

# Quartz Crystals

**HUS**

[ 10.7 \* 4.3 \* 3.5 mm ]

**HUSL**

[ 10.7 \* 4.3 \* 2.5 mm ]

Thru - Hole Crystals

Fundamental

3rd Overtone

Min.

3 MHz

Max.

100 MHz

**Features**

**Specifications**

- HUSL ( 2.5mm height ) & HUS ( 3.5mm height )
- Low cost and light weight



**General Specifications**

Item / Type	HUSL ( 10.7 * 4.3 * 2.5mm ) series	HUS ( 10.7 * 4.3 * 3.5mm ) series
Frequency Range & Crystal Cut	3.000 ~ 48.000 MHz , AT-cut , Fundamental Mode ( see Table 1 ) 27.000 ~ 100.000 MHz , AT-cut , 3rd overtone ( see Table 1 )	
Load Capacitance	Series or Parallel ( 8 to 32 pF ) resonance	
Drive Level	100μ W typical ( 500μ W max. )	
Frequency Tolerance	± 10 ppm , ± 20 ppm or ± 30 ppm ( max. ) at 25°C	
Frequency Stability	See Table 2	
Aging	ΔF / F : ±3 ppm ( max. )	
Storage Temperature Range	- 50°C to 105°C	

Table 1

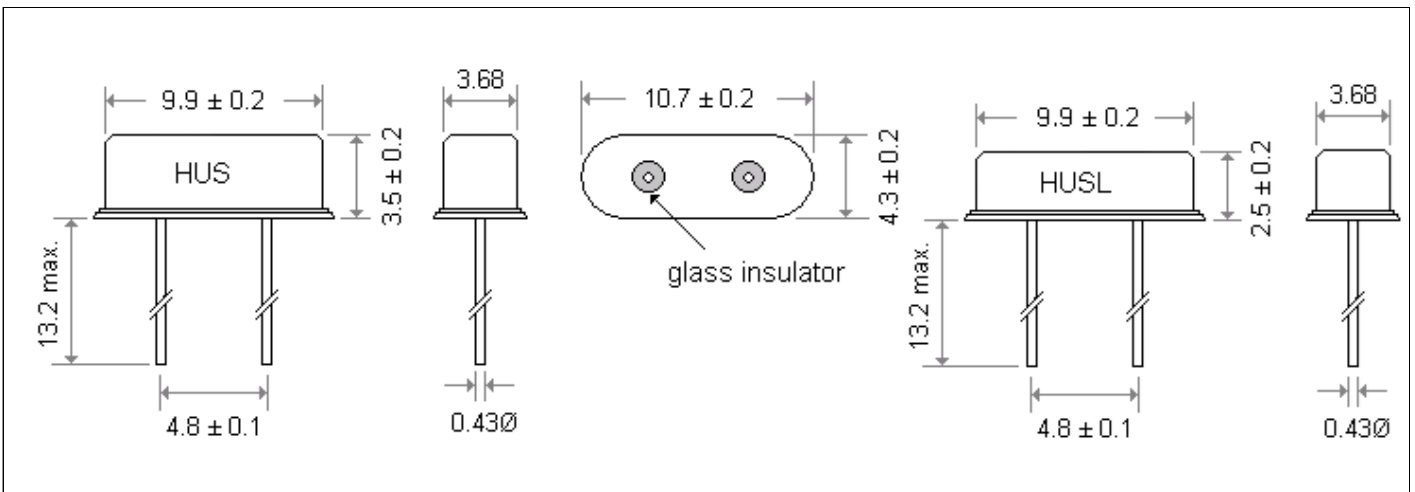
ESR ( Equivalent Series Resistance )					
Freq.(MHz)	E.S.R.	Osc. Mode	Freq.(MHz)	E.S.R.	Osc. Mode
3.0 ~ 3.4	300 Ω	AT , Fund.	27.0 ~ 30.0	150 Ω	AT , 3rd
3.5 ~ 6.0	120 Ω		30.1 ~ 50.0	100 Ω	
6.1 ~ 10.0	60 Ω		50.1 ~ 100.0	80 Ω	
10.1 ~ 48.0	40 Ω				

Table 2

Frequency stability vs Operating temperature range						
Stability code	Temp. (°C) \ ppm	± 10	± 15	± 20	± 25	± 30
X	-10 to 60°C	○	○	○	○	○
Y	-20 to 70°C	▲	○	○	○	○
I	-40 to 85°C		○	○	○	○

○ : available ; ▲ : contact Mercury

**Outline Dimensions ( Unit : mm )**



Mercury [www.mercury-crystal.com](http://www.mercury-crystal.com)

Taiwan : Tel: (+886)-2-2406-2779 / sales-tw@mercury-crystal.com

USA : Tel: (+1)-909-466-0427 / sales-us@mercury-crystal.com

China : Tel: (+86)-512-5763-8100 / sales-cn@mercury-crystal.com

# Part Number Formats and Product Marking Rules

## Quartz Crystals

### Holder Type

SMD type :	X11	X21	X22	X32	X42	MJ	MF	MQ	M49	ML49	MP5	MP4	MP25	MP24
Dip type :	H49	HUS	HUSL	U1	U5	T38	T26							
Jacket type :	H49MJ	49TMJ	U1MJ	U5MJ	T26MJ									
Gull wing :	H49SM	49TSM	U1SM	U5SM	T26SM									

### Part Number Format

	[ 1 ] Holder Type	-	[ 2 ] Center Freq.	-	[ 3 ] CL	-	[ 4 ] Freq. Tolerance	/	[ 5 ] Freq. Stability	[ 6 ] Operating Temp. Range Code	/	[ 7 ] Special ESR
Example (1)	H49	-	40.000A3	-	12	-	30	/	30	X		
(2)	X32	-	26.000	-	16	-	30	/	30	X	/	20R
(3)	MJ	-	12.000	-	20	-	10	/	10	W		
(4)	M49	-	24.000	-	18	-	20	/	30	H	/	15R

- Ex (1) : H49 - 40.000A3 - 12 - 30 / 30 X [ 49/U type , 40.000MHz , AT-cut 3rd overtone , 12pF , ±30ppm ( 25°C ) , ±30ppm ( -10°C to 60°C ) ]  
 Ex (2) : X32 - 26.000 - 16 - 30 / 30 X / 20R [ X32 type , 26.000MHz , 16pF , ±30ppm ( 25°C ) , ±30ppm ( -10°C to 60°C ) , 20 Ω ]  
 Ex (3) : MJ - 12.000 - 20 - 10 / 10 W [ MJ type , 12.000MHz , 20pF , ±10ppm ( 25°C ) , ±10ppm ( 0°C to 50°C ) ]  
 Ex (4) : M49 - 24.000 - 18 - 20 / 30 H / 15R [ M49 type , 24.000MHz , 18pF , ±20ppm ( 25°C ) , ±30ppm ( -30°C to 85°C ) , 15 Ω ]

[ 1 ]	Holder Type										
[ 2 ]	Center frequency . Please add " A3 , A5 or B " after the " Freq. in MHz " for the quartz cut other options . Blank : AT-cut fund. mode ; A3 : AT-cut 3rd overtone ; A5 : AT-cut 5th overtone ; B : BT-cut fund. mode										
[ 3 ]	Load Capacitance ( CL ) : series ( spec. code is " S " ) or										
	Parallel ( If parallel , please specify CL value , typical CL ranges from 8 to 32 pF )										
	Available Options " V " = Vinyl sleeve around holder , " K " = 3rd lead at bottom center , " R " = On reel " G " = 3rd lead at top center , " I " = Teflon insulator at bottom										
[ 4 ]	Calibration tolerance value : freq. tolerance value ( at 25°C ) , industrial temp. range										
[ 5 ]	Frequency Stability , industrial temp. range										
[ 6 ]	Temp. Range	W	0°C ~ +50°C	X	-10°C ~ +60°C	Y	-20°C ~ +70°C	F	-30°C ~ +70°C	G	-10°C ~ +80°C
		H	-30°C ~ +85°C	I	-40°C ~ +85°C	J	-40°C ~ +90°C	K	-40°C ~ +105°C	M	-55°C ~ +105°C
	Options	N	-55°C ~ +125°C	Z	Customized						
[ 7 ]	If non-standard please enter the desired ESR ( Equivalent Series Resistance ) after " / " , for example " 20R " : 20Ω										

### Production Marking Rules

General X'tal package type marking rules	MQ, MF, MJ, X42 marking rules	X22, X32 marking rules																																																												
<p>( Cutting method ) :                      A : AT-cut ( fundamental )                      B : BT-cut ( fundamental )                      3 : AT-cut ( 3rd overtone )                      5 : AT-cut ( 5th overtone )</p> <p>Lot code :                      ( month ) : Table 2                      ( Year ) :                      ex : 2020 --- 0                      2021 --- 1</p> <p>Load capacitance ( CL ) : Table 1</p>	<p>Mercury Logo</p> <p>( Cutting method ) :                      A : AT-cut , fundamental                      B : BT-cut , fundamental                      3 : AT-cut , 3rd overtone                      5 : AT-cut , 5th overtone</p> <p>Lot code :                      ( Month ) --- Table 2                      ( Year ) --- 2020 --- 0</p> <p>Load capacitance ( CL ) : Table 1</p>	<p>Mercury Logo</p> <p>( Month ) --- Table 2                      ( Year ) 2020 --- 0                      2021 --- 1</p> <p>Load capacitance ( CL ) : Table 1</p>																																																												
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