



## HC49US Thru-hole Crystals

■ Holder Type: 92 / 93 / 9S / 94 / 95

### Frequency Range:

3.01MHz to 100.00MHz

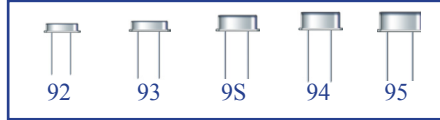
### Features:

- High Reliability & Low Cost Unit
- Tight Stability & Extended Temperature Available
- Lead-free Type
- For automotive applications, please contact our sales representative



92      93      9S      94      95

Actual Size



QUARTZ  
CRYSTALS

## ■ Standard Specifications

Item	Value
Frequency Range <sup>[*]</sup>	3.01 to 100.00 MHz
Frequency Tolerance	±30ppm (tighter tolerance also available)
Frequency Tolerance over Temperature range	±50ppm (tighter tolerance also available)
Operating Temperature Range	-10 °C to +60 °C (other operating range also available)
Operable Temperature Range	-40 °C to +85 °C
Equivalent Series Resistance (ESR)	Please refer to the ESR Table
Drive Level	50μW Typ. (300μW Max.)
Load Capacitance	12pF (3pF, 4.5pF, 6pF and series also available)
Ageing	±5ppm/year

Remark [\*]: 92 package starts from 6.0MHz

## ■ ESR Table

Frequency Range (MHz)	Mode	Standard ESR (Ohm)
3.01 to 3.5	AT Cut Fund.	300
3.5 to 4.0	AT Cut Fund.	150
4.0 to 4.5	AT Cut Fund.	130
4.5 to 5.0	AT Cut Fund.	110
5.0 to 6.0	AT Cut Fund.	80
6.0 to 7.0	AT Cut Fund.	60
7.0 to 10.0	AT Cut Fund.	50
10.0 to 13.0	AT Cut Fund.	40
13.0 to 50.0	AT Cut Fund.	30
27.0 to 100.0	BT Cut	40
26.0 to 100.0	3rd Overtone	100

Note:

1. Manufacturer reserves the right to change the specification and content of this product for improvement without notification.
2. Custom specification is welcome. Please contact our sales representative for further details.
3. If the crystal is intended for applications which have direct impact on human life and properties, and require a high degree of reliability and safety concerns, customers must provide full information such as but not limit to the application, electrical and reliability specification at the inquiry beginning stage.
4. Customers have to agree to the "Guideline for handling crystal units" and "Standard Terms and Condition of Sales" which is printed this catalog before placing orders to our company or our distributors. There are also unpredictable factors such as applied condition, oscillation margin and etc and customers must check them beforehand. In case of queries, please do not fail to send inquiry to our company before ordering.

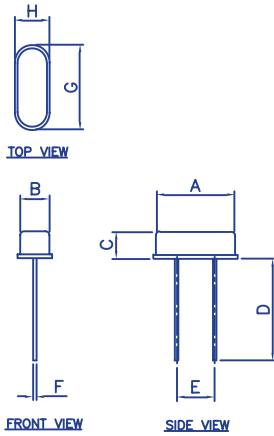
Ver.1.1

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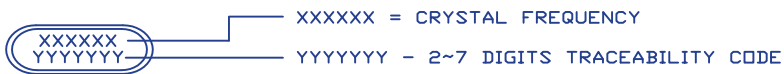
### ■ Dimensions (mm)



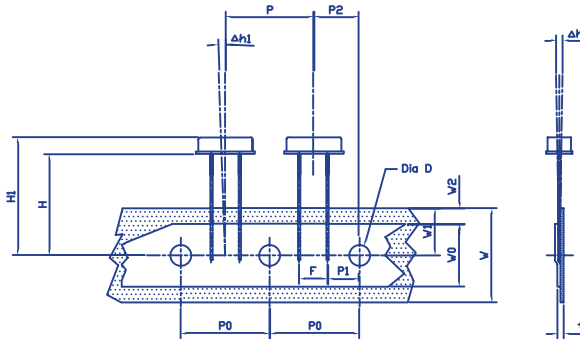
ITEM	DIMENSION	
A	10.16 Max.	
B	3.81 Max.	
C	TYPE	HEIGHT
	92	2.25/2.35mm*
	93	2.50mm Max.
	95	3.50mm Max.
	94	4.00mm Max.
D	1.LEAD LENGTH	13.2±0.5(STANDARD)
	2.LEAD LENGTH (2.8~16)±0.5	REFER TO CUSTOMER REQUEST
E	4.88 ±0.2	
F	0.45 ±0.05	
G	11.05 Max.	
H	4.7 MAX	

\* >5MHz = 2.25mm MAX  
<5MHz = 2.35mm MAX

#### MARKING INFORMATION



### ■ Bulk pack / Optional Tape Packing(mm)



NOTE: CRYSTAL DIMENSIONS PLEASE REFER TO CRYSTAL DRAWING

ITEM	SYMBOL	SIZE (mm)	REMARKS
PITCH OF COMPONENT	P	12.70 ± 1.0	
FEED HOLE PITCH	P0	12.70 ± 0.3	
HOLE CENTER TO LEAD	P1	3.85 ± 0.7	
FEED HOLE CENTER TO COMPONENT CENTER	P2	6.35 ± 1.3	
LEAD TO LEAD DISTANCE	F	5.00 ± 0.5	
COMPONENT ALIGNMENT	Δh	0.00 ± 2.0	
	Δh1	0.00 ± 2.0	
TAPE WIDTH	W	18.00 ± 0.4	
HOLD DOWN TAPE WIDTH	W0	12.00	
HOLD POSITION	W1	9.00 ± 0.5	
HOLD DOWN TAPE POSITION	W2	0.00 ± 0.8	
HEIGHT OF COMPONENT FROM TAPE CENTER	H	19.00 ± 1.0	
LEAD WIRE CLUNCH HEIGHT	H0	—————	
COMPONENT HEIGHT	HT	24.0 MAX.	
FEED HOLE DIAMETER	Dia D	4.00 ± 0.2	
TOTAL TAPE THICKNESS	t	0.60 ± 0.3	

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