

Product Summary

$V_{(BR)DSS}$	$R_{DS(on) \max}$	I_D $T_A = 25^\circ\text{C}$
20V	$18\text{m}\Omega$ @ $V_{GS} = 4.5\text{V}$	5.2A
	$30\text{m}\Omega$ @ $V_{GS} = 1.8\text{V}$	4.0A

Description and Applications

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.

- Power management functions
- Battery Pack
- Load Switch

Features and Benefits

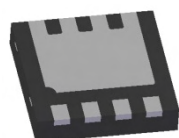
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- **ESD Protected Gate**
- **Lead, Halogen, and Antimony Free, RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: U-DFN3030-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Weight: 0.0172 grams (approximate)



ESD PROTECTED TO 2kV

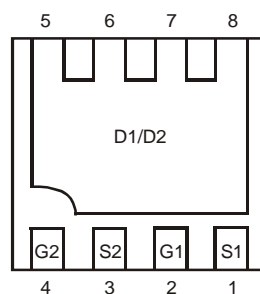


Top View

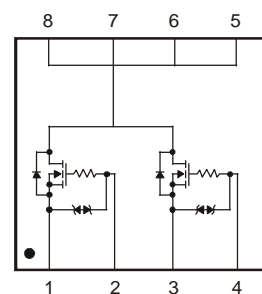


Bottom View

U-DFN3030-8



Bottom View
Pin Configuration



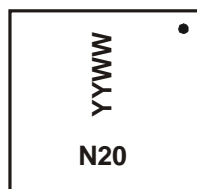
Top View
Equivalent Circuit

Ordering Information (Note 6)

Part Number	Case	Packaging
DMN2016LFG-7	U-DFN3030-8	3000 / Tape & Reel

- Notes:
1. No purposefully added lead. Halogen and Antimony Free.
 2. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>.
 3. For packaging details, go to our website at <http://www.diodes.com>

Marking Information



N20 = Product Type Marking Code
YYWW = Date Code Marking
YY = Last digit of year (ex: 09 for 2009)
WW = Week code (01 to 53)

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}	±8	V
Continuous Drain Current (Note 4)	Steady State	T _A = 25°C	I _D	5.2	A
		T _A = 70°C		4.1	
Pulsed Drain Current (10μs pulse, duty cycle = 1%)			I _{DM}	30	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	P _D	0.77	W
Thermal Resistance, Junction to Ambient @T _A = 25°C (Note 4)	R _{θJA}	169	°C/W
Thermal Resistance, Junction to Case @T _A = 25°C (Note 4)	R _{θJC}	15.8	°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	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 5)						
Drain-Source Breakdown Voltage	BV _{DSS}	20	-	-	V	V _{GS} = 0V, I _D = 250μA
Gate-Source Breakdown Voltage	BV _{GSO}	±8	-	-	V	V _{DS} = 0V, I _G = ±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 5)						
Gate Threshold Voltage	V _{GS(th)}	0.4	0.71	1.1	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	-	13	18	mΩ	V _{GS} = 4.5V, I _D = 6A
			13.5	19		V _{GS} = 4.0V, I _D = 6A
			14	20.5		V _{GS} = 3.1V, I _D = 6A
			15	22		V _{GS} = 2.5V, I _D = 6A
			21	30		V _{GS} = 1.8V, I _D = 6A
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 6)						
Input Capacitance	C _{iss}	-	1472	-	pF	V _{DS} = 10V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	-	311	-	pF	
Reverse Transfer Capacitance	C _{rss}	-	141	-	pF	
Gate Resistance	R _g	-	1.46	-	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge	Q _g	-	16.0	-	nC	V _{GS} = 4.5V, V _{DS} = 10V, I _D = 6A
Gate-Source Charge	Q _{gs}	-	36.6	-	nC	
Gate-Drain Charge	Q _{gd}	-	2.1	-	nC	
Turn-On Delay Time	t _{D(on)}	-	2.6	-	ns	V _{DD} = 10V, V _{GS} = 5V, R _{GEN} = 3Ω, R _L = 1.7Ω
Turn-On Rise Time	t _r	-	13.2	-	ns	
Turn-Off Delay Time	t _{D(off)}	-	84.5	-	ns	
Turn-Off Fall Time	t _f	-	46.8	-	ns	

- Notes:
4. Device mounted on FR-4 PCB, with minimum recommended pad layout.
 5. Repetitive rating, pulse width limited by junction temperature
 6. Guaranteed by design. Not subject to product testing

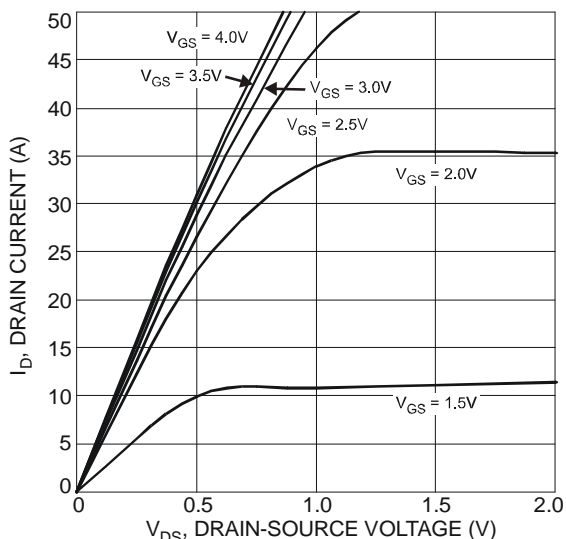


Fig.1 Typical Output Characteristic

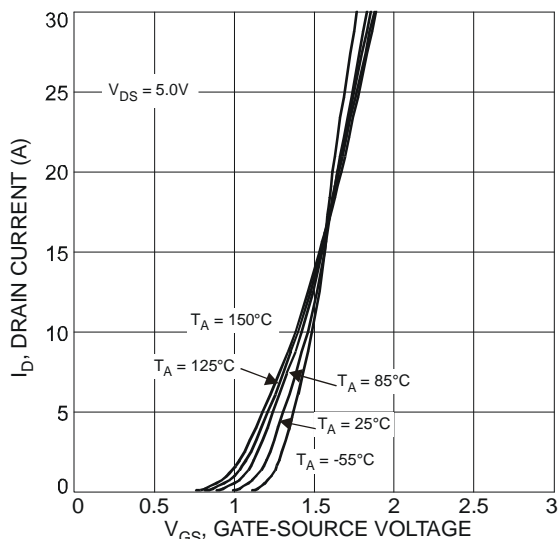


Fig.2 Typical Transfer Characteristics

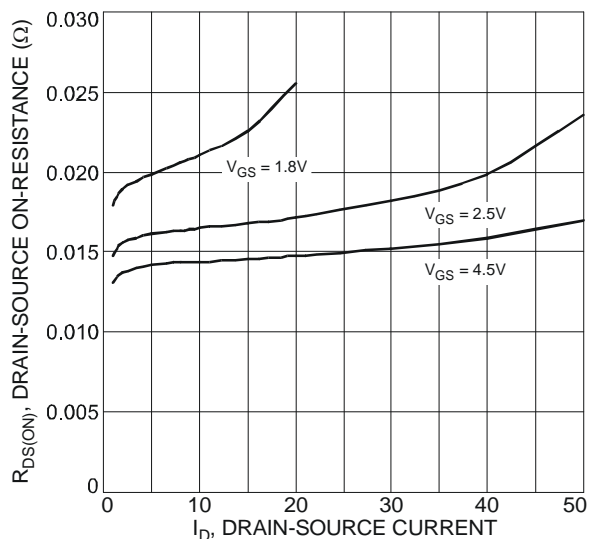


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

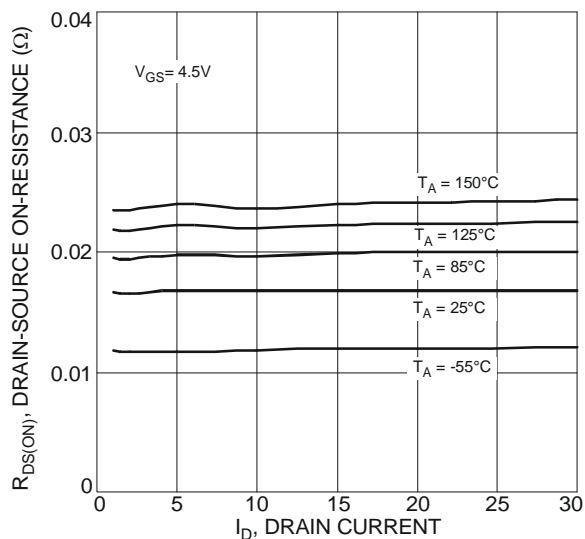


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

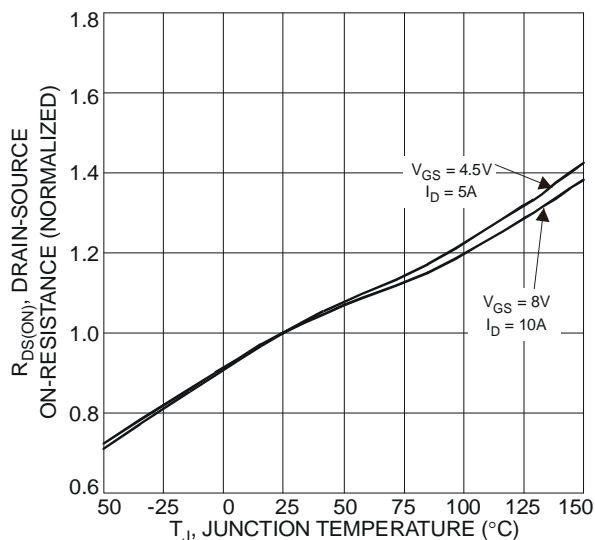


Fig. 5 On-Resistance Variation with Temperature

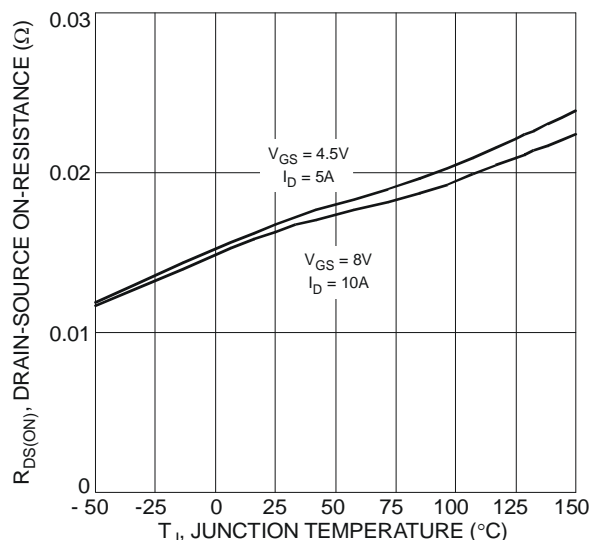


Fig. 6 On-Resistance Variation with Temperature

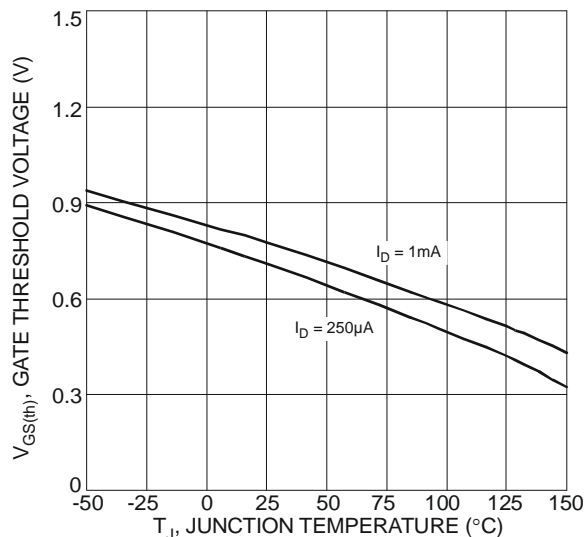


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

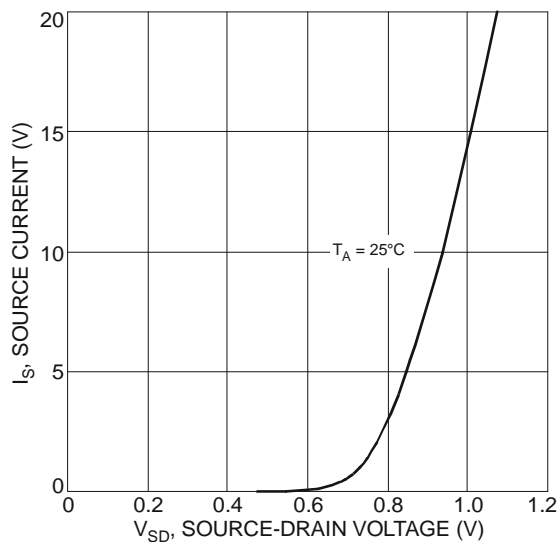


Fig. 8 Diode Forward Voltage vs. Current

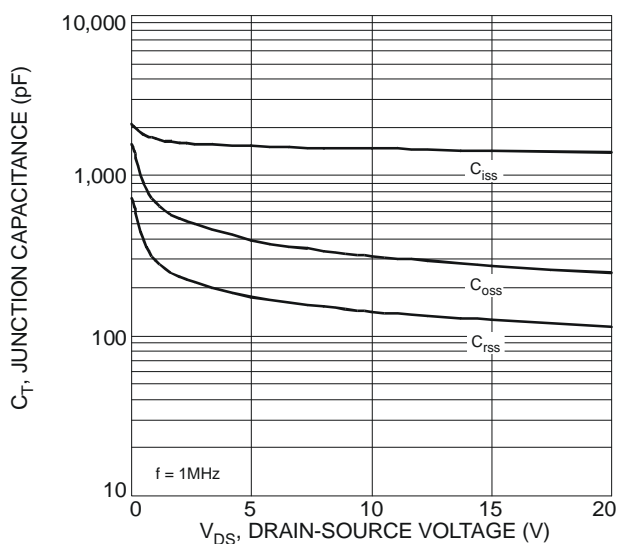


Fig. 9 Typical Junction Capacitance

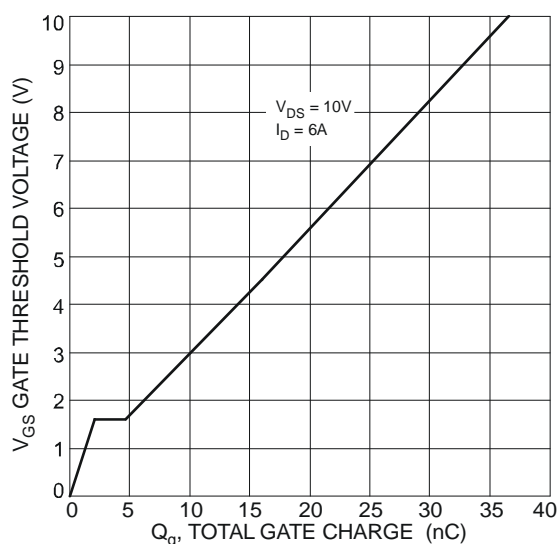


Fig. 10 Gate Charge

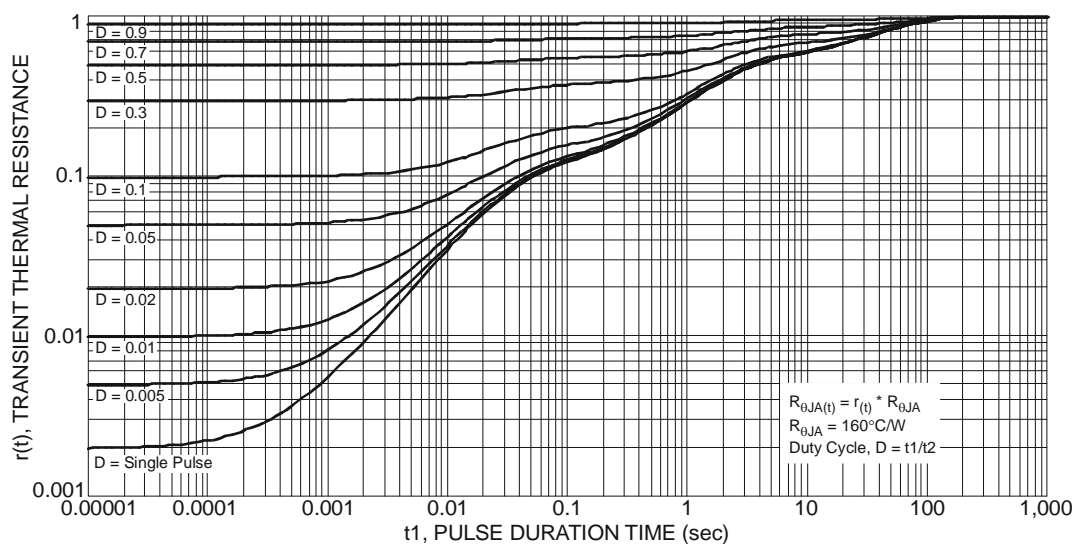
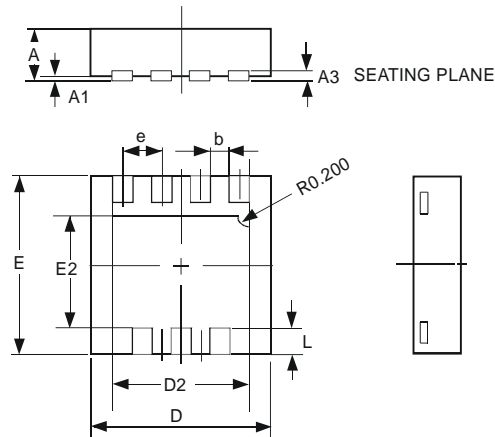


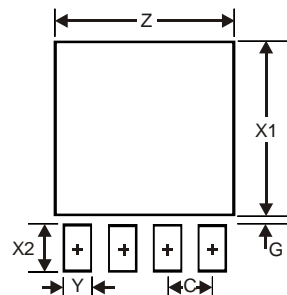
Fig. 11 Transient Thermal Resistance

Package Outline Dimensions



U-DFN3030-8			
Dim	Min	Max	Typ
A	0.57	0.63	0.60
A1	0	0.05	0.02
A3	—	—	0.15
b	0.29	0.39	0.34
D	2.90	3.10	3.00
D2	2.19	2.39	2.29
e	—	—	0.65
E	2.90	3.10	3.00
E2	1.64	1.84	1.74
L	0.30	0.60	0.45
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.59
G	0.11
X1	2.49
X2	0.65
Y	0.39
C	0.65

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