

## Product Summary

$BV_{DSS}$	$R_{DS(ON)}$ ( $\Omega$ )	$I_D$ (A)
60V	0.3 @ $V_{GS} = 10V$	1.6

## Description and Applications

This new generation of trench MOSFETs from Zetex 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.

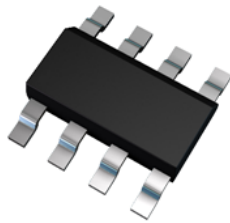
- DC-AC Converters
- Motor Control

## Features

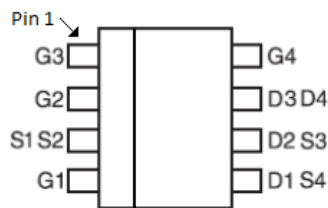
- Compact Package
- Low On State Losses
- Low Drive Requirements
- Operates up to 60V
- 1 Amp Continuous Rating
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

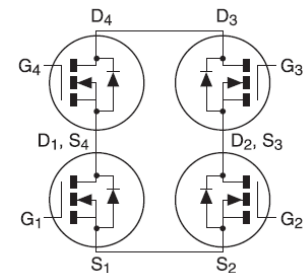
- Case: SM-8 (8 LEAD SOT223)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.117 grams (Approximate)



Top View



Top View  
Pin Out



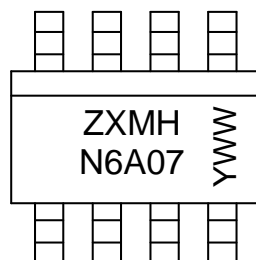
Equivalent Circuit

## Ordering Information (Note 4)

Part Number	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ZXMHN6A07T8TA	7	12	1,000
ZXMHN6A07T8TC	13	12	4,000

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



ZXMHN6A07 = Product Type Marking Code  
 YWW = Date Code Marking  
 Y or  $\bar{Y}$  = Last Digit of Year (ex: 5= 2015)  
 WW or  $\bar{W}W$  = Week Code (01 to 53)

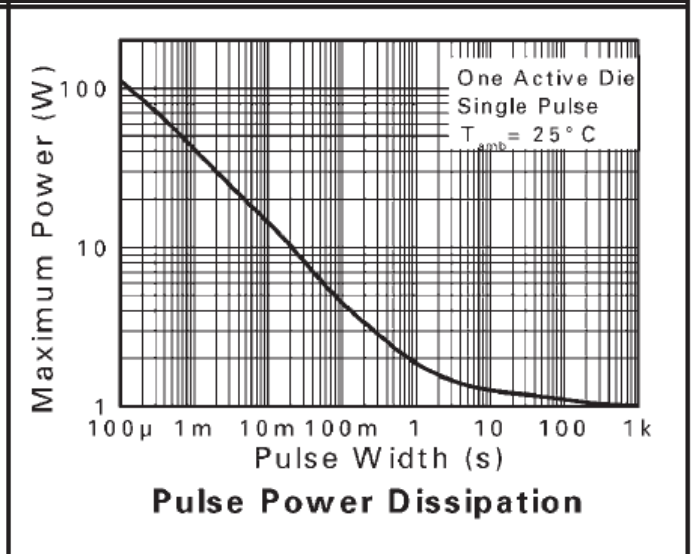
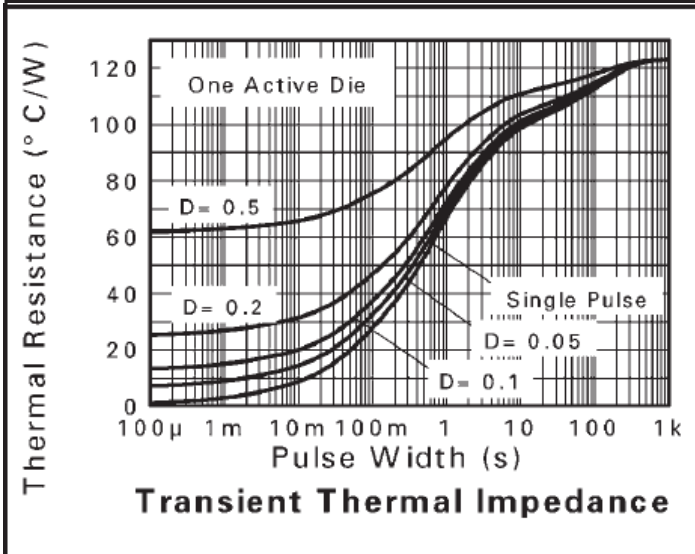
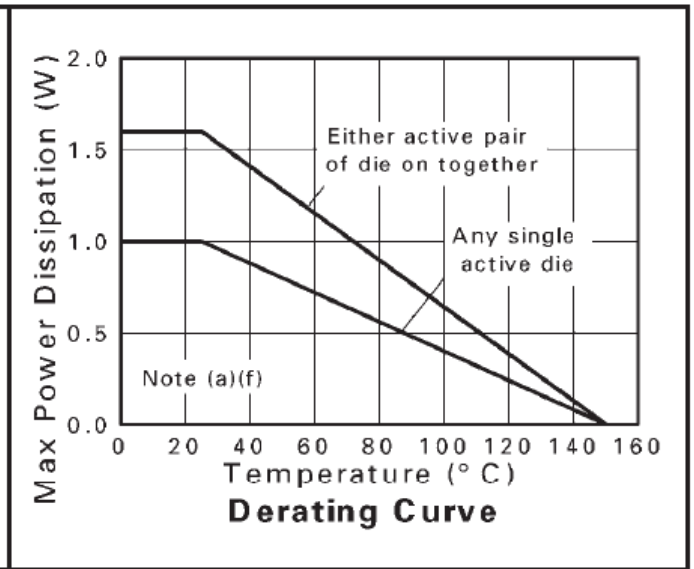
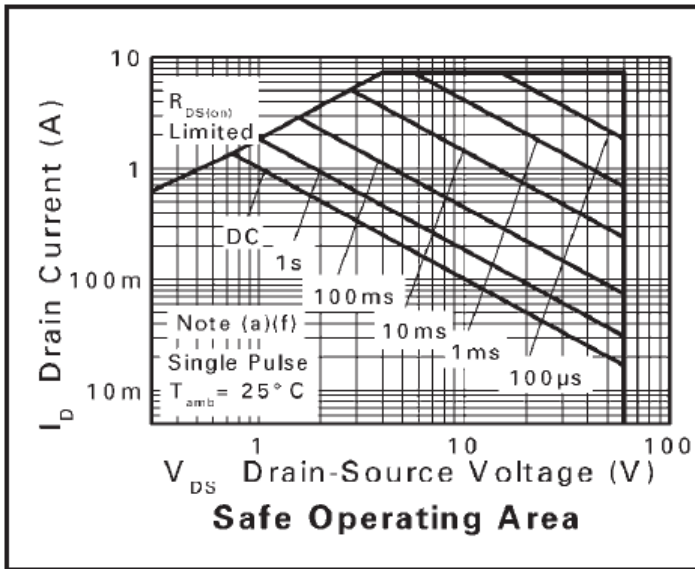
### Absolute Maximum Ratings

Characteristic		Symbol	Value	Unit	
Drain-Source Voltage		$V_{DSS}$	60	V	
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V	
Continuous Drain Current	$V_{GS} = 10V$	$I_D$	$T_A = +25^\circ C$ (Notes 6, 8)	1.6	A
			$T_A = +70^\circ C$ (Notes 6, 8)	1.3	
			$T_A = +25^\circ C$ (Notes 5, 8)	1.4	
Pulsed Drain Current (Note 7)		$I_{DM}$	9	A	
Continuous Source Current (Body Diode) (Notes 6, 8)		$I_S$	1	A	
Pulsed Source Current (Body Diode) (Note 7)		$I_{SM}$	9	A	

### Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation at $T_A = +25^\circ C$	Any Single transistor "on" (Notes 5, 8)	$P_{TOT}$	1.1	W
	Single transistor 'on' (Notes 6, 8)		1.4	
	Two transistors 'on' equally (Notes 5, 9)		1.6	
Linear Derating Factor above $+25^\circ C$	Single transistor "on" (Notes 5, 8)	$P_{TOT}$	8.8	mW/ $^\circ C$
	Single transistor 'on' (Notes 6, 8)		11.2	
	Two transistors 'on' equally (Notes 5, 9)		13.2	
Thermal Resistance - Junction to Ambient	Single transistor "on" (Notes 5, 8)	$R_{\theta JA}$	114	$^\circ C/W$
	Single transistor "on" (Notes 6, 8)		89	
	Two transistors 'on' equally (Notes 5, 9)		76	
Operating and Storage Temperature Range		$T_J, T_{STG}$	-55 to +150	$^\circ C$

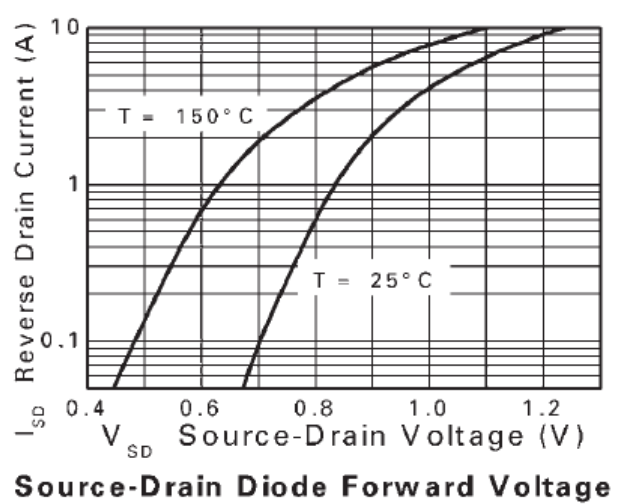
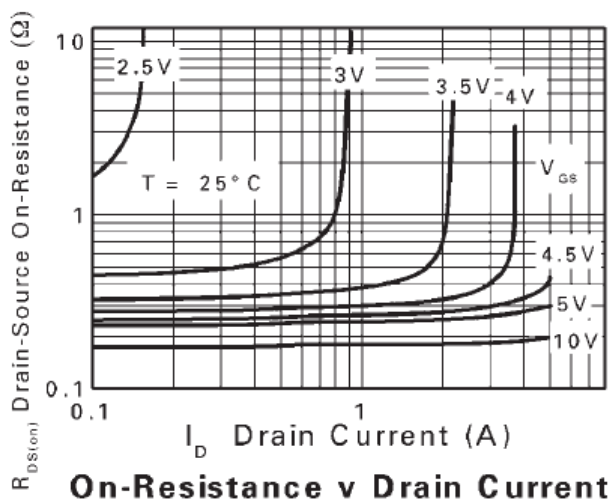
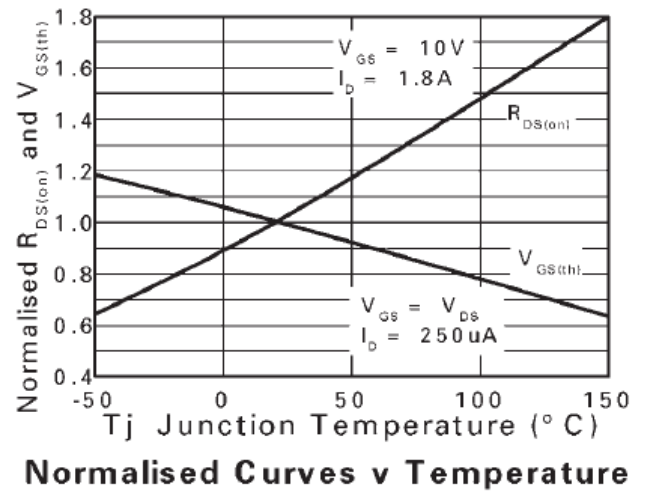
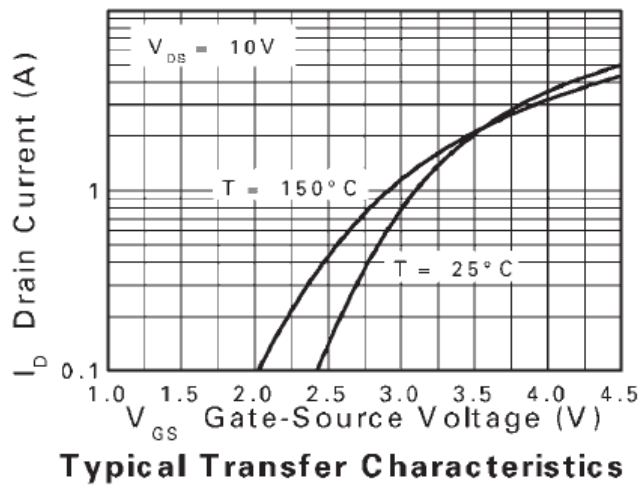
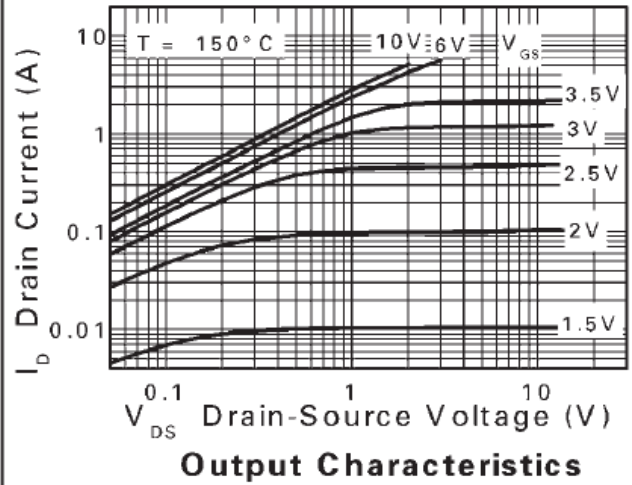
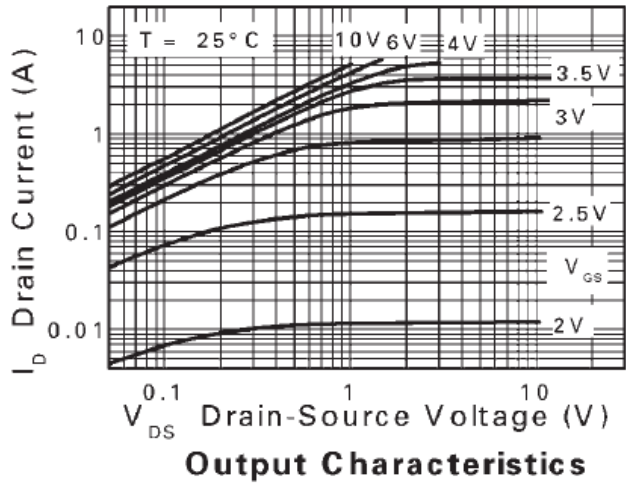
- Notes: 5. For a device mounted on 50mm x 50mm x 1.6mm FR-4 PCB with a high coverage of single sided 2oz weight copper in still air conditions with the heat sink split into three equal areas, one for each drain connection.  
6. For a device surface mounted on a FR-4 PCB at  $t \leq 10$  sec.  
7. Repetitive rating on 50mm x 50mm x 1.6mm FR-4 PCB, duty cycle 2%, pulse width 300 $\mu s$  in still air conditions with the heat sink split into three equal areas, one for each drain connection.  
8. For device with one active die.  
9. For any two die not sharing the same drain connection.

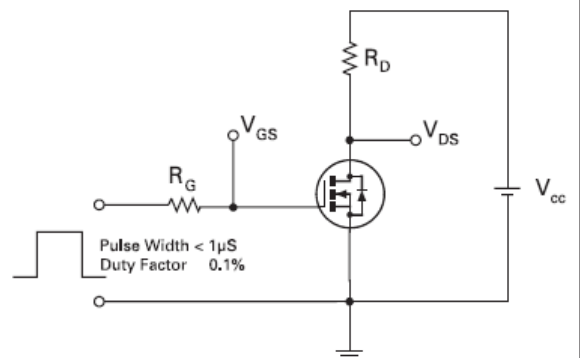
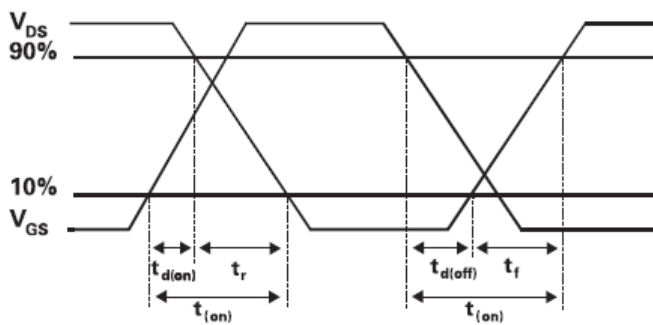
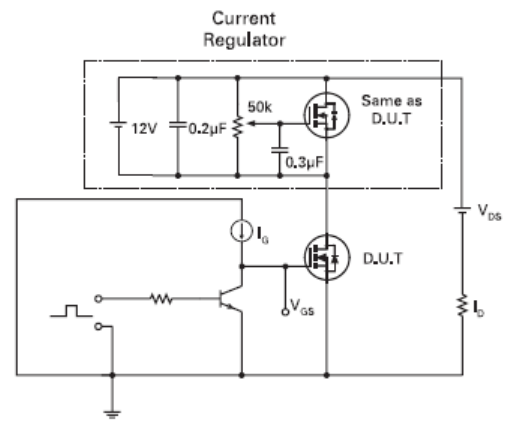
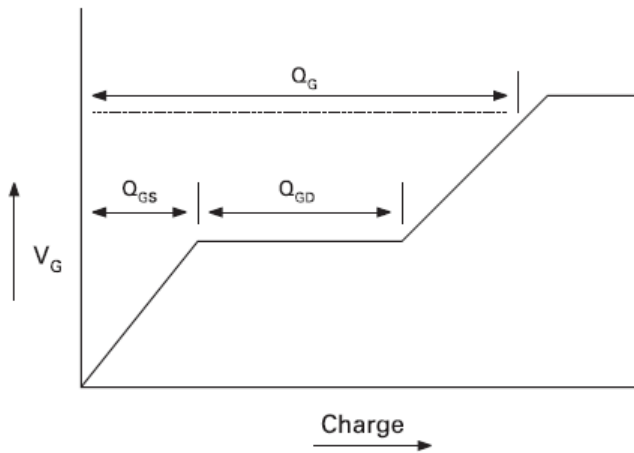
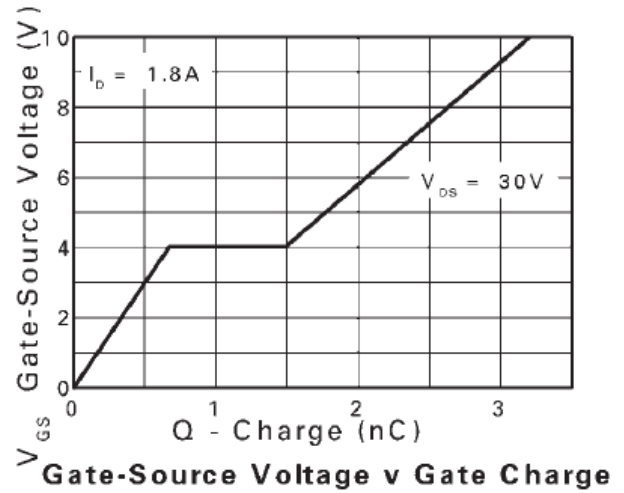
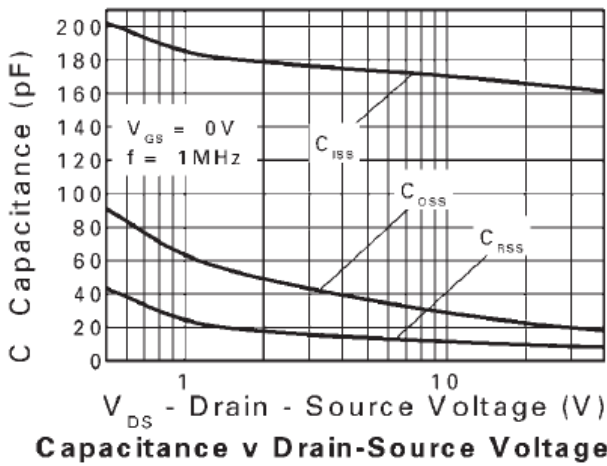


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>STATIC</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	60	–	–	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	–	–	1.0	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
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.0	–	3.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-State Resistance (Note 10)	R <sub>DS(ON)</sub>	–	–	0.3	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 1.8A
		–	–	0.45	Ω	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 1.3A
Forward Transconductance (Notes 10,12)	g <sub>fs</sub>	–	2.3	–	S	V <sub>DS</sub> = 15V, I <sub>D</sub> = 1.8A
<b>DYNAMIC (Note 12)</b>						
Input Capacitance	C <sub>iss</sub>	–	166	–	pF	V <sub>DS</sub> = 40V, V <sub>GS</sub> = 0V, f = 1MHz
Output Capacitance	C <sub>oss</sub>	–	20	–	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	–	9	–	pF	
<b>SWITCHING (Notes 11, 12)</b>						
Turn-On Delay Time	t <sub>D(ON)</sub>	–	1.8	–	ns	V <sub>DD</sub> = 30V, I <sub>D</sub> = 1.8A R <sub>G</sub> ≈ 6.0Ω, V <sub>GS</sub> = 10V
Turn-On Rise Time	t <sub>R</sub>	–	1.4	–	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	–	4.9	–	ns	
Turn-Off Fall Time	t <sub>F</sub>	–	2.0	–	ns	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 10V I <sub>D</sub> = 1.8A
Gate Charge	Q <sub>g</sub>	–	3.2	–	nC	
Gate-Source Charge	Q <sub>gs</sub>	–	0.7	–	nC	
Gate Drain Charge	Q <sub>gd</sub>	–	0.8	–	nC	
<b>Source-Drain Diode</b>						
Diode Forward Voltage (Note 10)	V <sub>SD</sub>	–	–	0.95	V	T <sub>J</sub> = +25°C, I <sub>S</sub> = 0.45A, V <sub>GS</sub> = 0V
Reverse Recovery Time (Note 12)	t <sub>RR</sub>	–	21	–	ns	T <sub>J</sub> = +25°C, I <sub>S</sub> = 1.0A, di/dt = 100A/μs
Reverse Recovery Charge (Note 12)	Q <sub>RR</sub>	–	21	–	nC	

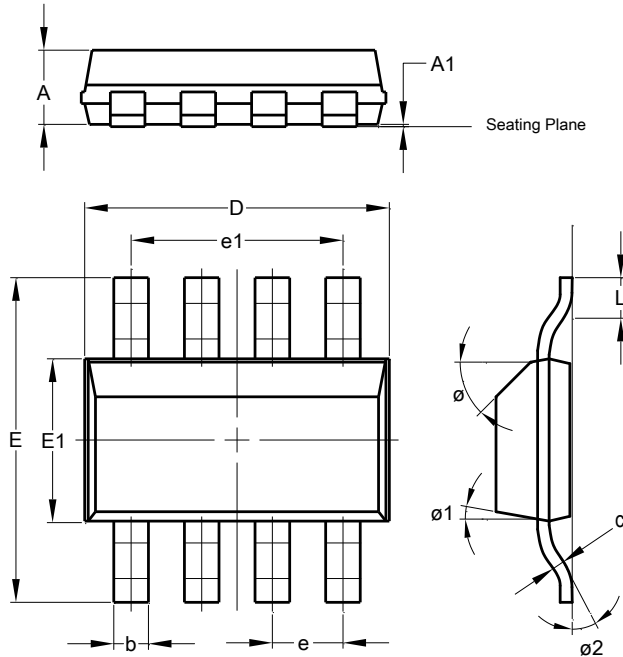
- Notes: 10. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.  
 11. Switching characteristics are independent of operating junction temperature.  
 12. For design aid only, not subject to production testing.





## Package Outline Dimensions

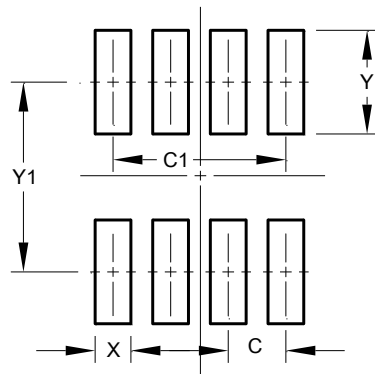
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SM-8			
Dim	Min	Max	Typ
A	--	1.70	1.60
A1	0.02	0.10	0.04
b	0.70	0.90	0.80
c	0.24	0.32	0.28
D	6.30	6.70	6.60
e	1.53 REF		
e1	4.59 REF		
E	6.70	7.30	7.00
E1	3.30	3.70	3.50
L	0.75	1.00	0.90
Ø	--	--	45°
Ø1	--	15°	--
Ø2	--	--	10°
All Dimensions in mm			

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
C	1.52
C1	4.60
X	0.95
Y	2.80
Y1	6.80

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