

Product Summary

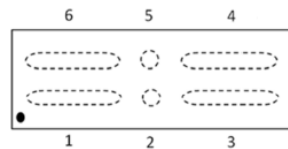
BV _{SSS}	R _{SS(ON)} Typ	I _S Max T _A = +25°C
12V	2.5mΩ @ V _{GS} = 3.8V	23.6A

Description

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

Applications

- Battery Management
- Load Switch
- Battery Protection



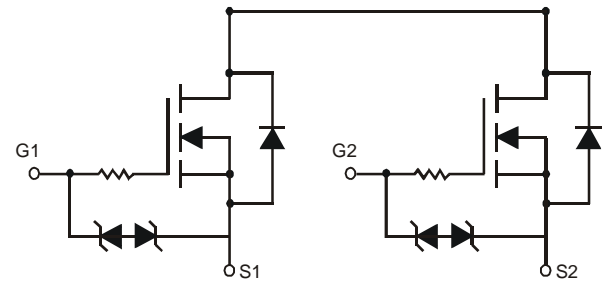
- Top View
- Source 1
 - Gate 1
 - Source 1
 - Source 2
 - Gate 2
 - Source 2

Features

- CSP with Footprint 3.54mm × 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](mailto:contact@diodes.com) 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 (e4)
- Weight: 0.0026 grams (Approximate)



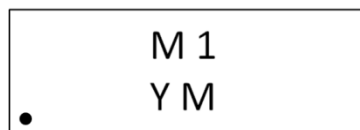
Equivalent Circuit

Ordering Information (Note 4)

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

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 - See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



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

Date Code Key

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025
Code	E	F	G	H	I	J	K	L	M

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

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

Characteristic			Symbol	Value	Unit
Source-Source Voltage			V _{SSS}	12	V
Gate-Source Voltage			V _{GSS}	±8	V
Continuous Source Current (Note 5) V _{GS} = 4.5V	Steady State	T _A = +25°C	I _S	23.6	A
		T _A = +70°C		18.9	
Continuous Source Current (Note 5) V _{GS} = 2.5V	Steady State	T _A = +25°C	I _S	16.8	A
		T _A = +70°C		13.4	
Pulsed Source Current (Note 6)			I _{SM}	100	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 7)	P _D	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)	R _{θJA}	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	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Source-Source Breakdown Voltage	BV _{SSS}	12	—	—	V	V _{GS} = 0V, I _S = 1mA
Zero Gate Voltage Source Current T _J = +25°C	I _{SSS}	—	—	1	μA	V _{SS} = 10V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	μA	V _{GS} = ±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
Static Source-Source On-Resistance	R _{SS(ON)}	1.6	2.3	3.2	mΩ	V _{GS} = 4.5V, I _S = 5A
		1.7	2.4	3.2		V _{GS} = 4.0V, I _S = 5A
		1.8	2.5	3.2		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	V _{SS}	—	0.7	1.2	V	V _{GS} = 0V, I _S = 3A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iSS}	—	3315	—	pF	V _{SS} = 6V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oSS}	—	850	—		
Reverse Transfer Capacitance	C _{rSS}	—	248	—		
Total Gate Charge	Q _g	—	56.5	—	nC	V _{SS} = 6V, V _{GS} = 4.5V, I _S = 27A
Gate-Source Charge	Q _{gs}	—	8.8	—		
Gate-Drain Charge	Q _{gd}	—	13.3	—		
Gate Charge at V _{TH}	Q _{g(TH)}	—	6.9	—		
Turn-On Delay Time	t _{D(ON)}	—	603	—	ns	V _{SS} = 6V, V _{GS} = 4.5V, I _S = 3A
Turn-On Rise Time	t _R	—	1694	—		
Turn-Off Delay Time	t _{D(OFF)}	—	4749	—		
Turn-Off Fall Time	t _F	—	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.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

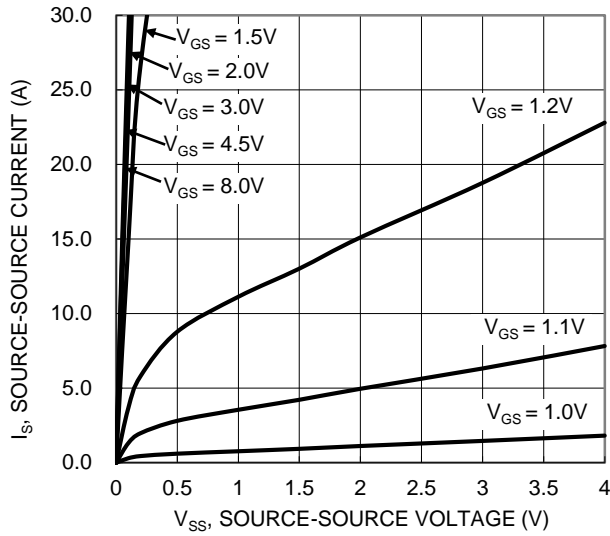


Figure 1. Typical Output Characteristic

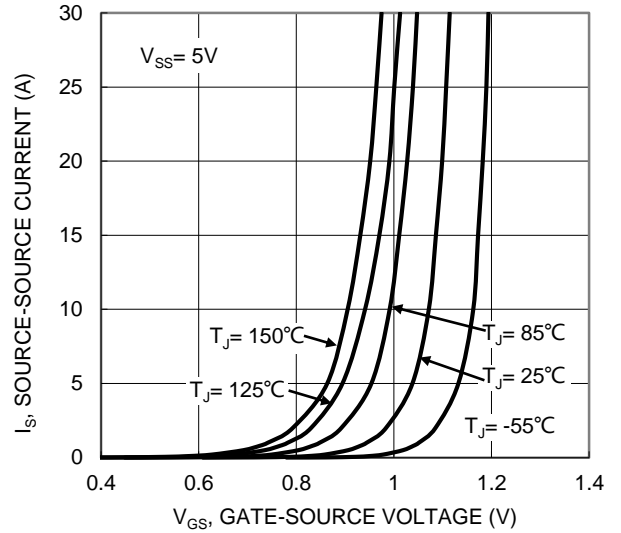


Figure 2. Typical Transfer Characteristic

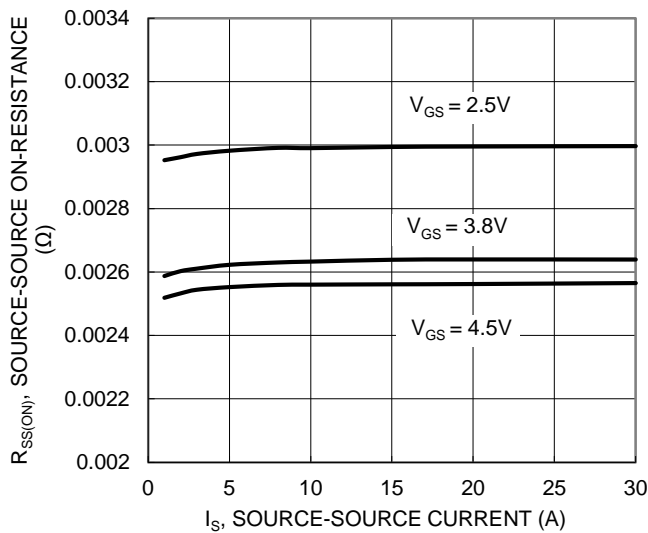


Figure 3. Typical On-Resistance vs. Source Current and Gate Voltage

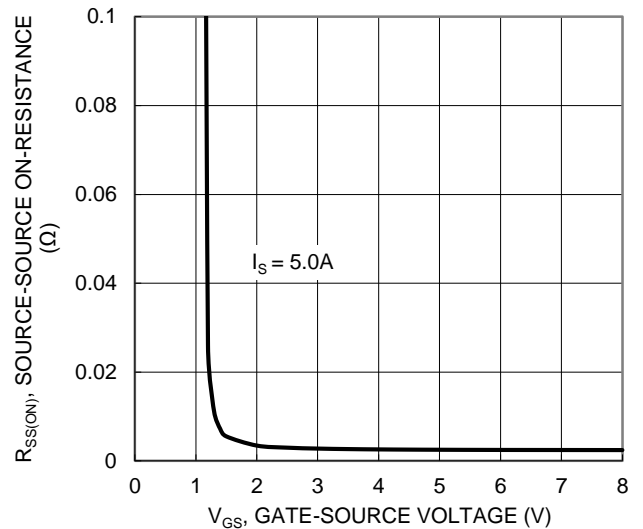


Figure 4. Typical Transfer Characteristic

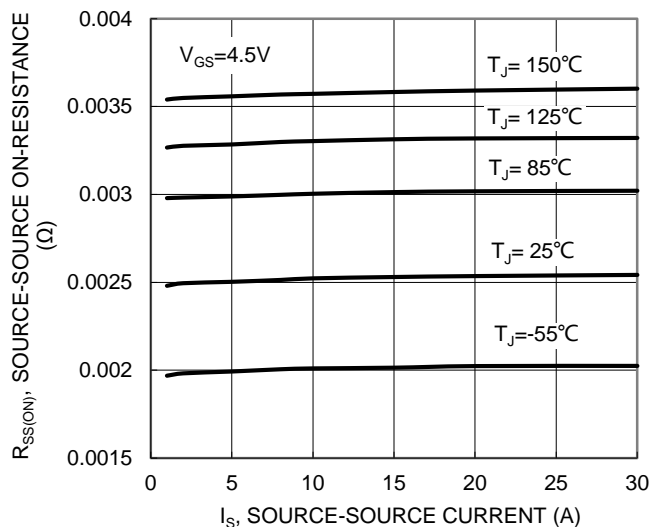


Figure 5. Typical On-Resistance vs. Source Current and Junction Temperature

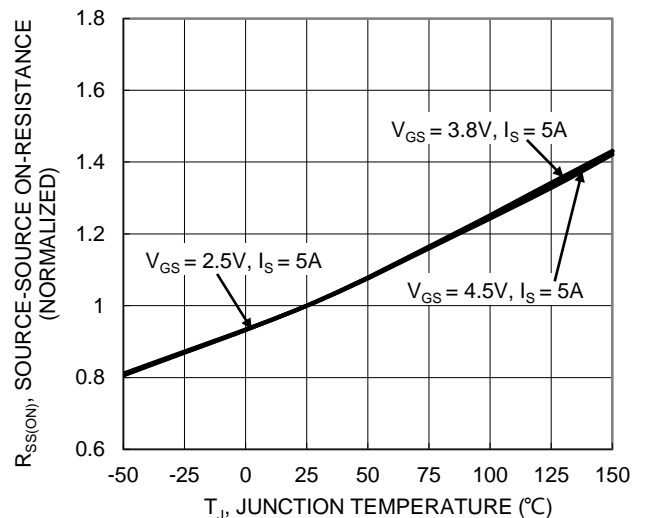
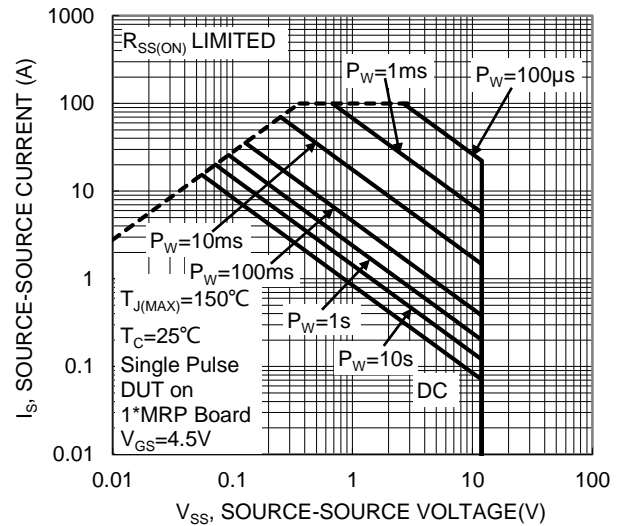
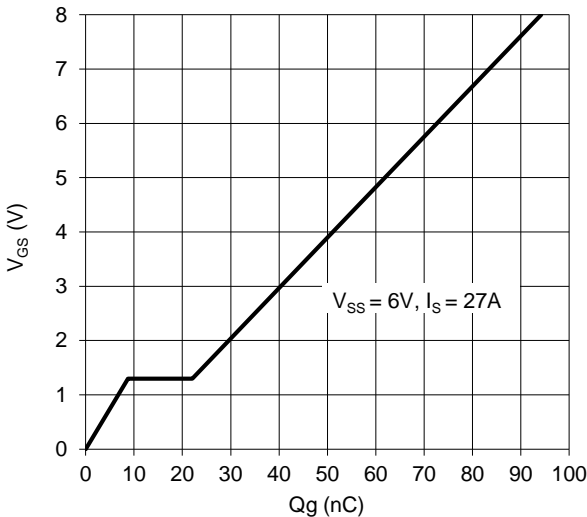
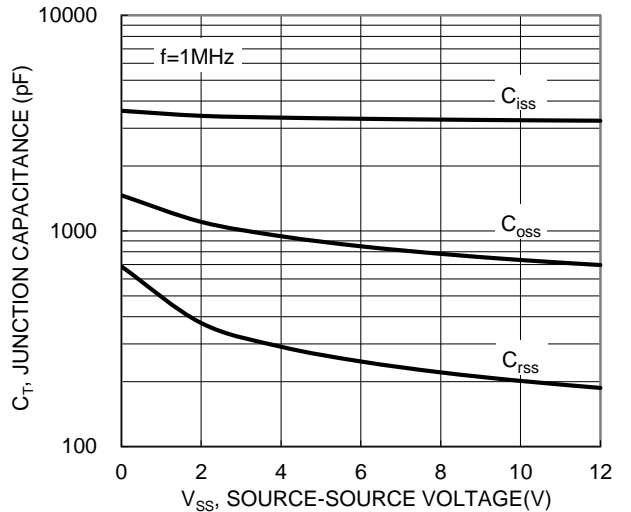
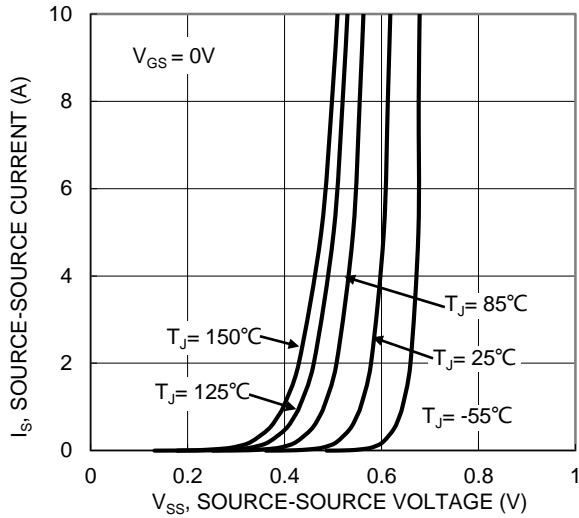
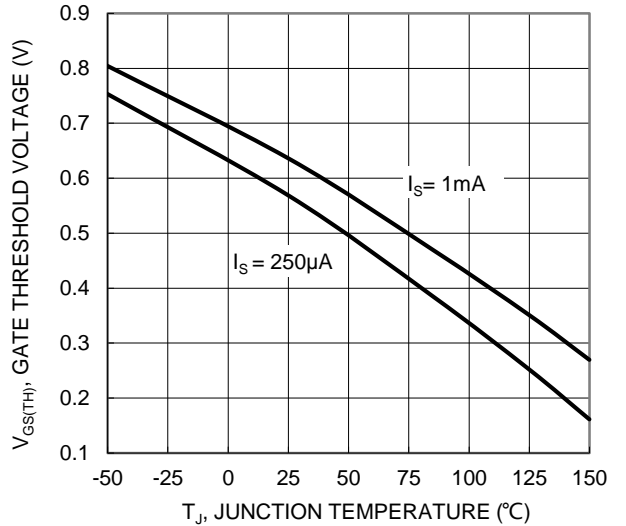
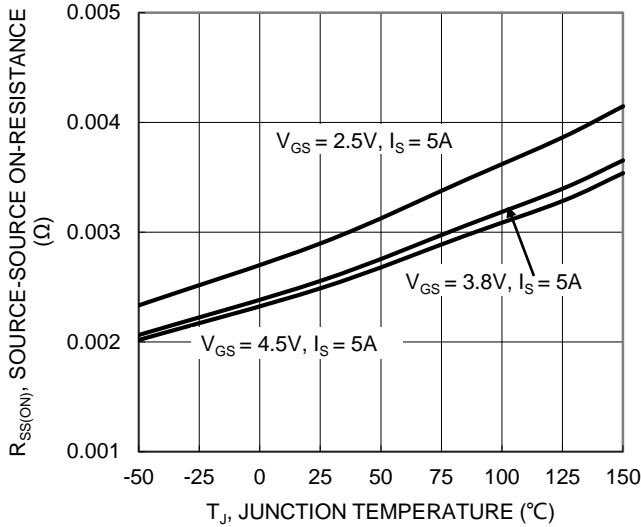


Figure 6. On-Resistance Variation with Junction Temperature



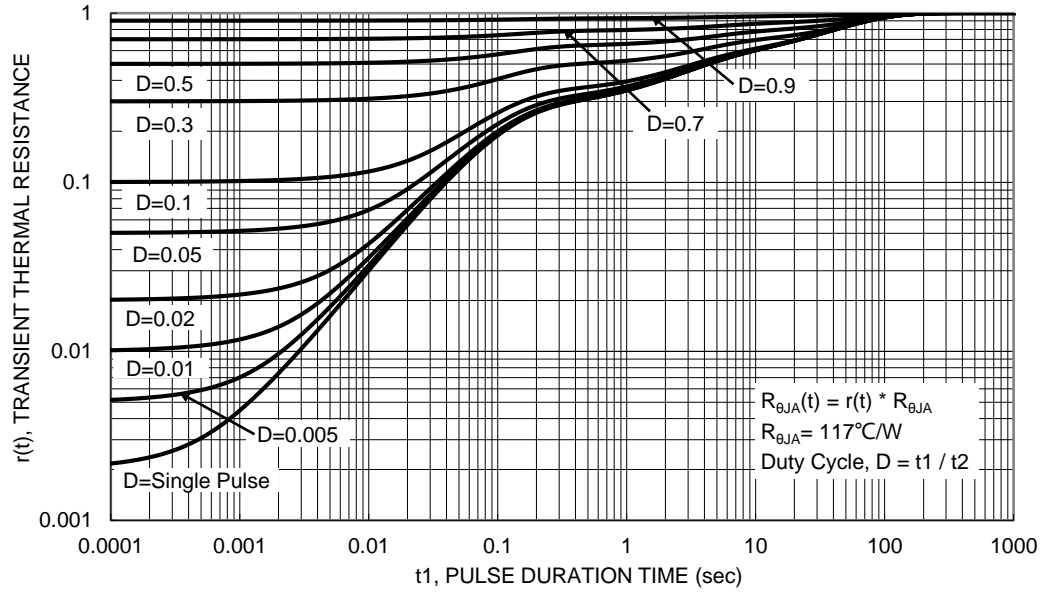
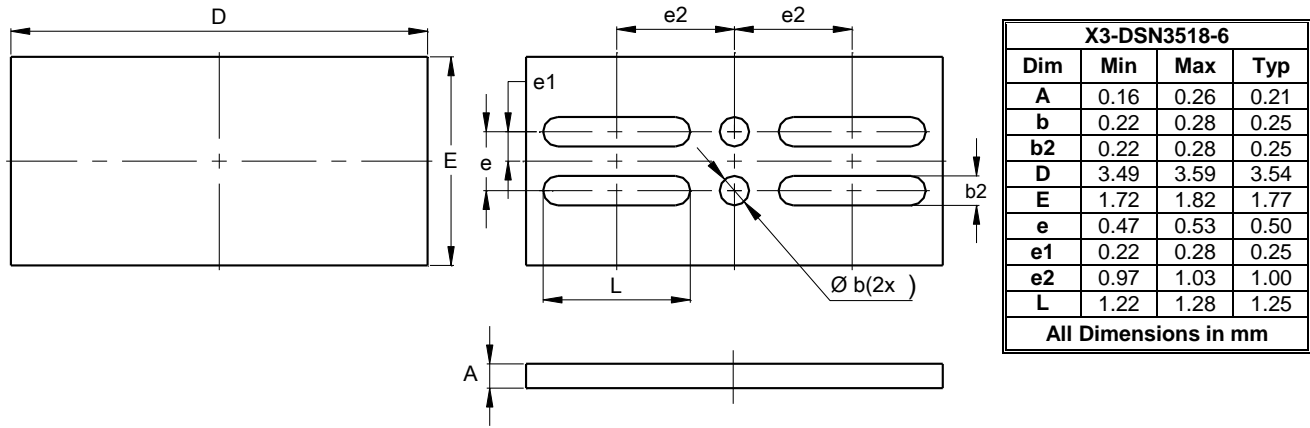


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

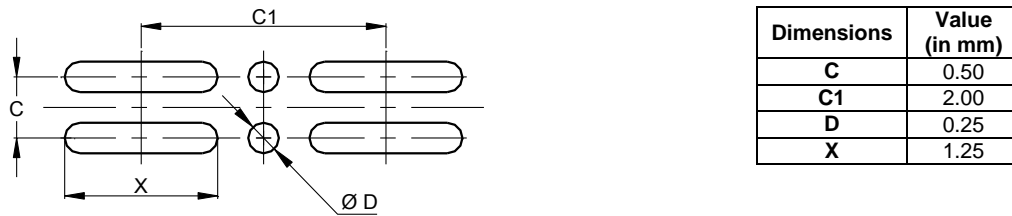
X3-DSN3518-6



Suggested Pad Layout

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

X3-DSN3518-6



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