



N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

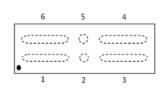
BV _{SSS}	R _{SS(ON)} Typ	I _{S Max} T _A = +25°C
12V	$2.5 \text{m}\Omega$ @ $V_{GS} = 3.8 \text{V}$	23.6A

Description

This new generation MOSFET has been designed to minimize the onstate resistance (RSS(ON)) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- **Battery Management**
- Load Switch
- **Battery Protection**



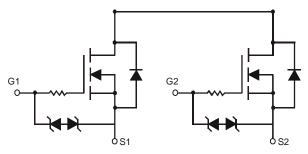
- 1. Source 1
- 2. Gate 1
- 3. Source 1 4. Source 2
- 5. Gate 2
- 6. Source 2

Features

- CSP with Footprint 3.54mm x 1.77mm
- Height = 0.21mm for Low Profile
- **ESD Protection of Gate**
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/

Mechanical Data

- Case: X3-DSN3518-6
- Terminal Connections: See Diagram Below
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish NiPdAu. Solderable per MIL-STD-202, Method 208 @4)
- Weight: 0.0026 grams (Approximate)



Equivalent Circuit

Ordering Information (Note 4)

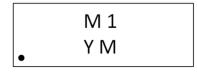
Part Number	Case	Packaging
DMN1003UCA6-7	X3-DSN3518-6	3000/Tape & Reel

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
- 2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and
- 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 https://www.diodes.com/design/support/packaging/diodes-packaging/

Top View

Marking Information



M1 = Product Type Marking Code YM = Date Code Marking Y or \overline{Y} = Year (ex: G = 2019) M or \overline{M} = Month (ex: 9 = September)

Date Code Kev

Year	2017	2018	20	019	2020	2021		2022	2023	202	24	2025
Code	Е	F		G	Н	ı		J	K	L		М
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.)

Characteristic	Symbol	Value	Unit		
Source-Source Voltage	Vsss	12	V		
Gate-Source Voltage			Vgss	±8	V
Continuous Source Current (Note 5) V _{GS} = 4.5V	Steady State	T _A = +25°C T _A = +70°C	Is	23.6 18.9	А
Continuous Source Current (Note 5) V _{GS} = 2.5V	Is	16.8 13.4	А		
Pulsed Source Current (Note 6)	Isм	100	Α		

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 7)	PD	1.05	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 7)	R _{θJA}	120.7	°C/W
Power Dissipation (Note 5)	P _D	2.67	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5)	Reja	46.8	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

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

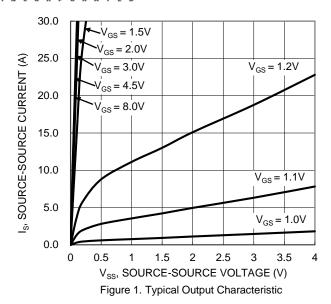
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)							
Source-Source Breakdown Voltage	BVsss	12	_	_	V	$V_{GS} = 0V$, $I_{S} = 1mA$	
Zero Gate Voltage Source Current T _J = +25°C	Isss		1	1	μΑ	Vss = 10V, Vgs = 0V	
Gate-Source Leakage	I _{GSS}	_	_	±10	μΑ	$V_{GS} = \pm 8V$, $V_{SS}=0V$	
ON CHARACTERISTICS (Note 8)							
Gate Threshold Voltage	$V_{GS(TH)}$	0.5	_	1.3	V	$V_{SS} = 6V$, $I_{S} = 1mA$	
		1.6	2.3	3.2		$V_{GS} = 4.5V, I_{S} = 5A$	
		1.7	2.4	3.2		$V_{GS} = 4.0V, I_{S} = 5A$	
Static Source-Source On-Resistance	Rss(on)	1.8	2.5	3.2	mΩ	$V_{GS} = 3.8V$, $I_{S} = 5A$	
		1.9	2.7	4.4		$V_{GS} = 3.1V, I_{S} = 5A$	
		2.1	3.0	6.3		$V_{GS} = 2.5V$, $I_{S} = 5A$	
Diode Forward Voltage	Vss	_	0.7	1.2	V	Vgs = 0V, Is = 3A	
DYNAMIC CHARACTERISTICS (Note 9)						•	
Input Capacitance	Ciss		3315			N	
Output Capacitance	Coss		850		pF	Vss = 6V, $Vgs = 0V$, $f = 1.0MHz$	
Reverse Transfer Capacitance	Crss		248			1 – 1.01/11/12	
Total Gate Charge	Qg		56.5				
Gate-Source Charge	Qgs		8.8	_	nC	Vss = 6V, Vgs = 4.5V,	
Gate-Drain Charge	Q_{gd}	_	13.3	_	110	I _S = 27A	
Gate Charge at VTH	Q _{g(TH)}		6.9	_			
Turn-On Delay Time	tD(ON)	_	603	_			
Turn-On Rise Time	t _R	_	1694	_		$V_{SS} = 6V, V_{GS} = 4.5V,$	
Turn-Off Delay Time	tD(OFF)	_	4749	_	ns	Is = 3A	
Turn-Off Fall Time	tF	_	6208	_			

Notes:

- Device mounted on FR-4 material with 1-inch² (6.45-cm²), 2-oz. (0.071-mm thick) Cu.
 Repetitive rating, pulse width limited by junction temperature.
 Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.

- 8. Short duration pulse test used to minimize self-heating effect.
- 9. Guaranteed by design. Not subject to production testing.





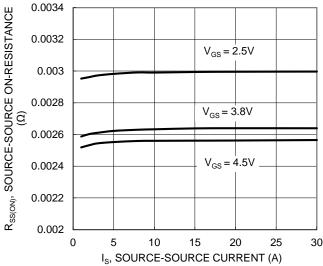


Figure 3. Typical On-Resistance vs. Source Current and Gate Voltage

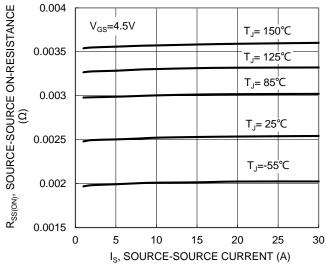


Figure 5. Typical On-Resistance vs. Source Current and Junction Temperature

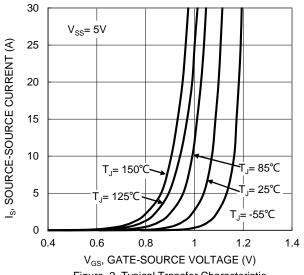
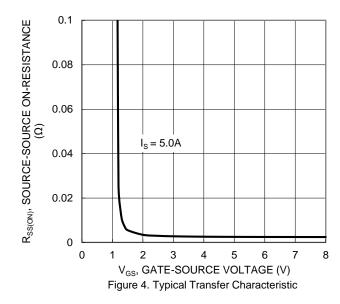


Figure 2. Typical Transfer Characteristic



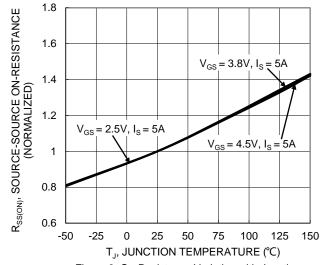
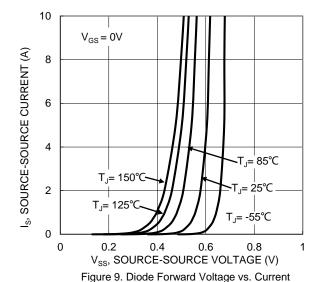


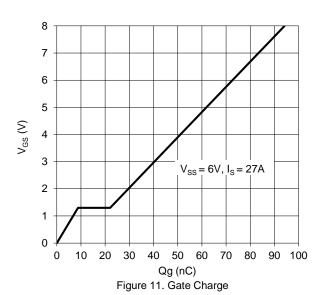
Figure 6. On-Resistance Variation with Junction Temperature



0.005 R_{SS(ON)}, SOURCE-SOURCE ON-RESISTANCE 0.004 $V_{GS} = 2.5V, I_{S} = 5A$ 0.003 $V_{GS} = 3.8V, I_{S}^{1} = 5A$ 0.002 $V_{GS} = 4.5V, I_{S} = 5A$ 0.001 -50 -25 0 25 50 75 100 125 150 T_J, JUNCTION TEMPERATURE (°C)

Figure 7. On-Resistance Variation with Junction Temperature





DMN1003UCA6

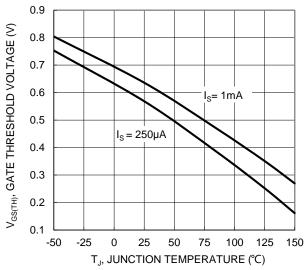
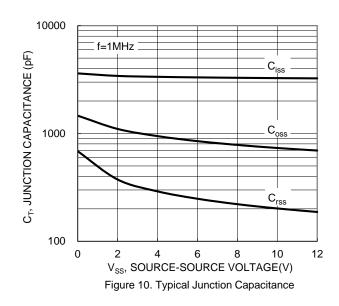
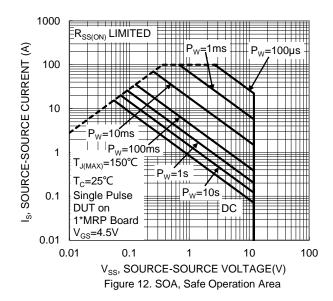


Figure 8. Gate Threshold Variation vs. Junction Temperature







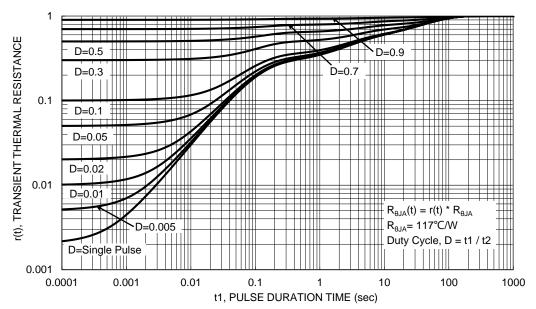


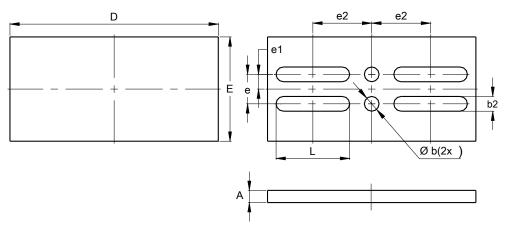
Figure 13. Transient Thermal Resistance



Package Outline Dimensions

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

X3-DSN3518-6

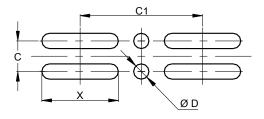


	X3-DSN3518-6						
Dim	Min	Max	Тур				
Α	0.16	0.26	0.21				
b	0.22	0.28	0.25				
b2	0.22	0.28	0.25				
D	3.49	3.59	3.54				
Е	1.72	1.82	1.77				
е	0.47	0.53	0.50				
e1	0.22	0.28	0.25				
e2	0.97	1.03	1.00				
L	1.22	1.28	1.25				
All Dimensions in mm							

Suggested Pad Layout

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

X3-DSN3518-6



Dimensions	Value				
Dimensions	(in mm)				
С	0.50				
C1	2.00				
D	0.25				
X	1.25				



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