Calibration Report

General Information

Object:	BODE 500
Serial Number:	102459966
Options:	
Manufacturer:	OMICRON electronics GmbH
Calibration Date:	2025-12-16
Test Engineer:	Mirko Popovic

Overall Result / Conformity

Overall Assessment:	pass
Specified Assessments:	469
Passed:	469
Failed:	0

Procedure

Calibration Procedure:	Adjust & Calibration
Calibration Software:	2.47
Page Count:	22

Ambient Conditions

Temperature:	23.0 °C ± 5.0 °C
	73.4 °F ± 9.0 °F
Relative Humidity:	45.0 % ± 20.0 %

Calibration Reference Equipment

Manufacturer	Model	SerialNo	TraceNo	Calibration due
Keithley Instr.	7510	04369582	18-136	2026-01-22
OMICRON electronics	Bode 500	102377723	23-498	2026-05-15
Rosenberger	53K36R-MSO	06D95	25-102	2026-02-26
Rosenberger	53S36R-MSO	06D89	23-009	2026-01-27
Rohde & Schwarz	NRP18T	102570	21-409	2026-07-08
OMICRON electronics	FRA-Bode RF	AC001A	22-149	2026-06-24
Pendulum	CNT-90	650612	24-142	2026-06-30

Test Results – Overview

Test Results – Detail

1   Output Frequency Calibration

Nominal	Actual			Error	Spec	Of Spec	Verdict
in kHz	in kHz			in mHz	in mHz	in %	
1000.0	999.999994			−6	500	−1.3	pass

2   Output Power Calibration

2.1   Frequency dependency

Frequency	Nominal	Actual		Error	Spec	Of Spec	Verdict
in MHz	in dBm	in dBm		in dBm	in dBm	in %	
0.00001	0.0	−0.012		−0.012	0.200	−5.8	pass
0.00010	0.0	−0.011		−0.011	0.200	−5.3	pass
0.00100	0.0	−0.010		−0.010	0.200	−4.9	pass
0.01000	0.0	−0.006		−0.006	0.200	−3.2	pass
0.10000	0.0	−0.013		−0.013	0.200	−6.4	pass
1.00000	0.0	−0.007		−0.007	0.200	−3.6	pass
10.00000	0.0	−0.006		−0.006	0.200	−2.9	pass
30.00000	0.0	−0.007		−0.007	0.200	−3.6	pass
50.00000	0.0	−0.009		−0.009	0.200	−4.7	pass
100.00000	0.0	−0.012		−0.012	0.200	−6.2	pass
150.00000	0.0	0.000		0.000	0.600	−0.1	pass
200.00000	0.0	0.022		0.022	0.600	3.7	pass
250.00000	0.0	0.051		0.051	0.600	8.6	pass
300.00000	0.0	0.060		0.060	0.600	10.0	pass
350.00000	0.0	0.112		0.112	0.600	18.7	pass
400.00000	0.0	0.091		0.091	0.600	15.1	pass
450.00000	0.0	0.009		0.009	0.600	1.6	pass

2.2   Power dependency

Frequency	Nominal	Actual		Error	Spec	Of Spec	Verdict
in kHz	in dBm	in dBm		in dBm	in dBm	in %	
1000.0	−10.0	−10.013		−0.013	0.200	−6.4	pass
1000.0	−5.0	−5.009		−0.009	0.200	−4.7	pass
1000.0	0.0	−0.007		−0.007	0.200	−3.4	pass
1000.0	5.0	4.994		−0.006	0.200	−3.0	pass
1000.0	10.0	10.002		0.002	0.200	0.8	pass
1000.0	13.0	13.007		0.007	0.200	3.6	pass

Frequency	Nominal	Actual	Error	Spec	Of Spec	Verdict
in kHz	in dBm	in dBm	in dBm	in dBm	in %	
1000.0	16.0	16.043	0.043	0.200	21.4	pass

3 ReturnLoss Calibration

3.1 Output

Return Loss

Frequency	Actual	Spec	Verdict
in MHz	in dB	in dB	
0.001	−48.4	<−30.0	pass
0.100	−47.6	<−30.0	pass
0.300	−46.5	<−30.0	pass
1.000	−45.1	<−30.0	pass
3.000	−43.6	<−30.0	pass
10.000	−41.7	<−30.0	pass
30.000	−41.6	<−30.0	pass
50.000	−46.4	<−30.0	pass
100.000	−52.2	<−30.0	pass
150.000	−39.7	<−26.0	pass
200.000	−32.4	<−26.0	pass
250.000	−30.4	<−23.0	pass
300.000	−30.6	<−23.0	pass
350.000	−36.7	<−23.0	pass
400.000	−34.5	<−23.0	pass
450.000	−28.4	<−23.0	pass

3.2 CH1 with 0dB Attenuator

Return Loss

Frequency	Actual	Spec	Verdict
in MHz	in dB	in dB	
0.001	−51.5	<−28.0	pass
0.100	−50.1	<−28.0	pass
0.300	−48.5	<−28.0	pass
1.000	−46.8	<−28.0	pass
3.000	−44.1	<−28.0	pass
10.000	−39.2	<−28.0	pass
30.000	−37.9	<−28.0	pass
50.000	−39.4	<−28.0	pass
100.000	−47.8	<−28.0	pass
150.000	−54.5	<−23.0	pass

Frequency	Actual		Spec	Verdict
in MHz	in dB		in dB	
200.000	−40.6		<−23.0	pass
250.000	−34.0		<−23.0	pass
300.000	−31.7		<−23.0	pass
350.000	−30.0		<−23.0	pass
400.000	−27.6		<−23.0	pass
450.000	−27.4		<−23.0	pass

3.3   CH1 with 20dB Attenuator

Return Loss

Frequency	Actual		Spec	Verdict
in MHz	in dB		in dB	
0.001	−51.8		<−28.0	pass
0.100	−50.2		<−28.0	pass
0.300	−48.4		<−28.0	pass
1.000	−46.8		<−28.0	pass
3.000	−43.9		<−28.0	pass
10.000	−38.9		<−28.0	pass
30.000	−37.1		<−28.0	pass
50.000	−37.8		<−28.0	pass
100.000	−43.2		<−28.0	pass
150.000	−49.7		<−23.0	pass
200.000	−37.1		<−23.0	pass
250.000	−32.2		<−23.0	pass
300.000	−31.4		<−23.0	pass
350.000	−34.1		<−23.0	pass
400.000	−37.2		<−23.0	pass
450.000	−33.3		<−23.0	pass

3.4   CH2 with 0dB Attenuator

Return Loss

Frequency	Actual		Spec	Verdict
in MHz	in dB		in dB	
0.001	−51.6		<−28.0	pass
0.100	−50.2		<−28.0	pass
0.300	−48.6		<−28.0	pass
1.000	−47.0		<−28.0	pass
3.000	−44.6		<−28.0	pass
10.000	−39.6		<−28.0	pass
30.000	−38.1		<−28.0	pass

Frequency	Actual		Spec	Verdict
in MHz	in dB		in dB	
50.000	−39.2		<−28.0	pass
100.000	−45.6		<−28.0	pass
150.000	−62.9		<−23.0	pass
200.000	−41.8		<−23.0	pass
250.000	−35.0		<−23.0	pass
300.000	−32.8		<−23.0	pass
350.000	−30.9		<−23.0	pass
400.000	−28.4		<−23.0	pass
450.000	−28.7		<−23.0	pass

3.5 CH2 with 20dB Attenuator

Return Loss

Frequency	Actual		Spec	Verdict
in MHz	in dB		in dB	
0.001	−51.6		<−28.0	pass
0.100	−50.1		<−28.0	pass
0.300	−48.6		<−28.0	pass
1.000	−47.0		<−28.0	pass
3.000	−44.4		<−28.0	pass
10.000	−39.2		<−28.0	pass
30.000	−37.3		<−28.0	pass
50.000	−37.8		<−28.0	pass
100.000	−42.8		<−28.0	pass
150.000	−53.0		<−23.0	pass
200.000	−38.0		<−23.0	pass
250.000	−33.1		<−23.0	pass
300.000	−32.3		<−23.0	pass
350.000	−35.0		<−23.0	pass
400.000	−36.8		<−23.0	pass
450.000	−31.5		<−23.0	pass

4 Voltage–Gain Calibration

4.1 Resistive Power Splitter

Gain

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in dB	in dB	in dB	in dB	in %	
0.00001	−0.001	0.000	0.000	0.200	0.1	pass
0.00003	−0.001	0.000	0.001	0.200	0.3	pass
0.00010	−0.001	0.000	0.000	0.200	0.2	pass
0.00030	0.000	0.000	0.001	0.200	0.3	pass
0.00100	0.000	0.001	0.001	0.200	0.4	pass
0.00300	0.000	0.001	0.000	0.200	0.2	pass
0.01000	0.000	0.001	0.001	0.200	0.3	pass
0.03000	0.001	0.001	0.001	0.200	0.3	pass
0.10000	0.001	0.001	0.001	0.200	0.4	pass
0.30000	0.001	0.002	0.002	0.200	0.8	pass
1.00000	0.001	0.002	0.001	0.200	0.6	pass
3.00000	0.001	0.002	0.001	0.200	0.7	pass
10.00000	0.001	0.000	−0.001	0.400	−0.3	pass
30.00000	0.003	0.004	0.001	0.600	0.1	pass
50.00000	0.006	0.006	0.001	0.800	0.1	pass
100.00000	0.007	0.008	0.001	1.000	0.1	pass
150.00000	0.003	0.005	0.001	1.000	0.1	pass
200.00000	0.005	0.007	0.001	1.000	0.1	pass
250.00000	0.017	0.018	0.001	1.000	0.1	pass
300.00000	0.022	0.023	0.001	1.000	0.1	pass
350.00000	0.022	0.024	0.002	1.000	0.2	pass
400.00000	0.028	0.027	−0.001	1.000	−0.1	pass
450.00000	0.044	0.044	−0.001	1.500	0.0	pass

Phase

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in m°	in m°	in °	in °	in %	
0.00001	0	0	0.00	1.00	0.0	pass
0.00003	0	0	0.00	1.00	0.0	pass
0.00010	0	0	0.00	1.00	0.0	pass
0.00030	0	−1	0.00	1.00	−0.1	pass
0.00100	0	0	0.00	1.00	0.0	pass
0.00300	0	1	0.00	1.00	0.1	pass
0.01000	0	0	0.00	1.00	0.0	pass
0.03000	0	1	0.00	1.00	0.1	pass
0.10000	0	2	0.00	1.00	0.1	pass

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in m°	in m°	in °	in °	in %	
0.30000	2	−8	−0.01	1.00	−1.0	pass
1.00000	2	2	0.00	1.00	−0.1	pass
3.00000	6	5	0.00	1.00	−0.1	pass
10.00000	20	17	0.00	2.00	−0.1	pass
30.00000	54	53	0.00	3.00	−0.1	pass
50.00000	78	74	0.00	5.00	−0.1	pass
100.00000	120	115	−0.01	5.00	−0.1	pass
150.00000	210	204	−0.01	5.00	−0.1	pass
200.00000	370	363	−0.01	5.00	−0.1	pass
250.00000	507	496	−0.01	5.00	−0.2	pass
300.00000	618	609	−0.01	5.00	−0.2	pass
350.00000	775	771	0.00	5.00	−0.1	pass
400.00000	989	980	−0.01	5.00	−0.2	pass
450.00000	1134	1113	−0.02	5.00	−0.4	pass

4.2   Ref. Att. 0dB

Gain

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in dB	in dB	in dB	in dB	in %	
0.00001	−0.027	−0.029	−0.003	0.200	−1.5	pass
0.00003	−0.027	−0.029	−0.002	0.200	−1.2	pass
0.00010	−0.027	−0.029	−0.002	0.200	−1.2	pass
0.00030	−0.027	−0.029	−0.002	0.200	−1.2	pass
0.00100	−0.027	−0.028	−0.001	0.200	−0.7	pass
0.00300	−0.027	−0.028	−0.002	0.200	−0.8	pass
0.01000	−0.027	−0.028	−0.001	0.200	−0.7	pass
0.03000	−0.027	−0.028	−0.001	0.200	−0.6	pass
0.10000	−0.029	−0.030	−0.001	0.200	−0.3	pass
0.30000	−0.031	−0.031	0.000	0.200	0.0	pass
1.00000	−0.036	−0.036	0.000	0.200	0.2	pass
3.00000	−0.045	−0.045	0.000	0.200	0.2	pass
10.00000	−0.060	−0.061	−0.001	0.400	−0.3	pass
30.00000	−0.066	−0.030	0.036	0.600	6.1	pass

Phase

Frequency	Actual	Measured		Error	Spec	Of Spec	Verdict
in MHz	in °	in °		in °	in °	in %	
0.00001	0.00	0.00		0.00	1.00	0.1	pass
0.00003	0.00	0.00		0.00	1.00	0.0	pass
0.00010	0.00	0.00		0.00	1.00	0.0	pass
0.00030	0.00	0.00		0.00	1.00	−0.2	pass
0.00100	0.00	0.00		0.00	1.00	0.0	pass
0.00300	0.00	0.00		0.00	1.00	0.1	pass
0.01000	−0.01	−0.01		0.00	1.00	0.0	pass
0.03000	−0.03	−0.03		0.00	1.00	0.2	pass
0.10000	−0.08	−0.08		0.00	1.00	0.5	pass
0.30000	−0.22	−0.22		0.00	1.00	−0.5	pass
1.00000	−0.66	−0.65		0.01	1.00	0.9	pass
3.00000	−1.87	−1.85		0.01	1.00	1.3	pass
10.00000	−6.01	−5.95		0.05	2.00	2.7	pass
30.00000	−17.84	−17.76		0.08	3.00	2.7	pass

4.3 Ref. Att. 20dB

Gain

Frequency	Actual	Measured		Error	Spec	Of Spec	Verdict
in MHz	in dB	in dB		in dB	in dB	in %	
0.00001	−20.033	−19.987		0.046	0.200	22.8	pass
0.00003	−20.033	−19.988		0.045	0.200	22.5	pass
0.00010	−20.033	−19.989		0.044	0.200	22.0	pass
0.00030	−20.032	−19.987		0.044	0.200	22.2	pass
0.00100	−20.028	−19.989		0.039	0.200	19.6	pass
0.00300	−20.028	−19.989		0.039	0.200	19.4	pass
0.01000	−20.027	−19.989		0.039	0.200	19.3	pass
0.03000	−20.027	−19.989		0.038	0.200	19.1	pass
0.10000	−20.028	−19.986		0.043	0.200	21.3	pass
0.30000	−20.029	−19.980		0.049	0.200	24.6	pass
1.00000	−20.030	−19.976		0.055	0.200	27.4	pass
3.00000	−20.036	−19.970		0.066	0.200	33.1	pass
10.00000	−20.053	−19.942		0.111	0.400	27.8	pass
30.00000	−20.110	−20.004		0.105	0.600	17.6	pass

Phase

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in °	in °	in °	in °	in %	
0.00001	0.00	−0.01	−0.01	1.00	−0.5	pass
0.00003	0.00	−0.01	−0.01	1.00	−0.7	pass
0.00010	0.00	0.00	0.00	1.00	−0.5	pass
0.00030	0.00	−0.01	−0.01	1.00	−0.8	pass
0.00100	0.00	−0.01	−0.01	1.00	−0.6	pass
0.00300	0.00	0.00	0.00	1.00	−0.2	pass
0.01000	0.00	0.00	0.00	1.00	−0.2	pass
0.03000	−0.01	0.00	0.01	1.00	0.6	pass
0.10000	−0.06	−0.03	0.04	1.00	3.5	pass
0.30000	−0.20	−0.16	0.04	1.00	3.9	pass
1.00000	−0.66	−0.58	0.08	1.00	8.2	pass
3.00000	−1.93	−1.75	0.18	1.00	18.0	pass
10.00000	−6.28	−6.18	0.10	2.00	5.1	pass
30.00000	−18.44	−18.97	−0.53	3.00	−17.8	pass

4.4 Ref. Att. 50dB

Gain

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in dB	in dB	in dB	in dB	in %	
0.00003	−50.017	−49.950	0.067	0.200	33.3	pass
0.00010	−50.017	−49.967	0.050	0.200	24.9	pass
0.00030	−50.017	−49.971	0.046	0.200	23.2	pass
0.00100	−50.017	−49.975	0.042	0.200	21.2	pass
0.00300	−50.017	−49.976	0.041	0.200	20.5	pass
0.01000	−50.017	−49.974	0.043	0.200	21.7	pass
0.03000	−50.017	−49.974	0.044	0.200	21.8	pass
0.10000	−50.018	−49.972	0.046	0.200	23.0	pass
0.30000	−50.020	−49.963	0.057	0.200	28.3	pass
1.00000	−50.018	−49.957	0.061	0.200	30.7	pass
3.00000	−50.024	−49.948	0.076	0.200	37.8	pass
10.00000	−50.035	−49.912	0.123	0.400	30.8	pass
30.00000	−50.082	−49.963	0.119	0.600	19.8	pass

Phase

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in °	in °	in °	in °	in %	
0.00003	0.00	−0.29	−0.29	1.00	−29.3	pass

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in °	in °	in °	in °	in %	
0.00010	0.00	−0.11	−0.11	1.00	−10.6	pass
0.00030	0.00	−0.07	−0.07	1.00	−6.5	pass
0.00100	0.00	−0.04	−0.04	1.00	−3.7	pass
0.00300	0.00	−0.01	−0.01	1.00	−0.6	pass
0.01000	−0.01	0.01	0.02	1.00	1.7	pass
0.03000	−0.03	0.00	0.03	1.00	3.5	pass
0.10000	−0.11	−0.02	0.09	1.00	9.0	pass
0.30000	−0.26	−0.15	0.11	1.00	10.8	pass
1.00000	−0.71	−0.56	0.15	1.00	15.1	pass
3.00000	−1.97	−1.75	0.22	1.00	21.7	pass
10.00000	−6.40	−6.24	0.15	2.00	7.7	pass
30.00000	−18.85	−19.30	−0.45	3.00	−15.1	pass

4.5 Ref. Att. 80dB

Gain

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in dB	in dB	in dB	in dB	in %	
0.001	−80.010	−79.990	0.020	0.500	3.9	pass
0.003	−80.010	−80.014	−0.004	0.500	−0.8	pass
0.010	−80.011	−79.964	0.046	0.500	9.3	pass
0.030	−80.011	−79.954	0.057	0.500	11.5	pass
0.100	−80.010	−79.956	0.055	0.500	10.9	pass
0.300	−80.013	−79.958	0.054	0.500	10.9	pass
1.000	−80.010	−79.949	0.061	0.500	12.3	pass
3.000	−80.018	−79.941	0.077	0.500	15.3	pass
10.000	−80.027	−79.893	0.134	0.600	22.3	pass
30.000	−80.081	−79.978	0.103	0.800	12.9	pass

Phase

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in °	in °	in °	in °	in %	
0.001	0.00	−0.77	−0.77	5.00	−15.3	pass
0.003	0.00	−0.11	−0.10	3.00	−3.5	pass
0.010	−0.02	0.13	0.15	3.00	5.0	pass
0.030	−0.05	0.04	0.09	3.00	3.1	pass
0.100	−0.16	−0.10	0.07	3.00	2.2	pass
0.300	−0.32	−0.15	0.17	3.00	5.6	pass
1.000	−0.80	−0.61	0.18	3.00	6.1	pass
3.000	−2.05	−1.72	0.32	3.00	10.7	pass

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in °	in °	in °	in °	in %	
10.000	−6.60	−6.23	0.38	4.00	9.4	pass
30.000	−19.35	−19.48	−0.13	6.00	−2.1	pass

5 S21 Calibration

5.1 Ref. Att. 0dB

S21 magnitude

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in dB	in dB	in dB	in dB	in %	
0.00001	−0.027	0.004	0.031	0.100	30.7	pass
0.00003	−0.027	0.004	0.031	0.100	30.7	pass
0.00010	−0.027	0.003	0.029	0.100	29.3	pass
0.00030	−0.026	0.003	0.029	0.100	29.0	pass
0.00100	−0.026	0.003	0.029	0.100	28.9	pass
0.00300	−0.026	0.003	0.029	0.100	28.7	pass
0.01000	−0.026	0.002	0.029	0.100	28.5	pass
0.03000	−0.027	0.002	0.029	0.100	28.6	pass
0.10000	−0.028	0.000	0.028	0.100	27.5	pass
0.30000	−0.031	−0.003	0.027	0.100	27.3	pass
1.00000	−0.032	−0.005	0.027	0.100	26.9	pass
3.00000	−0.041	−0.013	0.027	0.100	27.1	pass
10.00000	−0.047	−0.020	0.027	0.100	27.2	pass
26.00000	−0.065	−0.037	0.029	0.100	28.6	pass
50.00000	−0.095	−0.067	0.028	0.100	27.7	pass
100.00000	−0.143	−0.118	0.025	0.200	12.3	pass
150.00000	−0.176	−0.151	0.025	0.200	12.6	pass
200.00000	−0.204	−0.169	0.035	0.400	8.8	pass
250.00000	−0.245	−0.230	0.015	0.400	3.8	pass
300.00000	−0.284	−0.233	0.051	0.400	12.9	pass
350.00000	−0.324	−0.298	0.026	0.400	6.5	pass
400.00000	−0.362	−0.378	−0.015	0.400	−3.8	pass
450.00000	−0.394	−0.348	0.046	0.400	11.5	pass

S21 phase

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in °	in °	in °	in °	in %	
0.00001	0.000	0.000	0.001	0.500	0.1	pass
0.00003	0.000	−0.001	−0.001	0.500	−0.2	pass
0.00010	0.000	0.003	0.003	0.500	0.6	pass
0.00030	0.000	−0.003	−0.003	0.500	−0.5	pass

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in °	in °	in °	in °	in %	
0.00100	−0.001	0.001	0.002	0.500	0.3	pass
0.00300	−0.003	−0.003	0.000	0.500	0.0	pass
0.01000	−0.010	−0.009	0.002	0.500	0.3	pass
0.03000	−0.029	−0.031	−0.002	0.500	−0.4	pass
0.10000	−0.086	−0.090	−0.003	0.500	−0.7	pass
0.30000	−0.218	−0.222	−0.004	0.500	−0.8	pass
1.00000	−0.635	−0.632	0.002	0.500	0.5	pass
3.00000	−1.880	−1.876	0.004	0.500	0.8	pass
10.00000	−6.099	−6.095	0.004	0.500	0.9	pass
26.00000	−15.661	−15.667	−0.007	0.500	−1.3	pass
50.00000	−29.953	−29.985	−0.032	0.500	−6.5	pass
100.00000	−59.614	−59.648	−0.034	1.000	−3.4	pass
150.00000	−89.156	−89.215	−0.059	1.000	−5.9	pass
200.00000	−118.685	−118.835	−0.150	1.000	−15.0	pass
250.00000	−148.210	−148.443	−0.233	1.500	−15.5	pass
300.00000	−177.676	−177.740	−0.064	2.000	−3.2	pass
350.00000	152.793	152.513	−0.280	2.000	−14.0	pass
400.00000	123.281	123.588	0.307	5.000	6.1	pass
450.00000	93.835	93.585	−0.250	5.000	−5.0	pass

5.2   Ref. Att. 20dB

S21 magnitude

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in dB	in dB	in dB	in dB	in %	
0.00001	−20.015	−19.988	0.027	0.100	27.4	pass
0.00003	−20.015	−19.989	0.026	0.100	26.2	pass
0.00010	−20.015	−19.991	0.024	0.100	24.4	pass
0.00030	−20.015	−19.992	0.023	0.100	23.3	pass
0.00100	−20.015	−19.991	0.024	0.100	24.2	pass
0.00300	−20.016	−19.992	0.024	0.100	24.0	pass
0.01000	−20.016	−19.992	0.024	0.100	23.6	pass
0.03000	−20.016	−19.993	0.023	0.100	23.4	pass
0.10000	−20.018	−19.994	0.023	0.100	23.2	pass
0.30000	−20.019	−19.996	0.023	0.100	22.5	pass
1.00000	−20.021	−19.998	0.022	0.100	22.5	pass
3.00000	−20.029	−20.007	0.022	0.100	22.1	pass
10.00000	−20.041	−20.018	0.023	0.100	23.1	pass
26.00000	−20.058	−20.034	0.024	0.100	23.7	pass
50.00000	−20.087	−20.059	0.028	0.100	28.0	pass

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in dB	in dB	in dB	in dB	in %	
100.00000	−20.128	−20.106	0.023	0.200	11.4	pass
150.00000	−20.156	−20.125	0.031	0.200	15.4	pass
200.00000	−20.171	−20.150	0.022	0.400	5.4	pass
250.00000	−20.197	−20.180	0.018	0.400	4.4	pass
300.00000	−20.219	−20.193	0.026	0.400	6.5	pass
350.00000	−20.236	−20.196	0.040	0.400	10.0	pass
400.00000	−20.246	−20.224	0.022	0.400	5.4	pass
450.00000	−20.247	−20.243	0.004	0.400	1.0	pass

S21 phase

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in °	in °	in °	in °	in %	
0.00001	0.000	−0.009	−0.009	1.000	−0.9	pass
0.00003	0.000	−0.007	−0.007	1.000	−0.7	pass
0.00010	0.000	−0.003	−0.003	0.500	−0.7	pass
0.00030	0.000	−0.006	−0.005	0.500	−1.1	pass
0.00100	−0.002	−0.002	0.000	0.500	−0.1	pass
0.00300	−0.004	−0.003	0.001	0.500	0.1	pass
0.01000	−0.011	−0.010	0.000	0.500	0.1	pass
0.03000	−0.029	−0.029	−0.001	0.500	−0.1	pass
0.10000	−0.082	−0.085	−0.002	0.500	−0.5	pass
0.30000	−0.230	−0.229	0.001	0.500	0.2	pass
1.00000	−0.653	−0.651	0.002	0.500	0.3	pass
3.00000	−1.919	−1.918	0.001	0.500	0.2	pass
10.00000	−6.240	−6.206	0.034	0.500	6.8	pass
26.00000	−15.949	−15.894	0.055	0.500	11.0	pass
50.00000	−30.478	−30.441	0.037	0.500	7.4	pass
100.00000	−60.611	−60.630	−0.019	1.000	−1.9	pass
150.00000	−90.669	−90.658	0.011	1.000	1.1	pass
200.00000	−120.665	−120.706	−0.040	1.000	−4.0	pass
250.00000	−150.686	−150.780	−0.094	1.500	−6.3	pass
300.00000	179.344	179.116	−0.227	2.000	−11.4	pass
350.00000	149.308	149.253	−0.055	2.000	−2.7	pass
400.00000	119.272	119.473	0.201	5.000	4.0	pass
450.00000	89.220	89.270	0.049	5.000	1.0	pass

5.3 Ref. Att. 50dB

S21 magnitude

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in dB	in dB	in dB	in dB	in %	
0.00001	−50.017	−49.917	0.100	0.300	33.4	pass
0.00003	−50.017	−49.959	0.058	0.300	19.2	pass
0.00010	−50.017	−49.973	0.044	0.150	29.2	pass
0.00030	−50.017	−49.975	0.042	0.150	28.1	pass
0.00100	−50.017	−49.977	0.040	0.150	27.0	pass
0.00300	−50.017	−49.979	0.038	0.150	25.6	pass
0.01000	−50.017	−49.979	0.038	0.150	25.5	pass
0.03000	−50.017	−49.980	0.036	0.150	24.3	pass
0.10000	−50.016	−49.982	0.034	0.150	23.0	pass
0.30000	−50.018	−49.980	0.038	0.150	25.2	pass
1.00000	−50.018	−49.981	0.037	0.150	24.4	pass
3.00000	−50.025	−49.990	0.036	0.150	23.7	pass
10.00000	−50.042	−50.003	0.039	0.150	26.0	pass
26.00000	−50.058	−50.022	0.037	0.150	24.5	pass
50.00000	−50.086	−50.046	0.041	0.150	27.2	pass
100.00000	−50.122	−50.086	0.035	0.300	11.8	pass
150.00000	−50.140	−50.092	0.048	0.300	16.0	pass
200.00000	−50.139	−50.102	0.037	0.400	9.1	pass
250.00000	−50.138	−50.105	0.034	0.400	8.4	pass
300.00000	−50.135	−50.097	0.039	0.400	9.6	pass
350.00000	−50.104	−50.062	0.042	0.400	10.6	pass
400.00000	−50.063	−50.048	0.015	0.400	3.7	pass
450.00000	−50.002	−50.056	−0.054	0.400	−13.6	pass

S21 phase

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in °	in °	in °	in °	in %	
0.00001	0.000	−0.306	−0.306	1.000	−30.6	pass
0.00003	0.000	−0.217	−0.217	1.000	−21.7	pass
0.00010	0.000	−0.076	−0.076	1.000	−7.6	pass
0.00030	0.000	−0.037	−0.037	0.500	−7.4	pass
0.00100	−0.001	−0.019	−0.019	0.500	−3.8	pass
0.00300	−0.002	−0.011	−0.009	0.500	−1.7	pass
0.01000	−0.008	−0.010	−0.002	0.500	−0.4	pass
0.03000	−0.025	−0.027	−0.002	0.500	−0.4	pass
0.10000	−0.083	−0.075	0.008	0.500	1.5	pass
0.30000	−0.242	−0.248	−0.006	0.500	−1.2	pass

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in °	in °	in °	in °	in %	
1.00000	−0.675	−0.682	−0.008	0.500	−1.5	pass
3.00000	−1.975	−1.980	−0.005	0.500	−1.0	pass
10.00000	−6.402	−6.391	0.011	0.500	2.2	pass
26.00000	−16.361	−16.322	0.039	0.500	7.7	pass
50.00000	−31.264	−31.237	0.027	0.500	5.3	pass
100.00000	−62.188	−62.217	−0.029	1.000	−2.9	pass
150.00000	−93.077	−93.036	0.041	1.000	4.1	pass
200.00000	−123.939	−123.974	−0.035	1.000	−3.5	pass
250.00000	−154.741	−154.817	−0.076	1.500	−5.1	pass
300.00000	174.491	174.183	−0.308	2.000	−15.4	pass
350.00000	143.647	143.506	−0.141	2.000	−7.1	pass
400.00000	112.878	112.926	0.048	5.000	1.0	pass
450.00000	82.178	82.160	−0.019	5.000	−0.4	pass

5.4 Ref. Att. 80dB

S21 magnitude

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in dB	in dB	in dB	in dB	in %	
0.00001	−79.997	−78.185	1.812	5.000	36.2	pass
0.00003	−79.997	−79.409	0.588	4.000	14.7	pass
0.00010	−79.997	−79.802	0.195	1.000	19.5	pass
0.00030	−79.997	−79.895	0.102	0.600	17.1	pass
0.00100	−79.997	−79.957	0.040	0.400	10.0	pass
0.00300	−79.998	−79.979	0.019	0.300	6.3	pass
0.01000	−79.999	−79.963	0.036	0.300	12.0	pass
0.03000	−80.002	−79.970	0.032	0.300	10.6	pass
0.10000	−80.003	−79.970	0.033	0.300	11.0	pass
0.30000	−80.008	−79.979	0.029	0.300	9.6	pass
1.00000	−79.989	−79.970	0.019	0.300	6.4	pass
3.00000	−80.011	−79.988	0.023	0.300	7.6	pass
10.00000	−80.049	−79.995	0.054	0.300	17.8	pass
26.00000	−80.042	−80.015	0.028	0.300	9.2	pass
50.00000	−80.078	−80.046	0.032	0.300	10.6	pass
100.00000	−80.141	−80.092	0.048	0.600	8.0	pass

S21 phase

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in °	in °	in °	in °	in %	
0.00001	0.00	−8.04	−8.04			no spec
0.00003	0.00	−6.56	−6.56			no spec
0.00010	0.00	−2.49	−2.49			no spec
0.00030	0.00	−1.29	−1.29			no spec
0.00100	0.00	−0.49	−0.49			no spec
0.00300	0.00	−0.07	−0.07			no spec
0.01000	−0.01	−0.04	−0.03	1.00	−2.7	pass
0.03000	−0.03	−0.08	−0.05	1.00	−5.2	pass
0.10000	−0.09	−0.10	−0.01	1.00	−0.6	pass
0.30000	−0.25	−0.23	0.02	1.00	1.8	pass
1.00000	−0.63	−0.68	−0.05	1.00	−5.2	pass
3.00000	−2.03	−2.07	−0.04	1.00	−3.8	pass
10.00000	−6.52	−6.45	0.08	1.00	7.5	pass
26.00000	−16.71	−16.66	0.06	1.00	5.5	pass
50.00000	−31.89	−31.99	−0.10	2.00	−5.2	pass
100.00000	−63.62	−63.73	−0.11	2.00	−5.4	pass

6 Impedance Measurement Calibration

6.1 Impedance 50 Ohm

Impedance magnitude

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in Ω	in Ω	in mΩ	in mΩ	in %	
0.001	50.044	50.109	66	600	10.9	pass
0.100	50.062	50.122	60	600	10.1	pass
1.000	50.094	50.192	99	1000	9.9	pass
10.000	50.235	50.356	121	1500	8.1	pass

Impedance phase

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in MHz	in m°	in m°	in m°	in m°	in %	
0.001	1	1	0	100	0.4	pass
0.100	13	24	11	500	2.3	pass
1.000	40	39	−1	500	−0.2	pass
10.000	−142	−150	−8	1000	−0.8	pass

6.2 Impedance 83.5 Ohm

Impedance magnitude

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in kHz	in Ω	in Ω	in mΩ	in mΩ	in %	
1.0	83.355	83.448	93	500	18.5	pass
100.0	83.367	83.466	99	500	19.9	pass

Impedance phase

Frequency	Actual	Measured	Error	Spec	Of Spec	Verdict
in kHz	in m°	in m°	in m°	in m°	in %	
1.0	0	−1	−1	200	−0.6	pass
100.0	−128	−111	17	1000	1.7	pass

7 Level Linearity Calibration

7.1 AF Mode

Calibration of level dependent gain nonlinearity differrences between both input channels.
Both channels are driven at 10.0 kHz with the mentioned level (connected together).
This calibration shows how constant the gain reading behaves versus different input levels.

Gain at Reference Level (−6dBm)

Measured	Spec	Verdict
in dB	in dB	
0.001	0.100	pass

Gain change versus input level

Level	Measured	Spec	Verdict
in dBm	in dB	in dB	
13.0	0.0006	0.0200	pass
10.0	0.0001	0.0100	pass
7.0	0.0000	0.0100	pass
4.0	0.0000	0.0100	pass
1.0	−0.0001	0.0100	pass
−2.0	0.0000	0.0100	pass
−5.0	−0.0001	0.0100	pass
−8.0	0.0000	0.0100	pass
−11.0	−0.0001	0.0100	pass
−14.0	−0.0001	0.0100	pass
−17.0	0.0000	0.0100	pass
−20.0	0.0001	0.0100	pass
−23.0	0.0002	0.0100	pass
−26.0	0.0000	0.0100	pass

Level	Measured		Spec	Verdict
in dBm	in dB		in dB	
−29.0	−0.0003		0.0100	pass
−32.0	−0.0005		0.0100	pass
−35.0	0.0001		0.0100	pass
−38.0	0.0010		0.0100	pass
−41.0	0.0005		0.0100	pass

7.2   RF Mode

Calibration of level dependent gain nonlinearity differrences between both input channels.
Both channels are driven at 1.0 MHz with the mentioned level (connected together to the output).
This calibration shows how constant the gain reading behaves versus different input levels.

Gain at Reference Level (−6dBm)

Measured	Spec	Verdict
in dB	in dB	
0.006	0.100	pass

Gain change versus input level

Level	Measured		Spec	Verdict
in dBm	in dB		in dB	
13.0	−0.0001		0.0500	pass
10.0	−0.0002		0.0200	pass
7.0	0.0000		0.0200	pass
4.0	0.0000		0.0200	pass
1.0	0.0000		0.0200	pass
−2.0	−0.0001		0.0200	pass
−5.0	0.0000		0.0200	pass
−8.0	−0.0001		0.0200	pass
−11.0	0.0001		0.0200	pass
−14.0	−0.0001		0.0200	pass
−17.0	0.0000		0.0200	pass
−20.0	0.0003		0.0200	pass
−23.0	−0.0001		0.0200	pass
−26.0	−0.0004		0.0200	pass
−29.0	−0.0009		0.0200	pass
−32.0	0.0002		0.0200	pass
−35.0	0.0007		0.0200	pass
−38.0	−0.0008		0.0200	pass
−41.0	0.0000		0.0200	pass

8   Noise Floor Calibration

Each measured S21 value is calculated from multiple readings with 10 Hz Bandwidth, Psource=16dBm, CH2 attenuator = 0dB

Frequency in MHz	Measured in dB	Spec in dB	Verdict
0.0001	−122.0		no spec
0.0010	−126.8		no spec
0.0100	−138.1		no spec
0.1000	−140.0		no spec
0.2500	−137.4		no spec
1.0000	−134.4		no spec
10.0000	−129.9		no spec
100.0000	−131.8		no spec
300.0000	−115.7		no spec
450.0000	−114.1		no spec

Appendix

Internally, all values are calculated using full precision. For reporting purposes the values are rounded to a finite number of decimal places. Note that rounding can lead to an inaccurate final decimal digit in the report.

Nomenclature

DUT:	Device Under Test
Actual:	Value measured by reference equipment
Nominal:	Nominal value output by the DUT or source
Measured:	Value measured by the device under test
Error:	Difference between the actual and nominal/measured value

	DUT output:	**Error = Actual − Nominal**
	DUT input:	**Error = Measured − Actual**

Spec:	Specification, i.e. allowed deviation
Of Spec:	Deviation from the specification in percent
	Of Spec = Error / Spec * 100
Amplitude:	Voltage or current amplitude (not assessed)
Frequency:	Nominal output frequency
Hysteresis:	**Hysteresis = Upper Threshold − Lower Threshold**
Threshold:	Value measured by reference equipment (upper threshold)
Range:	Range setting for DUT measurement
Verdict:	Evaluation of a measurement result

	no spec	not specified, for information only
	skip	not assessed, because not measured
	pass	calibration / measurement within specification
	fail	calibration / measurement outside specification

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