DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

NEW PRODUCT

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)max}$	I_D T_A = +25°C
20V	15.5mΩ @ V_{GS} = 4.5V	7.5A
	16.5mΩ @ V_{GS} = 4.0V	7.3A
	19mΩ @ V_{GS} = 3.1V	6.9A
	20mΩ @ V_{GS} = 2.5V	6.7A
	30mΩ @ V_{GS} = 1.8V	5.4A

Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- **ESD Protected Gate**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Description

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

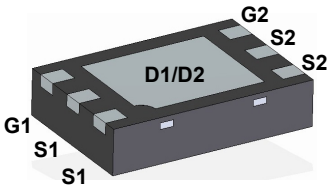
Mechanical Data

- Case: U-DFN2030-6
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.012 grams (approximate)

Applications

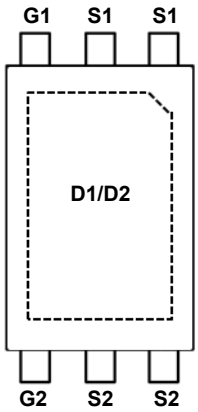
- Power Management Functions
- Battery Pack
- Load Switch

U-DFN2030-6

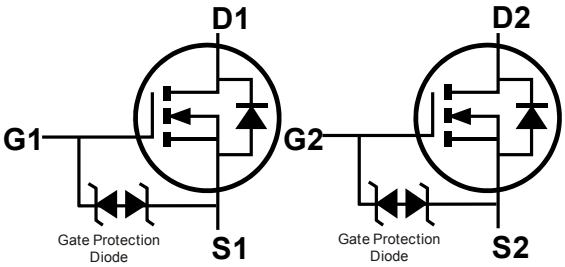


Bottom View

Bottom Drain Contact



Top View
Pin Configuration

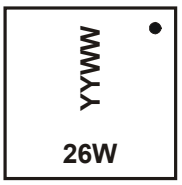


Ordering Information (Note 4)

Part Number	Case	Packaging
DMN2016LHAB-7	U-DFN2030-6	3,000 / 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/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



26W = Product Type Marking Code
YYWW = Date Code Marking
YY = Last digit of year (ex: 12 for 2012)
WW = Week code (01 to 53)

NEW PRODUCT

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}	±12	V
Continuous Drain Current (Note 6) V_{GS} = 4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	7.5 5.8	A
	t < 10s	T_A = +25°C T_A = +70°C	I_D	7.7 6.0	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	45	A

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	1.2	W
	T_A = +70°C		0.75	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	106	°C/W
	t < 10s		100	
Total Power Dissipation (Note 6)	T_A = +25°C	P_D	1.65	W
	T_A = +70°C		1	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	78	°C/W
	t < 10s		72	
Thermal Resistance, Junction to Case		$R_{\theta JC}$	11.4	
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	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	20	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current T_J = +25°C	I_{DSS}	—	—	1.0	µA	V_{DS} = 20V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±10	µA	V_{GS} = ±8V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	0.5	0.71	1.1	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	13	15.5	mΩ	V_{GS} = 4.5V, I_D = 4.0A
			13.5	16.5		V_{GS} = 4.0V, I_D = 4.0A
			14	19		V_{GS} = 3.1V, I_D = 4.0A
			15	20		V_{GS} = 2.5V, I_D = 4.0A
			21	30		V_{GS} = 1.8V, I_D = 3.5A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	25	—	S	V_{DS} = 5V, I_D = 6A
Diode Forward Voltage	V_{SD}	—	0.75	1.0	V	V_{GS} = 0V, I_S = 1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	1550	—	pF	V_{DS} = 10V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	166	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	145	—	pF	
Gate Resistance	R_g	—	1.37	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = 2.5V)	Q_g	—	8.4	—	nC	V_{DS} = 10V, I_D = 6A
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	16	—	nC	
Gate-Source Charge	Q_{gs}	—	2.3	—	nC	
Gate-Drain Charge	Q_{gd}	—	2.5	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	6.9	—	ns	V_{DD} = 10V, R_L = 1.7Ω, V_{GS} = 5.0V, R_G = 3Ω
Turn-On Rise Time	t_r	—	15.5	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	40.9	—	ns	
Turn-Off Fall Time	t_f	—	12	—	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 pad
7. Repetitive rating, pulse width limited by junction temperature
8. Guaranteed by design. Not subject to product testing

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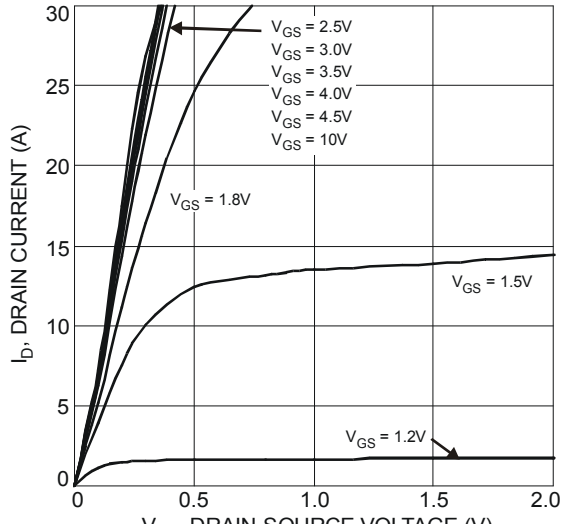

Figure 1 Typical Output Characteristic

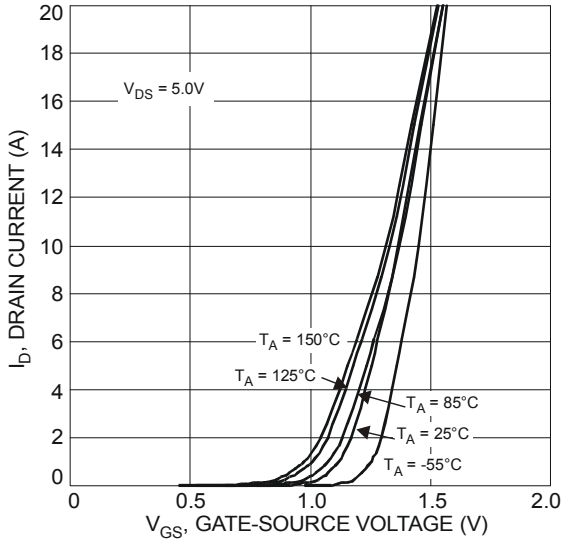

Figure 2 Typical Transfer Characteristics

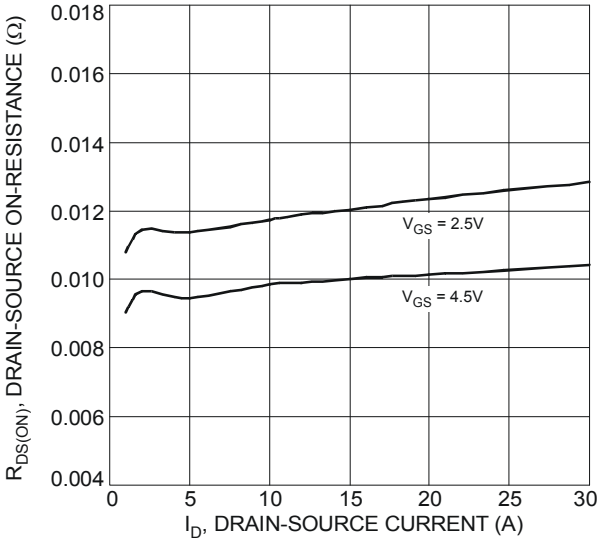

Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

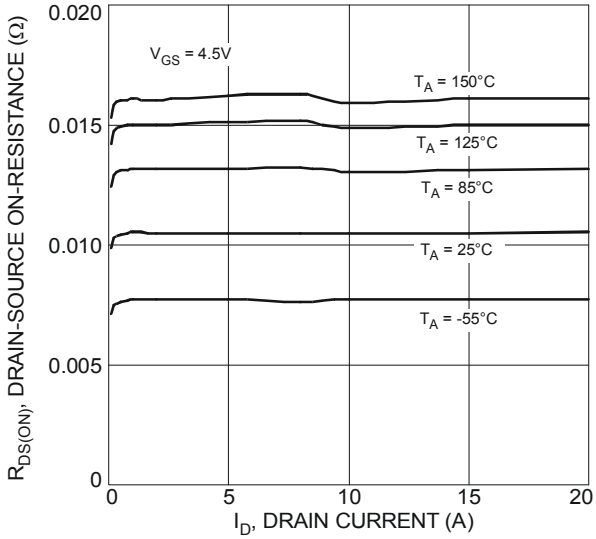

Figure 4 Typical On-Resistance vs. Drain Current and Temperature

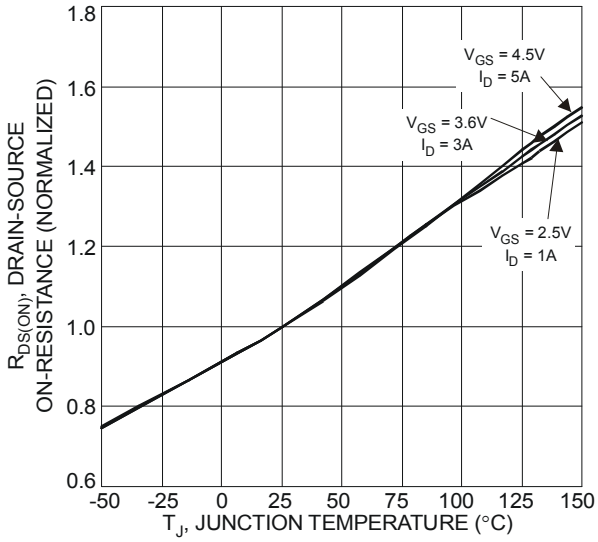

Figure 5 On-Resistance Variation with Temperature

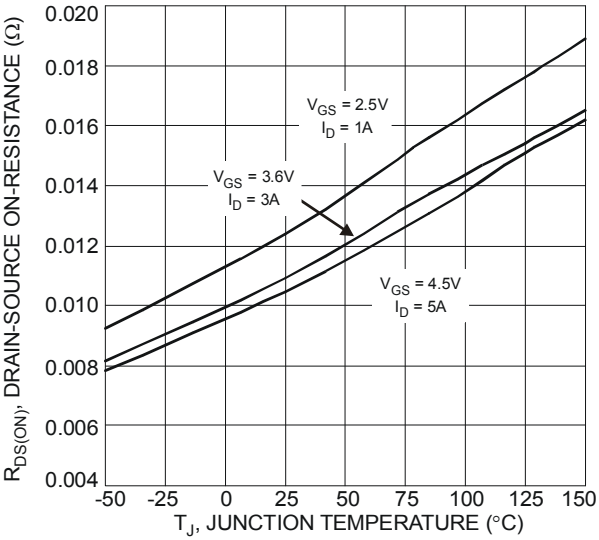

Figure 6 On-Resistance Variation with Temperature

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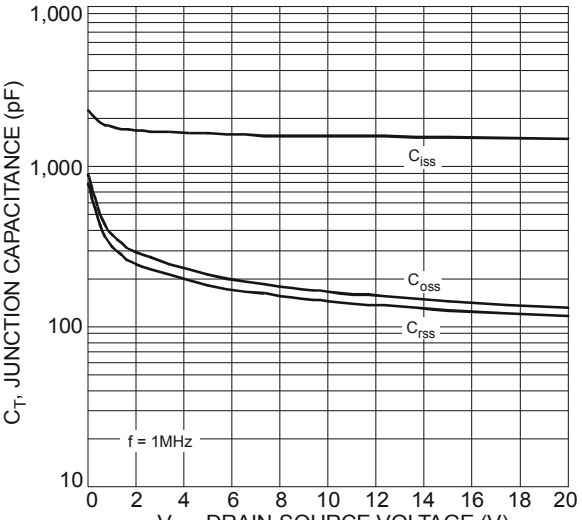

Figure 7 Typical Junction Capacitance

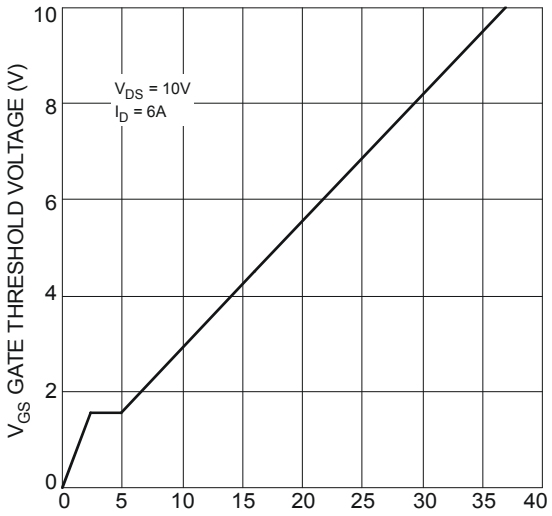

Figure 8 Gate Charge

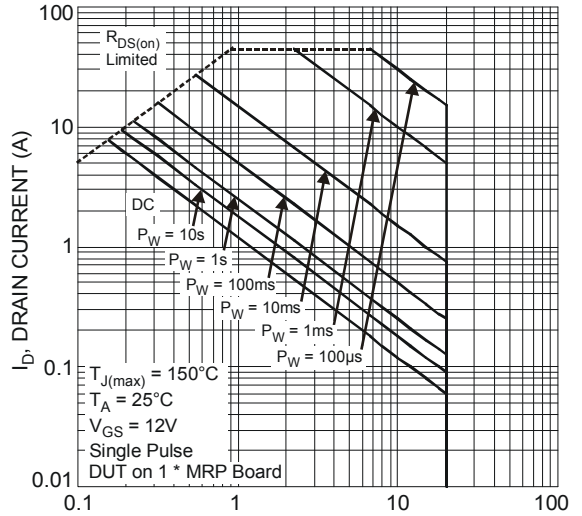

Figure 9 SOA, Safe Operation Area

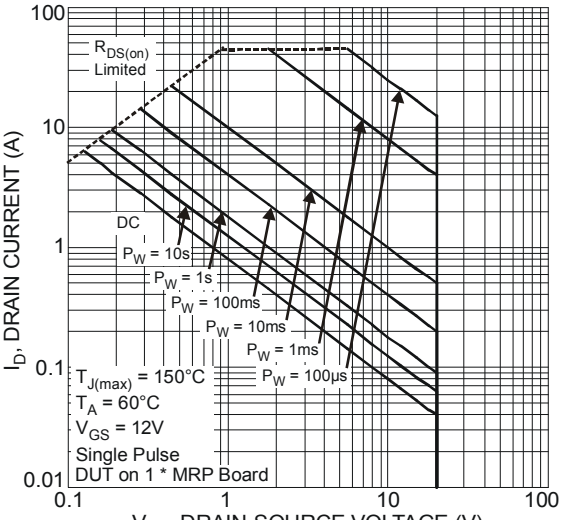

Figure 10 SOA, Safe Operation Area

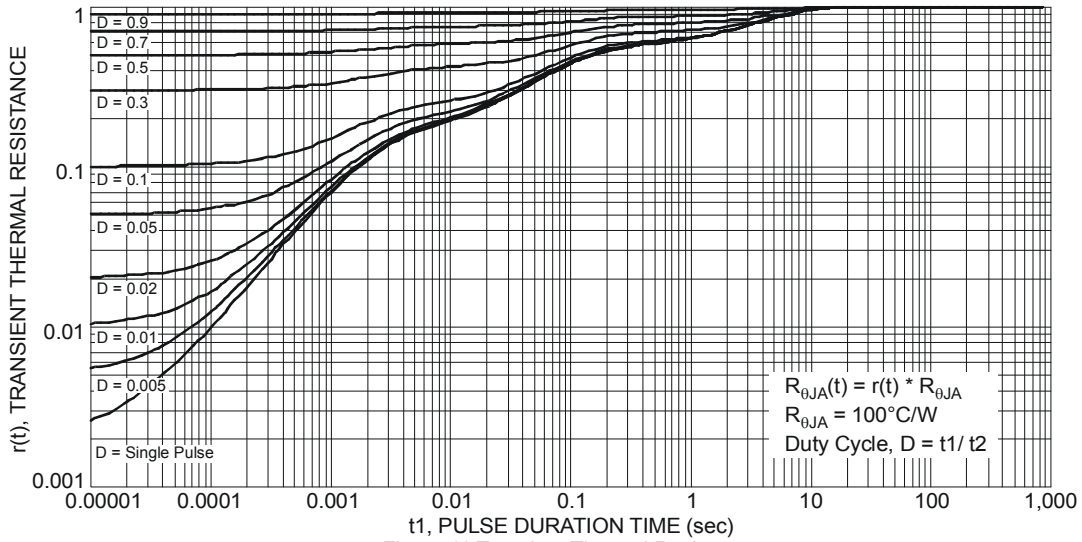

Figure 11 Transient Thermal Resistance

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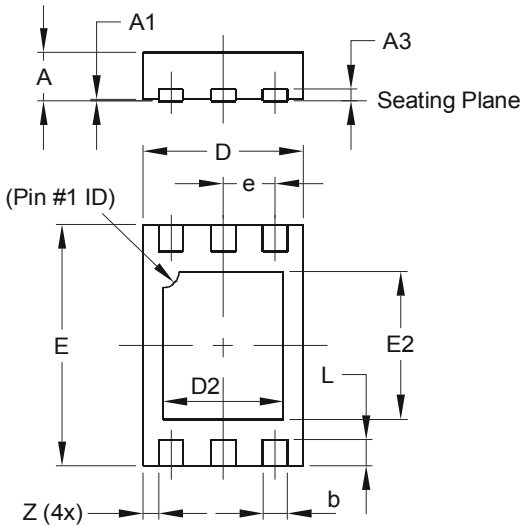
Package Outline Dimensions

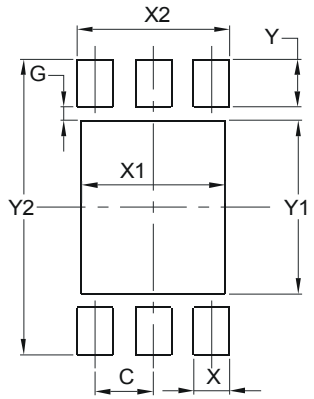
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



U-DFN2030-6 Type B			
Dim	**Min**	**Max**	**Typ**
A	0.55	0.65	0.60
A1	0	0.05	0.02
A3	-	-	0.15
b	0.25	0.35	0.30
D	1.95	2.05	2.00
D2	1.40	1.60	1.50
E	2.95	3.05	3.00
E2	1.74	1.94	1.84
e	-	-	0.65
L	0.28	0.38	0.33
Z	-	-	0.20
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	0.650
G	0.150
X	0.400
X1	1.600
X2	1.700
Y	0.530
Y1	1.940
Y2	3.300

NEW PRODUCT

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- Техническая поддержка проекта;
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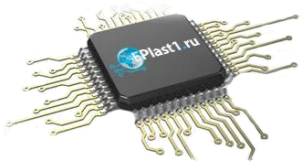

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