



Copper Mountain Technologies, LLC  
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## Certificate of Calibration

**Equipment Description:**

**NETWORK ANALYZER**

**Manufacturer:**

Copper Mountain Technologies  
3905 Vincennes Road, Suite 105  
Indianapolis, IN 46268 USA  
+1 317-222-5400  
support@coppermountaintech.com

**Calibration Location:**

Planar LLC Elkina  
str. 32, Vyabinsk  
454091  
Russian Federation

**Model:** \_\_\_\_\_ MODEL \_\_\_\_\_

**Factory Calibration Date:** \_\_\_\_\_ DATE \_\_\_\_\_

**Serial Number:** \_\_\_\_\_ SN \_\_\_\_\_

**Environment Conditions:**

**Temperature:** (23±5) °C  
**Humidity:** (30 to 70) %

**As Shipped Condition**

Problems noted: None.  
Within Tolerance: Yes

This certifies that the product listed above was calibrated in accordance with documented procedures using test equipment and standards the accuracy of which is traceable to international standards, national standards or derived from ratio type measurement using self-calibration techniques. The Quality Management system is certified to ISO 9001:2008.

**Comments:**

Performance tests passed.  
No change was made to product.



**Calibrated By:**

**Approved By:**

**Name:** \_\_\_\_\_ Alexander Bakurov \_\_\_\_\_

**Name:** \_\_\_\_\_ Alex Goloschokin \_\_\_\_\_

**Title:** \_\_\_\_\_ Lead Engineer, Planar LLC \_\_\_\_\_

**Title:** \_\_\_\_\_ Managing Director \_\_\_\_\_

**Signature:**

**Signature:**




# Network Analyzer Primary Performance Test Record

Model: MODEL, Serial Number: SN

Test name	Guide number	Test limit	Test result	Uncertainty	Conclusion
External examination	8.1				PASS
Trial	8.2				PASS
Port Connection Mechanical Characteristics	8.3.1				PASS
Adapters Mechanical Characteristics	8.3.2				PASS
Adapters Module Reflectance	8.3.3				PASS
Analyzer Specification Verification	8.4				
Frequency Accuracy	8.4.1	±5.0 ppm	-3.3 ppm	±0.1 ppm	PASS
RF Output Level Accuracy	8.4.2	±1.0 dB	-0.4 dB	±0.1 dB	PASS
Uncorrected System Performance: Source Match Receiver Match	8.4.3	Maximum -22 dB -22 dB	-25.1 dB -25.2 dB	±1 dB	PASS
Uncorrected System Performance: Directivity	8.4.4	Maximum -18 dB	-23.9 dB	±1 dB	PASS
Harmonic Distortion	8.4.5	Maximum -20 dBc	-29.0 dBc	±2 dB	PASS
Non-harmonic Spurious	8.4.6	Maximum -30 dBc	-35.0 dBc	±2 dB	PASS
Accuracy of Transmission Measurement  S21  и  S12  (Magnitude): +5 dB to 10 dB -50 dB to +5 dB -70 dB to -50 dB from 20 kHz to 300 kHz from 300 kHz to 4.8 GHz -90 dB to -70 dB from 300 kHz to 4.8 GHz	8.4.7	±0.2 dB ±2.5 dB ±0.5 dB ±0.5 dB	-0.03 dB 0.04 dB -0.18 dB -1.08 dB	±0.05 dB ±0.05 dB ±0.05 dB ±0.2 dB	PASS
Accuracy of Transmission Measurement S21 and S12 (Phase): +5 dB to 10 dB -50 dB to +5 dB -70 dB to -50 dB From 20 kHz to 300 kHz from 300 kHz to 4.8 GHz -90 dB to -70 dB from 300 kHz to 4.8 GHz	8.4.8	±2° ±1° ±11° ±3° ±11°	-1.21 ° -0.11 ° 0.95 ° -3.21 °	±0.2°	PASS
Accuracy of reflection measurement (magnitude) -35 to -25 dB -25 to -15 dB -15 to 0 dB Accuracy of reflection measurement (phase) -35 to -25 dB -25 to -15 dB -15 to 0 dB	8.4.9	±3.0 dB ±1.0 dB ±0.4 dB ±20° ±6° ±3°	1.21 dB 0.42 dB 0.11 dB -2.38 ° -1.73 ° -0.77 °	±1.50 dB ±0.40 dB ±0.10 dB ±10° ±2° ±1°	PASS
Receiver Noise Floor from 20 kHz to 300 kHz from 300 kHz to 4.8 GHz	8.4.11	Maximum -90 dBm -115dBm	-109.4 dBm -117.7 dBm	±2 dB	PASS
Trace Noise Magnitude from 20 kHz to 300 kHz from 300 kHz to 4.8 GHz	8.4.12	Maximum 0.015 dB 0.002 dB	0.00952 dB 0.00122 dB	±0.0005 dB ±0.0001 dB	PASS

Date: 06.17.2016

Name: Vatropin

Signature: 



## TRACEABILITY INFORMATION

The measurements made in support of this certificate are traceable to SNIIM (Siberian State Institute of Metrology) and its accredited affiliates, or standards administered by recognized national or international standards laboratories. At planned intervals, our measurement standards are calibrated by comparison to, or measurement against national or international standards, natural physical constants, consensus standards or by ratio type measurements using self-calibrating techniques.

This certificate and the tests, calibrations or measurements contained within, shall not be reproduced without prior written approval of Copper Mountain Technologies.

### Calibration Equipment Used:

Model Number	Model Description	Serial Number	Verification Organization	Calibration Certificate Number	Cal Due Date
PLANAR Obzor-804/1	Network Analyzer	14095107	VNIIFTRI Test Center, Russia	1/160-515-15	13.08.2016
Agilent E4408B	Spectrum Analyzer	MY41441058	Federal Budget Institution «URALTEST» Yekaterinburg, Russia	714697	04.09.2016
R&S NRP-Z51	Power sensor	104021	Federal Budget Institution «URALTEST» Yekaterinburg, Russia	719287	18.09.2016
Agilent 53150A	Universal Counter	US40502471	Federal Budget Institution «URALTEST» Yekaterinburg, Russia	714536	04.09.2016
PLANAR ACT-81	Programmable Attenuator	0600101	Science Research Institute, Mytishchi, Moscow region, Russia	21/25/085	01.10.2016
Rosenberger 05CK200-150	50 Ohm, Type N Verification	14607	Federal Budget Institution «URALTEST» Yekaterinburg, Russia	356855	11.09.2016
Rosenberger 05 CK 10A -150	50 Ohm, Type N Cal kit	14607	Federal Budget Institution «URALTEST» Yekaterinburg, Russia	356854	11.09.2016