

Summary

V_{DSS}	R_{DSON} max	I_D max T_A = +25°C
-20V	24mΩ @V _{GS} = -4.5V	-6.6 A
	31mΩ @V _{GS} = -2.5V	-5.8 A

Applications

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

- Power Management Functions
- Analog Switches

Features and Benefits

- Typical Off Board Profile of 0.575mm - Ideally Suited for Thin Applications
- Low R_{DSON} - Minimizes Conduction Losses
- PCB Footprint of 2.56mm²
- ESD Protected Gate 2kV
- **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

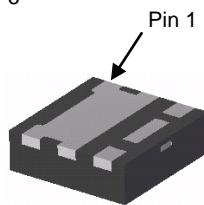
- Case: U-DFN1616-6
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Lead Free Plating (NiPdAu Finish over Copper Leadframe).
- Terminals: Solderable per MIL-STD-202, Method 208 ^④
- Weight: 0.04 grams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



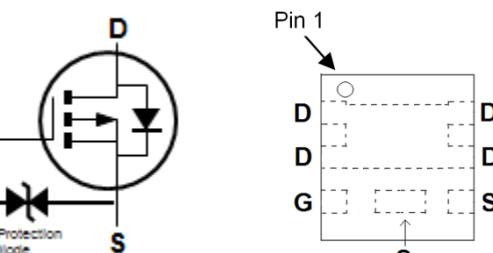
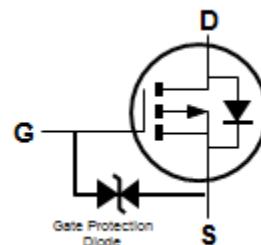
U-DFN1616-6



Top View



Bottom View



Top View Pin-Out

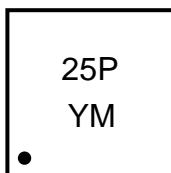
Ordering Information (Note 4)

Product	Case	Packaging
DMP2035UFCL-7	U-DFN1616-6	3,000/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>.

Marking Information



25P = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: C = 2015)
 M = Month (ex: 9 = September)

Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021					
Code	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 (@ $T_A = +25^\circ\text{C}$, 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)	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	-6.6 -5.3	A
Pulsed Drain Current (380 μs Pulse, 1% Duty Cycle)(Note 7)			I_{DM}	-40	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	-1.7	A

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	0.74	W
Thermal Resistance, Junction to Ambient @ $T_A = +25^\circ\text{C}$ (Note 5)	$R_{\theta JA}$	169	°C/W
Power Dissipation (Note 6)	P_D	1.6	W
Thermal Resistance, Junction to Ambient @ $T_A = +25^\circ\text{C}$ (Note 6)	$R_{\theta JA}$	79	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	-20	-	-	V	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$	I_{DSS}	-	-	-1.0	μA	$V_{DS} = -16\text{V}, V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current $T_J = +150^\circ\text{C}$ (Note 8)	I_{DSS}	-	-	-100	μA	$V_{DS} = -16\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	-	-	± 10	μA	$V_{GS} = \pm 8\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(TH)}$	-0.4	-	-1.0	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	19 24 31 31	24 31 45	$\text{m}\Omega$	$V_{GS} = -4.5\text{V}, I_D = -8.0\text{A}$ $V_{GS} = -2.5\text{V}, I_D = -7.0\text{A}$ $V_{GS} = -1.8\text{V}, I_D = -6.0\text{A}$
Diode Forward Voltage	V_{SD}	-0.5	-0.7	-1.2	V	$V_{GS} = 0\text{V}, I_S = -1\text{A}$
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	-	1,610	2,200	pF	$V_{DS} = -10\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	-	157	240	pF	
Reverse Transfer Capacitance	C_{rss}	-	145	220	pF	
Gate Resistance	R_g	-	9.45	14.5	Ω	
Total Gate Charge ($V_{GS} = -8\text{V}$)	Q_g	-	29	44	nC	$V_{DS} = -10\text{V},$ $I_D = -4\text{A}$
Total Gate Charge ($V_{GS} = -4.5\text{V}$)	Q_g	-	15.4	21	nC	
Gate-Source Charge	Q_{qs}	-	2.5	3.8	nC	
Gate-Drain Charge	Q_{qd}	-	3.3	5	nC	
Turn-On Delay Time	$t_{D(ON)}$	-	16.8	34	ns	$V_{DS} = -20\text{V}, V_{GS} = -10\text{V},$ $R_G = 6.0\Omega, I_D = -6\text{A}$
Turn-On Rise Time	t_R	-	12.4	25	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	-	94.1	188	ns	
Turn-Off Fall Time	t_F	-	42.4	85	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. Repetitive rating, pulse width limited by junction temperature.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.

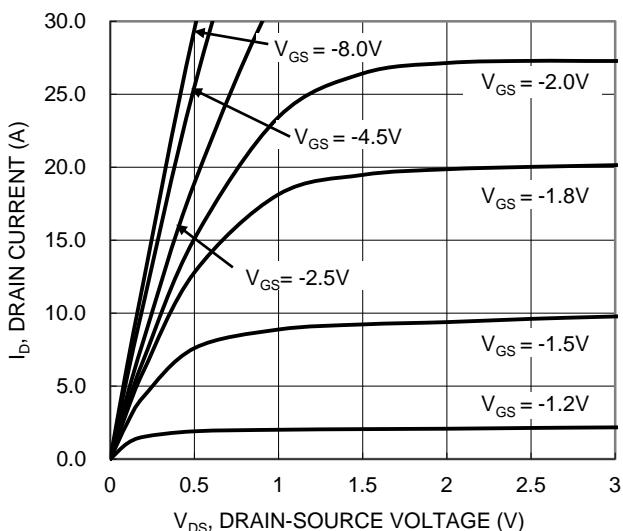


Figure 1. Typical Output Characteristic

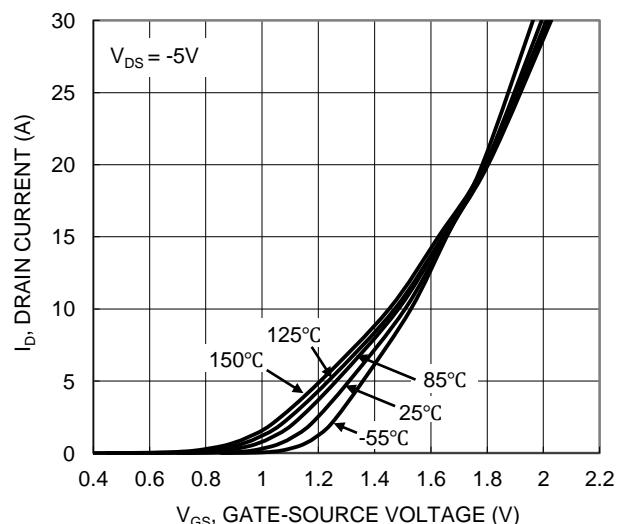


Figure 2. Typical Transfer Characteristic

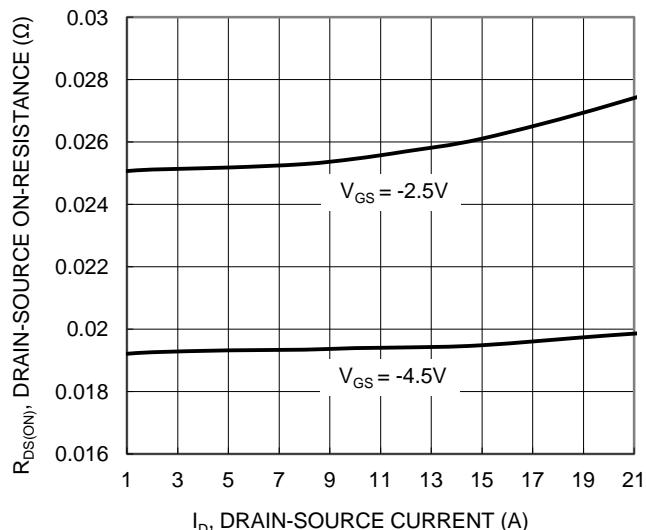


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

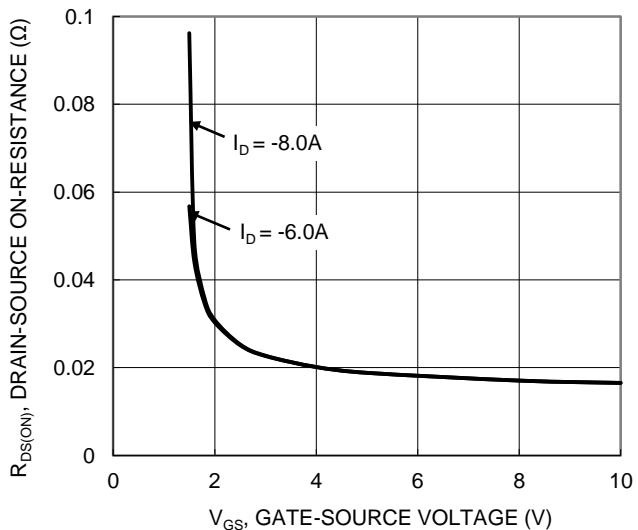


Figure 4. Typical Transfer Characteristic

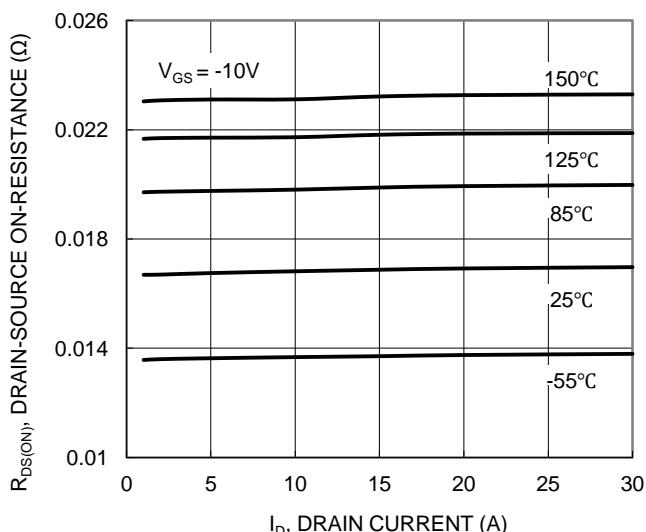


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

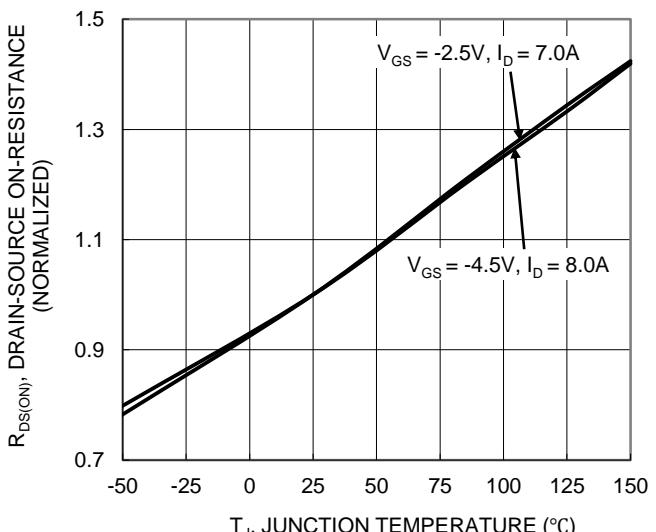
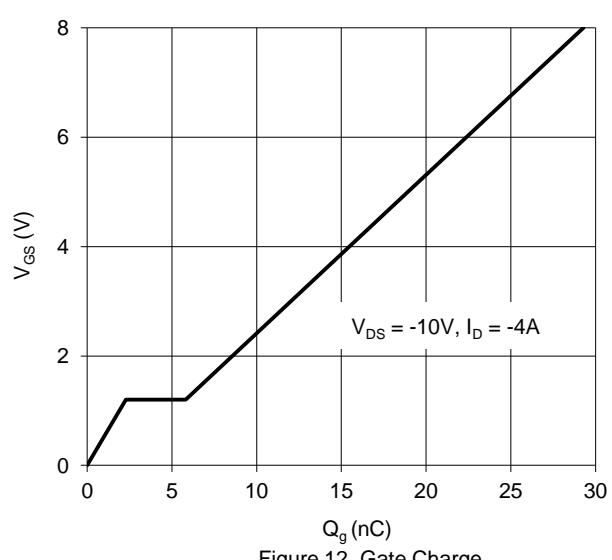
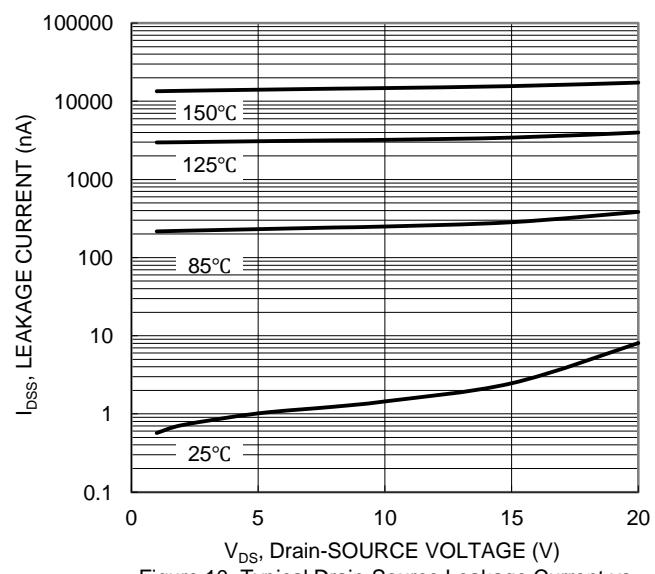
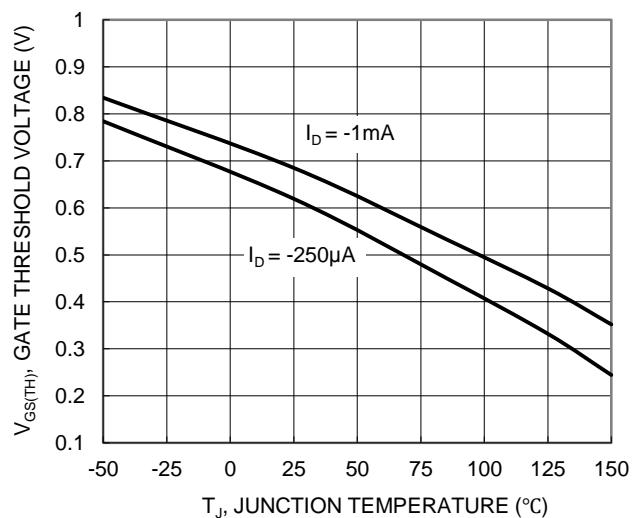
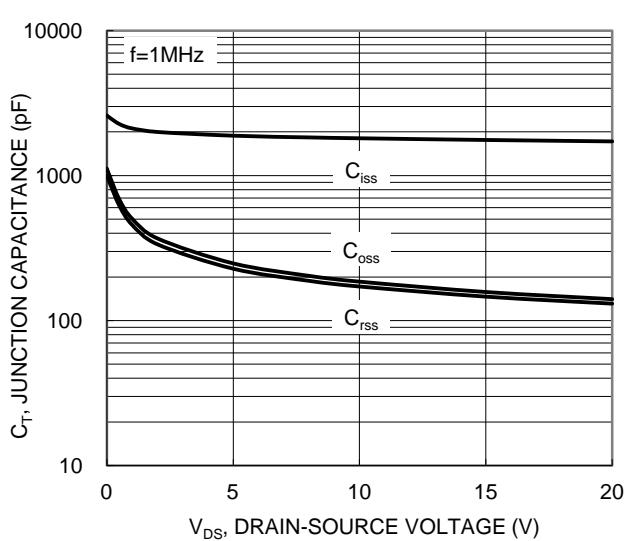
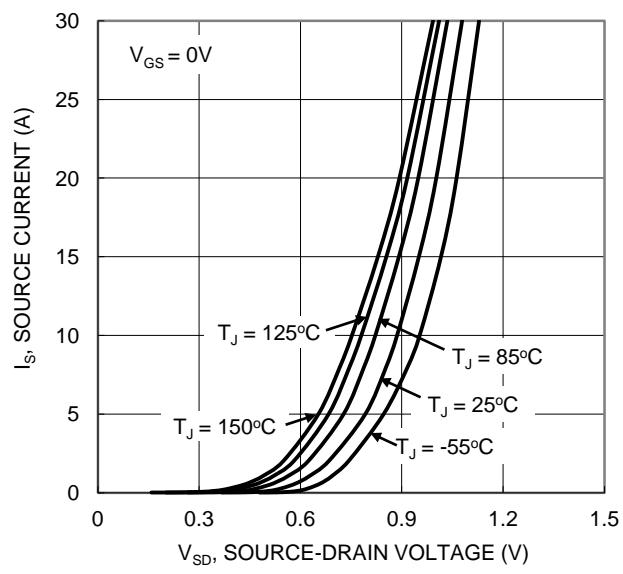
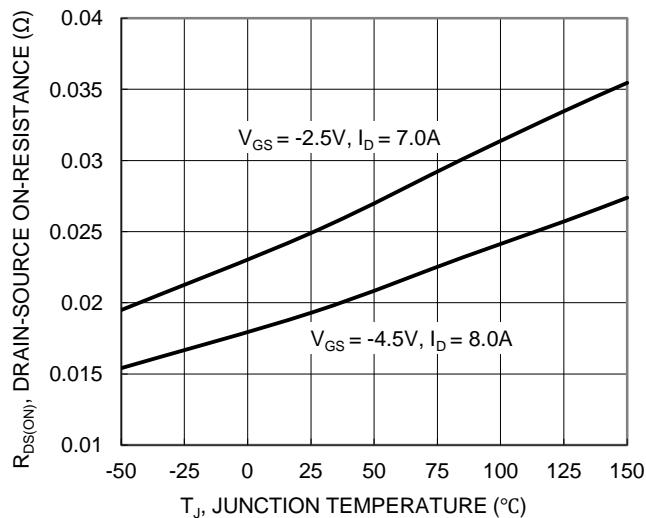
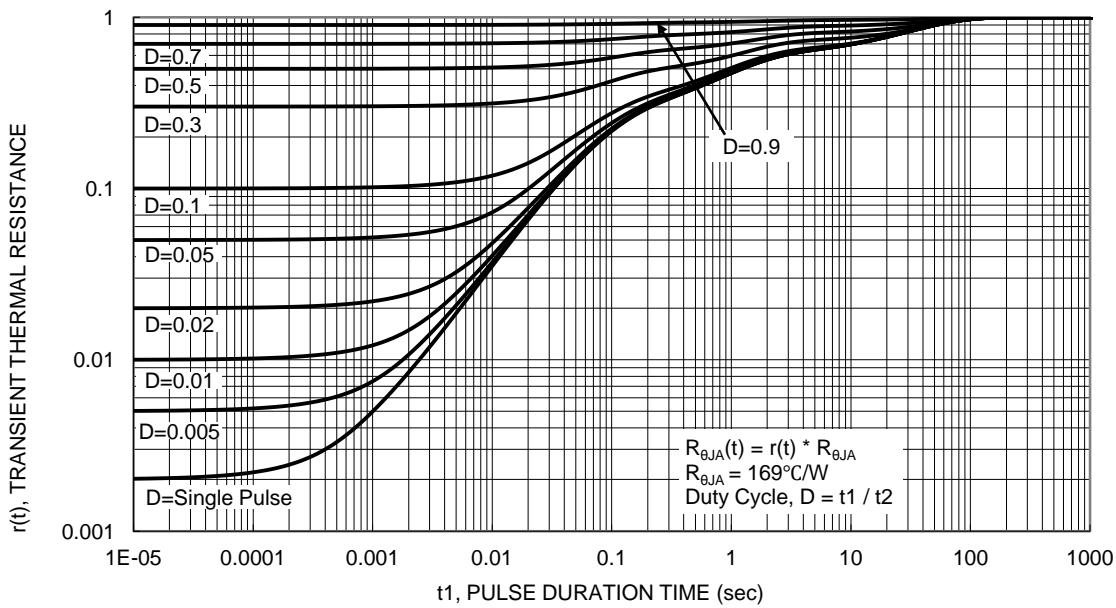
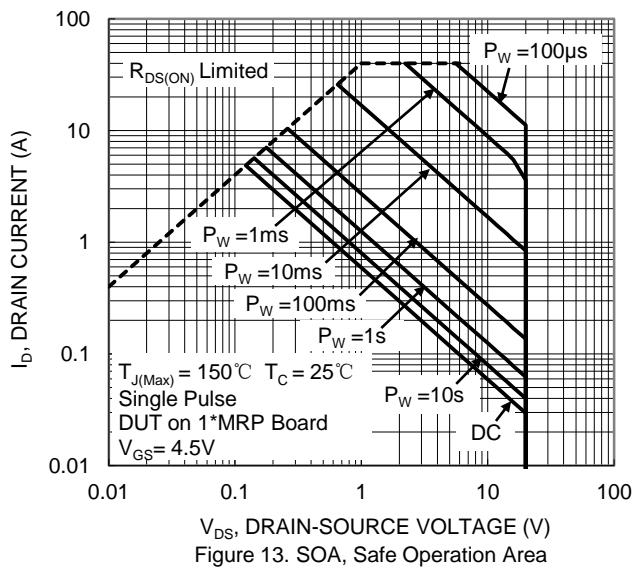


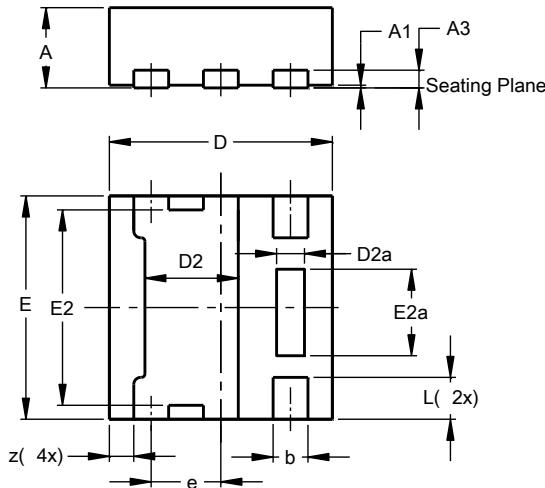
Figure 6. On-Resistance Variation with Junction Temperature





Package Outline Dimensions

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

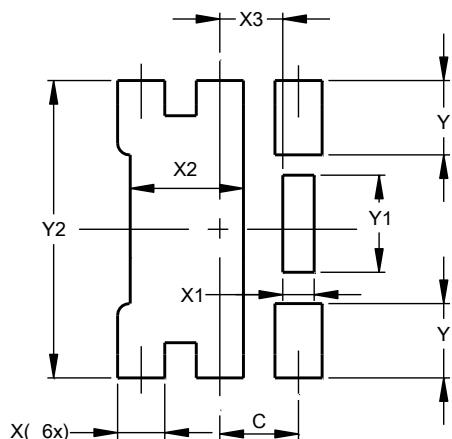


U-DFN1616-6 (Type K)			
Dim	Min	Max	Typ
A	0.55	0.60	0.575
A1	0.00	0.05	0.02
A3	--	--	0.13
b	0.20	0.30	0.25
D	1.55	1.65	1.60
D2	0.57	0.77	0.67
D2a	0.10	0.30	0.20
e	--	--	0.50
E	1.55	1.65	1.60
E2	1.30	1.50	1.40
E2a	0.52	0.72	0.62
L	0.25	0.35	0.30
z	--	--	0.175

All Dimensions in mm

Suggested Pad Layout

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



Dimensions	Value (in mm)
C	0.500
X	0.300
X1	0.200
X2	0.720
X3	0.400
Y	0.475
Y1	0.620
Y2	1.900

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