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Report No.: SHEM110800115501
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TEST REPORT

Application No. : SHEM110800115501

Applicant: Philips Electronics (Suzhou) Co.,Ltd

FCC ID: ZQ8RC198BR

Fundamental Frequency : 433.92MHz

Equipment Under Test (EUT):

Name: RF remote control

Model No.: RC198BR

Standards: FCC 47 CFR PART 15 SUBPART C

Date of Receipt: Aug. 26, 2011

Date of Test: Aug. 26, 2011 to Sep 7, 2011

Date of Issue: Sep 9, 2011

Test Result :

PASS *

* In the configuration tested, the EUT complied with the standards specified above.



Jim Xu
E&E Section Head
SGS-CSTC(Shanghai) Co., Ltd.

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E&E Project Engineer
SGS-CSTC(Shanghai) Co., Ltd.

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2 Test Summary

TEST ITEM	FCC REFERANCE	Test Method	RESULT
Powerline Conductived Emissions	15.207	ANSI C63.10: 2009	N/A
20dB Bandwidth	15.231(c)	ANSI C63.10: 2009	Pass
Limit of Transmission	15.231(a)(1)	ANSI C63.10: 2009	Pass
Radiated Emissions	FCC Part15 209(a) and FCC Part15 205	ANSI C63.10: 2009	Pass

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4 General Information

4.1 Client Information

Applicant : Philips Electronics (Suzhou) Co.,Ltd
Applicant Address: 19F-21F, 3rd Buliding, No 209, Zhu Yuan Road New District, Suzhou JiangSu, P.R.C
Manufacturer: Philips Electronics (Suzhou) Co.,Ltd
Manufacturer Address: 19F-21F, 3rd Buliding, No 209, Zhu Yuan Road New District, Suzhou JiangSu, P.R.C

4.2 Details of E.U.T.

Name: RF remote control
Trade Name: Philips
Model No.: RC198BR
Power Supply: 3VDC form Battery
Modulation Technique: FSK
Frequency Band : 433.92MHz

4.3 Description of Support Units

Name	Model No.	Remark
N/A		

4.4 Test Location

Tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.
Tel: +86 21 6191 5666 Fax: +86 21 6191 5655
No tests were sub-contracted.

4.5 Other Information Requested by the Customer

None.

4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2012-03-17.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3172 and C-3514 respectively. Date of Registration: 2009-11-30. Date of Expiry: 2012-03-17.

4.7 Test Instruments

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2011-6-3	2012-6-1
2	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2011-6-3	2012-6-1
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2011-3-12	2012-3-10
4	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2011-6-3	2012-6-1
5	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2010-10-9	2011-10-8
6	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY-2003P	--	2010-10-15	2011-10-14
7	CLAMP METER	FLUKE	316	86080010	2011-04-22	2012-04-20
8	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2010-10-15	2011-10-14
9	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2011-6-17	2012-6-16
11	Tunable Notch Filter	Wainwright instruments GmbH	WRCT1800.0/2000.0-0.2/40-5SSK	11	2011-1-26	2012-1-25
12	Tunable Notch Filter	Wainwright instruments GmbH	WRCT800.0/88 0.0-0.2/40-5SSK	9	2011-1-26	2012-1-25
13	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	2011-4-8	2012-4-7
14	Low nosie amplifier	TESEQ	LNA6900	70133	2011-7-5	2012-7-4
15	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2011-06-04	2012-06-03
16	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2011-05-07	2012-05-06

4.8 E.U.T. Operation

Input voltage: 3VDC (AA Battery X2)

Operating Environment:

Temperature: 25.0 °C

Humidity: 45 % RH

Atmospheric Pressure: 1010 mbar

EUT Operation: The EUT has been tested under RF Model .

Test program was used to control the EUT for staying in continuous transmitting mode.

The field strength of spurious emission was measured in the following position:EUT satnd-up position (Z axis),lie-down position (X, Y axis) .The worst emission was found in lie-down postion(X axis) and the worst case was recored.

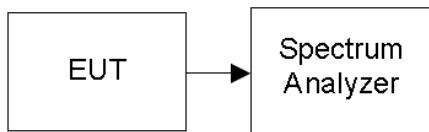
RF operation Frequency : 433.92MHz

5 Test Procedure & Measurement Data

5.1 20 dB Bandwidth

Test Requirement:	FCC Part 15 15.231(c)
Test date	Sep 5, 2011
Limit	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz. For devices operating above 900MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.
Measurment Procedure	The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW is set to 10KHz and VBW is set to 30KHz.

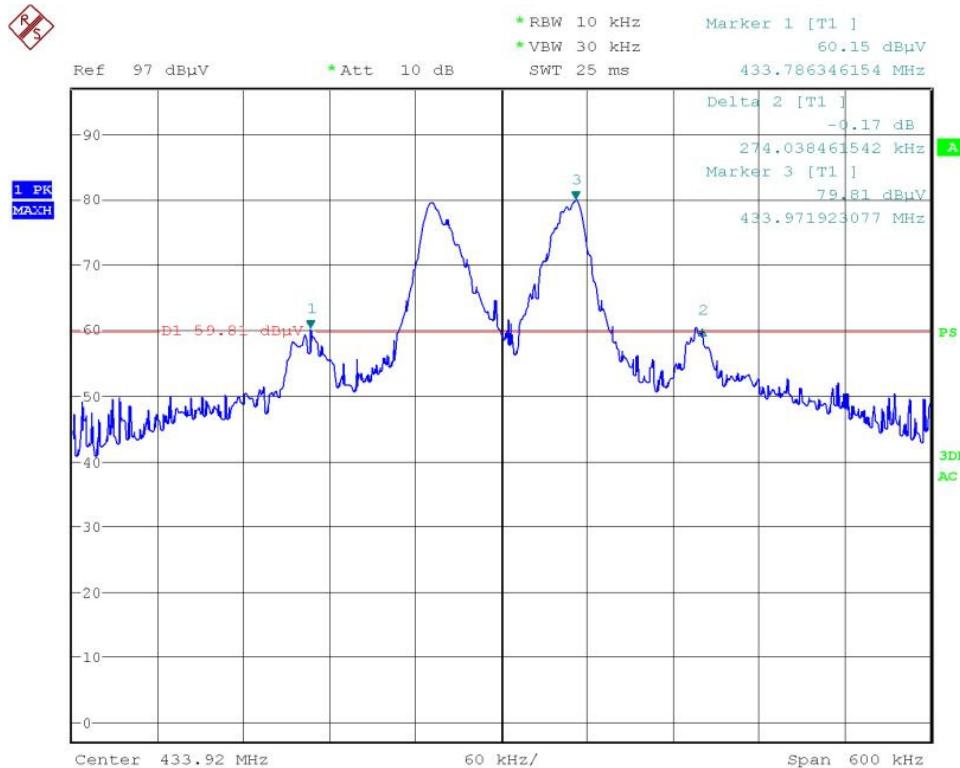
Test Configuration:



Measurement Result:

Frequency (MHz)	20 dB Bandwidth (kHz)	Limit (MHz)	Result
433.92	274.038	1.0848	PASS

20dB Bandwidth Test Plot



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5.2

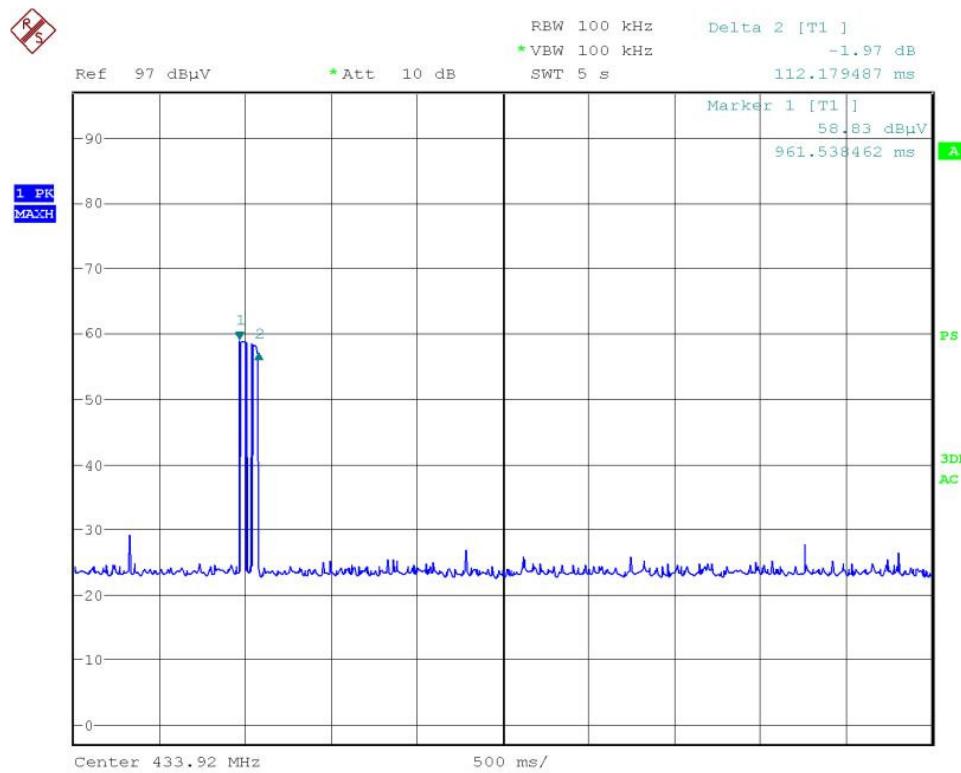
Limit of Transmission Time

Test Requirement: FCC Part15 231(a)(1)

Test date: Sep 5.2011

Limit According to 15.231(a)(1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Measurement Procedure: The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW and VBW are set to 100kHz, Span=0Hz.



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5.3

Radiated Emission Test

Test Requirement: FCC Part15 209(a) and FCC Part15 15.205

Test date: Sep 6.2011

Limit: 1.In the section 15.231(b): In addition to the provisions of Section 15.205, the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66 - 40.70	2250	225
70 - 130	1250	125
130 - 174	1250 to 3750*	125 to 375*
174 - 260	3750	375
260 - 470	3750 to 12500*	375 to 1250*
Above 470	12500	1250

2. According to §15.209(a), except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μ V/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

3. In the emission table above, the tighter limit applies at the band edges.

Measurement Procedure:

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.

Test instrumentation resolution bandwidth 120 kHz and Peak detector applies (30 MHz - 1000 MHz). 1MHz resolution bandwidth and Peak detector apply (1000 MHz – 25GHz)

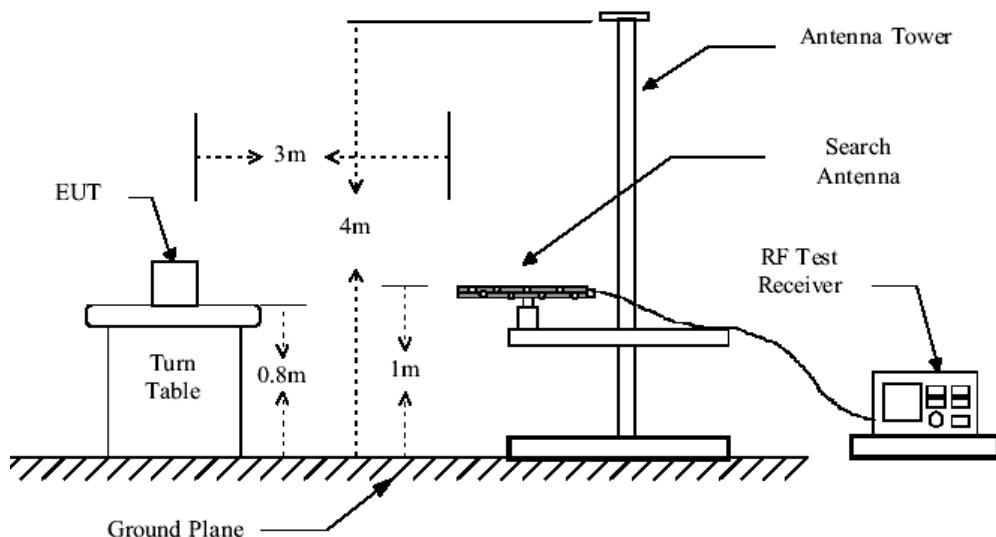
Above 1GHz

PEAK: RBW=VBW=1MHz / Sweep=AUTO

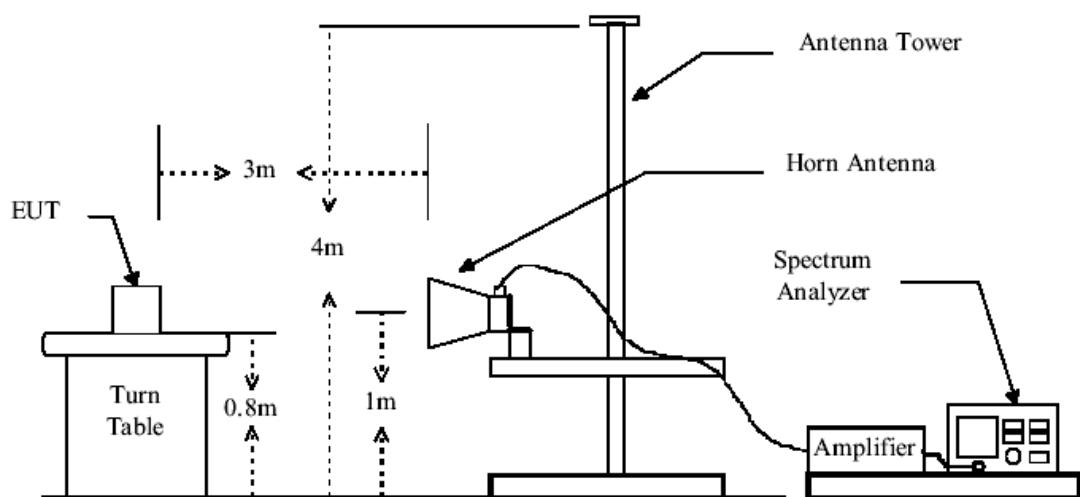
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until all frequency measured are complete.

Radiated Test Set-up:

Radiated Emission Test Set-up, Frequency Below 1000MHz



Radiated Emission Test Set-up Frequency Over 1GHz



Test Result:

FCC 15.205

Frequency (MHz)	Ant.Pol. (H/V)	Peak Reading Level (dBuV)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Peak Result (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)
433.920	H	85.58	16.5	2.4	24.3	80.18	100.80	-20.62
433.920	V	76.59	16.5	2.4	24.3	71.19	100.80	-29.61

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

Frequency (MHz)	Ant.Pol.	Peak Result (dBuV/m)	Duty Cycle (dB)	AVG Result (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)
433.920	H	80.18	-4.55	75.63	80.80	-5.17
433.920	V	71.19	-4.55	66.64	80.80	-14.16

Avg Result = Peak Result + Duty Cycle

Duty cycle

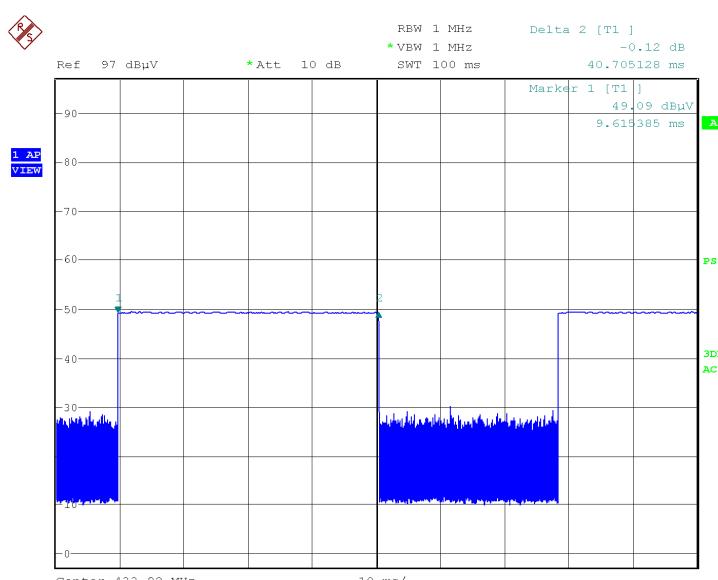
Measurement Result:

$T_{on} = 40.705\text{ms}$

$T_p = 68.910\text{ms}$

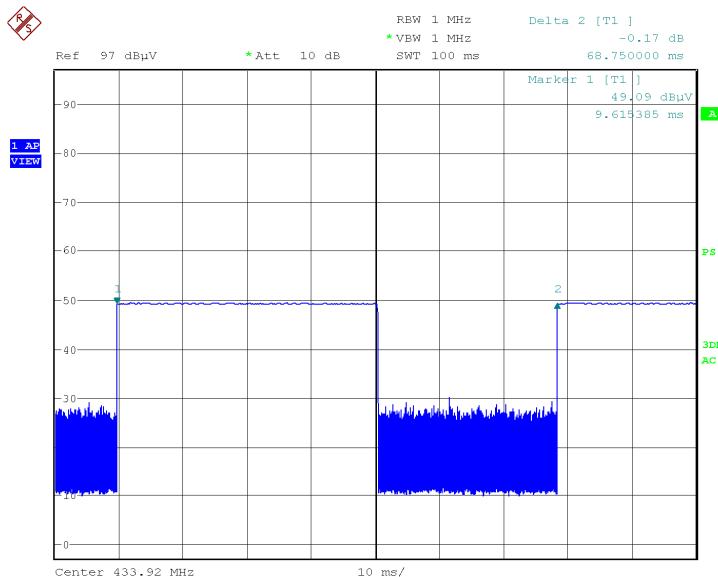
$\text{Factor} = 20 \cdot \log(T_{on}/T_p) = 20 \cdot \log (40.705/68.750) = -4.55\text{dB}$

Test Plot:

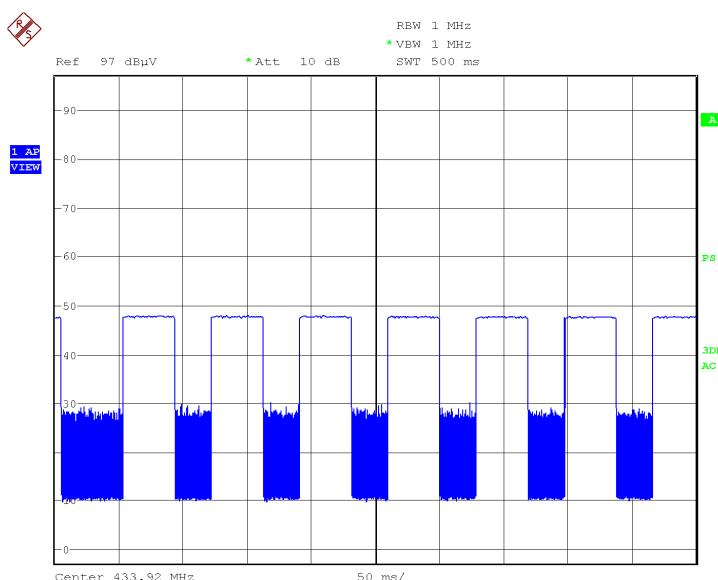


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Date: 20.SEP.2011 14:09:25

FCC 15.209(a)

Below 1GHz

Frequency (MHz)	Ant.Pol. (H/V)	Receiver Reading Level (dBuV)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Emission Level (dBV/m)	AVG Limit 3m (dBuV/m)	Margin (dB)
867.692	H	36.99	22.5	3.5	23.9	39.09	46.00	-6.91
933.084	H	25.02	23.2	3.7	23.9	28.20	46.00	-17.80
868.080	V	36.05	22.5	3.5	23.9	38.15	46.00	-7.85

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor

Remark:

1. No emission found between lowest internal used / generated frequency to 30 MHz. (9kHz ~ 30MHz)
2. Measuring frequencies from 30 MHz to the 1GHz.
3. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak detector mode.
- 4.. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.

Above 1GHz

1~6 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Ant.Pol. (H/V)	Receiver Reading Level (dBuV)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Emission Level (dBV/m)	AVG Limit 3m (dBuV/m)	Margin (dB)
3037.000	H	47.57	28.2	5.3	42.6	38.47	54.00	-15.53
3472.000	V	43.78	28.5	5.5	42.8	34.98	54.00	-19.02

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Margin (dB) = Remark result (dBuV/m) –Average Limit (dBuV/m).

5.4

FCC Part 15.205 Restricted Bands of Operations

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

End of Report