

30V N-CHANNEL ENHANCEMENT MODE MOSFET
Product Summary

$V_{(BR)DSS}$	Max $R_{DS(ON)}$	Max I_D $T_A = +25^\circ\text{C}$
30V	0.050 Ω @ $V_{GS} = 10\text{V}$	4.6A

Description and Applications

This new generation of TRENCH MOSFET from Zetex utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.

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

Features and Benefits

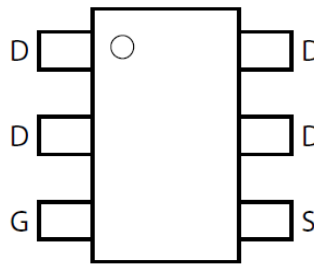
- Low On-resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

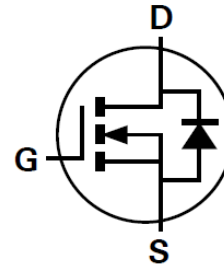
- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.015 grams (Approximate)



Top View



Pinout Top-view

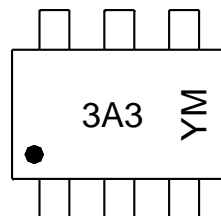


Device Symbol

Ordering Information (Note 4)

Part Number	Reel Size (inch)	Tape Width (mm)	Quantity Per Reel
ZXMN3A03E6TA	7	8	3000
ZXMN3A03E6TC	13	8	10,000

- 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


3A3 = 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	2023	2024	2025
Code	C	D	E	F	G	H	I	J	K	L	M

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

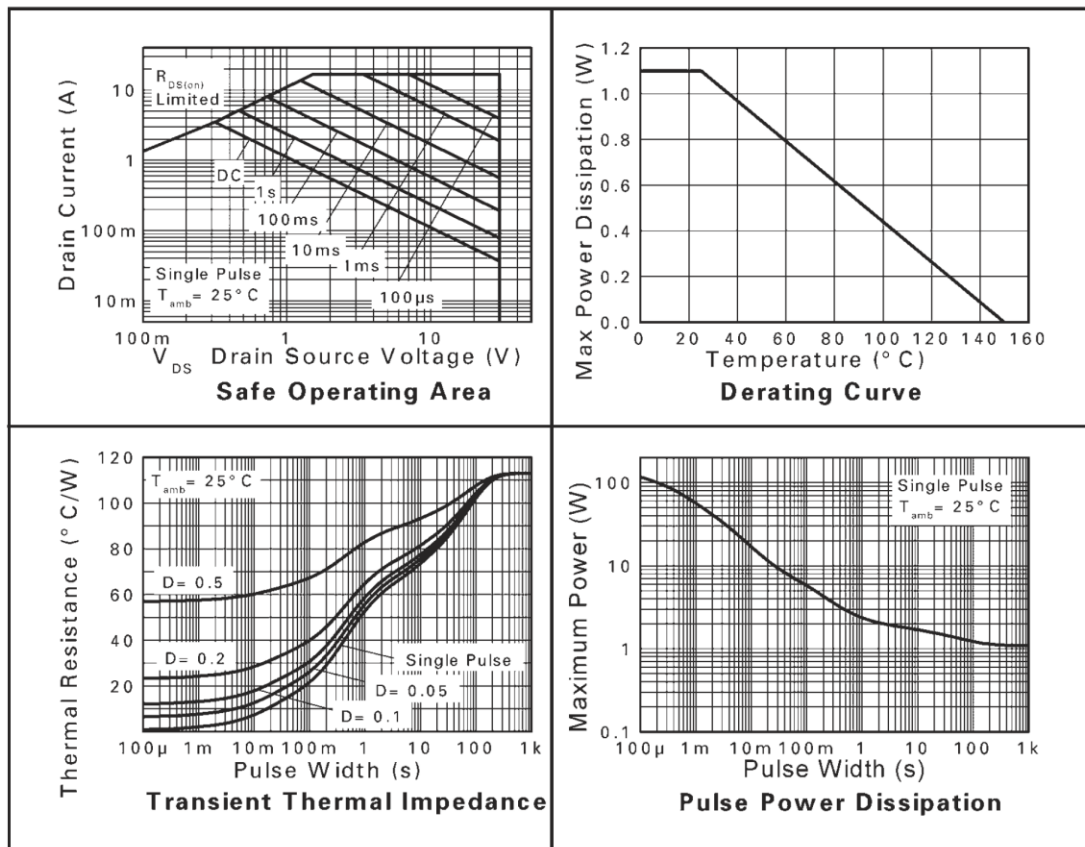
Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic		Symbol	Value	Unit	
Drain-Source Voltage		V_{DS}	30	V	
Gate-Source Voltage		V_{GS}	± 20	V	
Continuous Drain Current	$V_{GS} = 10\text{V}$	I_D	$T_A = +25^\circ\text{C}$ (Note 6)	4.6	A
			$T_A = +70^\circ\text{C}$ (Note 6)	3.7	
			$T_A = +25^\circ\text{C}$ (Note 5)	3.7	
Pulsed Drain Current (Note 7)		I_{DM}	17	A	
Continuous Source Current (Body Diode) (Note 6)		I_S	2.6	A	
Pulsed Source Current (Body Diode) (Note 7)		I_{SM}	17	A	

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

Characteristic	Symbol	Value	Unit
Power Dissipation at $T_A = +25^\circ\text{C}$ (Note 5)	P_D	1.1	W
Linear derating factor (Note 5)		8.8	$\text{mW}/^\circ\text{C}$
Power Dissipation at $T_A = +25^\circ\text{C}$ (Note 6)	P_D	1.7	W
Linear derating factor (Note 6)		13.6	$\text{mW}/^\circ\text{C}$
Junction to Ambient (Note 5)	$R_{\theta JA}$	113	$^\circ\text{C}/\text{W}$
Junction to Ambient (Note 6)	$R_{\theta JA}$	73	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

- 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 FR-4 PCB measured at $t \leq 10$ secs.
 - Repetitive rating 25mm x 25mm FR-4 PCB, $D = 0.05$, pulse width 10 μs - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

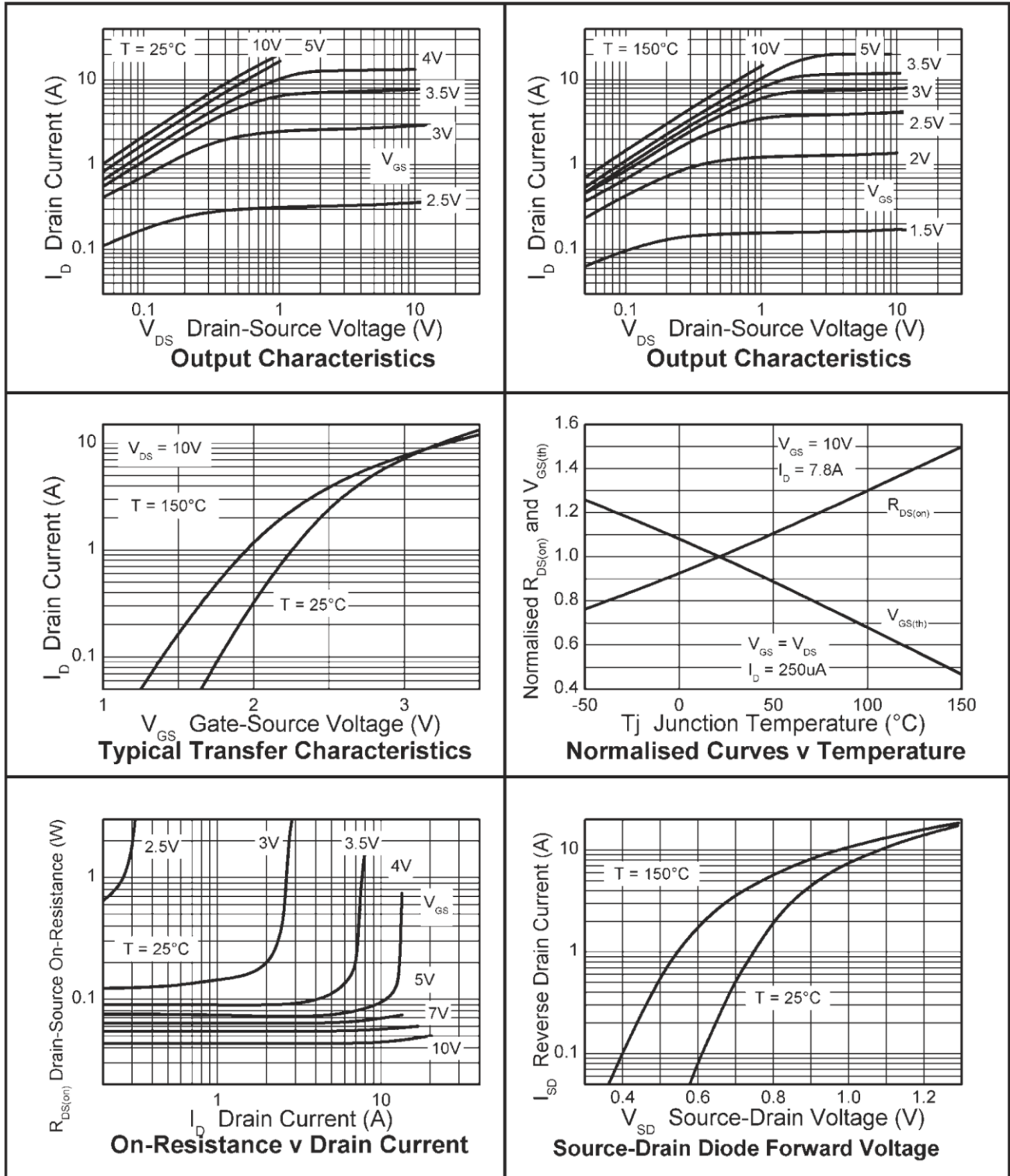
Thermal Characteristics


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

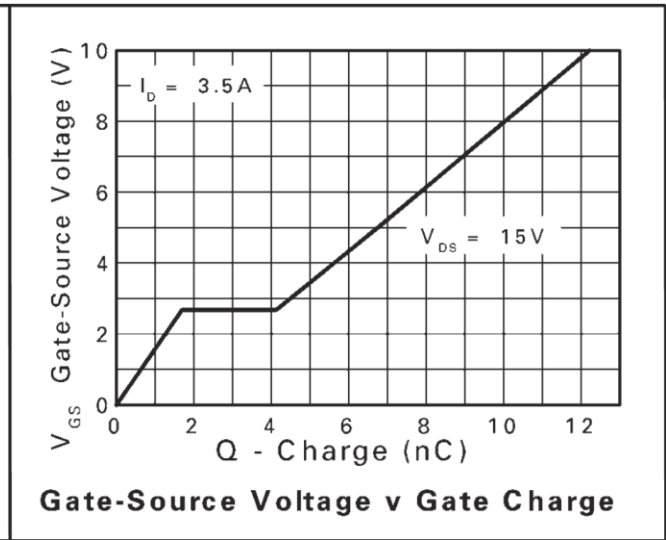
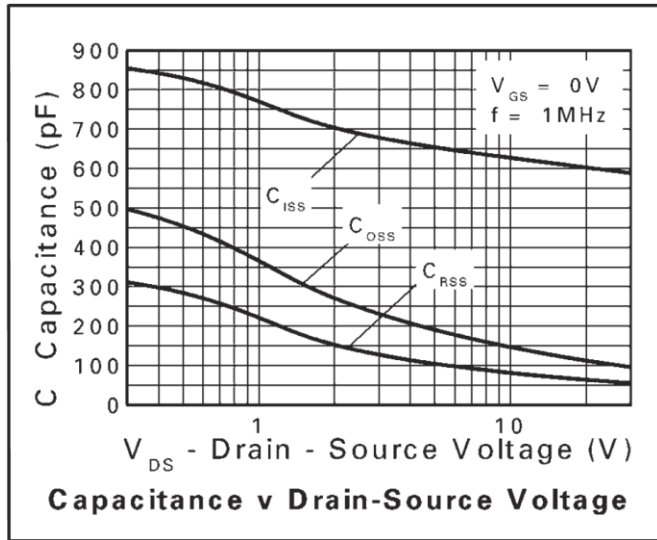
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-source Breakdown Voltage	BV _{DSS}	30	—	—	V	I _D = 250μA, V _{GS} = 0V
Zero Gate Voltage Drain Current	I _{DSS}	—	—	0.5	μA	V _{DS} = 30V, V _{GS} = 0V
Gate-body Leakage	I _{GSS}	—	—	100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS						
Gate-source Threshold Voltage	V _{GS(th)}	1	—	—	V	I _D = 250μA, V _{DS} = V _{GS}
Static Drain-source On-state Resistance (Note 8)	R _{DS(ON)}	—	—	0.050	Ω	V _{GS} = 10V, I _D = 7.8A
				0.065		V _{GS} = 4.5V, I _D = 6.8A
Forward Transconductance (Notes 8 & 10)	g _{fs}	—	10	—	S	V _{DS} = 10V, I _D = 7.8A
Diode Forward Voltage (Note 8)	V _{SD}	—	0.85	0.95	V	T _J = +25°C, I _S = 3.2A, V _{GS} = 0V
DYNAMIC CHARACTERISTICS (Notes 9 & 10)						
Input Capacitance	C _{iSS}	—	600	—	pF	V _{DS} = 25V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{oss}	—	104	—	pF	
Reverse Transfer Capacitance	C _{rSS}	—	58.5	—	pF	
Gate Charge	Q _g	—	6.9	—	nC	V _{GS} = 5V, V _{DS} = 15V I _D = 3.5A
Total Gate Charge	Q _g	—	12.6	—	nC	V _{GS} = 10V, V _{DS} = 15V I _D = 3.5A
Gate-source Charge	Q _{gs}	—	2.0	—	nC	
Gate-drain Charge	Q _{gd}	—	2.0	—	nC	
Reverse Recovery Time (Note 10)	t _{rr}	—	18.8	—	ns	T _J = +25°C, I _F = 3.5A, di/dt = 100A/μs
Reverse Recovery Charge (Note 10)	Q _{rr}	—	14.1	—	nC	
Turn-on Delay Time	t _{d(on)}	—	2.9	—	ns	V _{DD} = 15V, V _{GS} = 10V I _D = 3.5A, R _G = 6.0Ω
Turn-on Rise Time	t _r	—	6.4	—	ns	
Turn-off Delay Time	t _{d(off)}	—	16.0	—	ns	
Turn-off Fall Time	t _f	—	11.2	—	ns	

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

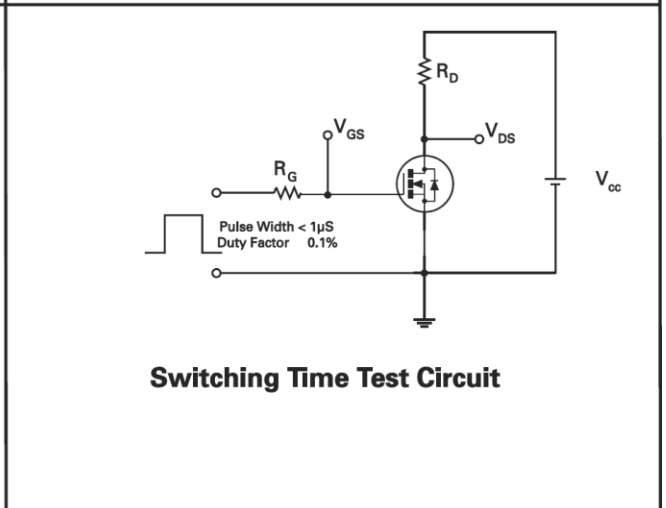
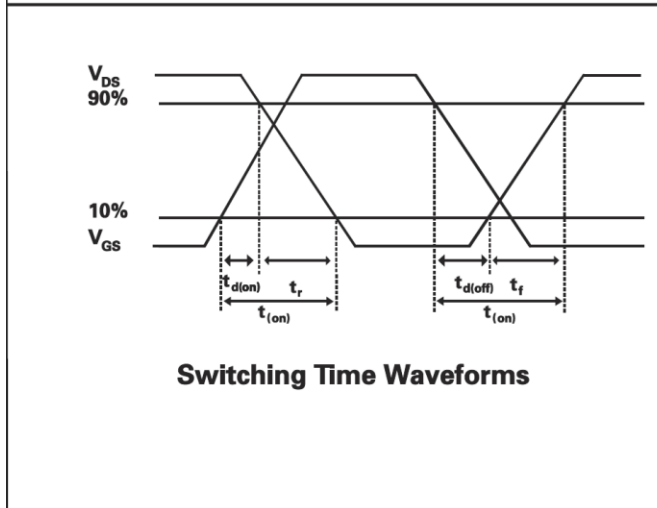
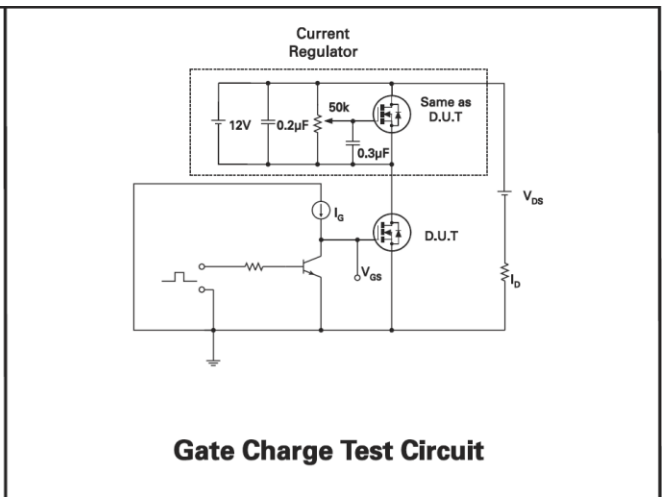
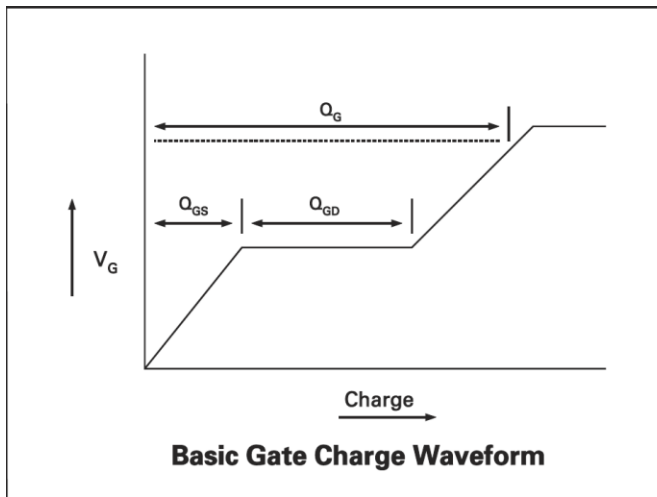
Typical Characteristics



Typical Characteristics (Cont.)

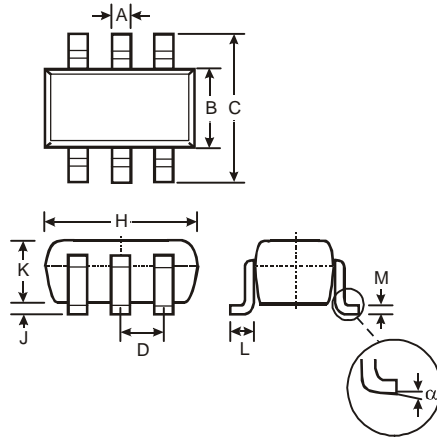


Test Circuits



Package Outline Dimensions

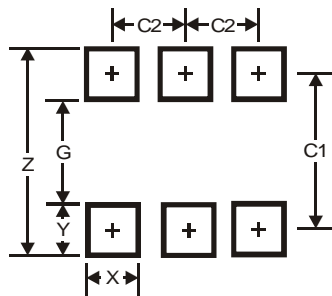
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT26			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
α	0°	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	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95

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