Calibration Certificate

Factory Standard Calibration

No: 44345-5041-002 / 01

Date: Sep 23, 2015

Recommended calibration interval: 1 Year

Manufacturer

Advantex LLC
Russian Federation,
111250, Moscow, Krasnokazarmennaya st., 13/1
tel. +7(495)721-47-74
e-mail: info@advantex.ru
www.advantexrf.com

Customer

Contract No

Contract Date

Location of calibration:

Company	Advantex LLC - IF/RF & Microwave Design				
Address	Krasnokazarmennaya st., 13/1				
City	Moscow	State		Zip Code	111250
Country	Russian Federation				

Calibrated / Tested Instrument Information

Model Name	UNO	Description	Freq. Synthesizer 100kHz-13GHz
Part Number	UNO-01M-C105W54H256		
Serial Number	44345-5041-002	Firmware version	1.0
Power-on Count		Total Operation Time, hours	

Installed Hardware

Part Number	Serial Number	Description
UNO-10M-RF	21976-5041-003	RF Frequency synthesizer 10kHz-13GHz, +15dBm

Calibration Certificate No 44345-5041-002 / 01
Factory Standard Calibration Date: Sep 23, 2015

P/N: UNO-01M-C105W54H256
S/N: 44345-5041-002

Calibration equipment used

Model Name	Description	Cal due date	Certificate No
R&S NRP-Z22	Average power sensor	Nov 10, 2012	20-311889
R&S FSUP26	Signal source analyzer 26.5GHz	Nov 16, 2012	20-312658
R&S SMBV100A	Vector signal generator	May 31, 2013	20-336295

Test conditions (unless explicitly specified)

Ambient Temperature: 23 $^{+5}_{-3}$ °C
Humidity: 20 to 70% RH
Test program name: SG8_TP
Test program version: 1.1

Test results summary

#	Test Name	Status	Note / Resolution
1	Mechanical Test Set		
1.1	Mechanical defects / damages test (case, display, connectors)	PASSED	
2	Power-On Test Set		
2.1	Power-on, display, keyboard, rotary knob operation test	SKIPPED	
2.2	EEPROM integrity test	PASSED	
3	PLL Lock Test		
3.1	PLL lock test at 6GHz+1Hz	PASSED	
3.2	PLL lock test at 13GHz	PASSED	
4	Remote Control Interfaces		
4.1	USB *IDN? response	PASSED	
4.2	RS-232 *IDN? response	PASSED	
5	RF Level Calibration Area		
5.1	Min. value of high bound of calibration area	PASSED	
5.2	Max. value of low bound of calibration area	PASSED	
6	RF Level Accuracy		
6.1	Absolute accuracy at Pout=0..+10dBm	PASSED	
6.2	Absolute accuracy within calibration area	PASSED	
7	RFout Frequency / Spectrum		
7.1	Frequency accuracy	PASSED	
7.2	Normalized phase noise	PASSED	
8	REF Out		
8.1	REF Out level	PASSED	
8.2	REF Out phase noise	PASSED	
9	REF In Sensitivity		
9.1	External reference signal 10MHz, 0dBm PLL lock	PASSED	
9.2	External reference signal 100MHz, 0dBm PLL lock	PASSED	
10	Analog Inputs		
10.1	Mic In	SKIPPED	
10.2	AUX In / TRIG	SKIPPED	

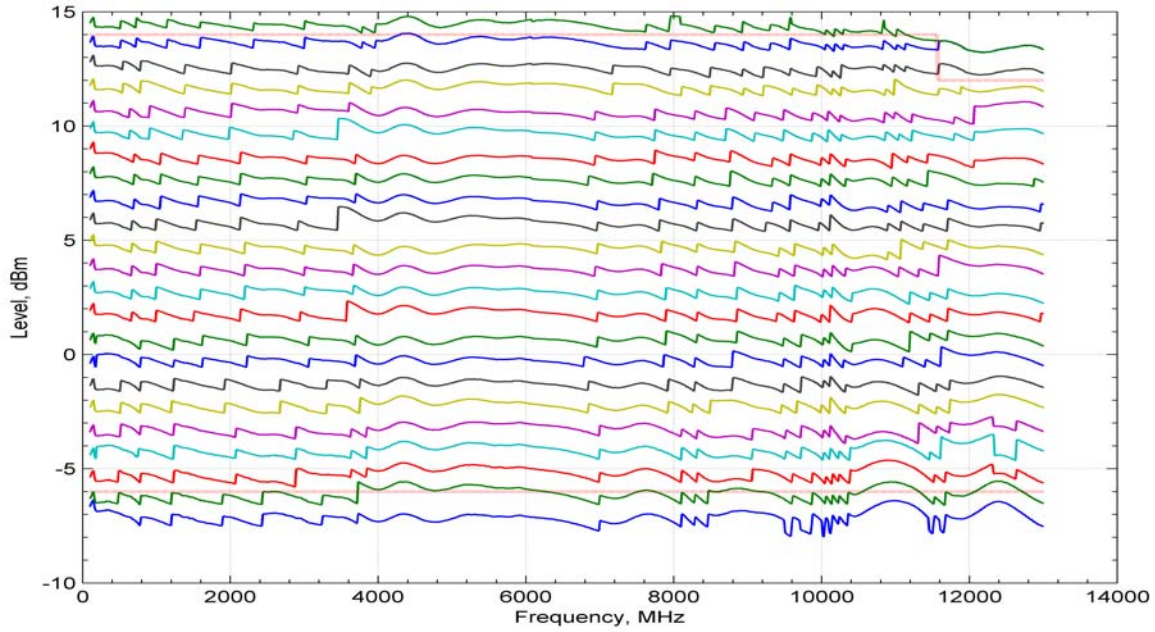
Notes:

Test Report Details - RF Level Calibration Area

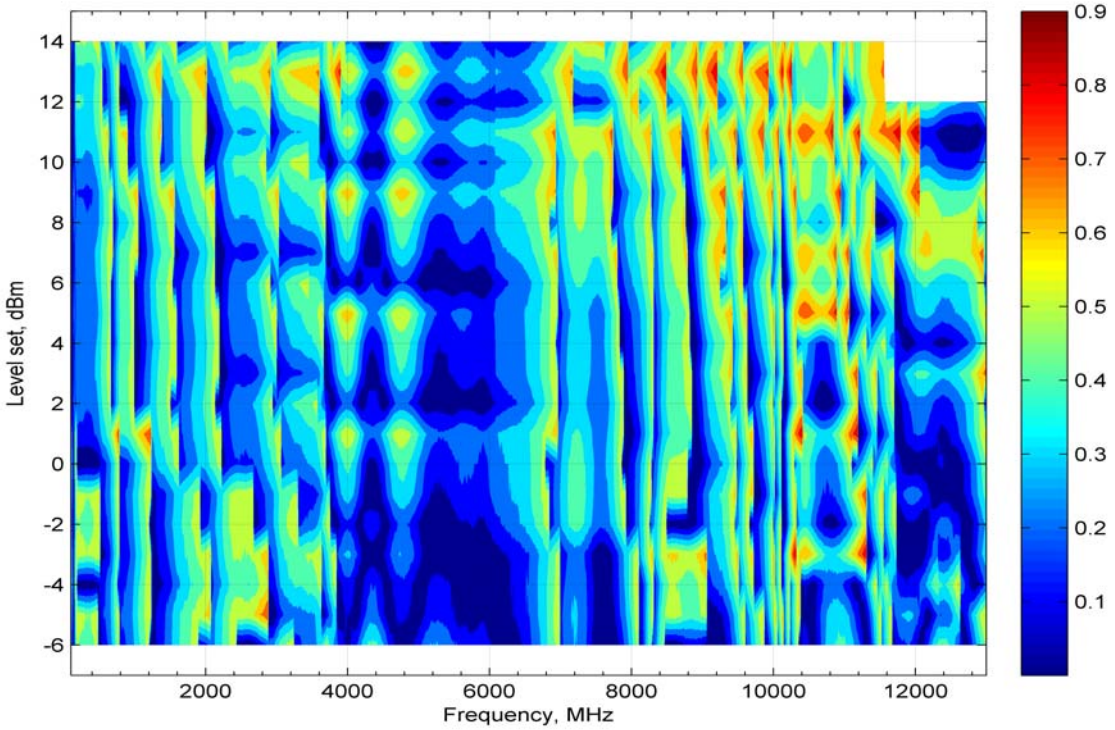
#	Test Name	Measured	Op.	Spec.	Meas. Accuracy	Units
5.1	Min. value of high bound of calibration area	+12	≥	+10	0.16	dBm
5.2	Max. value of low bound of calibration area	-6	≤	0	0.14	dBm

Test Report Details - RF Level Accuracy (ambient temp = +20..+25°C, int. block temp = +40°C)

#	Test Name	Measured	Op.	Spec.	Meas. Accuracy	Units
6.1	Absolute accuracy at Pout=0..+10dBm	0.92	≤	1.5	0.13	dBm
6.2	Absolute accuracy within calibration area	0.92	≤	2	0.12	dBm



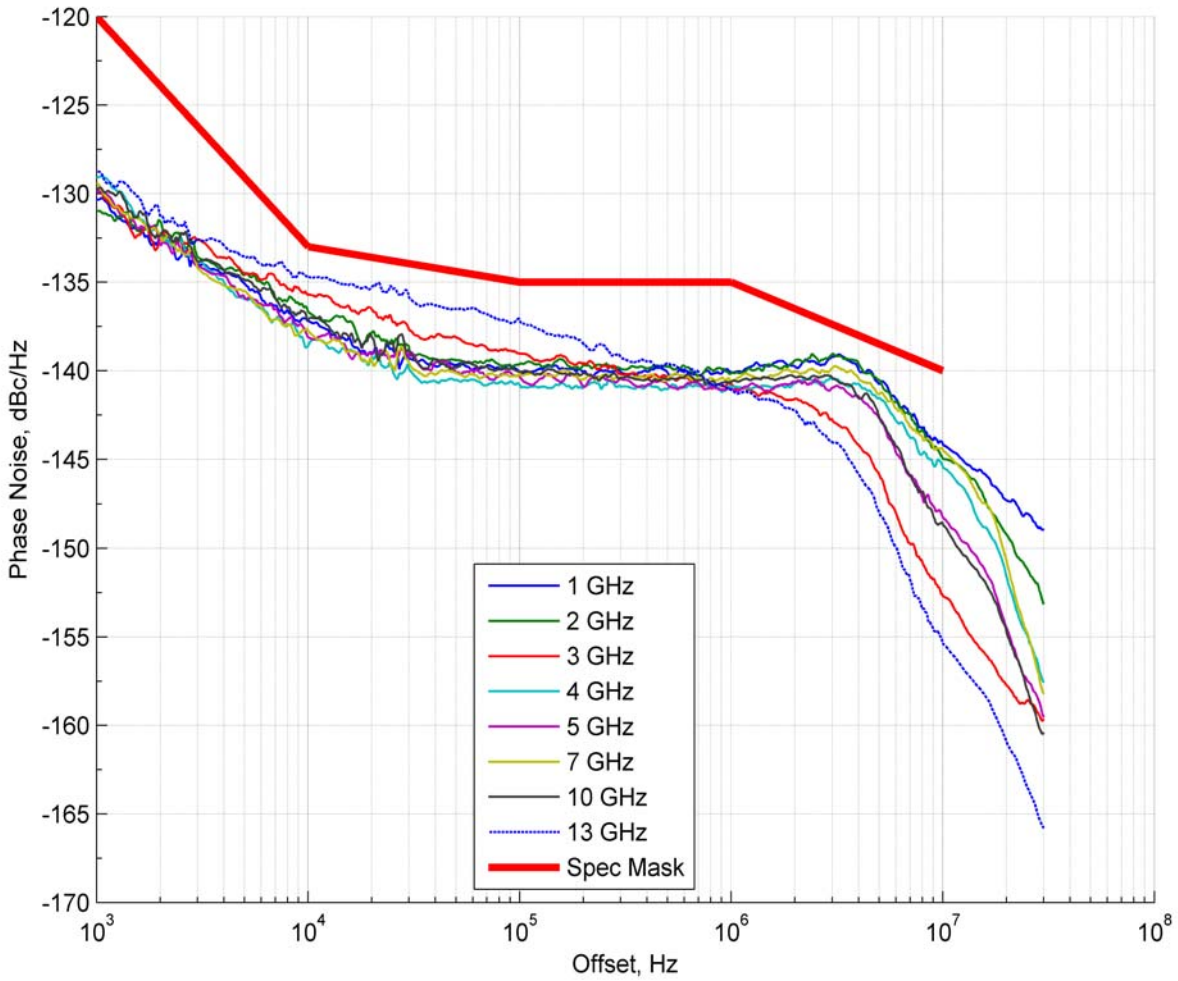
Level scan



Absolute level accuracy

Test Report Details - RFout Frequency / Spectrum (int. reference = 100MHz, int. block temp = +44°C)

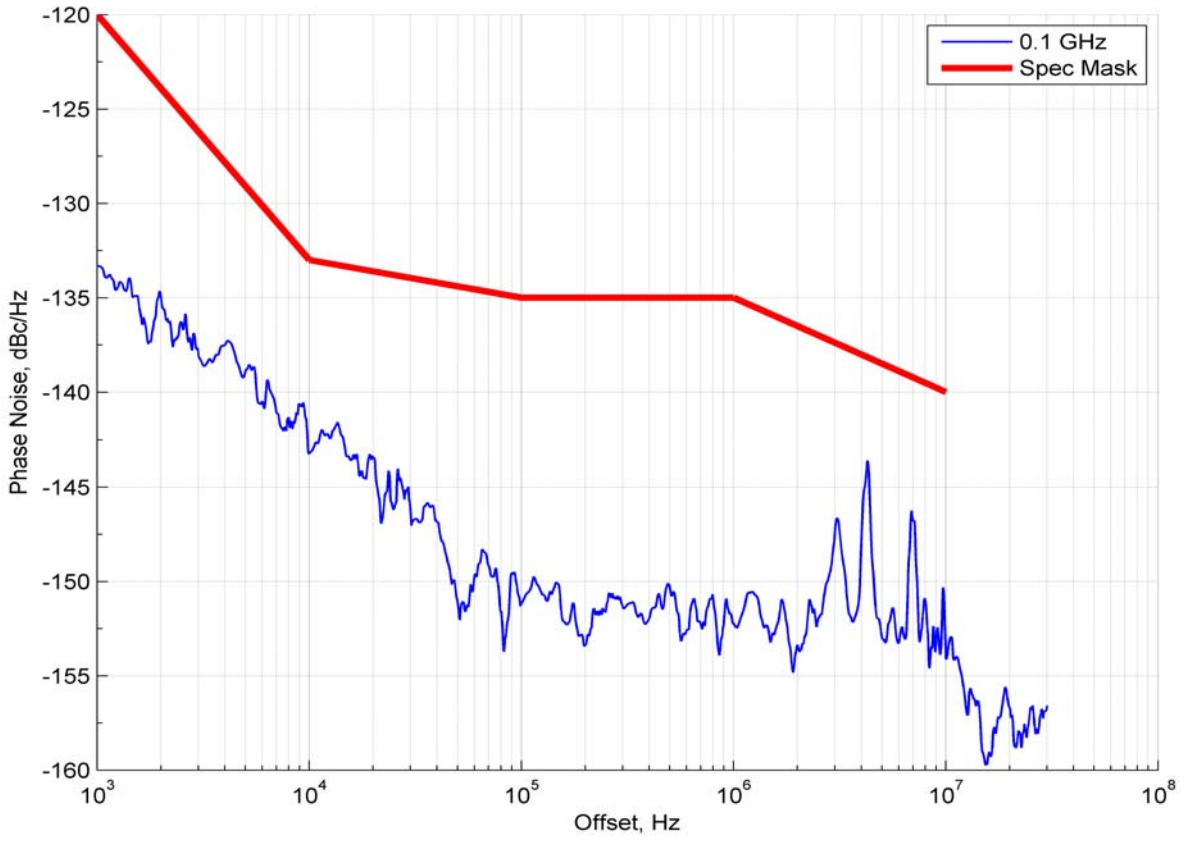
#	Test Name	Measured	Op.	Spec.	Meas. Accuracy	Units
7.1	Frequency Accuracy					
7.1.1	Relative error	-0.064	><	±0.1	0.01	ppm
7.2	Phase noise normalized to 1GHz center frequency, max for 1, 2 .. 13GHz center frequencies at offsets:					
7.2.1	1 kHz	-128	≤	-120	1	dBc/Hz
7.2.2	10 kHz	-135	≤	-133	1	dBc/Hz
7.2.3	100 kHz	-137	≤	-135	1	dBc/Hz
7.2.4	1 MHz	-140	≤	-135	1	dBc/Hz
7.2.5	10 MHz	-144	≤	-140	1	dBc/Hz



RF Out phase noise normalized to 1GHz center frequency

Test Report Details - REF Out (int. reference = 100MHz, int. block temp = +40°C)

#	Test Name	Measured	Op.	Spec.	Meas. Accuracy	Units
8.1	REF Out level					
8.1.1	REF Out level	+10.2	≥	+5	0.5	dBm
8.2	Phase noise normalized to 1GHz center frequency at offsets:					
8.2.1	1 kHz	-133	≤	-120	1	dBc/Hz
8.2.2	10 kHz	-140	≤	-133	1	dBc/Hz
8.2.3	100 kHz	-150	≤	-135	1	dBc/Hz
8.2.4	1 MHz	-150	≤	-135	1	dBc/Hz
8.2.5	10 MHz	-150	≤	-140	1	dBc/Hz



REF Out phase noise normalized to 1GHz center frequency

Remarks:
1) This calibration certificate ensures that the tests and measurements for a given instrument were carried out in accordance with approved calibration program specified above. Last page of the document must contain the name of executive, signature and QA Department stamp.
2) Warranty terms are specified in warranty certificate (supplied).
3) Delivery contents, storage conditions, maintenance, safety, and disposal information are listed in the "Operating Manual" for the instrument (supplied).
4) Detailed technical characteristics are specified in Datasheet for the instrument (can be downloaded from the web-site www.advantexrf.com).
5) Completeness of the delivery contents is ensured by the packing list (included).
6) Lifetime of the instrument: at least 5 years.

Andrew Polyakov
executive name, QA Department stamp

signature