

Prüfbericht - Nr.: 17008737 002
Test Report No.:
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Auftraggeber: Namtai Electronic (Shenzhen) Co., Ltd.
Client: Gusu Industrial Estate, Xixiang, Baoan, Shenzhen
Guangdong 518126, P.R. China

Gegenstand der Prüfung: Wireless Buzz!™ Buzzers
Test item:

Bezeichnung: SLEH-00069(USB Receiver) **Serien-Nr.:** n.a.
Identification: *Serial No.:*

Wareneingangs-Nr.: 163036072 **Eingangsdatum:** 2008-01-25
Receipt No.: *Date of receipt:*



Prüfört: TÜV Rheinland (Guangdong) Ltd.
Testing location: EMC Laboratory
Guangzhou Auto Market, Yuan Gang Section of Guangshan Road,
Guangzhou, P.R. China
FCC Registration No.: 833845

Prüfgrundlage: FCC CFR47 Part 15: Subpart C Section 15.247
Test specification: FCC CFR47 Part 15: Subpart C Section 15.207
FCC CFR47 Part 15: Subpart C Section 15.209

Prüfergebnis: Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).
The test item passed the test specification(s).

Test Result:

Prüflaboratorium TÜV Rheinland (Shenzhen) Co., Ltd.
Testing Laboratory

geprüft/ tested by:			kontrolliert/ reviewed by:		
					
2008-02-26	Sam Lin/ Project Engineer		2008-02-28	Shawn Peng/ Senior Project Manager	
Datum	Name/Stellung	Unterschrift	Datum	Name/Stellung	Unterschrift
<i>Date</i>	<i>Name/Position</i>	<i>Signature</i>	<i>Date</i>	<i>Name/Position</i>	<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.
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.

TEST SUMMARY

5.1 ANTENNA REQUIREMENT

RESULT: Passed

5.2 PEAK OUTPUT POWER

RESULT: Passed

5.3 6dB BANDWIDTH

RESULT: Passed

5.4 100kHz BANDWIDTH OF FREQUENCY BAND EDGE

RESULT: Passed

5.5 MAXIMUM POWER DENSITY

RESULT: Passed

5.6 SPURIOUS EMISSION

RESULT: Passed

5.7 CONDUCTED EMISSIONS

RESULT: Passed

5.8 RADIATED EMISSIONS

RESULT: Passed

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1. General Remarks

1.1 Complementary Materials

None

2. Test Sites

2.1 Test Facilities

TÜV Rheinland (Guangdong) Ltd.
EMC Laboratory

Guangzhou Auto Market,
Yuan Gang Section of Guangshan Road,
Guangzhou, P.R. China

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
For Radio Test Suite				
Spectrum Analyzer	Rhode & Schwarz	FSP30	100286	2008-09-16
Spurious Emission Test and Radiated Emission Test				
EMI Test Receiver	Rohde & Schwarz	ESCI3	1.807	2009-01-25
Trilog-Broadband Antenna	Schwarzbeck	VULB916 8	209	2009-05-08
3m Semi-anechoic chamber	Albatross Projects	N/A	N/A	2011-03-16
Horn Antenna	EMCO	21642	63042-766 (3160-09)	2008-07-25
Double-Ridged Waveguide Horn Antenna	Rohde & Schwarz	HF 906	100385	2009-07-09
Conducted Emission Test				
EMI Test Receiver	Rohde & Schwarz	ESCS30	830245/009	2008-08-12
Two-Line V-Network	Rohde & Schwarz	ESH3-Z5	100308	2008-08-12

2.3 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

2.4 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.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements are $\pm 3\text{dB}$.

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix 1 of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Guangdong) Ltd. test facility located at Guangzhou Auto Market, Yuan Gang Section of Guangshan Road, Guangzhou, P.R. China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3. General Product Information

3.1 Product Function and Intended Use

The EUT is wireless buzzer that is based on radio technology. The wireless buzzer is only designed for SONY PlayStation® 2 and SONY PlayStation® 3. It operates at 2.4GHz ISM frequency band.

For more information refer to the User's Manual.

3.2 Ratings and System Details

Table 2: Rating of EUT

Kind of Equipment:	Wireless Buzz!™ Buzzers
Type Designation:	SLEH-00069(USB Receiver)
FCC ID	VZVBUZZ02

Table 3: Technical Specification of EUT

Technical Specification	Value		
Operating Frequency band	2400 – 2483.5 MHz		
Channel number	18 Channels		
Channel list	2402 MHz	2404 MHz	2409 MHz
	2414 MHz	2419 MHz	2424 MHz
	2429 MHz	2434 MHz	2439 MHz
	2441 MHz	2444 MHz	2449 MHz
	2454 MHz	2459 MHz	2464 MHz
	2469 MHz	2474 MHz	2481 MHz
Modulation method	GFSK		
Operation Temperature	+5°C to +35°C		
Operation Voltage	DC 5V via USB port		
Antenna Type	Internal Antenna		

3.3 Independent Operation Modes

The basic operation modes are:

- A. Transmitting
 - 1. Low channel
 - 2. Middle channel
 - 3. High channel
- B. Receiving
- C. Standby
- D. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

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

4. Test Set-up and Operation Modes

4.1 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.

4.2 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.

4.3 Special Accessories and Auxiliary Equipment

Item Description	Model No.	Serial No.	Manufacturer
PlayStation®3	PlayStation®3	00-27450032-0056252-DECHAOOA	SONY
Television	KV-J29MF1	N/A	SONY
Software	Buzzer tester	Nantai Buzz!™	Nantai

4.4 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.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test

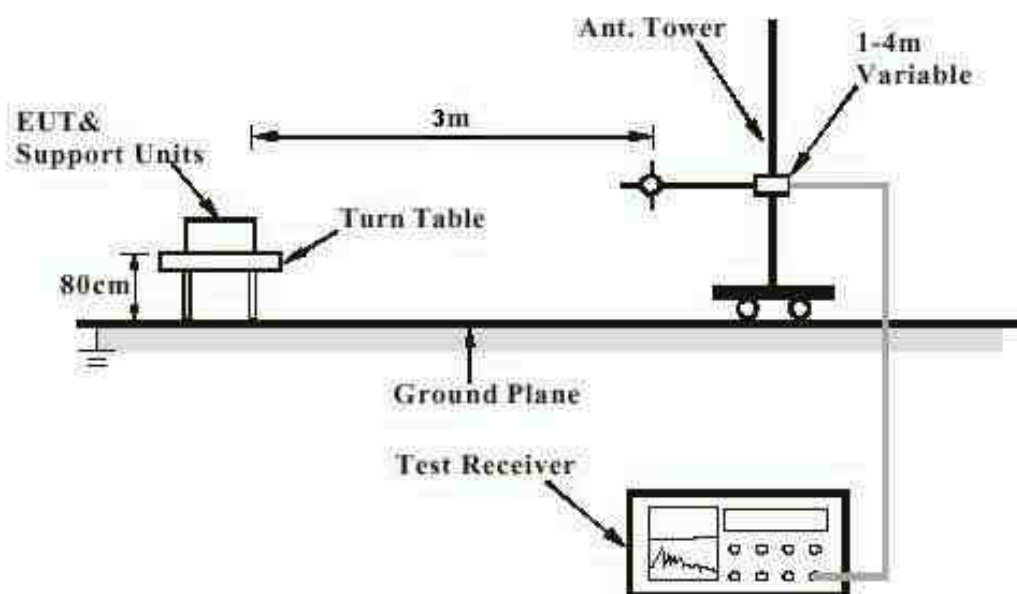


Diagram of Measurement Equipment Configuration for Conduction Measurement

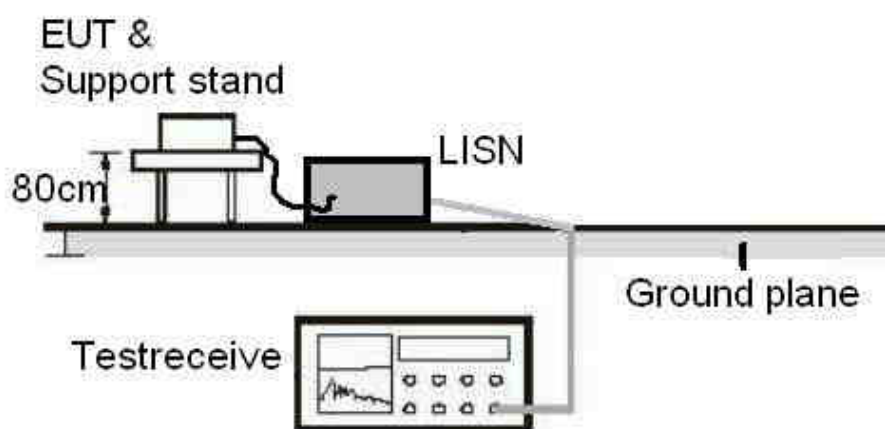
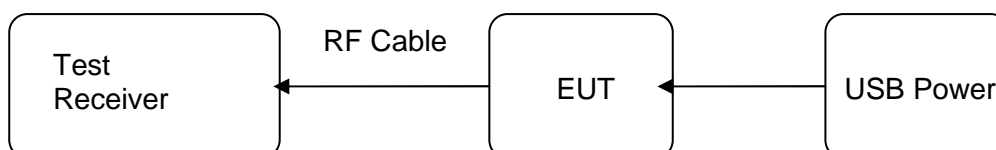


Diagram of Measurement Equipment Configuration for Transmitter Measurement



5. Test Results of Transmitter

5.1 Antenna Requirement

RESULT:**Passed**

Test date	:	2008-02-01
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's declaration, the EUT has an internal antenna, the directional gain of antenna is less than 6 dBi, 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.

Refer to EUT photo for details.

5.2 Peak Output Power

RESULT:**Passed**

Test date : 2008-01-30
Test standard : FCC Part 15.247(b)(3)
Basic standard : ANSI C63.4: 2003
Limit : 1 Watt
Kind of test site : Shielded room

Test setup

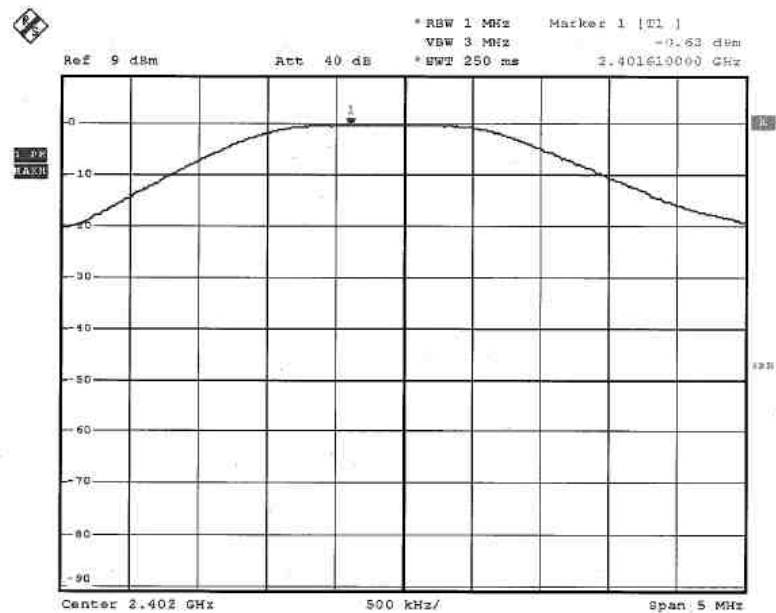
Test Channel : Low/ Middle/ High
Operation Mode : A
Ambient temperature : 20°C
Relative humidity : 40%
Atmospheric pressure : 100 kPa

Table 4: Test result of Peak Output Power

Channel	Channel Frequency (MHz)	Peak Output Power		Limit
		(dBm)	(W)	(W)
Low Channel	2402	-0.63	0.00086	1
Mid Channel	2441	-0.52	0.00089	1
High Channel	2481	-0.59	0.00087	1

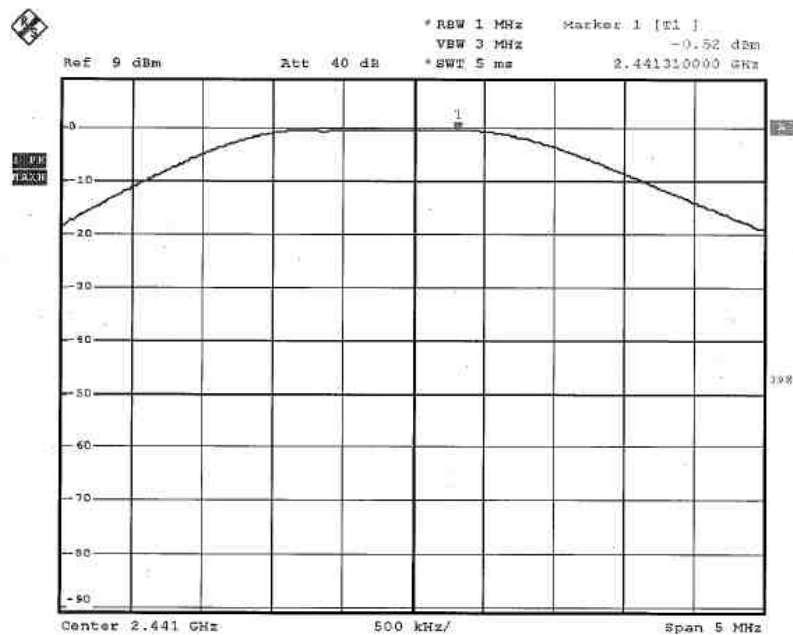
Test Plot of Peak Output Power

Low Channel



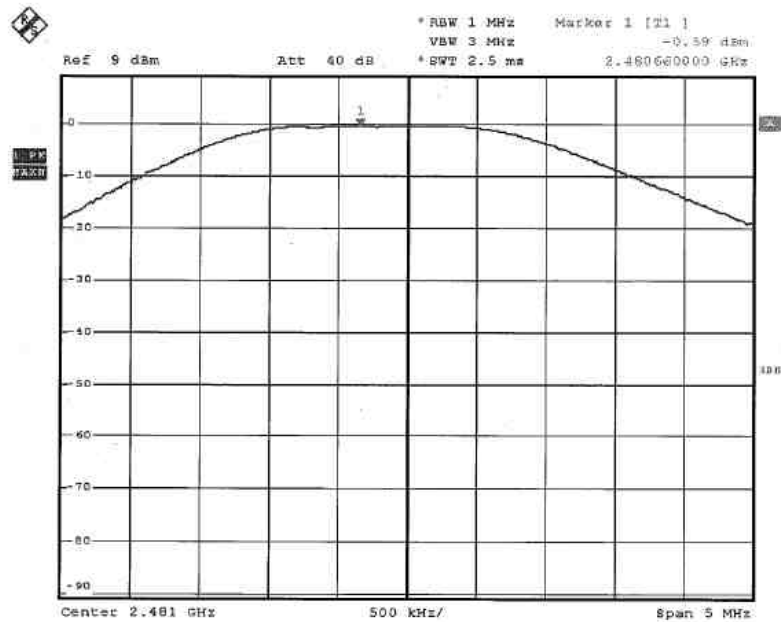
Date: 30. JAN. 2008 13:19:52

Middle Channel



Date: 30. JAN. 2008 14:03:13

High Channel



Date: 30.JAN.2008 13:43:07

5.3 6dB Bandwidth

RESULT:**Passed**

Date of testing : 2008-01-30
Test standard : FCC Part 15.247(a)(2)
Basic standard : ANSI C63.4: 2003
Requirement : at least 500kHz
Kind of test site : Shielded room

Test setup

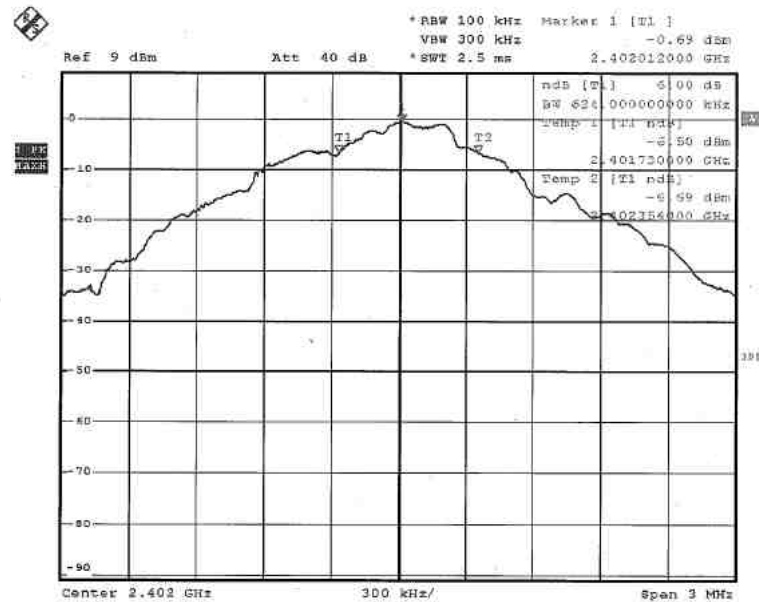
Test Channel : Low/ Middle/ High
Operation Mode : A
Ambient temperature : 20°C
Relative humidity : 40%
Atmospheric pressure : 100 kPa

Table 5: Test result of 6dB Bandwidth

Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low Channel	2402	624	≥500	Pass
Mid Channel	2441	624	≥500	Pass
High Channel	2481	624	≥500	Pass

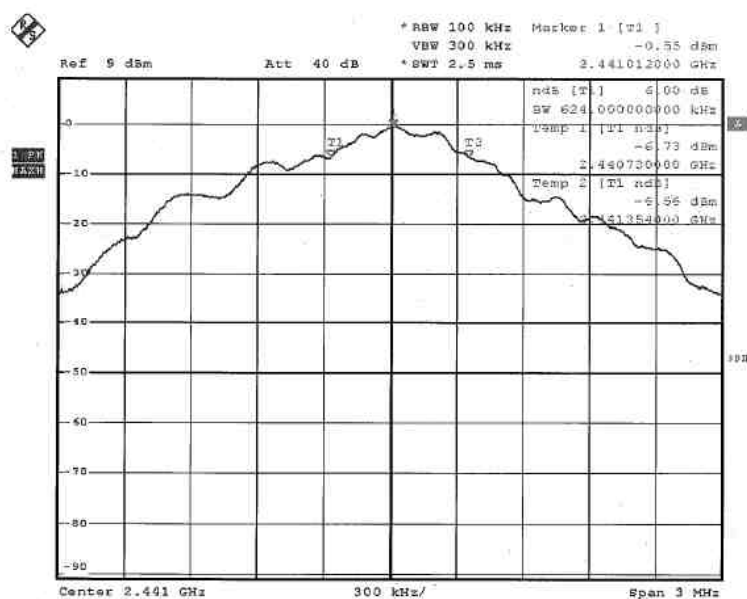
Test Plot of 6dB Bandwidth

Low Channel

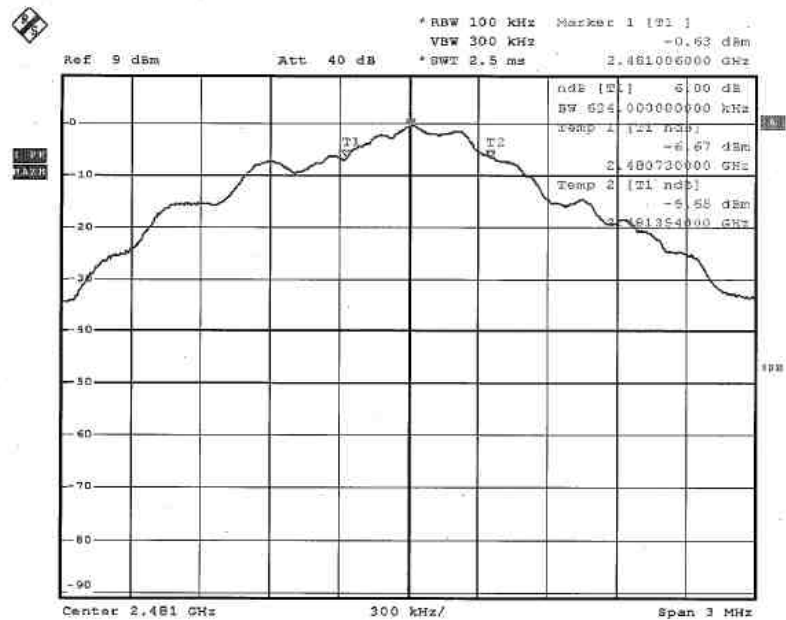


Date: 30.JAN.2008 13:21:46

Middle Channel



Date: 30.JAN.2008 14:04:27

High Channel


Date: 30.JAN.2008 13:44:39

5.4 100kHz Bandwidth of Frequency Band Edge

RESULT:**Passed**

Date of testing	:	2008-02-13
Test standard	:	FCC part 15.247(d)
Basic standard	:	ANSI C63.4: 2003
Limit	:	at least 20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power), in additional radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified in 15.209(a), whichever results in lower attenuation
Kind of test site	:	Shield room

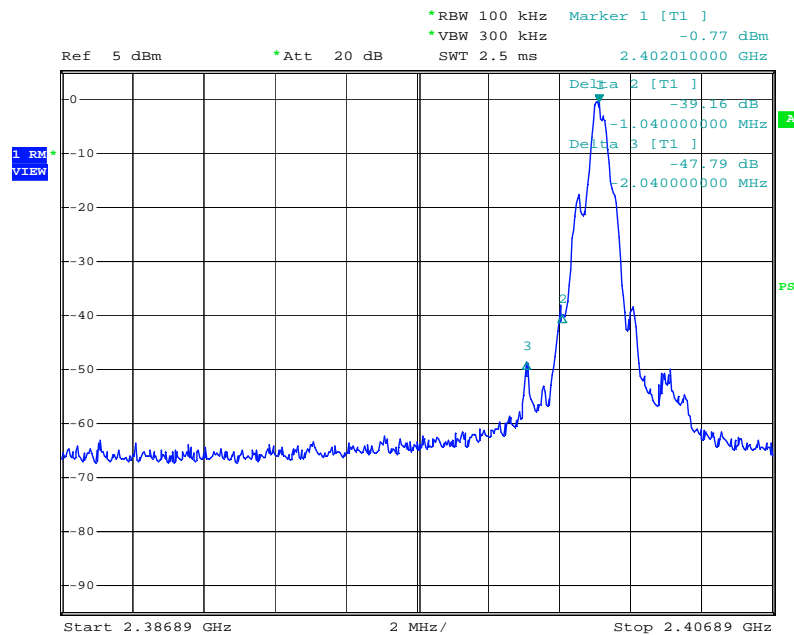
Test setup

Test Channel	:	Low/ High
Operation mode	:	A
Ambient temperature	:	20°C
Relative humidity	:	40%
Atmospheric pressure	:	100 kPa

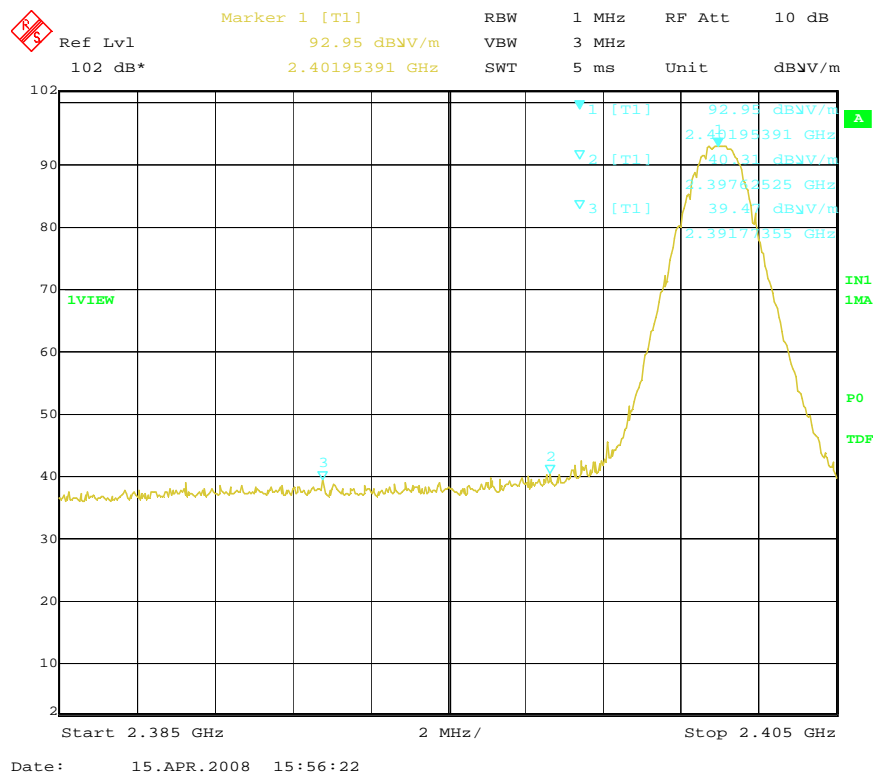
All emissions are more than 20dB below fundamental. Test results of 100kHz Bandwidth of Frequency Band Edge refer to following test plot.

Test Plot of 100kHz Bandwidth of Frequency Band Edge

Low Channel

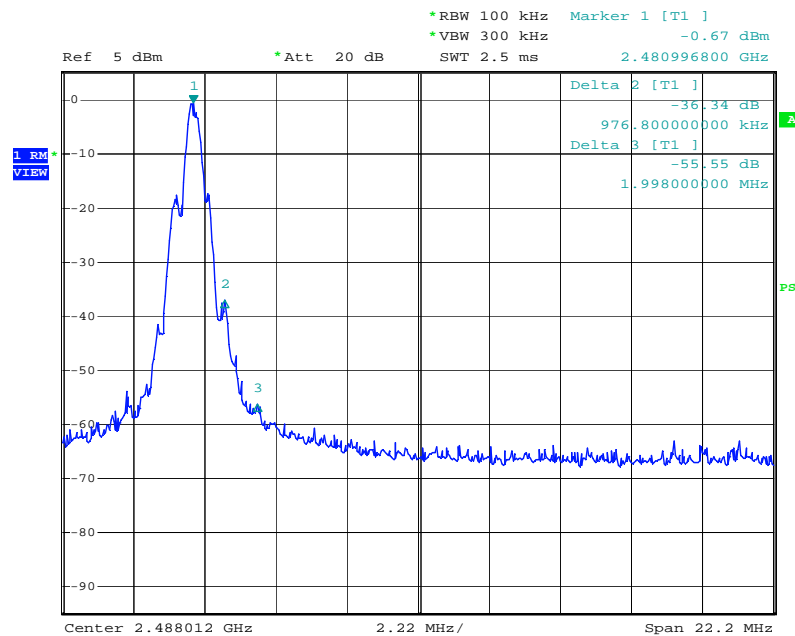


Date: 10.APR.2008 16:04:50

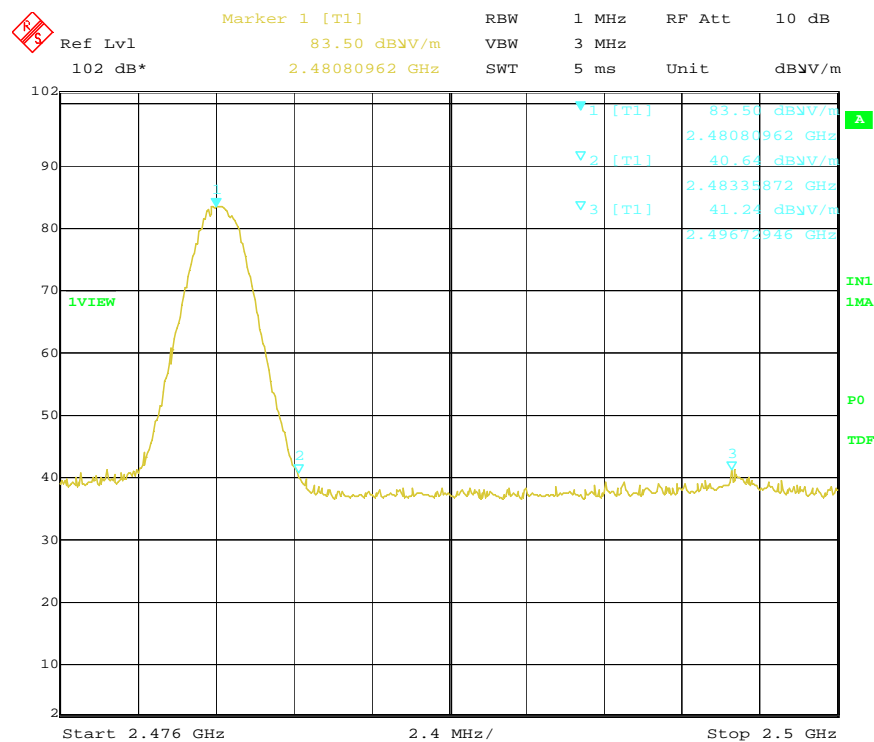


Date: 15.APR.2008 15:56:22

High Channel



Date: 10.APR.2008 16:07:35



Date: 15.APR.2008 15:51:02

5.5 Maximum Power Density

RESULT:**Passed**

Date of testing : 2008-01-30
Test standard : FCC Part 15.247(e)
Basic standard : ANSI C63.4: 2003
Limit : 8dBm/3kHz
Kind of test site : Shielded room

Test setup

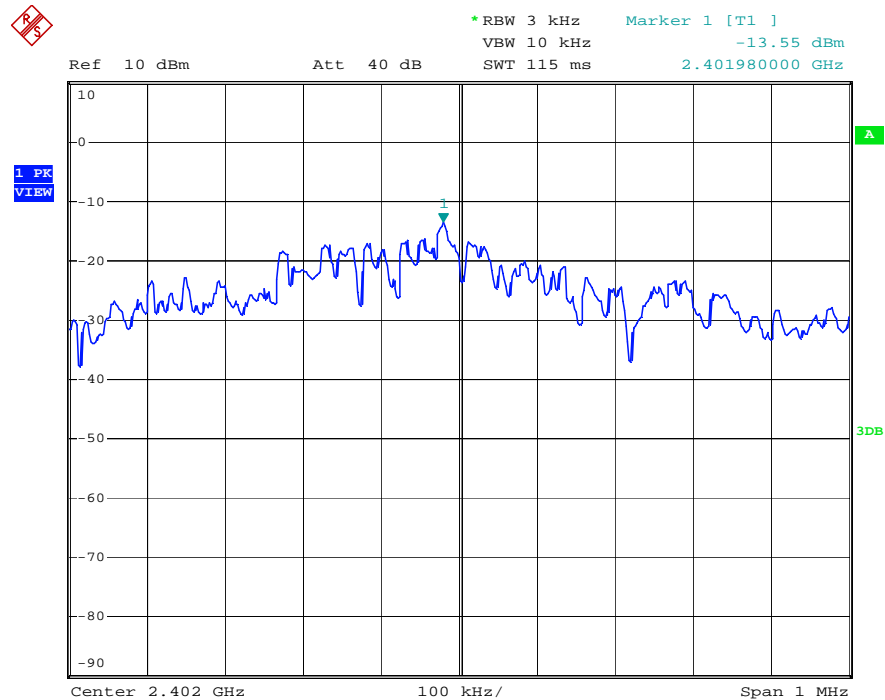
Test Channel : Low/ Middle/ High
Operation Mode : A
Ambient temperature : 20°C
Relative humidity : 40%
Atmospheric pressure : 100 kPa

Table 6: Test result of Maximum Power Density

Channel	Channel Frequency (MHz)	Maximum Power Density (dBm)	Limit (dBm)	Result
Low Channel	2402	-13.55	8	Pass
Mid Channel	2441	-13.73	8	Pass
High Channel	2481	-13.79	8	Pass

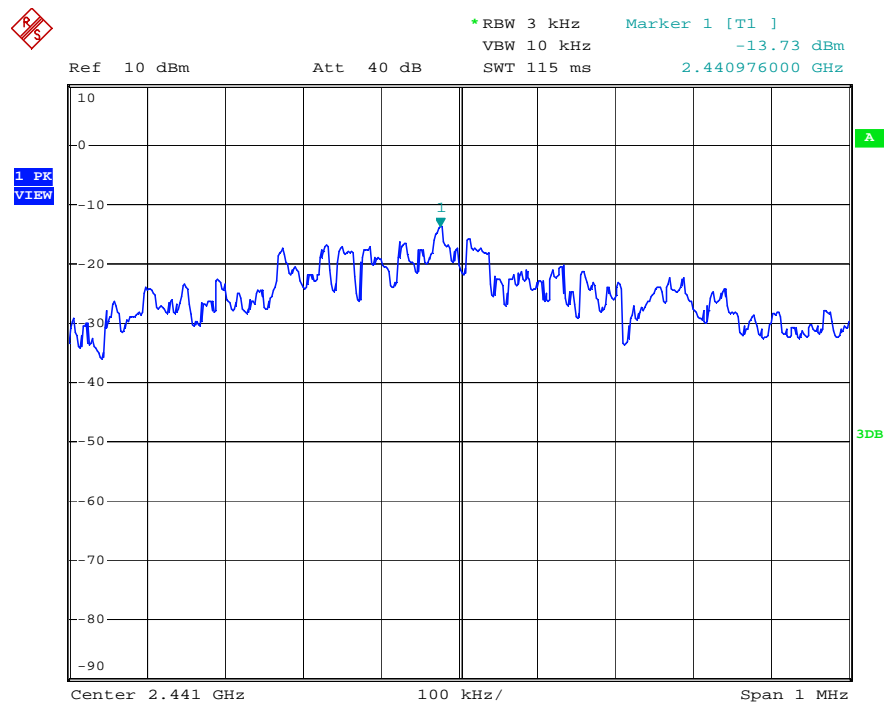
Test Plot of Maximum Power Density

Low Channel

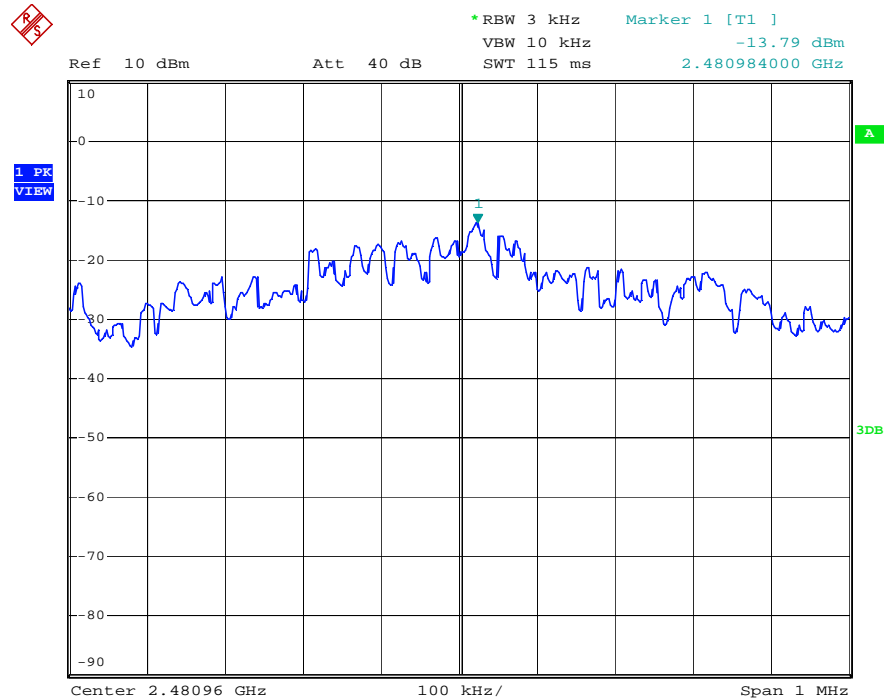


Date: 9.APR.2008 05:08:31

Middle Channel



Date: 9.APR.2008 05:07:15

High Channel


Date: 9.APR.2008 05:06:25

5.6 Spurious Emission

RESULT:**Passed**

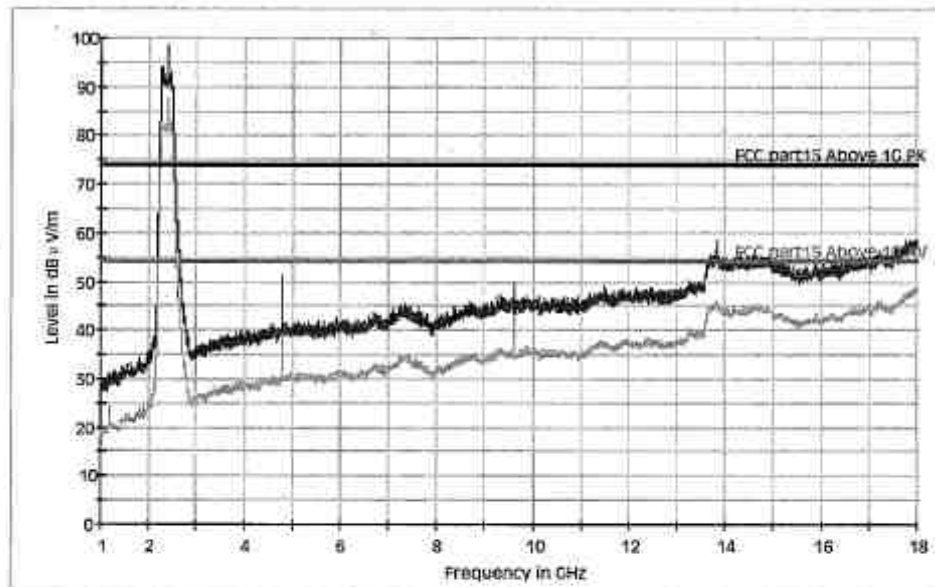
Date of testing	:	2008-01-24 to 2008-02-14
Test standard	:	FCC part 15.247 & FCC part 15.209
Basic standard	:	ANSI C63.4: 2003
Limits	:	Refer to 15.209(a)
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	Low/ Middle/ High
Operation mode	:	A
Ambient temperature	:	20°C
Relative humidity	:	40%
Atmospheric pressure	:	100 kPa

Test results of spurious emission refer to following test plot.

Test Plot of Spurious emission of Low channel– Vertical (Radiated, 1GHz – 18GHz)



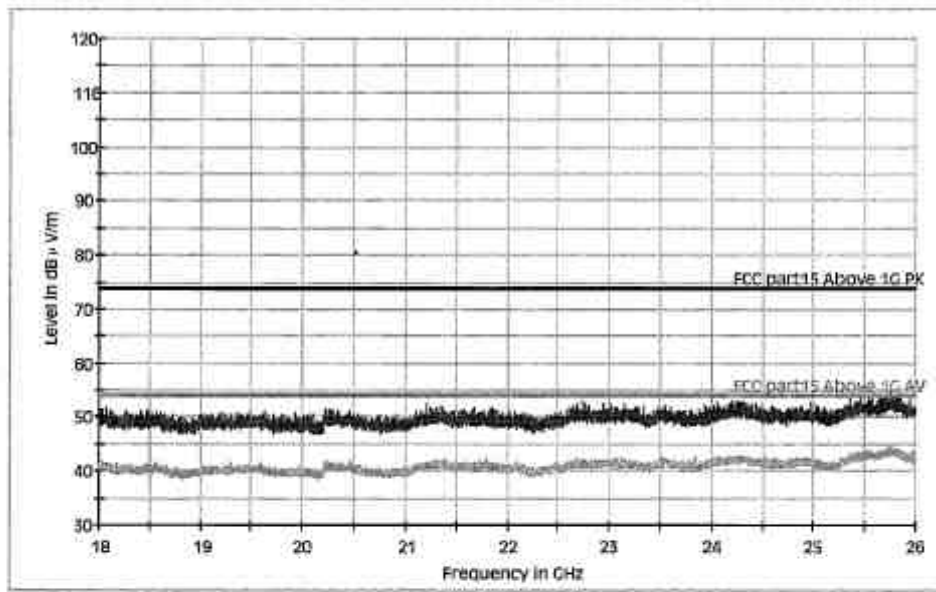
Limit and Margin PK

Frequency (MHz)	MaxPeak-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
4803.750000	51.2	22.8	74.0	
7324.000000	45.5	28.5	74.0	
9304.500000	47.2	26.8	74.0	
9606.250000	49.9	24.1	74.0	
13699.000000	55.5	18.5	74.0	
13826.500000	58.4	15.6	74.0	

Limit and Margin AV

Frequency (MHz)	Average-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
4803.750000	39.2	14.8	54.0	
7315.500000	34.6	19.4	54.0	
9336.375000	36.2	17.8	54.0	
9608.375000	42.7	11.3	54.0	
13713.875000	45.1	8.9	54.0	
13852.000000	46.0	8.0	54.0	

Test Plot of Spurious emission of Low channel– Vertical (Radiated, 18GHz – 26GHz)



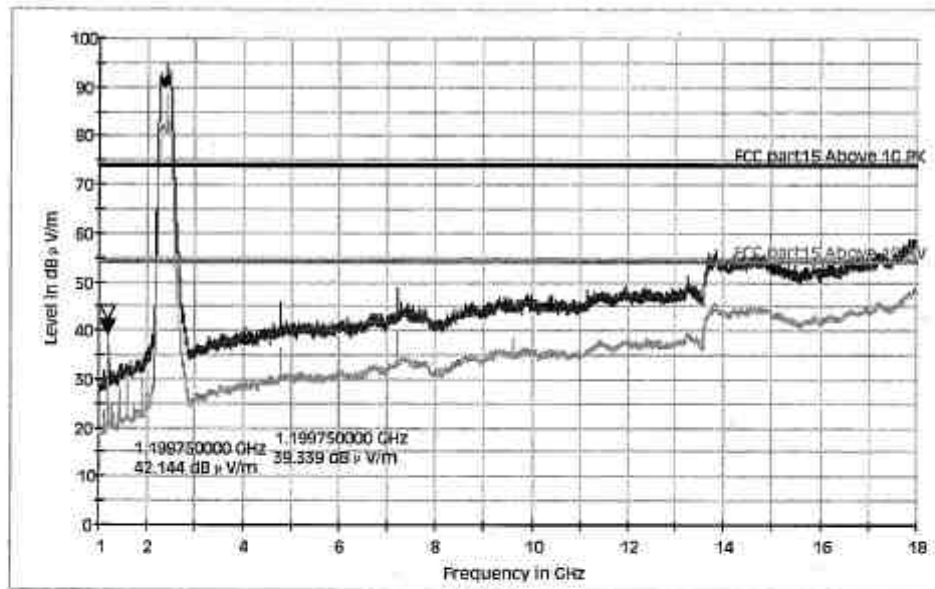
Limit and Margin PK

Frequency (MHz)	MaxPeak-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
18058.000000	49.9	24.1	74.0	
20216.000000	51.5	22.5	74.0	
21798.000000	48.6	25.4	74.0	
23072.000000	49.6	24.4	74.0	
24275.000000	50.7	23.3	74.0	
25736.000000	51.7	22.3	74.0	

Limit and Margin AV

Frequency (MHz)	Average-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
18058.000000	41.8	12.2	54.0	
20216.000000	42.1	11.9	54.0	
21798.000000	42.4	11.6	54.0	
23072.000000	42.4	11.6	54.0	
24275.000000	43.1	10.9	54.0	
25736.000000	44.9	9.1	54.0	

Test Plot of Spurious emission of Low channel– Horizontal (Radiated, 1GHz – 18GHz)



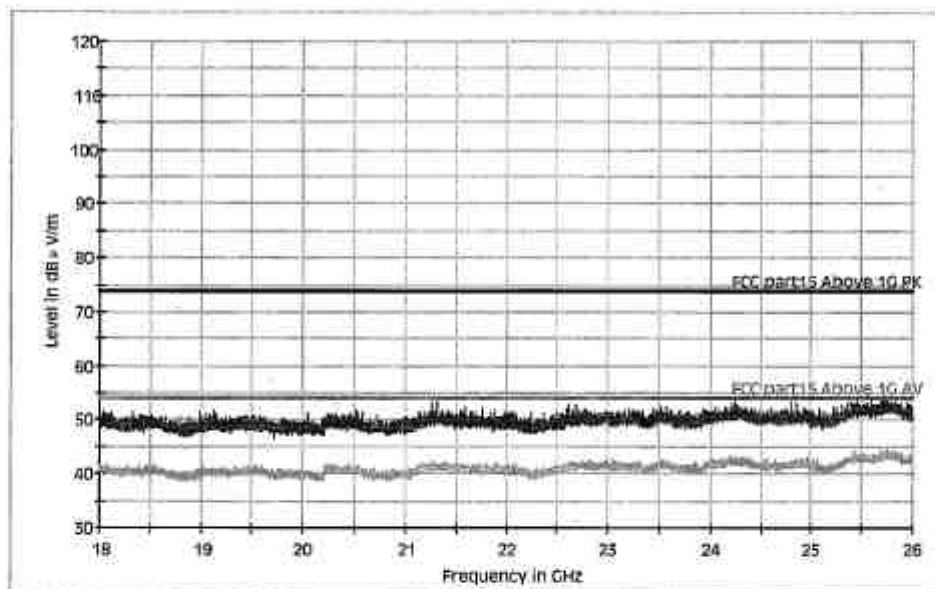
Limit and Margin PK

Frequency (MHz)	MaxPeak-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
4803.750000	45.8	28.2	74.0	
7205.000000	48.9	25.1	74.0	
9427.750000	46.9	27.1	74.0	
11155.375000	48.3	25.7	74.0	
13699.000000	55.8	18.2	74.0	
13854.125000	56.6	17.4	74.0	

Limit and Margin AV

Frequency (MHz)	Average-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
4803.750000	36.6	17.4	54.0	
7205.000000	39.8	14.2	54.0	
9306.625000	36.2	17.8	54.0	
9608.375000	38.2	15.8	54.0	
13716.000000	44.3	9.7	54.0	
13852.000000	46.0	8.0	54.0	

Test Plot of Spurious emission of Low channel– Horizontal (Radiated, 18GHz – 26GHz)



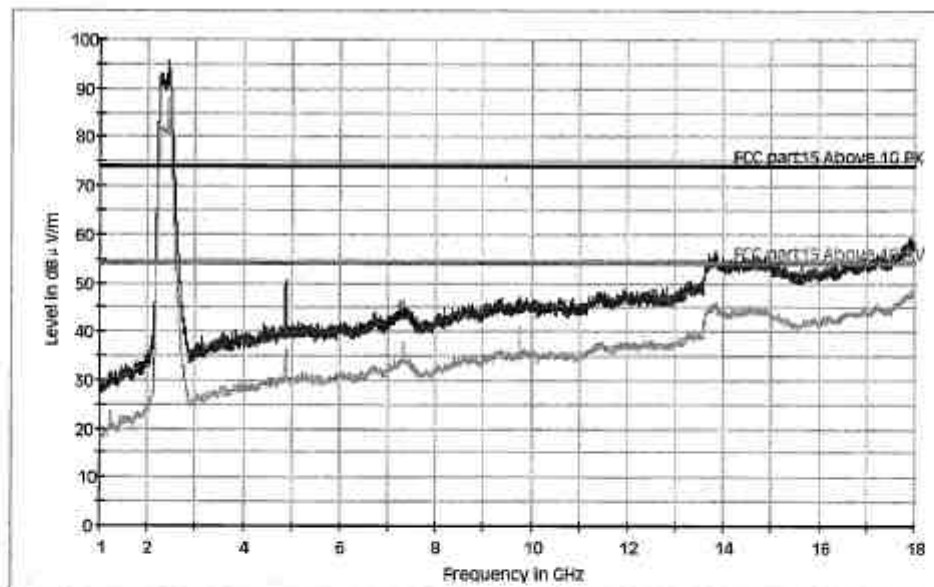
Limit and Margin PK

Frequency (MHz)	MaxPeak-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
18073.000000	49.8	24.2	74.0	
20445.000000	49.0	25.0	74.0	
21271.000000	50.5	23.5	74.0	
23052.000000	50.8	23.2	74.0	
24241.000000	52.8	21.2	74.0	
25761.000000	51.6	22.4	74.0	

Limit and Margin AV

Frequency (MHz)	Average-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
18073.000000	41.7	12.3	54.0	
20445.000000	41.9	12.1	54.0	
21271.000000	42.2	11.8	54.0	
23052.000000	42.6	11.4	54.0	
24241.000000	43.2	10.8	54.0	
25761.000000	44.6	9.4	54.0	

Test Plot of Spurious emission of Middle channel– Vertical (Radiated, 1GHz – 18GHz)



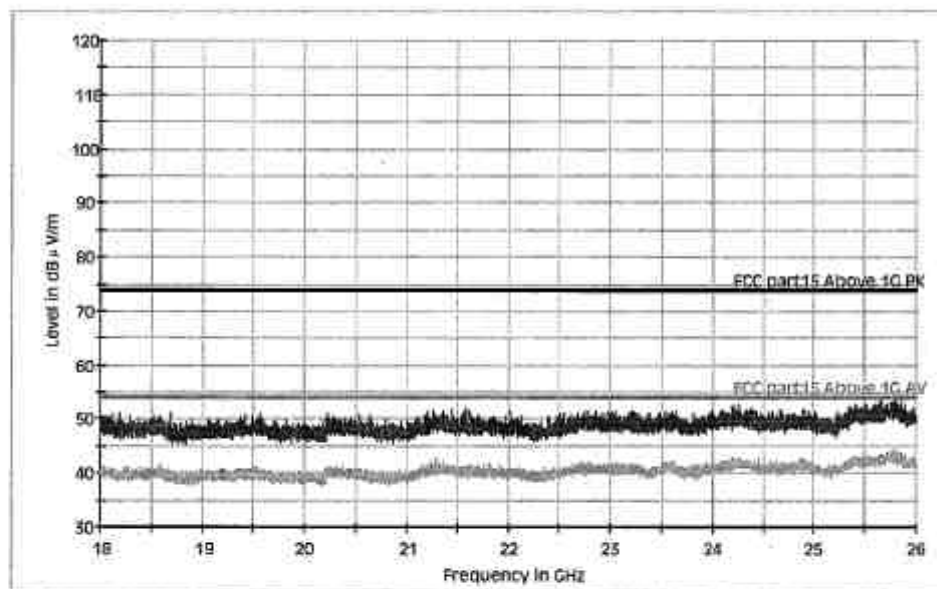
Limit and Margin PK

Frequency (MHz)	MaxPeak-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
4882.375000	50.5	23.5	74.0	
7321.875000	46.7	27.3	74.0	
9385.250000	46.9	27.1	74.0	
11529.375000	48.2	25.8	74.0	
13679.875000	56.0	18.0	74.0	
13845.625000	56.6	17.4	74.0	

Limit and Margin AV

Frequency (MHz)	Average-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
4882.375000	36.6	17.4	54.0	
7321.875000	37.9	16.1	54.0	
9402.250000	36.1	17.9	54.0	
9763.500000	41.3	12.7	54.0	
13728.750000	45.5	8.5	54.0	
13832.875000	46.0	8.0	54.0	

Test Plot of Spurious emission of Middle channel– Vertical (Radiated, 18GHz – 26GHz)



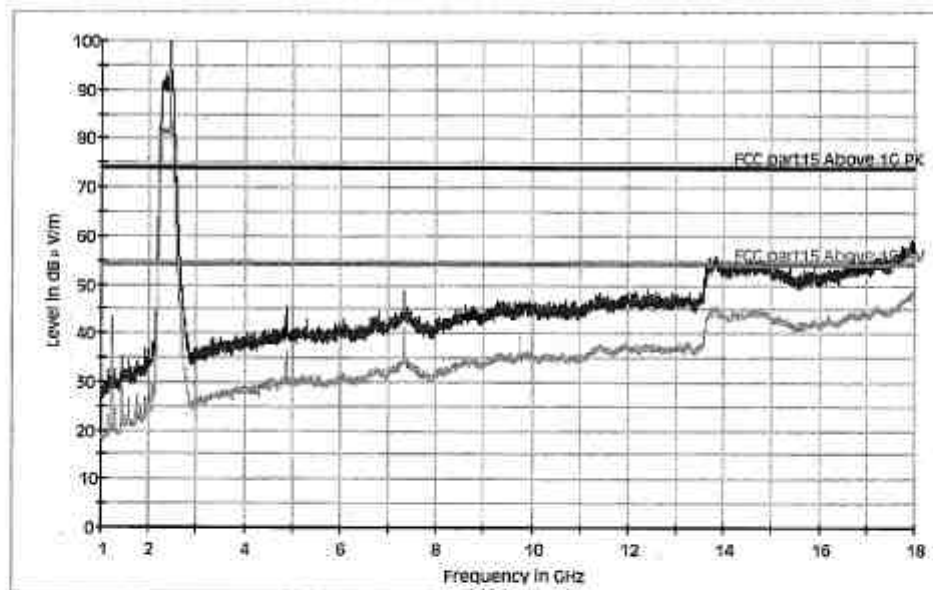
Limit and Margin PK

Frequency (MHz)	MaxPeak-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
18588.000000	47.8	26.2	74.0	
20372.000000	48.6	25.4	74.0	
21303.000000	48.3	25.7	74.0	
22783.000000	48.2	25.8	74.0	
24203.000000	52.3	21.7	74.0	
25775.000000	51.0	23.0	74.0	

Limit and Margin AV

Frequency (MHz)	Average-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
18588.000000	41.7	12.3	54.0	
20372.000000	41.3	12.7	54.0	
21303.000000	42.6	11.4	54.0	
22783.000000	42.1	11.9	54.0	
24203.000000	42.9	11.1	54.0	
25775.000000	44.5	9.5	54.0	

Test Plot of Spurious emission of Middle channel– Horizontal (Radiated, 1GHz – 18GHz)



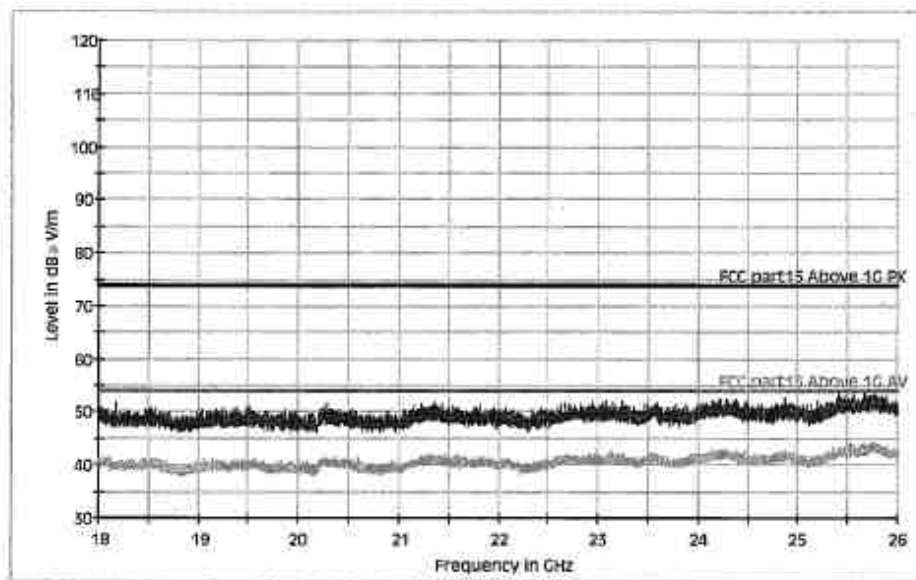
Limit and Margin PK

Frequency (MHz)	MaxPeak-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
4882.375000	45.6	28.4	74.0	
7321.875000	48.8	25.2	74.0	
9387.375000	46.6	27.4	74.0	
11425.250000	48.3	25.7	74.0	
13705.375000	55.6	18.4	74.0	
13858.375000	56.1	17.9	74.0	

Limit and Margin AV

Frequency (MHz)	Average-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
4882.375000	36.6	17.4	54.0	
7321.875000	41.1	12.9	54.0	
9353.375000	36.0	18.0	54.0	
9763.500000	39.5	14.5	54.0	
13728.750000	45.4	8.6	54.0	
13847.750000	46.2	7.8	54.0	

Test Plot of Spurious emission of Middle channel– Horizontal (Radiated, 18GHz – 26GHz)



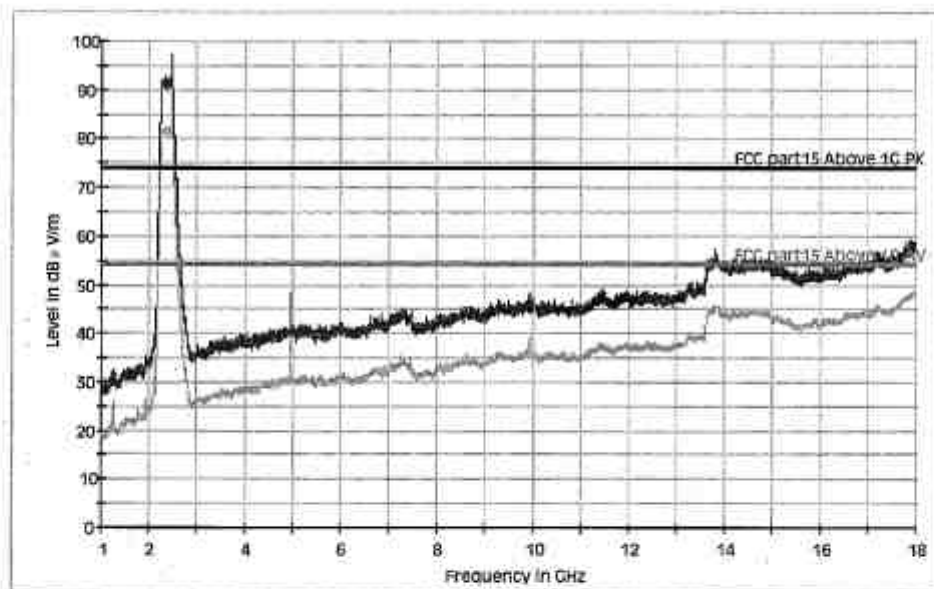
Limit and Margin PK

Frequency (MHz)	MaxPeak-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
18444.000000	48.7	25.3	74.0	
20253.000000	49.0	25.0	74.0	
21589.000000	49.1	24.9	74.0	
23136.000000	49.3	24.7	74.0	
24136.000000	50.0	24.0	74.0	
25753.000000	51.2	22.8	74.0	

Limit and Margin AV

Frequency (MHz)	Average-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
18444.000000	41.3	12.7	54.0	
20253.000000	41.5	12.5	54.0	
21589.000000	42.1	11.9	54.0	
23136.000000	42.8	11.2	54.0	
24136.000000	43.1	10.9	54.0	
25753.000000	44.4	9.6	54.0	

Test Plot of Spurious emission of High channel– Vertical (Radiated, 1GHz – 18GHz)



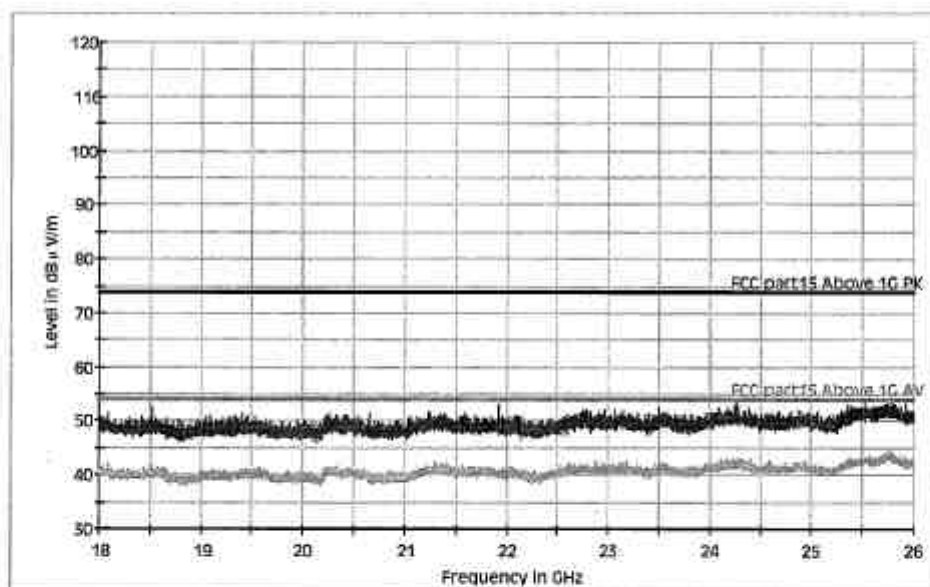
Limit and Margin PK

Frequency (MHz)	MaxPeak-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
4961.000000	48.6	25.4	74.0	
7281.500000	45.1	28.9	74.0	
9285.375000	46.8	27.2	74.0	
11467.750000	49.0	25.0	74.0	
13737.250000	55.4	18.6	74.0	
13820.125000	57.4	16.6	74.0	

Limit and Margin AV

Frequency (MHz)	Average-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
4961.000000	39.6	14.4	54.0	
7260.250000	35.3	18.7	54.0	
9349.125000	36.1	17.9	54.0	
9925.000000	39.1	14.9	54.0	
13728.750000	45.3	8.7	54.0	
13828.625000	46.0	8.0	54.0	

Test Plot of Spurious emission of High channel– Vertical (Radiated, 18GHz – 26GHz)



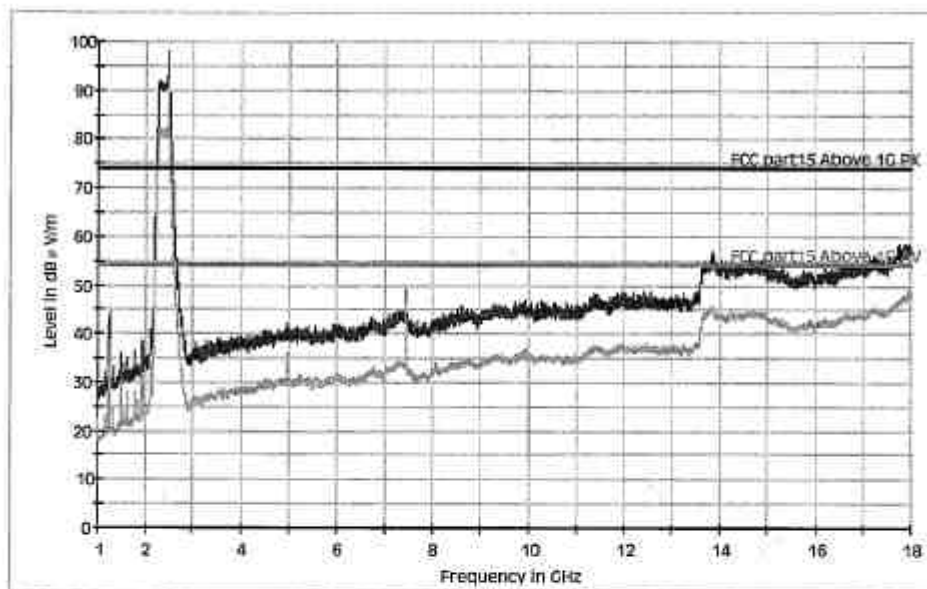
Limit and Margin PK

Frequency (MHz)	MaxPeak-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
18092.000000	48.2	25.8	74.0	
20227.000000	49.9	24.1	74.0	
21295.000000	50.6	23.4	74.0	
22885.000000	50.3	23.7	74.0	
24239.000000	50.9	23.1	74.0	
25782.000000	52.4	21.6	74.0	

Limit and Margin AV

Frequency (MHz)	Average-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
18092.000000	42.2	11.8	54.0	
20227.000000	41.7	12.3	54.0	
21295.000000	42.5	11.5	54.0	
22885.000000	42.8	11.2	54.0	
24239.000000	43.1	10.9	54.0	
25782.000000	44.5	9.5	54.0	

Test Plot of Spurious emission of High channel– Horizontal (Radiated, 1GHz – 18GHz)



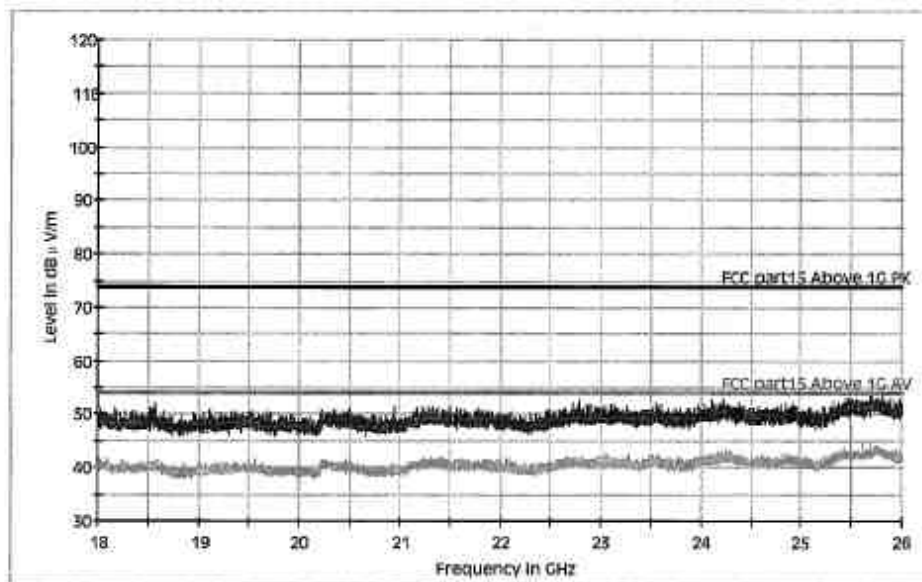
Limit and Margin PK

Frequency (MHz)	MaxPeak-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
4961.000000	42.3	31.7	74.0	
7307.000000	44.9	29.1	74.0	
7443.000000	49.1	24.9	74.0	
11389.125000	48.5	25.5	74.0	
13682.000000	54.8	19.2	74.0	
13824.375000	57.0	17.0	74.0	

Limit and Margin AV

Frequency (MHz)	Average-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
4961.000000	36.2	17.8	54.0	
7309.125000	34.2	19.8	54.0	
7443.000000	46.0	8.0	54.0	
11382.750000	37.9	16.1	54.0	
13724.500000	45.1	8.9	54.0	
13837.125000	46.1	7.9	54.0	

Test Plot of Spurious emission of High channel– Horizontal (Radiated, 18GHz – 26GHz)



Limit and Margin PK

Frequency (MHz)	MaxPeak-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
18015.000000	48.5	25.5	74.0	
20246.000000	49.3	24.7	74.0	
21423.000000	48.9	25.1	74.0	
23047.000000	49.1	24.9	74.0	
24267.000000	48.9	25.1	74.0	
25622.000000	50.3	23.7	74.0	

Limit and Margin AV

Frequency (MHz)	Average-Max Hold (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Comment
18015.000000	41.6	12.4	54.0	
20246.000000	41.6	12.4	54.0	
21423.000000	42.1	11.9	54.0	
23047.000000	42.7	11.3	54.0	
24267.000000	43.3	10.7	54.0	
25622.000000	44.3	9.7	54.0	

5.7 Conducted emissions

RESULT:**Passed**

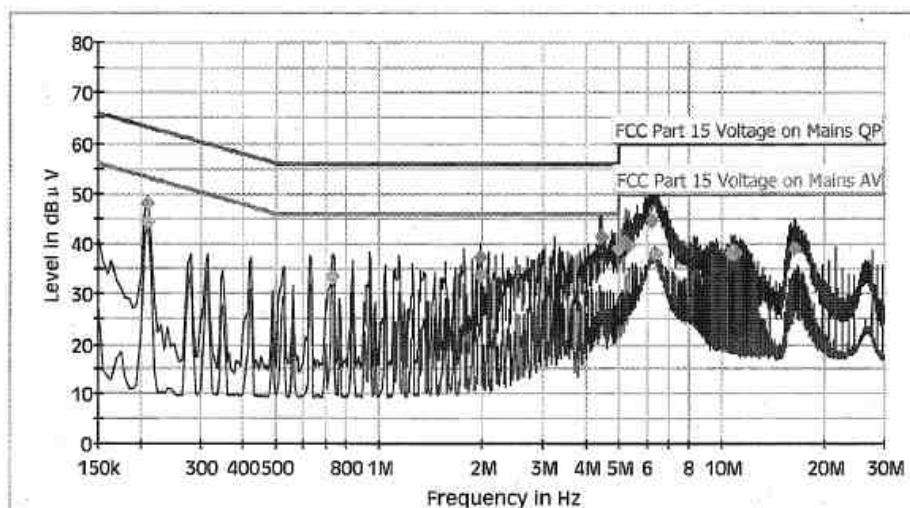
Date of testing	:	2008-02-01
Test standard	:	FCC Part 15.207(a)
Basic standard	:	ANSI C63.4: 2003
Frequency range	:	0.15 – 30MHz
Limits	:	FCC Part 15.207(a)
Kind of test site	:	Shield room

Test setup

Input Voltage	:	AC 120V, 60Hz
Operation Mode	:	A
Earthing	:	Not Connected
Ambient temperature	:	20°C
Relative humidity	:	40%
Atmospheric pressure	:	100 kPa

Test results of Conducted emissions refer to following test plot.

Test Plot of Conducted emissions - Live



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB μV)	Meas. Time (ms)	Bandwidth (kHz)	Line
0.210000	47.9	1000.000	9.000	L1
1.985000	37.4	1000.000	9.000	L1
4.440000	41.4	1000.000	9.000	L1
4.970000	38.9	1000.000	9.000	L1
5.190000	40.4	1000.000	9.000	L1
5.300000	39.7	1000.000	9.000	L1
6.260000	44.6	1000.000	9.000	L1
16.360000	38.9	1000.000	9.000	L1

(continuation of the "Final Measurement Detector 1" table from column 6 ...)

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB μV)	Comment
0.210000	10.1	15.3	63.2	
1.985000	10.2	18.6	56.0	
4.440000	10.4	14.6	56.0	
4.970000	10.5	17.1	56.0	
5.190000	10.5	19.8	60.0	
5.300000	10.5	20.3	60.0	
6.260000	10.5	15.4	60.0	
16.360000	11.4	21.1	60.0	

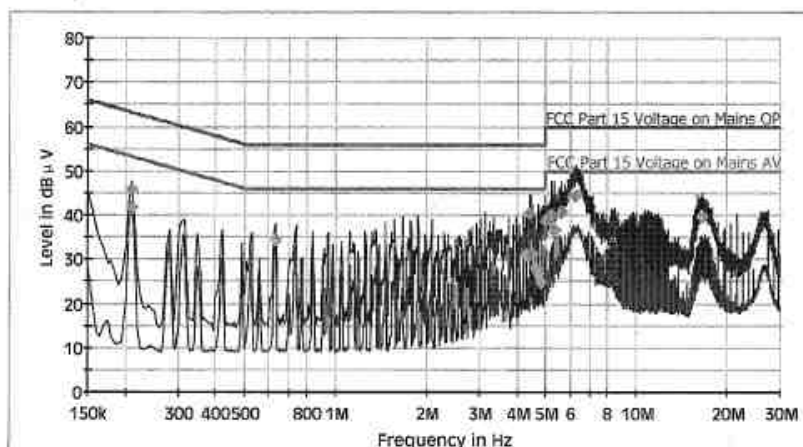
Final Measurement Detector 2

Frequency (MHz)	Average (dB μV)	Meas. Time (ms)	Bandwidth (kHz)	Line
0.210000	44.3	1000.000	9.000	L1
0.730000	33.5	1000.000	9.000	L1
1.985000	33.7	1000.000	9.000	L1
6.375000	38.0	1000.000	9.000	L1
10.660000	38.0	1000.000	9.000	L1
10.765000	38.4	1000.000	9.000	L1
10.870000	38.3	1000.000	9.000	L1
10.975000	37.9	1000.000	9.000	L1

(continuation of the "Final Measurement Detector 2" table from column 6 ...)

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB μV)	Comment
0.210000	10.1	8.9	63.2	
0.730000	10.1	12.5	46.0	
1.985000	10.2	12.3	46.0	
6.375000	10.5	12.0	50.0	
10.660000	10.8	12.0	50.0	
10.765000	10.8	11.6	50.0	
10.870000	10.8	11.7	50.0	
10.975000	10.9	12.1	50.0	

Test Plot of Conducted emissions - Neutral



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB μV)	Meas. Time (ms)	Bandwidth (kHz)	Line
0.210000	45.8	1000.000	9.000	N
4.425000	40.4	1000.000	9.000	N
4.970000	38.8	1000.000	9.000	N
5.190000	39.8	1000.000	9.000	N
5.345000	36.8	1000.000	9.000	N
5.625000	40.6	1000.000	9.000	N
6.290000	44.2	1000.000	9.000	N
16.500000	39.6	1000.000	9.000	N

(continuation of the "Final Measurement Detector 1" table from column 6 ...)

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB μV)	Comment
0.210000	10.1	17.4	63.2	
4.425000	10.3	15.6	56.0	
4.970000	10.3	17.2	56.0	
5.190000	10.4	20.2	60.0	
5.345000	10.4	23.2	60.0	
5.625000	10.4	19.4	60.0	
6.290000	10.4	15.8	60.0	
16.500000	11.2	20.4	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dB μV)	Meas. Time (ms)	Bandwidth (kHz)	Line
0.210000	41.7	1000.000	9.000	N
0.630000	34.4	1000.000	9.000	N
4.295000	31.0	1000.000	9.000	N
4.400000	30.8	1000.000	9.000	N
4.505000	31.1	1000.000	9.000	N
4.610000	28.1	1000.000	9.000	N
4.715000	26.7	1000.000	9.000	N
4.820000	24.9	1000.000	9.000	N

(continuation of the "Final Measurement Detector 2" table from column 6 ...)

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB μV)	Comment
0.210000	10.1	11.5	53.2	
0.630000	10.1	11.6	46.0	
4.295000	10.2	15.0	46.0	
4.400000	10.3	15.2	46.0	
4.505000	10.3	14.9	46.0	
4.610000	10.3	17.9	46.0	
4.715000	10.3	19.3	46.0	
4.820000	10.3	21.1	46.0	

5.8 Radiated emissions

RESULT:**Passed**

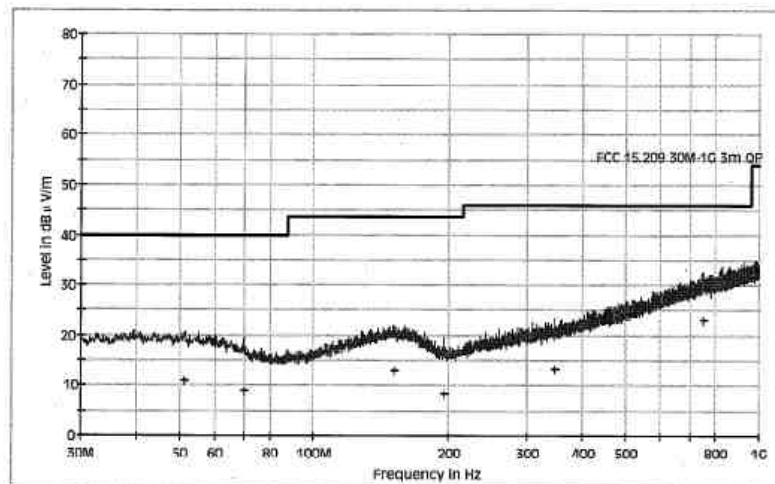
Date of testing	:	2008-02-03
Test standard	:	FCC Part 15.209
Basic standard	:	ANSI C63.4: 2003
Frequency range	:	30 – 1000MHz
Limits	:	FCC Part 15.209(a)
Kind of test site	:	3m Semi-Anechoic Chamber

Test Setup

Input Voltage	:	DC 5V via USB port
Operation Mode	:	A, B, C
Earthing	:	Not Connected
Ambient temperature	:	20°C
Relative humidity	:	40%
Atmospheric pressure	:	100 kPa

Test results of radiated emissions refer to following test plot.

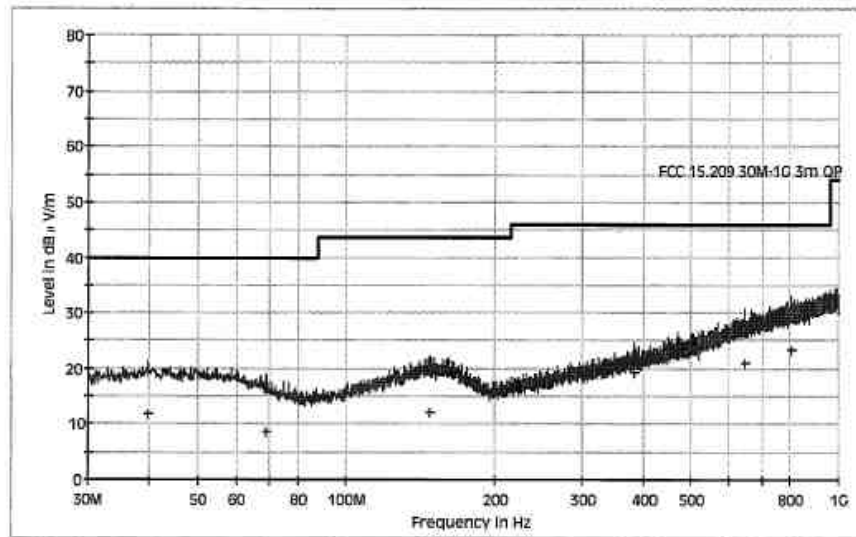
Test Plot of Radiated emissions of Low channel- Horizontal



Limit and Margin

Frequency (MHz)	QuasiPeak (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Polarity
51.350000	11.1	28.9	40.0	H
69.750000	9.0	31.0	40.0	H
151.500000	12.9	30.6	43.5	H
195.500000	8.3	35.2	43.5	H
346.600000	13.3	32.7	46.0	H
752.550000	23.1	22.9	46.0	H

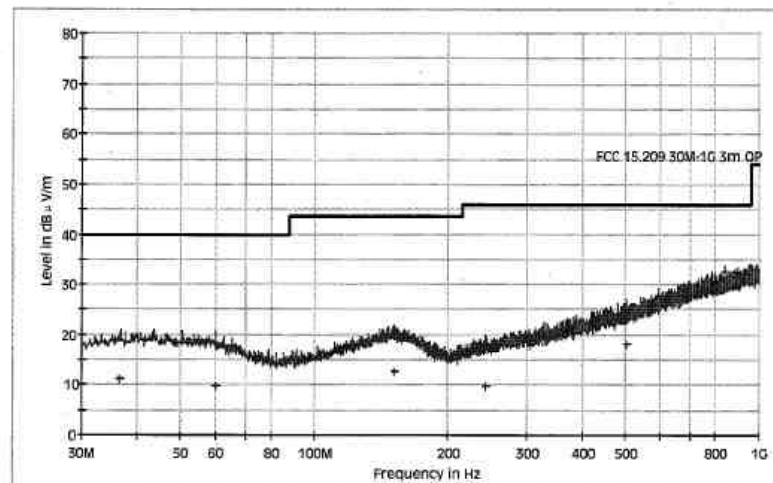
Test Plots of Radiated emissions of Low channel- Vertical



Limit and Margin

Frequency (MHz)	QuasiPeak (dB μ V/m)	Margin (dB)	Limit (dB μ V/m)	Polarity
39.800000	11.7	28.3	40.0	V
69.050000	8.6	31.4	40.0	V
147.850000	12.3	31.2	43.5	V
384.000000	19.3	26.7	46.0	V
644.300000	21.2	24.8	46.0	V
806.000000	23.5	22.5	46.0	V

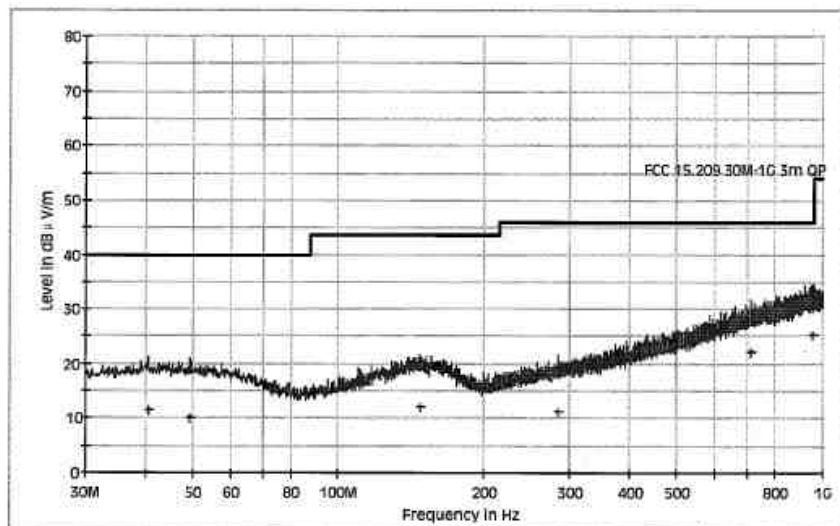
Test Plot of Radiated emissions of Middle channel- Horizontal



Limit and Margin

Frequency (MHz)	QuasiPeak (dB µV/m)	Margin (dB)	Limit (dB µV/m)	Polarity
36.600000	11.1	28.9	40.0	H
60.050000	9.8	30.2	40.0	H
151.350000	12.7	30.8	43.5	H
243.950000	9.8	36.2	46.0	H
501.150000	18.3	27.7	46.0	H
839.000000	32.6	13.4	46.0	H

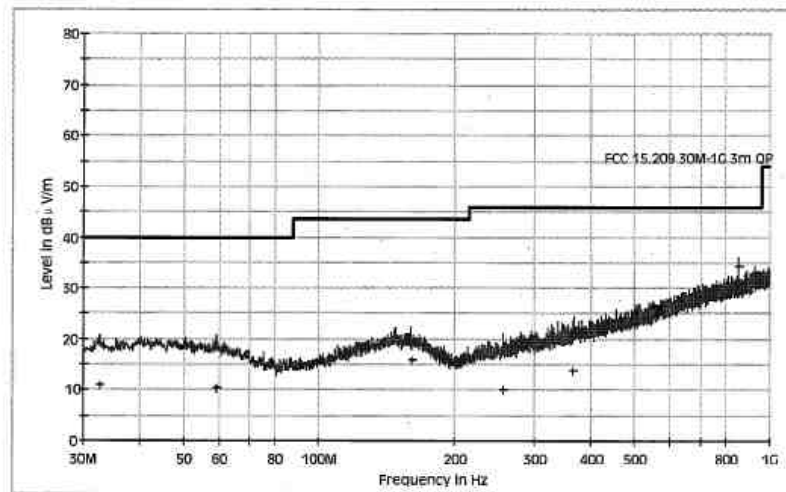
Test Plots of Radiated emissions of Middle channel- Vertical



Limit and Margin

Frequency (MHz)	QuasiPeak (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Polarity
40.450000	11.5	28.5	40.0	V
49.550000	10.1	29.9	40.0	V
148.100000	12.1	31.4	43.5	V
284.800000	11.3	34.7	46.0	V
710.600000	22.2	23.8	46.0	V
954.000000	25.3	20.7	46.0	V

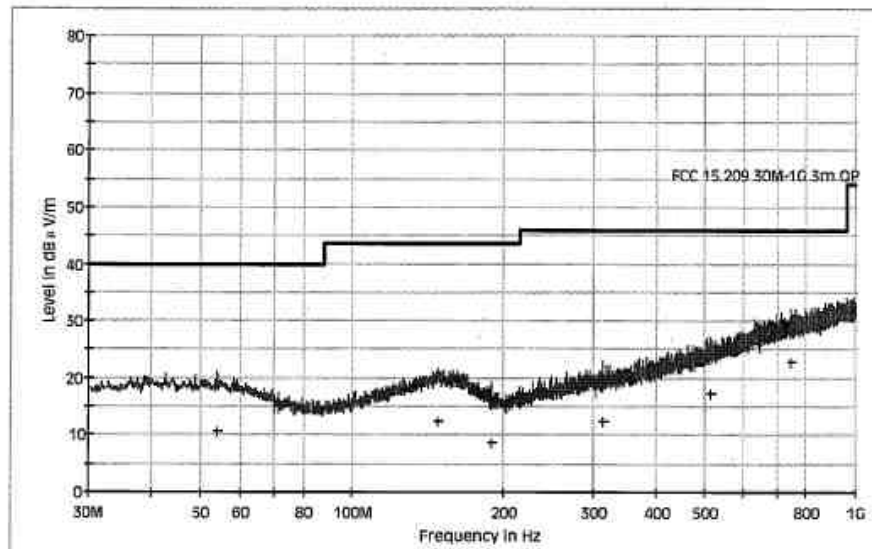
Test Plot of Radiated emissions of High channel- Horizontal



Limit and Margin

Frequency (MHz)	QuasiPeak (dB μ V/m)	Margin (dB)	Limit (dB μ V/m)	Polarity	MinPeak (dB μ V/m)
32.600000	10.8	29.2	40.0	H	---
59.150000	10.4	29.6	40.0	H	---
160.000000	15.8	27.7	43.5	H	---
256.200000	10.1	35.9	46.0	H	---
365.750000	13.8	32.2	46.0	H	---
853.000000	34.4	11.6	46.0	H	---

Test Plots of Radiated emissions of High channel- Vertical



Limit and Margin

Frequency (MHz)	QuasiPeak (dB μV/m)	Margin (dB)	Limit (dB μV/m)	Polarity
54.250000	10.6	29.4	40.0	V
147.850000	12.3	31.2	43.5	V
190.000000	8.7	34.8	43.5	V
314.050000	12.5	33.5	46.0	V
512.800000	17.3	28.7	46.0	V
744.550000	22.9	23.1	46.0	V

6. Photographs of the Test Set-Up

Photograph 1: Set-up for Conducted Emissions



Photograph 2: Set-up for Radiated Emissions



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



Photograph 4: Set-up for Spurious Emissions test (18GHz – 26GHz)



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