



LCIE

Test report

N°: 127624-656122B

Subject Radio spectrum Matters (ERM) tests according to standards:
47 CFR Part 95I & RSS-243 & RSS-Gen, Issue 3

Issued to SORIN
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Apparatus under test


☞ Product Orchestra plus link
☞ Trade mark SORIN Group
☞ Manufacturer SORIN Group
☞ Model KA351
☞ Serial number LA1403007E
☞ FCC ID YSGKA351
☞ IC ID 10270A-KA351

Test date 2014/07/10 to 2014/08/26
Test location Ecuelles Fontenay Aux Roses
Test performed by Stéphane PHOUDIAH & Laurent DENEUX
Composition of document 78 pages

Modification of the last version None

Document issued on 2014/10/22

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1. TEST PROGRAM

• **References**

- Standards: -47 CFR FCC Part 95l
-RSS-243
-RSS-Gen
-FCC 15.207
-FCC 15.109

• **Requirements:**

Clause (FCC Part 95l) Test Description	TEST RESULT - Comments
FCC § 95.628(e) & RSS-243 § 5.3 – Frequency error	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)
FCC § 95.633(e) & RSS-243 § 5.1 – Emission bandwidth	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)
RSS-Gen § 4.6.1 – Occupied bandwidth	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)
FCC § 95.639(f) & RSS-243 § 5.4 – Transmitter output power	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)
FCC § 15.207(d) & RSS-Gen § 7.2.4 – AC conducted emissions	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)
FCC § 95.635(d) & RSS-243 § 5.5 – Transmitter unwanted emission	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)
FCC 15.109 & RSS-243 § 5.6 – Receiver spurious emissions	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)
FCC 95.628 (a)(3) & RSS-243 § 5.7.1 – LBT threshold power level	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)
FCC 95.628 (a)(1) & RSS-243 § 5.7.2 – Monitoring system bandwidth	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)
FCC 95.628 (a)(2) & RSS-243 § 5.7.3 –Monitoring system scan cycle time	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)
FCC 95.628 (a)(2) & RSS-243 § 5.7.4 –Minimum channel monitoring period	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)
FCC 95.628 (a)(4) & RSS-243 § 5.7.5 – Channel access	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)
FCC 95.628 (a)(4) & RSS-243 § 5.7.6 – Discontinuation of MICS session	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> NA <input type="checkbox"/> NP (Limited Program)
FCC 95.628 (a)(5) & RSS-243 § 5.7.7 – Use of pre-scanned alternative channel	<input type="checkbox"/> PASS <input type="checkbox"/> FAIL <input checked="" type="checkbox"/> NA (The system does not use the provision for use of a pre-scanned alternate channel) <input type="checkbox"/> NP (Limited Program)
This table is a summary of test report, see conclusion of each clause of this test report for detail.	

The product SORIN Group KA351, SN: LA1403007E is Compliant according to FCC part 95l & RSS-243 & RSS-Gen standards.

- PASS: EUT complies with standard's requirement
 FAIL: EUT does not comply with standard's requirement
 NA: Not Applicable
 NP: Not Performed



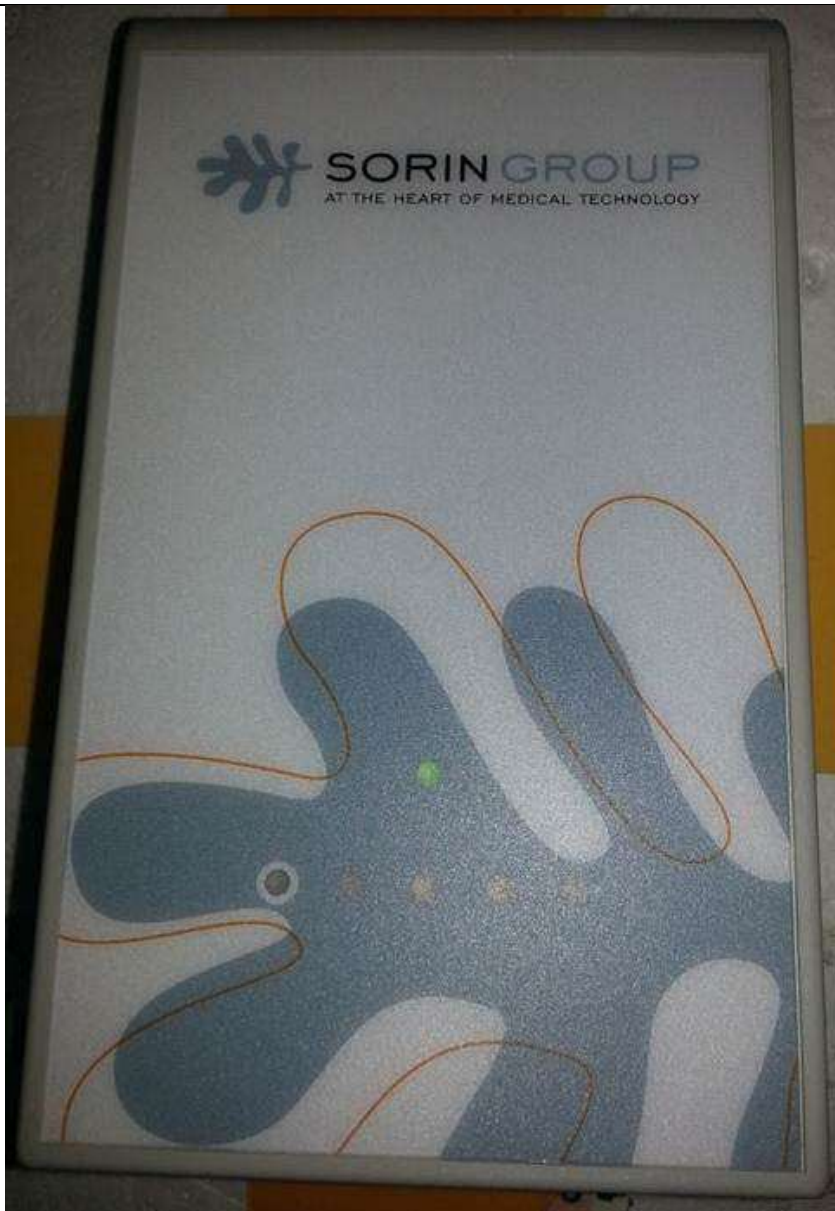
2. EQUIPMENT DESCRIPTION

2.1. GENERAL DESCRIPTION

-The SORIN Group KA351 is part of the RF Programmer System.
This system has been specially designed to program and interrogate Sorin Radio Frequency implantable medical devices. Sorin cardiac devices are equipped with a transceiver which receives clinical commands and sends clinical information and device parameters through the ORCHESTRA PLUS LINK Radio Frequency wireless technology.

2.2. HARDWARE & SOFTWARE IDENTIFICATION DECLARED BY THE MANUFACTURER

- Equipment under test (EUT):



Photograph of EUT



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

- Inductive Head
- Orchestra Plus



Photograph of AE



- **Input/output:**

- USB

- **Software identification:**

- Software version: RF_FW_v1.5

- **Equipment information:**

- Modulation: 2FSK

- Transmit operating mode: Multiples antenna
 Single antenna: Equipment with 2 diversity antennas operating in switched mode by which at any moment in time only 1 antenna is used

- Number of transmit chains: 1 2

- Number of receiver chains: 1 2

- Antenna type: Integral External

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

- Temperature range: Tmin: -20°C 0°C °C
Tnom: 20°C
Tmax: +35°C 55°C 40°C

- Test source voltage: Vnom: 120V/60Hz 5Vdc

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



- Antenna Gain:

Antenna Assembly	Gain (dBi)		
	Channel 0	Channel 5	Channel 9
1	-4.7	-4.9	-3.3
2	-5.7	-5.6	-4.4

- Operating frequency range:

Frequency Band (MHz)	
2400MHz to 2483,5MHz	<input checked="" type="checkbox"/>
5150MHz to 5350MHz	<input type="checkbox"/>
5470MHz to 5725MHz	<input type="checkbox"/>
402MHz to 405MHz	<input checked="" type="checkbox"/>

-Channel plan:

Channel	Frequency (MHz)
Cmin: 0	402.15
1	402.45
2	402.75
3	403.05
4	403.35
Cnom:5	403.65
6	403.95
7	404.25
8	404.55
Cmax: 9	404.85



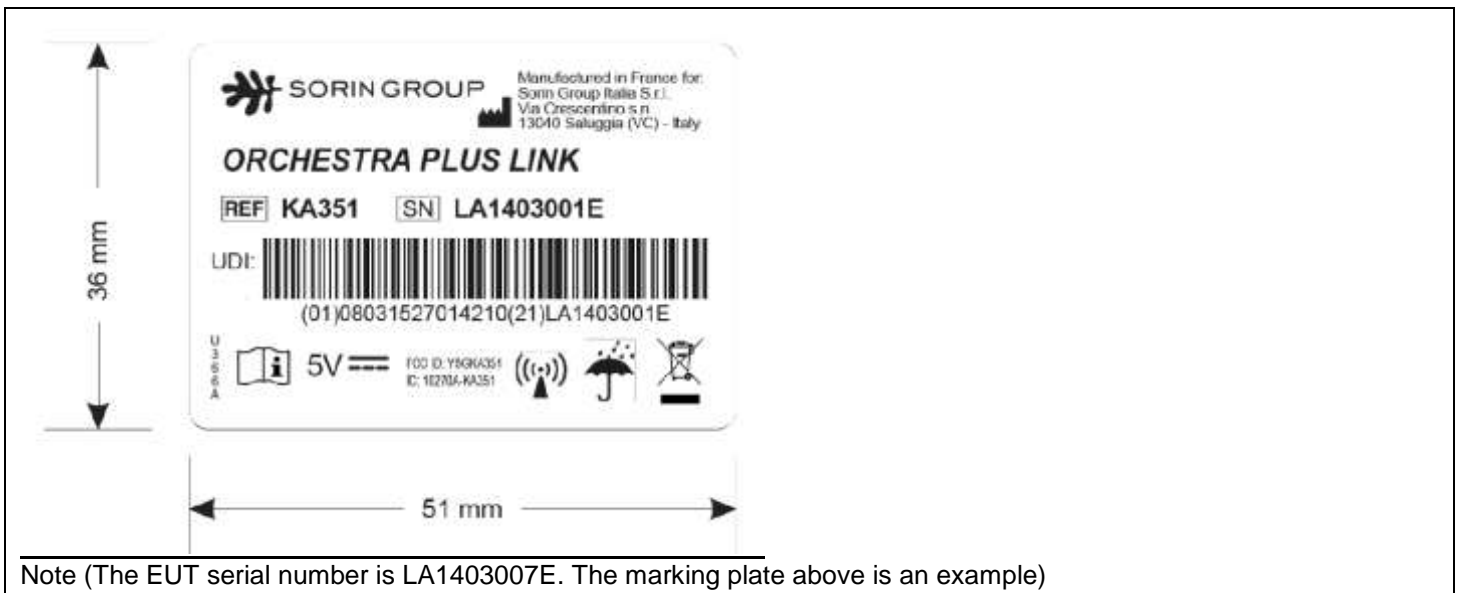
2.3. RUNNING MODE

The EUT is set in the following modes during tests:

- Permanent emission with modulation on a fixed channel at the highest power
- Permanent emission without modulation on a fixed channel at the highest power
- Permanent reception
- Emission-reception

Following commands with the specific test software are used to set the product:
See MISC2285A document

2.4. EQUIPMENT LABELLING



2.5. EQUIPMENT MODIFICATION

- No equipment modification has been necessary during testing.
- Modification applied for following tests:

3. FREQUENCY ERROR

3.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
Date of test : 2014/08/18
Ambient temperature : 22°C
Relative humidity : 42%

3.2. TEST SETUP

- The Equipment under Test is installed:

- In the climatic chamber
- On a table
- In an anechoic chamber

-Measurement is performed with a spectrum analyzer

- On the EUT conducted access
- With a test fixture

The spectrum analyzer counter or marker peak function is used to find the frequency error.



Photograph for Frequency Error



Photograph for Frequency Error

3.3. LIMIT

Frequency error for equipment operating in the 402 MHz to 405 MHz band shall not exceed ± 100 ppm under normal, extreme or any intermediate set of conditions.

3.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Multi-meter	KEITHLEY	2000	A1241084	2014/02	2016/02
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2013/10	2014/10
RF cable	Télédyne	920-0202-048	A5329661	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122209	2014/04	2015/04
RF cable	Télédyne	920-0202-048	A5329675	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122210	2014/04	2015/04
Spectrum Analyser	ROHDE & SCHWARZ	FSL 6	A4060032	2012/11	2014/11
Climatic room	SECASI	SLT 34	D1024029	Verified with calibrated thermometer	Verified with calibrated thermometer
Thermometer	AOIP	TM 6630	B4041042	2013/07	2014/07
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	2014/05	2015/05

Note: In our system quality, calibration due is more & less 2 month.

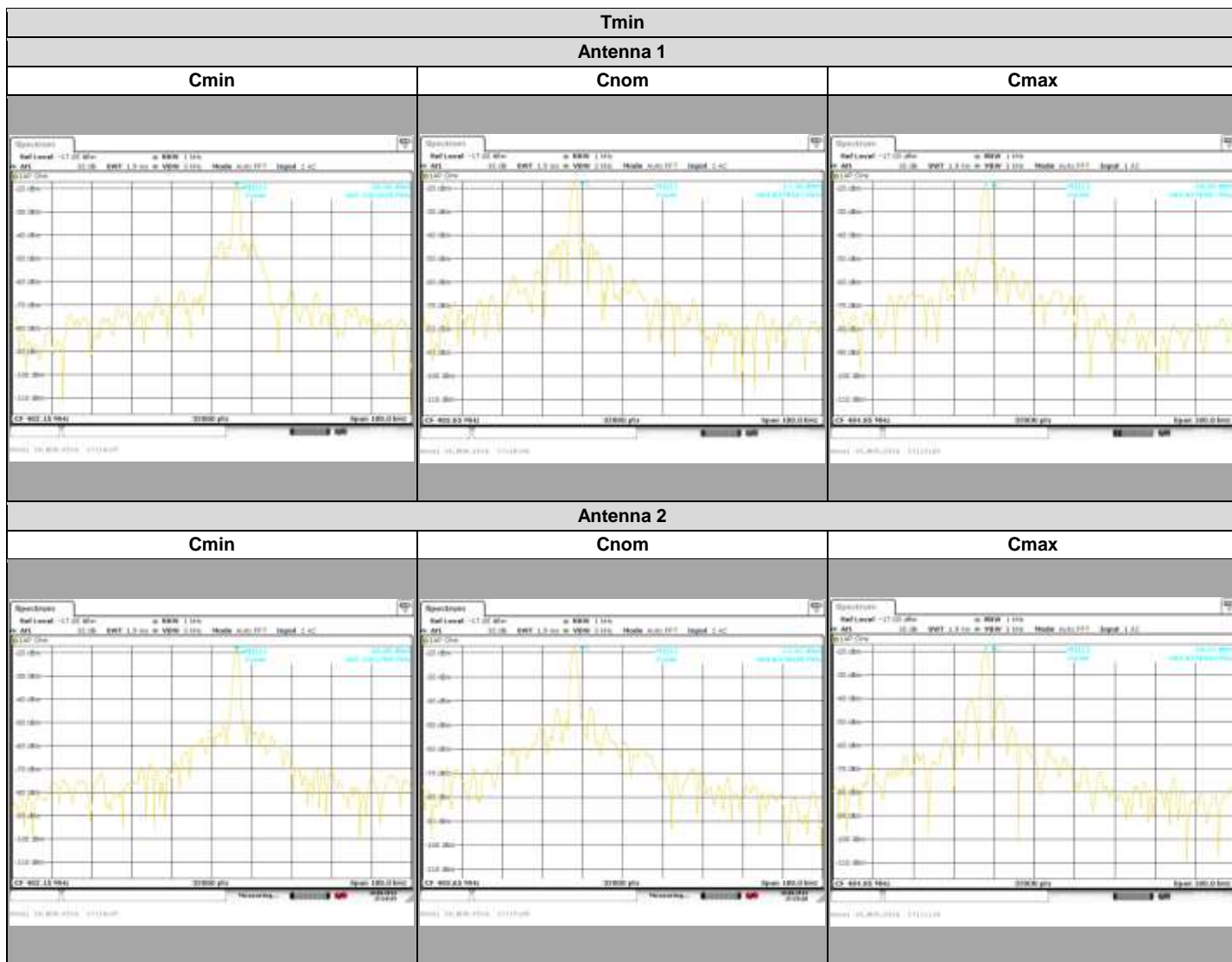
3.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

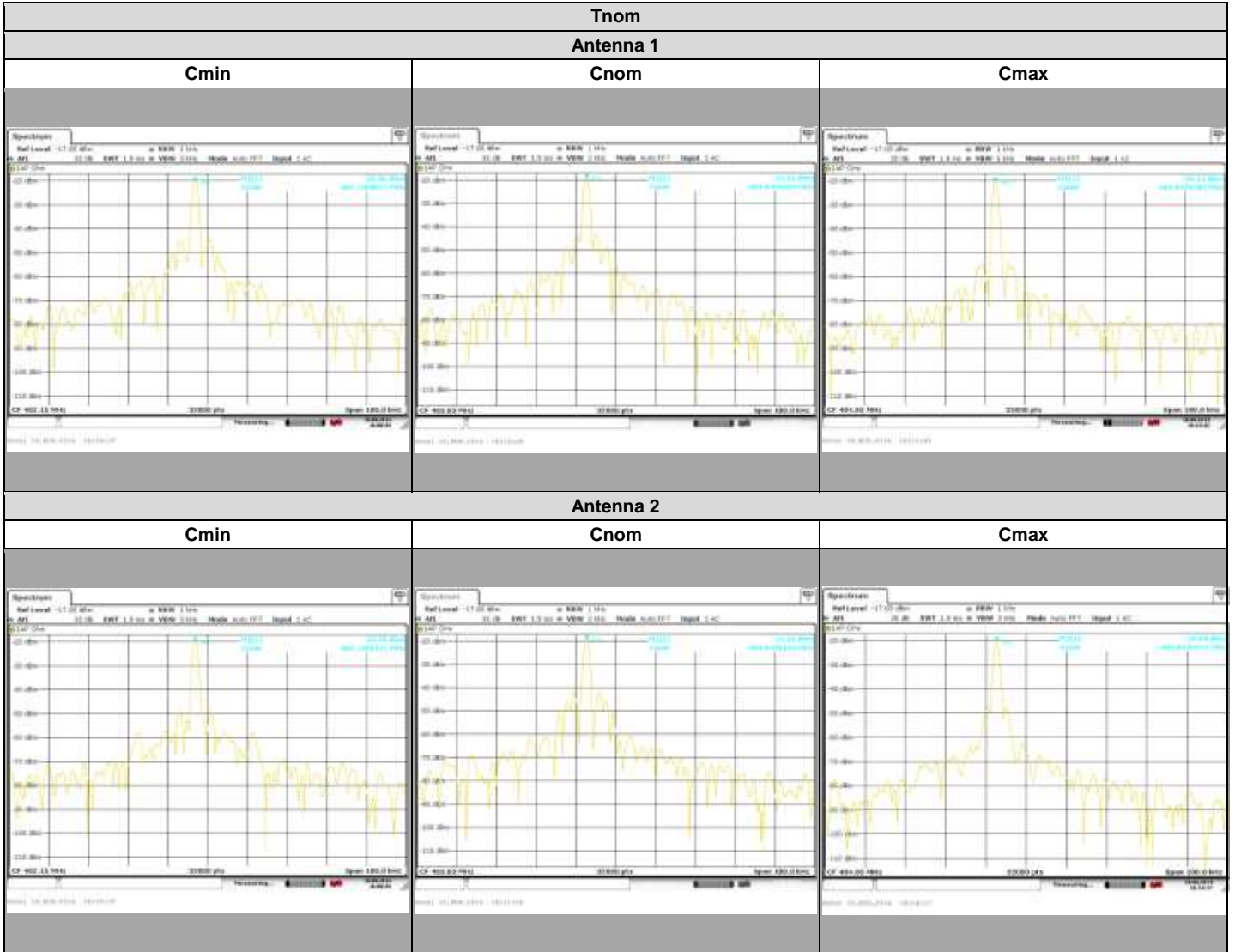
None

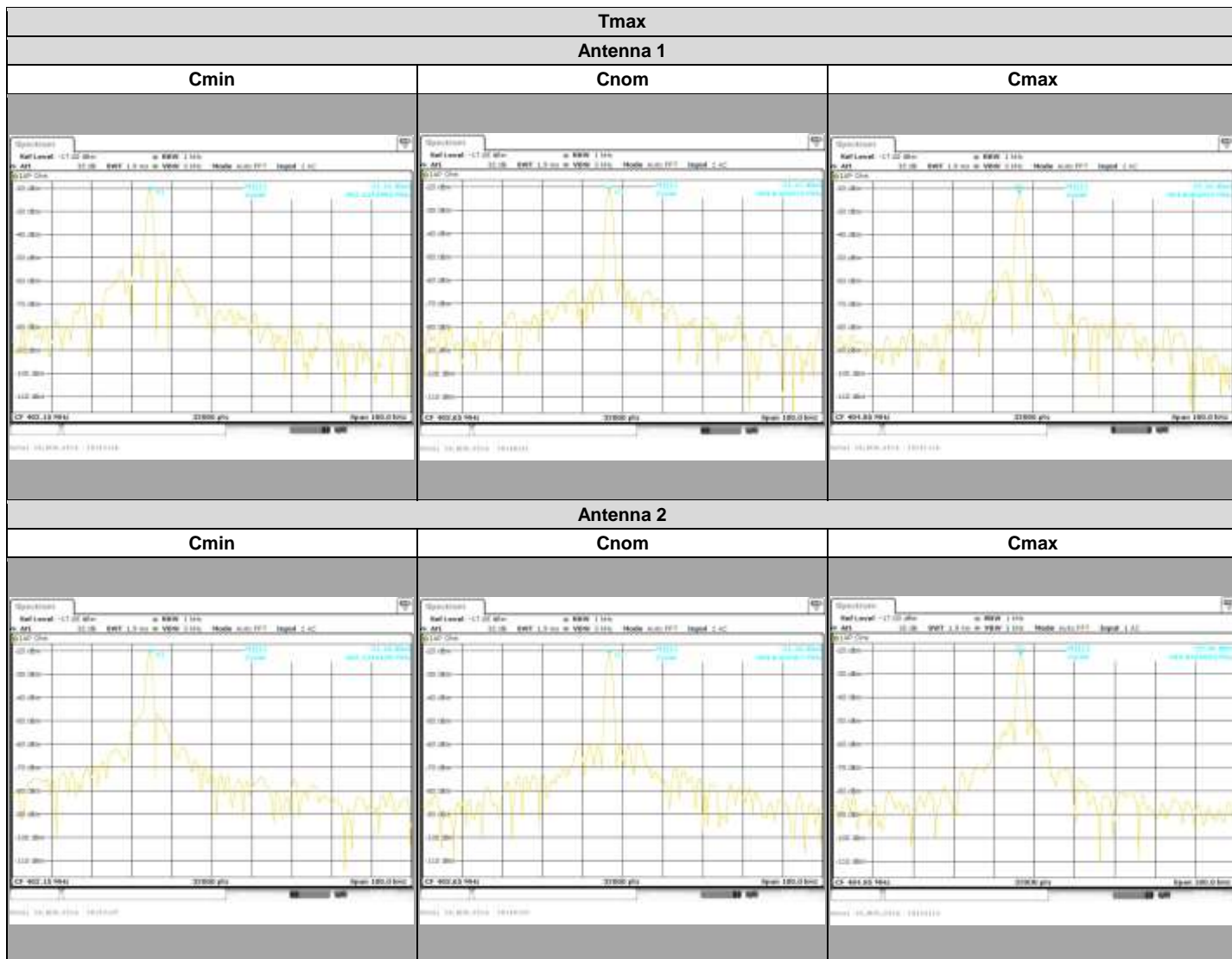
Divergence:



3.6. GRAPHICS & RESULTS









Temperature	Tmin			Tnom			Tmax		
Voltage	Vnom								
Antenna	1								
Channel	Cmin	Cnom	Cmax	Cmin	Cnom	Cmax	Cmin	Cnom	Cmax
Frequency (MHz)	402.1561	403.6378	404.8378	402.1468	403.6426	404.8426	402.1344	403.6466	404.8466
Frequency error (ppm)	23,1	-11,9	-11,9	Reference	Reference	Reference	-30,8	9,9	9,9
Antenna	2								
Channel	Cmin	Cnom	Cmax	Cmin	Cnom	Cmax	Cmin	Cnom	Cmax
Frequency (MHz)	402.1561	403.6378	404.8378	402.1468	403.6426	404.8426	402.1344	403.6466	404.8466
Frequency error (ppm)	23,1	-11,9	-11,9	Reference	Reference	Reference	-30,8	9,9	9,9

3.7. CONCLUSION

The product SORIN Group KA351, SN:LA1403007E, in configuration and description presented in this test report, complies with the frequency error measurement of FCC § 95.628(e) & RSS-243 § 5.3.

4. EMISSION BANDWIDTH

4.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
Date of test : 2014/08/18
Ambient temperature : 22°C
Relative humidity : 42%

4.2. TEST SETUP

- The Equipment under Test is installed:

- In the climatic chamber
- On a table
- In an anechoic chamber

-Measurement is performed with a spectrum analyzer

- On the EUT conducted access
- With a test fixture

The spectrum analyzer occupied ndB down function is used to find the emission bandwidth.



Photograph for Emission Bandwidth



Photograph for Emission Bandwidth

4.3. LIMIT

Emission bandwidth shall not exceed 300 kHz. If two or more devices that operate in a given MICS communications session operate in different portions of the 402 MHz to 405 MHz band, their combined emission bandwidths shall not exceed 300 kHz. This limits spectrum usage to a maximum of 300 kHz in any single MICS communications session. The 300 kHz limitation may be exceeded briefly due to intermittent transmissions that may occur when operating channel acquisitions or changes are required to maintain a communications session.

All emissions from each device that fall outside its emission bandwidth but do fall within the 402 MHz to 405 MHz band shall be attenuated at least 20dB.

In addition, emissions from a device operating in the low duty cycle low power mode in the band 403,5MHz to 403,8MHz must be attenuated at least 20 dB at the band edges, 403,5MHz and 403,8MHz.



4.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Multi-meter	KEITHLEY	2000	A1241084	2014/02	2016/02
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2013/10	2014/10
RF cable	Télédyne	920-0202-048	A5329661	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122209	2014/04	2015/04
RF cable	Télédyne	920-0202-048	A5329675	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122210	2014/04	2015/04
Climatic room	SECASI	SLT 34	D1024029	Verified with calibrated thermometer	Verified with calibrated thermometer
Thermometer	AOIP	TM 6630	B4041042	2013/07	2014/07
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	2014/05	2015/05

Note: In our system quality, calibration due is more & less 2 month.

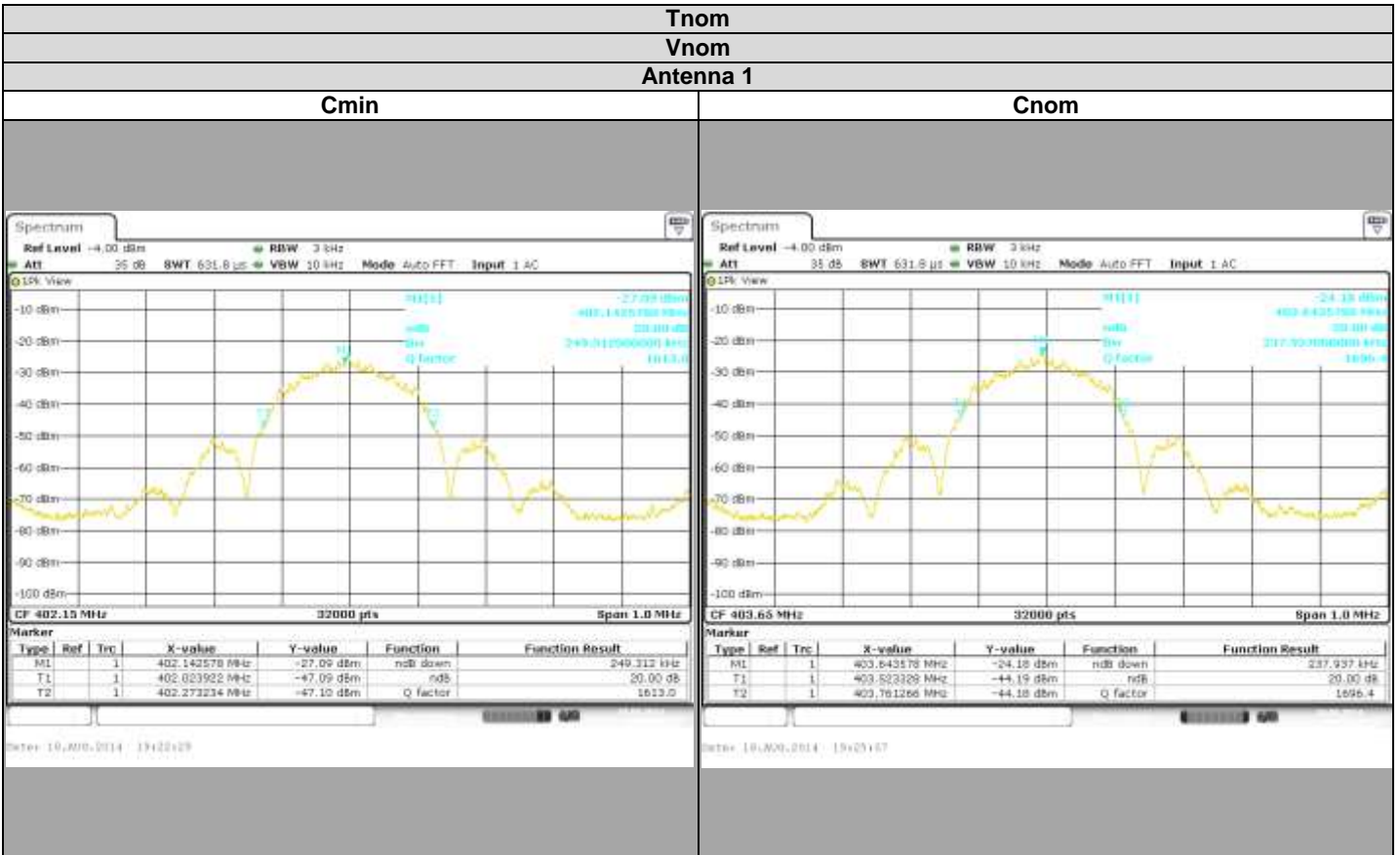
4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

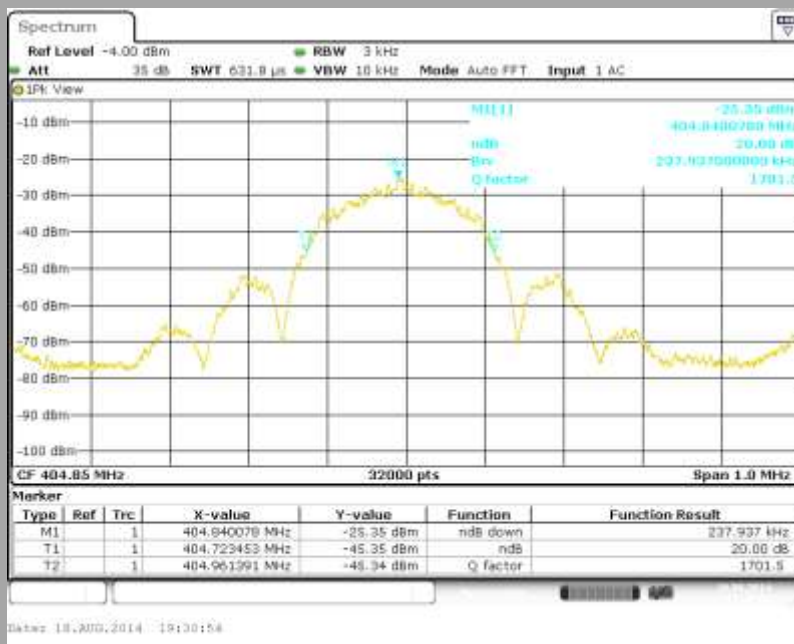
Divergence:



4.6. GRAPHICS & RESULTS



Cmax

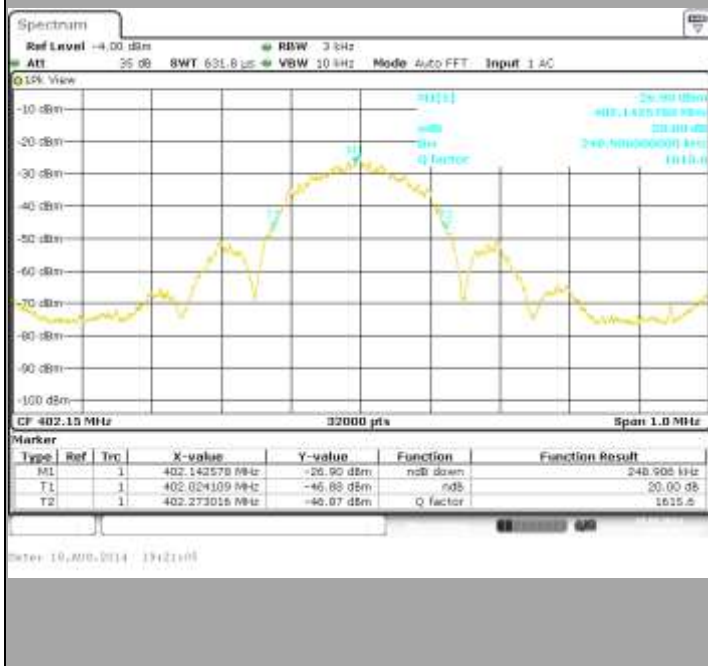




Tnom
Vnom
Antenna 2

Cmin

Cnom



Cmax





Temperature	Tnom		
Voltage	Vnom		
Antenna	1		
Channel	Cmin	Cnom	Cmax
Emission bandwidth (kHz)	249.312	237.937	237.937

Temperature	Tnom		
Voltage	Vnom		
Antenna	2		
Channel	Cmin	Cnom	Cmax
Emission bandwidth (kHz)	248.906	237.937	237.937

4.7. CONCLUSION

The product SORIN Group KA351, SN:LA1403007E, in configuration and description presented in this test report, complies with the emission bandwidth measurement of FCC § 95.633(e) & RSS-243 § 5.1.

5. OCCUPIED BANDWIDTH

5.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
Date of test : 2014/08/19
Ambient temperature : 23°C
Relative humidity : 39%

5.2. TEST SETUP

- The Equipment under Test is installed:

- In the climatic chamber
- On a table
- In an anechoic chamber

-Measurement is performed with a spectrum analyzer

- On the EUT conducted access
- With a test fixture

The product has been tested according to the RSS-GEN § 4.6.1 reference method.



Photograph for Occupied Bandwidth



Photograph for Occupied Bandwidth

5.3. LIMIT

No Limit

5.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Multi-meter	KEITHLEY	2000	A1241084	2014/02	2016/02
RF cable	Télédyne	920-0202-048	A5329661	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122209	2014/04	2015/04
RF cable	Télédyne	920-0202-048	A5329675	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122210	2014/04	2015/04
Spectrum Analyser	ROHDE & SCHWARZ	FSL 6	A4060032	2012/11	2014/11
Climatic room	SECASI	SLT 34	D1024029	Verified with calibrated thermometer	Verified with calibrated thermometer
Thermometer	AOIP	TM 6630	B4041042	2013/07	2014/07
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	2014/05	2015/05

Note: In our system quality, calibration due is more & less 2 month.

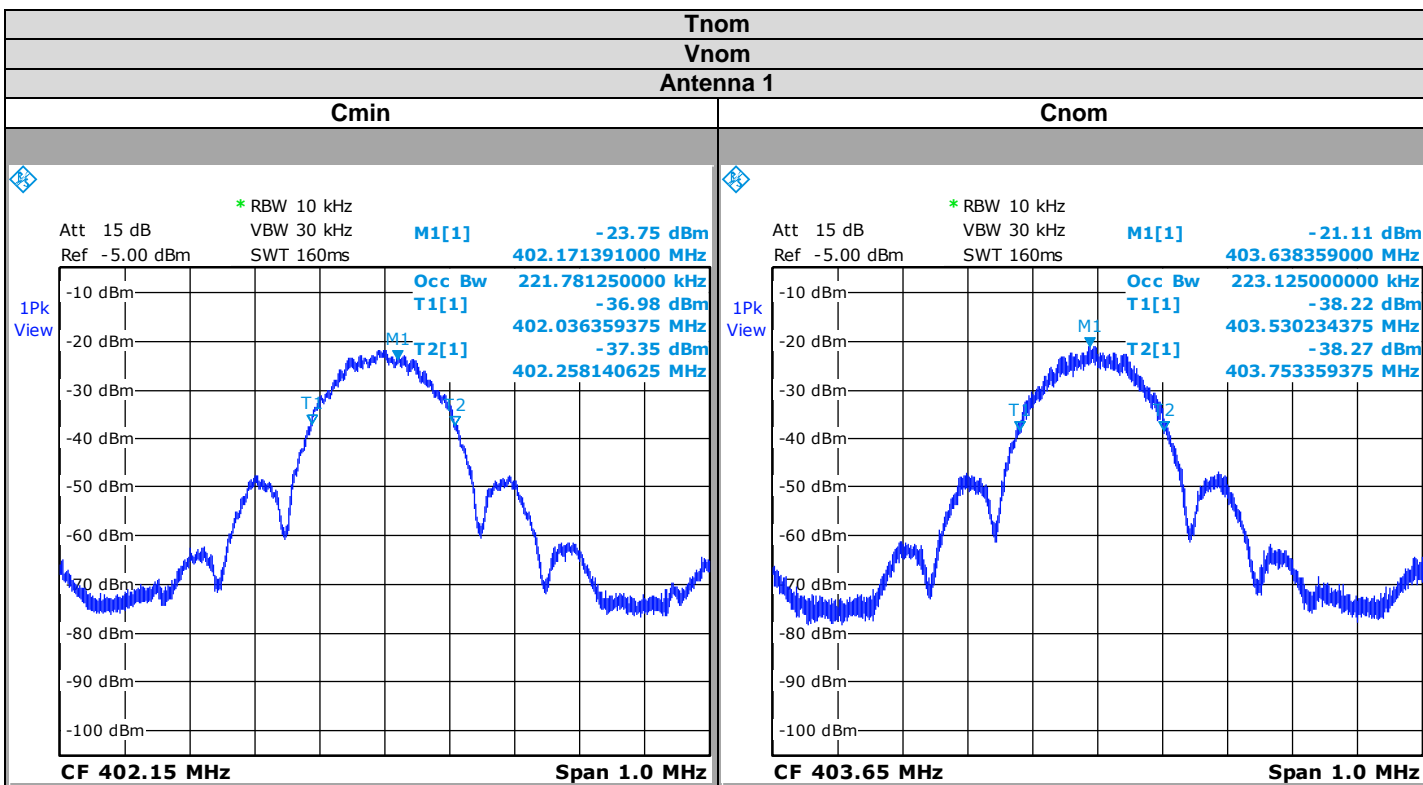
5.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

Divergence:

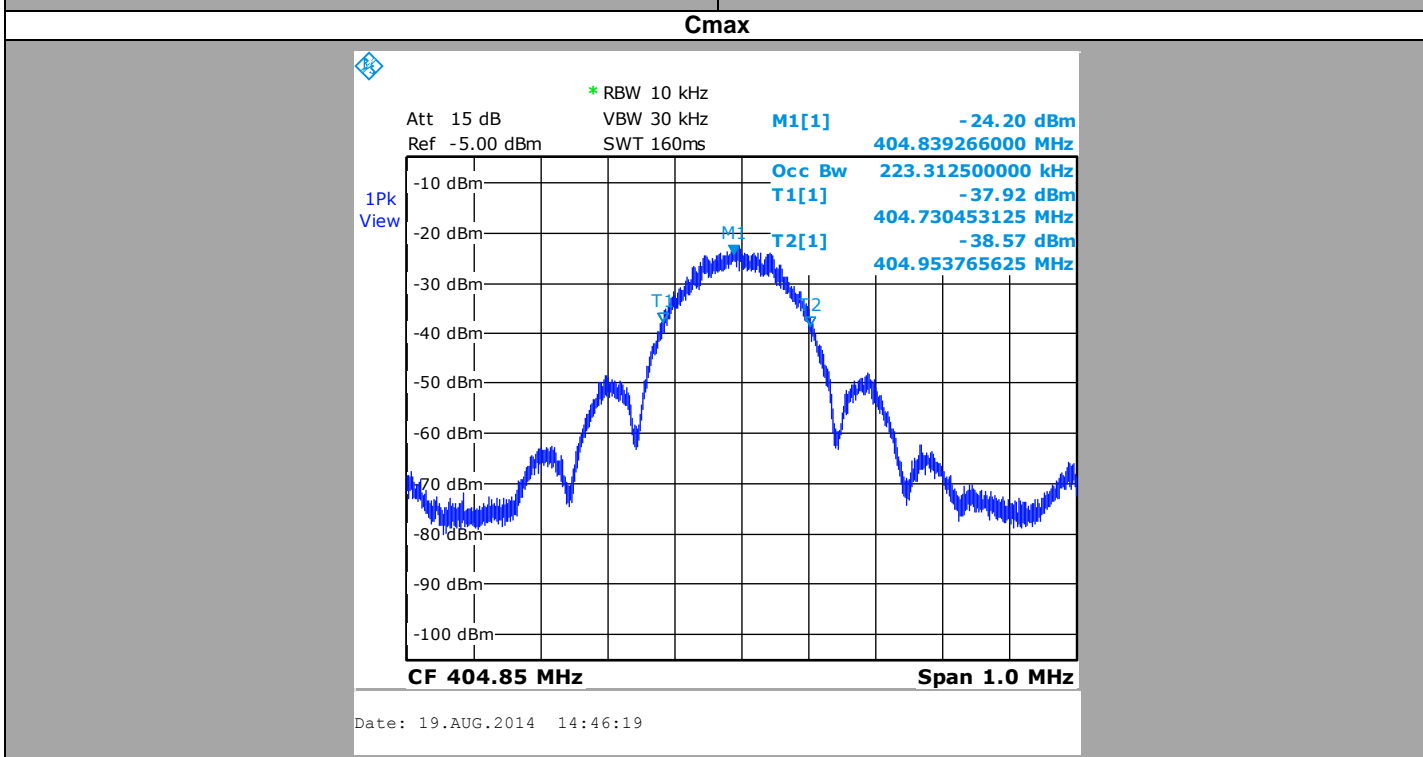


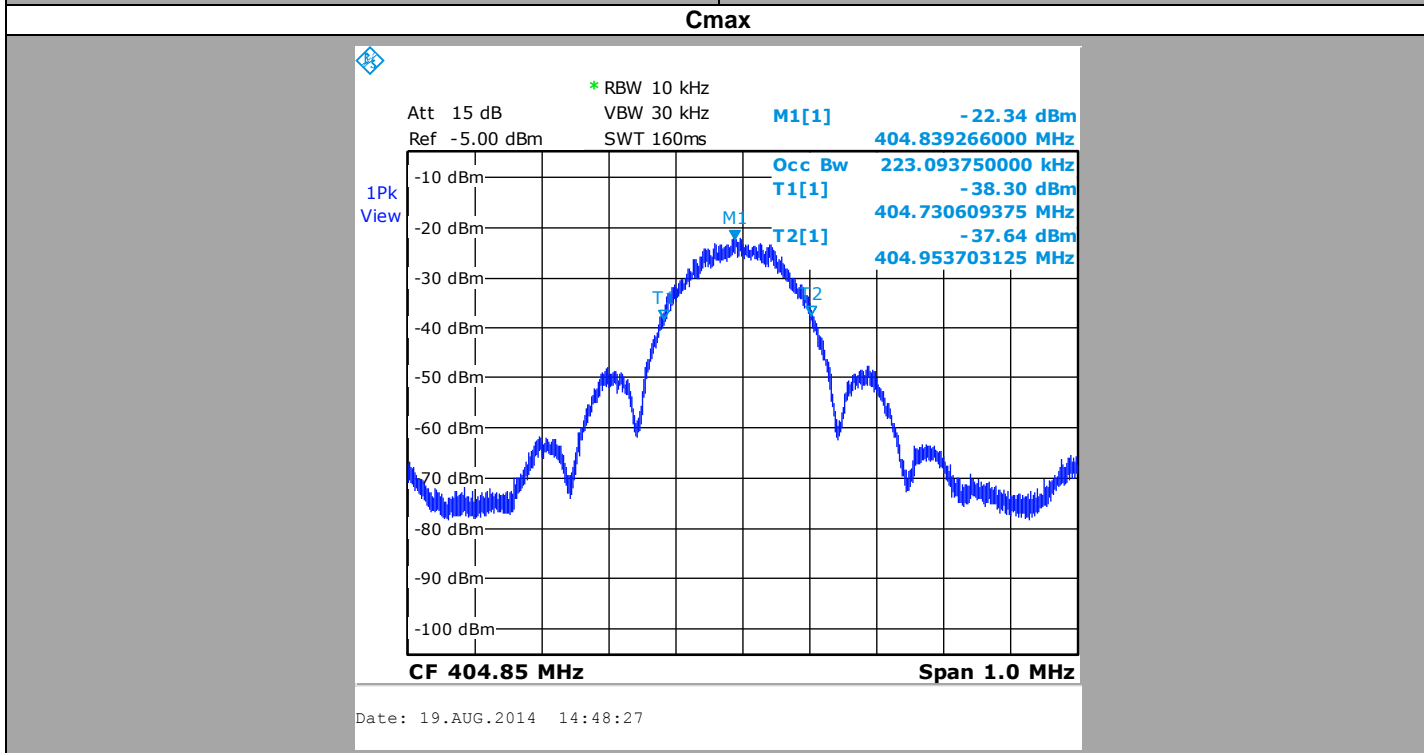
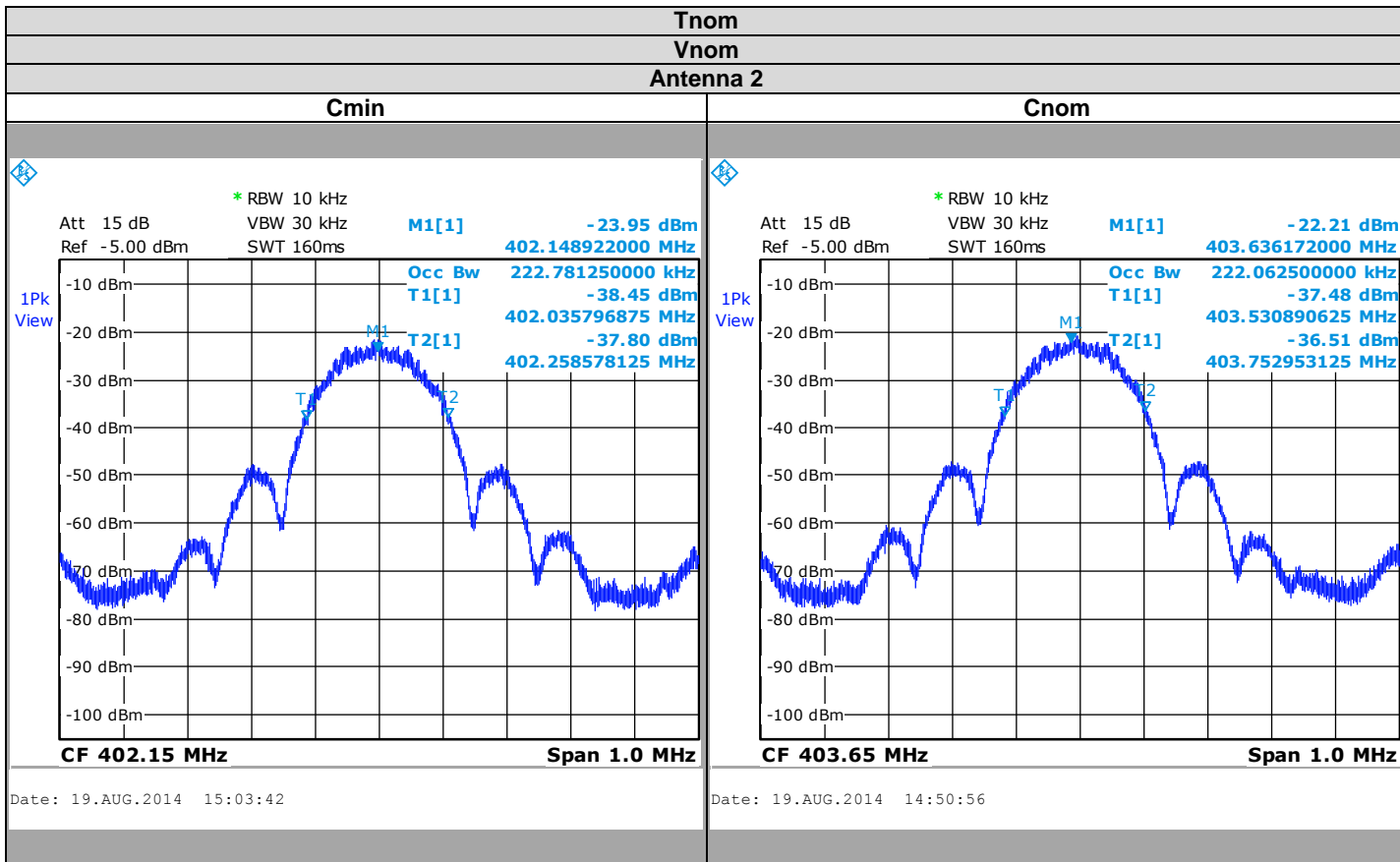
5.6. GRAPHICS & RESULTS



Date: 19.AUG.2014 15:01:01

Date: 19.AUG.2014 14:53:14







Temperature	Tnom		
Voltage	Vnom		
Antenna	1		
Channel	Cmin	Cnom	Cmax
Occupied Bandwidth (kHz)	221.781	223.125	223.312

Temperature	Tnom		
Voltage	Vnom		
Antenna	2		
Channel	Cmin	Cnom	Cmax
Occupied Bandwidth (kHz)	222.781	222.062	223.093

5.7. CONCLUSION

The product SORIN Group KA351, SN:LA1403007E, in configuration and description presented in this test report, complies with the occupied bandwidth measurement of RSS-Gen § 4.6.1.



6. TRANSMITTER OUTPUT POWER

6.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
Date of test : 2014/08/14
Ambient temperature : 25°C
Relative humidity : 47%

6.2. TEST SETUP

- The Equipment Under Test is installed:

- FAR
- SAR
- OATS

- Distance between EUT and the measuring antenna is:

- 3m
- 10m

- The setup is 1.5 m above the ground reference plane on an isolating table and the maximum emitted power value from the EUT is found by the rotation of the 360° turntable and:

- With measurement antenna height at 1.5m from the ground reference plane
- By variation of measurement antenna height between 1m and 4m from the ground reference plane

The measuring antenna is in vertical and then in horizontal polarization. The substitution antenna replaces the equipment under test. The substitution antenna is powered by signal generator through RF cables. The input signal on the substitution antenna is adjusted in order to obtain the same value found in the maximum emitted power search. Mean power at the output of the transmitter and product antenna gain (A+G) are deduced after correction due to the gain of the substitution antenna and the RF cables loss between the signal generator and the substitution antenna

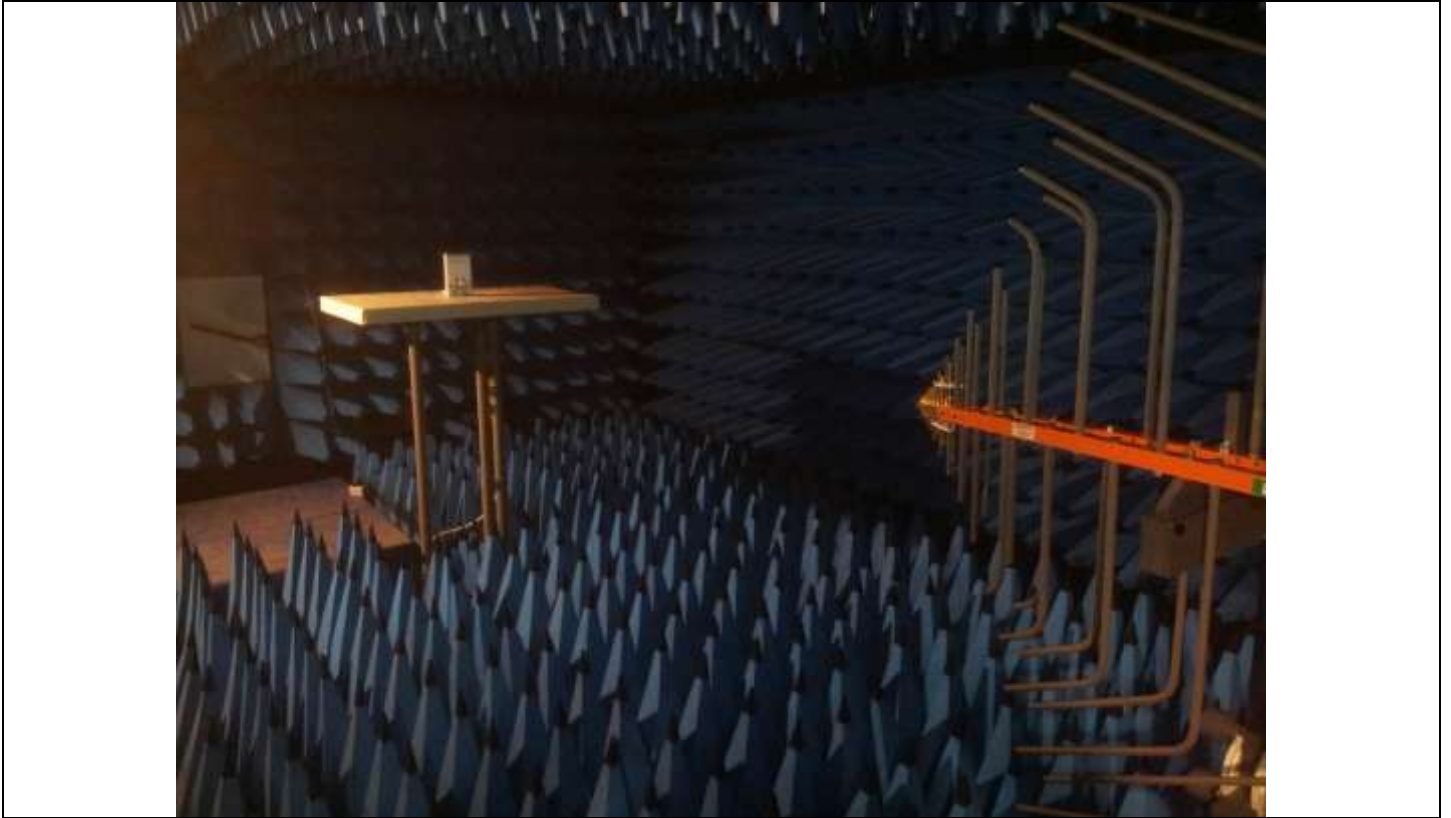
The Equivalent Isotropic Radiated Power (EIRP in dBm) is defined with the following formula:

$$EIRP = A+G$$

A (dBm): peak power at the output of the transmitter

G (dBi): product antenna gain

A+G: Measured in radiated by substitution method



Photograph for Transmitter output power

6.3. LIMIT

The EIRP of ULP-AMI and/or ULP-AMI-P equipment that operates as part of system that incorporates a monitoring system to select the frequency of operation using LBT and AFA shall not exceed 25 μW .

The EIRP of ULP-AMI transmitters operating on any frequency in the band 403,5 MHz to 403,8 MHz shall not exceed 100nW unless the frequency of operation in this band has been selected by a monitoring system using LBT and AFA. The duty cycle for any transmitter operating in the LDC mode is limited to 0,01%.



6.4. TEST EQUIPMENT LIST

Apparatus	Trade Mark	Type	Registration number	Cal_Date	Cal_Due
EMI receiver	ROHDE & SCHWARZ	ESI40 1088 740K40	A2642010	2014/02	2015/02
Substitution RF cable	CABLES & CONNECTIQUES	3.5MD/CSU528AA/3.5MD/10M	A5329354	2014/04	2015/04
Substitution RF cable	CABLES & CONNECTIQUES	3.5MD/CSU528AA/3.5MC/2000	A5329439	2014/05	2015/05
Measurement RF cable	Teledyne	082-5454-1.5MTR	A5329624	2013/09	2014/09
Measurement RF cable	Teledyne	082-0404-1MTR	A5329625	2013/09	2014/09
Measurement RF cable	Teledyne	082-5454-3MTR	A5329626	2013/09	2014/09
Signal generator	ROHDE & SCHWARZ	SMIQ 03B	A5442039	2014/04	2015/04
Attenuator 3dB	AGILENT	8493C	A7122222	2013/12	2014/12
Logperiodic antenna	AMPLIFIER RESEARCH	ATR80M6G	C2040149	2013/09	2014/09
Dipole Antenna	Schwarzbeck	UHA 9105	C2040207	05/2014	05/2015
Full anechoic chamber	SIEPEL	S36	D3044019	2014/07	2017/07

6.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None Divergence:

6.6. RESULTS

Tnom						
Vnom						
Antenna 1						
Frequency	Spectrum analyzer level (dBm)	Generator level (dBm)	Loss (dB)	Antenna gain (dBi)	EIRP (dBm)	EIRP(μW)
Cmin	-55,5	-18	4,8	1,2	-21,6	6,9
Cnom	-52,5	-14,9	4,8	1,2	-18,5	14,2
Cmax	-53,1	-15,5	4,8	1,3	-19,0	12,5

Tnom						
Vnom						
Antenna 2						
Frequency	Spectrum analyzer level (dBm)	Generator level (dBm)	Loss (dB)	Antenna gain (dBi)	EIRP (dBm)	EIRP(μW)
Cmin	-51,9	-18,5	4,8	1,2	-22,1	6,2
Cnom	-53,5	-15,9	4,8	1,2	-19,5	11,3
Cmax	-49,8	-15,9	4,8	1,3	-19,4	11,4

6.7. CONCLUSION

The product SORIN Group KA351, SN:LA1403007E, in configuration and description presented in this test report, complies with the transmitter output power measurement of FCC § 95.639(f) & RSS-243 § 5.4.

7. AC CONDUCTED EMISSIONS

7.1. TEST CONDITIONS

Test performed by : Laurent DENEUX
Date of test : 2014/07/10
Ambient temperature : 19°C
Relative humidity : 64%

7.2. 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 $50\Omega / 50\mu\text{H}$. Interconnecting cables and equipment's were moved to position that maximized emission.



Photograph for AC Power Line Conducted Emissions (Front View)



Photograph for AC conducted Emissions (Side View)



7.3. LIMIT

AC conducted emissions shall not exceed value below:

Quasi-Peak

0,15kHz to 0,5MHz: 66dB μ V to 56dB μ V*

0,5MHz to 5MHz: 56dB μ V

5MHz to 30MHz: 60dB μ V

Average

0,15kHz to 0,5MHz: 56dB μ V/m to 46dB μ V*

0,5MHz to 5MHz: 46dB μ V

5MHz to 30MHz: 50dB μ V

*Decreases with the logarithm of the frequency

7.4. TEST EQUIPMENT LIST

Apparatus	Trade Mark	Type	Registration number	Cal_Date	Cal_Due
Reference ground plane 2 x 3 m	LCIE	-	-	-	-
EMI receiver	ROHDE & SCHWARZ	ESCI	A2642017	2013/09	2014/09
pulse limiter	ROHDE & SCHWARZ	ESH3-Z2	A2649008	2014/02	2015/02
Cable (current absorber)	LCIE	BNC I-ABS	A5329589	2013/07	2014/07
V LISN	ROHDE & SCHWARZ	ESH2-Z5	C2322001	2014/03	2015/03

Note: In our system quality, calibration due is more & less 2 month.

7.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

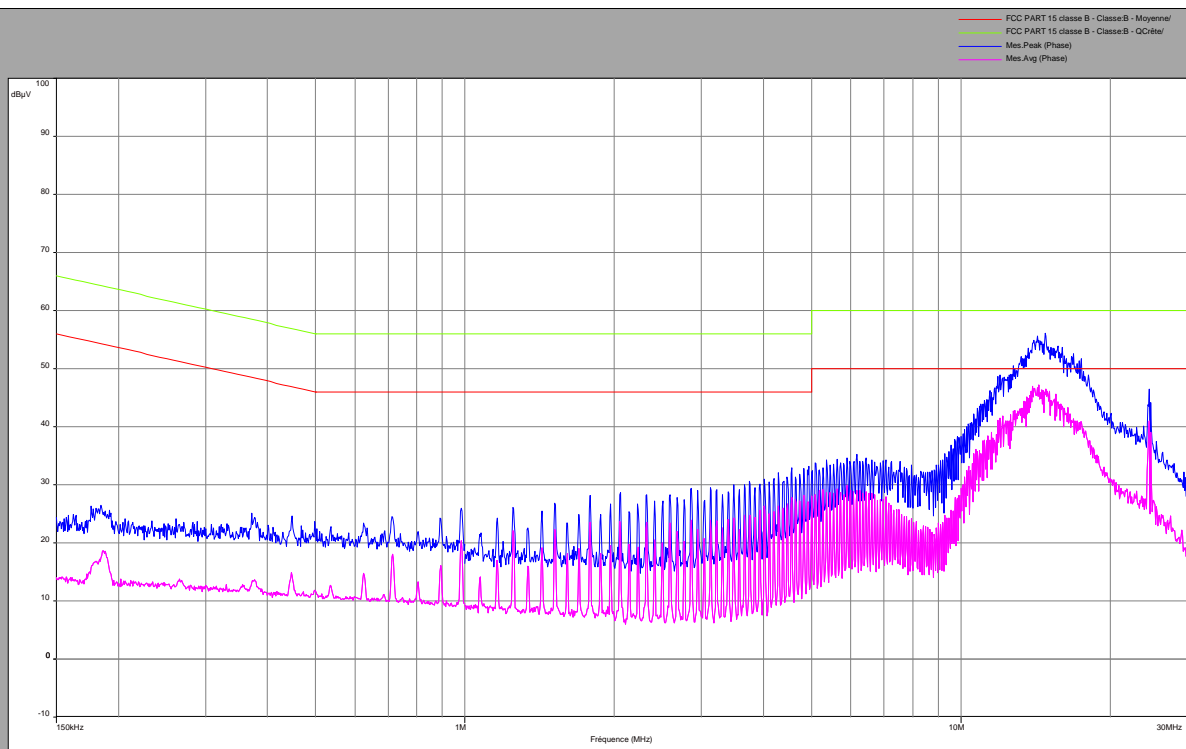
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Divergence:

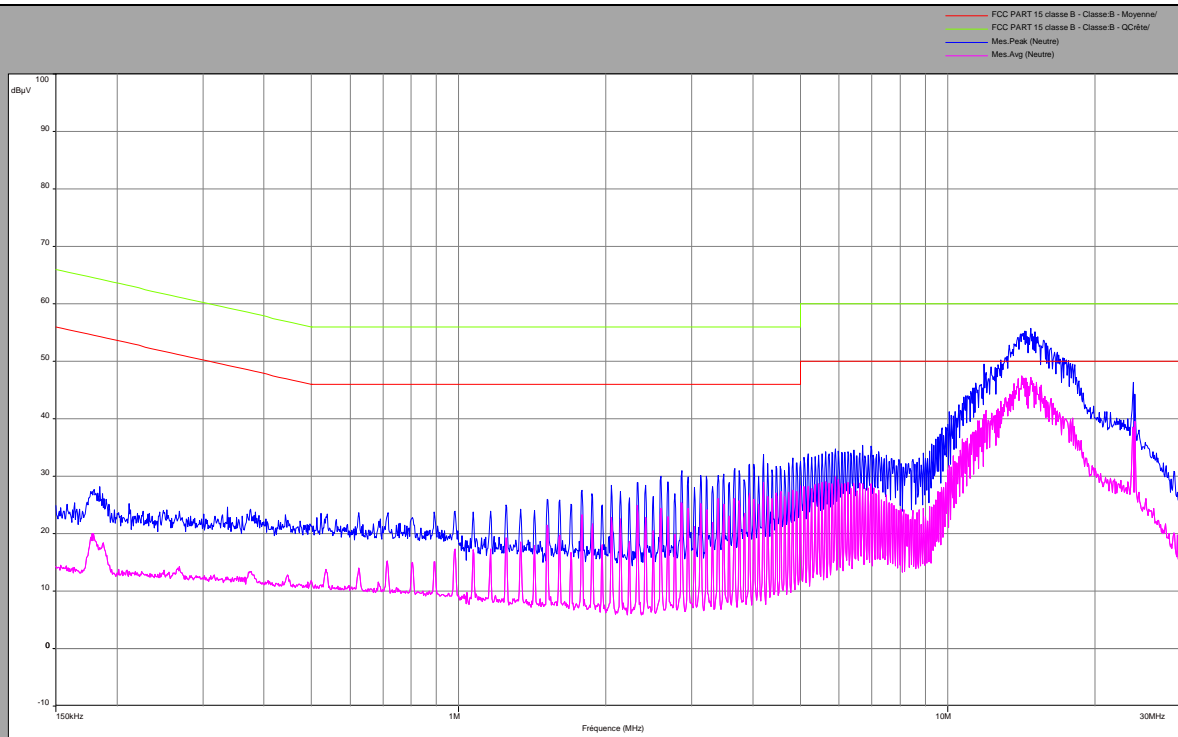
7.6. GRAPHICS & RESULTS

AC conducted emissions

Phase Line



Neutral Line





Phase Line					
Frequencies (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Average Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Average Limit (dB μ V)
0.1825	28	19	54.3	-	64.3
5.652	35.8	31	50	-	60
14.190	55	47	50	-	60

Neutral Line					
Frequencies (MHz)	Peak Level (dB μ V)	Quasi-Peak Level (dB μ V)	Average Level (dB μ V)	Quasi-Peak Limit (dB μ V)	Average Limit (dB μ V)
0.178	27.5	18	54.5	-	64.5
6.466	36	30	50	-	60
14.182	56.6	47	50	-	60

7.7. CONCLUSION

The product SORIN Group KA351, SN:LA1403007E, in configuration and description presented in this test report, complies with the AC conducted emissions measurement of FCC § 15.207(d) & RSS-Gen § 7.2.4.

8. TRANSMITTER UNWANTED EMISSIONS

8.1. TEST CONDITIONS

Test performed by : Laurent DENEUX & Stéphane PHOUDIAH
Date of test : 2014/07/10 & 2014/08/19 to 2014/08/20
Ambient temperature : 18°C & 23°C
Relative humidity : 51% & 43%

8.2. TEST SETUP

- The Equipment under Test is installed:

SAR OATS

- Distance between EUT and the measuring antenna is:

3m 10m

- Choice of measuring antenna below 1GHz:

Bilog Log periodic Biconic Dipole antenna

- Choice of measuring antenna above 1GHz:

Horn

The product has been tested according to ANSI C63.10 (2009). Test is performed in horizontal (H) and vertical (V) polarization. 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 Transmitter unwanted emissions



Photograph for Transmitter unwanted emissions

8.3. LIMIT

Transmitter unwanted emissions from MICS devices more than 250kHz outside of the 402-405 MHz band shall not exceed the field strength limits specified below:

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:	63.5dB μ V/m Peak 43.5dB μ V/m Average

Transmitter unwanted emissions within the 402-405MHz MICS band which are more than 150kHz away from the centre frequency of the spectrum, and the transmissions that occupy up to 250kHz above and below the band shall be attenuated at least 20dB below the maximum transmitter output power.



8.4. TEST EQUIPMENT LIST

Apparatus	Trade Mark	Type	Registration number	Cal_Date	Cal_Due
Multi-meter	KEITHLEY	2000	A1241084	2014/02	2016/02
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2013/10	2014/10
RF cable	Télédyne	920-0202-048	A5329661	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122209	2014/04	2015/04
RF cable	Télédyne	920-0202-048	A5329675	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122210	2014/04	2015/04
Spectrum Analyser	ROHDE & SCHWARZ	FSL 6	A4060032	2012/11	2014/11
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	2014/05	2015/05
Preamplifier	HEWLETT PACKARD	HP8449B	A4069002	2014/03	2015/03
Cable	CABLES & CONNECTIQUES	ND/CSU718AA/ND/2000	A5329380	2013/09	2014/09
Cable	CABLES & CONNECTIQUES	ND/CSU718AA/ND/2000	A5329380	2013/09	2014/09
Cable	CABLES & CONNECTIQUES	3.5MD/CSU528AA-TDINOX/3.5MD/12000	A5329443	2013/10	2014/10
Cable	CABLES & CONNECTIQUES	3.5MD/CSU440AA-TDINOX/3.5MD/7000	A5329449	2013/09	2014/09
Cable	-	-	A5329542	2014/01	2015/01
Bilog antenna	AH SYSTEMS	SAS200/521	C2040025	2014/02	2015/02
Horn antenna	EMCO	3115	C2042016	2014/04	2015/04
Open area test site	LCIE	-	F2000400	2014/06	2015/06
EMI receiver	ROHDE & SCHWARZ	ESI40 1088 740K40	A2642010	2014/02	2015/02

Note: In our system quality, calibration due is more & less 2 month.

8.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

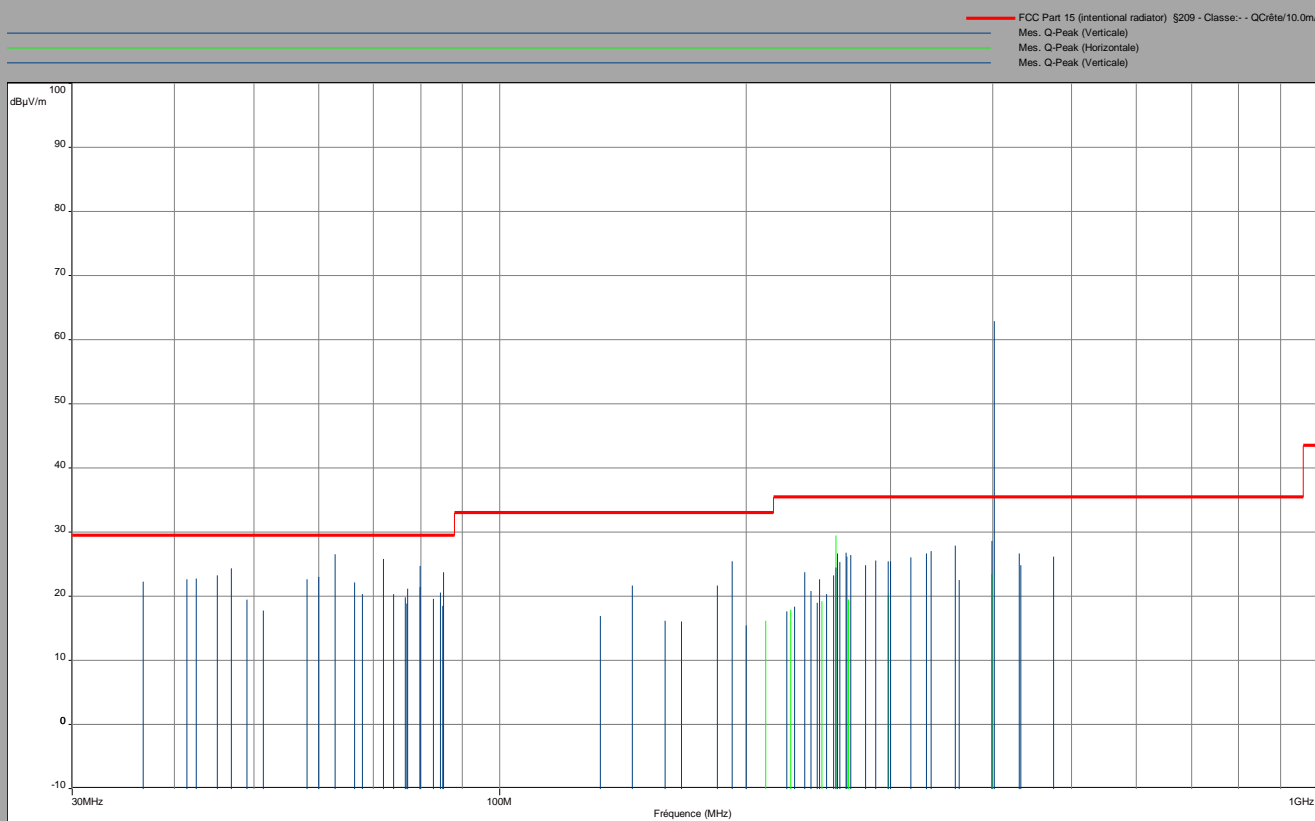
Divergence:



8.6. GRAPHICS & RESULTS

Out of band transmitter unwanted emissions

Below 1GHz





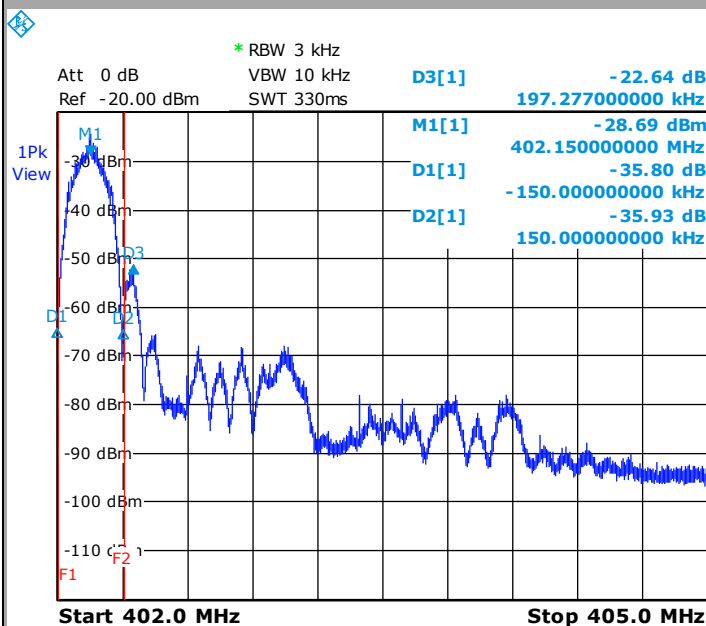
Tnom

Vnom

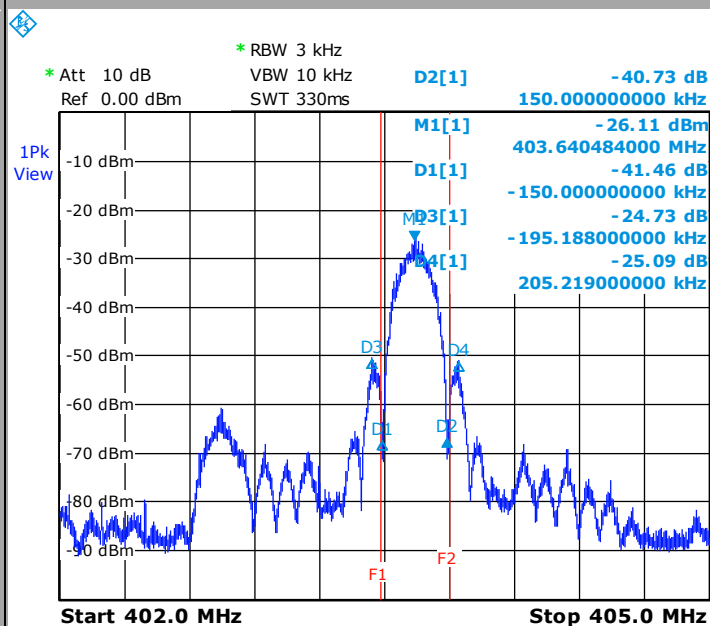
In band transmitter unwanted emissions

Cmin

Cnom

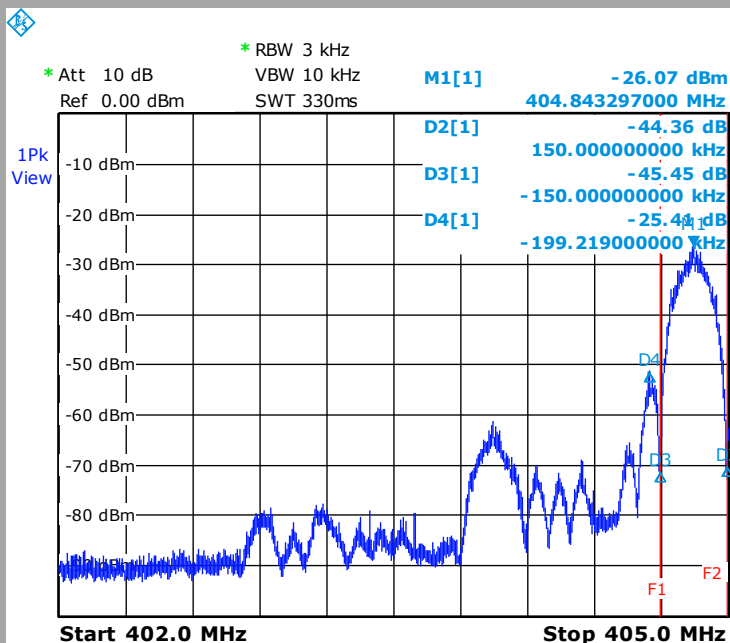


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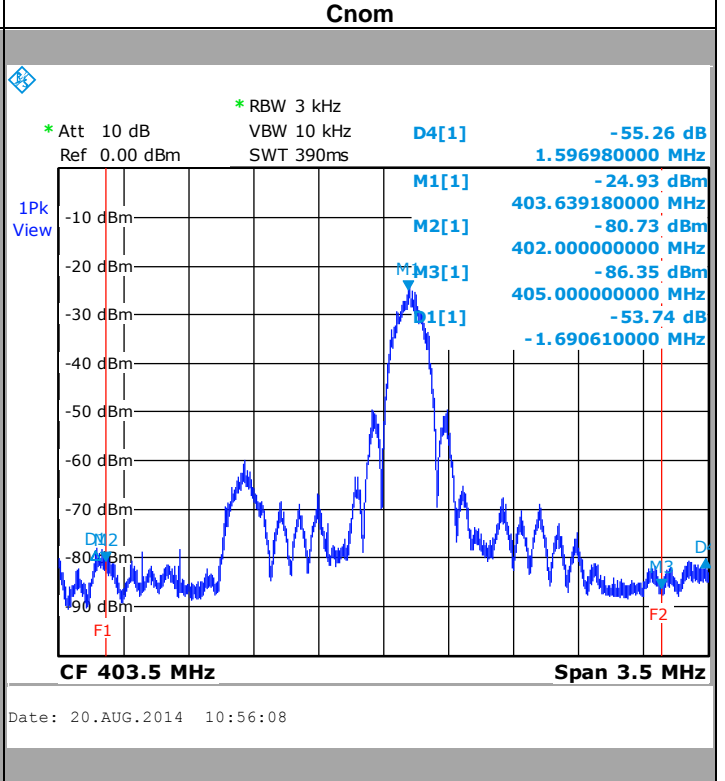
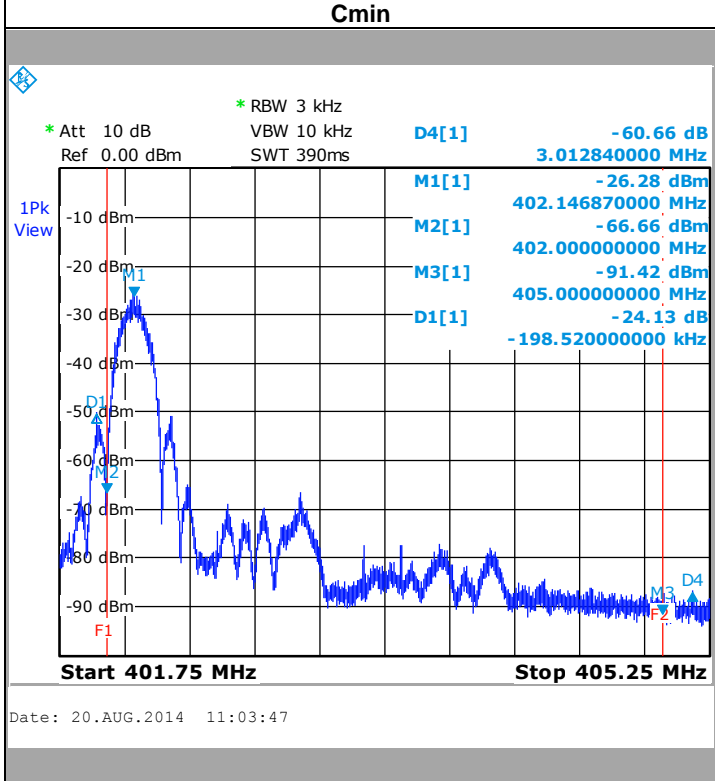
Cmax



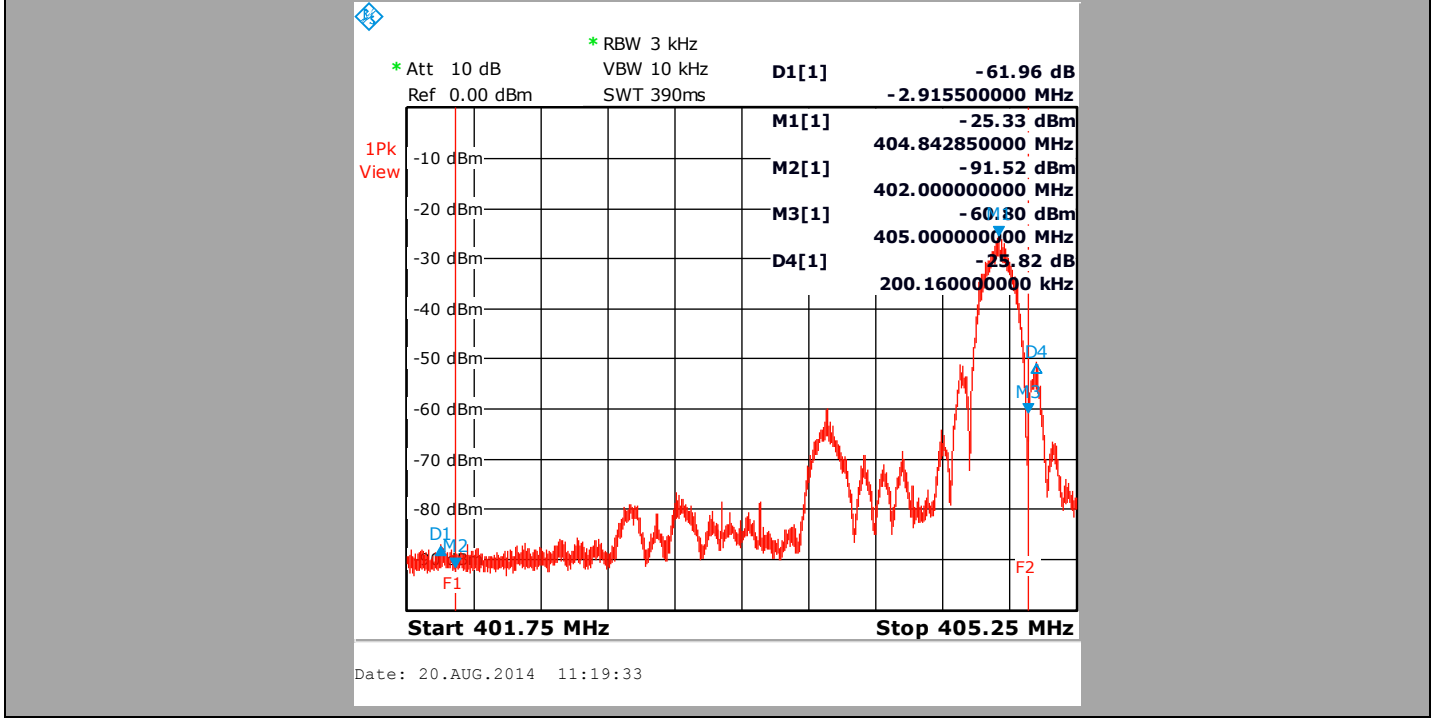
Date: 19.AUG.2014 16:38:35



Tnom
Vnom
Out of band transmitter unwanted emissions +/-250kHz



Cmax





Out of band transmitter unwanted emissions			
Below 1GHz			
Polarization	Frequencies (MHz)	Quasi-Peak Level (dB μ V/m)	Quasi-Peak Limit (dB μ V/m)
Vertical	36,6	22,4	29.5
Vertical	41,4	22,6	29.5
Vertical	42,5	22,8	29.5
Vertical	45,1	23,3	29.5
Vertical	47	24,3	29.5
Vertical	49,1	19,6	29.5
Vertical	51,4	17,8	29.5
Vertical	58,1	22,7	29.5
Vertical	60	23,1	29.5
Vertical	62,9	26,6	29.5
Vertical	66,4	22,2	29.5
Vertical	67,9	20,4	29.5
Vertical	72	25,8	29.5
Vertical	74,2	20,3	29.5
Vertical	76,7	19,9	29.5
Vertical	77	18,9	29.5
Vertical	77,2	21,2	29.5
Vertical	79,8	24,7	29.5
Vertical	79,9	21,4	29.5
Vertical	82,9	19,7	29.5
Vertical	84,6	20,6	29.5
Vertical	85,2	18,6	29.5
Vertical	85,4	23,8	29.5
Vertical	132,7	16,9	33
Vertical	145,1	21,7	33
Vertical	159,1	16,3	33
Vertical	166,6	16,1	33
Vertical	184,3	21,8	33
Vertical	192,1	25,4	33
Vertical	199,9	15,5	33
Vertical	224,1	17,7	35.5
Vertical	229,1	18,4	35.5
Vertical	236	23,8	35.5
Vertical	240	20,9	35.5
Vertical	244,3	19,1	35.5
Vertical	245,8	22,7	35.5
Vertical	250,6	20,4	35.5
Vertical	255,6	23,2	35.5
Vertical	257,7	24,6	35.5
Vertical	258,7	22,4	35.5



Out of band transmitter unwanted emissions			
Below 1GHz			
Polarization	Frequencies (MHz)	Quasi-Peak Level (dBμV/m)	Quasi-Peak Limit (dBμV/m)
Vertical	258,7	26,7	35.5
Vertical	260,5	25,4	35.5
Vertical	265,1	26,8	35.5
Vertical	265,5	26,3	35.5
Vertical	268,4	26,5	35.5
Vertical	280	24,9	35.5
Vertical	288	25,7	35.5
Vertical	298,2	25,5	35.5
Vertical	300	25,5	35.5
Vertical	318	26,1	35.5
Vertical	332	26,7	35.5
Vertical	336,2	27,0	35.5
Vertical	360	27,9	35.5
Vertical	364,5	22,6	35.5
Vertical	399,8	28,7	35.5
Vertical	431	26,8	35.5
Vertical	433,1	24,9	35.5
Vertical	475	26,3	35.5
Horizontal	211,5	16,3	33
Horizontal	226,5	17,9	35.5
Horizontal	247,7	19,3	35.5
Horizontal	257,7	29,5	35.5
Horizontal	266,5	19,5	35.5
Horizontal	298,2	20,3	35.5
Horizontal	399,8	23,6	35.5
Horizontal	258,7	26,7	35.5
Horizontal	260,5	25,4	35.5
Horizontal	265,1	26,8	35.5
Horizontal	265,5	26,3	35.5
Horizontal	268,4	26,5	35.5



Out of band +/-250kHz transmitter unwanted emissions			
Channel	Level (dB) at Fmin	Level (dB) at Fmax	Limit (dB)
Cmin	24.13	60.66	At least 20
Cnom	53.74	55.26	At least 20
Cmax	61.96	25.82	At least 20

In band transmitter unwanted emissions			
Channel	Level (dB) at Fmin	Level (dB) at Fmax	Limit (dB)
Cmin	35.80	35.93	At least 20
Cnom	24.73	25.09	At least 20
Cmax	25.41	44.36	At least 20

8.7. CONCLUSION

The product SORIN Group KA351, SN:LA1403007E, in configuration and description presented in this test report, complies with the Unwanted Emission into Restricted Bands measurement of FCC § 95.635(d) & RSS-243 § 5.5.

9. RECEIVER SPURIOUS EMISSIONS

9.1. TEST CONDITIONS

Test performed by : Laurent DENEUX
Date of test : 2014/07/10
Ambient temperature : 18°C
Relative humidity : 51%

9.2. TEST SETUP

- The Equipment under Test is installed:

SAR OATS

- Distance between EUT and the measuring antenna is:

3m 10m

- Choice of measuring antenna below 1GHz:

Bilog Log periodic Biconic Dipole antenna

- Choice of measuring antenna above 1GHz:

Horn

The product has been tested according to ANSI C63.10 (2009). Test is performed in horizontal (H) and vertical (V) polarization. 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 Receiver spurious emissions



Photograph for Receiver spurious emissions



9.3. LIMIT

Receiver spurious emissions shall not exceed value below:

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:	63.5dB μ V/m Peak 43.5dB μ V/m Average

9.4. TEST EQUIPMENT LIST

Apparatus	Trade Mark	Type	Registration number	Cal_Date	Cal_Due
Multi-meter	KEITHLEY	2000	A1241084	2014/02	2016/02
EMI receiver	ROHDE & SCHWARZ	ESR 7	A2642023	2013/10	2014/10
RF cable	Télédyne	920-0202-048	A5329661	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122209	2014/04	2015/04
RF cable	Télédyne	920-0202-048	A5329675	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122210	2014/04	2015/04
Spectrum Analyser	ROHDE & SCHWARZ	FSL 6	A4060032	2012/11	2014/11
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	2014/05	2015/05
Preamplifier	HEWLETT PACKARD	HP8449B	A4069002	2014/03	2015/03
Cable	CABLES & CONNECTIQUES	ND/CSU718AA/ND/2000	A5329380	2013/09	2014/09
Cable	CABLES & CONNECTIQUES	ND/CSU718AA/ND/2000	A5329380	2013/09	2014/09
Cable	CABLES & CONNECTIQUES	3.5MD/CSU528AA-TDINOX/3.5MD/12000	A5329443	2013/10	2014/10
Cable	CABLES & CONNECTIQUES	3.5MD/CSU440AA-TDINOX/3.5MD/7000	A5329449	2013/09	2014/09
Cable	-	-	A5329542	2014/01	2015/01
Bilog antenna	AH SYSTEMS	SAS200/521	C2040025	2014/02	2015/02
Horn antenna	EMCO	3115	C2042016	2014/04	2015/04
Open area test site	LCIE	-	F2000400	2014/006	2015/06
EMI receiver	ROHDE & SCHWARZ	ESI40 1088 740K40	A2642010	2014/02	2015/02

Note: In our system quality, calibration due is more & less 2 month.

9.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

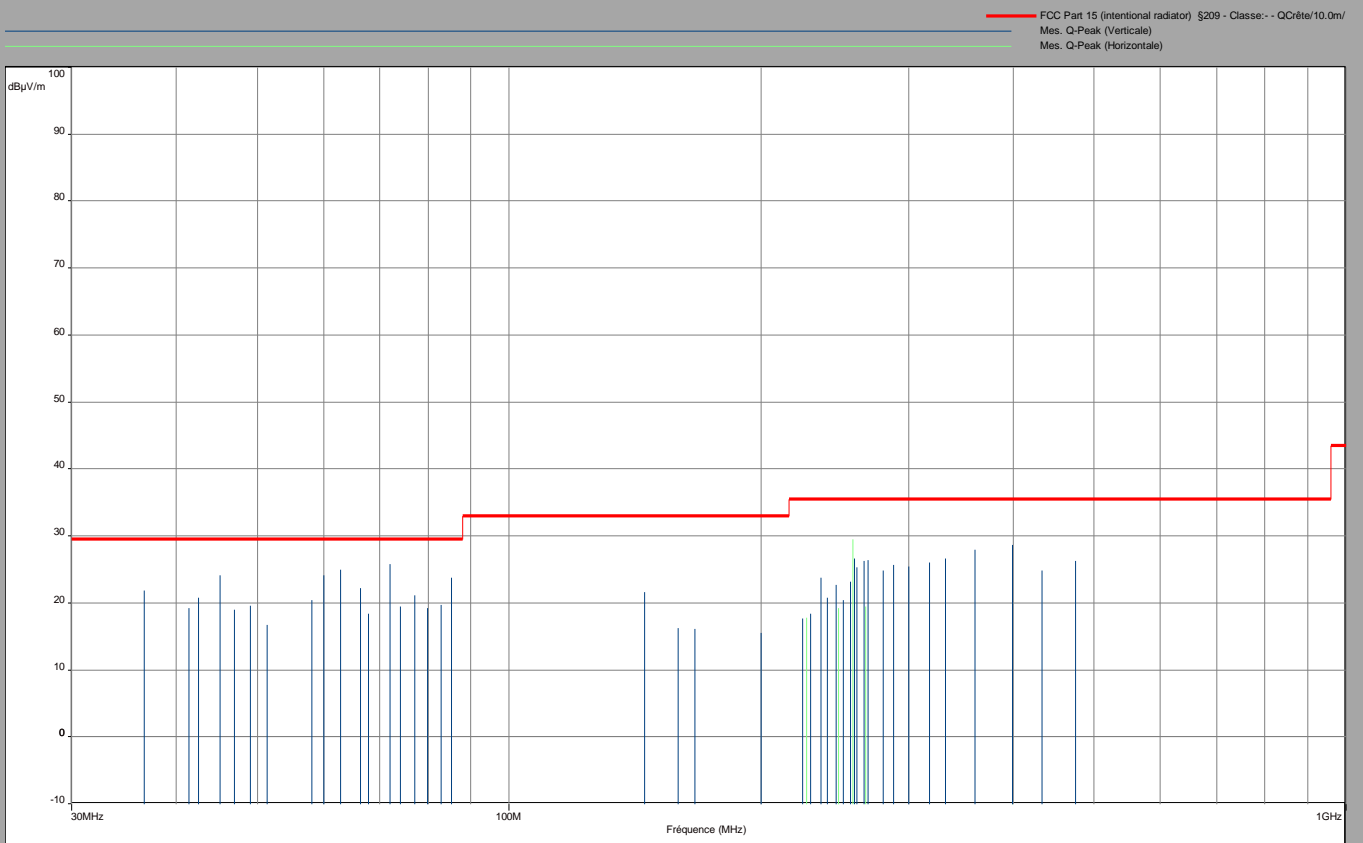
None Divergence:



9.6. GRAPHICS & RESULTS

Receiver Radiated Emissions

Below 1GHz





Out of band transmitter unwanted emissions			
Below 1GHz			
Polarization	Frequencies (MHz)	Quasi-Peak Level (dB μ V/m)	Quasi-Peak Limit (dB μ V/m)
Vertical	36,6	21,9	29.5
Vertical	41,4	19,3	29.5
Vertical	42,5	20,9	29.5
Vertical	45,1	24,2	29.5
Vertical	47	19,0	29.5
Vertical	49,1	19,6	29.5
Vertical	51,4	16,8	29.5
Vertical	58,1	20,5	29.5
Vertical	60	24,1	29.5
Vertical	62,9	25,0	29.5
Vertical	66,4	22,2	29.5
Vertical	67,9	18,4	29.5
Vertical	72	25,8	29.5
Vertical	74,2	19,5	29.5
Vertical	77,2	21,2	29.5
Vertical	79,8	19,2	29.5
Vertical	82,9	19,7	29.5
Vertical	85,4	23,8	29.5
Vertical	145,1	21,7	33
Vertical	159,1	16,3	33
Vertical	166,6	16,1	33
Vertical	199,9	15,5	33
Vertical	224,1	17,7	35.5
Vertical	229,1	18,4	35.5
Vertical	236	23,8	35.5
Vertical	240	20,9	35.5
Vertical	245,8	22,7	35.5
Vertical	250,6	20,4	35.5
Vertical	255,6	23,2	35.5
Vertical	258,7	26,7	35.5
Vertical	260,5	25,4	35.5
Vertical	265,5	26,3	35.5
Vertical	268,4	26,5	35.5
Vertical	280	24,9	35.5
Vertical	288	25,7	35.5
Vertical	300	25,5	35.5
Vertical	318	26,1	35.5
Vertical	332	26,7	35.5
Vertical	360	27,9	35.5
Vertical	399,8	28,7	35.5



Out of band transmitter unwanted emissions			
Below 1GHz			
Polarization	Frequencies (MHz)	Quasi-Peak Level (dBμV/m)	Quasi-Peak Limit (dBμV/m)
Vertical	433,1	24,9	35.5
Vertical	475	26,3	35.5
Horizontal	226,5	17,9	35.5
Horizontal	247,7	19,3	35.5
Horizontal	257,7	29,5	35.5
Horizontal	266,5	19,5	35.5
Horizontal	399,8	23,6	35.5

9.7. CONCLUSION

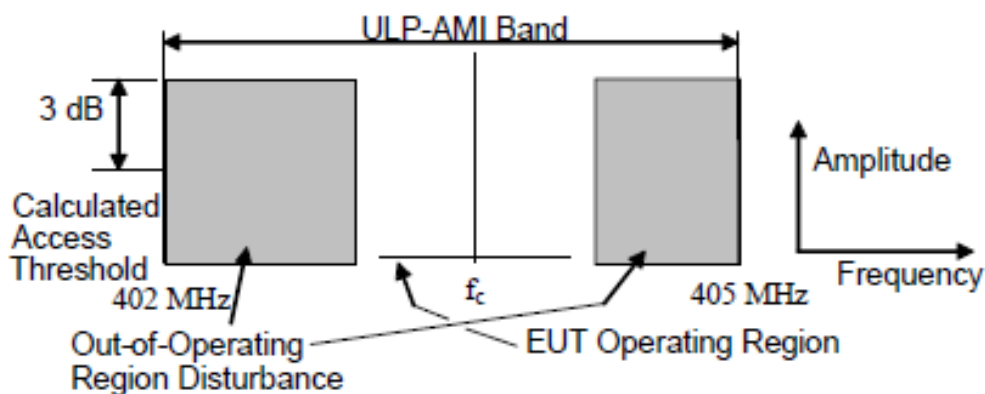
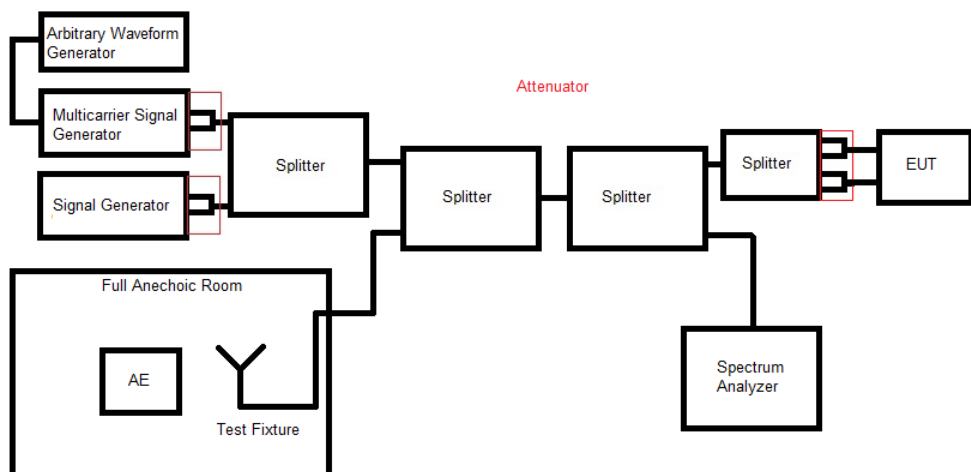
The product SORIN Group KA351, SN:LA1403007E, in configuration and description presented in this test report, complies with the receiver spurious emissions measurement of FCC 15.109 & RSS 5.6.

10. LBT THRESHOLD POWER LEVEL

10.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
 Date of test : 2014/08/25
 Ambient temperature : 21°C
 Relative humidity : 40%

10.2. TEST SETUP



Out-of-operating-region disturbance is generated by using a disturbance source that can generate a sufficient number (approximately $2 \times 3000 / \text{emission bandwidth in kHz}$) of independently-controlled CW signals across the 402 MHz to 405 MHz band to block access to the band except for a notch or notches equal to twice the emission bandwidth of the EUT.



Photograph for LBT Threshold Power Level

10.3. LIMIT

The monitoring system threshold power level, P_{Th} (dBm) shall not be greater than the calculated level given by the equation: $10 \log B$ (Hz) - 150 + G(dBi), where B is the emission bandwidth of the MICS communication session transmitter having the widest emission bandwidth and G is the ULP-AMI-P monitoring system antenna gain relative to an isotropic antenna.

If an ULP-AMI device is used to select the frequency of operation for a MICS system, the above LBT threshold level requirement may be adjusted higher by 1 dB for every 1 dB the ERP. of the device performing the LBT and AFA function is below the maximum permitted level of -16dBm. However, no other device operating in the MICL shall have an ERP greater than the device that selects the frequency of operation for the MICL. Thus, for a specific system a device whose output ERP is 10 dB lower than the maximum permitted level of -16dBm may add +10 dB to the above equation. This adjustment will permit implanted devices to provide the LBT and AFA function where antenna gain and body absorption significantly affect monitoring system sensitivity relative to external programmer/controllers.



10.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
RF cable	Télédynne	920-0202-048	A5329661	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122209	2014/04	2015/04
RF cable	Télédynne	920-0202-048	A5329675	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122210	2014/04	2015/04
Spectrum Analyser	ROHDE & SCHWARZ	FSL 6	A4060032	2012/11	2014/11
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	2014/05	2015/05
Splitter	Minicircuit	ZFSC-2-2500	A7130071	2013/12	2014/12
Arbitrary Waveform Generator	Agilent	33220A	A5486005	2014/08	2015/08
Signal Generator	ROHDE & SCHWARZ	SMIQ	A5442039	2014/04	2015/04
Vector signal generator	ROHDE & SCHWARZ	SMJ100A	A5444007	2014/04	2015/04
Attenuator	-	SA 4016	A7122212	2013/07	2014/07
Attenuator	-	SA 4016	A7122212	2013/07	2014/07
Power splitter/combiner 2 Way	Mini-Circuits	ZN2PD2-63-S+	A7132026	2013/07	2014/07
Power splitter/combiner 2 Way	Mini-Circuits	ZN2PD2-63-S+	A7132027	2013/07	2014/07
RF cable	CABLES & CONNECTIQUES	CS2C 02	A5329356	2014/02	2015/02
Attenuator	MINI CIRCUITS	BW-S3W2+	A7122208	2013/07	2014/07
RF cable	Télédynne	920-0202-024	A5329669	2014/04	2016/04
RF cable	Télédynne	920-0202-024	A5329672	2014/04	2016/04
RF cable	CABLES & CONNECTIQUES	CS3B 01	A5329458	2014/04	2015/04
RF cable	CABLES & CONNECTIQUES	CS3B 03	A5329430	2014/04	2015/04
RF cable	CABLES & CONNECTIQUES	CS2F 06	A5329433	2014/02	2015/02
RF cable	-	-	A5329533	2014/05	2015/05
Dipole Antenna	Schwarzbeck	UHA 9105	C2040207	2014/05	2015/05
Horn antenna	A-INFOMW	LB-10180-NF	C2042051	2014/04	2015/04
Full Anechoic Room	Siepel	S36	D3044019	Not used as measurement equipment	

Note: In our system quality, calibration due is more & less 2 month.

10.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

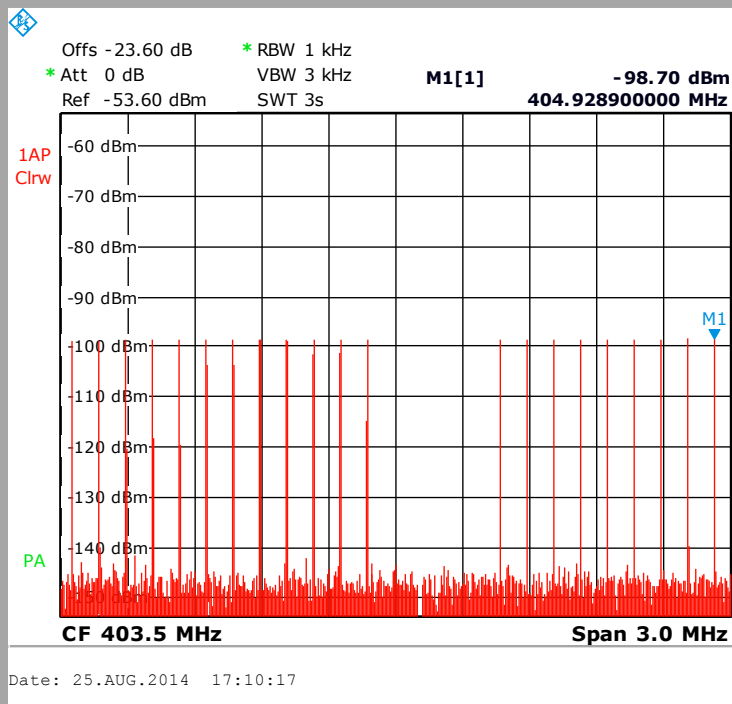
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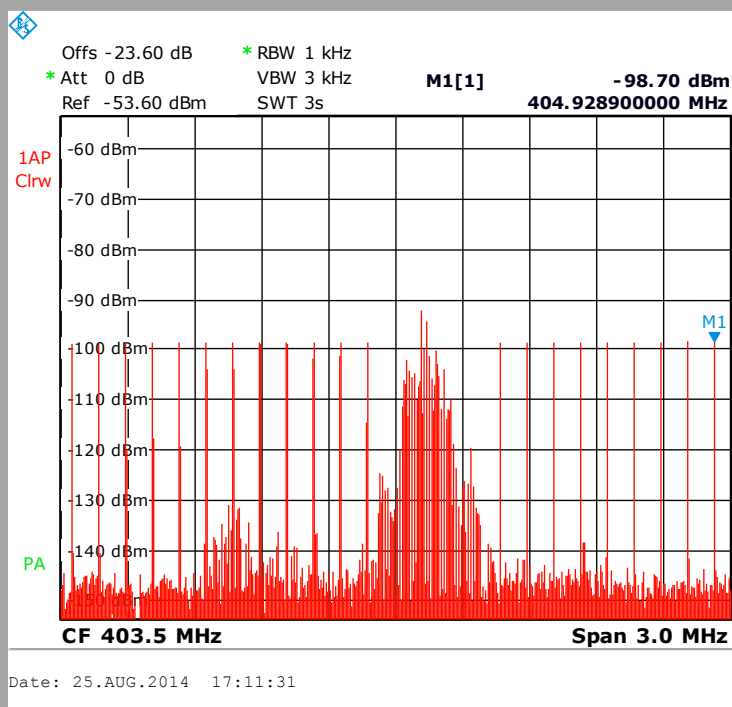


10.6. GRAPHICS & RESULTS

Tnom Vnom Signal Calibration



LBT threshold level without signal on fc

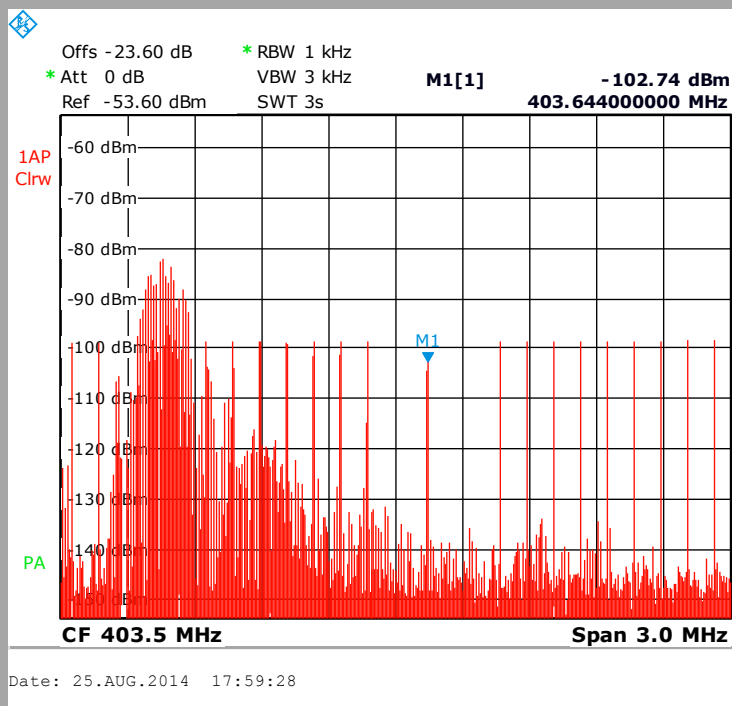




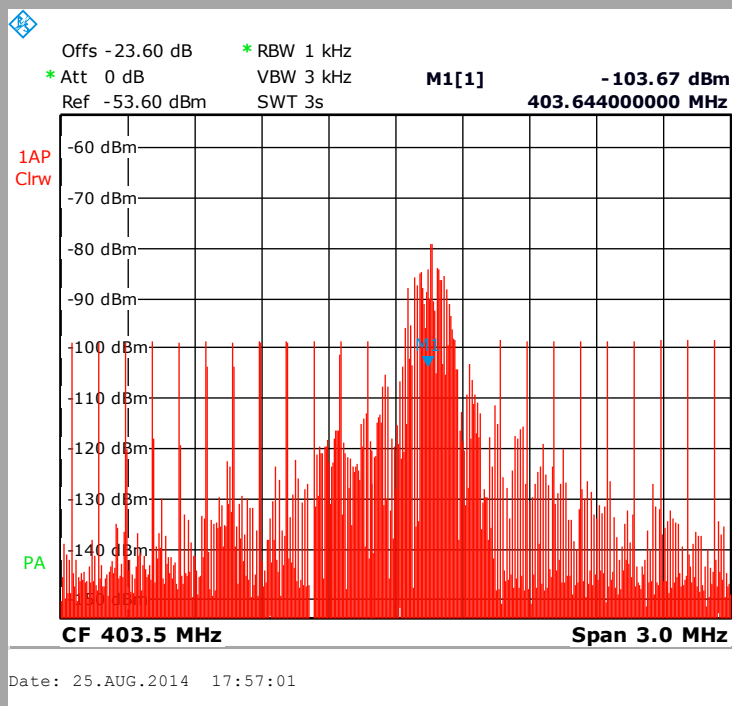
Tnom

Vnom

LBT threshold level with signal on fc= -102,74dBm



LBT threshold level with signal on fc= -103,74dBm





Temperature	Tnom
Voltage	Vnom
Channel	Cnom
LBT threshold power level (dBm)	-103.74-4=-106.74
Largest Emission Bandwidth (kHz)	249.31
Lowest Antenna Gain (dBi)	-5.7
Limit (dBm)	-101.7

10.7. CONCLUSION

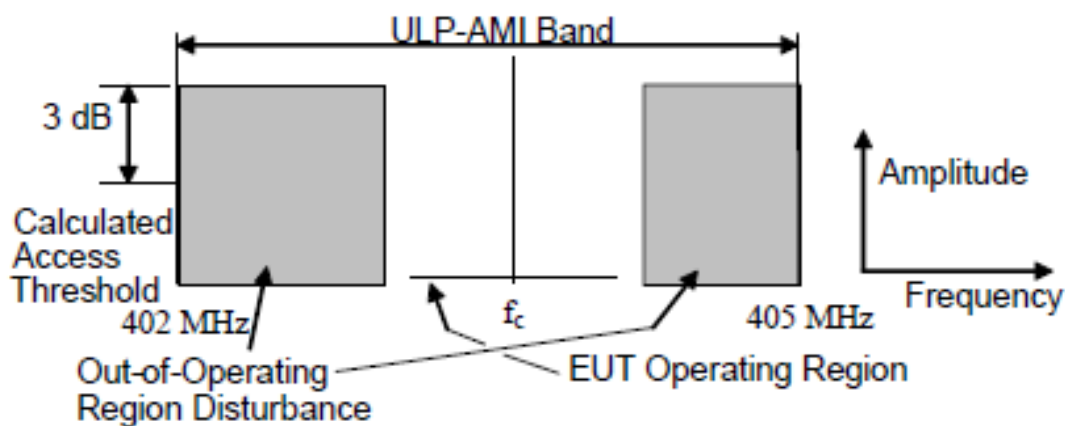
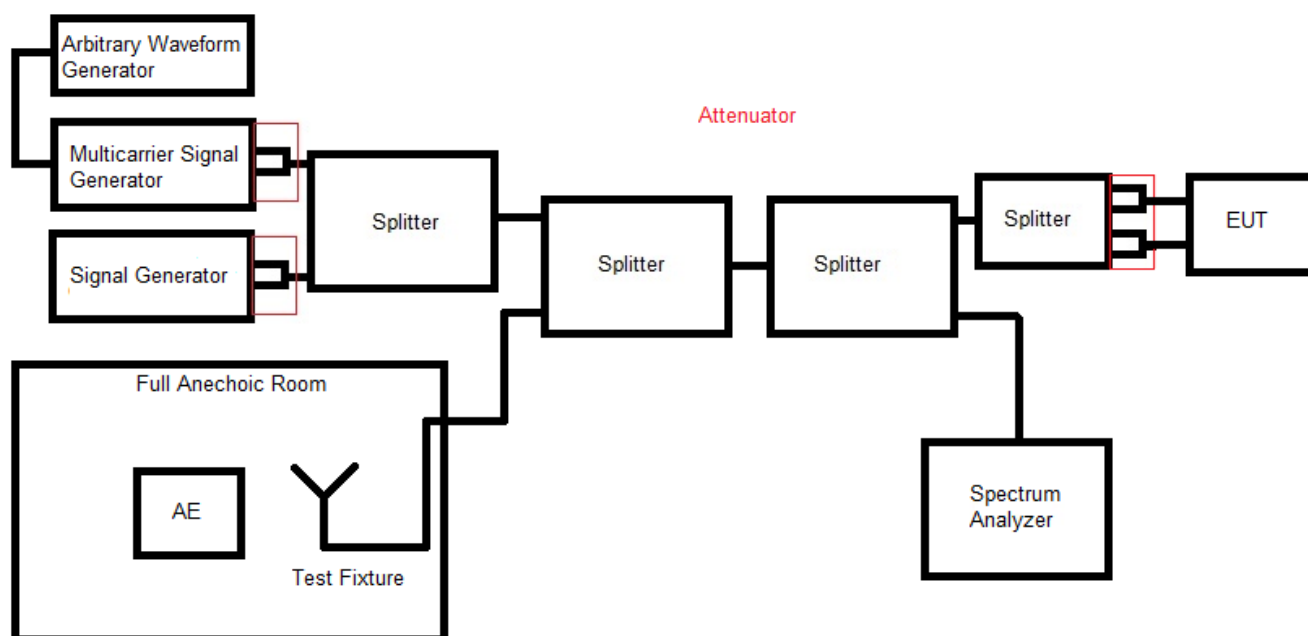
The product SORIN Group KA351, SN:LA1403007E, in configuration and description presented in this test report, complies with the LBT threshold power level measurement of FCC 95.628 (a)(3) & RSS-243 § 5.7.1.

11. MONITORING SYSTEM BANDWIDTH

11.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
 Date of test : 2014/08/25
 Ambient temperature : 21°C
 Relative humidity : 40%

11.2. TEST SETUP



Out-of-operating-region disturbance is generated by using a disturbance source that can generate a sufficient number (approximately 2×3000 /emission bandwidth in kHz) of independently-controlled CW signals across the 402 MHz to 405 MHz band to block access to the band except for a notch or notches equal to twice the emission bandwidth of the EUT.



Photograph for Monitoring system bandwidth

11.3. LIMIT

The monitoring system bandwidth measured at its 20dB down points shall be equal to or greater than the emission bandwidth of the intended transmission. The requirement is met if $P_b - P_a$ & $P_c - P_a$ are less than or equal to 20dB.



11.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
RF cable	Télédyne	920-0202-048	A5329661	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122209	2014/04	2015/04
RF cable	Télédyne	920-0202-048	A5329675	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122210	2014/04	2015/04
Spectrum Analyser	ROHDE & SCHWARZ	FSL 6	A4060032	2012/11	2014/11
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	2014/05	2015/05
Splitter	Minicircuit	ZFSC-2-2500	A7130071	2013/12	2014/12
Arbitrary Waveform Generator	Agilent	33220A	A5486005	2014/08	2015/08
Signal Generator	ROHDE & SCHWARZ	SMIQ	A5442039	2014/04	2015/04
Vector signal generator	ROHDE & SCHWARZ	SMJ100A	A5444007	2014/04	2015/04
Attenuator	-	SA 4016	A7122212	2013/07	2014/07
Attenuator	-	SA 4016	A7122212	2013/07	2014/07
Power splitter/combiner 2 Way	Mini-Circuits	ZN2PD2-63-S+	A7132026	2013/07	2014/07
Power splitter/combiner 2 Way	Mini-Circuits	ZN2PD2-63-S+	A7132027	2013/07	2014/07
RF cable	CABLES & CONNECTIQUES	CS2C 02	A5329356	2014/02	2015/02
Attenuator	MINI CIRCUITS	BW-S3W2+	A7122208	2013/07	2014/07
RF cable	Télédyne	920-0202-024	A5329669	2014/04	2016/04
RF cable	Télédyne	920-0202-024	A5329672	2014/04	2016/04
RF cable	CABLES & CONNECTIQUES	CS3B 01	A5329458	2014/04	2015/04
RF cable	CABLES & CONNECTIQUES	CS3B 03	A5329430	2014/04	2015/04
RF cable	CABLES & CONNECTIQUES	CS2F 06	A5329433	2014/02	2015/02
RF cable	-	-	A5329533	2014/05	2015/05
Dipole Antenna	Schwarzbeck	UHA 9105	C2040207	2014/05	2015/05
Horn antenna	A-INFOMW	LB-10180-NF	C2042051	2014/04	2015/04
Full Anechoic Room	Siepel	S36	D3044019	Not used as measurement equipment	

11.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

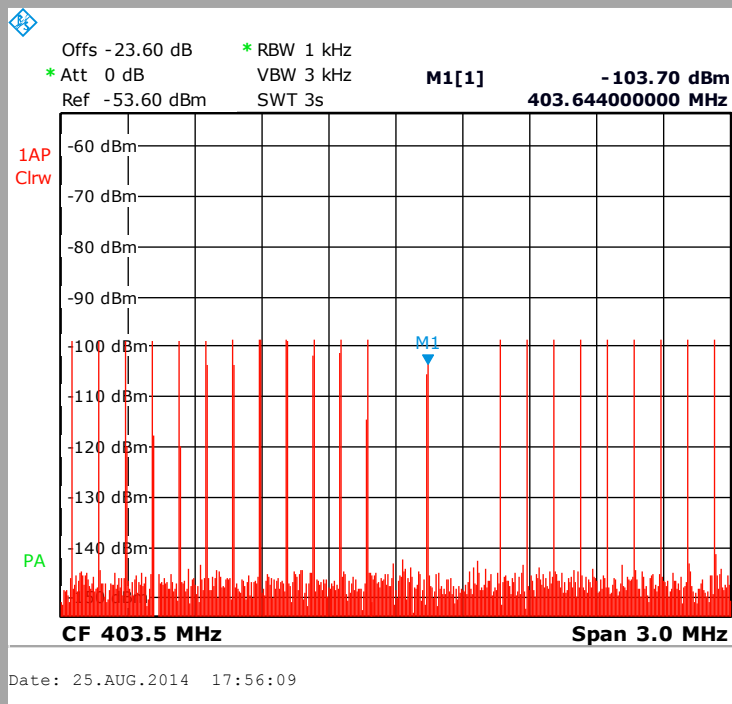
None

Divergence:

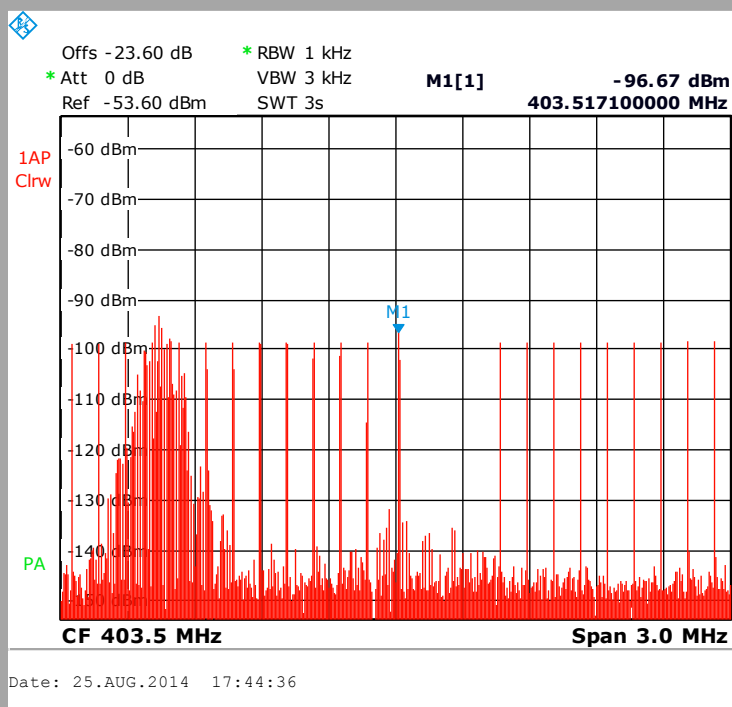


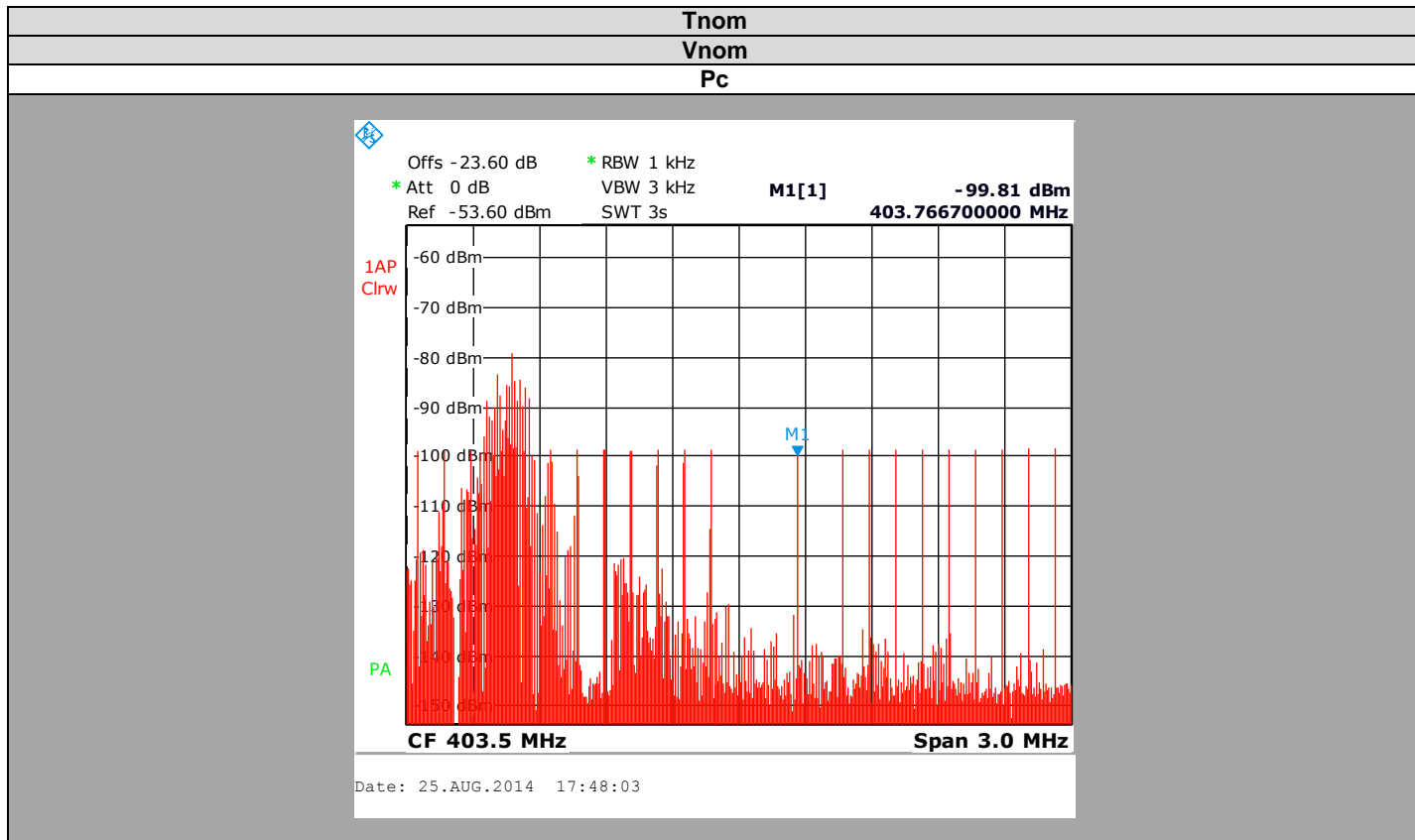
11.6. GRAPHICS & RESULTS

Tnom
Vnom
Pa



Pb





Temperature	Tnom
Voltage	Vnom
Channel	Cnom
Pa (dBm)	-103.72
Pb (dBm)	-96.67
Pc (dBm)	-99.81
Pb - Pa (dB)	7.05
Pc - Pa (dB)	3.91

11.7. CONCLUSION

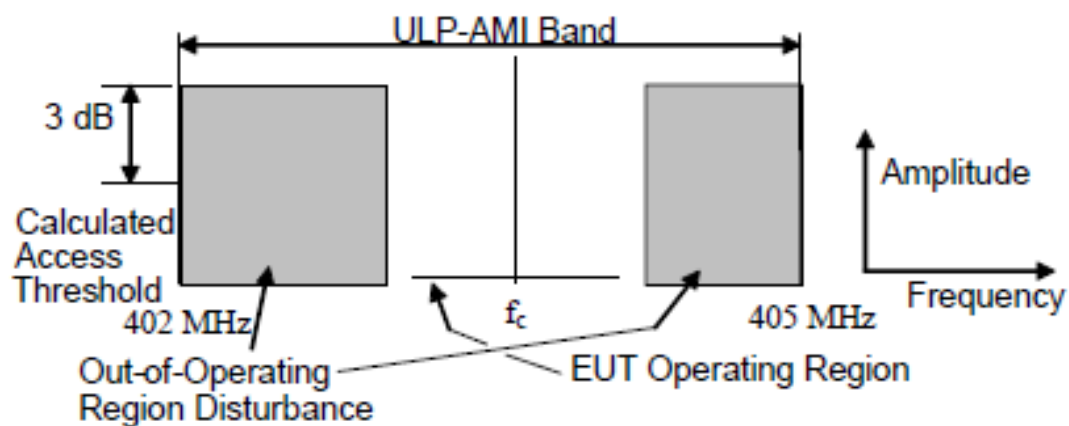
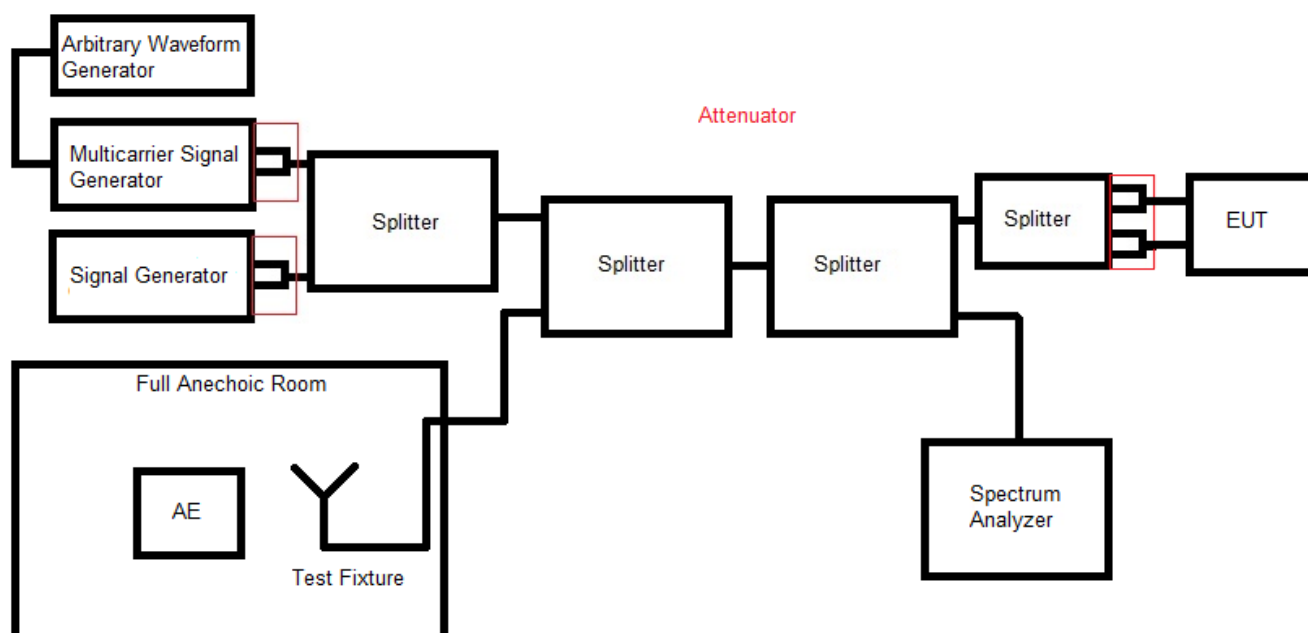
The product SORIN Group KA351, SN:LA1403007E, in configuration and description presented in this test report, complies with the monitoring system bandwidth measurement of FCC 95.628 (a)(1) & RSS-243 § 5.7.2 .

12. MONITORING SYSTEM SCAN CYCLE TIME

12.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
 Date of test : 2014/08/25
 Ambient temperature : 21°C
 Relative humidity : 40%

12.2. TEST SETUP



Out-of-operating-region disturbance is generated by using a disturbance source that can generate a sufficient number (approximately 2×3000 /emission bandwidth in kHz) of independently-controlled CW signals across the 402 MHz to 405 MHz band to block access to the band except for a notch or notches equal to twice the emission bandwidth of the EUT.



Photograph for Monitoring system scan cycle time

12.3. LIMIT

Scan cycle time shall not exceed 5 seconds



12.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
RF cable	Télédyne	920-0202-048	A5329661	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122209	2014/04	2015/04
RF cable	Télédyne	920-0202-048	A5329675	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122210	2014/04	2015/04
Spectrum Analyser	ROHDE & SCHWARZ	FSL 6	A4060032	2012/11	2014/11
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	2014/05	2015/05
Splitter	Minicircuit	ZFSC-2-2500	A7130071	2013/12	2014/12
Arbitrary Waveform Generator	Agilent	33220A	A5486005	2014/08	2015/08
Signal Generator	ROHDE & SCHWARZ	SMIQ	A5442039	2014/04	2015/04
Vector signal generator	ROHDE & SCHWARZ	SMJ100A	A5444007	2014/04	2015/04
Attenuator	-	SA 4016	A7122212	2013/07	2014/07
Attenuator	-	SA 4016	A7122212	2013/07	2014/07
Power splitter/combiner 2 Way	Mini-Circuits	ZN2PD2-63-S+	A7132026	2013/07	2014/07
Power splitter/combiner 2 Way	Mini-Circuits	ZN2PD2-63-S+	A7132027	2013/07	2014/07
RF cable	CABLES & CONNECTIQUES	CS2C 02	A5329356	2014/02	2015/02
Attenuator	MINI CIRCUITS	BW-S3W2+	A7122208	2013/07	2014/07
RF cable	Télédyne	920-0202-024	A5329669	2014/04	2016/04
RF cable	Télédyne	920-0202-024	A5329672	2014/04	2016/04
RF cable	CABLES & CONNECTIQUES	CS3B 01	A5329458	2014/04	2015/04
RF cable	CABLES & CONNECTIQUES	CS3B 03	A5329430	2014/04	2015/04
RF cable	CABLES & CONNECTIQUES	CS2F 06	A5329433	2014/02	2015/02
RF cable	-	-	A5329533	2014/05	2015/05
Dipole Antenna	Schwarzbeck	UHA 9105	C2040207	2014/05	2015/05
Horn antenna	A-INFOMW	LB-10180-NF	C2042051	2014/04	2015/04
Full Anechoic Room	Siepel	S36	D3044019	Not used as measurement equipment	

12.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

Divergence:

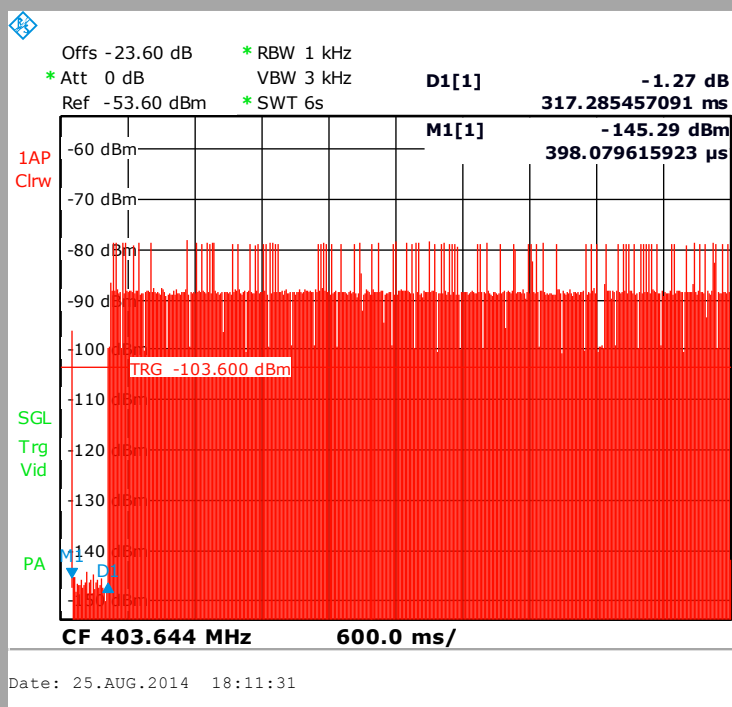


12.6. GRAPHICS & RESULTS

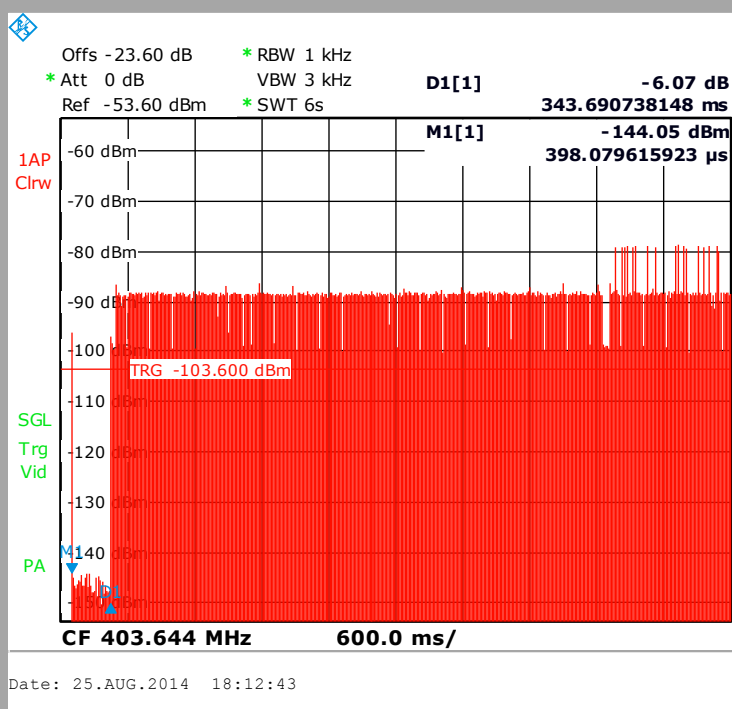
Tnom

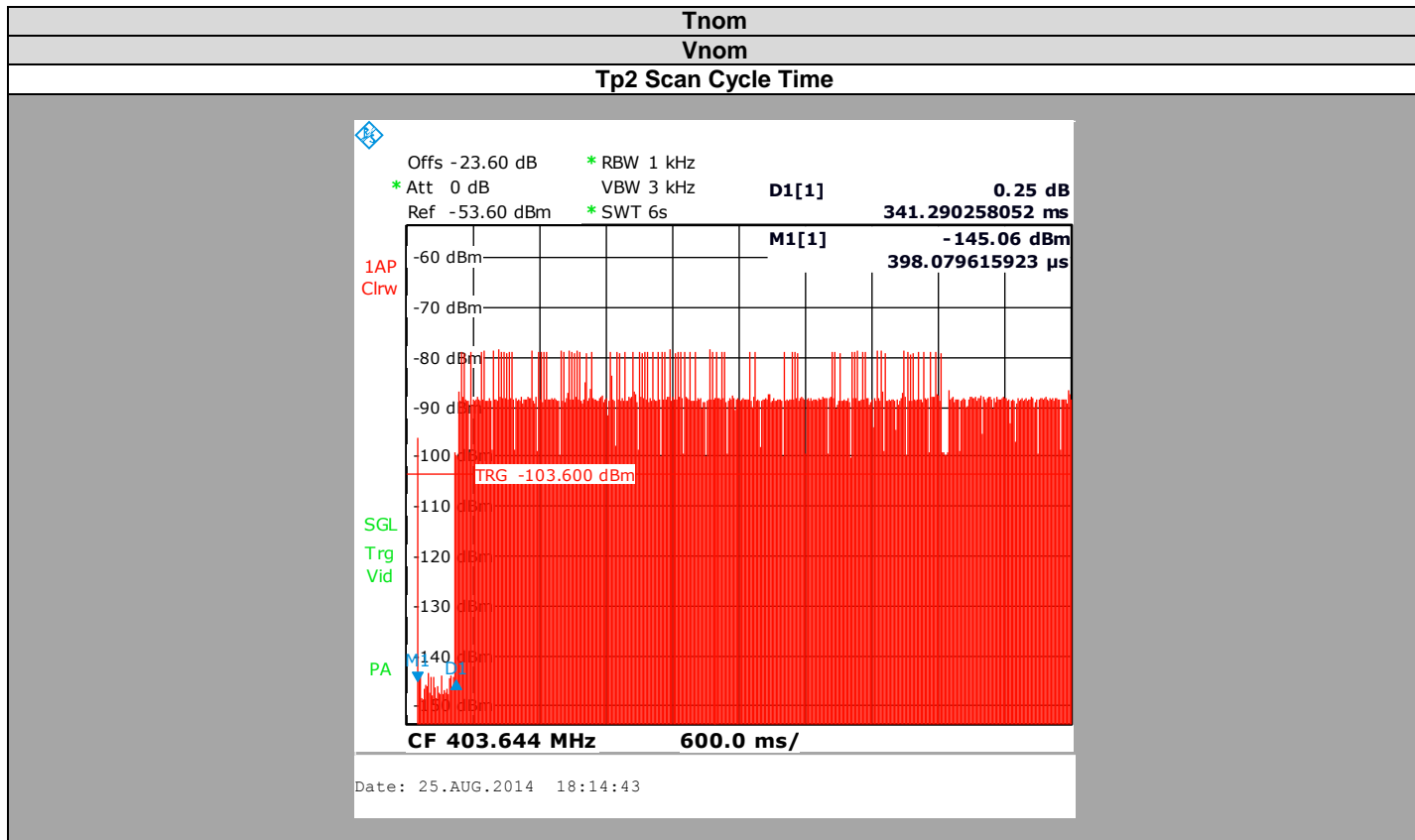
Vnom

Tp Scan Cycle Time



Tp1 Scan Cycle Time





Temperature	Tnom
Voltage	Vnom
Channel	Cnom
TP Scan Cycle Time (s)	0.317
TP1 Scan Cycle Time (s)	0.343
TP2 Scan Cycle Time (s)	0.341

12.7. CONCLUSION

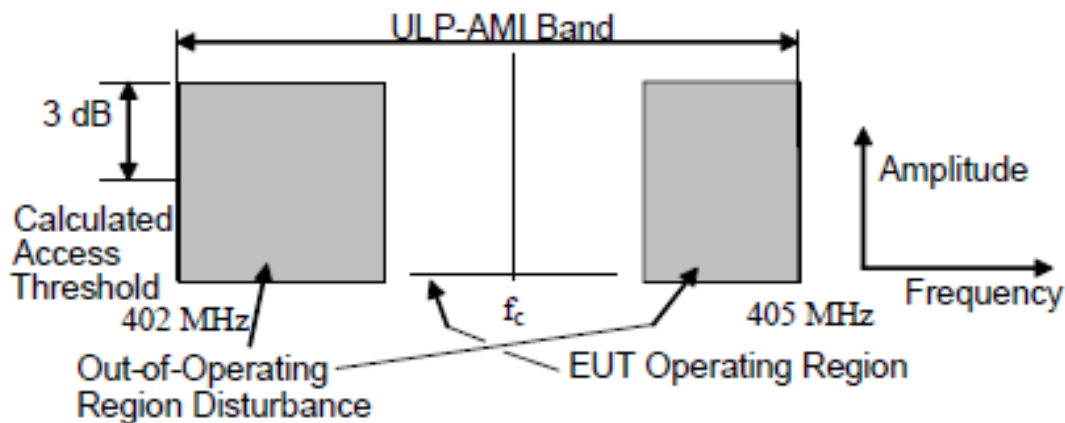
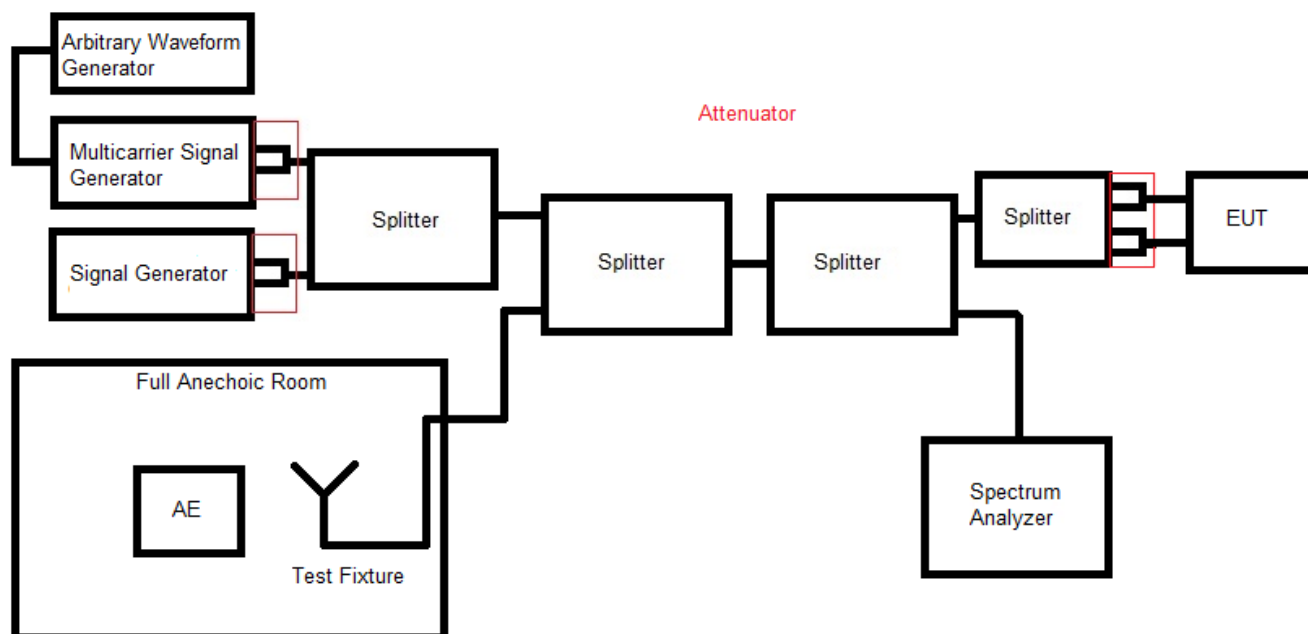
The product SORIN Group KA351, SN:LA1403007E, in configuration and description presented in this test report, complies with the monitoring system scan cycle time measurement of FCC 95.628 (a)(2) & RSS-243 § 5.7.3.

13. MINIMUM CHANNEL MONITORING PERIOD

13.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
 Date of test : 2014/08/25
 Ambient temperature : 21°C
 Relative humidity : 40%

13.2. TEST SETUP



Out-of-operating-region disturbance is generated by using a disturbance source that can generate a sufficient number (approximately $2 \times 3000 / \text{emission bandwidth in kHz}$) of independently-controlled modulated signal (0,1 ms pulse whose repetition frequency is 100 Hz) across the 402 MHz to 405 MHz band to block access to the band except for a notch or notches equal to twice the emission bandwidth of the EUT.



Photograph for Minimum channel monitoring period

13.3. LIMIT

The EUT shall initiate communications session on fc



13.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
RF cable	Télédynne	920-0202-048	A5329661	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122209	2014/04	2015/04
RF cable	Télédynne	920-0202-048	A5329675	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122210	2014/04	2015/04
Spectrum Analyser	ROHDE & SCHWARZ	FSL 6	A4060032	2012/11	2014/11
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	2014/05	2015/05
Splitter	Minicircuit	ZFSC-2-2500	A7130071	2013/12	2014/12
Arbitrary Waveform Generator	Agilent	33220A	A5486005	2014/08	2015/08
Signal Generator	ROHDE & SCHWARZ	SMIQ	A5442039	2014/04	2015/04
Vector signal generator	ROHDE & SCHWARZ	SMJ100A	A5444007	2014/04	2015/04
Attenuator	-	SA 4016	A7122212	2013/07	2014/07
Attenuator	-	SA 4016	A7122212	2013/07	2014/07
Power splitter/combiner 2 Way	Mini-Circuits	ZN2PD2-63-S+	A7132026	2013/07	2014/07
Power splitter/combiner 2 Way	Mini-Circuits	ZN2PD2-63-S+	A7132027	2013/07	2014/07
RF cable	CABLES & CONNECTIQUES	CS2C 02	A5329356	2014/02	2015/02
Attenuator	MINI CIRCUITS	BW-S3W2+	A7122208	2013/07	2014/07
RF cable	Télédynne	920-0202-024	A5329669	2014/04	2016/04
RF cable	Télédynne	920-0202-024	A5329672	2014/04	2016/04
RF cable	CABLES & CONNECTIQUES	CS3B 01	A5329458	2014/04	2015/04
RF cable	CABLES & CONNECTIQUES	CS3B 03	A5329430	2014/04	2015/04
RF cable	CABLES & CONNECTIQUES	CS2F 06	A5329433	2014/02	2015/02
RF cable	-	-	A5329533	2014/05	2015/05
Dipole Antenna	Schwarzbeck	UHA 9105	C2040207	2014/05	2015/05
Horn antenna	A-INFOMW	LB-10180-NF	C2042051	2014/04	2015/04
Full Anechoic Room	Siepel	S36	D3044019	Not used as measurement equipment	

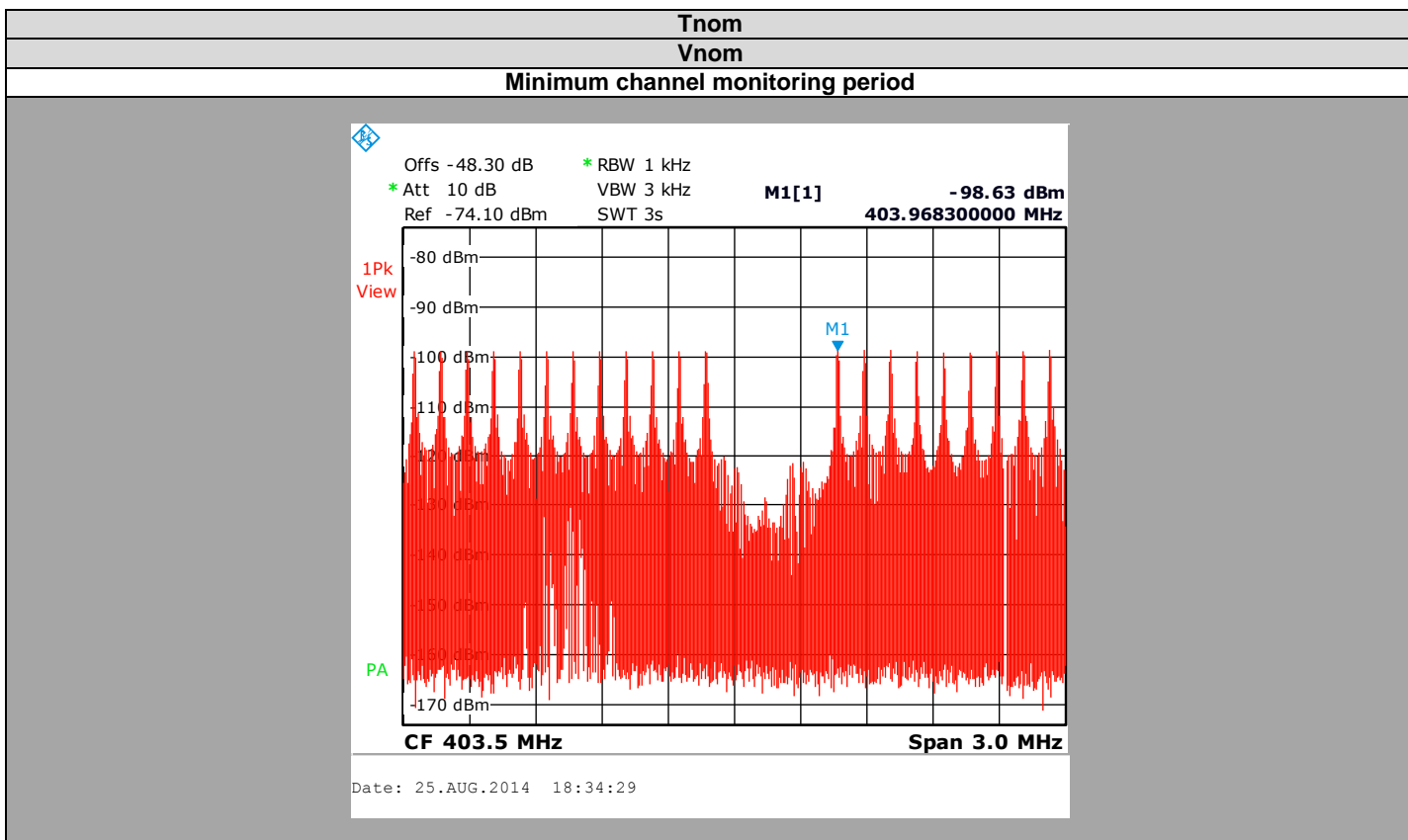
13.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

Divergence:



13.6. GRAPHICS & RESULTS



Temperature	Tnom
Voltage	Vnom
Channel	Cnom
EUT communicate on fc	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

13.7. CONCLUSION

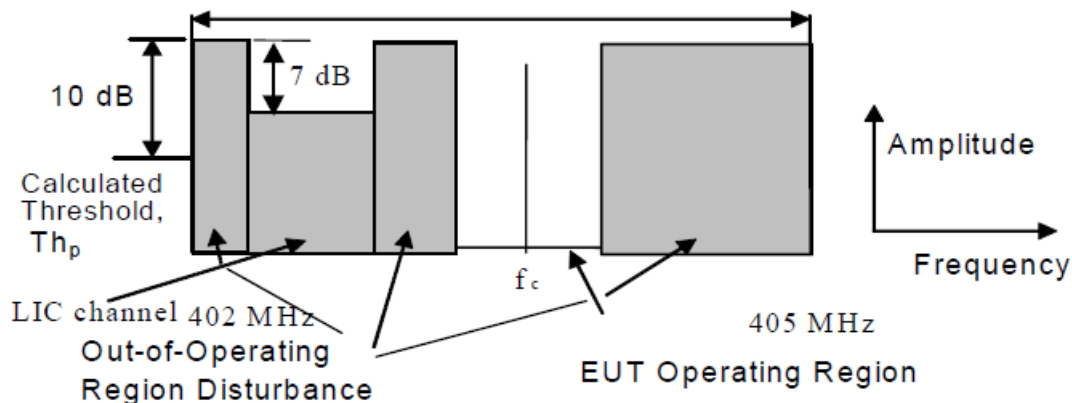
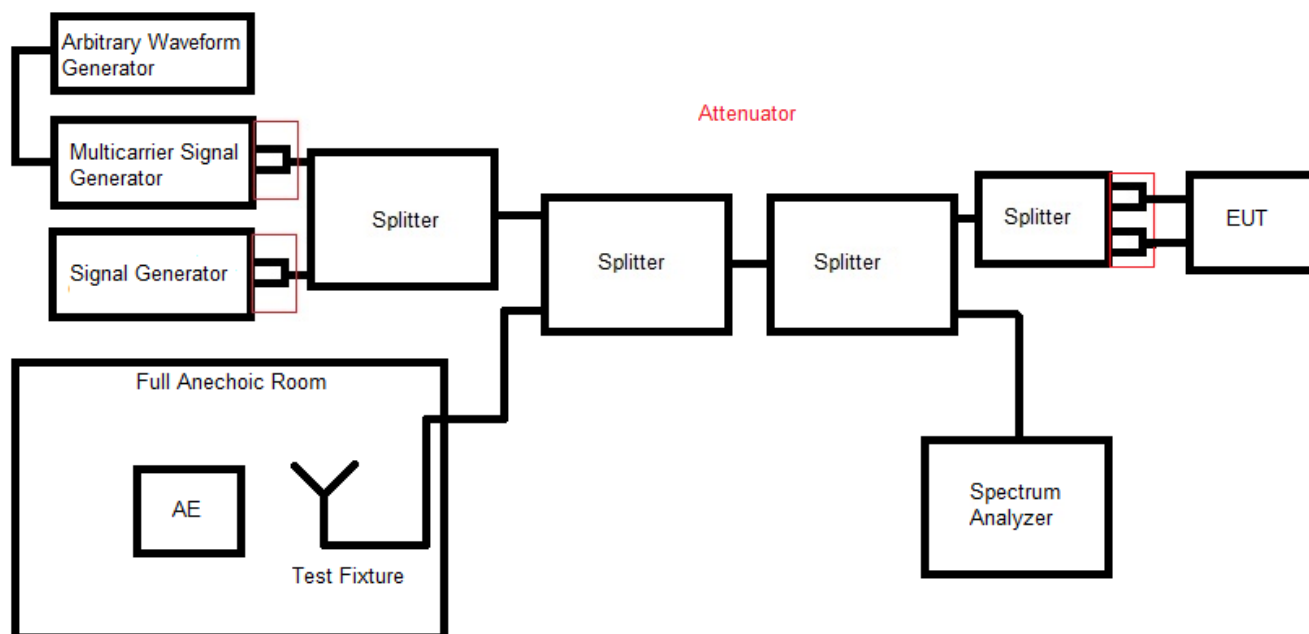
The product SORIN Group KA351, SN:LA1403007E, in configuration and description presented in this test report, complies with the minimum channel monitoring period measurement of FCC 95.628 (a)(2) & RSS-243 § 5.7.4.

14. CHANNEL ACCESS

14.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
 Date of test : 2014/08/26
 Ambient temperature : 21°C
 Relative humidity : 40%

14.2. TEST SETUP



Out-of-operating-region disturbance is generated by using a disturbance source that can generate a sufficient number (approximately $2 \times 3\,000$ /emission bandwidth in kHz) of independently-controlled CW signals across the 402 MHz to 405 MHz band to block access to the band except for a notch or notches equal to twice the emission bandwidth of the EUT.



Photograph for Channel access

14.3. LIMIT

The EUT shall access and transmit on the Least Interfered Channel (LIC) after the CW signal at the frequency f_c has been increased by 9dB from the initial level of 3dB below the calculated access threshold.



14.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
RF cable	Télédynne	920-0202-048	A5329661	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122209	2014/04	2015/04
RF cable	Télédynne	920-0202-048	A5329675	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122210	2014/04	2015/04
Spectrum Analyser	ROHDE & SCHWARZ	FSL 6	A4060032	2012/11	2014/11
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	2014/05	2015/05
Splitter	Minicircuit	ZFSC-2-2500	A7130071	2013/12	2014/12
Arbitrary Waveform Generator	Agilent	33220A	A5486005	2014/08	2015/08
Signal Generator	ROHDE & SCHWARZ	SMIQ	A5442039	2014/04	2015/04
Vector signal generator	ROHDE & SCHWARZ	SMJ100A	A5444007	2014/04	2015/04
Attenuator	-	SA 4016	A7122212	2013/07	2014/07
Attenuator	-	SA 4016	A7122212	2013/07	2014/07
Power splitter/combiner 2 Way	Mini-Circuits	ZN2PD2-63-S+	A7132026	2013/07	2014/07
Power splitter/combiner 2 Way	Mini-Circuits	ZN2PD2-63-S+	A7132027	2013/07	2014/07
RF cable	CABLES & CONNECTIQUES	CS2C 02	A5329356	2014/02	2015/02
Attenuator	MINI CIRCUITS	BW-S3W2+	A7122208	2013/07	2014/07
RF cable	Télédynne	920-0202-024	A5329669	2014/04	2016/04
RF cable	Télédynne	920-0202-024	A5329672	2014/04	2016/04
RF cable	CABLES & CONNECTIQUES	CS3B 01	A5329458	2014/04	2015/04
RF cable	CABLES & CONNECTIQUES	CS3B 03	A5329430	2014/04	2015/04
RF cable	CABLES & CONNECTIQUES	CS2F 06	A5329433	2014/02	2015/02
RF cable	-	-	A5329533	2014/05	2015/05
Dipole Antenna	Schwarzbeck	UHA 9105	C2040207	2014/05	2015/05
Horn antenna	A-INFOMW	LB-10180-NF	C2042051	2014/04	2015/04
Full Anechoic Room	Siepel	S36	D3044019	Not used as measurement equipment	

14.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

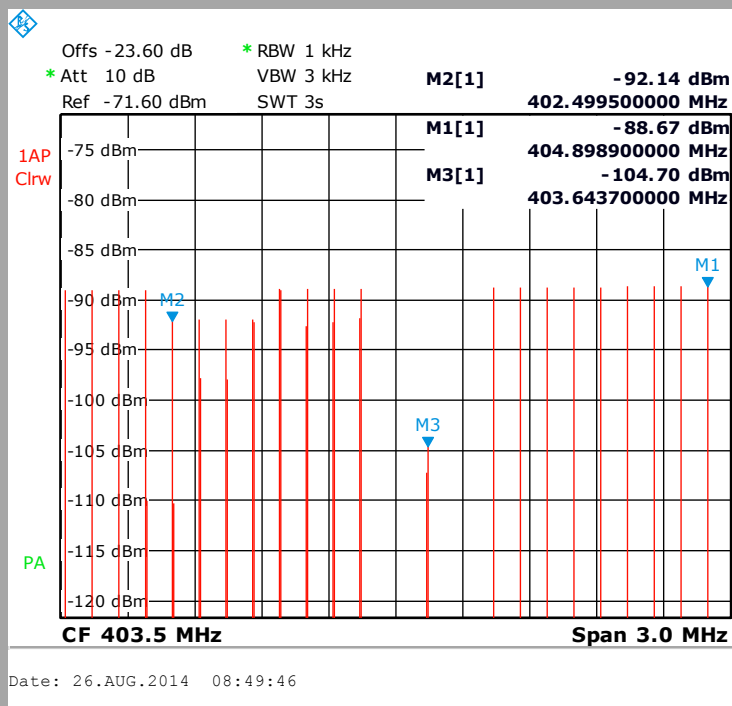
None

Divergence:

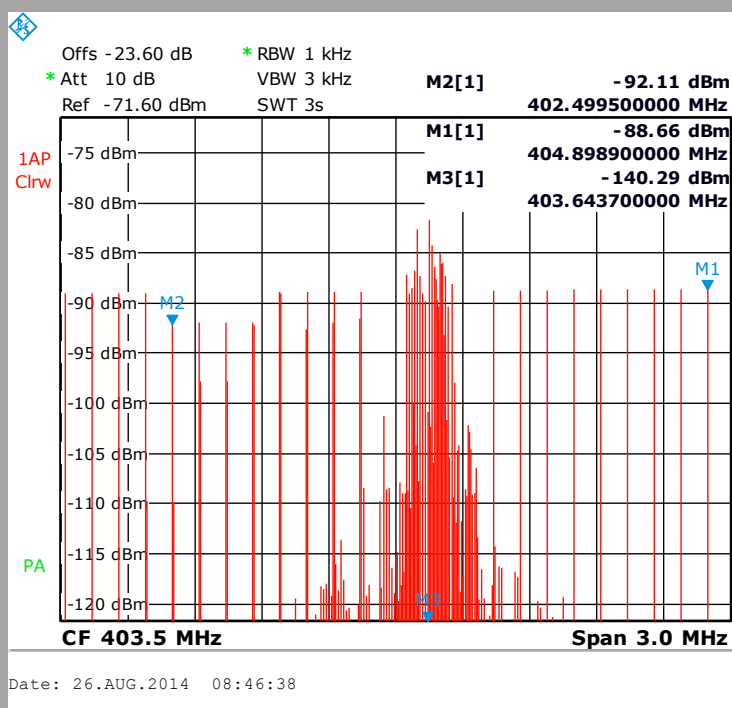


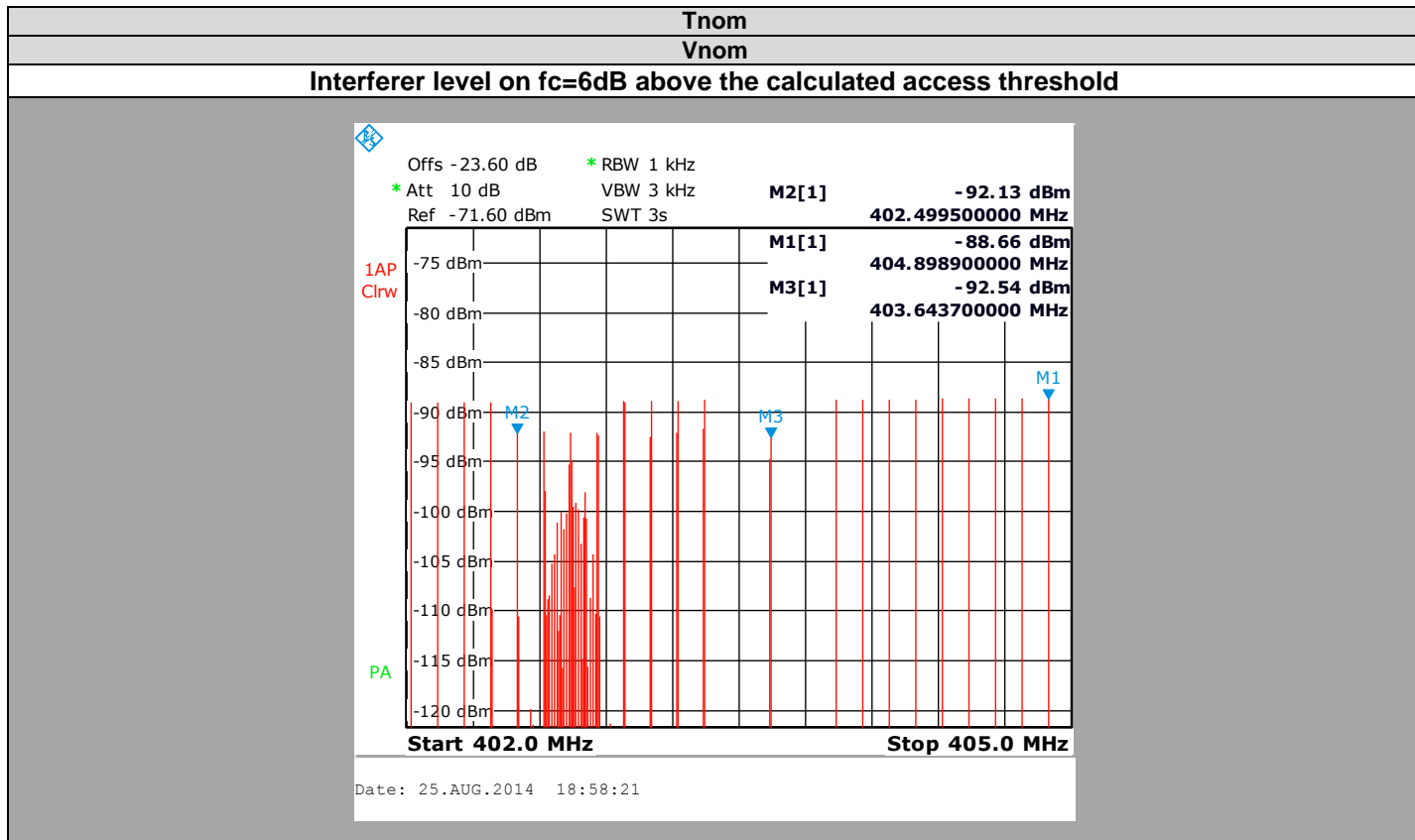
14.6. GRAPHICS & RESULTS

Tnom
Vnom
Interferer level on fc=-3dB below the calculated access threshold



Interferer level on fc=-3dB below the calculated access threshold





Temperature	Tnom
Voltage	Vnom
Channel	Cnom
EUT transmit on LIC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

14.7. CONCLUSION

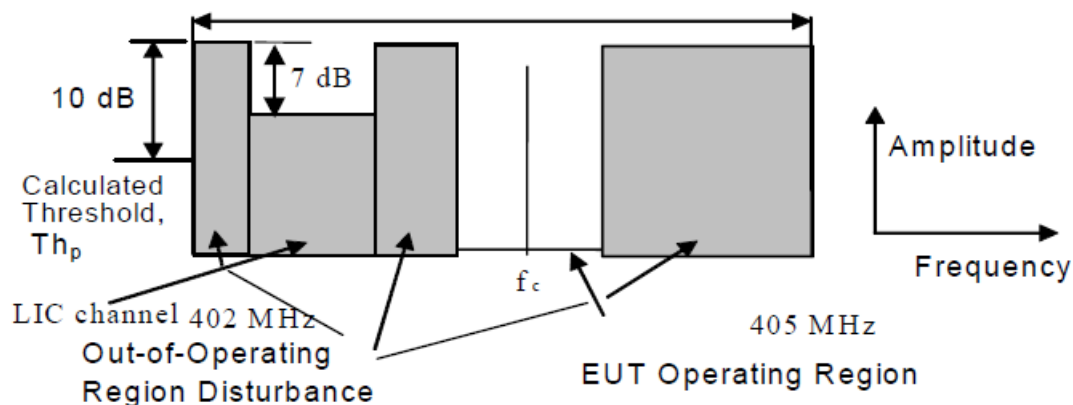
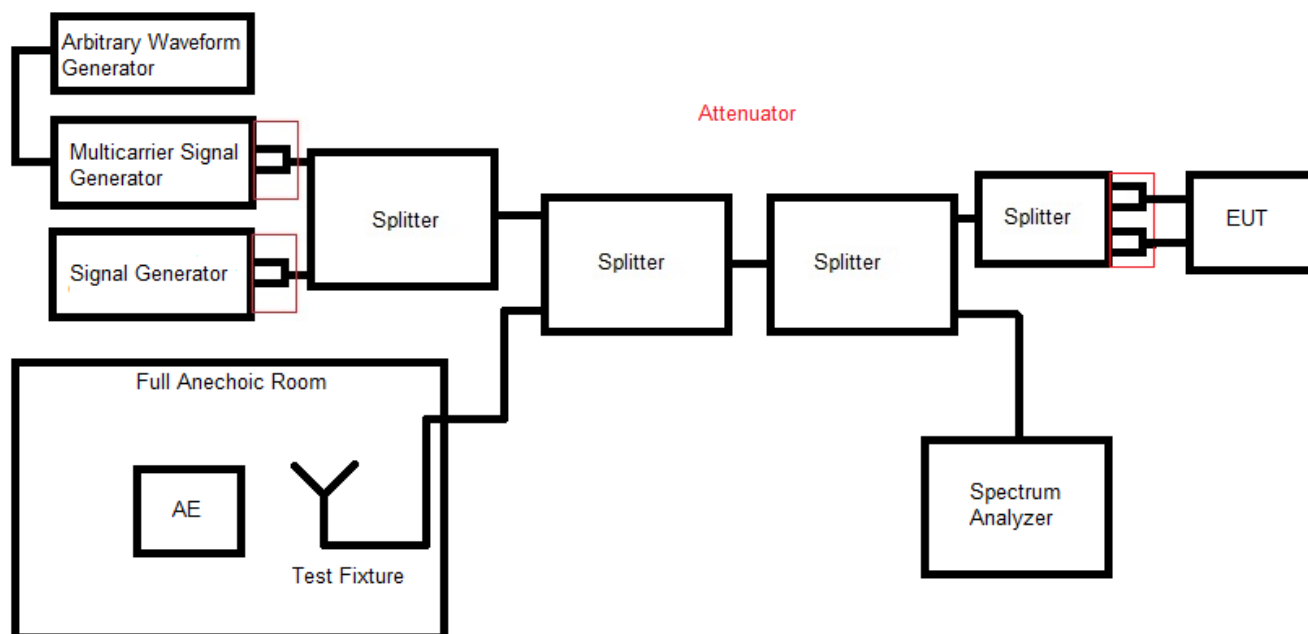
The product SORIN Group KA351, SN:LA1403007E, in configuration and description presented in this test report, complies with the channel access measurement of FCC 95.628 (a)(4) & RSS-243 § 5.7.5.

15. DISCONTINUATION OF MICS SESSION

15.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
 Date of test : 2014/08/26
 Ambient temperature : 21°C
 Relative humidity : 40%

15.2. TEST SETUP



Out-of-operating-region disturbance is generated by using a disturbance source that can generate a sufficient number (approximately $2 \times 3\,000$ /emission bandwidth in kHz) of independently-controlled CW signals across the 402 MHz to 405 MHz band to block access to the band except for a notch or notches equal to twice the emission bandwidth of the EUT.



Photograph for Discontinuation of MICS session

15.3. LIMIT

The EUT on the initial LIC channel shall cease transmission in period not exceeding 5 seconds after the ULP-AMI is turned off or blocked and the session should not restart on the initial LIC channel.



15.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
RF cable	Télédynne	920-0202-048	A5329661	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122209	2014/04	2015/04
RF cable	Télédynne	920-0202-048	A5329675	2014/04	2015/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122210	2014/04	2015/04
Spectrum Analyser	ROHDE & SCHWARZ	FSL 6	A4060032	2012/11	2014/11
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	2014/05	2015/05
Splitter	Minicircuit	ZFSC-2-2500	A7130071	2013/12	2014/12
Arbitrary Waveform Generator	Agilent	33220A	A5486005	2014/08	2015/08
Signal Generator	ROHDE & SCHWARZ	SMIQ	A5442039	2014/04	2015/04
Vector signal generator	ROHDE & SCHWARZ	SMJ100A	A5444007	2014/04	2015/04
Attenuator	-	SA 4016	A7122212	2013/07	2014/07
Attenuator	-	SA 4016	A7122212	2013/07	2014/07
Power splitter/combiner 2 Way	Mini-Circuits	ZN2PD2-63-S+	A7132026	2013/07	2014/07
Power splitter/combiner 2 Way	Mini-Circuits	ZN2PD2-63-S+	A7132027	2013/07	2014/07
RF cable	CABLES & CONNECTIQUES	CS2C 02	A5329356	2014/02	2015/02
Attenuator	MINI CIRCUITS	BW-S3W2+	A7122208	2013/07	2014/07
RF cable	Télédynne	920-0202-024	A5329669	2014/04	2016/04
RF cable	Télédynne	920-0202-024	A5329672	2014/04	2016/04
RF cable	CABLES & CONNECTIQUES	CS3B 01	A5329458	2014/04	2015/04
RF cable	CABLES & CONNECTIQUES	CS3B 03	A5329430	2014/04	2015/04
RF cable	CABLES & CONNECTIQUES	CS2F 06	A5329433	2014/02	2015/02
RF cable	-	-	A5329533	2014/05	2015/05
Dipole Antenna	Schwarzbeck	UHA 9105	C2040207	2014/05	2015/05
Horn antenna	A-INFOMW	LB-10180-NF	C2042051	2014/04	2015/04
Full Anechoic Room	Siepel	S36	D3044019	Not used as measurement equipment	

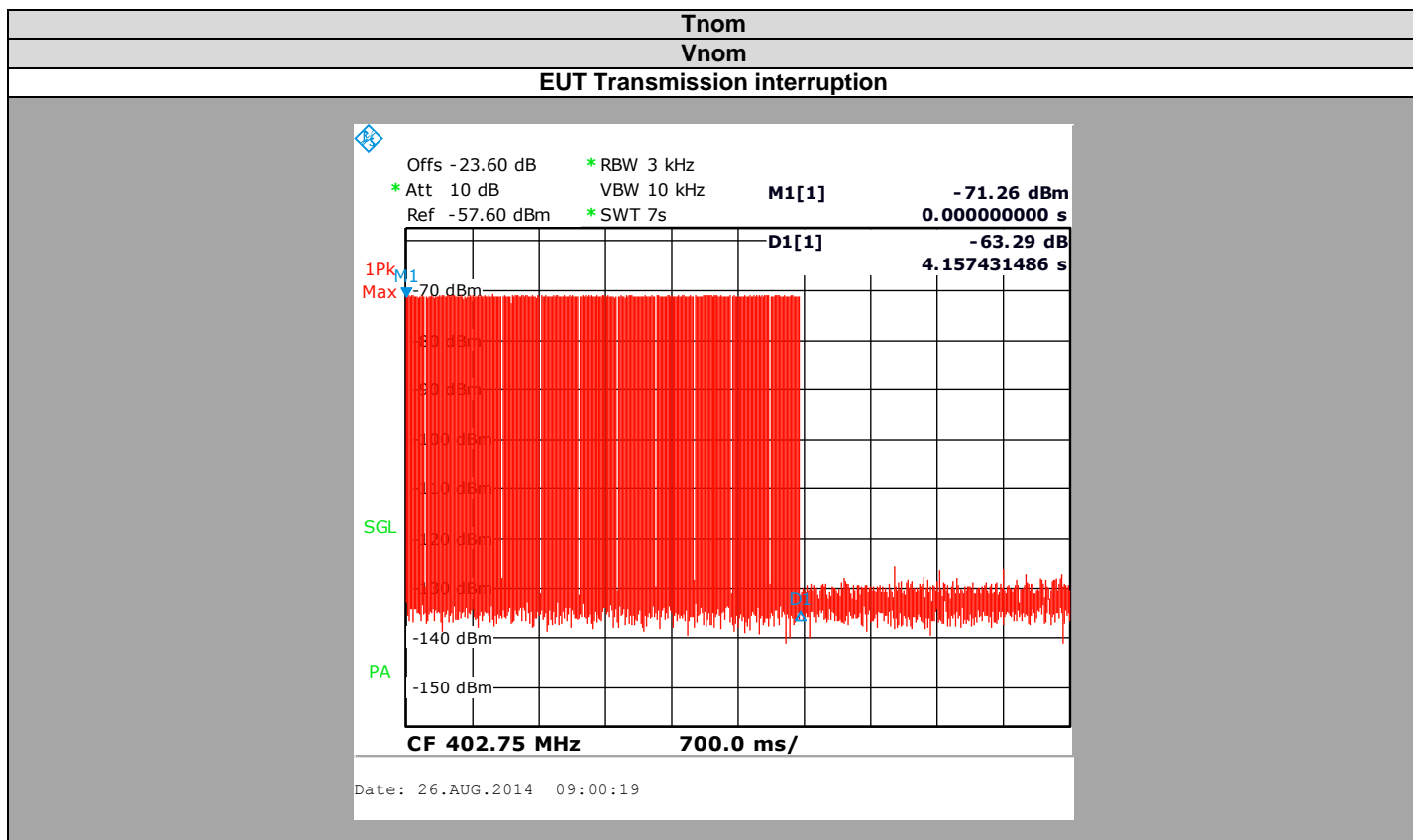
15.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

Divergence:



15.6. GRAPHICS & RESULTS



Temperature	Tnom
Voltage	Vnom
Channel	Cnom
EUT Transmission interruption (s)	4.15
EUT transmit on LIC at the ULP-AMI restart	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

15.7. CONCLUSION

The product SORIN Group KA351, SN:LA1403007E, in configuration and description presented in this test report, complies with the discontinuation of MICS session measurement of FCC 95.628 (a)(4) & RSS-243 § 5.7.6.



16. UNCERTAINTIES CHART

Kind of test	Measurement uncertainties (k=2) $\pm x(\text{dB}) / (\text{Hz})$	Limit for uncertainties $\pm y(\text{dB})$
REQUIREMENTS		
RF output power, conducted	$\pm 0.6 \text{ dB}$	$\pm 1,5 \text{ dB}$
Power Spectral Density, conducted	$\pm 0.6 \text{ dB}$	$\pm 1,5 \text{ dB}$
Unwanted Emissions, conducted	$\pm 0.6 \text{ dB}$	$\pm 1,5 \text{ dB}$
Radiated emissions <ul style="list-style-type: none"> • Frequency < 1000 MHz • Frequency > 1000 MHz 	$\pm 3.9 \text{ dB}$ $\pm 3.1 \text{ dB}$	$\pm 6 \text{ dB}$
Temperature	$\pm 0.5^\circ\text{C}$	$\pm 1^\circ\text{C}$
Humidity	$\pm 2.5 \%$	$\pm 5 \%$