

Product Summary

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

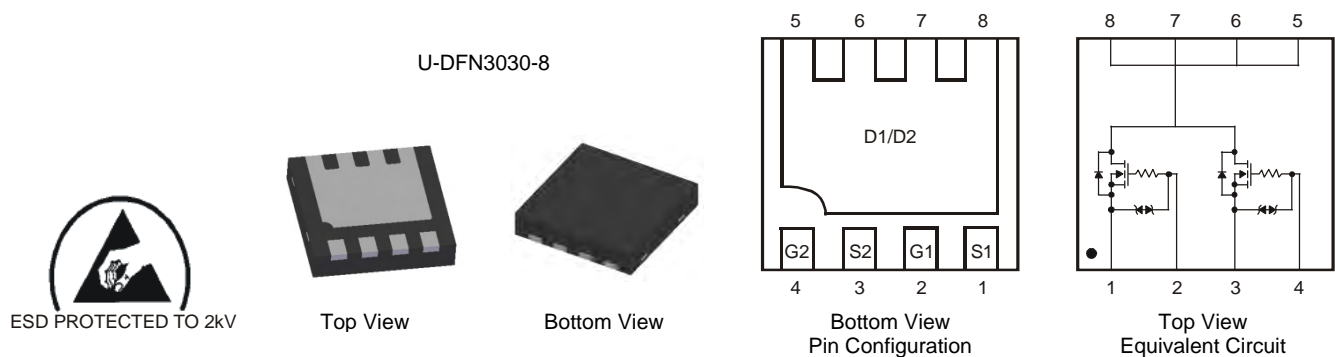
- Power management functions
- Battery Pack
- Load Switch

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)

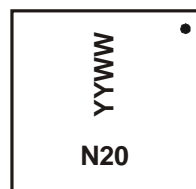


Ordering Information (Note 6)

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		
			14	20.5		
			15	22		
			21	30		
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

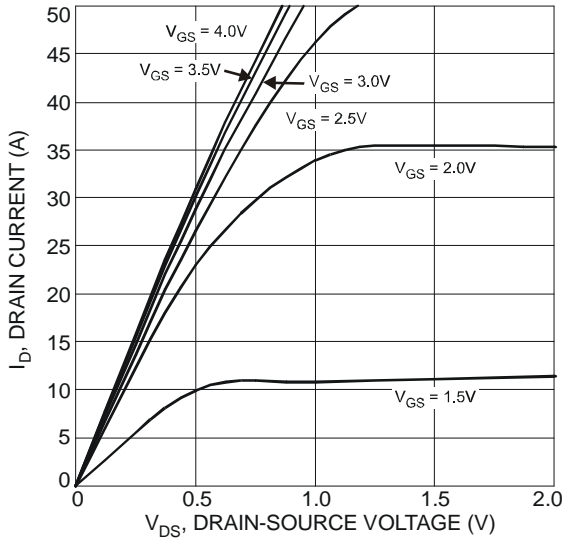


Fig. 1 Typical Output Characteristic

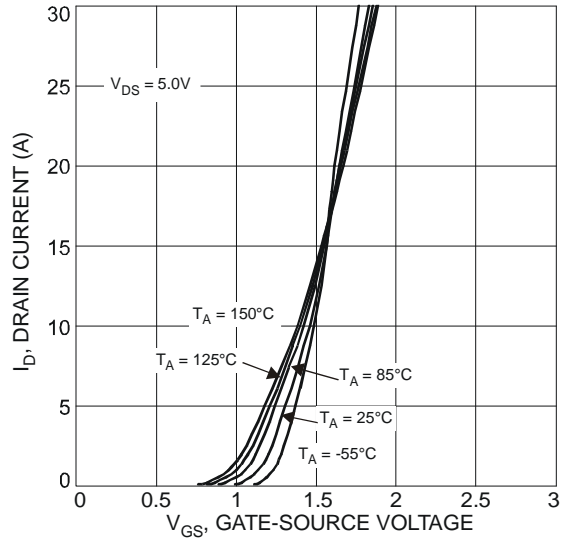


Fig. 2 Typical Transfer Characteristics

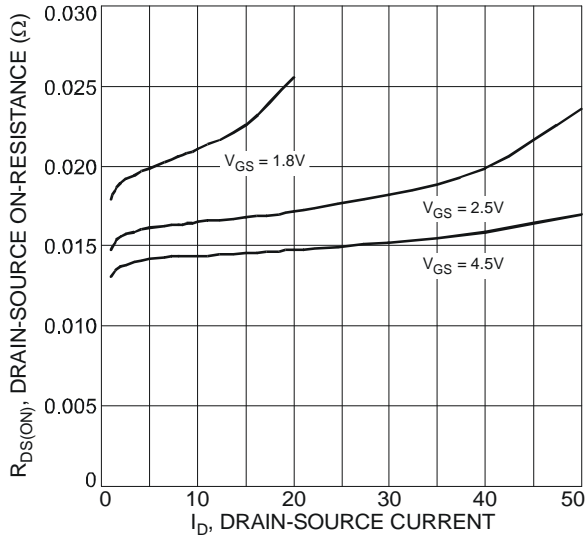


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

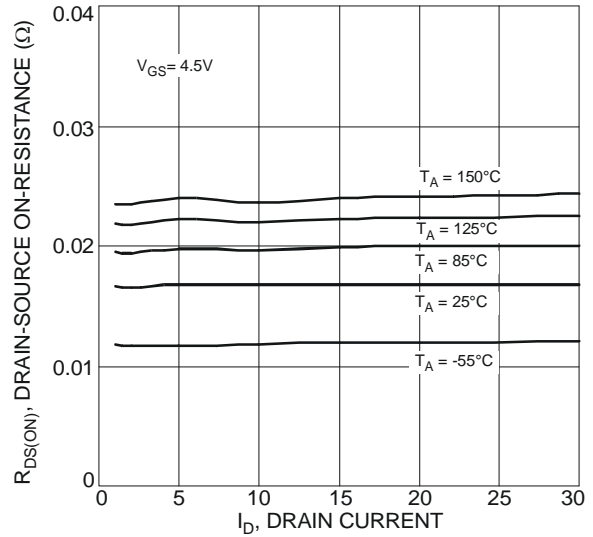


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

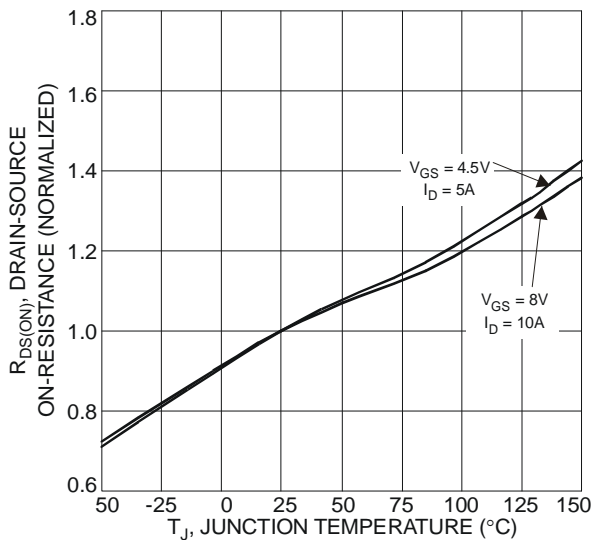


Fig. 5 On-Resistance Variation with Temperature

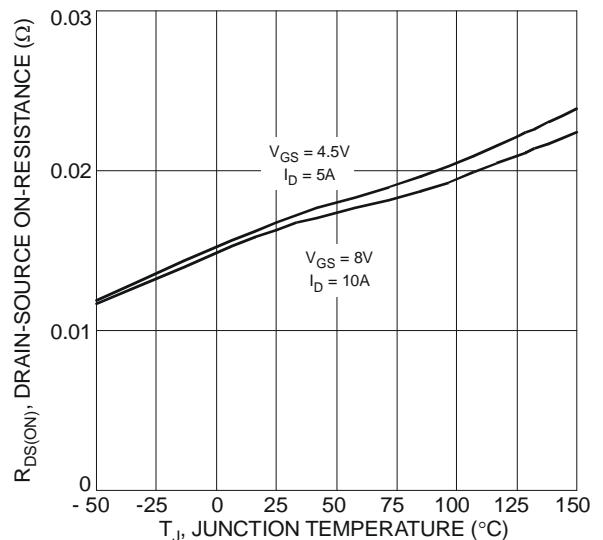


Fig. 6 On-Resistance Variation with Temperature

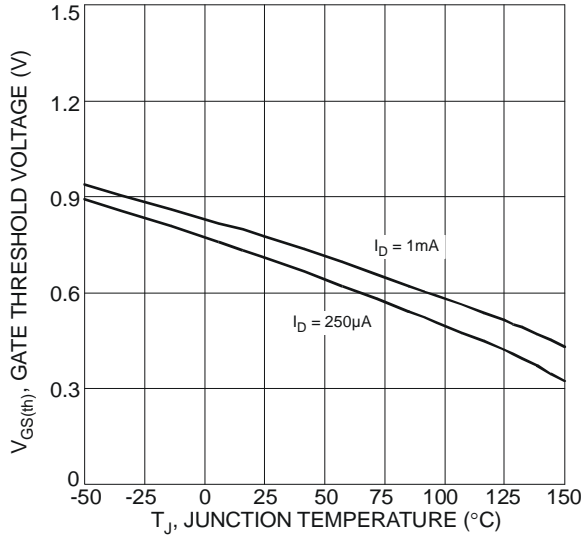


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

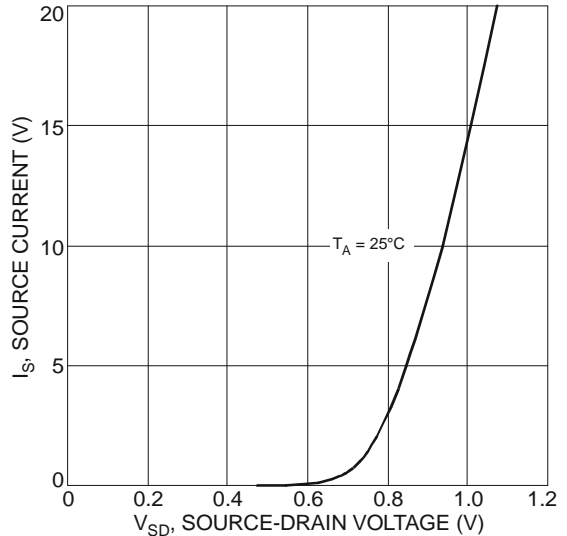


Fig. 8 Diode Forward Voltage vs. Current

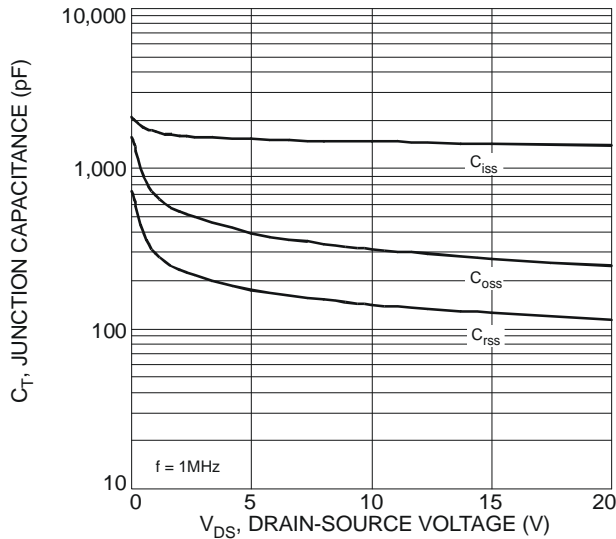


Fig. 9 Typical Junction Capacitance

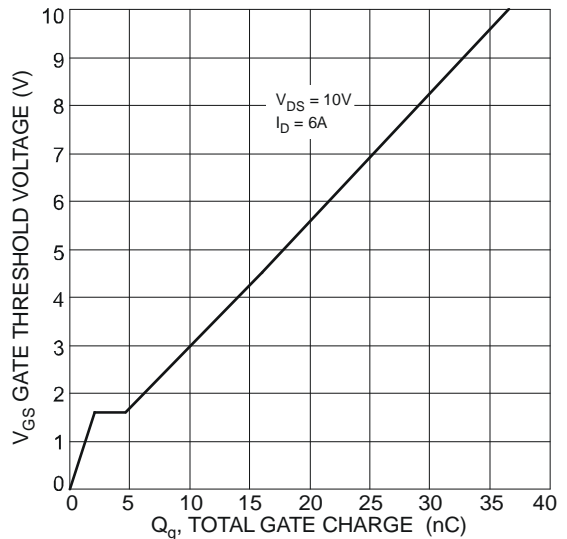


Fig. 10 Gate Charge

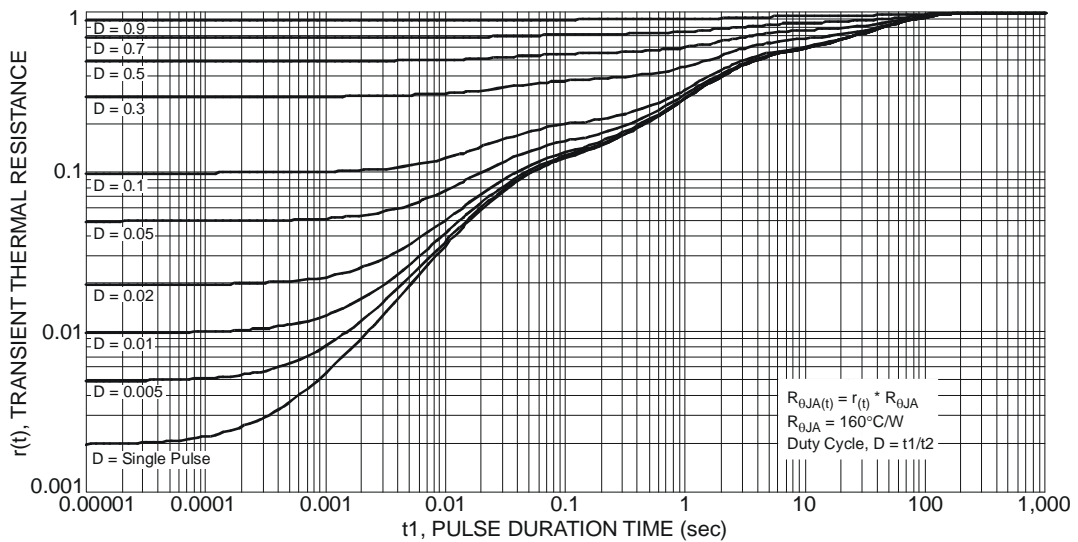
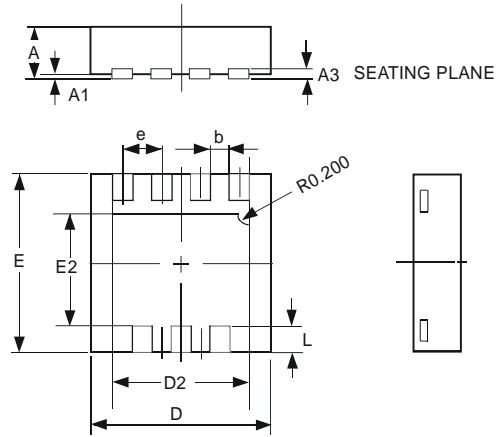


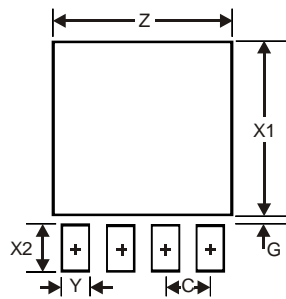
Fig. 11 Transient Thermal Resistance

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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