

Dates of Tests: June 18, 2017 ~ June 27, 2017
Test Report S/N: LR500111706P
Test Site : LTA CO., LTD.

CERTIFICATION OF COMPLIANCE

FCC ID.
APPLICANT**2AMMI-MIR-B001**
MIRO Corporation

Equipment Class	:	Digital Transmission System (DTS)
Manufacturing Description	:	Bluetooth wireless devices
Manufacturer	:	MIRO Corporation
Model name	:	MIR-B001
Test Device Serial No.:	:	Identical prototype
Rule Part(s)	:	FCC Part 15.247 Subpart C ; ANSI C-63.4-2014 / ANSI C-63.10-2013
Frequency Range	:	2402 ~ 2480 MHz (BLE)
Max. Output Power	:	Max -11.16 dBm – Conducted
Data of issue	:	June 27, 2017

This test report is issued under the authority of:



Yong-Cheol, Wang / Manager

The test was supervised by:



Hee-Cheon, Kwon / 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

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1. General information

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>
 E-mail : chahn@ltalab.com
 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	2017-09-30	ECT accredited Lab.
RRA	KOREA	KR0049	-	EMC accredited Lab.
FCC	U.S.A	610755	2019-04-21	FCC filing
FCC	U.S.A	649054	2019-04-13	FCC CAB
VCCI	JAPAN	R2133(10 m), C2307	UPDATING	VCCI registration
VCCI	JAPAN	T-2009	2017-12-23	VCCI registration
VCCI	JAPAN	G-563	2018-12-13	VCCI registration
IC	CANADA	5799A-1	2019-11-07	IC filing
KOLAS	KOREA	NO.551	UPDATING	KOLAS accredited Lab.

2. Information about test item

2-1 Client & Manufacturer

Company name : MIRO Corporation
 Address : 26F, M, 32, Songdogwahak-ro, Yeonsu-gu, Incheon, Korea
 Tel / Fax : TEL No : +82-70-4603-5057 / FAX No : +82-70-4032-5030

2-2 Equipment Under Test (EUT)

Model name : MIR-B001
 Serial number : Identical prototype
 Date of receipt : June 12, 2017
 EUT condition : Pre-production, not damaged
 Antenna type : Pattern Antenna: 3.5 dBi
 Frequency Range : 2402 ~ 2480 MHz
 RF output power : **Max -11.16 dBm – Conducted**
 Number of channels : 40 (BLE)
 Type of Modulation : GFSK (BLE)
 Power Source : 6.0 Vdc
 Firmware Version : V 1.0.0

2-3 Tested frequency

	LOW	MID	HIGH
Frequency (MHz) (BLE)	2402	2442	2480

2-4 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
NOTEBOOK	CR720	MS-1736	MSI

3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
15.247(a)	6 dB Bandwidth	> 500 kHz	Conducted	C
15.247(b)	Transmitter Peak Output Power	< 1 Watt		C
15.247(d)	Transmitter Power Spectral Density	< 8 dBm @ 3 kHz		C
15.247(d)	Band Edge	> 20 dBc		C
15.209	Field Strength of Harmonics	Emission	Radiated	C
15.207	AC Conducted Emissions	Emissions	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 MIRO Corporation FCC ID: 2AMMI-MIR-B001 unit complies with the requirement of §15.203.

The antenna type is Pattern Antenna.

The sample was tested according to the following specification:

*FCC Parts 15.247; ANSI C-63.4-2014; ANSI C-63.10-2013

*FCC KDB Publication No. 558074 D01 v03r05

*FCC TCB Workshop 2012, April

3.2 Technical Characteristics Test

3.2.1 6 dB Bandwidth

Procedure:

The bandwidth at 6 dB below the highest in-band spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

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 6 dB 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 6 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

Span = 5 MHz

VBW = 100 kHz (VBW $\geq$ RBW)

Sweep = auto

Trace = max hold

Detector function = peak

Measurement Data : **Complies**

Frequency (MHz)	Test Results	
	Measured Bandwidth (MHz)	Result
BLE		
2402	0.687	Complies
2442	0.723	Complies
2480	0.687	Complies

- See next pages for actual measured spectrum plots.

Minimum Standard:

6 dB Bandwidth > 500 kHz

Measurement Setup

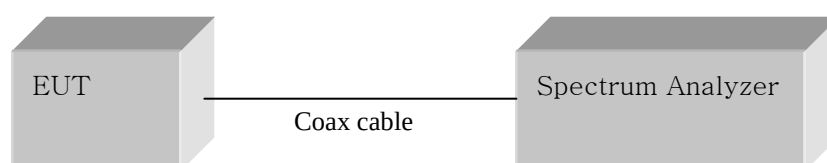
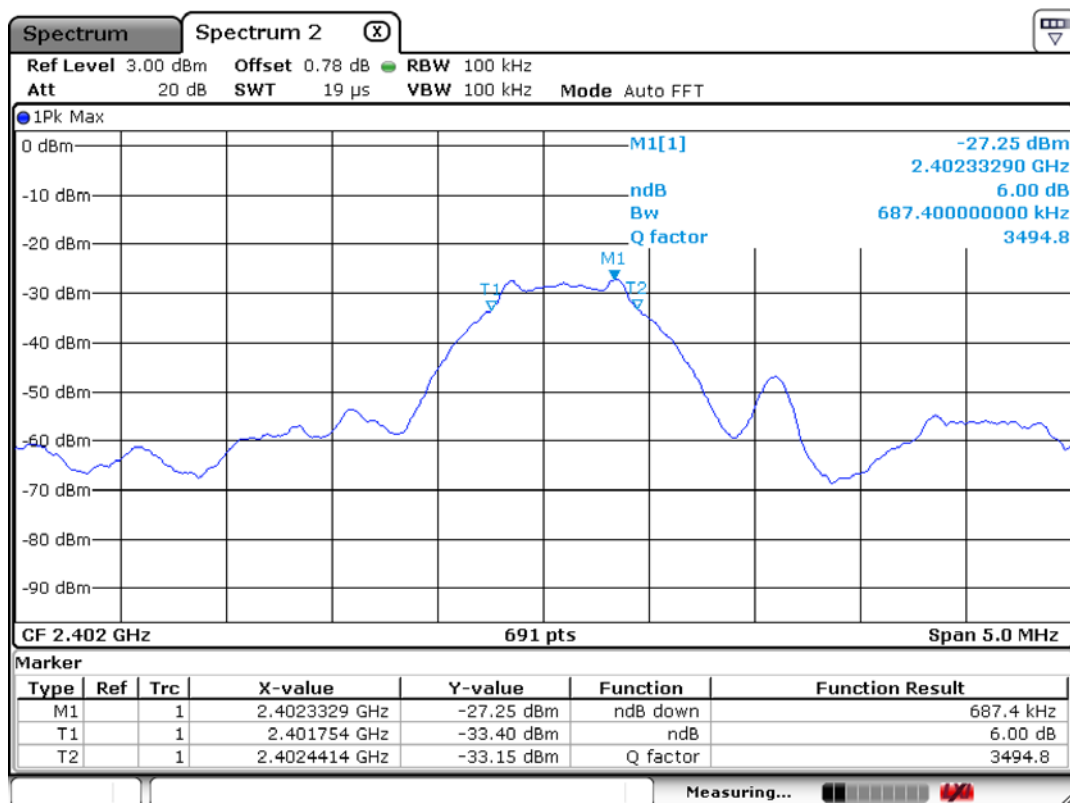
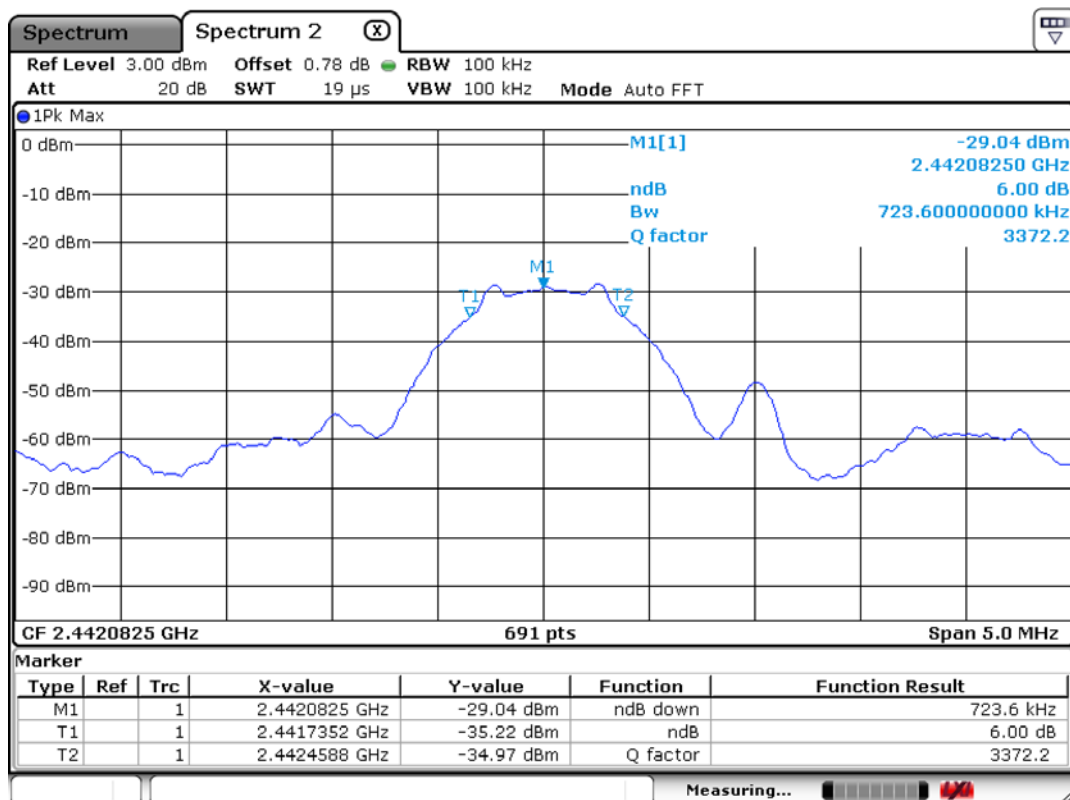


Figure 1: Measurement setup for the carrier frequency separation

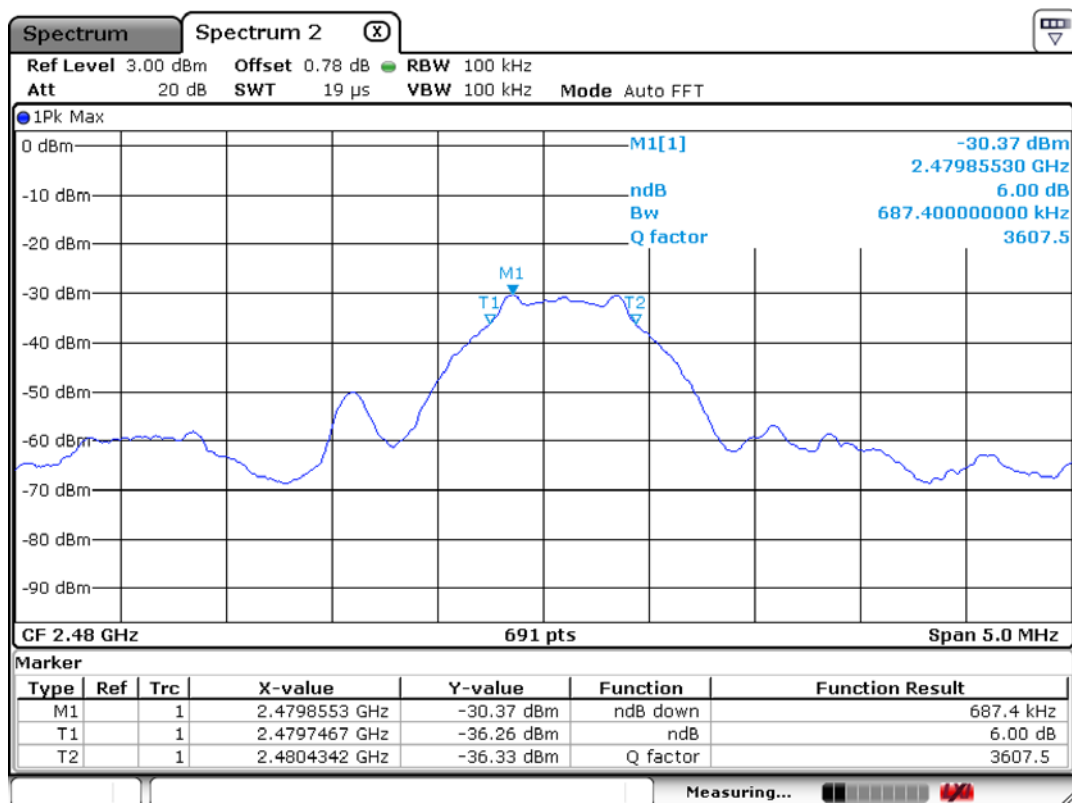
Low Channel (BLE)



Middle Channel (BLE)



High Channel (BLE)



3.2.2 Peak Output Power Measurement

Procedure:

The maximum peak output power was measured with the spectrum analyzer connected to the antenna output of the EUT. The spectrum analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99 % bandwidth. The EUT was operating in transmit mode at the appropriate center frequency.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 1 MHz

Span = auto

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

Sweep = auto

Detector function = peak

Measurement Data : **Complies**

Frequency (MHz)	Test Results		
	dBm	mW	Result
BLE			
2402	-11.16	0.07	Complies
2442	-12.14	0.06	Complies
2480	-13.06	0.04	Complies

- See next pages for actual measured spectrum plots.

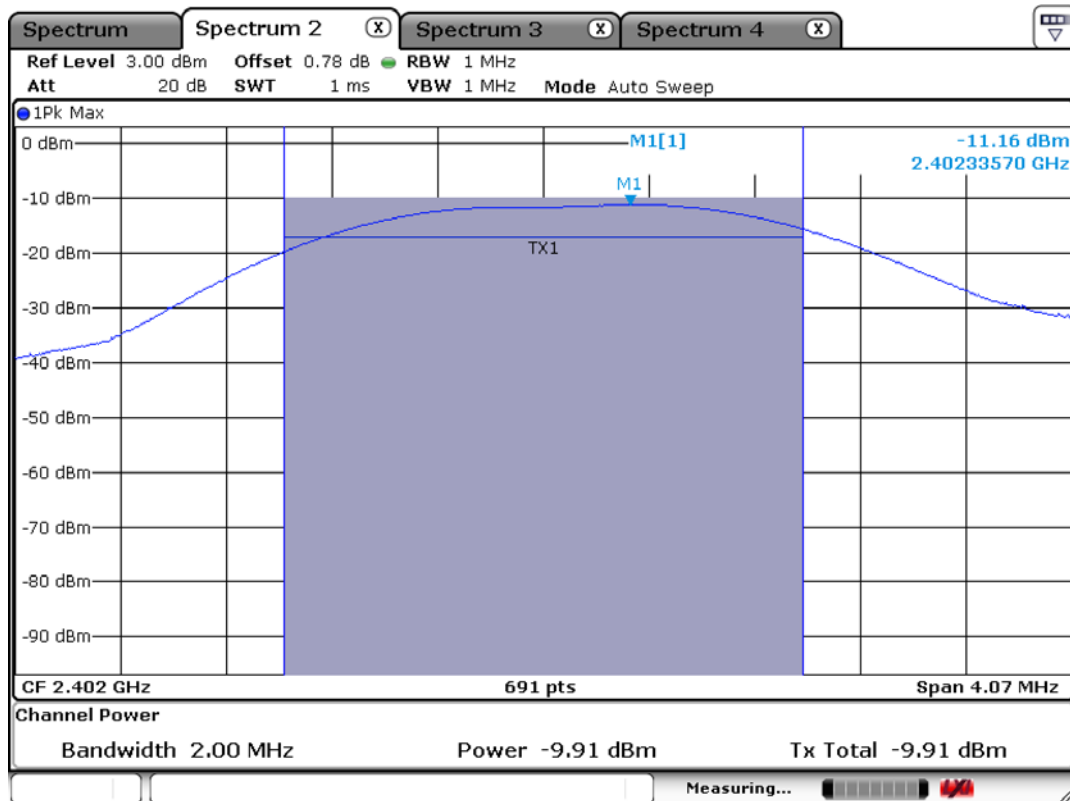
Minimum Standard:

Peak output power	< 1 W
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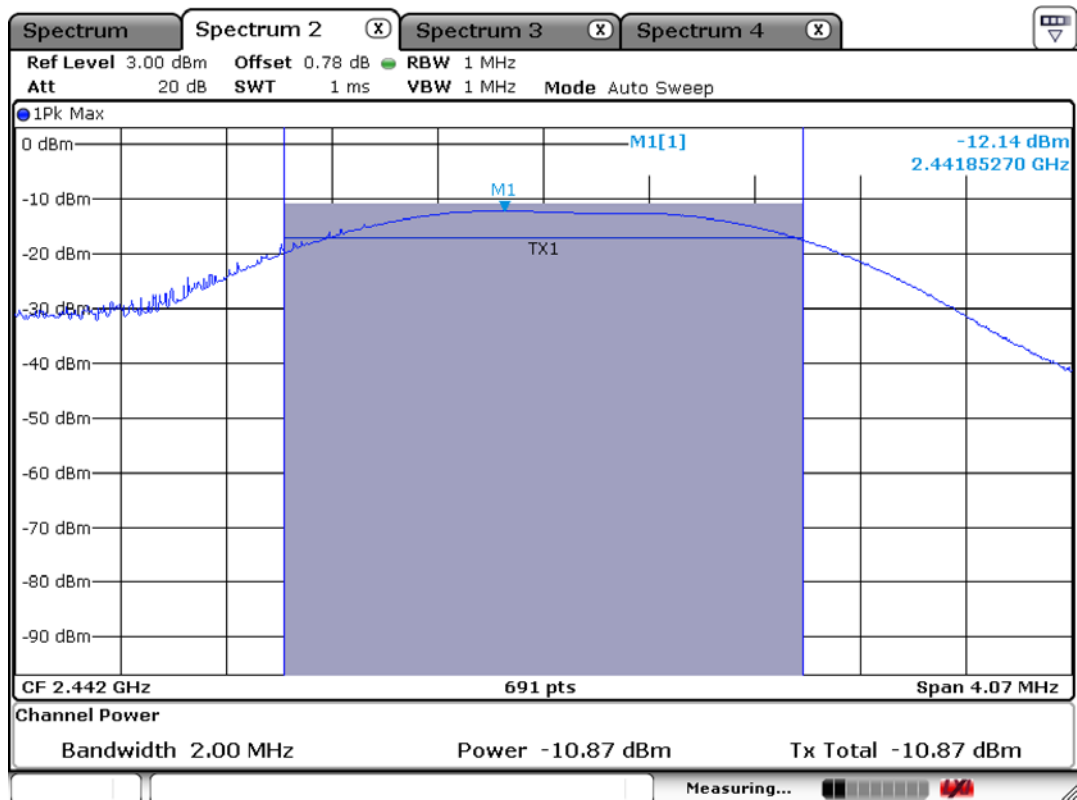
Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

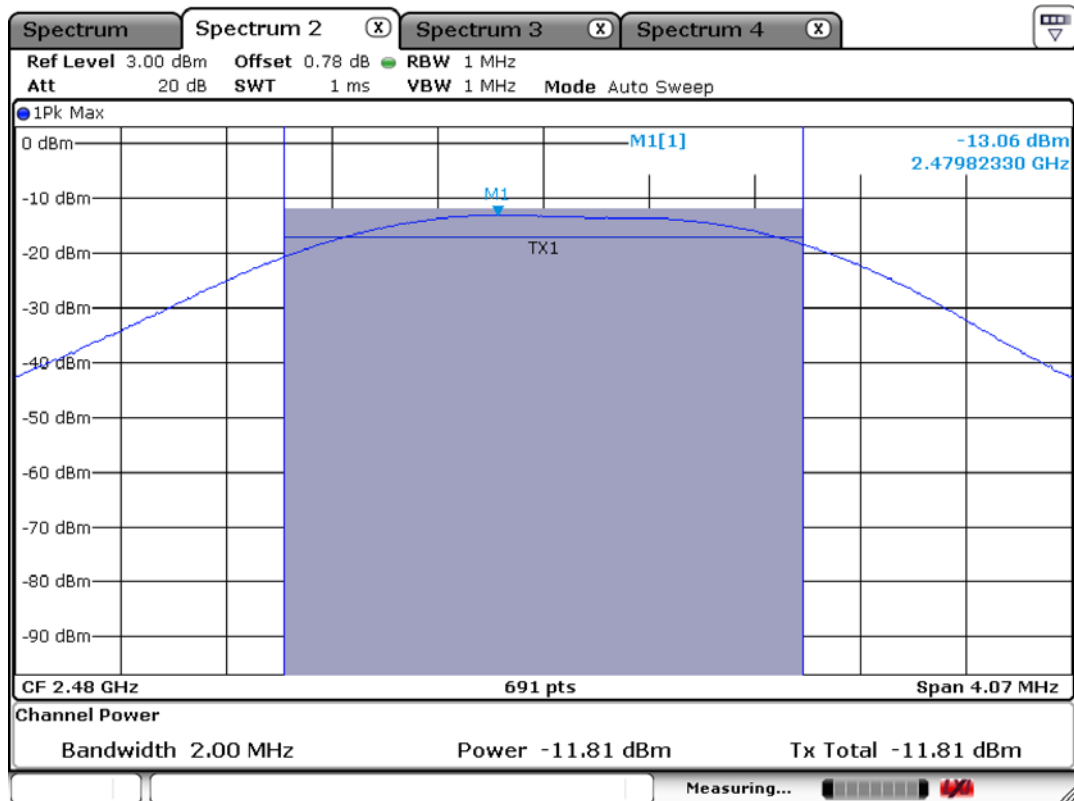
Low Channel (BLE)



Middle Channel (BLE)



High Channel (Bluetooth)



3.2.3 Power Spectral Density

Procedure:

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

The spectrum analyzer is set to:

RBW = 3 kHz

Span = 300 kHz

VBW = 3 kHz

Sweep = auto

Detector function = peak

Trace = max hold

Measurement Data : **Complies**

Frequency (MHz)	Test Results	
	dBm / 3 kHz	Result
BLE		
2402	-23.48	Complies
2442	-25.32	Complies
2480	-25.30	Complies

- See next pages for actual measured spectrum plots.

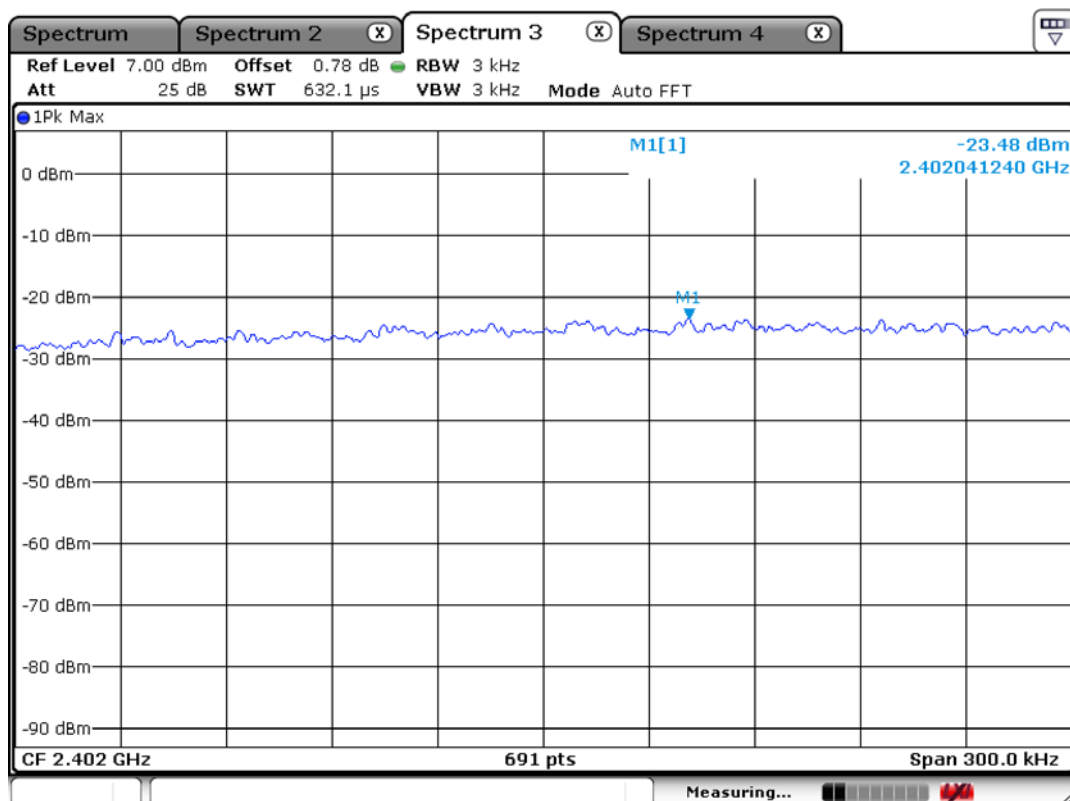
Minimum Standard:

Power Spectral Density	< 8 dBm @ 3 kHz BW
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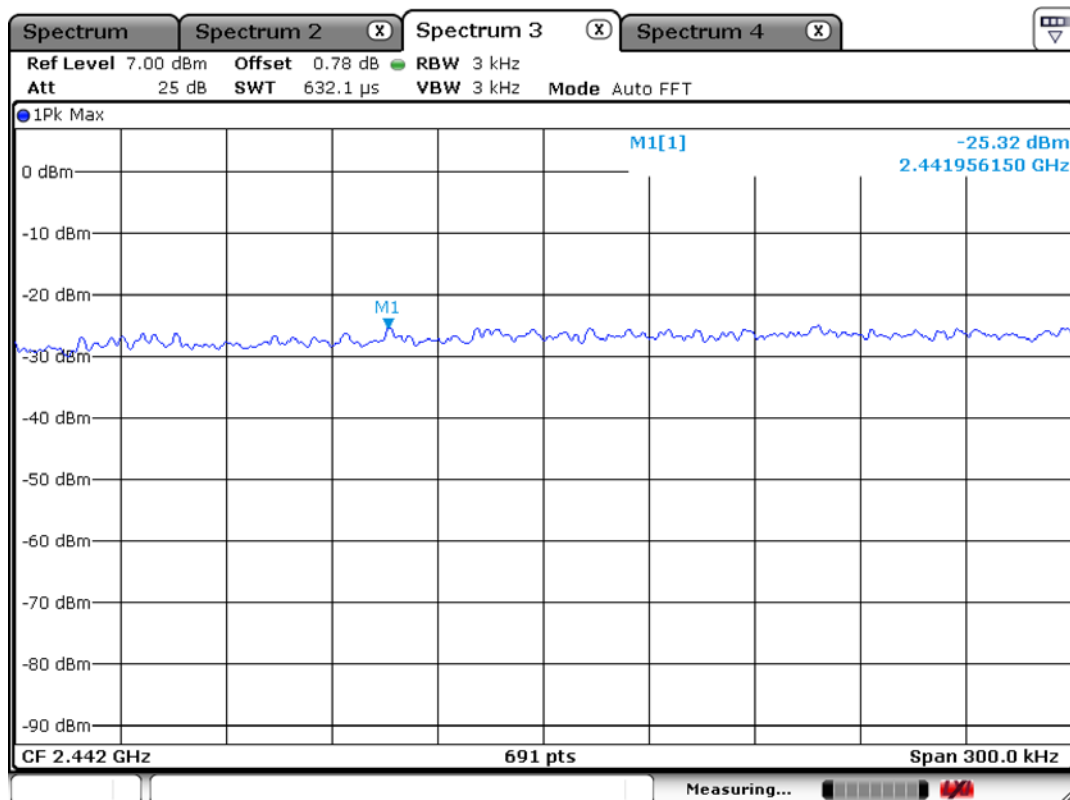
Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

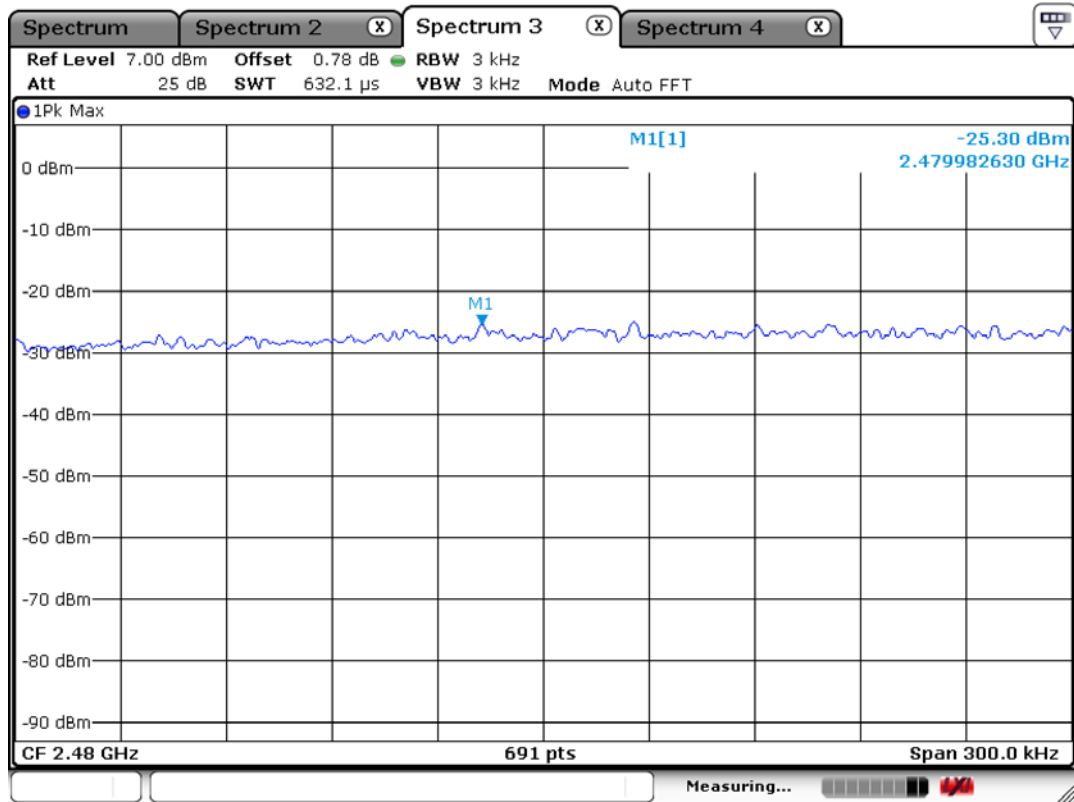
Power Density Measurement Low Channel (BLE)



Middle Channel (BLE)



High Channel (Bluetooth)



3.2.4 Band Edge

Procedure:

The bandwidth at 20 dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

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 = 40 MHz

Detector function = peak

Trace = max hold

Sweep = auto

Radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a)

The spectrum analyzer is set to:

Center frequency = the highest, the lowest channels

PEAK:

RBW = VBW = 1 MHz, Sweep=Auto

Average:

RBW = 1 MHz, VBW=10 Hz, Sweep=Auto

Measurement Distance:

3 m

Polarization:

Horizontal / Vertical

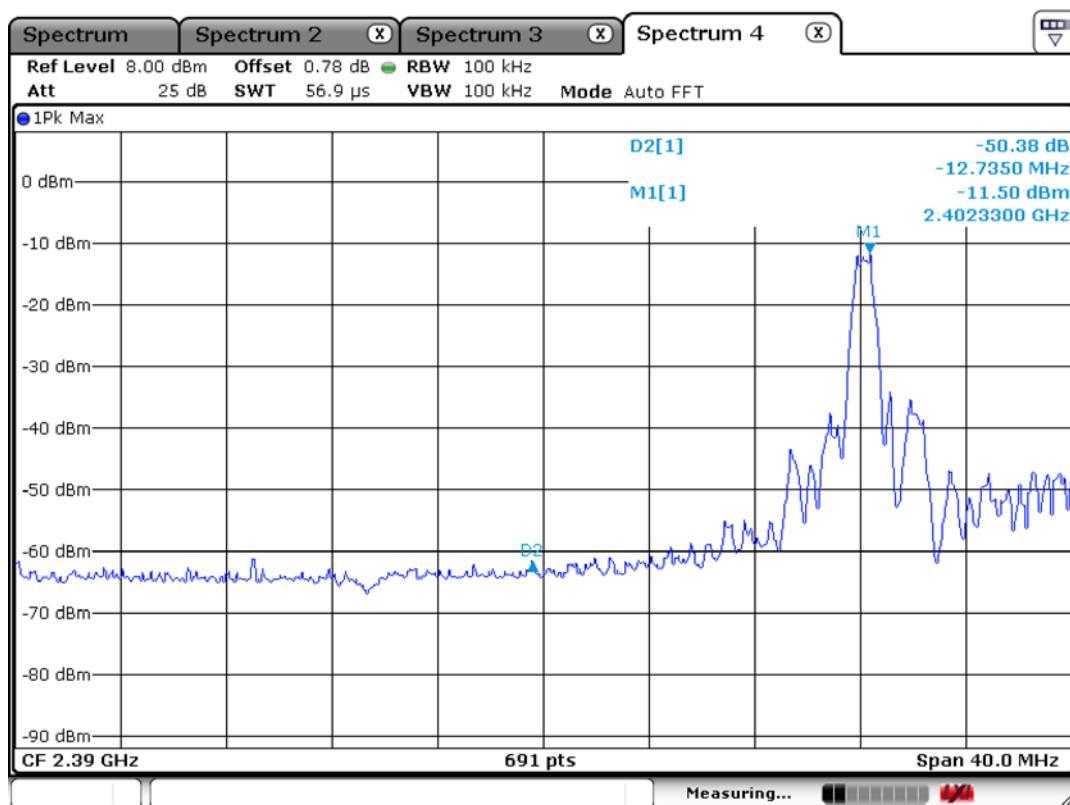
Measurement Data: Complies

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

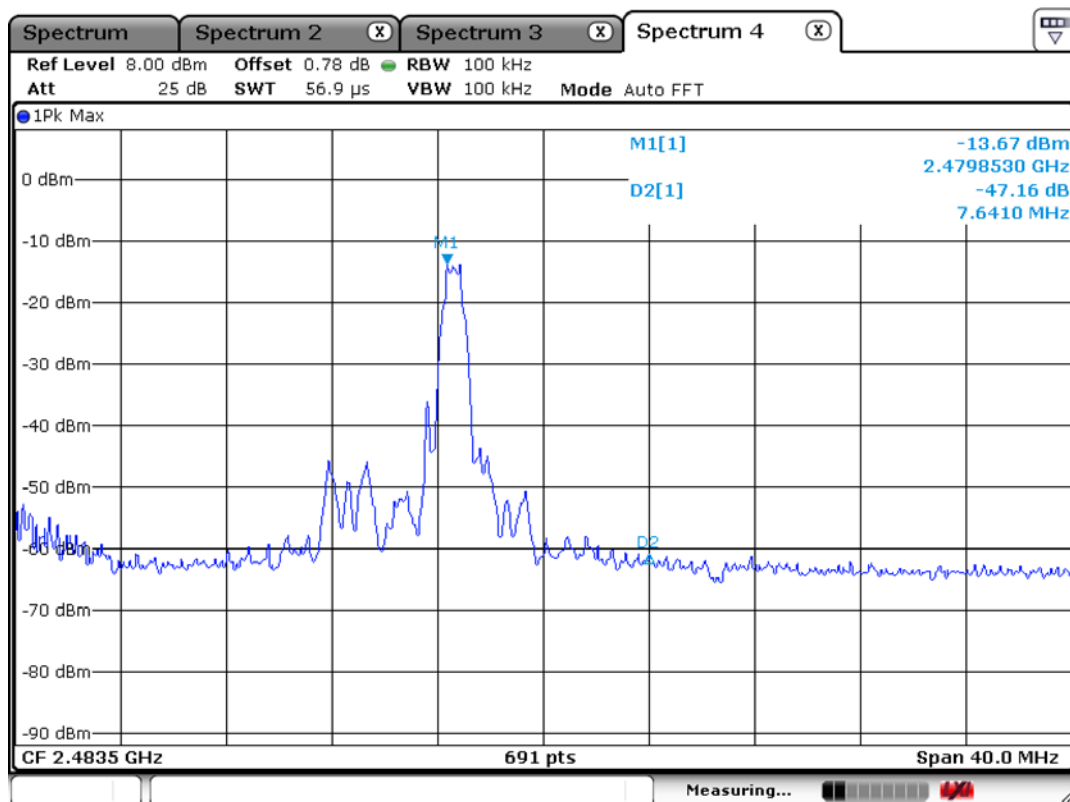
Minimum Standard:	> 20 dBc
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Band edge

Lower edge (BLE)



Upper edge (BLE)



Radiated Band-edges in the restricted band 2310-2390 MHz measurement_ Bluetooth

Frequency [MHz]	Reading [dBuV / m]		Pol.	Correction Factor		Limits [dBuV / m]		Result [dBuV / m]		Margin [dB]	
	AV / Peak			Antenna	Amp. Gain + Cable Loss	AV / Peak	AV / Peak	AV / Peak	AV / Peak		
2390.0	27.1	35.3	H	27.9	22.9	54.0	74.0	32.1	40.3	21.9	33.7

Radiated Band-edges in the restricted band 2483.5-2500 MHz measurement_ Bluetooth

Frequency [MHz]	Reading [dBuV / m]		Pol.	Correction Factor		Limits [dBuV / m]		Result [dBuV / m]		Margin [dB]	
	AV / Peak			Antenna	Amp. Gain + Cable Loss	AV / Peak		AV / Peak		AV / Peak	
2483.5	26.7	34.8	H	27.9	22.9	54.0	74.0	31.7	39.8	22.3	34.2

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

3.2.5 Conducted Spurious Emissions

Procedure:

The test follows KDB558074. The conducted spurious emissions were 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, set the marker on the peak of any spurious emission recorded.

The spectrum analyzer is set to:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions

RBW = 100 kHz

Sweep = auto

VBW = 100 kHz

Detector function = peak

Trace = max hold

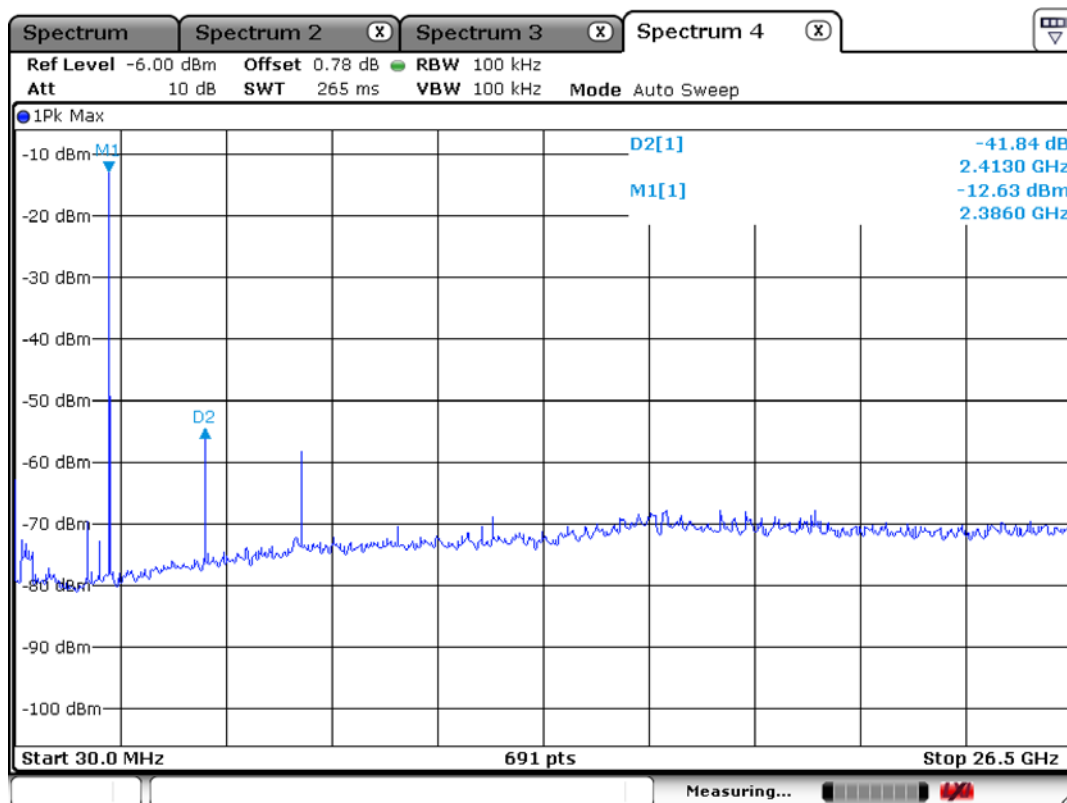
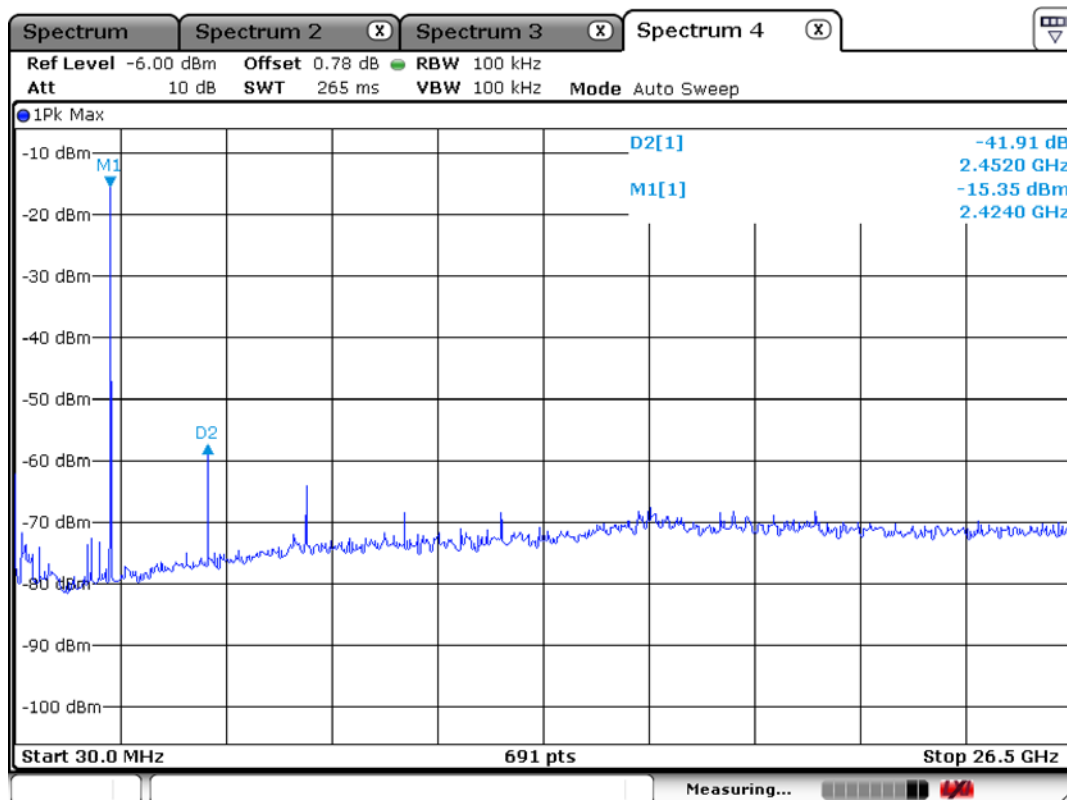
Measurement Data: Complies

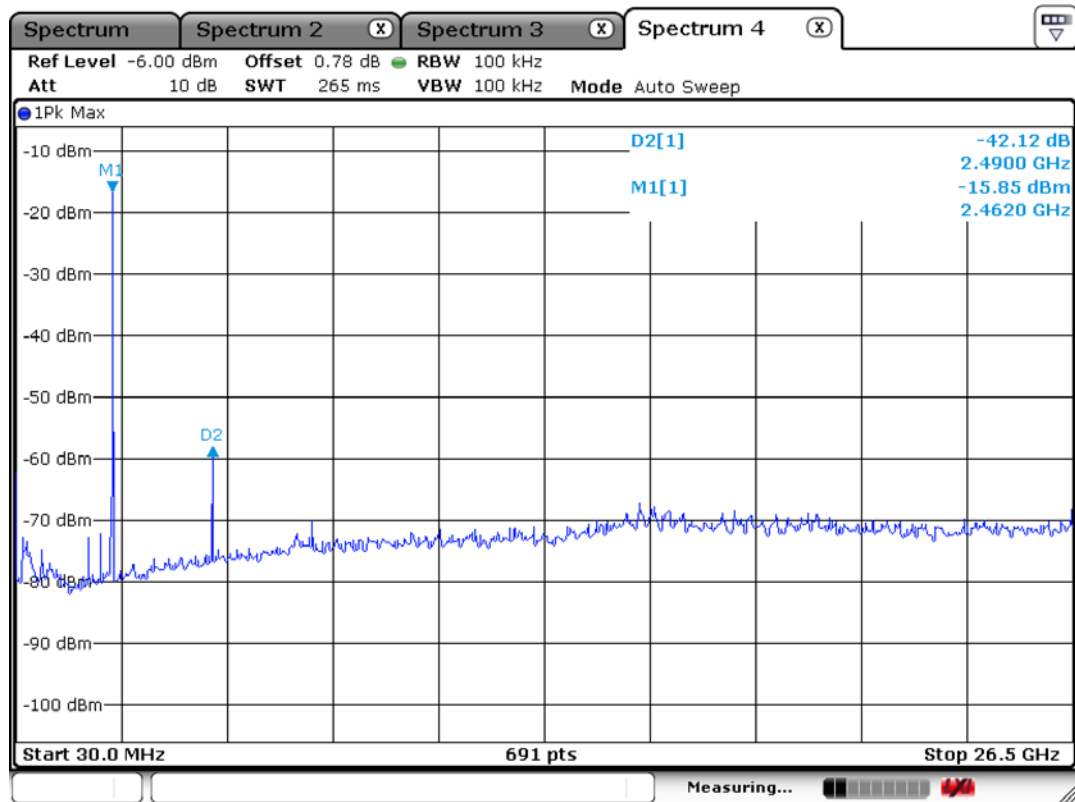
- All conducted emission in any 100 kHz bandwidth outside of the spread spectrum band was at least 20 dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.
- See next pages for actual measured spectrum plots.

Minimum Standard:	> 20 dBc
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Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

Unwanted Emission – Low Channel (Bluetooth)**Frequency Range = 30 MHz ~ 26.5 GHz****Unwanted Emission – Middle Channel (Bluetooth)****Frequency Range = 30 MHz ~ 26.5 GHz**

Unwanted Emission – High Channel (Bluetooth)**Frequency Range = 30 MHz ~ 26.5 GHz**

3.2.6 Radiated Spurious Emissions

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 = 9 kHz ~ 10th harmonic.

RBW = 100 kHz (30 MHz ~ 1 GHz)

= 1 MHz (1 GHz ~ 10th harmonic)

Span = 100 MHz

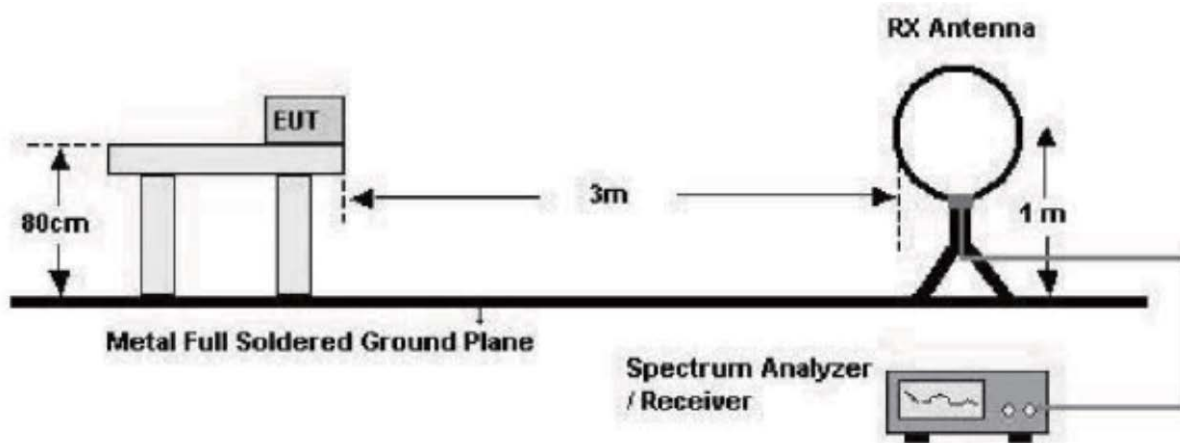
Trace = max hold

VBW $\geq$ RBW

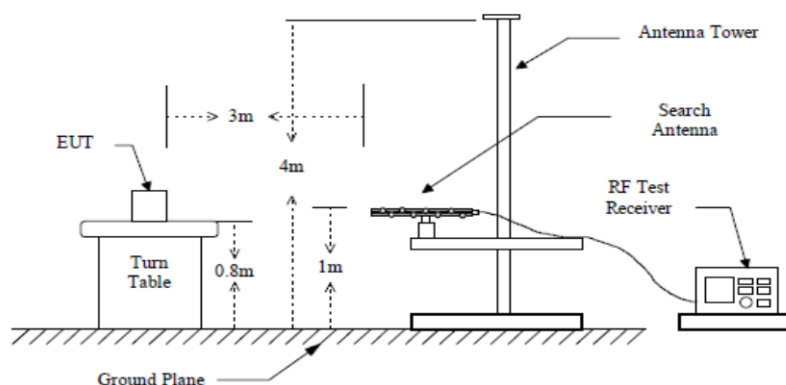
Detector function = peak

Sweep = auto

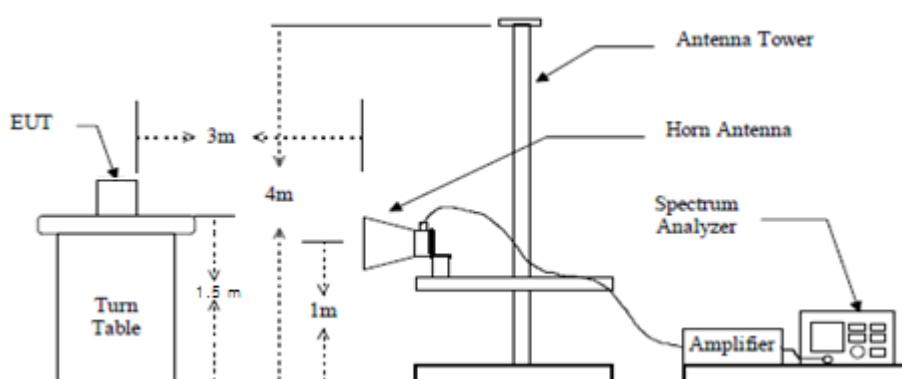
below 30 MHz



below 1 GHz (30 MHz to 1 GHz)



above 1 GHz



Measurement Data: Complies

- See next pages for actual measured data.
- No other emissions were detected at a level greater than 20 dB below limit include from 9 kHz to 30 MHz.

Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3 m
0.009 ~ 0.490	2400/F(kHz) (@ 300 m)
0.490 ~ 1.705	24000/F(kHz) (@ 30 m)
1.705 ~ 30	30(@ 30 m)
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, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

Measurement Data : (Above 1 GHz) – BLE

Frequency [MHz]	Reading [dBuV / m] AV / Peak		Pol.	Correction Factor Antenna+ (Cable-Amp.Gain)		Limits [dBuV / m] AV / Peak		Result [dBuV / m] AV / Peak		Margin [dB] AV / Peak	
10484.23	20.84	31.05	V	26.57		54.0	74.0	48.40	58.40		
10980.47	21.65	34.64	V	21.65		54.0	74.0	49.05	59.05		
10393.71	23.71	34.79	V	23.71		54.0	74.0	49.65	59.65		

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

Measurement Data : (9 kHz – 30 MHz)

Frequency [MHz]	Reading [dBuV / m] AV / Peak		Pol.	Correction Factor Antenna+ (Cable-Amp.Gain)		Limits [dBuV / m] AV / Peak		Result [dBuV / m] AV / Peak		Margin [dB] AV / Peak	
-	-	-	-	-	-	-	-	-	-	-	-
No emissions were detected at a level greater than 20 dB below limit.											
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

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

Radiated Emissions (Below 1 GHz) – 2.4GHz BLE mode

4, Songjuro 236Beon-gil, yanggi-myeon,
Yongin-si, Gyeonggi-do, Korea
Tel : +82-31-3236008,9
Fax : +82-31-3236010
www.ltalab.com

EUT/Model No.: MIR-B001

Temp/Humi: 25 / 49

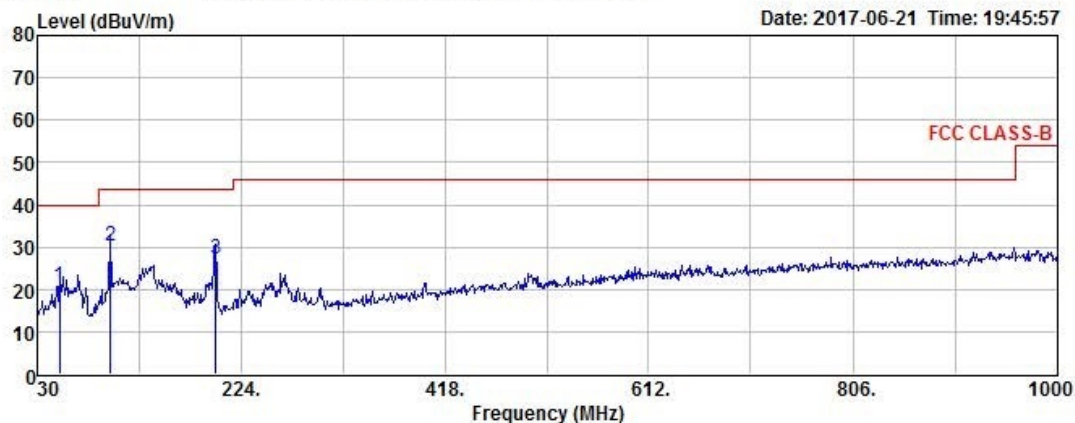
Test Mode : BLE mode

Tested by: BANG Y H

Data: 415

File: C:\Program Files (x86)\e3\1706-1.EM6 (420)

Date: 2017-06-21 Time: 19:45:57



Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	QP dBuV/m	dBuV/m	dB	cm	deg	
51.34	34.50	-13.86	20.64	40.00	19.36	152	233	HORIZONTAL
99.84	46.50	-16.42	30.08	43.50	13.42	200	153	HORIZONTAL
199.75	42.10	-14.75	27.35	43.50	16.15	311	50	HORIZONTAL

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



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www.ltalab.com

EUT/Model No.: MIR-B001

Temp/Humi: 25 / 49

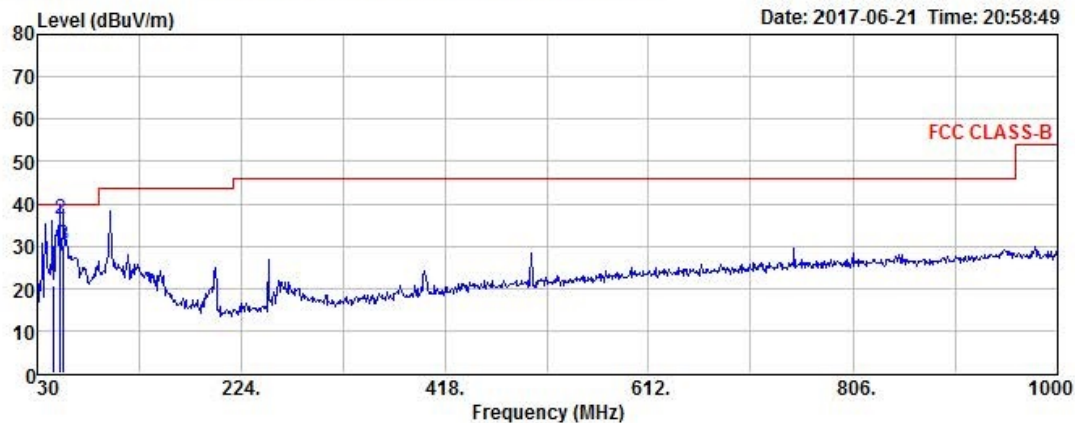
Test Mode : BLE mode

Tested by: BANG Y H

Data: 425

File: C:\Program Files (x86)\e3\1706-1.EM6 (425)

Date: 2017-06-21 Time: 20:58:49



Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	QP dBuV/m	dBuV/m	dB	cm	deg	
44.98	34.39	-13.86	20.53	40.00	19.47	132	164	VERTICAL
51.85	50.11	-13.87	36.24	40.00	3.76	107	150	VERTICAL
55.20	44.09	-13.95	30.14	40.00	9.86	100	144	VERTICAL

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

Radiated Emissions (Above 1 GHz) – 2.4GHz BLE mode (LOW)

EMI Chamber of LTA CO.,LTD.
 4, Songjuro236Beon-gil, Yangji-myeon,
 Yongin-si, Gyeonggi-do, Korea Autho.by NVLAP
 Tel :+82-31-3236008,9 www.ltalab.com
 Fax:+82-31-3236010

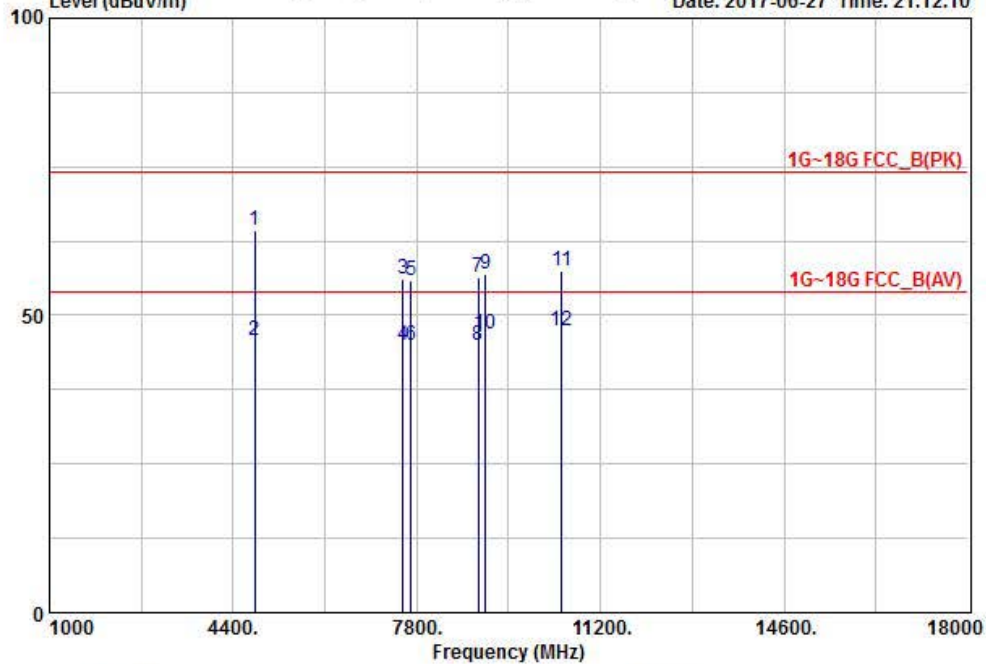
EUT/Model No. : MIR-B001

Test Mode: BLE (low) mode

Tested by : BANG Y H

Temp/Humi: 24 / 52

Data: 228 File: D:\LTA_e3\3_backup\1GHz 이상\2017\CH1_ABOVE 1GHz_1706-1.EMI (228)
 Level (dBuV/m) Date: 2017-06-27 Time: 21:12:10



Freq	Reading	C.F	Result	Limit	Margin	Polarity
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
1 4806.15	48.68	15.54	64.22	74.00	9.78	VERTICAL
2 4806.15	30.24	15.54	45.78	54.00	8.22	VERTICAL
3 7541.10	30.07	26.04	56.11	74.00	17.89	VERTICAL
4 7541.10	18.95	26.04	44.99	54.00	9.01	VERTICAL
5 7695.24	30.47	25.46	55.93	74.00	18.07	VERTICAL
6 7695.24	19.42	25.46	44.88	54.00	9.12	VERTICAL
7 8943.27	30.82	25.62	56.44	74.00	17.56	HORIZONTAL
8 8943.27	19.25	25.62	44.87	54.00	9.13	HORIZONTAL
9 9073.27	31.05	25.86	56.91	74.00	17.09	VERTICAL
10 9073.27	20.95	25.86	46.81	54.00	7.19	VERTICAL
11 10484.23	31.05	26.57	57.62	74.00	16.38	HORIZONTAL
12 10484.23	20.84	26.57	47.41	54.00	6.59	HORIZONTAL

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



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 Fax:+82-31-3236010

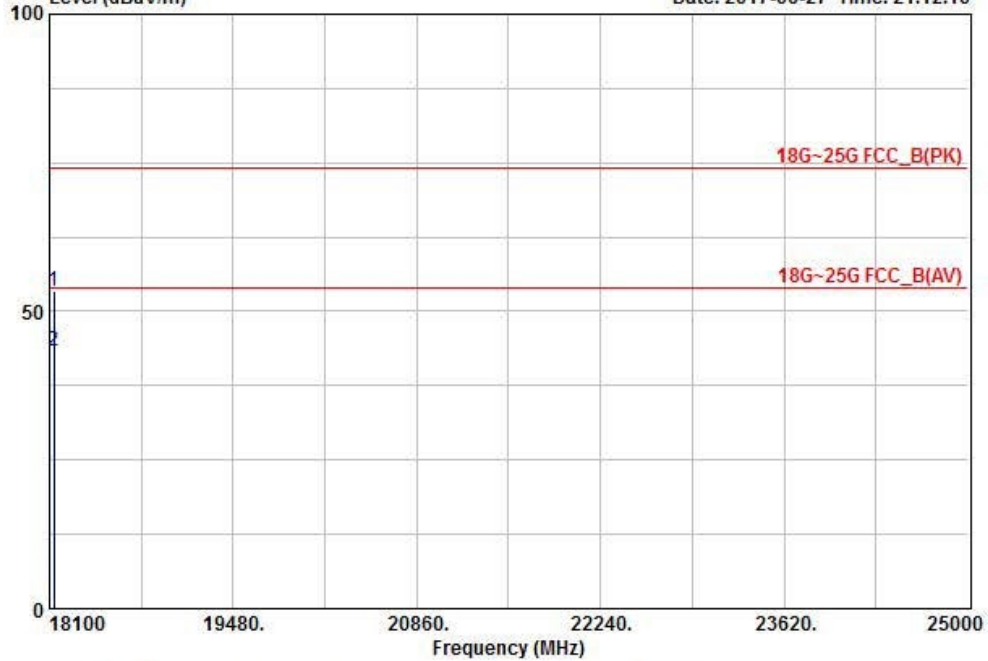
EUT/Model No. : MIR-B001

Test Mode: BLE (low) mode

Tested by : BANG Y H

Temp/Humi: 24 / 52

Data: 228 File: D:\LTA_e3\3_backup\1GHz 이상\2017\CH1_ABOVE 1GHz_1706-1.EMI (228)
 Level (dBuV/m) Date: 2017-06-27 Time: 21:12:10



Freq	Reading	C.F	Result	Limit	Margin	Polarity
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
118133.60	40.20	13.13	53.33	74.00	20.67	HORIZONTAL
218133.60	30.20	13.13	43.33	54.00	10.67	HORIZONTAL

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

Radiated Emissions (Above 1 GHz) – 2.4GHz BLE mode (MID)

EMI Chamber of LTA CO.,LTD.
4, Songjuro236Beon-gil, Yangji-myeon,
Yongin-si, Gyeonggi-do, Korea Autho.by NVLAP
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Fax:+82-31-3236010

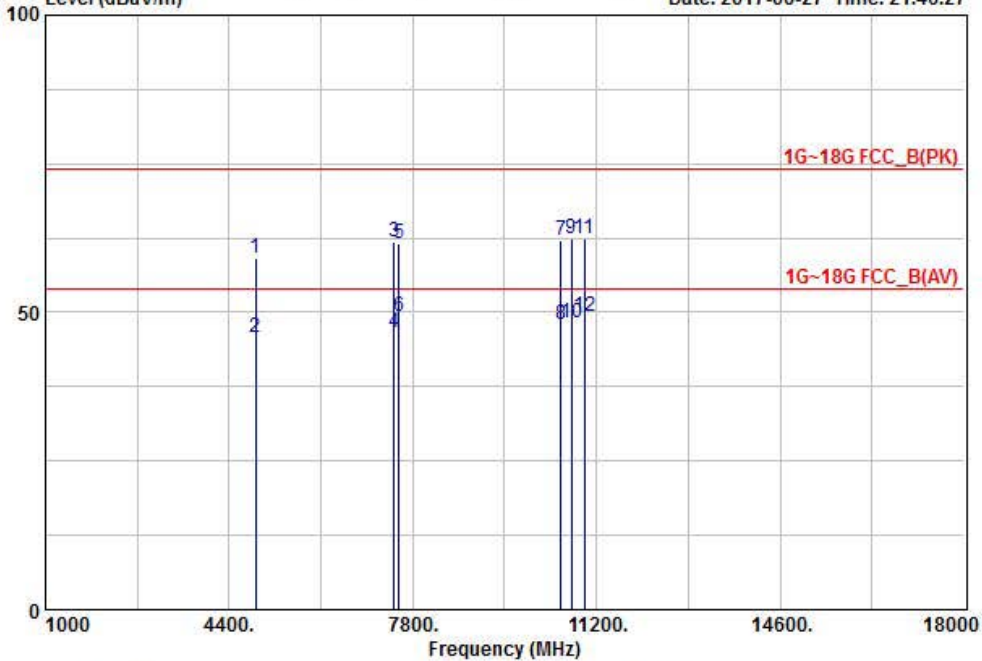
EUT/Model No. : MIR-B001

Test Mode: BLE (mid) mode

Tested by : BANG Y H

Temp/Humi: 24 / 52

Data: 231 File: D:\LTA_e3\3_backup\1GHz 이상\2017\CH1_ABOVE 1GHz_1706-1.EMI (231)
Level (dBuV/m) Date: 2017-06-27 Time: 21:46:27



Freq	Reading	C.F	Result	Limit	Margin	Polarity
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
1 4884.97	43.28	15.86	59.14	74.00	14.86	VERTICAL
2 4884.97	30.05	15.86	45.91	54.00	8.09	VERTICAL
3 7454.43	36.00	25.72	61.72	74.00	12.28	VERTICAL
4 7454.43	20.94	25.72	46.66	54.00	7.34	VERTICAL
5 7541.11	35.48	26.04	61.52	74.00	12.48	HORIZONTAL
6 7541.11	23.24	26.04	49.28	54.00	4.72	HORIZONTAL
7 10541.58	35.36	26.69	62.05	74.00	11.95	VERTICAL
8 10541.58	21.28	26.69	47.97	54.00	6.03	VERTICAL
9 10729.48	35.22	27.15	62.37	74.00	11.63	VERTICAL
10 10729.48	21.08	27.15	48.23	54.00	5.77	VERTICAL
11 10980.47	34.64	27.75	62.39	74.00	11.61	VERTICAL
12 10980.47	21.65	27.75	49.40	54.00	4.60	VERTICAL

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



EMI I Chamber of LTA CO.,LTD.
 4, Songjuro236Beon-gil, Yangji-myeon,
 Yongin-si, Gyeonggi-do, Korea Autho.by NVLAP
 Tel :+82-31-3236008,9 www.ltalab.com
 Fax:+82-31-3236010

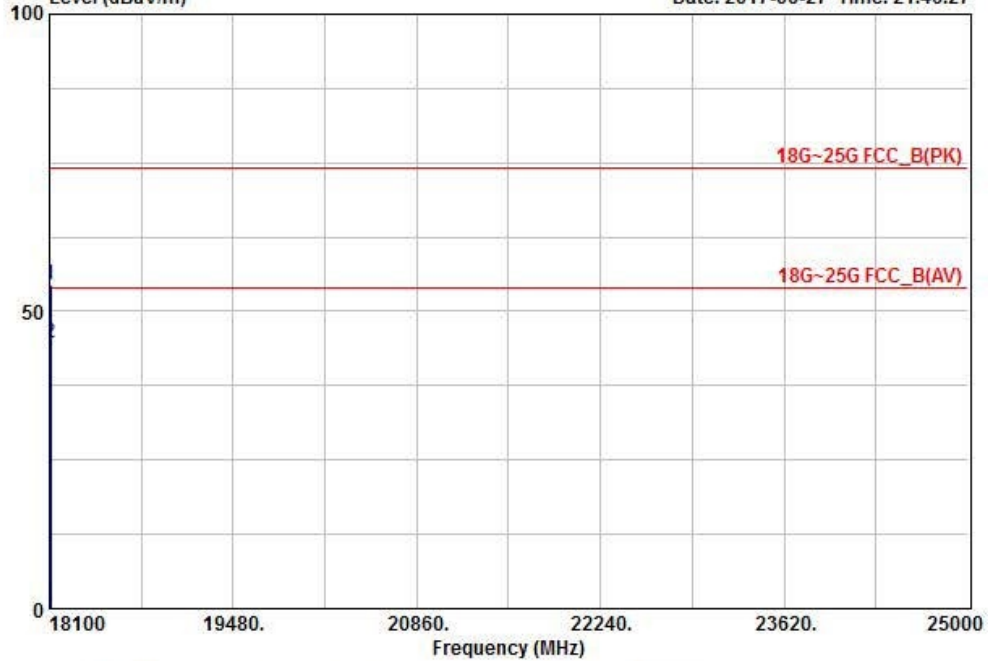
EUT/Model No. : MIR-B001

Test Mode: BLE(mid) mode

Tested by : BANG Y H

Temp/Humi: 24 / 52

Data: 231 File: D:\LTA_e3\3_backup\1GHz 이상\2017\CH1_ABOVE 1GHz_1706-1.EMI (231)
 Level (dBuV/m) Date: 2017-06-27 Time: 21:46:27



Freq	Reading	C.F	Result	Limit	Margin	Polarity
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
118111.40	41.50	13.11	54.61	74.00	19.39	HORIZONTAL
218111.40	31.50	13.11	44.61	54.00	9.39	HORIZONTAL

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

Radiated Emissions (Above 1 GHz) – 2.4GHz BLE mode (HIGH)

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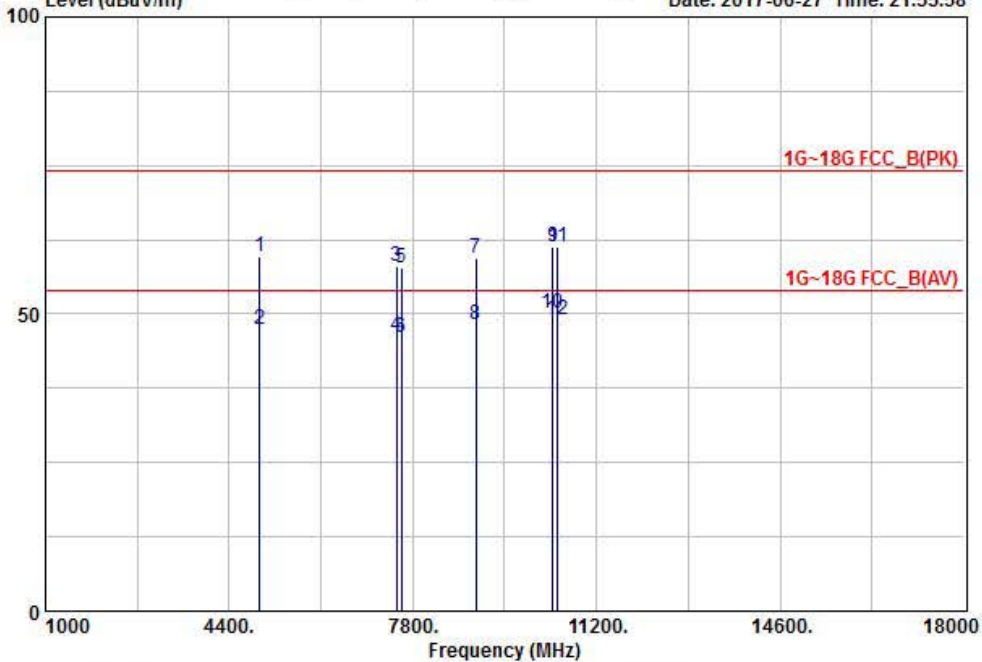
EUT/Model No.: MIR-B001

Test Mode: BLE(high) mode

Tested by : BANG Y H

Temp/Humi: 24 / 52

Data: 232 File: D:\LTA_e3\3_backup\1GHz 이상\2017\CH1_ABOVE 1GHz_1706-1.EMI (232)
 Level (dBuV/m) Date: 2017-06-27 Time: 21:55:58



Freq	Reading	C.F	Result	Limit	Margin	Polarity
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
1 4962.67	43.58	16.17	59.75	74.00	14.25	VERTICAL
2 4962.67	31.27	16.17	47.44	54.00	6.56	VERTICAL
3 7497.65	31.90	26.17	58.07	74.00	15.93	VERTICAL
4 7497.65	20.27	26.17	46.44	54.00	7.56	VERTICAL
5 7584.83	31.76	25.87	57.63	74.00	16.37	HORIZONTAL
6 7584.83	20.09	25.87	45.96	54.00	8.04	HORIZONTAL
7 8969.16	33.69	25.76	59.45	74.00	14.55	VERTICAL
8 8969.16	22.47	25.76	48.23	54.00	5.77	VERTICAL
9 10103.71	34.79	26.44	61.23	74.00	12.77	VERTICAL
10 10103.93	23.71	26.44	50.15	54.00	3.85	VERTICAL
11 110484.23	34.79	26.57	61.36	74.00	12.64	HORIZONTAL
12 1210484.23	22.48	26.57	49.05	54.00	4.95	HORIZONTAL

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



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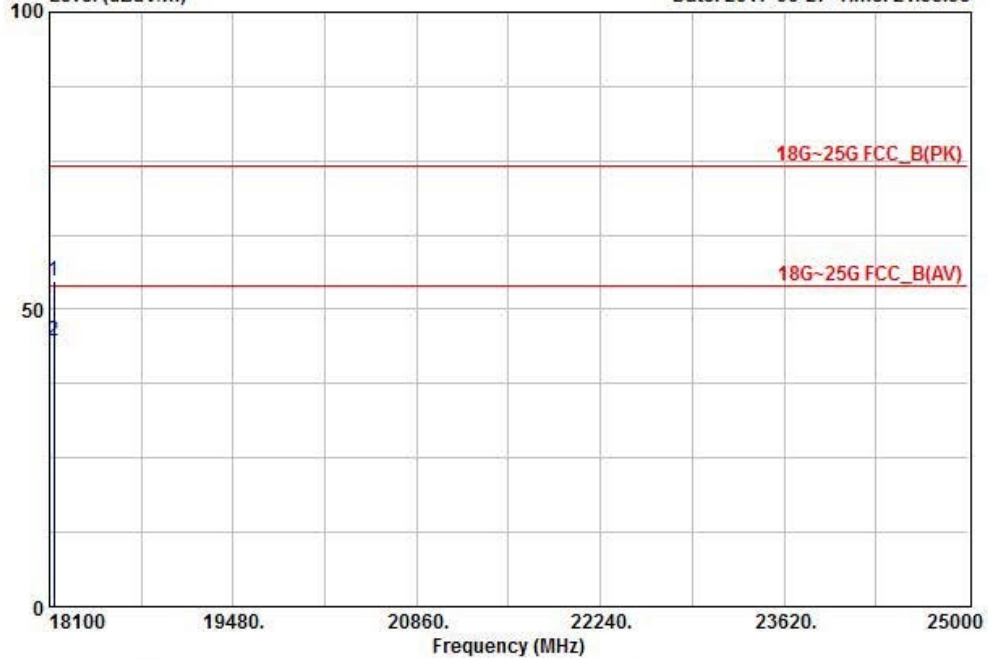
EUT/Model No. : MIR-B001

Test Mode: BLE(high) mode

Tested by : BANG Y H

Temp/Humi: 24 / 52

Data: 232 File: D:\LTA_e3\3_backup\1GHz 이상\2017\CH1_ABOVE 1GHz_1706-1.EMI (232)
 Level (dBuV/m) Date: 2017-06-27 Time: 21:55:58



Freq	Reading	C.F	Result	Limit	Margin	Polarity
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
118136.45	41.60	13.13	54.73	74.00	19.27	HORIZONTAL
218136.45	31.60	13.13	44.73	54.00	9.27	HORIZONTAL

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

3.3.7 AC Conducted Emissions

Procedure:

AC power line conducted emissions from the EUT were measured according to the dictates of ANSI C63.4:2003.

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: **Complie**

- Refer to the next page.
- No other emissions were detected at a level greater than 20dB below limit
- It gave the worse case emissions

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

Frequency Range (MHz)	Conducted Limit (d. 1t892 𐄂 BuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

* Note: The limits will decrease with the frequency logarithmically within 0.15MHz to 0.5MHz



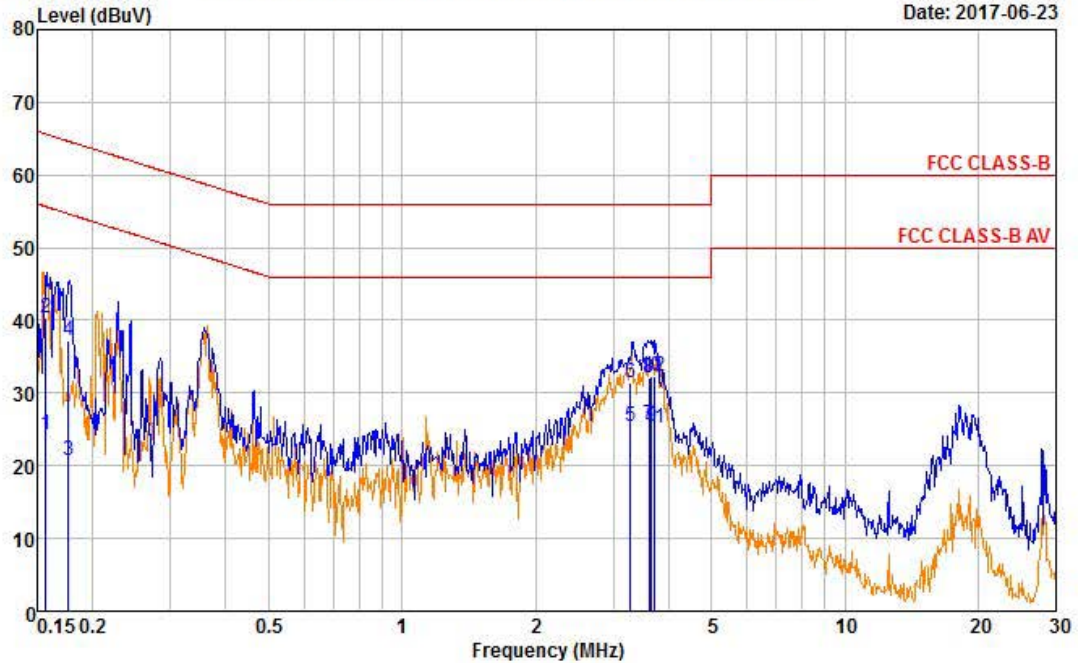
4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel: +82-31-3236008, 9
Fax: +82-31-3236010

EUT / Model No. : MIR-B001	Phase : LINE
Test Mode : BLE(low) mode	Test Power : 120 / 60
Temp. / Humi. : 21 / 42	Test Engineer : BANG Y H

Data: 2156

File: D:\Conducted Data\2017\LTA_Conduction_2017_06.EM6 (2156)

Date: 2017-06-23



Freq	RD	RD	C.F	Result	Result	Limit	Limit	Margin	Margin
MHz	QP	AV		QP	AV	QP	AV	QP	AV
	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.157	30.33	14.21	10.10	40.43	24.31	65.64	55.64	25.21	31.33
0.177	27.05	10.58	10.10	37.15	20.68	64.64	54.64	27.49	33.96
3.281	21.10	15.13	10.24	31.34	25.37	56.00	46.00	24.66	20.63
3.607	21.94	15.34	10.25	32.19	25.59	56.00	46.00	23.81	20.41
3.667	22.15	15.16	10.25	32.40	25.41	56.00	46.00	23.60	20.59
3.715	22.16	14.92	10.25	32.41	25.17	56.00	46.00	23.59	20.83

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



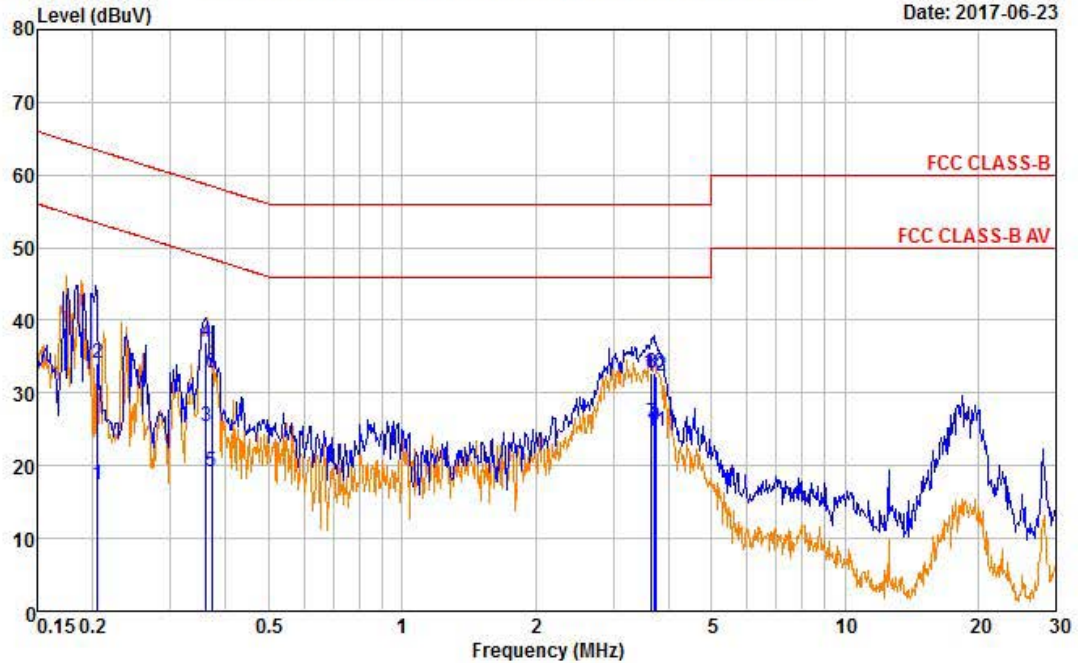
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Tel:+82-31-3236008,9
Fax:+82-31-3236010

EUT / Model No. : MIR-B001	Phase : NEUTRAL
Test Mode : BLE(low) mode	Test Power : 120 / 60
Temp. / Humi. : 21 / 42	Test Engineer : BANG Y H

Data: 2143

File: D:\Conducted Data\2017\LTA_Conduction_2017_06.EM6 (2152)

Date: 2017-06-23



Freq	RD	RD	C.F	Result	Result	Limit	Limit	Margin	Margin
MHz	QP	AV		QP	AV	QP	AV	QP	AV
	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.205	23.95	7.23	10.17	34.12	17.40	63.41	53.41	29.29	36.01
0.361	26.82	15.24	10.19	37.01	25.43	58.72	48.72	21.71	23.29
0.372	22.47	9.08	10.19	32.66	19.27	58.46	48.46	25.80	29.19
3.657	22.53	15.61	10.30	32.83	25.91	56.00	46.00	23.17	20.09
3.723	22.52	15.01	10.30	32.82	25.31	56.00	46.00	23.18	20.69
3.751	21.99	14.46	10.30	32.29	24.76	56.00	46.00	23.71	21.24

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



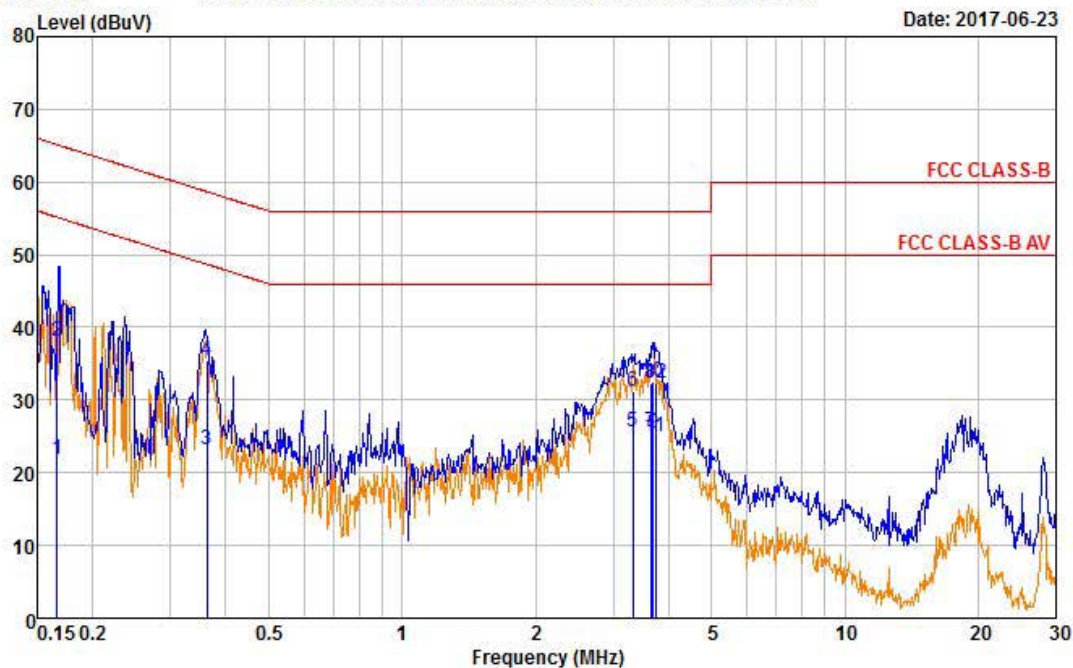
4, Songjuro 236 Beon-gil, Yangji-myeon
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Fax:+82-31-3236010

EUT / Model No. : MIR-B001	Phase : LINE
Test Mode : BLE(mid) mode	Test Power : 120 / 60
Temp. / Humi. : 21 / 42	Test Engineer : BANG Y H

Data: 2160

File: D:\Conducted Data\2017\LTA_Conduction_2017_06.EM6 (2160)

Date: 2017-06-23



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
0.166	28.07	11.84	10.10	38.17	21.94	65.16	55.16	26.99	33.22
0.362	25.40	13.05	10.11	35.51	23.16	58.67	48.67	23.16	25.51
3.319	21.01	15.28	10.24	31.25	25.52	56.00	46.00	24.75	20.48
3.644	22.11	15.34	10.25	32.36	25.59	56.00	46.00	23.64	20.41
3.692	22.32	15.25	10.25	32.57	25.50	56.00	46.00	23.43	20.50
3.730	22.02	14.69	10.25	32.27	24.94	56.00	46.00	23.73	21.06

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



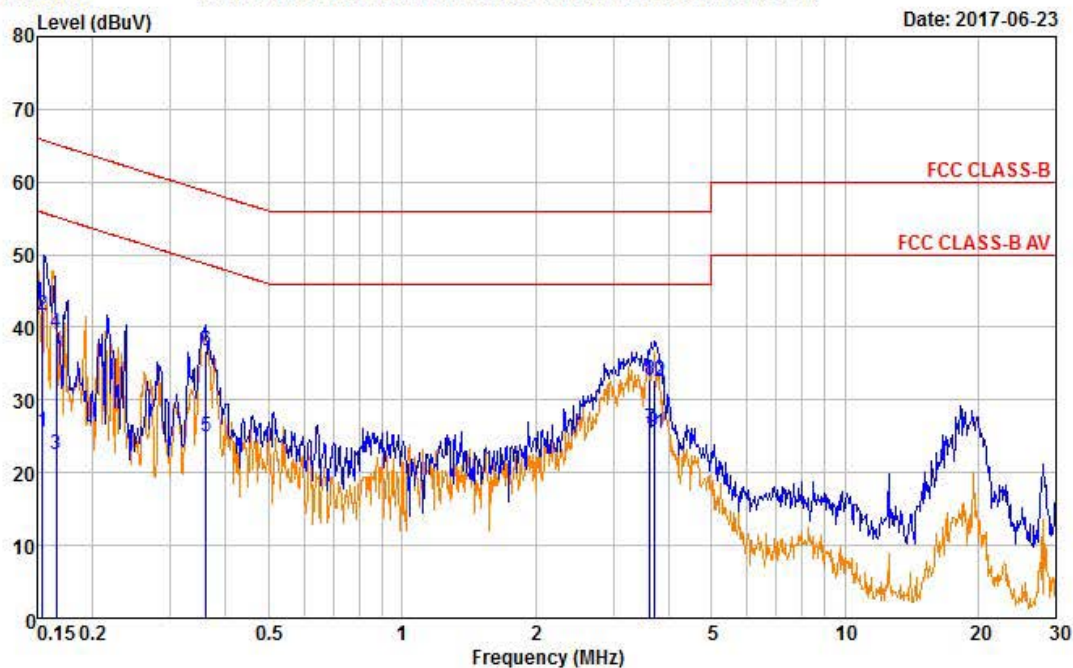
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EUT / Model No. : MIR-B001	Phase : NEUTRAL
Test Mode : BLE(mid) mode	Test Power : 120 / 60
Temp. / Humi. : 21 / 42	Test Engineer : BANG Y H

Data: 2147

File: D:\Conducted Data\2017\LTA_Conduction_2017_06.EM6 (2152)

Date: 2017-06-23



Freq	RD	RD	C.F	Result	Result	Limit	Limit	Margin	Margin
MHz	QP	AV		QP	AV	QP	AV	QP	AV
	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.154	31.48	15.37	10.15	41.63	25.52	65.78	55.78	24.15	30.26
0.166	29.03	12.32	10.16	39.19	22.48	65.17	55.17	25.98	32.69
0.362	26.65	14.69	10.19	36.84	24.88	58.69	48.69	21.85	23.81
3.629	22.42	15.68	10.30	32.72	25.98	56.00	46.00	23.28	20.02
3.702	22.38	15.35	10.30	32.68	25.65	56.00	46.00	23.32	20.35
3.722	22.25	15.01	10.30	32.55	25.31	56.00	46.00	23.45	20.69

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



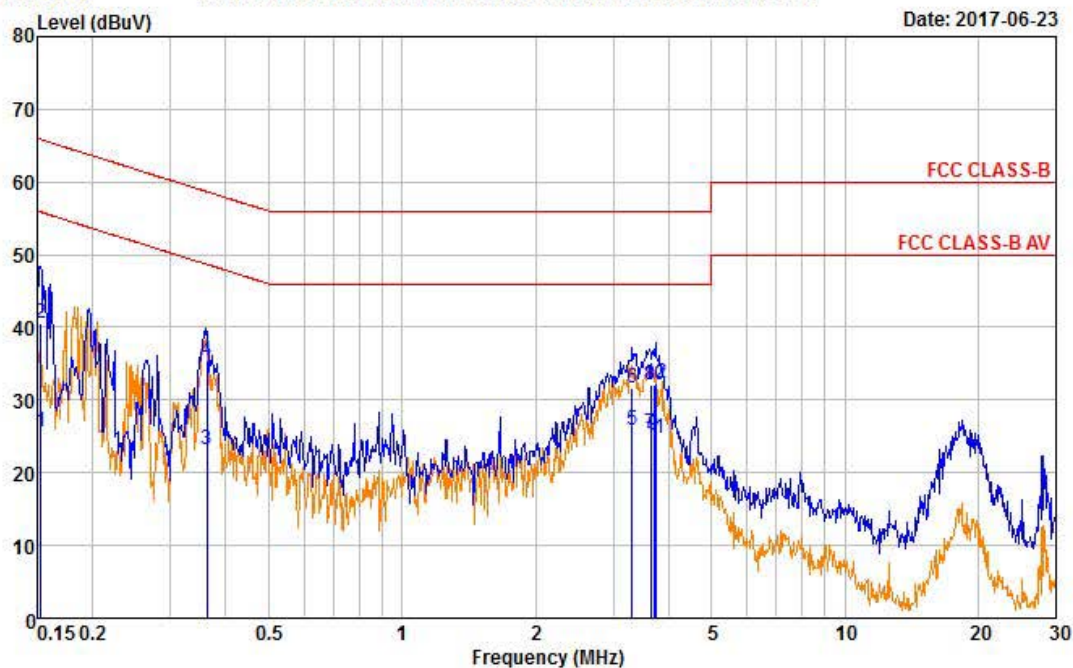
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Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel:+82-31-3236008,9
Fax:+82-31-3236010

EUT / Model No. : MIR-B001	Phase : LINE
Test Mode : BLE(high) mode	Test Power : 120 / 60
Temp. / Humi. : 21 / 42	Test Engineer : BANG Y H

Data: 2164

File: D:\Conducted Data\2017\LTA_Conduction_2017_06.EM6 (2164)

Date: 2017-06-23



Freq	RD	RD	C.F	Result	Result	Limit	Limit	Margin	Margin
MHz	QP	AV		QP	AV	QP	AV	QP	AV
	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.153	30.51	15.46	10.10	40.61	25.56	65.83	55.83	25.22	30.27
0.362	25.35	13.09	10.11	35.46	23.20	58.67	48.67	23.21	25.47
3.302	21.45	15.72	10.24	31.69	25.96	56.00	46.00	24.31	20.04
3.642	21.88	15.05	10.25	32.13	25.30	56.00	46.00	23.87	20.70
3.705	21.94	14.84	10.25	32.19	25.09	56.00	46.00	23.81	20.91
3.735	22.00	14.58	10.25	32.25	24.83	56.00	46.00	23.75	21.17

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



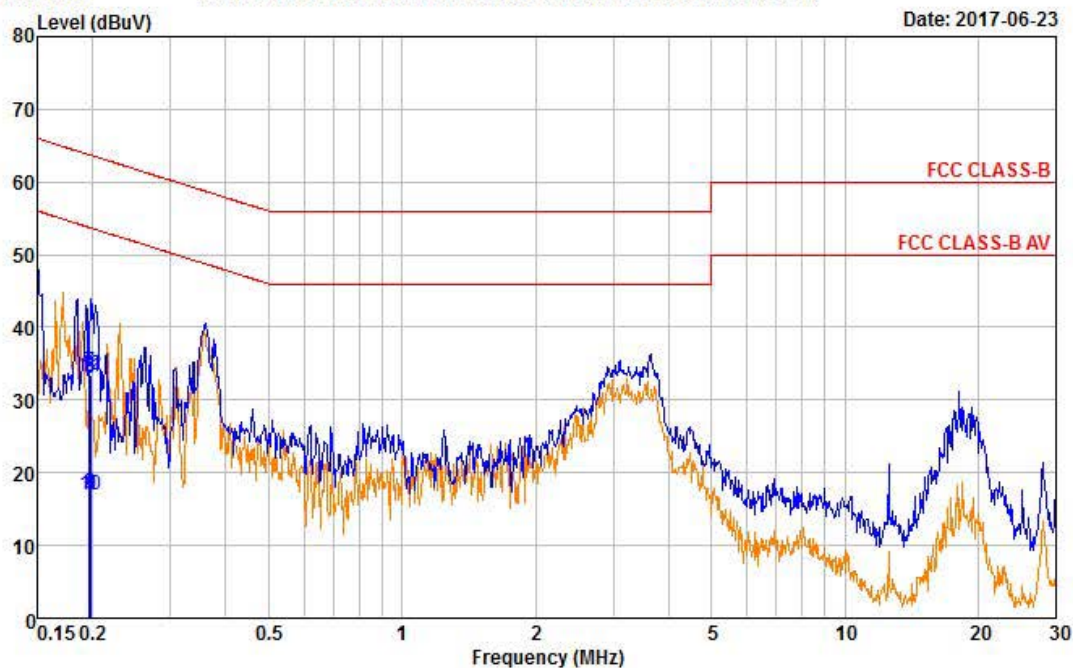
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Fax:+82-31-3236010

EUT / Model No. : MIR-B001	Phase : NEUTRAL
Test Mode : BLE(high) mode	Test Power : 120 / 60
Temp. / Humi. : 21 / 42	Test Engineer : BANG Y H

Data: 2152

File: D:\Conducted Data\2017\LTA_Conduction_2017_06.EM6 (2152)

Date: 2017-06-23



Freq	RD	RD	C.F	Result	Result	Limit	Limit	Margin	Margin
MHz	QP	AV		QP	AV	QP	AV	QP	AV
	dBuV	dBuV		dBuV	dBuV	dBuV	dBuV	dB	dB
0.197	22.82	7.15	10.16	32.98	17.31	63.75	53.75	30.77	36.44
0.199	23.35	6.87	10.16	33.51	17.03	63.67	53.67	30.16	36.64

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

APPENDIX

TEST EQUIPMENT USED FOR TESTS

	Use	Description	Model No.	Serial No.	Manufacturer	Interval	Last Cal. Date
1	■	Signal Analyzer (9 kHz ~ 30 GHz)	FSV30	100757	R&S	1 year	2016-10-11
2	■	Signal Generator (~3.2 GHz)	8648C	3623A02597	HP	1 year	2017-03-20
3		SYNTHESIZED CW GENERATOR	83711B	US34490456	HP	1 year	2017-03-20
4		Attenuator (3 dB)	8491A	37822	HP	1 year	2016-09-12
5		Attenuator (10 dB)	8491A	63196	HP	1 year	2016-09-12
6	■	EMI Test Receiver (~7 GHz)	ESCI7	100722	R&S	1 year	2016-09-12
7	■	RF Amplifier (~1.3 GHz)	8447D OPT 010	2944A07684	HP	1 year	2016-09-12
8	■	RF Amplifier (1~26.5 GHz)	8449B	3008A02126	HP	1 year	2017-03-21
9	■	Horn Antenna (1~18 GHz)	3115	00114105	ETS	2 year	2016-08-04
10		DRG Horn (Small)	3116B	81109	ETS-Lindgren	2 year	2016-05-03
11	■	DRG Horn (Small)	3116B	133350	ETS-Lindgren	2 year	2016-05-03
12	■	TRILOG Antenna	VULB 9160	9160-3237	SCHWARZBECK	2 year	2015-07-13
13		Temp.Humidity Data Logger	SK-L200TH II A	00801	SATO	1 year	2017-03-21
14		Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	-	-
15		Power Divider	11636A	06243	HP	1 year	2016-09-12
16	■	DC Power Supply	6674A	3637A01657	Agilent	-	-
17		Frequency Counter	5342A	2826A12411	HP	1 year	2017-03-21
18	■	Power Meter	EPM-441A	GB32481702	HP	1 year	2017-03-20
19	■	Power Sensor	8481A	3318A94972	HP	1 year	2016-12-30
20		Audio Analyzer	8903B	3729A18901	HP	1 year	2016-09-12
21		Modulation Analyzer	8901B	3749A05878	HP	1 year	2016-09-12
22		TEMP & HUMIDITY Chamber	YJ-500	LTAS06041	JinYoung Tech	1 year	2016-09-12
23		Stop Watch	HS-3	812Q08R	CASIO	2 year	2017-03-21
24		LISN	KNW-407	8-1430-1	Kyoritsu	1 year	2016-09-12
25	■	Two-Lime V-Network	ESH3-Z5	893045/017	R&S	1 year	2017-03-20
26		UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	106243	R&S	1 year	2017-03-20
27		Highpass Filter	WHKX1.5/15G-10SS	74	Wainwright Instruments	1 year	2017-03-20
28		Highpass Filter	WHKX3.0/18G-10SS	118	Wainwright Instruments	1 year	2017-03-20
29	■	Active Loop Antenna	FMZB1519	1519-031	SCHWARZBECK	2 year	2016-01-12
30		OSP120 BASE UNIT	OSP120	101230	R&S	1 year	2017-03-21
31		Signal Generator(100 kHz ~ 40 GHz)	SMB100A03	177621	R&S	1 year	2017-03-23
32		Signal Analyzer (10 Hz ~ 40 GHz)	FSV40	101367	R&S	1 year	2017-03-21