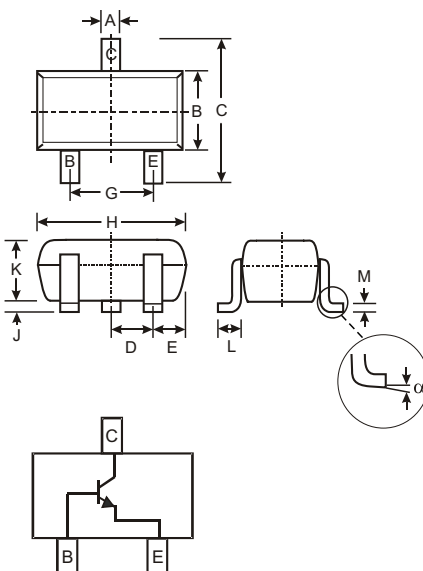


### Features

- Epitaxial Planar Die Construction
- Complementary PNP Type Available (MMSTA92)
- Ideal for Medium Power Amplification and Switching
- Ultra-Small Surface Mount Package

### 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
- Terminal Connections: See Diagram
- Marking (See Page 2): K3M
- 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 |
| $\alpha$             | 0°           | 8°   |
| All Dimensions in mm |              |      |

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

| Characteristic                                   | Symbol          | MMSTA42     | Unit               |
|--------------------------------------------------|-----------------|-------------|--------------------|
| Collector-Base Voltage                           | $V_{CBO}$       | 300         | V                  |
| Collector-Emitter Voltage                        | $V_{CEO}$       | 300         | V                  |
| Emitter-Base Voltage                             | $V_{EBO}$       | 6.0         | V                  |
| Collector Current (Note 1)                       | $I_C$           | 200         | 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 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>.

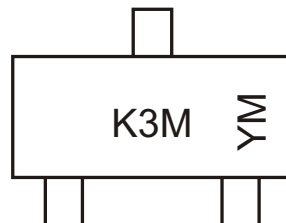
**Electrical Characteristics** @  $T_A = 25^\circ\text{C}$  unless otherwise specified

| Characteristic                       | Symbol        | Min            | Max | Unit | Test Condition                                                                                                                             |
|--------------------------------------|---------------|----------------|-----|------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS (Note 2)</b>  |               |                |     |      |                                                                                                                                            |
| Collector-Base Breakdown Voltage     | $V_{(BR)CBO}$ | 300            | —   | V    | $I_C = 100\mu\text{A}$ , $I_E = 0$                                                                                                         |
| Collector-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | 300            | —   | V    | $I_C = 1.0\text{mA}$ , $I_B = 0$                                                                                                           |
| Emitter-Base Breakdown Voltage       | $V_{(BR)EBO}$ | 6.0            | —   | V    | $I_E = 100\mu\text{A}$ , $I_C = 0$                                                                                                         |
| Collector Cutoff Current             | $I_{CBO}$     | —              | 100 | nA   | $V_{CB} = 200\text{V}$ , $I_E = 0$                                                                                                         |
| Collector Cutoff Current             | $I_{EBO}$     | —              | 100 | nA   | $V_{CE} = 6.0\text{V}$ , $I_C = 0$                                                                                                         |
| <b>ON CHARACTERISTICS (Note 2)</b>   |               |                |     |      |                                                                                                                                            |
| DC Current Gain                      | $h_{FE}$      | 25<br>40<br>40 | —   | —    | $I_C = 1.0\text{mA}$ , $V_{CE} = 10\text{V}$<br>$I_C = 10\text{mA}$ , $V_{CE} = 10\text{V}$<br>$I_C = 30\text{mA}$ , $V_{CE} = 10\text{V}$ |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | —              | 0.5 | V    | $I_C = 20\text{mA}$ , $I_B = 2.0\text{mA}$                                                                                                 |
| Base- Emitter Saturation Voltage     | $V_{BE(SAT)}$ | —              | 0.9 | V    | $I_C = 20\text{mA}$ , $I_B = 2.0\text{mA}$                                                                                                 |
| <b>SMALL SIGNAL CHARACTERISTICS</b>  |               |                |     |      |                                                                                                                                            |
| Output Capacitance                   | $C_{cb}$      | —              | 3.0 | pF   | $V_{CB} = 20\text{V}$ , $f = 1.0\text{MHz}$ , $I_E = 0$                                                                                    |
| Current Gain-Bandwidth Product       | $f_T$         | 50             | —   | MHz  | $V_{CE} = 20\text{V}$ , $I_C = 10\text{mA}$ ,<br>$f = 100\text{MHz}$                                                                       |

**Ordering Information** (Note 3)

| Device    | Packaging | Shipping         |
|-----------|-----------|------------------|
| MMSTA42-7 | SOT-323   | 3000/Tape & Reel |

- Notes: 2. Short duration test pulse used to minimize self-heating effect.  
 3. 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: 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    |