

DUAL N-CHANNEL ENHANCEMENT MODE MOSFET
Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ (MAX)	Package	I_D (MAX) $T_A = +25^{\circ}C$
30V	190m Ω @ $V_{GS} = 10V$	SOT363	1A
	335m Ω @ $V_{GS} = 4.5V$		0.75A

Description

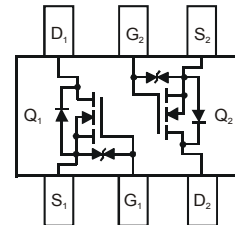
This MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- Motor Control
- Power Management Functions
- Load Switch



Top View


 Top View
Internal Schematic

Features and Benefits

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

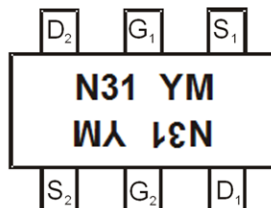
Mechanical Data

- 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)

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN3190LDW-7	SOT363	3000K/Tape & Reel
DMN3190LDW-13	SOT363	10000K/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


N31 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: Y = 2011)
 M = Month (ex: 9 = September)

Date Code Key

Year Code	2011	2012	2013	2014	2015	2016	2017
Code	Y	Z	A	B	C	D	E

Month Code	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 (@ $T_A = +25^\circ\text{C}$, 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 6) $V_{GS} = 10\text{V}$	I_D	$T_A = +25^\circ\text{C}$	1000
		$T_A = +70^\circ\text{C}$	900
Pulsed Drain Current (10 μs pulse, duty cycle=1%)	I_{DM}	$T_A = +25^\circ\text{C}$	1300
		$T_A = +70^\circ\text{C}$	1000
Maximum Continuous Body Diode Forward Current (Note 5)	I_S	0.5	A
Pulsed Drain Current (10 μs pulse, duty cycle=1%)	I_{DM}	2.0	A

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P_D	$T_A = +25^\circ\text{C}$	0.32
		$T_A = +70^\circ\text{C}$	0.19
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	Steady State	395
		$T < 5\text{s}$	320
Total Power Dissipation (Note 6)	P_D	$T_A = +25^\circ\text{C}$	0.4
		$T_A = +70^\circ\text{C}$	0.25
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	Steady State	320
		$T < 5\text{s}$	250
Thermal Resistance, Junction to Case	$R_{\theta JC}$	143	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	$V_{GS} = 0\text{V}, I_D = 1\text{mA}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	@ $T_C = +25^\circ\text{C}$, $V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	1.5	—	2.8	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	122	190	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 1.3\text{A}$
		—	181	335	$\text{m}\Omega$	$V_{GS} = 4.5\text{V}, I_D = 290\text{mA}$
Forward Transfer Admittance	$ Y_{fs} $	—	0.7	—	mS	$V_{DS} = 10\text{V}, I_D = 250\text{mA}$
Diode Forward Voltage	V_{SD}	—	—	1.2	V	$V_{GS} = 0\text{V}, I_S = 250\text{mA}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	87	—	pF	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	17	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	12	—	pF	
Gate Resistance	R_g	—	69.8	—	Ω	$f = 1\text{MHz}, V_{GS} = 0\text{V}, V_{DS} = 0\text{V}$
Total Gate Charge ($V_{GS} = 4.5\text{V}$)	Q_g	—	0.9	—	nC	$V_{DS} = 10\text{V}, I_D = 250\text{mA}$
Total Gate Charge ($V_{GS} = 10\text{V}$)	Q_g	—	2.0	—	nC	
Gate-Source Charge	Q_{gs}	—	0.3	—	nC	
Gate-Drain Charge	Q_{gd}	—	0.3	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	4.5	—	ns	$V_{DD} = 30\text{V}, V_{GS} = 10\text{V}, R_g = 10\Omega, I_D = 100\text{mA}$
Turn-On Rise Time	t_r	—	8.9	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	30.3	—	ns	
Turn-Off Fall Time	t_f	—	15.6	—	ns	

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

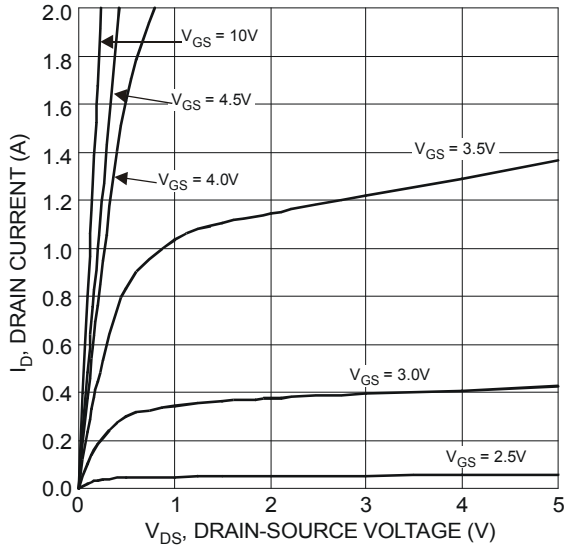


Figure 1 Typical Output Characteristic

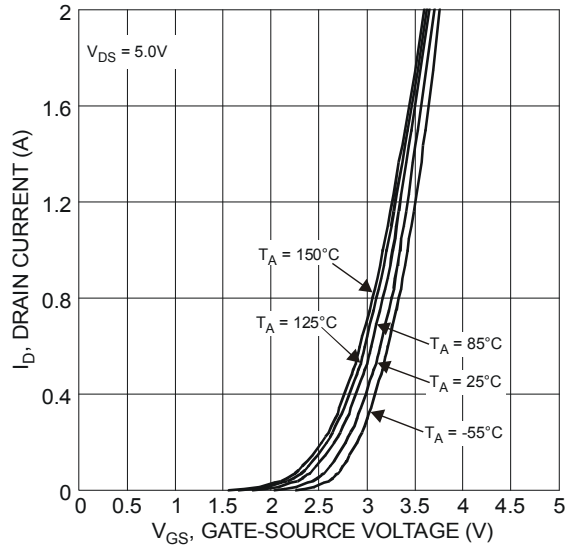


Figure 2 Typical Transfer Characteristics

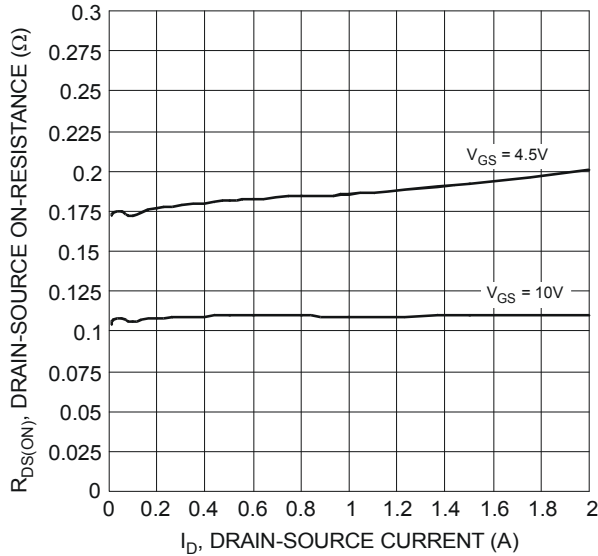


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

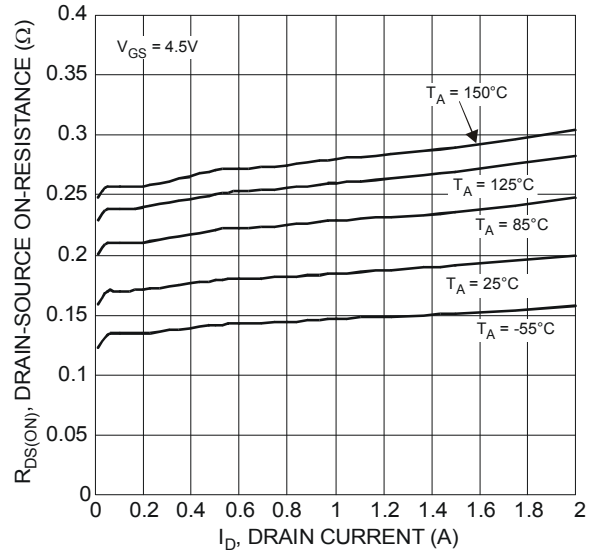


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

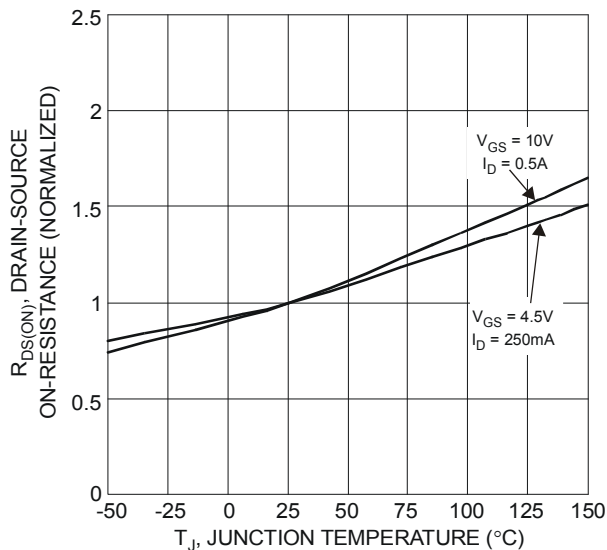


Figure 5 On-Resistance Variation with Temperature

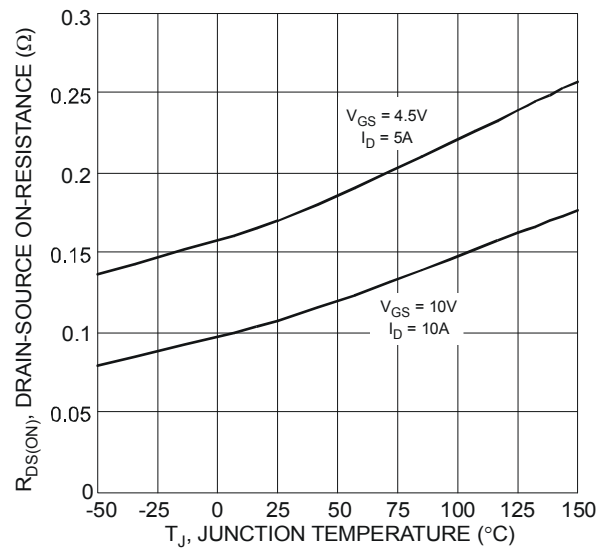


Figure 6 On-Resistance Variation with Temperature

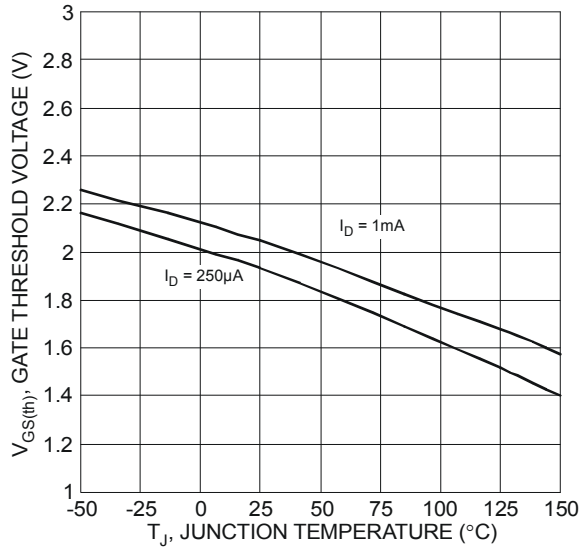


Figure 7 Gate Threshold Variation vs. Ambient Temperature

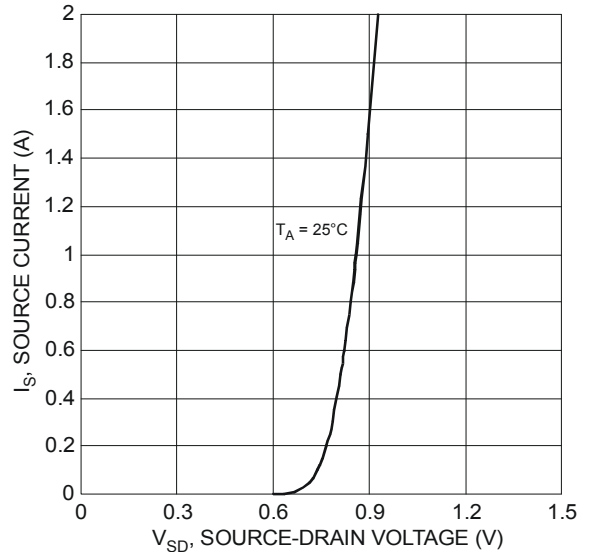


Figure 8 Diode Forward Voltage vs. Current

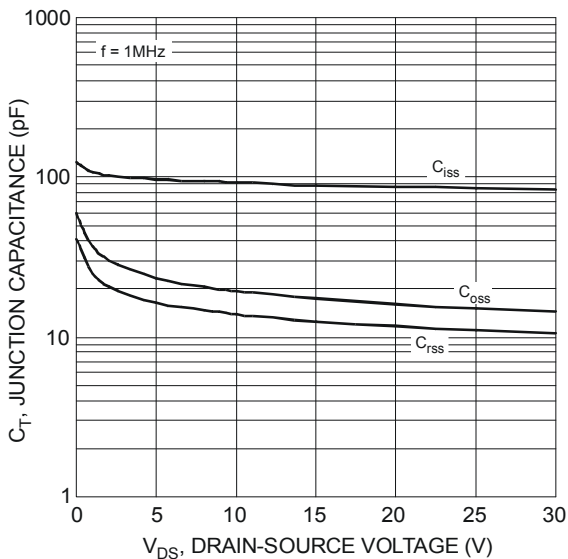


Figure 9 Typical Junction Capacitance

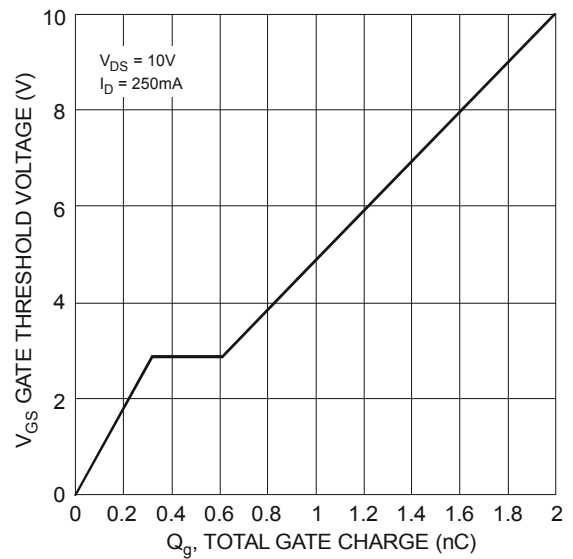
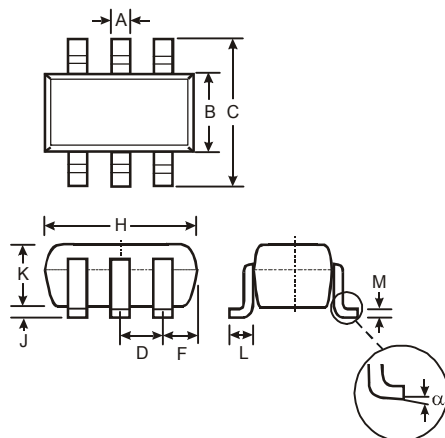


Figure 10 Gate Charge

Package Outline Dimensions

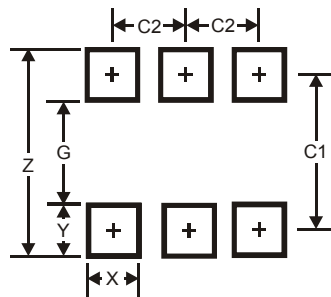
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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

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