

Product Summary

$V_{(BR)DSS}$	$R_{DS(on) max}$	I_D $T_A = +25^\circ C$
-30V	50mΩ @ $V_{GS} = -10V$	-3.7A
	60mΩ @ $V_{GS} = -4.5V$	-3.3A
	85mΩ @ $V_{GS} = -2.5V$	-2.7A

Features

- Low Input Capacitance
- Low On-Resistance
- 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**
- **PPAP (Note 4)**

Description and Applications

This new generation Small-Signal enhancement mode MOSFET features low on-resistance and fast switching, making it ideal for high-efficiency power management applications.

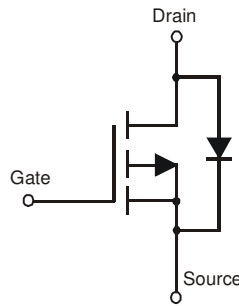
- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

Mechanical Data

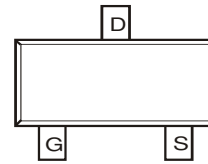
- Case: SC-59
- Case Material - Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish - Matte Tin Annealed over Copper Leadframe;
- Solderable per MIL-STD-202, Method 208③
- Weight: 0.014 grams (Approximate)



Top View



Equivalent Circuit



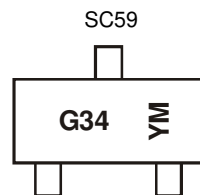
Top View

Ordering Information (Note 5)

Part Number	Case	Packaging
DMG3401LSNQ-7	SC59	3,000/Tape & Reel
DMG3401LSNQ-13	SC59	10,000/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> 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_grade_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



G34 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: Y = 2011)
 M = Month (ex: 9 = September)

Date Code Key

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Code	Y	Z	A	B	C	D	E	F	G	H	I	J

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}	-30	V
Gate-Source Voltage			V _{GSS}	±12	V
Continuous Drain Current (Note 6) V _{GS} = -10V	Steady State	T _A = +25°C	I _D	-3.0	A
		T _A = +70°C		-2.3	
Continuous Drain Current (Note 7) V _{GS} = -10V	Steady State	T _A = +25°C	I _D	-3.7	A
		T _A = +70°C		-2.9	
Pulsed Drain Current (10μs pulse, duty cycle = 1%)			I _{DM}	-30	A
Maximum Body Diode Continuous Current (Note 7)			I _S	-1.5	A

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation	(Note 6)	P _D	0.8	W
	(Note 7)		1.2	
Thermal Resistance, Junction to Ambient	(Note 6)	R _{θJA}	159	°C/W
	(Note 7)		105	
Thermal Resistance, Junction to Case	(Note 7)	R _{θJC}	36	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	-30	-	-	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	-	-	-1.0	μA	V _{DS} = -30V, V _{GS} = 0V
Gate-Body Leakage	I _{GSS}	-	-	±100	nA	V _{GS} = ±12V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(th)}	-0.5	-1.0	-1.3	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(on)}	-	41	50	mΩ	V _{GS} = -10V, I _D = -4A
		-	47	60		V _{GS} = -4.5V, I _D = -3.5A
		-	60	85		V _{GS} = -2.5V, I _D = -2.5A
Forward Transfer Admittance	Y _{fs}	-	12	-	S	V _{DS} = -5V, I _D = -4A
Diode Forward Voltage	V _{SD}	-	-0.8	-1.0	V	V _{GS} = 0V, I _S = -1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	-	1,326	-	pF	V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	-	103	-		
Reverse Transfer Capacitance	C _{rss}	-	71	-		
Gate Resistance	R _g	-	7.3	-	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = -4.5V)	Q _g	-	11.6	-	nC	V _{DD} = -15V, I _D = -4A
Total Gate Charge (V _{GS} = -10V)	Q _g	-	25.1	-		
Gate-Source Charge	Q _{gs}	-	2	-		
Gate-Drain Charge	Q _{gd}	-	1.7	-		
Turn-On Delay Time	t _{D(on)}	-	8	-	nS	V _{DS} = -15V, V _{GS} = -10V, R _{GEN} = 6Ω, R _L = 3.75Ω
Turn-On Rise Time	t _r	-	13	-		
Turn-Off Delay Time	t _{D(off)}	-	71	-		
Turn-Off Fall Time	t _f	-	38	-		

- Notes:
6. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 7. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper pad layout
 8. Short duration pulse test used to minimize self-heating effect.
 9. Guaranteed by design. Not subject to production testing.

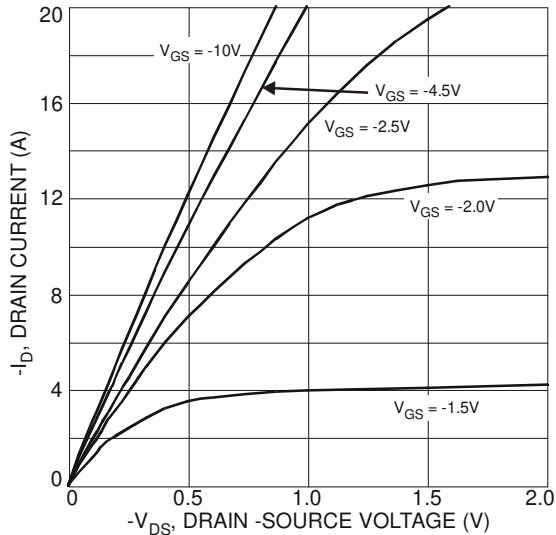


Figure 1 Typical Output Characteristics

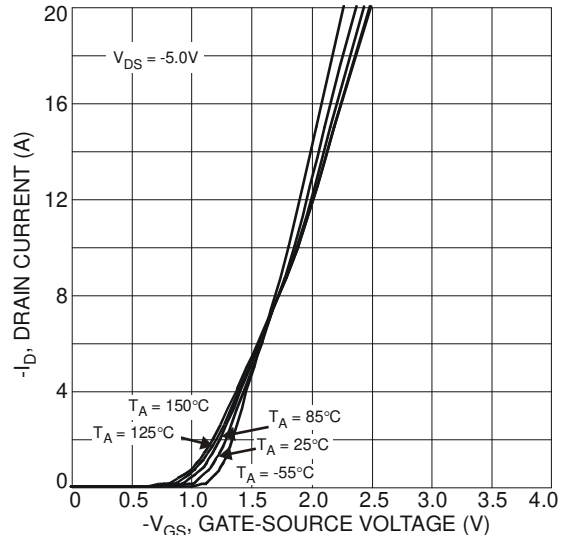


Figure 2 Typical Transfer Characteristics

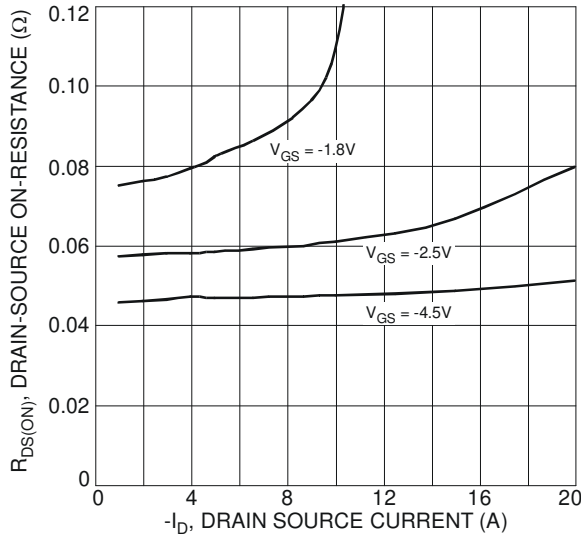


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

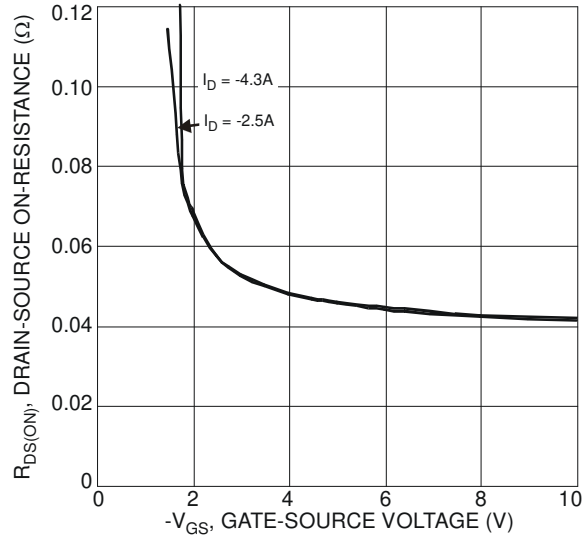


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

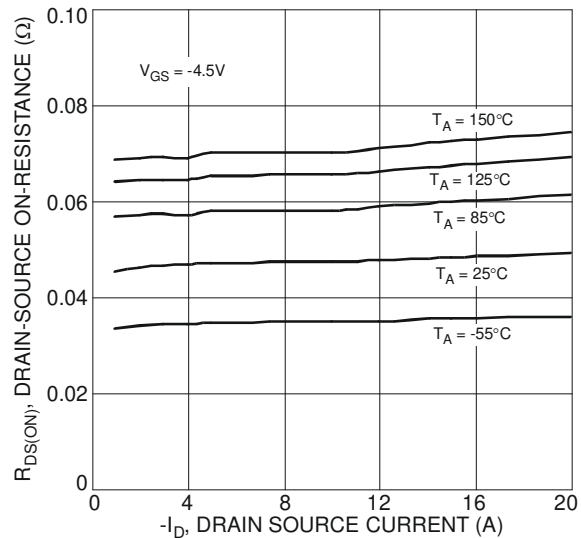


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

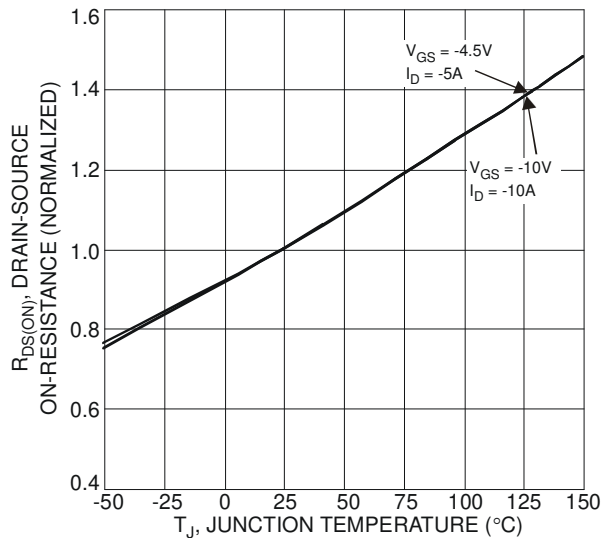


Figure 6 On-Resistance Variation with Temperature

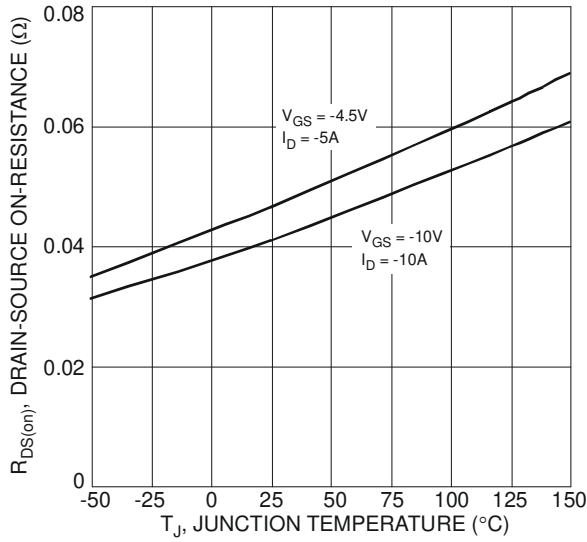


Figure 7 On-Resistance Variation with Temperature

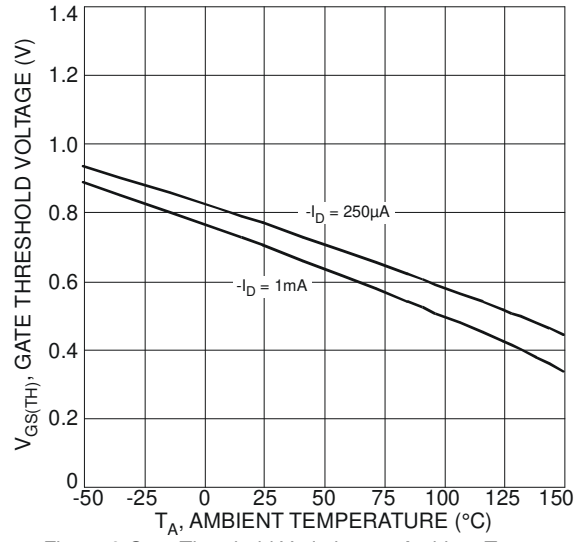


Figure 8 Gate Threshold Variation vs. Ambient Temperature

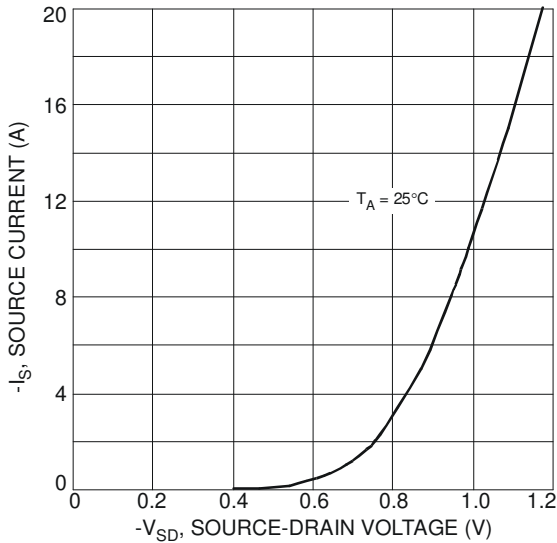


Figure 9 Diode Forward Voltage vs. Current

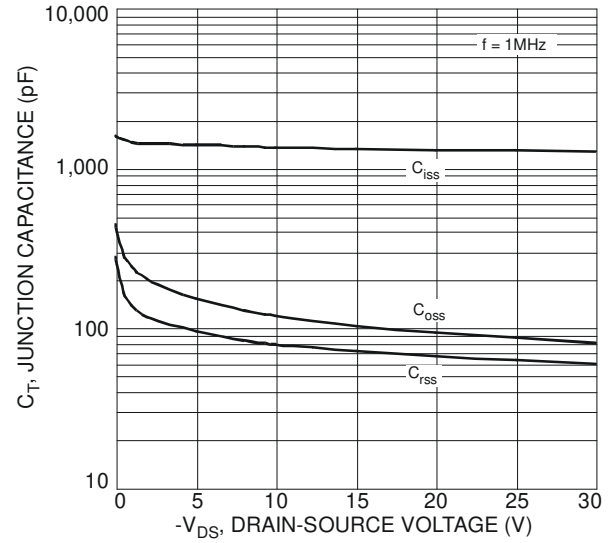


Figure 10 Typical Junction Capacitance

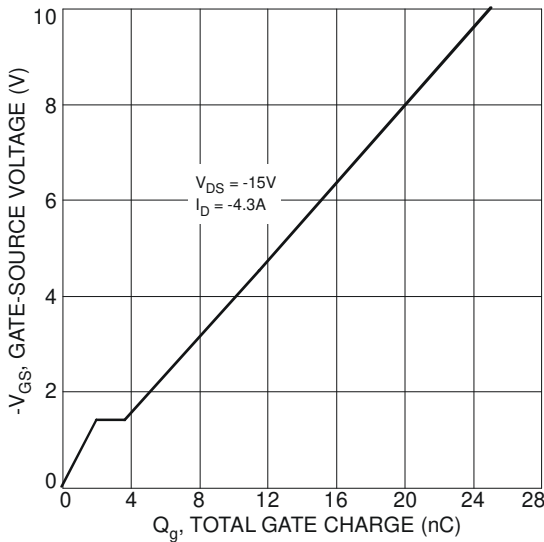


Figure 11 Gate-Charge Characteristics

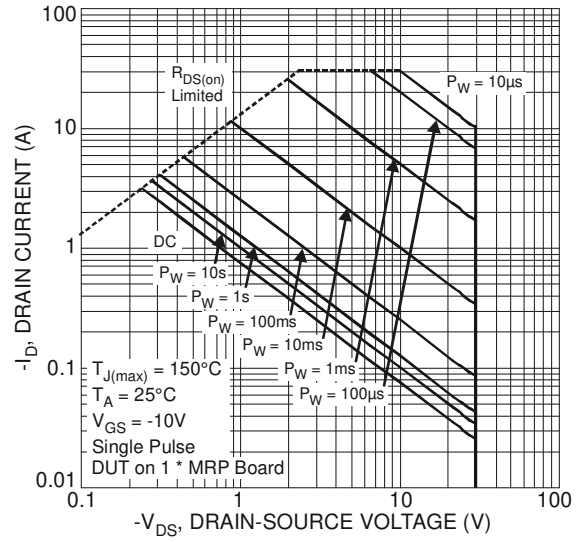


Figure 12 SOA, Safe Operation Area

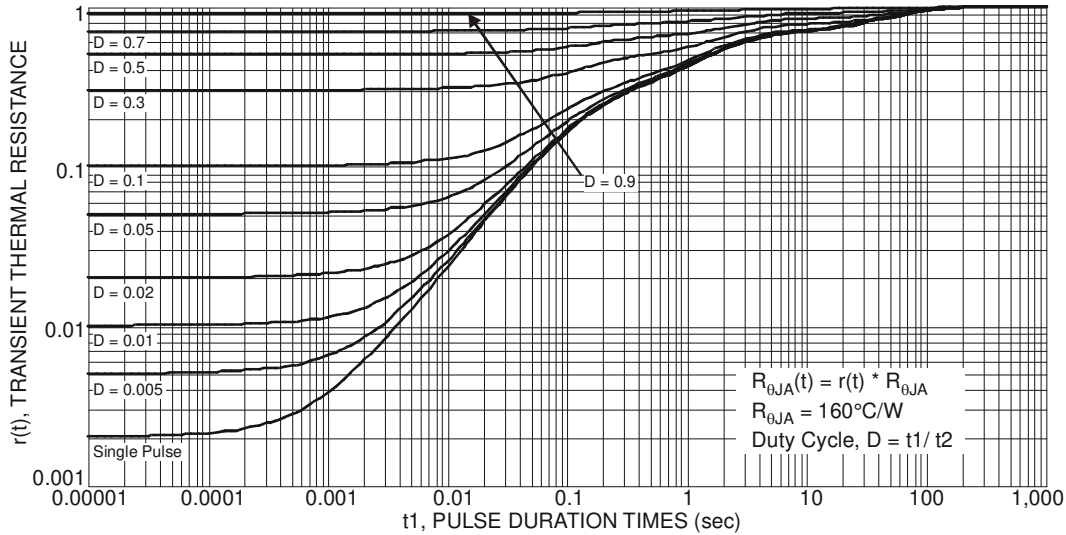
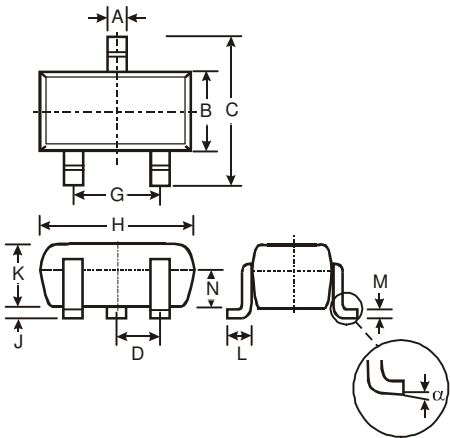


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

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

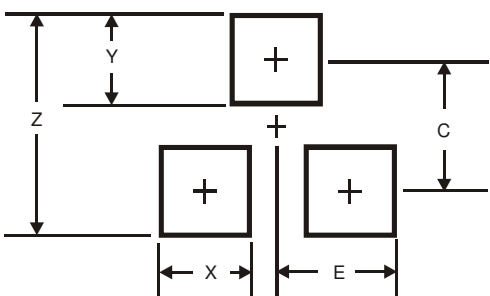


SC59			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	-	-	0.95
G	-	-	1.90
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
N	0.70	0.80	0.75
α	0°	8°	-

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	3.4
X	0.8
Y	1.0
C	2.4
E	1.35

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