Construct, Conduct & Comprehend Physics Experiments

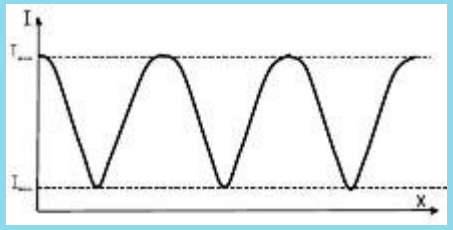
LEAI-65 Apparatus of Microwave & Measuring Waveguide Parameters

Note: oscilloscope not included

- *Ample experimental contents*
- *Qualified waveguide components and microwave devices*

This experimental system is designed to measure microwave parameters that is suitable for modern physics teaching in colleges and universities. It consists of various microwave waveguide components at three centimeters wavelength. Various experiments can be configured by selecting proper components, allowing students to conduct the following experiments:

1. Learn how to use various microwave devices.
2. Understand microwave work states and transmission characteristics.
3. Understand field properties of microwave transmission path.
4. Measure standing wave, attenuation, wavelength (frequency), and power.
5. Learn how to measure permittivity of microwave dielectric materials and tangent value of loss angle.



Standing wave distribution in cavity

Specifications

Solid state microwave signal source	
Frequency	range: 8.6 ~ 9.6 GHz; draft: $\pm 5\times10^{-4}$/15 min; display error: ±40 MHz
Output power	>20 mW
Attenuation adjustment range	> 20 dB
Wave form	Equal amplitude
Internal modulation	square-wave, repeat frequency 1000 Hz
External modulation	polarity: +/ -; amplitude: 5~40 V (P-P); width: 0.2~3 μs; freq: 300~3000 Hz
Narrow-band frequency scan	scan width: > 50 MHz, continuously adjustable
RF output connector	N-type 50 Ω coaxial connector
Scan output	BNC connector, sawtooth wave output: 1~10 V
Slotted line measurement device	
Frequency range	8.2 GHz ~ 12.4 GHz
Standing-wave coefficient	≤ 1.03 (synthesis voltage)
Probe	travel: 95 mm; insertion depth: 1.5 mm
Frequency-selective amplifier	
Frequency range	400 Hz - 10 kHz
Input voltage dynamic range	10 μV - 2000 mV
Sensitivity	10 μV (full scale)
Input impedance	20 kΩ (1 kHz)
Centimeter wave power meter	
Frequency range	8.6 GHz ~ 9.6 GHz
Power range	100 μW ~ 100 mW
Microwave wavemeter	range: 8.2 GHz-12.4 GHz; resolution: 0.005 GHz
Waveguides	inner: 22.86 mm × 10.16 mm

Part List

Solid state microwave signal source (3 cm)	1
Slotted line measurement device	1
Frequency-selective amplifier	1
Centimeter wave power meter	1
Variable attenuator	1
Wavelength meter	1
Detector	1
BNC Cable	1
Detector meter	1
Isolator	1
Circulator	1
Variable reactor	1
Single micrometer tuner	1
Straight waveguide	1
Matching load	1

Short circuit plate	1
Resonance cavity	1
Coupler plate	1
Dielectric material sample	3
Waveguide stand support	3
Screw	40
Instruction Manual	1
Precise variable attenuator	Option 1
H-type 90 degree curve waveguide	Option 2
H-type waveguide switch	
Straight waveguide (L=150)	
Directional coupler	
Mismatched load (VSWR 1.5 or 2.0)	
Mismatched load (VSWR 6-7)	
Passing through sample cavity	

Note: above product information is subject to change without notice.

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