

## FCC - TEST REPORT

Report Number : **60.790.19.003.02R01** Date of Issue : April 16, 2019

Model : Network Extender

Product Type : Connect Hub Repeater

Applicant : Mobile Technologies Inc.

Address : 1050 NE 67th Ave, Hillsboro, OR 97124

Production Facility : Dongguan YinYu Hardware Products Co., LTD

Address : No.6. Zhi Ye road, TuQiao District, Qingxi Town, Dongguan City,  
Guangdong Province, China

Test Result :  Positive  Negative

Total pages  
including  
Appendices : 35

*TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch is a subcontractor to TÜV SÜD Product Service GmbH according to the principles outlined in ISO 17025.*

*TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch reports apply only to the specific samples tested under stated test conditions. Construction of the actual test samples has been documented. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. The manufacturer/importer is responsible to the Competent Authorities in Europe for any modifications made to the production units which result in non-compliance to the relevant regulations. TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch issued reports.*

*This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval*

# 1 Table of Contents

1 Table of Contents.....	2
2 Description of Equipment Under Test .....	3
3 Summary of Test Standards .....	4
4 Details about the Test Laboratory .....	5
4.1 Test Equipment Site List .....	6
4.2 Measurement System Uncertainty .....	7
5 Summary of Test Results.....	8
6 General Remarks.....	9
7 Emission Test Results .....	10
7.1 Spurious Radiated Emission .....	10
7.2 Conducted Emission at AC Power line.....	14
7.3 6dB & 99% Bandwidth .....	16
7.4 Peak Output Power.....	19
7.5 Spurious Emissions at Antenna Terminals.....	22
7.6 100kHz Bandwidth of band edges.....	28
7.7 Power Spectral Density.....	31
7.8 Antenna Requirement.....	34
8 Appendix A - General Product Information .....	35

## 2 Description of Equipment Under Test

### Description of the Equipment Under Test

Product:	Connect Hub Repeater
Model no.:	Network Extender
FCC ID:	2AA2X-16500354
Rating:	Adapter input: 100-240V DC 1.0A, 50-60Hz, output:5.2V DC 3.0A Network Extender input: Max 5.2V DC, Max 3A. Internal Rechargeable Battery:3.7V DC
Frequency:	2405MHz-2480MHz (Tx and Rx)
Antenna gain:	Internal Chip Antenna: -1.5 dBi External Whip Antenna:2 dBi
Number of operated channel:	16
Modulation:	O-QPSK

### 3 Summary of Test Standards

Test Standards
FCC Part 15 Subpart C 10-1-17 Edition Federal Communications Commission, PART 15 — Radio Frequency Devices, Subpart C — Unintentional Radiators

All the tests were performed using the procedures from ANSI C63.4(2014) and ANSI C63.10 (2013).

## 4 Details about the Test Laboratory

### Site 1

Company name: TÜV SÜD Hong Kong Ltd.  
3/F, West Wing, Lakeside 2,  
10 Science Park West Avenue,  
Science Park, Shatin, Hong Kong

### Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch  
Building 12&13 Zhiheng Wisdomland Business Park,  
Nantou Checkpoint Road 2,  
Shenzhen 518052, P.R.China  
FCC Registration Number: 502708

Emission Tests	
Test Item	Test Site
<b>FCC Part 15 Subpart C</b>	
FCC Title 47 Part 15.205, 15.209 & 15.247(d) Spurious Radiated Emission	Site 2
FCC Title 47 Part 15.207 Conduct Emission	Site 2
FCC Title 47 Part 15.247(a)(1) 6dB & 99% Bandwidth	Site 2
FCC Title 47 Part 15.247(b) Peak Output Power	Site 2
FCC Title 47 Part 2.1051 & 15.247(d) Spurious Emissions at Antenna Terminals	Site 2
FCC Title 47 Part 15.247(d) 100kHz Bandwidth of band edges	Site 2
FCC Title 47 Part 15.247(e) Power Spectral Density	Site 2
FCC Title 47 Part 15.203 & 15.247(b) Antenna Requirement	Site 2

## 4.1 Test Equipment Site List

### Radiated emission Test – Site 1

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2019-7-6
Signal Analyzer	Rohde & Schwarz	FSV40	101031	2019-7-6
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100398	2019-7-6
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2019-6-28
Horn Antenna	Rohde & Schwarz	HF907	102294	2019-6-28
Wideband Horn Antenna	Q-PAR	QWH-SL-18-40-K-SG	12827	2019-7-12
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2019-7-6
Pre-amplifier	Rohde & Schwarz	SCU 40A	100432	2019-7-6
Attenuator	Agilent	8491A	MY39264334	2019-7-6
3m Semi-anechoic chamber	TDK	9X6X6	----	2020-7-7
Test software	Rohde & Schwarz	EMC32	Version 9.15.00	N/A

### Conducted Emission Test – Site 1

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 3	101782	2019-7-6
LISN	Rohde & Schwarz	ENV4200	100249	2019-7-6
LISN	Rohde & Schwarz	ENV432	101318	2019-7-6
LISN	Rohde & Schwarz	ENV216	100326	2019-7-6
ISN	Rohde & Schwarz	ENY81	100177	2019-7-6
ISN	Rohde & Schwarz	ENY81-CA6	101664	2019-7-6
High Voltage Probe	Rohde & Schwarz	TK9420(VT9420)	9420-584	2019-6-30
RF Current Probe	Rohde & Schwarz	EZ-17	100816	2019-6-30
Attenuator	Shanghai Huaxiang	TS2-26-3	080928189	2019-7-6
Test software	Rohde & Schwarz	EMC32	Version9.15.00	N/A

### 20dB & 99% Bandwidth, Peak Output Power, Spurious Emissions at Antenna Terminals, 100kHz Bandwidth of band edges, Power Spectral Density – Site 1

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Analyzer	Rohde & Schwarz	FSV40	101030	2019-7-6
Vector Signal Generator	Rohde & Schwarz	SMU 200A	105324	2019-7-6
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	101226/100851	2019-7-6

## 4.2 Measurement System Uncertainty

### Measurement System Uncertainty Emissions

System Measurement Uncertainty	
Items	Extended Uncertainty
Uncertainty for Radiated Emission in 3m chamber 9kHz-30MHz	4.46dB
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.91dB; Vertical: 4.89dB;
Uncertainty for Radiated Emission in 3m chamber 1000MHz-25000MHz	Horizontal: 4.80dB; Vertical: 4.79dB;
Uncertainty for Conducted Emission at AC Power Line 150kHz-30MHz	3.21dB
Uncertainty for Conducted RF Power	2.13dB
Uncertainty for frequency test	0.6×10 <sup>-7</sup>

## 5 Summary of Test Results

Emission Tests				
FCC Part 15 Subpart C				
Test Condition	Pages	Test Result		
		Pass	Fail	N/A
FCC Title 47 Part 15.205, 15.209 & 15.247(d) Spurious Radiated Emission	10-13	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.207 Conduct Emission	14-15	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.247(a)(2) 6dB & 99% Bandwidth	16-18	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.247(b) Peak Output Power	19-21	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 2.1051 & 15.247(d) Spurious Emissions at Antenna Terminals	22-27	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.247(d) 100kHz Bandwidth of band edges	28-30	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.247(e) Power Spectral Density	31-33	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.203 & 15.247(b) Antenna Requirement	34	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## 6 General Remarks

### Remarks

This submittal(s) (test report) is intended for **FCC ID: 2AA2X-16500354**, complies with Section 15.203, 15.205, 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C rules for the DTS grant

The TX and RX range is 2405MHz-2480MHz.

EUT has an internal antenna and an external, as manufacture declared, there is an RF switch that selects the internal antenna or the external antenna. Never both at the same time. And actually the internal antenna is not used under normal operation.

Testing was performed on both setting of using external antenna and internal antenna to make sure both could comply with standard's requirement. While this report final only shows the data of testing on external antenna, which we found it is the worst case.

### SUMMARY:

- All tests according to the regulations cited on page 8 were

■ - Performed

□ - **Not** Performed

- The Equipment Under Test

■ - **Fulfills** the general approval requirements.

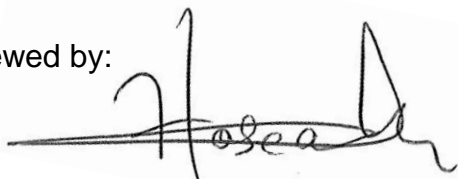
□ - **Does not** fulfill the general approval requirements.

Sample Received Date: January 30, 2019

Testing Start Date: February 26, 2019

Testing End Date: March 6, 2019

Reviewed by:



Hosea CHAN  
EMC Project Engineer

Prepared by:



Eric LI  
EMC Senior Project Engineer

## 7 Emission Test Results

### 7.1 Spurious Radiated Emission

EUT: Network Extender  
 Op Condition: Operated, TX Mode  
 (Worst case lies on 2480MHz channel)  
 Test Specification: FCC15.205, 15.209 & 15.247(d)  
 Comment: 120V AC  
 Remark: 9kHz to 1GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	Detector PK/QP/AV	Ant. Polarity H/V	Corr. (dB)
185.469444	18.31	43.50	-25.19	Peak	H	-28.6
434.651667	19.11	46.00	-26.89	Peak	H	-23.3
875.570556	27.75	46.00	-18.25	Peak	H	-15.9
53.441667	23.20	40.00	-16.80	Peak	V	-25.0
64.111667	22.86	40.00	-17.14	Peak	V	-28.8
872.660556	31.79	46.00	-14.21	Peak	V	-15.9

Remark:

- As the measured peak value not exceeded the Quasi peak limit, Quasi peak value no need to be measured.

**Spurious Radiated Emission**

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2405MHz)  
 Test Specification: FCC15.205, 15.209 & 15.247(d)  
 Comment: 120V AC  
 Remark: 1GHz to 25GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector PK/QP/AV	Ant. Polarity H/V	Corr. (dB)
1252.750000	32.92	54.00	-21.08	Peak	H	-12.1
1573.062500	27.40	54.00	-26.60	Peak	H	-10.8
4808.906250	40.02	54.00	-13.98	Peak	H	2.8
9413.906250	40.59	54.00	-13.41	Peak	H	8.7
13070.625000	43.97	54.00	-10.03	Peak	H	13.7
1981.937500	26.48	54.00	-27.52	Peak	V	-9.2
2281.250000	31.48	54.00	-22.52	Peak	V	-6.9
4810.781250	37.66	54.00	-16.34	Peak	V	2.8
7433.906250	39.23	54.00	-14.77	Peak	V	6.0
9420.937500	41.96	54.00	-12.04	Peak	V	8.8

Remark:

- 1.As the measured peak value not exceeded the average limit, average value no need to be measured.

## Spurious Radiated Emission

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2445MHz)  
 Test Specification: FCC15.205, 15.209 & 15.247(d)  
 Comment: 120V AC  
 Remark: 1GHz to 25GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	Detector PK/QP/AV	Ant. Polarity H/V	Corr. (dB)
1252.562500	34.15	54.00	-19.85	Peak	H	-12.1
1760.875000	27.48	54.00	-26.52	Peak	H	-10.0
4889.062500	37.80	54.00	-16.20	Peak	H	2.9
9360.468750	40.58	54.00	-13.42	Peak	H	8.5
15184.218750	46.19	54.00	-7.81	Peak	H	17.3
1597.625000	30.88	54.00	-23.12	Peak	V	-10.8
2392.562500	38.92	54.00	-15.08	Peak	V	-6.0
4890.468750	37.21	54.00	-16.79	Peak	V	2.9
7367.812500	38.66	54.00	-15.34	Peak	V	5.6
9402.656250	40.39	54.00	-13.61	Peak	V	8.7

## Remark:

1.As the measured peak value not exceeded the average limit, average value no need to be measured.

### Spurious Radiated Emission

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2480MHz)  
 Test Specification: FCC15.205, 15.209 & 15.247(d)  
 Comment: 120V AC  
 Remark: 1GHz to 25GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector PK/QP/AV	Ant. Polarity H/V	Corr. (dB)
1258.812500	31.73	54.00	-22.27	Peak	H	-12.0
1773.625000	28.51	54.00	-25.49	Peak	H	-10.1
5627.343750	36.52	54.00	-17.48	Peak	H	4.1
9507.656250	40.63	54.00	-13.37	Peak	H	9.2
13252.968750	43.05	54.00	-10.95	Peak	H	13.8
1795.875000	30.54	54.00	-23.46	Peak	V	-10.0
2399.562500	37.99	54.00	-16.01	Peak	V	-6.0
4960.781250	37.42	54.00	-16.58	Peak	V	3.3
5527.500000	37.94	54.00	-16.06	Peak	V	4.1
9462.656250	40.80	54.00	-13.20	Peak	V	9.0

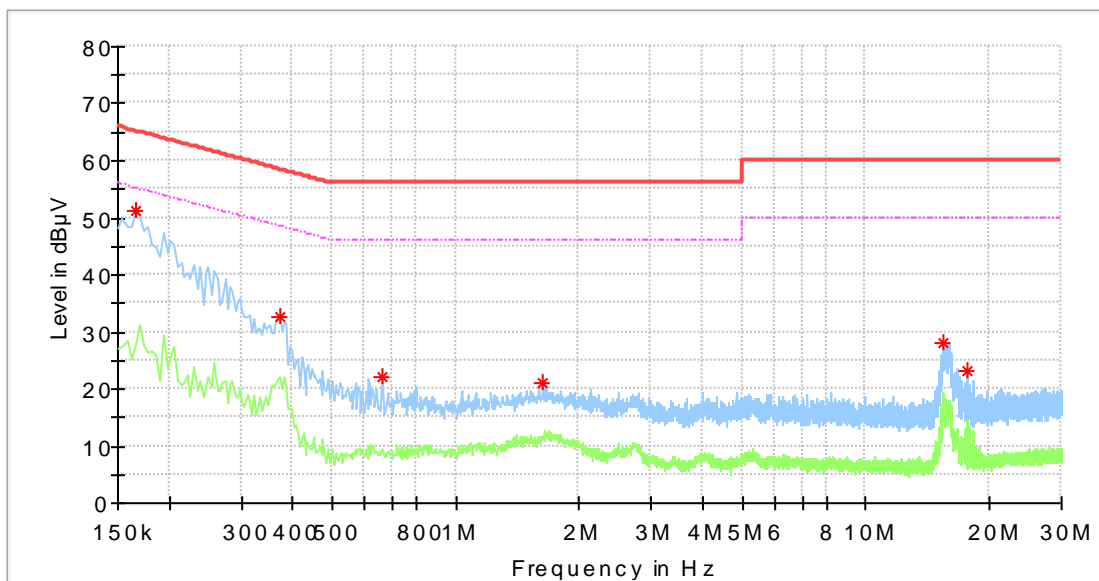
Remark:

- As the measured peak value not exceeded the average limit, average value no need to be measured.

## 7.2 Conducted Emission at AC Power line

EUT: Network Extender  
 Op Condition: Operated, TX Mode  
 Test Specification: FCC15.207  
 Comment: 120V AC  
 Remark: L Line

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

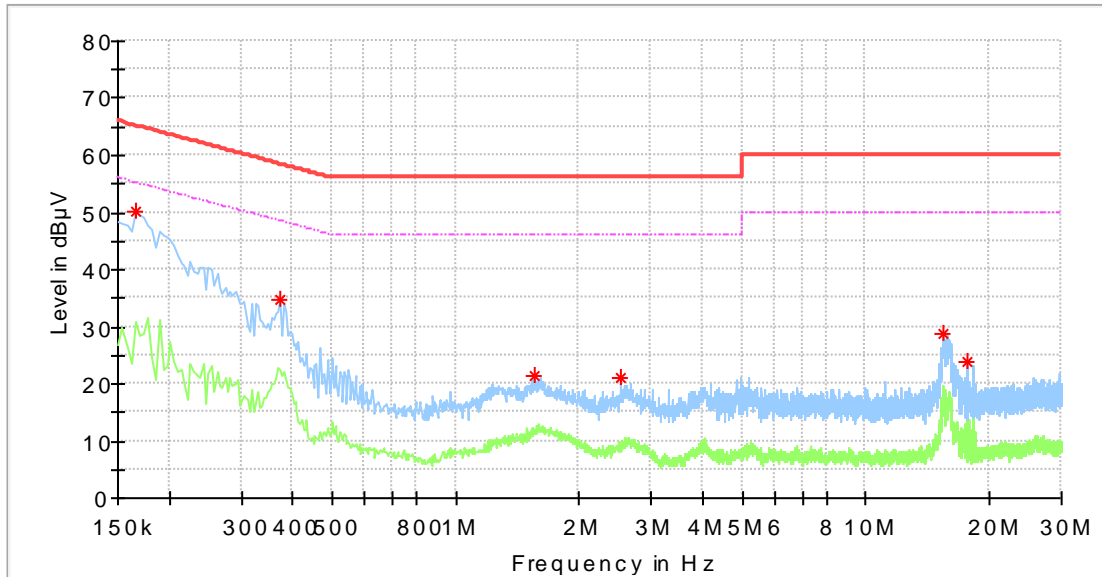


Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)
0.166000	51.14	---	65.16	-14.02
0.374000	32.48	---	58.41	-25.93
0.662000	21.99	---	56.00	-34.01
1.630000	21.15	---	56.00	-34.85
15.526000	28.09	---	60.00	-31.91
17.694000	23.20	---	60.00	-36.80

**Conducted Emission at AC Power line**

EUT: Network Extender  
 Op Condition: Operated, TX Mode  
 Test Specification: FCC15.207  
 Comment: 120V AC  
 Remark: N Line

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

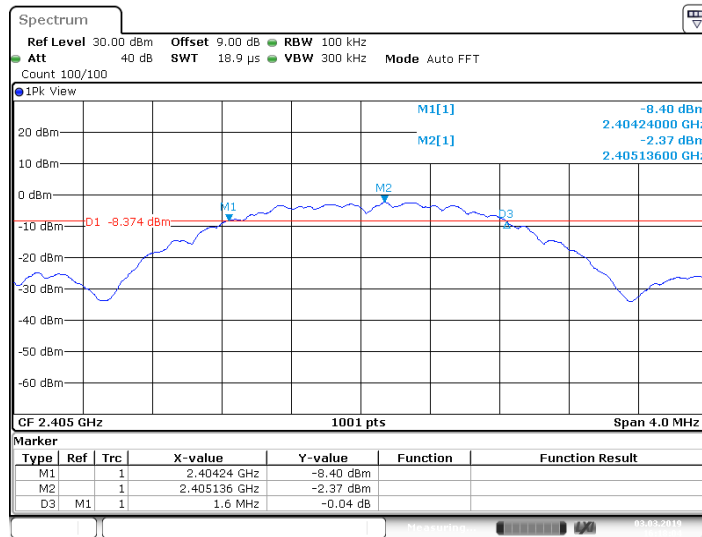


Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)
0.166000	50.16	---	65.16	-15.00
0.374000	34.57	---	58.41	-23.84
1.550000	21.51	---	56.00	-34.49
2.534000	21.08	---	56.00	-34.92
15.458000	28.87	---	60.00	-31.13
17.694000	23.88	---	60.00	-36.12

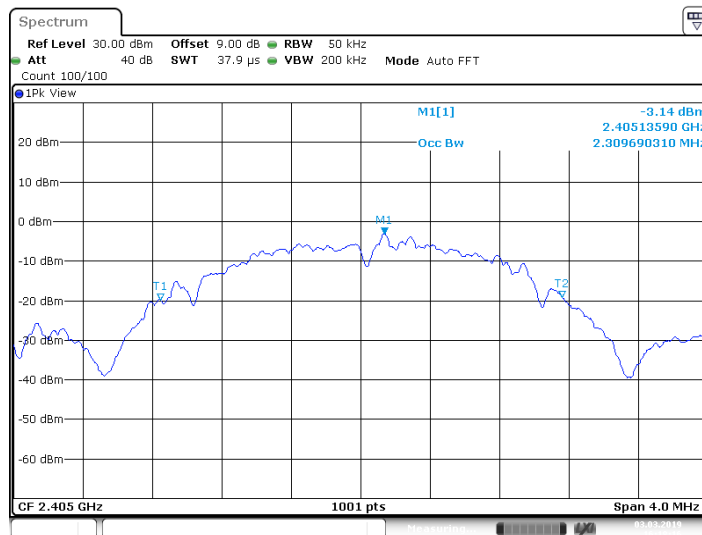
### 7.3 6dB & 99% Bandwidth

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2405MHz)  
 Test Specification: FCC15.247(a)(2), 6dB Bandwidth & 99% Bandwidth  
 Comment: 120V AC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Date: 3 MAR 2019 16:18:05



Date: 3 MAR 2019 16:18:16

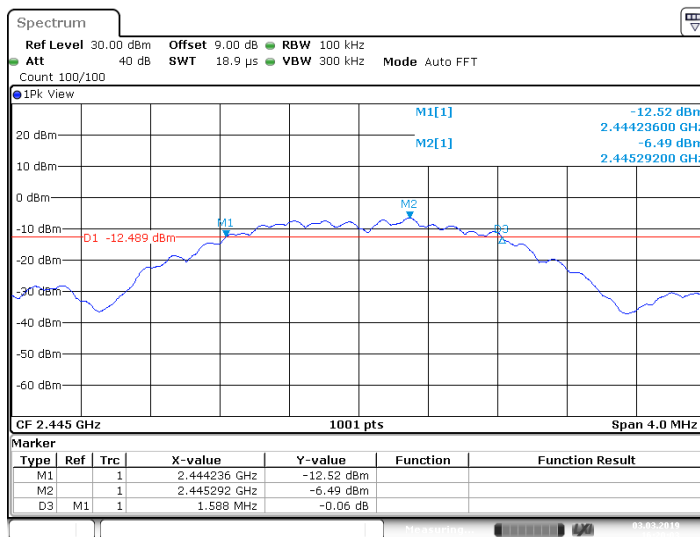
Bandwidth	Measured Value	Limit
6dB bandwidth	1.600MHz	> 0.5MHz
99% OCB	2.310MHz	NA



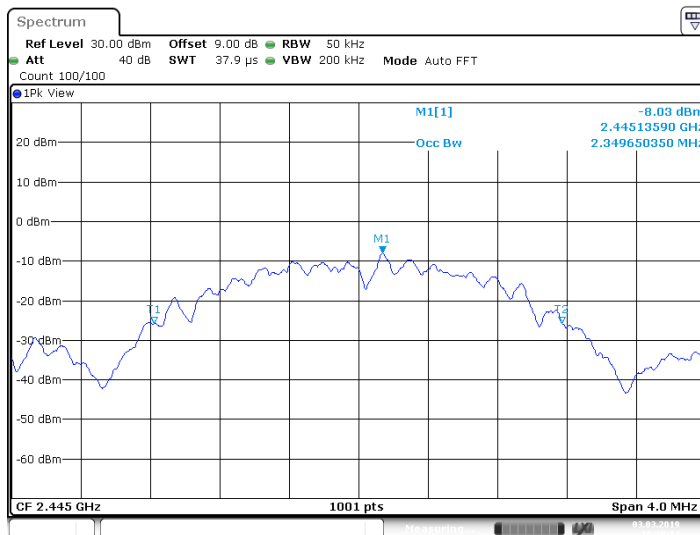
### 6dB & 99% Bandwidth

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2445MHz)  
 Test Specification: FCC15.247(a)(2), 6dB Bandwidth & 99% Bandwidth  
 Comment: 120V AC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Date: 3 MAR 2019 16:20:04



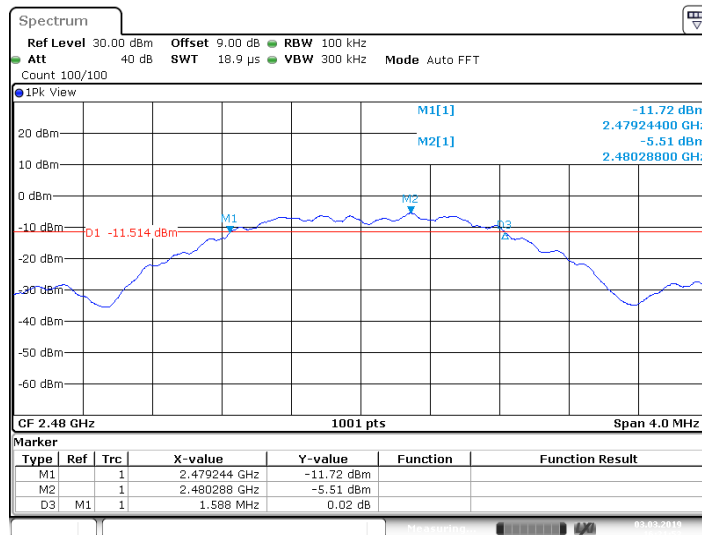
Date: 3 MAR 2019 16:20:15

Bandwidth	Measured Value	Limit
6dB bandwidth	1.588 MHz	> 0.5 MHz
99% OCB	2.350 MHz	NA

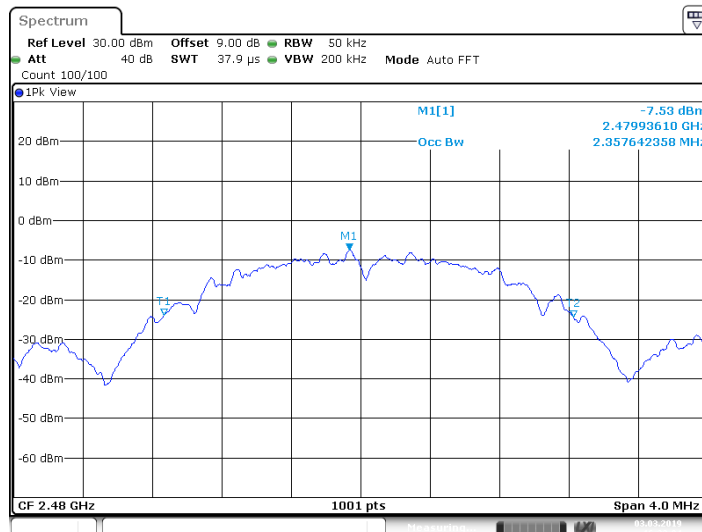
### 6dB & 99% Bandwidth

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2480MHz)  
 Test Specification: FCC15.247(a)(2), 6dB Bandwidth & 99% Bandwidth  
 Comment: 120V AC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Date: 3 MAR 2019 16:21:53



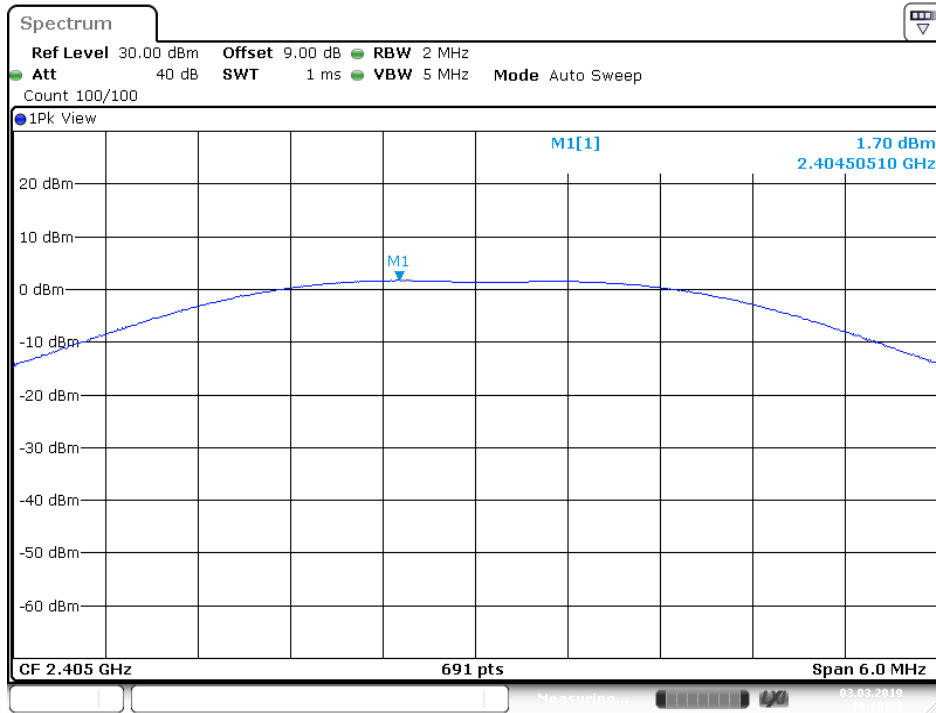
Date: 3 MAR 2019 16:22:04

Bandwidth	Measured Value	Limit
6dB bandwidth	1.588 MHz	> 0.5 MHz
99% OCB	2.358 MHz	NA

## 7.4 Peak Output Power

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2405MHz)  
 Test Specification: FCC15.247(b)  
 Comment: 120V AC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



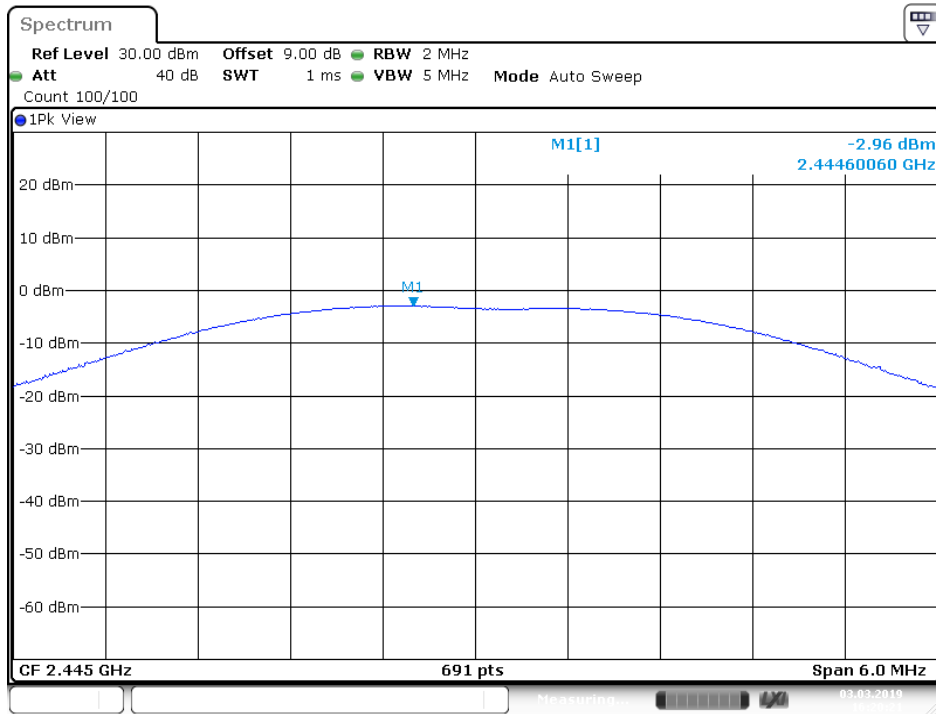
Date: 3 MAR 2019 16:18:23

Conducted Output Power	Limit
1.70 dBm	< 30dBm

**Peak Output Power**

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2445MHz)  
 Test Specification: FCC15.247(b)  
 Comment: 120V AC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



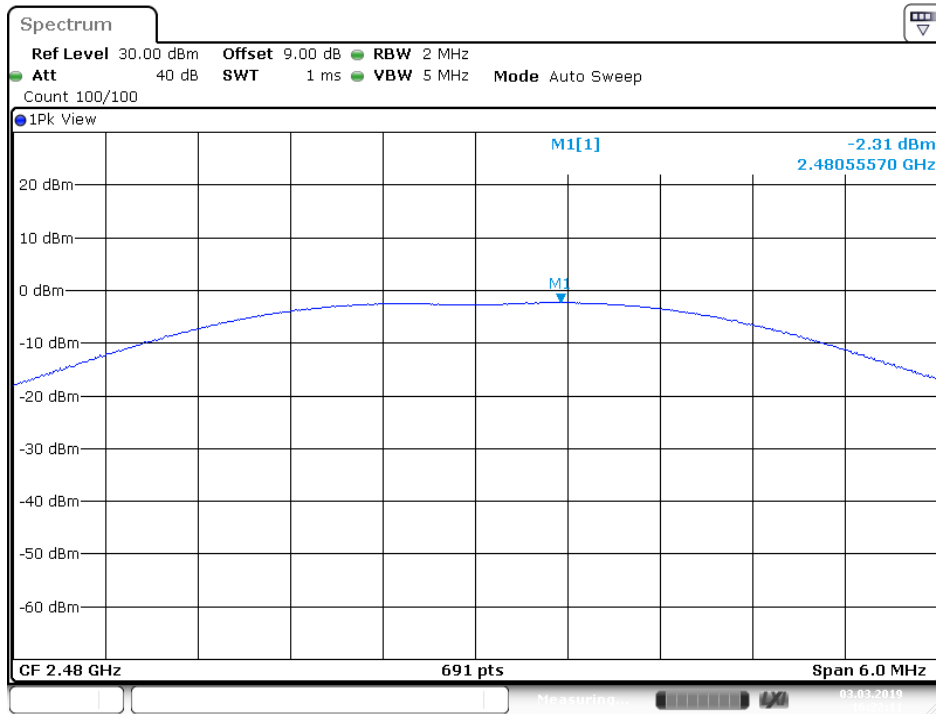
Date: 3 MAR 2019 16:20:22

Conducted Output Power	Limit
-2.96 dBm	< 30dBm

**Peak Output Power**

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2480MHz)  
 Test Specification: FCC15.247(b)  
 Comment: 120V AC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Date: 3 MAR 2019 16:22:11

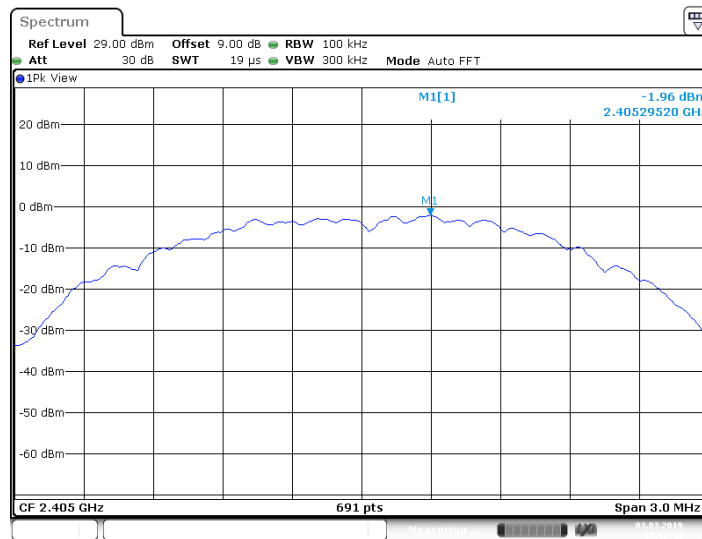
Conducted Output Power	Limit
-2.31 dBm	< 30dBm

## 7.5 Spurious Emissions at Antenna Terminals

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2405MHz)  
 Test Specification: FCC2.1051 & 15.247(d)  
 Comment: 120V AC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Channel	FreqRange	RefLevel	Result	Limit	Verdict
2405	Reference	-1.96	-1.96	---	PASS
2405	30~1000	-1.96	-61.17	-21.96	PASS
2405	1000~26500	-1.96	-44.24	-21.96	PASS

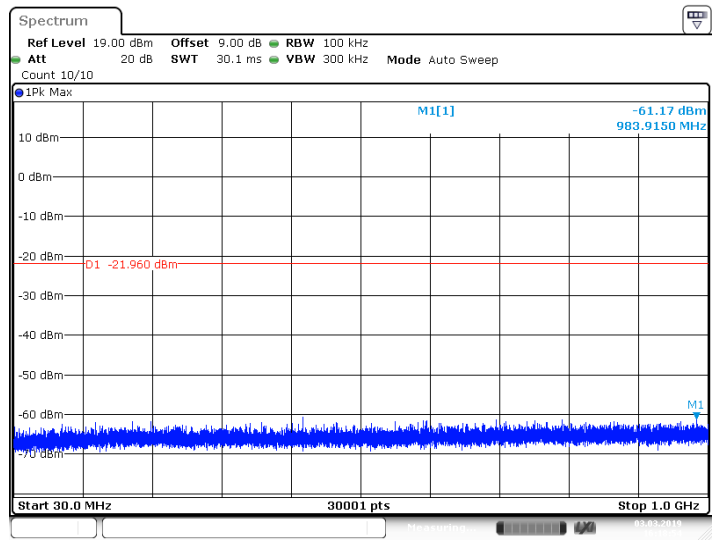


Date: 3 MAR 2019 16:18:45

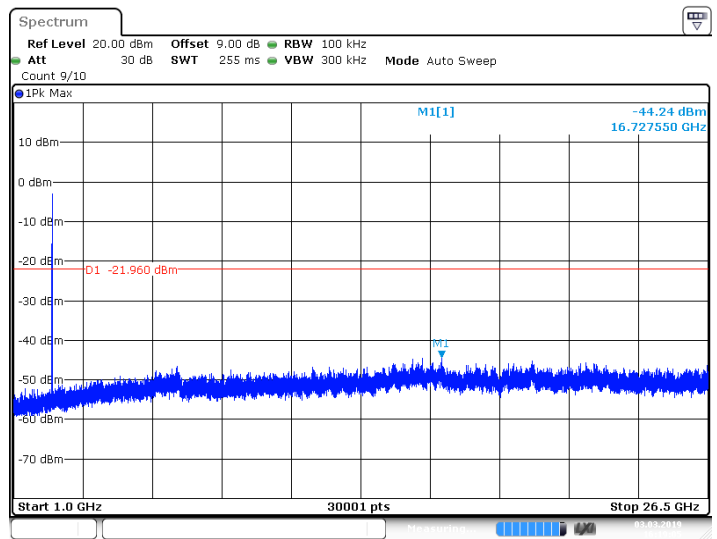
### Spurious Emissions at Antenna Terminals

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2405MHz)  
 Test Specification: FCC2.1051 & 15.247(d)  
 Comment: 120V AC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Date: 3 MAR 2019 16:18:54



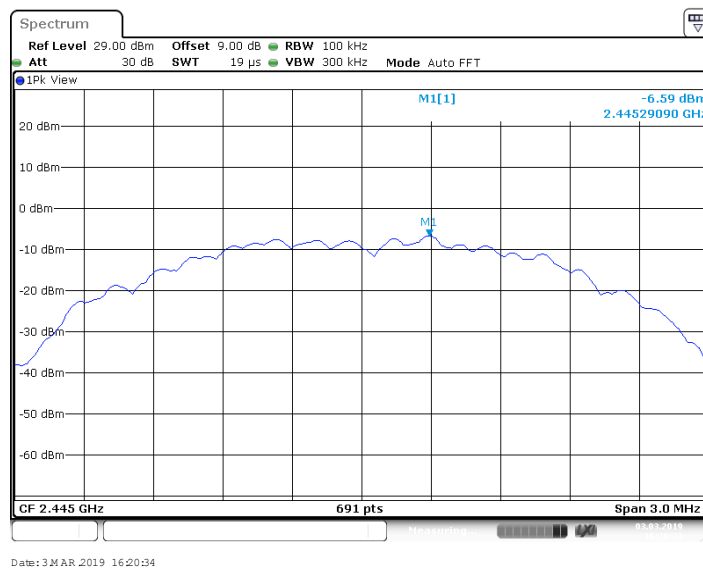
Date: 3 MAR 2019 16:19:06

### Spurious Emissions at Antenna Terminals

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2445MHz)  
 Test Specification: FCC2.1051 & 15.247(d)  
 Comment: 120V AC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Channel	FreqRange	RefLevel	Result	Limit	Verdict
2445	Reference	-6.59	-6.59	---	PASS
2445	30~1000	-6.59	-60.8	-26.59	PASS
2445	1000~26500	-6.59	-45.38	-26.59	PASS

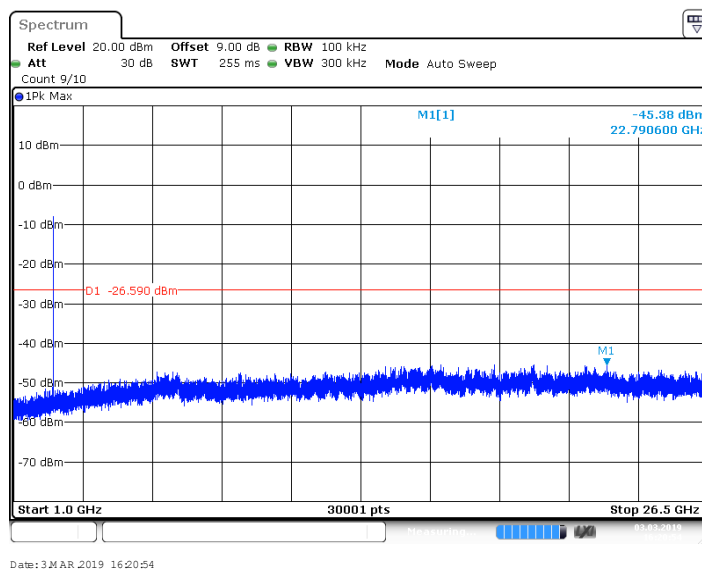
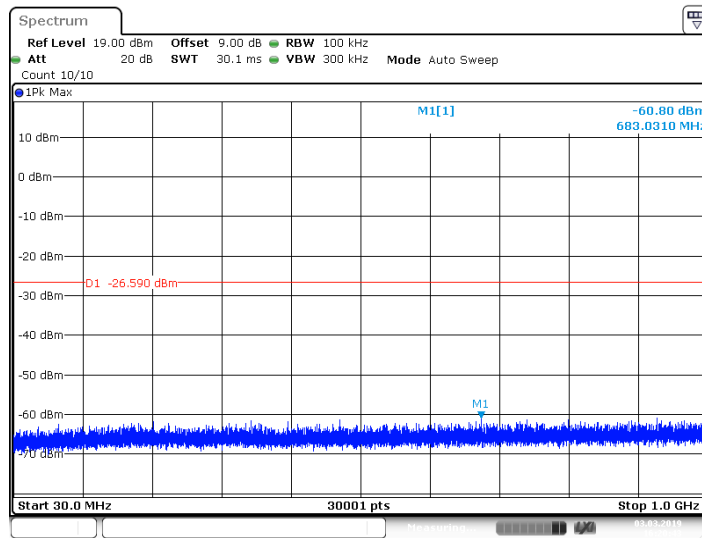




### Spurious Emissions at Antenna Terminals

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2445MHz)  
 Test Specification: FCC2.1051 & 15.247(d)  
 Comment: 120V AC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

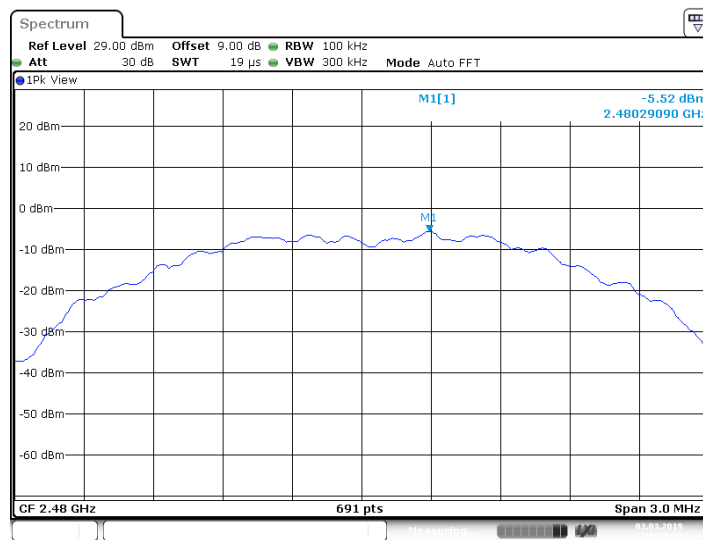


### Spurious Emissions at Antenna Terminals

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2480MHz)  
 Test Specification: FCC2.1051 & 15.247(d)  
 Comment: 120V AC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

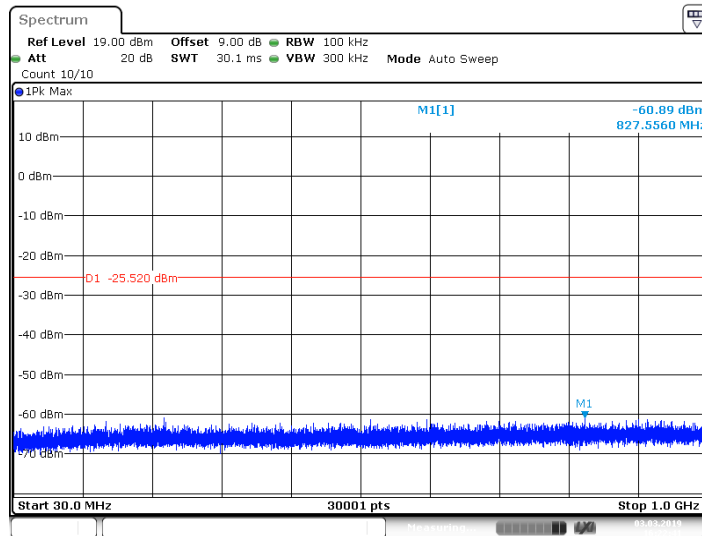
Channel	FreqRange	RefLevel	Result	Limit	Verdict
2480	Reference	-5.52	-5.52	---	PASS
2480	30~1000	-5.52	-60.89	-25.52	PASS
2480	1000~26500	-5.52	-45.41	-25.52	PASS



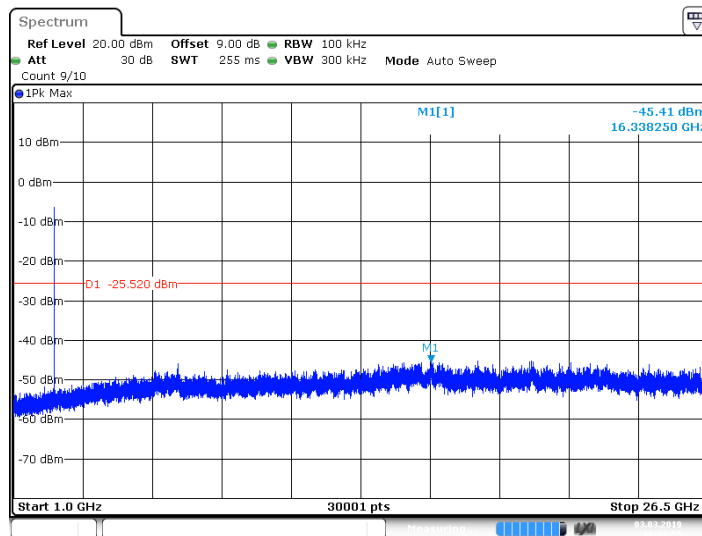
## Spurious Emissions at Antenna Terminals

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2480MHz)  
 Test Specification: FCC2.1051 & 15.247(d)  
 Comment: 120V AC

<b>Test Result</b>	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Date: 3 MAR 2019 16:22:42

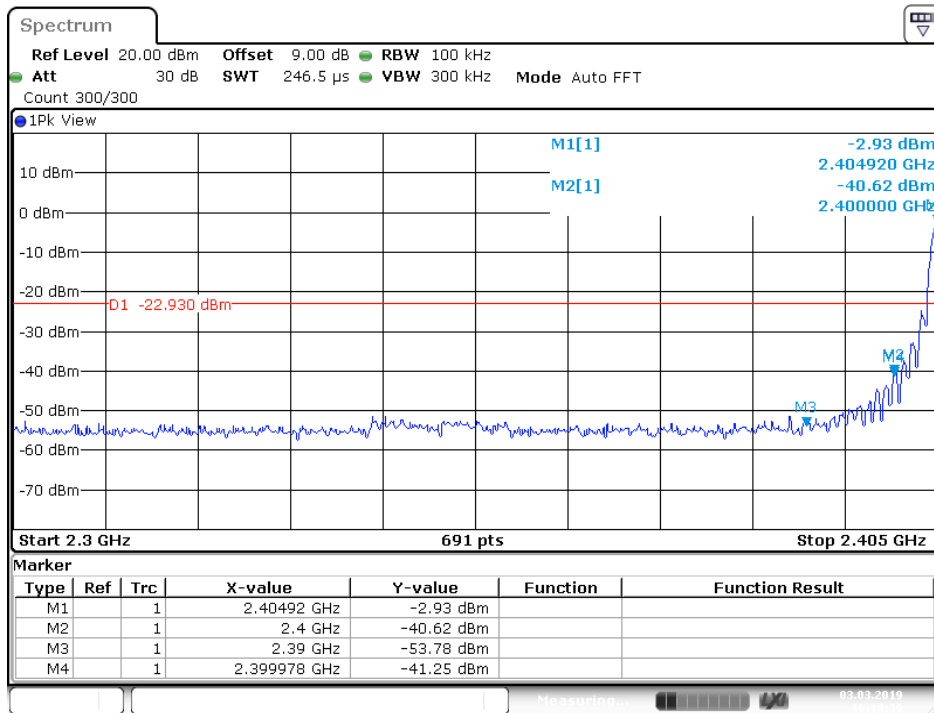


Date: 3 MAR 2019 16:22:53

## 7.6 100kHz Bandwidth of band edges

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2405MHz)  
 Test Specification: FCC15.247(d), Conducted  
 Comment: 120V AC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



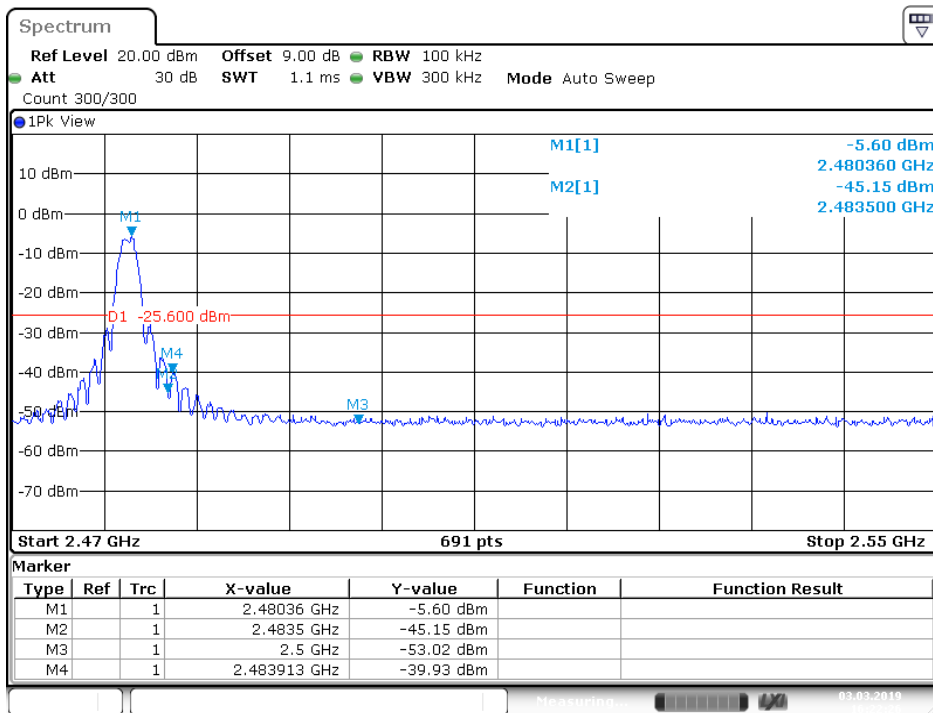
Date: 3 MAR 2019 16:18:39

<b>Band edges</b>	<b>Limit</b>
37.69 dB	> 20dB

**100kHz Bandwidth of band edges**

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2480MHz)  
 Test Specification: FCC15.247(d), Conducted  
 Comment: 120V AC

<b>Test Result</b>	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Date: 3 MAR 2019 16:22:27

<b>Band edges</b>	<b>Limit</b>
40.09 dB	> 20dB



China

**100kHz Bandwidth of band edges**

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2405MHz & 2480MHz)  
 Test Specification: FCC15.247(d), Radiated  
 Comment: 120V AC

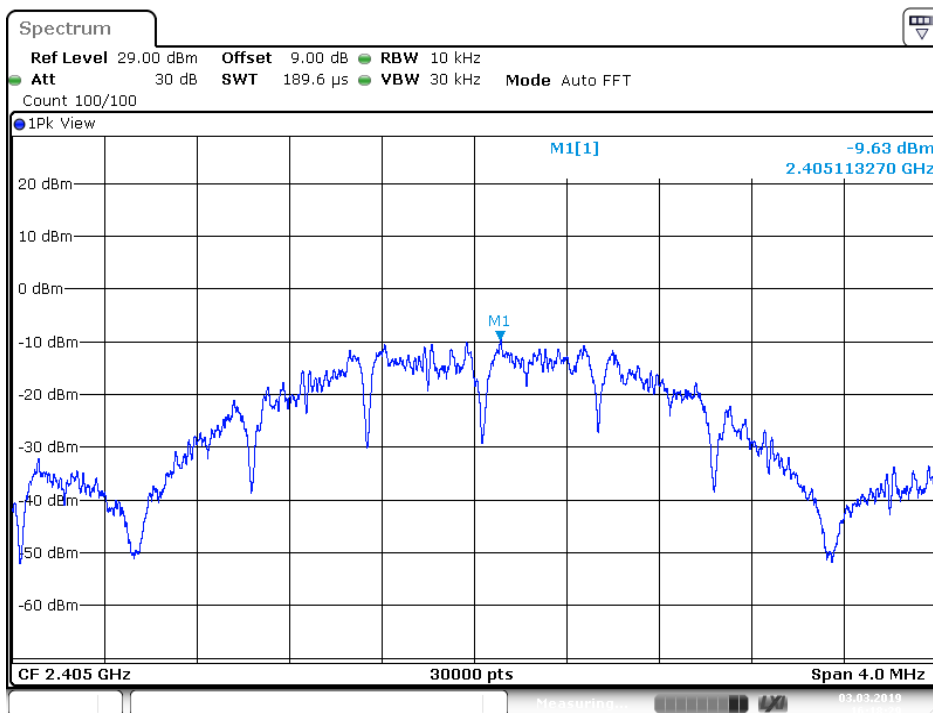
Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Channel	Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector PK /AV	Ant. Polarity H/V	Corr. (dB)
2405	2400.00	42.12	74.00	-31.88	Peak	H	-5.5
2405	2400.00	34.65	54.00	-19.35	Average	H	-5.5
2405	2400.00	39.35	74.00	-34.65	Peak	V	-5.5
2405	2400.00	32.59	54.00	-21.41	Average	V	-5.5
2480	2483.50	43.53	74.00	-30.47	Peak	H	-4.8
2480	2483.50	32.62	54.00	-21.38	Average	H	-4.8
2480	2483.50	45.48	74.00	-28.52	Peak	V	-4.8
2480	2483.50	32.95	54.00	-21.05	Average	V	-4.8

## 7.7 Power Spectral Density

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2405MHz)  
 Test Specification: FCC15.247(e)  
 Comment: 120V AC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



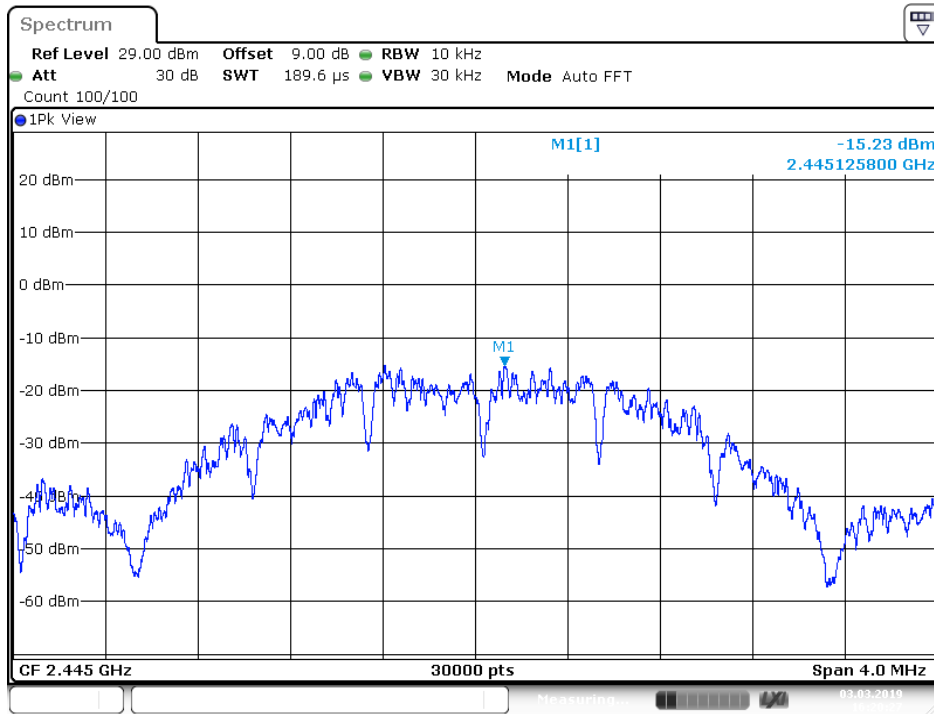
Date: 3 MAR 2019 16:18:29

PSD	Limit
-9.63 dBm	< 8 dBm

**Power Spectral Density**

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2445MHz)  
 Test Specification: FCC15.247(e)  
 Comment: 120V AC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Date: 3 MAR 2019 16:20:28

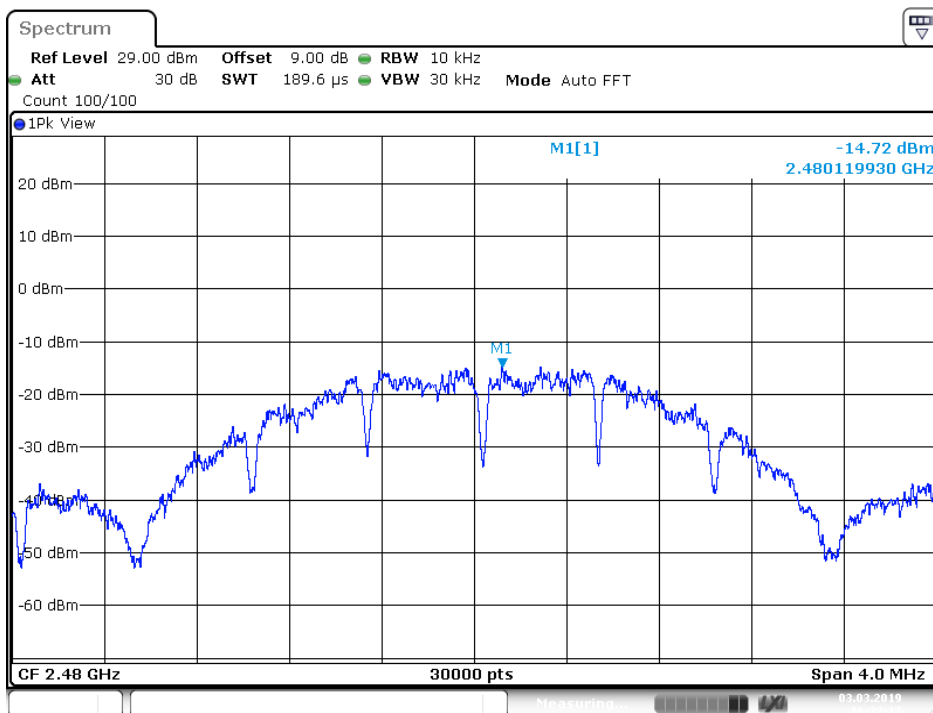
PSD	Limit
-15.23 dBm	< 8 dBm



## Power Spectral Density

EUT: Network Extender  
 Op Condition: Operated, TX Mode (2480MHz)  
 Test Specification: FCC15.247(e)  
 Comment: 120V AC

<b>Test Result</b>	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Date: 3 MAR 2019 16:22:17

<b>PSD</b>	<b>Limit</b>
-14.72 dBm	< 8 dBm

## 7.8 Antenna Requirement

EUT: Network Extender  
Op Condition: Operated, TX Mode  
Test Specification: FCC15.203 & 15.247(b)  
Comment: 120V AC

Test Result

Passed

Not Passed

### Limit

For intentional device, according to FCC Title 47 Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC Title 47 Part 15.247(b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### Antenna Connector Construction

EUT has two antennas, one is on-board chip antenna, another is external antenna with SMA interface. Internal chip antenna maximum gain is -1.5 dBi, external whip antenna maximum gain is 2dBi. So EUT fulfill with 15.203 requirements.

## 8 Appendix A - General Product Information

### Radiofrequency radiation exposure evaluation

This exposure evaluation is intended for **FCC ID: 2AA2X-16500354**.

According to KDB 447498 D01v06 section 4.3.1, For frequencies between 100 MHz to 6GHz and test separation distances  $\leq 50$  mm, the Numeric threshold is determined as:

Step a)

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR

>> The fundamental frequency of the EUT is 2405-2480MHz,  
the test separation distance is  $\leq 50$ mm.  
(Manufacturer specified the separation distance is: 20mm)

Step a)

>> Numeric threshold (2405MHz),  $\text{mW} / 20\text{mm} \cdot \sqrt{2.402\text{GHz}} \leq 3.0$   
Numeric threshold (2405MHz)  $\leq 38.713\text{mW}$

>> Numeric threshold (2445MHz),  $\text{mW} / 20\text{mm} \cdot \sqrt{2.440\text{GHz}} \leq 3.0$   
Numeric threshold (2445MHz)  $\leq 38.411\text{mW}$

>> Numeric threshold (2480MHz),  $\text{mW} / 20\text{mm} \cdot \sqrt{2.480\text{GHz}} \leq 3.0$   
Numeric threshold (2480MHz)  $\leq 38.100\text{mW}$

>> The power of EUT measured (2405MHz) is: 1.70dBm = 1.479mW  
The power of EUT measured (2445MHz) is: -2.96dBm = 0.506mW  
The power of EUT measured (2480MHz) is: -2.31dBm = 0.587mW

Which is smaller than the Numeric threshold.

Therefore, the device is exempt from stand-alone SAR test requirements.