

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> Max T <sub>A</sub> = +25°C
20V	25mΩ @ V <sub>GS</sub> = 4.5V	4.2A
	29mΩ @ V <sub>GS</sub> = 2.5V	4.0A
	37mΩ @ V <sub>GS</sub> = 1.8V	3.4A

## Description

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

## Applications

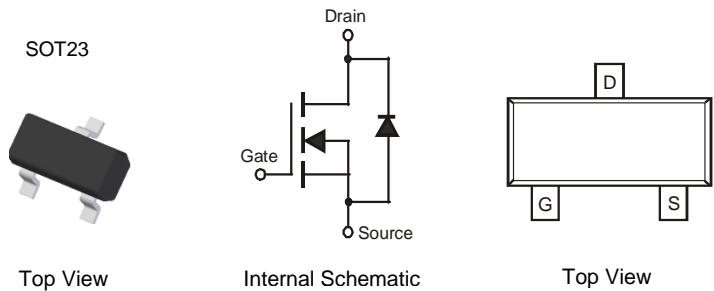
- Power-management functions
- DC-DC converters

## 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)**
- The DMG3414UQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**  
<https://www.diodes.com/quality/product-definitions/>

## Mechanical Data

- Package: SOT23
- Package 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 (e3)
- Terminals Connections: See Diagram Below
- Weight: 0.008 grams (Approximate)

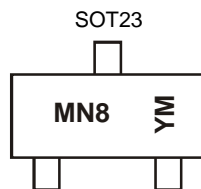


## Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMG3414UQ-7	SOT23	3,000	Tape & Reel
DMG3414UQ-13	SOT23	10,000	Tape & Reel

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  - See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  - For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



MN8 = Product Type Marking Code  
 YM or ȲM = Date Code Marking  
 Y or Ȳ = Year (ex: L = 2024)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2015	-	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Code	C	-	L	M	N	P	R	S	T	U	V	W

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
Drain-Source Voltage			V <sub>DSS</sub>	20	V
Gate-Source Voltage			V <sub>GSS</sub>	±8	V
Continuous Drain Current (Note 5)	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	4.2	A
		T <sub>A</sub> = +70°C		3.2	
Pulsed Drain Current (Note 6)			I <sub>DM</sub>	30	A

**Thermal Characteristics**

Characteristic		Symbol	Value	Unit
Power Dissipation (Note 5)		P <sub>D</sub>	0.78	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C		R <sub>θJA</sub>	162	°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	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b> (Note 7)						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	20	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1.0	μA	T <sub>J</sub> = +25°C, V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS</b> (Note 7)						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	0.5	—	0.9	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	19	25	mΩ	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 8.2A
			22	29		
			28	37		
Forward Transfer Admittance	Y <sub>fs</sub>	—	7	—	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 4A
<b>DYNAMIC CHARACTERISTICS</b> (Note 8)						
Input Capacitance	C <sub>iss</sub>	—	829.9	—	pF	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	85.3	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	81.2	—	pF	
Total Gate Charge	Q <sub>g</sub>	—	9.6	—	nC	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 10V, I <sub>D</sub> = 8.2A
Gate-Source Charge	Q <sub>gs</sub>	—	1.5	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	3.5	—	nC	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	8.1	—	ns	V <sub>DD</sub> = 10V, V <sub>GS</sub> = 4.5V, R <sub>L</sub> = 10Ω, R <sub>G</sub> = 6Ω, I <sub>D</sub> = 1A
Turn-On Rise Time	t <sub>R</sub>	—	8.3	—	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	40.1	—	ns	
Turn-Off Fall Time	t <sub>F</sub>	—	9.6	—	ns	

- Notes:
5. Device mounted on FR-4 PCB with 2oz. copper and test pulse width t ≤ 10s.
  6. Repetitive rating, pulse width limited by junction temperature.
  7. Short duration pulse test used to minimize self-heating effect.
  8. Guaranteed by design. Not subject to production testing.

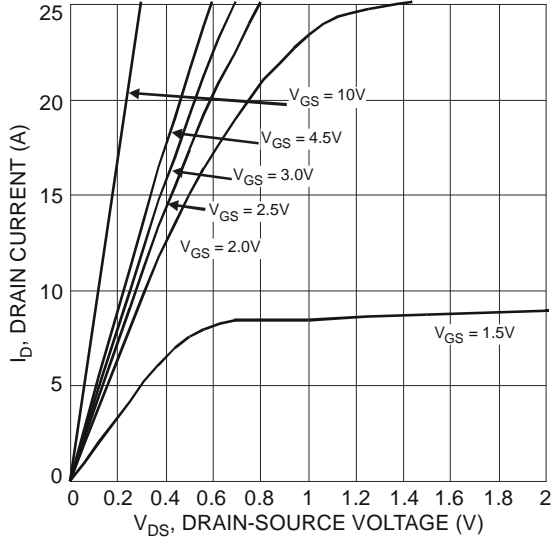


Fig. 1 Typical Output Characteristic

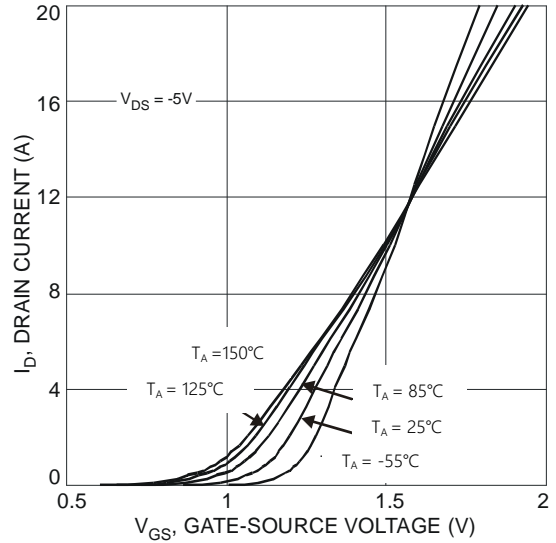


Fig. 2 Typical Transfer Characteristic

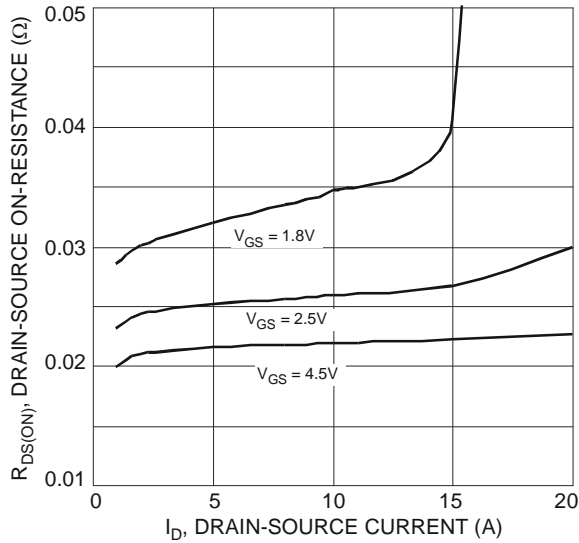


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

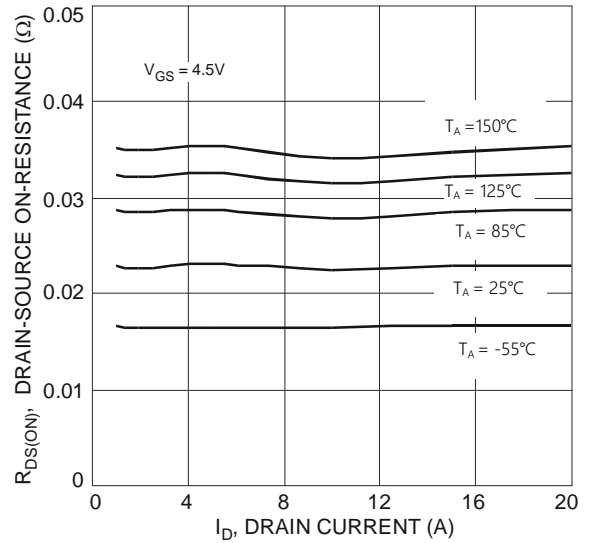


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

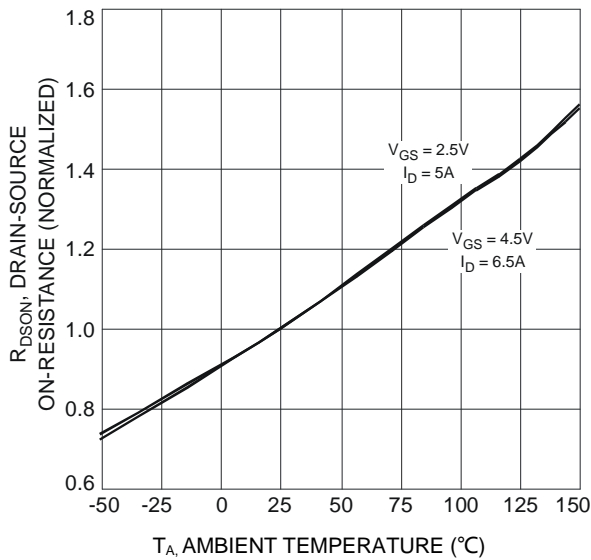


Fig. 5 On-Resistance Variation with Temperature

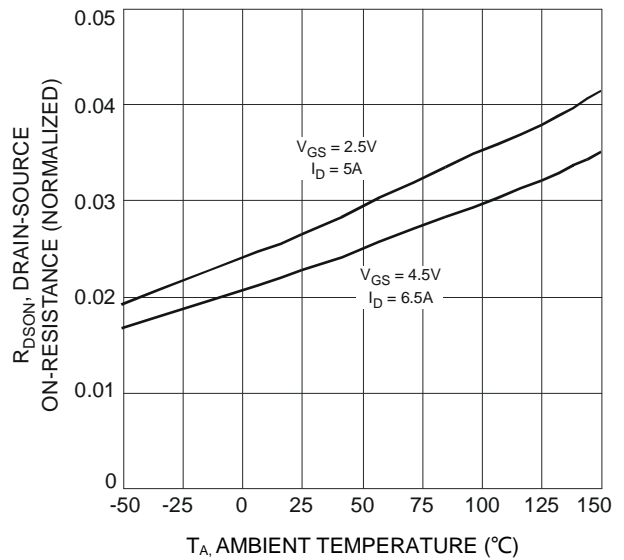


Fig. 6 On-Resistance Variation with Temperature

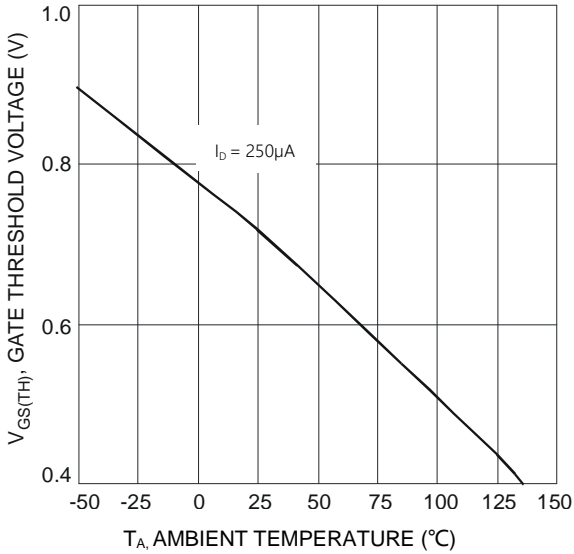


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

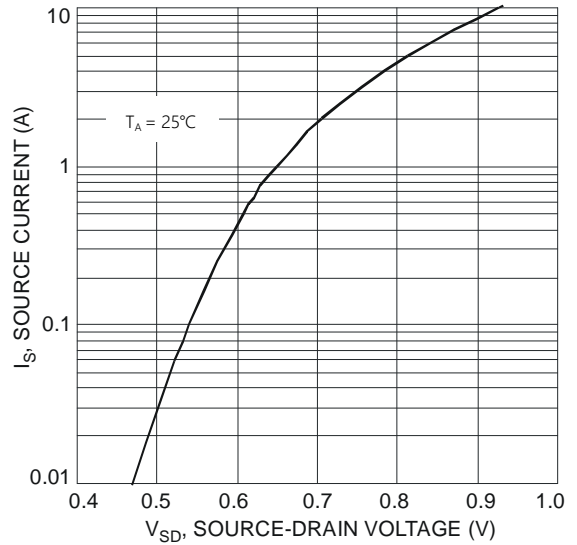


Fig. 8 Diode Forward Voltage vs. Current

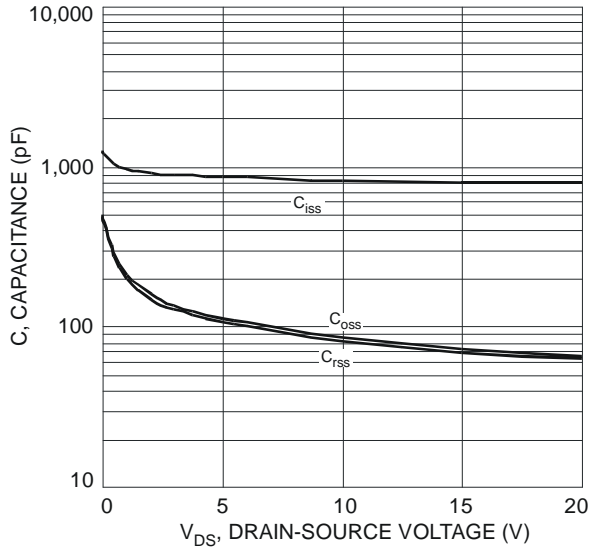


Fig. 9 Typical Total Capacitance

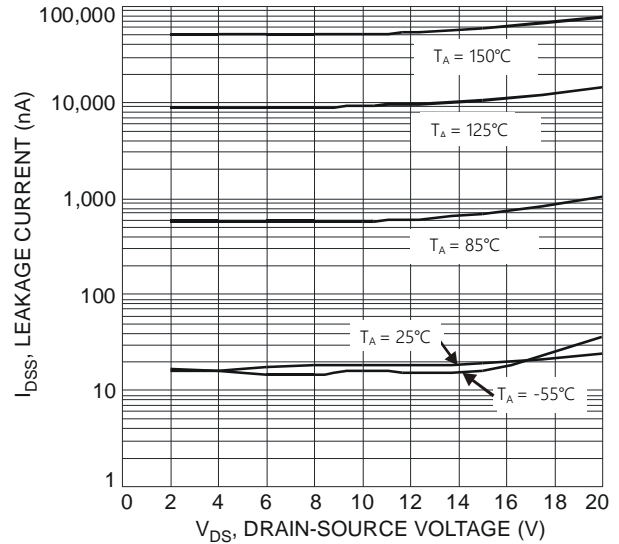


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

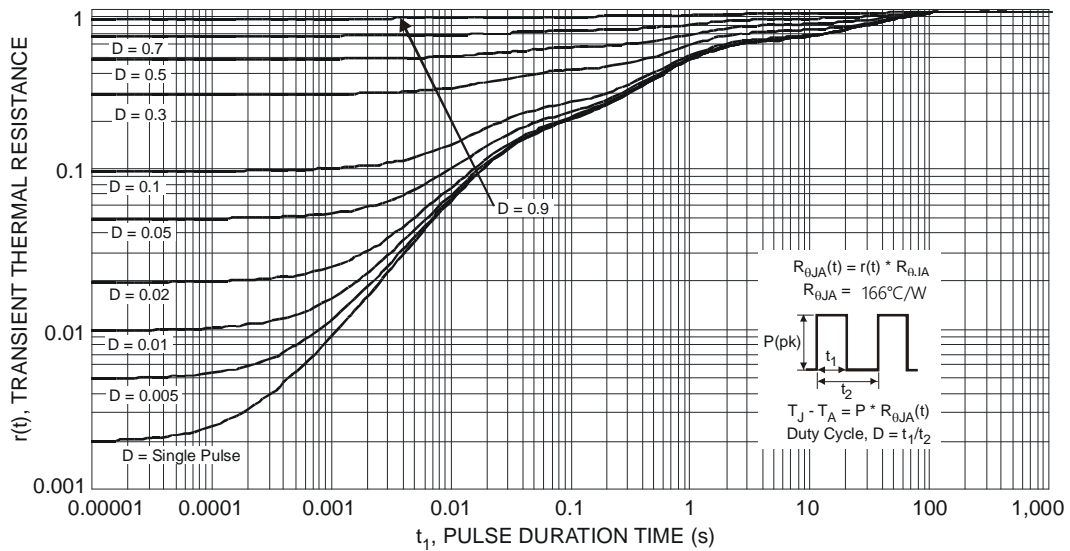
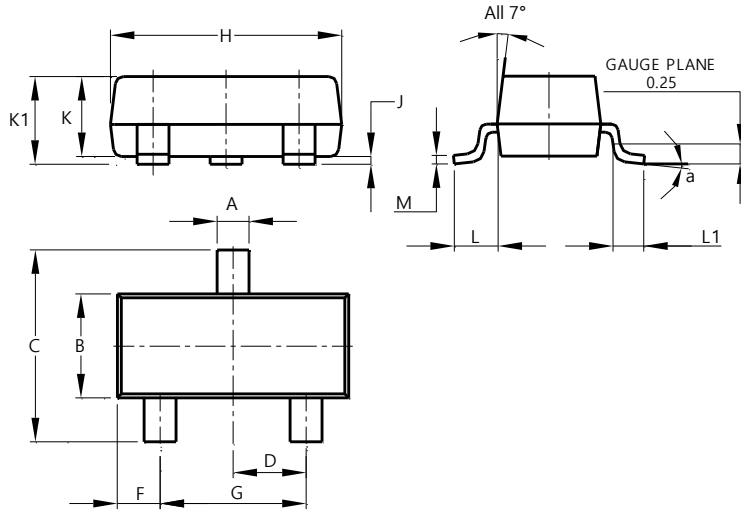


Fig. 11 Transient Thermal Response

**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT23**

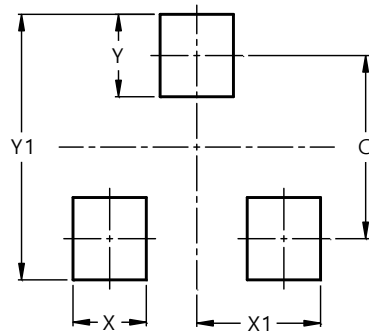


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

**Suggested Pad Layout**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT23**



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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