

**DUAL P-CHANNEL ENHANCEMENT MODE MOSFET**

**Product Summary**

<b>BV<sub>DSS</sub></b>	<b>R<sub>D1D2(ON)</sub> TYP</b>	<b>I<sub>D1D2</sub> T<sub>A</sub> = +25°C</b>
-20V	82mΩ @ V <sub>GS</sub> = -4.5V	-3.0A

**Description**

This new generation MOSFET has been designed to minimize the on-state resistance (R<sub>D1D2(ON)</sub>) yet maintain superior switching performance, making it ideal for high efficiency power management applications.

**Applications**

- Battery managements
- Load switches
- Battery protections

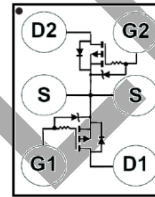
**Features and Benefits**

- Low Q<sub>g</sub> & Q<sub>gd</sub>
  - Dual PMOS in Common-Source Configuration
  - Small Footprint 1.5mm x 1.0mm
  - **Gate ESD Protection to 6kV**
  - **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: 280μm

U-WLB1510-6 (Type B)



Top View

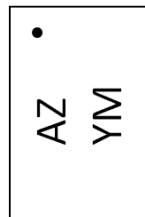


**Ordering Information** (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
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: J = 2022)  
 M = Month (ex: N = November)

Date Code Key

Year	2017	...	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	E	...	J	K	L	M	N	O	P	R	S	T

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
Drain-Source Voltage			V <sub>DS</sub>	-20	V
Gate-Source Voltage			V <sub>GS</sub>	-6	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = -4.5V	Steady State	T <sub>A</sub> = +25°C	I <sub>D1D2</sub>	-2.25	A
		T <sub>A</sub> = +70°C		-1.8	
Continuous Drain Current (Note 6) V <sub>GS</sub> = -4.5V	Steady State	T <sub>A</sub> = +25°C	I <sub>D1D2</sub>	-3.0	A
		T <sub>A</sub> = +70°C		-2.4	
Continuous Source Pin Current (Note 6)			I <sub>S</sub>	-2.0	A
Continuous Gate Clamp Current (Note 6)			I <sub>G</sub>	-0.5	A
Pulsed Source Pin Current (Pulse Duration 10μs, Duty Cycle ≤ 1%)			I <sub>SM</sub>	-39	A
Pulsed Gate Clamp Current (Pulse Duration 10μs, Duty Cycle ≤ 1%)			I <sub>GM</sub>	-7	A

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P <sub>D</sub>	0.84	W
Total Power Dissipation (Note 6)	P <sub>D</sub>	1.2	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	152.7	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	105.4	°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 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-20	—	—	V	V <sub>GS</sub> = 0V, I <sub>DS</sub> = -250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-1	μA	V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	-100	nA	V <sub>GS</sub> = -6V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-0.5	-0.75	-1.1	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>DS</sub> = -250μA
Static Drain-Source On-Resistance	R <sub>D1D2(ON)</sub>	—	82	100	mΩ	V <sub>GS</sub> = -4.5V, I <sub>D1D2</sub> = -1A
		—	110	150		V <sub>GS</sub> = -2.5V, I <sub>D1D2</sub> = -1A
		—	160	240		V <sub>GS</sub> = -1.8V, I <sub>D1D2</sub> = -1A
	R <sub>DS(ON)</sub>	—	42	55	mΩ	V <sub>GS</sub> = -4.5V, I <sub>DS</sub> = -1A
		—	56	80		V <sub>GS</sub> = -2.5V, I <sub>DS</sub> = -1A
		—	80	120		V <sub>GS</sub> = -1.8V, I <sub>DS</sub> = -1A
<b>DIODE CHARACTERISTICS</b>						
Diode Forward Voltage (Note 6)	V <sub>SD</sub>	—	-0.72	-1	V	V <sub>GS</sub> = 0V, I <sub>DS</sub> = -1A
Reverse Recovery Charge	Q <sub>R</sub>	—	2.3	—	nC	V <sub>DD</sub> = -10V, I <sub>F</sub> = -1A,
Reverse Recovery Time	t <sub>RR</sub>	—	7.1	—	ns	di/dt = 200A/μs
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	—	269	—	pF	V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	142	—	pF	
Reverse Transfer Capacitance	C <sub>r</sub>	—	7.6	—	pF	
Total Gate Charge (-4.5V)	Q <sub>g</sub>	—	2.1	—	nC	V <sub>GS</sub> = -4.5V, V <sub>DS</sub> = -10V, I <sub>DS</sub> = -1A
Gate-Source Charge	Q <sub>gs</sub>	—	0.3	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	0.3	—	nC	
Gate Charge at V <sub>TH</sub>	Q <sub>g(TH)</sub>	—	0.16	—	nC	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	6	—	ns	V <sub>DD</sub> = -10V, V <sub>GS</sub> = -4.5V, I <sub>DS</sub> = -1A, R <sub>G</sub> = 30Ω
Turn-On Rise Time	t <sub>r</sub>	—	7	—	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	34	—	ns	
Turn-Off Fall Time	t <sub>f</sub>	—	16	—	ns	

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

OBSOLETE - PART DISCONTINUED

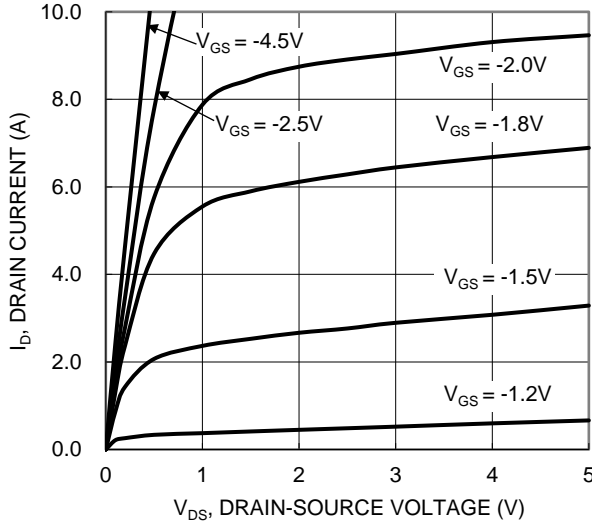


Figure 1. Typical Output Characteristic

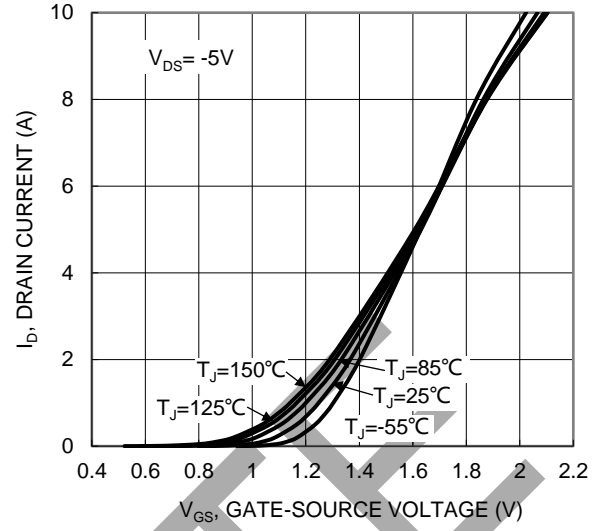


Figure 2. Typical Transfer Characteristic

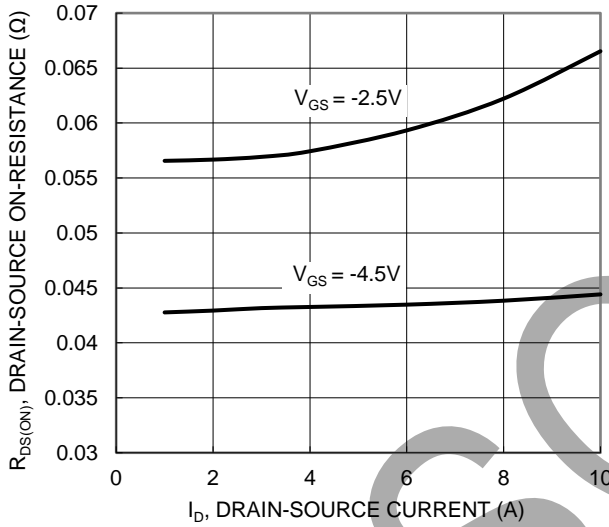


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

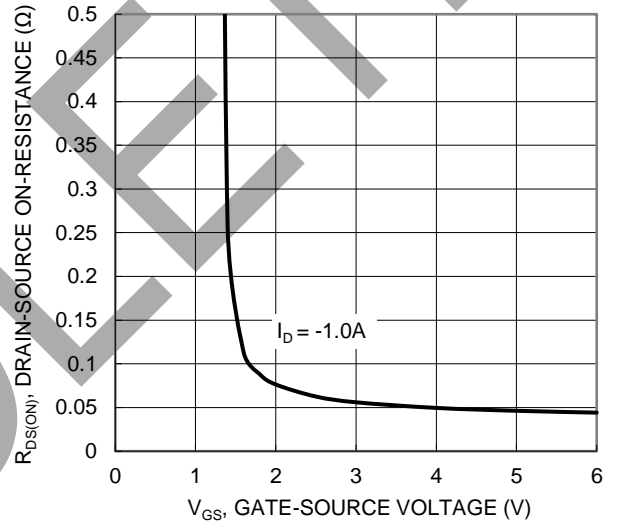


Figure 4. Typical Transfer Characteristic

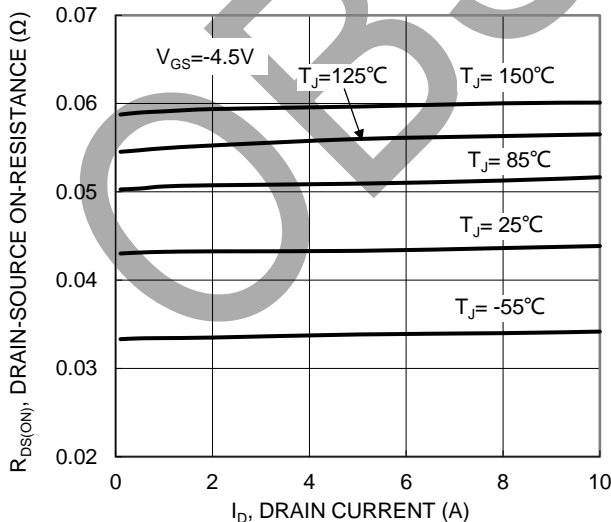


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

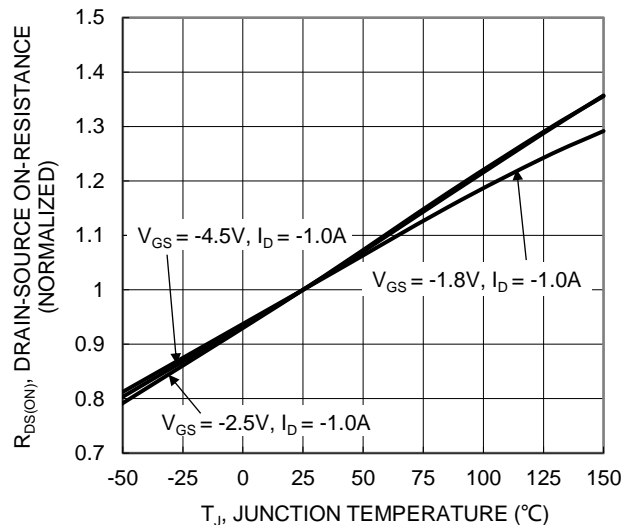


Figure 6. On-Resistance Variation with Junction Temperature

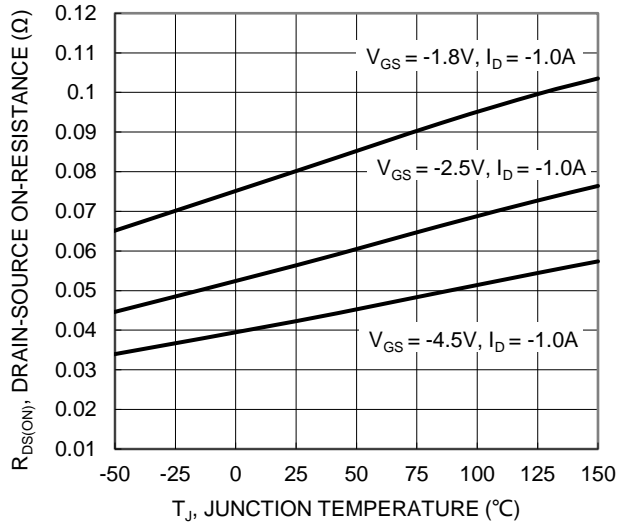


Figure 7. On-Resistance Variation with Junction Temperature

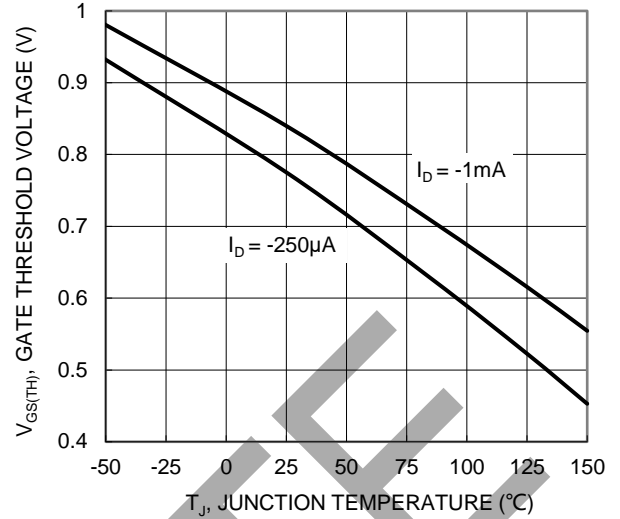


Figure 8. Gate Threshold Variation vs. Junction Temperature

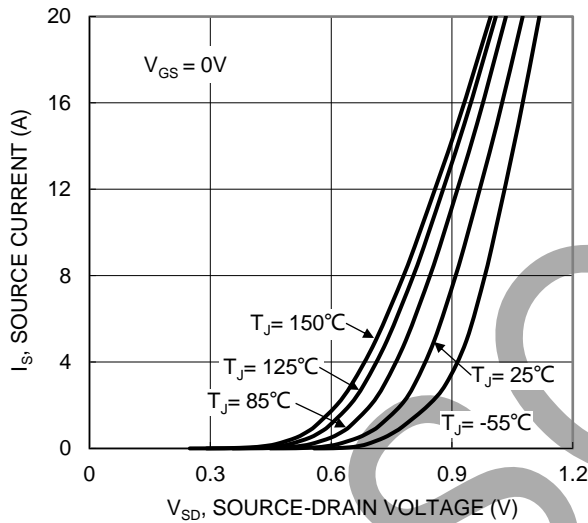


Figure 9. Diode Forward Voltage vs. Current

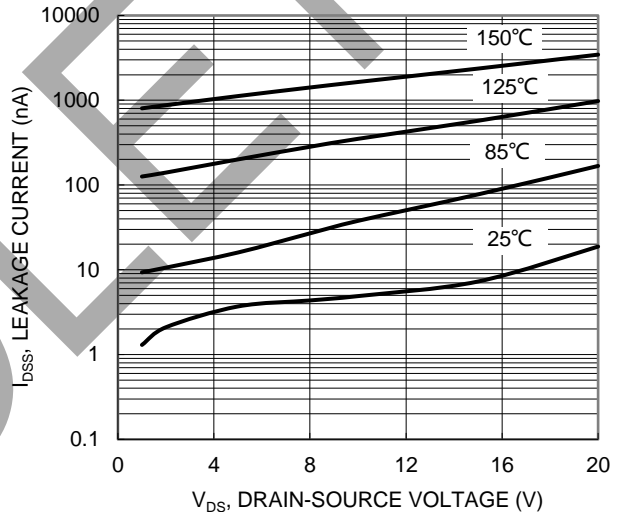


Figure 10. Typical Drain-Source Leakage Current vs. Voltage

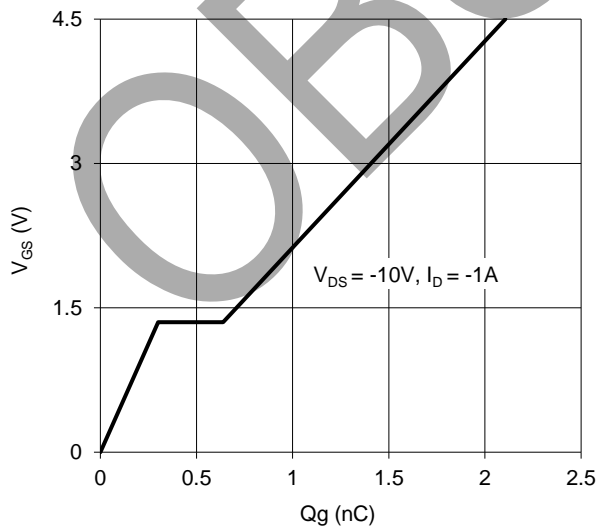


Figure 11. Gate Charge

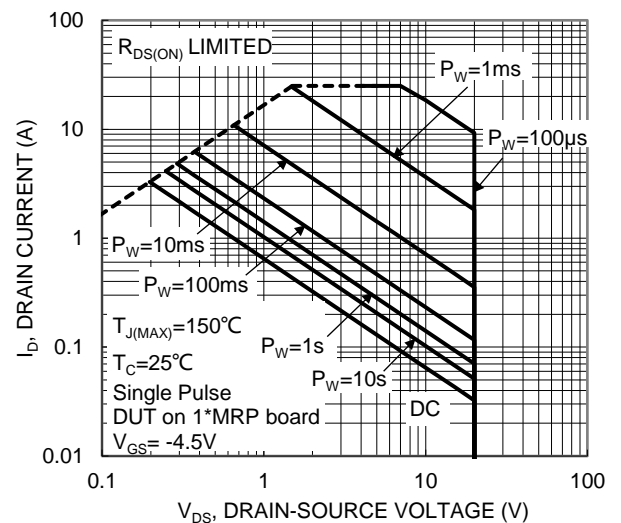


Figure 12. SOA, Safe Operation Area

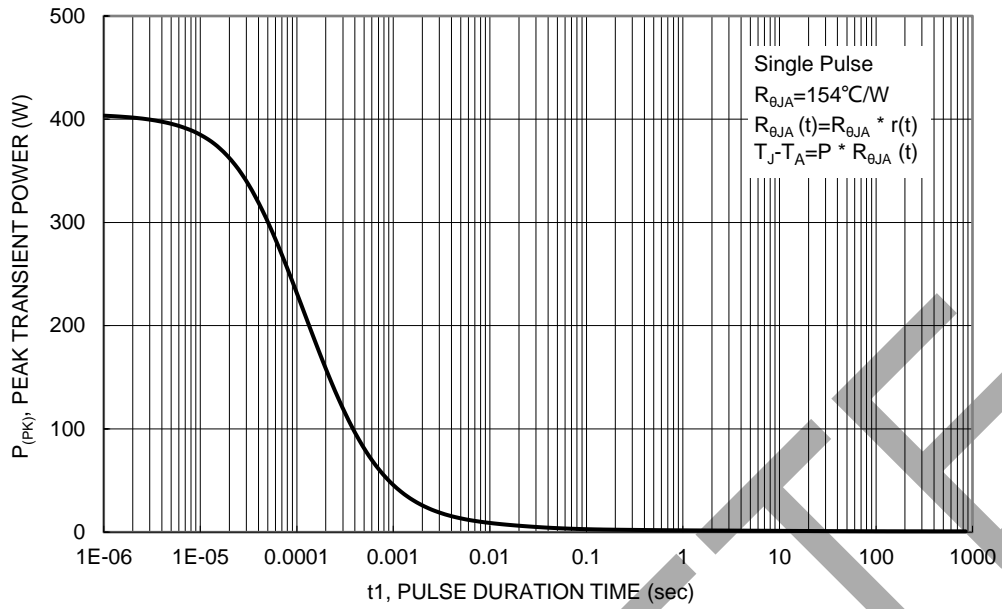


Figure 13. Single Pulse Maximum Power Dissipation

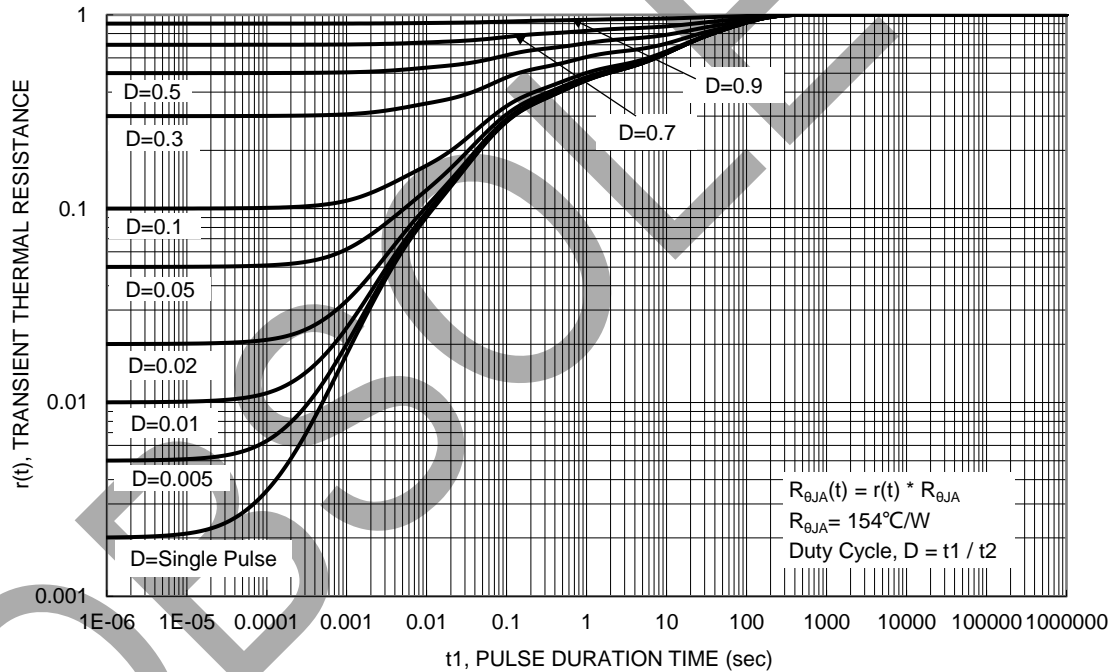
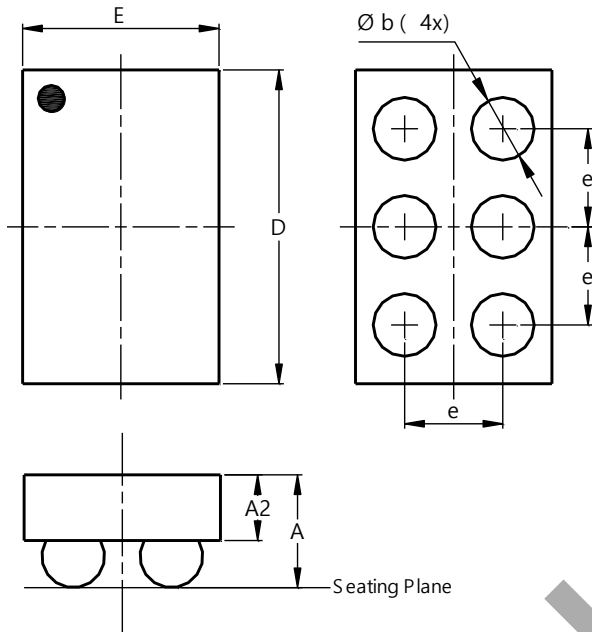


Figure 14. Transient Thermal Resistance

**Package Outline Dimensions**

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

**U-WLB1510-6 (Type B)**

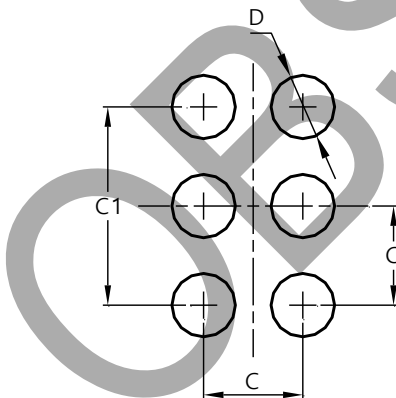


U-WLB1510-6 (Type B)			
Dim	Min	Max	Typ
A	--	0.60	--
A2	--	--	0.335
b	0.305	0.335	0.320
D	1.47	1.52	1.495
E	0.97	1.02	0.995
e	--	--	0.50
All Dimensions in mm			

**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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