

Product Summary

BV _{DSS}	R _{D(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

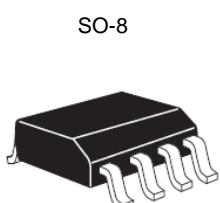
- DC-DC Converters
- Power Management Functions
- Disconnect Switches
- Motor Control

Features

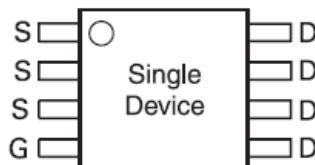
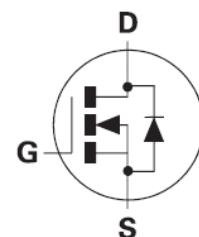
- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- Low Profile SO-8 Package
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**

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 ⑥③
- Weight: 0.076 grams (Approximate)



Top View


 Top View
 Pin Out Configuration


Equivalent Circuit

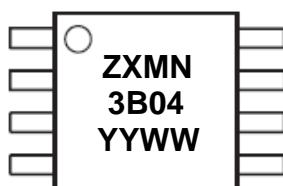
Ordering Information (Note 4)

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:

- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 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.
- Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- 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)

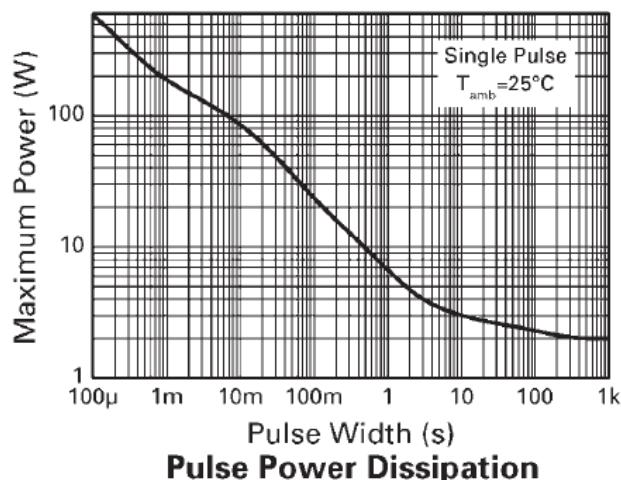
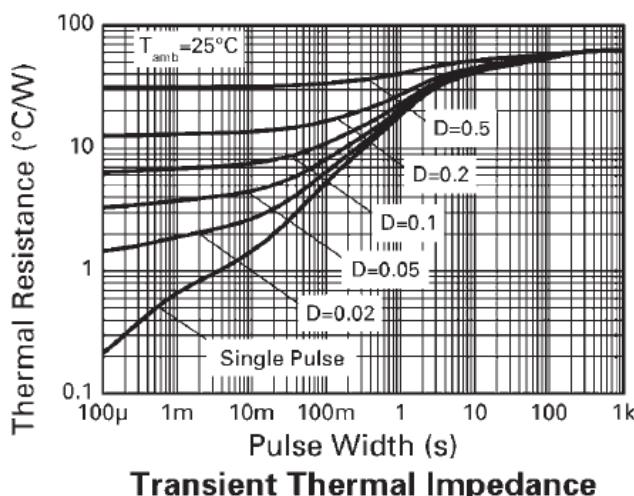
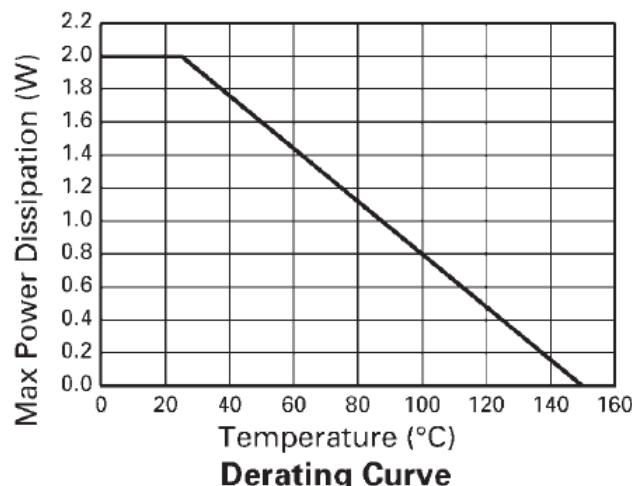
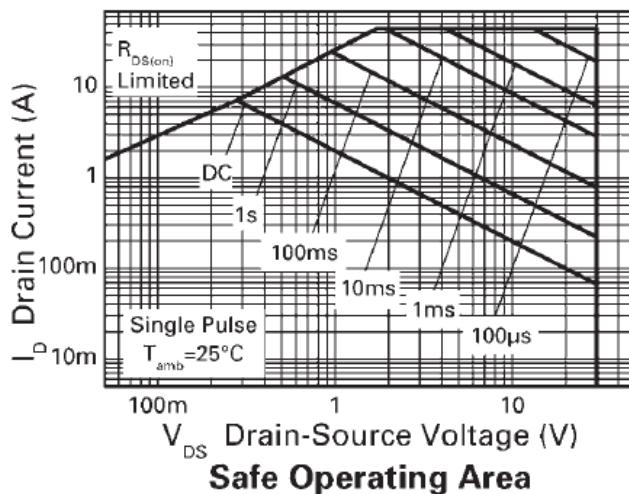
Maximum Ratings

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	8.9 7.3 7.2	A
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	°C

Thermal Characteristics

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

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



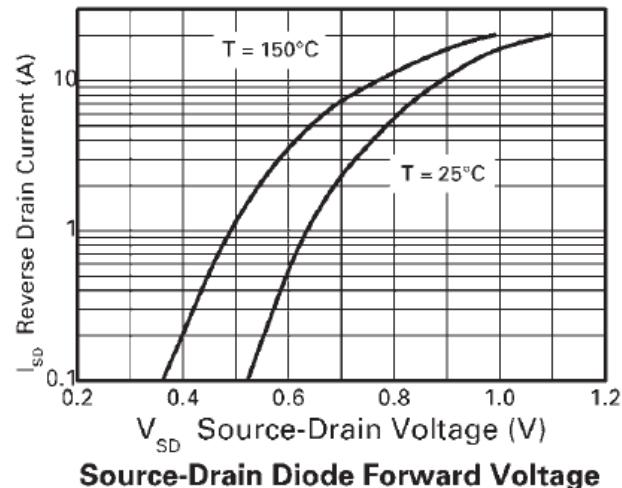
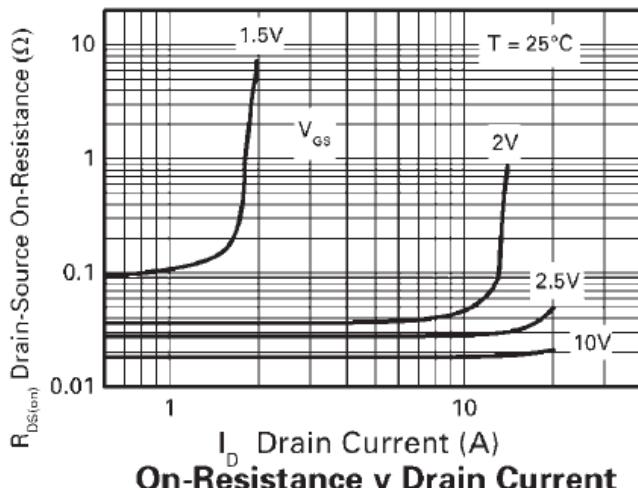
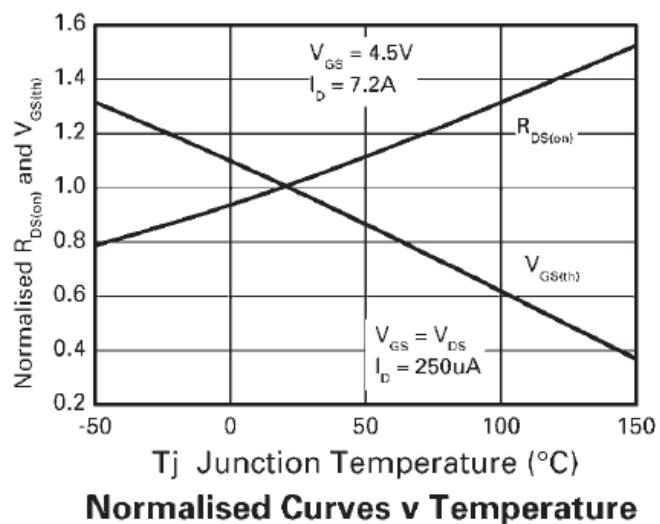
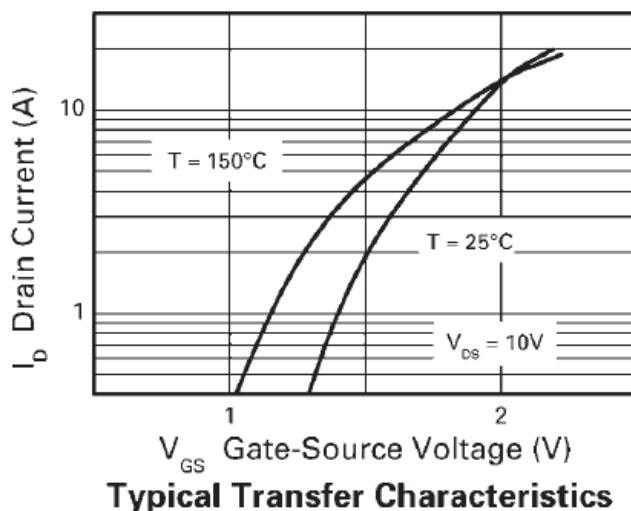
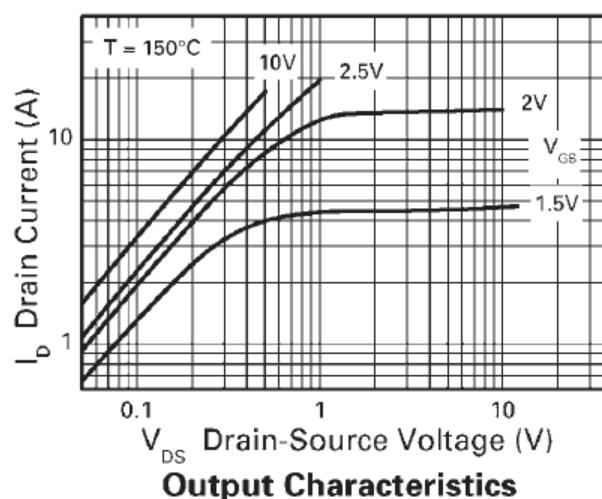
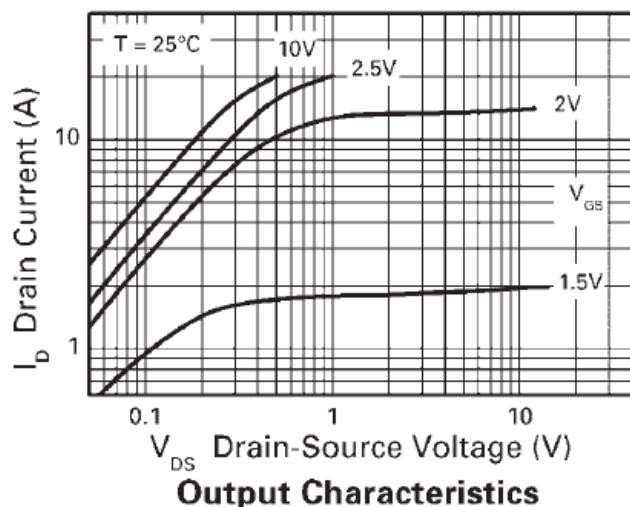
Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

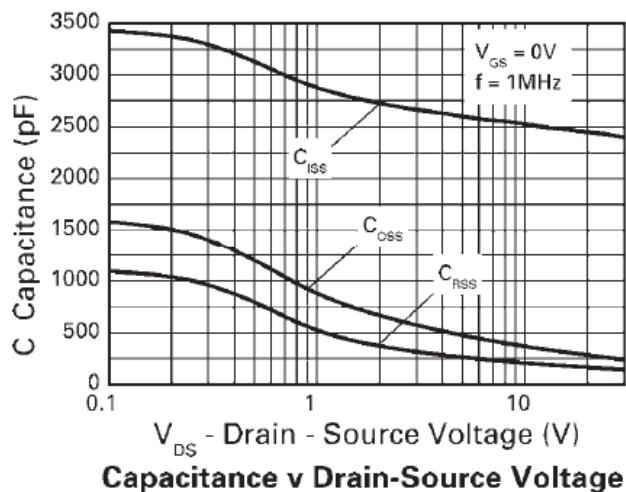
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
STATIC						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	$V_{\text{GS}} = 0\text{V}$, $I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	0.5	μA	$V_{\text{DS}} = 30\text{V}$, $V_{\text{GS}} = 0\text{V}$
Gate-Body Leakage	I_{GSS}	—	—	100	nA	$V_{\text{GS}} = \pm 12\text{V}$, $V_{\text{DS}} = 0\text{V}$
Gate-Source Threshold Voltage	$V_{\text{GS(TH)}}$	0.7	—	—	V	$V_{\text{DS}} = V_{\text{GS}}$, $I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance (Note 8)	$R_{\text{DS(ON)}}$	—	0.021	0.025	Ω	$V_{\text{GS}} = 4.5\text{V}$, $I_D = 7.2\text{A}$
		—	0.028	0.040		$V_{\text{GS}} = 2.5\text{V}$, $I_D = 5.7\text{A}$
Forward Transconductance (Notes 8 and 10)	g_{fs}	—	24	—	S	$V_{\text{DS}} = 15\text{V}$, $I_D = 7.2\text{A}$
DYNAMIC (Note 10)						
Input Capacitance	C_{iss}	—	2480	—	pF	$V_{\text{DS}} = 15\text{V}$, $f = 1.0\text{MHz}$, $V_{\text{GS}} = 0\text{V}$
Output Capacitance	C_{oss}	—	318	—		
Reverse Transfer Capacitance	C_{rss}	—	184	—		
SWITCHING (Notes 9 and 10)						
Turn-On Delay Time	$t_{\text{D(ON)}}$	—	9	—	ns	$V_{\text{DD}} = 15\text{V}$, $R_G = 6.0\Omega$, $I_D = 1\text{A}$, $V_{\text{GS}} = 4.5\text{V}$
Rise Time	t_R	—	11.5	—		
Turn-Off Delay Time	$t_{\text{D(OFF)}}$	—	40	—		
Fall Time	t_F	—	16.6	—		
Total Gate Charge	Q_g	—	23.1	—	nC	$V_{\text{DS}} = 15\text{V}$, $V_{\text{GS}} = 4.5\text{V}$, $I_D = 7.2\text{A}$
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	$T_J = +25^\circ\text{C}$, $I_S = 8\text{A}$, $V_{\text{GS}} = 0\text{V}$
Reverse Recovery Time (Note 10)	t_{RR}	—	17.9	—	ns	$di/dt = 100\text{A}/\mu\text{s}$, $I_F = 3.2\text{A}$, $T_J = +25^\circ\text{C}$
Reverse Recovery Charge (Note 10)	Q_{RR}	—	10	—	nC	

Notes: 8. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

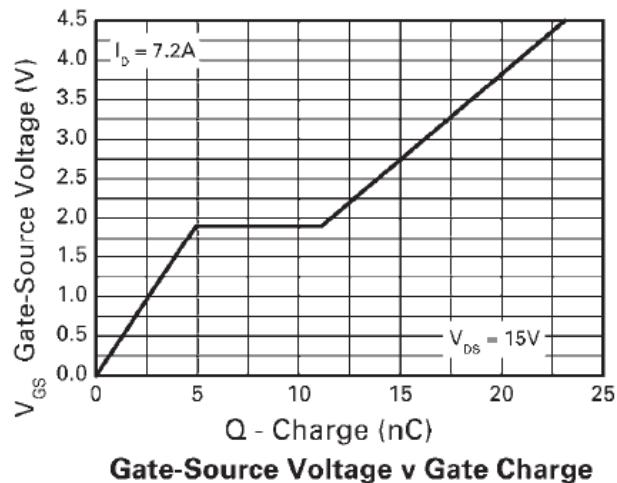
9. Switching characteristics are independent of operating junction temperature.

10. For design aid only, not subject to production testing.

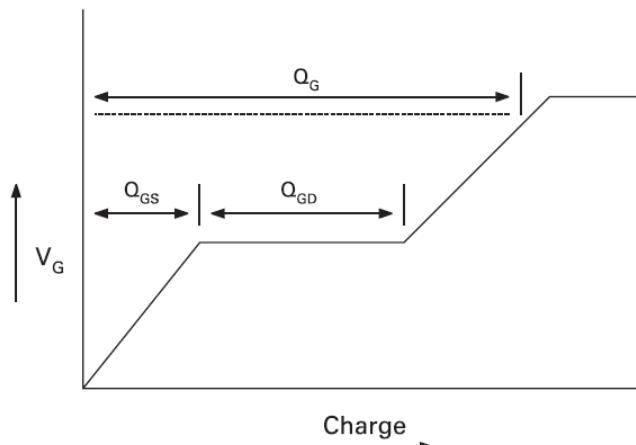




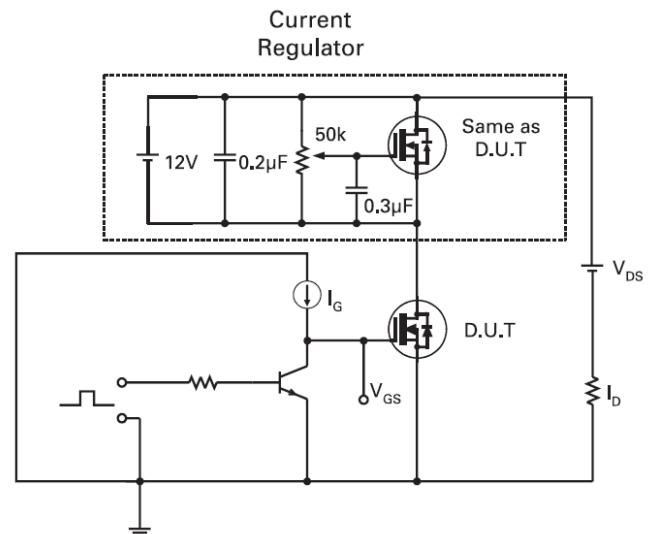
Capacitance v Drain-Source Voltage



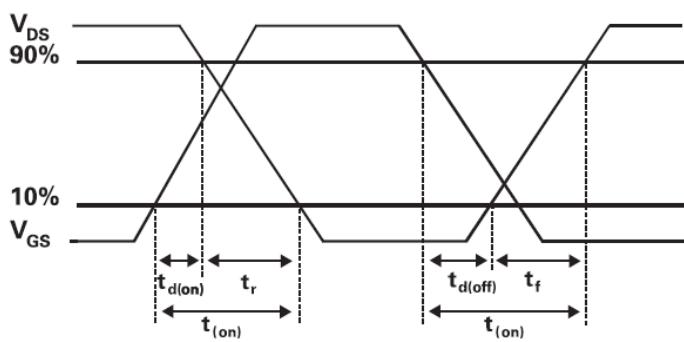
Gate-Source Voltage v Gate Charge



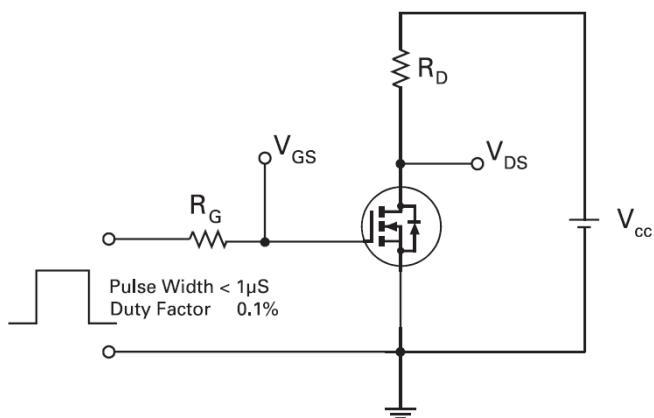
Basic Gate Charge Waveform



Gate Charge Test Circuit



Switching Time Waveforms

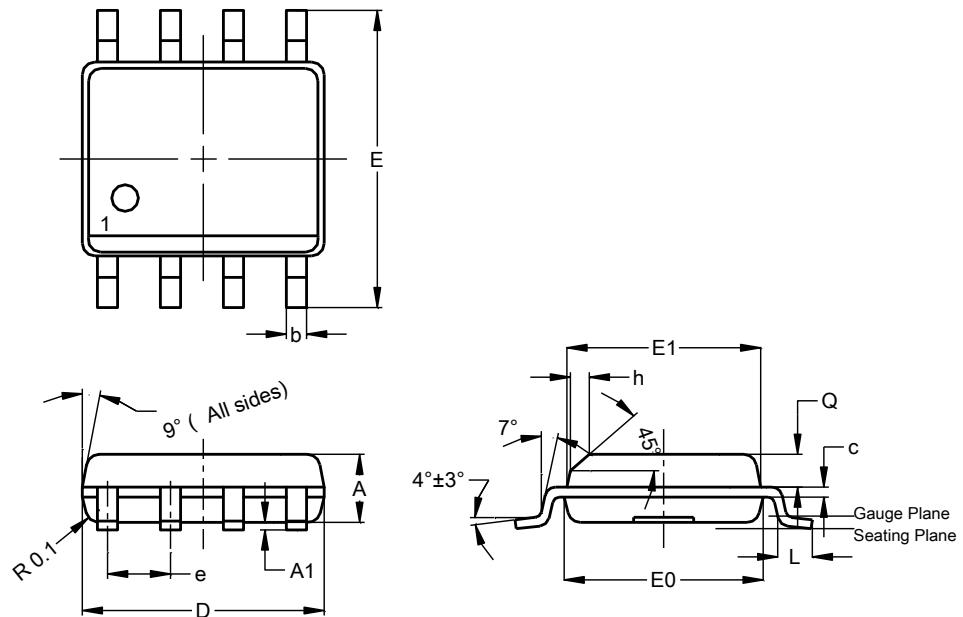


Switching Time Test Circuit

Package Outline Dimensions

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

SO-8



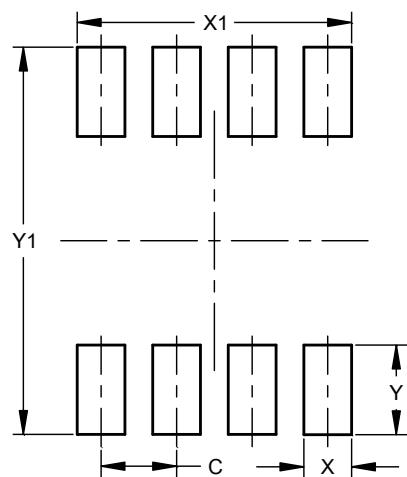
SO-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	-	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65

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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