



HOSONIC ELECTRONIC CO., LTD.



CRYSTAL UNIT SPECIFICATIONS

Customer	ADS
Customer P/N	
Product	49SA CRYSTAL
Nominal Frequency	9.216000MHz
HOSONIC P/N	E49A9E00X000GE
Version	10C0
Issue Date	2015/4/25

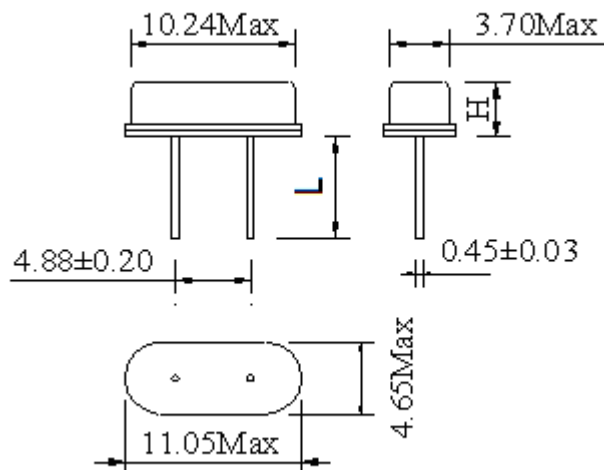
HOSONIC		
Drawn	Checked	Approved
LUCY	ZOE	JOHN

Approved By Customer : _____

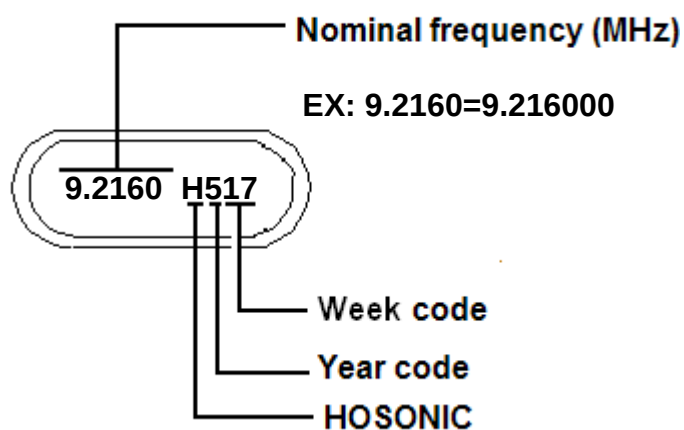
I ELECTRICAL PARAMETERS

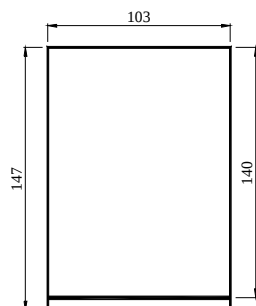
No.	Item	Symb.	Electrical Specification				Remark
			Min.	Typ.	Max.	Units	
1	Nominal Frequency	F0	9.216000			MHz	
2	Mode of Vibration		Fundamental				
3	Frequency Tolerance	$\Delta F/F0$	-30	-	30	ppm	at 25°C±3°C
4	Operating Temperature Range	T _{OPR}	-20	-	70	°C	
5	Frequency Stability	TC	-30	-	30	ppm	Ref. to 25°C
6	Storage Temperature	T _{STG}	-55	-	125	°C	
7	Load capacitance	CL	-	16	-	pF	
8	Equivalent Series Resistance	ESR	-	-	60	Ω	
9	Drive Level	DL	-	100	500	μW	
10	Insulation Resistance	IR	500	-	-	MΩ	At 100V _{DC}
11	Shunt Capacitance	C0	-	-	7	pF	
12	Aging Per Year	Fa	-5	-	5	ppm	First Year
13	Package type	HC-49SA					

NOTE: Storage Temperature is only for the product itself,the temperature for the packing material is -4~40°C .

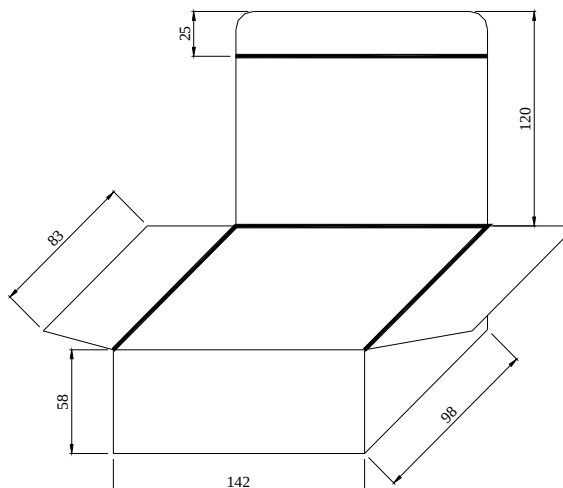
I Outline Dimensions (unit: mm)


$$L = 6.0 \pm 0.5 \quad H = 3.5 \text{MAX}$$

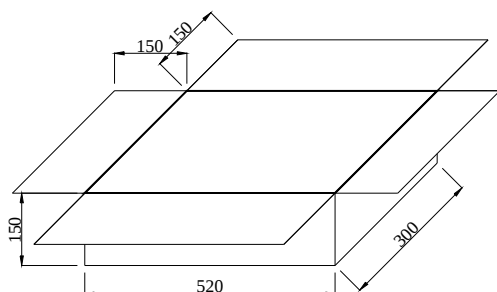
I MARKING


I PACKAGE (units : mm)


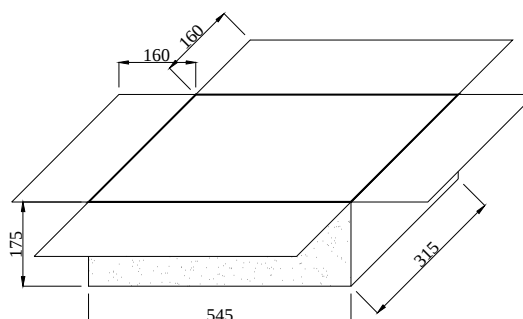
200 PCS = 1 BAG



5 BAGS = 1 INNER BOX



20 INNER BOX = 1 BOX



1 BOX = 1 OUTER BOX

* 20 K PCS = 1 OUTER BOX

I RELIABILITY SPECIFICATIONS

No.	Test Item	Test Conditions	Reference
1	High Temperature Storage	Temperature: $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Time: 1000 ± 12 Hours	MIL-STD-883E-1016
2	Temperature Cycle	Temperature 1: $-55^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Temperature 2: $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 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: $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 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: $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Relative Humidity: 80%~85% Time: 250Hours $\pm$ 24 Hours	MIL-STD-202F-103B
6	Steam Aging	Temperature: $97^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 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: $245^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Time: 10 Seconds	MIL-STD-202F-208H
8	Aging	Temperature: $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Time: 250 ± 12 Hours	MIL-STD-202 F-108A
9	Thermal Shock	Temperature 1: $-55^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Temperature 2: $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 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

CRYSTAL UNIT SPECIFICATIONS

Customer	ADS
Customer P/N	
Product	49SA CRYSTAL
Nominal Frequency	13.560000MHz
HOSONIC P/N	E49A13E0X000WE
Version	10C0
Issue Date	2016/4/12

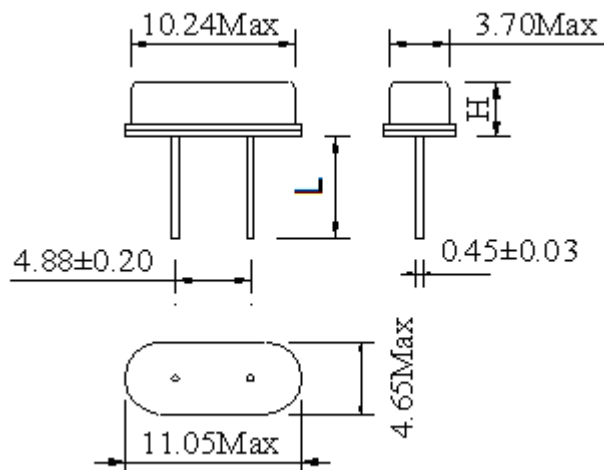
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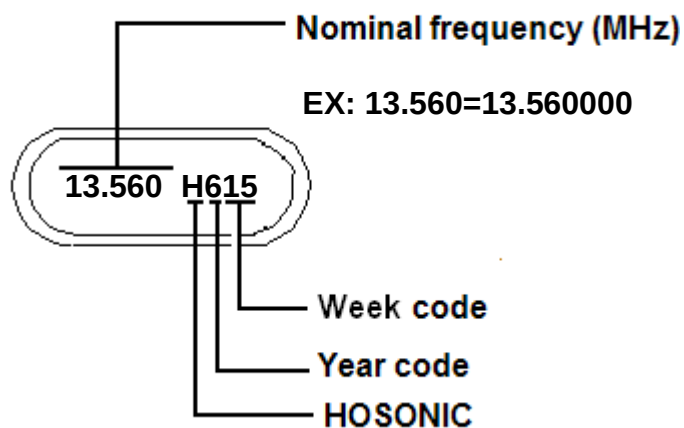
I ELECTRICAL PARAMETERS

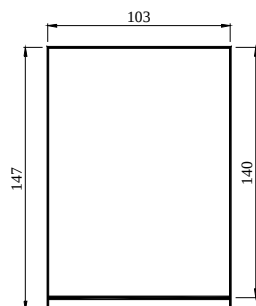
No.	Item	Symb.	Electrical Specification				Remark
			Min.	Typ.	Max.	Units	
1	Nominal Frequency	F0	13.560000			MHz	
2	Mode of Vibration		Fundamental				
3	Frequency Tolerance	$\Delta F/F0$	-30	-	30	ppm	at 25°C±3°C
4	Operating Temperature Range	T _{OPR}	-20	-	70	°C	
5	Frequency Stability (over operating temperature)	TC	-30	-	30	ppm	Ref. to 25°C
6	Storage Temperature	T _{STG}	-55	-	125	°C	
7	Load capacitance	CL	-	16	-	pF	
8	Equivalent Series Resistance	ESR	-	-	40	Ω	
9	Drive Level	DL	-	100	500	μW	
10	Insulation Resistance	IR	500	-	-	MΩ	At 100V _{DC}
11	Shunt Capacitance	C0	-	-	7	pF	
12	Aging Per Year	Fa	-5	-	5	ppm	First Year
13	Package type	HC-49SA					

NOTE: Storage Temperature is only for the product itself,the temperature for the packing material is -4~40°C .

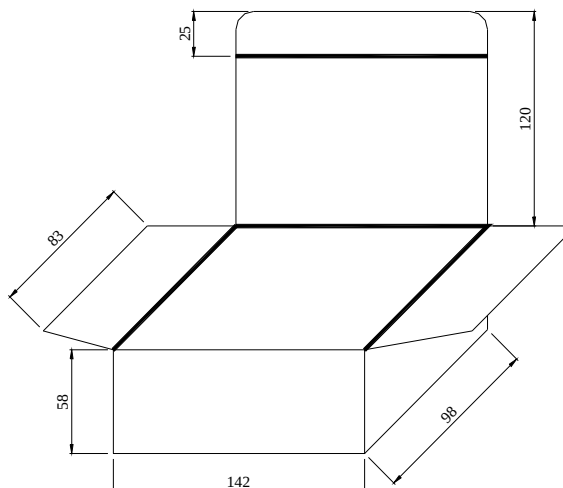
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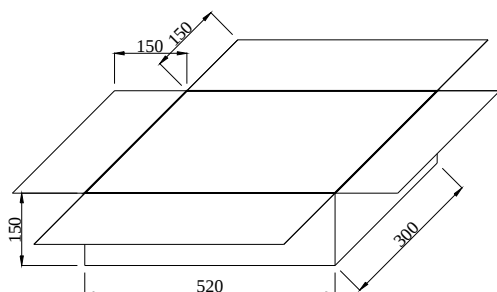
I MARKING


I PACKAGE (units : mm)


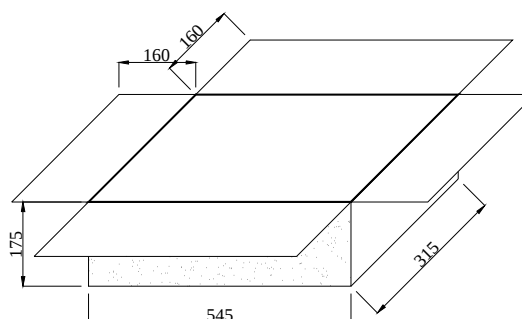
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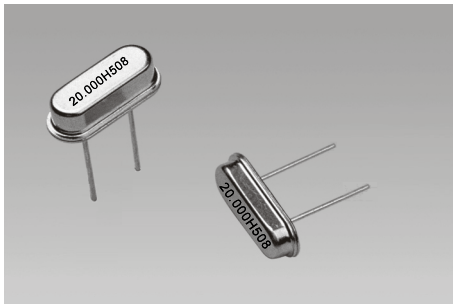
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3	Solder Heat Resistance	Pre-heat: 125°C 60~120 Seconds Solder Temperature: $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Time: 30 Seconds	MIL-STD-202F 210 E
4	Drop Test	3 Times Free Fall from 75cm height table to 3cm thickness hard wood board	MIL-STD-202F-203B
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10	Vibration	Frequency Range: 10Hz~2000Hz Amplitude: 1.5mm or 20G 4Hours in each direction, total 12Hours	MIL-STD-202F-204D

• E49A Series DIP 49US Crystal



This part is a miniature AT cut strip crystal units with a low profile package. It is with resistance weld.

FEATURES

- Low Cost
- Industry Standard
- Wide Frequency Range
- Excellent Aging

Electrical Specifications

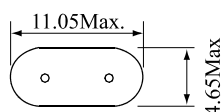
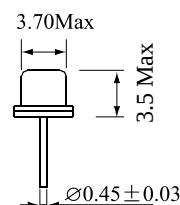
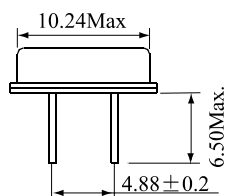
Type	E49A
Frequency Range	F0
Frequency Range	3.2~66.000MHz
Load Capacitance	CL
Load Capacitance	10pF to Series
Frequency Tolerance	$\Delta F / F_0$
Frequency Tolerance	$\pm 10\text{ppm}, \pm 30\text{ppm}, \pm 50\text{ppm}(\text{At } 25^\circ\text{C})$
Equivalent Series Resistance	ESR
Equivalent Series Resistance	See Table 1
Temperature Stability	TC
Temperature Stability	$\pm 10\text{ppm}, \pm 30\text{ppm}, \pm 50\text{ppm}(\text{Refer to } 25^\circ\text{C})$
Operating Temperature Range	TOPR
Operating Temperature Range	$-20\sim+70^\circ\text{C}, -30\sim+85^\circ\text{C}$ Option
Storage Temperature Range	TSTG
Storage Temperature Range	$-55\sim+125^\circ\text{C}$
Shunt Capacitance	C0
Shunt Capacitance	7pF max.
Insulator Resistance	IR
Insulator Resistance	500M Ω min. (At 100VDC)
Drive Level	DL
Drive Level	100 μW (500 μW max.)
Aging	Fa
Aging	$\pm 5\text{ppm}$ max. (At 25°C , First year)
Packing Unit	
Packing Unit	200pcs/bag

Table 1:Equivalent Series Resistance(ESR) and Mode of Vibration(Mode)

Frequency Range(Mhz)	Max ESR(Ω)	Mode	Frequency Range(Mhz)	Max ESR(Ω)	Mode
3.200 to 4.499	150	Fundamental/AT	9.000 to 9.999	60	Fundamental/AT
4.500 to 5.999	120	Fundamental/AT	10.000 to 12.999	50	Fundamental/AT
6.000 to 6.999	100	Fundamental/AT	13.000 to 40.000	40	Fundamental/AT
7.000 to 7.999	90	Fundamental/AT	40.000 to 66.000	80	3 rd Overtone
8.000 to 8.999	80	Fundamental/AT			

****Please contact us for inquiries regarding other Specifications**

Mechanical Dimensions(mm)



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CHINA:

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☎: 86-571-88778857
✉: hosonic.sales@hosonic.com

Specifications are subject to change without notice