



# QUARTZ CRYSTAL UNIT

*SERIES 7F, SEAM SEALED CERAMIC 2.0\*1.6MM SURFACE MOUNT PACKAGE*

深圳市晶科鑫实业有限公司

Shenzhen Crystal Technology Industrial Co., Ltd

## APPROVAL SHEET

CUSTOMER P/N:		
TYPE:	SMD CRYSTAL	
DESCRIPTION:	SMD2016 24.000MHZ 12PF ±10PPM -40~85°C	
P N/ SJK:	7F24000E12UCG	
ENVIRONMENTAL:	<input checked="" type="checkbox"/> RoHS <input checked="" type="checkbox"/> REACH <input checked="" type="checkbox"/> HF <input type="checkbox"/> PAHS <input type="checkbox"/> other	
REVISION:	A1 2017-5-10	MOQ: 3000pcs/real
MSL:	Levels 1	

SIGNATURE					
SUPPLIER			CUSTOMER		
Issue	Check	Approve	QA	Check	Approve
SJK			Signature		
FAE_EMAIL			Date		
Date			Approve:	<input type="checkbox"/> accept	<input type="checkbox"/> unaccepted
Note:					

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## 1. TESTING CONDITION

### Standard atmospheric conditions

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

and tests are as follow:

Ambient temperature :  $25 \pm 5^{\circ}\text{C}$

Relative humidity : 40%~70%

### Measure equipment

Electrical characteristics measured by S&A250B or equivalent.

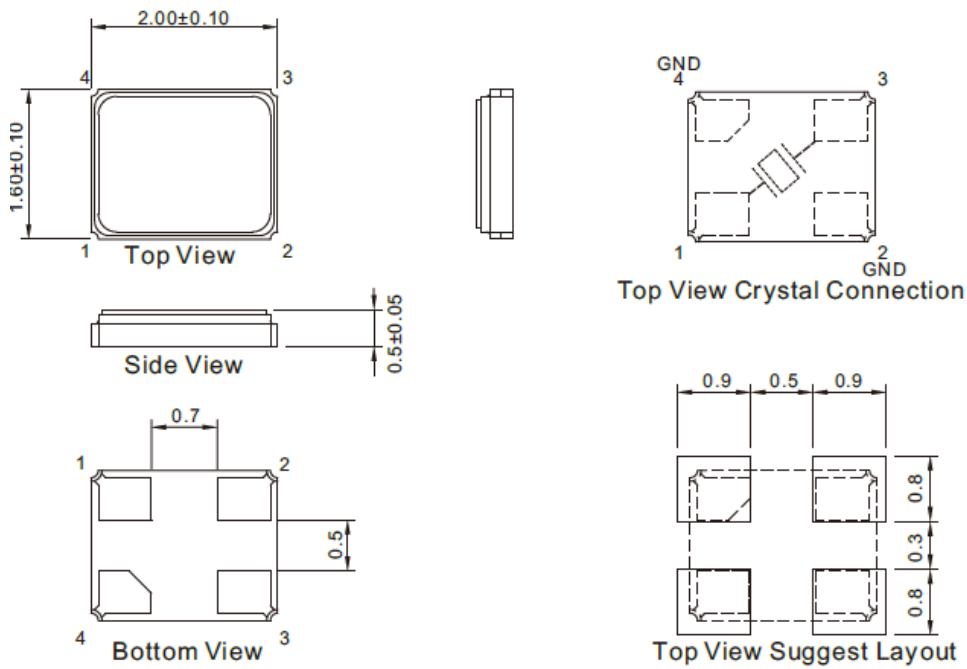
## 2. ELECTRICAL SPECIFICATIONS

Output Frequency Range	24.000000MHz
Mode	AT/Fundamental
Frequency Tolerance	$\pm 10$ ppm max (at $25^{\circ}\text{C}$ )
Load Capacitance( $C_L$ )	12.0 PF
Frequency Stability Over Operating Temperature Characteristics	$\pm 10$ ppm max /-20~70 $^{\circ}\text{C}$
	$\pm 30$ ppm max /-40~85 $^{\circ}\text{C}$
Operating Temperature Range	-40 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$
Storage Temperature Range	-40 $^{\circ}\text{C}$ to +125 $^{\circ}\text{C}$
Shunt Capacitance ( $C_0$ )	3.0 PF Max
Driver Level (Typical)	10 $\mu\text{W}$
Equivalent Series Resistance(ESR)	60 $\Omega$ Max
Aging @25 $^{\circ}\text{C}$ 1 <sup>st</sup> year (Max)	$\pm 3$ ppm/year

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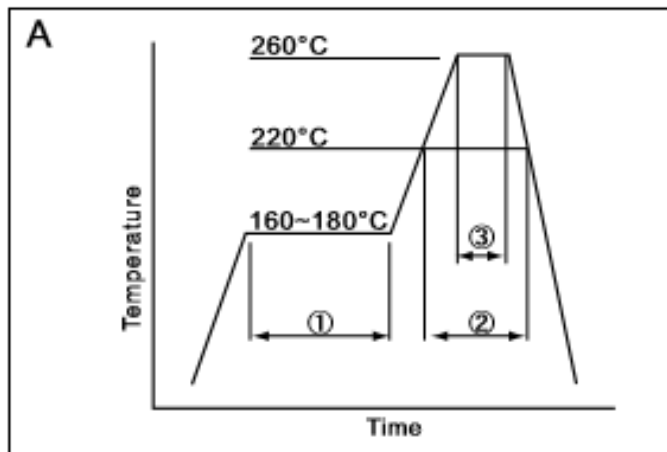
## 3. DIMENSION (Units: mm)



## 4. MARKING



## 5. REFLOW CONDITION



①	Preheat	$160 \sim 180^\circ\text{C}$	120sec.
②	Primary heat	$220^\circ\text{C}$	60sec.
③	Peak	$260^\circ\text{C}$	10sec. max

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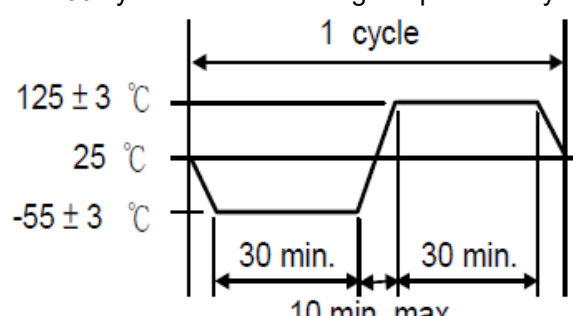
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## 6. RELIABILITY TEST SPECIFICATION

### 1. Mechanical Endurance

No.	Test Item	Test Methods	REF.DOC
1.1	Drop Test	150 cm height, 3 times on concrete floor.	JIS C6701
1.2	Mechanical Shock	Device are shocked to half sine wave ( 1000 G ) three mutually perpendicular axes each 3 times. 0.5m sec. duration time	MIL-STD-202F
1.3	Vibration	Frequency range 10 ~ 2000 Hz Amplitude 1.52 mm/20G Sweep time 20 minute Perpendicular axes each test time 4 hours (Total test time 12 hours)	MIL-STD-883E
1.4	Gross Leak	Standard Sample For Automatic Gross Leak Detector, Test Pressure: 2Kg / cm <sup>2</sup>	MIL-STD-883E
1.5	Fine Leak	Helium Bombing 4.5 Kg/ cm <sup>2</sup> for 2 hr	MIL-STD-883E
1.6	Solder ability	Temperature 245 °C ± 5°C Immersing depth 0.5 mm minimum Immersion time 5 ± 1 seconds Flux Rosin resin methyl alcohol solvent ( 1 : 4 )	MIL-STD-883E

### 2. Environmental Endurance

No.	Test Item	Test Methods	REF.DOC
2.1	Resistance To Soldering Heat	Pre-heat temperature 125 °C Pre-heat time 60 ~ 120 sec. Test temperature 260 ± 5 °C Test time 10 ± 1 sec.	MIL-STD-202F
2.2	High Temp. Storage	+ 125 °C ± 3 °C for 500 ± 12 hours	MIL-STD-883E
2.3	Low Temp. Storage	- 40 °C ± 3 °C for 500 ± 12 hours	MIL-STD-883E
2.4	Thermal Shock	Total 100 cycles of the following temperature cycle 	MIL-STD-883E
2.5	High Temp & Humidity	85°C ± 3°C, RH 85% , 500Hrs	JIS C5023
2.6	Pressure Cooker Storage	121 ± 3°C , RH100% , 2 bar , 240Hrs	JIS C6701