



CRYSTAL

HC49SS-12M1620F

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■ 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 ± 5

Relative humidity: 40%~70%

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

Ambient temperature : 25 ± 1

Relative humidity: 40%~70%

Measure equipment

Electrical characteristics measured by S&A 250B or equivalent.

Crystal cutting type

The crystal is using AT CUT (thickness shear mode)

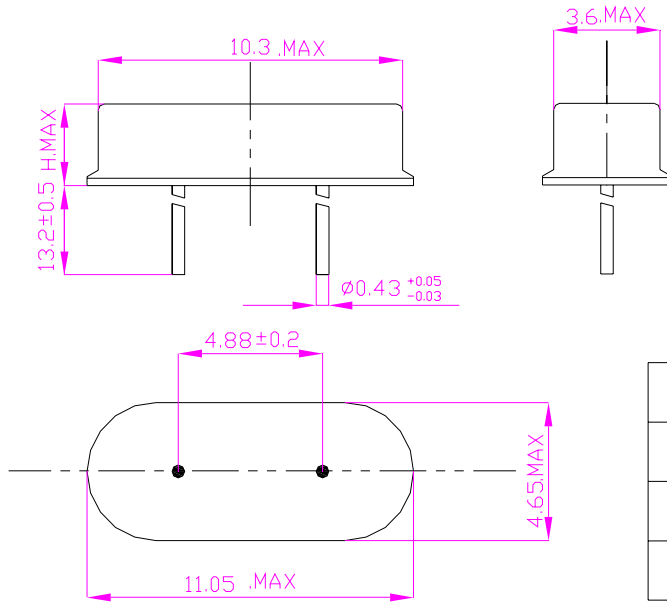
	Parameters	SYM	Electrical spec.	UNITS	Notes
1	Nominal Frequency	FL	12.000	MHz	-
2	Oscillation Mode	-	Fund	-	-
3	Load Capacitance	CL	16	pF	-
4	Frequency Tolerance	-	± 20	ppm	at 25 ± 3
5	Frequency Tolerance	-	± 20	ppm	Over Operating Temp. Range (Reference 25)
6	Operating Temperature	-	-20~+70		-
7	Aging	-	± 3	ppm	1st Year
8	Drive Level	DL	100	μ W	-
9	Effective Resistance Rr	Rr	40		-
10	Shunt Capacitance C0	C0	7.0max	pF	-
11	Motional Capacitance C1	C1	-	fF	-
12	Spurious Response	SPDB	-.	dB	
13	Insulation Resistance	-	500	M	at DC 100V
14	Storage Temperature Range	-	-55~+125		-
15	Others			-	-



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■ **DIMENSION**

1. Crystal enclosure seal : resistance weld
2. Crystal enclosure medium : Nitrogen



HOLDER	H
XS-3.0S	2.0
XS-3.0S	2.5
XS-5.0S	3.5

■ **MARKING**

M12.000E8D

■ **SHELF LIFE & STORAGE CONDITIONS**

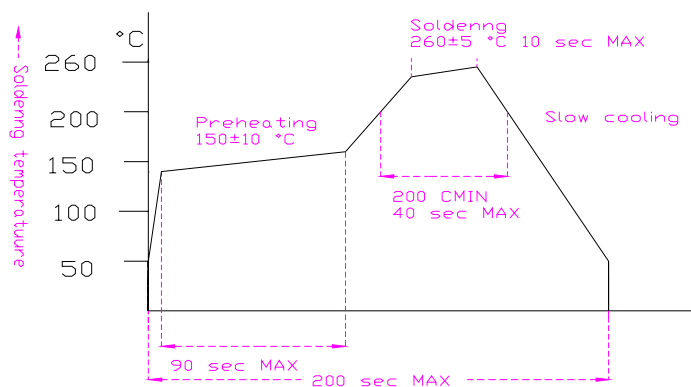
No shipment is allowed by manufactured over 1 year .

Storage Conditions:

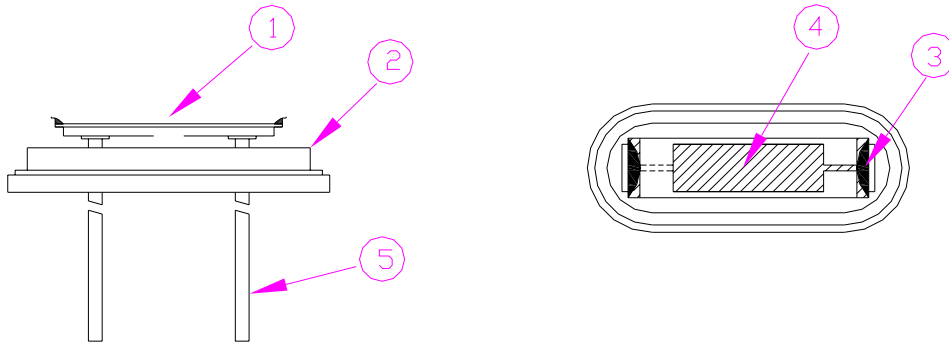
Temp.	Humidity
25 ± 3	40~60%

■ **SUGGESTED REFLOW PROFILE**

Total time : 200sec.Max.



■ STRUCTURE ILLUSTRATION



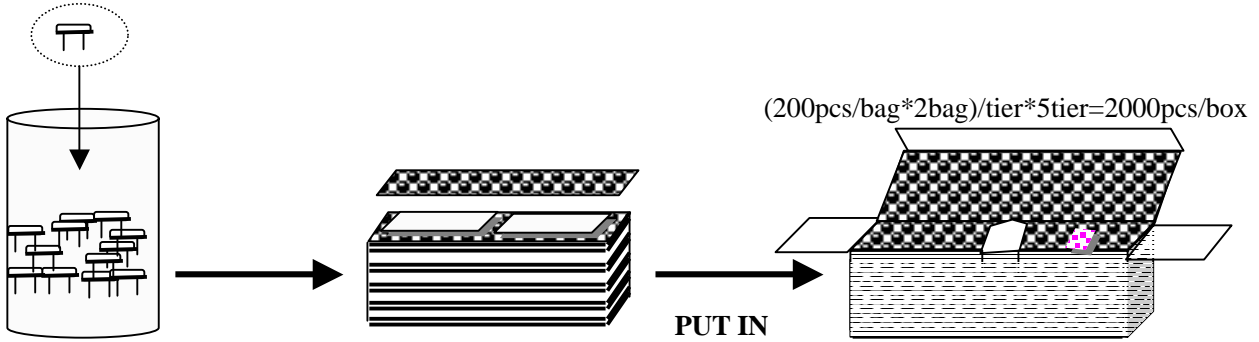
No	COMPONENTS	MATERIALS	QTY	FINISH/SPECIFCATIONS
1	CRYSTAL BLANK	SiO ₂	1	-
2	BASE	SPCC-SD	1	-
3	CONDUCTIVE ADHESIVE	Ag +Resin	2	-
4	ELECTRODE	Ag	2	-
5	LEAD	Kovar	2	-

剪脚公差: ±0.3 mm



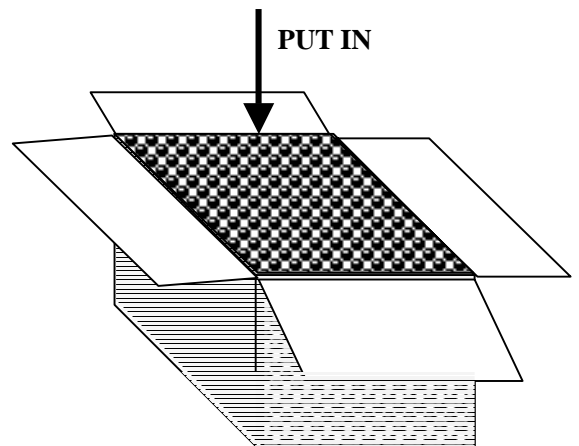
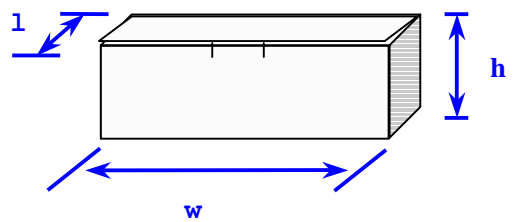
■ PACKING FOR PB FREE PARTS:

1 . INNER BOX :(Unit : mm)



2 . LOGO STICKER (CARTON and INNER BOX) :(Unit : mm)

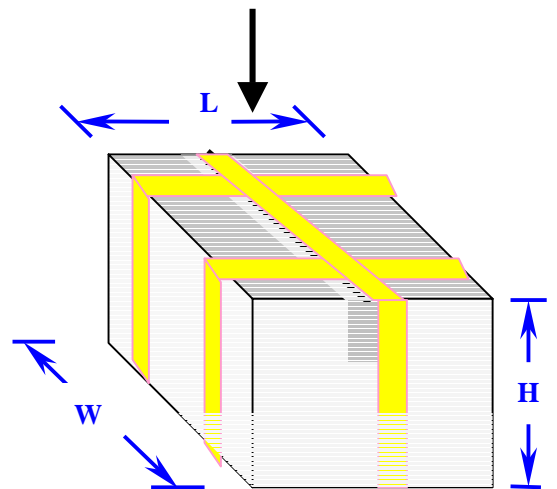
Dimensions(+/-10)				
No	w	l	h	Q'ty
1.	205	85	85	2K



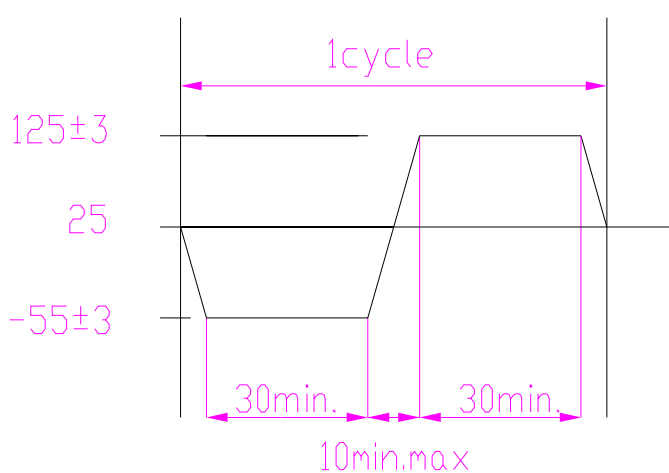
Put in stuff between space,
2000pcs/box*10box=20000pcs/carton

Dimensions(+/-10)				
No	W	L	H	Q'ty
1.	475	210	210	20K

Tie up the carton with 3 packthreads.



■ RELIABILITY SPECIFICATIONS

NO	Test Item	Test Methods	Ref.Doc
1	Drop test	50 cm height, fall freely onto stainless plate 3times.	-
2	Mechanical Shock	Device are shocked to half sine wave (1000G) three mutually pendicular axes each 3 times.0.5sec.duration time.	-
3	Vibration	Frequency range 10~2000Hz Amplitude 1.52mm Sweep time 20 minute Pendicular axes each test time 4 hours (Total test time 12 hours)	-
4	Solderability	Temperature 255 ± 5 Immersing depth 0.5mm minimum Immersion time 10 ± 0.5seconds Flux Rosin resin methyl alcohol Solvent (1:4)	-
5	Resistance To Soldering Heat	Pre-heat temperature 125 Pre-heat time 60~120sec. Test temperature 260 ± 5 Test time 5 ± 1sec.	-
6	High Temp. Storage	+125 ± 2 for 1000 ± 12hours	-
7	Low temp. Storage	-40 ± 2 for 1000 ± 12hours	
8	Thermal Cycles	Total 100 cycles of the following temperature cycle 	-



环境管理物质使用规范

Specification of the environment-related substances

范围 Range	产品 Products	包材 Packing Material	Test Method
禁限物质 Substances	最高含量 Maximum concentration ppm(mg/kg)	最高含量 Maximum concentration ppm(mg/kg)	
1. 镉及镉化合物 Cadmium and cadmium compounds	5	5	ICP-AES as per EN1122, method B2001 or other acid digestion.
2. 铅及铅化合物 Lead and lead compounds	40	100	ICP-AES after as per EPA 3050B or other acid digestion.
3. 汞及汞化合物 Mercury and mercury compounds	5	5	ICP-AES after as per EPA 3052 or other acid digestion.
4. 六价铬化合物 Hexavalent-Chromium VI (Cr ⁺⁶)	10	10	As per US EPA 7196A and US EPA 3060A.
5. 聚溴联苯 PBB Polybrominated biphenyls	5	5	With reference to USEPA 3540 or USEPA3550. Analysis was performed by LPLC/DAD, LC/MS or GC/MS. (prohibited by 2002/95/EC (RoHS), 83/261/EEC, and 76/769/EEC)
6. 聚溴二苯醚 PBDE Polybrominated diphenyl ethers	5	5	With reference to USEPA3540 or USEPA3550. Analysis was performed by HPLC/DAD LC/MS or GC/MS. (prohibited by 2002/95/EC(RoHS), 83/264/EEC, and 76/769/EEC)
7. 多氯联苯 (PCB) Polychlorinated biphenyl	5	5	
8. 多氯化萘 (PCN) Polychlorinated naphthalene	5	5	
9. 氯代烷烃 (CP) Chlorinated paraffin	5	5	
10. 其他有机氯化物 Other chlorinated organic compounds	5	5	
11. 其他有机溴化合物 Other brominated organic compounds	5	5	
12. 有机锡化合物 (三丁基锡化合物, 三苯基锡化合物) Organic tin compounds (Tributyl tin category & Triphenyl tin category)	5	5	
13. 石棉 Asbestos	5	5	
14. 偶氮化合物 Azo compounds	5	5	
15. 甲醛 Formaldehyde	5	5	
16. 聚氯乙烯(PVC)以及聚氯乙烯混合物 Polyvinyl chloride (PVC) and PVC blends	No detect	No detect	
17. 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	

Lead Free Products are "Directive 2002/95/EC of The European Parliament of 27 January 2003 on the restriction of certain hazardous substances (RoHS) in electrical and electronic equipment" and Sony SS-00259 Compliant.



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