

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)} \text{ Max}$	I_D $T_A = +25^\circ\text{C}$
30V	0.12Ω @ $V_{GS} = 10\text{V}$	3.0A
	0.18Ω @ $V_{GS} = 4.5\text{V}$	2.5A

Description

This MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

Applications

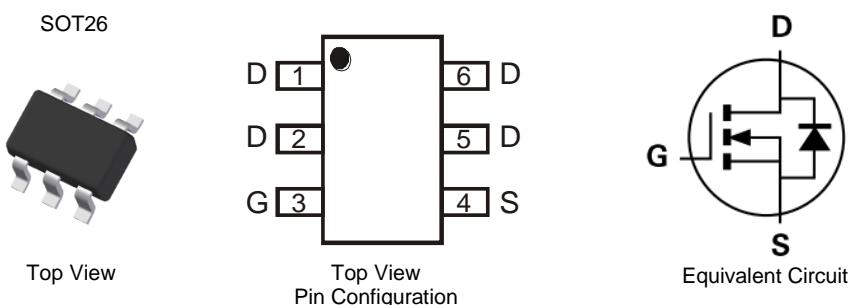
- DC-DC Converters
- Power Management Functions
- Backlighting

Features and Benefits

- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Tin Finish Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.018 grams (Approximate)



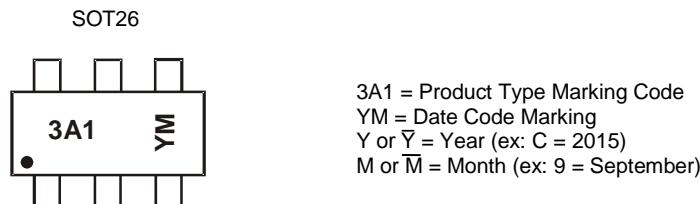
Ordering Information (Note 4)

Part Number	Case	Packaging
ZXMN3A01E6TA	SOT26	3,000/Tape & Reel

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



Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021	2022				
Code	C	D	E	F	G	H	I	J				
Month	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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Value	Units	
Drain-Source Voltage			V_{DSS}	30	V	
Gate-Source Voltage			V_{GSS}	± 20	V	
Continuous Drain Current, $V_{GS} = 10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ (Note 6)	I_D	3.0	A	
		$T_A = +70^\circ\text{C}$ (Note 6)		2.4		
		$T_A = +25^\circ\text{C}$ (Note 5)		2.4		
Maximum Body Diode Forward Current (Note 6)			I_S	2.4	A	
Pulsed Drain Current (Note 7)			I_{DM}	10	A	
Pulsed Source Current (Note 7)			I_{SM}	10	A	

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

Characteristic			Symbol	Value	Units
Total Power Dissipation		$T_A = +25^\circ\text{C}$ (Note 5)	P_D	1.1	W
Linear Derating Factor				8.8	$\text{mW}/^\circ\text{C}$
Total Power Dissipation		$T_A = +25^\circ\text{C}$ (Note 6)	P_D	1.7	W
Linear Derating Factor				13.6	$\text{mW}/^\circ\text{C}$
Thermal Resistance, Junction to Ambient		Steady State (Note 5)	$R_{\theta JA}$	113	$^\circ\text{C}/\text{W}$
		Steady State (Note 6)		70	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range			T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

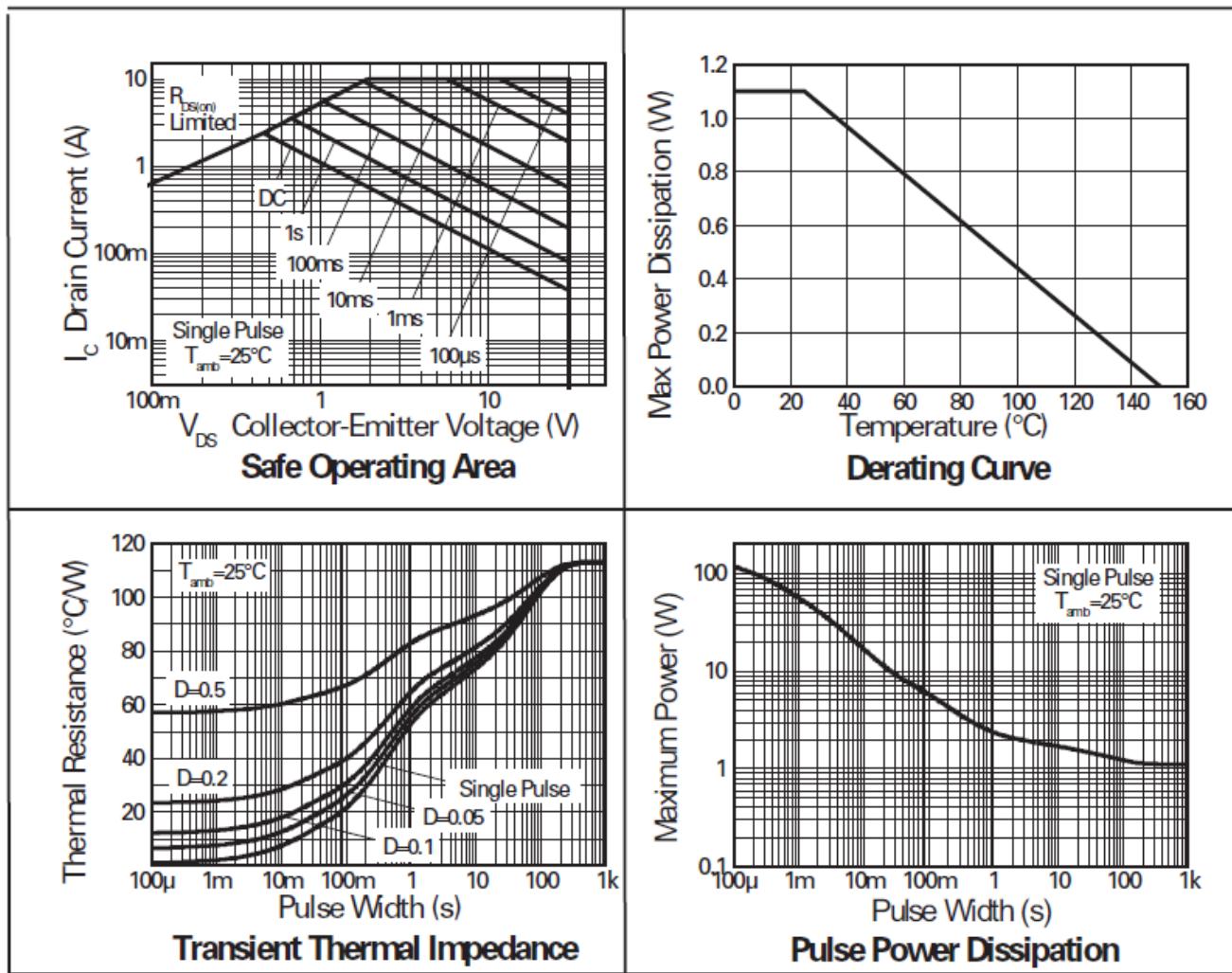
Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	0.5	μA	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	$V_{GS(\text{TH})}$	1.0	—	—	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance (Note 8)	$R_{DS(\text{ON})}$	—	0.106	0.12	Ω	$V_{GS} = 10\text{V}, I_D = 2.5\text{A}$
		—	—	0.18		$V_{GS} = 4.5\text{V}, I_D = 2.0\text{A}$
Diode Forward Voltage (Note 8)	V_{SD}	—	0.84	0.95	V	$V_{GS} = 0\text{V}, I_S = 1.7\text{A}$
Forward Transconductance (Notes 8 & 10)	g_{fs}	—	3.5	—	S	$V_{DS} = 4.5\text{V}, I_D = 2.5\text{A}$
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	190	—	pF	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	38	—		
Reverse Transfer Capacitance	C_{rss}	—	20	—		
Total Gate Charge ($V_{GS} = 5.0\text{V}$)	Q_g	—	2.3	—	nC	$V_{DS} = 15\text{V}, I_D = 2.5\text{A}$
Total Gate Charge ($V_{GS} = 10\text{V}$)	Q_g	—	3.9	—		
Gate-Source Charge	Q_{gs}	—	0.6	—		
Gate-Drain Charge	Q_{gd}	—	0.9	—		
Turn-On Delay Time	$t_{D(\text{ON})}$	—	1.7	—	ns	$V_{GS} = 10\text{V}, V_{DD} = 15\text{V}, R_G = 6.0\Omega, I_D = 2.5\text{A}$
Turn-On Rise Time	t_R	—	2.3	—		
Turn-Off Delay Time	$t_{D(\text{OFF})}$	—	6.6	—		
Turn-Off Fall Time	t_F	—	2.9	—		
Body Diode Reverse Recovery Time	t_{RR}	—	17.7	—	ns	$I_F = 2.5\text{A}, dI/dt = 100\text{A}/\mu\text{s}$
Body Diode Reverse Recovery Charge	Q_{RR}	—	13.0	—		

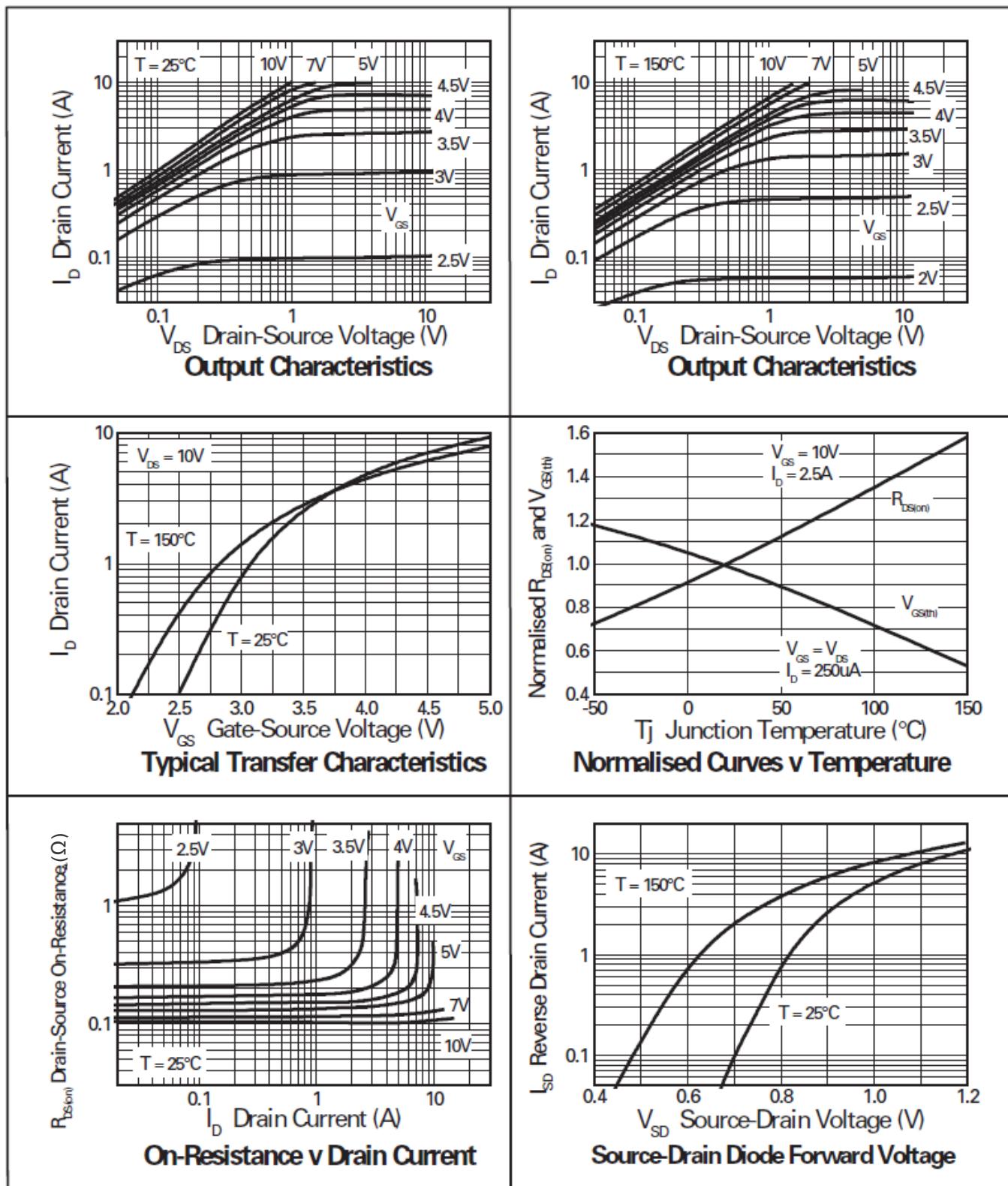
Notes:

- For a device surface mounted on 25mm x 25mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions.
- For a device surface mounted on FR-4 PCB measured at $t \leq 5$ secs.
- Repetitive rating 25mm x 25mm FR-4 PCB, $D = 0.05$, pulse width $10\mu\text{s}$ - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.
- Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$.
- Short duration pulse test used to minimize self-heating effect.
- Guaranteed by design. Not subject to product testing.

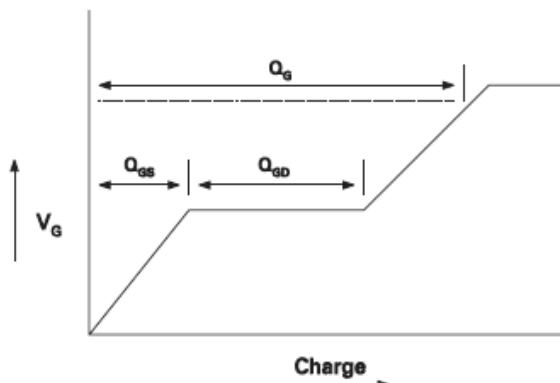
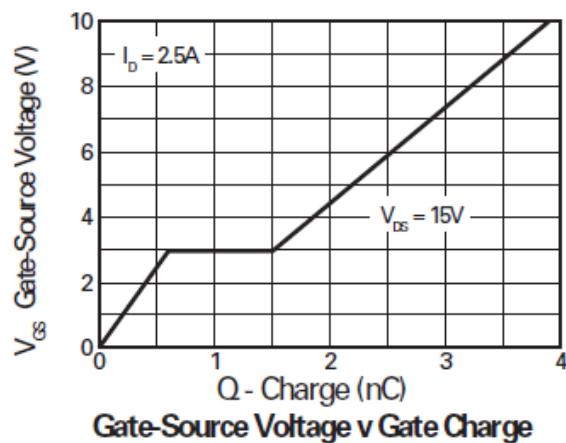
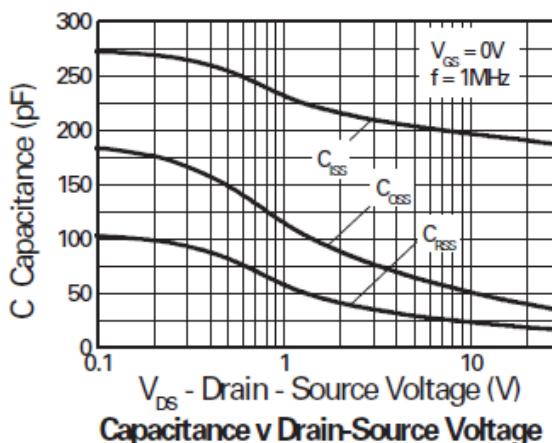
Typical Characteristics



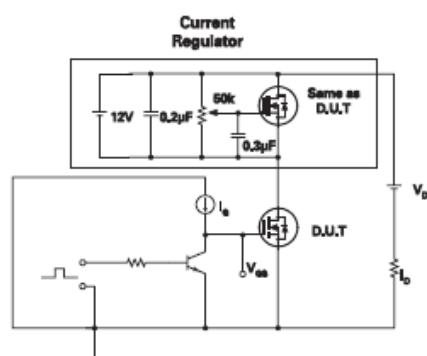
Typical Characteristics (cont.)



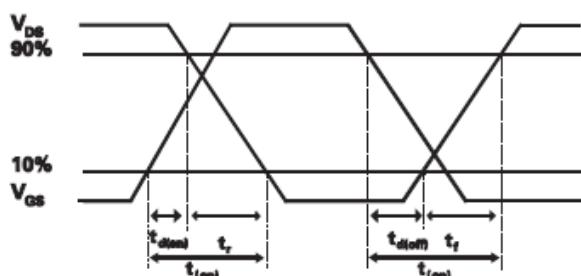
Typical Characteristics (cont.)



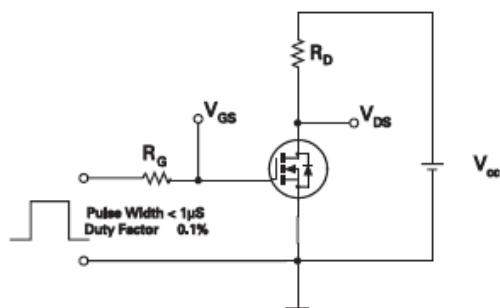
Basic Gate Charge Waveform



Gate Charge Test Circuit



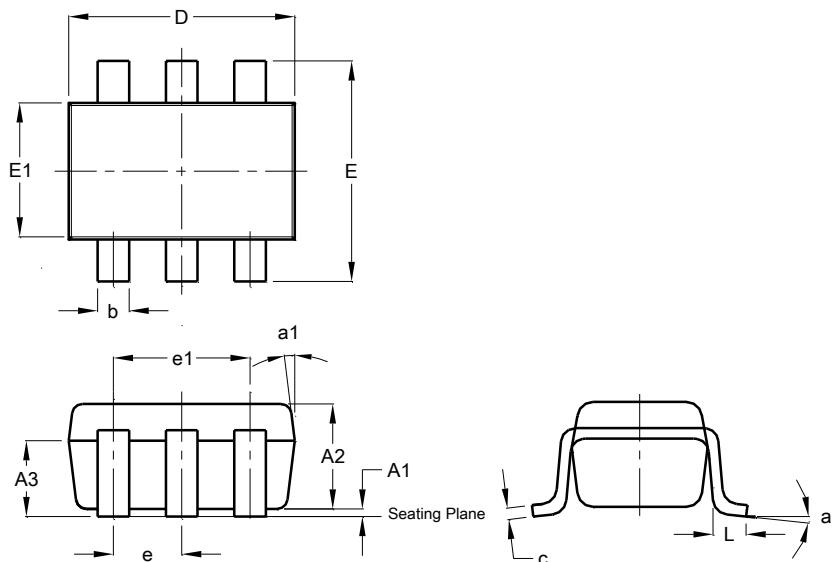
Switching Time Waveforms



Switching Time Test Circuit

Package Outline Dimensions

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

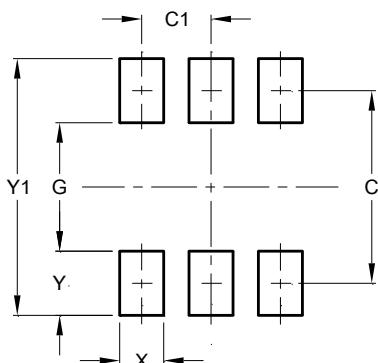


SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°

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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