

## Electromagnetic Emission

# FCC MEASUREMENT REPORT

### CERTIFICATION OF COMPLIANCE

#### FCC Part 15 Certification Measurement

**PRODUCT** : Main Unit of Front Surround System HTP-SB300  
**MODEL/Serial No.** : HTP-SB300SB / BB-BHT26704A  
**Multiple Model** : NONE  
**FCC ID** : AJDT107  
**IC** : 775E-T107  
**APPLICANT** : Pioneer Corporation  
4-1, Meguro 1-chome Meguro-ku Tokyo 153-8654 Japan  
Attn. : James Ha / VP, QA, Pioneer Electronics (USA) Inc.  
**MANUFACTURER** : Dong Guan Vision Electronics Co., Ltd.  
Yintai 1 Lu, YinHu Industrial XieGang-zhen,  
Dongguan 523590, People's Republic of China.  
**FCC CLASSIFICATION** : DSS: Spread Spectrum Transmitter  
**TYPE OF MODULATION** : GFSK  
**FREQUENCY CHANNEL** : 2 404 MHz to 2 476 MHz and Channel Spacing 3 MHz (25 Channels)  
**ANTENNA TYPE** : PIFA Antenna (Integral)  
**ANTENNA GAIN** : 2.08 dBi max  
**RULE PART(S)** : FCC Part 15 Subpart C  
RSS-210 Issue 7 – Category I Equipment, Annex 8  
**FCC PROCEDURE** : ANSI C63.4-2003  
**TEST REPORT No.** : ETLE090826.09  
**DATES OF TEST** : October 29, 2009 to November 05, 2009  
**REPORT ISSUE DATE** : November 18, 2009  
**TEST LABORATORY** : ETL Inc. (FCC Designation No. : KR0022, IC OATS number : 6473B-1)

The Main Unit of Front Surround System HTP-SB300, Model HTP-SB300SB has been tested in accordance with the measurement procedures specified in ANSI C63.4-2003 at the ETL Test Laboratory and has been shown to be complied with the electromagnetic radiated emission limits specified in FCC Rule Part15 Subpart C section 15.247 and RSS-210 Issue 7 – Category I Equipment, Annex 8.

I attest to the accuracy of data. All measurement herein was performed by me or was made under my supervision and is correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.



Hyung Seok, Lee / Chief Engineer

**ETL Inc.**

**#371-51, Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea**

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## FCC MEASUREMENT REPORT

**Scope** – Measurement and determination of electromagnetic emission (EME) of radio frequency devices including intentional radiators and/or unintentional radiators for compliance with the technical rules and regulations of the U.S Federal Communications Commission(FCC)

### General Information

<b>Applicant Name</b>	: Pioneer Corporation
<b>Address</b>	: 4-1, Meguro 1-chome Meguro-ku Tokyo 153-8654 Japan
<b>Attention</b>	: James Ha / VP, QA, Pioneer Electronics (USA) Inc.

- **EUT Type** : Main Unit of Front Surround System HTP-SB300
- **Model Number** : HTP-SB300SB
- **S/N** : BB-BHT26704A
- **Freq. Range** : 2 404 MHz – 2 476 MHz
- **Number of Channels** : 25
- **Modulation Technique** : GFSK
- **Frequency Channel** : 2 404 MHz to 2 476 MHz and Channel Spacing 3 MHz (25 Channels)
- **Antenna Type** : PIFA Antenna (Integral)
- **Antenna Gain** : 2.08 dBi max
- **FCC Rule Part(s)** : FCC Part 15 Subpart C
- **IC Equipment Category** : RSS-210 Issue 7– Category I Equipment, Annex 8
- **Test Procedure** : ANSI C63.4-2003
- **FCC Classification** : DSS: Spread Spectrum Transmitter
- **Place of Tests** : ETL Inc. Testing Lab.  
Radiated Emission test;  
#499-1, Sagot-ri, Seosin-myeon, Hwaseong-si, Gyeonggi-do,  
445-882, Korea  
  
Conducted Emission test;  
ETL Inc. Testing Lab.  
371-51, Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea

## 1. INTRODUCTION

The measurement test for radiated and conducted emission test was conducted at the ETL Inc. The site is constructed in conformance with the requirements of the ANSI C63.4-2003 and CISPR Publication 16. The ETL has site descriptions on file with the FCC for 3 m and 10 m site configurations. Detailed description of test facility was found to be in compliance with FCC Rules according to the ANSI C63.4-2003 and registered to the Federal Communications Commission (FCC Designation Number : KR0022).

The measurement procedure described in American National Standard for Method of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ANSI C63.4-2003) was used in determining radiated and conducted emissions from the Pioneer Corporation Model: HTP-SB300SB

## 2. PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the Main Unit of Front Surround System HTP-SB300 (model: HTP-SB300SB).

### 2.2 General Specification

Item	Specification
Power (Adapter)	Input: AC 100 V – 240 V; 50 Hz/60 Hz; 1.5 A Max
	Output: DC 24.0 V; 2,7 A
Dimension	900 mm (W) x 108 mm (H) x 95 mm (D)
Weight	2.9 kg
Operating Temperature	- 20 °C ~ 55 °C
Rated power output	Front: 50 W per channel (1 kHz, 6, 10 %)
	Center: 50 W (1 kHz, 6, 10 %)
HDMI terminal	Input: 19-pin x2
	Output: 19-pin (5 V, 100 mA)
Audio input	Coaxial x1
Front Speakers	Enclosure: Closed-box type
	System: 7.7 cm (3.1.) 1-way system
	Speakers: 7.7 cm (3.1.) cone type
	Impedance: 6
	Frequency range: 200 Hz to 20 kHz
	Maximum input power: 100 W
Center Speakers	Enclosure: Closed-box type
	System: 7.7 cm (3.1.) 1-way system
	Speakers: 7.7 cm (3.1.) cone type x2
	Impedance: 12
	Frequency range: 200 Hz to 20 kHz
	Maximum input power: 100 W
Power Requirements	AC 120 V/60 Hz
Power Consumption	40 W
In Standby	1 W
Antenna Gain	2.08 dBi max
RF Modulation Type	GFSK

## Frequency Channel Table

Channel ID	MHz	Channel ID	MHz	Channel ID	MHz
0	2 404	9	2 431	18	2 458
1	2 407	10	2 434	19	2 461
2	2 410	11	2 437	20	2 464
3	2 413	12	2 440	21	2 467
4	2 416	13	2 443	22	2 470
5	2 419	14	2 446	23	2 473
6	2 422	15	2 449	24	2 476
7	2 425	16	2 452		
8	2 428	17	2 455		

## 3. DESCRIPTION OF TESTS

The tests documented in this report were performed in accordance with ANSI C63.4-2003 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.247.

IC Equipment Category: RSS-210 Issue 7 – Category I Equipment, Annex 8

### 3.1 Radiated Emission Measurement

Radiated emission measurements were made in accordance with § 13 in ANSI C63.4-2003 "Measurement of Intentional radiators" The measurements were performed over the frequency range of 30 MHz to 40 GHz using antenna as the input transducer to a Spectrum analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Peak, Quasi-peak, Average" within a bandwidth of 120 kHz and above 1GHz is 1 MHz.

Preliminary measurements were made at 3 m using broadband antennas, and spectrum analyzer to determine the frequency producing the maximum emission in shielded room. Appropriate precaution was taken to ensure that all emission from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth and height with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 MHz to 1000 MHz using Log-Bicon antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used. Final measurements were made open site at 3 m. The test equipment was laced on a wooden turn-table. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined by manual. The detector function was set to CISPR Quasi-peak mode and the bandwidth of the receiver was set to 120 kHz or 1 MHz depending on the frequency of type of signal. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0,8 m high nonmetallic 1m x 1.5 m table. The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; the antenna height was varied 1 m to 4 m and stopped at the azimuth or height producing the maximum emission.

Varying the mode of operating frequencies of the EUT maximized each emission. The system was tested in all the three orthogonal planes and changing the polarity of the antenna. The worst-case emissions are recorded in the data tables. If necessary, the radiated emission measurement could be performed at a closer distance to ensure higher accuracy and the results were extrapolated to the specified distance using an inverse linear distance extrapolation factor (20 dB/decade) as per section 15.31(f).

Photographs of the worst-case emission can be seen in Photographs of the worst-case emission test setup can be seen in Appendix B.

## 3.2 Conducted Emission Measurement

Conducted emissions measurements were made in accordance with section § 13 in ANSI C63.4-2003 "measurement of intentional radiators". The measurements were performed over the frequency range of 0.15 MHz to 30 MHz using a 50  $\Omega$  / 50  $\mu$ H LISN as the input transducer to a Spectrum Analyzer or a Test Receiver. The measurements were made with the detector set for "Peak" amplitude within a bandwidth of 9 kHz or for "quasi-peak" within a bandwidth of 9 kHz.

The line-conducted emission test is conducted inside a shielded anechoic chamber room with 1 m x 1.5 m x 0.8 m wooden table which is placed 0.4 m away from the vertical wall and 1.5 m away from the side wall of the chamber room. Two LISN are bonded to the shielded room. The EUT is powered from the LISN and the support equipment is powered from the other LISN. Power to the LISNs are filtered by a noise cut power line filters. All electrical cables are shielded by braided tinned steel tubing with inner  $\phi$  1.2 cm. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and these supply lines will be connected to the LISN. Non-inductive bundling to a 1 m length shortened all interconnecting cables more than 1 m. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the EMI Test Receiver to determine the frequency producing the maximum emission from the EUT. The frequency producing the maximum level was reexamined using to set Quasi-Peak mode by manual, after scanned by automatic Peak mode from 0.15 MHz to 30 MHz. The bandwidth of the spectrum analyzer was set to 9 kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission.

Photographs of the worst-case emission can be seen in Photographs of the worst-case emission test setup can be seen in Appendix B.



## 3.3 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
<sup>1</sup> 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 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41			

<sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> 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 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, 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.

## 4. TEST CONDITION

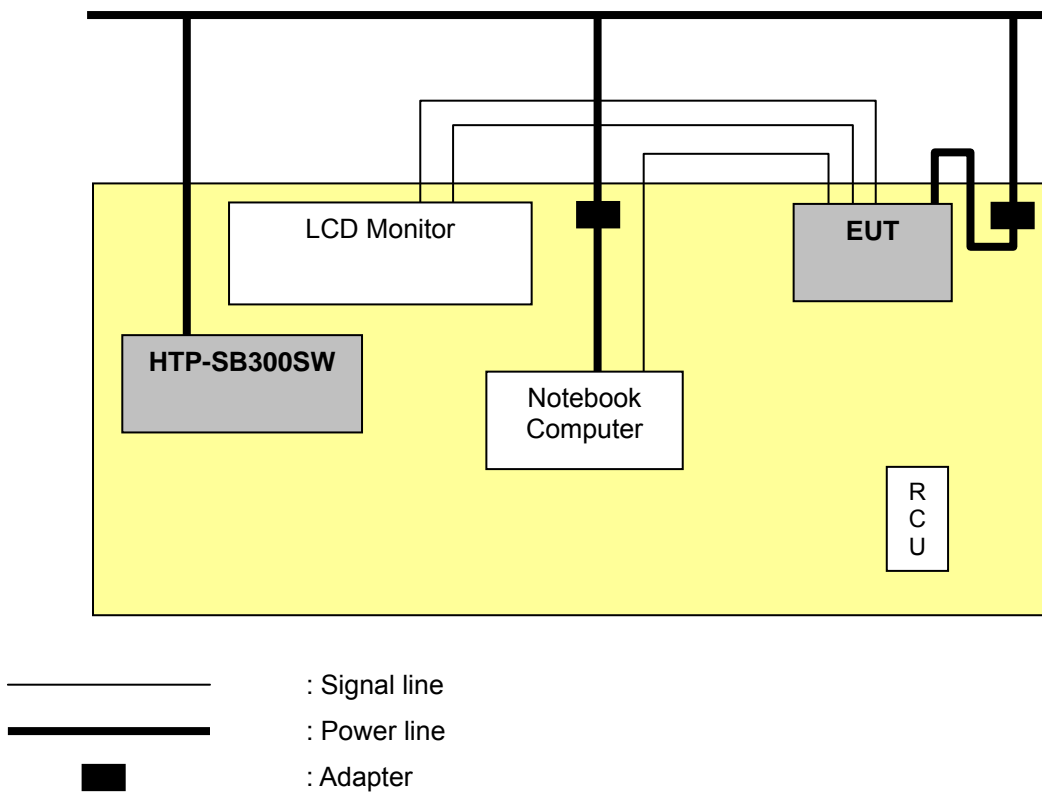
### 4.1 Test Configuration

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the following conditions and configurations were used.

### 4.2 Description of Test modes

Main Unit of Front Surround System HTP-SB300 that has the control software.

### 4.3 The setup drawing(s)



## 5. TEST RESULTS

### 5.1 Summary of Test Results

The measurement results were obtained with the EUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum emission of the EUT are reported.

47 CFR Part 15, Subpart C	RSS Standards	Measurement Required	Result
-	RSS-210, A8.1(a)	Channel Bandwidth	Pass
15.247(b)(3)	RSS-210, A8.4(4)	Maximum Peak Output Power	Pass
15.247(d)	RSS-210, A8.5	Bandwidth of Frequency Band Edges	Pass
15.247(e)	RSS-210, A8.2(b)	Power Spectral Density	Pass
15.247(a)(1)	RSS-210, A8.1(b)	Frequency Separation	Pass
15.247(a)(1)(iii)	RSS-210, A8.1(d)	Number of Hopping Channels	Pass
15.247(a)	RSS-210, A8.1(d)	Time of Occupancy(Dwell time)	Pass
15. 209(a)	RSS-210, A8.5	Spurious Emissions	Pass
15. 207	RSS-210, A8.5	Conducted Emissions	Pass
-	RSS-Gen, 7.2.3	Receiver Spurious Emission	Pass
15.247(i) 1.1307(b)(1)	RSS-210, A8.5	RF Exposure	Pass

The data collected shows that the **Pioneer Corporation / Main Unit of Front Surround System HTP-SB300 / HTP-SB300SB** complied with technical requirements of above rules part 15. 207, 209 and 15.247 and RSS-210, Gen Limits.

The equipment is not modified anything, mechanical or circuits to improve EMI status during a measurement. No EMI suppression device(s) was added and/or modified during testing.

## 5.2 Channel Bandwidth

### Bandwidth (99 % BW)

EUT	Main Unit of Front Surround System HTP-SB300
Model	HTP-SB300SB
Limit apply to	RSS-210, A8.2(a)
Test Date	October 29, 2009
Operating Condition	RF transmitting continuously during the tested.
Result	Passed

### Test Data

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
Low	2 404	1.710	< Carrier frequency separation
Mid	2 440	1.710	
High	2 476	1.725	

#### NOTES:

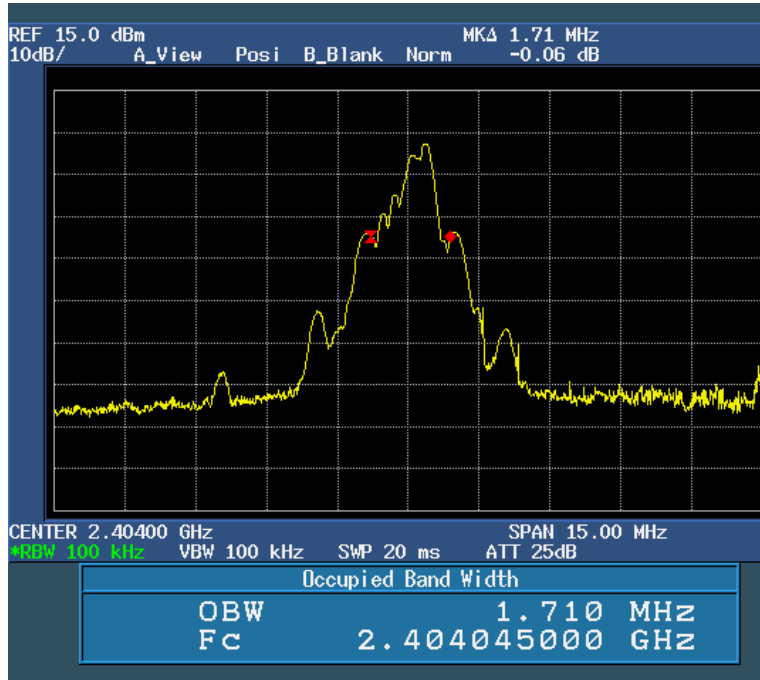
1. Measure frequency separation of relevant channel using spectrum analyzer.
2. Please see the measured plot in next page.



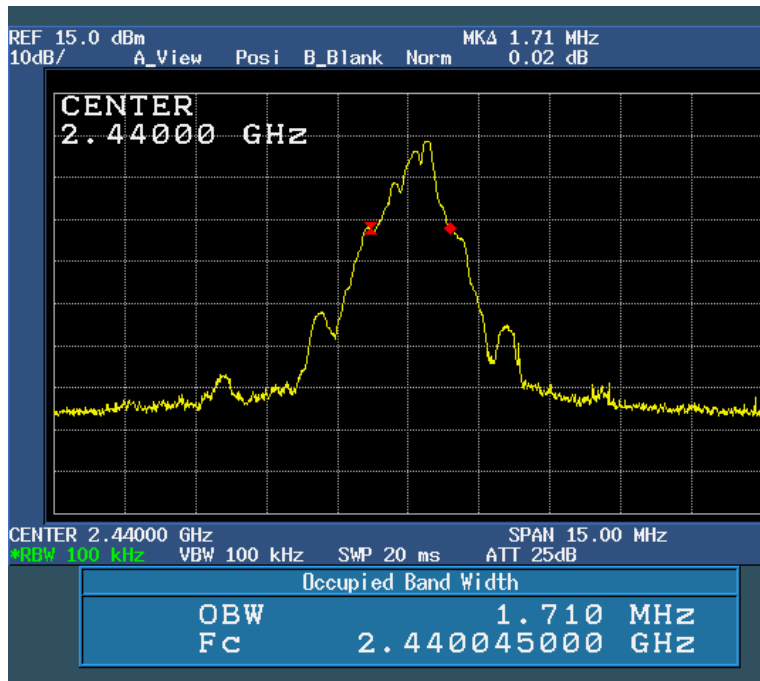
Test Engineer: Jeong Hwan, Pyo

## Plots of Bandwidth (99%)

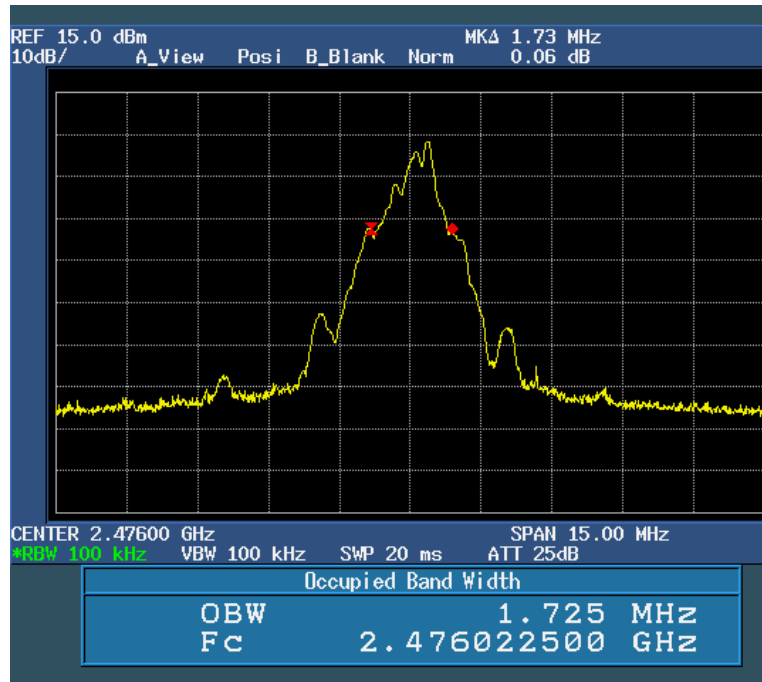
[2 404 MHz]



[2 440 MHz]



[2 476 MHz]



## 5.3 Maximum peak conducted output power

EUT	Main Unit of Front Surround System HTP-SB300
Model	HTP-SB300SB
Limit apply to	FCC Part 15.247(b)(3), RSS-210, A8.4(4)
Test Date	October 30, 2009
Operating Condition	RF transmitting continuously during the tested.
Result	Passed

### Limit

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

- For systems using digital modulation operating in the 2 404-2 476 MHz band: 1 watt

### Test Data

Channel	Frequency(MHz)	Output Power (dBm)	Limit
Low	2 404	4.73	< 30 dBm(1W)
Mid	2 440	5.84	
High	2 476	5.44	

### NOTES:

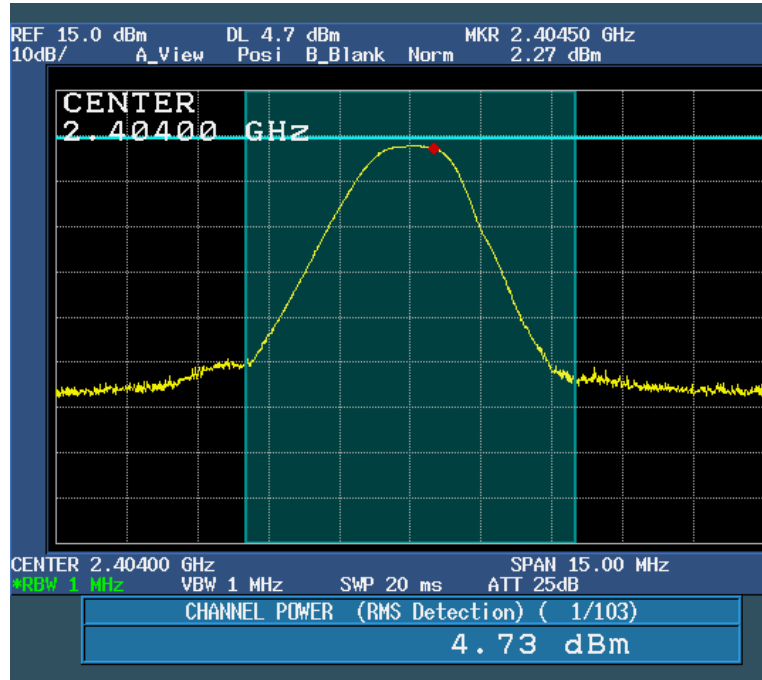
1. Measure conducted Channel power of relevant channel using Spectrum analyzer
2. RBW 1 MHz, VBW 1 MHz



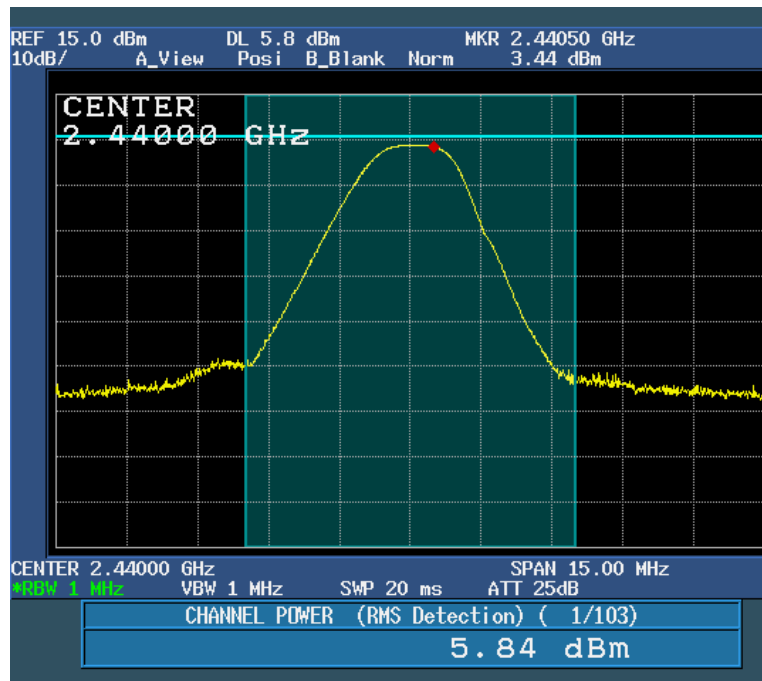
Test Engineer : Jeong Hwan, Pyo

## Plots of Maximum Peak Output Power

[2 404 MHz]

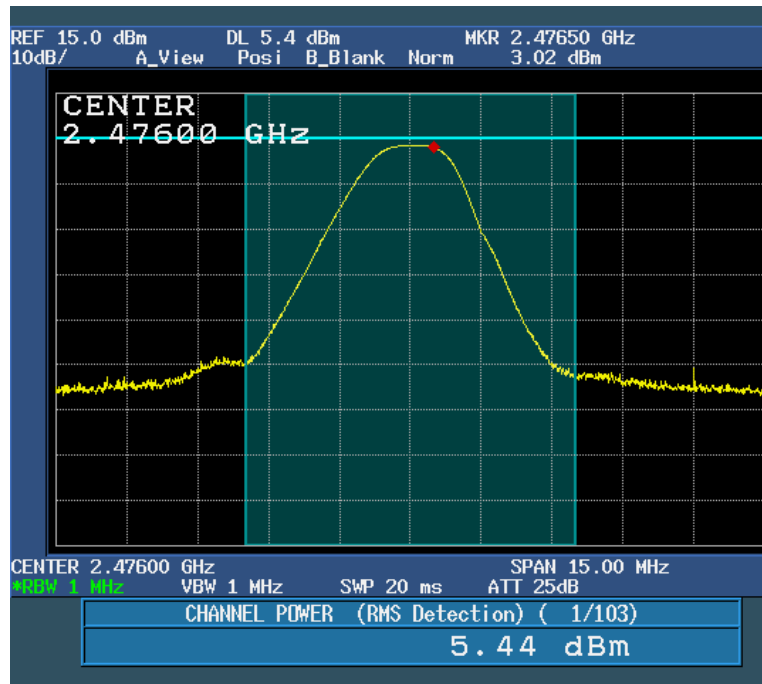


[2 440 MHz]





[2 476 MHz]



## 5.4 Bandwidth of Frequency Band Edges

EUT	Main Unit of Front Surround System HTP-SB300
Model	HTP-SB300SB
Limit apply to	FCC Part 15.247(d), RSS-210, A8.5
Test Date	October 30, 2009
Operating Condition	RF transmitting continuously during the tested.
Result	Passed

### Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

### Test Results

- Refer to see the measured plot in next page.

### NOTES:

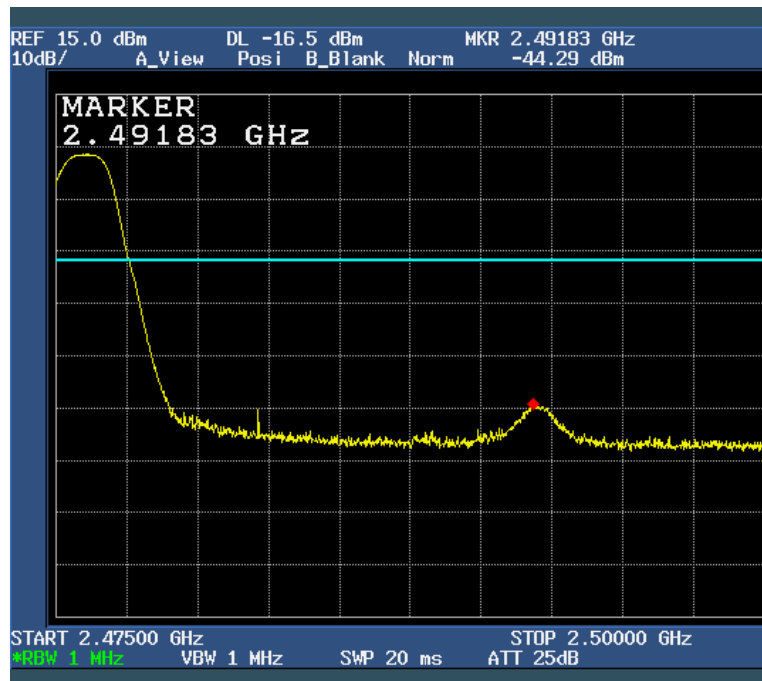
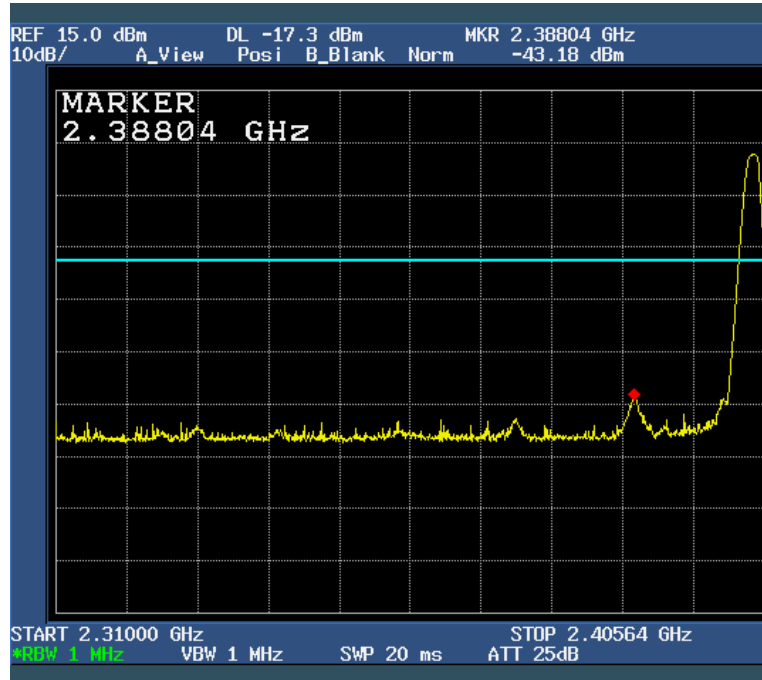
1. The test was performed to make a direct field strength measurement at the band edge frequencies.



Test Engineer : Jeong Hwan, Pyo

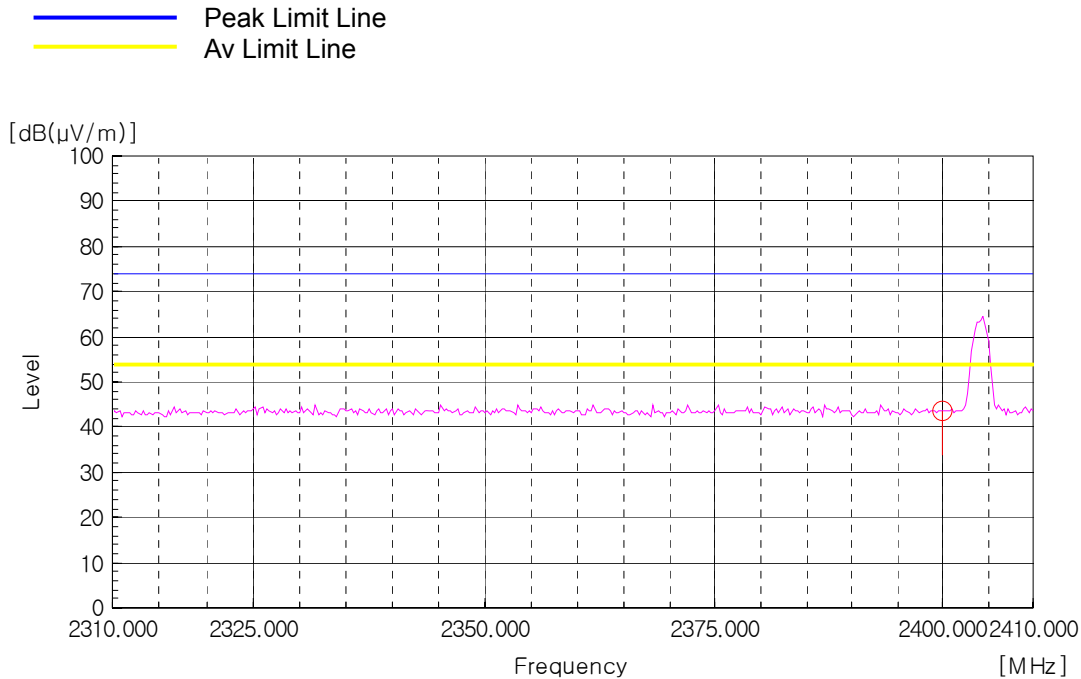
## Bandwidth of Frequency Band Edges

Conducted

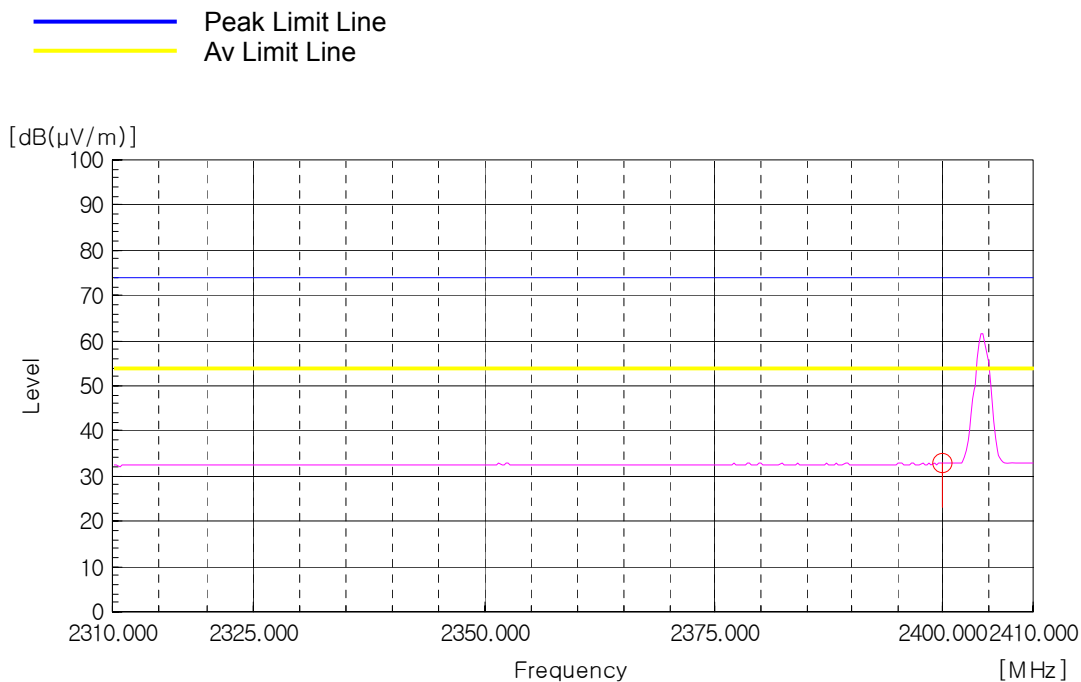


## Radiated

Peak Detector: RBW: 1 MHz, VBW: 1 MHz (2310 MHz – 2390 MHz), Worst case (0CH, Horizontal)

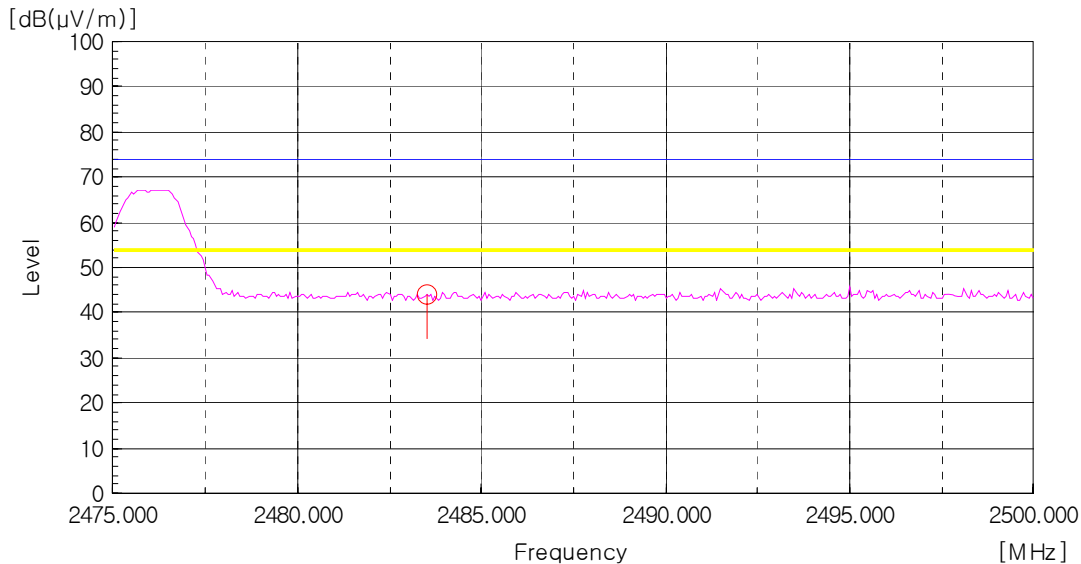


Av Detector: RBW: 1 MHz, VBW: 1 MHz (2310 MHz – 2390 MHz), Worst case (0CH, Horizontal)



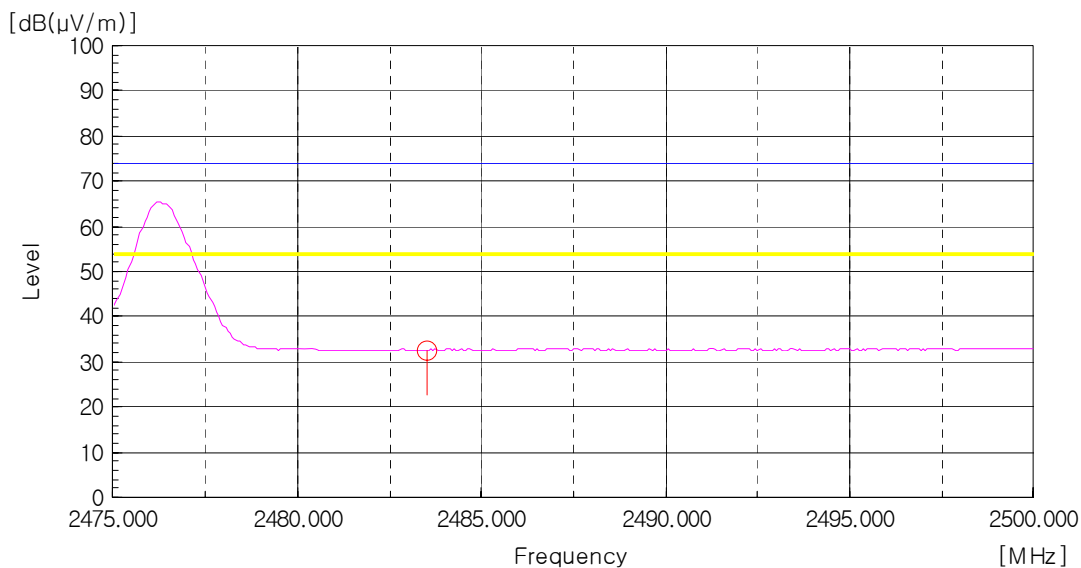
Peak Detector: RBW: 1MHz, VBW: 1MHz (2 483.5 MHz – 2 500 MHz), Worst case (24CH, Horizontal)

— Peak Limit Line  
— Av Limit Line



Av Detector: RBW: 1MHz, VBW: 10Hz (2 483.5 MHz – 2 500 MHz), Worst case (24CH, Horizontal)

— Peak Limit Line  
— Av Limit Line



## 5.5 Frequency Separation

EUT	Main Unit of Front Surround System HTP-SB300
Model	HTP-SB300SB
Limit apply to	FCC Part 15.247(a)(1), RSS-210, A8.1(b)
Test Date	November 03, 2009
Operating Condition	RF transmitting continuously during the tested.
Result	Passed

### Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

### Test Data

EUT Channel Separation (MHz)	20 dB Bandwidth (MHz)	Limit
3.003 (Worst)	1.98 (Worst)	> 25 kHz

### NOTES:

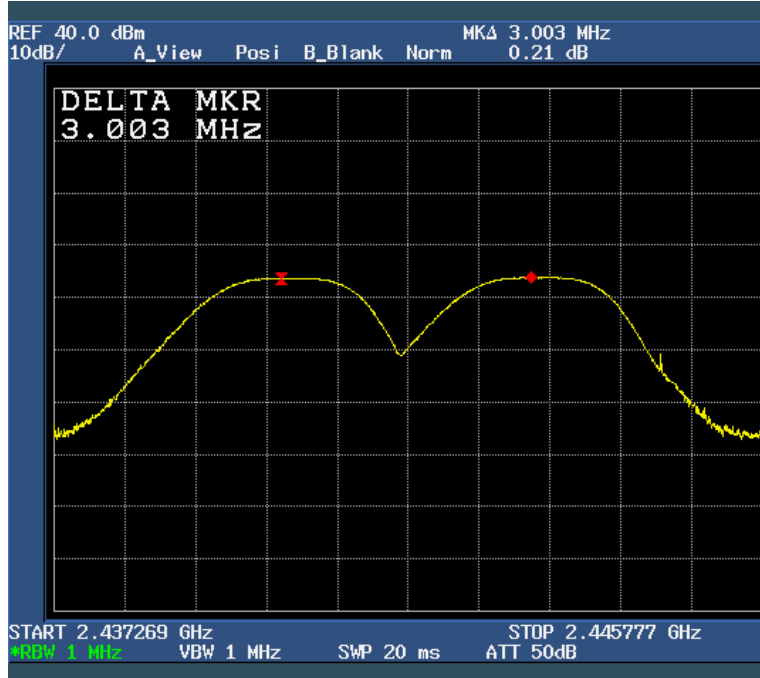
1. Measure frequency separation of relevant channel using spectrum analyzer.
2. Please see the measured plot in next page.



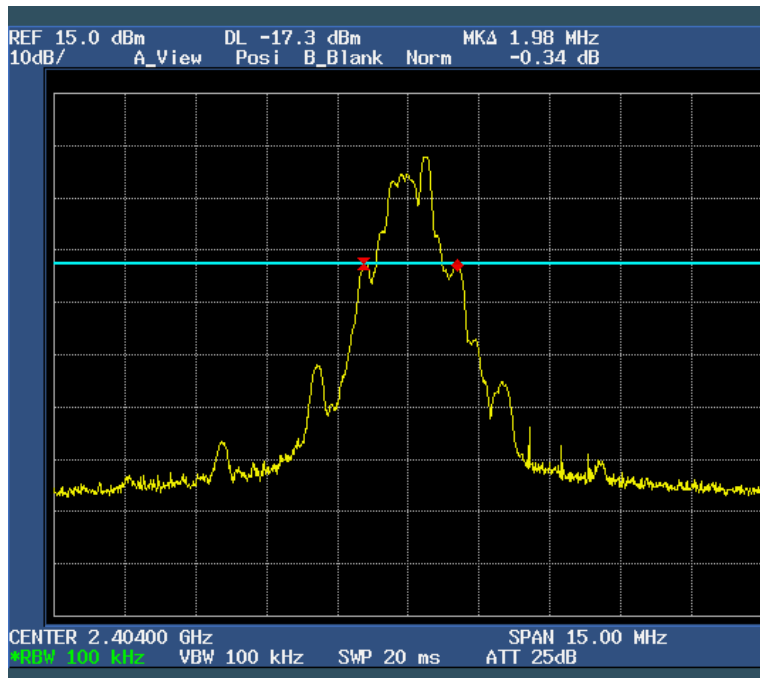
Test Engineer: Jeong Hwan, Pyo

## Frequency Separation

[Channel Separation]



[20 dB Bandwidth]



## 5.6 Number of Hopping Channels

EUT	Main Unit of Front Surround System HTP-SB300
Model	HTP-SB300SB
Limit apply to	FCC Part 15.247(a)(1)(iii), RSS-210, A8.1(d)
Test Date	November 03, 2009
Operating Condition	RF transmitting continuously during the tested.
Result	Passed

### Limit

Frequency hopping systems in the 2 400-2 483.5 MHz band shall use at least 15 channels.

### Test Data

Result	Limit
25	> 15 Channel

### NOTES:

1. Measure number of hopping channel of relevant channel using spectrum analyzer.
2. Please see the measured plot in next page.

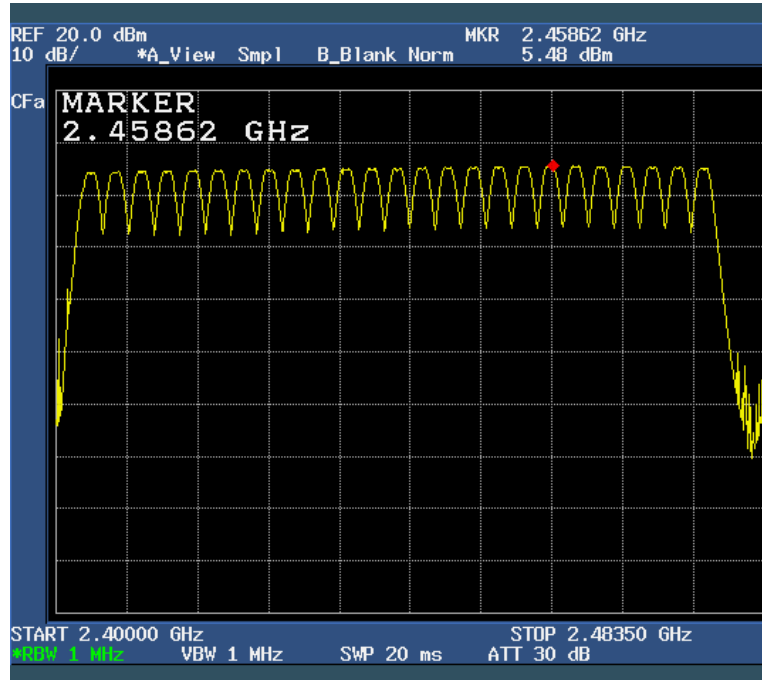


Test Engineer: Jeong Hwan, Pyo



## Number of Hopping Channels

[Hopping Channels]



## 5.7 Time of Occupancy

EUT	Main Unit of Front Surround System HTP-SB300
Model	HTP-SB300SB
Limit apply to	FCC Part 15.247(a)(1)(iii), RSS-210, A8.1(d)
Test Date	November 03, 2009
Operating Condition	RF transmitting continuously during the tested.
Result	Passed

### Limit

Frequency hopping systems in the 2 400-2 483.5 MHz band. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

### Test Data

Pulse Time (ms)	Total of Dwell (ms)	Limit (ms)
16.63	16.78	400.000

### NOTES:

1. Measure time of occupancy of relevant channel using spectrum analyzer.
2. Please see the measured plot in next page.



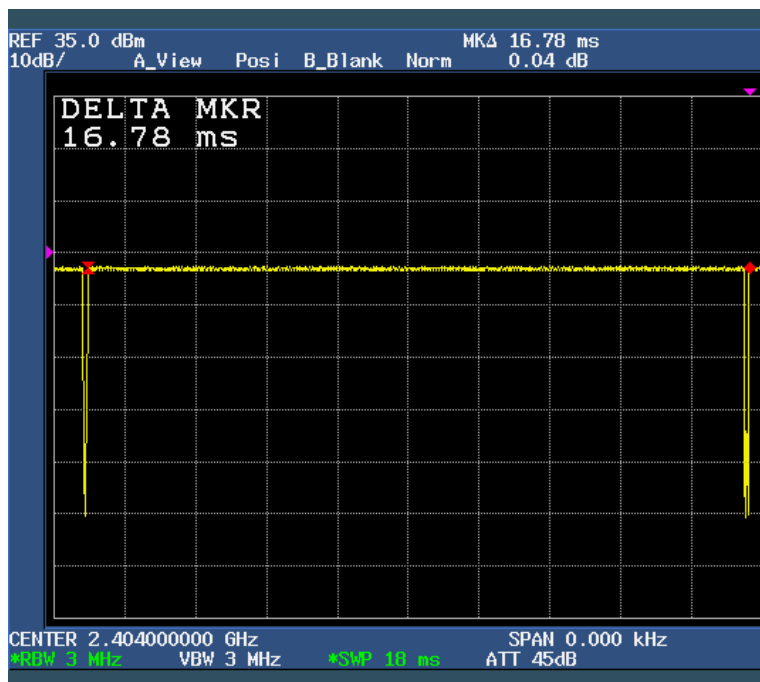
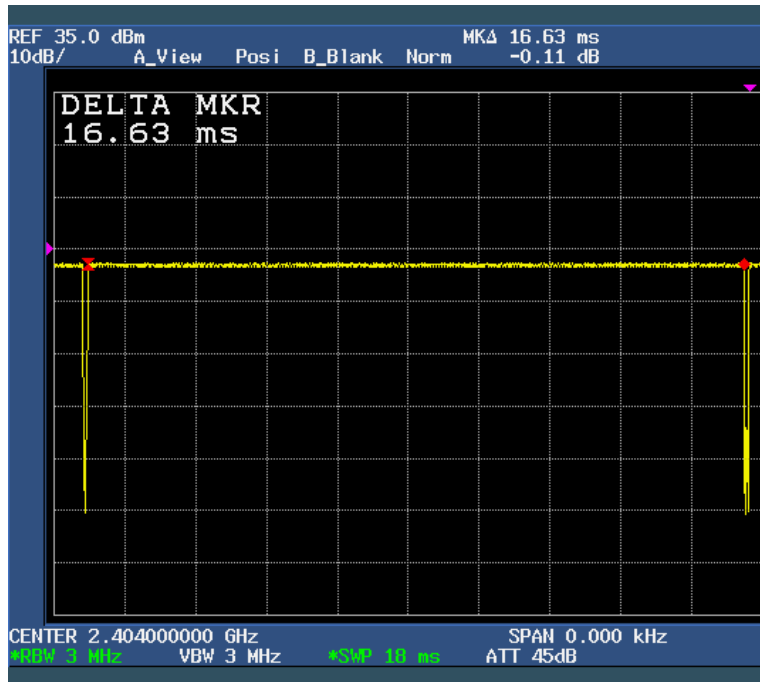
Test Engineer: Jeong Hwan, Pyo

### Time of Occupancy

$$0.4 \text{ s} \times 25(\text{CH}) = 10 \text{ s}$$

$$16.63 \text{ ms} \times ((1/16.78 \text{ ms})/25) \times 10 \text{ s} \times = 396 \text{ ms}$$

## Time of Occupancy



## 5.8 Spurious Emissions

### 5.8.1 Radiated Emissions(TX)

EUT	Main Unit of Front Surround System HTP-SB300
Model	HTP-SB300SB
Limit apply to	FCC Part 15.109, 209
Test Date	November 04, 2009
Operating Condition	Low CH, Middle CH, High CH Transmission
Result	Passed

#### Limit

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:

Frequencies (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measurement Distance (m)
30 – 88	100*	40.0	3
88 – 216	150*	43.5	3
216 – 960	200*	46.0	3
Above 960	500	54.0	3

\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

#### Test Results

- Refer to see the measured plot in next page.



Test Engineer : Jeong Hwan, Pyo

## Radiated Emissions Test data

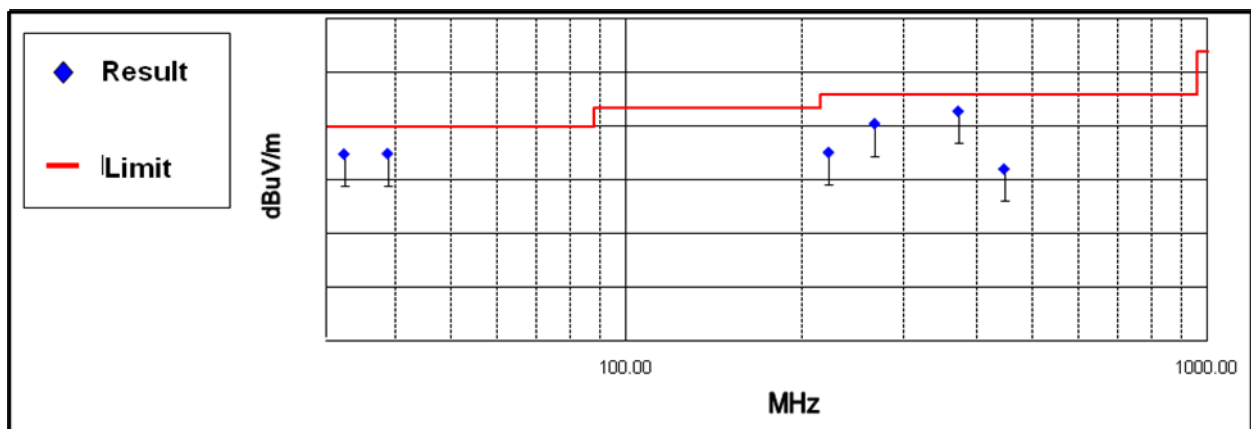
### Below 1 GHz

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.  
Detector mode: CISPR Quasi – Peak mode (6 dB Bandwidth: 120 kHz)

Frequency [MHz]	Reading [dB $\mu$ V]	Polarization (*H/**V)	Ant. Factor [dB/m]	Cable Loss [dB]	Result [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
32.72	22.14	V	11.26	1.40	34.80	40.00	5.20
38.86	21.91	V	11.51	1.48	34.90	40.00	5.10
222.93	21.28	H	9.89	3.93	35.10	46.00	10.90
267.24	24.79	H	11.47	4.24	40.50	46.00	5.50
372.46	23.78	H	14.03	4.99	42.80	46.00	3.20
446.70	10.19	H	16.03	5.78	32.00	46.00	14.00

### NOTES:

- \* H : Horizontal polarization , \*\* V : Vertical polarization
- Result = Reading + Antenna factor + Cable loss
- Margin value = Limit - Result
- The measurement was performed for the frequency range above 30 MHz according to FCC Part 15.209.



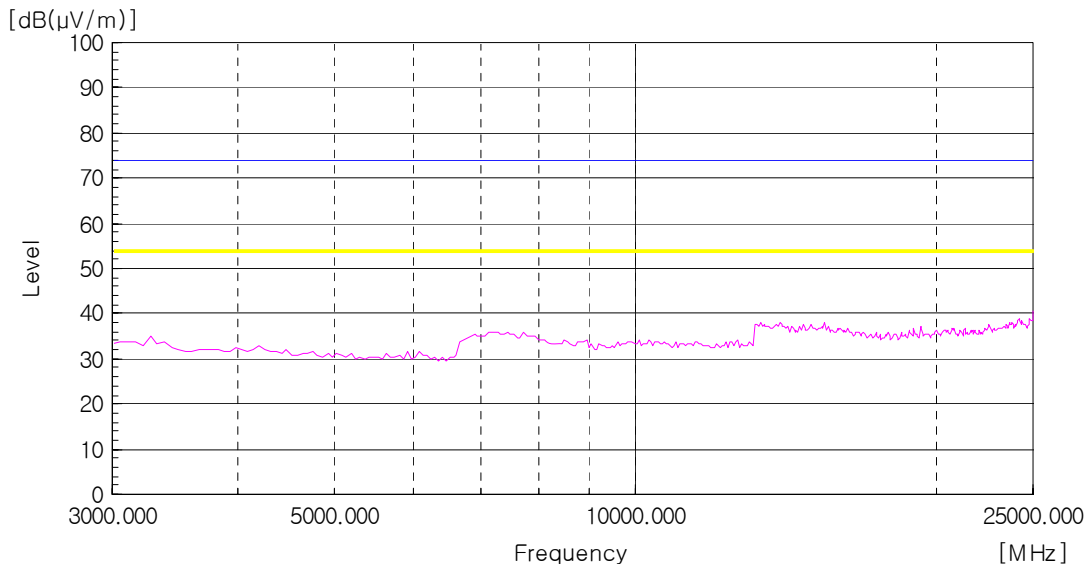
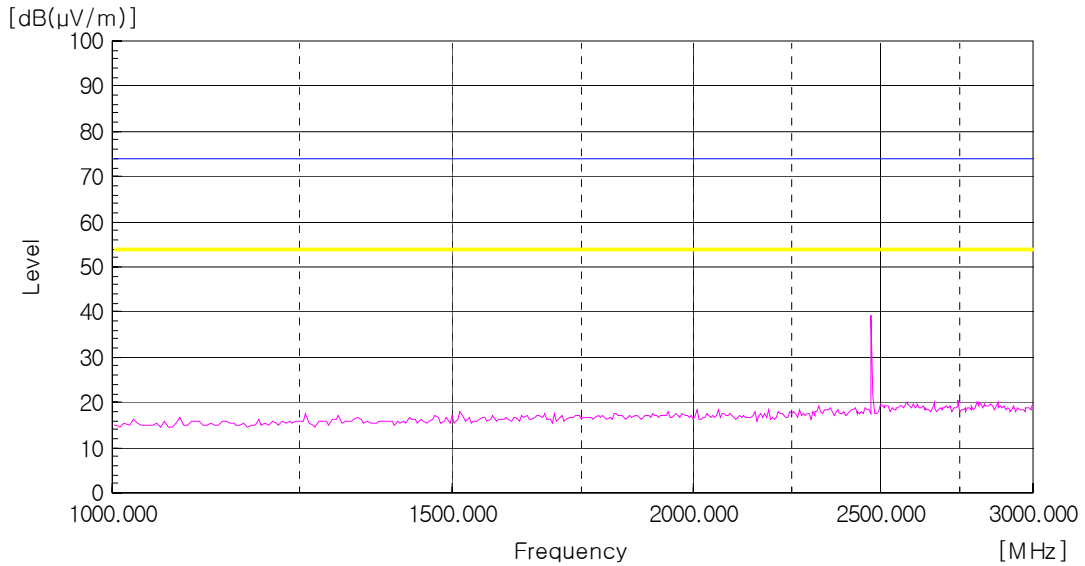
## Above 1 GHz

- Operating mode: TX / CH: Low, Mid, High

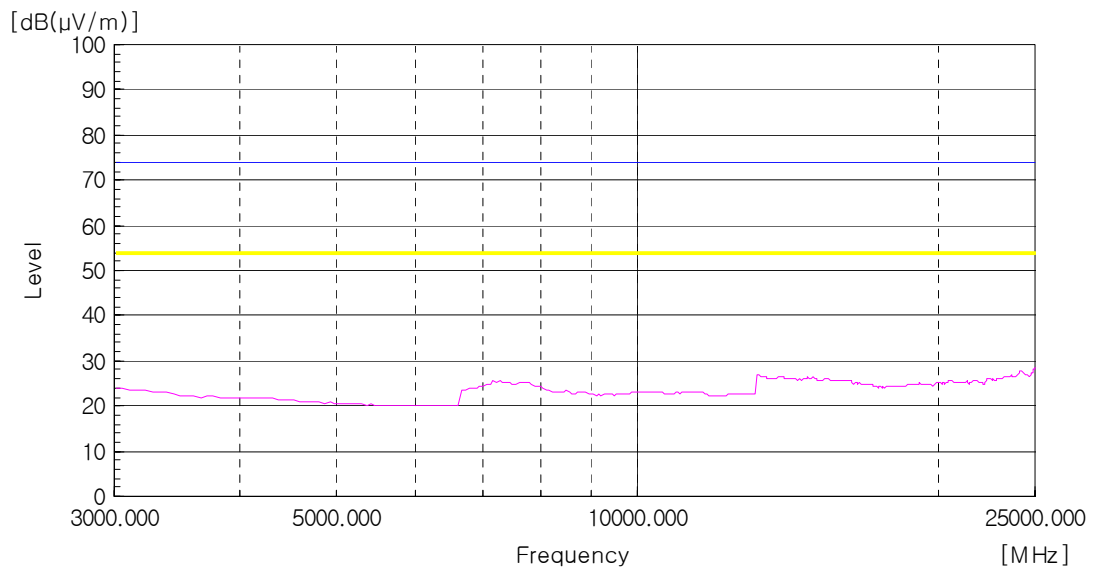
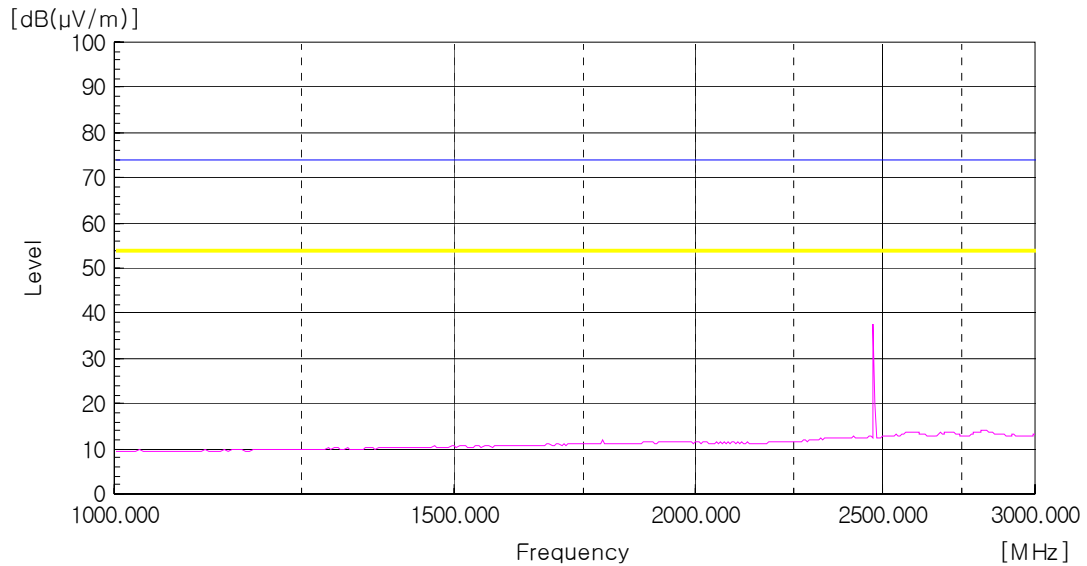
The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

— Peak Limit Line  
— AV Limit Line

### Final data Peak



## Final data AV



## 1. Low CH

Detector mode: Peak mode

Frequency [MHz]	Reading [dB $\mu$ V]	Polarization (*H/**V)	Ant. Factor [dBm]	Cable Loss [dB $\mu$ V]	Preamp [dBm]	Result [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
4810.00	20.63	V	31.25	14.12	-34.80	31.20	74.00	42.80

Detector mode: Average mode

Frequency [MHz]	Reading [dB $\mu$ V]	Polarization (*H/**V)	Ant. Factor [dBm]	Cable Loss [dB $\mu$ V]	Preamp [dBm]	Result [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
4804.00	10.53	V	31.25	14.12	-34.80	21.10	54.00	32.90

## 2. Middle CH

Detector mode: Peak mode

Frequency [MHz]	Reading [dB $\mu$ V]	Polarization (*H/**V)	Ant. Factor [dBm]	Cable Loss [dB $\mu$ V]	Preamp [dBm]	Result [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
4880.00	20.45	V	31.40	14.22	-34.80	31.27	74.00	42.73

Detector mode: Average mode

Frequency [MHz]	Reading [dB $\mu$ V]	Polarization (*H/**V)	Ant. Factor [dBm]	Cable Loss [dB $\mu$ V]	Preamp [dBm]	Result [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
4870.00	10.47	V	31.40	14.22	-34.80	21.29	54.00	32.71



### 3. High CH

Detector mode: Peak mode

Frequency [MHz]	Reading [dB $\mu$ V]	Polarization (*H/**V)	Ant. Factor [dBm]	Cable Loss [dB $\mu$ V]	Preamp [dBm]	Result [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
4952.00	20.66	V	31.55	14.29	-34.80	31.70	74.00	42.30

Detector mode: Average mode

Frequency [MHz]	Reading [dB $\mu$ V]	Polarization (*H/**V)	Ant. Factor [dBm]	Cable Loss [dB $\mu$ V]	Preamp [dBm]	Result [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
4954.00	10.59	V	31.55	14.29	-34.80	21.63	54.00	32.37

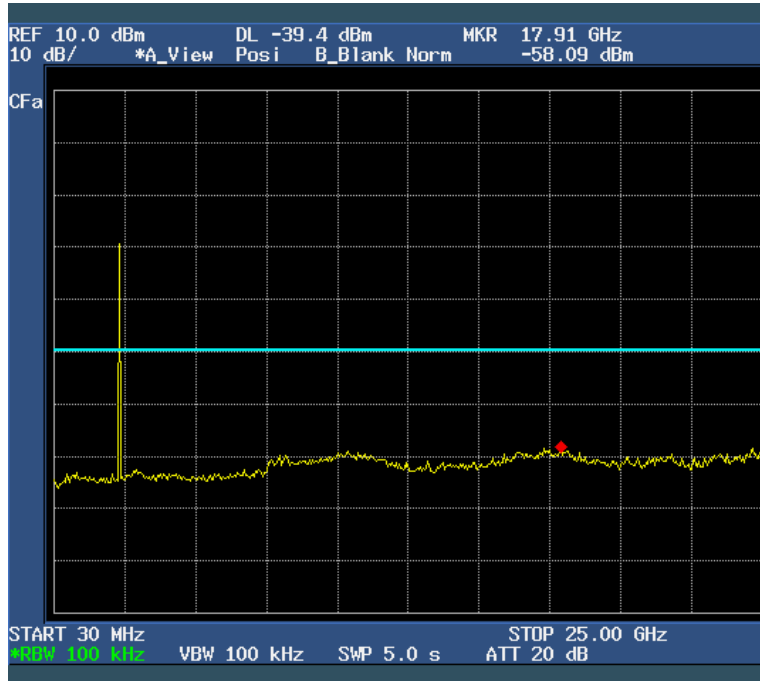
**Result: All emissions below noise floor of 20 dB $\mu$ V/m**

#### NOTES :

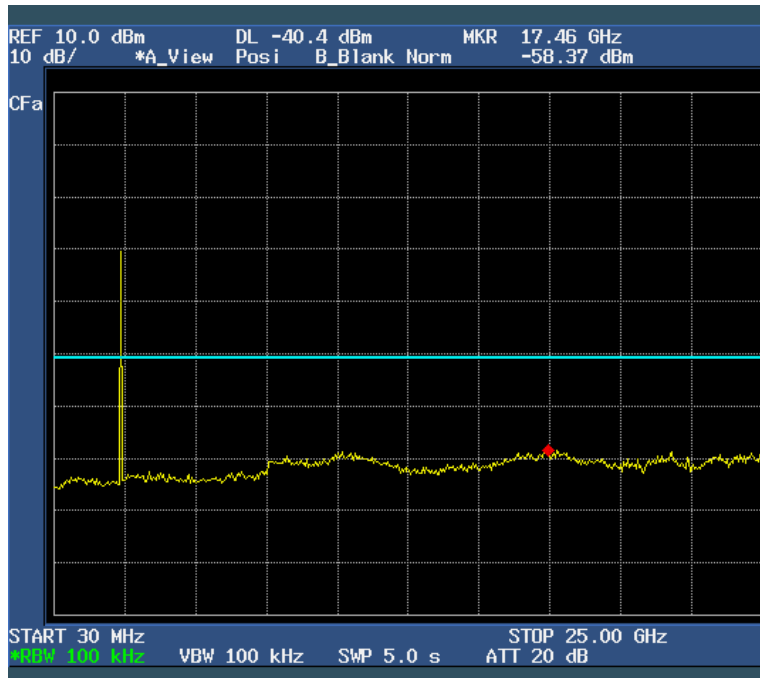
- \* H : Horizontal polarization , \*\* V : Vertical polarization
- Result = Reading + Antenna factor + Cable loss
- Margin value = Limit - Result
- Measuring frequencies from 1GHz to the 10<sup>th</sup> harmonic of highest fundamental frequency.
- Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded(ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
- Spectrum setting:
  - Peak Setting 1 GHz to 10<sup>th</sup> harmonics of fundamental, RBW = 1 MHz, VBW = 1 MHz, Sweep = Auto
  - AV Setting 1 GHz to 10<sup>th</sup> harmonics of fundamental, RBW = 1 MHz, VBW = 10 Hz, Sweep = Auto

## Spurious Emissions (Conducted Measurement)

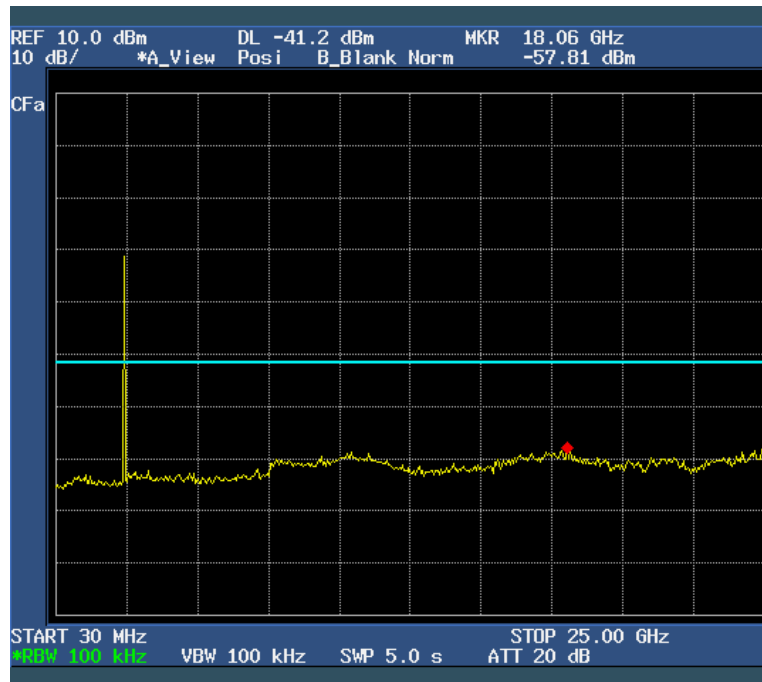
[CH Low]



[CH Mid]



[CH High]



## 5.8.2 Radiated Emissions(RX)

EUT	Main Unit of Front Surround System HTP-SB300
Model	HTP-SB300SB
Limit apply to	FCC Part 15.109, 209
Test Date	November 04, 2009
Operating Condition	Low CH, Middle CH, High CH RX Mode
Result	Passed

### Limit

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:

Frequencies (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measurement Distance (m)
30 – 88	100*	40.0	3
88 – 216	150*	43.5	3
216 – 960	200*	46.0	3
Above 960	500	54.0	3

\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

### Test Results

- Refer to see the measured plot in next page.



Test Engineer : Jeong Hwan, Pyo

## Radiated Emissions Test data

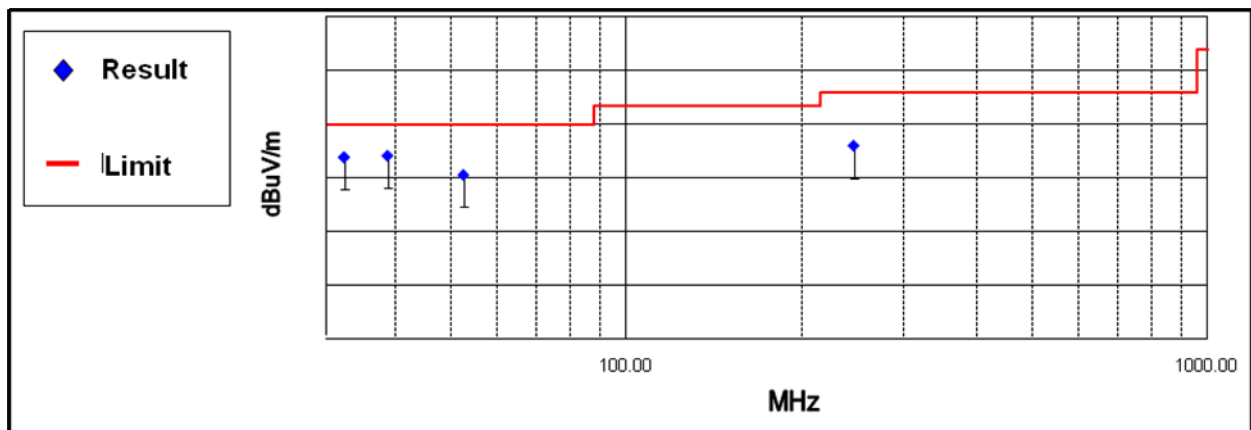
### Below 1 GHz

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.  
Detector mode: CISPR Quasi – Peak mode (6 dB Bandwidth: 120 kHz)

Frequency [MHz]	Reading [dB $\mu$ V]	Polarization (*H/**V)	Ant. Factor [dB/m]	Cable Loss [dB]	Result [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
32.72	21.14	V	11.26	1.40	33.80	40.00	6.20
38.86	21.11	V	11.51	1.48	34.10	40.00	5.90
52.49	16.91	V	11.99	1.70	30.60	40.00	9.40
246.11	21.04	H	10.78	4.08	35.90	46.00	10.10

### NOTES:

- \* H : Horizontal polarization , \*\* V : Vertical polarization
- Result = Reading + Antenna factor + Cable loss
- Margin value = Limit - Result
- The measurement was performed for the frequency range above 30 MHz according to FCC Part 15.209.



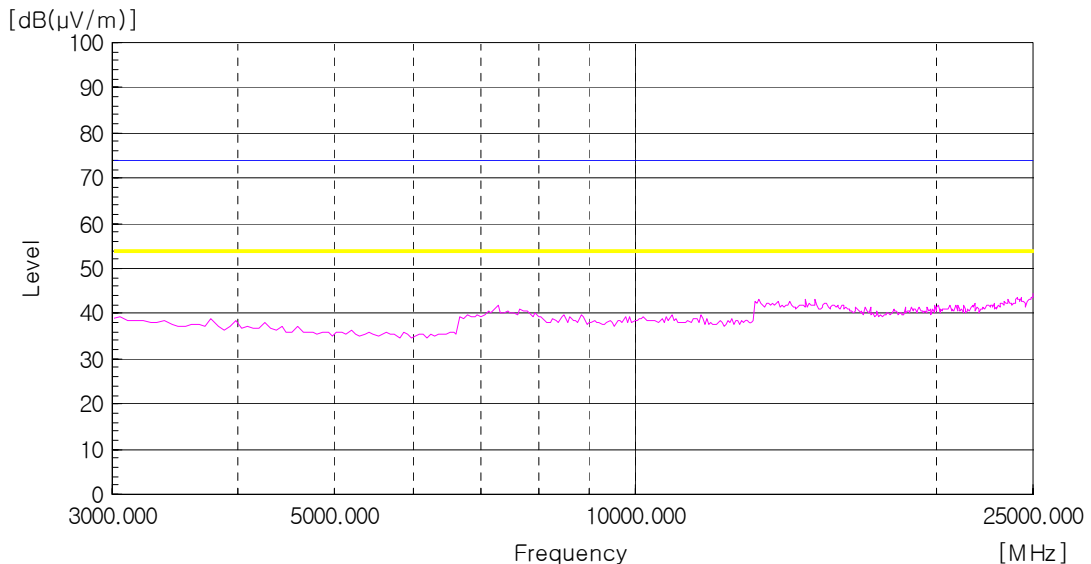
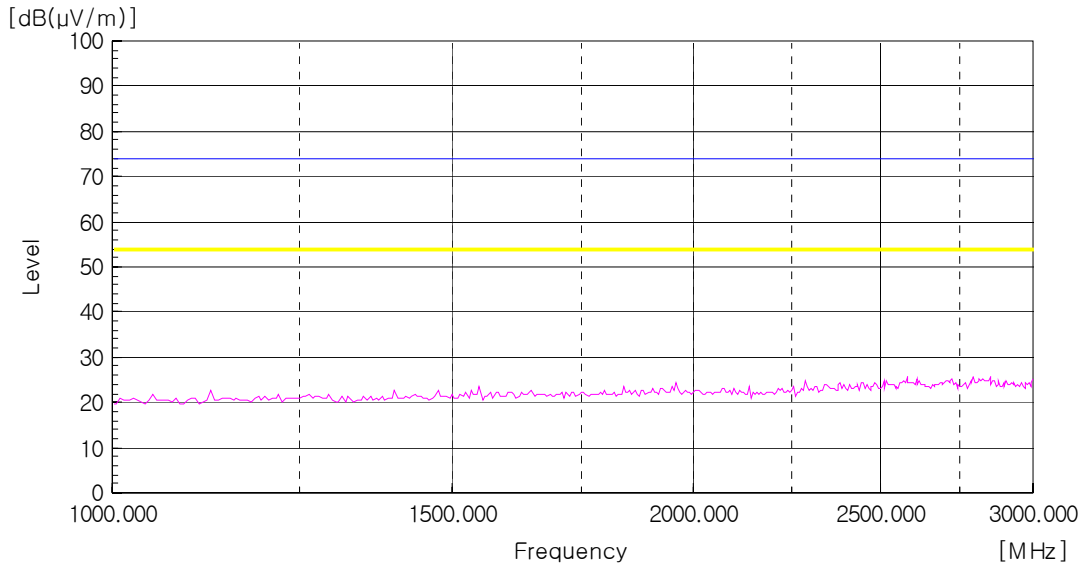
## Above 1 GHz

- Operating mode: TX / CH: Low, Mid, High

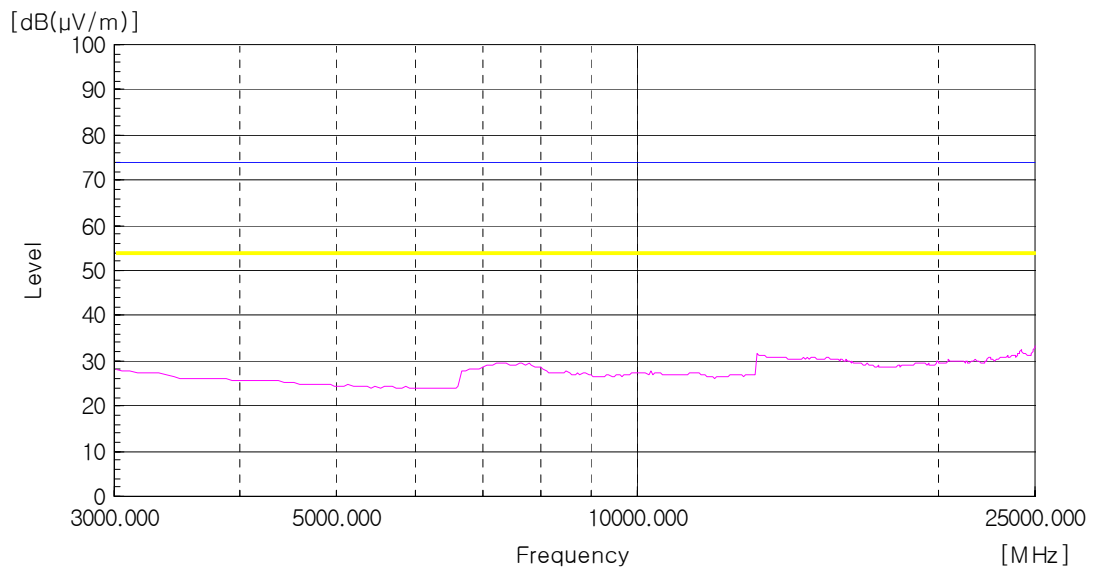
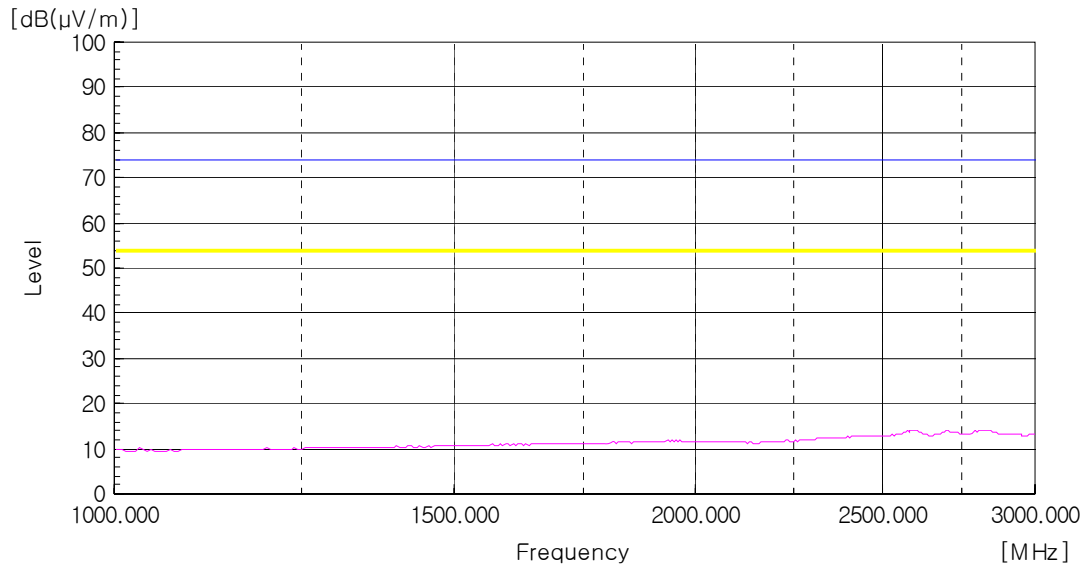
The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

— Peak Limit Line  
— AV Limit Line

### Final data Peak



## Final data AV



## 1. Low CH

Detector mode: Peak mode

Frequency [MHz]	Reading [dB $\mu$ V]	Polarization (*H/**V)	Ant. Factor [dBm]	Cable Loss [dB $\mu$ V]	Preamp [dBm]	Result [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
4809.00	26.10	V	31.25	14.12	-34.80	36.67	74.00	37.33

Detector mode: Average mode

Frequency [MHz]	Reading [dB $\mu$ V]	Polarization (*H/**V)	Ant. Factor [dBm]	Cable Loss [dB $\mu$ V]	Preamp [dBm]	Result [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
4807.00	13.53	V	31.25	14.12	-34.80	24.10	54.00	29.90

## 2. Middle CH

Detector mode: Peak mode

Frequency [MHz]	Reading [dB $\mu$ V]	Polarization (*H/**V)	Ant. Factor [dBm]	Cable Loss [dB $\mu$ V]	Preamp [dBm]	Result [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
4882.00	25.45	V	31.40	14.22	-34.80	36.27	74.00	37.73

Detector mode: Average mode

Frequency [MHz]	Reading [dB $\mu$ V]	Polarization (*H/**V)	Ant. Factor [dBm]	Cable Loss [dB $\mu$ V]	Preamp [dBm]	Result [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
4876.00	13.47	V	31.40	14.22	-34.80	24.29	54.00	29.71



### 3. High CH

Detector mode: Peak mode

Frequency [MHz]	Reading [dB $\mu$ V]	Polarization (*H/**V)	Ant. Factor [dBm]	Cable Loss [dB $\mu$ V]	Preamp [dBm]	Result [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
4950.00	25.66	V	31.55	14.29	-34.80	36.70	74.00	37.30

Detector mode: Average mode

Frequency [MHz]	Reading [dB $\mu$ V]	Polarization (*H/**V)	Ant. Factor [dBm]	Cable Loss [dB $\mu$ V]	Preamp [dBm]	Result [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
4952.00	14.59	V	31.55	14.29	-34.80	25.63	54.00	28.37

**Result: All emissions below noise floor of 20 dB $\mu$ V/m**

#### NOTES :

- \* H : Horizontal polarization , \*\* V : Vertical polarization
- Result = Reading + Antenna factor + Cable loss
- Margin value = Limit - Result
- Measuring frequencies from 1GHz to the 10<sup>th</sup> harmonic of highest fundamental frequency.
- Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded(ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
- Spectrum setting:
  - Peak Setting 1 GHz to 10<sup>th</sup> harmonics of fundamental, RBW = 1 MHz, VBW = 1 MHz, Sweep = Auto
  - AV Setting 1 GHz to 10<sup>th</sup> harmonics of fundamental, RBW = 1 MHz, VBW = 10 Hz, Sweep = Auto

## 5.9 Conducted Emissions Measurement

EUT	Main Unit of Front Surround System HTP-SB300
Model	HTP-SB300SB
Limit apply to	FCC Part 15.107, 207
Test Date	November 05, 2009
Operating Condition	RF transmitting continuously during the tested.
Result	Passed

### Conducted Emission Test Data

The following table shows the highest levels of conducted emissions on both polarizations of hot and neutral line.

Detector mode: CISPR Quasi-Peak mode (6 dB Bandwidth: 9 kHz)

Frequency [MHz]	Result [dB $\mu$ V]		Phase (*L/**N)	Limit [dB $\mu$ V]		Margin [dB]	
	Quasi-peak	Average		Quasi-peak	Average	Quasi-peak	Average
0.170	47.49	36.21	H	64.96	54.72	17.47	18.51
0.210	44.71	32.86	H	63.21	53.21	18.50	20.35
0.230	45.14	34.18	H	62.45	52.45	17.31	18.27
0.410	47.94	37.77	H	57.65	47.45	9.71	9.68
0.785	43.17	33.36	H	56.00	46.00	12.83	12.64
3.790	51.19	39.13	H	56.00	46.00	4.81	6.87
13.520	51.16	38.42	N	60.00	50.00	8.84	11.58

#### NOTES:

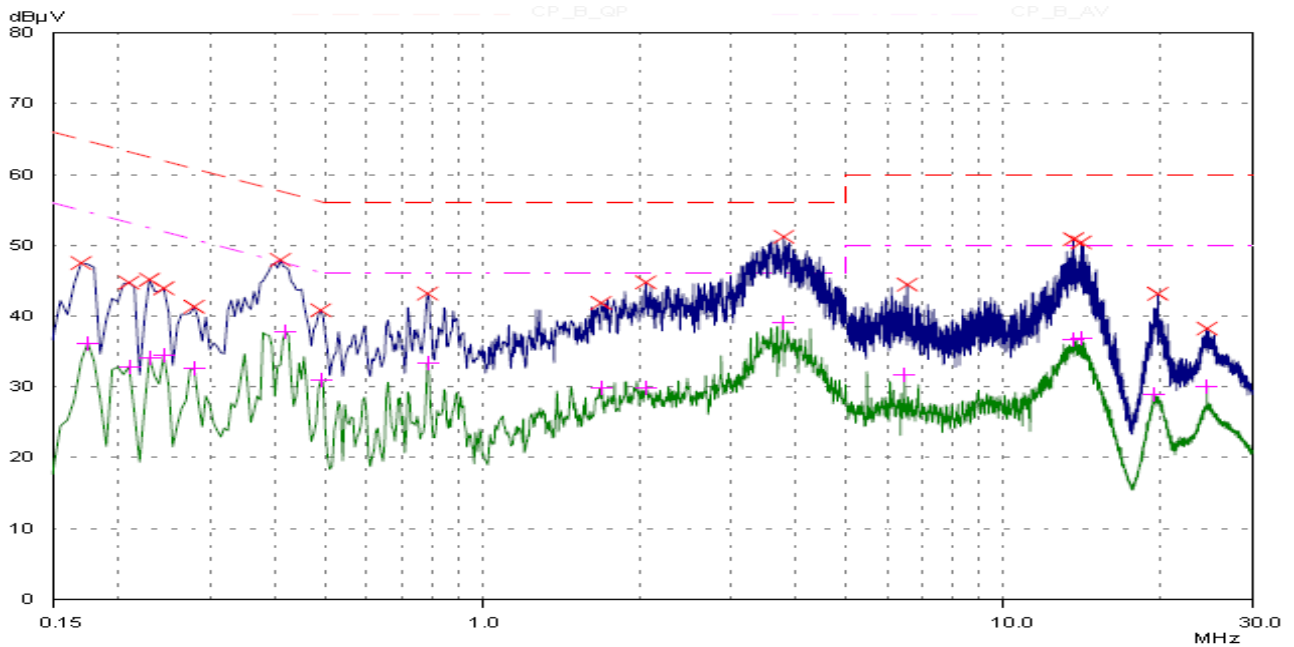
- \* H : HOT Line , \*\*N : Neutral Line
- Margin value = Limit – Result
- Measurement were performed at the AC Power Inlet in the frequency band of 150 kHz ~ 30 MHz according to the FCC Part 15 Class B.



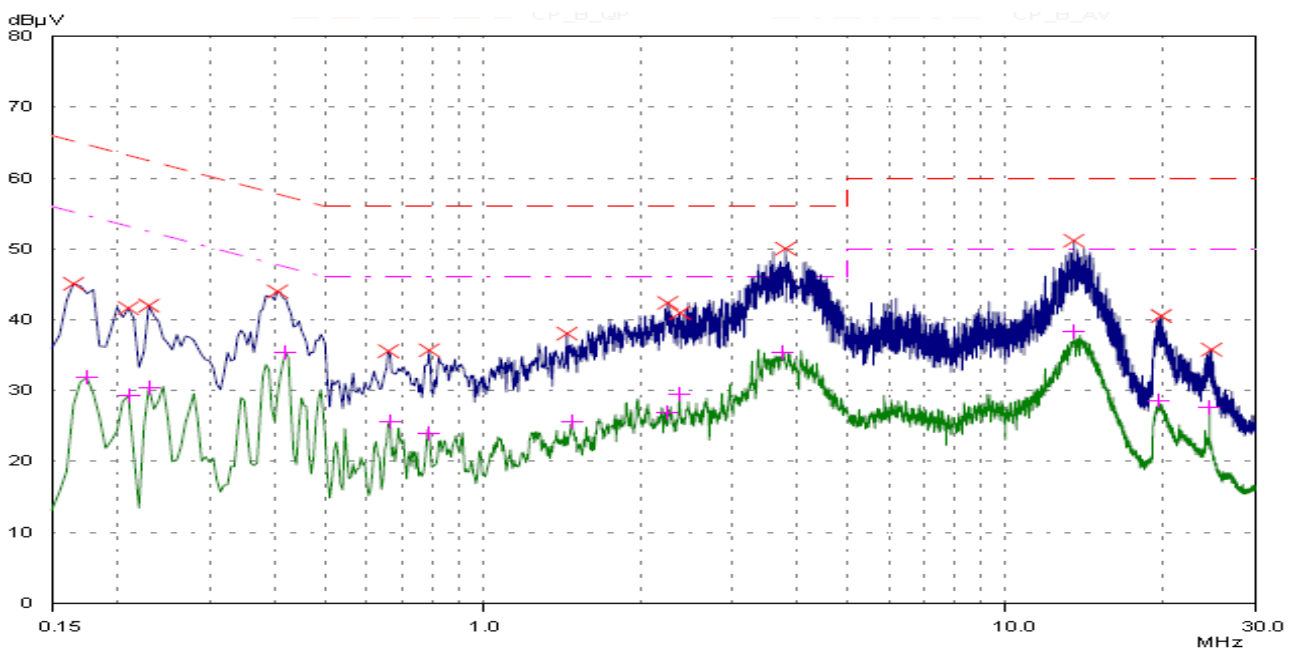
Test Engineer: Jeong Hwan, Pyo



Line: HOT Line Limit :

--- Quasi-Peak  
- - - Average



Line: Neutral Line



Quasi-peak   
Average 

## 6. SAMPLE CALCULATION

### Sample Field Strength Calculation

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

$$FS = RA + AF + CF$$

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

$$dB(\mu V) = 20 \log_{10} (uV) : \text{Equation}$$

Example : @ 372.46 MHz

$$\text{Class B Limit} = 46.00 \text{ dBuV/m}$$

$$\text{Reading} = 23.78 \text{ dBuV}$$

$$\text{Antenna Factor + Cable Loss} = 14.03 + 4.99 = 19.02 \text{ dBuV/m}$$

$$\text{Total} = 42.80 \text{ dBuV/m}$$

$$\text{Margin} = 46.00 - 42.80 = 3.20 \text{ dB}$$

$$= 3.20 \text{ dB below Limit}$$

## 7. List of test equipments used for measurements

Test Equipment		Model	Mfg.	Serial No.	Cal. Due Date
■	EMI Test Receiver	ESVS10	R & S	835165/001	10-04-02
■	Spectrum Analyzer	E7405A	H.P	US41160290	10-09-18
■	Spectrum Analyzer	R3273	Advantest	95090411	10-04-02
■	Spectrum Analyzer	R3132	Advantest	110401685	10-04-03
■	LogBicon Antenna	VULB9160	Schwarzbeck	3082	10-01-25
■	Broad band Horn antenna	BBHA 9120D	Schwarz Beck	227	11-03-16
■	Broad band Horn antenna	BBHA 9120D	Schwarz Beck	285	11-03-16
■	Preamplifier	8447D	H.P	3307A02865	10-09-18
■	System Power Supply	6030A	Agilent	1036546	10-04-03
■	Power Meter	NRVS	R & S	834053/060	10-09-18
■	Controller	HD2000	HD GmbH	C/125	N/A
■	Antenna Master	MA2400	HD GmbH	N/A	N/A
■	Turn-Table	MFT-120S	Max-Full Antenna Corp	N/A	N/A
■	Antenna Master	MFA-440E	Max-Full Antenna Corp	N/A	N/A