

FEATURES

- Cost effective
- Excellent aging
- Wide frequency range
- Low profile
- Excellent reliability
- Tape and Reel (1,000 pcs)

ECS's UM 1,5,4 quartz crystals are ideal for use in compact communication equipment.

PART NUMBERING GUIDE "EXAMPLE"

ECS	FREQUENCY (16.0000 MHz)	LOAD CAPACITANCE*	PACKAGE TYPE**
-	160	20	22

* Load capacitance (xx=xx pF, S= series resonance), ** Package Type examples (22 = UM-1, 21= UM-5, 25 = UM-4)
 Note: See Product Selection Guide for additional options.

OPERATING CONDITIONS/ELECTRICAL CHARACTERISTICS

PARAMETERS	UM-1	UM-5	UM-4
FREQUENCY RANGE	FUNDAMENTAL 10.000 ~ 30.000 MHz 3RD OVERTONE 25.000 ~ 90.000 MHz	30.000 ~ 90.000 MHz	
FREQUENCY TOLERANCE (@ +25°C)		See Table 1	
FREQUENCY-TEMPERATURE TOLERANCE (@ +25°C)		See Table 2	
OPERATING TEMPERATURE RANGE T _{OPR}		See Table 2	
STORAGE TEMPERATURE RANGE T _{STG}		-40 ~ +90°C	
LOAD CAPACITANCE (C _L)		10pF - Series (Customer Specified)	
SHUNT CAPACITANCE (C ₀)		7 pF max.	
DRIVE LEVEL (D _L)		500 μW max.	
CRYSTAL CUT		AT-cut	

TABLE 1 FREQUENCY TOLERANCE (@ +25°C)

Tolerance (x 10 ⁻⁶)				
±10	±15	±20	±30	±50
●	●	○	○	○

● recommended
○ available

TABLE 2 FREQUENCY-TEMPERATURE TOLERANCE (@ +25°C)

FREQUENCY	Tolerance (x 10 ⁻⁶)						
	±3.0	±5.0	±7.5	±10	±15	±20	±30
0 ~ +50°C	○	○	○	○			
-10 ~ +60°C		○	○	●	○		
-20 ~ +70°C			○	○	○	○	
-30 ~ +75°C					○	○	○
-30 ~ +80°C					○	○	●
-35 ~ +80°C						○	○
-40 ~ +85°C						○	○

TABLE 3 EQUIVALENT SERIES RESISTANCE / MODE OF OSCILLATION

NOMINAL FREQUENCY (MHz)	MODE	ESR (Ω)	
		UM-1	UM-5, UM-4
10 ~ 15	FUNDAMENTAL	40 max.	50 max.
15 ~ 30	FUNDAMENTAL	25 max.	30 max.
25 ~ 30	3rd	50 max.	60 max.
30 ~ 90	3rd	45 max.	60 max.

PACKAGE DIMENSIONS (mm)

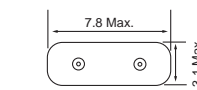
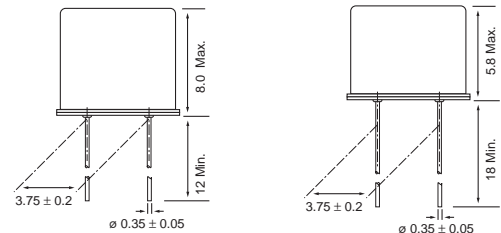


Figure 1) UM-1 Crystal Unit Side and Bottom view

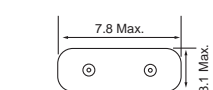


Figure 2) UM-5 Crystal Unit Side and Bottom view

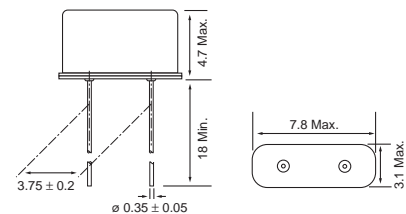


Figure 3) UM-4 Crystal Unit Side and Bottom view