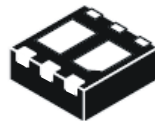


**P-CHANNEL ENHANCEMENT MODE MOSFET WITH INTEGRATED SBR
SUPER BARRIER RECTIFIER**
Features

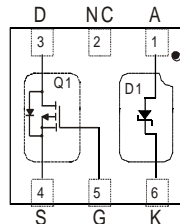
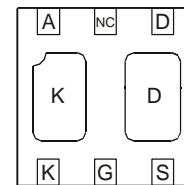
- Low On-Resistance
 - 95mΩ @V_{GS} = -4.5V
 - 120mΩ @V_{GS} = -2.5V
 - 86mΩ (Typ) @V_{GS} = -1.8V
- Low Gate Threshold Voltage, -1.3V Max
- Fast Switching Speed
- Low Input/Output Leakage
- Incorporates Low V_F Super Barrier Rectifier (SBR[®])
- Low Profile, 0.5mm Max Height
- **Totally Lead-Free & 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 refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. <https://www.diodes.com/quality/product-definitions/>**

Mechanical Data

- Case: U-DFN2020-6
- 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
- Terminals: Finish – NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 ^{Ⓔ4}
- Weight: 0.0065 grams (Approximate)

 U-DFN2020-6
(Type B)


Bottom View


 Top View
Internal Schematic

 Bottom View
Pin Configuration

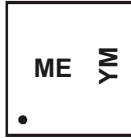
Ordering Information (Note 4)

Part Number	Case	Packaging
DMS2220LFDB-7	U-DFN2020-6 (Type B)	3000/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



ME = Marking Code
 YM = Date Code Marking
 Y = Year (ex: H = 2020)
 M = Month (ex: 9 = September)
 Dot Denotes Pin 1

Date Code Key

Year	2008	...	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Code	V	...	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



ME= 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	2008	...	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Code	8	...	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 – TOTAL DEVICE (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	1.4	W
Thermal Resistance, Junction to Ambient	R _{θJA}	89	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Maximum Ratings – P-CHANNEL MOSFET – Q1 (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	-20	V
Gate-Source Voltage	V _{GSS}	±12	V
Drain Current (Note 5)	I _D	-3.5	A
Pulsed Drain Current (Note 6)	I _{DM}	-12	A

Maximum Ratings – SBR – D1 (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	V _{RRM}	20	V
Working Peak Reverse Voltage	V _{RWM}		
DC Blocking Voltage	V _R		
RMS Reverse Voltage	V _{R(RMS)}	14	V
Average Rectified Output Current	I _O	1	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I _{FSM}	3	A

Electrical Characteristics – P-CHANNEL MOSFET – Q1 (@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}	-20	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	μA	V _{DS} = -20V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100 ±800	nA	V _{GS} = ±8V, V _{DS} = 0V V _{GS} = ±12V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	-0.45	—	-1.3	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	60	95	mΩ	V _{GS} = -4.5V, I _D = -2.8A
		—	74	120		V _{GS} = -2.5V, I _D = -2.0A
		—	86	—		V _{GS} = -1.8V, I _D = -1.0A
Forward Transfer Admittance	Y _{fs}	—	8	—	s	V _{DS} = -5V, I _D = -2.8A
Diode Forward Voltage (Note 7)	V _{SD}	—	-0.7	-1.2	V	V _{GS} = 0V, I _S = -1.6A
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iss}	—	632	—	pF	V _{DS} = -10V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	65	—	pF	
Reverse Transfer Capacitance	C _{riss}	—	54	—	pF	

Electrical Characteristics – SBR – D1 (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 7)	V _{(BR)R}	20	—	—	V	I _R = 1mA
Forward Voltage	V _F	—	—	0.45	V	I _F = 0.5A
		—	—	0.52		I _F = 1.0A
Reverse Current (Note 7)	I _R	—	—	100	μA	V _R = 20V

- Notes:
- Device mounted on FR-4 PCB, on minimum recommended, 2oz Copper pad layout.
 - Repetitive rating, pulse width limited by junction temperature.
 - Short duration pulse test used to minimize self-heating effect.

Q1 - P-CHANNEL MOSFET

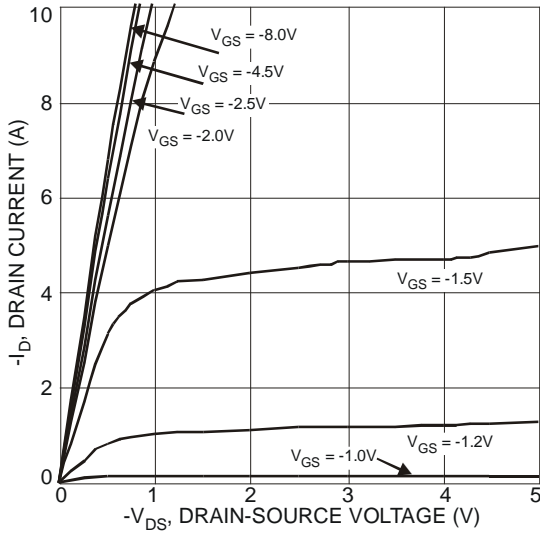


Fig. 1 Typical Output Characteristics

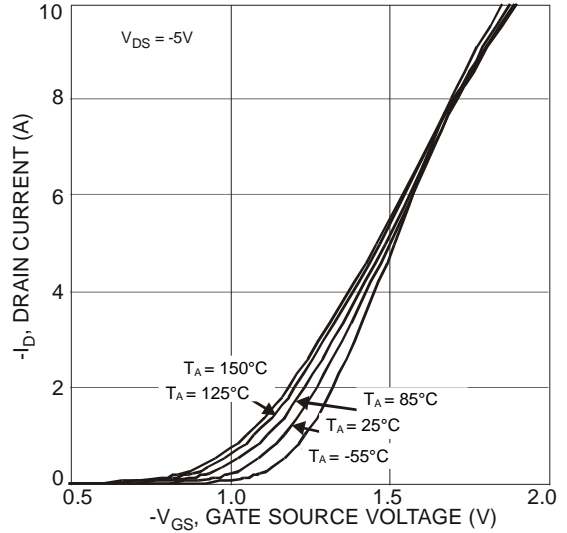


Fig. 2 Typical Transfer Characteristics

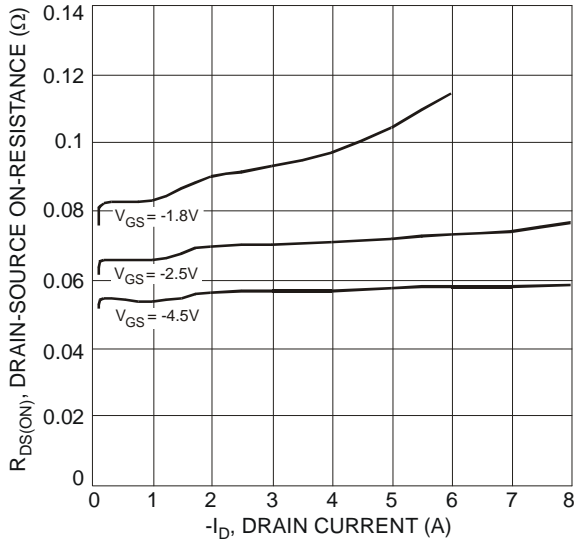


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

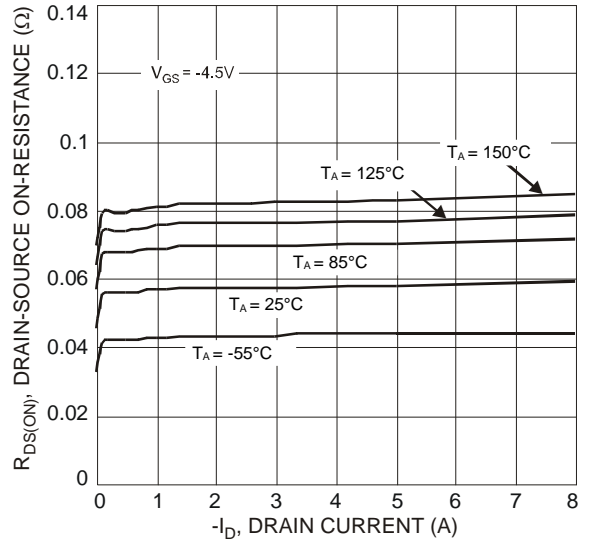


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

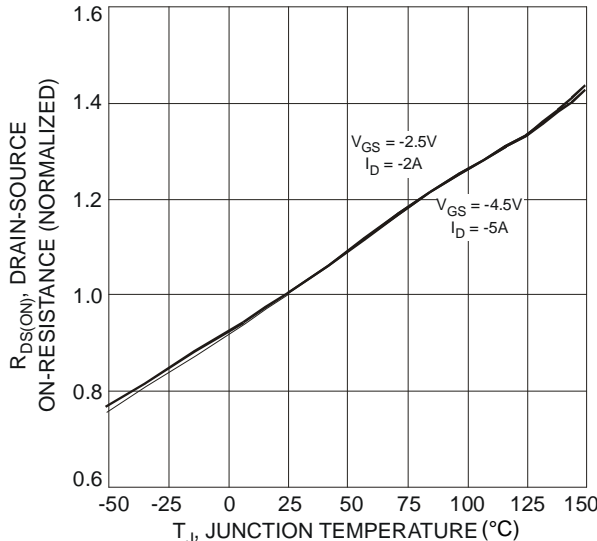


Fig. 5 On-Resistance Variation with Temperature

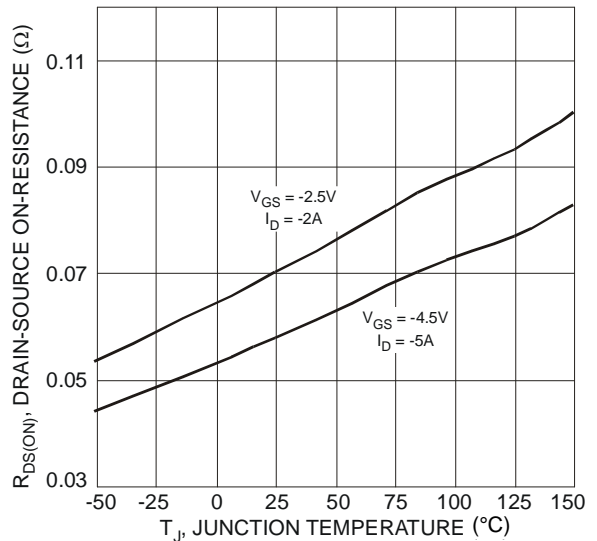
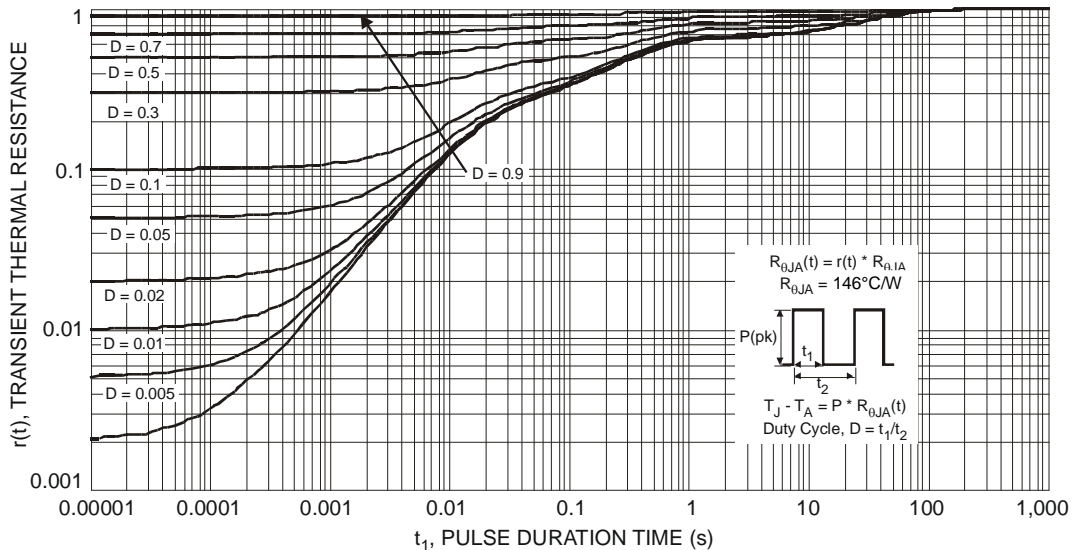
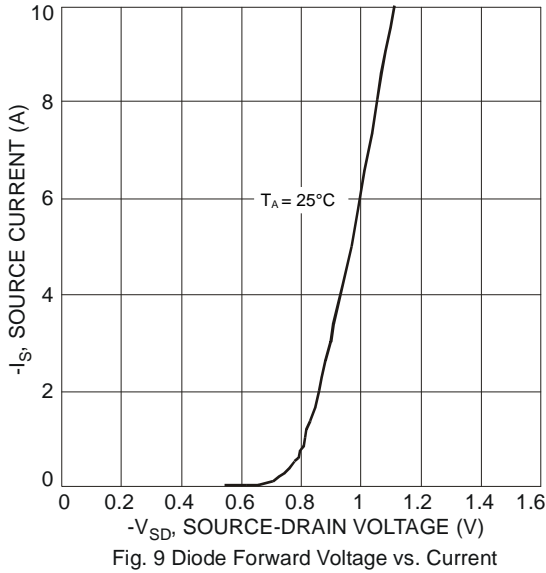
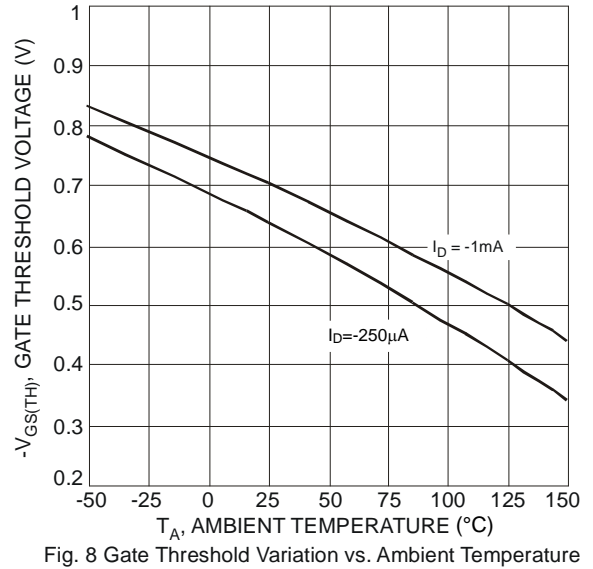
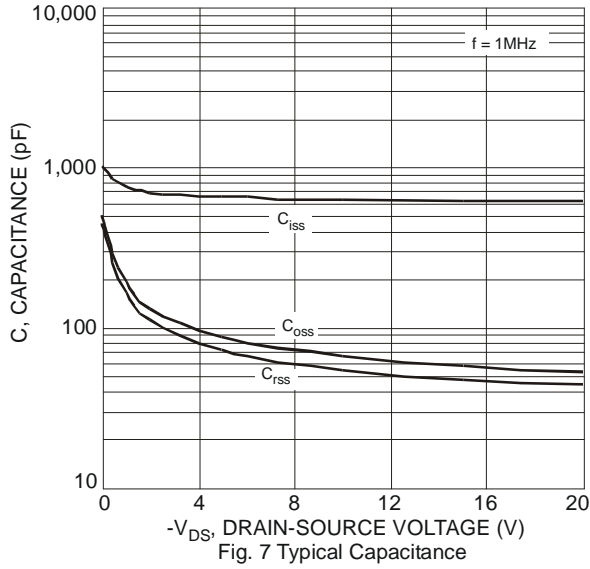


Fig. 6 On-Resistance Variation with Temperature



D1 - SBR

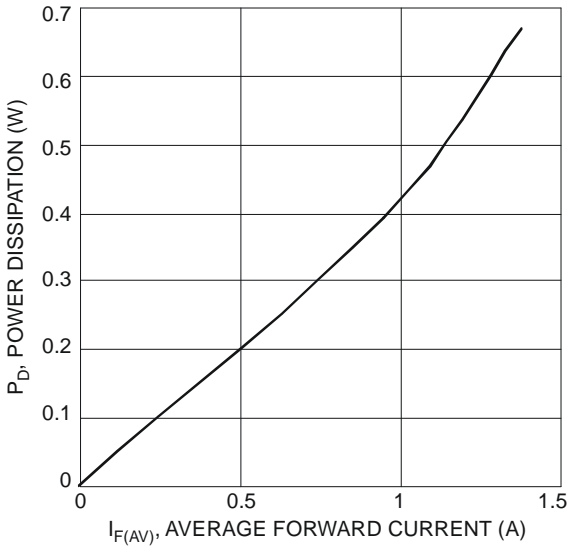


Fig. 11 Forward Power Dissipation

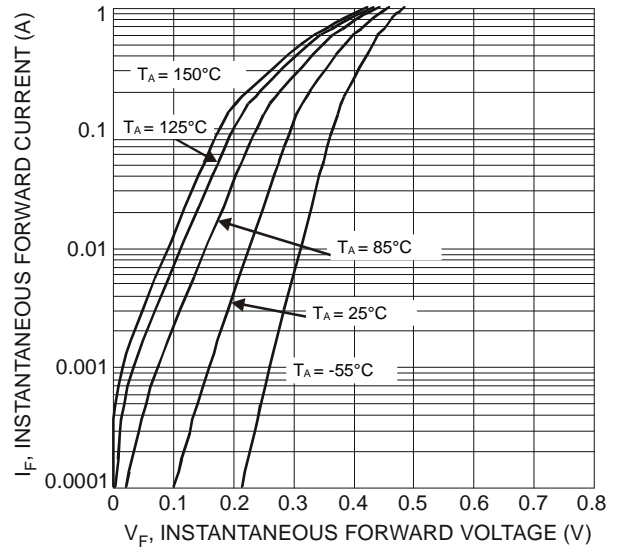


Fig. 12 Typical Forward Characteristics

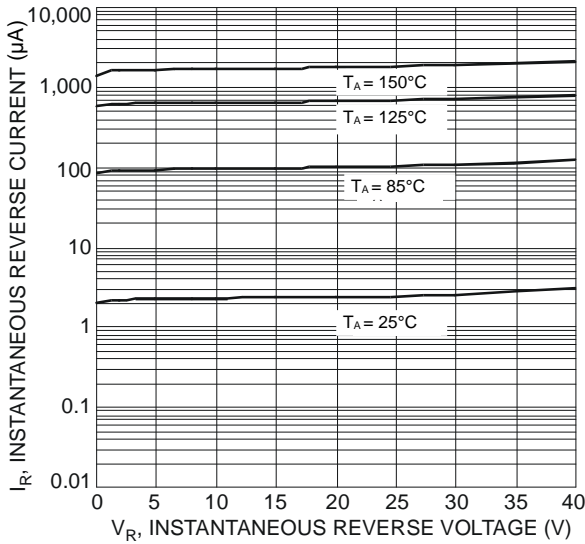


Fig. 13 Typical Reverse Characteristics

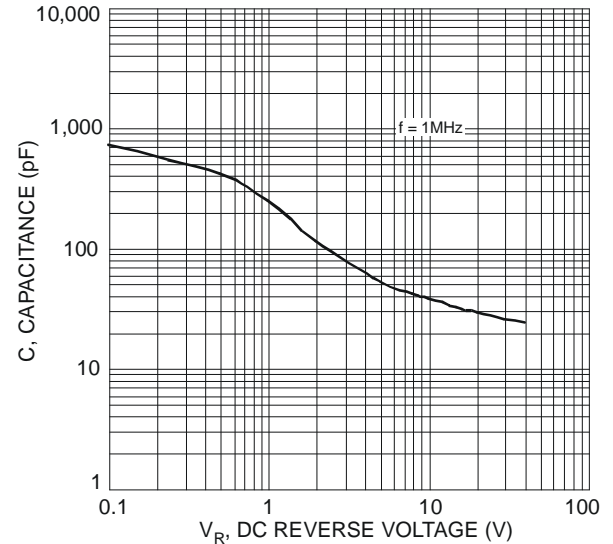


Fig. 14 Total Capacitance vs. Reverse Voltage

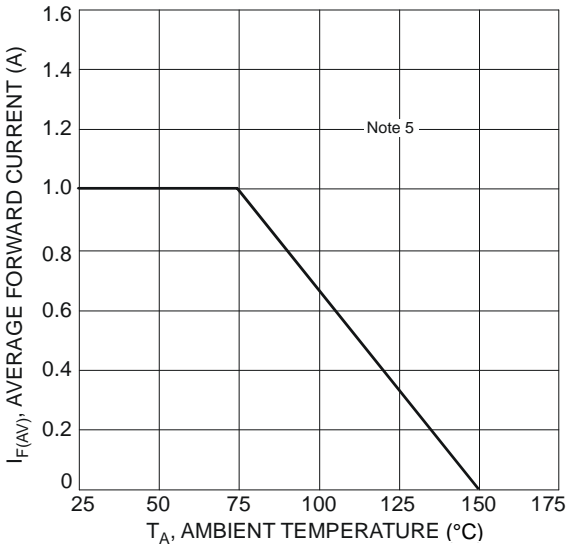


Fig. 15 Forward Current Derating Curve

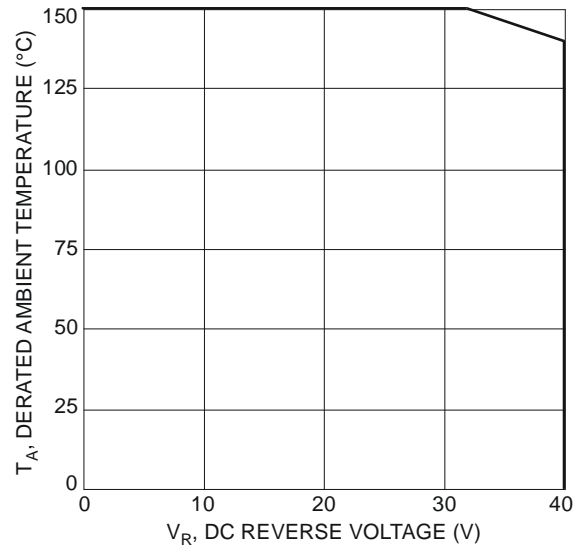
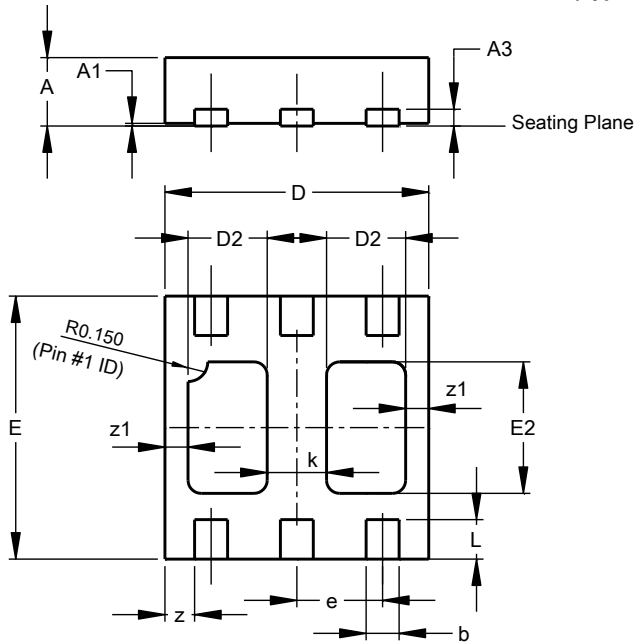


Fig. 16 Operating Temperature Derating

Package Outline Dimensions

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

U-DFN2020-6 (Type B)

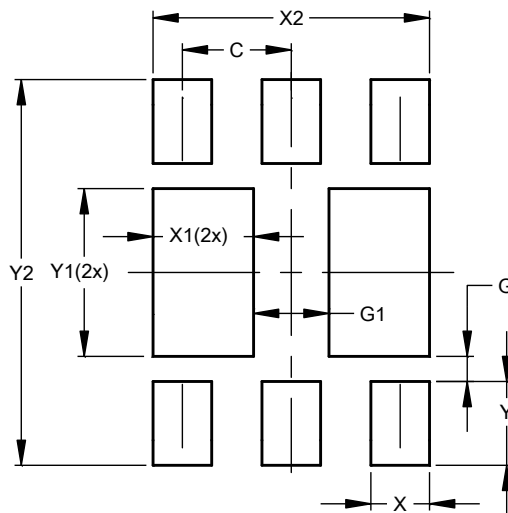


U-DFN2020-6 Type B			
Dim	Min	Max	Typ
A	0.545	0.605	0.575
A1	0.00	0.05	0.02
A3	-	-	0.13
b	0.20	0.30	0.25
D	1.95	2.075	2.00
D2	0.50	0.70	0.60
e	-	-	0.65
E	1.95	2.075	2.00
E2	0.90	1.10	1.00
k	-	-	0.45
L	0.25	0.35	0.30
z	-	-	0.225
z1	-	-	0.175
All Dimensions in mm			

Suggested Pad Layout

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

U-DFN2020-6 (Type B)



Dimensions	Value (in mm)
C	0.650
G	0.150
G1	0.450
X	0.350
X1	0.600
X2	1.650
Y	0.500
Y1	1.000
Y2	2.300

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