NEW PRODUCT

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D $T_A = 25°C$
30V	2Ω @ V_{GS} = 4V	270mA
	3.2Ω @ V_{GS} = 2.5V	210mA

Features and Benefits

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

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.

- Backlighting
- DC-DC Converters
- Power management functions

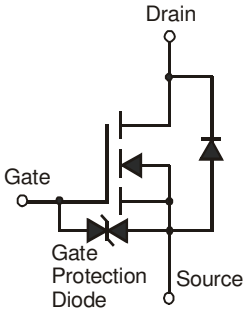
Mechanical Data

- Case: SOT-523
- 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 Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Weight: 0.002 grams (approximate)

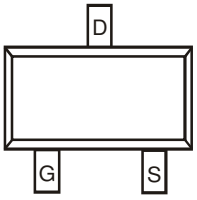
ESD PROTECTED TO 2kV

SOT-523

Top View



Equivalent Circuit



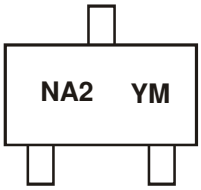
Top View
Pin-Out

Ordering Information (Note 3)

Part Number	Case	Packaging
DMN313DLT-7	SOT-523	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



NA2 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: X = 2010)
M = Month (ex: 9 = September)

Date Code Key

Year	2010	2011	2012	2013	2014	2015	2016
Code	X	Y	Z	A	B	C	D

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	Unit
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 4) V_{GS} = 4.0V	Steady State	T_A = 25°C T_A = 70°C	I_D	0.27 0.21	A
Continuous Drain Current (Note 5) V_{GS} = 4.0V	Steady State	T_A = 25°C T_A = 70°C	I_D	0.31 0.25	A
Continuous Drain Current (Note 5) V_{GS} = 4.0V	t ≤ 10s	T_A = 25°C T_A = 70°C	I_D	0.38 0.3	A
Continuous Drain Current (Note 4) V_{GS} = 2.5V	Steady State	T_A = 25°C T_A = 70°C	I_D	0.21 0.15	A
Continuous Drain Current (Note 5) V_{GS} = 2.5V	t ≤ 10s	T_A = 25°C T_A = 70°C	I_D	0.29 0.22	A
Pulsed Drain Current (Note 6)			I_{DM}	1.2	A

Thermal Characteristics

Characteristic	Symbol	Max	Unit
Power Dissipation (Note 4)	P_D	0.28	W
Thermal Resistance, Junction to Ambient @T_A = 25°C (Note 4)	$R_{\theta JA}$	474	°C/W
Power Dissipation (Note 5)	P_D	0.36	W
Thermal Resistance, Junction to Ambient @T_A = 25°C (Note 5)	$R_{\theta JA}$	361	°C/W
Power Dissipation (Note 5) t ≤ 10s	P_D	0.52	W
Thermal Resistance, Junction to Ambient @T_A = 25°C (Note 5) t ≤ 10s	$R_{\theta JA}$	252	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics @ T_A = 25°C unless otherwise stated

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	-	-	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current T_J = 25°C	I_{DSS}	-	-	0.1	µA	V_{DS} = 30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	-	-	±1.0	µA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	1.5	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	-	1.3	2	Ω	V_{GS} = 4V, I_D = 10mA
		-	1.6	3.2		V_{GS} = 2.5V, I_D = 1mA
Forward Transfer Admittance	$\|Y_{fs}\|$	-	93	-	mS	V_{DS} = 3V, I_D = 10mA
Diode Forward Voltage	V_{SD}	-	0.7	1.3	V	V_{GS} = 0V, I_S = 115mA
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	36.3	-	pF	V_{DS} = 5V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	7.6	-		
Reverse Transfer Capacitance	C_{rss}	-	4.7	-		
Gate Resistance	R_g	-	128	-	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge	Q_g	-	0.5	-	nC	V_{GS} = 4.5V, V_{DS} = 15V, I_D = 10mA
Gate-Source Charge	Q_{gs}	-	0.1	-		
Gate-Drain Charge	Q_{gd}	-	0.1	-		
Turn-On Delay Time	$t_{D(on)}$	-	4.5	-	ns	V_{GS} = 4.5V, V_{DS} = 15V, R_G = 2Ω, I_D = 180mA
Turn-On Rise Time	t_r	-	2.24	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	19.2	-	ns	
Turn-Off Fall Time	t_f	-	28.2	-	ns	

Notes:
4. Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
5. Device mounted on 2" x 2" FR-4 PCB with high coverage 2 oz. Copper, single sided.
6. Repetitive rating, pulse width limited by junction temperature.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

NEW PRODUCT

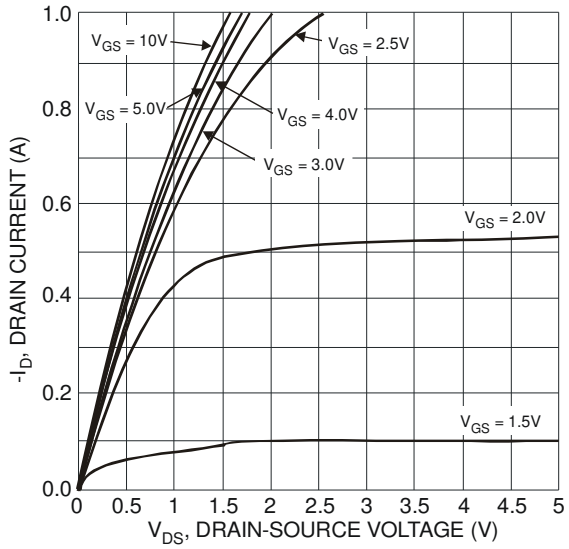


Fig. 1 Typical Output Characteristics

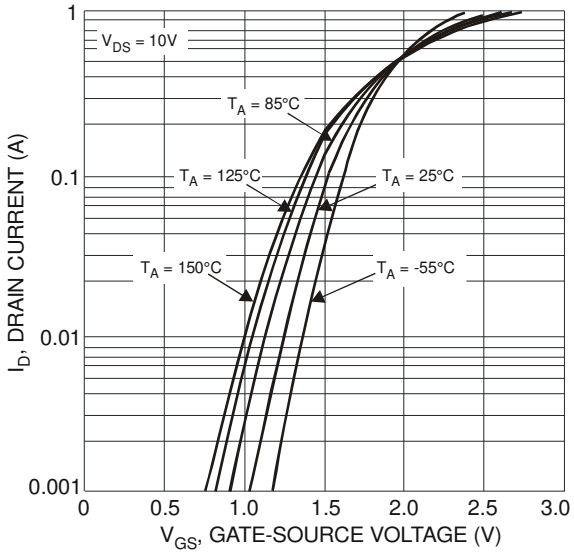


Fig. 2 Typical Transfer Characteristics

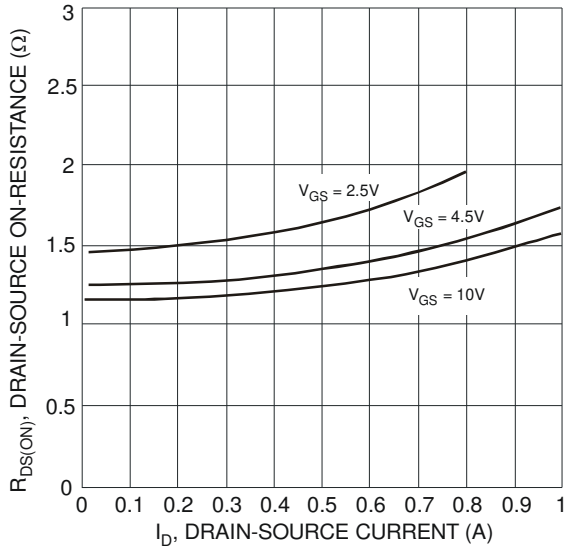


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

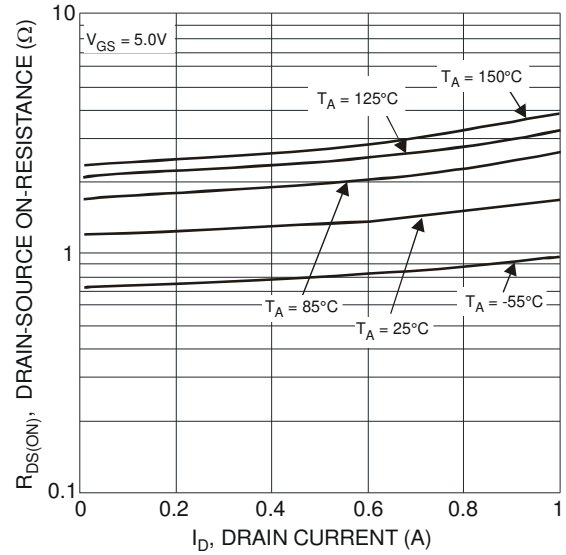


Fig. 4 Typical On-Resistance
vs. Drain Current and Temperature

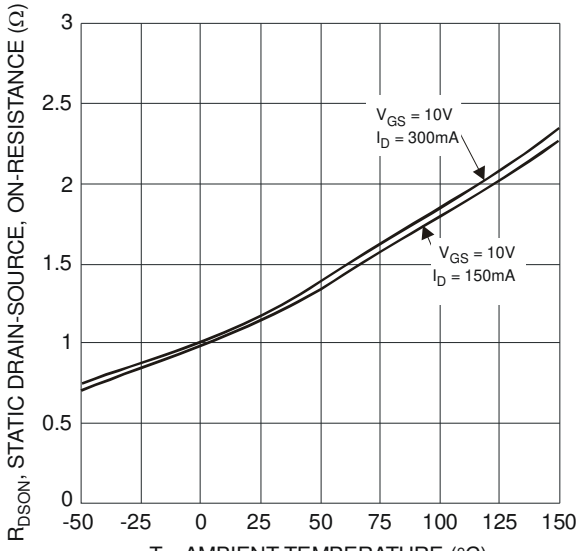


Fig. 5 On-Resistance Variation with Temperature

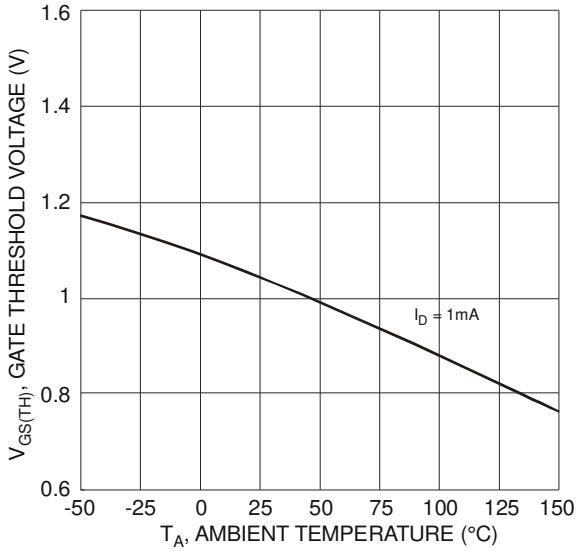


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

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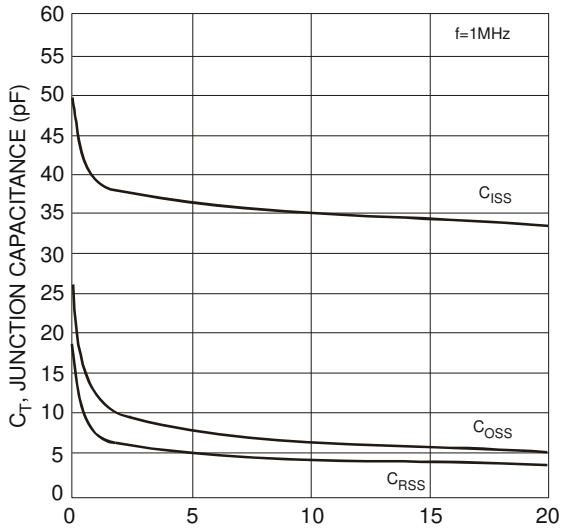


Fig. 7 Typical Junction Capacitance

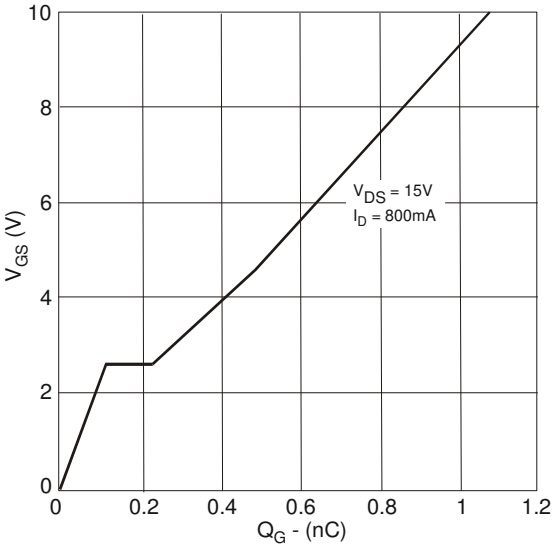


Fig. 08 Gate Charge Characteristics

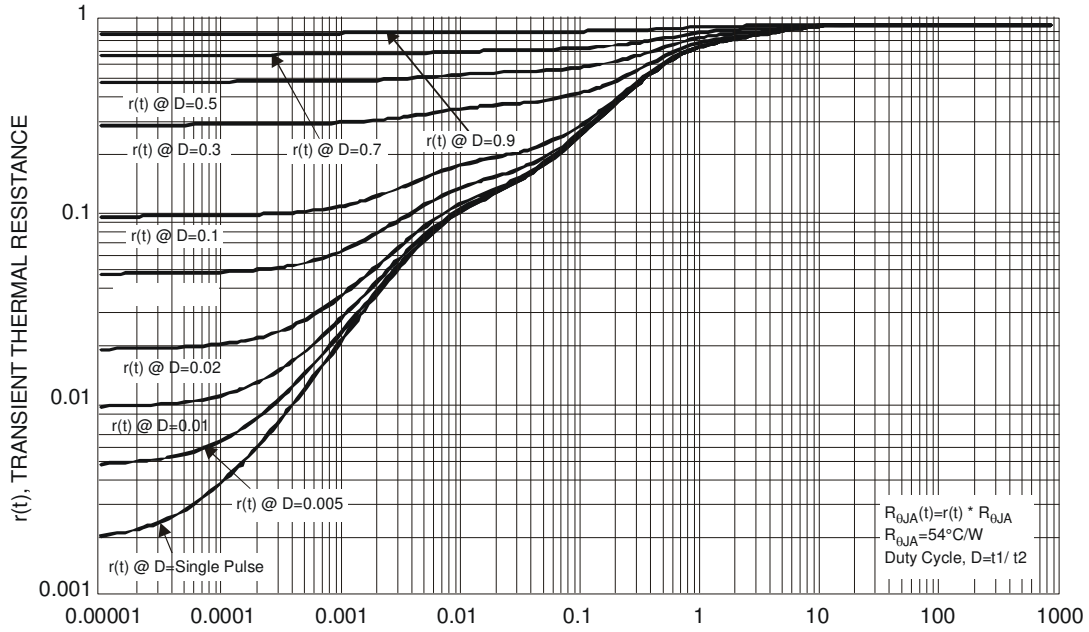
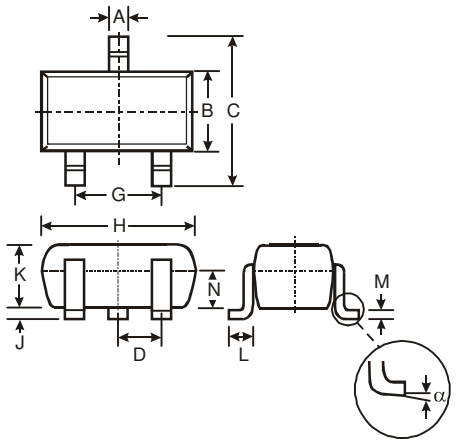


Fig. 9 Transient Thermal Resistance

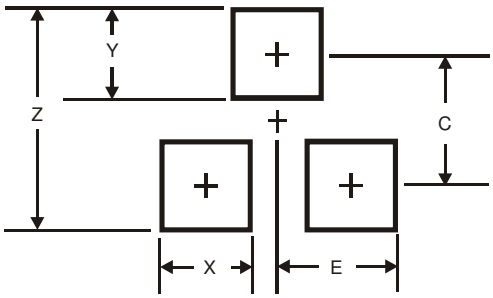
Package Outline Dimensions



SOT-523			
Dim	**Min**	**Max**	**Typ**
A	0.15	0.30	0.22
B	0.75	0.85	0.80
C	1.45	1.75	1.60
D	—	—	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
J	0.00	0.10	0.05
K	0.60	0.80	0.75
L	0.10	0.30	0.22
M	0.10	0.20	0.12
N	0.45	0.65	0.50
α	0°	8°	—
All Dimensions in mm			

NEW PRODUCT

Suggested Pad Layout



Dimensions	Value (in mm)
Z	1.8
X	0.4
Y	0.51
C	1.3
E	0.7