

Dual P-CHANNEL ENHANCEMENT MODE MOSFET
Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ max	I_D max
-20V	200m Ω @ $V_{GS} = -4.5V$	-1.7 A
	290m Ω @ $V_{GS} = -2.5V$	-1.3 A
	390m Ω @ $V_{GS} = -1.8V$	-1.1 A
	650m Ω @ $V_{GS} = -1.5V$	-0.5 A

Description

This device provides a high performance, low $R_{DS(ON)}$ P-Channel MOSFET in the thermally and spatially efficient DFN1616-6 package. The low $R_{DS(ON)}$ of this MOSFET ensures conduction losses are kept making it ideal for use in the following applications:

Applications

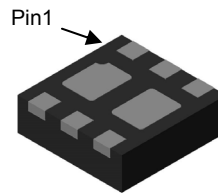
- Battery disconnect switch
- Load switch for power management functions

Features

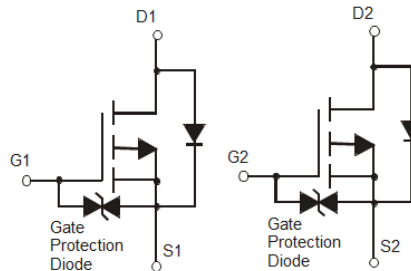
- Typical off board profile of 0.5mm - ideally suited for thin applications
- Low $R_{DS(ON)}$ – minimizes conduction losses
- PCB footprint of 2.56mm²
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- Qualified to AEC-Q101 standards for High Reliability**
- ESD Protected Gate**

Mechanical Data

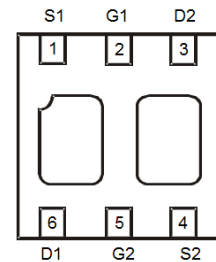
- Case: U-DFN1616-6 Type F
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Lead Free Plating (NiPdAu Finish over Copper leadframe).
- Terminals: Solderable per MIL-STD-202, Method 208 ⁽⁴⁾
- Weight: 0.04 grams (approximate)



Bottom View



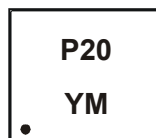
Device Symbol


 Pin Configuration
Bottom View

Ordering Information (Note 4)

Product	Reel size (inches)	Tape width (mm)	Quantity per reel
DMP2200UFCL-7	7	8	3,000

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 - 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.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information


P20 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: B= 2014)
 M = Month (ex: 9 = September)

Date Code Key

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

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}	-20	V
Gate-Source Voltage	V _{GSS}	±8	V
Continuous Drain Current (Note 6)	I _D	-1.7 -1.2	A
		@T _A = +25°C @T _A = +85°C	

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

Characteristic	Symbol	Value	Units
Total Power Dissipation	P _D	0.66 1.58	W
		(Note 5) (Note 6)	
Thermal Resistance, Junction to Ambient	R _{θJA}	193 80	°C/W
		(Note 5) (Note 6)	
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}	-20	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	μA	V _{DS} = -20V, V _{GS} = 0V
Gate-Body Leakage	I _{GSS}	—	—	±10	μA	V _{GS} = ±8V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(th)}	-0.4	—	-1.2	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS (ON)}	—	153 220 260 360	200 290 390 650	mΩ	V _{GS} = -4.5V, I _D = -2.0A V _{GS} = -2.5V, I _D = -1.2A V _{GS} = -1.8V, I _D = -0.24A V _{GS} = -1.5V, I _D = -0.18A
Diode Forward Voltage (Note 7)	V _{SD}	—	—	-1.2	V	V _{GS} = 0V, I _S = -0.6A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	184	—	pF	V _{DS} = -10V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	25.8	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	18.6	—	pF	
Total Gate Charge	Q _g	—	2.2	—	nC	V _{GS} = -4.5V, V _{DS} = -10V, I _D = -1.7A
Gate-Source Charge	Q _{gs}	—	0.4	—	nC	
Gate-Drain Charge	Q _{gd}	—	0.5	—	nC	
SWITCHING CHARACTERISTICS (Note 8)						
Turn-On Delay Time	t _{D(ON)}	—	9.8	—	ns	V _{DD} = -10V, I _D = -1.5A, V _{GS} = -4.5V, R _{GEN} = 1Ω
Turn-Off Delay Time	t _{D(OFF)}	—	23	—	ns	
Turn-On Rise Time	t _r	—	87	—	ns	
Turn-Off Fall Time	t _f	—	41	—	ns	

- 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. Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to product testing.

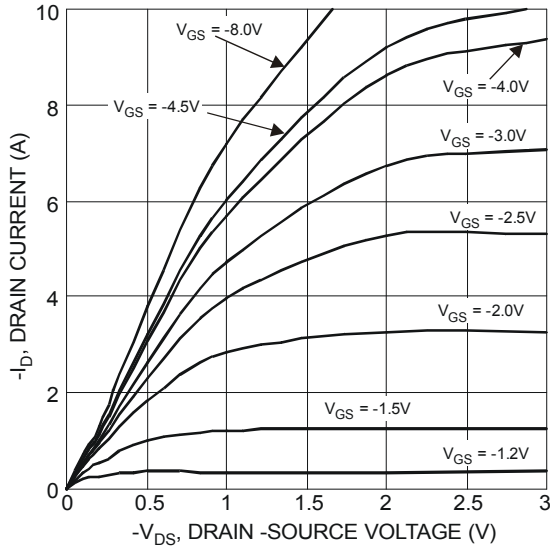


Figure 1 Typical Output Characteristics

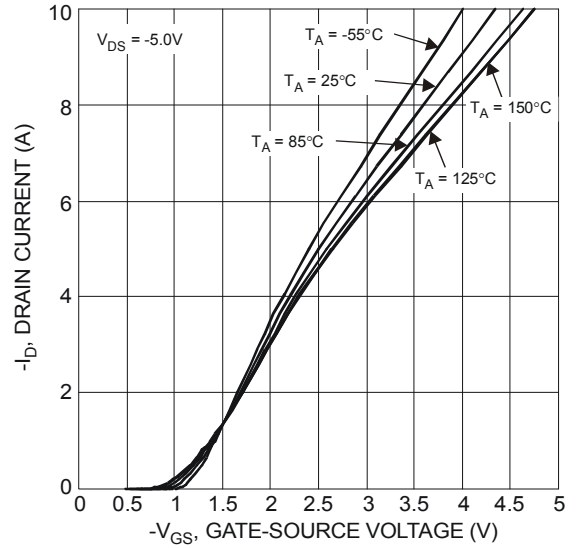


Figure 2 Typical Transfer Characteristics

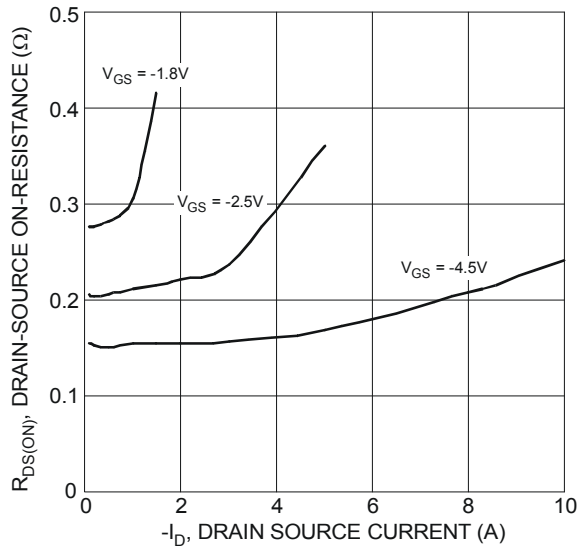


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

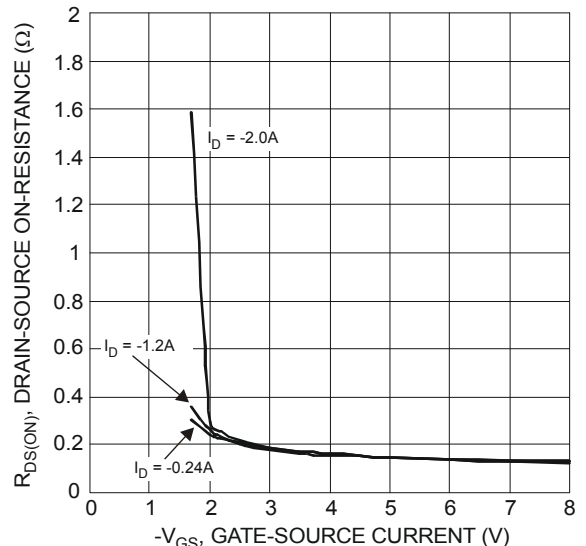


Figure 4 Typical Transfer Characteristics

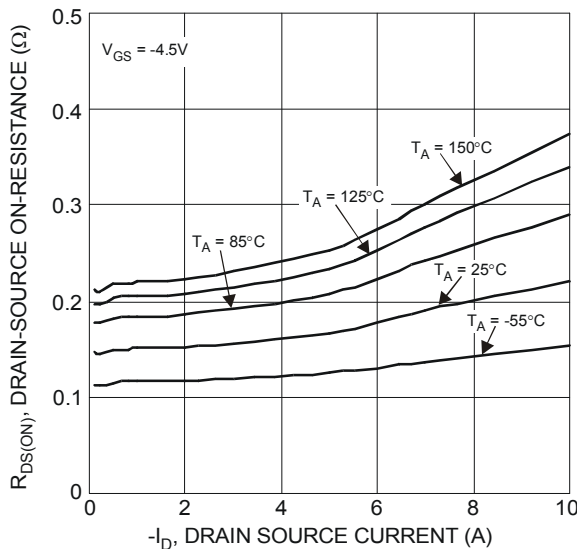


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

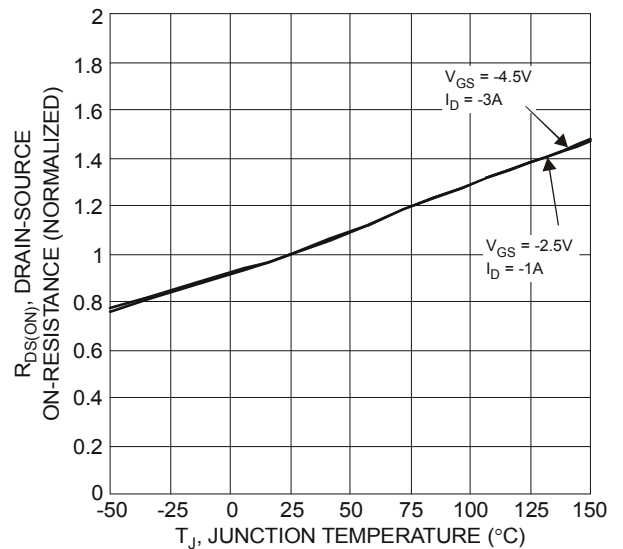
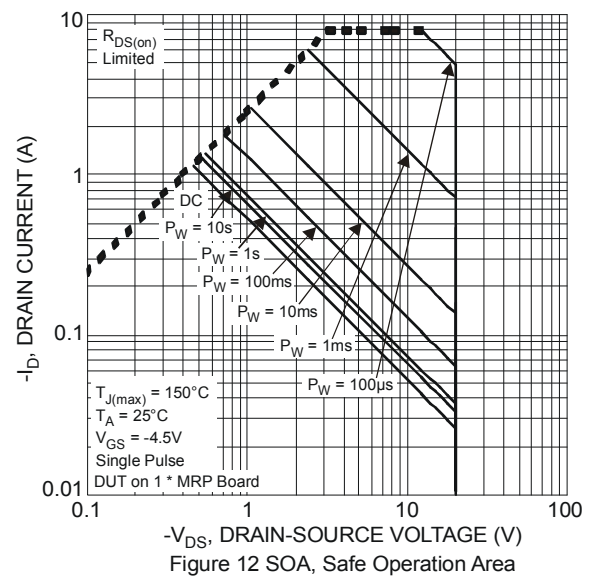
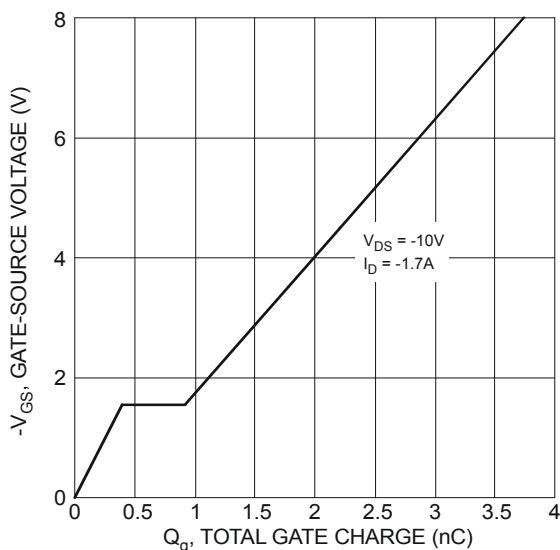
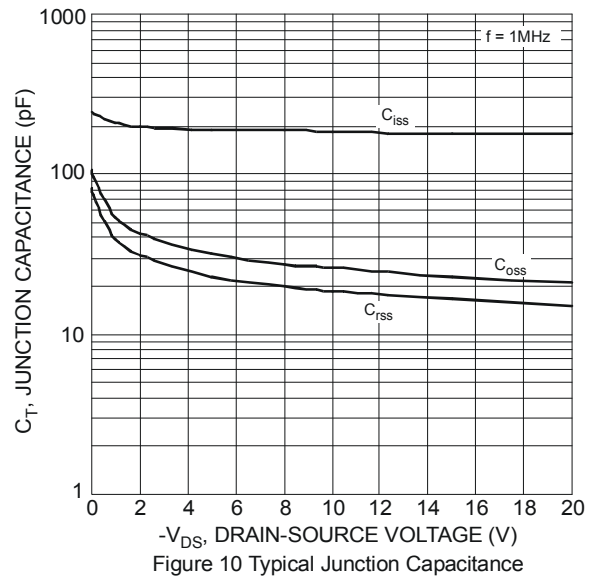
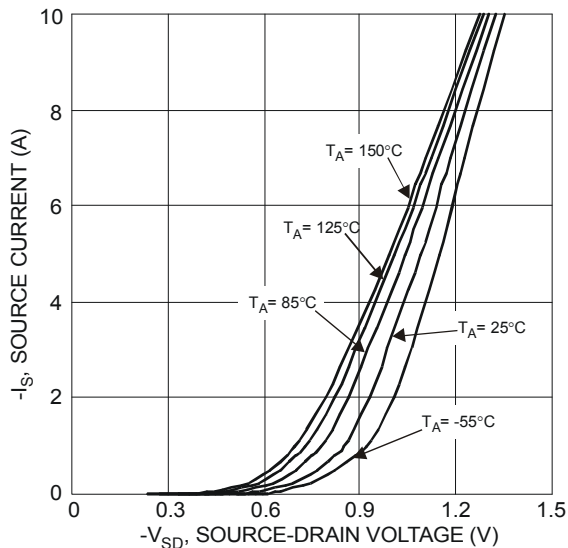
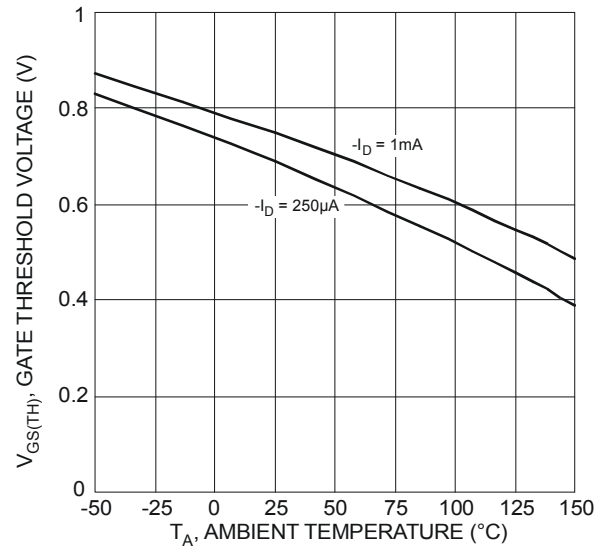
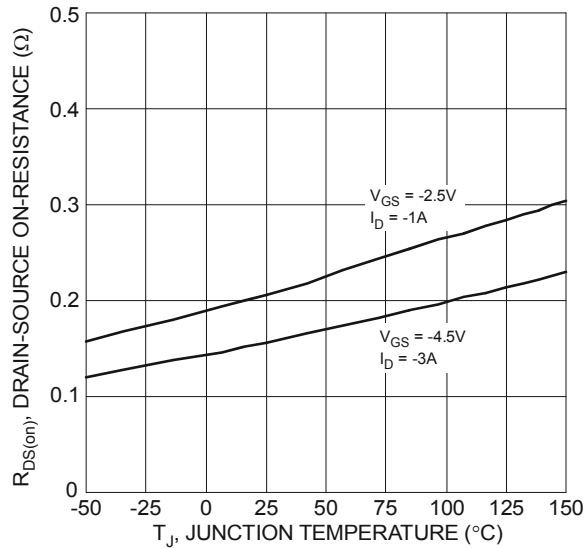
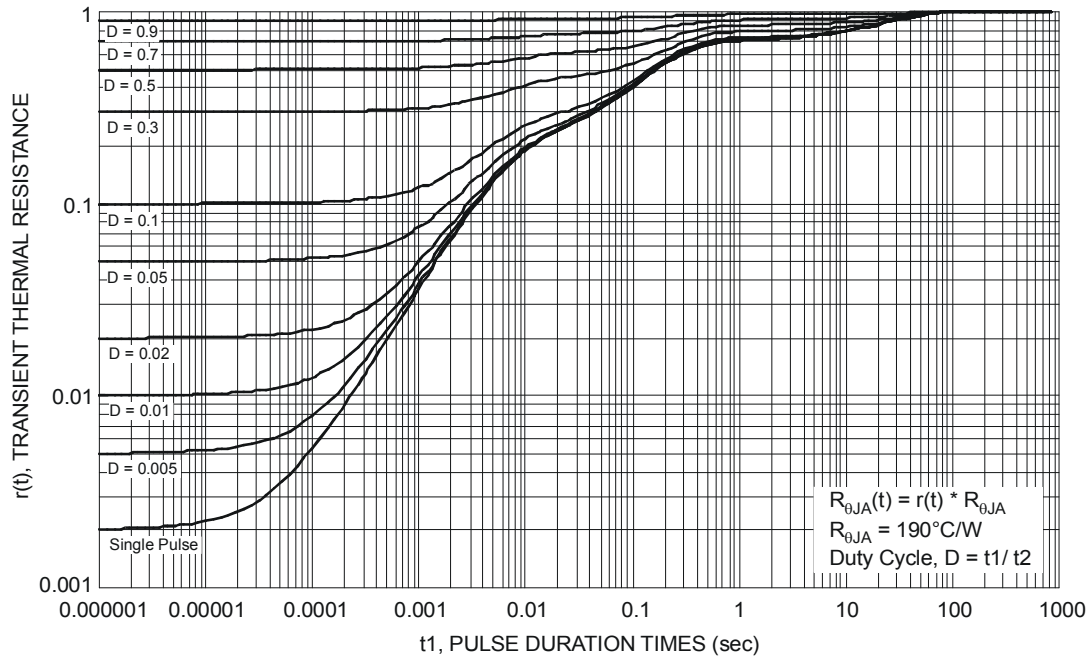


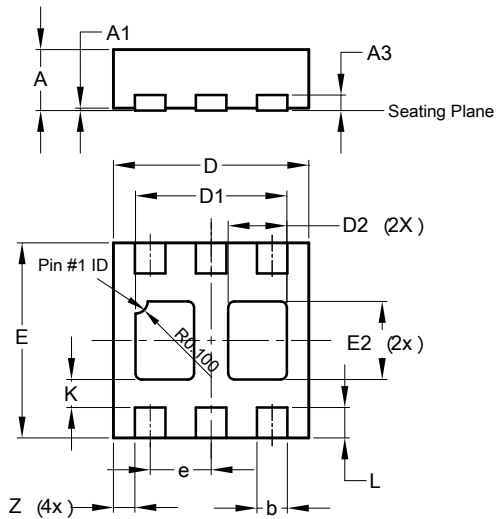
Figure 6 On-Resistance Variation with Temperature





Package Outline Dimensions

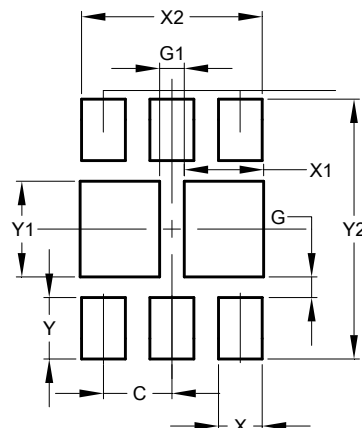
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



U-DFN1616-6 Type F			
Dim	Min	Max	Typ
A	0.45	0.55	0.50
A1	0	0.05	0.02
A3	—	—	0.127
b	0.20	0.30	0.25
D	1.55	1.65	1.60
D1	1.14	1.34	1.24
D2	0.38	0.58	0.48
E	1.55	1.65	1.60
E2	0.54	0.74	0.64
e	—	—	0.50
K	—	—	0.23
L	0.15	0.35	0.25
Z	—	—	0.175
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for latest version.



Dimensions	Value (in mm)
C	0.500
G	0.150
G1	0.180
X	0.320
X1	0.580
X2	1.320
Y	0.450
Y1	0.700
Y2	1.900

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