



**THE DATASHEET OF  
ZEN056V230A16CE**





## Product Overview

### PolyZen CE (Consumer Electronics) Series

The PolyZen CE Series is an integrated overvoltage and overcurrent protection device with a slim profile suited for today's thin mobile devices like tablets and ultrabooks.





## KEY FEATURES

- Integrated overvoltage and overcurrent protection
- High hold current rating
- Plug and play with +5V and +12V Zener voltage option
- Low 1.0mm height profile
- Single component placement

The new PolyZen CE (Consumer Electronics) series of circuit protection devices for tablet PCs and other portable consumer electronics is a new extension to the family. Consumer electronics require robust circuit protection to help protect sensitive electronics from overvoltage and overcurrent events that can result in costly product returns and warranty issues. The low-profile (1.0 mm-height) PolyZen CE device, rated at an industry-leading 2.6A, is an innovative solution that offers significant performance advantages over discrete solutions employing fuses, Zeners and other passive devices. The PolyZen CE series offers board designers plug-and-play overvoltage protection devices that relieve them of the time it takes to integrate and test less effective discrete and more costly IC solutions.

The PolyZen CE products integrate a precision Zener diode with 5.6V and 13.2V zener voltage (Vz) options and a PolySwitch PPTC (Polymer Positive Temperature Coefficient) device in a single, surface mount assembly. Offered in a compact thin package useful for space constrained applications, the PolyZen CE series uses a thermally protected Zener diode to help shield downstream electronics against voltage transients, reverse-bias and the incorrect use of power supplies. The PolySwitch PPTC element shuts out excessive current while the fault condition remains and helps protect the Zener diode and downstream electronics from damage.

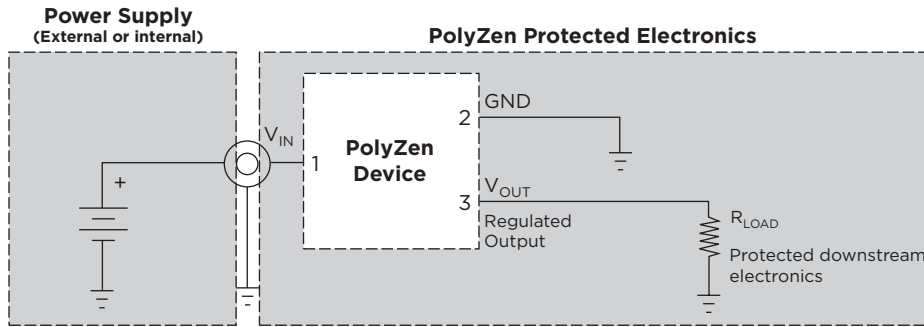
## APPLICATIONS

- Tablet PCs and Ultra-books
- Global Positioning and Navigation Systems
- HDDs, SSDs, and Personal Storage
- Cigarette Lighter Adaptor Chargers
- Cell phone charger port and USB power
- Set Top Boxes and Media Players
- Automotive Infotainment power
- DC power port protection
- Industrial handhelds and POS devices

## BENEFITS

- High hold current rating up to 2.6A @ 20°C meets Tablet PC requirement
- Low profile for thin form factor consumer electronics
- Fast clamping Zener diode helps to protect downstream electronics
- Integrated plug-and-play device to reduce design and test time
- Single component placement for space constrained applications
- Protects electronics against reverse polarity power sources
- Minimal power dissipation helps to meet total system power budget
- RoHS Compliant and Halogen Free

TYPICAL APPLICATION BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS

Part Description	V <sub>Z</sub> (V)			I <sub>Zt</sub> (A)	I <sub>HOLD</sub> <sup>(1)</sup> (A)		Leakage Current		R <sub>Typ</sub> <sup>(2)</sup> (Ω)	R <sub>1Max</sub> <sup>(3)</sup> (Ω)	V <sub>INT MAX</sub> <sup>(4)</sup> (V)		I <sub>FLT MAX</sub> <sup>(5)</sup> (A)		Tripped Power Dissipation <sup>(6)</sup>	
	Min.	Typ.	Max.		@20°C	@60°C	Test Voltage (V)	Max Current (mA)			V <sub>INT MAX</sub> (V)	Test Current (A)	I <sub>FLT MAX</sub> (A)	Test Voltage (V)	Power (W)	Test Voltage (V)
ZEN132V260A16CE	13.20	13.40	13.65	0.1	2.6	2.0	13.15	5.0	0.032	0.045	16	5	+3 -40	+16 -12	1	16
ZEN056V260A16CE	5.45	5.60	5.75	0.1	2.6	2.0	5.25	10.0	0.032	0.045	16	5	+5 -40	+16 -12	1	16
ZEN132V230A16CE	13.20	13.40	13.65	0.1	2.3 @ 20°C		13.15	5.0	0.032	0.060	16	5	+3 -40	+16 -12	1	16
ZEN056V230A16CE	5.45	5.60	5.75	0.1	2.3 @ 20°C		5.25	10.0	0.032	0.060	16	5	+5 -40	+16 -12	1	16
ZEN132V130A24CE	13.20	13.40	13.65	0.1	1.3 @ 20°C		13.15	5.0	0.070	0.105	24	3	+3 -40	+24 -16	1	24
ZEN056V130A24CE	5.45	5.60	5.75	0.1	1.3 @ 20°C		5.25	10.0	0.070	0.105	24	3	+10 -40	+24 -16	1	24

Electrical characteristics determined at 25°C unless otherwise specified.

(1) I<sub>HOLD</sub>: Maximum steady state input current that will not generate a trip event.

(2) R<sub>Typ</sub>: Resistance between V<sub>IN</sub> and V<sub>OUT</sub> pins during normal operation at room temperature.

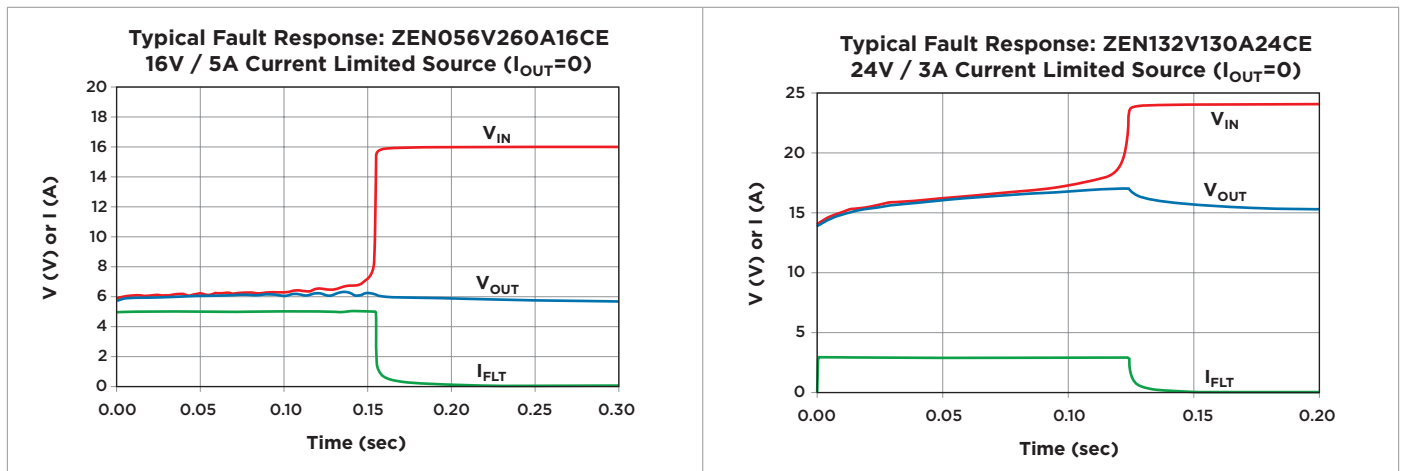
(3) R<sub>1Max</sub>: The maximum resistance between V<sub>IN</sub> and V<sub>OUT</sub> pins.

(4) V<sub>INT MAX</sub>: V<sub>INT MAX</sub> is defined as the voltage at which typical devices survived at least 100 trip cycles and 24 hours trip endurance at the specified voltage and current.

(5) I<sub>FLT MAX</sub>: Maximum RMS fault current the diode can withstand and remain resettable.

(6) The power dissipated by the device when in the “tripped” state.

TYPICAL FAULT RESPONSES

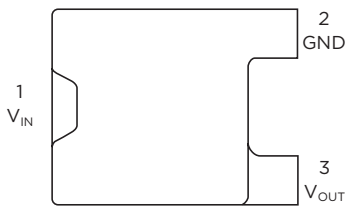


**GENERAL CHARACTERISTICS FOR POLYZEN DEVICES**

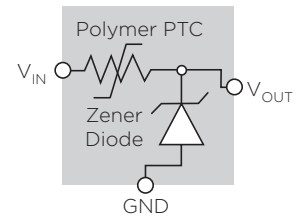
Operating temperature range	-40° to +85°C	
Storage temperature	-40° to +85°C	
ESD withstand	15kV Contact Discharge	IEC61000-4-2, Level 4
Diode capacitance	4200pF	Typical @ 1MHz, 1V <sub>RMS</sub>
Construction	RoHS compliant and Halogen Free	

**DEVICE INFORMATION**

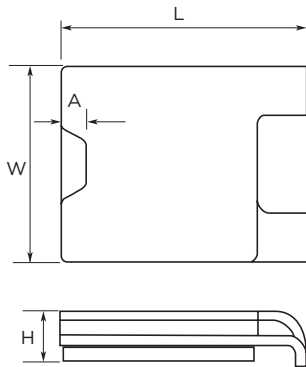
**Pin Configuration and Block Diagram**



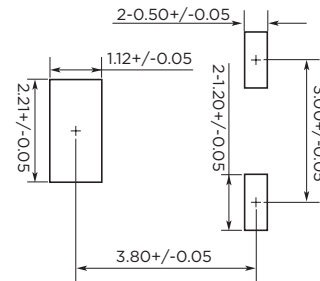
Pin Number	Pin Name	Pin Function
1	V <sub>IN</sub>	V <sub>IN</sub> = Protected input to Zener diode
2	GND	GND = Ground
3	V <sub>OUT</sub>	V <sub>OUT</sub> = Zener regulated voltage output



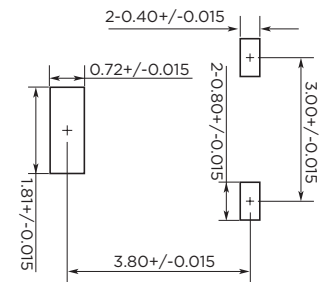
**Mechanical Dimension and Recommended Pad Layout**



**Recommended Pad Layout**



**Recommended Solder Stencil (mm)**



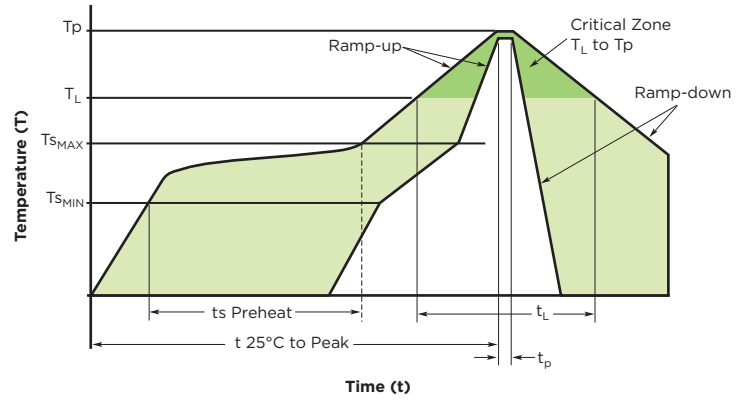
Solder thickness - 0.15mm

		(mm)		
		Min	Typical	Max
Length	L	4.8	5.0	5.2
Width	W	3.8	4.0	4.2
Height	H	0.8	1.0	1.2
Dimension	A	0.7	0.8	0.9

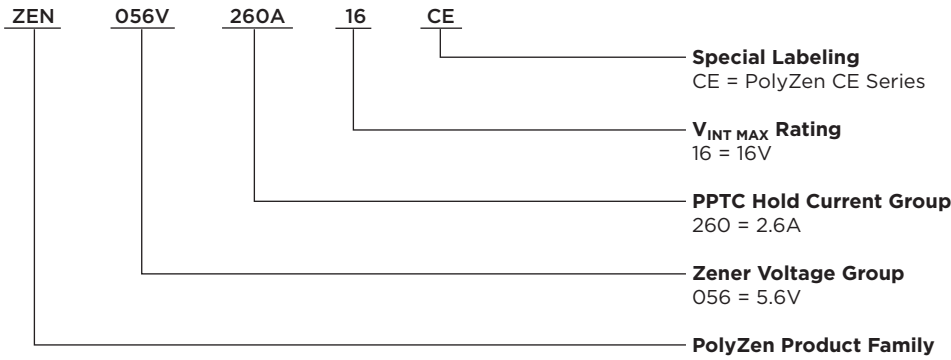
**RECOMMENDED REFLOW PROFILE**

**Classification Reflow Profiles**

Profile Feature	Pb-Free Assembly
Average Ramp-up Rate ( $T_{S_{MAX}}$ to $T_p$ )	3°C/second max
Average Ramp-down Rate ( $T_p$ to $T_L$ )	6°C/second max
<b>Preheat</b>	
• Temperature Min ( $T_{S_{MIN}}$ )	150°C
• Temperature Max ( $T_{S_{MAX}}$ )	200°C
• Time ( $t_s$ Preheat)	60-180 seconds
<b>Time maintained above:</b>	
• Temperature ( $T_L$ )	217°C
• Time ( $t_L$ )	60-150 seconds
<b>Peak / Classification Temperature</b>	
• Temperature ( $T_p$ )	260°C
<b>Time within 5°C of actual peak</b>	
• Time ( $t_p$ )	20-40 seconds
<b>Time 25°C to peak Temperature</b>	8 minutes max



**PART NUMBERING SYSTEM**

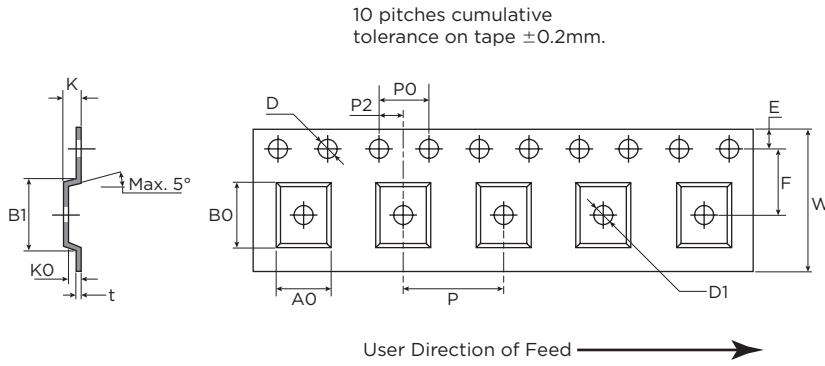


**DEVICE MARKING INFORMATION**



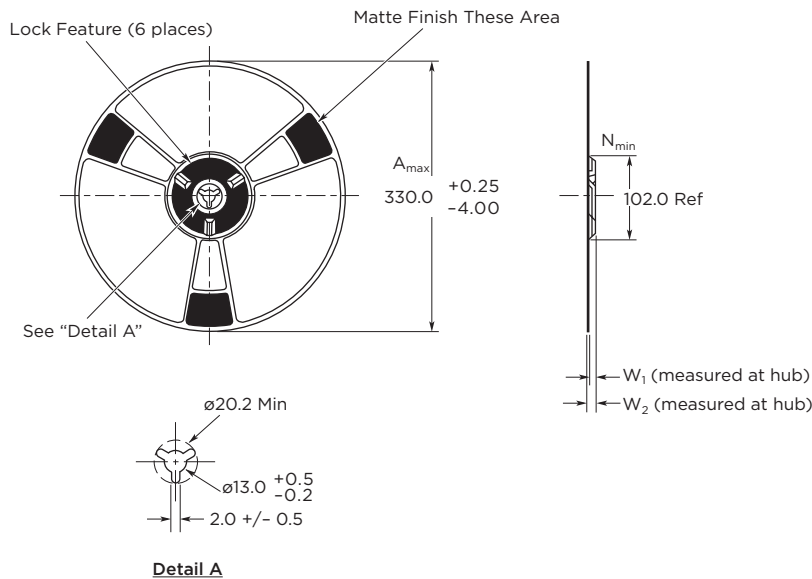
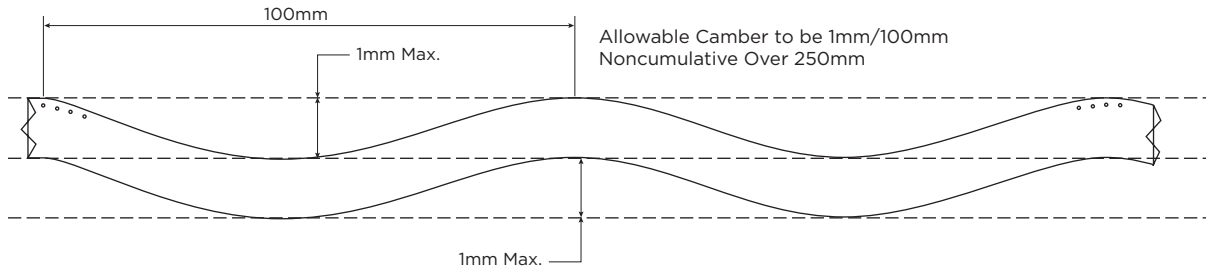
VVII	Zener Voltage	Hold Current	Part Description
05613	5.6V	1.3A	ZEN056V130A24CE
05623	5.6V	2.3A	ZEN056V230A16CE
05626	5.6V	2.6A	ZEN056V260A16CE
13213	13.2V	1.3A	ZEN132V130A24CE
13223	13.2V	2.3A	ZEN132V230A16CE
13226	13.2V	2.6A	ZEN132V260A16CE
####	Last 4 digits of batch number		

**TAPE AND REEL DIMENSION**



Symbol	Dimension (mm)
D0	1.55 + 0.1 - 0.0
E1	1.75 ± 0.1
P0	4.0 ± 0.1
T max	0.35
B1 max	6.2
D1 min	1.5
F	5.5 ± 0.05
K1 max	1.7
P2	2.0 ± 0.05
W	12.0 ± 0.3
P1	8.0 ± 0.1
A0	4.3 ± 0.05
B0	5.3 ± 0.05
K0	1.3 ± 0.05

Note:  
 1. Materials: Conductive PS.  
 2. All dimensions meet EIA-481-D.



Symbol	Dimension (mm)
A <sub>max</sub>	330
N <sub>min</sub>	102
W <sub>1</sub>	8.4
W <sub>2</sub>	11.1

**POLYZEN PRODUCT FAMILY PACKAGE QUANTITY**

Reel Quantity	Standard Box Quantity
4,000	20,000

**MATERIAL INFORMATION**

**RoHS Compliant**

**Directive 2002/95/EC  
Compliant**

**ELV Compliant**

**Directive 2000/53/EC  
Compliant**

**Halogen Free\***



\* Halogen Free refers to: Br≤900ppm, Cl≤900ppm, Br+Cl≤1500ppm.

## FOR MORE INFORMATION

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[www.circuitprotection.com](http://www.circuitprotection.com)  
[www.circuitprotection.com.hk](http://www.circuitprotection.com.hk) (Chinese)  
[www.te.com/japan/bu/circuitprotection/](http://www.te.com/japan/bu/circuitprotection/) (Japanese)

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Fax : 55-11-2103-6216

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Fax : 49-89-6089394

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Fax : 60-4-6433288

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Mobile : 91-99-0248-8886

Part numbers in this brochure are RoHS Compliant\*, unless marked otherwise.  
\*as defined [www.te.com/leadfree](http://www.te.com/leadfree)

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RCPO138E 08/2012

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-  Cost Control Management
-  Shortage Management
-  Alternative Solution
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