

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)}) yet maintain superior switching performance, making it ideal for high-efficiency power-management applications.

Applications

- Battery management
- Load switches
- Battery protections



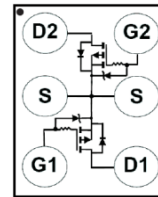
Features and Benefits

- Low Q_g & Q_{gd}
- Dual PMOS in Common-Source Configuration
- Small Footprint 1.5mm × 1.0mm
- 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](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative.

<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

- Package: 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: 245μm
- Weight: 0.002 grams (Approximate)



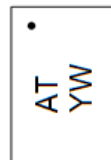
Top View

Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMP2109UCB6-7	U-WLB1510-6 (Type C)	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



AT = Product Type Marking Code
YW = Date Code Marking
Y or \bar{Y} = Year (ex: 5 = 2025)
W or \bar{W} = Week (ex: a = week 27; z represents week 52 and 53)

Date Code Key

Year	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Code	5	6	7	8	9	0	1	2	3	4	5	6

Week	1-26	27-52	53
Code	A-Z	a-z	z

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	-1.52	A
Continuous Gate Clamp Current (Note 6)			I _G	-0.5	A
Pulsed Source Pin Current (Pulse Duration 10μs, Duty Cycle ≤ 1%)			I _{SM}	-22	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 _{θJA}	152.7	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	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} = 0, I _{DS} = -250μA
Zero Gate Voltage Drain Current @T _C = +25°C	I _{DSS}	—	—	-1	μA	V _{DS} = -16V, V _{GS} = 0
Gate-Source Leakage	I _{GSS}	—	—	-100	nA	V _{GS} = -6V, V _{DS} = 0
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	108	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} = 0, I _{DS} = -1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iSS}	—	269	—	pF	V _{DS} = -10V, V _{GS} = 0, f = 1.0MHz
Output Capacitance	C _{oss}	—	142	—	pF	
Reverse Transfer Capacitance	C _{rSS}	—	7.6	—	pF	
Total Gate Charge	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:
- Device mounted on FR-4 PCB with minimum recommended pad layout.
 - Device mounted on FR-4 material with 1 inch² (6.45cm²), 2 oz. (0.071mm thick) Cu.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

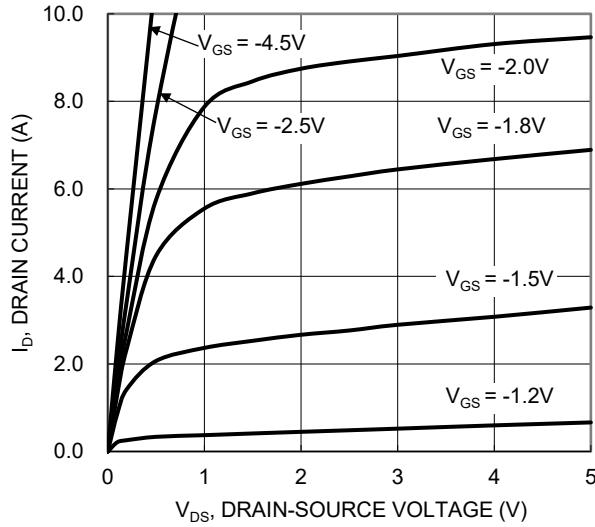


Figure 1. Typical Output Characteristic

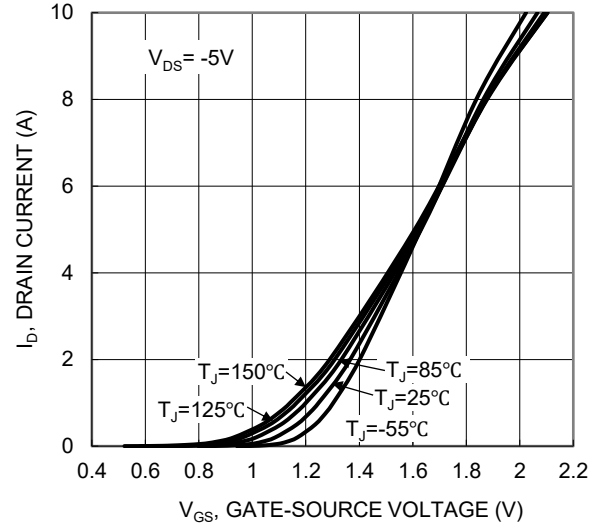


Figure 2. Typical Transfer Characteristic

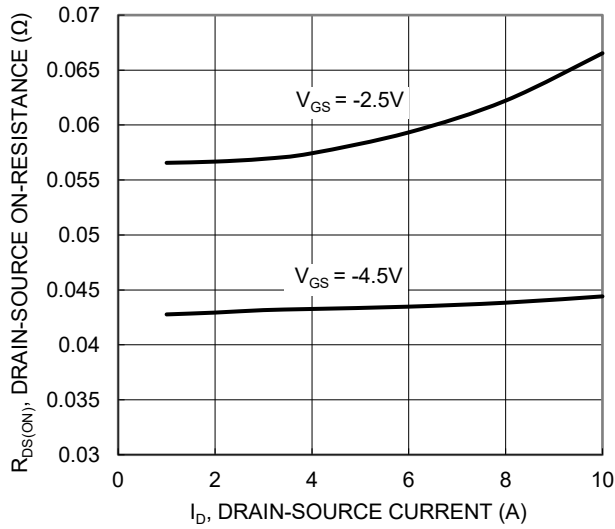


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

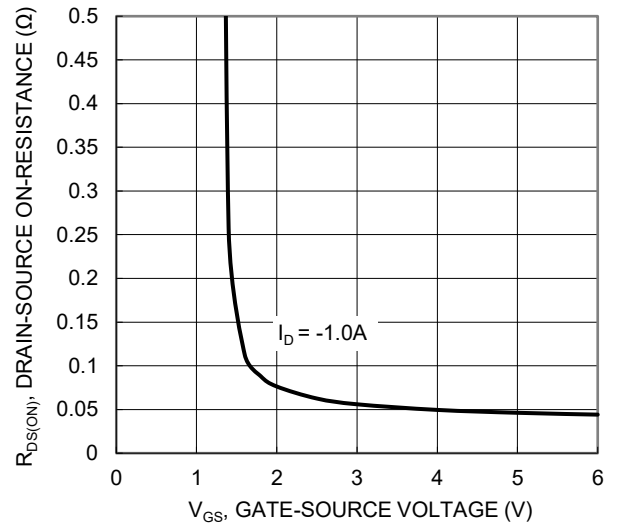


Figure 4. Typical Transfer Characteristic

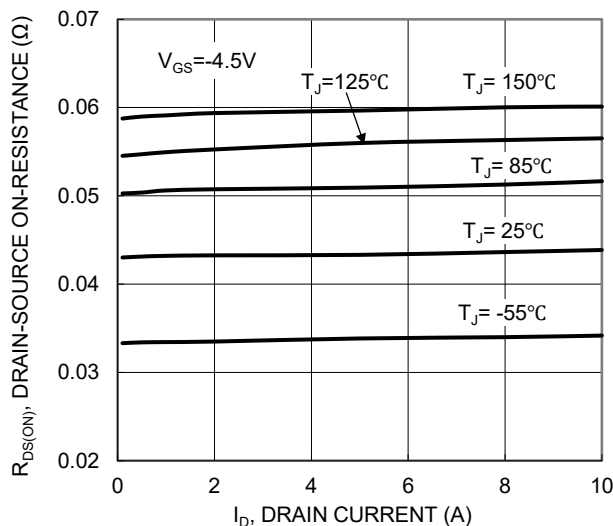


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

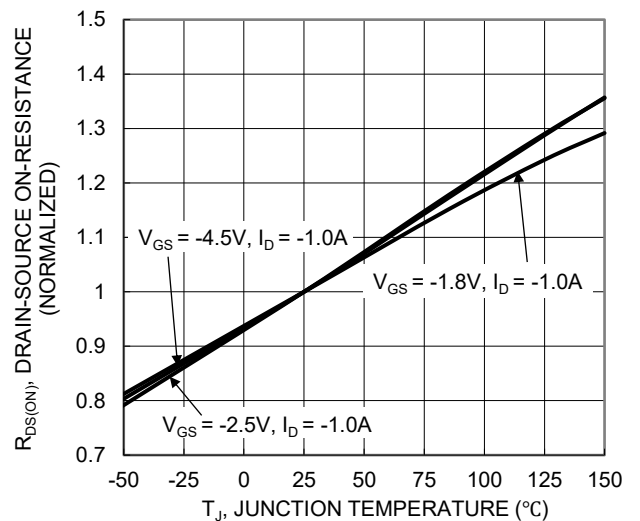


Figure 6. On-Resistance Variation with Junction Temperature

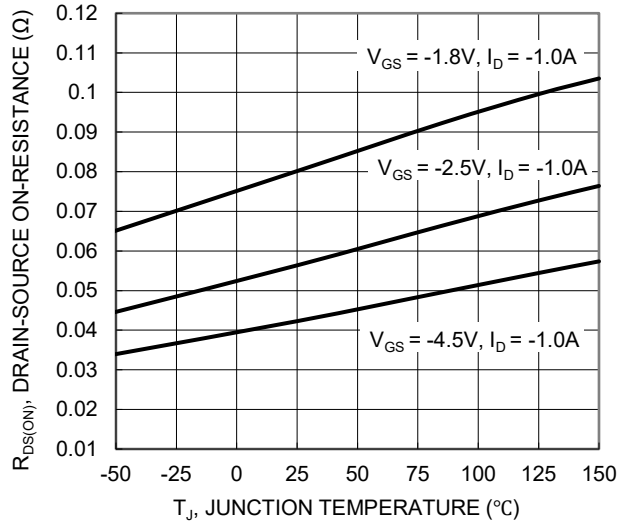


Figure 7. On-Resistance Variation with Junction Temperature

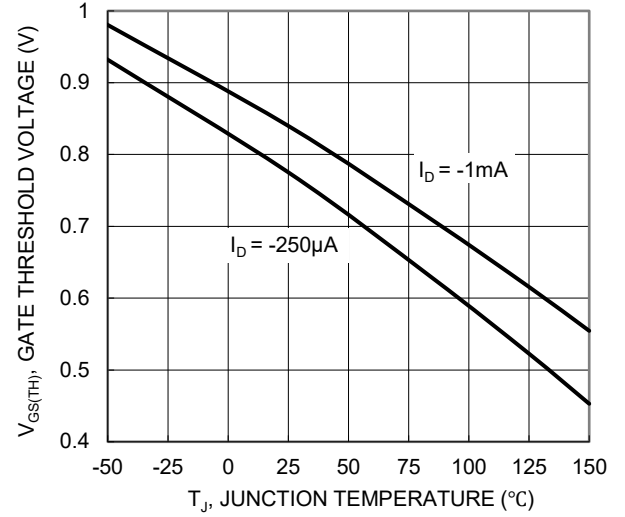


Figure 8. Gate Threshold Variation vs. Junction Temperature

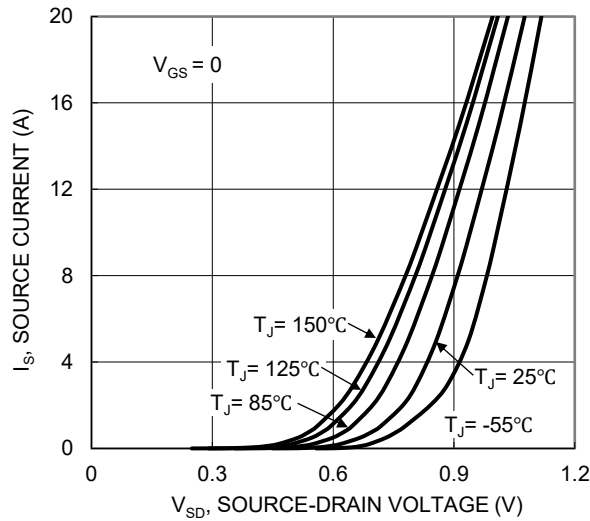


Figure 9. Diode Forward Voltage vs. Current

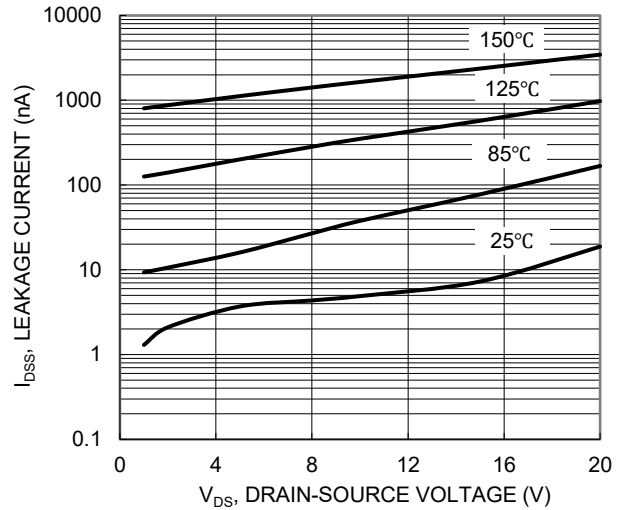


Figure 10. Typical Drain-Source Leakage Current vs. Voltage

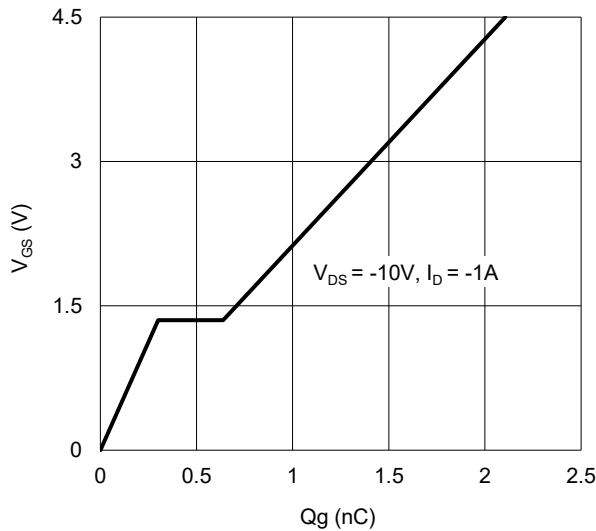


Figure 11. Gate Charge

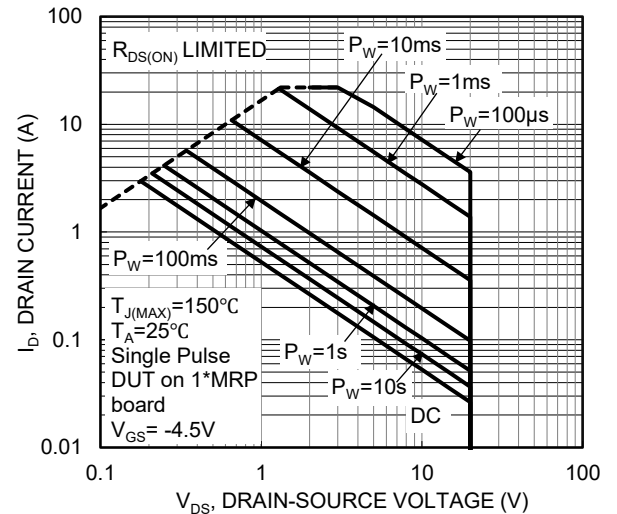


Figure 12. SOA, Safe Operation Area

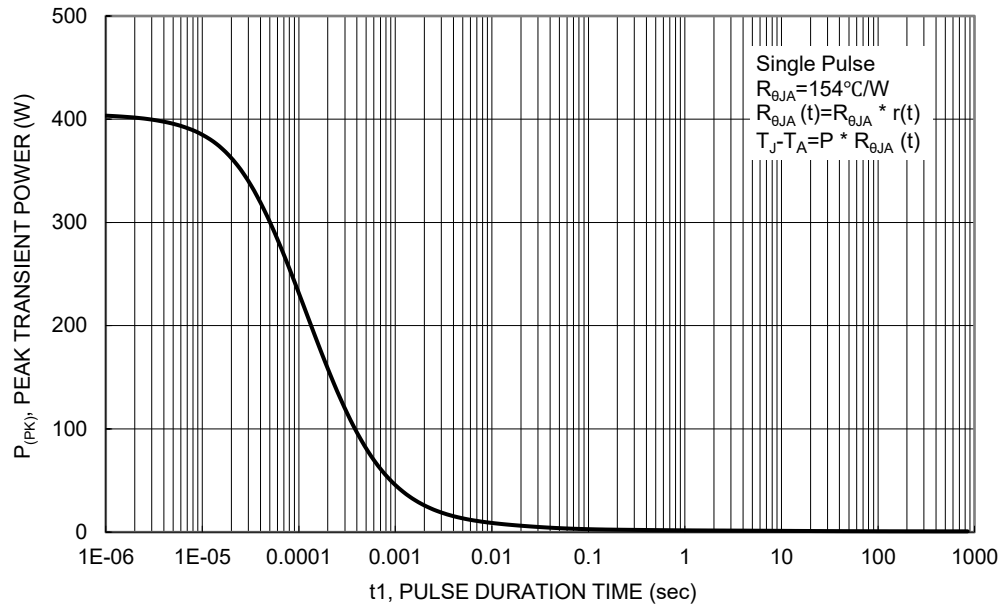


Figure 13. Single Pulse Maximum Power Dissipation

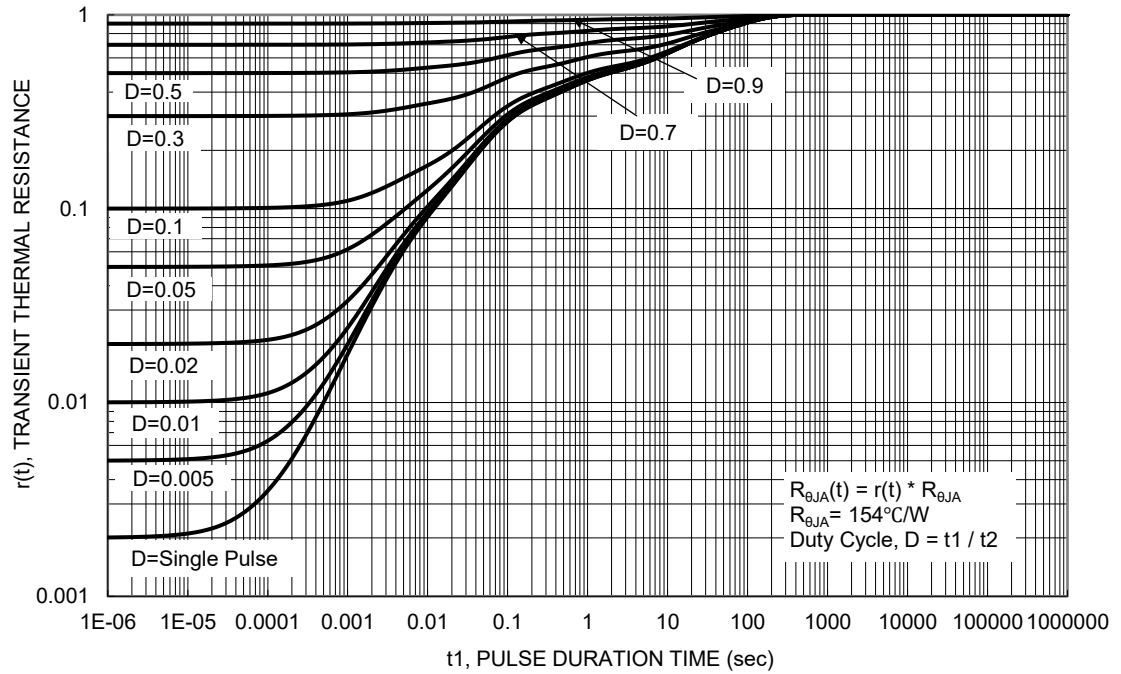
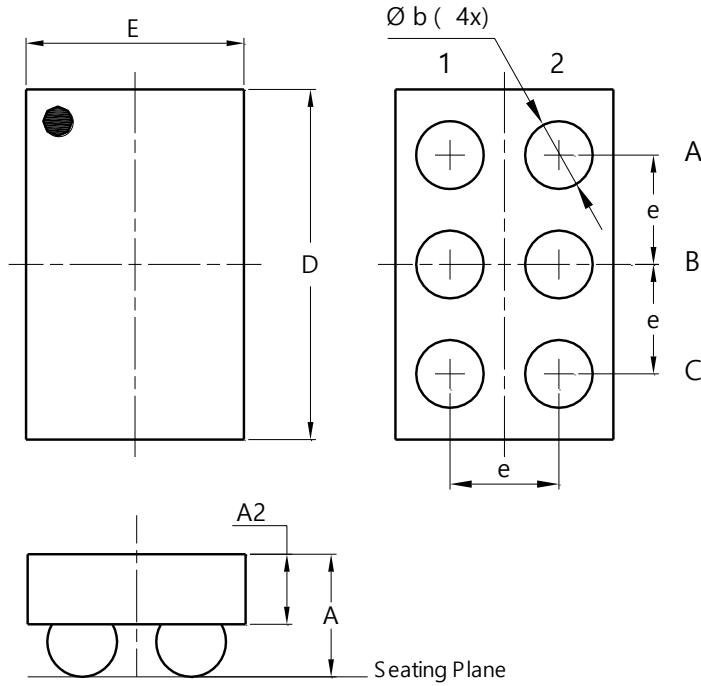


Figure 14. Transient Thermal Resistance

Package Outline Dimensions

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

U-WLB1510-6 (Type C)

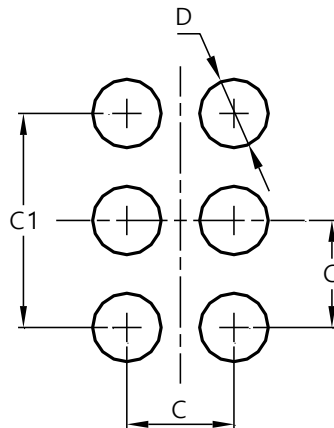


U-WLB1510-6 (Type C)			
Dim	Min	Max	Typ
A	--	0.625	--
A2	--	--	0.320
b	0.279	0.341	0.310
D	1.470	1.520	1.495
E	0.970	1.020	0.995
e	--	--	0.50
Co-planarity	≤ 0.038		
All Dimensions in mm			

Suggested Pad Layout

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

U-WLB1510-6 (Type C)



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

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