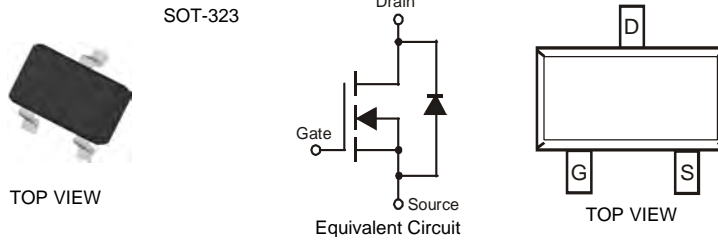


Features

- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- High Drain-Source Voltage Rating
- **Lead Free/RoHS Compliant (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **"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).
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.006 grams (approximate)



Maximum Ratings @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Units |
|---|------------------|-------|-------|
| Drain-Source Voltage | V _{DSS} | 100 | V |
| Drain-Gate Voltage R _{GS} ≤ 20KΩ | V _{DGR} | 100 | V |
| Gate-Source Voltage | V _{GSS} | ±20 | V |
| Drain Current (Note 1) | I _D | 170 | mA |
| | I _{DM} | 680 | |

Thermal Characteristics @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Units |
|--|-----------------------------------|-------------|-------|
| Total 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 _j , T _{STG} | -55 to +150 | °C |

- Notes:
1. 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>.
 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 | Typ | Max | Unit | Test Condition |
|-------------------------------------|---------------------|-----|------|-----------|----------|---|
| OFF CHARACTERISTICS (Note 5) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 100 | — | — | V | V _{GS} = 0V, I _D = 250μA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 1.0 10 | μA nA | V _{DS} = 100V, V _{GS} = 0V V _{DS} = 20V, V _{GS} = 0V |
| Gate-Body Leakage, Forward | I _{GSSF} | — | — | 50 | nA | V _{GS} = 20V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 5) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | 0.8 | 1.4 | 2.0 | V | V _{DS} = V _{GS} , I _D = 1mA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | — | 6.0 10 | Ω | V _{GS} = 10V, I _D = 0.17A V _{GS} = 4.5V, I _D = 0.17A |
| Forward Transconductance | g _{FS} | 80 | 370 | — | mS | V _{DS} = 10V, I _D = 0.17A, f = 1.0KHz |
| Drain-Source Diode Forward Voltage | V _{SD} | — | 0.84 | 1.3 | V | V _{GS} = 0V, I _S = 0.34A |
| DYNAMIC CHARACTERISTICS | | | | | | |
| Input Capacitance | C _{iSS} | — | 29 | 60 | pF | V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oSS} | — | 10 | 15 | pF | |
| Reverse Transfer Capacitance | C _{rSS} | — | 2 | 6 | pF | |
| SWITCHING CHARACTERISTICS | | | | | | |
| Turn-On Rise Time | t _r | — | — | 8 | ns | V _{DD} = 30V, I _D = 0.28A, R _{GEN} = 50Ω, V _{GS} = 10V |
| Turn-Off Fall Time | t _f | — | — | 16 | ns | |
| Turn-On Delay Time | t _{D(ON)} | — | — | 8 | ns | |
| Turn-Off Delay Time | t _{D(OFF)} | — | — | 13 | ns | |

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

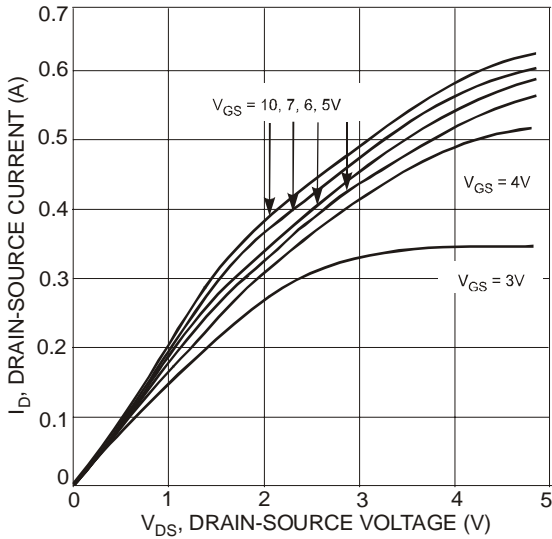


Fig. 1 On-Region Characteristics

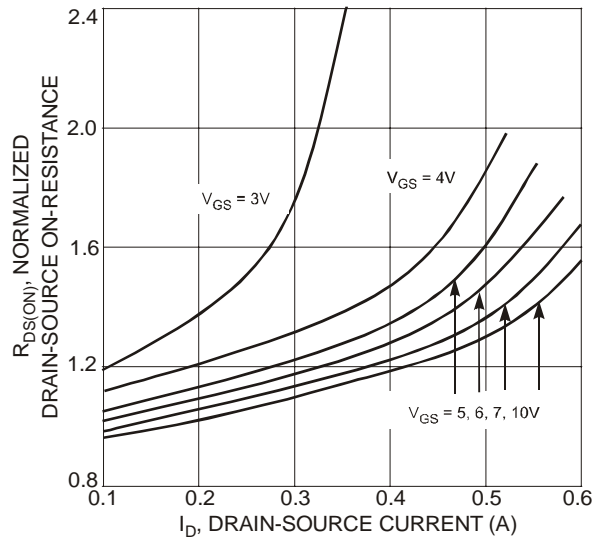


Fig. 2 On-Resistance Variation with Gate Voltage and Drain-Source Current

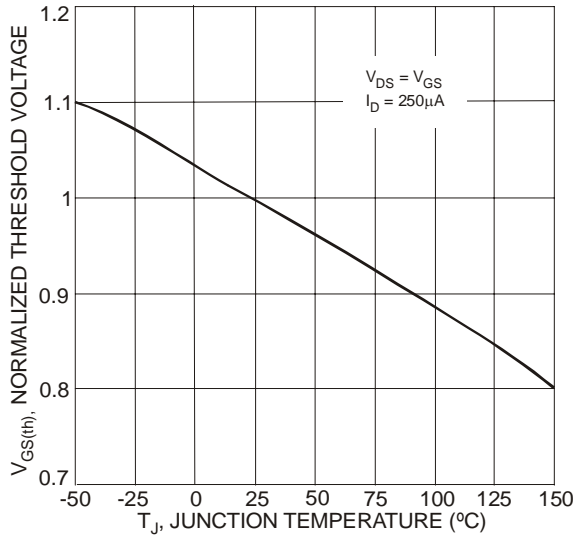


Fig. 3 Gate Threshold Variation with Temperature

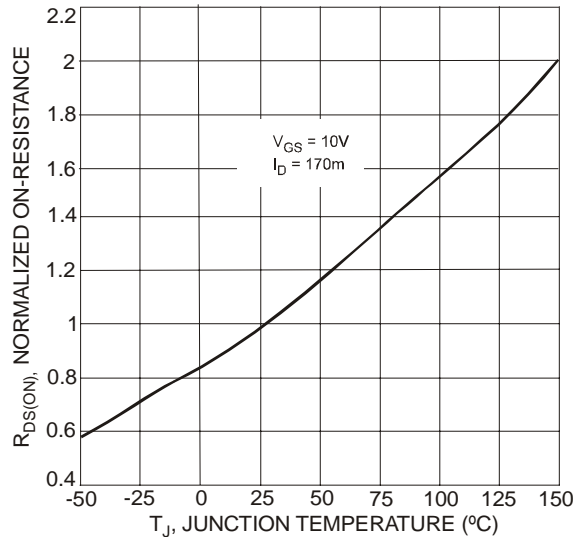


Fig. 4 On-Resistance Variation with Temperature

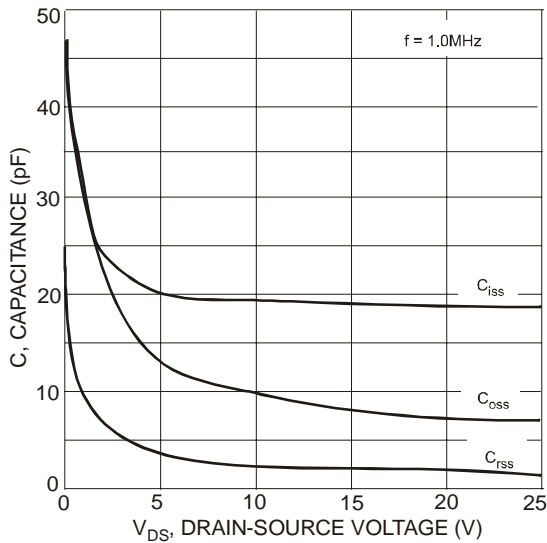


Fig. 5 Typical Capacitance

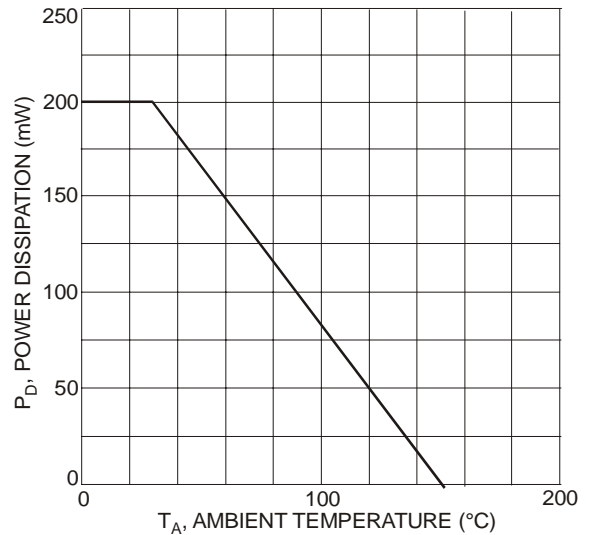


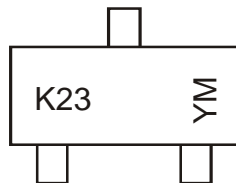
Fig. 6 Power Derating Curve, Total Package

Ordering Information (Notes 4 & 6)

| Part Number | Case | Packaging |
|-------------|---------|------------------|
| BSS123W-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



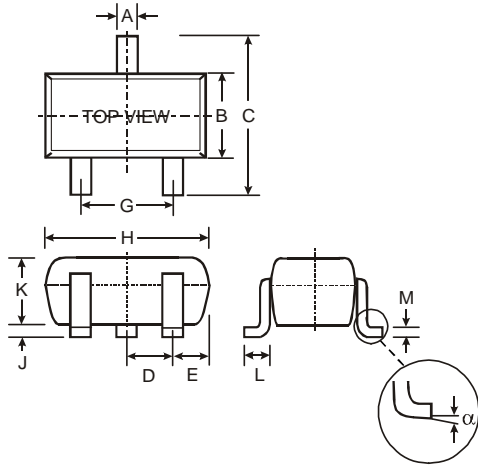
K23 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year ex: N = 2002
 M = Month ex: 9 = September

Date Code Key

| Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | N | P | R | S | T | U | V | W | X | Y | Z |

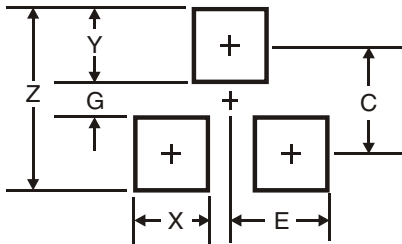
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

Package Outline Dimensions



| SOT-323 | | |
|----------------------|--------------|------|
| Dim | Min | Max |
| A | 0.25 | 0.25 |
| B | 1.15 | 1.35 |
| C | 2.00 | 2.00 |
| 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 | | |

Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z | 2.8 |
| G | 1.0 |
| X | 0.7 |
| Y | 0.9 |
| C | 1.9 |
| E | 0.65 |

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