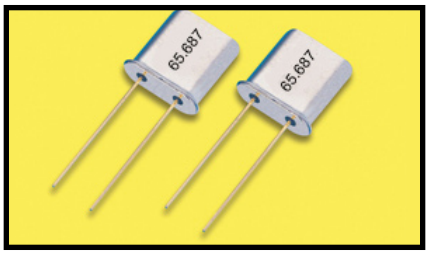
Quartz Crystal Unit UM-1 & UM-5 — D & E Series

Resistance Weld Package *(UM-1, UM-5)*

MEC Crystals

Features:

- Excellent frequency temperature characteristics extending across a wide temperature range.
- Excellent aging characteristics.
- Uniform frequency tuning range and modulation sensitivity.
- Excellent shock resistance.
- **RoHs Compliant (Pb Free)**



Electrical Specifications:

	Code: D	Code: E
Holder Type	UM-1	UM-5
Frequency Range	4.000MHz ~ 200.000MHz	
Mode of Vibration	Fundamental / 3rd Overtone / 5th Overtone / 7th Overtone	
Frequency Tolerance	±10ppm ~ ±50ppm @ 25°C	
Frequency Stability	see Freq. Stability v.s. Operating Temp. Table	
Operating Temperature Range	-20°C ~ +70°C (Typ.), -10°C ~ +60°C, -40°C ~ +85°C or specify	
Storage Temperature Range	-40°C ~ +85°C	
Load Capacitance	Series, 16pF, 20pF, 30pF or specify	
Drive Level	100μW (Typ.)	
Shunt Capacitance (Co)	4.5pF ~ 7pF (Typ.)	
Aging	±5ppm / year	
Equivalent Series Resistance (E.S.R.)	see chart	

Part Numbering System:

24D0000 — 16 F X 10 15

① ② ③ ④ ⑤ ⑥

①
- First five digits of the frequency or all significant digit if frequency contains more than 5 digits.
- Holder code represented by letter "D" or "E" for holder type & indicating decimal point.

② Load Capacitance CL

Code	Load Capacitance
S	Series
16	16pF
20	20pF
30	30pF
Specify	

③ Mode of Vibration

Code	Cut-Mode
F	AT Fund
3	AT 3rd OT
5	AT 5th OT
7	AT 7th OT

④ Operating Temperature

Code	Ranges
A	-10°C ~ +60°C
B	-20°C ~ +70°C
X	-40°C ~ +85°C

⑤ Frequency Tolerance

Code	Tolerance
10	± 10 ppm
20	± 20 ppm
30	± 30 ppm
50	± 50 ppm

⑥ Frequency Stability

Code	Stability
10	± 10 ppm (-10°C ~ +60°C) & (-20°C ~ +70°C)
15	± 15 ppm (-10°C ~ +60°C) & (-20°C ~ +70°C)
20	± 20 ppm (-10°C ~ +60°C) & (-20°C ~ +70°C) & (-40°C ~ +85°C)
25	± 25 ppm (-10°C ~ +60°C) & (-20°C ~ +70°C) & (-40°C ~ +85°C)
30	± 30 ppm (-10°C ~ +60°C) & (-20°C ~ +70°C) & (-40°C ~ +85°C)
50	± 50 ppm (-10°C ~ +60°C) & (-20°C ~ +70°C) & (-40°C ~ +85°C)

Remark: Specifications are subject to change without prior notice. Please confirm with our sales engineer.

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Frequency Stability vs. Operating Temperature Range:

Temperature Range	Frequency Stability					
	± 10ppm	± 15ppm	± 20ppm	± 25ppm	± 30ppm	± 50ppm
-10°C ~ +60°C	●	●	●	●	●	●
-20°C ~ +70°C	●	●	●	●	●	●
-40°C ~ +85°C			●	●	●	●

Equivalent Series Resistance (ESR) & Mode of Operation (Mode):

Frequency Range	E.S.R. (Ω)	Mode	Frequency Range	E.S.R. (Ω)	Mode
4.000MHz ~ 4.999MHz	100 max	Fundamental	14.000MHz ~ 19.999MHz	40 max	Fundamental
5.000MHz ~ 5.999MHz	90 max	Fundamental	20.000MHz ~ 23.999MHz	30 max	3rd Overtone
6.000MHz ~ 6.999MHz	80 max	Fundamental	24.000MHz ~ 34.999MHz	40 max	3rd Overtone
7.000MHz ~ 9.999MHz	60 max	Fundamental	35.000MHz ~ 100.000MHz	80 max	3rd Overtone
10.000MHz ~ 13.999MHz	50 max	Fundamental	100.000MHz ~ 200.000MHz	100 max	5th / 7th Overtone

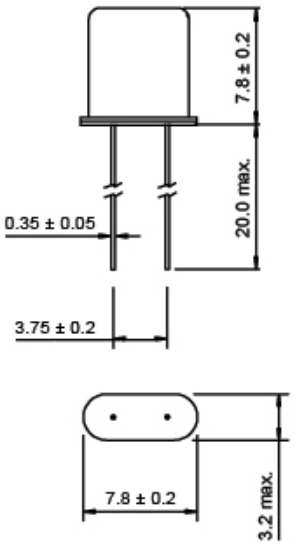
Mechanical Characteristics:

Resistance to shock	± 3 ppm max. ±3Ohms max., naturally drop it 3 times on a hard wood plate from 100cm height.
Resistance to vibration	± 3 ppm max. ±3Ohms max.

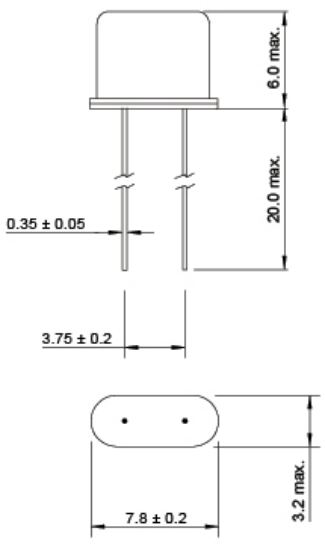
Reliability:

Aging		± 3 ppm max. / year
Air tightness		
	(1) Gross leak	should be immerged in hot water (90 ± 5°C) for 5 minutes
	(2) Fine leak	should be less than 5 x 10^{-8} atmcc/sec by helium leak detector
Low drive characteristics		Measured Δ1, C1, 3 point at 1.0, 10, 100μW

UM-1



UM-5



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