

Features

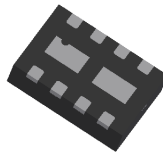
- Low On-Resistance
 - 95mΩ @ $V_{GS} = -4.5V$
 - 120mΩ @ $V_{GS} = -2.5V$
 - 150mΩ (typ) @ $V_{GS} = -1.8V$
- Low Gate Threshold Voltage, -1.3V Max
- Fast Switching Speed
- Low Input/Output Leakage
- Incorporates Low V_F Super Barrier Rectifier (SBR)
- Low Profile, 0.5mm Max Height
- **Lead Free/RoHS Compliant (Note 2)**
- **"Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

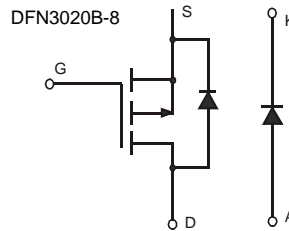
- Case: DFN3020B-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminal Connections: See Diagram
- Terminals: Finish – NiPdAu annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 5
- Ordering Information: See Page 5
- Weight: 0.011 grams (approximate)



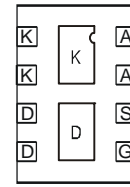
Top View



Bottom View



Equivalent Circuit


 Bottom View
Pin Configuration

Maximum Ratings – TOTAL DEVICE @ $T_A = 25^\circ C$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 1)	P_D	1.5	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	85	$^\circ C/W$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ C$

Maximum Ratings – P-CHANNEL MOSFET – Q1 @ $T_A = 25^\circ C$ unless otherwise specified

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	± 12	V
Drain Current (Note 1)	I_D	-2.9	A
Pulsed Drain Current (Note 4)	I_{DM}	-10	A

Maximum Ratings – SBR – D1 @ $T_A = 25^\circ C$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}		
Working Peak Reverse Voltage	V_{RWM}	40	V
DC Blocking Voltage	V_R		
RMS Reverse Voltage	$V_{R(RMS)}$	28	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

- Notes:
1. Device mounted on FR-4 PCB, on minimum recommended, 2oz Copper pad layout.
 2. No purposefully added lead.
 3. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
 4. Repetitive rating, pulse width limited by junction temperature.

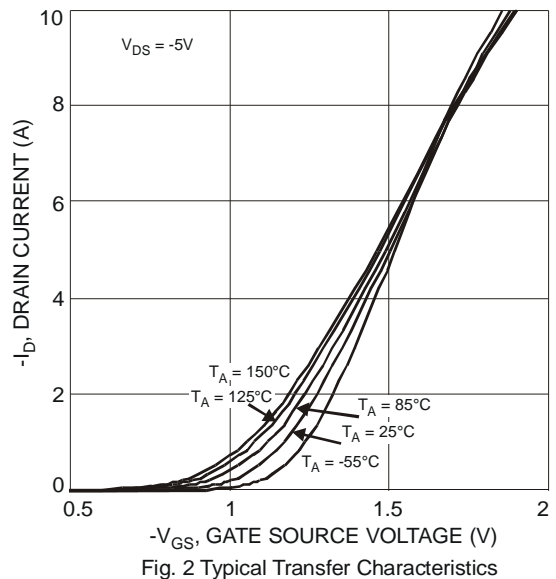
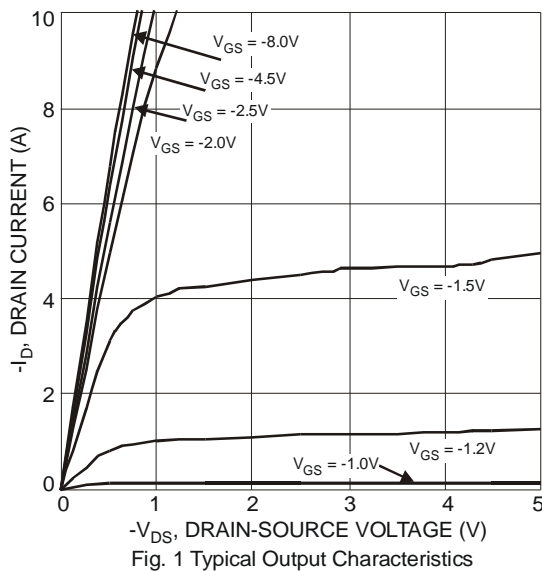
Electrical Characteristics – P-CHANNEL MOSFET – Q1 @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 5)						
Drain-Source Breakdown Voltage	BV_{DSS}	-20	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	μA	$V_{DS} = -20V, V_{GS} = 0V$
Gate-Source Leakage	I_{GSS}	—	—	± 100 ± 800	nA	$V_{GS} = \pm 8V, V_{DS} = 0V$ $V_{GS} = \pm 12V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 5)						
Gate Threshold Voltage	$V_{GS(th)}$	-0.45	—	-1.3	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	70	95	m Ω	$V_{GS} = -4.5V, I_D = -2.8A$
		—	84	120		$V_{GS} = -2.5V, I_D = -2.0A$
		—	100	150		$V_{GS} = -1.8V, I_D = -1.0A$
Forward Transfer Admittance	$ Y_{fs} $	—	8	—	S	$V_{DS} = -5V, I_D = -2.8A$
Diode Forward Voltage (Note 5)	V_{SD}	—	0.42	-1.2	V	$V_{GS} = 0V, I_S = -1.0A$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	—	632	—	pF	$V_{DS} = -10V, V_{GS} = 0V$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	65	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	54	—	pF	

Electrical Characteristics – SBR – D1 @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 5)	$V_{(BR)R}$	40	—	—	V	$I_R = 1\text{mA}$
Forward Voltage	V_F	—	—	0.42	V	$I_F = 0.5A$
		—	—	0.49		$I_F = 1.0A$
Reverse Current (Note 5)	I_R	—	—	30	μA	$V_R = 20V$

Notes: 5. Short duration pulse test used to minimize self-heating effect.

Q1, P-CHANNEL MOSFET


Q1, P-CHANNEL MOSFET - Continued

NEW PRODUCT

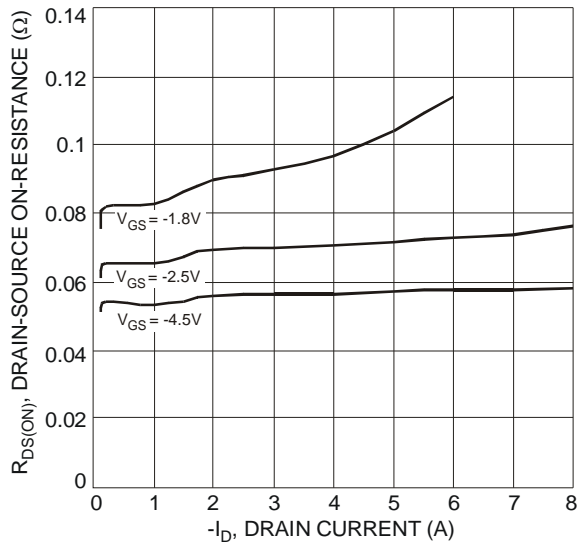


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

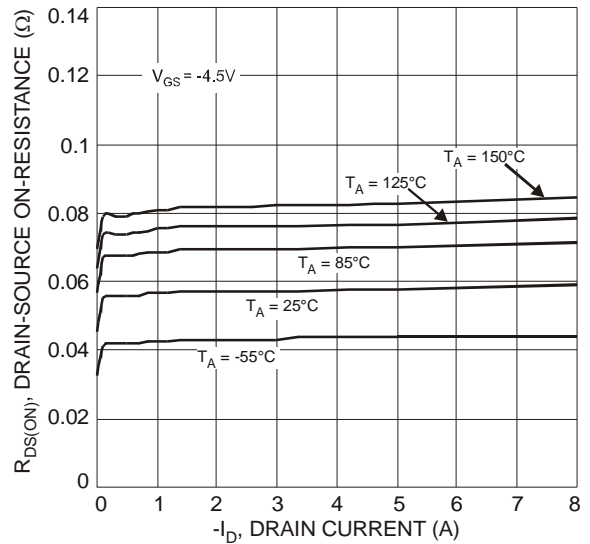


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

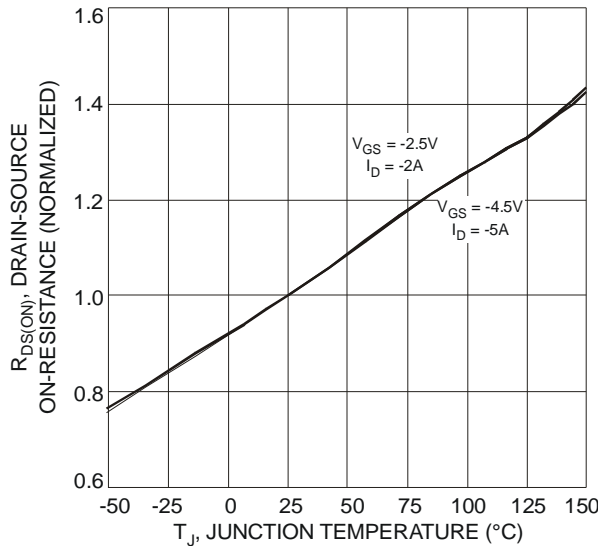


Fig. 5 On-Resistance Variation with Temperature

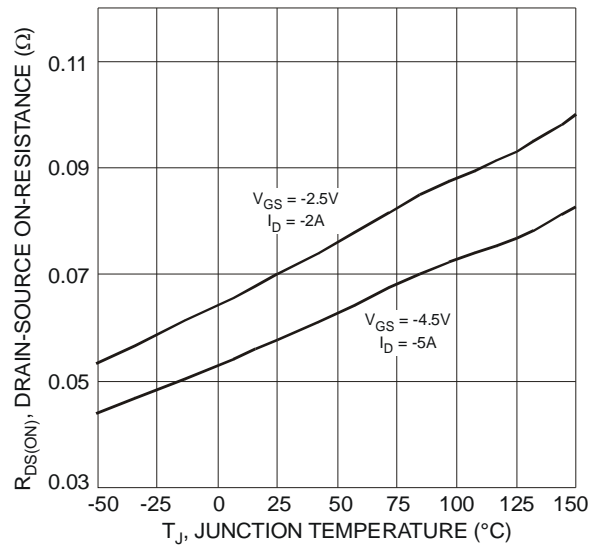


Fig. 6 On-Resistance Variation with Temperature

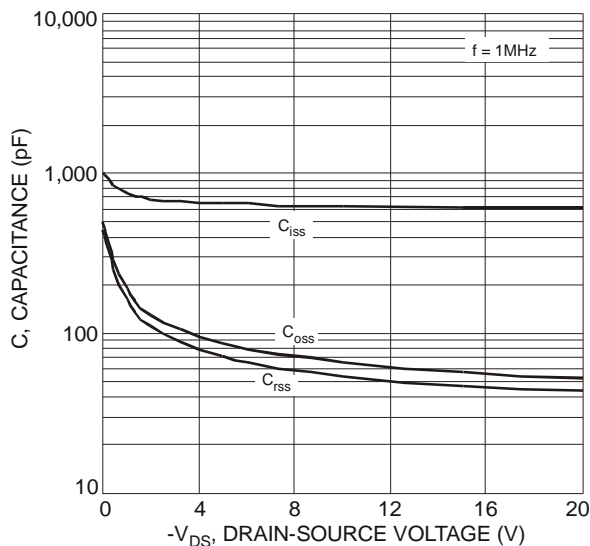


Fig. 7 Typical Capacitance

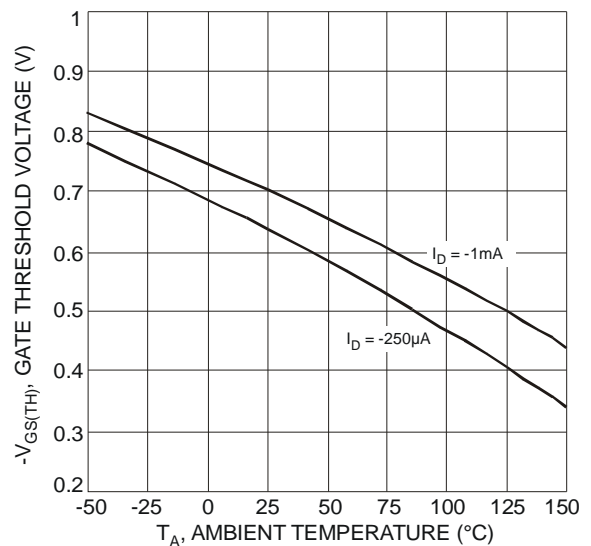


Fig. 8 Gate Threshold Variation vs. Ambient Temperature

Q1, P-CHANNEL MOSFET - Continued

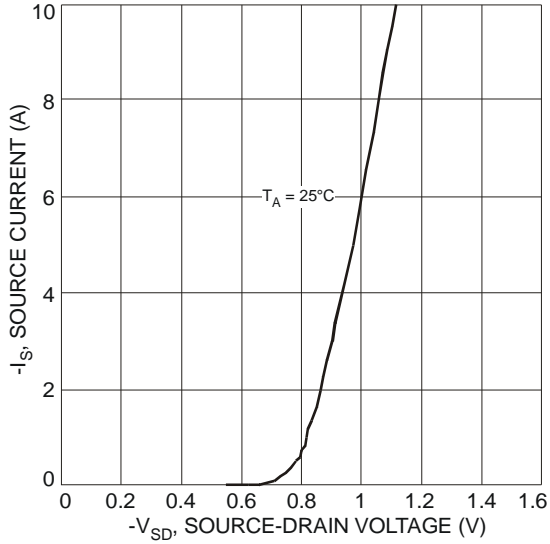


Fig. 9 Diode Forward Voltage vs. Current

D1, SBR

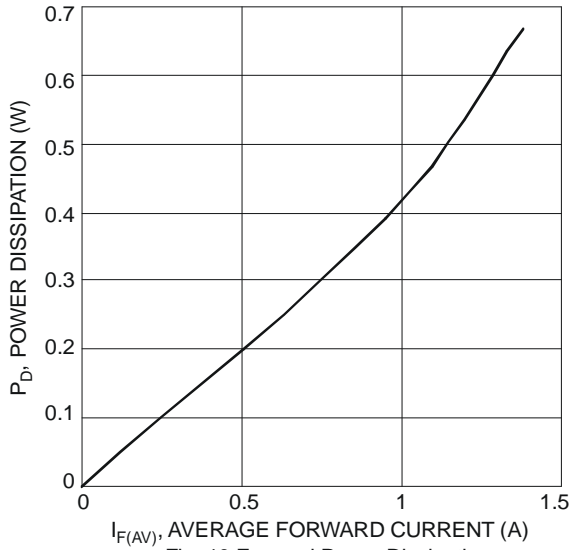


Fig. 10 Forward Power Dissipation

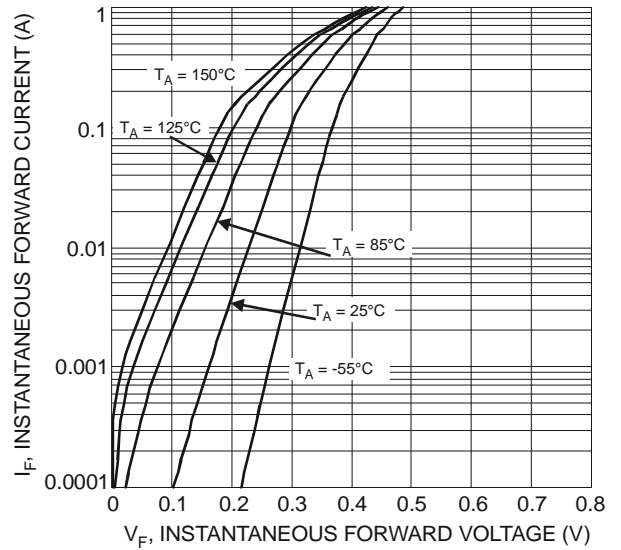


Fig. 11 Typical Forward Characteristics

D1, SBR - Continued

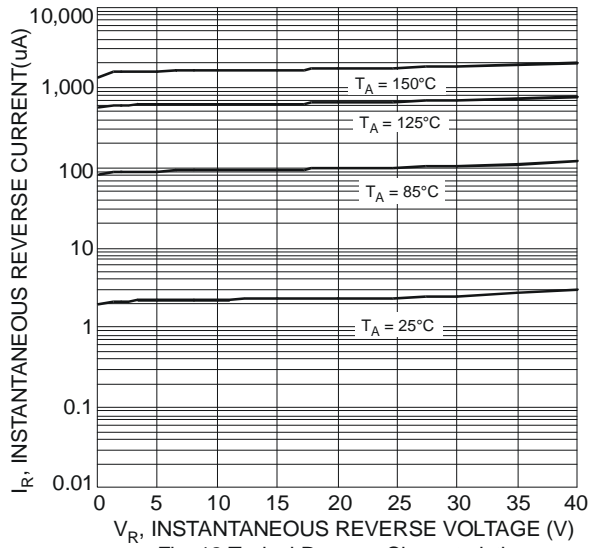


Fig. 12 Typical Reverse Characteristics

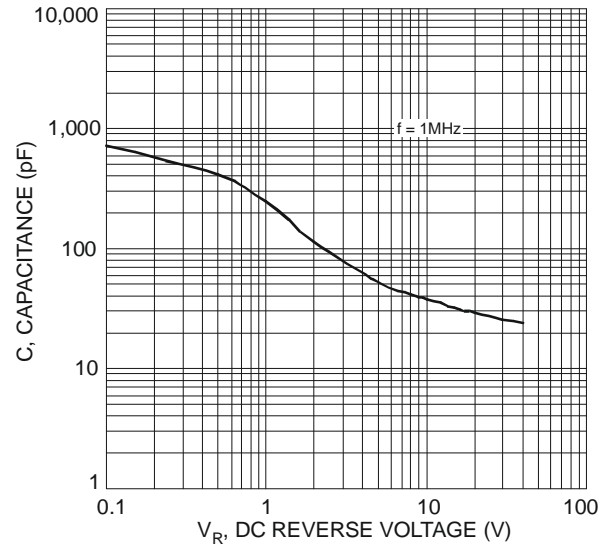


Fig. 13 Total Capacitance vs. Reverse Voltage

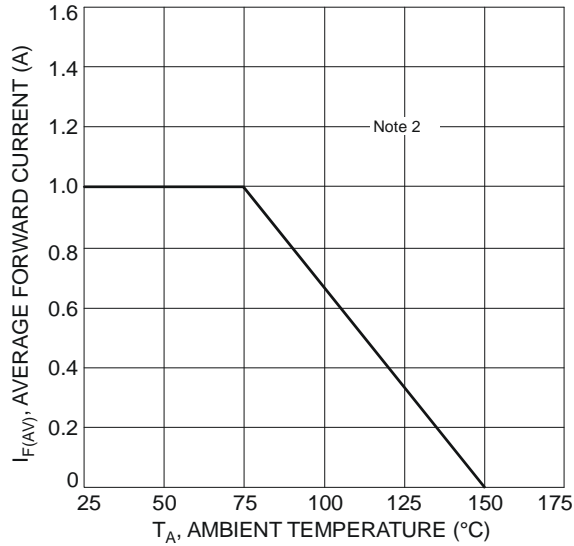


Fig. 14 Forward Current Derating Curve

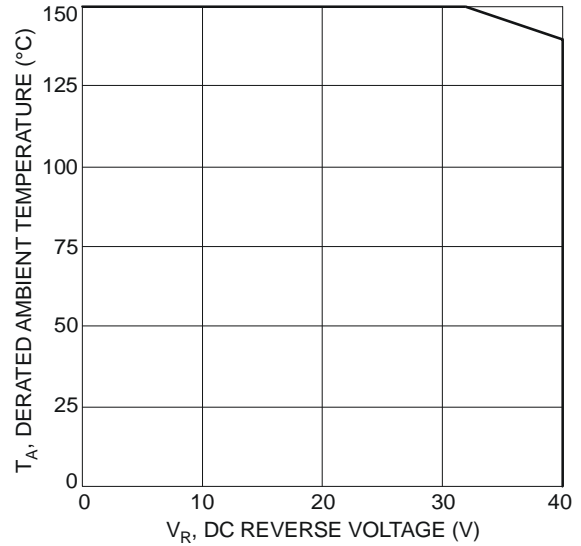


Fig. 15 Operating Temperature Derating

Ordering Information (Note 6)

Part Number	Case	Packaging
DMS2120LFWB-7	DFN3020B-8	3000/Tape & Reel

Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



MF = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: V = 2008)
 M = Month (ex: 9 = September)

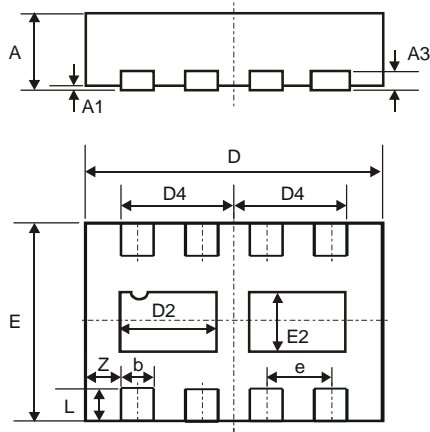
Date Code Key

Year	2008	2009	2010	2011	2012	2013	2014	2015
Code	V	W	X	Y	Z	A	B	C

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

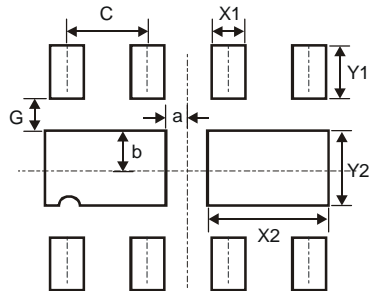
SBR is a registered trademark of Diodes Incorporated.

Package Outline Dimensions



DFN3020B-8			
Dim	Min	Max	Typ
A	0.77	0.83	0.80
A1	0	0.05	0.02
A3	-	-	0.15
b	0.25	0.35	0.30
D	2.95	3.075	3.00
D2	0.82	1.02	0.92
D4	1.01	1.21	1.11
e	-	-	0.65
E	1.95	2.075	2.00
E2	0.43	0.63	0.53
L	0.25	0.35	0.30
Z	-	-	0.375
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
a	0.09
b	0.365
C	0.65
G	0.285
X1	0.4
X2	1.12
Y1	0.5
Y2	0.73

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2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

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