

**SMD CRYSTAL UNIT SPECIFICATIONS**

<b>Issue</b>	<b>Oct 21 2013</b>
<b>Rev.</b>	<b>1.0</b>
<b>Page</b>	<b>9</b>

<b>Customer</b>	立创
<b>Customer P/N</b>	
<b>Product</b>	<b>2520 Seam Sealing X'tal</b>
<b>Nominal Frequency</b>	<b>48.0000MHz</b>
<b>HOSONIC P/N</b>	<b>E2SB48E000009E</b>

<b>Drawn</b>	<b>Checked</b>	<b>Approved</b>



**HOSONIC ELECTRONIC CO., LTD.**



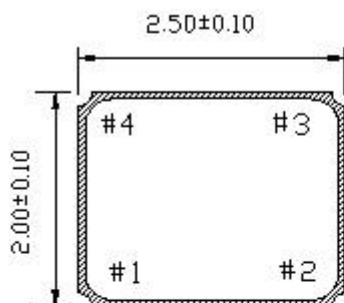
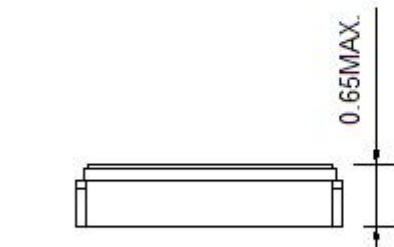
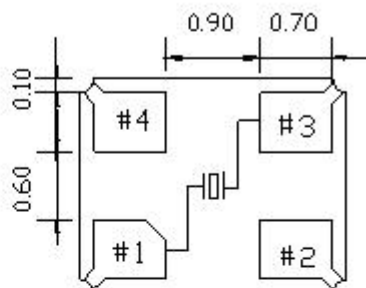
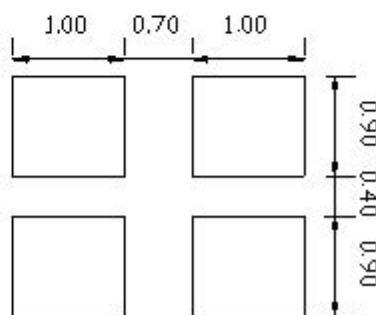
Revised Record

Rev.	Rev. Date	Item	Content	Remark
1.0	2013-10-21		Initial released	

**● ELECTRICAL PARAMETERS**

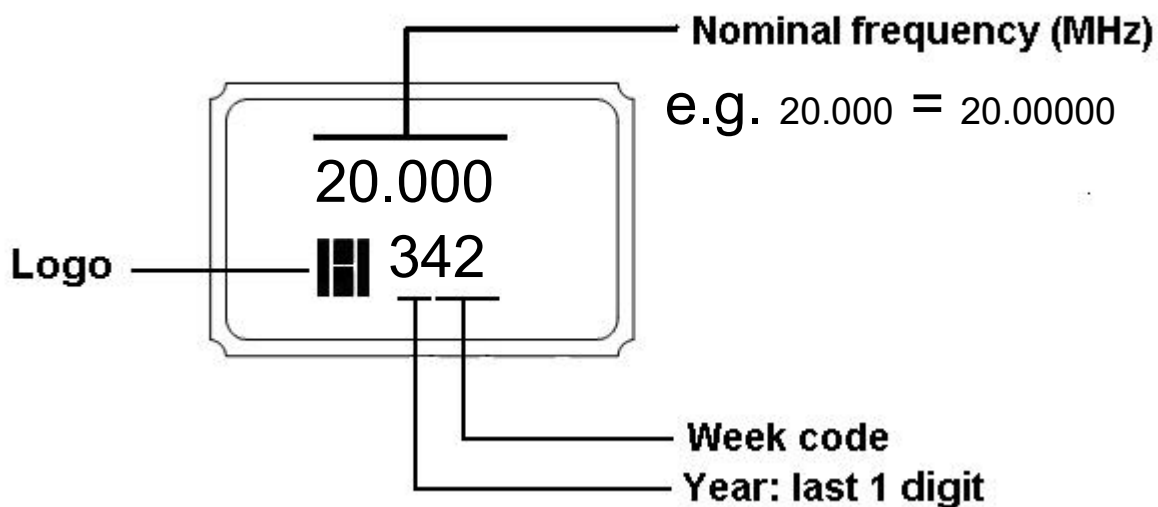
No.	Item	Symb.	Electrical Specification				Remark
			Min.	Typ.	Max.	Units	
1	Nominal Frequency	F0	48.0000			MHz	
2	Mode of Vibration		Fundamental				
3	Frequency Tolerance	$\Delta F/F0$	-10	-	10	ppm	at 25°C±3°C
4	Operating Temperature Range	T <sub>OPR</sub>	-30	-	85	°C	
5	Frequency Stability	TC	-10	-	10	ppm	
6	Storage Temperature	T <sub>STG</sub>	-55	-	125	°C	
7	Load capacitance	CL	-	12	-	pF	
8	Equivalent Series Resistance	ESR	-	-	80	Ω	
9	Drive Level	DL	-	50	100	μW	
10	Insulation Resistance	IR	500	-	-	MΩ	At 100V <sub>DC</sub>
11	Shunt Capacitance	C0	-	-	3	pF	
12	Aging Per Year	Fa	-2	-	2	ppm	First Year
13	Package type	HCX-2SB					

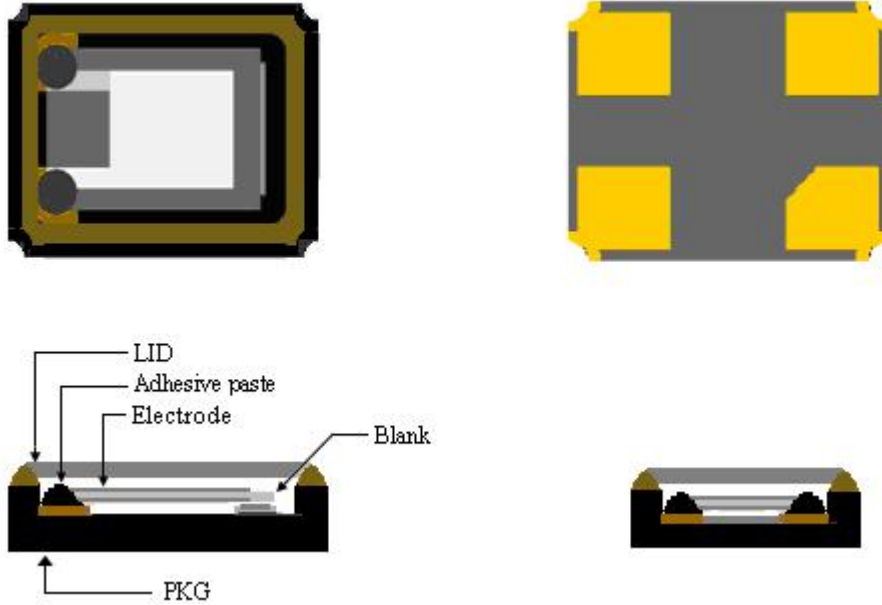
- **OUTLINE DIMENSIONS (UNIT: mm)**


**Top View**

**Recommended Solder Pattern**


Pin	Connection
#1,#3	X'tal
#2,#4	GND

- **MARKING**

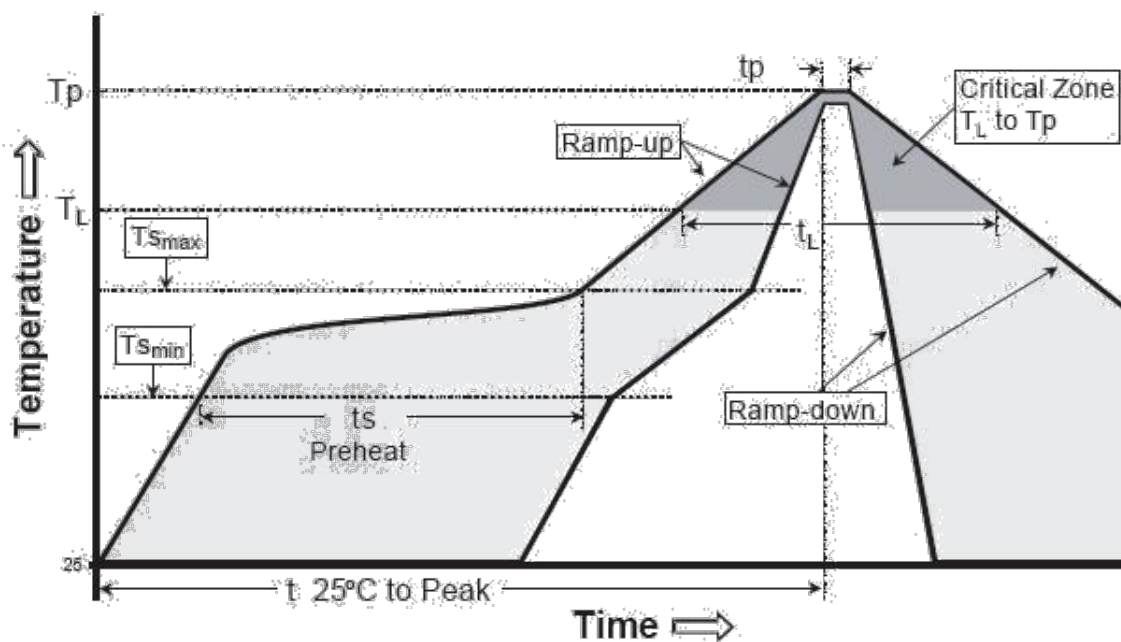


**● PRODUCT LAYOUT**


NO.	PART	MATERIAL	REMARK
1	LID	KOVAR(Fe+Co+Ni alloy)	
2	PKG	Al <sub>2</sub> O <sub>3</sub>	Base
3	Blank	SiO <sub>2</sub>	Quartz
4	Adhesive paste	Ag/Silicon	Support
5	Electrode	Noble metal	

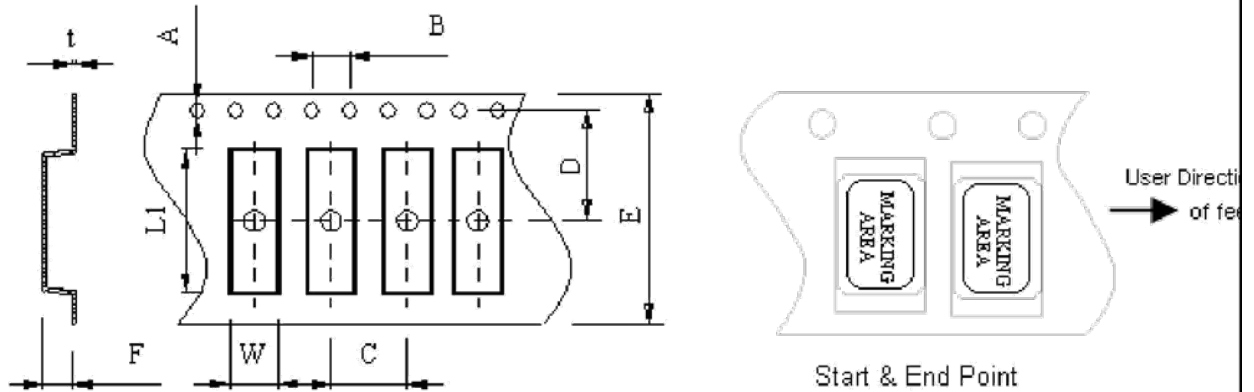
**REFLOW PROFILES**

Profiles Feature	Pb-Free Assembly
Average Ramp-up Rate (Ts max to Tp)	3°C/second max.
Preheat ■ Temperature Min (Ts min) ■ Temperature Max (Ts max) ■ Time (ts min to ts max)	125°C 200°C 60~180 seconds
Time maintained above ■ Temperature (TL) ■ Time (tL)	217°C 60~150 seconds
Peak/Classification Temperature (Tp)	260°C
Time within 5°C of actual Peak Temperature (tp)	20~40 seconds
Ramp-down rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.
<b>Suggest reflow times</b>	<b>3 Times max</b>


**Remark: To reference JEDEC J-STD-020C**

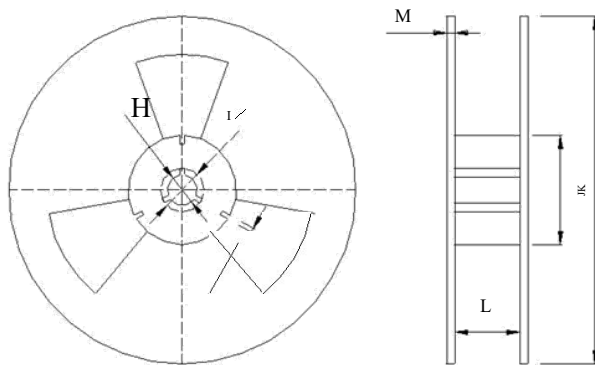
● **PACKAGE**

*Tape Dimensions(unit : mm)*



A	B	C	D	E	F	L1	W	t
1.50	4.0	4.0	3.5	8.0	1.0	2.75	2.25	0.2

*Reel Dimensions(unit: mm)*

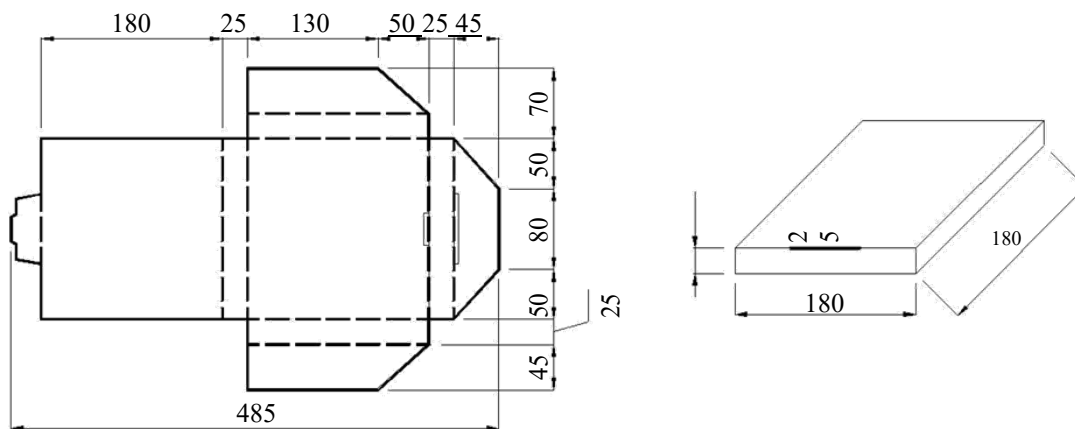


G	H	I	J	K	L	M
2.5	13.5	21.6	60.0	178	9.5	1.6

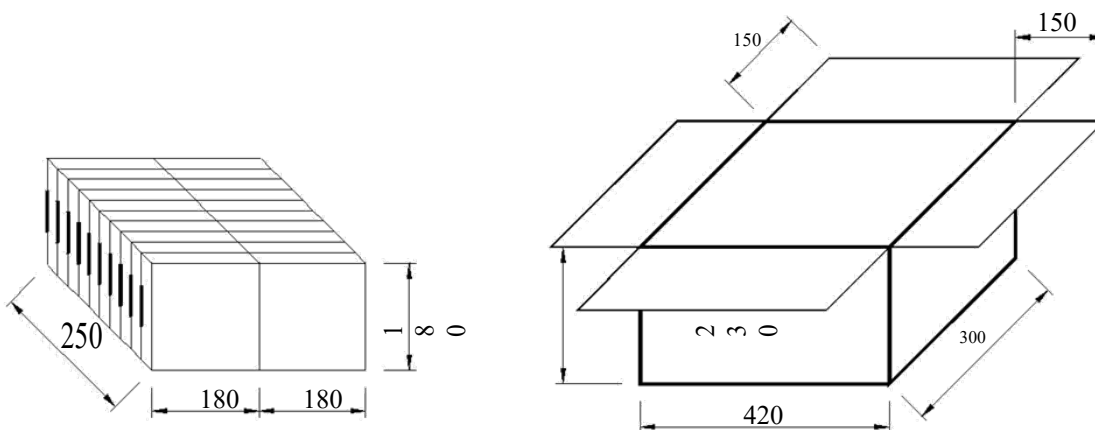
\*3000pcs/Reel







1 reel = 1 Inner box



20 Inner boxes = 1

Carton 60kpcs = 1 Carton

No.	Test Item	Test Conditions	Reference
1	High Temperature Storage	Temperature: 125°C ±5°C Time: 1000±12 Hours	MIL-STD-883E-1016
2	Temperature Cycle	Temperature 1: -55°C ±5°C Temperature 2: 125°C ±5°C Temperature change between T1 and T2 at soonest Run 1000 cycles, maintain T1 and T2 5minutes each in one cycle	JESD22 Method JA-104
3	Solder Heat Resistance	Pre-heat: 125°C 60~120 Seconds Solder Temperature: 260°C ±5°C Time: 30 Seconds	MIL-STD-202F 210 E
4	Drop Test	3 Times Free Fall from 75cm height table to 3cm thickness hard wood board	MIL-STD-202F-203B
5	High Temperature, High Humidity Storage	Temperature: 85°C ±5°C Relative Humidity: 80%~85% Time: 250Hours±24 Hours	MIL-STD-202F-103B
6	Steam Aging	Temperature: 97°C ±5°C Time: 24 Hours 260°C solder pot to check solderability	MIL-STD-883 C-1008.2B
7	Solderability	Dip in flux 5~10 seconds Temperature: 245°C ±5°C Time: 10 Seconds	MIL-STD-202F-208H
8	Aging	Temperature: 85°C ±5°C Time: 250±12Hours	MIL-STD-202 F-108A
9	Thermal Shock	Temperature 1: -55°C ±5°C Temperature 2: 125°C ±5°C Temperature change between T1 and T2: 5 seconds 100 cycles, maintain T1 and T2 for 30 minutes each in one cycle	MIL-STD-883E-1011.9B
10	Vibration	Frequency Range: 10Hz~2000Hz Amplitude: 1.5mm or 20G 4Hours in each direction, total 12Hours	MIL-STD-202F-204D

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