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Dates of Tests : Nov 30 ~ Dec 08 2011
Test Report S/N: LR50011112C
Test Site : LTA CO., LTD

CERTIFICATION OF COMPLIANCE

FCC ID.

SXV-Z2

APPLICANT

COWON SYSTEMS, Inc.

Equipment Class	:	Part 15 Spread Spectrum Transmitter (DSS)
Manufacturing Description	:	MP3 Player
Manufacturer	:	COWON SYSTEMS, Inc.
Model name	:	Z2
Test Device Serial No.:	:	Identical prototype
Rule Part(s)	:	FCC Part 15.247 Subpart C; ANSI C-63.4-2003
Frequency Range	:	2402 ~ 2480MHz
RF power	:	Max 2.99 dBm - Conducted
Data of issue	:	December 12, 2011

This test report is issued under the authority of:

The test was supervised by:

Hyun-Chae You, Manager

Ki-Hun Cho, 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. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.



NVLAP LAB Code.: 200723-0

TABLE OF CONTENTS

1. GENERAL INFORMATION'S	3
2. INFORMATION'S ABOUT TEST ITEM	4
3. TEST REPORT	5
3.1 SUMMARY OF TESTS	5
3.2 TECHNICAL CHARACTERISTICS TEST	6
3.2.1 CARRIER FREQUENCY SEPARATION	6
3.2.2 NUMBER OF HOPPING FREQUENCIES	8
3.2.3 20 dB BANDWIDTH	10
3.2.4 TIME OF OCCUPANCY (Dwell Time)	17
3.2.5 TRANSMITTER OUTPUT POWER	22
3.2.6 BAND – EDGE & SPURIOUS	26
3.2.7 FIELD STRENGTH OF HARMONICS	32
3.2.8 AC CONDUCTED EMISSIONS	39
 APPENDIX	
APPENDIX TEST EQUIPMENT USED FOR TESTS	48

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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 Telephone : +82-31-323-6008
 Facsimile : +82-31-323-6010

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	2012-09-30	ECT accredited Lab.
RRL	KOREA	KR0049	2013-04-24	EMC accredited Lab.
FCC	U.S.A	610755	2014-04-27	FCC filing
FCC	U.S.A	649054	2013-04-13	FCC CAB
VCCI	JAPAN	R2133(10m), C2307	2014-06-21	VCCI registration
VCCI	JAPAN	T-2009	2013-12-23	VCCI registration
IC	CANADA	IC5799	2012-05-14	IC filing

2. Information's about test item

2-1 Applicant & Manufacturer

Company name : COWON SYSTEMS, Inc.
 Address : COWON Tower, 689-3, Yeoksam-dong, Gangnam-gu, Seoul 135-080, Korea
 Tel / Fax : +82-2-6900-0102 / +82-2-6900-0022

2-2 Equipment Under Test (EUT)

Trade name : MP3 Player
 FCC ID : SXV-Z2
 Model name : Z2
 Serial number : Identical prototype
 Date of receipt : Nov 29, 2011
 EUT condition : Pre-production, not damaged
 Antenna type : Chip antenna with Max. 2.1 dBi gain
 Frequency Range : 2402 ~ 2480MHz
 RF output power : Maximum 2.99 dBm
 Number of channels : 79
 Channel spacing : 1MHz
 Channel Access Protocol : Frequency Hopping Spread Spectrum (FHSS)
 Type of Modulation : Basic Mode(GFSK), EDR Mode(DQPSK, 8DPSK)
 Power source (Batt.) : Battery : 3.7V (Li-Polymer Battery)
 Power source (Adaptor.) Input: 100-240VAC, 0.3A Output: 5.0VDC, 2A

2-3 Tested frequency

	LOW	MID	HIGH
Frequency (MHz)	2402	2441	2480

2-4 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
PC	N/A	N/A	N/A
TV MONITOR	LE23R18(R)	63343HDP901399E	SAMSONG
KEYBOARD	PKB 1500U	018070294293	PLEOMAX
MOUSE	M056U0A	F09027AB	DELL
PRINTER	STYLUS C65	N/A	EPSON
EARPHONE	N/A	N/A	N/A
Micro SD CARD	N/A	N/A	SANDISK

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 99% 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 ENSPERT Inc. FCC ID: SXV-Z2 unit complies with the requirement of §15.203.
The antenna is connected to inside of EUT. And type is Chip antenna.

The sample was tested according to the following specification:
FCC Parts 15.247; 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 = 3 MHz (wide enough to capture the peaks of two adjacent channels)

RBW = 10 kHz (1% of the span or more) Sweep = auto

VBW = 10 kHz Detector function = peak

Trace = max hold

Measurement Data:

Test Results	
Carrier Frequency Separation (MHz)	Result
1.003	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

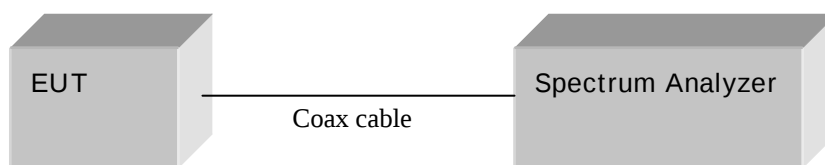
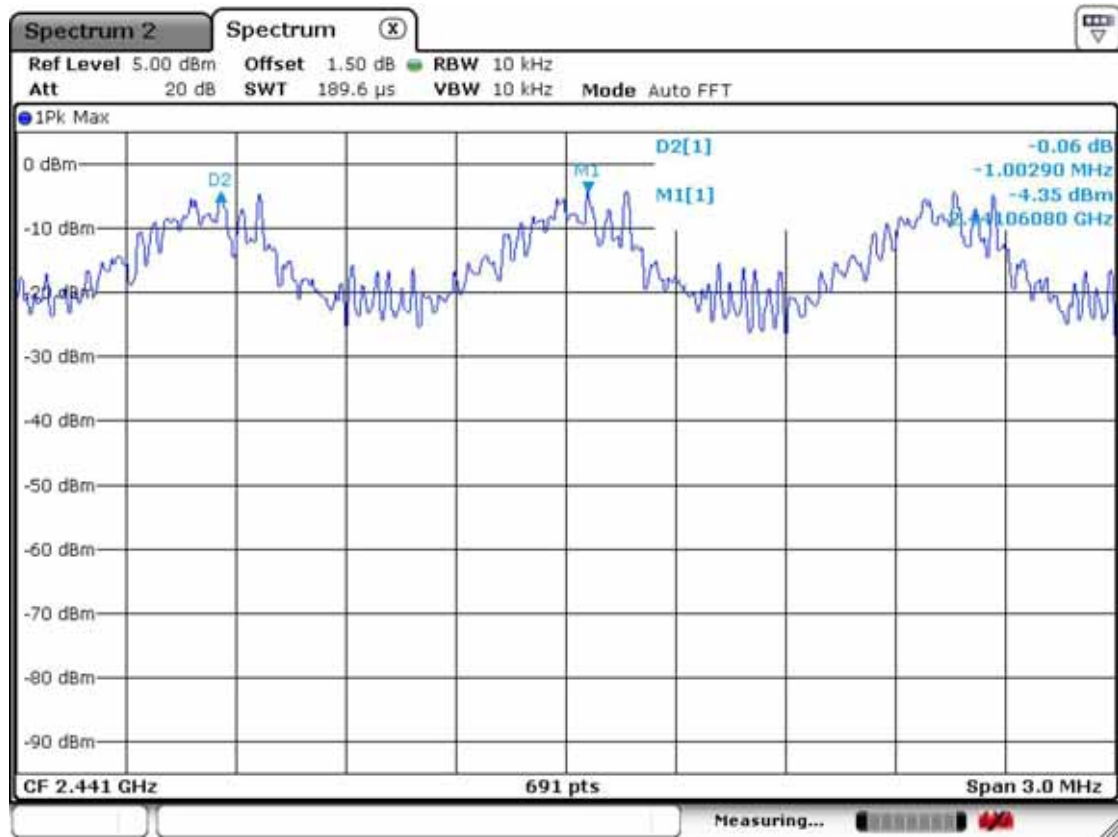


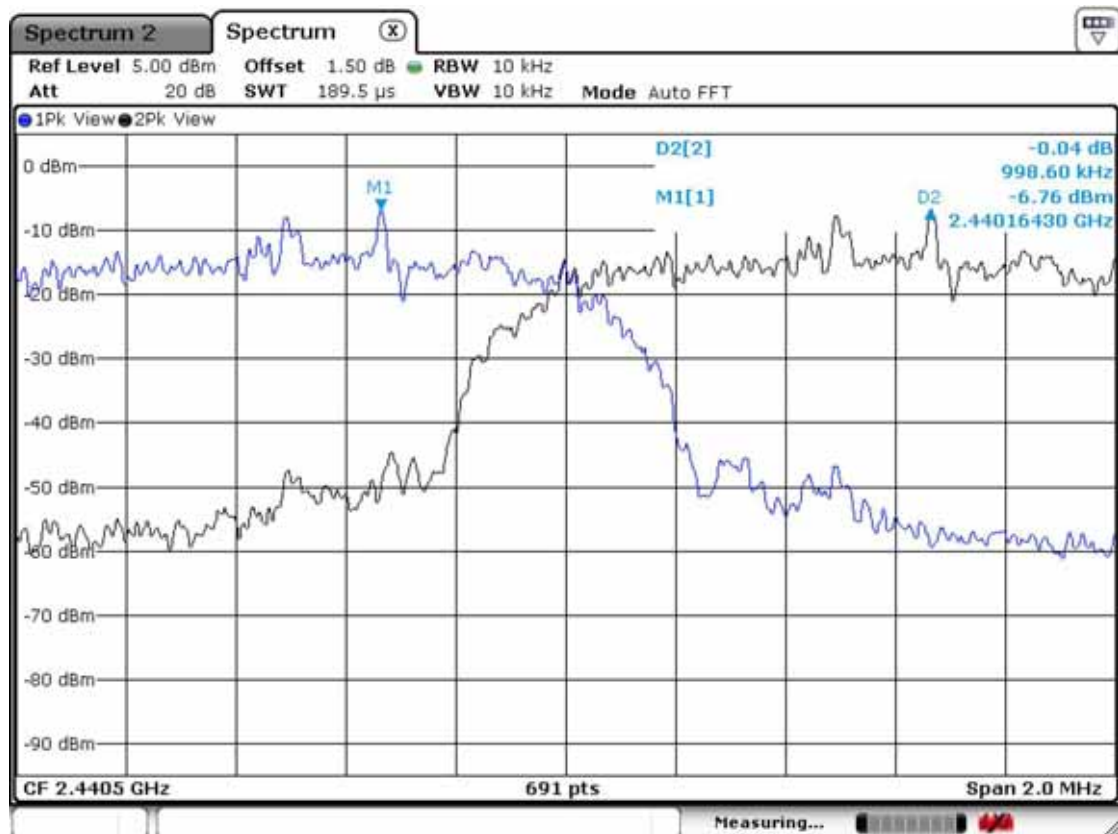
Figure 1: Measurement setup for the carrier frequency separation

Carrier Frequency Separation

Basic Mode



EDR Mode



3.2.2 Number of Hopping Frequencies

Procedure:

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

To get higher resolution, four frequency ranges within the 2400 ~ 2483.5 MHz FH band were examined.

The spectrum analyzer is set to:

Frequency range 1: Start = 2400.0MHz, Stop = 2441.5 MHz

 2: Start = 2441.5MHz, Stop = 2483.5 MHz

RBW = 100 kHz (1% of the span or more) Sweep = auto

VBW = 100 kHz (VBW ≥ RBW) Detector function = peak

Trace = max hold Span > 40MHz

Measurement Data: Complies

Total number of Hopping Channels	79
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- See next pages for actual measured spectrum plots.

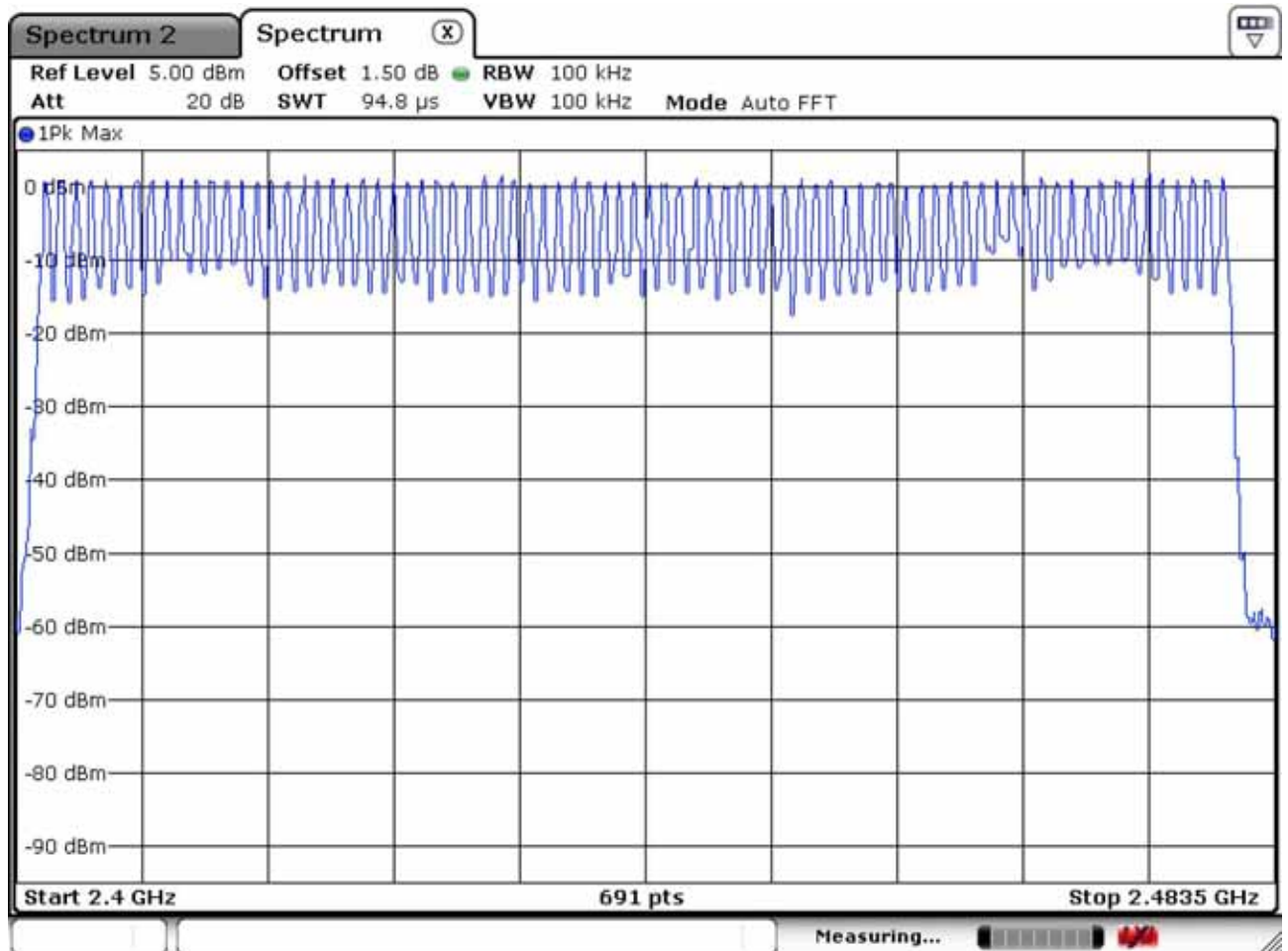
Minimum Standard:

At least 15 hopes

Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

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 = 3 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

dB/Div = 5dB

Measurement Data: Basic Mode

Frequency (MHz)	Channel No.	Test Results(MHz)	
		20dB Bandwidth	99% Bandwidth
2402	0	0.851	0.925
2441	39	0.903	0.920
2480	78	0.899	0.925

Measurement Data: EDR Mode

Frequency (MHz)	Channel No.	Test Results(MHz)	
		20dB Bandwidth	99% Bandwidth
2402	0	1.294	1.177
2441	39	1.294	1.181
2480	78	1.298	1.177

- See next pages for actual measured spectrum plots.

Minimum Standard:

N/A

Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

Low Channel of basic mode**20 dB Bandwidth****99% Bandwidth**

Mid Channel of basic mode**20 dB Bandwidth****99% Bandwidth**

High Channel of basic mode20 dB Bandwidth99% Bandwidth

Low Channel at EDR mode**20 dB Bandwidth****99% Bandwidth**

Mid Channel at EDR mode**20 dB Bandwidth****99% Bandwidth**

High Channel at EDR mode20 dB Bandwidth99% 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 = 2441 MHz

Span = zero

RBW = 1 MHz

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

Trace = max hold

Detector function = peak

Measurement Data:

Mode	Number of transmission in a 31.6s (79Hopping*0.4)	Length of Transmission Time (msec)	Result (msec)	Limit (msec)
DH1	30(Times / 3sec) *10.533 = 315.99	0.493	155.78	400
DH3	16(Times / 3sec) *10.533 = 168.53	1.754	277.12	400
DH5	11(Times / 3sec) *10.533 = 115.86	3.036	319.78	400
EDR 3Mbps DH5	11(Times / 3sec) *10.533 = 115.86	3.000	315.99	400

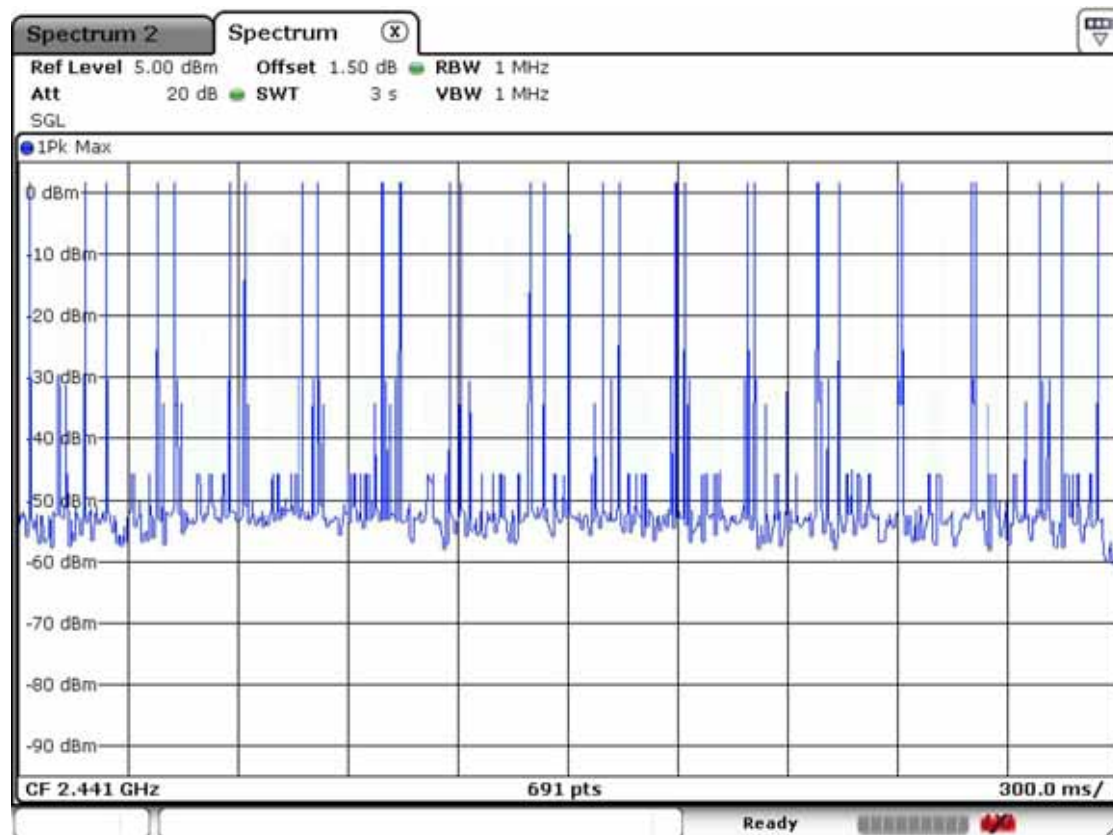
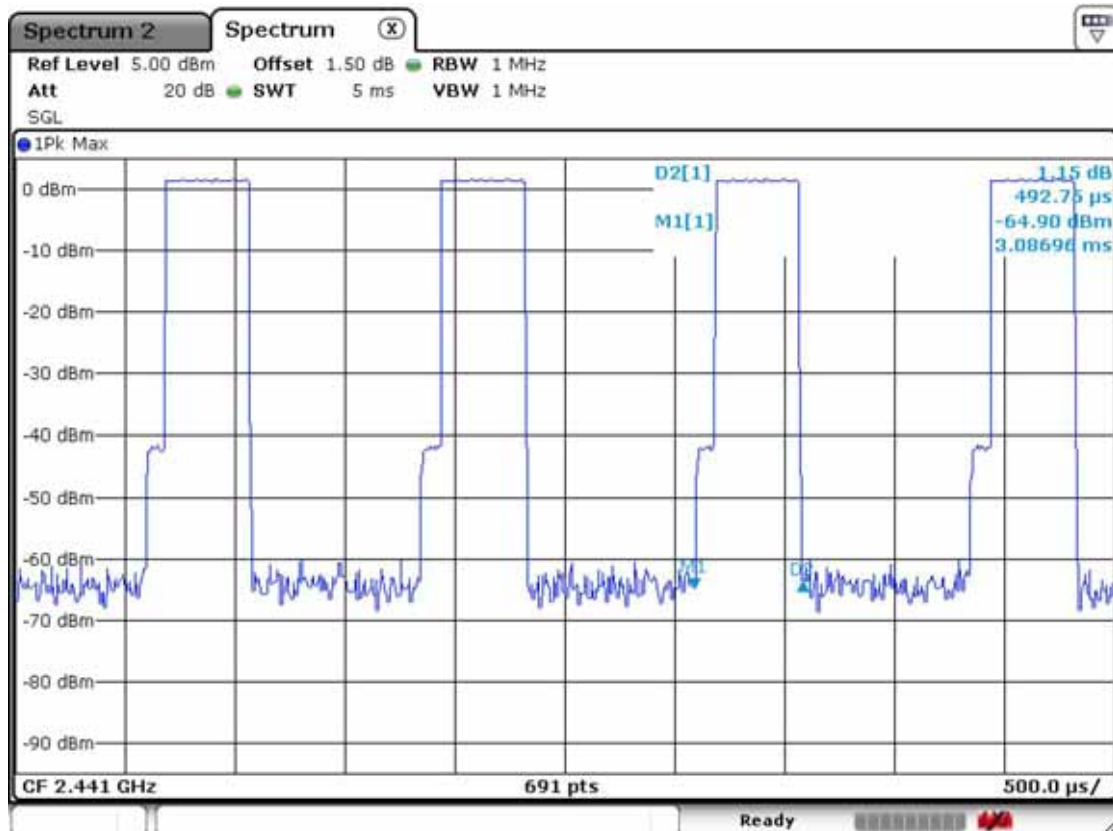
- See next pages for actual measured spectrum plots.
- dwell time = {(number of hopping per second / number of slot) x duration time per channel} x 0.4 ms

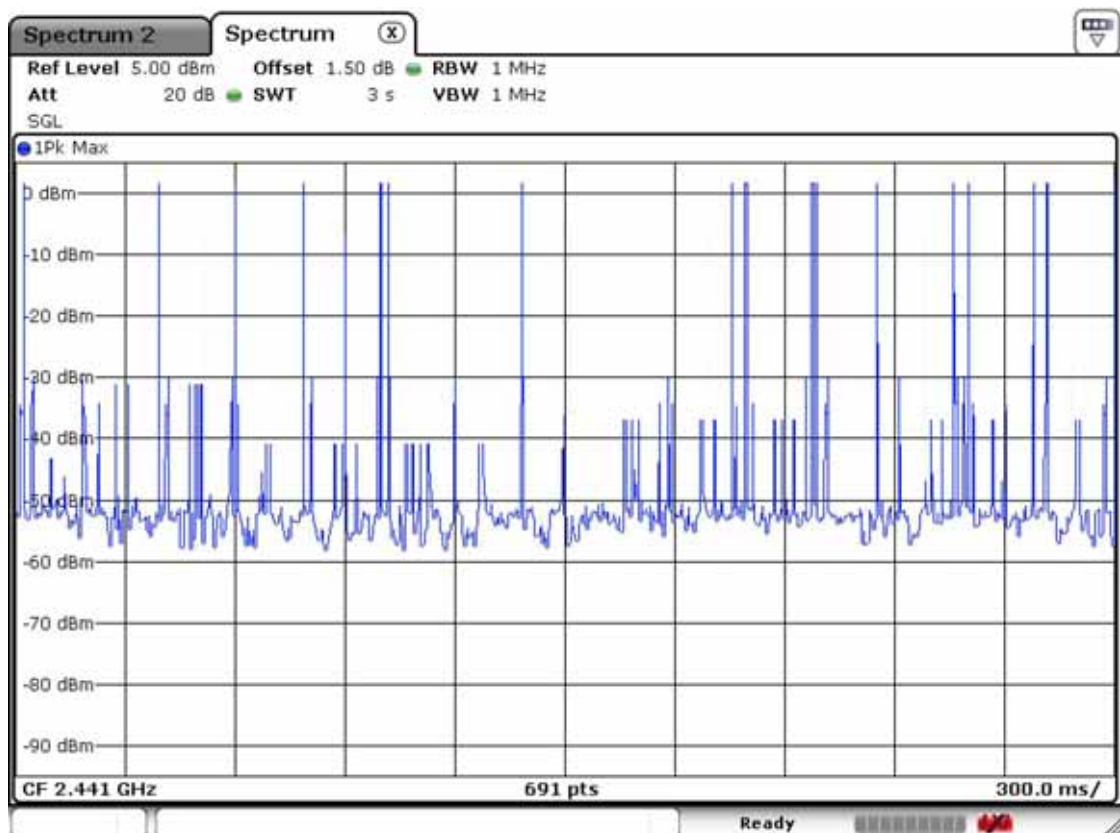
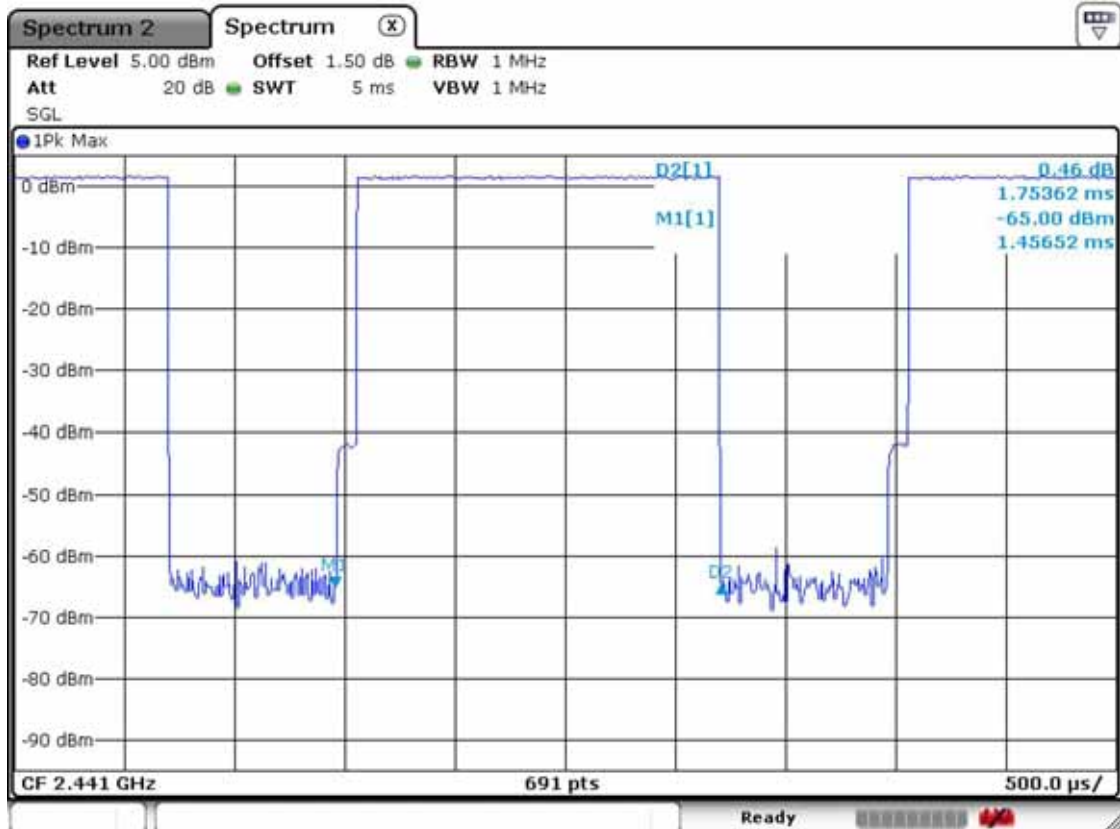
Minimum Standard:

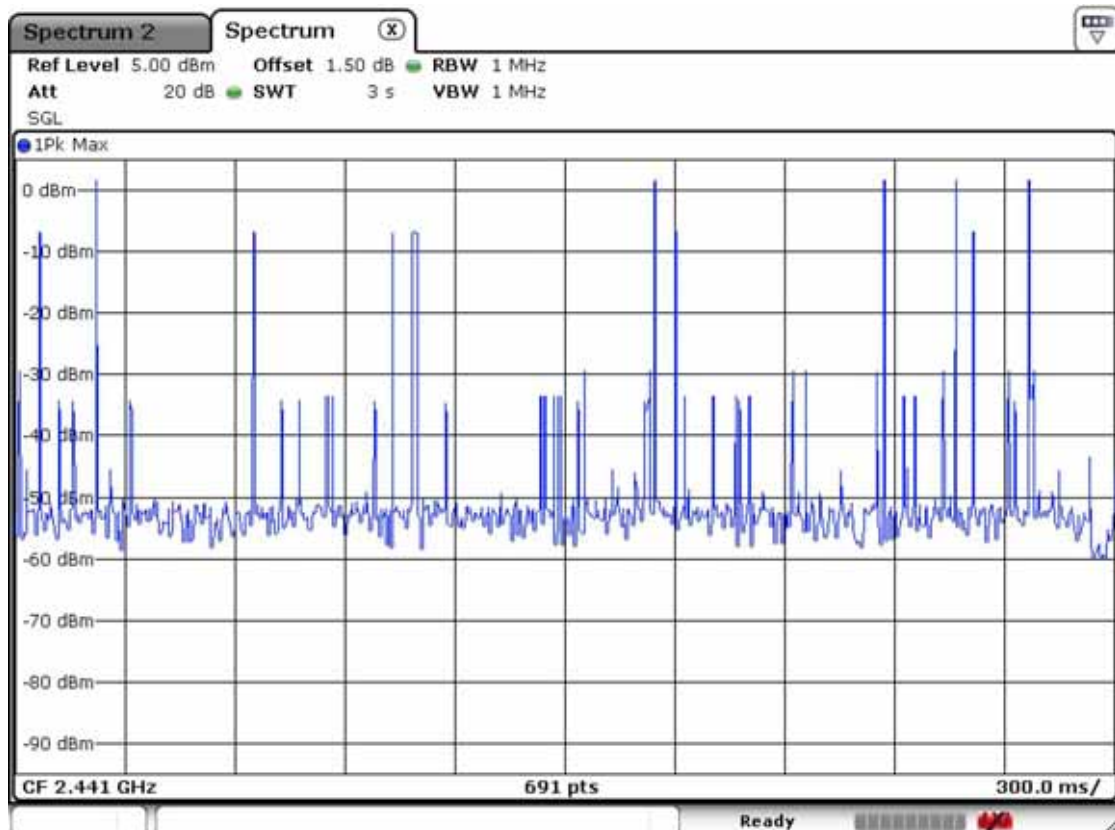
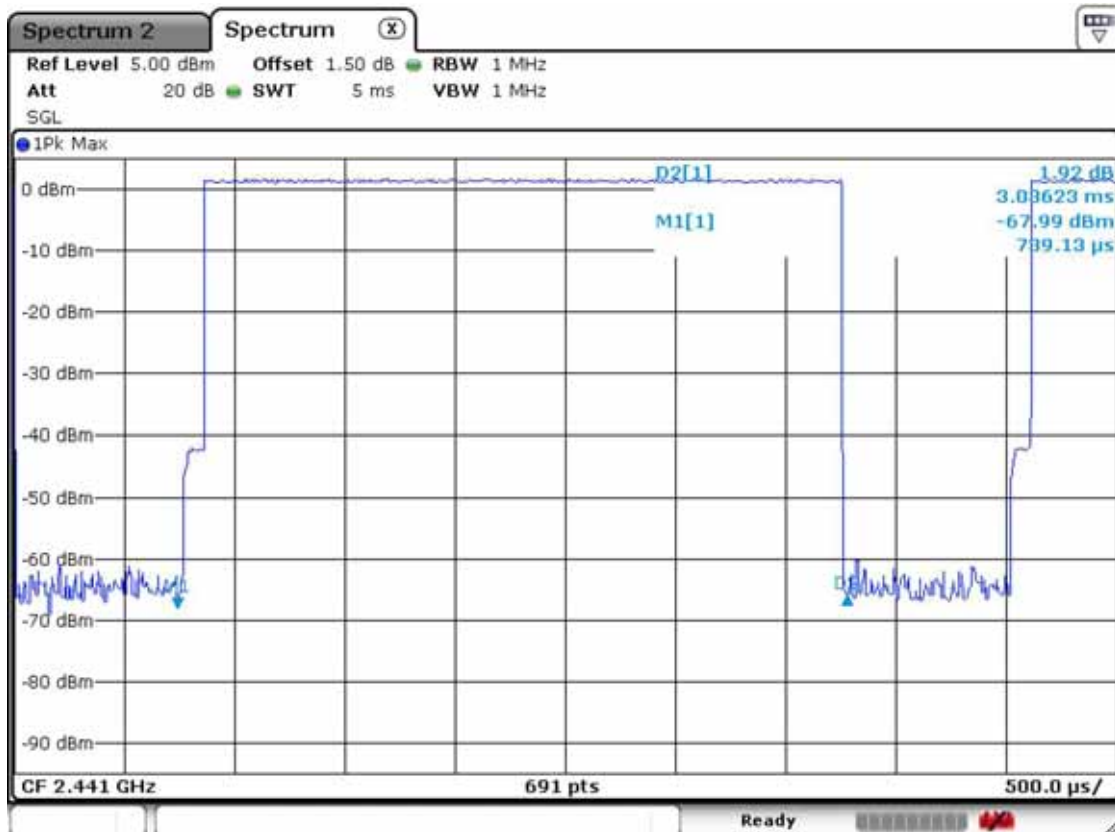
0.4 seconds within a 30 second period per any frequency

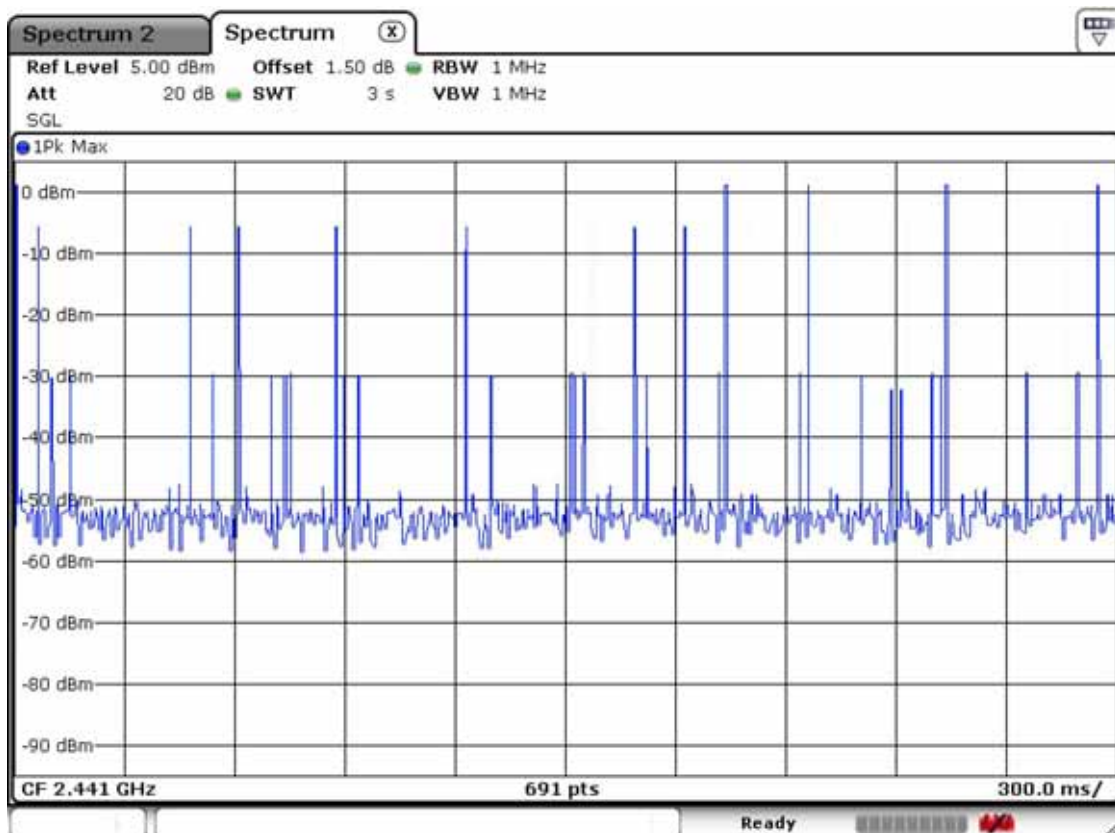
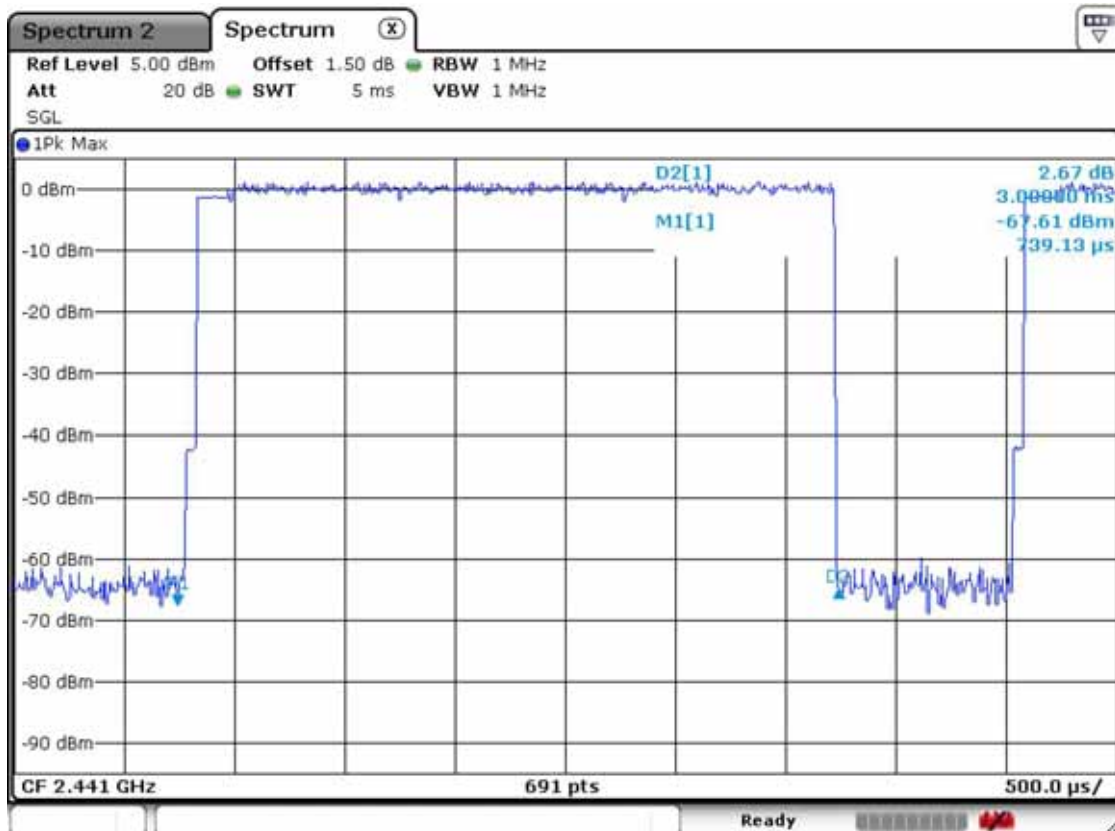
Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

DH1 at basic mode

DH3 at basic mode

DH5 at basic mode

DH5 at EDR mode with 3Mbps

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
2402	0	1.82	1.52	Complies
2441	39	1.70	1.48	Complies
2480	78	2.55	1.80	Complies

Measurement Data: EDR Mode

Frequency (MHz)	Ch.	Test Results		
		dBm	mW	Result
2402	0	2.23	1.67	Complies
2441	39	2.09	1.62	Complies
2480	78	2.99	1.99	Complies

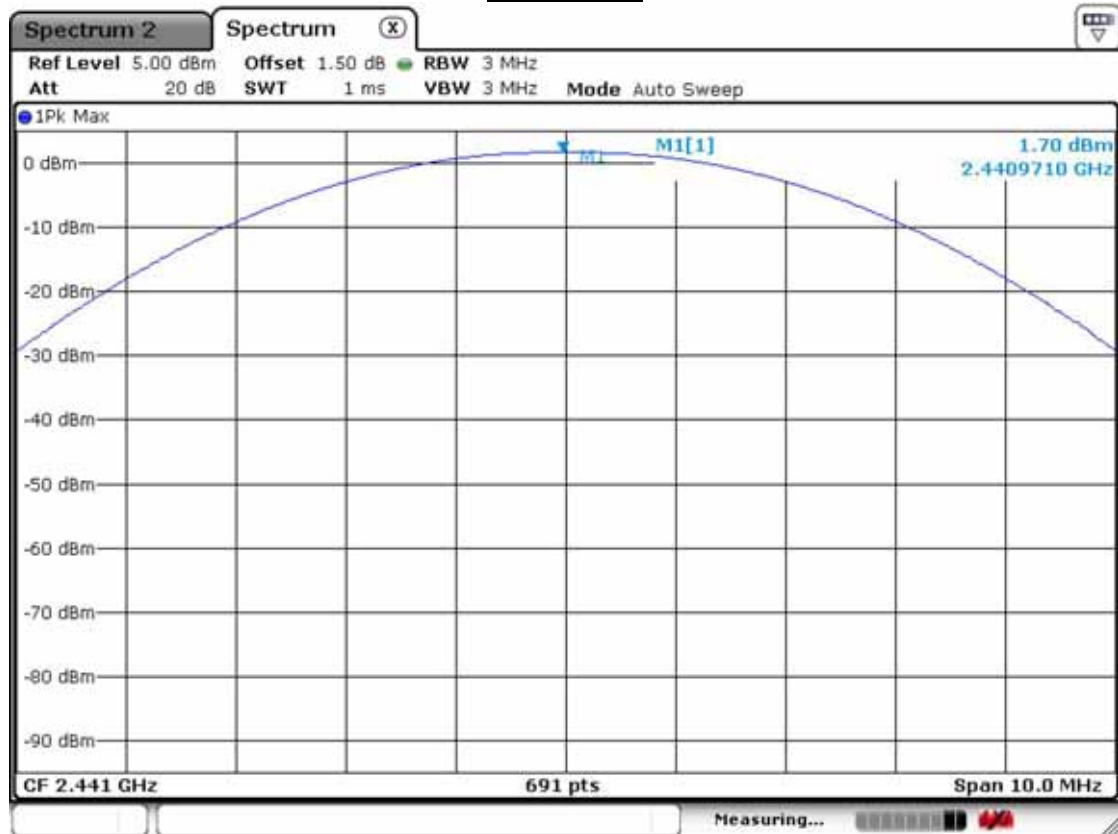
- See next pages for actual measured spectrum plots.

Minimum Standard:	< 250 mW
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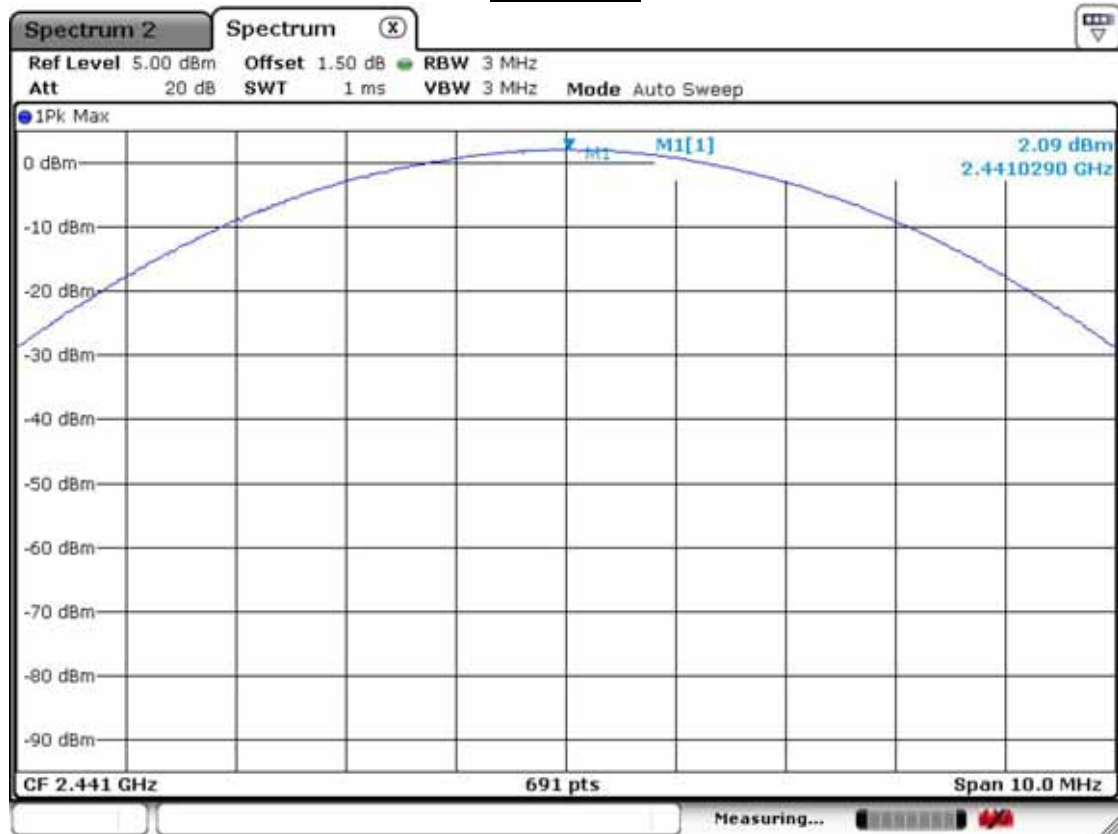
Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

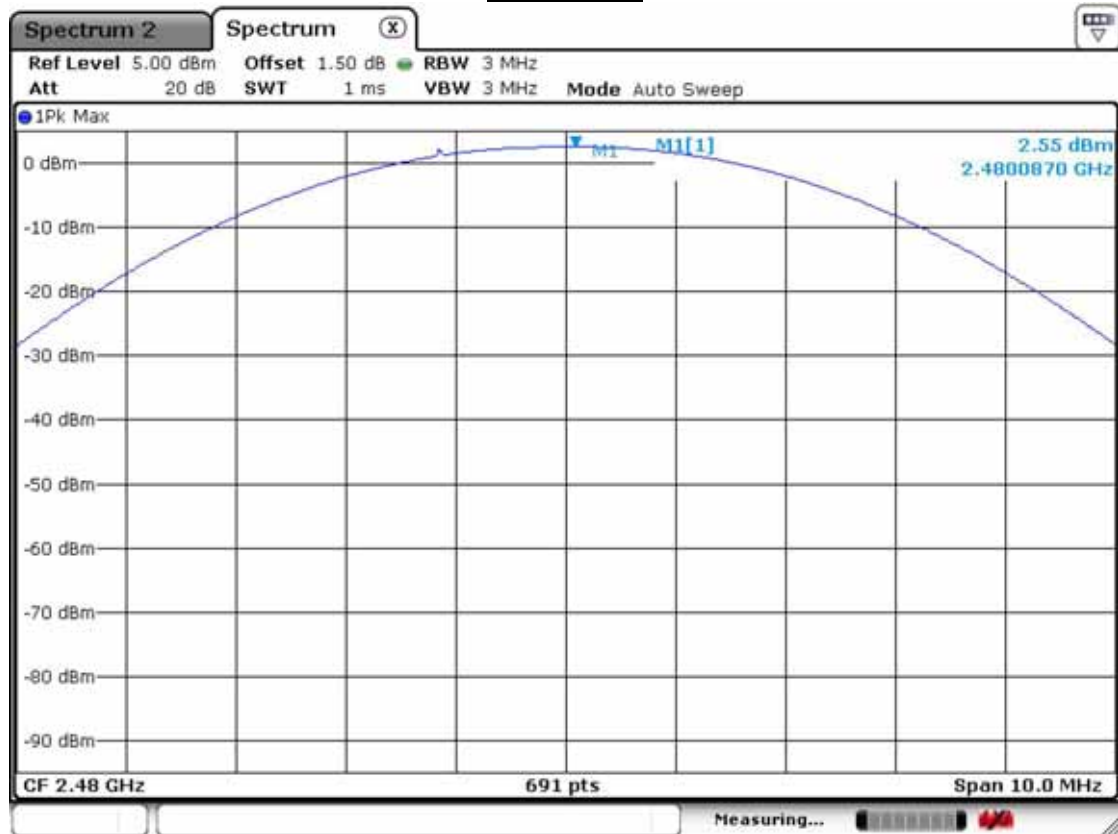
Mid Channel Basic mode



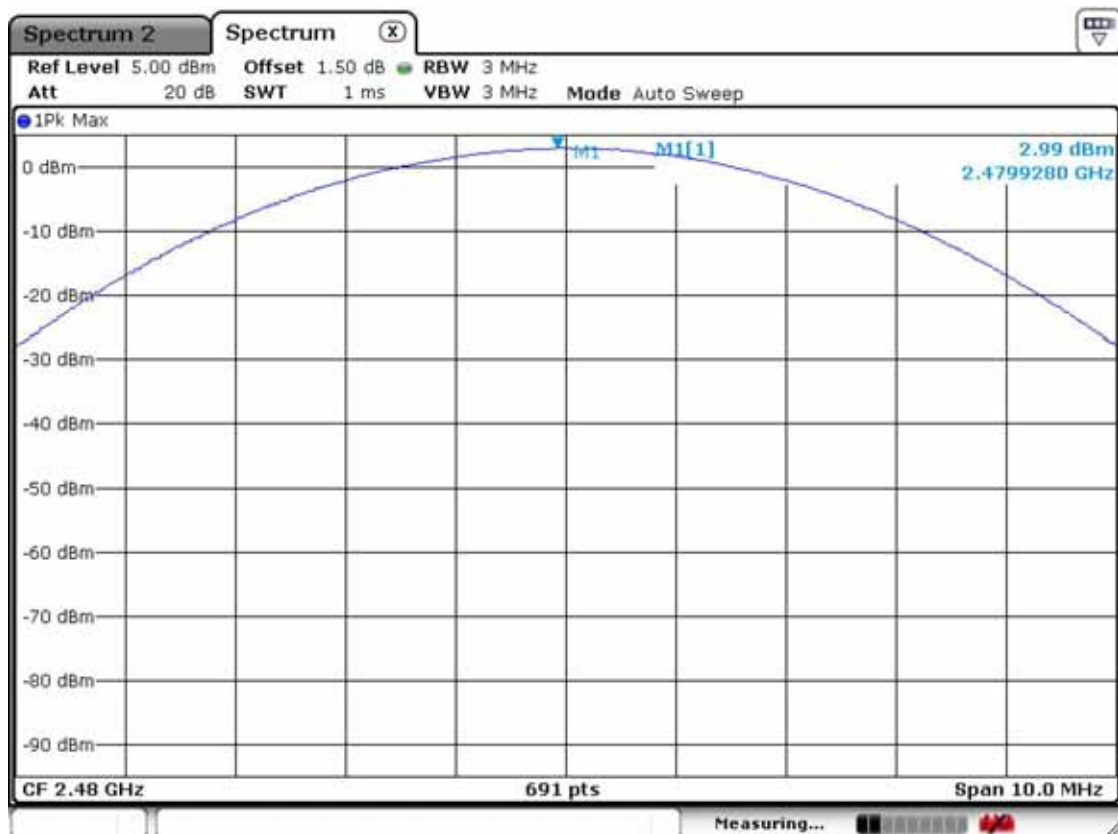
EDR mode



High Channel Basic mode



EDR mode



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 = 10 MHz

Detector function = peak

Trace = max hold

Sweep = auto

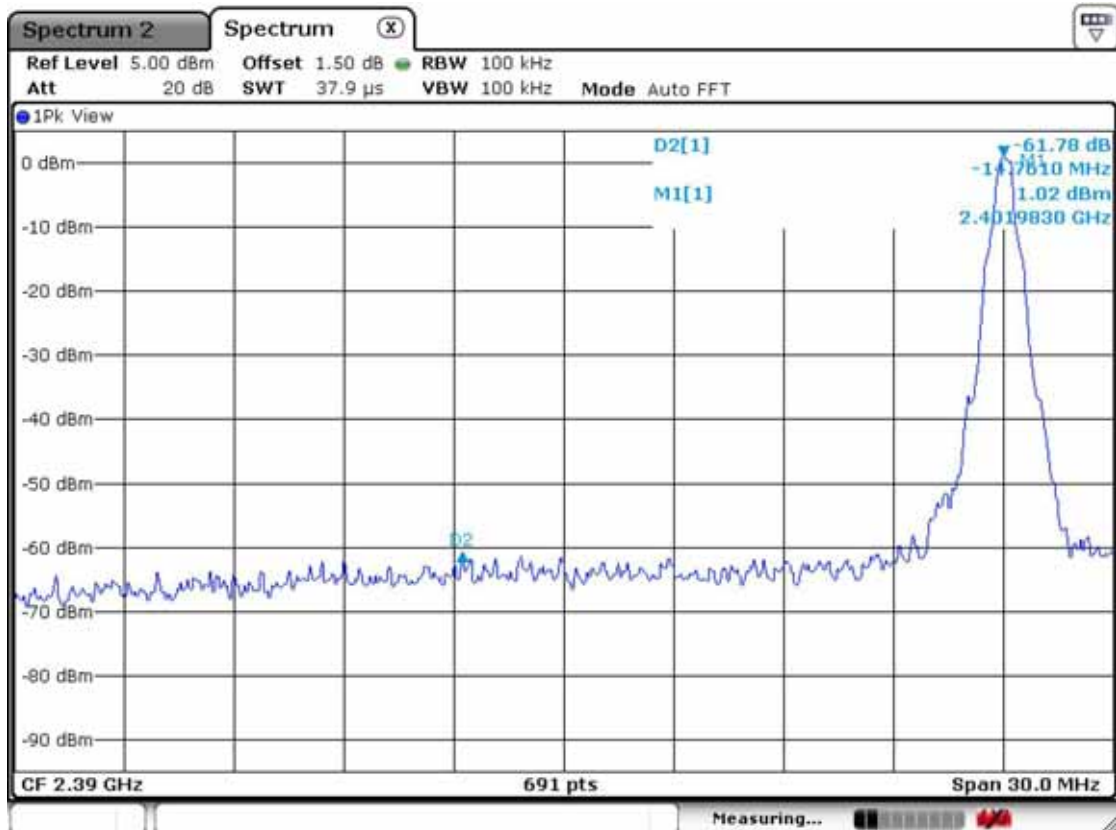
Measurement Data: Complies

- 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.

Minimum Standard:	> 20 dBc
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Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

Band – edgeLower edgeUpper edge

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

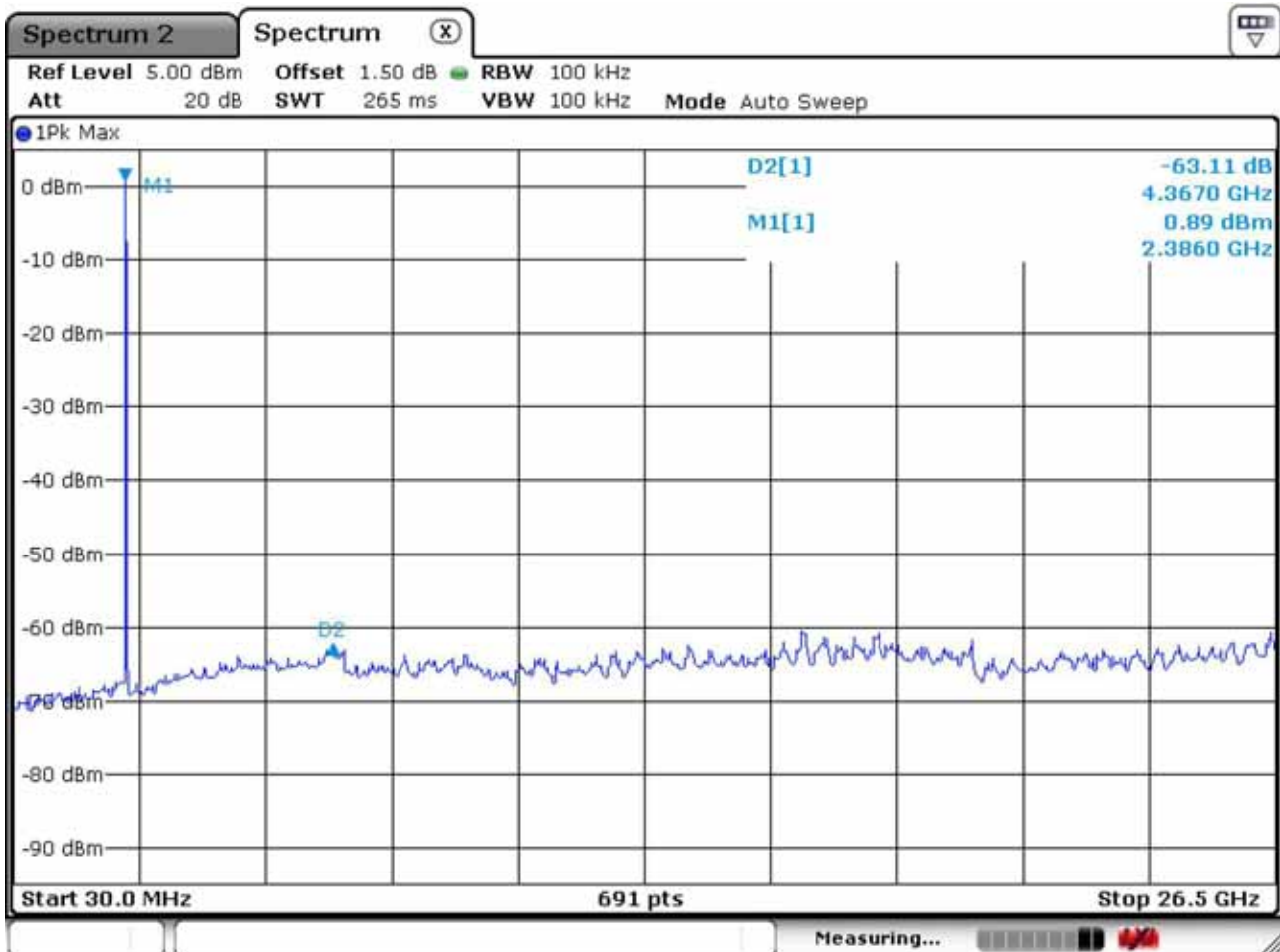
Frequency [MHz]	Reading [dBuV / m]		Pol.	Correction Factor			Limits [dBuV / m]		Result [dBuV / m]		Margin [dB]	
	AV / Peak			Antenna	Amp. Gain	Cable	AV / Peak	AV / Peak	AV / Peak			
2390	39.4	50.3	H	25.4	37.1	4.0	54.0	74.0	31.7	42.6	22.4	31.5

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

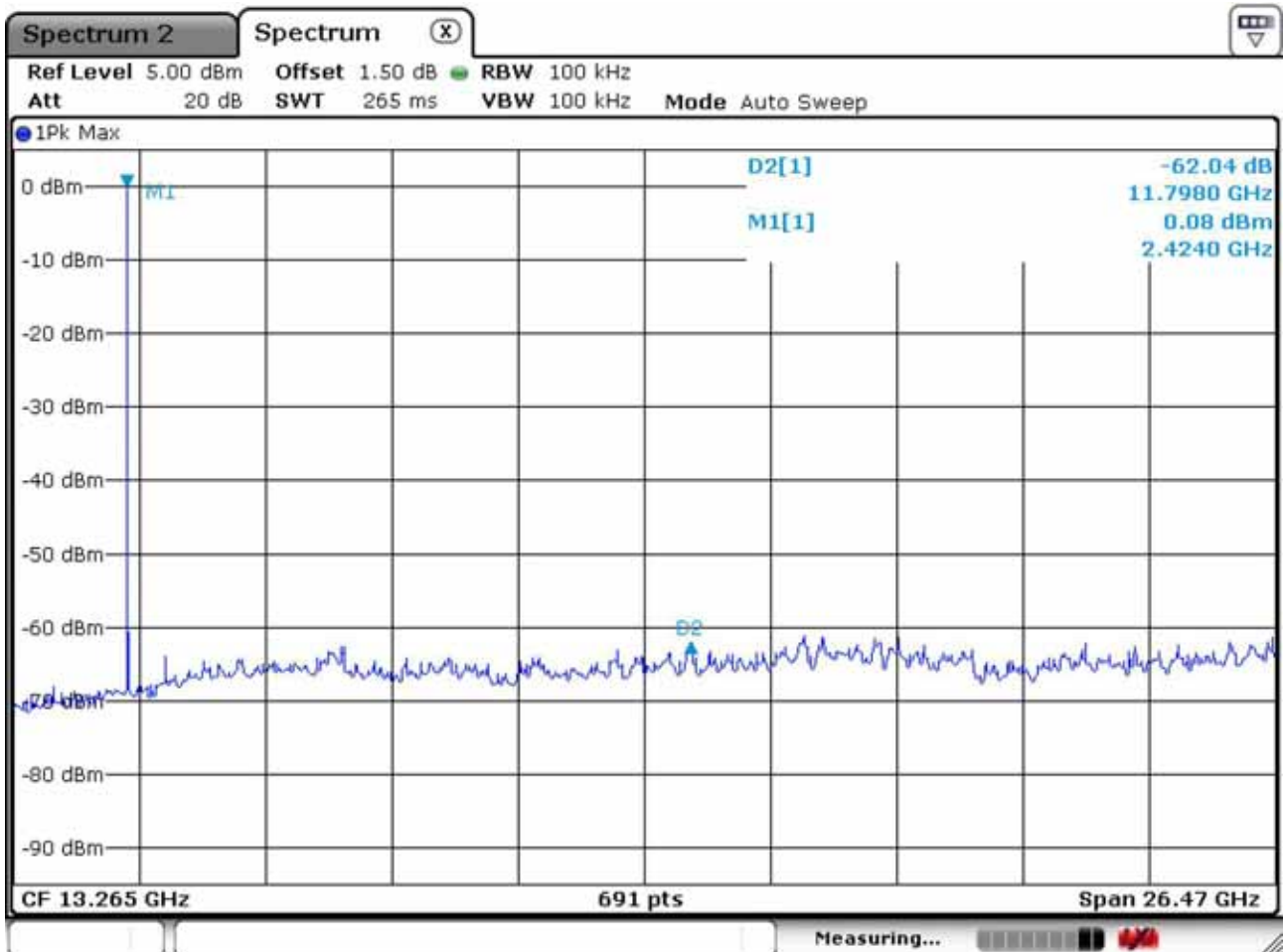
Frequency [MHz]	Reading [dBuV / m]		Pol.	Correction Factor			Limits [dBuV / m]		Result [dBuV / m]		Margin [dB]	
	AV / Peak			Antenna	Amp. Gain	Cable	AV / Peak		AV / Peak		AV / Peak	
2483.5	39.6	52.9	H	25.4	37.1	4.0	54.0	74.0	31.9	45.2	22.2	28.9

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

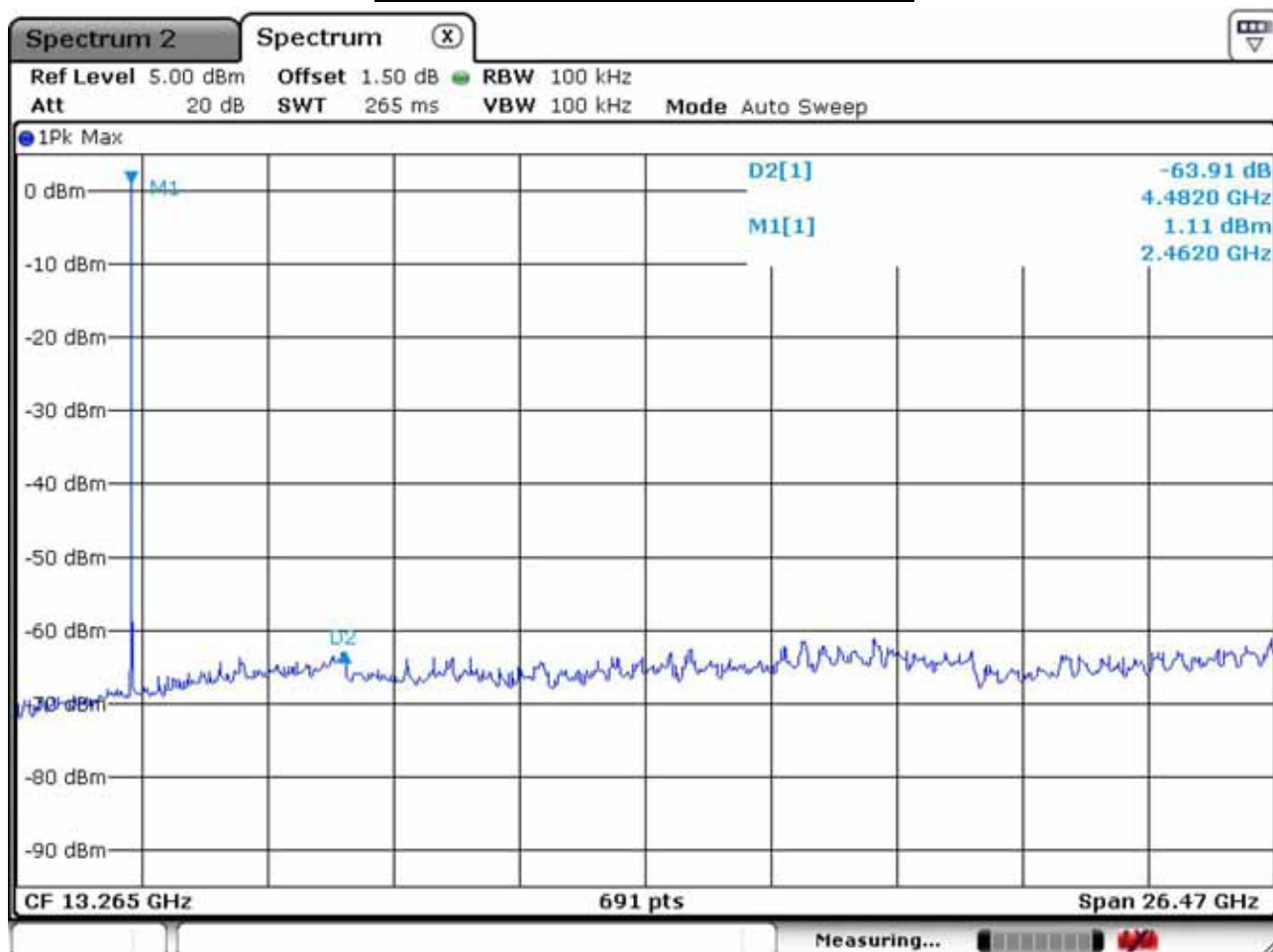
Unwanted Emission – Low channel
Frequency Range = 30 MHz ~ 26.5 GHz



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.

- In the frequency range of 9kHz to 30 MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
- In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is carried from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 10 MHz ~ 10th harmonic.

RBW = 100 kHz (10MHz ~ 1 GHz)

= 1 MHz (1 GHz ~ 10th harmonic)

Span = 100 MHz

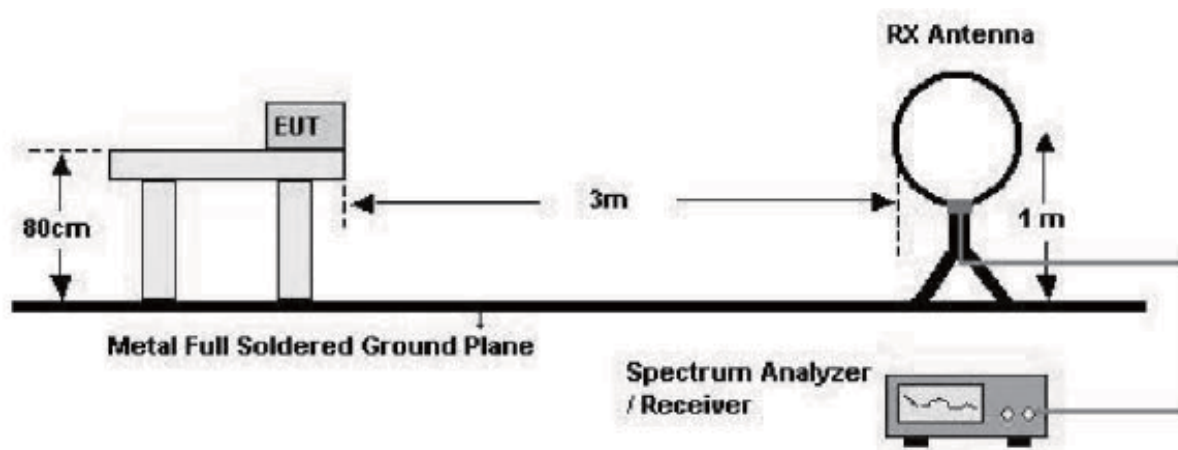
Trace = max hold

VBW ≥ RBW

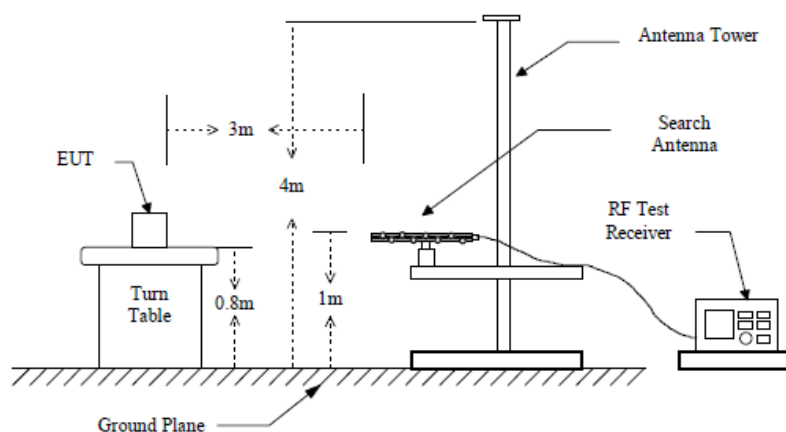
Detector function = peak

Sweep = auto

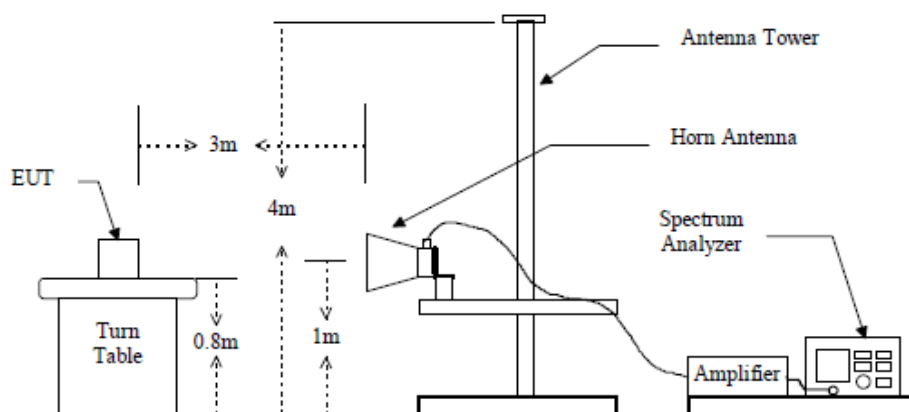
below 30MHz



below 1GHz (30MHz to 1GHz)



above 1GHz



Measurement Data: Complies

- See next pages for actual measured data.
- No other emissions were detected at a level greater than 20dB below limit

Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3m
0.009 ~ 0.490	2400/F(kHz) (@ 300m)
0.490 ~ 1.705	24000/F(kHz) (@ 30m)
1.705 ~ 30	30(@ 30m)
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] AV / Peak		Pol.	Correction Factor			Limits [dBuV / m] AV / Peak		Result [dBuV / m] AV / Peak		Margin [dB] AV / Peak	
				Antenna	Amp.Gain	Cable						
4804.0	33.7	43.8	H	31.4	36.5	5.7	54.0	74.0	34.4	44.5	19.6	29.5
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
4882.0	34.2	44.1	H	31.4	36.5	5.7	54.0	74.0	34.9	44.7	19.1	29.3
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
4959.00	33.9	44.9	H	31.4	36.5	5.7	54.0	74.0	34.6	45.6	19.4	28.4
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

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

Radiated Emissions – Charging+Play mode

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

EUT/Model No.: Z2

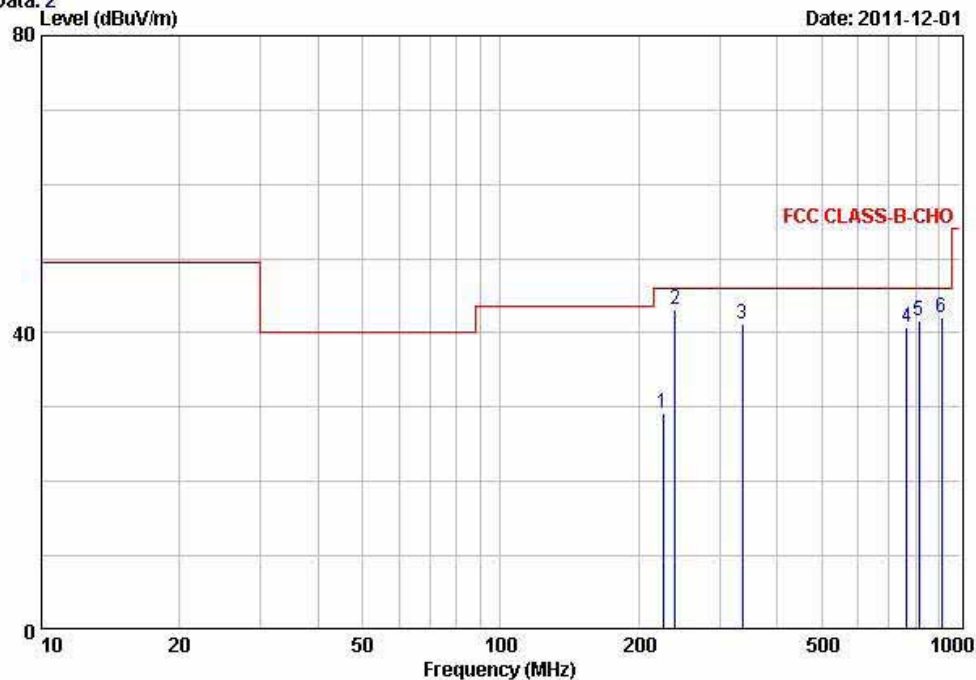
TEST MODE: Charging+Play mode

Temp Humi : 9 / 38

Tested by: PARK.H.W

Data: 2

Date: 2011-12-01



	Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
	MHz	dBuV/m	dB/m	dBuV/m	QP	dB	cm	deg	
1	225.50	39.50	-10.24	29.26	46.00	16.74	192	105	HORIZONTAL
2	240.00	52.70	-9.54	43.16	46.00	2.84	174	107	HORIZONTAL
3	335.98	47.70	-6.40	41.30	46.00	4.70	115	125	HORIZONTAL
4	767.97	38.00	2.77	40.77	46.00	5.23	244	71	HORIZONTAL
5	815.98	38.20	3.44	41.64	46.00	4.36	116	89	HORIZONTAL
6	911.98	37.60	4.43	42.03	46.00	3.97	192	36	HORIZONTAL

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

Radiated Emissions – Charging+BT mode

243 Jubug-ni, yangji-Myeon, Youngin-si,
Gyeonggi-do 449-822 Korea
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Fax:+82-31-3236010

EUT/Model No.: Z2

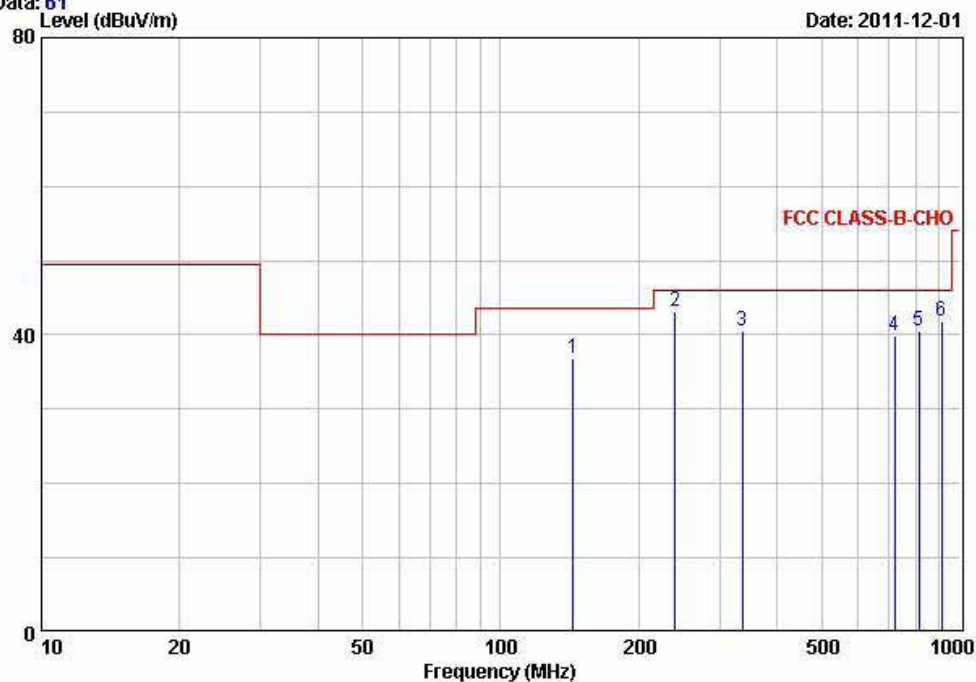
TEST MODE: Charging+BT mode

Temp Humi : 9 / 38

Tested by: PARK.H.W

Data: 61

Date: 2011-12-01



	Freq	Reading	C.F	Result	Limit QP	Margin	Height	Angle	Polarity
	MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	144.00	45.90	-9.07	36.83	43.50	6.67	216	27	HORIZONTAL
2	240.01	52.80	-9.54	43.26	46.00	2.74	177	49	HORIZONTAL
3	335.98	47.00	-6.40	40.60	46.00	5.40	120	175	HORIZONTAL
4	720.00	37.90	2.07	39.97	46.00	6.03	123	169	HORIZONTAL
5	816.00	37.10	3.44	40.54	46.00	5.46	122	114	HORIZONTAL
6	911.99	37.40	4.43	41.83	46.00	4.17	194	135	HORIZONTAL

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

Radiated Emissions – PC mode

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

EUT/Model No.: Z2

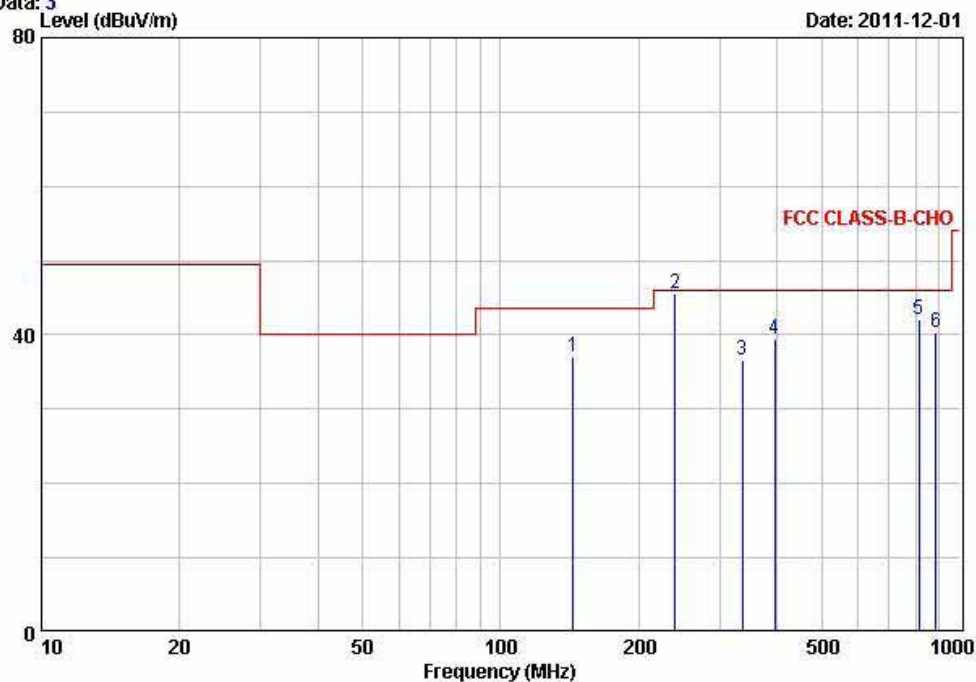
TEST MODE: PC mode

Temp Humi : 9 / 38

Tested by: PARK.H.W

Data: 3

Date: 2011-12-01



Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
MHz	dBuV/m	dB/m	dBuV/m	QP	dB	cm	deg	
1 144.00	46.10	-9.07	37.03	43.50	6.47	400	125	HORIZONTAL
2 240.00	55.00	-9.54	45.46	46.00	0.54	400	162	HORIZONTAL
3 336.00	43.00	-6.40	36.60	46.00	9.40	139	120	HORIZONTAL
4 396.00	44.80	-5.42	39.38	46.00	6.62	105	76	VERTICAL
5 816.00	38.70	3.44	42.14	46.00	3.86	135	169	HORIZONTAL
6 888.00	36.40	3.91	40.31	46.00	5.69	143	248	HORIZONTAL

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

Radiated Emissions – Charging+REC mode

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

EUT/Model No.: Z2

TEST MODE: Charging+Rec mode

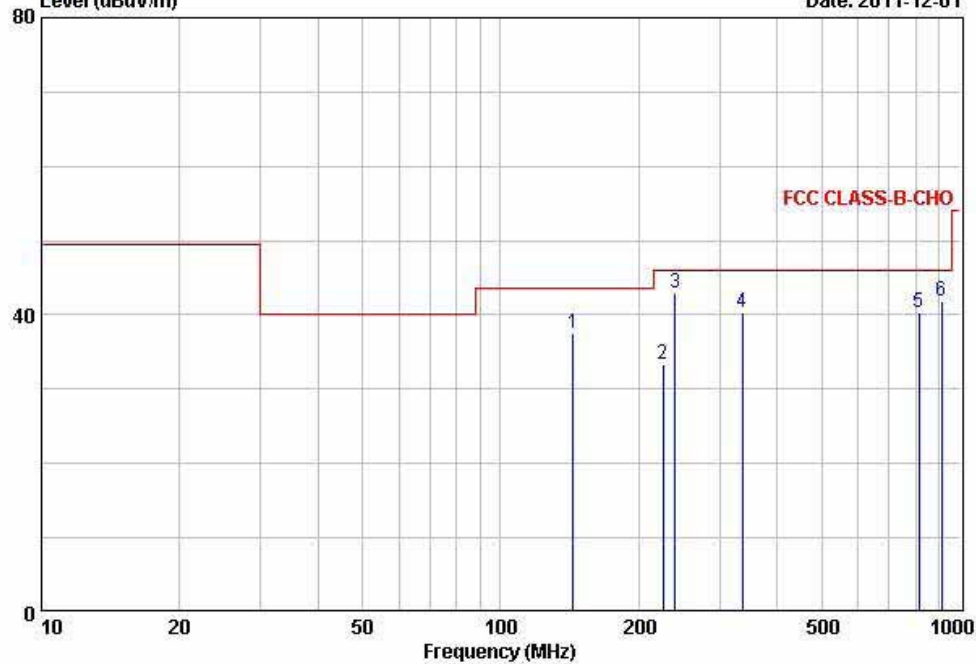
Temp Humi : 9 / 38

Tested by: PARK.H.W

Data: 18

Level (dBuV/m)

Date: 2011-12-01



Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
MHz	dBuV/m	dB/m	dBuV/m	QP	dB	cm	deg	
1	144.01	46.50	-9.07	37.43	43.50	6.07	244	71 HORIZONTAL
2	225.51	43.60	-10.24	33.36	46.00	12.64	194	127 HORIZONTAL
3	240.00	52.50	-9.54	42.96	46.00	3.04	176	123 HORIZONTAL
4	336.00	46.80	-6.40	40.40	46.00	5.60	113	167 HORIZONTAL
5	815.97	36.90	3.44	40.34	46.00	5.66	124	103 HORIZONTAL
6	912.00	37.40	4.43	41.83	46.00	4.17	201	159 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 20dB below limit.

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

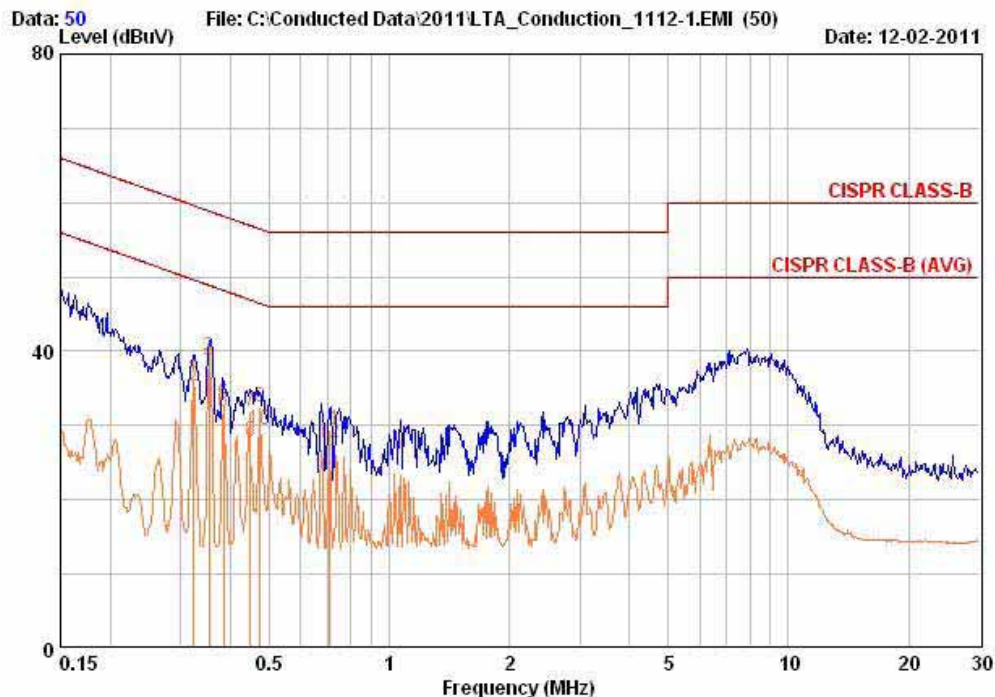
Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

*Decreases with the logarithm of the frequency

AC Conducted Emissions at Charging+Play mode – Line

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

EUT / Model No. : Z2	Phase : LINE
Test Mode : Charging+Play mode	Test Power : 120 / 60
Temp./Humi. : 21 / 33	Test Engineer : PARK.H.W



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
0.324	26.83	25.73	9.63	36.46	35.36	59.60	49.60	23.15	14.25
0.354	29.53	28.63	9.63	39.16	38.26	58.87	48.87	19.71	10.61
0.385	23.33	22.23	9.64	32.97	31.87	58.17	48.17	25.20	16.30
0.449	22.22	18.22	9.62	31.85	27.85	56.89	46.89	25.04	19.04
0.474	22.92	19.72	9.62	32.54	29.34	56.44	46.44	23.90	17.10
0.709	19.82	18.02	9.71	29.53	27.73	56.00	46.00	26.47	18.27

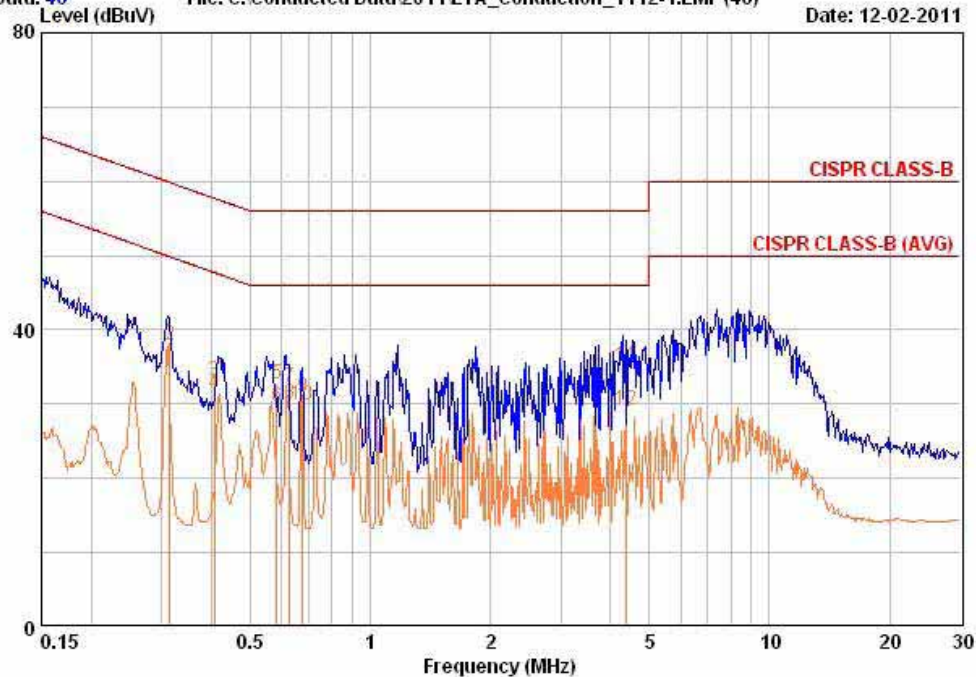
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions at Charging+Play mode – Neutral

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

EUT / Model No. : Z2	Phase : NEUTRAL
Test Mode : Charging+Play mode	Test Power : 120 / 60
Temp./Humi. : 21 / 33	Test Engineer : PARK.H.W

Data: 46 File: C:\Conducted Data\2011\LTA_Conduction_1112-1.EMI (46) Date: 12-02-2011



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
0.314	28.83	28.33	9.59	38.42	37.92	59.86	49.86	21.44	11.94
0.406	23.43	21.73	9.67	33.10	31.40	57.73	47.73	24.63	16.33
0.584	23.12	20.02	9.67	32.79	29.69	56.00	46.00	23.21	16.31
0.627	22.62	20.42	9.65	32.27	30.07	56.00	46.00	23.73	15.93
0.676	21.42	20.22	9.64	31.06	29.86	56.00	46.00	24.94	16.14
4.373	25.34	19.44	9.72	35.06	29.16	56.00	46.00	20.94	16.84

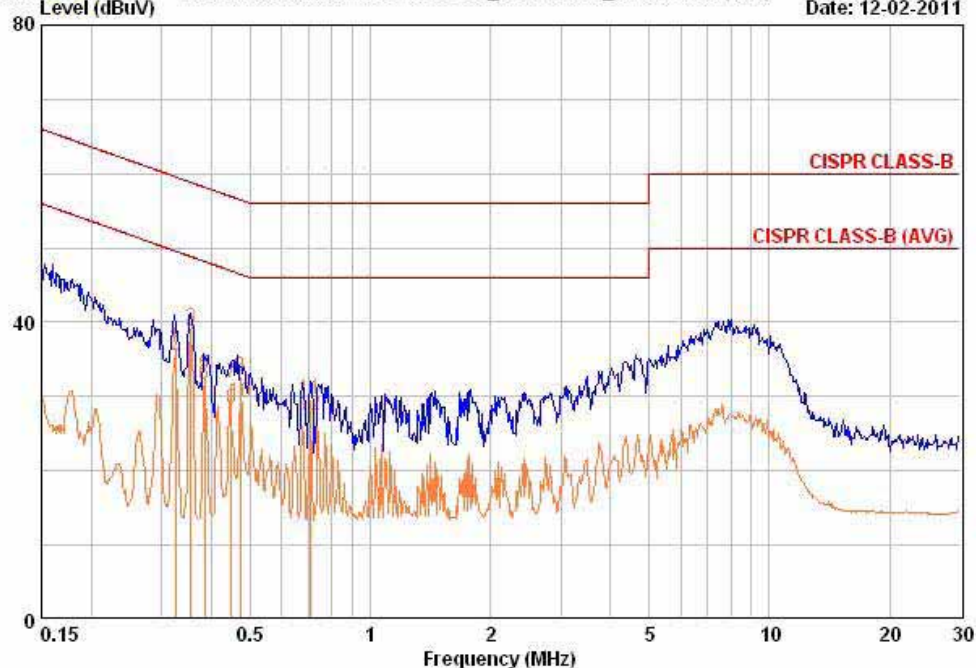
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions at Charging+BT mode – Line

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

EUT / Model No. : Z2	Phase : LINE
Test Mode : Charging+BT mode	Test Power : 120 / 60
Temp./Humi. : 21 / 33	Test Engineer : PARK.H.W

Data: 161 File: C:\Conducted Data\2011\LTA_Conduction_1112-1.EMI (161) Date: 12-02-2011



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
0.325	26.93	25.83	9.63	36.56	35.46	59.58	49.58	23.02	14.12
0.355	29.63	28.63	9.63	39.26	38.26	58.84	48.84	19.58	10.58
0.384	23.33	21.93	9.64	32.97	31.57	58.19	48.19	25.23	16.63
0.449	22.12	18.62	9.62	31.75	28.25	56.89	46.89	25.14	18.64
0.473	23.02	19.62	9.62	32.64	29.24	56.46	46.46	23.82	17.22
0.708	19.92	17.82	9.71	29.63	27.53	56.00	46.00	26.37	18.47

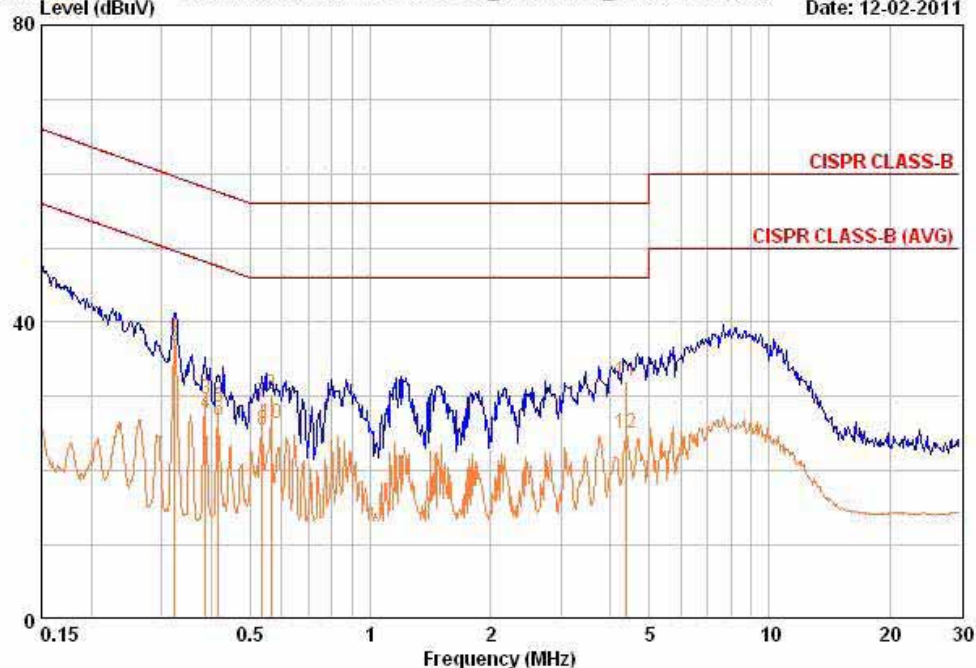
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions at Charging+BT mode – Neutral

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

EUT / Model No. : Z2	Phase : NEUTRAL
Test Mode : Charging+BT mode	Test Power : 120 / 60
Temp./Humi. : 21 / 33	Test Engineer : PARK.H.W

Data: 162 File: C:\Conducted Data\2011\LTA_Conduction_1112-1.EMI (162) Date: 12-02-2011



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
0.324	28.23	27.23	9.60	37.83	36.83	59.60	49.60	21.77	12.77
0.386	20.03	17.93	9.66	29.69	27.59	58.15	48.15	28.46	20.56
0.417	18.93	17.03	9.68	28.60	26.70	57.51	47.51	28.90	20.80
0.536	19.62	15.72	9.69	29.31	25.41	56.00	46.00	26.69	20.59
0.563	20.62	16.72	9.68	30.30	26.40	56.00	46.00	25.70	19.60
4.393	22.34	15.44	9.72	32.06	25.16	56.00	46.00	23.94	20.84

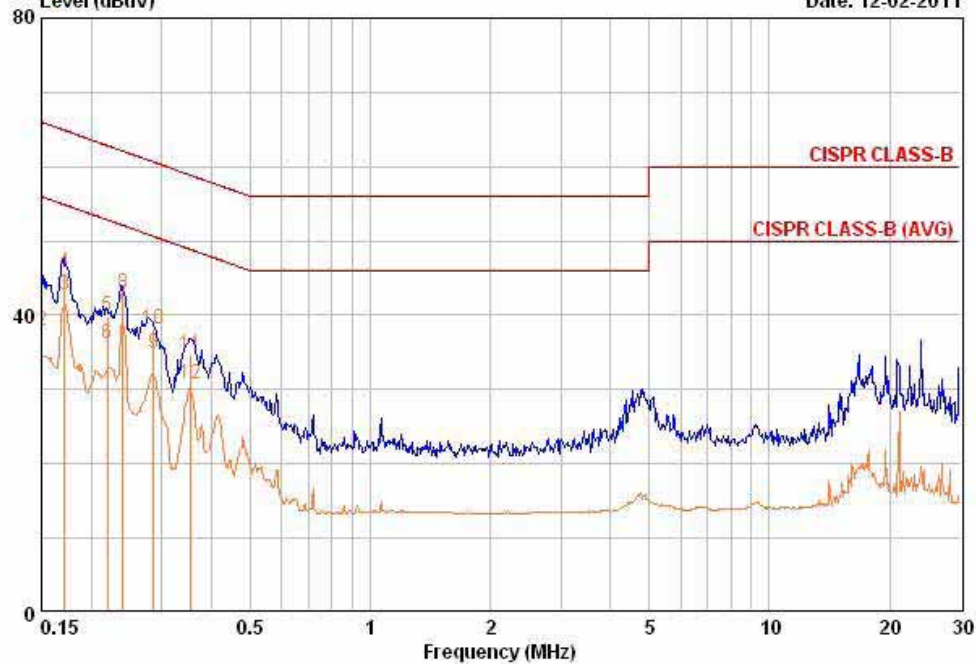
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions at PC mode – Line

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

EUT / Model No. : Z2	Phase : LINE
Test Mode : PC mode	Test Power : 120 / 60
Temp./Humi. : 21 / 33	Test Engineer : PARK.H.W

Data: 12 Level (dBuV) File: C:\Conducted Data\2011\LTA_Conduction_1112-1.EMI (12) Date: 12-02-2011



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
0.150	32.54	28.24	9.72	42.26	37.96	66.00	56.00	23.74	18.04
0.171	36.04	32.94	9.69	45.73	42.63	64.91	54.91	19.18	12.28
0.220	30.24	26.54	9.64	39.87	36.17	62.82	52.82	22.94	16.64
0.240	33.43	31.73	9.62	43.05	41.35	62.10	52.10	19.05	10.75
0.286	28.53	25.23	9.62	38.15	34.85	60.64	50.64	22.49	15.79
0.354	24.93	21.03	9.63	34.56	30.66	58.87	48.87	24.31	18.21

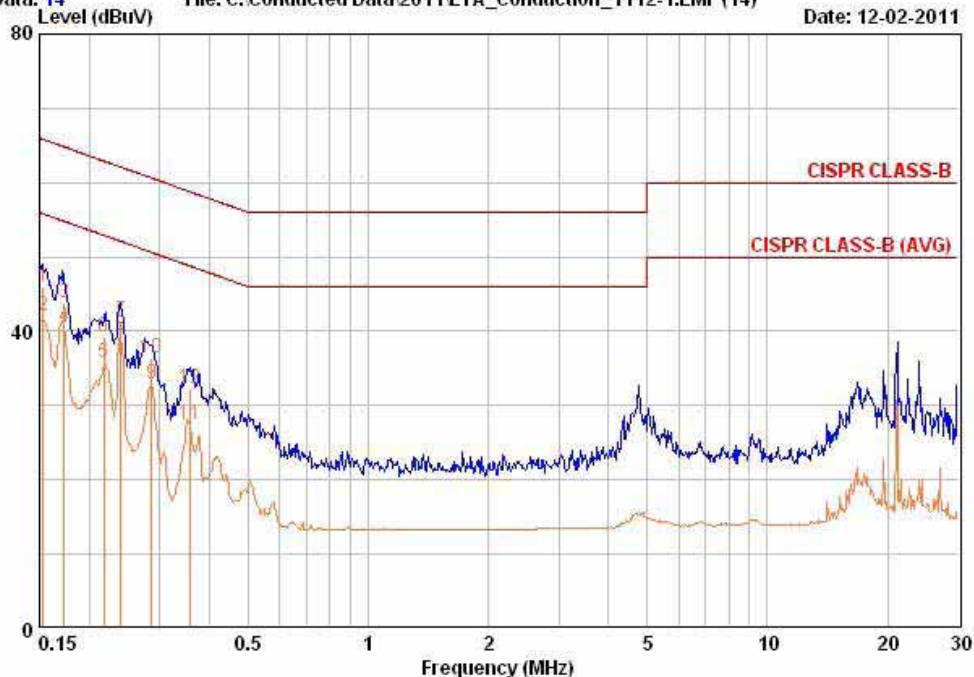
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions at PC mode – Neutral

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

EUT / Model No. : Z2	Phase : NEUTRAL
Test Mode : PC mode	Test Power : 120 / 60
Temp./Humi. : 21 / 33	Test Engineer : PARK.H.W

Data: 14 File: C:\Conducted Data\2011\LTA_Conduction_1112-1.EMI (14) Date: 12-02-2011



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
0.153	36.34	32.44	9.64	45.98	42.08	65.84	55.84	19.85	13.75
0.173	34.24	30.94	9.61	43.85	40.55	64.82	54.82	20.97	14.27
0.217	29.64	26.04	9.61	39.25	35.65	62.93	52.93	23.69	17.29
0.240	31.73	29.73	9.67	41.41	39.41	62.10	52.10	20.69	12.69
0.286	26.73	23.23	9.61	36.34	32.84	60.64	50.64	24.30	17.80
0.357	22.53	17.93	9.63	32.16	27.56	58.80	48.80	26.63	21.23

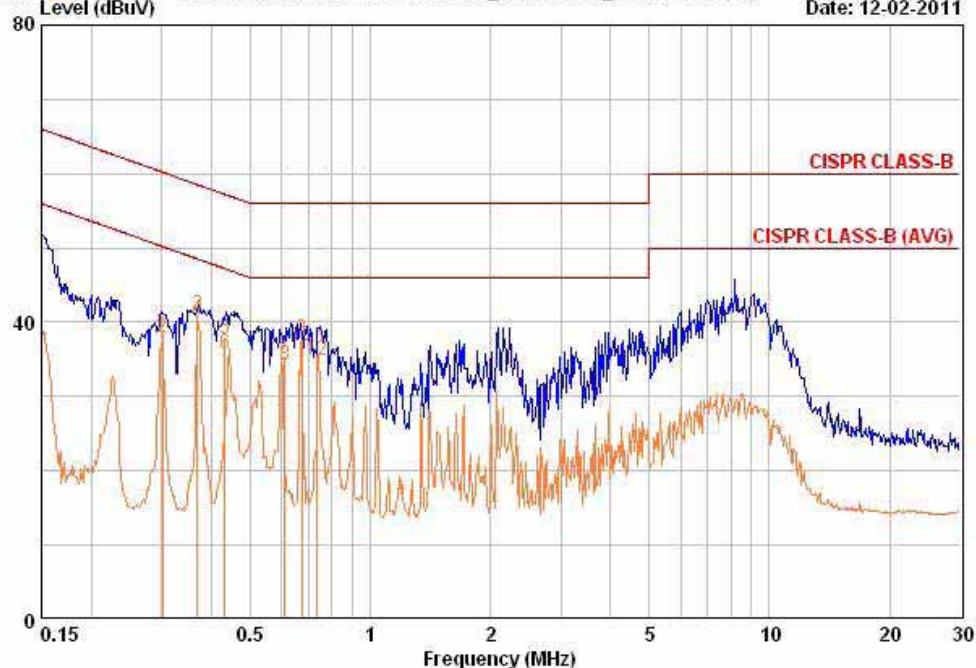
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions at Charging+REC mode – Line

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

EUT / Model No. : Z2	Phase : LINE
Test Mode : Charging+Rec mode	Test Power : 120 / 60
Temp./Humi. : 21 / 33	Test Engineer : PARK.H.W

Data: 42 File: C:\Conducted Data\2011\LTA_Conduction_1112-1.EMI (42) Date: 12-02-2011



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
0.302	29.13	28.33	9.62	38.75	37.95	60.19	50.19	21.44	12.24
0.368	31.43	30.73	9.63	41.06	40.36	58.55	48.55	17.48	8.18
0.432	28.13	26.03	9.63	37.76	35.66	57.21	47.21	19.46	11.56
0.610	25.92	24.62	9.67	35.59	34.29	56.00	46.00	20.41	11.71
0.673	28.02	27.12	9.70	37.72	36.82	56.00	46.00	18.28	9.18
0.732	26.82	25.22	9.72	36.54	34.94	56.00	46.00	19.46	11.06

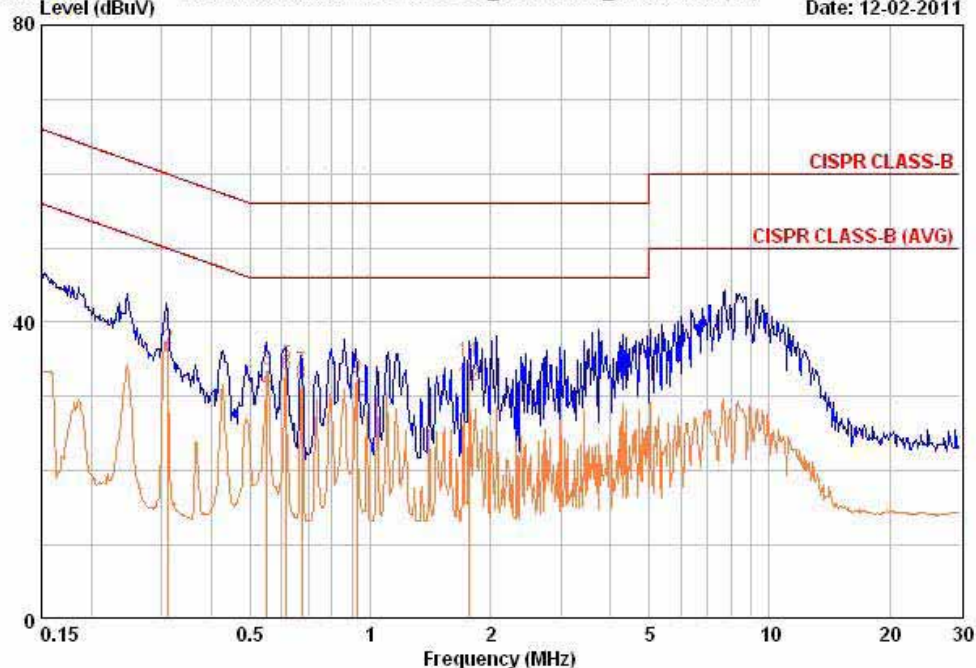
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

AC Conducted Emissions at Charging+REC mode – Neutral

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

EUT / Model No. : Z2	Phase : NEUTRAL
Test Mode : Charging+Rec mode	Test Power : 120 / 60
Temp./Humi. : 21 / 33	Test Engineer : PARK.H.W

Data: 44 File: C:\Conducted Data\2011\LTA_Conduction_1112-1.EMI (44) Date: 12-02-2011



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
0.311	28.53	26.73	9.59	38.12	36.32	59.94	49.94	21.82	13.62
0.551	23.82	21.02	9.68	33.50	30.70	56.00	46.00	22.50	15.30
0.616	24.62	23.22	9.66	34.28	32.88	56.00	46.00	21.72	13.12
0.675	23.72	22.02	9.64	33.36	31.66	56.00	46.00	22.64	14.34
0.925	22.73	19.73	9.68	32.40	29.40	56.00	46.00	23.60	16.60
1.770	24.95	21.85	9.65	34.59	31.49	56.00	46.00	21.41	14.51

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

APPENDIX

TEST EQUIPMENT USED FOR TESTS

	Description	Model No.	Serial No.	Manufacturer	Interval	Last Cal. Date
1	Spectrum Analyzer (~30GHz)	FSV-30	100757	R&S	1 year	2011-01-24
2	Signal Generator (~3.2GHz)	8648C	3623A02597	HP	1 year	2011-03-30
3	Signal Generator (1~20GHz)	83711B	US34490456	HP	1 year	2011-03-30
4	Attenuator (3dB)	8491A	37822	HP	2 year	2010-10-08
5	Attenuator (10dB)	8491A	63196	HP	2 year	2010-10-08
6	Attenuator (30dB)	8498A	3318A10929	HP	2 year	2011-01-05
7	Test Receiver (~30MHz)	ESHS10	828404/009	R&S	1 year	2011-03-30
8	EMI Test Receiver (~1GHz)	ESCI7	100722	R&S	1 year	2011-10-07
9	RF Amplifier (~1.3GHz)	8447D	2439A09058	HP	2 year	2010-10-08
10	RF Amplifier (1~18GHz)	8449B	3008A02126	HP	2 year	2010-03-29
11	Horn Antenna (1~18GHz)	BBHA 9120D	9120D122	SCHWARZBECK	2 year	2010-12-24
12	Horn Antenna (18 ~ 40GHz)	SAS-574	154	Schwarzbeck	2 year	2010-11-25
13	Horn Antenna (18 ~ 40GHz)	SAS-574	155	Schwarzbeck	2 year	2010-11-25
14	TRILOG Antenna	VULB 9160	9160-3172	SCHWARZBECK	2 year	2010-10-07
15	Dipole Antenna	VHA9103	2116	SCHWARZBECK	2 year	2010-11-25
16	Dipole Antenna	VHA9103	2117	SCHWARZBECK	2 year	2010-11-25
17	Dipole Antenna	VHA9105	2261	SCHWARZBECK	2 year	2010-11-25
18	Dipole Antenna	VHA9105	2262	SCHWARZBECK	2 year	2010-11-25
19	Hygro-Thermograph	THB-36	0041557-01	ISUZU	2 year	2010-04-12
20	Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	-	-
21	Power Divider	11636A	6243	HP	2 year	2010-10-08
22	DC Power Supply	6622A	3448A03079	HP	-	-
23	Frequency Counter	5342A	2826A12411	HP	1 year	2011-03-30
24	Power Meter	EPM-441A	GB32481702	HP	1 year	2011-03-30
25	Power Sensor	8481A	US41030291	HP	1 year	2011-10-07
26	Audio Analyzer	8903B	3729A18901	HP	1 year	2011-10-07
27	Modulation Analyzer	8901B	3749A05878	HP	1 year	2011-10-07
28	TEMP & HUMIDITY Chamber	YJ-500	LTAS06041	JinYoung Tech	1 year	2011-10-07
29	Stop Watch	HS-3	601Q09R	CASIO	2 year	2010-03-31
30	LISN	ENV216	100408	R&S	1 year	2011-10-07
31	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	106243	R&S	2 year	2010-05-13
32	Highpass Filter	WHKX1.5/15G-10SS	74	Wainwright Instruments	-	-
33	Highpass Filter	WHKX3.0/18G-10SS	118	Wainwright Instruments	-	-
34	Loop Antenna	FMZB 1516	151602/94	SCHWARZBECK	2 year	2011-04-05