

Features

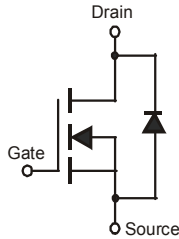
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

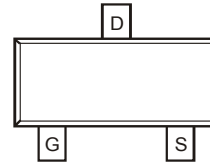
- Case: SOT-23
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish — Matte Tin annealed over Copper leadframe.
Solderable per MIL-STD-202, Method 208
- Terminals Connections: See Diagram Below
- Weight: 0.008 grams (approximate)



TOP VIEW



Internal Schematic



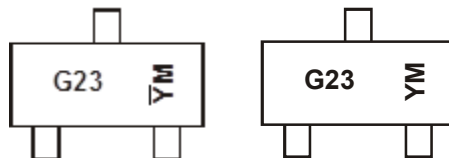
TOP VIEW

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|-------------|--------|------------------|
| DMG2302U-7 | SOT-23 | 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/quality/lead_free.html 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/products/packages.html>

Marking Information



G23 = Product Type Marking Code

YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)

YM = Date Code Marking for CAT (Chengdu Assembly/ Test site)

Y or Y = Year (ex: A = 2013)

M = Month (ex: 9 = September)

Date Code Key

| Year | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|------|------|------|------|------|------|------|------|
| Code | 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_A = +25°C unless otherwise specified

| Characteristic | | | Symbol | Value | Units |
|-----------------------------------|--------------|------------------------|------------------|-------|-------|
| Drain-Source Voltage | | | V _{DSS} | 20 | V |
| Gate-Source Voltage | | | V _{GSS} | ±8 | V |
| Continuous Drain Current (Note 5) | Steady State | T _A = +25°C | I _D | 4.2 | A |
| | | T _A = +70°C | | 3.4 | |
| Pulsed Drain Current (Note 6) | | | I _{DM} | 27 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|------------------------|------|
| Power Dissipation (Note 5) | P _D | T _A = +25°C | 0.8 |
| | | T _A = +70°C | 0.5 |
| Thermal Resistance, Junction to Ambient @T _A = +25°C | R _{θJA} | 156 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

Notes: 5. Device mounted on FR-4 PCB, with minimum recommended pad layout.
6. Repetitive rating, pulse width limited by junction temperature.

Electrical Characteristics @T_A = +25°C unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------------|-----|-------|------|------|---|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 20 | — | — | V | V _{GS} = 0V, I _D = 10μA |
| Zero Gate Voltage Drain Current T _J = +25°C | I _{DSS} | — | — | 1.0 | μA | V _{DS} = 20V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = ±8V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | 0.4 | — | 1.0 | V | V _{DS} = V _{GS} , I _D = 50μA |
| Static Drain-Source On-Resistance | R _{DS(on)} | — | — | 90 | mΩ | V _{GS} = 4.5V, I _D = 3.6A |
| | | | | 120 | | V _{GS} = 2.5V, I _D = 3.1A |
| Forward Transfer Admittance | Y _{fs} | — | 13 | — | S | V _{DS} = 5V, I _D = 3.6A |
| Diode Forward Voltage | V _{SD} | — | 0.75 | 1.0 | V | V _{GS} = 0V, I _S = 1A |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{iss} | — | 594.3 | — | pF | V _{DS} = 10V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 64.5 | — | pF | |
| Reverse Transfer Capacitance | C _{rss} | — | 57.7 | — | pF | |
| Gate Resistance | R _g | — | 1.5 | — | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1MHz |
| Total Gate Charge | Q _g | — | 7.0 | — | nC | V _{GS} = 4.5V, V _{DS} = 10V, I _D = 3.6A |
| Gate-Source Charge | Q _{gs} | — | 0.9 | — | nC | |
| Gate-Drain Charge | Q _{gd} | — | 1.4 | — | nC | |
| Turn-On Delay Time | t _{D(on)} | — | 7.4 | — | ns | V _{DD} = 10V, V _{GS} = 4.5V, R _L = 2.78Ω, R _G = 1.0Ω |
| Turn-On Rise Time | t _r | — | 9.8 | — | ns | |
| Turn-Off Delay Time | t _{D(off)} | — | 28.1 | — | ns | |
| Turn-Off Fall Time | t _f | — | 6.7 | — | ns | |

Notes: 7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

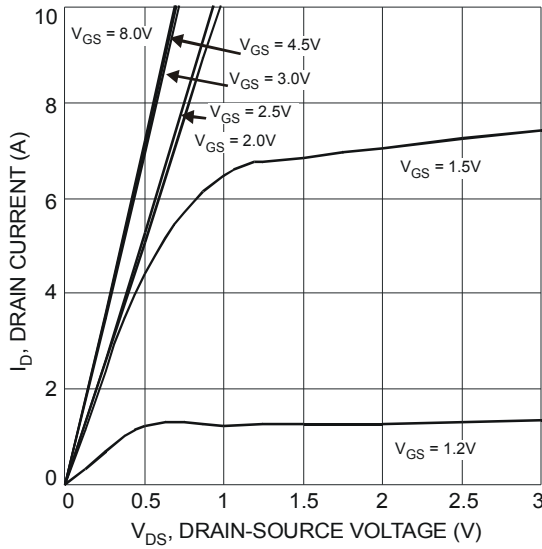


Fig. 1 Typical Output Characteristics

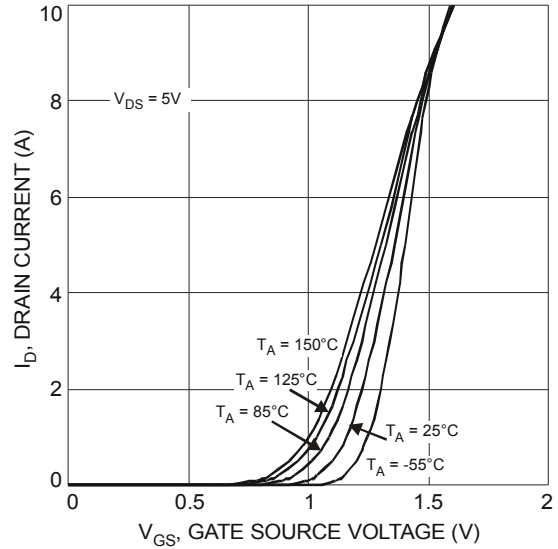


Fig. 2 Typical Transfer Characteristics

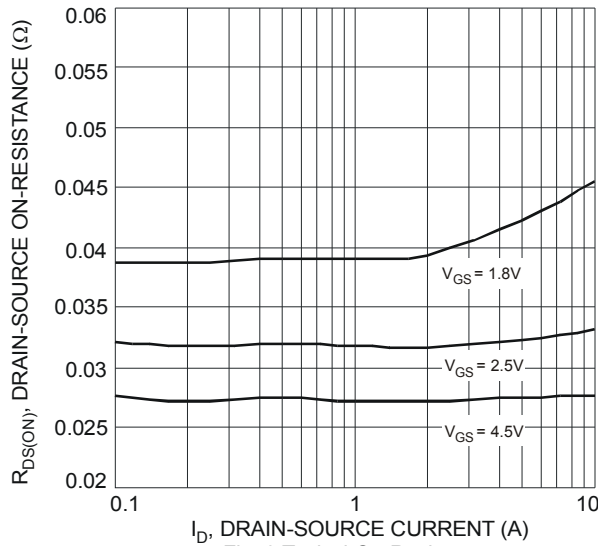


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

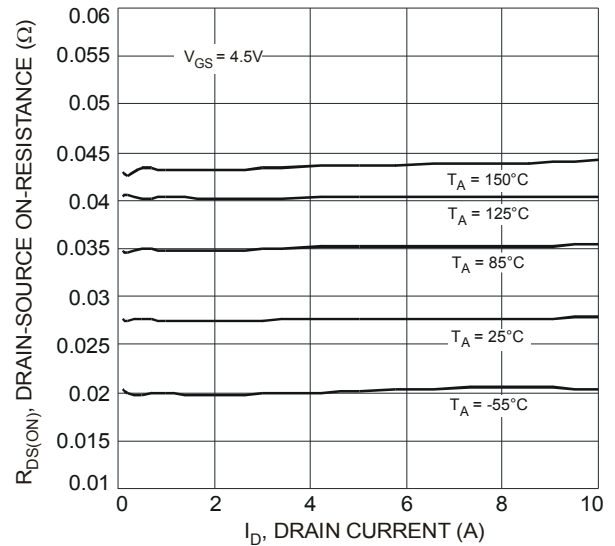


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

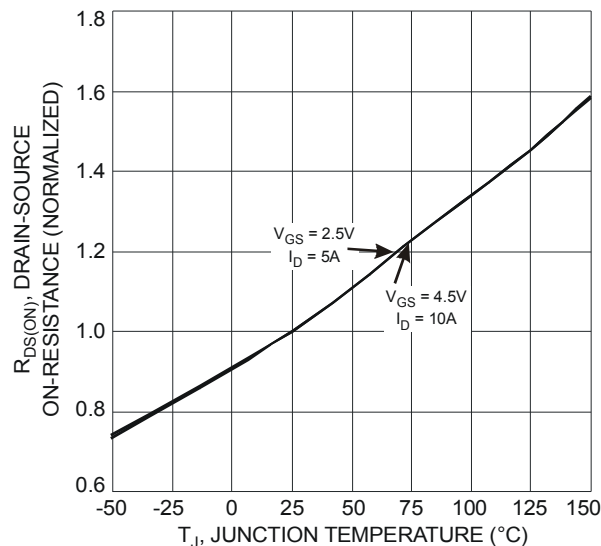


Fig. 5 On-Resistance Variation with Temperature

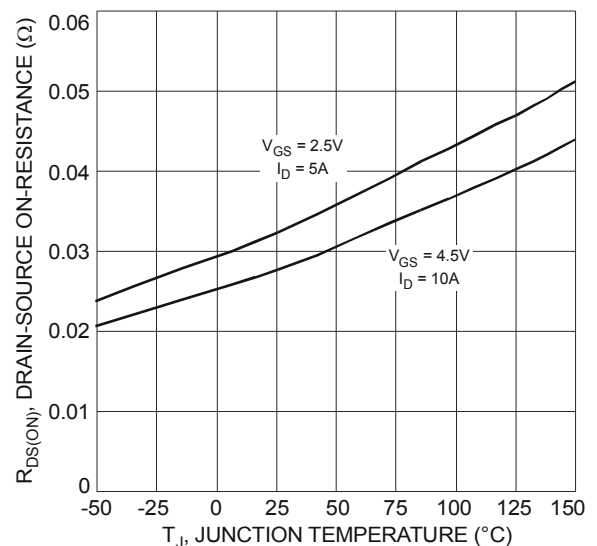


Fig. 6 On-Resistance Variation with Temperature

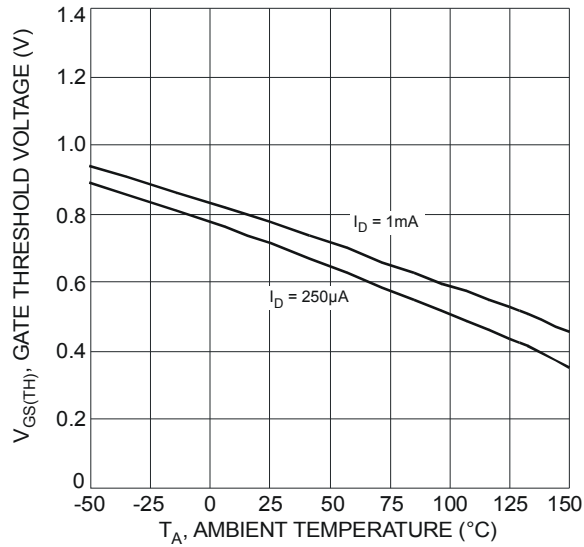


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

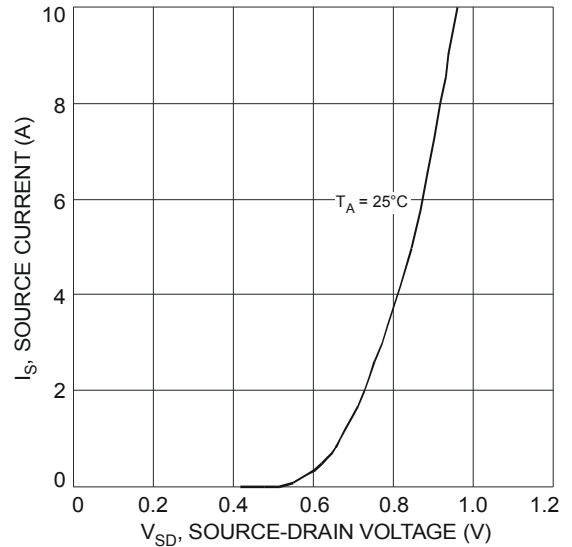


Fig. 8 Diode Forward Voltage vs. Current

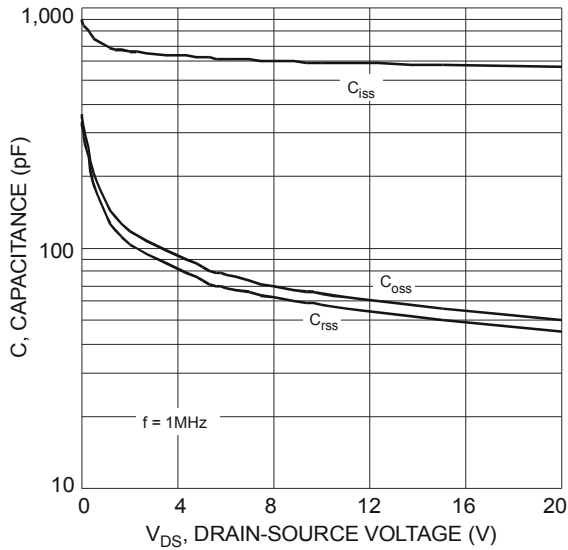


Fig. 9 Typical Capacitance

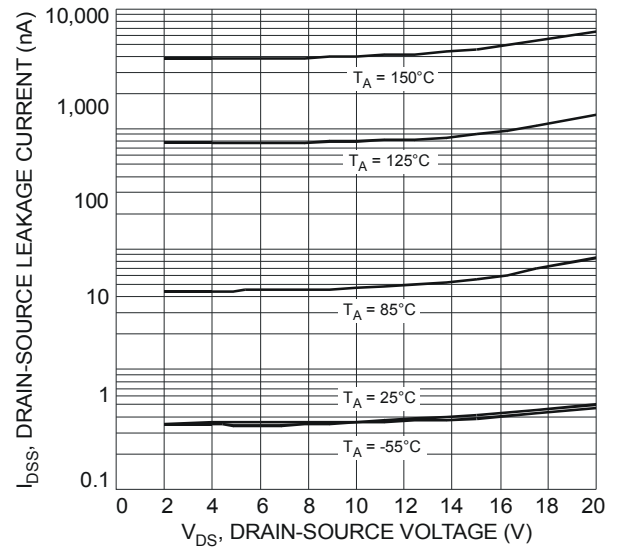


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

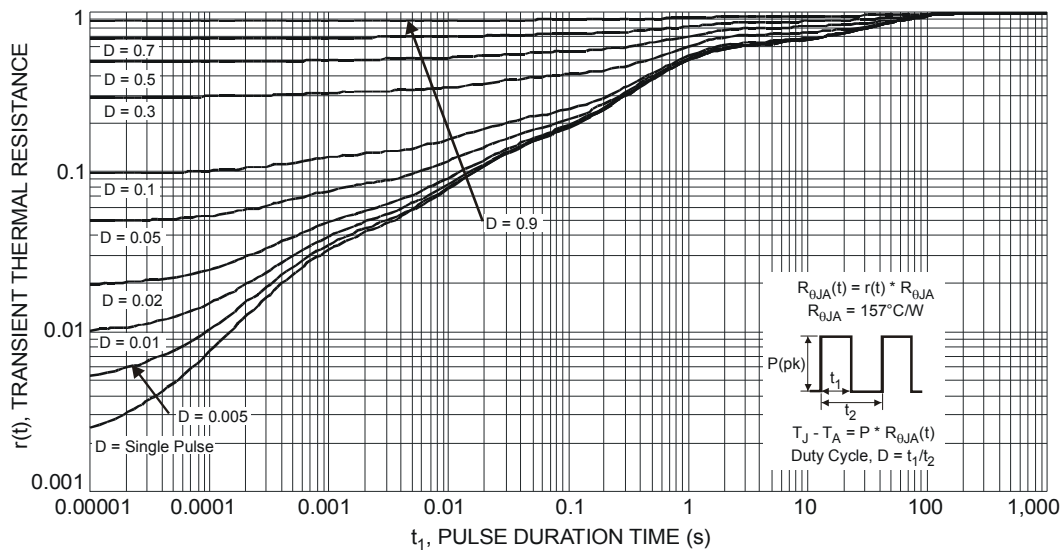
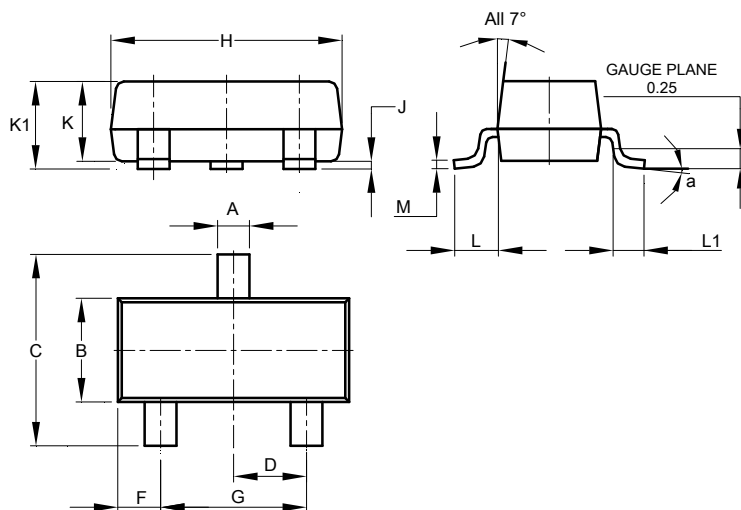


Fig. 11 Transient Thermal Response

Package Outline Dimensions

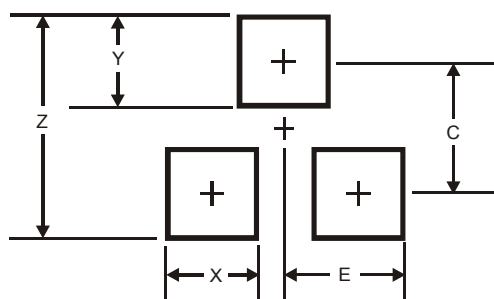
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| 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 | 0.890 | 1.00 | 0.975 |
| K1 | 0.903 | 1.10 | 1.025 |
| L | 0.45 | 0.61 | 0.55 |
| L1 | 0.25 | 0.55 | 0.40 |
| M | 0.085 | 0.150 | 0.110 |
| α | 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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