

Product Summary

V_{(BR)DSS}	Max R_{Ds(ON)}	Max I_D T_A = +25°C (Note 6)
-30V	70mΩ @ V _{GS} = -10V	-4A

Description and Applications

This new generation of TRENCH MOSFETs 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

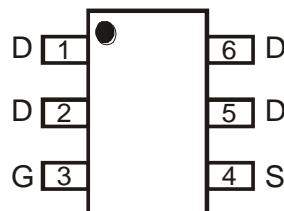
- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

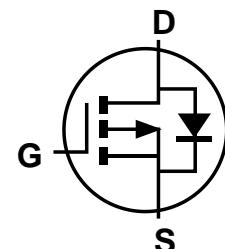
- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.016 grams (Approximate)



Top View



Pin-Out (Top View)



Equivalent Circuit

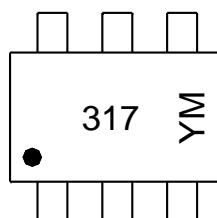
Ordering Information (Note 4)

Part Number	Marking	Reel Size (inch)	Tape Width (mm)	Quantity Per Reel
ZXMP3A17E6TA	317	7	8	3000
ZXMP3A17E6TC	317	13	8	10,000

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



317 = Product Type Marking Code

YM = Date Code Marking

Y or Ȳ = Year (ex: C = 2015)

M or M̄ = 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}	-30	V	
Gate-Source Voltage			V_{GS}	± 20	V	
Continuous Drain Current	$V_{GS} = -10\text{V}$	$T_A = +25^\circ\text{C}$ (Note 6)	I_D	-4.0	A	
		$T_A = +70^\circ\text{C}$ (Note 6)		-3.2		
		$T_A = +25^\circ\text{C}$ (Note 5)		-3.2		
Pulsed Drain Current (Note 7)			I_{DM}	-14.4	A	
Continuous Source Current (Body Diode) (Note 6)			I_S	-2.5	A	
Pulsed Source Current (Body Diode) (Note 7)			I_{SM}	-14.4	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		8.8	mW/°C
Power Dissipation at $T_A = +25^\circ\text{C}$ (Note 6)	P_D	1.7	W
Linear Derating Factor		13.6	mW/°C
Junction to Ambient (Note 5)	R_{JJA}	113	°C/W
Junction to Ambient (Note 6)	R_{JJA}	73	°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.

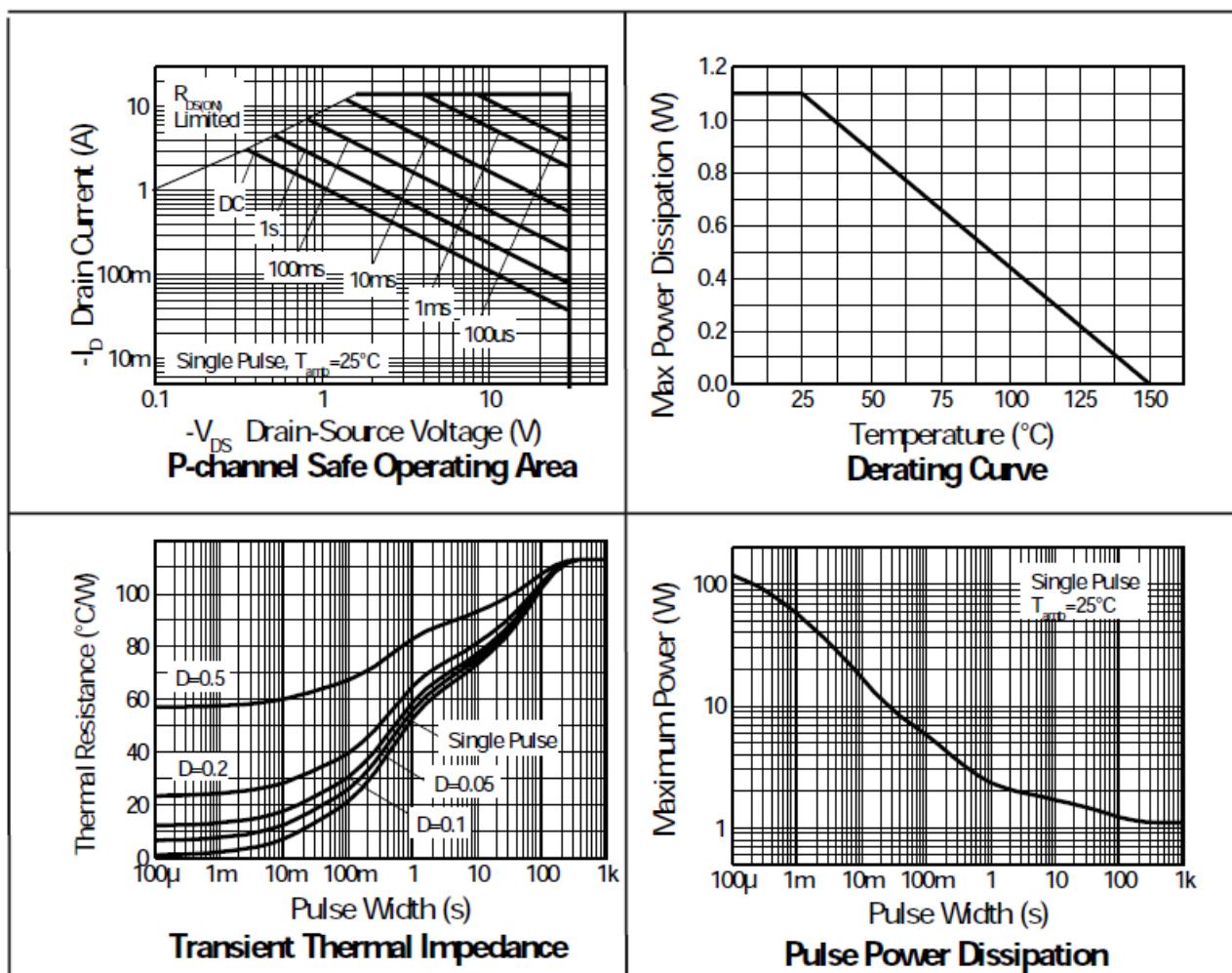
Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

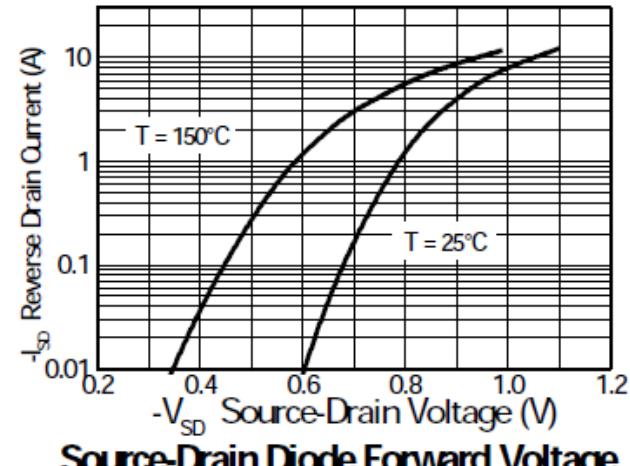
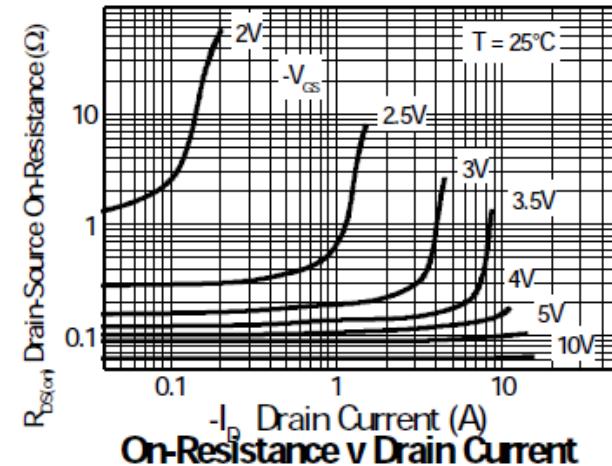
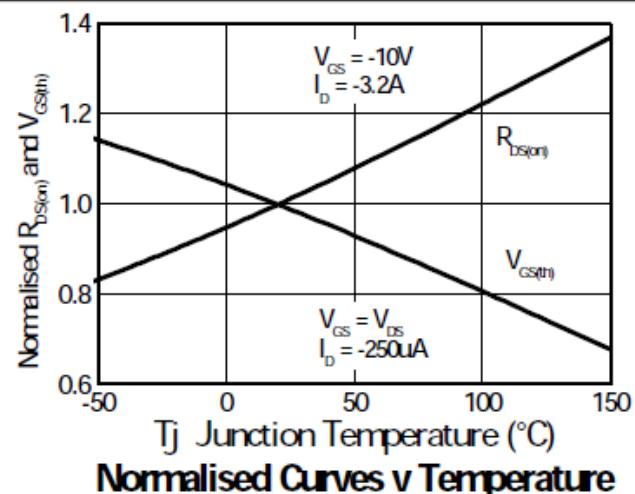
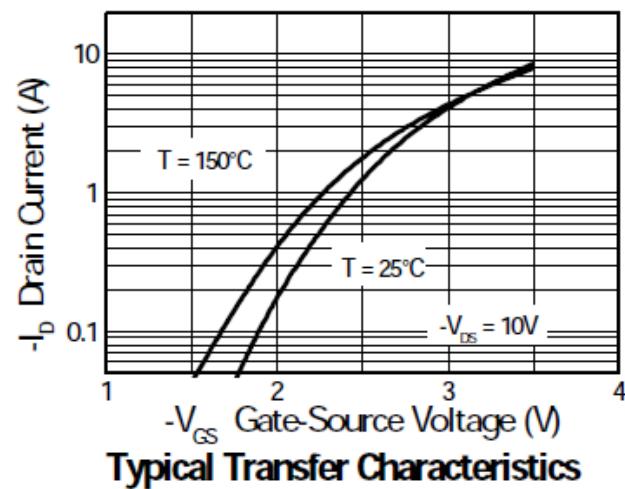
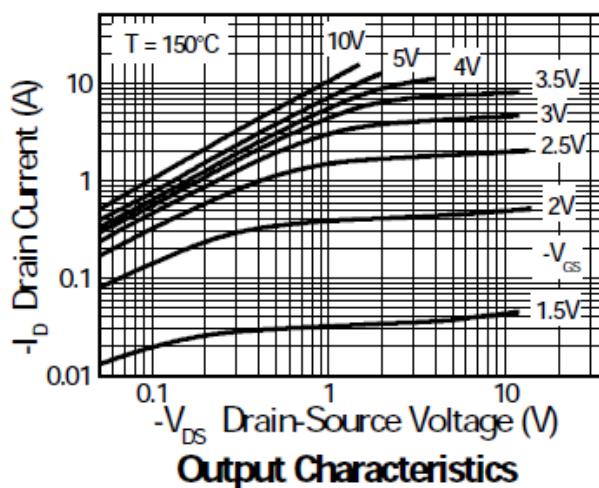
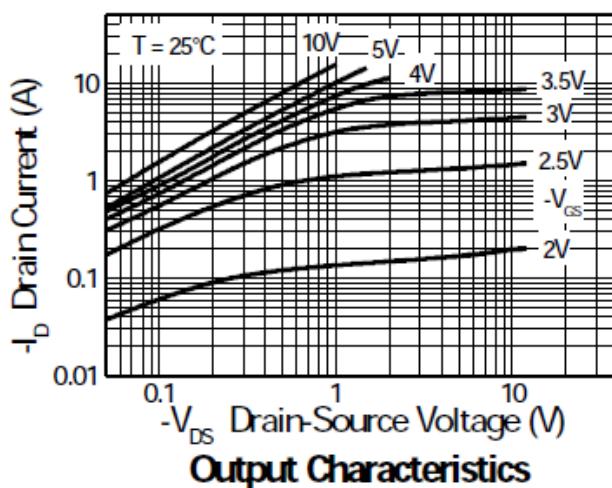
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-30	-	-	V	$I_D = -250\mu\text{A}, V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	-0.5	μA	$V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$
Gate-Body Leakage	I_{GSS}	-	-	100	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(TH)}$	-1.0	-	-	V	$I_D = -250\mu\text{A}, V_{DS} = V_{GS}$
Static Drain-Source On-State Resistance (Note 8)	$R_{DS(\text{ON})}$	-	-	0.070	Ω	$V_{GS} = -10\text{V}, I_D = -3.2\text{A}$
				0.110		$V_{GS} = -4.5\text{V}, I_D = -2.5\text{A}$
Forward Transconductance (Notes 8 & 10)	g_{fs}	-	6.4	-	S	$V_{DS} = -15\text{V}, I_D = -3.2\text{A}$
Diode Forward Voltage (Note 8)	V_{SD}	-	-0.85	-1.2	V	$T_J = +25^\circ\text{C}, I_S = -2.5\text{A}, V_{GS} = 0\text{V}$
DYNAMIC CHARACTERISTICS						
Input Capacitance (Note 10)	C_{iss}	-	630	-	pF	$V_{DS} = -15\text{V}, V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance (Note 10)	C_{oss}	-	113	-	pF	
Reverse Transfer Capacitance (Note 10)	C_{rss}	-	78	-	pF	
Gate Charge (Notes 9 & 10)	Q_g	-	8.28	-	nC	$V_{GS} = -5\text{V}, V_{DS} = -15\text{V}$ $I_D = -3.2\text{A}$
Total Gate Charge (Notes 9 & 10)	Q_g	-	15.8	-	nC	$V_{GS} = -10\text{V}, V_{DS} = -15\text{V}$ $I_D = -3.2\text{A}$
Gate-Source Charge (Notes 9 & 10)	Q_{gs}	-	1.84	-	nC	
Gate-Drain Charge (Notes 9 & 10)	Q_{gd}	-	2.8	-	nC	
Turn-On Delay Time (Notes 9 & 10)	$t_{D(\text{ON})}$	-	1.74	-	ns	$V_{DD} = -15\text{V}, V_{GS} = -10\text{V}$ $I_D = -1\text{A}, R_G = 6.0\Omega$
Turn-On Rise Time (Notes 9 & 10)	t_R	-	2.87	-	ns	
Turn-Off Delay Time (Notes 9 & 10)	$t_{D(\text{OFF})}$	-	29.2	-	ns	
Turn-Off Fall Time (Notes 9 & 10)	t_F	-	8.72	-	ns	
Reverse Recovery Time (Note 10)	t_{RR}	-	19.5	-	ns	$T_J = +25^\circ\text{C}, I_F = -1.7\text{A},$ $di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge (Note 10)	Q_{RR}	-	16.3	-	nC	

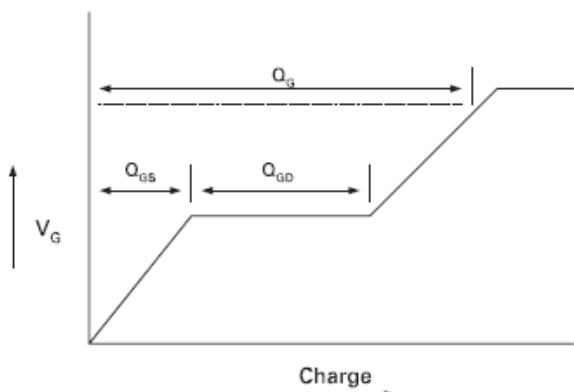
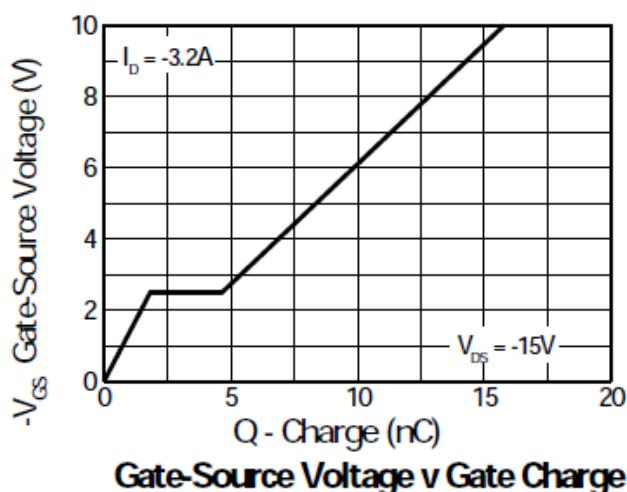
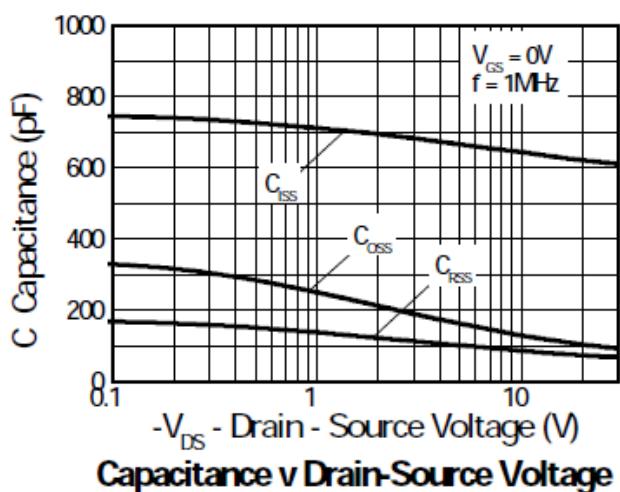
Notes: 8. Measured under pulsed conditions. Width=300μs. Duty cycle ≤ 2%

9. Switching characteristics are independent of operating junction temperature.

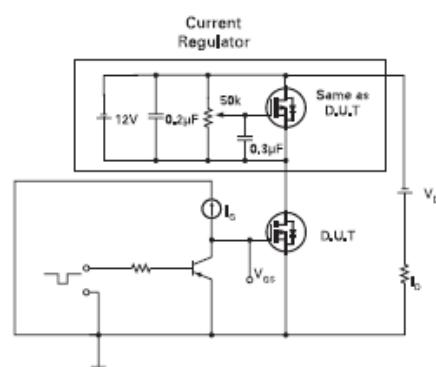
10. For design aid only, not subject to production testing.



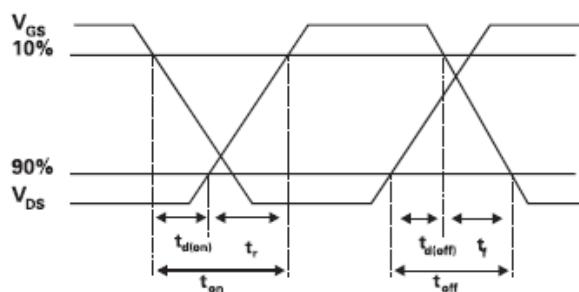




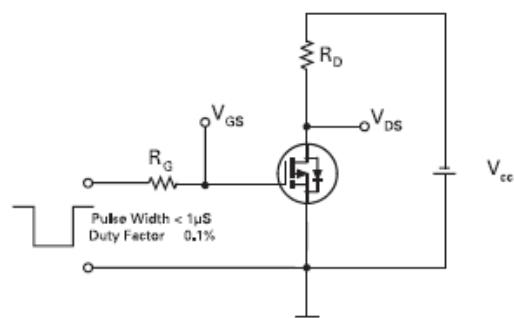
Basic Gate Charge Waveform



Gate Charge Test Circuit



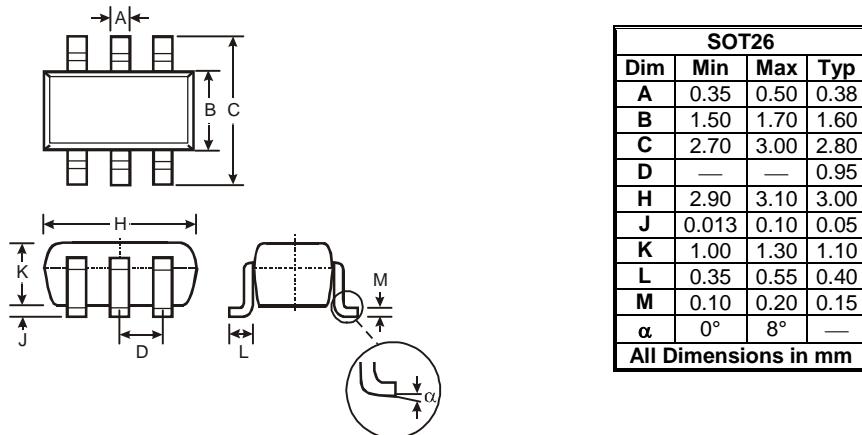
Switching Time Waveforms



Switching Time Test Circuit

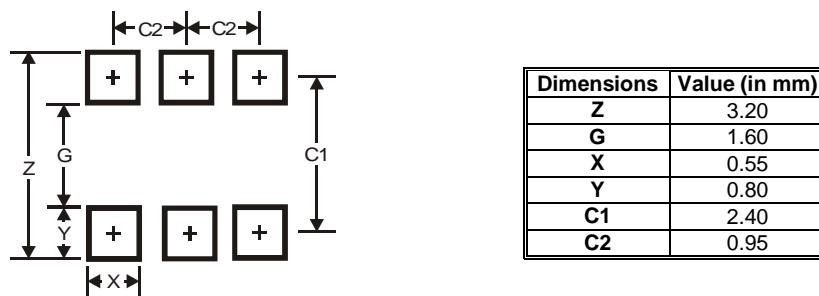
Package Outline Dimensions

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



Suggested Pad Layout

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