

Product Summary

BV _{DSS}	R _{DS(ON)} Typ	I _D Max T _A = +25°C
12V	20mΩ @ V _{GS} = 2.5V	7.4A

Description

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

Applications

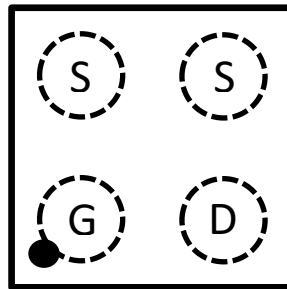
- Battery managements
- Load switches
- DC-DC converters

Features

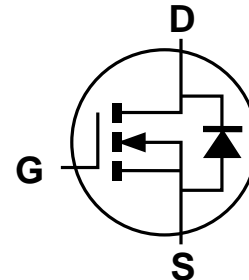
- CSP with Footprint 0.76mm × 0.76mm
- Height = 0.275mm (Typical) for Low Profile
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact_us) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>

Mechanical Data

- Package: X2-TSN0808-4
- Terminal Connections: See Diagram Below
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — NiAu. Solderable per MIL-STD-202, Method 208 (e4)
- Weight: 0.00034 grams (Approximate)



Top View



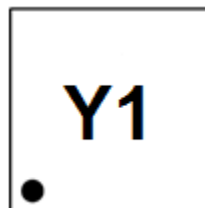
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMN1021UCA4-7	X2-TSN0808-4	3,000	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



Y1 = Product Type Marking Code

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DS}	12	V
Gate-Source Voltage			V _{GS}	±8	V
Continuous Drain Current (Note 5) V _{GS} = 4.5V	Steady State	T _A = +25°C	I _D	7.4	A
		T _A = +70°C		5.9	
Continuous Drain Current (Note 5) V _{GS} = 2.5V	Steady State	T _A = +25°C	I _D	6.4	A
		T _A = +70°C		5.1	
Pulsed Drain Current (Note 6)			I _{DM}	37	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 7)	P _D	0.69	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 7)	R _{θJA}	184.2	°C/W
Power Dissipation (Note 5)	P _D	1.8	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5)	R _{θJA}	70.6	°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)						
Drain-Source Breakdown Voltage	BV _{DSS}	12	—	—	V	V _{GS} = 0V, I _S = 1mA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	—	—	1	μA	V _{DS} = 9.6V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±8V, V _{SS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	0.3	0.73	1.2	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	9	16	21	mΩ	V _{GS} = 4.5V, I _D = 1.8A
		11	20	28		V _{GS} = 2.5V, I _D = 1.8A
		14	30	43		V _{GS} = 1.8V, I _D = 0.5A
Diode Forward Voltage	V _{SD}	—	0.74	1.0	V	V _{GS} = 0V, I _D = 1.8A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	409	—	pF	V _{DS} = 10V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	125	—		
Reverse Transfer Capacitance	C _{rss}	—	87	—		
Total Gate Charge	Q _g	—	5.1	—	nC	V _{DS} = 6V, V _{GS} = 4V, I _D = 3.6A
Gate-Source Charge	Q _{gs}	—	0.9	—		
Gate-Drain Charge	Q _{gd}	—	1.3	—		
Turn-On Delay Time	t _{D(ON)}	—	7.4	—	ns	V _{DS} = 6V, V _{GS} = 4V, I _D = 1.8A
Turn-On Rise Time	t _R	—	10.8	—		
Turn-Off Delay Time	t _{D(OFF)}	—	31.0	—		
Turn-Off Fall Time	t _F	—	14.5	—		

- Notes:
- Device mounted on FR-4 material with 1inch² (6.45cm²), 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.

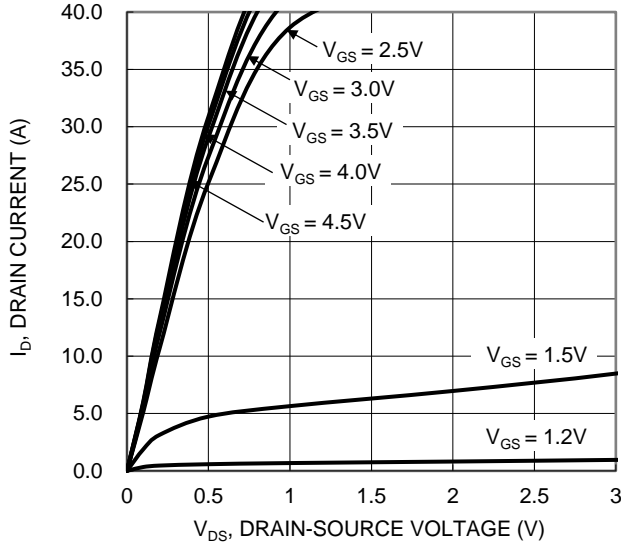


Figure 1. Typical Output Characteristic

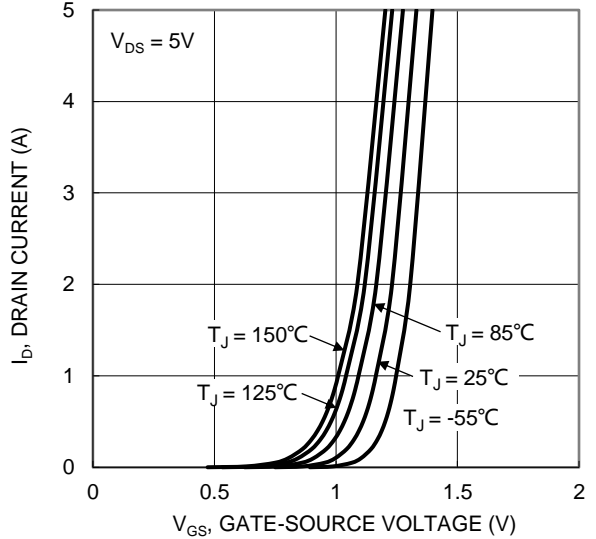


Figure 2. Typical Transfer Characteristic

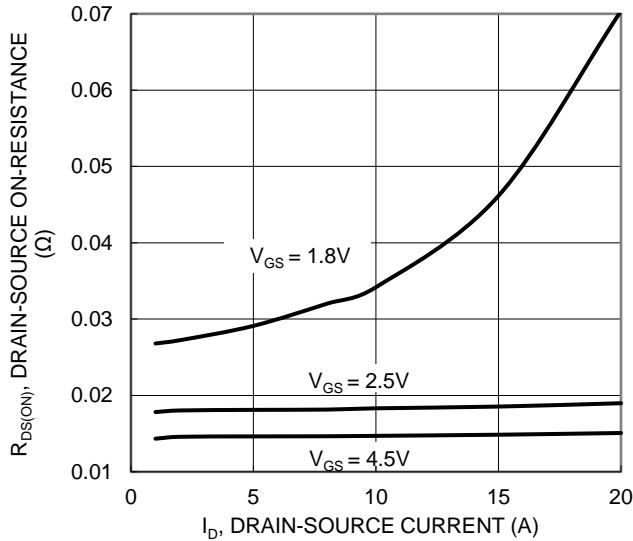


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

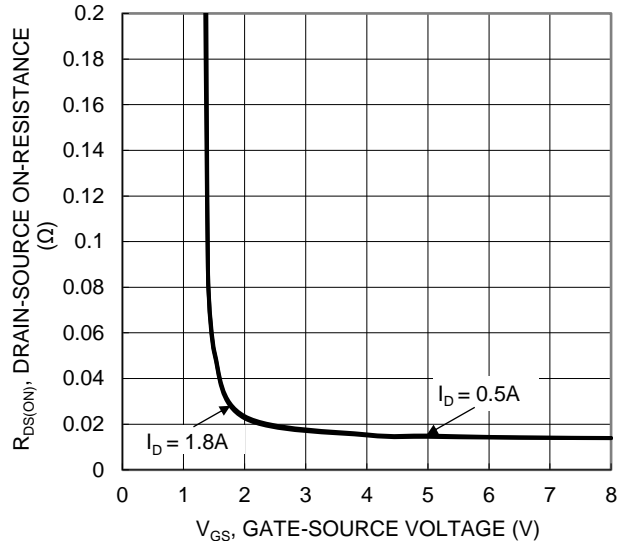


Figure 4. Typical Transfer Characteristic

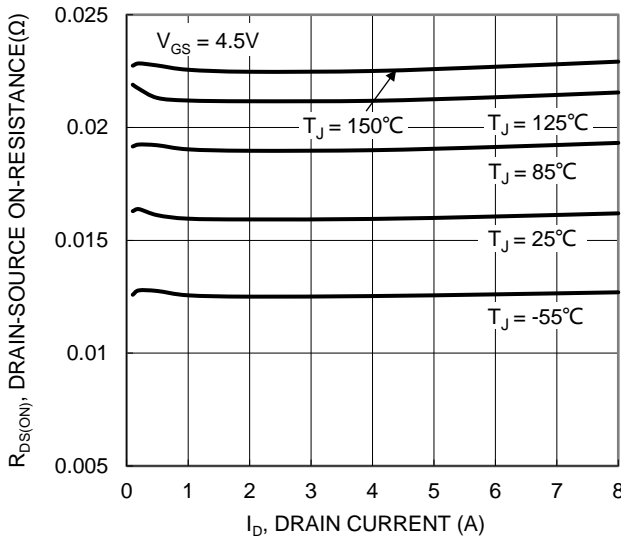


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

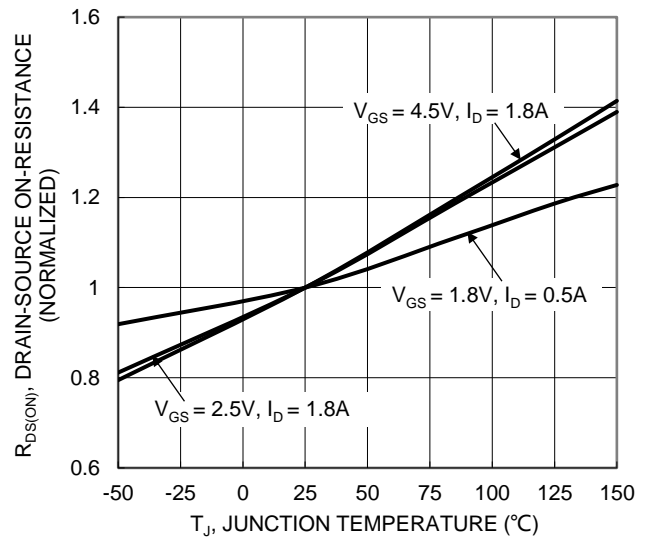


Figure 6. On-Resistance Variation with Temperature

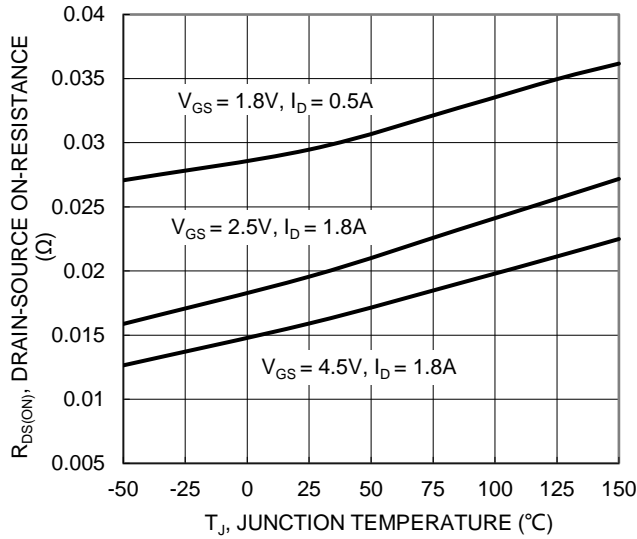


Figure 7. On-Resistance Variation with Temperature

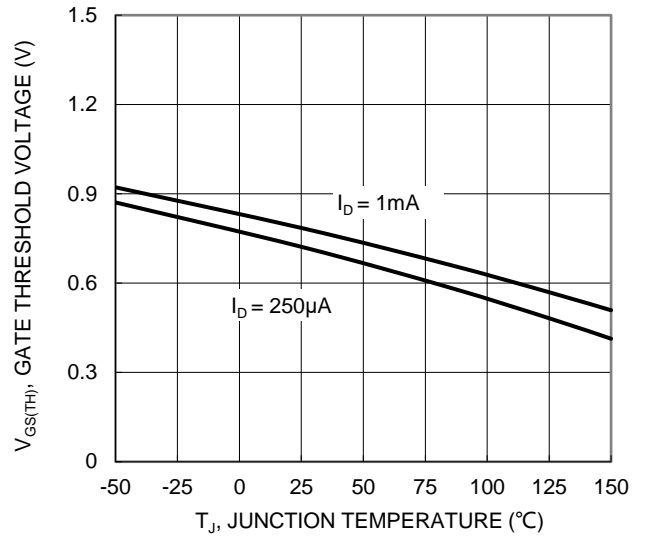


Figure 8. Gate Threshold Variation vs. Temperature

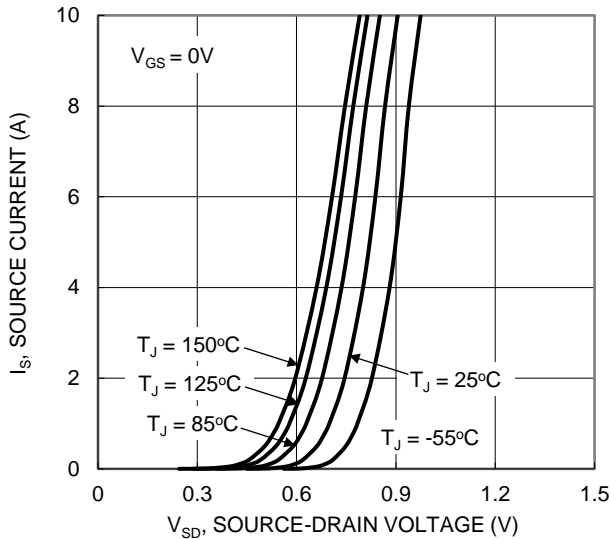


Figure 9. Diode Forward Voltage vs. Current

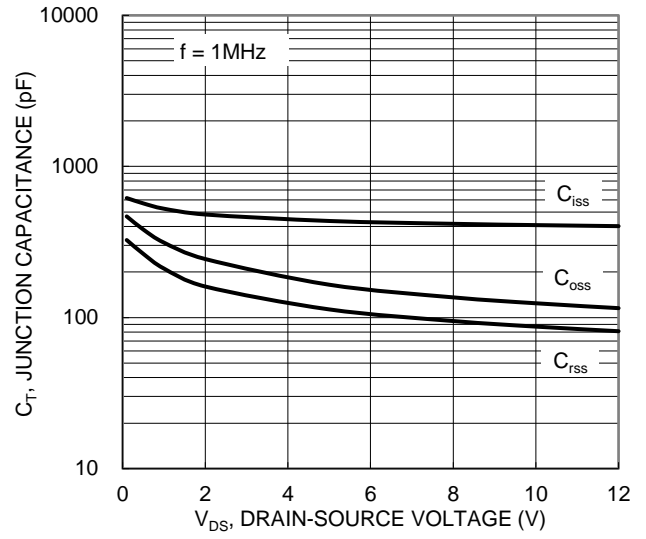


Figure 10. Typical Junction Capacitance

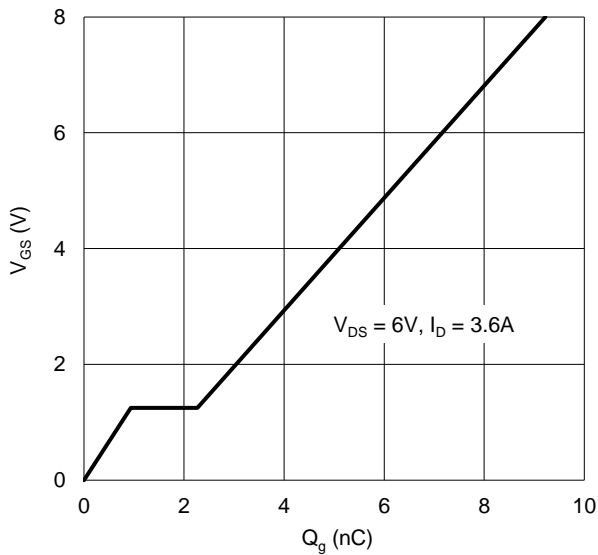


Figure 11. Gate Charge

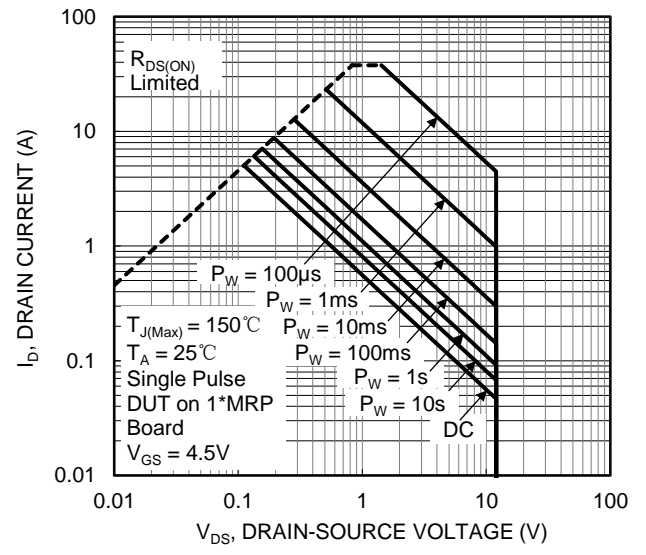


Figure 12. SOA, Safe Operation Area

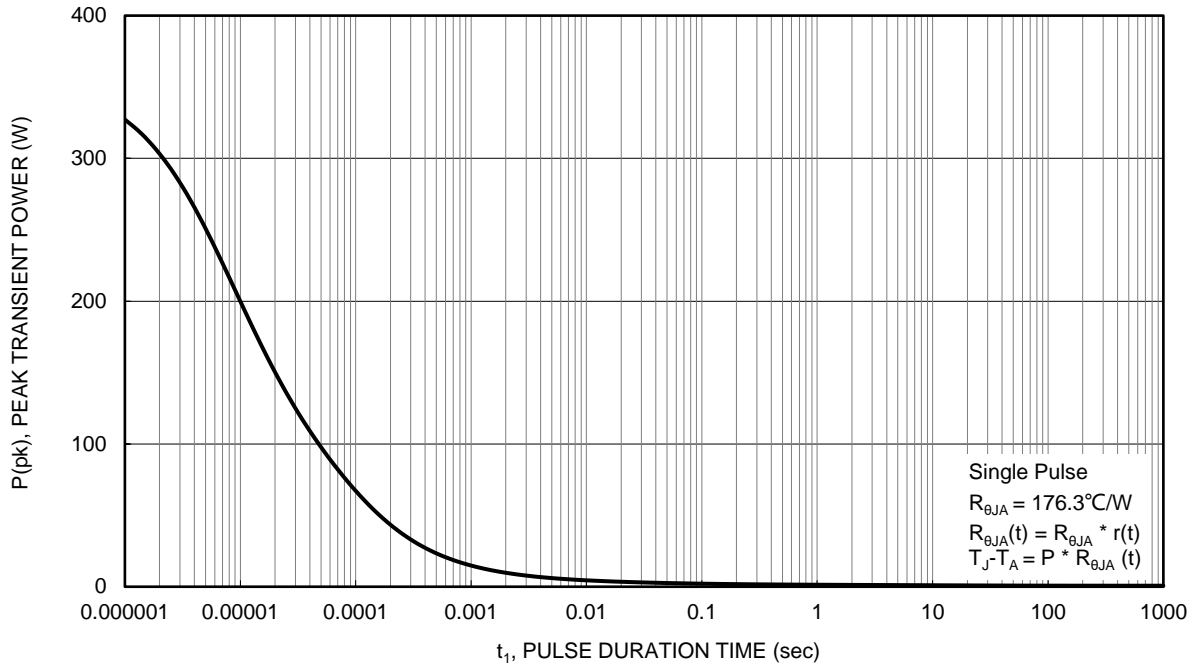


Figure 13. Single Pulse Maximum Power Dissipation

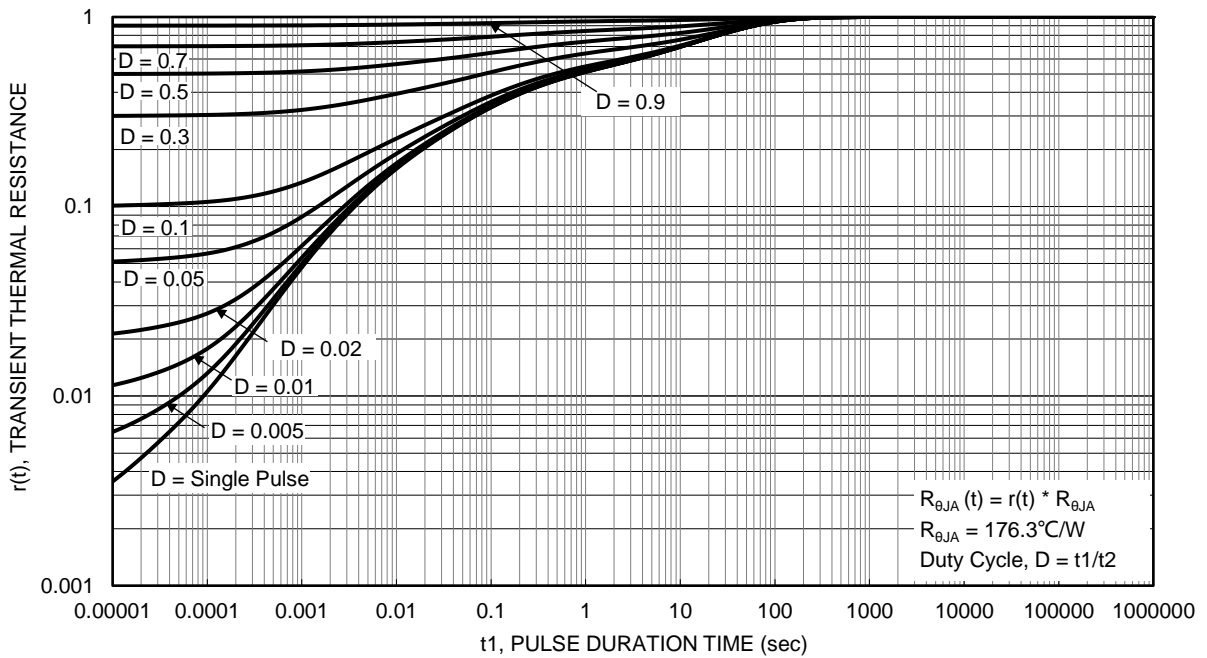
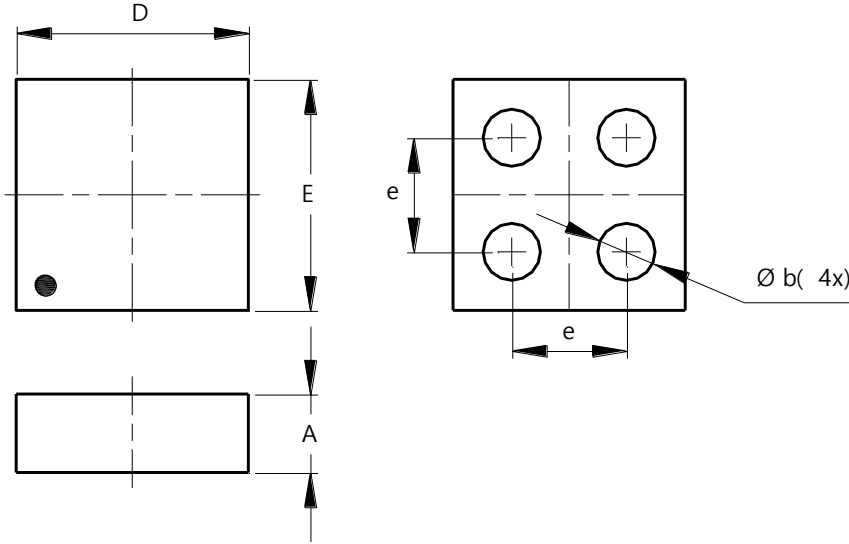


Figure 14. Transient Thermal Resistance

Package Outline Dimensions

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

X2-TSN0808-4

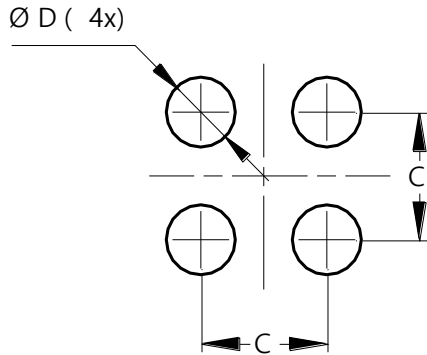


X2-TSN0808-4			
Dim	Min	Max	Typ
A	0.245	0.305	0.275
b	0.170	0.230	0.200
D	0.720	0.800	0.760
E	0.720	0.800	0.760
e	0.400 BSC		
All Dimensions in mm			

Suggested Pad Layout

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

X2-TSN0808-4



Dimensions	Value (in mm)
C	0.400
D	0.200

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