

Product Summary

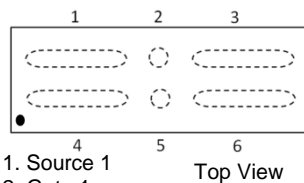
BV_{SSS}	$R_{SS(ON)}$ Max	I_S $T_A = +25^\circ C$
12V	3.2m Ω @ $V_{GS} = 4.5V$	23.6A
	6.5m Ω @ $V_{GS} = 2.5V$	16.8A

Description

This new generation MOSFET is 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



- Source 1
- Gate 1
- Source 1
- Source 2
- Gate 2
- Source 2

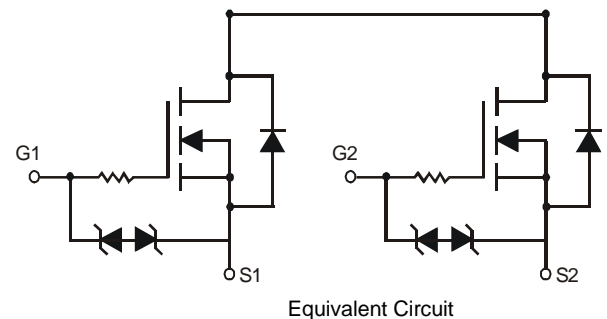
Top View

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)**

Mechanical Data

- Case: X3-DSN3518-6 (Type B)
- Terminal Connections: See Diagram Below
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — NiPdAu. Solderable per MIL-STD-202, Method 208



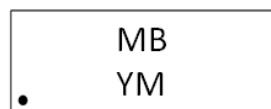
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN13M9UCA6-7	X3-DSN3518-6 (Type B)	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



MB= Product Type Marking Code
 YM = Date Code Marking
 Y or \bar{Y} = Year (ex: F= 2018)
 M or \bar{M} = Month (ex: 9 = September)

Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021
Code	C	D	E	F	G	H	I

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)}	1.2	2.3	3.2	mΩ	V _{GS} = 4.5V, I _S = 5A
		1.2	2.4	3.2		V _{GS} = 4.0V, I _S = 5A
		1.3	2.5	3.4		V _{GS} = 3.8V, I _S = 5A
		1.3	2.7	4.6		V _{GS} = 3.1V, I _S = 5A
		1.4	3.0	6.5		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.

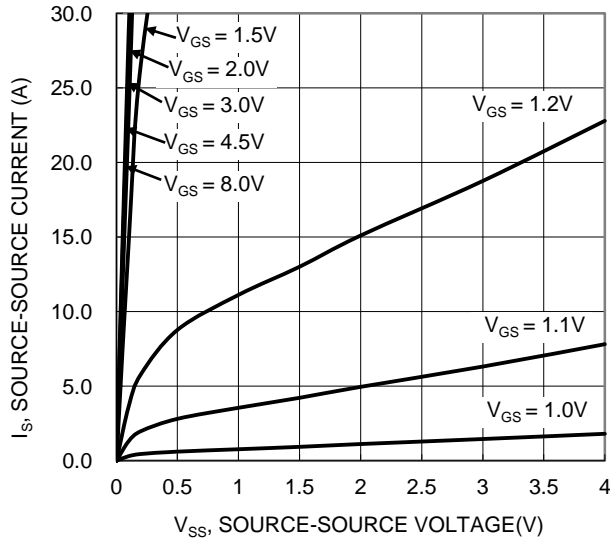


Figure 1. Typical Output Characteristic

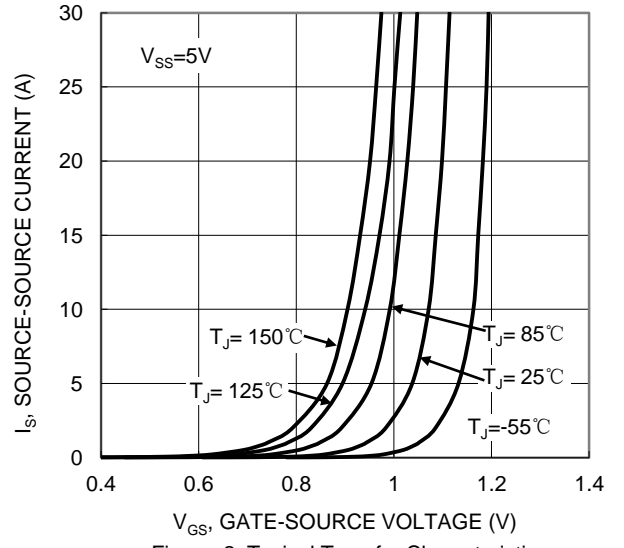


Figure 2. Typical Transfer Characteristic

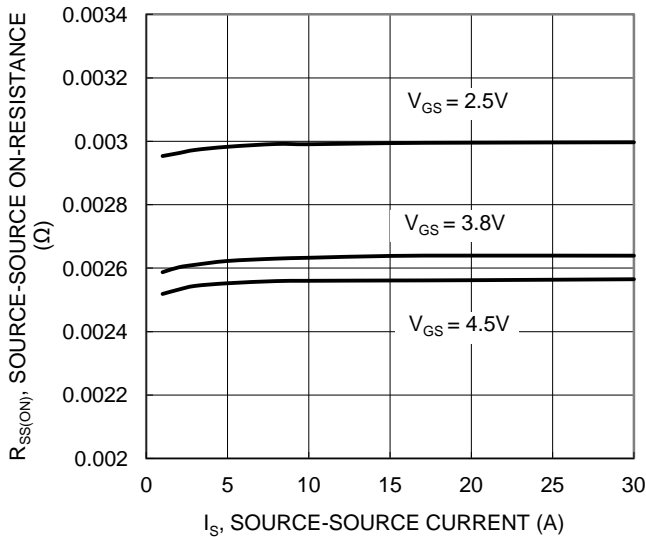


Figure 3. Typical On-Resistance vs. Source Current and Gate Voltage

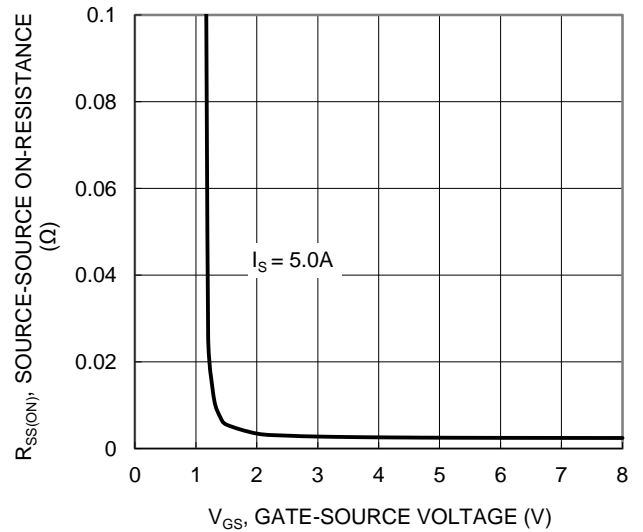


Figure 4. Typical Transfer Characteristic

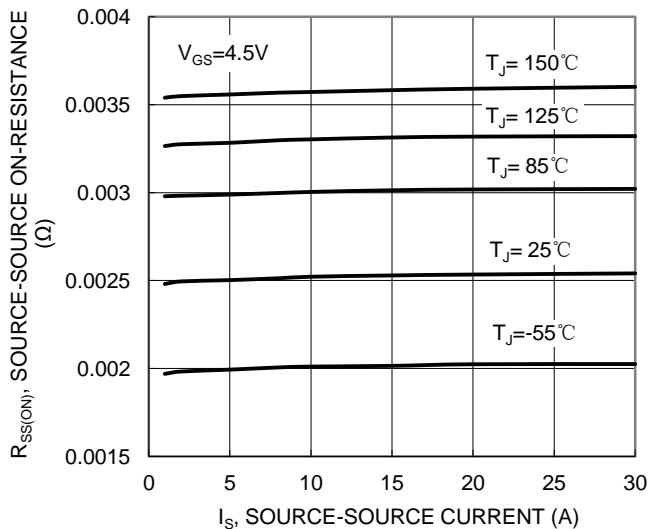


Figure 5. Typical On-Resistance vs. Source Current and Junction Temperature

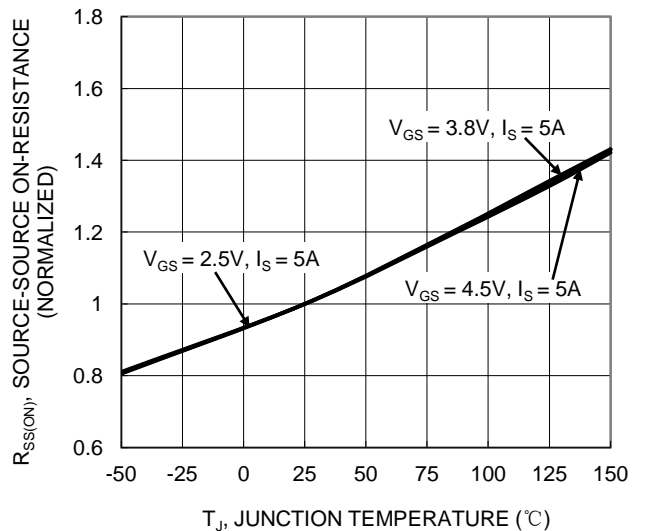
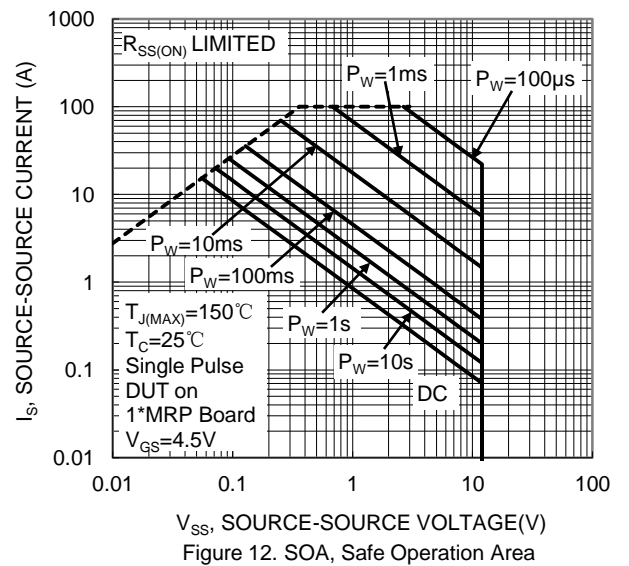
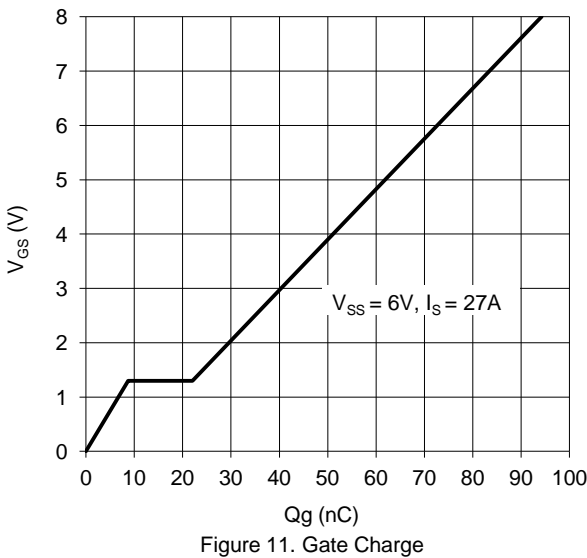
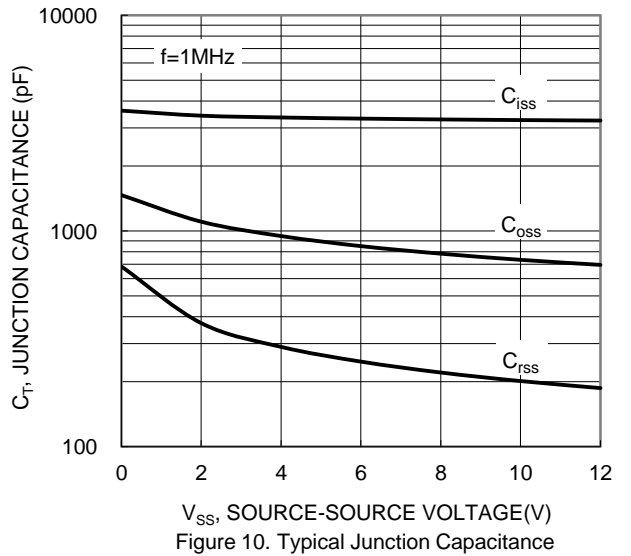
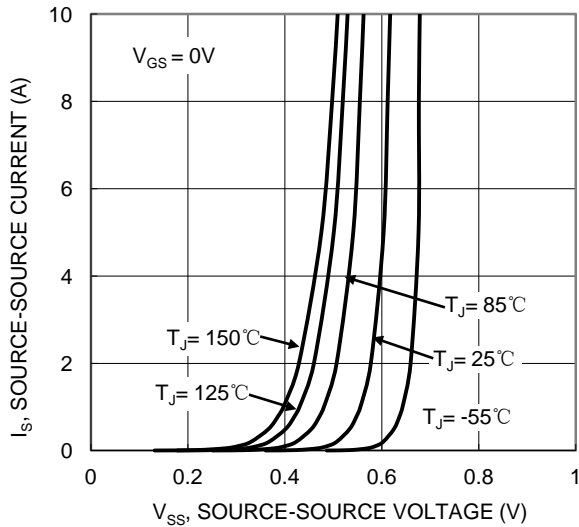
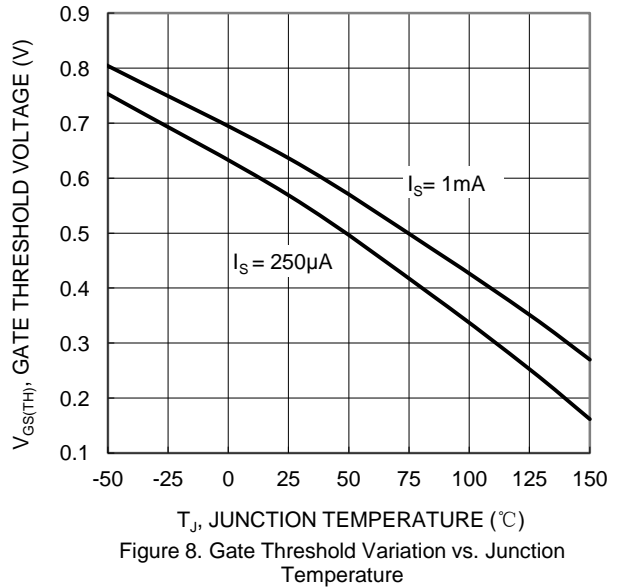
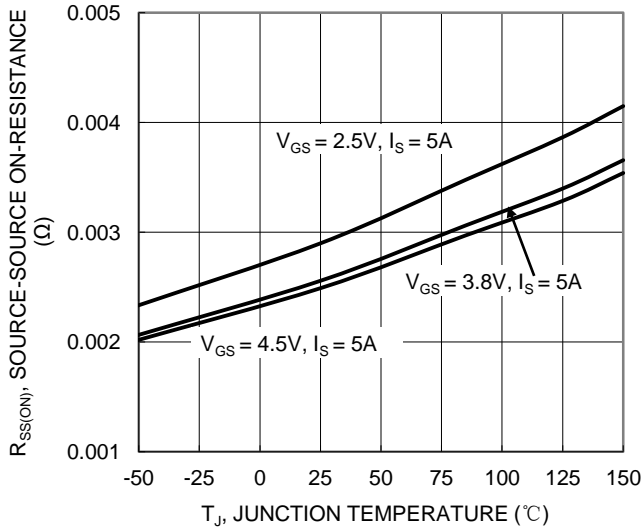


Figure 6. On-Resistance Variation with Junction Temperature



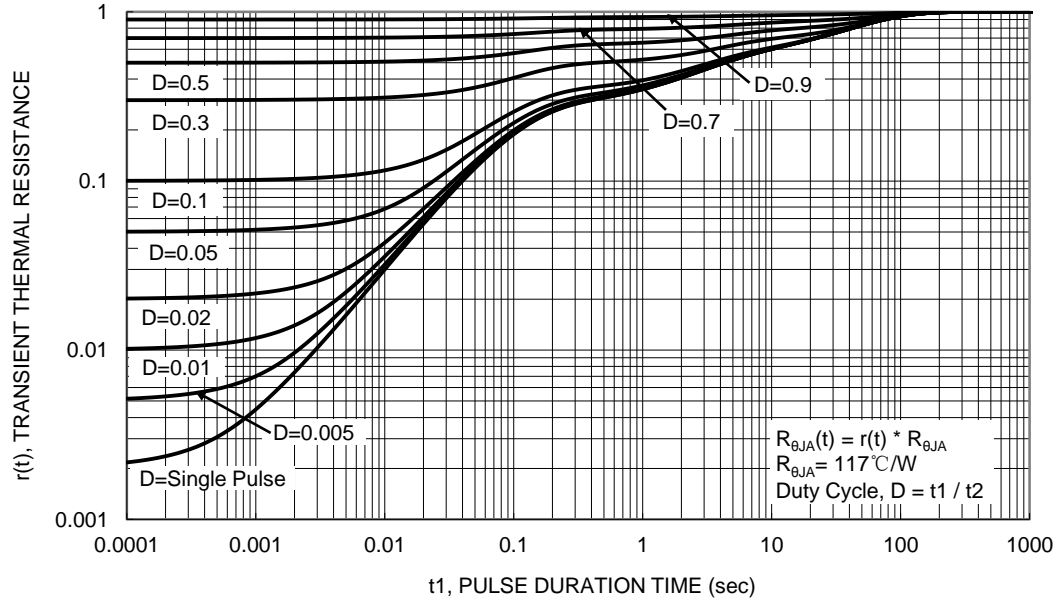
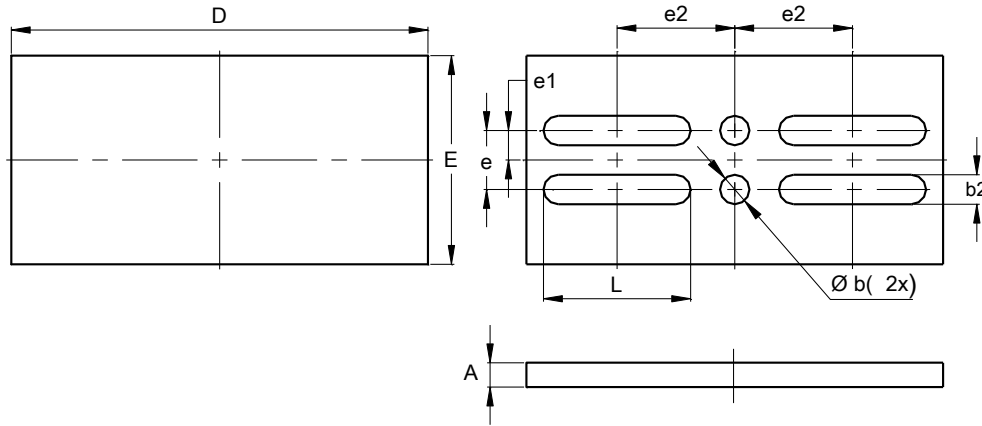


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

X3-DSN3518-6 (Type B)

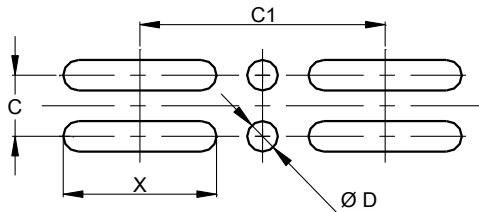


X3-DSN3518-6 (Type B)			
Dim	Min	Max	Typ
A	0.15	0.27	0.21
b	0.22	0.28	0.25
b2	0.22	0.28	0.25
D	3.48	3.60	3.54
E	1.71	1.83	1.77
e	0.47	0.53	0.50
e1	0.22	0.28	0.25
e2	0.97	1.03	1.00
L	1.22	1.28	1.25
All Dimensions in mm			

Suggested Pad Layout

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

X3-DSN3518-6 (Type B)



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

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