

FCC - TEST REPORT

Report Number : **709502310219-01C** Date of Issue: February 26, 2025

Model : SC162-WCE3, SC162-WCE3A, SC162-WCE3B, SC162-WCD3, SC162-WCB3, SC162-WCC3, SC162-WCB3A, SC162-WCC3A, SC162-WCD3A, SC162-WCB4, SC162-WCB4A, SC162-WCC4, SC162-WCC5A, SC162-WCD5, SC162-WCD5A.

Product Type : Smart Battery Doorbell

Applicant : Zhejiang Lingzhu Technology Co., Ltd.

Address : Room 302, No 1 Building Huace Center, Xihu District, Hangzhou
City, Zhejiang Province, China.

Manufacturer : Zhejiang Lingzhu Technology Co., Ltd.

Address : Room 302, No 1 Building Huace Center, Xihu District, Hangzhou
City, Zhejiang Province, China.

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including Appendices : 39



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2 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
709502310219-00C	First Issue	03/07/2024
709502310219-01C	Amendment 1: The infrared lamp beads have been changed and added some new models. Additional tests were performed.	02/26/2025

3 Details about the Test Laboratory

Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch
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Shanghai 201108,
P.R. China

Telephone: +86 21 6141 0123

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FCC Registration No.: 820234

FCC Designation Number: CN1183

ISED CAB identifier CN0101

IC Registration No.: 31668

4 Description of the Equipment under Test

Product: Smart Battery Doorbell

Model no.: SC162-WCE3, SC162-WCE3A, SC162-WCE3B, SC162-WCD3, SC162-WCB3, SC162-WCC3, SC162-WCB3A, SC162-WCC3A, SC162-WCD3A, SC162-WCB4, SC162-WCB4A, SC162-WCC4, SC162-WCC5A, SC162-WCD5, SC162-WCD5A

FCC ID: 2BEWXSC162

Options and accessories: NA

Rating: AC 8-24V or 5V Input (type C)

RF Transmission Frequency: 802.11b/g/n-HT20: 2412~2462 MHz (Wi-Fi)
802.11n-HT40: 2422~2452 MHz (Wi-Fi)
2402~2480 MHz (BLE5.0)
433.92MHz (SRD)

No. of Operated Channel:

802.11b/g/n(HT20)				802.11n(HT40)			
Ch	Fre(MHz)	Ch	Fre(MHz)	Ch	Fre(MHz)	Ch	Fre(MHz)
1	2412	7	2442	3	2422	8	2447MHz
2	2417	8	2447	4	2427	9	2452MHz
3	2422	9	2452	5	2432		
4	2427	10	2457	6	2437		
5	2432	11	2462	7	2442		
6	2437						

Bluetooth Low Energy							
Ch	Fre(MHz)	Ch	Fre(MHz)	Ch	Fre(MHz)	Ch	Fre(MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480



Modulation:	Direct Sequence Spread Spectrum (DSSS) for 802.11b Orthogonal Frequency Division Multiplexing (OFDM) for 802.11g/n; 2.4GHz BLE: GFSK (1Mbps and 2Mbps)
Hardware Version:	V1.0.1
Software Version:	V1.2.80
Antenna Type:	FPC Antenna for 2.4GHz Spring antenna for 433.92MHz
Antenna Gain:	0.45dBi for 2.4GHz; -2.01dBi for 433.92MHz
Description of the EUT:	The EUT was a Smart Battery Doorbell which has Wi-Fi and BLE function, it also can transmit at 433.92MHz. We tested it and listed the worst data in this report. This report is only for BLE. According to the client's declaration, all models are identical except for different model name only for differentiate when sold in different regions. So model SC162-WCE3 was chosen to perform all the tests
Test sample no.:	SHA-884460-1 (RF Radiated and Conducted)

The sample's mentioned in this report is/are submitted/ supplied/ manufactured by client. The laboratory therefore assumes no responsibility for accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.



5 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2023 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

All the test methods were according to KDB 558074 D01 15.247 Meas Guidance v05r02 Measurement Guidance and ANSI C63.10-2020.



6 Summary of Test Results

Technical Requirements						
FCC Part 15 Subpart C						
Test Condition		Pages	Test Site	Test Result		
				Pass	Fail	N/A
§15.207	Conducted emission AC power port	Refer to clause 7	Site 1	☒	☐	☐
§15.247 (b) (3)	Conducted peak output power	14-16	Site 1	☒	☐	☐
§15.247(a)(1)	20dB bandwidth and 99% Occupied Bandwidth	---	---	☐	☐	☒
§15.247(a)(1)	Carrier frequency separation	---	---	☐	☐	☒
§15.247(a)(1)(iii)	Number of hopping frequencies	---	---	☐	☐	☒
§15.247(a)(1)(iii)	Dwell Time - Average Time of Occupancy	---	---	☐	☐	☒
§15.247(a)(2)	6dB bandwidth	Refer to clause 7	Site 1	☒	☐	☐
§15.247(e)	Power spectral density	Refer to clause 7	Site 1	☒	☐	☐
§15.247(e)	Spurious RF conducted emissions	Refer to clause 7	Site 1	☒	☐	☐
§15.247(d)	Band edge	Refer to clause 7	Site 1	☒	☐	☐
§15.247(d) & §15.209 & §15.205	Spurious radiated emissions for transmitter	17-35	Site 1	☒	☐	☐
§15.203	Antenna requirement	See note 1		☒	☐	☐

Remark 1: N/A – Not Applicable.

Note 1: The EUT uses PCB antenna, which gain is 0.45dBi. In accordance to §15.203, It is considered sufficiently to comply with the provisions of this section.

7 General Remarks

Remarks

This report was based on the report 709502310219-00C for adding some new models (highlight as below table) and slight changes have been made in some places. Detail refer to below table:

	Existing certified product	New models	
Model	SC162-WCD3	SC162-WCE3, SC162-WCE3A, SC162-WCE3B SC162-WCD3, SC162-WCB3, SC162-WCC3, SC162-WCB3A, SC162-WCC3A, SC162-WCD3A, SC162-WCB4, SC162-WCB4A, SC162-WCC4, SC162-WCC5A, SC162-WCD5, SC162-WCD5A.	
Outside View	Type A	SC162-WCE3, SC162-WCE3A, SC162-WCE3B	SC162-WCD3, SC162-WCB3, SC162-WCC3, SC162-WCB3A, SC162-WCC3A, SC162-WCD3A, SC162-WCB4, SC162-WCB4A, SC162-WCC4, SC162-WCC5A, SC162-WCD5, SC162-WCD5A.
		Type B	Type A
Declaration	All above models are identical to each other, except for different model numbers, sensor, color and tiny enclosure difference, such as different chamfering. These differences are not related to the radio frequency function. The "3" in "SC162-WCD3" could potentially be replaced with "4" or "5", So 3, 4, 5 in model name for different sensor, The "D" in "SC162-WCD3" could potentially be replaced with "A" or "B" or "C" or "E", So A, B, C,D,E in model name for tiny enclosure difference. The "A" in "SC162-WCD3A" could potentially be replaced with "A" or "B", So A, B in model name for different color. Product changes: 1. The light board has not changed (only the welding position of the material has changed), the main board remains unchanged. 2. The infrared lamp beads have been changed 3. The 2.4GHz antenna has been changed. Same type, same gain antenna. (only different shape) 4. The outer shell has been changed.		

So, in this test report only test data of, "Conducted peak output power" and "Spurious radiated emissions for transmitter" were new data, other test data were quoted from report 709502310219-00C and the test data are still effective.

This report is only for 2.4GHz BLE.

For 2.4GHz Wi-Fi report, refer to report no. 709502310219-00B & 709502310219-01B.

For 433.92MHz report, refer to report no. 709502310219-00D.

This submittal(s) (test report) is intended for FCC ID: 2BEWXSC162 complies with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C rules.



SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

□ - **Not** Performed

The Equipment under Test

■ - **Fulfills** the general approval requirements.

□ - **Does not** fulfill the general approval requirements.

Sample Received Date: January 17, 2025

Testing Start Date: January 24, 2025

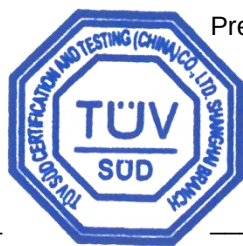
Testing End Date: February 24, 2025

-TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch

Reviewed by:

Jiaxi Xu

Jiaxi XU
Review Engineer



Prepared by:

Hui Tong

Hui TONG
Project Engineer

Tested by:

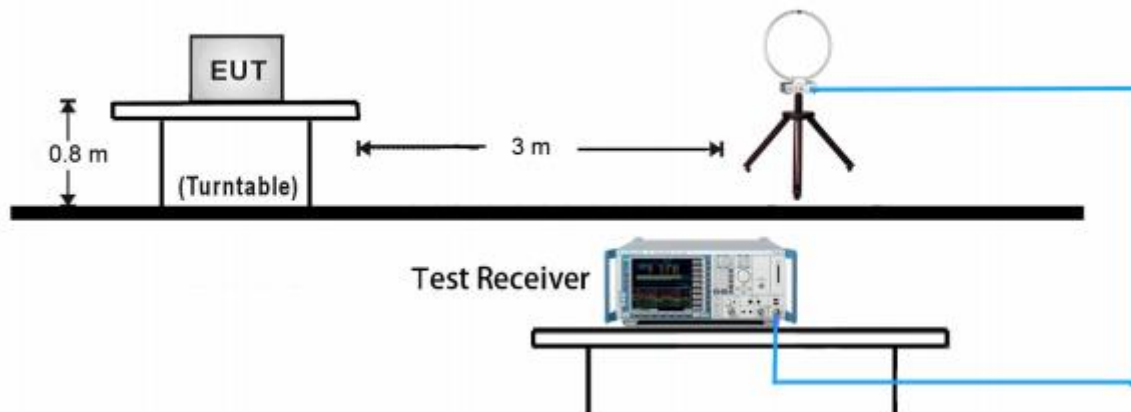
Tianji Xu

Tianji XU
Test Engineer

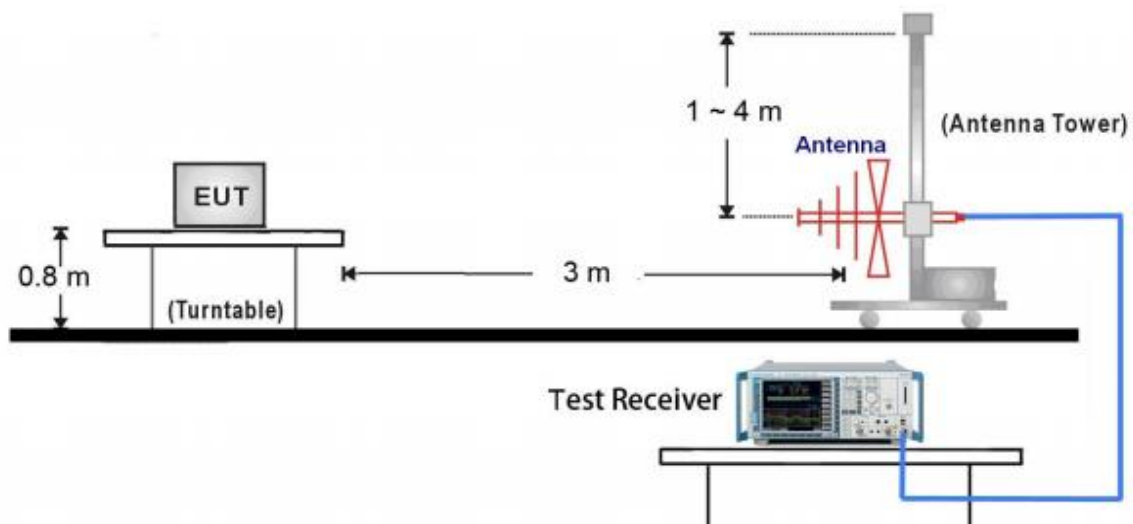
8 Test Setups

8.1 Radiated test setups

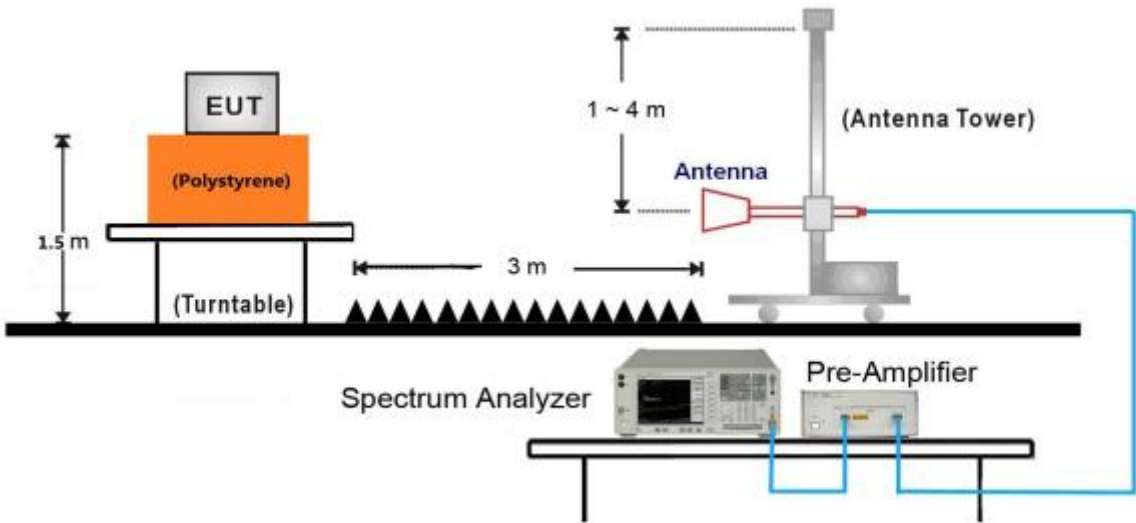
9kHz ~ 30MHz Test Setup:



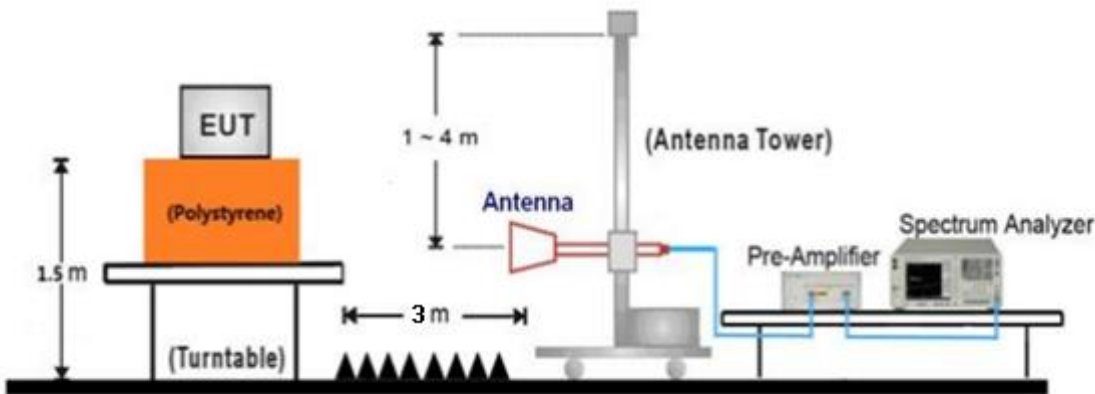
30MHz ~ 1GHz Test Setup:



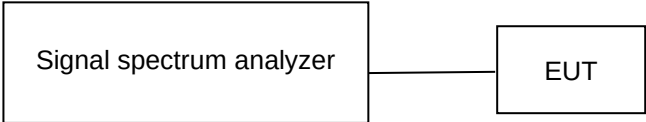
1GHz ~ 18GHz Test Setup:



18GHz ~ 25GHz Test Setup:



8.2 Conducted RF test setups



9 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
Notebook	Lenovo	E470	PF-OU5TS7 17/09

Test software: RTLBTAPP.exe, which used to control the EUT in continues transmitting mode

The system was configured to channel 0, 19, and 39 for the test.

Test Mode Applicability and Tested Channel Detail:

Mode	Tested Channel	Data Rate (Mbps)	Modulation	Power level setting
Bluetooth LE	0	1	GFSK	06
	19	1	GFSK	06
	39	1	GFSK	06
Bluetooth LE	0	2	GFSK	06
	19	2	GFSK	06
	39	2	GFSK	06

Non-hopping mode: The system was configured to operate at a signal channel transmitting. The test software allows the configuration and operation at the worst-case duty and the highest transmit power.

10 Technical Requirement

10.1 Conducted peak output power

Test Method

1. Use the following spectrum analyzer settings:
RBW > the 6 dB bandwidth of the emission being measured, VBW $\geq$ 3RBW, Span $\geq$ 3RBW
Sweep = auto, Detector function = peak, Trace = max hold.
2. Add a correction factor to the display.
3. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power.

Limits

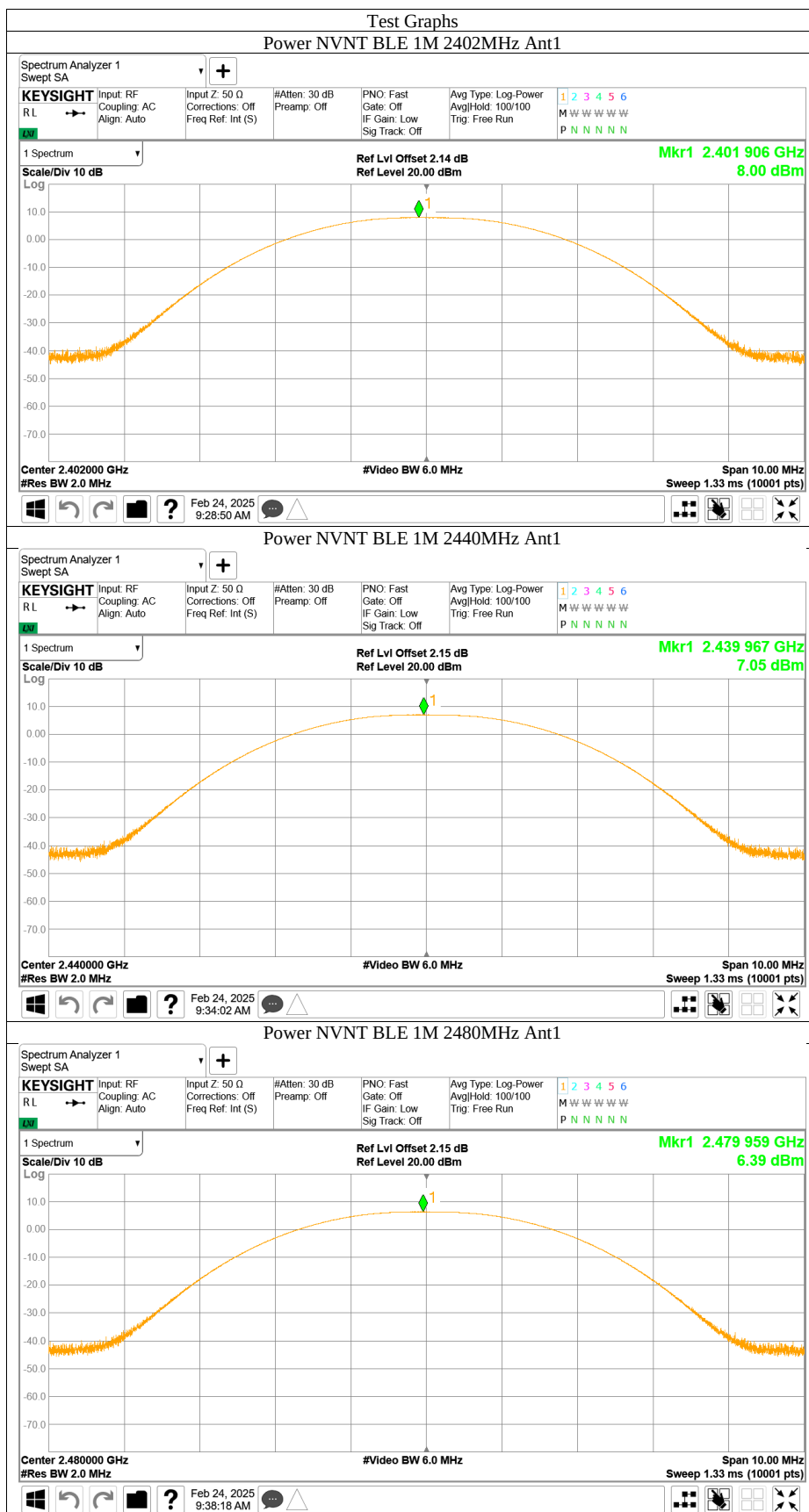
According to §15.247 (b) (3), conducted peak output power limit as below:

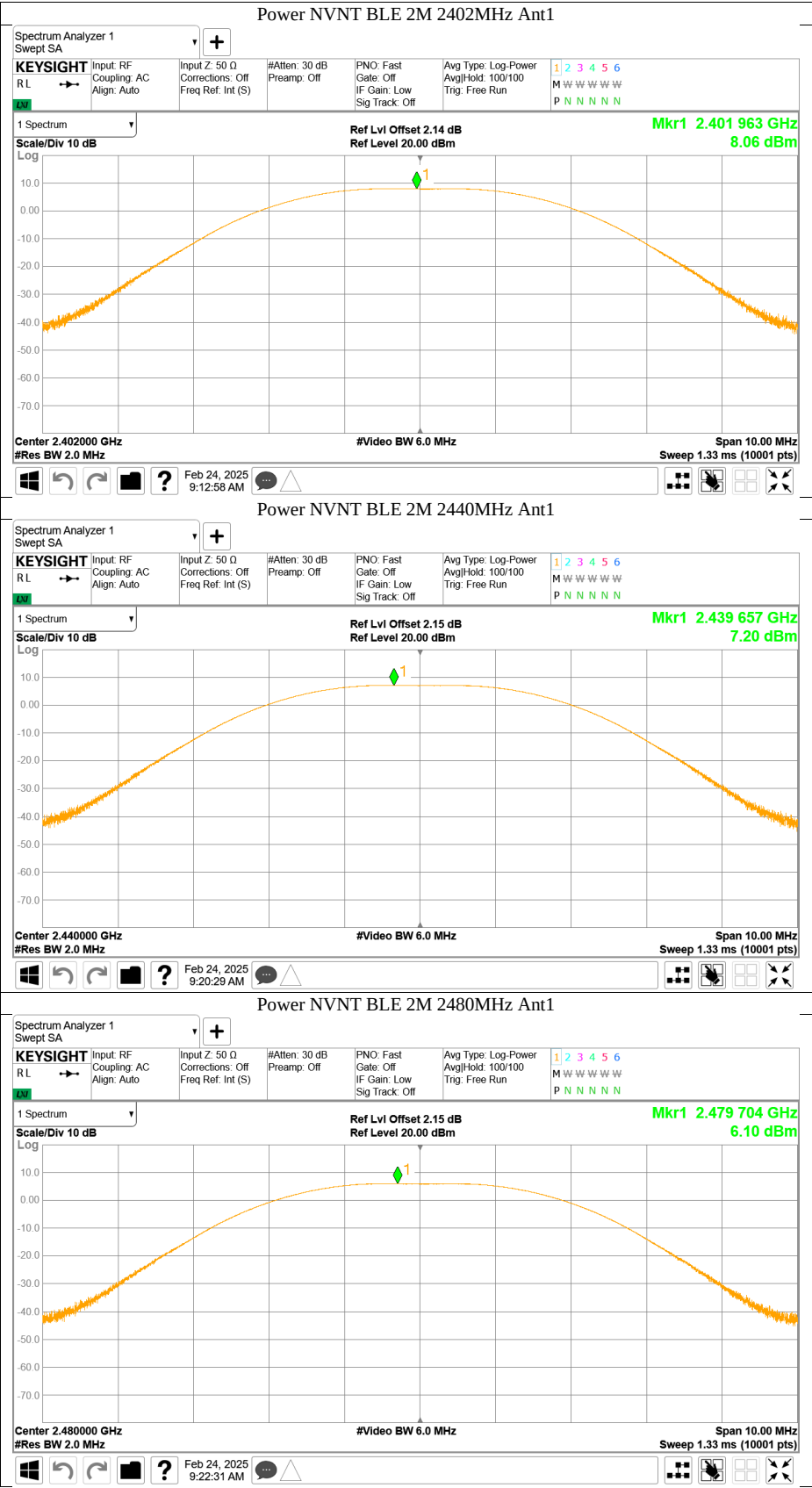
Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	≤ 1	≤ 30

Test result as below table

Data transmission rate:1Mbps		
Frequency	Conducted Peak Output Power	Result
MHz	dBm	
Low channel 2402MHz	8.00	Pass
Middle channel 2440MHz	7.05	Pass
High channel 2480MHz	6.39	Pass

Data transmission rate:2Mbps		
Frequency	Conducted Peak Output Power	Result
MHz	dBm	
Low channel 2402MHz	8.06	Pass
Middle channel 2440MHz	7.21	Pass
High channel 2480MHz	6.10	Pass





10.2 Spurious radiated emissions for transmitter

Test Method

1. The EUT was placed on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
3. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. Use the following spectrum analyzer settings According to C63.10
 - 1) Procedure for Unwanted Emissions Measurements Below 1000 MHz
Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 100 kHz to 120kHz, VBW ≥ RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.
 - 2) For Peak unwanted emissions Above 1GHz:
Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 1MHz, VBW ≥ RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.
Procedures for average unwanted emissions measurements above 1GHz
 - a) RBW = 1MHz.
 - b) $VBW \leq [3 \times RBW]$.
 - c) Detector = RMS (power averaging), if $[\text{span} / (\# \text{ of points in sweep})] \leq RBW / 2$.
Satisfying this condition can require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, then the detector mode shall be set to peak.
 - d) Averaging type = power (i.e., rms) (As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.)
 - e) Sweep time = auto.
 - f) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, then the number of traces shall be increased by a factor of $1 / D$, where D is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 100 traces shall be averaged.)
 - g) If tests are performed with the EUT transmitting at a duty cycle less than 98%, then a correction factor shall be added to the measurement results prior to comparing with the emission limit, to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:
 - 1) If power averaging (rms) mode was used in the preceding step e), then the correction factor is $[10 \log (1 / D)]$, where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB shall be added to the measured emission levels.



2) If linear voltage averaging mode was used in the preceding step e), then the correction factor is $[20 \log (1 / D)]$, where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB shall be added to the measured emission levels.

3) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission (AV) at frequency above 1GHz.

Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under § 15.247(b)(3) and RSS 247 section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in § 15.209(a) and RSS-Gen is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a) and RSS-Gen section 8.9, must also comply with the radiated emission limits specified in § 15.209(a) and RSS-Gen section 8.10.

Frequency MHz	Field Strength $\mu\text{V/m}$	Field Strength $\text{dB}\mu\text{V/m}$	Detector	Measurement distance meters
0.009-0.490	2400/F(kHz)	48.5-13.8	AV	300
0.490-1.705	24000/F(kHz)	33.8-23.0	QP	30
1.705-30	30	29.5	QP	30
30-88	100	40	QP	3
88-216	150	43.5	QP	3
216-960	200	46	QP	3
960-1000	500	54	QP	3
Above 1000	500	54	AV	3
Above 1000	5000	74	PK	3

Note 1: Limit $3\text{m}(\text{dB}\mu\text{V/m}) = \text{Limit } 300\text{m}(\text{dB}\mu\text{V/m}) + 40\text{Log}(300\text{m}/3\text{m})$ (Below 30MHz)

Note 2: Limit $3\text{m}(\text{dB}\mu\text{V/m}) = \text{Limit } 30\text{m}(\text{dB}\mu\text{V/m}) + 40\text{Log}(30\text{m}/3\text{m})$ (Below 30MHz)

Spurious radiated emissions for transmitter

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

Test result

Worst case Radiated Emission 9KHz-30MHz

0.009-30MHz Radiated Emission

EUT Information

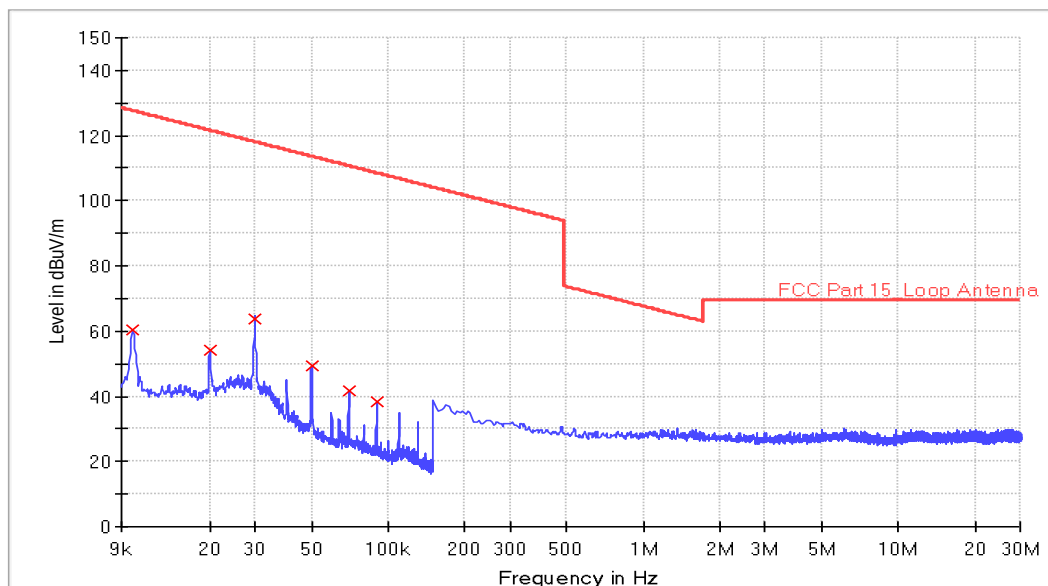
EUT Name: Smart Battery Doorbell
 Model: SC162-WCE3
 Client: Zhejiang Lingzhu Technology Co., Ltd
 Op Cond: Power on and TX_2402MHz at 1Mbps data rate
 Operator: Tianji XU
 Test Spec: FCC Part 15.209(a)
 Comment: Horizontal
 Sample No: SHA-884460-1

Sweep Setup: RE_Loop E_pre [EMI radiated]

Hardware Setup: RE_Loop Antenna V
 Receiver: [ESR 3]
 Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
9 kHz - 150 kHz	70.5 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	3.731 kHz	PK+	9 kHz	0.01 s	0 dB

RE_Loop E_pre

**Limit and Margin**

Frequency (MHz)	MaxPeak (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBuV/m)
0.009880	60.2	0.200	100.0	H	0.0	19.6	67.509	127.709
0.019960	54.4	0.200	100.0	H	0.0	19.0	67.241	121.601
0.029960	63.5	0.200	100.0	H	0.0	18.9	54.573	118.073
0.050040	49.5	0.200	100.0	H	0.0	18.9	64.108	113.618
0.069960	41.7	0.200	100.0	H	0.0	18.8	69.047	110.707
0.090040	38.1	0.200	100.0	H	0.0	18.8	70.415	108.515

0.009-30MHz Radiated Emission

EUT Information

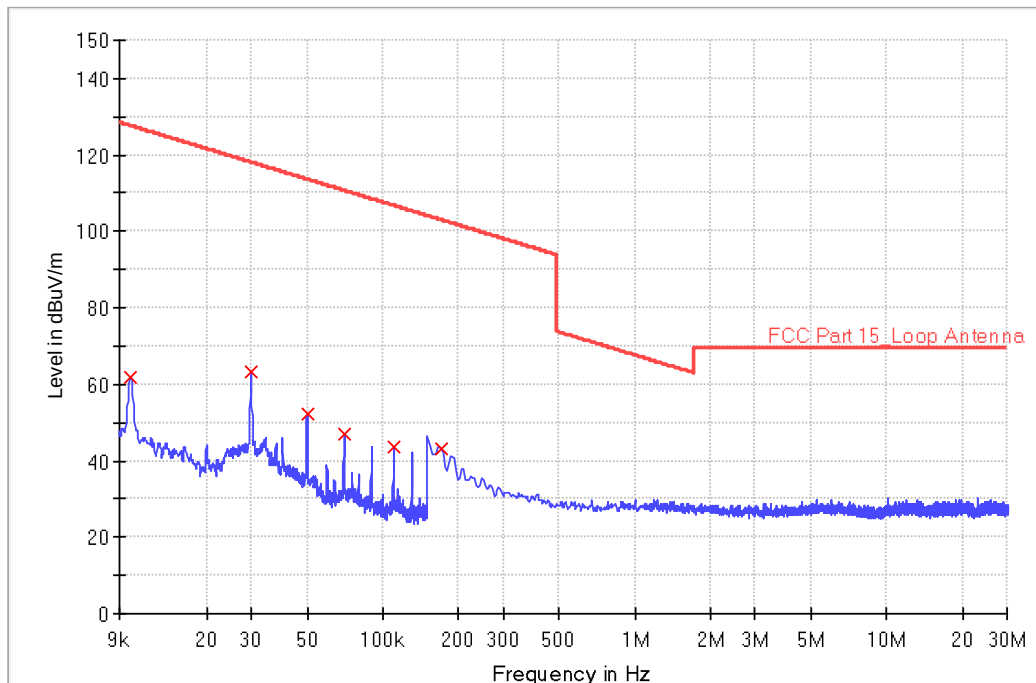
EUT Name: Smart Battery Doorbell
 Model: SC162-WCE3
 Client: Zhejiang Lingzhu Technology Co., Ltd
 Op Cond: Power on and TX_2402MHz at 1Mbps data rate
 Operator: Tianji XU
 Test Spec: FCC Part 15.209(a)
 Comment: Vertical
 Sample No: SHA-884460-1

Sweep Setup: RE_Loop E_pre [EMI radiated]

Hardware Setup: RE_Loop Antenna V
 Receiver: [ESR 3]
 Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamplifier
9 kHz - 150 kHz	70.5 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	3.731 kHz	PK+	9 kHz	0.01 s	0 dB

RE_Loop E_pre



Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBuV/m)
0.009960	61.8	1000.0	0.200	100.0	V	0.0	19.6	65.882	127.639
0.029960	63.4	1000.0	0.200	100.0	V	0.0	18.9	54.633	118.073
0.050040	52.2	1000.0	0.200	100.0	V	0.0	18.9	61.408	113.618
0.069960	47.0	1000.0	0.200	100.0	V	0.0	18.8	63.677	110.707
0.110040	43.5	1000.0	0.200	100.0	V	0.0	18.8	63.253	106.773
0.170000	43.0	1000.0	9.000	100.0	V	0.0	18.7	59.995	102.995

Worst case Radiated Emission 30MHz-1GHz

30-1000MHz Radiated Emission**EUT Information**

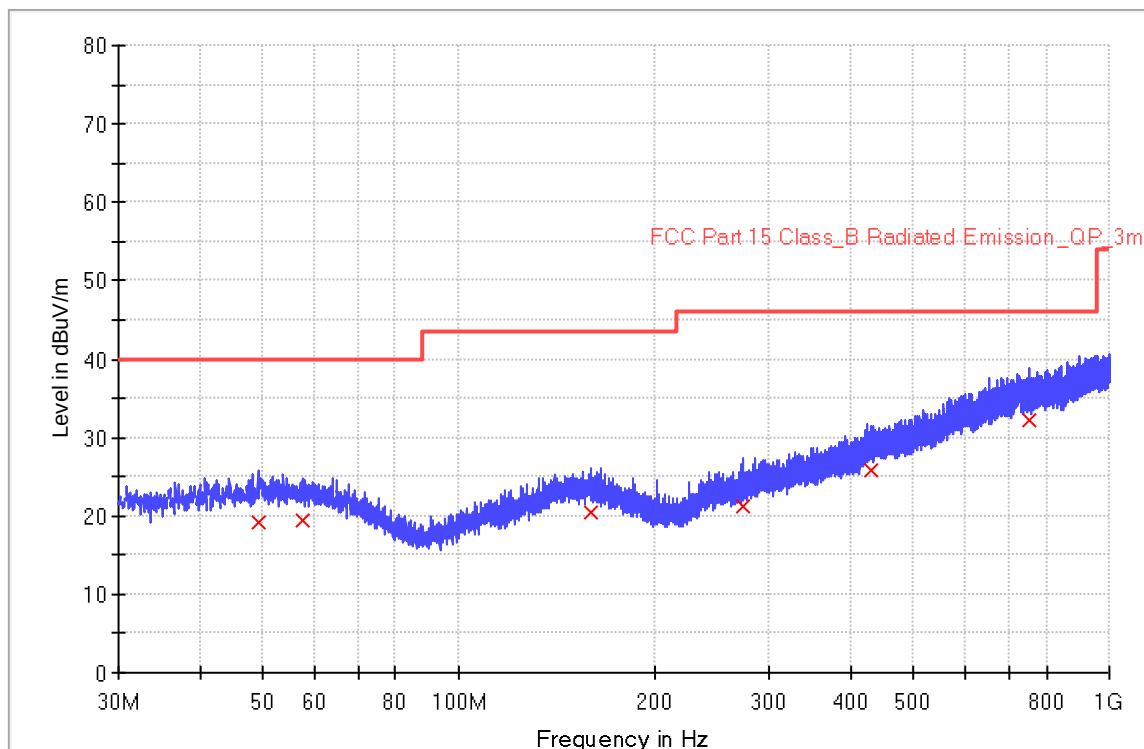
EUT Name: Smart Battery Doorbell
Model: SC162-WCE3
Client: Zhejiang Lingzhu Technology Co., Ltd
Op Cond: Power on and TX_2402MHz at 1Mbps data rate
Operator: Tianji XU
Test Spec: FCC Part 15.209(a)
Comment: Horizontal
Sample No: SHA-884460-1

Sweep Setup: RE_VULB9168_pre_Cont_30-1000 [EMI radiated]

Hardware Setup: RE_VULB9168
Receiver: [ESR 3]
Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 1 GHz	48.5 kHz	PK+	120 kHz	0.2 s	20 dB

RE_VULB9168_pre_Cont_30-1000



Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - QPK (dB)
49.120000	19.2	1000.0	120.000	112.0	H	234.0	20.8	20.8
57.760000	19.3	1000.0	120.000	200.0	H	228.0	20.8	20.7
159.360000	20.4	1000.0	120.000	150.0	H	301.0	21.0	23.1
274.400000	21.1	1000.0	120.000	157.0	H	117.0	20.9	24.9
429.960000	25.8	1000.0	120.000	230.0	H	287.0	25.5	20.2
751.760000	32.3	1000.0	120.000	220.0	H	31.0	32.2	13.7

(continuation of the "Limit and Margin" table from column 16 ...)

Frequency (MHz)	Limit - QPK (dBuV/m)	Comment
49.120000	40.0	
57.760000	40.0	
159.360000	43.5	
274.400000	46.0	
429.960000	46.0	
751.760000	46.0	

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

30-1000MHz Radiated Emission

EUT Information

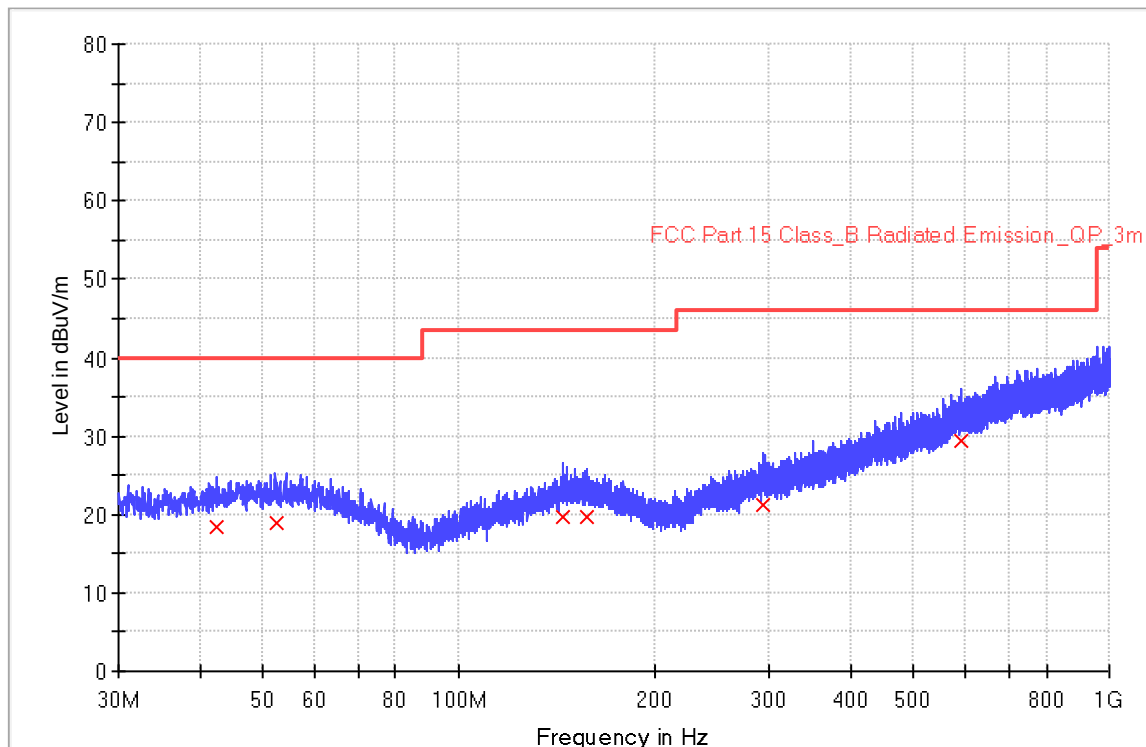
EUT Name: Smart Battery Doorbell
Model: SC162-WCE3
Client: Zhejiang Lingzhu Technology Co., Ltd
Op Cond: Power on and TX_2402MHz at 1Mbps data rate
Operator: Tianji XU
Test Spec: FCC Part 15.209(a)
Comment: Vertical
Sample No: SHA-884460-1

Sweep Setup: RE_VULB9168_pre_Cont_30-1000 [EMI radiated]

Hardware Setup: RE_VULB9168
Receiver: [ESR 3]
Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamplifier
30 MHz - 1 GHz	48.5 kHz	PK+	120 kHz	0.2 s	20 dB

RE_VULB9168_pre_Cont_30-1000



Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - QPK (dB)
42.400000	18.4	1000.0	120.000	110.0	V	240.0	20.1	21.6
52.320000	18.9	1000.0	120.000	100.0	V	291.0	20.9	21.1
144.560000	20.2	1000.0	120.000	220.0	V	211.0	20.9	23.3
157.440000	19.7	1000.0	120.000	150.0	V	359.0	21.1	23.8
294.440000	21.1	1000.0	120.000	102.0	V	314.0	21.7	24.9
592.280000	29.4	1000.0	120.000	110.0	V	225.0	29.3	16.6

(continuation of the "Limit and Margin" table from column 16 ...)

Frequency (MHz)	Limit - QPK (dBuV/m)	Comment
42.400000	40.0	
52.320000	40.0	
144.560000	43.5	
157.440000	43.5	
294.440000	46.0	
592.280000	46.0	

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

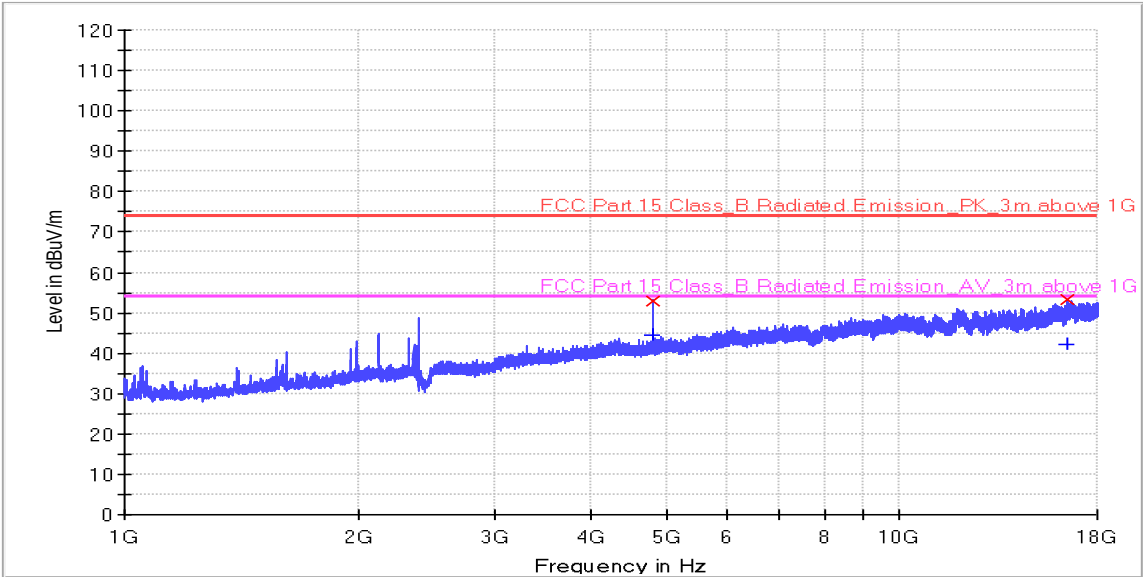
Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)



Radiated Emission 1-18 GHz

Frequency:2402MHz at 1Mbps

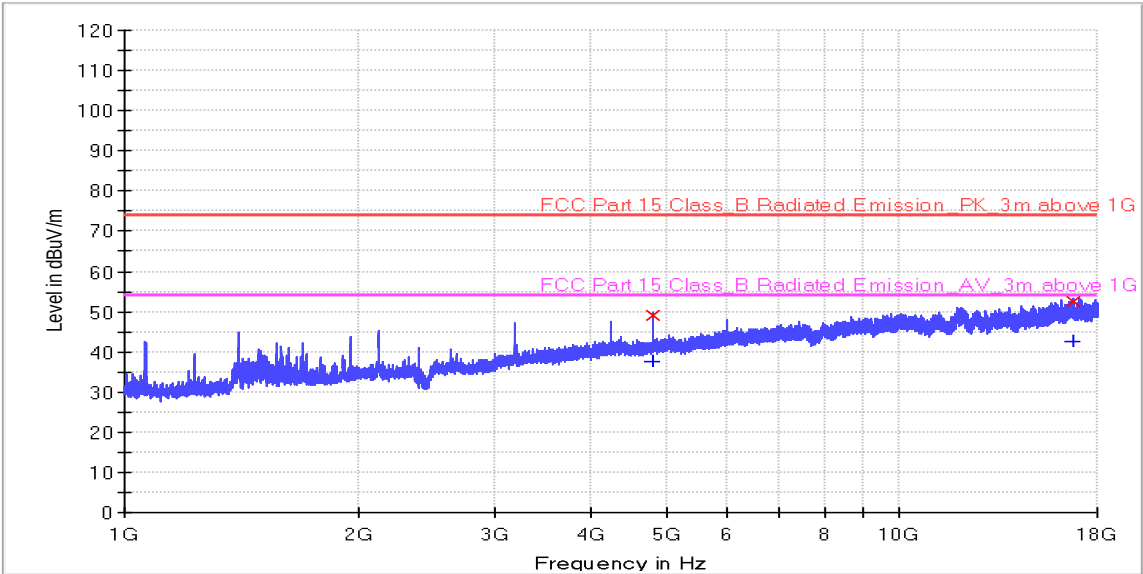
RE_HF907_BRF_Pre



Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+	Limit - PK+	Margin - AV	Limit - AV
4803.700000	52.8	44.3	1000.000	156.0	H	253.0	-2.7	21.2	74.0	9.7	54.0
16473.700000	53.1	42.3	1000.000	103.0	H	253.0	6.7	20.9	74.0	11.7	54.0

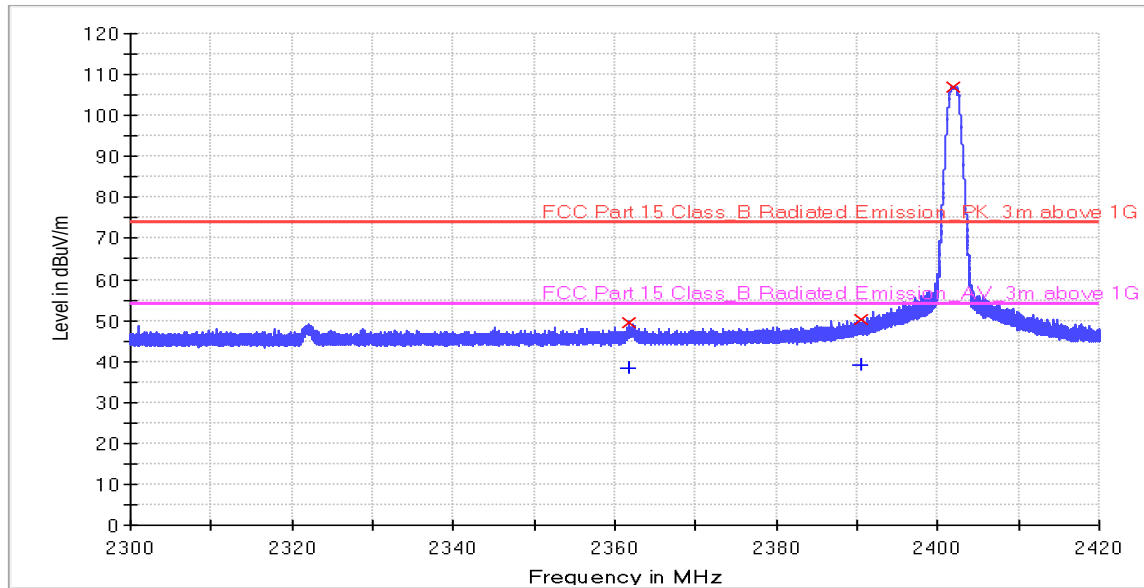
RE_HF907_BRF_Pre



Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+	Limit - PK+	Margin - AV	Limit - AV
4804.900000	49.1	37.7	1000.000	172.0	V	46.0	-2.7	24.9	74.0	16.3	54.0
16745.200000	52.6	42.6	1000.000	128.0	V	46.0	7.2	21.4	74.0	11.4	54.0

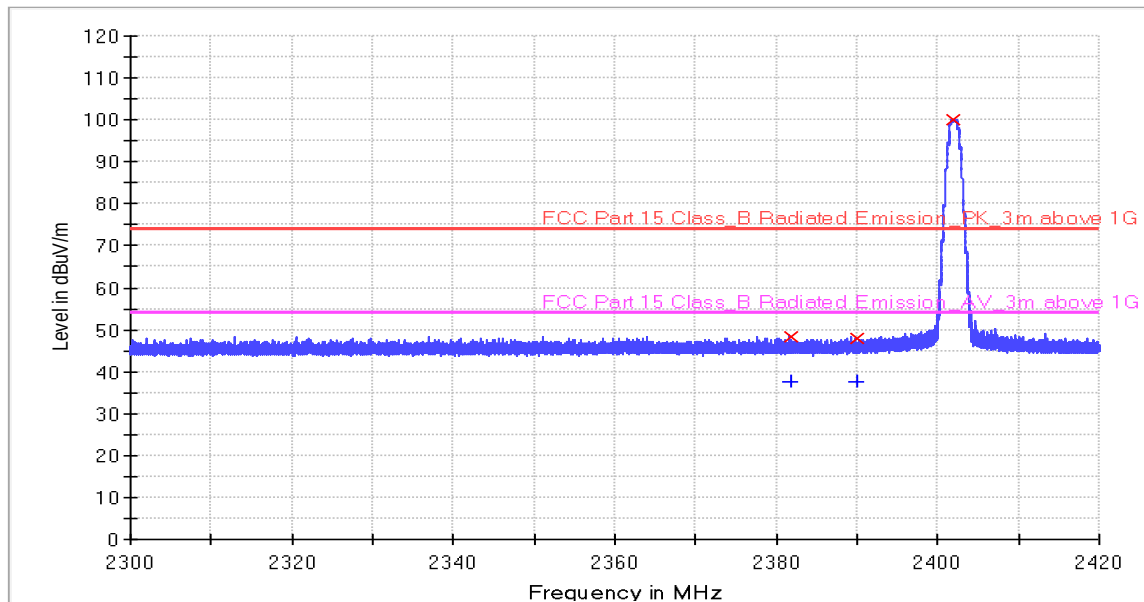
RE_HF907_BRF_Pre



Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBuV/)	Margin - AV (dB)	Limit - AV (dBuV/)
2361.700000	49.5	38.5	1000.000	103.0	H	1.0	-0.9	24.5	74.0	15.5	54.0
2390.500000	50.3	39.1	1000.000	232.0	H	1.0	-0.8	23.7	74.0	14.9	54.0
2402.000000	106.9	---	1000.000	169.0	H	1.0	-0.8	-32.9	74.0	---	---

RE_HF907_BRF_Pre

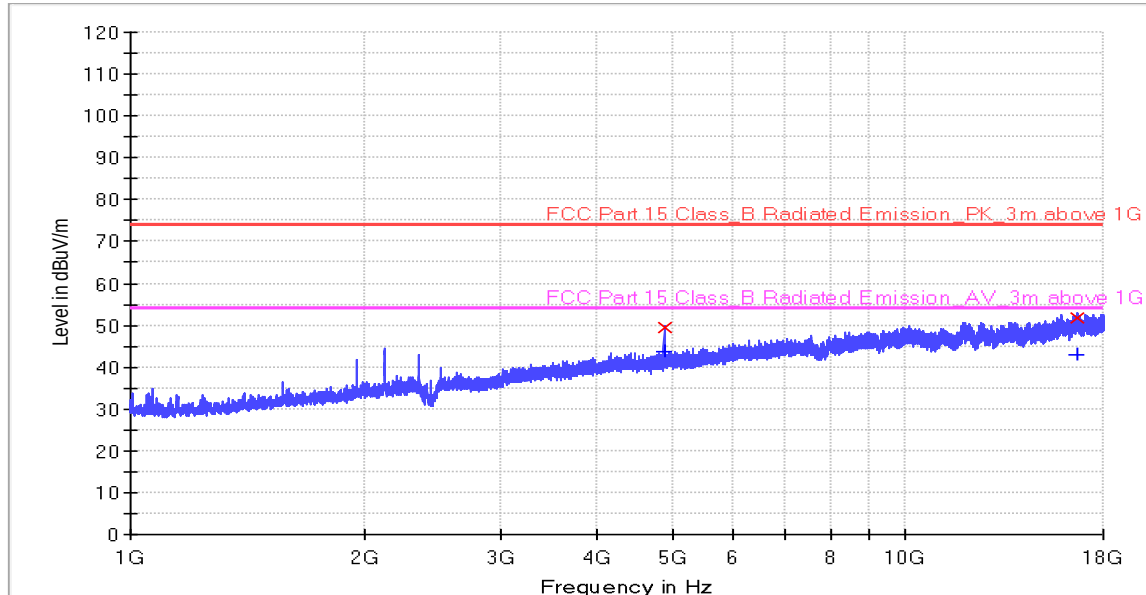


Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBuV/)	Margin - AV (dB)	Limit - AV (dBuV/)
2381.800000	48.2	37.6	1000.000	249.0	V	0.0	-0.8	25.8	74.0	16.4	54.0
2390.000000	47.9	37.4	1000.000	160.0	V	0.0	-0.8	26.1	74.0	16.6	54.0
2402.000000	100.1	---	1000.000	230.0	V	0.0	-0.8	-26.1	74.0	---	---

Frequency: 2440MHz at 1Mbps

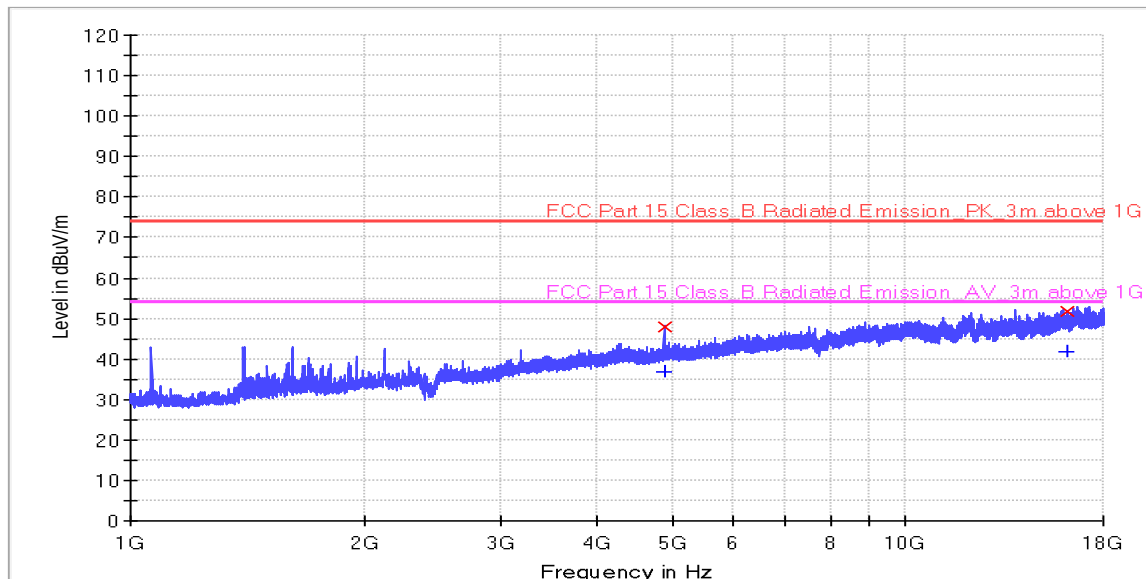
RE_HF907_BRF_Pre



Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+	Limit - PK+	Margin - AV	Limit - AV
4880.200000	49.5	43.8	1000.000	299.0	H	192.0	-2.4	24.5	74.0	10.2	54.0
16702.300000	51.8	43.1	1000.000	175.0	H	192.0	7.2	22.2	74.0	10.9	54.0

RE_HF907_BRF_Pre



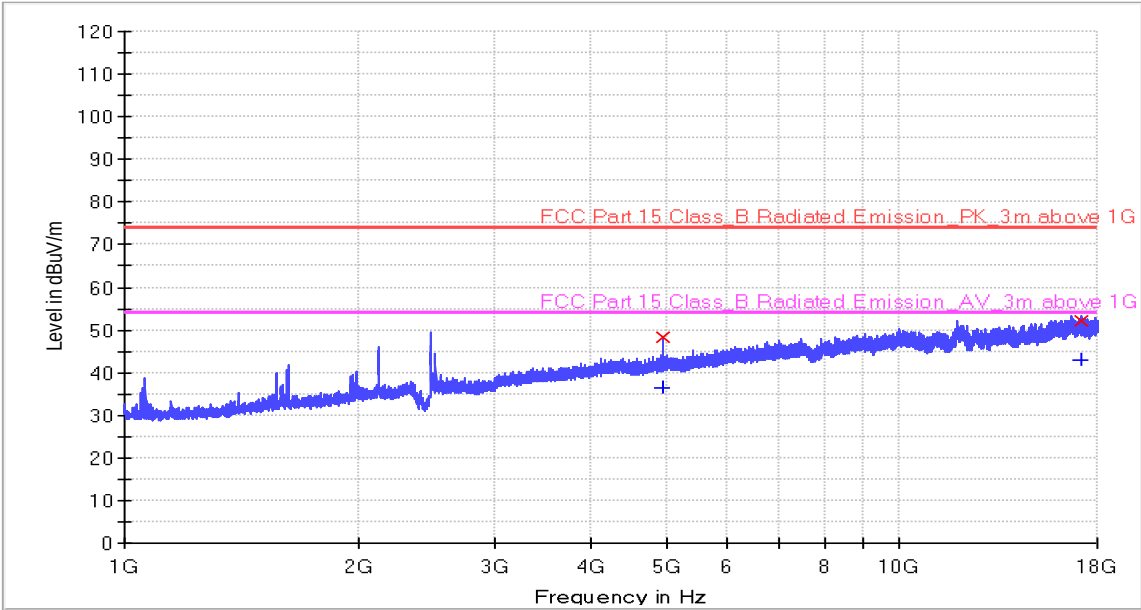
Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+	Limit - PK+	Margin - AV	Limit - AV
4879.300000	48.1	36.7	1000.000	242.0	V	162.0	-2.4	25.9	74.0	17.3	54.0
16125.700000	51.6	41.9	1000.000	140.0	V	162.0	6.3	22.4	74.0	12.1	54.0



Frequency:2480MHz at 1Mbps

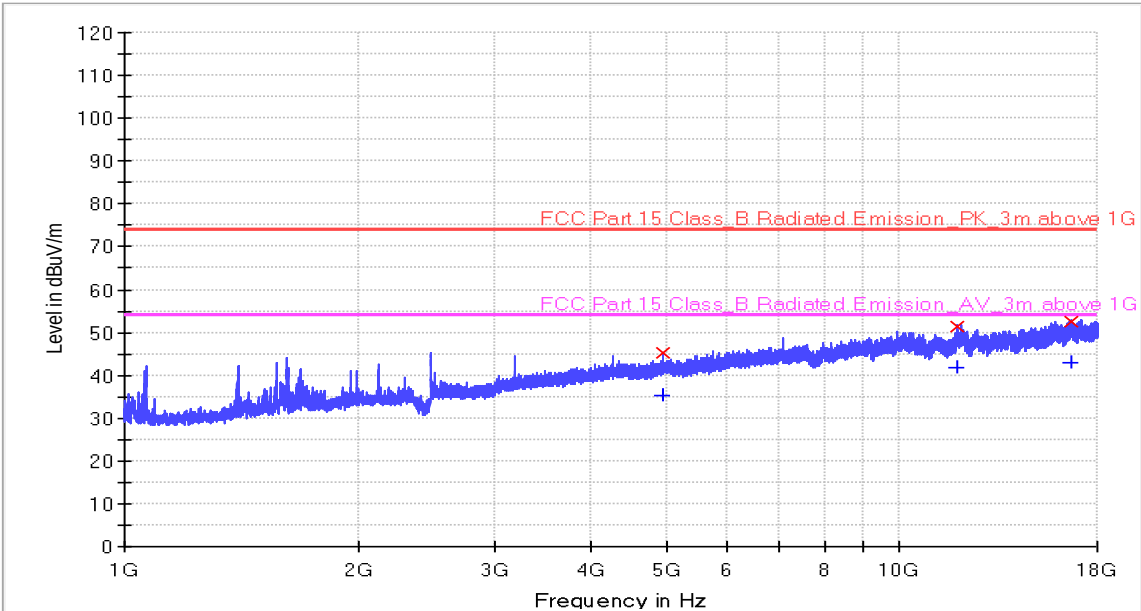
RE_HF907_BRF_Pre



Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+	Limit - PK+	Margin - AV	Limit - AV
4960.900000	48.3	36.6	1000.000	167.0	H	1.0	-2.3	25.7	74.0	17.4	54.0
17121.400000	52.3	43.1	1000.000	265.0	H	1.0	7.3	21.7	74.0	10.9	54.0

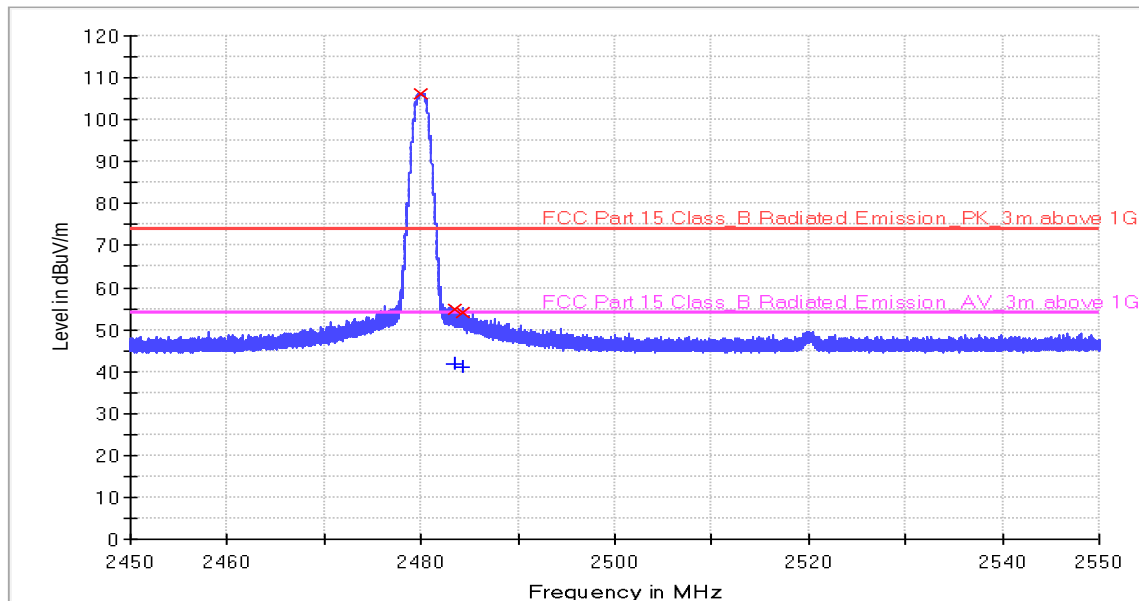
RE_HF907_BRF_Pre



Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+	Limit - PK+	Margin - AV	Limit - AV
4960.900000	45.2	35.1	1000.000	292.0	V	163.0	-2.3	28.8	74.0	18.9	54.0
11849.800000	51.2	41.6	1000.000	280.0	V	163.0	5.1	22.8	74.0	12.4	54.0
16670.800000	52.4	43.0	1000.000	169.0	V	163.0	7.2	21.6	74.0	11.0	54.0

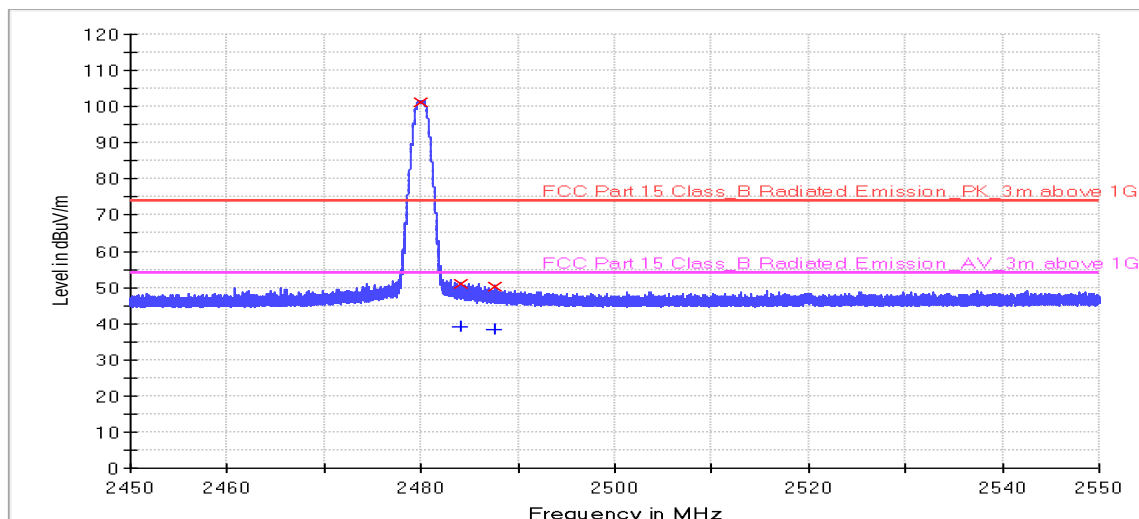
RE_HF907_BRF_Pre



Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBuV/)	Margin - AV (dB)	Limit - AV (dBuV/)
2480.000000	106.3	---	1000.000	167.0	H	1.0	-0.3	-32.3	74.0	---	---
2483.500000	54.7	41.7	1000.000	300.0	H	1.0	-0.3	19.3	74.0	12.3	54.0
2484.400000	54.2	41.2	1000.000	172.0	H	1.0	-0.3	19.8	74.0	12.8	54.0

RE_HF907_BRF_Pre

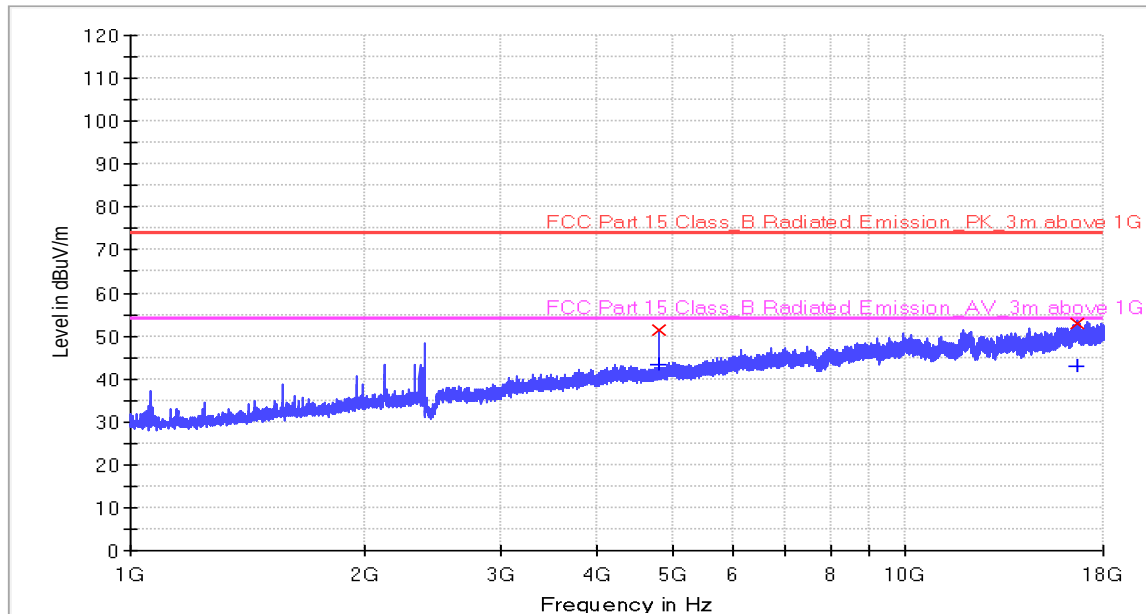


Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBuV/)	Margin - AV (dB)	Limit - AV (dBuV/)
2480.000000	101.3	---	1000.000	246.0	V	0.0	-0.3	-27.3	74.0	---	---
2483.500000	51.0	39.0	1000.000	221.0	V	0.0	-0.3	23.0	74.0	15.0	54.0
2487.700000	50.3	38.3	1000.000	251.0	V	0.0	-0.3	23.7	74.0	15.7	54.0

Frequency: 2402MHz at 2Mbps

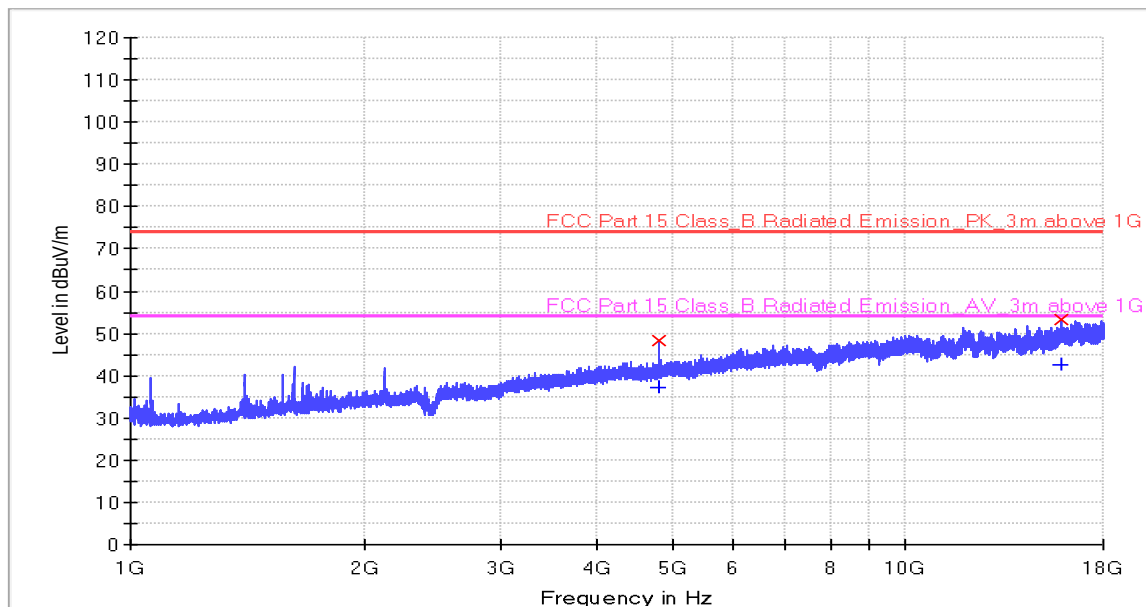
RE_HF907_BRF_Pre



Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+	Limit - PK+	Margin - AV	Limit - AV
4804.900000	51.4	43.5	1000.000	119.0	H	359.0	-2.7	22.6	74.0	10.5	54.0
16677.700000	52.9	43.0	1000.000	246.0	H	359.0	7.2	21.1	74.0	11.0	54.0

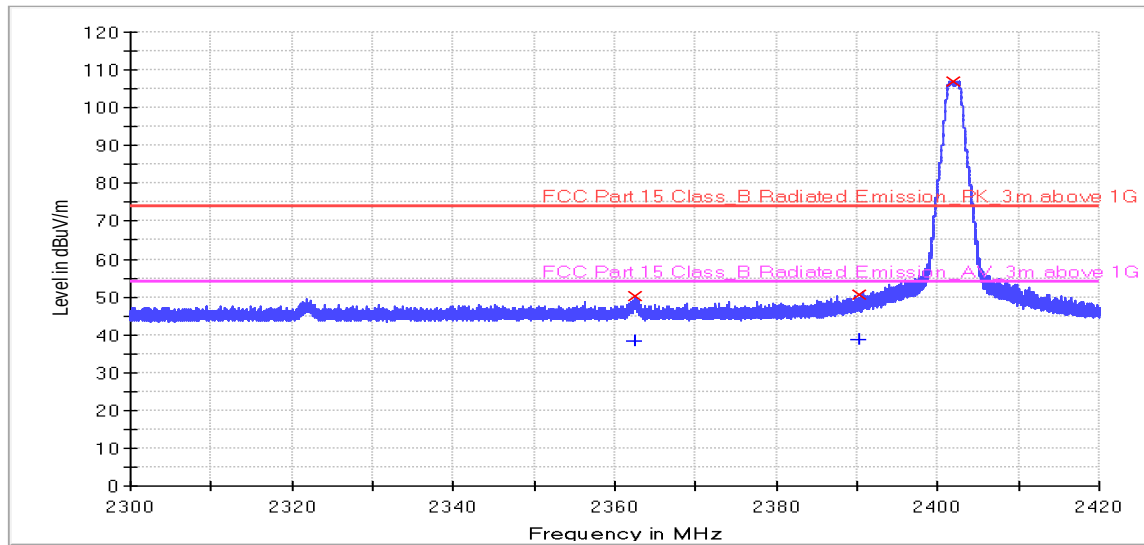
RE_HF907_BRF_Pre



Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+	Limit - PK+	Margin - AV	Limit - AV
4802.800000	48.2	37.1	1000.000	289.0	V	1.0	-2.7	25.8	74.0	16.9	54.0
15902.200000	53.2	42.5	1000.000	230.0	V	1.0	5.9	20.8	74.0	11.5	54.0

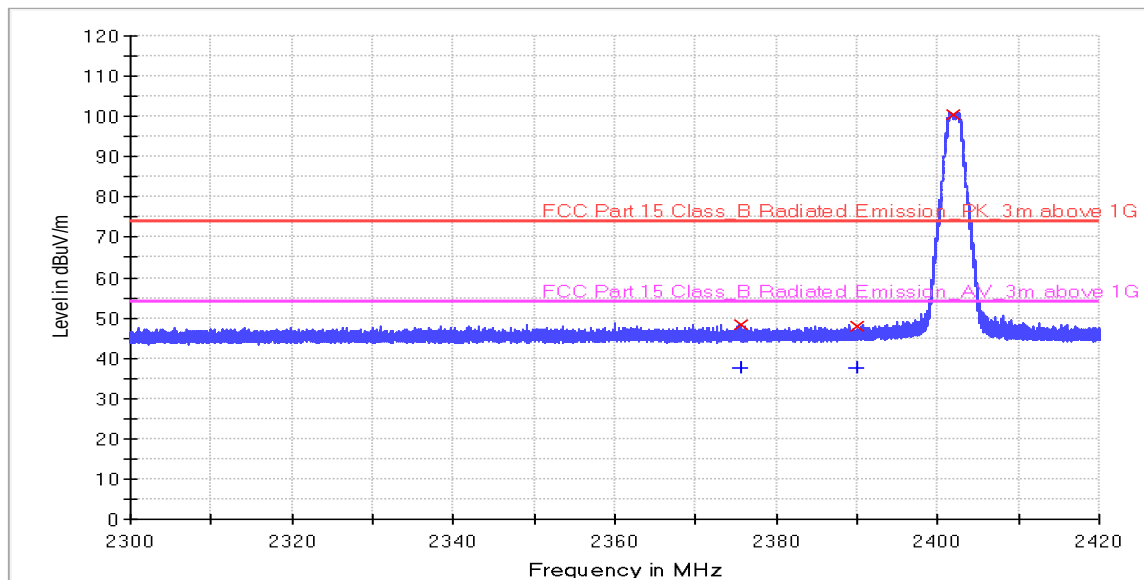
RE_HF907_BRF_Pre



Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBuV)	Margin - AV (dB)	Limit - AV (dBuV)
2362.600000	50.1	38.2	1000.000	139.0	H	330.0	-0.9	23.9	74.0	15.8	54.0
2390.200000	50.5	38.6	1000.000	107.0	H	330.0	-0.8	23.5	74.0	15.4	54.0
2402.000000	106.9	---	1000.000	192.0	H	330.0	-0.8	-32.9	74.0	---	---

RE_HF907_BRF_Pre



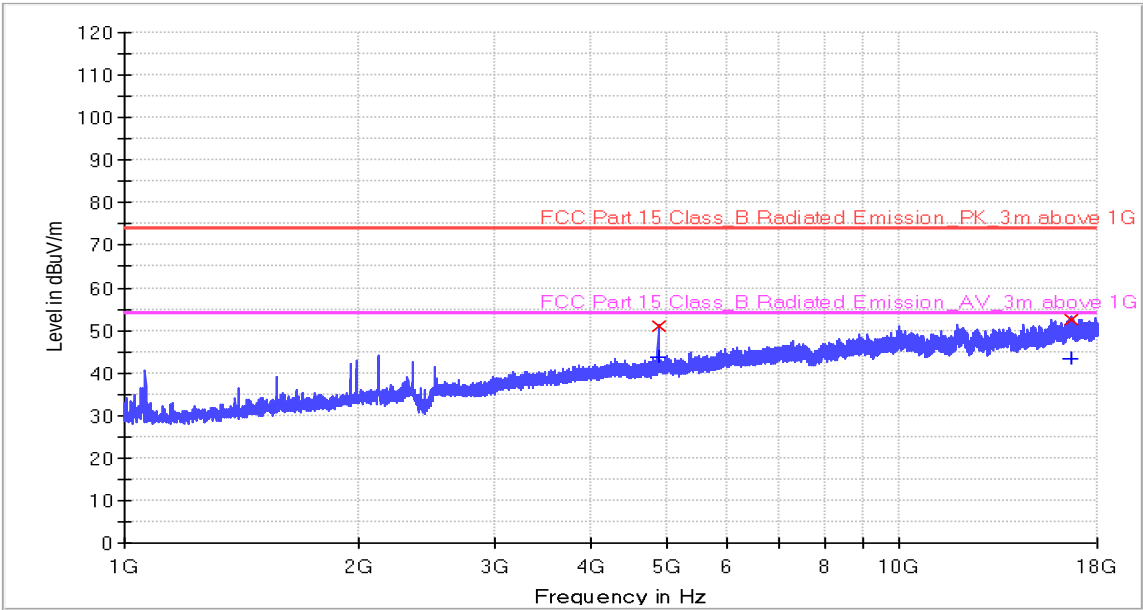
Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBuV)	Margin - AV (dB)	Limit - AV (dBuV)
2375.500000	48.2	37.4	1000.000	103.0	V	0.0	-0.8	25.8	74.0	16.6	54.0
2390.000000	47.8	37.5	1000.000	169.0	V	0.0	-0.8	26.2	74.0	16.5	54.0
2402.000000	100.6	---	1000.000	140.0	V	0.0	-0.8	-26.6	74.0	---	---



Frequency:2440MHz at 2Mbps

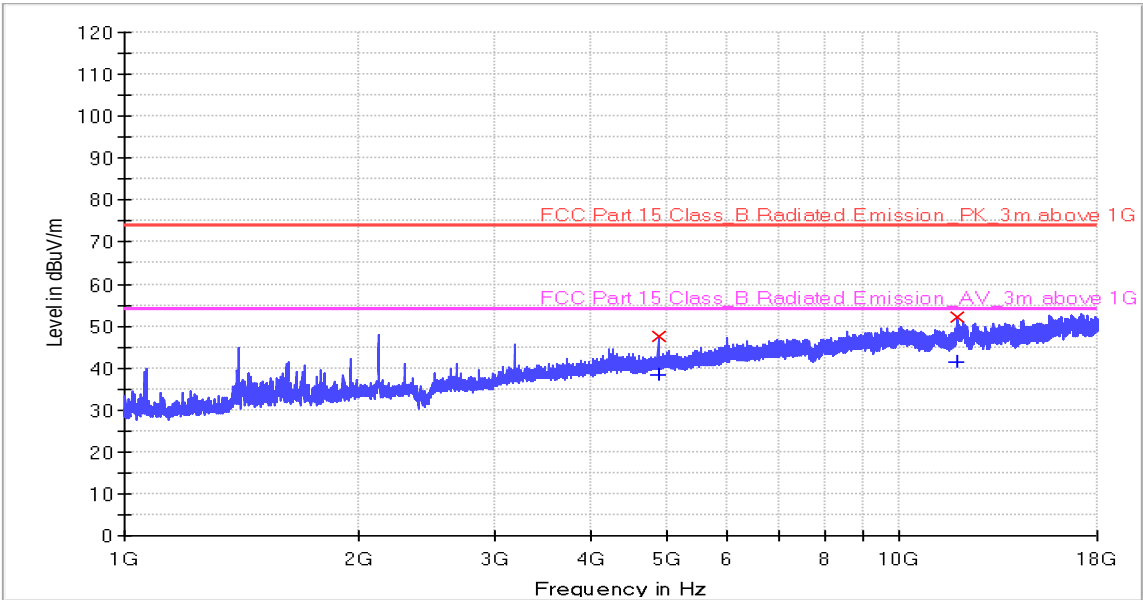
RE_HF907_BRF_Pre



Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+	Limit - PK+	Margin - AV	Limit - AV
4880.200000	51.1	43.7	1000.000	253.0	H	26.0	-2.4	22.9	74.0	10.3	54.0
16688.200000	52.6	43.3	1000.000	108.0	H	26.0	7.2	21.4	74.0	10.7	54.0

RE_HF907_BRF_Pre



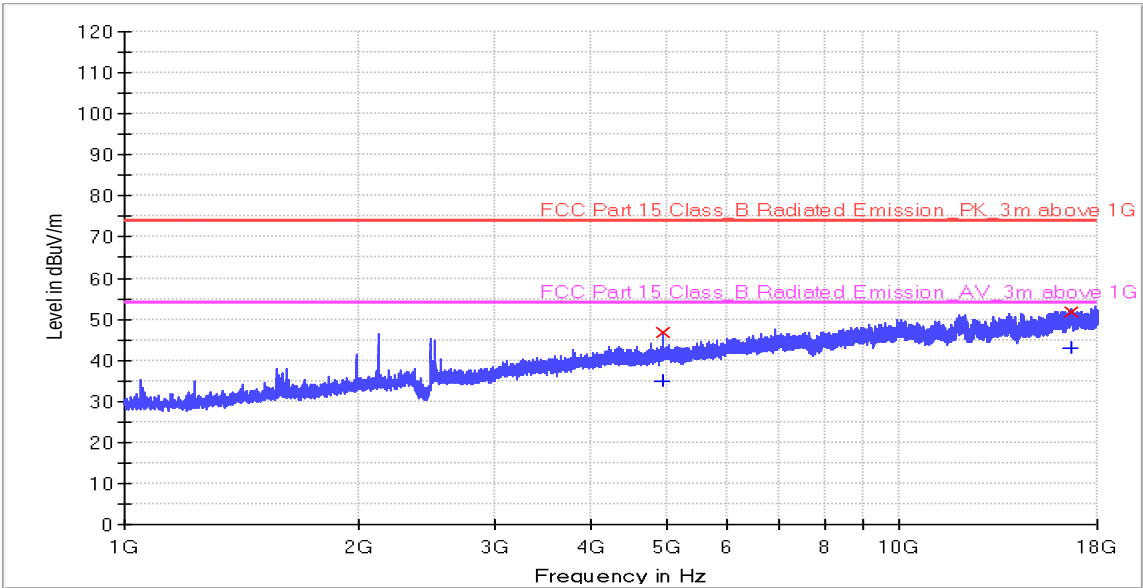
Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+	Limit - PK+	Margin - AV	Limit - AV
4880.800000	47.5	38.2	1000.000	264.0	V	1.0	-2.4	26.5	74.0	15.8	54.0
11845.600000	52.3	41.3	1000.000	238.0	V	1.0	5.1	21.7	74.0	12.7	54.0



Frequency:2480MHz at 2Mbps

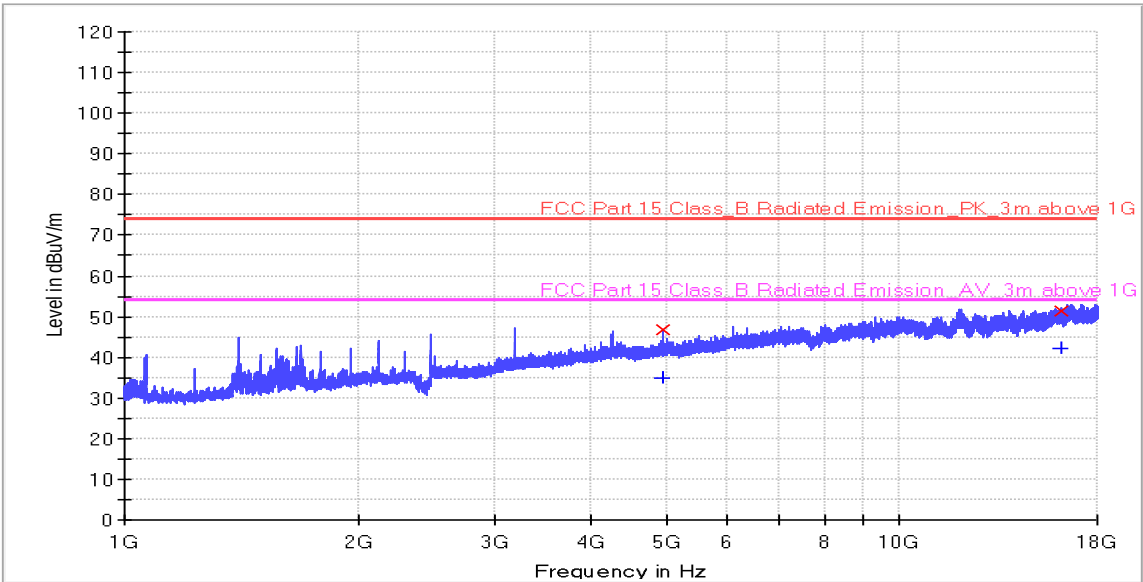
RE_HF907_BRF_Pre



Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+	Limit - PK+	Margin - AV	Limit - AV
4960.900000	46.9	35.0	1000.000	294.0	H	118.0	-2.3	27.1	74.0	19.0	54.0
16686.700000	51.6	43.1	1000.000	257.0	H	118.0	7.2	22.4	74.0	10.9	54.0

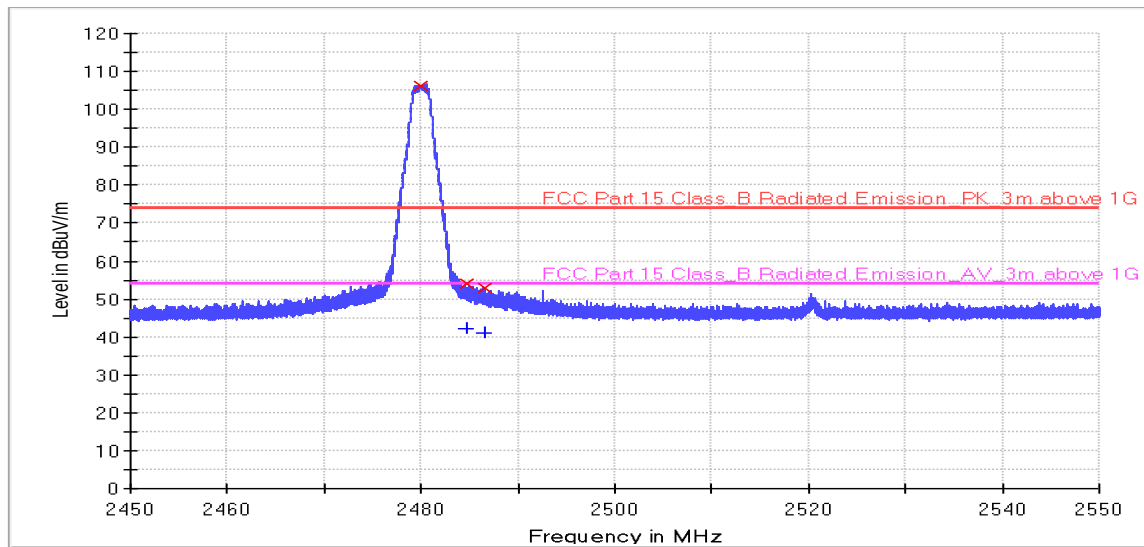
RE_HF907_BRF_Pre



Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+	Limit - PK+	Margin - AV	Limit - AV
4960.600000	46.7	34.8	1000.000	283.0	V	1.0	-2.3	27.3	74.0	19.2	54.0
16191.700000	51.2	42.0	1000.000	106.0	V	1.0	6.2	22.8	74.0	12.0	54.0

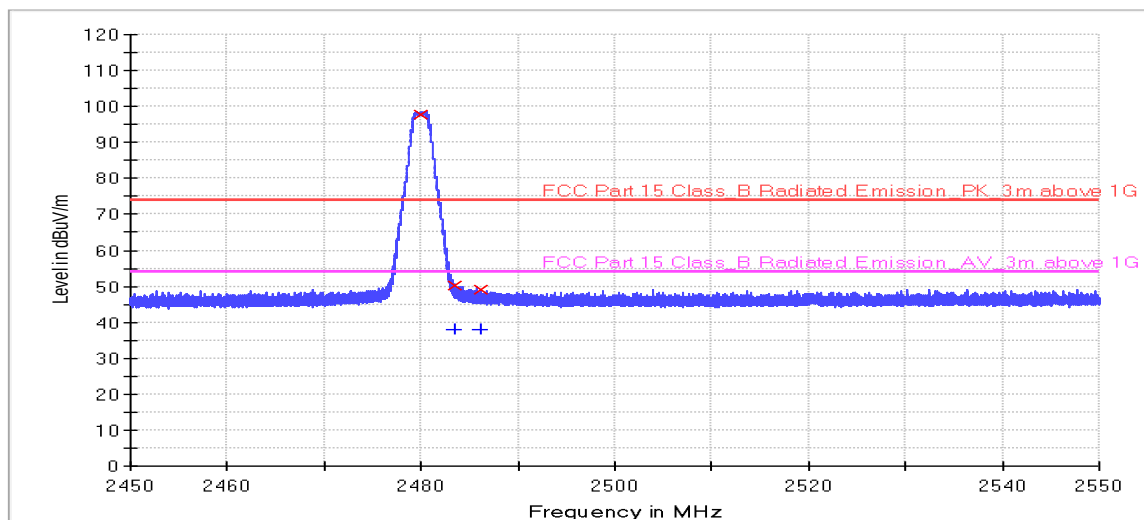
RE_HF907_BRF_Pre



Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBuV)	Margin - AV (dB)	Limit - AV (dBuV)
2480.000000	106.3	---	1000.000	184.0	H	350.0	-0.3	-32.3	74.0	---	---
2484.700000	54.1	42.3	1000.000	280.0	H	350.0	-0.3	19.9	74.0	11.7	54.0
2486.500000	52.9	41.2	1000.000	122.0	H	350.0	-0.3	21.1	74.0	12.8	54.0

RE_HF907_BRF_Pre



Limit and Margin

Frequency (MHz)	MaxPeak (dBuV/m)	AV (dBuV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBuV)	Margin - AV (dB)	Limit - AV (dBuV)
2480.000000	97.8	---	1000.000	147.0	V	159.0	-0.3	-23.8	74.0	---	---
2483.500000	50.2	38.1	1000.000	111.0	V	159.0	-0.3	23.8	74.0	15.9	54.0
2486.200000	49.2	37.9	1000.000	231.0	V	159.0	-0.3	24.8	74.0	16.1	54.0

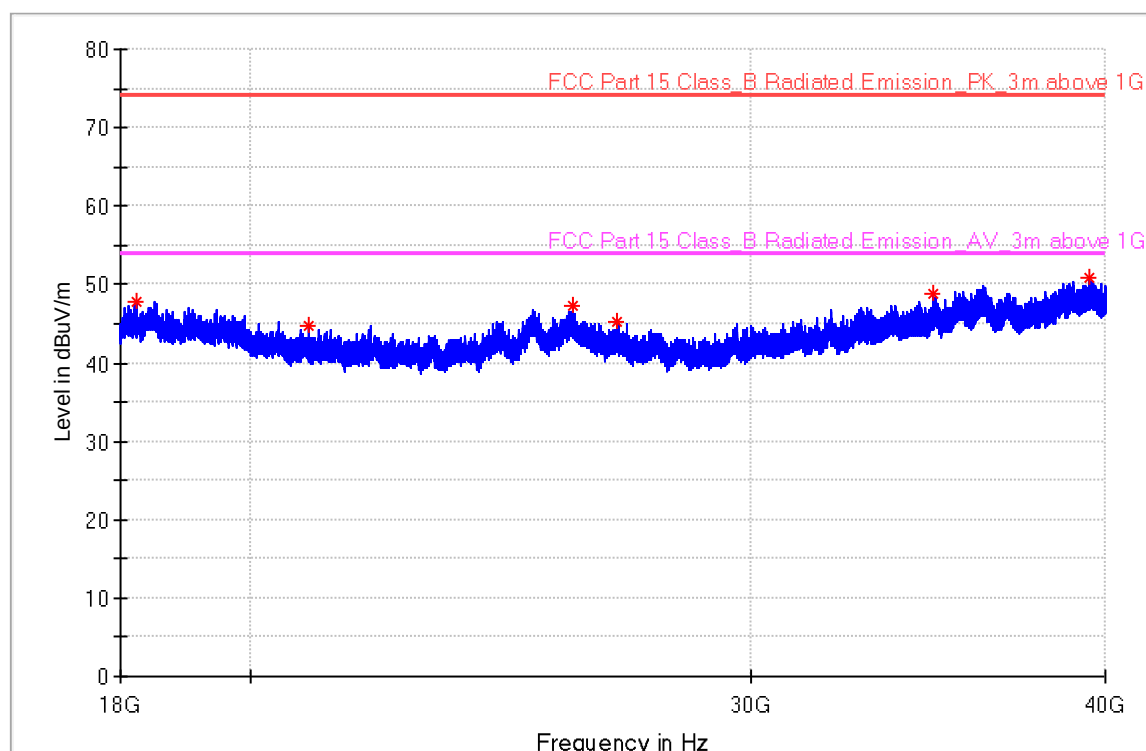
Remark:

- (1) Emission level= Original Receiver Reading + Correct Factor
- (2) Correct Factor = Antenna Factor + Cable Loss -Amplifier gain
- (3) Margin = limit – Corrected Reading

Worst case Radiated Emission 18-25GHz

EUT Name: Smart Battery Doorbell
 Model: SC162-WCE3
 Client: Zhejiang Lingzhu Technology Co., Ltd
 Op Cond: Power on and TX_2402MHz at 1Mbps data rate
 Operator: Tianji XU
 Test Spec: FCC Part 15.209(a)
 Comment: Horizontal
 Sample No: SHA-884460-1

Full Spectrum



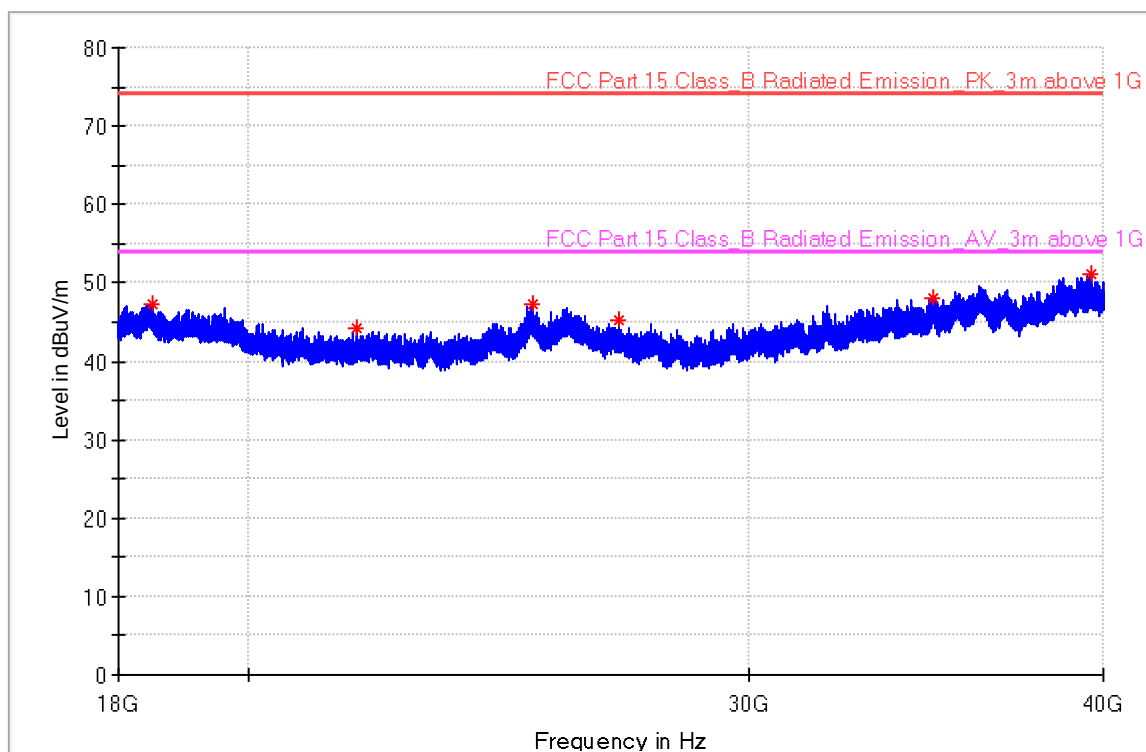
Critical_Freqs

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18222.750000	47.72	---	74.00	26.28	100.0	H	236.0	8.1
18440.000000	---	42.66	54.00	11.34	100.0	H	273.0	8.1
20847.625000	---	39.38	54.00	14.62	100.0	H	0.0	8.5
20952.125000	44.74	---	74.00	29.27	100.0	H	1.0	8.5
25152.750000	---	42.33	54.00	11.67	100.0	H	167.0	9.1
25983.250000	47.23	---	74.00	26.77	100.0	H	182.0	9.7
26935.437500	45.23	---	74.00	28.77	100.0	H	40.0	9.1
26958.125000	---	39.91	54.00	14.09	100.0	H	243.0	9.1
34788.750000	48.84	---	74.00	25.16	100.0	H	175.0	12.1
34788.750000	---	43.55	54.00	10.45	100.0	H	175.0	12.1
38600.937500	---	45.45	54.00	8.55	100.0	H	324.0	13.5
39472.000000	50.74	---	74.00	23.26	100.0	H	309.0	13.7

Worst case Radiated Emission 18-25GHz

EUT Name: Smart Battery Doorbell
 Model: SC162-WCE3
 Client: Zhejiang Lingzhu Technology Co., Ltd
 Op Cond: Power on and TX_2402MHz at 1Mbps data rate
 Operator: Tianji XU
 Test Spec: FCC Part 15.209(a)
 Comment: Vertical
 Sample No: SHA-884460-1

Full Spectrum



Critical_Freqs

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18413.875000	---	42.57	54.00	11.43	100.0	V	150.0	8.1
18501.187500	47.19	---	74.00	26.81	100.0	V	67.0	8.1
21175.562500	---	39.03	54.00	14.97	100.0	V	178.0	8.6
21848.625000	44.27	---	74.00	29.73	100.0	V	24.0	8.7
25167.187500	---	41.95	54.00	12.05	100.0	V	81.0	9.1
25188.500000	47.32	---	74.00	26.68	100.0	V	81.0	9.2
26938.187500	---	39.89	54.00	14.11	100.0	V	208.0	9.1
27002.812500	45.22	---	74.00	28.78	100.0	V	282.0	9.1
34809.375000	---	43.90	54.00	10.10	100.0	V	352.0	12.1
34845.125000	48.09	---	74.00	25.91	100.0	V	142.0	12.2
39235.500000	---	45.65	54.00	8.35	100.0	V	267.0	13.5
39606.750000	51.22	---	74.00	22.78	100.0	V	297.0	13.8

11 Test Equipment List

List of Test Instruments
Test Site1

	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE	CAL. DUE DATE
C	Signal spectrum analyzer	Agilent	N9020B	MY59050168	2025-2-19	2026-2-18
RE	EMI Test Receiver	Rohde & Schwarz	ESR3	101906	2024-8-1	2025-7-31
	Signal Analyzer	Rohde & Schwarz	FSV40	101091	2024-8-1	2025-7-31
	Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9168	961	2024-8-30	2025-8-29
	Double-ridged waveguide horn antenna	Rohde & Schwarz	HF907	102868	2024-4-14	2025-4-13
	Pre-amplifier	Shenzhen HzEMC	HPA-081843	HYP A23026	2024-4-16	2025-4-15
	Loop antenna	Rohde & Schwarz	HFH2-Z2	100443	2024-6-26	2025-6-25
	Double Ridged Horn Antenna	ETS-Lindgren	3116C	00246076	2023-7-7	2026-7-6
	3m Semi-anechoic chamber	TDK	9X6X6	----	2024-5-8	2027-5-7

Measurement Software Information			
Test Item	Software	Manufacturer	Version
C	MTS 8310	MWRFTtest	3.0.0.0
RE	EMC 32	Rohde & Schwarz	V10.50.40
CE	EMC 32	Rohde & Schwarz	V9.15.03

C - Conducted RF tests

- Conducted peak output power



12 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

Items	Extended Uncertainty
Conducted Disturbance at Mains Terminals	150kHz to 30MHz, LISN, 3.16dB
Radiated Disturbance	9kHz to 30MHz, 3.52dB 30MHz to 1GHz, 5.03dB (Horizontal) 5.12dB (Vertical) 1GHz to 18GHz, 5.49dB 18GHz to 40GHz, 5.63dB
RF Conducted Measurement	Power related: 1.16dB Frequency related: 6.00×10 ⁻⁸

Measurement Uncertainty Decision Rule:

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2023, clause 4.3.3.



13 Photographs of Test Set-ups

Refer to the < Test Setup photos >.



14 Photographs of EUT

Refer to the < External Photos > & < Internal Photos >.

-----End of Test Report-----