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DMN2075UDW-7

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DIODES INCORPORATED

Lead-free Green

DMN2075UDW

N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)\ max}$	I_D T_A = 25°C
20V	48mΩ @ V_{GS} = 4.5V	2.8A
	59mΩ @ V_{GS} = 2.5V	2.6A

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.

- DC-DC Converters
- Power management functions

Benefit and Features

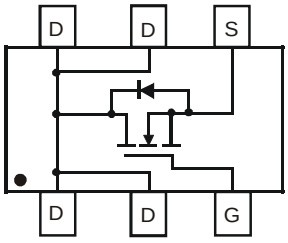
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SOT363
- 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 Alloy42 leadframe. Solderable per MIL-STD-202, Method 208
- Terminals Connections: See Diagram Below
- Weight: 0.006 grams (approximate)

SOT363

Top View



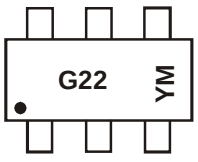
Top View
Internal Schematic

Ordering Information (Note 3)

Part Number	Case	Packaging
DMN2075UDW-7	SOT363	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



G22 = 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
Code	Y	Z	A	B	C	D	E

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

DMN2075UDW

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}	±8V	V
Continuous Drain Current (Note 5) V_{GS} = 4.5V	Steady State	T_A = 25°C T_A = 70°C	I_D	2.8 2.2	A
	t<5s	T_A = 25°C T_A = 70°C	I_D	3.1 2.5	A
Continuous Drain Current (Note 5) V_{GS} = 2.5V	Steady State	T_A = 25°C T_A = 70°C	I_D	2.6 2.1	A
	t<5s	T_A = 25°C T_A = 70°C	I_D	2.8 2.2	A
Pulsed Drain Current (10µs pulse, Duty cycle = 1%)			I_{DM}	20	A
Maximum Continuous Body Diode Current			I_S	1.0	A

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 4)		P_D	0.5	W
Thermal Resistance, Junction to Ambient (Note 4)	Steady state	$R_{\theta JA}$	257	°C/W
	t<5s		213	°C/W
Total Power Dissipation (Note 5)		P_D	0.58	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	$R_{\theta JA}$	221	°C/W
	t<5s		183	°C/W
Thermal Resistance, Junction to Case (Note 5)		$R_{\theta JC}$	65	°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}	-	-	1.0	µA	V_{DS} = 20V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	-	-	±100	nA	V_{GS} = ±8V, V_{DS} = 0V
ON CHARACTERISTICS (Note 5)						
Gate Threshold Voltage	$V_{GS(th)}$	0.4	-	1.0	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	-	40	48	mΩ	V_{GS} = 4.5V, I_D = 3A
		-	45	59		V_{GS} = 2.5V, I_D = 2A
		-	51	70		V_{GS} = 1.8V, I_D = 1A
		-	68	100		V_{GS} = 1.5V, I_D = 1A
Forward Transfer Admittance	$\|Y_{fs}\|$	-	13	-	S	V_{DS} = 5V, I_D = 3A
Diode Forward Voltage	V_{SD}	-	0.75	1.0	V	V_{GS} = 0V, I_S = 1A
DYNAMIC CHARACTERISTICS (Note 6)						
Input Capacitance	C_{iss}	-	594.3	-	pF	V_{DS} = 10V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	64.5	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	57.7	-	pF	
Gate Resistance	R_g	-	1.5	-	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge	Q_g	-	7.0	-	nC	V_{GS} = 4.5V, V_{DS} = 10V, I_D = 3.6A
Gate-Source Charge	Q_{gs}	-	0.9	-	nC	
Gate-Drain Charge	Q_{gd}	-	1.4	-	nC	
Turn-On Delay Time	$t_{D(on)}$	-	7.4	-	ns	V_{DD} = 10V, V_{GS} = 4.5V, R_L = 2.78Ω, R_G = 1.0Ω
Turn-On Rise Time	t_r	-	9.8	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	28.1	-	ns	
Turn-Off Fall Time	t_f	-	6.7	-	ns	

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

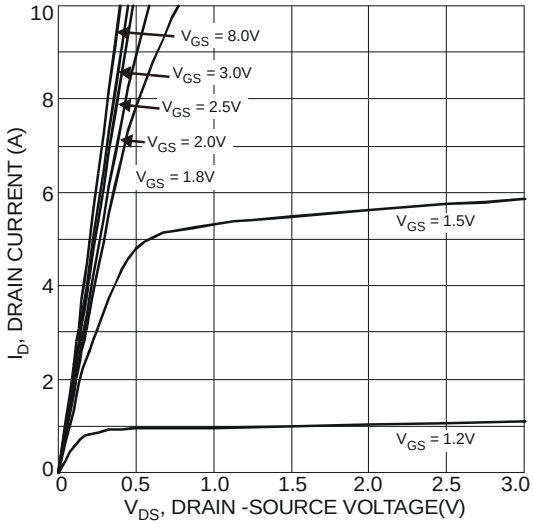


Fig. 1 Typical Output Characteristics

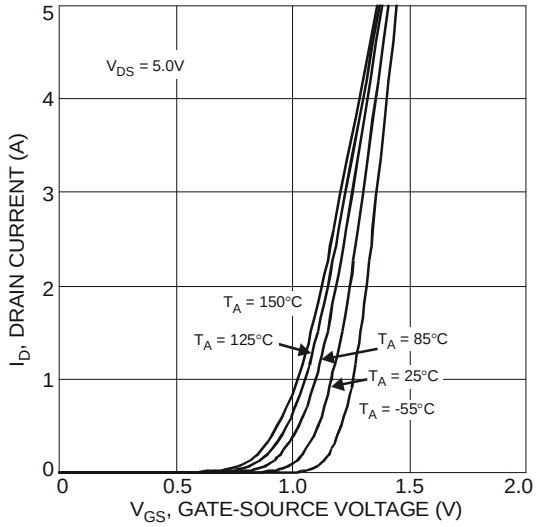


Fig. 2 Typical Transfer Characteristics

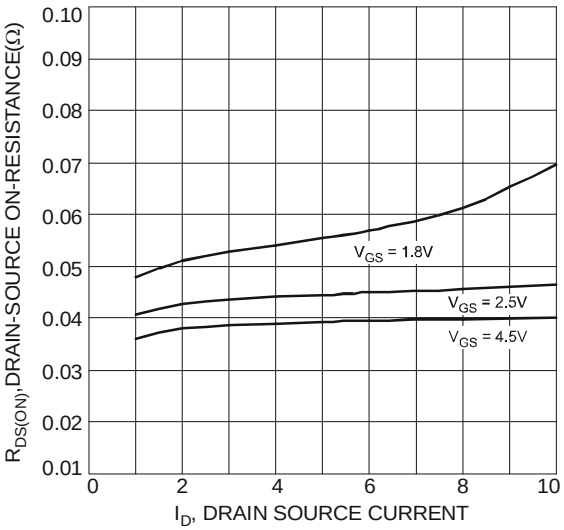


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

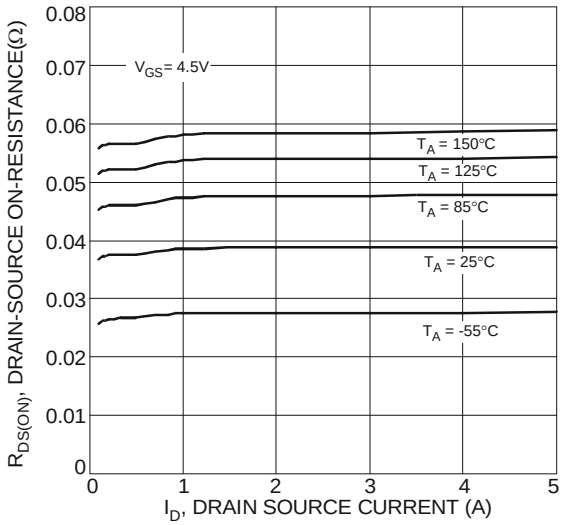


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

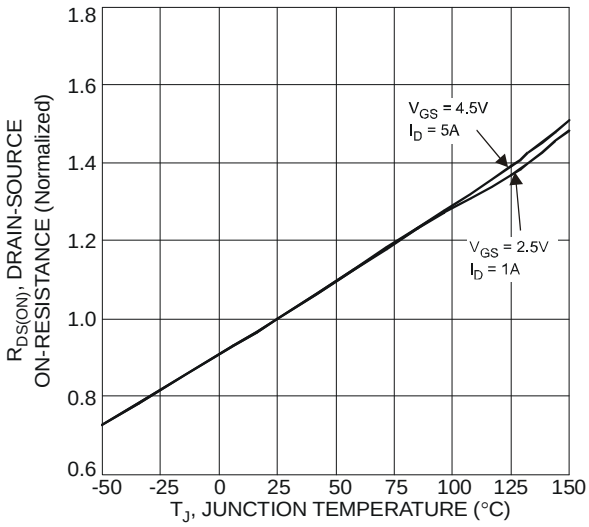


Fig. 5 On-Resistance Variation with Temperature

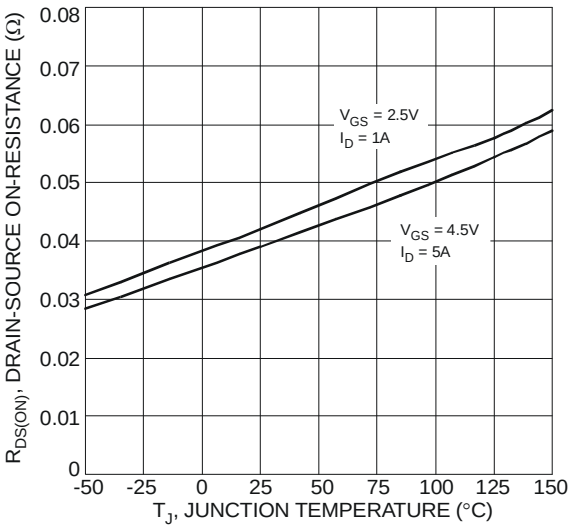


Fig. 6 On-Resistance Variation with Temperature

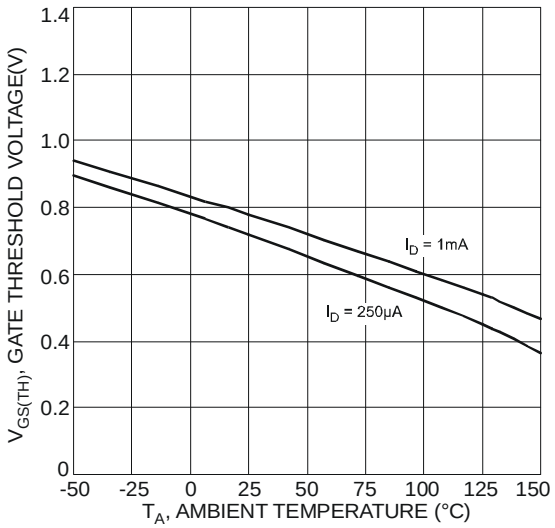


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

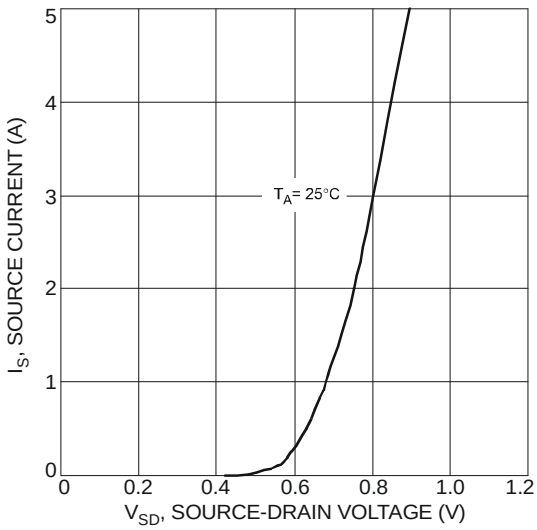


Fig. 8 Diode Forward Voltage vs. Current

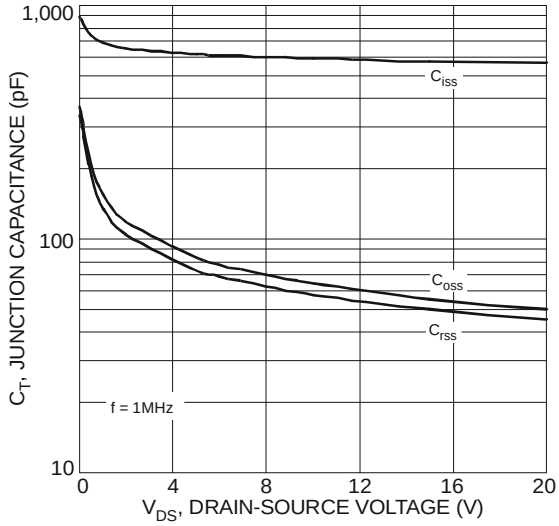


Fig. 9 Typical Junction Capacitance

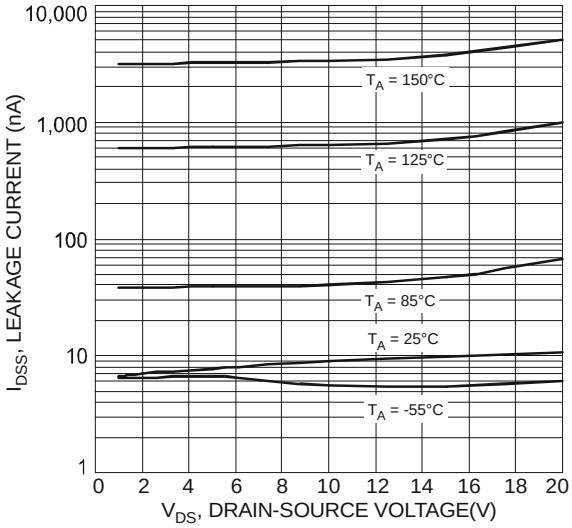


Fig. 10 Typical Drain-Source Leakage Current vs. Voltage

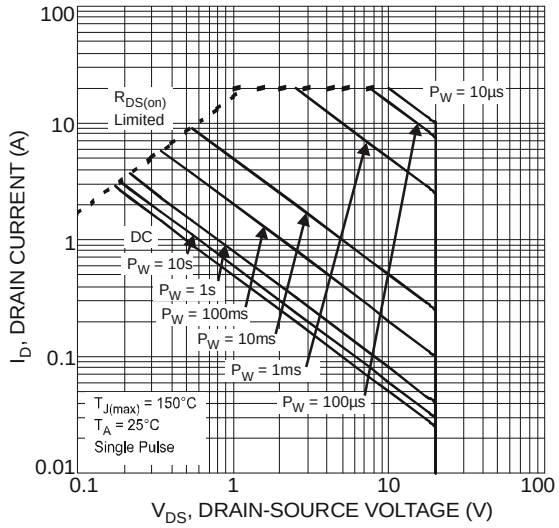


Fig. 11 SOA, Safe Operation Area

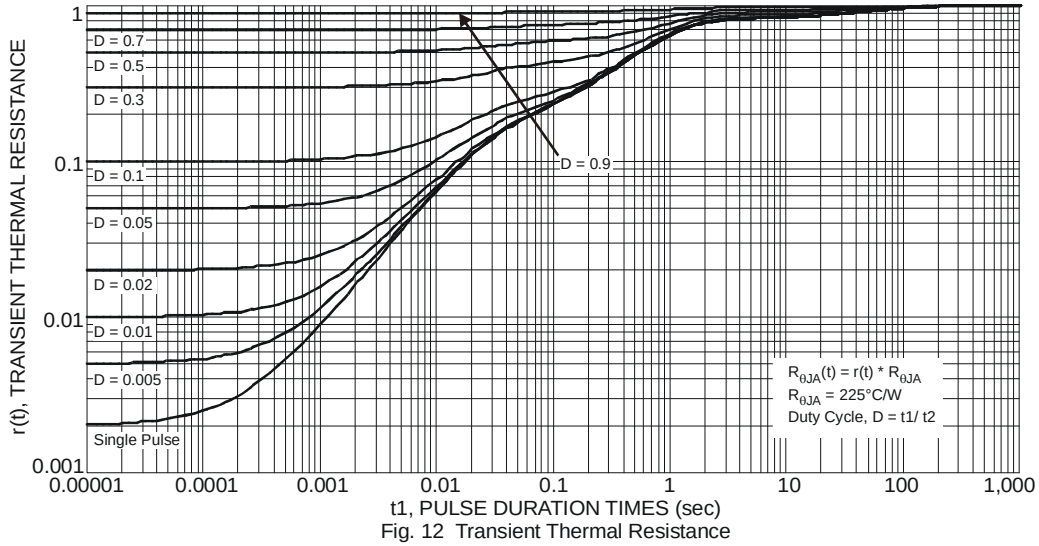
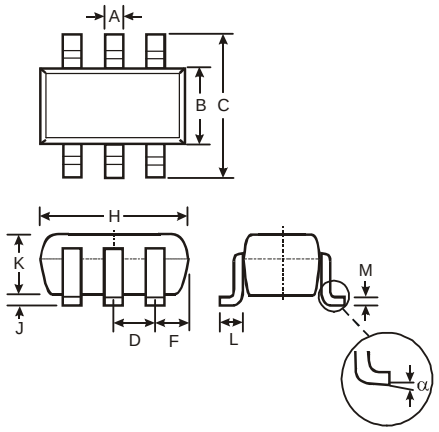


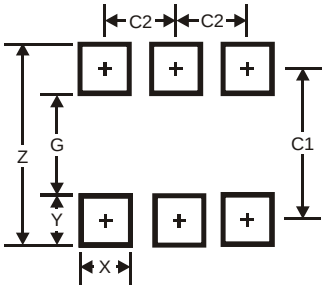
Fig. 12 Transient Thermal Resistance

Package Outline Dimensions



SOT363		
Dim	**Min**	**Max**
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Typ	
F	0.40	0.45
H	1.80	2.20
J	0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.22
α	0°	8°
All Dimensions in mm		

Suggested Pad Layout



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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