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TEST REPORT

RADIO

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Composition of document: 52 pages

FCC Part 15 of September 9, 2009
RSS 243 Issue 2 (2005)
FCC Part 95 Subpart I (2008)
RSS-102 of November 2005
RSS-210 of June 2007

Issued to

SORIN CRM
Parc d'affaires NOVEOS
4, Avenue Réaumur
92140 CLAMART Cedex

Mme de JESO

Apparatus under test	SMARTVIEW MONITOR
Trade mark	SORIN GROUP
Manufacturer	SELCO EOLANE COMBREE
Type	SMARTVIEW MONITOR KA 961 (US version with GPRS)
Serial number	HB1107001S
FCC ID	YSGKA961
Test date	May 2nd to June 14th, 2011 September 23th, 2011
Tests performed by	Stéphane PHOUDIAH
Test site	LCIE Fontenay aux Roses (92) and Moret/Loing (77)
Date of issue	December 7th, 2011
Date of correction	February 24th, 2012
Date of issue	February 24th, 2012

LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES
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SUMMARY

1. REFERENCE DOCUMENTS

- **47 CFR Part 15 of September 9, 2009:** Code of federal regulations – Telecommunication –Radiofrequency devices

- **Radio performance tests procedures given in part 15:**
  - Paragraph 33: frequency range of radiated measurements
  - Paragraph 35: measurement detector functions and bandwidths
  - Paragraph 203: antenna requirement
  - Paragraph 205: restricted bands of operation
  - Paragraph 207: conducted limits
  - Paragraph 209: radiated emission limits; general requirements

- **RSS-Gen of June 2007:** General Requirements and Information for the Certification of Radiocommunication Equipment

- **RSS-102 of November 2010:** Radio Frequency Exposure Compliance of Radiocommunication Apparatus

- **RSS-210 of June 2007 -** Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

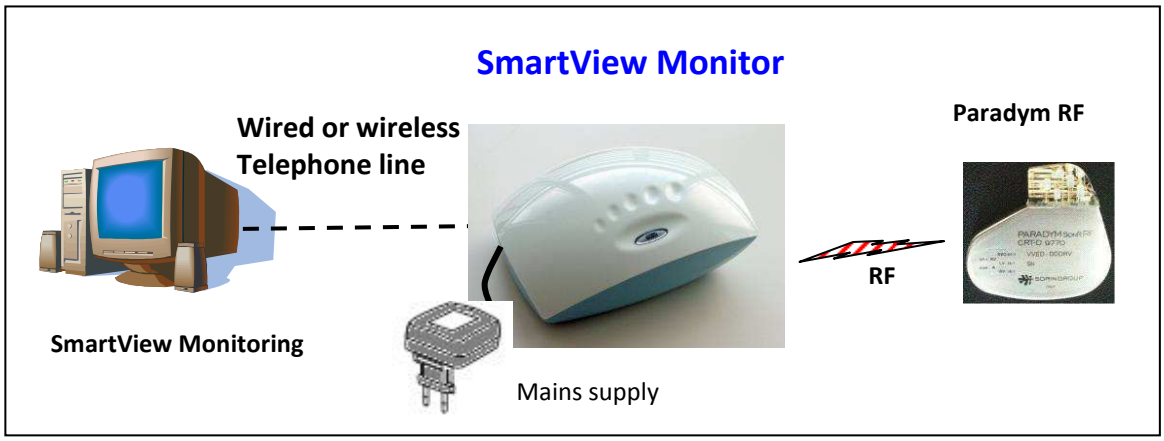
- **RSS-243 of November 2005:** - Active Medical Implants Operating in the 402-405 MHz Band

- **ANSI C63.4 of December 11, 2003:** American national standard for methods of measurement of radio noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz.

- **PART 95**—PERSONAL RADIO SERVICES - Equipment Description

2. EQUIPMENT UNDER TEST DESCRIPTION

The SmartView Monitor (SM) is intended to collect patient's clinical data from an Implantable Medical Device (IMD) and transfer them to data management system (Back Office server).
The IMD is implanted into the patient's body. The SmartView Monitor is installed at patient Home and is intended to collect data from the IMD remotely in absence of physician according to scheduled operation. It is not intended to act as emergency response system.
The connection between the SmartView Monitor and the implant is achieved through Radio-Frequency (RF) telemetry while the connection to the server is performed through the telephone line (fix or mobile net).



Applicant	**SORIN CRM** Parc d'affaires NOVEOS 4, Avenue Réaumur 92140 CLAMART Cedex
Manufacturer	**SELCO EOLANE COMBREE** Le Val d'Ombrée 49520 Combrée France
Dimensions	
Frequencies band	402-405 MHz 2400-2483 MHz GSM-GPRS: Allow connection of the SM to mobile telephony. GSM / GPRS SIMCOM SIM340E quad-band module is certified by FCC according following information. - FCC IDENTIFIER: UDV-0606020080701. - Name of Grantee: Shanghai Simcom Ltd. - Equipment Class: Part 15 Class B Computing Device Peripheral. - Notes: GSM/GPRS 850/900/1800/1900 Module. - Modular Type: Limited Single Modular.
Number of channel	10 for 402-405 MHz band 15 for 2400-2483.5 band
Channel spacing	-
Modulation	FSK for 402-405 MHz band OOK for 2400-2483.5 band
User power adjustment	No
Is the operation point to point?	Yes
Power supply	Power Supply manufactured by FRIWO, model FW 7660M/05: 100-240V~ 50-60Hz 250mA, Output 5Vdc 1.6A
I/O cables used for testing	USB cable (only for test configuration)

SMARTVIEW MONITOR KA961 (US version with GPRS)

Equipment photograph

Marking plate

Marking on PS

Marking on SMARTVIEW MONITOR

Block part	Description
User interface	- One pushbutton to allow the user to force a data transmission on demand, - One status LED indicating overall system health, - 5 LEDs showing the data collection and transmission progress
RF	- Unidirectional link from RM to implant in the ISM band (2.45 GHz) to wake up the implant. Chipcon CC2500 chip, - Bidirectional link between the RM and the implant in the MEDRADIO band (402-405 MHz) for patient data transmission (Zarlink ZL70101 chip)
Power Supply	External 100-240V to 5V AC/DC adapter Power Supply manufactured by FRIWO, model FW 7660M/05: 100-240V~ 50-60Hz 250mA, Output 5Vdc 1.6A
GSM / GPRS	GSM-GPRS: Allow connection of the SM to mobile telephony. GSM / GPRS SIMCOM SIM340E quad-band module is certified by FCC according following information. - FCC IDENTIFIER: UDV-0606020080701. - Name of Grantee: Shanghai Simcom Ltd. - Equipment Class: Part 15 Class B Computing Device Peripheral. - Notes: GSM/GPRS 850/900/1800/1900 Module. Modular Type: Limited Single Modular.
Ethernet module	To be used in production for RM investigation
Processor	Freescale MCIMX27L chip, ARM9-based 32-bit RISC
Real time clock / Battery	Maxim DS1391 RTC chip with a CR1620 backup lithium cell (60 mAh)
USB cable	Allow connection to the RM via USB
Memory (DRAM, code, data & boot FLASH)	- DRAM memory: Micron MT46H16M16 chip, 32 MB DDR SDRAM memory - Flash memories: Samsung K9F5608R0D chip, 32 MB NAND flash memory

Antenna Type

SmartView Monitor (Wake-up operating mode – ISM band):

-Monopole antenna (customized by Sorin CRM)

This antenna is internal and can not be removed.

- HP Max gain: -1dBi max
- VP Max gain: +2dBi max

-IFA antenna (customized by Sorin CRM)

This antenna is internal and can not be removed.

- HP Max gain: -6dBi max
- VP Max gain: -8dBi max

SmartView Monitor (Data transmission operating mode – MEDRADIO band)

This antenna is internal and can not be removed.

- HP Max gain: 1,4dBi max
- VP Max gain: 1,4dBi max

3. SMARTVIEW MONITOR FUNCTIONAL DESCRIPTION ET OPERATING MODES

In the following sections the SmartView Monitor is described, highlighting its Features and Operation.

Note: IMD is also described through this section as a slave of the SM.

SmartView Monitor Operation

The summary of mission / operation of the SmartView Monitor is the following:

- SM is a device to be installed in Patient Home.
  - Connection to power line (wall plug adapter)
- SM shall be activated after connecting it to power supply. Executes:
  - bootstrap;
  - self-diagnostic;
  - implant pairing (at first boot)
- SM is paired through an automatic procedure to the Implant present at first boot
- SM shall collect patient's clinical data from Implanted device and transfer them to data management system (Back Office server).
- The Implant data collection shall be performed according to 3 use cases:
  - Scheduled Patient Home Follow-up
  - On Alert event/status evidenced by the Implant diagnostic features
  - On-Demand by Patient (if enabled)
- SM shall give indication to user about its correct operation and the function in progress:
  - SM health is ok (HW and code)
  - Patient should stay close to SM
  - Communication to IMD or BO is in progress
  - Error in IMD or BO communication

SM Operating modes

The SmartView Monitor is installed at patient Home in the context of RMS. The GPRS modem is connected to Back Office through the mobile cellular telephone net.

The SmartView Monitor communicates with the implanted device on two wireless RF bands:
- ISM band (2.45- GHz) for communication initialization (implant wake-up)
- MEDRADIO (402-405 MHz) band for data transfer

IMD Operating modes

The IMD communicates with the SmartView Monitor on two wireless RF bands:
- ISM band (2.45 GHz) for communication initialization (implant wake-up)
- MEDRADIO (402-405 MHz) band for data transfer

IMD Hardware

RF bi-band communication is done using the same ultra low consumption transceiver module connected through a stripe line and a hermetic bipolar feed-thru to a unique RF antenna loop embedded to the external connector of the device. The transceiver is driven by the CPU of the device upon dedicated interrupt request raised by the RF module.

4. TEST PROGRAM

Transmitter requirement in 400 MHz band:

Test Description	FCC	RSS 243	Test result	Remarks
– Frequency error	95.628(e)	3.3	Pass	
– Emission bandwidth	95.633(e)	3.2	Pass	
– Effective isotropic radiated power	95.639(f)	5.4	Pass	**Note**
– Unwanted Emissions – Band Edge Compliance	95.635(d)	3.4	Pass	
– Conducted emissions	15.207		Pass	

Note: The 400MHz power setting has been reduced due to the GPRS antenna and his positioning. See Sorin Document "MISC1052_GprsAntennaPositioning.pdf " for more information.

Receiver requirement in 400 MHz band:

Test Description	FCC	RSS 243	Test result	Remarks
– Spurious radiation	15.209	3.5	Pass	
– Monitoring system threshold power level	95.628(a) (3)	5.7.1	Pass	
– Monitoring system bandwidth	95.628 (a) (1)	5.7.2	Pass	
– Scan cycle time	95.628 (a) (2)	5.7.3	Pass	
– Minimum channel monitoring period	95.628 (a) (2)	5.7.4	Pass	
– Channel access	95.628 (a) (4)	5.7.5	Pass	
– Discontinuation of MEDRADIO session	95.628 (a) (4)	5.7.6 (f)	Pass	
– Use of pre-scanned alternate channel	95.628 (a) (5)	5.7.7	Pass	

Pass: EUT complies with standard's requirement
Fail: EUT does not comply with standard's requirement
N/A: Not Applicable

5. TRANSMITTER - FREQUENCY ERROR

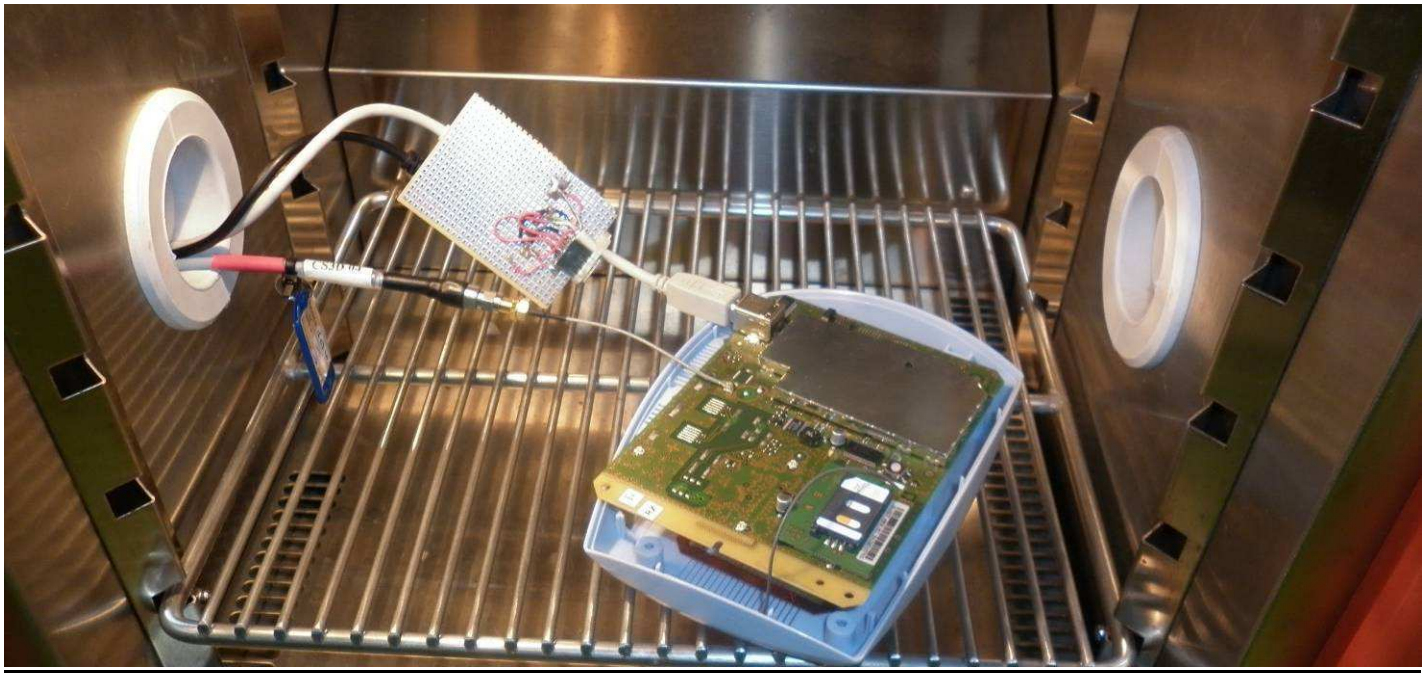
5.1. TEST CONDITIONS

Test performed by : Stéphane Phoudiah
Date of test : 2011/05/09
Ambient temperature : 20°C
Relative humidity : 40%

5.2. TEST SETUP

The test is performed on EUT in permanent emission without modulation on 402,15MHz; 403,65MHz and 404,85MHz.

Qualification measurements in a climatic chamber
For measurement under normal and extreme test conditions, the Equipment under Test is installed in the climatic chamber. A test fixture has been used.



5.3. TEST SEQUENCE AND RESULTS

Method of measurement

☒ FCC 95.628(e) – RSS 243 §3.3

Temperature	Channel	0°C	+20°C	+55°C
Voltage: 253V, 230V & 207V Frequency Drift (kHz)	Fmin	9	0	-12
Voltage: 253V, 230V & 207V Frequency Drift (kHz)	Fo	-4	0	0
Voltage: 253V, 230V & 207V Frequency Drift (kHz)	Fmax	-4	0	9

See graphics N°1 to N°9 in annex 2

Limit: → 402 MHz to 405 MHz band shall not exceed ±100 ppm (±40,32 kHz)

Result: Maximum frequency drift measured is 12kHz when the temperature is varied from 0°C to +55°C and when the power voltage is varied from 207 Vac to 253 Vac.

5.4. CONCLUSION

Frequency error test performed on the sample "SMARTVIEW MONITOR KA961"show levels below the FCC 95.628(e) limits.

6. TRANSMITTER – EFFECTIVE RADIATED POWER OF FUNDAMENTAL EMISSION

6.1. TEST CONDITIONS

Test performed by : Stéphane Phoudiah
Date of test : 2011/09/23
Ambient temperature : 24°C
Relative humidity : 42%

6.2. TEST SETUP

The test is performed on EUT in permanent emission without modulation on 402,15MHz; 403,65MHz and 404,85MHz.

Method of measurement

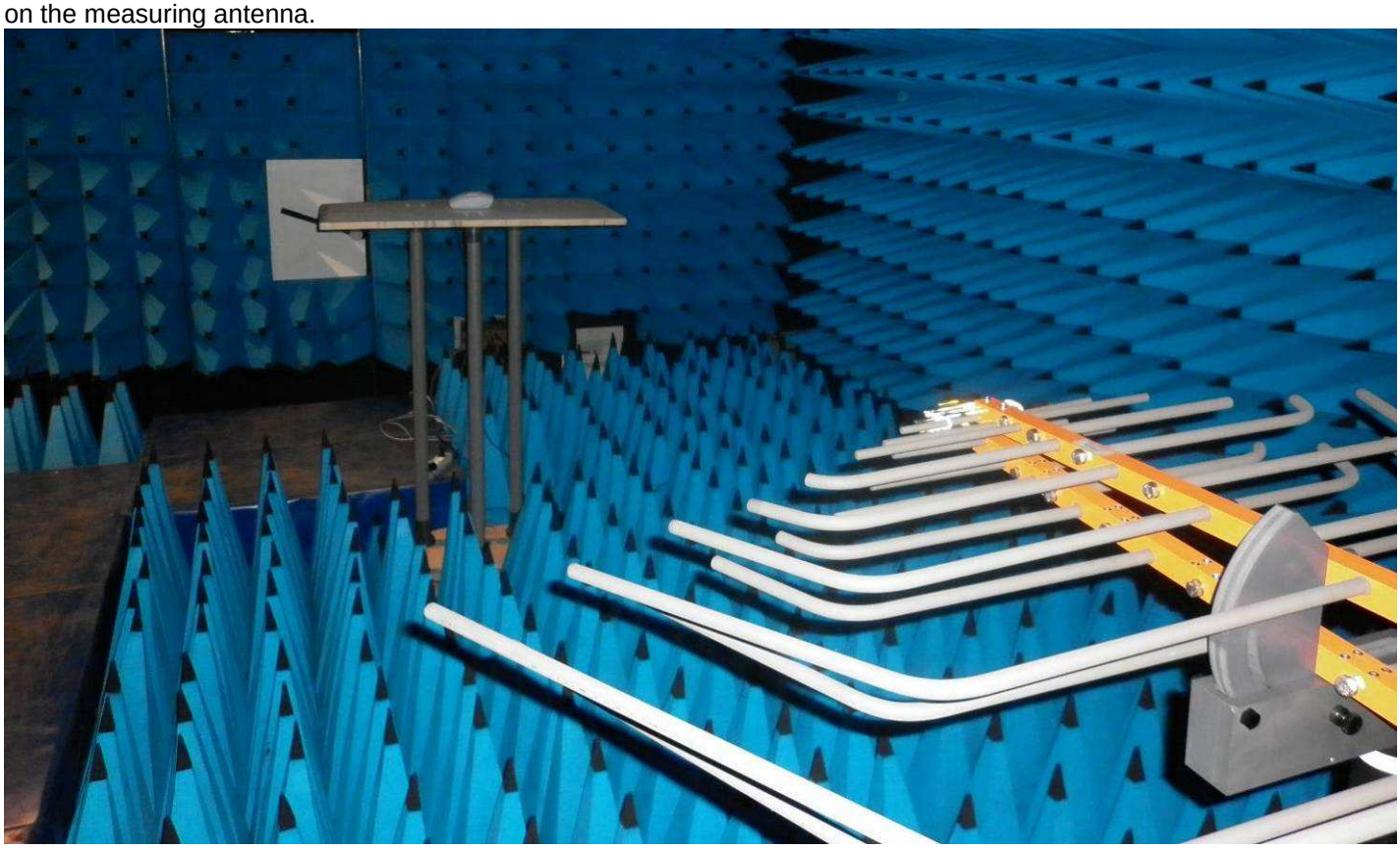
☒ FCC 95.639(f) – RSS 243 § 5.4

Configuration

RF field: ☒ Unmodulated
☐ Modulated

Qualification measurements in the 3 meters full anechoic chamber

The setup is 1.5m above the ground reference plane on a wooden table. Distance between measuring antenna and the EUT is 3 meters.The measuring antenna is in vertical and then in horizontal polarization. Continuous linear turntable azimuth search was performed with 360 degrees range. The substitution antenna replaces the equipment under test for Effective Radiated Power (ERP) measurement. Power is measured for the same level of radiated field strength obtained on the measuring antenna.



6.3. TEST SEQUENCE AND RESULTS

Measurement result under normal test conditions:
Measurements are performed in normal test conditions. The measuring bandwidth of the spectrum analyzer is 120 kHz and the detector type is Peak.

Result:

Channel	Frequency (MHz)	EIRP (dBm) Vertical polarization	EIRP (µW) Vertical polarization	Limit (dBm or µW)	Comments
Fmin	402,15	-24,7	3,5	-16 dBm or 25 µW	Pass
F0	403,65	-20,8	8,3	-16 dBm or 25 µW	Pass
Fmax	404,85	-21,5	7,1	-16 dBm or 25 µW	Pass

6.4. CONCLUSION

Effective Radiated Power test, performed on the sample "SMARTVIEW MONITOR KA961"show levels below the FCC 95.639(f) – RSS 243 §5.4 limits.

7. TRANSMITTER - EMISSION BANDWIDTH

7.1. TEST CONDITIONS

Test performed by : Stéphane Phoudiah
Date of test : 2011/05/02
Ambient temperature : 21°C
Relative humidity : 34%

7.2. TEST SETUP

The test is performed on EUT in permanent emission with modulation on 402,15MHz; 403,65MHz and 404,85MHz.

Method of measurement

☒ Emission bandwidth FCC 95.633(e) or RSS 243 §3.2

Qualification measurements on a table

Emission bandwidth is measured with a spectrum analyzer on the EUT RF conducted access.

7.3. TEST SEQUENCE AND RESULTS

Normal test conditions – Transmitter modulation bandwidth
The transmitter range of modulation bandwidth is measured 20dB below the peak power.

Result:

Channel	Frequency (MHz)	Emission Banwidth (kHz)	Limit (kHz)	Comments
Fmin	402,15	205,6	300	Pass
F0	403,65	207,6	300	Pass
Fmax	404,85	209,6	300	Pass

See graphics N°10 to N°12 in annex 2

7.4. CONCLUSION

Modulation bandwidth test performed on the sample "SMARTVIEW MONITOR KA961"show levels below the FCC 95.633(e) or RSS 243 §3.2 limits.

8. UNWANTED EMISSIONS - BAND EGDE COMPLIANCE- SPURIOUS RADIATION

8.1. TEST CONDITIONS

Test performed by : Stéphane Phoudiah
Date of test : 2011/06/14
Ambient temperature : 21°C
Relative humidity : 32%

8.2. TEST SETUP

The test is performed on EUT in permanent emission with modulation on 402,15MHz; 403,65MHz and 404,85MHz.

Method of measurement

☒ Unwanted emission FCC 95.633(d) or RSS 243 §3.2
☒ Out of-band emission: FCC 95.635(d)(1) or RSS 243 §3.2
☒ In band emission: FCC 95.635(d)(4) or RSS 243 §3.2

Characterization in semi-anechoic chamber (30MHz to 5 GHz):

The setup is 1.5m above the ground reference plane on a wooden table.
Distance between measuring antenna and the EUT is 3 meters.
The measuring antenna is in vertical and then in horizontal polarization. Measurement bandwidth was 100 kHz.
Continuous linear turntable azimuth search was performed with 360 degrees range.

8.3. TEST SEQUENCE AND RESULTS

Normal test conditions – Unwanted emission – Spurious radiation

Characterization in semi-anechoic chamber (30MHz to 5 GHz):

Frequency (MHz)	Measure (dBµV/m)	Limit (dBµV/m)
30	28,9	40
34	27,2	40
42,7	29,2	40
43,6	27	40
57,8	27,6	40
91	31,5	43,5
98,5	30,9	43,5
233,8	29,9	46
251	28,7	46
2284	46,7	53,9
2362	49,5	53,9
2596	44,5	53,9
2383	49,2	53,9
2303	40,8	53,9
2536,5	41,1	53,9
4306	39,4	53,9

See graphics N°13 to N°15 in annex 2

Limit FCC 95.635 (d)(1) and FCC 15.209

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
30 à 88	100	3
88 à 216	150	3
216 à 960	200	3
> 960	500	3

Normal test conditions – In band emission
The “In band emission” is measured 20dB below the peak power.

Channel	Measure (kHz)	Limit (kHz)	Comments
Fmin	102,8	150	Pass
F0	103,8	150	Pass
Fmax	104,8	150	Pass

Limit FCC 95.635(d)(4)
Emissions within the MEDRADIO band (402 – 405 MHz) more than 150 kHz away from the center frequency of the spectrum the transmission is intended to occupy will be attenuated below the transmitter output power by at least 20 dB.

Normal test conditions – Band-edge emission
The “Band edge emission” is measured 20dB below the peak power.

Channel	Measure (MHz)	Limit (MHz)	Comments
Fmin	402,04	Above 401,75	Pass
Fmax	404,95	Below 405,25	Pass

See graphics N°10 and N°12 in annex 2

Band-edge emissions: FCC 95.635(d)(5)
Emissions 250 kHz or less that are above and below the MEDRADIO band (402 – 405 MHz) will be attenuated below the maximum permitted output power by at least 20 dB (-16 dBm or 25 µW e.i.r.p.).

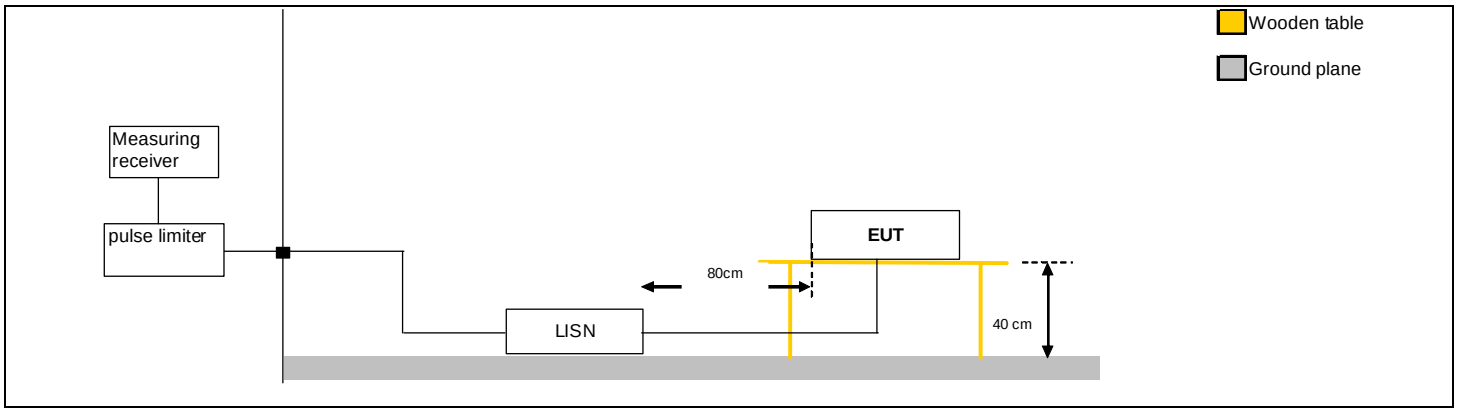
8.4. CONCLUSION

Unwanted emission, spurious radiation and band edge emission tests performed on the sample “SMARTVIEW MONITOR KA961”show levels below the FCC limits.

9. MEASUREMENT OF CONDUCTED DISTURBANCE: POWER SUPPLY

Specifications		
Test method according **FCC Part 15 (2009)**	FCC Part 15.207	
Frequency	0.15 – 30 MHz	
Limit	See summary table	Power supply : Class B
Detector	Peak , Quasi Peak and average	RBW 9 kHz
Operating conditions		
Comments	The measurement is performed on power supply with a LISN and telecommunication lines with RSI or current clamp for shielded cables.	
Equipment list	See at the end of the paragraph	
Deviation method	No	
Product installation	The EUT is installed on a wooden table 80 cm above the reference plane, 40 cm from vertical plane, at 80cm of the LISN.	
Operating mode	Nominal	
Conclusion		
The product is compliant with the standard		

Measure on main power supply			
Line	**Operating mode**	**Graphics**	**Comments**
Phase	Nominal	N°16	Pass
Neutral	Nominal	N°17	Pass



Test set up of conducted emission on power supply

10. SPECTRUM ACCESS

10.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
Date of test : 2011/05/05 and 2011/05/06
Ambient temperature : 22°C
Relative humidity : 37%

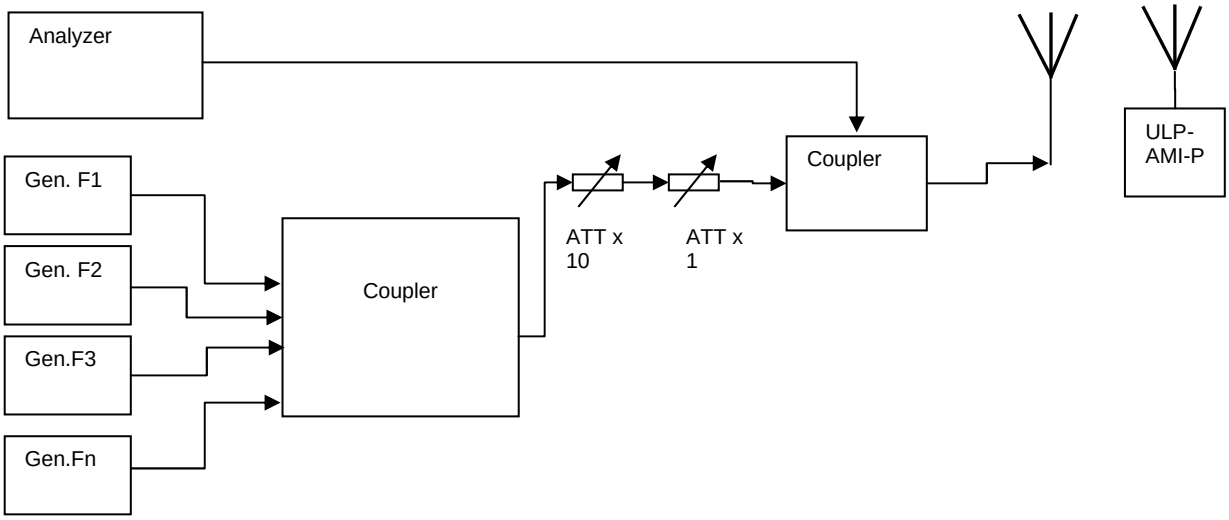
10.2. TEST SETUP

Method of measurement

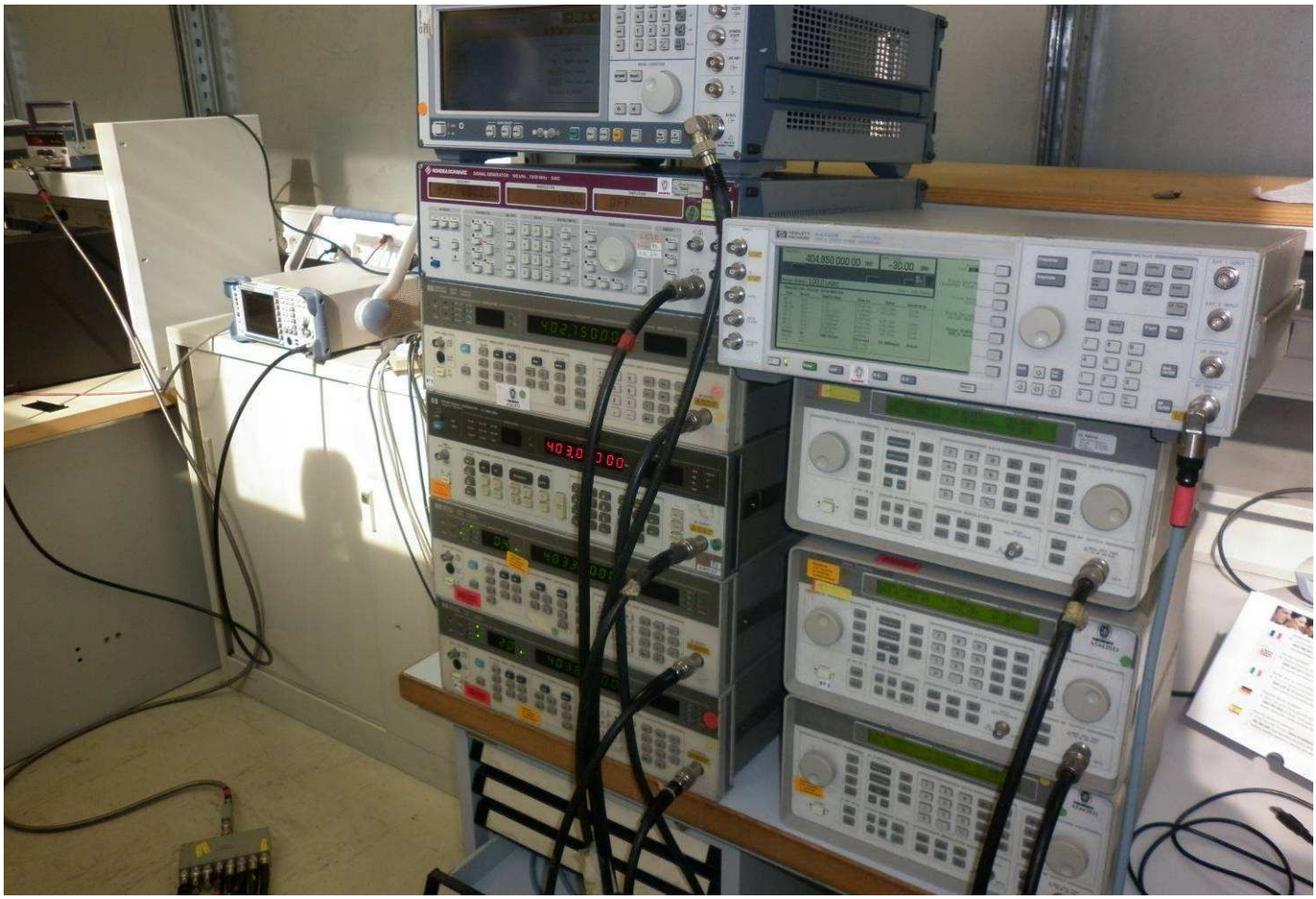
For these tests, a blocking band was created using 10 signal generators and transmits by antenna or by conduction.

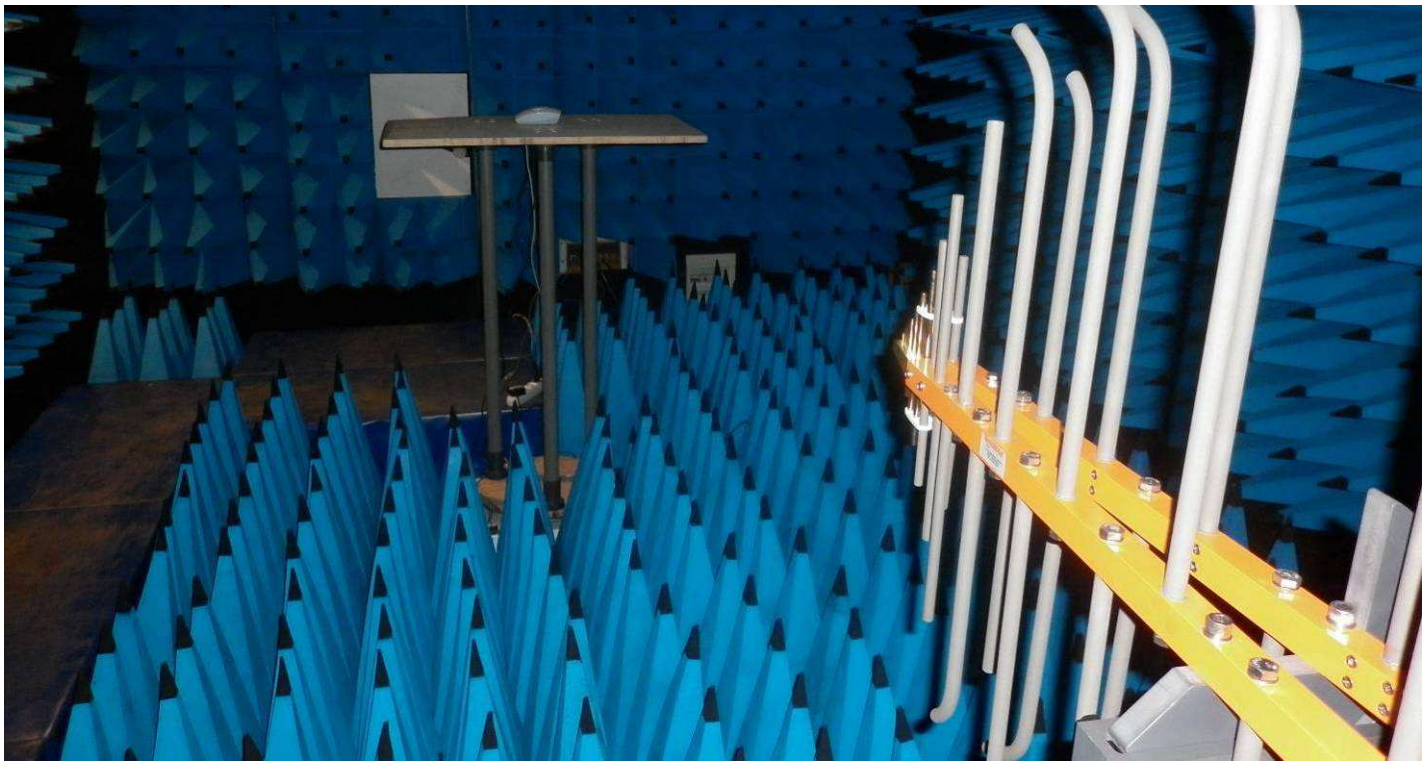
Frequency	(MHz)
F0	402,15
F1	402,45
F2	402,75
F3	403,05
F4	403,35
F5	403,65
F6	403,95
F7	404,25
F8	404,55
F9	404,85

A spectrum analyzer (listed in test equipment list) is used to adjust the level and the frequency. For traceability, this analyzer is the reference for level and frequency generated from 9 signals used for this test.



Spectrum access test set up





11. MONITORING SYSTEM THRESHOLD POWER LEVEL

11.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
Date of test : 2011/05/05 and 2011/05/06
Ambient temperature : 22°C
Relative humidity : 37%

11.2. TEST SETUP

Method of measurement

For these tests, a blocking band was created using 10 signal generators and transmits by antenna.

FCC 95.628 (a) (3)

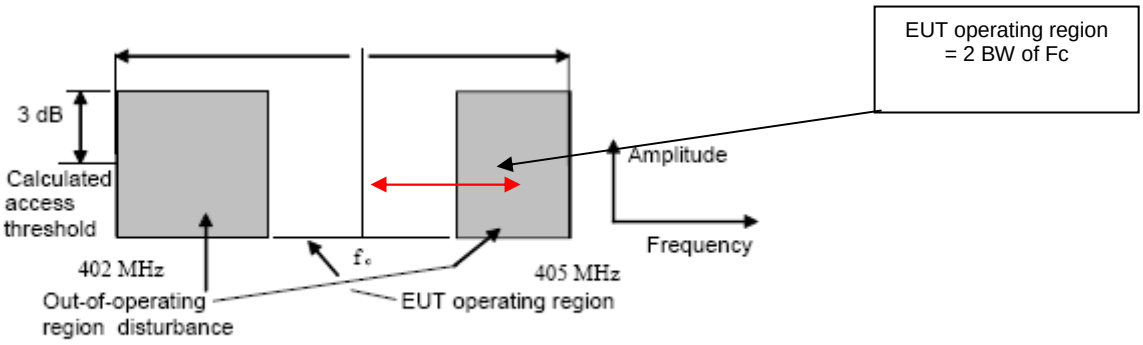


Figure 1: Spectrum Mask for Test of clauses 10.1.1 and 10.1.2

The monitoring system threshold power level, Thp shall not be greater than the calculated level given by the equation:

Thp =10logB(Hz) – 150 (dBm/Hz) + G (dBi)

Emission Bandwith (Hz)	Antenna gain (dBi)	Pth (dBm)
213600	1,4	-95,3

11.3. CONCLUSION

Monitoring system threshold power level test performed on the sample "SMARTVIEW MONITOR KA961"show levels below the FCC 95.628 (a) (3) limits.

12. MONITORING SYSTEM BANDWIDTH

12.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
Date of test : 2011/05/05 and 2011/05/06
Ambient temperature : 22°C
Relative humidity : 37%

12.2. TEST SETUP

Method of measurement

For these tests, a blocking band was created using 10 signal generators and transmits by antenna.

FCC 95.628 (a) (1)
The intent of this requirement is to insure that the EUT measures the power in a bandwidth that is equal to or greater than the emission bandwidth of the transmitter with the widest emission that it will participate with in a MEDRADIO communications session.
Measure of bandwidth where a channel is occupied, the bandwidth should be at least so big as the emission bandwidth.

Bandwidth = 207,6 kHz

12.3. RESULTS

Result:

	Frequency (MHz)	Interferer level (dBm)
Fc	403,65	-96,5
Flow	403,5472	-89,5
Fhigh	404,7528	-78,5

	Level (dB)	Limit (dB)	Comments
PFlow- PFc	7	20	Pass
PFhigh-PFc	18	20	Pass

See graphics N°18 to N°20 in annex 2

12.4. CONCLUSION

Monitoring system bandwidth test performed on the sample "SMARTVIEW MONITOR KA961"show levels below the FCC 95.628 (a) (1) limits.

13. SCAN CYCLE TIME

13.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
Date of test : 2011/05/05 and 2011/05/06
Ambient temperature : 22°C
Relative humidity : 37%

13.2. TEST SETUP

Method of measurement

For these tests, a blocking band was created using 10 signal generators and transmits by antenna.

FCC 95.628 (a) (2)

The intent of this requirement is to ensure that the monitoring system updates the detected power levels by scanning the ULP-AMI band at a rate less 5s. Within 5s prior to initiating a communication cession, circuitry associated with medical implant programmer/control transmitter shall monitor the channels.

This test is done 4 times

13.3. RESULTS

Frequency (MHz)	Scan cycle time (s)	Limit (s)	Comments
403,65	1,22	5	Pass

See graphic N°21 in annex 2

13.4. CONCLUSION

Monitoring system scan cycle time test performed on the sample "SMARTVIEW MONITOR KA961"show levels below the FCC 95.628 (a) (2) limits.

14. MINIMUM CHANNEL MONITORING PERIOD

14.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
Date of test : 2011/05/05 and 2011/05/06
Ambient temperature : 22°C
Relative humidity : 37%

14.2. TEST SETUP

Method of measurement

For these tests, a blocking band was created using 10 signal generators and transmits by conduction.

FCC 95.628 (a) (2)

The intent of this requirement is to ensure that the monitoring period on each channel is 10ms or longer to detect transmissions that may have silent periods between data that are less than 10ms in duration.

Minimum channel monitoring period:
all channels occupied, except Channel Fc → Level shall be > 3dB than Threshold Power Level
Channel 9 with pulsed Interferer → Pulse 100µs on, 9,9ms off

14.3. RESULTS

The communication is performed on the Channel 9.

Result: Pass

See graphic N°22 in annex 2

Limit: The EUT should not initiate a communication session on a frequency different from channel Fc

14.4. CONCLUSION

Minimum channel monitoring period test performed on the sample "SMARTVIEW MONITOR KA961"show levels above the FCC 95.628 (a) (2) limits.

15. CHANNEL ACCESS

15.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
Date of test : 2011/05/05 and 2011/05/06
Ambient temperature : 22°C
Relative humidity : 37%

15.2. TEST SETUP

Method of measurement

For these tests, a blocking band was created using 10 signal generators and transmits by antenna.

FCC 95.628 (a) (4)

MEDRADIO programmer/control transmitters are permitted to initiate a connection to an implant transmitter if the ambient signal level is below the maximum permitted threshold. If no channel is available with an ambient power level at or below the maximum permitted threshold, spectrum access is permitted based on the channel with the lowest ambient power level referred to as the LIC or "Least interfered channel".

Check, whether the channel disturbed least is selected if all channels are occupied.
All channels are occupied except channel Fc. Channel 2 shall be 3dB above the Threshold Power
All other channels shall be 10dB above the Threshold Power Level.
Level of continuous Interferer adjusts on channel Fc, 3dB below the Threshold Power Level;
Level of continuous Interferer increases at 9dB on channel Fc;

15.3. RESULTS

The communication switched on the least interfered channel (Channel 2) after the 9dB increasing level of Fc

Result: Pass

See graphic N°23 in annex 2

Limit: The EUT should access and transmit on the least interfered channel after the 9dB increasing level of Fc

15.4. CONCLUSION

Channel Access test performed on the sample "SMARTVIEW MONITOR KA961"show levels below the FCC 95.628 (a) (4) limits.

16. DISCONTINUATION OF MEDRADIO SESSION

16.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
Date of test : 2011/05/05 and 2011/05/06
Ambient temperature : 22°C
Relative humidity : 37%

16.2. TEST SETUP

Method of measurement

For these tests, a blocking band was created using 10 signal generators and transmits by antenna.

FCC 95.628 (a) (4)

MEDRADIO system shall cease transmission in the event that the communication session is interrupted for a period of 5s or more.

Check, whether communication switching off, after 5s break
All channels are occupied, except channel 2.
Measure time up to communication switching off.

16.3. RESULTS

Discontinuation of MEDRADIO session (s)	Limit (s)	Comments
4,3	5	Pass

16.4. CONCLUSION

Discontinuation of MEDRADIO session test performed on the sample "SMARTVIEW MONITOR KA961"show levels below the FCC 95.628 (a) (4) limits.

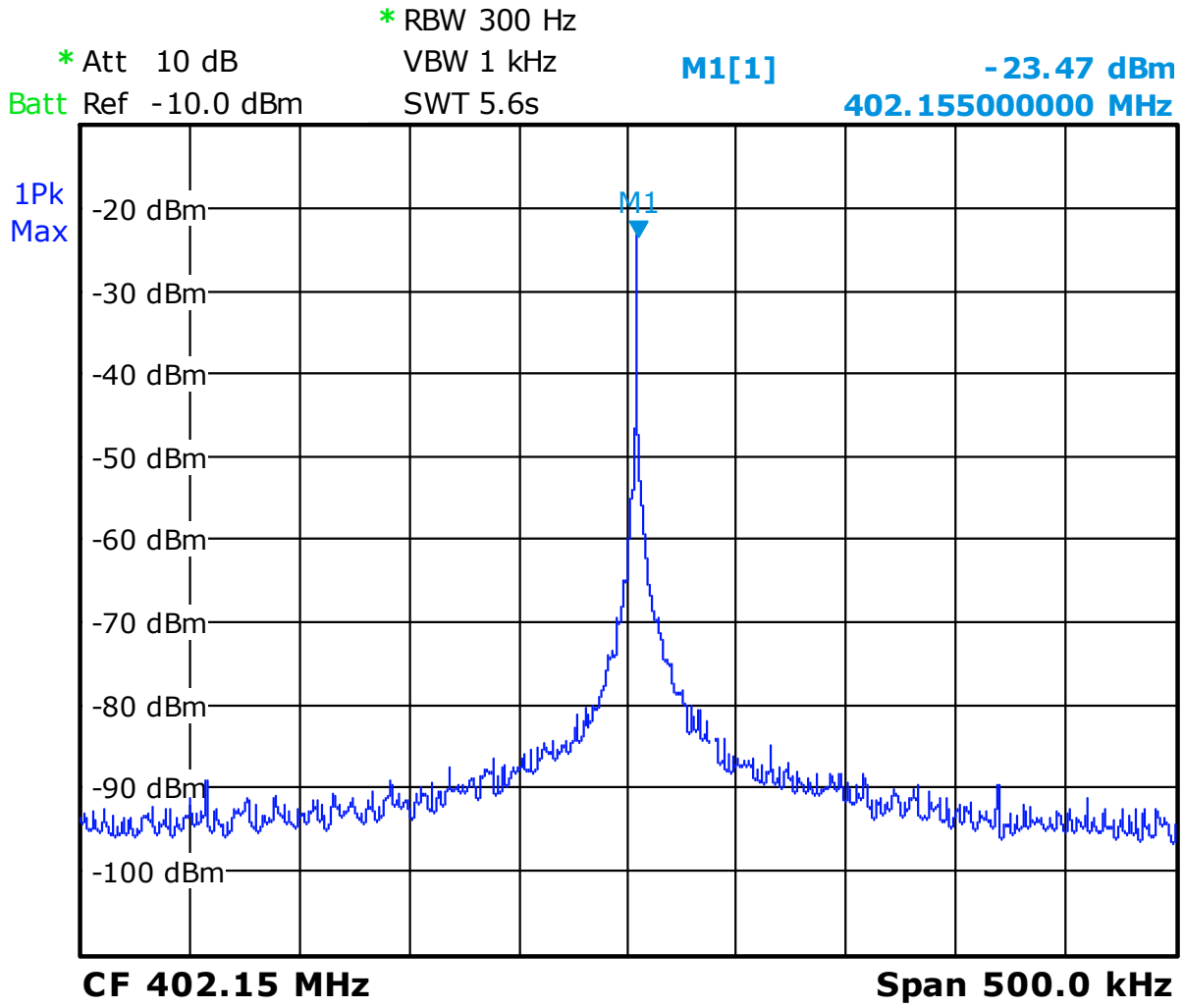
17. ANNEX 1: UNCERTAINTIES CHART

Maximum measurement uncertainties

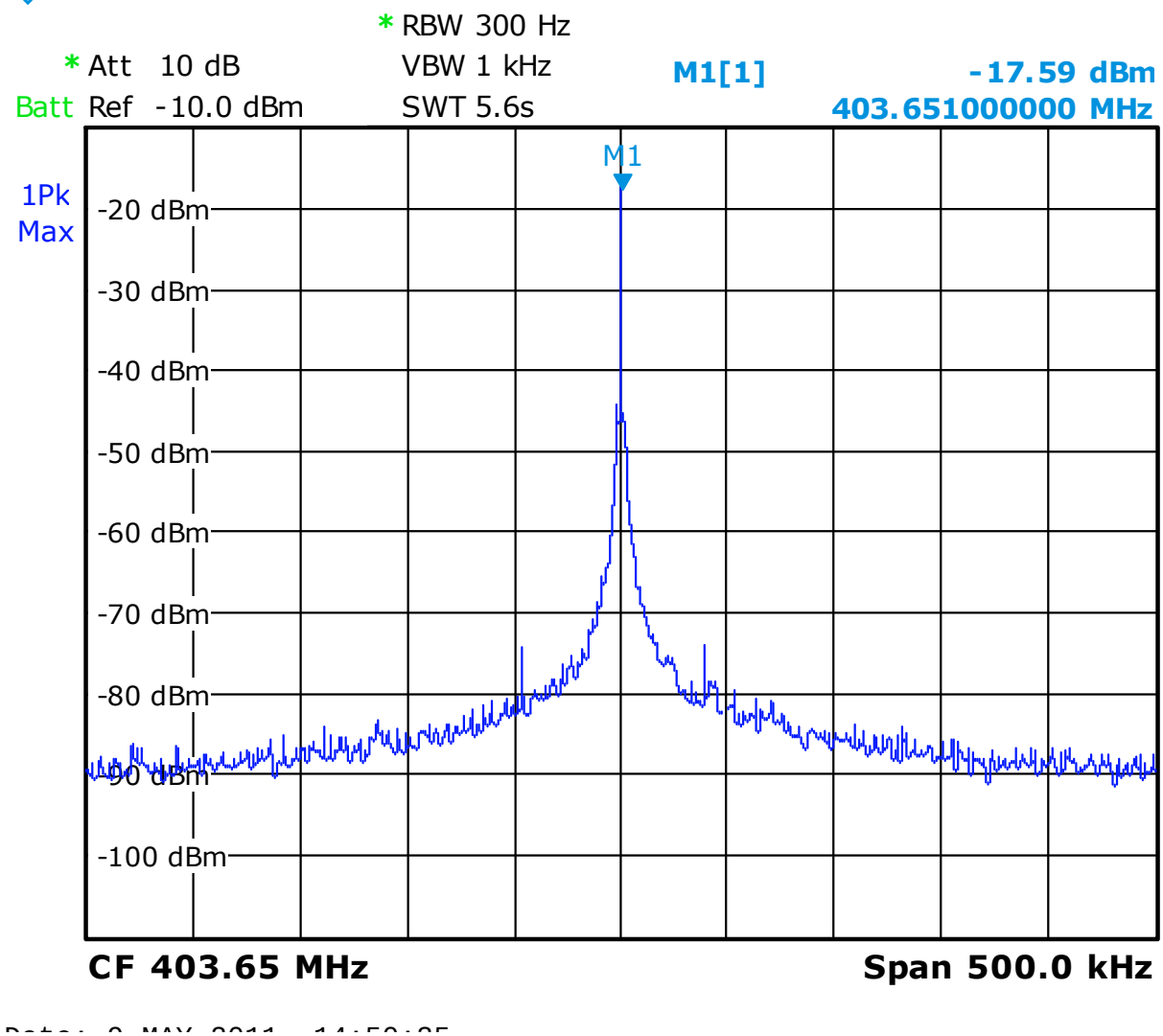
Kind of test	***Wide uncertainty laboratory* (k=2) ±x(dB) / (Hz)**	***uncertainty limit* ±y(dB)**
TRANSMITTER REQUIREMENTS		
Frequency error	±10kHz	
Carrier power (conducted)		±4 dB
Effective radiated Power • *Frequency < 1000 MHz* • *Frequency > 1000 MHz*	±5.72 dB ±5.69 dB ±5.72 dB ±5.69 dB	±6 dB
Frequency deviation		
Modulation Depth		
Adjacent channel power		±3 dB
Range of modulation bandwidth for wide band equipment		
Spurious emissions (§8.7) • *Frequency < 1000 MHz* • *Frequency > 1000 MHz*	±5.72 dB ±5.46 dB ±5.72 dB ±5.46 dB	±6 dB
Frequency stability under low-voltage conditions	$\pm 2.10^{-8}$ Hz	$\pm 1.10^{-7}$ Hz
Duty cycle	--	--
RECEIVER REQUIREMENTS		
Adjacent channel selectivity-in band	±2.89 dB	--
Adjacent band selectivity	±2.89 dB	--
Blocking or desensitlzation	±2.89 dB	--
Spurious emissions (§9.4) • *Frequency < 1000 MHz* • *Frequency > 1000 MHz*	±5.72 dB ±5.46 dB ±5.72 dB ±5.46 dB	±6 dB

18. ANNEX 2 (GRAPHICS)

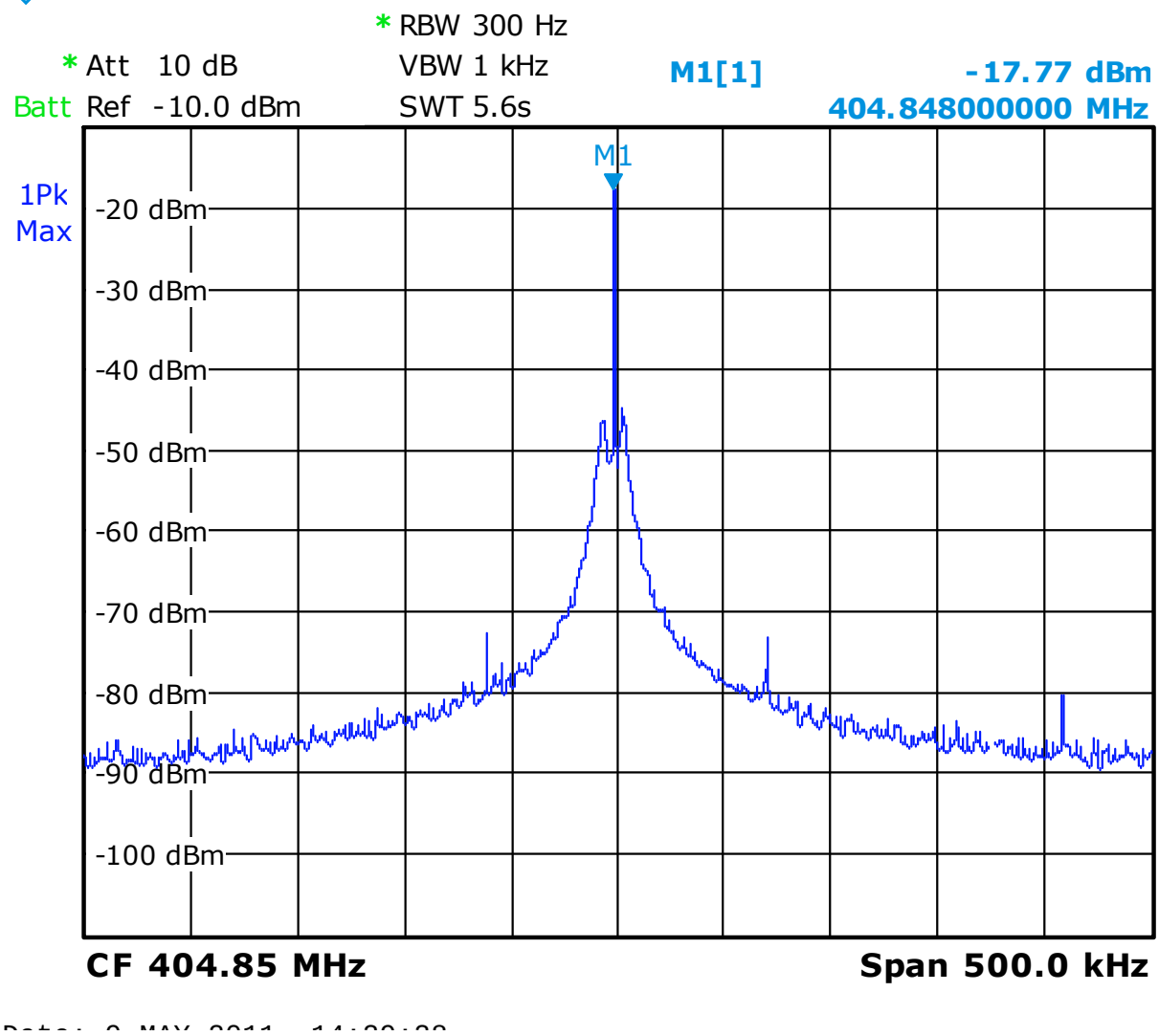
Graphic N°1
Frequency error
207Vdc, 230Vdc & 253Vdc
402,15MHz
0°C



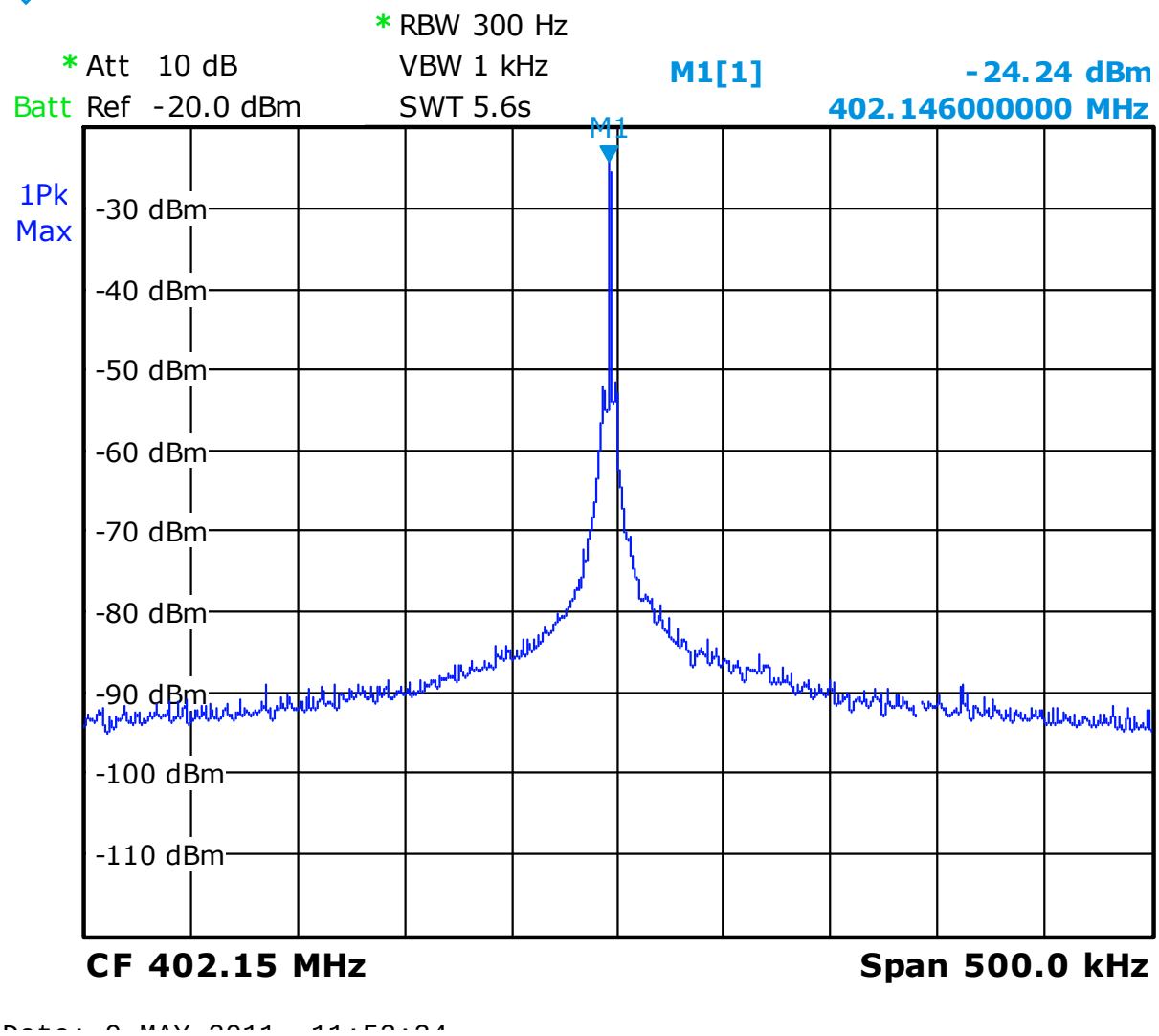
Graphic N°2
Frequency error
207Vdc, 230Vdc & 253Vdc
403,65MHz
0°C



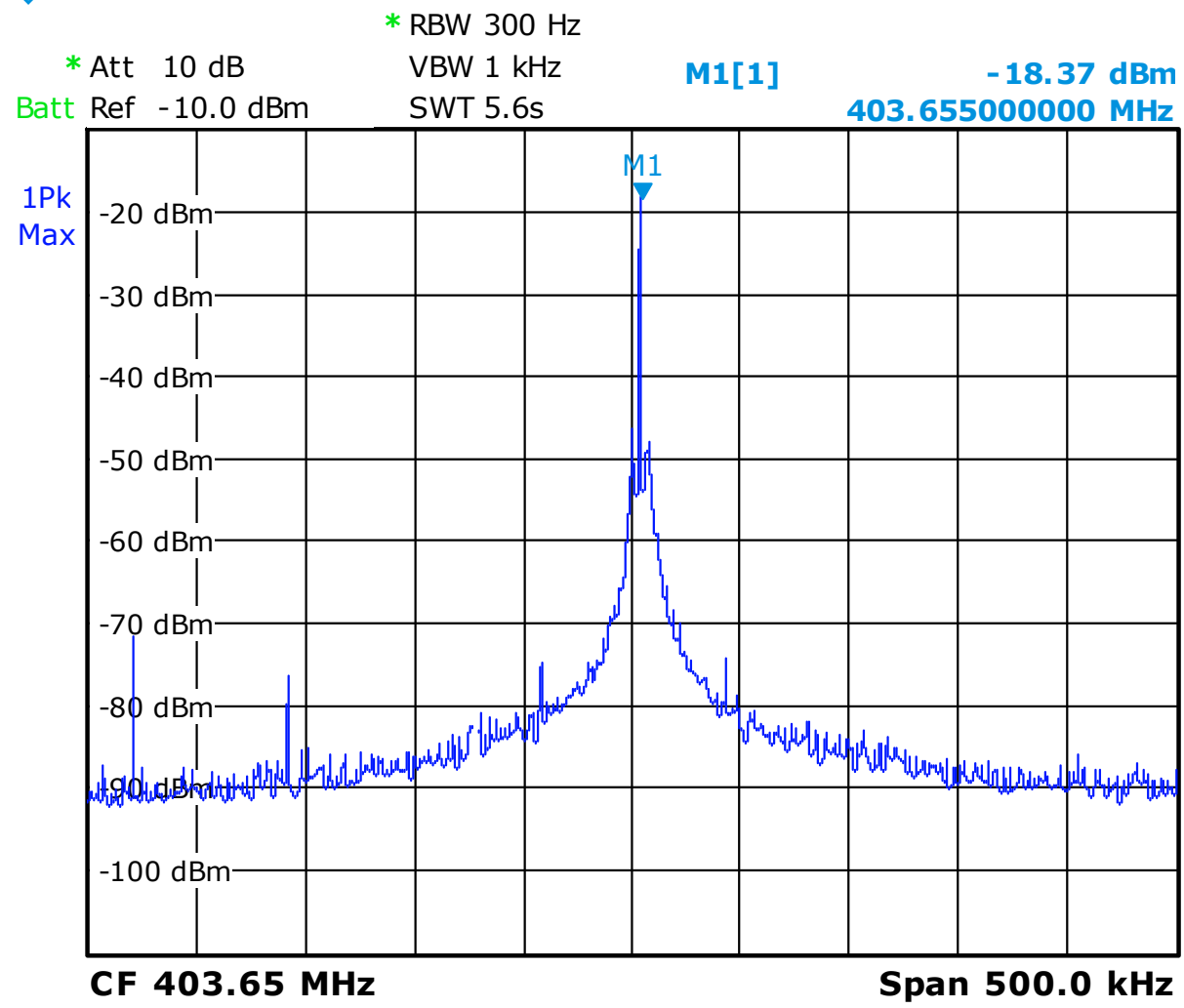
Graphic N°3
Frequency error
207Vdc, 230Vdc & 253Vdc
404,85MHz
0°C



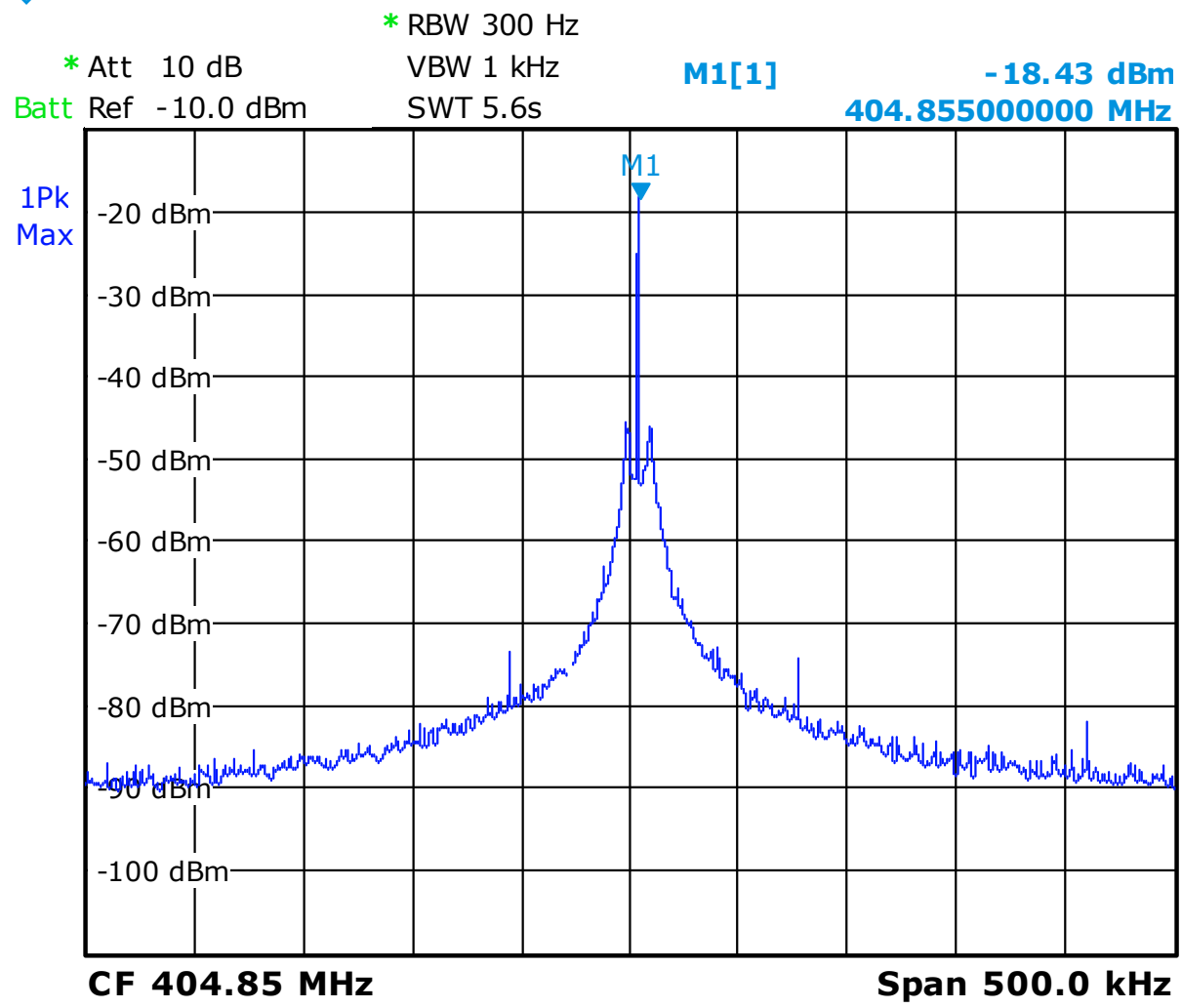
Graphic N°4
Frequency error
207Vdc, 230Vdc & 253Vdc
402,15MHz
20°C



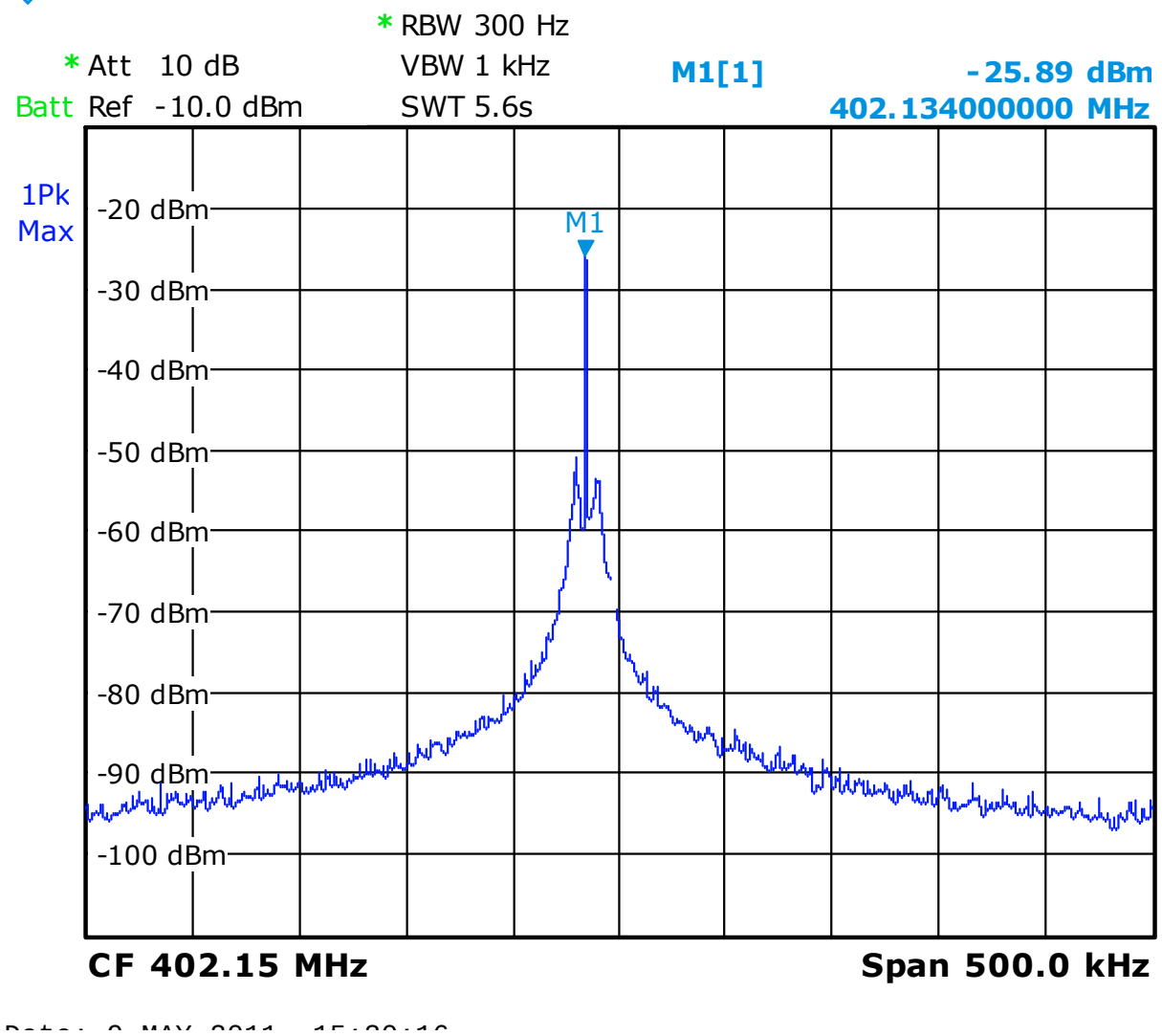
Graphic N°5
Frequency error
207Vdc, 230Vdc & 253Vdc
403,65MHz
20°C



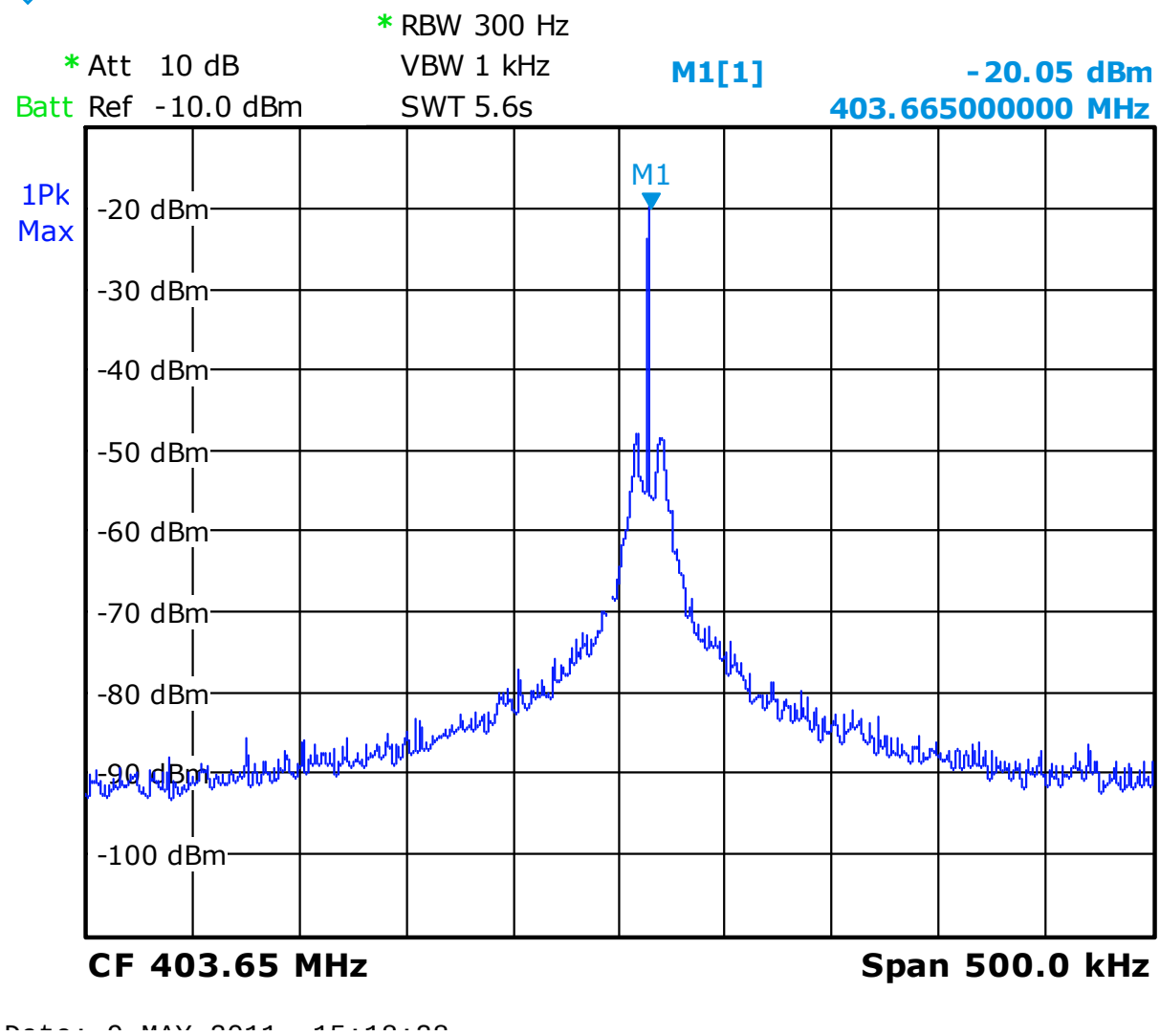
Graphic N°6
Frequency error
207Vdc, 230Vdc & 253Vdc
404,85MHz
20°C



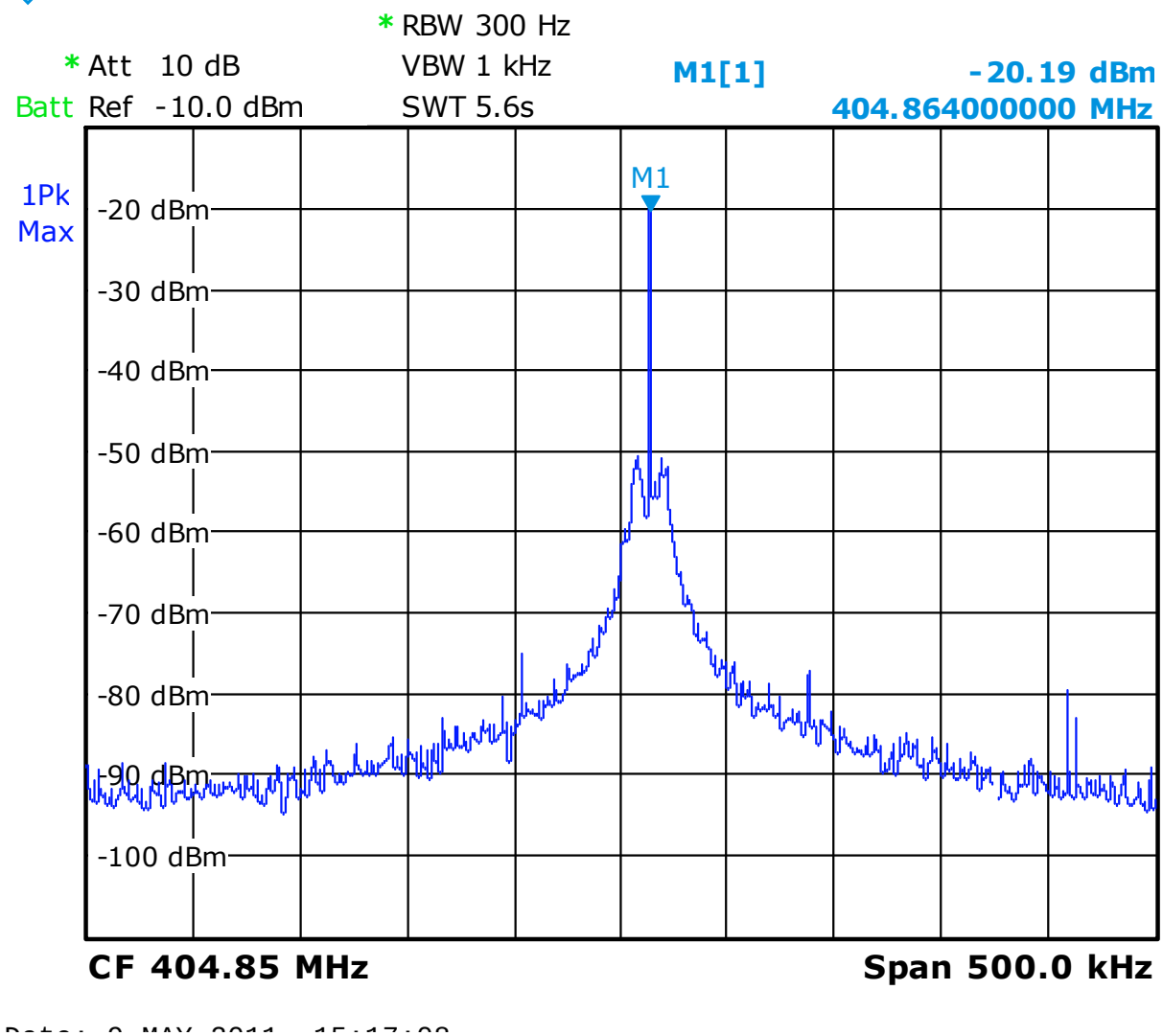
Graphic N°7
Frequency error
207Vdc, 230Vdc & 253Vdc
402,15MHz
55°C



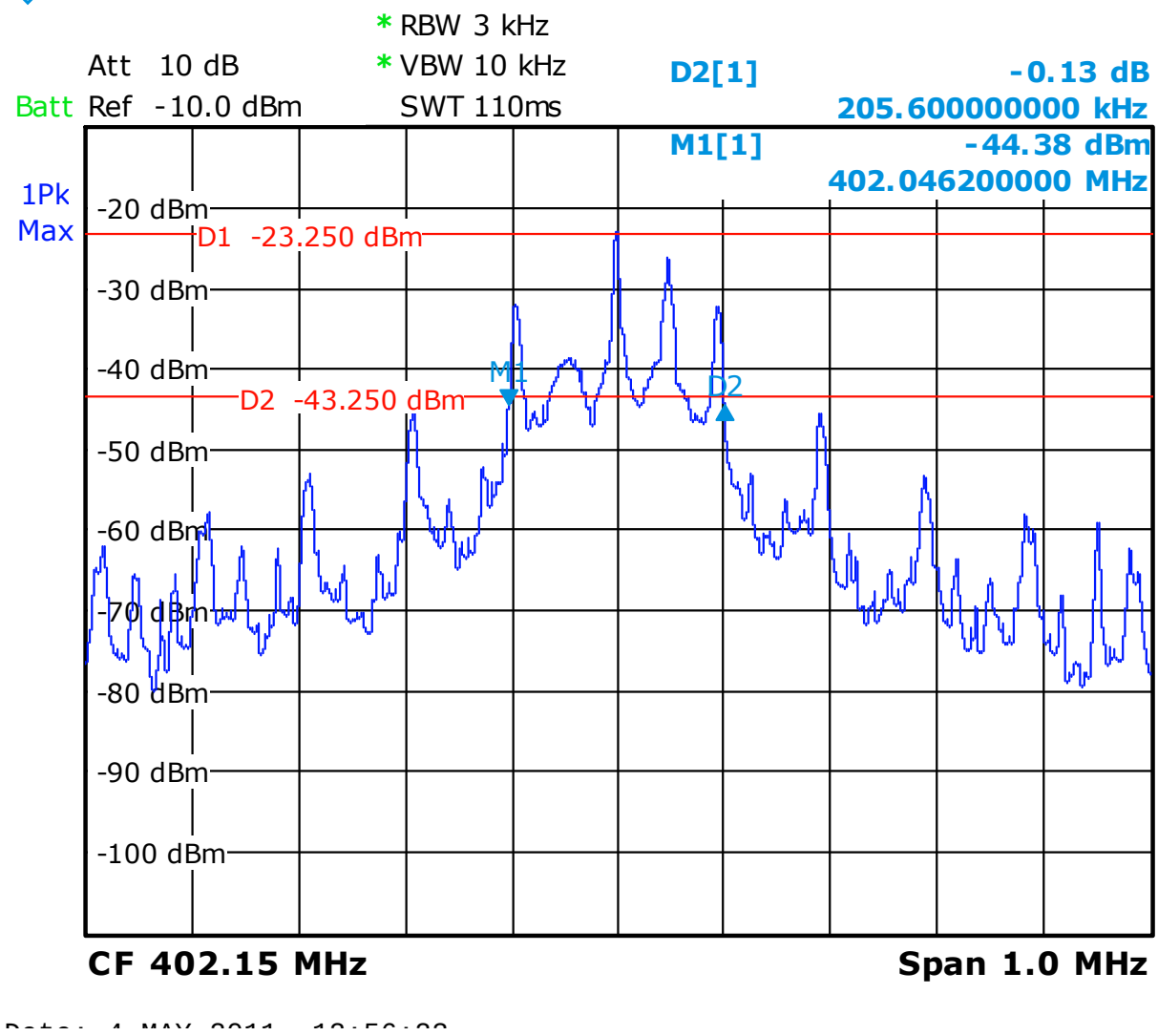
Graphic N°8
Frequency error
207Vdc, 230Vdc & 253Vdc
403,65MHz
55°C



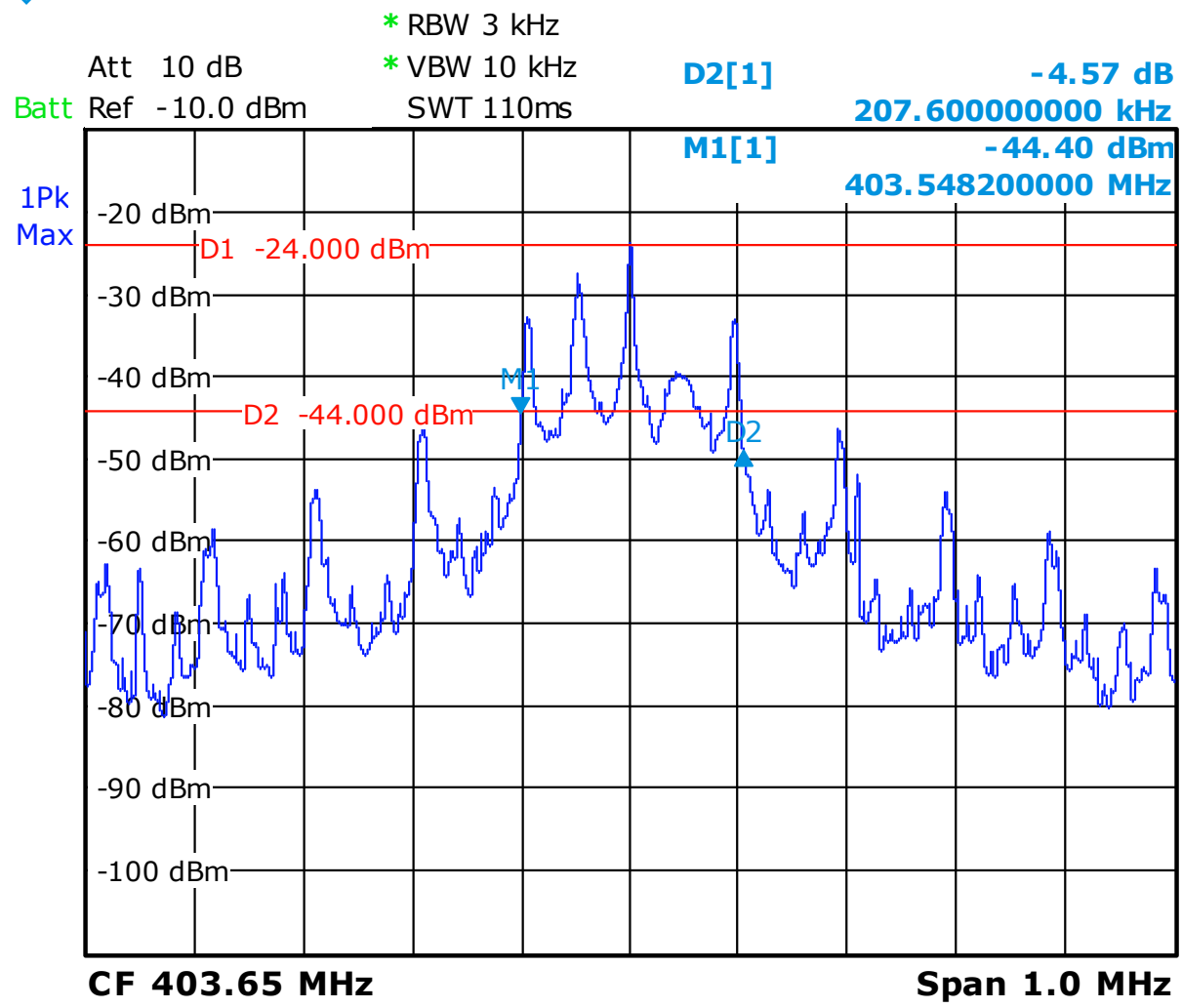
Graphic N°9
Frequency error
207Vdc, 230Vdc & 253Vdc
404,85MHz
55°C



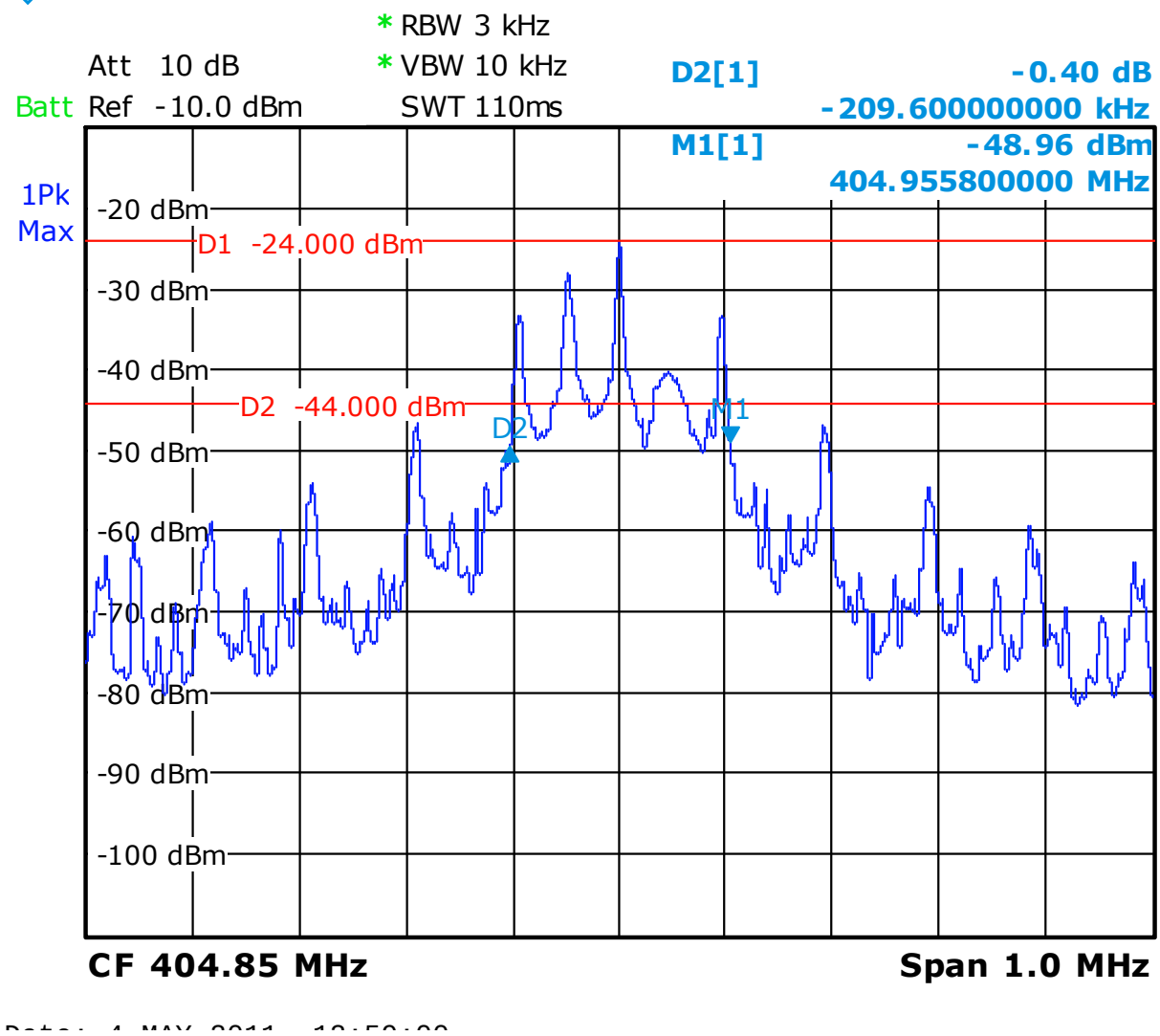
Graphic N°10
Emission Bandwidth
230Vdc
402,15MHz
21°C



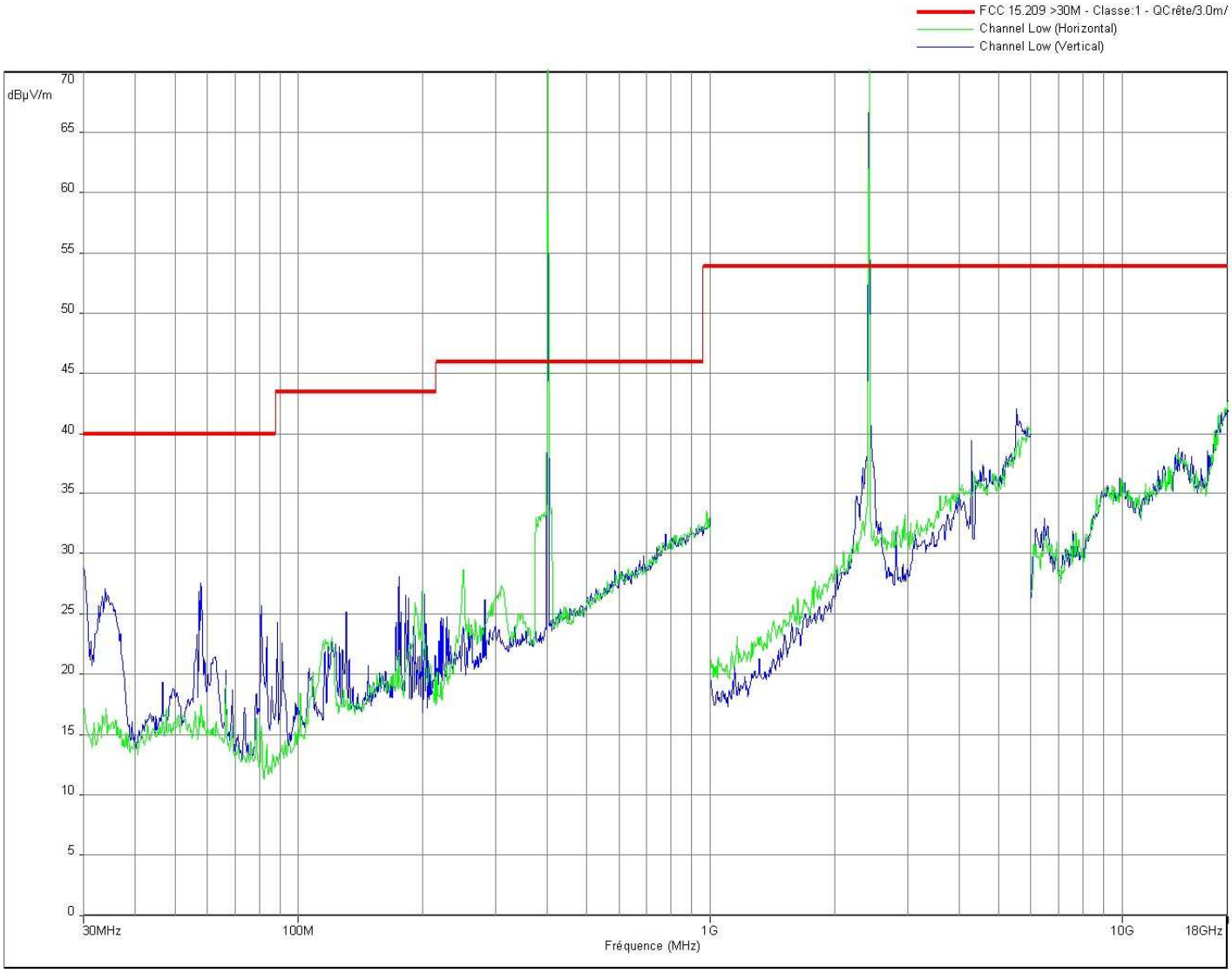
Graphic N°11
Emission Bandwidth
230Vdc
403,65MHz
21°C



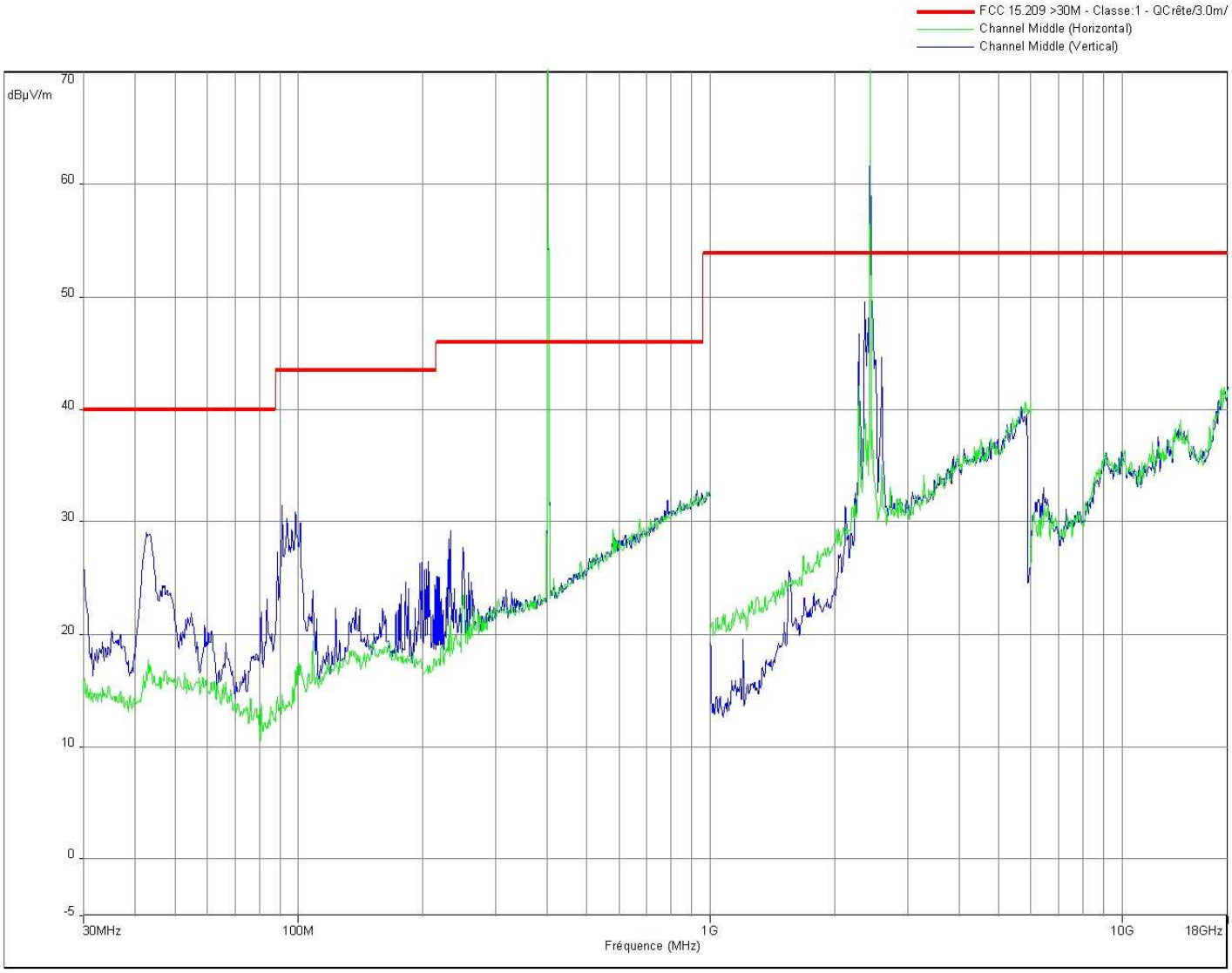
Graphic N°12
Emission Bandwidth
230Vdc
404,85MHz
21°C



Graphic N°13
Unwanted emissions and spurious radiation (402,15MHz + 2412MHz)
Vertical + Horizontal Polarization
230Vdc
21°C

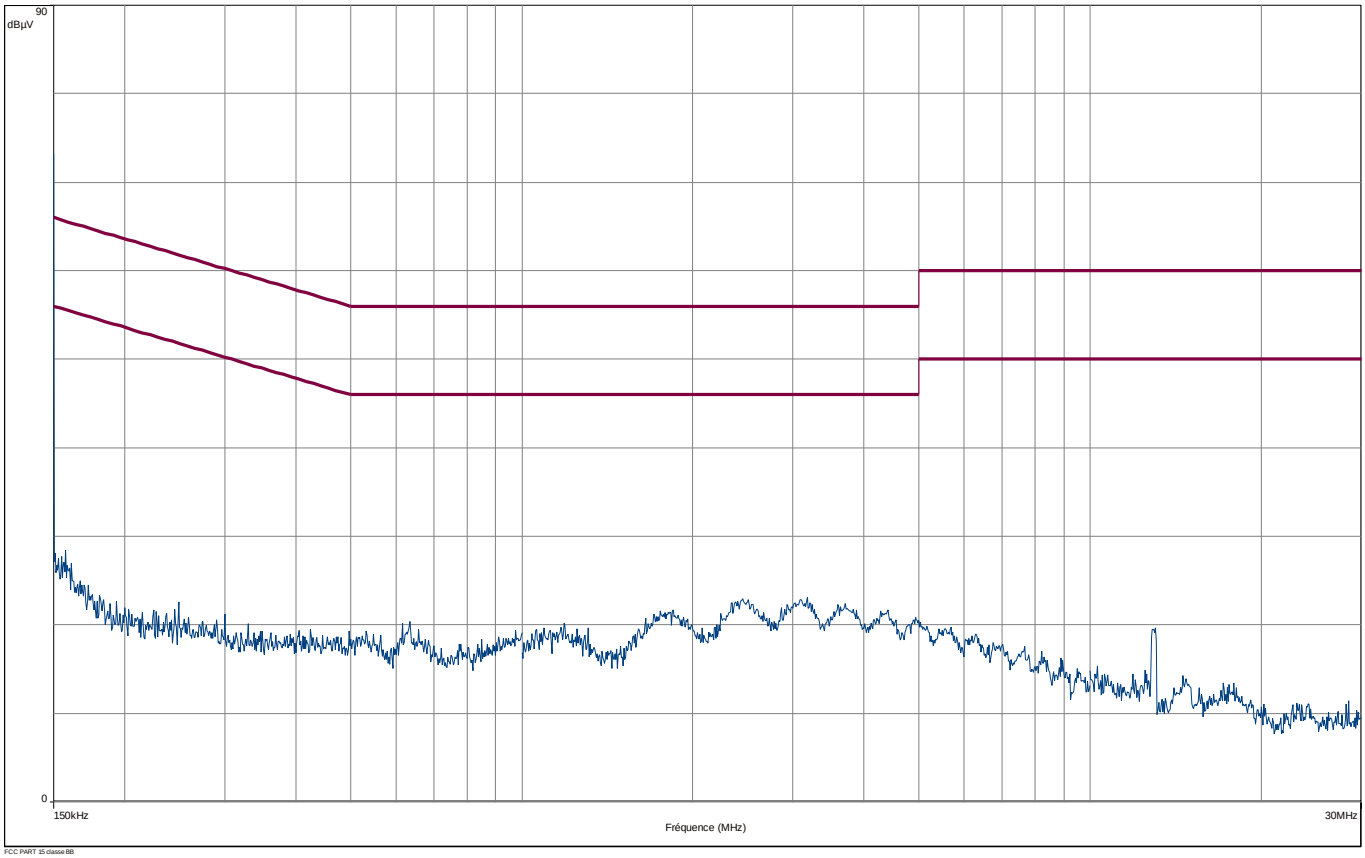


Graphic N°14
Unwanted emissions and spurious radiation (403,65MHz + 2440MHz)
Vertical + Horizontal Polarization
230Vdc
21°C

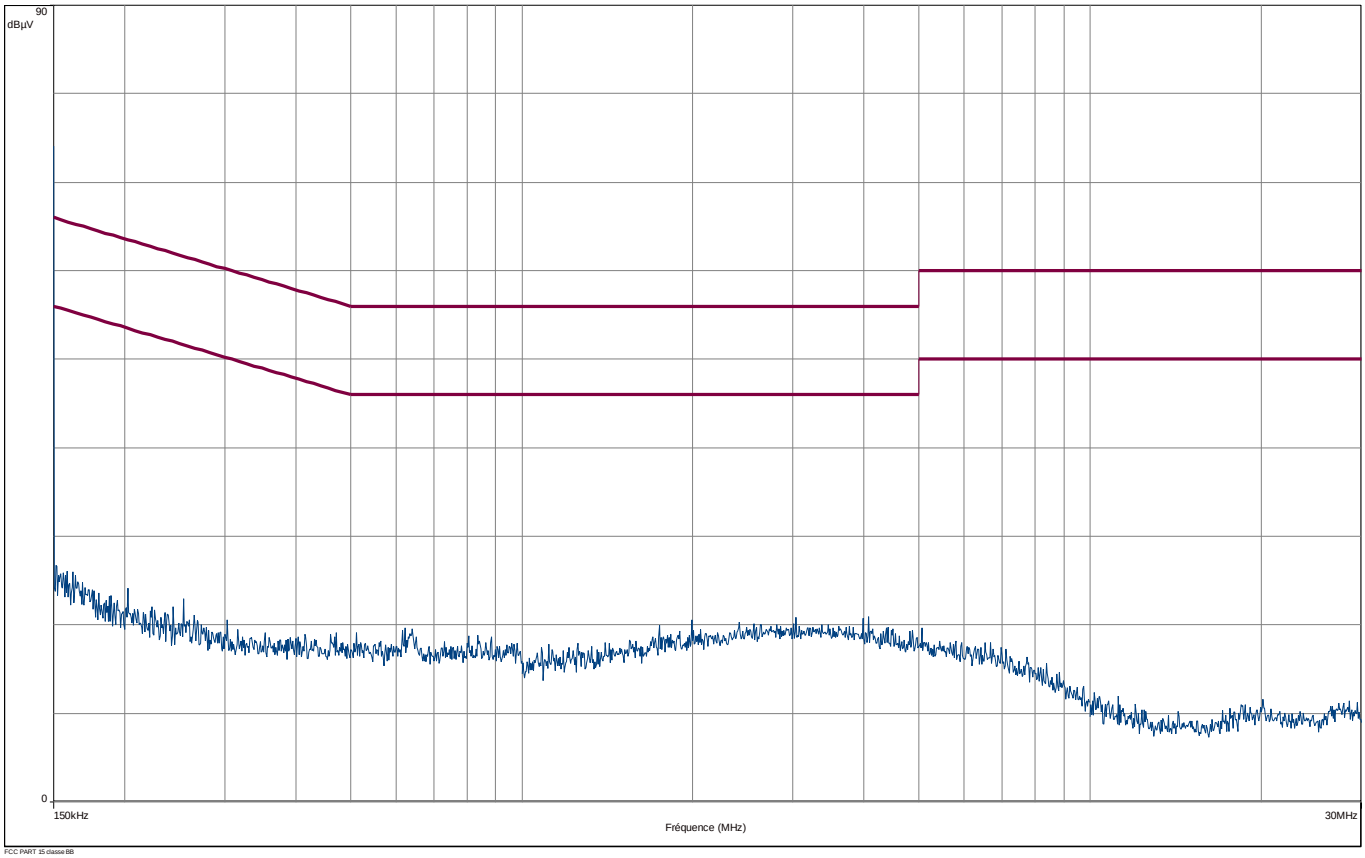


Graphic N°15
Unwanted emissions and spurious radiation (404,85MHz + 2459MHz)
Vertical + Horizontal Polarization
230Vdc
21°C

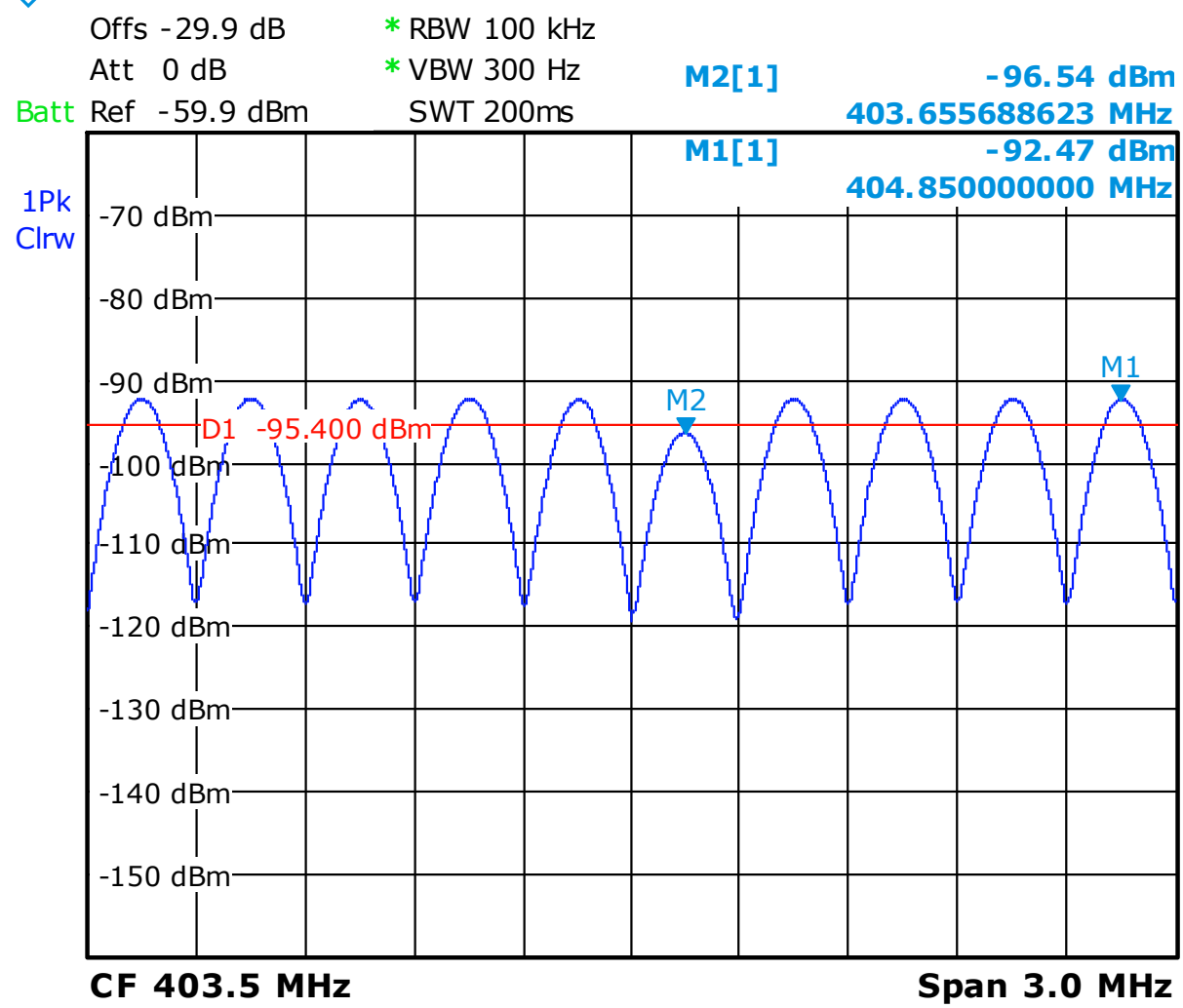
Graphic N°16
Conducted emission
Phase line
110V/60Hz



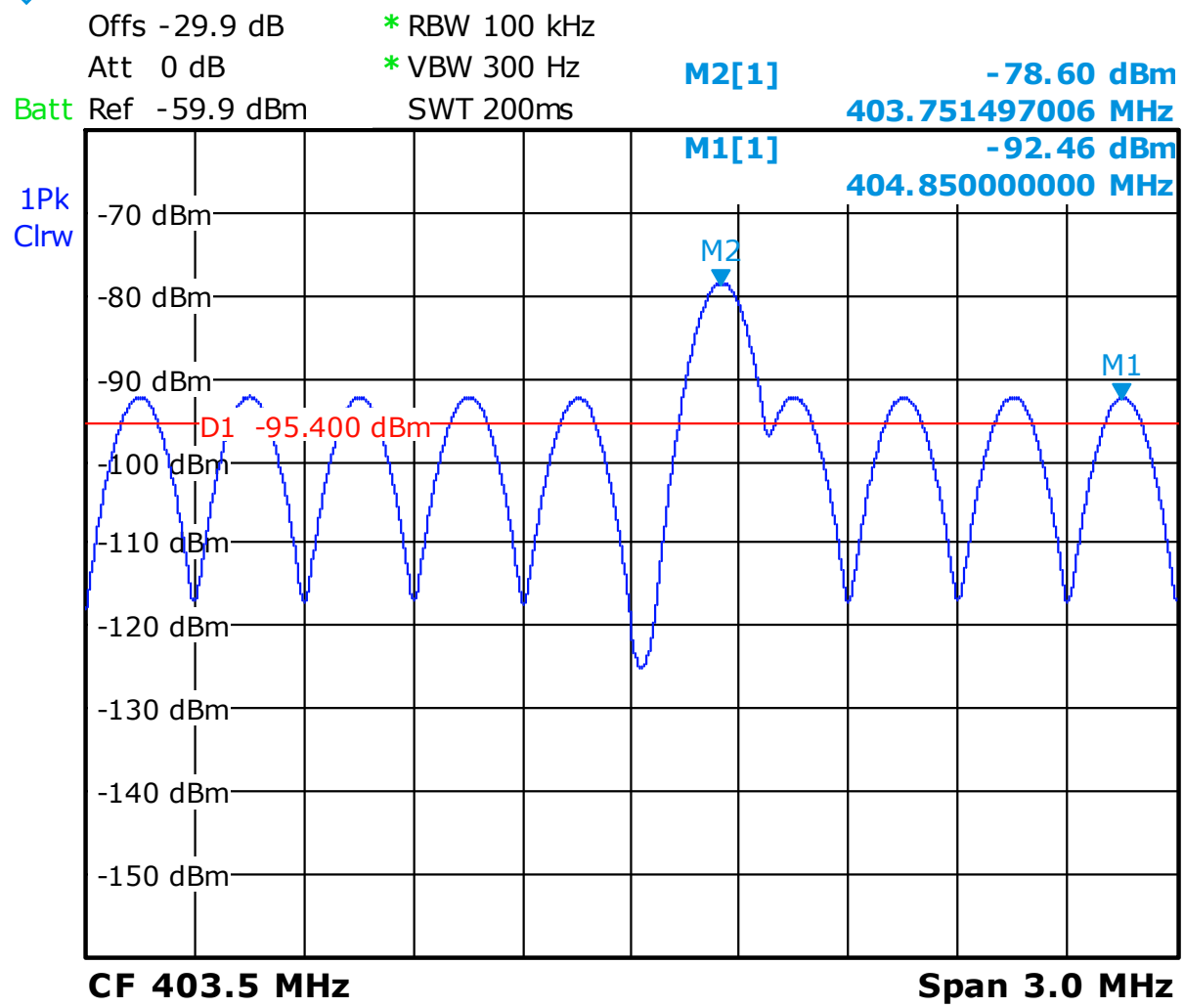
Graphic N°17
Conducted emission
Neutral line
110V/60Hz



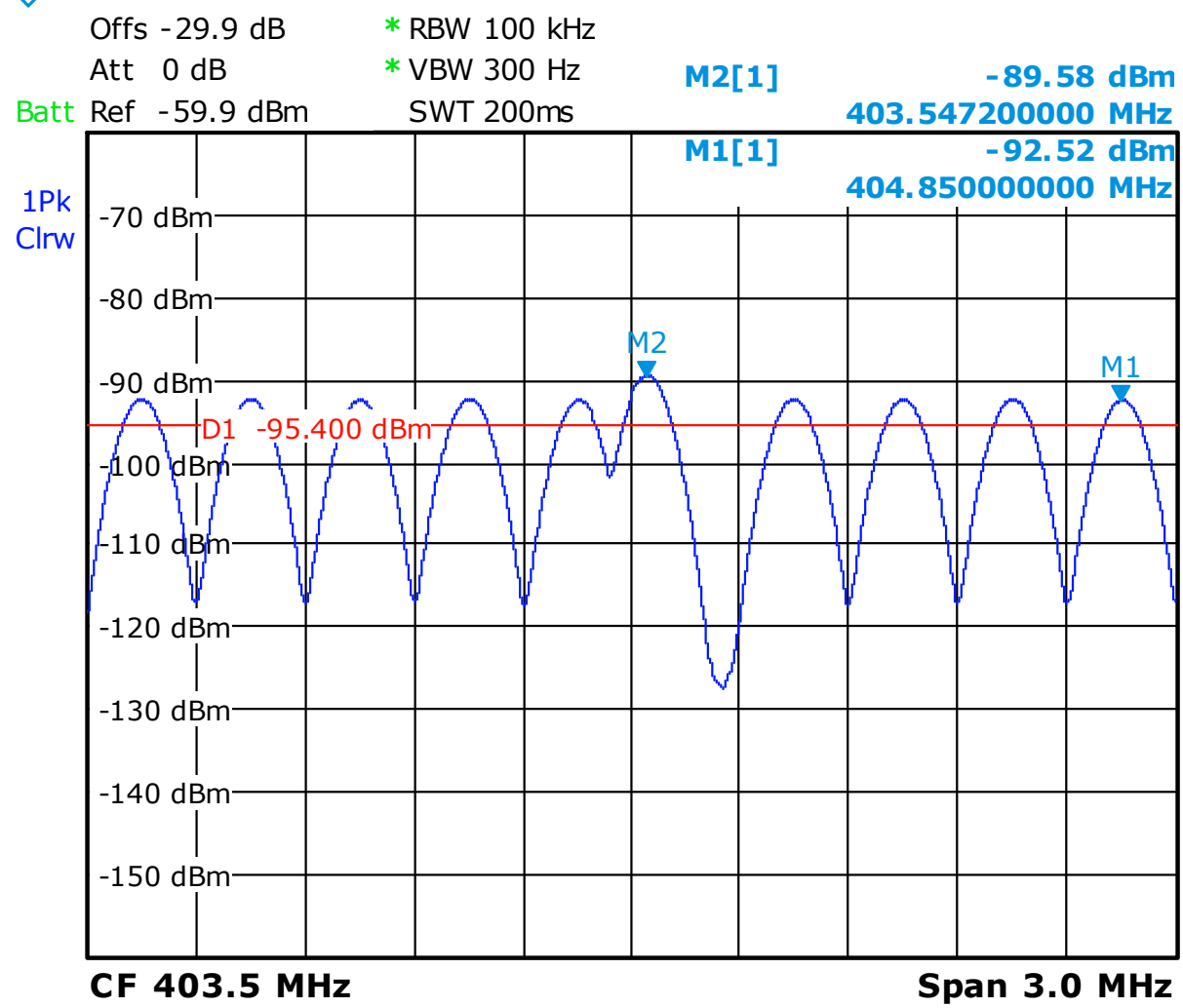
Graphic N°18
Monitoring System Bandwidth
230Vdc
22°C



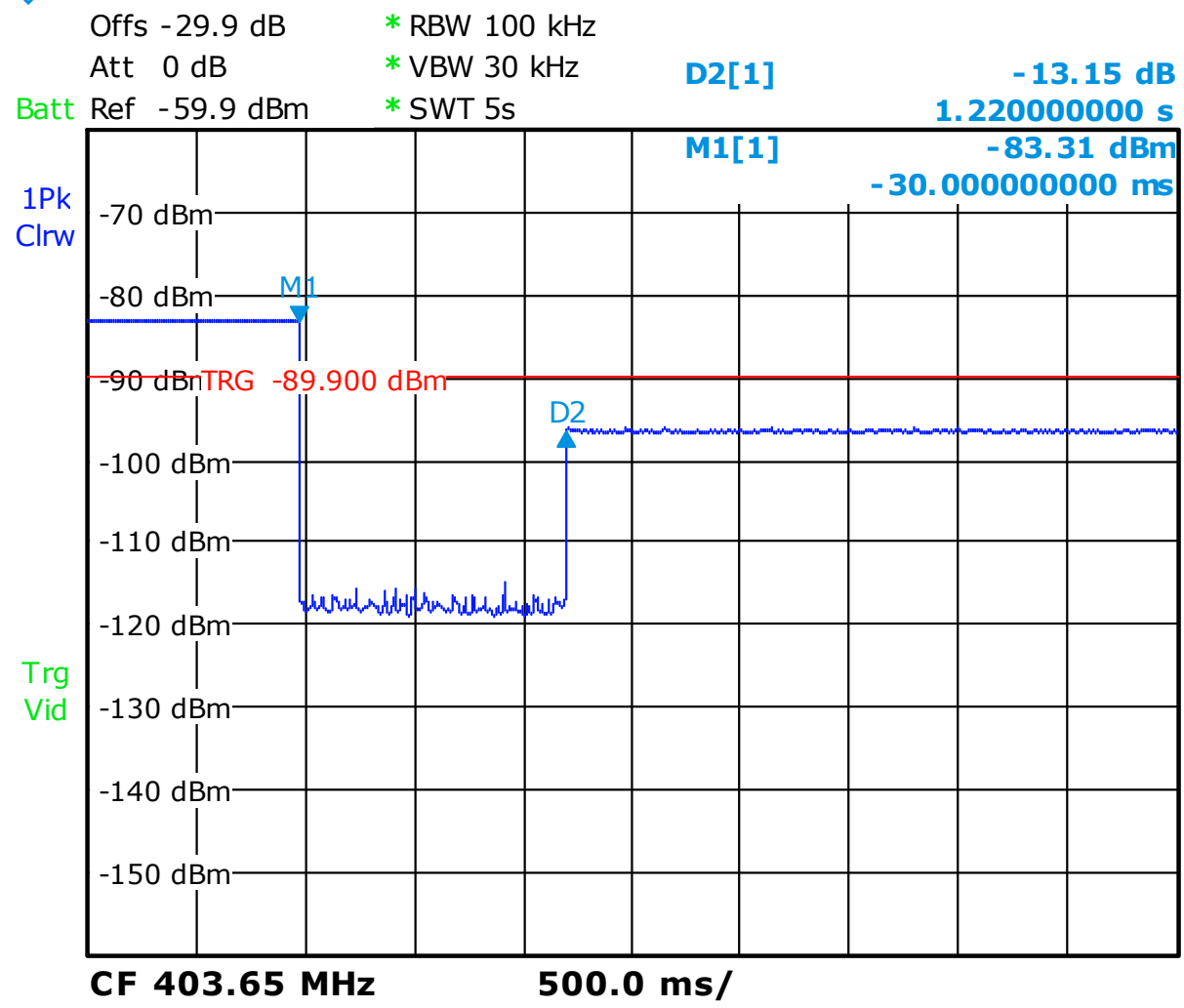
Graphic N°19
Monitoring System Bandwidth
230Vdc
22°C



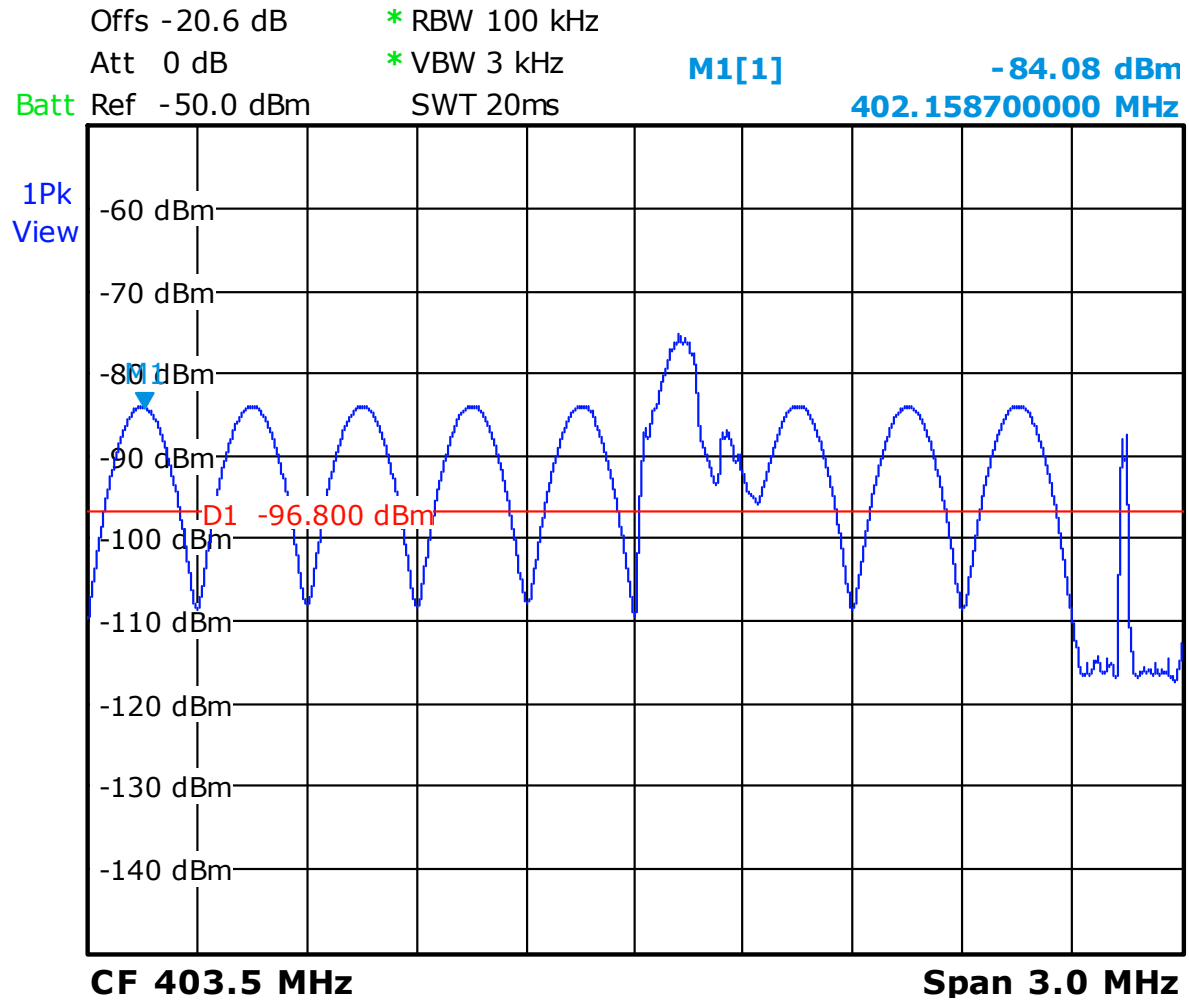
Graphic N°20
Monitoring System Bandwidth
230Vdc
22°C



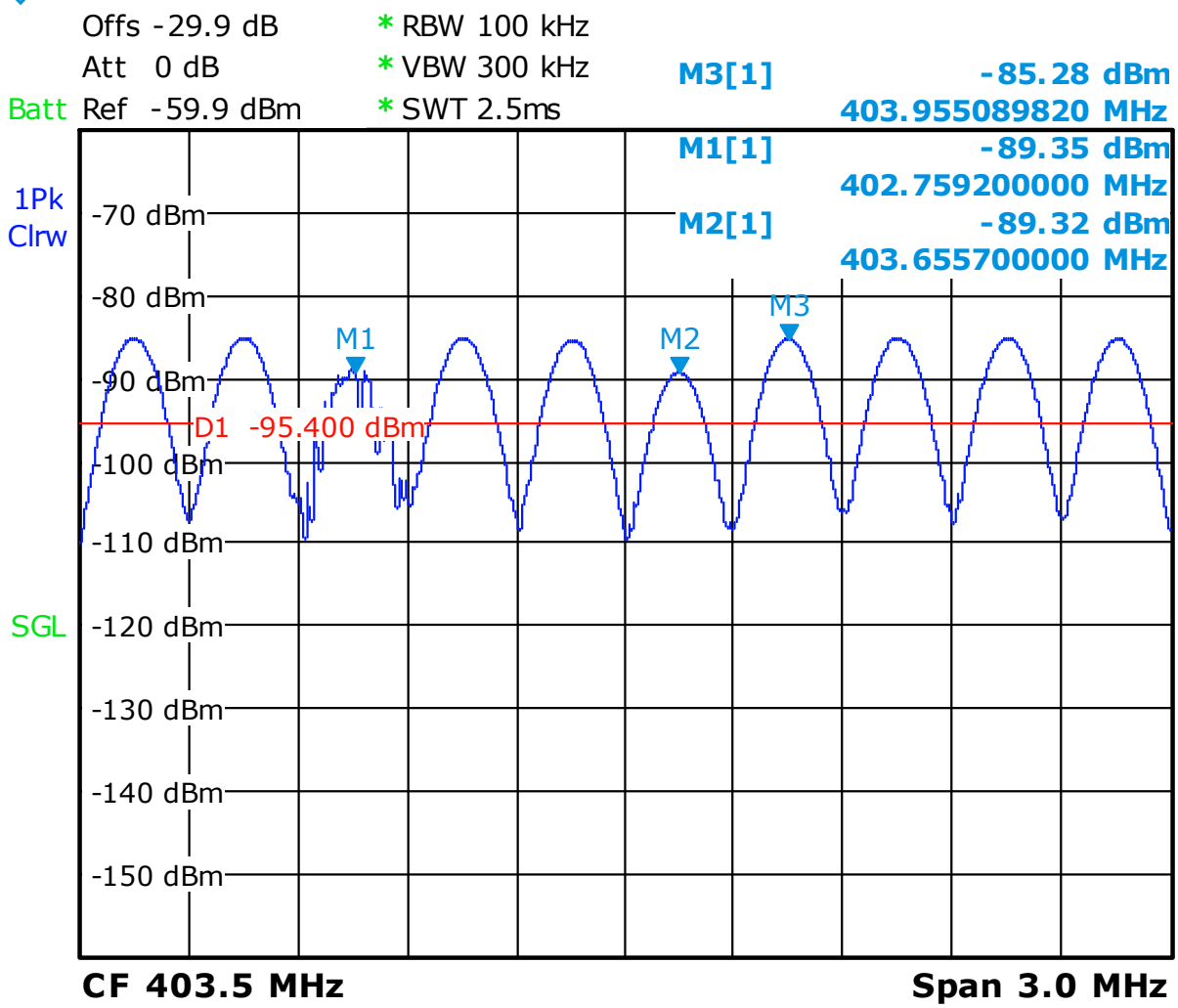
Graphic N°21
Scan Cycle Time
230Vdc
22°C



Graphic N°22
Minimum Channel Monitoring Period
230Vdc
22°C



Graphic N°23
Channel Access
230Vdc
22°C



19. ANNEX 3 (TEST EQUIPMENT LIST)

Test	Apparatus	Trade Mark	Type	Registration number
X	Signal generator	HP	8657B	A5442024
X	RF step attenuator 139dB	ROHDE & SCHWARZ	DPSP	A7122105
X	Full anechoic chamber	SIEPEL	S36	D3044019
X	Signal generator	HP	8648B	A5442033
X	Signal generator	HP	8648B	A5442032
X	Signal generator	HP	8648B	A5442031
X	Signal generator	HP	E4433B	A5488014
X	Signal generator	ROHDE & SCHWARZ	SMIQ	A5442039
X	Bilog Antenna	CHASE	CBL 6111C	C2040124
X	Signal generator	HP	8657B	A5442023
X	Double Ridge Guide Horn Antenna	AH SYSTEMS	SAS-S71	C2042041
X	Logperiodic antenna	AMPLIFIER RESEARCH	ATR80M6G	C2040149
X	Preamplier	BONN Elektronik	BLNA 3018-8F30S	A7080053
X	Climatic Chamber	SECASI Technologies	SLT-34	D1024029
X	Horn antenna	EMCO	.3115	C2042016
X	Signal Generator	ROHDE & SCHWARZ	SMY02	A5442013
X	Signal Generator	HP	8656B	E5400003
X	Bilog antenna	CHASE	CBL 6112A	C2040040
X	Semi anechoic chamber	SIEPEL	C01	D3044008
X	Signal Generator	HP	8657B	A5442019
X	Coupler	Mini circuit	ZB8PD	
X	Receiver	RHODE & SCHWARZ	ESU	A2642018
X	V ISLN	RHODE & SCHWARZ	ESH2-Z5	C2322001
X	RSI	TESEQ	TLISN-T4	C2320097
X	Spectrum analyzer	FSL6	R & S	A4060032
X	EMI Test Receiver	ROHDE & SCHWARZ	ESMI	A2642009
X	Power supply	1501L	CALIFORNIA INSTRUMENT	A7042261

End of this test report