

**30V DUAL N-CANNEL ENHANCEMENT MODE MOSFET**

**Product Summary**

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	$I_D$ max $T_A = +25^\circ C$
30V	22m $\Omega$ @ $V_{GS} = 10V$	6.7A
	30m $\Omega$ @ $V_{GS} = 4.5V$	5.2A

**Description**

This MOSFET has been 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**

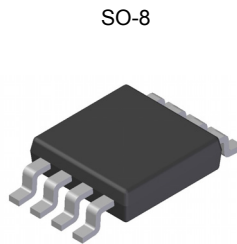
- Backlighting
- Power Management Functions
- DC-DC Converters

**Features**

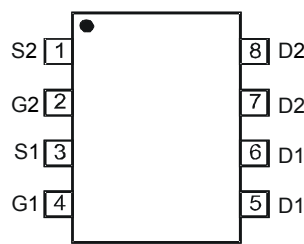
- Low On-Resistance
- 100% UIS (Avalanche) Rated
- **ESD Protected Gate**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**Mechanical Data**

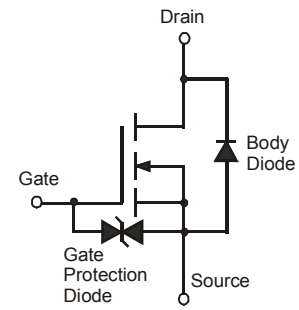
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.008 grams (approximate)



Top View



Top View  
Pin Configuration



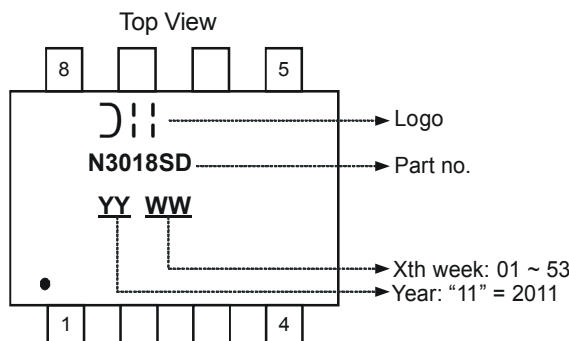
Equivalent Circuit per Element

**Ordering Information** (Note 4)

Part Number	Case	Packaging
DMN3018SSD-13	SO-8	2500/Tape & Reel

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

**Marking Information**



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

Characteristic	Symbol	Value	Units	
Drain-Source Voltage	$V_{DSS}$	30	V	
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V	
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$	6.7	A
		$T_A = +70^\circ\text{C}$	5.3	A
	$t < 10\text{s}$	$T_A = +25^\circ\text{C}$	8.7	A
		$T_A = +70^\circ\text{C}$	6.9	A
Pulsed Drain Current (10 $\mu\text{s}$ pulse, duty cycle = 1%)	$I_{DM}$	60	A	
Maximum Body Diode continuous Current	$I_S$	2.0	A	
Avalanche Current (Note 6) $L = 0.1\text{mH}$	$I_{AR}$	19	A	
Repetitive Avalanche Energy (Note 6) $L = 0.1\text{mH}$	$E_{AR}$	18	mJ	

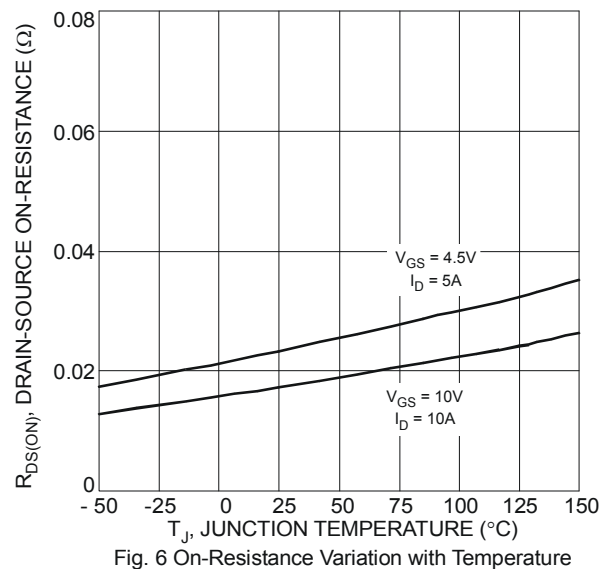
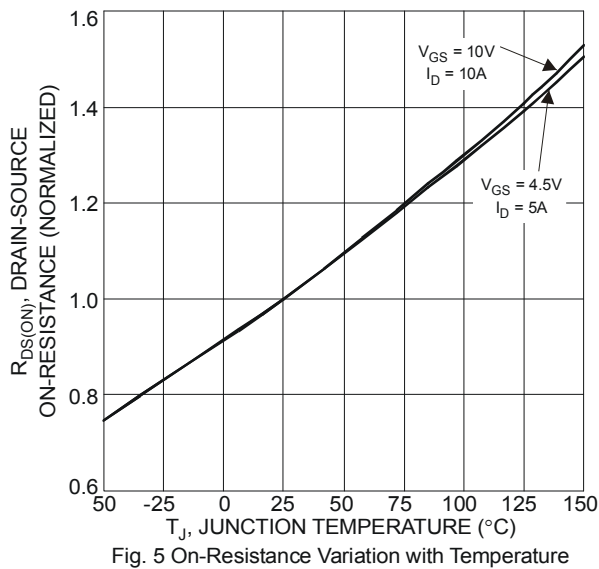
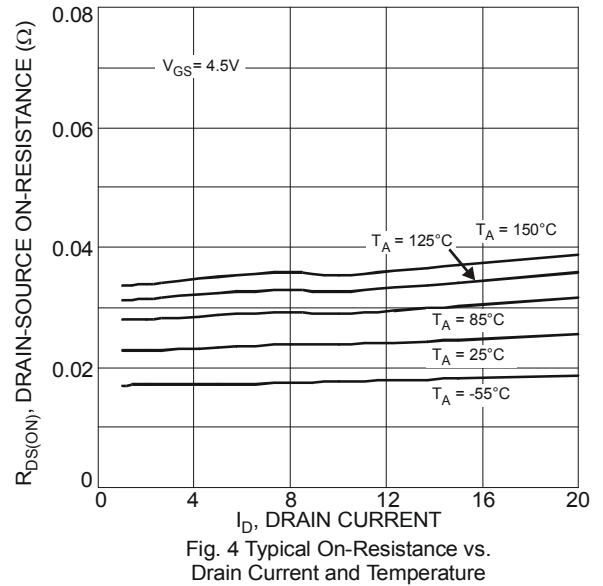
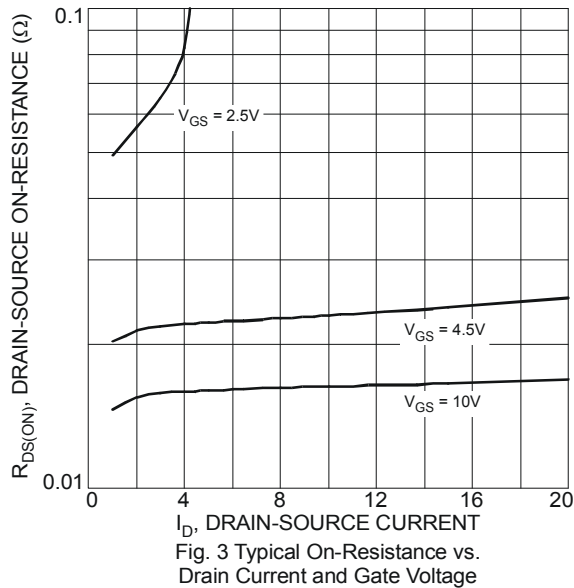
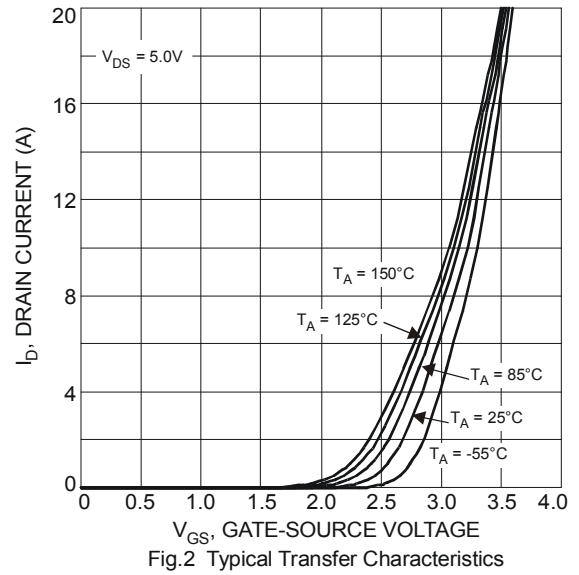
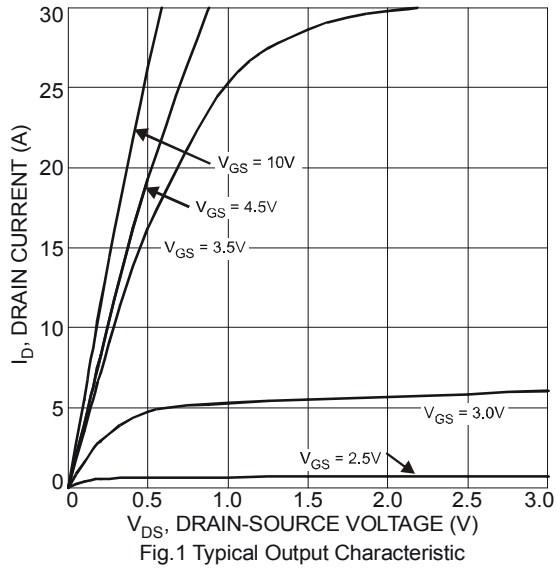
**Thermal Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Units	
Total Power Dissipation (Note 5)	$P_D$	1.5	W	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	$R_{\theta JA}$	83	$^\circ\text{C/W}$
		$t < 10\text{s}$	50	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case (Note 5)	$R_{\theta JC}$	14.5	$^\circ\text{C/W}$	
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	$BV_{DSS}$	30	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 24\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	1	1.7	2.1	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	16	22	m $\Omega$	$V_{GS} = 10\text{V}, I_D = 10\text{A}$
		—	23	30		$V_{GS} = 4.5\text{V}, I_D = 6\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	—	8.3	—	S	$V_{DS} = 5\text{V}, I_D = 6.9\text{A}$
Diode Forward Voltage	$V_{SD}$	0.5	—	1.2	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	—	697	—	pF	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	97	—		
Reverse Transfer Capacitance	$C_{rss}$	—	67	—		
Gate resistance	$R_g$	—	1.47	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Total Gate Charge ( $V_{GS} = 4.5\text{V}$ )	$Q_g$	—	6.0	—	nC	$V_{GS} = 10\text{V}, V_{DS} = 15\text{V}, I_D = 9\text{A}$
Total Gate Charge ( $V_{GS} = 10\text{V}$ )	$Q_g$	—	13.2	—		
Gate-Source Charge	$Q_{gs}$	—	2.2	—		
Gate-Drain Charge	$Q_{gd}$	—	1.8	—		
Turn-On Delay Time	$t_{D(on)}$	—	4.3	—	ns	$V_{DD} = 15\text{V}, V_{GS} = 10\text{V}, R_L = 15\Omega, I_D = 1\text{A}, R_G = 6\Omega$
Turn-On Rise Time	$t_r$	—	4.4	—		
Turn-Off Delay Time	$t_{D(off)}$	—	20.1	—		
Turn-Off Fall Time	$t_f$	—	4.1	—		
Reverse Recovery Time	$t_{rr}$	—	7.3	—	ns	$I_F = 9\text{A}, di/dt = 500\text{A}/\mu\text{s}$
Reverse Recovery Charge	$Q_{rr}$	—	7.9	—	nC	

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
  - $I_{AR}$  and  $E_{AR}$  rating are based on low frequency and duty cycles to keep  $T_J = +25^\circ\text{C}$
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.



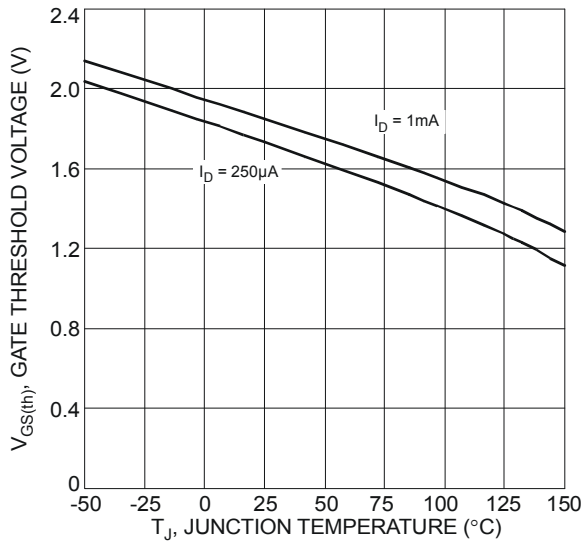


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

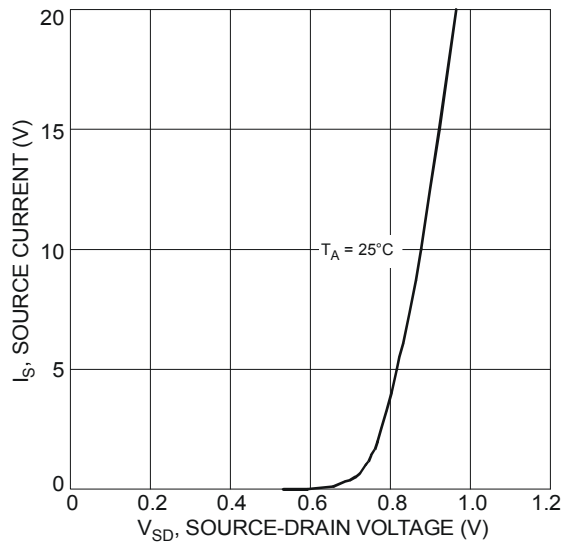


Fig. 8 Diode Forward Voltage vs. Current

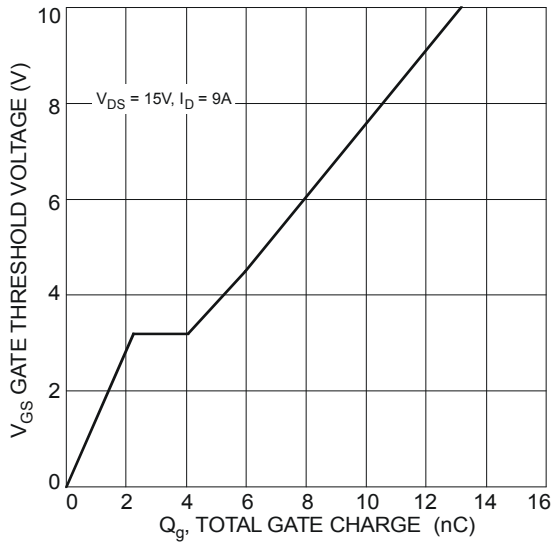


Fig. 9 Gate Charge

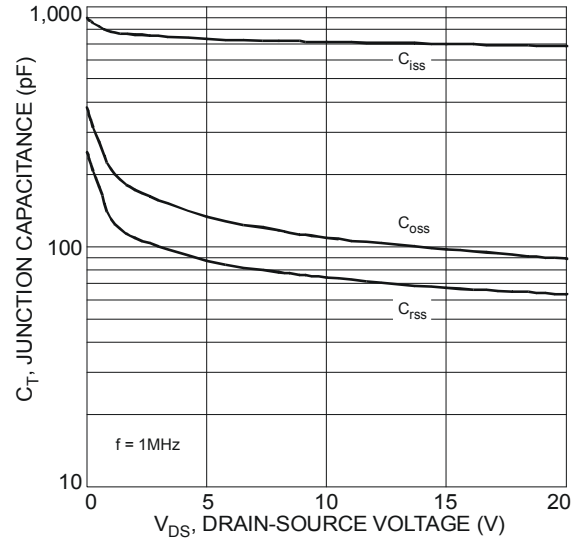


Fig. 10 Typical Junction Capacitance

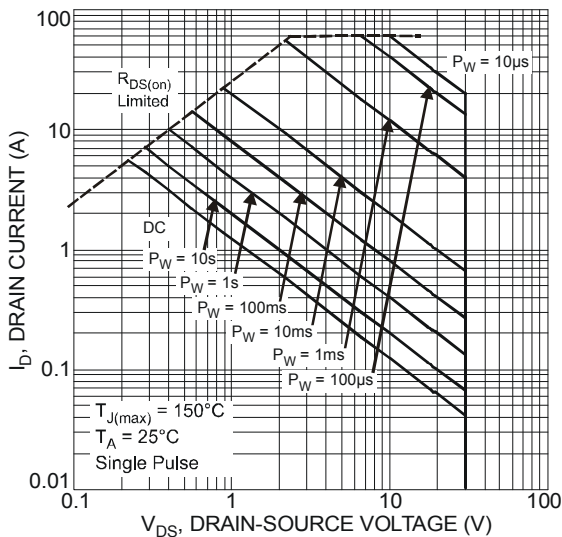


Fig. 11 SOA, Safe Operation Area

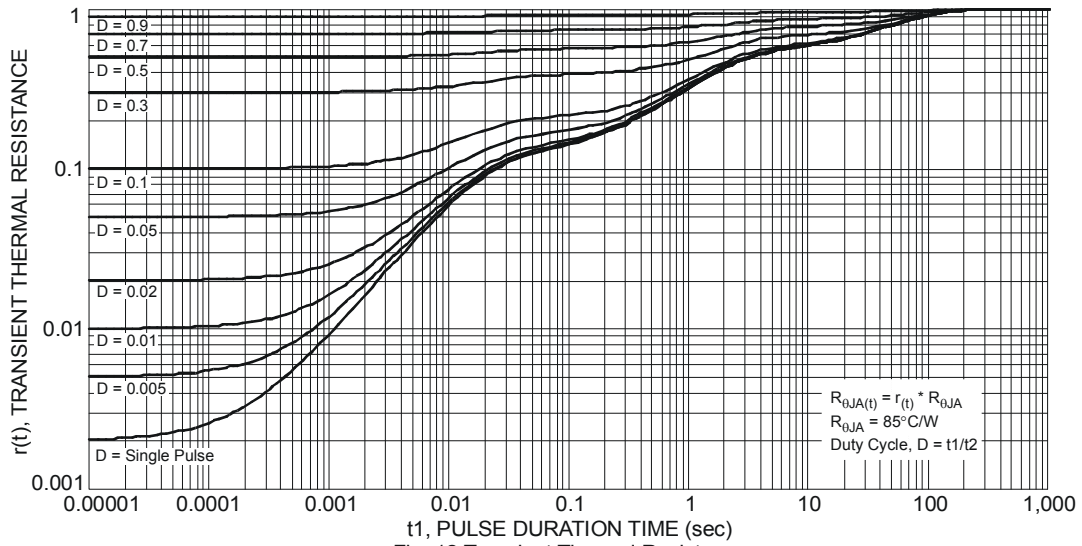
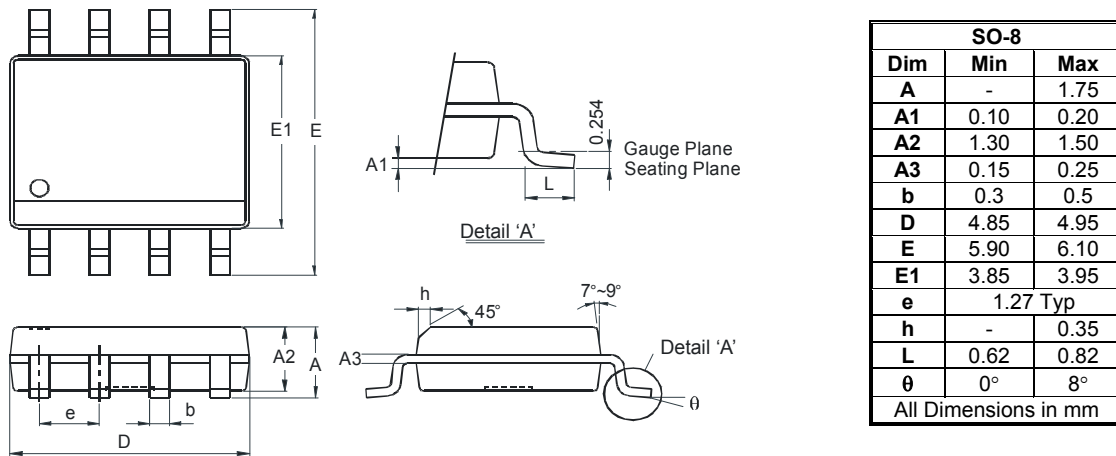


Fig. 12 Transient Thermal Resistance

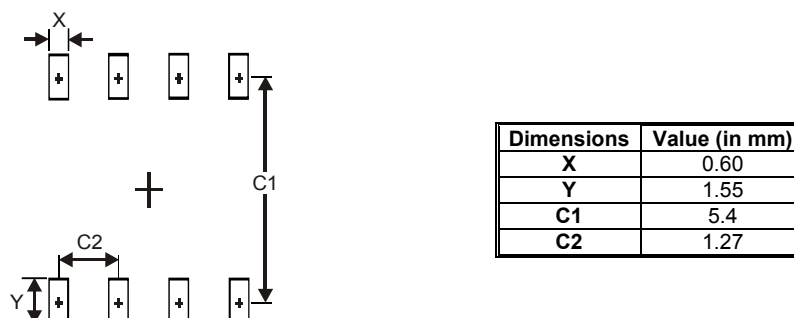
**Package Outline Dimensions**

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



**Suggested Pad Layout**

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



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