

**Data sheet**

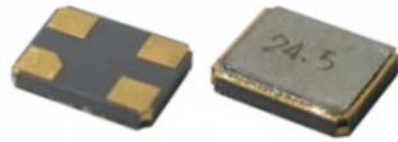
**F1612AS**

**4 pad Ceramic SMD Crystal (1.6 x 1.2 x 0.35 mm)**

1.6 x 1.2 x 0.35 mm

**FEATURES**

- Ultra miniature 4 pad SMD Crystal package
- Ultra thin thickness 0.35mm
- Excellent heat resistance and shock resistance
- Frequency range 24 MHz - 60 MHz (fundamental mode)
- Options for initial stability and temperature tolerance



Parameter	min.	typ.	max.	Unit	Condition
Frequency range	24		60	MHz	
Vibration mode	AT cut, fundamental				
Frequency stability					
Initial tolerance @25°C		±30		ppm	See options
vs. operating temperature range		±30		ppm	See options
operating temperature range	-10		+60	°C	See options
Equivalent Series Resistance (ESR)	See table 1				
Load Capacitance (CL)	Series or 8pF to 32pF (see options)				
Shunt Capacitance (Co)			3.5	pF	
Drive Level			50	µW	
Aging			±2	ppm	At 25°C, first year
Insulation Resistance	500			MΩ	@ 100Vdc
Enclosure (see drawing) (LxWxH)	1.6 x 1.2 x 0.35			mm	
Soldering Condition	260°C, 10 sec x 2 max.				
Packing	3,000 pcs./reel				

**Table 1 : Standard ESR**

Frequency	Mode	ESR
24.0—40.0MHz	Fundamental	150Ω max.
41.0—60.0MHz	Fundamental	100Ω max.

**Ordering Code:**

Freq. Tolerance @ 25°C	Freq. Stability	Operating Temp. range	Load Capacitance	Mode	Frequency in MHz	ESR if other than STD
10 = ± 10ppm	10 = ± 10ppm	<b>D</b> = -10 / +60°C	Please specify CL	F = Fundamental	Specify the	Specify a value
15 = ± 15ppm	15 = ± 15ppm	<b>E</b> = 0° / +70°C	in pF or S for series		frequency in MHz	in Ω
20 = ± 20ppm	20 = ± 20ppm	<b>F</b> = -20° / +70°C				
25 = ± 25ppm	25 = ± 25ppm	<b>G</b> = -30° / +75°C				
30 = ± 30ppm	30 = ± 30ppm	<b>H</b> = -30° / +85°C				
50 = ± 50ppm	50 = ± 50ppm	<b>K</b> = -40° / +85°C				

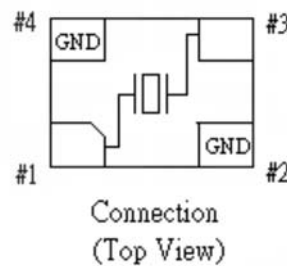
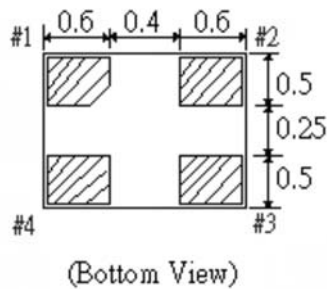
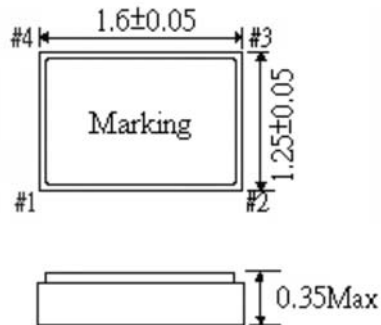
**Example: F1612AS-20-20-D-30-F-27.000MHz**

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**F1612AS**

**4 pad Ceramic SMD Crystal (1.6 x 1.2 x 0.35 mm)**

**Outline Dimensions:**



**Environmental conditions**

Test	IEC 60068 Part ...	IEC 60679-1 clause ...	Test conditions (IEC)
Sealing tests (if applicable)	2-17	5.6.2	Gross leak: Test Qc, Fine leak: Test Qk
Solderability	2-20	5.6.3	Test Ta Method 1
Resistance to soldering heat	2-58		Test Td <sub>1</sub> Method 2 Test Td <sub>2</sub> Method 2
Shock*	2-27	5.6.8	Test Ea, 3 x per axes 100g, 6 ms half-sine pulse
Vibration, sinusoidal*	2-6	5.6.7.1	Test Fc, 30 min per axes, 10 Hz - 55 Hz 0,75mm; 55 Hz - 2 kHz, 10g
Vibration random *	2-64	5.6.7.3	Test Fdb
Endurance tests			
- ageing		5.7.1	30 days @ 85°C, OCXO @25°C
- extended aging		5.7.2	1000h, 2000h, 8000h @85°C

Rev. 9 dated 01-02-2014