Product Summary

BV_{DSS}	$R_{D1D2(ON)\ TYP}$	I_{D1D2} T_A = +25°C
-20V	82mΩ @ V_{GS} = -4.5V	-3.0A

Description

This new generation MOSFET has been designed to minimize the on-state resistance ($R_{D1D2(ON)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- Battery Management
- Load Switch
- Battery Protection

Features and Benefits

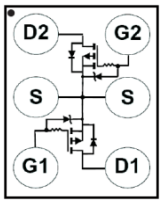
- Low Q_g & Q_{gd}
- Dual PMOS in Common-Source Configuration
- Small Footprint 1.5mm × 1.0mm
- **Gate ESD Protection to 6kV**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: U-WLB1510-6
- Terminal Connections: See Diagram Below
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal: Finish - SnAgCu. Solderable per MIL-STD-202 Method 208 e1
- UBM Opening: 280µm

U-WLB1510-6 (Type B)





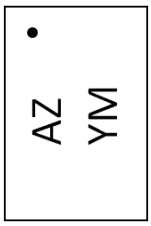
Top View

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP2108UCB6-7	U-WLB1510-6 (Type B)	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



AZ= Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: G = 2019)
M = Month (ex: N = November)

Date Code Key

Year	2019	2020	2021	2022	2023	2024	2025
Code	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

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DS}	-20	V
Gate-Source Voltage			V_{GS}	-6	V
Continuous Drain Current (Note 5) V_{GS} = -4.5V	Steady State	T_A = +25°C T_A = +70°C	I_{D1D2}	-2.25 -1.8	A
Continuous Drain Current (Note 6) V_{GS} = -4.5V	Steady State	T_A = +25°C T_A = +70°C	I_{D1D2}	-3.0 -2.4	A
Continuous Source Pin Current (Note 6)			I_S	-2.0	A
Continuous Gate Clamp Current (Note 6)			I_G	-0.5	A
Pulsed Source Pin Current (Pulse Duration 10µs, Duty Cycle ≤ 1%)			I_{SM}	-39	A
Pulsed Gate Clamp Current (Pulse Duration 10µs, Duty Cycle ≤ 1%)			I_{GM}	-7	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	0.84	W
Total Power Dissipation (Note 6)	P_D	1.2	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	152.7	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	105.4	°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_{DS} = -250µA
Zero Gate Voltage Drain Current @T_C = +25°C	I_{DSS}	—	—	-1	µA	V_{DS} = -16V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	-100	nA	V_{GS} = -6V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	-0.5	-0.75	-1.1	V	V_{DS} = V_{GS}, I_{DS} = -250µA
Static Drain-Source On-Resistance	$R_{D1D2(ON)}$	—	82	100	mΩ	V_{GS} = -4.5V, I_{D1D2} = -1A
		—	110	150		V_{GS} = -2.5V, I_{D1D2} = -1A
		—	160	240		V_{GS} = -1.8V, I_{D1D2} = -1A
	$R_{DS(ON)}$	—	42	55	mΩ	V_{GS} = -4.5V, I_{DS} = -1A
		—	56	80		V_{GS} = -2.5V, I_{DS} = -1A
		—	80	120		V_{GS} = -1.8V, I_{DS} = -1A
DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 6)	V_{SD}	—	-0.72	-1	V	V_{GS} = 0V, I_{DS} = -1A
Reverse Recovery Charge	Q_{RR}	—	2.3	—	nC	V_{DD} = -10V, I_F = -1A, di/dt = 200A/µs
Reverse Recovery Time	t_{RR}	—	7.1	—	ns	
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	269	—	pF	V_{DS} = -10V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	142	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	7.6	—	pF	
Total Gate Charge (-4.5V)	Q_g	—	2.1	—	nC	V_{GS} = -4.5V, V_{DS} = -10V, I_{DS} = -1A
Gate-Source Charge	Q_{gs}	—	0.3	—	nC	
Gate-Drain Charge	Q_{gd}	—	0.3	—	nC	
Gate Charge at V_{TH}	$Q_{g(TH)}$	—	0.16	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	6	—	ns	V_{DD} = -10V, V_{GS} = -4.5V, I_{DS} = -1A, R_G = 30Ω
Turn-On Rise Time	t_R	—	7	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	34	—	ns	
Turn-Off Fall Time	t_F	—	16	—	ns	

Notes:
5. Device mounted on FR-4 PCB with minimum recommended pad layout.
6. Device mounted on FR-4 material with 1 inch^2 (6.45cm^2), 2 oz. (0.071mm thick) Cu.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

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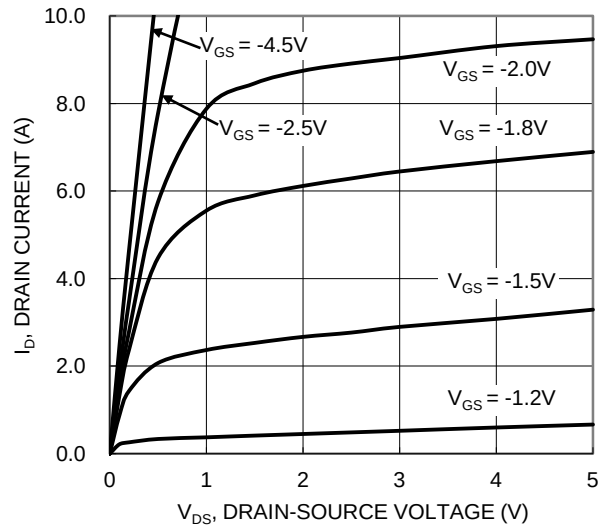


Figure 1.Typical Output Characteristic

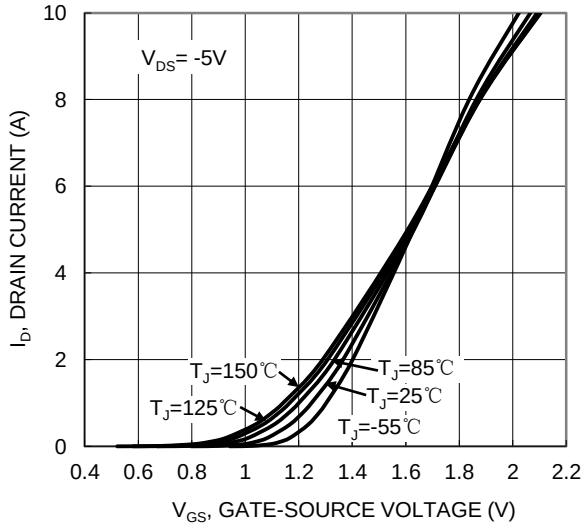


Figure 2. Typical Transfer Characteristic

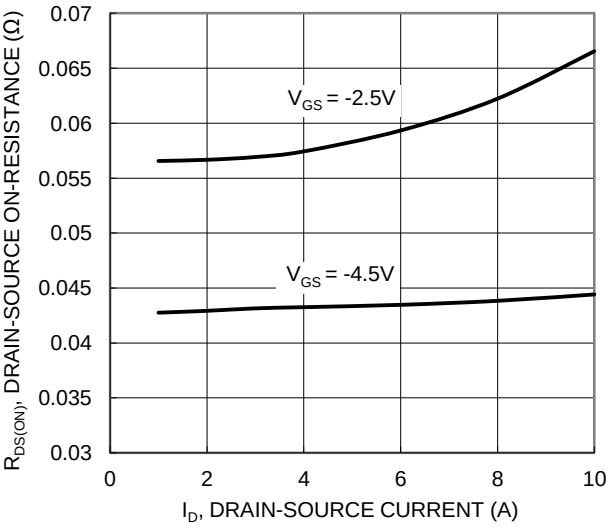


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

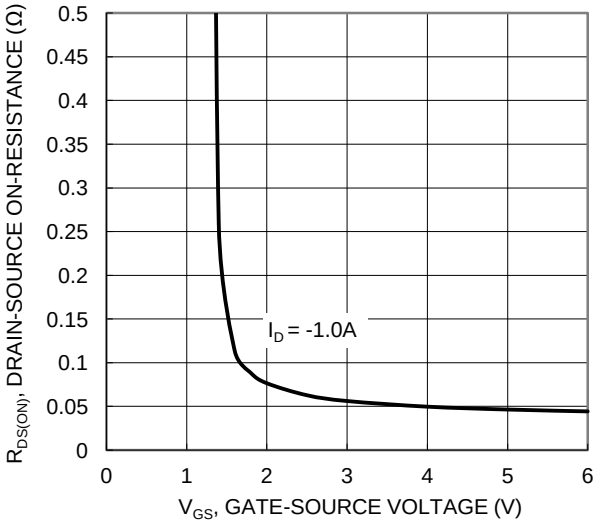


Figure 4. Typical Transfer Characteristic

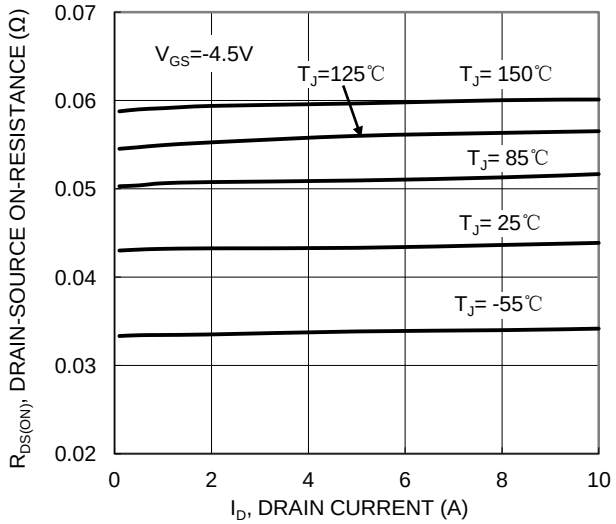


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

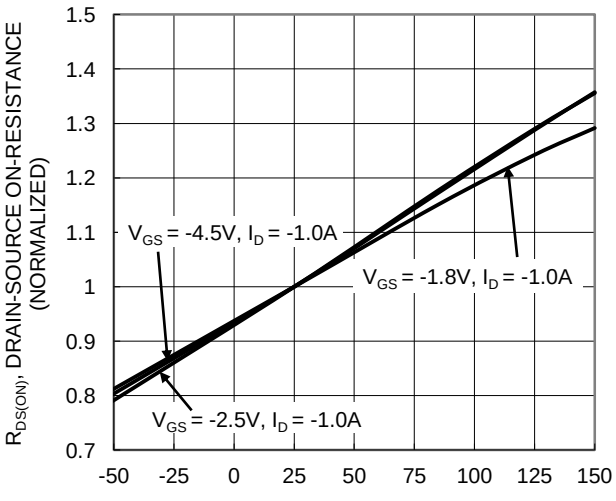


Figure 6. On-Resistance Variation with Junction Temperature

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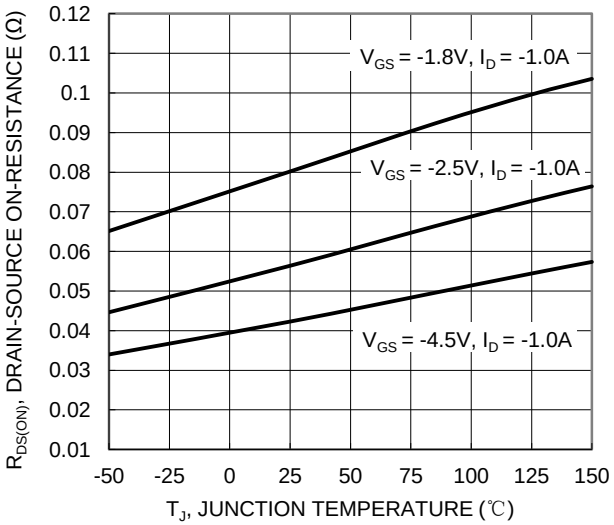


Figure 7. On-Resistance Variation with Junction Temperature

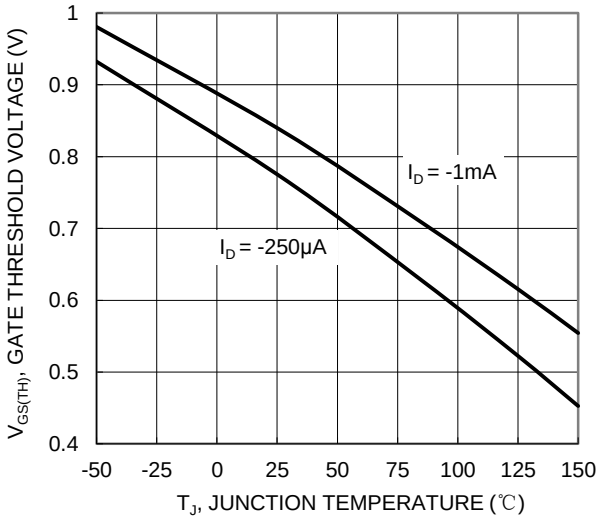


Figure 8. Gate Threshold Variation vs. Junction Temperature

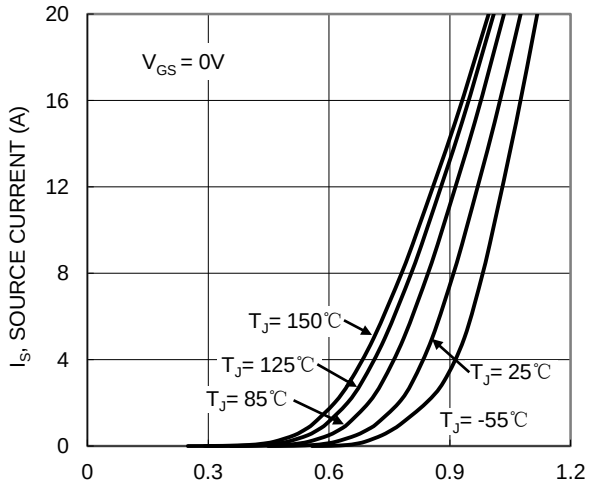


Figure 9. Diode Forward Voltage vs. Current

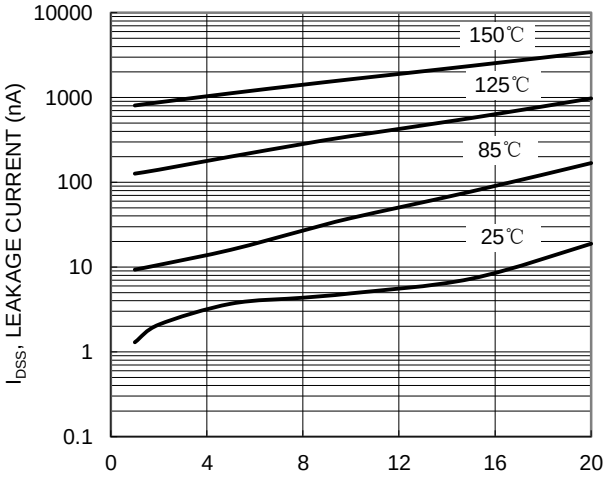


Figure 10. Typical Drain-Source Leakage Current vs. Voltage

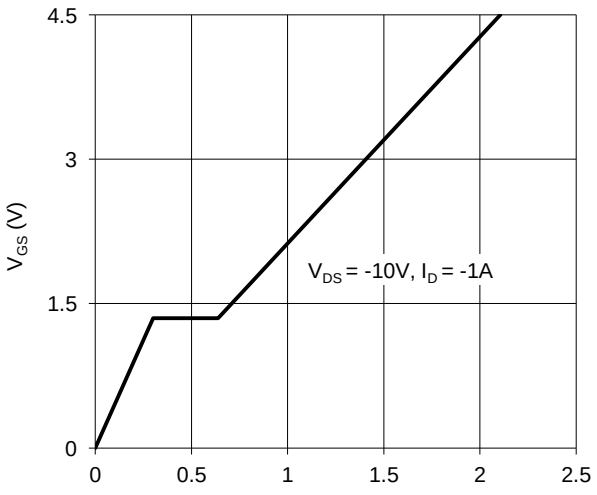


Figure 11. Gate Charge

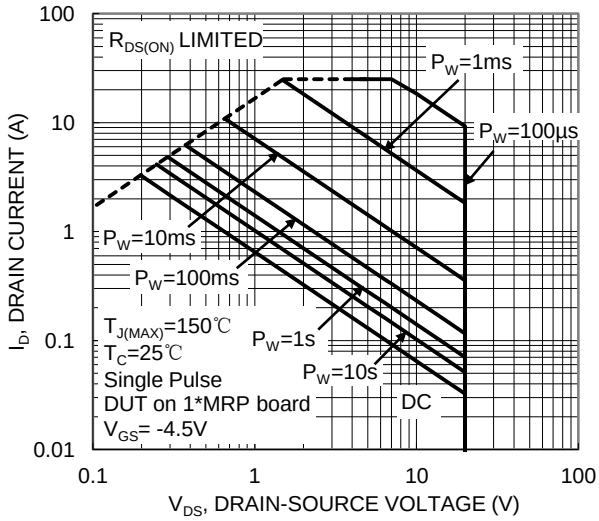


Figure 12. SOA, Safe Operation Area

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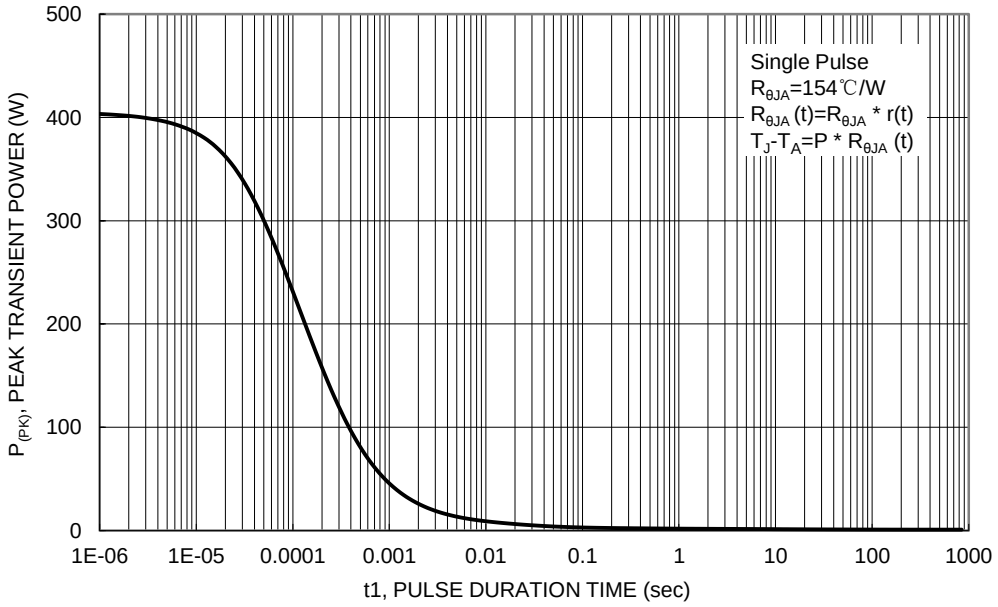


Figure 13. Single Pulse Maximum Power Dissipation

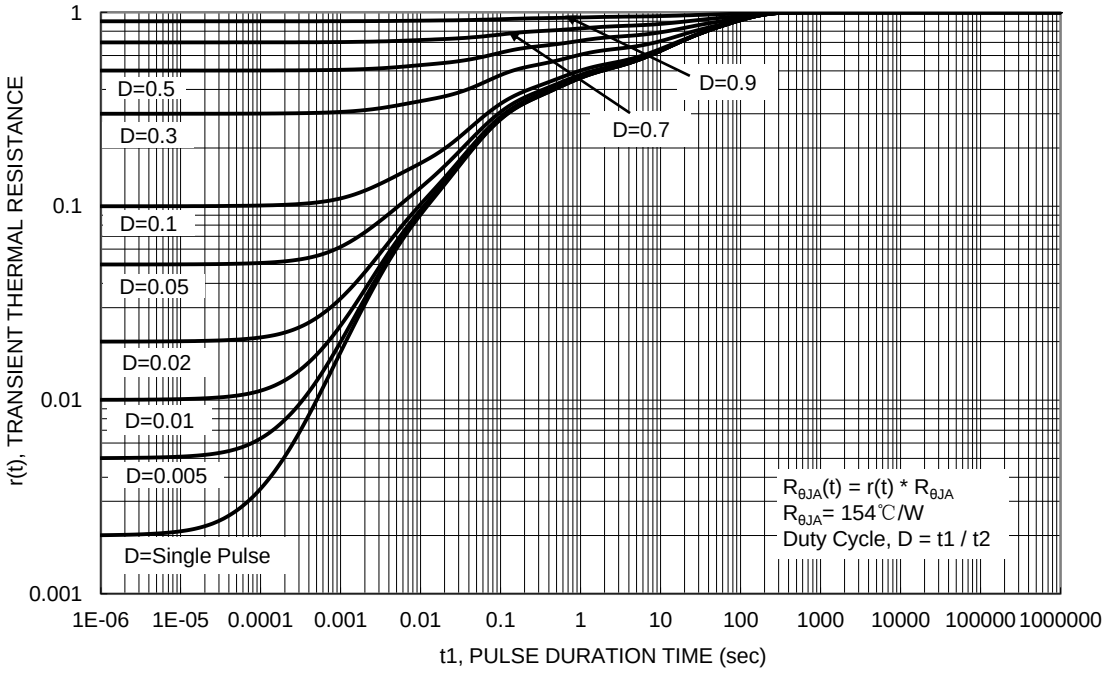


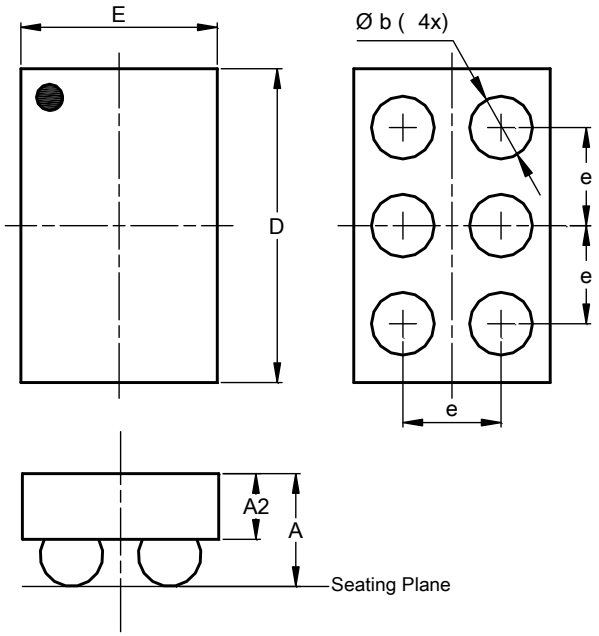
Figure 14. Transient Thermal Resistance

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Package Outline Dimensions

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

U-WLB1510-6 (Type B)

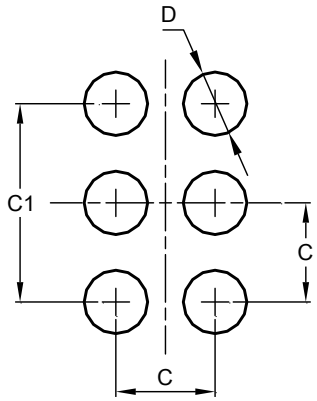


U-WLB1510-6 (Type B)			
Dim	**Min**	**Max**	**Typ**
A	--	0.60	--
A2	--	--	0.335
b	0.305	0.335	0.320
D	1.47	1.52	1.495
E	0.97	1.02	0.995
e	--	--	0.50
All Dimensions in mm			

Suggested Pad Layout

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

U-WLB1510-6 (Type B)



Dimensions	Value (in mm)
C	0.50
C1	1.00
D	0.30

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