Verification and Calibration Procedures v2.07 AnaPico Signal Generators

APMS, APSIN, APULN Models

Document size:

1 (one) title page
18 (eighteen) content pages

Contents

Instrument Model …… :
Serial Number …… :
Installed Options …… :
Firmware Version …… :
Number of Channels …… : *Date of measuring …… :*
Tested Channel …… : *Performed by …… :*

This document describes the performance verification and calibration procedures that are performed to guarantee instrument performance according to specification.
Test procedures described in this document may be simplified and of restricted range compared with those that relate to the generally more comprehensive factory test facilities which are necessary to demonstrate complete compliance with the specifications.
When making tests to verify that the instrument meets the stated performance limits always allow for the uncertainty of the test equipment. The tests should be performed at least every 24 months.

I. Measuring Conditions

Temperature	23°C ± 5°C
Relative Humidity	20 to 80 %
Instrument warm-up time	1 hour

II. List of parameters and tests to perform

Parameter	Test	Recommended Test Equipment
Internal Settings	1. Self-Test	None
Frequency	2. Absolute accuracy	Frequency counter
	3. Relative accuracy	Frequency counter
Output power	4. Maximum power	Power meter like LB5940L
	5. Power level accuracy	Power meter like LB5940L
	6. Power level linearity	Power meter like LB5940L
	7. Low levels accuracy (PE)	Measuring receiver like FSMR26
Spurious	8. Harmonic Spurious	Spectrum analyzer like FSEK30
Phase Noise	9. Single-sideband phase noise	Signal source analyzer like APPH20G
Pulse Modulation	10. On/off ratio	Spectrum analyzer like FSEK30
	11. Rise/fall times	Real-time oscilloscope
Amplitude Modulation	12. Depth	Measuring receiver like FSMR26
	13. Distortion	Measuring receiver like FSMR26
Frequency Modulation	14. Frequency Response	Measuring receiver like FSMR26
	15. Distortion	Measuring receiver like FSMR26

III. Verification and Calibration Overview

Calibration involves verification and, if necessary, adjustment and re-verification of the instrument.

Verification is the process of testing to ensure the accuracy of the device.

Adjustment is the process of measuring and compensating the device performance to improve the measurement accuracy.

IV. Performance Verification Tests

APMS

The “Status” column of a test should be marked with “N/A” if a setting cannot be tested on the device under test (DUT). If the test is within tolerance, the “Status” should be marked with a ✓ ; if the test is outside tolerance, it should be marked with a ✗.

When a value in the “Tolerance” column is followed by “(typ.)” it is a typically expected value. In that case the tolerance value is an indication of the performance that can be achieved, but the test cannot be marked as failed.

1. Self-Test

Use the Signal Generator GUI to perform a self-test of the device. (Controller -> Diagnostic Self Test).

Return Codes	Returned Code	Status
0 => pass -1 => Power Error -2 => Frequency Error		

2. Absolute Frequency Accuracy

Use a GPS conditioned Rubidium signal or similar as the timing reference of the frequency counter.

Output Frequency (Hz)	Measured Frequency (Hz)	Tolerated Error (Hz)	Status
100 000 000		< ± 100	

3. Relative Frequency Accuracy

Use a common reference for the Device Under Test (DUT) and the frequency counter.

Output Frequency (Hz)	Measured Frequency (Hz)	Tolerated Error (Hz)	Status
500 000 000		< ± 1	
5 000 000 000		< ± 1	

4. Maximum Output Power

Depending on the installed option refer to the appropriate Max Power column (standard, PE3 or PE4).

Output Frequency	Measured Power (dBm)	Max Power (dBm)			Status
		Standard	PE4 (6, 12, 20G)	PE4 (33, 40G)	
10 MHz		20	18	19	
1 GHz		25	20	19	
6 GHz		25	20	19	
12 GHz		23	18	19	
20 GHz		20	15	19	
26 GHz		18	-	16	
33 GHz		18	-	15	
40 GHz		18	-	14	

5. Power Level Accuracy

Frequency response at 0 dBm output power.

Frequency	Measured Power (dBm)	Tolerated Error (dB)	Status
10 MHz		< ± 0.8	
100 MHz		< ± 0.8	
1 GHz		< ± 0.8	
2 GHz		< ± 0.8	
4 GHz		< ± 0.8	
6 GHz		< ± 0.9	
12 GHz		< ± 1.0	
15 GHz		< ± 1.0	
20 GHz		< ± 1.0	
26 GHz		< ± 1.2	
33 GHz		< ± 1.2	
40 GHz		< ± 1.2	

6. Power Level Linearity

Level Linearity at different frequencies.

Frequency (GHz)	Output Power (dBm)	Measured Power (dBm)	Tolerated Error (dB)	Status
1	15		< ± 0.8	
1	10		< ± 0.8	
1	5		< ± 0.8	
1	0		< ± 0.8	
1	-5		< ± 0.8	
1	-10		< ± 0.8	
1	-15		< ± 0.8	
10	15		< ± 0.8	
10	10		< ± 0.8	
10	5		< ± 0.8	
10	0		< ± 0.8	
10	-5		< ± 0.8	
10	-10		< ± 0.8	
10	-15		< ± 0.8	

7. Low Level Accuracy (option PE4)

Level Accuracy at -50 dBm output power.

Frequency	Measured Power (dBm)	Tolerated Error (dB)	Status
10 MHz		< ± 1.2	
100 MHz		< ± 1.2	
1 GHz		< ± 1.2	
2 GHz		< ± 1.2	
4 GHz		< ± 1.2	
6 GHz		< ± 1.3	
12 GHz		< ± 1.6	
15 GHz		< ± 1.6	
20 GHz		< ± 1.6	
26 GHz		< ± 1.7	
33 GHz		< ± 1.7	
40 GHz		< ± 1.7	

8. Harmonic Distortion

Output power set to 5 dBm.

Frequency	Test Frequency	Measured Relative Power (dBc)	Tolerance (dBc)	Status
100 MHz	50 MHz		< -70	
100 MHz	200 MHz		< -20	
100 MHz	300 MHz		< -20	
1 GHz	500 MHz		< -70	
1 GHz	2 GHz		< -30	
1 GHz	3 GHz		< -30	
6 GHz	3 GHz		< -65	
6 GHz	12 GHz		< -25	
6 GHz	18 GHz		< -25	
12 GHz	6 GHz		< -60	
12 GHz	24 GHz		< -25	
12 GHz	36 GHz		< -25	
18 GHz	9 GHz		< -60	
18 GHz	36 GHz		< -25	
26 GHz	13 GHz		< -55 (typ.)	
33 GHz	16.5 GHz		< -55 (typ.)	
40 GHz	20 GHz		< -55 (typ.)	

9. Single-sideband Phase Noise

Output power set to maximum, Automatic Level Control (ALC) off.

Frequency	Frequency Offset	Measured Phase Noise (dBc/Hz)	Tolerance (dBc/Hz)		Status
			Standard	Option LN	
1 GHz	10 Hz		-82	-96	
	100 Hz		-109	-106	
	1 kHz		-126	-126	
	10 kHz		-138	-138	
	100 kHz		-145	-145	
4 GHz	10 Hz		-70	-81	
	100 Hz		-101	-97	
	1 kHz		-112	-112	
	10 kHz		-124	-124	
	100 kHz		-133	-133	
10 GHz	10 Hz		-63	-73	
	100 Hz		-93	-90	
	1 kHz		-107	-107	
	10 kHz		-117	-117	
	100 kHz		-124	-124	

10. Pulse Modulation On/Off Ratio

Output power set to 10 dBm. If available, the pulse modulation mode must be set to high on/off ratio (RAT).

Frequency	On/Off ratio (dBc)	Tolerance (dBc)	Status
1 GHz		> 80	
6 GHz		> 80	
12 GHz		> 70	
18 GHz		> 65	
26 GHz		> 75 (typ.)	
33 GHz		> 75 (typ.)	
40 GHz		> 75 (typ.)	

11. AM Depth (option MOD only)

Modulation rate 1 kHz, output power 0 dBm.

Frequency	Depth	Measured Depth	Tolerance (%)	Status
1 GHz	30%		< 4	
1 GHz	80%		< 4	

12. AM Distortion (option MOD only)

Modulation rate 1 kHz, output power 0 dBm.

Carrier Frequency	Depth	Measured Distortion	Tolerance (%)	Status
1 GHz	30%		< 1	
1 GHz	80%		< 1	

13. FM Frequency Response (option MOD only)

Modulation rate 1 kHz, output power 0 dBm.

Carrier Frequency	Deviation (kHz)	Measured Deviation	Tolerance (%)	Status
1 GHz	1		< 2	
1 GHz	10		< 2	
1 GHz	100		< 2	

14. FM Distortion (option MOD only)

Modulation rate 1 kHz, output power 0 dBm.

Carrier Frequency	Deviation (kHz)	Measured distortion	Tolerance (%)	Status
1 GHz	10		1 (typ.)	

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The “Status” column of a test should be marked with “N/A” if a setting cannot be tested on the device under test (DUT). If the test is within tolerance, the “Status” should be marked with a ✓ ; if the test is outside tolerance, it should be marked with a ✗.

When a value in the “Tolerance” column is followed by “(typ.)” it is a typically expected value. In that case the tolerance value is an indication of the performance that can be achieved, but the test cannot be marked as failed.

1. Self-Test

Use the Signal Generator GUI to perform a self-test of the device. (Controller -> Diagnostic Self Test).

Return Codes	Returned Code	Status
0 => pass -1 => Power Error -2 => Frequency Error		

2. **Absolute Frequency Accuracy**

Use a GPS conditioned Rubidium signal or similar as the timing reference of the frequency counter.

Output Frequency (Hz)	Measured Frequency (Hz)	Tolerated Error (Hz)	Status
100 000 000		< ± 100	

3. **Relative Frequency Accuracy**

Use a common reference for the Device Under Test (DUT) and the frequency counter.

Output Frequency (Hz)	Measured Frequency (Hz)	Tolerated Error (Hz)	Status
500 000 000		< ± 1	
2 000 000 000		< ± 1	

4. Maximum Output Power

Depending on the installed option refer to the appropriate Max Power column (standard, PE3 or PE4).

Output Frequency	Measured Power (dBm)	Max Power (dBm)		Status
		Standard	PE3	
10 MHz		18	17	
1 GHz		18	17	
2 GHz		18	17	
4 GHz		18	17	
6 GHz		18	17	

5. Power Level Accuracy

Frequency response at 0 dBm output power.

Frequency	Measured Power (dBm)	Tolerated Error (dB)	Status
10 MHz		< ± 0.8	
100 MHz		< ± 0.8	
1 GHz		< ± 0.8	
2 GHz		< ± 0.8	
4 GHz		< ± 0.8	
6 GHz		< ± 0.8	

6. Power Level Linearity

Level Linearity at 1 GHz output frequency.

Frequency (GHz)	Output Power (dBm)	Measured Power (dBm)	Tolerated Error (dB)	Status
1	10		< ± 0.8	
1	5		< ± 0.8	
1	0		< ± 0.8	
1	-5		< ± 0.8	
1	-10		< ± 0.8	
1	-15		< ± 0.8	
1	-20		< ± 0.8	

7. Low Level Accuracy (option PE3)

Level Accuracy at -50 dBm output power.

Frequency	Measured Power (dBm)	Tolerated Error (dB)	Status
10 MHz		< ± 1.3	
100 MHz		< ± 1.3	
1 GHz		< ± 1.3	
2 GHz		< ± 1.3	
4 GHz		< ± 1.3	
6 GHz		< ± 1.3	

8. Harmonic Distortion

Output power set to 10 dBm.

Frequency	Test Frequency	Measured Relative Power (dBc)	Tolerance (dBc)	Status
100 MHz	50 MHz		< -70	
100 MHz	200 MHz		< -30	
100 MHz	300 MHz		< -30	
1 GHz	500 MHz		< -70	
1 GHz	2 GHz		< -30	
1 GHz	3 GHz		< -30	
6 GHz	3 GHz		< -70	
6 GHz	12 GHz		< -30	
6 GHz	18 GHz		< -30	

9. Single-sideband Phase Noise

Output power set to maximum, Automatic Level Control (ALC) off.

Frequency	Frequency Offset	Measured Phase Noise (dBc/Hz)	Tolerance (dBc/Hz)	Status
1 GHz	10 Hz		-75	
	100 Hz		-100	
	1 kHz		-112	
	10 kHz		-120	
	100 kHz		-126	
4 GHz	10 Hz		-60	
	100 Hz		-86	
	1 kHz		-100	
	10 kHz		-108	
	100 kHz		-114	

10. Pulse Modulation On/Off Ratio

Output power set to 10 dBm. If available, the pulse modulation mode must be set to high on/off ratio (RAT).

Frequency	On/Off ratio (dBc)	Tolerance (dBc)	Status
1 GHz		> 70 (typ.)	
6 GHz		> 70 (typ.)	

11. AM Depth (option MOD only)

Modulation rate 1 kHz, output power 0 dBm.

Frequency	Depth	Measured Depth	Tolerance (%)	Status
1 GHz	30%		< 4	
1 GHz	80%		< 4	

12. AM Distortion

Modulation rate 1 kHz, output power 0 dBm.

Carrier Frequency	Depth	Measured Distortion	Tolerance (%)	Status
1 GHz	30%		< 1	
1 GHz	80%		< 1	

13. FM Frequency Response

Modulation rate 1 kHz, output power 0 dBm.

Carrier Frequency	Deviation (kHz)	Measured Deviation	Tolerance (%)	Status
1 GHz	1		< 2	
1 GHz	10		< 2	
1 GHz	100		< 2	

14. FM Distortion

Modulation rate 1 kHz, output power 0 dBm.

Carrier Frequency	Deviation (kHz)	Measured distortion	Tolerance (%)	Status
1 GHz	10		1 (typ.)	

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The “Status” column of a test should be marked with “N/A” if a setting cannot be tested on the device under test (DUT). If the test is within tolerance, the “Status” should be marked with a ✓ ; if the test is outside tolerance, it should be marked with a ✗.

When a value in the “Tolerance” column is followed by “(typ.)” it is a typically expected value. In that case the tolerance value is an indication of the performance that can be achieved, but the test cannot be marked as failed.

1. Self-Test

Use the Signal Generator GUI to perform a self-test of the device. (Controller -> Diagnostic Self Test).

Return Codes	Returned Code	Status
0 => pass -1 => Power Error -2 => Frequency Error		

2. Absolute Frequency Accuracy

Use a GPS conditioned Rubidium signal or similar as the timing reference of the frequency counter.

Output Frequency (Hz)	Measured Frequency (Hz)	Tolerated Error (Hz)	Status
100 000 000		< ± 100	

3. Relative Frequency Accuracy

Use a common reference for the Device Under Test (DUT) and the frequency counter.

Output Frequency (Hz)	Measured Frequency (Hz)	Tolerated Error (Hz)	Status
500 000 000		< ± 1	
5 000 000 000		< ± 1	

4. Maximum Output Power

Depending on the installed option refer to the appropriate Max Power column (standard, PE3 or PE4).

Output Frequency	Measured Power (dBm)	Max Power (dBm)				Status
		Standard	PE3	HP	PE3 + HP	
10 MHz		15	13	18	18	
1 GHz		15	13	25	22	
6 GHz		15	13	23	22	
12 GHz		15	13	23	20	
20 GHz		15	13	20	18	
24 GHz		15	13	20	15	

5. Power Level Accuracy

Frequency response at 0 dBm output power.

Frequency	Measured Power (dBm)	Tolerated Error (dB)	Status
10 MHz		< ± 1.0	
100 MHz		< ± 1.0	
1 GHz		< ± 1.0	
2 GHz		< ± 1.0	
4 GHz		< ± 1.0	
6 GHz		< ± 1.0	
12 GHz		< ± 1.0	
15 GHz		< ± 1.0	
20 GHz		< ± 1.0	

6. Power Level Linearity

Level Linearity at different frequencies.

Frequency (GHz)	Output Power (dBm)	Measured Power (dBm)	Tolerated Error (dB)	Status
1	15		< ± 1	
1	10		< ± 1	
1	5		< ± 1	
1	0		< ± 1	
1	-5		< ± 1	
1	-10		< ± 1	
1	-15		< ± 1	
10	15		< ± 1	
10	10		< ± 1	
10	5		< ± 1	
10	0		< ± 1	
10	-5		< ± 1	
10	-10		< ± 1	
10	-15		< ± 1	

7. Low Level Accuracy (option PE3)

Level Accuracy at -50 dBm output power.

Frequency	Measured Power (dBm)	Tolerated Error (dB)	Status
10 MHz		< ± 1.5	
100 MHz		< ± 1.5	
1 GHz		< ± 1.5	
2 GHz		< ± 1.5	
4 GHz		< ± 1.5	
6 GHz		< ± 1.5	
12 GHz		< ± 1.5	
15 GHz		< ± 1.5	
20 GHz		< ± 1.5	

8. Harmonic Spurious

Output power set to 10 dBm.

Frequency	Test Frequency	Measured Relative Power (dBc)	Tolerance (dBc)	Status
100 MHz	50 MHz		< -65	
100 MHz	200 MHz		< -30	
100 MHz	300 MHz		< -30	
1 GHz	500 MHz		< -65	
1 GHz	2 GHz		< -30	
1 GHz	3 GHz		< -30	
6 GHz	3 GHz		< -60	
6 GHz	12 GHz		< -30	
6 GHz	18 GHz		< -30	
12 GHz	6 GHz		< -60	
12 GHz	24 GHz		< -30	
12 GHz	36 GHz		< -30	
18 GHz	9 GHz		< -60	
18 GHz	36 GHz		< -30	
20 GHz	10 GHz		< -40	
20 GHz	40 GHz		< -30	

9. Single-sideband Phase Noise

Output power set to maximum, Automatic Level Control (ALC) off.

Frequency	Frequency Offset	Measured Phase Noise (dBc/Hz)	Tolerance (dBc/Hz)	Status
1 GHz	10 Hz		-72	
	100 Hz		-95	
	1 kHz		-112	
	10 kHz		-123	
	100 kHz		-126	
5 GHz	10 Hz		-55	
	100 Hz		-85	
	1 kHz		-101	
	10 kHz		-111	
	100 kHz		-113	
10 GHz	10 Hz		-51	
	100 Hz		-76	
	1 kHz		-92	
	10 kHz		-103	
	100 kHz		-106	

10. Pulse Modulation On/Off Ratio

Output power set to 10 dBm. If available, the pulse modulation mode must be set to high on/off ratio (RAT).

Frequency	On/Off ratio (dBc)	Tolerance (dBc)	Status
1 GHz		> 70 (typ.)	
6 GHz		> 70 (typ.)	
12 GHz		> 70 (typ.)	
20 GHz		> 70 (typ.)	

11. AM Depth (option MOD only)

Modulation rate 1 kHz, output power 0 dBm.

Frequency	Depth	Measured Depth	Tolerance (%)	Status
1 GHz	30%		< 4	
1 GHz	80%		< 4	

12. AM Distortion

Modulation rate 1 kHz, output power 0 dBm.

Carrier Frequency	Depth	Measured Distortion	Tolerance (%)	Status
1 GHz	30%		< 1	
1 GHz	80%		< 1	

13. FM Frequency Response

Modulation rate 1 kHz, output power 0 dBm.

Carrier Frequency	Deviation (kHz)	Measured Deviation	Tolerance (%)	Status
1 GHz	1		< 2	
1 GHz	10		< 2	
1 GHz	100		< 2	

14. FM Distortion

Modulation rate 1 kHz, output power 0 dBm.

Carrier Frequency	Deviation (kHz)	Measured distortion	Tolerance (%)	Status
1 GHz	10		1 (typ.)	

APULN

The “Status” column of a test should be marked with “N/A” if a setting cannot be tested on the device under test (DUT). If the test is within tolerance, the “Status” should be marked with a ✓ ; if the test is outside tolerance, it should be marked with a ✗.

When a value in the “Tolerance” column is followed by “(typ.)” it is a typically expected value. In that case the tolerance value is an indication of the performance that can be achieved, but the test cannot be marked as failed.

1. Self-Test

Use the Signal Generator GUI to perform a self-test of the device. (Controller -> Diagnostic Self Test).

Return Codes	Returned Code	Status
0 => pass -1 => Power Error -2 => Frequency Error		

2. **Absolute Frequency Accuracy**

Use a GPS conditioned Rubidium signal or similar as the timing reference of the frequency counter.

Output Frequency (Hz)	Measured Frequency (Hz)	Tolerated Error (Hz)	Status
100 000 000		< ± 100	

3. **Relative Frequency Accuracy**

Use a common reference for the Device Under Test (DUT) and the frequency counter.

Output Frequency (Hz)	Measured Frequency (Hz)	Tolerated Error (Hz)	Status
500 000 000		< ± 1	
5 000 000 000		< ± 1	

4. Maximum Output Power

Depending on the installed option refer to the appropriate Max Power column (standard, PE3 or PE4).

Output Frequency	Measured Power (dBm)	Max Power (dBm)				Status
		Standard	PE4	FILT	PE4 + FILT	
10 MHz		18	18	18	15	
1 GHz		24	20	15	12	
6 GHz		23	20	15	12	
12 GHz		20	15	15	12	
20 GHz		20	15	13	10	
26 GHz		18	15	13	10	
40 GHz		18	15	11	8	

5. Power Level Accuracy

Frequency response at 0 dBm output power.

Frequency	Measured Power (dBm)	Tolerated Error (dB)	Status
10 MHz		< ± 0.8	
100 MHz		< ± 0.8	
1 GHz		< ± 0.8	
2 GHz		< ± 0.8	
4 GHz		< ± 0.8	
6 GHz		< ± 0.9	
12 GHz		< ± 1.0	
15 GHz		< ± 1.0	
20 GHz		< ± 1.0	
26 GHz		< ± 1.2	
33 GHz		< ± 1.2	
40 GHz		< ± 1.2	

6. Power Level Linearity

Level Linearity at different frequencies.

Frequency (GHz)	Output Power (dBm)	Measured Power (dBm)	Tolerated Error (dB)	Status
1	15		< ± 0.8	
1	10		< ± 0.8	
1	5		< ± 0.8	
1	0		< ± 0.8	
1	-5		< ± 0.8	
1	-10		< ± 0.8	
1	-15		< ± 0.8	
10	15		< ± 0.8	
10	10		< ± 0.8	
10	5		< ± 0.8	
10	0		< ± 0.8	
10	-5		< ± 0.8	
10	-10		< ± 0.8	
10	-15		< ± 0.8	

7. Low Level Accuracy (option PE)

Level Accuracy at -50 dBm output power.

Frequency	Measured Power (dBm)	Tolerated Error (dB)	Status
10 MHz		< ± 1.2	
100 MHz		< ± 1.2	
1 GHz		< ± 1.2	
2 GHz		< ± 1.2	
4 GHz		< ± 1.2	
6 GHz		< ± 1.3	
12 GHz		< ± 1.6	
15 GHz		< ± 1.6	
20 GHz		< ± 1.6	
26 GHz		< ± 2.5	
33 GHz		< ± 2.5	
40 GHz		< ± 2.5	

8. Harmonic Spurious

Output power set to 10 dBm.

Frequency	Test Frequency	Measured Relative Power (dBc)	Tolerance (dBc)		Status
			Standard	Filt	
100 MHz	50 MHz		< -75 (typ.)	< -75 (typ.)	
100 MHz	200 MHz		< -30	< -30	
100 MHz	300 MHz		< -30	< -30	
1 GHz	500 MHz		< -75 (typ.)	< -75 (typ.)	
1 GHz	2 GHz		< -30	-50	
1 GHz	3 GHz		< -30	-50	
6 GHz	3 GHz		< -70 (typ.)	< -70 (typ.)	
6 GHz	12 GHz		< -25	-50	
6 GHz	18 GHz		< -25	-50	
12 GHz	6 GHz		< -70 (typ.)	< -70 (typ.)	
12 GHz	24 GHz		< -25	-50	
12 GHz	36 GHz		< -25	-50	
18 GHz	9 GHz		< -70 (typ.)	< -70 (typ.)	
18 GHz	36 GHz		< -25	-50	
26 GHz	13 GHz		< -55 (typ.)	< -65 (typ.)	
33 GHz	16.5 GHz		< -55 (typ.)	< -65 (typ.)	
40 GHz	20 GHz		< -55 (typ.)	< -65 (typ.)	

9. Single-sideband Phase Noise

Output power set to maximum, Automatic Level Control (ALC) off.

Frequency	Frequency Offset	Measured Phase Noise (dBc/Hz)	Tolerance (dBc/Hz)		Status
			Standard	Option LN	
100 MHz	10 Hz		-102	-115	
	100 Hz		-132	-127	
	1 kHz		-144	-144	
	10 kHz		-148	-148	
	100 kHz		-150	-150	
1 GHz	10 Hz		-83	-96	
	100 Hz		-114	-114	
	1 kHz		-126	-126	
	10 kHz		-138	-138	
	100 kHz		-145	-145	
4 GHz	10 Hz		-70	-83	
	100 Hz		-102	-102	
	1 kHz		-112	-112	
	10 kHz		-125	-125	
	100 kHz		-133	-133	
10 GHz	10 Hz		-63	-76	
	100 Hz		-96	-96	
	1 kHz		-107	-107	
	10 kHz		-117	-117	
	100 kHz		-125	-125	

10. Pulse Modulation On/Off Ratio

Output power set to 10 dBm. If available, the pulse modulation mode must be set to high on/off ratio (RAT).

Frequency	On/Off ratio (dBc)	Tolerance (dBc)	Status
1 GHz		> 70	
6 GHz		> 70	
12 GHz		> 70	
20 GHz		> 65	
26 GHz		> 65	
33 GHz		> 65	
40 GHz		> 65	

11. AM Depth (option MOD only)

Modulation rate 1 kHz, output power 0 dBm.

Frequency	Depth	Measured Depth	Tolerance (%)	Status
1 GHz	30%		< 4	
1 GHz	80%		< 4	

12. AM Distortion

Modulation rate 1 kHz, output power 0 dBm.

Carrier Frequency	Depth	Measured Distortion	Tolerance (%)	Status
1 GHz	30%		< 1	
1 GHz	80%		< 1	

13. FM Frequency Response

Modulation rate 1 kHz, output power 0 dBm.

Carrier Frequency	Deviation (kHz)	Measured Deviation	Tolerance (%)	Status
1 GHz	1		< 2	
1 GHz	10		< 2	
1 GHz	100		< 2	

14. FM Distortion

Modulation rate 1 kHz, output power 0 dBm.

Carrier Frequency	Deviation (kHz)	Measured distortion	Tolerance (%)	Status
1 GHz	10		1 (typ.)	

Document History

Version	Date	Author	Notes
2.00	12.05.2020	MH	Creation
2.01	15.06.2020	MH	Added sections for APMS, APSINX010, APSINXXG and APULN
2.02	25.06.2020	MH	Updated test values
2.03	21.07.2020	MH	Removed rise / fall time from list of tests
2.04	22.12.2020	MH	Updated values for APULN
2.05	05.01.2021	MH	Updated PhN values for APULN
2.06	08.01.2021	MH	Updated values for APULN max power, phase noise for APMS, APSINXXG, APSINx010
2.07	28.09.2021	MH	Updated Maxpower values for APMS @ >=33 GHz

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