NEW PRODUCT

Lead-free Green

DMN33D8LDW

DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max T_A = +25°C
30V	3Ω @ V_{GS} = 4.5V	250 mA
	5Ω @ V_{GS} = 4.0V	200 mA
	7Ω @ V_{GS} = 2.5V	100 mA

Description

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.

Applications

- Motor Control
- Power Management Functions
- DC-DC Converters
- Backlighting

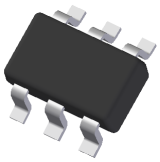
Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- ESD Protected Gate to 2kV
- **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**

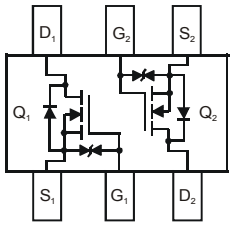
Mechanical Data

- Case: SOT363
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish — Matte Tin annealed over Alloy42 leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.006 grams (approximate)

SOT363



Top View



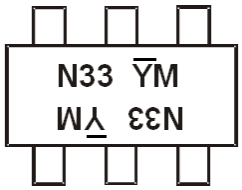
Top View
Internal Schematic

Ordering Information (Note 4)

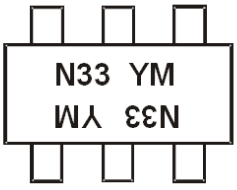
Part Number	Case	Packaging
DMN33D8LDW-7	SOT363	3K/Tape & Reel
DMN33D8LDW-13	SOT363	10K/Tape & Reel

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. For packaging details, go to our website at http"//www.diodes.com/products/packages.html

Marking Information



Chengdu A/T Site



Shanghai A/T Site

N33 = Product Type Marking Code
YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)
ȲM = Date Code Marking for CAT (Chengdu Assembly/ Test site)
Y or Ȳ = Year (ex: A = 2013)
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

NEW PRODUCT

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 5) V_{GS} = 4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	250 200	mA
Maximum Continuous Body Diode Forward Current (Note 5)			I_S	0.5	A
Pulsed Drain Current (10µs pulse, duty cycle=1%)			I_{DM}	0.8	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	0.35	W
	T_A = +70°C		0.22	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	360	°C/W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	126	
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 = 1mA
Zero Gate Voltage Drain Current @T_C = +25°C	I_{DSS}	—	—	1	µA	V_{DS} = 30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±10	µA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(th)}$	0.8	—	1.5	V	V_{DS} = 3V, I_D = 100µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	—	2.4	Ω	V_{GS} = 10V, I_D = 250mA
		—	—	3.0		V_{GS} = 4.5V, I_D = 250mA
		—	—	5.0		V_{GS} = 4.0V, I_D = 10mA
		—	—	7.0		V_{GS} = 2.5V, I_D = 5mA
		—	—	20		V_{GS} = 1.8V, I_D = 5mA
Forward Transfer Admittance	$\|Y_{fs}\|$	10	—	-	mS	V_{DS} = 3V, I_D = 10mA
Diode Forward Voltage	V_{SD}	—	—	1.2	V	V_{GS} = 0V, I_S = 115mA
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	—	48	—	pF	V_{DS} = 5V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	11	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	8	—	pF	
Gate Resistance	R_g	—	57	—	Ω	f=1MHz , Vgs=0V, Vds=0V
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	0.55	—	nC	V_{GS} = 10V, V_{DS} = 10V, I_D = 250mA
Total Gate Charge (V_{GS} = 10V)	Q_g	—	1.23	—	nC	
Gate-Source Charge	Q_{gs}	—	0.14	—	nC	
Gate-Drain Charge	Q_{gd}	—	0.14	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	2.9	—	ns	V_{DD} = 30V, V_{GS} = 10V, R_G = 25Ω, I_D = 200mA
Turn-On Rise Time	t_r	—	2.6	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	18.2	—	ns	
Turn-Off Fall Time	t_f	—	13.6	—	ns	

Notes: 5. Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. Copper, single sided.
6. Short duration pulse test used to minimize self-heating effect.
7. Guaranteed by design. Not subject to product testing.

NEW PRODUCT

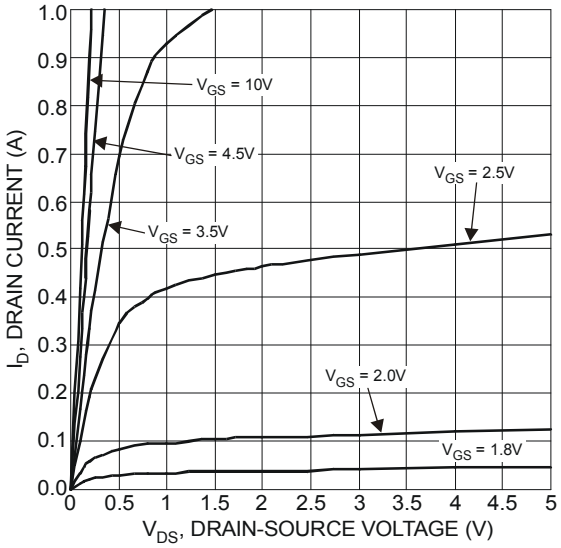


Figure 1 Typical Output Characteristics

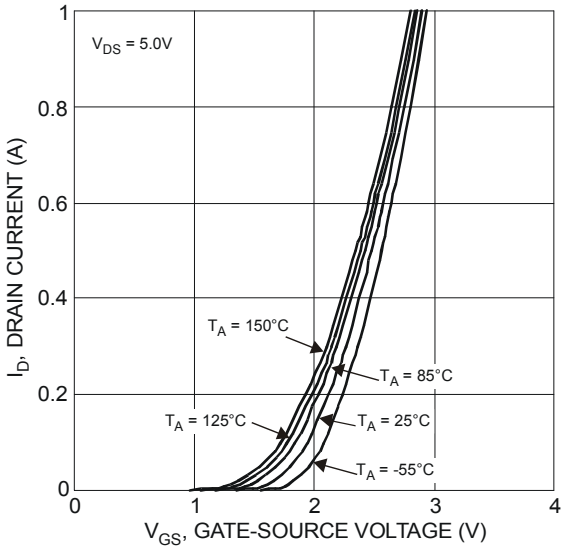


Figure 2 Typical Transfer Characteristics

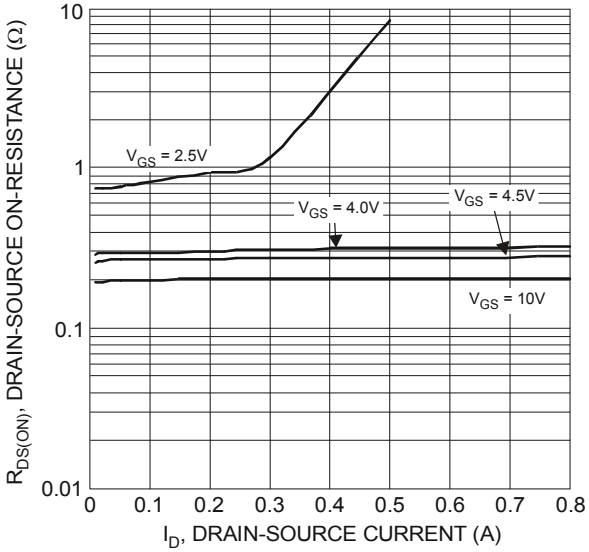


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

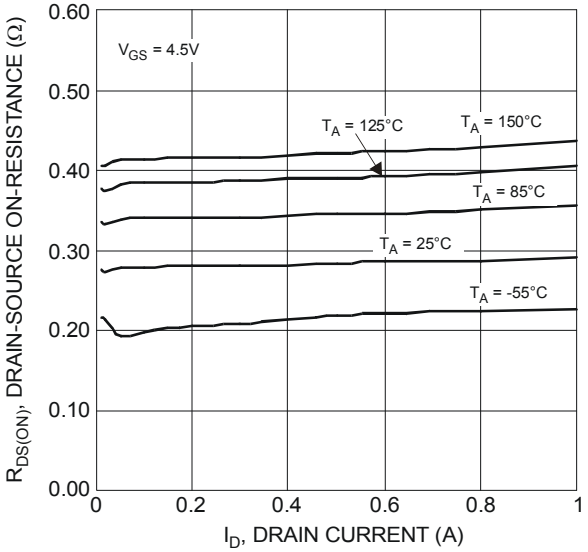


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

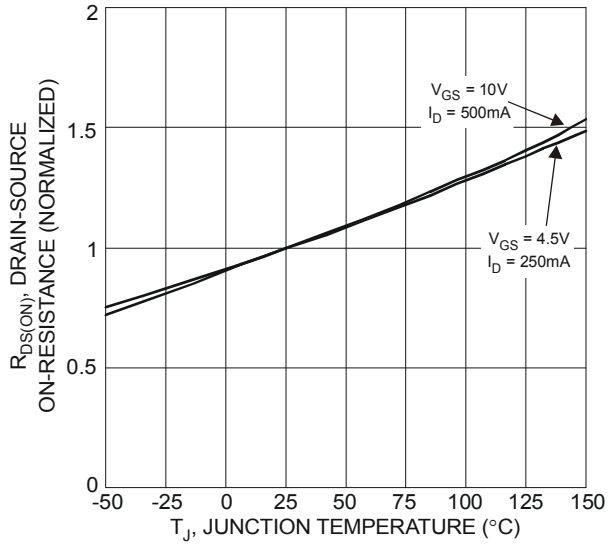


Figure 5 On-Resistance Variation with Temperature

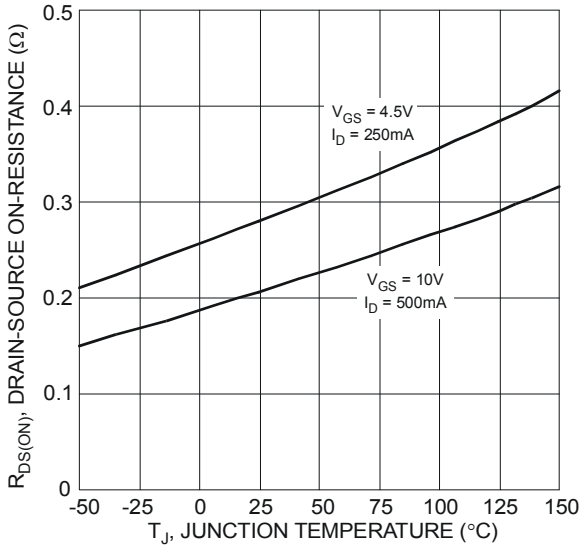


Figure 6 On-Resistance Variation with Temperature

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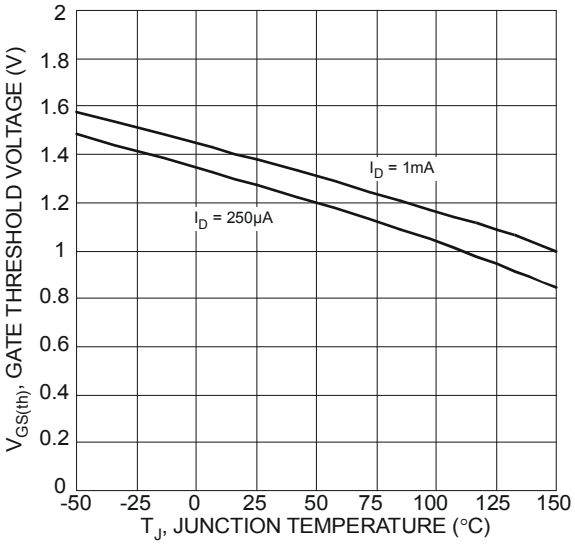

Figure 7 Gate Threshold Variation vs. Ambient Temperature

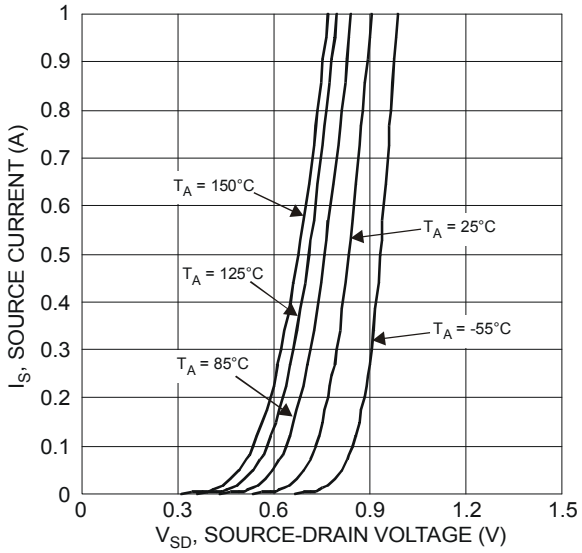

Figure 8 Diode Forward Voltage vs. Current

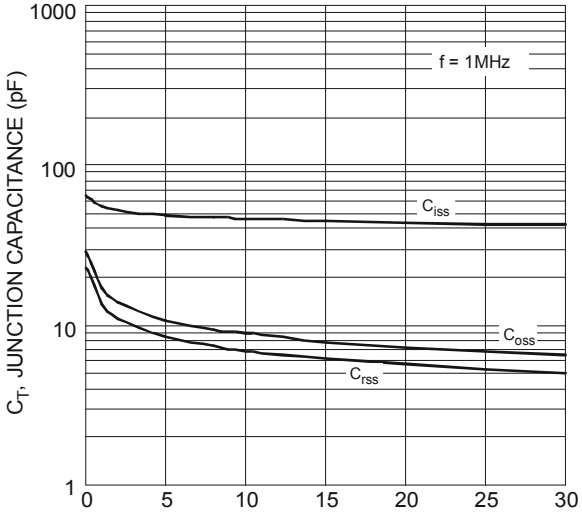

Figure 9 Typical Junction Capacitance

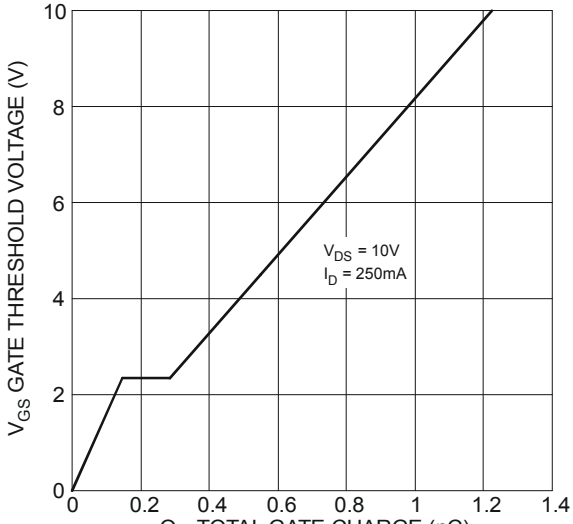

Figure 10 Gate Charge

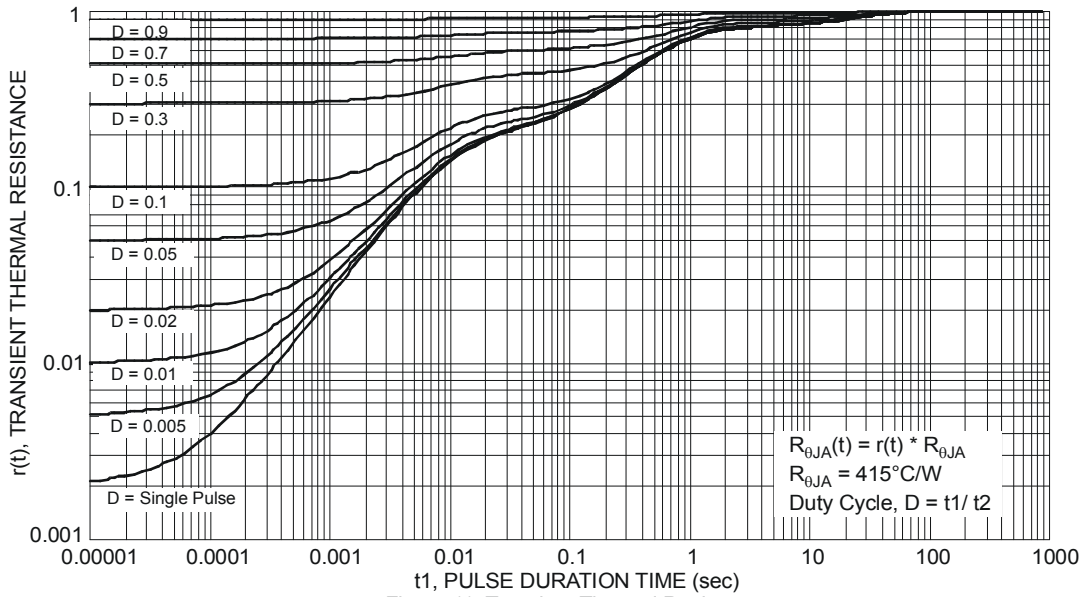

Figure 11 Transient Thermal Resistance

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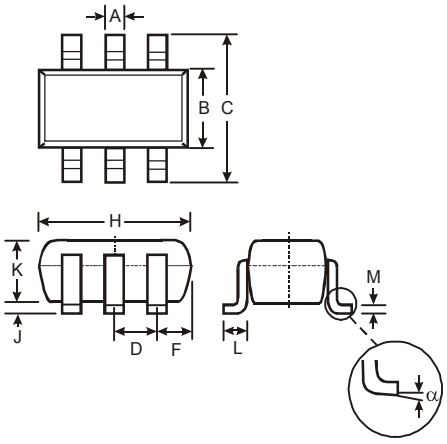
Package Outline Dimensions

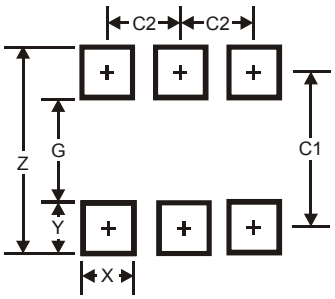
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



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

NEW PRODUCT

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