

U1, U5

[7.8 * 3.2 * 8.0 (6.0) mm]

U1SL

[7.8 * 2.6 * 8.0 mm]

Thru - Hole Crystals

Fund.

3rd O.T.

5th O.T.

Min.

1.0MHz

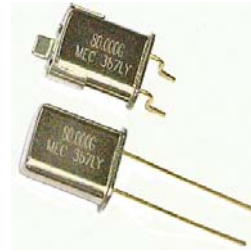
Max.

200MHz

Features

Specifications

- A round shaped AT-Cut crystal plate inside.
- Available up to 200 MHz using a 5th overtone crystal mode
- Annealed and pre-aged for low frequency drift over a long-term operation



RoHS Compliance

General Specifications

Item / Type	U1 ; U1SL ; U5 ; U1MJ ; U5MJ series
Frequency Range	U1 & U1MJ : 1.0 ~ 1.2MHz , 4.0 ~ 200.0MHz ; U5 : 10.0 ~ 200MHz
Load Capacitance	Series or Parallel (8 to 32 pF) resonance
Drive Level	100μ W typical (500μ W max.)
Frequency Tolerance	AT-cut : ± 5 ppm , ± 10 ppm , ± 20 ppm or ± 30 ppm at 25°C SL-cut : ± 50 ppm at 25°C
Frequency Stability	See Table 2
Aging	ΔF / F : ±3 ppm / year (max.)
Storage Temperature Range	- 50°C to 105°C

Table 1

U1 & U1MJ ESR (Equivalent Series Resistance)			U5 & U5MJ ESR (Equivalent Series Resistance)		
Freq.(MHz)	Osc. Mode	E.S.R.	Freq.(MHz)	Osc. Mode	E.S.R.
1.0 ~ 1.2	SL, Fund.	5K Ω	11.0 ~ 12.9	AT, Fund.	40 Ω
6.0 ~ 6.9	AT, Fund.	100 Ω	13.0 ~ 45.0	AT, Fund.	25 Ω
7.0 ~ 7.9	AT, Fund.	90 Ω	30.0 ~ 50.0	AT, 3rd	40 Ω
8.0 ~ 8.9	AT, Fund.	80 Ω	50.1 ~ 100.0	AT, 3rd	50 Ω
9.0 ~ 10.9	AT, Fund.	90 Ω	80.0 ~ 200.0	AT, 5th	80 Ω
			10.0 ~ 11.9	AT, Fund.	60 Ω
			12.0 ~ 14.9	AT, Fund.	50 Ω
			15.0 ~ 35.0	AT, Fund.	30 Ω
			35.1 ~ 90.0	AT, 3rd	60 Ω
			90.1 ~ 135.0	AT, 3rd	40 Ω
			90.1 ~ 159.0	AT, 5th	100 Ω
			160.0 ~ 200.0	AT, 5th	80 Ω

Table 2

Stability code	Temp. (°C) \ ppm	Frequency stability vs Operating temperature range							
		± 5	± 10	± 15	± 20	± 25	± 30	± 50	± 100 (SL-cut)
X	-10 to 60°C	○	○	○	○	○	○	○	○
Y	-20 to 70°C	▲	○	○	○	○	○	○	○
I	-40 to 85°C		▲	○	○	○	○	○	○

○ : available ; ▲ : contact Mercury

Outline Dimensions (Unit : mm)

Dip type (U1, U1SL, U5)				Metal jacket (U1MJ, U5MJ)		
	H	T1	T2		H	W
U1	8.0 ± 0.2	2.2 ± 0.2	3.2 ± 0.2	U1MJ	8.0 ± 0.2	11.8 ± 0.2
U1SL	8.0 ± 0.2	1.8 ± 0.2	2.6 ± 0.2	U5MJ	6.0 ± 0.2	9.8 ± 0.2
U5	6.0 ± 0.2	2.2 ± 0.2	3.2 ± 0.2			

Mercury www.mercury-crystal.com

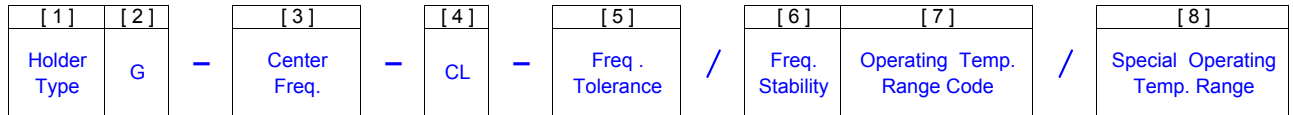
Part Number Formats and Product Marking Rules

Quartz Crystals

Holder Type

SMD type :	X22	X32	X42	MJ	MF	MQ	M49	ML49	MP5	MP4
Dip type :	H49	49T	H50	H48	HUS	HUSL	U1	U5	T38	T26
Jecket type :	H49MJ	49TMJ	U1MJ	U5MJ	T38MJ	T26MJ				
Gull wing :	H49SM	49TSM	U1SM	U5SM	T38SM	T26SM				

Part Number Format



Example	(1)	H49	G	-	40.000A3	-	12					
	(2)	MJ		-	12.000	-	20	-	10	/	10	Y
	(3)	M49	G	-	24.000	-	18	-	20	/	30	/

Ex (1) : H49G - 40.000A3 - 12 [49/U type, RoHS, 40.000MHz, AT-cut 3rd overtone, 12pF, ±30ppm (25°C), ±30ppm (-10°C to 60°C)]

Ex (2) : MJ - 12.000 - 20 - 10 / 10 Y [MJ type, 12.000MHz, 20pF, ±10ppm (25°C), ±10ppm (-20°C to 70°C)]

Ex (3) : M49G - 24.000 - 18 - 20 / 30 / -30+75 [M49 type, RoHS, 24.000MHz, 18pF, ±20ppm (25°C), ±30ppm (-30°C to 75°C)]

[1]	Holder Type
[2]	Please add " G " after the " type code " for RoHS compliant (Does not apply to X22 , X32 , X42 , MJ , MF , MQ series)
[3]	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
[4]	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
[5]	Calibration tolerance value : freq. tolerance value (at 25°C) , industrial temp. range
[6]	Frequency Stability , industrial temp. range
[7]	industrial temp. range --- X : -10°C to 60°C ; Y : -20°C to 70°C ; I : -40°C to 85°C
[8]	If non-standard please enter the desired temp. range after " / " , for example " / -30+70 " : -30°C to 70°C

Production Marking Rules

General X'tal package type marking rules	MQ, MF, MJ, X42 marking rules	X22, X32 marking rules
<p>(X22 , X32 , X42 , MJ , MF , MQ series are not included.)</p> <p>Suffix " G " for RoHS compliant .</p> <p>(Cutting method) : A : AT-cut (fundamental) B : BT-cut (fundamental) 3 : AT-cut (3rd overtone) 5 : AT-cut (5th overtone)</p> <p>Date code (month) : Table 2 (Year) : ex: 2010 --- 0 2011 --- 1</p> <p>Load capacitance (CL) : Table 1</p>	<p>MQ, MF, MJ, X42 marking rules</p> <p>(Cutting method) : A : AT-cut , fundamental B : BT-cut , fundamental 3 : AT-cut , 3rd overtone 5 : AT-cut , 5rd overtone</p> <p>Date code (Month) --- Table 2 (Year) --- 2010 --- 0 Load capacitance (CL) : Table 1</p>	<p>X22, X32 marking rules</p> <p>Date code (Month) --- Table 2 (Year) 2010 --- 0 2011 --- 1</p>

Table 1	CL	< 10	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	>34	Series
	Code	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	a	b

Table 2	Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
	Code	A	B	C	D	E	F	G	H	I	J	K	L

Mercury Green Program

Common points for all crystal products

Mercury Green Program

Mercury's Green Program is implemented in accordance with the European Union's directive on "Restriction of the use of certain Hazardous Substance(RoHS)". Mercury's Lead-Free and RoHS Compliant products follow the EU directive (2002/95/EC) and include test reports issued by SGS Group on hazardous substances levels for the six substances: lead(pb), cadmium(cd), mercury (Hg), hexavalent chromium(Cr+6), polybrominated biphenyl(PBB), and polybrominated diphenyl ether (PBDE).

- Crystal Green Program-Crystals
- Crystal Oscillator Green Program-XO、VCXO、VCTCXO、TCXO、OCXO
- Crystal Filter Green Program-Filters



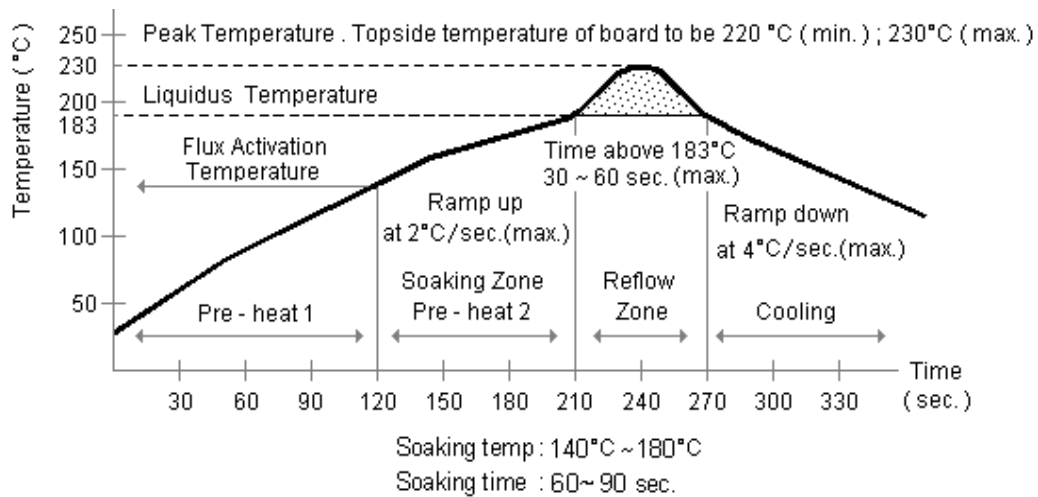
**RoHS Compliant Product
by Mercury**

Soldering conditions

- (1) Lead wires should be soldered within 3 seconds with the iron heated to a temperature of 380°C (max.).
- (2) In solder-dip mounting , it should be within 10 seconds with a temperature of 260°C (max.).
Heating the whole crystal unit in the dip mounting process should be avoided .
Upright mounting is recommended (to prevent applying heat directly to the body of a crystal unit).
- (3) Heating the whole body of the crystal unit , for example , in a reflow oven may affect the performance.
The holder is small and is sealed by solder material by press sealing , so that such a reflow process is not allowed to be applied .

Suggested Reflow Profile [SMD type products]

(1) Low temperature solder reflow : For Sn62 , Pb36 , Ag2 , Sn63 , Pb37 alloy .



(2) High temperature solder reflow : For Sn96.5% , Ag3.5% , Cu0.5% alloy .

