

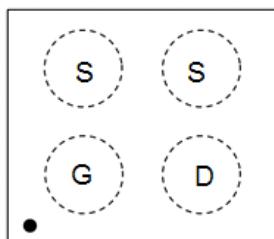
## Product Summary

BV <sub>DSS</sub>	R <sub>Ds(ON)</sub> Max	I <sub>D</sub> T <sub>A</sub> = +25°C t = 10s
20V	40mΩ @ V <sub>GS</sub> = 4.5V	4.5A
	50mΩ @ V <sub>GS</sub> = 2.5V	4.2A
	56mΩ @ V <sub>GS</sub> = 1.8V	4.0A
	70mΩ @ V <sub>GS</sub> = 1.5V	1.5A

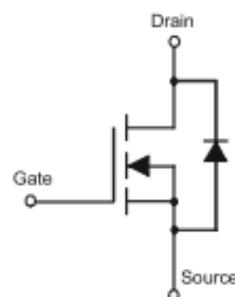
## Description and Applications

This new generation MOSFET is designed to minimize the on-state resistance (R<sub>Ds(ON)</sub>) and yet maintain superior switching performance, making it ideal for high efficiency power management applications. It is a high performance MOSFET in ultra-small 1.0mm x 1.0mm package.

- Portable Applications
- Load Switch
- Power Management Functions



Top View



Equivalent Circuit

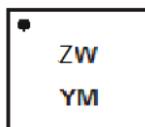
## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN2044UCB4-7	U-WLB1010-4 (Type B)	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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



ZW = Product Type Marking Code

YM = Date Code Marking

Y or Y = Year (ex: E = 2017)M or 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
Code	1	2	3	4	5	6	7

## Maximum Ratings

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	20	V
Gate-Source Voltage	V <sub>GSS</sub>	±8	V
Continuous Source Current @ V <sub>GS</sub> = 4.5V, t=10s (Note 5)	I <sub>D</sub>	3.3 2.6	A
Continuous Source Current @ V <sub>GS</sub> = 4.5V, t=10s (Note 6)	I <sub>D</sub>	4.5 3.6	A
Pulsed Drain Current (Pulse Duration 10µs, Duty Cycle ≤1%)	I <sub>DM</sub>	16	A
Continuous Source-Drain Diode Current	I <sub>S</sub>	1.2	A
Pulse Diode Forward Current	I <sub>SM</sub>	10	A

## Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P <sub>D</sub>	0.72	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	175	°C/W
Thermal Resistance, Junction to Case (Note 5)	R <sub>θJC</sub>	40	°C/W
Total Power Dissipation (Note 6)	P <sub>D</sub>	1.18	W
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	106	°C/W
Operating and Storage Temperature Range	T <sub>J, T<sub>STG</sub></sub>	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	20	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250µA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1.0	µA	V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V
		—	—	1.0	mA	V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V, T <sub>J</sub> = +150°C
Gate-Body Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	0.4	—	0.9	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	29	40	mΩ	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 1.5A
			32	50		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 1.0A
			36	56		V <sub>GS</sub> = 1.8V, I <sub>D</sub> = 1.0A
			43	70		V <sub>GS</sub> = 1.5V, I <sub>D</sub> = 0.5A
Forward Transfer Admittance	Y <sub>fs</sub>	—	5.9	—	S	V <sub>DS</sub> = 10V, I <sub>S</sub> = 1.5A
Body Diode Forward Voltage	V <sub>SD</sub>	—	0.7	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1.5A
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	—	1056	1400	pF	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	117	160	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	105	140	pF	
Gate Resistance	R <sub>g</sub>	—	0.98	1.5	Ω	
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	—	13.1	26.5	nC	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge (V <sub>GS</sub> = 8V)	Q <sub>g</sub>	—	23.2	47	nC	
Gate-Source Charge	Q <sub>gs</sub>	—	1.4	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	2.1	—	nC	
Reverse Recovery Charge	Q <sub>RR</sub>	—	2.16	6	nC	I <sub>F</sub> = 1.5A, di/dt = 100A/µs
Body Diode Reverse Recovery Time	t <sub>RR</sub>	—	7.92	18	ns	
Reverse Recovery Fall Time	t <sub>A</sub>	—	6.5	—	ns	
Reverse Recovery Rise Time	t <sub>B</sub>	—	4.12	—	ns	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	4.57	10	ns	V <sub>DD</sub> = 10V, I <sub>D</sub> = 1.5A V <sub>GEN</sub> = 4.5V, R <sub>G</sub> = 1Ω, R <sub>L</sub> = 6.7Ω
Turn-On Rise Time	t <sub>R</sub>	—	6.33	15	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	19.84	42	ns	
Turn-Off Fall Time	t <sub>F</sub>	—	2.96	6	ns	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	2.88	6	ns	V <sub>DD</sub> = 10V, I <sub>D</sub> = 1.5A V <sub>GEN</sub> = 8V, R <sub>G</sub> = 1Ω, R <sub>L</sub> = 6.7Ω
Turn-On Rise Time	t <sub>R</sub>	—	6.31	14	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	14.9	30	ns	
Turn-Off Fall Time	t <sub>F</sub>	—	1.71	4	ns	

Notes:

5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

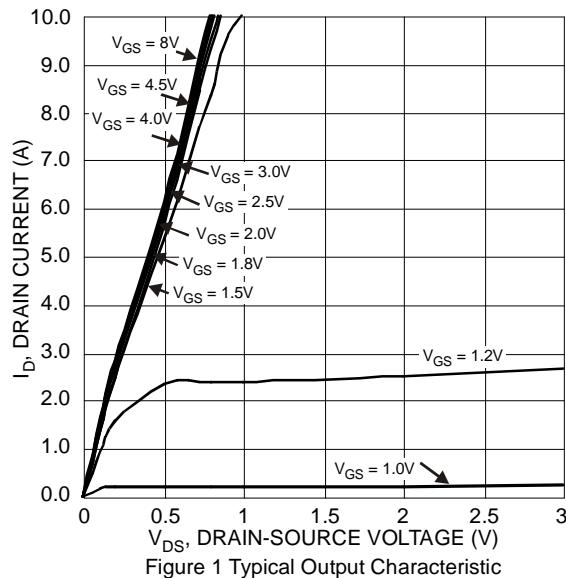


Figure 1 Typical Output Characteristic

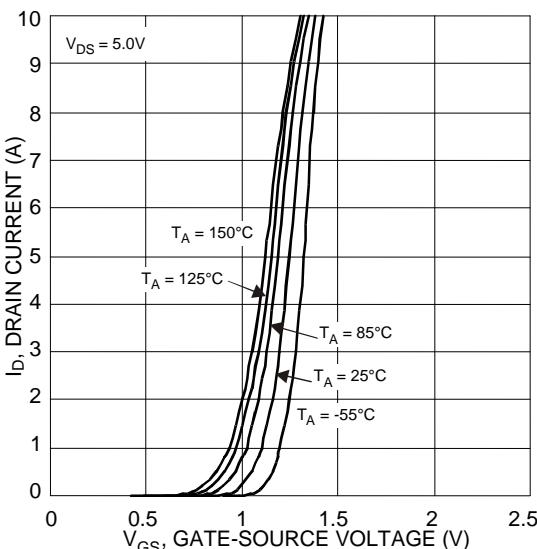


Figure 2 Typical Transfer Characteristics

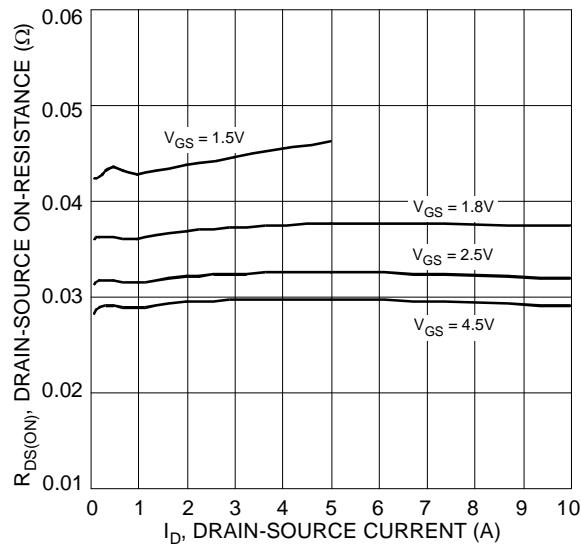


Figure 3 Typical On-Resistance vs.  
Drain Current and Gate Voltage

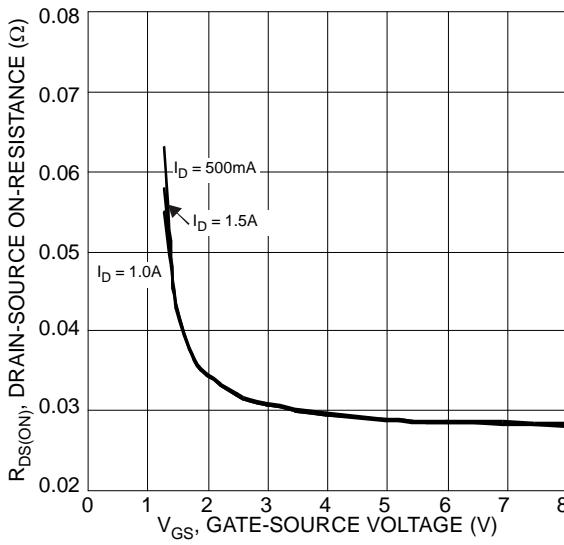


Figure 4 Typical Transfer Characteristics

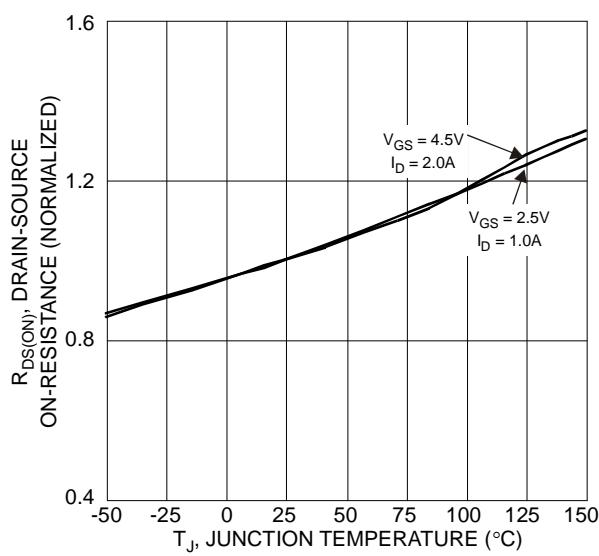


Figure 5 On-Resistance Variation with Temperature

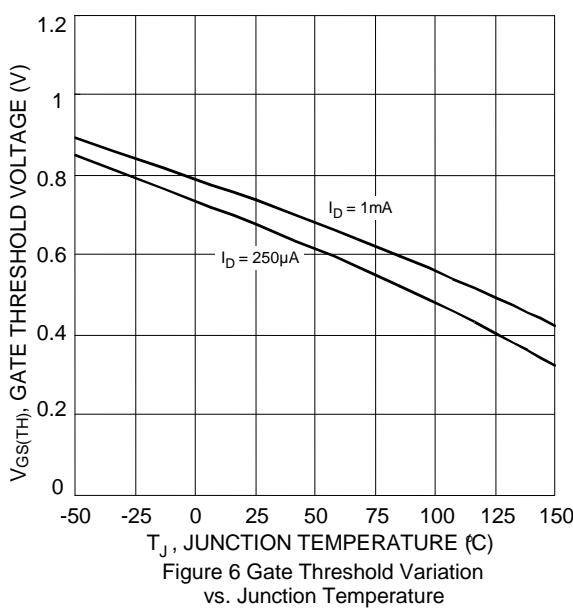
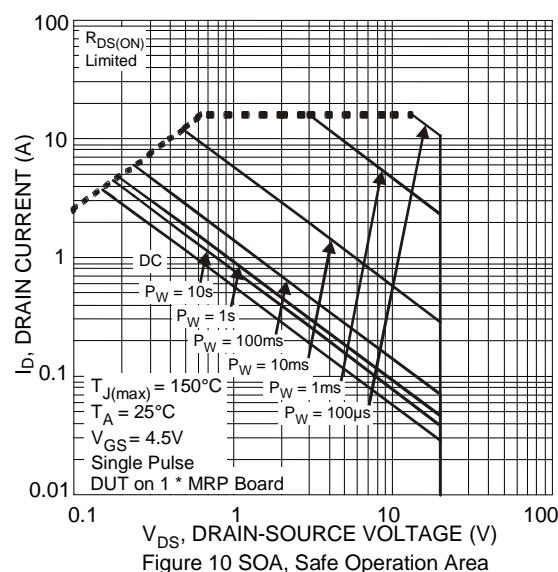
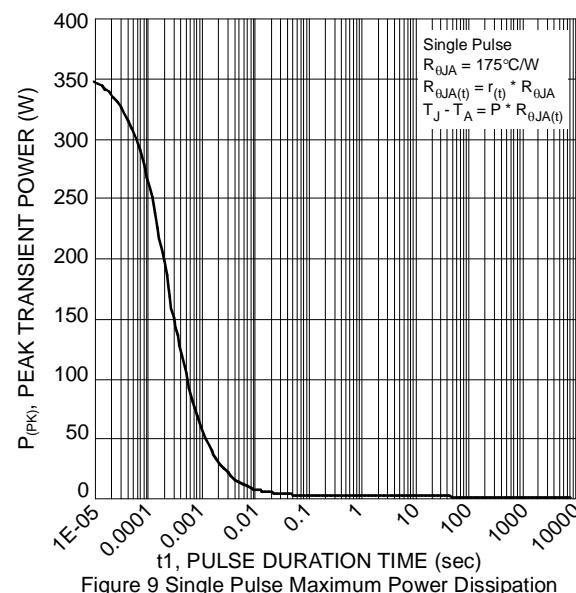
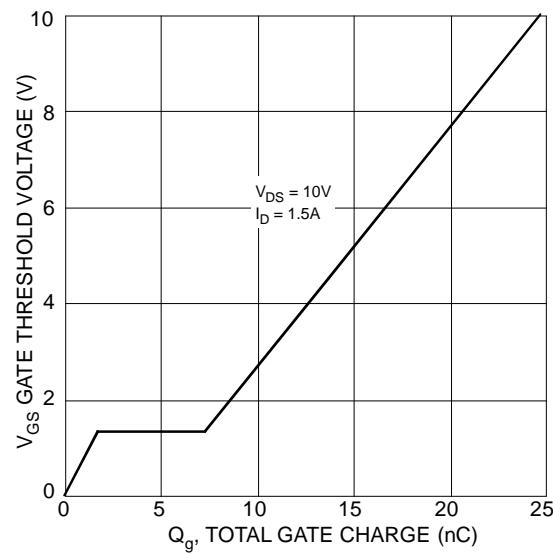
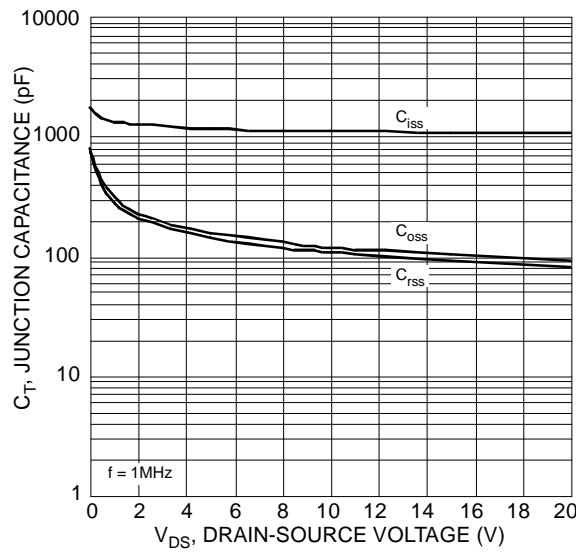


Figure 6 Gate Threshold Variation  
vs. Junction Temperature



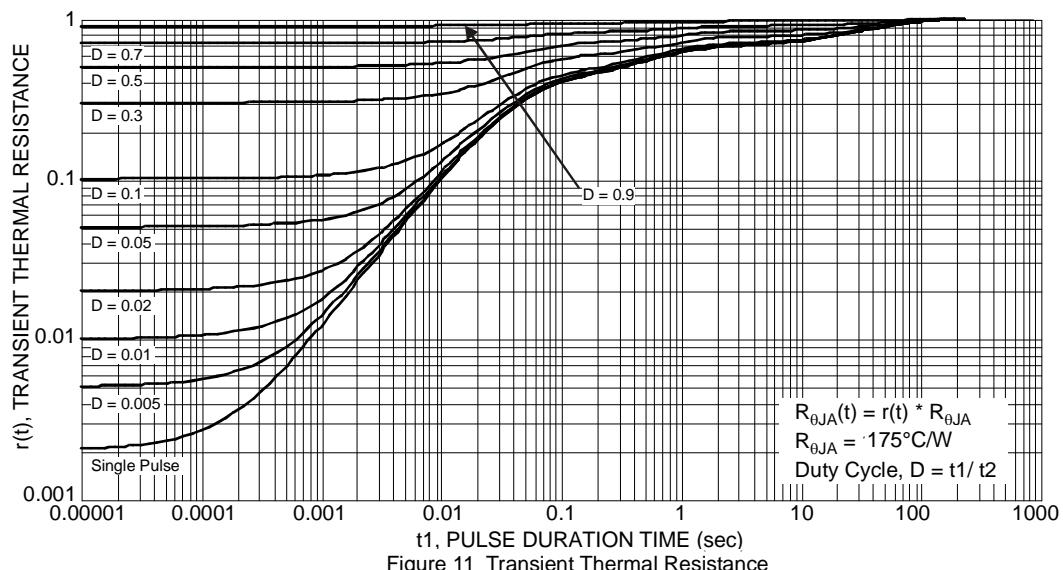
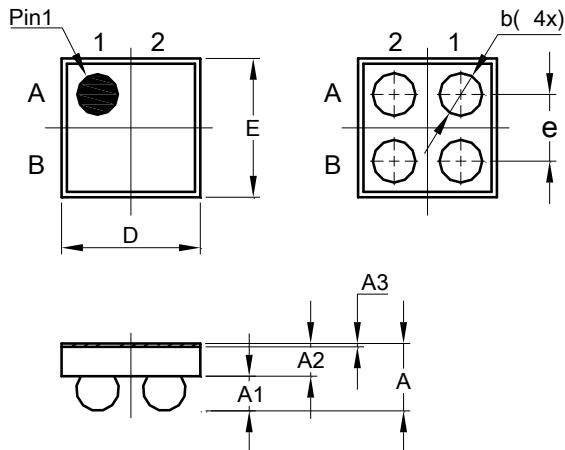


Figure 11 Transient Thermal Resistance

## Package Outline Dimensions

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

U-WLB1010-4 (Type B)



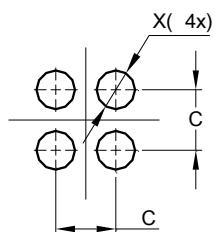
U-WLB1010-4 (Type B)			
Dim	Min	Max	Typ
A	0.4535	0.5565	0.5050
A1	0.2115	0.2585	0.2350
A2	0.2200	0.2700	0.2450
A3	0.0220	0.0280	0.0250
b	0.2880	0.3520	0.3200
D	1.030	1.050	1.040
e	0.500 BSC		
E	1.030	1.050	1.040

All Dimensions in mm

## Suggested Pad Layout

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

U-WLB1010-4 (Type B)



Dimensions	Value (in mm)
C	0.500
X	0.3200

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