

## Product Summary

BV <sub>SSS</sub>	R <sub>SS(ON)</sub> Typ	I <sub>S Max</sub> T <sub>A</sub> = +25°C
24V	7.4mΩ @ V <sub>GS</sub> = 3.8V	13.0A

## Description

This new generation MOSFET is designed to minimize the on-state resistance (R<sub>SS(ON)</sub>) 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 2.70mm × 1.81mm
- 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

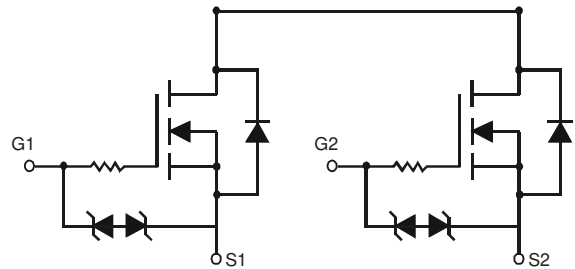
- Case: X3-DSN2718-6
- Terminal Connections: See Diagram Below
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — NiPdAu or NiAu. Solderable per MIL-STD-202, Method 208 <sup>(e4)</sup>
- Weight: 0.0026 grams (Approximate)



X3-DSN2718-6



Top View



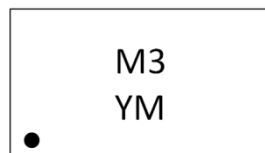
Equivalent Circuit

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN2012UCA6-7	X3-DSN2718-6	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 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



M3 = 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	2018	2019	2020	2021	2022	2023	2024	2025	2026			
Code	F	G	H	I	J	K	L	M	N			
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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Source-Source Voltage			V <sub>SSS</sub>	24	V
Gate-Source Voltage			V <sub>GSS</sub>	±12	V
Continuous Source Current (Note 5) V <sub>GS</sub> = 4.5V	Steady State	T <sub>A</sub> = +25°C	I <sub>S</sub>	13.0	A
		T <sub>A</sub> = +70°C		10.4	
Continuous Source Current (Note 5) V <sub>GS</sub> = 2.5V	Steady State	T <sub>A</sub> = +25°C	I <sub>S</sub>	10.8	A
		T <sub>A</sub> = +70°C		8.6	
Pulsed Source Current (Note 6)			I <sub>SM</sub>	60	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 7)	P <sub>D</sub>	0.82	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 7)	R <sub>θJA</sub>	151.9	°C/W
Power Dissipation (Note 5)	P <sub>D</sub>	2.3	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 5)	R <sub>θJA</sub>	55.0	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 8)</b>						
Source-Source Breakdown Voltage	BV <sub>SSS</sub>	24	—	—	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1mA
Zero Gate Voltage Source Current T <sub>J</sub> = +25°C	I <sub>SSS</sub>	—	—	1	μA	V <sub>SS</sub> = 20V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±10	μA	V <sub>GS</sub> = ±12V, V <sub>SS</sub> = 0V
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	0.5	0.9	1.3	V	V <sub>SS</sub> = 10V, I <sub>S</sub> = 1mA
Static Source-Source On-Resistance	R <sub>SS(ON)</sub>	—	7.0	9.0	mΩ	V <sub>GS</sub> = 4.5V, I <sub>S</sub> = 5A
		—	7.3	9.5		V <sub>GS</sub> = 4.0V, I <sub>S</sub> = 5A
		—	7.4	10.1		V <sub>GS</sub> = 3.8V, I <sub>S</sub> = 5A
		—	7.9	10.3		V <sub>GS</sub> = 3.1V, I <sub>S</sub> = 5A
		—	9.1	13.0		V <sub>GS</sub> = 2.5V, I <sub>S</sub> = 5A
Diode Forward Voltage	V <sub>SS</sub>	—	0.7	—	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 10A
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	C <sub>ISS</sub>	—	2417	—	pF	V <sub>SS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>OSS</sub>	—	270	—		
Reverse Transfer Capacitance	C <sub>RSS</sub>	—	102	—		
Total Gate Charge	Q <sub>g</sub>	—	26.0	—	nC	V <sub>SS</sub> = 19.2V, V <sub>GS</sub> = 4.0V, I <sub>S</sub> = 3A
Gate-Source Charge	Q <sub>gs</sub>	—	5.2	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	9.5	—		
Gate Charge at V <sub>TH</sub>	Q <sub>g(TH)</sub>	—	4.5	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	543	—	ns	V <sub>SS</sub> = 20V, V <sub>GS</sub> = 4.0V, I <sub>S</sub> = 10A, R <sub>g</sub> = 6.0Ω
Turn-On Rise Time	t <sub>R</sub>	—	1183	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	1810	—		
Turn-Off Fall Time	t <sub>F</sub>	—	1602	—		

- Notes:
- Device mounted on FR-4 material with 1inch<sup>2</sup> (6.45cm<sup>2</sup>), 2oz. (0.071mm 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.

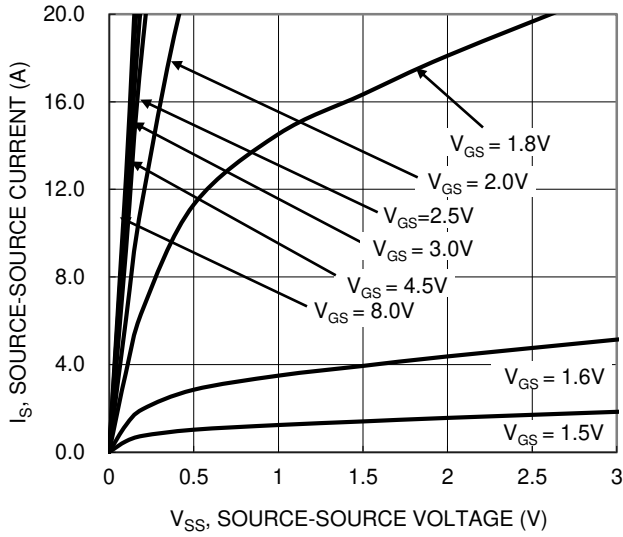


Figure 1. Typical Output Characteristic

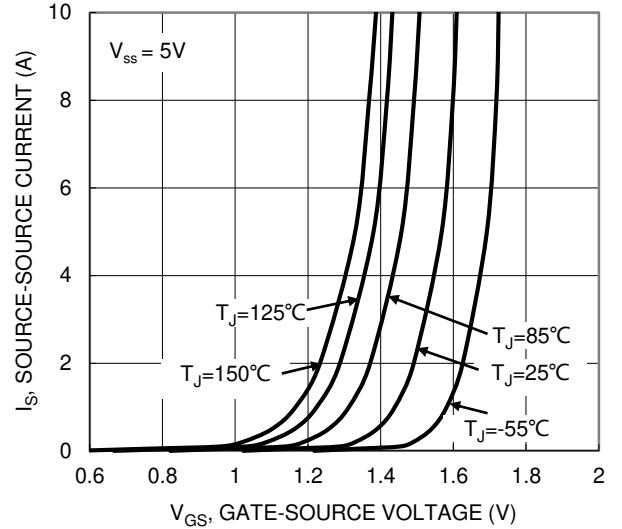


Figure 2. Typical Transfer Characteristic

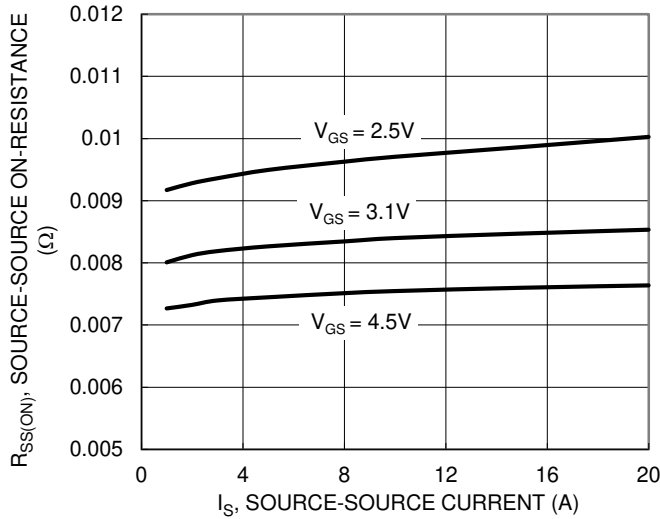


Figure 3. Typical On-Resistance vs. Source Current and Gate Voltage

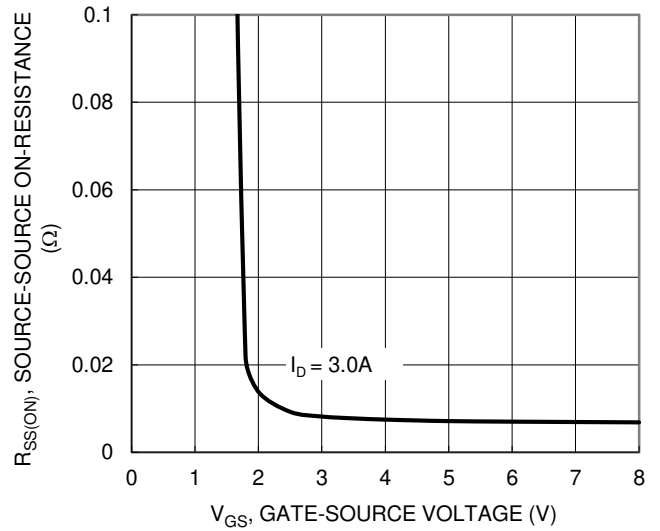


Figure 4. Typical Transfer Characteristic

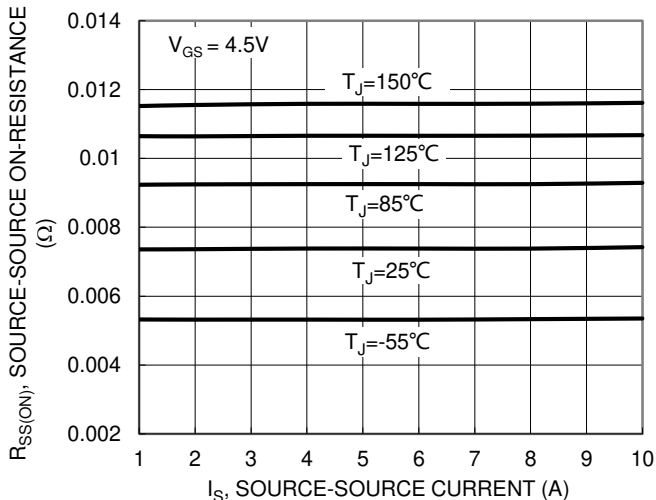


Figure 5. Typical On-Resistance vs. Source Current and Junction Temperature

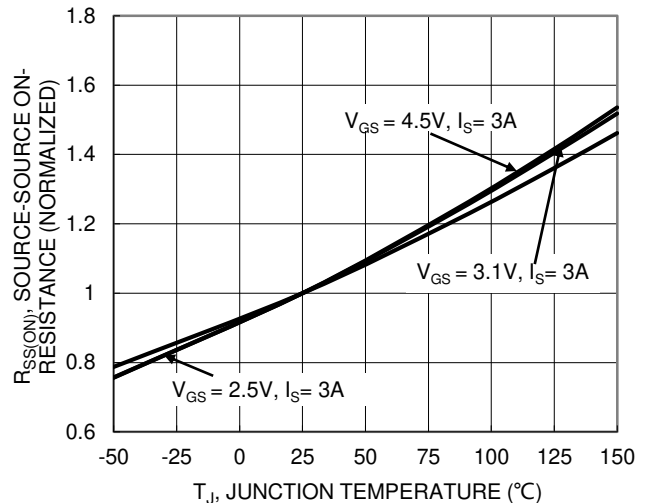
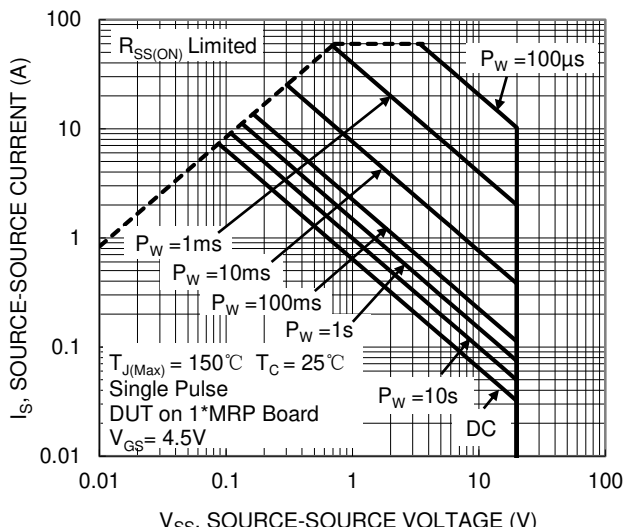
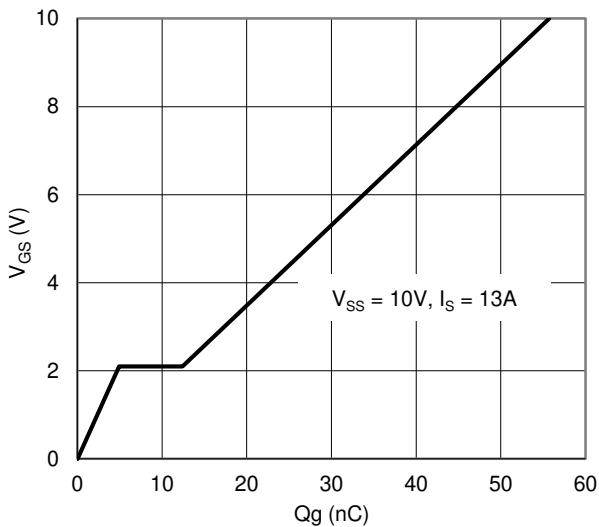
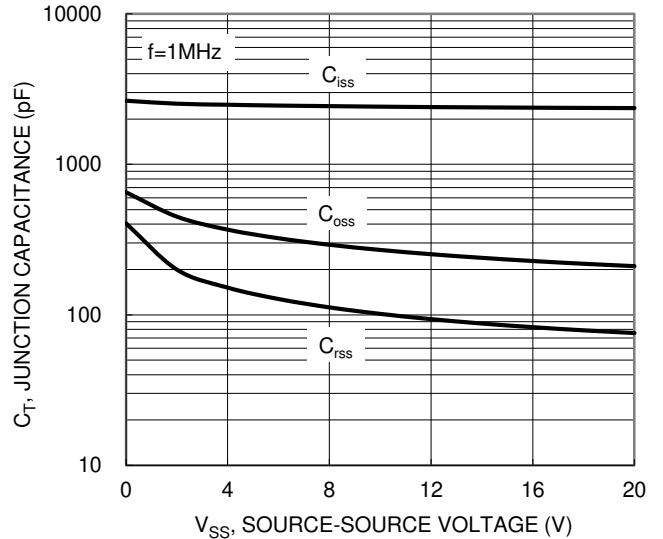
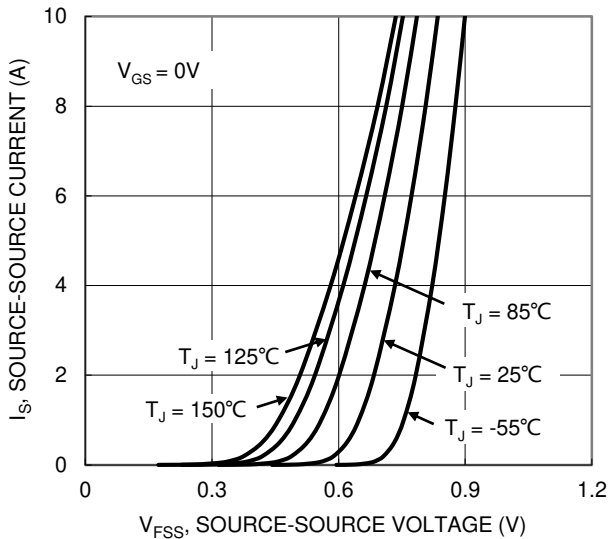
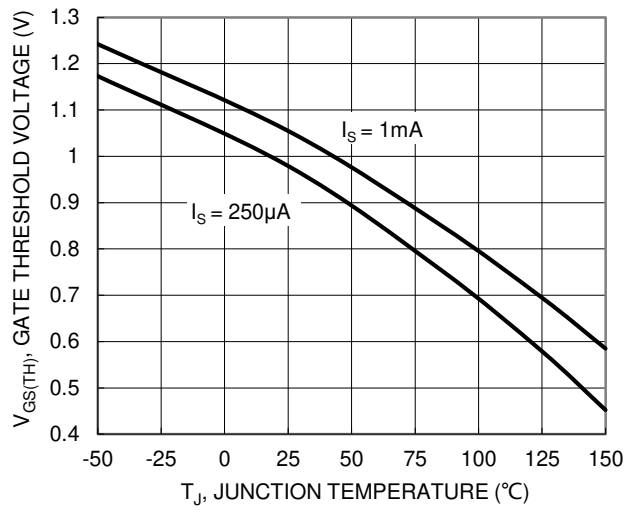
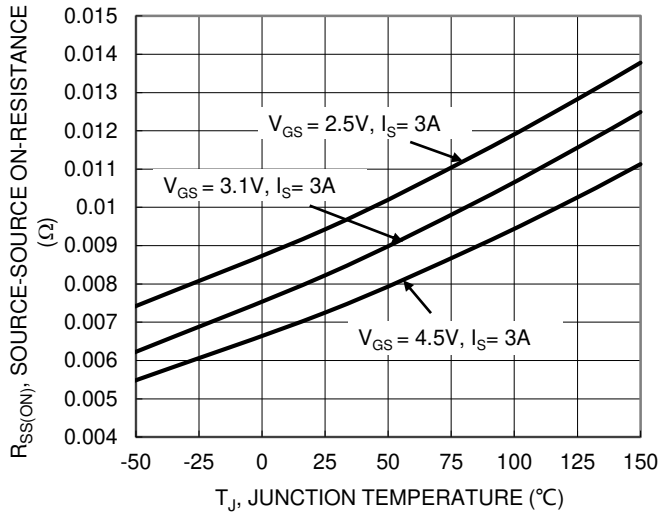


Figure 6. On-Resistance Variation with Junction Temperature



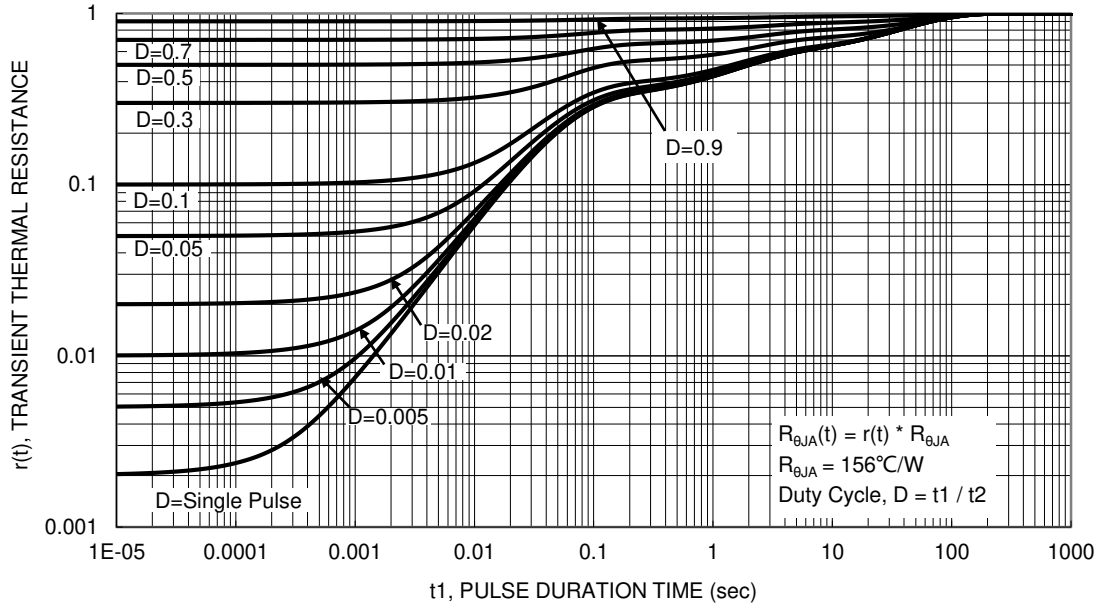
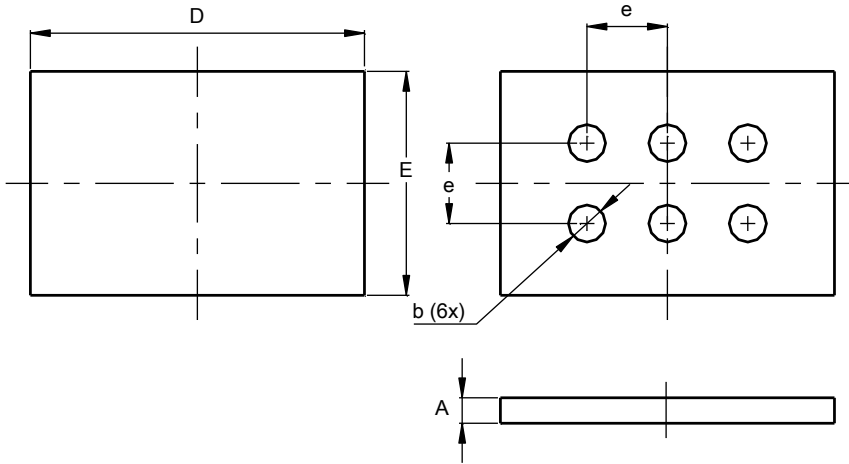


Figure 13. Transient Thermal Resistance

**Package Outline Dimensions**

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

X3-DSN2718-6

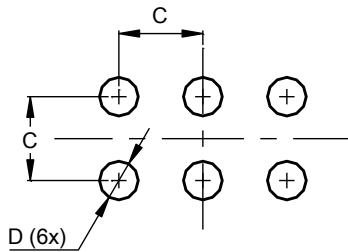


X3-DSN2718-6			
Dim	Min	Max	Typ
A	0.16	0.26	0.21
b	0.27	0.33	0.30
D	2.65	2.75	2.70
E	1.76	1.86	1.81
e	0.62	0.68	0.65
All Dimensions in mm			

**Suggested Pad Layout**

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

X3-DSN2718-6



Dimensions	Value (in mm)
C	0.65
D	0.30

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