MDO4000 Pre-Amplifier

TPA-N-PRE Datasheet


TPA-N-PRE Pre-Amp.

Features & Benefits

- 9 kHz - 6 GHz frequency range
- 12 dB gain (nominal)
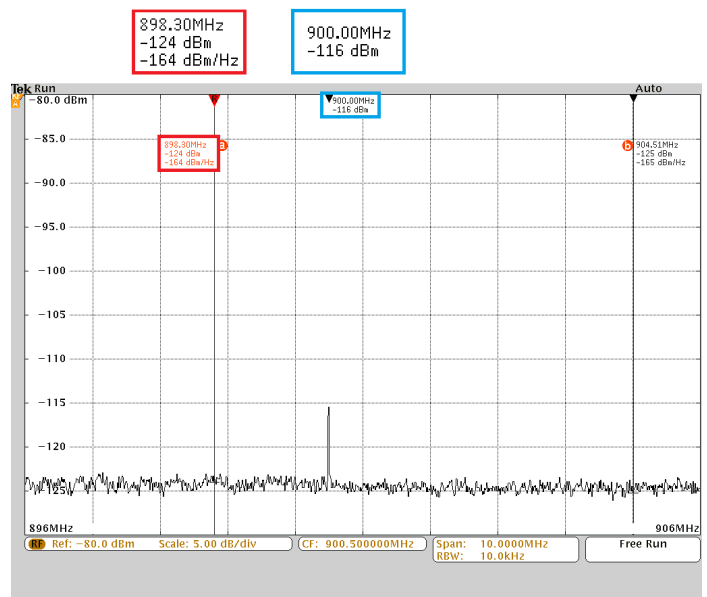- 10 dB DANL improvement

Applications

- Measurement of low-power signals

TPA-N-PRE Preamplifier

The TPA-N-PRE preamplifier accessory for the MDO4000 Series Mixed Domain Oscilloscopes provides 12 dB nominal gain, further lowering the already low noise floor in the MDO4000 Series. This allows you to pull very small signals out of the noise in low-amplitude signal applications. For example, in the following screenshot we are measuring a noise floor of -114 dBm (-154 dBm/Hz) without the TPA-N-PRE preamplifier. It appears that there is only noise present.
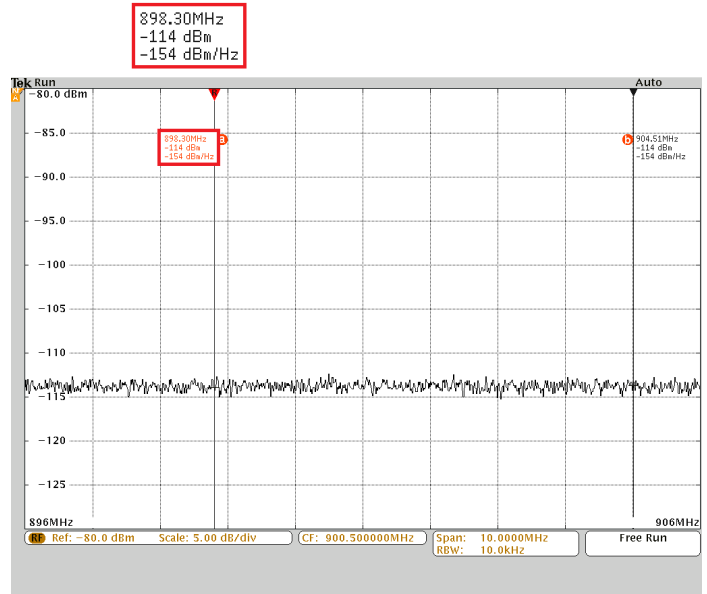
In the screenshot below, we've turned on the preamplifier. Notice that the noise floor has dropped to -124 dBm (-164 dBm/Hz). As a result of the noise floor dropping significantly, we're now able to see a -116 dBm signal present at 900 MHz that was hidden in the noise without the preamplifier.

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Characteristics

General

Characteristic	Description
Frequency range	Preamp: 9 kHz to 6 GHz MDO4XX4-6 with preamp: 50 kHz to 6 GHz MDO4XX4-3 with preamp: 50 kHz to 3 GHz
Preamp gain	Amplifying state: 12 dB (nominal) Bypass state: -1.5 dB (nominal)
Displayed average noise level (DANL) with the preamp attached to the MDO RF input	With the preamp mode set to "Auto" and the reference level set to -40 dBm: MDO4XXX-6: 50 kHz to 5 MHz: < -140 dBm/Hz (-144 dBm/Hz typical) 5 MHz to 3 GHz: < -158 dBm/Hz (-162 dBm/Hz typical) 3 GHz to 6 GHz: < -150 dBm/Hz (-153 dBm/Hz typical) MDO4XX4-3: 50 kHz to 5 MHz: < -140 dBm/Hz (-144 dBm/Hz typical) 5 MHz to 3 GHz: < -158 dBm/Hz (-162 dBm/Hz typical)
Level measurement uncertainty with the preamp attached to the MDO RF input	Preamp mode set to "Auto". Reference Level 10 dBm to –40 dBm. Input level ranging from reference level to 30 dB below reference level. Specifications exclude mismatch error. < ±1.5 dB typical, 20 – 30ºC temperature range, either preamp state. < ±2.3 dB typical, over full operating range, either preamp state.
Maximum operating input level with preamp attached to the MDO RF input	Average continuous power: +30 dBm (1 W) DC maximum before damage: ±20 V DC Maximum power before damage (CW): +30 dBm (1 W) Maximum power before damage (pulse): +45 dBm (32 W) (<10 µs pulse width, <1% duty cycle, and reference level of ≥ +10 dBm)
Reference level range with preamp attached to MDO RF input	Amplifying state: -30 dBm to DANL Bypass state: +30 dBm to DANL.
Connector type	SMA – female (outside threads)

Environmental

Characteristic	Description
Temperature	
Operating	0 °C to +50 °C
Nonoperating	-20 °C to +60 °C
Humidity	
Operating	High: 40 °C to 50 °C (104 °F to 122 °F), 10% to 60% RH Low: 0 °C to 40 °C (32 °F to 104 °F) 10% to 90% RH
Nonoperating	High: 40 °C to 60 °C (104 °F to 122 °F), 10% to 60% RH Low: 0 °C to 40 °C (32 °F to 104 °F) 5% to 90% RH
Altitude	
Operating	Up to 3,000 meters
Nonoperating	Up to 12,000 meters

Power Requirements

The TPA-N-PRE is powered directly from the RF input on MDO4000 Series oscilloscopes.

Regulatory

Compliance labeling: WEEE (European Union).

Recommended Oscilloscopes

MDO4000 Mixed Domain Oscilloscopes

Note: For best probe support, download and install the latest version of the oscilloscope firmware from www.tektronix.com

Warranty information

One year parts and labor.

Ordering Information

TPA-N-PRE

MDO4000 Pre-Amplifier. Includes Instruction Manual (English) (071-3058-XX)

Service Options

Opt. C3 – Calibration Service 3 years (initial certification, plus 2 calibrations).
Opt. C5 – Calibration Service 5 years (initial certification, plus 4 calibrations).
Opt. R3 – Repair Service. Repair warranty extended to cover 3 years.
Opt. R5 – Repair Service. Repair warranty extended to cover 3 years.

Additional Service Products Available During Warranty (DW)

TPA-N-PRE R3DW – Repair Service Coverage 3 Years (includes product warranty period). 3-year period starts at time of customer instrument purchase
TPA-N-PRE R5DW – Repair Service Coverage 5 Years (includes product warranty period). 5-year period starts at time of customer instrument purchase

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Updated 10 February 2011

For Further Information. Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit **www.tektronix.com**

27 May 2015   51W-28540-01

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