

## Product Summary

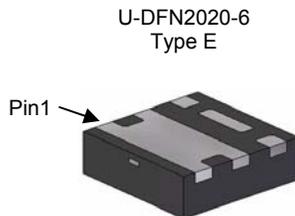
$V_{(BR)DSS}$	$R_{DS(ON)}$	Package	$I_D$ $T_A = +25^\circ C$
-20V	36m $\Omega$ @ $V_{GS} = -4.5V$	U-DFN2020-6 Type E	-6.2A
	56m $\Omega$ @ $V_{GS} = -2.5V$		-5.0A
	75m $\Omega$ @ $V_{GS} = -1.8V$		-4.2A

## Description

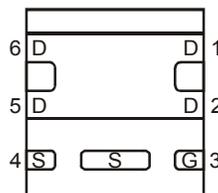
This new generation MOSFET has been designed to minimize the on-state resistance ( $R_{DS(on)}$ ) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

## Applications

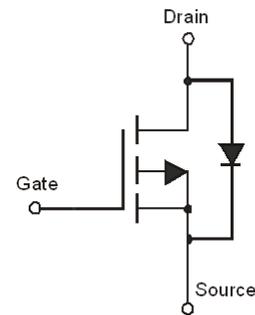
- General Purpose Interfacing Switch
- Power Management Functions
- Analog Switch



Bottom View



Bottom View  
Internal Schematic



Equivalent Circuit

## 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

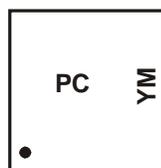
- Case: U-DFN2020-6 Type E
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Weight: 0.0065 grams (approximate)

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			$V_{DSS}$	-20	V
Gate-Source Voltage			$V_{GSS}$	$\pm 12$	V
Continuous Drain Current (Note 5) $V_{GS} = -4.5\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	-6.2 -4.9	A
	$t < 5\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	-7.5 -5.9	A
Continuous Drain Current (Note 5) $V_{GS} = -1.8\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	-4.2 -3.4	A
	$t < 5\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	-5.2 -4.1	A
Pulsed Drain Current (10 $\mu\text{s}$ pulse, duty cycle = 1%)			$I_{DM}$	-25	A
Maximum Continuous Body Diode Forward Current (Note 5)			$I_S$	2.5	A

**Thermal Characteristics**

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 6)		$P_D$	0.66	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	$R_{\theta JA}$	189	$^\circ\text{C/W}$
	$t < 5\text{s}$		123	$^\circ\text{C/W}$
Total Power Dissipation (Note 5)		$P_D$	2.03	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	$R_{\theta JA}$	61	$^\circ\text{C/W}$
	$t < 5\text{s}$		40	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case (Note 5)		$R_{\theta JC}$	9.3	$^\circ\text{C/W}$
Operating and Storage Temperature Range		$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-20	—	—	V	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	-1	$\mu\text{A}$	$V_{DS} = -20\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 12.0\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	-0.4	—	-1.1	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	25	36	m $\Omega$	$V_{GS} = -4.5\text{V}, I_D = -4.6\text{A}$
		—	33	56		$V_{GS} = -2.5\text{V}, I_D = -3.8\text{A}$
		—	50	75		$V_{GS} = -1.8\text{V}, I_D = -2.0\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	—	9	—	S	$V_{DS} = -10\text{V}, I_D = -4.5\text{A}$
Diode Forward Voltage	$V_{SD}$	—	-0.7	-1.2	V	$V_{GS} = 0\text{V}, I_S = -2.1\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	—	1537	—	pF	$V_{DS} = -10\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	146	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	127	—	pF	
Gate Resistance	$R_g$	—	10.4	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Total Gate Charge	$Q_g$	—	14.4	—	nC	$V_{DS} = -10\text{V}, V_{GS} = -4.5\text{V}$ $I_D = -4.5\text{A}$
Gate-Source Charge	$Q_{gs}$	—	2.6	—		
Gate-Drain Charge	$Q_{gd}$	—	2.7	—		
Turn-On Delay Time	$t_{D(on)}$	—	13.7	—	ns	$V_{DD} = -10\text{V}, V_{GS} = -4.5\text{V}, R_G = 6\Omega,$ $R_L = 10\Omega, I_D = -1\text{A}$
Turn-On Rise Time	$t_r$	—	14.0	—		
Turn-Off Delay Time	$t_{D(off)}$	—	79.1	—		
Turn-Off Fall Time	$t_f$	—	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.

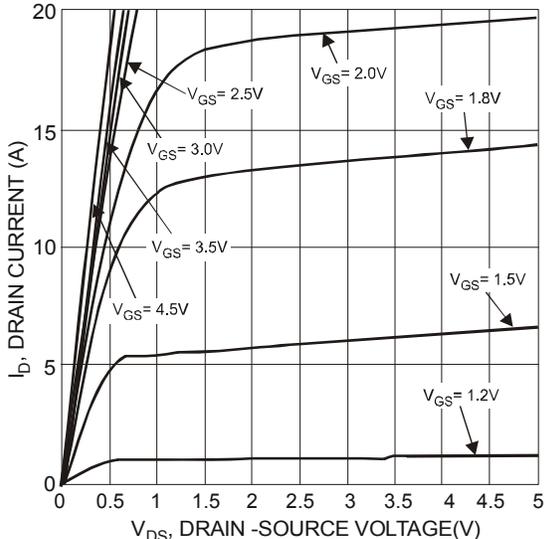


Fig. 1 Typical Output Characteristics

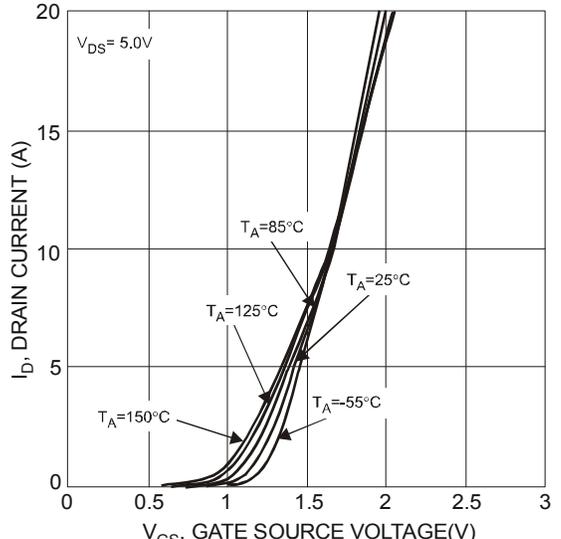


Fig. 2 Typical Transfer Characteristics

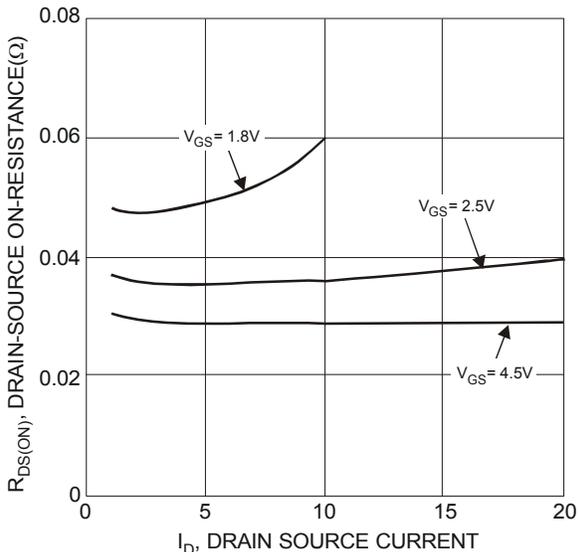


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

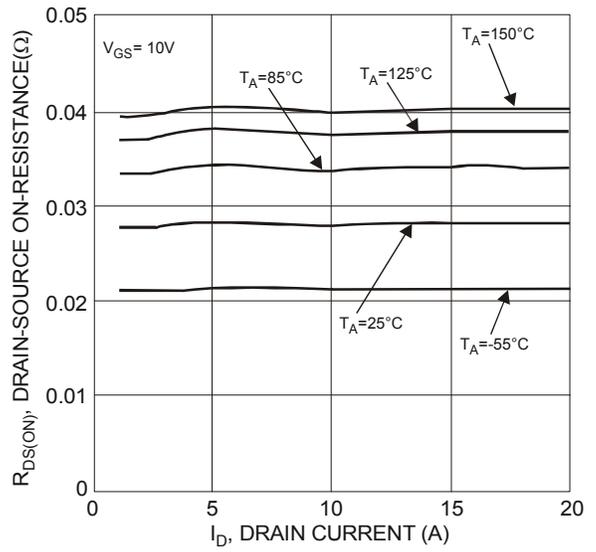


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

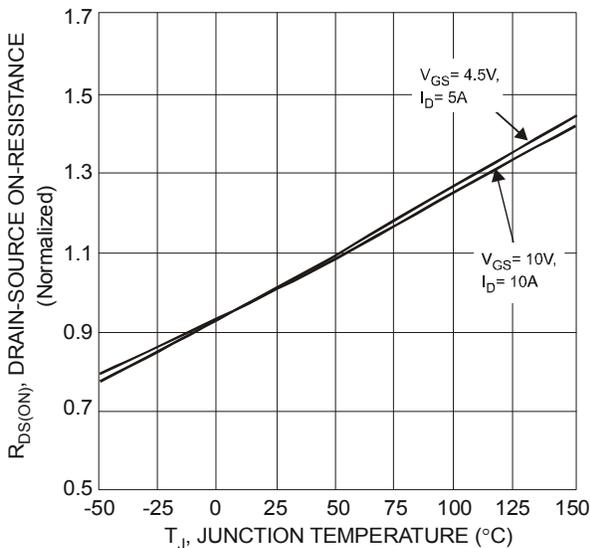


Fig. 5 On-Resistance Variation with Temperature

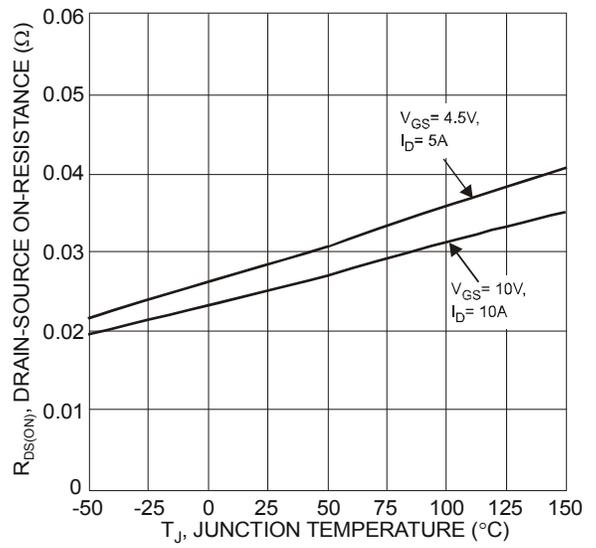


Fig. 6 On-Resistance Variation with Temperature

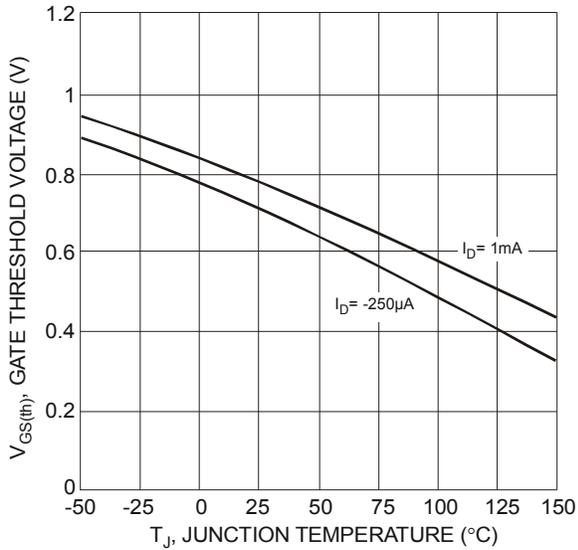


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

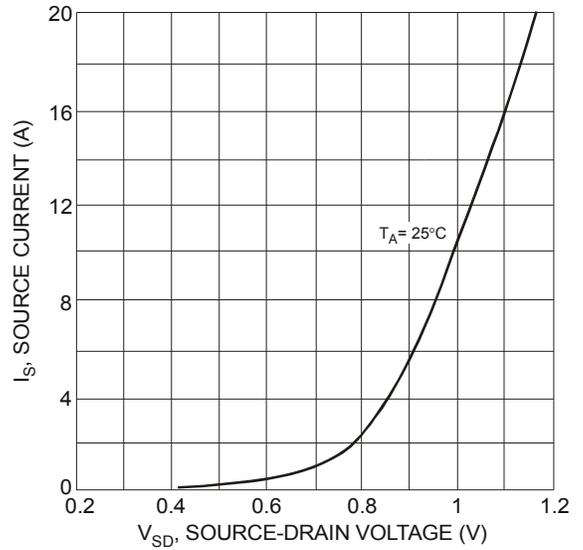


Fig. 8 Diode Forward Voltage vs. Current

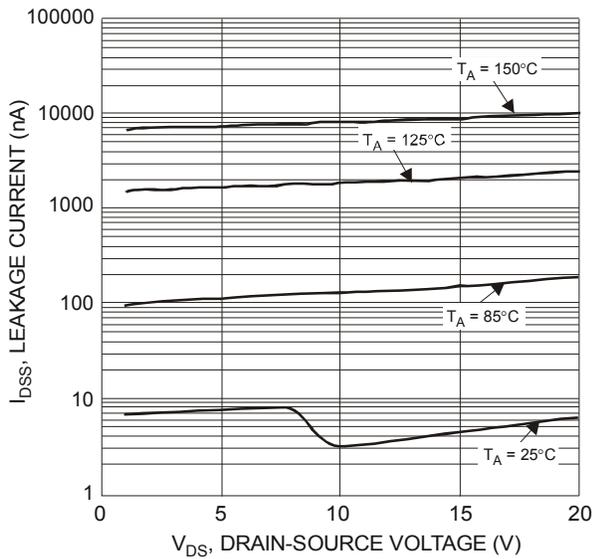


Fig. 9 Typical Drain-Source Leakage Current vs. Voltage

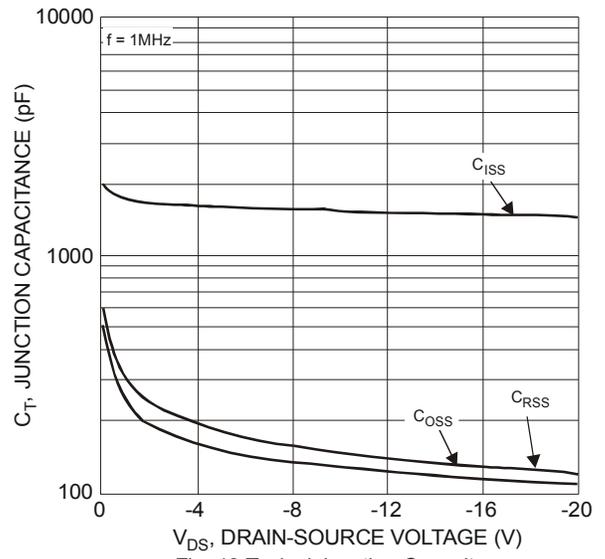


Fig. 10 Typical Junction Capacitance

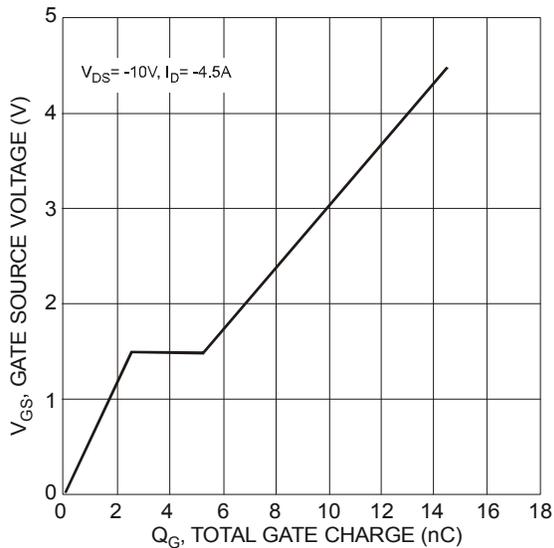


Fig. 11 Gate Charge Characteristics

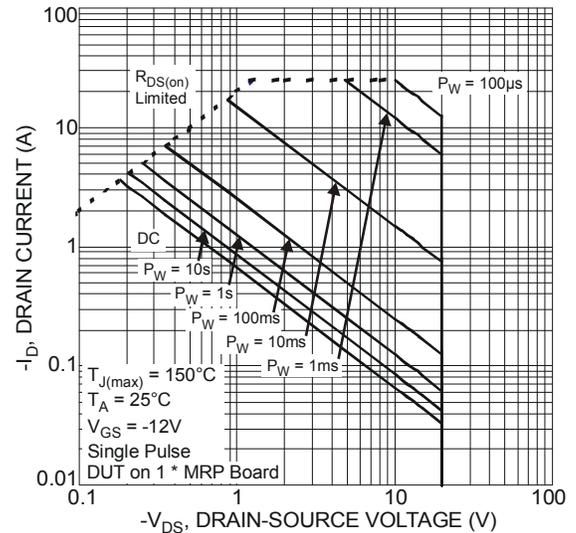
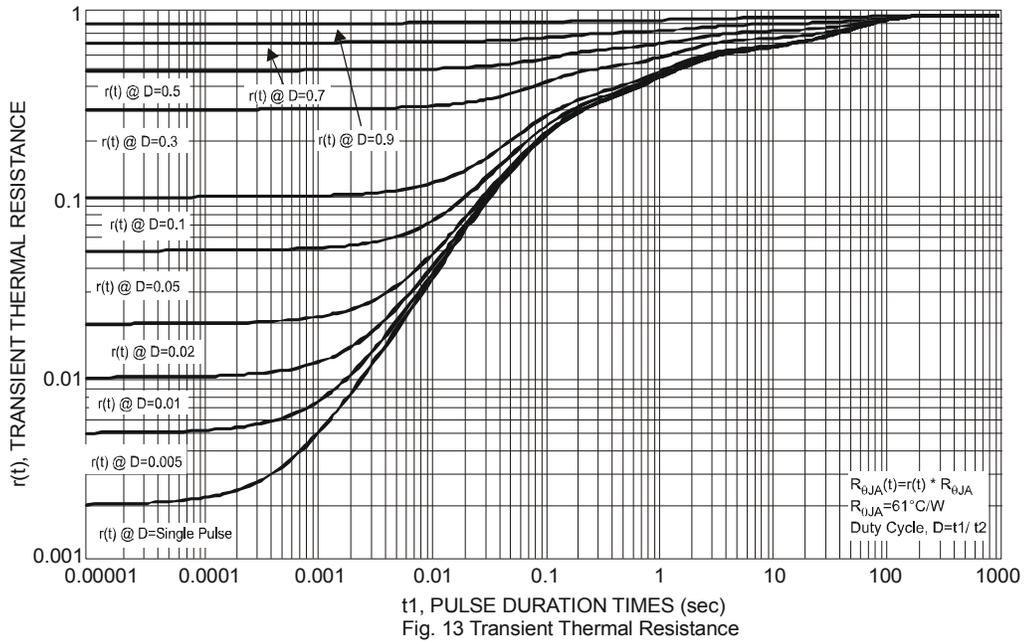
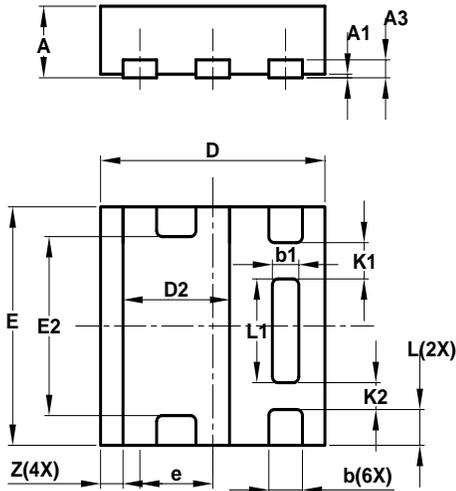


Fig. 12 SOA, Safe Operation Area



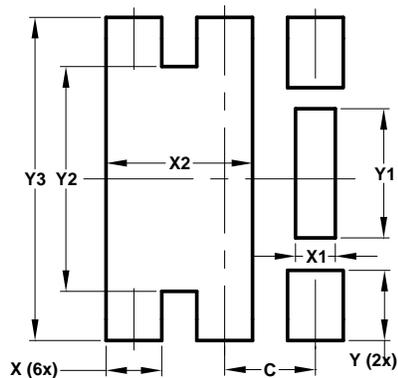
**Package Outline Dimensions**



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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