

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D $T_A = +25^\circ\text{C}$
20V	0.200Ω @ $V_{GS}=4.5\text{V}$	2.1A
	0.240Ω @ $V_{GS}=2.5\text{V}$	1.9A
	0.310Ω @ $V_{GS}=1.8\text{V}$	1.7A

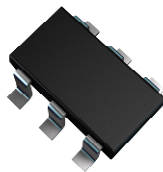
Description

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

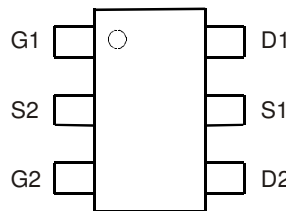
Applications

- Power Management Functions
- Disconnect Switches
- Relay Driving and Load Switching

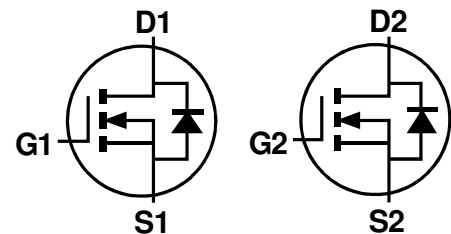
SOT26



Top View



Pin Out - Top View



Equivalent Circuit

Features and Benefits

- Low On-Resistance
- Low Gate Drive Capability
- SOT26 (dual) 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**

Mechanical Data

- Case: SOT26
- Case Material: Molded Plastic.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe.
Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.018 grams (Approximate)

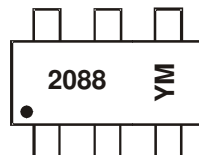
Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
ZXMN2088DE6TA	Standard	SOT26	3,000 / Tape & Reel
ZXMN2088DE6TC	Standard	SOT26	10,000 / 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 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

SOT26



2088 = 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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

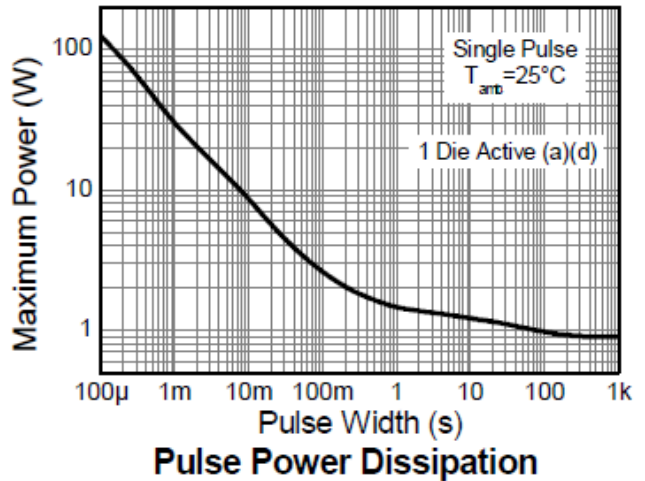
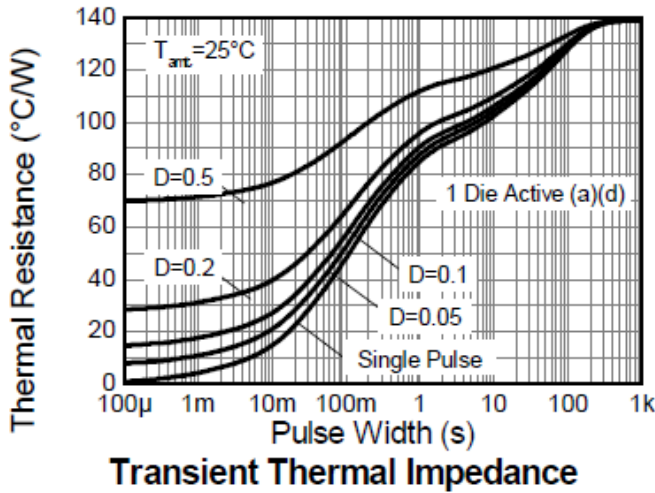
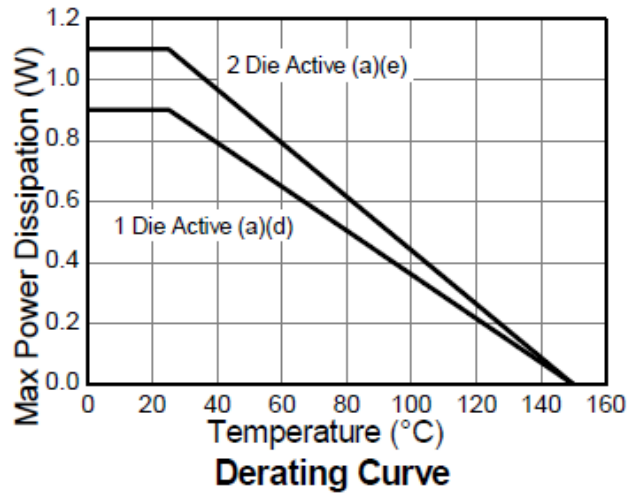
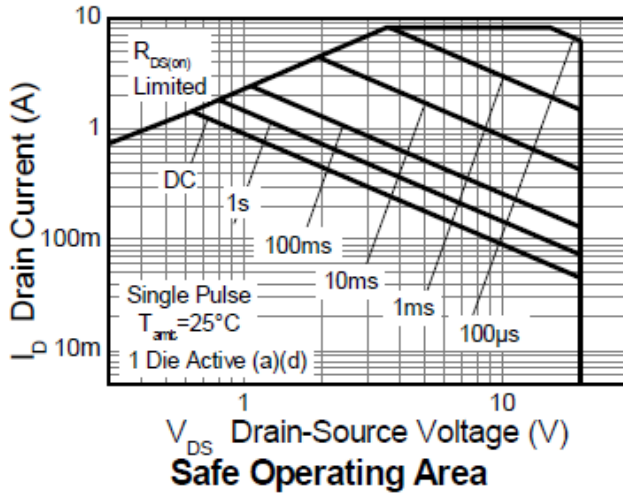
Characteristic		Symbol	Value	Unit	
Drain-Source Voltage		V_{DSS}	20	V	
Gate-Source Voltage		V_{GS}	± 8	V	
Continuous Drain Current	$V_{GS} = 4.5\text{V}$	I_D	$T_A = +25^\circ\text{C}$ (Notes 6 & 8)	2.1	A
			$T_A = +70^\circ\text{C}$ (Notes 6 & 8)	1.7	
			$T_A = +25^\circ\text{C}$ (Notes 5 & 8)	1.7	
Pulsed Drain Current		I_{DM}	8	A	

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

Characteristic		Symbol	Value	Unit
Power Dissipation at $T_A = +25^\circ\text{C}$ Linear Derating Factor	(Notes 5 & 8)	P_D	0.9 7.2	W mW/ $^\circ\text{C}$
	(Notes 5 & 9)	P_D	1.1 8.8	W mW/ $^\circ\text{C}$
	(Notes 6 & 8)	P_D	1.3 10.4	W mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	(Notes 5 & 8)	$R_{\theta JA}$	139	$^\circ\text{C/W}$
	(Notes 5 & 9)		113	
	(Notes 6 & 8)		96	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

- Notes:
5. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 6. Same as Note (5), except the device is measured at $t \leq 5$ sec.
 7. Same as Note (5), except the device is pulsed with $D = 0.02$ and pulse width 300 μs . The pulse width is limited by the maximum junction temperature.
 8. For device with one active die.
 9. For device with two active die running at equal power.

Thermal Characteristics

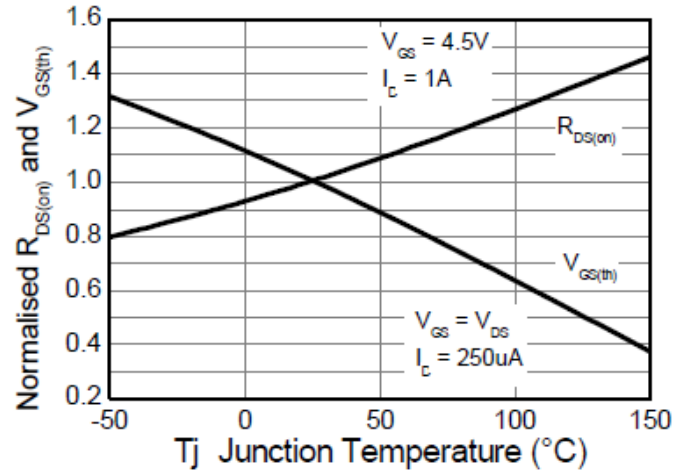
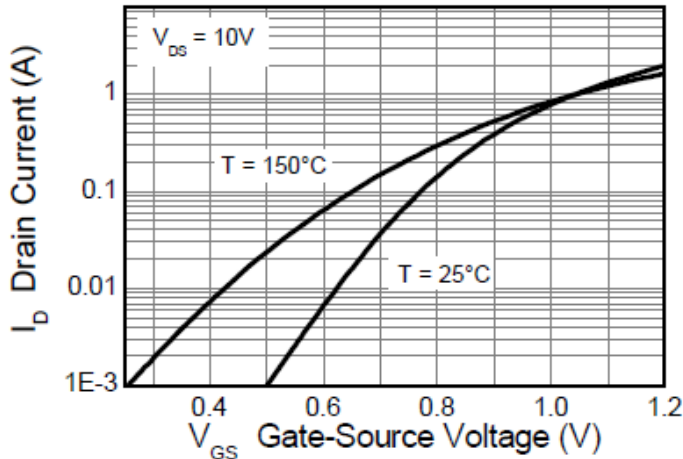
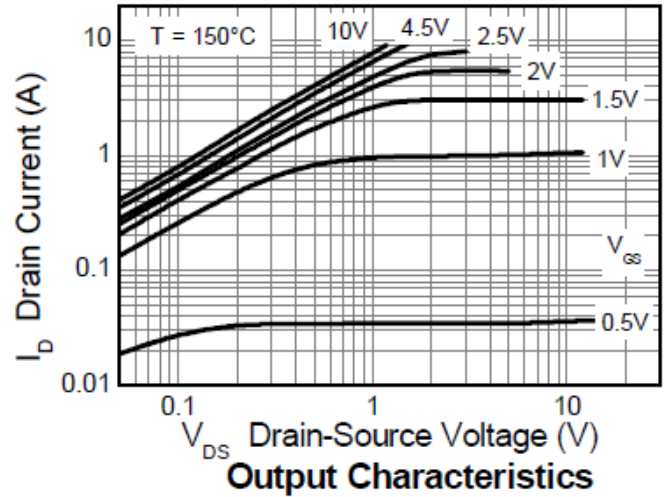
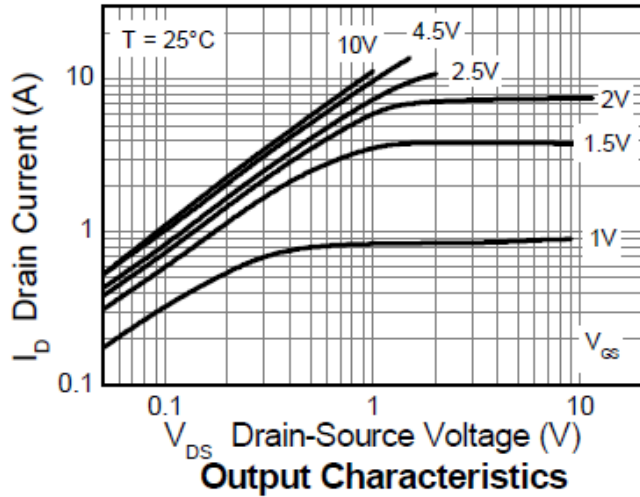


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	20	—	—	V	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	100	nA	$V_{DS} = 3\text{V}$, $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 20\text{V}$, $V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 8\text{V}$, $V_{DS} = 0\text{V}$
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	0.4	—	1.0	V	$I_D = 250\mu\text{A}$, $V_{DS} = V_{GS}$
Static Drain-Source On-Resistance (Note 10)	$R_{DS(on)}$	—	0.112	0.200	Ω	$V_{GS} = 4.5\text{V}$, $I_D = 1.0\text{A}$
			0.137	0.240		$V_{GS} = 2.5\text{V}$, $I_D = 0.6\text{A}$
			0.165	0.310		$V_{GS} = 1.8\text{V}$, $I_D = 0.3\text{A}$
Forward Transconductance (Notes 10 & 12)	g_{fs}	—	4.6	—	S	$V_{DS} = 10\text{V}$, $I_D = 1.0\text{A}$
Diode Forward Voltage (Note 12)	V_{SD}	—	0.75	0.95	V	$I_S = 1.0\text{A}$, $V_{GS} = 0\text{V}$, $T_J = +25^\circ\text{C}$
DYNAMIC CHARACTERISTICS (Note 12)						
Input Capacitance	C_{iss}	—	279	—	pF	$V_{DS} = 10\text{V}$, $V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance	C_{oss}	—	52	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	29	—	pF	
Total Gate Charge	Q_g	—	3.8	—	nC	$V_{GS} = 4.5\text{V}$ $V_{DS} = 10\text{V}$ $I_D = 2.4\text{A}$
Gate-Source Charge	Q_{gs}	—	0.41	—	nC	
Gate-Drain Charge	Q_{gd}	—	0.56	—	nC	
Turn-On Delay Time (Note 11)	$t_{D(on)}$	—	2.0	—	ns	$V_{DD} = 10\text{V}$, $V_{GS} = 4.5\text{V}$ $I_D = 1.0\text{A}$, $R_G \cong 6.0\Omega$
Turn-On Rise Time (Note 11)	t_r	—	3.2	—	ns	
Turn-Off Delay Time (Note 11)	$t_{D(off)}$	—	12.7	—	ns	
Turn-Off Fall Time (Note 11)	t_f	—	6.2	—	ns	
Reverse Recovery Time	t_{rr}	—	6.6	—	ns	$I_F = 1.24\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$, $T_J = +25^\circ\text{C}$
Reverse Recovery Charge	Q_{rr}	—	1.6	—	nC	

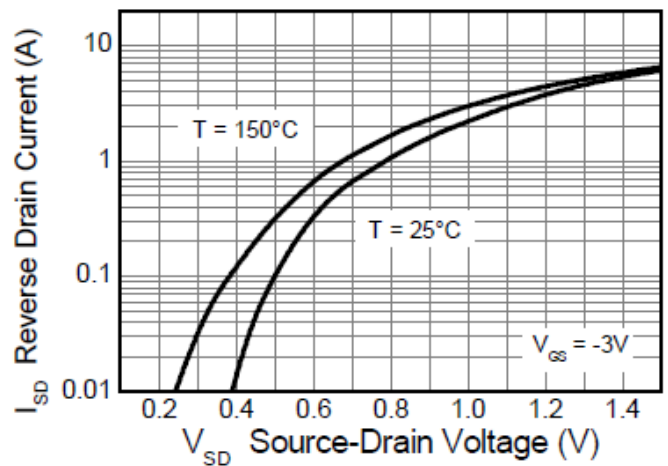
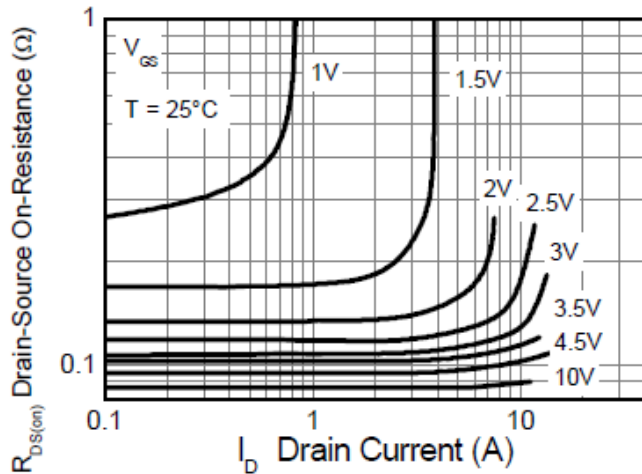
- Notes:
10. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.
 11. Switching characteristics are independent of operating junction temperature.
 12. For design aid only, not subject to production testing.

Typical Characteristics



Typical Transfer Characteristics

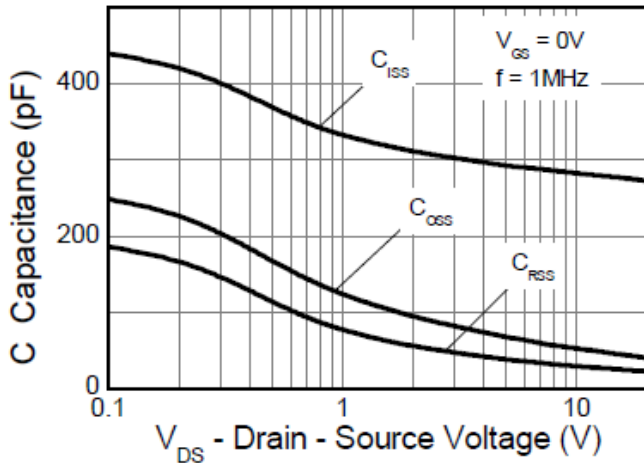
Normalized Curves v Temperature



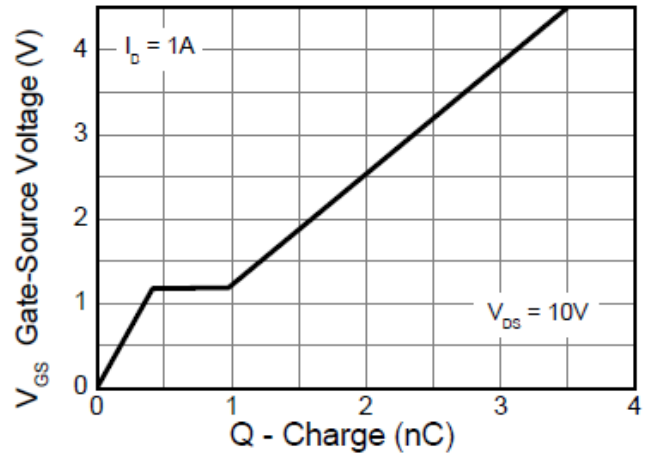
On-Resistance v Drain Current

Source-Drain Diode Forward Voltage

Typical Characteristics (continued)

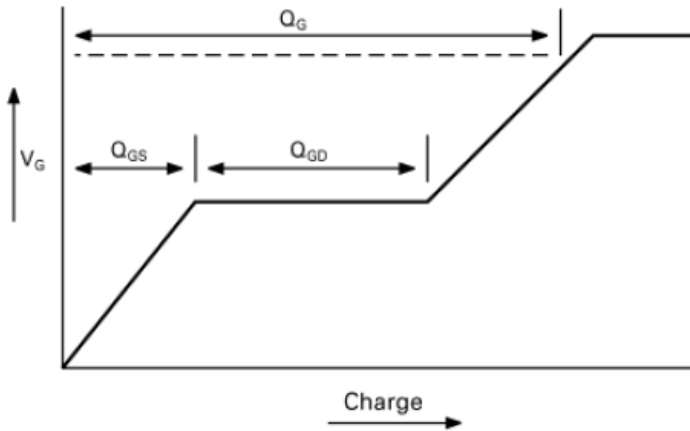


Capacitance v Drain-Source Voltage

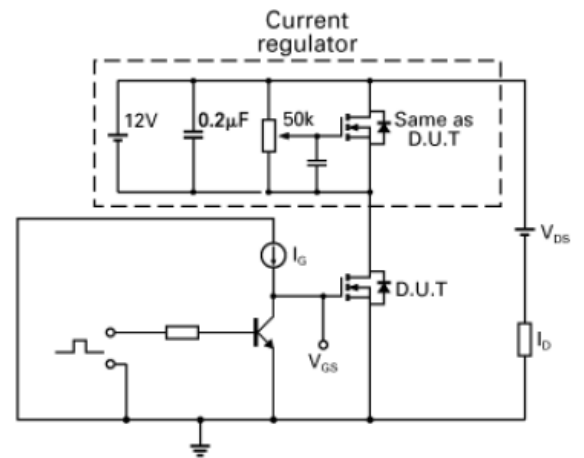


Gate-Source Voltage v Gate Charge

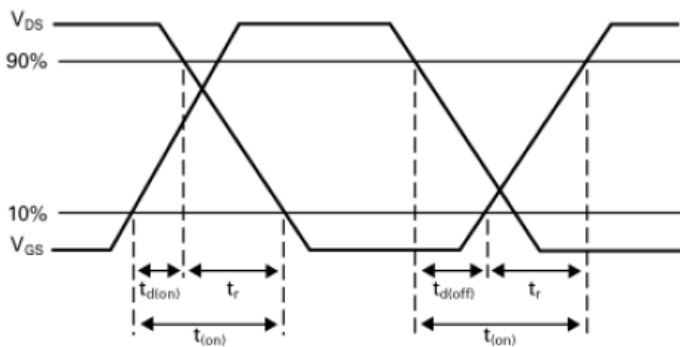
Test Circuits



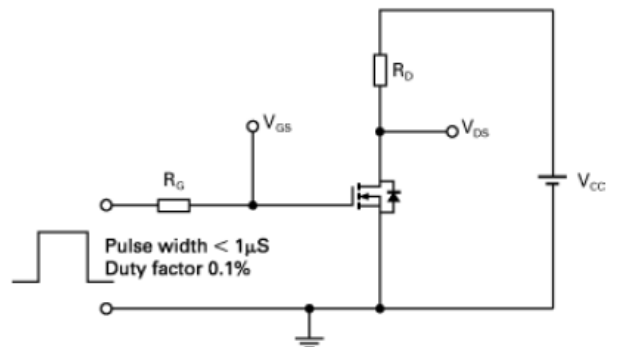
Basic gate charge waveform



Gate charge test circuit



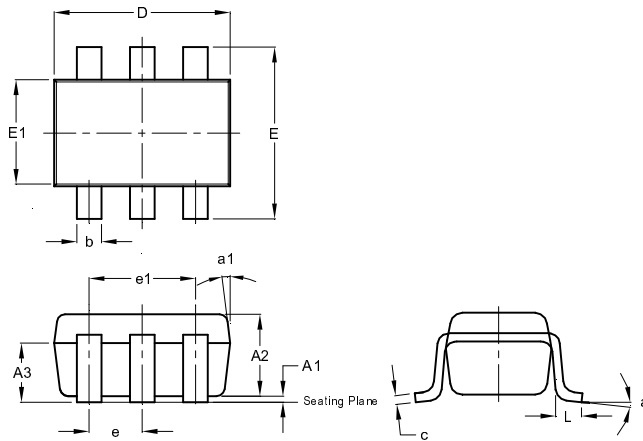
Switching time waveforms



Switching time test circuit

Package Outline Dimensions

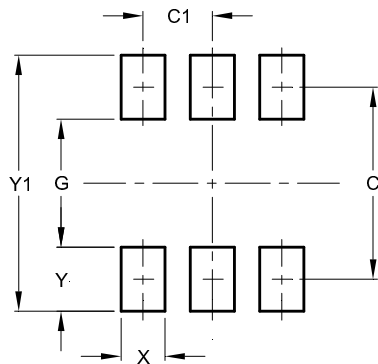
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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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