

## Product Summary

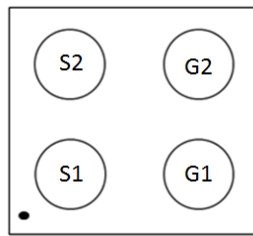
$V_{SSS}$	$R_{SS(ON)}$	$I_S$ $T_A = +25^\circ\text{C}$
12V	26mΩ @ $V_{GS} = 4.5\text{V}$	5.5 A

## Description

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

## Applications

- Battery Management
- Load Switch
- Battery Protection



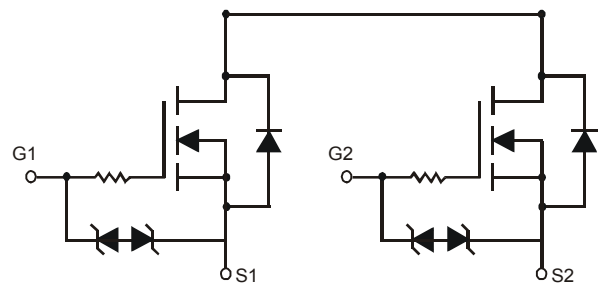
Top View

## Features and Benefits

- Built-in G-S protection diode against ESD 2kV HBM.
- 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-WLB1818-4
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Weight: 0.005 grams (approximate)



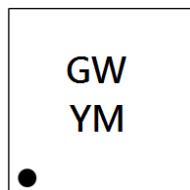
Equivalent Circuit

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN1033UCB4-7	U-WLB1818-4	3000/Tape & Reel

- Notes:
- 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](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.
  - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  - For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



GW = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: Y = 2011)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2009	2010	2011	2012	2013	2014	2015
Code	W	X	Y	Z	A	B	C

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			$V_{SSS}$	12	V
Gate-Source Voltage			$V_{GSS}$	$\pm 6$	V
Continuous Source Current @ $V_{GS} = 4.5V$ $T_A = +25^\circ C$ (Note 5)	Steady State	$T_A = +25^\circ C$ $T_A = +70^\circ C$	$I_S$	5.5 4.5	A
Pulsed Source Current @ $T_A = +25^\circ C$ (Notes 5 & 6)			$I_{SM}$	20	A

## Thermal Characteristics

Characteristic	Symbol	Value	Units
Power Dissipation, @ $T_A = +25^\circ C$ (Note 5)	$P_D$	1.45	W
Thermal Resistance, Junction to Ambient @ $T_A = +25^\circ C$ (Note 5)	$R_{\theta JA}$	88.21	$^\circ C/W$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ C$

## Electrical Characteristics (@ $T_A = +25^\circ C$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Source to Source Breakdown Voltage $T_J = +25^\circ C$	$V_{(BR)SS}$	12	—	—	V	$I_S = 1mA, V_{GS} = 0V$
Zero Gate Voltage Source Current $T_J = +25^\circ C$	$I_{SSS}$	—	—	1.0	$\mu A$	$V_{SS} = 12V, V_{GS} = 0V$
Gate-Body Leakage	$I_{GSS}$	—	—	$\pm 10$	$\mu A$	$V_{GS} = \pm 6V, V_{DS} = 0V$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	0.35	0.5	0.7	V	$V_{SS} = 10V, I_S = 1.0mA$
Static Source -Source On-Resistance	$R_{SS(ON)}$	—	19.5 20 20.5 21 21.5 22 26 35	26 27 28 29 30 31 33 50	m $\Omega$	$V_{GS} = 4.5V, I_S = 3.0A$ $V_{GS} = 4.0V, I_S = 3.0A$ $V_{GS} = 3.7V, I_S = 3.0A$ $V_{GS} = 3.5V, I_S = 3.0A$ $V_{GS} = 3.1V, I_S = 3.0A$ $V_{GS} = 2.5V, I_S = 3.0A$ $V_{GS} = 1.8V, I_S = 3.0A$ $V_{GS} = 1.5V, I_S = 3.0A$
Forward Transfer Admittance	$ Y_{fs} $	—	11	—	S	$V_{SS} = 10V, I_S = 3.0A$
Body Diode Forward Voltage	$V_{F(S-S)}$	—	0.7	1.0	V	$I_F = 3.0A, V_{GS} = 0V$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Total Gate Charge	$Q_g$	—	37	—	nC	$V_{GS} = 4.5V, V_{SS} = 10V, I_S = 6A$
Turn-On Delay Time	$t_{D(on)}$	—	10	—	ns	$V_{DD} = 6V,$ $R_L = 6.0\Omega, I_S = 3.0A$
Turn-On Rise Time	$t_r$	—	20	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	83	—	ns	
Turn-Off Fall Time	$t_f$	—	52	—	ns	

- Notes:
- Device mounted on FR4 material with 1-inch<sup>2</sup> (6.45-cm<sup>2</sup>), 2-oz. (0.071-mm thick) Cu.
  - Repetitive rating, pulse width limited by junction temperature.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.

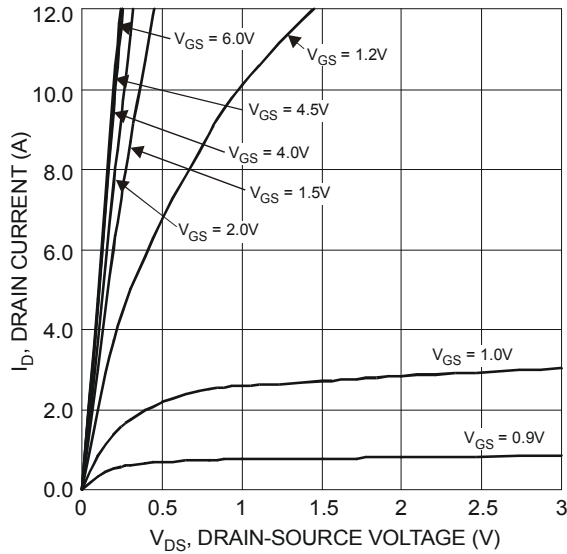


Figure 1 Typical Output Characteristics

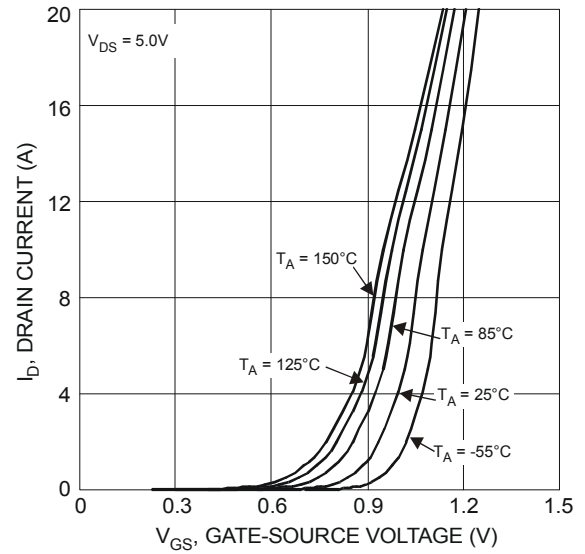


Figure 2 Typical Transfer Characteristics

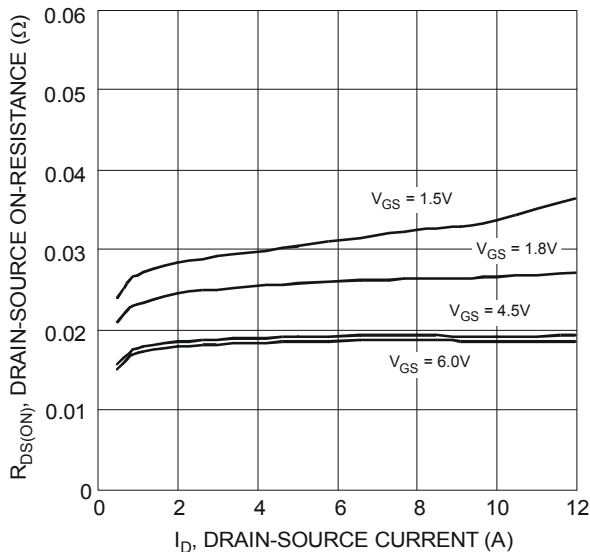


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

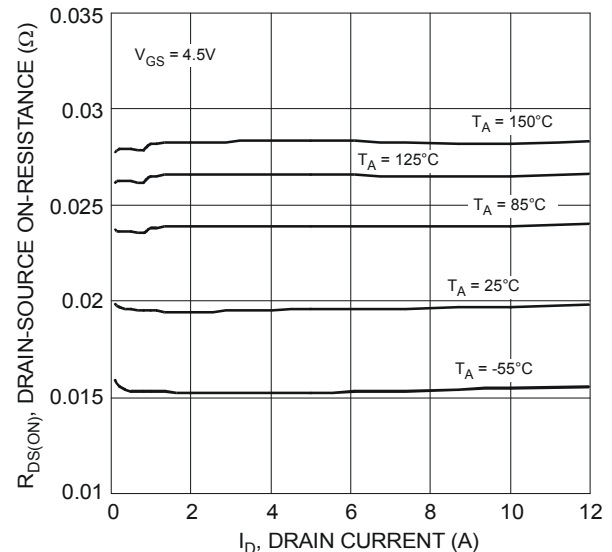


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

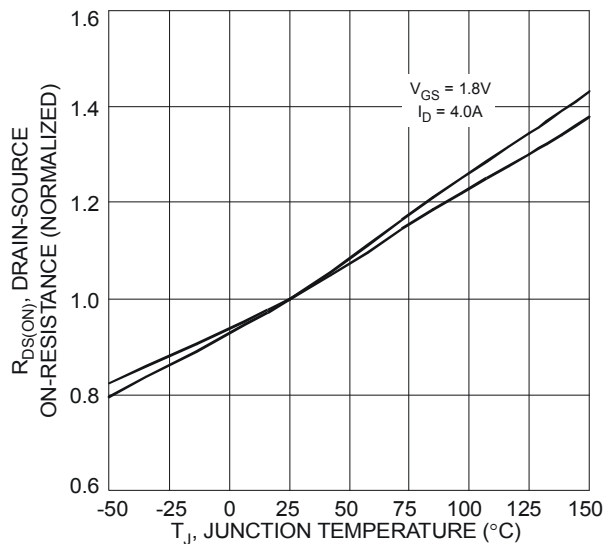


Figure 5 On-Resistance Variation with Temperature

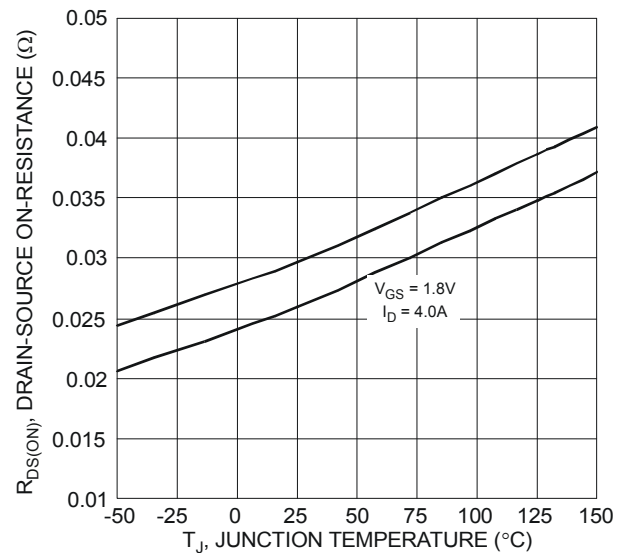


Figure 6 On-Resistance Variation with Temperature

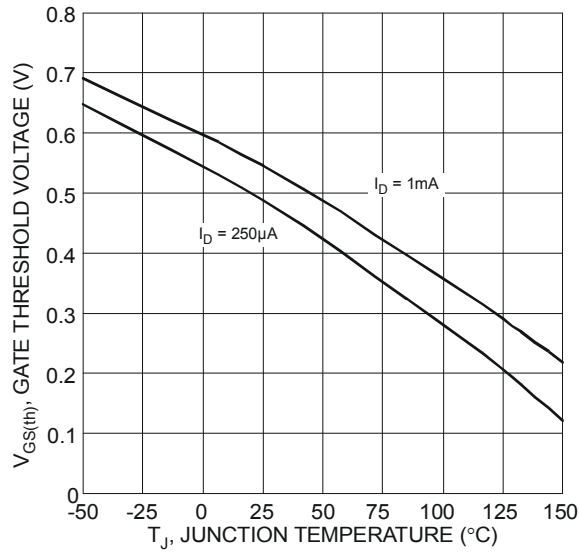


Figure 7 Gate Threshold Variation vs. Ambient Temperature

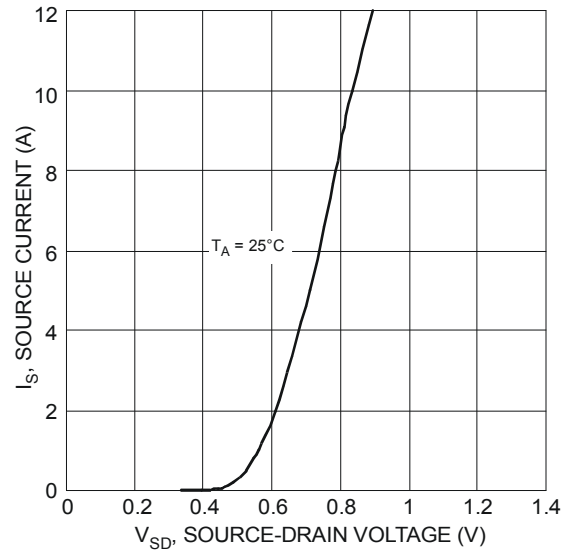


Figure 8 Diode Forward Voltage vs. Current

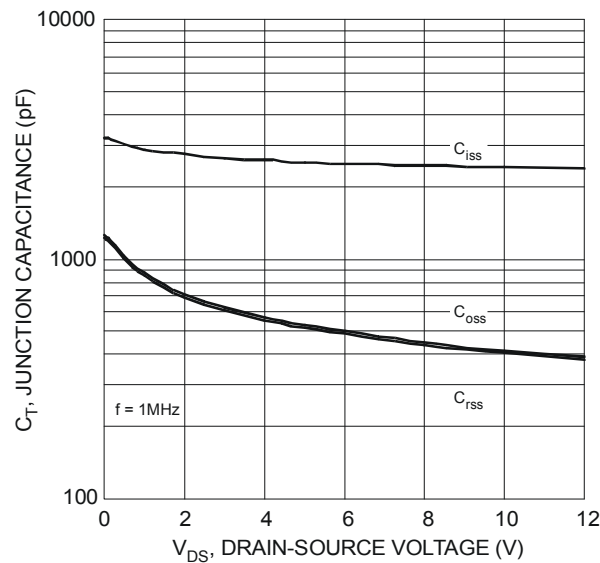


Figure 9 Typical Junction Capacitance

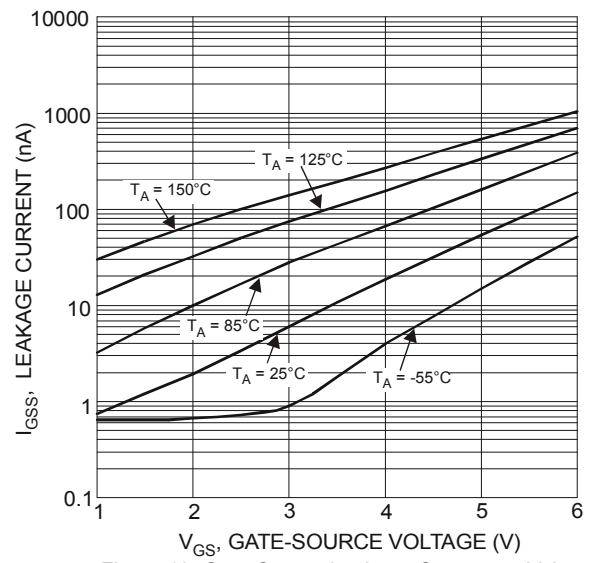


Figure 10 Gate-Source Leakage Current vs. Voltage

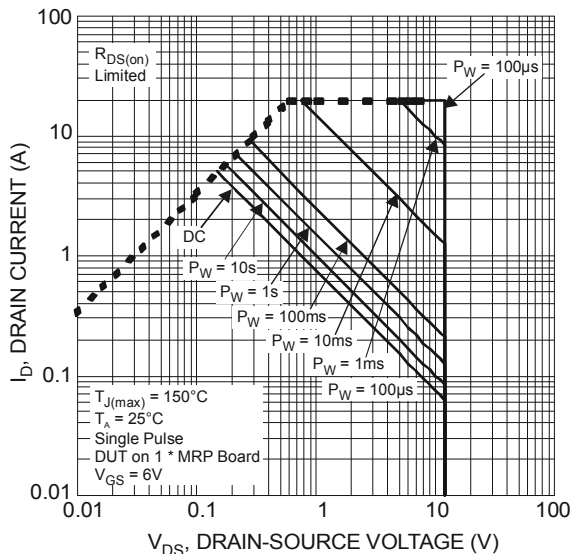
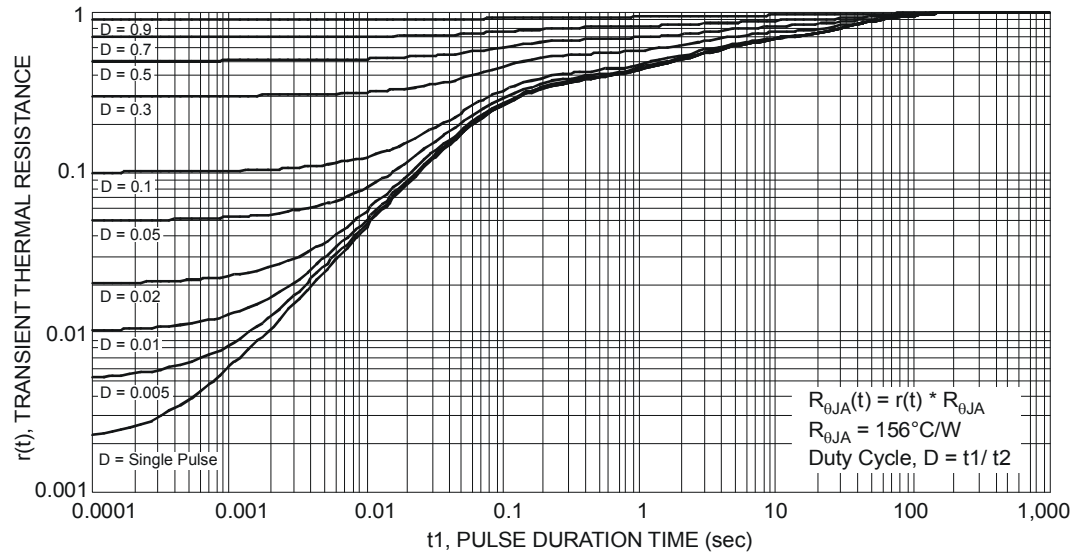
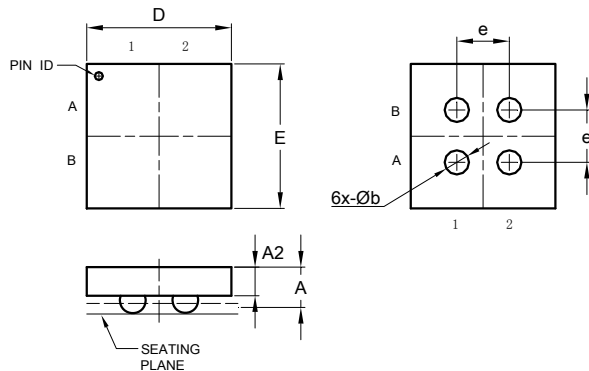


Figure 11 SOA, Safe Operation Area



## Package Outline Dimensions

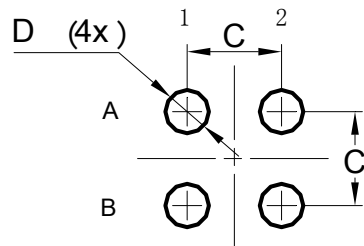
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



U-WLB1818-4			
Dim	Min	Max	Typ
A	—	0.62	—
A2	—	—	0.36
b	0.25	0.35	0.30
D	1.75	1.80	1.79
E	1.75	1.80	1.79
e	—	—	0.65
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)
C	0.65
D	0.30

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