

Product Summary (Typ @ $V_{GS} = -4.5V$, $T_A = +25^\circ C$)

BV_{DSS}	$R_{DS(ON)}$	I_D
-20V	37m Ω @ $V_{GS} = -4.5V$	-4.6A
	49m Ω @ $V_{GS} = -2.5V$	-3.7A

Features and Benefits

- Low Q_g & Q_{gd}
- Small Footprint
- Low Profile 0.62mm Height
- ESD Protected Up To 3kV
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Description and Applications

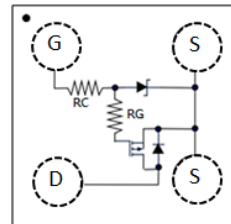
This new generation MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$), yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Battery Management
- Load Switch
- Battery Protection

Mechanical Data

- Case: U-WLB1010-4 (Type C)
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal: Finish - SnAgCu. Solderable per MIL-STD-202 Method 208 (e1)
- Terminal Connections: See Diagram Below

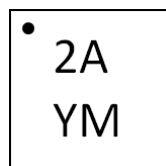
U-WLB1010-4 (Type C)


 Top View
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP2042UCB4-7	U-WLB1010-4 (Type C)	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


2A = Product Type Marking Code
 YM = Date Code Marking
 Y or \bar{Y} = Year (ex: F = 2018)
 M or \bar{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

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	-20	V
Gate-Source Voltage	V _{GSS}	-6	V
Continuous Drain Current (Note 5) V _{GS} = -4.5V	I _D	-4.6	A
Continuous Drain Current (Note 5) V _{GS} = -2.5V	I _D	-3.7	A
Pulsed Drain Current (Note 6)	I _{DM}	-16	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 7)	P _D	0.75	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 7)	R _{θJA}	165	°C/W
Power Dissipation (Note 5)	P _D	1.4	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5)	R _{θJA}	87	°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}	-20	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current T _J = +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 8)						
Gate Threshold Voltage	V _{GS(TH)}	-0.4	-0.8	-1.2	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	37	45	mΩ	V _{GS} = -4.5V, I _D = -1A
		—	49	65		V _{GS} = -2.5V, I _D = -1A
Forward Transfer Admittance	Y _{FS}	—	6.6	-	S	V _{DS} = -10V, I _D = -1A
Diode Forward Voltage	V _{SD}	—	-0.7	-1.0	V	V _{GS} = 0V, I _S = -1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	218	—	pF	V _{DS} = -10V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	148	—		
Reverse Transfer Capacitance	C _{rss}	—	11	—		
Series Gate Resistance	R _g	—	20	—	Ω	f = 1MHz, V _{GS} = 0V, V _{DS} = 0V
Series Clamp Resistance	R _C	—	5,000	—		
Total Gate Charge	Q _g	—	2.5	—	nC	V _{GS} = -4.5V, V _{DS} = -10V, I _D = -1A
Gate-Source Charge	Q _{gs}	—	0.4	—		
Gate-Drain Charge	Q _{gd}	—	0.4	—		
Gate Charge at V _{TH}	Q _{g(TH)}	—	0.2	—		
Turn-On Delay Time	t _{D(ON)}	—	0.6	—	μs	V _{DS} = -10V, V _{GS} = -2.5V, R _G = 10Ω, I _D = -1A
Turn-On Rise Time	t _R	—	0.8	—		
Turn-Off Delay Time	t _{D(OFF)}	—	1.4	—		
Turn-Off Fall Time	t _F	—	0.8	—		
Reverse Recovery Charge	Q _{RR}	—	2.2	—	nC	V _{DD} = -10V, I _F = -1.0A, di/dt = 100A/μs
Reverse Recovery Time	t _{RR}	—	10	—	ns	

- Notes:
- Device mounted on FR-4 material with 1-inch² (6.45-cm²), 2-oz. (0.071-mm 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.

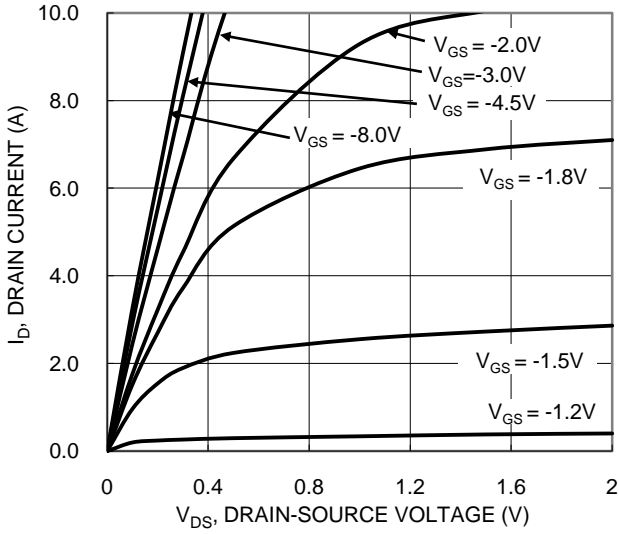


Figure 1. Typical Output Characteristic

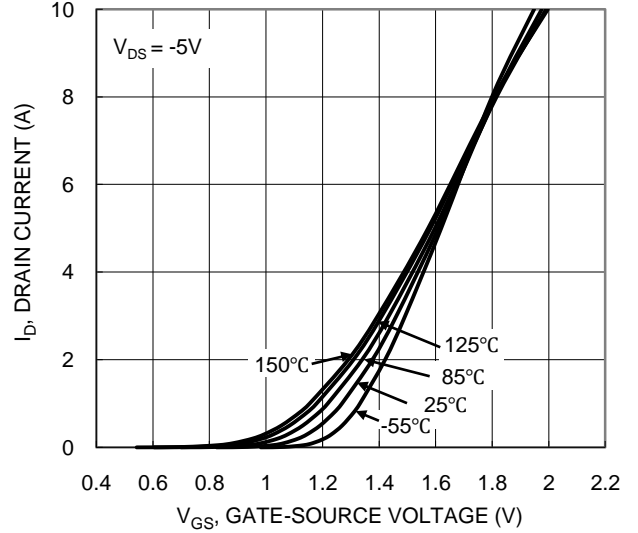


Figure 2. Typical Transfer Characteristic

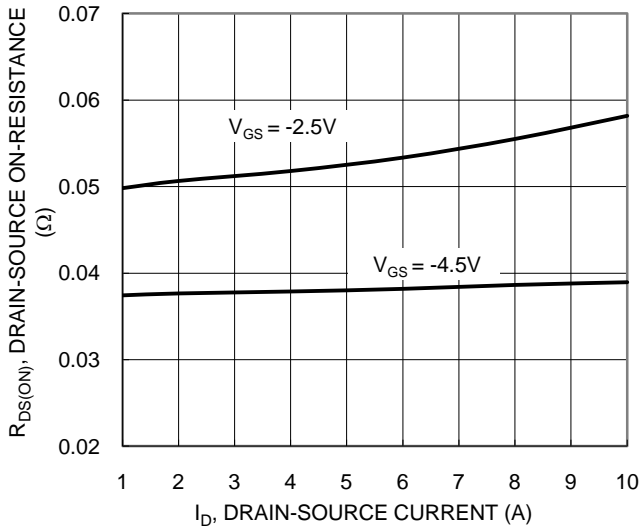


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

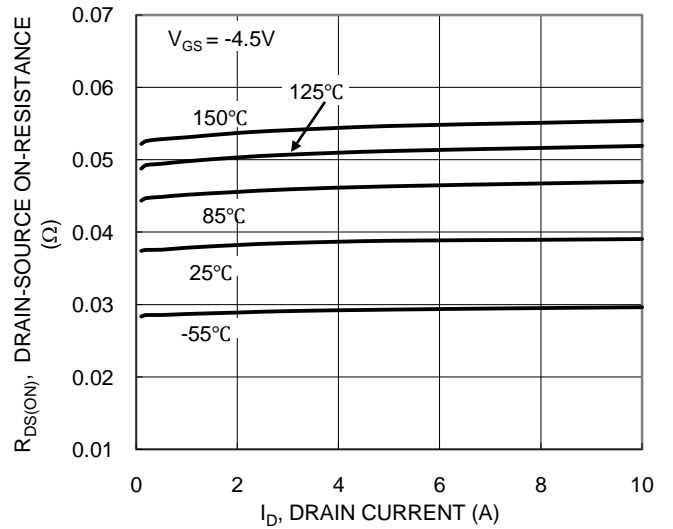


Figure 4. Typical On-Resistance vs. Drain Current and Junction Temperature

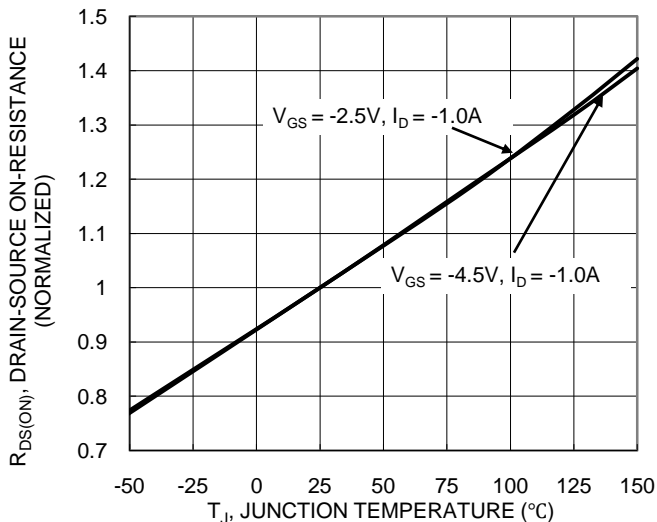


Figure 5. On-Resistance Variation with Junction Temperature

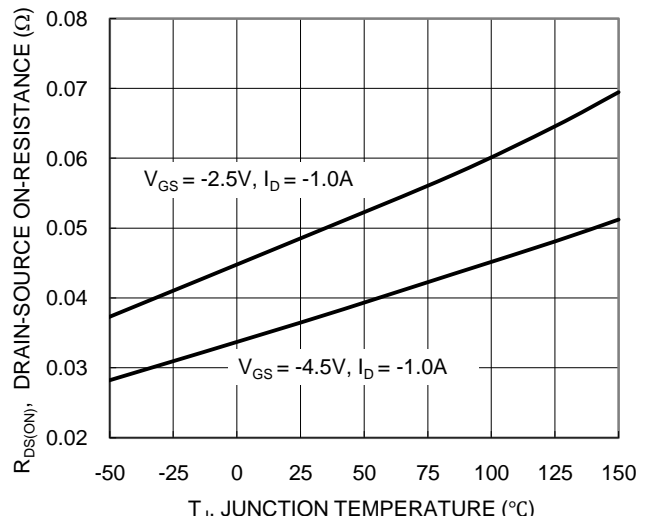
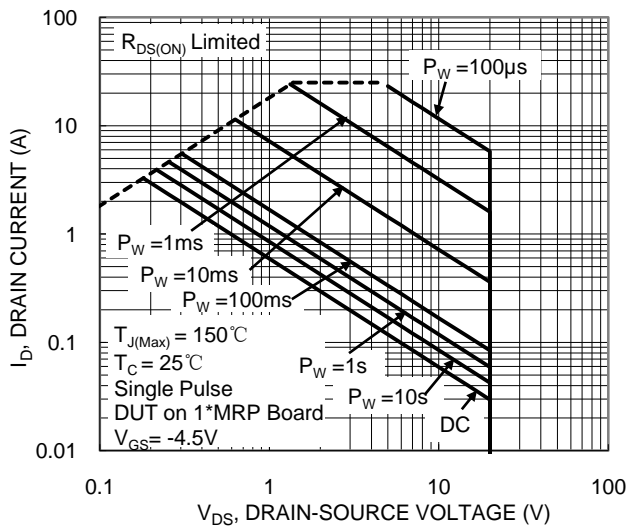
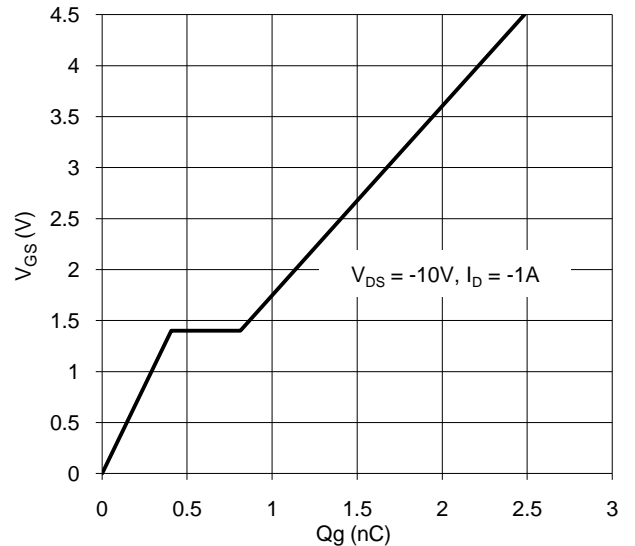
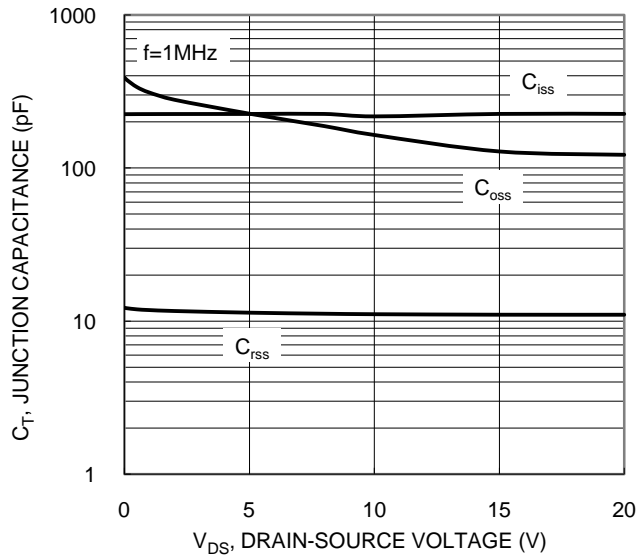
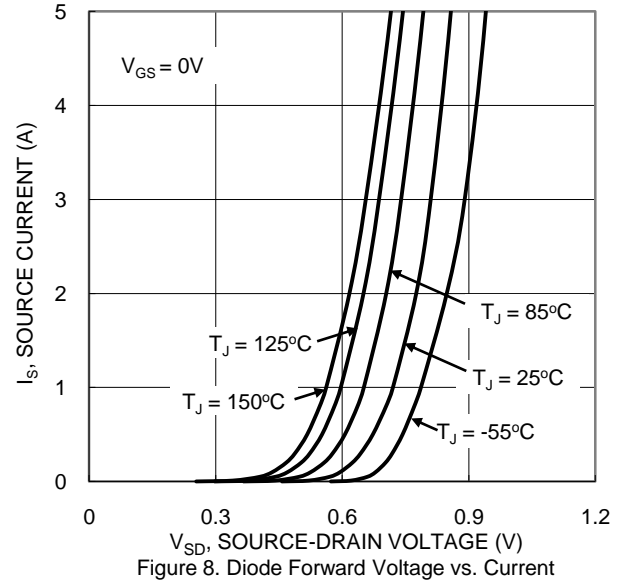
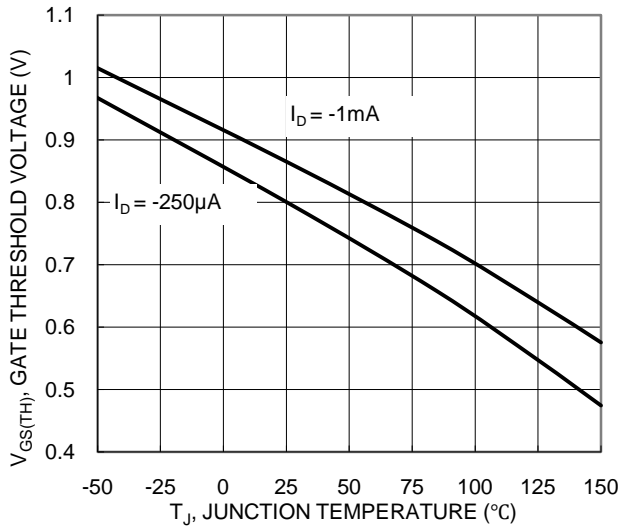


Figure 6. On-Resistance Variation with Junction Temperature



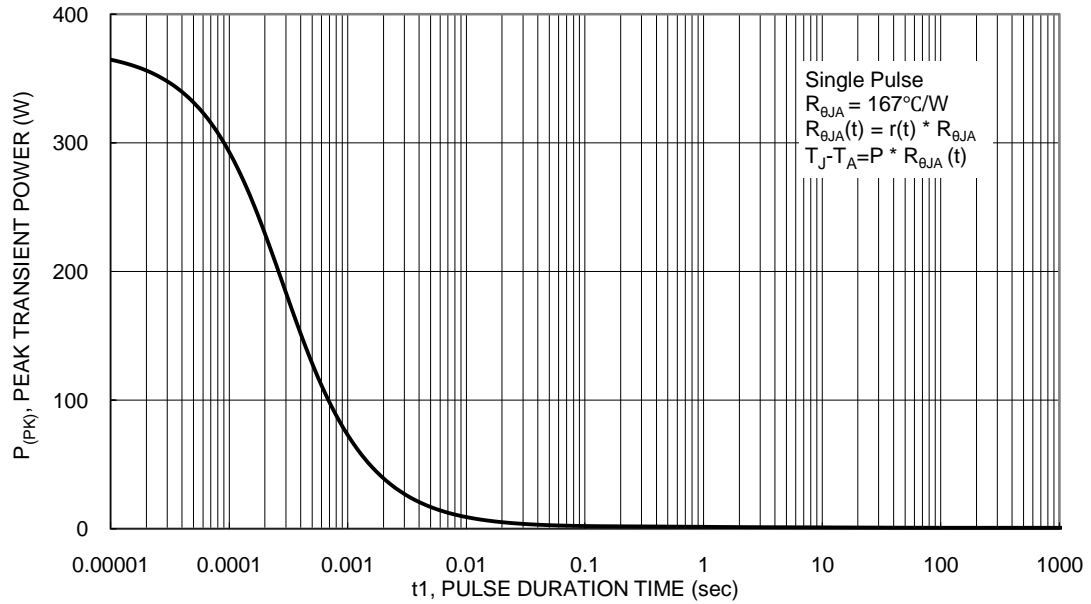


Figure 12. Single Pulse Maximum Power Dissipation

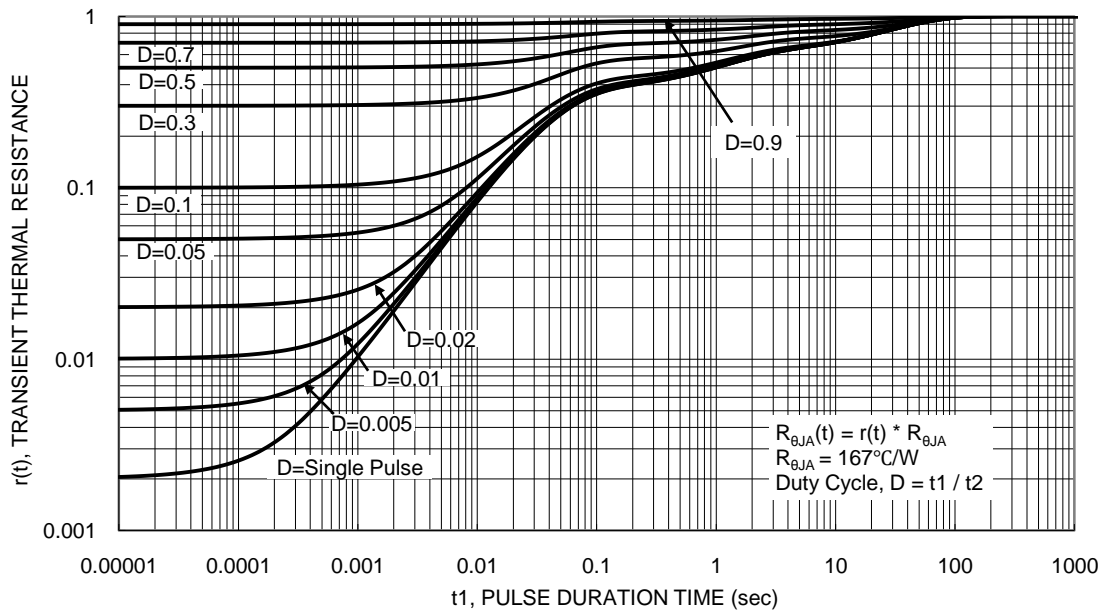
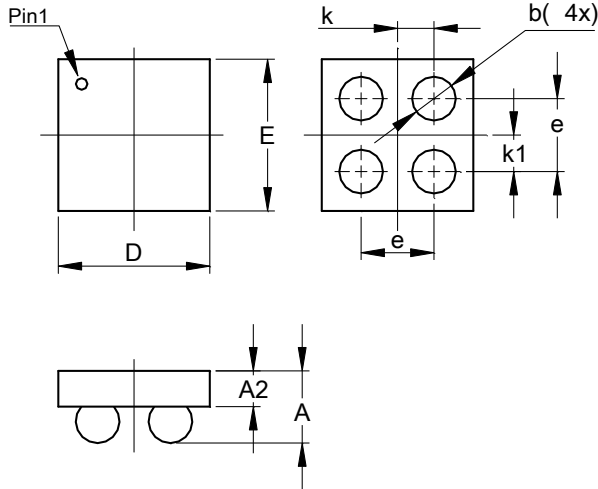


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

U-WLB1010-4 (Type C)

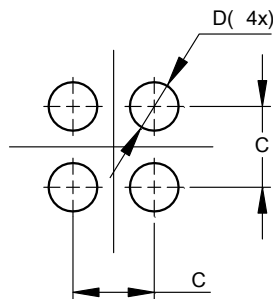


U-WLB1010-4 (Type C)			
Dim	Min	Max	Typ
A	--	0.62	--
A2	--	--	0.38
b	0.25	0.35	0.30
D	0.92	1.00	0.96
E	0.92	1.00	0.96
e	--	--	0.50
k	--	--	0.25
k1	--	--	0.25
All Dimensions in mm			

Suggested Pad Layout

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

U-WLB1010-4 (Type C)



Dimensions	Value (in mm)
C	0.500
D	0.300

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