Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D T_A = +25°C
-20V	28mΩ @ V_{GS} = -4.5V	-8A
	43mΩ @ V_{GS} = -2.5V	-6.8A

Description and Applications

This 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.

- Load Switch

Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **ESD Protected Gate**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

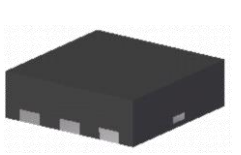
Mechanical Data

- 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
- Terminals: Finish NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.003 grams (Approximate)

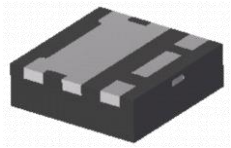


ESD PROTECTED

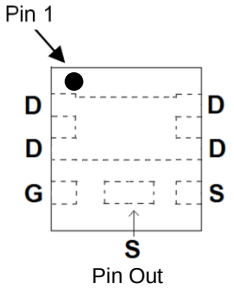
U-DFN1616-6 (Type K)



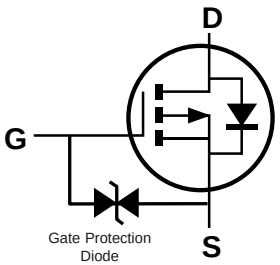
Top View



Bottom View



Pin Out
Top View



Internal Schematic

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP2037UFCL-7	U-DFN1616-6 (Type K)	3,000 / Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ 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 https://www.diodes.com/design/support/packaging/diodes-packaging/.

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Marking Information

U-DFN1616-6 (Type K)



OE = Product Type Marking Code
YWX = Date Code Marking
Y = Year (ex: 1 = 2021)
W = Week (ex: a = Week 27; z Represents Week 52 and 53)
X = Internal Code (ex: U = Monday)

Date Code Key

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	0	1	2	3	4	5	6	7	8	9	0	1

Week	1-26	27-52	53
Code	A-Z	a-z	z

Internal Code	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Code	T	U	V	W	X	Y	Z

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

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	-20	V
Gate-Source Voltage		V_{GSS}	±10	V
Continuous Drain Current (Note 7) V_{GS} = -4.5V	T_A = +25°C T_A = +70°C	I_D	-8 -6	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)		I_{DM}	-45	A
Maximum Continuous Body Diode Forward Current (Note 6)		I_S	-3.1	A
Avalanche Current, L = 0.1mH (Note 8)		I_{AS}	-8	A
Avalanche Energy, L = 0.1mH (Note 8)		E_{AS}	7	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)		P_D	1.1	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	114	°C/W
Total Power Dissipation (Note 6)		P_D	2.3	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	55	°C/W
Thermal Resistance, Junction to Case (Note 7)		$R_{\theta JC}$	8.7	
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 9)						
Drain-Source Breakdown Voltage	BV_{DSS}	-20	—	—	V	V_{GS} = 0V, I_D = -1mA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	µA	V_{DS} = -16V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±10	µA	V_{GS} = ±8V, V_{DS} = 0V
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	$V_{GS(TH)}$	-0.5	—	-1.5	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	17	28	mΩ	V_{GS} = -4.5V, I_D = -2A
		—	23	43		V_{GS} = -2.5V, I_D = -2A
Diode Forward Voltage	V_{SD}	—	-0.7	-1.1	V	V_{GS} = 0V, I_S = -1A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	806	—	pF	V_{DS} = -10V, V_{GS} = 0V f = 1MHz
Output Capacitance	C_{oss}	—	119	—		
Reverse Transfer Capacitance	C_{rss}	—	55	—		
Gate Resistance	R_G	—	81	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = -8V)	Q_g	—	16.5	—	nC	V_{DD} = -10V, I_D = -20A
Total Gate Charge (V_{GS} = -4.5V)	Q_g	—	8.5	—		
Gate-Source Charge	Q_{gs}	—	4.2	—		
Gate-Drain Charge	Q_{gd}	—	0.5	—		
Turn-On Delay Time	$t_{D(ON)}$	—	13	—	ns	V_{GS} = -4.5V, V_{DD} = -10V, R_G = 1Ω, R_G = 1Ω, I_D = -10A
Turn-On Rise Time	t_R	—	6	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	110	—		
Turn-Off Fall Time	t_F	—	38	—		

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 bias to bottom layer 1inch square copper plate.
7. Thermal resistance from junction to soldering point (on the exposed drain pad).
8. I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = 25°C.
9. Short duration pulse test used to minimize self-heating effect.
10. Guaranteed by design. Not subject to product testing.

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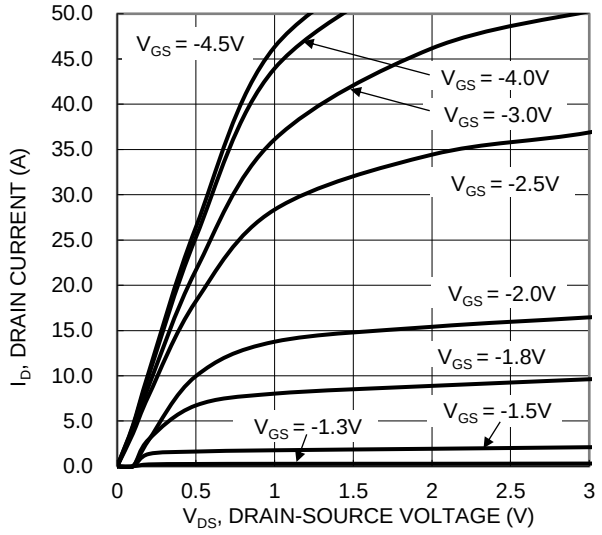


Figure 1. Typical Output Characteristic

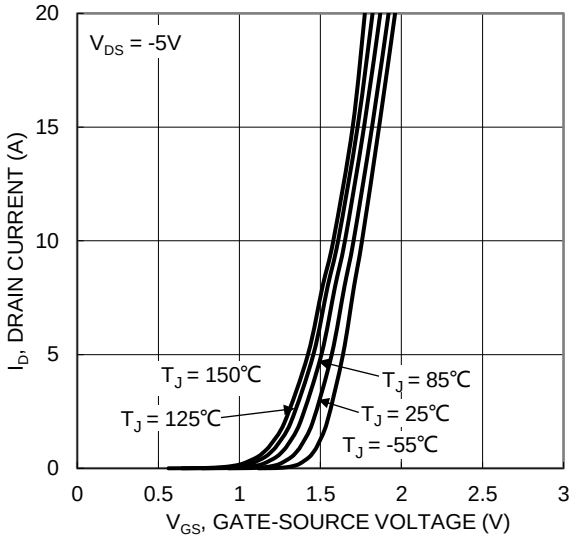


Figure 2. Typical Transfer Characteristic

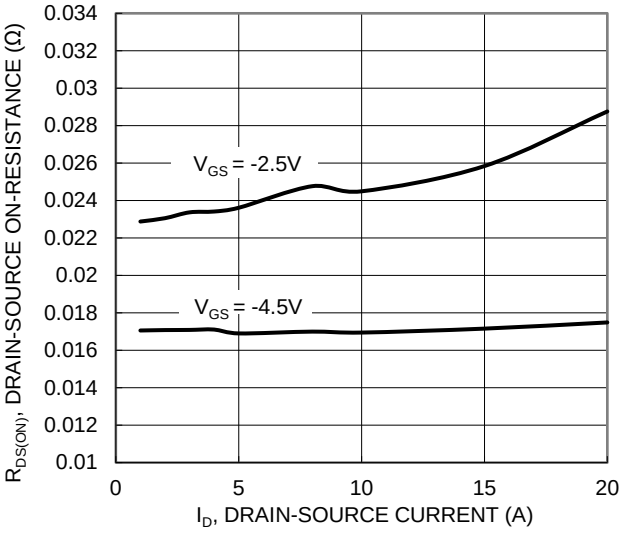


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

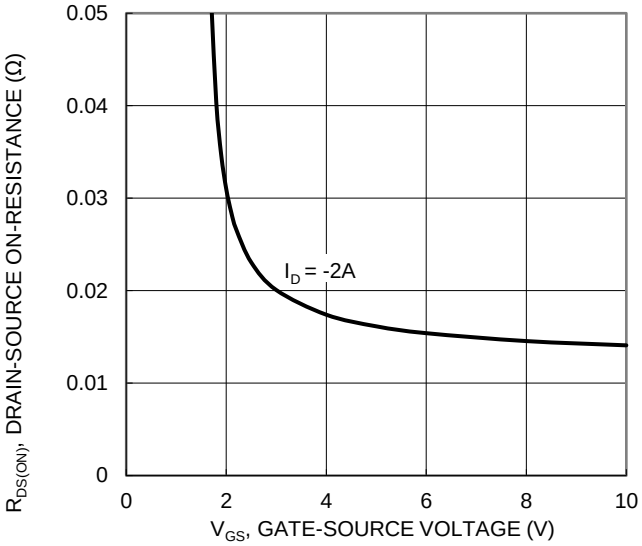


Figure 4. Typical Transfer Characteristic

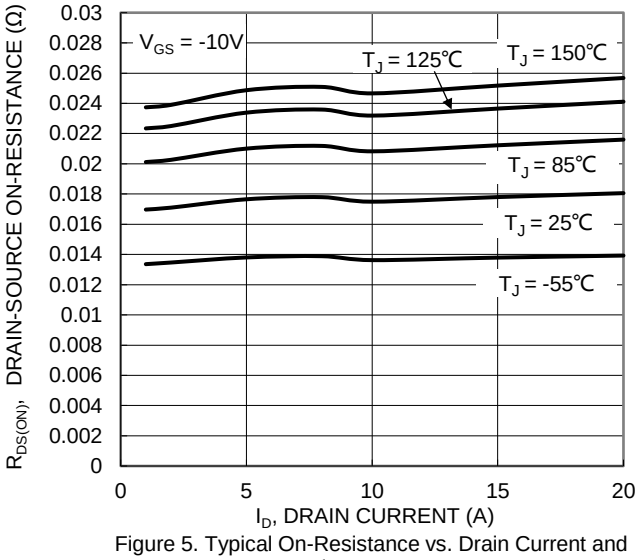


Figure 5. Typical On-Resistance vs. Drain Current and JunctionTemperature

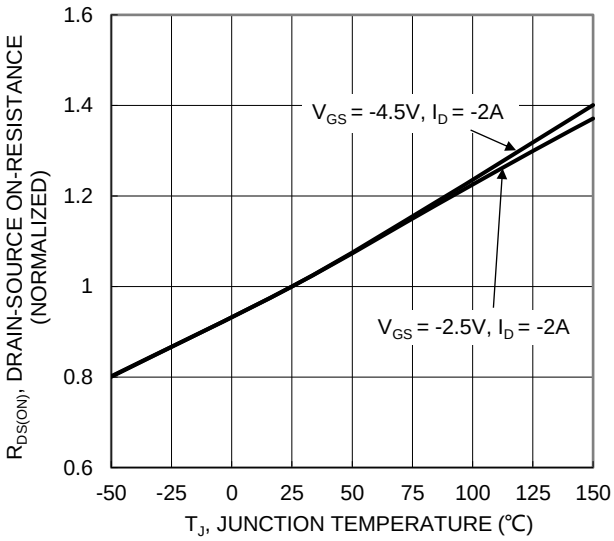


Figure 6. On-Resistance Variation with Junction Temperature

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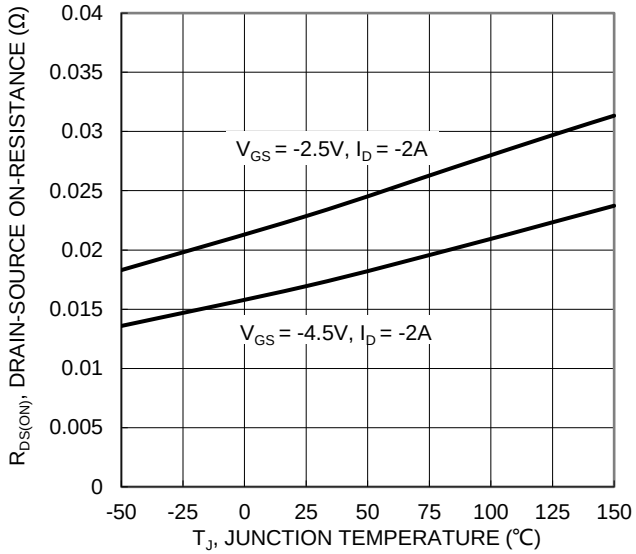


Figure 7. On-Resistance Variation with Junction Temperature

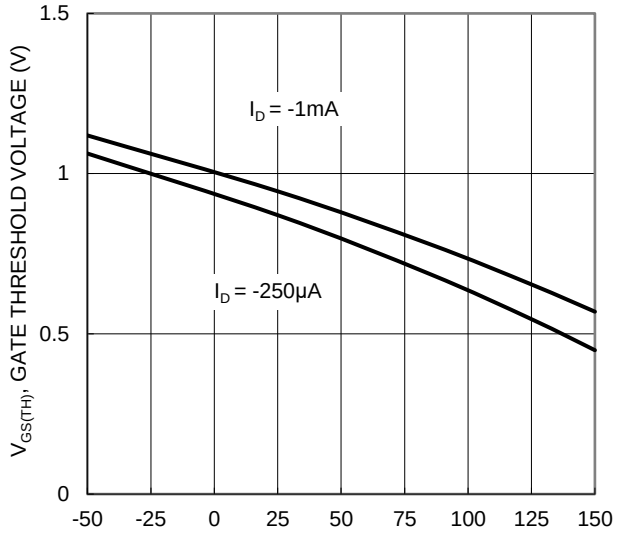


Figure 8. Gate Threshold Variation vs. Junction Temperature

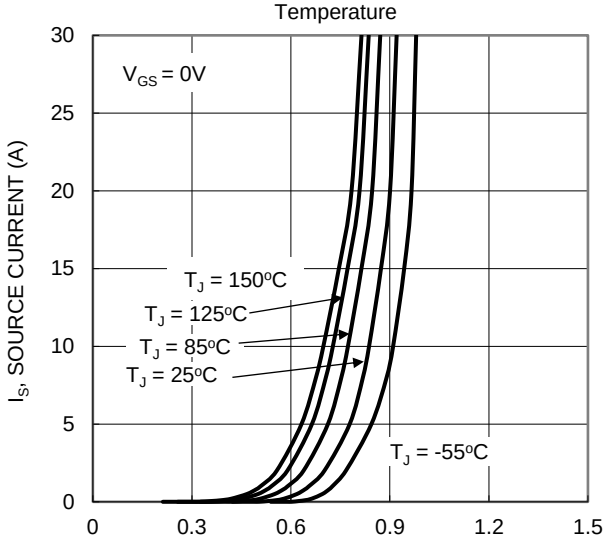


Figure 9. Diode Forward Voltage vs. Current

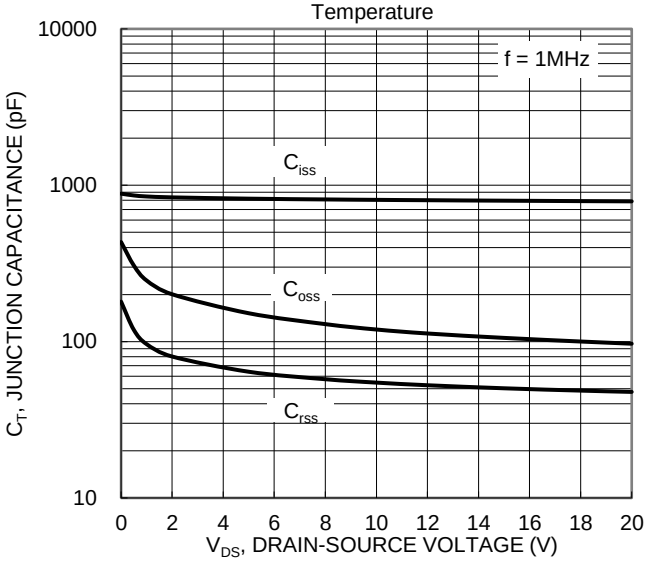


Figure 10. Typical Junction Capacitance

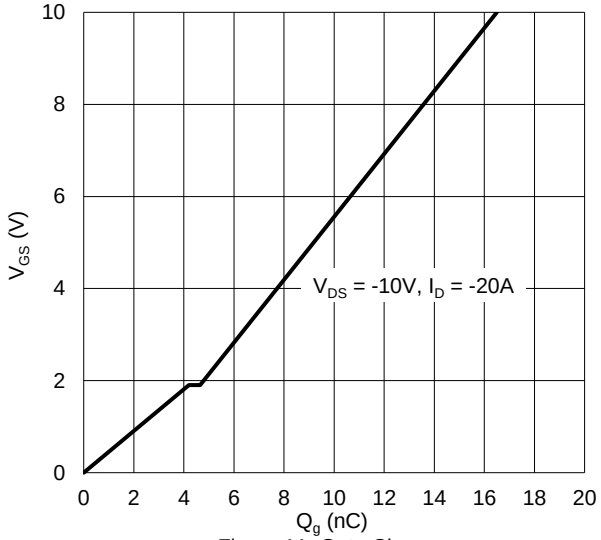


Figure 11. Gate Charge

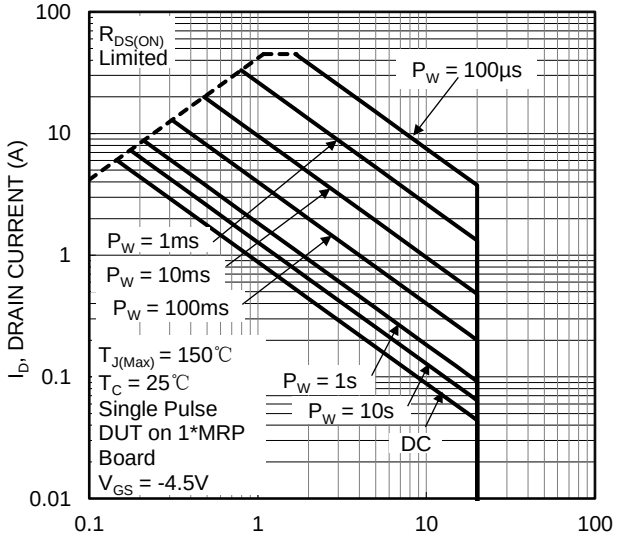


Figure 12. SOA, Safe Operation Area

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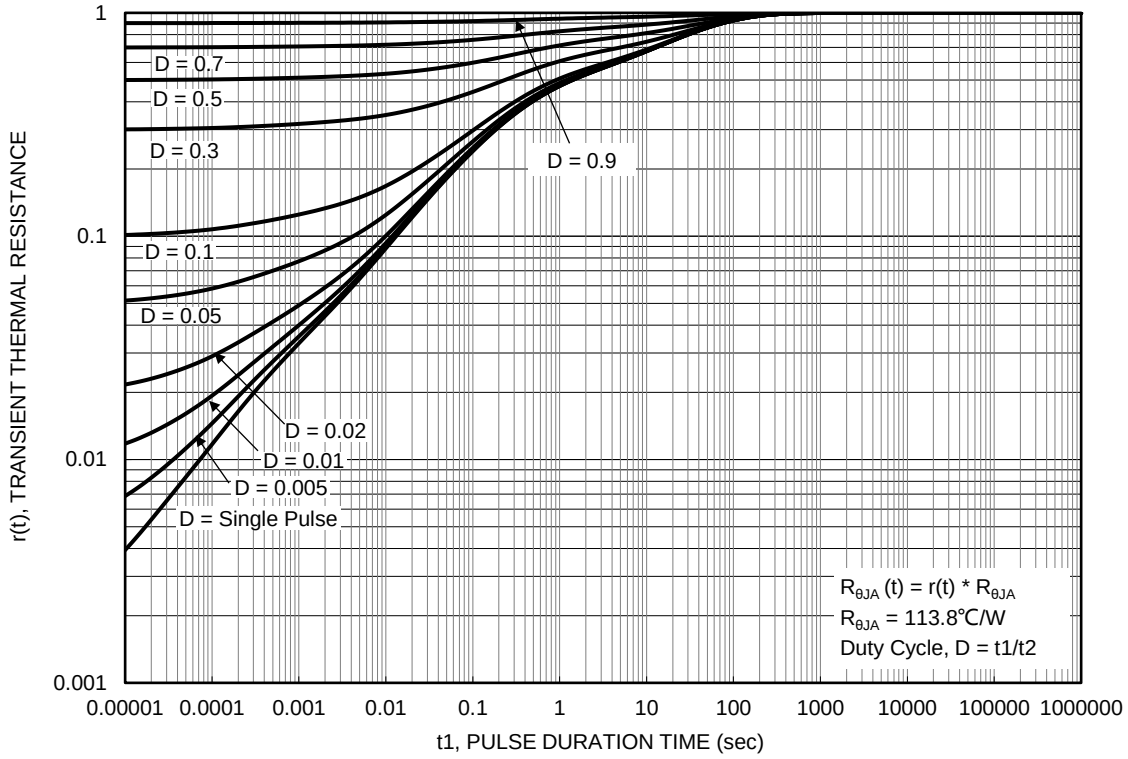


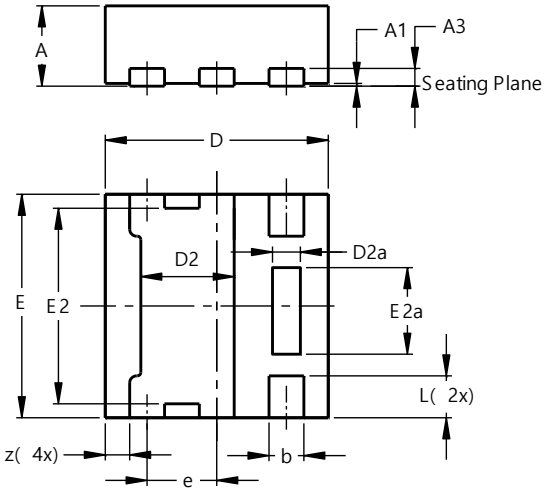
Figure 13. Transient Thermal Resistance

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Package Outline Dimensions

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

U-DFN1616-6 (Type K)

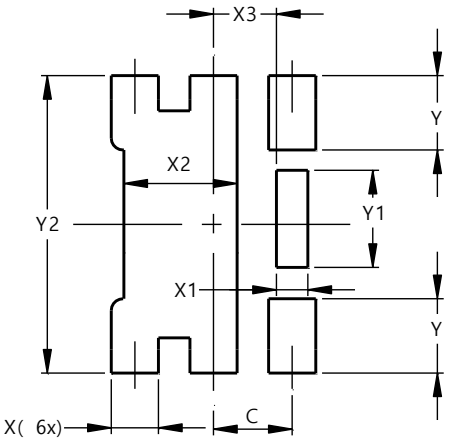


U-DFN1616-6 (Type K)			
Dim	**Min**	**Max**	**Typ**
A	0.55	0.60	0.575
A1	0.00	0.05	0.02
A3	--	--	0.13
b	0.20	0.30	0.25
D	1.55	1.65	1.60
D2	0.57	0.77	0.67
D2a	0.10	0.30	0.20
e	--	--	0.50
E	1.55	1.65	1.60
E2	1.30	1.50	1.40
E2a	0.52	0.72	0.62
L	0.25	0.35	0.30
z	--	--	0.175
All Dimensions in mm			

Suggested Pad Layout

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

U-DFN1616-6 (Type K)



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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