TEST REPORT

Number 128363-657631A
Composition of document 41 pages

RADIO

FCC Registration Number 166175

Standards 47 CFR Part 15.247

Issued to
SURGIRIS
80 rue de la Gare
59170 Croix

Apparatus under test Zigbee transmitter
Trade mark SURGIRIS
Manufacturer SURGIRIS
Type SCY00-040
Serial number ID-4469696
FCC ID 2AC7OCTRL000

Test date 2014/10/10

Tests performed by Stéphane PHOUDIAH & Armand MAHOUNGOU

Test site Fontenay aux Roses

Date of issue 2014/11/12

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SUMMARY

1. TEST PROGRAM

- **References**

Standards: - 47 CFR Part 15C
- CISPR 16-4-2
- ANSI C63.10

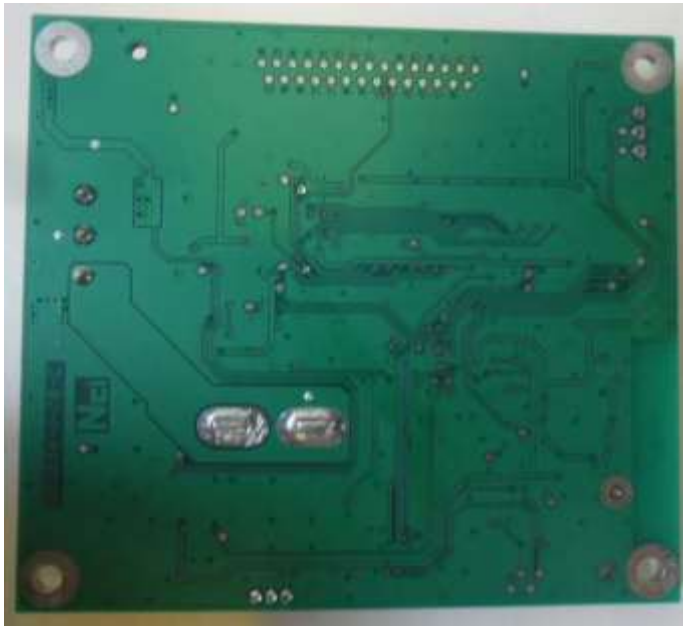
Standard Section	Test Description	TEST RESULT - Comments
CFR 47 § 15.247 (a) (2)	-6dB Bandwidth	PASS
CFR 47 § 15.247 (b)	Maximum Output Power	PASS
CFR 47 § 15.247 (e)	Power Spectral Density	PASS
CFR 47 § 15.247 (d)	Conducted Spurious Emission at the Band Edge	PASS
CFR 47 § 15.247 (d)	Unwanted Emissions into Non-Restricted Frequency Bands	PASS
CFR 47 § 15.207	AC Power Line Conducted Emissions	PASS
CFR 47 § 15.209 (a) CFR 47 § 15.205 (a) CFR 47 § 15.247 (d)	Unwanted Emissions into Restricted Frequency Bands	PASS

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. HARDWARE & SOFTWARE IDENTIFICATION

- **Equipment under test (EUT):**



Photograph of EUT

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

Photograph of AE

- **Input/output:**

- Input Power
- GPIO for keyboard

- **Software identification:**

-Software version: V2.0.1

- **Equipment information:**

- Modulation technology: DSSS modulation
- EIRP: See 3.3. Result
- Transmit operating mode: ☐ Multiples antenna without beam forming
  ☐ Multiples antenna with beam forming
  ☒ Single antenna
- Number of transmit chains: ☒ 1 ☐ 2 ☐ 3 ☐ 4
  ☐ Symmetrical ☐ Asymmetrical
- Number of receiver chains: ☒ 1 ☐ 2 ☐ 3 ☐ 4
- Antenna type: ☒ Integral ☐ External
- Beamforming gain: ☐ Yes (dB) ☒ No
- Type of the equipment: ☐ Stand-alone equipment ☒ Plug-in radio device ☐ Combined equipment
- Test source voltage: Vnom: ☐ 120V/60Hz ☒ 24Vdc
- Type of power source: ☐ Battery (Alkaline/Lithium-Ion/Lead acid/Other) ☐ Internal power supply
  ☒ External power supply ☐ Car Charger
- Test sequence/test software used: See 2.2. Running Mode
- Duty Cycle: ☐ Continuous duty ☐ Intermittent duty ☒ Continuous operation
- Equipment type: ☒ Representative production model ☐ Pre-production model

-Channel plan:

Channel	Frequency (MHz)
Cmin: 0	2405
1	2410
2	2415
3	2420
4	2425
5	2430
6	2435
Cnom: 7	2440
8	2445
9	2450
10	2455
11	2460
12	2465
13	2470
14	2475
Cmax: 15	2480

-Data Rate:

Data Rate (Mbps)	Modulation Type	Worst Case Modulation
0,25	O-QPSK	☒

- Operating frequency range

Frequency Band (MHz)
2400MHz to 2483,5MHz

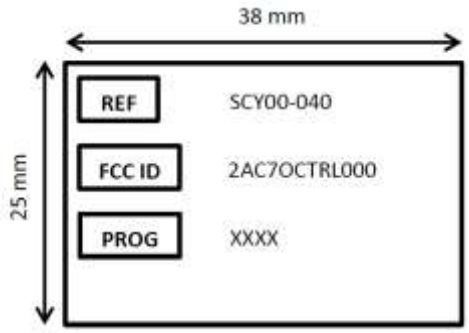
- Antenna Characteristics:

Frequency Band (MHz)	Declared Antenna Gain (dBi)
2400 to 2500	0.5dBi

2.2. 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

2.3. EQUIPEMENT LABELLING



2.4. EQUIPMENT MODIFICATIONS

No equipment modification has been necessary during testing.

3. -6DB BANDWIDTH

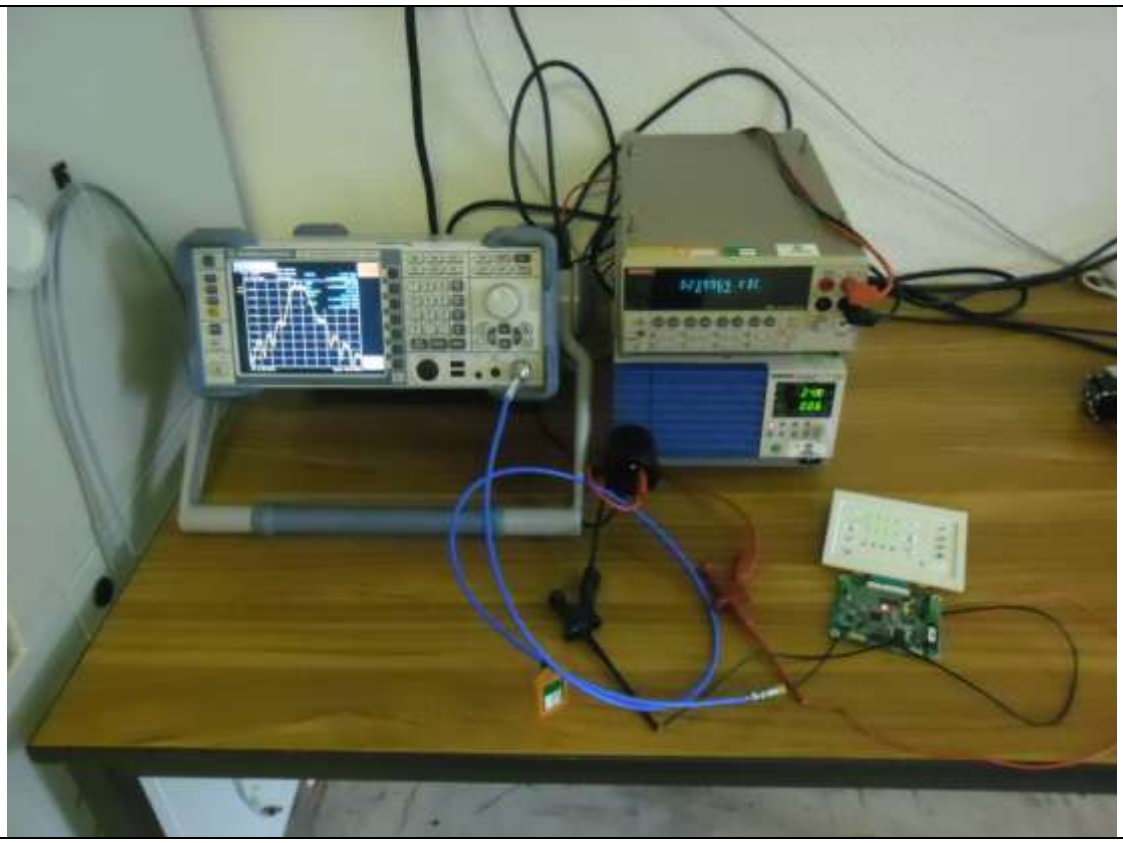
3.1. TEST CONDITIONS

Test performed by : Stephane PHOUDIAH
Date of test : 2014/10/10
Ambient temperature : 23°C
Relative humidity : 48

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 FCC KDB 558074 D01 DTS Meas Guidance v03r2 § 8.1.

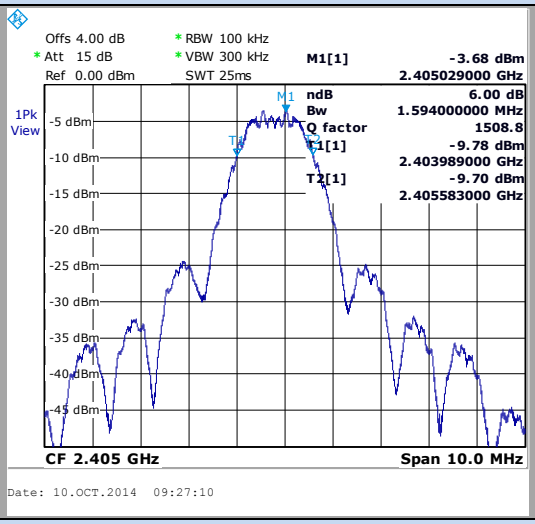
Spectrum Analyzer Setting:
Center frequency= Cmin or Cnom or Cmax
Span= At least twice the emission spectrum
Amplitude= Sufficient to observe the signal amplitude
RBW= 100kHz
VBW= 300kHz
Sweep= Auto
Trace= Max Hold
Detector= Peak



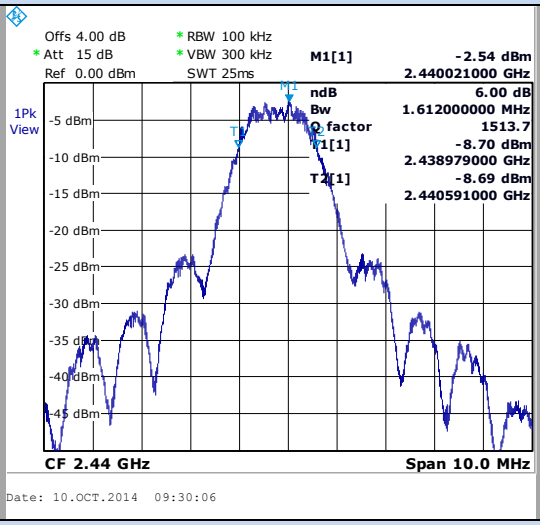
Photograph for -6dB Bandwidth

3.1. GRAPHICS & RESULTS

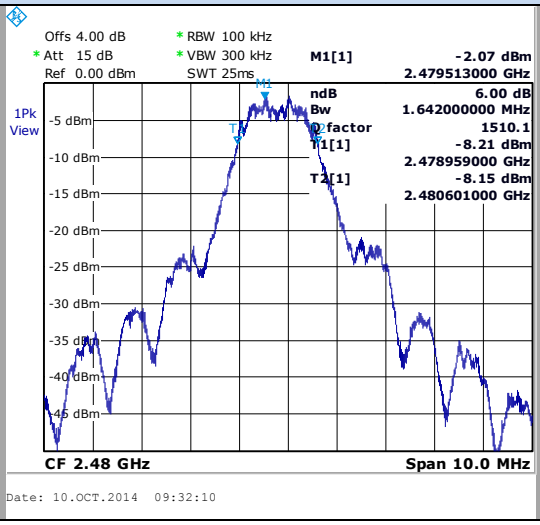
Cmin



Cnom



Cmax



Temperature	**Tnom**		
Voltage	**Vnom**		
Frequency	Cmin	Cnom	Cmax
-6dB Bandwidth (MHz)	1.59	1.61	1.64

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

4. MAXIMUM CONDUCTED POWER

4.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
Date of test : 2014/10/10
Ambient temperature : 23°C
Relative humidity : 45%

4.2. TEST SETUP

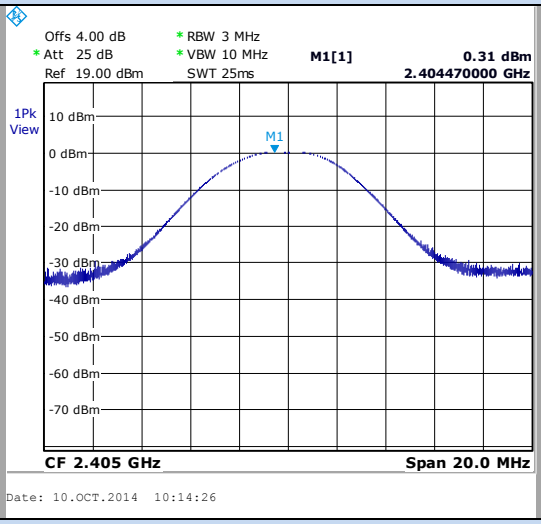
The Equipment Under Test is installed on a table and set in permanent emission with modulation. Measurement is performed with a spectrum analyzer on the EUT conducted access. The product has been tested according to the FCC KDB 558074 D01 DTS Meas Guidance v03 r2 § 9.1.1.

Spectrum Analyzer Setting (Maximum Peak Conducted Power):
Center frequency= Cmin or Cnom or Cmax
Span= At least twice the emission spectrum
Amplitude= Sufficient to observe the signal amplitude
RBW= 3MHz
VBW= 10MHz
Sweep= Auto
Trace= Max Hold
Detector= Peak
Meas Fonction= Channel Power inside of the emission spectrum

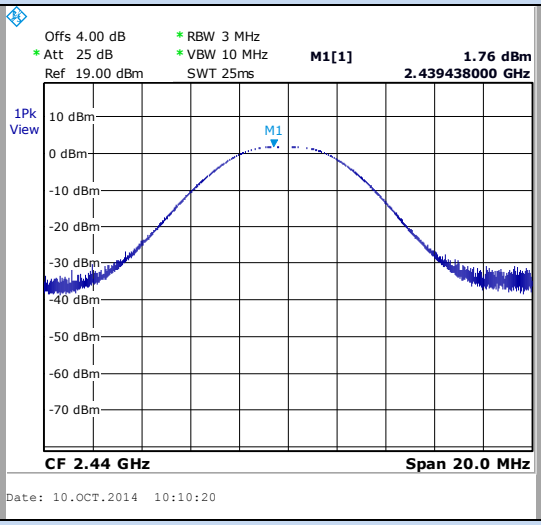
Photograph for Maximum Conducted Power

4.1. GRAPHICS & RESULTS

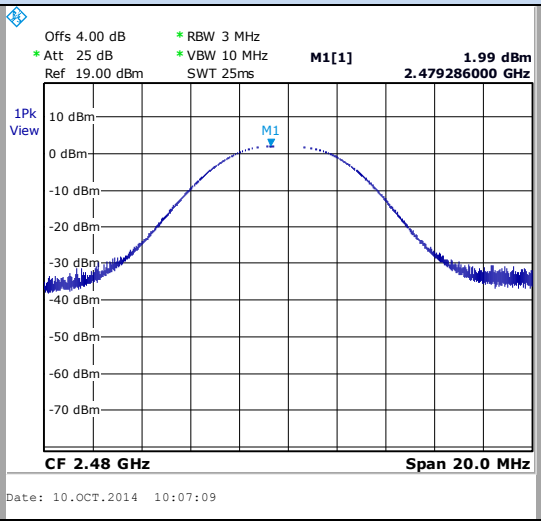
Cmin



Cnom



Cmax



Spectrum Analyzer Offset:
Cable Loss + Attenuator= 4dB

Channel	Maximum Conducted Power (dBm)	Antenna Gain (dBi)	Limit (dBm)
Cmin	0.31	0.5	30
Cnom	1.76	0.5	30
Cmax	1.99	0.5	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

5. POWER SPECTRAL DENSITY

5.1. TEST CONDITIONS

Test performed by : Stephane PHOUDIAH
Date of test : 2014/10/10
Ambient temperature : 23°C
Relative humidity : 45%

5.2. TEST SETUP

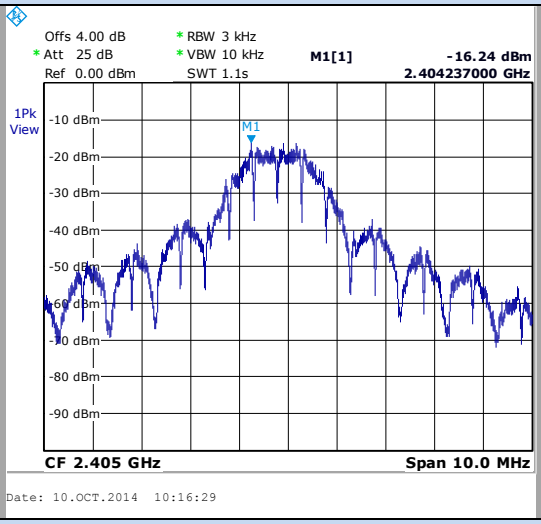
The Equipment Under Test is installed on a table and set in permanent emission with modulation. Measurement is performed with a spectrum analyzer on the EUT conducted access. The product has been tested according to the FCC KDB 558074 D01 DTS Meas Guidance v03r2 § 10.2.

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= 3kHz
VBW= 10kHz
Sweep= Auto
Trace= Max Hold
Detector= Peak

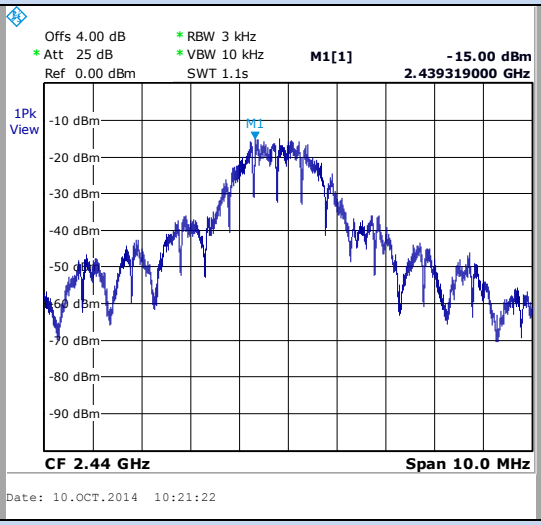
Photograph for Power Spectral Density

5.1. GRAPHICS & RESULTS

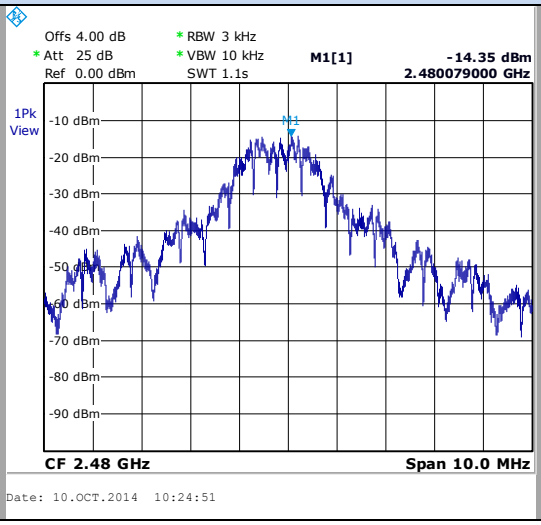
Cmin



Cnom



Cmax



Spectrum Analyzer Offset:
Cable Loss + Attenuator= 4dB

Channel	Power spectral density (dBm/3kHz)	Antenna Gain (dBi)	Limit (dBm/3kHz)
Cmin	-16.2	0.5	8
Cnom	-15	0.5	8
Cmax	-14.3	0.5	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

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

6.1. TEST CONDITIONS

Test performed by : Stephane PHOUDIAH
Date of test : 2014/10/10
Ambient temperature : 25°C
Relative humidity : 44%

6.2. TEST SETUP

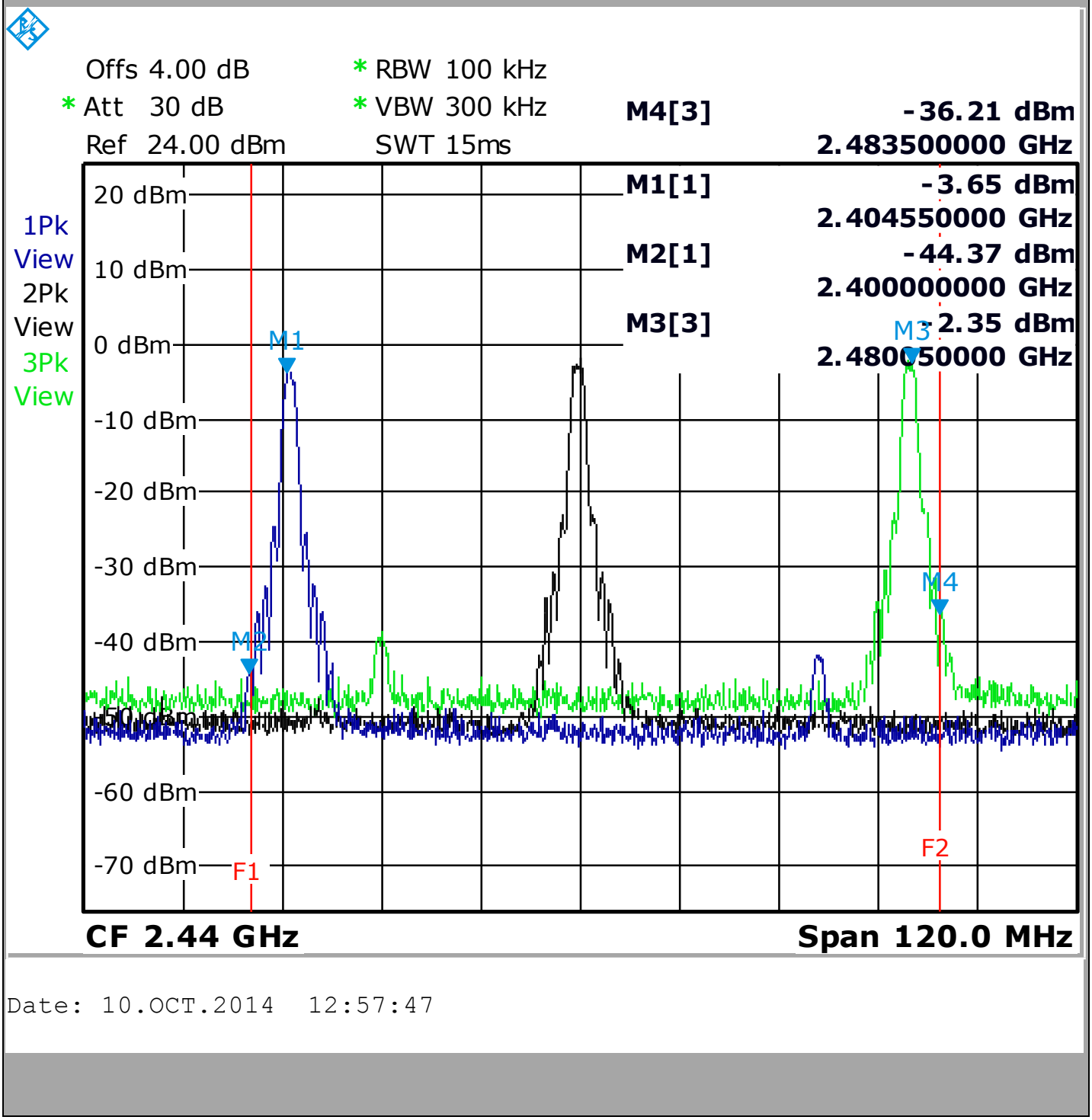
The Equipment Under Test is installed on a table and set in permanent emission with modulation. Measurement is performed with a spectrum analyzer on the EUT conducted access. The product has been tested according to the FCC KDB 558074 D01 DTS Meas Guidance v03r2 § 11.1.

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

6.1. GRAPHICS & RESULTS

Cmin Cnom Cmax



Temperature	**Tnom**	
Voltage	**Vnom**	
Conducted Spurious Emission at the Band Edge (MHz)	2400	2483,5
Spurious Level (dBc)	48,02	38,56

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”

7. UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS

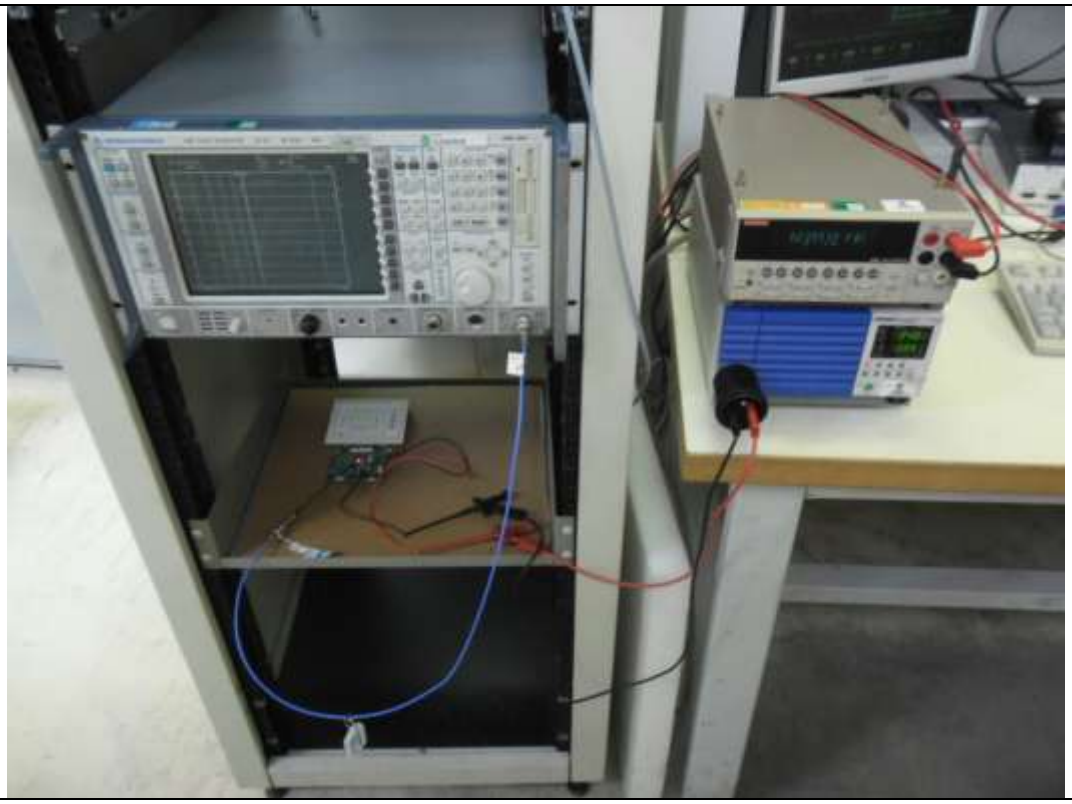
7.1. TEST CONDITIONS

Test performed by : Stephane PHOUDIAH
Date of test : 2014/10/10
Ambient temperature : 26°C
Relative humidity : 44%

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 v03r1 § 11.1.

Spectrum Analyzer Setting:
Start frequency= 30MHz
Stop frequency= 25GHz
Amplitude= Sufficient to observe the signal amplitude
RBW= 100kHz
VBW= 300kHz
Sweep Time= Auto
Sweep Point= 249700
Trace= Max Hold
Detector= Peak

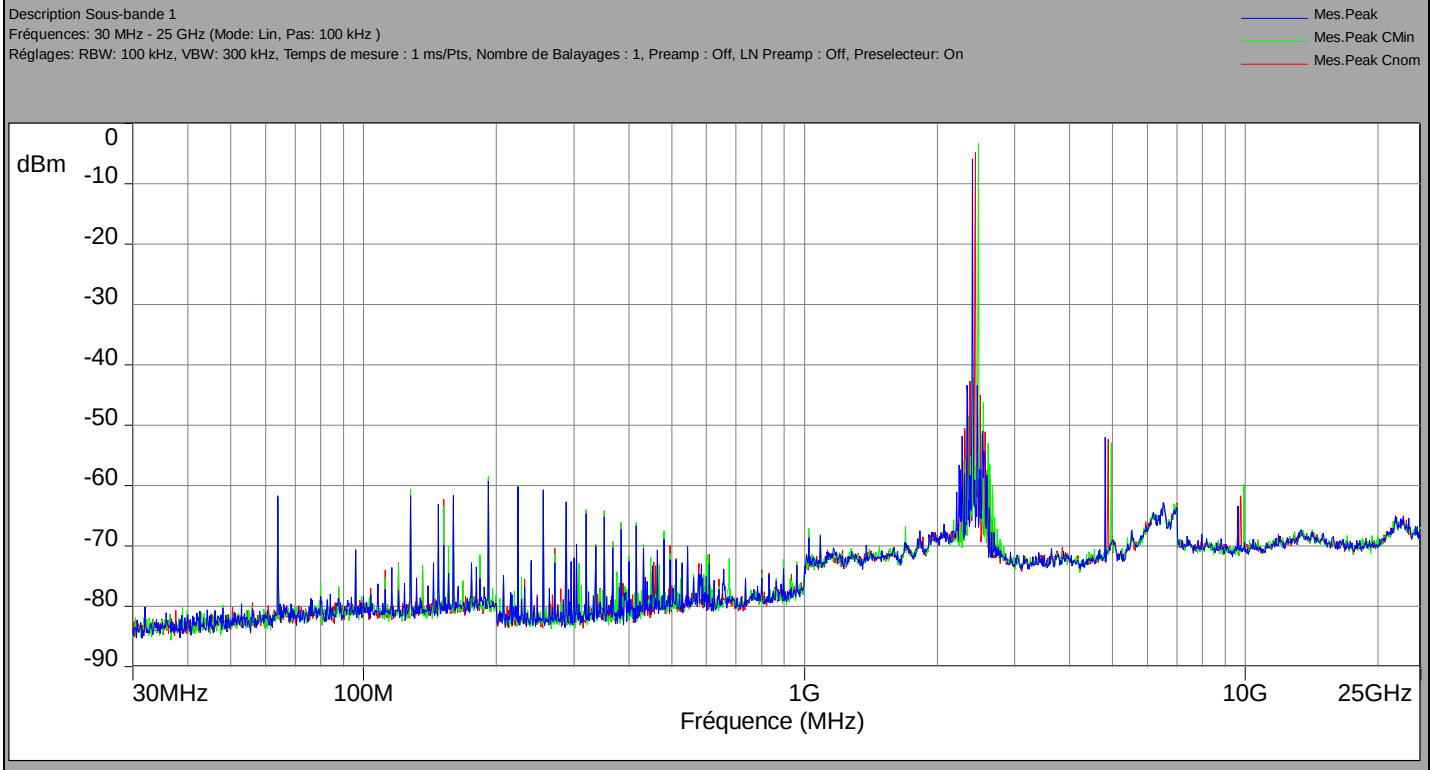


Photograph for Unwanted Emissions into Non-Restricted Frequency Bands

7.3. GRAPHICS & RESULTS

Cmin Cnom Cmax

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



Cmin=-5,91dBm

Frequency (MHz)	Spurious Level (dBm)	Spurious Level (dBc)
64	-61,68	55,77
128	-61,66	55,75
192	-59,29	53,38
224	-60,24	54,33
256	-60,72	54,81
2340,7	-43,39	37,48
2533	-50,97	45,06
4809,6	-51,95	46,04
9621,1	-63,39	57,48

Cnom=-5,67dBm

Frequency (MHz)	Spurious Level (dBm)	Spurious Level (dBc)
64	-62,05	56,38
128	-60,05	54,38
192	-58,67	53
224	-60,49	54,82
256	-61,22	55,55
2375,9	-42,73	37,06
2504	-44,95	39,28
4979,6	-52,33	46,66
9757,1	-61,72	56,05

Cmax=-3,27dBm

Frequency (MHz)	Spurious Level (dBm)	Spurious Level (dBc)
64	-62,05	58,78
128	-60,55	57,28
192	-58,54	55,27
224	-60	56,73
256	-60,85	57,58
2352	-48,46	45,19
2544,1	-46,24	42,97
4959,6	-52,86	49,59
9917,1	-59,83	56,56

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

8. AC POWER LINE CONDUCTED EMISSIONS

8.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
Date of test : 2014/10/10
Ambient temperature : 21°C
Relative humidity : 54%

8.2. TEST SETUP

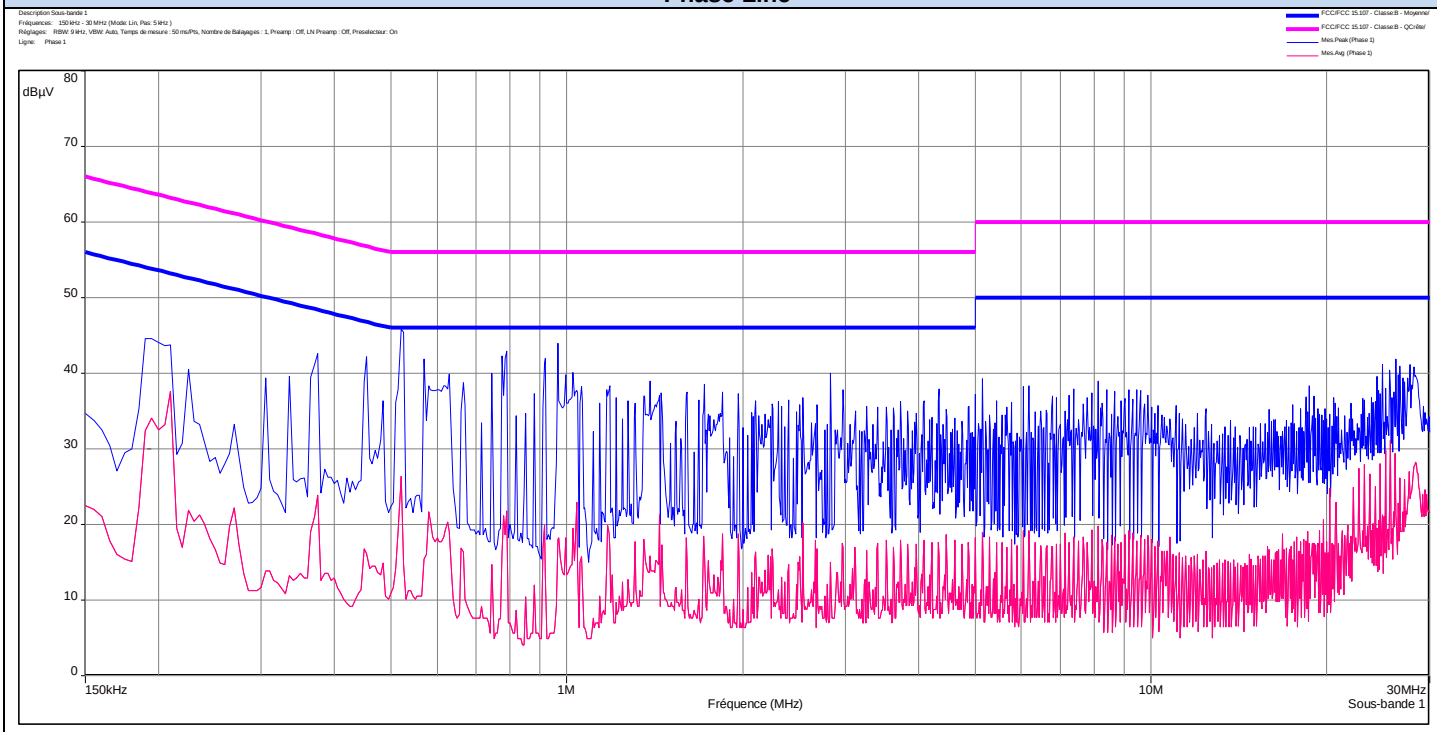
The product has been tested according to ANSI C63.10 (2009) method. The EUT is placed on the ground reference plane, at 80cm from the LISN. The distance between the EUT and the vertical ground plane is 40cm. Auxiliaries are powered by another LISN. The cable has been shorted to 1meter length. The EUT 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 50Ω / 50µH. Interconnecting cables and equipment's were moved to position that maximized emission.

Photograph for AC Power Line Conducted Emissions (Front view)

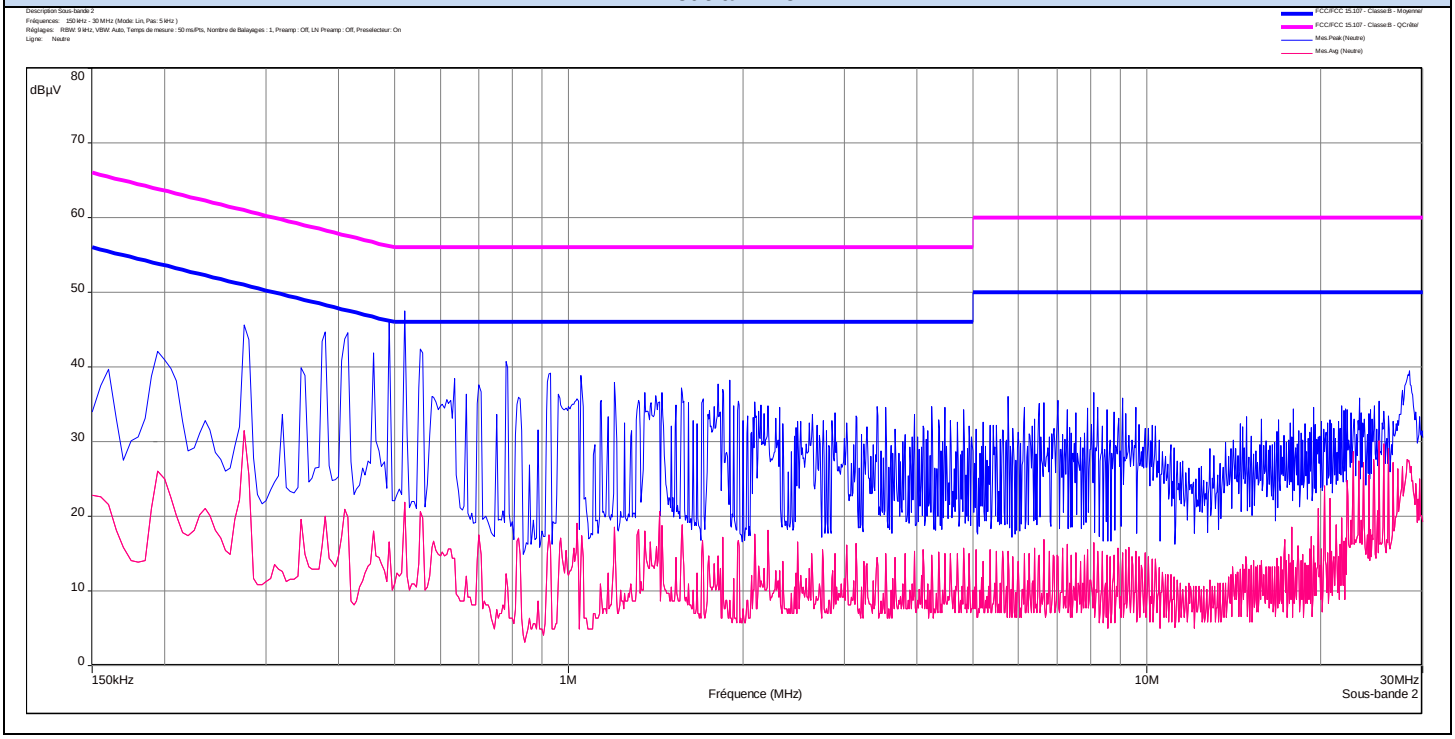
Photograph for AC Power Line Conducted Emissions (Rear view)

8.3. RESULTS

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)
0,19	44,61	-	64	32,42	54
0,21	43,77	-	63,2	37,62	53,2
0,52	45,79	-	56	26,32	46
0,965	44	-	56	18,23	46
2,83	40,05	-	56	14,98	46
26,22	41,92	-	60	26,18	50

Neutral Line

Frequency (MHz)	Peak Level (dBµV)	Quasi-Peak Level (dBµV)	Quasi-Peak Limit (dBµV)	Average Level (dBµV)	Average Limit (dBµV)
0,27	45,63	-	60,94	31,44	50,94
0,41	44,54	-	57,54	20,94	47,54
0,49	46,31	-	56,17	18,06	46,17
0,52	47,48	-	56	21,89	46
0,78	40,72	-	56	12,32	46
28,17	39,45	-	60	27,57	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

9. UNWANTED EMISSIONS INTO RESTRICTED FREQUENCY BANDS

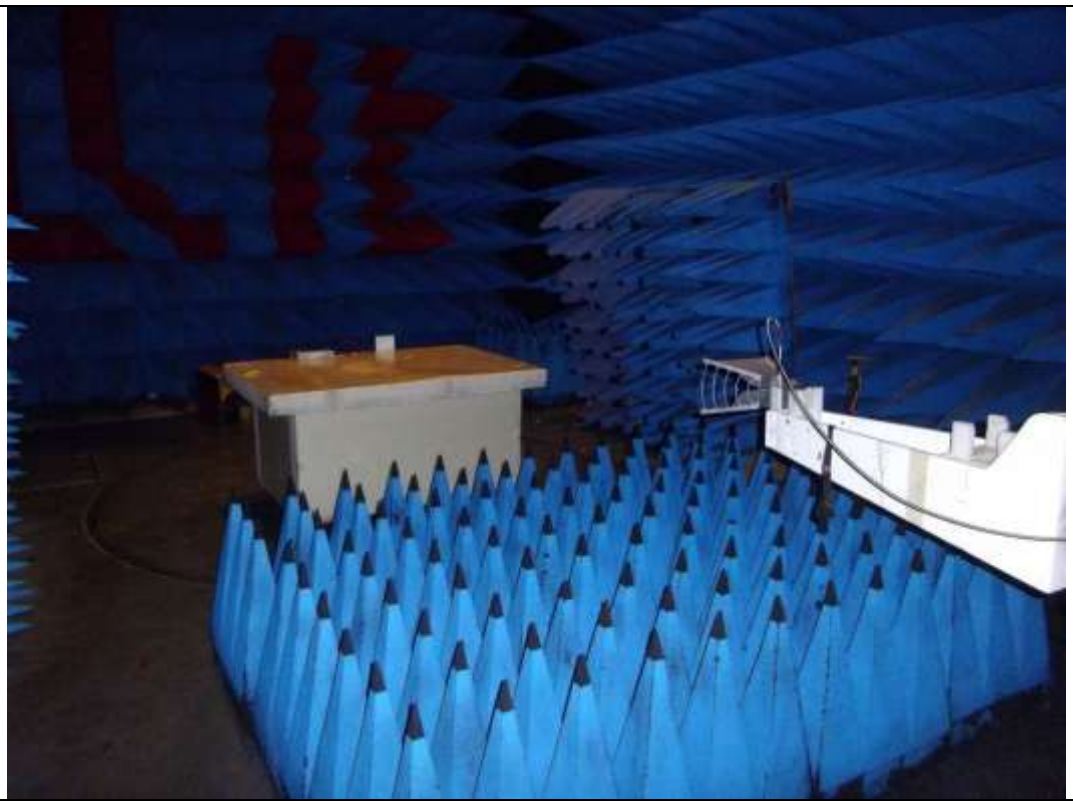
9.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
Date of test : 2014/10/10
Ambient temperature : 21°C
Relative humidity : 54%

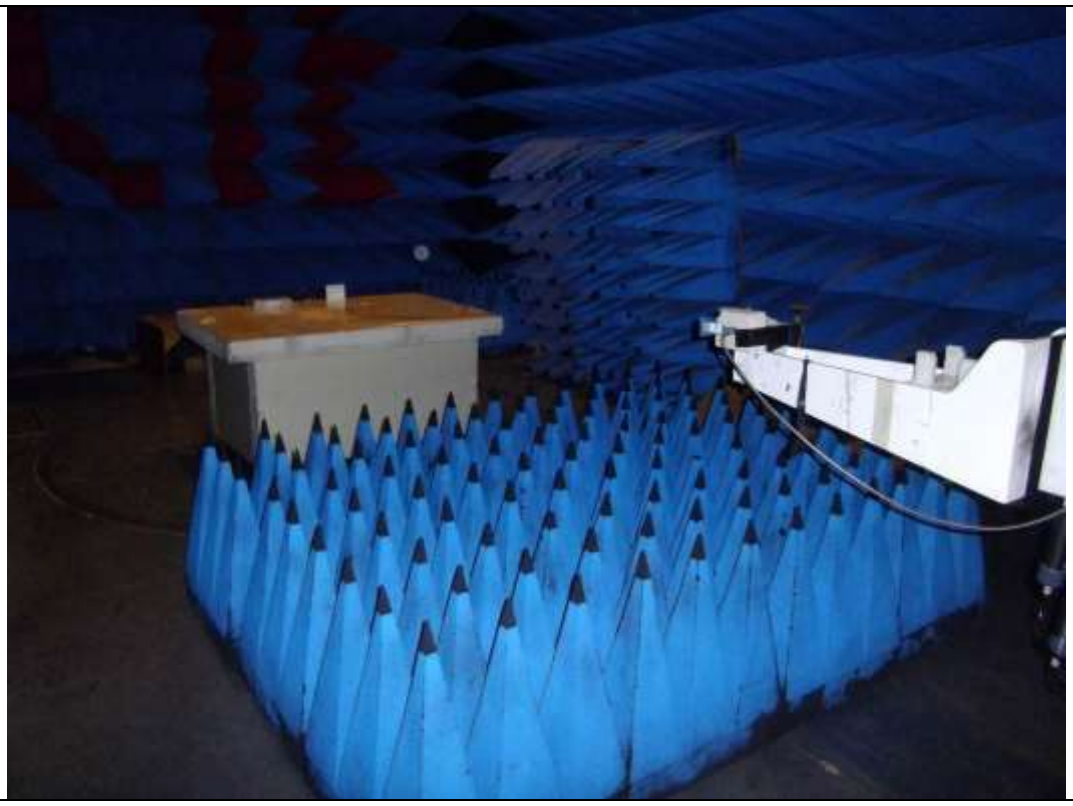
9.2. TEST SETUP

The product has been tested according to ANSI C63.10 (2009). The EUT is placed in a semi-anechoic chamber. Distance between measuring antenna and the EUT is 3m. 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.

Photograph for Unwanted Emissions into Restricted Frequency Bands



Photograph for Unwanted Emissions into Restricted Frequency Bands



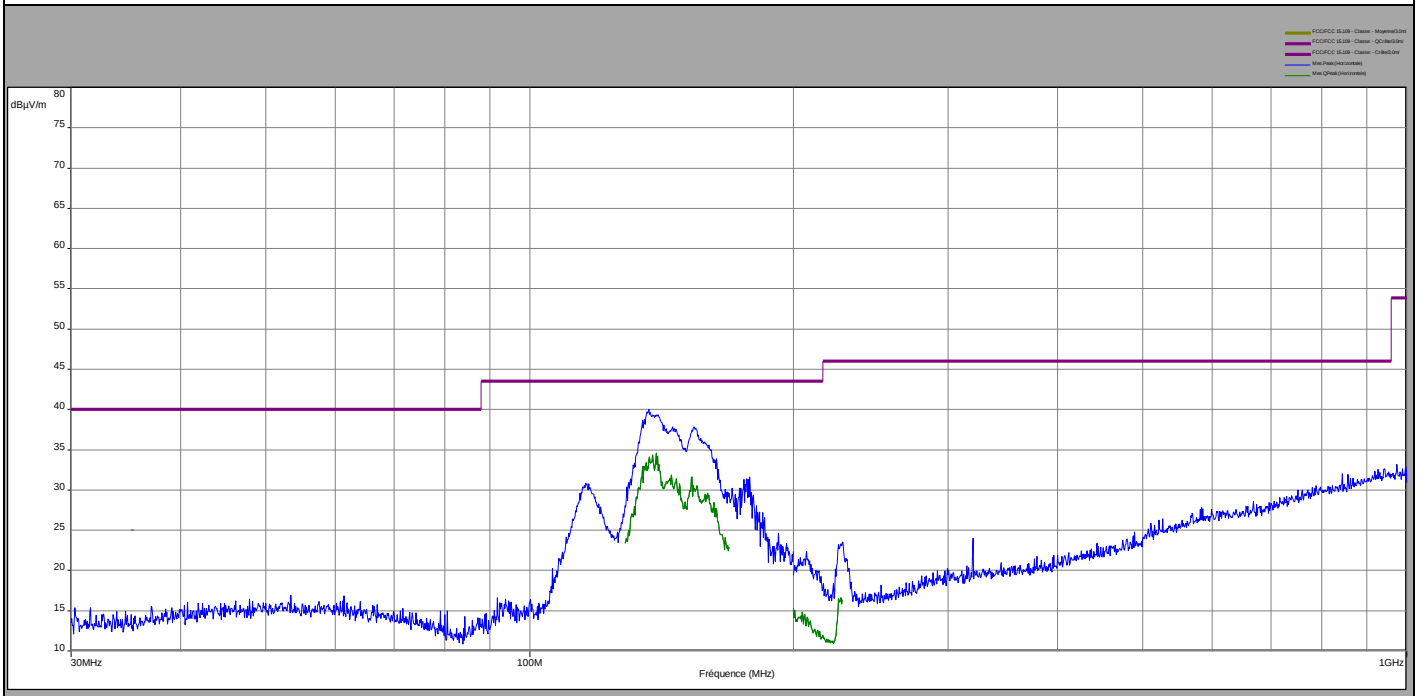
Photograph for Unwanted Emissions into Restricted Frequency Bands

9.3. RESULTS

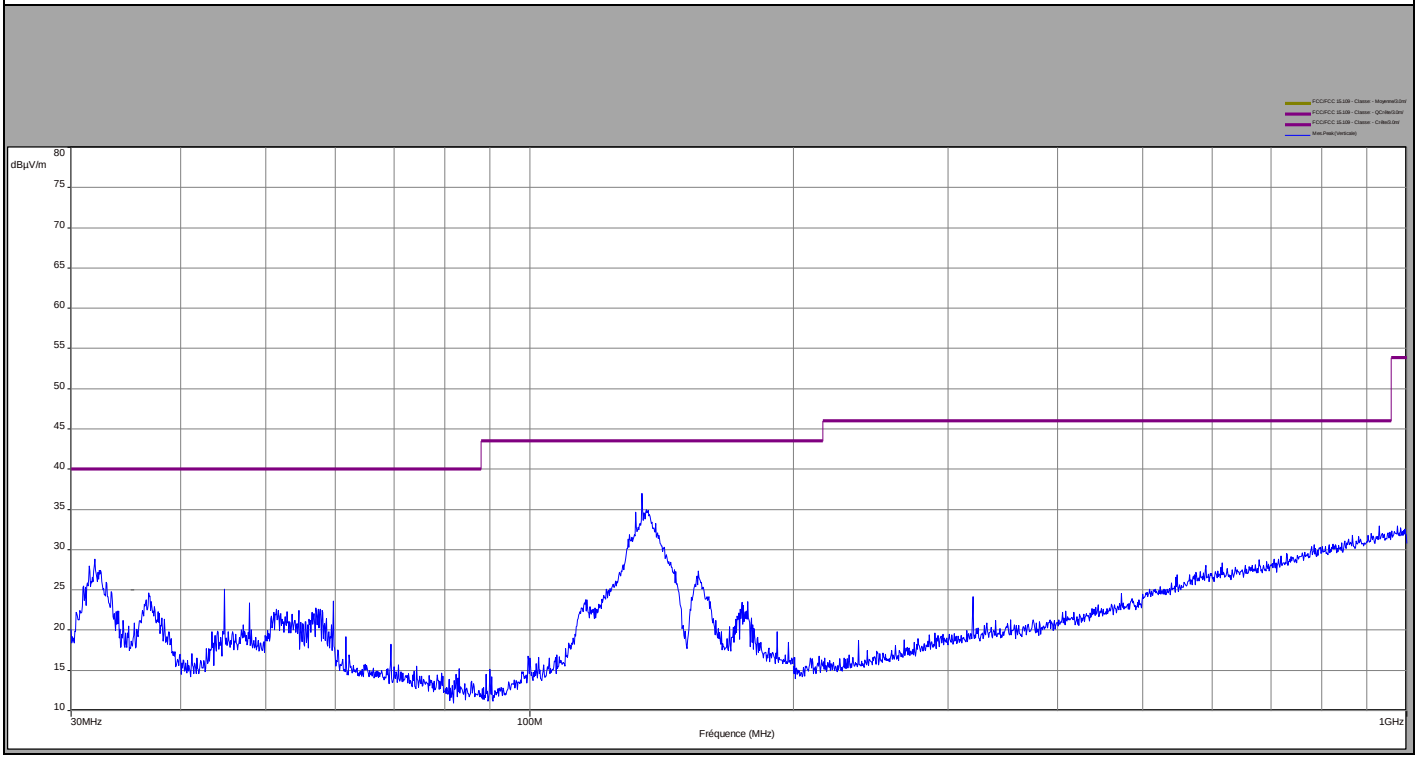
Below 1GHz

Cmin

vertical



Horizontal

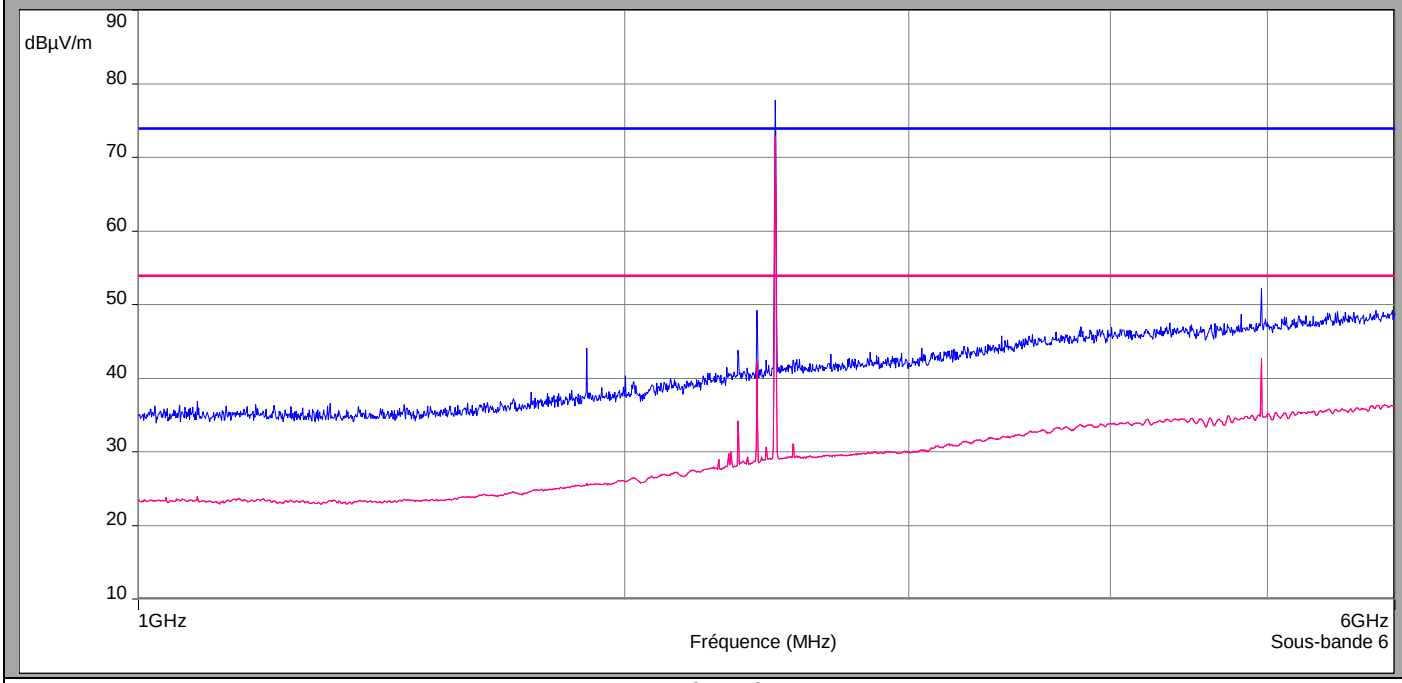


Above 1GHz to 6GHz

Cmin

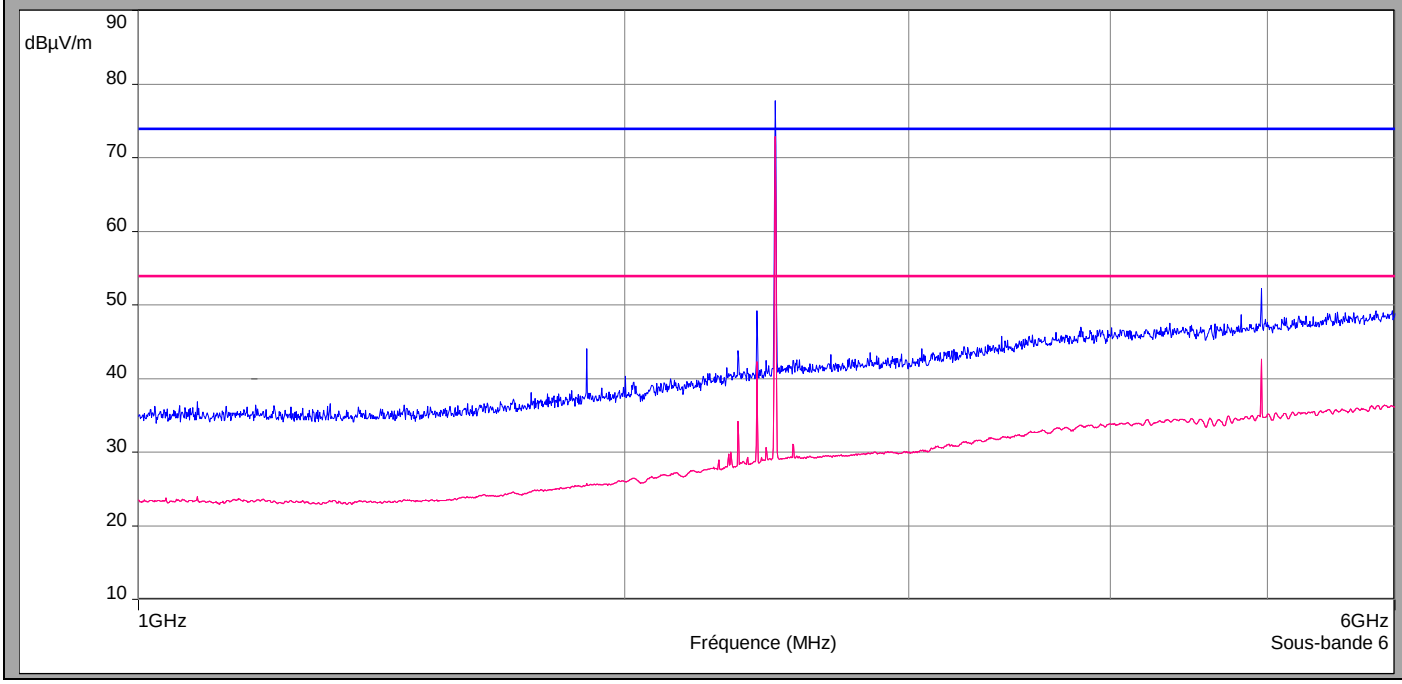
vertical

Description Sous-bande 6
Fréquences: 1 GHz - 6 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Verticale
Distance: 3 m



Horizontal

Description Sous-bande 6
Fréquences: 1 GHz - 6 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Verticale
Distance: 3 m

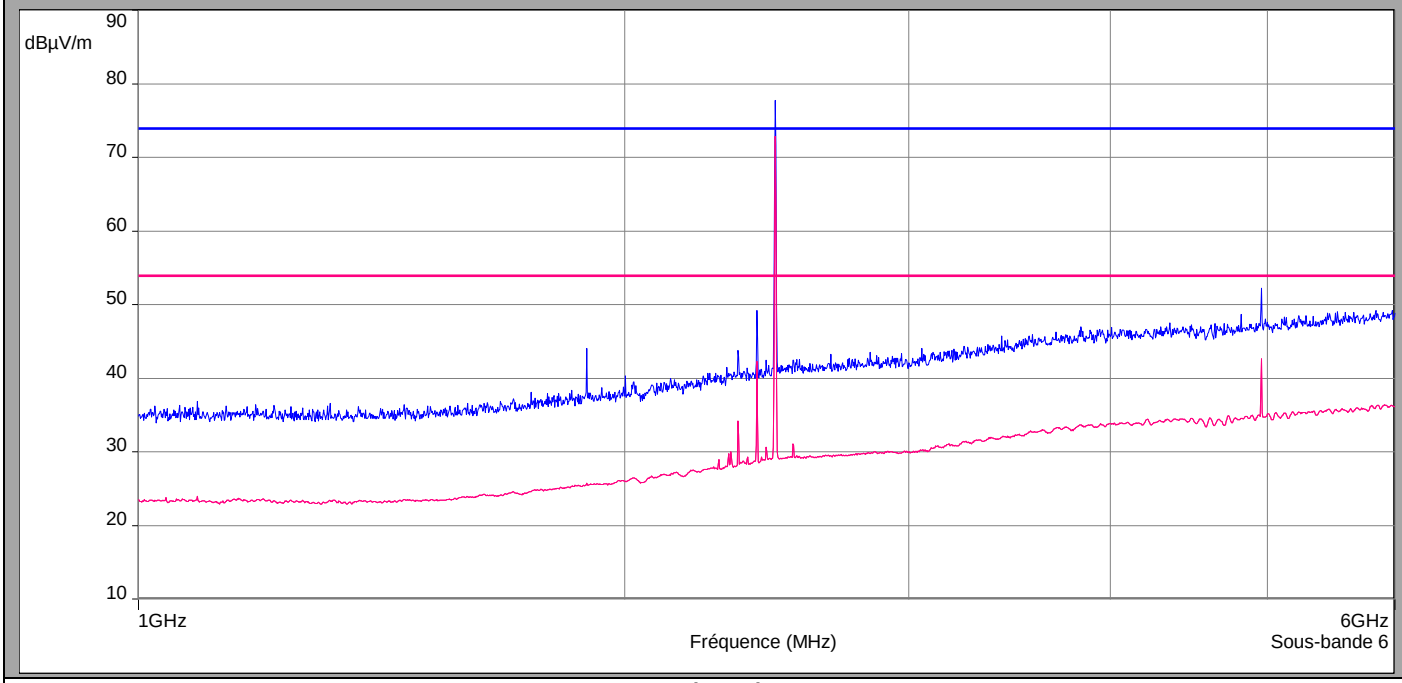


Above 1GHz to 6GHz

Cnom

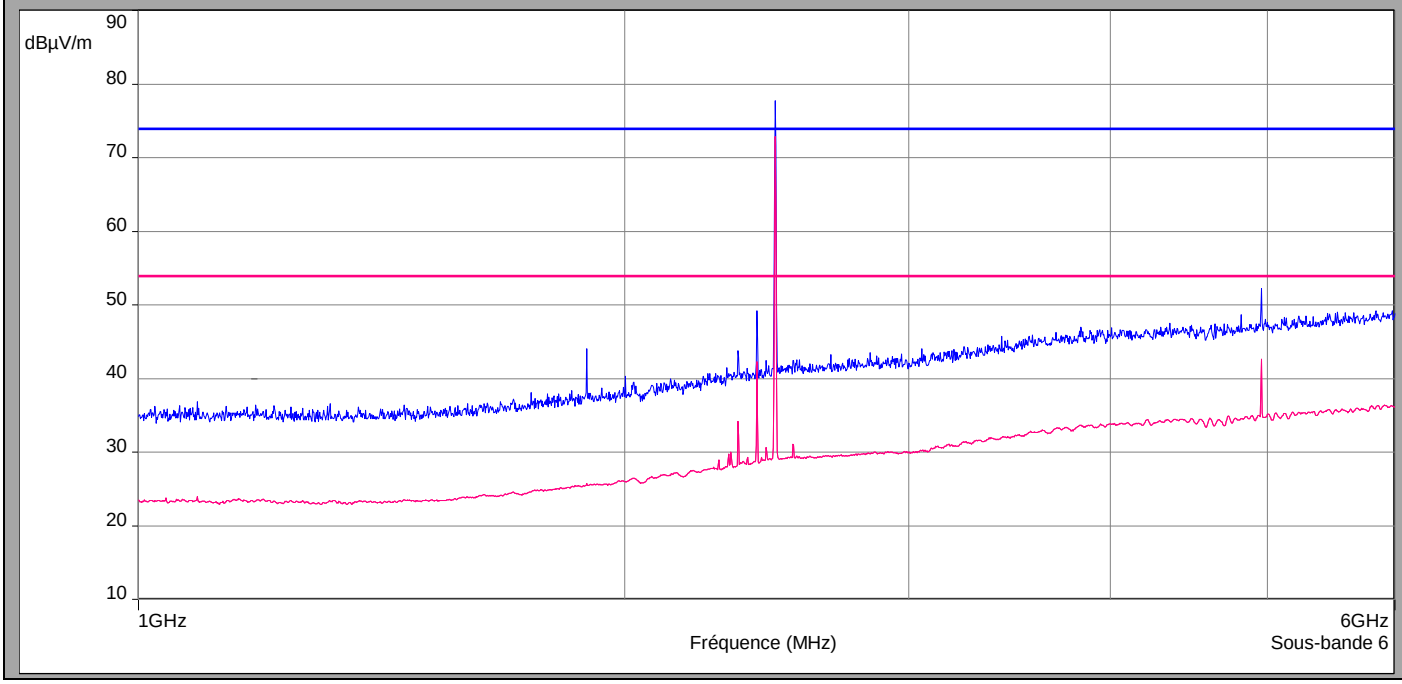
vertical

Description Sous-bande 6
Fréquences: 1 GHz - 6 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Verticale
Distance: 3 m



Horizontal

Description Sous-bande 6
Fréquences: 1 GHz - 6 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Verticale
Distance: 3 m



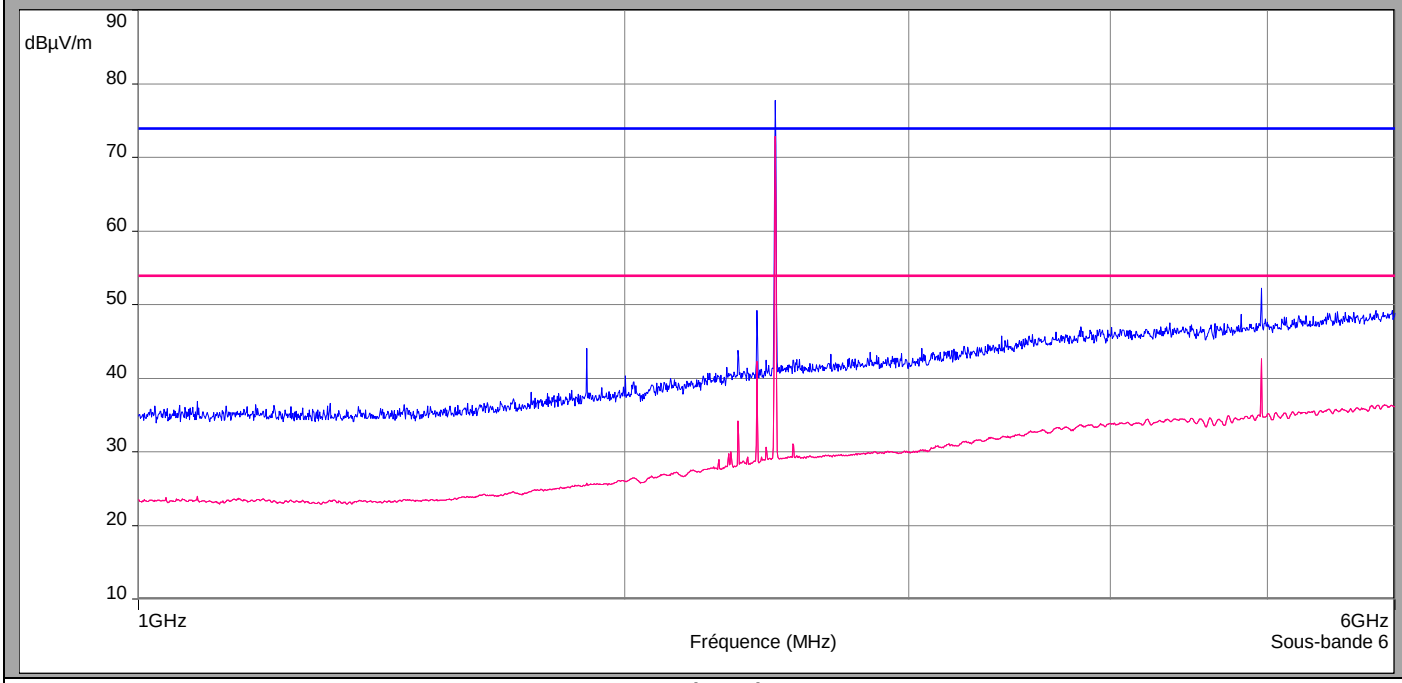
Above 1GHz to 6GHz

Cmax

vertical

Description Sous-bande 6
Fréquences: 1 GHz - 6 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Verticale
Distance: 3 m

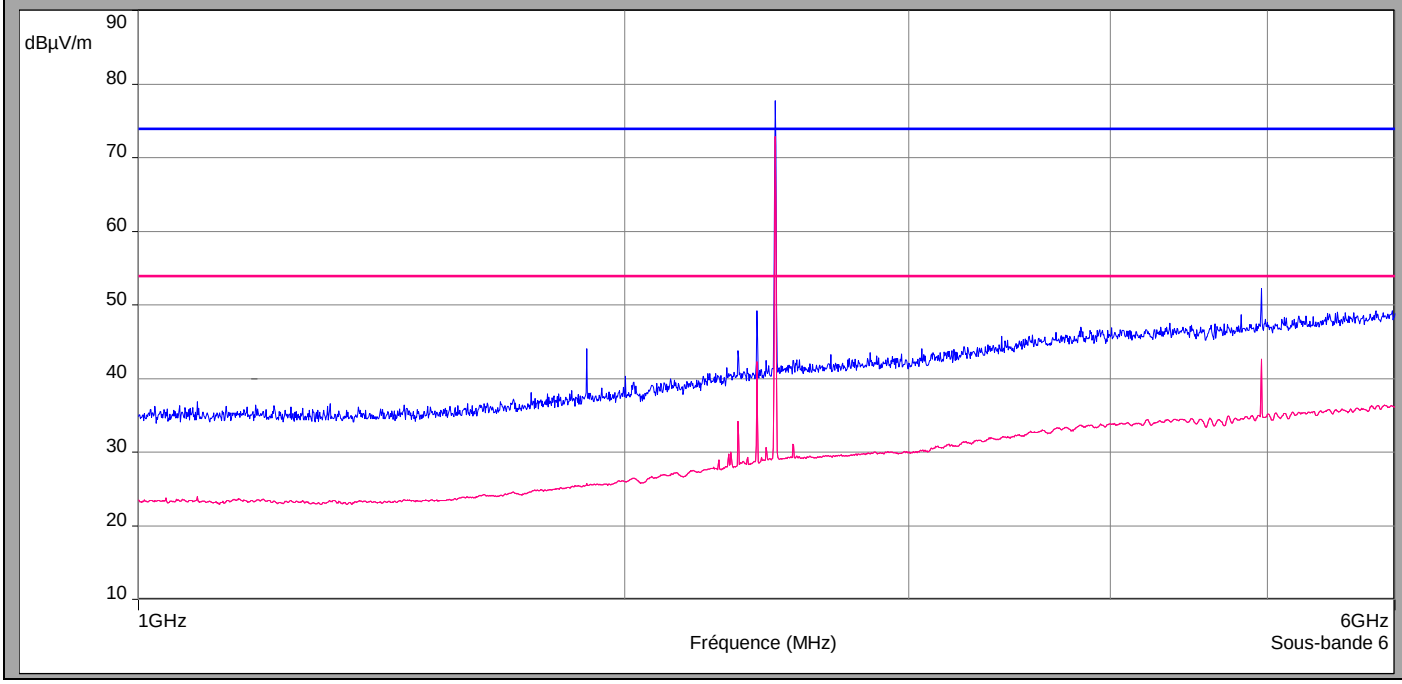
FCC/FCC 15.109 - Classe: - Moyenne/3.0m/
FCC/FCC 15.109 - Classe: - Crête/3.0m/
Mes.Peak (Verticale)
Mes.Avg (Verticale)



Horizontal

Description Sous-bande 6
Fréquences: 1 GHz - 6 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Verticale
Distance: 3 m

FCC/FCC 15.109 - Classe: - Moyenne/3.0m/
FCC/FCC 15.109 - Classe: - Crête/3.0m/
Mes.Peak (Verticale)
Mes.Avg (Verticale)

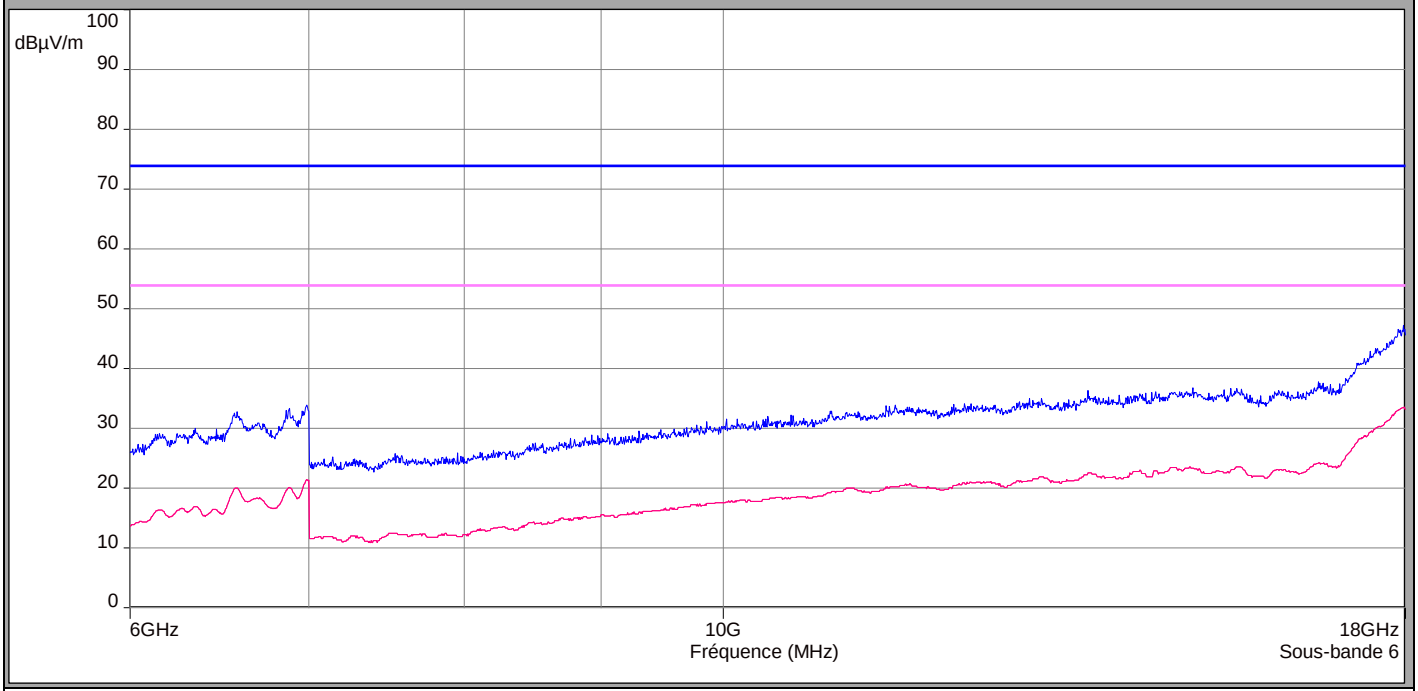


Above 6GHz to 18GHz

Cmin

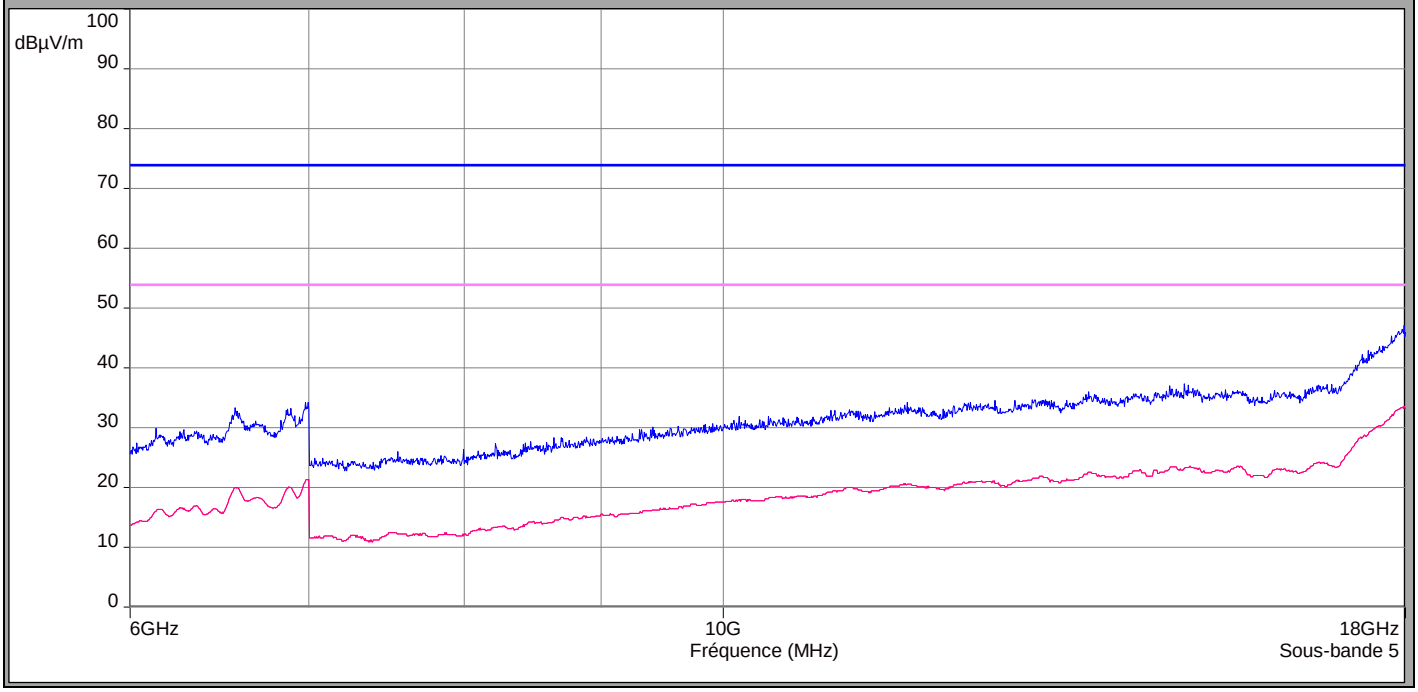
vertical

Description Sous-bande 6
Fréquences: 6 GHz - 18 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Verticale
Distance: 3 m



Horizontal

Description Sous-bande 5
Fréquences: 6 GHz - 18 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Horizontale
Distance: 3 m

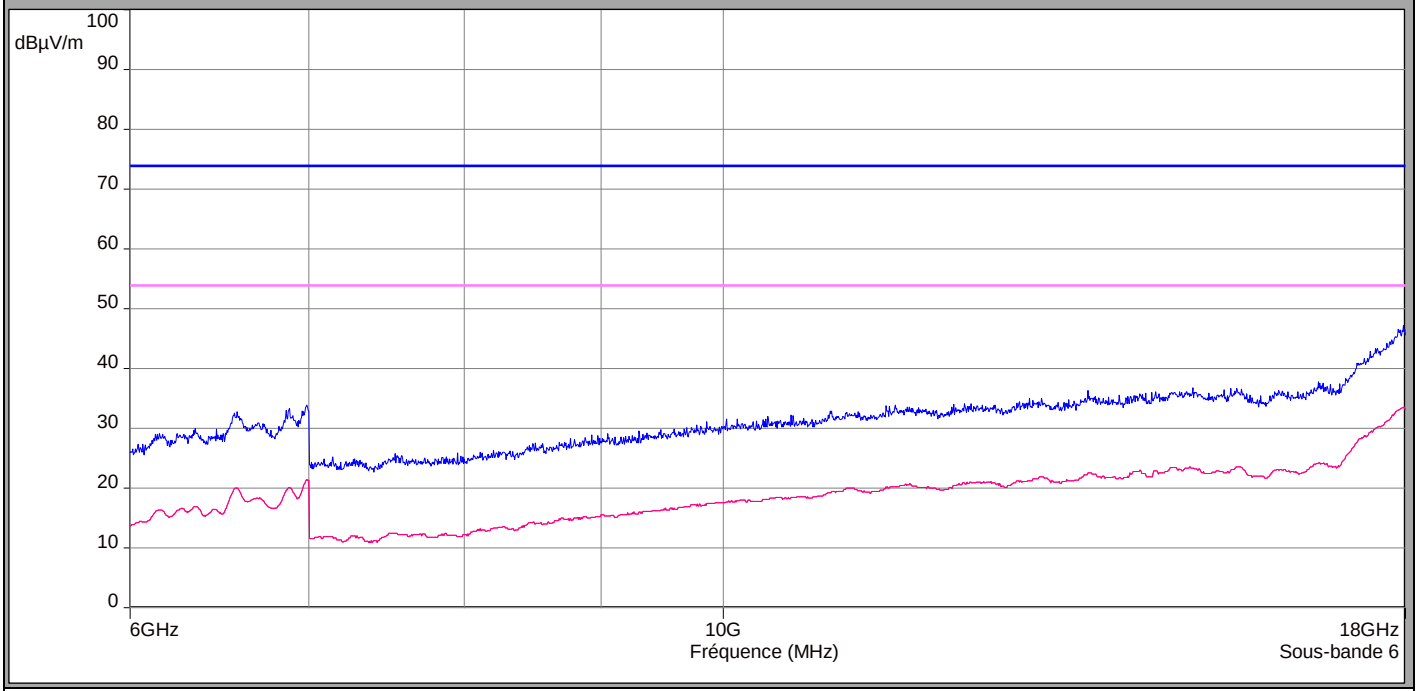


Above 6GHz to 18GHz

Cnom

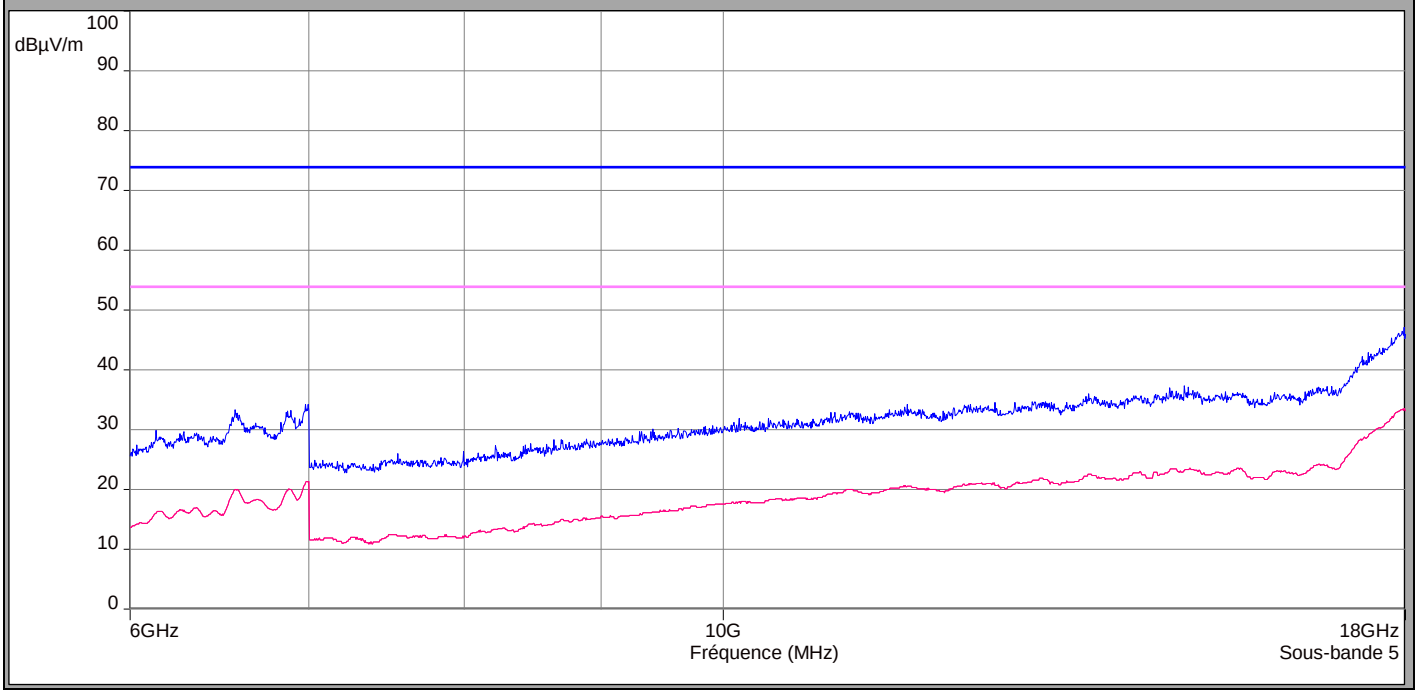
vertical

Description Sous-bande 6
Fréquences: 6 GHz - 18 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Verticale
Distance: 3 m



Horizontal

Description Sous-bande 5
Fréquences: 6 GHz - 18 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Horizontale
Distance: 3 m

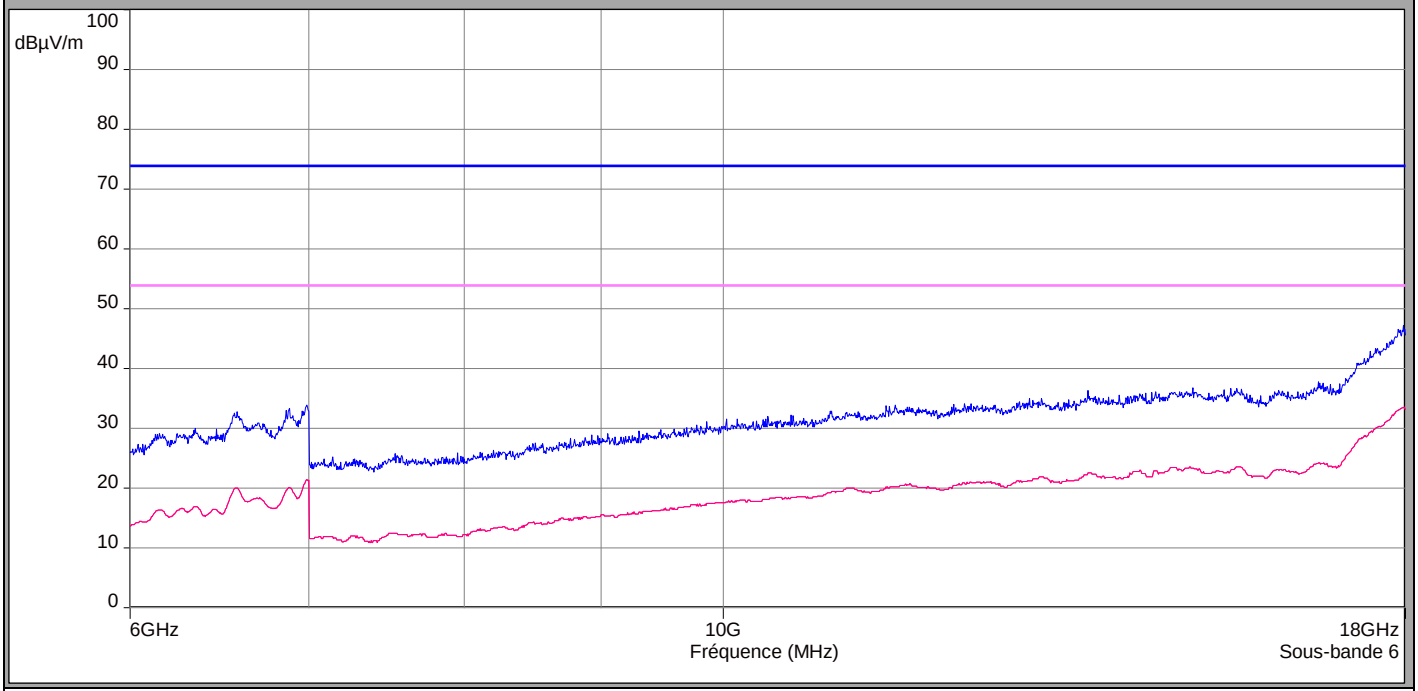


Above 6GHz to 18GHz

Cmax

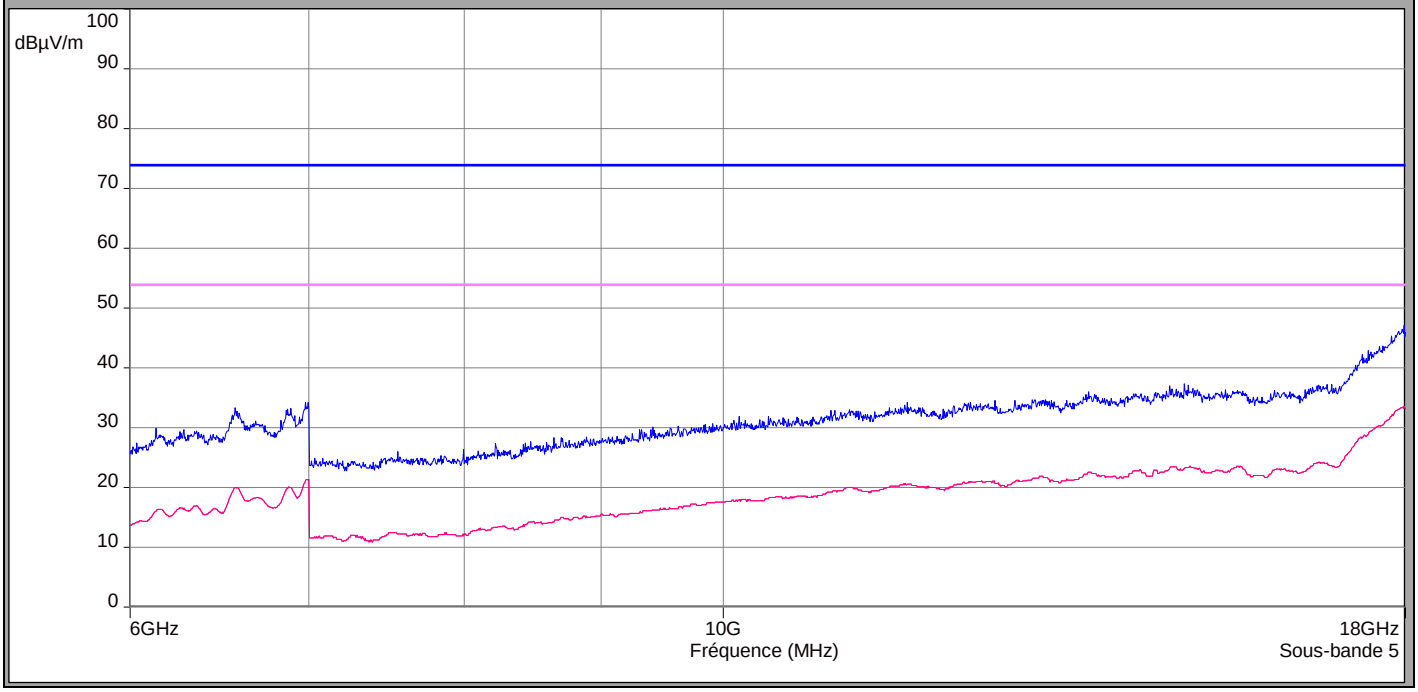
vertical

Description Sous-bande 6
Fréquences: 6 GHz - 18 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Verticale
Distance: 3 m



Horizontal

Description Sous-bande 5
Fréquences: 6 GHz - 18 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Horizontale
Distance: 3 m



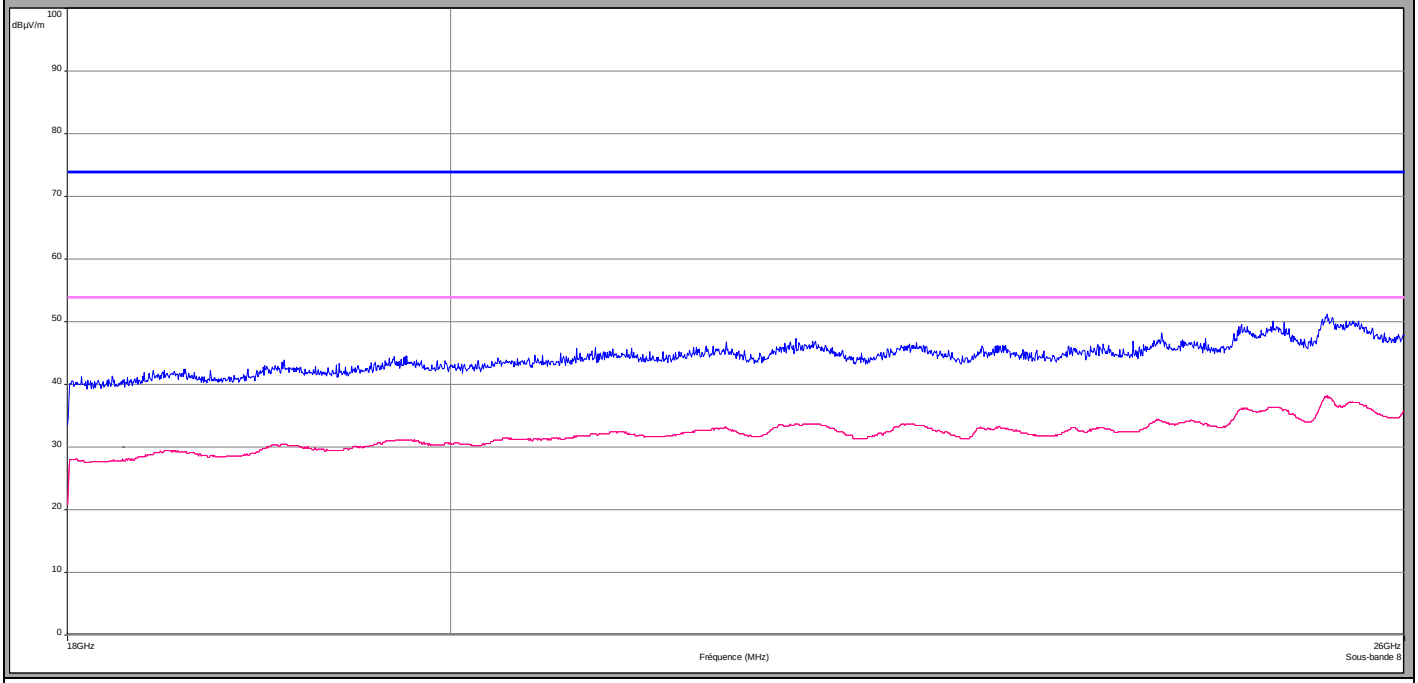
Above 18GHz to 26GHz

Cmin

vertical

Description Sous-bande 8
Fréquences: 18 GHz - 26 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Verticale
Distance: 3 m

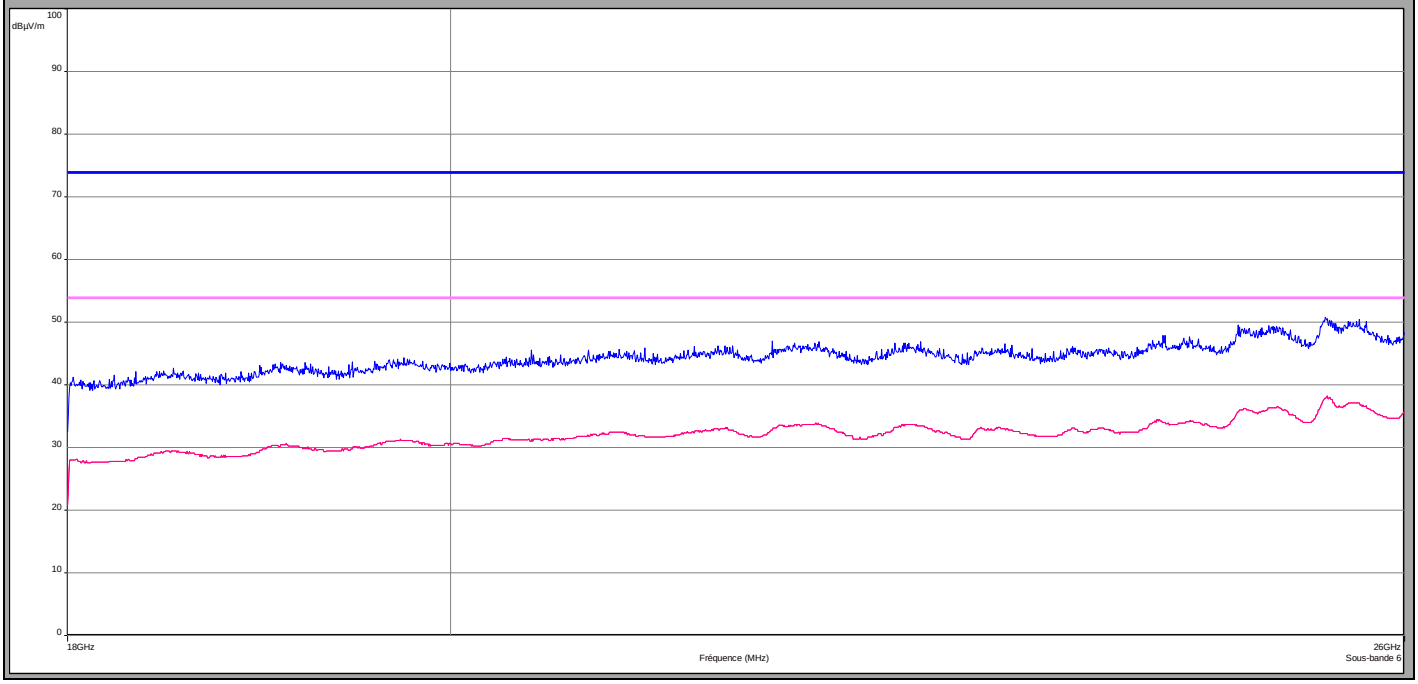
FCC/FCC 15.209 >30M - Classe:1 - Moyenne/3.0m/
FCC/FCC 15.209 >30M - Classe:1 - Crête/3.0m/
Mes.Peak (Verticale)
Mes.Avg (Verticale)



Horizontal

Description Sous-bande 6
Fréquences: 18 GHz - 26 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Horizontale
Distance: 3 m

FCC/FCC 15.209 >30M - Classe:1 - Moyenne/3.0m/
FCC/FCC 15.209 >30M - Classe:1 - Crête/3.0m/
Mes.Peak (Horizontale)
Mes.Avg (Horizontale)

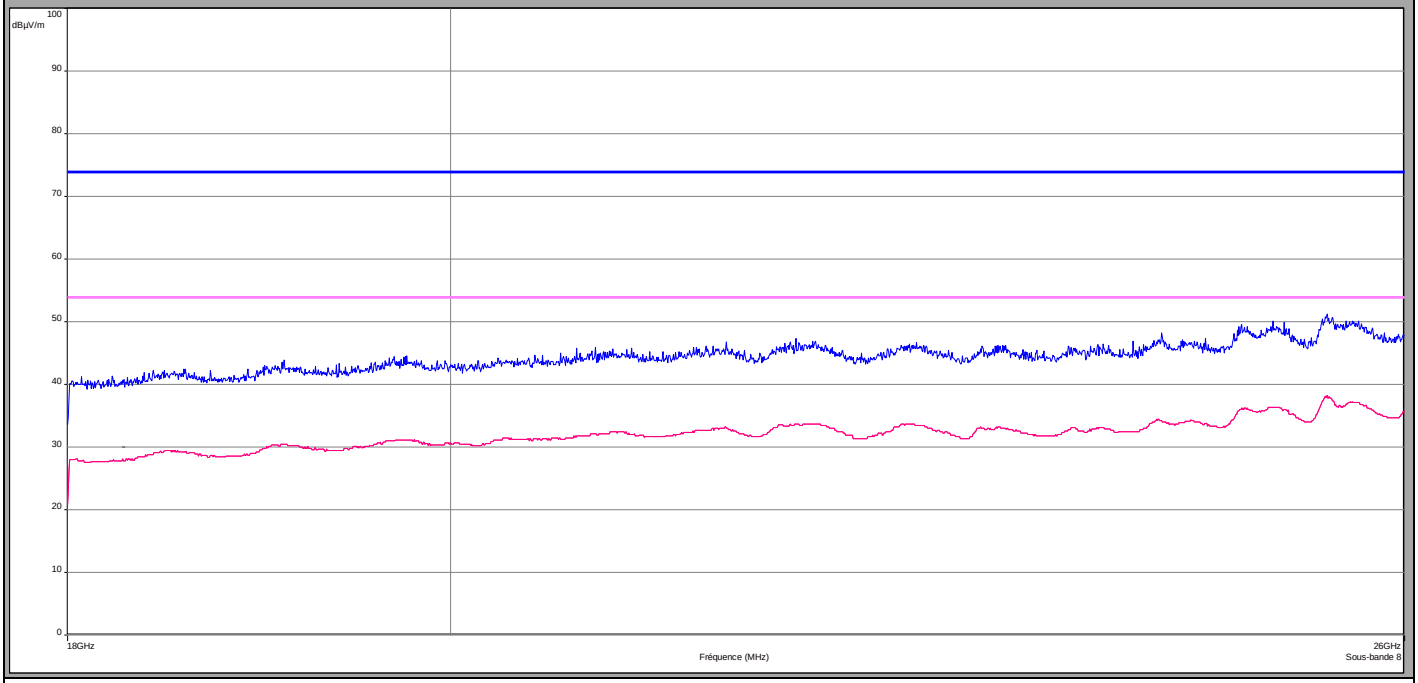


Above 18GHz to 26GHz

Cnom

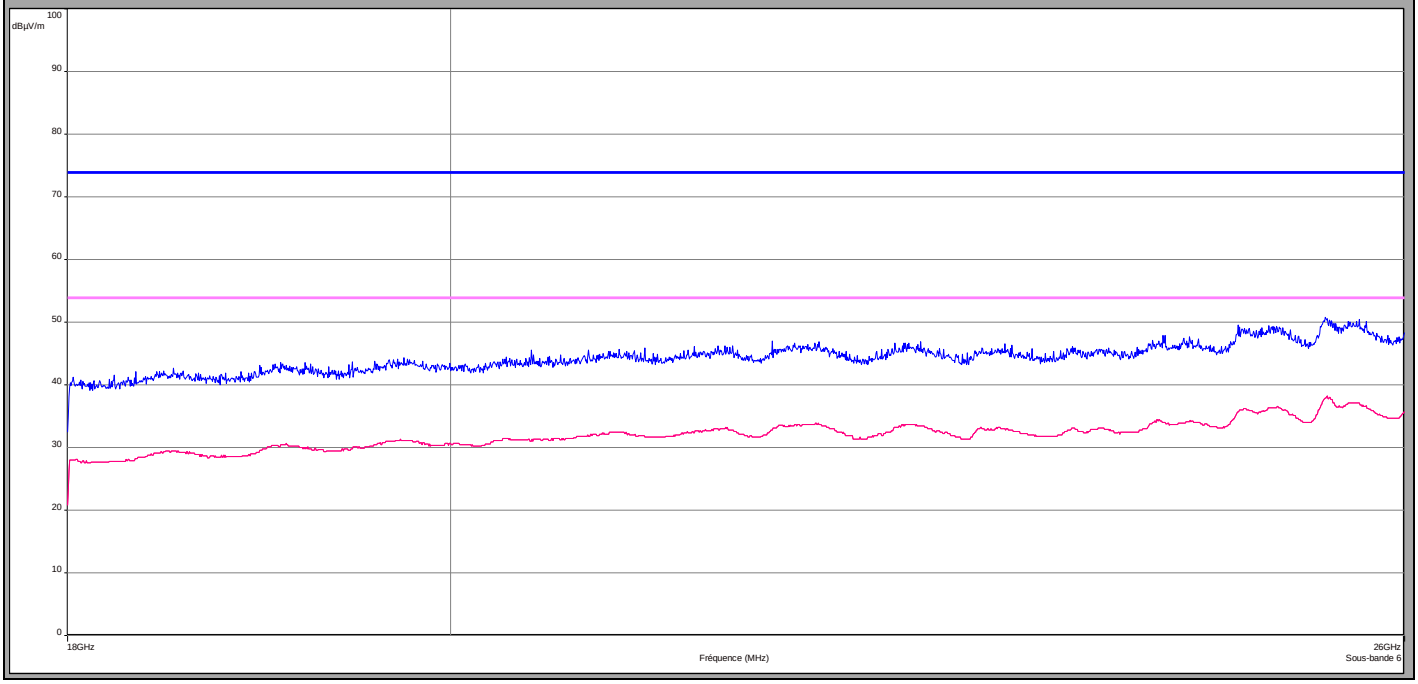
vertical

Description Sous-bande 8
Fréquences: 18 GHz - 26 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Verticale
Distance: 3 m



Horizontal

Description Sous-bande 6
Fréquences: 18 GHz - 26 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Horizontale
Distance: 3 m



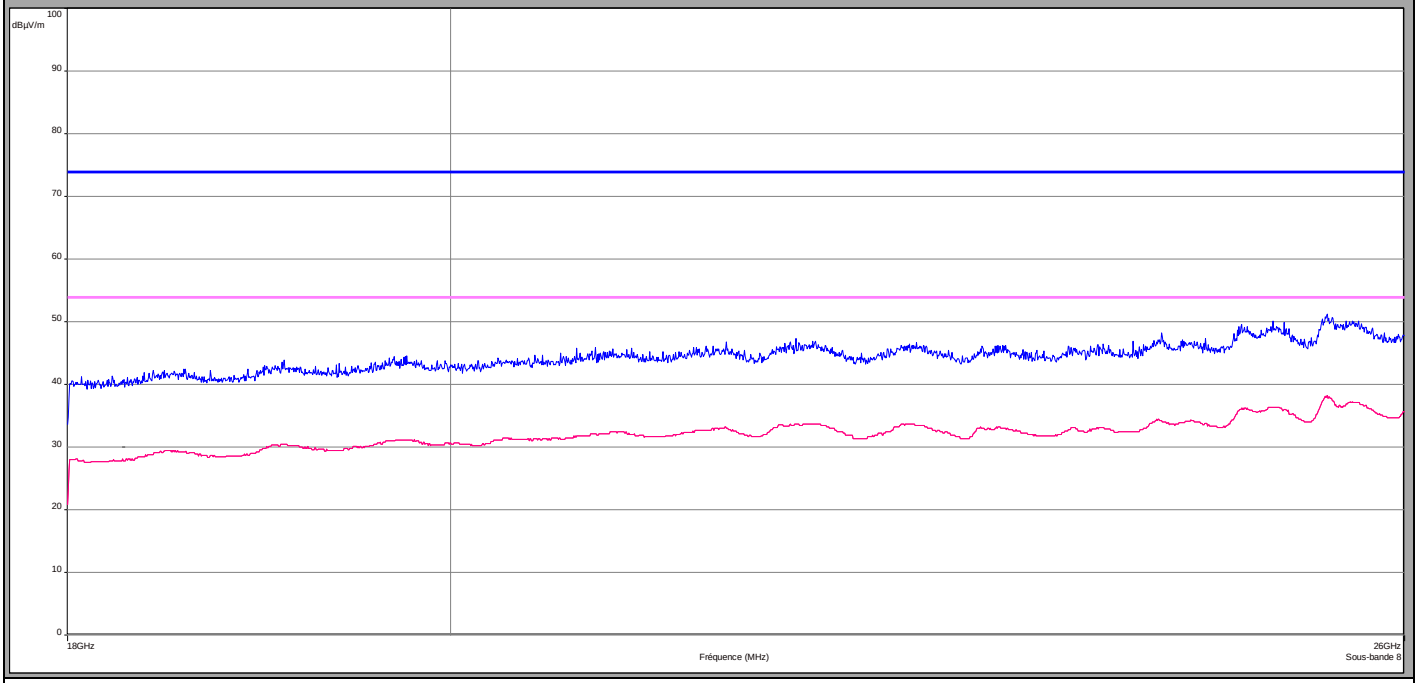
Above 18GHz to 26GHz

Cmax

vertical

Description Sous-bande 8
Fréquences: 18 GHz - 26 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Verticale
Distance: 3 m

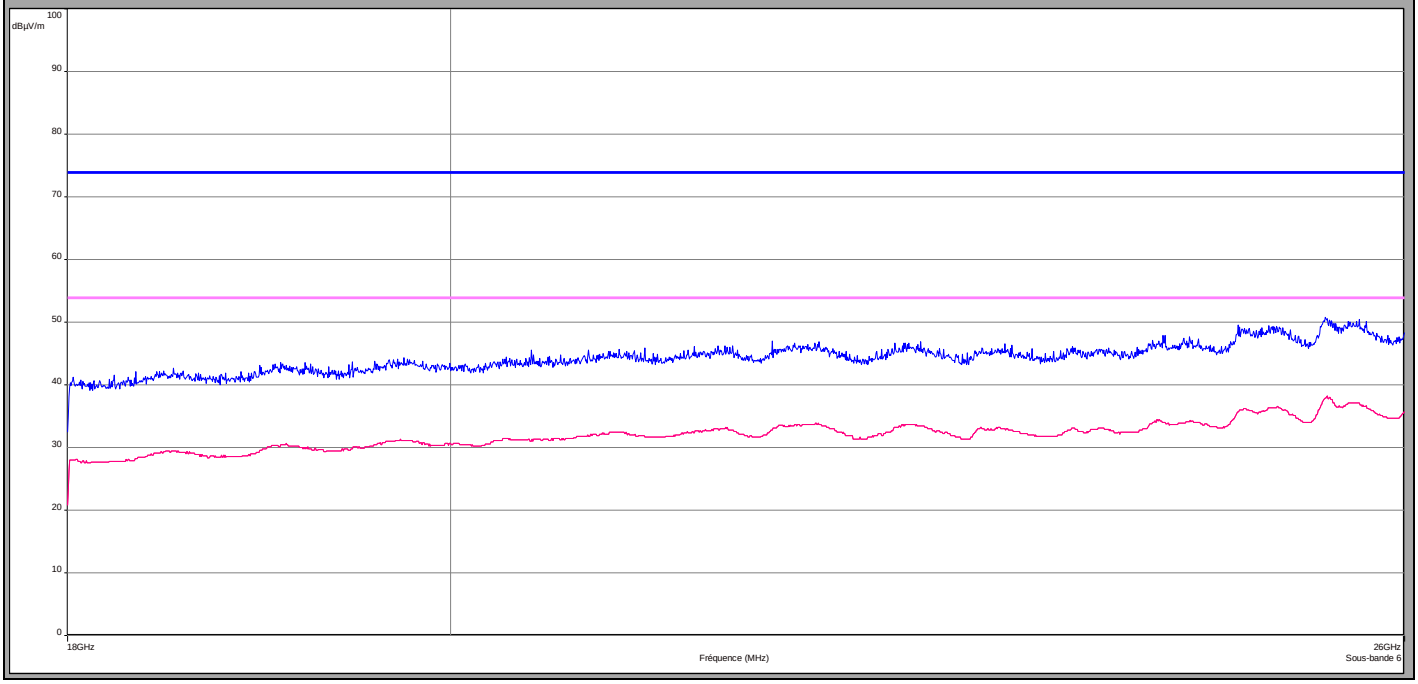
FCC/FCC 15.209 >30M - Classe:1 - Moyenne/3.0m/
FCC/FCC 15.209 >30M - Classe:1 - Crête/3.0m/
Mes.Peak (Verticale)
Mes.Avg (Verticale)



Horizontal

Description Sous-bande 6
Fréquences: 18 GHz - 26 GHz (Mode: Lin, Pas: 500 kHz)
Réglages: RBW: 1 MHz, VBW: Auto, Temps de mesure : 10 ms/Pts, Nombre de Balayages : 1, Preamp : On : 20 dB, LN Preamp : Off, Preselecteur: Off
Polarisation:Horizontale
Distance: 3 m

FCC/FCC 15.209 >30M - Classe:1 - Moyenne/3.0m/
FCC/FCC 15.209 >30M - Classe:1 - Crête/3.0m/
Mes.Peak (Horizontale)
Mes.Avg (Horizontale)



- **Characterization in a semi anechoic chamber (30MHz to 26GHz):**

Below 1GHz
Cmin

Polarisation	Frequency (MHz)	Peak Level (dBµV/m)	QPeak Level (dBµV/m)	Limit (dBµV/m)
V	31,95	28,8	-	40
V	36,8	24,63	-	40
V	44,85	25,07	-	40
V	59,7	23,57	-	40
H	115,75	30,82	-	43,5
H	136,8	39,99	34,14	43,5
H	140,2	39,1	34,56	43,5
H	153,9	37,82	31,65	43,5
H	178	31,64	-	43,5
H	320	23,09	-	46

Above 1GHz
Cmin-Cnom-Cmax

Polarisation	Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)
V	1895,5	25,78	54	44,05	74
V	2352	34,2	54	43,42	74
V	4958,5	42,58	54	51,48	74
H	1896	26,5	54	52,16	74
H	2352	35,01	54	44	74
H	4958,5	42,45	54	51,42	74

Result: PASS

Limit: →

30MHz to 88MHz:	40dBµV/m QPeak
88MHz to 216MHz:	43,5dBµV/m QPeak
216MHz to 960MHz:	46dBµV/m QPeak
960MHz to 1000MHz:	54dBµV/m QPeak
Above 1000MHz:	74dBµV/m Peak
	54dBµV/m Average

10. TEST EQUIPMENT LIST

-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**
RF Cable	TELEDYNE	Stormflex 141 920-0202-048	A5329661	2014/04	2015/04
Attenuator	MINICIRCUIT	BW-S3W2	A7122208	2014/09	2015/09
Spectrum analyzer	ROHDE & SCHWARZ	FSL6	A4060032	2012/11	2014/11
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	2014/05	2015/05
Multi-meter	KEITHLEY	2000	A1241084	2014/02	2016/02
Unwanted Emissions into Restricted Frequency Bands					
Apparatus	**Trade Mark**	**Type**	**Registration number**	**Calibration date**	**Calibration due**
Semi anechoic chamber	SIEPEL	C01	D3044008	2014/06	2017/06
Preamplifier	LCIE; LCIE	LCIE-ALB-001	A7080073	2013/11	2014/11
Cable	-	082-0404-1MTR	A5329625	2013/09	2014/09
EMI receiver	ROHDE & SCHWARZ	ESI40 1088 740K40	A2642010	2014/02	2015/02
Cable	-	Câble RF type Emission rayonnée	A5329261	2014/05	2015/05
Cable	CABLES & CONNECTIQUES	3.5MD/CSU528AA/3.5MD/4000	A5329374	2014/05	2015/05
Cable	CABLES & CONNECTIQUES	3.5MD/CSU528AA-TDINOX/3.5MD/7000	A5329459	2014/04	2015/04
Bilog antenna	SCHWARZBECK	VULB 9160	C2040150	2014/06	2015/06
Horn antenna	A-INFOMW	LB-10180-NF	C2042051	2014/04	2015/04
Horn antenna	PASTERNACK	PE9852/2F-20	C2042048	2013/02	2015/02
EMI receiver	ROHDE & SCHWARZ	ESI40 1088 740K40	A2642010	2014/02	2015/02
AC Power Line Conducted Emissions					
Apparatus	**Trade Mark**	**Type**	**Registration number**	**Calibration date**	**Calibration due**
Semi anechoic chamber 11,8x8,1x9,5m	SIEPEL	C01	D3044008	2014/06	2017/06
EMI receiver	ROHDE & SCHWARZ	ESI40 1088 740K40	A2642010	2014/02	2015/02
Cable	CABLES & CONNECTIQUES	-	A5329411	2014/05	2015/05
Cable	CABLES & CONNECTIQUES	-	A5329412	2013/12	2014/12
Cable	-	-	A5329530	2014/05	2015/05
V LISN	ROHDE & SCHWARZ	ENV216	C2320162	2014/03	2015/03

11. UNCERTAINTIES CHART

Kind of test	Measurement uncertainties (k=2) ±x(dB) / (Hz)	Limit for uncertainties ±y(dB)
TRANSMITTER REQUIREMENTS		
Radio frequency	$\pm 2.10^{-8}$ Hz	$\pm 1.10^{-7}$ Hz
RF Conducted power	±0.6 dB	±1.5 dB
Spurious emissions • Frequency < 1000 MHz • Frequency > 1000 MHz	 ±3.9 dB ±3.1 dB	±6 dB
Spurious in conduction	±1.6 dB	±3 dB
Temperature	±0.5°C	±1°C
Humidity	±2.5 %	±10 %
RECEIVER REQUIREMENTS		
Spurious emissions • Frequency < 1000 MHz • Frequency > 1000 MHz	 ±3.9 dB ±3.1 dB	±6 dB