

# 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.