

## Product Summary

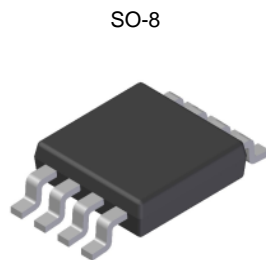
BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> T <sub>A</sub> = +25°C (Notes 7 & 9)
-60V	125mΩ @ V <sub>GS</sub> = -10V	-3.4A
	190mΩ @ V <sub>GS</sub> = -4.5V	-2.8A

## Description

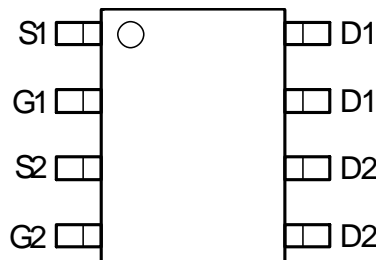
This MOSFET has been designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

## Applications

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



Top View



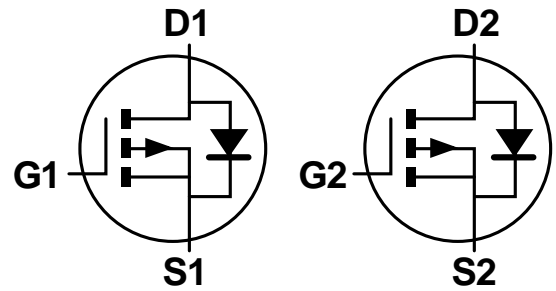
Top View

## Features

- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- Low Profile SOIC Package
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

## 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; Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.074 grams (Approximate)



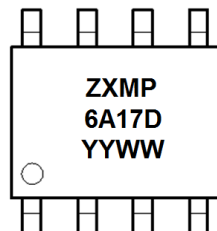
Equivalent Circuit

## Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ZXMP6A17DN8TA	AEC-Q101	ZXMP6A17D	7	12	500
ZXMP6A17DN8TC	AEC-Q101	ZXMP6A17D	13	12	2,500
ZXMP6A17DN8QTC	Automotive	ZXMP6A17D	13	12	2,500

- 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to [http://www.diodes.com/product\\_compliance\\_definitions.html](http://www.diodes.com/product_compliance_definitions.html).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



ZXMP6A17D = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Year (ex: 17 = 2017)  
 WW = Week (01 to 53)

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

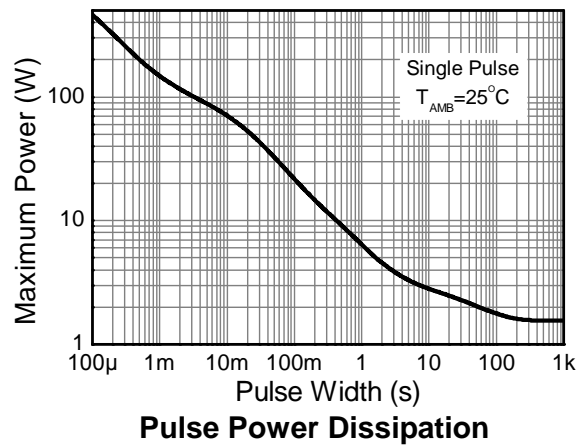
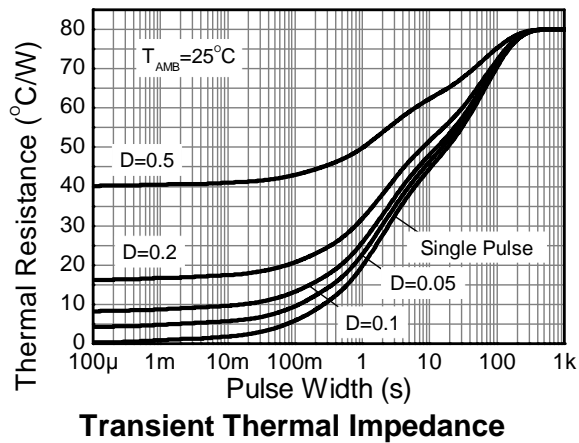
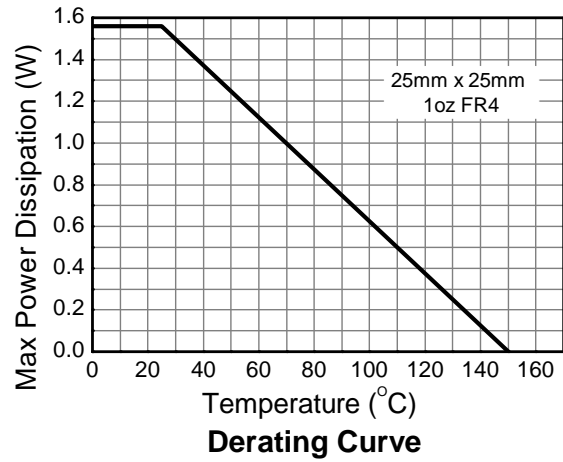
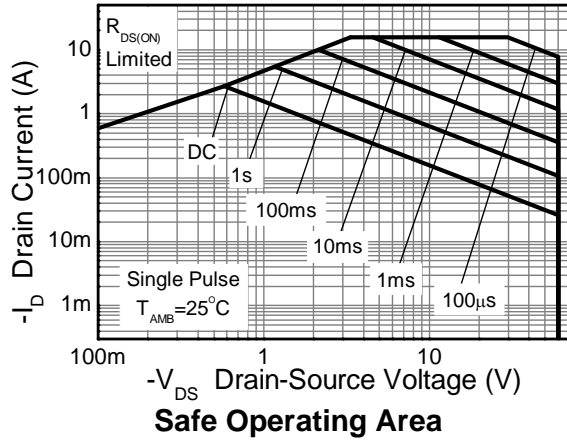
Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V <sub>DSS</sub>	-60	V
Gate-Source Voltage		V <sub>GS</sub>	±20	V
Continuous Drain Current	V <sub>GS</sub> = 10V	(Notes 7 & 9)	-3.42	A
		T <sub>A</sub> = +70°C (Notes 7 & 9)	-2.73	
		(Notes 6 & 9)	-2.7	
Pulsed Drain Current		I <sub>DM</sub>	-15.6	A
Continuous Source Current (Body Diode)		I <sub>S</sub>	-3.4	A
Pulsed Source Current (Body Diode)		I <sub>SM</sub>	-15.6	A

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

Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Notes 6 & 9)	P <sub>D</sub>	1.25	W mW/°C
			10.0	
	(Notes 6 & 10)		1.81	
			14.5	
Thermal Resistance, Junction to Ambient	(Notes 7 & 9)	R <sub>θJA</sub>	2.15	°C/W
	(Notes 6 & 9)		17	
	(Notes 6 & 10)		100	
Thermal Resistance, Junction to Lead	(Notes 7 & 9)	R <sub>θJL</sub>	70	°C/W
	(Notes 9 & 11)		60	
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
6. For a device surface mounted on 25mm x 25mm x 1.6mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
  7. Same as note (6), except the device is measured at t ≤ 10 sec.
  8. Same as note (6), except the device is pulsed with D = 0.02 and pulse width 300µs. The pulse current is limited by the maximum junction temperature.
  9. For a dual device with one active die.
  10. For a device with two active die running at equal power.
  11. Thermal resistance from junction to solder-point.

**Thermal Characteristics**

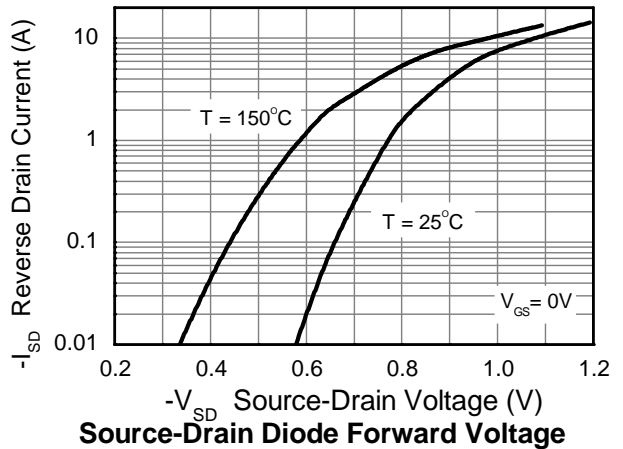
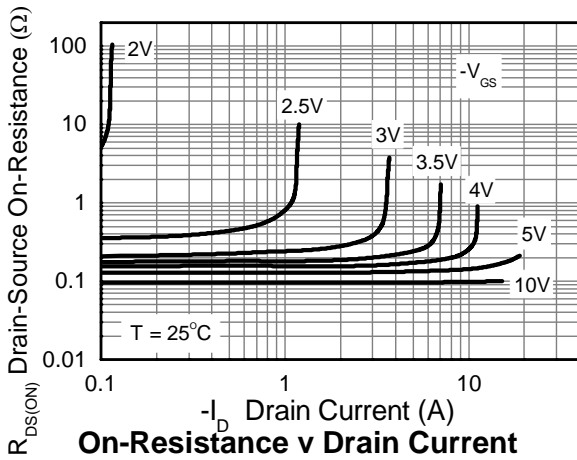
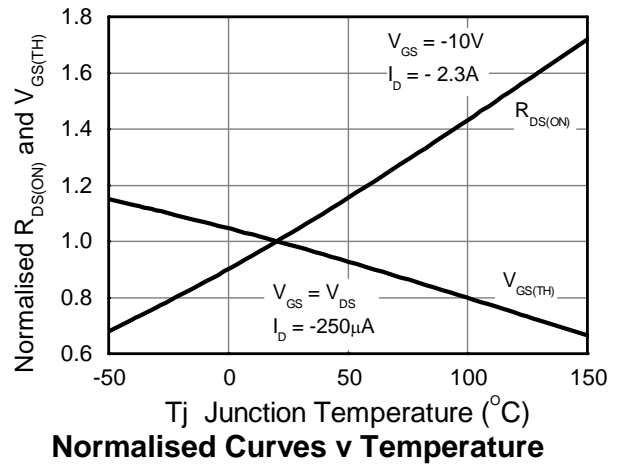
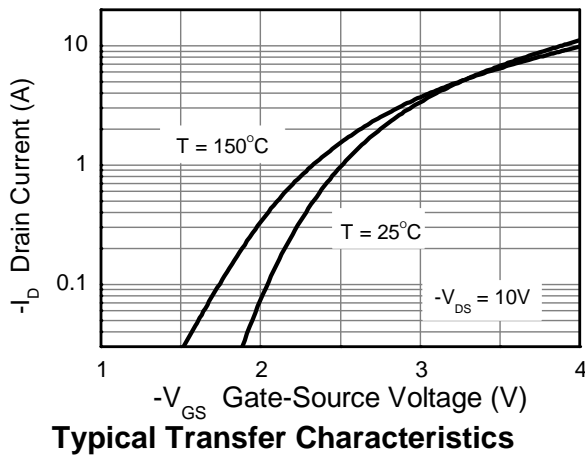
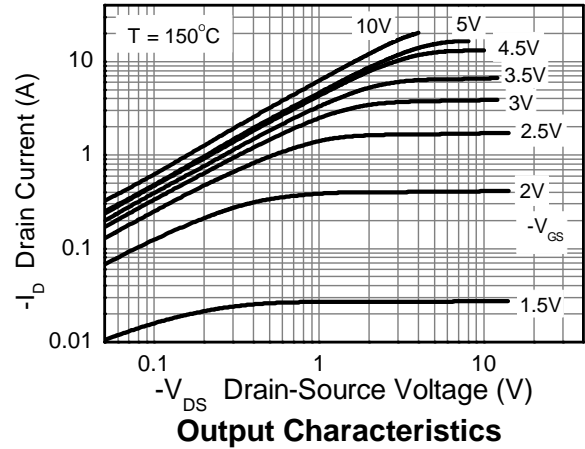
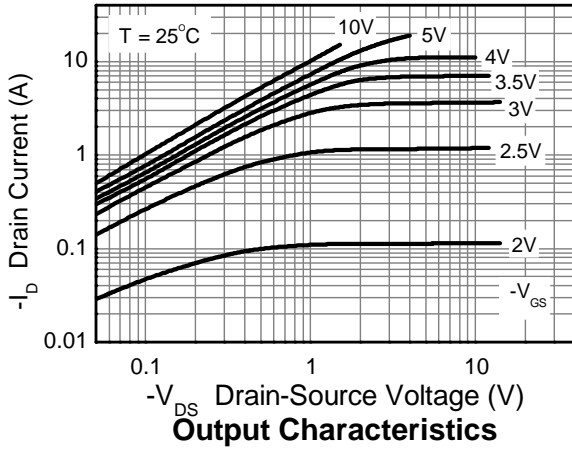


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

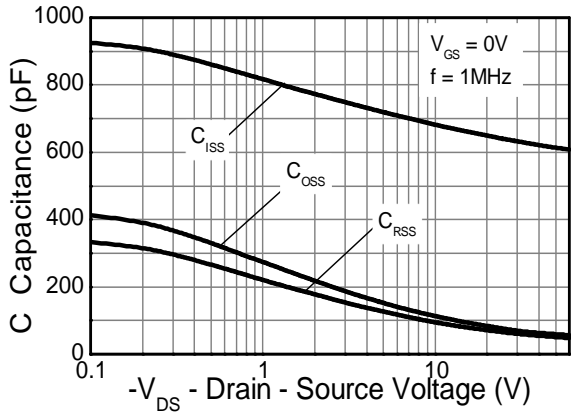
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-60	—	—	V	I <sub>D</sub> = -250μA, V <sub>GS</sub> = 0V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-0.5	μA	V <sub>DS</sub> = -60V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-1.0	—	—	V	I <sub>D</sub> = -250μA, V <sub>DS</sub> = V <sub>GS</sub>
Static Drain-Source On-Resistance (Note 12)	R <sub>DS(ON)</sub>	—	—	0.125	Ω	V <sub>GS</sub> = -10V, I <sub>D</sub> = -2.3A
				0.190		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -1.9A
Forward Transconductance (Notes 12 & 13)	g <sub>fs</sub>	—	4.7	—	S	V <sub>DS</sub> = -15V, I <sub>D</sub> = -2.3A
Diode Forward Voltage (Note 12)	V <sub>SD</sub>	—	-0.85	-0.95	V	I <sub>S</sub> = -2.0A, V <sub>GS</sub> = 0V
Reverse Recovery Time (Note 13)	t <sub>RR</sub>	—	25.1	—	ns	I <sub>S</sub> = -1.7A, di/dt = 100A/μs
Reverse Recovery Charge (Note 13)	Q <sub>RR</sub>	—	27.2	—	nC	
<b>DYNAMIC CHARACTERISTICS (Note 13)</b>						
Input Capacitance	C <sub>iss</sub>	—	637	—	pF	V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V f = 1MHz
Output Capacitance	C <sub>oss</sub>	—	70	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	53	—	pF	
Total Gate Charge (Note 14)	Q <sub>g</sub>	—	9.0	—	nC	V <sub>GS</sub> = -4.5V
Total Gate Charge (Note 14)	Q <sub>g</sub>	—	17.7	—	nC	V <sub>GS</sub> = -10V V <sub>DS</sub> = -30V I <sub>D</sub> = -2.2A
Gate-Source Charge (Note 14)	Q <sub>gs</sub>	—	1.6	—	nC	
Gate-Drain Charge (Note 14)	Q <sub>gd</sub>	—	4.4	—	nC	
Turn-On Delay Time (Note 14)	t <sub>D(ON)</sub>	—	2.6	—	ns	V <sub>DD</sub> = -30V, V <sub>GS</sub> = -10V I <sub>D</sub> = -1A, R <sub>g</sub> ≅ 6.0Ω
Turn-On Rise Time (Note 14)	t <sub>R</sub>	—	3.4	—	ns	
Turn-Off Delay Time (Note 14)	t <sub>D(OFF)</sub>	—	26.2	—	ns	
Turn-Off Fall Time (Note 14)	t <sub>F</sub>	—	11.3	—	ns	

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

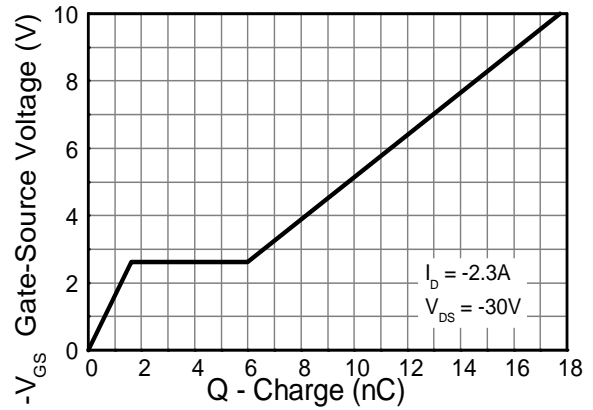
**Typical Characteristics**



**Typical Characteristics (Cont.)**

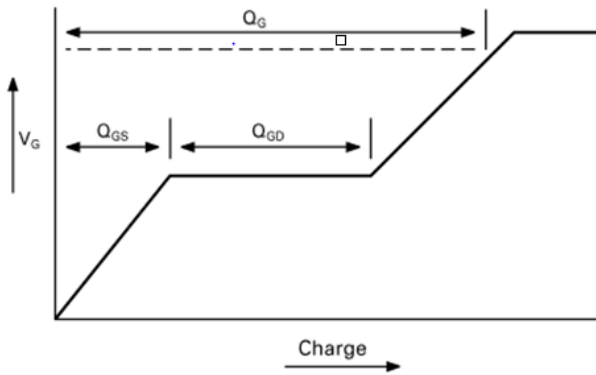


**Capacitance v Drain-Source Voltage**

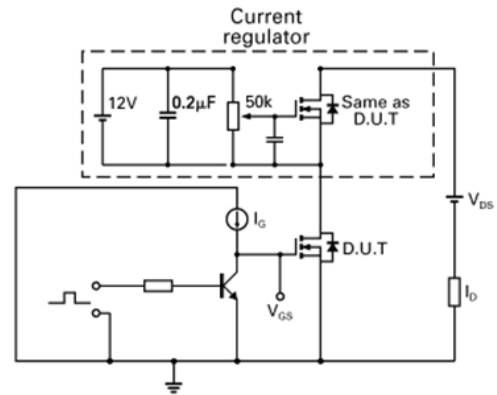


**Gate-Source Voltage v Gate Charge**

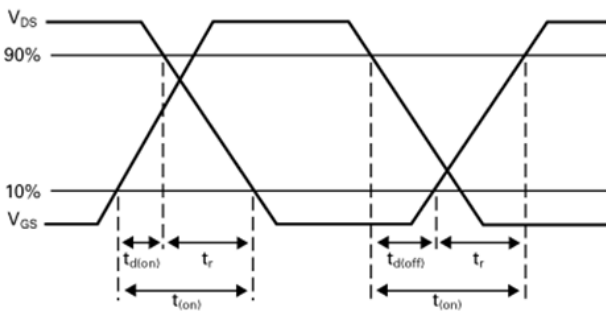
**Test Circuits**



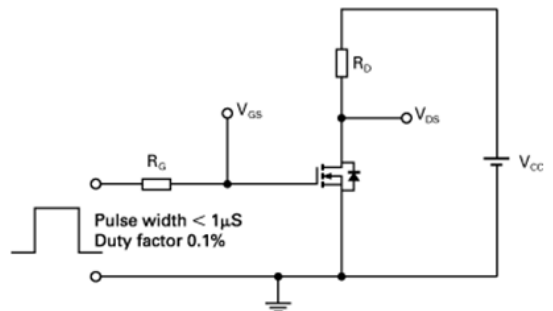
**Basic gate charge waveform**



**Gate charge test circuit**



**Switching time waveforms**

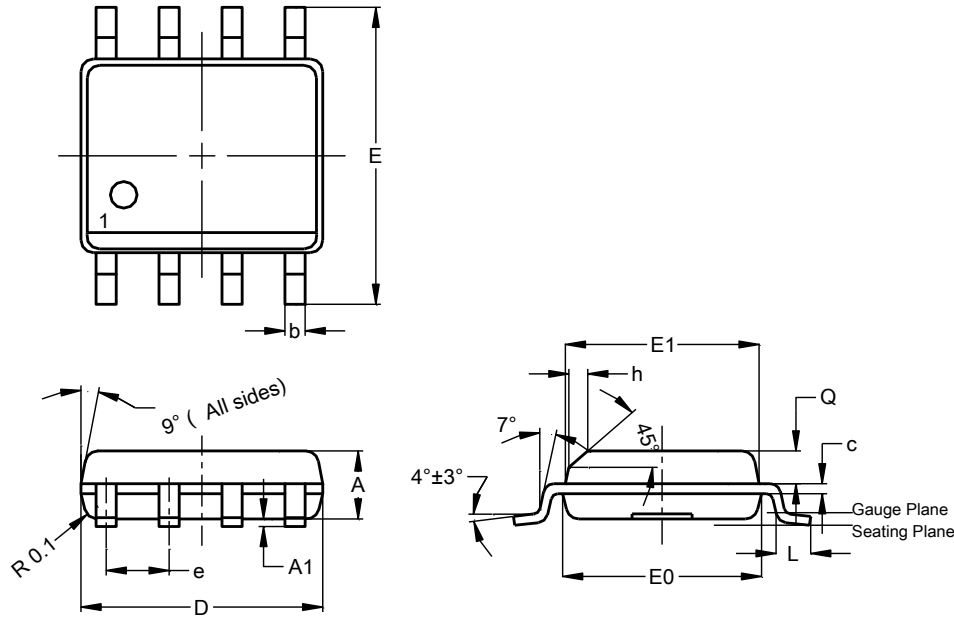


**Switching time test circuit**

**Package Outline Dimensions**

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

**SO-8**

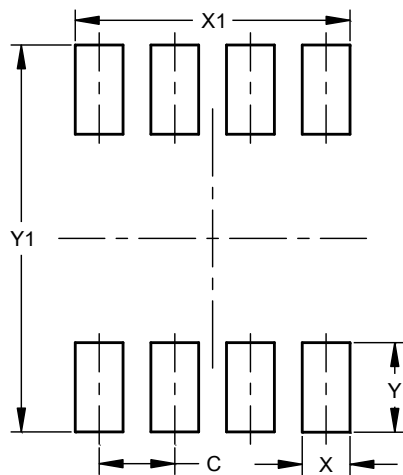


SO-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	-	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

**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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