

福建省长兴电子有限公司

CHANGXING ELECTRONICS CO., LTD.

福建省将乐县东门新村3号

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石英晶体谐振器产品确认书

Quartz Crystal Resonator Specification For Approval

产品型号:	Seam2016 4PIN 16.000000MHz
Model	
客户名称:	
Customer	
客户编号:	
Customer's Part No.	
长兴编号:	3DSC160G0009L
Product No.	
发行日期:	
Issue Date	

承办: 吴丽萍

审核: 林峰

批准: 杨启付

内容:

- 1、Features 特点
- 2、Electrical Specifications 电气参数
- 3、Dimensions 外型尺寸
- 4、Marking 印码
- 5、Reflow Condition 回流焊条件
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- 7、Reliability Specifications 可靠性规范
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客户 Conclusion:

☐ Conditional Approval ☐ Full Approval ☐ Reject

会 签 意 见	
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APPROVED BY :

ISSUED DATE :

2.0×1.6×0.50mm SMD Seam Sealing Crystals / 3D Series

■ Features 特点

- . Extremely small SMD type crystal units.
- . High precision and high frequency stability.
- . Excellent heat resistance and environmental characteristics.
- . Applications in PDA, DSC, DVC, PC, etc.
- . RoHS Compliant / Pb Free.

■ Electrical Specifications 电气参数

Standard atmospheric conditions

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

Ambient temperature: $22 \pm 5^{\circ}\text{C}$

Relative humidity : 40%~70%

If there is any doubt about the results, measurement shall be made within the following limits:

Ambient temperature: $22 \pm 1^{\circ}\text{C}$

Relative humidity : 40%~70%

Measure equipment

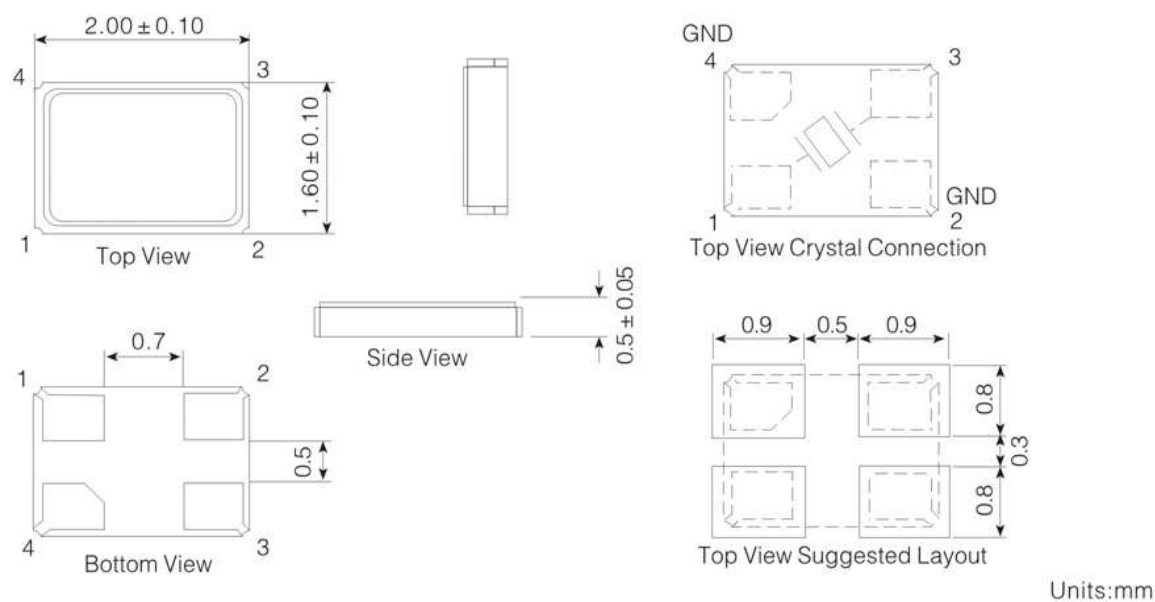
Electrical characteristics measured by HP E5100A or equivalent.

Crystal cutting type

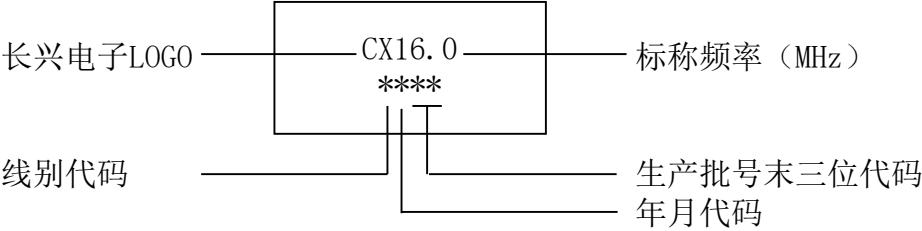
The crystal is using AT CUT (thickness shear mode).

	Parameters	Electrical Spec.	UNITS	Notes
1	Nominal Frequency	16.000000	MHz	-
2	Oscillation Mode	Fund	-	-
3	Load Capacitance	9	pF	-
4	Frequency Tolerance	± 10	ppm	at $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$
5	Frequency Tolerance	± 30	ppm	Over Operating Temp. Range
6	Operating Temperature	$-40 \sim +85$	$^{\circ}\text{C}$	-
7	Aging	± 3	ppm	1st Year
8	Drive Level	100	uW	-
9	Effective Resistance Rr	150 Max.	Ω	-
10	Shunt Capacitance C0	5 Max.	pF	-
11	Motional Capacitance C1	-	fF	-
12	Pulling Sensitivity TS	-	ppm/pF	-
13	Spurious Response	-3.0	dB	-1000~+5000 ppm 125 步
14	Insulation Resistance	500 Min.	M Ω	at DC 100V
15	Storage Temperature Range	$-55 \sim +125$	$^{\circ}\text{C}$	-
16	RLD2	150 Max.	Ω	0.01~30 μW /15 steps 30~100 μW /10 steps 100~30 μW /10 steps 30~0.01 μW /15 steps
17	FDDL	10 Max.	ppm	
18	DLD2	10 Max.	Ω	
19	FDDLH	5 Max.	ppm	
20	DLDH2	5 Max.	Ω	
21	DLDF	-	Ω	0.01~30 μW /15 steps
22	DLD2 (低)	-	Ω	
23	Others	-	-	-

■ Dimensions外型尺寸



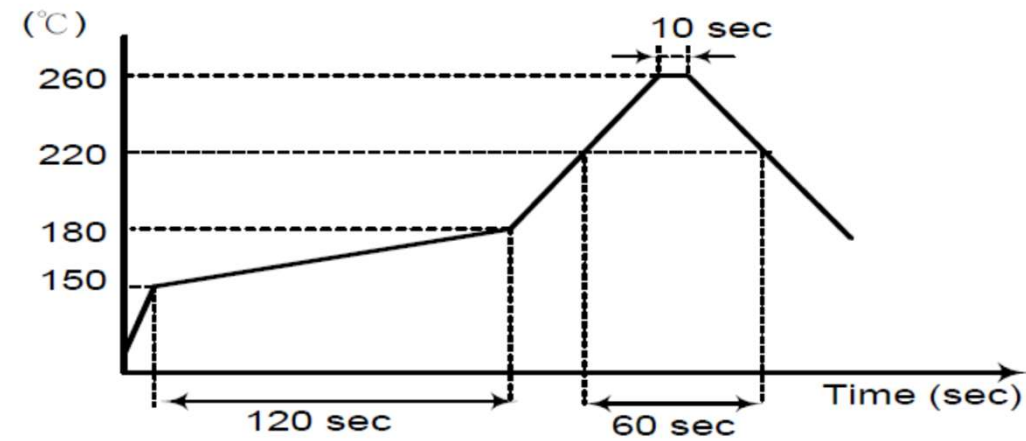
■ Marking印码



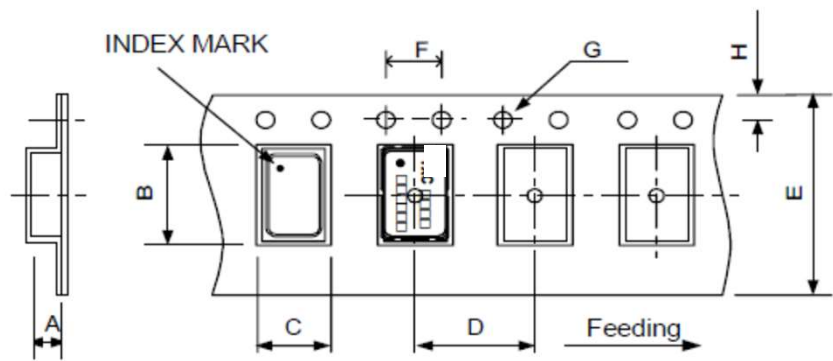
年月代码（四年一个周期）：

月份		一月	二月	三月	四月	五月	六月	七月	八月	九月	十月	十一月	十二月
年份	2015	a	b	c	d	e	f	g	h	j	k	l	m
	2016	n	p	q	r	s	t	u	v	w	x	y	z
	2017	A	B	C	D	E	F	G	H	J	K	L	M
	2018	N	P	Q	R	S	T	U	V	W	X	Y	Z

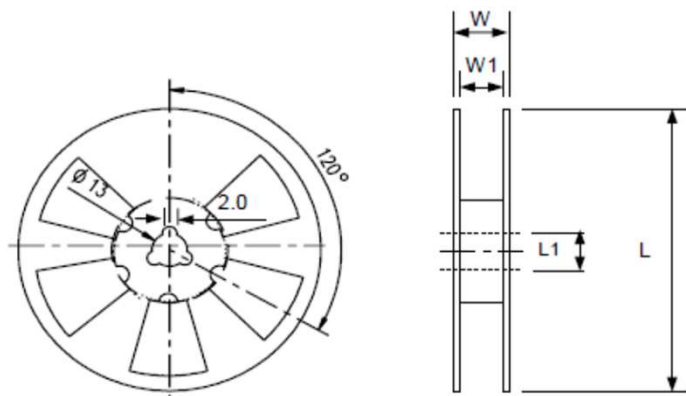
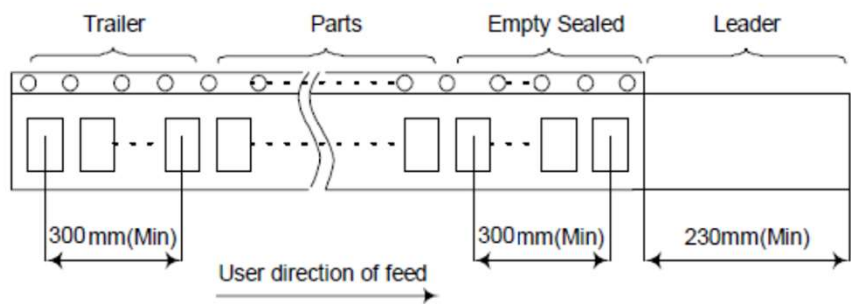
■ Reflow Condition回流焊条件



■ Packing包装 (EIA-481-2)



DIMENSIONS	A	B	C	D	E	F	G	H
UNIT : mm	0.65±0.1	2.30±0.1	1.90±0.1	4.00±0.1	8.0±0.2	4.00±0.1	1.55±0.05	1.75±0.1



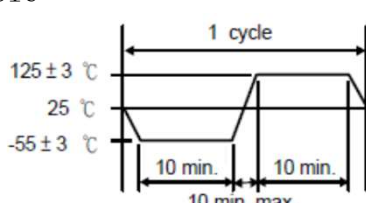
DIMENSIONS	L	L1	W	W1	Standard Reel Quantity
UNIT : mm	178±1.0	13±0.5	11.5±0.2	8.0±1.0	3,000 pcs per reel (WHITE)

■ Reliability Specifications (可靠性规范)

1. Mechanical Endurance (机械耐久性)

No.	Test Item	Test Methods	REF. DOC
1.1	Drop Test	150 cm height, 3 times on concrete floor .	JIS C6701
1.2	Shock Test	150g/150cm Height, 3 times in the direction of $\pm X$, $\pm Y$, $\pm Z$ on concrete floor	IEC-68-02-27
1.3	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
1.4	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
1.5	Gross Leak	Standard Sample For Automatic Gross Leak Detector, Test Pressure: 2Kg / cm ²	MIL-STD-883E
1.6	Fine Leak	Helium Bombing 4.5 Kgf / cm ² for 2 hr	
1.7	Solderability	Temperature 260 °C $\pm$ 5°C Immersing depth 0.5 mm minimum Immersion time 5 $\pm$ 1 seconds Flux Rosin resin methyl alcohol solvent (1 : 4)	MIL-STD-883E

2. Environmental Endurance (环境耐久性)

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 $\pm$ 5 °C Test time 10 $\pm$ 1 sec.	MIL-STD-202F
2.2	High Temp. Storage	+ 125 °C $\pm$ 3 °C for 500 $\pm$ 12 hours	MIL-STD-883E
2.3	Low Temp. Storage	- 40 °C $\pm$ 3 °C for 500 $\pm$ 12 hours	
2.4	Thermal Shock	Total 100 cycles of the following temperature cycle 	MIL-STD-883E
2.5	High Temp&Humidity	85°C $\pm$ 3°C , RH 85% , 500Hrs	JIS C5023
2.6	Pressure Cooker Storage	125°C $\pm$ 3°C , RH100% , 2 bar , 240Hrs	JIS C6701

Material Composition Declaration

材 料 成 份 表

1.PRODUCTION NAME : Seam 2016

2.PRODUCTION WEIGHT(mg) : 6.144

编号 No.	构成部件 Name of Part	部件材质名 Material Name	材质质量 Material Mass(mg)	材质质量百分比 Mat er i al mass (%)	构成之元素名称 Constituent name	CAS编号 CAS No.	元素百分比 Material Analysis(%)
1	基座 Base	陶瓷 Ceramics	2.153	35.04%	Al ₂ O ₃ Aluminum oxide	1344-28-1	92.40%
					SiO ₂ Siliconoxide	14808-60-7	4.30%
					Cr2o3 Chromium oxide	1308-38-9	1.51%
					MgO Magnesium oxide	1309-48-4	0.69%
					CaO Calcium oxide	7439-98-7	1.09%
		KV环	0.877	14.28%	Fe Iron	7439-89-6	40.70%
					Ni Nickel	7440-02-0	21.79%
					Co Cobalt	7440-48-4	12.78%
		焊料			Ag Silver	7440-22-4	21.02%
					Cu Copper	7440-50-8	3.71%
		金属化 (Metal)	1.490	24.25%	W Tungsten	7440-33-7	86.04%
镀层 Metallizing	Au Gold	7440-57-5			2.88%		
	Ni Nickel	7440-02-0			11.07%		
2	外壳 Cover	4J29 (基材)	1.301	21.18%	Fe Iron	7439-89-6	47.70%
					Ni Nickel	7440-02-0	26.10%
					Co Cobalt	7440-48-4	15.44%
		Ni (镀层)	Ni Nickel	7440-02-0	10.76%		
3	黏合剂 Adhesive	金属 Metal	0.058	0.94%	Ag Silver	7440-22-4	75.00%
		聚合物 Polymer			晶态二氧化硅	—	5.00%
					石油溶剂	—	5.00%
					有机硅树脂 Silicone resin	—	15.00%
4	Blank	晶片 Quartz	0.250	4.07%	SiO ₂ Silicon oxide	14808-60-7	100.00%
5	Electrode	电极 Electrode	0.015	0.24%	Cr Chromium	7440-47-3	5.56%
					Ag Silver	7440-22-4	94.44%