

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D $T_A = +25^\circ C$
30V	0.12Ω @ $V_{GS} = 10V$	2.0A

Description

This new generation MOSFET has been 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
- Motor Control

Features

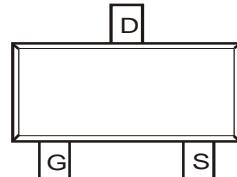
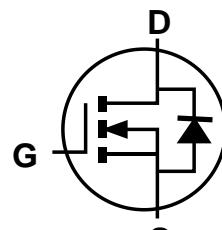
- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- Small Surface Mount Package
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208 
- Lead Free Plating (Matte Tin Finish Annealed over Alloy 42 Leadframe)
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)



Top View


 Top View
 Pin Configuration


Equivalent Circuit

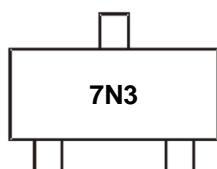
Ordering Information (Note 4)

Part Number	Case	Packaging
ZXMN3A01FTA	SOT23	3,000/Tape & Reel
ZXMN3A01FTC	SOT23	10,000/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



7N3 = Product Type Marking Code

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

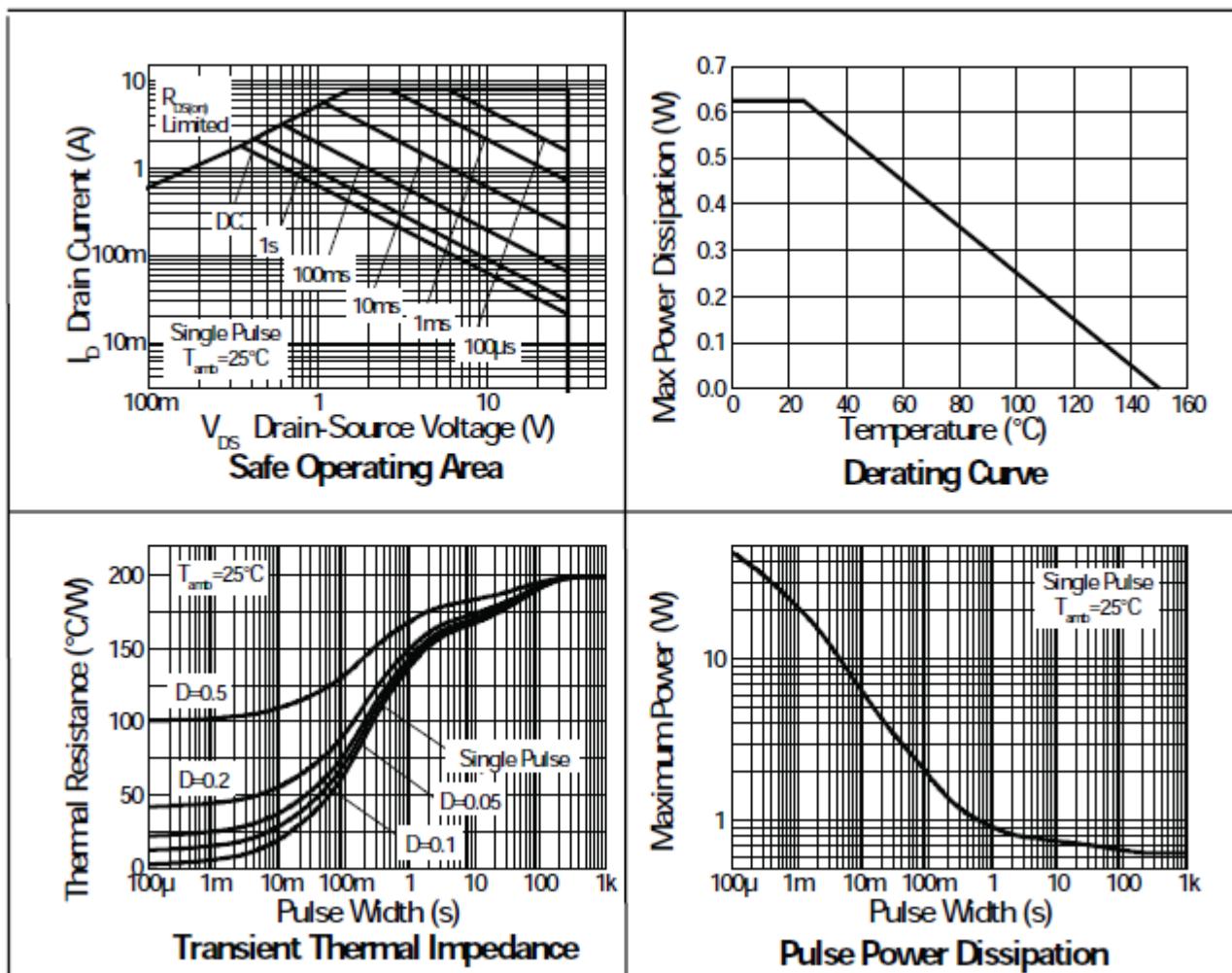
Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	± 20	V
Continuous Drain Current, $V_{GS} = 10\text{V}$	(Note 6) (Note 6) (Note 5)	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$ $T_A = +25^\circ\text{C}$	I_D	2.0 1.6 1.8	A
Pulsed Drain Current (Note 7)			I_{DM}	8	A
Maximum Body Diode Continuous Current (Note 6)			I_S	1.3	A

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

Characteristic		Symbol	Value	Units
Total Power Dissipation	(Note 5)	P_D	625	mW
Linear Derating Factor	(Note 5)	P_D	5	mW/°C
Total Power Dissipation	(Note 6)	P_D	806	mW
Linear Derating Factor	(Note 6)	P_D	6.4	mW/°C
Thermal Resistance, Junction to Ambient	(Note 5) (Note 6)	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	155	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes:

5. For a device surface mounted on 25mm x 25mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions.
6. For a device surface mounted on FR-4 PCB measured at $t \leq 5$ secs.
7. 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.

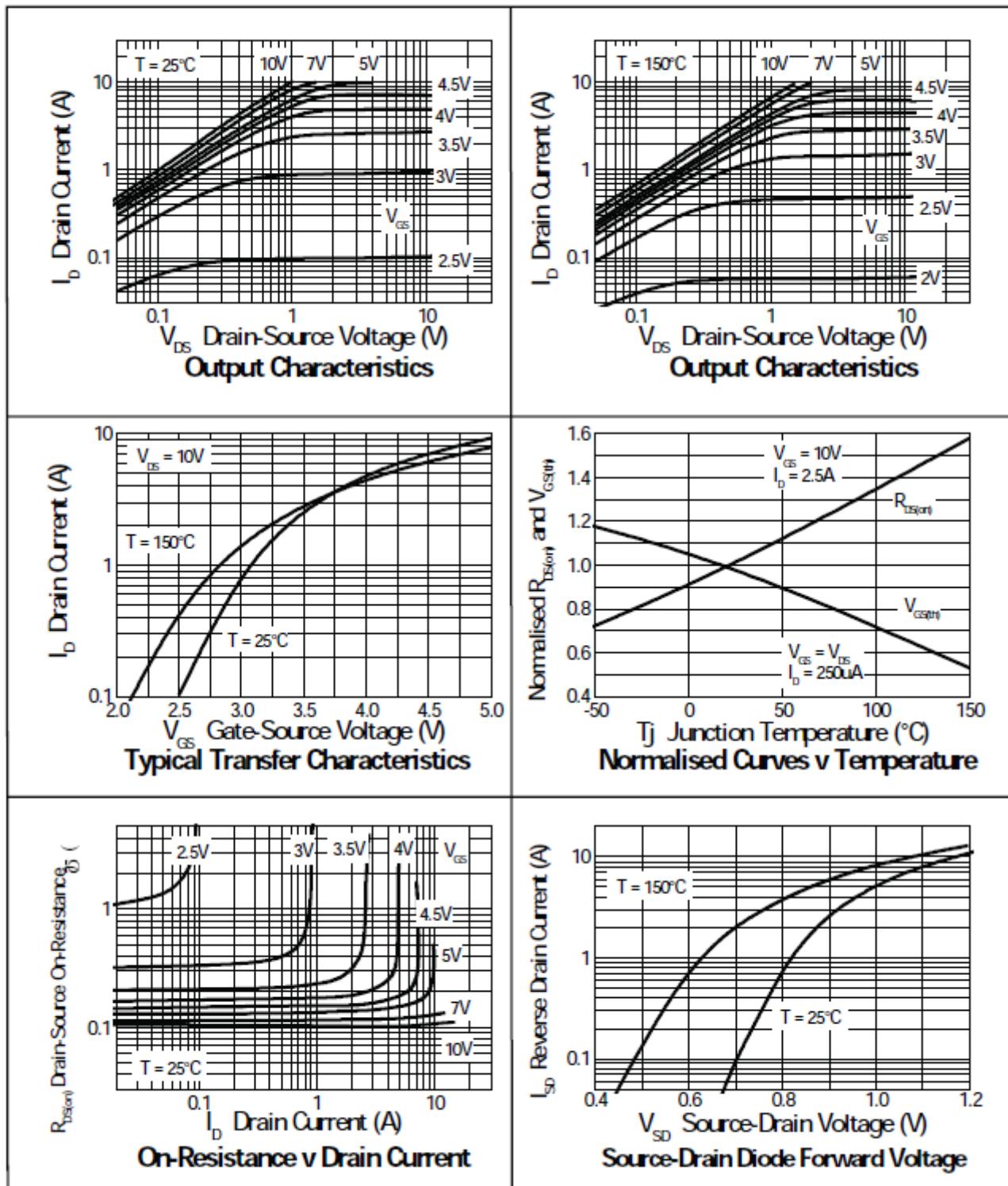


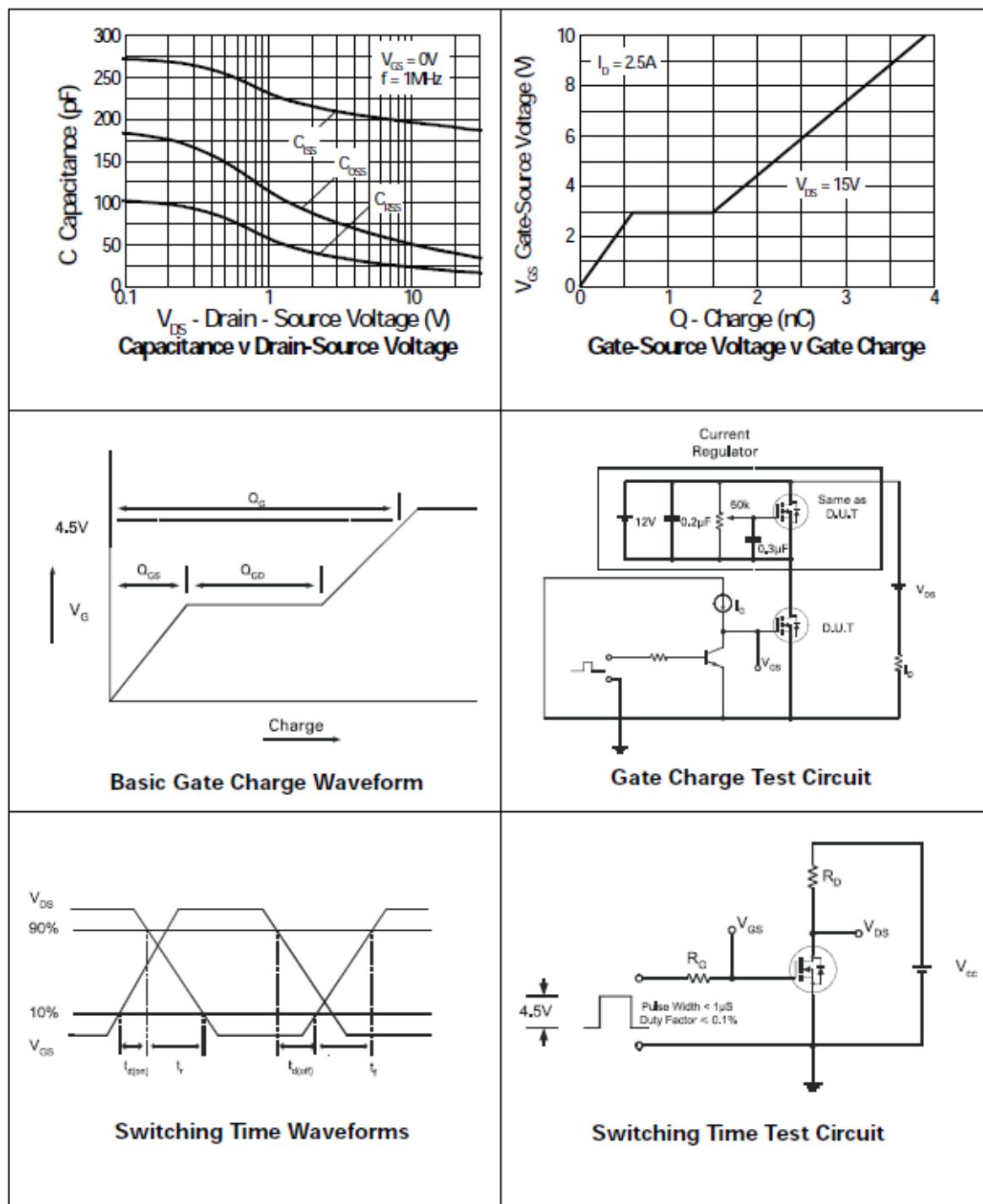
Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	$\text{V}_{\text{GS}} = 0\text{V}$, $\text{I}_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	0.5	μA	$\text{V}_{\text{DS}} = 30\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$
Gate-Body Leakage	I_{GSS}	—	—	100	nA	$\text{V}_{\text{GS}} = \pm 20\text{V}$, $\text{V}_{\text{DS}} = 0\text{V}$
ON CHARACTERISTICS						
Gate Threshold Voltage	$\text{V}_{\text{GS}(\text{th})}$	1	—	2.5	V	$\text{V}_{\text{DS}} = \text{V}_{\text{GS}}$, $\text{I}_D = 250\mu\text{A}$
Static Drain-Source On-Resistance (Note 8)	$\text{R}_{\text{DS}(\text{ON})}$	—	0.11	0.12	Ω	$\text{V}_{\text{GS}} = 10\text{V}$, $\text{I}_D = 2.5\text{A}$
		—	—	0.18	Ω	$\text{V}_{\text{GS}} = 4.5\text{V}$, $\text{I}_D = 2\text{A}$
Forward Transconductance	g_{FS}	—	3.5	—	S	$\text{V}_{\text{DS}} = 4.5\text{V}$, $\text{I}_D = 2.5\text{A}$
Diode Forward Voltage (Note 8 & 10)	V_{SD}	—	0.85	0.95	V	$\text{V}_{\text{GS}} = 0\text{V}$, $\text{I}_S = 1.7\text{A}$, $\text{T}_J = +25^\circ\text{C}$
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	190	—	pF	$\text{V}_{\text{DS}} = 25\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$, $f = 1\text{MHz}$
Output Capacitance	C_{oss}	—	38	—		
Reverse Transfer Capacitance	C_{rss}	—	20	—		
Gate Charge (Note 9)	Q_g	—	2.3	—	nC	$\text{V}_{\text{DS}} = 15\text{V}$, $\text{V}_{\text{GS}} = 5\text{V}$, $\text{I}_D = 2.5\text{A}$
Total Gate Charge (Note 9)	Q_g	—	3.9	—		
Gate-Source Charge (Note 9)	Q_{gs}	—	0.6	—		
Gate-Drain Charge (Note 9)	Q_{qd}	—	0.9	—		
Turn-On Delay Time (Note 9)	$\text{t}_{\text{D}(\text{on})}$	—	1.7	—	ns	$\text{V}_{\text{DD}} = 15\text{V}$, $\text{I}_D = 2.5\text{A}$, $\text{R}_G = 6\Omega$, $\text{V}_{\text{GS}} = 10\text{V}$
Turn-On Rise Time (Note 9)	t_r	—	2.3	—		
Turn-Off Delay Time (Note 9)	$\text{t}_{\text{D}(\text{off})}$	—	6.6	—		
Turn-Off Fall Time (Note 9)	t_f	—	2.9	—		
Reverse Recovery Time	t_{rr}	—	17.7	—	ns	$\text{T}_J = +25^\circ\text{C}$, $\text{I}_F = 2.5\text{A}$, $\text{di}/\text{dt} = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge	Q_{rr}	—	13	—	nC	

Notes:

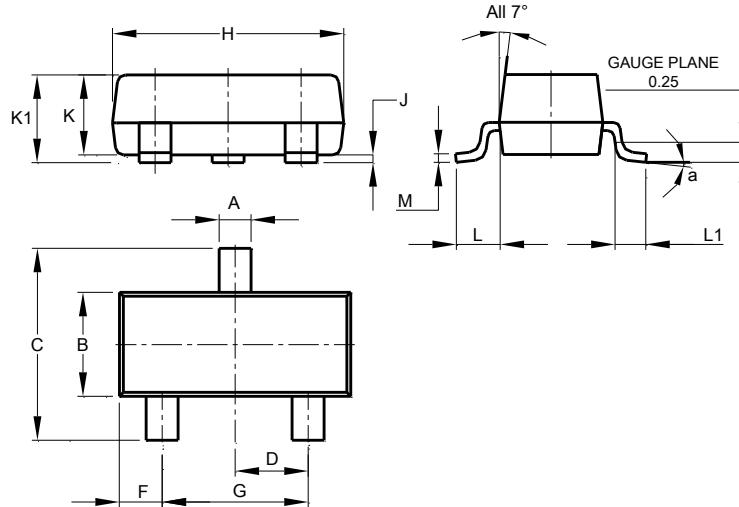
- 8. Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$.
- 9. Switching characteristics are independent of operating junction temperature.
- 10. Guaranteed by design. Not subject to production testing.





Package Outline Dimensions

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

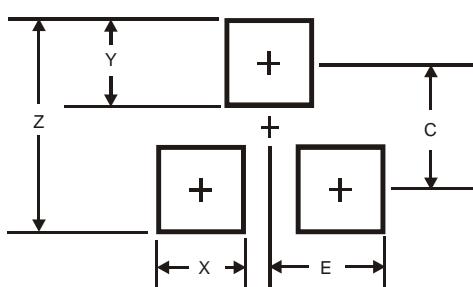


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	8°		

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)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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