



NO.

ECAB2601077

Acknowledgement Book

Customer : _____

Production name: MF3215 3.2*1.5 _____

Nominal Freq. : 32.768 KHz _____

Customer P/N : _____

ECEC P/N : EF3276E039 _____

Receiver

Please return one after acknowledgement

JinHua East Crystal Electronic Co.,Ltd.

Approved By	MFG	QA	PE/RD
			
总经理: 郭雄伟	副总: 郭雄伟	副总: 黄文俊	部长: 王晓东
2026/1/13	2026/1/13	2026/1/13	2026/1/13

公司名称: 东晶电子金华有限公司

Corporation: JinHua East Crystal Electronic Co.,Ltd.

地址: 浙江省金华市宾虹路二段555号

ADD: No 555,Sec 2,Binghong Road Jinhua Zhejiang , P.R.C

电话(TEL): 0086-0579-89186666 0086-579-89186777

FAX: 0086-579-89186677 <http://www.ecec.com.cn>

BOOK OF MODIFICATION

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SPECIFICATION OF QUARTZ CRYSTAL UNITS

1.HOLDER TYPE: **MF3215 3.2*1.5**
32.768 KHz

2. ELECTRICAL SPECIFICATIONS

Standard atmospheric conditions

Unless otherwise specified, the standard range of atmospheric conditions for making measurement

Ambient temperature : 25±3℃
Relative humidity : 40% ~ 70%

If there is any doubt about the results ,measurement shall be made within the following limits .

Ambient temperature : 25±3℃
Relative humidity : 40% ~ 70%

Electrical characteristics measured by S&A250B or equivalent .

The crystal is using NT CUT (Surface bending mode).

3.ELECTRICAL CHARACTERISTICS

	Parameters	SYM	Electrical Spec				Notes
			MIN	TYP	MAX	UNITS	
1	Nominal Frequency	FL	32.768000				KHz
2	Oscillation mode	-	Fundamental				-
3	Load Capacitance	CL	12.5				pF
4	Frequency Tolerance	-	±30				ppm at 25±3℃
5	Operating Temperature	-	-40	~	85	℃	
6	Parabolic Coefficient	-	-0.04~-0.02				ppm/℃ ²
7	Equivalent Resistance Rr	Rr	-	-	70	KΩ	
8	Drive Level	DL	-	0.1	0.5	uW	
9	Shunt Capacitance C0	C0	-	-	1.6	pF	
10	Insulation Resistance	-	500	-	-	MΩ	at DC 100V
11	Aging	-	±2				ppm Year
12	Storage Temperature Range	-	-55	~	125	℃	

Notes:

1. Ultrasonic cleaning

General cleaning solutions or ultrasonic cleaning method may be used to clean our products. However, under certain circumstances, ultrasonic cleaning machine could generate resonance at the oscillation frequency of our products and thus deteriorate the electrical characteristics in devices, and even damage the overall structure of devices. Therefore, verification test is recommended before cleaning.

2.Ultrasonic welding

Avoid mounting and processing by Ultrasonic welding this method has a possibility of an excessive vibration spreading inside the crystal products and becoming the cause of characteristic deterioration and not oscillating.

3.Storage temperature description

Storage Temperature is only for the product itself,the temperature for the packing material is 5℃~40℃.

4. Recommended conditions for manual welding

Temperature: 350 ± 10 ℃,Time: 3 sec max,Re-solder times: twice max

■ FACTORY LOCATION

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No 555,Sec 2,Binghong Road Jinhua Zhejiang , P.R.C

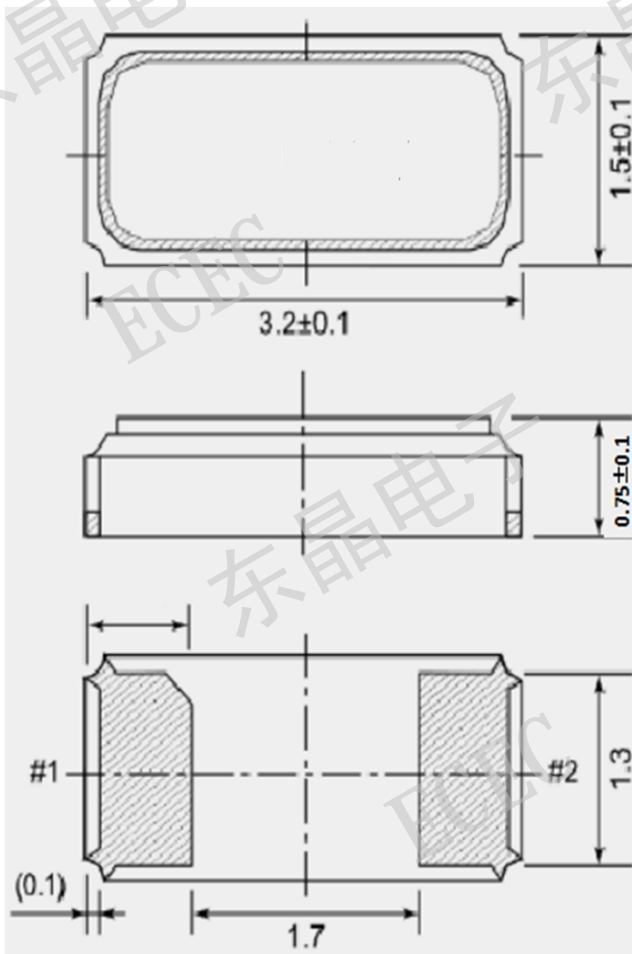
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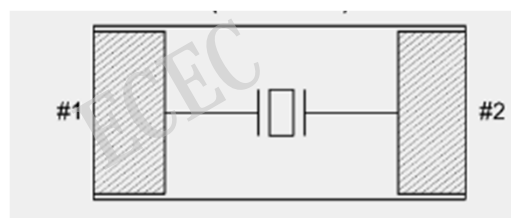
4.DIMENSIONS AND MARKING

4-1 HOLDER TYPE MF3215 3.2*1.5
32.768 KHz

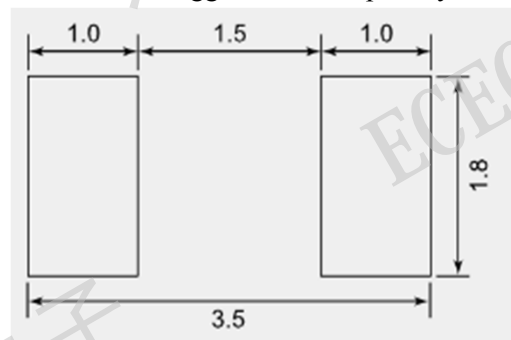
4-2 DIMENSION (mm)



*Internal Connections(Top View)



*Suggested solder pad layout



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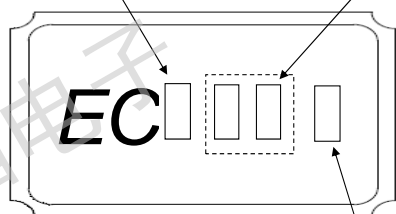
Date:

2026/1/13

4-3 MARKING

Year/Month Code

LOT NO



Load Code

Year/Month code:as shown in the table

EX) December of 2020 shall be marked as "z"

Four year 1 cycle

Year \ Month										Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov	Dec.
2001	2009	2017	2025	2033	2041	2049	2057	2065	2073	A	B	C	D	E	F	G	H	J	K	L	M
2002	2010	2018	2026	2034	2042	2050	2058	2066	2074	N	P	Q	R	S	T	U	V	W	X	Y	Z
2003	2011	2019	2027	2035	2043	2051	2059	2067	2075	a	b	c	d	e	f	g	h	j	k	l	m
2004	2012	2020	2028	2036	2044	2052	2060	2068	2076	n	p	q	r	s	t	u	v	w	x	y	z
2005	2013	2021	2029	2037	2045	2053	2061	2069	2077	A	B	C	D	E	F	G	H	J	K	L	M
2006	2014	2022	2030	2038	2046	2054	2062	2070	2078	N	P	Q	R	S	T	U	V	W	X	Y	Z
2007	2015	2023	2031	2039	2047	2055	2063	2071	2079	a	b	c	d	e	f	g	h	j	k	l	m
2008	2016	2024	2032	2040	2048	2056	2064	2072	2080	n	p	q	r	s	t	u	v	w	x	y	z

Load Code:

w: 6pf; j: 7pf; c: 9pf; E: 12.5pf

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No:

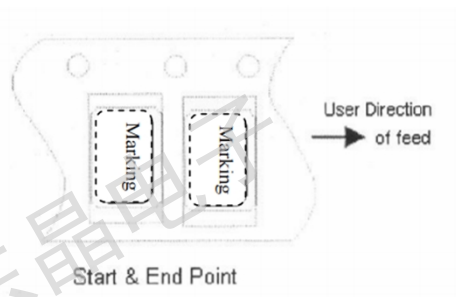
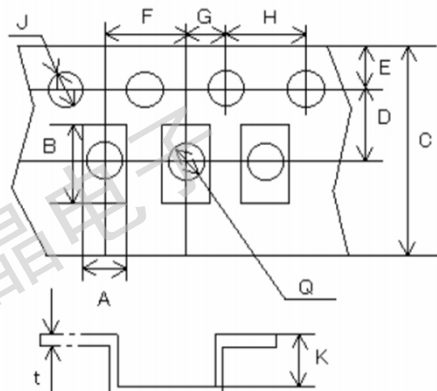
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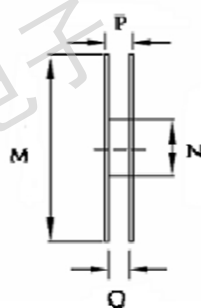
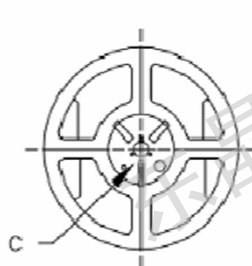
4-4 PACKING

4-4-1 Dimensions of the tape

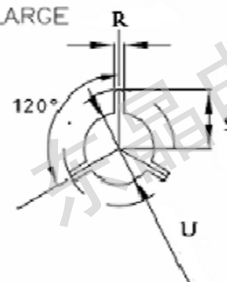


A	B	C	D	E	F	G	H	J	K	t
1.75	3.45	12.0	5.5	1.75	4.0	2.0	4.0	1.5	1.0	0.25

4-4-2 Dimensions of the reel



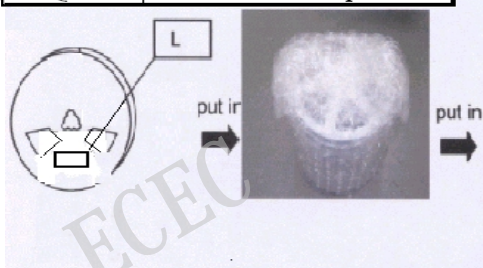
C.ENLARGE



M	N	P	Q	R	S	U
180	60	15.4	13.0	2.5	10.5	13.0

4-4-3 Packing and Label

QUARTZ CRYSTAL UNITS	
P/O	
P/N	
HOLD	
FREQ.	MHz
Q'TY	Kpcs



1 Reel=3000pcs

Box type(Reel quantity)	Box size(L×W×H) mm
Atype (Reel x 5pcs max)	200×200×140
Btype (Reel x 6~15pcs)	200×200×255
Ctype (Reel x 16~30pcs)	395×200×255
Dtype (Reel x 31~60pcs)	395×400×255

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5.RELIABILITY TEST

Provided that measurement shall be carried out after letting it alone in the room temperature for 1 hour.(Test SPEC as list 1)

5-1.SHOCK

Electrical characteristics shall be satisfied after dropping three times from the height of 100cm onto the board of the 3cm thickness.

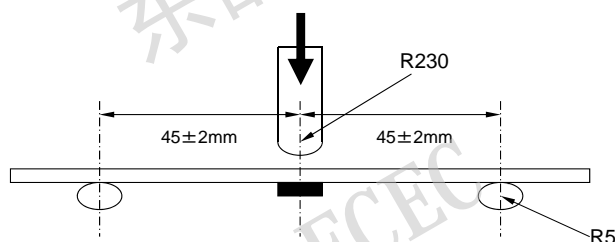
5-2.VIBRATION

Electrical characteristics shall be satisfied after supplying following vibration.

- | | |
|---------------------------|-----------------------|
| a).ENTIRE FREQUENCY RANGE | 10~55Hz |
| b).REPEATED PERIOD | 1~2min |
| c).AMPLITUDE | 1.5mm |
| d).DIRECTION | X.Y.Z |
| e).PERIOD | 2hours/Each Direction |

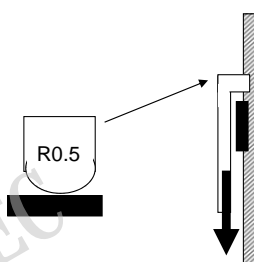
5-3.SUBSTRATE BENDING TEST

Resonator is soldered into the ceater of PCB which is laid on the 2 small supporters spaced 90cm. PCB deflected to 3mm below from horizontal level by the pressing force with stick. The force is supplied for 10 second by 0.5mm/s speed. After above test there is no observation of any visual damages on specimen and the electical characteristic shall be satisfied.

**5-4.ADHESION TEST**

A static load of 5N using a R0.5 scrach tool shall be applied on the center at long direction side of the component and for 10sec.

After above test a),there is no observation of any visual damages on the specimen.



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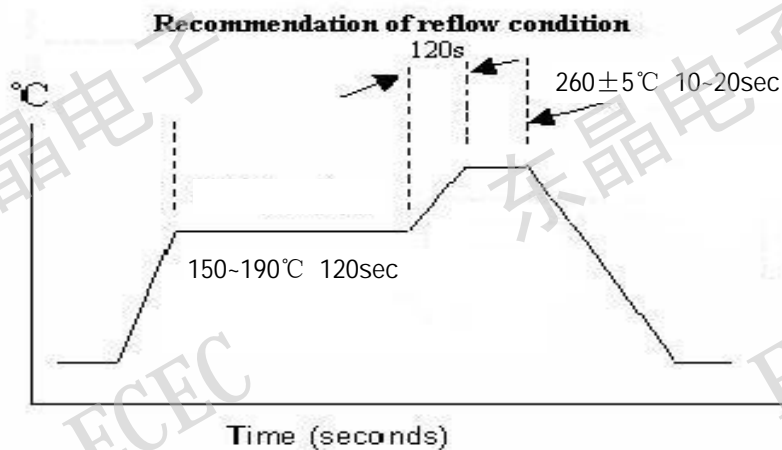
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5-5.REFLOW(WAVE)SOLDERING

Following profile of heat stress is applied to resonator,then being place in the natural condition for 1 hour,resonator shall be measured.

**5-6.SOLDERING DIP**

Terminals/lead-wires of specimen shall be dipped into solder melter tank at +260°C±5°C for 3 sec.

Dipping depth shall be 2mm from the bottom of specimens body.(After applying ROSIN FLUX) soldering portion shall be covered in over 95% of Terminals/lead-wires dipped.

5-7.HUMIDITY

Electrical characteristics shall be satisfied after letting it alone at 85±2°C in humidity of 80~85% for 500 hours.

5-8.STORAGE IN LOW TEMPRATURE

Electrical characteristics shall be satisfied after letting it alone at -40±2°C for 500 hours.

5-9.STORAGE IN HIGH TEMPRATURE

Electrical characteristics shall be satisfied after letting it alone at 85±2°C for 500 hours.

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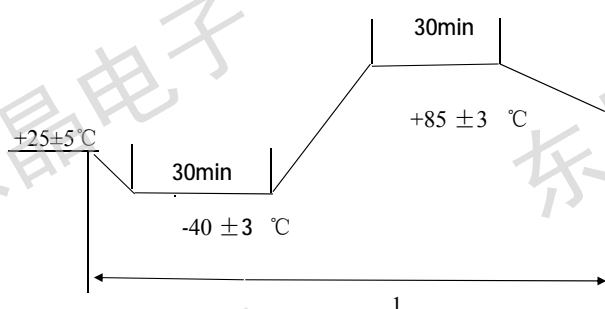
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5-10.TEMPERATURE CYCLE

THE CRYSTAL UNIT SHALL BE SUBJECTED TO 100 SUCCESSIVE
CHANGE OF TEMPERATURE CYCLES



5-11.FINE LEAK

HELIUM BOMBING $5.0 \sim 5.5 \text{ Kg} / \text{cm}^2$, FOR 2 HOURS.

Spec of the reliability test

List 1

Item	ΔF	ΔCI
5-1、SHOCK	$\pm 20\text{ppm} \quad \text{max}$	$\pm 5\text{K}\Omega$ or 20% max
5-5、REFLOW SOLDERING		
5-7、HUMIDITY		
5-8、LOW TEMPRATURE		
5-2、VIBRATION	$\pm 10\text{ppm} \quad \text{max}$	$\pm 5\text{K}\Omega$ or 20% max
5-9、HIGH TEMPRATURE		
5-10、TEMPERATURE CYCLE		
5-11、FINE LEAK		
	$< 1*1\text{E-9 Pa} \cdot \text{m}^3/\text{sec}$	

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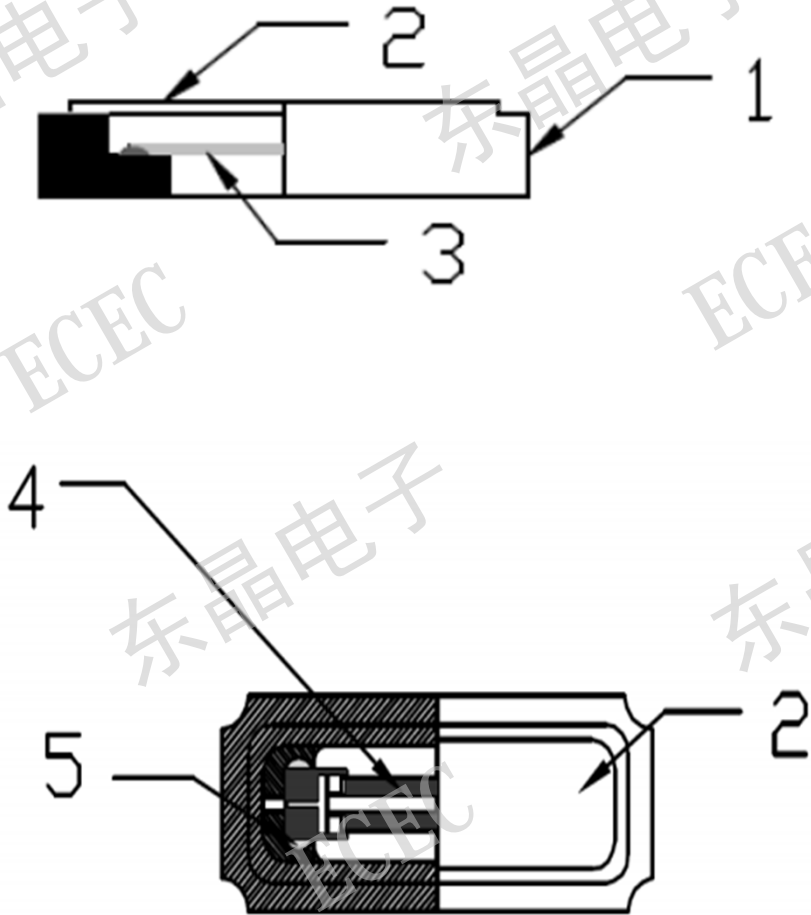
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6.Structure Illustration



No.	Items	Materials
1	PKG(Base)	CERAMIC+Au PLATING
2	LID(Cap)	Fe ALLOY
3	Element(Blank)	SiO2
4	Internal Electrode	Ag、 Au
5	Conductive Adhesive	Ag+Silicon

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