



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

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PRODUCT SPECIFICATION SHEET

CUSTOMER : _____
PRODUCT TYPE : OSC 5.0X3.2 (4PAD)
NOMINAL FREQ. : 16.000000 MHz
FL P/N : 5C16000006
REVISION : S0
CUSTOMER P/N : _____

CUSTOMER'S APPROVAL&DATE

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FL CORPORATION

APPROVED	CHECKED	DESIGNED
Liu Feng	Huang Ji Ning	Li Xiang

MSL1
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 |

Attention

- If you intend to use products on the controlling equipment that relate to medical, aeronautical, aerospace, military science, space and etc, please make sure to let us know your intentions in advance.
- Ultrasonic related process may cause damage to crystal blank by resonance itself. If ultrasonic related process is used, we strongly recommend to assess the damage risk under related ultrasonic conditions before use in production.



ELECTRICAL SPECIFICATIONS

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&A 280B or equivalent.

Crystal cutting type

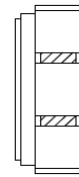
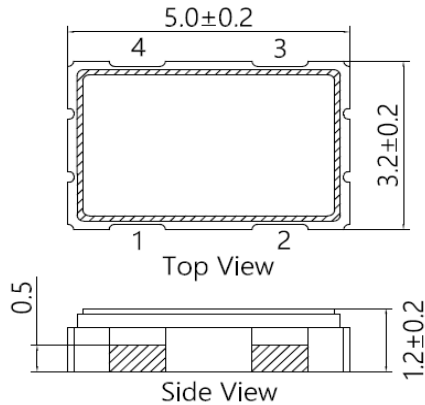
The crystal is using AT CUT (thickness shear mode)

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Electrical Spec.	UNITS	Notes
Nominal Frequency	FL	16.000000	MHz	-
Operating Temperature	TOPR	-40 ~ +85	$^{\circ}\text{C}$	-
The Total Frequency Offset	-	+/-50	ppm	-
Output Load	CL	15.0	p F	Max
Supply Voltage	VDD	3.3	V	-
"0"Level	VOL	VDDx0.1	V	Max
"1"Level	VOH	VDDx0.9	V	Min
Enable High Voltage	ELH	VDDx0.7	V	Min.
Enable Low Voltage	ELL	VDDx0.3	V	Max.
Symmetry of Wave From	Symmetry	45~55%		-
Current Consumption	IDD	10.0	m A	Max
Rise and Fall Time	Tr,Tf	5.0	nSec	Max
Start time	tosc	10.0	mSec	Max
Aging	-	+/-5	ppm	1st Year
Storage Temperature Range	-	-55 ~ +125	$^{\circ}\text{C}$	-
Output waveform		CMOS		
ESD	-	HBM>2000V	-	JESD22-A114-B
MSL	-	Level 1	-	IPC/JEDEC J-STD-033C



DIMENSION

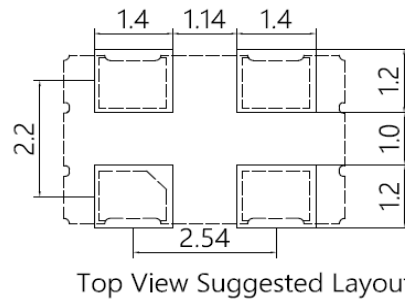
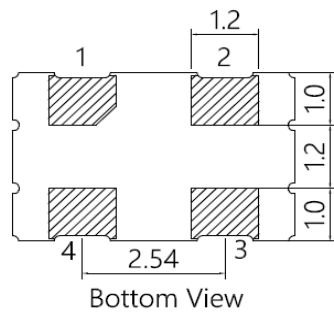


PAD FUNCTION

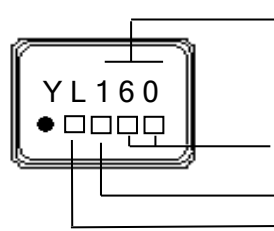
- 1: ENABLE CONTROL
- 2: GND
- 3: OUT
- 4: VDD

Enable Control

Pad 1 Input	Pad 3 Output
Level High or Open	Normal Operation
Level Low	Stopped



MARKING



Frequency

Ex: 160=16.000MHz

Lot (2 digits)

Year Month Code

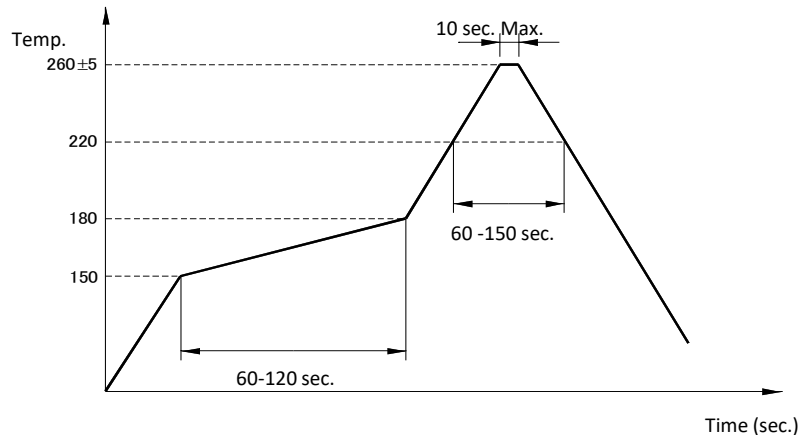
Administrative Symbol

		month											
year		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2021	2025	A	B	C	D	E	F	G	H	J	K	L	M
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

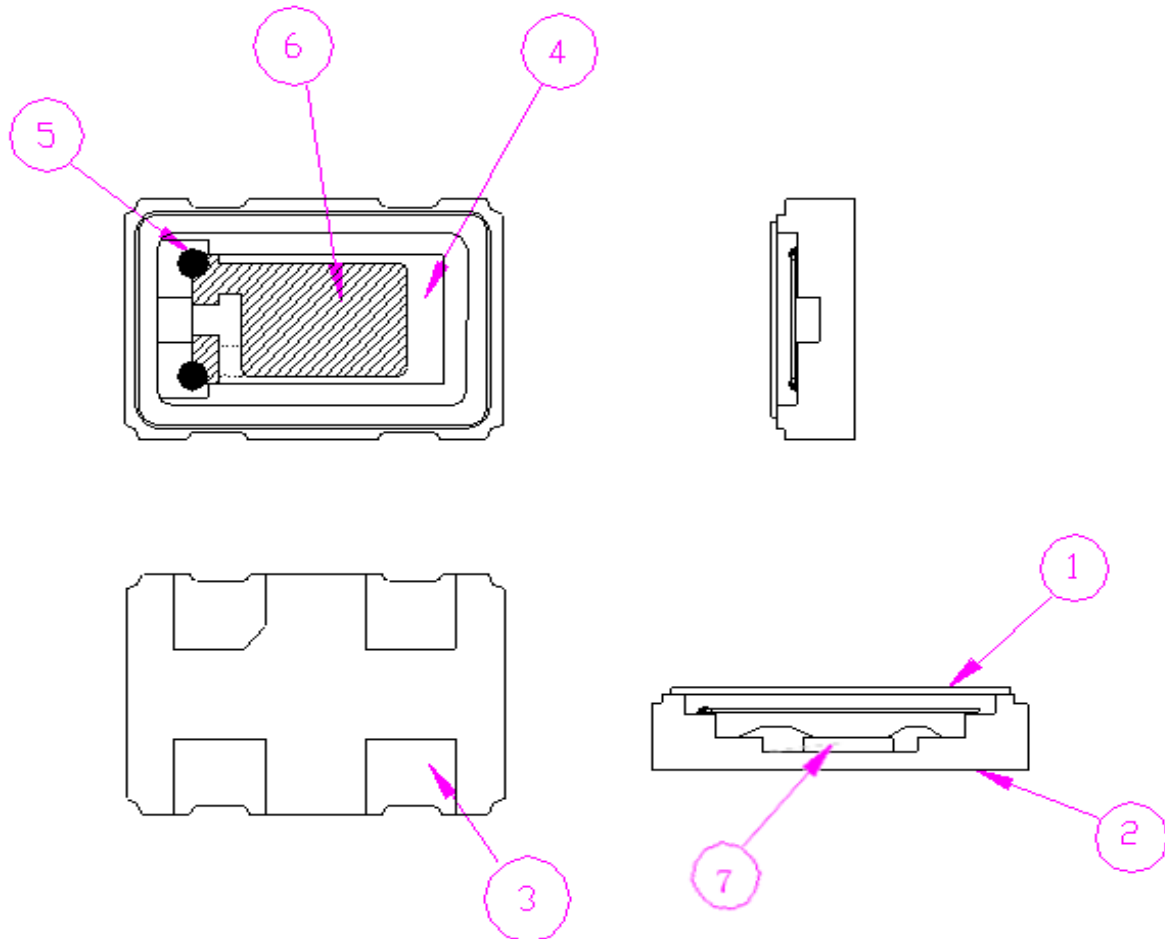
Total time : 360 sec. Max.

Solder melting point : 225 °C





STRUCTURE ILLUSTRATION



NO	COMPONENTS	MATERIALS	QTY	FINISH/SPECIFICATIONS
1	Cap (Lid)	Metal (Fe)	1	-
2	Base (Package)	Ceramic (Al ₂ O ₃)	1	Alumina ceramics
3	Pad (Package)	Au	4	Tungsten metalize +Ni plating +Au plating
4	Crystal blank	SiO ₂	1	-
5	Conductive adhesive	Ag	4	Silicone resin
6	Electrode	Noble metal	2	-
7	IC	Silicon (Si)	1	-



RELIABILITY SPECIFICATIONS

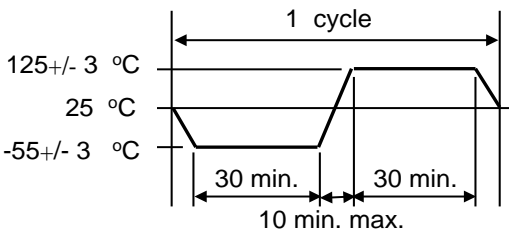
1.MECHANICAL ENDURANCE

No.	Test Item	Test Methods	
1	Drop Test	75 cm height, fall freely onto stainless plate 3 times.	JIS C6701
2	Mechanical Shock	Device are shocked to half sine wave (1000 G) three mutually pendicular axes each 3 times. 0.5m sec. duration time	MIL-STD-202F
3	Vibration	Frequency range 10 ~ 2000 Hz Amplitude 1.52 mm Sweep time 20 minute Pendicular axes each test time 4 hours (Total test time 12 hours)	MIL-STD-883E
4	Solderability	Temperature 260 °C +/- 5 °C , 5 +/-1 sec Immersing depth 0.5 mm minimum Immersion time 10 +/- 0.5 seconds Flux Rosin resin methyl alcohol solvent (1 : 4)	MIL-STD-883E
5	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%

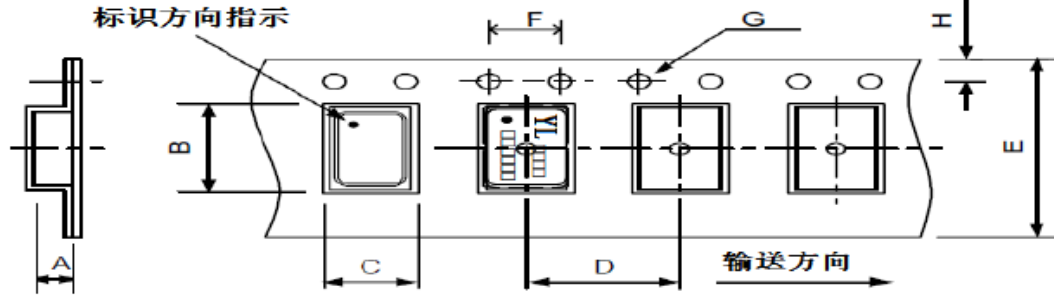
2.ENVIRONMENTAL ENDURANCE

No.	Test Item	Test Methods	
6	High Temp. Storage	+ 125 °C +/- 2 °C for 1000 +/- 12 hours	MIL-STD-883E
7	Low Temp. Storage	- 40 °C +/- 2 °C for 1000 +/- 12 hours	
8	Thermal Shock	Total 10 cycles of the following temperature cycle 	MIL-STD-883E
9	High Temp. Operation	+ 85°C, VCC, for 1000 hours	MIL-STD-883E
10	Low Temp. Operation	- 40°C, VCC, for 1000 hours	MIL-STD-883E

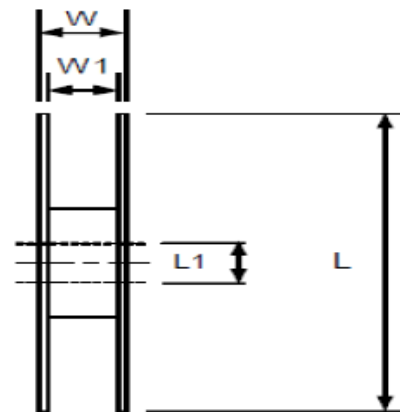
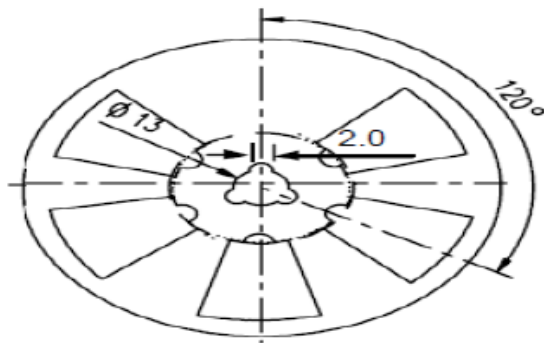
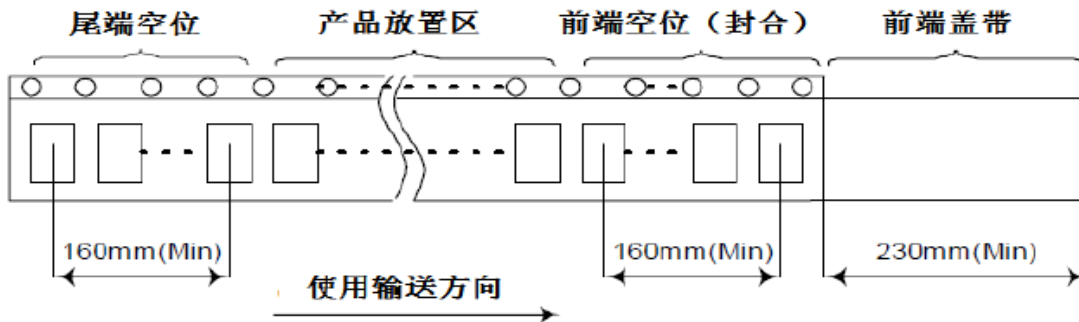


PACKING :

12mm-8mm, 1000pcs / reel, $\phi 178$;



尺寸	A	B	C	D	E	F	G	H	单位:
	1.40	5.40	3.60	8.00	12.00	4.00	1.55	1.75	mm
	± 0.1	± 0.1	± 0.1						



尺寸	L	L1	W	W1	单位: mm
	178	13	16.5	12	每卷数量: 1000 支





SMD PRODUCT PACKING STANDARD

Out-going packing instruction

Reel Packing	Inner Packing	Carton
name: reel standard: diameter 18cm material: plastics name: Anti-Static Shielding Bag standard: 205x250mm	name: Anti-Static Bubble Bags standard: 430x330+20mm material: HDPE(15 reels enter)	name: carton standard: 400x400x280mm material: AB corrugated paper (40 boxes enter)
		
	PART NO : 3526000389 LOT NO : 20041400 Q'TY : 3000 FREQ : 26.000000MHz  	

The label instruction

Label Drawing	Mark	Name of Article	Spec.	Size	Printing
	L1	条码标签 Bar Code Label (Chintz Paper)	1.Part No. 2.Lot No. 3.Q'ty 4.Freq	70x50mm	White
	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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FL P/N: 5C16000006
VER: S0 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) Fluorine、Chlorine、Bromine、Iodine	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

