DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D $T_A = 25°C$
60V	1.8Ω @ V_{GS} = 10V	440mA
	2.1Ω @ V_{GS} = 4.5V	410mA

Features and Benefits

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

Description and Applications

This new generation 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.

- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- DC-DC Converters
- Power management functions

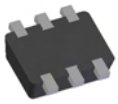
Mechanical Data

- Case: SOT563
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Weight: 0.006 grams (approximate)

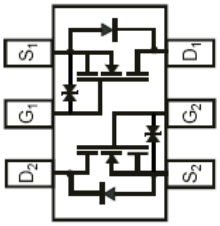
SOT563

ESD PROTECTED TO 2kV

Top View



Bottom View



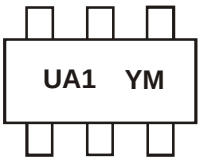
Top View
Pin Definition/Schematic

Ordering Information (Note 3)

Part Number	Case	Packaging
DMG1026UV-7	SOT563	3000 / Tape & 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



UA1 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: X = 2010)
M = Month (ex: 9 = September)

Date Code Key

Year	2009	2010	2011	2012	2013	2014	2015	2016
Code	W	X	Y	Z	A	B	C	D

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	Unit
Drain-Source Voltage			V_{DSS}	60	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 4) V_{GS} = 10V	Steady State	T_A = 25°C T_A = 85°C	I_D	410 300	mA
Continuous Drain Current (Note 5) V_{GS} = 10V	t ≤ 10s	T_A = 25°C T_A = 85°C	I_D	440 320	mA
Continuous Drain Current (Note 4) V_{GS} = 4.5V	Steady State	T_A = 25°C T_A = 85°C	I_D	380 270	mA
Continuous Drain Current (Note 5) V_{GS} = 4.5V	t ≤ 10s	T_A = 25°C T_A = 85°C	I_D	410 295	mA
Pulsed Drain Current (Note 6)			I_{DM}	1.0	A

Thermal Characteristics

Characteristic	Symbol	Max	Unit
Power Dissipation (Note 4)	P_D	0.58	W
Thermal Resistance, Junction to Ambient @T_A = 25°C (Note 4)	$R_{\theta JA}$	213	°C/W
Power Dissipation (Note 5) t ≤ 10s	P_D	0.65	W
Thermal Resistance, Junction to Ambient @T_A = 25°C (Note 5) t ≤ 10s	$R_{\theta JA}$	192	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics @ T_A = 25°C unless otherwise stated

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	-	-	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current T_J = 25°C	I_{DSS}	-	-	1.0	µA	V_{DS} = 50V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	-	-	±50	nA	V_{GS} = ±5V, V_{DS} = 0V
		-	-	±150	nA	V_{GS} = ±10V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	1.8	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	-	1.2	1.8	Ω	V_{GS} = 10V, I_D = 500mA
		-	1.4	2.1		V_{GS} = 4.5V, I_D = 200mA
Forward Transfer Admittance	$\|Y_{fs}\|$	80	580	-	mS	V_{DS} = 10V, I_D = 200mA
Continuous Source Current (Note 7)	I_S	-	-	200	mA	-
Diode Forward Voltage	V_{SD}	-	0.8	1.3	V	V_{GS} = 0V, I_S = 200mA
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	32	-	pF	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	4.4	-		
Reverse Transfer Capacitance	C_{rss}	-	2.9	-		
Gate Resistance	R_g	-	126	-	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge	Q_g	-	0.45	-	pC	V_{GS} = 4.5V, V_{DS} = 10V, I_D = 250mA
Gate-Source Charge	Q_{gs}	-	0.08	-		
Gate-Drain Charge	Q_{gd}	-	0.08	-		
Turn-On Delay Time	$t_{D(on)}$	-	3.4	-	ns	V_{GS} = 10V, V_{DS} = 30V, R_L = 150Ω, R_G = 25Ω, I_D = 200mA
Turn-On Rise Time	t_r	-	3.4	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	26.4	-	ns	
Turn-Off Fall Time	t_f	-	16.3	-	ns	

Notes:
4. Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
5. Device mounted on FR-4 PCB with minimum recommended pad layout, measured in t ≤ 10s.
6. Repetitive rating, pulse width limited by junction temperature, 10µs pulse, duty cycle = 1%
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

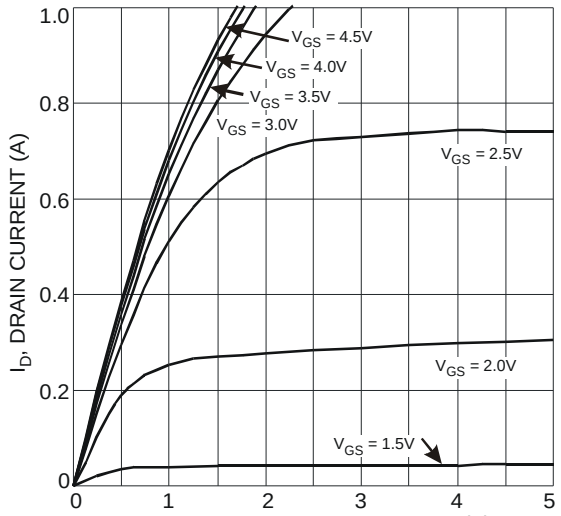


Fig. 1 Typical Output Characteristic

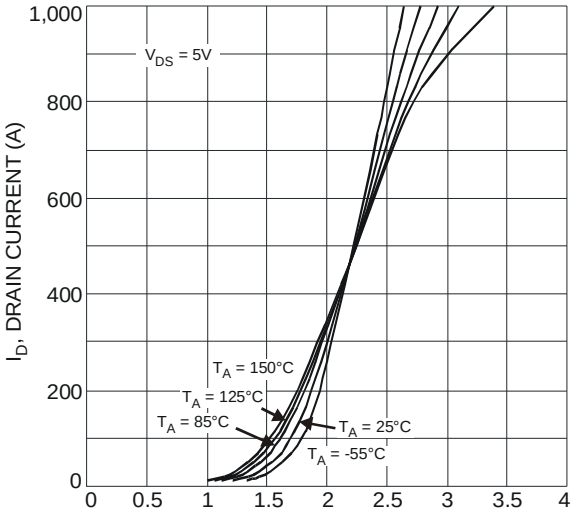


Fig. 2 Typical Transfer Characteristic

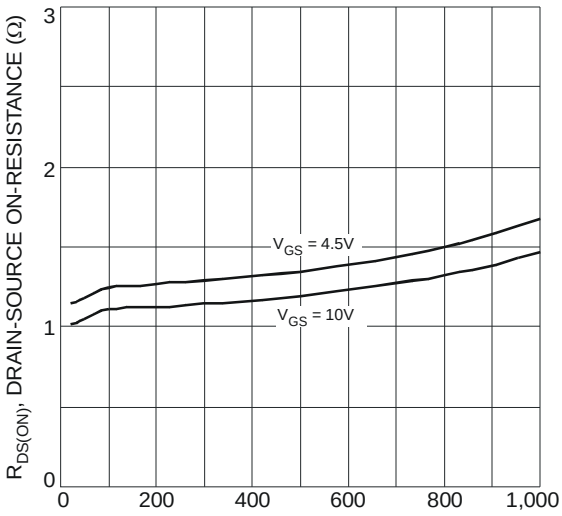


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

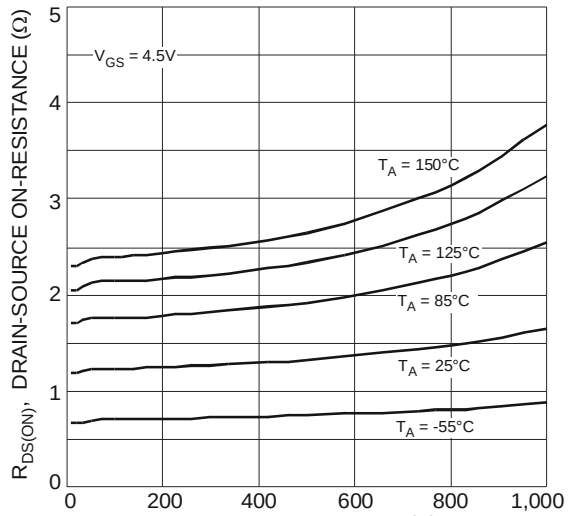


Fig. 4 Typical On-Resistance
vs. Drain Current and Temperature

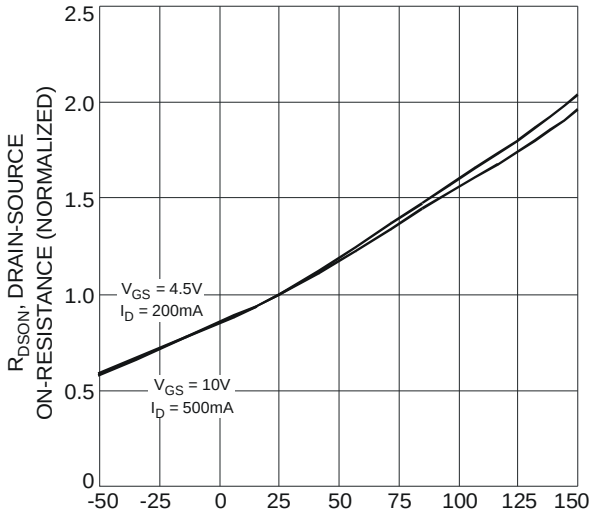


Fig. 5 On-Resistance Variation with Temperature

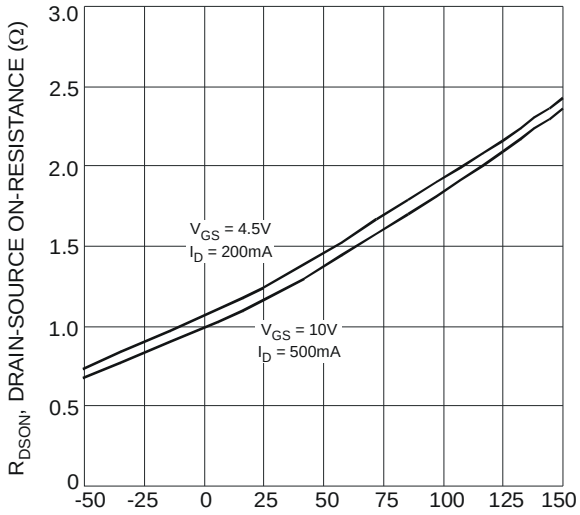


Fig. 6 On-Resistance Variation with Temperature

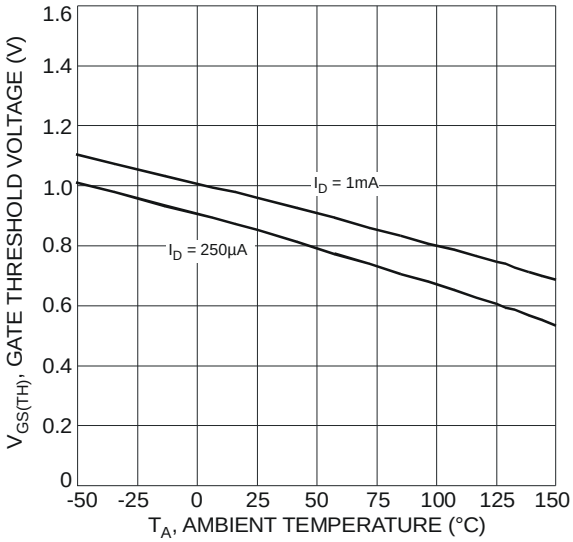


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

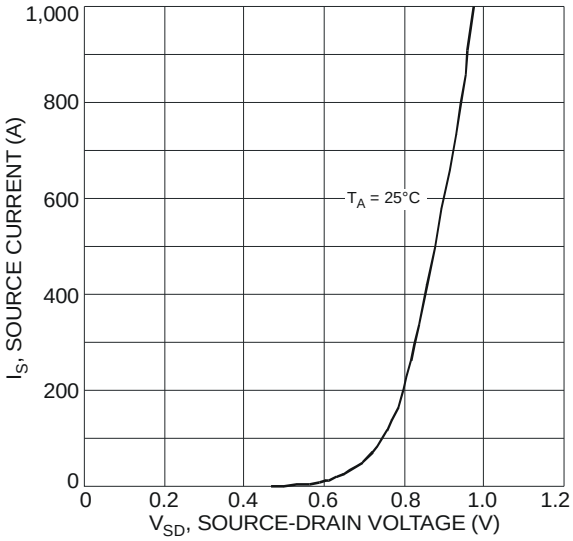


Fig. 8 Diode Forward Voltage vs. Current

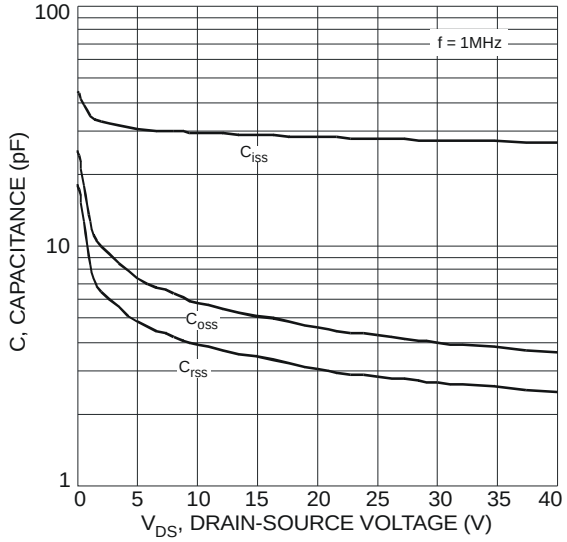


Fig. 9 Typical Total Capacitance

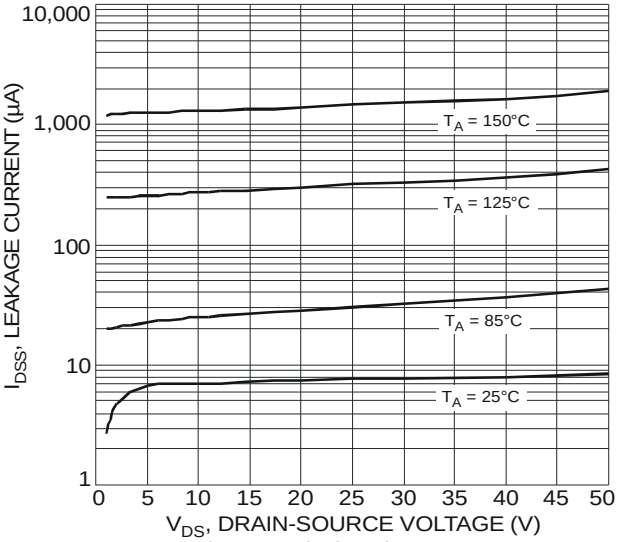


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

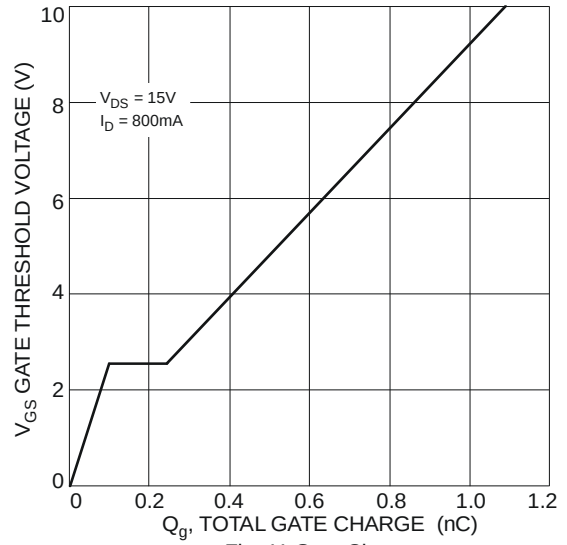


Fig. 11 Gate Charge

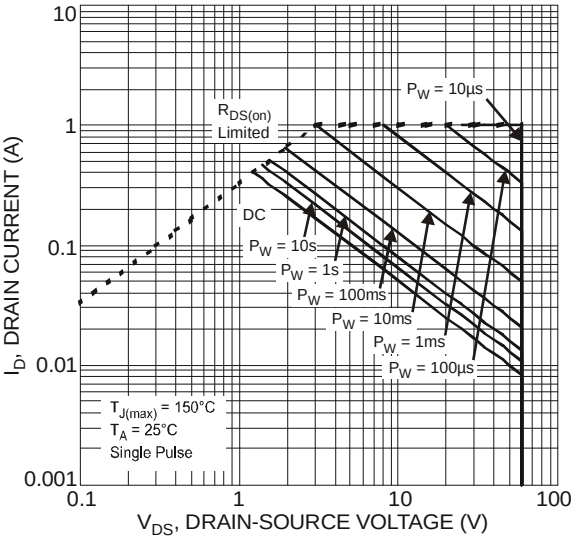


Fig. 12 SOA, Safe Operation Area

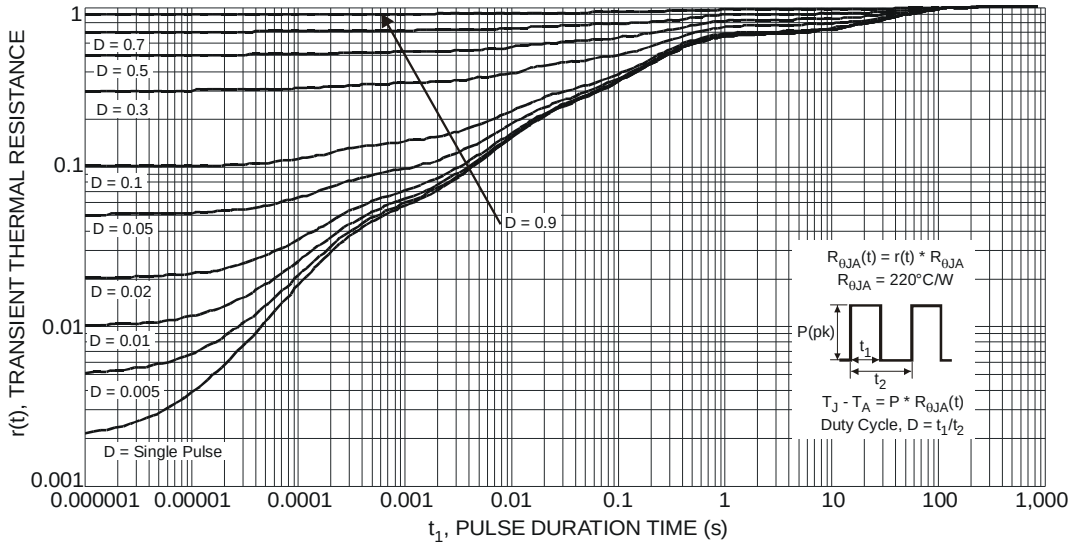
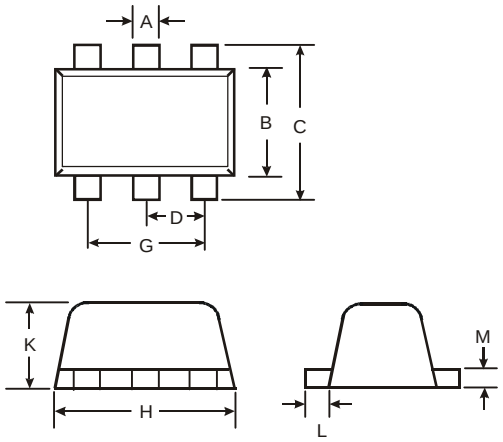


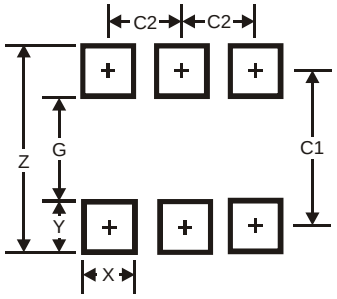
Fig. 13 Transient Thermal Response

Package Outline Dimensions



SOT563			
Dim	**Min**	**Max**	**Typ**
A	0.15	0.30	0.20
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	-	-	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.55	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	0.11
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.2
G	1.2
X	0.375
Y	0.5
C1	1.7
C2	0.5

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