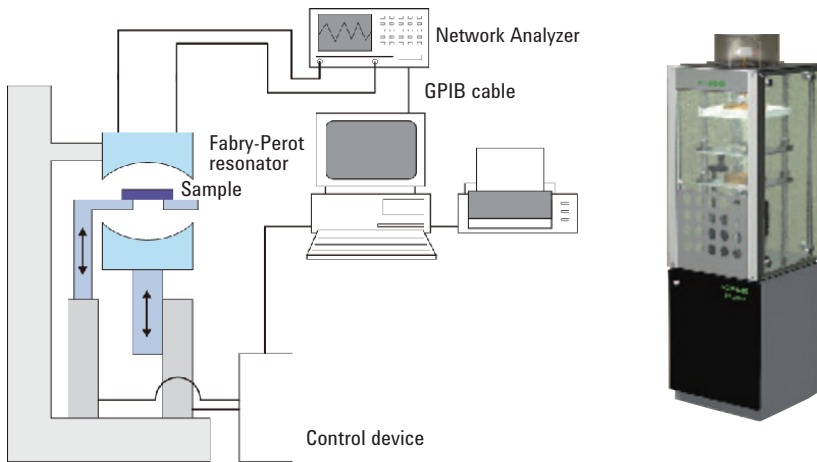


Keysight Technologies and KEYCOM Corp. Permittivity and Dielectric Loss Tangent Measurement System for Millimeter Wave for sheet and ultra-thin sheet System No. DPS03



Supports specimens as thin as $5\mu\text{m}$ in wide frequency range of 18GHz~110GHz

< JIS Standard >

KEYCOM's Fabry-Perot ϵ_r and $\tan\delta$ measurement system combines the high measurement accuracy in the millimeter wave range and simplicity of installing the specimens, expanding its measurement capability for ultrathin sheet to supporting specimens as thin as $5\mu\text{m}$. It is also ideal for low $\tan\delta$ measurement.

Standardization

JIS R 1660-2
(Japanese Industrial Standards)

Publications

H.Suzuki, T.Kamijo "Millimeter wave measurement of complex permittivity by perturbation method using open resonator" IEEE Trans. Instrumentation and Measurement
VOL.57, No.12, Dec.2008
pp2868-2873



Applications

- Printed circuit board
- Radome
- Thin film
- Ceramics
- Collision avoidance radar etc.

Specimen examples

- 10 μm thick PTFE film
- 20 μm thick PE film
- 0.2mm thick sapphire plate
- 0.1mm thick BaTiO₃ plate etc.

Specifications

Frequency: 18~110GHz

Permittivity: 1.05~30
(Accuracy: +- 3%)
 $\tan\delta$: 0.0001~0.05
(Accuracy: +- 7%)

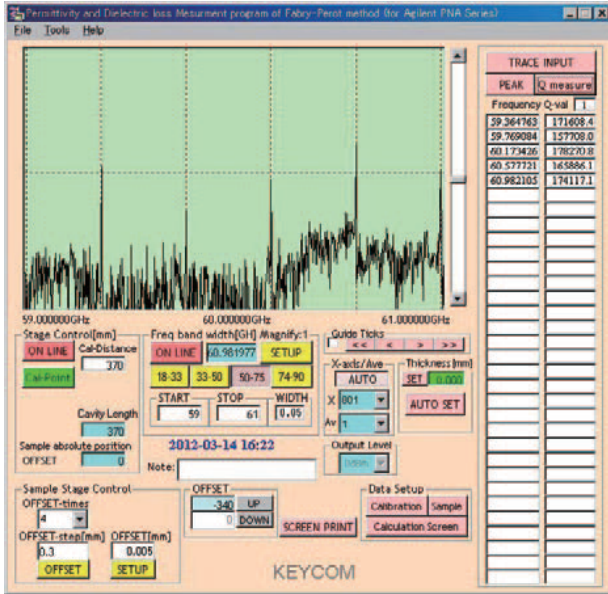
Specimen size:
70mm x 70mm min. (18GHz)
30mm x 30mm min. (50GHz)

Specimen thickness:
5 μm ~ 0.2mm or
integral multiplication of half
the effective wave length
(with software option)

Measurement Process

1. Set a frequency range and the number of frequency steps.
2. Make sure the resonance without the specimen is shown on the graph.
3. Enter the thickness of the specimen, and place it on the measurement stage.
4. Make sure the resonance with the specimen is shown on the graph.
5. Adjust the altitude of the specimen by controlling the stage so that the resonant frequency is minimum.
6. Measure the resonant frequency and the Q value of the specimen, and register the values.
7. Then measure the resonant frequency and the Q value without the specimen under the same condition, and register the values.
8. The software will calculate the values and come up with the results.

Permittivity and Dielectric Loss Tangent Measurement System for Millimeter Wave



Resonance View

Data of Calibration		Data of Sample Insert		Results of Calculation	
Frequency	Q Value	Frequency	Q Value	Empty	Exists
60.184207	168227.7	60.164205	52079.1	60.184207	60.164205
				3.46378	0.01419
				3.46379	0.01419

Calculation Table

Ordering Information

Keysight Technologies, Inc.

Vector network analyzer

- PNA series (N52xx)
- ENA series (E50xx)

KEYCOM Corp.

System No. DPS03

1. Precision automatic mobile stage MDM-02 (common to all frequencies)
2. Fabry-Perot resonator
 - 18-33GHz FPR-33
 - 26.5-40GHz FPR-40
 - 33-50GHz FPR-50
 - 39-60GHz FPR-60
 - 50-75GHz FPR-75
 - 59-90GHz FPR-90
 - 75-110GHz FPR-110
 - 89-140GHz FPR-140
3. Software (common to all frequencies)
 - For sheet P118050123-04
 - For ultra-thin sheet P118050123-05
4. Windows PC, Printer Available upon request
5. GPIB cable GP-01

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For more information on KEYCOM Corp. products, applications or services, please visit our website at www.keycom.co.jp or e-mail us at E-mail: Info@keycom.co.jp

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