

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ max	I_D $T_C = +25^\circ C$
-30V	20m Ω @ $V_{GS} = -10V$	-18.0A
	29m Ω @ $V_{GS} = -5V$	-15.0A

Description

This new generation 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

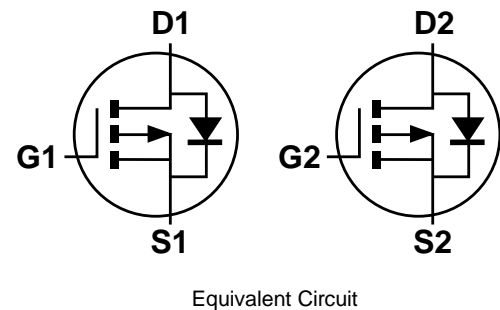
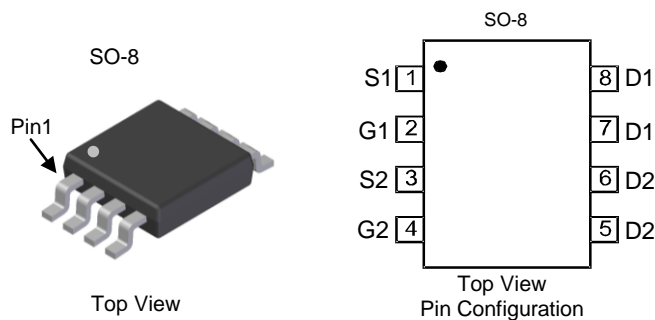
- DC-DC Converters
- Power Management Functions
- Backlighting

Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

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: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.074 grams (Approximate)

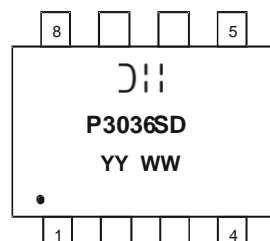


Ordering Information (Note 4)

Part Number	Case	Packaging
DMP3036SSD-13	SO-8	2,500 / 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/quality/lead_free.html 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/products/packages.html>.

Marking Information



- DII = Manufacturer's Marking
 P3036SD = Product Type Marking Code
 YYWW = Date Code Marking
 YY or YY = Year (ex: 14 = 2014)
 WW = Week (01 - 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	
Drain-Source Voltage	V _{DSS}	-30	V	
Gate-Source Voltage	V _{GSS}	±25	V	
Continuous Drain Current (Note 6) V _{GS} = -10V	T _C = +25°C T _C = +70°C	I _D I _D	-18.0 -14.3	A
	T _A = +25°C T _A = +70°C	I _D	-10.6 -8.5	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I _{DM}	-80	A	
Maximum Continuous Body Diode Forward Current (Note 6)	I _S	-3.6	A	
Avalanche Current (Note 7) L = 0.3mH	I _{AS}	-17.5	A	
Avalanche Energy (Note 7) L = 0.3mH	E _{AS}	64	mJ	

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units	
Total Power Dissipation (Note 5)	P _D	T _A = +25°C	1.2	W
		T _A = +70°C	0.9	
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	Steady State	104	°C/W
		t < 10s	45	
Total Power Dissipation (Note 6)	P _D	T _A = +25°C	1.7	W
		T _A = +70°C	1.1	
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	Steady State	72	°C/W
		t < 10s	37	
Thermal Resistance, Junction to Case (Note 6)	R _{θJC}	13		
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C	

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	-30	-	-	V	V _{GS} = 0V, I _D = -1mA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	-	-	-1.0	µA	V _{DS} = -30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	-	-	±100	nA	V _{GS} = ±25V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(th)}	-1.0	-1.7	-3.0	V	V _{DS} = V _{GS} , I _D = -250µA
Static Drain-Source On-Resistance	R _{DS(on)}	-	16	20	mΩ	V _{GS} = -10V, I _D = -9A
		-	22	29		V _{GS} = -5V, I _D = -7A
Diode Forward Voltage	V _{SD}	-	-0.7	-1.0	V	V _{GS} = 0V, I _S = -1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iSS}	-	1931	-	pF	V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	-	226	-	pF	
Reverse Transfer Capacitance	C _{rSS}	-	168	-	pF	
Gate Resistance	R _g	-	10.9	-	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge at V _{GS} = -5V	Q _g	-	8.8	-	nC	V _{DS} = -15V, I _D = -10A
Total Gate Charge at V _{GS} = -10V	Q _g	-	16.5	-	nC	
Gate-Source Charge	Q _{gs}	-	2.6	-	nC	
Gate-Drain Charge	Q _{gd}	-	3.6	-	nC	
Turn-On Delay Time	t _{D(on)}	-	8.2	-	ns	
Turn-On Rise Time	t _r	-	14	-	ns	
Turn-Off Delay Time	t _{D(off)}	-	65	-	ns	V _{GEN} = -10V, V _{DD} = -15V, R _{GEN} = 3Ω, I _D = -10A
Turn-Off Fall Time	t _f	-	31.6	-	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.
 - I_{AS} and E_{AS} rating are based on low frequency and duty cycles to keep T_J = +25°C.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

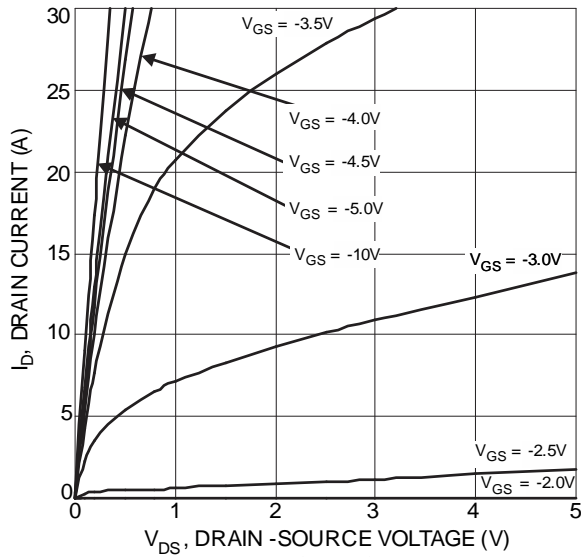


Figure 1 Typical Output Characteristics

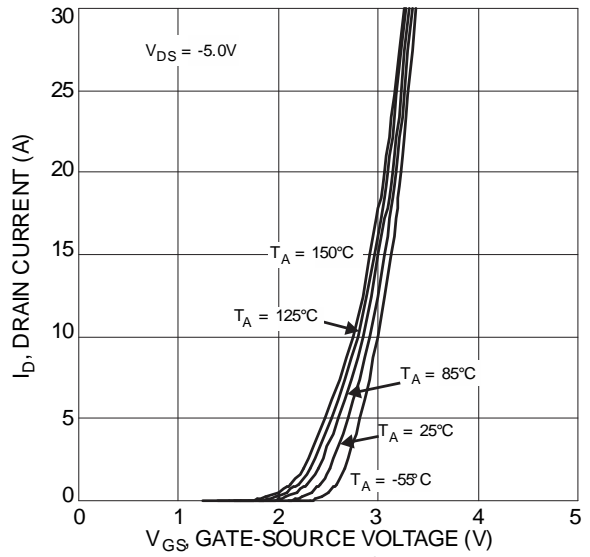


Figure 2 Typical Transfer Characteristics

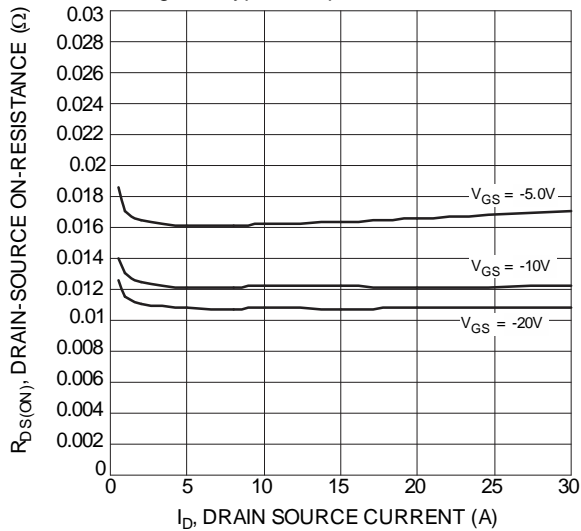


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

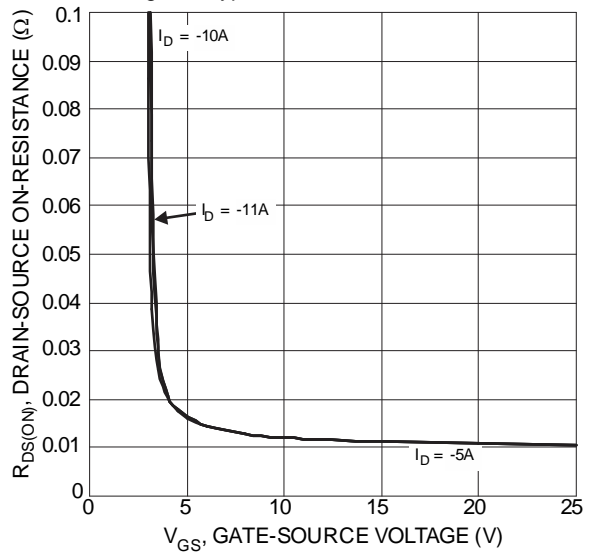


Figure 4 Typical Transfer Characteristics

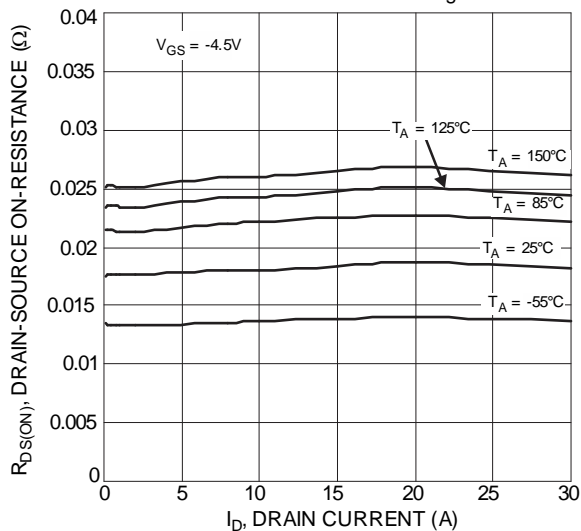


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

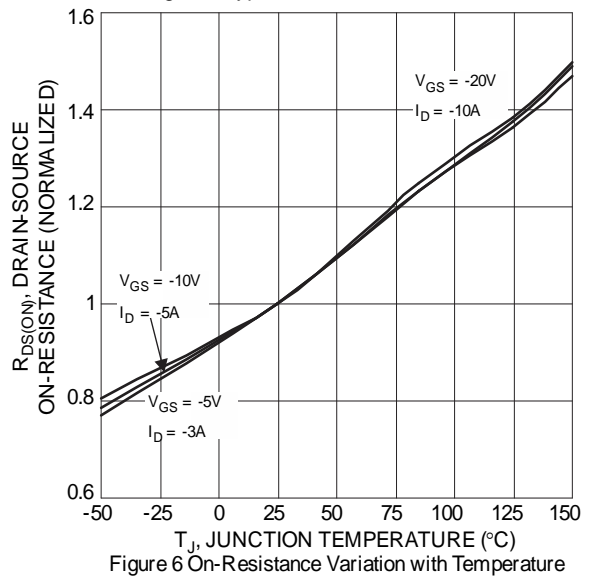


Figure 6 On-Resistance Variation with Temperature

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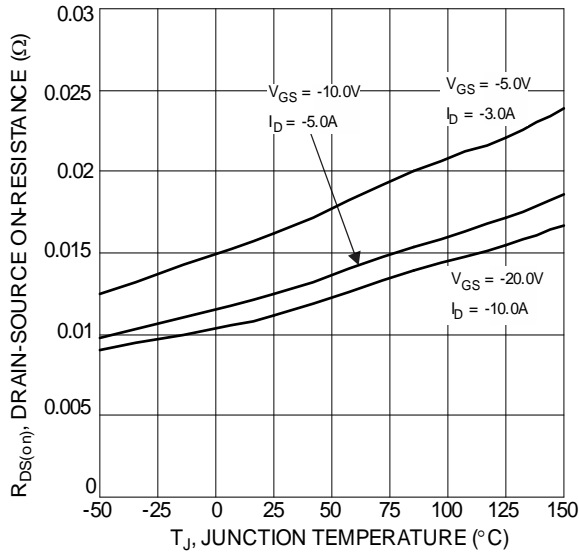


Figure 7 On-Resistance Variation with Temperature

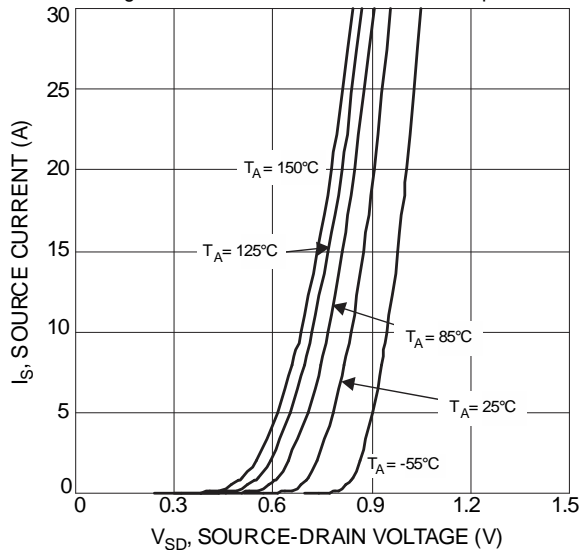


Figure 9 Diode Forward Voltage vs. Current

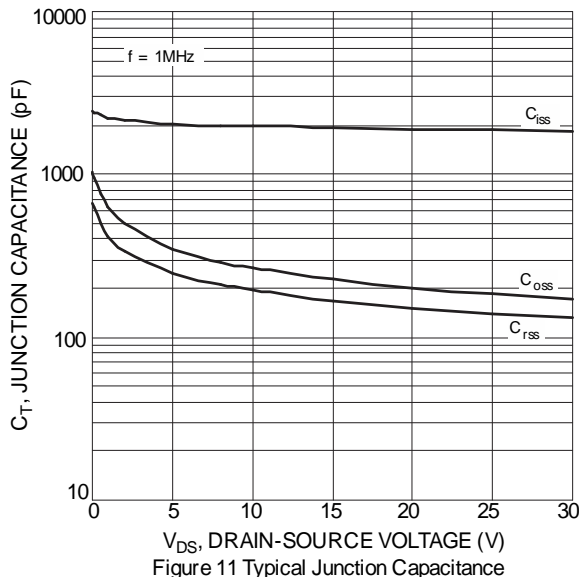


Figure 11 Typical Junction Capacitance

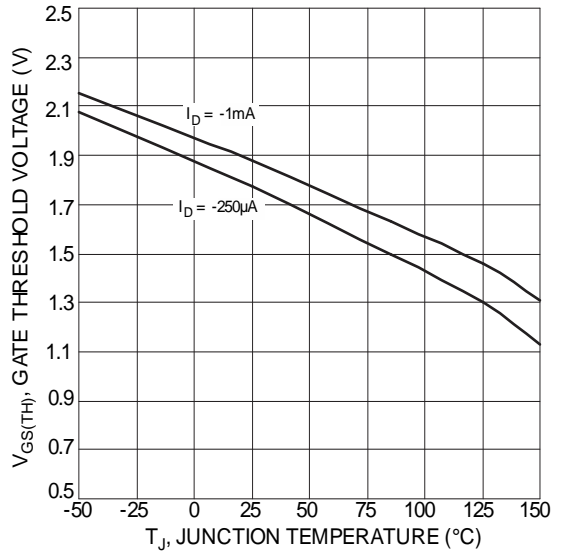


Figure 8 Gate Threshold Variation vs. Ambient Temperature

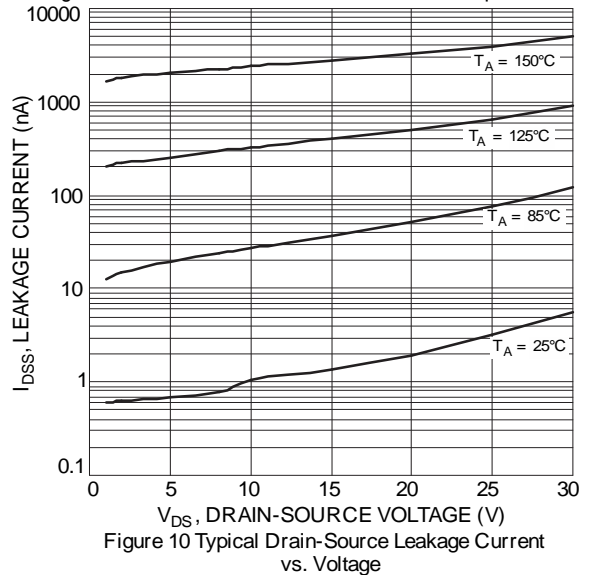


Figure 10 Typical Drain-Source Leakage Current vs. Voltage

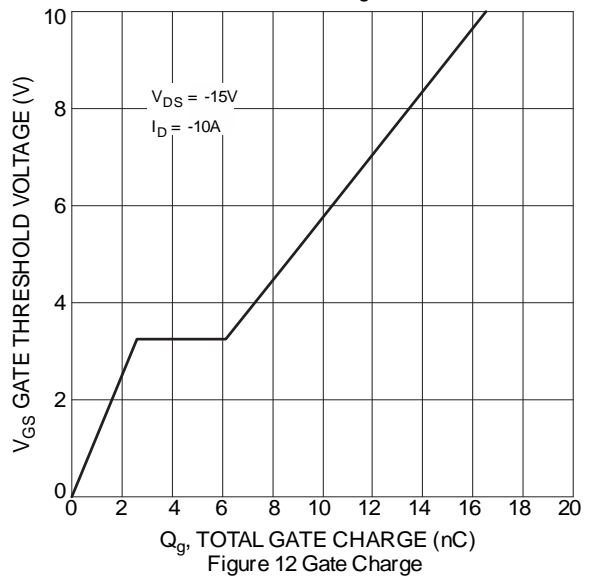
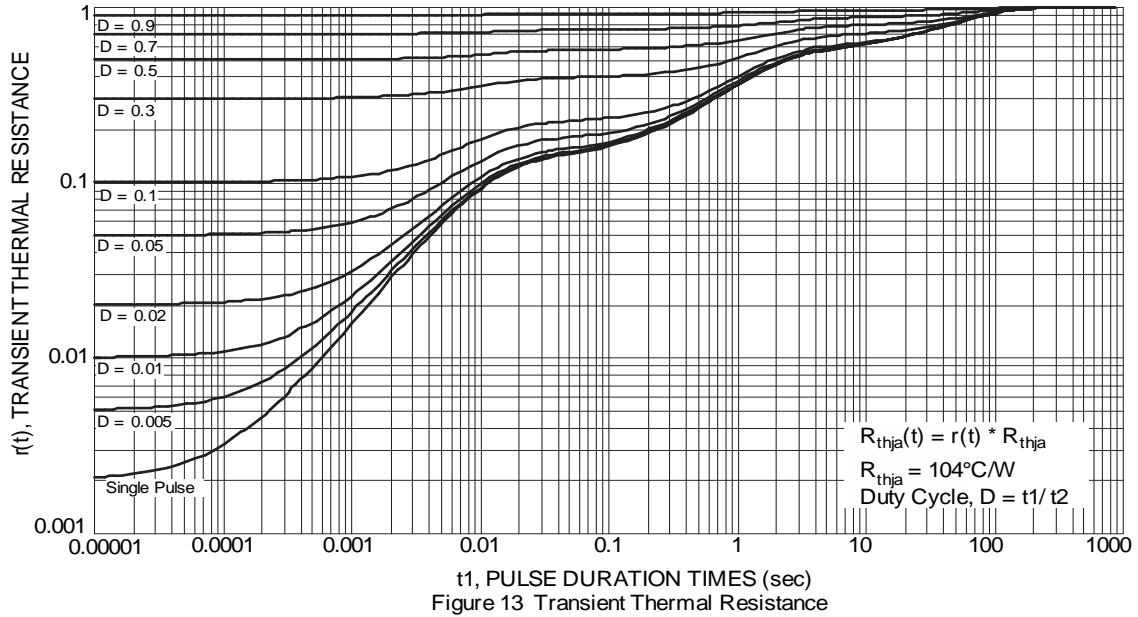


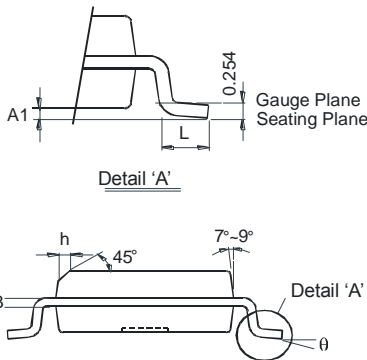
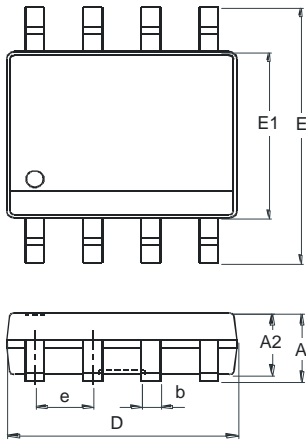
Figure 12 Gate Charge



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Package Outline Dimensions

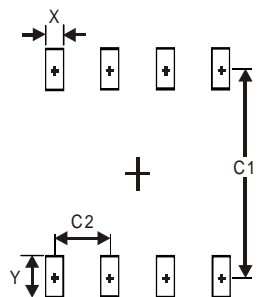
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SO-8		
Dim	Min	Max
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	0°	8°
All Dimensions in mm		

Suggested Pad Layout

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



Dimensions	Value (in mm)
X	0.60
Y	1.55
C1	5.4
C2	1.27

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