

RF Input Limiter for Rigol DSA815-TG Spectrum Analyzer

Description:

Type 'N' Male/Female, 200 kHz to 3 GHz, +13 dBm RF, Power Limiter.

Primary Use:

For protection of Spectrum Analyzer RF Input Circuitry

Recommended Use:

1. When Spectrum Analyzer is connected to an Antenna
2. RF Input level is unknown, or potentially may exceed +10 dBm

Primary Component:

Mini-Circuits model 'RLM-33-2W+' RF Power Limiter

<http://www.minicircuits.com/pdfs/RLM-33-2W+.pdf>

General RLM-33-2W+ Specifications:

- Impedance: 50 Ohms
- Signal Flow Direction: Bi-Directional
- Bandwidth: 0.2 to 3,000 MHz
- VSWR: 1.22:1 typical
- Linear Range: Up to -10 dBm without IMD (similar to Rigol DSA815, etc.)
- 1 dB Compression: $\geq +5$ dBm
- Limiting Range: Inputs of +10 to +33 dBm (2.5 Watts)
- Output Power: Limited to +13 dBm
- Maximum Input: +33 dBm(2.5 Watts)*

Note: * If the RF Input may potentially exceed +33 dBm (2.5 Watts), use an appropriate external power attenuator to reduce the Input level.

Construction:

Use appropriate microwave construction techniques!

It is recommended to assemble the Mini-Circuits RF Limiter in an appropriate Male to Female connector assembly. i.e. Type 'N' Male and Female 'Clamp' solder type (NOT Crimp) RF coaxial connectors (designed for use with LMR400/RG214) mounted Back-to-Back with a threaded 'Connecting Bushing**.

Note ** The 'Connecting Bushing' can be fabricated from one of the connectors rear cable 'Clamping Compression Nuts' by grinding or cutting off the outer nut protrusion.

The photo shows one of the original cable 'Clamping Compression Nuts', and just below it, a fabricated 'Connecting Bushing'.



'N' connectors before (top) and after final assembly (bottom) with a label applied.

Assembly Recommendations:

Solder the RML-33-2W+ onto the center of a 0.03" X 0.125" X 0.80 copper strap. Bend the ends of the strap to fit cross-ways inside one of the connectors and solder it to the inside walls for RF grounding and thermal integrity. The RF Limiter I/O connections are made to the M/F center pins prior to final assembly.