10209I is specialized RF signal generator and detector covering frequency range from35MHz to 4GHz with reliable performance and multiple built like modulation capabilities (AM, FM, PSK).The architecture use highly accurate and stable Phase locked loop (PLL) synthesizer based frequency generator with double harmonics capability having with excellent phase noise. The RFGD system employs in built high dynamic log detector arrangement for forward and reflected power arrangement. A SMA connecter provide output for full span with adjustable output power form -30dBm to +OdBm into a 50 ohm load.A BNC type input available for modulating signal at the near end equipment. User friendly GUI supports monitoring, controlling and plotting the records.

FEATURES

- 3GHz Synthesised RF Generator and Detector
- Internal and External Frequency Modulation
- High Stability and Low Phase Noise
- Wide Power Range from -30dBm to +OdBm
- Dynamic Range -5OdBm to +10dBm
- Frequency Stepping 1MHz
- S-Parameters Measurement
- Analysis of Filters Response
- Highly Reliable
- Both Standalone and PC interface
- 1dB Insertion Loss Directional Coupler

SPECIFICATIONS

Frequency	: 35MHz TO 3GHz
Frequency Resolution	: 1MHz
Modes	:Single tone,Freq sweep, Freq hopping, Power sweep
Freq sweep for full span	:5 3.8 sec
Frequency Offset	: ± 100 Hz
Sub Harmonics	: 50 dBc/Hz
Phase Noise	: 80 dBc/Hz @800MHz
Power Max	: OdBm @ upto 1.5GHz
	: -10dBm @ upto 3GHz
Power Variation	: ± 0.5dBm
Power Resolution	: 0.5dB
Power sweep mode	: 3 sec
Detector dynamic range	: -50dBm to 10dBm
RF Detector Sensitivity	: -60dB
Modulation	:AM,FM,PSK
AM Modulation Range	: 100MHz to 2.8GHz
FM Modulation Range	: 300MHz to 1 Ghz
PSK Modulation Range	: 100MHzto 1GHz
LCD display	:128x64 graphics display
Interface	
Impedance	: USB-B type : 50 0
User interface	: Standalone and PC based control mode available
Size	:170mmx292mmx100m

Software : User friendly GUI having inbuilt cable calibration facility and compatible environment Win XP Win 7,Win Vista

External Directional Coupler

Frequency Range	: Wide Band 20MHz to 3GHz
Directivity	:20dB
Insertion Loss	:1dB
Measurement	:Return Loss, VSWR & Impedance

RF GENERATOR

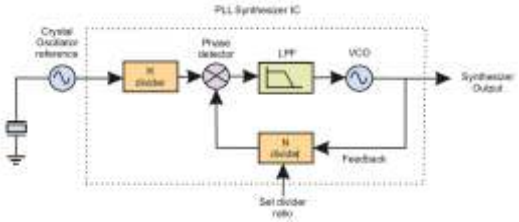
Synthesized radio frequency signal generators

Virtually all radio frequency signal generators used today employ frequency synthesizer technology.

- Using this technique enables frequencies to be entered directly from a keypad, or via remote control and it also enables the output signal to be determined very accurately.
- The accuracy being dependent upon either an internal reference oscillator that can have a very high degree of accuracy, or the signal can be locked to an external frequency reference which can be exceedingly accurate .
- Synthesized signal generators are available in many forms.
- High end RF signal generators can be contained in traditional bench cases as well as in modular forms like PXI. In addition to this, a number of much lower cost USB RF signal generators are coming onto the market. Using the power of a PC, these signal generators can be made much more cheaply that those in specialised cases with front panels, power supplies and the like.

Phase locked loop synthesizer:

- Phase locked loop synthesizers are used within most RF signal generators as they enable signals to be generated over a wide range of frequencies with a relatively low level of spurious signals. Phase locked loop synthesizer technology is well developed and enables high performance RF signal generators to be produced using them.



Note: Specifications are subject to change.

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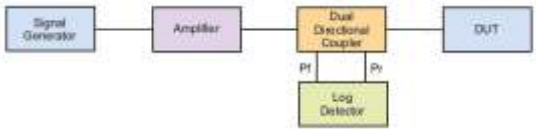
RF Detector

Phase locked loop synthesizer:

RF power detectors pick up radio frequency signals and generate an output corresponding to the strength of the signal. Subsequently, a processor correlates this output to real signal power. In applications requiring greater dynamic range, a new generation of instruments, such as logarithmic and RMS instruments, are replacing the traditional diode detection method. All classes of detection systems possess unique characteristics that make them suitable for particular uses.

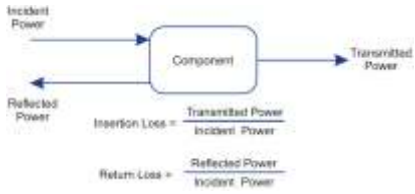
Real signal power provides RF engineers with information essential to selecting the component size and establishing controls for optimal signal and data accuracy. The power is monitored closely over increasing distance to analyze circuit performance and reliability in communications application



Recently directional coupler and log detector used to measure the forward and reflected power in a RF system. The block diagram is shown as above

INSERTION LOSS MEASUREMENT

Insertion loss is the loss of signal when traveling in and out of a given circuit or traveling into a component and out of the component. If your signal is at 100% going into a component, and coming out there is a loss, its described as insertion loss and is measured in decibels (dB). 3dB is described as the end point for any component and is equivalent to the signal strength being reduced by 50%

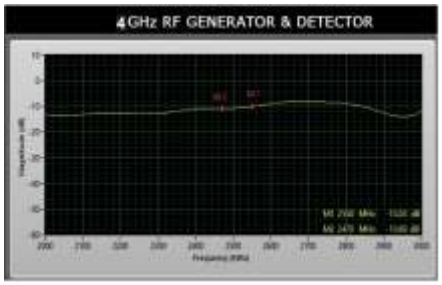


KEY MEASUREMENT PARAMETERS

1. Insertion Loss (S_{12})

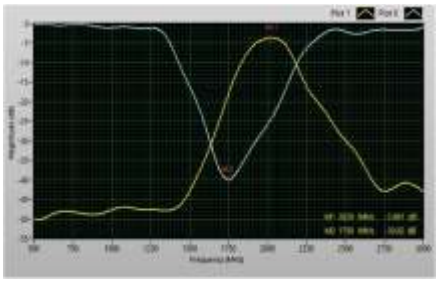
Graph shows insertion loss of passive Microstrip BPF filter. It shows 3dB bandwidth of Microstrip BPF is 260MHz

2. Isolation (S_{41})



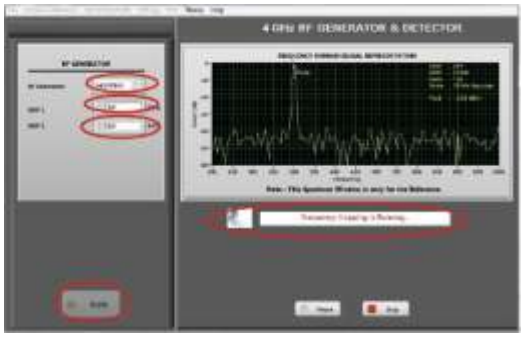
isolation at 2470MHz.Directional coupler is 4 ports device. For S41 measurement remaining two ports will be terminated by 50 Ohm load.

3. Transmission and Reflection coefficient (S_{41})



Graphs show transmission and reflection coefficient of filter. It can conclude that the transmitted power (S12) is -3dB and reflected power (Sii) of filter is very less around -39.8dB.

4.Single tone frequency generation.



Graphs show this operating mode is to generate the single tone frequency at the selected power

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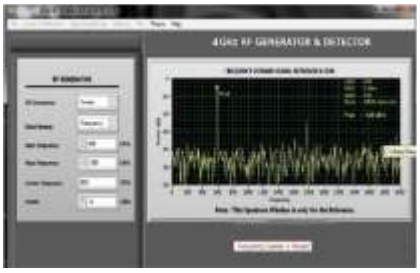
5.Frequency Sweep



Graphs shows RF Generater Frequency Sweep from 500MHz to 1300 MHz It. also shows power generating -4dBm at 600 MHZ

ACCESSORIES

- 10209I—Control Unit :01nos
- SMA(M) to SMA(M) 50 ohm Rg316 cable 50cm : 02nos
- BNC to BNC Cable : 01nos
- 9VAdapter : 01nos
- USB cable (Male Ato Male B) : 01nos
- Power Cord : 01nos
- Software on CD : 01nos
- Manual : 01nos
- Wide Band Directional Coupler : 01nos

Experiments list

01. Determination of insertion loss (S_{21}) of Microstrip Ring Resonator
02. Measurement of Isolation Characteristics of Circulator
03. Measurement of Attenuation Power for Pi Attenuator
04. Gain Measurement of MMIC Amplifier
05. PIN Diode Modulator Investigations
06. Characterization of Circulator
07. Characterization VCO
08. Characterization RF Mixer
09. Characterization of Schottky Diode Detector
10. Determination of Power Division Characteristics (S21 ,S31)
11. Measurement of Isolation of Directional Coupler (S_{41})
12. Determination of 3dB Bandwidth of BPF Filter
13. Determination of 3dB cut off Frequency of LPF Filter
14. Characterization of PIN Diode as RF Switch

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