



**THE DATASHEET OF  
ZXMN3A01E6TA**



## Product Summary

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

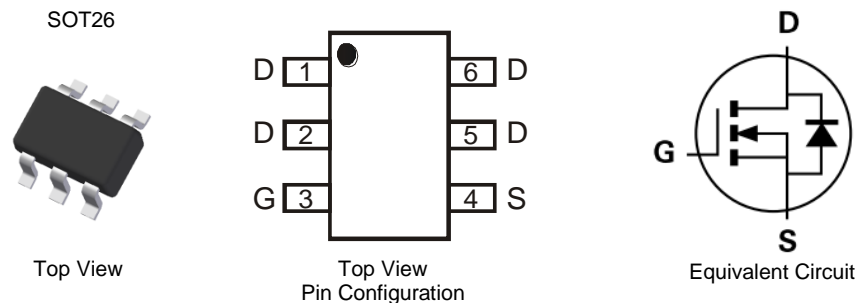
- DC-DC Converters
- Power Management Functions
- Backlighting

## 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 **Ⓔ**
- Weight: 0.018 grams (Approximate)

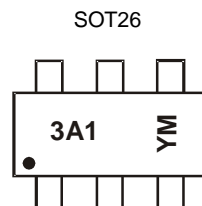


## Ordering Information (Note 4)

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

- 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



3A1 = 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	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<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>GSS</sub>	±20	V	
Continuous Drain Current, V <sub>GS</sub> = 10V	Steady State	I <sub>D</sub>	T <sub>A</sub> = +25°C (Note 6)	3.0	A
			T <sub>A</sub> = +70°C (Note 6)	2.4	
			T <sub>A</sub> = +25°C (Note 5)	2.4	
Maximum Body Diode Forward Current (Note 6)		I <sub>S</sub>	2.4	A	
Pulsed Drain Current (Note 7)		I <sub>DM</sub>	10	A	
Pulsed Source Current (Note 7)		I <sub>SM</sub>	10	A	

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

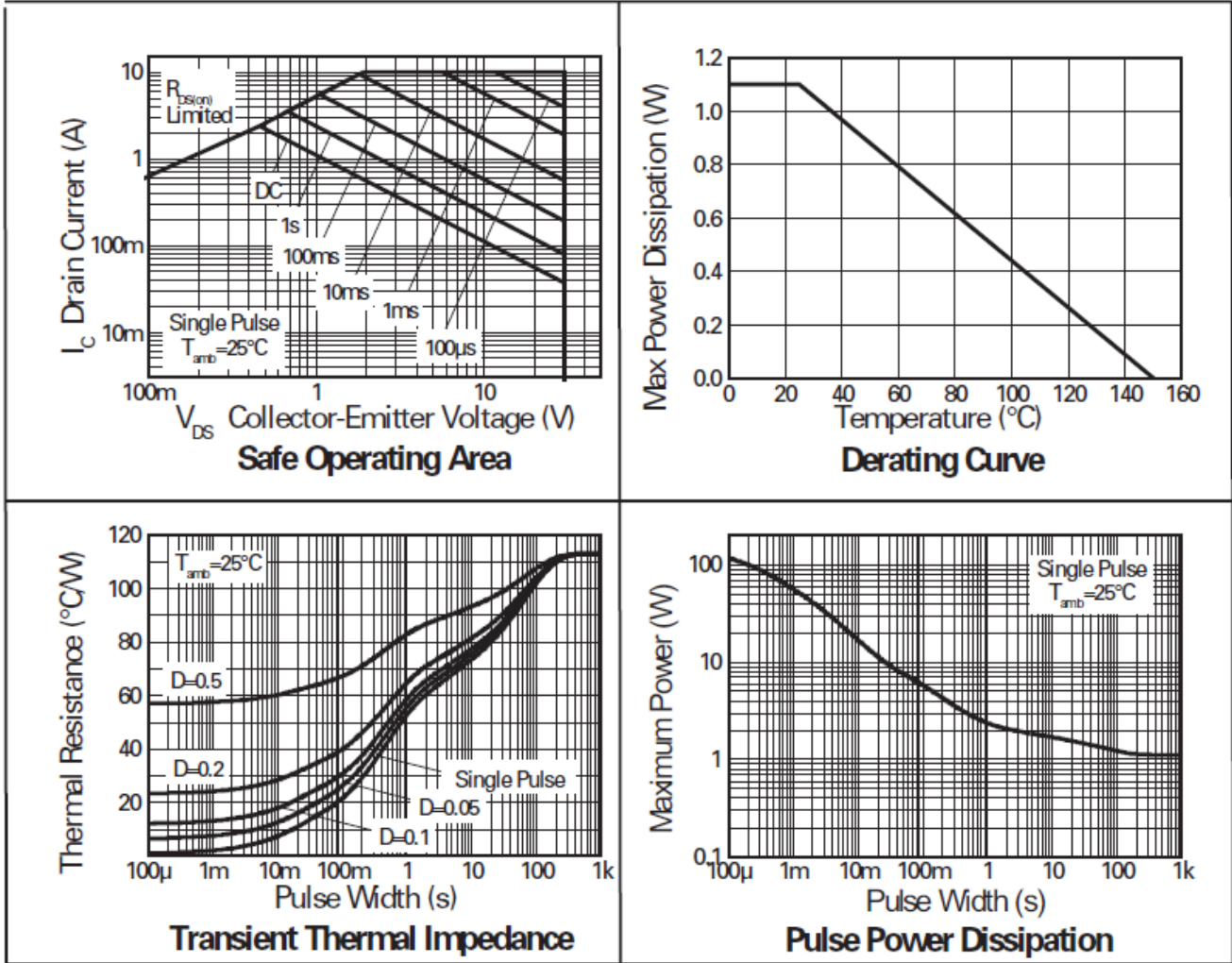
Characteristic		Symbol	Value	Units
Total Power Dissipation	T <sub>A</sub> = +25°C (Note 5)	P <sub>D</sub>	1.1	W
Linear Derating Factor			8.8	mW/°C
Total Power Dissipation	T <sub>A</sub> = +25°C (Note 6)	P <sub>D</sub>	1.7	W
Linear Derating Factor			13.6	mW/°C
Thermal Resistance, Junction to Ambient	Steady State (Note 5)	R <sub>θJA</sub>	113	°C/W
	Steady State (Note 6)		70	°C/W
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

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

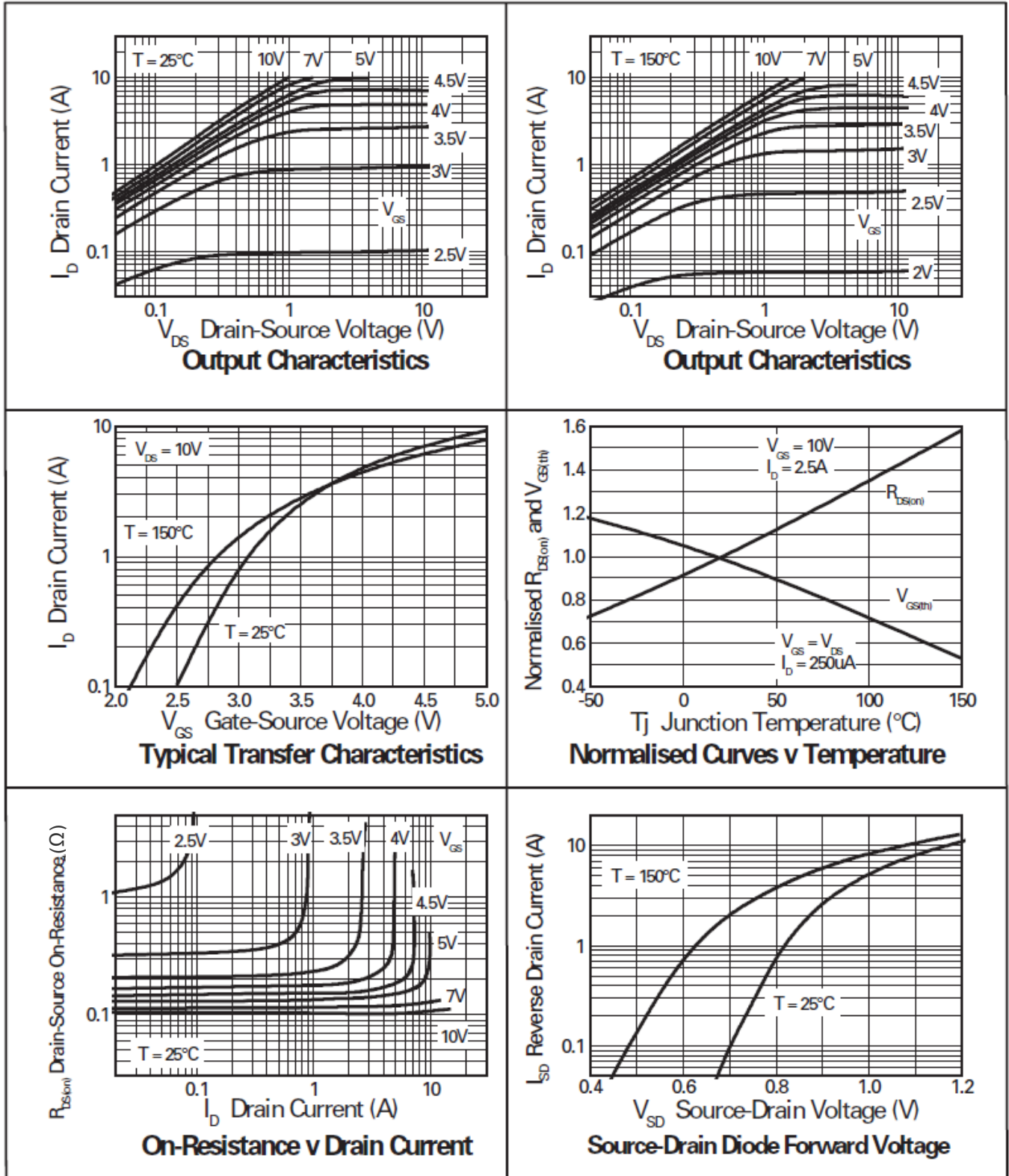
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 9)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	0.5	μA	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 9)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.0	—	—	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance (Note 8)	R <sub>DS(ON)</sub>	—	0.106	0.12	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 2.5A
		—	—	0.18		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 2.0A
Diode Forward Voltage (Note 8)	V <sub>SD</sub>	—	0.84	0.95	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1.7A
Forward Transconductance (Notes 8 & 10)	g <sub>fs</sub>	—	3.5	—	S	V <sub>DS</sub> = 4.5V, I <sub>D</sub> = 2.5A
<b>DYNAMIC CHARACTERISTICS (Note 10)</b>						
Input Capacitance	C <sub>iss</sub>	—	190	—	pF	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	38	—		
Reverse Transfer Capacitance	C <sub>riss</sub>	—	20	—		
Total Gate Charge (V <sub>GS</sub> = 5.0V)	Q <sub>g</sub>	—	2.3	—	nC	V <sub>DS</sub> = 15V, I <sub>D</sub> = 2.5A
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	—	3.9	—		
Gate-Source Charge	Q <sub>gs</sub>	—	0.6	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	0.9	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	1.7	—	ns	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 15V, R <sub>G</sub> = 6.0Ω, I <sub>D</sub> = 2.5A
Turn-On Rise Time	t <sub>R</sub>	—	2.3	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	6.6	—		
Turn-Off Fall Time	t <sub>F</sub>	—	2.9	—		
Body Diode Reverse Recovery Time	t <sub>RR</sub>	—	17.7	—	ns	I <sub>F</sub> = 2.5A, dI/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	—	13.0	—	nC	

- 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 ≤ 5 secs.
  - Repetitive rating 25mm x 25mm FR-4 PCB, D = 0.05, pulse width 10μs - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.
  - Measured under pulsed conditions. Width=300μs. Duty cycle ≤ 2%.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

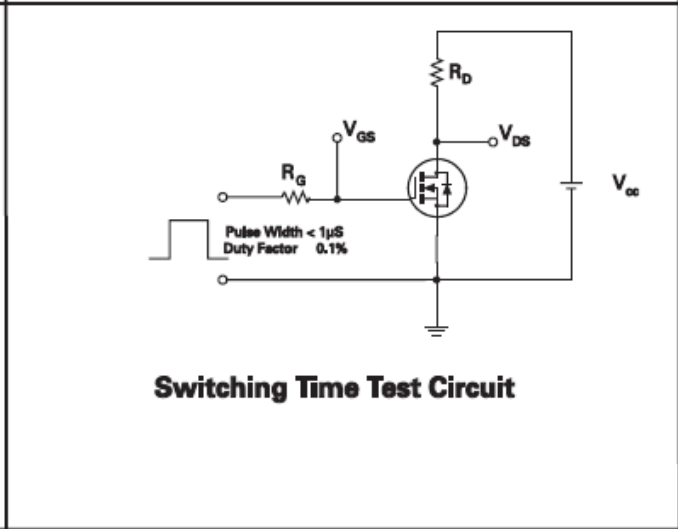
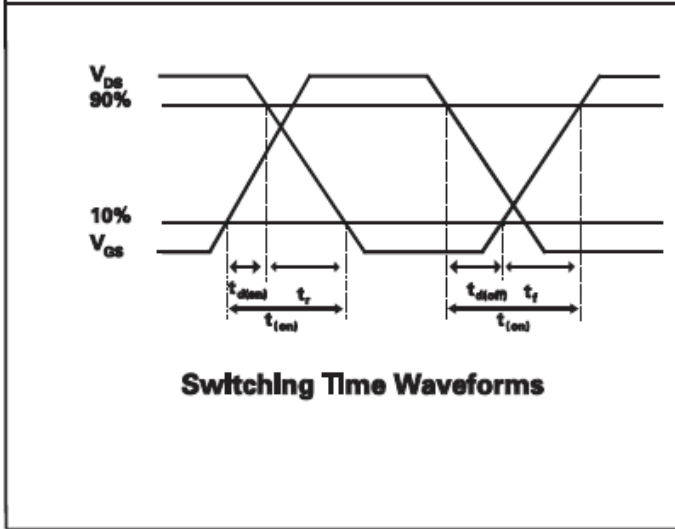
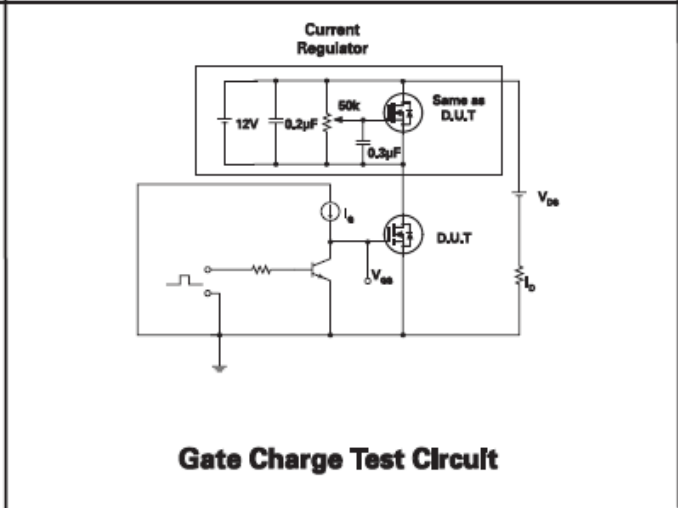
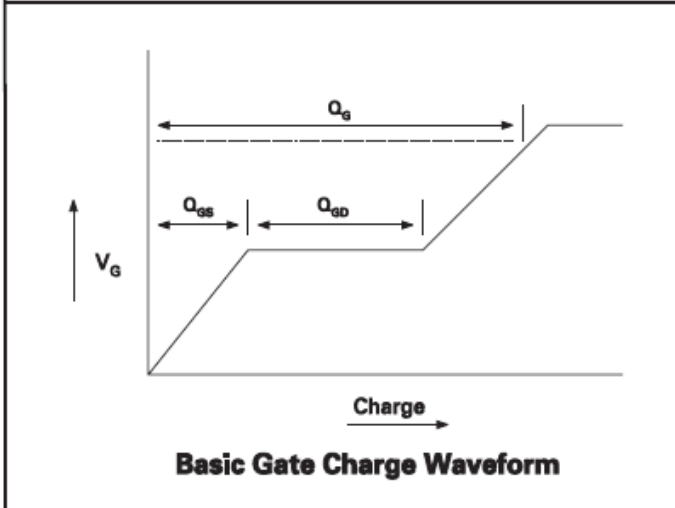
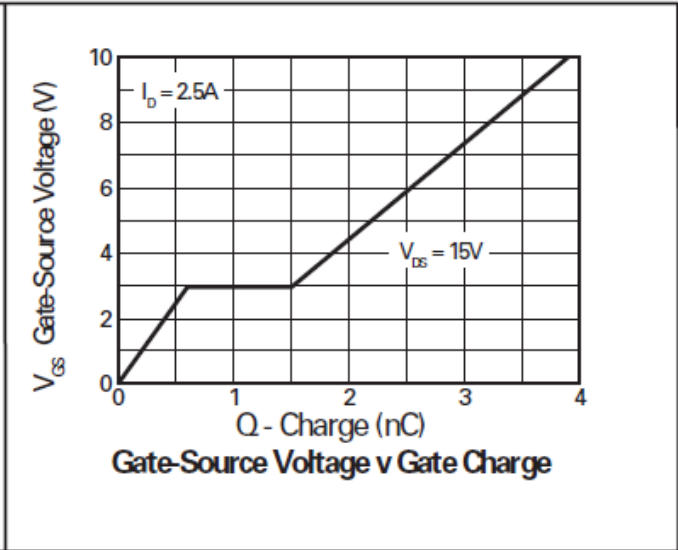
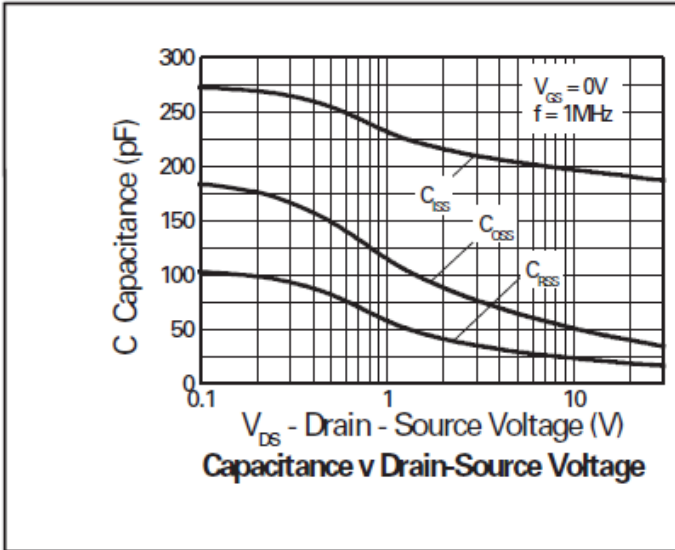
**Typical Characteristics**



**Typical Characteristics (cont.)**

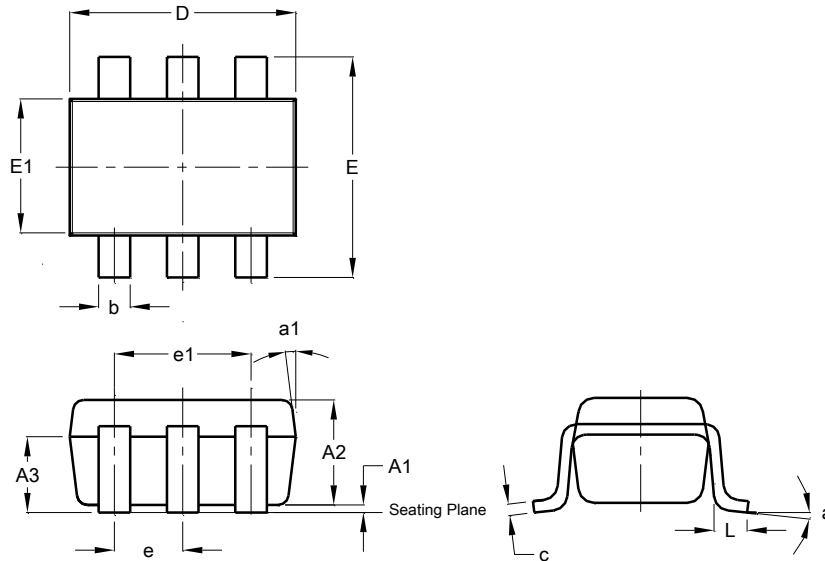


**Typical Characteristics (cont.)**



## Package Outline Dimensions

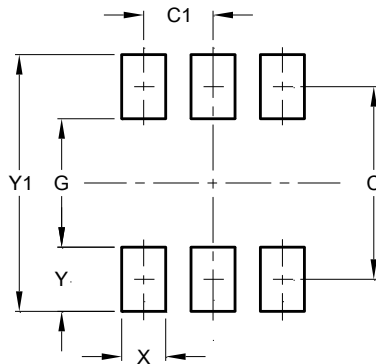
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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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