Product Summary (Typ. @ V_{GS} = 4.5V, T_A = +25°C)

BV_{DSS}	$R_{DS(ON)}$	Q_g	Q_{gd}	I_D
20V	43mΩ	7.4nC	1.5nC	4.0A

Description

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

Applications

- DC-DC Converters
- Battery Management
- Load Switch

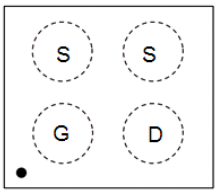
Features

- Built-in G-S Protection Diode Against ESD 2kV HBM
- Trench-MOS Technology with The Lowest $R_{DS(ON)}$:
  $R_{DS(ON)}$ = 43mΩ to Minimize On-State Losses
- $V_{GS(TH)}$ = 0.7V Typ. for A Low Turn-On Potential
- CSP with Footprint 0.8mm × 0.8mm
- Height = 0.35mm for Low Profile
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

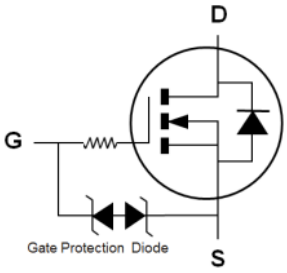
Mechanical Data

- Case: X2-WLB0808-4 (Type B)
- Terminal Connections: See Diagram Below





Top-View
Pin Configuration



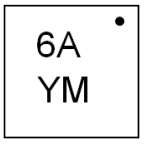
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN2080UCB4-7	X2-WLB0808-4 (Type B)	3000/Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/quality/lead_free.html 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



6A = Product Type Marking Code
YM = Date Code Marking
Y or $\overline{Y}$ = Year (ex: E = 2017)
M or $\overline{M}$ = Month (ex: 9 = September)

Date Code Key

Year	2016	2017	2018	2019	2020	2021	2022
Code	D	E	F	G	H	I	J

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

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Maximum Ratings

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±8	V
Continuous Source Current @ V_{GS} = 4.5V (Note 5)	T_A = +25°C T_A = +70°C	I_D	3.0 2.4	A
Continuous Source Current @ V_{GS} = 4.5V (Note 6)	T_A = +25°C T_A = +70°C	I_D	4.0 3.2	A
Pulsed Drain Current (Pulse Duration 10µs, Duty Cycle ≤1%)		I_{DM}	8	A
Continuous Source-Drain Diode Current		I_S	0.74	A
Pulse Diode Forward Current		I_{SM}	15	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	0.71	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	176	°C/W
Total Power Dissipation (Note 6)	P_D	1.25	W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	99	°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 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	20	-	-	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1.0	µA	V_{DS} = 20V, V_{GS} = 0V
Gate-Body Leakage	I_{GSS}	-	-	±0.5	µA	V_{GS} = ±4.5V, V_{DS} = 0V
		-	-	±6		V_{GS} = ±8V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	0.4	0.7	1	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	43 49 60 72	56 68 90 115	mΩ	V_{GS} = 4.5V, I_D = 1.0A V_{GS} = 2.5V, I_D = 1.0A V_{GS} = 1.8V, I_D = 1.0A V_{GS} = 1.5V, I_D = 0.5A
Forward Transfer Admittance	$\|Y_{fs}\|$	-	4	-	S	V_{DS} = 10V, I_S = 1.0A
Body Diode Forward Voltage	V_{SD}	-	0.7	1.2	V	V_{GS} = 0V, I_S = 1.0A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	540	-	pF	V_{DS} = 10V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	70	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	33	-	pF	
Gate Resistance	R_g	-	1	-	kΩ	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge	Q_g	-	7.4	-	nC	V_{GS} = 4.5V, V_{DS} = 10V, I_D = 1.0A
Gate-Source Charge	Q_{gs}	-	0.8	-	nC	
Gate-Drain Charge	Q_{gd}	-	1.5	-	nC	
Turn-On Delay Time	$t_{D(ON)}$	-	152	-	ns	V_{DD} = 10V, I_D = 1.0A V_{GEN} = 4.5V, R_G = 1Ω, R_L = 10Ω
Turn-On Rise Time	t_R	-	268	-	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	-	1245	-	ns	
Turn-Off Fall Time	t_F	-	816	-	ns	
Reverse Recovery Charge	Q_{RR}	-	13	-	nC	I_F = 1A, di/dt = 100A/µs
Body Diode Reverse Recovery Time	t_{RR}	-	5	-	ns	

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

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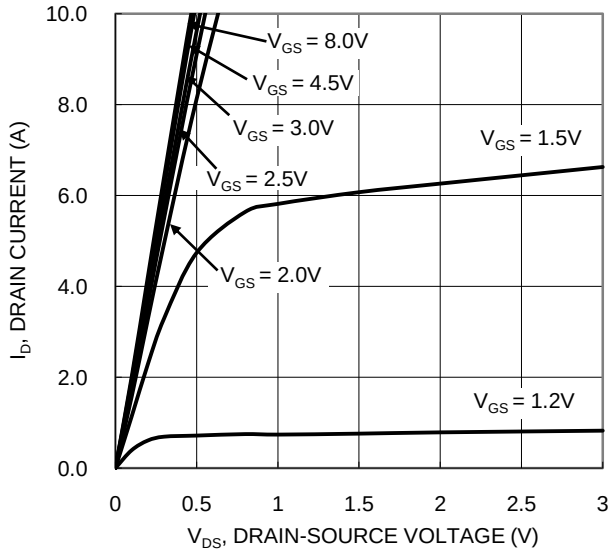


Figure 1. Typical Output Characteristic

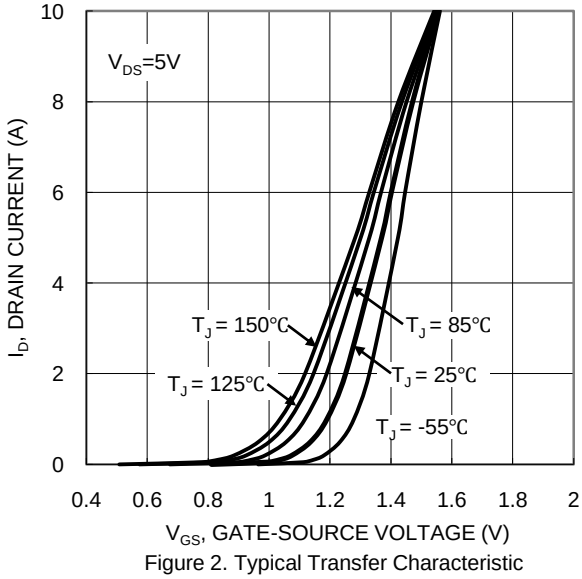


Figure 2. Typical Transfer Characteristic

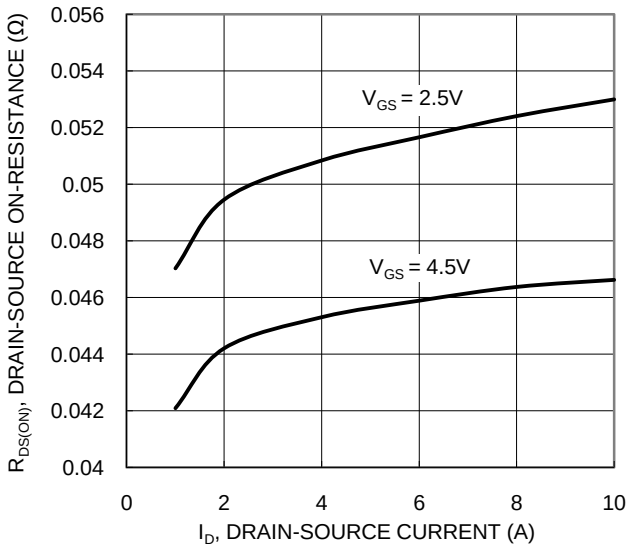


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

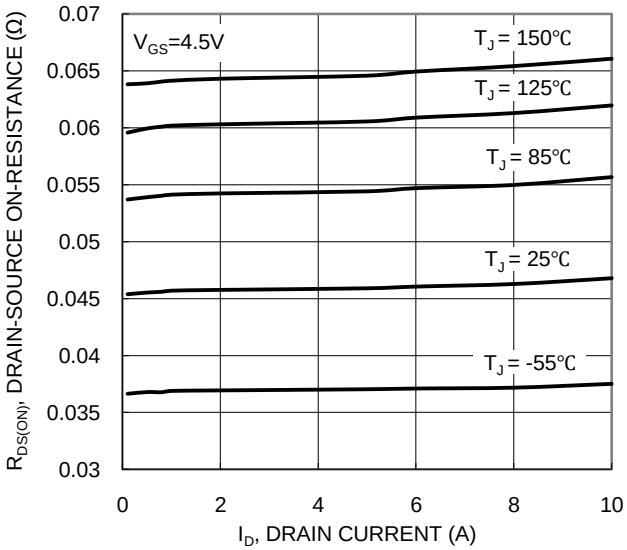


Figure 4. Typical On-Resistance vs. Drain Current and Junction Temperature

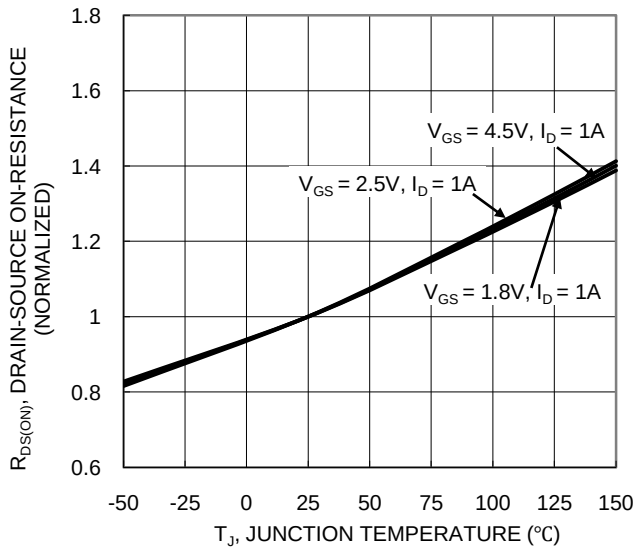


Figure 5. On-Resistance Variation with Junction Temperature

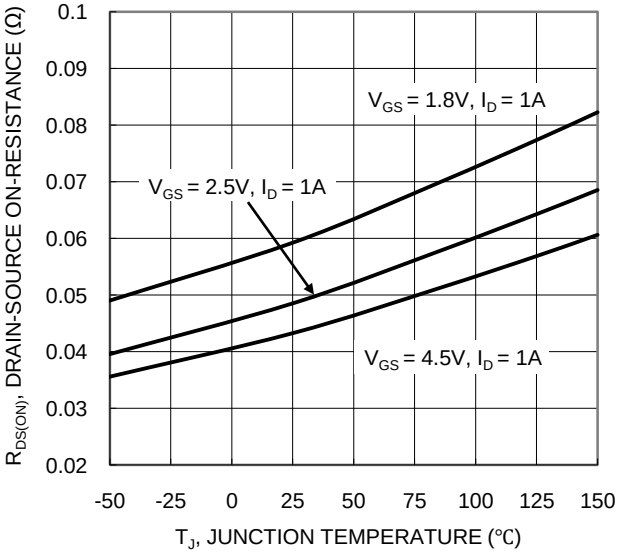


Figure 6. On-Resistance Variation with Junction Temperature

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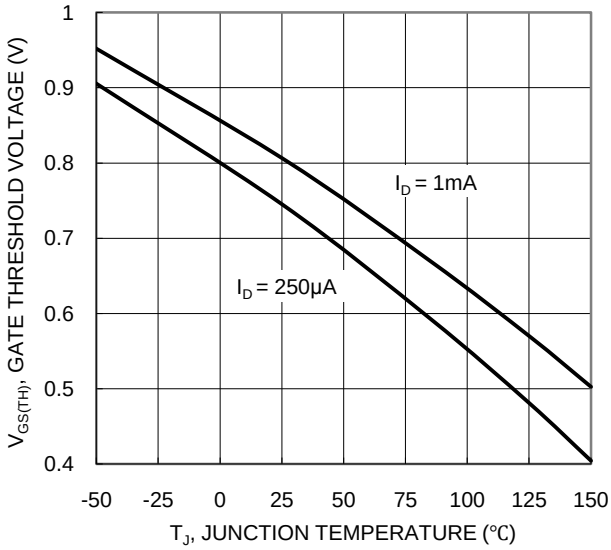


Figure 7. Gate Threshold Variation vs. Junction Temperature

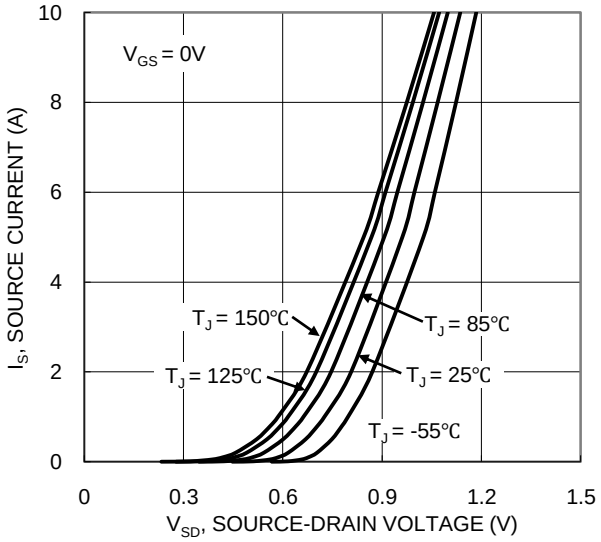


Figure 8. Diode Forward Voltage vs. Current

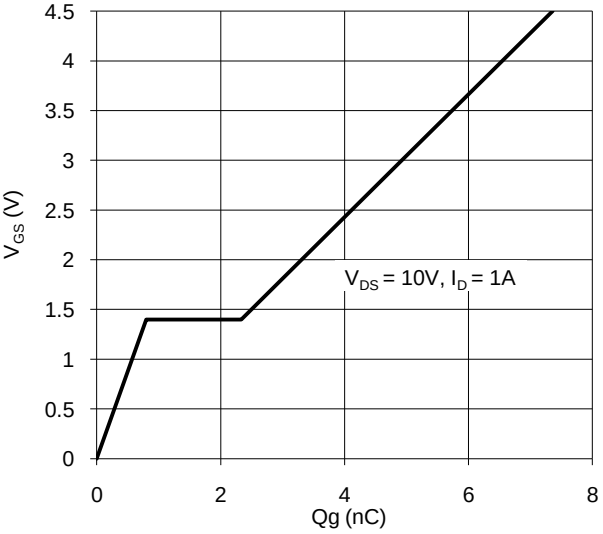


Figure 9. Gate Charge

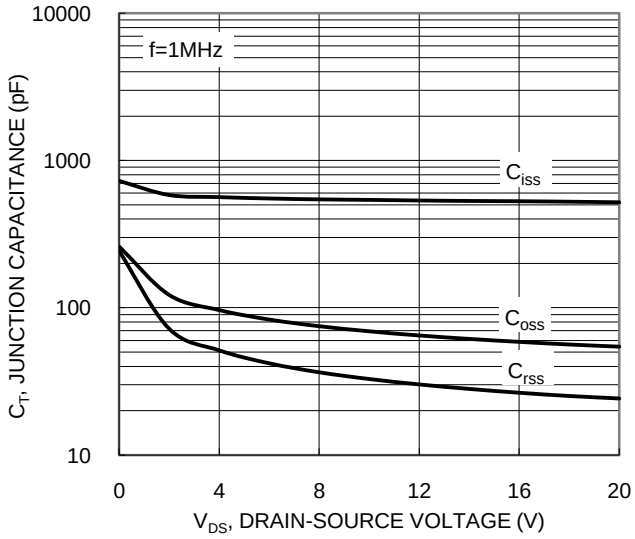


Figure 10. Typical Junction Capacitance

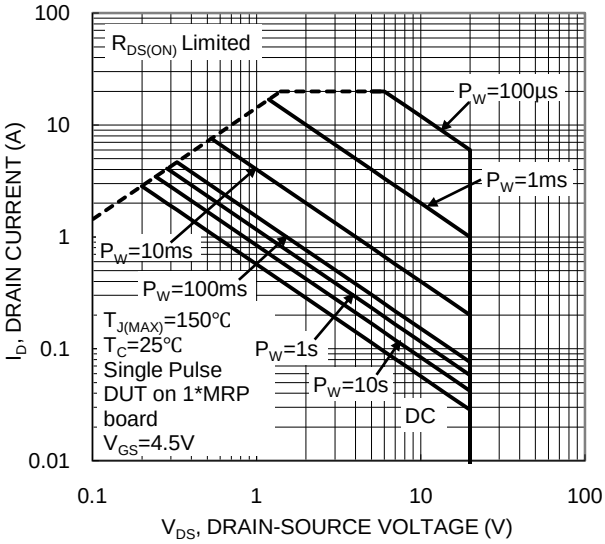


Figure 11. SOA, Safe Operation Area

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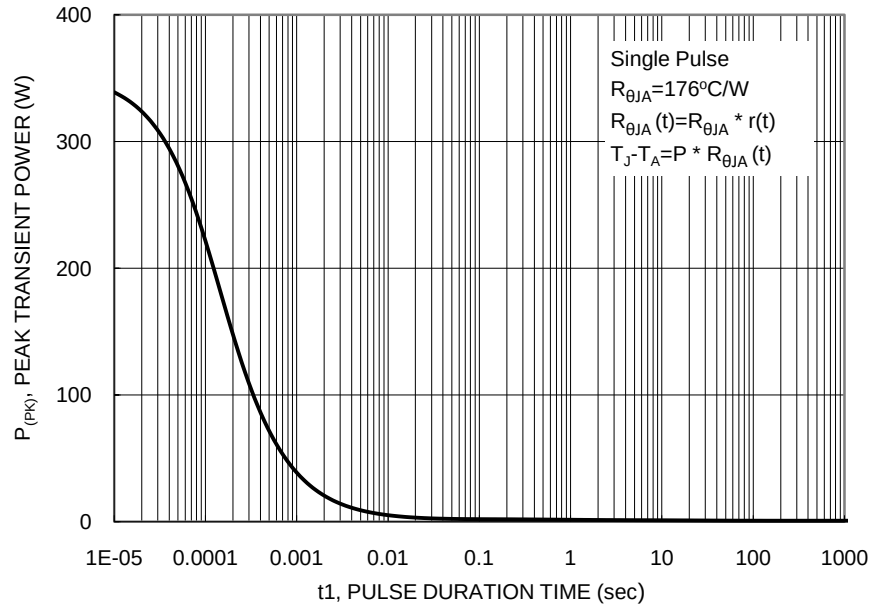


Figure 12. Single Pulse Maximum Power Dissipation

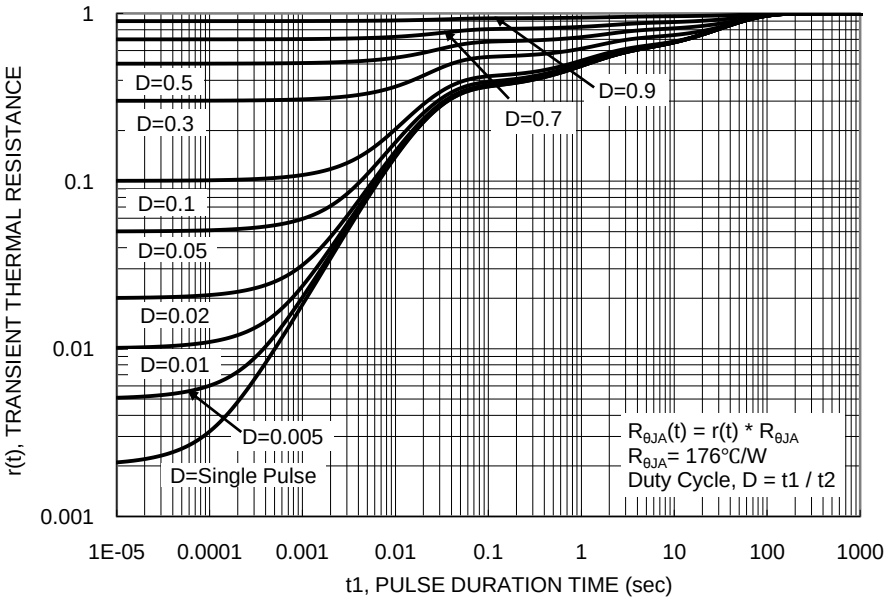


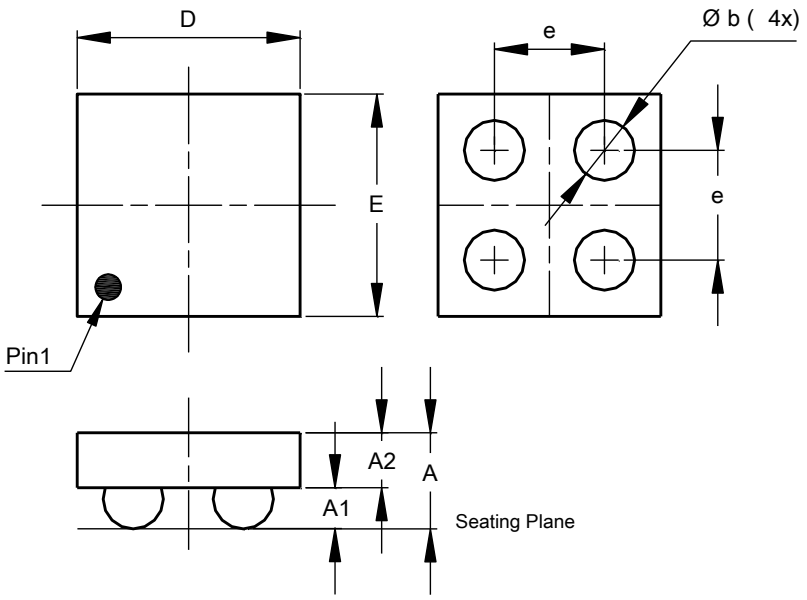
Figure 13. Transient Thermal Resistance

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Package Outline Dimensions

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

X2-WLB0808-4 (Type B)

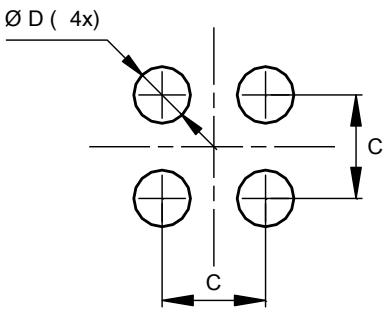


X2-WLB0808-4 (Type B)			
Dim	**Min**	**Max**	**Typ**
A	0.3100	0.3900	0.3500
A1	0.1350	0.1650	0.1500
A2	0.1750	0.2250	0.2000
b	0.1971	0.2409	0.2190
D	0.7900	0.8300	0.8100
E	0.7900	0.8300	0.8100
e	-	-	0.400
All Dimensions in mm			

Suggested Pad Layout

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

X2-WLB0808-4 (Type B)



Dimensions	Value (in mm)
C	0.400
D	0.219

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