

**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**

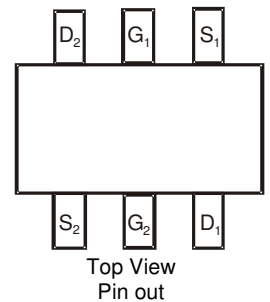
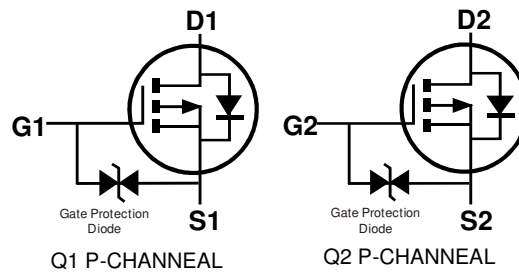
- Case: SOT363
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin Annealed over Alloy 42 Leadframe. Solderable per MIL-STD-202, Method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



SOT363



Top View

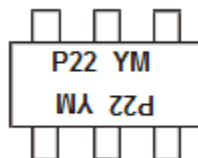

**Ordering Information** (Note 4)

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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V <sub>DSS</sub>	-20	V
Gate-Source Voltage	V <sub>GSS</sub>	±8	V
Continuous Drain Current (Note 6)	I <sub>D</sub>	T <sub>A</sub> = +25°C	-0.9
		T <sub>A</sub> = +85°C	-0.7

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P <sub>D</sub>	0.45	W
Total Power Dissipation (Note 6)		0.6	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	275	°C/W
Thermal Resistance, Junction to Ambient (Note 6)		208	
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	72	
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-20	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-1	μA	V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V
Gate-Body Leakage	I <sub>GSS</sub>	—	—	±10	μA	V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	-0.4	—	-1.2	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	180	260	mΩ	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -0.88A
			240	500		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -0.71A
			320	1,000		V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -0.20A
Diode Forward Voltage	V <sub>SD</sub>	—	-0.8	-1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -0.48A
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>ISS</sub>	—	184	—	pF	V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>OSS</sub>	—	26.4	—	pF	
Reverse Transfer Capacitance	C <sub>RSS</sub>	—	18.5	—	pF	
Gate Resistance	R <sub>g</sub>	—	221	—	Ω	V <sub>DS</sub> = V <sub>GS</sub> = 0V, f = 1.0MHz
Total Gate Charge	Q <sub>g</sub>	—	2.1	—	nC	V <sub>GS</sub> = -4.5V, V <sub>DS</sub> = -10V, I <sub>D</sub> = -1.7A
Gate-Source Charge	Q <sub>gs</sub>	—	0.4	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	0.5	—	nC	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	9.8	—	ns	V <sub>DD</sub> = -10V, I <sub>D</sub> = -1.5A, V <sub>GS</sub> = -4.5V, R <sub>GEN</sub> = 1Ω
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	24.4	—	ns	
Turn-On Rise Time	t <sub>r</sub>	—	88	—	ns	
Turn-Off Fall Time	t <sub>f</sub>	—	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.

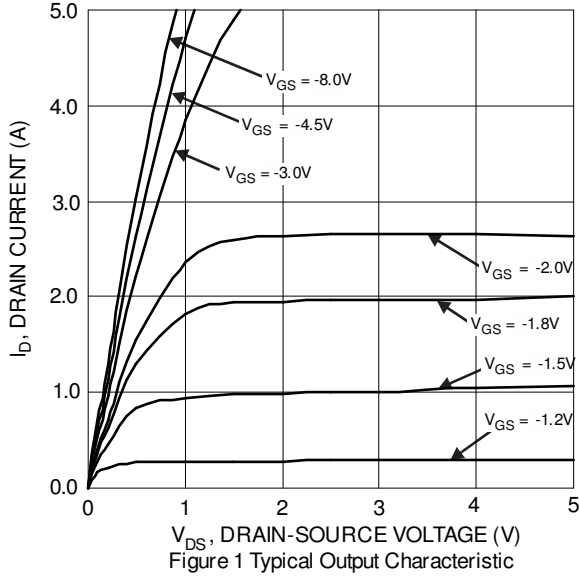


Figure 1 Typical Output Characteristic

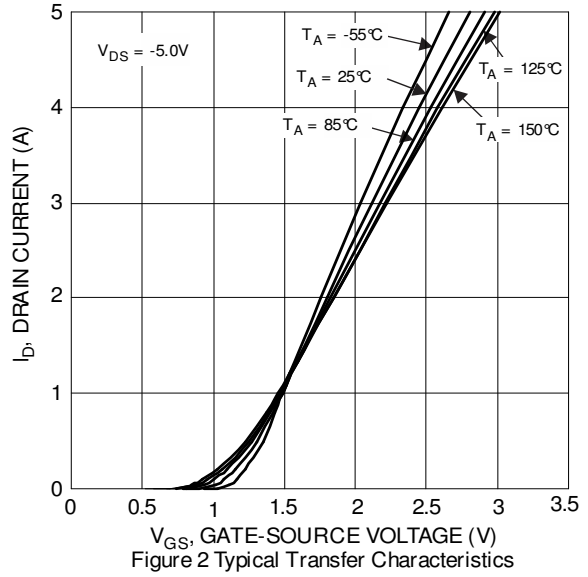


Figure 2 Typical Transfer Characteristics

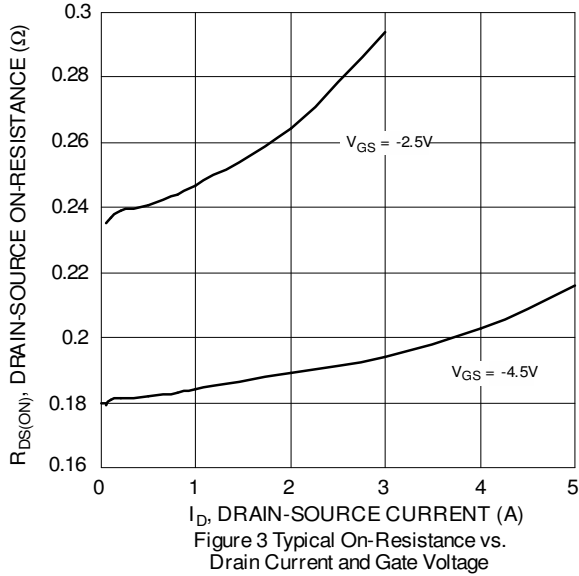


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

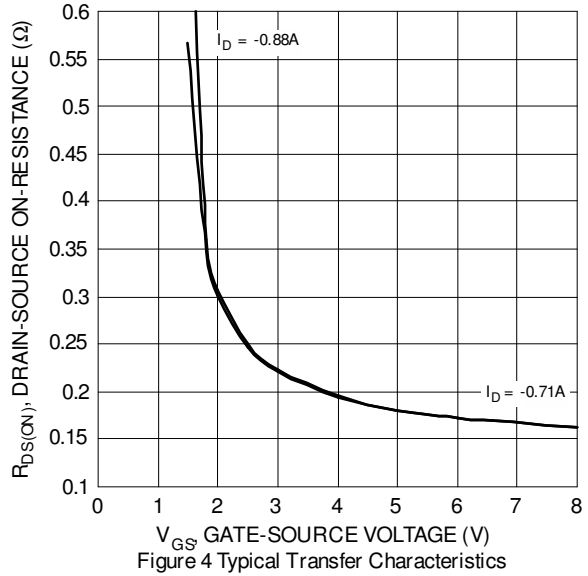


Figure 4 Typical Transfer Characteristics

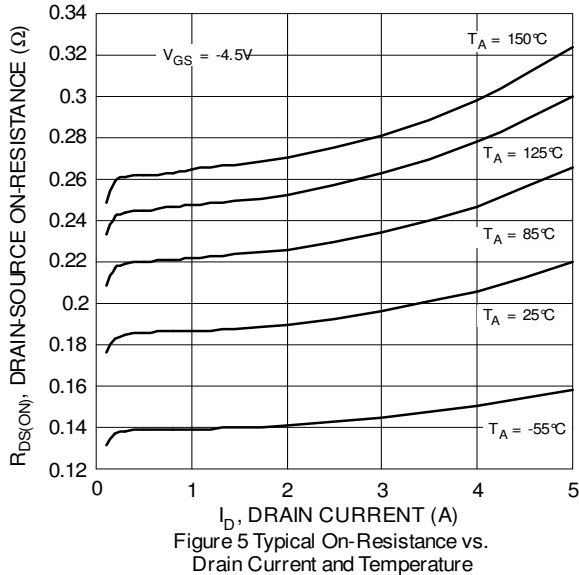


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

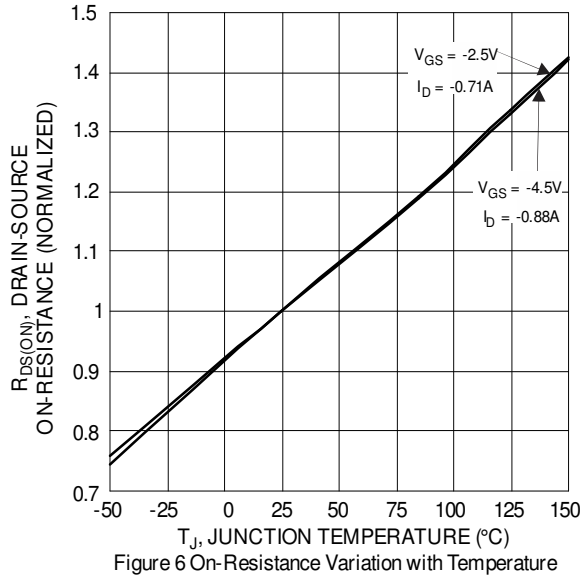


Figure 6 On-Resistance Variation with Temperature

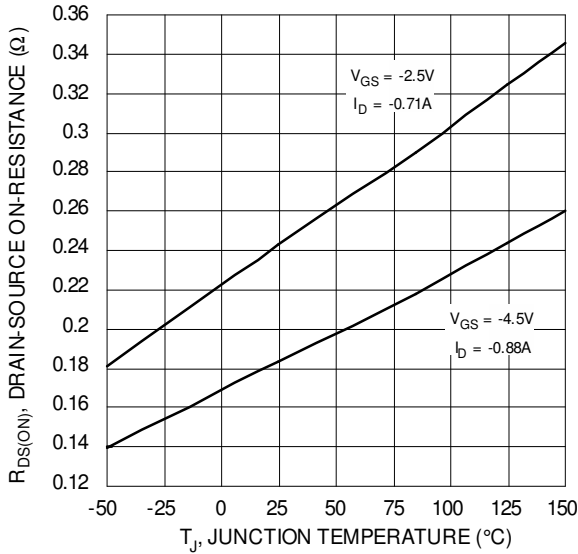


Figure 7 On-Resistance Variation with Temperature

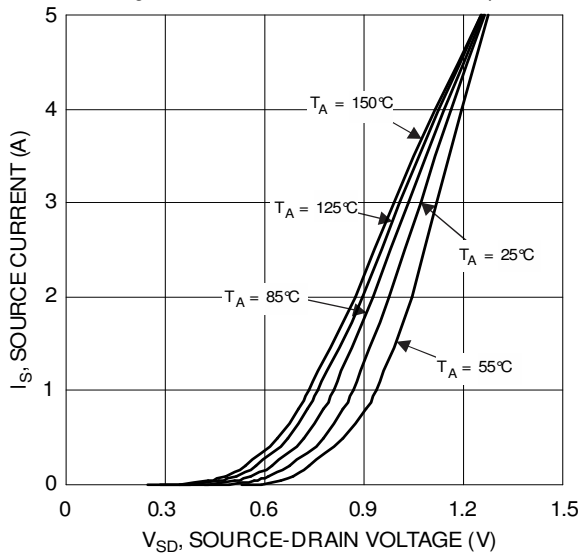


Figure 9 Diode Forward Voltage vs. Current

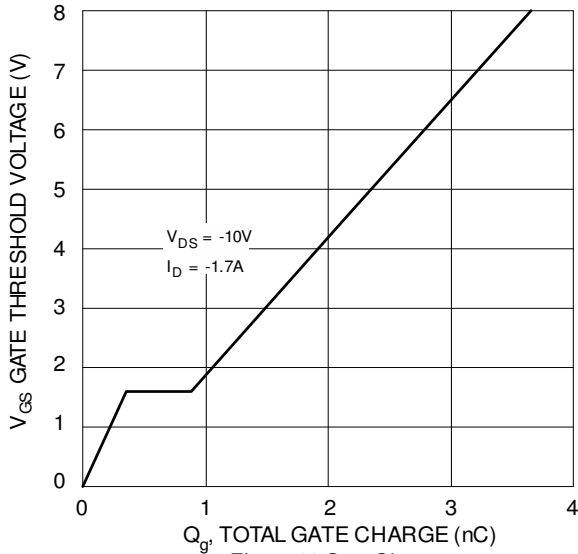


Figure 11 Gate Charge

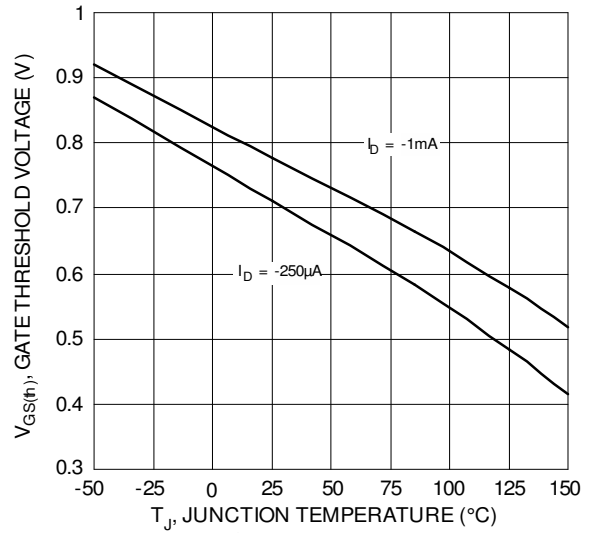


Figure 8 Gate Threshold Variation vs. Junction Temperature

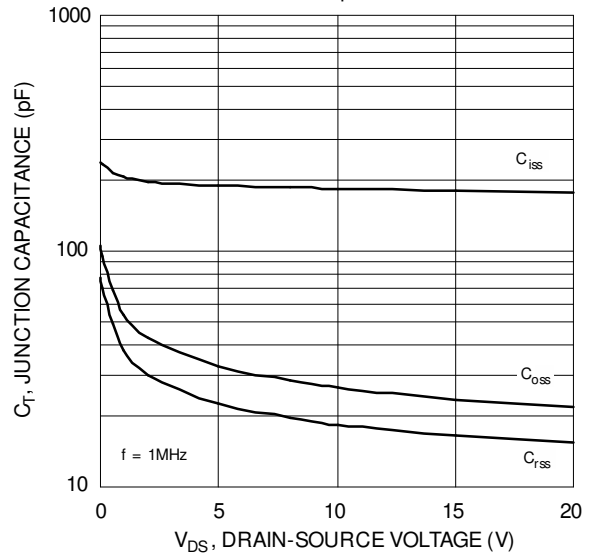


Figure 10 Typical Junction Capacitance

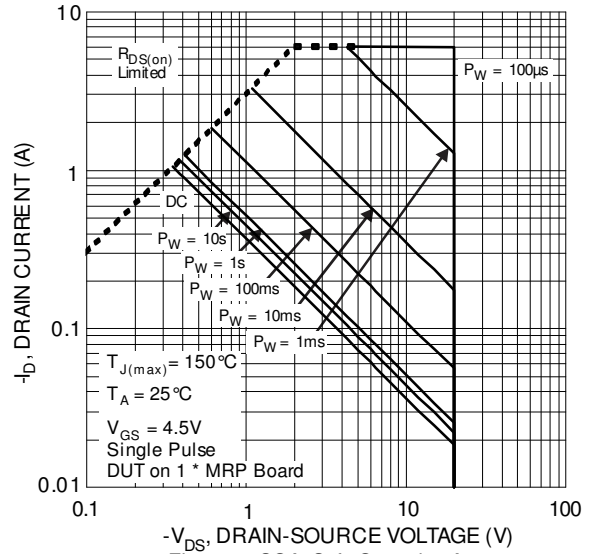
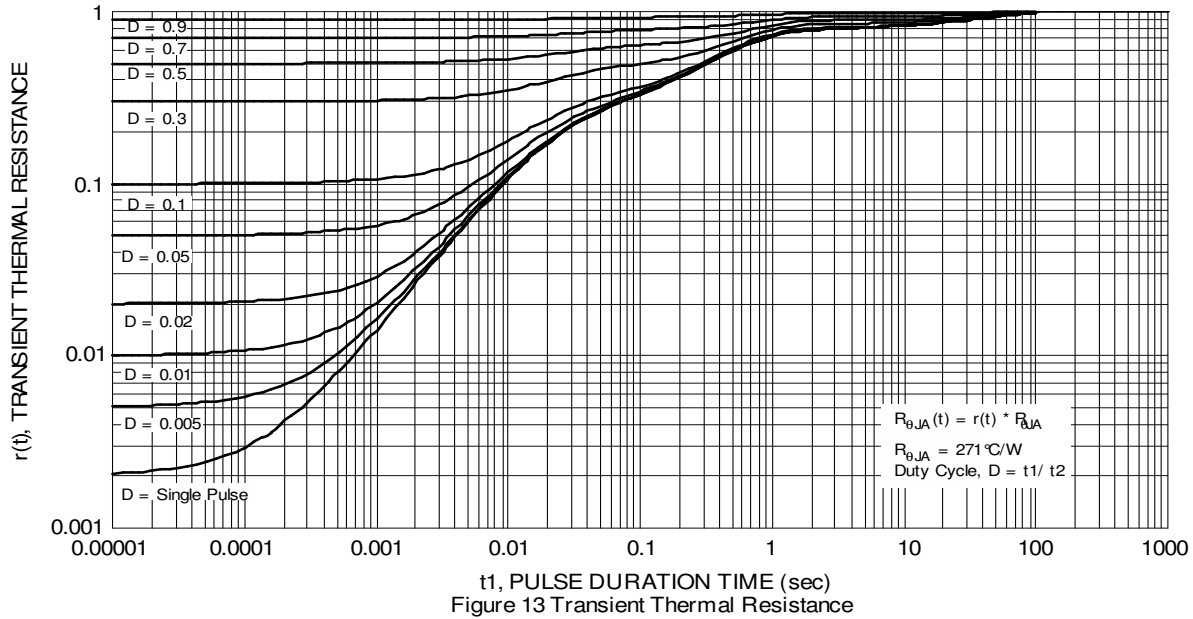
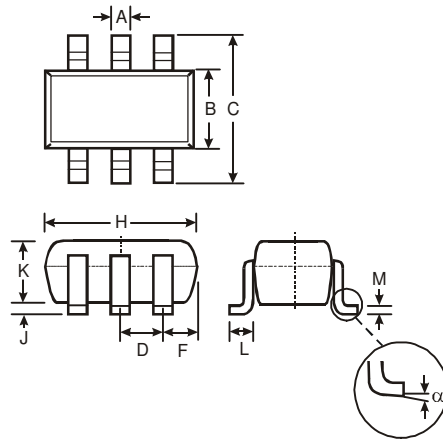


Figure 12 SOA, Safe Operation Area



**Package Outline Dimensions**

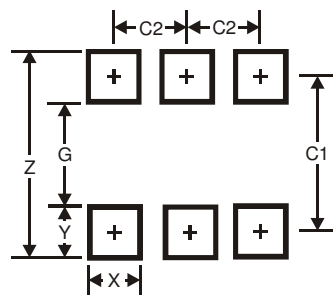
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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