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Dates of Tests: Mar 25 ~ Apr 1, 2010  
 Test Report S/N: LR500191004A  
 Test Site : LTA CO., LTD.

## CERTIFICATION OF COMPLIANCE

FCC ID.

**PBN-ET21KV**

APPLICANT

**ENTER TECH CO.,LTD.**

<b>Equipment Class</b>	:	<b>FHSS Sequence Spread Spectrum (FHSS)</b>
<b>Manufacturing Description</b>	:	<b>Magicsing Karaoke(Main Station)</b>
<b>Manufacturer</b>	:	<b>ENTER TECH CO.,LTD.</b>
<b>Model name</b>	:	<b>ET21KV</b>
<b>Test Device Serial No.:</b>	:	<b>Identical prototype</b>
<b>Rule Part(s)</b>	:	<b>FCC Part 15.247 Subpart C; ANSI C-63.4-2003</b>
<b>Frequency Range</b>	:	<b>2403 ~ 2477MHz</b>
<b>RF power</b>	:	<b>13.90 mW - Conducted</b>
<b>Data of issue</b>	:	<b>April 1, 2010</b>

This test report is issued under the authority of:

Kyung-Taek LEE, Technical Manager

The test was supervised by:

Hyun-Chae You, Test Engineer

**This test result only responds to the tested sample. It is not allowed to copy this report even partly without the allowance of the test laboratory. This report must not be used by the applicant to claim product endorsement by any agency.**



NVLAP LAB Code.: 200723-0

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## 1. General information's

### 1-1 Test Performed

Company name : LTA Co., Ltd.  
 Address : 243, Jubug-ri, Yangji-Myeon, Youngin-Si, Kyunggi-Do, Korea. 449-822  
 Web site : <http://www.ltalab.com>  
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Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the “General requirements for the competents of calibration and testing laboratory”.

### 1-2 Accredited agencies

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2010-09-30	ECT accredited Lab.
RRL	KOREA	KR0049	2011-06-20	EMC accredited Lab.
FCC	U.S.A	610755	2011-04-22	FCC filing
VCCI	JAPAN	R2133, C2307	2011-06-21	VCCI registration
IC	CANADA	IC5799	2010-05-03	IC filing

## 2. Information's about test item

### 2-1 Client & Manufacturer

Company name : ENTER TECH CO.,LTD.  
 Address : Samhwa Bldg. 401-5, Hwagok-7dong, Kangseo-gu,  
 Seoul, 157-887, Korea.  
 Tel / Fax : +82-2-2605-0884  
 +82-2-2691-5354

### 2-2 Equipment Under Test (EUT)

Trade name : Magicsing Karaoke(Main Station)  
 FCC ID : PBN-ET21KV  
 Model name : ET21KV  
 Serial number : Identical prototype  
 Date of receipt : March 24, 2010  
 EUT condition : Pre-production, not damaged  
 Antenna type : Max Gain 2.118dBi  
 Frequency Range : 2403 ~ 2477MHz  
 RF output power : Max. 11.43dBm - Conducted  
 Number of channels : 16  
 Channel spacing : 5MHz  
 Channel Access Protocol : Frequency Hopping  
 Type of Modulation : GFSK  
 Power Source : 12.0Vdc (by AC/DC Adaptor: M/N : SW36-12003000-W)

### 2-3 Tested frequency

	LOW	MID	HIGH
Frequency (MHz)	2403	2438	2477

### 2-4 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
PC	HP Compaq dx2200	CNG6500RWK	HP
MONITOR	HPL1710	CNC816QH92	HP
Keyboard	SK-8115	68A-04Q6	DELL
Mouse	MO56UO	520107013	DELL
PRINTER	STYLUS C65	FXSY002205	EPSON
TV moniter	LT-26H6TVH	DO8090SR100075	N/A
SD CARD	N/A	N/A	N/A
Resistance jig	LTA010	L051201	LTA
USB Memorystick	SKYLUX	N/A	Axxen

### 3. Test Report

#### 3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
15.247(a)	Carrier Frequency Separation	> 25 kHz	Conducted	C
15.247(a)	Number of Hopping Frequencies	> 15 hops		C
15.247(a)	20 dB Bandwidth	> 1.5 MHz		C
15.247	Dwell Time	< 0.4 seconds		C
15.247(b)	Transmitter Output Power	< 250 mWatt		C
15.247(d)	Conducted Spurious emission	> 20 dBc		C
15.247(d)	Band Edge	> 20 dBc		C
15.249 / 15.209	Field Strength of Harmonics	< 54 dBuV (at 3m)	Radiated	C
15.109	Field Strength	-		C
15.207 / 15.107	AC Conducted Emissions	EN 55022	Line Conducted	C
15.203	Antenna requirement	-	-	C

*Note 1:* C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

*Note 2:* The data in this test report are traceable to the national or international standards.

→ Antenna Requirement

The ENTER TECH CO.,LTD. FCC ID: PBN-ET21KV unit complies with the requirement of §15.203. The antenna is connected to inside of EUT. And type is Helical antenna.

The sample was tested according to the following specification:

FCC Parts 15.247, DA 00-705; ANSI C-63.4-2003

## 3.2 Transmitter requirements

### 3.2.1 Carrier Frequency Separation

#### Procedure:

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

After the trace being stable, the reading value between the peaks of the adjacent channels using the marker-delta function was recorded as the measurement results.

The spectrum analyzer is set to:

Span = 15 MHz (wide enough to capture the peaks of two adjacent channels)

RBW = 30 kHz

Sweep = auto

VBW = 30 kHz

Detector function = peak

Trace = max hold

#### Measurement Data:

Test Results	
Carrier Frequency Separation (MHz)	Result
5.253	Complies

- See next pages for actual measured spectrum plots.

#### Minimum Standard:

The EUT shall have hopping channel carrier frequencies separated by a minimum of 25kHz or two-thirds of 20dB bandwidth of the hopping channel, whichever is greater.

#### Measurement Setup

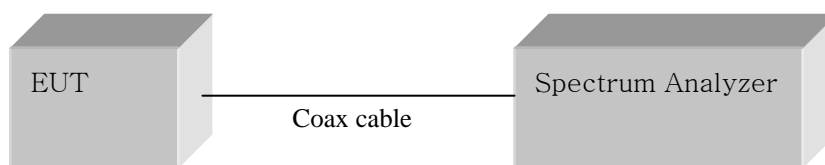
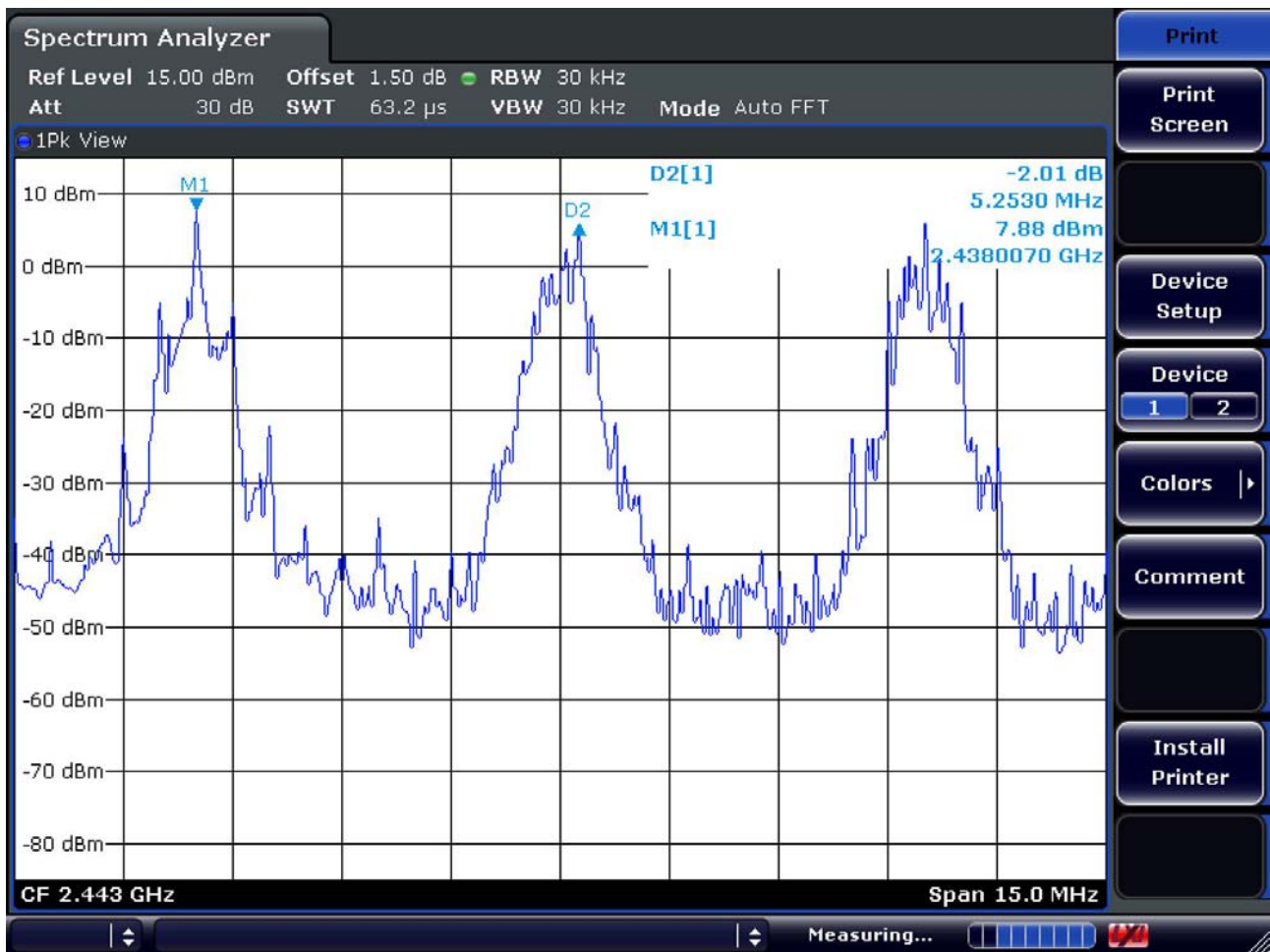


Figure 1: Measurement setup for the carrier frequency separation

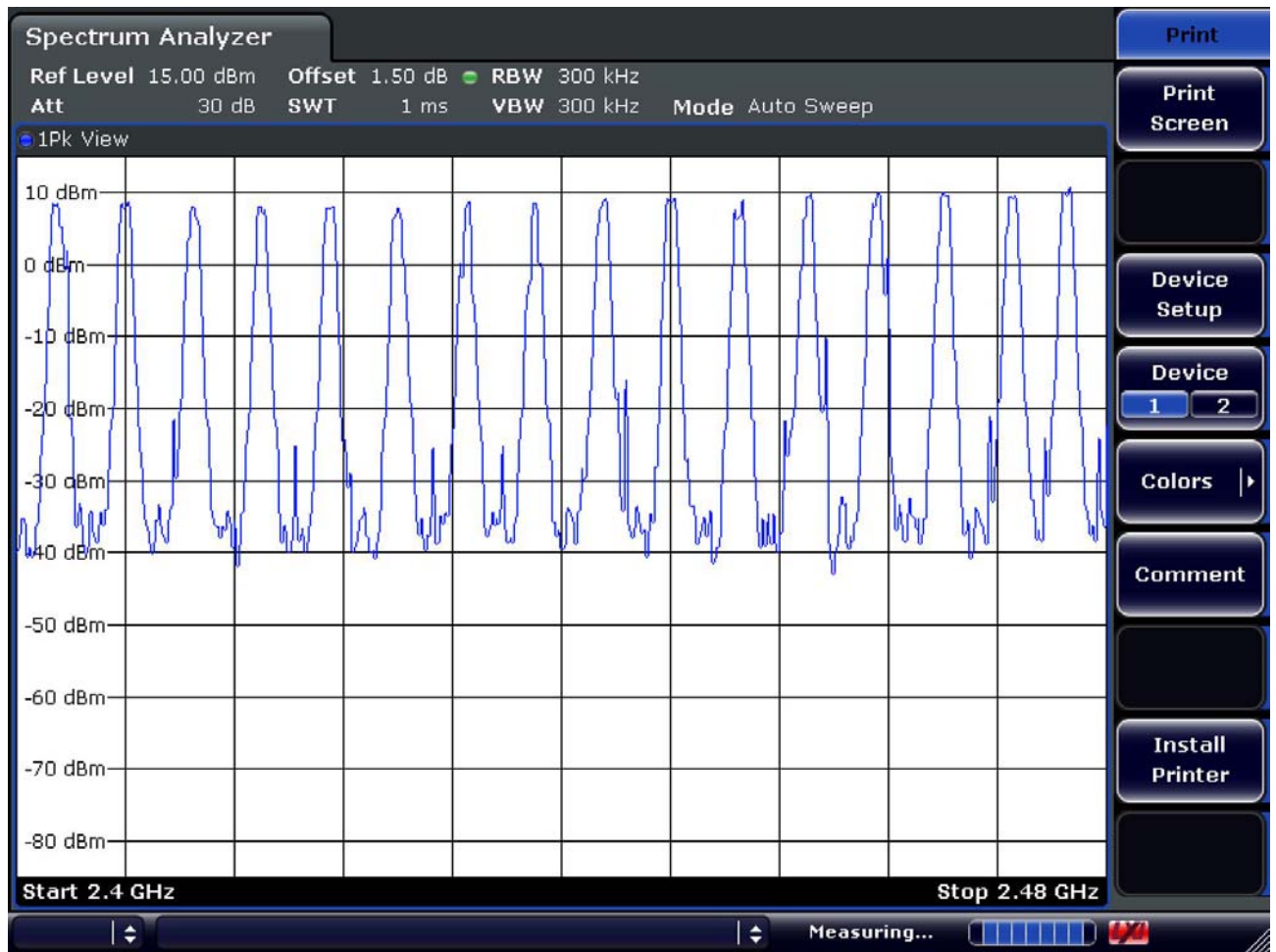
### Carrier Frequency Separation







### Number of Hopping Frequencies



### 3.2.3 20 dB Bandwidth

#### Procedure:

The bandwidth at 20 dB below the highest inband spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels..

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is ( as close as possible to ) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

#### The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

Span = 5 MHz (approximately 2 or 3 times of the 20 dB bandwidth)

RBW = 30 kHz

Sweep = auto

VBW = 30 kHz (VBW  $\geq$  RBW)

Detector function = peak

Trace = max hold

#### Measurement Data: Basic Mode

Frequency (MHz)	Channel No.	Test Results(MHz)
		20dB Bandwidth
2403	1	1.143
2438	8	1.143
2477	16	1.136

- See next pages for actual measured spectrum plots.

#### Minimum Standard:

N/A

#### Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

**Channel 1**  
**20 dB Bandwidth**



**Channel 8**  
**20 dB Bandwidth**



**Channel 16**  
**20 dB Bandwidth**



### 3.2.4 Time of Occupancy (Dwell Time)

#### Procedure:

The dwell time was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

The spectrum analyzer is set to:

Center frequency = 2438 MHz

Span = zero

RBW = 1 MHz

VBW = 1 MHz (VBW  $\geq$  RBW)

Trace = Single Sweep

Detector function = peak

#### Measurement Data:

Number of transmission in 6.4s ( 16Hopping*0.4)	Length of Transmission Time (msec)	Result (msec)	Limit (msec)
16(Times/6.4sec) = 16	0.753	12.05	400

- See next pages for actual measured spectrum plots.
- dwell time = {(number of hopping per second / number of slot ) x duration time per channel} x 0.4 ms

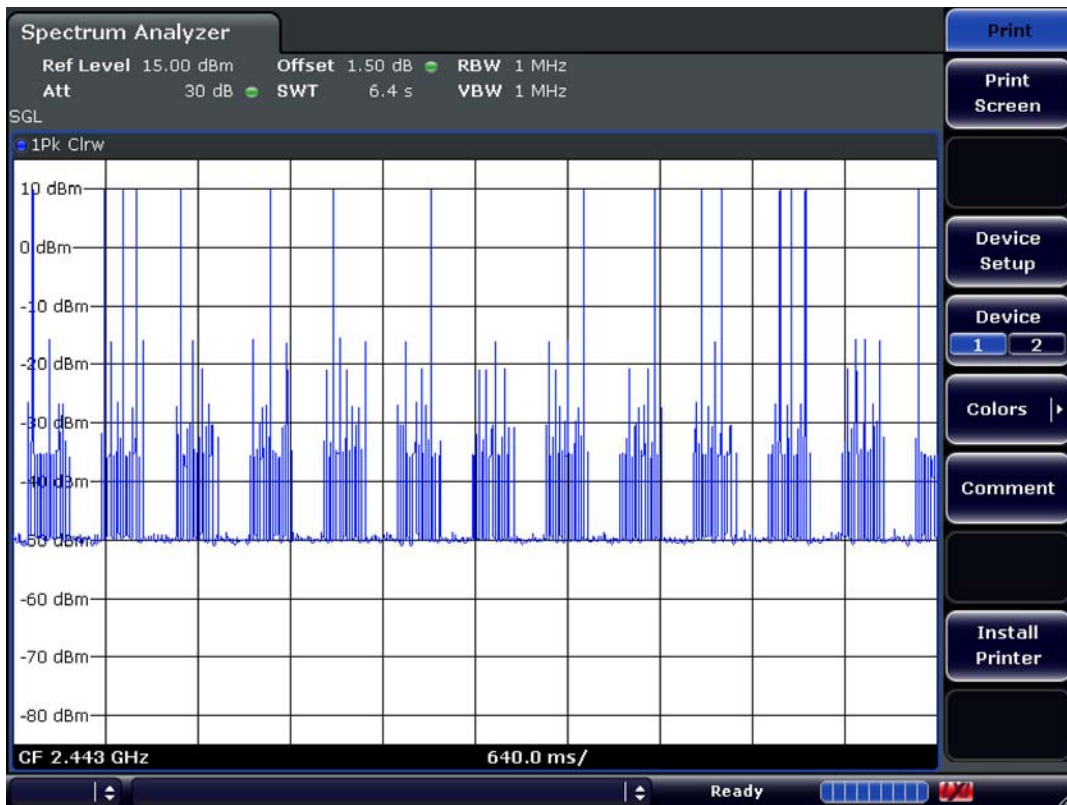
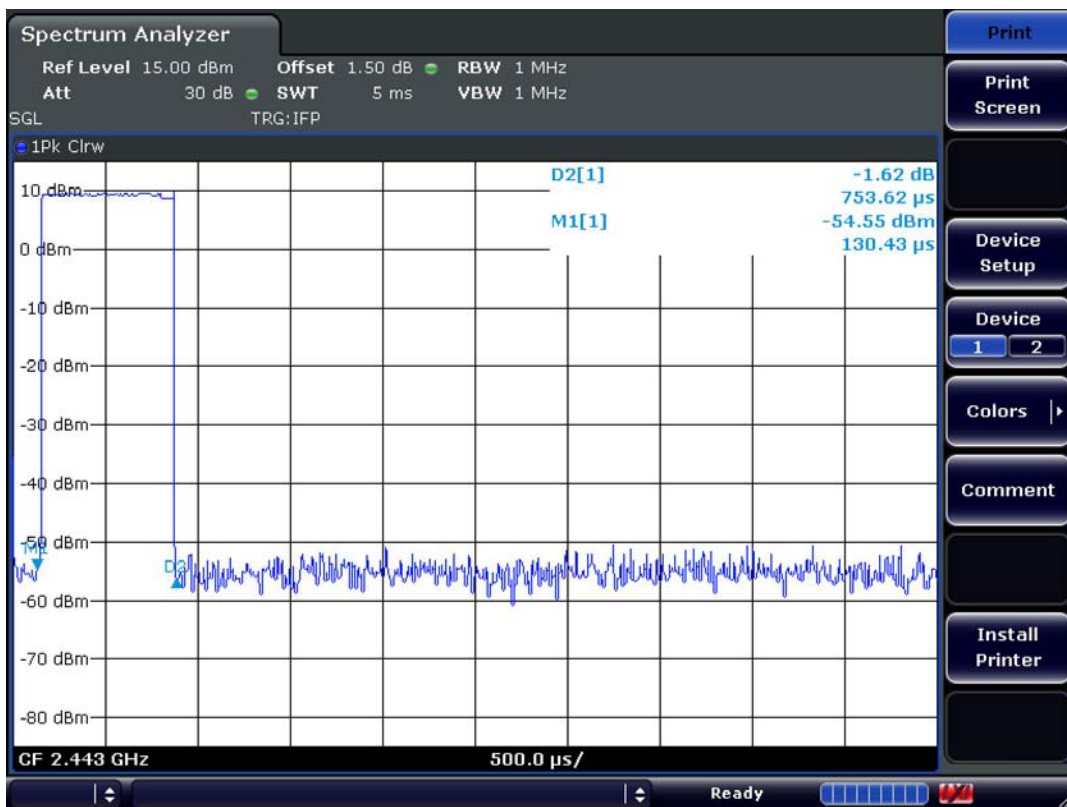
#### Minimum Standard:

0.4 seconds within a 30 second period per any frequency

#### Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

### Time of Occupancy for PACKET



### 3.2.5 Transmitter Output Power

#### Procedure:

The peak output power was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels..

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power.

#### The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

Span = 10 MHz (approximately 5 times of the 20 dB bandwidth)

RBW = 3 MHz (greater than the 20dB bandwidth of the emission being measured)

VBW = 3 MHz (VBW  $\geq$  RBW)

Detector function = peak

Trace = max hold

Sweep = auto

#### Measurement Data: Basic Mode

Frequency (MHz)	Ch.	Test Results		
		dBm	mW	Result
2403	1	9.88	9.73	Complies
2438	8	10.52	11.27	Complies
2477	16	11.43	13.90	Complies

- See next pages for actual measured spectrum plots.

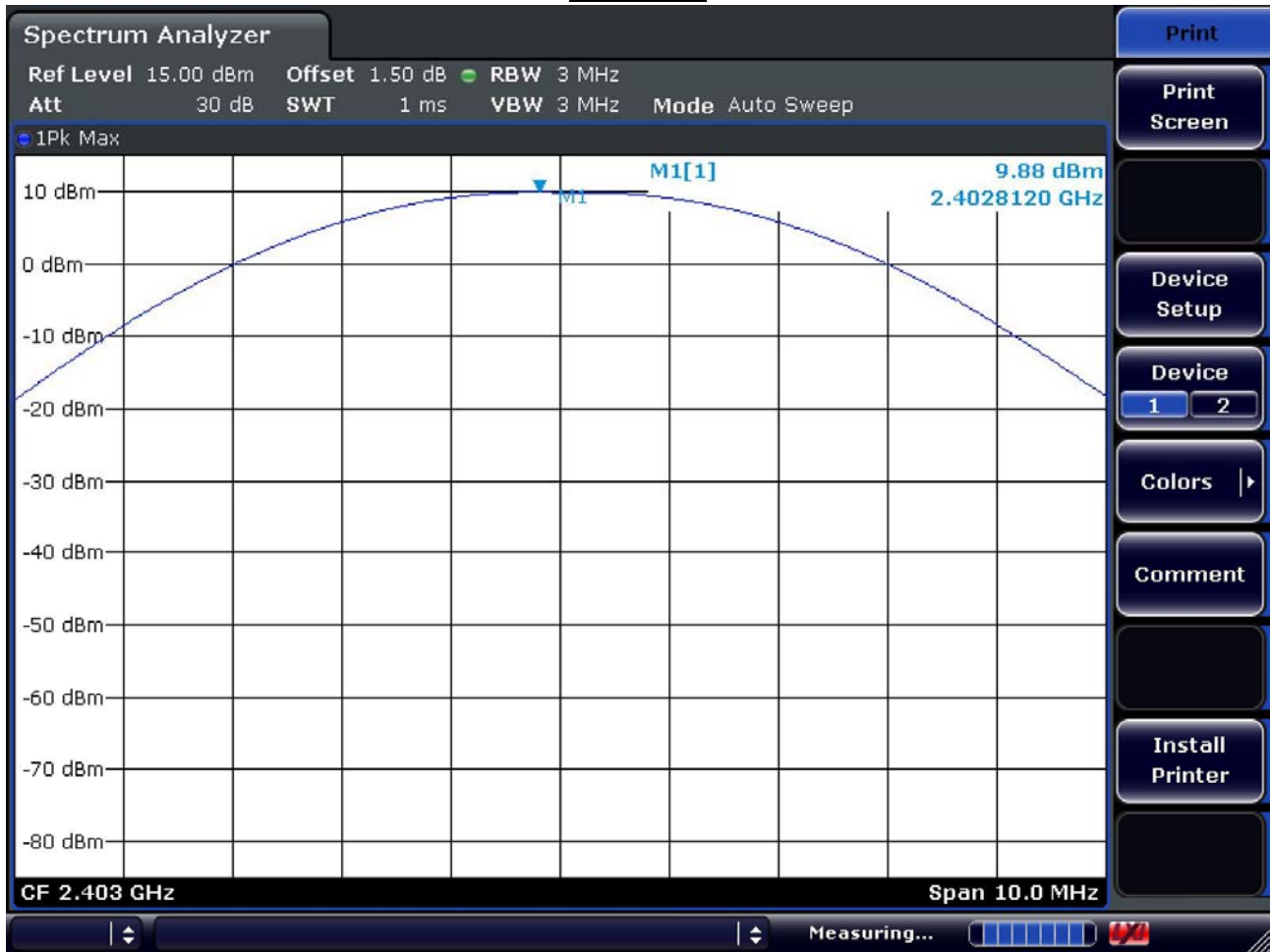
<b>Minimum Standard:</b>	< 250 mW
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#### Measurement Setup

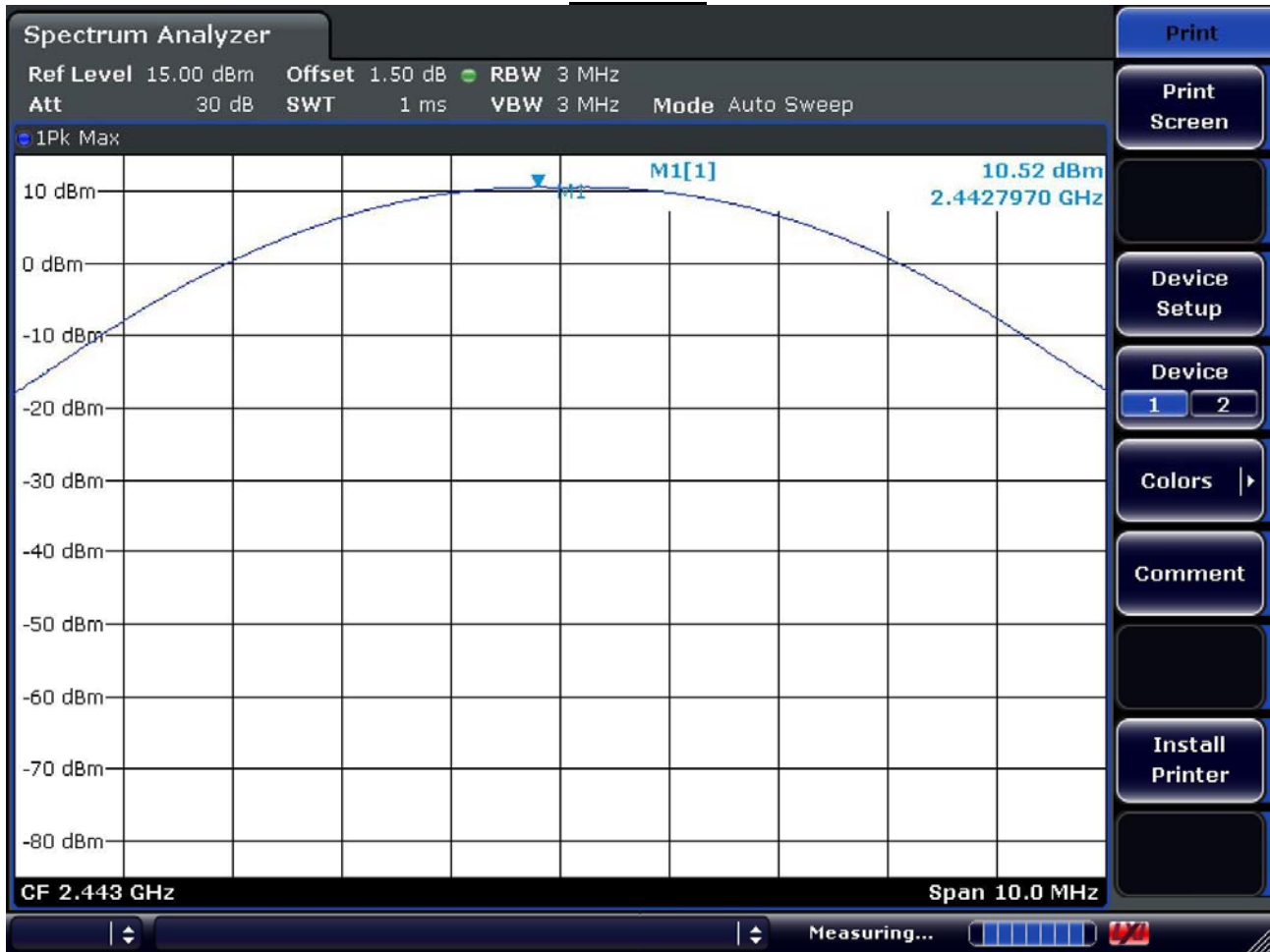
Same as the Chapter 3.2.1 (Figure 1)



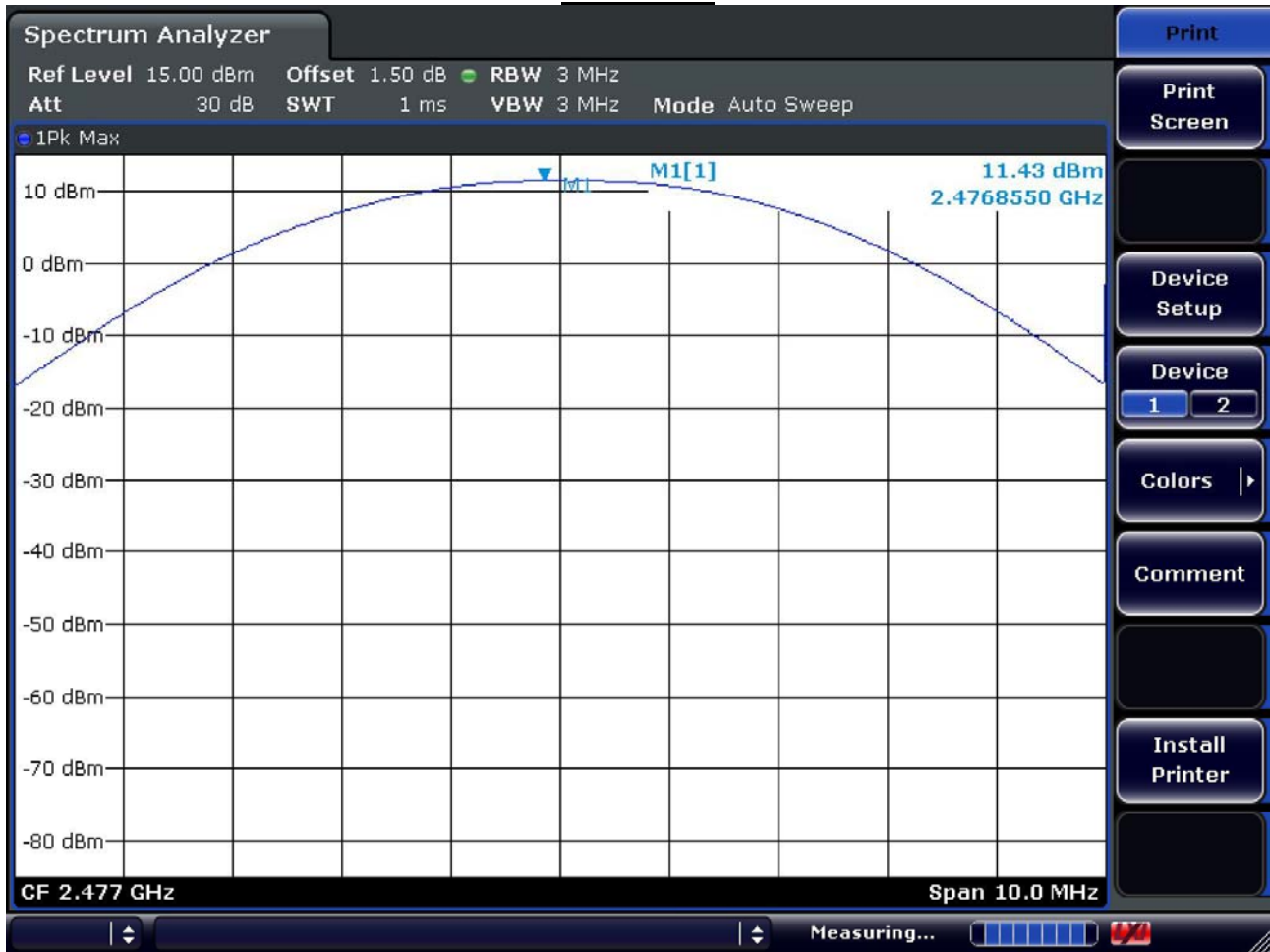
### Channel 1



### Channel 8



### Channel 16



### 3.2.6 Band Edge

**Procedure:**

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels.

After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

VBW = 100 kHz

Span = 20 MHz

Detector function = peak

Trace = max hold

Sweep = auto

**Measurement Data: Complies**

- All conducted emission in any 100kHz bandwidth outside of the spread spectrum band was at least 20dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.
- See next pages for actual measured spectrum plots.

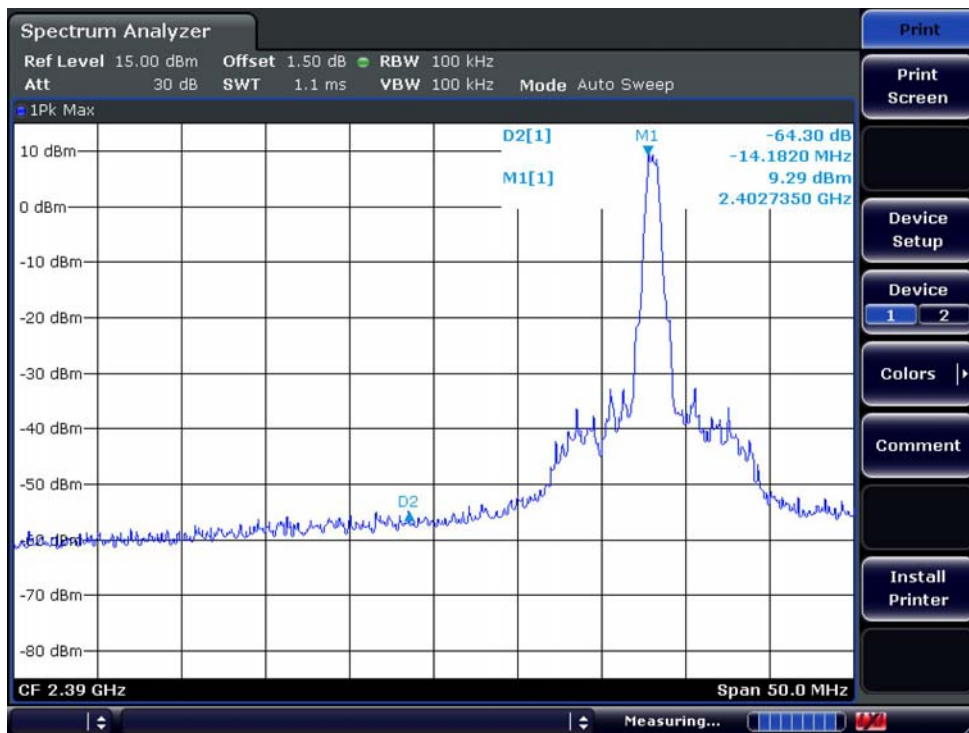
<b>Minimum Standard:</b>	> 20 dBc
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**Measurement Setup**

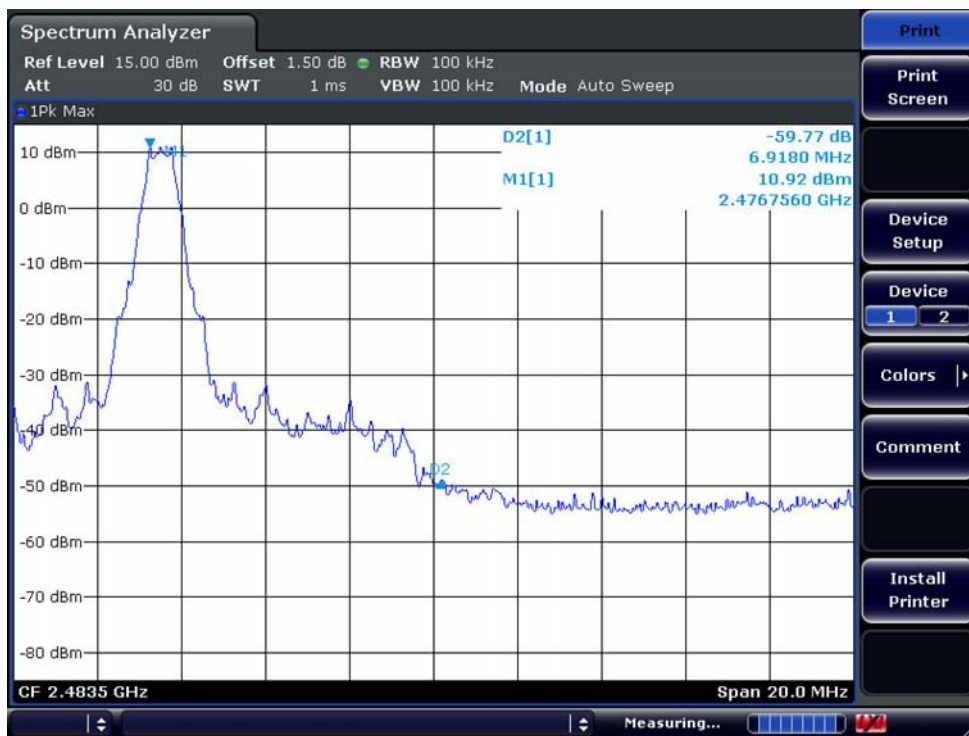
Same as the Chapter 3.2.1 (Figure 1)

**Band – edge of Basic Mode**

**Lower edge**



**Upper edge**



**Band-edges in the restricted band 2310-2390 MHz measurement**

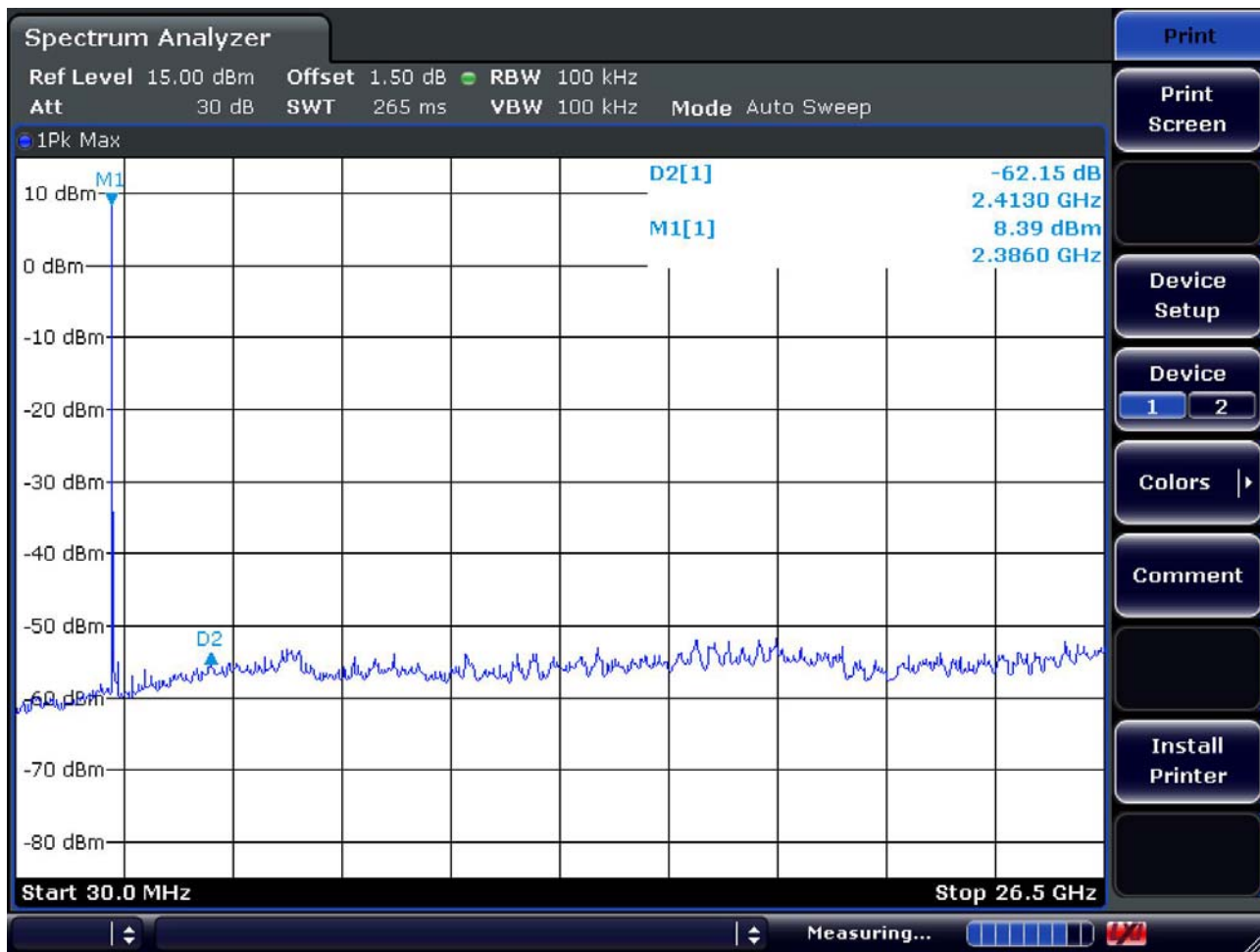
Frequency [MHz]	Reading [dBuV/m]		Pol.	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV / Peak			Antenna	Amp. Gain	Cable	AV / Peak		AV / Peak		AV / Peak	
2390	41.8	52.4	H	26.0	36.5	8.2	54.0	74.0	39.5	50.1	14.5	23.9

**Band-edges in the restricted band 2483.5-2500 MHz measurement**

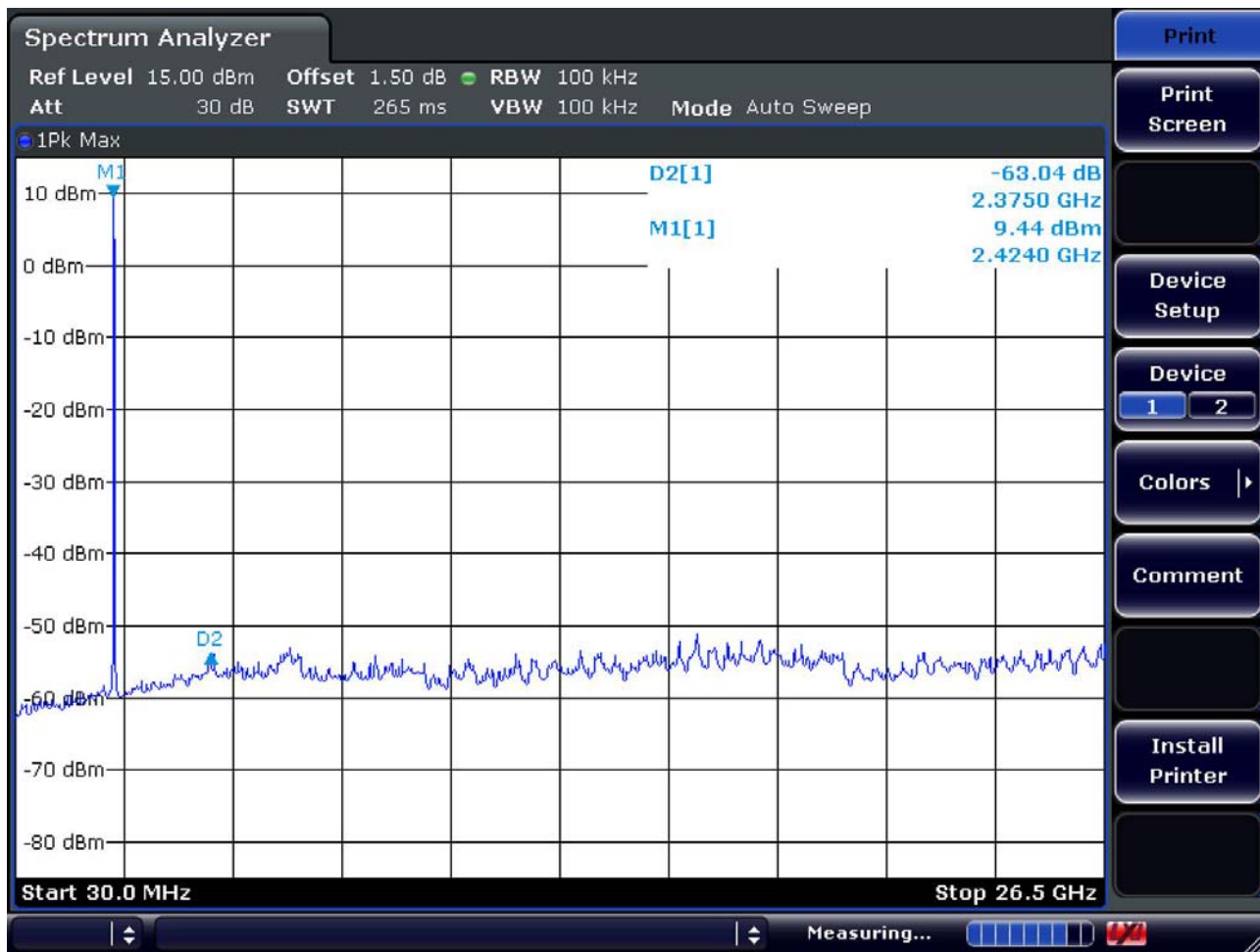
Frequency [MHz]	Reading [dBuV/m]		Pol.	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV / Peak			Antenna	Amp. Gain	Cable	AV / Peak		AV / Peak		AV / Peak	
2483.5	47.9	58.9	V	26.0	36.5	8.2	54.0	74.0	45.6	56.6	8.4	17.4

**Note : This EUT was tested in 3 orthogonal positions and the worst-case data was presented.**

**Unwanted Emission – Low channel**  
**Frequency Range = 30 MHz ~ 26.5 GHz**

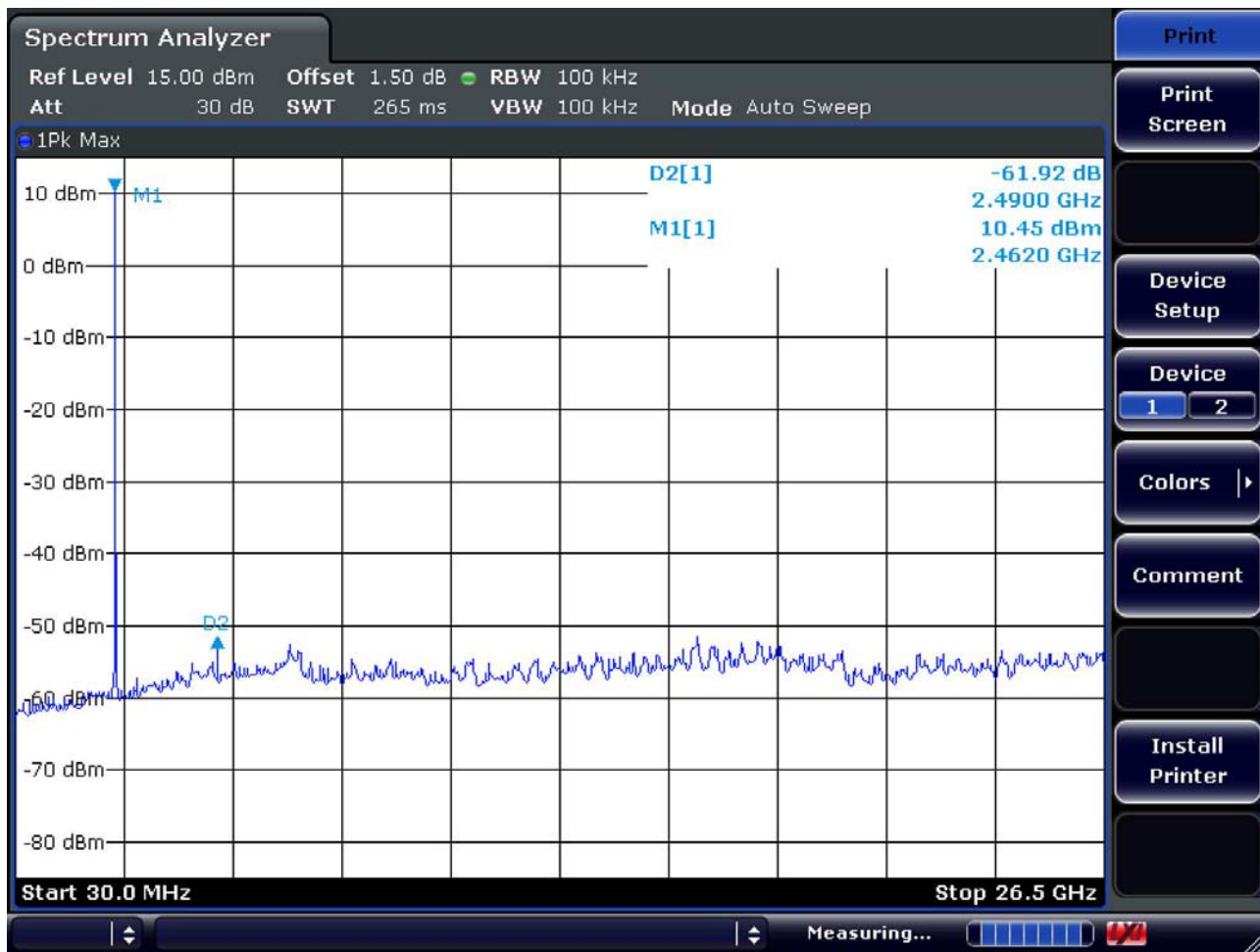


**Unwanted Emission – Middle channel**  
**Frequency Range = 30 MHz ~ 26.5 GHz**





**Unwanted Emission – High channel**  
**Frequency Range = 30 MHz ~ 26.5 GHz**



### 3.2.7 Field Strength of Harmonics

#### Procedure:

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

#### The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic.

RBW = 100 kHz ( 30MHz ~ 1 GHz)

= 1 MHz ( 1 GHz ~ 10<sup>th</sup> harmonic )

Span = 100 MHz

Trace = max hold

Peak:VBW  $\geq$  RBW

Average:VBW=10Hz

Detector function = Peak and Average

Sweep = auto

#### Measurement Data: Complies

- Refer to the next page.
- No other emissions were detected at a level greater than 10dB below limit.
- The three antennas were used with this EUT during the Testing.

#### Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

\*\* Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

Measurement Data:

Frequency [MHz]	Reading [dBuV/m]		Pol.	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV / Peak			Antenna	Amp.Gain	Cable	AV / Peak		AV / Peak		AV / Peak	
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

Frequency [MHz]	Reading [dBuV/m]		Pol.	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV / Peak			Antenna	Amp.Gain	Cable	AV / Peak		AV / Peak		AV / Peak	
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

Frequency [MHz]	Reading [dBuV/m]		Pol.	Correction Factor			Limits [dBuV/m]		Result [dBuV/m]		Margin [dB]	
	AV / Peak			Antenna	Amp.Gain	Cable	AV / Peak		AV / Peak		AV / Peak	
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

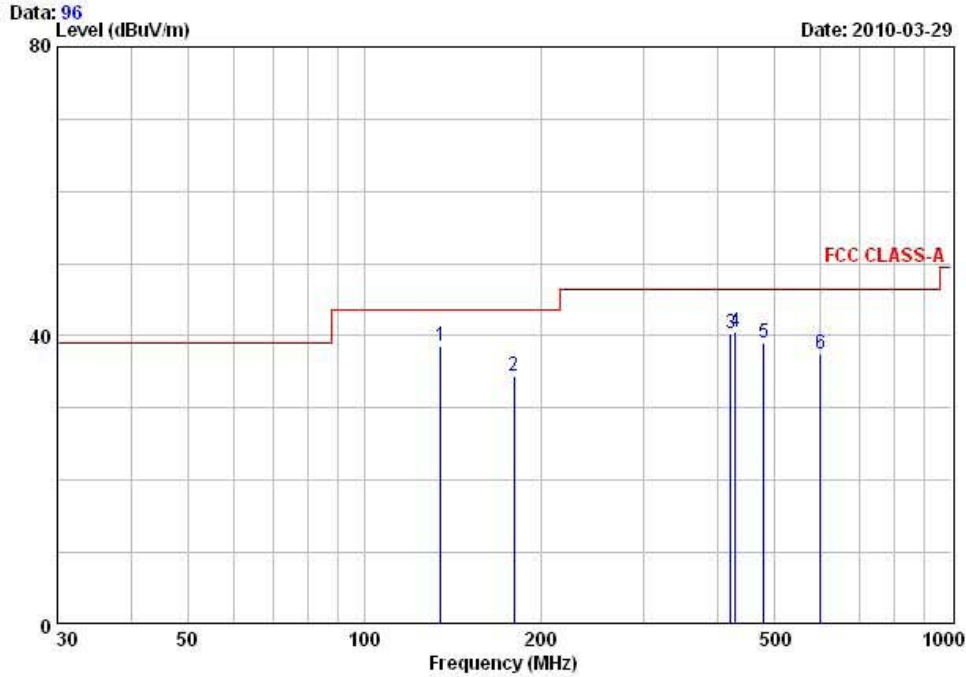
No other emissions were detected at a level greater than 20dB below limit.

**Radiated Emissions - PC**



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EUT/Model No.: BT21KV TEST MODE: PC mode  
Temp Humi : 12 / 26 Tested by: PARK.H.W



Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	135.05	51.10	-12.61	38.49	43.50	5.01	400	132 HORIZONTAL
2	180.24	46.30	-11.87	34.43	43.50	9.07	400	79 HORIZONTAL
3	421.07	46.80	-6.40	40.40	46.40	6.00	132	77 VERTICAL
4	429.33	46.80	-6.27	40.53	46.40	5.87	187	34 HORIZONTAL
5	480.03	44.60	-5.54	39.06	46.40	7.34	135	242 VERTICAL
6	599.07	40.10	-2.67	37.43	46.40	8.97	129	227 HORIZONTAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

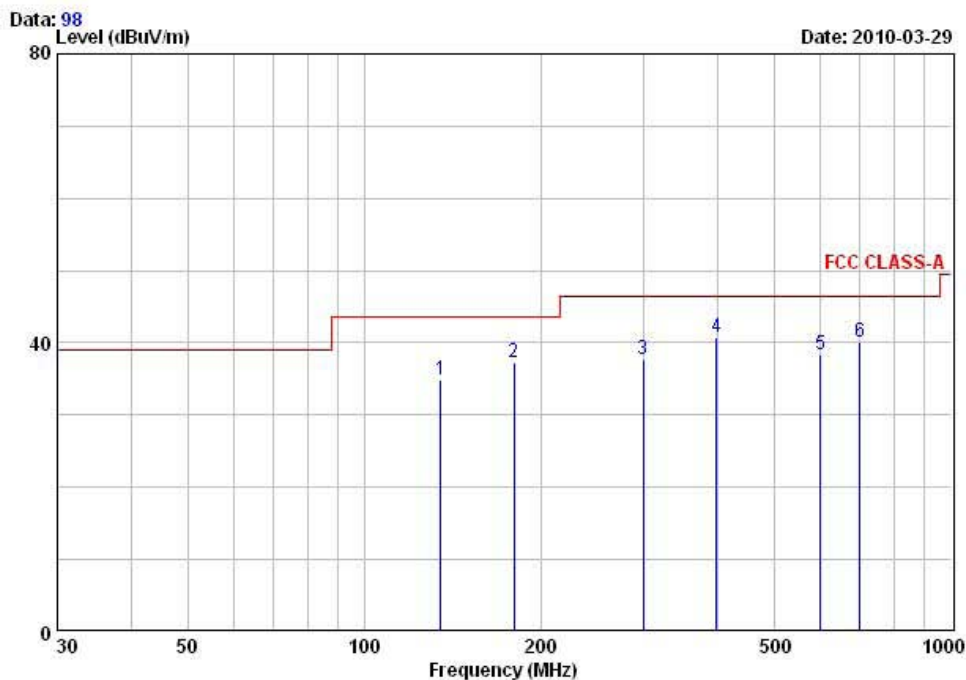
**Radiated Emissions – Hopping mode**



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EUT/Model No.: BT21KV TEST MODE: Hopping mode

Temp Humi : 12 / 26 Tested by: PARK.H.W



Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	135.03	47.60	-12.61	34.99	43.50	8.51	400	317 HORIZONTAL
2	180.02	49.20	-11.86	37.34	43.50	6.16	400	178 HORIZONTAL
3	299.04	46.20	-8.54	37.66	46.40	8.74	100	28 VERTICAL
4	399.02	47.50	-6.75	40.75	46.40	5.65	150	33 VERTICAL
5	599.02	41.10	-2.67	38.43	46.40	7.97	132	258 HORIZONTAL
6	699.03	41.10	-1.03	40.07	46.40	6.33	100	74 HORIZONTAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

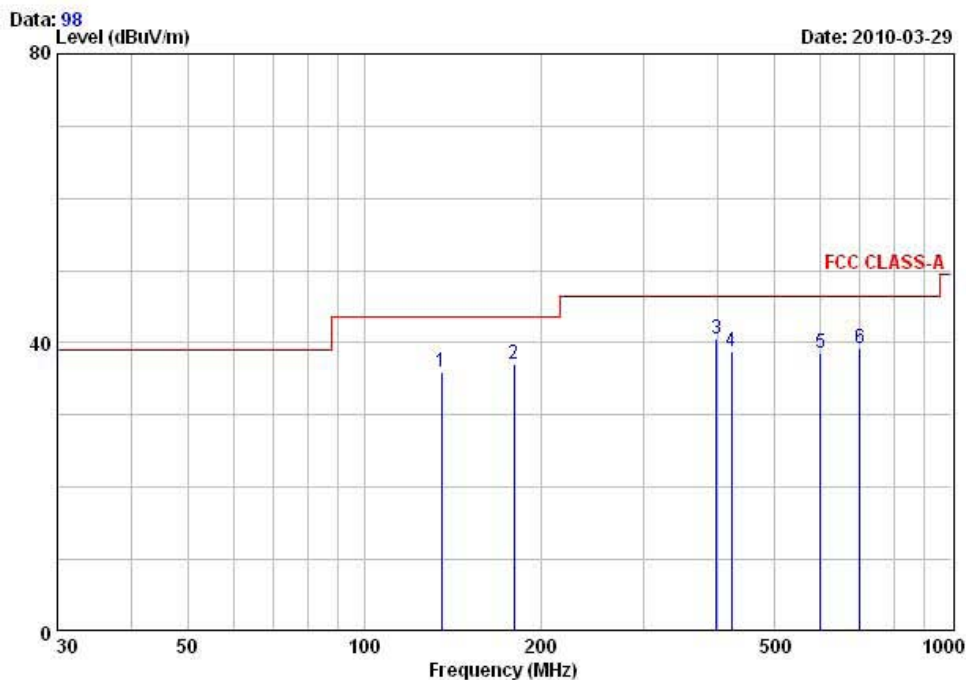
**Radiated Emissions – SD Card PLAY mode**



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EUT/Model No.: BT21KV TEST MODE: SD Card PLAY mode

Temp Humi : 12 / 26 Tested by: PARK.H.W



Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	135.27	48.60	-12.59	36.01	43.50	7.49	400	323 HORIZONTAL
2	180.02	48.90	-11.86	37.04	43.50	6.46	400	178 HORIZONTAL
3	399.02	47.30	-6.75	40.55	46.40	5.85	142	35 VERTICAL
4	422.96	45.10	-6.37	38.73	46.40	7.67	130	83 VERTICAL
5	599.03	41.20	-2.67	38.53	46.40	7.87	123	265 HORIZONTAL
6	699.03	40.20	-1.03	39.17	46.40	7.23	100	76 HORIZONTAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

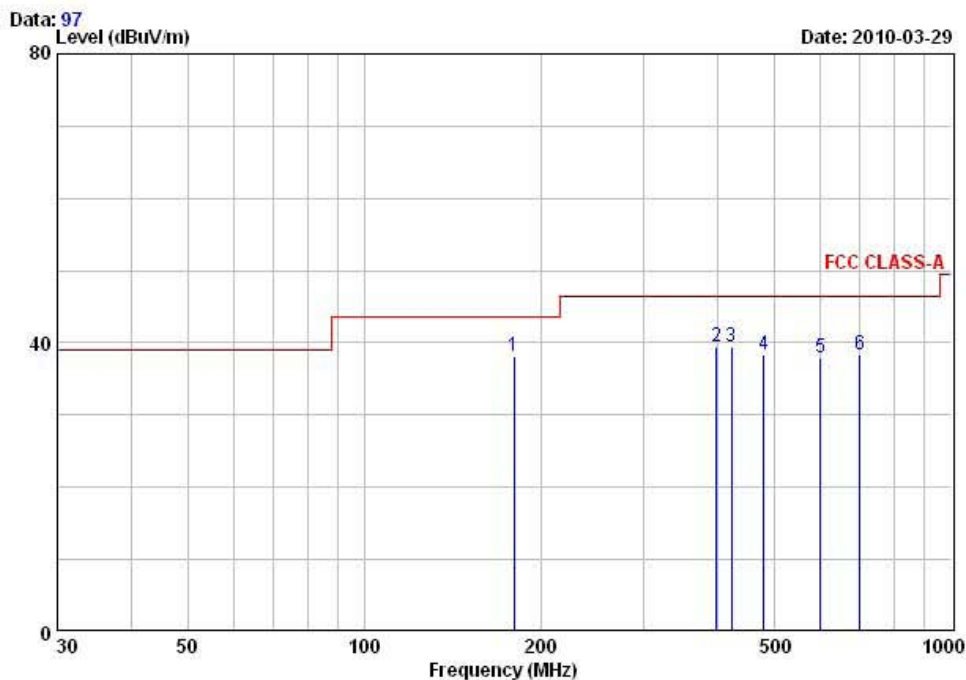
**Radiated Emissions – USB PLAY mode**



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Tel :+82-31-3236008,9  
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EUT/Model No.: BT21KV TEST MODE: USB PLAY mode

Temp Humi : 12 / 26 Tested by: PARK.H.W



Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	180.03	50.10	-11.86	38.24	43.50	5.26	400	175 HORIZONTAL
2	399.03	46.20	-6.75	39.45	46.40	6.95	135	28 VERTICAL
3	423.26	45.90	-6.36	39.54	46.40	6.86	133	67 VERTICAL
4	480.03	44.00	-5.54	38.46	46.40	7.94	147	158 HORIZONTAL
5	599.04	40.50	-2.67	37.83	46.40	8.57	121	245 HORIZONTAL
6	699.05	39.50	-1.03	38.47	46.40	7.93	100	79 HORIZONTAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

### 3.2.8 AC Conducted Emissions

#### Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

#### Measurement Data: Complies

- See next pages for actual measured spectrum plots.
- No emissions were detected at a level greater than 10dB below limit.

#### Minimum Standard: FCC Part 15.207(a)/EN 55022

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

\* Decreases with the logarithm of the frequency



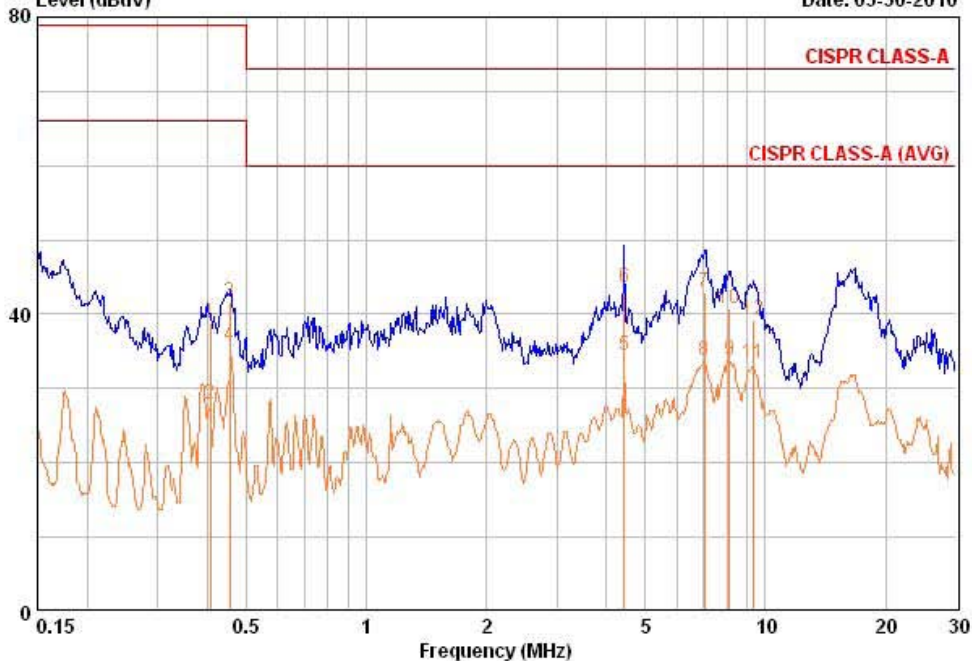
**AC Conducted Emissions- PC- Line**



243 Jubug-ri, yangji-Myeon, Youngin-si,  
Gyeonggi-do 449-822 Korea  
Tel +82-31-3236008,9  
Fax:+82-31-3236010

EUT / Model No. : ET21KV Phase : LINE  
 Test Mode : PC mode Test Power : 120 / 60  
 Temp./Humi. : 17 / 24 Test Engineer : PARK H W

Data: 342 File: C:\Conducted Data\2010\LTA\_Conduction\_1003\_2.EMI (378) Date: 03-30-2010



Freq MHz	RD		C.F	Result		Limit		Margin	
	QP dBuV	AV dBuV		QP dBuV	AV dBuV	QP dBuV	AV dBuV	QP dB	AV dB
0.407	29.04	18.14	9.67	38.71	27.81	79.00	66.00	40.29	38.19
0.454	31.93	26.13	9.67	41.60	35.80	79.00	66.00	37.40	30.20
4.436	33.67	24.57	9.91	43.58	34.48	73.00	60.00	29.42	25.52
7.048	32.94	23.84	9.97	42.92	33.82	73.00	60.00	30.08	26.18
8.115	30.74	23.84	10.04	40.78	33.88	73.00	60.00	32.22	26.12
9.312	29.02	23.22	10.11	39.13	33.33	73.00	60.00	33.87	26.67

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

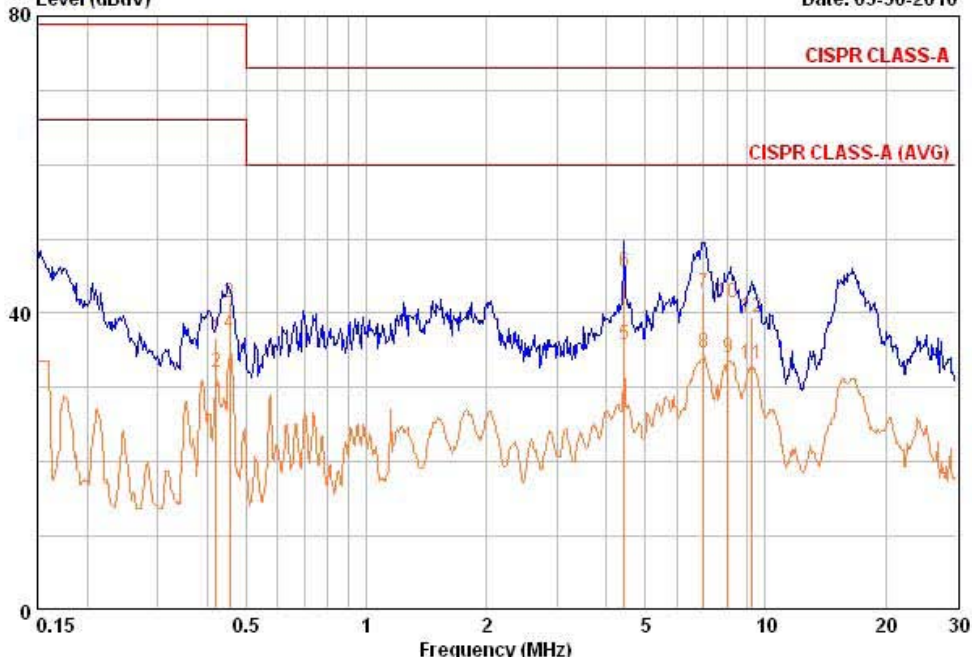
**AC Conducted Emissions – PC – Neutral**



243 Jubug-ri, yangji-Myeon, Youngin-si,  
Gyeonggi-do 449-822 Korea  
Tel +82-31-3236008,9  
Fax:+82-31-3236010

EUT / Model No. : ET21KV	Phase : NEUTRAL
Test Mode : PC mode	Test Power : 120 / 60
Temp./Humi. : 17 / 24	Test Engineer : PARK H W

Data: 344 File: C:\Conducted Data\2010\LTA\_Conduction\_1003\_2.EMI (378) Date: 03-30-2010



Freq MHz	RD		C.F	Result		Limit		Margin	
	QP dBuV	AV dBuV		QP dBuV	AV dBuV	QP dBuV	AV dBuV	QP dB	AV dB
0.421	26.95	22.45	9.66	36.61	32.11	79.00	66.00	42.39	33.89
0.455	31.84	27.64	9.66	41.50	37.30	79.00	66.00	37.50	28.70
4.433	35.57	25.87	9.91	45.47	35.77	73.00	60.00	27.53	24.23
6.988	32.75	24.65	9.96	42.71	34.61	73.00	60.00	30.29	25.39
8.070	31.35	23.95	10.03	41.38	33.98	73.00	60.00	31.62	26.02
9.209	29.34	23.04	10.09	39.43	33.13	73.00	60.00	33.57	26.87

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

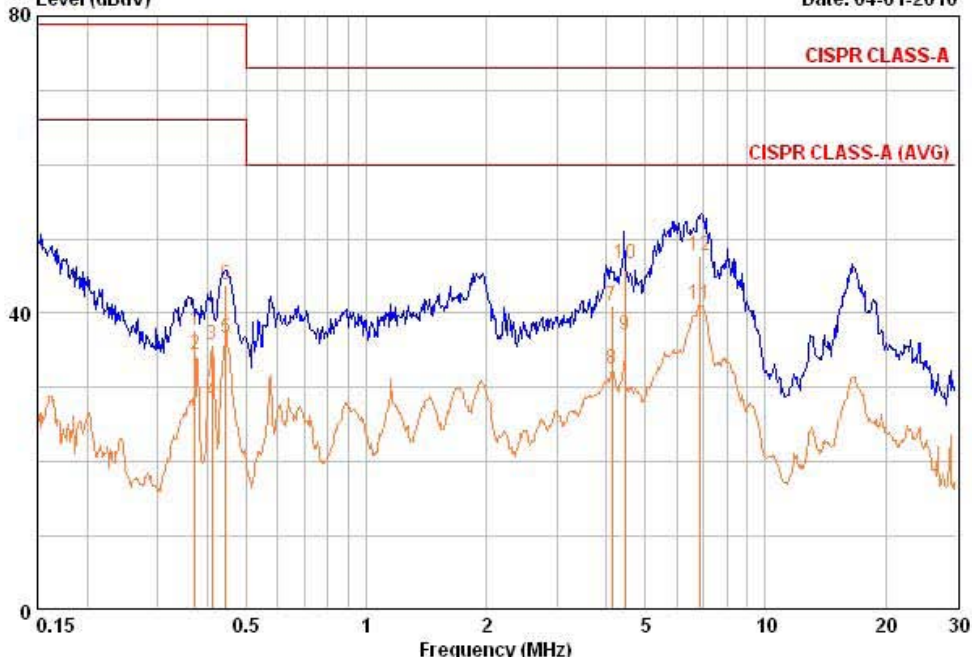
### AC Conducted Emissions- Hopping- Line



243 Jubug-ri, yangji-Myeon, Youngin-si,  
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Tel +82-31-3236008,9  
Fax:+82-31-3236010

EUT / Model No. : ET21KV	Phase : LINE
-----	-----
Test Mode : Hopping mode	Test Power : 120 / 60
-----	-----
Temp./Humi. : 24 / 30	Test Engineer : PARK HW
-----	-----

Data: 340 File: C:\Conducted Data\2010\LTA\_Conduction\_1003\_1.EMI (340) Date: 04-01-2010



Freq MHz	RD		C.F	Result		Limit		Margin	
	QP dBuV	AV dBuV		QP dBuV	AV dBuV	QP dBuV	AV dBuV	QP dB	AV dB
0.373	28.06	24.86	9.67	37.73	34.53	79.00	66.00	41.27	31.47
0.410	26.16	18.46	9.67	35.83	28.13	79.00	66.00	43.17	37.87
0.444	34.15	27.05	9.67	43.82	36.72	79.00	66.00	35.18	29.28
4.125	31.14	22.54	9.89	41.03	32.43	73.00	60.00	31.97	27.57
4.440	36.64	27.14	9.91	46.55	37.05	73.00	60.00	26.45	22.95
6.877	37.85	31.15	9.97	47.82	41.12	73.00	60.00	25.18	18.88

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

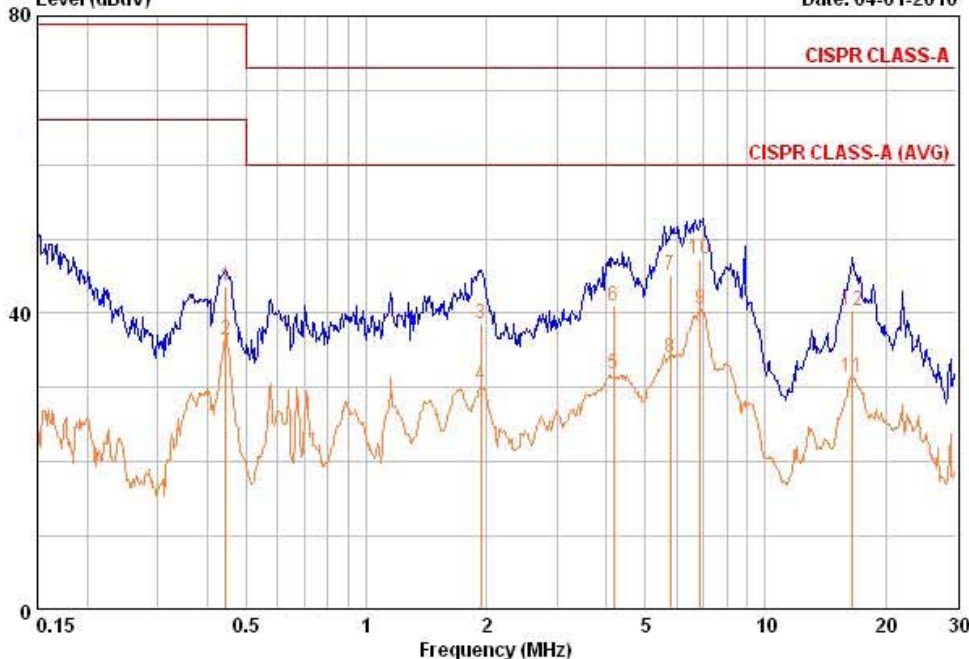
**AC Conducted Emissions – Hopping – Neutral**



243 Jubug-ri, yangji-Myeon, Youngin-si,  
Gyeonggi-do 449-822 Korea  
Tel +82-31-3236008,9  
Fax:+82-31-3236010

EUT / Model No. : ET21KV Phase : NEUTRAL  
 -----  
 Test Mode : Hopping mode Test Power : 120 / 60  
 -----  
 Temp./Humi. : 24 / 30 Test Engineer : PARK HW  
 -----

Data: 342 File: C:\Conducted Data\2010\LTA\_Conduction\_1003\_1.EMI (342) Date: 04-01-2010



Freq MHz	RD		C.F	Result		Limit		Margin	
	QP dBuV	AV dBuV		QP dBuV	AV dBuV	QP dBuV	AV dBuV	QP dB	AV dB
0.445	33.95	26.65	9.66	43.61	36.31	79.00	66.00	35.39	29.69
1.936	28.85	20.45	9.82	38.67	30.27	73.00	60.00	34.33	29.73
4.174	31.04	21.94	9.89	40.93	31.83	73.00	60.00	32.07	28.17
5.777	35.25	24.15	9.94	45.19	34.09	73.00	60.00	27.81	25.91
6.879	37.25	30.65	9.96	47.21	40.61	73.00	60.00	25.79	19.39
16.485	29.90	20.90	10.47	40.38	31.38	73.00	60.00	32.62	28.62

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

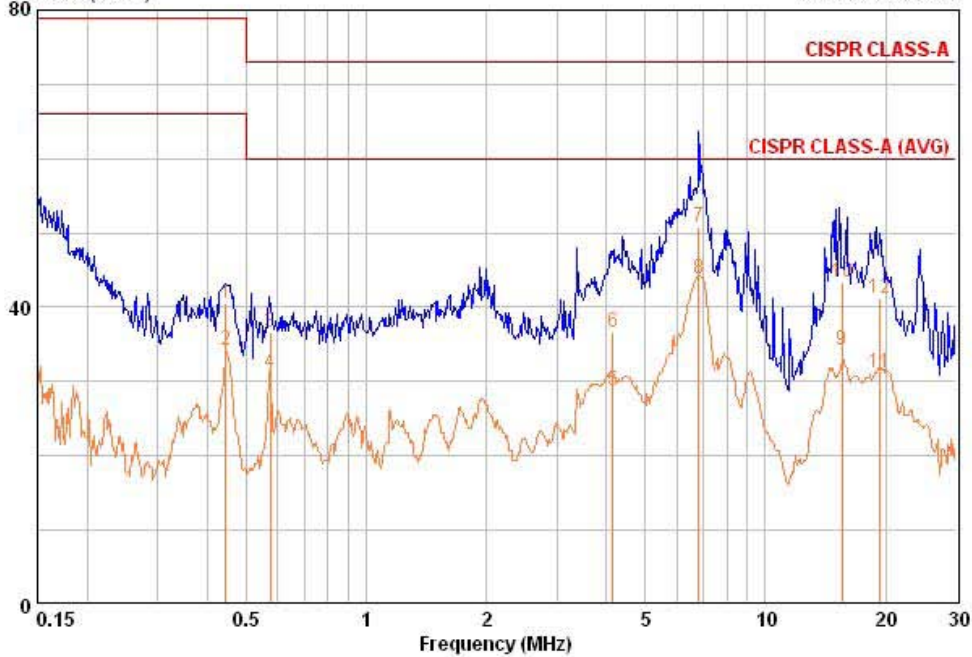
**AC Conducted Emissions– SD Card PLAY – Line**



243 Jubug-ri, yangji-Myeon, Youngin-si,  
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Tel +82-31-3236008,9  
Fax:+82-31-3236010

EUT / Model No. : ET21KV Phase : LINE  
 Test Mode : SD Card PLAY mode Test Power : 120 / 60  
 Temp./Humi. : 17 / 24 Test Engineer : PARK H W

Data: 332 File: C:\Conducted Data\2010\LTA\_Conduction\_1003\_2.EMI (378) Date: 03-30-2010



Freq MHz	RD		C.F	Result		Limit		Margin	
	QP dBuV	AV dBuV		QP dBuV	AV dBuV	QP dBuV	AV dBuV	QP dB	AV dB
0.444	30.94	24.64	9.67	40.61	34.31	79.00	66.00	38.39	31.69
0.575	26.91	21.41	9.71	36.63	31.13	73.00	60.00	36.37	28.87
4.144	26.67	18.97	9.89	36.56	28.86	73.00	60.00	36.44	31.14
6.817	40.84	33.84	9.97	50.81	43.81	73.00	60.00	22.19	16.19
15.547	32.90	23.90	10.43	43.33	34.33	73.00	60.00	29.67	25.67
19.256	30.68	20.68	10.57	41.25	31.25	73.00	60.00	31.75	28.75

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss



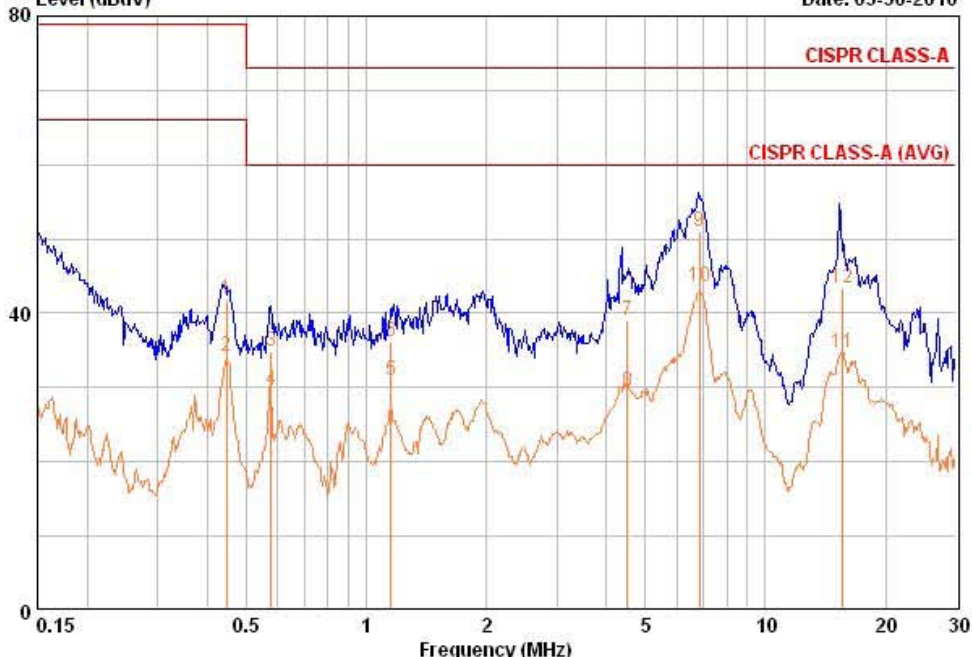
**AC Conducted Emissions – SD Card PLAY – Neutral**



243 Jubug-ri, yangji-Myeon, Youngin-si,  
Gyeonggi-do 449-822 Korea  
Tel +82-31-3236008,9  
Fax:+82-31-3236010

EUT / Model No. : ET21KV Phase : NEUTRAL  
 Test Mode : SD Card PLAY mode Test Power : 120 / 60  
 Temp./Humi. : 17 / 24 Test Engineer : PARK H W

Data: 334 File: C:\Conducted Data\2010\LTA\_Conduction\_1003\_2.EMI (378) Date: 03-30-2010



Freq	RD	RD	C.F	Result	Result	Limit	Limit	Margin	Margin
MHz	QP	AV	dB	QP	AV	QP	AV	QP	AV
	dBuV	dBuV		dBuV	dBuV	dBuV	dBuV	dB	dB
0.447	32.15	24.65	9.66	41.81	34.31	79.00	66.00	37.19	31.69
0.577	25.12	20.02	9.71	34.83	29.73	73.00	60.00	38.17	30.27
1.151	26.31	21.11	9.79	36.10	30.90	73.00	60.00	36.90	29.10
4.504	29.07	19.57	9.91	38.98	29.48	73.00	60.00	34.02	30.52
6.835	41.05	33.55	9.96	51.01	43.51	73.00	60.00	21.99	16.49
15.657	33.00	24.20	10.44	43.43	34.63	73.00	60.00	29.57	25.37

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

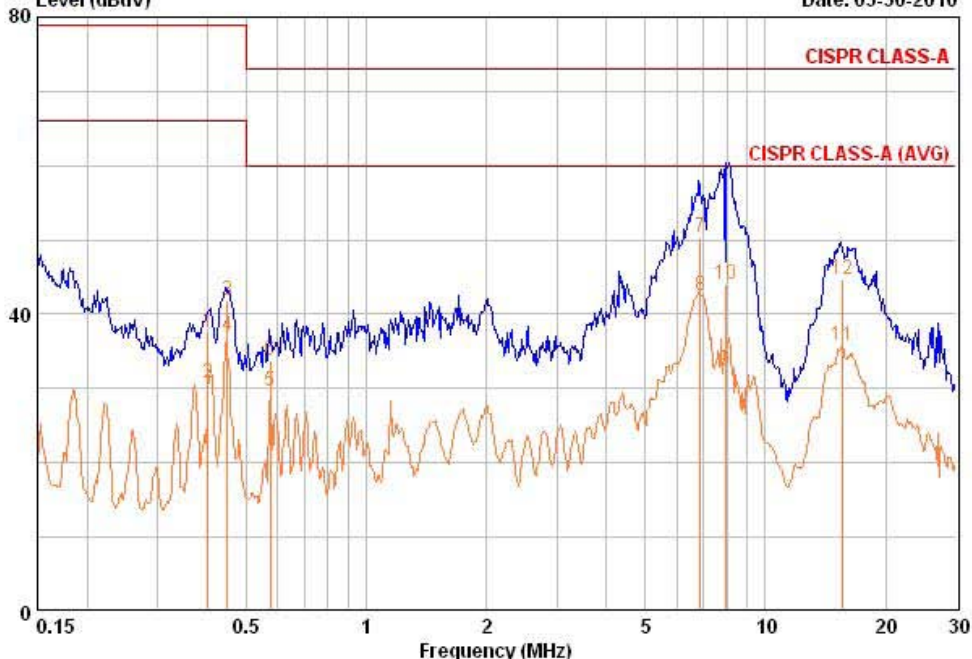
**AC Conducted Emissions– USB PLAY – Line**



243 Jubug-ri, yangji-Myeon, Youngin-si,  
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Fax:+82-31-3236010

EUT / Model No. : ET21KV Phase : LINE  
 Test Mode : USB PLAY mode Test Power : 120 / 60  
 Temp./Humi. : 17 / 24 Test Engineer : PARK H W

Data: 340 File: C:\Conducted Data\2010\LTA\_Conduction\_1003\_2.EMI (378) Date: 03-30-2010  
 Level (dBuV)



Freq MHz	RD		C.F	Result		Limit		Margin	
	QP dBuV	AV dBuV		QP dBuV	AV dBuV	QP dBuV	AV dBuV	QP dB	AV dB
0.402	28.14	21.14	9.67	37.81	30.81	79.00	66.00	41.19	35.19
0.449	32.14	27.34	9.67	41.81	37.01	79.00	66.00	37.19	28.99
0.574	24.01	19.91	9.71	33.72	29.62	73.00	60.00	39.28	30.38
6.874	40.44	32.54	9.97	50.41	42.51	73.00	60.00	22.59	17.49
7.932	34.05	22.35	10.03	44.08	32.38	73.00	60.00	28.92	27.62
15.553	34.20	25.30	10.43	44.63	35.73	73.00	60.00	28.37	24.27

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

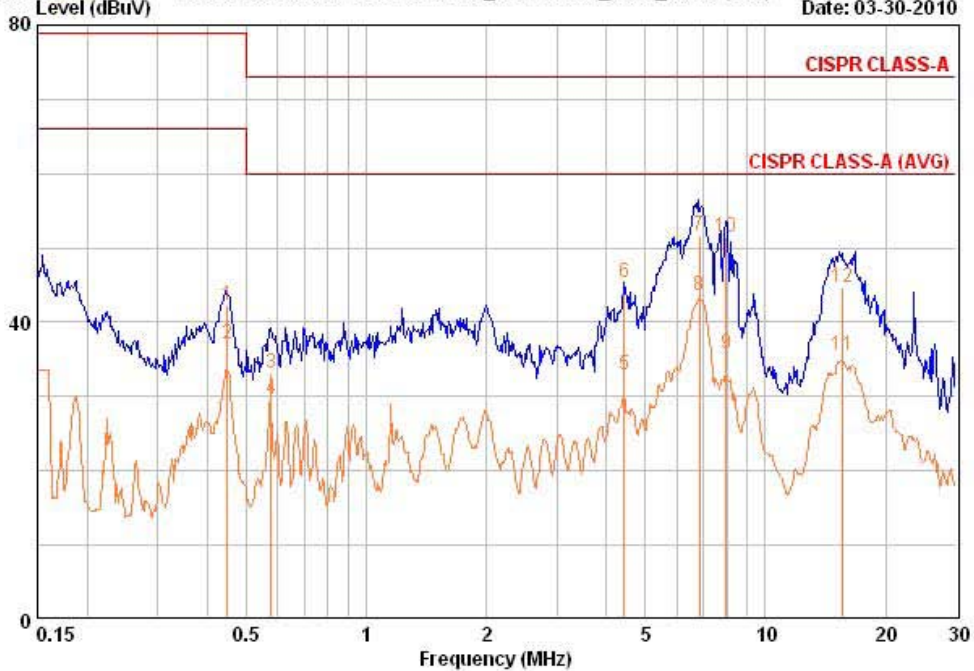
**AC Conducted Emissions – USB PLAY – Neutral**



243 Jubug-ri, yangji-Myeon, Youngin-si,  
Gyeonggi-do 449-822 Korea  
Tel +82-31-3236008,9  
Fax:+82-31-3236010

EUT / Model No. : ET21KV	Phase : NEUTRAL
Test Mode : USB PLAY mode	Test Power : 120 / 60
Temp./Humi. : 17 / 24	Test Engineer : PARK H W

Data: 338 File: C:\Conducted Data\2010\LTA\_Conduction\_1003\_2.EMI (378) Date: 03-30-2010



Freq MHz	RD		C.F	Result		Limit		Margin	
	QP dBuV	AV dBuV		QP dBuV	AV dBuV	QP dBuV	AV dBuV	QP dB	AV dB
0.448	32.55	27.35	9.66	42.21	37.01	79.00	66.00	36.79	28.99
0.577	23.52	20.02	9.71	33.23	29.73	73.00	60.00	39.77	30.27
4.435	35.37	23.07	9.91	45.28	32.98	73.00	60.00	27.72	27.02
6.827	41.65	33.55	9.96	51.61	43.51	73.00	60.00	21.39	16.49
7.963	41.35	25.65	10.02	51.38	35.68	73.00	60.00	21.62	24.32
15.564	34.30	25.20	10.43	44.73	35.63	73.00	60.00	28.27	24.37

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss



## APPENDIX

### TEST EQUIPMENT USED FOR TESTS

	Description	Model No.	Serial No.	Manufacturer	Next Cal. Date
1	Spectrum Analyzer	FSV-30	100757	R&S	Feb-11
2	Spectrum Analyzer	8563E	3425A02505	HP	Mar-11
3	Spectrum Analyzer	8594E	3710A04074	HP	Oct-10
4	Signal Generator	8648C	3623A02597	HP	Mar-11
5	Signal Generator	83711B	US34490456	HP	Mar-11
6	Attenuator (3dB)	8491A	37822	HP	Oct-10
7	Attenuator (10dB)	8491A	63196	HP	Oct-10
8	Attenuator (30dB)	8498A	1801A06689	HP	Oct-10
9	EMI Test Receiver	ESVD	843748/001	R&S	Mar-11
10	Horn Antenna(18 ~ 40GHz)	SAS-574	154	Schwarzbeck	Nov-10
11	Horn Antenna(18 ~ 40GHz)	SAS-574	155	Schwarzbeck	Nov-10
12	RF Amplifier	8447D	2949A02670	HP	Oct-10
13	RF Amplifier	8449B	3008A02126	HP	Mar-11
14	Test Receiver	ESHS10	828404/009	R&S	Mar-11
15	TRILOG Antenna	VULB 9160	9160-3212	SCHWARZBECK	Apr-11
16	Log.-Per. Antenna	VULP 9118	9118 A 401	SCHWARZBECK	Apr-11
17	Biconical Antenna	BBA 9106	VHA 9103-2315	SCHWARZBECK	Apr-11
18	Horn Antenna	3115	00055005	ETS LINDGREN	Mar-11
19	Horn Antenna	BBHA 9120D	9120D122	SCHWARZBECK	Dec-11
20	Dipole Antenna	VHA9103	2116	SCHWARZBECK	Nov-10
21	Dipole Antenna	VHA9103	2117	SCHWARZBECK	Nov-10
22	Dipole Antenna	VHA9105	2261	SCHWARZBECK	Nov-10
23	Dipole Antenna	VHA9105	2262	SCHWARZBECK	Nov-10
24	Hygro-Thermograph	THB-36	0041557-01	ISUZU	Mar-11
25	Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	-
26	RF Switch	MP59B	6200414971	ANRITSU	-
27	Power Divider	11636A	6243	HP	Oct-10
28	DC Power Supply	6622A	3448A03079	HP	Oct-10
29	Frequency Counter	5342A	2826A12411	HP	Mar-11
30	Power Meter	EPM-441A	GB32481702	HP	Mar-11
31	Power Sensor	8481A	2702A64048	HP	Mar-11
32	Audio Analyzer	8903B	3729A18901	HP	Oct-10
33	Modulation Analyzer	8901B	3749A05878	HP	Oct-10
34	TEMP & HUMIDITY Chamber	YJ-500	LTAS06041	JinYoung Tech	Oct-10
35	LOOP-ANTENNA	FMZB 1516	151602/94	SCHWARZBECK	Mar-11
36	Stop Watch	HS-3	601Q09R	CASIO	Mar-11
37	LISN	ENV216	100408	R&S	Oct-10