

## Features

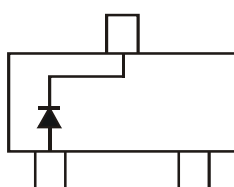
- Low Forward Voltage Drop
- Fast Switching
- PN Junction Guard Ring for Transient and ESD Protection
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

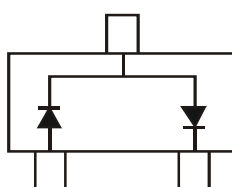
- Case: SOT23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Solderable per MIL-STD-202, Method 208 **(e3)**
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Polarity: See Diagrams Below
- Weight: 0.008 grams (approximate)



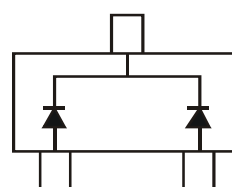
Top View



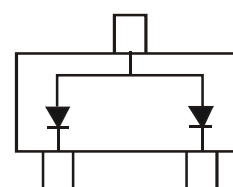
BAS40



BAS40-04



BAS40-05



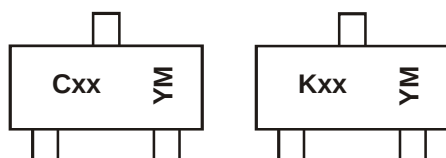
BAS40-06

## Ordering Information (Note 4 & 5)

| Part Number  | Case  | Packaging        |
|--------------|-------|------------------|
| BAS40-7-F    | SOT23 | 3000/Tape & Reel |
| BAS40-04-7-F | SOT23 | 3000/Tape & Reel |
| BAS40-05-7-F | SOT23 | 3000/Tape & Reel |
| BAS40-06-7-F | SOT23 | 3000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See <http://www.diodes.com> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.
  5. Product manufactured with Date Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb<sub>2</sub>O<sub>3</sub> Fire Retardants.

## Marking Information



K=(SAT,Shanghai Assembly / test site)  
 C=(CAT / DTC , ChengDu Assembly / test site)  
 xx = Product Type Marking Code:  
   43 = BAS40  
   44 = BAS40-04  
   45 = BAS40-05  
   46 = BAS40-06  
 YM = Date Code Marking  
 Y = Year (ex: T = 2006)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year  | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code  | K    | L    | M    | N    | P    | R    | S    | T    | U    | V    | W    | X    | Y    | Z    | A    | B    | C    |
| 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    |      |      |      |      |      |

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                                                         | Symbol                                                 | Value | Unit |
|----------------------------------------------------------------------------------------|--------------------------------------------------------|-------|------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | V <sub>RRM</sub><br>V <sub>RWM</sub><br>V <sub>R</sub> | 40    | V    |
| Forward Continuous Current (Note 6)                                                    | I <sub>FM</sub>                                        | 200   | mA   |
| Forward Surge Current (Note 6) @ t < 1.0s                                              | I <sub>FSM</sub>                                       | 600   | mA   |

**Thermal Characteristics**

| Characteristic                                       | Symbol           | Value       | Unit |
|------------------------------------------------------|------------------|-------------|------|
| Power Dissipation (Note 6)                           | P <sub>D</sub>   | 350         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 6) | R <sub>θJA</sub> | 357         | °C/W |
| Operating Temperature Range                          | T <sub>J</sub>   | -55 to +125 | °C   |
| Storage Temperature Range                            | T <sub>STG</sub> | -65 to +150 | °C   |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                     | Symbol             | Min | Typ | Max         | Unit | Test Condition                                                                                  |
|------------------------------------|--------------------|-----|-----|-------------|------|-------------------------------------------------------------------------------------------------|
| Reverse Breakdown Voltage (Note 7) | V <sub>(BR)R</sub> | 40  | —   | —           | V    | I <sub>R</sub> = 10μA                                                                           |
| Forward Voltage                    | V <sub>F</sub>     | —   | —   | 380<br>1000 | mV   | t <sub>p</sub> < 300μs, I <sub>F</sub> = 1.0mA<br>t <sub>p</sub> < 300μs, I <sub>F</sub> = 40mA |
| Reverse Leakage Current (Note 7)   | I <sub>R</sub>     | —   | 20  | 200         | nA   | t <sub>p</sub> < 300μs, V <sub>R</sub> = 30V                                                    |
| Total Capacitance                  | C <sub>T</sub>     | —   | 4.0 | 5.0         | pF   | V <sub>R</sub> = 0V, f = 1.0MHz                                                                 |
| Reverse Recovery Time              | t <sub>rr</sub>    | —   | —   | 5.0         | ns   | I <sub>F</sub> = I <sub>R</sub> = 10mA to I <sub>R</sub> = 1.0mA,<br>R <sub>L</sub> = 100Ω      |

Notes: 6. Part mounted on FR-4 board with recommended pad layout, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.  
 7. Short duration pulse test used to minimize self-heating effect.

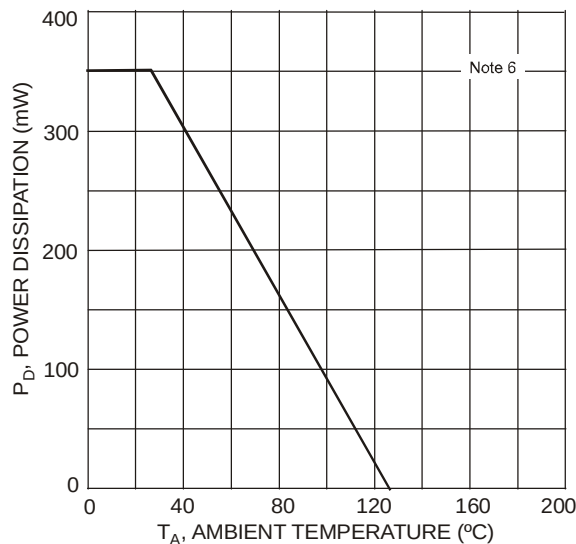


Figure 1 Power Derating Curve, Total Package

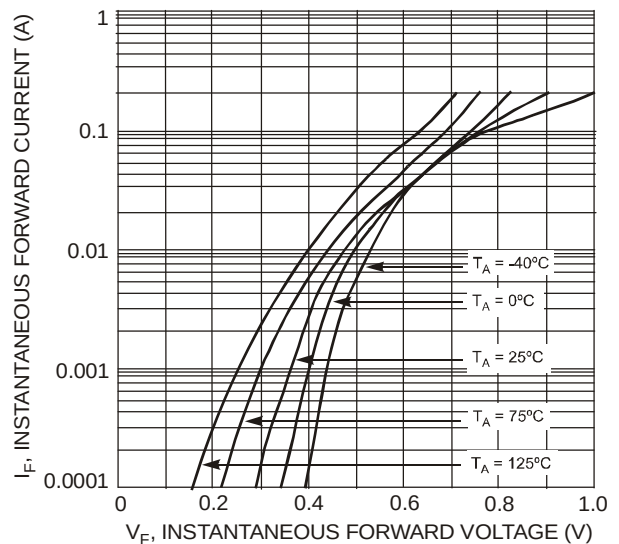


Figure 2 Typical Forward Characteristics

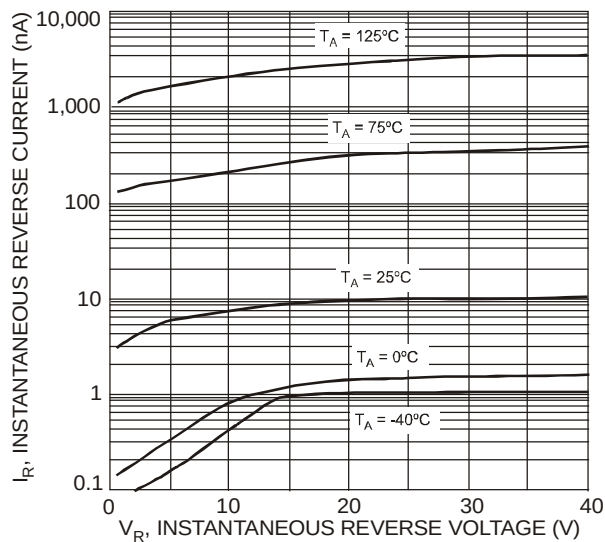


Figure 3 Typical Reverse Characteristics

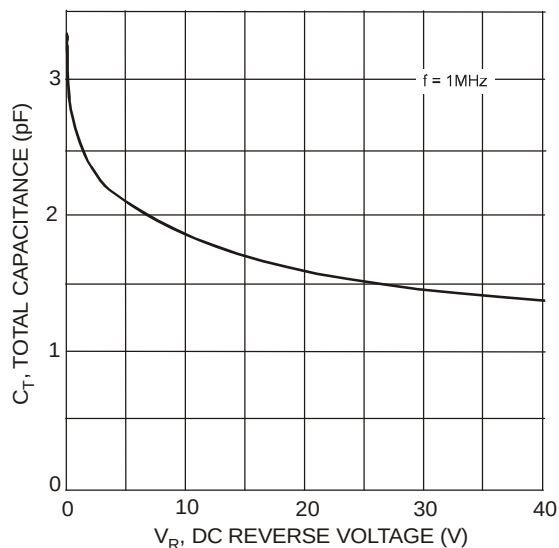
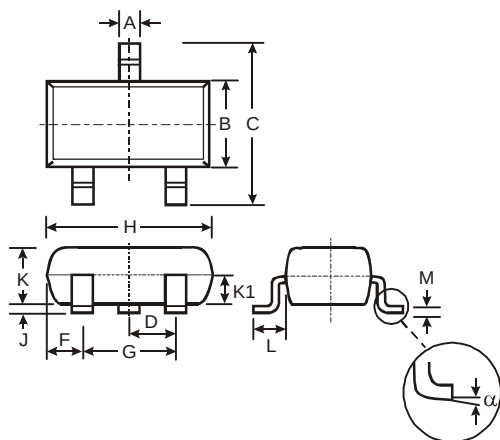


Figure 4 Total Capacitance vs. Reverse Voltage

## Package Outline Dimensions

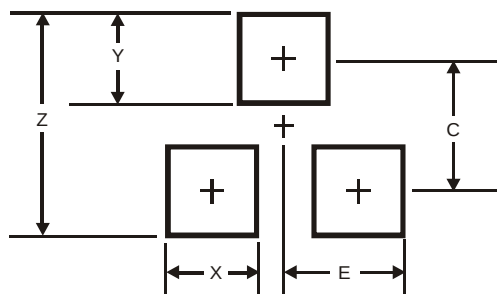
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| SOT23                |       |      |       |
|----------------------|-------|------|-------|
| Dim                  | Min   | Max  | Typ   |
| A                    | 0.37  | 0.51 | 0.40  |
| B                    | 1.20  | 1.40 | 1.30  |
| C                    | 2.30  | 2.50 | 2.40  |
| D                    | 0.89  | 1.03 | 0.915 |
| F                    | 0.45  | 0.60 | 0.535 |
| G                    | 1.78  | 2.05 | 1.83  |
| H                    | 2.80  | 3.00 | 2.90  |
| J                    | 0.013 | 0.10 | 0.05  |
| K                    | 0.903 | 1.10 | 1.00  |
| K1                   | -     | -    | 0.400 |
| L                    | 0.45  | 0.61 | 0.55  |
| M                    | 0.085 | 0.18 | 0.11  |
| $\alpha$             | 0°    | 8°   | -     |
| All Dimensions in mm |       |      |       |

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.9           |
| X          | 0.8           |
| Y          | 0.9           |
| C          | 2.0           |
| E          | 1.35          |

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