DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **ESD Protected up to 2kV**
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 standards for High Reliability**

Mechanical Data

- Case: SOT-563
- 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
- Terminal Connections: See Diagram
- Weight: 0.006 grams (approximate)

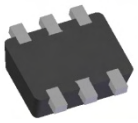


ESD PROTECTED TO 2kV

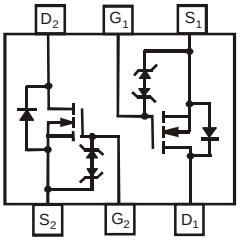
SOT-563



Top View



Bottom View



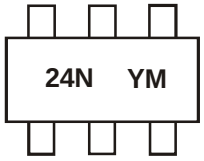
Top View
Internal Schematic

Ordering Information (Note 3)

Part Number	Case	Packaging
DMN2400UV-7	SOT-563	3,000/Tape & Reel
DMN2400UV-13	SOT-563	10,000/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



24N = Marking Code
YM = Date Code Marking
Y = Year (ex: W = 2009)
M = Month (ex: 9 = September)

Date Code Key

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

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

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Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	20	V
Gate-Source Voltage			V_{GSS}	±12	V
Continuous Drain Current (Note 4)	Steady State	T_A = 25°C T_A = 85°C	I_D	1.33 0.84	A
Pulsed Drain Current			I_{DM}	3	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 4)	P_D	530	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	233.8	°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 5)						
Drain-Source Breakdown Voltage	BV_{DSS}	20	-	-	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current T_J = 25°C	I_{DSS}	-	-	100	nA	V_{DS} = 20V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	-	-	±1.0	µA	V_{GS} = ±4.5V, V_{DS} = 0V
		-	-	±50		V_{GS} = ±10V, V_{DS} = 0V
ON CHARACTERISTICS (Note 5)						
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	0.9	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	-	0.3	0.48	Ω	V_{GS} = 5.0V, I_D = 200mA
		-	0.35	0.5		V_{GS} = 4.5V, I_D = 600mA
		-	0.45	0.7		V_{GS} = 2.5V, I_D = 500mA
		-	0.55	0.9		V_{GS} = 1.8V, I_D = 350mA
		-	0.65	1.5		V_{GS} = 1.5V, I_D = 50mA
Forward Transfer Admittance	$\|Y_{fs}\|$	-	1.4	-	S	V_{DS} = 10V, I_D = 400mA
Diode Forward Voltage (Note 5)	V_{SD}		0.7	1.2	V	V_{GS} = 0V, I_S = 150mA, f = 1.0MHz
DYNAMIC CHARACTERISTICS (Note 6)						
Input Capacitance	C_{iss}	-	36.0	-	pF	V_{DS} =16V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	5.7	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	4.2	-	pF	
Gate Resistance	R_g	-	68	-	Ω	V_{DS} = 0V, V_{GS} = 0V,
Total Gate Charge	Q_g	-	0.5	-	nC	V_{GS} =4.5V, V_{DS} = 10V, I_D =250mA
Gate-Source Charge	Q_{gs}	-	0.07	-	nC	
Gate-Drain Charge	Q_{gd}	-	0.1	-	nC	
Turn-On Delay Time	$t_{D(on)}$	-	4.06	-	ns	V_{DD} = 10V, V_{GS} = 4.5V, R_L = 47Ω, R_G = 10Ω, I_D = 200mA
Turn-On Rise Time	t_r	-	7.28	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	13.74	-	ns	
Turn-Off Fall Time	t_f	-	10.54	-	ns	

Notes: 4. Device soldered onto FR-4 PCB, minimum recommended soldering pad dimensions (25.4mm x 25.4mm x1.6mm, 2oz Cu pad: 0.18mm^2 x 6).
5. Short duration pulse test used to minimize self-heating effect.
6. Guaranteed by design. Not subject to product testing.

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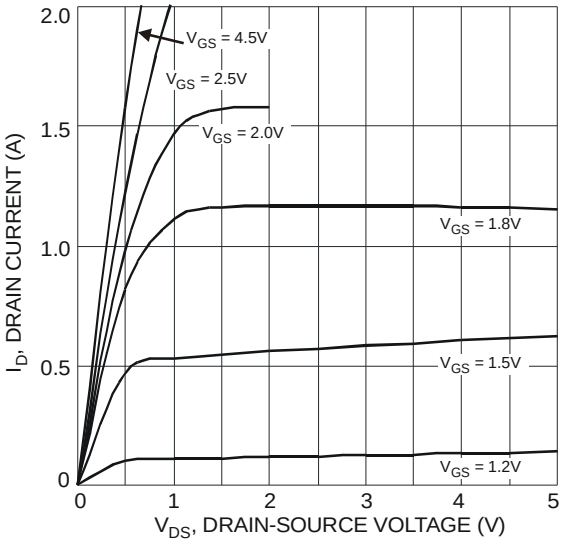


Fig. 1 Typical Output Characteristics

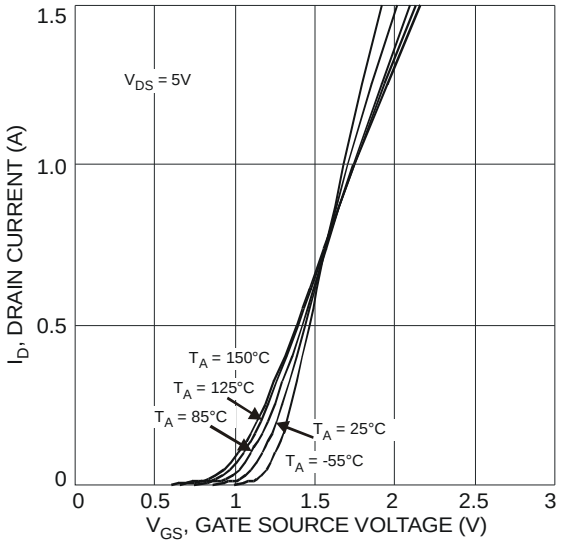


Fig. 2 Typical Transfer Characteristics

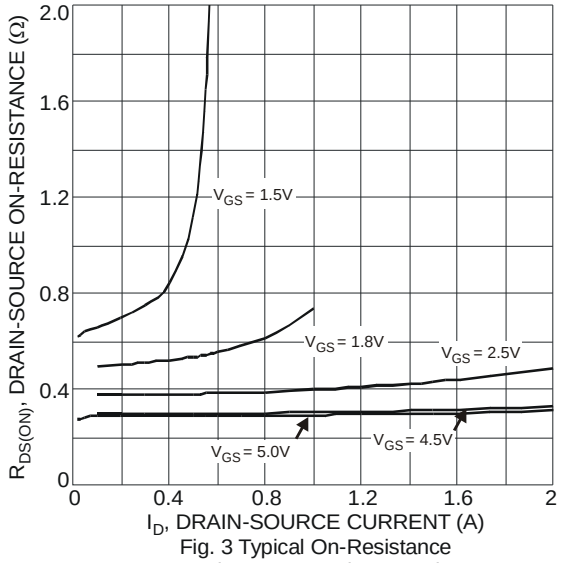


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

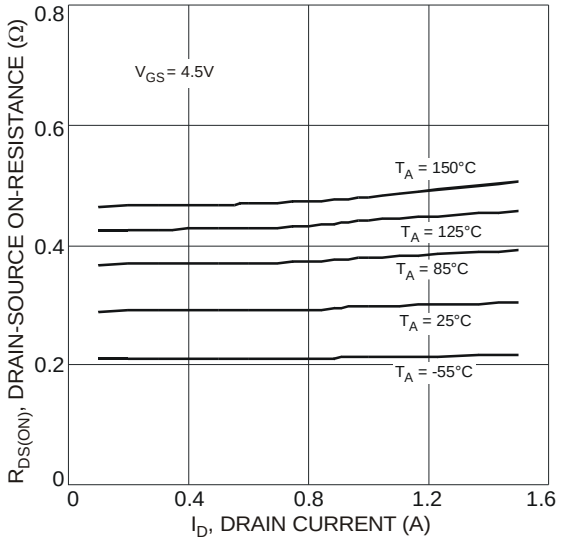


Fig. 4 Typical Drain-Source On-Resistance
vs. Drain Current and Temperature

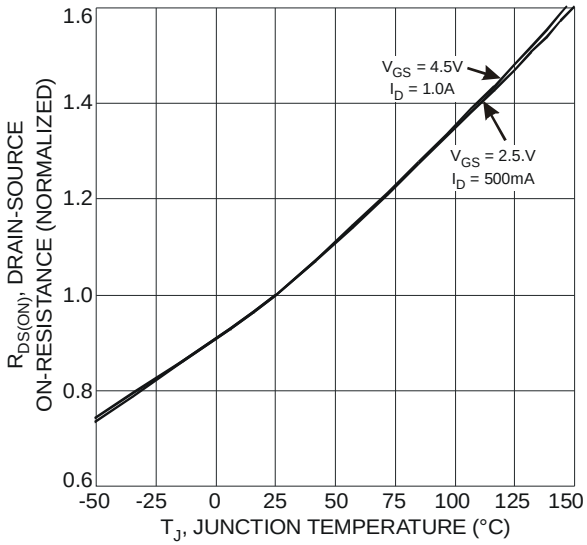


Fig. 5 On-Resistance Variation with Temperature

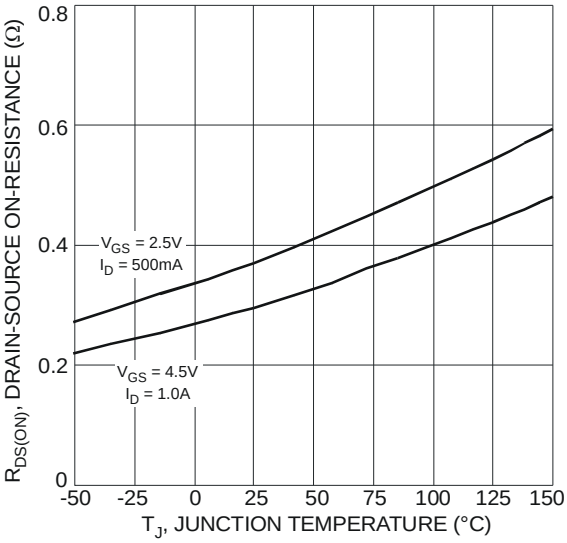


Fig. 6 On-Resistance Variation with Temperature

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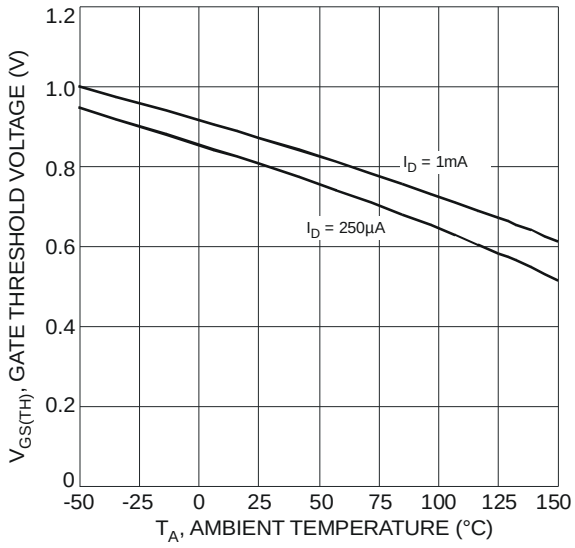


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

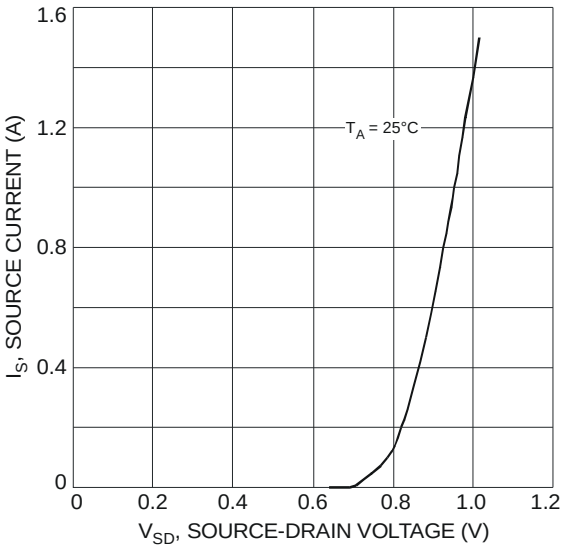


Fig. 8 Diode Forward Voltage vs. Current

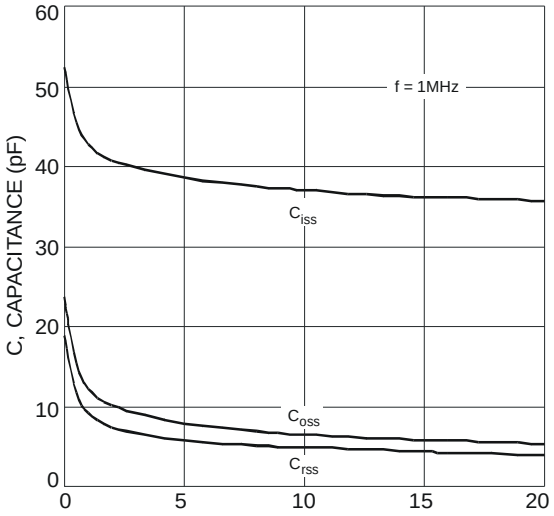


Fig. 9 Typical Capacitance

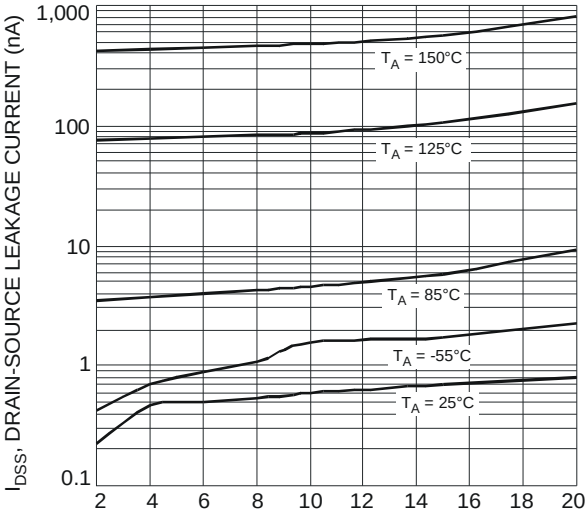


Fig. 10 Typical Drain-Source Leakage Current vs. Drain-Source Voltage

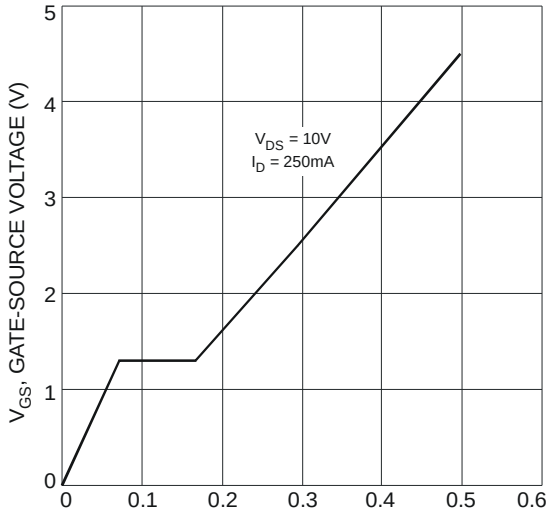


Fig. 11 Gate-Charge Characteristics

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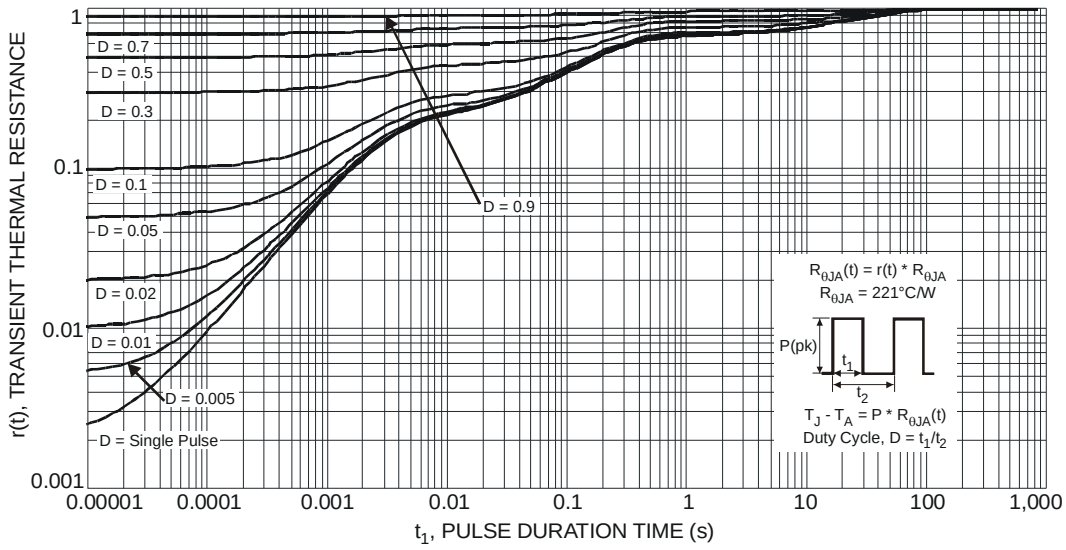
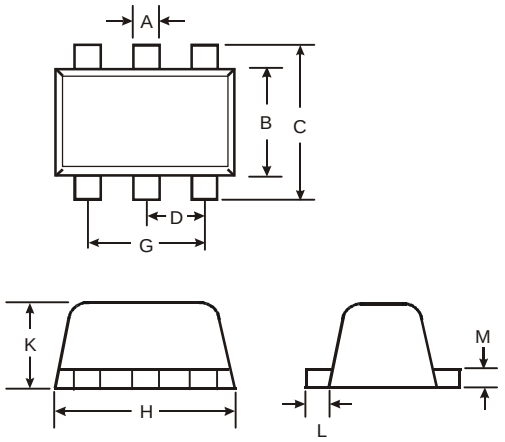


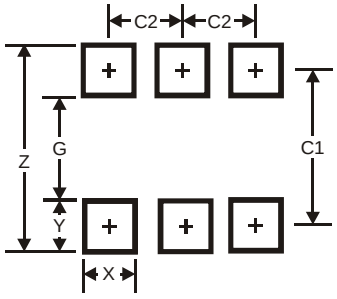
Fig. 12 Transient Thermal Response

Package Outline Dimensions



SOT-563			
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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