

## Crystals in UM-4 and UM-5 cases

### General application

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

### Features

Cases UM-4 and UM-5 series are highly reliable, hermetically sealed by seam welding. Crystals can be supplied in slim cases, see outline dimensions below.

### Assembly, taping

Cases UM-4 and UM-5 series are designed for through hole mount, but it 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-4, UM-5		
Overtone	1.	3.	5.
Frequency range [MHz]	11-45 MHz	25-100 MHz	75-180 MHz
Freq. adjustment tolerance at 25°C	$\pm 5, \pm 7, \pm 10, \pm 15, \pm 20, \pm 50 \times 10^{-6}$		
Frequency stability	see table 1		
Equivalent series resistance	see table 2		
Aging	$\pm 1, \pm 2, \pm 3$ ppm/year		
Storage temperature range	-40 ... +90 °C		
Load capacitance	series resonance, $C_L = 5 \dots 50$ pF		
Drive level	10 - 1000 $\mu$ W		

Differences from standard values and other parameters can be consulted.

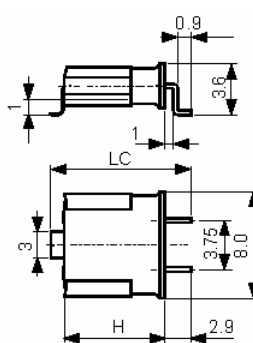
Frequency stability in temperature ranges (table 1)

Temperature range [°C]	Frequency stability [ppm]											
	$\pm 2$	$\pm 3$	$\pm 4$	$\pm 5$	$\pm 7$	$\pm 10$	$\pm 15$	$\pm 20$	$\pm 25$	$\pm 30$	$\pm 40$	$\pm 50$
+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)

Overtone	Frequency [MHz]								
	11	25	32	45	75	100	120	160	180
1.	20 $\Omega$		15 $\Omega$						
3.			60 $\Omega$	40 $\Omega$					
5.						60 $\Omega$	80 $\Omega$	100 $\Omega$	

### Outline dimensions [mm]



#### SMD modification

	H	LC	B <sub>max</sub>	D	Note
UM5-SMD*	6.0	10.0		0.35 with clip**	
UM4-SMD	4.6	8.6		0.35 with clip**	

\* available in 3-pin version

\*\* clip means solderable metal cable sleeve

#### through hole modification

	H	T	B <sub>max</sub>	D	Note
UM 5	6.0	2.3	3.0	0.35	from 11 MHz
UM 4	4.6	2.3	3.0	0.35	from 12 MHz
UM 5-SLIM	6.0	1.65	2.3	0.35	from 11 MHz
UM 5-3	6.0	2.3	3.0	0.35	3 pins, central pin is connected with the case