

Product Summary

BV_{DSS}	R_{DS(ON)}	I_D T_A = +25°C
30V	0.025Ω@V _{GS} = 4.5V	8.9A

Description

This new generation of Trench MOSFETs from Diodes Incorporated utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.

Applications

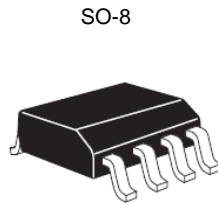
- DC-DC Converters
- Power Management Functions
- Disconnect Switches
- Motor Control

Features

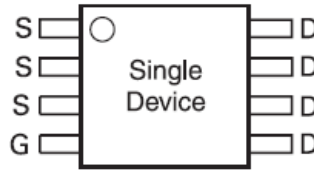
- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- Low Profile SO-8 Package
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

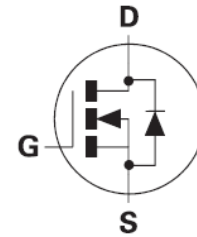
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.076 grams (Approximate)



Top View



Top View
Pin Out Configuration



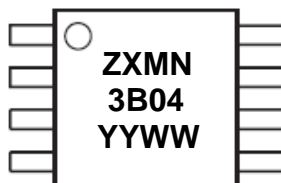
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Reel Size	Tape Width	Quantity Per Reel
ZXMN3B04N8TA	SO-8	7"	12mm	500 Units
ZXMN3B04N8TC	SO-8	13"	12mm	2500 Units

- 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



ZXMN3B04 = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 17 = 2017)
 WW = Week Code (01 to 53)

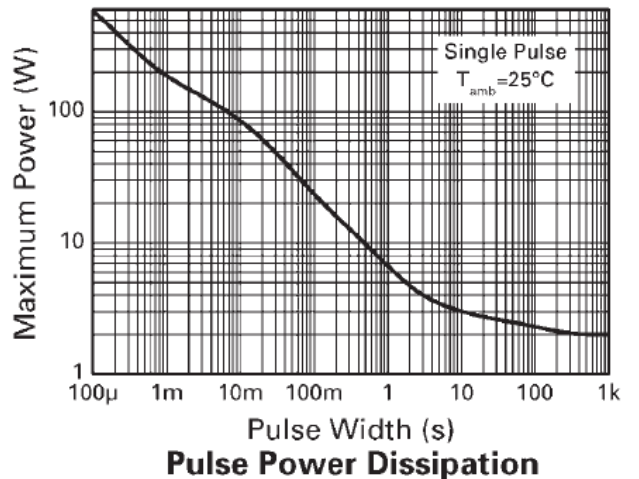
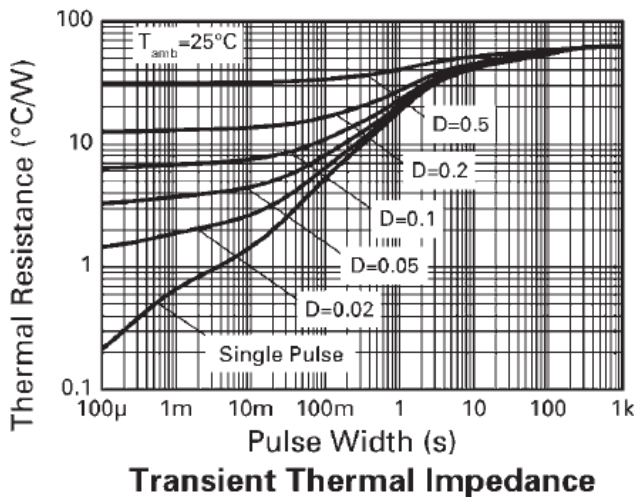
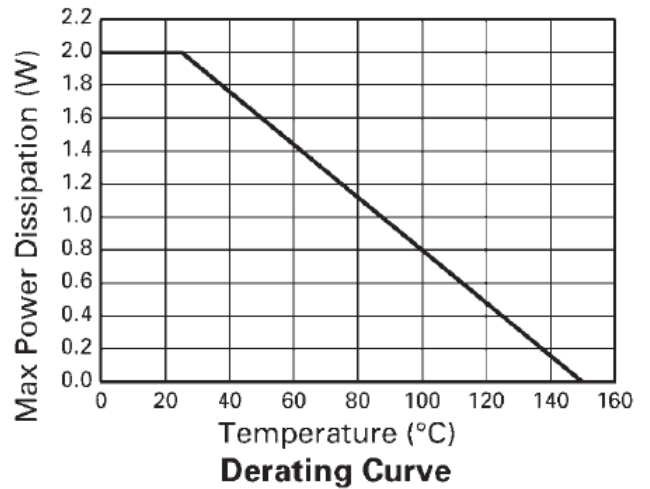
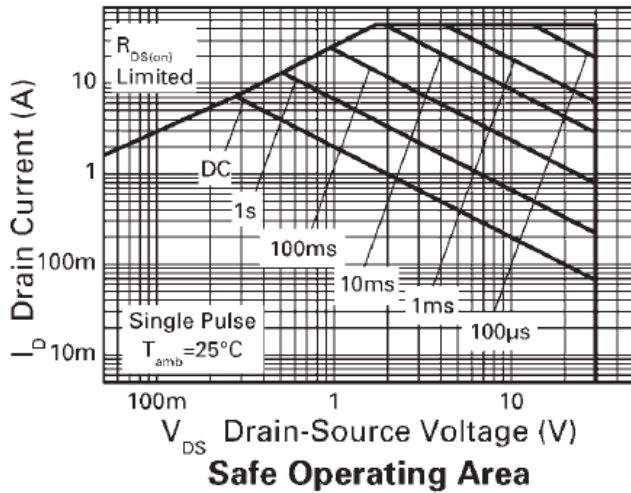
Maximum Ratings

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current @ $V_{GS} = 4.5V$	I_D	$T_A = +25^\circ C$ (Note 6)	8.9
		$T_A = +70^\circ C$ (Note 6)	7.3
		$T_A = +25^\circ C$ (Note 5)	7.2
Pulsed Drain Current (Note 7)	I_{DM}	45	A
Continuous Source Current (Body Diode) (Note 6)	I_S	4.5	A
Pulsed Source Current (Body Diode) (Note 7)	I_{SM}	45	A
Power Dissipation at $T_A = +25^\circ C$ (Note 5)	P_D	2	W
Linear Derating Factor		16	mW/ $^\circ C$
Power Dissipation at $T_A = +25^\circ C$ (Note 6)	P_D	3	W
Linear Derating Factor		24	mW/ $^\circ C$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ C$

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	62.5	$^\circ C/W$
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	41.4	

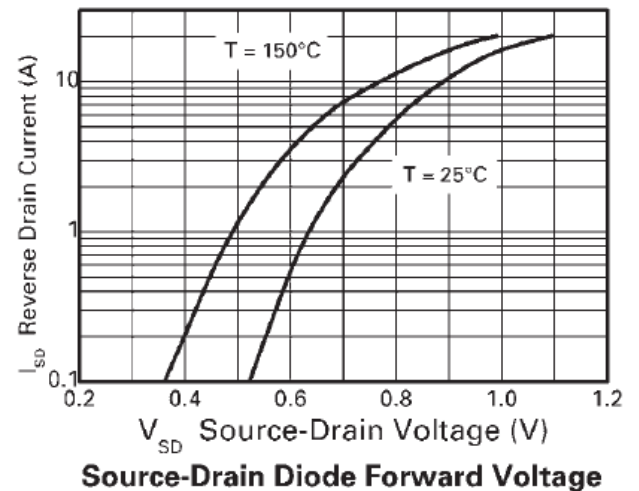
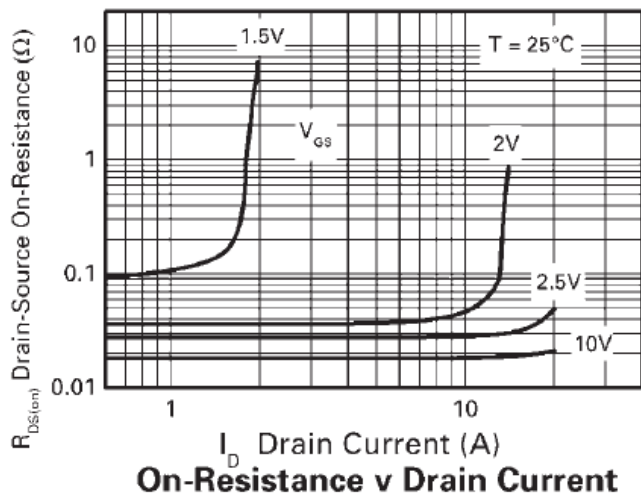
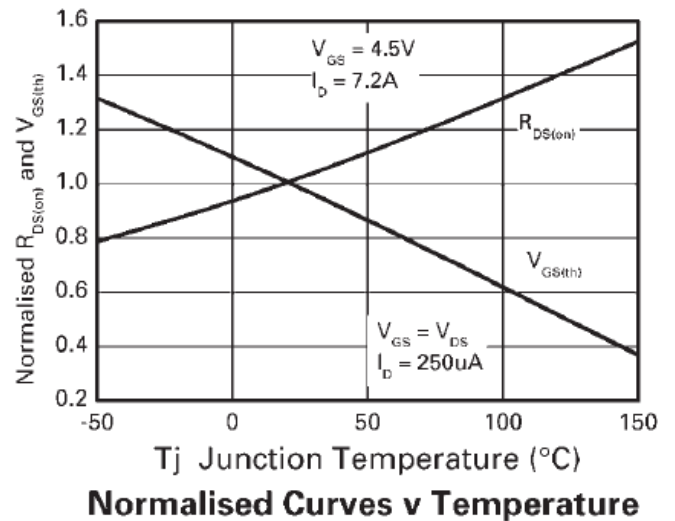
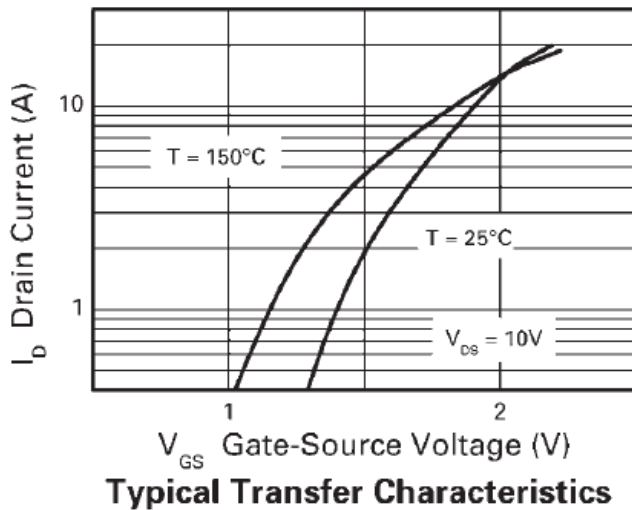
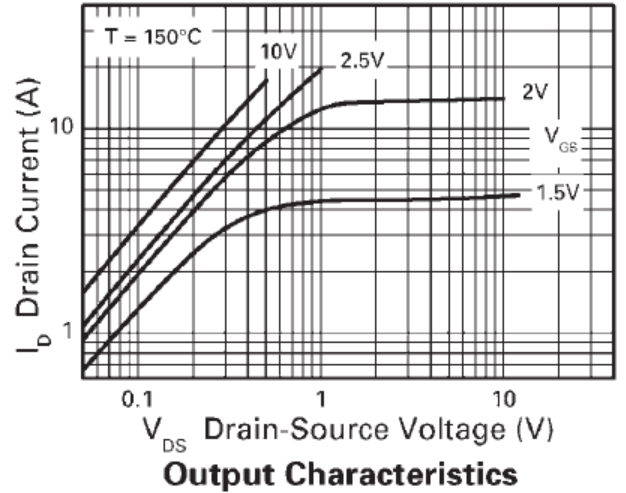
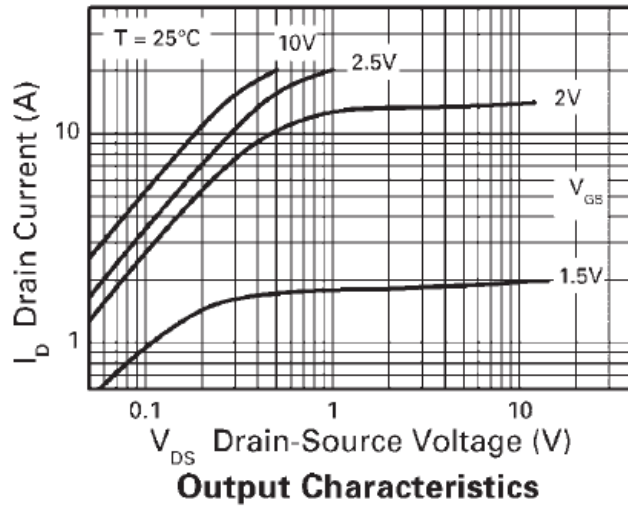
- Notes:
- For a device surface mounted on 50mm x 50mm FR-4 PCB with high coverage of single sided 2oz copper, in still air conditions.
 - For a device surface mounted on FR-4 PCB measured at $t \leq 10$ sec.
 - Repetitive rating - 25mm x 25mm FR-4 PCB, $D=0.02$, pulse width 300 μs - pulse width limited by maximum junction temperature.

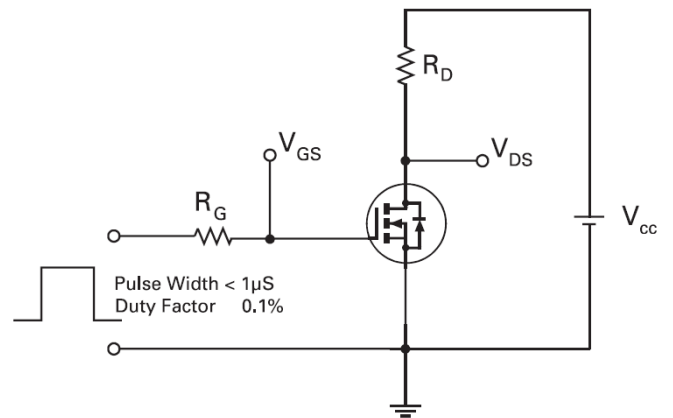
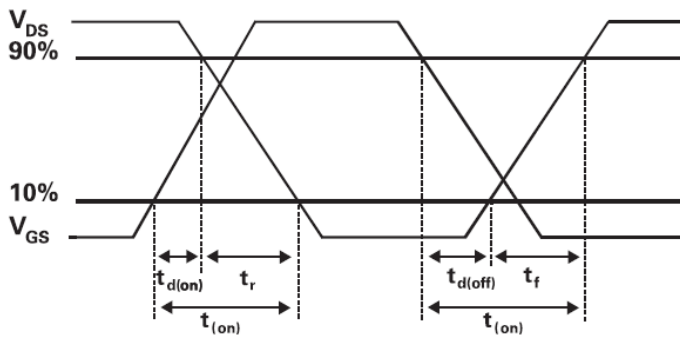
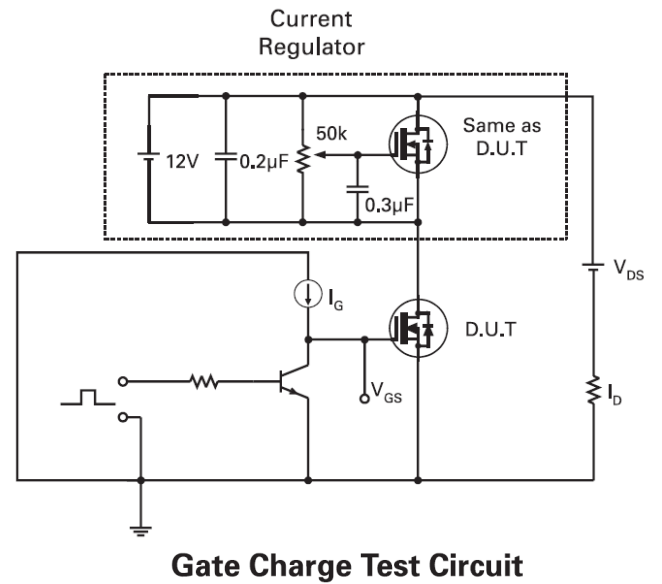
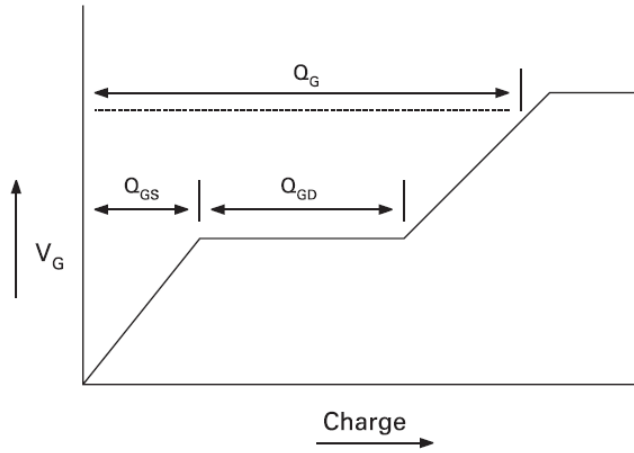
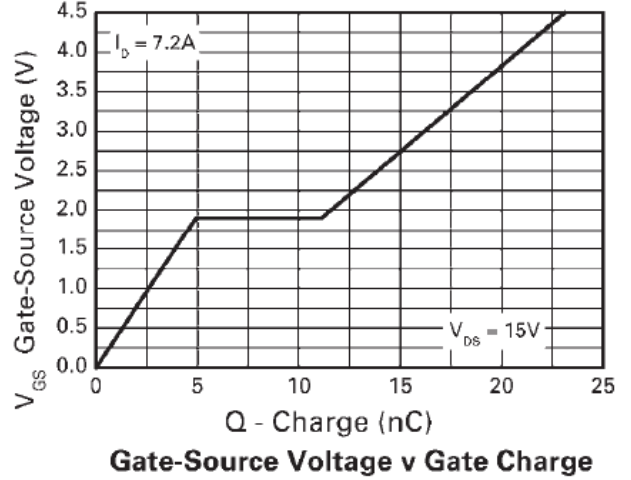
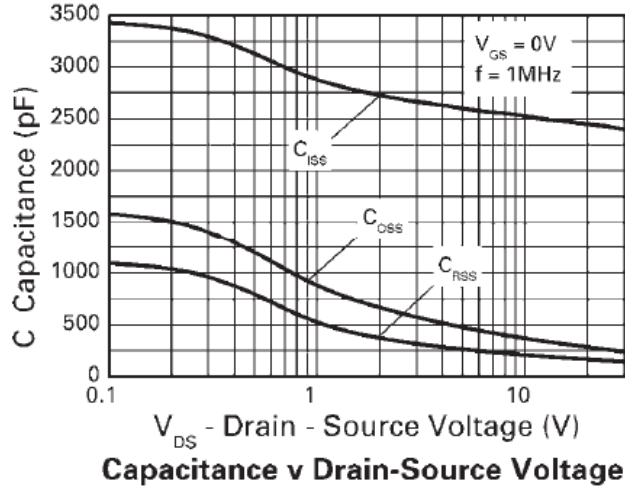


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
STATIC						
Drain-Source Breakdown Voltage	BV _{DSS}	30	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	0.5	μA	V _{DS} = 30V, V _{GS} = 0V
Gate-Body Leakage	I _{GSS}	—	—	100	nA	V _{GS} = ±12V, V _{DS} = 0V
Gate-Source Threshold Voltage	V _{GS(TH)}	0.7	—	—	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance (Note 8)	R _{DS(ON)}	—	0.021	0.025	Ω	V _{GS} = 4.5V, I _D = 7.2A
		—	0.028	0.040		V _{GS} = 2.5V, I _D = 5.7A
Forward Transconductance (Notes 8 and 10)	g _{fs}	—	24	—	S	V _{DS} = 15V, I _D = 7.2A
DYNAMIC (Note 10)						
Input Capacitance	C _{iss}	—	2480	—	pF	V _{DS} = 15V, f = 1.0MHz, V _{GS} = 0V
Output Capacitance	C _{oss}	—	318	—		
Reverse Transfer Capacitance	C _{rss}	—	184	—		
SWITCHING (Notes 9 and 10)						
Turn-On Delay Time	t _{D(ON)}	—	9	—	ns	V _{DD} = 15V, R _G = 6.0Ω, I _D = 1A, V _{GS} = 4.5V
Rise Time	t _R	—	11.5	—		
Turn-Off Delay Time	t _{D(OFF)}	—	40	—		
Fall Time	t _F	—	16.6	—	nC	V _{DS} = 15V, V _{GS} = 4.5V, I _D = 7.2A
Total Gate Charge	Q _g	—	23.1	—		
Gate-Source Charge	Q _{gs}	—	4.9	—		
Gate-Drain Charge	Q _{gd}	—	6.2	—		
SOURCE-DRAIN DIODE						
Diode Forward Voltage (Note 8)	V _{SD}	—	0.85	0.95	V	T _J = +25°C, I _S = 8A, V _{GS} = 0V
Reverse Recovery Time (Note 10)	t _{RR}	—	17.9	—	ns	di/dt = 100A/μs, I _F = 3.2A,
Reverse Recovery Charge (Note 10)	Q _{RR}	—	10	—	nC	T _J = +25°C

- Notes:
8. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
 9. Switching characteristics are independent of operating junction temperature.
 10. For design aid only, not subject to production testing.

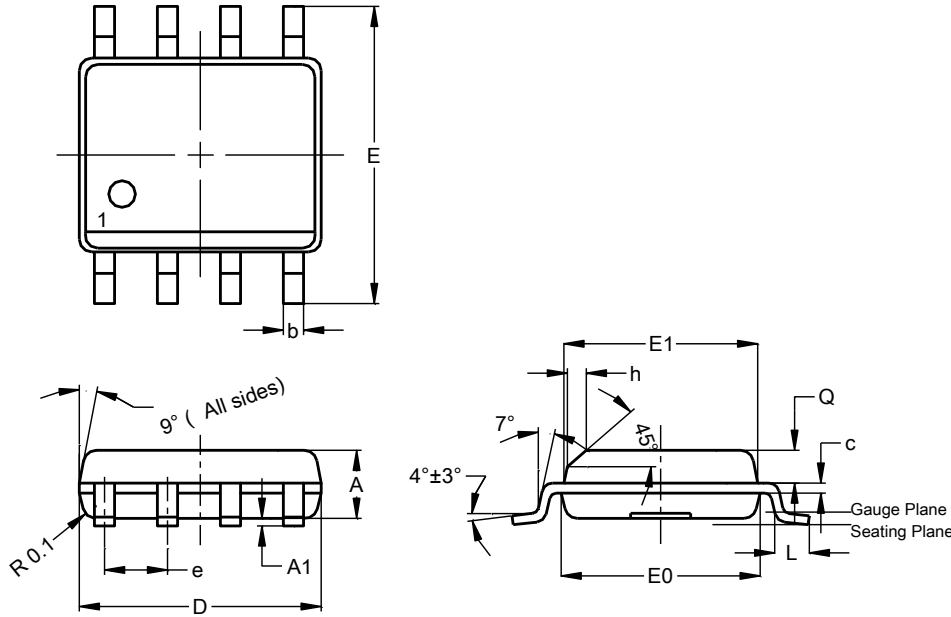




Package Outline Dimensions

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

SO-8

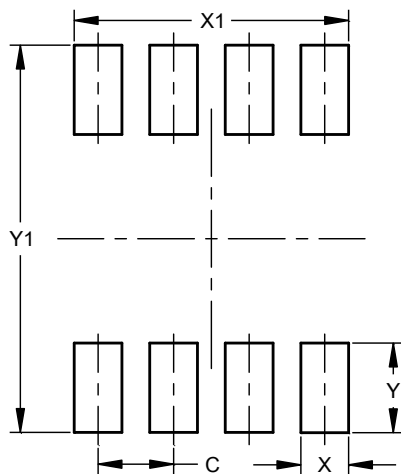


SO-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	--	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

Suggested Pad Layout

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

SO-8



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

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