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Product Summary

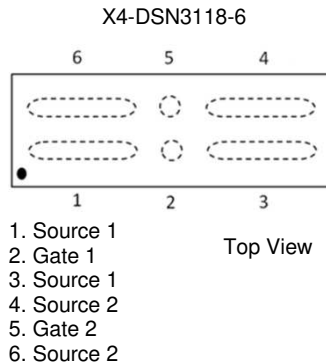
BV _{SSS}	R _{SS(ON)} Max	I _S T _A = +25°C
12V	2.75mΩ @ V _{GS} = 4.5V	24.4A
	6.1mΩ @ V _{GS} = 2.5V	16.4A

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

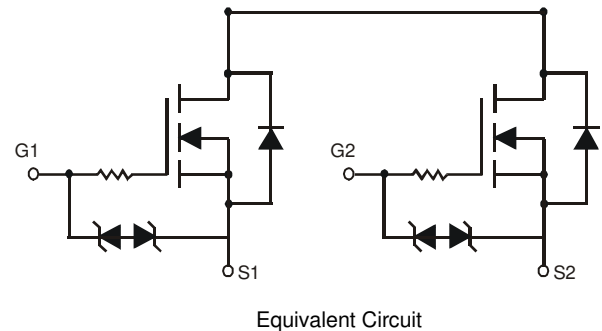


Features

- CSP with Footprint 3.05mm × 1.77mm
- Height = 0.11mm 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: X4-DSN3118-6
- Terminal Connections: See Diagram Below
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — NiPdAu. Solderable per MIL-STD-202, Method 208 (e4)

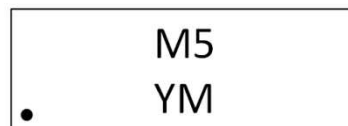


Ordering Information (Note 4)

Part Number	Case	Packaging
DMN1002UCA6-7	X4-DSN3118-6	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



M5 = 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	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	24.4	A
		T _A = +70°C		19.6	
Continuous Source Current (Note 5) V _{GS} = 2.5V	Steady State	T _A = +25°C	I _S	16.4	A
		T _A = +70°C		13.1	
Pulsed Source Current (Note 6)			I _{SM}	100	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 7)	P _D	1.10	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 7)	R _{θJA}	114.1	°C/W
Power Dissipation (Note 5)	P _D	2.47	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5)	R _{θJA}	50.7	°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 Drain Current T _J = +25°C	I _{SSS}	—	—	1	μA	V _{SS} = 9.6V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	μA	V _{GS} = ±8V, V _{SS} = 0V
		—	—	±1.0	μA	V _{GS} = ±5V, V _{SS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	0.35	0.8	1.4	V	V _{SS} = 10V, I _S = 1.41mA
Static Source-Source On-Resistance	R _{SS(ON)}	1.5	2.27	2.75	mΩ	V _{GS} = 4.5V, I _S = 6A
		1.6	2.36	2.85		V _{GS} = 3.8V, I _S = 6A
		1.7	2.54	3.95		V _{GS} = 3.1V, I _S = 6A
		1.9	2.9	6.1		V _{GS} = 2.5V, I _S = 6A
Diode Forward Voltage	V _{SS}	—	0.69	1.2	V	V _{GS} = 0V, I _S = 6A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iSS}	—	3062	4593	pF	V _{SS} = 10V, V _{GS} = 0V, f = 1kHz
Output Capacitance	C _{oSS}	—	758	1137		
Reverse Transfer Capacitance	C _{rSS}	—	198	297		
Total Gate Charge	Q _g	—	45.7	68.6	nC	V _{SS} = 8V, V _{GS} = 4V, I _S = 6A
Gate-Source Charge	Q _{gs}	—	8.3	12.5		
Gate-Drain Charge	Q _{gd}	—	16.0	24.0		
Gate Charge at V _{TH}	Q _{g(th)}	—	4.5	6.8		
Turn-On Delay Time	t _{D(ON)}	—	1005	1508	ns	V _{SS} = 8V, V _{GS} = 4V, I _S = 6A
Turn-On Rise Time	t _R	—	2186	3279		
Turn-Off Delay Time	t _{D(OFF)}	—	2643	3965		
Turn-Off Fall Time	t _F	—	4193	6290		

- 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.

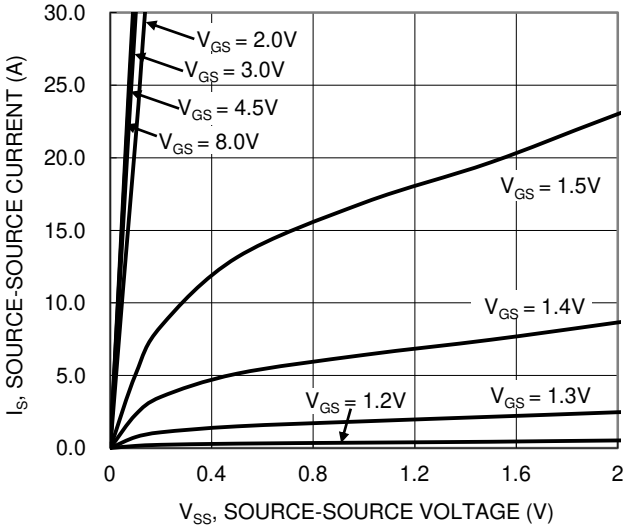


Figure 1. Typical Output Characteristic

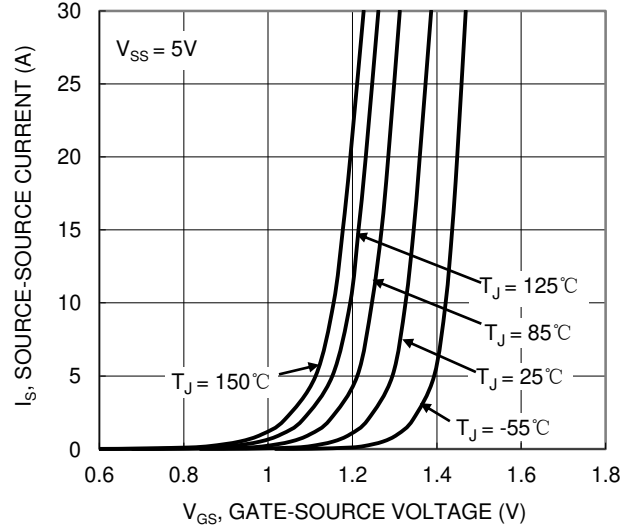


Figure 2. Typical Transfer Characteristic

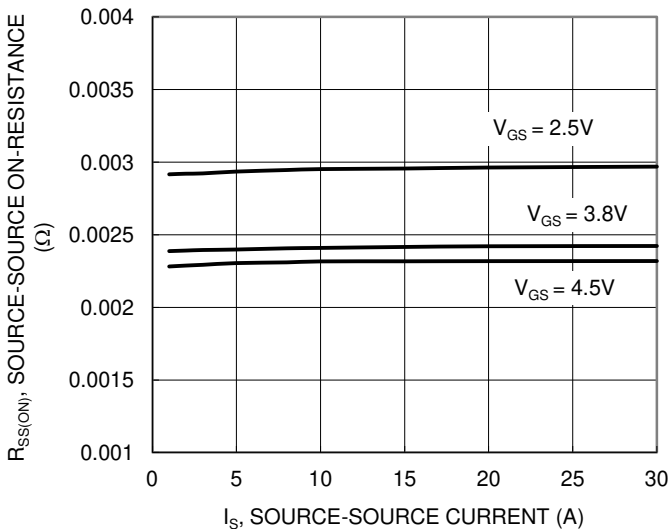


Figure 3. Typical On-Resistance vs. Source Current and Gate Voltage

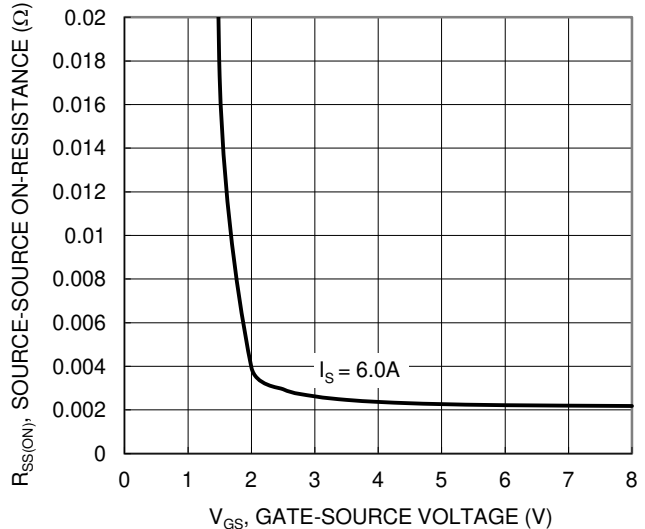


Figure 4. Typical Transfer Characteristic

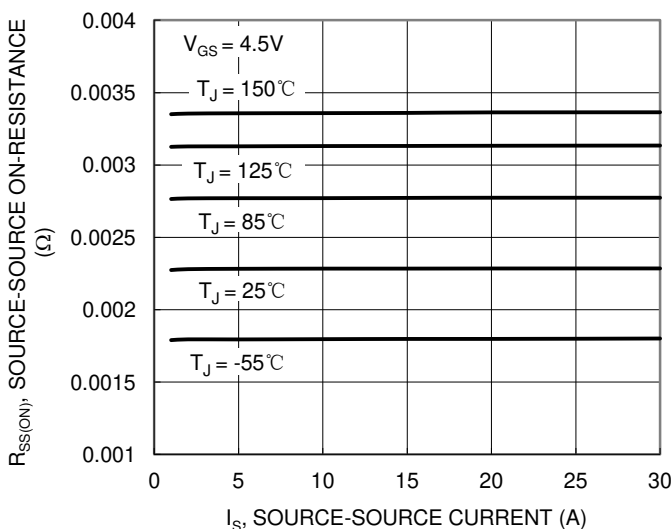


Figure 5. Typical On-Resistance vs. Source Current and Junction Temperature

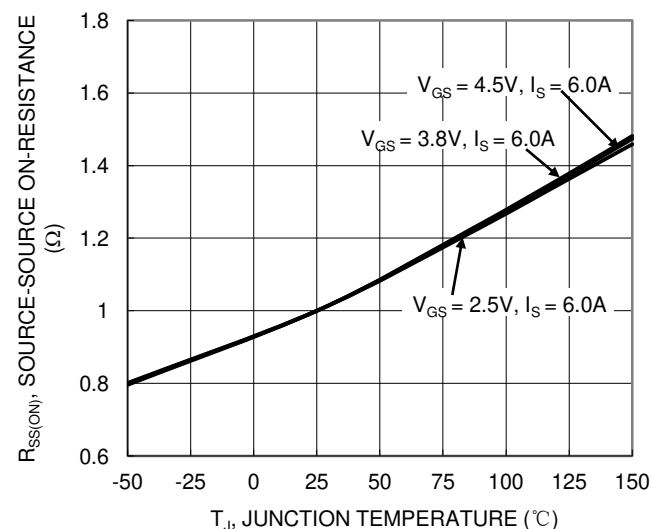
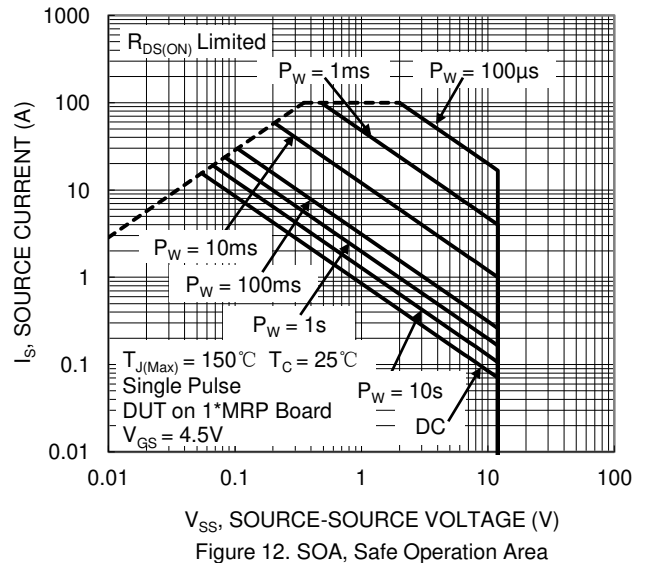
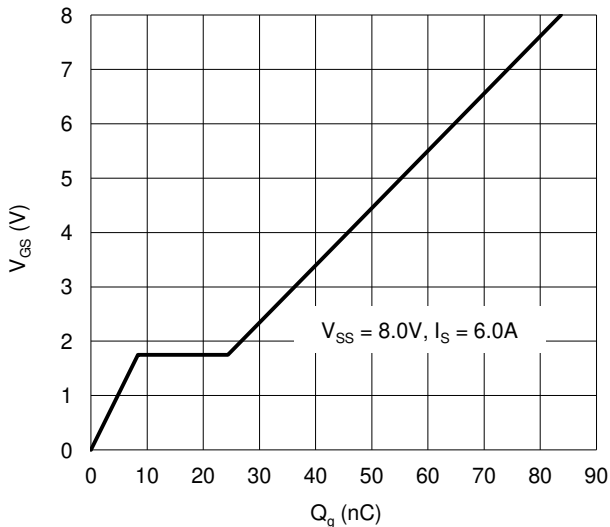
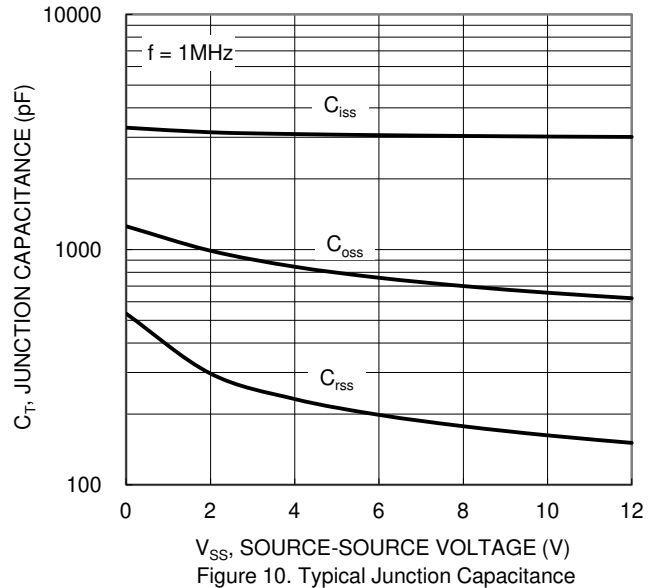
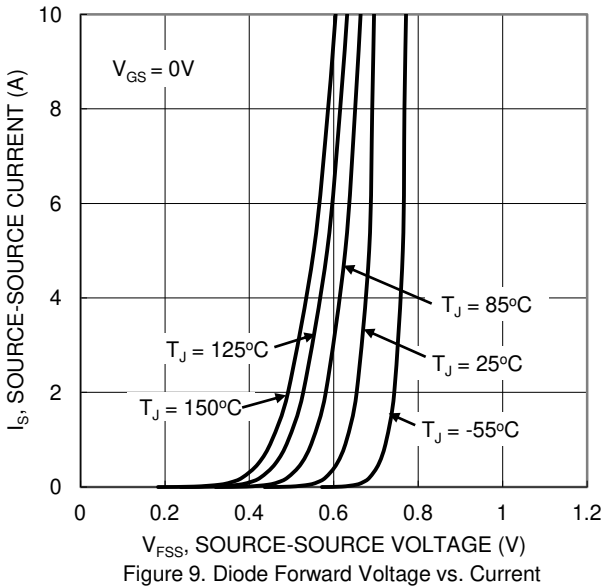
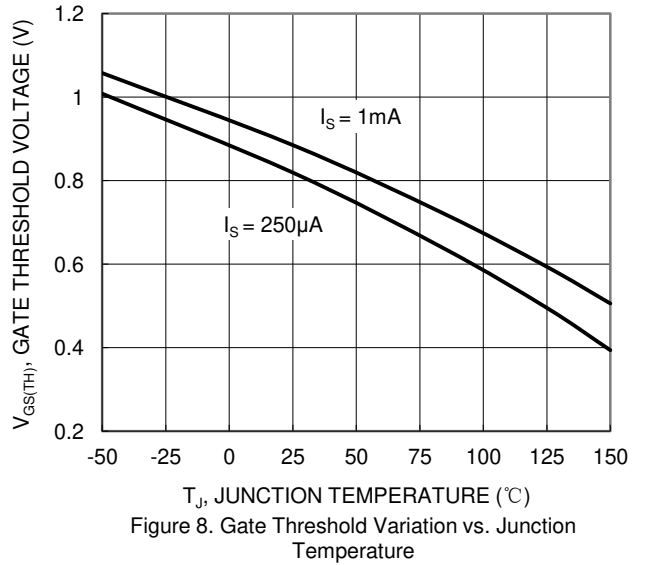
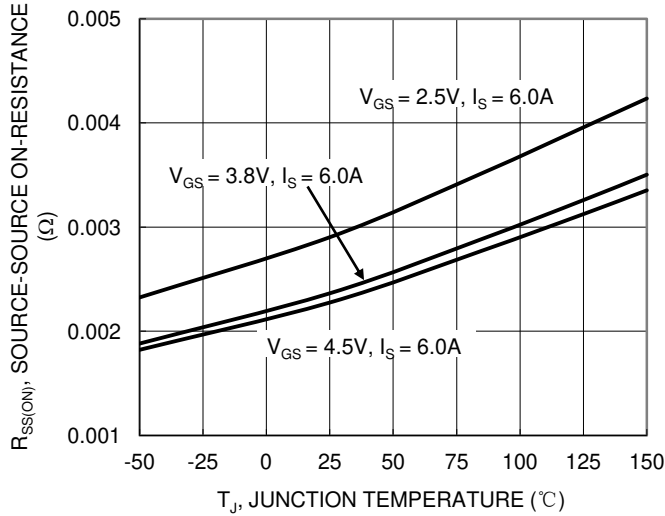


Figure 6. On-Resistance Variation with Junction Temperature



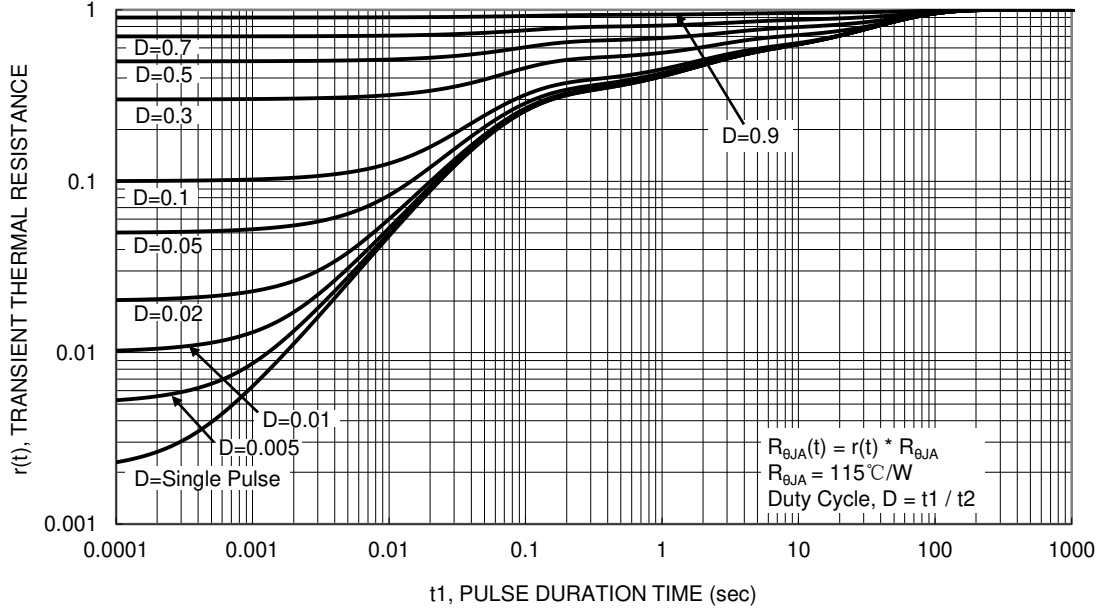
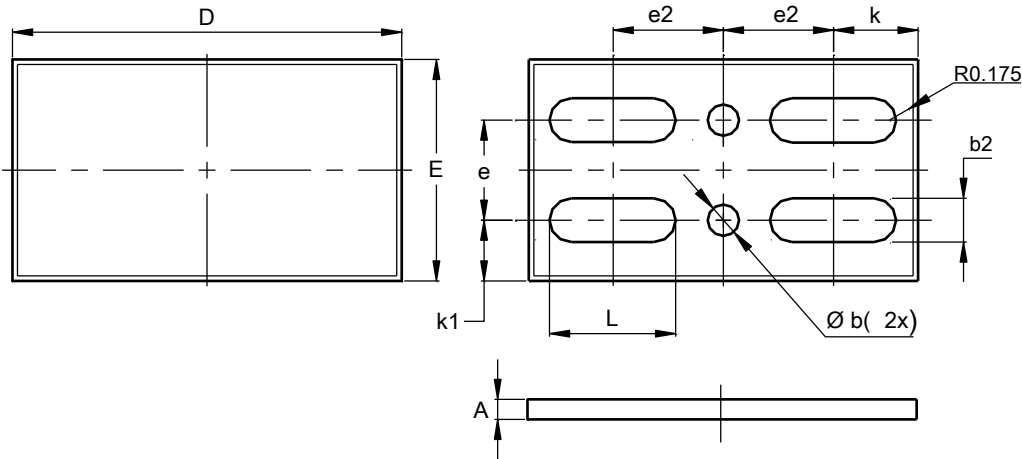


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

X4-DSN3118-6

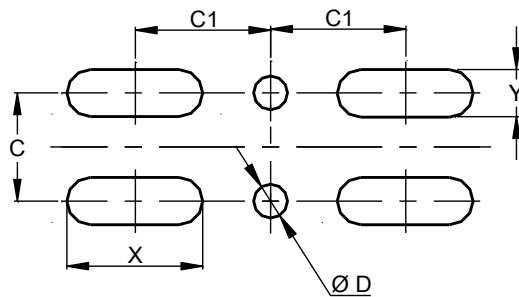


X4-DSN3118-6			
Dim	Min	Max	Typ
A	0.09	0.16	0.11
b	--	--	0.25
b2	0.32	0.38	0.35
D	3.00	3.10	3.05
E	1.72	1.82	1.77
e	--	--	0.800
e2	--	--	0.878
k	--	--	0.648
k1	--	--	0.485
L	0.975	1.035	1.005
All Dimensions in mm			

Suggested Pad Layout

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

X4-DSN3118-6



Dimensions	Value (in mm)
C	0.800
C1	0.878
D	0.250
X	1.005
Y	0.350

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