



DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(ON)} Max	I _D Max T _A = +25°C
001/	20mΩ @ V _{GS} = 10V	7.7A
30V	32mΩ @ V _{GS} = 4.5V	6.1A

Description

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

Applications

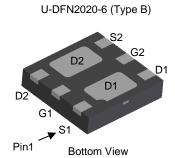
- General Purpose Interfacing Switch
- Power Management Functions

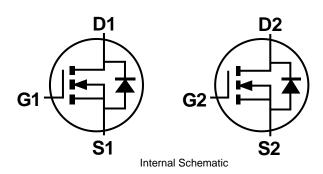
Features and Benefits

- 0.6mm Profile Ideal for Low Profile Applications
- Low Gate Threshold Voltage
- Low On-Resistance
- 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 B)
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish NiPdAu Annealed over Copper Leadframe.
 Solderable per MIL-STD-202, Method 208 (4)
- Terminals Connections: See Diagram Below
- Weight: 0.0065 grams (Approximate)





Ordering Information (Note 4)

Part Number	Case	Packaging
DMT3020LFDB-7	U-DFN2020-6 (Type B)	3,000/Tape & Reel
DMT3020LFDB-13	U-DFN2020-6 (Type B)	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



Y2 = Product Type Marking Code YM = Date Code Marking Y = Year (ex: C = 2015) M = Month (ex: 9 = September)

Date Code Key

Year	201	5	2016		2017	20	18	2019		2020		2021
Code	С		D		E		=	G		Н		
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 $(@T_A = +25^{\circ}C, \text{ unless otherwise specified.})$

Characteristic		Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	30	V	
Gate-Source Voltage	V _{GSS}	±20	V	
Continuous Drain Current (Note 6) V _{GS} = 10V	I _D	7.7 6.2	А	
Maximum Continuous Body Diode Forward Curren	t (Note 6)	Is	2	Α
Pulsed Drain Current (380µs Pulse, Duty Cycle = 1	l%)	I _{DM}	50	А

Thermal Characteristics

Characteristic	Symbol	Value	Unit	
Total Power Dissipation (Note 5)		P_{D}	0.7	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	170	°C/W
Total Power Dissipation (Note 6)		P _D	1.8	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	70	°C/W
Operating and Storage Temperature Range		$T_{J_{I}}T_{STG}$	-55 to +150	°C

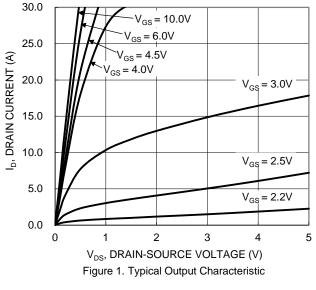
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

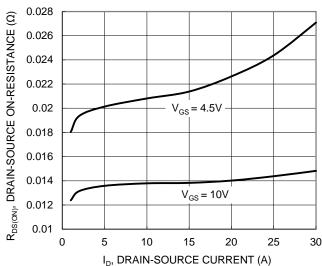
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						•
Drain-Source Breakdown Voltage	BV _{DSS}	30	_	_	V	$V_{GS} = 0V$, $I_D = 250\mu A$
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	_	_	1.0	μΑ	$V_{DS} = 24V, V_{GS} = 0V$
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	1.0	_	3.0	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$
Static Drain-Source On-Resistance				20	mΩ	$V_{GS} = 10V, I_D = 9.0A$
Static Dialit-Source Off-Resistance	R _{DS} (ON)	_		32	11122	$V_{GS} = 4.5V, I_D = 7.0A$
Diode Forward Voltage	V_{SD}	_	_	1.0	V	$V_{GS} = 0V, I_{S} = 2A$
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{ISS}	_	393	_	pF	15)()(
Output Capacitance	Coss	_	173	_	pF	$V_{DS} = 15V, V_{GS} = 0V,$ - f = 1.0MHz
Reverse Transfer Capacitance	C_{RSS}	_	27	_	pF	1 = 1.000112
Gate Resistance	R_{G}	_	1.1	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$
Total Gate Charge (V _{GS} = 10V)	Q_G	_	7.0	_	nC	
Total Gate Charge (V _{GS} = 4.5V)	Q_G	_	3.6	_	nC	7, 45,4 04
Gate-Source Charge	Q_GS	_	0.9	_	nC	$V_{DD} = 15V, I_{D} = 9A$
Gate-Drain Charge	Q_GD	_	1.5	_	nC	1
Turn-On Delay Time	t _{D(ON)}	_	1.8	_	ns	
Turn-On Rise Time	t _R	_	1.9	_	ns	$V_{DD} = 15V, V_{GS} = 10V,$
Turn-Off Delay Time	t _{D(OFF)}	_	7.5	_	ns	$R_G = 6\Omega$, $I_D = 9A$
Turn-Off Fall Time	t _F	_	2.4	_	ns	7
Reverse Recovery Time	t _{RR}	_	10	_	ns	
Reverse Recovery Charge	Q _{RR}	_	2.6	_	nC	$I_F = 9A$, di/dt = 100A/ μ s

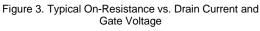
Notes:

- 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 1-inch square copper plate.
- 7. I_{AS} and E_{AS} 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.









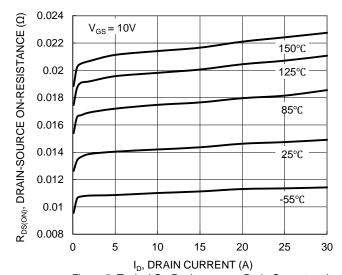
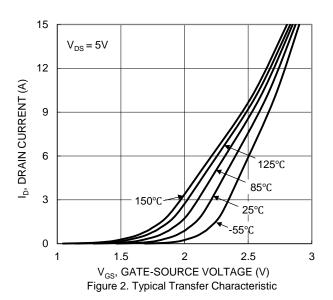
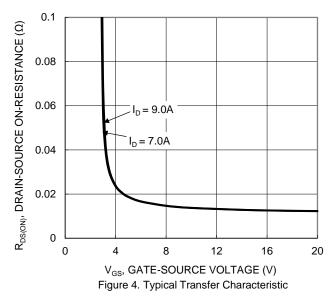


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature





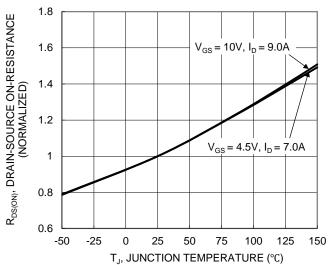


Figure 6. On-Resistance Variation with Junction Temperature



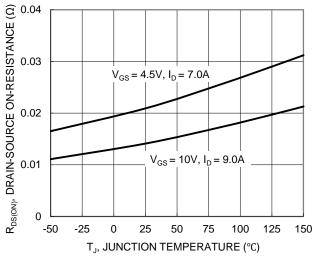


Figure 7. On-Resistance Variation with Junction Temperature

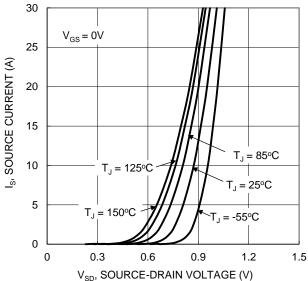


Figure 9. Diode Forward Voltage vs. Current

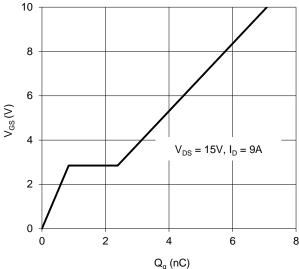


Figure 11. Gate Charge

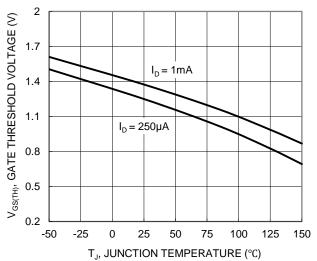
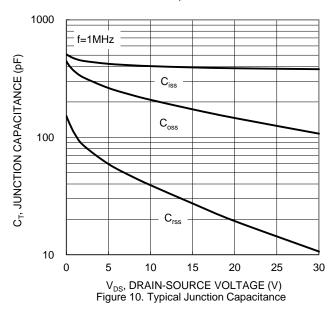


Figure 8. Gate Threshold Variation vs. Junction Temperature



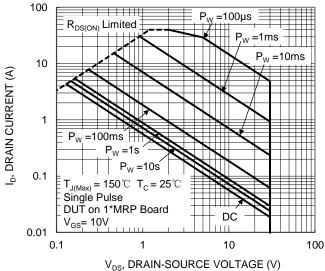


Figure 12. SOA, Safe Operation Area



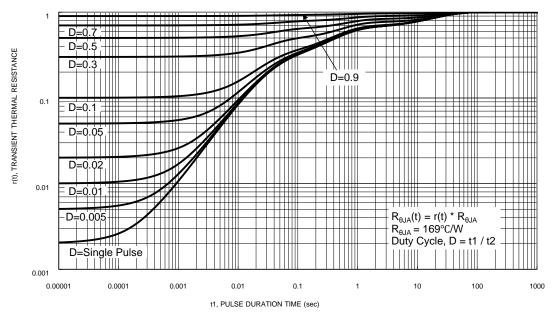


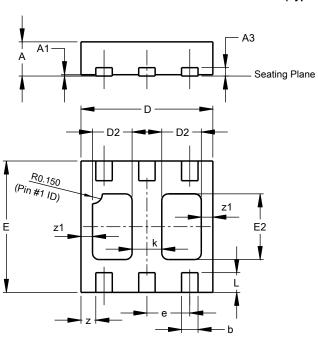
Figure 13. Transient Thermal Resistance



Package Outline Dimensions

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

U-DFN2020-6 (Type B)

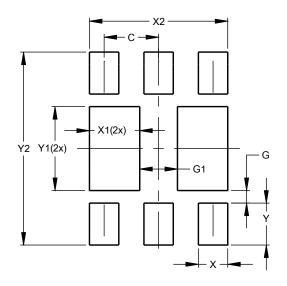


U-DFN2020-6									
	Type B								
Dim	Min	Max	Тур						
Α	0.545	0.605	0.575						
A1	0.00	0.05	0.02						
A3	-	-	0.13						
b	0.20	0.30	0.25						
D	1.95	2.075	2.00						
D2	0.50	0.70	0.60						
е	-	-	0.65						
Е	1.95	2.075	2.00						
E2	0.90	1.10	1.00						
k	-	-	0.45						
L	0.25	0.35	0.30						
Z	-	-	0.225						
z1	-	-	0.175						
All Dimensions in mm									

Suggested Pad Layout

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

U-DFN2020-6 (Type B)



Dimensions	Value
פווטופוושוווע	(in mm)
C	0.650
G	0.150
G1	0.450
Х	0.350
X1	0.600
X2	1.650
Y	0.500
Y1	1.000
Y2	2.300



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