

**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/>

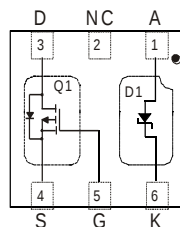
Mechanical Data

- 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)

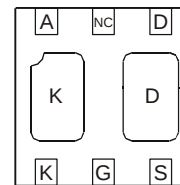
U-DFN2020-6
(Type B)



Bottom View



Top View
Internal Schematic



Bottom View
Pin Configuration

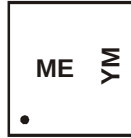
Ordering Information (Note 4)

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

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 - 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.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information

Site 1



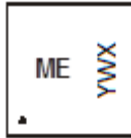
ME = Marking Code
 YM = Date Code Marking
 Y = Year (ex: H = 2020)
 M = Month (ex: 9 = September)
 Dot Denotes Pin 1

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.)

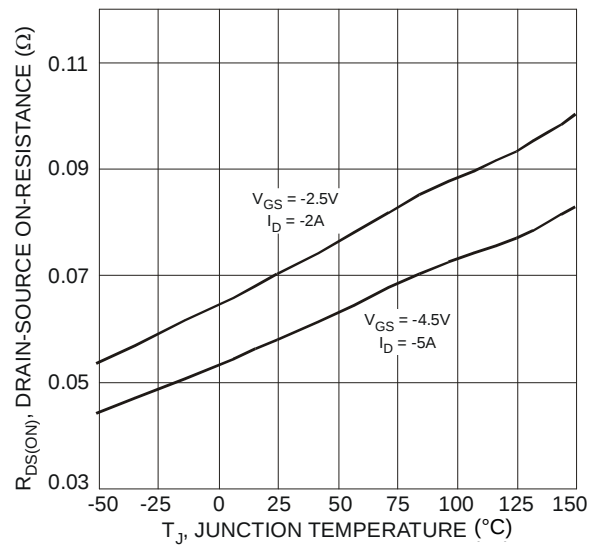
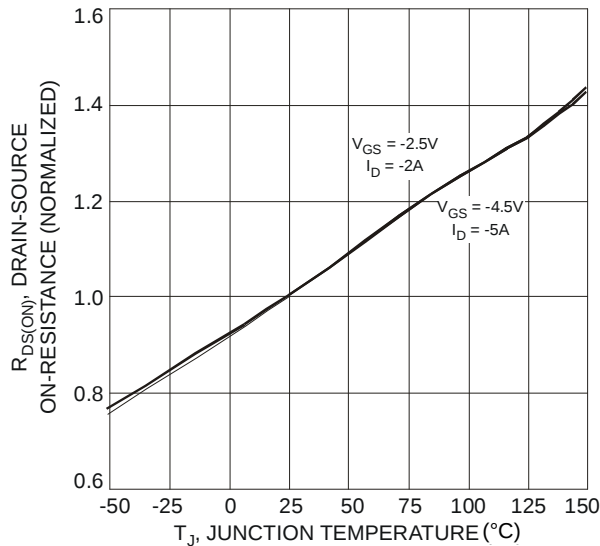
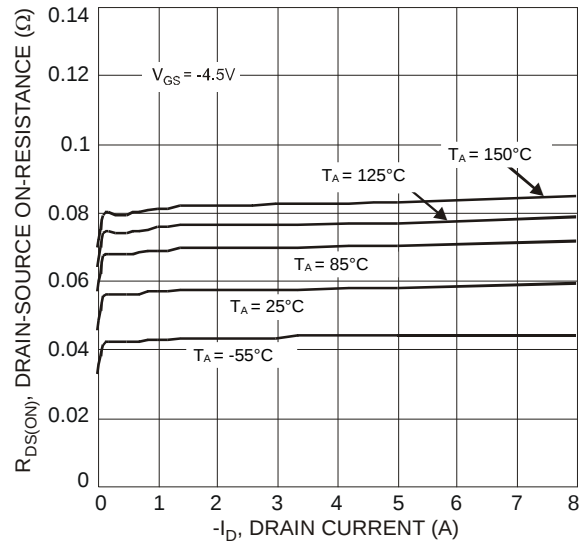
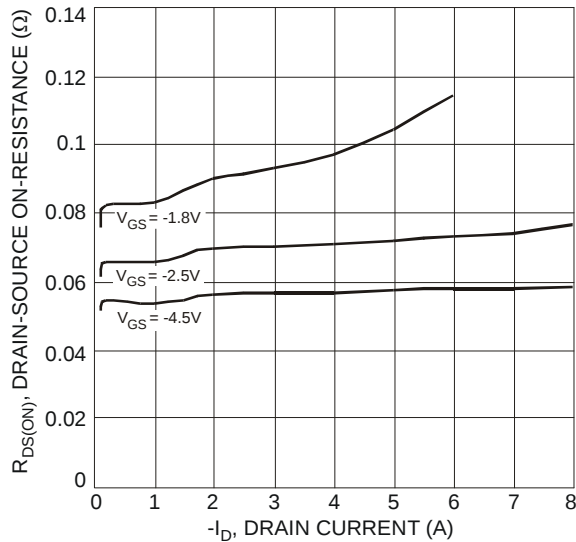
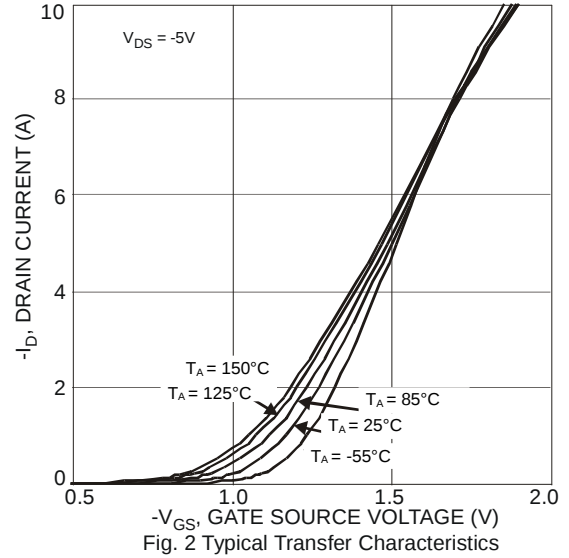
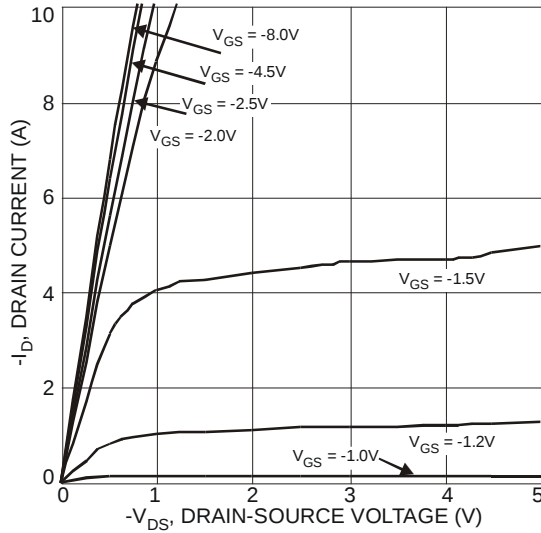
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	-20	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	μA	V _{DS} = -20V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100 ±800	nA	V _{GS} = ±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 _{rss}	—	54	—	pF	

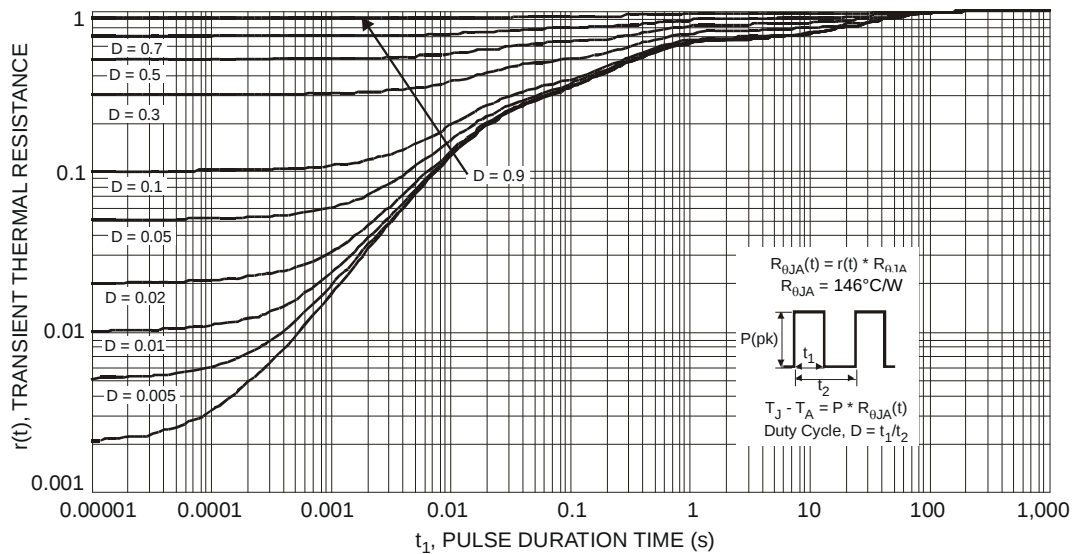
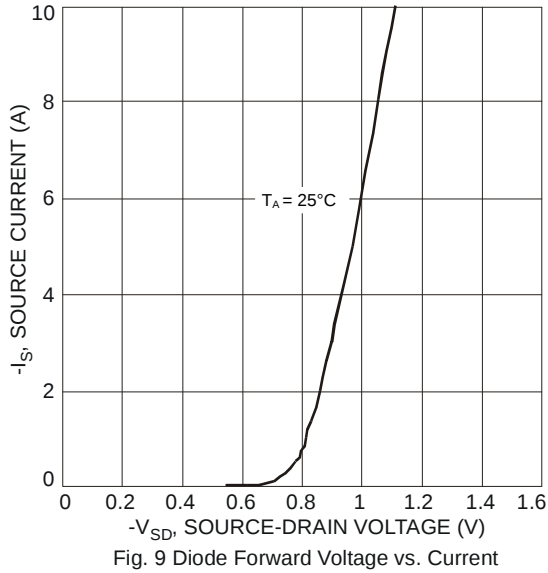
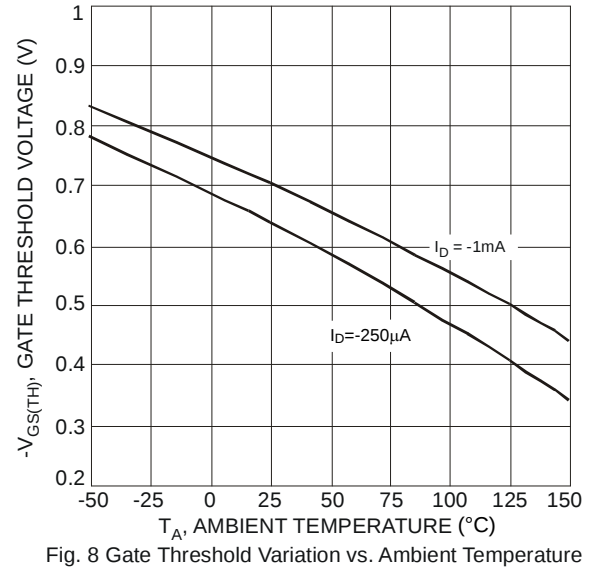
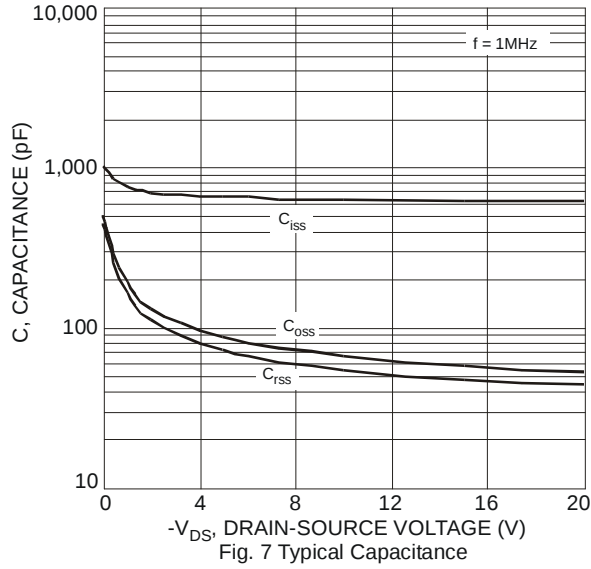
Electrical Characteristics – SBR – D1 (@T_A = +25°C, unless otherwise specified.)

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 0.52	V	I _F = 0.5A I _F = 1.0A
Reverse Current (Note 7)	I _R	—	—	100	μA	V _R = 20V

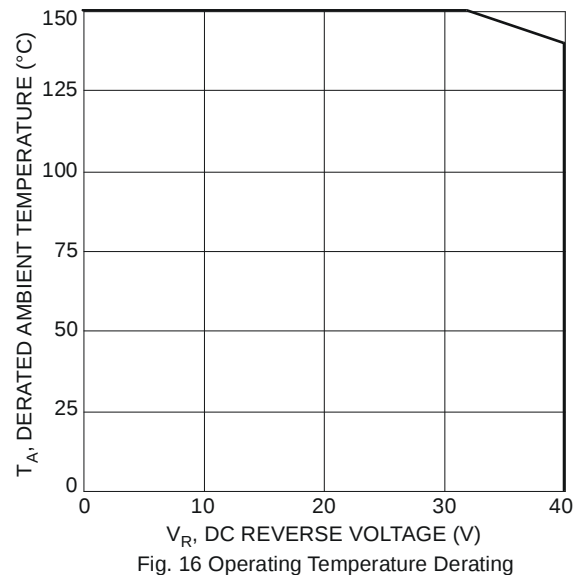
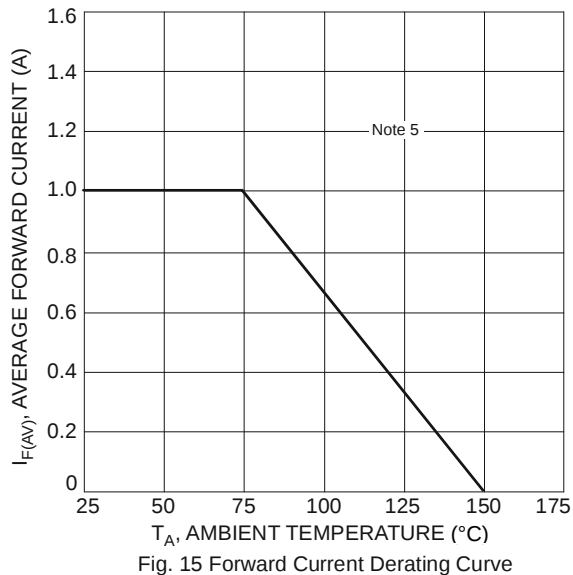
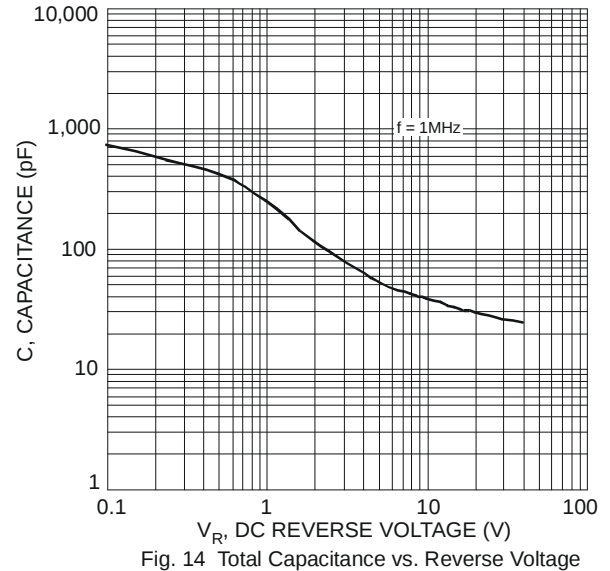
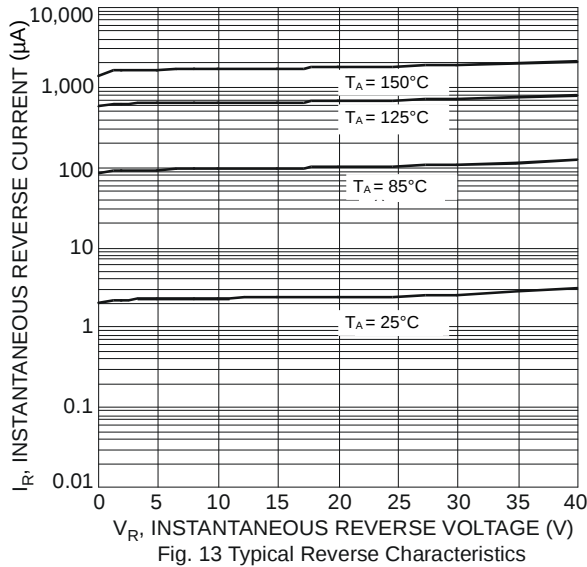
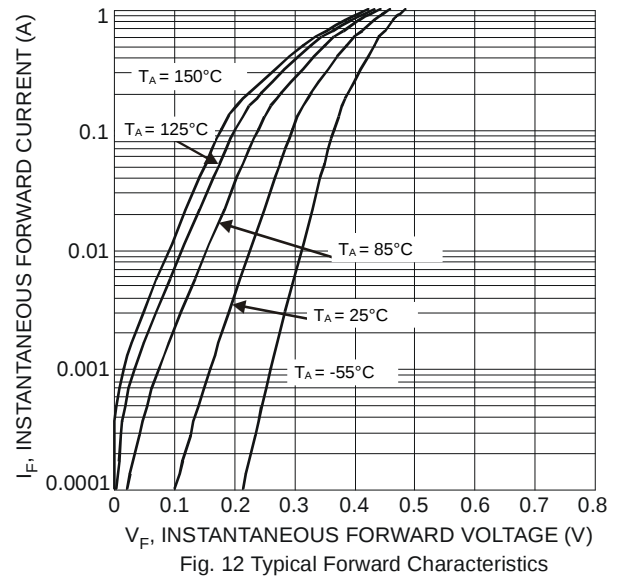
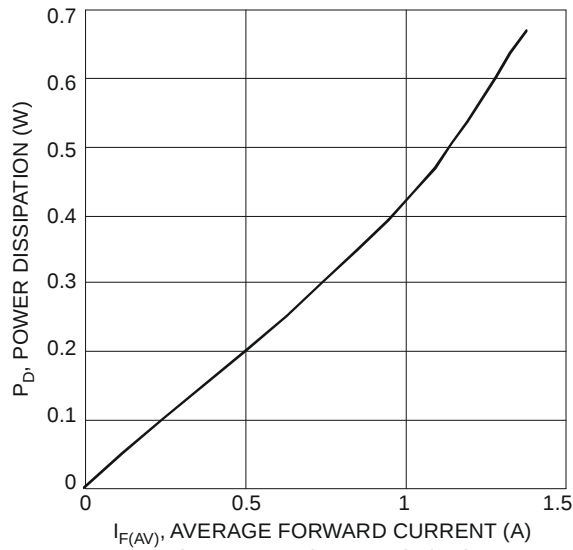
Notes: 5. Device mounted on FR-4 PCB, on minimum recommended, 2oz Copper pad layout.
6. Repetitive rating, pulse width limited by junction temperature.
7. Short duration pulse test used to minimize self-heating effect.

Q1 - P-CHANNEL MOSFET





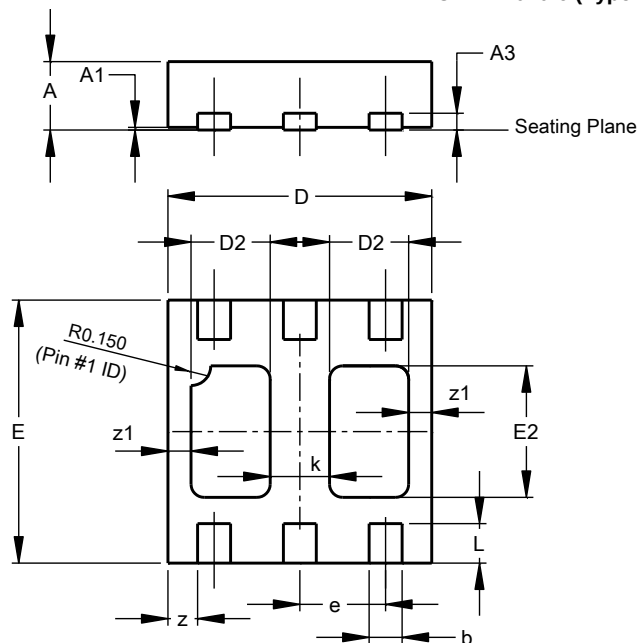
D1 - SBR



Package Outline Dimensions

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

U-DFN2020-6 (Type B)

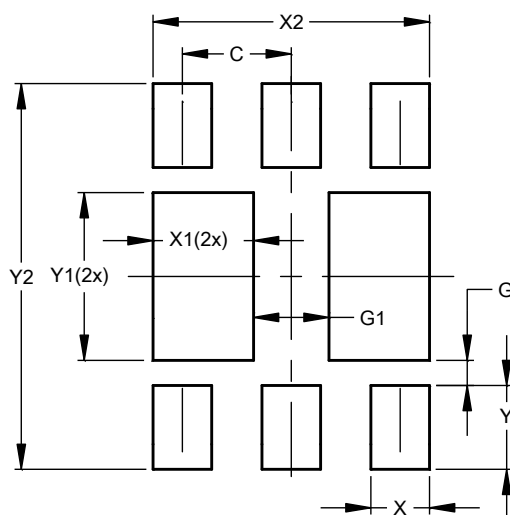


U-DFN2020-6 Type B			
Dim	Min	Max	Typ
A	0.545	0.605	0.575
A1	0.00	0.05	0.02
A3	-	-	0.13
b	0.20	0.30	0.25
D	1.95	2.075	2.00
D2	0.50	0.70	0.60
e	-	-	0.65
E	1.95	2.075	2.00
E2	0.90	1.10	1.00
k	-	-	0.45
L	0.25	0.35	0.30
z	-	-	0.225
z1	-	-	0.175
All Dimensions in mm			

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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