

250V P-CHANNEL ENHANCEMENT MODE MOSFET
Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max $T_A = +25^\circ\text{C}$
-250V	14Ω @ $V_{GS} = -10\text{V}$	-0.26A
	18Ω @ $V_{GS} = -3.5\text{V}$	-0.23A

Description

This new generation 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.

Applications

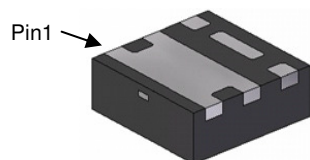
- General Purpose Interfacing Switch
- Load Switching
- Battery Management Application
- Power Management Functions

Features

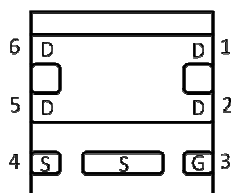
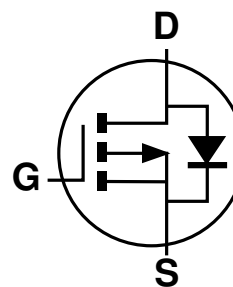
- 0.6mm Profile – Ideal for Low-Profile Applications
- PCB Footprint of 4mm²
- Low Gate Threshold Voltage
- Low On-Resistance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: U-DFN2020-6
- 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: 0.0065 grams (Approximate)

U-DFN2020-6


Bottom View

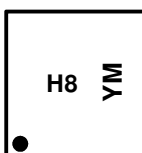

 Pin Out
Bottom View


Equivalent Circuit

Ordering Information (Note 4)

Part Number	Marking	Reel Size (inches)	Quantity per Reel
DMP25H18DLFDE-7	H8	7	3,000
DMP25H18DLFDE-13	H8	13	10,000

- 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
U-DFN2020-6


H8 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: B = 2014)
 M = Month (ex: 9 = September)

Date Code Key

Date Code Key

Year	2014	2015	2016	2017	2018	2019	2020	2021
Code	B	C	D	E	F	G	H	I

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V _{DSS}	-250	V
Gate-Source Voltage			V _{GSS}	±40	V
Continuous Drain Current (Note 6) V _{GS} = 10V	Steady State	T _A = +25°C T _A = +70°C	I _D	-0.26 -0.21	A
Pulsed Drain Current (10μs pulse, duty cycle ≤ 1%)			I _{DM}	-0.8	A
Maximum Body Diode Continuous Current (Note 6)			I _S	1.2	A

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation	(Note 5)	P _D	0.6	W
	(Note 6)		1.4	
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	191	°C/W
	(Note 6)		86	
Thermal Resistance, Junction to Case	(Note 6)	R _{θJC}	17	
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}	-250	—	—	V	V _{GS} = 0V, I _D = -1mA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	—	—	-1	μA	V _{DS} = -250V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±40V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(th)}	-0.5	-1.7	-2.5	V	V _{DS} = V _{GS} , I _D = -1mA
Static Drain-Source On-Resistance	R _{DS(on)}	—	10	14	Ω	V _{GS} = -10V, I _D = -200mA
			13	18		V _{GS} = -3.5V, I _D = -100mA
Diode Forward Voltage	V _{SD}	—	-0.8	-1.2	V	V _{GS} = 0V, I _S = -200mA
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	81	—	pF	V _{DS} = -25V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	14	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	4	—	pF	
Gate Resistance	R _g	—	13	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = -10V)	Q _g	—	2.8	—	nC	V _{DS} = -25V, I _D = -200mA
Gate-Source Charge	Q _{gs}	—	0.3	—	nC	
Gate-Drain Charge	Q _{gd}	—	0.6	—	nC	
Turn-On Delay Time	t _{D(on)}	—	7.5	—	ns	V _{DS} = -30V, I _D = -200mA V _{GS} = -10V, R _G = 50Ω
Turn-On Rise Time	t _r	—	25	—	ns	
Turn-Off Delay Time	t _{D(off)}	—	124	—	ns	
Turn-Off Fall Time	t _f	—	95	—	ns	I _F = -1.0A, di/dt = 100A/μs
Reverse Recovery Time	t _{rr}	—	85	—	ns	
Reverse Recovery Charge	Q _{rr}	—	294	—	uC	

- Notes:
5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate.
 7. Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to production testing.

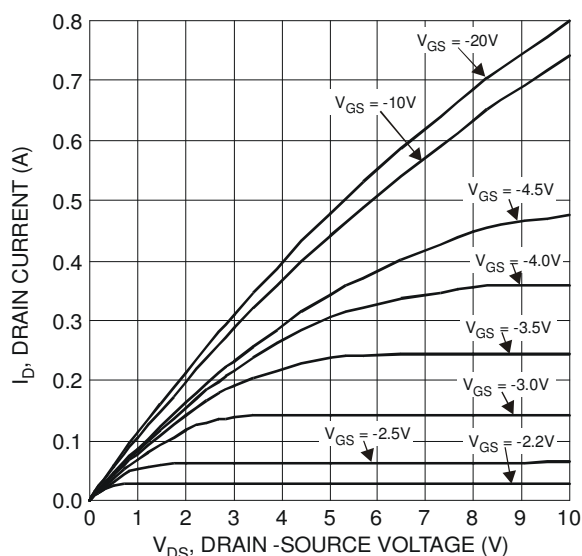


Figure 1 Typical Output Characteristics

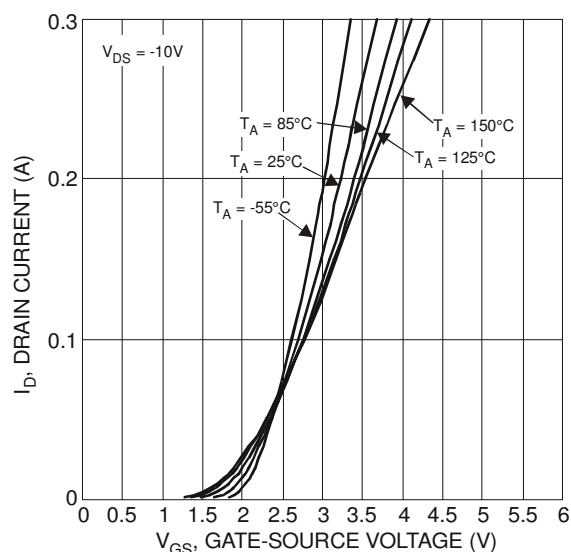


Figure 2 Typical Transfer Characteristics

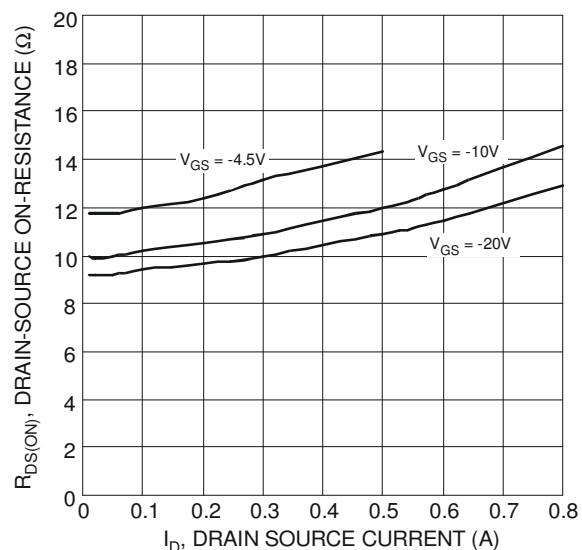


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

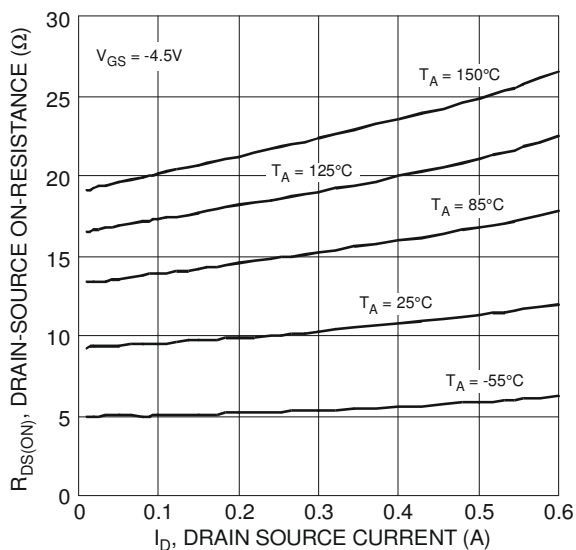


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

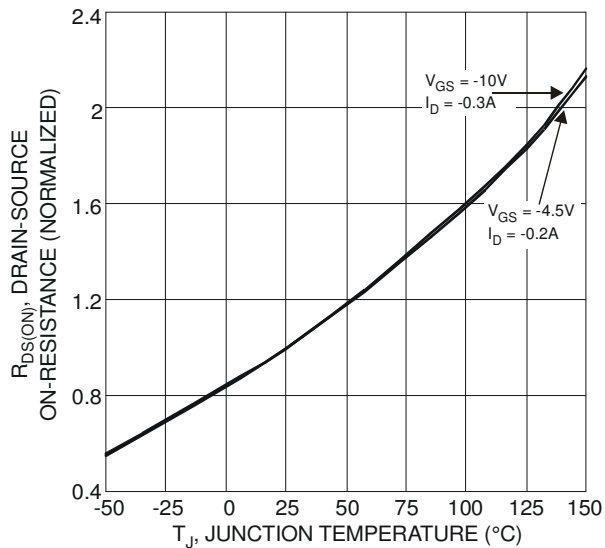


Figure 5 On-Resistance Variation with Temperature

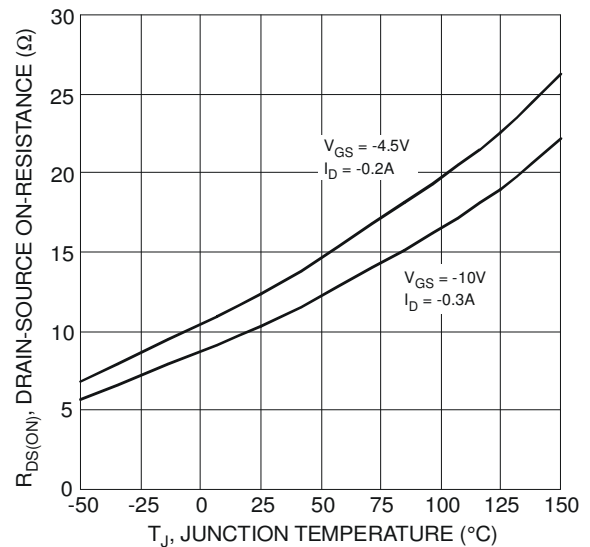


Figure 6 On-Resistance Variation with Temperature

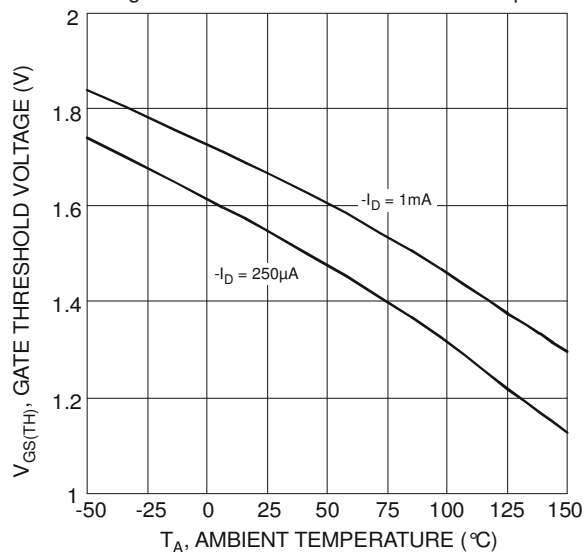


Figure 7 Gate Threshold Variation vs. Ambient Temperature

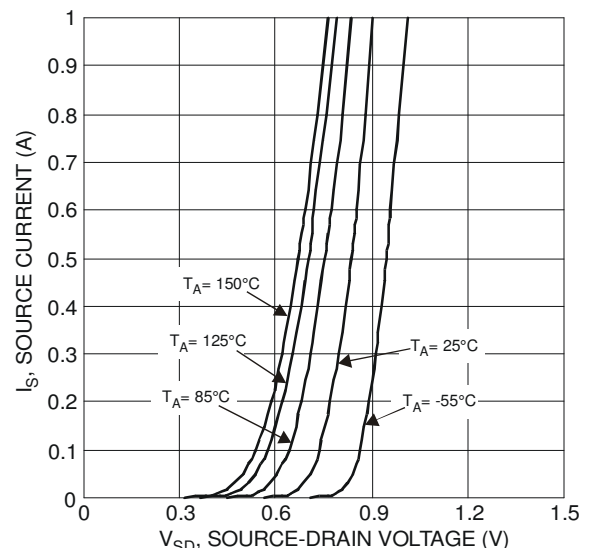


Figure 8 Diode Forward Voltage vs. Current

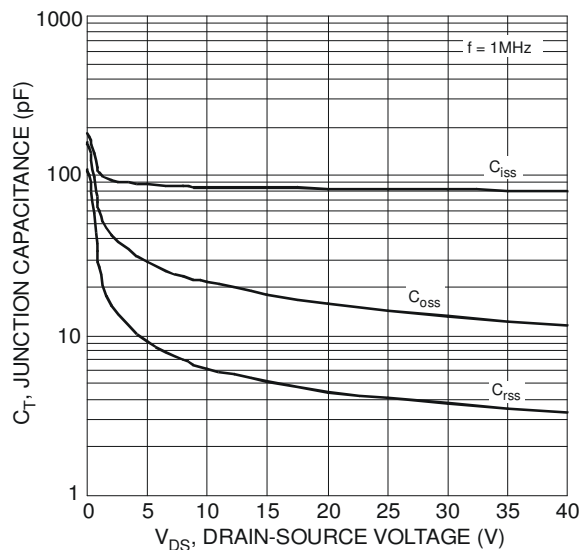


Figure 9 Typical Junction Capacitance

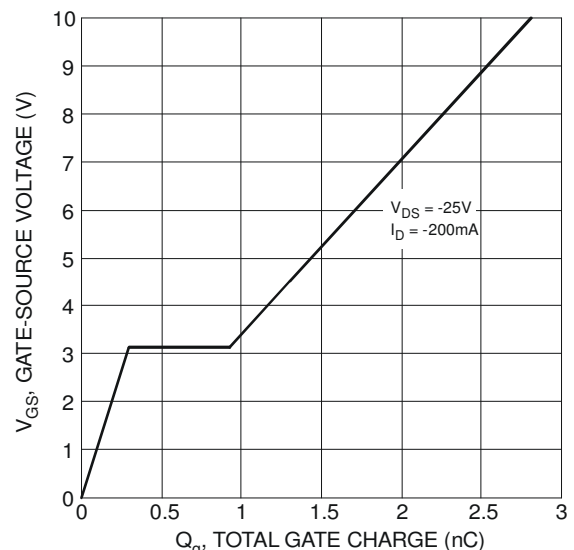
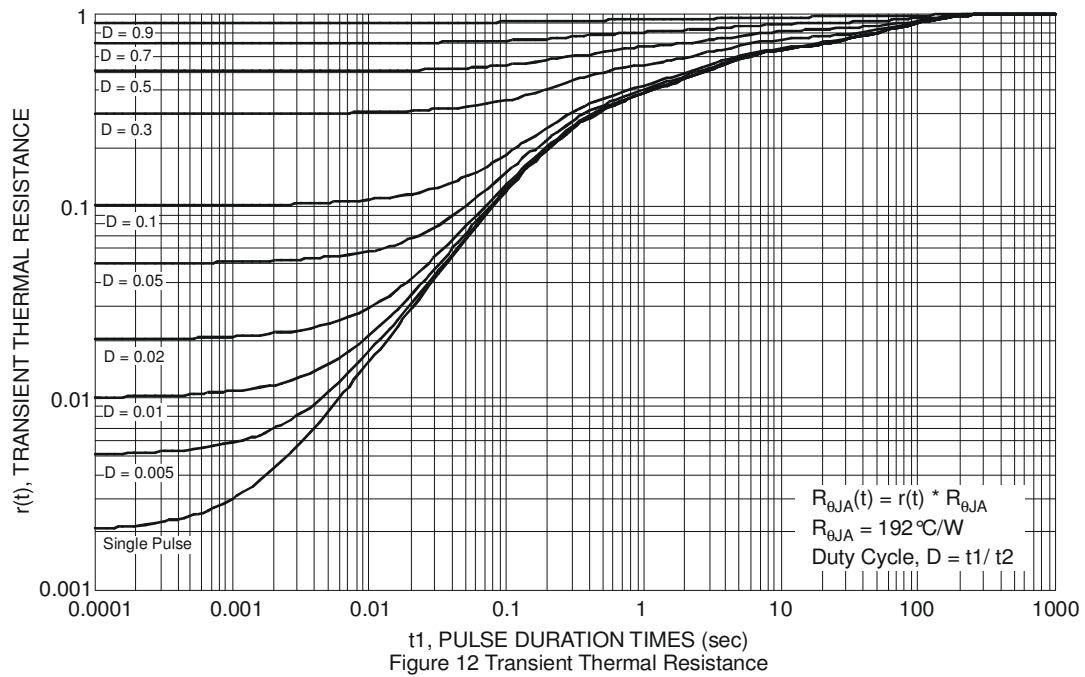
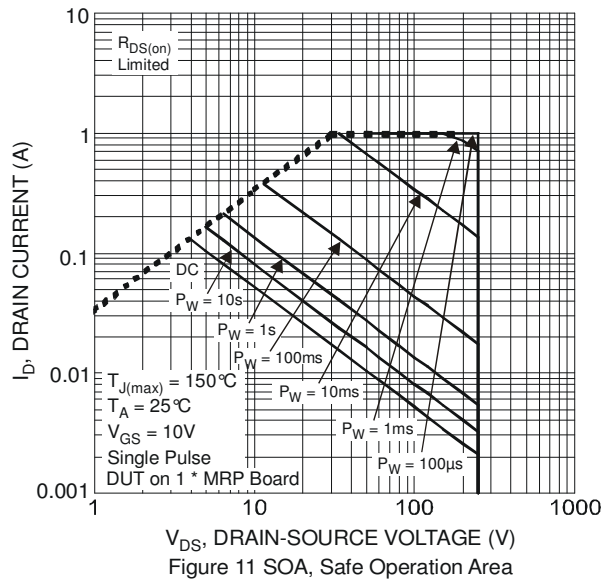
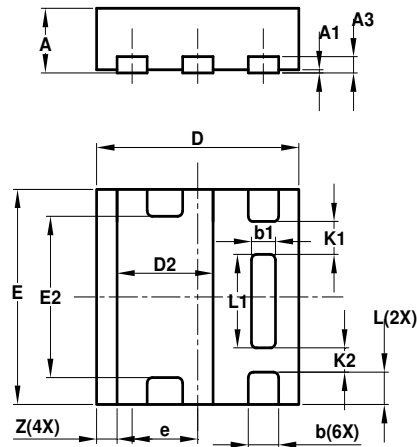


Figure 10 Gate-Charge Characteristics



Package Outline Dimensions

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

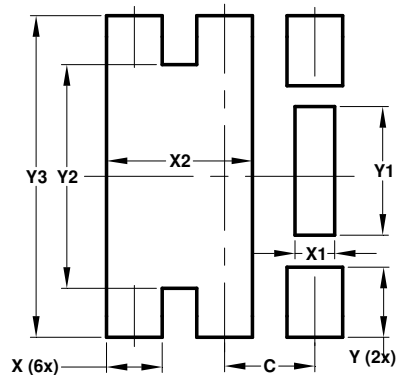


U-DFN2020-6 Type E			
Dim	Min	Max	Typ
A	0.57	0.63	0.60
A1	0	0.05	0.03
A3	—	—	0.15
b	0.25	0.35	0.30
b1	0.185	0.285	0.235
D	1.95	2.05	2.00
D2	0.85	1.05	0.95
E	1.95	2.05	2.00
E2	1.40	1.60	1.50
e	—	—	0.65
L	0.25	0.35	0.30
L1	0.82	0.92	0.87
K1	—	—	0.305
K2	—	—	0.225
Z	—	—	0.20
All Dimensions in mm			

Suggested Pad Layout

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

U-DFN2020-6 Type E



Dimensions	Value (in mm)
C	0.650
X	0.400
X1	0.285
X2	1.050
Y	0.500
Y1	0.920
Y2	1.600
Y3	2.300

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