

**Dual P-CHANNEL ENHANCEMENT MODE MOSFET**
**Summary**

$V_{(BR)DSS}$	$R_{DS(on)}$ max	$I_D$ max
-20V	260m $\Omega$ @ $V_{GS} = -4.5V$	-0.9 A
	500m $\Omega$ @ $V_{GS} = -2.5V$	
	1000m $\Omega$ @ $V_{GS} = -1.8V$	

**Description**

This MOSFET is 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**

- Battery Disconnect Switch
- Load Switch for Power Management Functions

**Features**

- Low  $R_{DS(on)}$  – Minimizes Conduction Losses
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- ESD Protected Gate**
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**

**Mechanical Data**

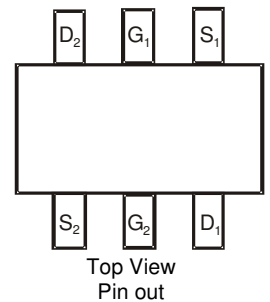
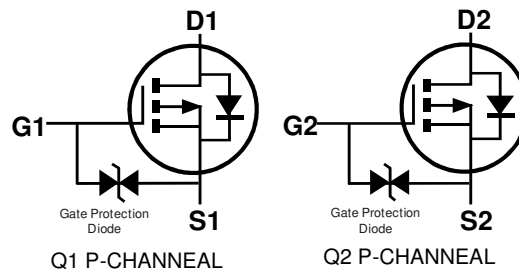
- Case: SOT363
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin Annealed over Alloy 42 Leadframe. Solderable per MIL-STD-202, Method 208  $\text{e3}$
- Weight: 0.006 grams (Approximate)



SOT363



Top View

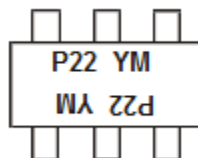

**Ordering Information** (Note 4)

Part Number	Case	Packaging
DMP2200UDW-7	SOT363	3,000/Tape & Reel
DMP2200UDW-13	SOT363	10,000/Tape & Reel

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  - See <http://www.diodes.com> 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 <http://www.diodes.com>.

**Marking Information**

SOT363



P22 = Marking Code  
 YM = Date Code Marking  
 Y or Y = Year (ex: B = 2014)  
 M = Month (ex: 9 = September)

## Date Code Key

Year	2014	2015	2016	2017	2018	2019	2020
Code	B	C	D	E	F	G	H

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	$V_{GSS}$	$\pm 8$	V
Continuous Drain Current (Note 6)	$I_D$	$T_A = +25^\circ\text{C}$	-0.9
		$T_A = +85^\circ\text{C}$	-0.7

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

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	$P_D$	0.45	W
Total Power Dissipation (Note 6)		0.6	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	275	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient (Note 6)		208	
Thermal Resistance, Junction to Case	$R_{\theta JC}$	72	
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	$V_{GS} = 0V, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	-1	$\mu\text{A}$	$V_{DS} = -16V, V_{GS} = 0V$
Gate-Body Leakage	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 8V, V_{DS} = 0V$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	-0.4	—	-1.2	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	180	260	m $\Omega$	$V_{GS} = -4.5V, I_D = -0.88A$
		—	240	500		$V_{GS} = -2.5V, I_D = -0.71A$
		—	320	1,000		$V_{GS} = -1.8V, I_D = -0.20A$
Diode Forward Voltage	$V_{SD}$	—	-0.8	-1.2	V	$V_{GS} = 0V, I_S = -0.48A$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	—	184	—	pF	$V_{DS} = -10V, V_{GS} = 0V$ $f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	26.4	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	18.5	—	pF	
Gate Resistance	$R_g$	—	221	—	$\Omega$	$V_{DS} = V_{GS} = 0V, f = 1.0\text{MHz}$
Total Gate Charge	$Q_g$	—	2.1	—	nC	$V_{GS} = -4.5V, V_{DS} = -10V,$ $I_D = -1.7A$
Gate-Source Charge	$Q_{gs}$	—	0.4	—	nC	
Gate-Drain Charge	$Q_{gd}$	—	0.5	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	9.8	—	ns	$V_{DD} = -10V, I_D = -1.5A,$ $V_{GS} = -4.5V, R_{GEN} = 1\Omega$
Turn-Off Delay Time	$t_{D(OFF)}$	—	24.4	—	ns	
Turn-On Rise Time	$t_r$	—	88	—	ns	
Turn-Off Fall Time	$t_f$	—	45	—	ns	

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

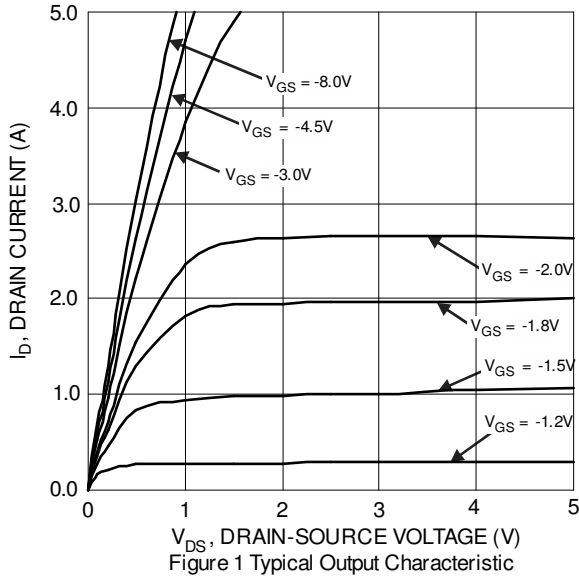


Figure 1 Typical Output Characteristic

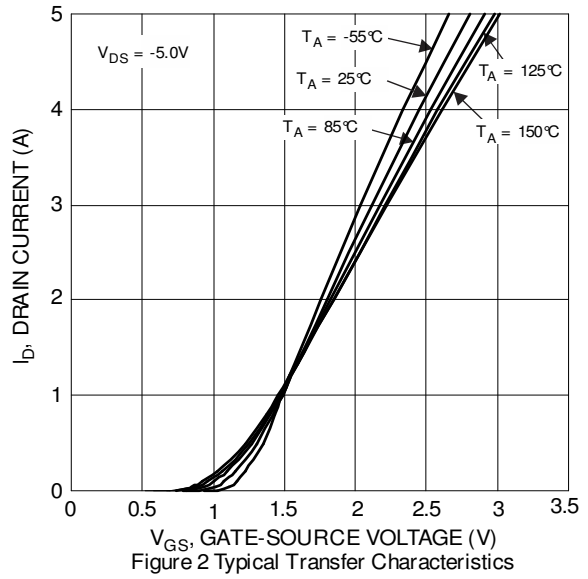


Figure 2 Typical Transfer Characteristics

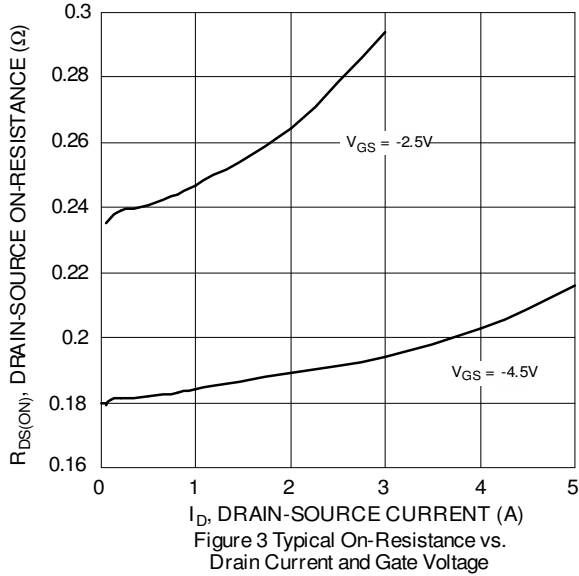


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

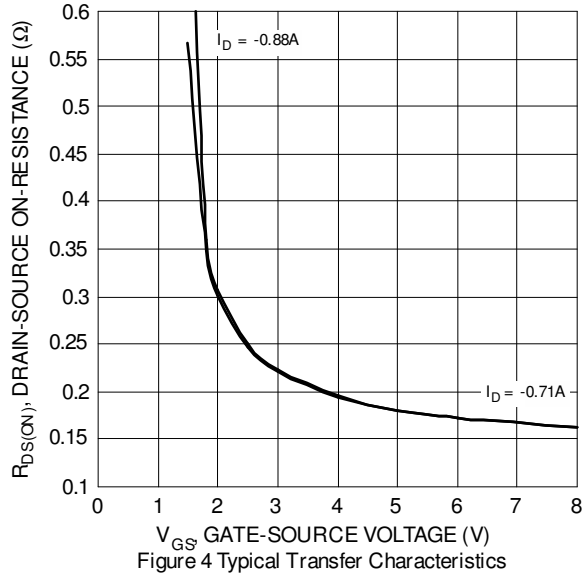


Figure 4 Typical Transfer Characteristics

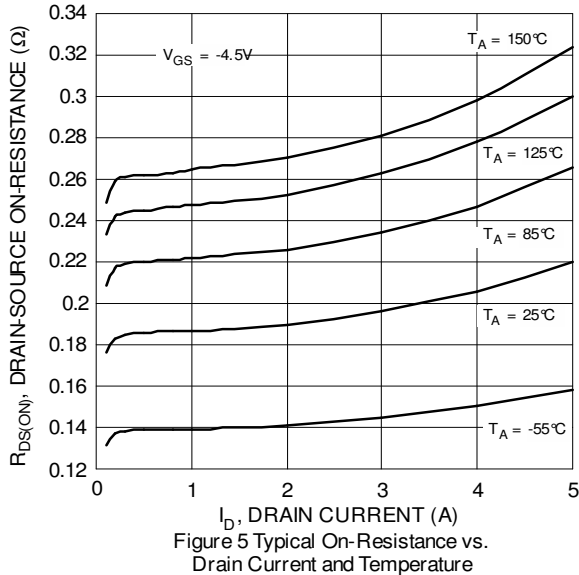


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

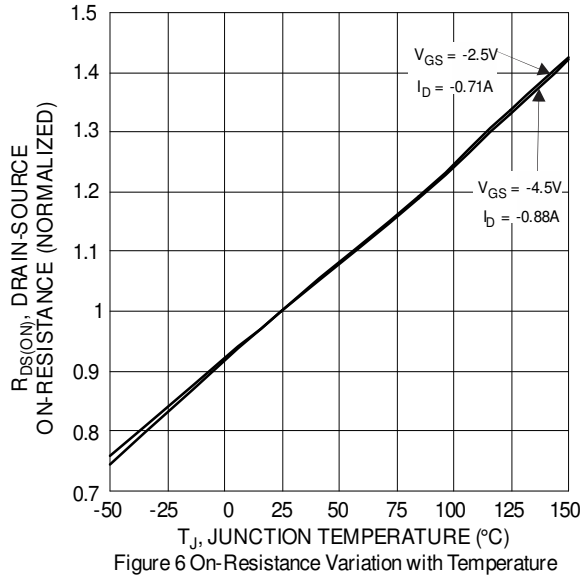


Figure 6 On-Resistance Variation with Temperature

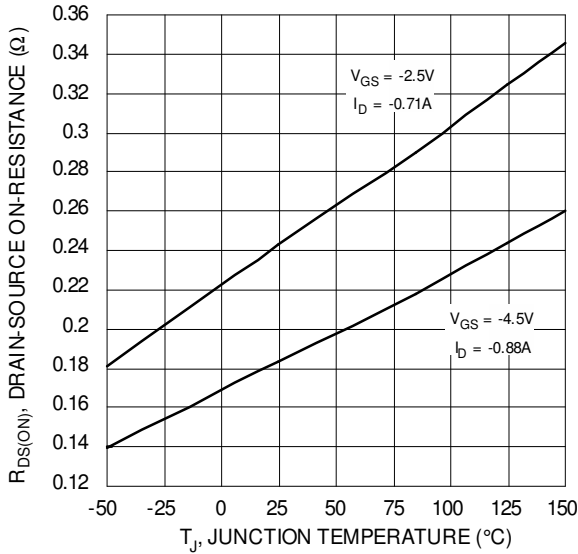


Figure 7 On-Resistance Variation with Temperature

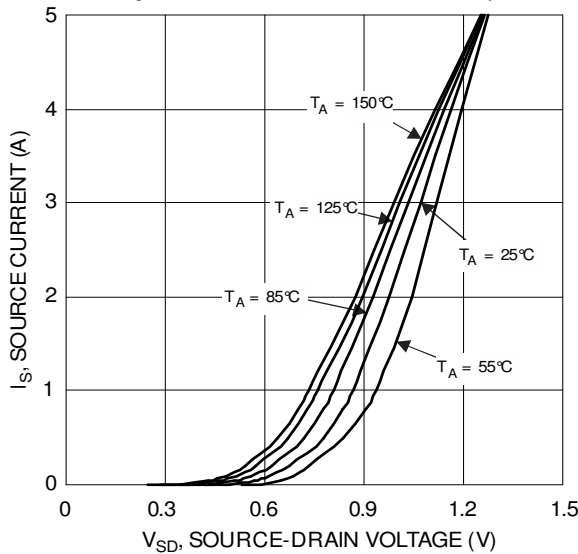


Figure 9 Diode Forward Voltage vs. Current

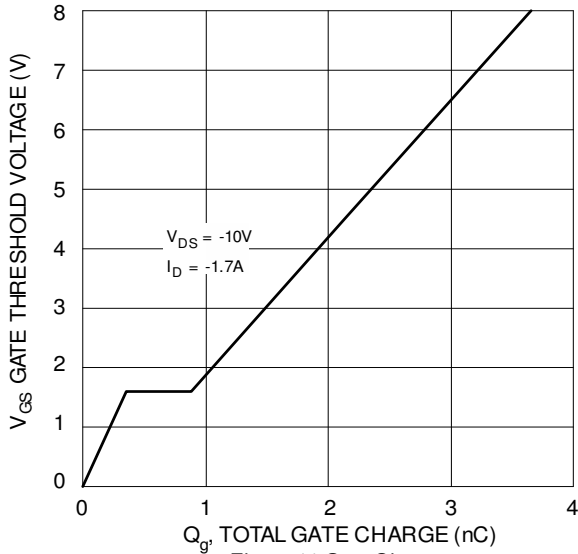


Figure 11 Gate Charge

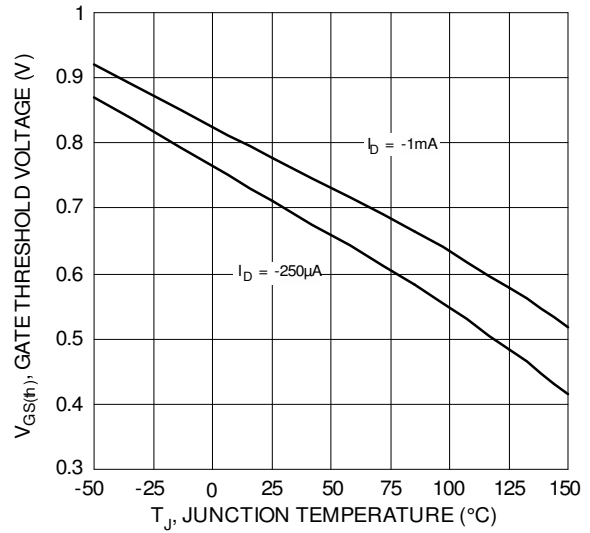


Figure 8 Gate Threshold Variation vs. Junction Temperature

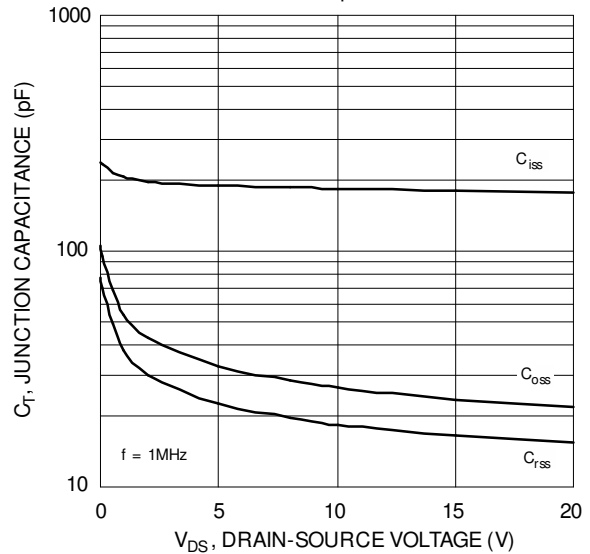


Figure 10 Typical Junction Capacitance

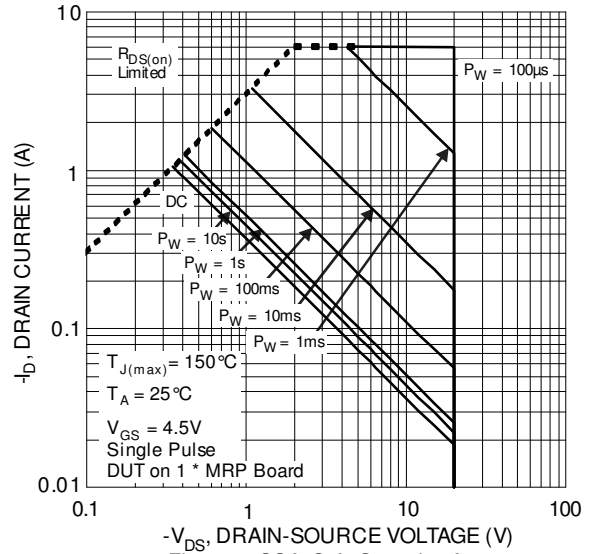
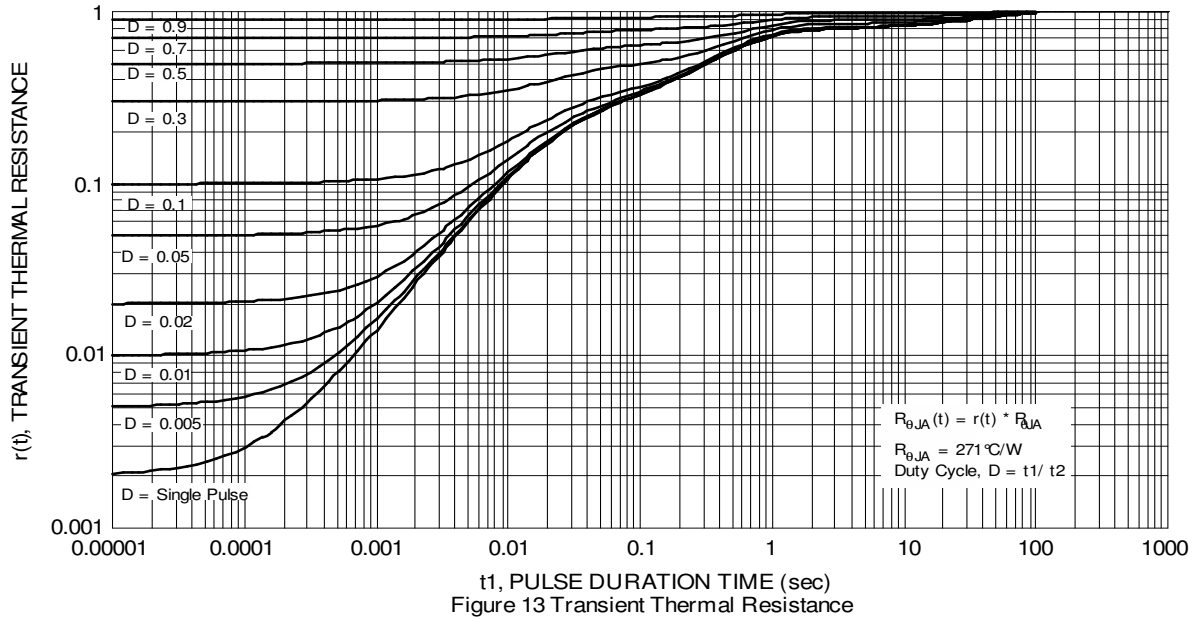
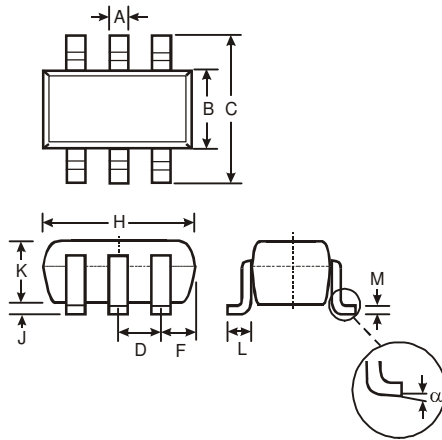


Figure 12 SOA, Safe Operation Area



**Package Outline Dimensions**

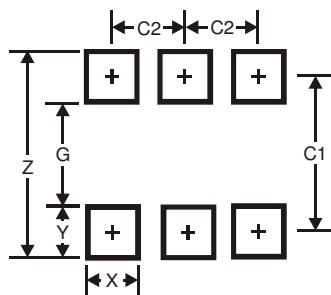
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT363			
Dim	Min	Max	Typ
A	0.10	0.30	0.25
B	1.15	1.35	1.30
C	2.00	2.20	2.10
D	0.65 Typ		
F	0.40	0.45	0.425
H	1.80	2.20	2.15
J	0	0.10	0.05
K	0.90	1.00	1.00
L	0.25	0.40	0.30
M	0.10	0.22	0.11
α	0°	8°	-
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
Z	2.5
G	1.3
X	0.42
Y	0.6
C1	1.9
C2	0.65

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