

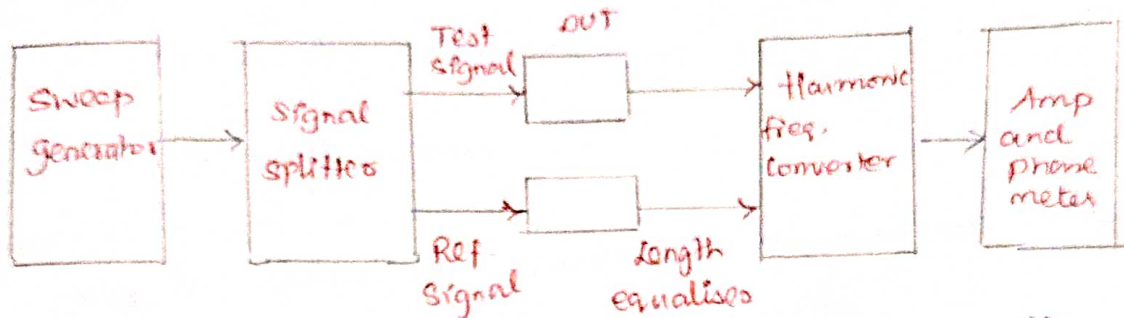
Course - Abto know the principle of ^{spectrum analyzer} power meter and applications.

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Network Analyser

Aim: To learn the working principle and applications of

Network analyser in microwave measurements
objective. To study the construction of n/w analyser
 * N/w analyser measures both amplitude and phase of a signal
 over a wide frequency range within a reasonable time.



Schematic block diagram of a complex N/w analyser

* microwave signal from sweep osc divided by power divider into test signal & ref. signal

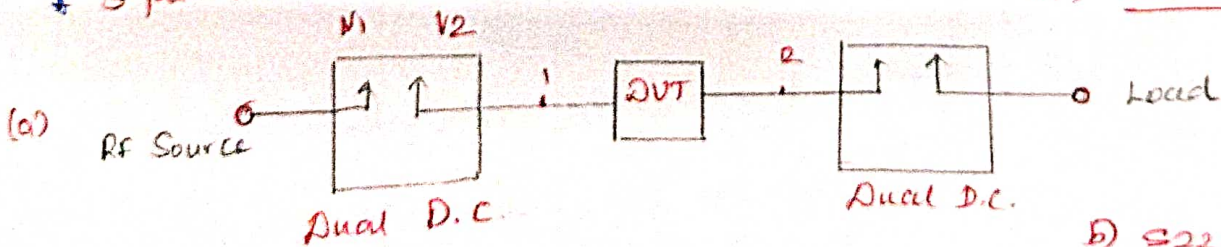
* Test signal & ref. signals are converted to a fixed IF by harmonic freq. converter.

* o/p from HFC compared to determine the amp & phase of the signal

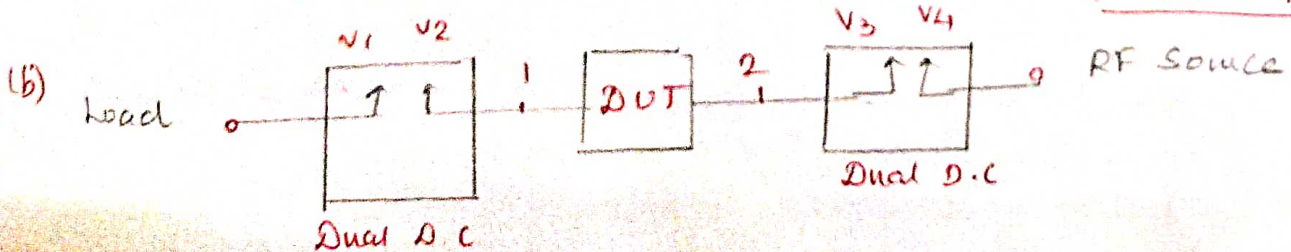
* S parameter measurements

S parameter test set

a) S_{11} & S_{21}



b) S_{22} & S_{21}



$$S_{11} = \frac{V_2}{V_1} (\phi_2 - \phi_1)$$

$$S_{21} = \frac{V_3}{V_1} (\phi_3 - \phi_1)$$

$$S_{22} = \frac{V_3}{V_4} (\phi_3 - \phi_4)$$

$$S_{12} = \frac{V_2}{V_4} (\phi_2 - \phi_4)$$

Opera. Freq.

5 Hz to 1.05 THz.

Applications:

- * To measure S-parameters
- * Characterize two-port networks such as Amplifiers, filters
- * RF design applications

Outcome:

Able to analyse the S-parameter measurements using N/w analyser, working and applications.

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