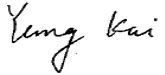



Prüfbericht - Nr.: 16801479 001			Seite 1 von 20 Page 1 of 20		
<i>Test Report No.:</i>					
Auftraggeber: <i>Client:</i>		Technicolor USA, Inc. 101 West 103 rd Street, Indianapolis, IN 46290, United States			
Gegenstand der Prüfung: <i>Test item:</i>		Set Top Box			
Bezeichnung: <i>Identification:</i>		DCI401COM3	Serien-Nr.: <i>Serial No.:</i>		Engineering sample
Wareneingangs-Nr.: <i>Receipt No.:</i>		1140004181	Eingangsdatum: <i>Date of receipt:</i>		2012-08-22
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of test item at delivery:</i>		The sample is ok for test and not damaged.			
Prüfort: <i>Testing location:</i>		Refer to section 1.1			
Prüfgrundlage: <i>Test specification:</i>		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 item passed the test specification(s).</i>			
Prüflaboratorium: <i>Testing Laboratory:</i>		Refer to section 1.1			
geprüft/ tested by:			kontrolliert/ reviewed by:		
2012-09-14	Yang, Kai/PE		2012-09-14	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:					
This report is based on the report 16800796 001, and for the class II permissive change application.					
Abkürzungen:		<i>P(ass) = entspricht Prüfgrundlage</i>	Abbreviations:		<i>P(ass) = passed</i>
		<i>F(ail) = entspricht nicht Prüfgrundlage</i>			<i>F(ail) = failed</i>
		<i>N/A = nicht anwendbar</i>			<i>N/A = not applicable</i>
		<i>N/T = nicht getestet</i>			<i>N/T = not tested</i>
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 item. 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 SPURIOUS EMISSION
RESULT: Passed

Contents

1.	TEST SITES	4
1.1	TEST FACILITIES	4
1.2	LIST OF TEST AND MEASUREMENT INSTRUMENTS.....	4
1.3	TRACEABILITY	5
1.4	CALIBRATION	5
1.5	MEASUREMENT UNCERTAINTY.....	5
2.	GENERAL PRODUCT INFORMATION	6
2.1	PRODUCT FUNCTION AND INTENDED USE.....	6
2.2	RATINGS AND SYSTEM DETAILS	6
2.3	INDEPENDENT OPERATION MODES	7
2.4	NOISE GENERATING AND NOISE SUPPRESSING PARTS	7
2.5	SUBMITTED DOCUMENTS	7
3.	TEST SET-UP AND OPERATION MODES	8
3.1	PRINCIPLE OF CONFIGURATION SELECTION.....	8
3.2	TEST OPERATION AND TEST SOFTWARE	8
3.3	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	8
3.4	COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE.....	9
3.5	TEST SETUP DIAGRAM	9
4.	TEST RESULTS	11
4.1	TRANSMITTER REQUIREMENT & TEST SUITES	11
4.1.1	<i>Spurious Emission</i>	11
5.	PHOTOGRAPHS OF THE TEST SET-UP	19
6.	LIST OF TABLES	20
7.	LIST OF FIGURES	20
8.	LIST OF PHOTOGRAPHS	20

1. Test Sites

1.1 Test Facilities

Laboratory: TA Beijing Limited (FCC Registration No.: 413514)

Address: Building B-4, No.1, JingHai 3rd Road, BDA East Park, Beijing, 100176 China

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	100488	2013-02-16
Double Ridge Guide Horn Antenna	ETS-Lindgren	EMCO 3117	00056662	2013-02-16
EMI Test Receiver	Rohde & Schwarz	ESIB26	100301	2013-02-22

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

2.2 Ratings and System Details

Table 3: Rating of EUT

Kind of Equipment:	Set Top Box
Type Designation:	DCI401COM3
FCC ID	G95DCI401XXXX
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.

Identifiers and differences:

The DCI401COM3 has the exactly same electric characteristics and construction with the model DCI401COM2, except the modification listed below:

1. RJ45 Connector is added;
2. Ethernet PHY IC chip is added;
3. DC-DC power IC chip is added for Ethernet power supply;
4. 25MHz crystal is added for Ethernet PHY chip;

The model DCI401COM3 and DCI401COM2 have the same FCC ID: G95DCI401XXXX. Considering this difference, the spurious radiated emission test at the frequency range of 30MHz-12.75GHz was performed.

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
Ethernet	1	Unshielding cable/less than3m

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

- Rating Label
- PCB Layout
- Photo Document
- Circuit Diagram
- Instruction Manual

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	Remote Solution Co., Ltd.	TX4CRB29A	CRB29A	2 AA batteries, 3V
Television	TOSHIBA	DoC	19AV615D	100-240V 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

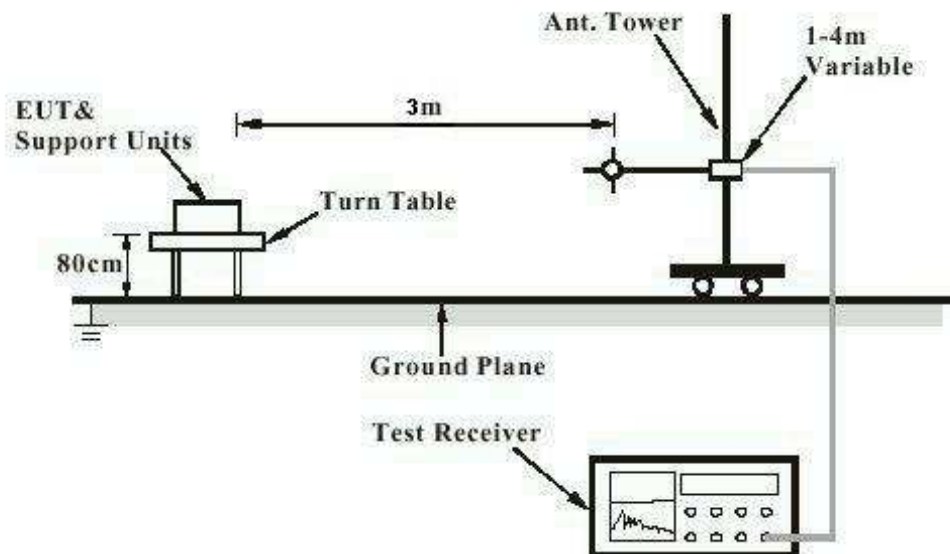


Diagram of Measurement Equipment Configuration for Conduction Measurement

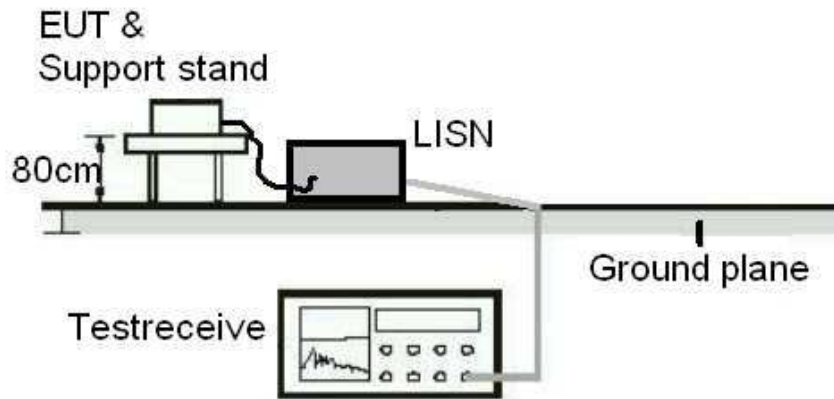
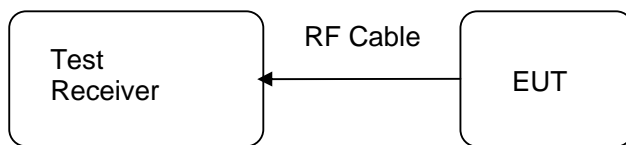


Diagram of Measurement Equipment Configuration for Transmitter Measurement



4. Test Results

4.1 Transmitter Requirement & Test Suites

4.1.1 Spurious Emission

RESULT: **Passed**

Date of testing : 2012-09-04
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

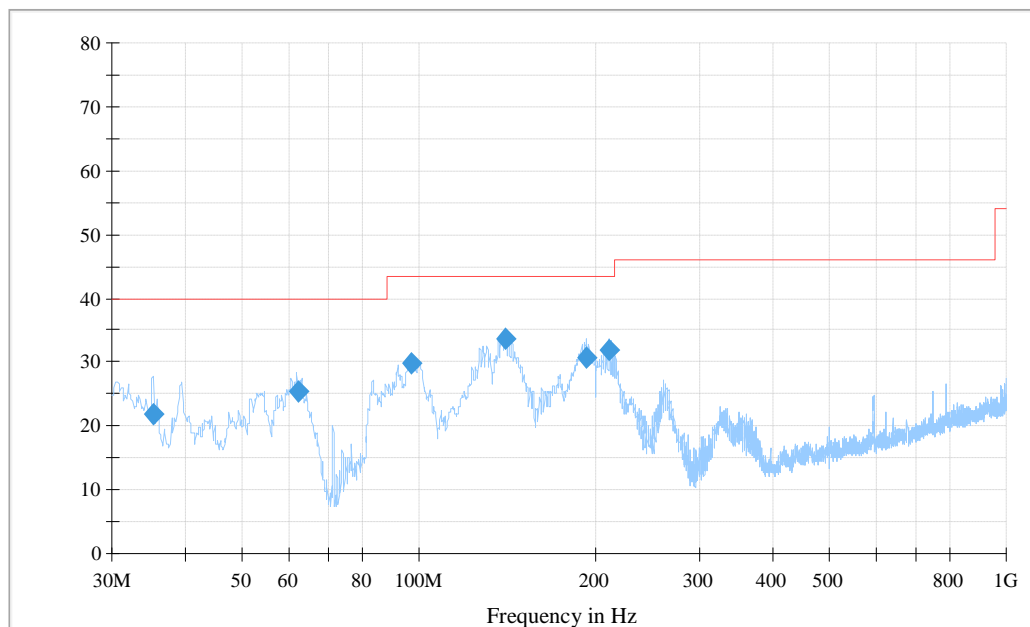
During the test, the turn table was rotated 360° around and the antenna was varied from 1m to 4m to find the maximum disturbance. The test was performed with the antenna both in its horizontal and vertical polarizations.

The following figures and tables were those measured by an automatic measurement system. The value found on the operating frequency should be ignored.

Plots of the band edge are also shown.

During the test, the Ethernet Socket was connected to the router, and the router is below the ground plane.

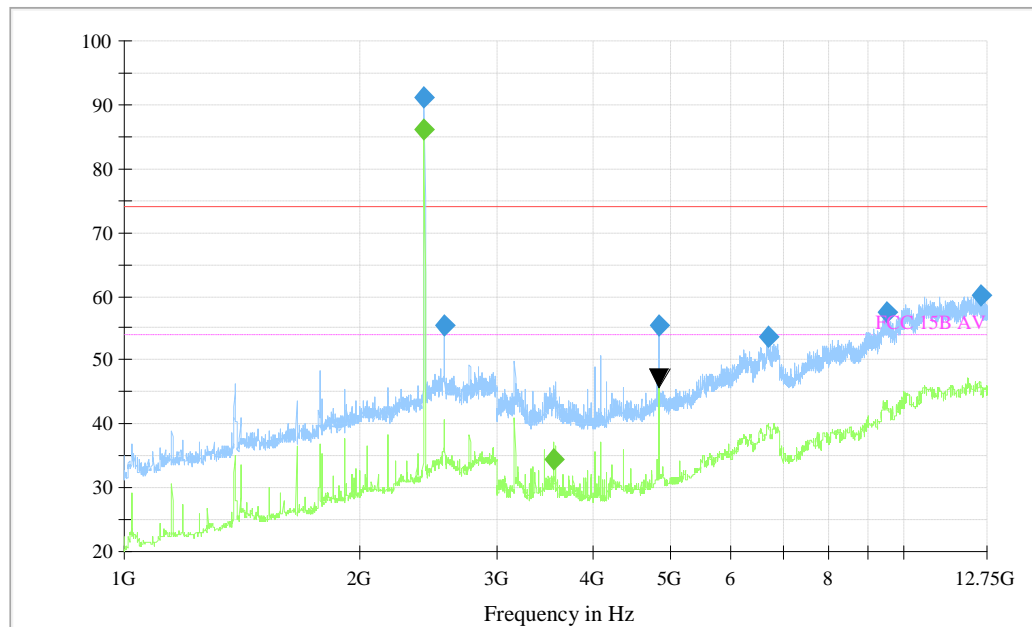
Figure 1: Spurious emission measurement results, low channel, 30-1000MHz, vertical and horizontal polarization

 Level [dB μ V/m]


Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dB μ V/m)
35.170381	21.8	120.000	100.0	V	96.0	18.20	40.00
62.303687	25.3	120.000	142.0	V	252.0	14.70	40.00
96.794108	29.9	120.000	100.0	V	103.0	13.60	43.50
139.910160	33.6	120.000	100.0	V	292.0	9.90	43.50
192.995972	30.7	120.000	119.0	H	249.0	12.80	43.50
211.390842	31.8	120.000	100.0	V	15.0	11.70	43.50

Figure 2: Spurious emission measurement results, low channel, 1-12.75GHz, vertical and horizontal polarization

 Level [dB μ V/m]


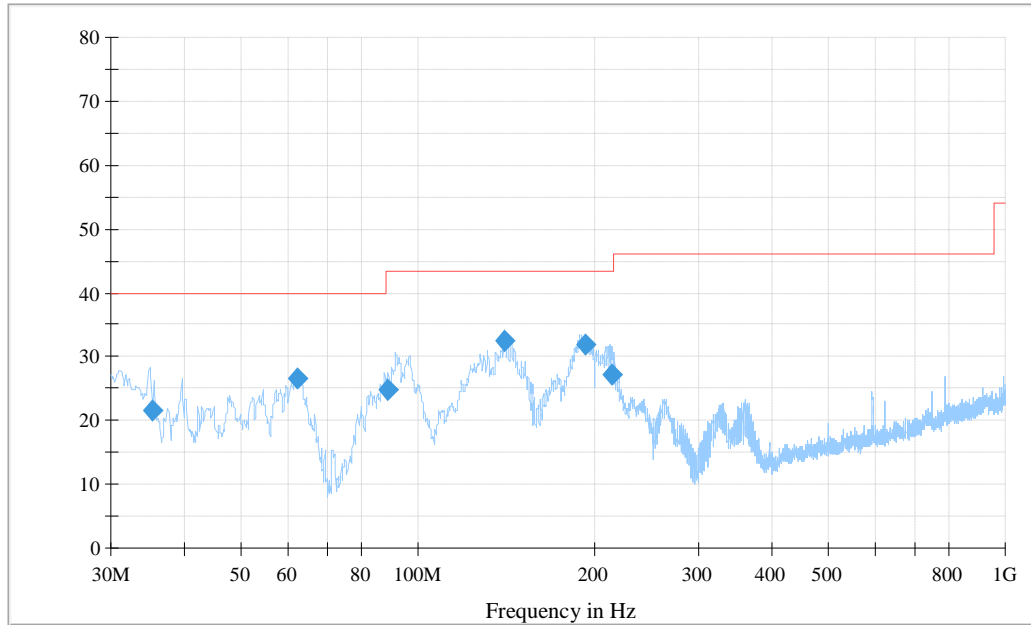
Final peak measurement result:

Frequency (MHz)	Peak (dB μ V/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dB μ V/m)
2573.849098	55.3	1000.000	170.0	V	180.0	18.70	74.00
4848.997395	55.3	1000.000	170.0	V	0.0	18.70	74.00
6673.245491	53.6	1000.000	170.0	H	87.0	20.40	74.00
9476.350501	57.5	1000.000	170.0	V	4.0	16.50	74.00
12521.243086	60.1	1000.000	170.0	V	252.0	13.90	74.00

Final average measurement result:

Frequency (MHz)	Average (dB μ V/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dB μ V/m)
3546.492986	34.4	1000.000	170.0	H	90.0	19.60	54.00

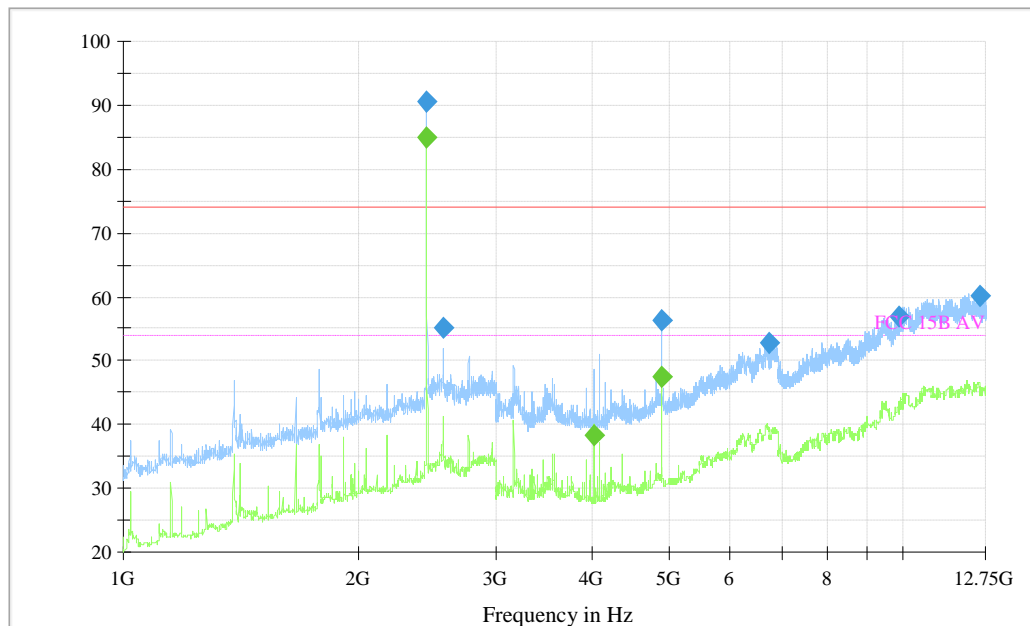
Figure 3: Spurious emission measurement results, mid channel, 30-1000MHz, vertical and horizontal polarization

 Level [dB μ V/m]


Final peak measurement result:

Frequency (MHz)	Peak (dB μ V/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dB μ V/m)
35.219820	21.5	120.000	100.0	V	166.0	18.50	40.00
62.503968	26.6	120.000	150.0	V	270.0	13.40	40.00
88.495591	24.7	120.000	135.0	V	22.0	18.80	43.50
139.960561	32.6	120.000	100.0	V	292.0	10.90	43.50
192.554369	31.9	120.000	119.0	H	288.0	11.60	43.50
213.804048	27.2	120.000	100.0	V	18.0	16.30	43.50

Figure 4: Spurious emission measurement results, mid channel, 1-12.75GHz, vertical and horizontal polarization

 Level [dB μ V/m]


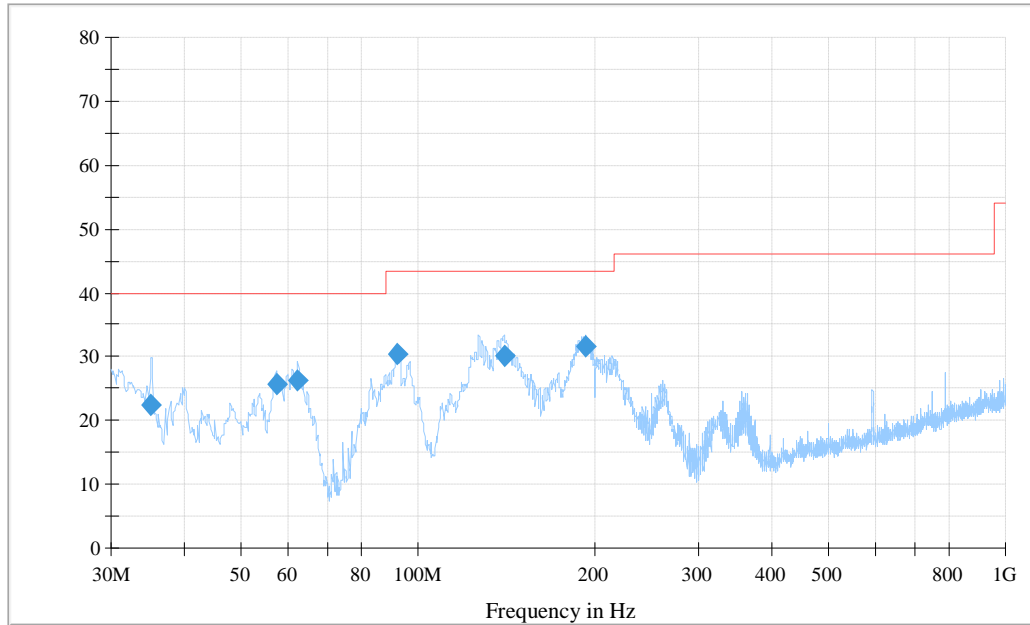
Final peak measurement result:

Frequency (MHz)	Peak (dB μ V/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dB μ V/m)
2449.498397	90.5	1000.000	170.0	V	292.0	-16.50	74.00
2574.147295	55.2	1000.000	170.0	V	176.0	18.80	74.00
4900.902004	56.3	1000.000	170.0	V	0.0	17.80	74.00
6718.941082	52.7	1000.000	170.0	H	22.0	21.30	74.00
9874.947695	56.8	1000.000	170.0	V	270.0	17.20	74.00
12544.587174	60.0	1000.000	170.0	V	18.0	14.00	74.00

Final average measurement result:

Frequency (MHz)	Average (dB μ V/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dB μ V/m)
4005.511022	38.3	1000.000	170.0	H	90.0	15.70	54.00
4899.198397	47.5	1000.000	170.0	V	0.0	6.50	54.00

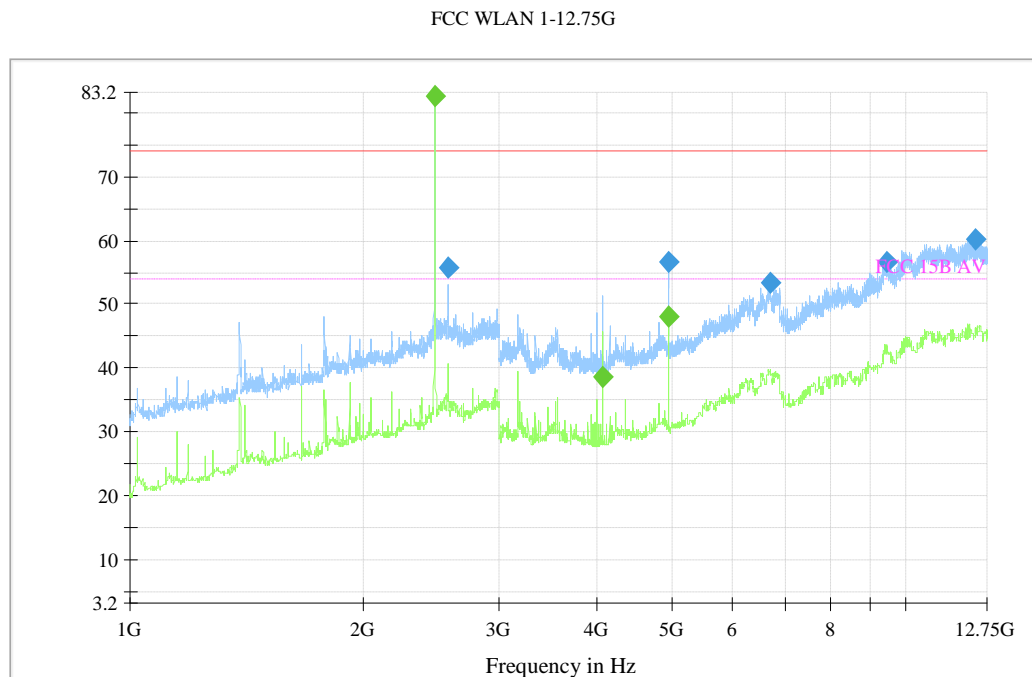
Figure 5: Spurious emission measurement results, high channel, 30-1000MHz, vertical and horizontal polarization

 Level [dB μ V/m]


Final peak measurement result:

Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dB μ V/m)
35.120100	22.5	120.000	100.0	V	8.0	17.50	40.00
57.364709	25.6	120.000	100.0	V	11.0	14.40	40.00
62.474810	26.4	120.000	142.0	V	256.0	13.60	40.00
92.043166	30.3	120.000	100.0	V	11.0	13.20	43.50
139.949760	30.2	120.000	100.0	V	270.0	13.30	43.50
192.526774	31.6	120.000	119.0	H	288.0	11.90	43.50

Figure 6: Spurious emission measurement results, high channel, 1-12.75GHz, vertical and horizontal polarization

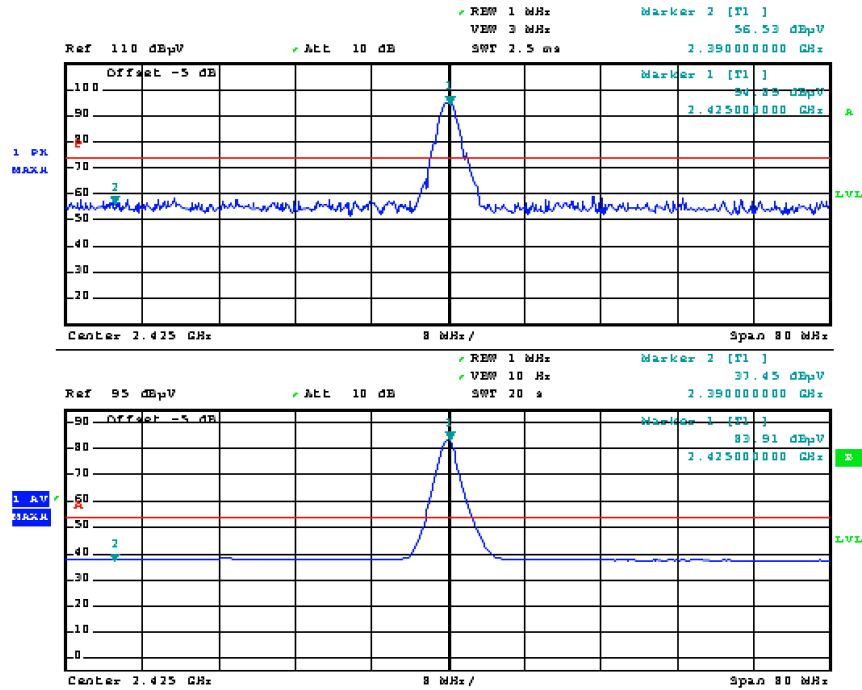
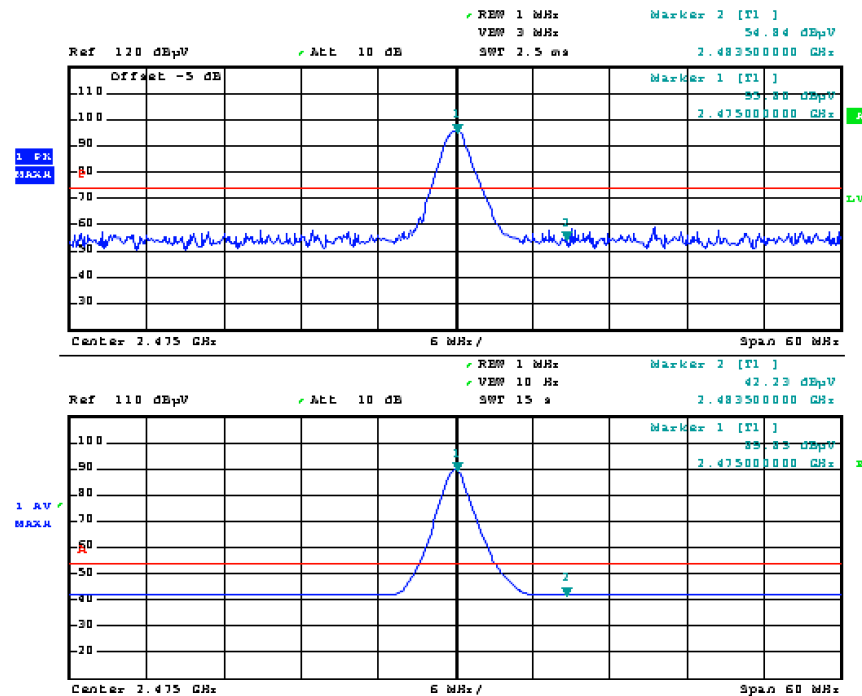
 Level [dB μ V/m]


Final peak measurement result:

Frequency (MHz)	Peak (dB μ V/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dB μ V/m)
2475.450701	89.5	1000.000	170.0	V	284.0	-15.50	74.00
2573.847295	55.7	1000.000	170.0	V	169.0	18.30	74.00
4948.997595	56.7	1000.000	170.0	V	0.0	17.30	74.00
6682.965331	53.5	1000.000	170.0	H	107.0	20.50	74.00
9468.741483	56.7	1000.000	170.0	H	112.0	17.30	74.00
12340.379359	60.2	1000.000	170.0	H	187.0	13.80	74.00

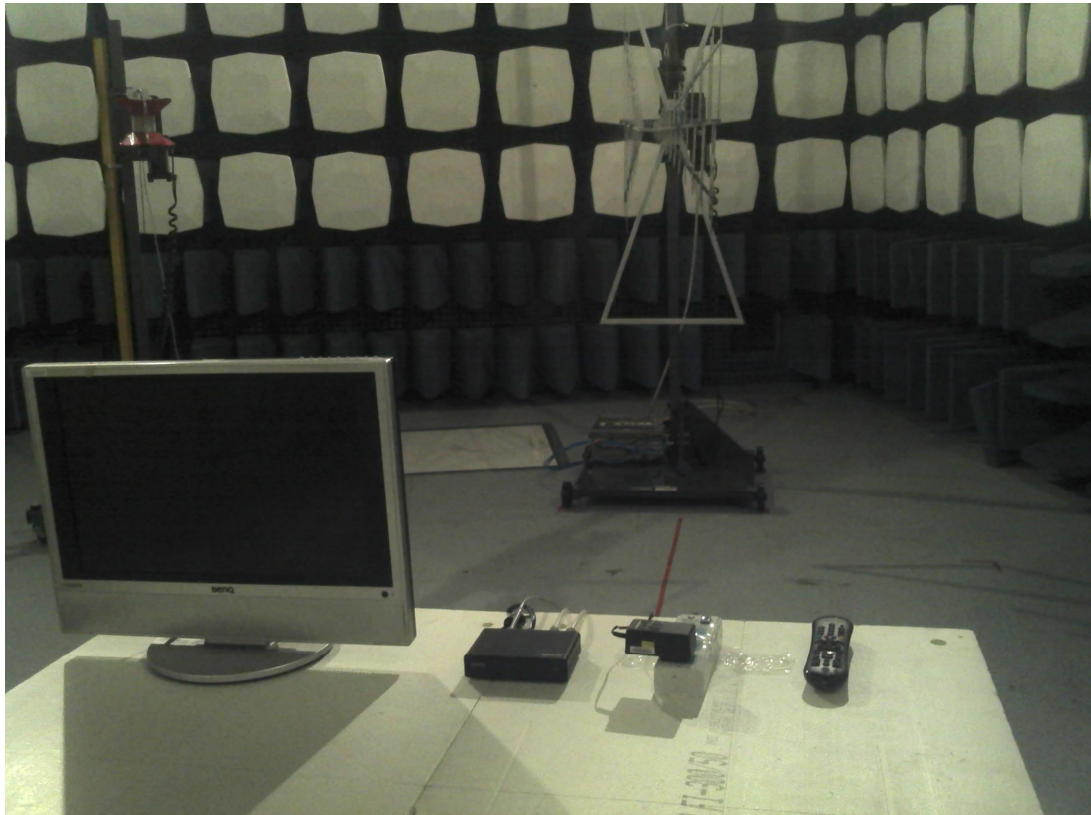
Final average measurement result:

Frequency (MHz)	Average (dB μ V/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dB μ V/m)
4079.458918	38.5	1000.000	170.0	H	0.0	15.50	54.00
4948.797595	48.1	1000.000	170.0	V	0.0	5.90	54.00

Figure 7: Band Edge measurement results
Low Channel

High Channel


5. Photographs of the Test Set-Up

Photograph 1: Set-up for Spurious Emissions



6. List of Tables

Table 1: List of Test and Measurement Equipment	4
Table 2: Measurement Uncertainty	5
Table 3: Rating of EUT	6
Table 4: Technical Specification.....	7
Table 5: Interface port of EUT	7
Table 6: Test Auxiliary Equipments	8

7. List of Figures

Figure 1: Spurious emission measurement results, low channel, 30-1000MHz, vertical and horizontal polarization	12
Figure 2: Spurious emission measurement results, low channel, 1-12.75GHz, vertical and horizontal polarization	13
Figure 3: Spurious emission measurement results, mid channel, 30-1000MHz, vertical and horizontal polarization	14
Figure 4: Spurious emission measurement results, mid channel, 1-12.75GHz, vertical and horizontal polarization	15
Figure 5: Spurious emission measurement results, high channel, 30-1000MHz, vertical and horizontal polarization	16
Figure 6: Spurious emission measurement results, high channel, 1-12.75GHz, vertical and horizontal polarization	17
Figure 7: Band Edge measurement results	18

8. List of Photographs

Photograph 1: Set-up for Spurious Emissions	19
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