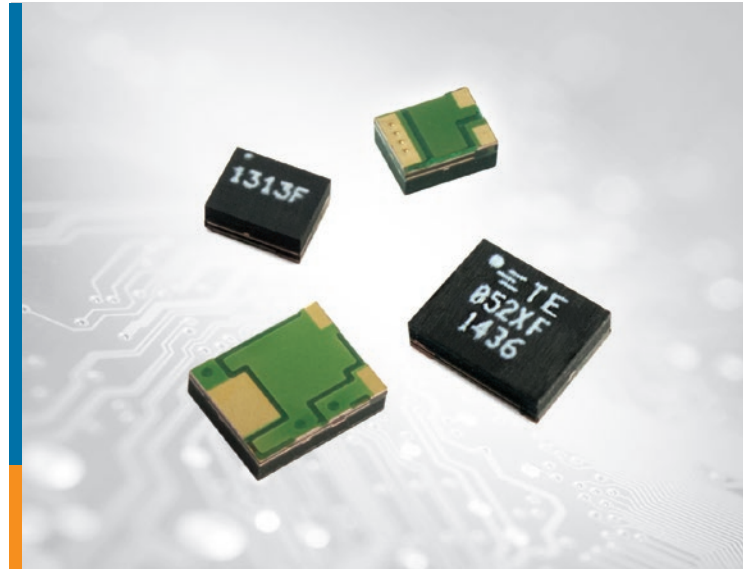


POLYZEN YC/YM DEVICES

Integrated Protection

For Consumer Electronics such as
Tablets, Set-top Boxes, Hard Disk
Drives and DC Power Ports



POLYZEN YC/YM DEVICES

Integrated Protection

Integrated PolyZen YC/YM devices help protect consumer electronics such as tablets, set-top boxes, hard disk drives and DC power ports. PolyZen YC/YM devices provide an effective, space-savings alternative to using typical discrete approaches.

Expanding TE's innovative PolyZen product family, the PolyZen YC/YM device series was introduced to help protect sensitive consumer applications from damage caused by overvoltage, overcurrent, reverse-bias, ESD (electrostatic discharge) and overtemperature events that can result in costly product returns and warranty issues.

The PolyZen YC/YM device combines a precision Zener diode and a resettable PolySwitch PPTC (polymer positive temperature coefficient) device. A PolyZen device's Zener diode is thermally connected to the PPTC device to enable rapid heat transfer, which in turn increases the reaction time of the PPTC device. A single PolyZen YC/YM device can help to simultaneously protect against many types of over-stress events more effectively than solutions using multiple fuses, PPTC, TVS (transient voltage suppression) or OVP (overvoltage protection) devices.

Designers of consumer applications must comply with the IEC 61000-4-2 and IEC 61000-4-5 safety standards. The PolyZen YC/YM series help them meet these requirements by providing ESD protection (+/- 30kV) and overvoltage protection (8/20 microsecond pulse: 150A). They also help enhance reliability in sensitive electronics by offering up to 2.6A hold-current at room temperature.

Benefits

- High hold current rating up to 2.6A at room temperature
- High-impulse overvoltage protection up to 150A (per IEC 61000-4-5)
- ESD protection up to +/- 30kV (per IEC 61000-4-2)
- RoHS Compliant and Halogen Free

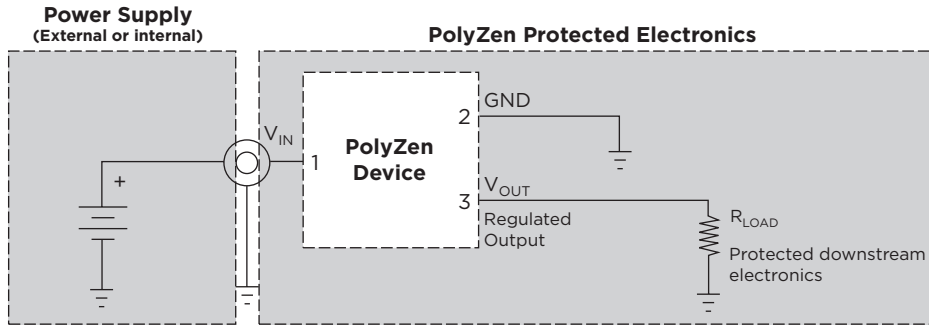
Features

- Integrates PolySwitch PPTC/stable Zener diode for single-component, space-saving solution
- Can help shield downstream circuits from overvoltage, overcurrent, reverse-bias, ESD and overtemperature events more effectively than using multiple discrete components
- Compact (4.0mm x 5.0mm x 1.3mm) package for YC devices
- Compact (2.5mm x 3.2mm x 1.2mm) package for YM devices

Applications

- Set-top Boxes
- Tablet PCs and Ultra-slim Notebooks
- Global Positioning and Navigation Systems
- Security Devices
- PNDs
- Other DC Power Ports

Typical Application Block Diagram

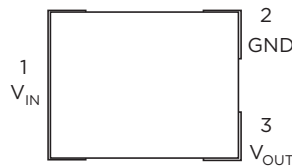


Device Information

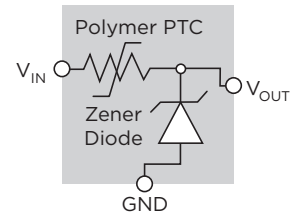
Pin Description

Pin Number	Pin Name	Pin Function
1	V_{IN}	V_{IN} Device input
2	GND	GND
3	V_{OUT}	V_{OUT} Zener regulated voltage output

Pin Configuration (Top View)



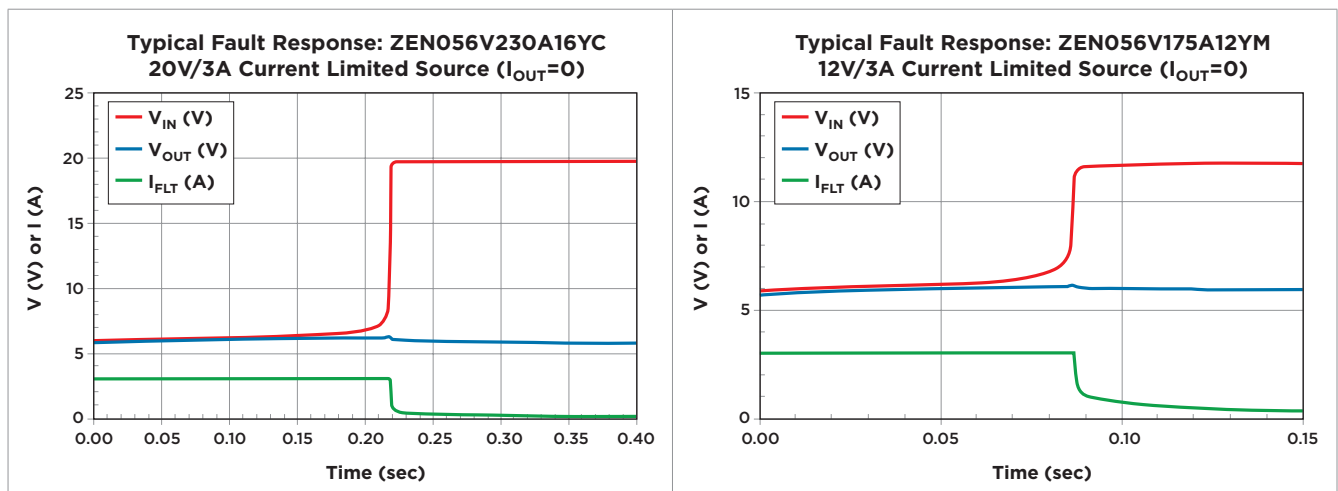
Block Diagram



General Characteristics

Operating temperature range	-40° to +85°C	
Storage temperature	-40° to +85°C	
ESD withstand	30kV Contact Discharge	IEC61000-4-2
Diode capacitance	4200pF	Typical @ 1MHz, 1V _{RMS}
Construction	RoHS compliant and Halogen Free	

Typical Fault Responses



Electrical Characteristics

Part description	V_z^4 (V)		I_{zt}^4 (A)	Leakage Current		I_{HOLD}^5 @20°C (A)	I_{HOLD}^5 @60°C (A)	R_{TYP}^6 (Ohms)	R_{IMax}^7 (Ohms)	$V_{INT} Max^8$ (V)	
	Min	Max		Test Voltage (V)	Max Current (mA)					$V_{INT} Max$ (V)	Test Current (A)
ZEN056V130A16YM	5.35	5.85	0.1	5.25	10	1.30	1.0	0.110	0.160	14	3
ZEN132V130A16YM	13.20	13.80	0.1	13.15	5	1.30	1.0	0.110	0.160	14	3
ZEN056V175A12YM	5.35	5.85	0.1	5.25	10	1.75	1.3	0.050	0.095	12	4
ZEN056V230A16YC	5.35	5.85	0.1	5.25	10	2.30	1.5	0.040	0.070	16	5
ZEN056V260A16YC	5.35	5.85	0.1	5.25	10	2.60	2.0	0.040	0.055	16	5

Maximum Ratings

Part description	$V_{IN} Max^9$		$I_{FLT} Max^{10}$		Peak pulse current	ESD withstand (IEC 61000-4-2)		Temperature		Tripped Power Dissipation ¹¹ Max	
	$V_{IN} Max$ (V)	Test Current (A)	$I_{FLT} Max$ (A)	Test Voltage (V)	8/20µs pulse (IEC 61000-4-5) (A)	Contact (KV)	Air (KV)	Operating (°C)	Storage (°C)	Value (W)	Test Voltage (V)
ZEN056V130A16YM	20	3	3	16	150	+/- 30	+/- 30	-40 to +85	-40 to +85	1.0	20
	-14	-3	-40	-12							
ZEN132V130A16YM	28	1	1	20	80	+/- 30	+/- 30	-40 to +85	-40 to +85	1.0	20
	-14	-3	-40	-12							
ZEN056V175A12YM	16	3	3	12	150	+/- 30	+/- 30	-40 to +85	-40 to +85	1.0	12
	-12	-3	-40	-12							
ZEN056V230A16YC	20	3	3	16	150	+/- 30	+/- 30	-40 to +85	-40 to +85	1.0	20
	-16	-3	-40	-12							
ZEN056V260A16YC	20	3	3	16	150	+/- 30	+/- 30	-40 to +85	-40 to +85	1.0	20
	-16	-3	-40	-12							

Note 1: Electrical characteristics determined at 25°C unless otherwise specified.

Note 2: This device is intended for limited fault protection. Repeated trip events or extended trip endurance can degrade the device and may affect performance to specifications. Performance impact will depend on multiple factors including, but not limited to, voltage, trip current, trip duration, trip cycles, load condition and circuit design. For details or ratings specific to your application contact TE Connectivity Circuit Protection Division directly.

Note 3: Specifications developed using 1.0 ounce 0.045" wide copper traces on dedicated FR4 test boards. Performance in your application may vary.

Note 4: I_{zt} is the current at which V_z is measured ($V_z = V_{OUT}$). Additional V_z values are available on request.

Note 5: I_{HOLD} : Maximum steady state current (current entering or exiting the V_{IN} pin of the device) that will not generate a trip event at the specified temperature. Specification assumes I_{FLT} (current flowing through the Zener diode) is sufficiently low so as to prevent the diode from acting as a heat source. Testing is conducted with an "open" Zener.

Note 6: R_{TYP} : Resistance between V_{IN} and V_{OUT} pins during normal operation at room temperature.

Note 7: R_{IMax} : The maximum resistance between V_{IN} and V_{OUT} pins at room temperature, one hour after first tripped event or after reflow soldering.

Note 8: $V_{INT} Max$: $V_{INT} Max$ is defined as the maximum voltage at which devices can be survived according to typical qualification process at the specified voltage and current. $V_{INT} Max$ testing is conducted using a "shorted" load ($V_{OUT} = 0V$). $V_{INT} Max$ is a survivability rating, not a performance rating. For performance ratings, see Note 2.

Note 9: $V_{IN} Max$: For practical application, PolyZen devices are polymer enhanced diode, it use the Polymer PTC technology to offer the diode resettable protection against continuous overvoltage fault events. $V_{IN} Max$ is defined as the maximum voltage rating of the whole device at which devices can be survived according to typical qualification process at specified voltage and current. Testing conducted with no load connected to V_{OUT} . $V_{IN} Max$ is a survivability rating, not a performance rating. For performance ratings, see Note 2.

Note 10: $I_{FLT} Max$: Maximum RMS fault current the device can withstand and remain resettable. Specification is dependent on the direction of current flow through the device. RMS fault currents above $I_{FLT} Max$ may permanently damage the PolyZen device. Specification assumes $I_{OUT} = 0$. Testing conducted with no load connected to V_{OUT} .

Note 11: The power dissipated by the device when in the "tripped" state, as measured on TE test boards (see note 3).

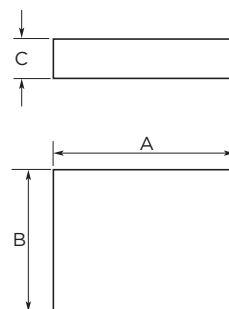
Note 12: Specifications based on limited qualification data and subject to change.

Mechanical Dimensions and Recommended Pad Layout

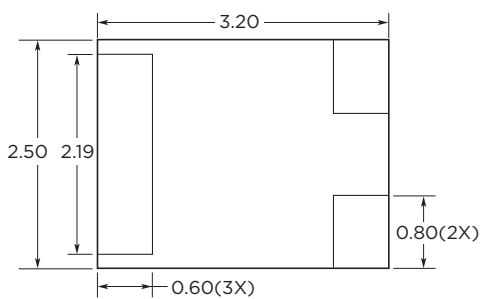
PolyZen YM Devices

Mechanical Dimensions

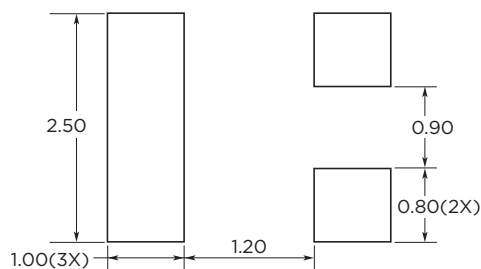
		Min	Typ	Max
		mm (in)		
Length	A	3.00 (0.118)	3.20 (0.126)	3.40 (0.134)
Width	B	2.30 (0.091)	2.50 (0.098)	2.70 (0.106)
Height	C	1.10 (0.043)	1.20 (0.047)	1.30 (0.051)



Recommended Pad Dimensions (mm)



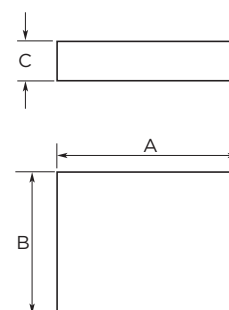
Recommended Pad Layout (mm)



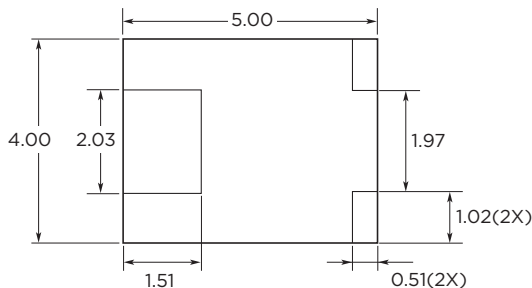
PolyZen YC Devices

Mechanical Dimensions

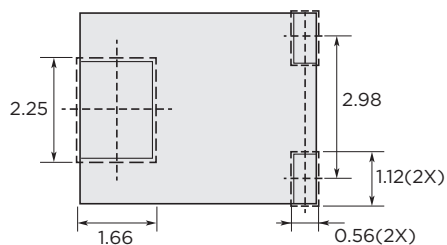
		Min	Typ	Max
		mm (in)		
Length	A	4.80 (0.190)	5.00 (0.197)	5.20 (0.206)
Width	B	3.80 (0.150)	4.00 (0.158)	4.20 (0.166)
Height	C	1.20 (0.047)	1.30 (0.051)	1.40 (0.055)



Recommended Pad Dimensions (mm)



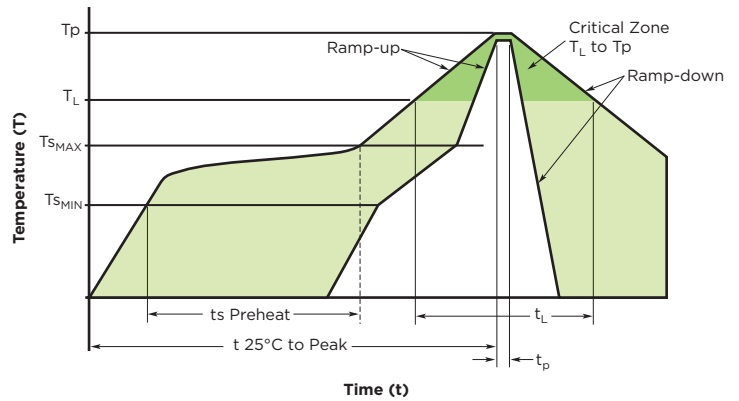
Recommended Pad Layout (mm)



Recommended Reflow Profile

Classification Reflow Profiles

Profile Feature	Pb-Free Assembly
Average Ramp-up Rate ($T_{S_{MAX}}$ to T_p) Average Ramp-down Rate (T_p to T_L)	3°C/second max. 3°C/second max.
Preheat • Temperature Min ($T_{S_{MIN}}$) • Temperature Max ($T_{S_{MAX}}$) • Time (t_s Preheat)	150°C 200°C 60-180 seconds
Time maintained above: • Temperature (T_L) • Time (t_L)	217°C 60-150 seconds
Peak/Classification Temperature • Temperature (T_p)	250°C
Time within 5°C of actual Peak Time (t_p)	20-40 seconds
Time 25°C to peak Temperature	8 minutes max



Note: Avoid scratching the package when the device surface temperature is great than 85°C

Device Marking Information

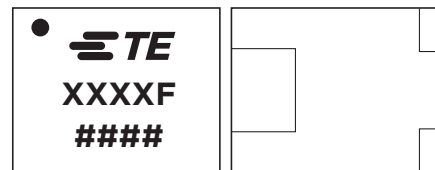
PolyZen YM Devices

Markings	Vz	Hold Current	Special Code	Part Description
0513F	5.6V	1.3A	F	ZEN056V130A16YM
1313F	13.2V	1.3A	F	ZEN132V130A16YM
0517F	5.6V	1.75A	F	ZEN056V175A12YM



PolyZen YC Devices

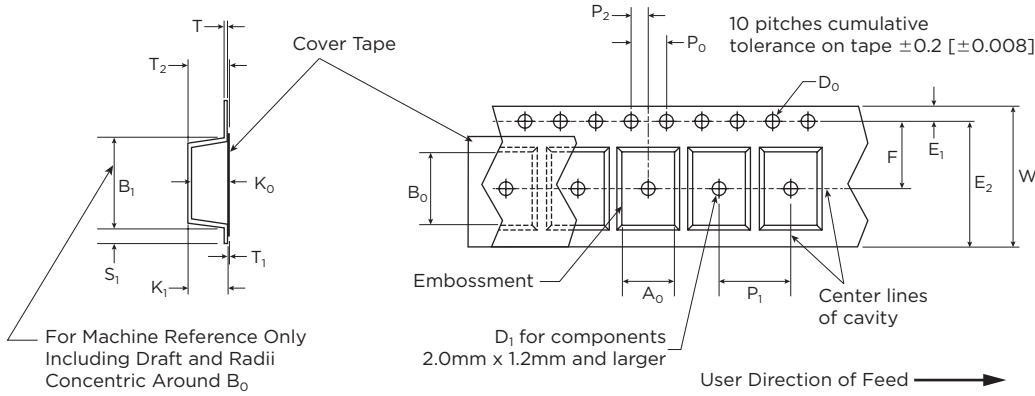
Markings	Vz	Hold Current	Special Code	Part Description
052XF	5.6V	2.3A	F	ZEN056V230A16YC
052XF	5.6V	2.6A	F	ZEN056V260A16YC
####	Last 4 digits of batch number			



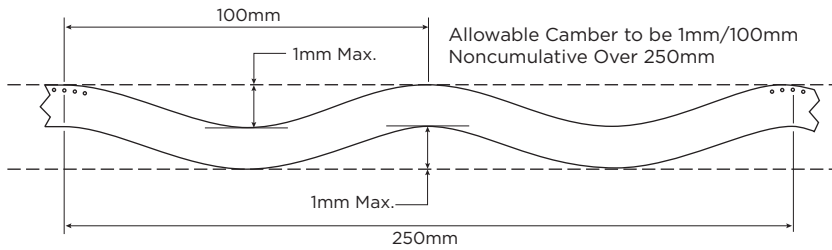
Tape and Reel Dimension

PolyZen YM Devices

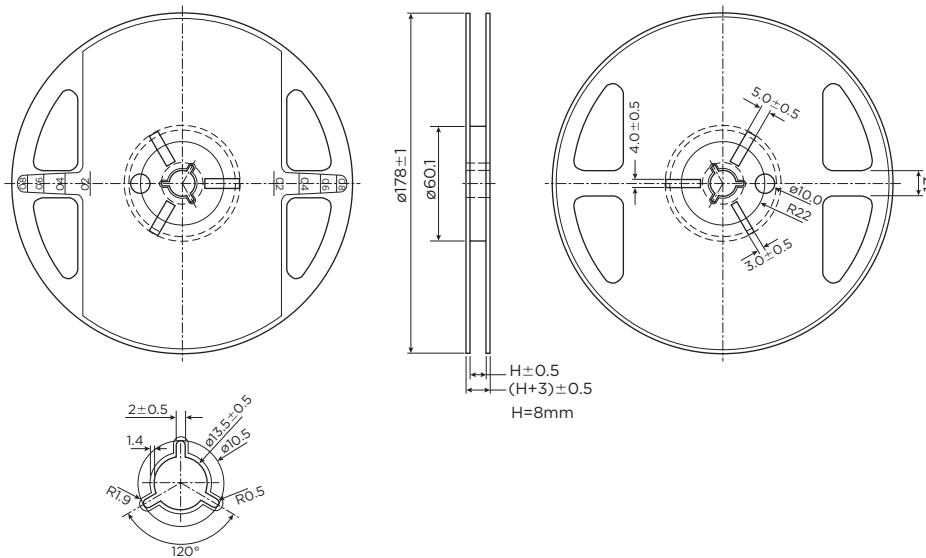
Tape Dimensions (mm)



Symbol	Dimensions (mm)
A ₀	29.0 ± 0.10
B ₀	3.55 ± 0.10
K ₀	1.27 ± 0.10
P ₀	4.00 ± 0.10
P ₁	4.00 ± 0.10
P ₂	2.00 ± 0.05
B _{1Max}	4.35
T	0.25 ± 0.02
E ₁	1.75 ± 0.10
F	3.50 ± 0.05
D ₀	1.55 ± 0.05
D ₁	1.00 ± 0.10
W	8.00 ± 0.30
D _{1Max}	1.0



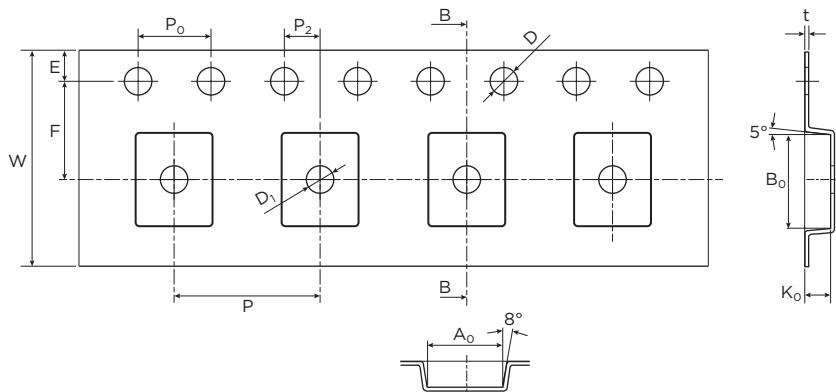
Reel Dimensions (mm)



Tape and Reel Dimension (Con't)

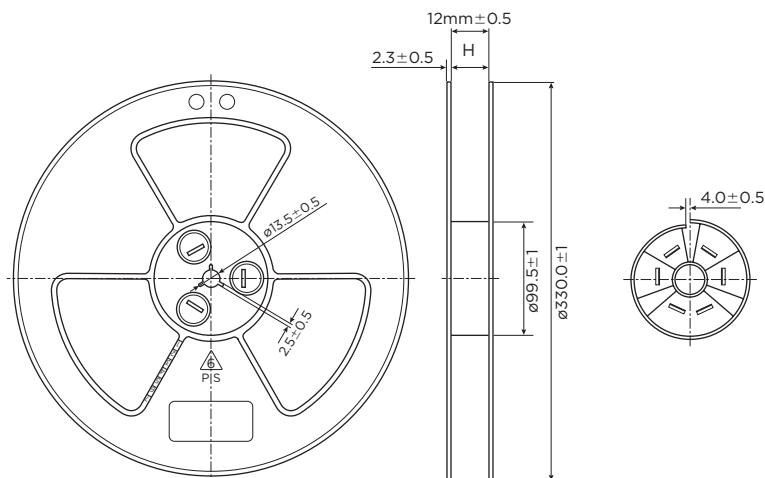
PolyZen YC Devices

Tape Dimensions (mm)



Symbol	Dimensions (mm)	Tolerance (mm)
W	12.00	±0.10
P	8.00	±0.10
E	1.75	±0.10
F	5.50	±0.10
P ₂	2.00	±0.10
D	1.50	+0.10 -0.00
D ₁	1.50	±0.10
P ₀	4.00	±0.10
10P ₀	40.00	±0.20
A ₀	4.20	±0.10
B ₀	5.25	±0.10
K ₀	1.40	±0.10
t	0.24	±0.05

Reel Dimensions (mm)



Package Quantity

Part Description	Reel Quantity	Standard Box Quantity
ZEN056V130A16YM	3,000	30,000
ZEN132V130A16YM	3,000	30,000
ZEN056V175A12YM	3,000	30,000
ZEN056V230A16YC	4,000	20,000
ZEN056V260A16YC	4,000	20,000

Material Construction

RoHS Compliant

Directive 2002/95/EC
Compliant

ELV Compliant

Directive 2000/53/EC
Compliant

Pb-Free



Halogen Free*



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

For More Information

TE Circuit Protection

306 Constitution Drive
Menlo Park, CA USA 94025-1164
Tel : (800) 227-7040, (650) 361-6900
Fax : (650) 361-4600

www.circuitprotection.com
www.circuitprotection.com.cn (Chinese)
www.te.com/jpn-ja/products/circuit-protection.html (Japanese)

Brazil

Tel : 55-21-3958-0955
Email: Genaro.Maldonado@te.com

**UK / Ireland / Benelux /
Netherlands /South Africa /
France / Italy / Spain / Portugal /
Greece / Turkey / Tunisia / Israel**
Tel : 33-1-34208455
Fax : 33-1-34208479
Email: contact_emea_cpd@te.com

**Germany / Austria / Switzerland /
Eastern Europe / Russia /
Nordic / Baltic / Others**
Tel : 49-89-6089485
Fax : 49-89-6089394
Email: contact_emea_cpd@te.com

India

Tel : 91-80-6702-2540
Mobile: 91-77-6051-3140
Email: haribabu@te.com

Taiwan

Tel : 886-2-2171-5213
Fax : 886-2-8768-1277
Email: monica.chen@te.com

China, Hong Kong

Tel : 852-2738-8181
Fax : 852-2735-1625
Email: yimmui.lo@te.com

China, Beijing

Tel : 86-21-6106-7597
Fax : 86-21-6485-3255
Email: kiko.long@te.com

China, Shanghai

Tel : 86-21-6106-7379
Fax : 86-21-6485-3255
Email: vivian.xu@te.com

China, Shenzhen / Guangzhou

Tel : 86-755-2515-4780
Fax : 86-755-2598-0419
Email: sammi.zhao@te.com

Japan

Tel : 81-44-844-8194
Fax : 81-44-844-8040
Email: jnppoly@te.com

Korea

Tel : 82-2-3415-4654
Fax : 82-2-3486-1786
Email: zokim@te.com

Thailand / Malaysia / Vietnam Singapore / Indonesia / Australia / New Zealand / Philippines

Tel : 60-4-810-2112
Mobile: 60-19-472-5628
Fax : 60-4-6433288
Email: patrick.wong@te.com



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