

# Abundance Enterprise Co. PRODUCT SPECIFICATION

## **CERAMIC RESONATOR**

AEC PART NUMBER / SPEC. NO: ZTTCP4.00MG

**CUSTOMER:** Schukat electronic Vertriebs GmbH





Peak soldering temperature 260°C/10 sec Ceramic component is exempted (According to ROHS directive 2005/95/EC ANNEX point 7)

Customer's Name	Schukat electronic Vertriebs GmbH
Production Name	Ceramic Resonator
Frequency	4.00MHz
Model No	ZTTCP4.00MG
Issue Date	15 <sup>th</sup> Oct, 2013

Address: Room 602-603, Java Commercial Centre,

128 Java Road,

North Point, Hong Kong

Homepage: <a href="http://www.aeccrystal.com/">http://www.aeccrystal.com/</a>

Email: sales@aeccrystal.com

Telephone: (852)-28560000 Fax (852) 2561 2161

Prepared	Inspection	Approved
Nathan	Andy	Henkie

Product Specification	Original Date	31/07/2013
1 Toduct Specification	PN:	ZTTCP

## 1. SCOPE

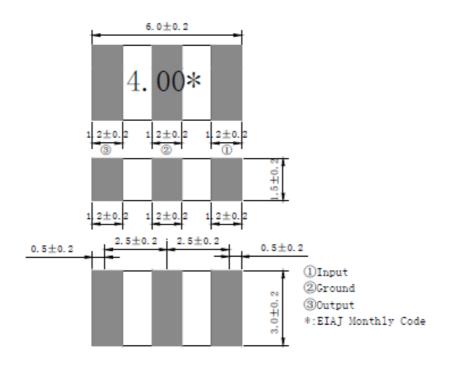
This specification shall cover the characteristics of the ceramic resonator with the type ZTTCP4.00MG

## 2. PART NO.:

PART NUMBER	CUSTOMER PART NO	SPECIFICATION NO
ZTTCP4.00MG		

#### 3. OUTLINE DRAWING AND DIMENSIONS:

- 3.1 Appearance: No visible damage and dirt.
- 3.2 Dimensions:



UINT: mm

Product Specification	Original Date	31/07/2013
1 Todact Specification	PN:	ZTTCP

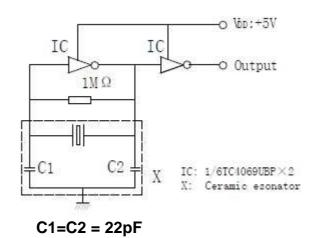
## 4. ELECTRICAL SPECIFICATIONS:

	Item	Requirements
4.1	Oscillation Frequency Fosc (MHz)	4.00
	Frequency Accuracy (%)	±0.5
4.2	Resonant Impedance Ro	40
	$(\Omega)$ max	
4.3	Temperature Coefficient of	±0.3 (Oscillation
	Oscillation Frequency (%) max	Frequency drift -20℃ to
		+80℃)
4.4	Withstanding Voltage	100 VDC, 5 sec
4.5	Rating Voltage U <sub>R</sub> (V)	
	(1) D.C. Voltage	6 VDC.
	(2) A.C. Voltage	15 Vp-p.
4.6	Insulation Resistance Ri, ( $\mathbf{M}\Omega$ ) min	500 ( 10V, 1min)
4.7	Operating Temperature (℃)	<b>-20∼+80</b>
4.8	Storage Temperature (°C)	<b>-55∼+85</b>
4.9	Aging Rate (%) max	±0.1 From initial value

Components shall be left in a chamber of +85±2°C for 1000 hours, then measured after leaving in natural condition for 1 hours.

#### 4. MEASUREMENT:

- 4.1 Measurement Conditions: Parts shall be measured under a condition (Temp.: 20±15℃, Humidity: 65±20% R.H.) unless the standard condition (Temp.: 25±3 ℃, Humidity: 65±5% R.H.) is regulated to measure.
- 4.2 Test Circuit:



Product Specification	Original Date	31/07/2013
Toduct Specification	PN:	ZTTCP

# 5. PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Requirem   Requirem   Requirem   Requirem   Subject the resonator at 40±2°C and   90-95% RH for 96±4 hours. Then Release the resonator into the room Condition for 1 hour prior to the Measurement.   It shall fulfill specification   Table 1.	nce
90-95% RH for 96±4 hours. Then Release the resonator into the room Condition for 1 hour prior to the Measurement.  6.2 Vibration  Subject the resonator to vibration for 2 hours each in x ⋅ y and z axis With the amplitude of 1.5mm, the frequency shall be varied uniformly between the limits of 10 Hz—55Hz.  6.3 Mechanical Drop the resonator randomly onto a wooden floor from the height of 100cm 3 times.  6.4 Soldering Test  Passed through the re-flow oven under the following condition and left at room temperature for 1 hour before measurement.  Temperature at the surface of time the substrate  Preheat 150±5°C  6.5 Solder  Ability  Ability  Subject the resonator to 80±5°C for 96  It shall fulfill specification Table 1.  The termina be at least 9 covered by 50 the shall fulfill sh	
the resonator into the room Condition for 1 hour prior to the Measurement.  Subject the resonator to vibration for 2 hours each in x · y and z axis With the amplitude of 1.5mm, the frequency shall be varied uniformly between the limits of 10 Hz—55Hz.  Drop the resonator randomly onto a wooden floor from the height of 100cm 3 times.  Table 1.  Shock Passed through the re-flow oven under the following condition and left at room temperature for 1 hour before measurement. Temperature at the surface of measurement. Temperature at the surface of the substrate Preheat 150±5°C Feak 260±5°C Dipped in 250±5°C solder bath for 3±0.5 Ability Subject the resonator to 80±5°C for 96 It shall fulfill specification Table 1.	
for 1 hour prior to the Measurement.  Subject the resonator to vibration for 2 hours each in x ⋅ y and z axis With the amplitude of 1.5mm, the frequency shall be varied uniformly between the limits of 10 Hz—55Hz.  6.3 Mechanical Shock Drop the resonator randomly onto a wooden floor from the height of 100cm 3 times.  6.4 Soldering Test Passed through the re-flow oven under the following condition and left at room temperature for 1 hour before measurement.  Temperature at the surface of measurement.  Temperature at the surface of time the substrate  Preheat 150±5℃ 60±10 sec  Peak 260±5℃ 10±3 sec  6.5 Solder Dipped in 250±5℃ solder bath for 3±0.5 The termina sec seconds with rosin flux (25wt% be at least 9 ethanol solution.)  6.6 High Subject the resonator to 80±5℃ for 96 It shall fulfill	ıs in
Subject the resonator to vibration for 2 hours each in x ⋅ y and z axis With the amplitude of 1.5mm, the frequency shall be varied uniformly between the limits of 10 Hz—55Hz.  6.3 Mechanical Shock Drop the resonator randomly onto a wooden floor from the height of 100cm 3 times.  6.4 Soldering Test Passed through the re-flow oven under the following condition and left at room temperature for 1 hour before measurement.  Temperature at the surface of the substrate Preheat 150±5°C 60±10 sec  Peak 260±5°C 10±3 sec  Feak 260±5°C 5older bath for 3±0.5 The termina sec seconds with rosin flux (25wt% be at least 9 covered by 50.6 High Subject the resonator to 80±5°C for 96 It shall fulfill.	
hours each in x \ y and z axis With the amplitude of 1.5mm, the frequency shall be varied uniformly between the limits of 10 Hz—55Hz.  6.3 Mechanical Shock Drop the resonator randomly onto a wooden floor from the height of 100cm 3 times.  6.4 Soldering Passed through the re-flow oven under the following condition and left at room temperature for 1 hour before measurement.  Temperature at the surface of the substrate Preheat 150±5°C 60±10 sec  Peak 260±5°C 10±3 sec  6.5 Solder Dipped in 250±5°C solder bath for 3±0.5 The termina be at least 9 ethanol solution.)  6.6 High Subject the resonator to 80±5°C for 96 It shall fulfill	
amplitude of 1.5mm, the frequency shall be varied uniformly between the limits of 10 Hz—55Hz.  6.3 Mechanical Shock Drop the resonator randomly onto a wooden floor from the height of 100cm 3 times.  6.4 Soldering Test Passed through the re-flow oven under the following condition and left at room temperature for 1 hour before measurement.  Temperature at the surface of Time the substrate Preheat 150±5℃ 60±10 sec  Peak 260±5℃ 10±3 sec  6.5 Solder Dipped in 250±5℃ solder bath for 3±0.5 The terminal be at least 9 ethanol solution.)  6.6 High Subject the resonator to 80±5℃ for 96 It shall fulfill	the
be varied uniformly between the limits of 10 Hz—55Hz.  6.3 Mechanical Shock Drop the resonator randomly onto a wooden floor from the height of 100cm 3 times.  6.4 Soldering Passed through the re-flow oven under the following condition and left at room temperature for 1 hour before measurement.  Temperature at the surface of time the substrate  Preheat 150±5°C for 96 It shall fulfill second to the following condition and left at room temperature for 1 hour before measurement.  Temperature at the surface of time the substrate  Preheat 150±5°C for 96 It shall fulfill be at least 9 covered by 5 cover	s in
10 Hz—55Hz.  6.3 Mechanical Shock Drop the resonator randomly onto a wooden floor from the height of 100cm 3 times.  6.4 Soldering Test Passed through the re-flow oven under the following condition and left at room temperature for 1 hour before measurement.  Temperature at the surface of the substrate Preheat 150±5°C for 96 lt shall fulfill sec sec echanol solution.)  6.5 Solder Ability Subject the resonator to 80±5°C for 96 lt shall fulfill specification and left at room temperature for 1 hour before measurement.  Table 1. It shall fulfill specification and left at room temperature at the surface of Time the substrate Preheat 150±5°C for 96 lt shall fulfill specification and left at room temperature for 1 hour before measurement.  Table 1. It shall fulfill specification and left at room temperature for 1 hour before measurement.  Temperature at the surface of time the substrate preheat 150±5°C for 96 lt shall fulfill specification and left at room temperature for 1 hour before measurement.  Table 1. It shall fulfill specification and left at room temperature for 1 hour before measurement.  Table 1. It shall fulfill specification and left at room temperature for 1 hour before measurement.  Table 1. It shall fulfill specification and left at room temperature for 1 hour before measurement.  Table 1. It shall fulfill specification and left at room temperature for 1 hour before measurement.  Table 1.	
6.3 Mechanical Shock  Shock  Shock  Soldering Test  Passed through the re-flow oven under the following condition and left at room temperature for 1 hour before measurement.  Temperature at the surface of the substrate Preheat 150±5℃  Feak 260±5℃  Peak 260±5℃  Solder Ability  Drop the resonator randomly onto a wooden floor from the height of 100cm 3 pecification and left at room temperature for 1 hour before measurement.  Temperature at the surface of time the substrate Preheat 150±5℃  Feak 260±5℃  Solder Dipped in 250±5℃ solder bath for 3±0.5 are least 9 per solder by	
Shock wooden floor from the height of 100cm 3 times.  6.4 Soldering Passed through the re-flow oven under the following condition and left at room temperature for 1 hour before measurement.  Temperature at the surface of the substrate Preheat 150±5°C for 96  6.5 Solder Dipped in 250±5°C solder bath for 3±0.5 the terminal sec seconds with rosin flux (25wt% be at least 9 ethanol solution.)  Specification Table 1.	
times.  6.4 Soldering Test  Passed through the re-flow oven under the following condition and left at room temperature for 1 hour before measurement.  Temperature at the surface of the substrate  Preheat 150±5°C  60±10  sec  Peak 260±5°C  10±3 sec  6.5 Solder Ability  Sec seconds with rosin flux (25wt% ethanol solution.)  6.6 High  Table 1.	the
6.4 Soldering Test  Passed through the re-flow oven under the following condition and left at room temperature for 1 hour before measurement.  Temperature at the surface of the substrate Preheat 150±5℃  6.5 Solder Ability  Passed through the re-flow oven under the following condition and left at room specification Table 1.  Table 1.  Table 1.  Temperature at the surface of the sec Peak 260±5℃  10±3 sec  The termina sec seconds with rosin flux (25wt% be at least 9 ethanol solution.)  6.6 High  Subject the resonator to 80±5℃ for 96  It shall fulfill	ıs in
the following condition and left at room temperature for 1 hour before measurement.  Temperature at the surface of the substrate  Preheat 150±5℃ 60±10  sec  Peak 260±5℃ 10±3 sec  Peak 260±5℃ solder bath for 3±0.5 The terminal sec seconds with rosin flux (25wt% be at least 9 ethanol solution.)  6.6 High Subject the resonator to 80±5℃ for 96 It shall fulfilled.	
temperature for 1 hour before measurement.  Temperature at the surface of the substrate  Preheat 150±5°C 60±10 sec  Peak 260±5°C 10±3 sec  Dipped in 250±5°C solder bath for 3±0.5 The terminal beat least 9 ethanol solution.)  6.6 High Subject the resonator to 80±5°C for 96 It shall fulfill	the
measurement.  Temperature at the surface of the substrate  Preheat 150±5°C 60±10 sec  Peak 260±5°C 10±3 sec  Dipped in 250±5°C solder bath for 3±0.5 The terminal sec seconds with rosin flux (25wt% be at least 9 ethanol solution.)  6.6 High Subject the resonator to 80±5°C for 96 It shall fulfill	ıs in
Temperature at the surface of the substrate  Preheat 150±5°C 60±10 sec  Peak 260±5°C 10±3 sec  6.5 Solder Dipped in 250±5°C solder bath for 3±0.5 The termina sec seconds with rosin flux (25wt% be at least 9 ethanol solution.)  6.6 High Subject the resonator to 80±5°C for 96 It shall fulfill	
the substrate  Preheat 150±5℃  Peak 260±5℃  The terminal sec seconds with rosin flux (25wt% be at least 9 ethanol solution.)  Subject the resonator to 80±5℃ for 96  the substrate  Preheat 150±5℃  50±10  50±20  10±3 sec  The terminal be at least 9 covered by 50±20  Covered by 50±20  The terminal be at least 9 covered by 50±20  The ter	
Preheat 150±5℃ 60±10 sec  Peak 260±5℃ 10±3 sec  6.5 Solder Dipped in 250±5℃ solder bath for 3±0.5 The terminal beat least 9 sec seconds with rosin flux (25wt% beat least 9 sec seconds solution.)  6.6 High Subject the resonator to 80±5℃ for 96 It shall fulfill	
Sec   Peak 260±5°C   10±3 sec	
Peak 260±5℃ 10±3 sec  6.5 Solder Dipped in 250±5℃ solder bath for 3±0.5 The terminal sec seconds with rosin flux (25wt% be at least 9 ethanol solution.) covered by seconds the resonator to 80±5℃ for 96 It shall fulfill	
6.5 Solder  Ability  Dipped in 250±5°C solder bath for 3±0.5  Sec seconds with rosin flux (25wt% be at least 9 covered by 9 covered by 9 solder bath for 3±0.5  Bubject the resonator to 80±5°C for 96  Bubject the resonator to 80±5°C for 96	
Ability sec seconds with rosin flux (25wt% be at least 9 covered by 5 6.6 High Subject the resonator to 80±5℃ for 96 It shall fulfill	
ethanol solution.) covered by solution. Subject the resonator to 80±5℃ for 96 It shall fulfill	s shall
ethanol solution.) covered by solution. Subject the resonator to 80±5℃ for 96 It shall fulfill	5%
6.6 High Subject the resonator to 80±5℃ for 96 It shall fulfill	older.
	ıs in
Exposure the room conditions for 1 hour prior to Table 1.	
the measurement.	
6.7 Low Subject the resonator to -20±5℃ for 96 It shall fulfill	the
Temperature hours, then release the resonator into specification	ıs in
Exposure the room conditions for 1 hour prior to Table 1.	
the measurement.	

Product Specification	Original Date	31/07/2013
1 Todact Specification	PN:	ZTTCP

	<b>A</b>	
Item	Condition of Test	Performance
		Requirements
Temperature	Subject the resonator to -40℃ for 30	It shall fulfill the
Cycling	min. followed by a high temperature of	specifications in
	85℃ for 30 min.	Table 1.
	Cycling shall be repeated 5 times with a	
	transfer time of 15 sec. At the room	
	temperature for 1 hour prior to the	
	measurement.	
Board	Mount a glass-epoxy board	Mechanical
Bending	(Width=40mm,thickness=1.6mm),then	damage such as
	bend it to 1mm displacement and keep it	breaks shall not
	for 5 seconds. (See the following figure)	occur.
	PRESS HEAD  D.U.T.  OF SUPPORT BAR	occur.
	Cycling	Temperature Cycling  Subject the resonator to -40°C for 30  min. followed by a high temperature of 85°C for 30 min.  Cycling shall be repeated 5 times with a transfer time of 15 sec. At the room temperature for 1 hour prior to the measurement.  Board Bending  Mount a glass-epoxy board (Width=40mm,thickness=1.6mm),then bend it to 1mm displacement and keep it for 5 seconds. (See the following figure)  PRESS  PRESS  D.U.T.  PRESS  PRE

TABLE 1

Item	Specification
Oscillation Frequency	
Change	±0.3
Fosc/Fosc (%) max	
Resonant Impedance	AE
Ro(Ω)max	45

Note: The limits in the above table are referenced to the initial measurements.

## 6. REVIEW OF SPECIFICATIONS

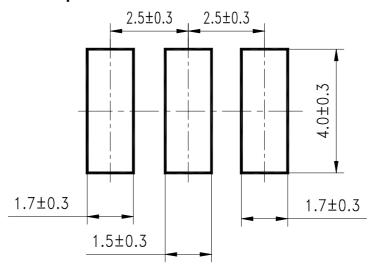
When something gets doubtful with this specifications, we shall jointly work to get an agreement.

Product Specification	Original Date	31/07/2013
1 Toutet Specification	PN:	ZTTCP

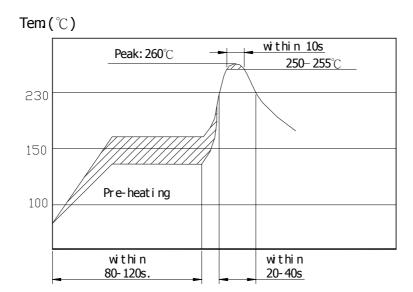
#### 7. RECOMMENDED LAND PATTERN AND REFLOW SOLDERING

## **STANDARD CONDITIONS**

## 8.1Recommended land pattern



## 8.2 Recommended reflow soldering standard conditions



Product Specification	Original Date	31/07/2013
	PN:	ZTTCP

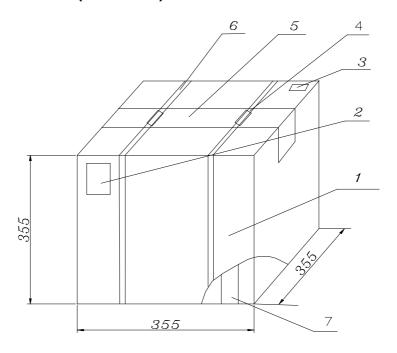
#### 8. PACKAGE

To protect the products in storage and transportation, it is necessary to pack them (outer and inner package). On paper pack, the following requirements are requested.

#### 8.1 Dimensions and Mark

At the end of package, the warning (moisture proof, upward put) should be stick to it.

**Dimensions and Mark (see below)** 



NO.	Name	Quantity	Notes
1	Package	1	
2	Certificate of approval	1	
3	Label	1	
4	Tying	2	
5	Adhesive tape	1.2m	
6	Belt	2.9m	
7	Inner Box	10	

#### 8.2 Section of package

Package is made of corrugated paper with thickness of 0.8cm. Package has 10 inner boxes, each box has 1 reel (each reel for plastic bag).

Product Specification	Original Date	31/07/2013
	PN:	ZTTCP

## 8.3 Quantity of package

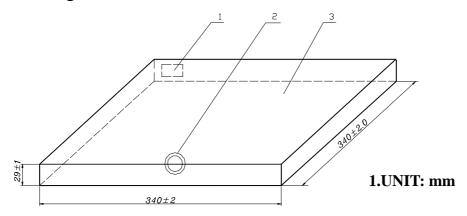
Per plastic reel 4000 pieces of piezoelectric ceramic part

Per inner box 1 reel

Per package 10 inner boxes (40000 pieces of piezoelectric

ceramic part )

## 8.4 Inner Packing Dimensions

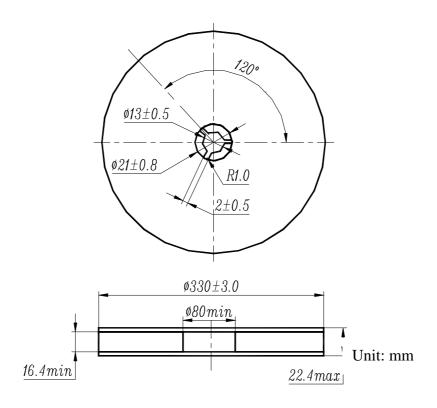


1	Label
2	QC Label
3	Inner Box

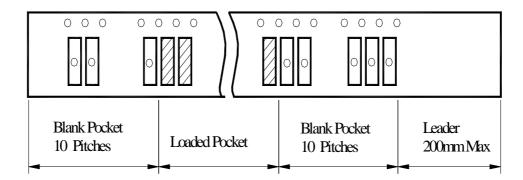
Pars shall be packaged in box with hold down tape upside. Part No., quantity and lot No.

Product Specification	<b>Original Date</b>	31/07/2013
1 Todact Specification	PN:	ZTTCP

#### 8.5 Reel



## 8.6 Packing Method Sketch Map



# 8.7 Test Condition Of Peeling Strength

