



30V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C
	19mΩ @ V _{GS} = 4.5V	15A
30V	$25m\Omega$ @ $V_{GS} = 2.5V$	14A
	40mΩ @ V _{GS} = 1.8V	10A
	120 m Ω @ $V_{GS} = 1.5$ V	6A

Description

This MOSFET is 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.

- Battery Management Application
- Power Management Functions
- DC-DC Converters

Features

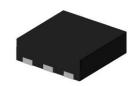
- 0.6mm Profile Ideal for Low Profile Applications
- PCB Footprint of 4mm²
- Low Gate Threshold Voltage
- Fast Switching Speed
- ESD Protected Gate
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

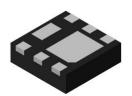
Mechanical Data

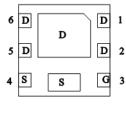
- Case: U-DFN2020-6 (Type F)
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish NiPdAu over Copper Leadframe.
 Solderable per MIL-STD-202, Method 208 @4
- Weight: 0.007 Grams (Approximate)

U-DFN2020-6 (Type F)









Gate Protection Solide Internal Schematic

Top View

Bottom View

Pin Out Bottom View

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN3020UFDF-7	U-DFN2020-6 (Type F)	3,000/Tape & Reel
DMN3020UFDF-13	U-DFN2020-6 (Type F)	10,000/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



2F = Product Type Marking Code YM = Date Code Marking Y = Year (ex: D = 2016) M = Month (ex: 9 = September)

Date Code Key

Year	2015		2016	2017		2018	2019		2020	2021		2022
Code	С		D	Е		F	G		Н	ı		J
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D



Maximum Ratings (@ $T_A = +25$ °C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit		
Drain-Source Voltage	V_{DSS}	30	V		
Gate-Source Voltage	V_{GSS}	±12	V		
Continuous Durin Compant (Nata C) V	Steady State	$T_C = +25$ °C $T_C = +70$ °C	l _D	15 13	А
Continuous Drain Current (Note 6) V _{GS} = 4.5V	t<5s	$T_A = +25$ °C $T_A = +70$ °C	I _D	10.4 8.3	А
Pulsed Drain Current (380µs Pulse, Duty Cycle = 1%	I_{DM}	40	Α		
Continuous Source-Drain Diode Current (Note 6)	Is	2.2	Α		
Avalanche Current (Note 7) L = 0.1mH	I _{AS}	17	Α		
Avalanche Energy (Note 7) L = 0.1mH	E _{AS}	15	mJ		

Thermal Characteristics

Characteristic		Symbol	Value	Unit	
Total Dawar Discipation (Note 5)	T _A = +25°C	D	0.73	W	
Total Power Dissipation (Note 5)	$T_A = +70^{\circ}C$	P_{D}	0.47		
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	D	171	°C/W	
Thermal Resistance, Junction to Ambient (Note 5)	t<5s	$R_{\theta JA}$	112		
Total Dower Discipation (Note 6)	$T_A = +25^{\circ}C$	6	2.03	W	
Total Power Dissipation (Note 6)	$T_A = +70^{\circ}C$	P_{D}	1.30		
Thermal Desigtance Junction to Ambient (Note C)	Steady State	5	63		
Thermal Resistance, Junction to Ambient (Note 6)	t<5s	$R_{\theta JA}$	40	°C/W	
Thermal Resistance, Junction to Case	Steady State	$R_{ heta JC}$	18		
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	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)							
Drain-Source Breakdown Voltage	BV _{DSS}	30	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	_	_	1	μΑ	$V_{DS} = 30V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	_	_	±10	μΑ	$V_{GS} = \pm 10V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 8)							
Gate Threshold Voltage	V _{GS(TH)}	0.4	0.6	1.0	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
			16	19		$V_{GS} = 4.5V, I_D = 4.5A$	
Static Drain-Source On-Resistance	В		19	25	mΩ	$V_{GS} = 2.5V, I_D = 3.5A$	
Static Diam-Source On-Resistance	R _{DS(ON)}	_	26	40	11122	$V_{GS} = 1.8V, I_D = 2.0A$	
			32	120		$V_{GS} = 1.5V, I_D = 1.0A$	
Diode Forward Voltage	V_{SD}	_	0.6	1.2	V	$V_{GS} = 0V, I_{S} = 1.0A$	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	C _{iss}	_	1304	_		V 45V V 0V	
Output Capacitance	Coss	_	87	_	pF	$V_{DS} = 15V, V_{GS} = 0V,$ f = 1.0MHz	
Reverse Transfer Capacitance	C _{rss}	_	80	_			
Gate Resistance	R_{g}	_	1.3	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (V _{GS} = 4.5V)	Qg	_	15	_			
Total Gate Charge (V _{GS} = 8V)	Qg	_	27		nC	151/ 1 1 5 6	
Gate-Source Charge	Q _{gs}	_	2.0	_	nc	$V_{DS} = 15V, I_D = 4.5A$	
Gate-Drain Charge	Q_{gd}	_	2.1	_			
Turn-On Delay Time	t _{D(ON)}	_	4.1	_			
Turn-On Rise Time	t _R	_	4.8	_		$V_{DS} = 15V, V_{GS} = 4.5V,$	
Turn-Off Delay Time	t _{D(OFF)}	_	20.5	_	ns	$R_G = 1\Omega, I_D = 4.5A$	
Turn-Off Fall Time	t _F	_	3.2	_			
Reverse Recovery Time	t _{RR}	_	7.1	_	ns	1 4 00 11/14 4000/	
Reverse Recovery Charge	Q _{RR}	_	1.7	_	nC	$I_F = 1.0A$, di/dt = 100A/ μ s	

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

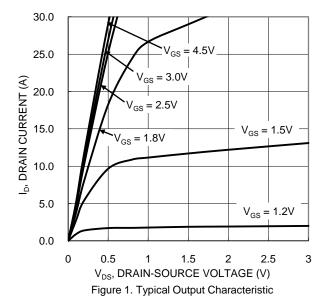
^{6.} Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

^{7.} IAs and EAs ratings are based on low frequency and duty cycles to keep $T_J = +25$ °C.

^{8.} Short duration pulse test used to minimize self-heating effect.

^{9.} Guaranteed by design. Not subject to product testing.





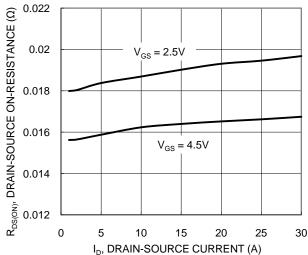


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

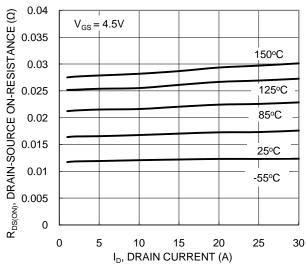
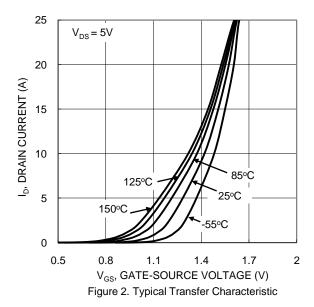
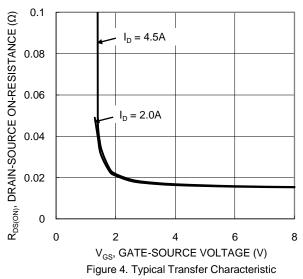


Figure 5. Typical On-Resistance vs. Drain Current and Temperature





1.8

V_{GS} = 4.5V, I_D = 4.5A

V_{GS} = 2.5V, I_D = 3.5A

V_{GS} = 2.5V, I_D = 3.5A

V_{GS} = 2.5V, I_D = 3.5A

T_J, JUNCTION TEMPERATURE (°C)

Figure 6. On-Resistance Variation with Temperature



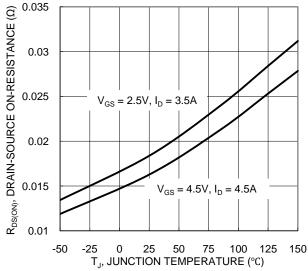
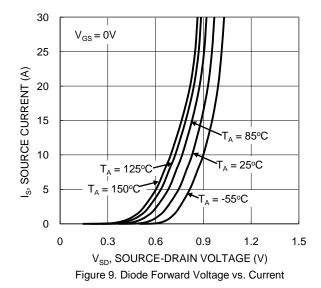
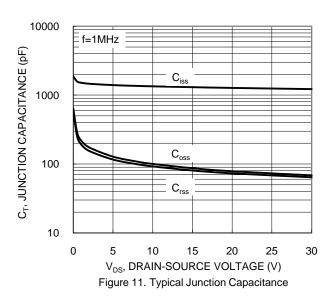


Figure 7. On-Resistance Variation with Temperature





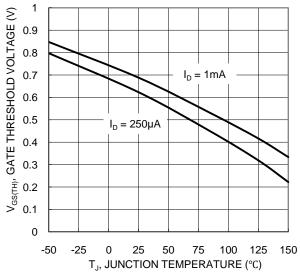


Figure 8. Gate Threshold Variation vs. Temperature

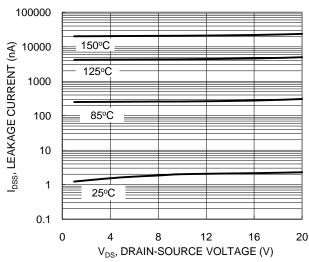
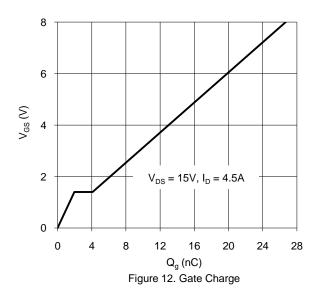
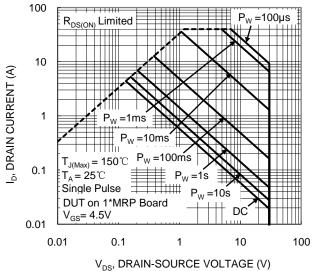


Figure 10. Typical Drain-Source Leakage Current vs. Voltage







V_{DS}, DRAIN-SOURCE VOLTAGE (V) Figure 13. SOA, Safe Operation Area

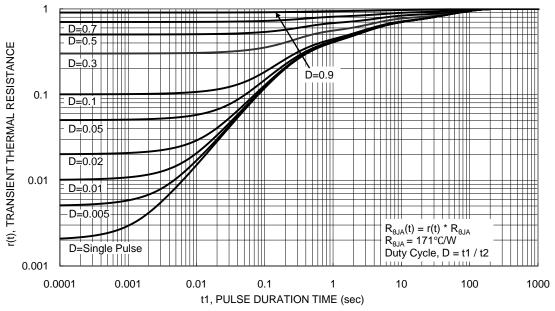


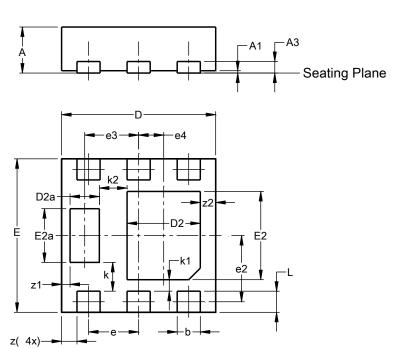
Figure 14. Transient Thermal Resistance



Package Outline Dimensions

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

U-DFN2020-6 (Type F)

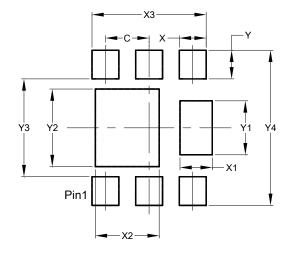


U-DFN2020-6								
(Type F)								
Dim		Min Max Typ						
Α	0.57	0.63	0.60					
A1	0.00	0.00 0.05 0.03						
A3	-	-	0.15					
b	0.25	0.35	0.30					
D	1.95	2.05	2.00					
D2	0.85	1.05	0.95					
D2a	0.33	0.43	0.38					
Е	1.95	2.05	2.00					
E2	1.05	1.25	1.15					
E2a	0.65	0.75	0.70					
е	0.65 BSC							
e2	0.863 BSC							
е3	0.70 BSC							
e4	0.325 BSC							
k	0.37 BSC							
k1	0.15 BSC							
k2	0.36 BSC							
L	0.225 0.325 0.275							
Z	0.20 BSC							
z1	0.110 BSC							
z2	0.20 BSC							
All Dimensions in mm								

Suggested Pad Layout

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

U-DFN2020-6 (Type F)



Dimensions	Value (in mm)
С	0.650
Х	0.400
X1	0.480
X2	0.950
Х3	1.700
Y	0.425
Y1	0.800
Y2	1.150
Y3	1.450
Y4	2.300



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многоканальный

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