



TEST REPORT

Number
Composition of document

RADIO

139112-680504A
72 pages

FCC Registration Number
Industry Canada Number

166175 (FAR) or 888863 (Ecuelles)
6230B

Standards

47 CFR Part 15.247
RSS-247, Issue 1
RSS-Gen, Issue 4

Issued to

NXP Semiconductors
2 Esplanade Anton Philips
14906 Caen Cedex 9
FRANCE
NXP Semiconductors

Apparatus under test

Trade mark
Manufacturer
Type
Serial number
IC
FCC ID

JN5179-001-M00 & JN5179-001-RPSMA
NXP
NXP Semiconductors
JN5179-001-M00 & JN5179-001-RPSMA
No serial number
8764A-JN5179M0
XXMJN5179M0

Test date

2015/12/23 & 2015/12/24, 2015/12/18 & 2016/03/14

Tests performed by

Armand MAHOUNGOU

Test site

Fontenay aux Roses/ Ecuelles

Date of issue

2016/04/01

Written by :
Armand MAHOUNGOU
Tests operator

Approved by :
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1. TEST PROGRAM

- References**

Standards:

- 47 CFR Part 15C
- RSS-247
- RSS-Gen
- CISPR 16-4-2
- ANSI C63.10 (2013)
- DTS measurement guidance 558074 D01 v03r04

Standard Section	Test Description	TEST RESULT - Comments
RSS-Gen § 6.6	Occupied Bandwidth	PASS
CFR 47 § 15.247 (a) (2) RSS-247 § 5.2 (1)	-6dB Bandwidth	PASS
CFR 47 § 15.247 (b) RSS-247 § 5.4 (4)	Maximum Output Power	PASS
CFR 47 § 15.247 (e) RSS-247 § 5.2 (2)	Power Spectral Density	PASS
CFR 47 § 15.247 (d) RSS-247 § 5.5	Conducted Spurious Emission at the Band Edge	PASS
CFR 47 § 15.247 (d) RSS-247 § 5.5	Unwanted Emissions into Non-Restricted Frequency Bands	PASS
CFR 47 § 15.207 RSS-Gen § 8.8	AC Power Line Conducted Emissions	PASS
CFR 47 § 15.209 (a) CFR 47 § 15.205 (a) CFR 47 § 15.247 (d) RSS-Gen § 8.10	Unwanted Emissions into Restricted Frequency Bands	PASS
RSS-Gen § 7.1	Receiver Radiated emissions	PASS (Include in Unwanted Emissions into Restricted Frequency Bands)

PASS: EUT complies with standard's requirement

FAIL: EUT does not comply with standard's requirement

NA: Not Applicable

NP: Test Not Performed



2. EQUIPMENT DESCRIPTION

2.1. EQUIPMENT OF THE SAME FAMILY

Model	RF mode	Power supply	Test performed
JN5179-001-M00	Integral antenna	3.3Vdc (Note 1)	Unwanted emission into the restricted frequency bands AC power line conducted emissions
		6Vdc (Note 1)	Unwanted emission into the restricted frequency bands AC power line conducted emissions
JN5179-001-RPSMA	SMA-RP connector	3.3Vdc (Note 1)	Occupied bandwidth -6dB bandwidth Maximum conducted power Power spectral density Unwanted emission into non-restricted frequency bands at the band edge Unwanted emission into non-restricted frequency bands
		6Vdc (Note 1)	Occupied bandwidth -6dB bandwidth Maximum conducted power Power spectral density Unwanted emission into non-restricted frequency bands at the band edge Unwanted emission into non-restricted frequency bands

Note 1: The hardware difference between 3.3V and 6V power supplied versions only differ with the following component(s) : R4 (0 ohm) is not connected on the 3.3V power supplied versions. Other parts are identical.

2.2. HARDWARE & SOFTWARE IDENTIFICATION

- Equipment under test (EUT):**



JN5179-001-M00 (3.3Vdc)



JN5179-001-RPSMA (3.3Vdc)



JN5179-001-M00 (6Vdc)

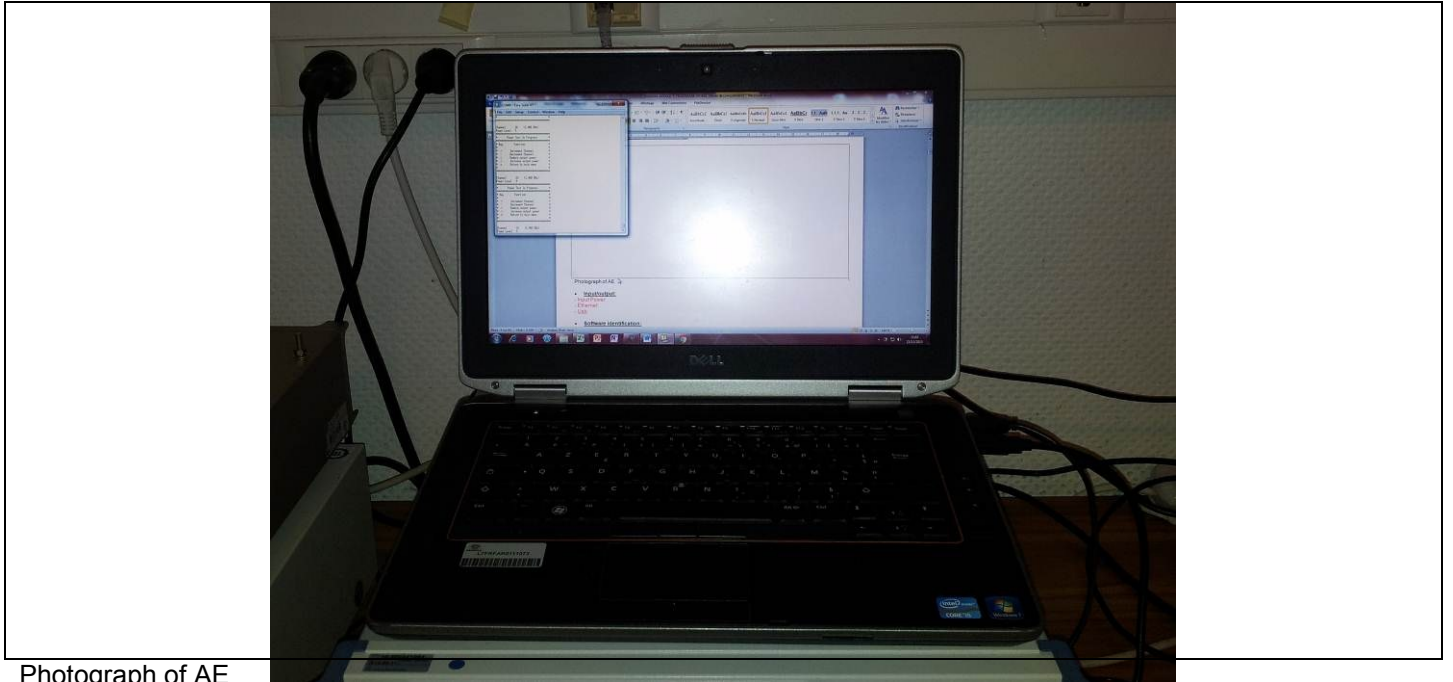


JN5179-001-RPSMA (6Vdc)

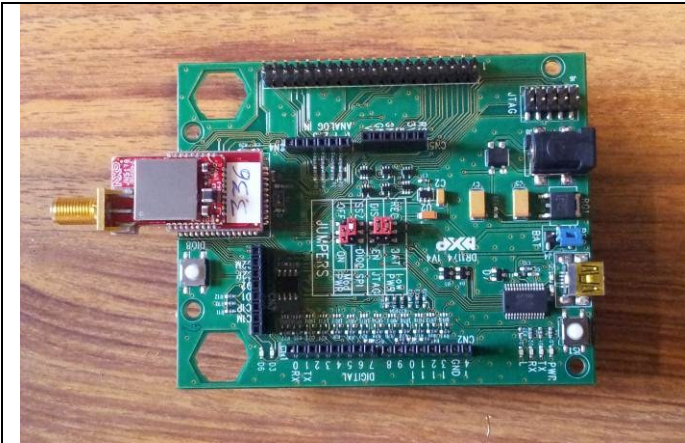
Photograph of EUT Electronic Board



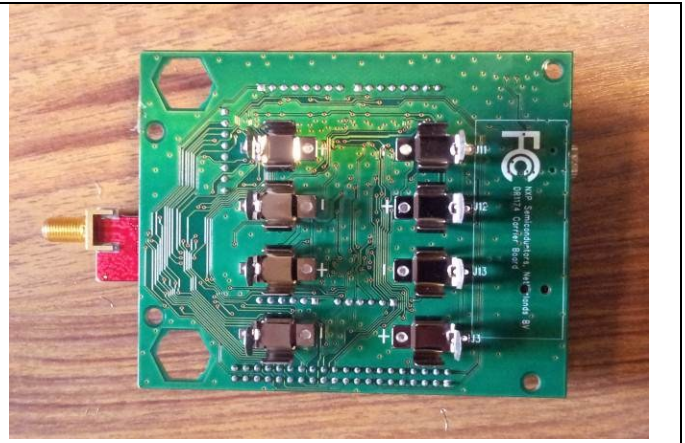
- **Auxiliary equipment (AE) used for testing:**



Photograph of AE



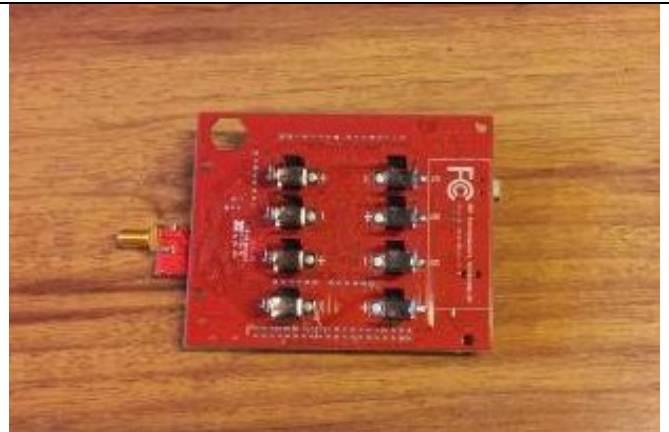
Front face (USB cable 3.3V)



Back face (USB cable 3.3V)



Front face (Power supply 6V)



Front face (Power supply 6V)



USB cable



Power supply

Photograph of AE



- **Input/output:**

- Input Power
- Usb

- **Software identification:**

- Software version: CMET 4.2

- **Equipment information:**

- Modulation technology: DSSS modulation

- Transmit operating mode: Single antenna

- Number of transmit chains: 1

- Number of receiver chains: 1

- Antenna type: Integral (JN5179-001-M00) External (JN5179-001-RPSMA)

- Beamforming gain: Yes No

- Type of the equipment: Stand-alone equipment Plug-in radio device Combined equipment

- Test source voltage1: Vnom: 120V/60Hz 3.3 Vdc

Note: the mother board is connected to the PC with USB. A LDO on the mother board generates the 3.3V voltage from the USB 5V supply.

- Test source voltage2: Vnom: 120V/60Hz 6 Vdc

Note: the mother board is connected to the PC with USB only for control. An extra board connected to the 110V main supply generates the 6V voltage that supplies the mother board and the JN5179 module.

- Type of power source: Battery (Alkaline/Lithium-Ion/Lead acid/Other) Internal power supply
 External power supply Car Charger

- Duty Cycle: Continuous duty Intermittent duty Continuous operation

- Equipment type: Representative production model Pre-production model



- Antenna Characteristics:

Declared Antenna Gain (dBi)
0.86

- Operating frequency range:

Frequency Band (MHz)	Available
2400MHz to 2483,5MHz	<input checked="" type="checkbox"/>

-Channel plan:

Channel	Frequency (MHz)	Available Channel
Cmin: 11	2405	<input checked="" type="checkbox"/>
12	2410	<input checked="" type="checkbox"/>
13	2415	<input checked="" type="checkbox"/>
14	2420	<input checked="" type="checkbox"/>
15	2425	<input checked="" type="checkbox"/>
16	2430	<input checked="" type="checkbox"/>
17	2435	<input checked="" type="checkbox"/>
Cnom: 18	2440	<input checked="" type="checkbox"/>
19	2445	<input checked="" type="checkbox"/>
20	2450	<input checked="" type="checkbox"/>
21	2455	<input checked="" type="checkbox"/>
22	2460	<input checked="" type="checkbox"/>
23	2465	<input checked="" type="checkbox"/>
24	2470	<input checked="" type="checkbox"/>
25	2475	<input checked="" type="checkbox"/>
Cmax: 26	2480	<input checked="" type="checkbox"/>

-Data Rate:

Data Rate (Mbps)	Modulation Type	Worst Case Modulation
0,25	O-QPSK	<input checked="" type="checkbox"/>

2.3. RUNNING MODE

The EUT is set in the following modes during tests:





- Permanent emission with modulation on a fixed channel in the data rate that produced the highest power
- Permanent reception

The following procedure is used to set the equipment:

- CMET for Certification JN5179-.doc



2.4. EQUIPEMENT LABELLING

 JN5179-001-M00 FCC ID:XXMJN5179M0 IC ID:8764A-JN5179M0  0081	 JN5179-001-RPSMA FCC ID:XXMJN5179M0 IC ID:8764A-JN5179M0  0081
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2.5. EQUIPMENT MODIFICATIONS

The power on channel 26 was reduced: Setting -> 4



3. OCCUPIED BANDWIDTH

3.1. TEST CONDITIONS

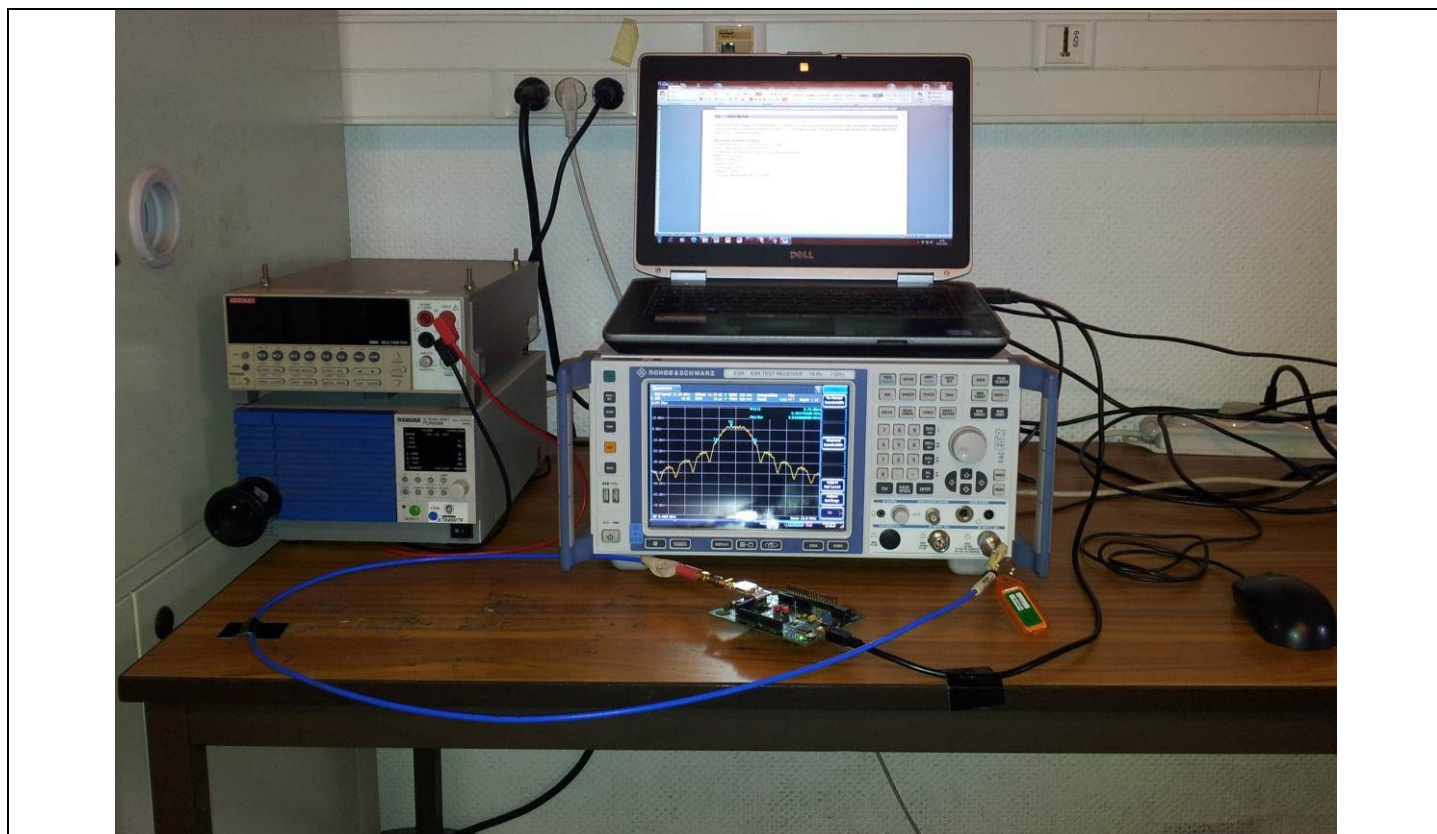
Test performed by : Armand MAHOUNGOU
Date of test : 2015/12/23
Ambient temperature : 24°C
Relative humidity : 47%

3.2. TEST SETUP

The Equipment Under Test is installed on a table and set in permanent emission with modulation. Measurement is performed with a spectrum analyzer on the EUT conducted access. The product has been tested according to the RSS-GEN § 6.6 reference method.

Spectrum Analyzer Setting:

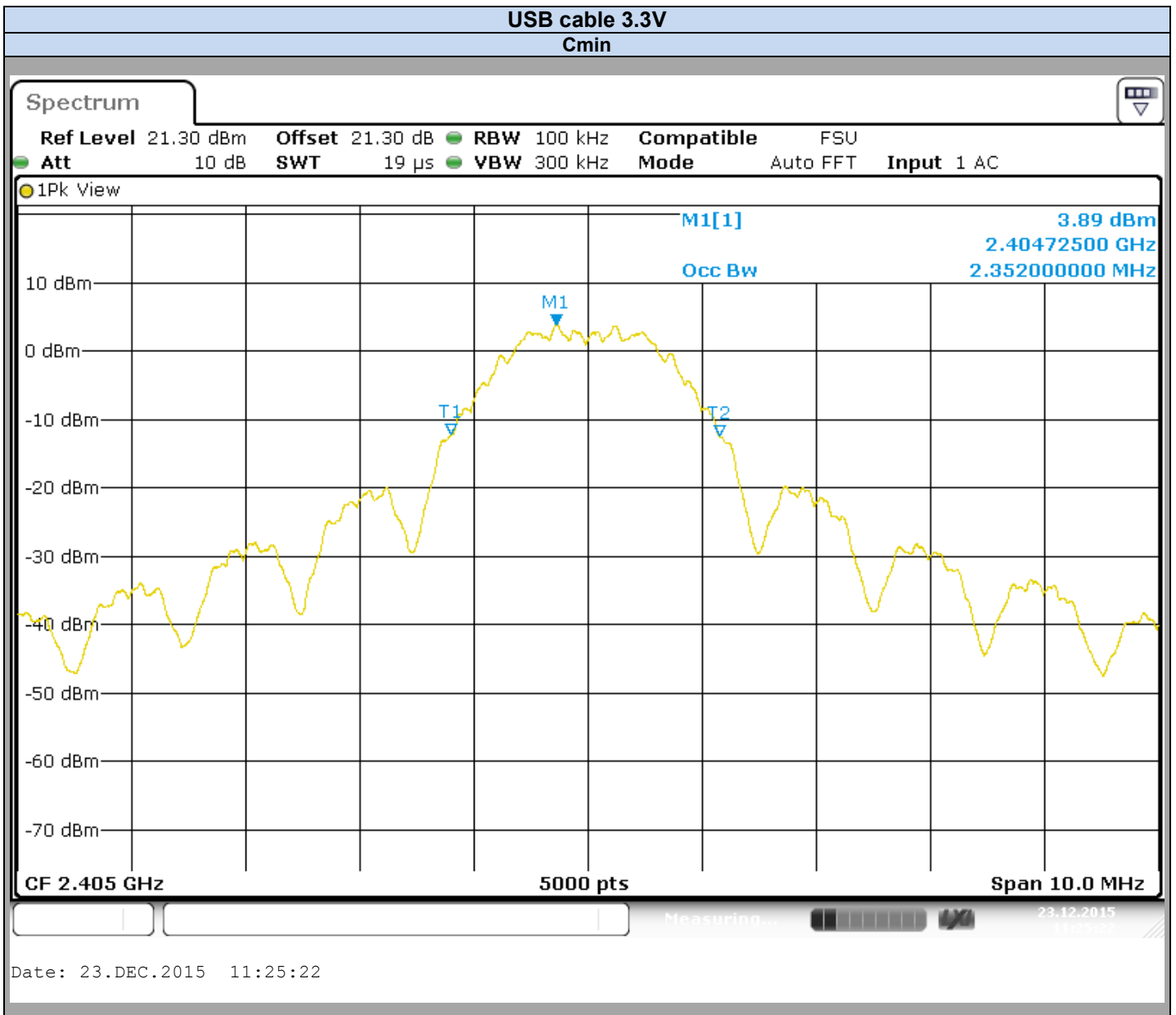
Center frequency= Cmin or Cnom or Cmax
Span= Above the emission spectrum
Amplitude= Sufficient to observe the signal amplitude
RBW= 1% of span
VBW \geq 3*RBW
Sweep= Auto
Trace= Max Hold
Detector= Peak
Occupied Bandwidth 99% activated

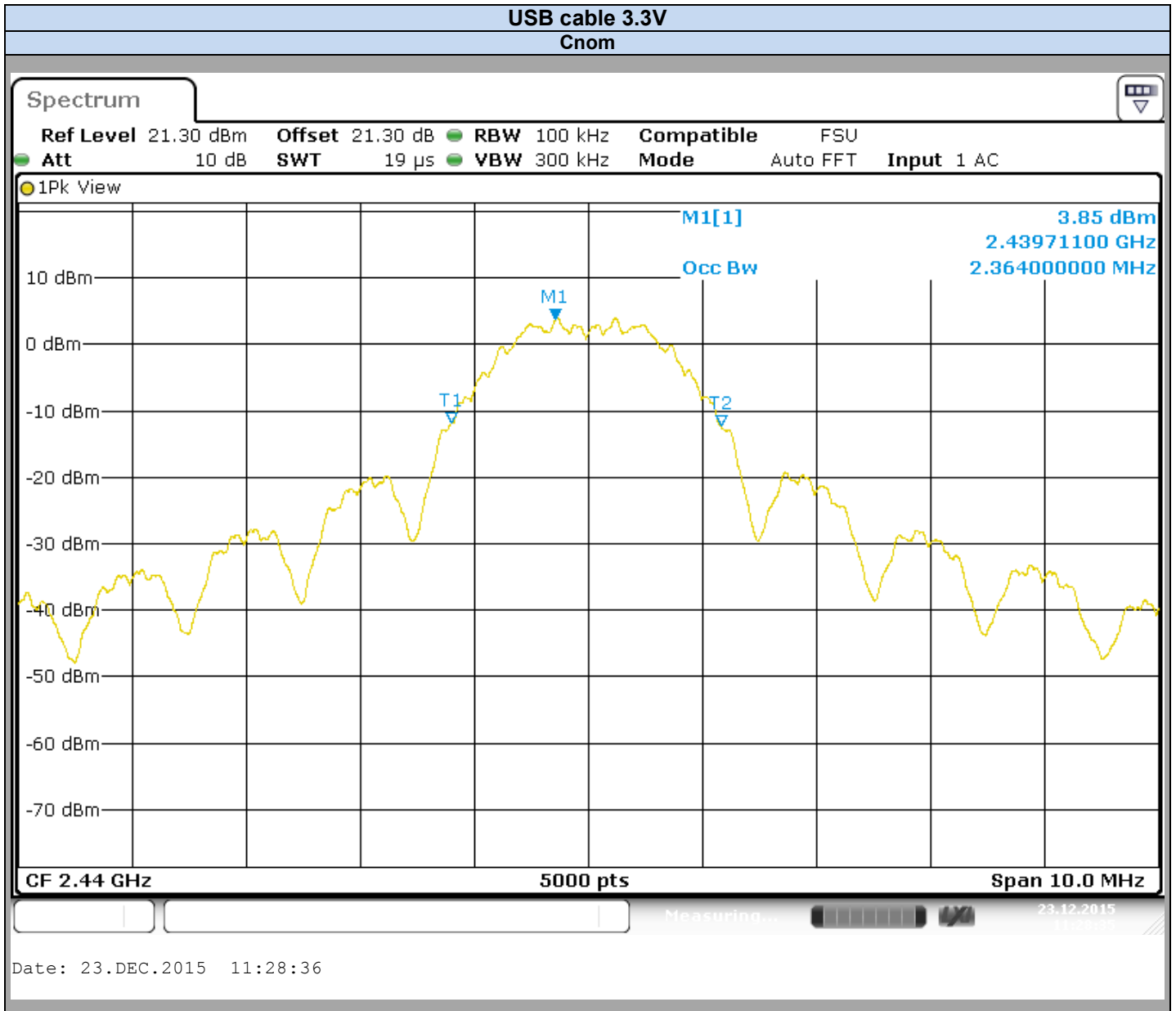


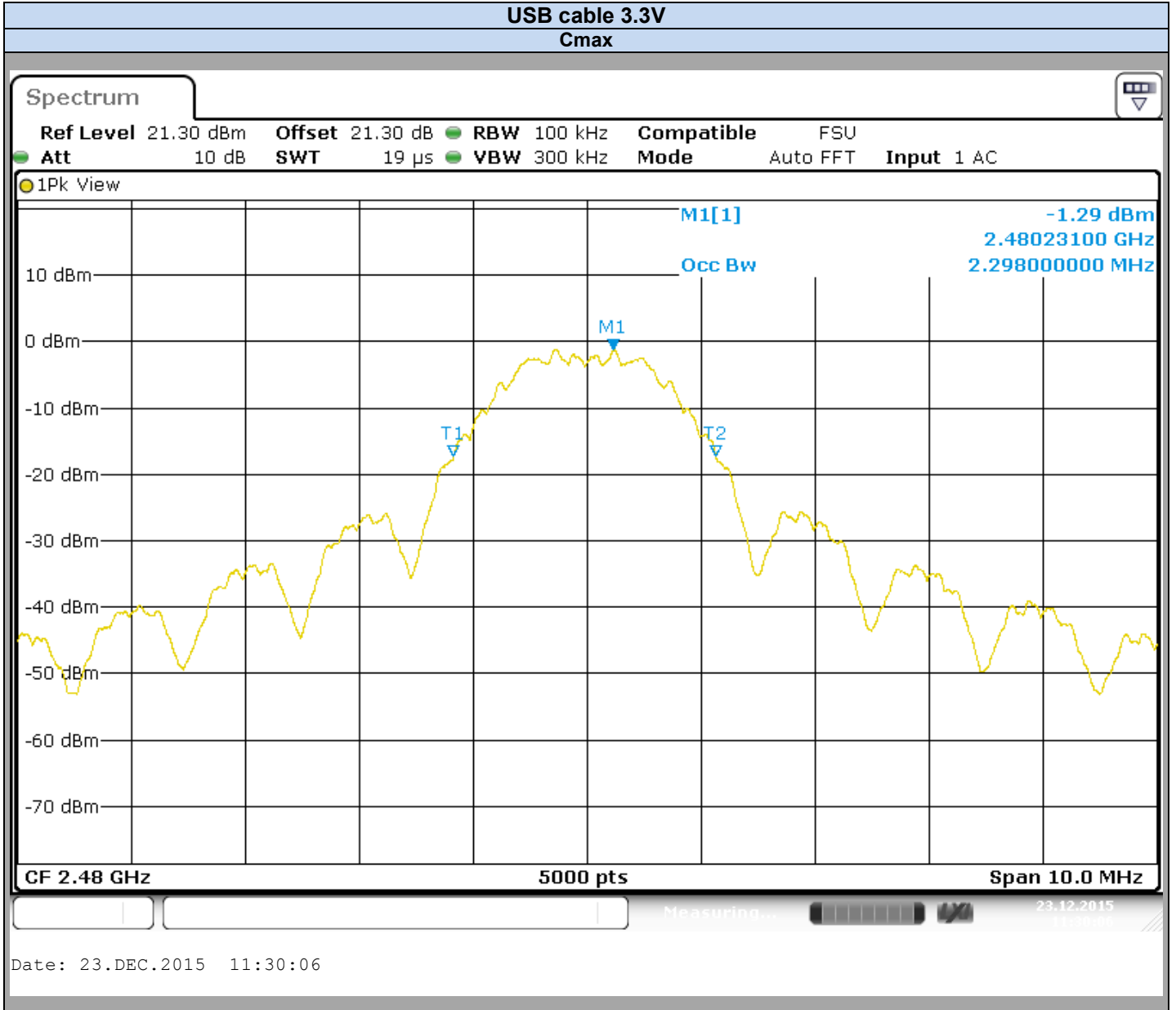
Photograph for Occupied Bandwidth

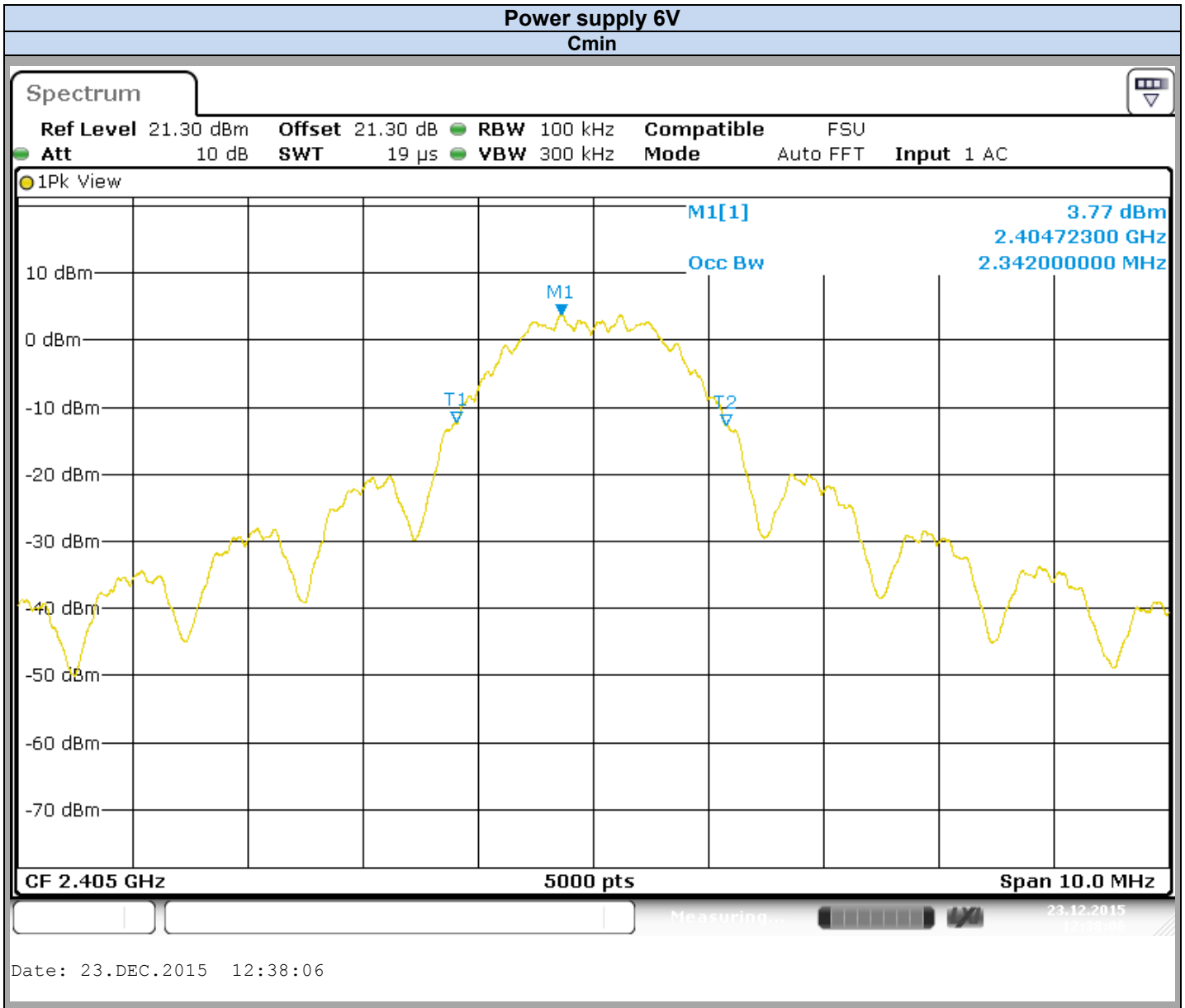


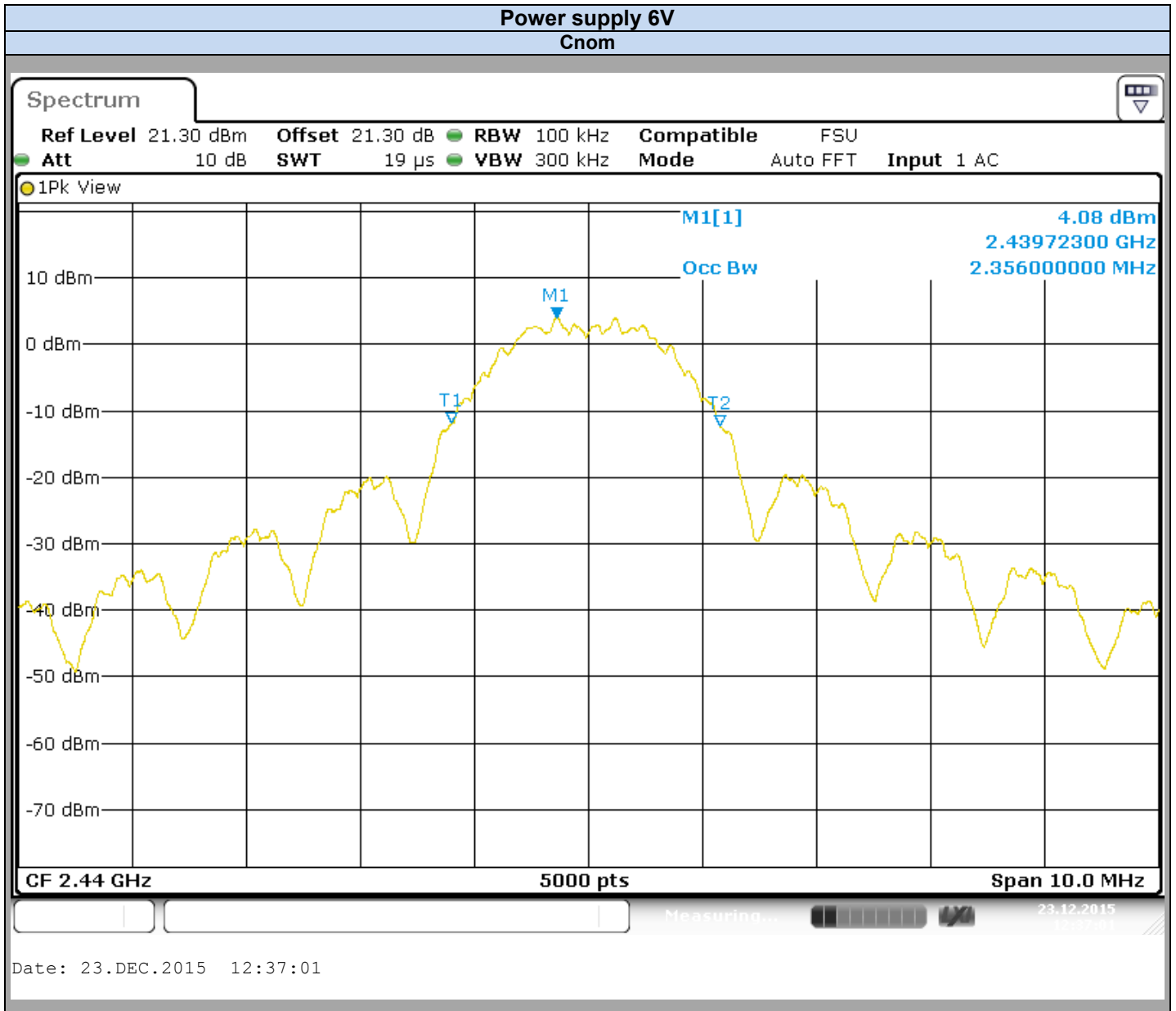
3.3. GRAPHICS & RESULTS

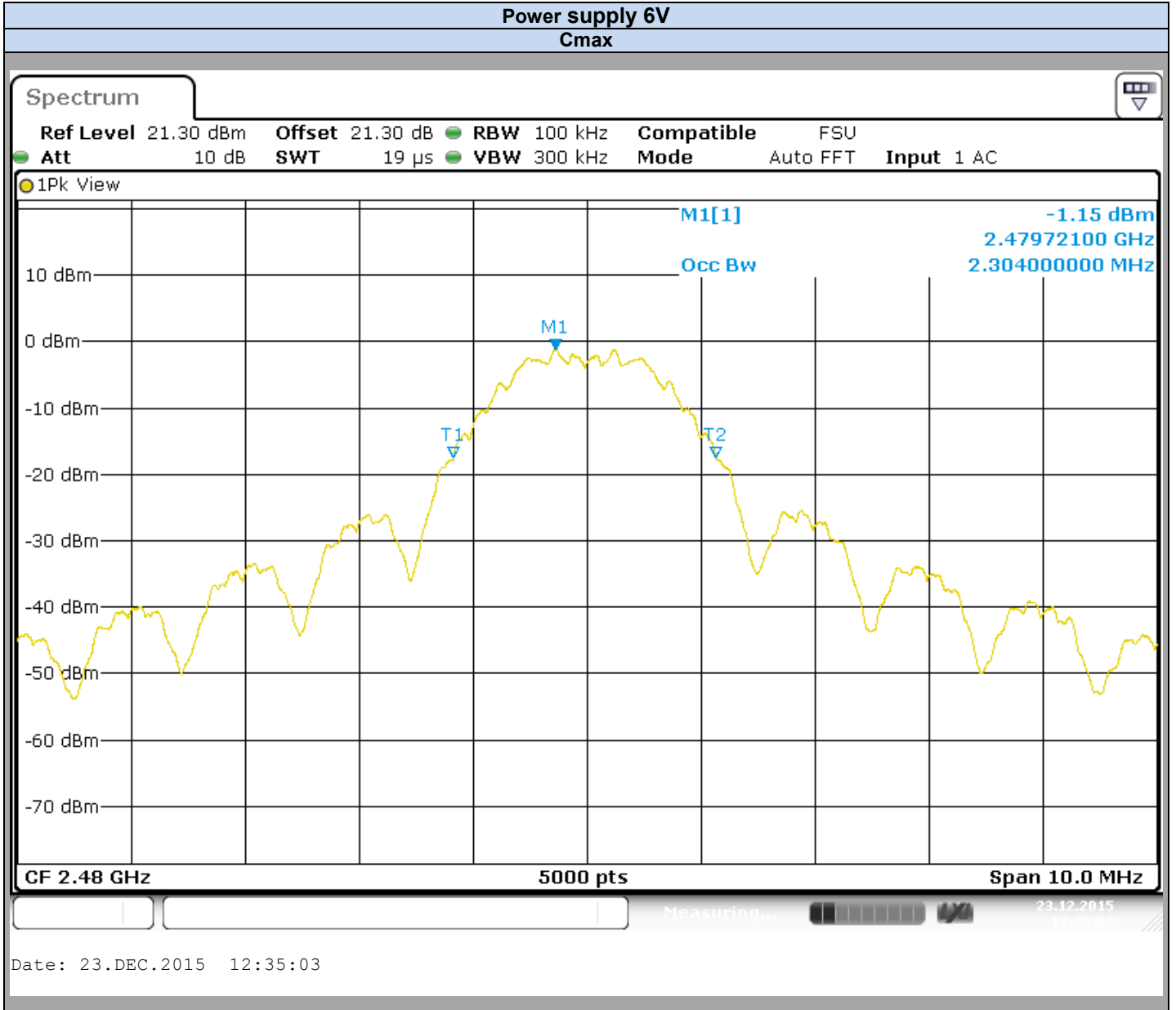














USB cable 3.3V			
Temperature	Tnom		
Voltage	Vnom		
Frequency	Cmin	Cnom	Cmax
Occupied Bandwidth (MHz)	2.352	2.364	2.298

Power supply 6V			
Temperature	Tnom		
Voltage	Vnom		
Frequency	Cmin	Cnom	Cmax
Occupied Bandwidth (MHz)	2.342	2.356	2.304

Result: **PASS**

Limit: → None



4. -6dB BANDWIDTH

4.1. TEST CONDITIONS

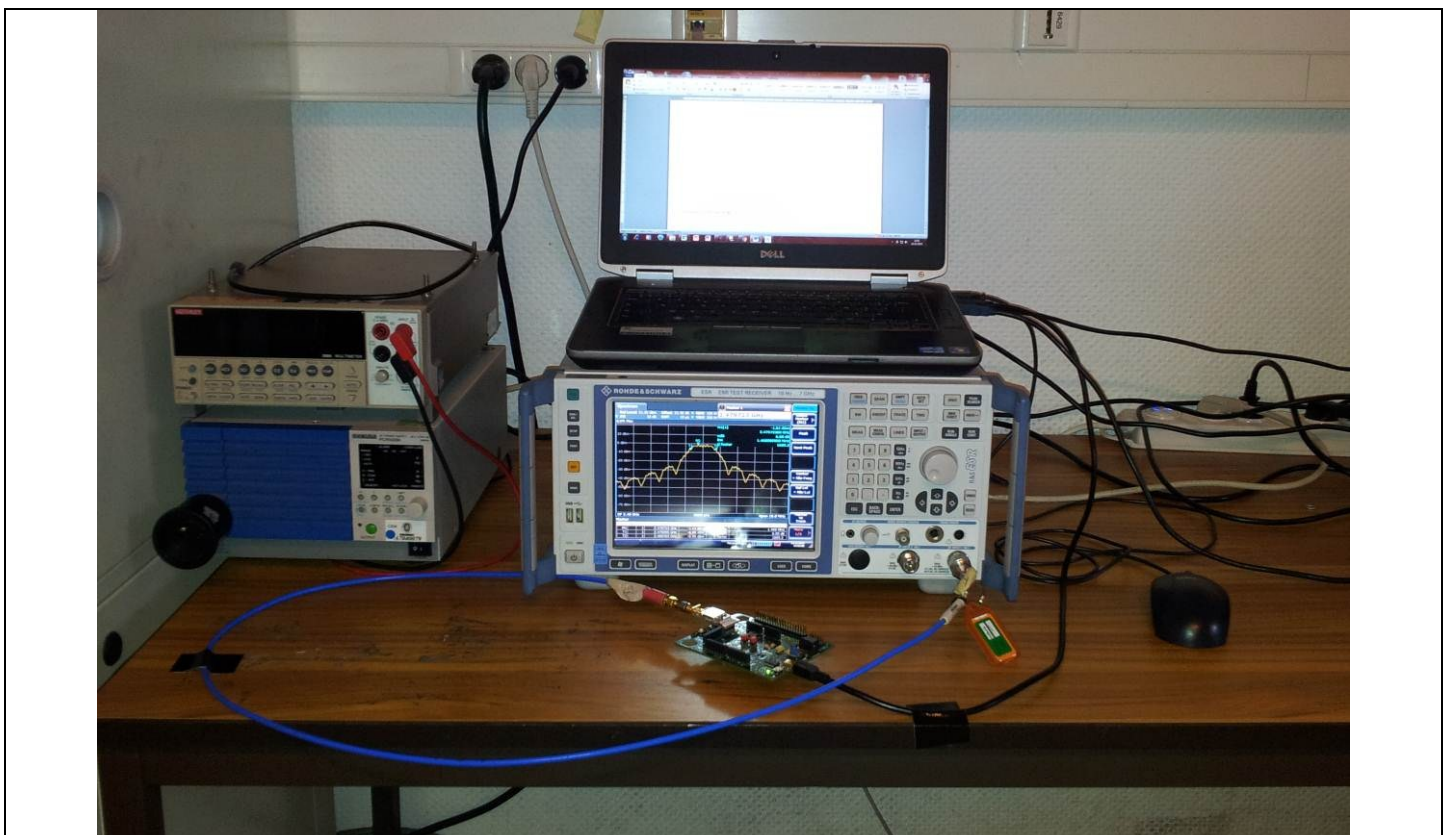
Test performed by : Armand MAHOUNGOU
Date of test : 2015/12/23
Ambient temperature : 24°C
Relative humidity : 47%

4.2. TEST SETUP

The Equipment Under Test is installed on a table and set in permanent emission with modulation. Measurement is performed with a spectrum analyzer on the EUT conducted access. The product has been tested according to the FCC KDB 558074 D01 DTS Meas Guidance v03r04 § 8.1 Option 1.

Spectrum Analyzer Setting:

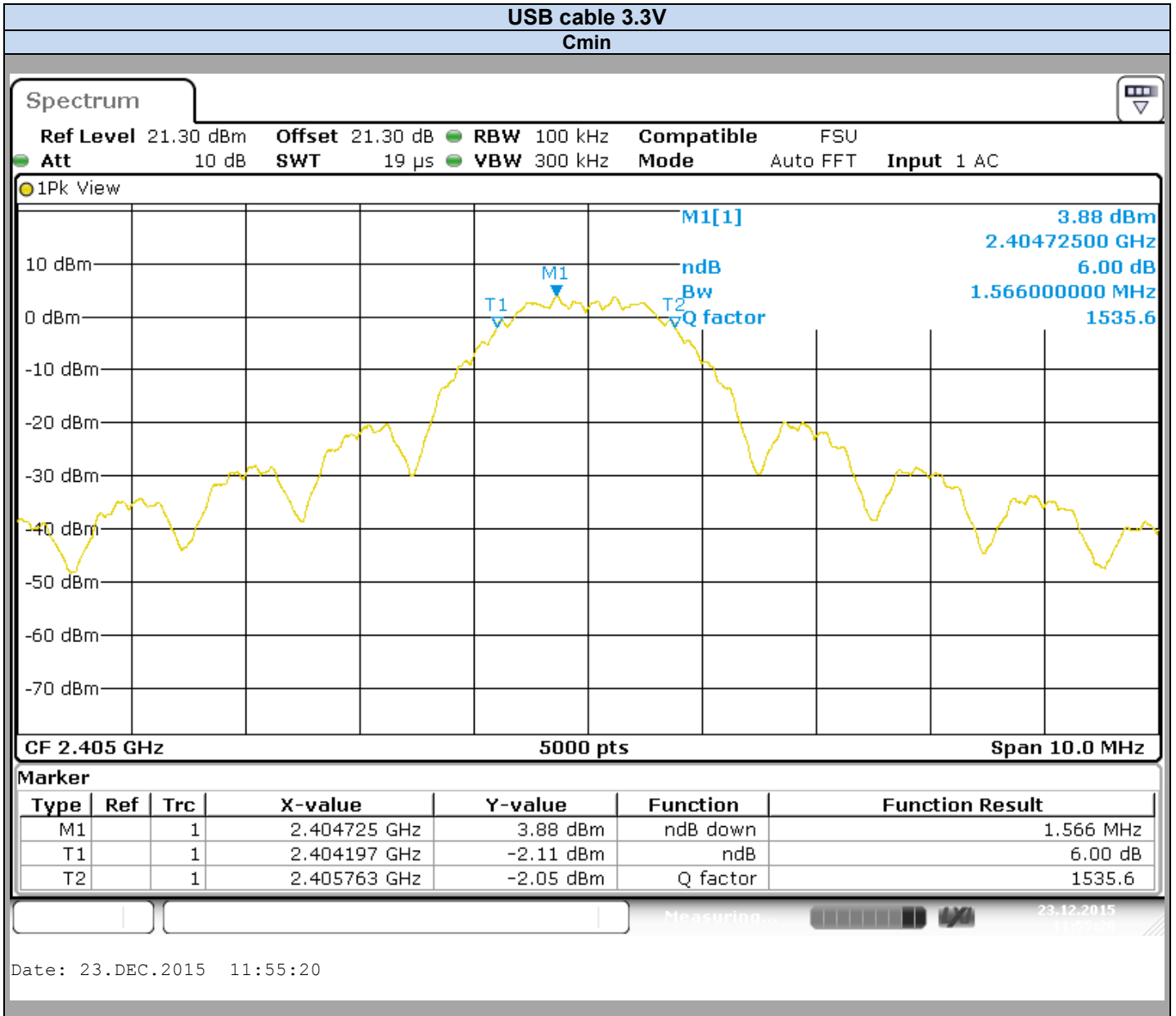
Center frequency= Cmin or Cnom or Cmax
Span= At least twice the emission spectrum
Amplitude= Sufficient to observe the signal amplitude
RBW= 100kHz
VBW≥ 300kHz
Sweep= Auto
Trace= Max Hold
Detector= Peak

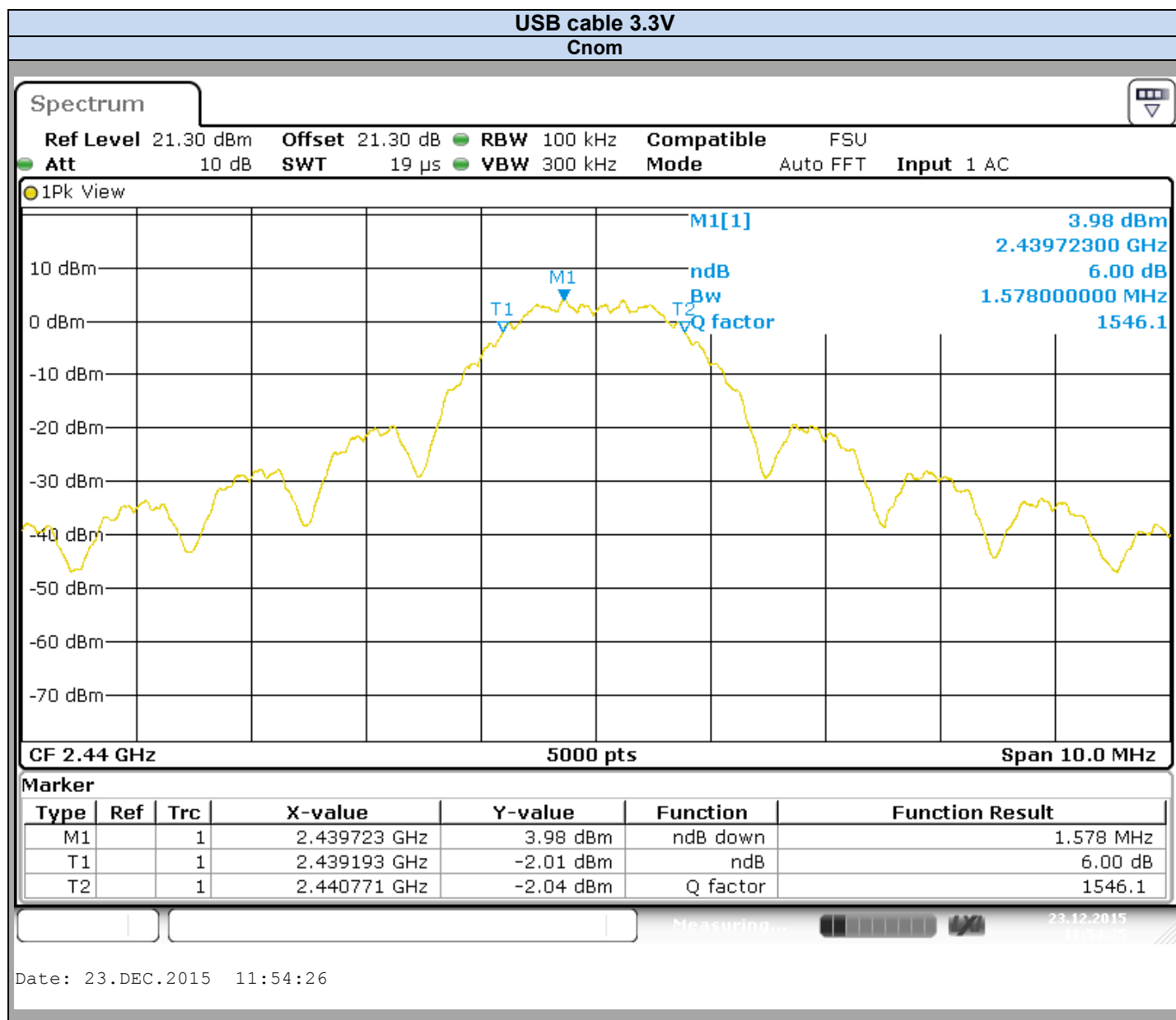


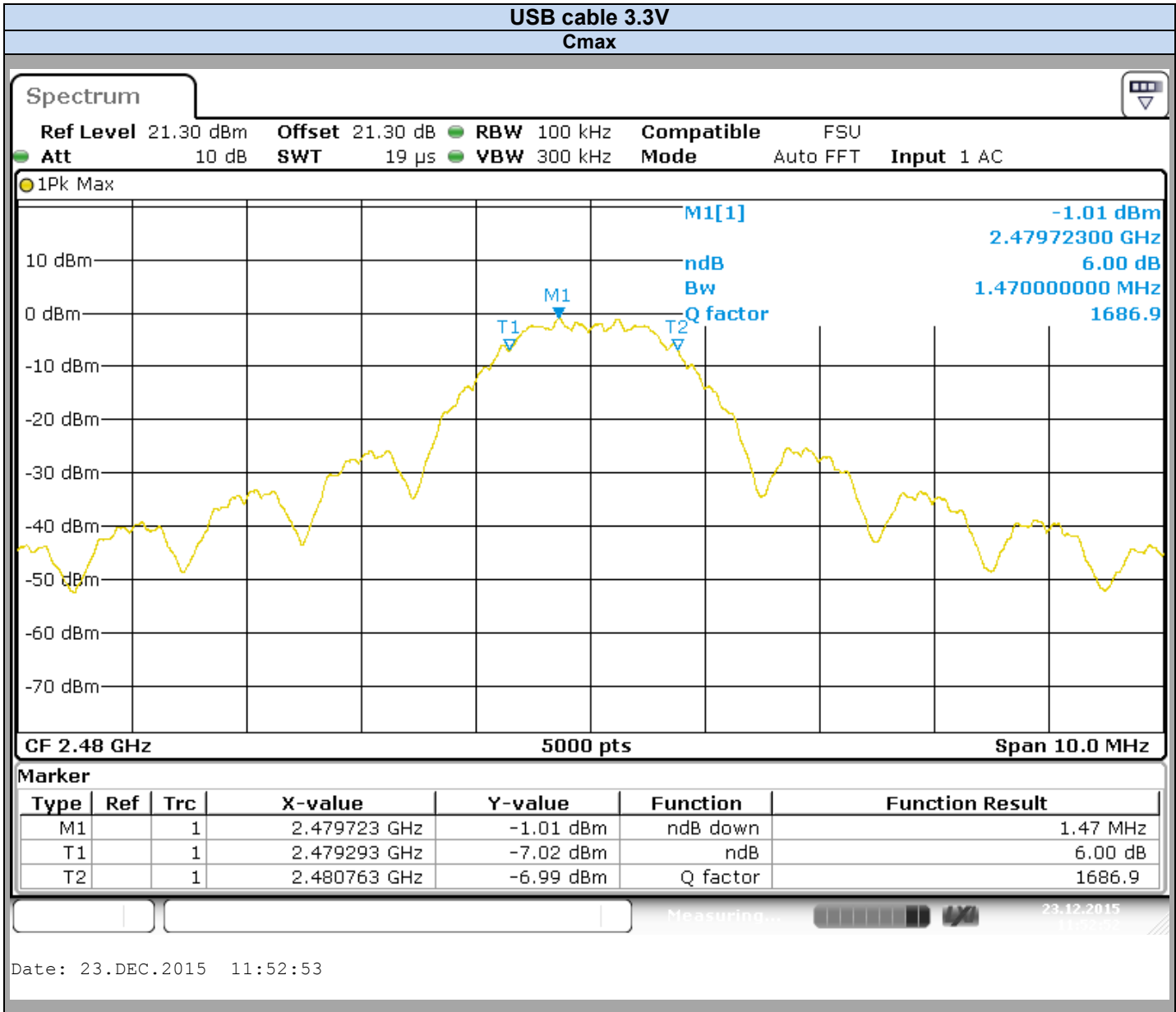
Photograph for -6dB Bandwidth

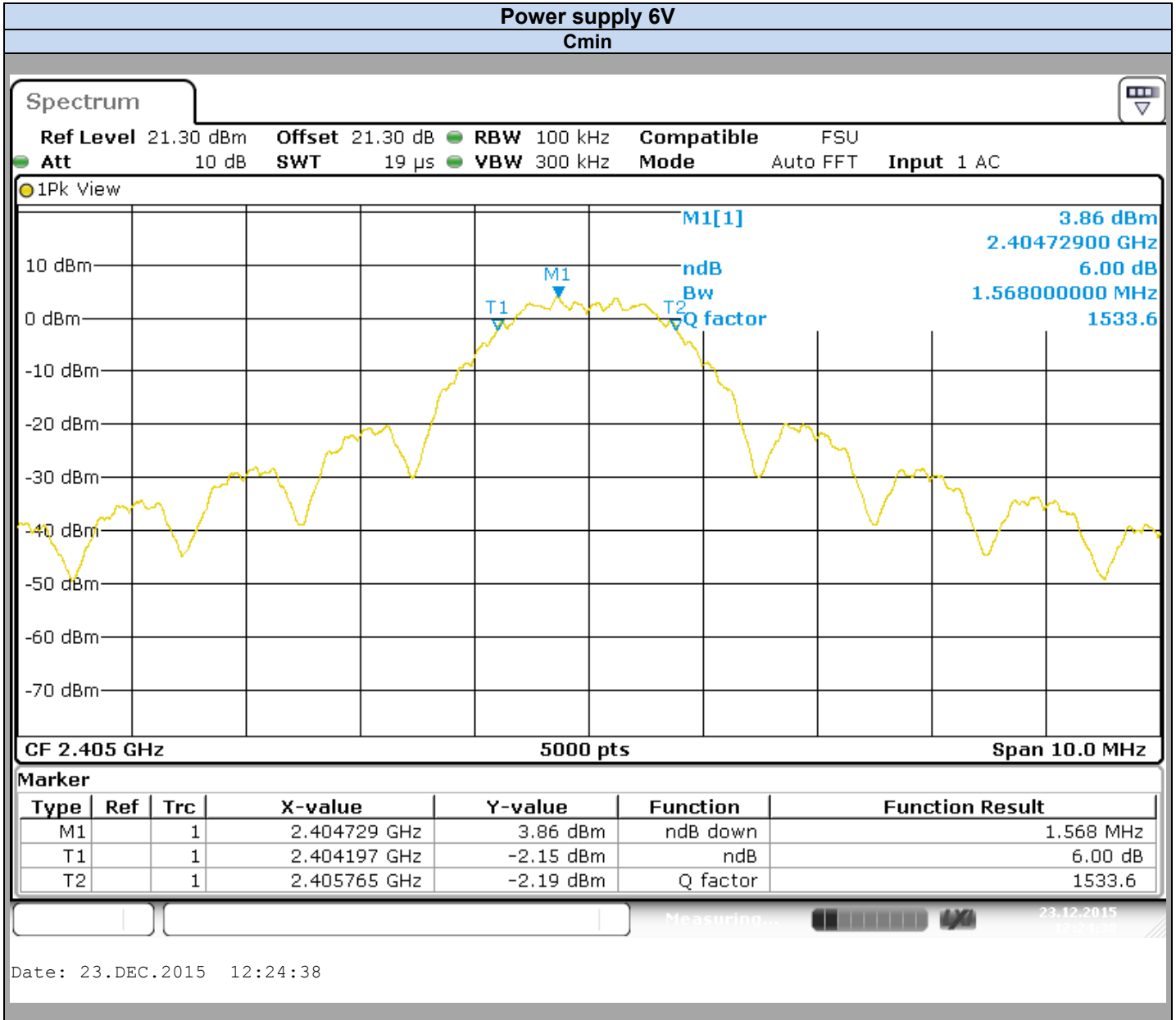


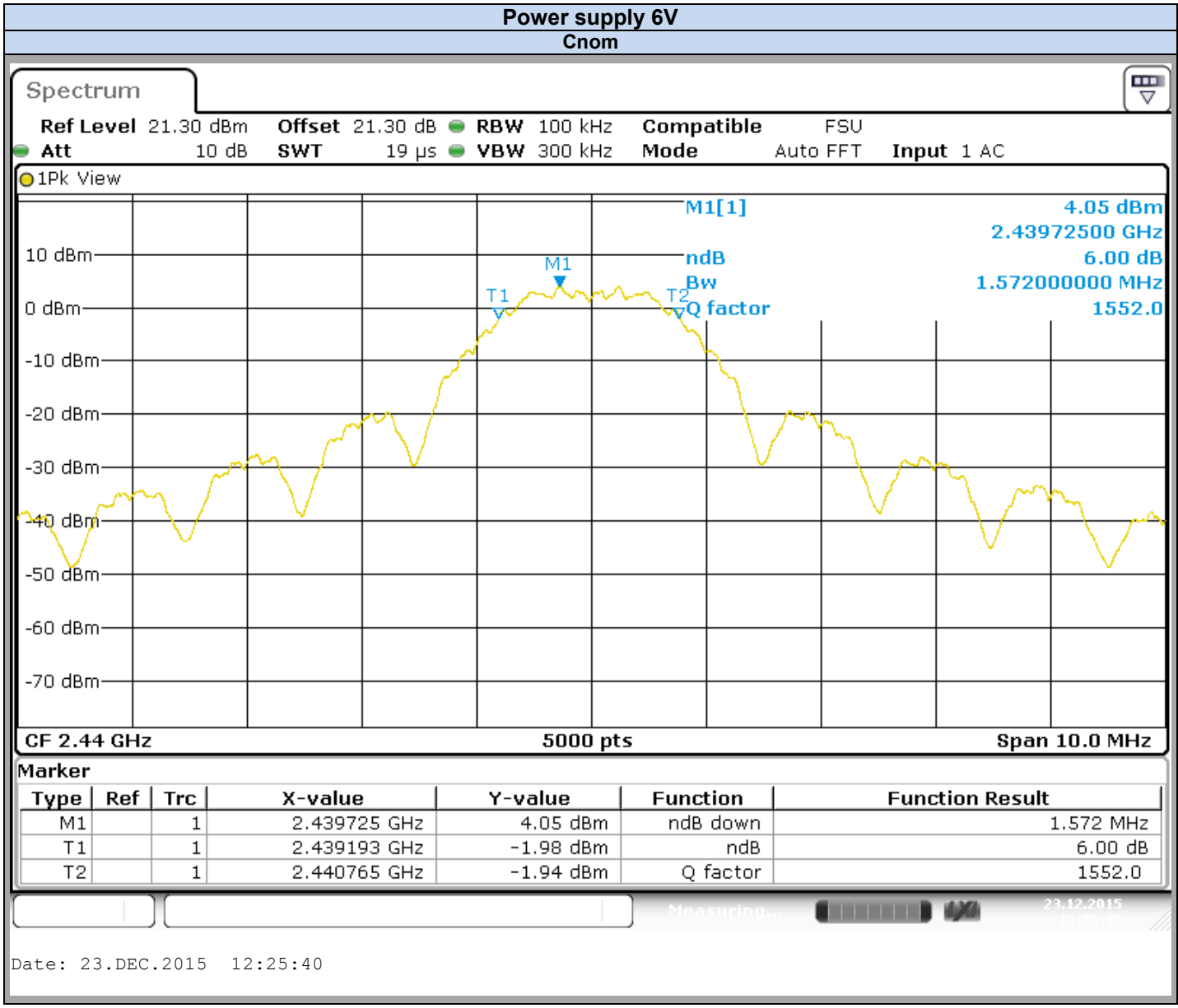
4.1. GRAPHICS & RESULTS











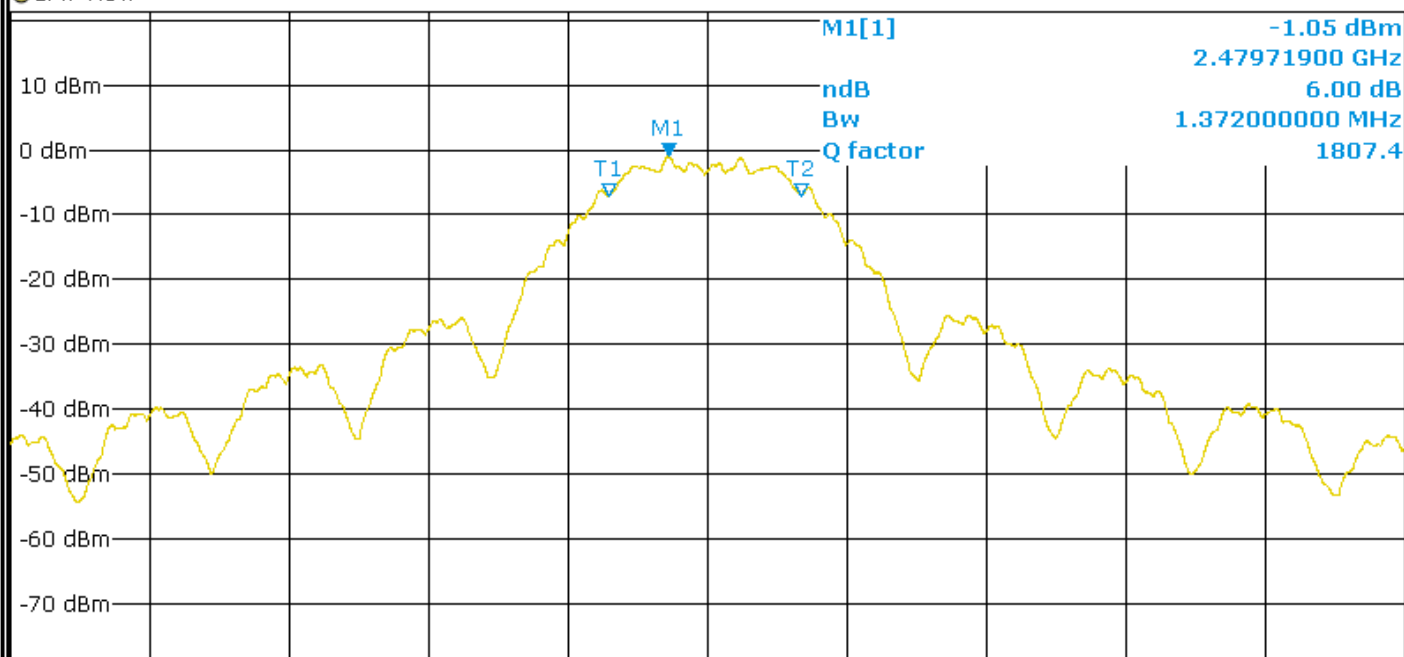


Power supply 6V
Cmax

Spectrum

Ref Level 21.30 dBm **Offset** 21.30 dB **RBW** 100 kHz **Compatible** FSU
Att 10 dB **SWT** 19 μ s **VBW** 300 kHz **Mode** Auto FFT **Input** 1 AC

● 1Pk View



CF 2.48 GHz **5000 pts** **Span** 10.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.479719 GHz	-1.05 dBm	ndB down	1.372 MHz
T1		1	2.479295 GHz	-7.02 dBm	ndB	6.00 dB
T2		1	2.480667 GHz	-7.04 dBm	Q factor	1807.4

Measuring... 23.12.2015 12:26:32



USB cable 3.3V			
Voltage	Vnom		
Frequency	Cmin	Cnom	Cmax
-6dB Bandwidth (MHz)	1.566	1.578	1.470

Power supply 6V			
Voltage	Vnom		
Frequency	Cmin	Cnom	Cmax
-6dB Bandwidth (MHz)	1.568	1.572	1.372

Result: PASS

Limit: → The -6dB bandwidth must be greater than 500kHz



5. MAXIMUM CONDUCTED POWER

5.1. TEST CONDITIONS

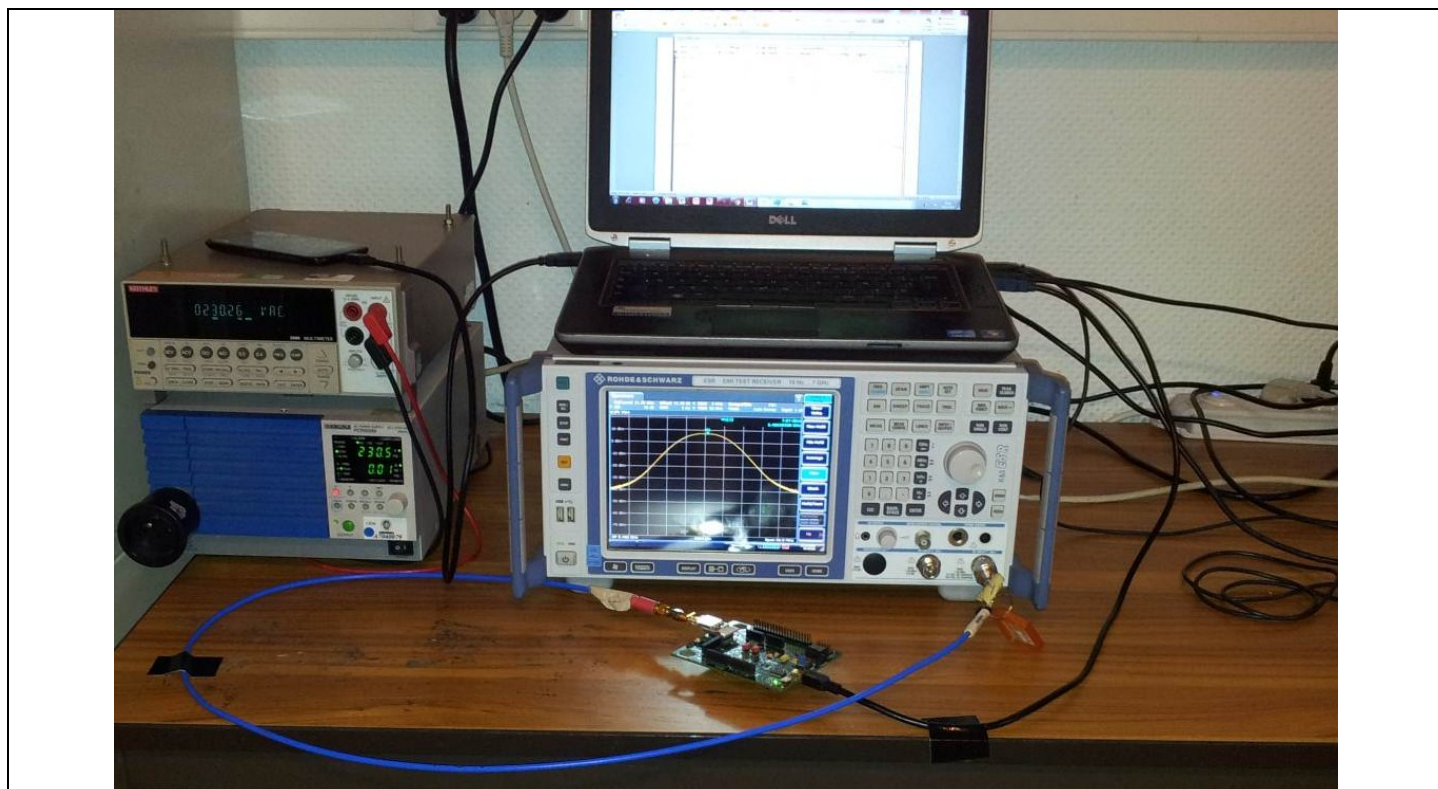
Test performed by : Armand MAHOUNGOU
Date of test : 2015/12/23
Ambient temperature : 24°C
Relative humidity : 47%

5.2. TEST SETUP

The Equipment Under Test is installed on a table and set in permanent emission with modulation. Measurement is performed with a spectrum analyzer on the EUT conducted access. The product has been tested according to the FCC KDB 558074 D01 DTS Meas Guidance v03r4 § 9.1.1

Spectrum Analyzer Setting (Maximum Peak Conducted Power):

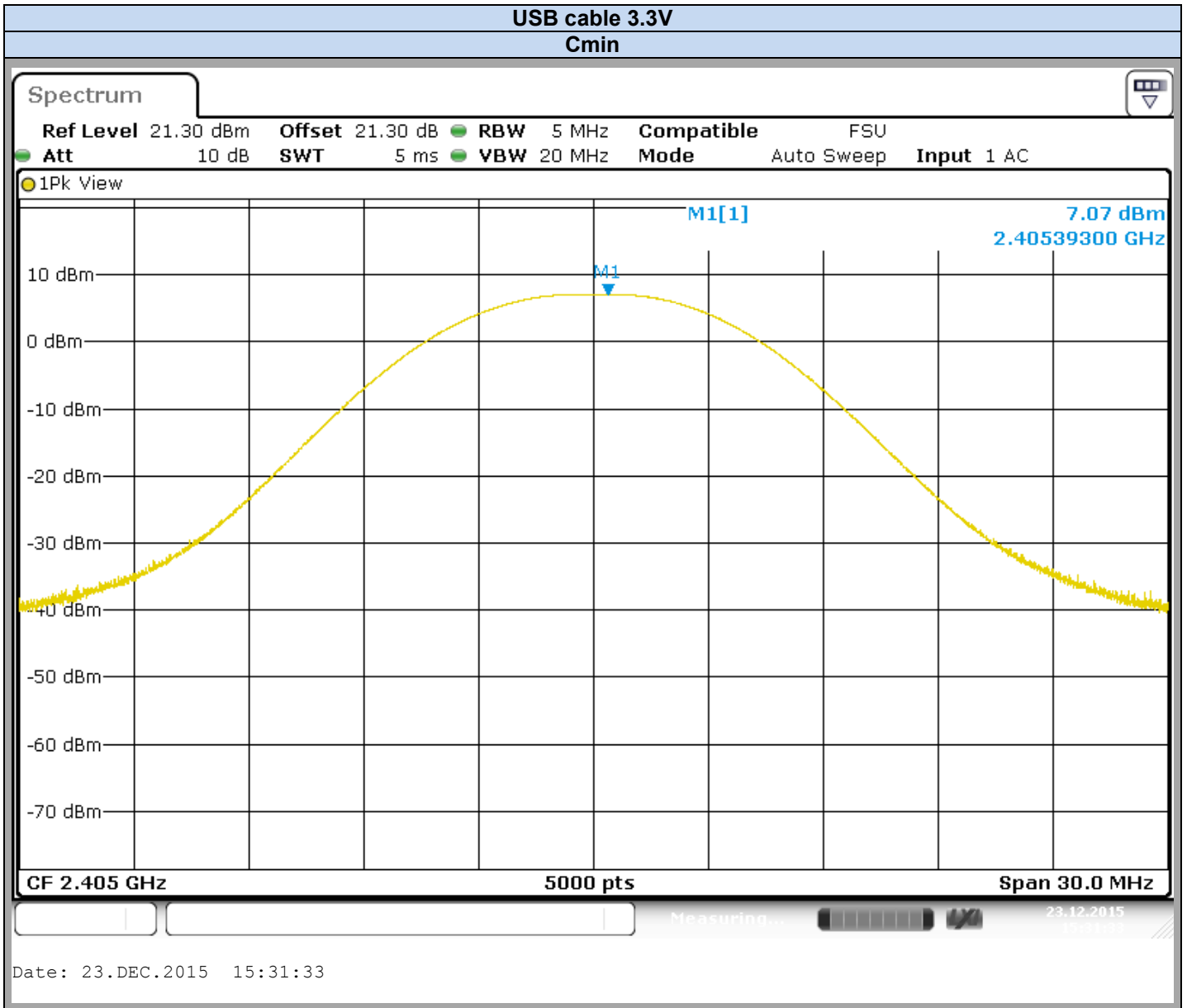
Center frequency= Cmin or Cnom or Cmax
Span \geq 3RBW
Amplitude= Sufficient to observe the signal amplitude
RBW \geq DTS Bandwidth
VBW \geq 3RBW
Sweep= Auto
Trace= Max Hold
Detector= Peak

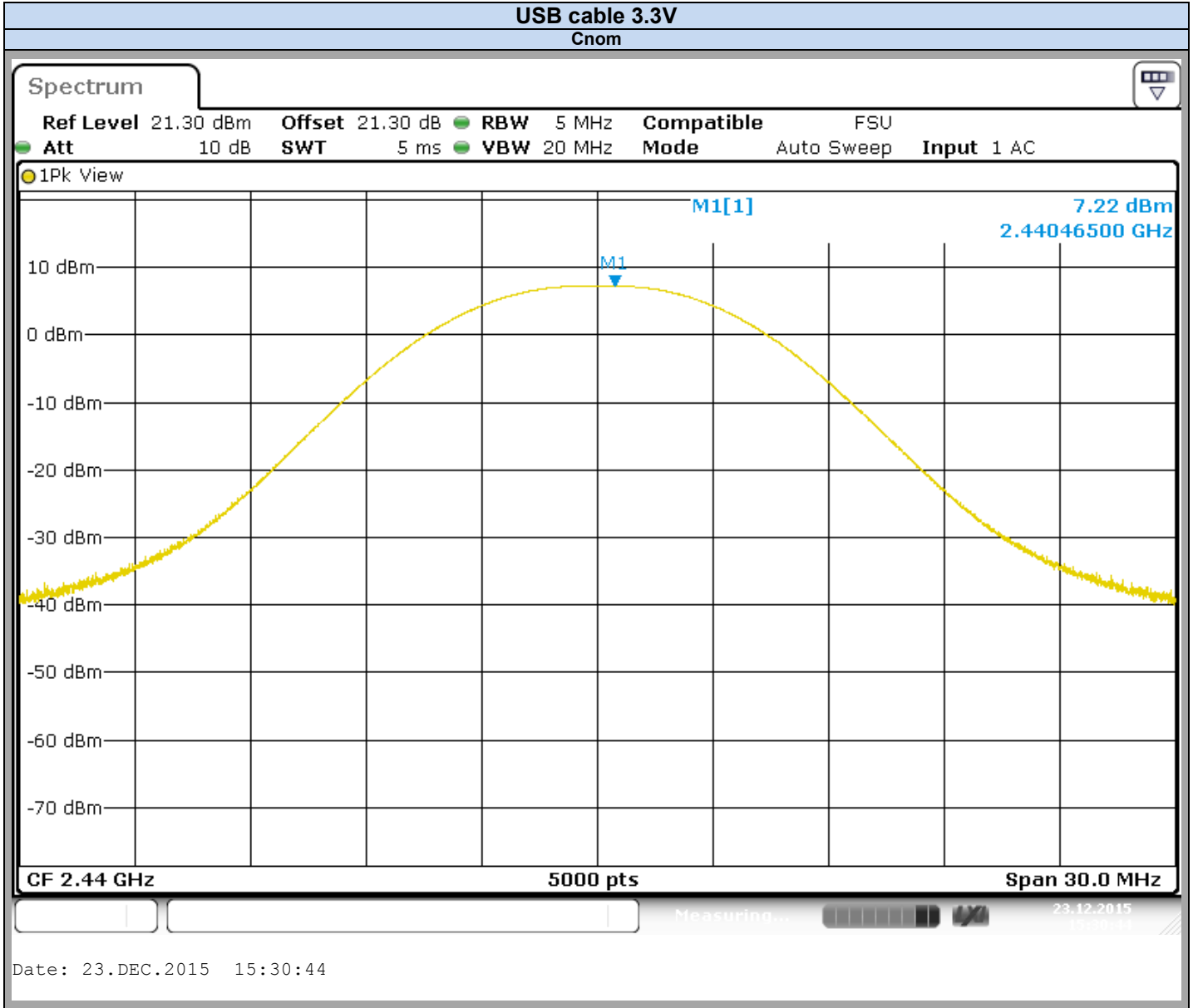


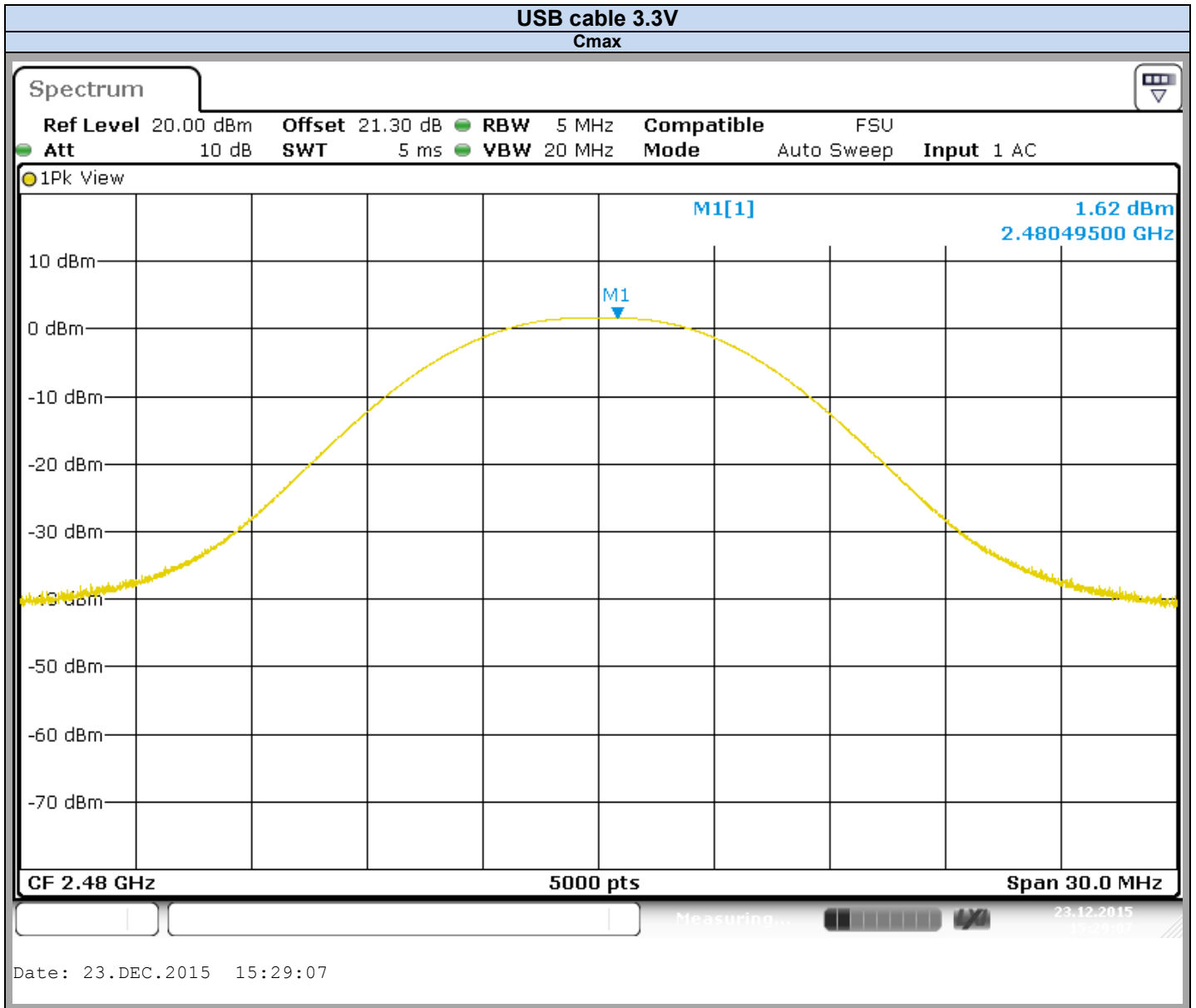
Photograph for Maximum Conducted Power

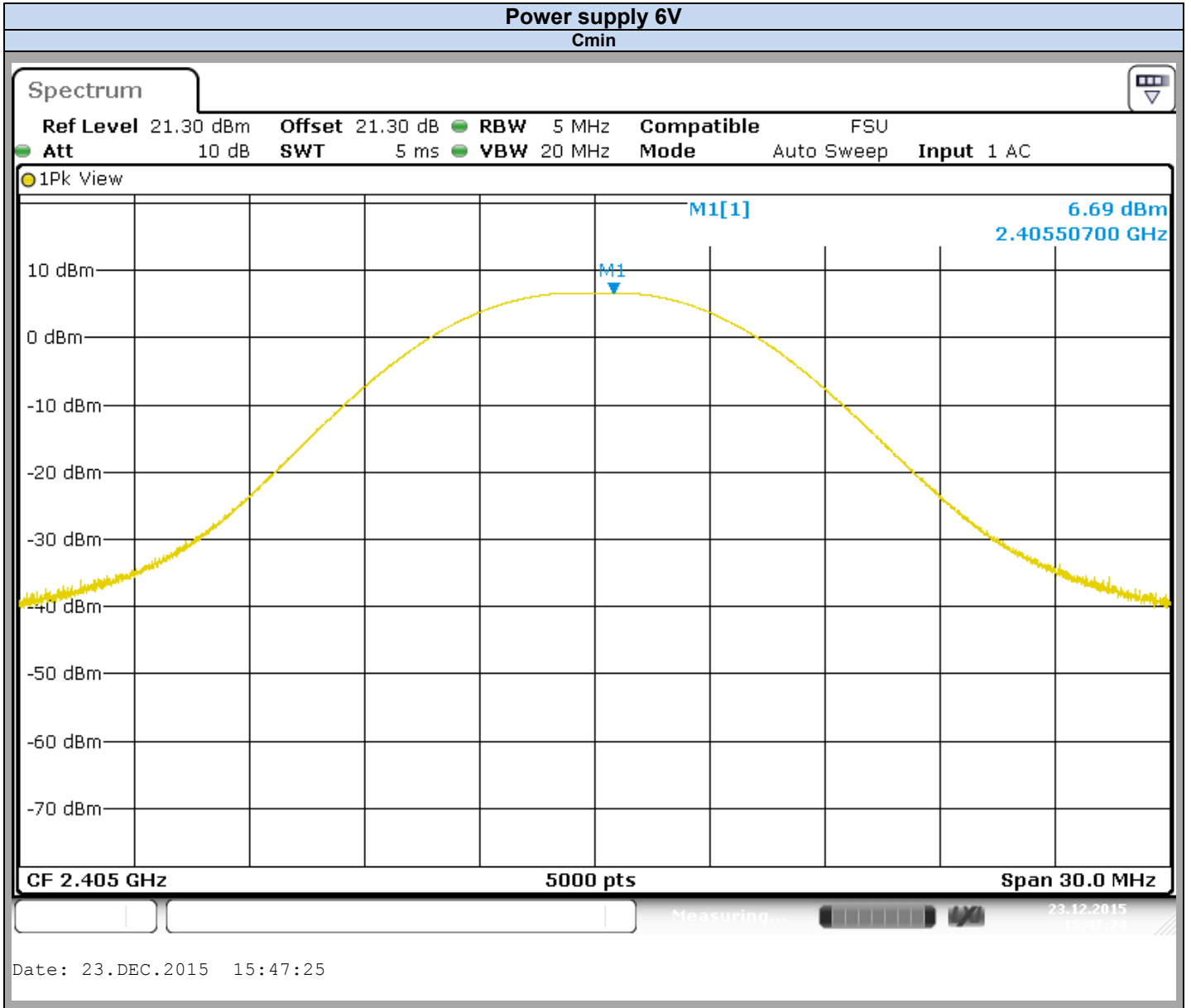


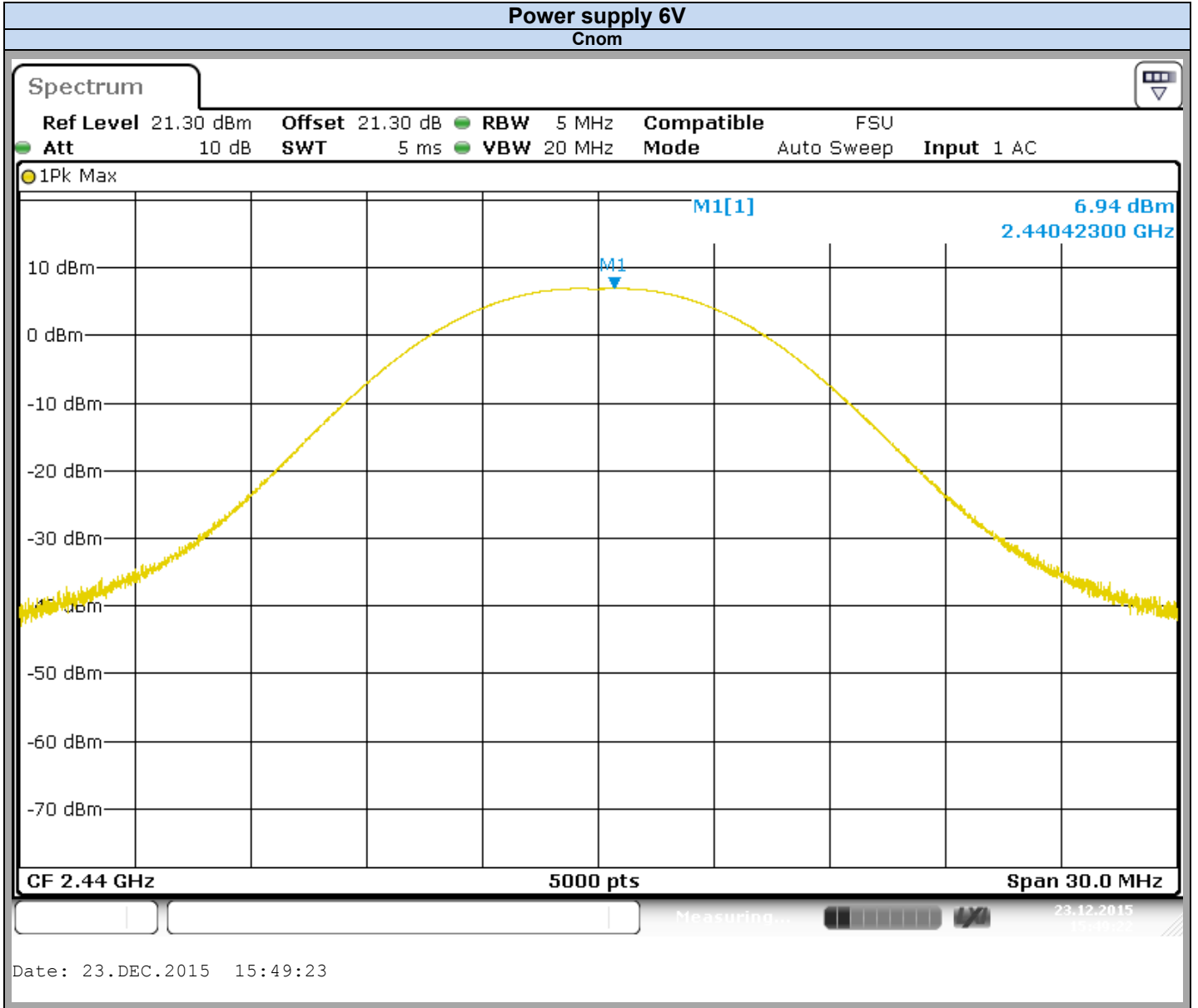
5.1. GRAPHICS & RESULTS

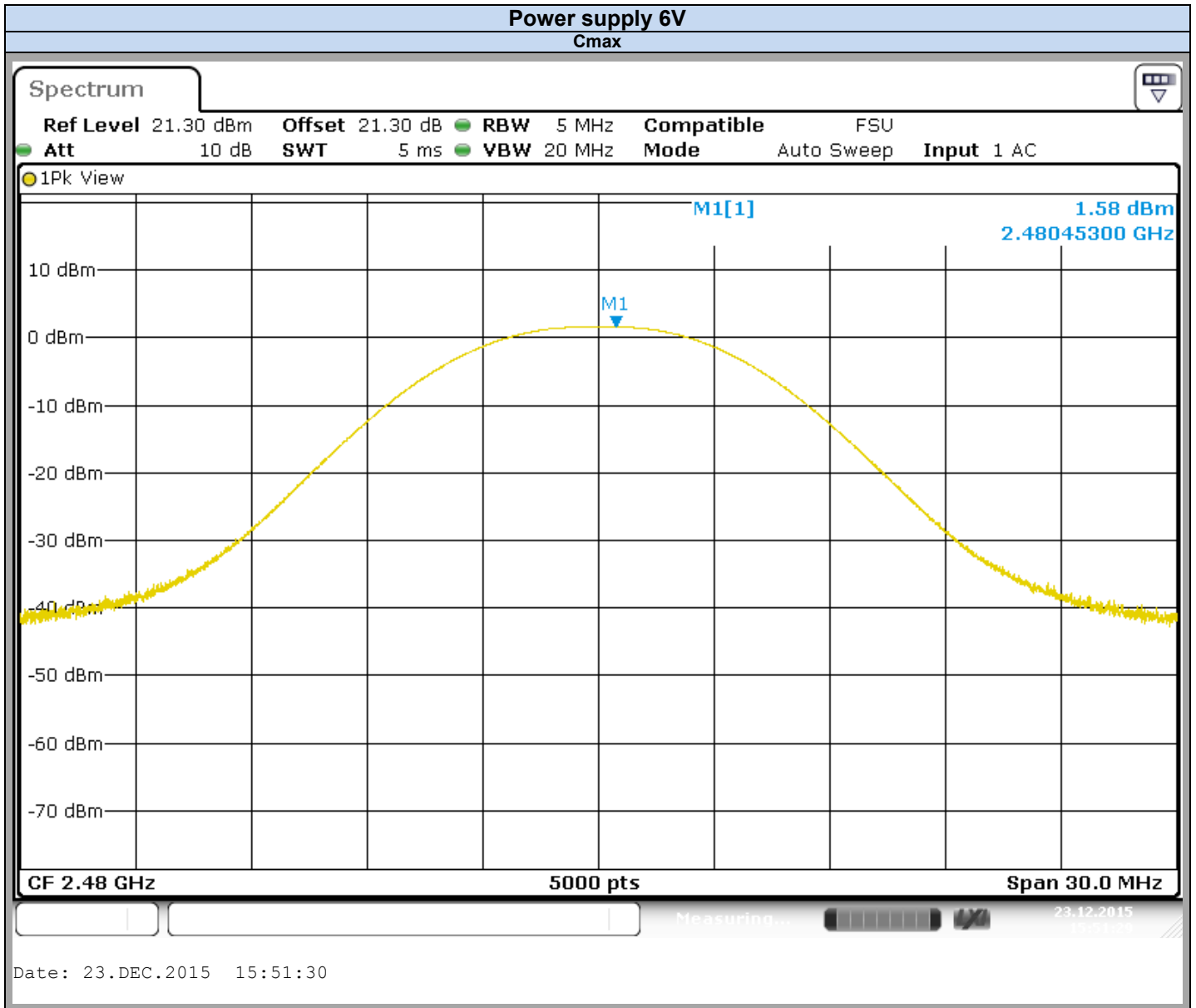














Spectrum Analyzer Offset:
Cable Loss=1.3dB + Attenuator= 20dB

USB cable 3.3Vdc			
Channel	Tx1 (dBm)	Overall Antenna Gain (dBi)	Limit (dBm)
Cmin	7.07	0.86	30
Cnom	7.22	0.86	30
Cmax	1.62	0.86	30

Power supply 6V			
Channel	Tx1 (dBm)	Overall Antenna Gain (dBi)	Limit (dBm)
Cmin	6.69	0.86	30
Cnom	6.94	0.86	30
Cmax	1.58	0.86	30

Result: PASS

Limit: → The Maximum Conducted Power must be lower than 30dBm
Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi



6. POWER SPECTRAL DENSITY

6.1. TEST CONDITIONS

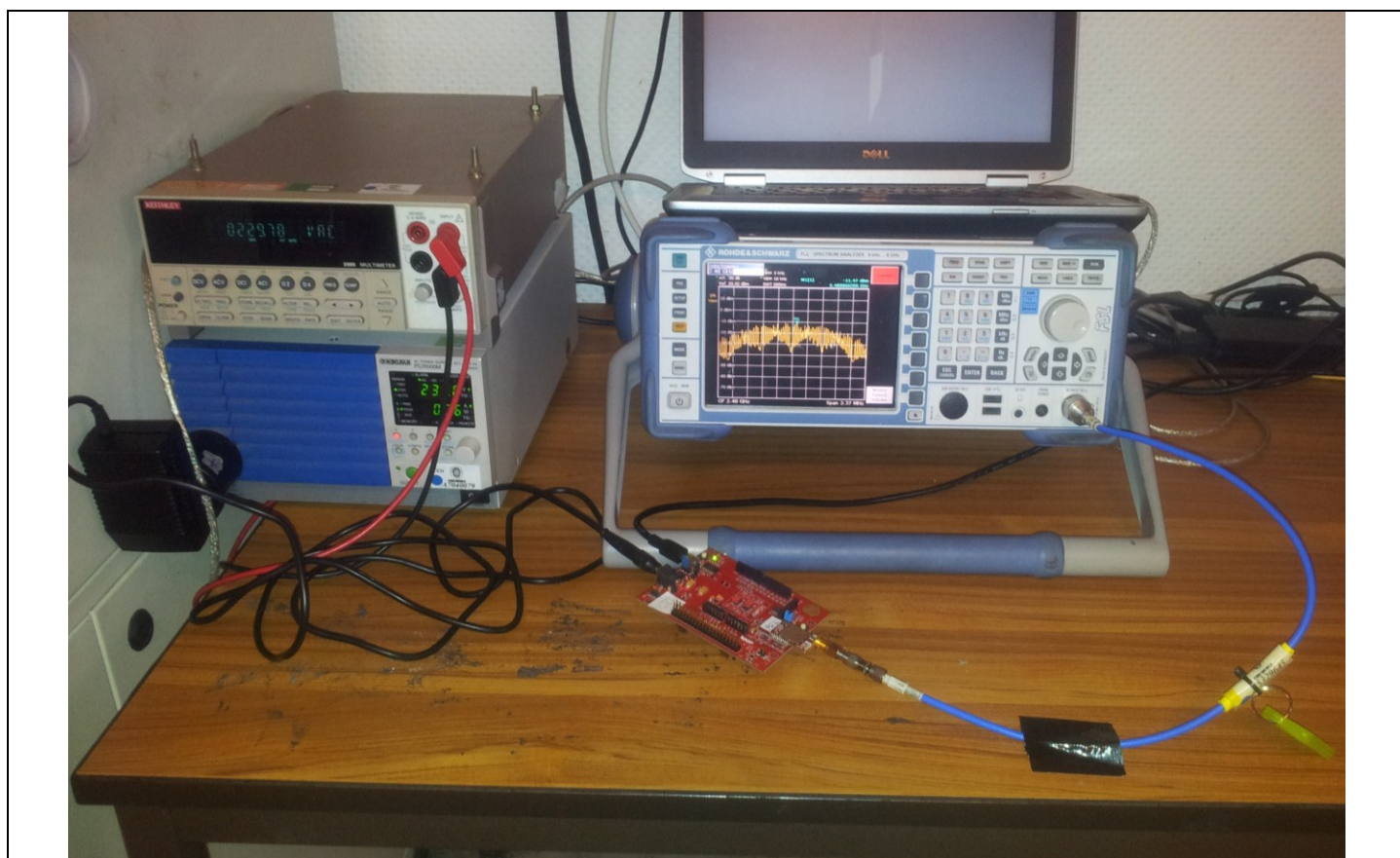
Test performed by : Armand MAHOUNGOU
Date of test : 2015/03/14
Ambient temperature : 22°C
Relative humidity : 44%

6.2. TEST SETUP

The Equipment Under Test is installed on a table and set in permanent emission with modulation. Measurement is performed with a spectrum analyzer on the EUT conducted access. The product has been tested according to the FCC KDB 558074 D01 DTS Meas Guidance v03r4 § 10.2.

Spectrum Analyzer Setting:

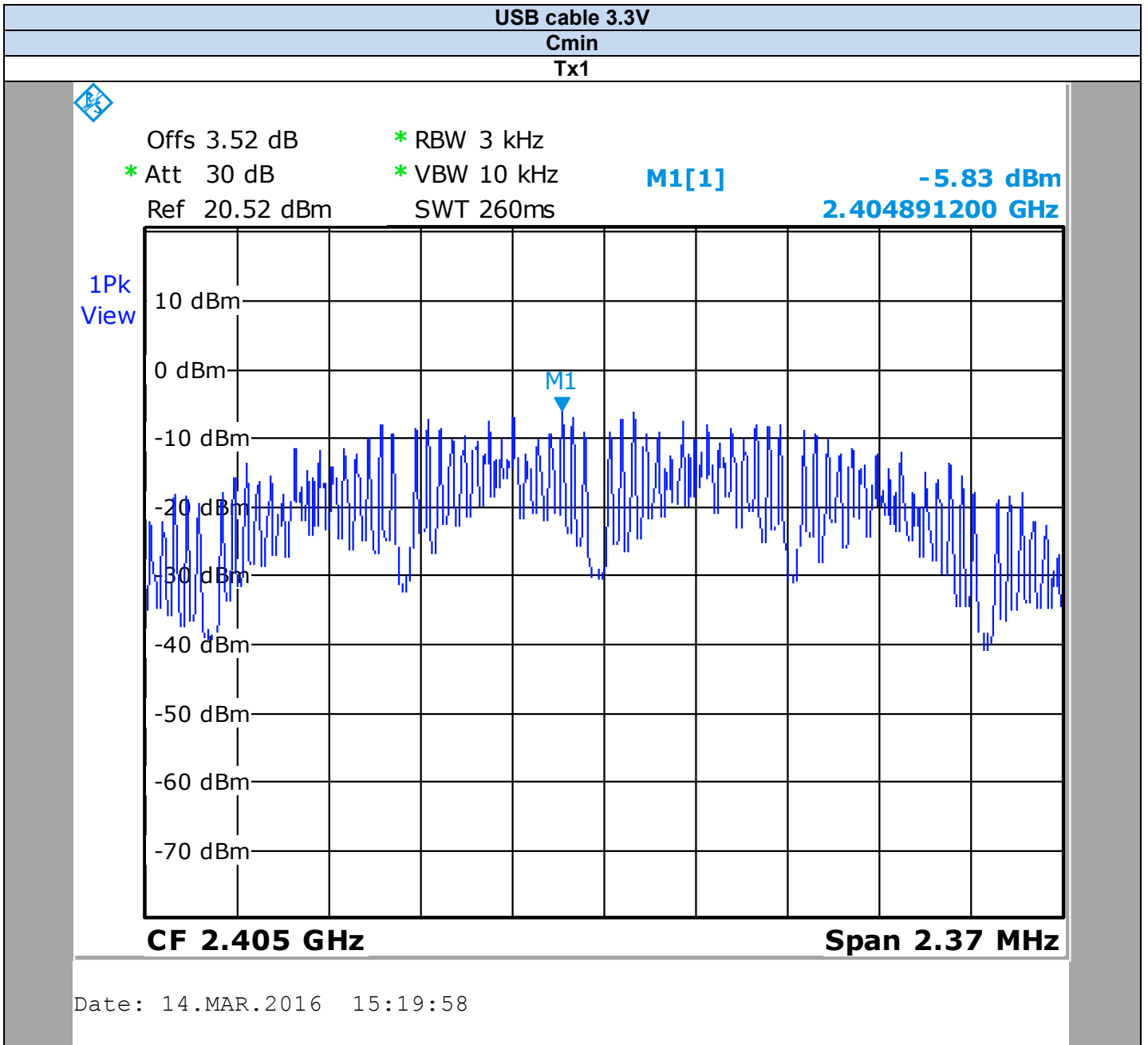
Center frequency= Cmin or Cnom or Cmax
Span= 1.5 times the DTS Bandwith
Amplitude= Sufficient to observe the signal amplitude
RBW= $3\text{kHz} \leq \text{RBW} \leq 100\text{kHz}$
VBW $\geq 3 * \text{RBW}$
Sweep= Auto
Trace= Max Hold
Detector= Peak

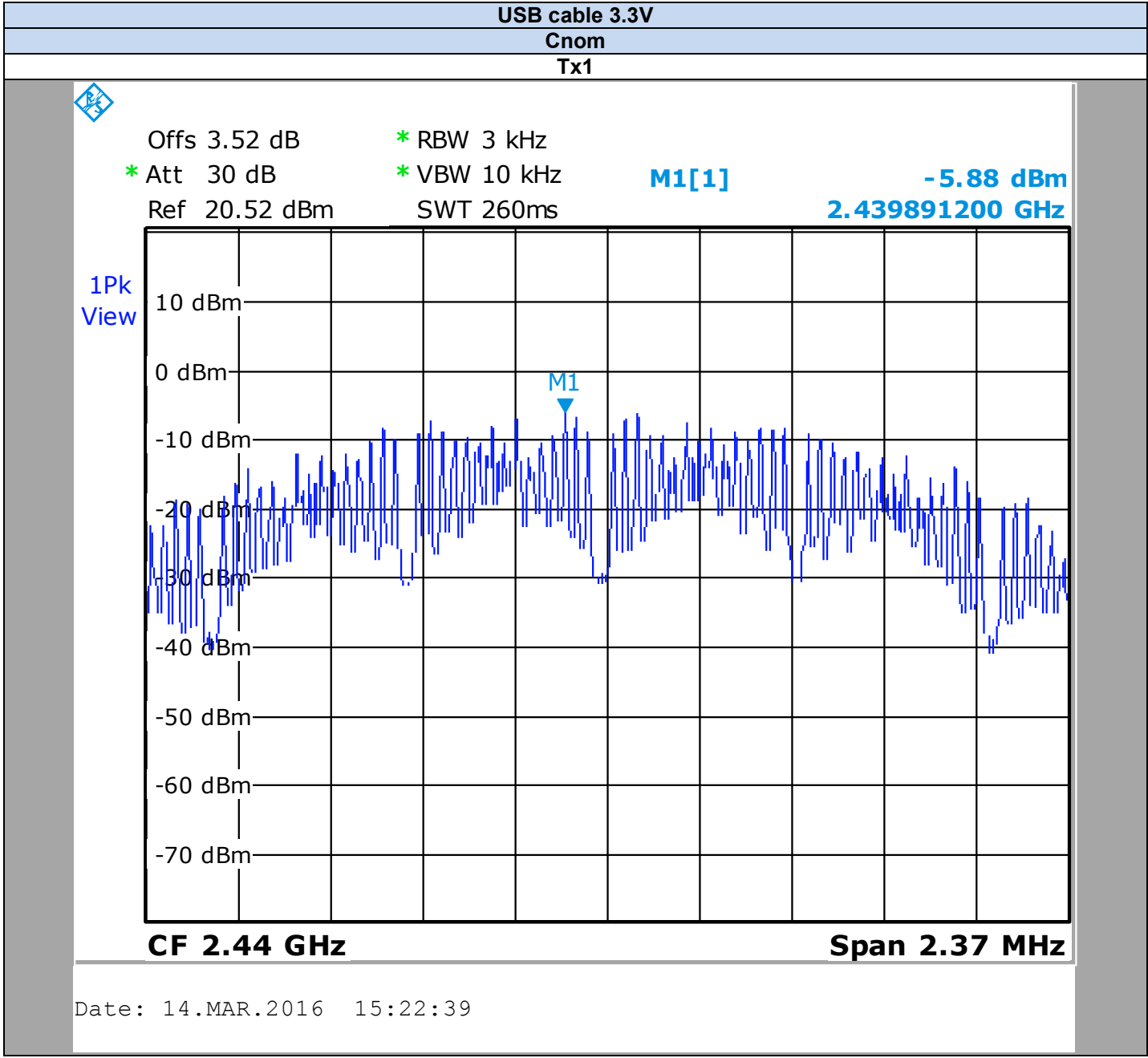


Photograph for Power Spectral Density



6.1. GRAPHICS & RESULTS







USB cable 3.3V

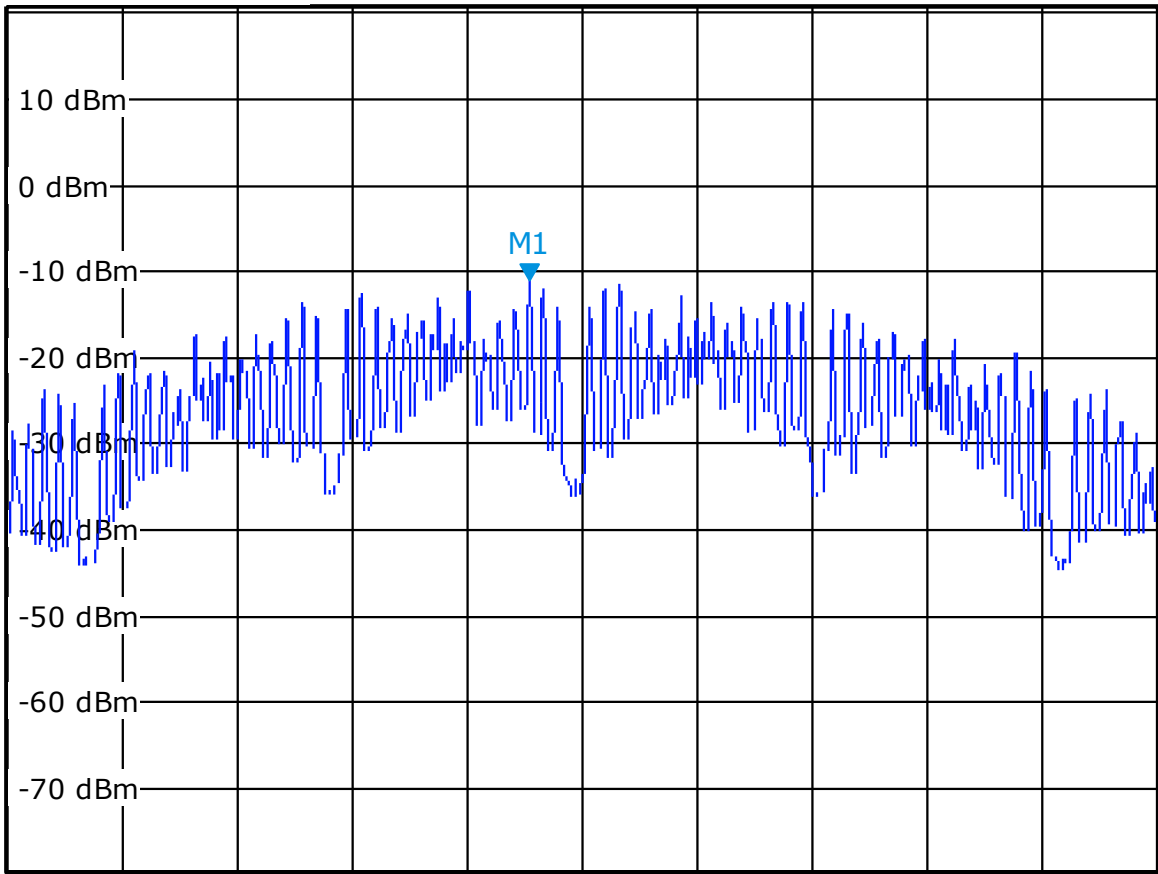
Cmax

Tx1



Offs 3.52 dB * RBW 3 kHz
* Att 30 dB * VBW 10 kHz **M1[1]** **- 11.04 dBm**
Ref 20.52 dBm SWT 260ms **2.479891200 GHz**

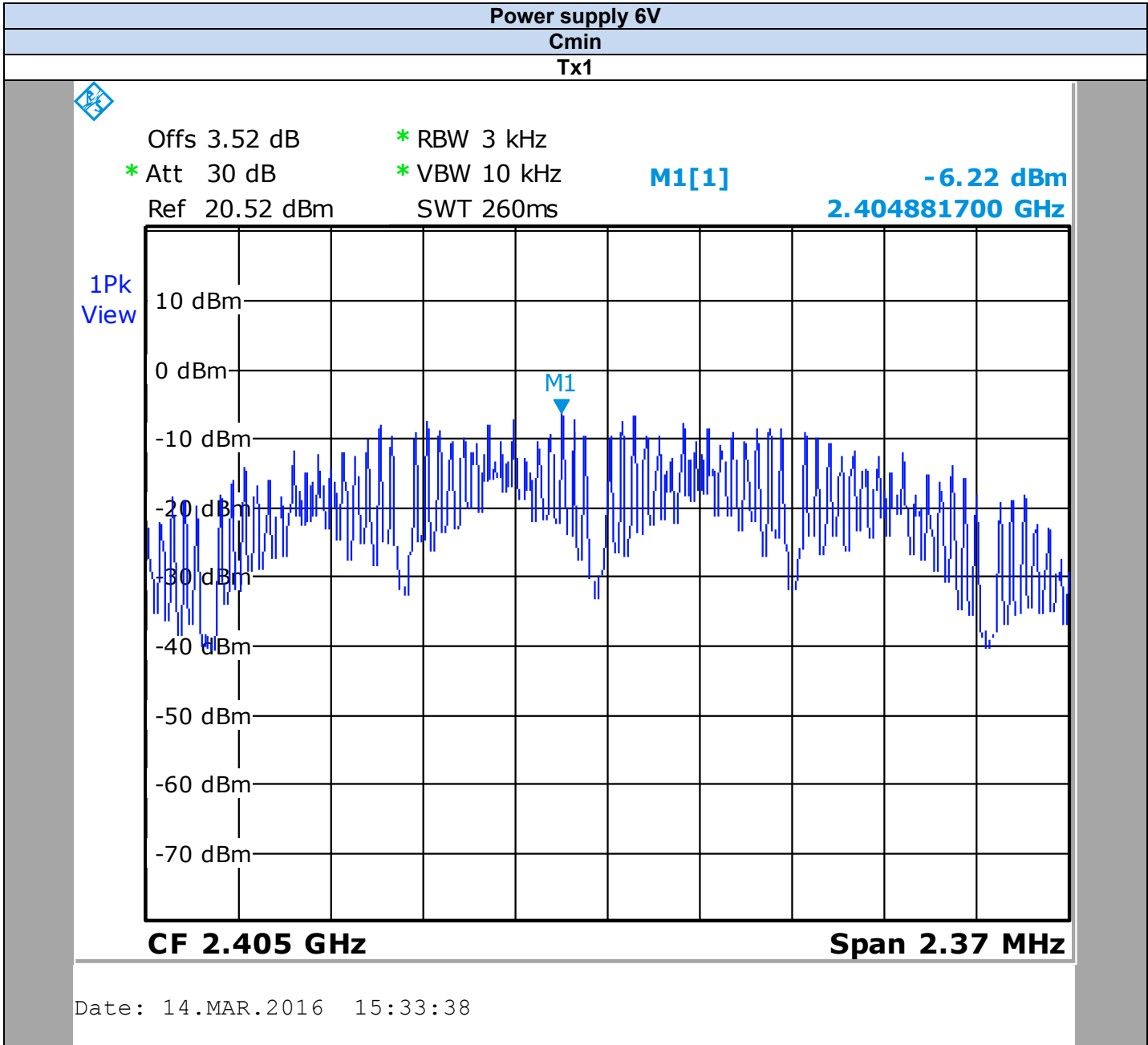
1Pk
View



CF 2.48 GHz

Span 2.37 MHz

Date: 14.MAR.2016 15:25:15





Power supply 6V

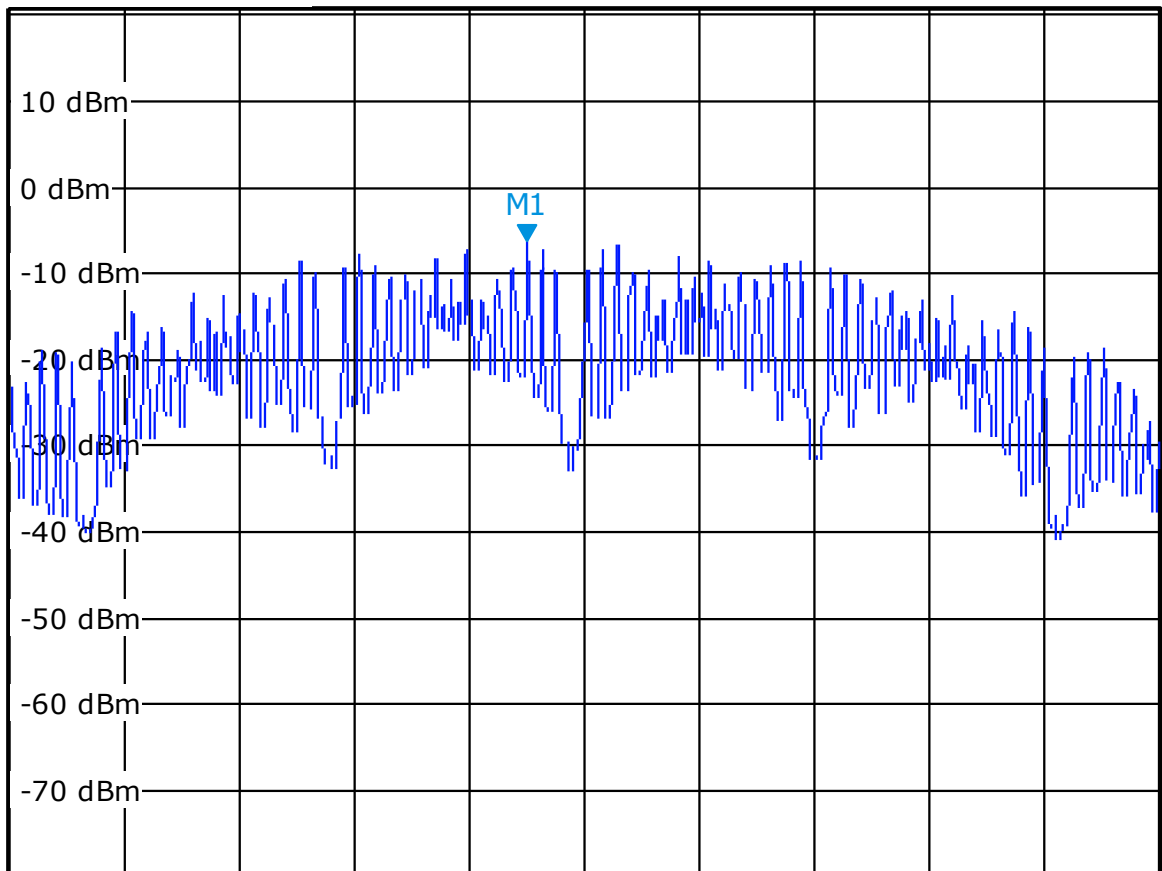
Cnom

Tx1



Offs 3.52 dB * RBW 3 kHz
* Att 30 dB * VBW 10 kHz **M1[1]** **-6.17 dBm**
Ref 20.52 dBm SWT 260ms **2.439881700 GHz**

1Pk
View



CF 2.44 GHz

Span 2.37 MHz

Date: 14.MAR.2016 15:35:26



Power supply 6V

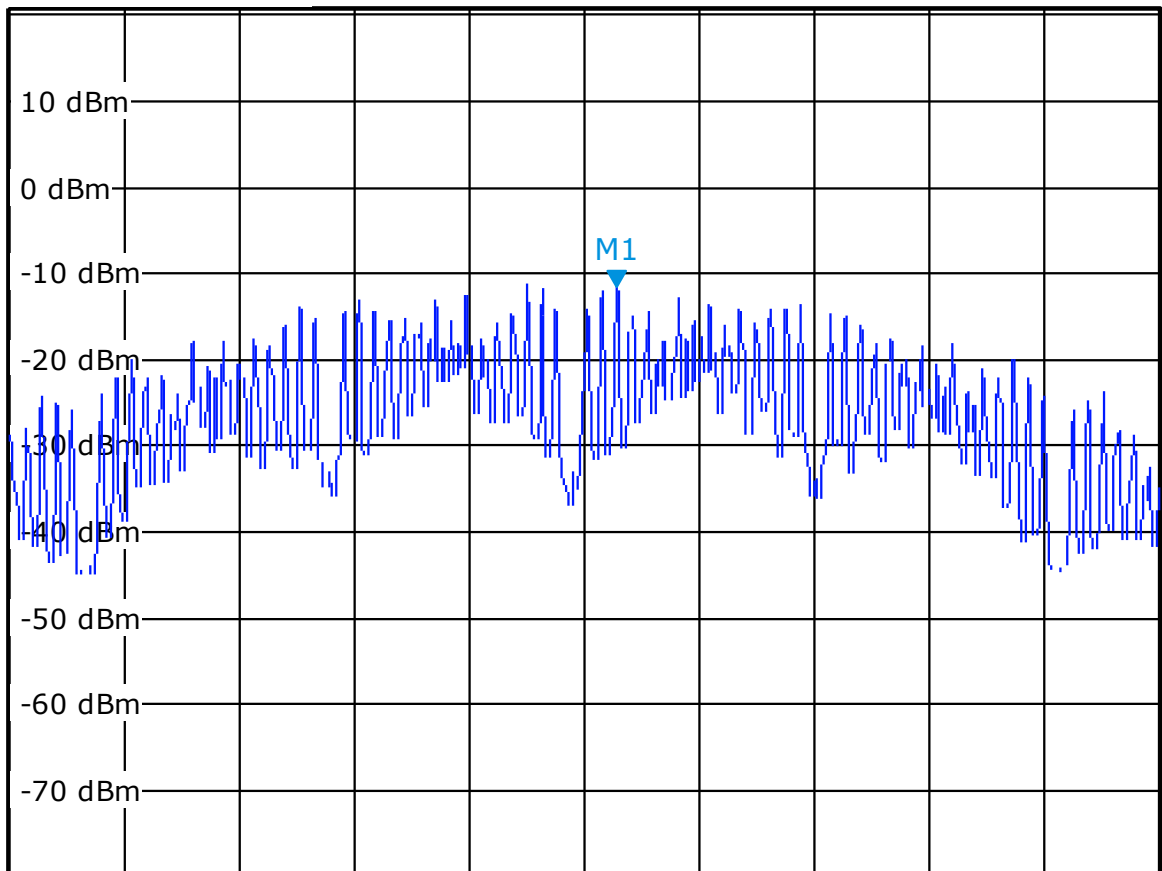
Cmax

Tx1



Offs 3.52 dB * RBW 3 kHz
* Att 30 dB * VBW 10 kHz **M1[1]** **- 11.47 dBm**
Ref 20.52 dBm SWT 260ms **2.480066200 GHz**

1Pk
View



CF 2.48 GHz

Span 2.37 MHz

Date: 14.MAR.2016 15:37:19



Spectrum Analyzer Offset:
Cable Loss=1,3dB + Attenuator= 20dB

USB cable 3V			
Channel	Tx1 (dBm)	Overall Antenna Gain (dBi)	Limit (dBm)
Cmin	-5.83	0.86	8
Cnom	-5.88	0.86	8
Cmax	-11.04	0.86	8

Power supply 6V			
Channel	Tx1 (dBm)	Overall Antenna Gain (dBi)	Limit (dBm)
Cmin	-6.22	0.86	8
Cnom	-6.17	0.86	8
Cmax	-11.47	0.86	8

Result: PASS

Limit: → The Power Spectral Density must be lower than 8dBm/3kHz
Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi



7. UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS AT THE BAND EDGE

7.1. TEST CONDITIONS

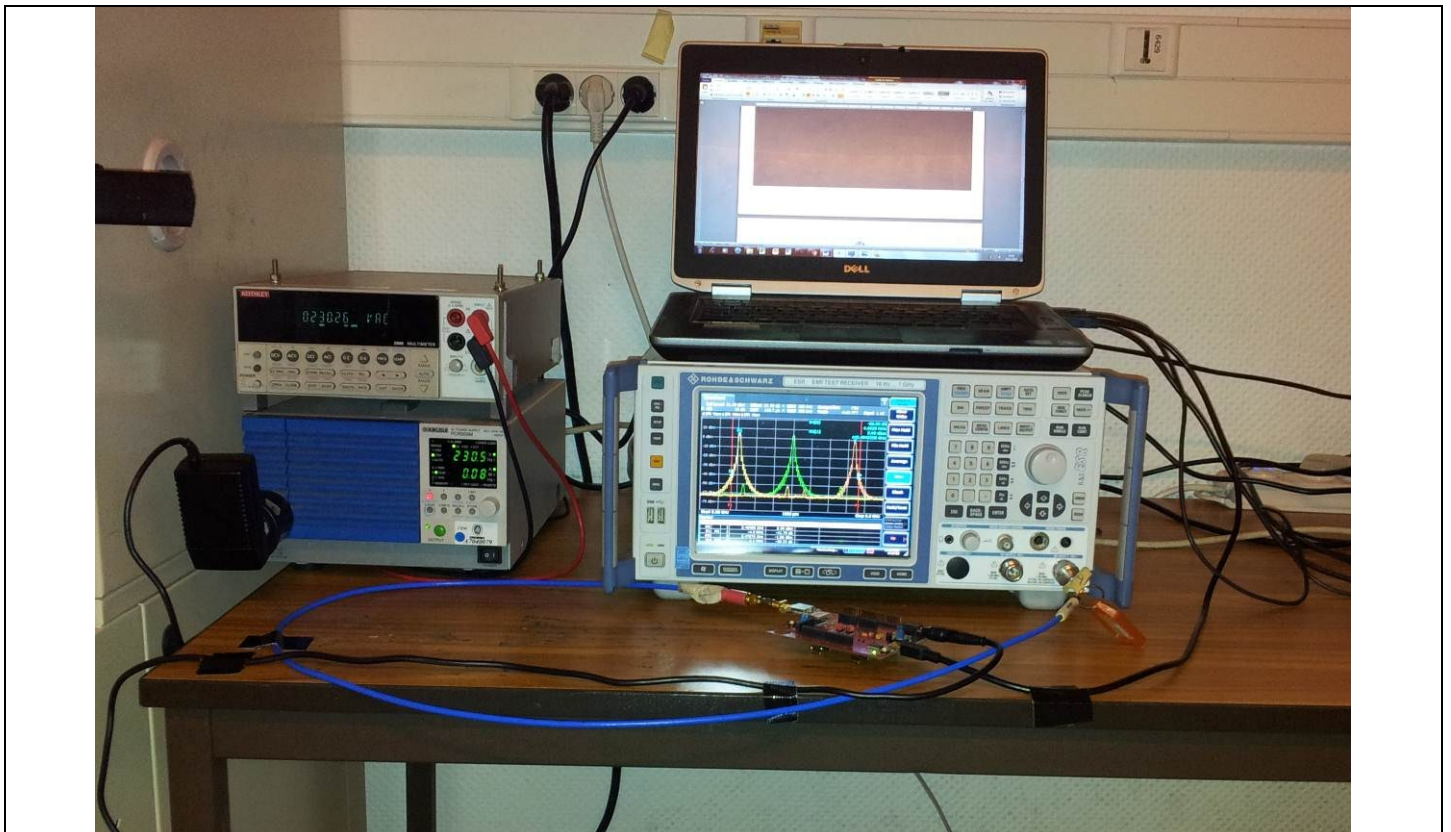
Test performed by : Armand MAHOUNGOU
Date of test : 2015/12/23
Ambient temperature : 24°C
Relative humidity : 47%

7.2. TEST SETUP

The Equipment Under Test is installed on a table and set in permanent emission with modulation. Measurement is performed with a spectrum analyzer on the EUT conducted access. The product has been tested according to the FCC KDB 558074 D01 DTS Meas Guidance v03r4 § 11.0.

Spectrum Analyzer Setting:

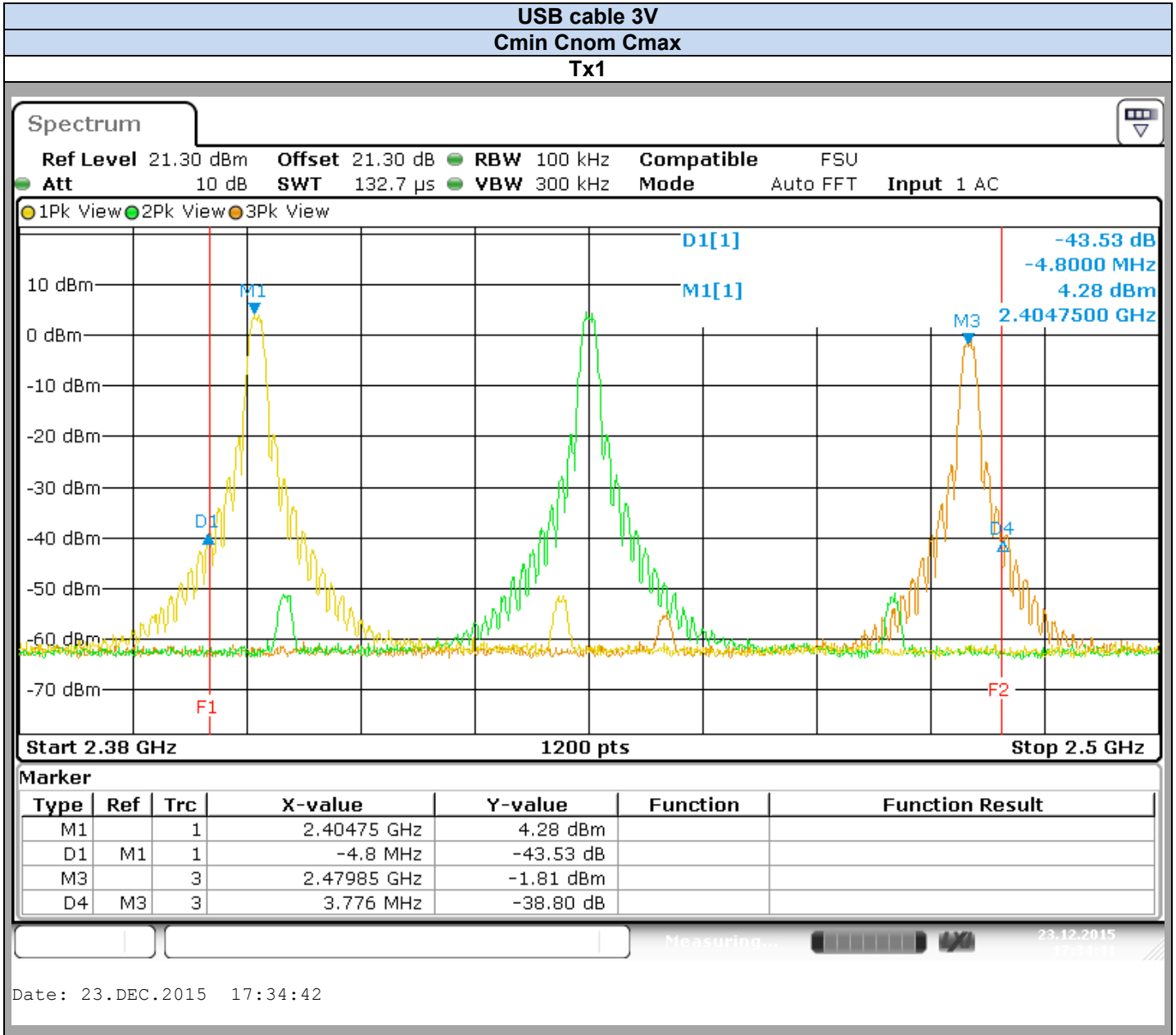
Start frequency= 2380MHz
Stop frequency= 2500MHz
Amplitude= Sufficient to observe the signal amplitude
RBW= 100kHz
VBW= 300kHz
Sweep Time= Auto
Sweep Point= 1200
Trace= Max Hold
Detector= Peak

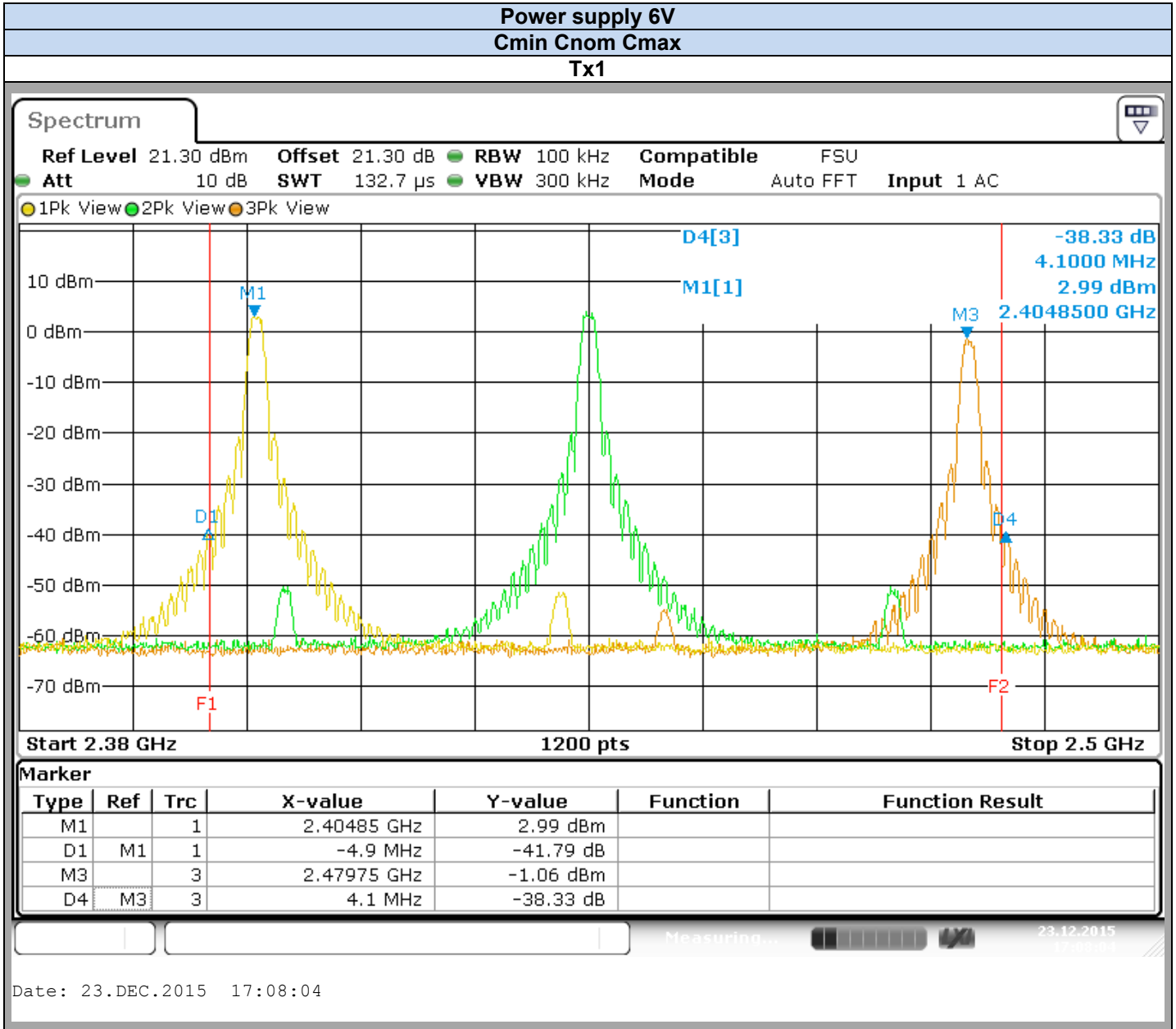


Photograph for Unwanted Emissions into Non-Restricted Frequency Bands At the Band Edge



7.1. GRAPHICS & RESULTS







USB cable 3.3V		
Temperature	Tnom	
Voltage	Vnom	
Conducted Spurious Emission at the Band Edge (MHz)	2400	2483,5
Spurious Level (dBc)	43.53	38.80

Power supply 6V		
Temperature	Tnom	
Voltage	Vnom	
Conducted Spurious Emission at the Band Edge (MHz)	2400	2483,5
Spurious Level (dBc)	41.79	38.33

Result: PASS

Limit: → All Spurious Emissions must be at least 20dB (Maximum Conducted Power), below the Fundamental Radiator Level at the Band Edge Edge "2400MHz & 2483,5MHz"



8. UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS

8.1. TEST CONDITIONS

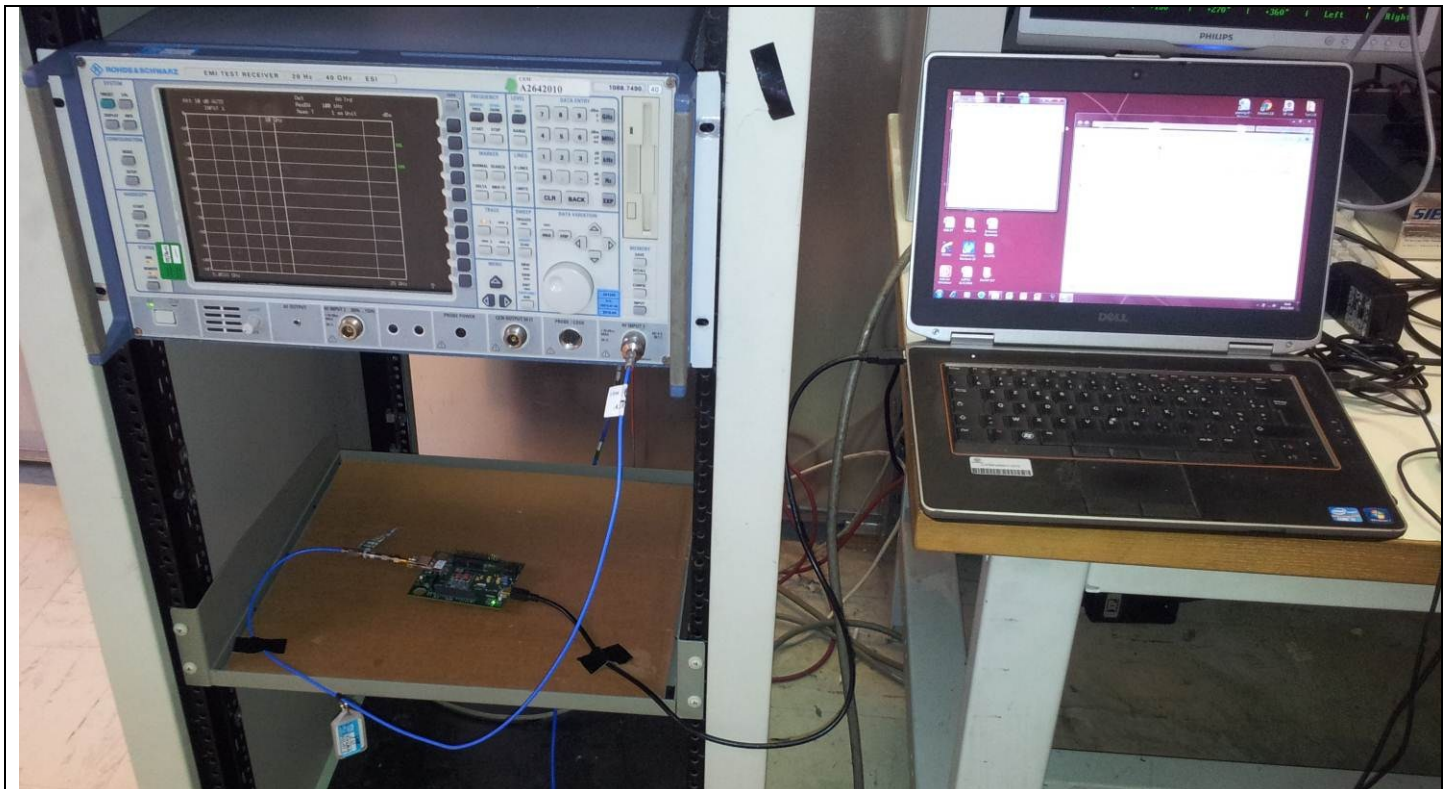
Test performed by : Armand MAHOUNGOU
Date of test : 2015/12/24
Ambient temperature : 24°C
Relative humidity : 47%

8.2. TEST SETUP

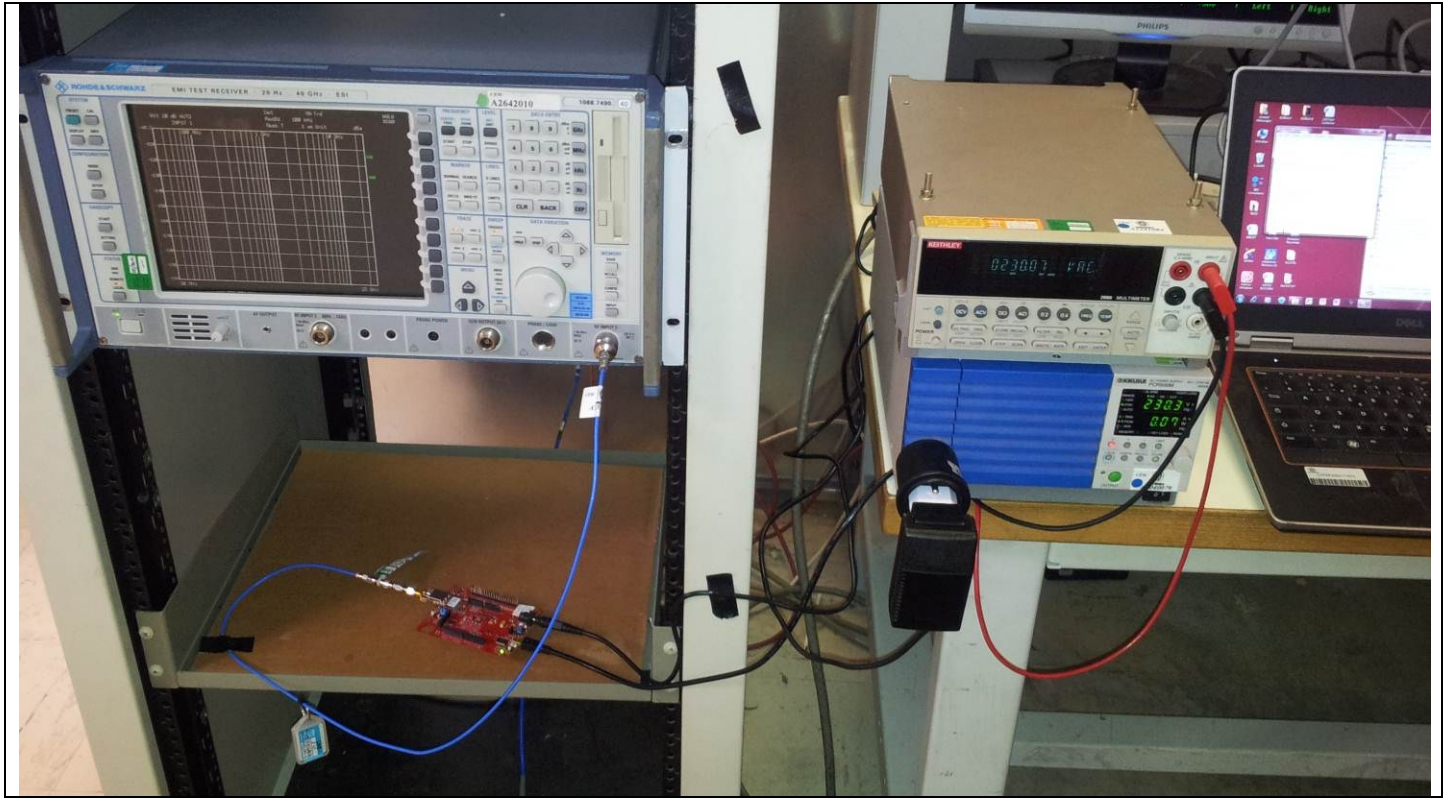
The Equipment Under Test is installed on a table and set in permanent emission with modulation. Measurement is performed with a spectrum analyzer on the EUT conducted access. The product has been tested according to the FCC KDB 558074 D01 DTS Meas Guidance v03r4 § 11.0.

Spectrum Analyzer Setting:

Start frequency= 30MHz
Stop frequency= 25GHz
Amplitude= Sufficient to observe the signal amplitude
RBW= 100kHz
VBW= 300kHz
Sweep Time= Auto
Trace= Max Hold
Detector= Peak



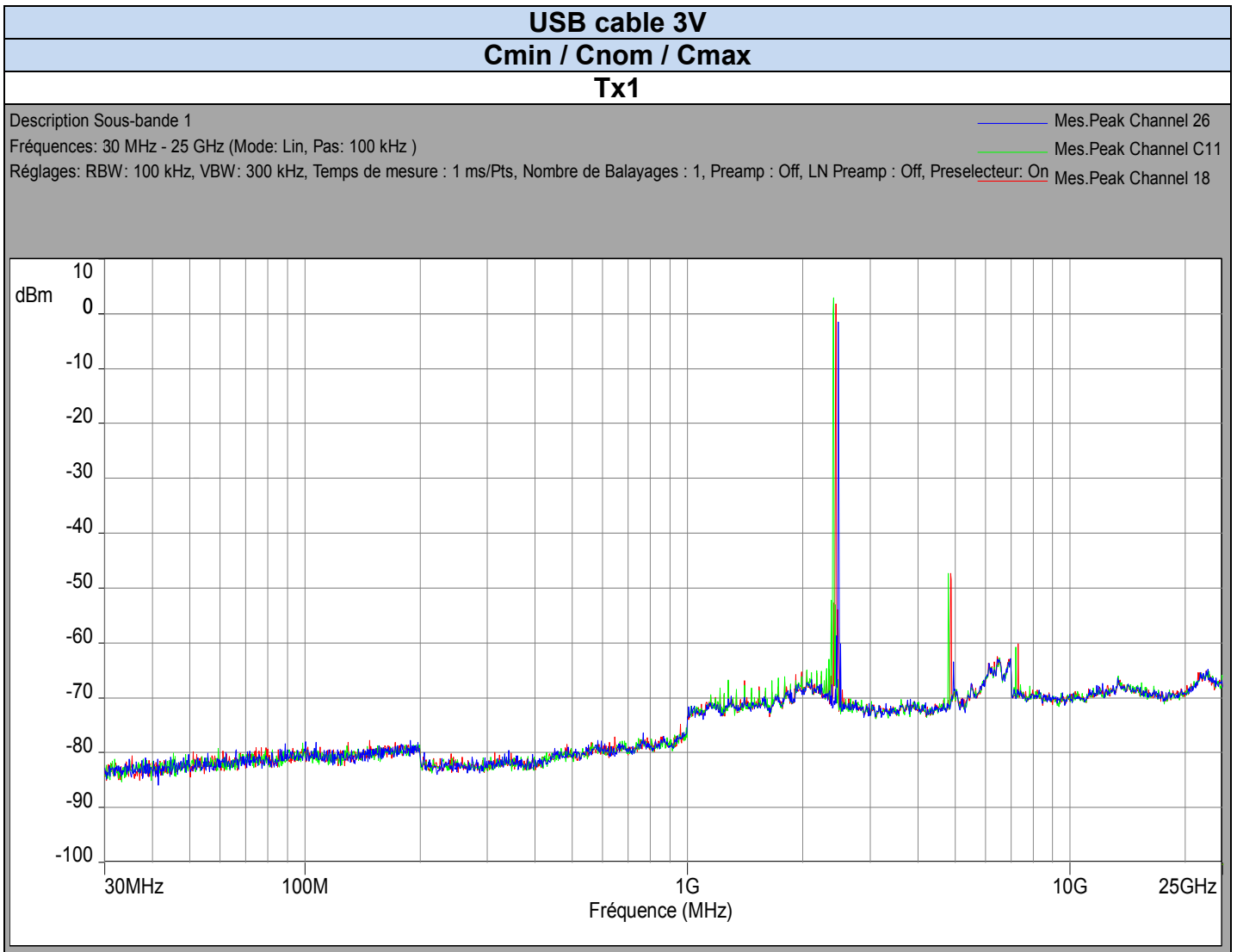
Photograph for Unwanted Emissions into Non-Restricted Frequency Bands



Photograph for Unwanted Emissions into Non-Restricted Frequency Bands



8.3. GRAPHICS & RESULTS

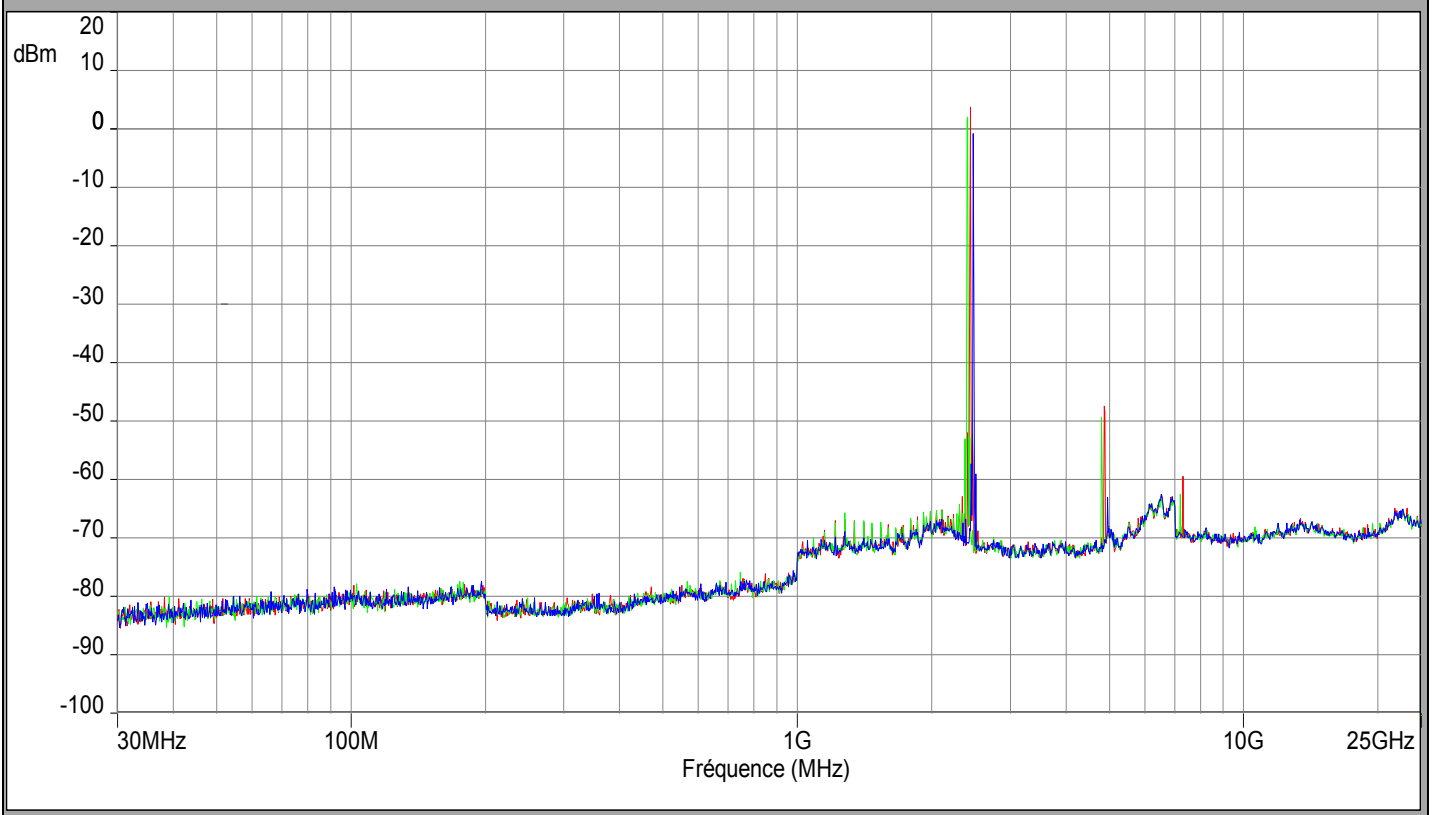




Power supply 6V
Cmin / Cnom / Cmax
Tx1

Description Sous-bande 1
Fréquences: 30 MHz - 25 GHz (Mode: Lin, Pas: 100 kHz)
Réglages: RBW: 100 kHz, VBW: 300 kHz, Temps de mesure : 1 ms/Pts, Nombre de Balayages : 1, Preamp : Off, LN Preamp : Off, Preselecteur: On

Mes.Peak Channel 26
Mes.Peak Channel 11
Mes.Peak Channel 18





USB cable 3.3V		
Frequency (MHz)	Spurious Level (dBm)	Spurious Level (dBc)
4809	-47.74	-44.84
4879	-47.37	-45.52
4959	-63.51	-65.05
7213.7	-60.73	-57.83
7321.5	-60.09	-58.24

Power supply 6V		
Frequency (MHz)	Spurious Level (dBm)	Spurious Level (dBc)
4811	-49.37	-41.41
4879	-47.49	-43.70
4959	-63.11	-63.92
7213.7	-62.49	-60.53
7318.5	-59.46	-55.67

Result: **PASS**

Limit: → All Spurious Emissions must be at least 20dB (Maximum Conducted Power), below the Fundamental Radiator Level outside of the 2400MHz-2483,5MHz band



9. AC POWER LINE CONDUCTED EMISSIONS

9.1. TEST CONDITIONS

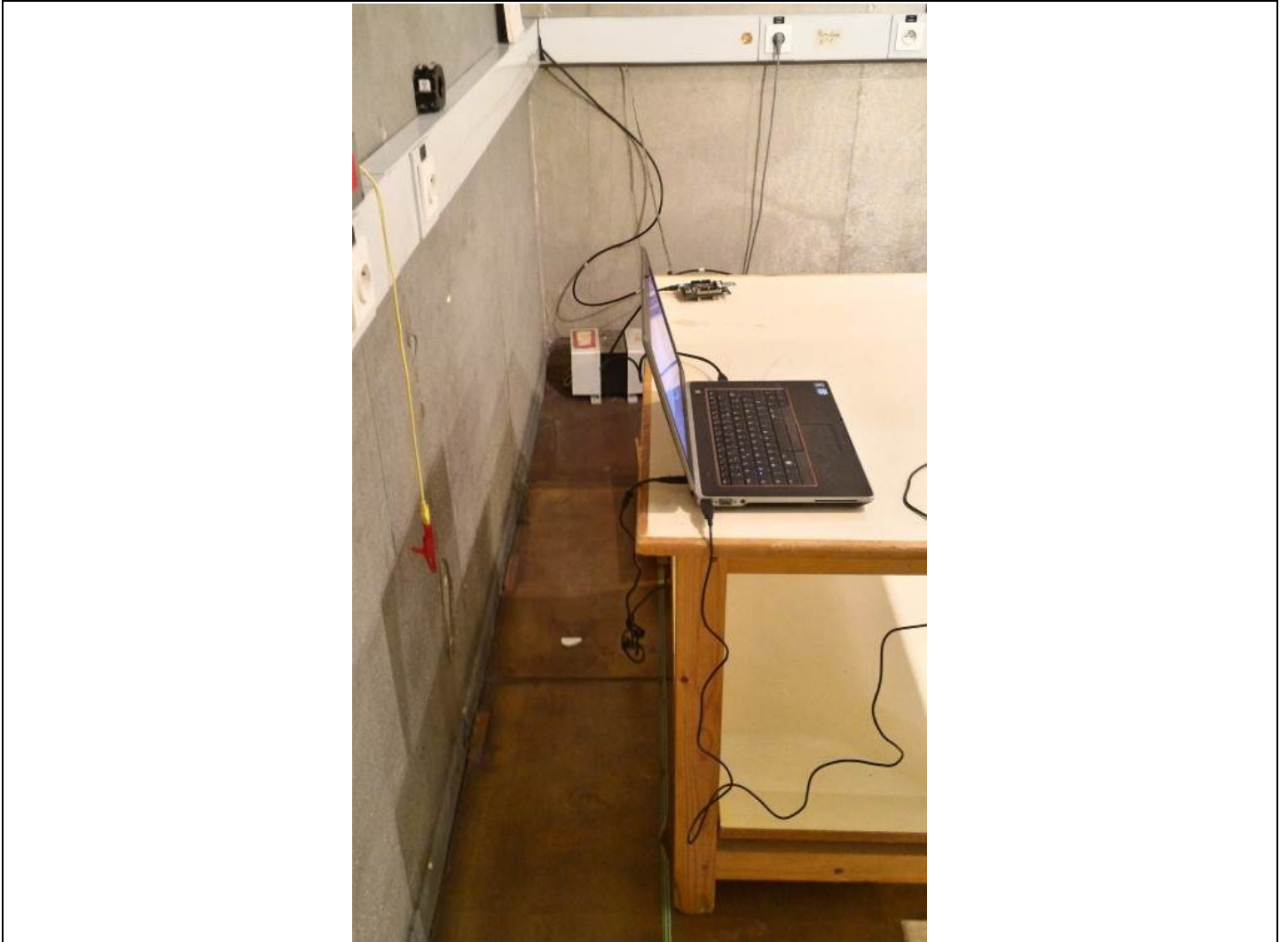
Test performed by :Laurent DENEUX
Date of test :December 18th,2015
Ambient temperature :21°C
Relative humidity :53%

9.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2013) method. The EUT is placed on the ground reference plane, at 80cm from the LISN. The distance between the EUT and the vertical ground plane is 40cm. Auxiliaries are powered by another LISN. The cable has been shorted to 1meter length. The EUT is powered through the LISN. Measurement is made with a receiver in peak mode. This was followed by a Quasi-Peak, i.e. CISPR measurement for any strong signal. If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary. The LISN (measure) is $50\Omega / 50\mu\text{H}$. Interconnecting cables and equipment's were moved to position that maximized emission.



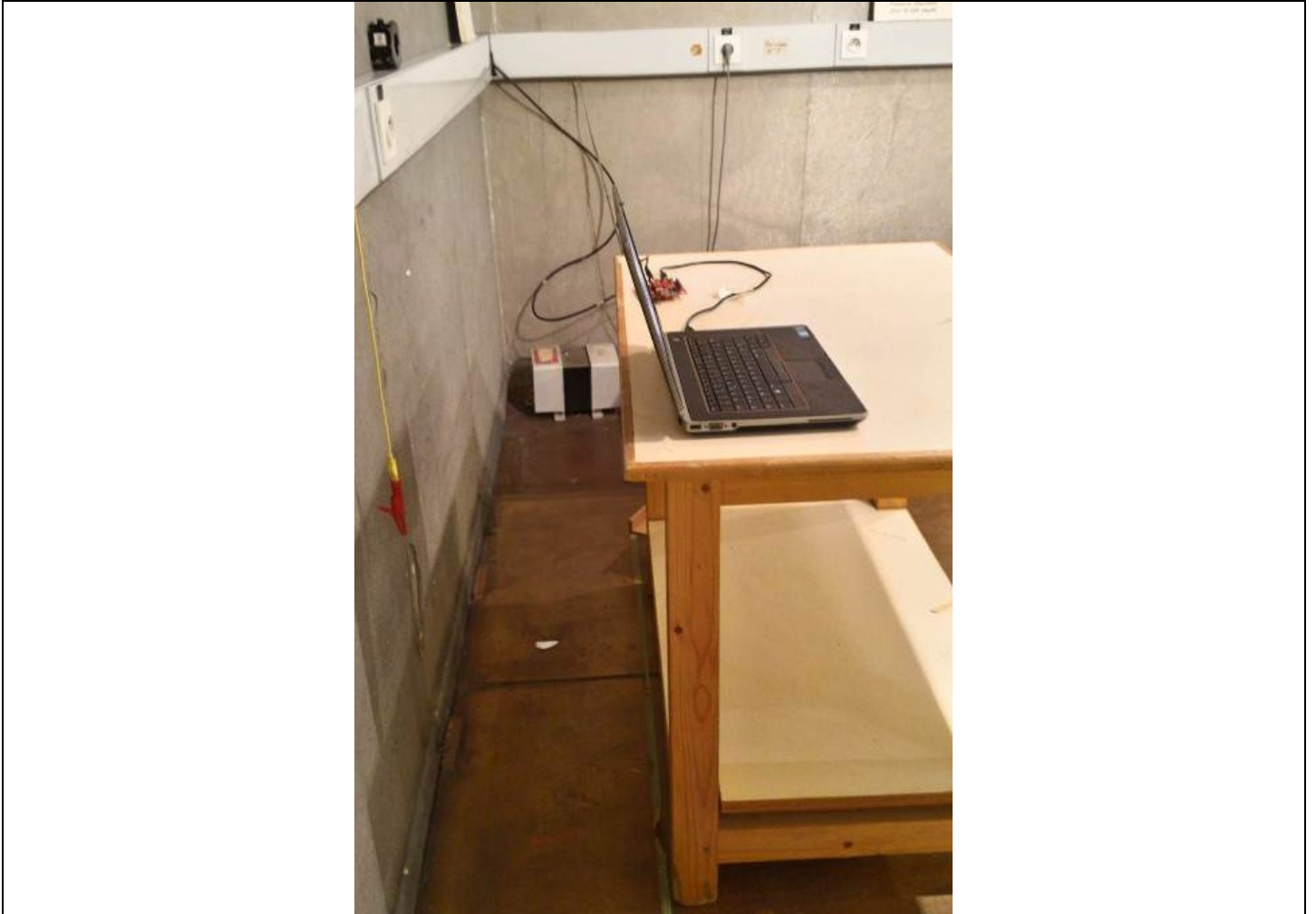
Photograph for AC Power Line Conducted Emissions (Front view) - JN5179-001-M00 3V



Photograph for AC Power Line Conducted Emissions (Rear view) -JN5179-001-M00 3V



Photograph for AC Power Line Conducted Emissions (Front view) -JN5179-001-M00 6V



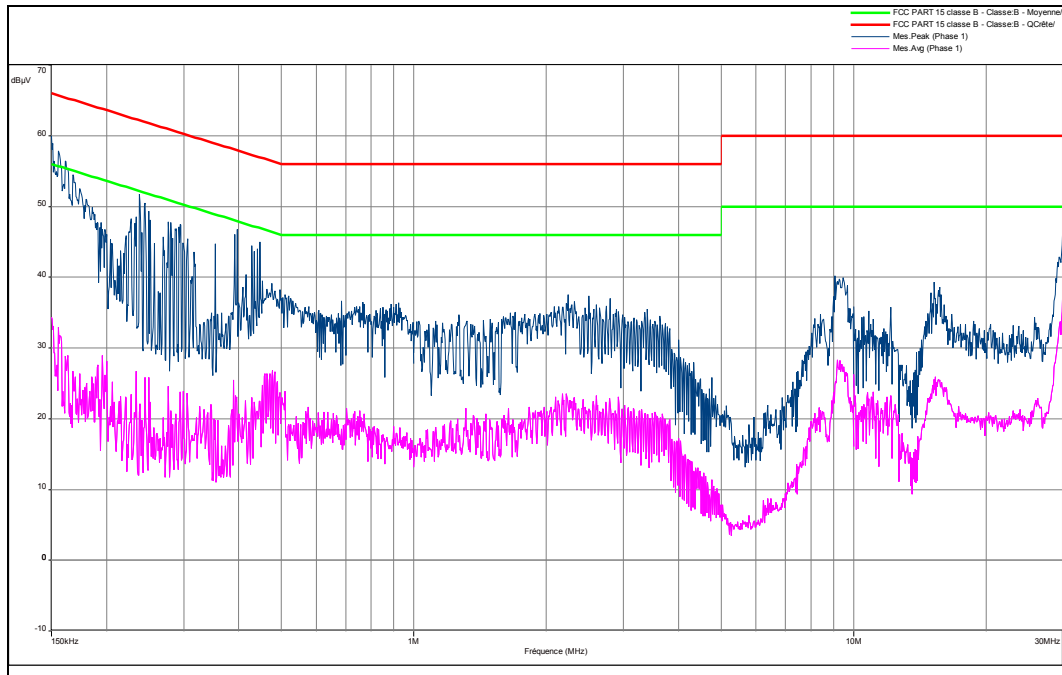
Photograph for AC Power Line Conducted Emissions (Rear view) - JN5179-001-M00 6V



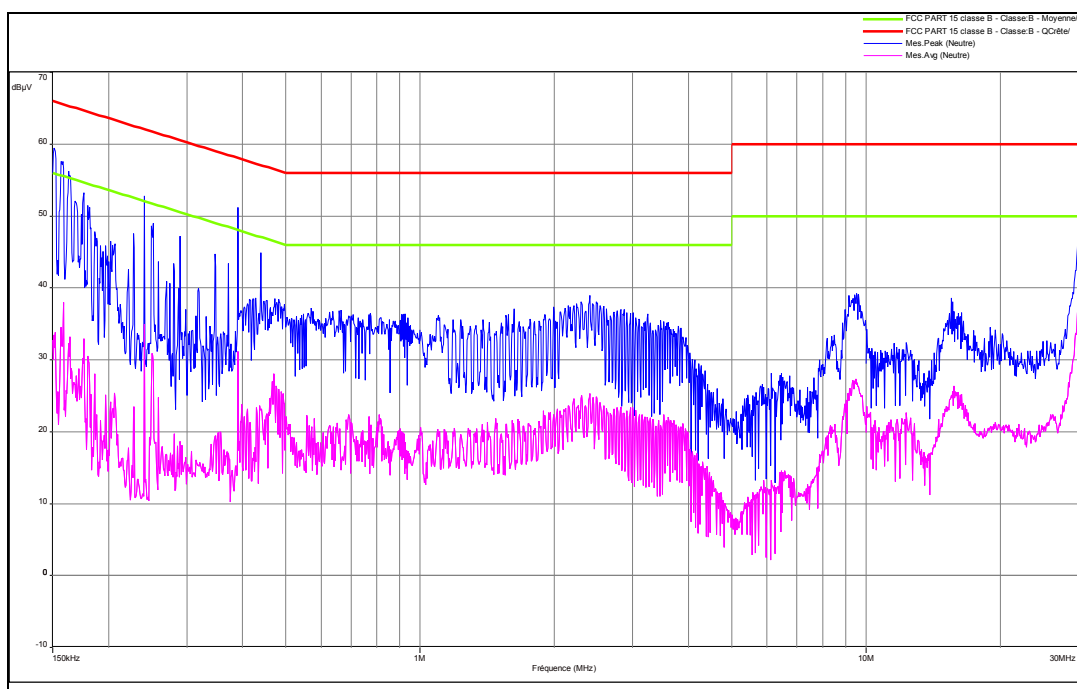
9.3. RESULTS

Channel 11 - JN5179-001-M00 3V

Phase Line



Neutral Line





Phase Line

Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Average Level (dBμV)	Average Limit (dBμV)
0.150	60	-	66	34.3	56
0.237	51.7	-	62	26.7	52
0.396	46.7	-	58	25.5	48
9.058	40.2	-	60	28.4	50
15.248	39.3	-	60	25.9	50
30	42.7	-	60	38.6	50

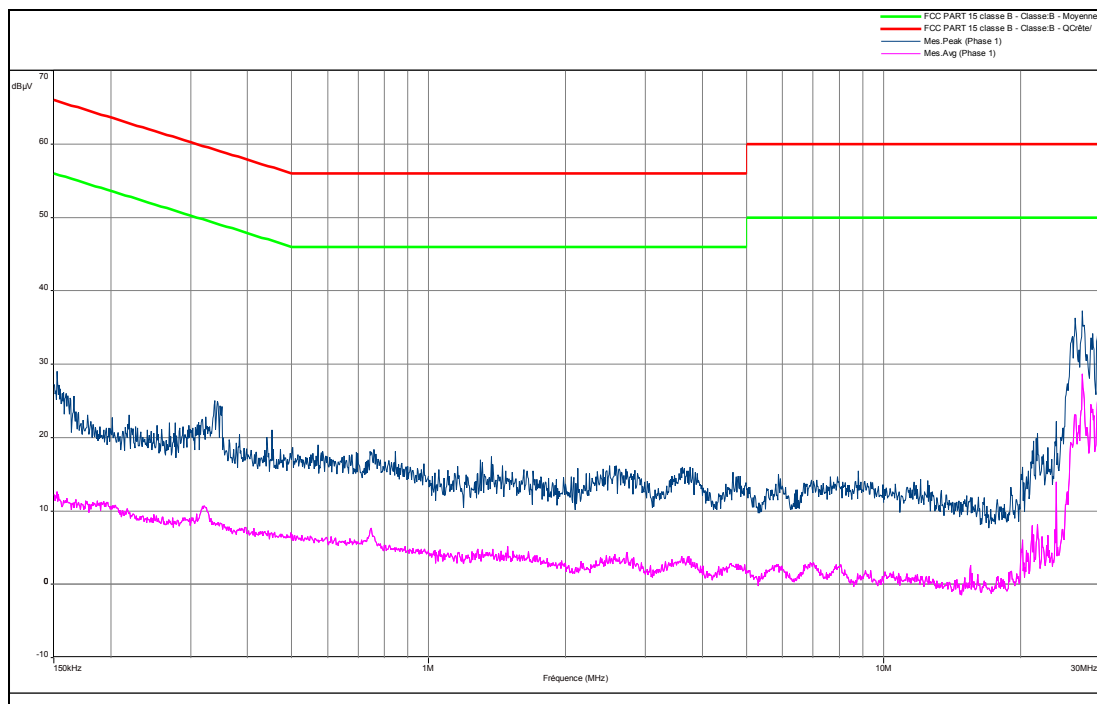
Neutral Line

Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Average Level (dBμV)	Average Limit (dBμV)
0.151	59.2	-	65.9	38	55.9
0.240	52.7	-	62	35	52
0.390	51.2	-	58	31.2	48
9.426	39	-	60	27.3	50
15.66	42	-	60	26.3	50
30	47	-	60	39	50

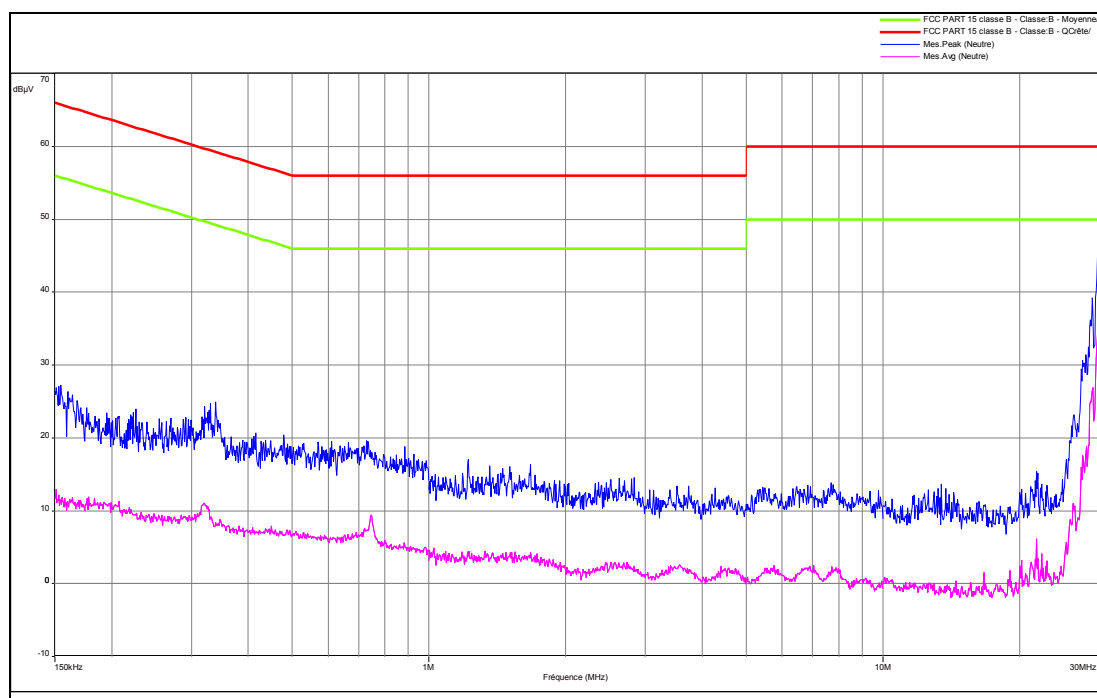


Channel 11 - JN5179-001-M00 6V

Phase Line



Neutral Line





Phase Line

Frequency (MHz)	Peak Level (dBµV)	Quasi-Peak Level (dBµV)	Quasi-Peak Limit (dBµV)	Average Level (dBµV)	Average Limit (dBµV)
0.152	29	-	65.8	13	55.8
0.343	25	-	59.1	11	49.1
21.37	20	-	60	6	50
24	38	-	60	14	50
27.37	37	-	60	28.6	50
29.7	39.3	-	60	29	50

Neutral Line

Frequency (MHz)	Peak Level (dBµV)	Quasi-Peak Level (dBµV)	Quasi-Peak Limit (dBµV)	Average Level (dBµV)	Average Limit (dBµV)
0.154	27.2	-	65.7	13	55.7
0.338	25	-	59.2	9.5	49.2
21.8	44.5	-	60	3	50
26.3	37.5	-	60	28	50
29	39.2	-	60	27	50
29.7	45.4	-	60	34.8	50

Result: PASS

Limit: → Quasi-Peak
 0,15kHz to 0,5MHz: 66dBµV to 56dBµV*
 0,5MHz to 5MHz: 56dBµV
 5MHz to 30MHz: 60dBµV

Average
 0,15kHz to 0,5MHz: 56dBµV to 46dBµV*
 0,5MHz to 5MHz: 46dBµV
 5MHz to 30MHz: 50dBµV

*Decreases with the logarithm of the frequency



10. UNWANTED EMISSIONS INTO RESTRICTED FREQUENCY BANDS

10.1. TEST CONDITIONS

Test performed by :Laurent DENEUX
Date of test :December 18th,2015
Ambient temperature :18°C
Relative humidity :47%

10.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2013). The EUT is placed in a semi-anechoic chamber. Distance between measuring antenna and the EUT is 10m. Test is performed in horizontal (H) and vertical (V) polarization with bilog antenna below 1GHz and with a horn antenna above 1GHz. Measurement bandwidth was 120kHz below 1GHz and 1MHz above 1GHz. The level has been maximised by the turntable rotation of 360 degrees range on the 3 axis of EUT. Antenna height search was performed from 1 to 4m. The EUT is place at 1.5m high above 1GHz and at 0.8m high under 1GHz.



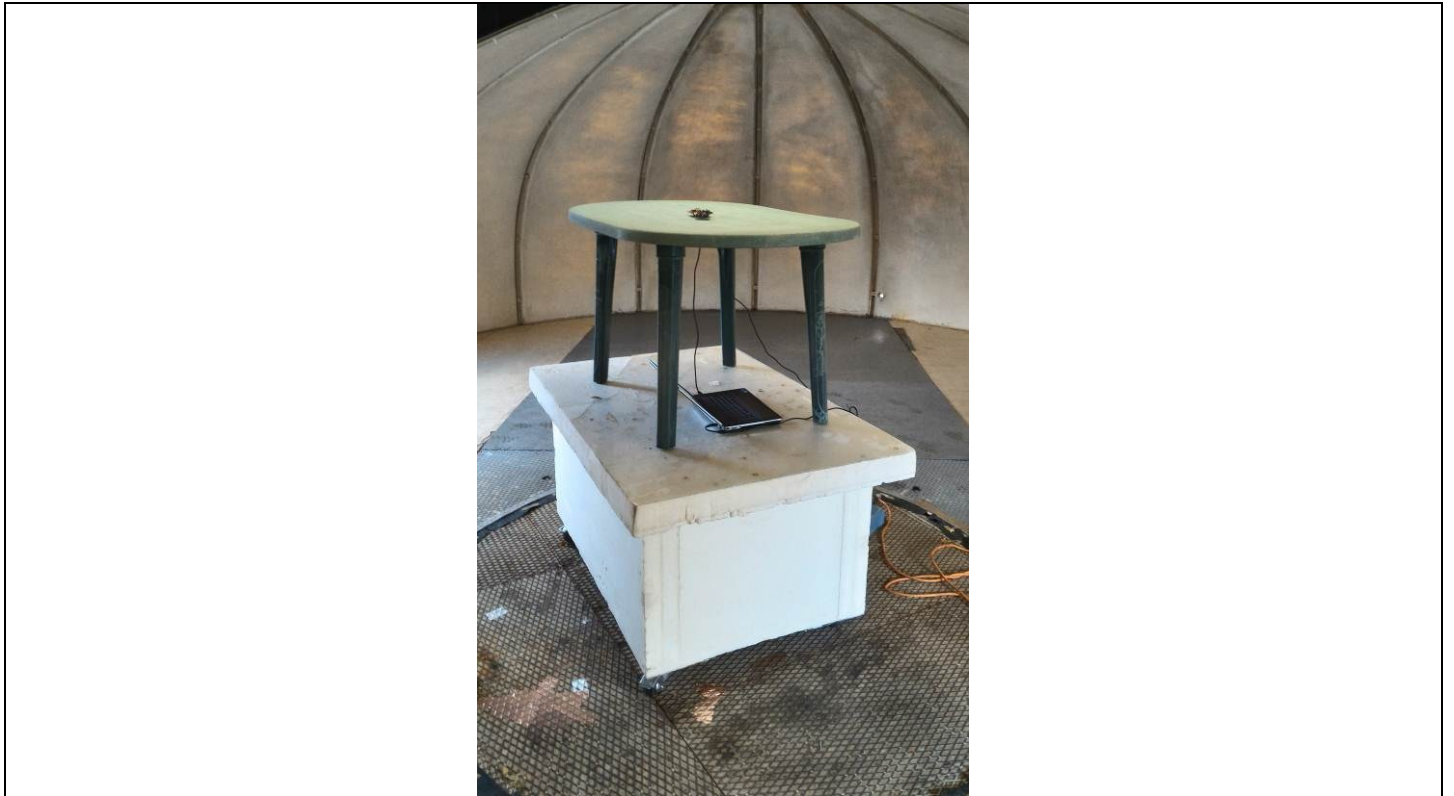
Photograph for Unwanted Emissions into Restricted Frequency Bands (JN5179-001-M00 -power supply 3V)



Photograph for Unwanted Emissions into Restricted Frequency Bands (JN5179-001-M00 -power supply 3V)



Photograph for Unwanted Emissions into Restricted Frequency Bands (JN5179-001-M00 -power supply 6V)

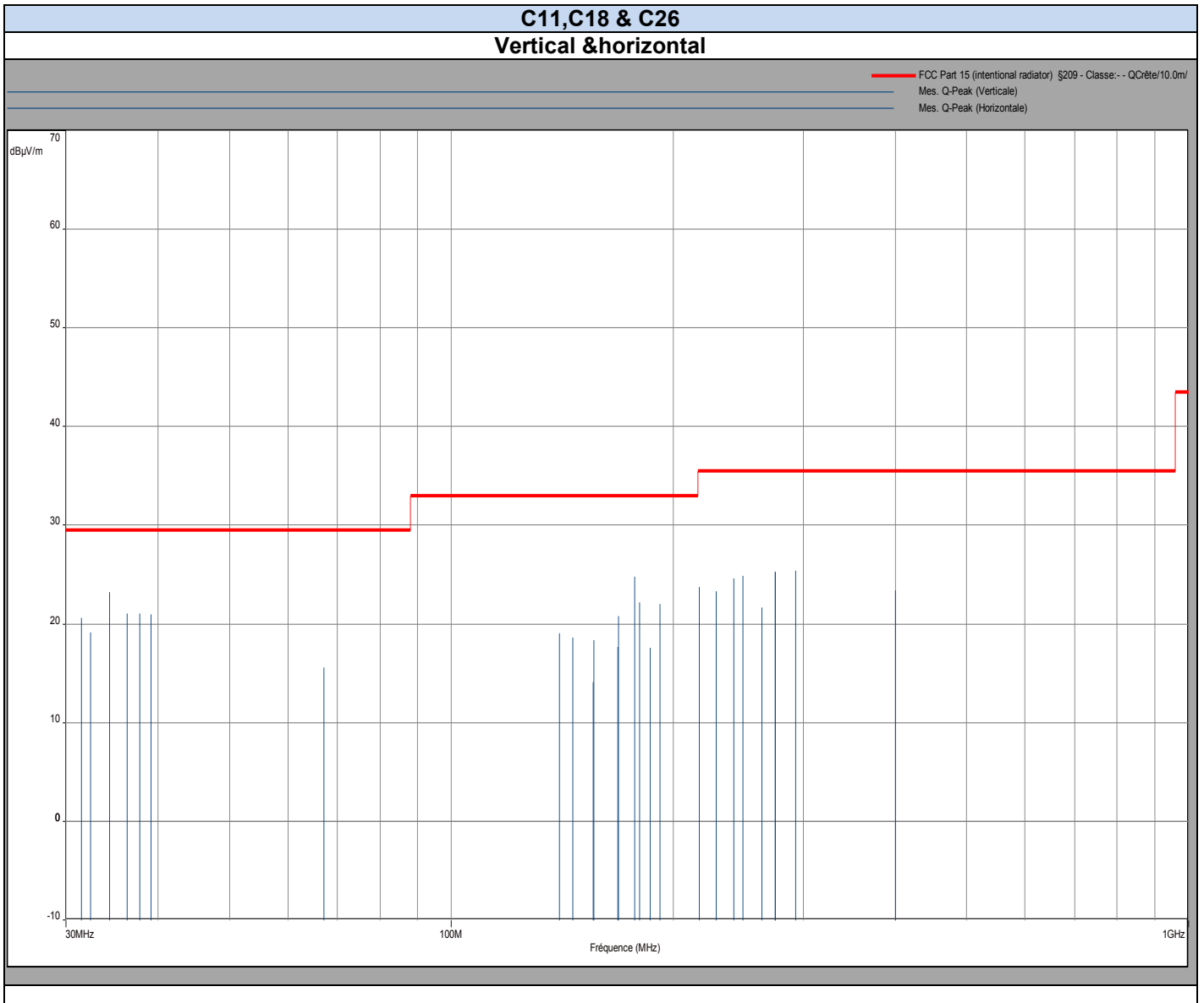


Photograph for Unwanted Emissions into Restricted Frequency Bands (JN5179-001-M00 -power supply 6V)



10.3. RESULTS

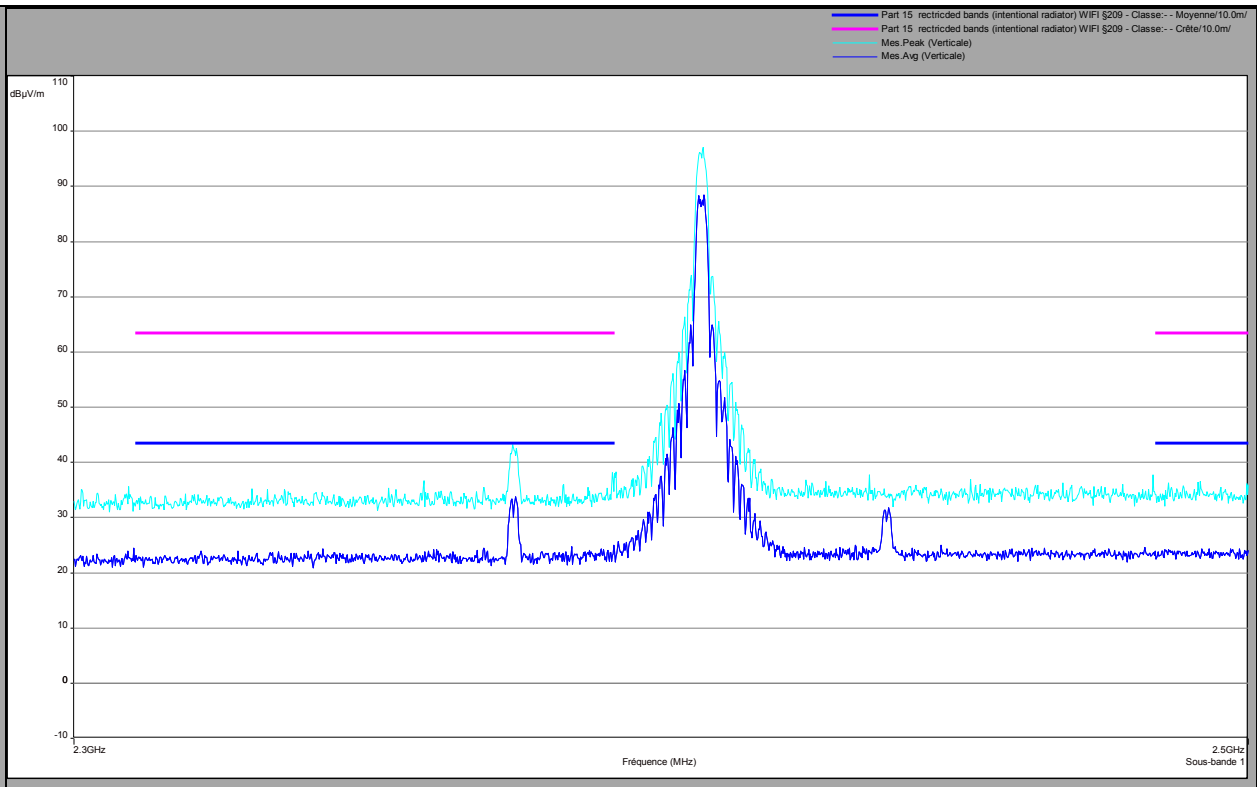
JN5179-001-M00 (power supply 3V)
Below 1GHz



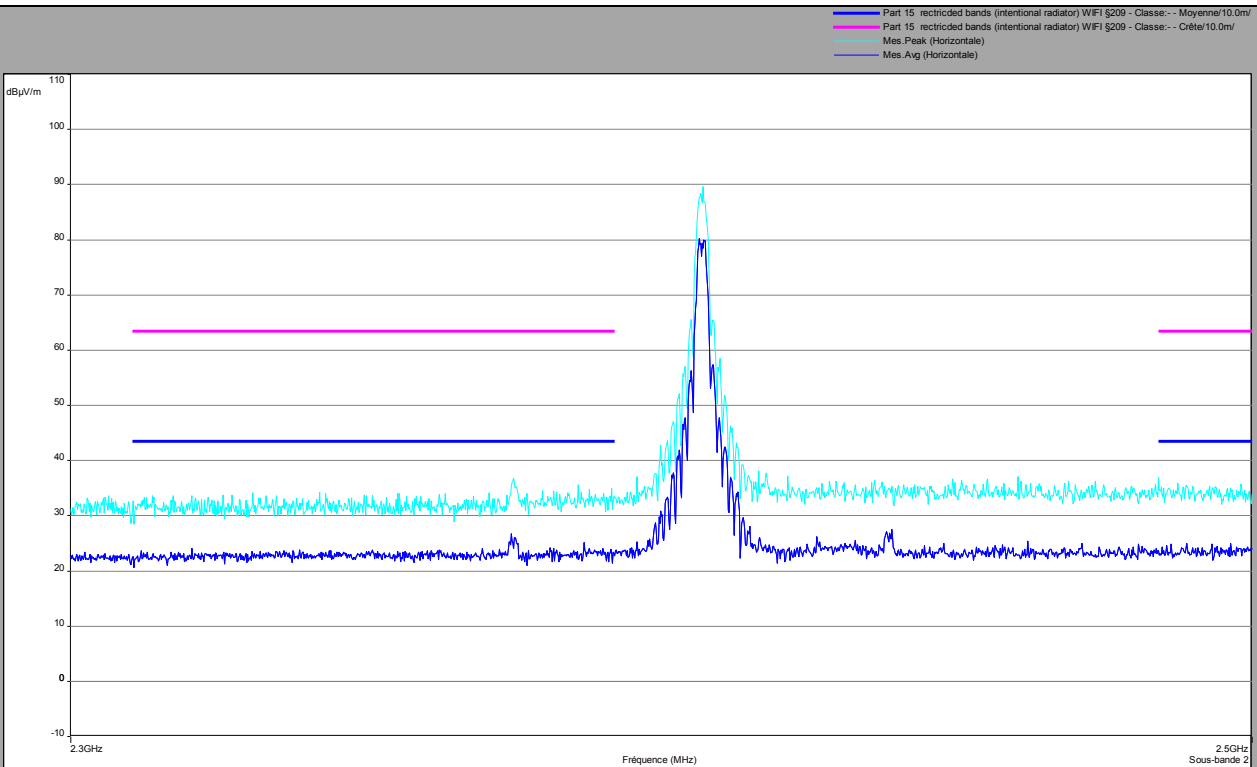


JN5179-001-M00 (power supply 3V)
Above 1GHz

C11
Vertical

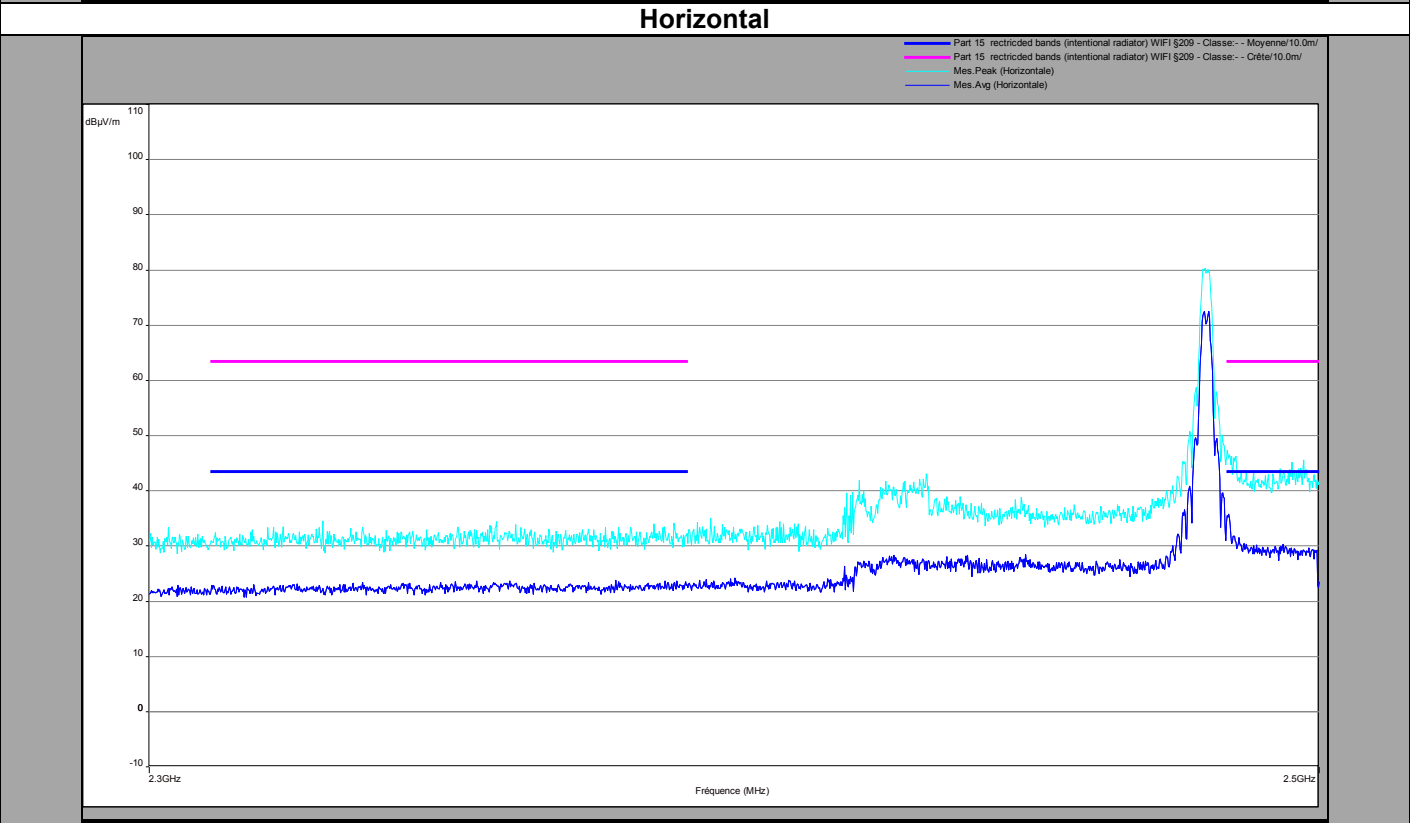
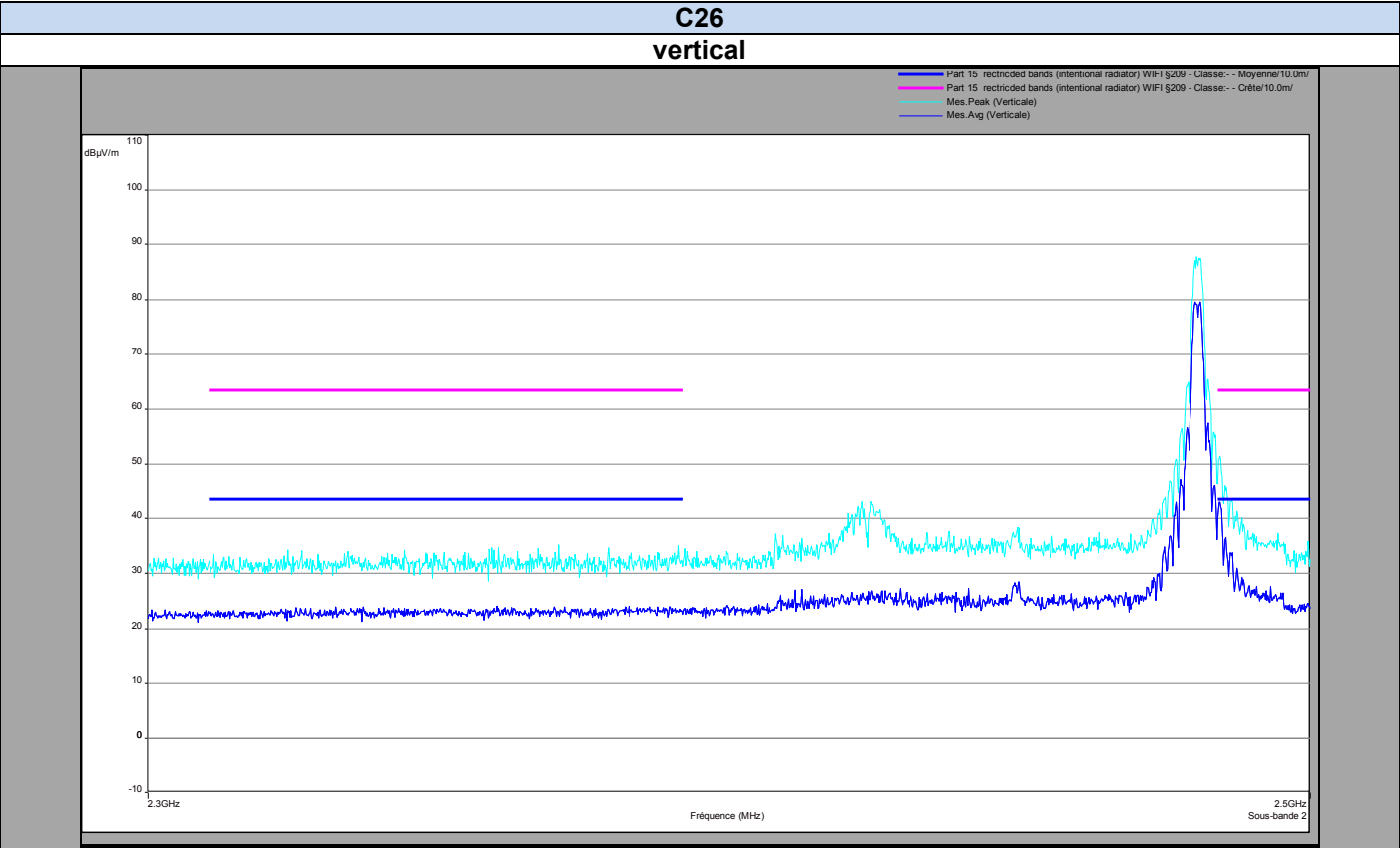


Horizontal



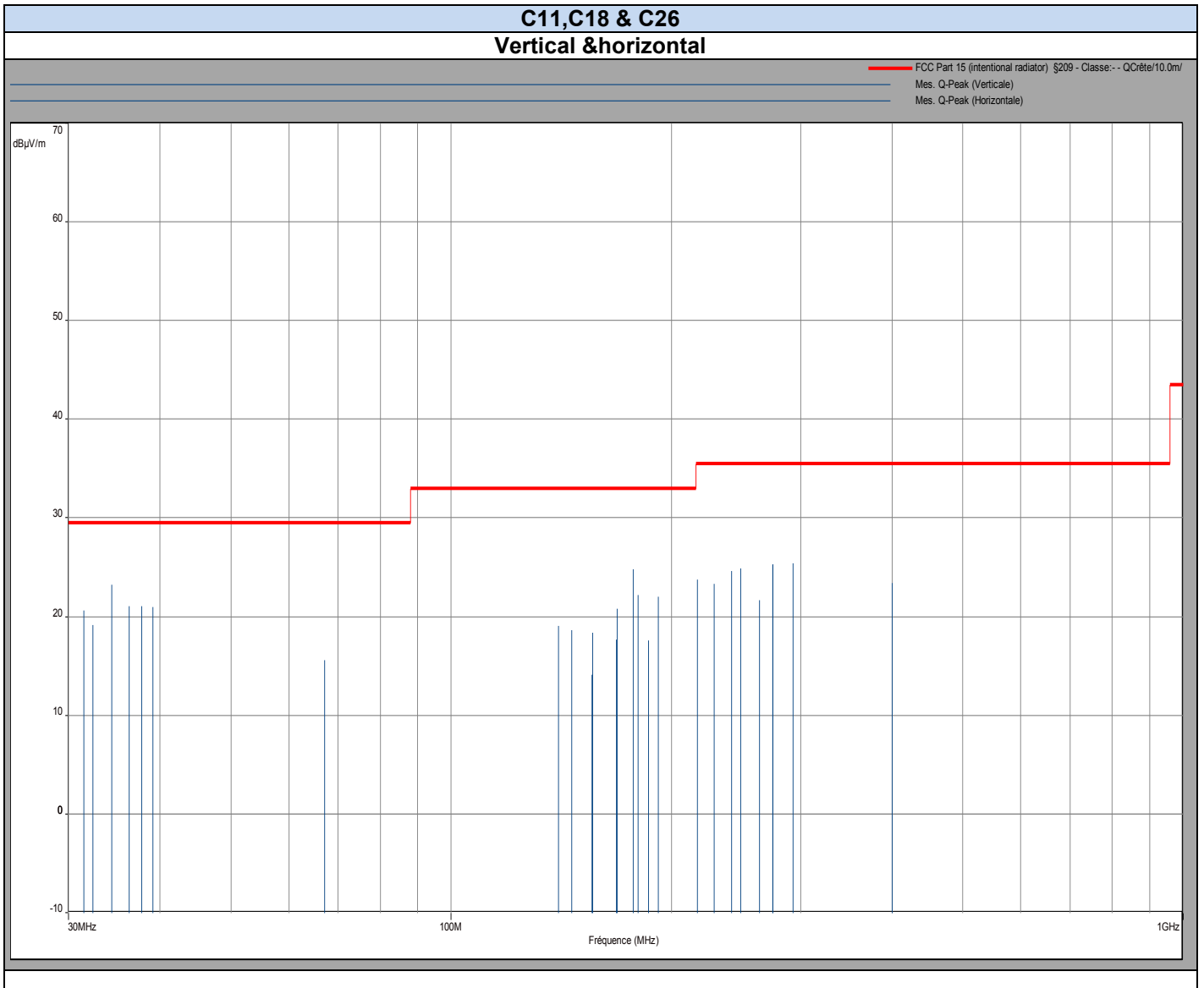


JN5179-001-M00 (power supply 3V)
Above 1GHz





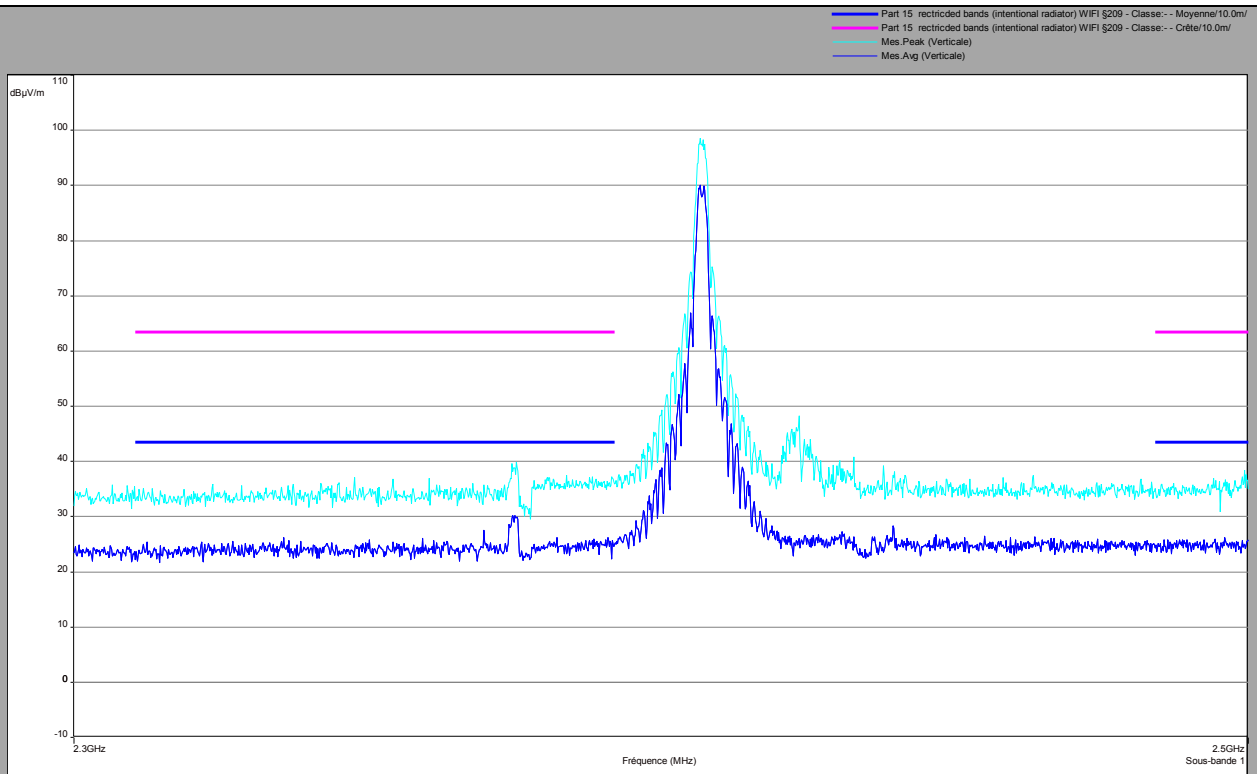
JN5179-001-M00 (power supply 6V)
Below 1GHz



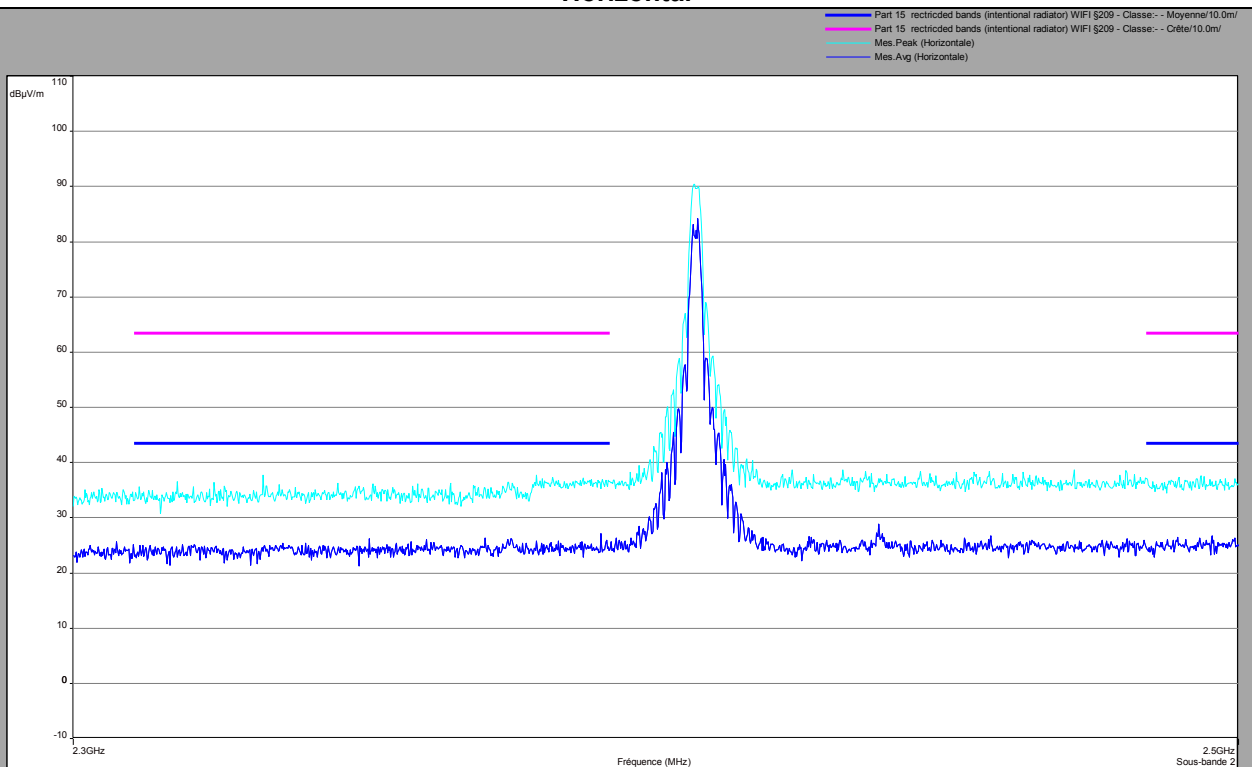


JN5179-001-M00 (power supply 6V)
Above 1GHz

C11
Vertical



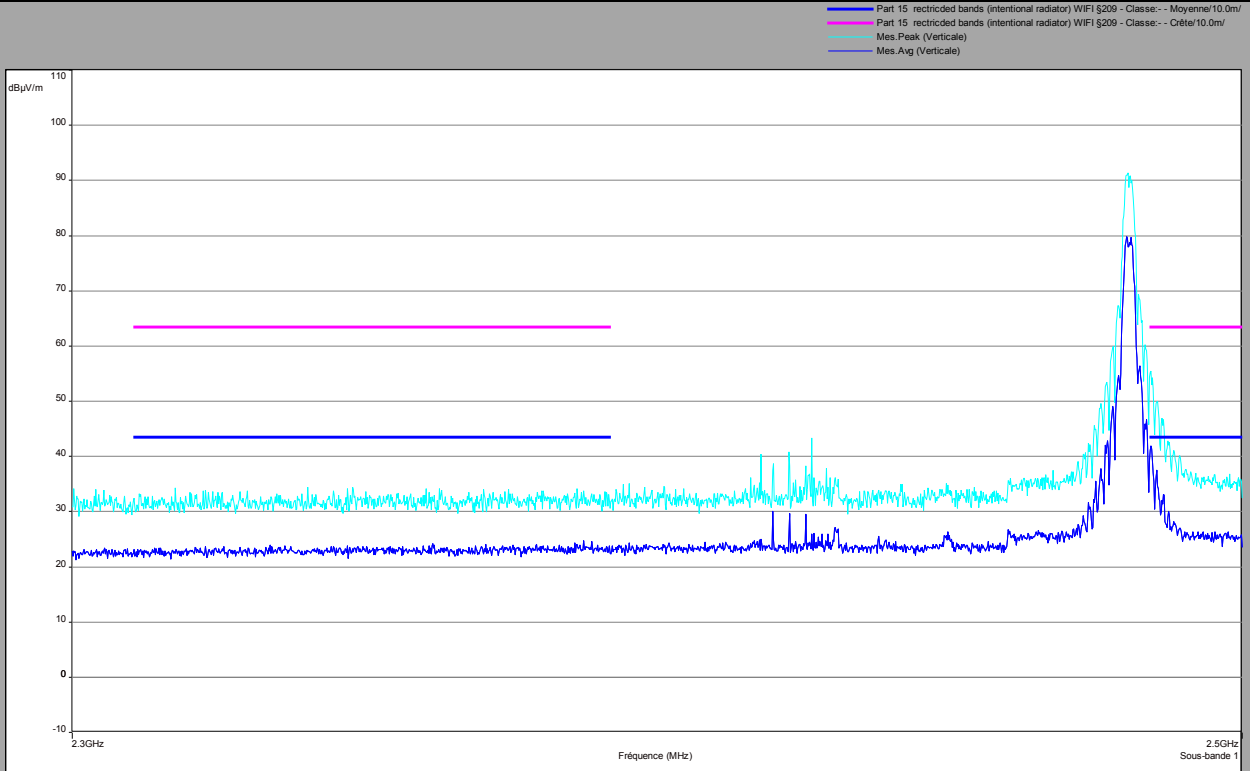
Horizontal



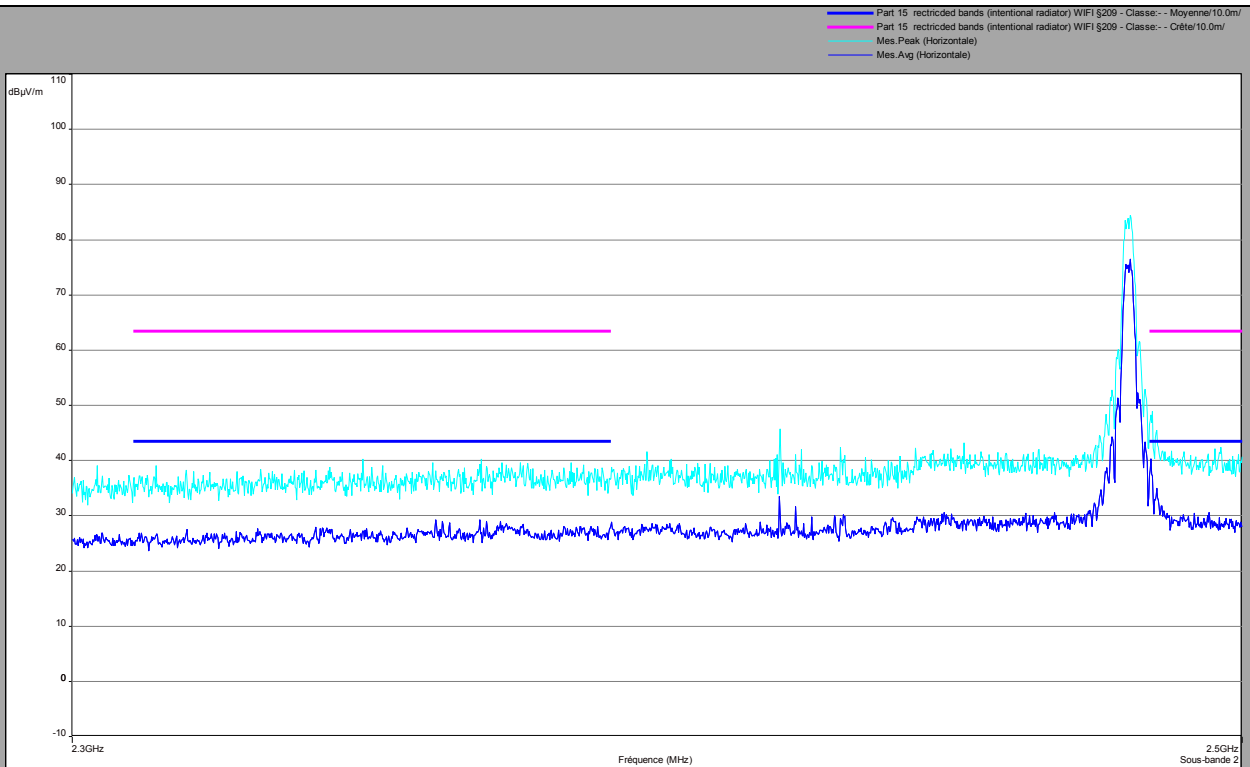


JN5179-001-M00 (power supply 6V)
Above 1GHz

C26
vertical



Horizontal





• **Characterization on an open test site (30MHz to 40GHz):**
JN5179-001-M00 (power supply 3V)
Below 1GHz

C11 18 and 26

Polarisation	Frequency (MHz)	QPeak Level (dBµV/m)	Limit (dBµV/m)
Vertical	32.3	22.03	29.5
Vertical	34.6	22.59	29.5
Vertical	40.9	22.31	29.5
Vertical	72	23.85	29.5
Vertical	166	14.78	33
Vertical	177.4	19.82	33
Vertical	192.1	20.18	33
Vertical	202.1	22.7	33
Vertical	209.8	18.79	33
Vertical	221.6	24.17	35.5
Vertical	240	19.96	35.5
Vertical	253.9	22.91	35.5
Vertical	268.7	25.9	35.5
Vertical	285.6	25.32	35.5
Vertical	300	25.5	35.5
Vertical	400	23.45	35.5
Vertical	480	25.05	35.5
Horizontal	180.1	18.52	33
Horizontal	233.8	19.27	35.5
Horizontal	266.4	20.23	35.5
Horizontal	281.1	21.86	35.5
Horizontal	300	25.43	35.5
Horizontal	396.3	26.09	35.5
Horizontal	500	26.29	35.5

Above 1GHz

C11

Polarisation	Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)
Vertical	4810	25.3	43.5	34.3	63.5
Vertical	7215	41.8	43.5	50.5	63.5
Horizontal	7215	42.7	43.5	52.3	63.5

C18

Polarisation	Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)
Vertical	4880	28.1	43.5	34.7	63.5
Vertical	7320	41.1	43.5	50.1	63.5
Horizontal	7320	40.4	43.5	50.4	63.5

C26

Polarisation	Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)
Vertical	7441	38.6	43.5	51.3	63.5
Horizontal	7441	38.7	43.5	51.3	63.5



**JN5179-001-M00 (power supply 6V)
Below 1GHz**

C11 , 18 and 26

Polarisation	Frequency (MHz)	QPeak Level (dBµV/m)	Limit (dBµV/m)
Vertical	31.5	20.67	29.5
Vertical	32.4	19.21	29.5
Vertical	34.4	23.27	29.5
Vertical	36.3	21.08	29.5
Vertical	37.8	21.11	29.5
Vertical	39.1	21.03	29.5
Vertical	67.2	15.63	29.5
Vertical	140.2	19.12	33
Vertical	146.2	18.69	33
Vertical	155.6	14.17	33
Vertical	168.3	17.69	33
Vertical	177.4	24.82	33
Vertical	185.9	17.66	33
Vertical	216.9	23.76	35.5
Vertical	228.6	23.33	35.5
Vertical	248.5	24.95	35.5
Vertical	263.7	21.67	35.5
Vertical	275.2	25.23	35.5
Vertical	292.8	25.41	35.5
Vertical	400	23.42	35.5
Horizontal	156.2	18.43	33
Horizontal	168.5	20.82	33
Horizontal	180	22.25	33
Horizontal	191.9	22.07	33
Horizontal	241.6	24.66	35.5
Horizontal	275.2	25.34	35.5

Above 1GHz

C11

Polarisation	Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)
Vertical	7215	37.5	43.5	52.4	63.5
Horizontal	7215	41.2	43.5	53.3	63.5

C18

Polarisation	Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)
Vertical	7320	38.7	43.5	52.2	63.5
Horizontal	7320	40.4	43.5	52.6	63.5

C26

Polarisation	Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)
Vertical	7441	36.3	43.5	50.9	63.5
Horizontal	7441	37.1	43.5	50	63.5



Result: PASS

Limit: →	30MHz to 88MHz:	29.5dB μ V/m QPeak
	88MHz to 216MHz:	33dB μ V/m QPeak
	216MHz to 960MHz:	35.5dB μ V/m QPeak
	960MHz to 1000MHz:	43.5dB μ V/m QPeak
	Above 1000MHz:	63.5B μ V/m Peak
		43.5B μ V/m Average



11. TEST EQUIPMENT LIST

Occupied Bandwidth, -6dB Bandwidth, Maximum Peak Output Power, Power Spectral Density and Unwanted Emissions into Non-Restricted Frequency Bands					
Apparatus	Trade Mark	Type	Registration number	Calibration date	Calibration due
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2015/03	2016/03
RF cable & 20 dB attenuator	Télédyne	920-0202-048	A5329661	2015/10	2016/10
Multi-meter	KEITHLEY	2000	A1241084	2014/02	2016/02
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	2014/05	2016/05
Spectrum analyzer	ROHDE & SCHWARZ	FSL6	A4060032	2015/04	2017/04
Unwanted Emissions into Restricted Frequency Bands & Receiver Spurious Emissions					
Apparatus	Trade Mark	Type	Registration number	Calibration date	Calibration due
EMI receiver	ROHDE & SCHWARZ	ESI40 1088 740K40	A2642010	2015/05	2016/05
Rejector filter 2,4GHz	-	2.45GHz	A7484048	2015/12	2016/12
Measurement RF cable	-	-	A5329592	2014/05	2016/05
Attenuator 3dB	WEINSCHEL	WA54-3-12	A7122223	2015/06	2016/06
Multi-meter	KEITHLEY	2000	A1241084	2014/02	2016/02
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	2014/05	2016/05
AC Power Line Conducted Emissions					
Apparatus	Trade Mark	Type	Registration number	Calibration date	Calibration due
Receiver	ROHDE & SCHWARZ	ESU 26	A2642018	2015-01	2016-01
V ISLN	ROHDE & SCHWARZ	ESH2-Z5	C2322001	2015-06	2016-06
Pulse limiter	ROHDE & SCHWARZ	ESH3-Z2	A2649008	2015-02	2016-02
Cable	-	-	A5329417	2015-10	2016-10
Ground plane	LCIE	-	-	-	-



12. UNCERTAINTIES CHART

Kind of test	Measurement uncertainties (k=2) $\pm x(\text{dB}) / (\text{Hz})$	Limit for uncertainties $\pm y(\text{dB})$
TRANSMITTER REQUIREMENTS		
Radio frequency	$\pm 2 \cdot 10^{-8}$ Hz	$\pm 1 \cdot 10^{-7}$ Hz
RF Conducted power	± 0.6 dB	± 1.5 dB
Spurious emissions <ul style="list-style-type: none"> • Frequency < 1000 MHz • Frequency > 1000 MHz 	± 3.9 dB ± 3.1 dB	± 6 dB
Spurious in conduction	± 1.6 dB	± 3 dB
Temperature	$\pm 0.5^\circ\text{C}$	$\pm 1^\circ\text{C}$
Humidity	± 2.5 %	± 10 %
RECEIVER REQUIREMENTS		
Spurious emissions <ul style="list-style-type: none"> • Frequency < 1000 MHz • Frequency > 1000 MHz 	± 3.9 dB ± 3.1 dB	± 6 dB