

## Product Summary

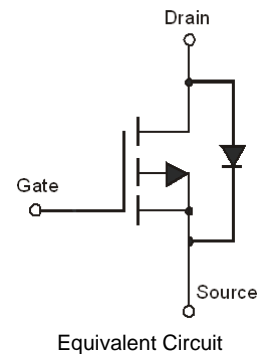
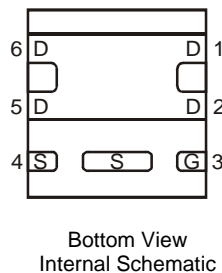
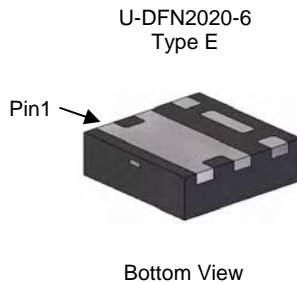
$V_{(BR)DSS}$	$R_{DS(ON)}$	Package	$I_D$ $T_A = +25^\circ\text{C}$
-20V	36m $\Omega$ @ $V_{GS} = -4.5\text{V}$	U-DFN2020-6 Type E	-6.2A
	56m $\Omega$ @ $V_{GS} = -2.5\text{V}$		-5.0A
	75m $\Omega$ @ $V_{GS} = -1.8\text{V}$		-4.2A

## Description

This new generation MOSFET has been 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
- Power Management Functions
- Analog Switch



## Features

- 0.6mm profile – ideal for low profile applications
- PCB footprint of 4mm<sup>2</sup>
- Low Gate Threshold Voltage
- Low On-Resistance
- **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

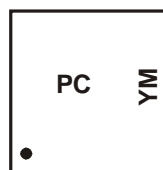
- Case: U-DFN2020-6 Type E
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Weight: 0.0065 grams (approximate)

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMP2066UFDE-7	U-DFN2020-6 Type E	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> 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



PC = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: Y = 2011)  
 M = Month (ex: 9 = September)  
 Dot Denotes Pin 1

### Date Code Key

Year	2011	2012	2013	2014	2015	2016	2017
Code	Y	Z	A	B	C	D	E

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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V <sub>DSS</sub>	-20	V
Gate-Source Voltage			V <sub>GSS</sub>	±12	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = -4.5V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-6.2 -4.9	A
	t < 5s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-7.5 -5.9	A
Continuous Drain Current (Note 5) V <sub>GS</sub> = -1.8V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-4.2 -3.4	A
	t < 5s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-5.2 -4.1	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I <sub>DM</sub>	-25	A
Maximum Continuous Body Diode Forward Current (Note 5)			I <sub>S</sub>	2.5	A

**Thermal Characteristics**

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 6)		P <sub>D</sub>	0.66	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	R <sub>θJA</sub>	189	°C/W
	t < 5s		123	°C/W
Total Power Dissipation (Note 5)		P <sub>D</sub>	2.03	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	R <sub>θJA</sub>	61	°C/W
	t < 5s		40	°C/W
Thermal Resistance, Junction to Case (Note 5)		R <sub>θJC</sub>	9.3	°C/W
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-20	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250µA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-1	µA	V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±12.0V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	-0.4	—	-1.1	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250µA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	—	25	36	mΩ	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -4.6A
		—	33	56		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -3.8A
		—	50	75		V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -2.0A
Forward Transfer Admittance	Y <sub>fs</sub>	—	9	—	S	V <sub>DS</sub> = -10V, I <sub>D</sub> = -4.5A
Diode Forward Voltage	V <sub>SD</sub>	—	-0.7	-1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -2.1A
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	—	1537	—	pF	V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	146	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	127	—	pF	
Gate Resistance	R <sub>g</sub>	—	10.4	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz
Total Gate Charge	Q <sub>g</sub>	—	14.4	—	nC	V <sub>DS</sub> = -10V, V <sub>GS</sub> = -4.5V I <sub>D</sub> = -4.5A
Gate-Source Charge	Q <sub>gs</sub>	—	2.6	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	2.7	—		
Turn-On Delay Time	t <sub>D(on)</sub>	—	13.7	—	ns	V <sub>DD</sub> = -10V, V <sub>GS</sub> = -4.5V, R <sub>G</sub> = 6Ω, R <sub>L</sub> = 10Ω, I <sub>D</sub> = -1A
Turn-On Rise Time	t <sub>r</sub>	—	14.0	—		
Turn-Off Delay Time	t <sub>D(off)</sub>	—	79.1	—		
Turn-Off Fall Time	t <sub>f</sub>	—	35.5	—		

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

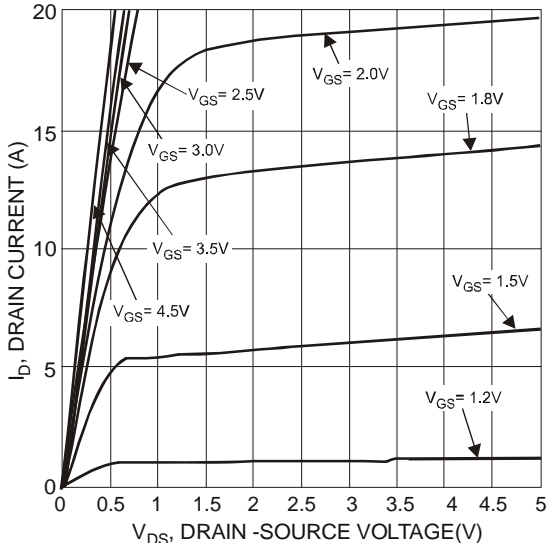


Fig. 1 Typical Output Characteristics

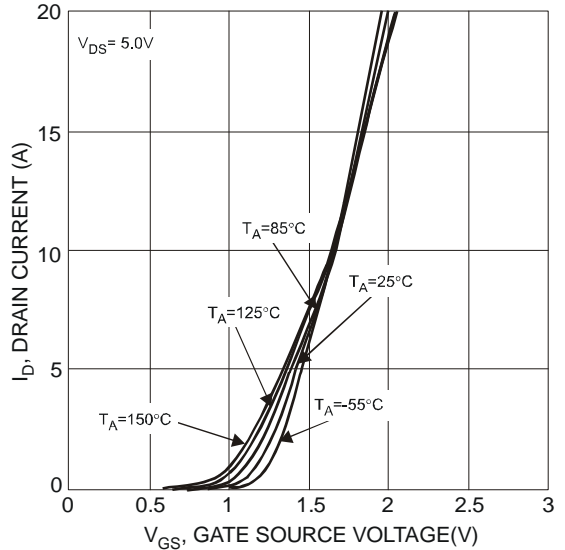


Fig. 2 Typical Transfer Characteristics

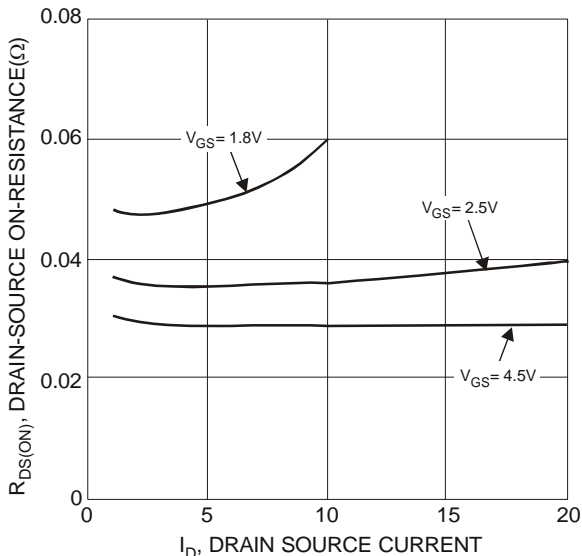


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

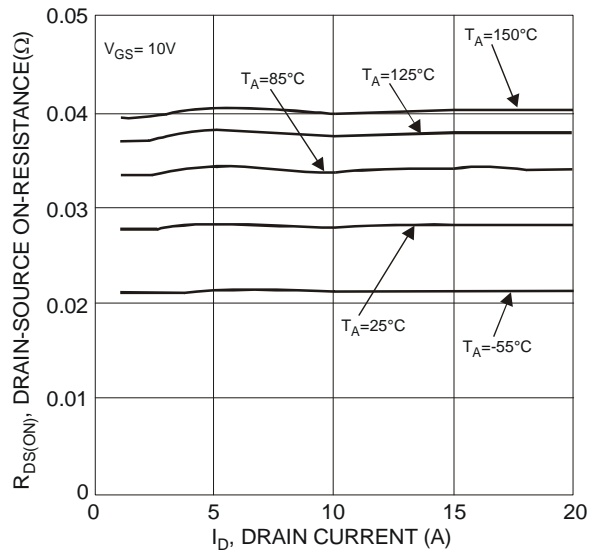


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

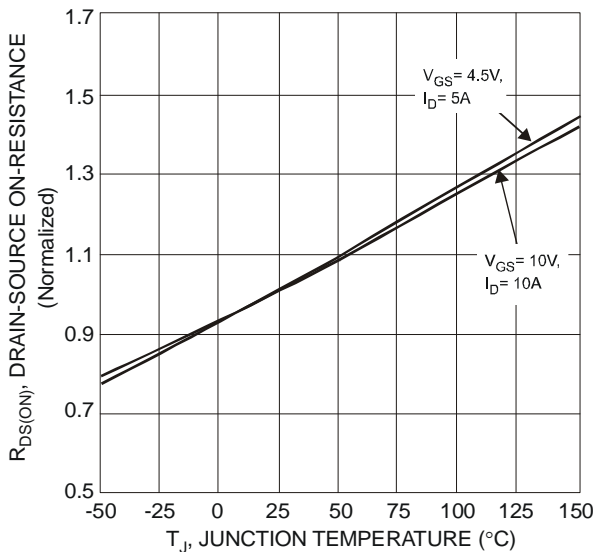


Fig. 5 On-Resistance Variation with Temperature

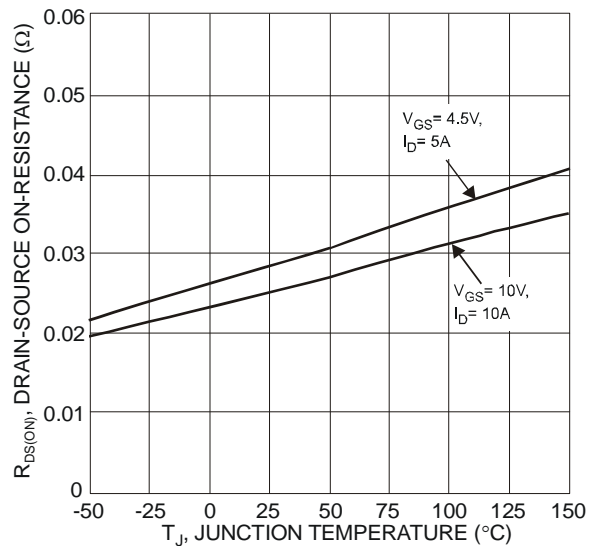


Fig. 6 On-Resistance Variation with Temperature

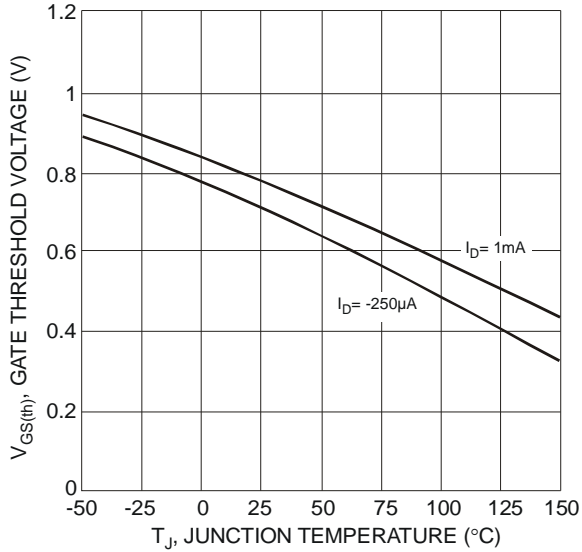


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

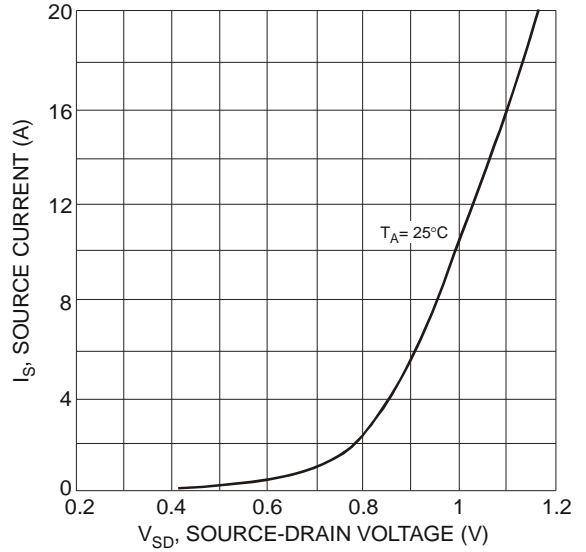


Fig. 8 Diode Forward Voltage vs. Current

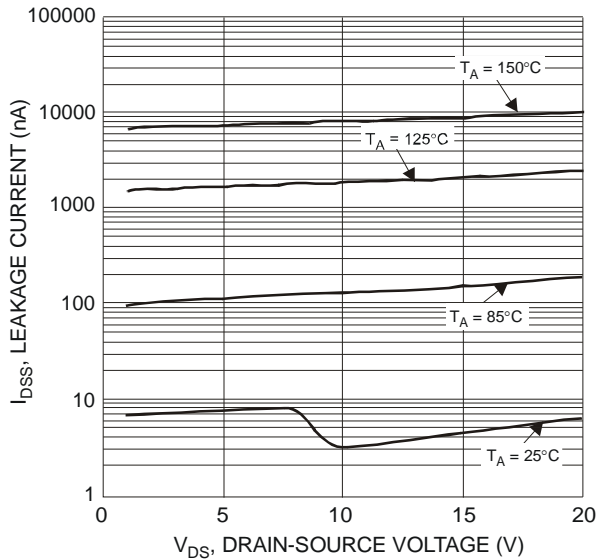


Fig. 9 Typical Drain-Source Leakage Current vs. Voltage

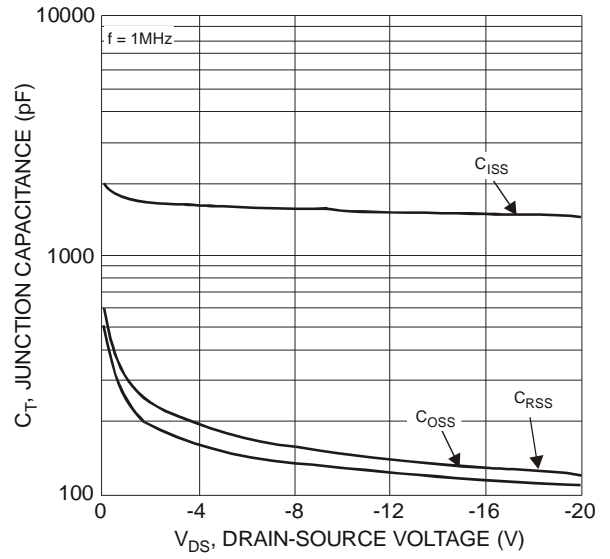


Fig. 10 Typical Junction Capacitance

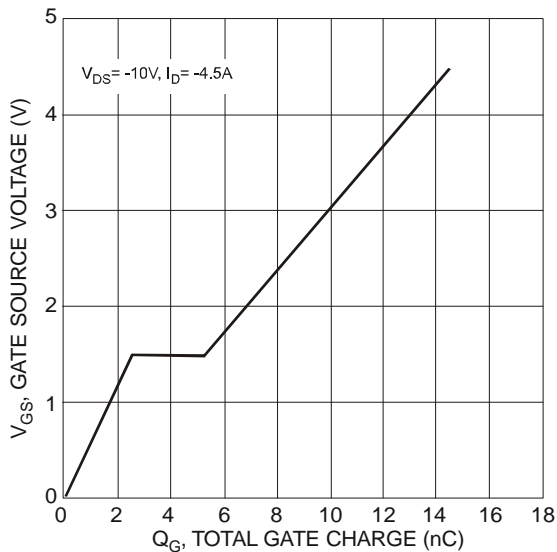


Fig. 11 Gate Charge Characteristics

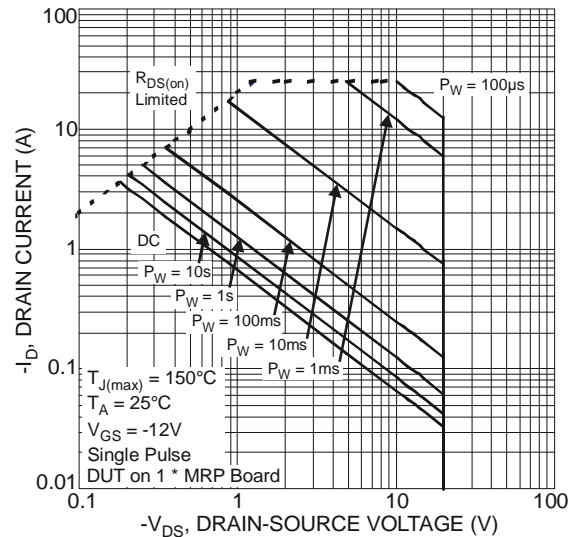
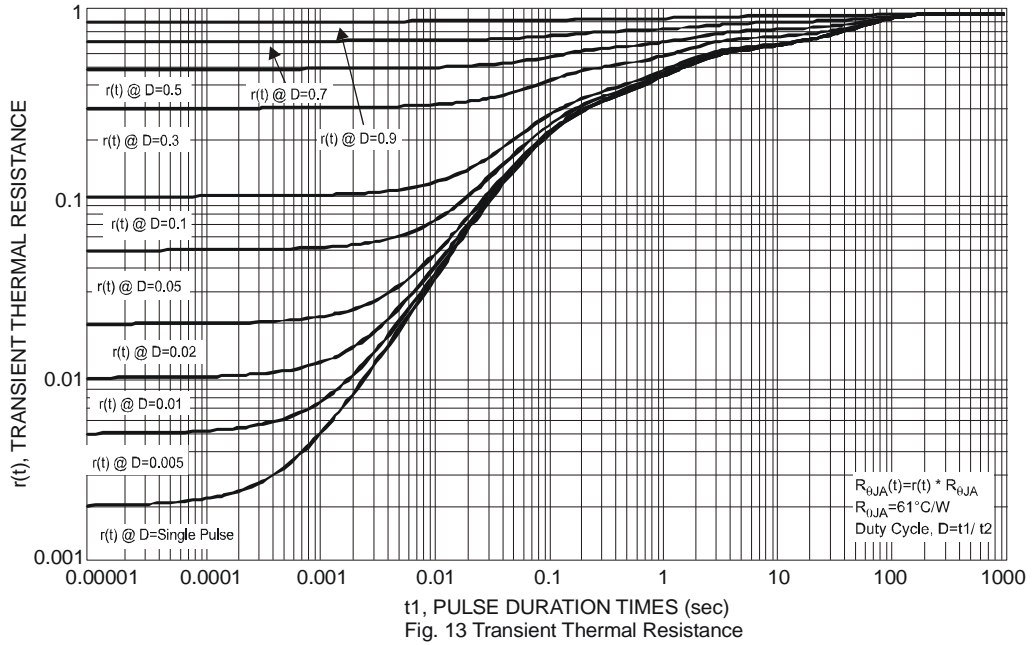
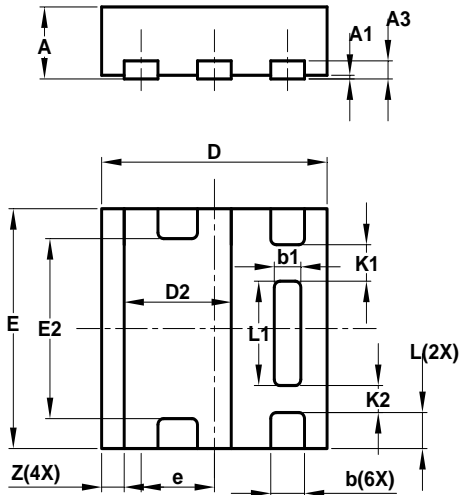


Fig. 12 SOA, Safe Operation Area



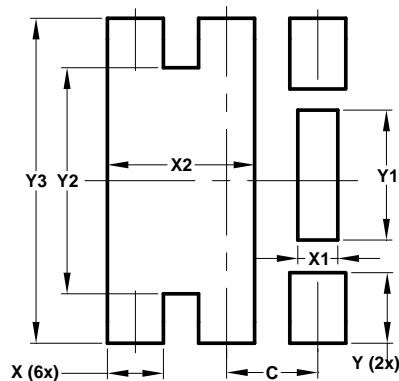
**Package Outline Dimensions**



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



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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