

# DSA815-TG 'Power Sweep' Mode

## Measure Compression of a RF Amplifier, Mixer, etc to Determine Linearity

Power Sweep is used for testing an RF Amplifier, etc output characteristics by displaying its power output curve approaching the level of output limiting. Reference the DSA800 Series User Guide pages 2-42, 43 for parameters.

### 1. Initial Settings for Configuring Power Sweep Operation:

**Connections:** Connect a coax cable directly between the TG Output/SA Input.  
**Initially Select and Set: Preset** (Green key), **FREQ:** 750 MHz (or other Test Freq. A/R)  
**SPAN:** 100 Hz, **RBW:** 3 kHz, **TG:** On, **TG Level:** -20 dB, **Power Range:** 20 dB,  
**Power Sweep:** On, **AMP, Scale/Div:** 2 dB, **Ref Level:** 0 dBm

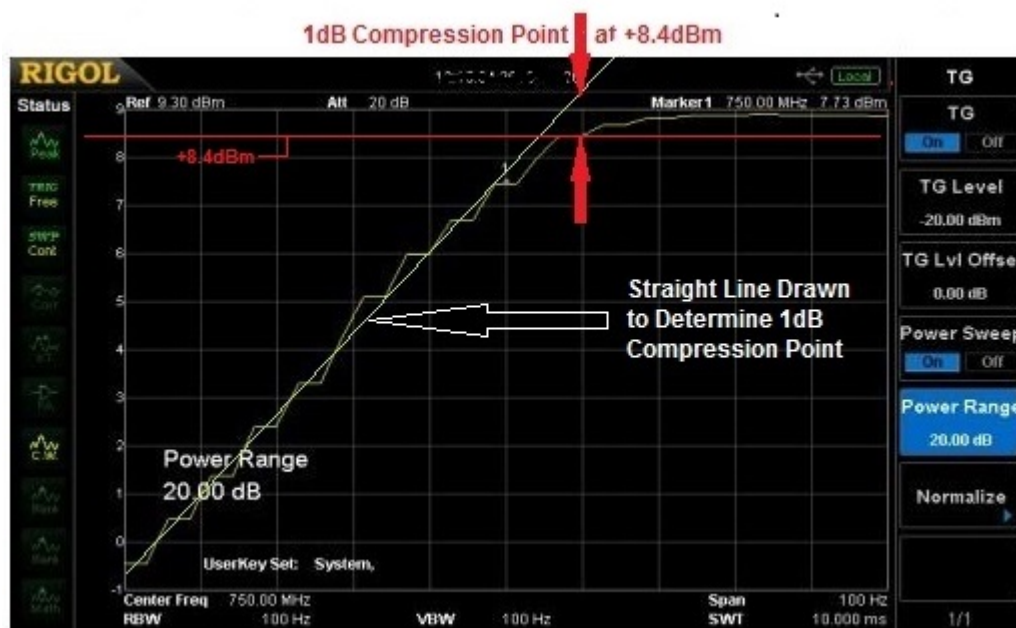
This initial configuration produces a Power Sweep with a 20 dB range in 2 dB increments.

### 2. For Testing a RF Active/Passive Device (RF Amplifier, Mixer, RF Limiter, etc)

**Connections:** Connect TG Output to the UUT Input, UUT Output to SA Input.  
**Change:** FREQ, Power Range, Ref Level, Scale/Div, TG Level, etc A/R

An external attenuator and/or amplifier can be used with the Unit Under Test if Input/Output levels are beyond the DSA815-TG's I/O capabilities. Adjust the Spectrum Analyzer parameters as required to optimise the display.

### Example DSA815-TG Power Sweep Screen Display of a RF Amplifier Linearity Test



For clarity this is with a 10 dB vertical range, although the above set-up info provides for 20 dB

This screen shows the change from linear behavior (at the marker) to the non-linear output of the device. The point where the measured power differs 1 dB from the theoretical linear extension is referred to as the 1dB-Compression Point (P1dB), an important parameter for RF Amplifiers, etc.

Note: Some amount of 2 tone IMD could start to be generated at 10 dB below the P1dB.

Note: 'P1dB' is expressed as the RF Amplifier's Input power that the output 1 dB Compression Point occurs at, whereas the +8.4dBm '1 dB Compression Point' in this example is the Output Power.