

P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on) max}$	I_D $T_C = +25^\circ C$
-30V	20m Ω @ $V_{GS} = -10V$	-19.5A
	29m Ω @ $V_{GS} = -5V$	-16.2A

Features

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

Description

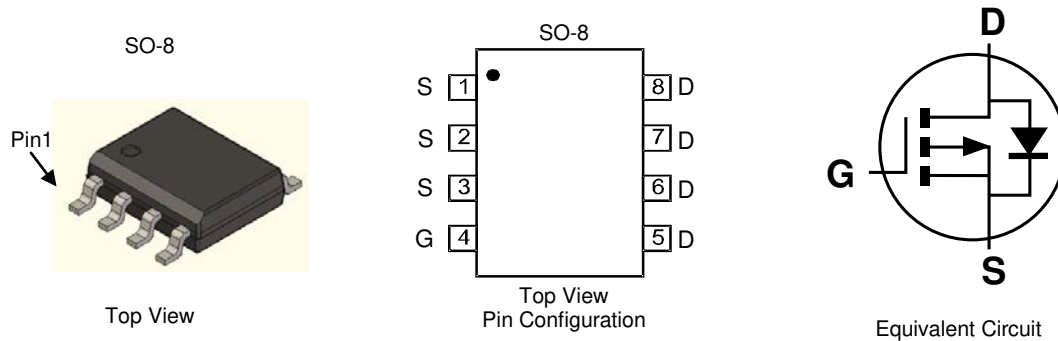
This new generation MOSFET is designed to minimize the on-state resistance ($R_{DS(on)}$) yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

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 Below
- Weight: 0.076 grams (Approximate)

Applications

- DC-DC Converters
- Power Management Functions
- Backlighting

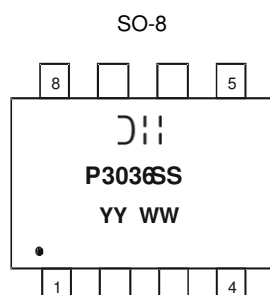


Ordering Information (Note 4)

Part Number	Case	Packaging
DMP3036SSS-13	SO-8	2500 / Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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
P3036SS = Product Type Marking Code
YYWW = Date Code Marking
YY or YY = Year (ex: 19 = 2019)
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 5) V _{GS} = -10V	I _D	T _C = +25°C	-19.5	A
		T _C = +70°C	-15.6	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	T _A = +25°C	-11.4	A
		T _A = +70°C	-9.2	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	

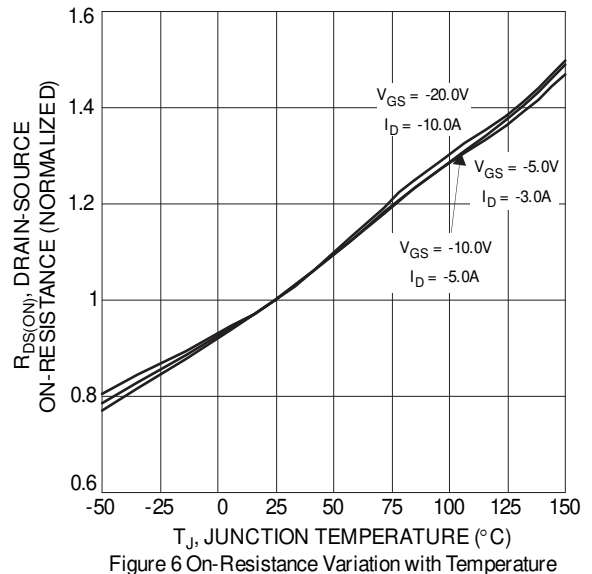
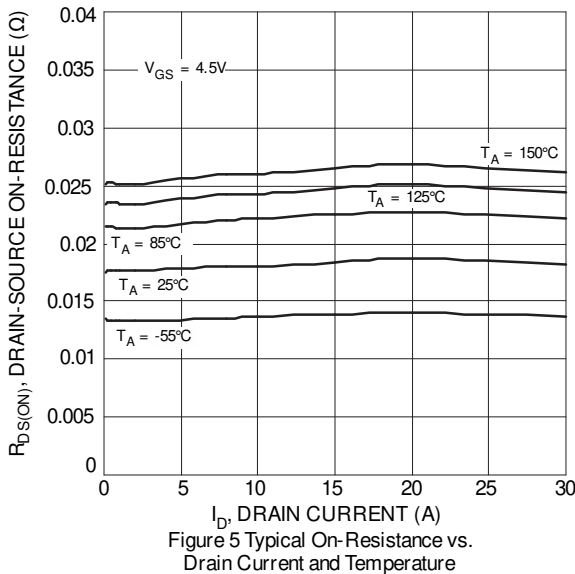
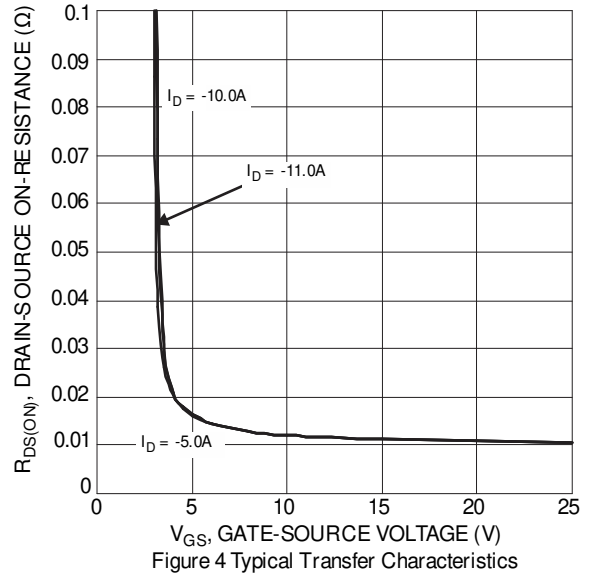
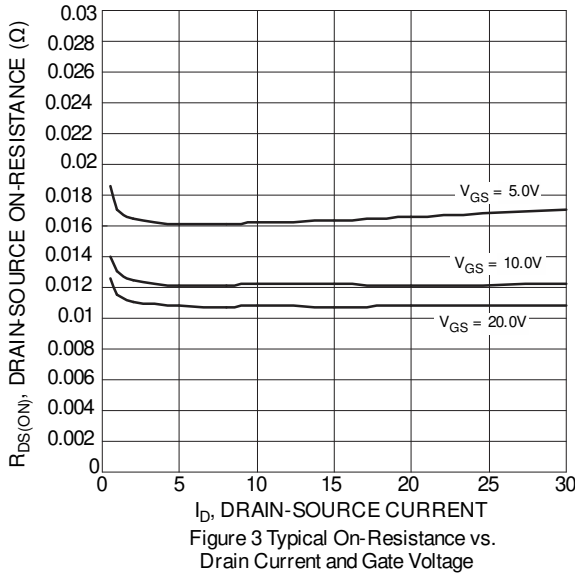
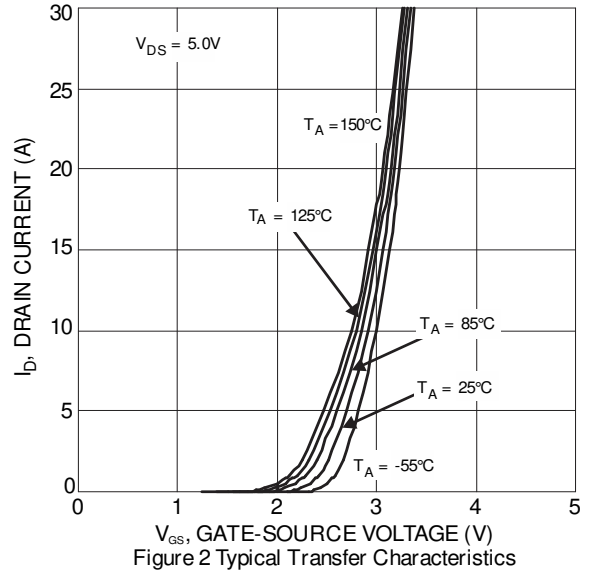
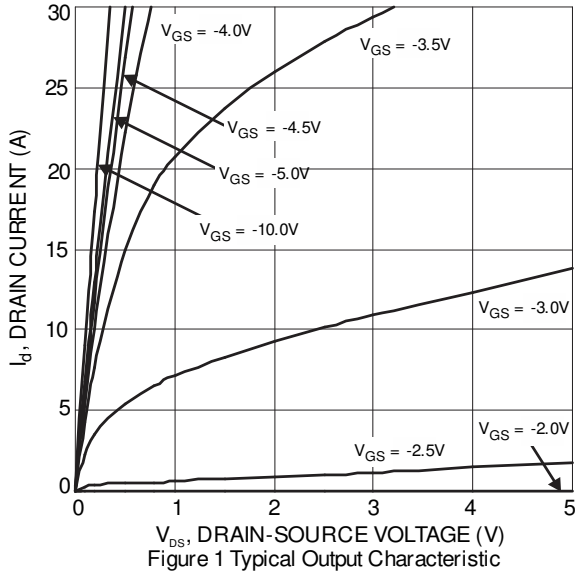
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units	
Total Power Dissipation (Note 5)	P _D	T _A = +25°C	1.4	W
		T _A = +70°C	0.9	
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	Steady State	88	°C/W
		t < 10s	37	
Total Power Dissipation (Note 6)	P _D	T _A = +25°C	1.9	W
		T _A = +70°C	1.2	
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	Steady State	65	°C/W
		t < 10s	32	
Thermal Resistance, Junction to Case (Note 6)	R _{θJC}	11		
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	V _{DS} = -15V, I _D = -10A
Gate-Drain Charge	Q _{gd}	—	3.6	—	nC	
Turn-On Delay Time	t _{D(on)}	—	8.2	—	ns	V _{GEN} = -10V, V _{DD} = -15V, R _{GEN} = 3Ω, I _D = -10A
Turn-On Rise Time	t _r	—	14	—	ns	
Turn-Off Delay Time	t _{D(off)}	—	65	—	ns	
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 1-inch 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.



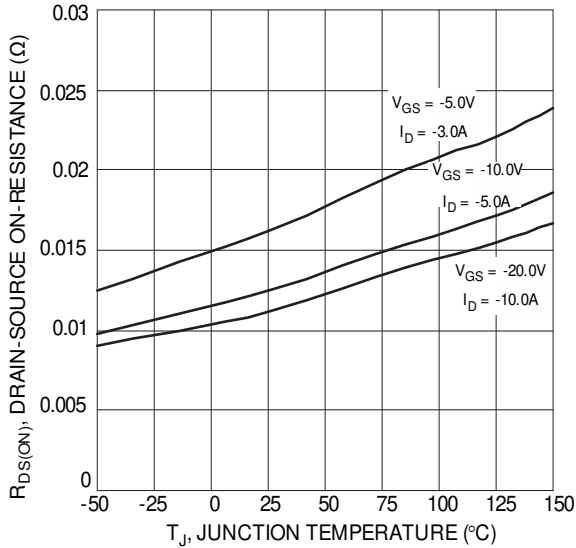


Figure 7 On-Resistance Variation with Temperature

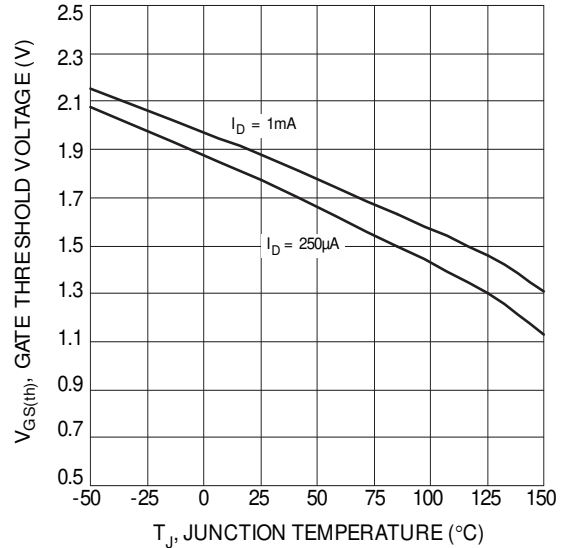


Figure 8 Gate Threshold Variation vs. Ambient Temperature

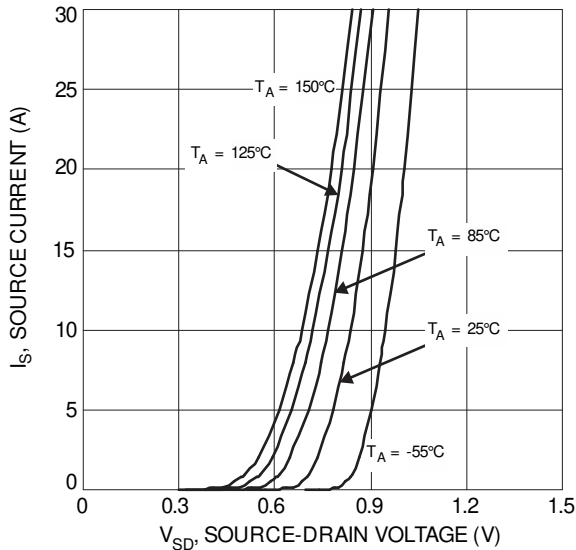


Figure 9 Diode Forward Voltage vs. Current

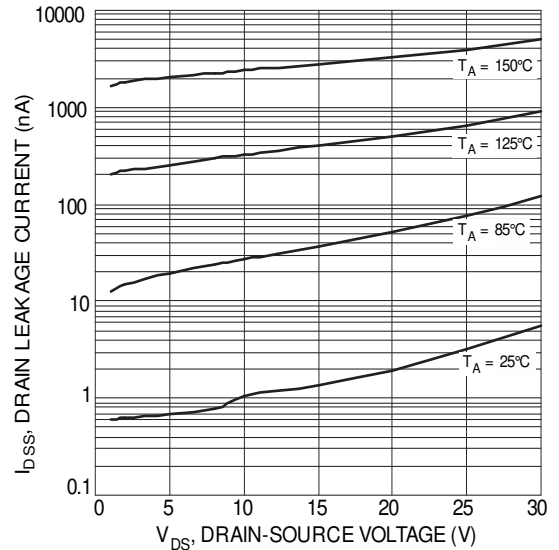


Figure 10 Typical Drain-Source Leakage Current vs. Voltage

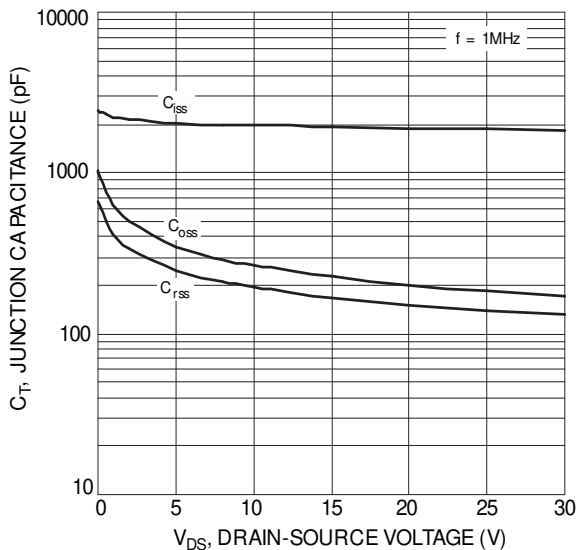


Figure 11 Typical Junction Capacitance

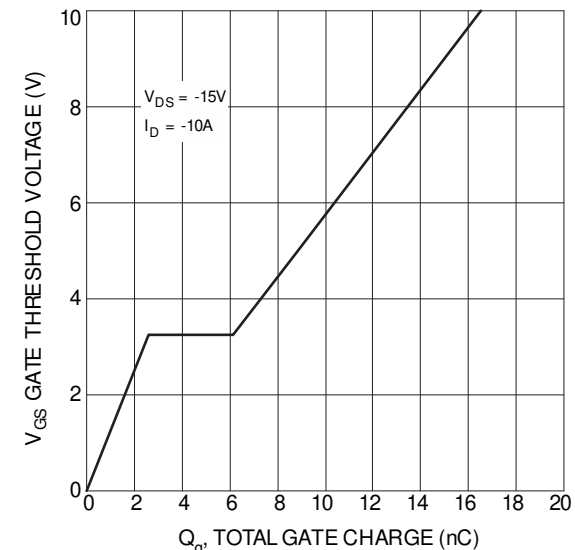
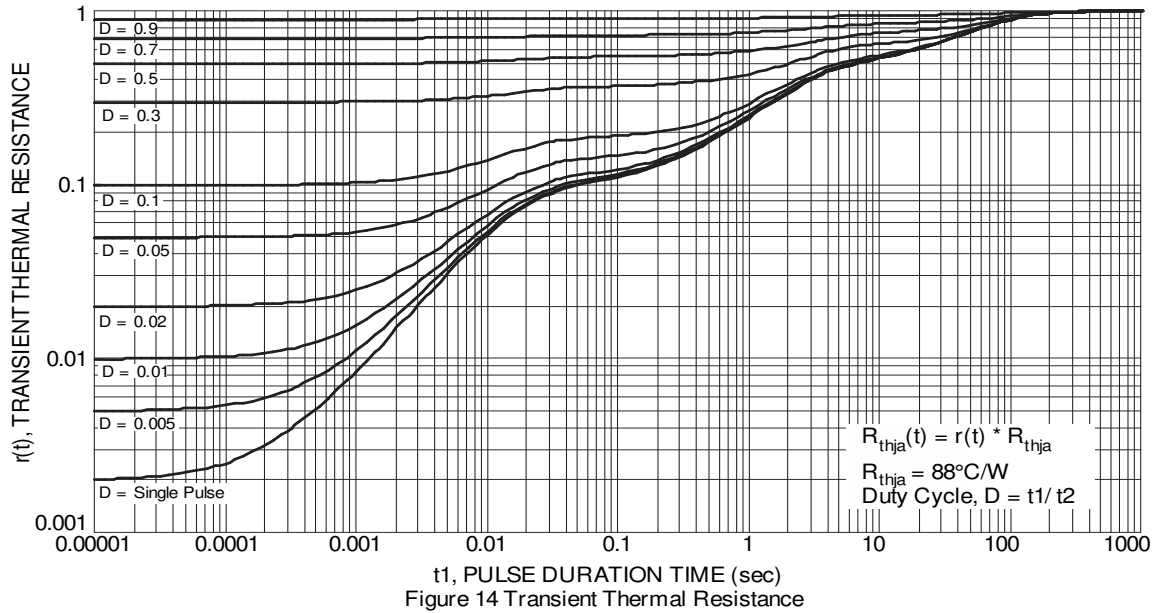
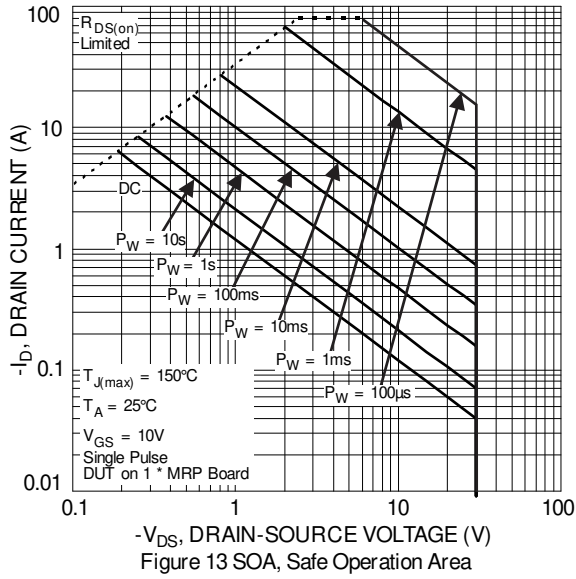


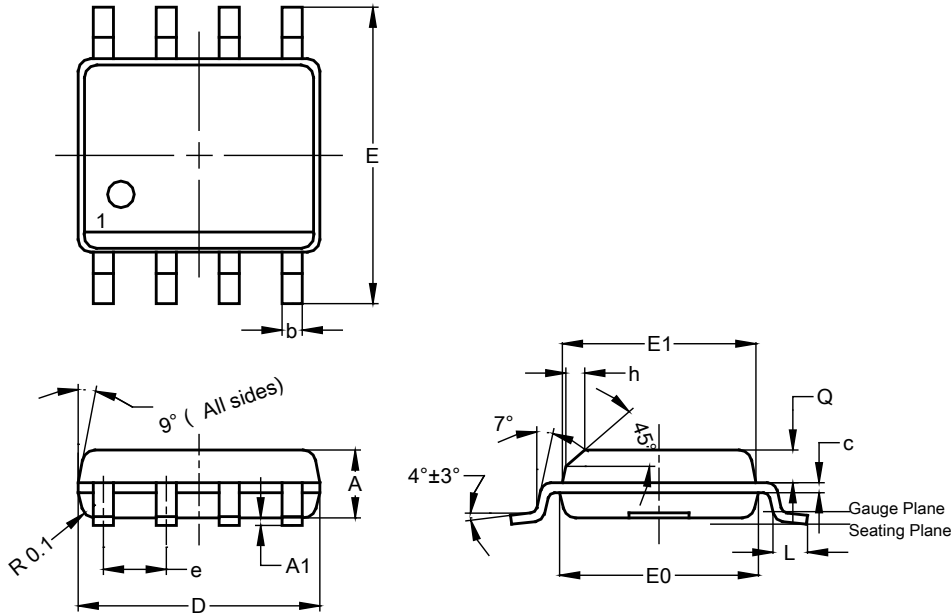
Figure 12 Gate Charge



Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SO-8

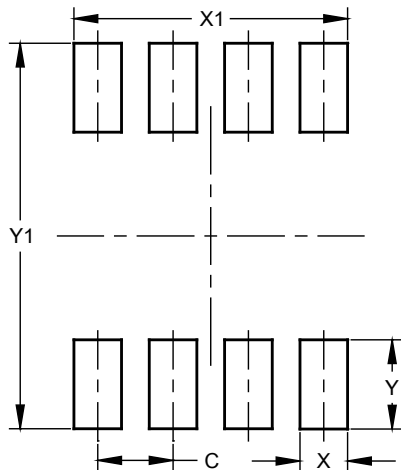


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Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	-	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

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Dimensions	Value (in mm)
C	1.27
X	0.802
X1	4.612
Y	1.505
Y1	6.50

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