



**CHEQUERS ELECTRONIC (CHINA) LIMITED**  
捷嘉電子(中國)有限公司

**CERAMIC RESONATOR SPECIFICATION**

**PART NO.: ZTB455EC**

**<< This Product is RoHS Compliant >>**

Part no.	: ZTB455EC
Printed on	: 8-Jan-09
Prepared	: Marco
Ver. Ctrl.	: 131206/M
Page	: 1 of 4

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## 1. Scope

This specification shall cover the characteristics of the ceramic resonator ZTB455EC.

## 2. Specification no.: CQ2.882.455E

## 3. Part no.: ZTB455EC

## 4. Electrical specification

4-1	Oscillating frequency (Fosc)	455kHz±2.0kHz
4-2	Anti-resonant impedance	35KΩ Min.
4-3	Resonant impedance	20Ω Max.
4-4	Capacitance (Co)	275pF±20% Max.
4-5	Temperature characteristic of oscillating frequency (-20°C to +80°C)	±0.3% Max. (from initial value)
4-6	Rating voltage	50V DC Max. (1 minute Max.)
4-7	Maximum input voltage	15Vp-p
4-8	Insulation resistance	10 <sup>9</sup> Ω Min. (at 10V DC)
4-9	Operating temperature	-20°C to +80°C
4-10	Storing temperature	-40°C to +85°C
4-11	Aging rate (for 10 years)	Fosc±0.5% Max.

## 5. Physical characteristics

	Test item	Condition of test	Performance requirement
5-1	Random drop	Resonator shall be measured after 3 times of random drops from the height of 1 meter on concrete floor.	No visible damage and the measured values shall meet Table 1.
5-2	Vibration	Resonator shall be measured after being applied with vibration (amplitude: 1.5mm, frequency: 10Hz to 55Hz) to each of the 3 perpendicular directions for 1 hour.	The measured values shall meet Table 1.
5-3	Resistance to soldering heat	Lead terminals are immersed up to 1.5mm from the resonator's body in solder bath (+350°C±10°C for 10 seconds±0.5 second). Then the resonator shall be measured after being placed in room temperature for 1 hour.	The measured values shall meet Table 1.
5-4	Solderability	Lead terminals are immersed no closer than 1.5mm in soldering bath of +230°C±5°C for 10 seconds±1 second.	Min. 95% of lead terminals' surface shall be covered with solder.
5-5	Terminal strength	1. After a weight of 3 Kg is applied to each terminal in axial direction without any shocks. 2. After lead terminals are fixed at 2mm from the resonator's body. They shall be folded up to 90° from their axial direction and folded back to -90°, then folded back to their axial direction. The speed of folding shall be 3 seconds.	No visible damage and the measured values shall meet Table 1.  No cutting off shall be visible.

Part no.	:	ZTB455EC
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Page	:	2 of 4

**6. Environmental characteristics**

	<b>Test item</b>	<b>Condition of test</b>	<b>Performance requirement</b>
<b>6-1</b>	High temperature	After being placed in a chamber (+80°C±5°C) for 1000 hours±4 hours, the resonator is measured after being placed in room temperature for 1 hour.	The measured values shall meet Table 1.
<b>6-2</b>	Low temperature	After being placed in a chamber (-30°C±5°C) for 1000 hours±4 hours, the resonator is measured after being placed in room temperature for 1 hour.	
<b>6-3</b>	Humidity	After being placed in a chamber with a humidity of 90% RH and a temperature of +40°C±2°C for 1000 hours±4 hours, the resonator is measured after being placed in room temperature for 1 hour.	
<b>6-4</b>	Thermal impact	After being kept at room temperature, resonator shall be placed at a temperature of -55°C. After 30 minutes at this temperature, the resonator is immediately placed at a temperature of +85°C. After another 30 minutes at this temperature, the resonator is placed under -30°C again. The above processes are counted as 1 cycle. After 5 cycles (with transfer time of 15 minutes between each cycle), the resonator shall be measured after being placed in room temperature for 1 hour.	

**Table 1**

<b>Measurements</b>	<b>Requirements</b>
Oscillating frequency change	±0.2% Max. (from initial value)
Capacitance change	±20% Max.
Resonant impedance	20Ω Max.
Rated voltage	50V DC

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Ver. Ctrl.	: 131206/M
Page	: 3 of 4

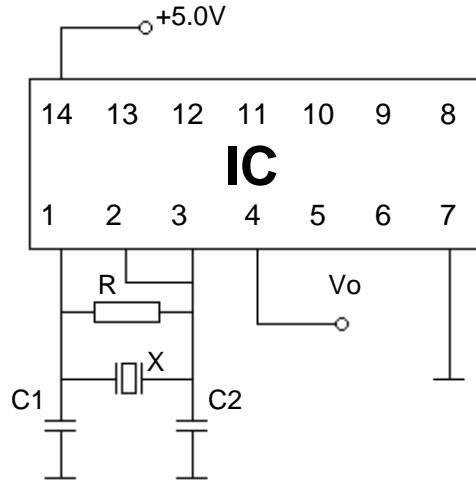
## 7. Test circuit

### 7-1 Measuring condition

- The reference temperature shall be  $+25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ . The measurement shall be performed in the temperature range of  $+5^{\circ}\text{C}$  to  $+35^{\circ}\text{C}$  unless test result is doubtful.

### 7-2 Measuring circuit and equipment

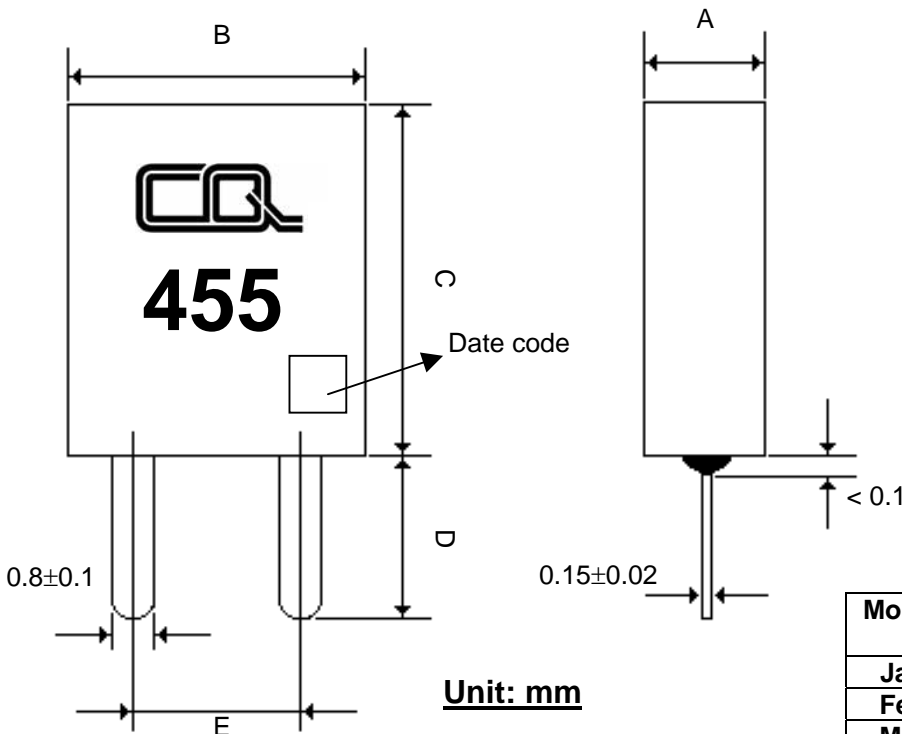
- Oscillating frequency shall be measured by the standard test circuit as shown below.
- Resonant impedance and anti-resonant impedance shall be measured by the impedance meter (HP-4194A)
- Capacitance shall be measured by the Universal Bridge (CCJ-1C)



X: ZTB455EC  
 IC: MC14069 (Motorola)  
 Vcc:  $5.0\text{V} \pm 0.1\text{V}$  DC  
 R:  $1\text{M}\Omega$   
 Vo: Signal out

Frequency range (kHz)	C1	C2
190 ~ 249	330	470
250 ~ 374	220	470
375 ~ 429	120	470
430 ~ 449	100	100
450 ~ 509	100	100
510 ~ 699	100	100
700 ~ 999	100	100
1000 ~ 1250	100	100

## 8. Dimension of ZTB455EC



**Unit: mm**

### Dimension

	Dimensions (Tolerance: $\pm 0.3\text{mm}$ )				
	A	B	C	D	E
190 ~ 249	3.8	13.5	14.7	8.0	10.0
250 ~ 374	3.8	11.0	12.2	7.0	7.7
375 ~ 429	3.6	7.9	9.3	6.0	5.5
430 ~ 449	3.6	7.9	9.3	5.0	5.0
450 ~ 509	3.5	7.0	9.0	5.0	5.0
510 ~ 699	3.5	7.0	9.0	5.0	5.0
700 ~ 999	2.2	5.0	6.0	3.5	2.5
1000 ~ 1250	2.2	5.0	6.0	3.5	2.5

### Explanation of Date Code System

Month	2007 2011	2008 2012	2009 2013	2010 2014
Jan	a	n	A	N
Feb	b	p	B	P
Mar	c	q	C	Q
Apr	d	r	D	R
May	e	s	E	S
Jun	f	t	F	T
Jul	g	u	G	U
Aug	h	v	H	V
Sep	j	w	J	W
Oct	k	x	K	X
Nov	l	y	L	Y
Dec	m	z	M	Z

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Page	: 4 of 4