



### N-CHANNEL ENHANCEMENT MODE MOSFET

### **Product Summary**

V <sub>(BR)DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> Max T <sub>A</sub> = +25°C
001/	$25m\Omega$ @ $V_{GS} = 10V$	5.8A
30V	35mΩ @ V <sub>GS</sub> = 4.5V	4.8A

### **Description and Applications**

This MOSFET has been designed to minimize the on-state resistance (R<sub>DS(ON)</sub>) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Battery Charging
- Power Management Functions
- DC-DC Converters
- Portable Power Adaptors

## **Features and Benefits**

- 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)

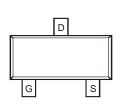
### **Mechanical Data**

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound.
  UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Annealed over Copper Leadframe.
   Solderable per MIL-STD-202, Method 208 <sup>3</sup>
- Terminals Connections: See Diagram Below
- Weight: 0.008 grams (Approximate)

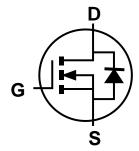
SOT23



Top View



Top View Pin Configuration



**Equivalent Circuit** 

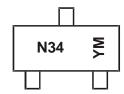
### Ordering Information (Note 4)

Part Number	Case	Packaging
DMG3404L-7	SOT23	3000/Tape & Reel
DMG3404L-13	SOT23	10000/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**



N34 = Product Type Marking Code YM = Date Code Marking Y or  $\overline{Y}$  = Year (ex: C = 2015) M = Month (ex: 9 = September)

Date Code Key

	Year	2012	2	2013	2014	:	2015	2016		2017	2018		2019
	Code	Z		Α	В		С	D		Е	F		G
Ī	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Code	4	0	0	4	_	0	7	_	0		N.I.	7



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

Characteristic		Symbol	Value	Unit	
Drain-Source Voltage	$V_{DSS}$	30	V		
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = 10V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	l <sub>D</sub>	4.2 3.5	Α
Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I <sub>D</sub>	5.8 4.9	Α
Pulsed Drain Current (Pulse Width ≤10µS, Duty	Cycle ≤1%)	I <sub>DM</sub>	30	А	

## **Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	$P_{D}$	0.78	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>0JA</sub>	164	°C/W
Power Dissipation (Note 6)	$P_{D}$	1.33	W
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>0JA</sub>	96	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

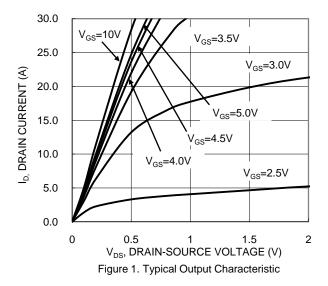
## **Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)	-					
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	_	_	1.0	μΑ	$V_{DS} = 30V, V_{GS} = 0V$
Gate-Source Leakage	I <sub>GSS</sub>	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.0	1.5	2.0	V	$V_{DS} = V_{GS}$ , $I_D = 250\mu A$
Static Drain-Source On-Resistance	Р	_	21	25	mΩ	$V_{GS} = 10V, I_D = 5.8A$
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	_	24	35	11177	$V_{GS} = 4.5V, I_D = 4.8A$
Diode Forward Voltage	$V_{SD}$	_	0.75	1.0	V	$V_{GS} = 0V, I_{S} = 1A$
DYNAMIC CHARACTERISTICS (Note 8)			•			•
Input Capacitance	C <sub>iss</sub>	_	641	_	рF	451/11/
Output Capacitance	Coss	_	66	_	pF	$V_{DS} = 15V, V_{GS} = 0V,$ f = 1.0MHz
Reverse Transfer Capacitance	Crss	_	51	_	pF	1 = 1.0101112
Gate Resistance	$R_g$	_	2.2	_	Ω	$V_{DS} = 0V$ , $V_{GS} = 0V$ , $f = 1MHz$
Total Gate Charge	Qq	_	13.2	_	nC	
Gate-Source Charge	Qgs	_	1.7	_	nC	$V_{GS} = 10V, V_{DS} = 15V, I_{D} = 5.8A$
Gate-Drain Charge	Q <sub>qd</sub>	_	2.2	_	nC	
Turn-On Delay Time	t <sub>D(ON)</sub>	_	3.3	_	ns	
Turn-On Rise Time	t <sub>R</sub>	_	4.4	_	ns	$V_{DD} = 15V, V_{GS} = 10V,$
Turn-Off Delay Time	t <sub>D(OFF)</sub>	_	22	_	ns	$R_L = 1.25\Omega$ , $R_G = 3\Omega$
Turn-Off Fall Time	t <sub>F</sub>	_	5.2	_	ns	7

Notes:

- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
   Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1 inch square copper plate.
   Short duration pulse test used to minimize self-heating effect.
   Guaranteed by design. Not subject to production testing.





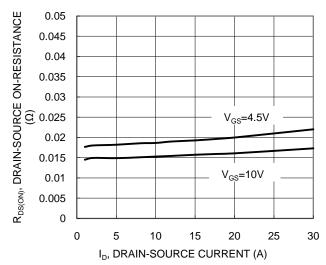


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

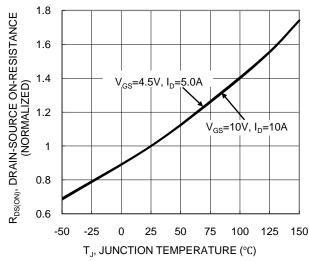
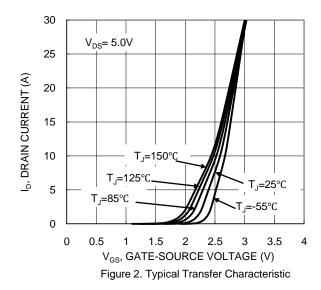


Figure 5. On-Resistance Variation with Temperature



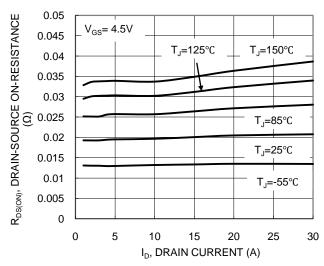


Figure 4. Typical On-Resistance vs. Drain Current and Temperature

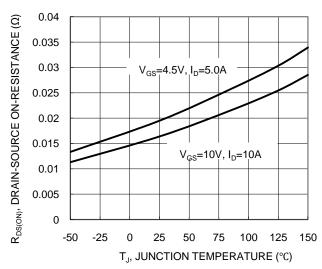


Figure 6. On-Resistance Variation with Temperature



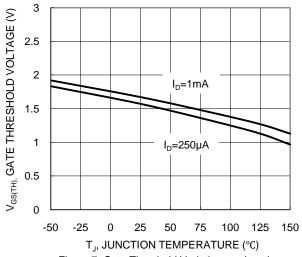
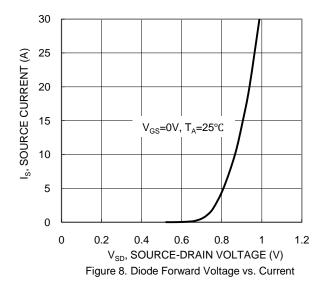


Figure 7. Gate Threshold Variation vs. Junction Temperature



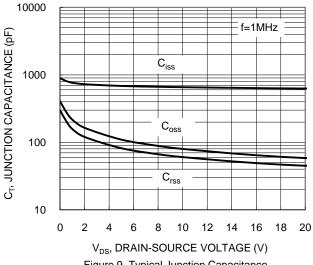
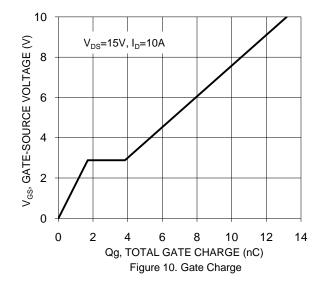
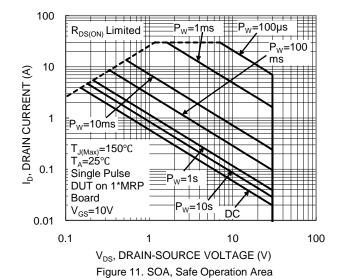


Figure 9. Typical Junction Capacitance







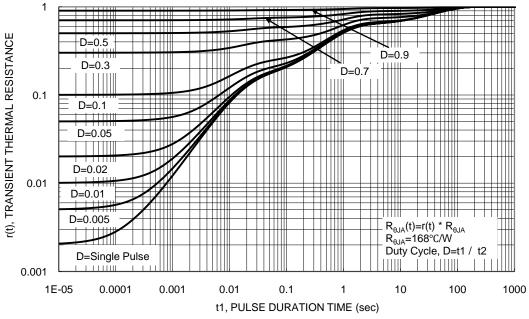
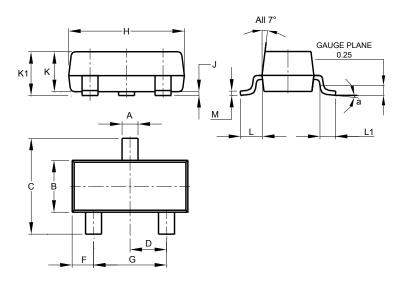


Figure 12. Transient Thermal Resistance

## **Package Outline Dimensions**

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

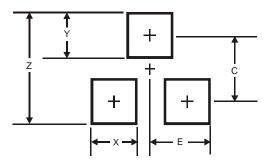


SOT23								
Dim	Min	Max	Тур					
Α	0.37	0.51	0.40					
В	1.20	1.40	1.30					
С	2.30	2.50	2.40					
D	0.89	1.03	0.915					
F	0.45	0.60	0.535					
G	1.78	2.05	1.83					
Н	2.80 3.00 2.9							
J	0.013	0.10	0.05					
K	0.890 1.00 0.97							
K1	0.903	1.10	1.025					
L	0.45	0.61	0.55					
L1	0.25	0.55	0.40					
M	0.085	0.150	0.110					
а	a 8°							
All	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
Х	0.8
Y	0.9
С	2.0
E	1.35

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