

Prüfbericht - Nr.: 16800338 001 <i>Test Report No.:</i>			Seite 1 von 48 <i>Page 1 of 48</i>		
Auftraggeber: <i>Client:</i>			Technicolor USA, Inc. 101 West 103 rd Street, Indianapolis, IN 46290, United States		
Gegenstand der Prüfung: Set Top Box <i>Test item:</i>					
Bezeichnung: <i>Identification:</i>		DCI401COM2		Serien-Nr.: <i>Serial No.:</i>	
Wareneingangs-Nr.: <i>Receipt No.:</i>		1143005145		Eingangsdatum: <i>Date of receipt:</i>	
Prüfort: <i>Testing location:</i>		Refer to section 1.1			
Prüfgrundlage: <i>Test specification:</i>		FCC Part 15 Subpart C Section 15.207 FCC Part 15 Subpart C Section 15.209 FCC Part 15 Subpart C Section 15.247			
Prüfergebnis: <i>Test Result:</i>		Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test items passed the test specification(s).</i>			
Prüflaboratorium: <i>Testing Laboratory:</i>		Refer to section 1.1			
geprüft/ tested by: kontrolliert/ reviewed by:					
2011-06-27 Yang, Kai/PE				2011-07-01 Sun, Lixun/Reviewer	
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>
Sonstiges/ Other Aspects:					
Abkürzungen: P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet Abbreviations: P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested					
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>					

TEST SUMMARY

4.1.1 ANTENNA REQUIREMENT

RESULT: Passed

4.1.2 PEAK OUTPUT POWER

RESULT: Passed

4.1.3 6dB BANDWIDTH

RESULT: Passed

4.1.4 CONDUCTED SPURIOUS EMISSIONS IN 100kHz BANDWIDTH

RESULT: Passed

4.1.5 POWER SPECTRAL DENSITY

RESULT: Passed

4.1.6 SPURIOUS EMISSION

RESULT: Passed

4.1.7 CONDUCTED EMISSIONS

RESULT: Passed

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1. Test Sites

1.1 Test Facilities

Laboratory: The State Radio_Monitoring_Center Testing (SRTC) (FCC Registration No.: 910917)

Address: No.98 BeiLishi Road, Xicheng District, Beijing 100037

The used test equipment is in accordance with CISPR 16-1 for measurement of radio interference.

1.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
Spurious Radiated Emissions				
Bi-log Antenna	Rohde & Schwarz	HL562	100016	2011-08-20
Horn Antenna	Rohde & Schwarz	HF906	100030	2011-08-20
EMI Test Receiver	Rohde & Schwarz	ESI40	100015	2011-08-20
Horn Antenna	Rohde & Schwarz	RA42-K-F-4B-C	002058-002	2011-08-20
Pre/Power Amplifier	Rohde & Schwarz	HP2800	800584	2011-08-20
Radio Frequency Test Suite				
Spectrum Analyzer	Rohde & Schwarz	FSV	100930	2012-03-15
Conducted Emissions				
EMI Receiver	SCHAFFNER	SMR4503	29	2011-12-24
LISN	SCHAFFNER	NNB42	04/10158	2011-12-22

1.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology P.R. China) or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

1.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

1.5 Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO/IEC 17025 are:

Table 2: Measurement Uncertainty

Items		Extended Uncertainty
RE (30-1000MHz)	Field strength (dBuV/m)	$U=\pm 4.94\text{dB}$, $k=2$, $\sigma=95\%$
RE (1-25GHz)	Field strength (dBuV/m)	$U=\pm 4.34\text{dB}$, $k=2$, $\sigma=95\%$
CE	Disturbance Voltage (dBuV)	$U=\pm 2.56\text{dB}$, $k=2$, $\sigma=95\%$

2. General Product Information

2.1 Product Function and Intended Use

The EUT(equipment under test) is a set top box with 2.4G wireless technology. For the further information refer to the User Manual and Circuit Diagram.

This report covers the circuitry of the device subject to FCC part 15, subpart C, the circuitry of the device subjected to FCC part 15, subpart B has been tested and is covered in the report 16800338 002.

2.2 Ratings and System Details

Table 3: Rating of EUT

Kind of Equipment:	Set Top Box
Type Designation:	DCI401COM2
FCC ID	G95DCI401COM2
Rated Input Voltage	DC 5V (via power supply unit)
Rated input Current	1.5A
Kind of Equipment:	Power Supply Unit
Type Designation:	WAA020
Rated Input Voltage	AC 100-120V; 60Hz
Rated input Current	0.2A
Output voltage and current	DC 5V;1.5A
PN	3682860A
Manufacturer	AcBel ELECTRONIC (DONGGUAN) Co., Ltd.

Table 4: Technical Specification

Item	Description
Operating Frequency band	2423.5-2476.5MHz
Channel Number	3
Channel Center Frequency	2425MHz, 2450MHz, 2475MHz
Modulation	O-QPSK
Antenna	Integrated Antenna
Antenna Gain (dBi)	2.15

Table 5: Interface port of EUT

Name of Ports	No. of Ports	Cable descriptions/Max Length
RF In	1	Shielding cable/1.524m
RF Out	1	Shielding cable/1.524m
HDMI	1	Shielding cable/1.829m
DC In	1	Unshielding cable/2m

2.3 Independent Operation Modes

The basic operation modes are:

- A. On, transmitting
 - 1. Low channel
 - 2. Middle channel
 - 3. High channel
- B. Off

2.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

2.5 Submitted Documents

- Bill of Material
- PCB Layout
- Photo Document
- Circuit Diagram
- Instruction Manual
- Rating Label

3. Test Set-up and Operation Modes

3.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use. And prior to the measurements, the test object operated about 5 minutes (warm-up) in order to stabilize its operating conditions and to ensure reliable measurement values.

3.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All testing were performed according to the procedures in ANSI C63.4: 2003.

As the sample has two antenna which with the same structure and characteristic, and there is only one antenna can transmit at one time, for all of the tests in this report, the both antennas' output were pre-tested, and the final test was performed on the larger antenna's output status to get the maximal value.

3.3 Special Accessories and Auxiliary Equipment

Table 6: Test Auxiliary Equipments

Description	Manufacturer	FCC ID	Model	Specification
Remote control	Philips	RCSRC2 843001	RC2843001	2 AA batteries, 3V
Television	TOSHIBA	DoC	19AV615D	220-240V 50/60Hz 50W

3.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

3.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test

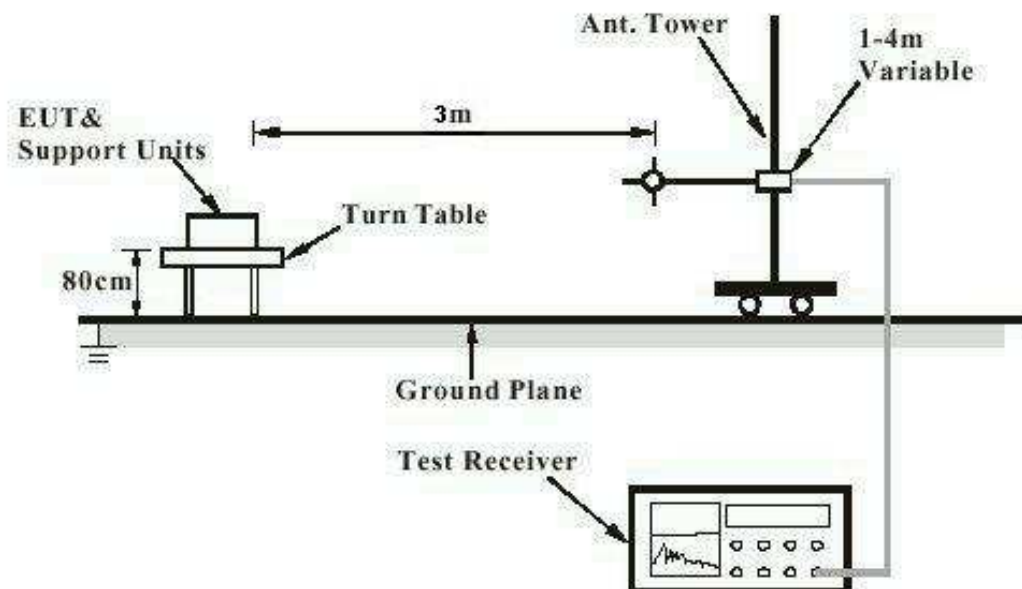


Diagram of Measurement Equipment Configuration for Conduction Measurement

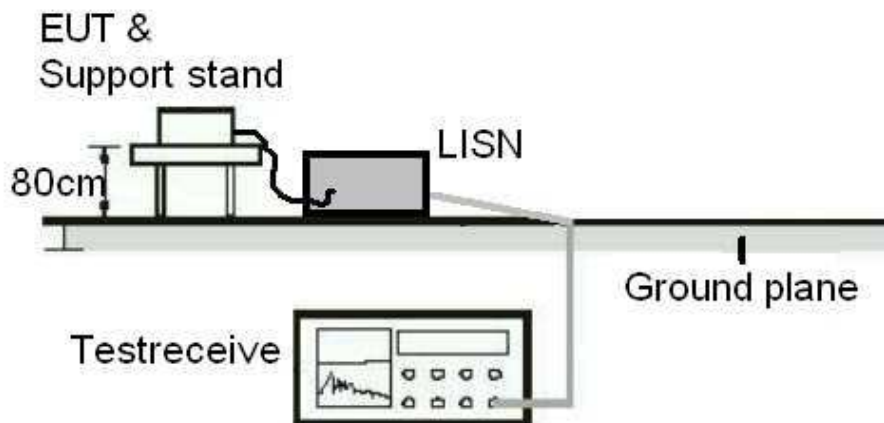
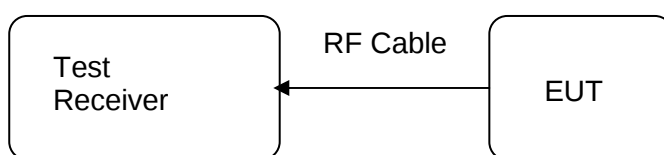


Diagram of Measurement Equipment Configuration for Transmitter Measurement



4. Test Results

4.1 Transmitter Requirement & Test Suites

4.1.1 Antenna Requirement

RESULT:**Passed**

Test date	:	2011-06-14
Test standard	:	FCC Part 15.247(b)(4) and Part 15.203
Limit	:	the use of antennas with directional gains that do not exceed 6 dBi

According to the manufacturer declared, the EUT has an internal antenna, the directional gain of antenna is 2.15dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

4.1.2 Peak Output Power

RESULT:**Passed**

Test date : 2011-06-03
Test standard : FCC Part 15.247(b)(1)
Basic standard : ANSI C63.4: 2003
Limit : 1 Watt
Kind of test site : Shielded room

Test setup

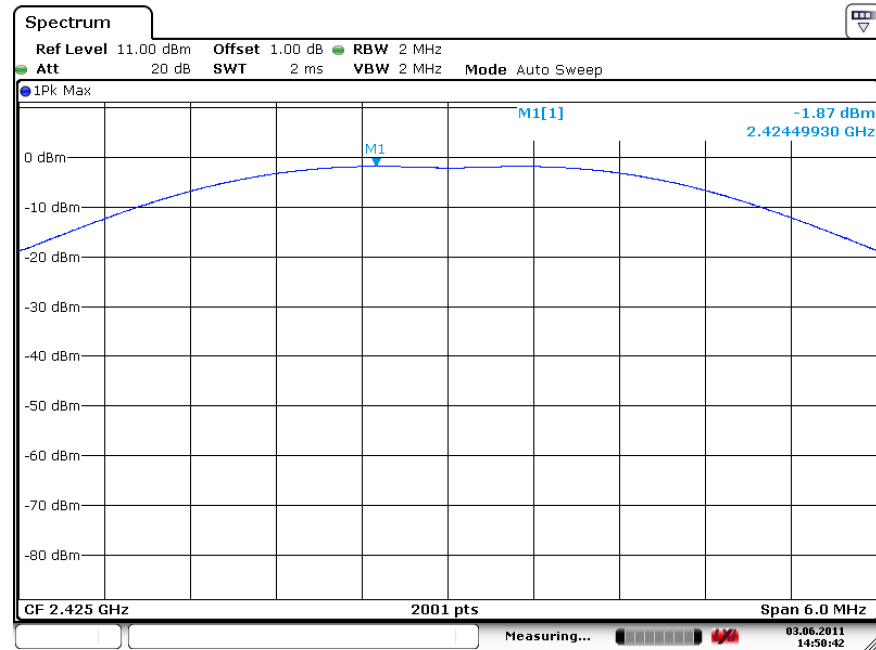
Test Channel : Low/ Middle/ High
Operation Mode : A
Ambient temperature : 24°C
Relative humidity : 53%
Atmospheric pressure : 101 kPa

Table 7: Test result of Peak Output Power

Channel	Channel Frequency (MHz)	Peak Output Power		Limit (W)
		(dBm)	(W)	
Low Channel	2425	-1.87	0.00065	1
Middle Channel	2450	-2.07	0.00062	1
High Channel	2475	-2.28	0.00059	1

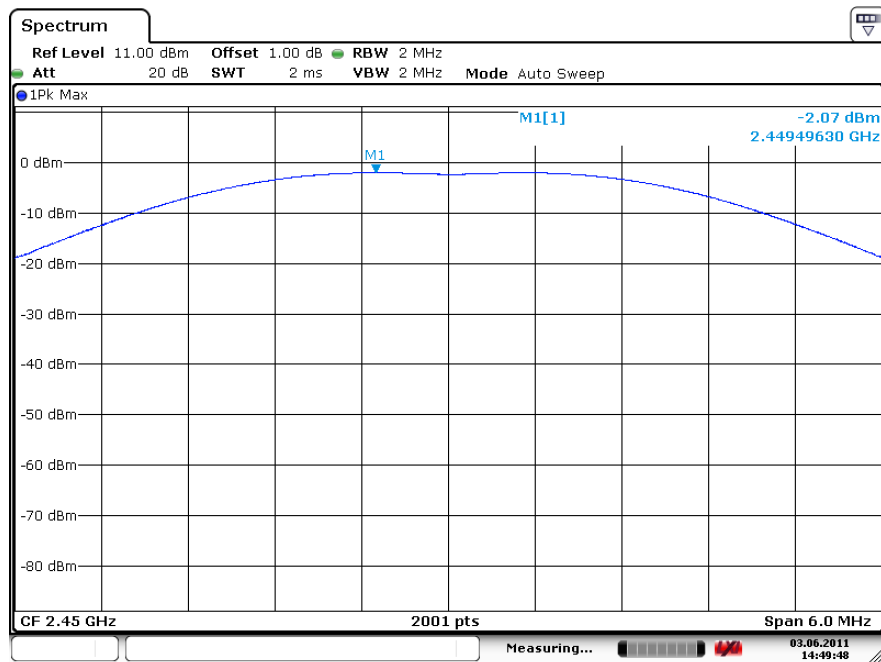
Test Graph of Peak Output Power

Low Channel



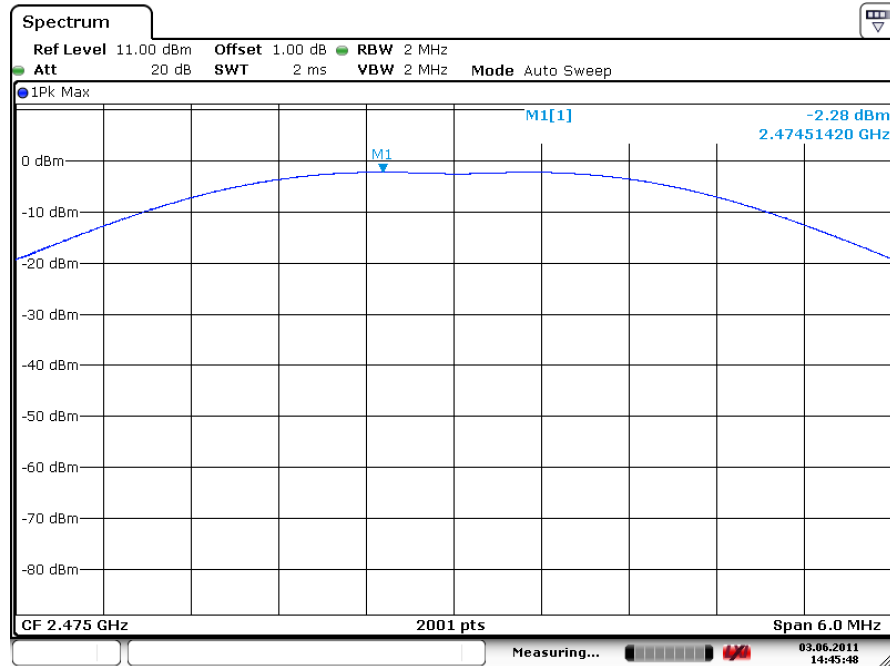
Date: 3.JUN.2011 14:50:42

Middle Channel



Date: 3.JUN.2011 14:49:48

High Channel



Date: 3.JUN.2011 14:45:48

4.1.3 6dB Bandwidth

RESULT:**Passed**

Date of testing : 2011-06-03
Test standard : FCC Part 15.247(a)(1)
Basic standard : ANSI C63.4: 2003
Kind of test site : Shielded room

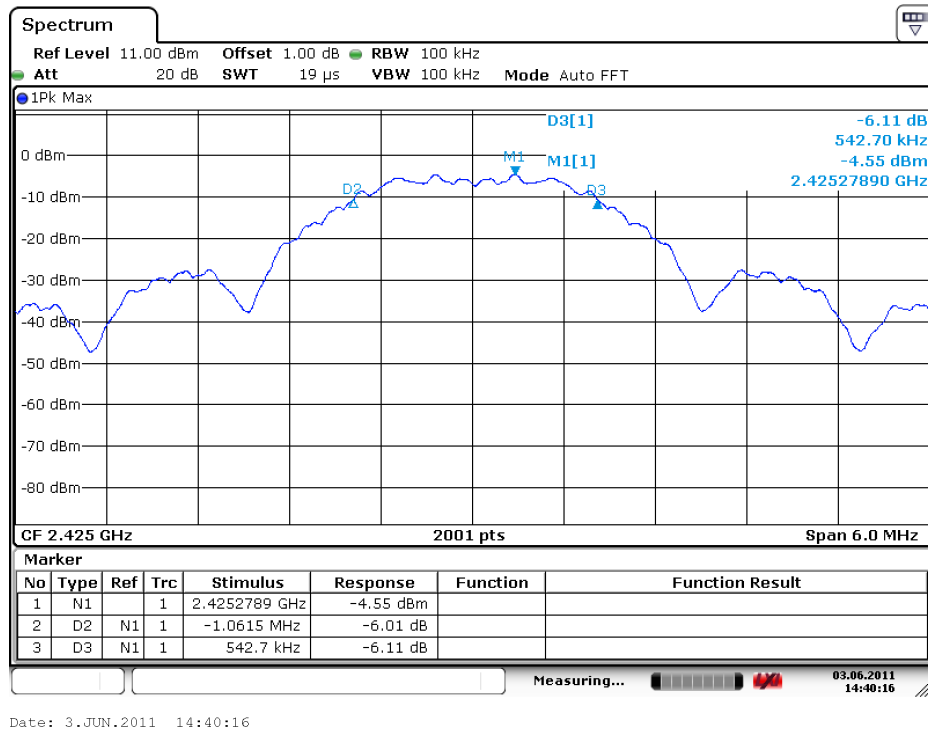
Test setup

Test Channel : Low/ Middle/ High
Operation Mode : A
Ambient temperature : 24°C
Relative humidity : 53%
Atmospheric pressure : 101 kPa

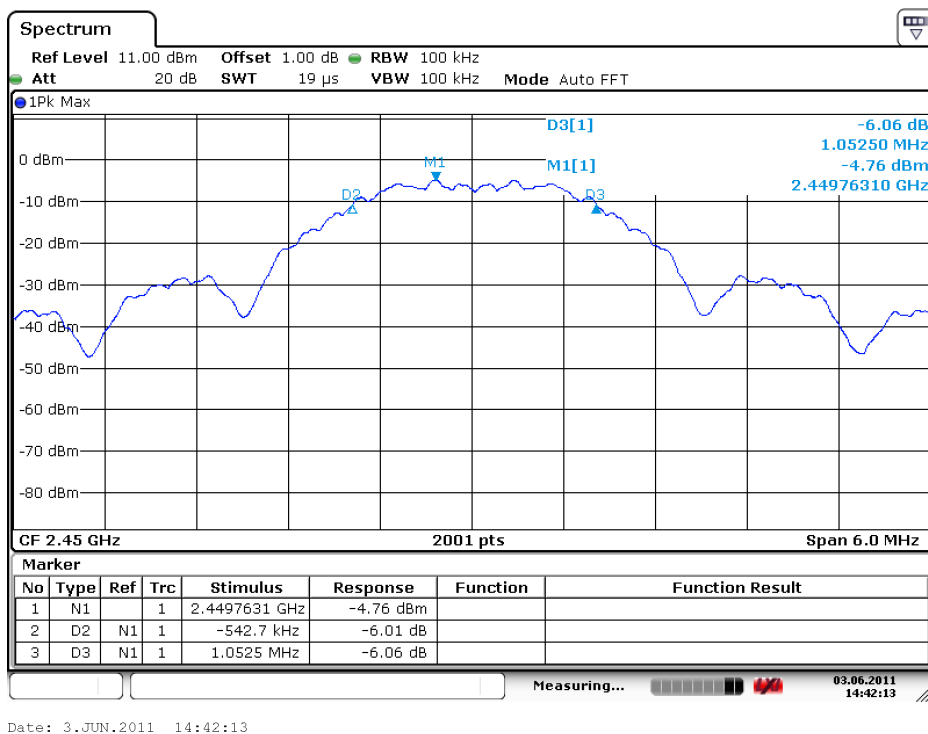
Table 8: Test result of 6dB Bandwidth

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Limit
Low Channel	2425	1.6042	500kHz
Mid Channel	2450	1.5952	500kHz
High Channel	2475	1.5832	500kHz

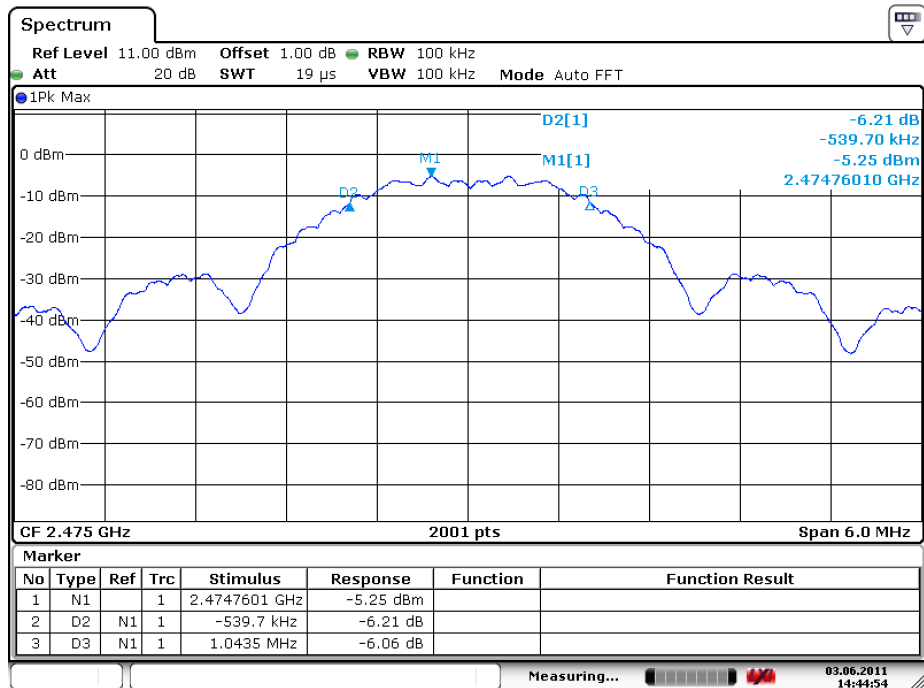
Test Graph of 6dB Bandwidth Low Channel



Middle Channel



High Channel



Date: 3.JUN.2011 14:44:54

4.1.4 Conducted Spurious Emissions in 100kHz Bandwidth

RESULT:**Passed**

Date of testing	:	2011-06-03
Test standard	:	FCC part 15.247(d)
Basic standard	:	ANSI C63.4: 2003
Limit	:	20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power); In addition, radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified in 15.209(a)
Kind of test site	:	Shield room

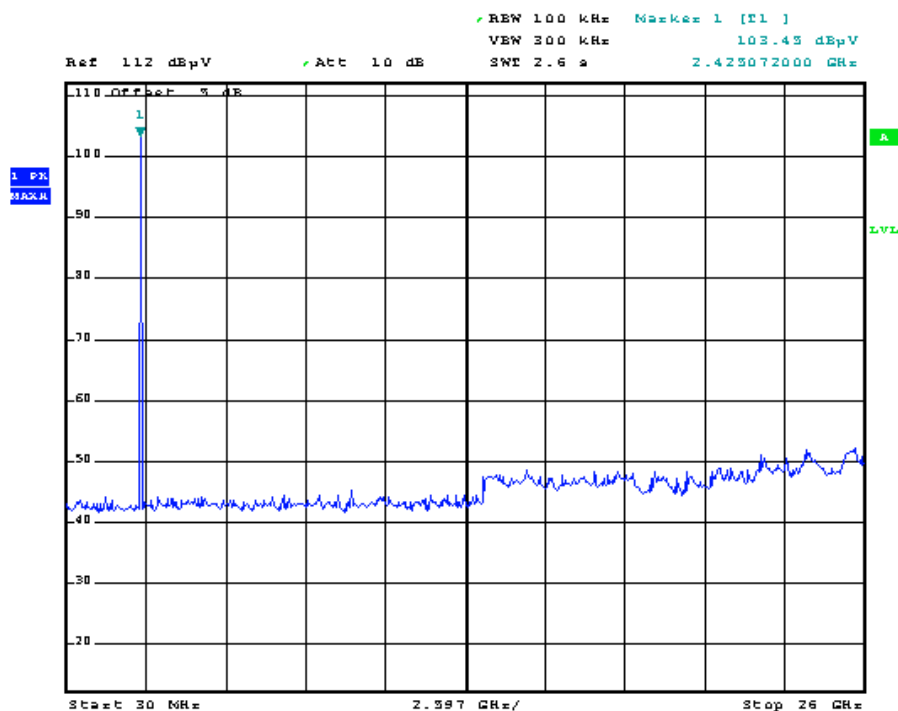
Test setup

Test Channel	:	Low/ High
Operation mode	:	A
Ambient temperature	:	24°C
Relative humidity	:	53%
Atmospheric pressure	:	101 kPa

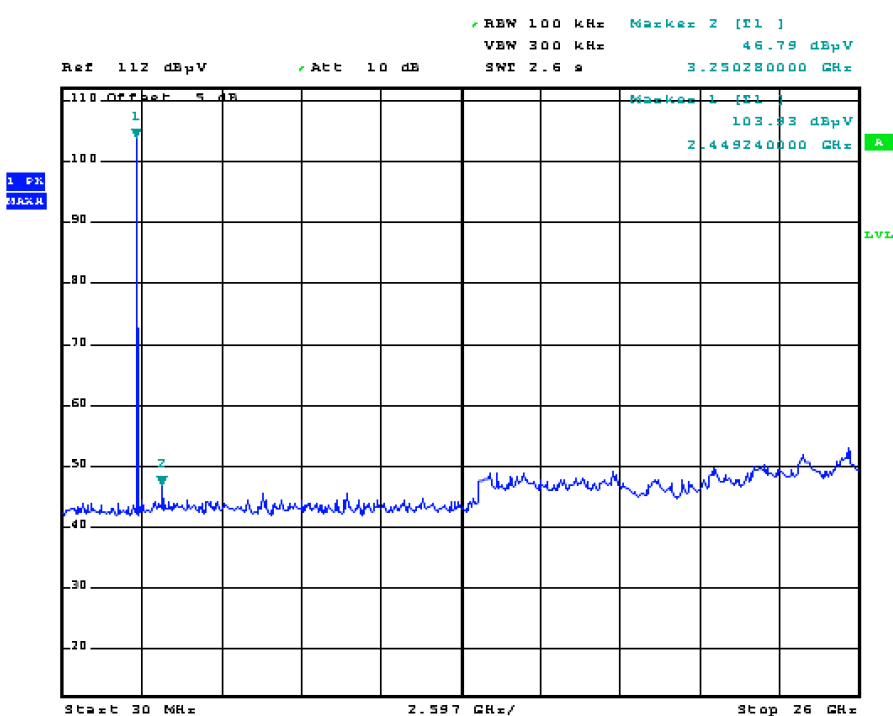
All emissions are more than 20dB below fundamental, details refer to following test Graph, and compliance is achieved as well.

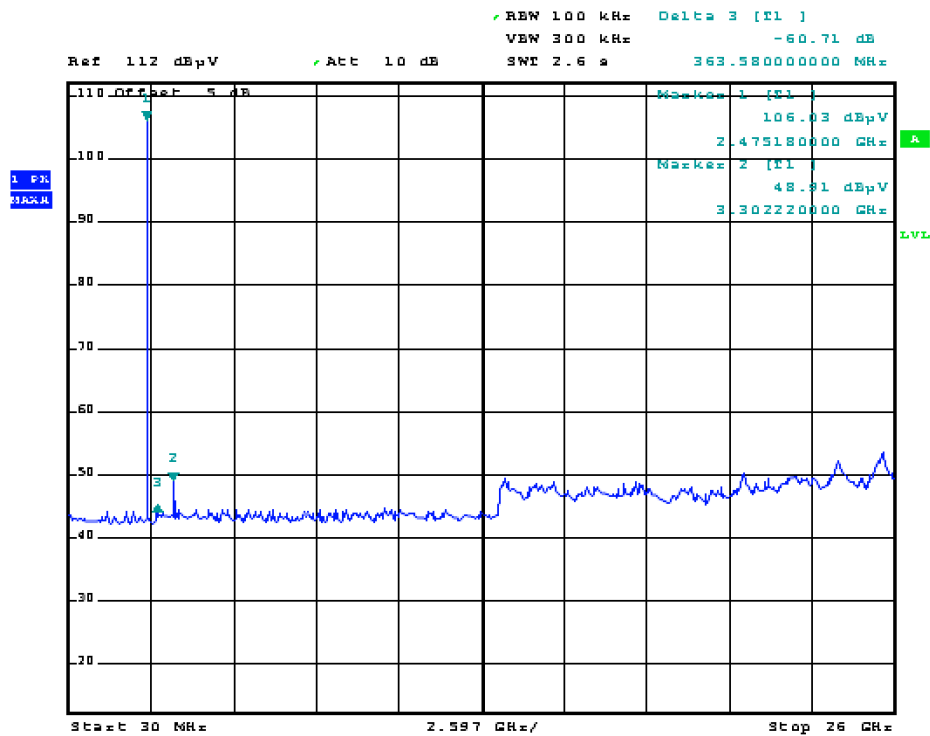
Test Graph of Conducted Spurious Emissions measured in 100kHz Bandwidth

Low Channel



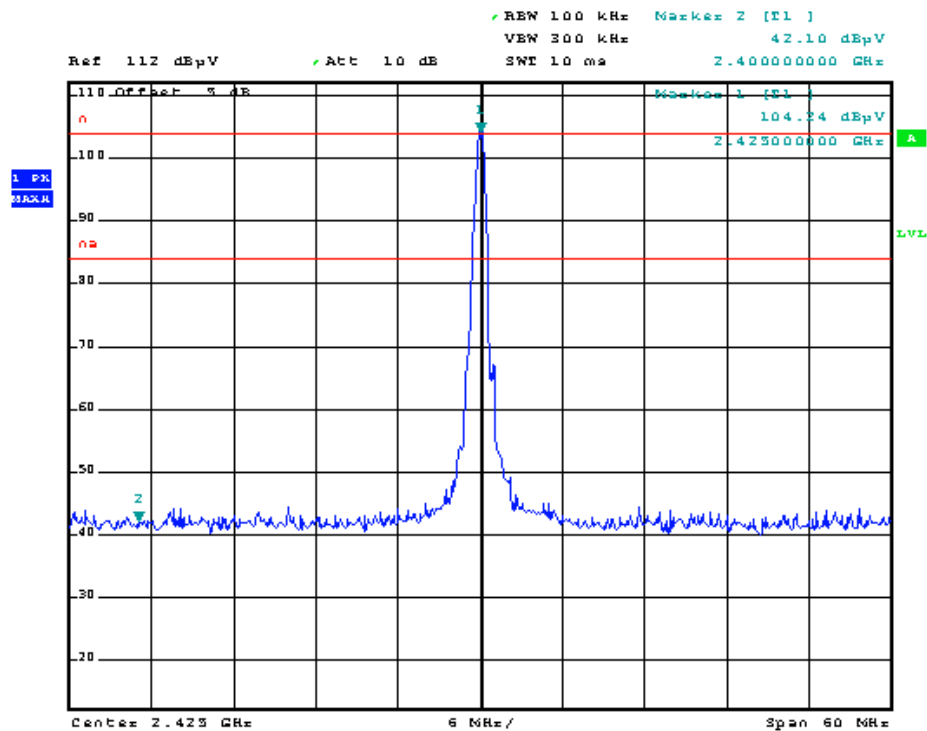
Middle Channel



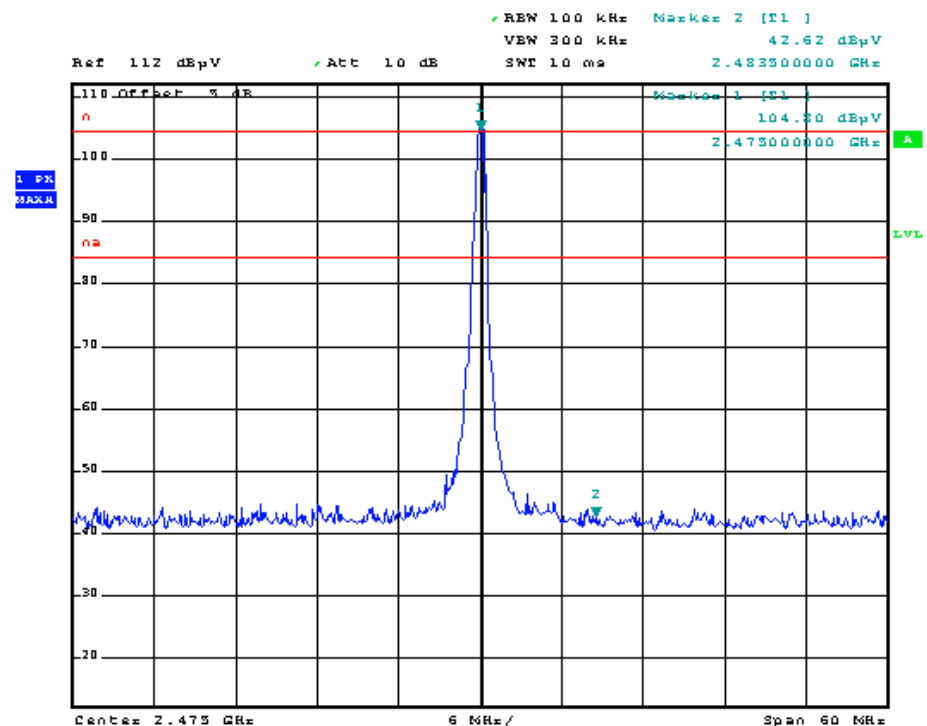
High Channel


Test Graph of Band Edge measured in 100kHz Bandwidth

Low Channel



High Channel



4.1.5 Power Spectral Density

RESULT:**Passed**

Date of testing : 2011-06-03
Test standard : FCC part 15.247(e)
Basic standard : ANSI C63.4: 2003
Limits : 8.0 dBm (in any 3kHz band)
Kind of test site : Shield room

Test Setup

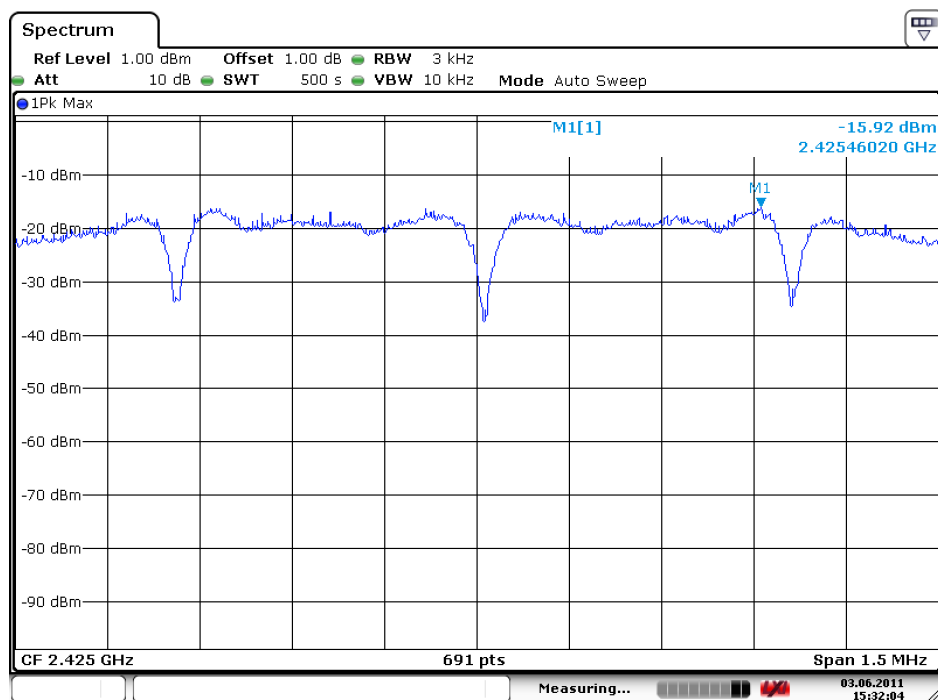
Test Channel : Low/ Middle/ High
Operation mode : A
Ambient temperature : 24°C
Relative humidity : 53%
Atmospheric pressure : 101 kPa

Table 9: Test result of power spectral density

Maximum power spectral density			
Low Channel (dBm/1MHz)	Middle Channel (dBm/1MHz)	High Channel (dBm/1MHz)	Limit (dBm/3kHz)
-15.92	-15.83	-17.04	8

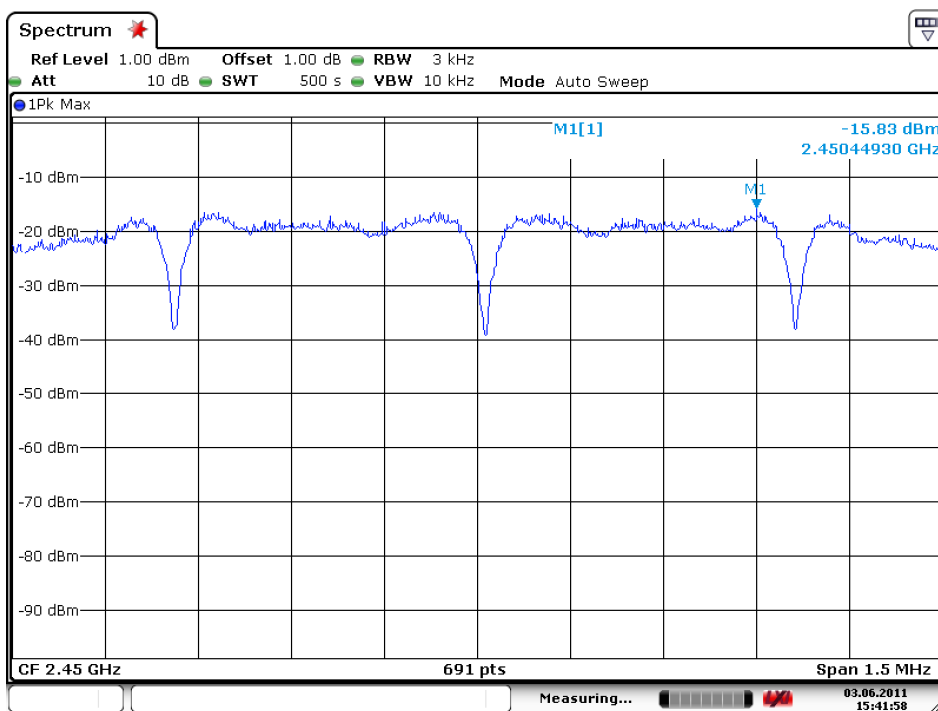
Test Graph of Power Spectral Density

Low Channel



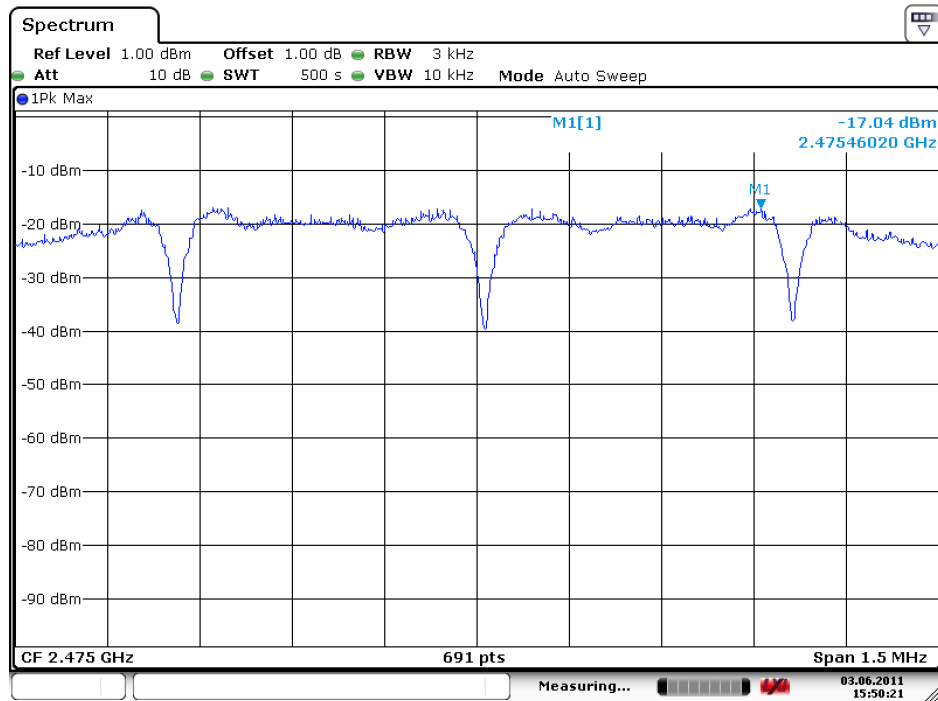
Date: 3.JUN.2011 15:32:04

Middle Channel



Date: 3.JUN.2011 15:41:59

High Channel



Date: 3.JUN.2011 15:50:21

4.1.6 Spurious Emission

RESULT:**Passed**

Date of testing	:	2011-06-14
Test standard	:	FCC part 15.247(d)
Basic standard	:	ANSI C63.4: 2003
Limits	:	Refer to 15.209(a)
Kind of test site	:	3m Semi-Anechoic Chamber

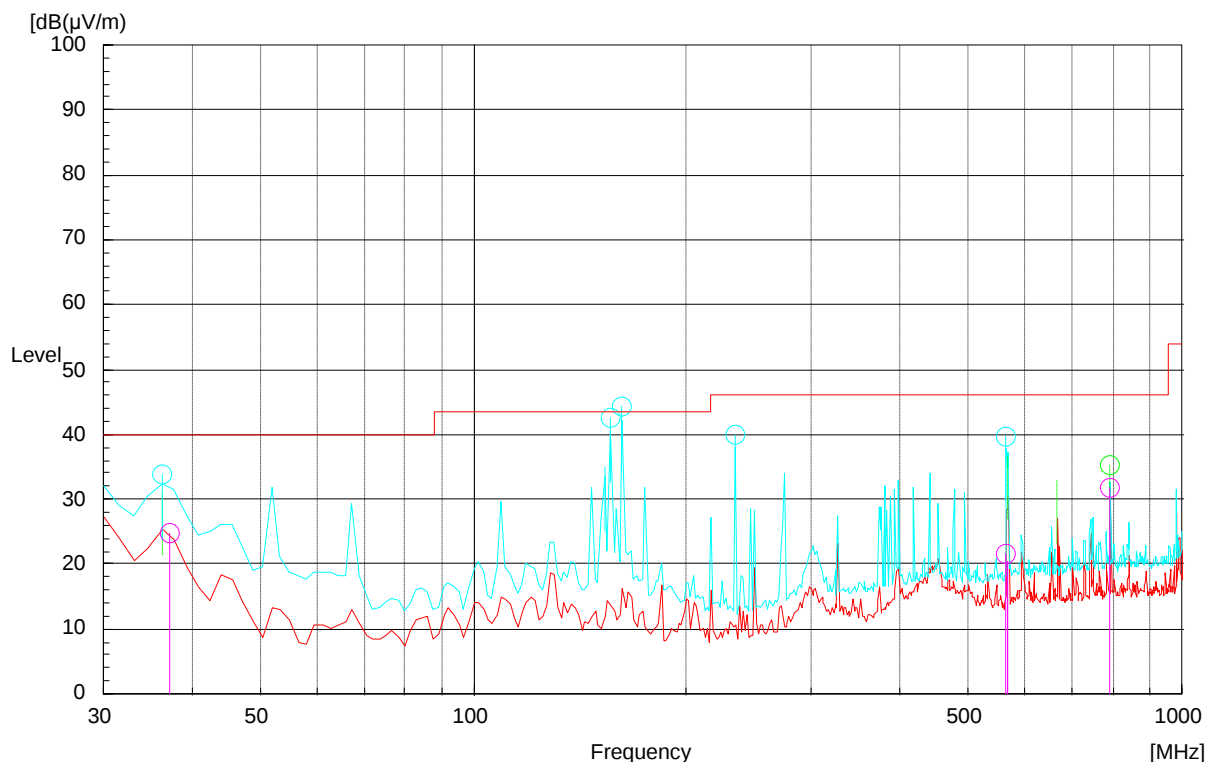
Test setup

Test Channel	:	Low/ Middle/ High
Operation mode	:	A
Ambient temperature	:	23°C
Relative humidity	:	51%
Atmospheric pressure	:	100 kPa

During the test, the wooden table was rotated 360° around and the antenna was varied from 1m to 4m to find the maximum disturbance. The test was performed with the antenna both in its horizontal and vertical polarizations.

The following figures and tables were those measured by an automatic measurement system. The vertical results are marked with red, and the horizontal ones are marked with blue.

Plots of the band edge are also shown.

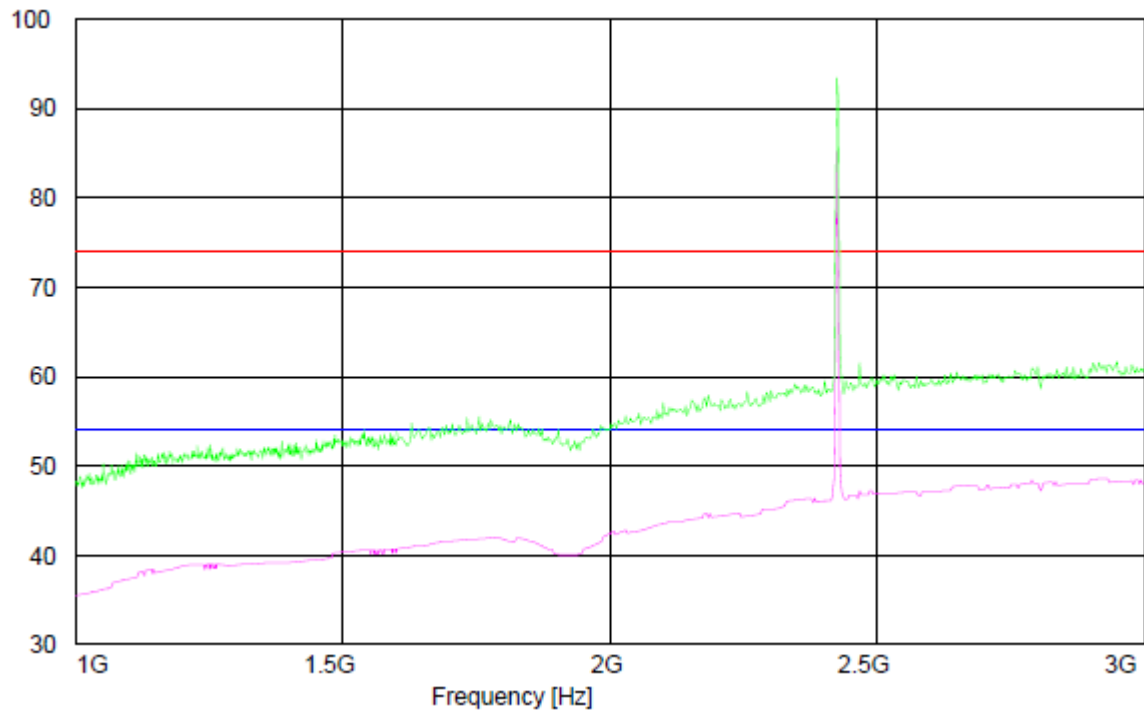
Figure 1: Spurious emission measurement results, low channel, 30-1000MHz, vertical and horizontal polarization


Final quasi-peak measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Height(m) (cm)	Angle (°)	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB(μ V/m)
37.098	H	100.0	91.9	40.0	33.0	7.0
570.500	H	400.0	207.8	46.0	20.5	25.5
668.325	V	300.0	348.2	46.0	14.2	31.8
681.998	H	100.0	334.7	46.0	31.7	14.3
39.708	V	100.0	112.1	40.0	24.9	15.1
153.603	H	100.0	119.3	43.5	13.1	30.4
156.697	H	100.0	179.3	43.5	14.0	29.5
232.845	H	100.0	263.0	46.0	9.1	36.9
568.907	V	200.0	126.2	46.0	23.1	22.9

Figure 2: Spurious emission measurement results, low channel, 1-3GHz, vertical and horizontal polarization

Level [dB μ V/m]

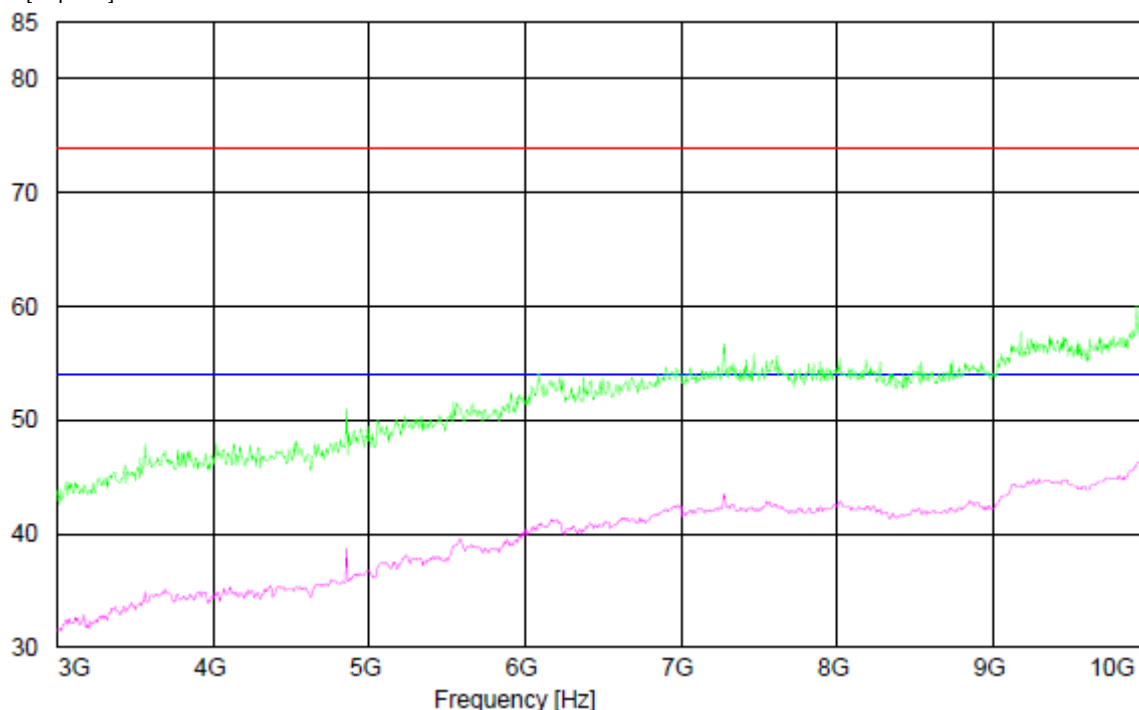


Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dB μ V/m)	Level (dB μ V/m)	Margin (QP) dB(μ V/m)
2466.933	H	Peak	74.0	61.56	12.44
2466.933	H	AV	54.0	47.17	6.83
2904.609	V	Peak	74.0	61.49	12.51
2904.609	V	AV	54.0	48.48	5.52

Figure 3: Spurious emission measurement results, low channel, 3-10GHz, vertical and horizontal polarization

Level [dBμV/m]

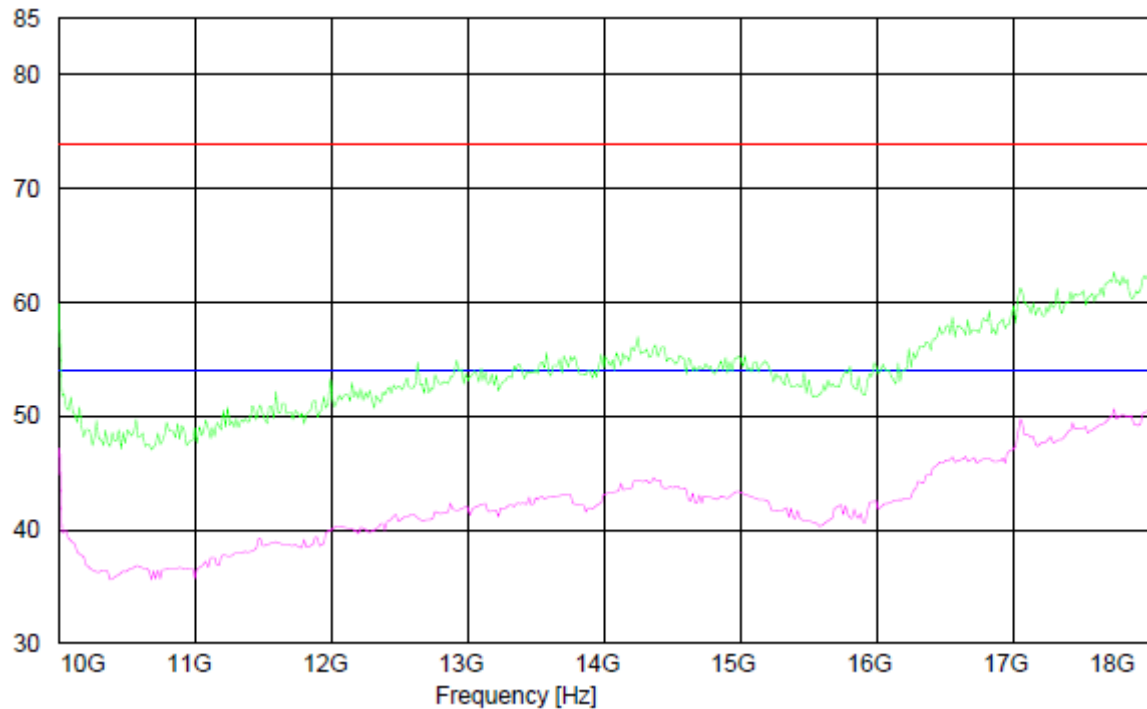


Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB(μ V/m)
4851.703	H	Peak	74.0	61.56	12.44
4851.703	H	AV	54.0	47.17	6.83
4851.703	V	Peak	74.0	61.49	12.51
4851.703	V	AV	54.0	48.48	5.52
7276.553	H	Peak	74.0	55.48	18.52
7276.553	H	AV	54.0	42.99	11.01
7276.553	V	Peak	74.0	56.69	17.31
7276.553	V	AV	54.0	43.39	10.61
9699.398	H	Peak	74.0	57.54	16.46
9699.398	H	AV	54.0	44.57	9.43
9699.398	V	Peak	74.0	57.29	16.71
9699.398	V	AV	54.0	44.57	9.43

Figure 4: Spurious emission measurement results, low channel, 10-18GHz, vertical and horizontal polarization

Level [dBμV/m]

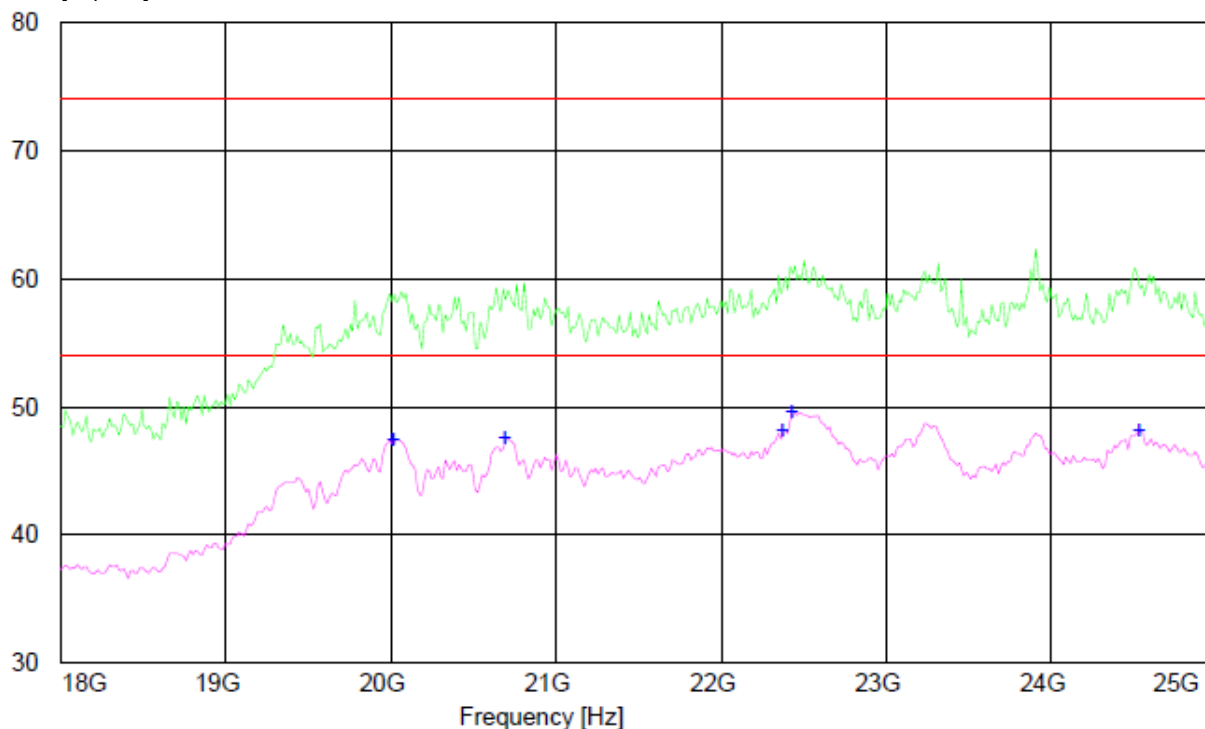


Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB(μ V/m)
12148.296	H	Peak	74.0	52.94	21.06
12148.296	H	AV	54.0	40.13	13.87
12148.296	V	Peak	74.0	52.31	21.69
12148.296	V	AV	54.0	40.10	13.9

Figure 5: Spurious emission measurement results, low channel, 18-25GHz, vertical and horizontal polarization

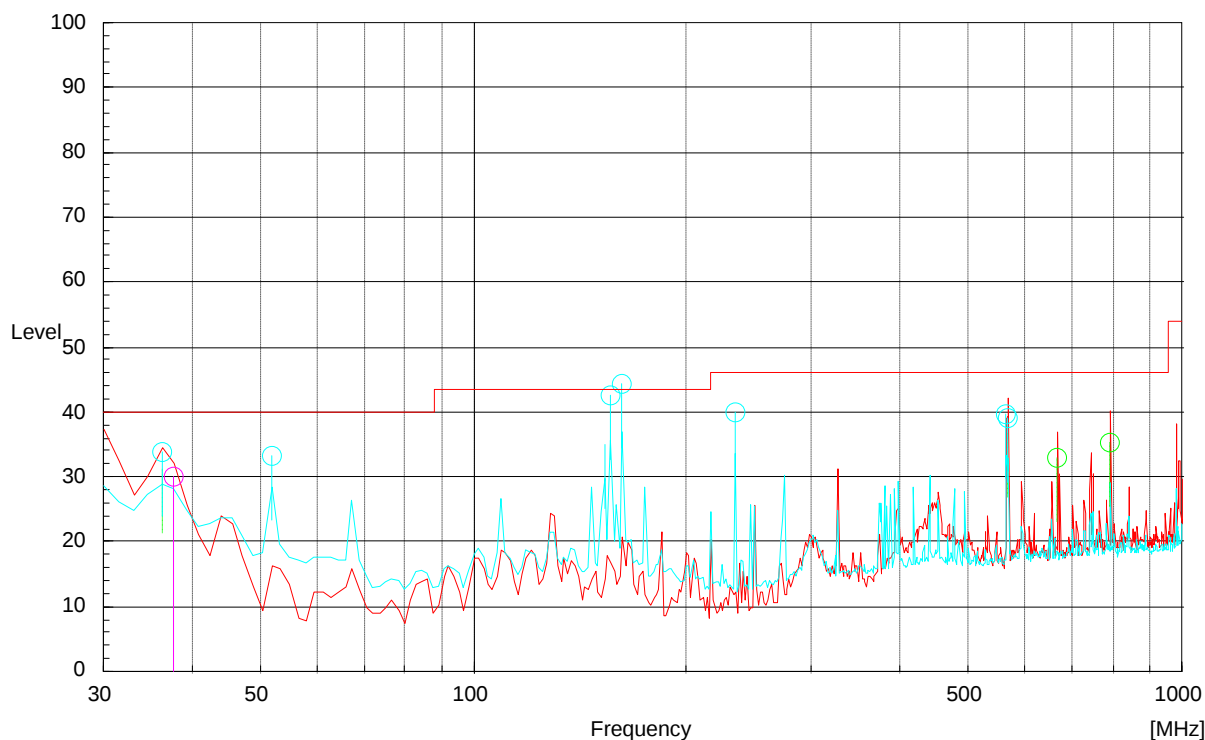
Level [dBμV/m]



Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB(μ V/m)
20034.068	H	AV	54.0	47.49	6.51
20707.414	H	AV	54.0	47.69	6.31
22390.781	V	AV	54.0	48.24	5.76
22446.893	V	AV	54.0	49.61	4.39
24551.102	V	AV	54.0	48.25	5.75

Figure 6: Spurious emission measurement results, mid channel, 30-1000MHz, vertical and horizontal polarization

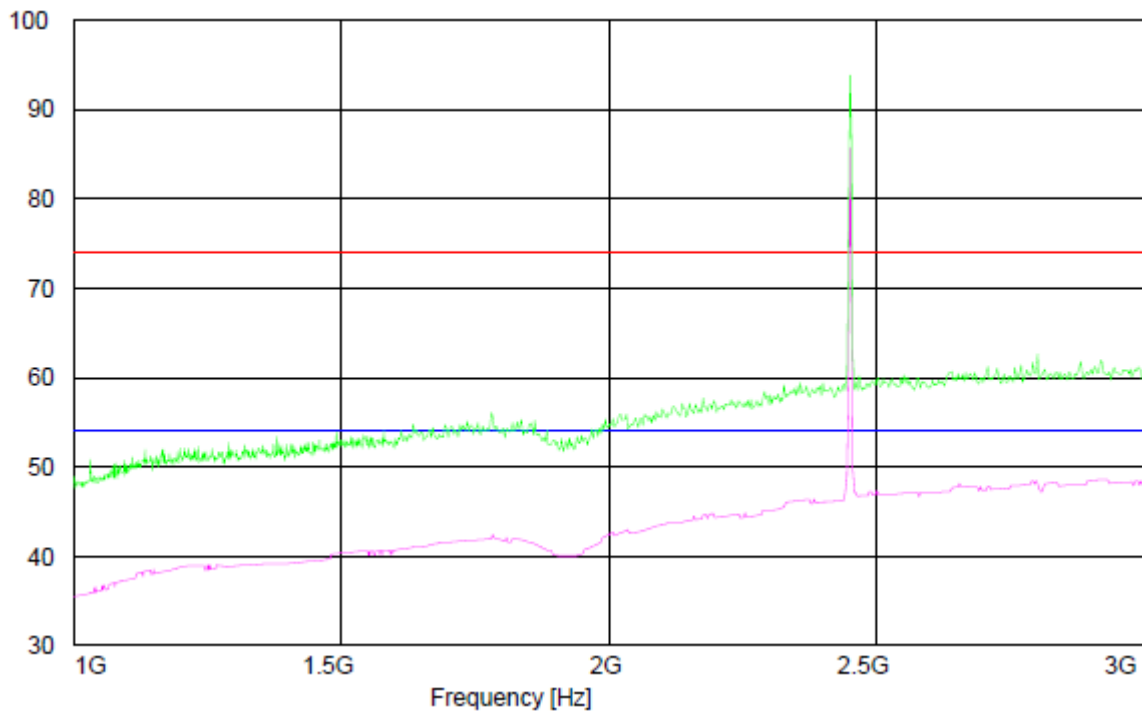
 Level [dB μ V/m]


Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Height(m) (cm)	Angle (°)	Limit (dB μ V/m)	Level (dB μ V/m)	Margin (QP) dB(μ V/m)
37.098	H	100.0	75.9	40.0	25.9	14.1
578.700	V	400.0	126.8	46.0	21.5	24.5
668.625	H	300.0	348.2	46.0	13.1	32.9
791.998	H	100.0	334.7	46.0	32.7	13.3
38.658	V	100.0	122.1	40.0	31.0	9.0
51.640	H	100.0	357.9	40.0	16.2	23.8
158.697	H	100.0	129.3	43.5	15.0	28.5
161.487	H	100.0	149.3	43.5	15.4	28.1
212.865	H	100.0	243.0	46.0	9.6	36.4
544.732	H	200.0	125.2	46.0	22.7	23.3
568.907	V	200.0	147.2	46.0	21.0	25.0

Figure 7: Spurious emission measurement results, mid channel, 1-3GHz, vertical and horizontal polarization

Level [dB μ V/m]

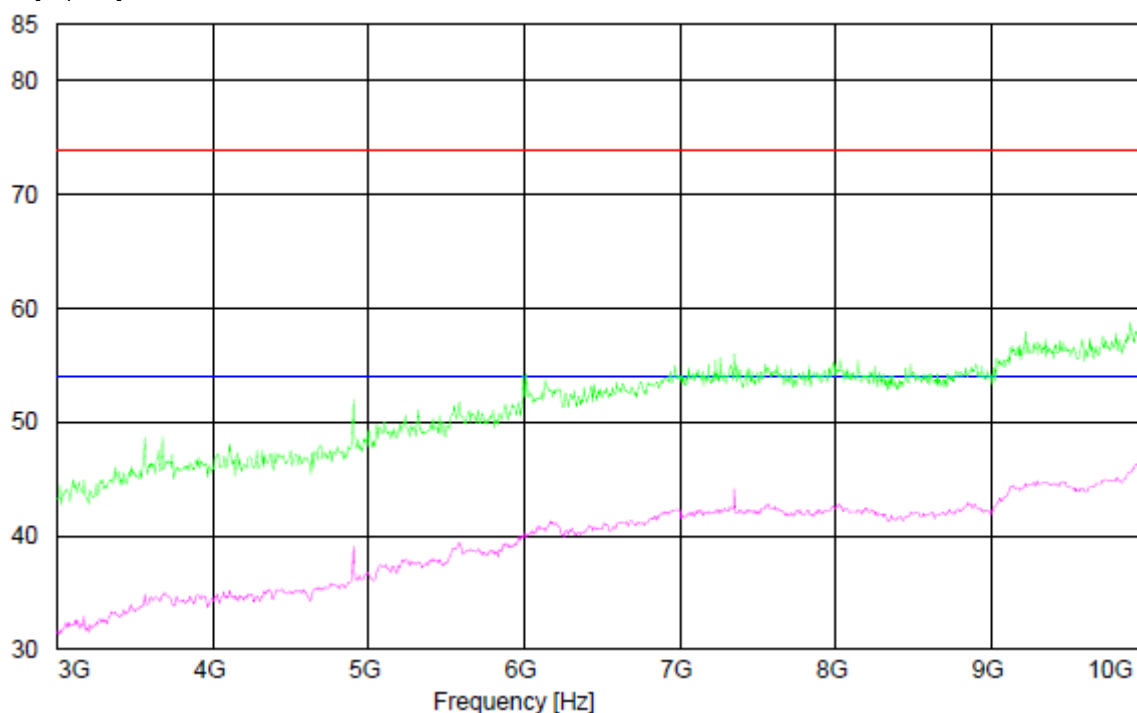


Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dB μ V/m)	Level (dB μ V/m)	Margin (QP) dB(μ V/m)
2792.384	H	Peak	74.0	61.69	12.31
2792.384	H	AV	54.0	48.45	5.55
2918.637	V	Peak	74.0	61.91	12.09
2918.637	V	AV	54.0	48.53	5.47

Figure 8: Spurious emission measurement results, mid channel, 3-10GHz, vertical and horizontal polarization

Level [dBμV/m]

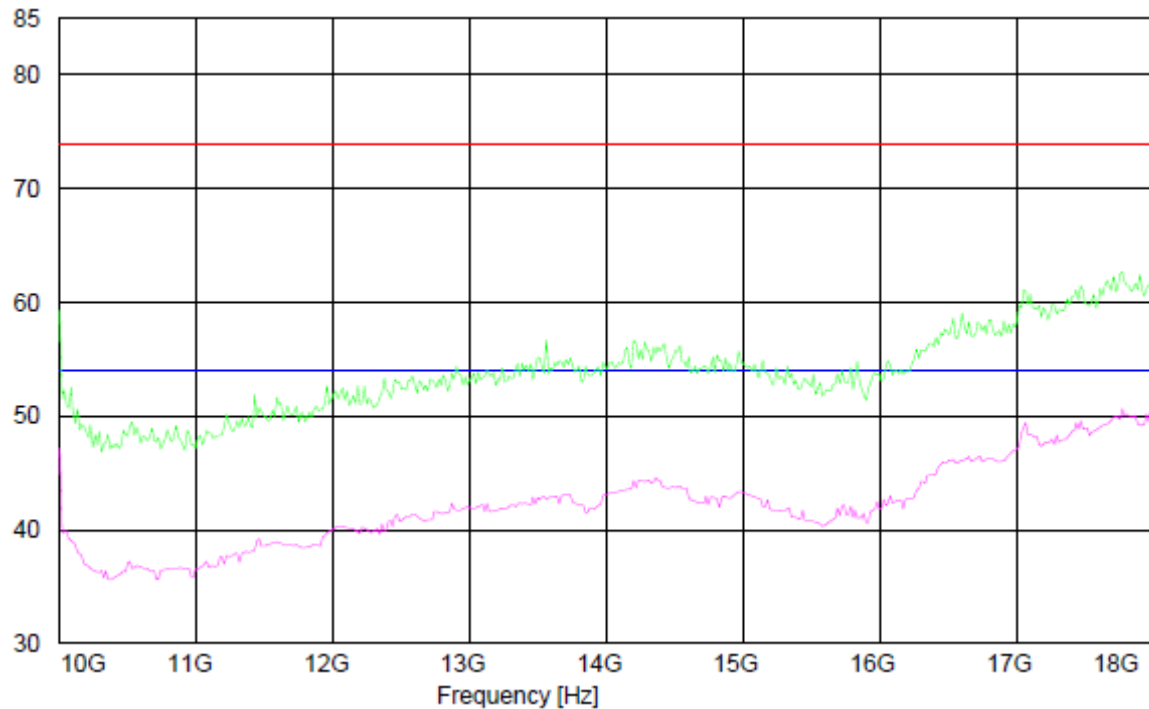


Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBμV/m)	Level (dBμV/m)	Margin (QP) dB(μ V/m)
4899.799	H	Peak	74.0	54.26	19.74
4899.799	H	AV	54.0	40.11	13.89
4899.799	V	Peak	74.0	51.97	22.03
4899.799	V	AV	54.0	39.07	14.93
7348.697	H	Peak	74.0	54.22	19.78
7348.697	H	AV	54.0	42.29	11.71
7348.697	V	Peak	74.0	56.00	18.0
7348.697	V	AV	54.0	44.10	9.9
9801.603	H	Peak	74.0	57.60	16.4
9801.603	H	AV	54.0	45.11	8.89
9801.603	V	Peak	74.0	57.83	16.17
9801.603	V	AV	54.0	45.10	8.9
3352.705	H	Peak	74.0	45.54	28.46
3424.849	H	Peak	74.0	46.22	27.78

Figure 9: Spurious emission measurement results, mid channel, 10-18GHz, vertical and horizontal polarization

Level [dBμV/m]

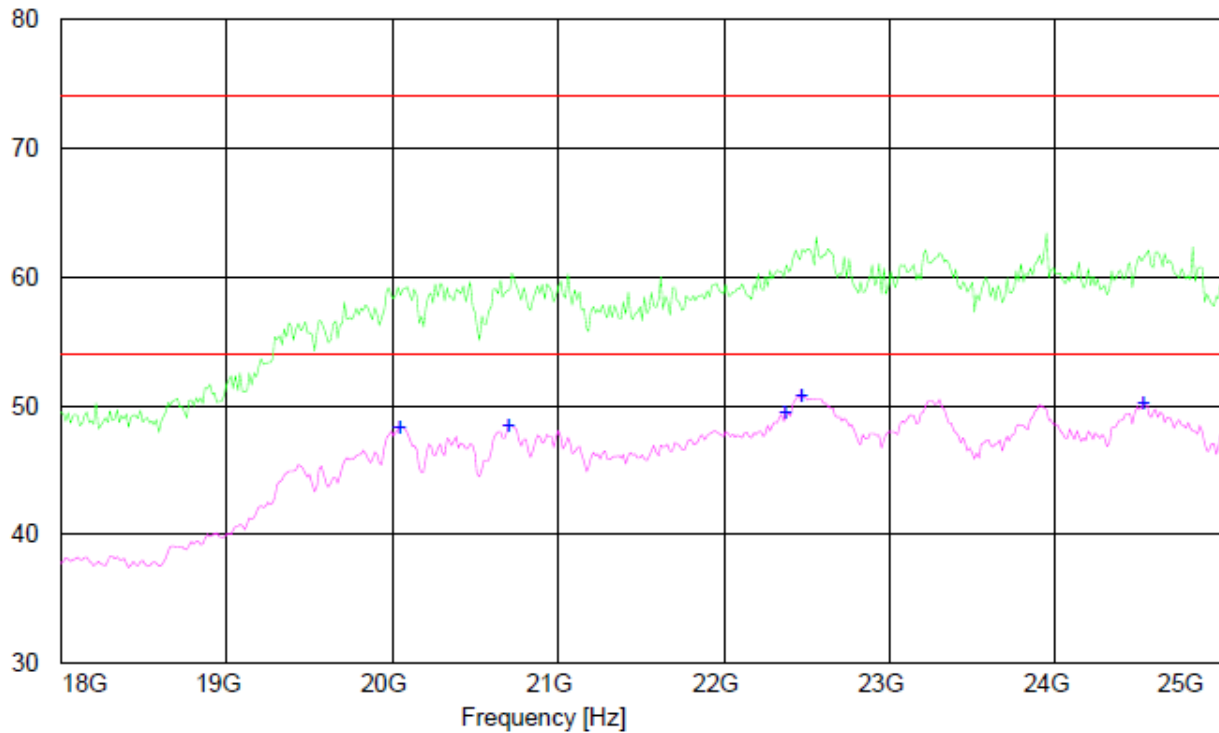


Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB(μ V/m)
13382.765	V	Peak	74.0	54.64	19.36

Figure 10: Spurious emission measurement results, mid channel, 18-25GHz, vertical and horizontal polarization

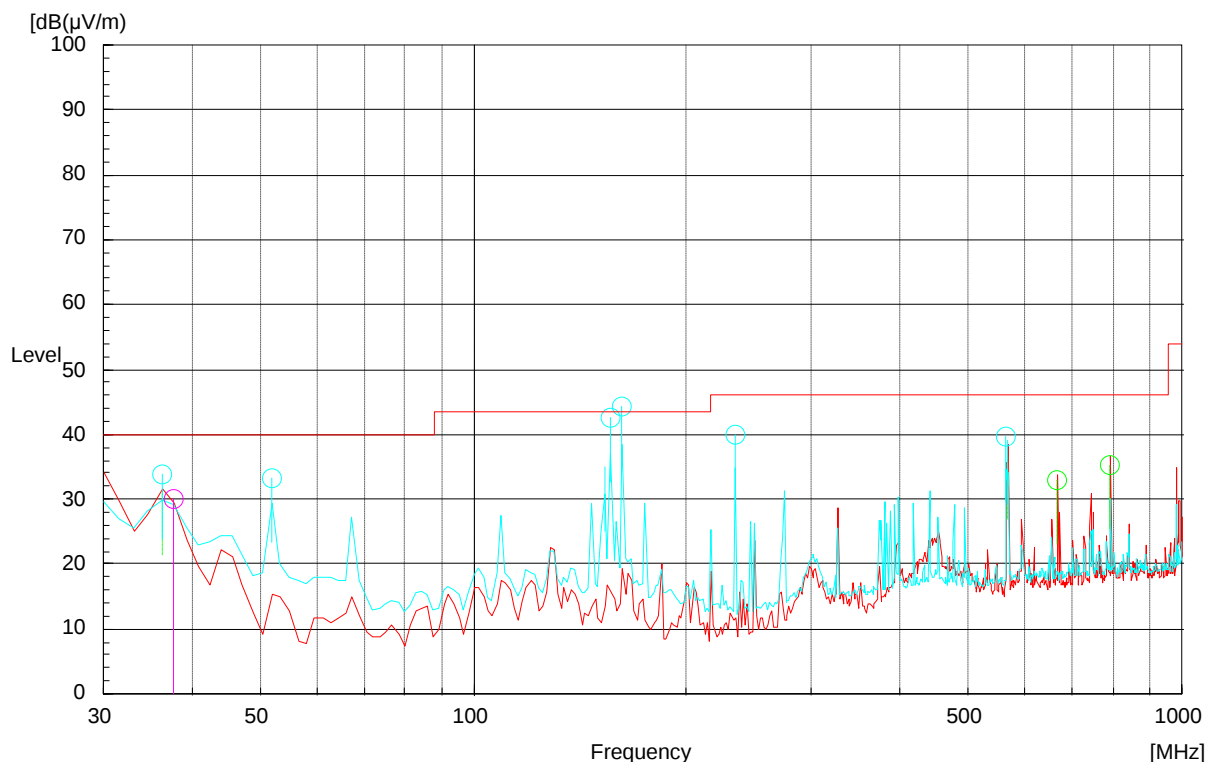
Level [dB μ V/m]



Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dB μ V/m)	Level (dB μ V/m)	Margin (QP) dB(μ V/m)
20062.124	H	AV	54.0	48.35	5.65
20721.442	H	AV	54.0	48.44	5.56
22390.781	V	AV	54.0	49.44	4.56
22488.977	V	AV	54.0	50.79	3.21
24551.102	V	AV	54.0	50.28	3.72

Figure 11: Spurious emission measurement results, high channel, 30-1000MHz, vertical and horizontal polarization

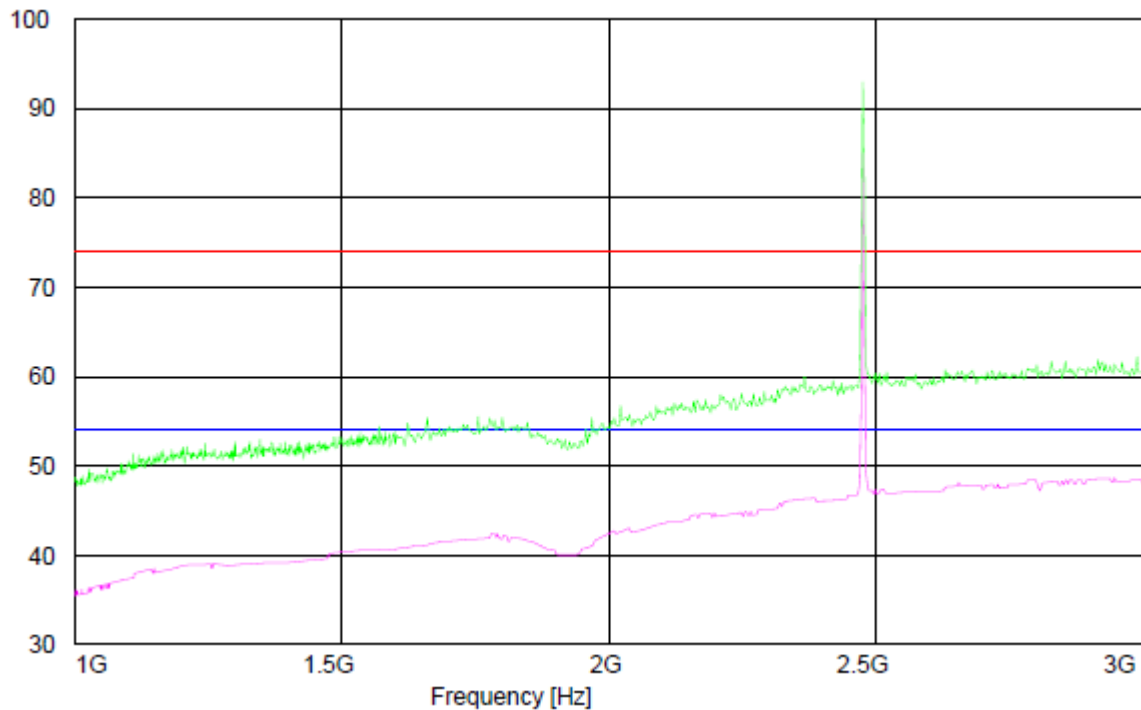


Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Height(m) (cm)	Angle (°)	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB(μ V/m)
37.098	H	100.0	73.9	40.0	25.4	14.6
668.625	H	300.0	308.2	46.0	13.6	32.4
791.998	H	100.0	344.7	46.0	30.7	15.3
38.658	V	100.0	172.1	40.0	31.3	8.7
51.640	H	100.0	347.9	40.0	16.5	23.5
158.697	H	100.0	129.3	43.5	15.5	28.0
161.487	H	100.0	169.3	43.5	15.7	27.8
212.865	H	100.0	233.0	46.0	9.8	36.2
544.732	H	200.0	126.2	46.0	21.9	24.1

Figure 12: Spurious emission measurement results, high channel, 1-3GHz, vertical and horizontal polarization

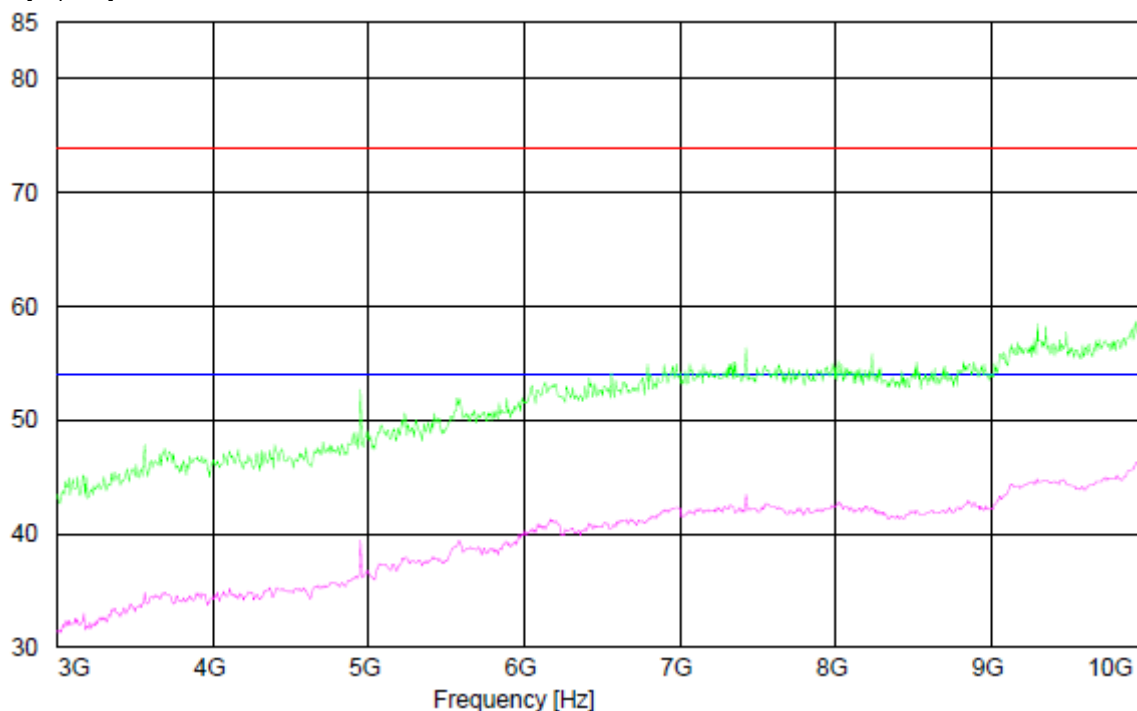
Level [dBμV/m]



Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB(μ V/m)
2828.857	H	Peak	74.0	61.76	12.24
2876.553	V	Peak	74.0	61.75	12.25

Figure 13: Spurious emission measurement results, high channel, 3-10GHz, vertical and horizontal polarization

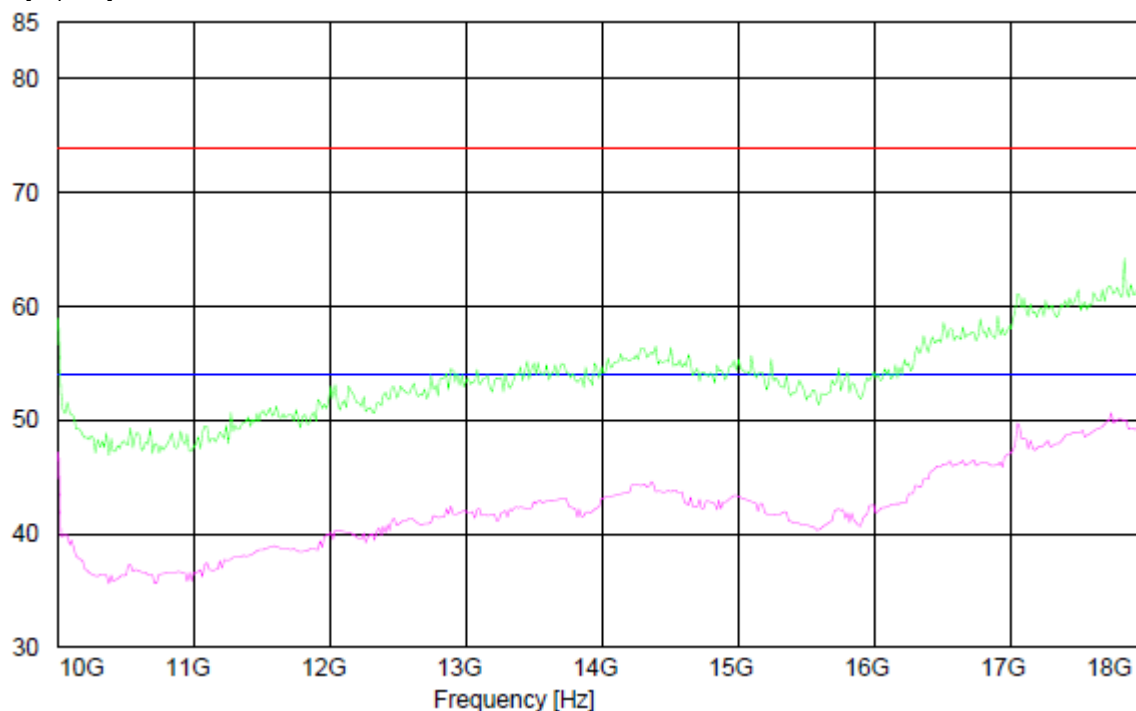
 Level [dB μ V/m]


Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dB μ V/m)	Level (dB μ V/m)	Margin (QP) dB(μ V/m)
4947.895	H	Peak	74.0	52.26	21.74
4947.895	H	AV	54.0	39.55	14.45
4947.895	V	Peak	74.0	52.66	21.34
4947.895	V	AV	54.0	39.44	14.56
7420.841	H	Peak	74.0	54.50	19.5
7420.841	H	AV	54.0	42.21	11.79
7420.841	V	Peak	74.0	56.37	17.63
7420.841	V	AV	54.0	43.48	10.52
9903.807	H	Peak	74.0	57.00	17.0
9903.807	H	AV	54.0	45.62	8.38
9903.807	V	Peak	74.0	58.04	15.96
9903.807	V	AV	54.0	45.62	8.38
3689.378	V	Peak	74.0	47.53	26.47
8286.573	V	Peak	74.0	54.60	19.4

Figure 14: Spurious emission measurement results, high channel, 10-18GHz, vertical and horizontal polarization

Level [dBμV/m]

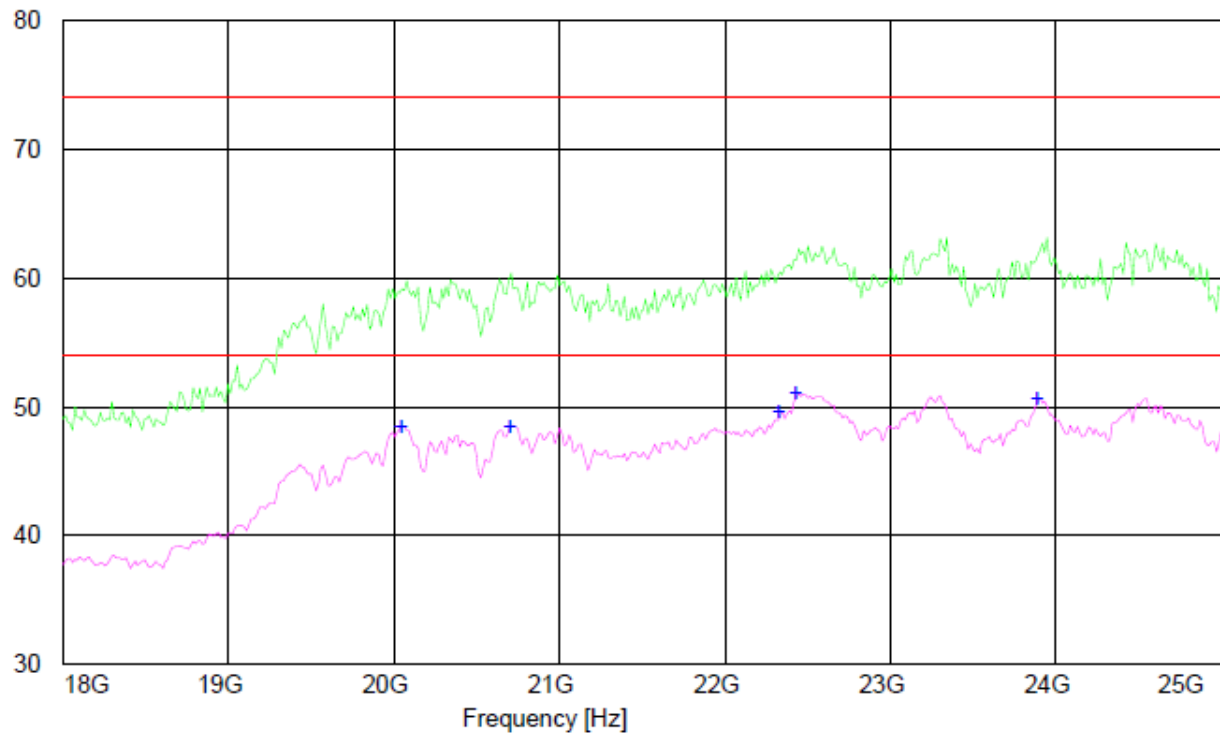


Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB(μ V/m)
17743.486	V	Peak	74.0	62.86	11.14
17054.108	V	Peak	74.0	61.92	12.08
17054.108	H	AV	54.0	49.73	4.27

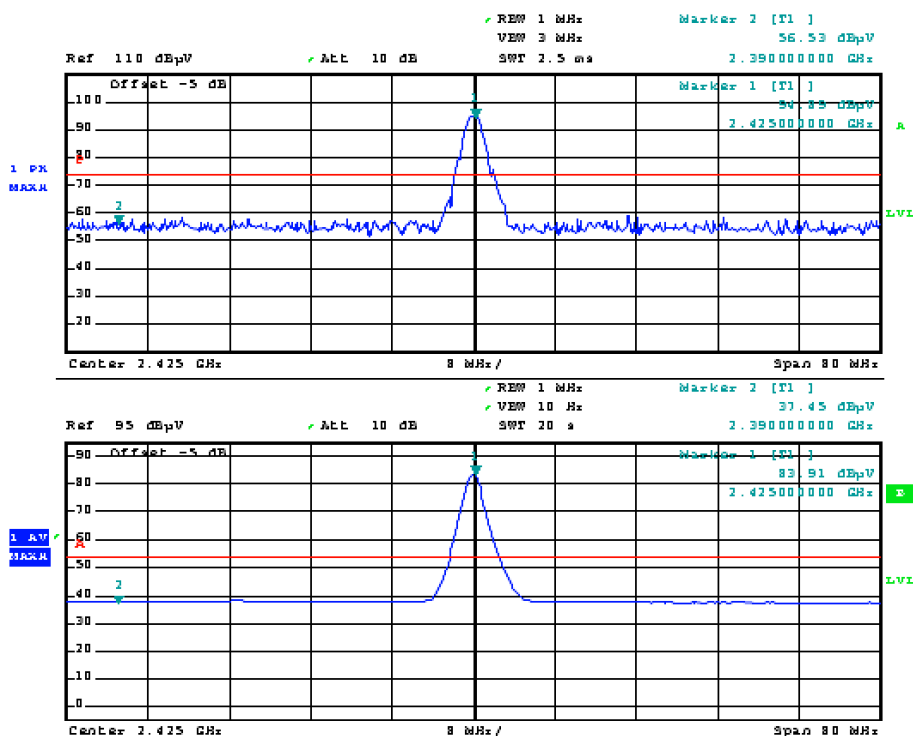
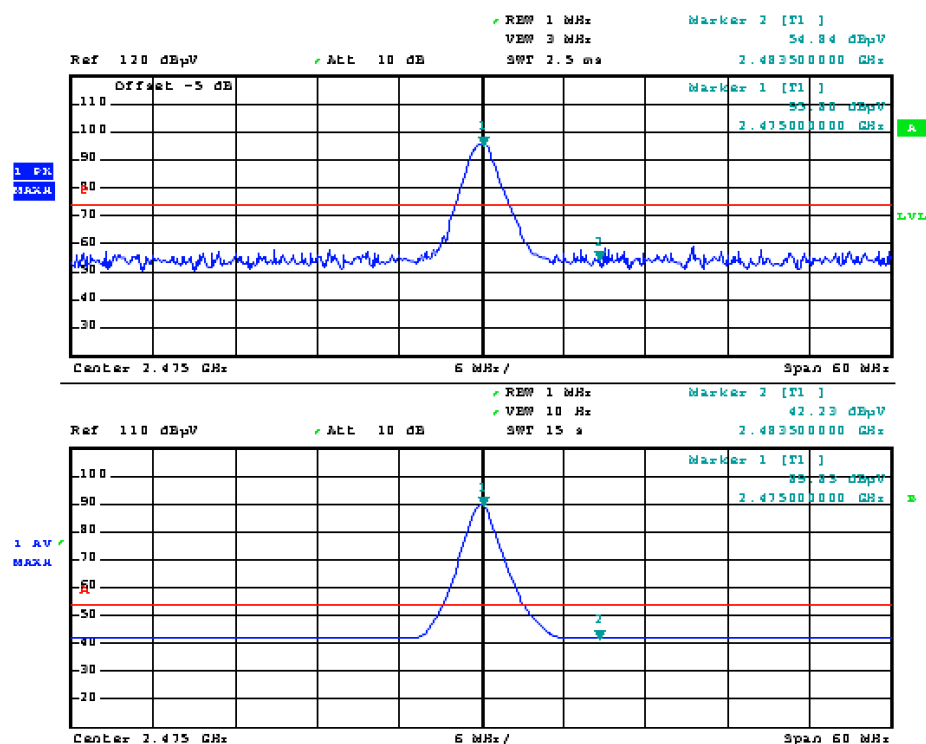
Figure 15: Spurious emission measurement results, high channel, 18-25GHz, vertical and horizontal polarization

Level [dBμV/m]



Final measurement result:

Frequency(MHz)	polarization (horizontal H/ vertical V)	Detector	Limit (dBuV/m)	Level (dBuV/m)	Margin (QP) dB(μ V/m)
20062.124	H	AV	54.0	48.47	5.53
20721.442	H	AV	54.0	48.58	5.42
22348.697	V	AV	54.0	49.72	4.28
22446.893	V	AV	54.0	51.03	2.97
23905.811	V	AV	54.0	50.69	3.31

Figure 16: Band Edge measurement results
Low Channel

High Channel


4.1.7 Conducted emissions

RESULT:**Passed**

Date of testing : 2011-06-14
Test standard : FCC Part 15.207(a)
Basic standard : ANSI C63.4: 2003
Frequency range : 0.15 – 30MHz
Limits : FCC Part 15.207(a)
Kind of test site : Shield room

Test setup

Input Voltage : DC 5V (via power supply unit)
Operation Mode : A
Earthing : Not Connected
Ambient temperature : 23°C
Relative humidity : 51%
Atmospheric pressure : 100 kPa

The measurement setup was made in a shielded room.

The measurement equipment like test receivers, quasi-peak detector, average detector and LISN are in compliance with CISPR 16-1 series standards and ANSI C63.4-2003. The tested object was operated under its rated voltage and its rated frequency. Prior to the measurements the test object operated about 5 minutes (warm-up) in order to stabilize its operating conditions and to ensure reliable measurement values.

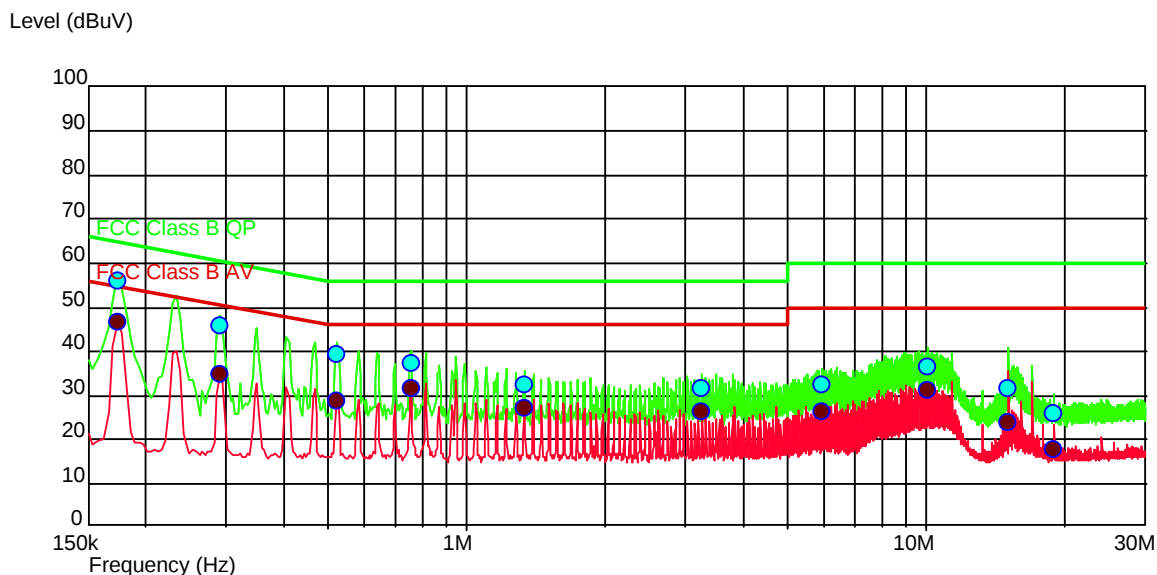
Furthermore an internal calibration with the test receiver was conducted prior to each measurement.

The EUT was set 0.8m away from the LISN. The cord longer than necessary to be connected to the LISN was folded forth and back parallel so as to form a bundle with a length between 0.3m and 0.4m.

The interference voltage was determined while measuring the line conductor by turns.

The test was carried out from 100V to 120V for the max. measurement results.

The following figures and tables were those measured by an automatic measuring system. A preview test was first made with peak detector. Final test with quasi-peak detector and average detector was only performed at these critical frequencies found via preview test.

Figure 17: Conducted emission measurement results, Line L


Final quasi-peak measurement results:

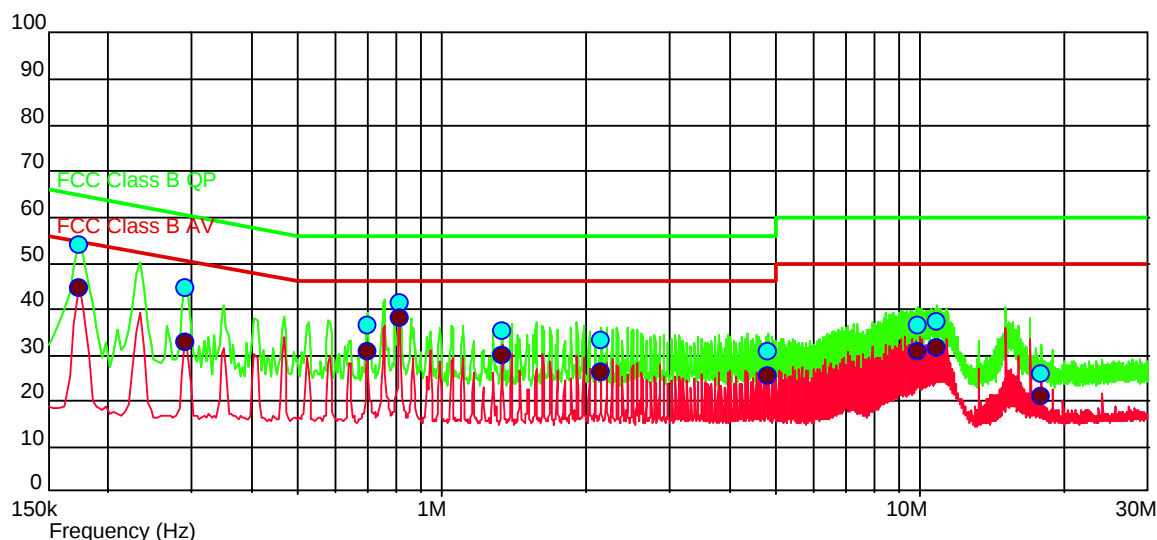
Frequency(Hz)	Level(dBuV)	Limit(dBuV)	Margin(dBuV)	Detector	RBW(Hz)
174.0 k	55.73	64.77	9.04	QP	9.0 k
290.0 k	45.79	60.52	14.73	QP	9.0 k
522.0 k	39.12	56.00	16.88	QP	9.0 k
758.0 k	37.32	56.00	18.68	QP	9.0 k
1.338 M	32.44	56.00	23.56	QP	9.0 k
3.254 M	31.48	56.00	24.52	QP	9.0 k
5.926 M	32.14	60.00	27.86	QP	9.0 k
10.11 M	36.52	60.00	23.48	QP	9.0 k
15.11 M	31.36	60.00	28.64	QP	9.0 k
18.882 M	25.84	60.00	34.16	QP	9.0 k

Final average measurement results:

Frequency(Hz)	Level(dBuV)	Limit(dBuV)	Margin(dBuV)	Detector	RBW(Hz)
174.0 k	46.43	54.77	8.34	AVERAGE	9.0 k
290.0 k	34.79	50.52	15.74	AVERAGE	9.0 k
522.0 k	28.85	46.00	17.15	AVERAGE	9.0 k
758.0 k	31.57	46.00	14.43	AVERAGE	9.0 k
1.338 M	27.20	46.00	18.80	AVERAGE	9.0 k
3.254 M	26.14	46.00	19.86	AVERAGE	9.0 k
5.926 M	26.40	50.00	23.60	AVERAGE	9.0 k
10.11 M	31.13	50.00	18.87	AVERAGE	9.0 k
15.11 M	23.60	50.00	26.40	AVERAGE	9.0 k
18.882 M	17.85	50.00	32.15	AVERAGE	9.0 k

Figure 18: Conducted emission measurement results, Line N

Level (dBuV)



Final quasi-peak measurement results:

Frequency(Hz)	Level(dBuV)	Limit(dBuV)	Margin(dBuV)	Detector	RBW(Hz)
174.0 k	53.73	64.77	11.03	QP	9.0 k
290.0 k	44.50	60.52	16.02	QP	9.0 k
698.0 k	36.22	56.00	19.78	QP	9.0 k
814.0 k	41.23	56.00	14.77	QP	9.0 k
1.338 M	35.35	56.00	20.65	QP	9.0 k
2.15 M	33.13	56.00	22.87	QP	9.0 k
4.826 M	30.81	56.00	25.19	QP	9.0 k
9.878 M	36.19	60.00	23.81	QP	9.0 k
10.87 M	37.14	60.00	22.86	QP	9.0 k
17.918 M	25.87	60.00	34.13	QP	9.0 k

Final average measurement results:

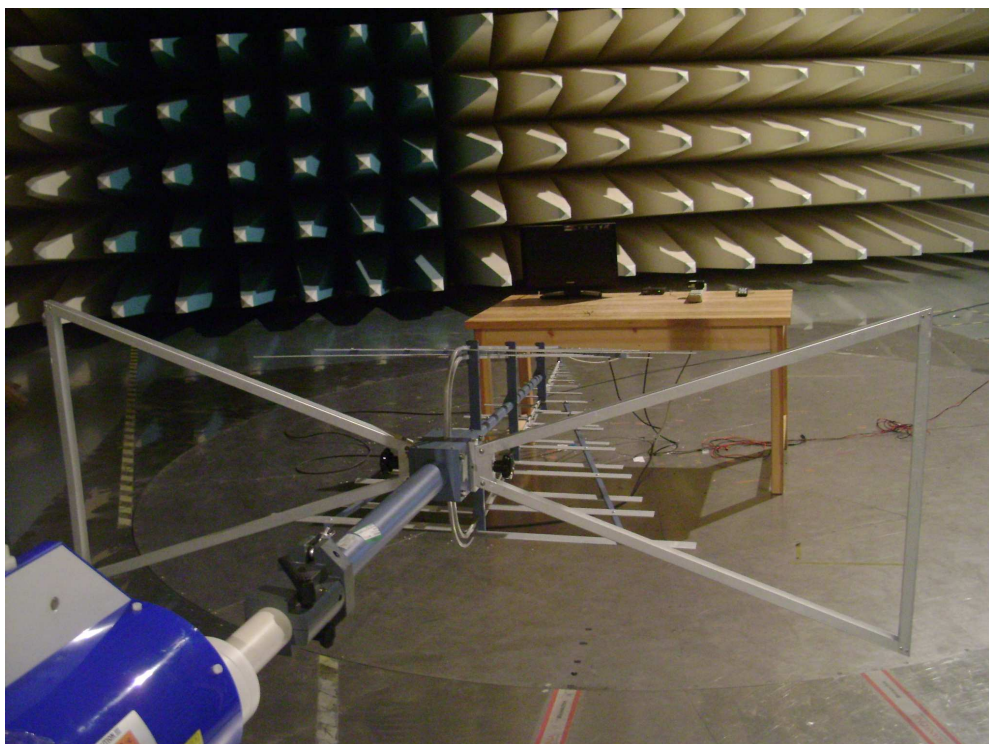
Frequency(Hz)	Level(dBuV)	Limit(dBuV)	Margin(dBuV)	Detector	RBW(Hz)
174.0 k	44.38	54.77	10.39	AVERAGE	9.0 k
290.0 k	32.84	50.52	17.69	AVERAGE	9.0 k
698.0 k	30.49	46.00	15.51	AVERAGE	9.0 k
814.0 k	38.09	46.00	7.91	AVERAGE	9.0 k
1.338 M	30.06	46.00	15.94	AVERAGE	9.0 k
2.15 M	26.09	46.00	19.91	AVERAGE	9.0 k
4.826 M	25.33	46.00	20.67	AVERAGE	9.0 k
9.878 M	30.87	50.00	19.13	AVERAGE	9.0 k
10.87 M	31.69	50.00	18.31	AVERAGE	9.0 k
17.918 M	20.87	50.00	29.13	AVERAGE	9.0 k

5. Photographs of the Test Set-Up

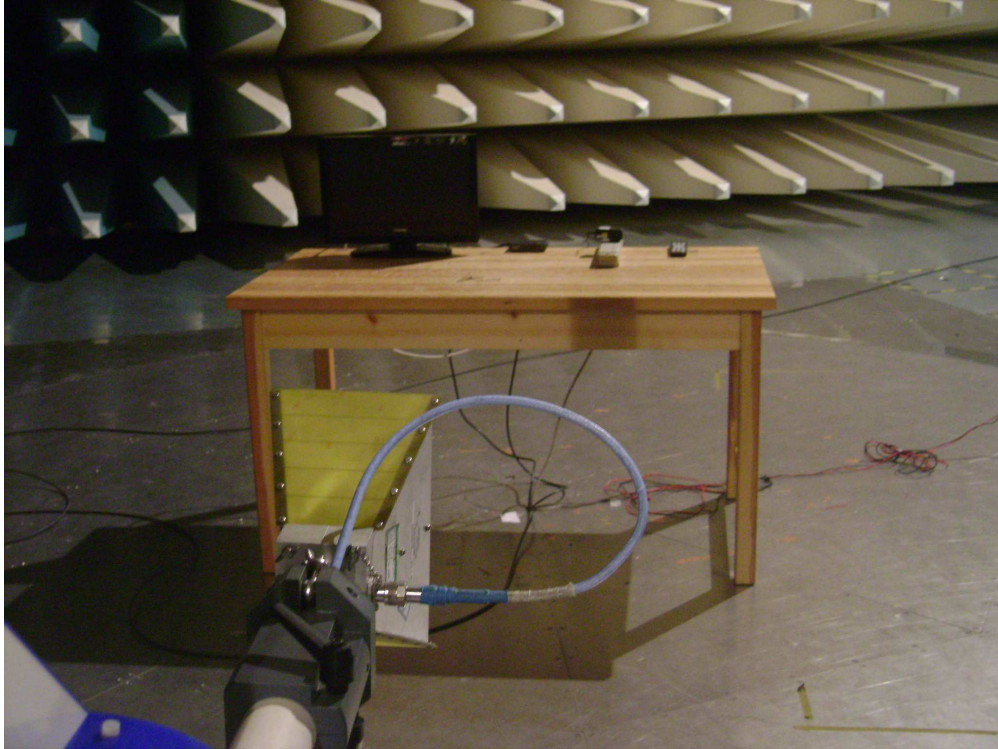
Photograph 1: Set-up for Conducted Emissions



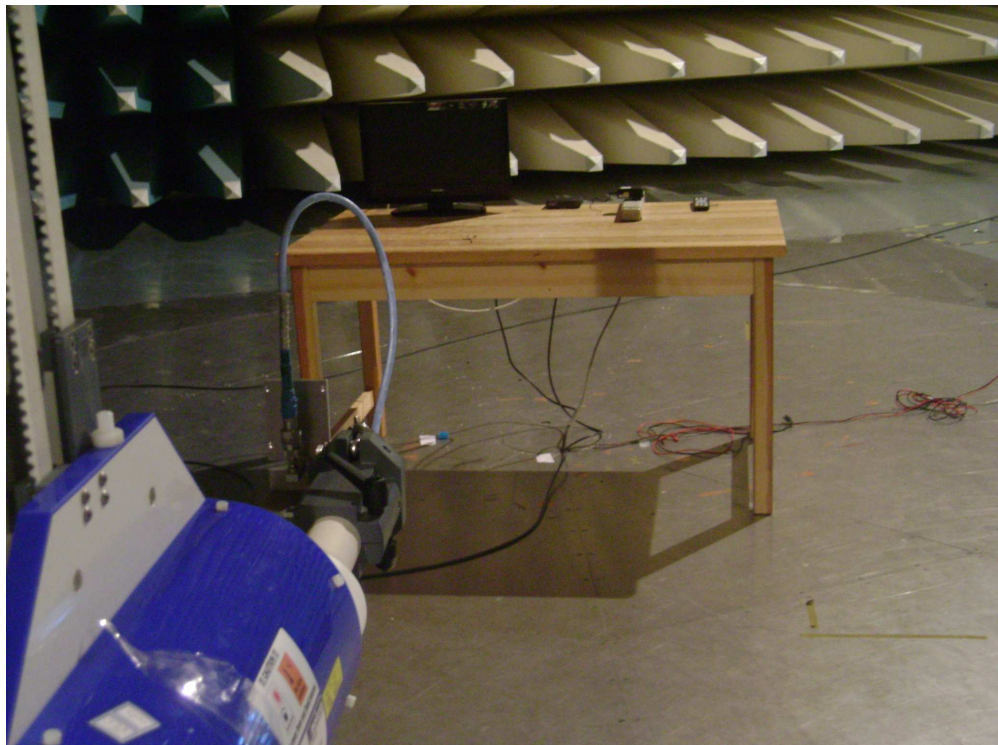
Photograph 2: Set-up for Spurious Emissions 30MHz – 1GHz



Photograph 3: Set-up for Spurious Emissions 1GHz – 18GHz



Photograph 4: Set-up for Spurious Emissions 18GHz – 25GHz



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