



P-CHANNEL ENHANCEMENT MODE MOSFET

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

BV _{DSS}	R _{DS(ON)}	I _D
201/	$37m\Omega @ V_{GS} = -4.5V$	-4.6A
-20V	49mΩ @ 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.

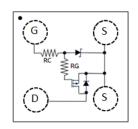
- Battery Management
- Load Switch
- Battery Protection

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 @1)
- 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 YM

2A = Product Type Marking Code YM = Date Code Marking Y or \overline{Y} = Year (ex: F = 2018) M or \overline{M} = Month (ex: 9 = September)

Date Code Key

Year	201	6	2017		2018	20	19	2020		2021	2	2022
Code	D		Е		F	(3	Н				J
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	1	5	6	7	Ω	a	0	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	Α
Continuous Drain Current (Note 5) V _{GS} = -2.5V	I _D	-3.7	Α
Pulsed Drain Current (Note 6)	I _{DM}	-16	Α

Thermal Characteristics

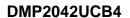
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 7)	P _D	0.75	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 7)	R _{0JA}	165	°C/W
Power Dissipation (Note 5)	P _D	1.4	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5)	Reja	87	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

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

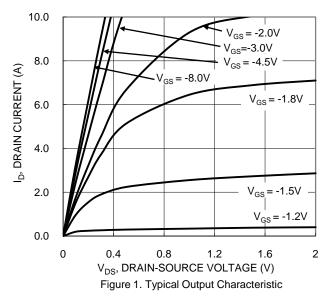
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	-20	_	_	V	V _{GS} = 0V, I _D = -250µA
Zero Gate Voltage Drain Current T _J = +25°C	IDSS	_	_	-1	μA	V _{DS} = -16V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	_	_	-100	nA	V _{GS} = -6V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)	1 000	I		I		1 00 1 7 20 1
Gate Threshold Voltage	V _{GS(TH)}	-0.4	-0.8	-1.2	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$
Static Drain-Source On-Resistance		_	37	45	mΩ	V _{GS} = -4.5V, I _D =-1A
Static Drain-Source On-Resistance	R _{DS(ON)}	_	49	65	11122	$V_{GS} = -2.5V, I_D = -1A$
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	_		$V_{DS} = -10V, V_{GS} = 0V,$ f = 1.0MHz
Output Capacitance	Coss	_	148	_	pF	
Reverse Transfer Capacitance	C _{rss}	_	11	_		
Series Gate Resistance	Rg	_	20	_	Ω	(4MI
Series Clamp Resistance	R _C	_	5,000	_	12	$f = 1MHz$, $V_{GS} = 0V$, $V_{DS} = 0V$
Total Gate Charge	Qg	_	2.5	_		
Gate-Source Charge	Qgs	_	0.4	_	nC	$V_{GS} = -4.5V, V_{DS} = -10V,$
Gate-Drain Charge	Q _{gd}	_	0.4	_	nc	I _D =-1A
Gate Charge at V _{TH}	Q _{g(TH)}	_	0.2	_		
Turn-On Delay Time	t _{D(ON)}	_	0.6	_		
Turn-On Rise Time	t _R	_	0.8	_		$V_{DS} = -10V, V_{GS} = -2.5V,$
Turn-Off Delay Time	t _{D(OFF)}	_	1.4	_	μs	$R_G = 10\Omega$, $I_D = -1A$
Turn-Off Fall Time	t _F	_	0.8	_		
Reverse Recovery Charge	Q _{RR}	_	2.2	_	nC	$V_{DD} = -10V, I_F = -1.0A,$
Reverse Recovery Time	t _{RR}	_	10	_	ns	di/dt =100A/µs

Notes:

- 5. Device mounted on FR-4 material with 1-inch² (6.45-cm²), 2-oz. (0.071-mm thick) Cu. 6. Repetitive rating, pulse width limited by junction temperature. 7. Device mounted on FR-4 PCB with minimum recommended pad layout, single sided. 8. Short duration pulse test used to minimize self-heating effect. 9. Guaranteed by design. Not subject to production testing.







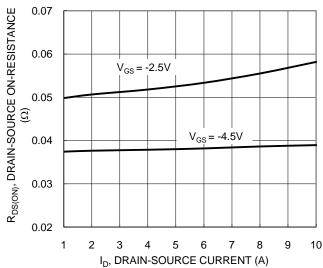
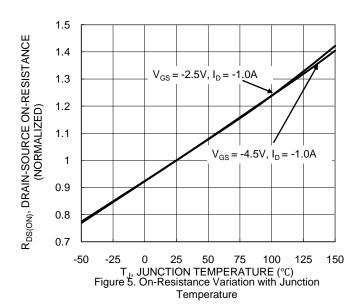


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage



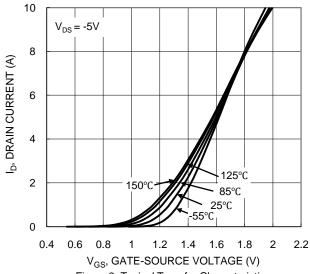


Figure 2. Typical Transfer Characteristic

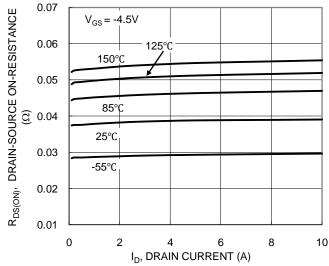
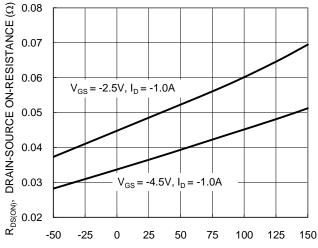
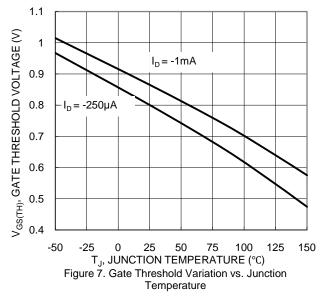


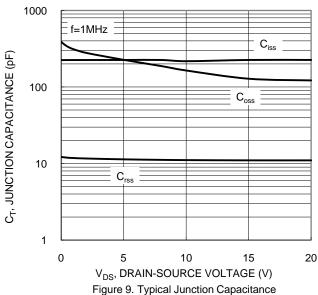
Figure 4. Typical On-Resistance vs. Drain Current and Junction Temperature

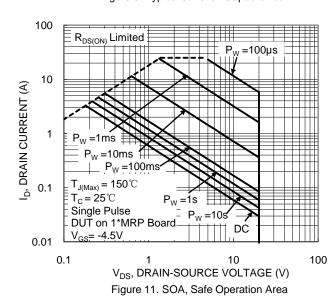


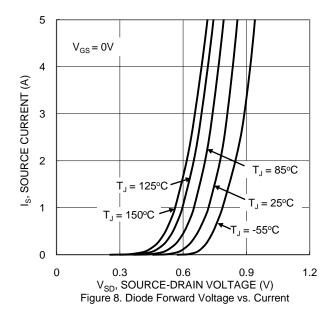
T_J, JUNCTION TEMPERATURE (°C) Figure 6. On-Resistance Variation with Junction Temperature

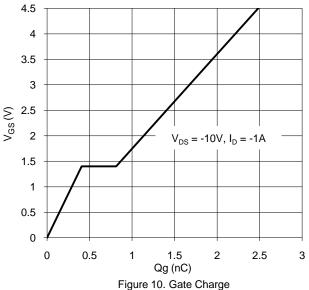




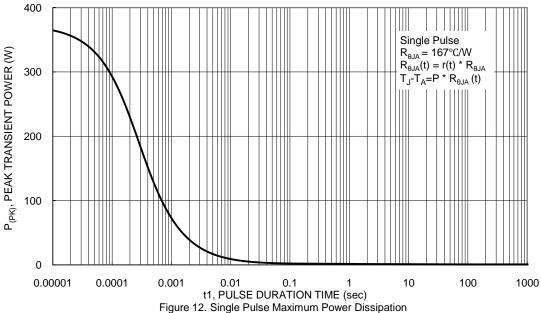












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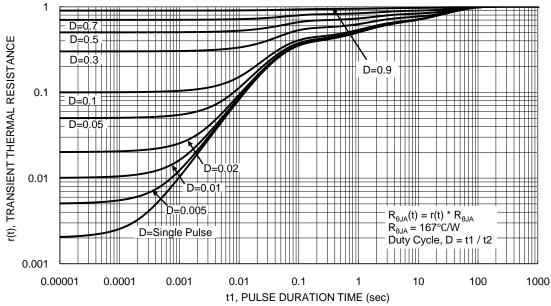


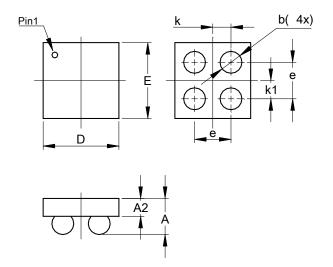
Figure 13. Transient Thermal Resistance



Package Outline Dimensions

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

U-WLB1010-4 (Type C)

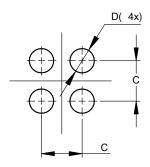


U-WLB1010-4 (Type C)						
Dim	Min	Max	Тур			
Α		0.62				
A2			0.38			
b	0.25	0.35	0.30			
D	0.92	1.00	0.96			
Е	0.92	1.00	0.96			
e			0.50			
k			0.25			
k1			0.25			
All Dimensions in mm						

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)		
С	0.500		
D	0.300		



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