

Datasheet

TM Resonators



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General:

EM labs' TM Resonators with a Keysight Technologies' network analyzer provides the capability of measuring the complex relative permittivity of low-loss dielectric materials. With dedicated software, you can efficiently capture accurate permittivity values of your samples with ease of use.

Models:

Seven models of TM Resonators are available, covering the frequency range from 1GHz to 10GHz. A single resonator is designed to operate at one specific frequency.

The TM010 resonance mode is used for CP-001 through CP-245 and the TM020 mode is used for the other resonators, with the electric field oriented parallel to the sample.

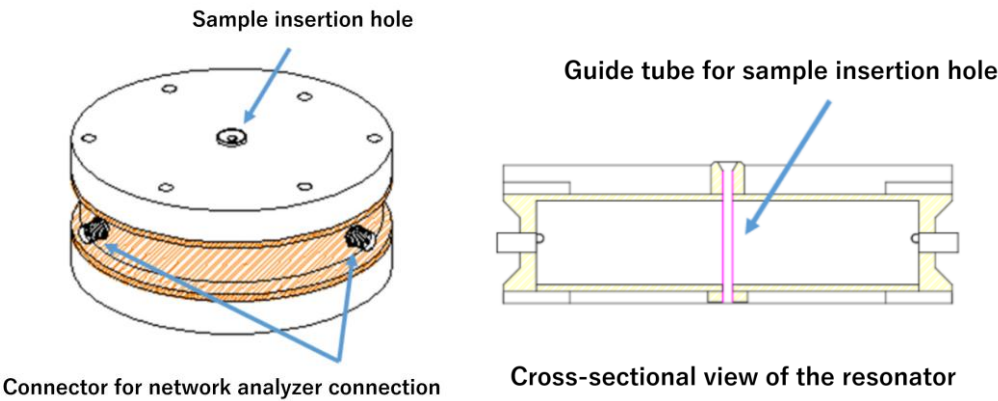
Moder number	Frequency	Resonance mode	unloaded Q	Connector
CP-001	1GHz	TM010	>10,000	2.92mm(f)
CP-002	2GHz	TM010	>10,000	2.92mm(f)
CP-245	2.45GHz	TM010	>10,000	2.92mm(f)
CP-003	3GHz	TM020	>10,000	2.92mm(f)
CP-005	5GHz	TM020	>7,000	2.92mm(f)
CP-580	5.8GHz	TM020	>7,000	2.92mm(f)
CP-010	10GHz	TM020	>6,000	2.92mm(f)

Sample shape and size:

The recommended sample shape is either a strip or a round bar, with dimensions listed in table below.

Strip	2mmW x 80mmL, Thickness < 2mm
Round bar	Diameter < 2.5mm, 80mmL

The shape of the TM Resonators is shown below.



Reference sample:

A reference Fused Silica round bar with pre-measured permittivity value is provided as an option for certification and maintenance purposes.

Note: Fused silica is chosen for its stable permittivity over temperature and humidity; however, its permittivity is still affected by the environment, with variations of approximately 0.003 for Dk and 0.00003 for Df.

Repeatability:

- Dk standard deviation < 0.2%
- Df standard deviation < 0.00003

Repeatability is defined as the standard deviation of ten measurements of the reference fused silica bar, with the bar being removed, and reinserted into the resonator before each measurement.

Operating temperature:

- 10 to 40°C (no condensation)

Size/Weight:

- CP-001: 246mm diameter x 74mmH / 7.2kg
- CP-002: 131mm diameter x 72mmH / 2.2kg
- CP-245: 110mm diameter x 72mmH / 1.7kg
- CP-003: 192mm diameter x 72mmH / 3.8kg
- CP-005: 121mm diameter x 62mmH / 1.6kg
- CP-058: 106mm diameter x 72mmH / 1.6kg
- CP-010: 69mm diameter x 52mmH / 0.6kg