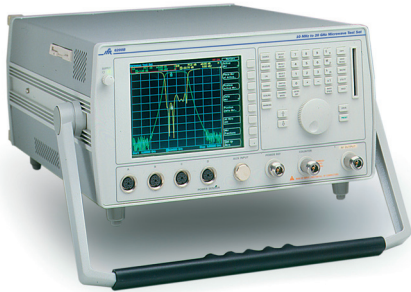


# Microwave

## 6200 Series Gain Compression Application

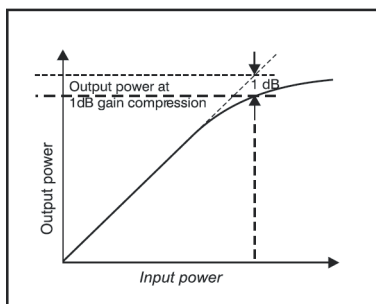
**AEROFLEX**  
A passion for performance.



The gain compression application software provides a fast, effective way to measure gain compression against frequency through on screen connection diagrams.

- Fast measurement of gain compression against frequency
- On screen connection diagrams for operator guidance
- GPIB controllable for production test requirements
- Remote levelling capability

The gain compression software utility runs on the 6200 series Microwave Test Set (MTS) to provide a powerful tool for characterising amplifiers. It is often necessary to characterise the power handling capability of an amplifier. A key aspect of this is the output power at which the gain of the amplifier drops to 1 dB below the small signal value; this is known as the 1 dB compression point. When an amplifier is in compression its characteristics become non-linear. Consequently, signals passing through it will be distorted.

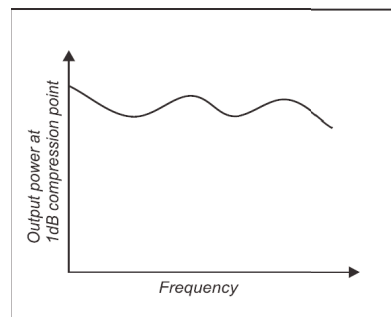


*Output power variation against input power showing amplifier going into compression.*

Although the 1 dB compression point is the most commonly used, other values are also measured.

For example the 3 dB or 6 dB compression points of high powered devices, such as travelling wave tubes (TWT) or klystrons, are often measured as a definition of amplifier saturation.

For many classes of power amplifier the degree of gain compression varies with frequency. The frequency at which gain compression is greatest determines the power limit of the amplifier.



*The output power of an amplifier at the 1 dB compression point varies with frequency.*

The gain compression software allows the user to perform a swept frequency compression measurement. Deficiencies in power handling become immediately apparent.

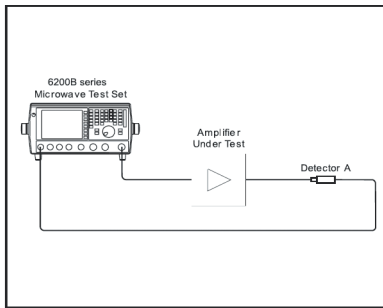
The 6200 screen displays the frequency dependant gain compression and the corresponding output power level. Conventional methods when applied to wideband amplifiers can involve considerable testing time, without the near instantaneous results necessary for adjusting performance interactively. This capability is especially useful during the design and production stages of broadband amplifiers.

The gain compression software utility generates this display quickly and easily with minimal user interaction, completing the entire measurement typically in under 30 seconds. The gain compression software is held on a memory card and run by inserting the card into the MTS front panel slot. The software can be configured to run automatically from power on or instrument preset so as to simplify its operation in a production environment.

**Operation**

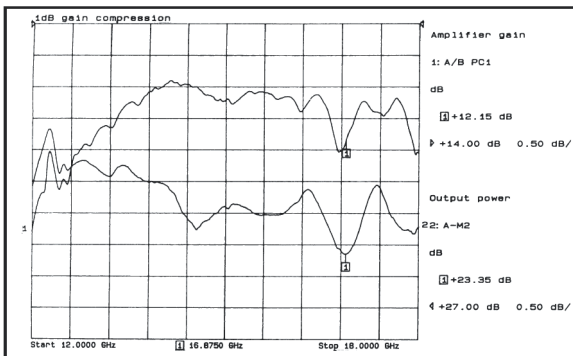
During the measurement set up, clear diagrams are displayed on the MTS screen showing how to connect the measurement components. The user is guided through calibration and measurement. Consequently, procedural measurement errors are eliminated and test time is minimised.

The basic measurement set up is shown below. The RF output of the MTS is applied directly to the input of the amplifier under test, and a scalar detector connected to input A measures the amplifier output.



*Basic measurement set up.*

It is possible to modify the basic set up by the use of attenuators at either the input or output stages of the amplifier or by the use of a pre-amplifier. A pre-amplifier may be necessary when testing low gain, high compression point amplifiers which the standard MTS may not be able to drive into compression.



*Plot of measurement results. Trace 1 (top trace) Shows amplifier gain against frequency. Trace 2 (lower trace) shows amplifier output power against frequency. All frequency measurement points are at 1 dB compression.*

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