



N-CHANNEL ENHANCEMENT MODE FIELD MOSFET

Product Summary

BV _{SSS}	Rss(on) max	I _S T _A = +25°C		
30V	7.8 m Ω @ $V_{GS} = 10$ V	14.6A		

Description

This new generation MOSFET has been designed to minimize the on-state resistance ($R_{SS(ON)}$) with a 3.37mm x 1.47mm x 0.2mm size and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Features

- Built-in G-S Protection Diode Against ESD 2kV HBM.
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

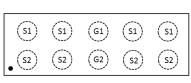
Mechanical Data

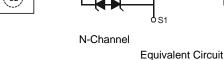
- Case: X4-DSN3415-10
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram

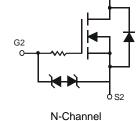
Applications

- Battery Management
- Load Switch
- Battery Protection









Top View

VICVV

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN3008SCP10-7	X4-DSN3415-10	3000/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

4A YM $\begin{array}{l} 4A = Product\ Type\ Marking\ Code \\ YM = Date\ Code\ Marking \\ Y\ or\ \overline{Y} = Year\ (ex:\ E = 2017) \\ M\ or\ \overline{M} = Month\ (ex:\ 9 = September) \end{array}$

Date Code Key

Year	201	5	2016		2017	20	18	2019		2020		2021
Code	С		D		Е		F	G		Н		
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D



Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Charac	teristic		Symbol	Value	Unit
Source -Source Voltage			V _{SSS}	30	V
Gate-Source Voltage (Note 5)			V _{GSS}	±20	V
Continuous Source Current @ T _A = +25°C (Note 6)	Steady State	$T_A = +25$ °C $T_A = +70$ °C	Is	14.6 11.6	А
Pulsed Source Current @ T _A = +2	25°C (Notes 6 & 7)	I _{SM}	80	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation, @ T _A = +25°C (Note 6)	P _D	2.7	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 6)	$R_{ hetaJA}$	46.9	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

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

<u> </u>							
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)	OFF CHARACTERISTICS (Note 8)						
Source to Source Breakdown Voltage T _J = +25°C	BV_{SSS}	30	_	_	V	$I_S = 250\mu A$, $V_{GS} = 0V$ TEST CIRCUIT 1	
Zero Gate Voltage Source Current T _J = +25°C	Isss		1	1.0	μΑ	V _{SS} = 24V, V _{GS} = 0V TEST CIRCUIT 1	
Gate-Body Leakage	IGSS		1	10	μΑ	$V_{GS} = \pm 20V$, $V_{DS} = 0V$ TEST CIRCUIT 2	
ON CHARACTERISTICS (Note 8)							
Gate Threshold Voltage	V _{GS(TH)}	1.3	1.6	2.3	V	V _{SS} = 10V, I _S = 250µA TEST CIRCUIT 3	
Static Source -Source On-Resistance	Dagrans		6.1	7.8	mΩ	$V_{GS} = 10 \text{ V}, I_S = 7.0 \text{A TEST CIRCUIT 5}$	
Static Source -Source On-Nesistance	R _{SS(ON)}		8.1	11	11152	$V_{GS} = 4.5V$, $I_S = 7.0A$ TEST CIRCUIT 5	
Body Diode Forward Voltage	$V_{F(S-S)}$	_	0.8	_	V	$I_F = 7.0A$, $V_{GS} = 0V$, TEST CIRCUIT 6	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	Ciss	_	1476	_		45)/)/ 6)/ (4.014)/	
Output Capacitance	Coss	_	204	_	pF	V _{SS} = 15V, V _{GS} = 0V, f = 1.0MHz TEST CIRCUIT 7	
Reverse Transfer Capacitance	Crss	1	97	_		TEST CIRCUIT	
Gate Resistance	R_g	_	436.8	_	Ω	Vss = 0V, $Vgs = 0V$, $f = 1MHz$	
Total Gate Charge (10V)	Qg	_	31.3	_	nC		
Total Gate Charge (4.5V)	Qg	_	15.8	_	nC	457.1	
Gate-Source Charge	Q_{gs}	_	4.7	_	nC	V _{SS} = 15V, I _S = 7A TEST CIRCUIT 9	
Gate-Drain Charge	Q_{gd}	-	6.3	_	nC	TEST CIRCUIT 9	
Gate Charge at V _{TH}	$Q_{g(TH)}$	1	3.1	_	nC		
Turn-On Delay Time	t _{D(ON)}		186	_	ns	1/ 45)/	
Turn-On Rise Time	t _R	1	314	_	ns	V _{SS} = 15V,	
Turn-Off Delay Time	t _{D(OFF)}	_	928	_	ns	$R_L = 2.1Ω$, $I_S = 7A$ TEST CIRCUIT 8	
Turn-Off Fall Time	t _F	1	858	_	ns	1201 0110011 0	

Notes:

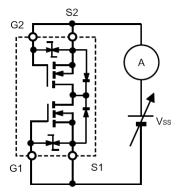
- 5. AEC-Q101 V_{GS} maximum is 16V.
- 6. Device mounted on FR-4 material with 1inch² (6.45cm²), 2oz (0.071mm thick) Cu.
- 7. Repetitive rating, pulse width limited by junction temperature.

 8. Short duration pulse test used to minimize self-heating effect.

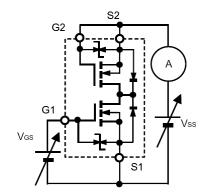
 9. Guaranteed by design. Not subject to production testing.



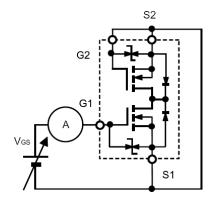
Test Circuits



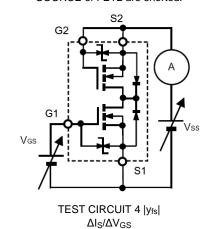
TEST CIRCUIT 1 Isss

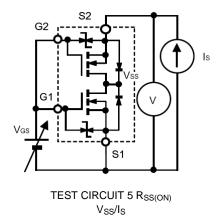


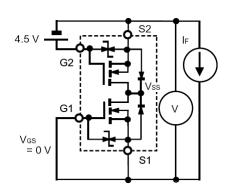
TEST CIRCUIT 3 V_{GS(OFF)}
When FET1 is measured, between GATE and SOURCE of FET2 are shorted.



TEST CIRCUIT 2 I_{GSS}
When FET1 is measured, between GATE and
SOURCE of FET2 are shorted.



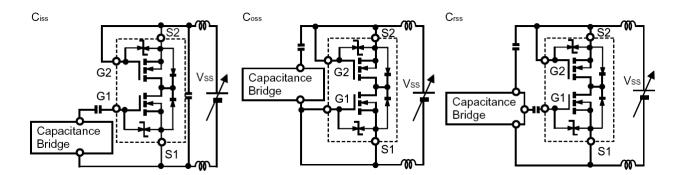




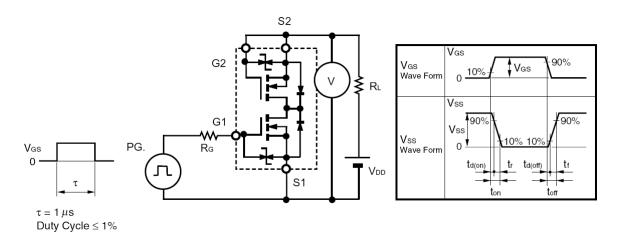
TEST CIRCUIT 6 $V_{F(S\text{-}S)}$ When FET1 is measured, FET2 is added V_{GS} +4.5V.



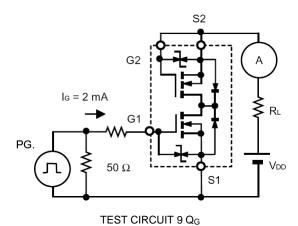
Test Circuits (Cont.)



TEST CIRCUIT 7

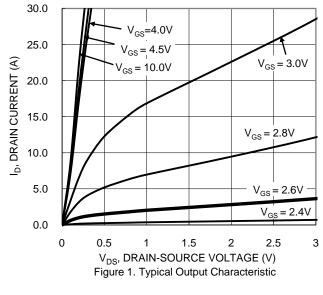


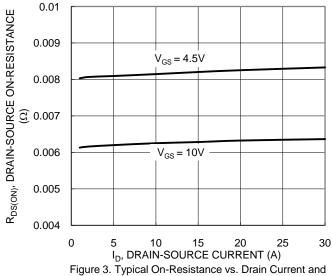
TEST CIRCUIT 8 $t_{d(on)}$, t_r , $t_{d(off)}$, t_f











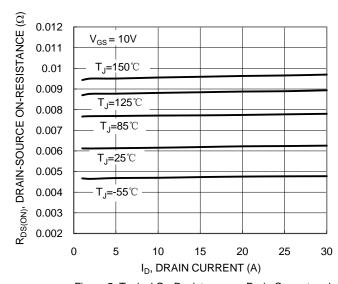
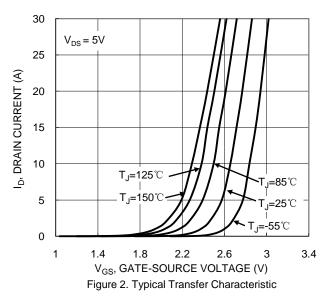
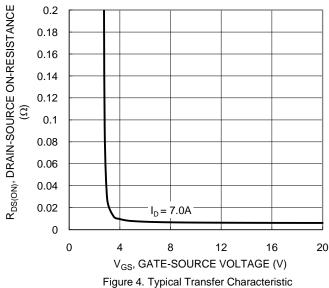


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

Gate Voltage





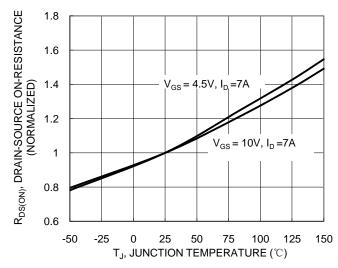


Figure 6. On-Resistance Variation with Junction Temperature



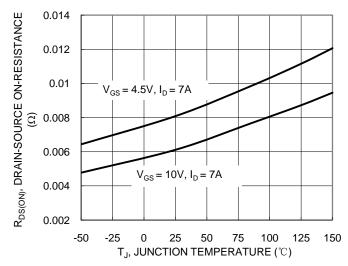


Figure 7. On-Resistance Variation with Junction Temperature

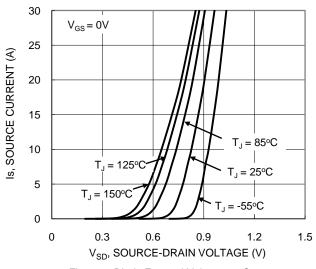
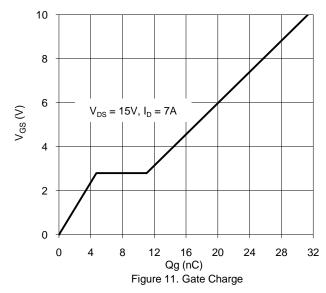


Figure 9. Diode Forward Voltage vs. Current



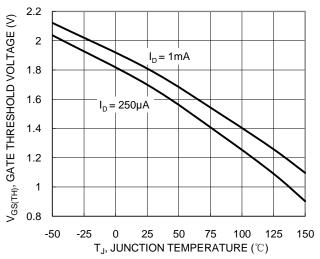
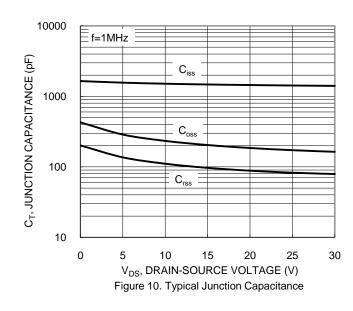


Figure 8. Gate Threshold Variation vs. Junction Temperature



100 ID, DRAIN CURRENT (A) 10 1 P_w=10ms $P_W = 100 ms$ $T_{J(Max)} = 150^{\circ}C$ 0.1 $T_C = 25^{\circ}C$ =1s Single Pulse DUT on 1*MRP Board DC V_{GS}= 4.5V 0.01 0.01 100 10 V_{DS} , DRAIN-SOURCE VOLTAGE (V) Figure 12. SOA, Safe Operation Area



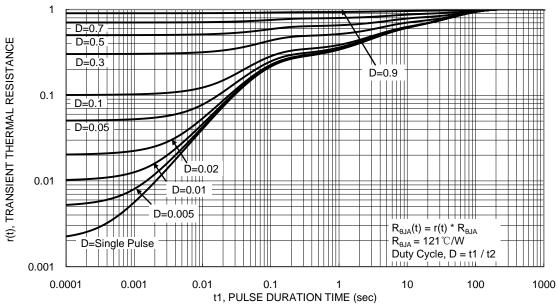
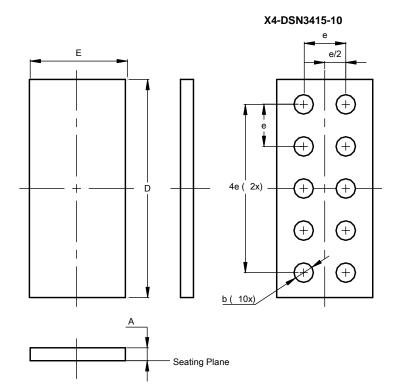


Figure 13. Transient Thermal Resistance



Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

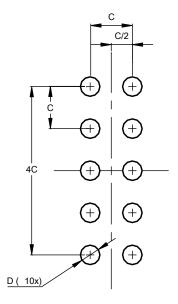


X4-DSN3415-10							
Dim	Min	Max	Тур				
Α	0.18	0.22	0.20				
b	0.27	0.33	0.30				
D	3.32	3.42	3.37				
Е	1.42	1.52	1.47				
е			0.65				
All Dimensions in mm							

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

X4-DSN3415-10



Dimensions	Value (in mm)		
С	0.65		
D	0.30		



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многоканальный

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Офис по работе с юридическими лицами:

105318, г. Москва, ул. Щербаковская д. 3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru moschip.ru_6 moschip.ru_4 moschip.ru_9