Product Summary

$V_{(BR)DSS}$	$R_{DS(on)\ max}$	I_D T_A = +25°C
-30V	16mΩ @ V_{GS} = -20V	-7.3A
	20mΩ @ V_{GS} = -10V	-6.0A

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)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at https://www.diodes.com/products/automotive/automotive-products/.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. https://www.diodes.com/quality/product-definitions/**

Description

This new generation 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.

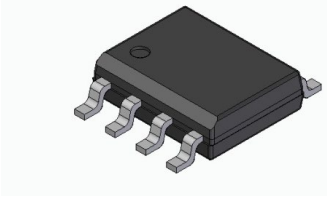
Applications

- DC-DC Converters
- Power management functions
- Backlighting

Mechanical Data

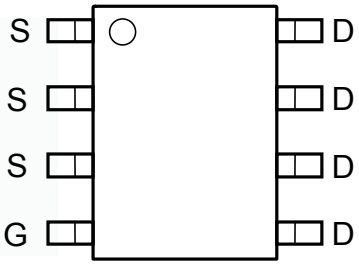
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish — Matte Tin annealed over Copper Lead-Frame. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.074 grams (Approximate)

SO-8

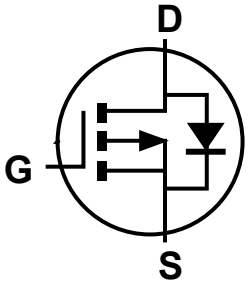


Top View

Top View
Internal Schematic



Top View
Pin-Out



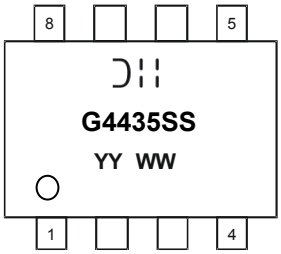
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMG4435SSS-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 https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



= Manufacturer's Marking
G4435SS = Product Type Marking Code
YYWW = Date Code Marking
YY or YY = Year (ex: 20 = 2020)
WW or WW= Week (01 to 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} = -20	Steady State	T_A = +25°C T_A = +70°C	I_D	-7.3 -5.7	A
	t < 10s	T_A = +25°C T_A = +70°C	I_D	-10 -7.5	A
Pulsed Drain Current (Note 6)			I_{DM}	-80	A

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Power Dissipation (Note 5)	T_A = +25°C	P_D	2.5	W
	T_A = +70°C		1.5	W
Thermal Resistance, Junction to Ambient @ T_A = +25°C	Steady state	$R_{\theta JA}$	96.5	°C/W
	t < 10s		55	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes: 5. Device mounted on 1in. x 1in. FR-4 PCB with 2oz. Copper, and the testing is based on the t<10s. The value in any given application depends on the user's specific board design.
6. Repetitive rating, pulse width limited by junction temperature.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
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 7)						
Gate Threshold Voltage	$V_{GS(th)}$	-1.0	-1.7	-2.5	V	V_{DS} = V_{GS}, I_D = -250μA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	—	13	16	mΩ	V_{GS} = -20V, I_D = -11A
			15	20		V_{GS} = -10V, I_D = -10A
			21	29		V_{GS} = -5V, I_D = -5A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	22	—	S	V_{DS} = -5V, I_D = -10A
Diode Forward Voltage	V_{SD}	—	-0.74	-1.0	V	V_{GS} = 0V, I_S = -1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	1614	—	pF	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	226	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	214	—	pF	
Gate Resistance	R_g	—	6.8	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge at 10V	Q_g	—	35.4	—	nC	V_{GS} = -10V, V_{DS} = -15V, I_D = -10A
Total Gate Charge at 5V	Q_g	—	18.9	—	nC	V_{GS} = -5V, V_{DS} = -15V, I_D = -10A
Gate-Source Charge	Q_{gs}	—	4.6	—	nC	
Gate-Drain Charge	Q_{gd}	—	5.7	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	8.6	—	ns	V_{DS} = -15V, V_{GS} = -10V, R_L = 1.5Ω, R_{GEN} = 3Ω
Turn-On Rise Time	t_r	—	12.7	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	44.9	—	ns	
Turn-Off Fall Time	t_f	—	22.8	—	ns	

Notes: 7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

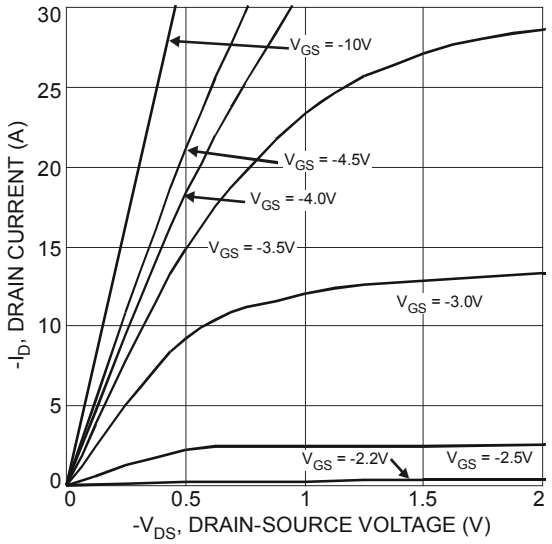


Fig. 1 Typical Output Characteristic

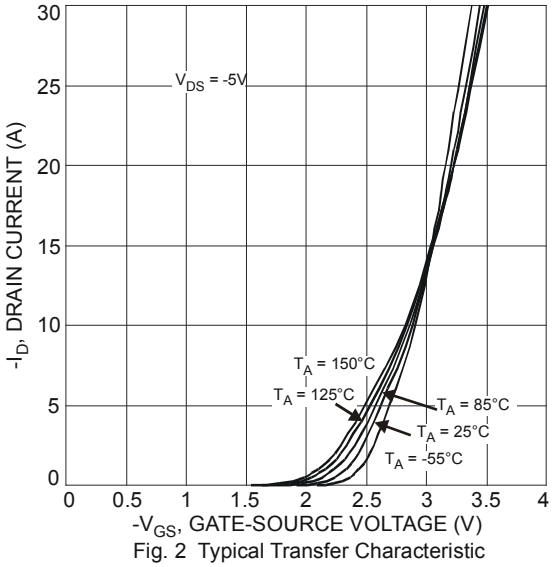


Fig. 2 Typical Transfer Characteristic

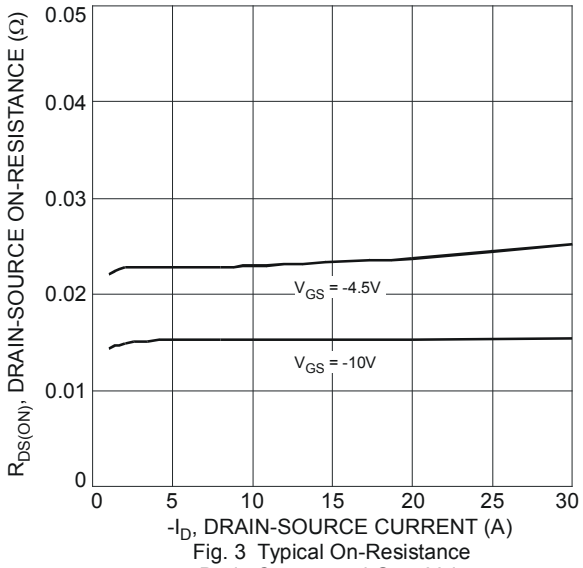


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

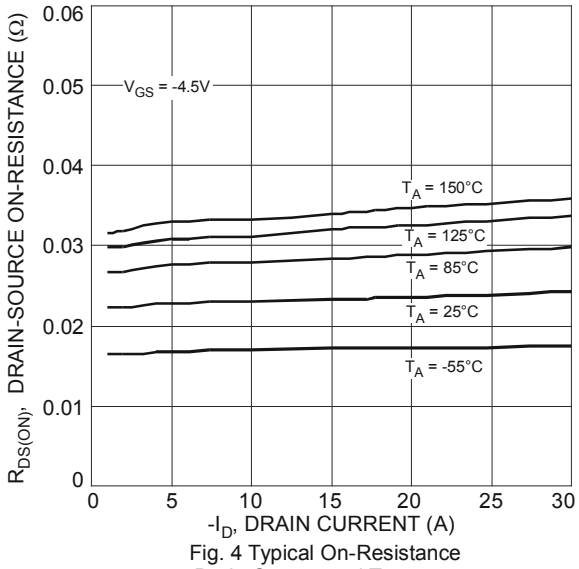


Fig. 4 Typical On-Resistance
vs. Drain Current and Temperature

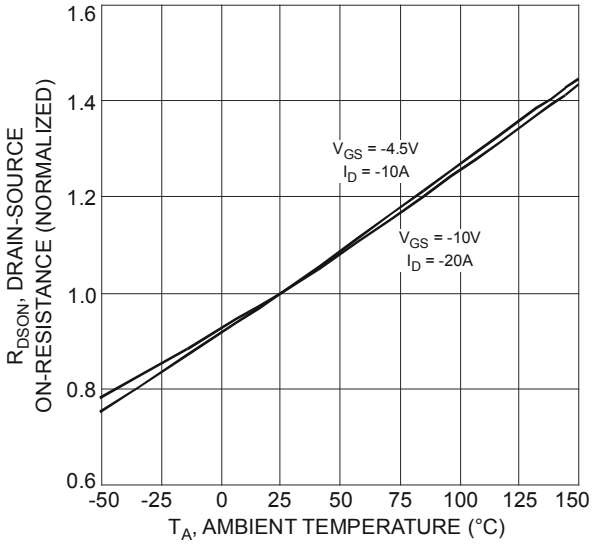


Fig. 5 On-Resistance Variation with Temperature

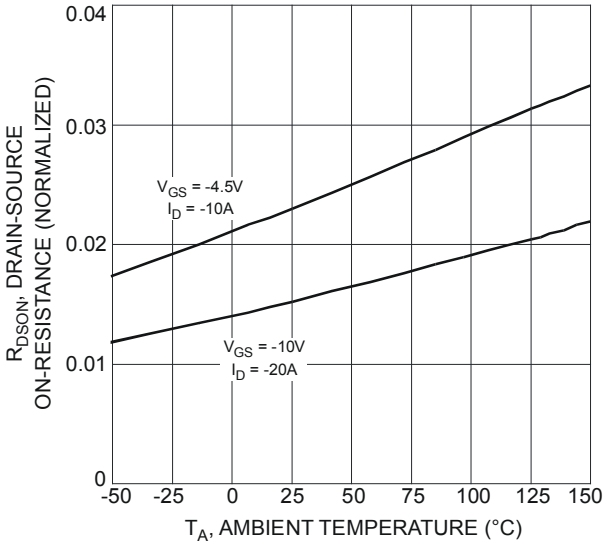


Fig. 6 On-Resistance Variation with Temperature

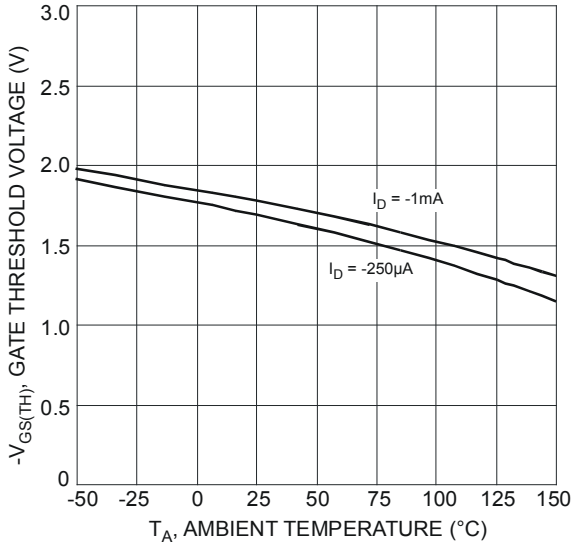


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

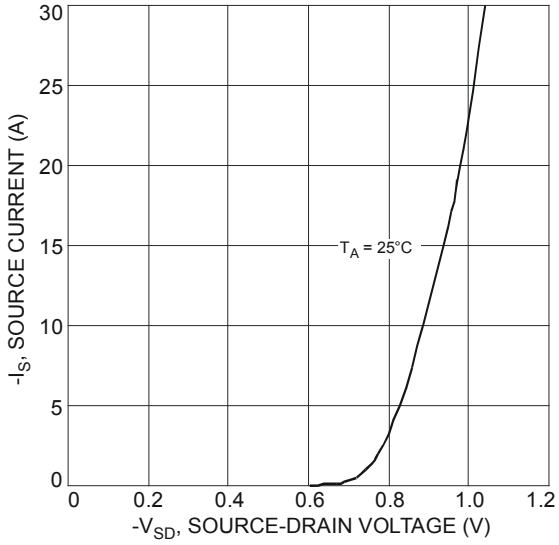


Fig. 8 Diode Forward Voltage vs. Current

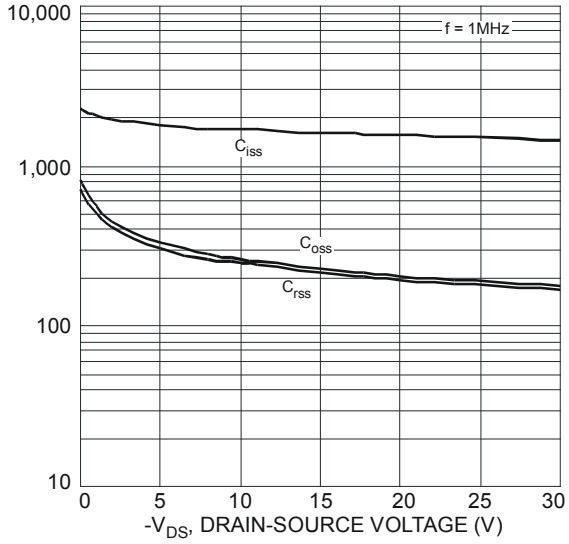


Fig. 9 Typical Total Capacitance

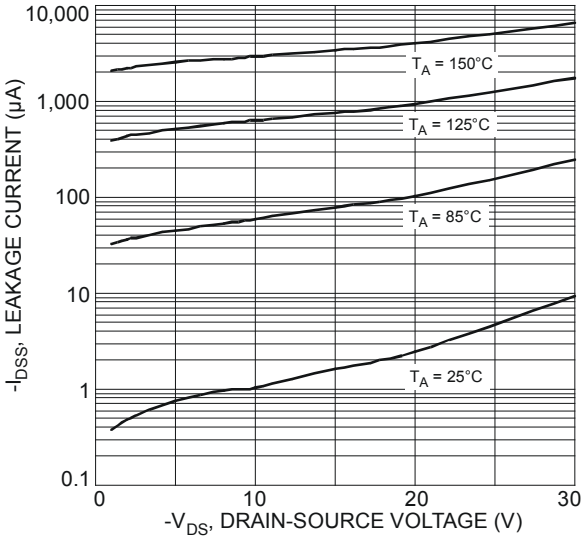


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

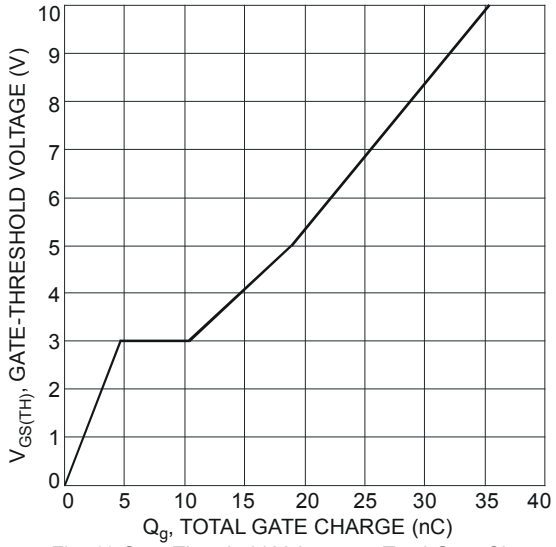


Fig. 11 Gate Threshold Voltage vs. Total Gate Charge

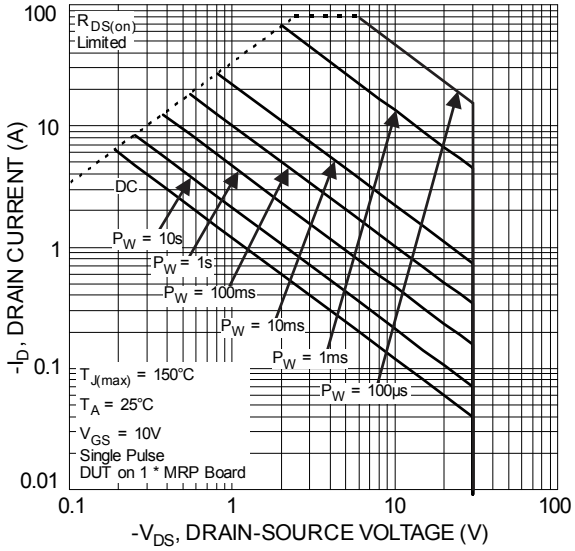


Fig. 12. SOA, Safe Operation Area

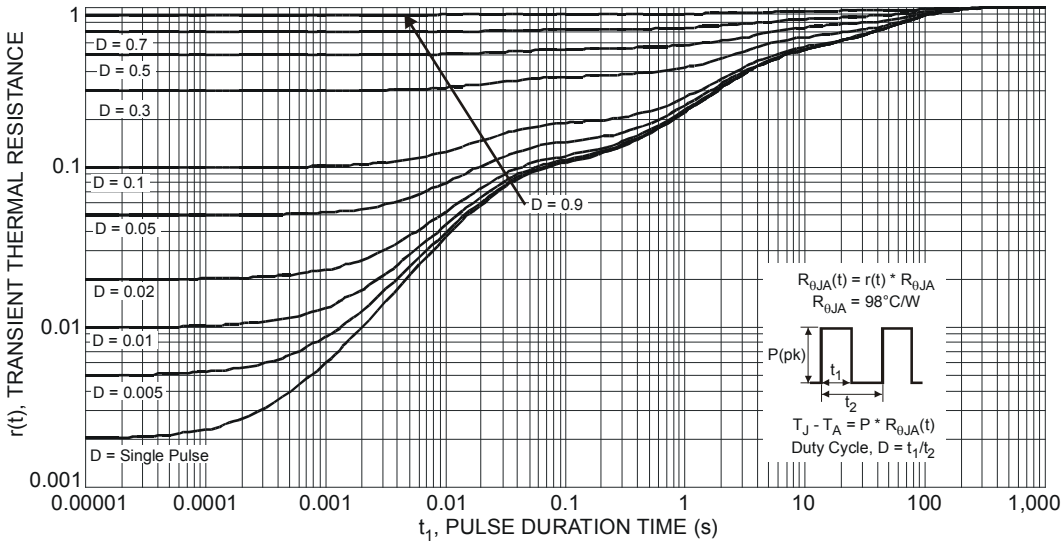
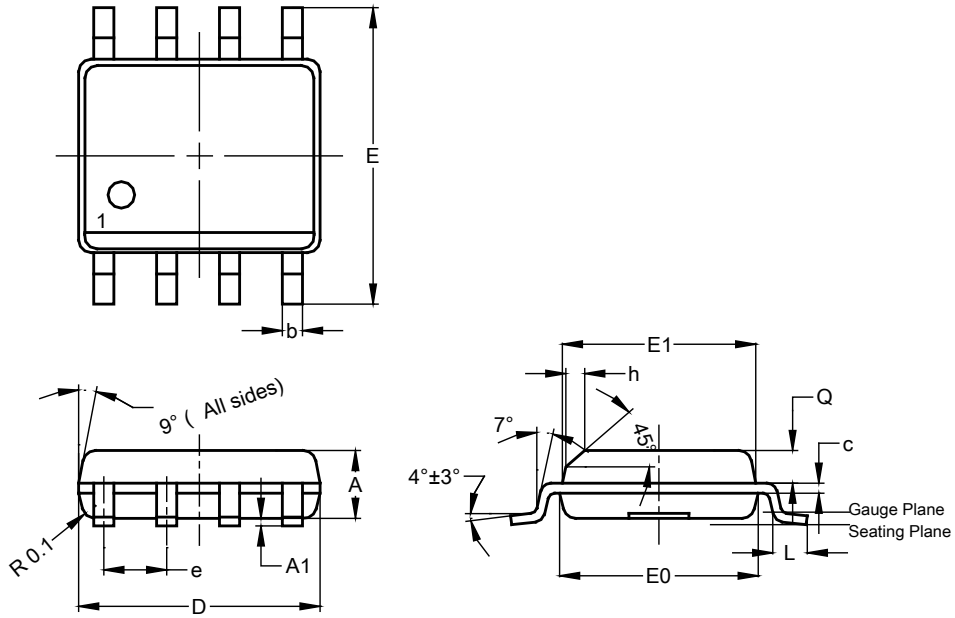


Fig. 13. Transient Thermal Resistance

Package Outline Dimensions

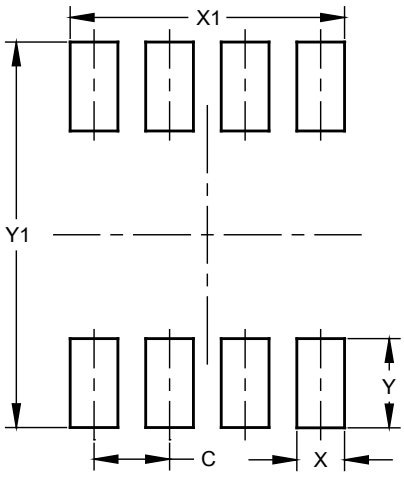
Please see http://www.diodes.com/package-outlines.html for the latest version.



SO-8			
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.



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

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