



**广东惠伦晶体科技股份有限公司**  
 GUANGDONG FAILONG CRYSTAL TECHNOLOGY Co.,Ltd.

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# PRODUCT SPECIFICATION SHEET

CUSTOMER : \_\_\_\_\_  
 PRODUCT TYPE : SMD X'TAL 1.6\*1.2(4PAD)  
 NOMINAL FREQ. : 24.000000 MHz  
 FL P/N : 1S24000053-Q  
 REVISION : S2  
 CUSTOMER P/N : \_\_\_\_\_

## CUSTOMER'S APPROVAL&DATE

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## FL CORPORATION

APPROVED	CHECKED	DESIGNED
Xing Yue	Jin Qi	Li Xiang

RoHS Compliant





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## ATTACHMENT (optional)

- |                                    |   |                              |  |
|------------------------------------|---|------------------------------|--|
| • ELECTRICAL CHARACTERISTICS TEST  | A | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| • TEMPERATURE CHARACTERISTICS TEST | B | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |



## PRODUCT DESCRIPTION

### Standard atmospheric conditions

Unless otherwise specified. The standard range of atmospheric conditions for making measurement and tests are as follow:

Ambient temperature :  $25\pm 2^{\circ}\text{C}$   
Relative humidity : 40%~70%

If there is no doubt the results, measurement shall be made within the following limits:

Ambient temperature :  $25\pm 2^{\circ}\text{C}$   
Relative humidity : 40%~70%

### Measure equipment

Electrical characteristics measured by S&A250B or equivalent.

### Crystal cutting type

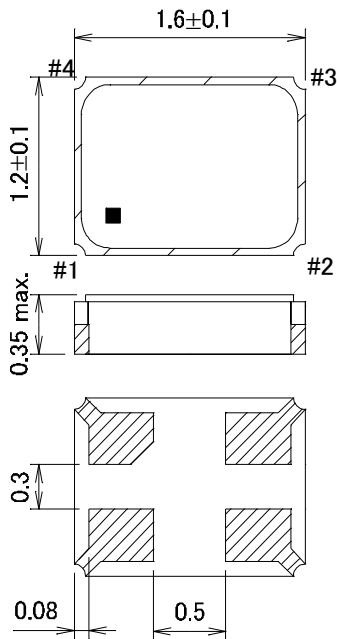
The crystal is using AT CUT (thickness shear mode)

## ELECTRICAL SPECIFICATIONS

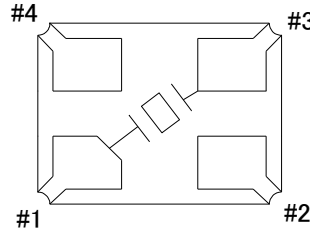
No.	Items	Electrical Spec.					Remarks
		Symbol	Min	Typ	Max	Units	
1	Nominal Frequency	FL	24.000000			MHz	-
2	Oscillation Mode	-	Fundamental			-	-
3	Load Capacitance	CL	8.0			pF	-
4	Frequency Tolerance	-	$\pm 10$			ppm	at $25\pm 2^{\circ}\text{C}$
5	Frequency Stability	-	$\pm 10$			ppm	at $-20\sim +70^{\circ}\text{C}$ (reference $25^{\circ}\text{C}$ )
6	Shunt Capacitance	C0	-	-	3	pF	
7	Aging (/1 year)	-	$\pm 3$			ppm/year	at $25\pm 2^{\circ}\text{C}$
8	Operating Temperature	-	-20		70	$^{\circ}\text{C}$	-
9	Storage Temperature	-	-40		85	$^{\circ}\text{C}$	-
10	Equivalent series resistance	ESR	-		55	ohms	-
11	Insulation Resistance	IR	500	-	-	M-ohms	at DC 100V
12	ESD	-	HBM>4000V			-	JESD22-A114-B
13	MSL	-	Level 1			-	IPC/JEDEC J-STD-033C
14	Drive Level	DL	-	-	100	$\mu\text{W}$	-



**DIMENSIONS unit:mm**

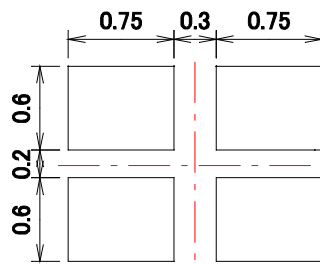


**CONNECTION DIAGRAM (TOP VIEW)**

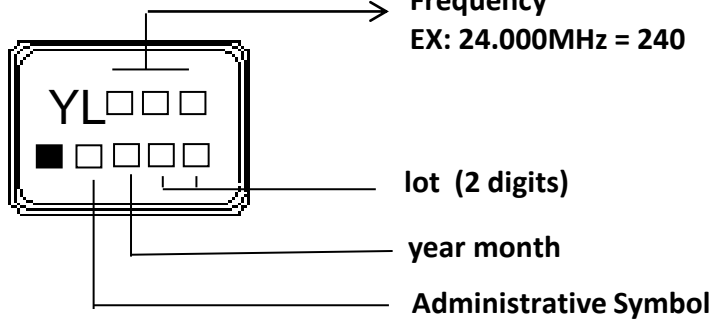


Pin	Function
#1	Xtal terminal (Input)
#2	GND terminal
#3	Xtal terminal (Output)
#4	N/C

**LAND PATTERN unit:mm**



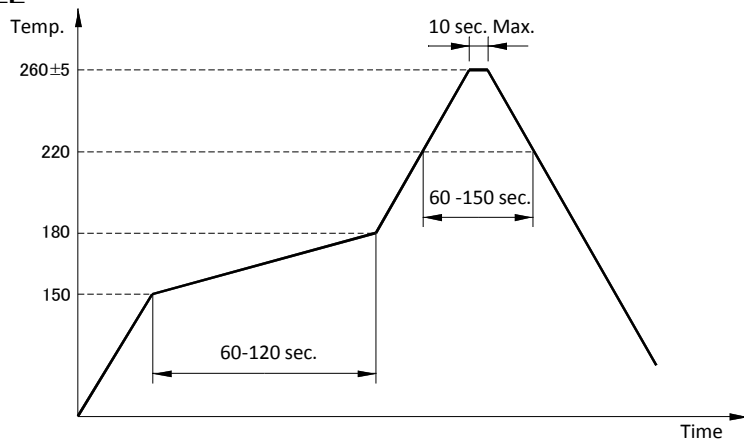
**MARKING**



year	month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
		2021	2025	A	B	C	D	E	F	G	H	J	K
2022	2026	N	P	Q	R	S	T	U	V	W	X	Y	Z
2023	2027	a	b	c	d	e	f	g	h	j	k	l	m
2024	2028	n	p	q	r	s	t	u	v	w	x	y	z

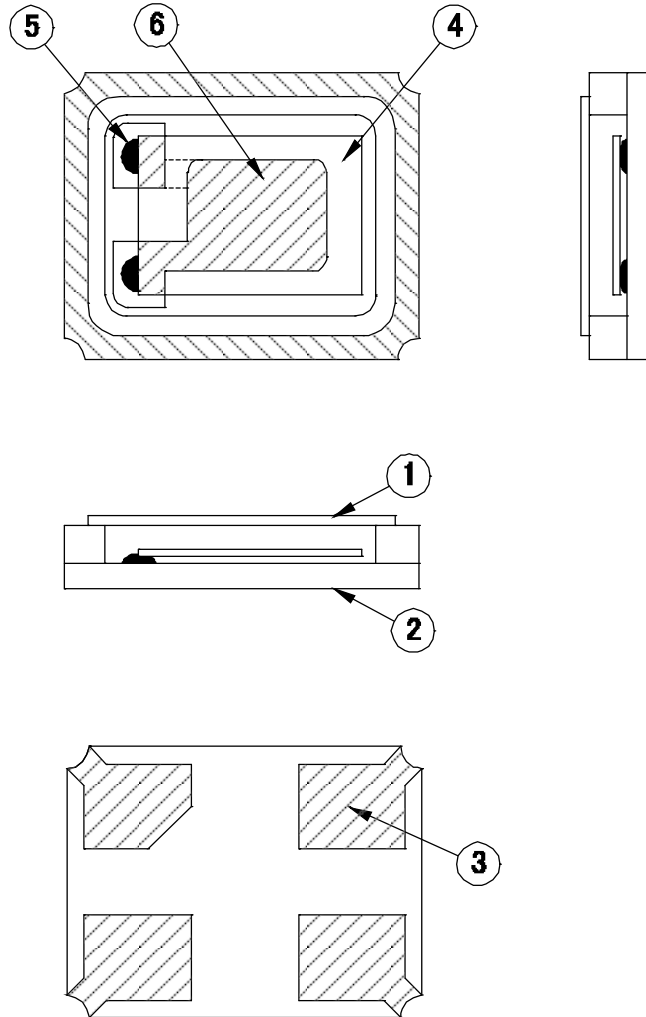
**SUGGESTED REFLOW PROFILE**

Total time : 360 sec. Max.  
 Solder melting point :225 °C





### STRUCTURE ILLUSTRATION



NO	COMPONENTS	MATERIALS	QTY	FINISH/SPECIFICATIONS
1	Cap(Lid)	Kovar(Fe+Co+Ni) + AuSn	1	-
2	Base(Package)	Alumina Ceramics (Al <sub>2</sub> O <sub>3</sub> )	1	
3	Pad(Package)	Ni + Au	4	Ni + Au plating
4	Crystal blank	SiO <sub>2</sub>	1	-
5	Conductive adhesive	Ag	2	Silicone resin
6	Electrode	Noble metal	2	-



**RELIABILITY SPECIFICATIONS**

**1.MECHANICAL ENDURANCE**

No.	Test Item	Test Methods	
1	Drop Test	150 cm height, fall freely onto stainless plate 3 times.	JIS C6701
2	Shock Test	150g/150cm Height,3times in the direction of $\pm x$ , $\pm y$ , $\pm z$ on concrete floor	IEC-68-02-27
3	Mechanical Shock	Device are shocked to half sine wave ( 1000 G ) three mutually pendicular axes each 3 times. 1.0m sec. duration time	MIL-STD-202F
4	Vibration	Frequency range 10 ~ 55 Hz Amplitude 1.52 mm Penticular axes each test time 2 hours ( x,y,z Axis ) Total test time 6 hours	MIL-STD-883E
5	Gross Leak	Standard Sample For Automatic Gross Leak Detector Test Pressure 2kg/cm2	MIL-STD-883E
6	Fine Leak	Helium Bombing 4.5kgf/cm2 for 2 hr	MIL-STD-883E
7	Solderability	Temperature 215 °C +/- 5 °C Immersing depth 0.5 mm minimum Immersion time 10 +/- 0.5 seconds Flux Rosin resin methyl alcohol solvent ( 1 : 4 )	MIL-STD-883E
8	Resistance To Soldering Heat	Pre-heat temperature 125 °C Pre-heat time 60 ~ 120 sec. Test temperature 260 +/- 5 °C Test time 5 +/- 1 sec.	MIL-STD-202F

\*Storage conditions : 18 months

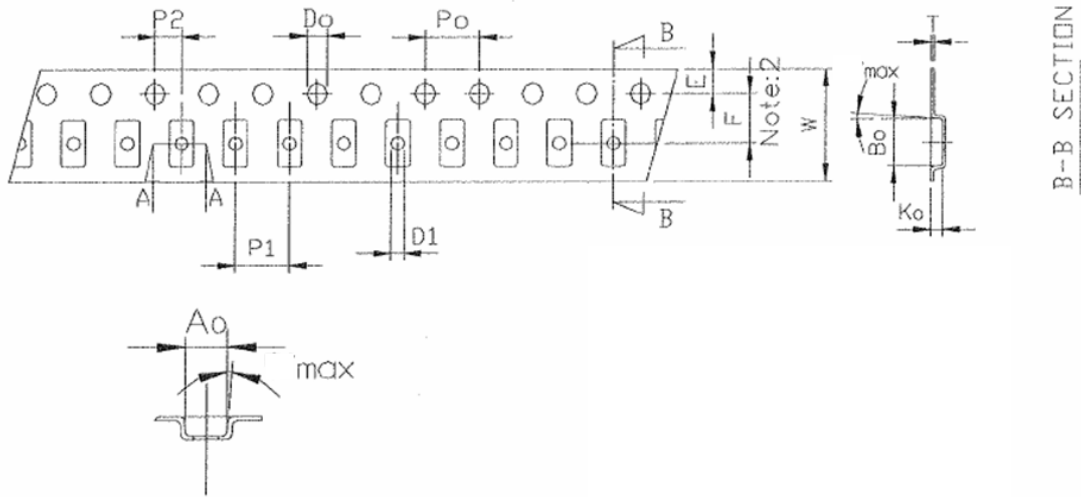
\*Constant humidity : 40~70%

**2.ENVIRONMENTAL ENDURANCE**

No.	Test Item	Test Methods	
9	High Temp. Storage	+ 125 °C +/- 3 °C for 500 +/- 12 hours	MIL-STD-883E
10	Low Temp. Storage	- 40 °C +/- 3 °C for 500 +/- 12 hours	
11	Thermal Shock	Total 100 cycles of the following temperature cycle  	MIL-STD-883E
12	High Temp&Homidity	85°C±3°C, RH 85%,500Hrs	JIS C5023
13	Pressure Cooker Storage	120 +/- 3°C, RH100%, 2 bar, for 240 hours	JIS C6701



**PACKING : (EIA-481-2)**



Dimension PKG Type	Unit : mm						
	A0	B0	K0	T	W	E	F
1612(8mm)	1.45±0.1	1.85±0.1	0.45±0.10	0.25±0.05	8±0.3	1.75±0.1	3.50±0.1
	P1	P2	D1	D0	P0		
	4±0.1	2±0.1	0.6±0.1	1.55±0.05	4±0.1		

Standard Reel Quantity is 3,000 pcs per reel.

**THE INSPECTION FOR TAPE TENSION**

ITEM		Defect	Method
Appearance	ALL	1.The tape is not coincidence 2.The bubble	Visual inspection
Tape Tension	8045、7050 6035-12mm 5032-12mm 3225-12mm	overstep 61±6g(55~67g)	Pull test
	3225-8mm	overstep 40±5g(35~45g)	
	2520-8mm	overstep 55±6g(49~61g)	
	2016-8mm	overstep 34±6g(28~40g)	
	1612-8mm	overstep 34±6g(28~40g)	
	6035-16mm 5032-16mm	overstep 60±6g(54~66g)	





**REMARK : NA**









**SMD PRODUCT PACKING STANDARD**

**Out-going packing instruction**


Reel Packing	Inner Packing	Carton
name: reel standard: diameter 18cm material: plastics	name: Bubble Wrap standard: 430x330+20mm material: HDPE(15 reels enter)	name: carton standard: 400x400x280mm material: AB corrugated paper(4 bags enter)
		
		

**The label instruction**

Label Drawing	Mark	Name of Article	Spec.	Size	Printing
<p>PART NO : 3526000389</p> <p>LOT NO : 20041400</p> <p>Q'TY : 3000</p> <p>FREQ : 26.000000MHz</p>  <p>MSL 1</p>  <p>MADE IN CHINA</p>	L1	条码标签 Bar Code Label (Chintz Paper)	1.Part No. 2.Lot No. 3.Q'ty 4.Freq	70x50mm	White
<p>PART NO : 3526000389</p> <p>DATE CODE: 2015</p> <p>Q'TY : 30000</p> <p>FREQ : 26.000000MHz</p>  <p>MSL 1</p>  <p>MADE IN CHINA</p>	L2	条码标签 Bar Code Label (Chintz Paper)	1.Part No. 2.Date Code 3.Q'ty 4.Freq	70x50mm	White

**Remark**

Specifications on the label is for the use of templates with different product specifications may vary.  
If customer specified requirements for labels packaging, please provide the operation procedure.

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		VER:	S2	PAGE:	9/9
Range	Products	Packing Material			
Banned Substances	Maximum concentration ppm(mg/kg)	Maximum concentration ppm(mg/kg)			
1.镉及镉化合物 Cadmium and cadmium compounds	100	100			
2.铅及铅化合物 Lead and lead compounds	1000	100			
3.汞及汞化合物 Mercury and mercury compounds	1000	100			
4.六价铬化合物 Hexavalent-Chromium VI (Cr+6)	1000	100			
5.聚溴联苯 PBB Polybrominated biphenyls	1000	N/A			
6.聚溴二苯醚 PBDE Polybrominated diphenyl ethers	1000	N/A			
7.邻苯二甲酸二(2-乙基己基)酯 DEHP Di (2-ethylhexyl) phthalate	1000	N/A			
8.邻苯二甲酸丁苄酯 BBP Butyl Benzyl Phthalate	1000	N/A			
9.邻苯二甲酸二丁酯 DBP Dibutyl Phthalate	1000	N/A			
10 邻苯二甲酸二异丁酯 DIBP Diisobutyl Phthalate	1000	N/A			
11. 氟 (F)、氯 (Cl)、溴 (Br)、碘 (I) <u>Fluorine, Chlorine, Bromine, Iodine</u>	900、900、900、900 注: Br+Cl<1000	N/A			
12.包装材料中重金属(汞、镉、六价铬、铅、PBB、PBDE)之总量 Heavy metals (mercury, cadmium, lead, Cr+6,PBB and PBDE) in packing materials	N/A	100 铅(Pb) + 镉(Cd) + 汞(Hg) + 六价铬 (Cr+6) <100ppm			
13.高度关注物质 SVHC-Substances of Very High Concern	1000	N/A			

