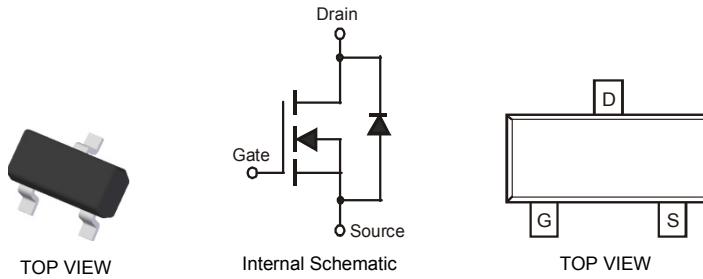


## Features

- 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)



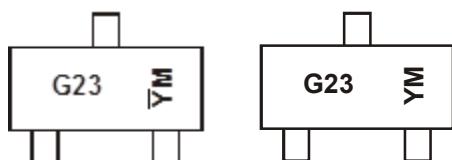
## Ordering Information (Note 4)

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](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 YM = 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** @ $T_A = +25^\circ\text{C}$  unless otherwise specified

Characteristic			Symbol	Value	Units
Drain-Source Voltage			$V_{DSS}$	20	V
Gate-Source Voltage			$V_{GSS}$	$\pm 8$	V
Continuous Drain Current (Note 5)	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	4.2 3.4	A
Pulsed Drain Current (Note 6)			$I_{DM}$	27	A

**Thermal Characteristics**

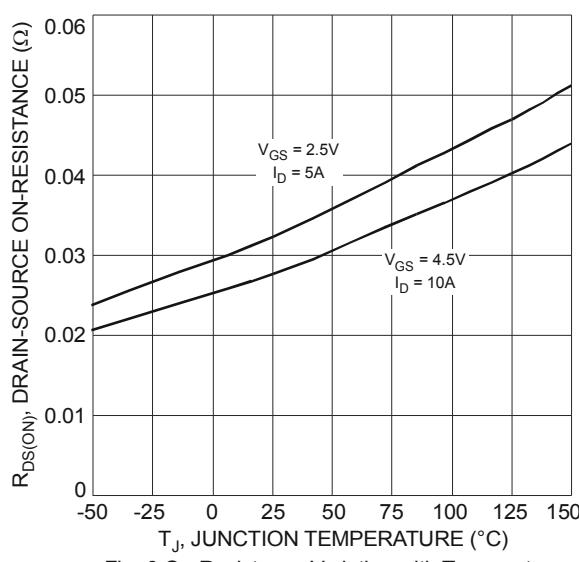
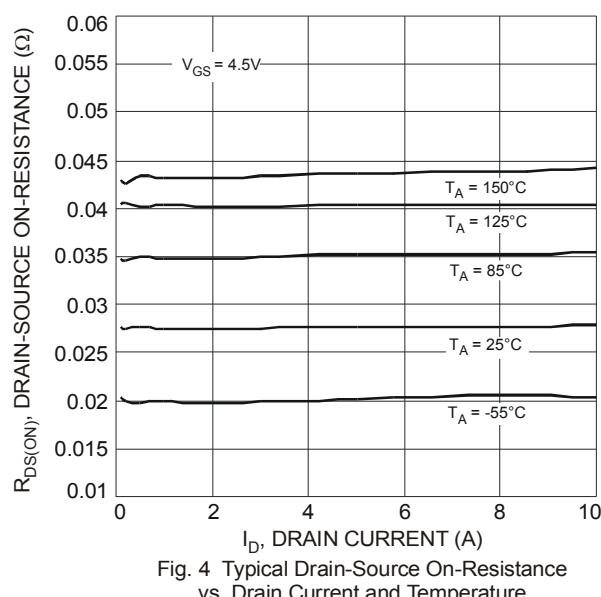
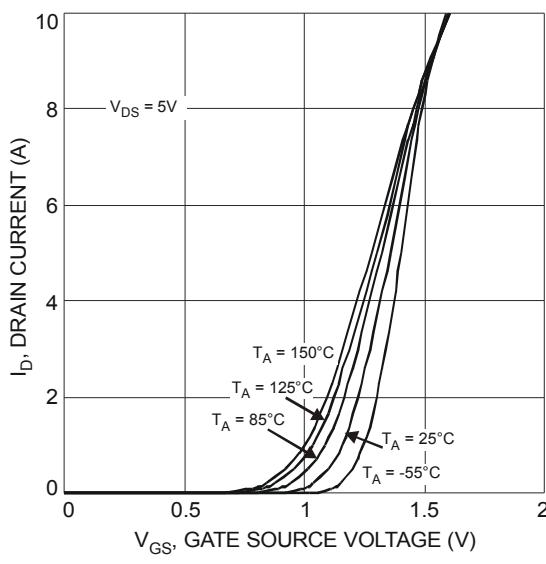
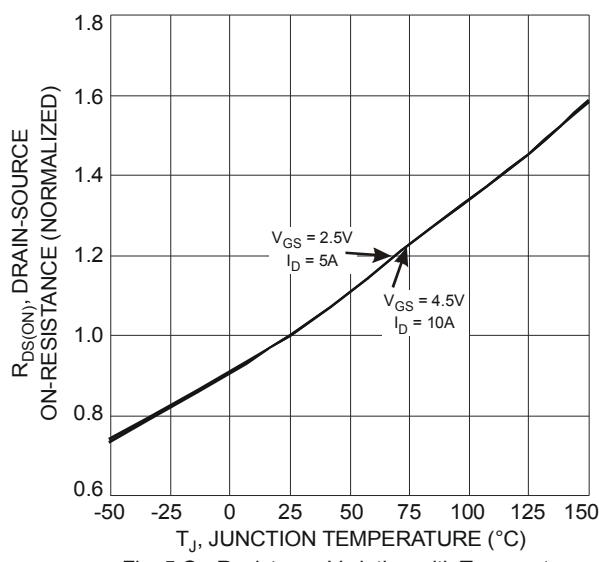
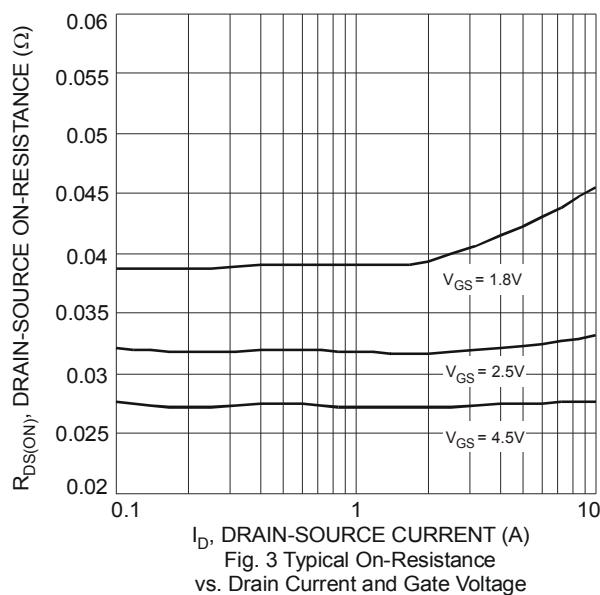
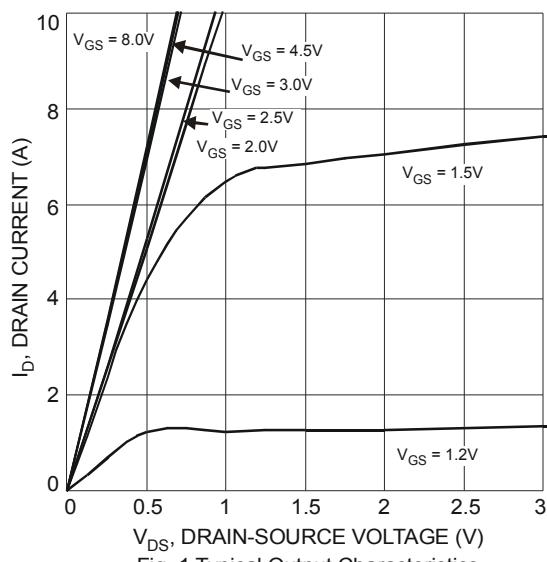
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$P_D$	0.8 0.5
Thermal Resistance, Junction to Ambient @ $T_A = +25^\circ\text{C}$	$R_{\theta JA}$	156	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C

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

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	20	—	—	V	$V_{GS} = 0\text{V}, I_D = 10\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$	$I_{DSS}$	—	—	1.0	$\mu\text{A}$	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 8\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(\text{th})}$	0.4	—	1.0	V	$V_{DS} = V_{GS}, I_D = 50\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(\text{ON})}$	—	—	90 120	$\text{m}\Omega$	$V_{GS} = 4.5\text{V}, I_D = 3.6\text{A}$ $V_{GS} = 2.5\text{V}, I_D = 3.1\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	—	13	—	S	$V_{DS} = 5\text{V}, I_D = 3.6\text{A}$
Diode Forward Voltage	$V_{SD}$	—	0.75	1.0	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	—	594.3	—	$\text{pF}$	$V_{DS} = 10\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	64.5	—	$\text{pF}$	
Reverse Transfer Capacitance	$C_{rss}$	—	57.7	—	$\text{pF}$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Gate Resistance	$R_g$	—	1.5	—	$\Omega$	
Total Gate Charge	$Q_g$	—	7.0	—	$\text{nC}$	$V_{GS} = 4.5\text{V}, V_{DS} = 10\text{V}, I_D = 3.6\text{A}$
Gate-Source Charge	$Q_{gs}$	—	0.9	—	$\text{nC}$	
Gate-Drain Charge	$Q_{gd}$	—	1.4	—	$\text{nC}$	$V_{DD} = 10\text{V}, V_{GS} = 4.5\text{V}, R_L = 2.78\Omega, R_G = 1.0\Omega$
Turn-On Delay Time	$t_{D(\text{on})}$	—	7.4	—	ns	
Turn-On Rise Time	$t_r$	—	9.8	—	ns	
Turn-Off Delay Time	$t_{D(\text{off})}$	—	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.



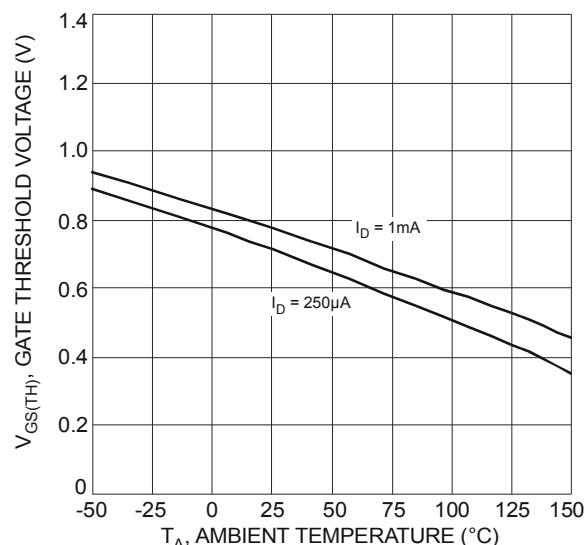


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

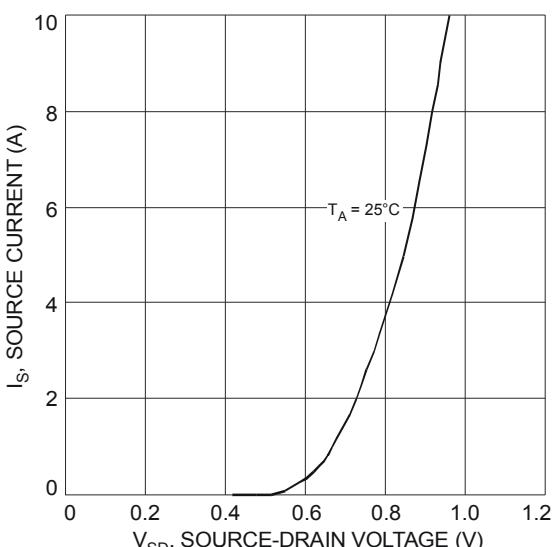


Fig. 8 Diode Forward Voltage vs. Current

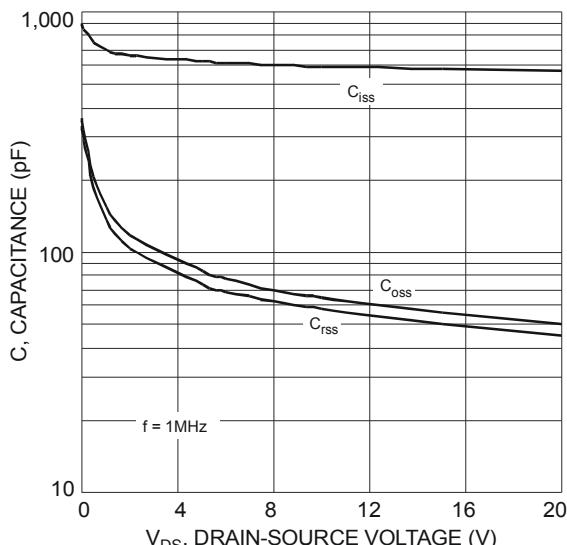


Fig. 9 Typical Capacitance

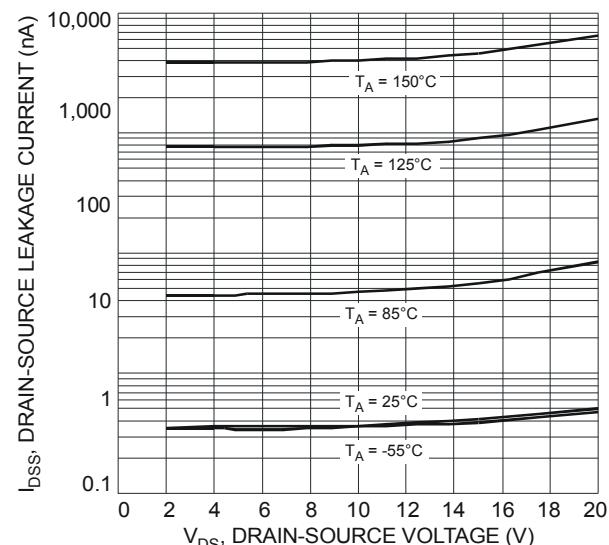


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

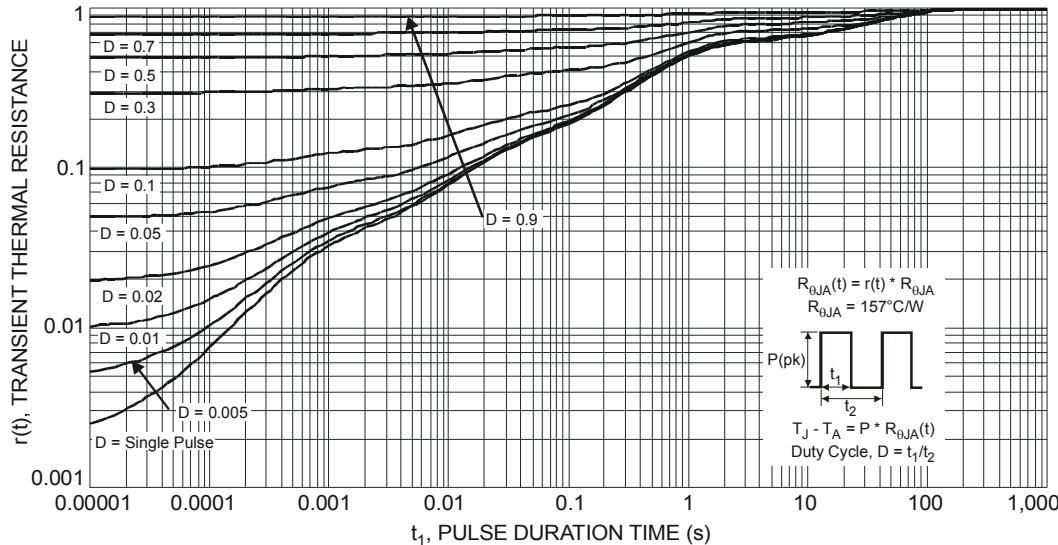
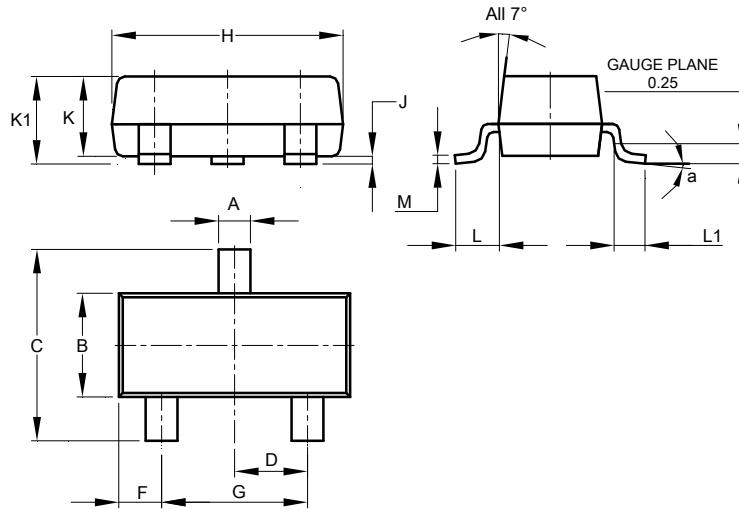


Fig. 11 Transient Thermal Response

## Package Outline Dimensions

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

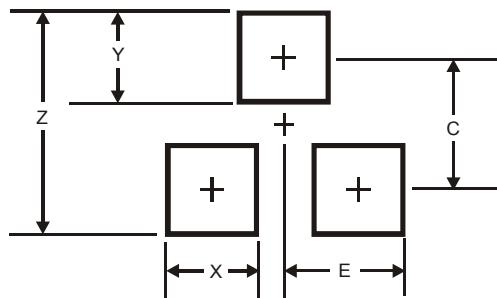


SOT23			
Dim	Min	Max	Typ
<b>A</b>	0.37	0.51	0.40
<b>B</b>	1.20	1.40	1.30
<b>C</b>	2.30	2.50	2.40
<b>D</b>	0.89	1.03	0.915
<b>F</b>	0.45	0.60	0.535
<b>G</b>	1.78	2.05	1.83
<b>H</b>	2.80	3.00	2.90
<b>J</b>	0.013	0.10	0.05
<b>K</b>	0.890	1.00	0.975
<b>K1</b>	0.903	1.10	1.025
<b>L</b>	0.45	0.61	0.55
<b>L1</b>	0.25	0.55	0.40
<b>M</b>	0.085	0.150	0.110
$\alpha$	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)
<b>Z</b>	2.9
<b>X</b>	0.8
<b>Y</b>	0.9
<b>C</b>	2.0
<b>E</b>	1.35

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