



**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. : 32.000000 MHz  
 FL P/N : 1S320H1001  
 REVISION : S1  
 CUSTOMER P/N : \_\_\_\_\_

## CUSTOMER'S APPROVAL&DATE

FL CORPORATION

APPROVED	CHECKED	DESIGNED
Jay Lee	Jin Qi	Chen XuanRu

**MSL1**  
**RoHS Compliant**



## CONTENTS

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## ATTACHMENT (optional)

- ELECTRICAL CHARACTERISTICS TEST A  YES  NO
- TEMPERATURE CHARACTERISTICS TEST B  YES  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

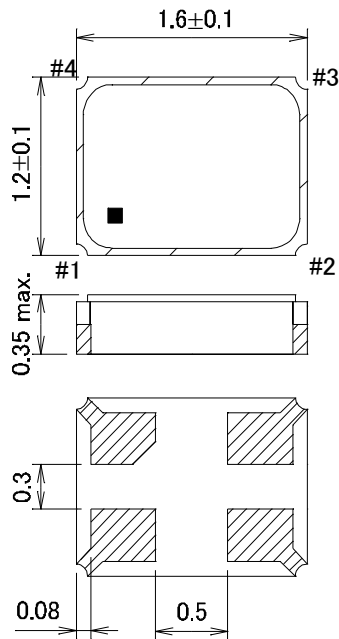
	Item	Unite	Electrical Spec.		
			Min	Typicl	Max
Function	Nominal Frequency	MHz		32	
	Oscillation Mode			Fundamental	
	Load Capacitance CL	pF		8	
	Frequency Tolerance@25°C	PPM	-10		10
	Frequency after 2X reflow	PPM	/	/	/
	Frequency Stability vs. temperature	-30°C ~85°C (PPM)	-10		10
		85°C ~95°C (PPM)	/	/	/
		95°C ~105°C (PPM)	/	/	/
	Aging (@25°C)	PPM(1st year)	-3		3
		PPM(2nd years)	/	/	/
		PPM(5 years)	/	/	/
	Drive Level	μW	10		100
	Equivalent Resistance/RR	Ω			60
	Shunt Capacitance C0	pF	/	/	/
Insulation Resistance	MΩ	500			
Turning Sensitivity	ppm/pF	/	/	/	



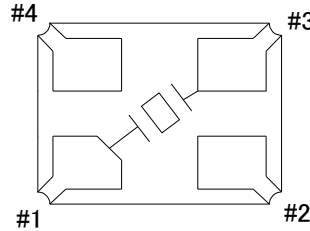
	@CL=8pF		/	/	/
	Q Factor		/	/	/
	Specification for DLD measurement		/		
	DLD2	Ω	/	/	/
	DLDH2	Ω	/	/	/
	FDDL	ppm	/	/	/
	FDLDH	ppm	/	/	/
Package		mm	(1.6±0.1) x (1.2±0.1) x 0.5 max		
Quality/ reliability	Life period	Year	5		
	Failure rate	FITS			70
	FDPPM	PPM	/	/	/
	Statistic Process Capability (frequency、RR、DLD2)	Cpk	/	/	/
	Leak	Pa·cm <sup>3</sup> /s			
	MSL	level		1	
	ESD level	V	/	/	/
	Operating Temperature	°C	-30		85
	Storage Temperature	°C	-40		85
	Soldering Temp./Time	°C/S	/	/	/
	ROHS / REACH	/	meet with RoHS & REACH		
	The rate of temperature change(max value)		/	/	/



**DIMENSIONS unit:mm**

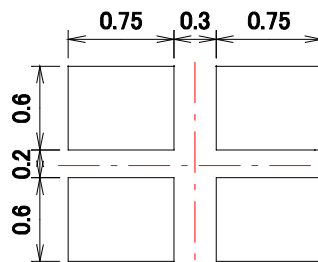


**CONNECTION DIAGRAM (TOP VIEW)**

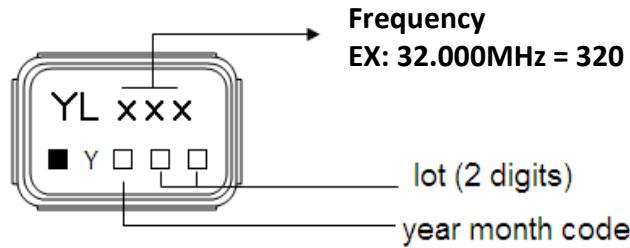


Pin	Function
#1	Xtal terminal (Input)
#2	GND terminal
#3	Xtal terminal (Output)
#4	N/C

**LAND PATTERN unit:mm**



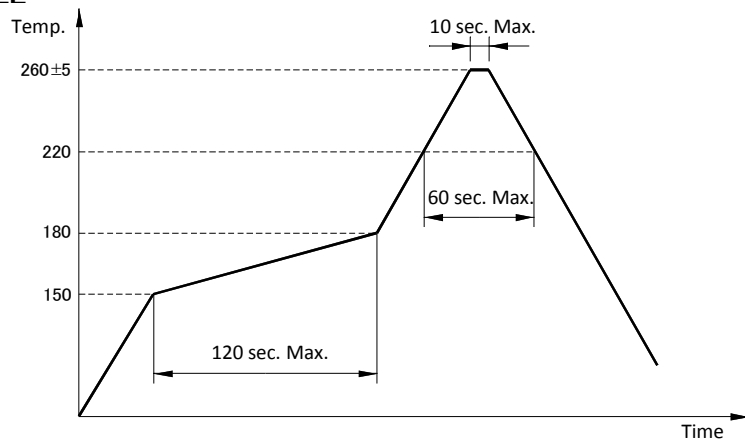
**MARKING**



month year		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
		2013	2017	A	B	C	D	E	F	G	H	J	K
2014	2018	N	P	Q	R	S	T	U	V	W	X	Y	Z
2015	2019	a	b	c	d	e	f	g	h	j	k	l	m
2016	2020	n	p	q	r	s	t	u	v	w	x	y	z

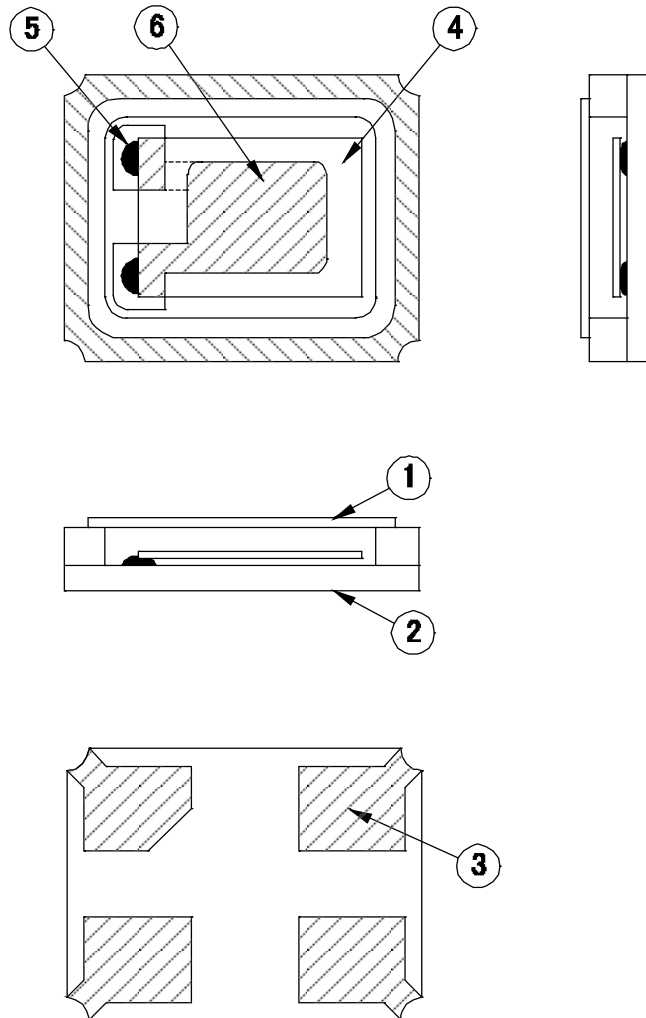
**SUGGESTED REFLOW PROFILE**

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 ( $Al_2O_3$ )	1	
3	Pad(Package)	Ni + Au	4	Ni + Au plating
4	Crystal blank	$SiO_2$	1	-
5	Conductive adhesive	Ag	2	Silicone resin
6	Electrode	Noble metal	2	-

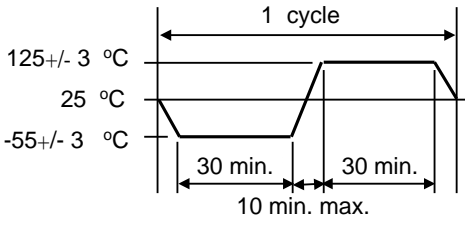


**RELIABILITY SPECIFICATIONS**

**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 Pendicular 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 245 °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

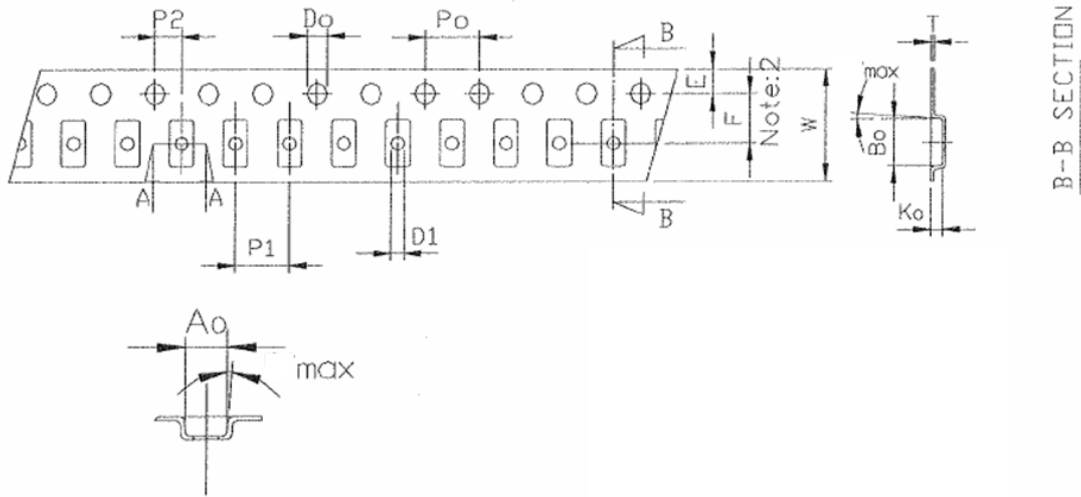
**2.ENVIRONMENTAL ENDURANCE**

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





**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**


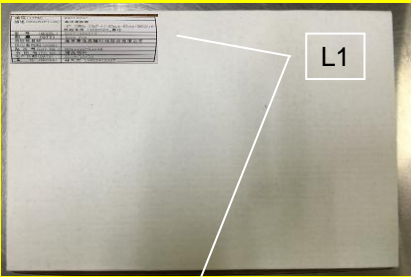

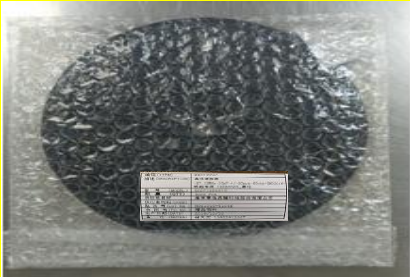

ITEM		Defect	Method
Appearance	ALL	1.The tape is not coincidence 2.The bubble	Visual inspection
Tape Tension	8045、7050 6035-12mm 5032-12mm 3225-12mm	overstep 61±6g(55~67g)	Pull test
	3225-8mm	overstep 40±5g(35~45g)	
	2520-8mm	overstep 55±6g(49~61g)	
	2016-8mm	overstep 34±6g(28~40g)	
	1612-8mm	overstep 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: inner box standard: L19.0xW19.0xH2.5cm material: B corrugated paper	name: carton standard: L34.0xW22.0xH22.0cm material: AB corrugated paper(10 boxes enter)																				
																						
	<table border="1"> <tr><td>编码 (ITEM)</td><td>99012YVC</td></tr> <tr><td>描述 (DESCRIPTION)</td><td>晶体谐振器 -27.12MHz-10pF+/-20ppm-60ohm-SMD2016-终端专用-12020363_惠伦</td></tr> <tr><td>型号 (MODEL)</td><td>9S27100001H</td></tr> <tr><td>数量 (QTY)</td><td>2000 PCS</td></tr> <tr><td>供应商名称</td><td>广东惠伦晶体科技股份有限公司</td></tr> <tr><td>供应商代码 (CODE)</td><td></td></tr> <tr><td>批次号 (LOT. No.)</td><td>H9S1910-Y1045</td></tr> <tr><td>合同号 (PO. NO.)</td><td>赠品物料</td></tr> <tr><td>生产日期 (DATE)</td><td>2019/10/10</td></tr> <tr><td>备注 (NOTES)</td><td>林天文 13922912067</td></tr> </table>	编码 (ITEM)	99012YVC	描述 (DESCRIPTION)	晶体谐振器 -27.12MHz-10pF+/-20ppm-60ohm-SMD2016-终端专用-12020363_惠伦	型号 (MODEL)	9S27100001H	数量 (QTY)	2000 PCS	供应商名称	广东惠伦晶体科技股份有限公司	供应商代码 (CODE)		批次号 (LOT. No.)	H9S1910-Y1045	合同号 (PO. NO.)	赠品物料	生产日期 (DATE)	2019/10/10	备注 (NOTES)	林天文 13922912067	
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**The label instruction**

Label Drawing	Mark	Name of Article	Spec.	Size	Printing																				
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编码 (ITEM)	99012YVC																								
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**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.

 <b>广东惠伦晶体科技股份有限公司</b> GUANGDONG FAILONG CRYSTAL TECHNOLOGY Co.,Ltd.		TEL : +86(0)769-38879888 FAX : 86(0)769-38879889		FL P/N:	1S320H1001
		VER:	S1	PAGE:	10/10
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			



惠伦晶体

FAILONG CRYSTAL