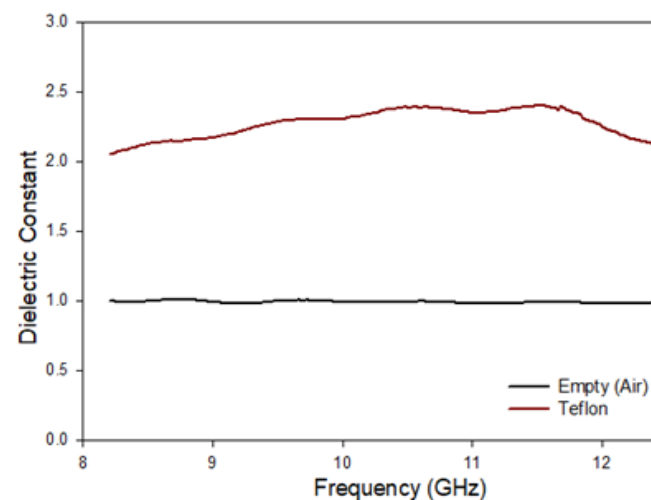
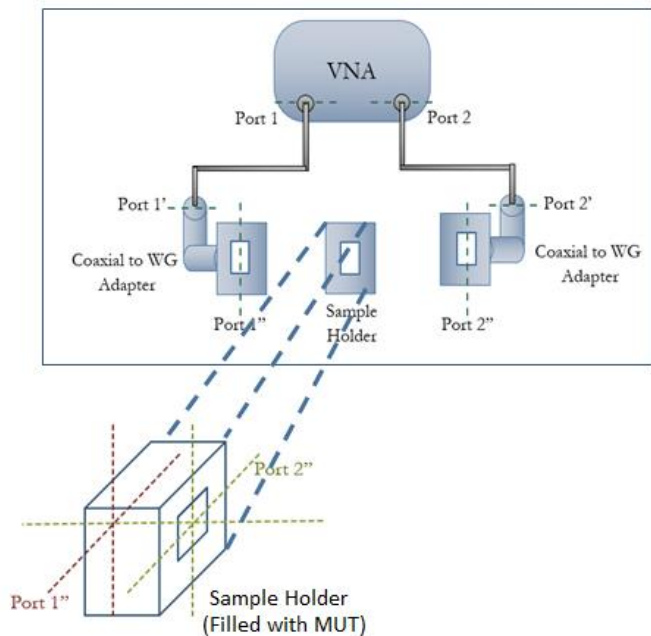




Name of the Knowhow: VNA based Broadband Dielectric Measurement Systems for solids (X-band)

A Know-how is being developed based on material characterization algorithm, sample holders, and waveguide calibration kit along with a user Proposed technology has three parts.

- Algorithm to measure dielectric properties along with tangent loss from Scattering parameters of VNA-based measurements of solids for X-band frequencies. The algorithm will work on any VNA platform and is capable to evaluate the Dielectric Properties and tangent loss for any waveguide kit available with the user.
- Waveguide Calibration Kit along with Algorithm and Sample holder to measure Dielectric Properties and tangent loss of solids for X-band frequencies. This system is valid for any VNA.
- Evaluation of uncertainty for (a) and (b) both.





Applications:

Precise knowledge of dielectric permittivity, permeability and loss of materials is a fundamental requisite for the engineering applications of these materials. The dielectric properties of materials play important role in applications like construction of high-frequency electronic components, quality of printed circuit board (PCB) substrate and efficiency of microwave absorption materials. We present accurate and easy to use dielectric property measurement solution for solids based on transmission-reflection method. The method is based on modified NRW procedure with simplified measurement using a VNA based technique.

Novelty features of this knowhow:

1. Simplified NRW procedure-based material property retrieval
2. Fabricated coaxial to waveguide adapters & Sample holders
3. Calibration standards (short, offset, load)
4. Dielectric property extraction algorithm

Advantages of the knowhow:

1. Simplified measurement procedure
2. Accurate measurement with uncertainty analysis
3. Calibration standards along with sample holders to be provided
4. Dielectric property extraction algorithm

Readiness level of the Technology:

Idea	Concept Definition	Proof of Concept	Prototype	Lab Validation	Technology Development	Technology Demonstration	Technology Integrated	Market Launch

Related Patents (if any): NA

Year of Introduction: 2022

Broad Area/Category: Electronics & Instrumentation/ Strategic Materials Characterization

User Industries: RF and related device manufacturers, EM Shielding, Material characterization, strategic sector, RADAR and Radome material manufacturers, etc.