

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)} \text{ max}$	$I_D \text{ max}$ $T_A = 25^\circ\text{C}$
-30V	90m Ω @ $V_{GS} = -10\text{V}$	-3.8A
	134m Ω @ $V_{GS} = -4.5\text{V}$	-3.1A

Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 standards for High Reliability**

Description and Applications

This MOSFET has been designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- General Purpose Interfacing Switch
- Power Management Functions
- Load Switch for Portable Devices

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-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.08 grams (approximate)

Ordering Information (Note 3)

Part Number	Case	Packaging
DMG2307L-7	SOT-23	3000Tape & Reel

- Notes:
1. No purposefully added lead.
 2. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>.
 3. For packaging details, go to our website at <http://www.diodes.com>.

Marking Information

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}	±20	V
Continuous Drain Current (Note 4) V _{GS} = -10V	Steady State	T _A = 25°C T _A = 70°C	I _D	-2.5 -2.0	A
Continuous Drain Current (Note 5) V _{GS} = -10V	Steady State	T _A = 25°C T _A = 70°C	I _D	-3.8 -3.0	A
Continuous Drain Current (Note 5) V _{GS} = -10V	t ≤ 10sec	T _A = 25°C T _A = 70°C	I _D	-4.6 -3.6	A
Continuous Drain Current (Note 5) V _{GS} = -4.5V	Steady State	T _A = 25°C T _A = 70°C	I _D	-3.1 -2.5	A
Pulsed Drain Current (Note 5)			I _{DM}	-20	A

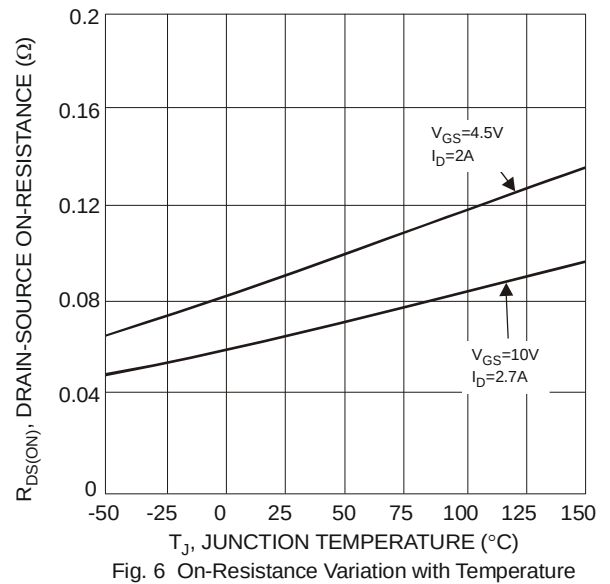
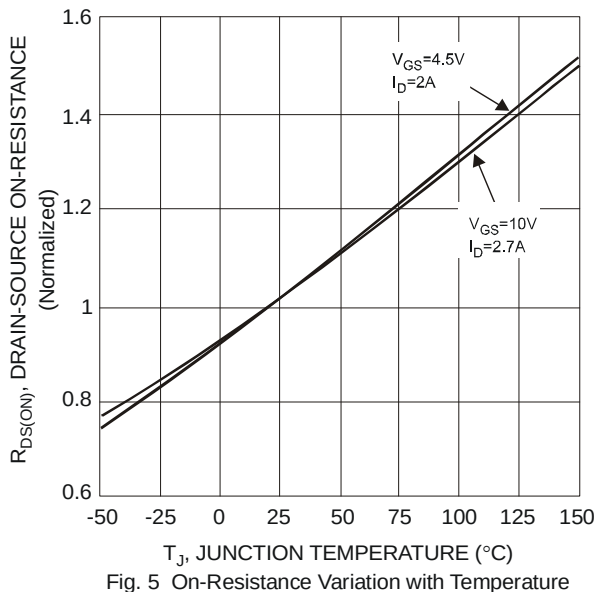
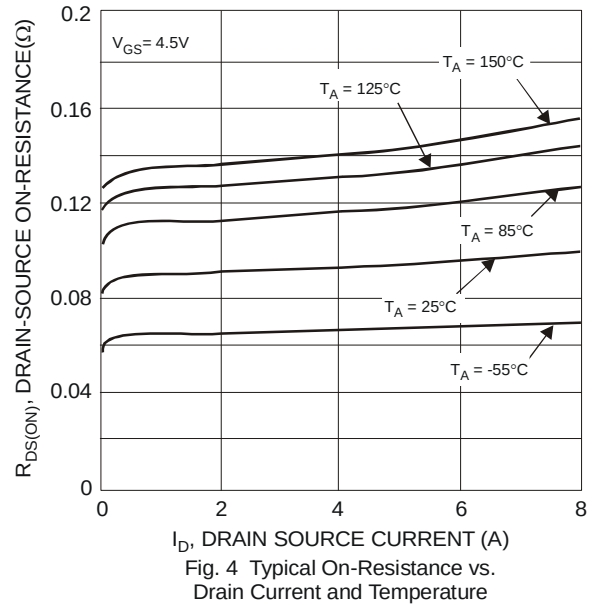
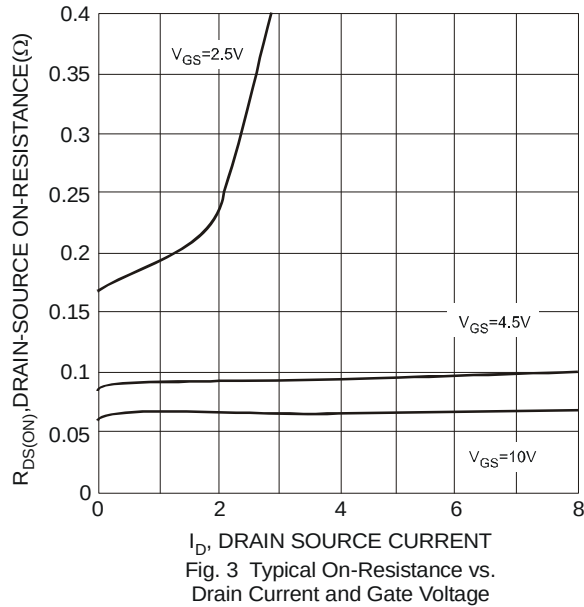
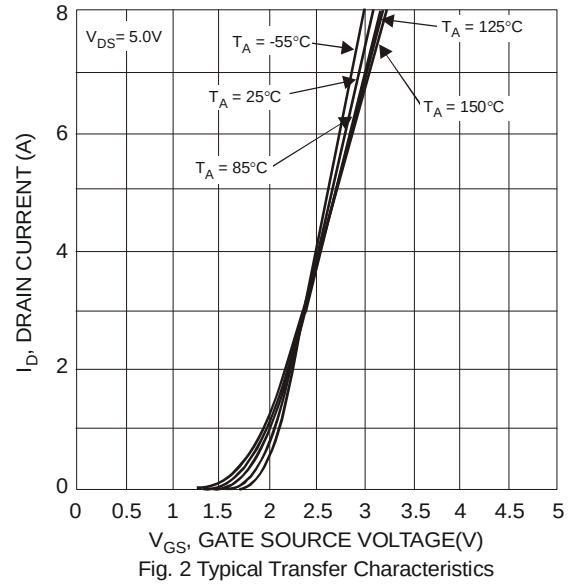
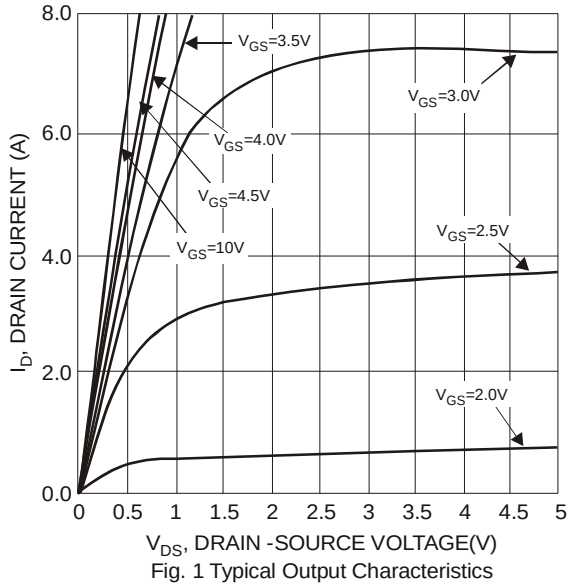
Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 4)	P _D	0.76	W
Thermal Resistance, Junction to Ambient (Note 4)	R _{θJA}	159	°C/W
Total Power Dissipation (Note 5)	P _D	1.36	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	94	°C/W
Total Power Dissipation (Note 5) t ≤ 10sec	P _D	1.9	W
Thermal Resistance, Junction to Ambient (Note 5) t ≤ 10sec	R _{θJA}	65.8	°C/W
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 6)						
Drain-Source Breakdown Voltage	BV _{DSS}	-30	-	-	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current @T _c = 25°C	I _{DSS}	-	-	-1.0	μA	V _{DS} = -30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	-	-	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V _{GS(th)}	-1.0	-	-3.0	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(on)}	-	70	90	mΩ	V _{GS} = -10V, I _D = -2.5A
		-	105	134		V _{GS} = -4.5V, I _D = -2.5A
Forward Transfer Admittance	Y _{fs}	-	4.8	-	S	V _{DS} = -10V, I _D = -2.5A
Diode Forward Voltage (Note 6)	V _{SD}	-	-0.75	-1.0	V	V _{GS} = 0V, I _S = -1A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{iss}	-	371.3	-	pF	V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	-	51.3	-	pF	
Reverse Transfer Capacitance	C _{rss}	-	45.9	-	pF	
Gate Resistance	R _g	-	17	-	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = -4.5V)	Q _g	-	4.0	-	nC	V _{GS} = -10V, V _{DS} = -15V, I _D = -3A
Total Gate Charge (V _{GS} = -10V)	Q _g	-	8.2	-	nC	
Gate-Source Charge	Q _{gs}	-	0.9	-	nC	
Gate-Drain Charge	Q _{gd}	-	1.2	-	nC	V _{DS} = -15V, V _{GS} = -10V, R _L = 15Ω, R _G = 6Ω, I _D = -1A
Turn-On Delay Time	t _{D(on)}	-	4.8	-	ns	
Turn-On Rise Time	t _r	-	7.3	-	ns	
Turn-Off Delay Time	t _{D(off)}	-	22.4	-	ns	
Turn-Off Fall Time	t _f	-	13.4	-	ns	

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



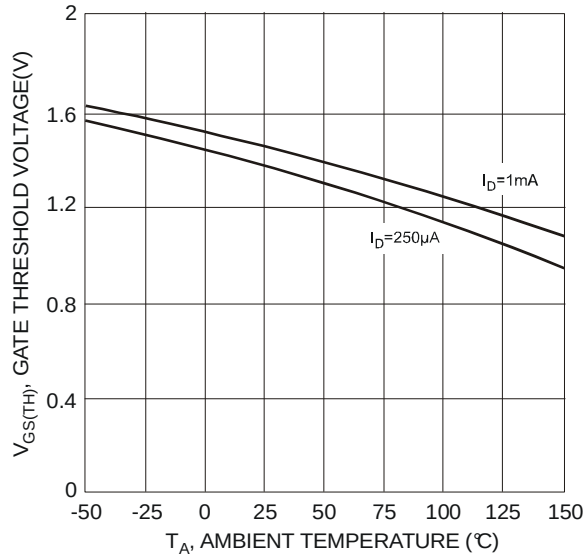


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

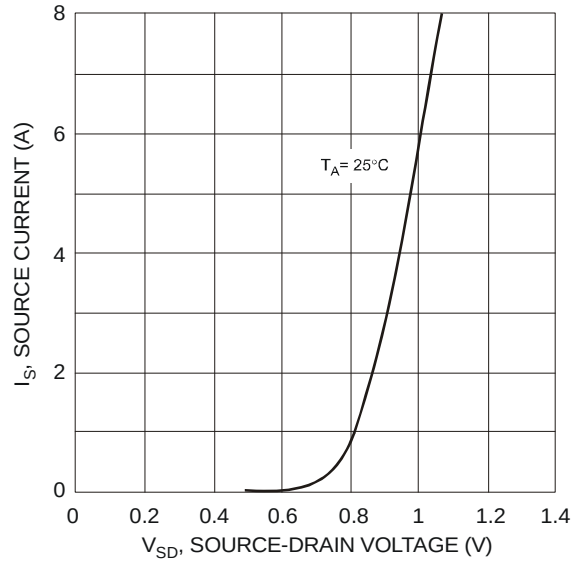


Fig. 8 Diode Forward Voltage vs. Current

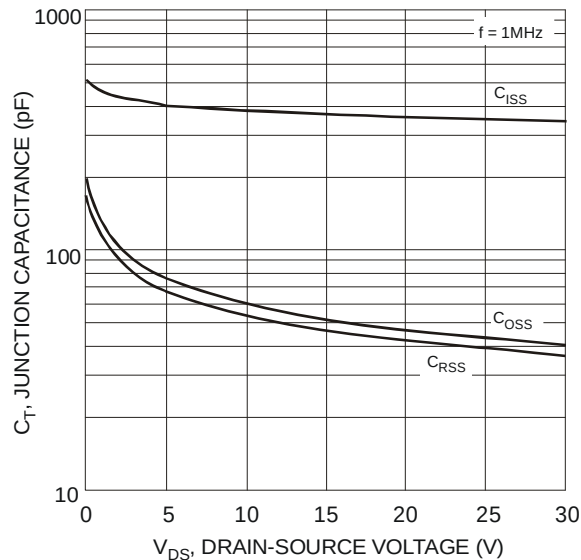


Fig. 9 Typical Junction Capacitance

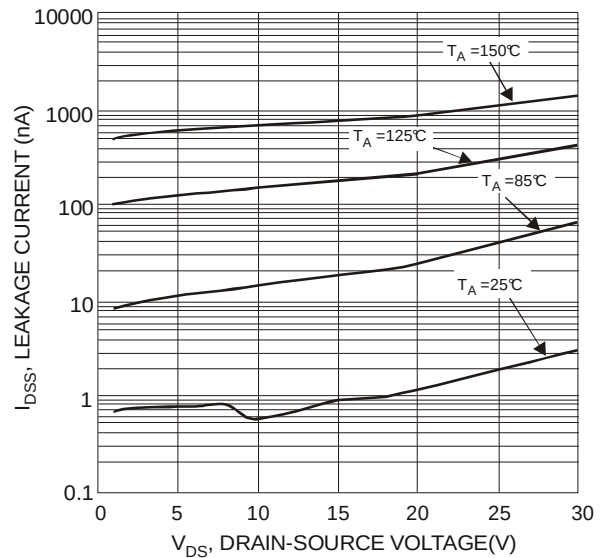


Fig. 10 Typical Drain-Source Leakage Current vs. Voltage

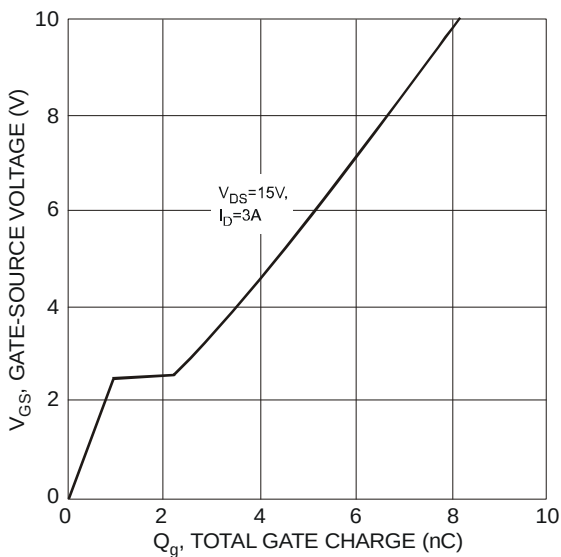


Fig. 11 Gate-Charge Characteristics

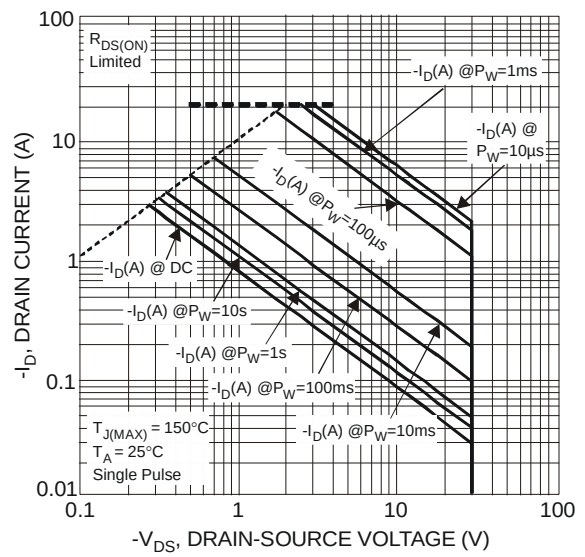


Fig. 12 SOA, Safe Operation Area

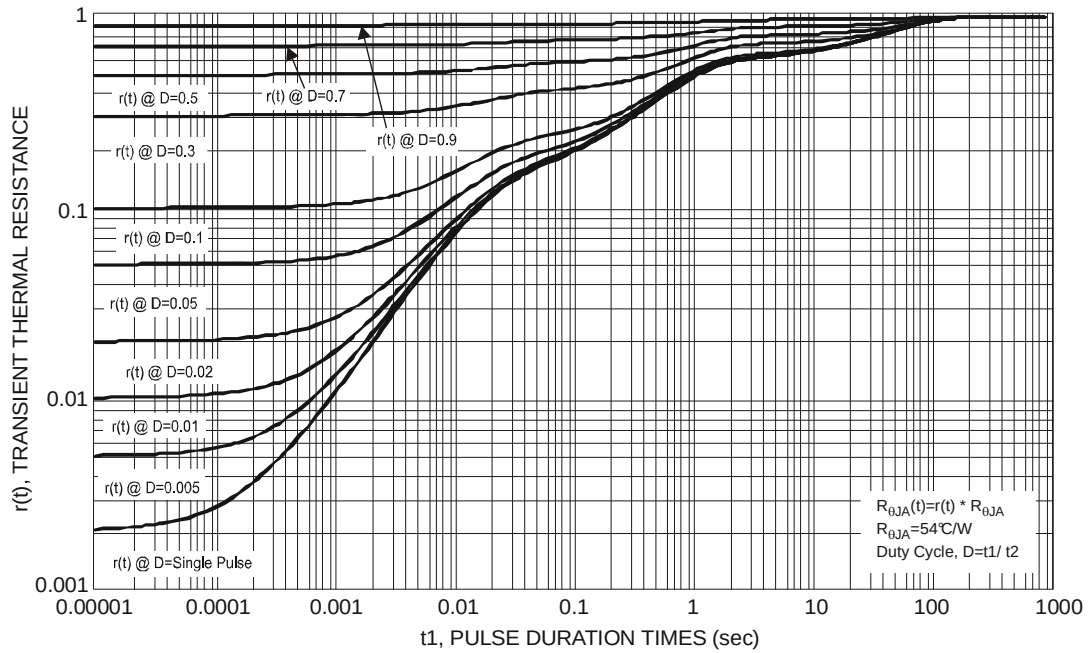
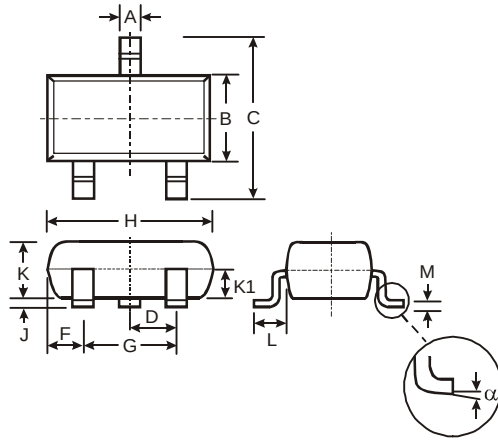


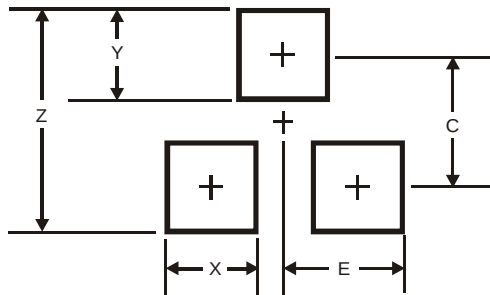
Fig. 13 Transient Thermal Resistance

Package Outline Dimensions



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	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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