



#### P-CHANNEL ENHANCEMENT MODE MOSFET

### **Product Summary**

V <sub>(BR)DSS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub> T <sub>A</sub> = +25°C
-12V	$80m\Omega @ V_{GS} = -4.5V$	-3.3A
	$93m\Omega @ V_{GS} = -2.5V$	-3.0A

#### **Description**

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

### **Applications**

- Battery Management
- Load Switch
- Battery Protection

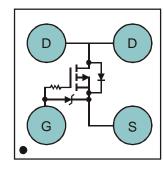
#### **Features**

- Low Q<sub>q</sub> & Q<sub>qd</sub>
- 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)
- Qualified to AEC-Q101 Standards for High Reliability

#### **Mechanical Data**

- Case: U-WLB1010-4
- Terminal Connections: See Diagram Below
- Weight: 0.0018 grams (approximate)

#### U-WLB1010-4



Top View Equivalent Circuit



### **Ordering Information (Note 4)**

Part Number	Case	Packaging
DMP1080UCB4-7	U-WLB1010-4	3000/Tape & Reel

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 2. See http://www.diodes.com 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 http://www.diodes.com.

# **Marking Information**



BW = Product Type Marking Code YM = Date Code Marking Y = Year (ex: X = 2010)

M = Month (ex: 9 = September)

Date Code Key

Year	201	1	2012		2013	20	14	2015		2016	2	2017
Code	Υ		Z		Α	l l	3	С		D		E
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D



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

Characteristic	Symbol	Value	Unit		
Drain-Source Voltage	$V_{DSS}$	-12	V		
Gate-Source Voltage	V <sub>GSS</sub>	-6	V		
Continuous Drain Current (Note 5) V <sub>GS</sub> = -4.5V	Steady State	$T_A = +25$ °C $T_A = +70$ °C	I <sub>D</sub>	-3.3 -2.7	Α
Continuous Drain Current (Note 5) V <sub>GS</sub> = -2.5V	Steady State	$T_A = +25$ °C $T_A = +70$ °C	I <sub>D</sub>	-3.0 -2.4	Α
Pulsed Drain Current (Note 6)	I <sub>DM</sub>	20	А		

### **Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 7)	$P_{D}$	0.82	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 7)	R <sub>0</sub> JA	150	°C/W
Thermal Resistance, Junction to Case @T <sub>C</sub> = +25°C (Note 7)	$R_{ heta JC}$	42.66	°C/W
Power Dissipation (Note 5)	P <sub>D</sub>	1.59	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 5)	$R_{\theta JA}$	80.29	°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.)

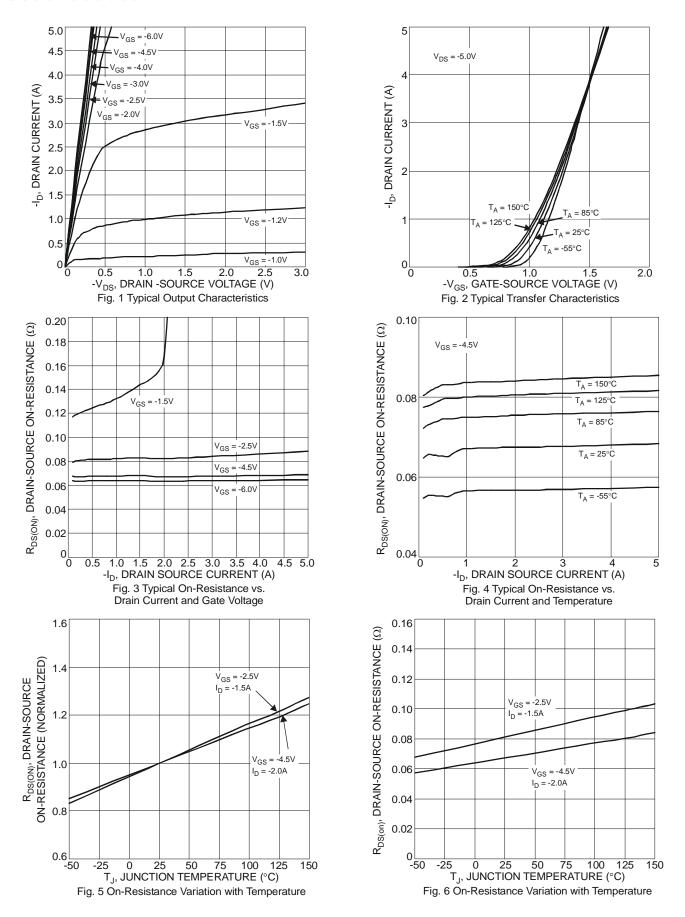
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)			-				
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-12	-	-	V	$V_{GS} = 0V, I_D = -250\mu A$	
Gate-Source Breakdown Voltage	BV <sub>GSS</sub>	-6.0	-	-	V	$V_{DS} = 0V, I_{G} = -250\mu A$	
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	-	-	-1	μΑ	$V_{DS} = -9.6V, V_{GS} = 0V$	
Gate-Source Leakage	IGSS	1	-	-100	nA	$V_{GS} = -6V$ , $V_{DS} = 0V$	
ON CHARACTERISTICS (Note 8)						_	
Gate Threshold Voltage	$V_{GS(th)}$	-0.4	-0.6	-1.0	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	
		-	65	80		$V_{GS} = -4.5V$ , $I_D = -500$ mA	
Static Drain-Source On-Resistance	R <sub>DS (ON)</sub>	-	77	93	$m\Omega$	$V_{GS} = -2.5V$ , $I_D = -500$ mA	
		-	108	130		$V_{GS} = -1.5V$ , $I_D = -500$ mA	
Forward Transfer Admittance	Y <sub>fs</sub>	-	4	-	S	$V_{DS} = -6V, I_{D} = -500mA$	
Diode Forward Voltage	$V_{SD}$		-0.6	-1.0	V	$V_{GS} = 0V, I_{S} = -500mA$	
Reverse Recovery Charge	$Q_{rr}$	-	2.0	-	nC	$V_{dd} = -4.0V$ , $I_F = -0.5A$ ,	
Reverse Recovery Time	t <sub>rr</sub>	-	9.5	-	ns	di/dt =100A/μs	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	C <sub>iss</sub>	-	213	350		24 24 24	
Output Capacitance	Coss	-	119	250	pF	$V_{DS} = -6V, V_{GS} = 0V,$ f = 1.0MHz	
Reverse Transfer Capacitance	C <sub>rss</sub>	-	54.4	90		I = 1.0MHZ	
Total Gate Charge	Qg	-	2.5	5			
Gate-Source Charge	Qgs	-	0.3	-	nC	$V_{GS} = -4.5V, V_{DS} = -6V,$	
Gate-Drain Charge	Q <sub>gd</sub>	-	0.6	-	nc nc	$I_D = -500 \text{mA}$	
Gate Charge at Vth	Q <sub>g(th)</sub>	-	0.15	-			
Turn-On Delay Time	t <sub>D(on)</sub>	-	16.7	-			
Turn-On Rise Time		-	20.6	-		$V_{DS} = -6V, V_{GS} = -2.5V,$	
Turn-Off Delay Time	t <sub>D(off)</sub>	-	38.4	-	ns	$R_G = 20\Omega, I_D = -500 \text{mA}$	
Turn-Off Fall Time	t <sub>f</sub>	-	28.4	-			

Notes:

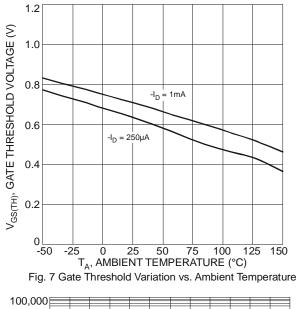
- Device mounted on FR4 material with 1-inch² (6.45-cm²), 2-oz. (0.071-mm thick) Cu.
  Repetitive rating, pulse width limited by junction temperature.
  Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.

- Short duration pulse test used to minimize self-heating effect.
  Guaranteed by design. Not subject to production testing.









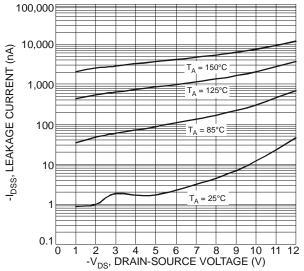
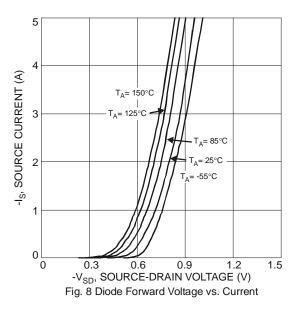
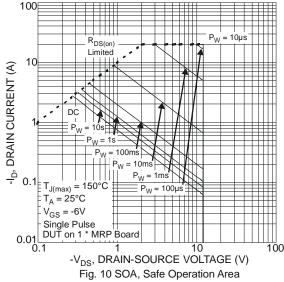
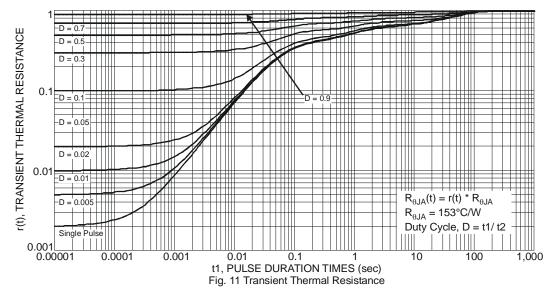


Fig. 9 Typical Drain-Source Leakage Current vs. Voltage



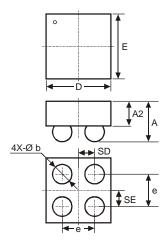






# **Package Outline Dimensions**

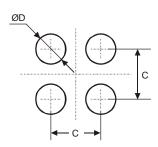
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



	U-WLB1010-4							
Dim	Min	Max	Тур					
D	0.95	1.05	1.00					
Е	0.95	1.05	1.00					
Α	_	0.62	_					
A2	_	_	0.38					
b	0.25	0.35	0.30					
е	<u> </u>		0.50					
SD	_	_	0.25					
SE	_	_	0.25					
All Dimensions in mm								

# **Suggested Pad Layout**

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
С	0.50
D	0.25



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#### Офис по работе с юридическими лицами:

105318, г. Москва, ул. Щербаковская д. 3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru moschip.ru\_6 moschip.ru 4 moschip.ru 9