

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _A = +25°C
60V	25mΩ @ V _{GS} = 10V	6.5A
	34mΩ @ V _{GS} = 4.5V	5.2A

Description and Applications

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.

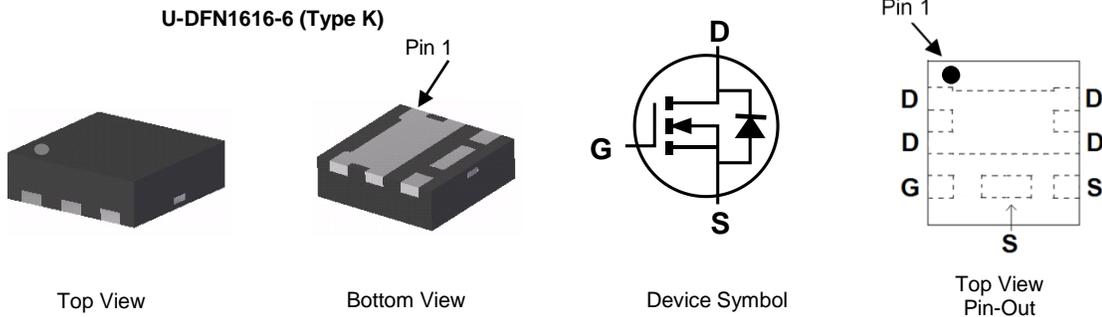
- Power Management Functions
- Load Switch

Features and Benefits

- 0.6mm Profile—Ideal for Low Profile Applications
- Low On-Resistance
- PCB Footprint of 2.56mm²
- **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](mailto:contact@diodes.com) 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: Lead Free Plating (NiPdAu Finish over Copper Leadframe). Solderable per MIL-STD-202, Method 208 ^(e4)
- Weight: 0.003 grams (Approximate)



Ordering Information (Note 4)

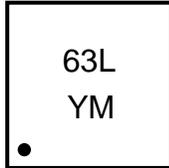
Part Number	Case	Packaging
DMT6030LFCL-7	U-DFN1616-6 (Type K)	3,000/Tape & Reel

- 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/>.

Marking Information

Site 1:

U-DFN1616-6 (Type K)



63L = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: H = 2020)
 M = Month (ex: 9 = September)

Date Code Key

Year	2017	...	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Code	E	...	H	I	J	K	L	M	N	O	P	R

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

Site 2:

U-DFN1616-6 (Type K)



63L = Product Type Marking Code
 YWX = Date Code Marking
 Y = Year (ex: 0 = 2020)
 W = Week (ex: a = Week 27; z Represents Week 52 and 53)
 X = Internal Code (ex: U = Monday)

Date Code Key

Year	2017	...	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Code	7	...	0	1	2	3	4	5	6	7	8	9

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

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	60	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (Note 6) V _{GS} = 10V	I _D	6.5	A
		Steady State	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	30	A
Maximum Body Diode Continuous Current (Note 6)	I _S	1.7	A
Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%)	I _{SM}	30	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	0.78	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	160	°C/W
Total Power Dissipation (Note 6)	P _D	1.58	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	79	°C/W
Thermal Resistance, Junction to Case (Note 6)	R _{θJC}	16.7	°C/W
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}	60	—	—	V	V _{GS} = 0V, I _D = 250µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 48V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	1	—	2.5	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	19	25	mΩ	V _{GS} = 10V, I _D = 6.5A
		—	25	34		V _{GS} = 4.5V, I _D = 4A
Diode Forward Voltage	V _{SD}	—	0.7	1.2	V	V _{GS} = 0V, I _S = 1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	639	—	pF	V _{DS} = 30V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{oss}	—	166	—		
Reverse Transfer Capacitance	C _{rss}	—	13.1	—		
Gate Resistance	R _g	—	1.4	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 10V)	Q _g	—	9.1	—	nC	V _{DS} = 30V, I _D = 10A
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	4.5	—		
Gate-Source Charge	Q _{gs}	—	1.2	—		
Gate-Drain Charge	Q _{gd}	—	2.0	—		
Turn-On Delay Time	t _{D(ON)}	—	2.6	—	ns	V _{GS} = 10V, V _{DD} = 30V, R _g = 6Ω, I _D = 10A
Turn-On Rise Time	t _r	—	2.2	—		
Turn-Off Delay Time	t _{D(OFF)}	—	10.7	—		
Turn-Off Fall Time	t _f	—	3.4	—		
Body Diode Reverse Recovery Time	t _{RR}	—	26.5	—	ns	I _F = 10A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q _{RR}	—	12.3	—	nC	

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

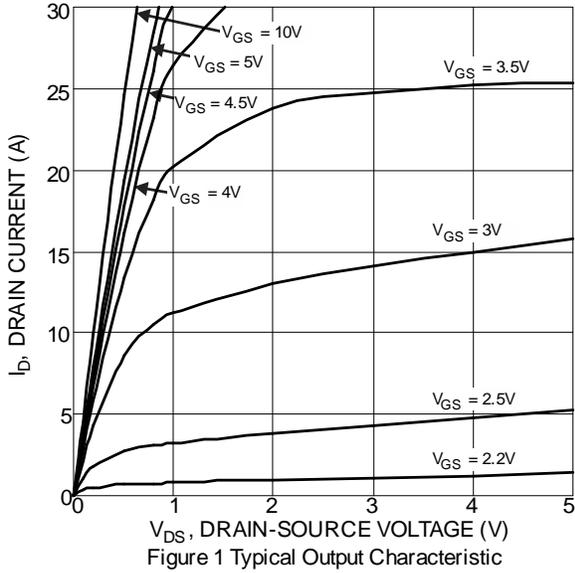


Figure 1 Typical Output Characteristic

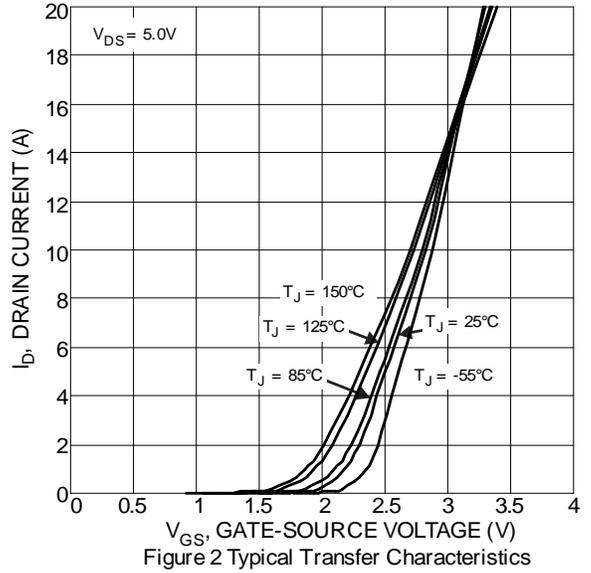


Figure 2 Typical Transfer Characteristics

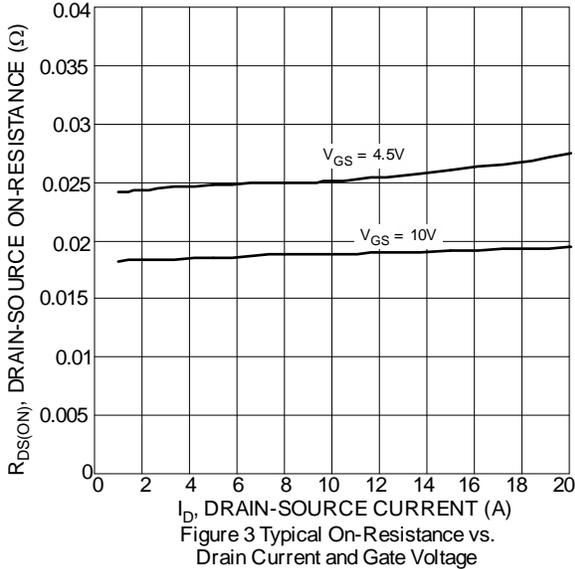


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

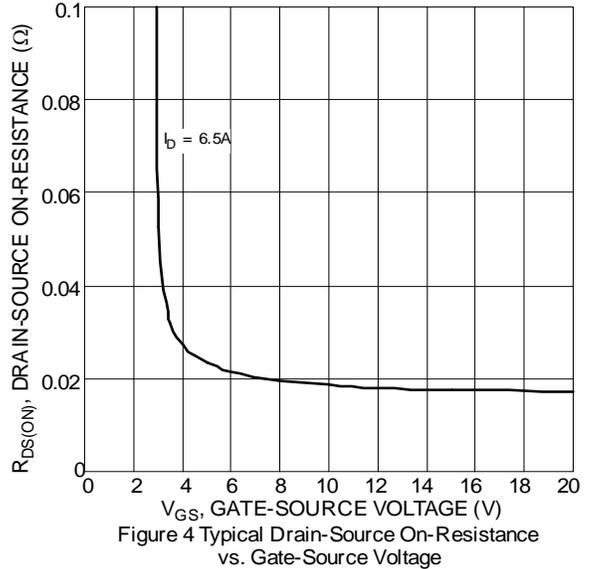


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

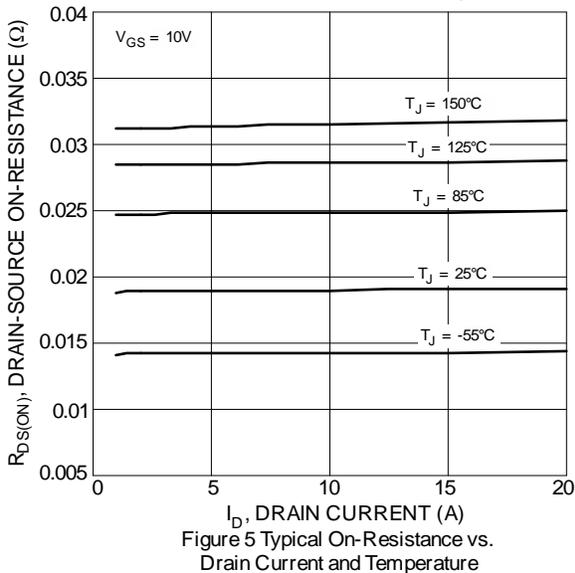


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

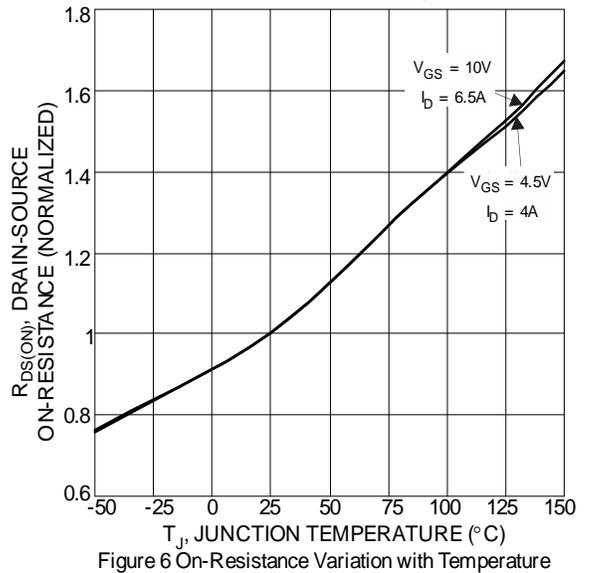


Figure 6 On-Resistance Variation with Temperature

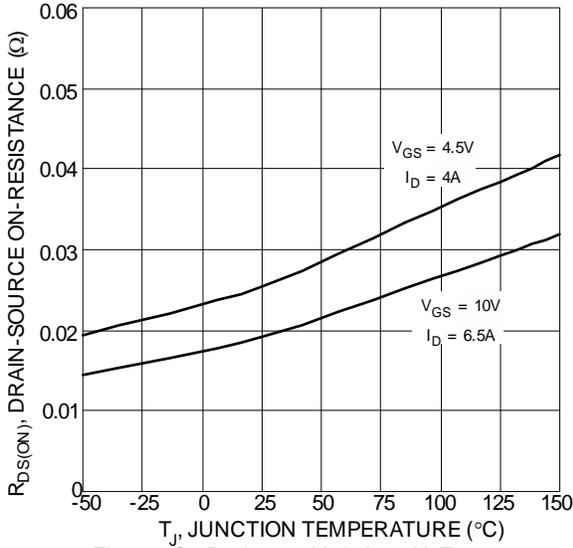


Figure 7 On-Resistance Variation with Temperature

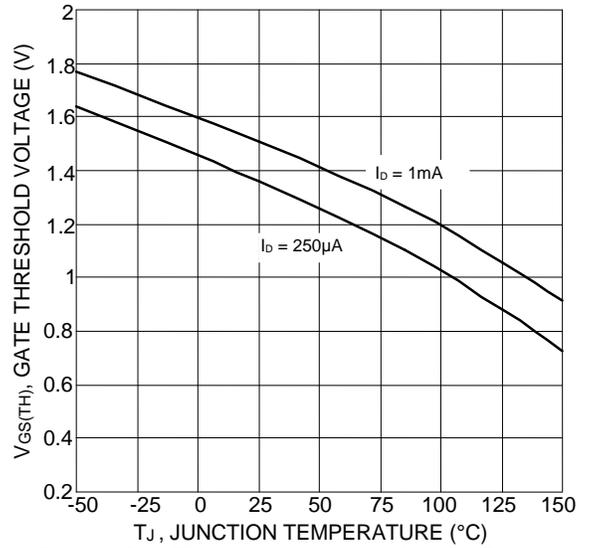


Figure 8 Gate Threshold Variation vs. Junction Temperature

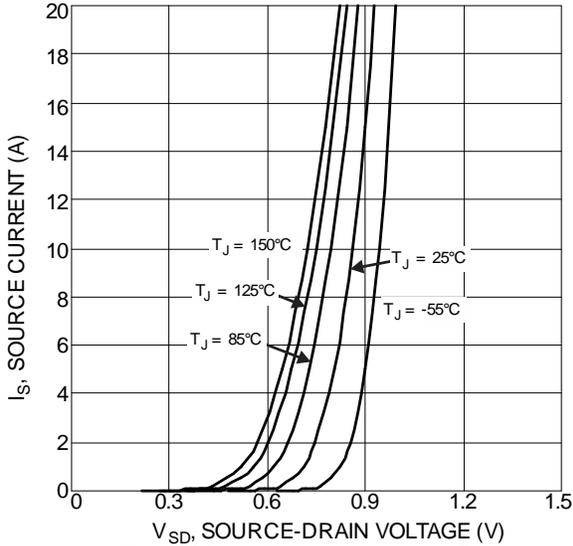


Figure 9 Diode Forward Voltage vs. Current

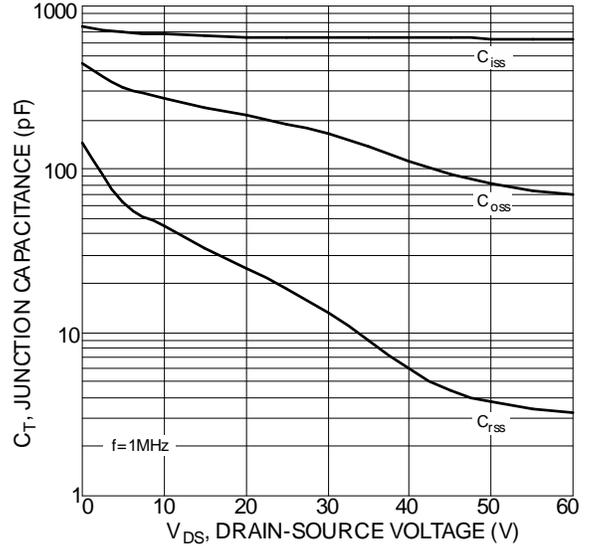


Figure 10 Typical Junction Capacitance

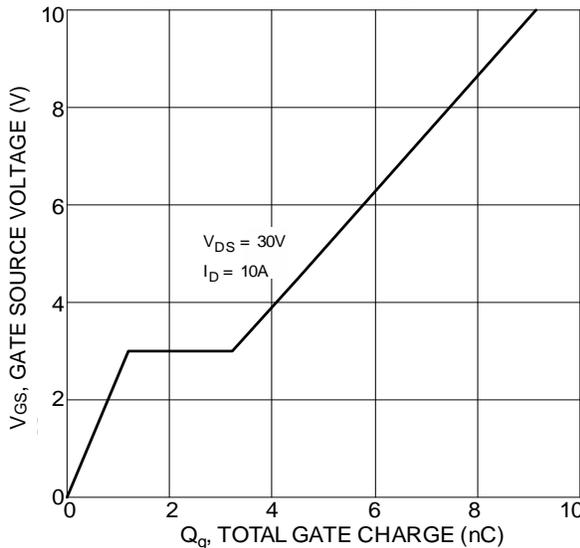


Figure 11 Gate Charge

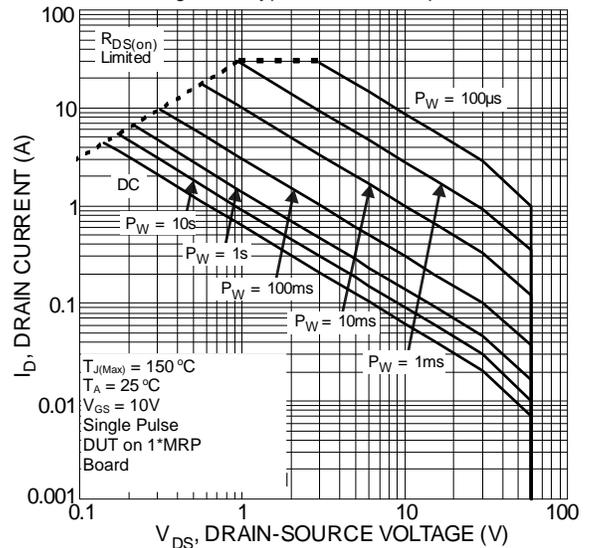
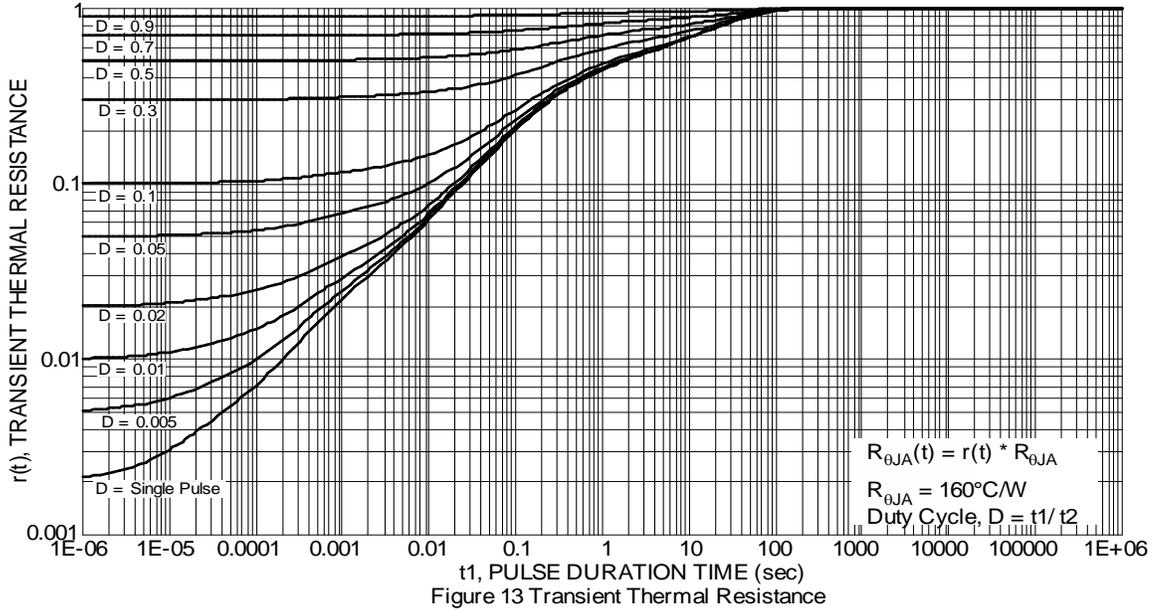


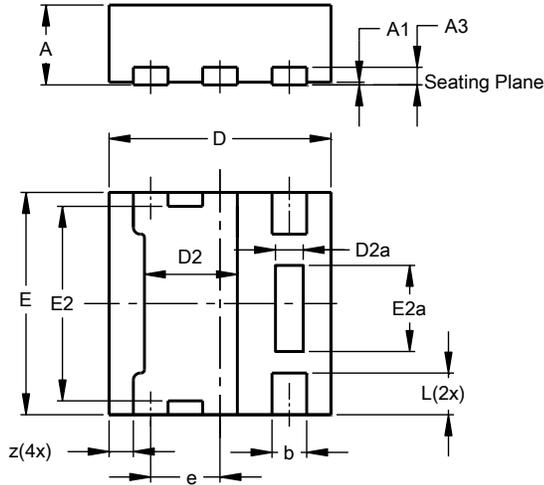
Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

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

U-DFN1616-6 (Type K)



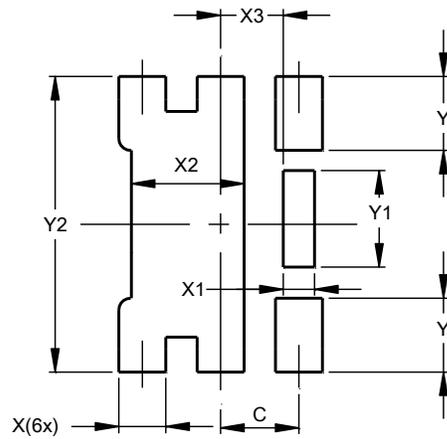
U-DFN1616-6 (Type K)			
Dim	Min	Max	Typ
A	0.55	0.60	0.575
A1	0.00	0.05	0.02
A3	—	—	0.13
b	0.20	0.30	0.25
D	1.55	1.65	1.60
D2	0.57	0.77	0.67
D2a	0.10	0.30	0.20
e	—	—	0.50
E	1.55	1.65	1.60
E2	1.30	1.50	1.40
E2a	0.52	0.72	0.62
L	0.25	0.35	0.30
z	—	—	0.175

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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