



N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{DSS}	R _{DS(on)}	$\mathbf{Q}_{\mathbf{g}}$	Q_{gd}	l _D
12V	18mΩ	3.2nC	0.3nC	4.8A

Typ. @ $V_{GS} = 4.5V$, $T_A = +25$ °C

Description

This 2^{nd} generation Lateral MOSFET (LD-MOS) is engineered to minimize on-state losses and switch ultra-fast, making it ideal for high efficiency power transfer. It uses Chip-Scale Package (CSP) to increase power density by combining low thermal impedance with minimal $R_{DS(on)}$ per footprint area.

Applications

- DC-DC Converters
- Battery Management
- Load Switch

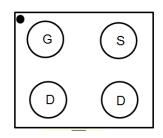
Features

- LD-MOS technology with the lowest Figure of Merit: R_{DS(on)} = 18mΩ to minimize on-state losses Q_q = 3.2nC for ultra-fast switching
- $V_{gs(th)} = 0.8V$ typ. for a low turn-on potential
- CSP with Footprint 1.0mm × 1.0mm
- Height = 0.62mm for Low Profile
- 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

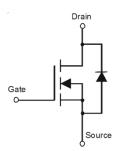
Mechanical Data

- Case: U-WLB1010-4
- Terminal Connections: See Diagram Below

U-WLB1010-4



Top View



Equivalent Circuit

Ordering Information (Note 4)

- 1			
	Part Number	Case	Packaging
	DMN1032UCB4-7	U-WLB1010-4	3,000/Tape & Reel

Notes:

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

Marking Information

U-WLB1010-4



MW = Product Type Marking Code YM = Date Code Marking Y or \overline{Y} = Year (ex: B = 2014) M or \overline{M} = Month (ex: 9 = September)

Date Code Key

Code B C D E F G H I J K	Codo	D (1	_							
•	Code	В	C D	E	F	G	Н	J	K	L	M
	•		<u> </u>					 			

Code 1 2 3 4 5 6 7 8 9 O N D	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_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	
Drain-Source Voltage	V_{DSS}	12	V	
Gate-Source Voltage		V_{GSS}	±8	V
Continuous Drain Current (Note 5) V _{GS} = 4.5V	I _D	4.8 3.8	Α	
Continuous Drain Current (Note 5) V _{GS} = 2.5V	ID	4.5 3.6	А	
Pulsed Drain Current (Note 6)	•	I _{DM}	15	Α

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 7)	P _D	0.9	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 7)	R _{θJA}	138.81	°C/W
Thermal Resistance, Junction to Case @T _C = +25°C (Note 7)	R _{θJC}	31.77	°C/W
Power Dissipation (Note 5)	P _D	1.16	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5)	R _{θJA}	107.59	°C/W
Operating and Storage Temperature Range	T_{J}, T_{STG}	-55 to +150	°C

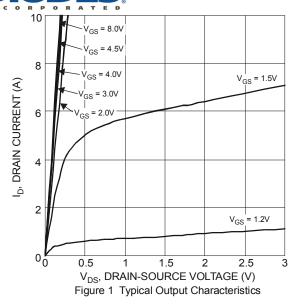
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

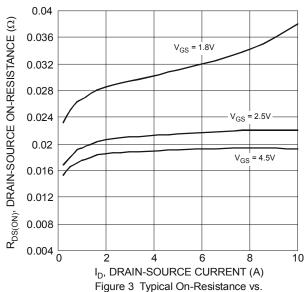
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)							
Drain-Source Breakdown Voltage	BV _{DSS}	12	I	_	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}		I	1.0	μA	$V_{DS} = 9.6V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}			±100	nA	$V_{GS} = \pm 8V$, $V_{DS} = 0V$	
ON CHARACTERISTICS (Note 8)						_	
Gate Threshold Voltage	$V_{GS(th)}$	0.4	0.8	1.2	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
			18	26		$V_{GS} = 4.5V, I_{D} = 1A$	
Static Drain-Source On-Resistance	R _{DS(ON)}		21	29	mΩ	$V_{GS} = 2.5V, I_D = 1A$	
		_	27	38		V _{GS} = 1.8V, I _D = 1A	
Forward Transfer Admittance	Y _{fs}	_	8.1	_	S	$V_{DS} = 6V$, $I_D = 1A$	
Diode Forward Voltage	V_{SD}	_	0.7	1.0	V	V _{GS} = 0V, I _S = 1A	
Reverse Recovery Charge	Qrr		1.2	_	nC	V _{dd} = 5V, I _F = 1A,	
Reverse Recovery Time	t _{rr}		10.5	_	ns	di/dt =100A/µs	
DYNAMIC CHARACTERISTICS (Note 9)				•	•	•	
Input Capacitance	C _{iss}	_	325	450		N/ 01/ 1/ 01/	
Output Capacitance	Coss	_	183	250	pF	$V_{DS} = 6V, V_{GS} = 0V,$ f = 1 0MHz	
Reverse Transfer Capacitance	C _{rss}	_	31	47		1 - 1.000112	
Series Gate Resistance	R_{G}	-	3.1	_	Ω	f=1MHz,Vgs=0V, Vds=0V	
Total Gate Charge	Qg	_	3.2	4.5			
Gate-Source Charge	Qgs		0.4	_	nC	$V_{GS} = 4.5V, V_{DS} = 6V,$	
Gate-Drain Charge	Q_{gd}		0.3	_	IIC	I _D =1A	
Gate Charge at Vth	Q _{g(th)}		0.2	_			
Turn-On Delay Time	t _{D(on)}	_	3.3	10			
Turn-On Rise Time	t _r	_	5.6	_		$V_{DS} = 6V, V_{GS} = 4.5V,$	
Turn-Off Delay Time	t _{D(off)}	_	24	36	ns	$R_G = 20\Omega$, $I_D = 1A$	
Turn-Off Fall Time	t _f	_	9	_			

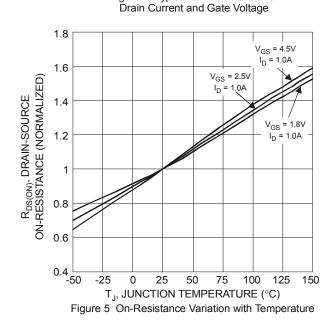
Notes:

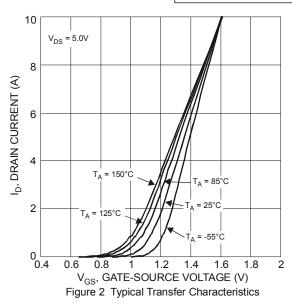
- Device mounted on FR4 material with 1-inch² (6.45-cm²), 2-oz. (0.071-mm thick) Cu.
 Repetitive rating, pulse width limited by junction temperature.
 Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
 Short duration pulse test used to minimize self-heating effect.
 Guaranteed by design. Not subject to production testing.

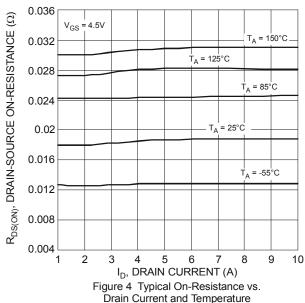
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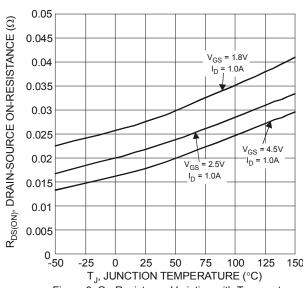














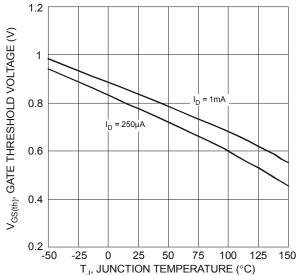


Figure 7 Gate Threshold Variation vs. Ambient Temperature

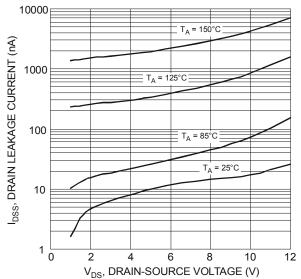
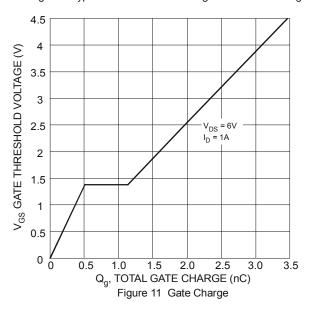
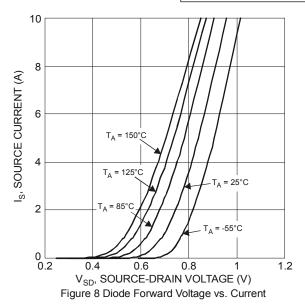
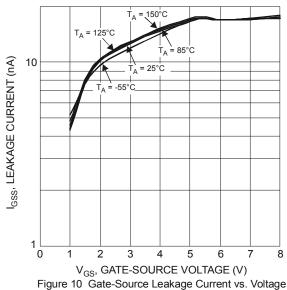


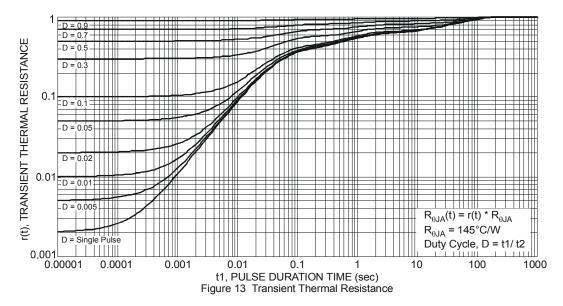
Figure 9 Typical Drain-Source Leakage Current vs. Voltage





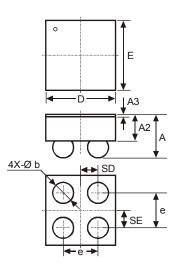






Package Outline Dimensions

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

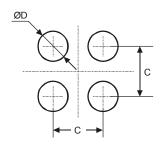


	U-WLB1010-4								
Dim	Min	Max	Тур						
D	0.95	1.05	1.00						
Е	0.95	1.05	1.00						
Α	-	0.62	-						
A2	_	_	0.38						
A3	0.015	0.025	0.025						
b	0.25	0.35	0.30						
е	_	_	0.50						
SD	_	_	0.25						
SE	_	_	0.25						
All	Dimens	ions in r	nm						

Suggested Pad Layout

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

U-WLB1010-4



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