

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	$I_D$ $T_A = +25^\circ\text{C}$
-30V	0.15Ω @ $V_{GS} = -10\text{V}$	-2.6A
	0.23Ω @ $V_{GS} = -4.5\text{V}$	-1.5A

## Description

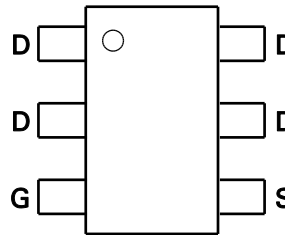
This MOSFET utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed, making it ideal for high-efficiency power management applications.

## Applications

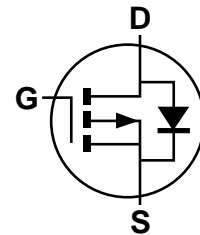
- DC-DC Converters
- Power Management Functions
- Disconnect Switches
- Motor Control



Top View



Pin Out - Top



Equivalent Circuit

## Features and Benefits

- Fast Switching Speed
- Low On-Resistance
- Low Threshold
- Low Gate Drive
- **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**

## Mechanical Data

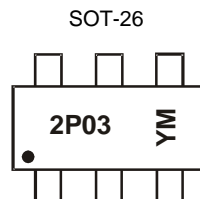
- Case: SOT-26
- Case Material: Molded Plastic; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish; Solderable per MIL-STD-202, Method 208
- Weight: 0.015 grams (Approximate)

## Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXM62P03E6TA	2P03	7	8	3,000 Units
ZXM62P03E6TC	2P03	13	8	10,000 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](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



2P03 = Product Type Marking Code  
 YM = Date Code Marking  
 Y or  $\bar{Y}$  = Year (ex: C = 2015)  
 M or  $\bar{M}$  = Month (ex: 9 = September)

### Date Code Key

Year Code	2015	2016	2017	2018	2019	2020	2021	2022
Code	C	D	E	F	G	H	I	J

Month Code	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V <sub>DSS</sub>	-30	V
Gate-Source Voltage			V <sub>GS</sub>	±20	V
Continuous Drain Current	V <sub>GS</sub> = -4.5V	T <sub>A</sub> = +25°C (Note 5) T <sub>A</sub> = +70°C (Note 5)	I <sub>D</sub>	-1.5 -1.2	A
Pulsed Drain Current (Note 7)			I <sub>DM</sub>	-7.4	A
Continuous Source Current (Body Diode)			I <sub>S</sub>	-0.54	A
Pulsed Source Current (Body Diode)			I <sub>SM</sub>	-7.4	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	625	mW
Linear Derating Factor		5	mW/°C
Power Dissipation (Note 6)	P <sub>D</sub>	806	mW
Linear Derating Factor		6.4	mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	113	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	73	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

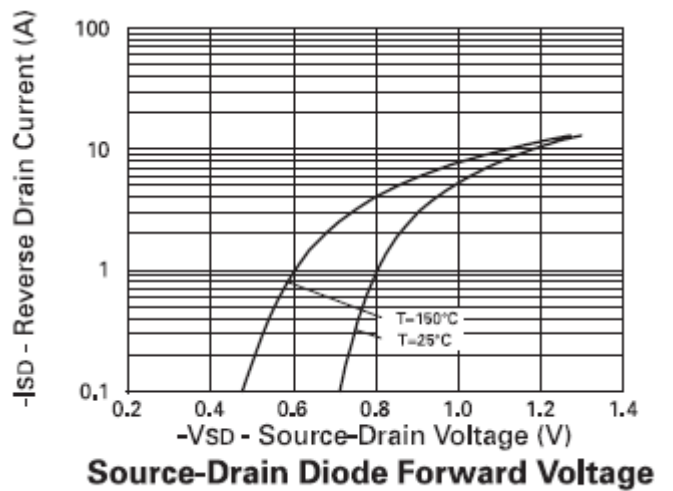
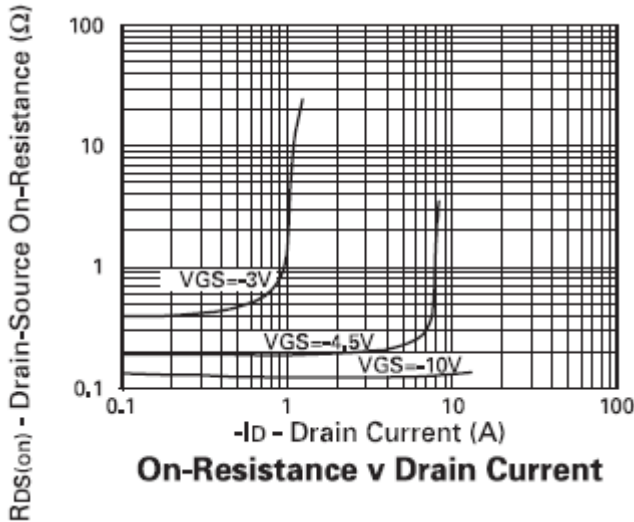
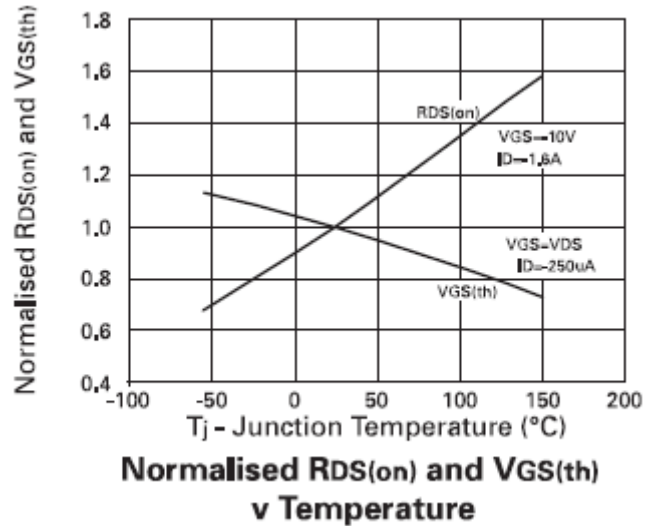
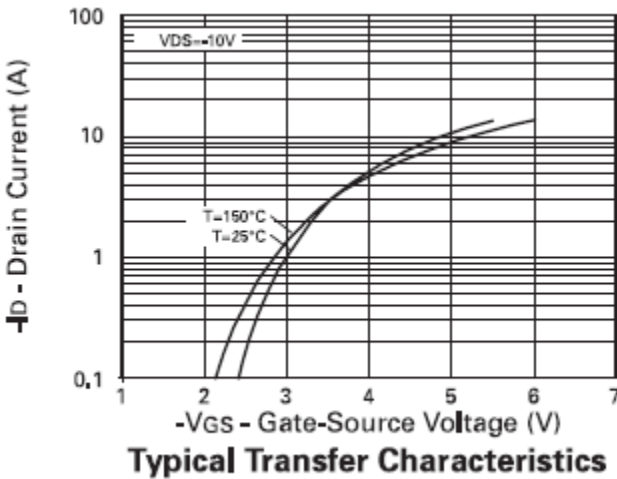
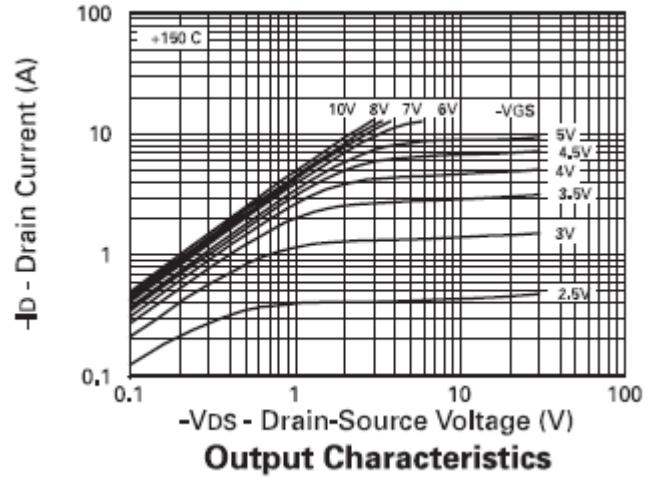
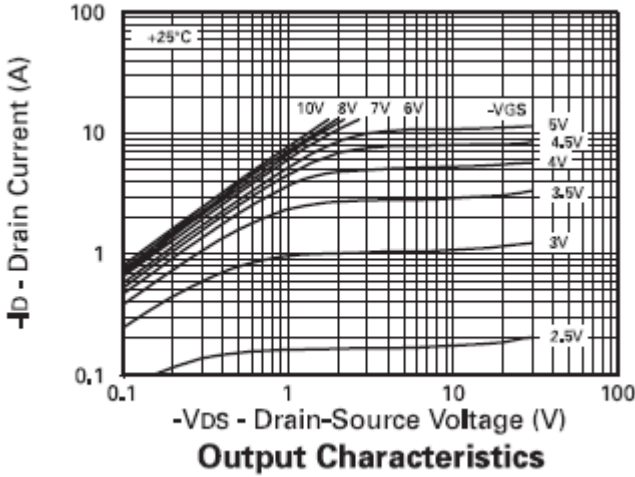
- Notes:
- For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions
  - For a device surface mounted on FR4 PCB measured at t ≤ 5 seconds.
  - Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

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

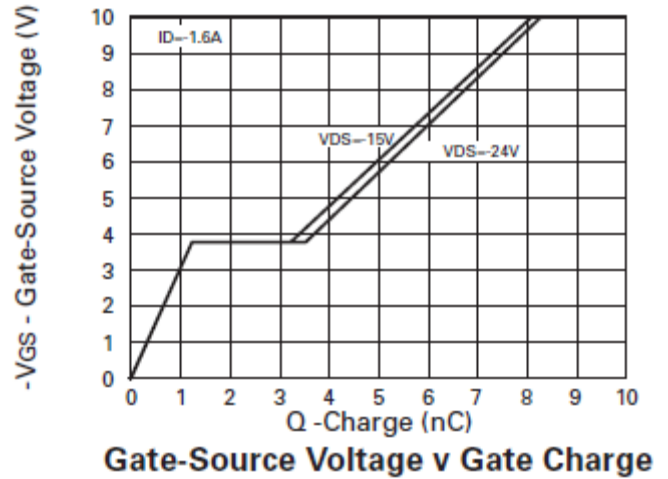
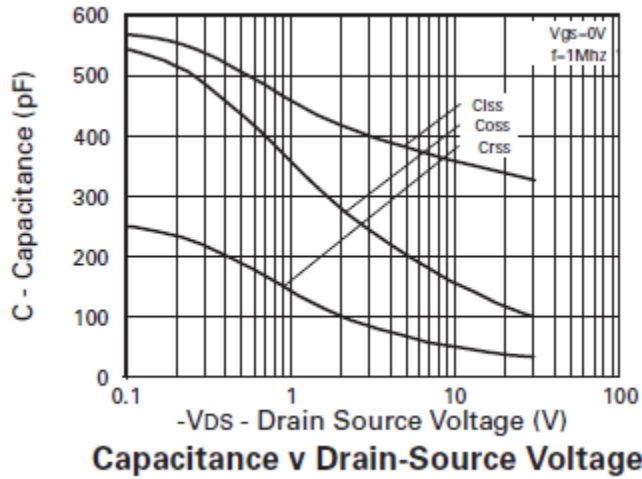
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-30	—	—	V	I <sub>D</sub> = -250μA, V <sub>GS</sub> = 0V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-1	μA	V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V
Gate-Source 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	—	—	V	I <sub>D</sub> = -250μA, V <sub>DS</sub> = V <sub>GS</sub>
Static Drain-Source On-Resistance (Note 8)	R <sub>DS(on)</sub>	—	—	0.15	Ω	V <sub>GS</sub> = -10V, I <sub>D</sub> = -1.6A
				0.23		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -0.8A
Forward Transconductance (Notes 8 & 10)	g <sub>fs</sub>	1.1	—	—	S	V <sub>DS</sub> = -10V, I <sub>D</sub> = -0.8A
Diode Forward Voltage (Note 8)	V <sub>SD</sub>	—	—	-0.95	V	T <sub>J</sub> = +25°C, I <sub>S</sub> = -1.6A, V <sub>GS</sub> = 0V
Reverse Recovery Time (Note 10)	t <sub>rr</sub>	—	19.9	—	ns	T <sub>J</sub> = +25°C, I <sub>F</sub> = -1.6A,
Reverse Recovery Charge (Note 10)	Q <sub>rr</sub>	—	13	—	nC	di/dt = 100A/μs
<b>DYNAMIC CHARACTERISTICS</b> (Note 10)						
Input Capacitance	C <sub>iSS</sub>	—	330	—	pF	V <sub>DS</sub> = -25V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oSS</sub>	—	120	—		
Reverse Transfer Capacitance	C <sub>rSS</sub>	—	45	—		
Turn-On Delay Time (Note 9)	t <sub>d(on)</sub>	—	2.8	—	ns	V <sub>DD</sub> = -15V, I <sub>D</sub> = -1.6A, R <sub>G</sub> ≅ 6.2Ω, R <sub>D</sub> ≅ 25Ω,
Turn-On Rise Time (Note 9)	t <sub>r</sub>	—	6.4	—		
Turn-Off Delay Time (Note 9)	t <sub>d(off)</sub>	—	13.9	—		
Turn-Off Fall Time (Note 9)	t <sub>f</sub>	—	10.3	—		
Total Gate Charge (Note 9)	Q <sub>g</sub>	—	—	10.2	nC	V <sub>DS</sub> = -24V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -1.6A
Gate-Source Charge (Note 9)	Q <sub>gs</sub>	—	—	1.5		
Gate-Drain Charge (Note 9)	Q <sub>gd</sub>	—	—	3		

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

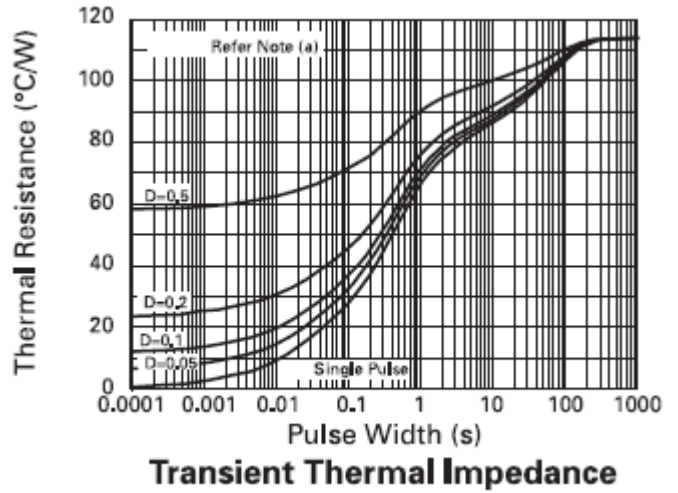
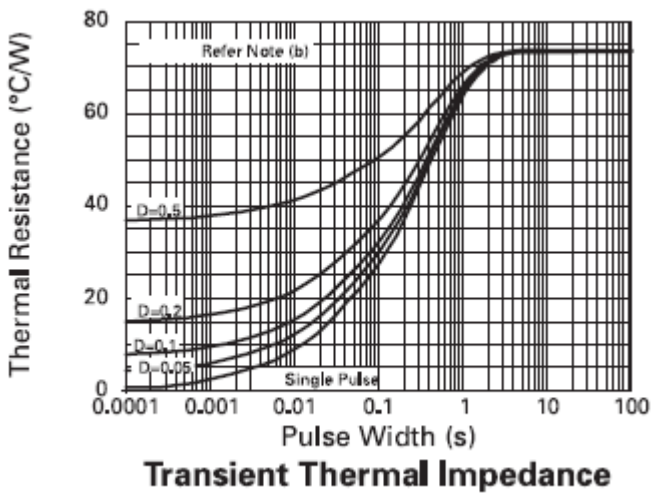
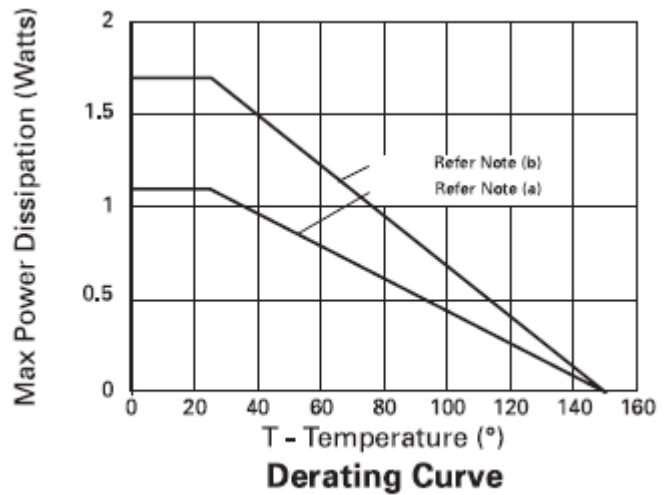
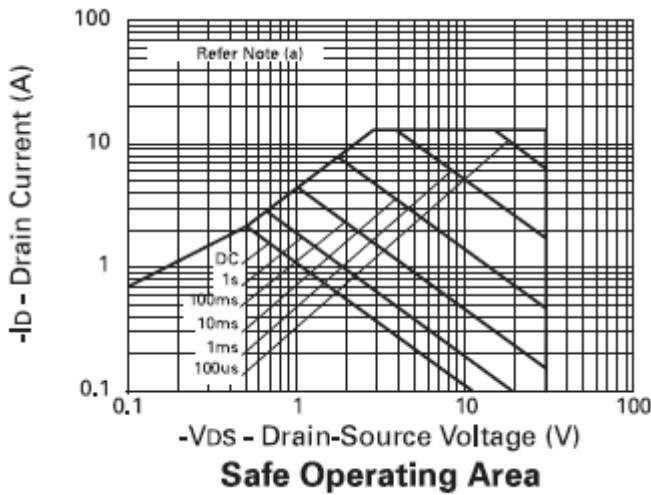
**Typical Characteristics**



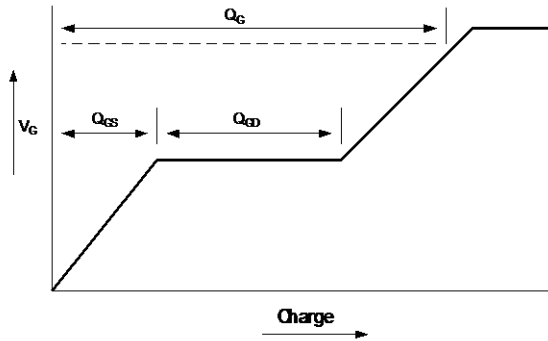
**Typical Characteristics (cont.)**



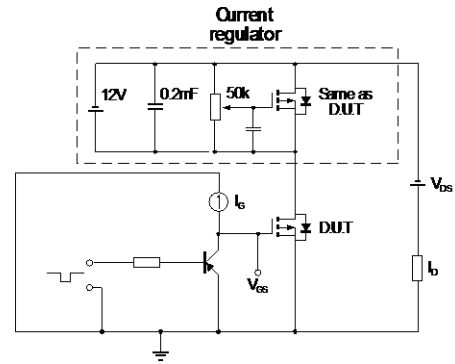
**Thermal Characteristics**



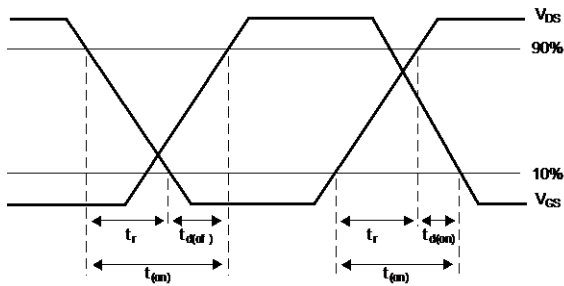
**Test Circuits**



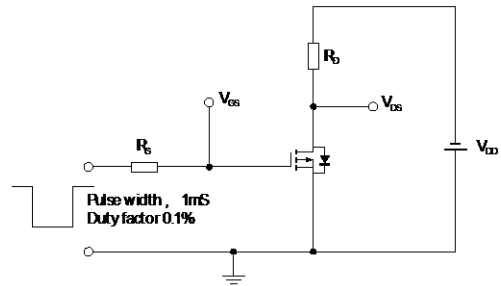
**Basic gate charge waveform**



**Gate charge test circuit**



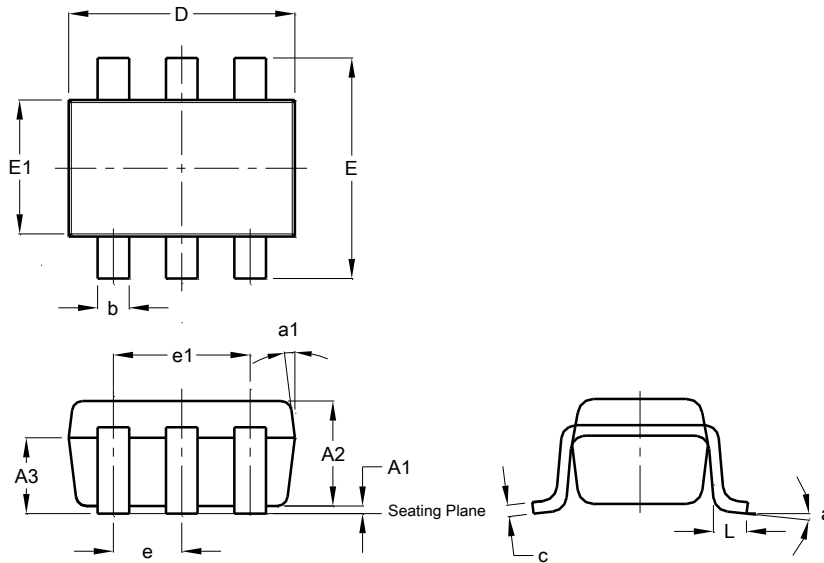
**Switching time waveforms**



**Switching time test circuit**

**Package Outline Dimensions**

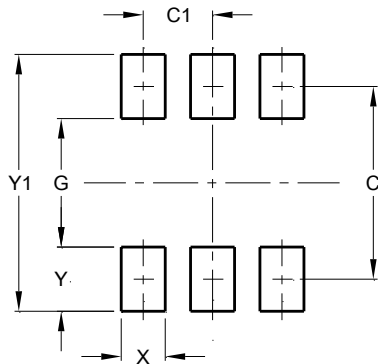
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
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	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20

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