

Crystals in UM-1 cases

General application

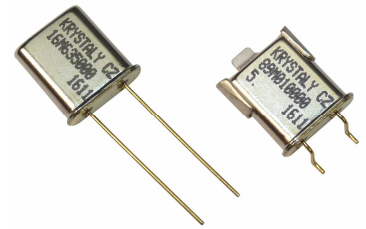
Microcomputers, audio-/video-applications, wireless phones, communication devices

Features

Cases UM-1 series are highly reliable, hermetically sealed by seam welding.
Crystals can be supplied in slim cases, see outline dimensions below.

Assembly, taping

Cases UM-1 series are designed for through hole mount, but can be designed for SMD too.
Crystals in SMD modification can be delivered in tapes wound on reels, suitable for automatic assembly.



Typical specifications

Type	UM-1				
Overtone	1.	3.	5.	7.	9.
Frequency range [MHz]	3.5-45	16-135	60-190	60-190	120-190
Freq. adjustment tolerance at 25°C	±5, ±7, ±10, ±15, ±20, ±50 x 10 ⁻⁶				
Frequency stability	see table 1				
Equivalent series resistance	see table 2				
Aging	±1, ±2, ±3 ppm/year				
Storage temperature range	-40 ... +90 °C				
Load capacitance	series resonance, C _L = 5 ... 50 pF				
Drive level	10 - 1000 μW				

Differences from standard values and other parameters can be consulted.

Frequency stability in temperature ranges (table 1)

Temperature range [°C]	Frequency stability [ppm]											
	±2	±3	±4	±5	±7	±10	±15	±20	±25	±30	±40	±50
+15 ... +35	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
+10 ... +40	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
+5 ... +45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0 ... +50			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
-5 ... +55				✓	✓	✓	✓	✓	✓	✓	✓	✓
-10 ... +60					✓	✓	✓	✓	✓	✓	✓	✓
-15 ... +65						✓	✓	✓	✓	✓	✓	✓
-20 ... +70							✓	✓	✓	✓	✓	✓
-25 ... +75								✓	✓	✓	✓	✓
-30 ... +80									✓	✓	✓	✓
-40 ... +90										✓	✓	✓
-55 ... +105											✓	✓

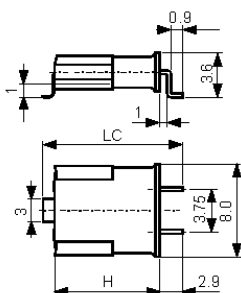
Equivalent series resistance (ESR_{max}) (table 2) for first overtone

Overtone	Frequency [MHz]							
	3.5	4	5	7	10	15	20	45
1.	300 Ω	200 Ω	100 Ω	80 Ω	50 Ω	40 Ω	30 Ω	

for higher overtones

Overtone	Frequency [MHz]						
	16	25	50	60	90	120	190
3.	130 Ω	80 Ω		40 Ω			
5.					60 Ω		
7.						120 Ω	
9.							200 Ω

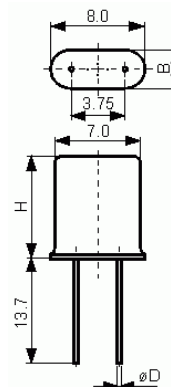
Outline dimensions [mm]



SMD modification

	H	LC	B _{max}	D	Note
UM 1 SMD*	8.0	11.9	0.35	with clip**	
UM 1 SMD*	8.8	12.6	0.35	with clip**	

* available in 3-pin version
** clip means solderable metal cable sleeve



through hole modification

	H	T	B _{max}	D	Note
UM 1	8.0	2.3	3.0	0.35	cap 7.5mm
UM 1	8.8	2.3	3.0	0.35	cap 8.2mm
UM 1-3	8.0	2.3	3.0	0.35	3 pins, central pin is connected with the case
UM 1-3	8.8	2.3	3.0	0.35	
UM 1-SLIM	7.7	1.65	2.3	0.35	
UM 1-S	8.0	2.3	3.0	0.35	3 - point mounting for higher resistivity to shock and vibrations
UM 1-S	8.8	2.3	3.0	0.35	