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Dates of Tests: February 26 ~ March 19, 2018
Test Report S/N: LR500111803D
Test Site : LTA CO., LTD.

CERTIFICATION OF COMPLIANCE

FCC ID. **2APDI-BCM-L102-A**
IC ID. **8738A-BCML120A**
APPLICANT **BNCOM CO.LTD**

Equipment Class	**:**	**Digital Transmission System (DTS)**
Manufacturing Description	**:**	**Bluetooth Module**
Manufacturer	**:**	**BNCOM CO.LTD**
Model name	**:**	**BCM-L102-A**
Test Device Serial No.:	**:**	**Identical prototype**
FCC Rule Part(s)	**:**	**FCC Part 15.247 Subpart C ; ANSI C-63.4-2014**
IC Rule Parts(s)		**RSS-247 and Issue No.2 DATE : 2017**
Frequency Range	**:**	**2402 ~ 2480 MHz**
Max. Output Power	**:**	**Max -1.32 dBm – Conducted**
Data of issue	**:**	**March 19, 2018**

This test report is issued under the authority of:

Yong-Cheol, Wang / Manager

The test was supervised by:

Jae-hum Yeon, 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.

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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	2020-03-15	ECT accredited Lab.
RRA	KOREA	KR0049	-	EMC accredited Lab.
FCC	U.S.A	649054	2019-04-13	FCC CAB
VCCI	JAPAN	C-4948 T-2416 R-4483(10m) G-847	2020-09-10 2020-09-10 2020-10-15 2018-12-13	VCCI registration
IC	CANADA	5799A-1	2019-11-07	IC filing
KOLAS	KOREA	NO.551	2021-08-20	KOLAS accredited Lab.

2. Information about test item

2-1 Client & Manufacturer

Company name	:	BNCOM CO.LTD
Address	:	102-903, SK Ventium, Gosan-ro, Gunpo-si, Gyeonggi-do, Korea
Tel / Fax	:	TEL No : +82-31-427-8904 / FAX No : +82-31-427-8907

2-2 Equipment Under Test (EUT)

Trade name	:	BNCOM CO.LTD
Model name	:	BCM-L102-A
Serial number	:	Identical prototype
Date of receipt	:	February 26, 2017
EUT condition	:	Pre-production, not damaged
Antenna type	:	Chip Antenna (Max Gain : 3.14 dBi)
Frequency Range	:	2402 ~ 2480 MHz
RF output power	:	Max -1.32 dBm – Conducted
Number of channels	:	40
Type of Modulation	:	GFSK
Power Source	:	3.0 Vdc

2-3 Tested frequency

	LOW	MID	HIGH
Frequency (MHz)	2402	2440	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.

Note 1: Antenna Requirement
The BNCOM CO.LTD FCC ID: 2APDI-BCM-L102-A unit complies with the requirement of §15.203.
The antenna type is Chip Antenna.

Note 2: The sample was tested according to the following specification:
*FCC Parts 15.247; ANSI C-63.4-2014
*RSS-247 and Issue NO.2 Date:2017

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 = 10 MHz

VBW = 100 kHz (VBW ≥ RBW)

Sweep = auto

Trace = max hold

Detector function = peak

Measurement Data : Complies

Frequency (MHz)	Test Results	
	Measured Bandwidth (MHz)	Result
2402	**0.709**	Complies
2440	**0.709**	Complies
2480	**0.709**	Complies

- See next pages for actual measured spectrum plots.

Minimum Standard:

6 dB Bandwidth > 500 kHz

Measurement Setup

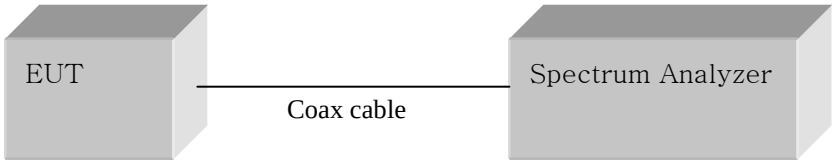
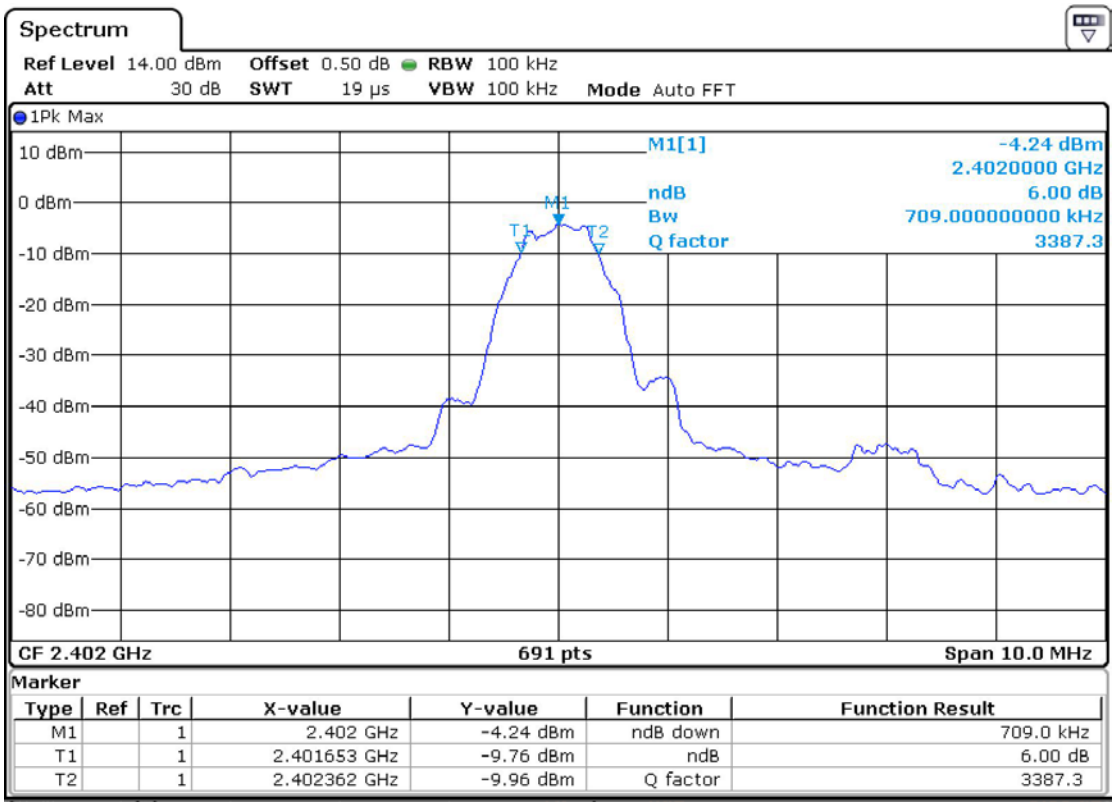


Figure 1: Measurement setup for the carrier frequency separation

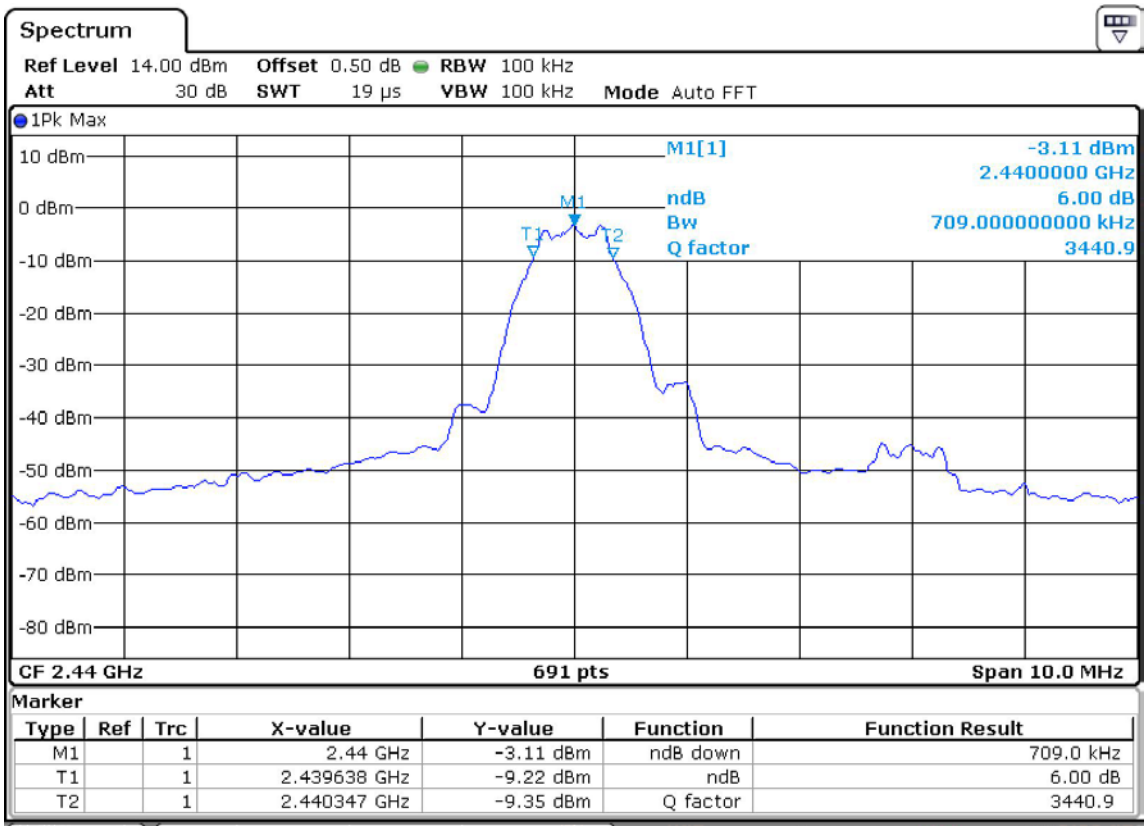
Low Channel



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.402 GHz	-4.24 dBm	ndB down	709.0 kHz
T1		1	2.401653 GHz	-9.76 dBm	ndB	6.00 dB
T2		1	2.402362 GHz	-9.96 dBm	Q factor	3387.3

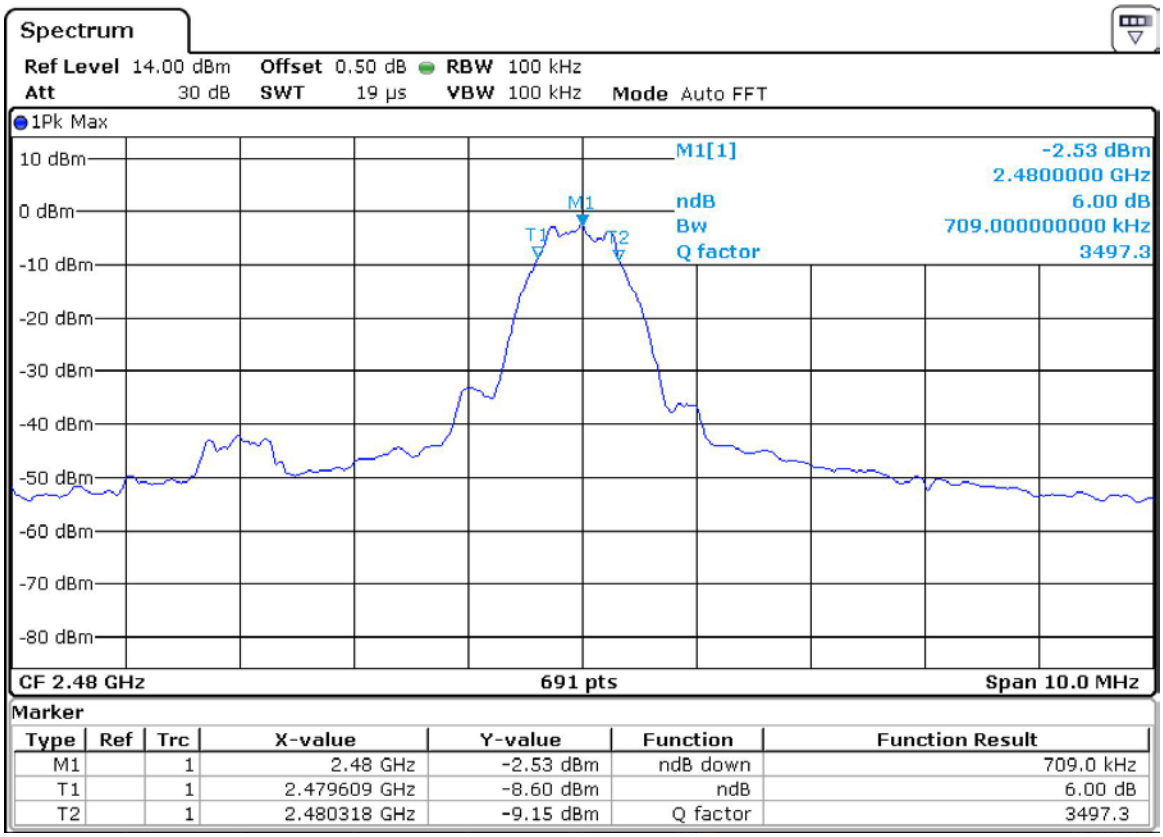
Middle Channel



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.44 GHz	-3.11 dBm	ndB down	709.0 kHz
T1		1	2.439638 GHz	-9.22 dBm	ndB	6.00 dB
T2		1	2.440347 GHz	-9.35 dBm	Q factor	3440.9

High Channel



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 ≥ RBW) Sweep = auto

Detector function = peak

Measurement Data : Complies

Frequency (MHz)	Test Results		
	dBm	mW	Result
2402	**-2.66**	**0.542**	Complies
2440	**-1.32**	**0.738**	Complies
2480	**-0.79**	**0.834**	Complies

- See next pages for actual measured spectrum plots.

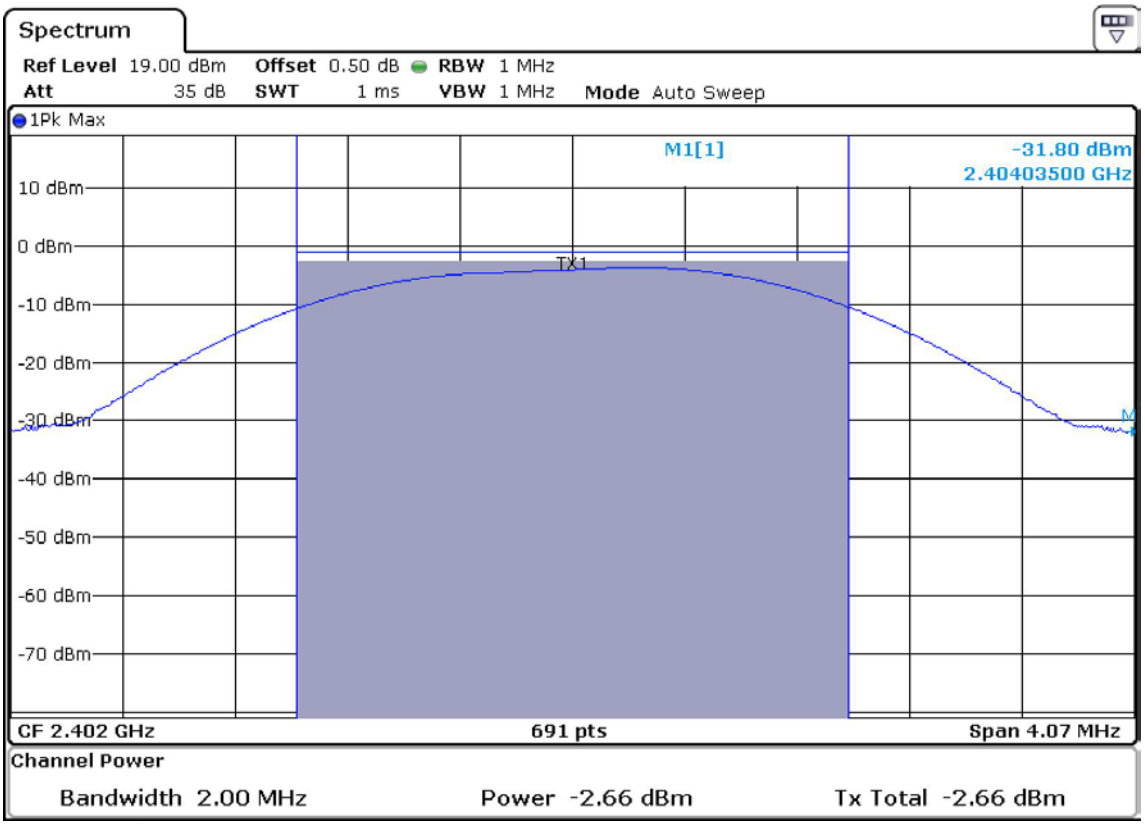
Minimum Standard:

Peak output power	< 1 W

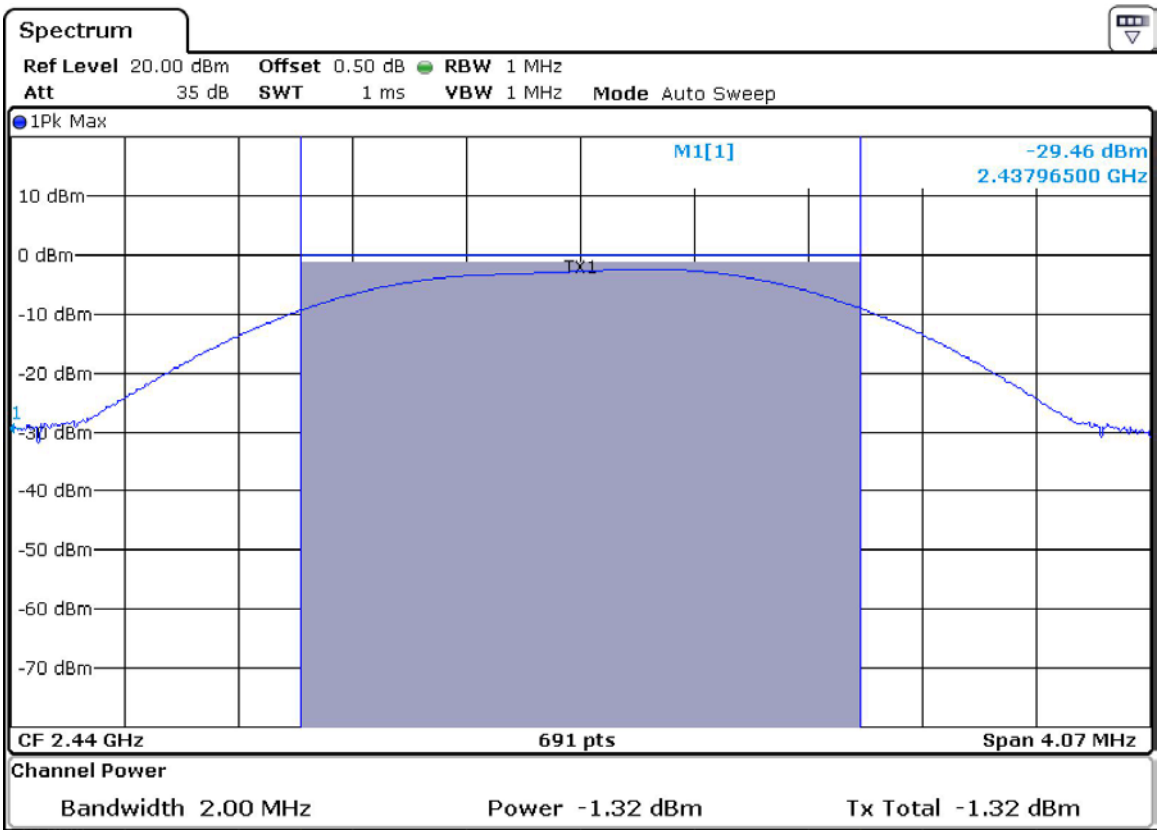
Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

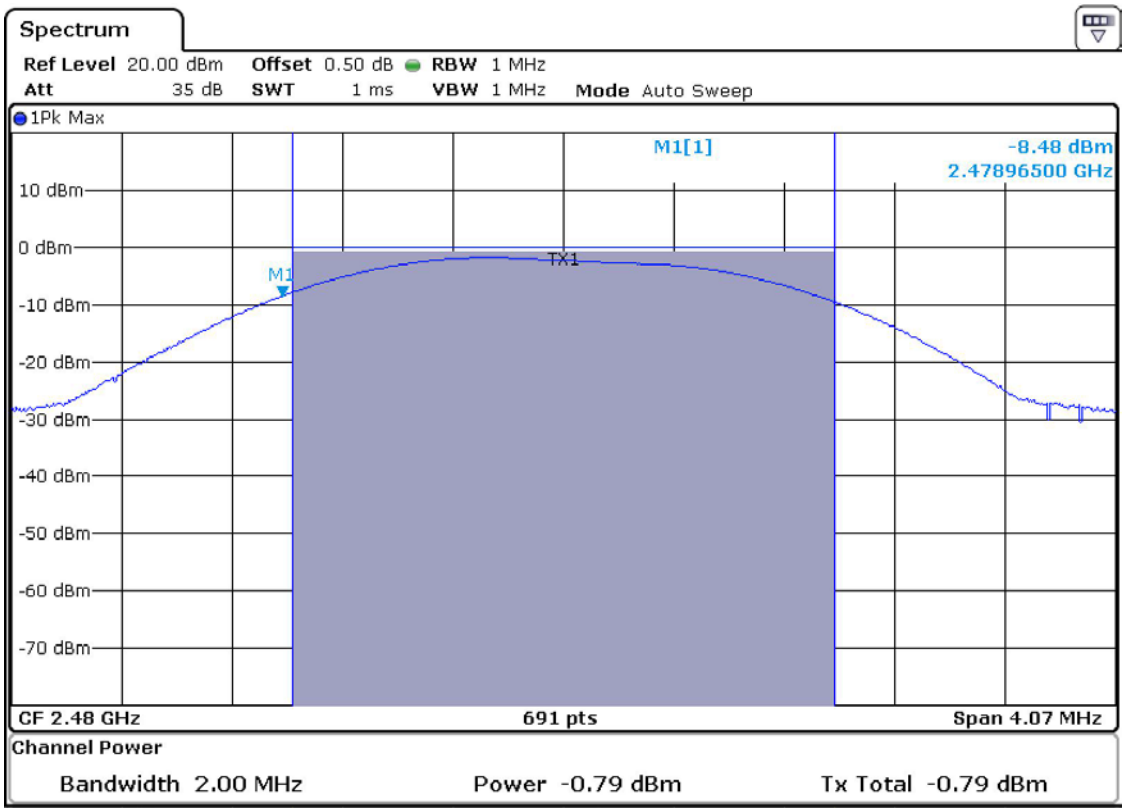
Low Channel



Middle Channel



High Channel



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 = 1.5 MHz (1.5 times the DTS bandwidth)

VBW = 10 kHz (≥ 3 x RBW) — Sweep = auto

Detector function = peak — Trace = max hold

Measurement Data : Complies

Frequency (MHz)	Test Results	
	dBm/ 3 kHz BW	Result
2402	**-17.59**	Complies
2440	**-18.78**	Complies
2480	**-18.44**	Complies

- See next pages for actual measured spectrum plots.

Minimum Standard:

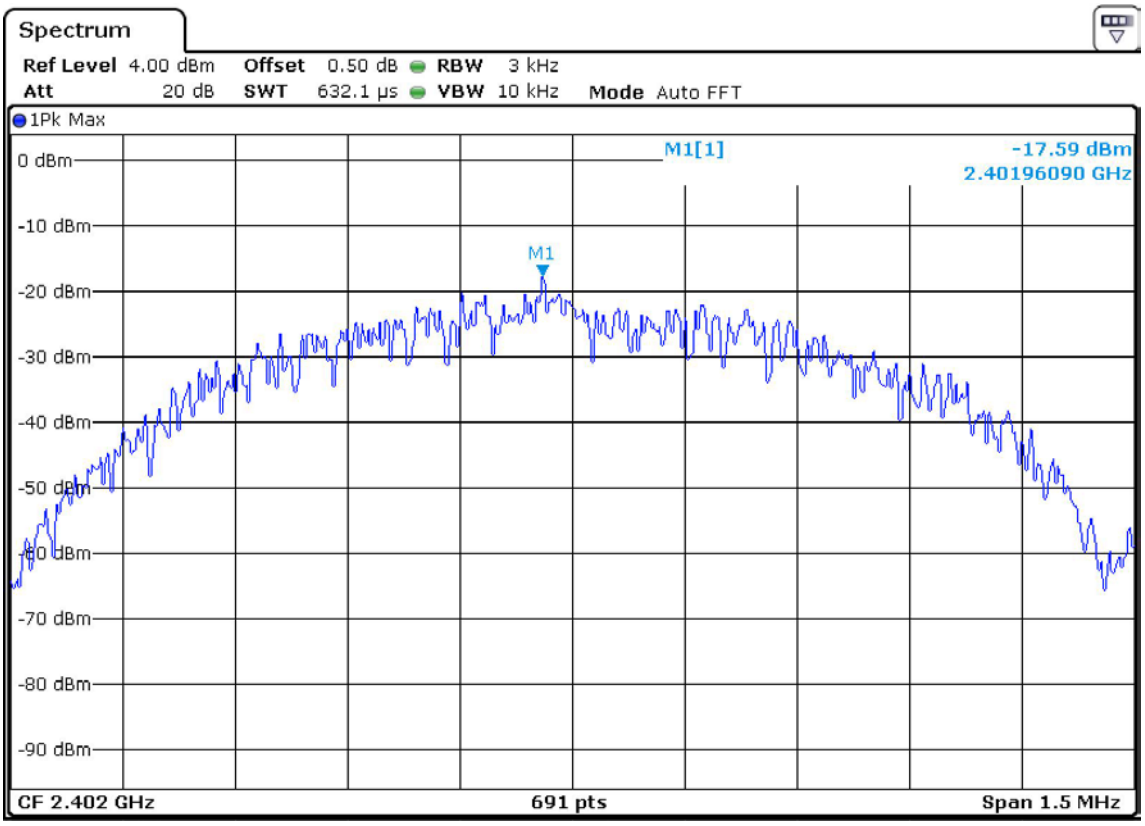
Power Spectral Density	< 8 dBm @ 3 kHz BW

Measurement Setup

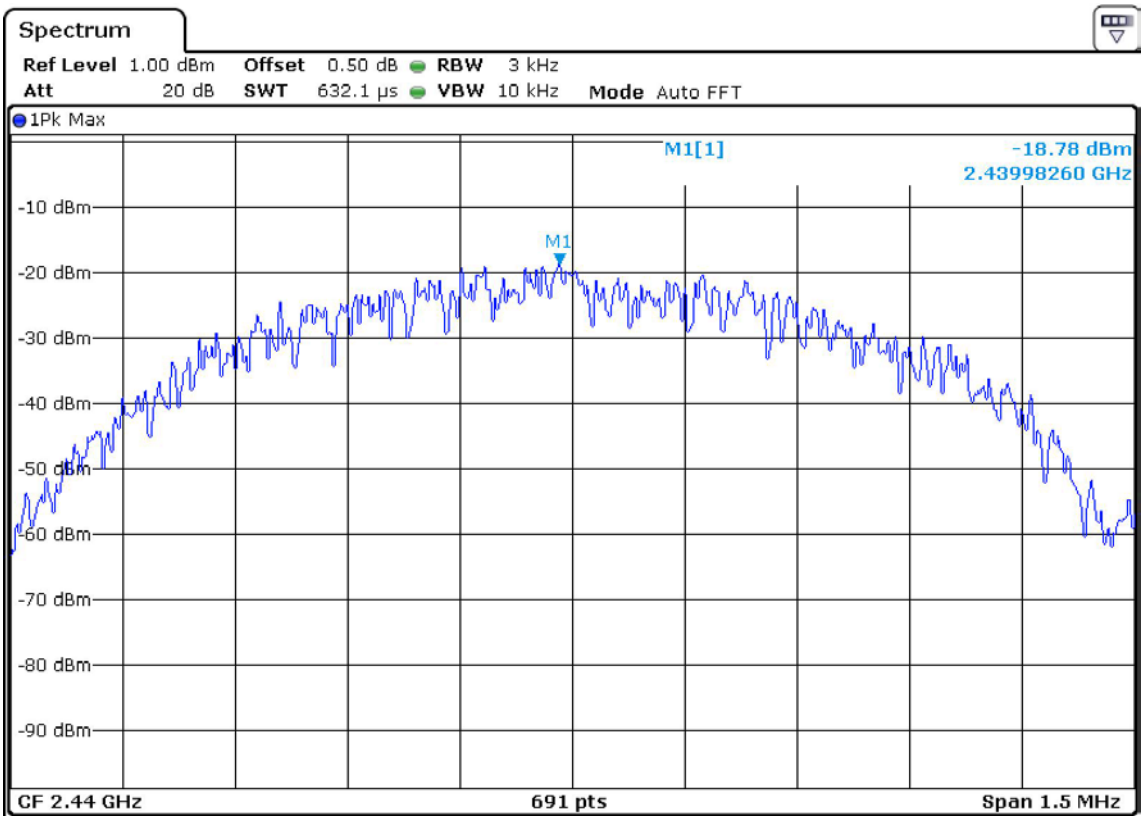
Same as the Chapter 3.2.1 (Figure 1)

Power Density Measurement

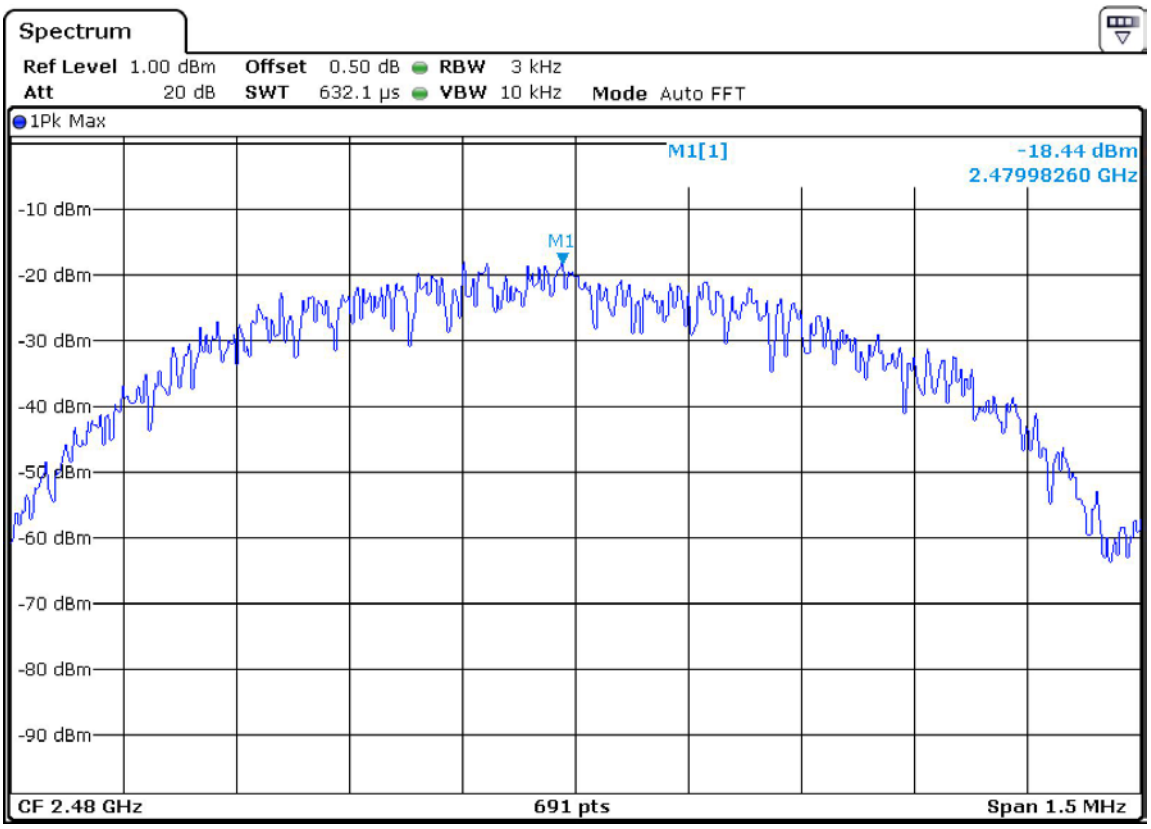
Low Channel



Middle Channel



High Channel



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 or 30 dB down for average power, DTS only.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz	VBW = 100 kHz
Span = 40 MHz, 100 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

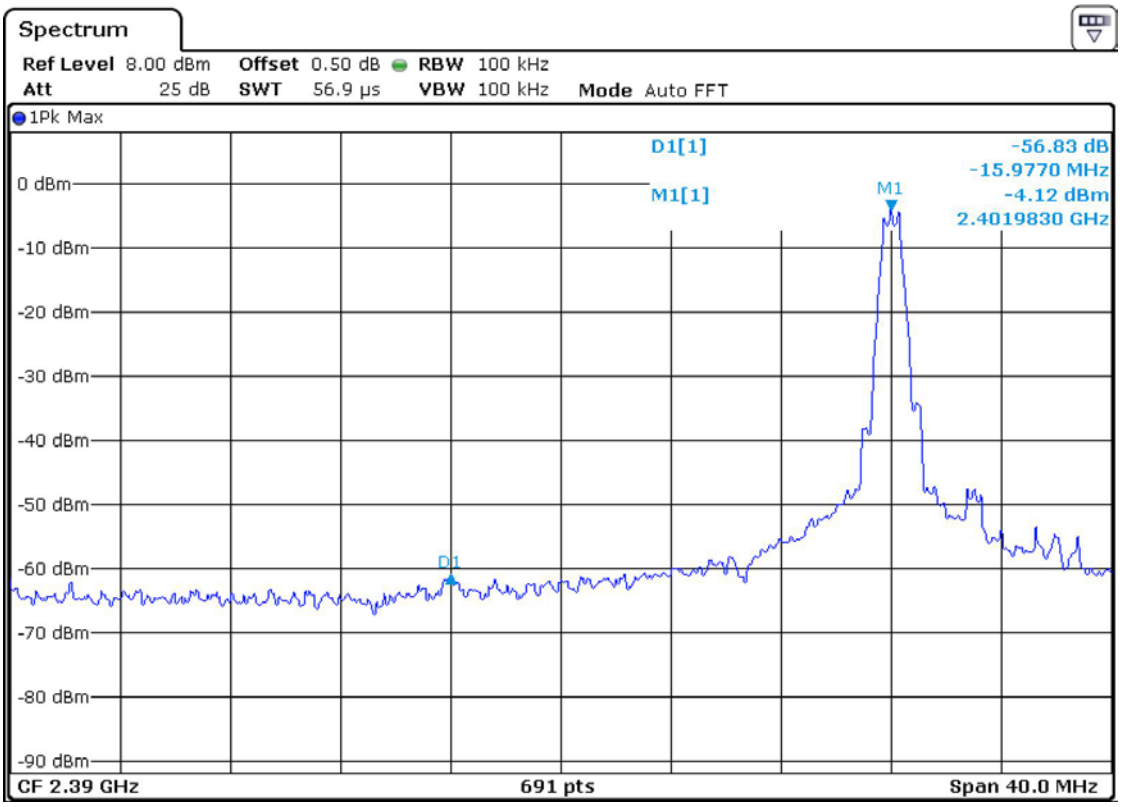
PEAK:	RBW = VBW = 1 MHz, Sweep=Auto
Average:	RBW = 1 MHz, VBW=10 Hz, Sweep=Auto
Measurement Distance:	3 m
Polarization:	Horizontal / Vertical

Measurement Data: Complies

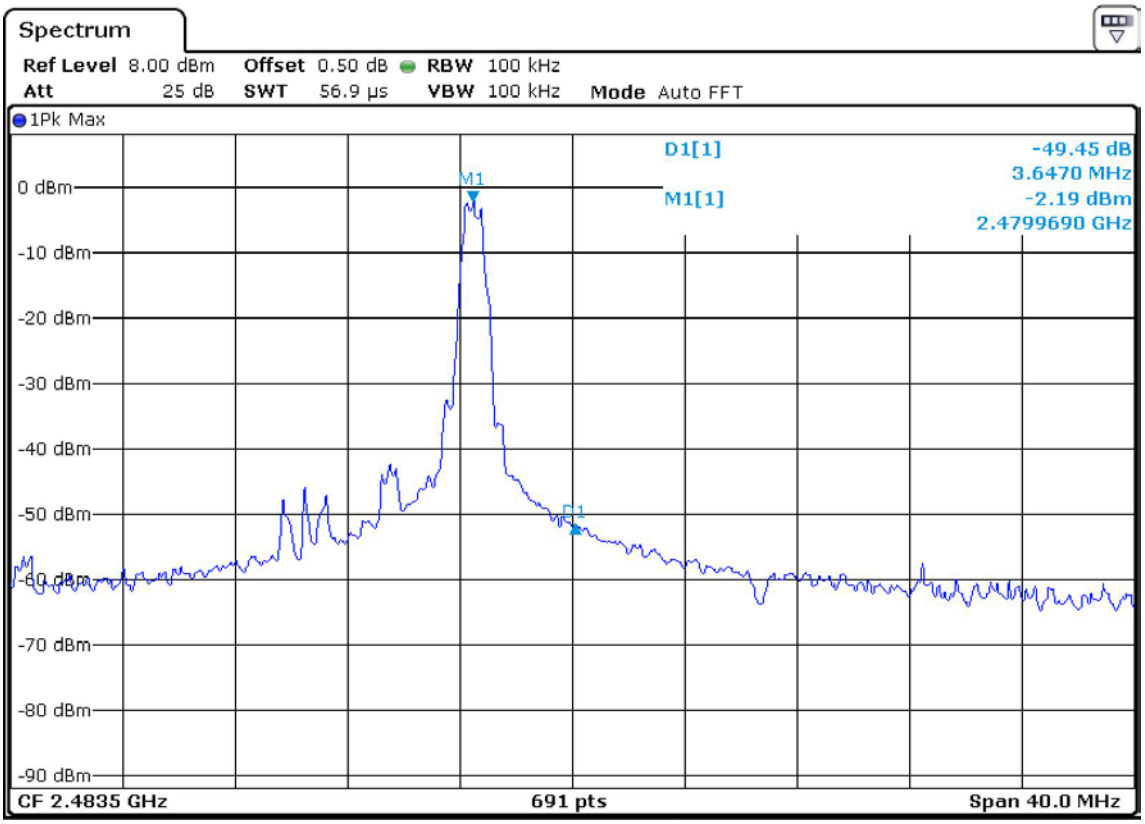
- All conducted emission in any 100 kHz bandwidth outside of the spread spectrum band was at least 20 dB lower than the highest inband spectral density. Therefore the applying equipment meets the require ment.
- See next pages for actual measured spectrum plots.

Minimum Standard:	> 20 dBc

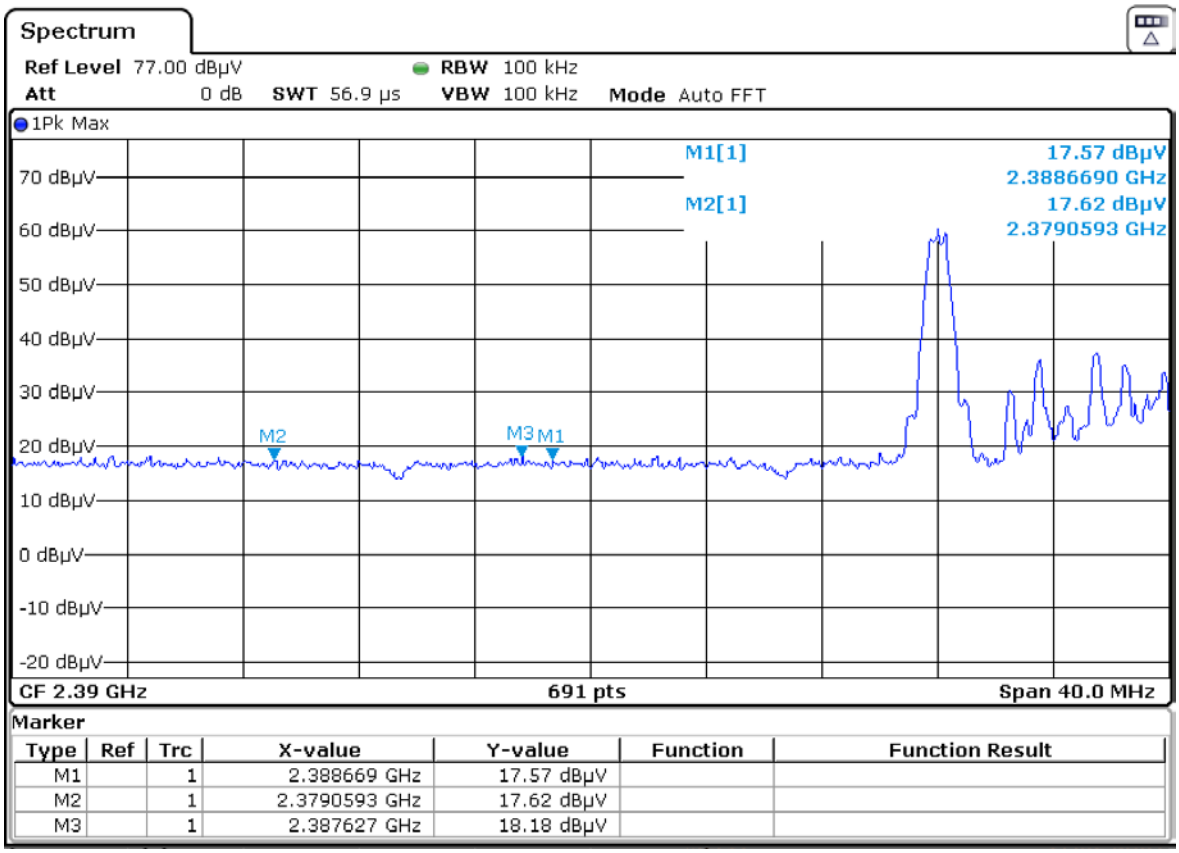
Lower edge



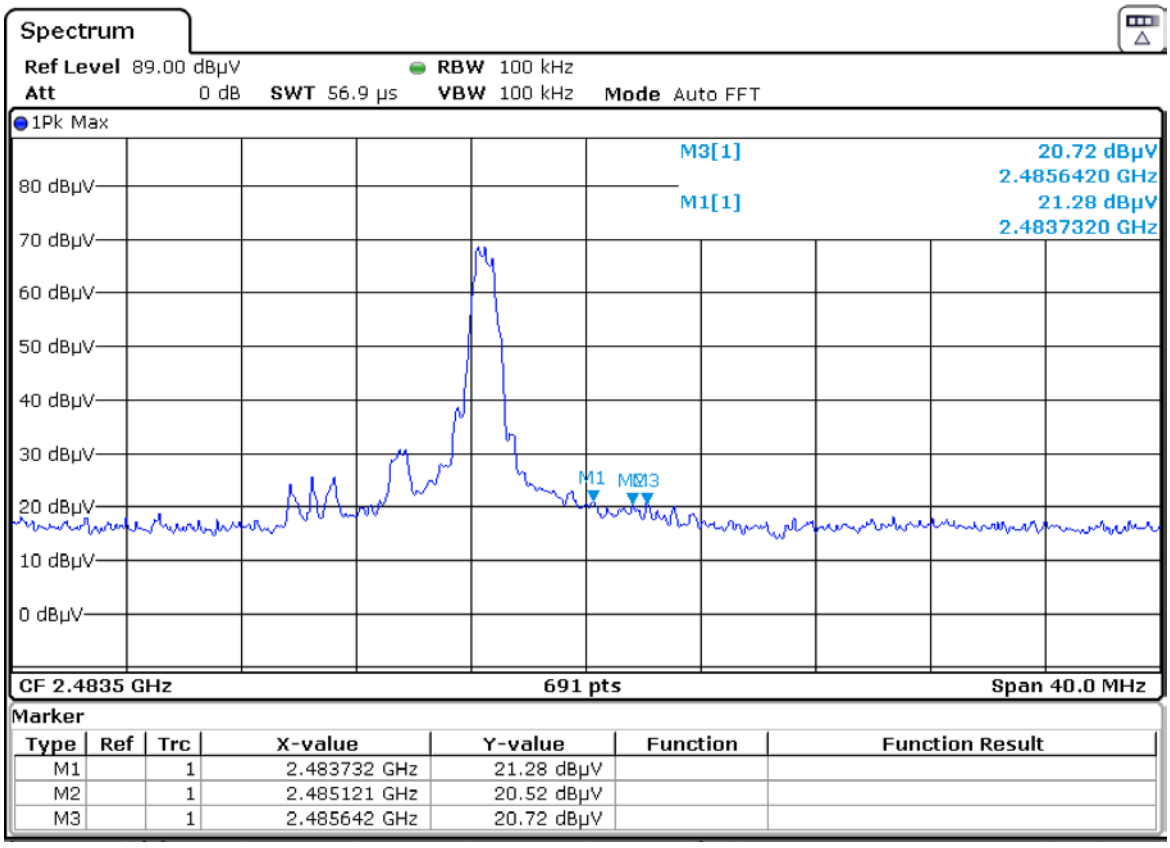
Upper edge



Radiated emissions Lower edge



Radiated emissions Upper edge



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

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 Loss						
2373.2	14.26	17.57	H	28.08	8.77	54	74	33.57	36.88	20.43	37.12
2375.6	14.4	17.62	H	28.09	8.78	54	74	33.71	36.93	20.29	37.07
2348.1	14.78	18.18	H	28.08	8.77	54	74	34.09	37.49	19.91	36.51

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

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 Loss						
2483.7	17.94	21.28	H	27.88	8.57	54	74	37.25	40.59	16.75	33.41
2485.1	17.45	20.52	H	27.88	8.57	54	74	36.76	39.83	17.24	34.17
2485.6	17.62	20.72	H	27.88	8.57	54	74	36.93	40.03	17.07	33.97

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

7Trace = 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 require ment.
- See next pages for actual measured spectrum plots.

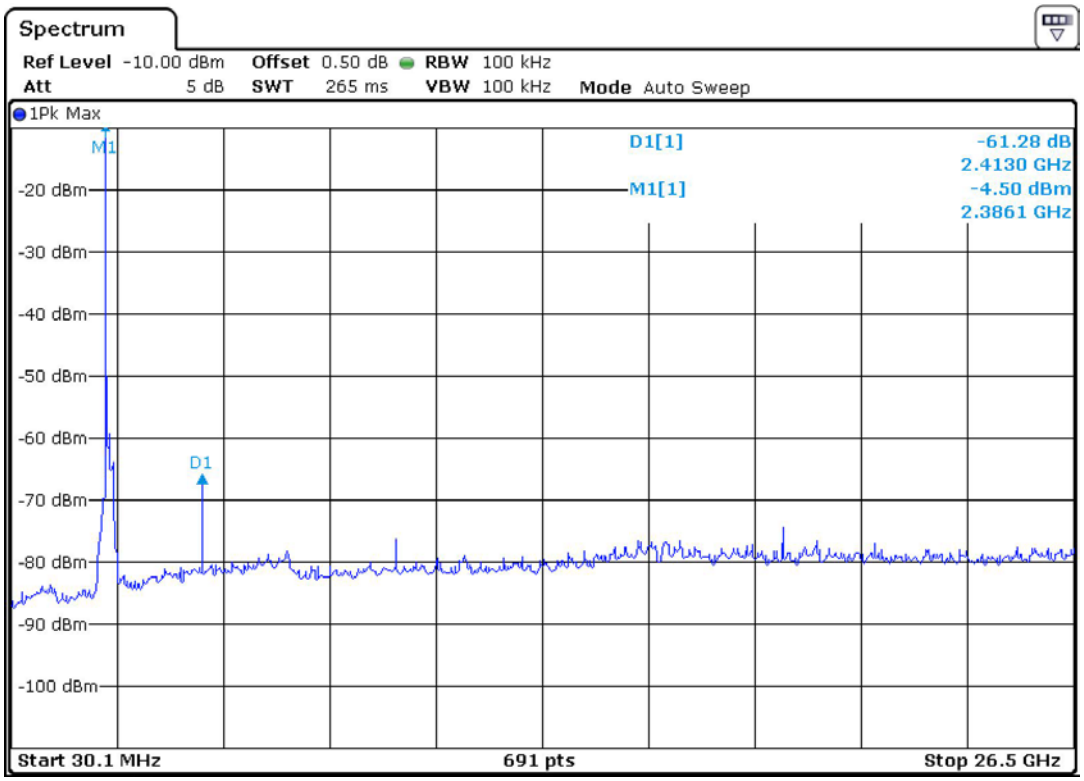
Minimum Standard:	> 20 dBc

Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

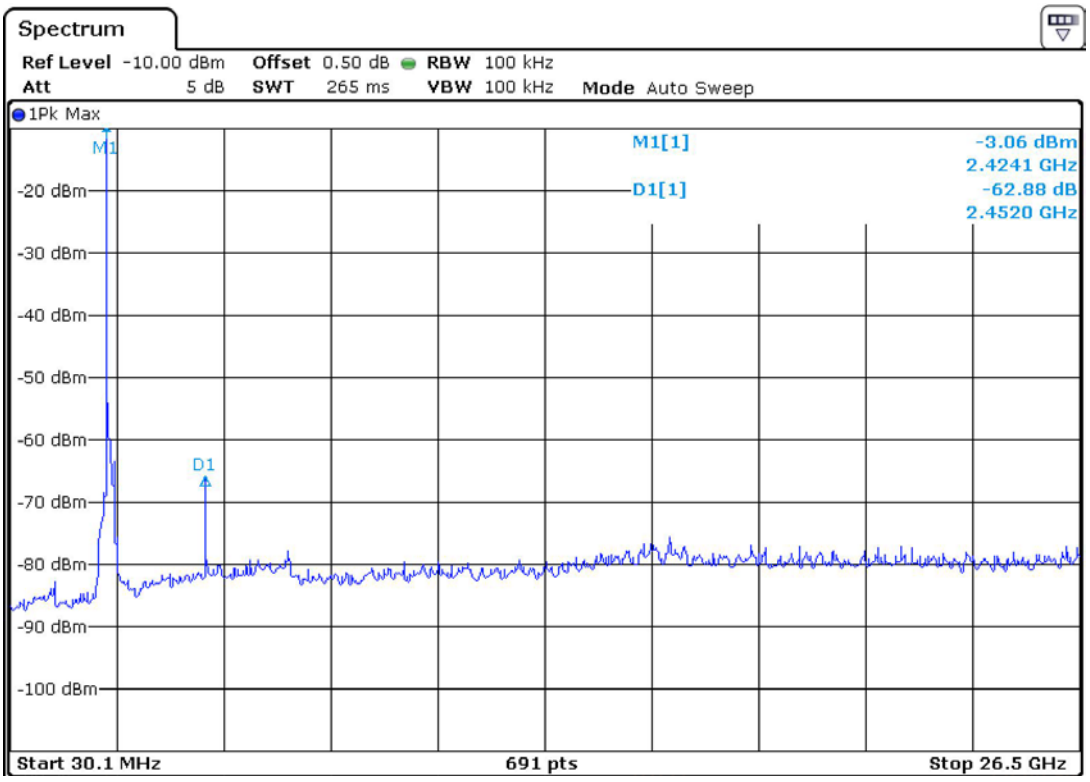
Unwanted Emission – Low Channel

Frequency Range = 30 MHz ~ 26.5 GHz



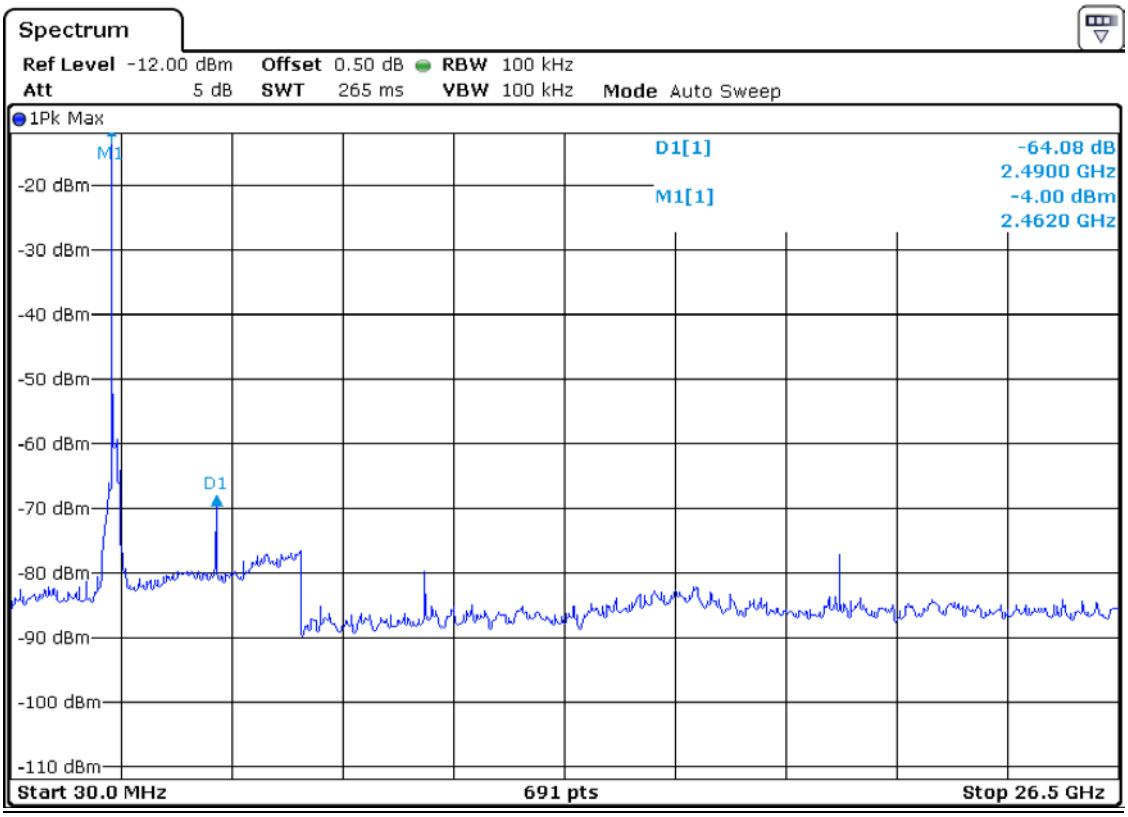
Unwanted Emission – Middle Channel

Frequency Range = 30 MHz ~ 26.5 GHz



Unwanted Emission – High Channel

Frequency Range = 30 MHz ~ 26.5 GHz



3.2.6 Radiated Spurious Emissions

Procedure:

Radiated emissions from 30 MHz to 25 GHz were measured according to the methods defines in ANSI C63.10-2013. The EUT is a placed on as turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 9 kHz ~ 10^{th} harmonic.

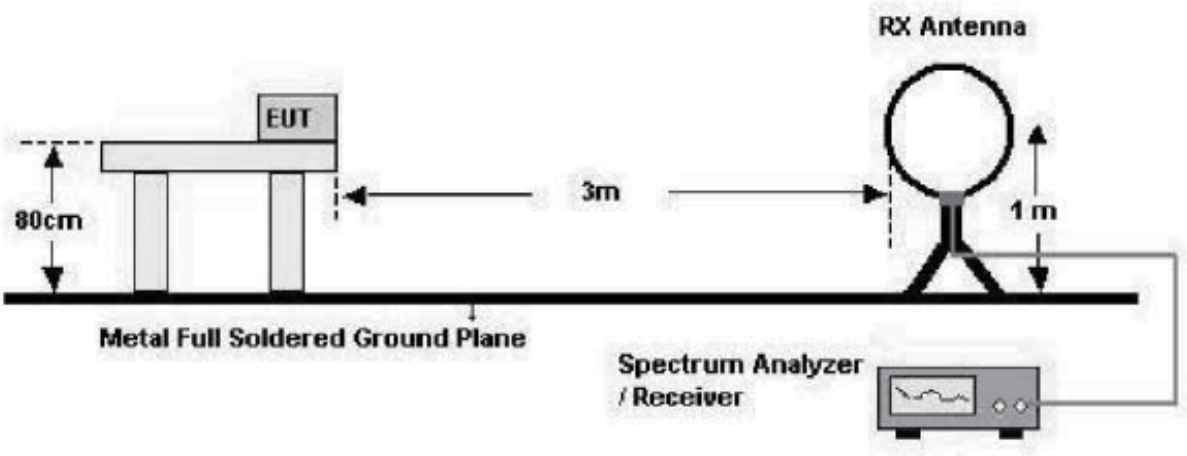
RBW = 100 kHz (30 MHz ~ 1 GHz) VBW ≥ RBW

= 1 MHz (1 GHz ~ 10^{th} harmonic)

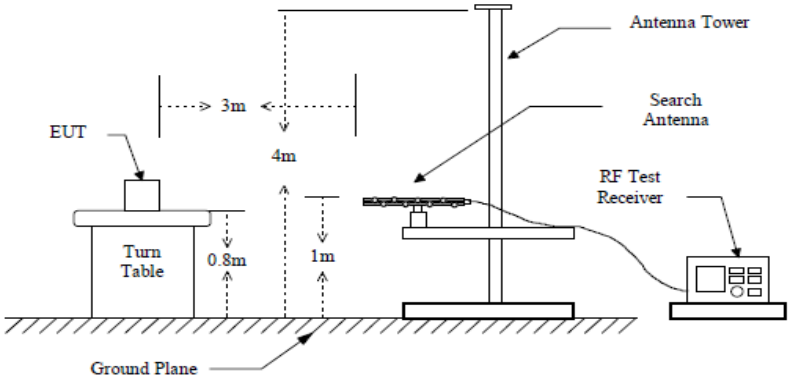
Span = 100 MHz Detector function = peak

Trace = max hold Sweep = auto

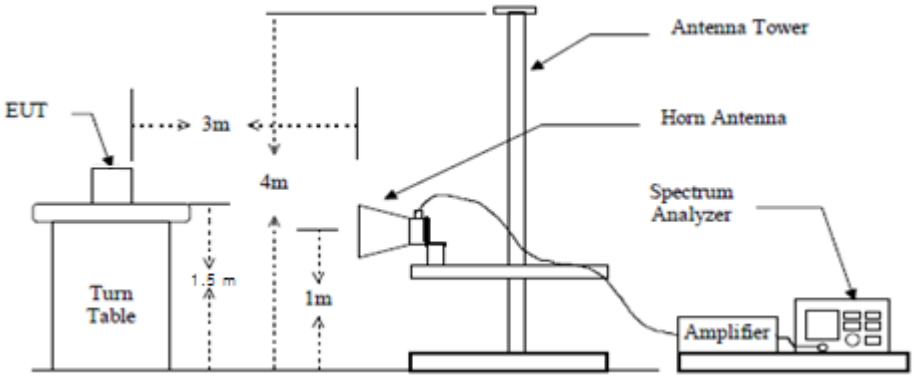
below 30 MHz



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 30MHz.

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)

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						
2987.9	44.8	47.5	v	27.84	46.65	54	74	26.99	29.69	27.01	44.31
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

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

Measurement Data : (Below 1 GHz)

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						
131.85	57.23	60.45	H	14.42	32.23	54	74	39.42	42.64	14.58	31.36
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

*No 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		Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
				Antenna	Amp.Gain+Cable						
0.611	21.51	24.37	H	14.15	31.96	54	74	3.70	6.56	50.30	67.44
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

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

Radiated Emissions (Below 1 GHz) – Bluetooth(LOW) mode, Vertical

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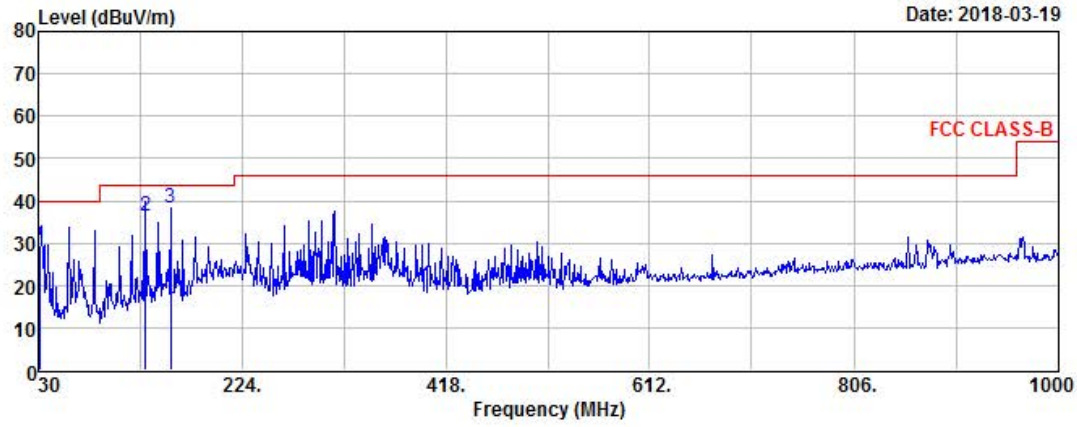
www.ltalab.com

EUT/Model No.: BCM-L102-A Temp/Humi: 21 / 42

Test Mode : BT BLE(LOW) Tested by: YEON J H

Data: 1161 File: C:\Program Files (x86)\e3\1803-1.EM6 (1164)



Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
31.99	49.22	-19.81	29.41	40.00	10.59	111	175	VERTICAL
132.01	54.31	-17.80	36.51	43.50	6.99	101	134	VERTICAL
156.00	55.27	-16.82	38.45	43.50	5.05	194	157	VERTICAL

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

Bluetooth(LOW) mode, Horizontal

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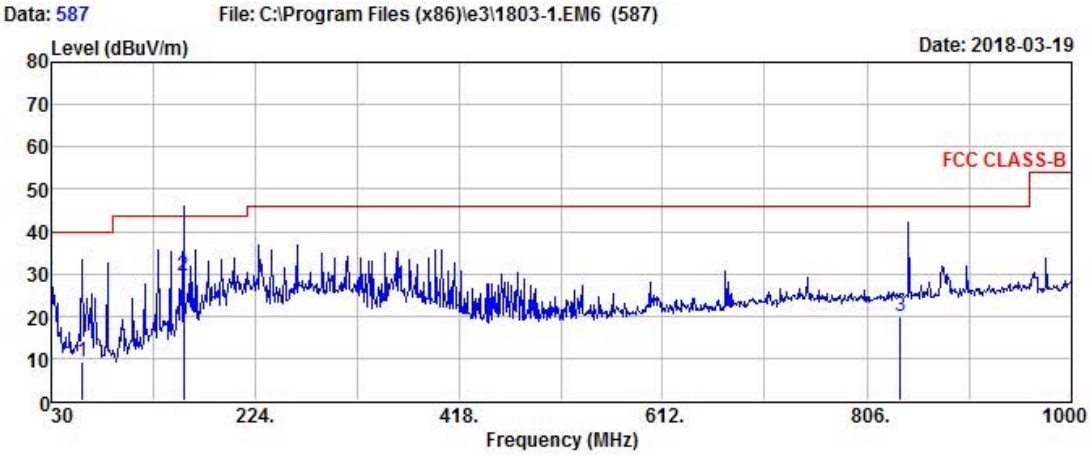
www.ltalab.com

EUT/Model No.: BCM-L102-A Temp/Humi: 21 / 42

Test Mode : BT BLE(LOW) Tested by: YEON J H



Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
59.36	28.27	-19.19	9.08	40.00	30.92	359	291	HORIZONTAL
156.00	46.23	-16.82	29.41	43.50	14.09	204	118	HORIZONTAL
836.89	24.21	-4.24	19.97	46.00	26.03	353	149	HORIZONTAL

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

Bluetooth(MID) mode, Vertical

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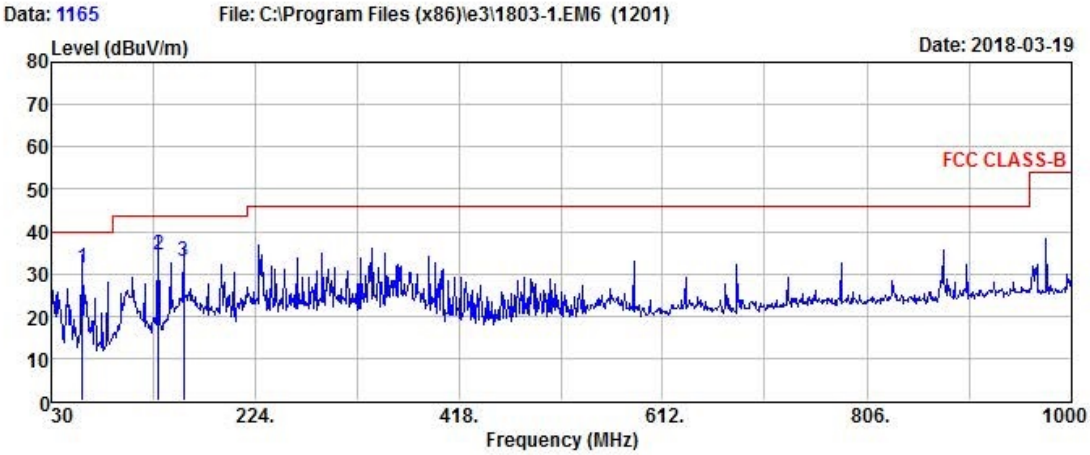
EUT/Model No.: BCM-L102-A Temp/Humi: 21 / 42

Test Mode : BT BLE(MID) Tested by: YEON J H



Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
60.07	50.75	-19.26	31.49	40.00	8.51	374	128	VERTICAL
131.85	52.27	-17.81	34.46	43.50	9.04	366	52	VERTICAL
156.10	49.88	-16.82	33.06	43.50	10.44	379	149	VERTICAL

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

Bluetooth(MID) mode, Horizontal

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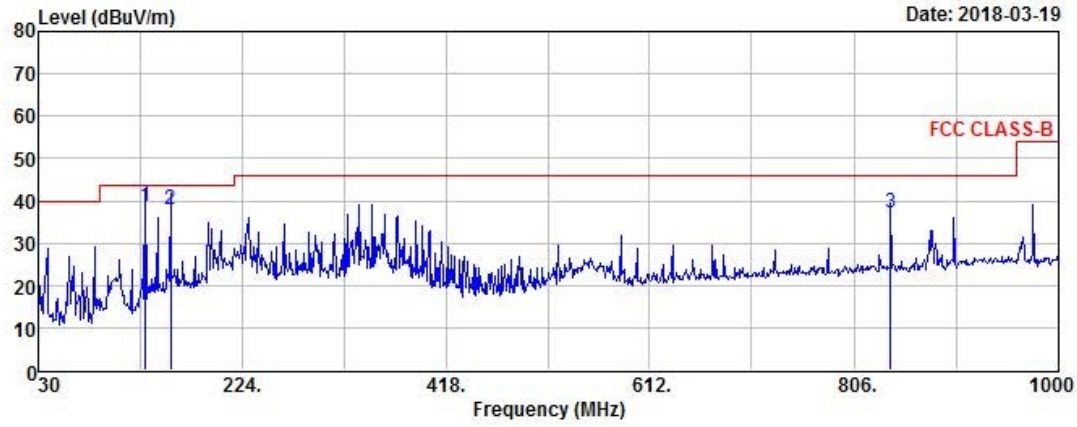
EUT/Model No.: BCM-L102-A Temp/Humi: 21 / 42

Test Mode : BT BLE(MID) Tested by: YEON J H

Data: 1164 File: C:\Program Files (x86)\e3\1803-1.EM6 (1201)



Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
131.85	56.39	-17.81	38.58	43.50	4.92	167	205	HORIZONTAL
156.10	54.68	-16.82	37.86	43.50	5.64	174	84	HORIZONTAL
839.95	41.39	-4.19	37.20	46.00	8.80	109	177	HORIZONTAL

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

Bluetooth(HIGH) mode, Vertical

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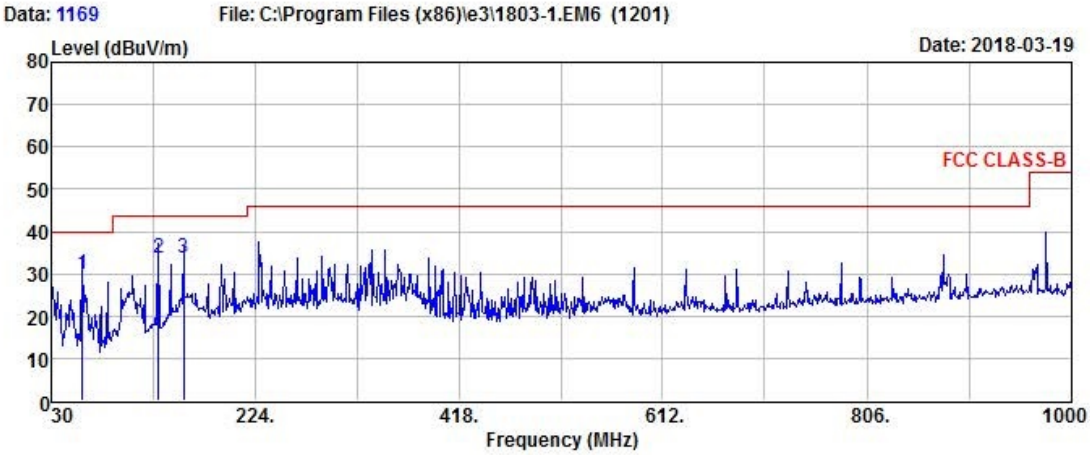
EUT/Model No.: BCM-L102-A Temp/Humi: 21 / 42

Test Mode : BT BLE(HIGH) Tested by: YEON J H



Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
60.07	49.10	-19.26	29.84	40.00	10.16	372	109	VERTICAL
131.85	51.58	-17.81	33.77	43.50	9.73	347	172	VERTICAL
156.10	50.52	-16.82	33.70	43.50	9.80	358	149	VERTICAL

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

Bluetooth(HIGH) mode, Horizontal

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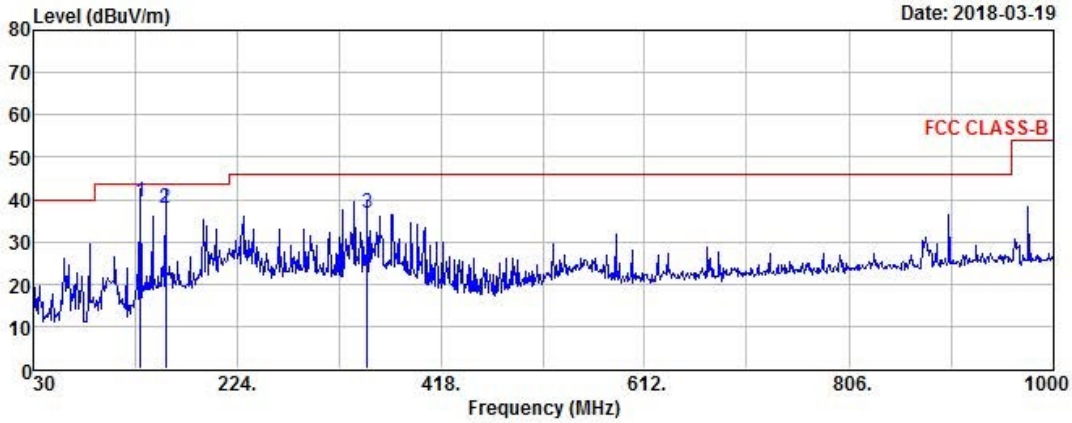
EUT/Model No.: BCM-L102-A Temp/Humi: 21 / 42

Test Mode : BT BLE(HIGH) Tested by: YEON J H

Data: 1168 File: C:\Program Files (x86)\e3\1803-1.EM6 (1201)



Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
131.85	57.23	-17.81	39.42	43.50	4.08	147	168	HORIZONTAL
156.10	54.76	-16.82	37.94	43.50	5.56	121	85	HORIZONTAL
348.16	51.19	-14.56	36.63	46.00	9.37	121	186	HORIZONTAL

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

Radiated Emissions (Above 1 GHz) – Bluetooth(LOW) mode

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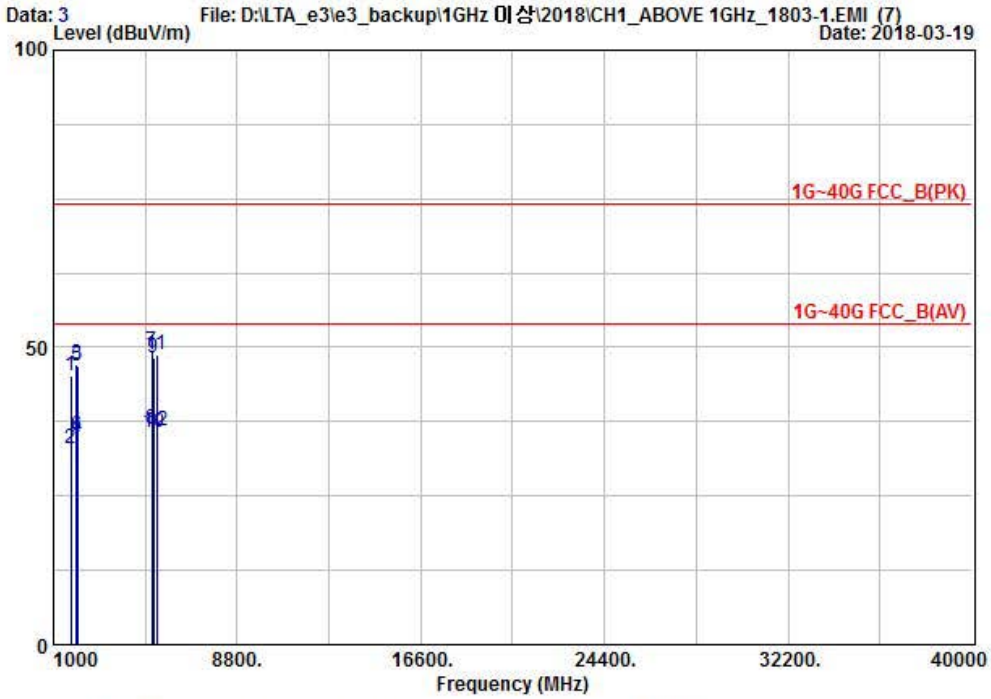
EUT/Model No.: BCM-L102-A Test Mode: BT BLE(LOW)
Tested by : YEON J H Temp/Humi: 22 / 62



	Freq	Reading	C.F	Result PK	Limit	Margin	Polarity
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	1728.40	46.30	-0.95	45.35	74.00	28.65	VERTICAL
2	1728.40	33.90	-0.95	32.95	54.00	21.05	VERTICAL
3	1982.90	45.70	1.45	47.15	74.00	26.85	HORIZONTAL
4	1982.90	33.50	1.45	34.95	54.00	19.05	HORIZONTAL
5	2019.40	45.30	1.68	46.98	74.00	27.02	HORIZONTAL
6	2019.40	33.40	1.68	35.08	54.00	18.92	HORIZONTAL
7	5177.60	30.80	18.65	49.45	74.00	24.55	VERTICAL
8	5177.60	17.60	18.65	36.25	54.00	17.75	VERTICAL
9	5247.50	29.70	18.61	48.31	74.00	25.69	HORIZONTAL
10	5247.50	17.20	18.61	35.81	54.00	18.19	HORIZONTAL
11	5384.30	29.40	19.25	48.65	74.00	25.35	VERTICAL
12	5384.30	16.80	19.25	36.05	54.00	17.95	VERTICAL

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

Bluetooth(MID) mode

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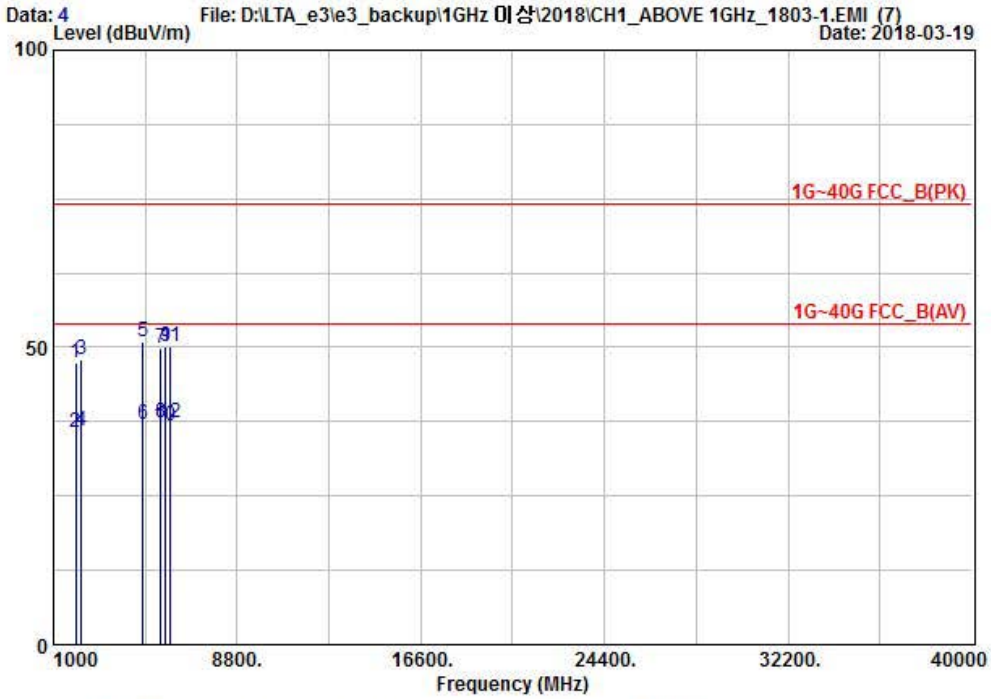
EUT/Model No.: BCM-L102-A Test Mode: BT BLE(MID)
Tested by : YEON J H Temp/Humi: 22 / 62



	Freq	Reading	C.F	Result PK	Limit	Margin	Polarity
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	1941.30	46.20	1.20	47.40	74.00	26.60	VERTICAL
2	1941.30	34.50	1.20	35.70	54.00	18.30	VERTICAL
3	2189.80	45.80	2.20	48.00	74.00	26.00	HORIZONTAL
4	2189.80	33.70	2.20	35.90	54.00	18.10	HORIZONTAL
5	4809.20	33.10	17.79	50.89	74.00	23.11	VERTICAL
6	4809.20	19.40	17.79	37.19	54.00	16.81	VERTICAL
7	5557.50	30.10	19.82	49.92	74.00	24.08	HORIZONTAL
8	5557.50	17.60	19.82	37.42	54.00	16.58	HORIZONTAL
9	5746.10	29.80	20.33	50.13	74.00	23.87	HORIZONTAL
10	5746.10	16.40	20.33	36.73	54.00	17.27	HORIZONTAL
11	5982.70	28.40	21.80	50.20	74.00	23.80	VERTICAL
12	5982.70	15.50	21.80	37.30	54.00	16.70	VERTICAL

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

Bluetooth(HIGH) mode

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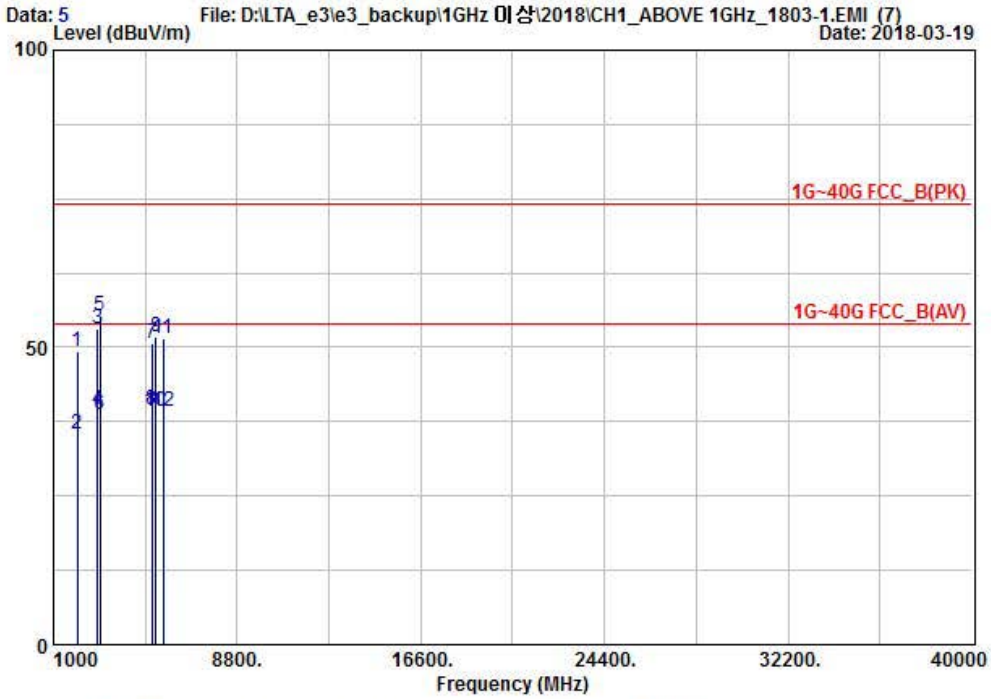
EUT/Model No.: BCM-L102-A Test Mode: BT BLE(HIGH)

Tested by : YEON J H Temp/Humi: 22 / 62



	Freq	Reading	C.F	Result PK	Limit	Margin	Polarity
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	2027.30	47.70	1.73	49.43	74.00	24.57	VERTICAL
2	2027.30	33.60	1.73	35.33	54.00	18.67	VERTICAL
3	2868.40	46.70	6.34	53.04	74.00	20.96	HORIZONTAL
4	2868.40	33.10	6.34	39.44	54.00	14.56	HORIZONTAL
5	2987.90	47.50	7.68	55.18	74.00	18.82	VERTICAL
6	2987.90	30.90	7.68	38.58	54.00	15.42	VERTICAL
7	5194.50	31.80	18.78	50.58	74.00	23.42	HORIZONTAL
8	5194.50	20.80	18.78	39.58	54.00	14.42	HORIZONTAL
9	5342.80	32.80	19.04	51.84	74.00	22.16	VERTICAL
10	5342.80	20.10	19.04	39.14	54.00	14.86	VERTICAL
11	5652.80	31.50	20.03	51.53	74.00	22.47	HORIZONTAL
12	5652.80	19.10	20.03	39.13	54.00	14.87	HORIZONTAL

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

3.2.7 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

- 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

Class B

Frequency Range	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

Conducted Emissions – 2.4 GHz Bluetooth Mode(MID) + Negative

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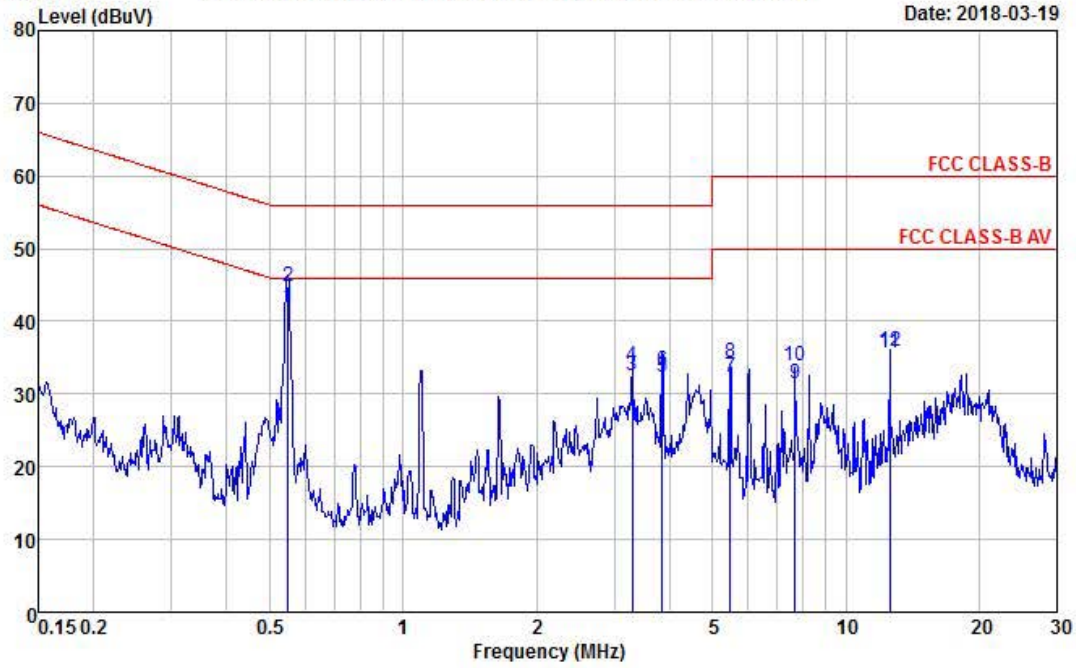
Fax:+82-31-3236010

EUT / Model No. : BCM-L102-A
Phase : NEGATIVE
Test Mode : Bluetooth mode
Test Power : DV 3.0 V
Temp. / Humi. : 24 / 50
Test Engineer : YEON J H

Data: 1507 File: D:\Conducted Data\2018\LTA_Conduction_2018_3.EM6 (1549)



Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.549	25.41	22.47	19.47	44.88	41.94	56.00	46.00	11.12	4.06
3.294	14.45	13.09	19.53	33.98	32.62	56.00	46.00	22.02	13.38
3.845	13.70	12.75	19.55	33.25	32.30	56.00	46.00	22.75	13.70
5.489	14.72	12.74	19.58	34.30	32.32	60.00	50.00	25.70	17.68
7.685	14.13	11.67	19.65	33.78	31.32	60.00	50.00	26.22	18.68
12.560	16.13	15.91	19.73	35.86	35.64	60.00	50.00	24.14	14.36

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

Conducted Emissions – 2.4 GHz Bluetooth Mode(MID) + Positive

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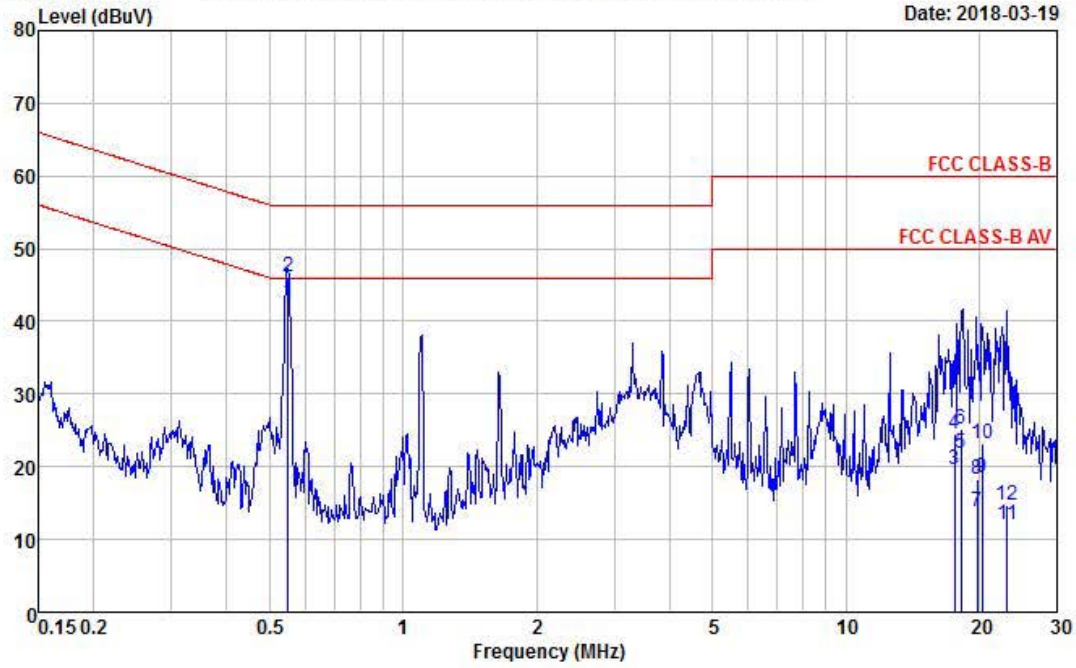
EUT / Model No. : BCM-L102-A
Phase : POSITIVE
Test Mode : Bluetooth mode
Test Power : DC 3.0 V
Temp. / Humi. : 24 / 50
Test Engineer : YEON J H

Data: 1506 File: D:\Conducted Data\2018\LTA_Conduction_2018_3.EM6 (1549)



Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.549	26.59	23.16	19.49	46.08	42.65	56.00	46.00	9.92	3.35
17.580	4.67	-0.27	19.90	24.57	19.63	60.00	50.00	35.43	30.37
18.234	5.35	1.87	19.93	25.28	21.80	60.00	50.00	34.72	28.20
19.792	-1.69	-6.20	19.99	18.30	13.79	60.00	50.00	41.70	36.21
20.322	3.21	-1.53	20.00	23.21	18.47	60.00	50.00	36.79	31.53
23.169	-5.37	-7.94	20.00	14.63	12.06	60.00	50.00	45.37	37.94

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

3.4 Measurement Uncertainty

Parameter	Uncertainty
Centre Frequency	±1 × 10^{-5} MHz
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±1.5 dB
Power Spectral Density, conducted	±3 dB
Unwanted Emissions, conducted	±3 dB
All emissions, radiated	±6 dB
Temperature	±1 °C
Humidity	±5 %
DC and low frequency voltages	±3 %
Time	±5 %
Duty Cycle	±5 %

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	2017-09-07
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	2017-09-07
5		Attenuator (10 dB)	8491A	63196	HP	1 year	2017-09-07
6		EMI Test Receiver (~7 GHz)	ESCI7	100722	R&S	1 year	2017-09-07
7	■	RF Amplifier (~1.3 GHz)	8447D OPT 010	2944A07684	HP	1 year	2017-09-07
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	2017-04-17
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	■	DC Power Supply	6674A	3637A01657	Agilent	-	-
16		Frequency Counter	5342A	2826A12411	HP	1 year	2017-03-21
17	■	Power Meter	EPM-441A	GB32481702	HP	1 year	2017-03-20
18	■	Power Sensor	8481A	3318A94972	HP	1 year	2017-12-26
19		Audio Analyzer	8903B	3729A18901	HP	1 year	2017-09-07
20		Modulation Analyzer	8901B	3749A05878	HP	1 year	2017-09-07
21	■	TEMP & HUMIDITY Chamber	YJ-500	LTAS06041	JinYoung Tech	1 year	2017-09-07
22		Stop Watch	HS-3	812Q08R	CASIO	2 year	2017-03-21
23		LISN	KNW-407	8-1430-1	Kyoritsu	1 year	2017-09-07
24		Two-Lime V-Network	ESH3-Z5	893045/017	R&S	1 year	2017-03-20
25		UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	106243	R&S	1 year	2017-03-20
26		Highpass Filter	WHKX1.5/15G-10SS	74	Wainwright Instruments	1 year	2017-03-20
27		Highpass Filter	WHKX3.0/18G-10SS	118	Wainwright Instruments	1 year	2017-03-20
28		OSP120 BASE UNIT	OSP120	101230	R&S	1 year	2017-03-21
29		Signal Generator(100 kHz ~ 40 GHz)	SMB100A03	177621	R&S	1 year	2017-03-23
30		Signal Analyzer (10 Hz ~ 40 GHz)	FSV40	101367	R&S	1 year	2017-03-21