

## Product Summary

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

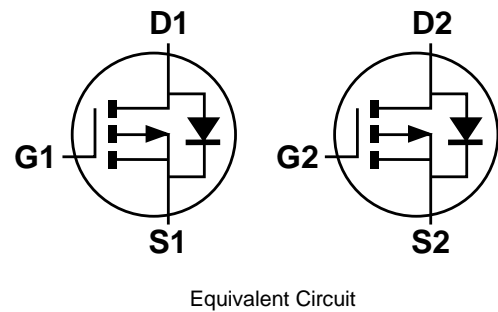
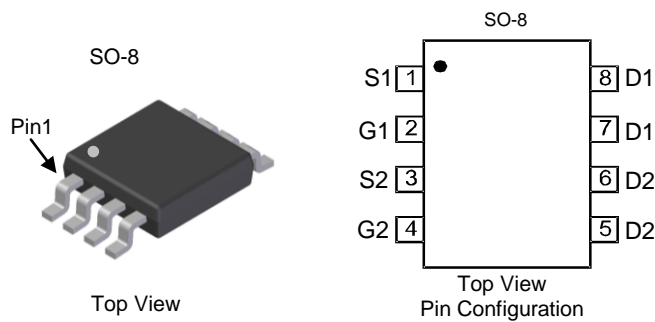
- DC-DC Converters
- Power Management Functions
- Backlighting

## 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  $\text{e3}$
- Weight: 0.074 grams (Approximate)

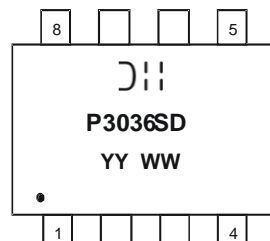


## Ordering Information (Note 4)

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](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



$\text{D}|||$  = 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<sub>A</sub> = +25°C, unless otherwise specified.)

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

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

Characteristic	Symbol	Value	Units	
Total Power Dissipation (Note 5)	P <sub>D</sub>	T <sub>A</sub> = +25°C	1.2	W
		T <sub>A</sub> = +70°C	0.9	
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	Steady State	104	°C/W
		t < 10s	45	
Total Power Dissipation (Note 6)	P <sub>D</sub>	T <sub>A</sub> = +25°C	1.7	W
		T <sub>A</sub> = +70°C	1.1	
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	Steady State	72	°C/W
		t < 10s	37	
Thermal Resistance, Junction to Case (Note 6)	R <sub>θJC</sub>	13		
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 8)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-30	-	-	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -1mA
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	-	-	-1.0	µA	V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±25V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	-1.0	-1.7	-3.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250µA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	-	16	20	mΩ	V <sub>GS</sub> = -10V, I <sub>D</sub> = -9A
		-	22	29		V <sub>GS</sub> = -5V, I <sub>D</sub> = -7A
Diode Forward Voltage	V <sub>SD</sub>	-	-0.7	-1.0	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	C <sub>iSS</sub>	-	1931	-	pF	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	226	-	pF	
Reverse Transfer Capacitance	C <sub>rSS</sub>	-	168	-	pF	
Gate Resistance	R <sub>g</sub>	-	10.9	-	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge at V <sub>GS</sub> = -5V	Q <sub>g</sub>	-	8.8	-	nC	V <sub>DS</sub> = -15V, I <sub>D</sub> = -10A
Total Gate Charge at V <sub>GS</sub> = -10V	Q <sub>g</sub>	-	16.5	-	nC	
Gate-Source Charge	Q <sub>gs</sub>	-	2.6	-	nC	
Gate-Drain Charge	Q <sub>gd</sub>	-	3.6	-	nC	
Turn-On Delay Time	t <sub>D(on)</sub>	-	8.2	-	ns	
Turn-On Rise Time	t <sub>r</sub>	-	14	-	ns	
Turn-Off Delay Time	t <sub>D(off)</sub>	-	65	-	ns	
Turn-Off Fall Time	t <sub>f</sub>	-	31.6	-	ns	V <sub>GEN</sub> = -10V, V <sub>DD</sub> = -15V, R <sub>GEN</sub> = 3Ω, I <sub>D</sub> = -10A

- 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<sub>AS</sub> and E<sub>AS</sub> rating are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

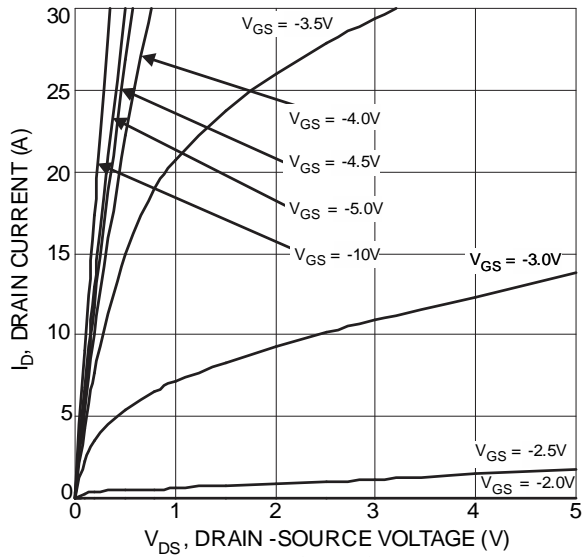


Figure 1 Typical Output Characteristics

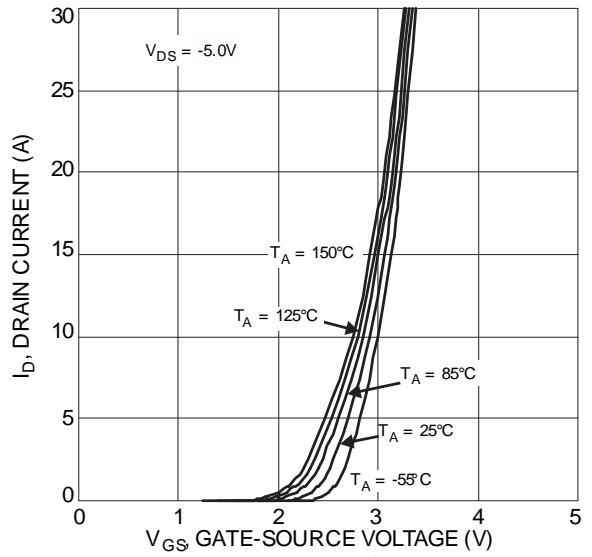


Figure 2 Typical Transfer Characteristics

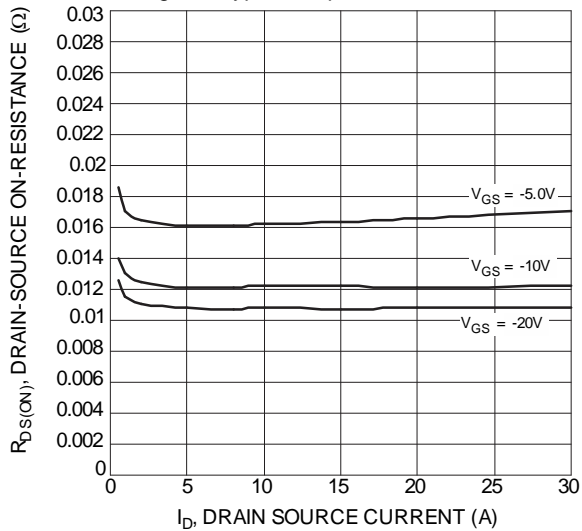


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

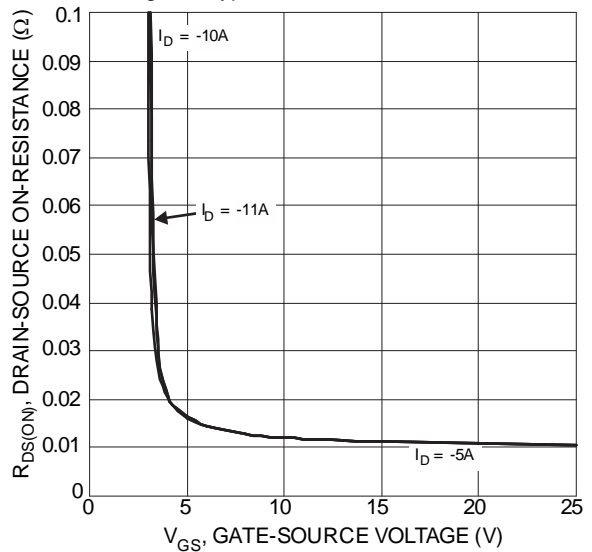


Figure 4 Typical Transfer Characteristics

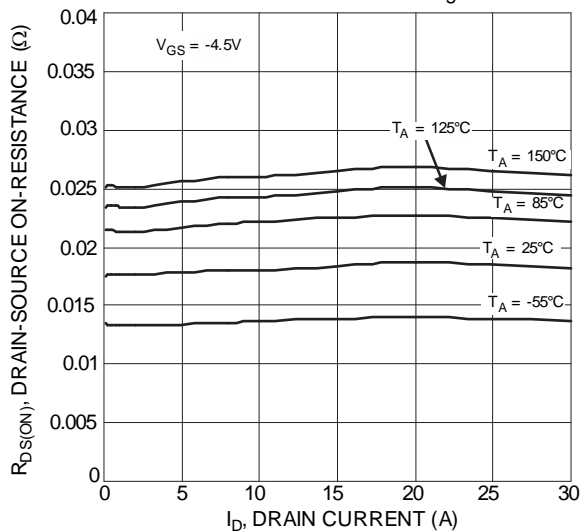


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

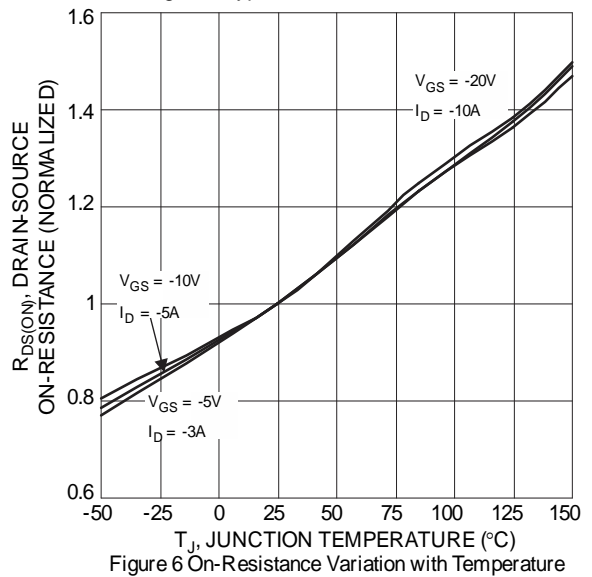


Figure 6 On-Resistance Variation with Temperature

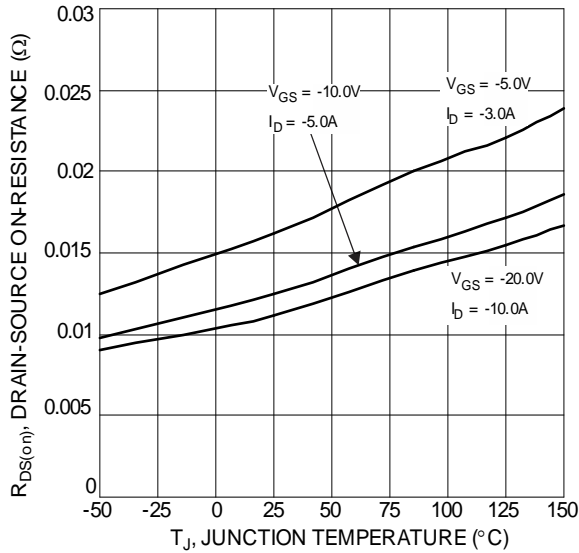


Figure 7 On-Resistance Variation with Temperature

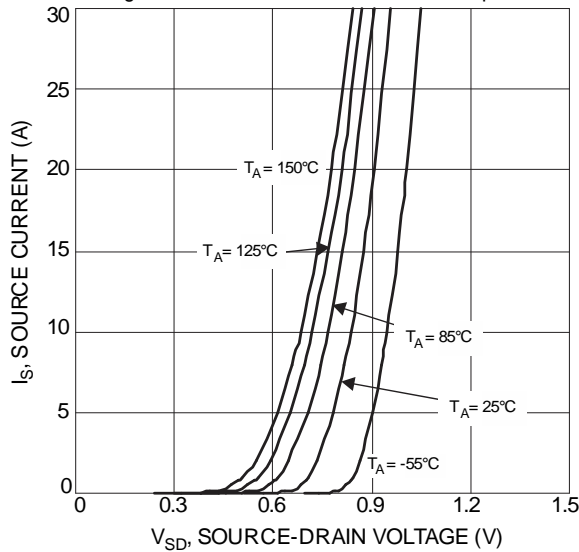


Figure 9 Diode Forward Voltage vs. Current

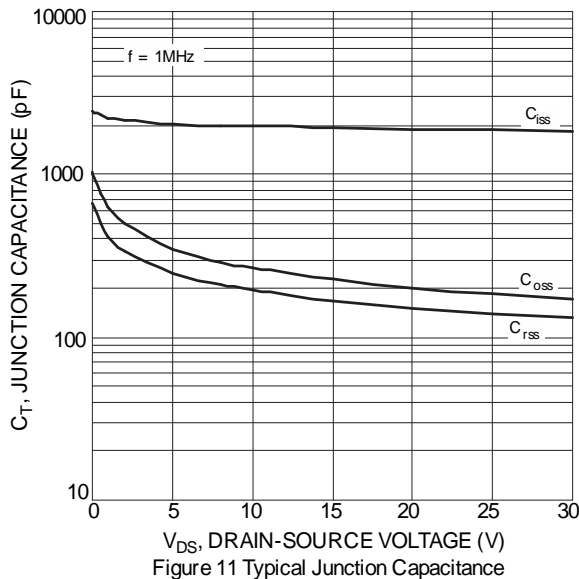


Figure 11 Typical Junction Capacitance

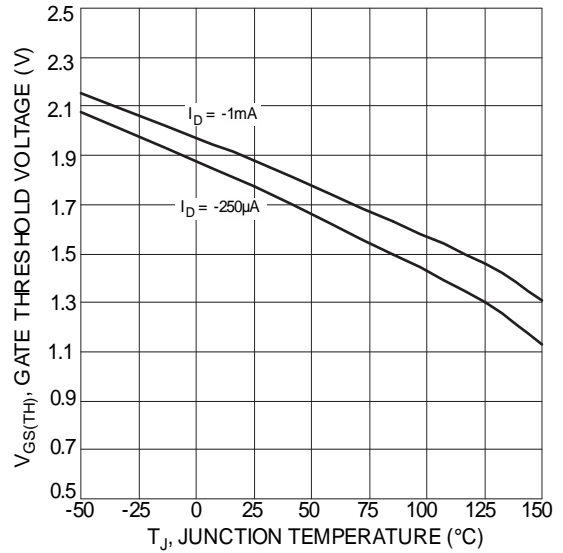


Figure 8 Gate Threshold Variation vs. Ambient Temperature

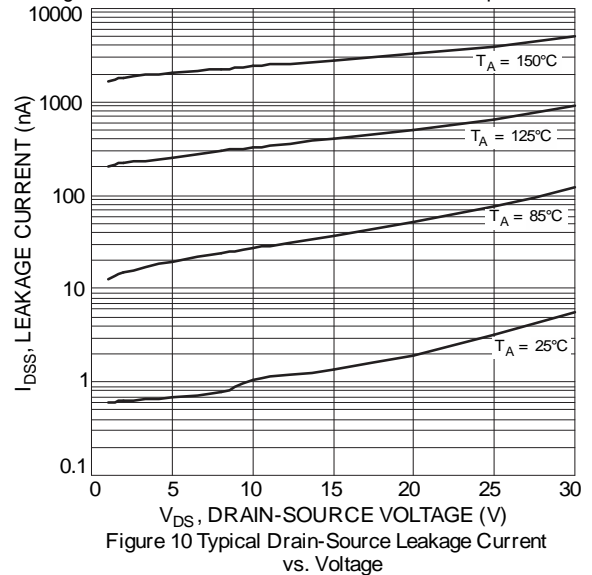


Figure 10 Typical Drain-Source Leakage Current vs. Voltage

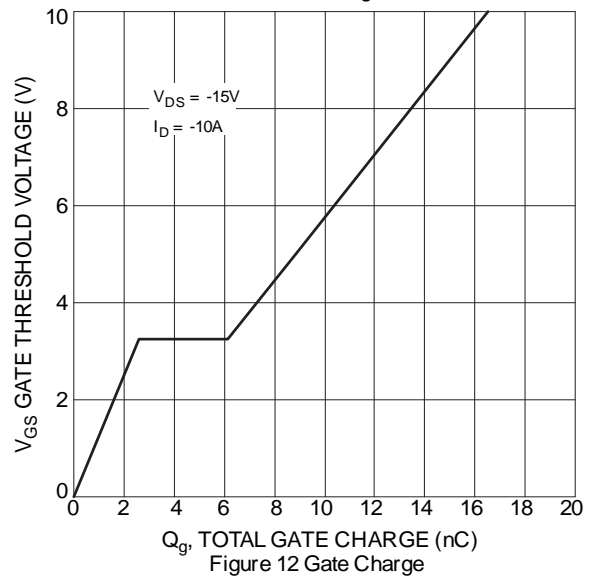
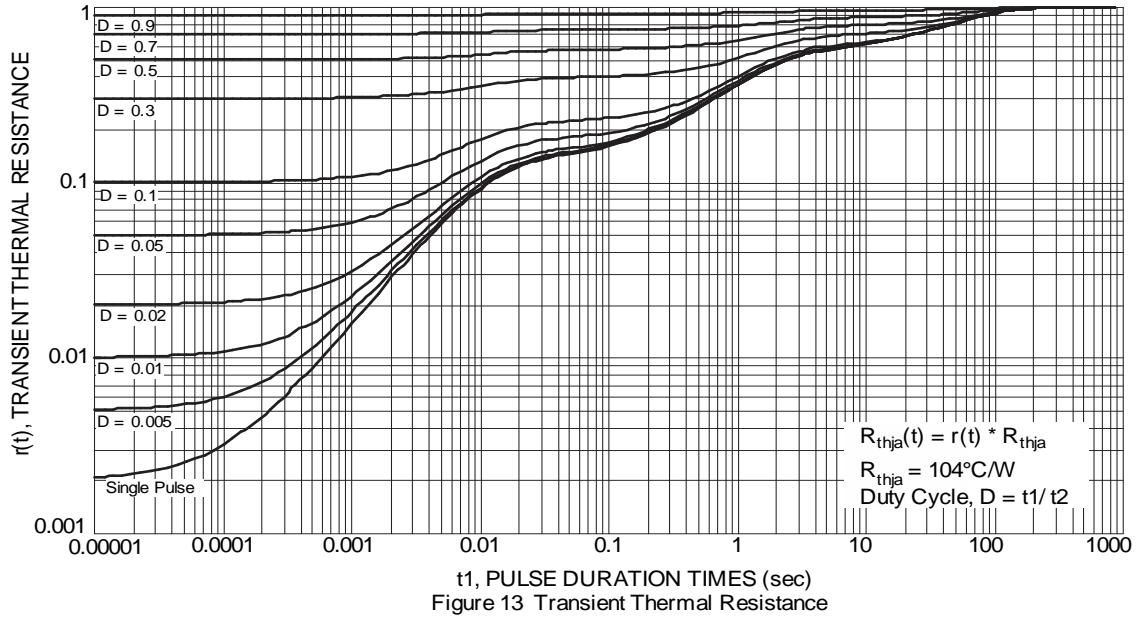


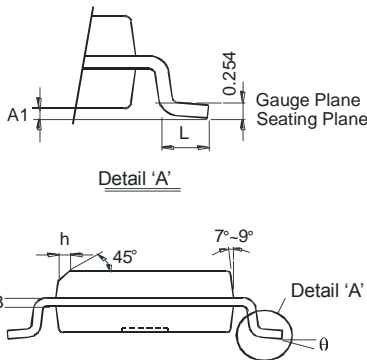
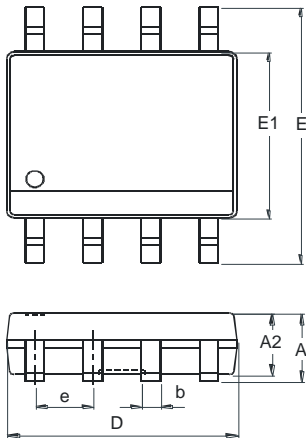
Figure 12 Gate Charge



NEW PRODUCT

**Package Outline Dimensions**

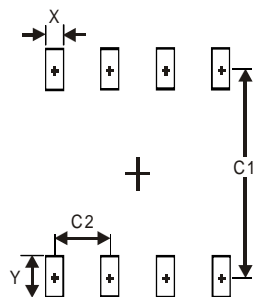
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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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