RADIO TEST REPORT

Test Report No. : 26CE0070-HO-2a

Applicant	:	**Sony Corporation**
Type of Equipment	:	**WIRELESS MICROPHONE (Microphone)**
Model No.	:	**ECM-HW1T**
FCC ID	:	**AK8ECMHW1T**
Test standard	:	**FCC Part 15 Subpart C** **Section 15.207, Section 15.247: 2005**
Test Result	:	**Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with the above regulation. We hereby certify that the data contain a true representation of the EMC profile.
4. The test results in this report are traceable to the national or international standards.

Date of test:

November 18 to December 14, 2005

Tested by:

Makoto Kosaka
EMC Services

Mitsuru Fujimura
EMC Services

Takumi Shimada
EMC Services

Norihisa Hashimoto
EMC Services

Approved by :

Naoki Sakamoto
Group Leader of
EMC Services

UL Apex Co., Ltd.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

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SECTION 1: Client information

Company Name	Sony EMCS Corporation
Address	1 Suzumegairi Sakazaki, Kohda-cho, Nukata-gun, Aichi-PRF, 444-0194 Japan
Telephone Number	+81-564 62 6649
Facsimile Number	+81-564 63 6179
Contact Person	Susumu Ishiwata

*Sony EMCS Corporation is on behalf of the applicant: Sony Corporation.

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	WIRELESS MICROPHONE (Microphone)
Model No.	ECM-HW1T
Serial No.	68
Country of Manufacture	Japan
Rating	DC3.0V(LR03(SG)1.5V x 2)
Receipt Date of Sample	November 18, 2005
Condition of EUT	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

2.2.1 General Information

Feature of EUT	Model: ECM-HW1T is a part of Wireless Microphone System for SONY, Digital Video Camera Recorder and is used with model: ECM-HW1R by the set. ECM-HW1T has a microphone inside and transmits the audio data to ECM-HW1R by Bluetooth.
Range of Operation temperature	+5 deg. C. to +40 deg. C.
Operation Clock	12MHz / 24MHz / 48MHz / 32.768KHz

2.2.2 Radio specification / Bluetooth

Equipment Type	Transceiver
Frequency band	2402-2480MHz
Bandwidth & Channel spacing	1MHz & 1MHz
Type of Modulation	GFSK/FHSS
Antenna Type	YCE-5277 (Loop Antenna)
Antenna Connector Type	N/A
Antenna Gain	+1dBi
ITU code	F1D
Method1of Frequency Generation	Synthesizer

FCC 15.31 (e)

This EUT provides the stable voltage (DC3.0V) constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part15 Subpart C : 2005
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits : 2005 Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz : 2005

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin*0)	Results
1	Conducted emission	**FCC:** ANSI C63.4:2003 7. AC powerline conducted emission measurements	**FCC:** Section 15.207	-	N/A	N/A	N/A*1)
		IC: RSS-Gen 7.2.2	**IC:** RSS-Gen 7.2.2				
2	Carrier Frequency Separation	**FCC:** ANSI C63.4:2003 13. Measurement of intentional radiators	**FCC:** Section15.247(a)(1)	Conducted	N/A	See data.	Complied
		IC: -	**IC:** RSS-210 A8.1 (2)				
3	20dB Bandwidth	**FCC:** ANSI C63.4:2003 13. Measurement of intentional radiators	**FCC:** Section15.247(a)(1)	Conducted	N/A		Complied
		IC: -	**IC:** RSS-210 A8.1 (1)				
4	Number of Hopping Frequency	**FCC:** ANSI C63.4:2003 13. Measurement of intentional radiators	**FCC:** Section15.247(a)(1)(iii)	Conducted	N/A		Complied
		IC: -	**IC:** RSS-210 A8.1 (4)				
5	Dwell time	**FCC:** ANSI C63.4:2003 13. Measurement of intentional radiators	**FCC:** Section15.247(a)(1)(iii)	Conducted	N/A		Complied
		IC: -	**IC:** RSS-210 A8.1 (4)				
6	Maximum Peak Output Power	**FCC:** ANSI C63.4:2003 13. Measurement of intentional radiators	**FCC:** Section15.247(b)(1)	Conducted	N/A		Complied
		IC: RSS-Gen 4.6	**IC:** RSS-210 A8.4 (2)				
7	Band Edge Compliance	**FCC:** ANSI C63.4:2003 13. Measurement of intentional radiators	**FCC:** Section15.247(d)	Conducted	N/A		Complied
		IC: -	**IC:** RSS-210 A8.5				
8	Spurious Emission	**FCC:** ANSI C63.4:2003 13. Measurement of intentional radiators	**FCC:** Section15.247(d)	Conducted/ Radiated	N/A	**<Tx>** 3.7dB, 4960MHz, Hor, AV 13.9dB, 2390MHz, Ver, PK **<Rx>** 18.1dB, 4882MHz, Ver, AV 24.3dB, 4882MHz, Hor, PK	Complied
		IC: RSS-Gen 4.7 RSS-Gen 4.8	**IC:** RSS-210 A8.5 RSS-Gen 7.2.1 and 7.2.3				

Note: UL Apex's EMI Work Procedures No.QPM05 and QPM15.
*0) The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
*1) This test is not applicable, because the EUT does not have AC mains.

*These tests were also referred to FCC Public Notice DA 00-705 "Guidance on Measurement for Frequency Hopping Spread Spectrum Systems".
*These tests were performed without any deviations from test procedure except for additions or exclusions.

3.3 Addition to standards

No.	Item	Specification	Test Procedure	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	**IC**: RSS-Gen 4.4.1	**IC**: RSS-Gen 4.4.1	Conducted	N/A	N/A	N/A

3.4 Uncertainty

Spurious Emission (Radiated)
The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is ±4.5dB(3m)/ ±4.7dB(10m).
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is ±5.2dB(3m)/ ±3.8dB(10m).
The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is ±6.6dB.
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

Other test except Conducted Emission and Spurious Emission (Radiated)
The measurement uncertainty (with a 95% confidence level) for this test is ±3.0dB.

3.5 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	IC4247A	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	846015	IC4247A-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.4 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1 and No.2 semi-anechoic and No.3 shielded room.

3.6 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

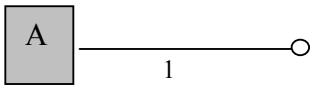
SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

The mode used for test: [FHSS:Bluetooth]
Transmitting mode(Packet size DH5)
Low Channel : 2402MHz
Mid Channel : 2441MHz
High Channel : 2480MHz
Receiving : 2441MHz
Page Scan mode

* As EUT does not have Inquiry mode in its specification, test was not performed at the mode.
*Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not influence on the output power and bandwidth of the EUT. However, the limit level 125mWof AFH mode was used for the test.

4.2 Configuration and peripherals



* Cabling and setup were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID
A	Wireless Microphone (Microphone)	ECM-HW1T	68	Sony EMCS Corporation	AK8ECMHW1T

List of cables used

No.	Name	Length (m)	Shield	Remark
1	Radio test cable	0.06	N	Used only in channel setting for test

SECTION 5: Spurious Emission

[Conducted]

Test Procedure
The Out of Band Emission was measured with a spectrum analyzer connected to the antenna port.
Test data : APPENDIX 3
Test result : Pass

[Radiated]

Test Procedure
EUT was placed on a platform of nominal size, 0.5m by 1.0m, raised 80cm above the conducting ground plane.
The Radiated Electric Field Strength intensity has been measured in a Semi Anechoic Chamber with a ground plane and at a distance of 3m(Below 10GHz) and 1m(Upper 10GHz).
The height of the measuring varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer (in linear mode).
The test was made with the detector (RBW/VBW) in the following table.
When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

***Delta Marker Method (Measurement for Band-edge)**
STEP 1) Perform an in-band field strength measurement of the fundamental emission using the RBW table below.
STEP 2) Choose a spectrum analyzer span that encompasses both the peak of the fundamental emission and the band-edge emission under investigation. Set the analyzer RBW to 1% of the total span, and measure the amplitude delta between the peak of the fundamental and the peak of the band-edge emission.
STEP 3) Subtract the delta measured in STEP 2) from the field strengths measured in STEP 1). The result is the field strength of band-edge.

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver / Spectrum Analyzer	Spectrum Analyzer
Detector IF Bandwidth	QP: BW 120kHz(T/R) 20dBc : RBW: 100kHz VBW: 300kHz (S/A)	PK: RBW:1MHz/VBW: 1MHz AV: RBW:1MHz/VBW:10Hz 20dBc : RBW:100kHz/VBW:300kHz

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Test data : APPENDIX 3
Test result : Pass

SECTION 6: Bandwidth

Test Procedure

The bandwidth was measured with a spectrum analyzer connected to the antenna port.

Test data **: APPENDIX 3**
Test result **: Pass**

SECTION 7: Maximum Peak Output Power

Test Procedure
The Maximum Peak Output Power was measured with a spectrum analyzer connected to the antenna port.

Test data **: APPENDIX 3**
Test result : **Pass**

SECTION 8: Carrier Frequency Separation

Test Procedure

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna port.

Test data **: APPENDIX 3**
Test result **: Pass**

SECTION 9: Number of Hopping Frequency

Test Procedure

The Number of Hopping Frequency was measured with a spectrum analyzer connected to the antenna port.

Test data **: APPENDIX 3**
Test result **: Pass**

SECTION 10: Dwell time

Test Procedure

The Dwell time was measured with a spectrum analyzer connected to the antenna port.

Test data **: APPENDIX 3**
Test result **: Pass**

APPENDIX 1: Photographs of test setup

Spurious Emission (Radiated)

Front

Rear

Worst Case Position (Horizontal : X-axis / Vertical : Y-axis)

X-axis

Y-axis

Z-axis

APPENDIX 2:Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE	2005/04/11 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2005/10/10 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2005/10/14 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2004/12/16 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2005/02/24 * 12
MPA-09	Pre Amplifier	Agilent	8447D	RE	2005/09/07 * 12
MRENT-21	Spectrum Analyzer	Advantest	R3273	RE	2005/08/19 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE	2005/02/02 * 12
MHF-02	High Pass Filter	Tokimec	TF323DCA	RE	2005/09/27 * 12
MAT-22	Attenuator(10dB)(above1 GHz)	Orient Microwave	BX10-0476-00	AT	2005/03/16 * 12
MPA-10	Pre Amplifier	Agilent	8449B	RE	2005/09/07 * 12
MCC-18	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX 104	RE	2005/02/03 * 12
MCC-26	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	RE	2005/08/30 * 12
MAT-20	Attenuator(10dB)(above1 GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	RE	2005/01/11 * 12
MAEC-01	Anechoic Chamber	TDK	Semi Anechoic Chamber 10m	RE	2005/11/12 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	RE	2005/11/10 * 12
MHA-02	Horn Antenna	EMCO	3160-09	RE	2005/1/10 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	AT	2005/09/16 * 12
MBTR-00	R&S Bluetooth RF Conformance Testsystem	Rohde & Schwarz	TS8960	AT	2005/09/13 * 3

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Test Item:

CE: Conducted emission
RE: Radiated emission
AT: Antenna Terminal Measurement

APPENDIX 3: Data of EMI test

Carrier Frequency Separation

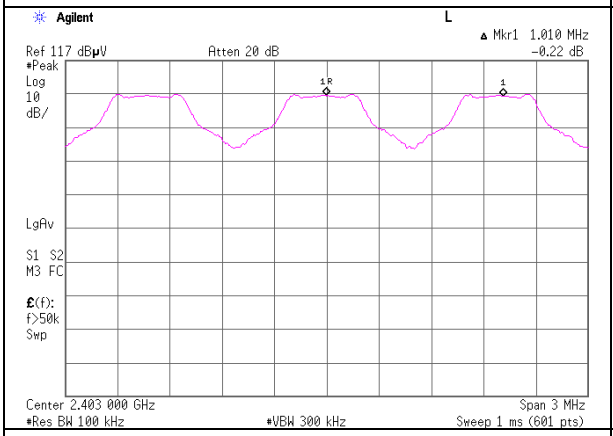
UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Shielded Room

COMPANY	:	Sony EMCS Corporation	REGULATION	:	Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	:	Wireless Microphone	TEST DISTANCE	:	-
MODEL	:	ECM-HW1T	DATE	:	12/07/2005
S/ N	:	68	TEMPERATURE	:	25deg.C
POWER	:	DC 3.0V	HUMIDITY	:	30%
MODE	:	Tx(Hopping on)/Page Scan	ENGINEER	:	Makoto Kosaka

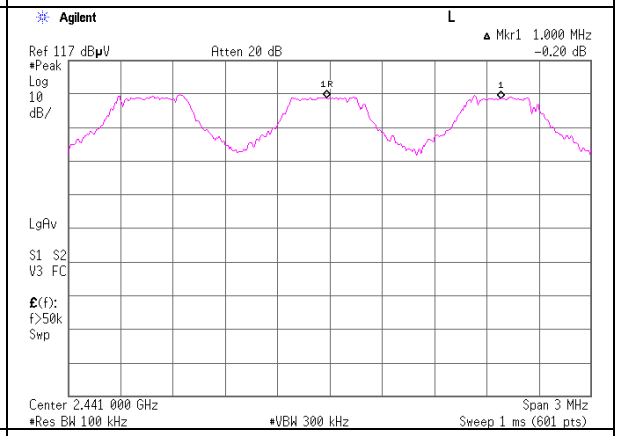
Ch	Freq. [MHz]	Channel separation [MHz]	Limit
Low	2402.0	1.010	>20dB Bandwidth and 25[kHz]
Mid	2441.0	1.000	>20dB Bandwidth and 25[kHz]
High	2480.0	1.010	>20dB Bandwidth and 25[kHz]
PageScan	2441.0	2.000	>20dB Bandwidth and 25[kHz]

Carrier Frequency Separation

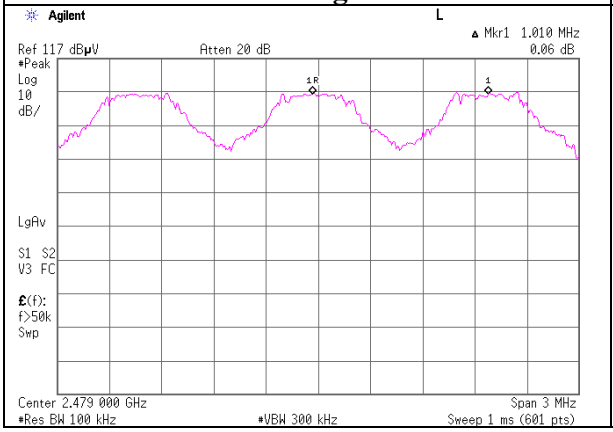
Ch:Low



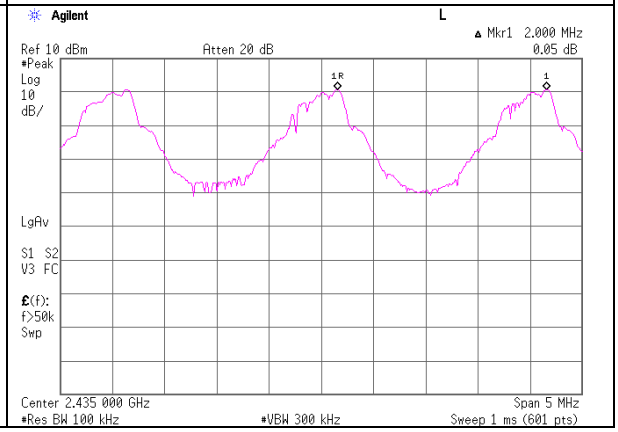
Ch:Mid



Ch:High



Page Scan



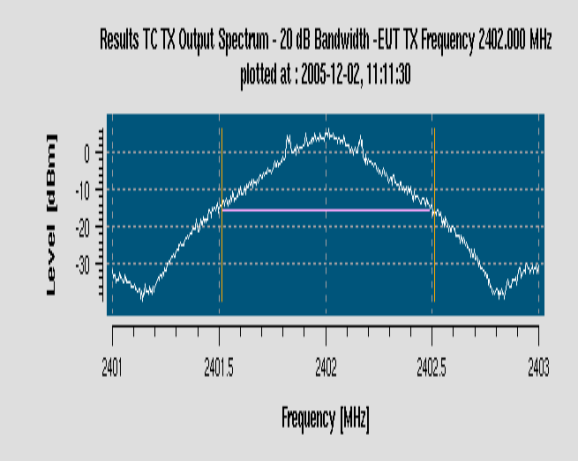
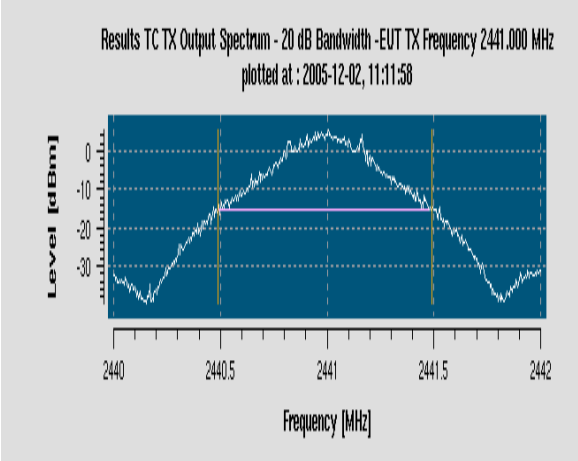
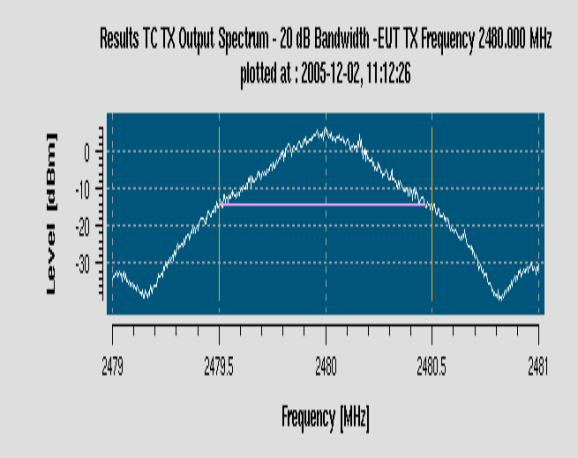
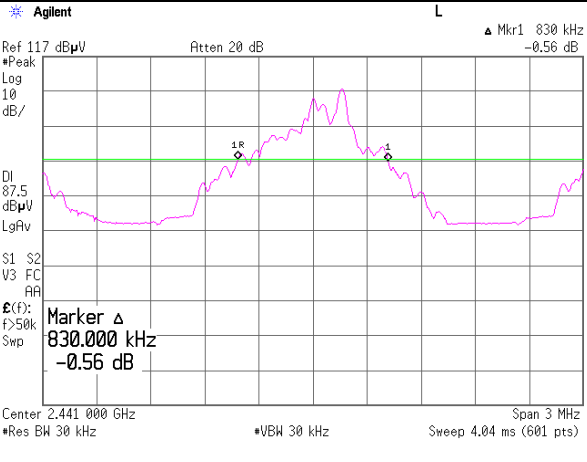
20dB Bandwidth

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Shielded Room

COMPANY	:	Sony EMCS Corporation	REGULATION	:	Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	:	Wireless Microphone	TEST DISTANCE	:	-
MODEL	:	ECM-HW1T	DATE	:	12/02/2005
S/ N	:	68	TEMPERATURE	:	25deg.C
POWER	:	DC 3.0 V	HUMIDITY	:	30%
MODE	:	Tx (Hopping on/off)/Page Scan	ENGINEER	:	Norihisa Hashimoto

Ch	Freq. [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
Low	2402.0	0.974	-
Mid	2441.0	0.986	-
High	2480.0	0.966	-
Page Scan	2441.0	0.830	-

20dB Bandwidth

Ch:Low	Ch:Mid
	
Ch:High	**Page Scan**
	

Number of Hopping Frequency

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Shielded Room

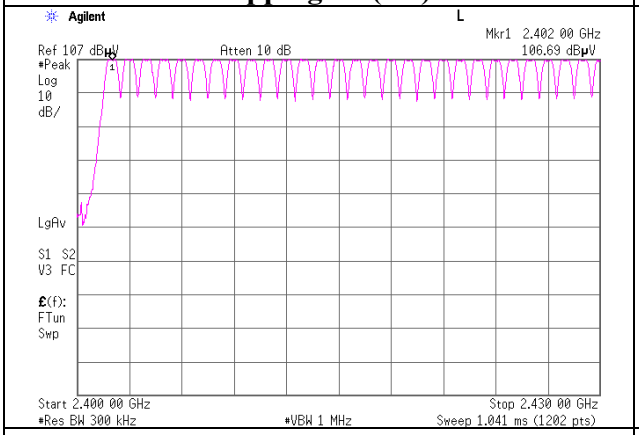
COMPANY	:	Sony EMCS Corporation	REGULATION	:	Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	:	Wireless Microphone	TEST DISTANCE	:	-
MODEL	:	ECM-HW1T	DATE	:	12/07/2005
S/ N	:	68	TEMPERATURE	:	25deg.C
POWER	:	DC 3.0 V	HUMIDITY	:	30%
MODE	:	Tx (Hopping on)/Page Scan	ENGINEER	:	Takumi Shimada

Mode	Number of channel [time]	Limit [time]
Tx(Hoppng on)	79	≧15

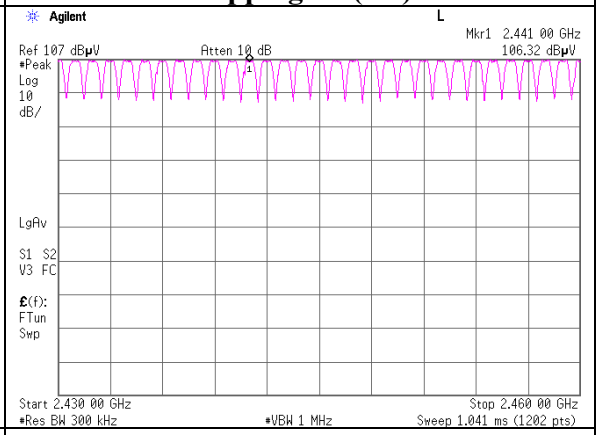
Mode	Number of channel [time]	Limit [time]
PageScan	32	≧15

Number of Hopping Frequency

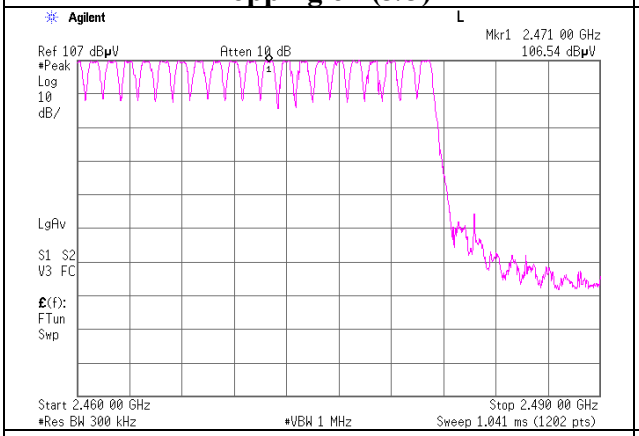
Hopping on (1/3)



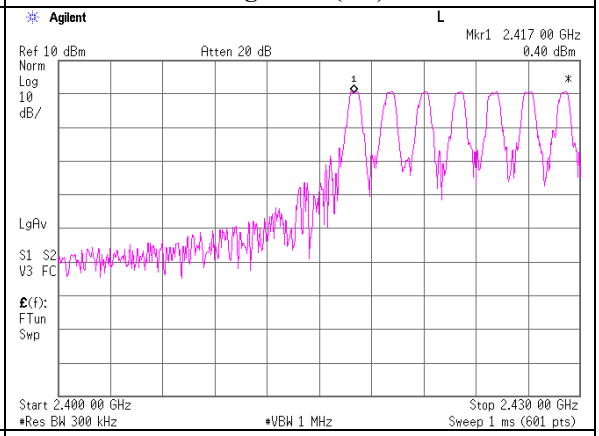
Hopping on (2/3)



Hopping on (3/3)



Page Scan(1/3)



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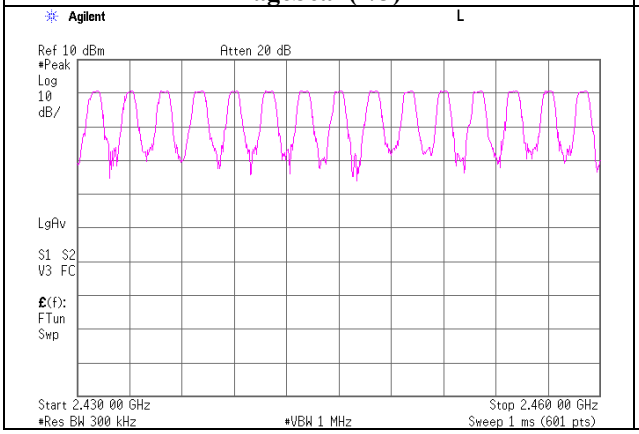

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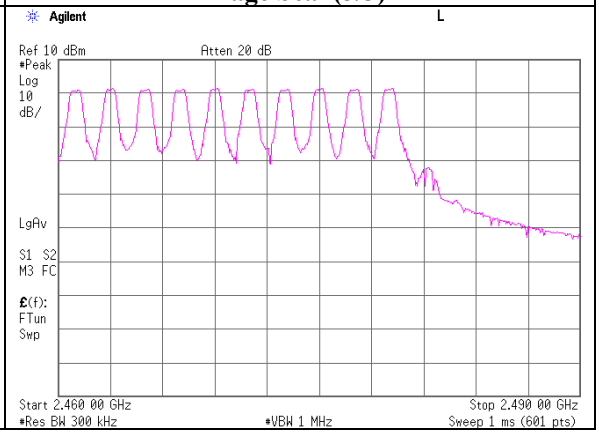


Dwell time

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Shielded Room

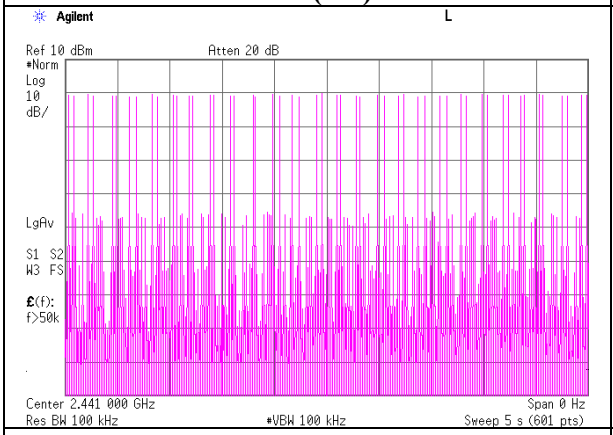
COMPANY	:	Sony EMCS Corporation	REGULATION	:	Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	:	Wireless Microphone	TEST DISTANCE	:	-
MODEL	:	ECM-HW1T	DATE	:	12/07/2005
S/ N	:	68	TEMPERATURE	:	25deg.C
POWER	:	DC 3.0 V	HUMIDITY	:	30%
MODE	:	Tx (Hopping off) /Page Scan	ENGINEER	:	Takumi Shimada

Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8(32 Hopping x 0.4)second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	50 times /5sec. x 31.6 = 316 times	0.383	121	400
DH3	25.4 times / 5sec. x 31.6 = 161times	1.758	282	400
DH5	19.2 times / 5 sec. x 31.6 = 121 times	3.033	368	400
Page Scan	100 times / 1sec. x 12.8 = 1280 times	0.121	155	400

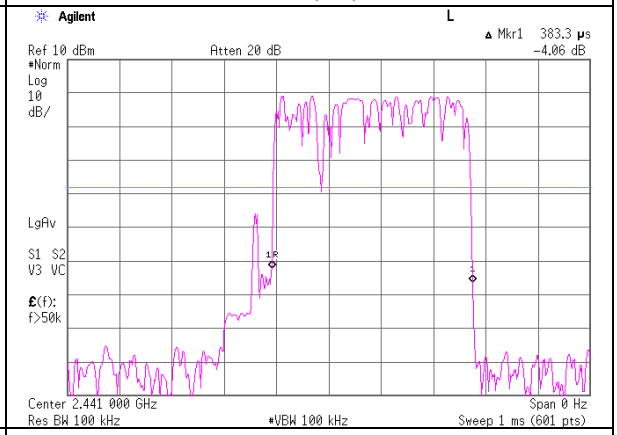
※Average data of 5 tests

Dwell time

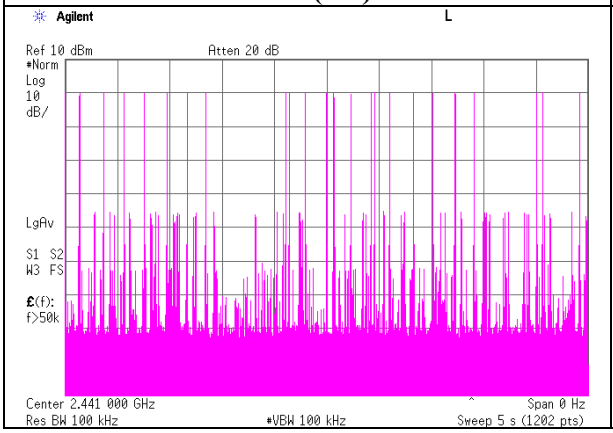
DH1 (1/2)



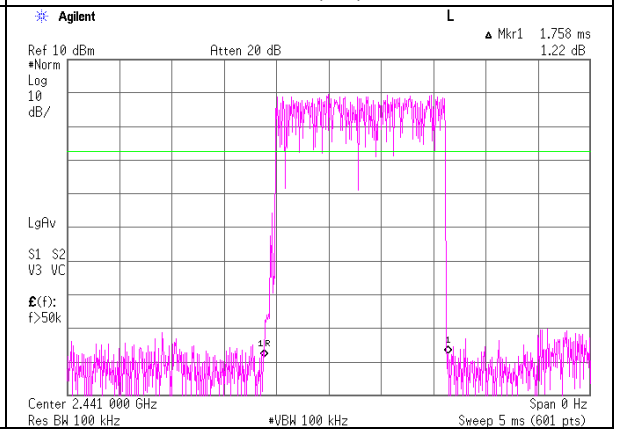
DH1 (2/2)



DH3 (1/2)

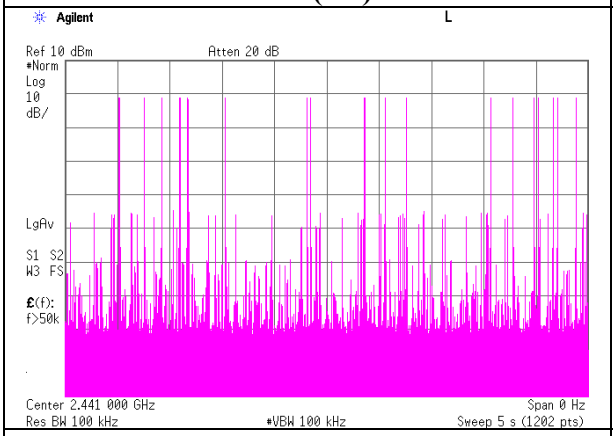


DH3 (2/2)

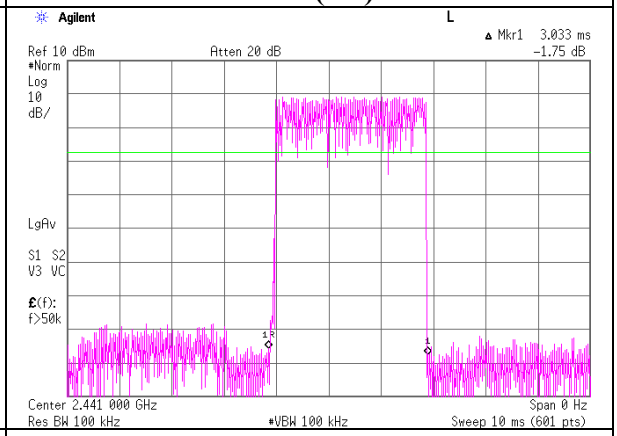


Dwell time

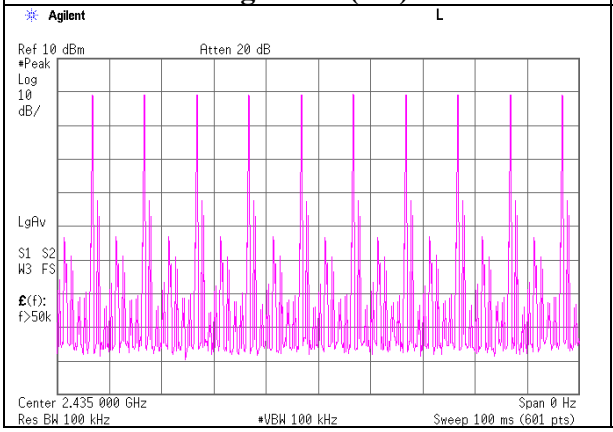
DH5 (1/2)



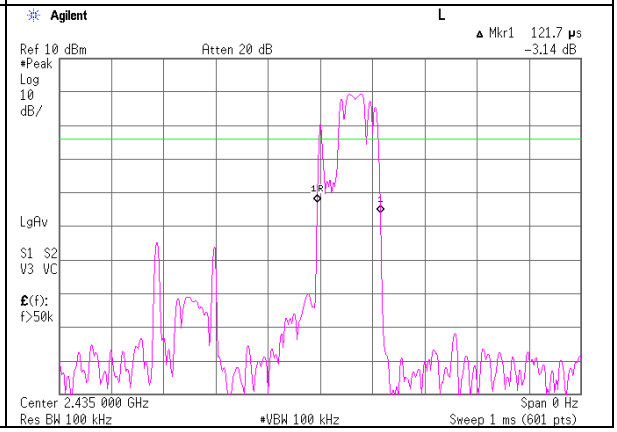
DH5 (2/2)



Page Scan (1/2)



Page Scan (2/2)



Maximum Peak Output Power

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Shielded Room

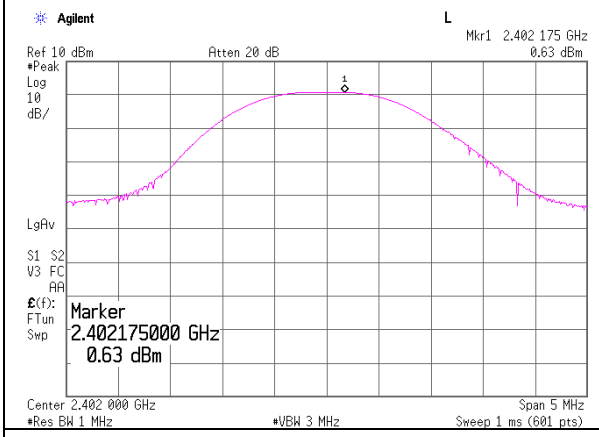
COMPANY	:	Sony EMCS Corporation	REGULATION	:	Fcc Part15 Subpart C 15.247(b)(1)
EQUIPMENT	:	Wireless Microphone	TEST DISTANCE	:	-
MODEL	:	ECM-HW1T	DATE	:	11/30/2005
S/ N	:	68	TEMPERATURE	:	23deg.C
POWER	:	DC 3.0 V	HUMIDITY	:	25%
MODE	:	Tx(Hopping off)/Page Scan	ENGINEER	:	Makoto Kosaka

Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
Low	2402.0	0.63	0.82	9.91	11.36	20.96	9.60
Mid	2441.0	0.41	0.84	9.91	11.16	20.96	9.80
High	2480.0	0.41	0.86	9.91	11.18	20.96	9.78
PageScan	2441.0	0.72	0.84	9.91	11.47	20.96	9.49

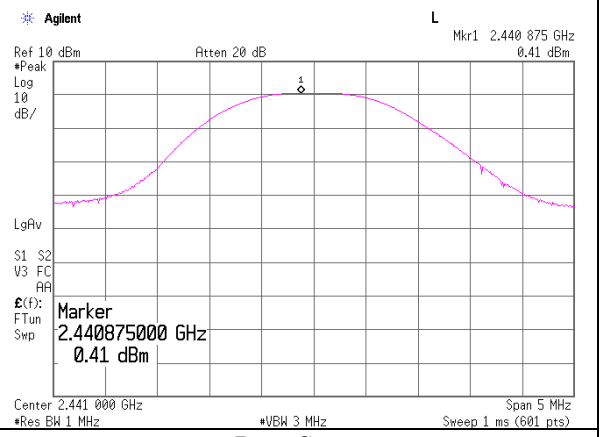
Sample Calculation:
Result = Reading + Cable Loss (supplied by customer)+ Attenuator
* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.

Maximum Peak Output Power

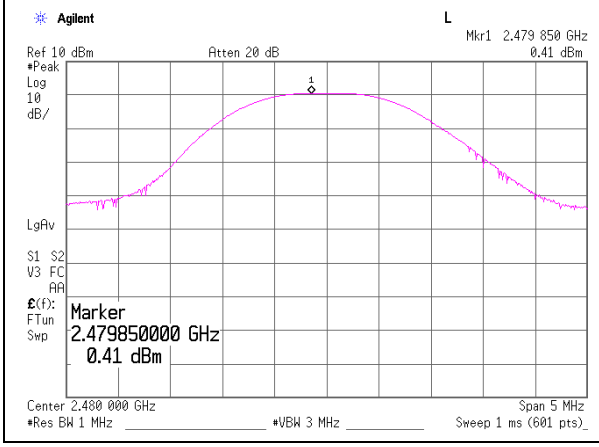
Ch:Low



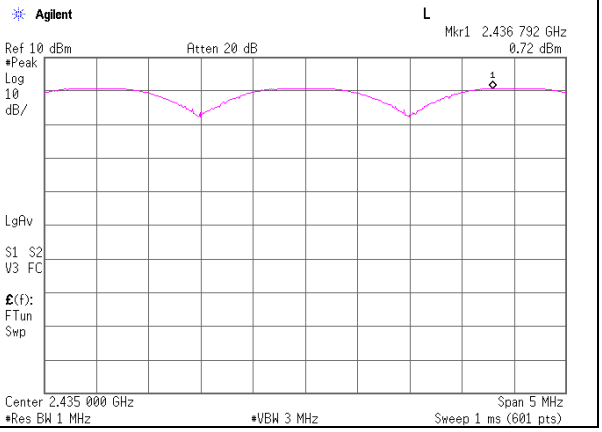
Ch:Mid



Ch:High



Page Scan



Radiated Spurious Emission
(30MHz-1GHz)
*There is no spurious emission from 30MHz to 1GHz.

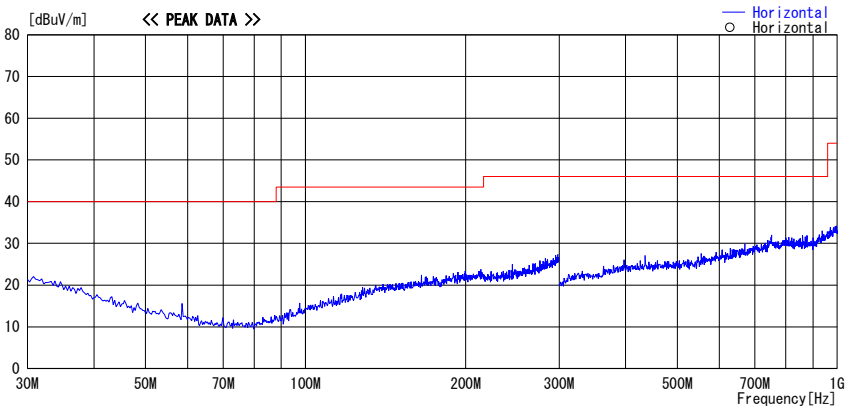
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Applicant	: Sony EMCS Corporation	Report No.	: 26CE0070-HO
Kind of EUT	: WIRELESS MICROPHONE	Power	: DC3.0V
Model No.	: ECM-HW1T	Temp./Humi.	: 23deg.C. / 24%
Serial No.	: 68	Operator	: Makoto Kosaka

Mode / Remarks : Tx 2402MHz(DH5) EUT Position Hor(X-axis) Ver(Y-axis)

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV



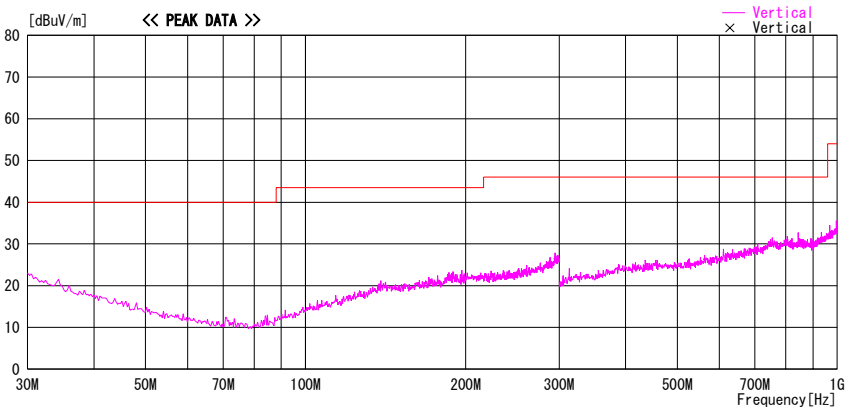


CHART:WITH FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

Radiated Spurious Emission
(30MHz-1GHz)
*There is no spurious emission from 30MHz to 1GHz.

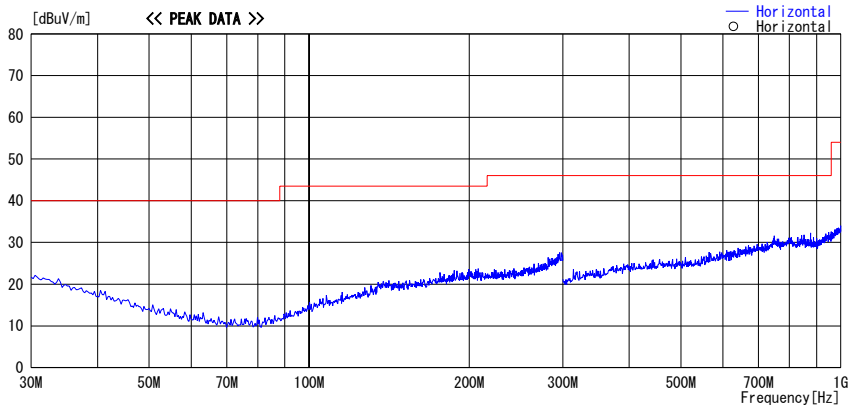
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Applicant	: Sony EMCS Corporation	Report No.	: 26CE0070-HO
Kind of EUT	: WIRELESS MICROPHONE	Power	: DC3.0V
Model No.	: ECM-HW1T	Temp./Humi.	: 23deg.C. / 24%
Serial No.	: 68	Operator	: Makoto Kosaka

Mode / Remarks : Tx 2441MHz(DH5) EUT Position Hor(X-axis) Ver(Y-axis)

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV



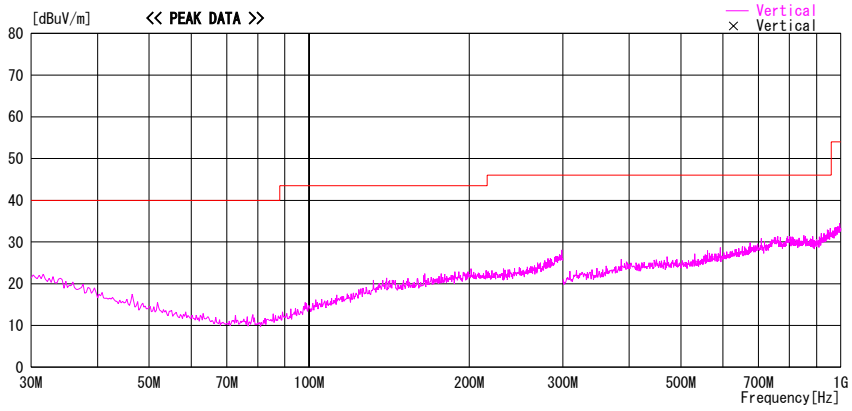


CHART:WITH FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

Radiated Spurious Emission
(30MHz-1GHz)
*There is no spurious emission from 30MHz to 1GHz.

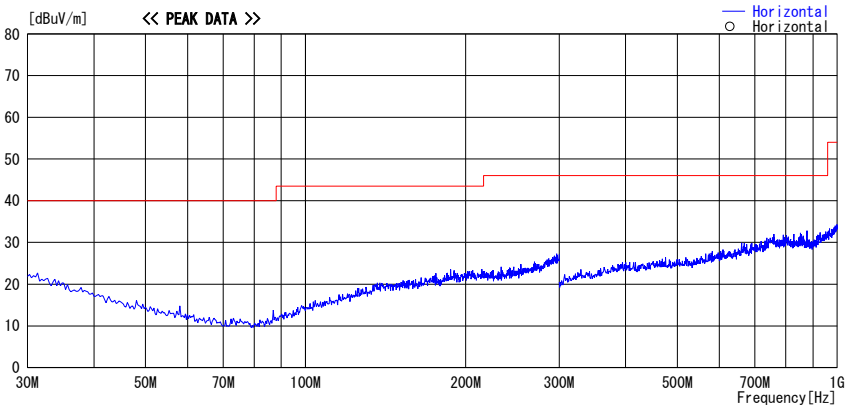
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Applicant	: Sony EMCS Corporation	Report No.	: 26CE0070-HO
Kind of EUT	: WIRELESS MICROPHONE	Power	: DC3.0V
Model No.	: ECM-HW1T	Temp./Humi.	: 23deg.C. / 24%
Serial No.	: 68	Operator	: Makoto Kosaka

Mode / Remarks : Tx 2480MHz(DH5) EUT Position Hor(X-axis) Ver(Y-axis)

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV



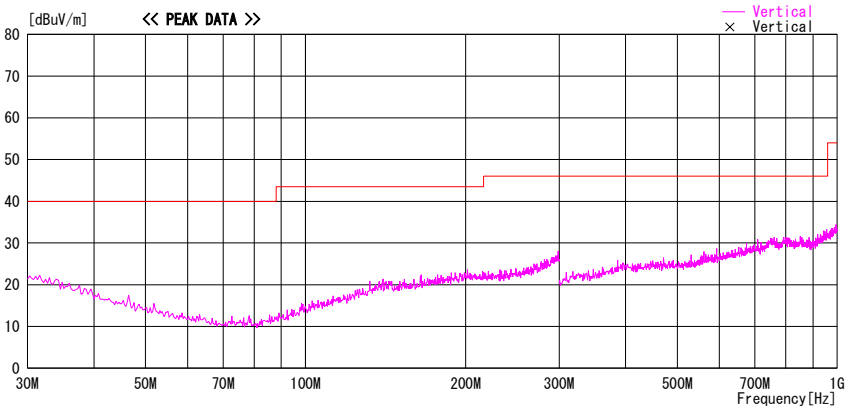


CHART:WITH FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

Radiated Spurious Emission
(30MHz-1GHz)
*There is no spurious emission from 30MHz to 1GHz.

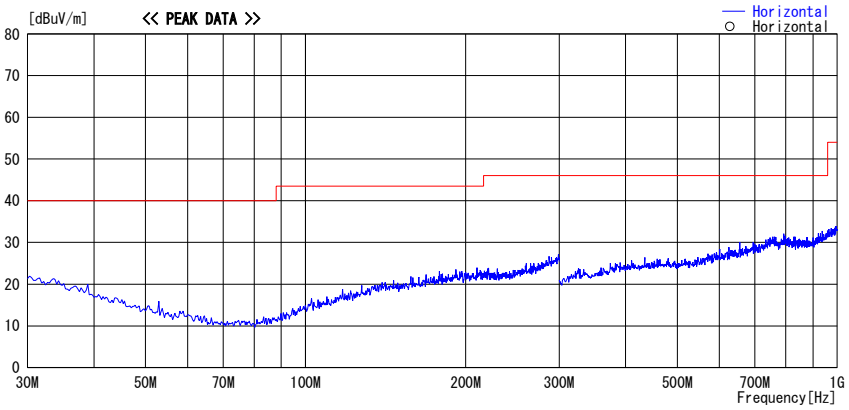
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Applicant	: Sony EMCS Corporation	Report No.	: 26CE0070-HO
Kind of EUT	: WIRELESS MICROPHONE	Power	: DC3.0V
Model No.	: ECM-HW1T	Temp./Humi.	: 23deg.C. / 24%
Serial No.	: 68	Operator	: Makoto Kosaka

Mode / Remarks : Rx 2441MHz EUT Position Hor(X-axis) Ver(Y-axis)

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV



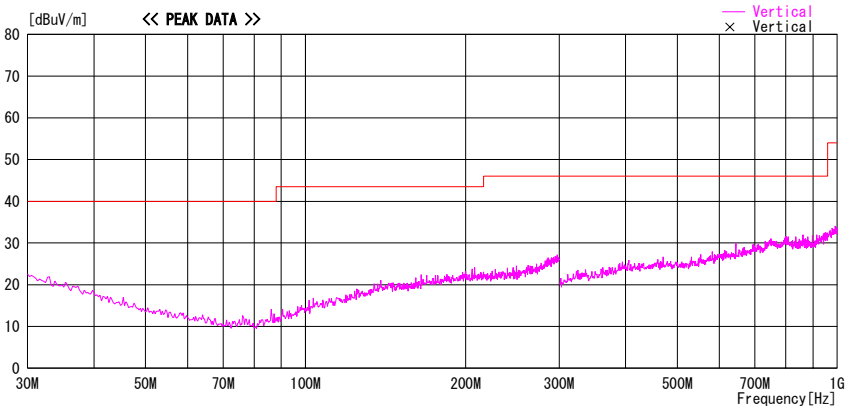


CHART:WITH FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

Radiated Spurious Emission
(1GHz-26.5GHz)

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

Company	: Sony EMCS Corporation	REPORT NO	: 26CE0070-HO
Equipment	: WIRELESS MICROPHONE	REGULATION	: Fcc Part15 Subpart C 15.247(d)
Model	: ECM-HW1T	TEST DISTANCE	: 3/1m
Sample No.	: 68	DATE	: 11/29/2005
Power	: DC3.0V	TEMPERATURE	: 22deg.C
Mode	: Bluetooth, Tx 2402MHz	HUMIDITY	: 32%
Remarks	: Hor X-axis/Ver Y-axis	ENGINEER	: Mitsuru Fujimura

PK DETECT (RBW: 1MHz, VBW: 1MHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2390.0	48.1	48.5	30.9	32.4	3.1	10.0	59.7	60.1	74.0	14.3	13.9
2*	2400.0	75.9	74.6	30.9	32.4	3.1	10.0	87.5	86.2	74.0	-13.5	-12.2
3	4803.9	43.1	42.3	34.9	31.9	4.3	0.8	51.2	50.4	74.0	22.8	23.6
4	7206.0	43.6	43.3	37.6	31.5	5.1	0.3	55.1	54.8	74.0	18.9	19.2
5	9607.6	44.8	43.7	36.3	31.7	6.1	0.7	56.2	55.1	74.0	17.8	18.9
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
6	12010.0	43.4	47.5	41.6	36.1	7.8	0.0	47.2	51.3	74.0	26.8	22.7
7	14412.0	44.5	44.7	41.7	34.6	8.5	0.0	50.6	50.8	74.0	23.4	23.2
8	16814.0	45.1	44.6	45.1	35.1	9.0	0.0	54.6	54.1	74.0	19.4	19.9
9	19216.0	45.5	45.6	40.1	34.1	9.7	0.0	51.7	51.8	74.0	22.3	22.2
10	21618.0	45.8	45.8	39.8	34.8	9.9	0.0	51.2	51.2	74.0	22.8	22.8
11	24020.0	45.8	46.0	40.4	35.5	10.8	0.0	52.0	52.2	74.0	22.0	21.8

AV DETECT (RBW: 1MHz, VBW: 10Hz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2390.0	31.6	31.2	30.9	32.4	3.1	10.0	43.2	42.8	54.0	10.8	11.2
2*	2400.0	64.9	61.2	30.9	32.4	3.1	10.0	76.5	72.8	54.0	-22.5	-18.8
3	4803.9	30.4	30.3	34.9	31.9	4.3	0.8	38.5	38.4	54.0	15.6	15.6
4	7206.0	31.1	30.8	37.6	31.5	5.1	0.3	42.6	42.3	54.0	11.4	11.7
5	9607.6	31.3	29.9	36.3	31.7	6.1	0.7	42.7	41.3	54.0	11.3	12.7
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
6	12010.0	33.7	37.7	41.6	36.1	7.8	0.0	37.5	41.5	54.0	16.5	12.5
7	14412.0	33.0	33.0	41.7	34.6	8.5	0.0	39.1	39.1	54.0	14.9	14.9
8	16814.0	33.2	33.1	45.1	35.1	9.0	0.0	42.7	42.6	54.0	11.3	11.4
9	19216.0	32.1	32.6	40.1	34.1	9.7	0.0	38.3	38.8	54.0	15.7	15.2
10	21618.0	33.6	33.4	39.8	34.8	9.9	0.0	39.0	38.8	54.0	15.0	15.2
11	24020.0	32.9	33.1	40.4	35.5	10.8	0.0	39.1	39.3	54.0	14.9	14.7

*Reference data

20dBc(Fundamental 2402MHz) (RBW: 100kHz, VBW: 300kHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	ATT or	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter Loss	HOR	VER	20dBc	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	[dB]
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2402.0	100.4	99.1	30.9	32.4	3.1	10.0	112.0	110.7	-	-	-
2	2400.0	50.2	49.2	30.9	32.4	3.1	10.0	61.8	60.8	Funda-20dB	30.2	30.0

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB
*Except for the above table : All other spurious emissions were less than 20dB for the limit.
*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.
*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

Radiated Spurious Emission
(1GHz-26.5GHz)

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

Company	: Sony EMCS Corporation	REPORT NO	: 26CE0070-HO
Equipment	: WIRELESS MICROPHONE	REGULATION	: Fcc Part15 Subpart C 15.247(d)
Model	: ECM-HW1T	TEST DISTANCE	: 3/1m
Sample No.	: 68	DATE	: 11/29/2005
Power	: DC3.0V	TEMPERATURE	: 22deg.C
Mode	: Bluetooth, Tx 2441MHz	HUMIDITY	: 32%
Remarks	: Hor X-axis/Ver Y-axis	ENGINEER	: Mitsuru Fujimura

PK DETECT (RBW: 1MHz, VBW: 1MHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	4882.1	44.9	43.9	35.4	31.8	4.3	0.8	53.6	52.6	74.0	20.4	21.4
2	7323.2	44.8	43.7	37.8	31.7	5.2	0.3	56.4	55.3	74.0	17.6	18.7
3	9764.0	44.3	43.4	36.2	31.8	6.2	0.6	55.5	54.6	74.0	18.6	19.4
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
4	12205.0	44.6	44.7	41.6	36.0	7.8	0.0	48.5	48.6	74.0	25.5	25.4
5	14646.0	44.3	44.0	42.2	35.2	8.5	0.0	50.3	50.0	74.0	23.7	24.0
6	17087.0	45.3	44.9	45.2	34.9	9.1	0.0	55.2	54.8	74.0	18.8	19.2
7	19528.0	45.7	45.7	40.3	34.3	9.8	0.0	52.0	52.0	74.0	22.0	22.0
8	21969.0	46.0	45.8	39.8	34.2	10.0	0.0	52.1	51.9	74.0	21.9	22.1
9	24410.0	46.5	45.4	40.4	35.8	10.8	0.0	52.4	51.3	74.0	21.6	22.7

AV DETECT (RBW: 1MHz, VBW: 10Hz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	4882.1	34.6	32.0	35.4	31.8	4.3	0.8	43.3	40.7	54.0	10.7	13.4
2	7323.2	31.5	30.9	37.8	31.7	5.2	0.3	43.1	42.5	54.0	10.9	11.5
3	9764.0	30.9	30.6	36.2	31.8	6.2	0.6	42.1	41.8	54.0	11.9	12.3
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
4	12205.0	33.0	33.1	41.6	36.0	7.8	0.0	36.9	37.0	54.0	17.1	17.0
5	14646.0	32.2	32.4	42.2	35.2	8.5	0.0	38.2	38.4	54.0	15.8	15.6
6	17087.0	32.8	32.4	45.2	34.9	9.1	0.0	42.7	42.3	54.0	11.3	11.7
7	19528.0	33.0	32.6	40.3	34.3	9.8	0.0	39.3	38.9	54.0	14.7	15.1
8	21969.0	33.8	34.1	39.8	34.2	10.0	0.0	39.9	40.2	54.0	14.1	13.8
9	24410.0	34.1	34.1	40.4	35.8	10.8	0.0	40.0	40.0	54.0	14.0	14.0

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB
*Except for the above table : All other spurious emissions were less than 20dB for the limit.
*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.
*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

Radiated Spurious Emission
(1GHz-26.5GHz)

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

Company	: Sony EMCS Corporation	REPORT NO	: 26CE0070-HO
Equipment	: WIRELESS MICROPHONE	REGULATION	: Fcc Part15 Subpart C 15.247(d)
Model	: ECM-HW1T	TEST DISTANCE	: 3/1m
Sample No.	: 68	DATE	: 11/28/2005 11/29/2005
Power	: DC3.0V	TEMPERATURE	: 22deg.C : 22deg.C
Mode	: Bluetooth, Tx 2480MHz	HUMIDITY	: 40% : 32%
Remarks	: Hor X-axis/Ver Y-axis	ENGINEER	: Mitsuru Fujimura

PK DETECT (RBW: 1MHz, VBW: 1MHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1*	2483.5	67.1	67.0	30.8	32.4	3.1	10.0	78.6	78.5	74.0	-4.6	-4.5
2	4960.0	48.7	46.8	35.8	31.8	4.3	0.8	57.8	55.9	74.0	16.2	18.1
3	7440.0	44.0	43.7	37.9	31.9	5.3	0.3	55.6	55.3	74.0	18.4	18.7
4	9920.0	44.5	44.0	36.2	32.0	6.3	0.6	55.6	55.1	74.0	18.4	18.9
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
5	12400.0	44.5	44.3	41.7	35.8	7.9	0.0	48.8	48.6	74.0	25.2	25.4
6	14880.0	44.7	44.6	42.7	36.0	8.5	0.0	50.4	50.3	74.0	23.6	23.7
7	17360.0	46.2	45.5	44.7	35.1	9.3	0.0	55.6	54.9	74.0	18.4	19.1
8	19840.0	45.9	46.1	40.4	34.8	9.8	0.0	51.8	52.0	74.0	22.2	22.0
9	22320.0	45.2	45.8	39.8	34.1	10.1	0.0	51.5	52.1	74.0	22.5	21.9
10	24800.0	45.8	45.7	40.7	35.1	10.9	0.0	52.8	52.7	74.0	21.2	21.3

AV DETECT (RBW: 1MHz, VBW: 10Hz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1*	2483.5	44.0	43.8	30.8	32.4	3.1	10.0	55.5	55.3	54.0	-1.5	-1.3
2	4960.0	41.2	37.9	35.8	31.8	4.3	0.8	50.3	47.0	54.0	3.7	7.0
3	7440.0	31.6	30.9	37.9	31.9	5.3	0.3	43.2	42.5	54.0	10.8	11.5
4	9920.0	31.9	31.1	36.2	32.0	6.3	0.6	43.0	42.2	54.0	11.0	11.9
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
5	12400.0	31.1	31.2	41.7	35.8	7.9	0.0	35.4	35.5	54.0	18.6	18.5
6	14880.0	31.8	31.9	42.7	36.0	8.5	0.0	37.5	37.6	54.0	16.5	16.4
7	17360.0	31.5	31.6	44.7	35.1	9.3	0.0	40.9	41.0	54.0	13.1	13.0
8	19840.0	33.0	33.1	40.4	34.8	9.8	0.0	38.9	39.0	54.0	15.1	15.0
9	22320.0	33.1	33.2	39.8	34.1	10.1	0.0	39.4	39.5	54.0	14.6	14.5
10	24800.0	33.4	33.1	40.7	35.1	10.9	0.0	40.4	40.1	54.0	13.6	13.9

* Reference data

Marker-Delta Method (RBW:100kHz)

No.	FREQ	Reading calculation*		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
PK DETECT												
1	2483.5	50.4	50.2	30.8	32.4	3.1	10.0	61.9	61.7	74.0	12.1	12.3
AV DETECT												
1	2483.5	31.6	31.1	30.8	32.4	3.1	10.0	43.0	42.6	54.0	11.0	11.4

*Reading calculation = Carrier(RBW:1MHz) - {Carrier(RBW:100kHz) - Bandedge(RBW:100kHz)}

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB
*Except for the above table : All other spurious emissions were less than 20dB for the limit.
*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.
*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

Radiated Spurious Emission
(1GHz-26.5GHz)

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

Company	: Sony EMCS Corporation	REPORT NO	: 26CE0070-HO
Equipment	: WIRELESS MICROPHONE	REGULATION	: Fcc Part15 Subpart C 15.247(d)
Model	: ECM-HW1T	TEST DISTANCE	: 3/1m
Sample No.	: 68	DATE	11/30/2005
Power	: DC3.0V	TEMPERATURE	: 22deg.C
Mode	: Bluetooth, Rx 2441MHz	HUMIDITY	: 32%
Remarks	: Hor X-axis/Ver Y-axis	ENGINEER	: Mitsuru Fujimura

PK DETECT (RBW: 1MHz, VBW: 1MHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2441.0	44.1	43.8	30.9	32.4	3.2	0.0	45.8	45.5	74.0	28.2	28.5
2	4882.0	41.8	41.4	35.4	31.8	4.3	0.0	49.7	49.3	74.0	24.3	24.7

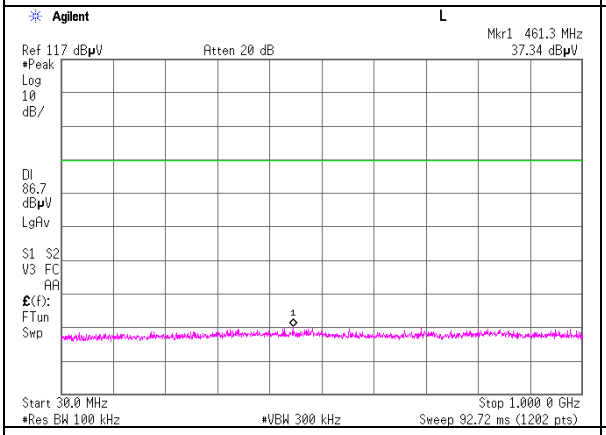
AV DETECT (RBW: 1MHz, VBW: 10Hz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2441.0	31.5	30.2	30.9	32.4	3.2	0.0	33.2	31.9	54.0	20.8	22.1
2	4882.0	28.0	28.1	35.4	31.8	4.3	0.0	35.9	36.0	54.0	18.1	18.1

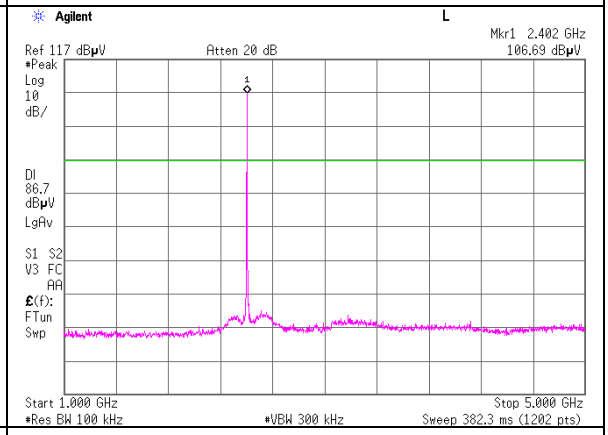
*Except for the above table : All other spurious emissions were less than 20dB for the limit.
*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.
*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

Conducted Spurious Emission
Tx, Ch:Low

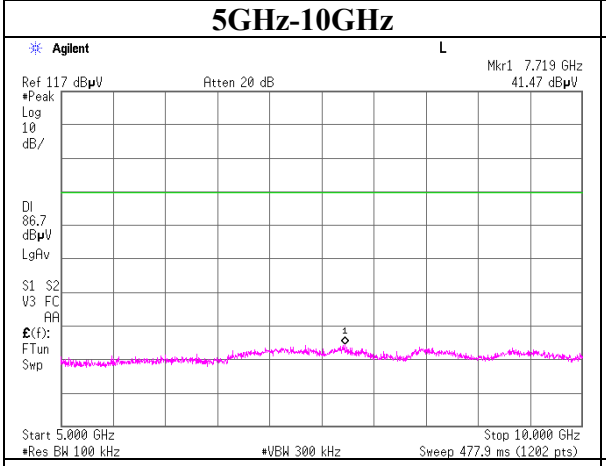
30MHz-1GHz



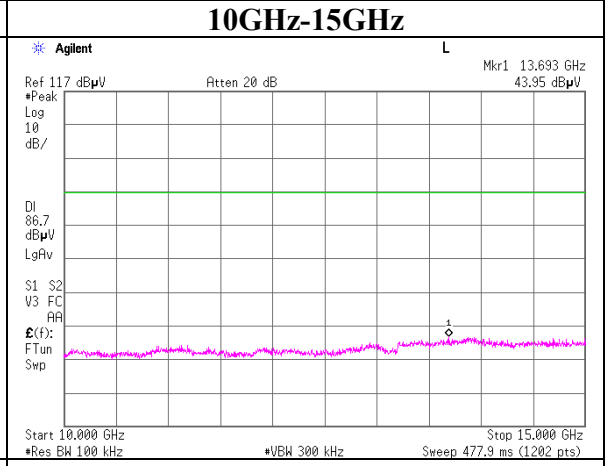
1GHz-5GHz



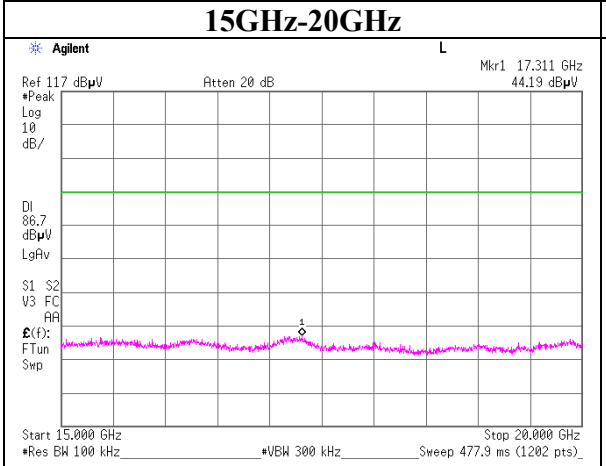
5GHz-10GHz



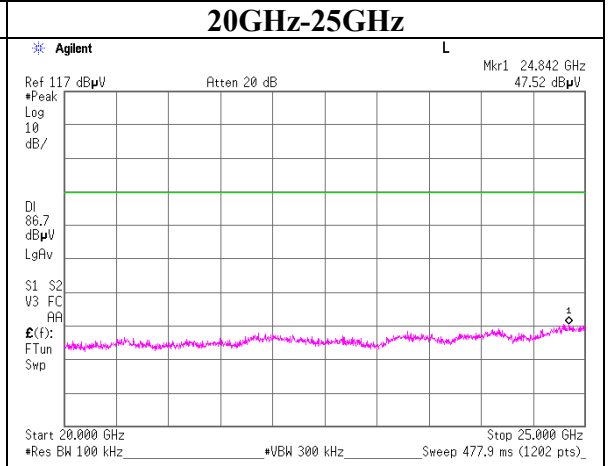
10GHz-15GHz



15GHz-20GHz

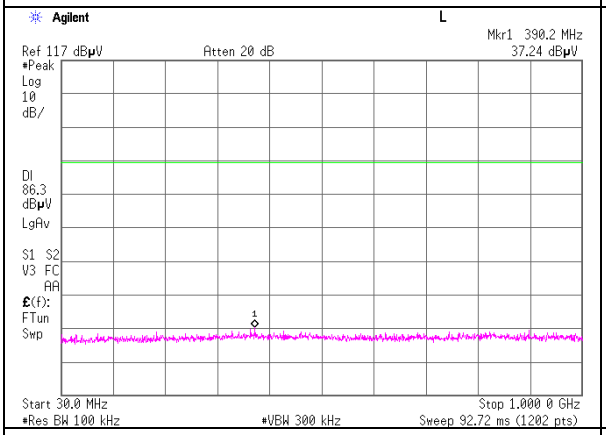


20GHz-25GHz

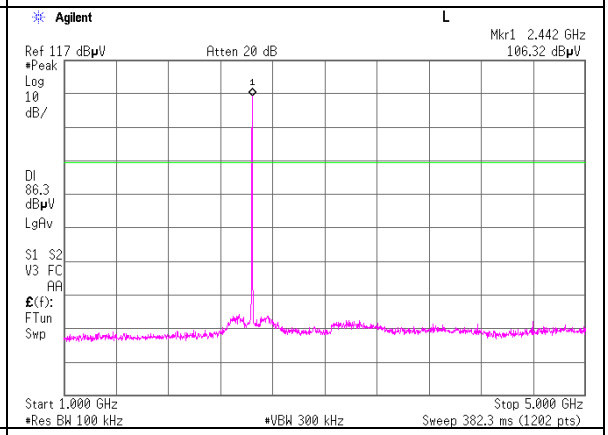


Conducted Spurious Emission
Tx, Ch:Mid

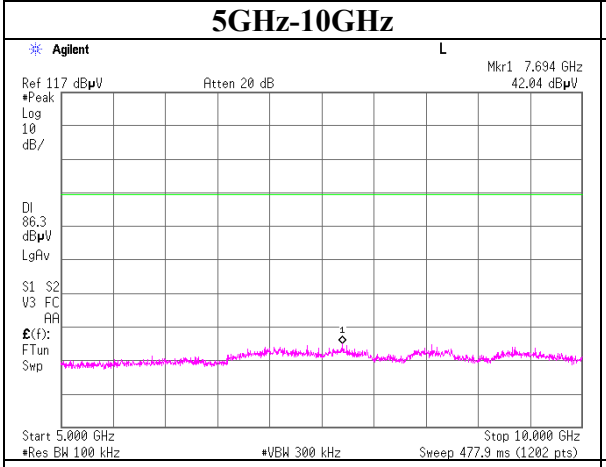
30MHz-1GHz



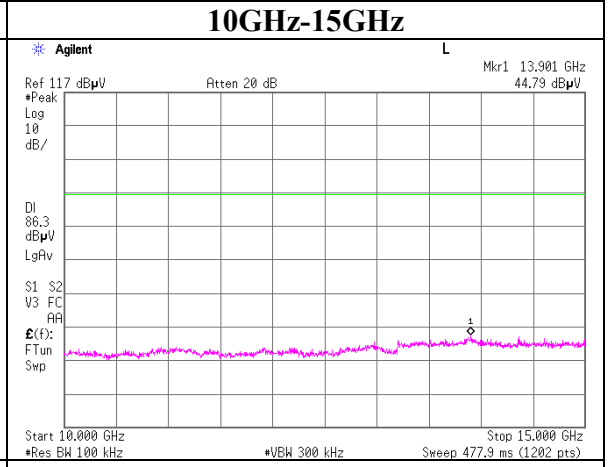
1GHz-5GHz



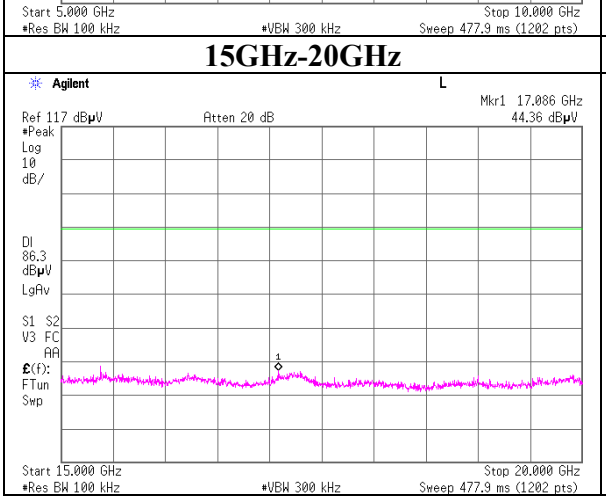
5GHz-10GHz



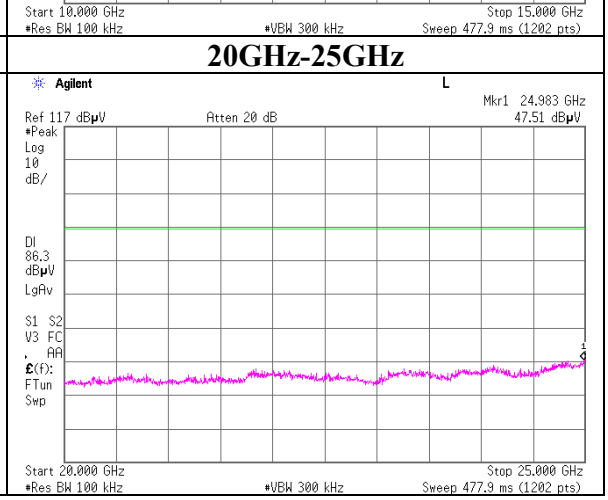
10GHz-15GHz



15GHz-20GHz

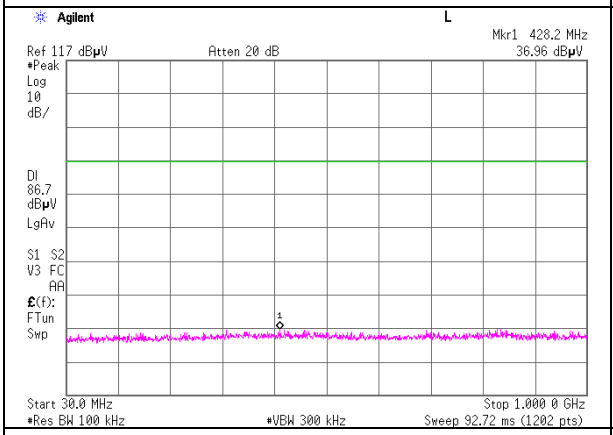


20GHz-25GHz

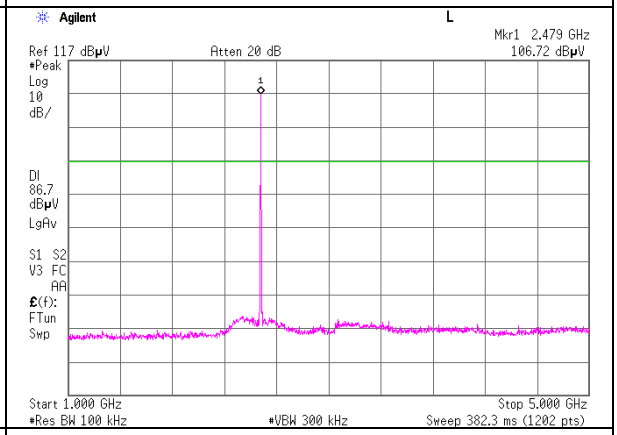


Conducted Spurious Emission
Tx, Ch:High

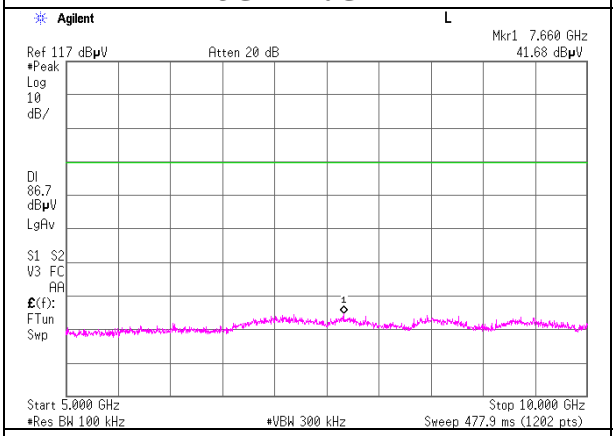
30MHz-1GHz



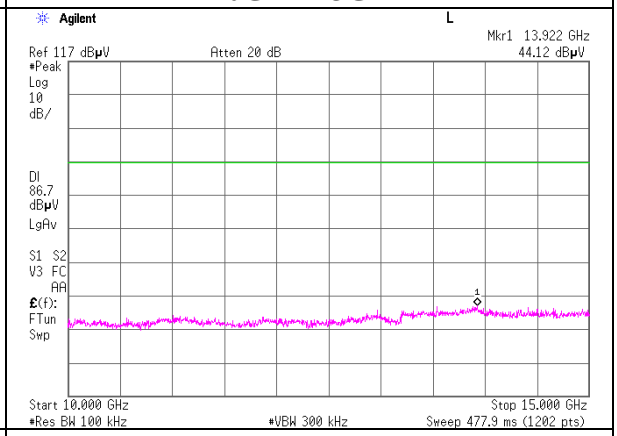
1GHz-5GHz



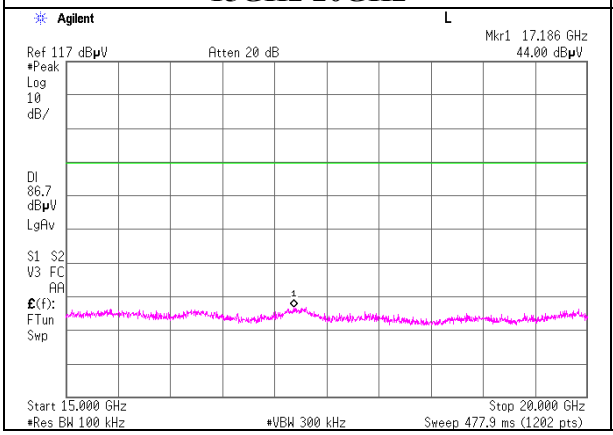
5GHz-10GHz



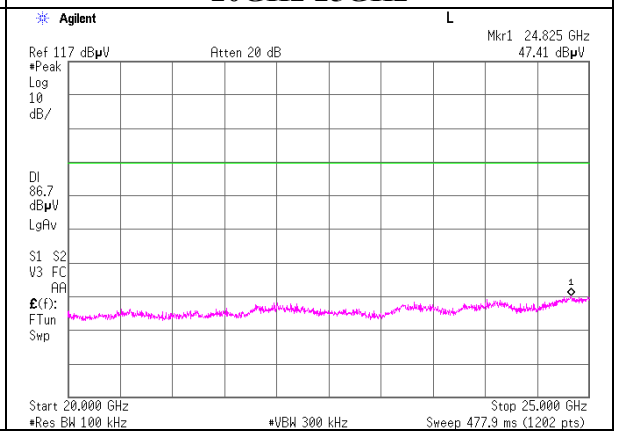
10GHz-15GHz



15GHz-20GHz

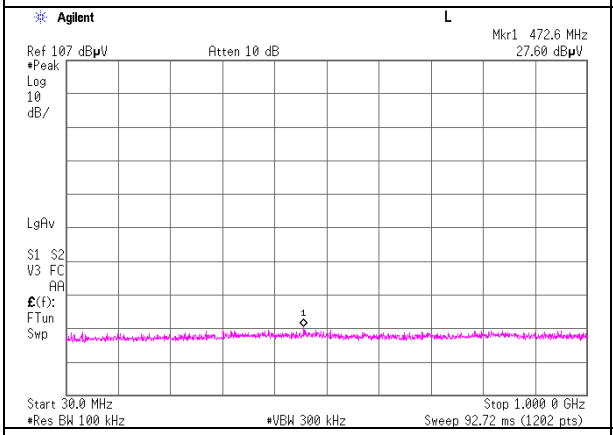


20GHz-25GHz

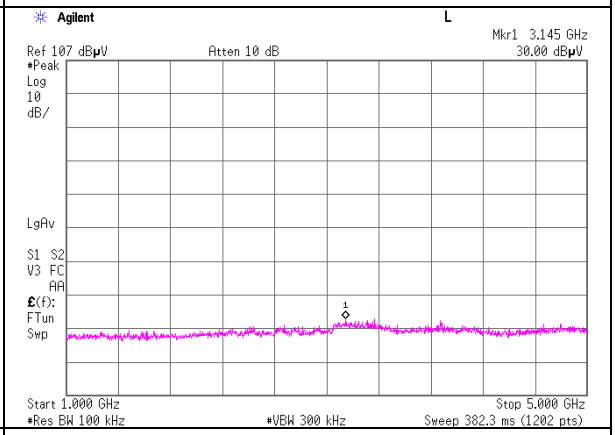


Conducted Spurious Emission
Rx, Ch:Mid

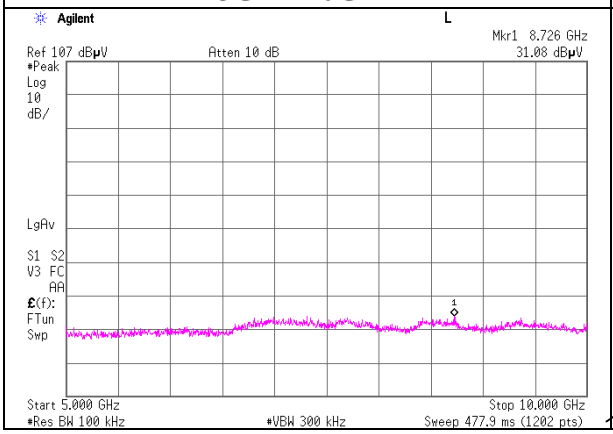
30MHz-1GHz

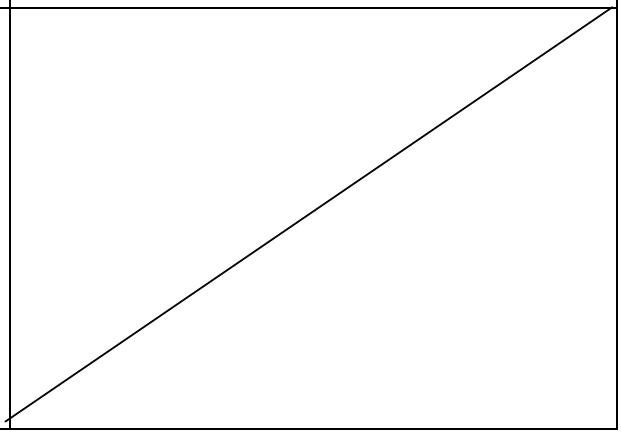


1GHz-5GHz



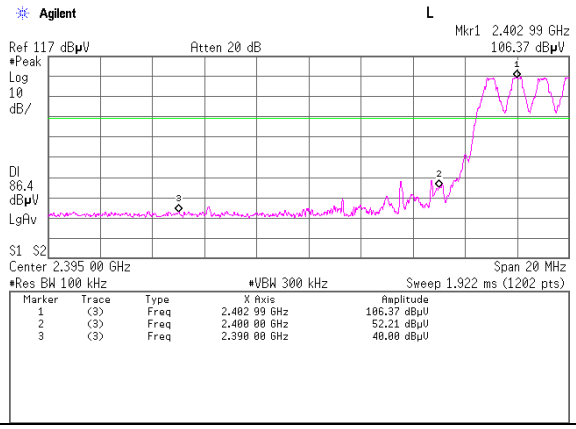
5GHz-10GHz



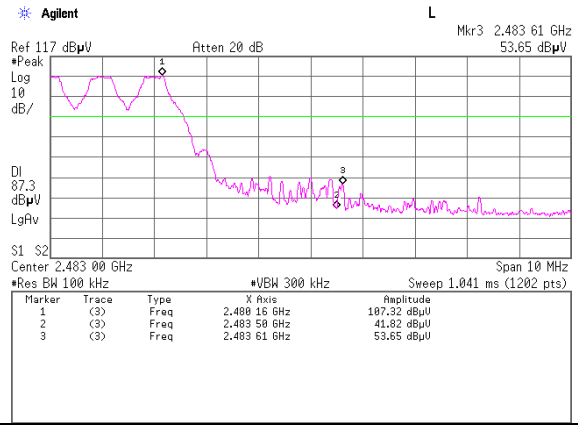


Conducted Spurious Emission
Band Edge compliance

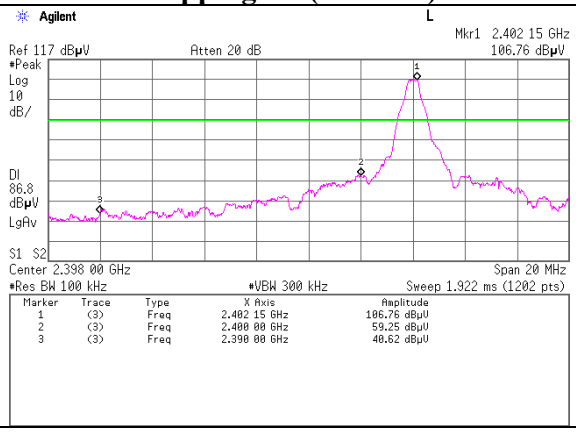
Hopping on (Ch:Low)



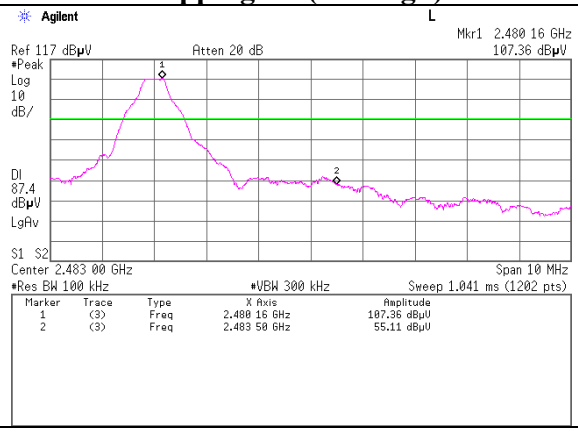
Hopping on (Ch:High)



Hopping off (Ch:Low)

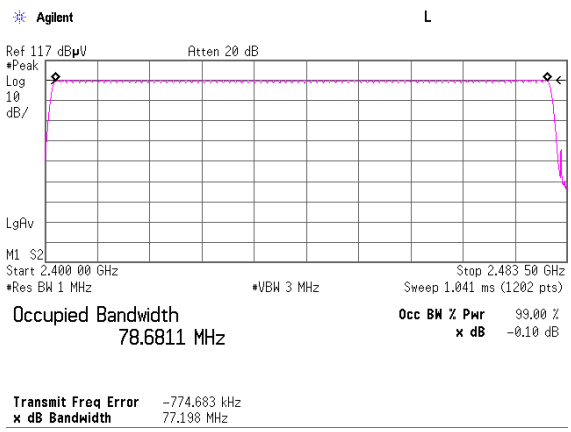


Hopping off (Ch:High)

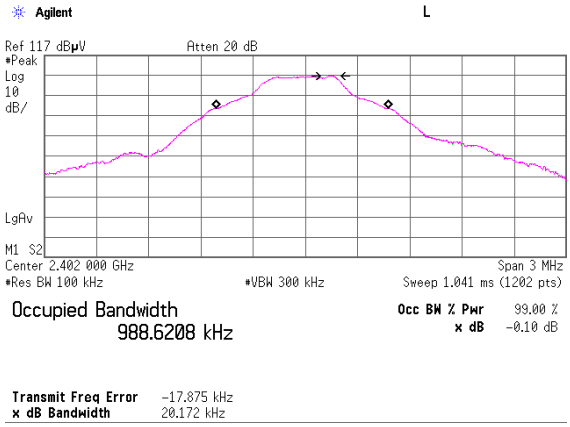


99% Occupied Bandwidth

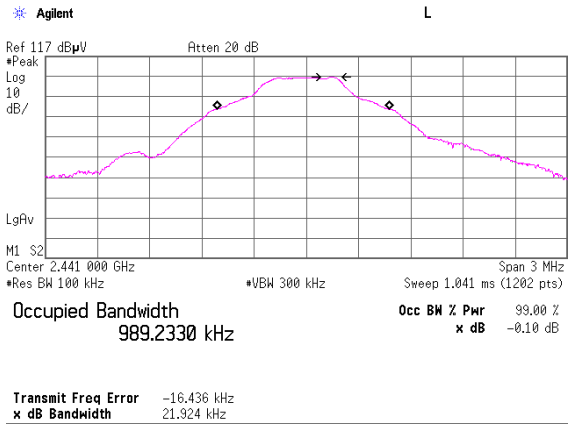
Hopping ON



Hopping OFF, Ch: Low



Hopping OFF, Ch: Mid



Hopping OFF, Ch: High