

DUAL N-CHANNEL ENHANCEMENT MODE MOSFET
Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	Package	I_D $T_A = +25^\circ\text{C}$
60V	8Ω @ $V_{GS} = 5\text{V}$	SOT363	170mA
	6Ω @ $V_{GS} = 10\text{V}$		200mA

Description

This new generation MOSFET is 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.

Applications

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

Features

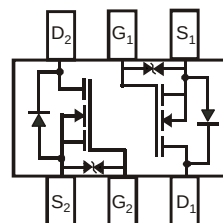
- Dual N-Channel MOSFET
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package
- ESD Protected Gate, 1KV (HBM)
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

Mechanical Data

- Case: SOT363
- Case Material: Molded Plastic; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208 (e3)
- Lead-Free Plating (Matte Tin Finish Annealed over Alloy 42 Leadframe).
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)



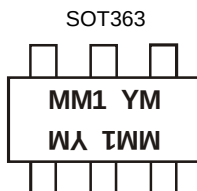
Top View


 Top View
 Internal Schematic

Ordering Information (Note 5)

Part Number	Case	Packaging
DMN65D8LDWQ-7	SOT363	3,000/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/quality/lead_free.html 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


MM1= Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: A = 2013)
 M = Month (ex: 9 = September)

Date Code Key

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Code	U	V	W	X	Y	Z	A	B	C	D	E	F

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}	60	V
Gate-Source Voltage				V _{GSS}	±20	V
Continuous Drain Current (Note 6)	V _{GS} = 10V	Steady State	T _A = +25°C T _A = +70°C	I _D	180 140	mA
Continuous Drain Current (Note 6)	V _{GS} = 5V	Steady State	T _A = +25°C T _A = +70°C	I _D	150 120	mA
Continuous Drain Current (Note 7)	V _{GS} = 10V	Steady State	T _A = +25°C T _A = +70°C	I _D	200 160	mA
Continuous Drain Current (Note 7)	V _{GS} = 5V	Steady State	T _A = +25°C T _A = +70°C	I _D	170 140	mA
Pulsed Drain Current (10μs pulse, duty cycle = 1%)				I _{DM}	800	mA

Thermal Characteristics

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 6)	P _D	300	mW
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	435	°C/W
Total Power Dissipation (Note 7)	P _D	400	mW
Thermal Resistance, Junction to Ambient (Note 7)	R _{θJA}	330	°C/W
Thermal Resistance, Junction to Case (Note 7)	R _{θJC}	139	°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 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	60	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1.0	μA	V _{DS} = 60V, V _{GS} = 0V
				5.0		
Gate-Body Leakage	I _{GSS}	—	—	±5.0	μA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(th)}	1.0	—	2.0	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(on)}	—	—	8	Ω	V _{GS} = 5.0V, I _D = 0.115A
		—	—	6	Ω	V _{GS} = 10.0V, I _D = 0.115A
Forward Transconductance	g _{FS}	80	—	—	mS	V _{DS} = 10V, I _D = 0.115A
Diode Forward Voltage	V _{SD}	—	0.8	1.2	V	V _{GS} = 0V, I _S = 115mA
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	22.0	—	pF	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	3.2	—		
Reverse Transfer Capacitance	C _{rss}	—	2.0	—		
Gate Resistance	R _G	—	79.9	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge V _{GS} = 10V	Q _g	—	0.87	—	nC	V _{GS} = 10V, V _{DS} = 30V, I _D = 150mA
Total Gate Charge V _{GS} = 4.5V	Q _g	—	0.43	—		
Gate-Source Charge	Q _{gs}	—	0.11	—		
Gate-Drain Charge	Q _{gd}	—	0.11	—		
Turn-On Delay Time	t _{D(on)}	—	3.3	—	nS	V _{DD} = 30V, I _D = 0.115A, V _{GEN} = 10V, R _{GEN} = 25Ω
Turn-On Rise Time	t _r	—	3.2	—		
Turn-Off Delay Time	t _{D(off)}	—	12.0	—		
Turn-Off Fall Time	t _f	—	6.3	—		

- 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.

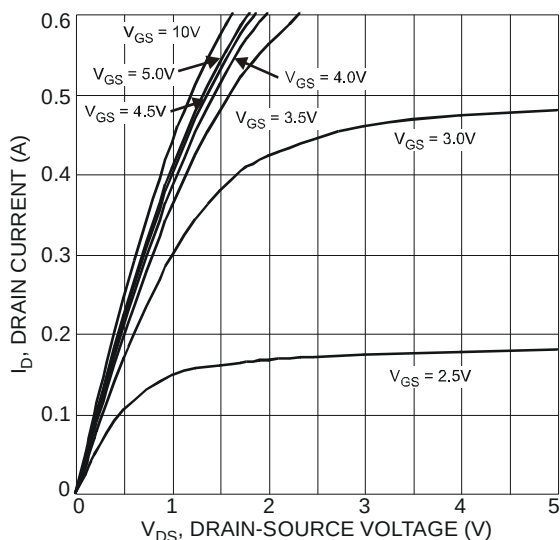


Fig.1 Typical Output Characteristic

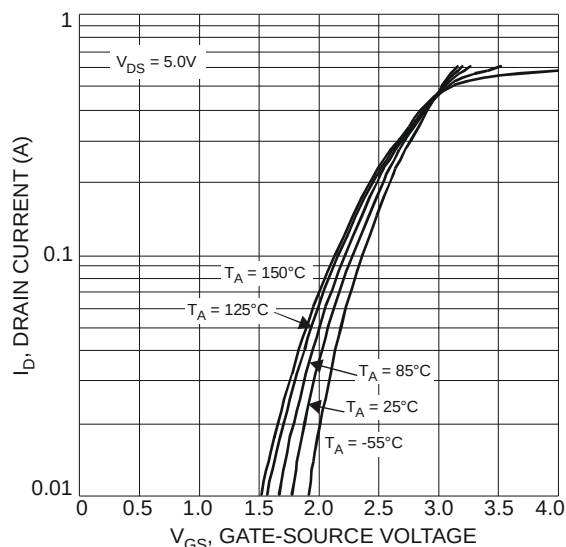


Fig.2 Typical Transfer Characteristics

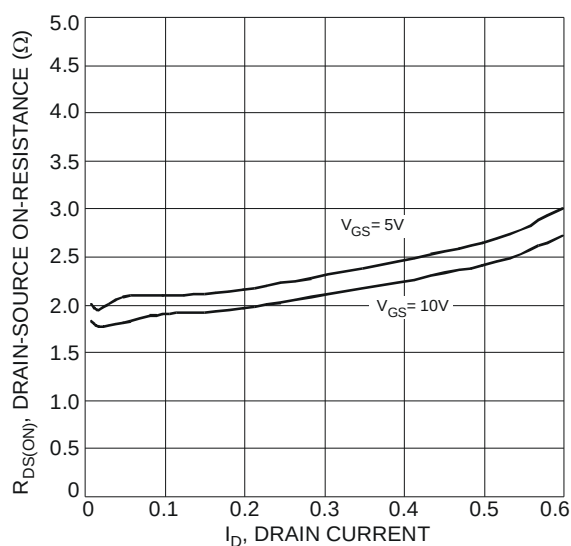


Fig.3 Typical On-Resistance vs. Drain Current and Temperature

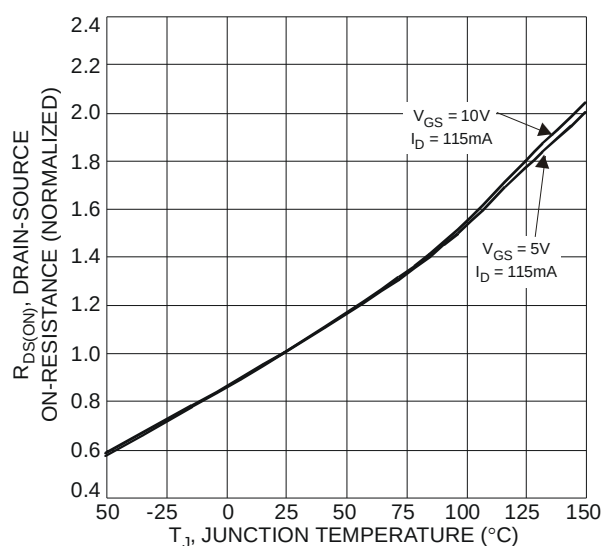


Fig.4 On-Resistance Variation with Temperature

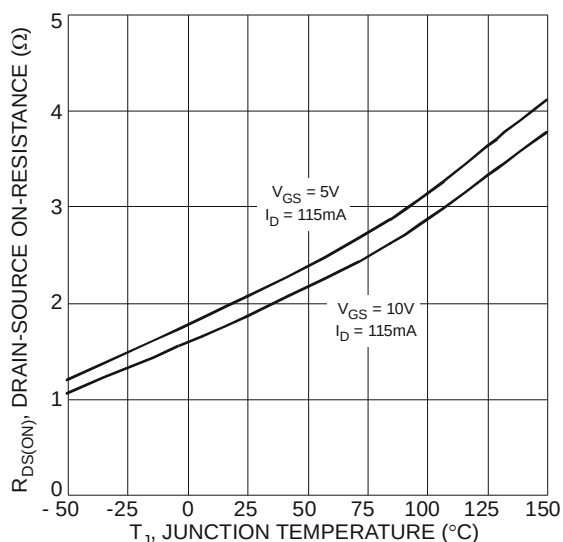


Fig.5 On-Resistance Variation with Temperature

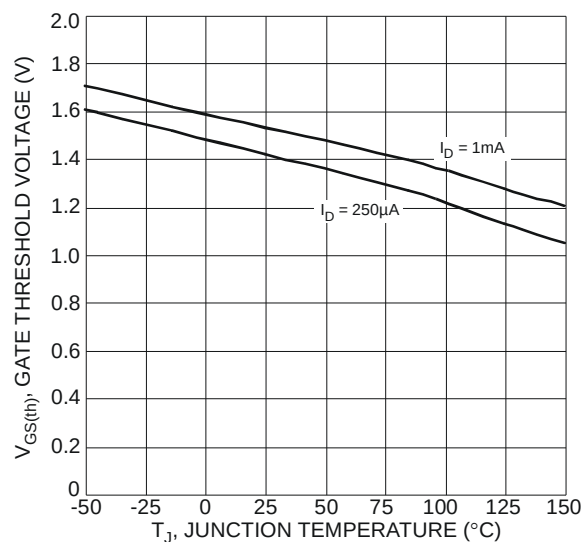


Fig.6 Gate Threshold Variation vs. Ambient Temperature

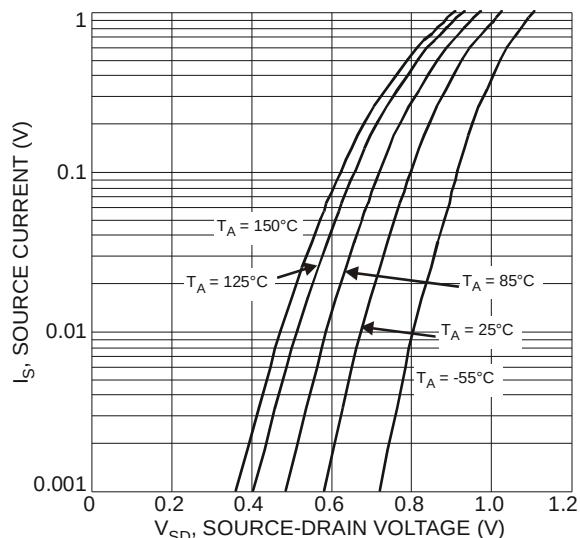


Fig. 7 Diode Forward Voltage vs. Current

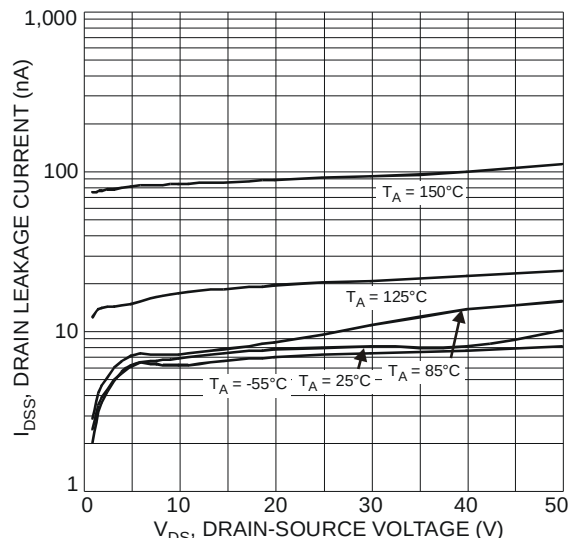


Fig. 8 Typical Drain-Source Leakage Current vs. Voltage

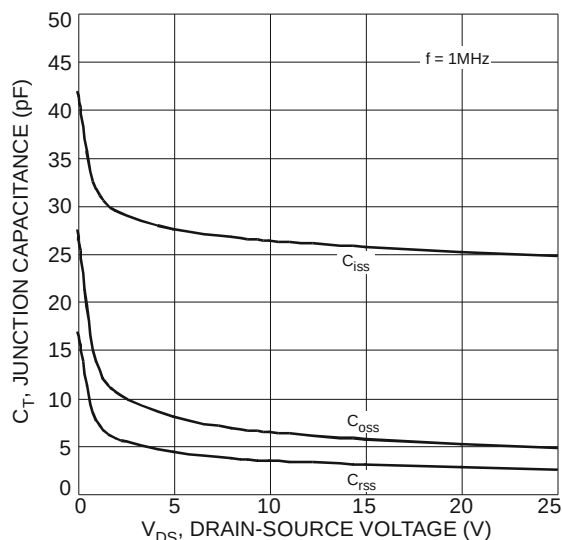


Fig. 9 Typical Junction Capacitance

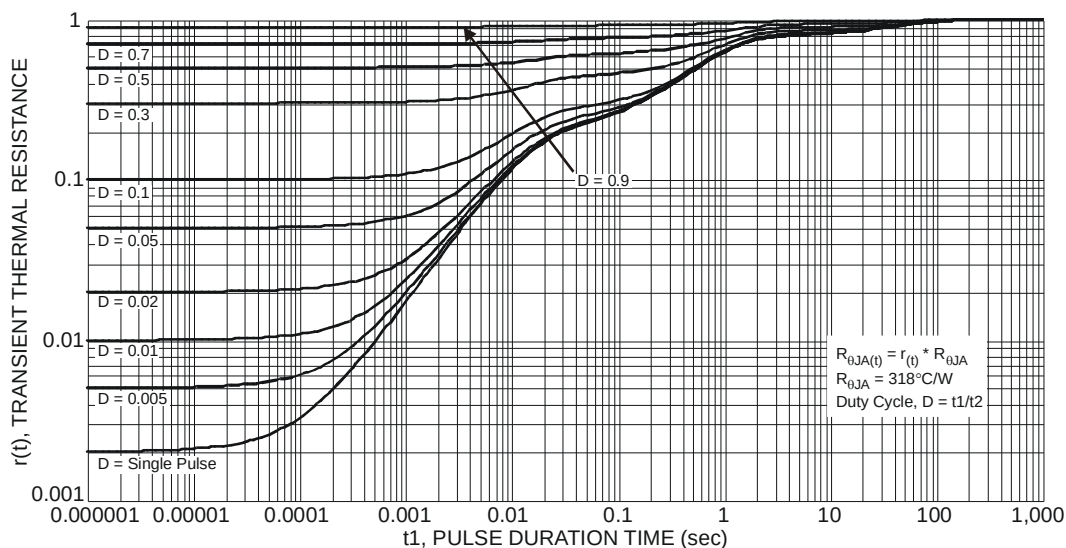
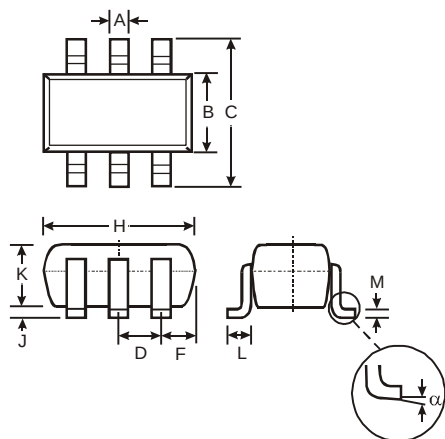


Fig. 10 Transient Thermal Resistance

Package Outline Dimensions

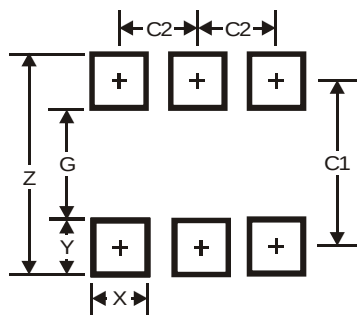
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT363			
Dim	Min	Max	Typ
A	0.10	0.30	0.25
B	1.15	1.35	1.30
C	2.00	2.20	2.10
D	0.65 Typ		
F	0.40	0.45	0.425
H	1.80	2.20	2.15
J	0	0.10	0.05
K	0.90	1.00	1.00
L	0.25	0.40	0.30
M	0.10	0.22	0.11
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	2.5
G	1.3
X	0.42
Y	0.6
C1	1.9
C2	0.65

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