



## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 1 of 85

# TEST REPORT

**Application No.:** KSCR2408001502AT  
**FCC ID:** 2BEA6TPC070RK3568  
**Applicant:** Vantron Technology, Inc.  
**Address of Applicant:** 48434 Milmont Drive Fremont, CA 94538-7324, USA  
**Manufacturer:** Vantron Technology, Inc.  
**Address of Manufacturer:** 48434 Milmont Drive Fremont, CA 94538-7324, USA  
**Factory:** Chengdu Vantron Technology Co., Ltd.  
**Address of Factory:** No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China  
**Equipment Under Test (EUT):**  
**EUT Name:** All-in-one Panel PC  
**Model No.:** TPC070-RK3568  
**Trade Mark:** Vantron  
**Standard(s) :** 47 CFR Part 15, Subpart C 15.247  
**Date of Receipt:** 2024-08-06  
**Date of Test:** 2024-08-07 to 2024-08-29  
**Date of Issue:** 2024-08-30

<b>Test Result:</b>	<b>Pass*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

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# Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 2 of 85

<i>Revision Record</i>			
<i>Version</i>	<i>Description</i>	<i>Date</i>	<i>Remark</i>
00	Original	2024-08-30	/

<b>Authorized for issue by:</b>			
<b>Tested By</b>		<i>Maker Qi</i>	
		_____ Maker_Qi/Project Engineer	
<b>Approved By</b>		<i>Terry Hou</i>	
		_____ Terry Hou /Reviewer	



## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 3 of 85

## 2 Test Summary

Radio Spectrum Technical Requirement					
Item	Standard	Method	Requirement	Result	Test Lab*
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)	Customer Declaration	N/A

Radio Spectrum Matter Part					
Item	Standard	Method	Requirement	Result	Test Lab*
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass	B
Radiated Emissions which fall in the restricted bands		ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass	B
Radiated Spurious Emissions Below 1GHz		ANSI C63.10 (2013) Section 6.4,6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass	B
Radiated Spurious Emissions Above 1GHz		ANSI C63.10 (2013) Section 6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass	B
Conducted Peak Output Power		ANSI C63.10 (2013) Section 11.9.1	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass	A
Minimum 6dB Bandwidth		ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass	A
Power Spectrum Density		ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass	A
Conducted Band Edges Measurement		ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass	A
Conducted Spurious Emissions		ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass	A

### 3 Contents

	Page
<b>1 COVER PAGE.....</b>	<b>1</b>
<b>2 Test Summary.....</b>	<b>3</b>
<b>3 Contents.....</b>	<b>4</b>
<b>4 General Information.....</b>	<b>5</b>
4.1 Details of E.U.T.....	5
4.2 Power level setting using in test.....	5
4.3 Description of Support Units.....	5
4.4 Measurement Uncertainty.....	6
4.5 Test Location.....	7
4.6 Test Facility.....	7
4.7 Deviation from Standards.....	7
4.8 Abnormalities from Standard Conditions.....	7
<b>5 Equipment List.....</b>	<b>8</b>
<b>6 Radio Spectrum Technical Requirement.....</b>	<b>10</b>
6.1 Antenna Requirement.....	10
<b>7 Radio Spectrum Matter Test Results.....</b>	<b>11</b>
7.1 Conducted Emissions at AC Power Line (150kHz-30MHz).....	11
7.2 Radiated Emissions which fall in the restricted bands.....	15
7.3 Radiated Spurious Emissions Below 1GHz.....	33
7.4 Radiated Spurious Emissions Above 1GHz.....	37
7.5 Conducted Peak Output Power.....	51
7.6 Minimum 6dB Bandwidth.....	53
7.7 Power Spectrum Density.....	54
7.8 Conducted Band Edges Measurement.....	55
7.9 Conducted Spurious Emissions.....	56
<b>8 Test Setup Photo.....</b>	<b>57</b>
<b>9 EUT Constructional Details (EUT Photos).....</b>	<b>57</b>
<b>10 Appendix.....</b>	<b>58</b>

## 4 General Information

### 4.1 Details of E.U.T.

Power supply:	Switching Adapter: Model: FJ-SW20261203000 Input: 100~240V~,50-60Hz,1.5A Max Output: 12V/3A 36W
Test voltage:	AC 120V/60Hz
Operation Frequency:	2402MHz to 2480MHz
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	External antenna
Antenna Gain:	4.5dBi(Provided by the manufacturer)

### 4.2 Power level setting using in test

Channel	BLE	
	1M	2M
0	default	default
19	default	default
39	default	default

### 4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Notebook	LENOVO	K27	EB24537645

**4.4 Measurement Uncertainty**

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4 x 10 <sup>-8</sup>
2	Timeout	2s
3	Duty Cycle	0.37%
4	Occupied Bandwidth	3%
5	RF Conducted Power	0.6dB
6	RF Power Density	2.9dB
7	Conducted Spurious Emissions	0.75dB
8	RF Radiated Power	5.2dB (Below 1GHz)
		5.9dB (Above 1GHz)
9	Radiated Spurious Emission Test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		5.1dB (1GHz-18GHz)
		5.4dB (Above 18GHz)
10	Temperature Test	1°C
11	Humidity Test	3%
12	Supply Voltages	1.5%
13	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 7 of 85

### 4.5 Test Location

#### Lab A:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

#### Lab B:

Conducted Emissions at AC Power Line (150kHz-30MHz); Radiated Emissions; Radiated Emissions which fall in the restricted bands test at:

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.

No.2,Tongsheng Road,Wuzhong District,Suzhou,Jiangsu,China

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

### 4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

#### Lab A:

##### • A2LA

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

##### • FCC

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

##### • ISED

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 2324E

##### • VCCI

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

#### Lab B:

##### • A2LA (Certificate No. 6336.01)

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

##### • Innovation, Science and Economic Development Canada

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

##### • FCC –Designation Number: CN1312

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327

### 4.7 Deviation from Standards

None

### 4.8 Abnormalities from Standard Conditions

None



## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 8 of 85

### 5 Equipment List

#### Lab A:

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
<b>RF Conducted Test</b>						
1	Spectrum Analyzer	Keysight	N9020A	KUS1911E004-2	08/24/2024	08/23/2025
2	Spectrum Analyzer	Keysight	N9020A	KUS2001M001-2	08/24/2024	08/23/2025
3	Spectrum Analyzer	Keysight	N9030B	KSEM021-1	01/15/2024	01/14/2025
4	Signal Generator	R&S	SMBV100B	KSEM032	03/19/2024	03/18/2025
5	Signal Generator	R&S	SMW200A	KSEM020-1	08/24/2024	08/23/2025
6	Signal Generator	Agilent	N5182A	KUS2001M001-1	08/24/2024	08/23/2025
7	Radio Communication Test Station	Anritsu	MT8000A	KSEM001-1	08/24/2024	08/23/2025
8	Radio Communication Analyzer	Anritsu	MT8821C	KSEM002-1	03/19/2024	03/18/2025
9	Universal Radio Communication Tester	R&S	CMW500	KUS1911E004-1	08/24/2024	08/23/2025
10	Switcher	TST	FY562	KUS2001M001-4	01/15/2024	01/14/2025
11	AC Power Source	EXTECH	6605	KS301178	N.C.R	N.C.R
12	DC Power Supply	Aglient	E3632A	KS301180	N.C.R	N.C.R
13	Conducted Test Cable	Thermax	RF01-RF04	CZ301111-CZ301120	01/15/2024	01/14/2025
14	Temp. / Humidity Chamber	TERCHY	MHK-120AK	KS301190	08/24/2024	08/23/2025
15	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-5	03/19/2024	03/18/2025
16	Software	BST	TST-PASS	/	NCR	NCR





## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 9 of 85

### Lab B:

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
<b>Conducted Emission at Mains Terminals</b>						
1	Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2/1/2024	1/31/2025
2	Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-06	2/8/2024	2/7/2025
3	Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-03	2/4/2024	2/3/2025
4	Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-04	2/4/2024	2/3/2025
5	Measurement Software	Tonscend	JS32-CE	SUWI-02-09-05	NCR	NCR
<b>RF Radiated Test</b>						
1	Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-02	6/3/2023	6/2/2026
2	Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-13	2/8/2024	2/7/2025
3	Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	5/8/2024	5/7/2025
4	Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-06	11/21/2023	11/20/2024
5	Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2/1/2024	1/31/2025
6	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	VULB 9168	SUWI-01-11-04	11/25/2023	11/24/2024
7	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9120D	SUWI-01-11-05	11/25/2023	11/24/2024
8	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9170	SUWI-01-11-03	5/12/2023	5/11/2025
9	Active Loop Antenna	SCHWRZBECK MESS- ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	5/13/2023	5/12/2025
10	Amplifier	Tonscend	TAP9K3G40	SUWI-01-14-01	2/1/2024	1/31/2025
11	Amplifier	Tonscend	TAP01018050	SUWI-01-14-02	2/1/2024	1/31/2025
12	Amplifier	Tonscend	TAP18040048	SUWI-01-14-03	2/1/2024	1/31/2025
13	Measurement Software	Tonscend	JS32-RE	SUWI-02-09-04	NCR	NCR
14	Measurement Software	Tonscend	JS32-RSE	SUWI-02-09-06	NCR	NCR

## **6 Radio Spectrum Technical Requirement**

### **6.1 Antenna Requirement**

#### **6.1.1 Test Requirement:**

47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)

#### **6.1.2 Conclusion**

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is External antenna and no consideration of replacement. The best case gain of the antenna is 4.5dBi.

Antenna location: Refer to internal photo.

## 7 Radio Spectrum Matter Test Results

### 7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency of emission(MHz)	Conducted limit(dBµV)	
	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.

Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

#### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C

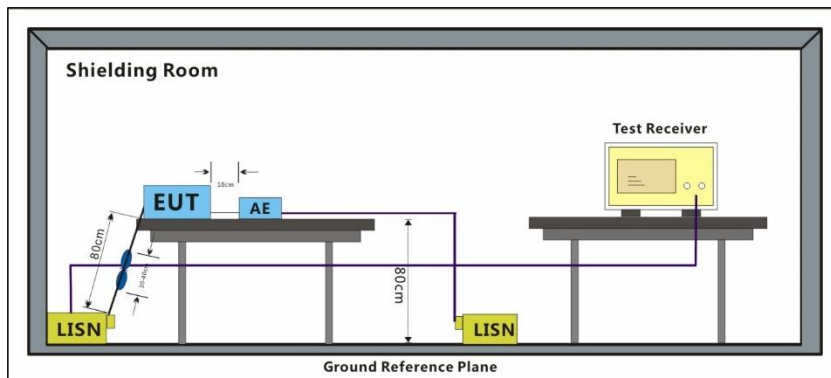
Humidity: 51 % RH

Atmospheric Pressure: 1010 mbar

#### 7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Pre-scan	06	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

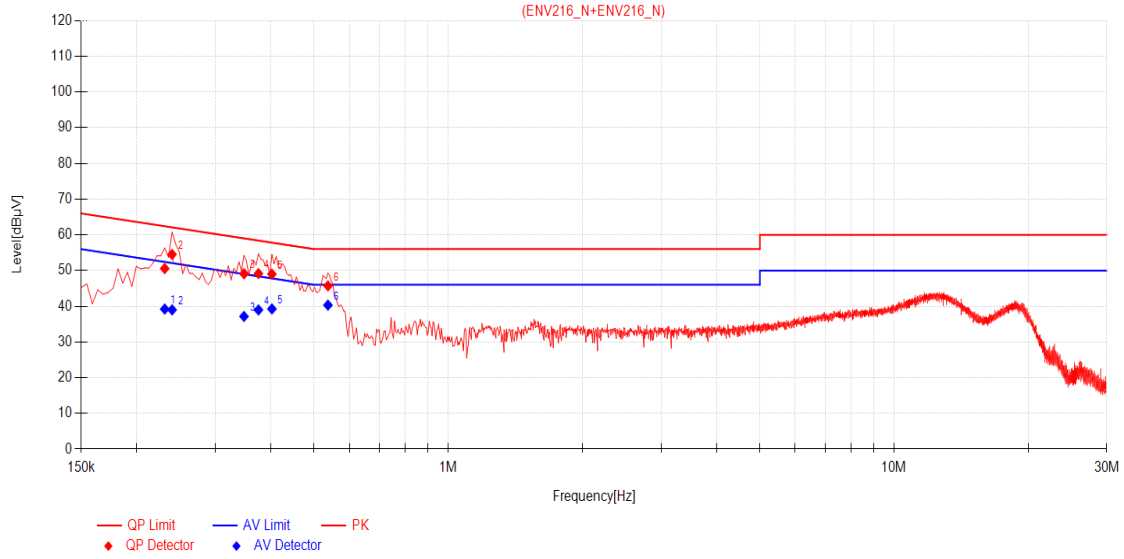
#### 7.1.3 Test Setup Diagram



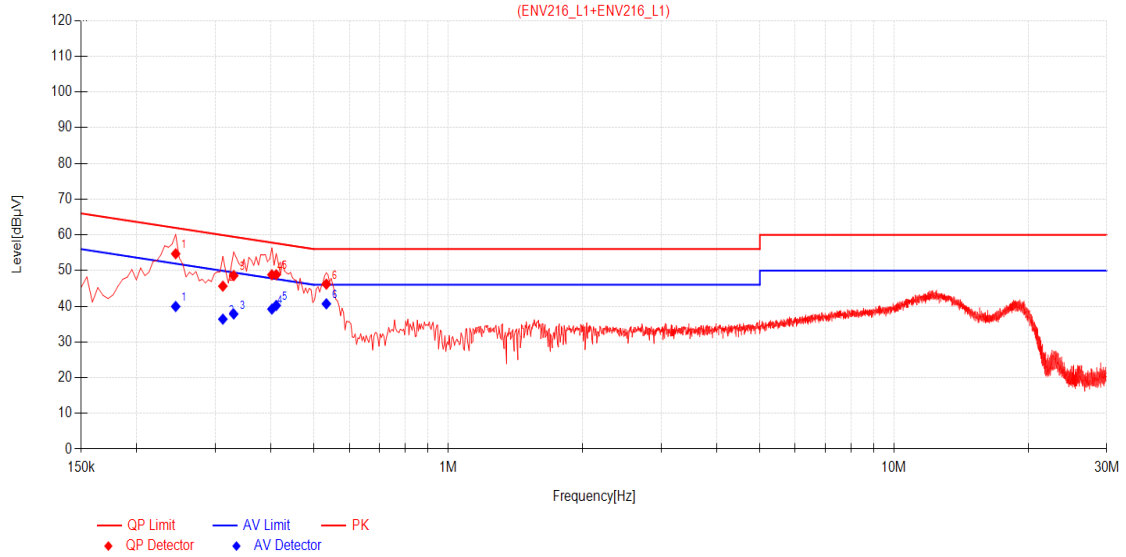
**7.1.4 Measurement Procedure and Data**

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: Level=Read Level+ Cable Loss+ LISN Factor



Final Data List											
NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBµV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.2310	10.88	39.67	50.55	62.41	11.86	28.34	39.22	52.41	13.19	PASS
2	0.2400	10.85	43.67	54.52	62.10	7.58	28.14	38.99	52.10	13.11	PASS
3	0.3480	10.69	38.42	49.11	59.01	9.90	26.46	37.15	49.01	11.86	PASS
4	0.3750	10.68	38.47	49.15	58.39	9.24	28.29	38.97	48.39	9.42	PASS
5	0.4020	10.68	38.32	49.00	57.81	8.81	28.59	39.27	47.81	8.54	PASS
6	0.5370	10.66	35.06	45.72	56.00	10.28	29.66	40.32	46.00	5.68	PASS



Final Data List											
NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBµV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.2445	10.91	43.79	54.70	61.94	7.24	29.02	39.93	51.94	12.01	PASS
2	0.3120	10.78	34.85	45.63	59.92	14.29	25.61	36.39	49.92	13.53	PASS
3	0.3300	10.78	37.80	48.58	59.45	10.87	27.05	37.83	49.45	11.62	PASS
4	0.4020	10.75	38.06	48.81	57.81	9.00	28.46	39.21	47.81	8.60	PASS
5	0.4110	10.75	38.08	48.83	57.63	8.80	29.47	40.22	47.63	7.41	PASS
6	0.5325	10.73	35.46	46.19	56.00	9.81	29.95	40.68	46.00	5.32	PASS

## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 15 of 85

### 7.2 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.10.5

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

#### 7.2.1 E.U.T. Operation

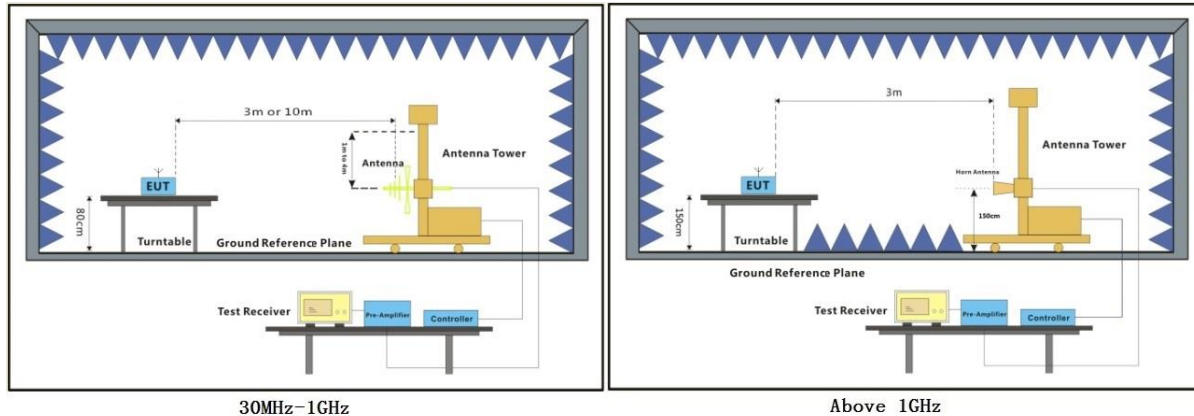
Operating Environment:

Temperature: 24 °C Humidity: 51 % RH Atmospheric Pressure: 1010 mbar

#### 7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	06	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

### 7.2.3 Test Setup Diagram



### 7.2.4 Measurement Procedure and Data

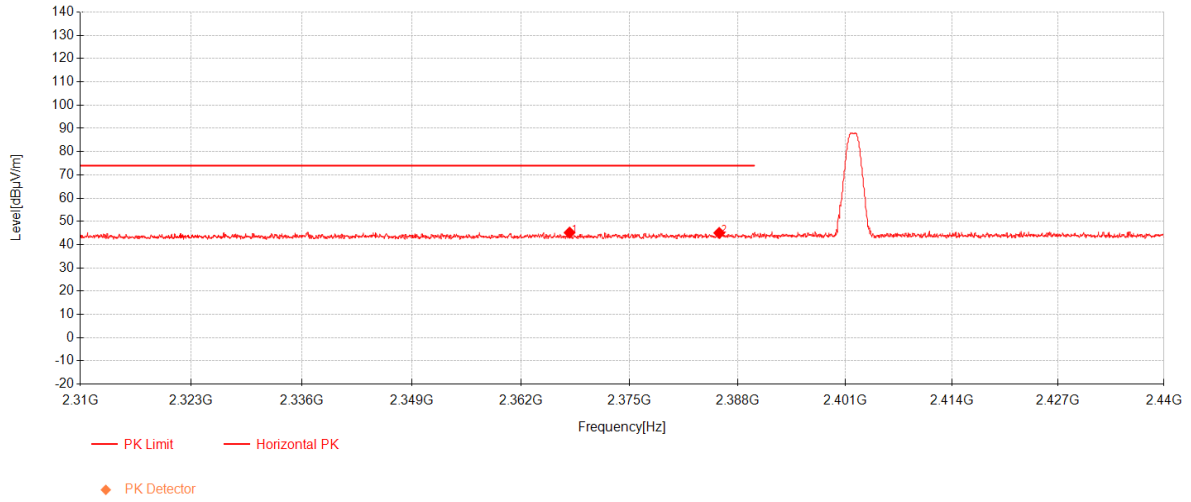
- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height 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.
- e. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

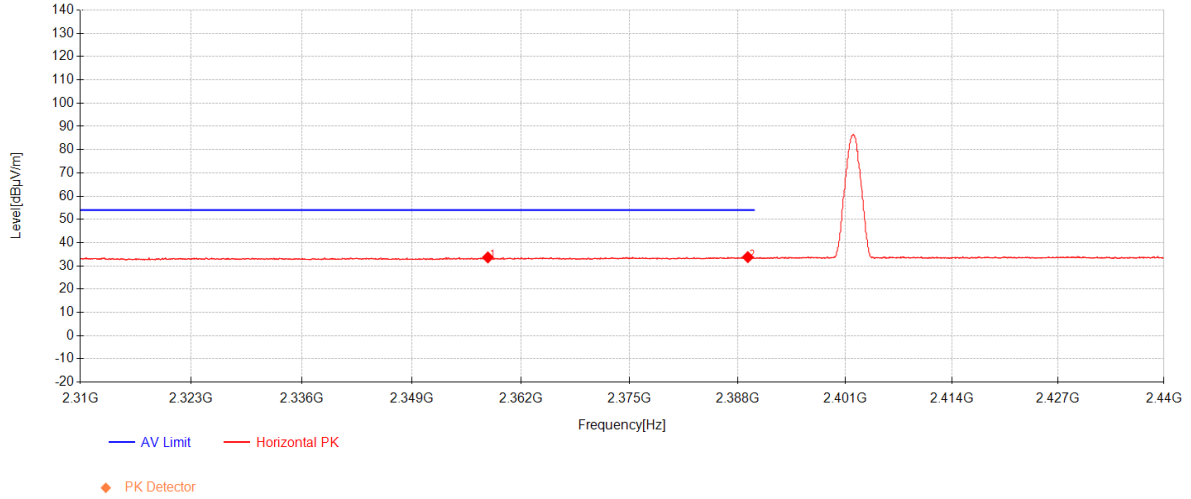


### BLE 1M\_Channel 00



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2367.8175	40.51	27.11	-22.45	45.17	74.00	28.83	Horizontal
2	2385.79	40.29	27.15	-22.41	45.03	74.00	28.97	Horizontal

### BLE 1M\_Channel 00



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2358.0675	29.04	27.09	-22.48	33.65	54.00	20.35	Horizontal
2	2389.235	29.01	27.16	-22.40	33.77	54.00	20.23	Horizontal

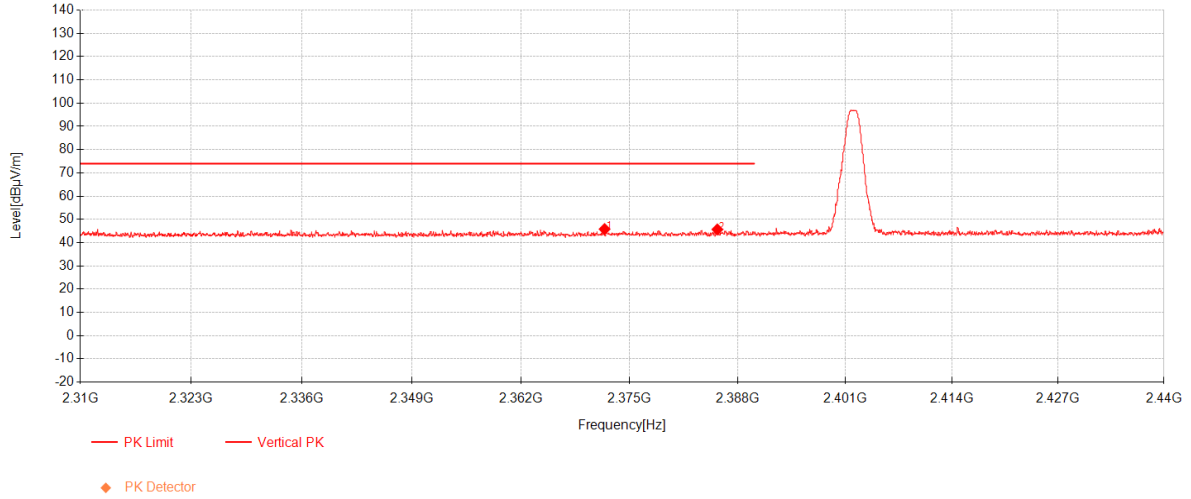
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

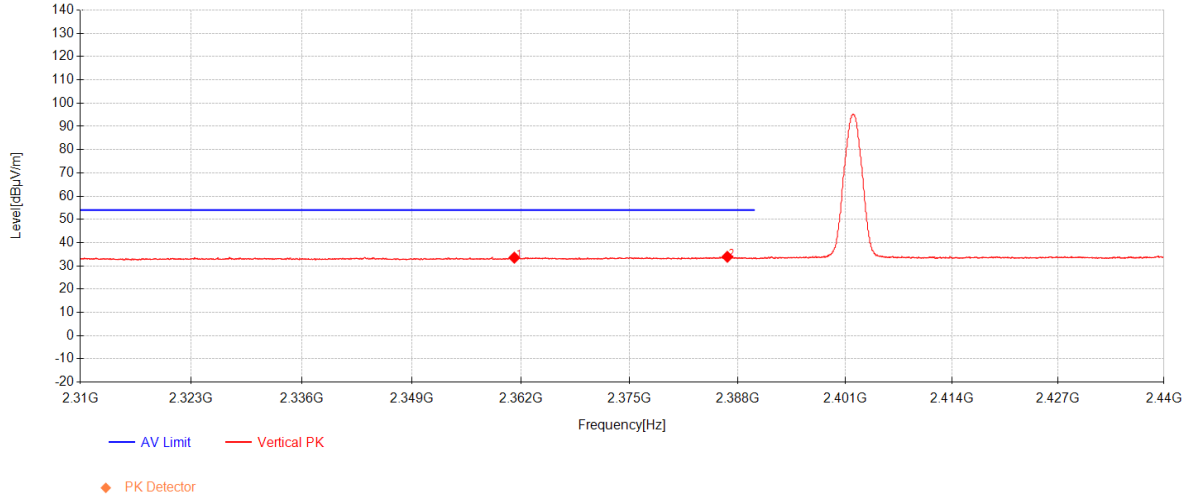
Page: 19 of 85

### BLE 1M\_Channel 00



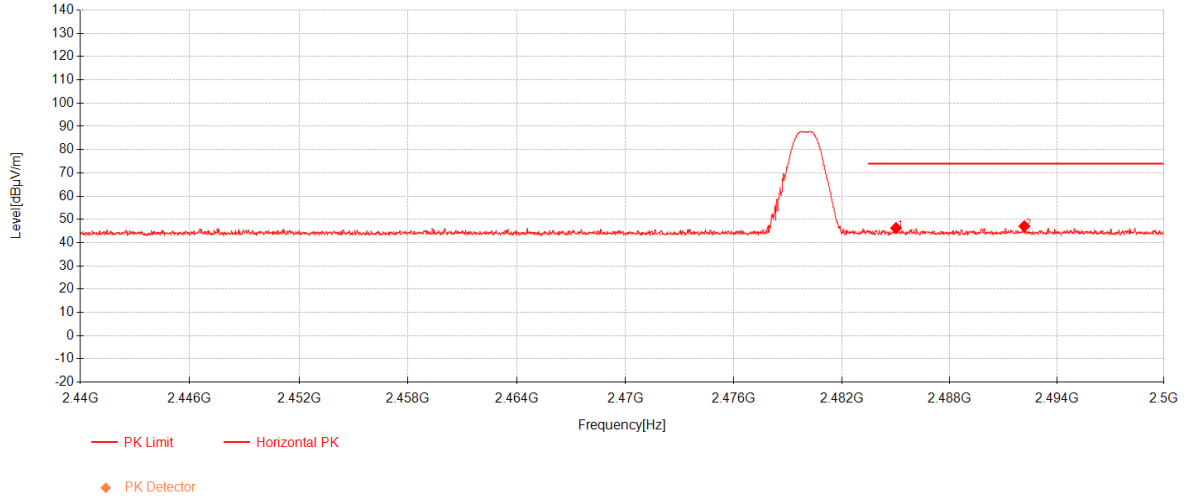
Data List								
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1	2372.01	41.12	27.12	-22.44	45.80	74.00	28.20	Vertical
2	2385.5625	40.92	27.15	-22.41	45.66	74.00	28.34	Vertical

### BLE 1M\_Channel 00



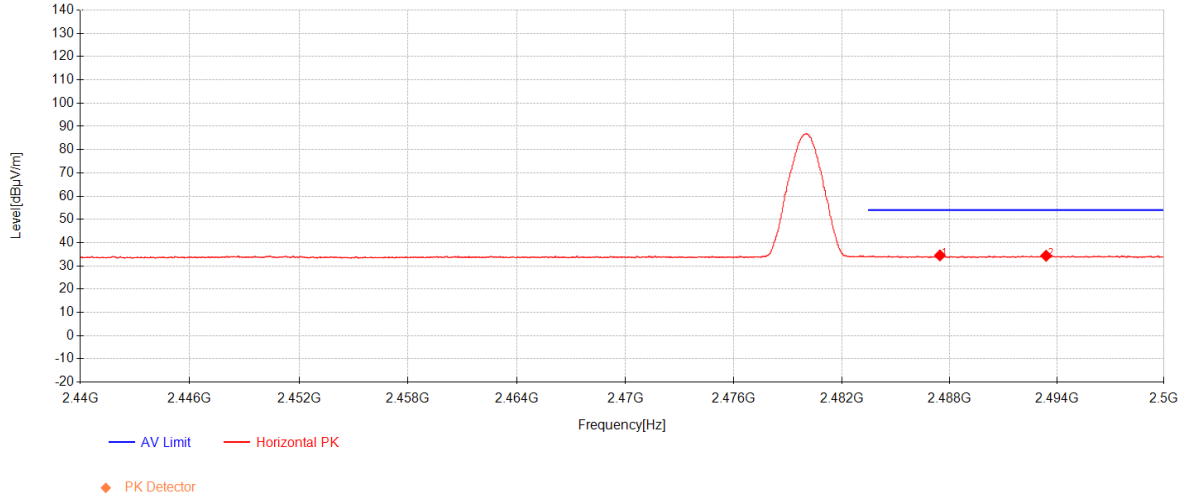
Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2361.22	28.92	27.09	-22.47	33.54	54.00	20.46	Vertical
2	2386.765	29.16	27.15	-22.40	33.91	54.00	20.09	Vertical

### BLE 1M\_Channel 39



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2485.03	41.20	27.37	-22.29	46.27	74.00	27.73	Horizontal
2	2492.185	41.95	27.38	-22.29	47.05	74.00	26.95	Horizontal

### BLE 1M Channel 39



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2487.475	29.44	27.37	-22.29	34.52	54.00	19.48	Horizontal
2	2493.4	29.25	27.39	-22.29	34.35	54.00	19.65	Horizontal



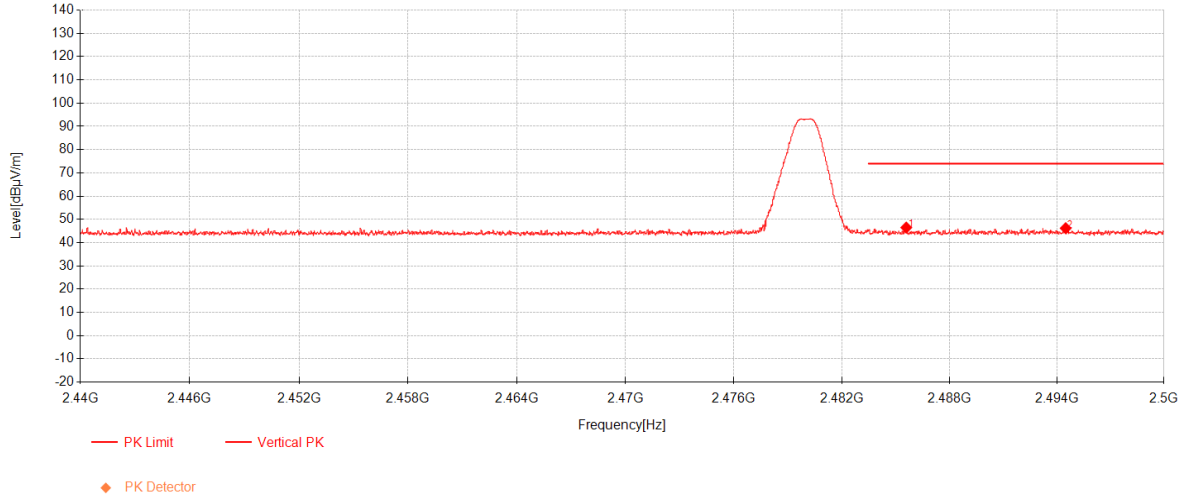
# Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

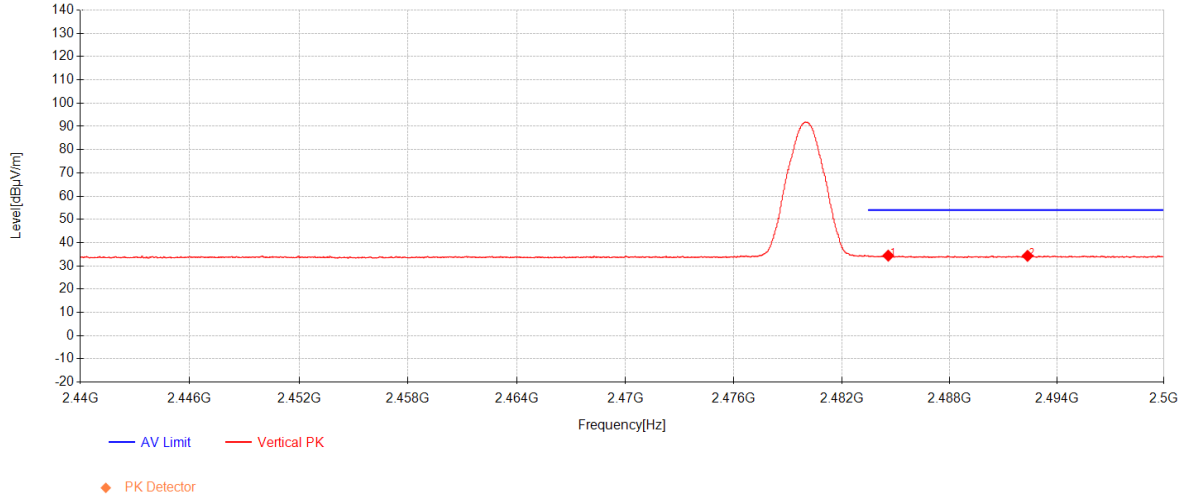
Page: 23 of 85

## BLE 1M Channel 39



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2485.6	41.39	27.37	-22.29	46.47	74.00	27.53	Vertical
2	2494.495	41.10	27.39	-22.28	46.20	74.00	27.80	Vertical

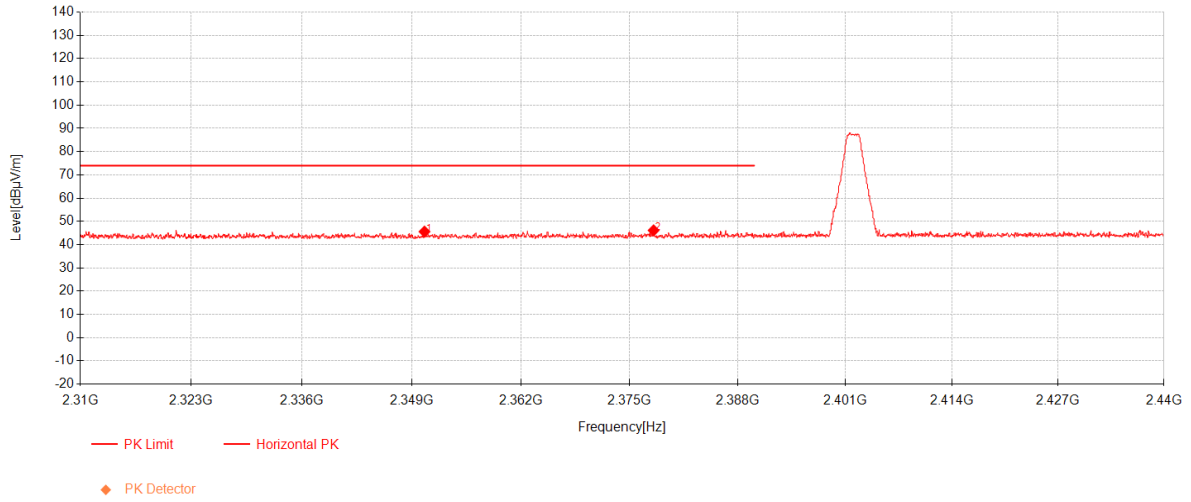
### BLE 1M Channel 39



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2484.595	29.33	27.37	-22.29	34.40	54.00	19.60	Vertical
2	2492.365	29.21	27.38	-22.29	34.31	54.00	19.69	Vertical

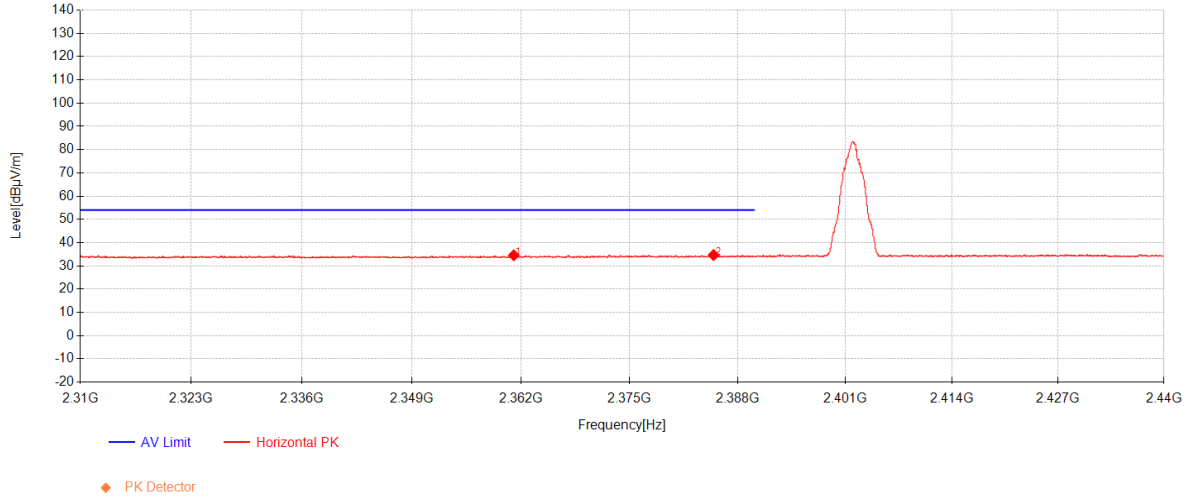


### BLE 2M\_Channel 00



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2350.5275	41.01	27.07	-22.50	45.58	74.00	28.42	Horizontal
2	2377.8925	41.42	27.13	-22.43	46.12	74.00	27.88	Horizontal

### BLE 2M\_Channel 00



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2361.155	29.94	27.09	-22.47	34.56	54.00	19.44	Horizontal
2	2385.1075	29.92	27.15	-22.41	34.66	54.00	19.34	Horizontal



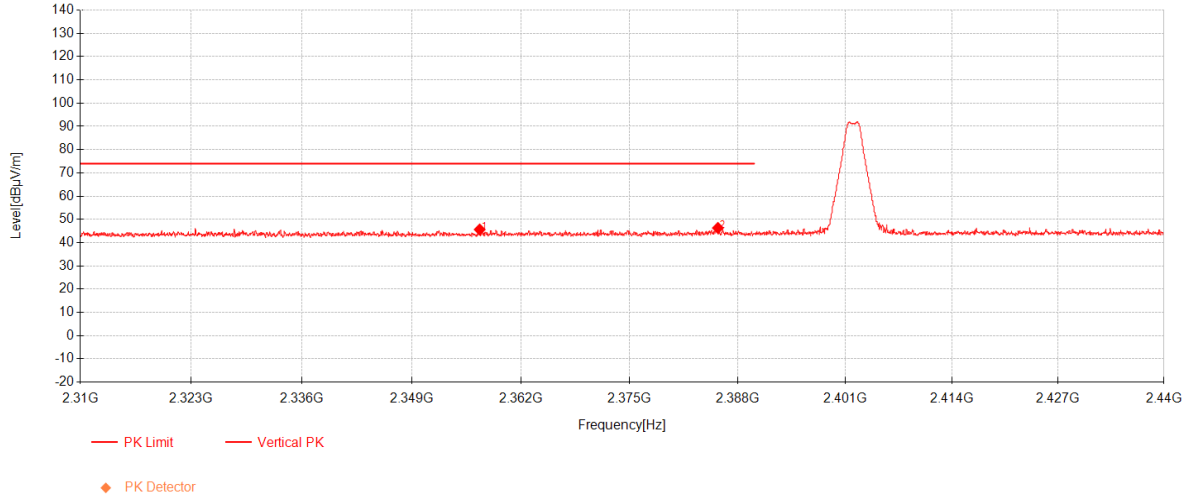
# Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

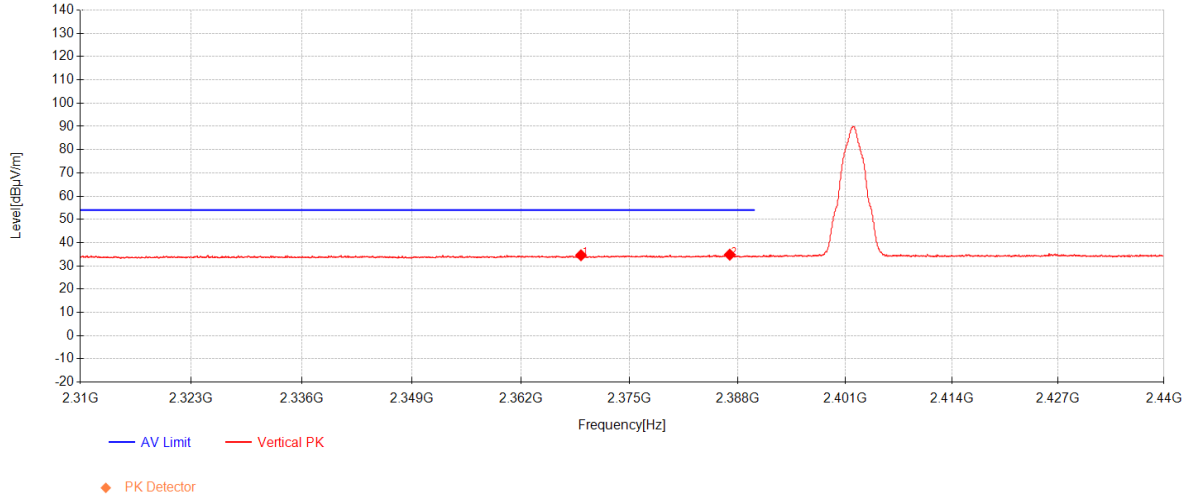
Page: 27 of 85

## BLE 2M\_Channel 00



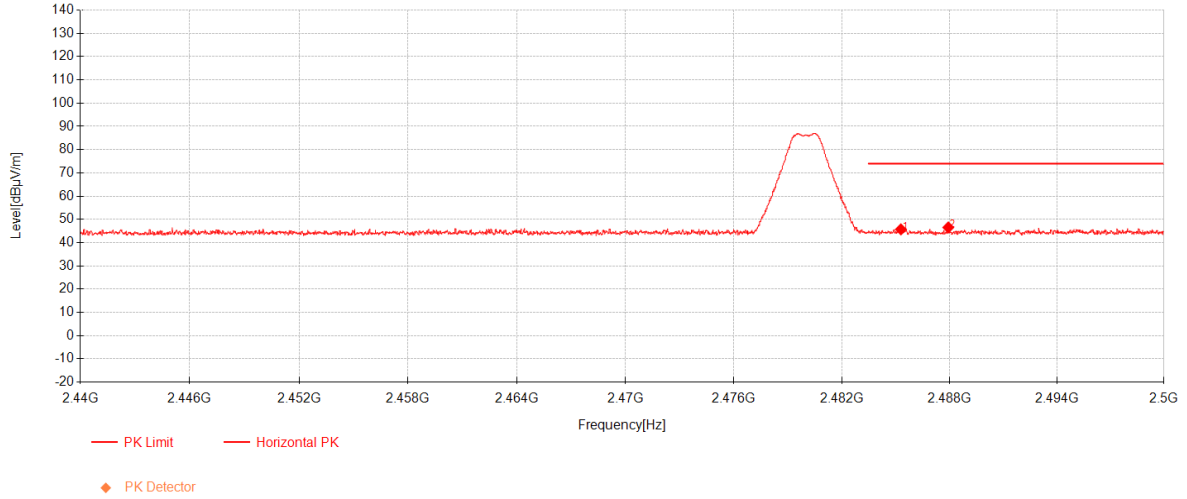
Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2357.0925	41.03	27.09	-22.48	45.63	74.00	28.37	Vertical
2	2385.6275	41.58	27.15	-22.41	46.32	74.00	27.68	Vertical

### BLE 2M\_Channel 00



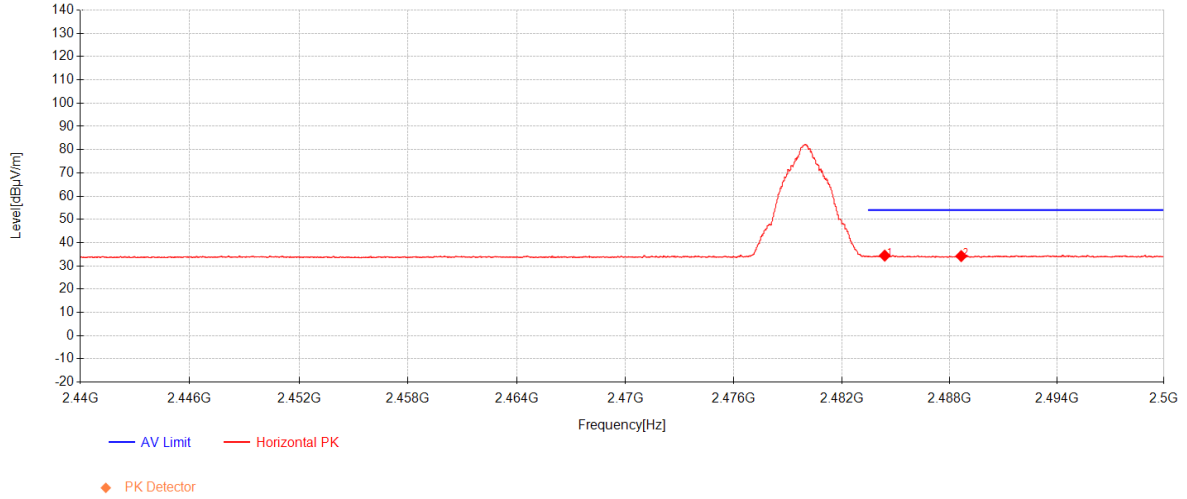
Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2369.1825	29.92	27.11	-22.45	34.58	54.00	19.42	Vertical
2	2387.0575	30.07	27.15	-22.40	34.82	54.00	19.18	Vertical

### BLE 2M\_Channel 39



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2485.3	40.63	27.37	-22.29	45.70	74.00	28.30	Horizontal
2	2487.94	41.45	27.37	-22.29	46.53	74.00	27.47	Horizontal

### BLE 2M Channel 39



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2484.4	29.35	27.37	-22.29	34.42	54.00	19.58	Horizontal
2	2488.66	29.13	27.38	-22.29	34.21	54.00	19.79	Horizontal



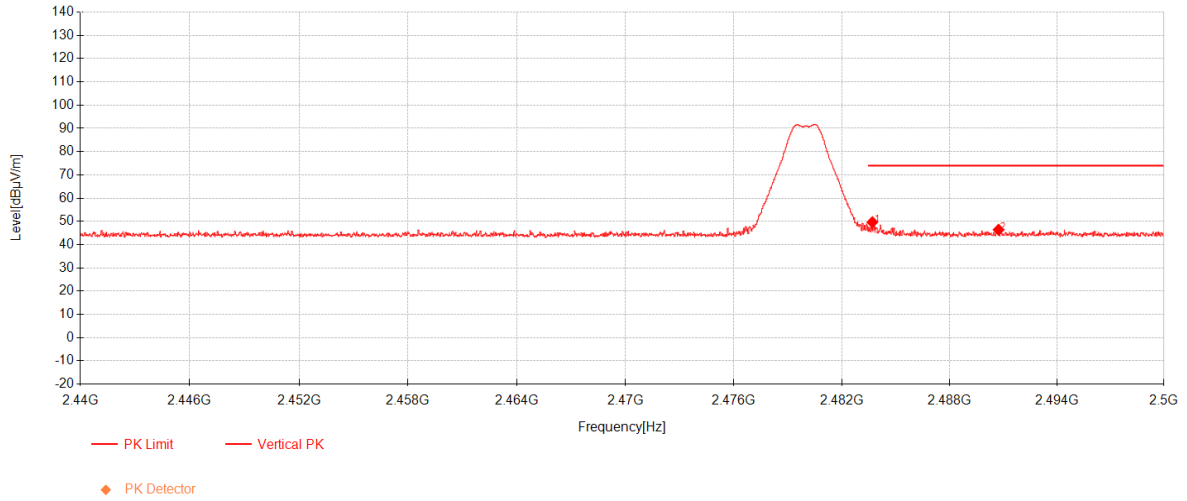
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CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

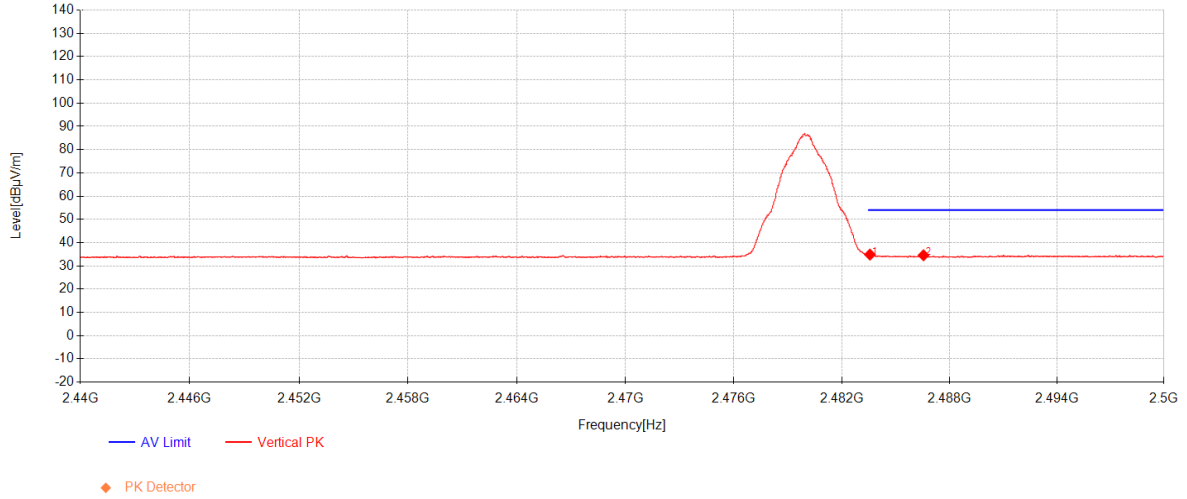
Page: 31 of 85

## BLE 2M Channel 39



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2483.71	44.58	27.36	-22.29	49.65	74.00	24.35	Vertical
2	2490.745	41.32	27.38	-22.29	46.41	74.00	27.59	Vertical

### BLE 2M Channel 39



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2483.575	29.79	27.36	-22.29	34.86	54.00	19.14	Vertical
2	2486.56	29.48	27.37	-22.29	34.56	54.00	19.44	Vertical



### 7.3 Radiated Spurious Emissions Below 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4,6.5

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
960-1000	500	3

#### 7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C

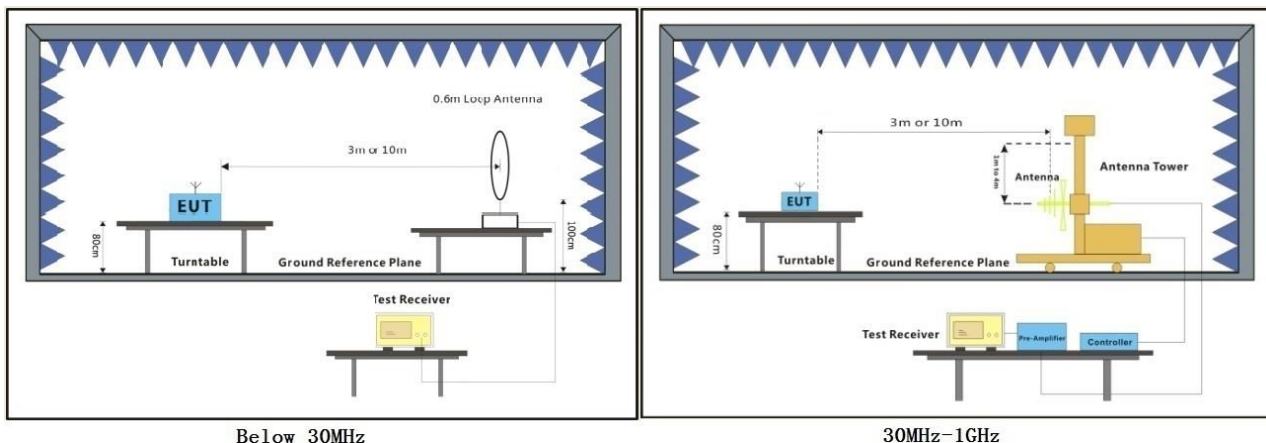
Humidity: 51 % RH

Atmospheric Pressure: 1010 mbar

#### 7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	06	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

#### 7.3.3 Test Setup Diagram



**7.3.4 Measurement Procedure and Data**

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height 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.
- d. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using quasi-peak method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

- 1.  $Level = Read\ Level + Cable\ Loss + Antenna\ Factor - Preamp\ Factor$
- 2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

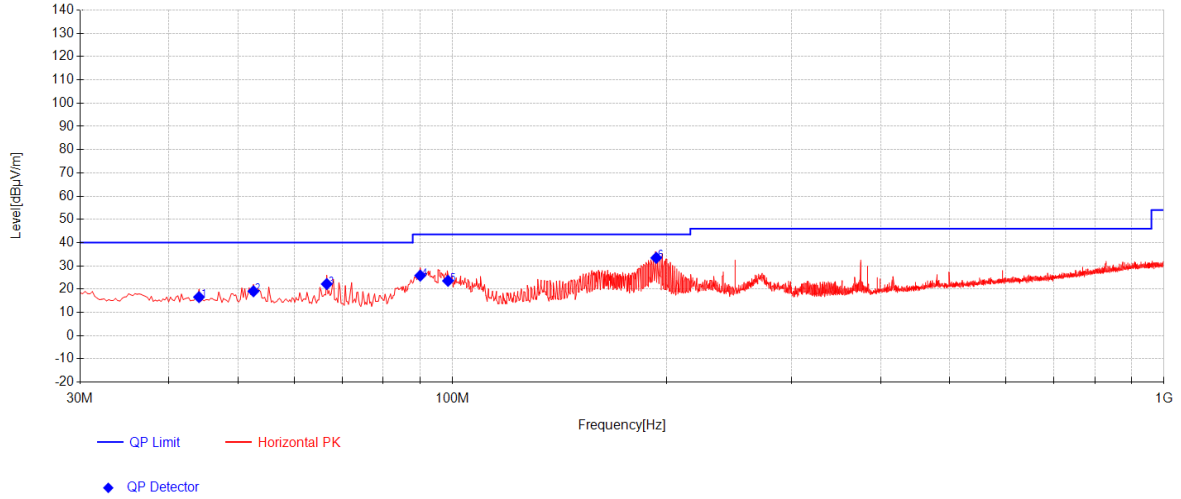
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CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

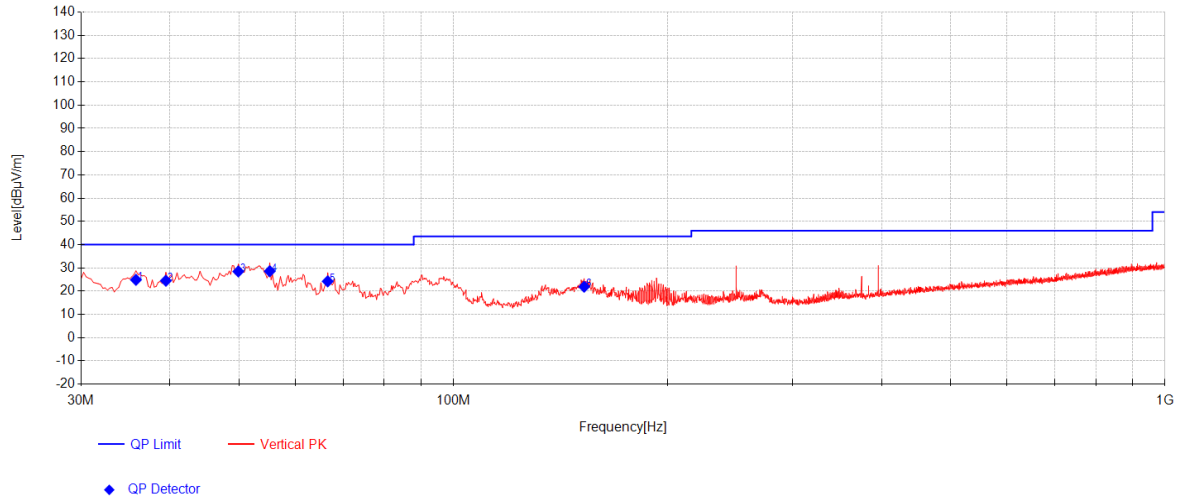
Page: 35 of 85

### BLE 1M\_Channel 39



Final Data List								
NO.	Frequency [MHz]	Reading [dBµV]	Factor [dB]	AF [dB/m]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity
1	44.065	31.24	-33.99	19.32	16.57	40.00	23.43	Horizontal
2	52.5525	34.22	-33.95	18.82	19.09	40.00	20.91	Horizontal
3	66.6175	38.32	-33.78	17.67	22.21	40.00	17.79	Horizontal
4	90.14	44.96	-33.57	14.42	25.81	43.50	17.69	Horizontal
5	98.6275	41.54	-33.49	15.52	23.57	43.50	19.93	Horizontal
6	193.445	50.54	-32.79	15.69	33.45	43.50	10.05	Horizontal

### BLE 1M\_Channel 39



Final Data List								
NO.	Frequency [MHz]	Reading [dBµV]	Factor [dB]	AF [dB/m]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity
1	35.82	40.02	-34.00	18.85	24.87	40.00	15.13	Vertical
2	39.4575	38.96	-34.00	19.50	24.47	40.00	15.53	Vertical
3	49.885	43.53	-33.98	18.91	28.46	40.00	11.54	Vertical
4	55.22	43.73	-33.92	18.74	28.56	40.00	11.44	Vertical
5	66.6175	40.32	-33.78	17.67	24.21	40.00	15.79	Vertical
6	152.705	36.59	-33.16	18.46	21.90	43.50	21.60	Vertical

**7.4 Radiated Spurious Emissions Above 1GHz**

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.6

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
Above 1000	500	3

**7.4.1 E.U.T. Operation**

Operating Environment:

Temperature: 24 °C

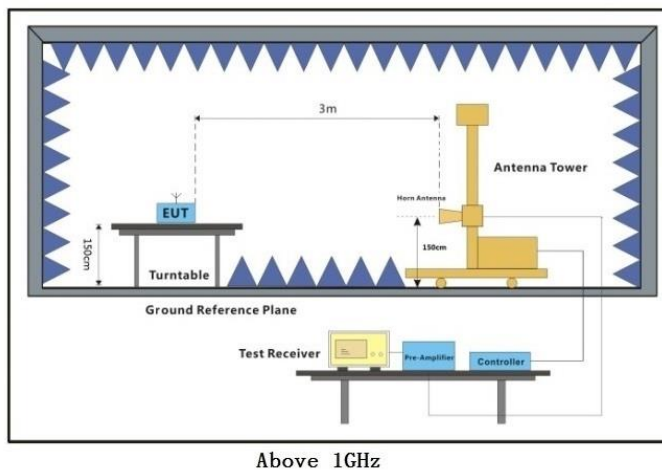
Humidity: 51 % RH

Atmospheric Pressure: 1010 mbar

**7.4.2 Test Mode Description**

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	06	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

**7.4.3 Test Setup Diagram**



**7.4.4 Measurement Procedure and Data**

- a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height 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.
- d. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

- 1.  $Level = Read\ Level + Cable\ Loss + Antenna\ Factor - Preamp\ Factor$
- 2. Scan from 1GHz to 25GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- 3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



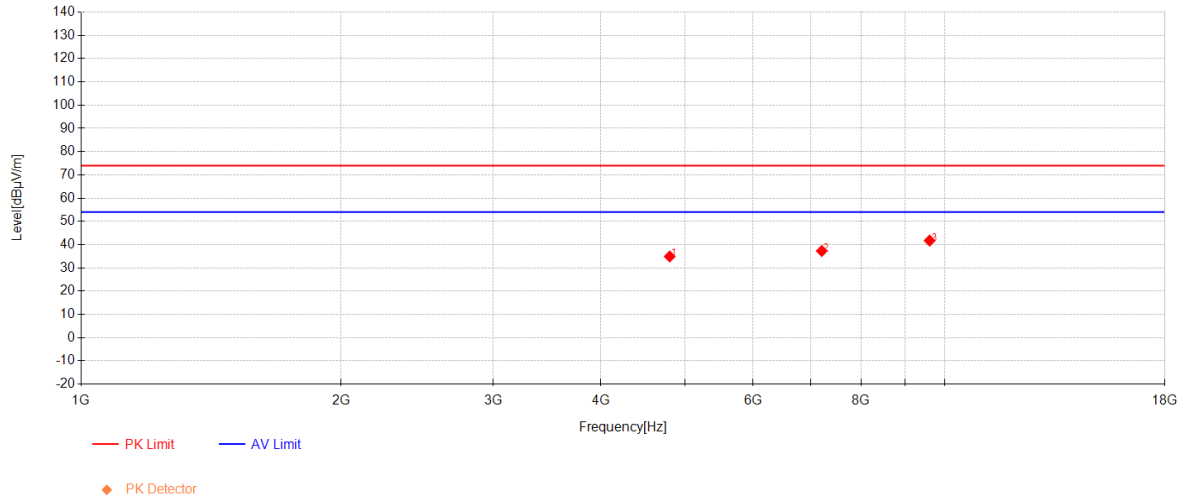
# Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 39 of 85

## BLE 1M\_Channel 00



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4804	43.63	32.77	-41.49	34.91	74.00	39.09	Horizontal
2	7206	39.04	36.25	-38.02	37.27	74.00	36.73	Horizontal
3	9608	37.40	37.78	-33.45	41.73	74.00	32.27	Horizontal

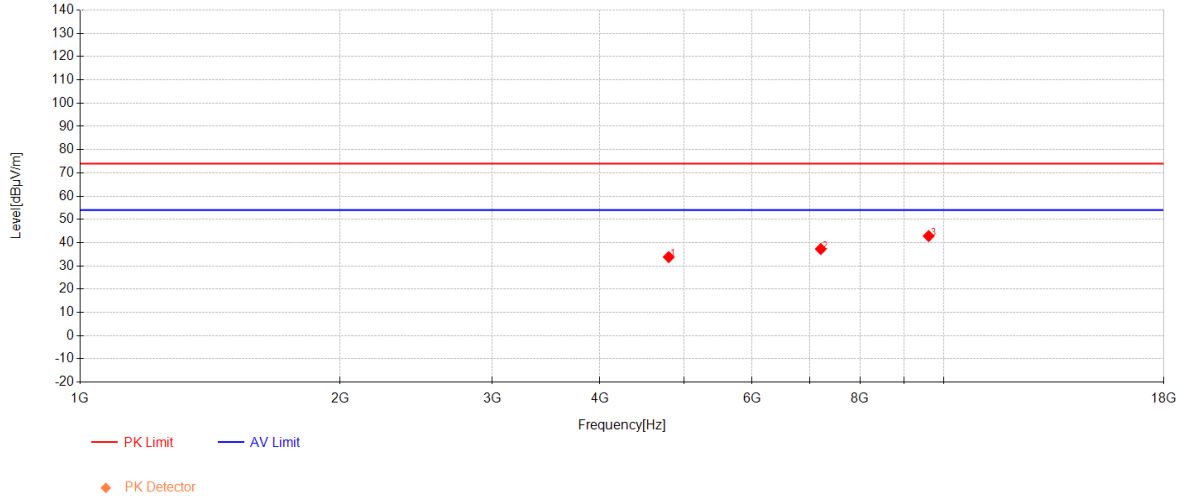
## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 40 of 85

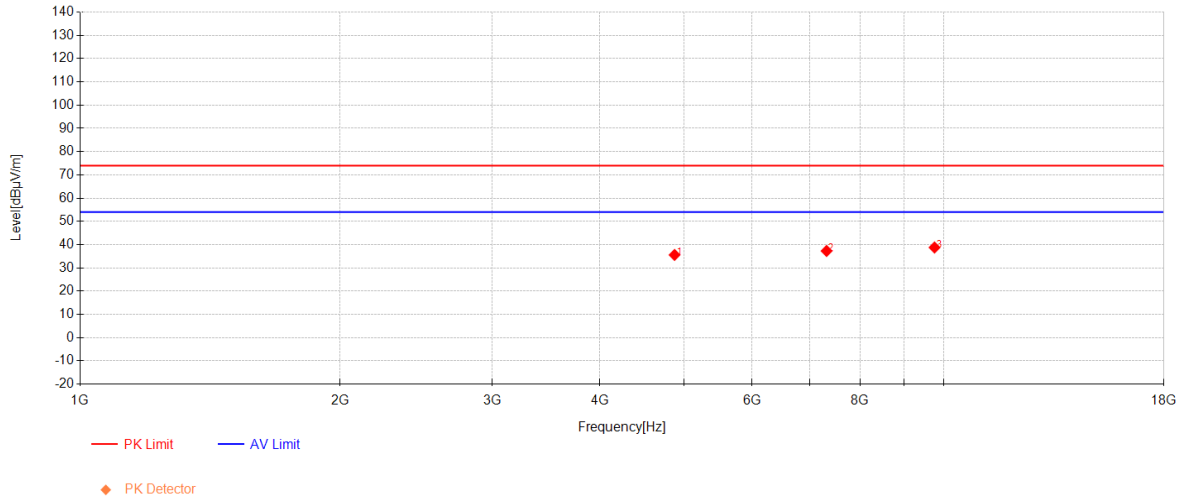
### BLE 1M\_Channel 00



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4804	42.52	32.77	-41.49	33.80	74.00	40.20	Vertical
2	7206	39.03	36.25	-38.02	37.26	74.00	36.74	Vertical
3	9608	38.51	37.78	-33.45	42.84	74.00	31.16	Vertical

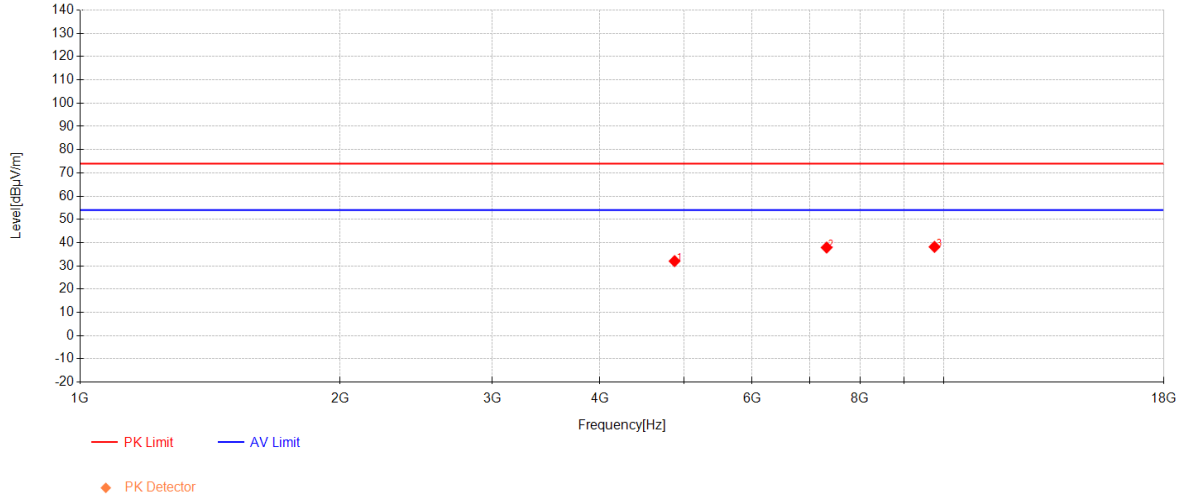


### BLE 1M Channel 19



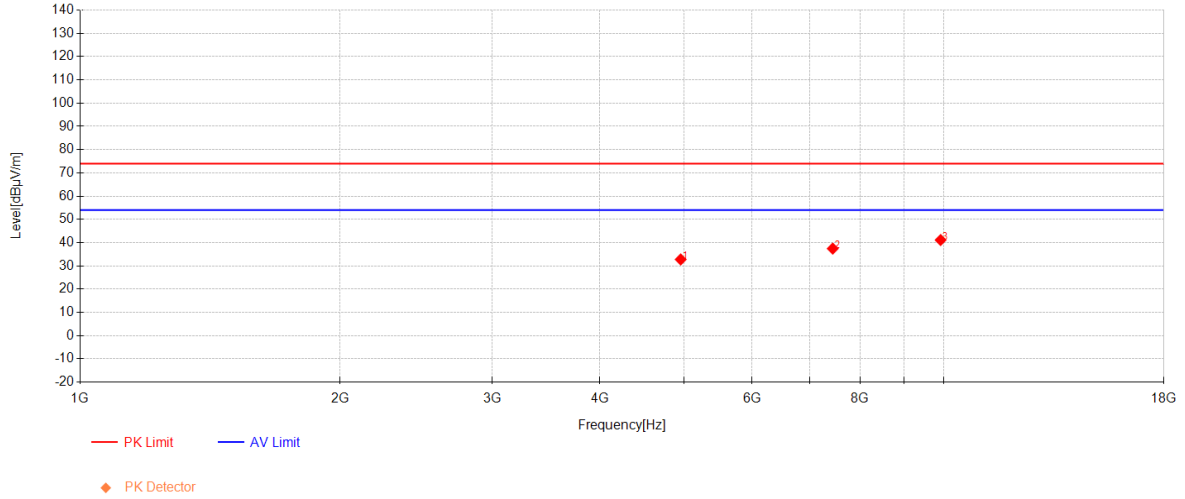
Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4880	43.90	32.94	-41.26	35.58	74.00	38.42	Horizontal
2	7320	38.36	36.38	-37.47	37.28	74.00	36.72	Horizontal
3	9760	34.01	37.83	-33.07	38.77	74.00	35.23	Horizontal

### BLE 1M Channel 19



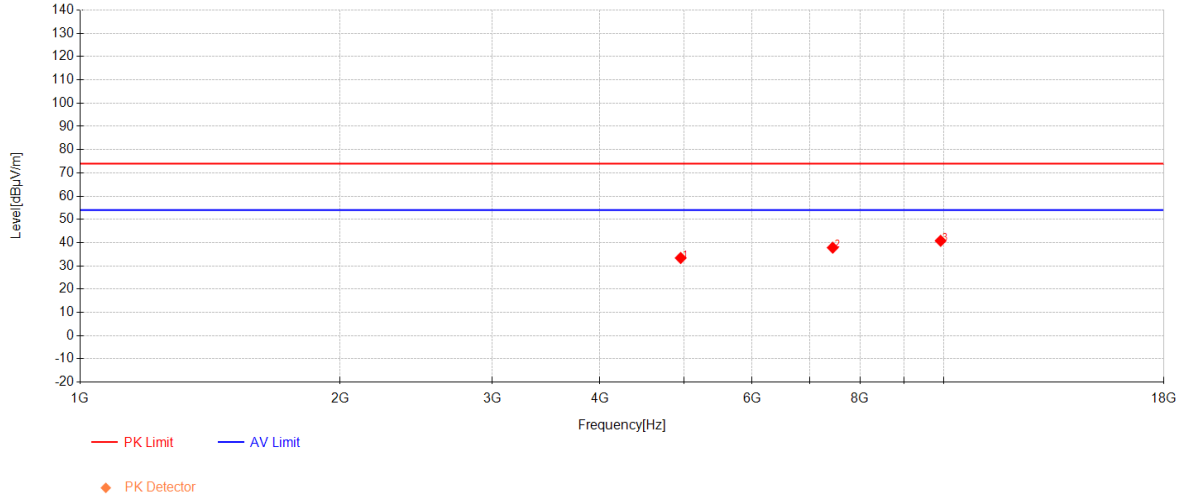
Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4880	40.38	32.94	-41.26	32.06	74.00	41.94	Vertical
2	7320	38.97	36.38	-37.47	37.89	74.00	36.11	Vertical
3	9760	33.42	37.83	-33.07	38.18	74.00	35.82	Vertical

### BLE 1M Channel 39



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4960	41.02	33.11	-41.36	32.77	74.00	41.23	Horizontal
2	7440	38.76	36.53	-37.85	37.44	74.00	36.56	Horizontal
3	9920	35.80	37.88	-32.55	41.13	74.00	32.87	Horizontal

### BLE 1M Channel 39



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4960	41.64	33.11	-41.36	33.39	74.00	40.61	Vertical
2	7440	39.15	36.53	-37.85	37.83	74.00	36.17	Vertical
3	9920	35.45	37.88	-32.55	40.78	74.00	33.22	Vertical



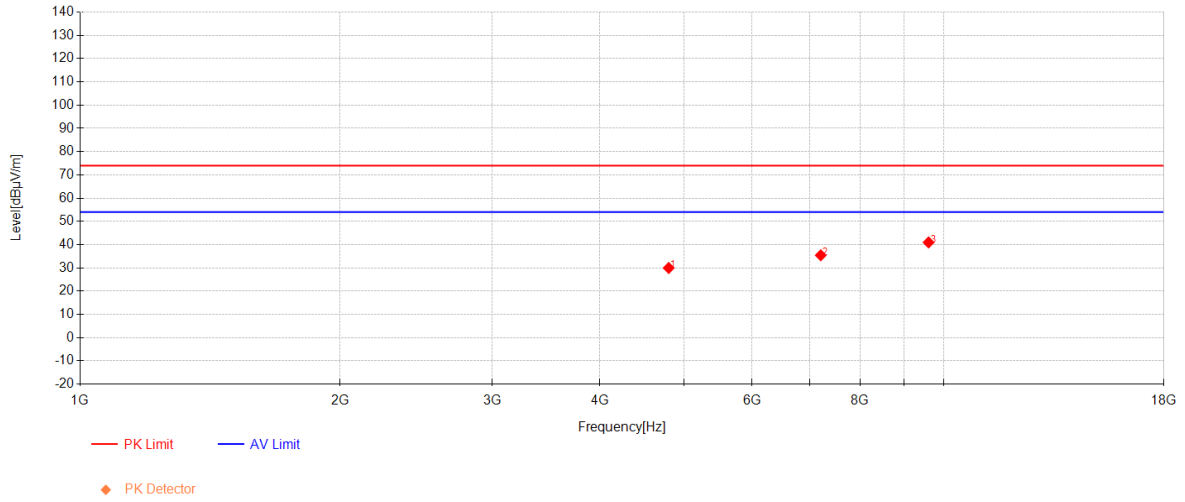
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CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

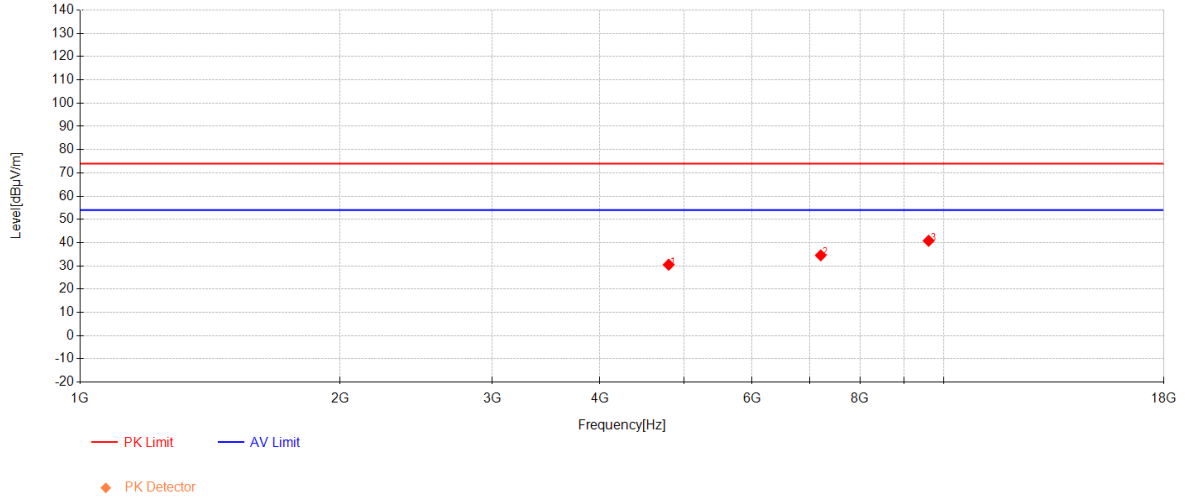
Page: 45 of 85

## BLE 2M\_Channel 00



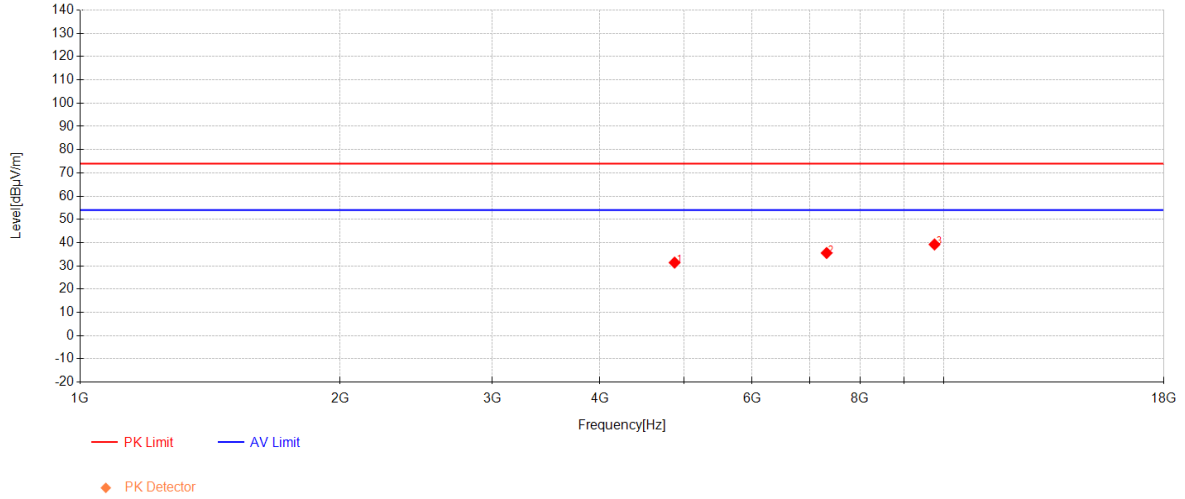
Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4804	38.68	32.77	-41.49	29.96	74.00	44.04	Horizontal
2	7206	37.20	36.25	-38.02	35.43	74.00	38.57	Horizontal
3	9608	36.63	37.78	-33.45	40.96	74.00	33.04	Horizontal

### BLE 2M\_Channel 00



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4804	39.23	32.77	-41.49	30.51	74.00	43.49	Vertical
2	7206	36.30	36.25	-38.02	34.53	74.00	39.47	Vertical
3	9608	36.48	37.78	-33.45	40.81	74.00	33.19	Vertical

### BLE 2M Channel 19



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4880	39.72	32.94	-41.26	31.40	74.00	42.60	Horizontal
2	7320	36.62	36.38	-37.47	35.54	74.00	38.46	Horizontal
3	9760	34.46	37.83	-33.07	39.22	74.00	34.78	Horizontal



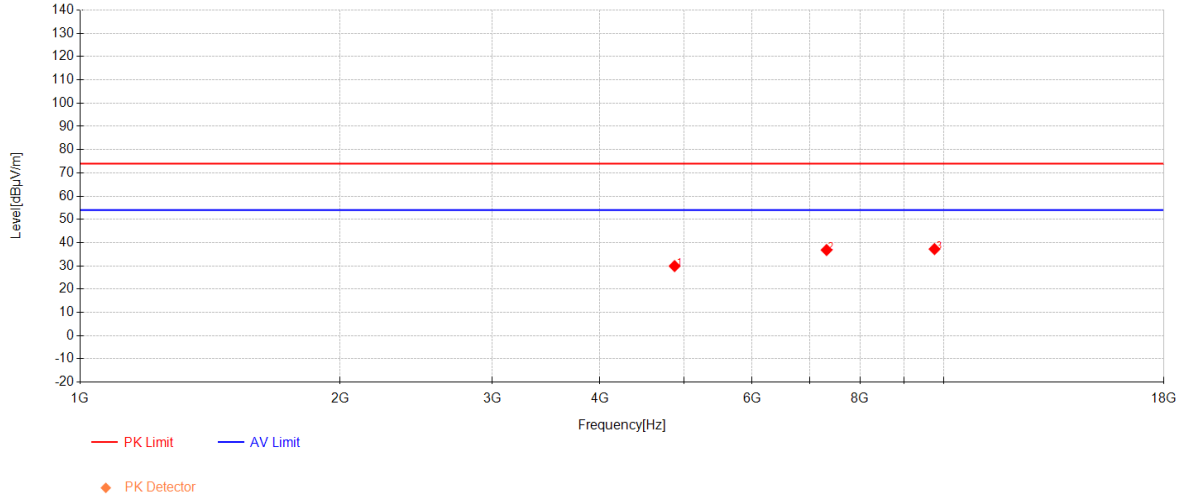
# Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 48 of 85

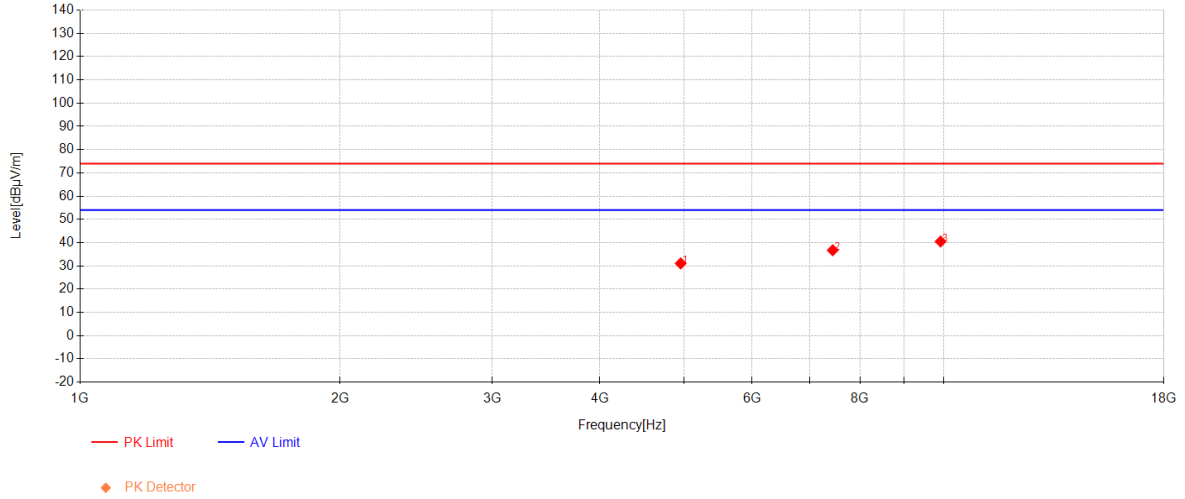
## BLE 2M Channel 19



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4880	38.23	32.94	-41.26	29.91	74.00	44.09	Vertical
2	7320	37.91	36.38	-37.47	36.83	74.00	37.17	Vertical
3	9760	32.47	37.83	-33.07	37.23	74.00	36.77	Vertical



### BLE 2M Channel 39



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4960	39.29	33.11	-41.36	31.04	74.00	42.96	Horizontal
2	7440	38.05	36.53	-37.85	36.73	74.00	37.27	Horizontal
3	9920	35.17	37.88	-32.55	40.50	74.00	33.50	Horizontal



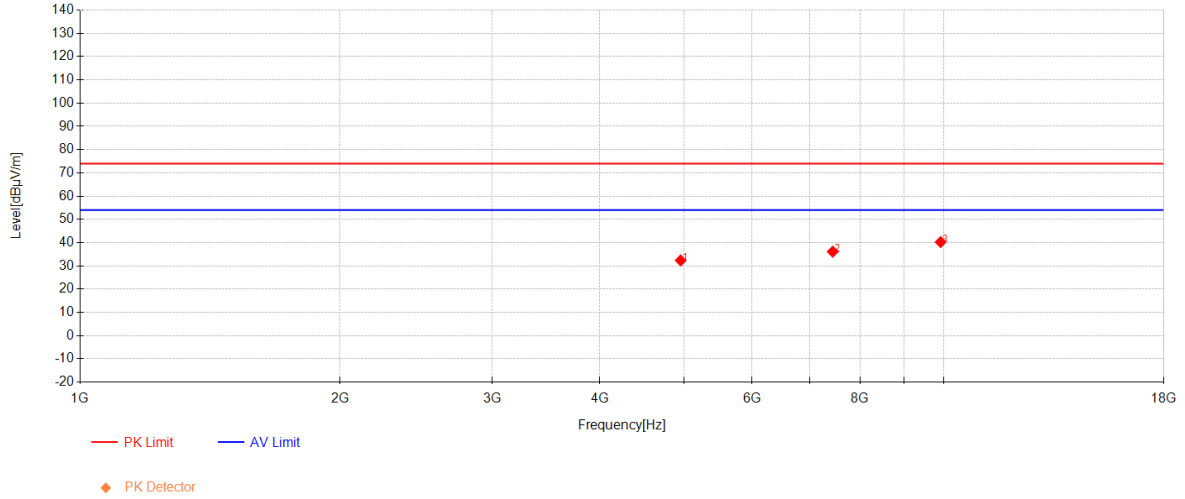
# Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 50 of 85

## BLE 2M Channel 39



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4960	40.59	33.11	-41.36	32.34	74.00	41.66	Vertical
2	7440	37.44	36.53	-37.85	36.12	74.00	37.88	Vertical
3	9920	34.94	37.88	-32.55	40.27	74.00	33.73	Vertical

### 7.5 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)

Test Method: ANSI C63.10 (2013) Section 11.9.1

Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for $\geq 50$ hopping channels
	0.25 for $25 \leq$ hopping channels $< 50$
	1 for digital modulation
2400-2483.5	1 for $\geq 75$ non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

#### 7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C

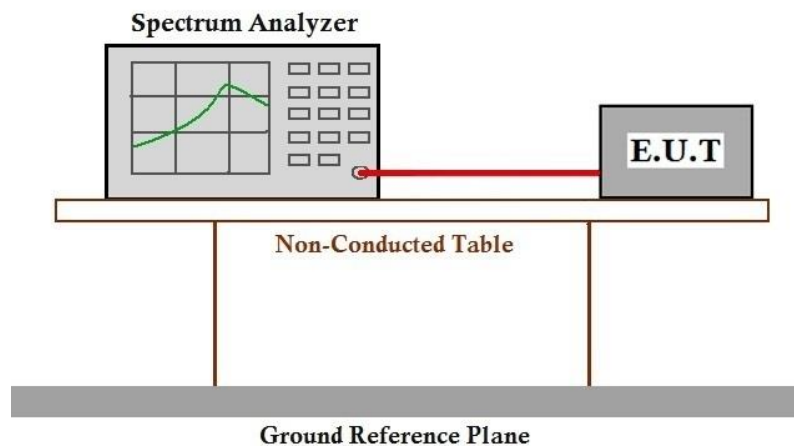
Humidity: 50.5 % RH

Atmospheric Pressure: 1010 mbar

#### 7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	06	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

#### 7.5.3 Test Setup Diagram





## **Compliance Certification Services (Kunshan) Inc.**

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 52 of 85

### **7.5.4 Measurement Procedure and Data**

Note: Since the verify power the same operating range bandwidth and smaller power can be covered by the higher power.

Please Refer to Appendix for Details

### 7.6 Minimum 6dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)

Test Method: ANSI C63.10 (2013) Section 11.8.1

Limit:

≥500 kHz

#### 7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C

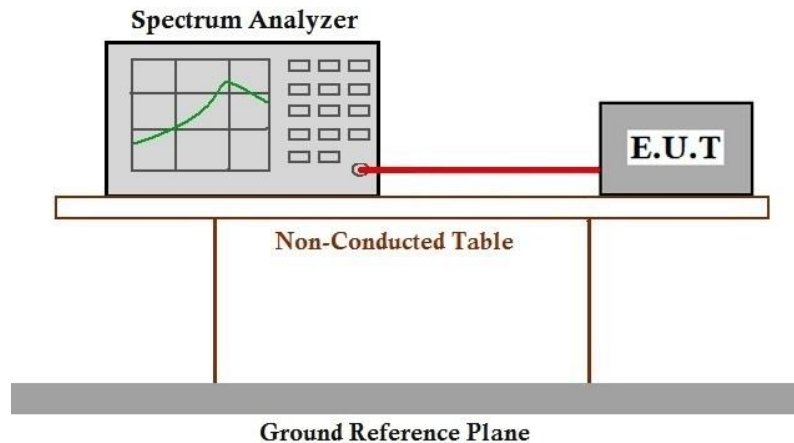
Humidity: 50.5 % RH

Atmospheric Pressure: 1010 mbar

#### 7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	06	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

#### 7.6.3 Test Setup Diagram



#### 7.6.4 Measurement Procedure and Data

Please Refer to Appendix for Details

### 7.7 Power Spectrum Density

Test Requirement 47 CFR Part 15, Subpart C 15.247(e)

Test Method: ANSI C63.10 (2013) Section 11.10.2

Limit:

≤8dBm in any 3 kHz band during any time interval of continuous transmission

#### 7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C

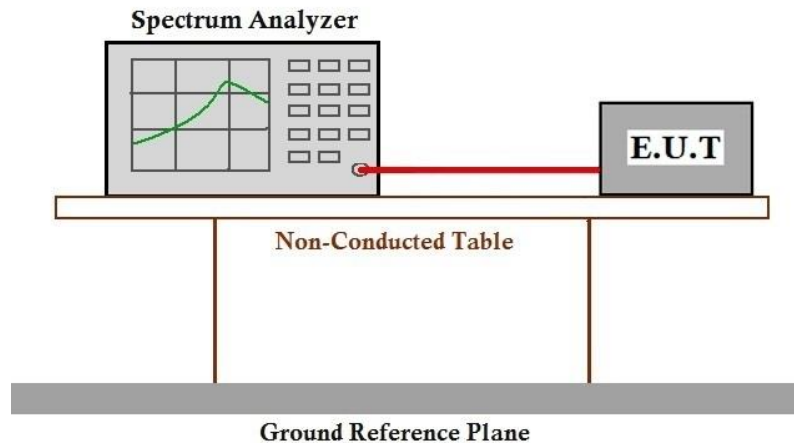
Humidity: 50.5 % RH

Atmospheric Pressure: 1010 mbar

#### 7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	06	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

#### 7.7.3 Test Setup Diagram



#### 7.7.4 Measurement Procedure and Data

Please Refer to Appendix for Details

# Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 55 of 85

## 7.8 Conducted Band Edges Measurement

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)  
 Test Method: ANSI C63.10 (2013) Section 11.13.3.2

**Limit:**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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 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 paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, 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) (see §15.205(c)).

### 7.8.1 E.U.T. Operation

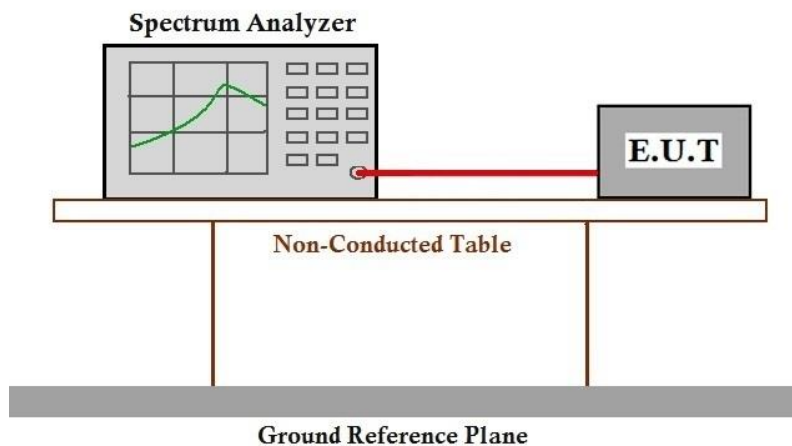
Operating Environment:

Temperature: 23 °C Humidity: 50.5 % RH Atmospheric Pressure: 1010 mbar

### 7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	06	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

### 7.8.3 Test Setup Diagram



### 7.8.4 Measurement Procedure and Data

Please Refer to Appendix for Details

### 7.9 Conducted Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)

Test Method: ANSI C63.10 (2013) Section 11.11

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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 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 paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, 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) (see §15.205(c)).

#### 7.9.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C

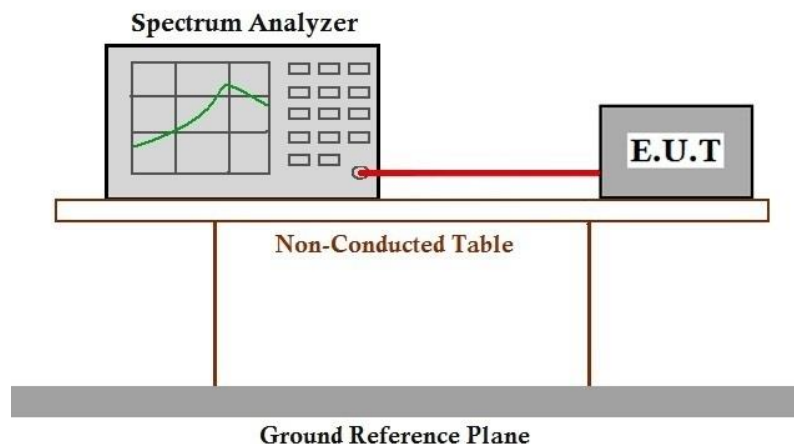
Humidity: 50.5 % RH

Atmospheric Pressure: 1010 mbar

#### 7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	06	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

#### 7.9.3 Test Setup Diagram



#### 7.9.4 Measurement Procedure and Data

Please Refer to Appendix for Details





## **Compliance Certification Services (Kunshan) Inc.**

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 57 of 85

### **8 Test Setup Photo**

Refer to Appendix - Test Setup Photo for KSCR2408001502AT

### **9 EUT Constructional Details (EUT Photos)**

Refer to Appendix - Photographs of EUT Constructional Details for KSCR2408001502AT



## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 58 of 85

## 10 Appendix

### 1. Duty Cycle

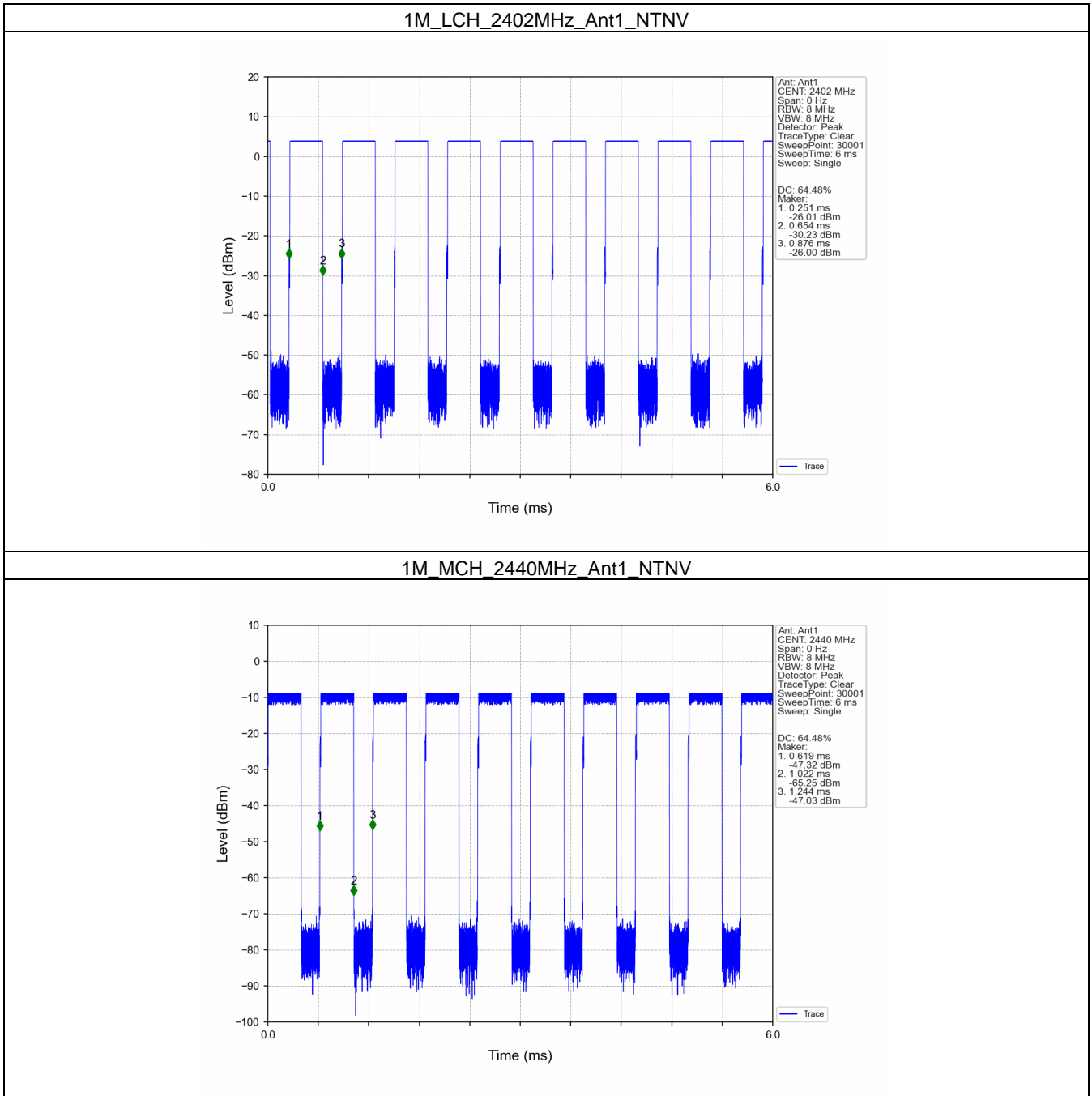
#### 1.1 Test Result

##### 1.1.1 Ant1

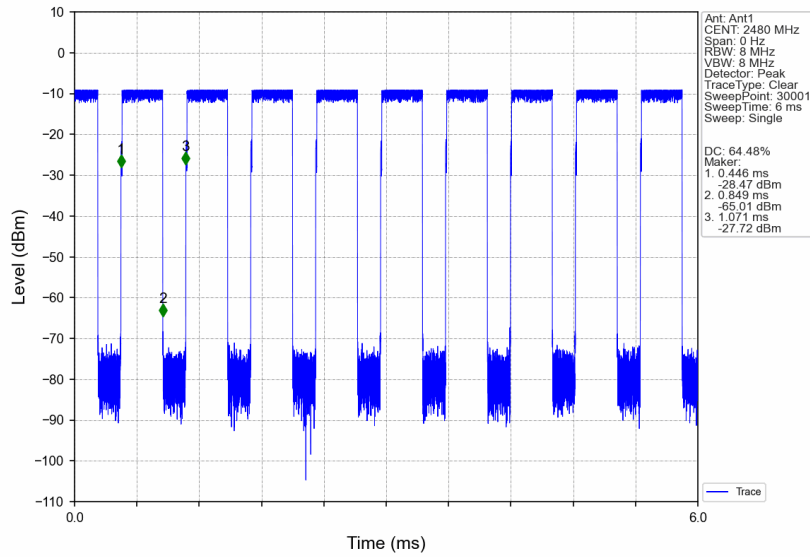
Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
1M	SISO	2402	0.403	0.625	64.48	1.91	0.00
		2440	0.403	0.625	64.48	1.91	0.00
		2480	0.403	0.625	64.48	1.91	0.02
2M	SISO	2402	0.206	0.625	32.96	4.82	0.03
		2440	0.212	0.625	33.92	4.70	0.00
		2480	0.212	0.625	33.92	4.70	0.00

### 1.2 Test Graph

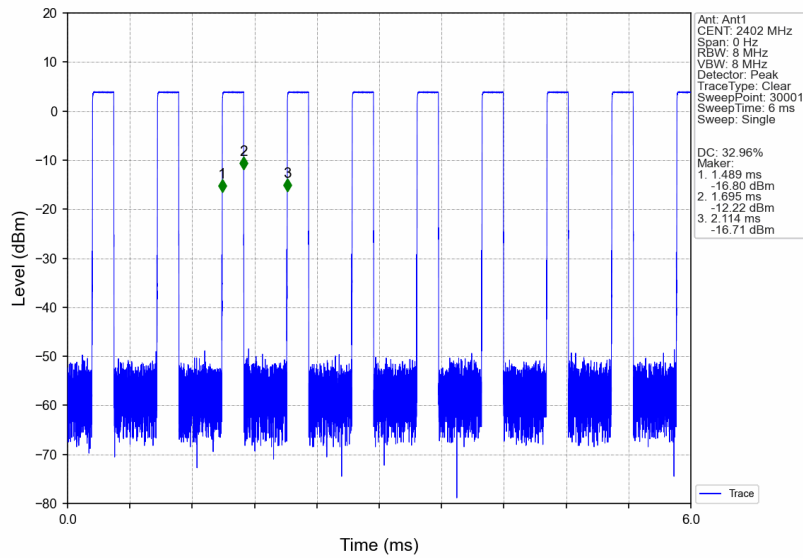
#### 1.2.1 Ant1



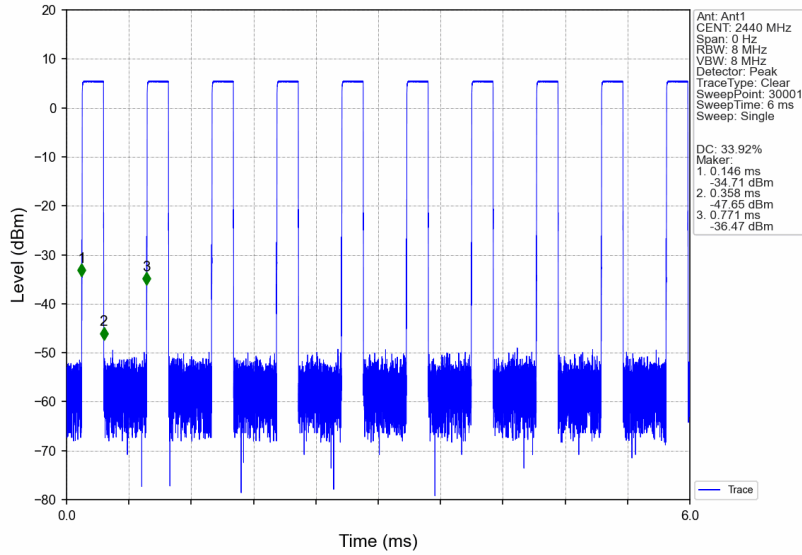
1M\_HCH\_2480MHz\_Ant1\_NTNV



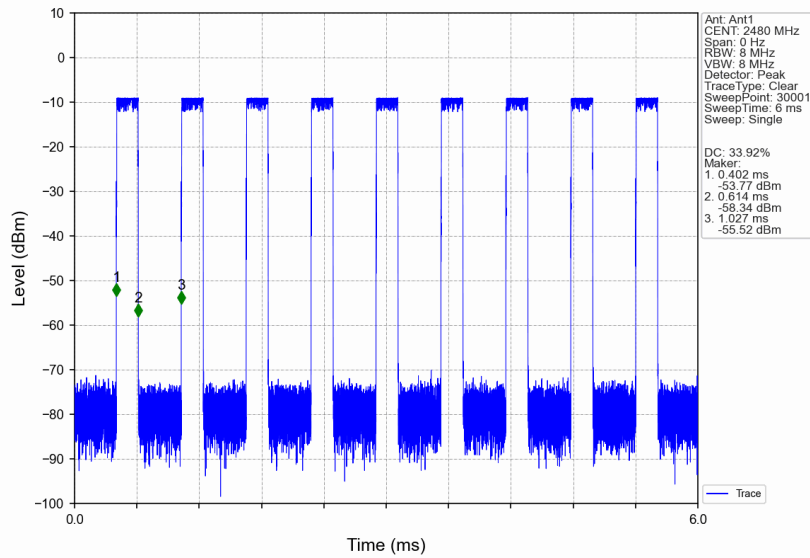
2M\_LCH\_2402MHz\_Ant1\_NTNV



2M\_MCH\_2440MHz\_Ant1\_NTNV



2M\_HCH\_2480MHz\_Ant1\_NTNV



## 2. Bandwidth

### 2.1 Test Result

#### 2.1.1 OBW

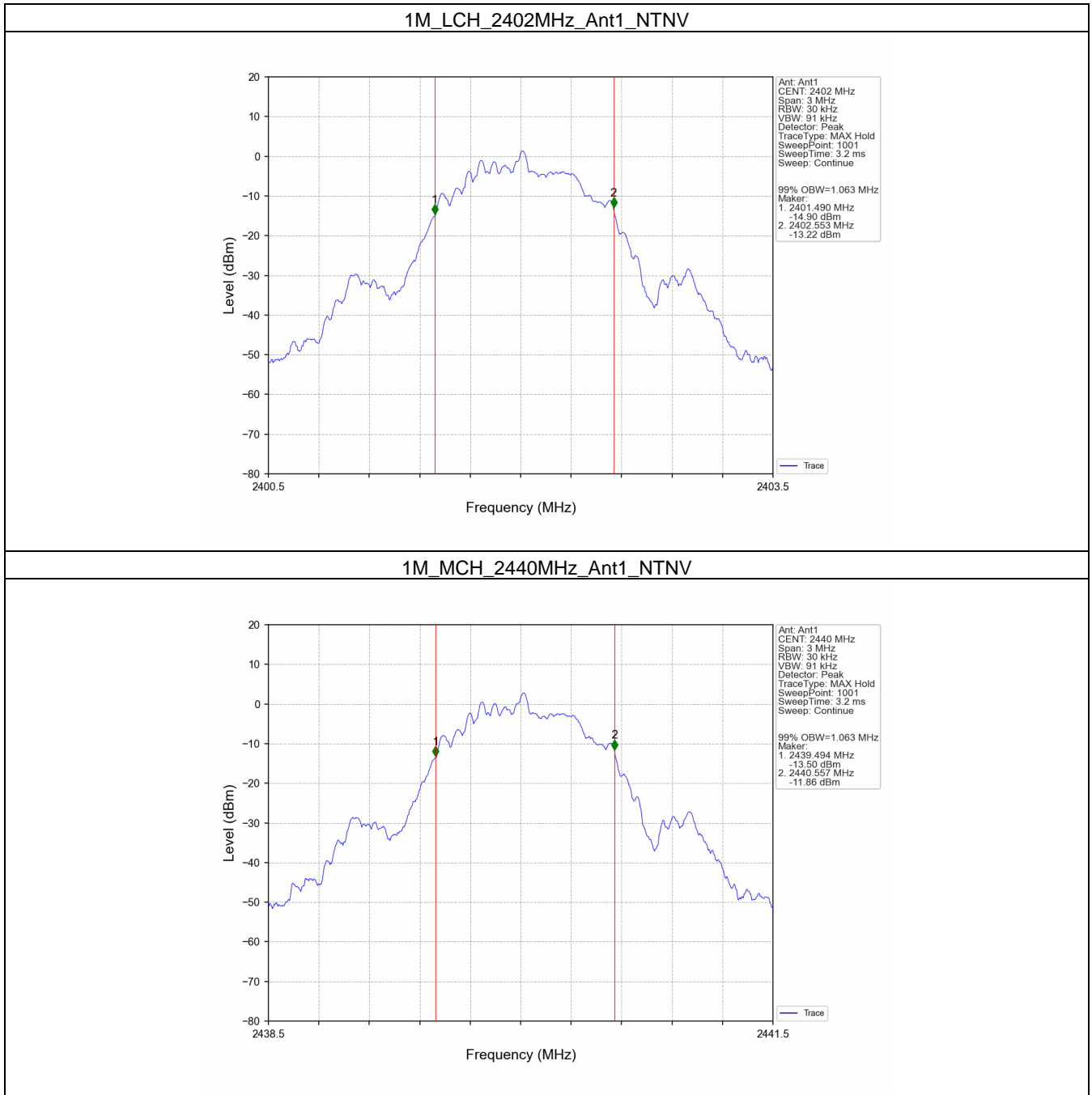
Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)		Verdict
				Result	Limit	
1M	SISO	2402	1	1.063	/	Pass
		2440	1	1.063	/	Pass
		2480	1	1.064	/	Pass
2M	SISO	2402	1	2.094	/	Pass
		2440	1	2.093	/	Pass
		2480	1	2.092	/	Pass

#### 2.1.2 6dB BW

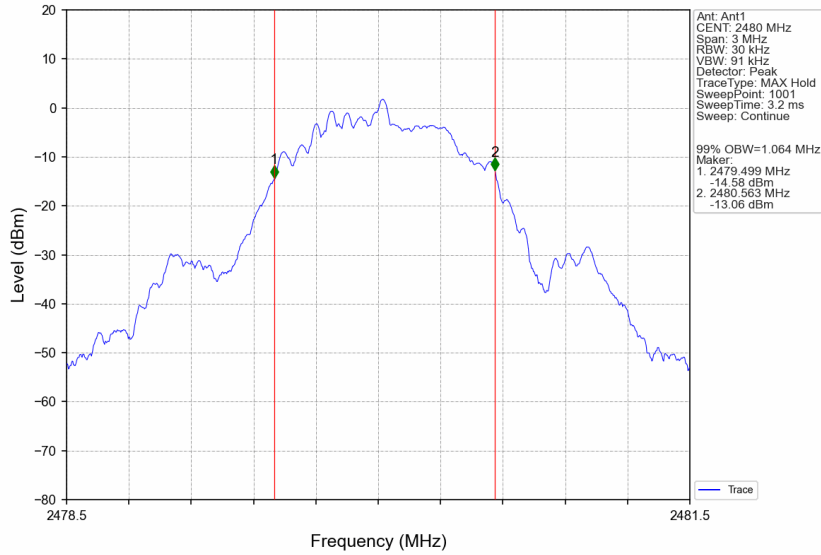
Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
1M	SISO	2402	1	0.709	$\geq 0.5$	Pass
		2440	1	0.708	$\geq 0.5$	Pass
		2480	1	0.707	$\geq 0.5$	Pass
2M	SISO	2402	1	1.116	$\geq 0.5$	Pass
		2440	1	1.124	$\geq 0.5$	Pass
		2480	1	1.122	$\geq 0.5$	Pass

### 2.2 Test Graph

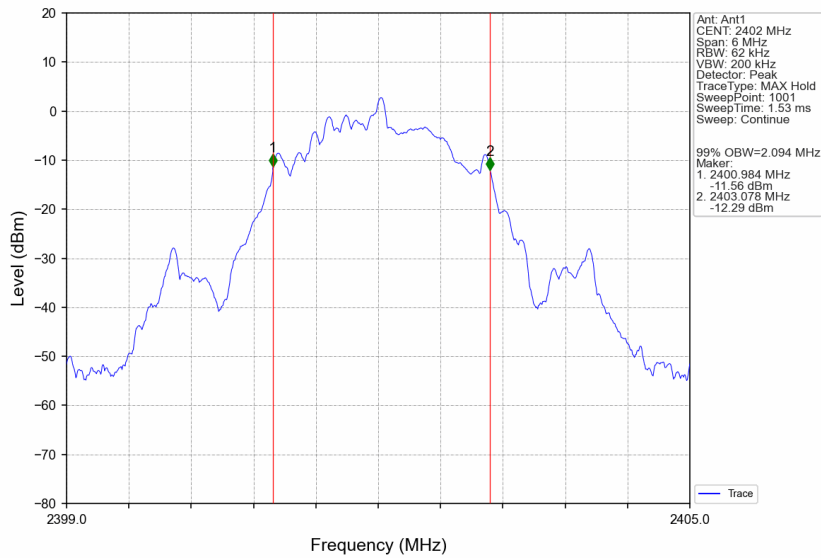
#### 2.2.1 OBW



1M\_HCH\_2480MHz\_Ant1\_NTNV

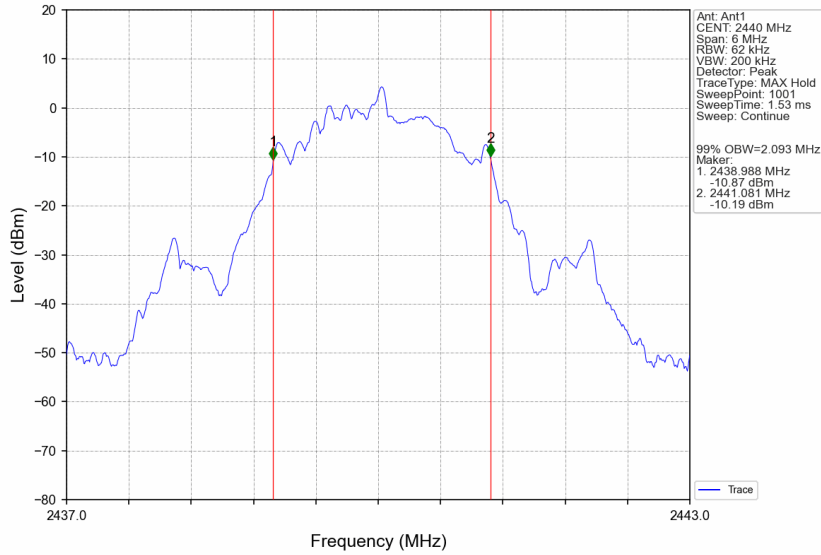


2M\_LCH\_2402MHz\_Ant1\_NTNV

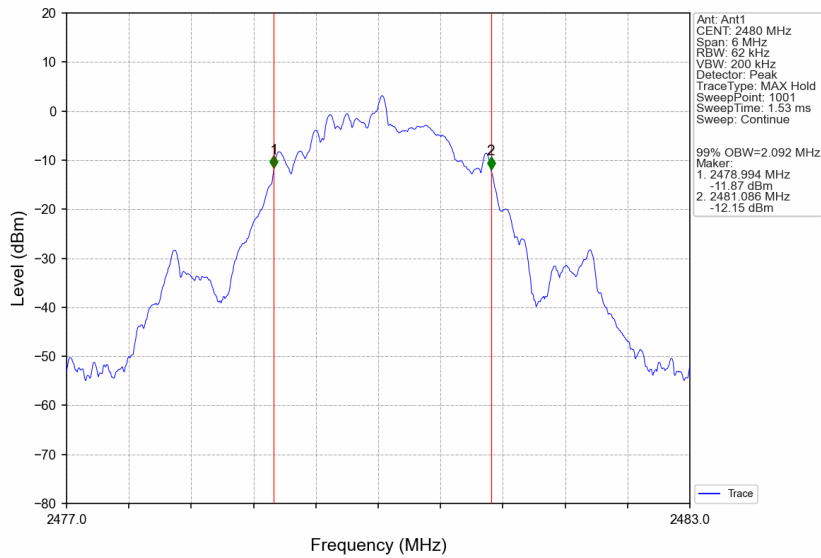




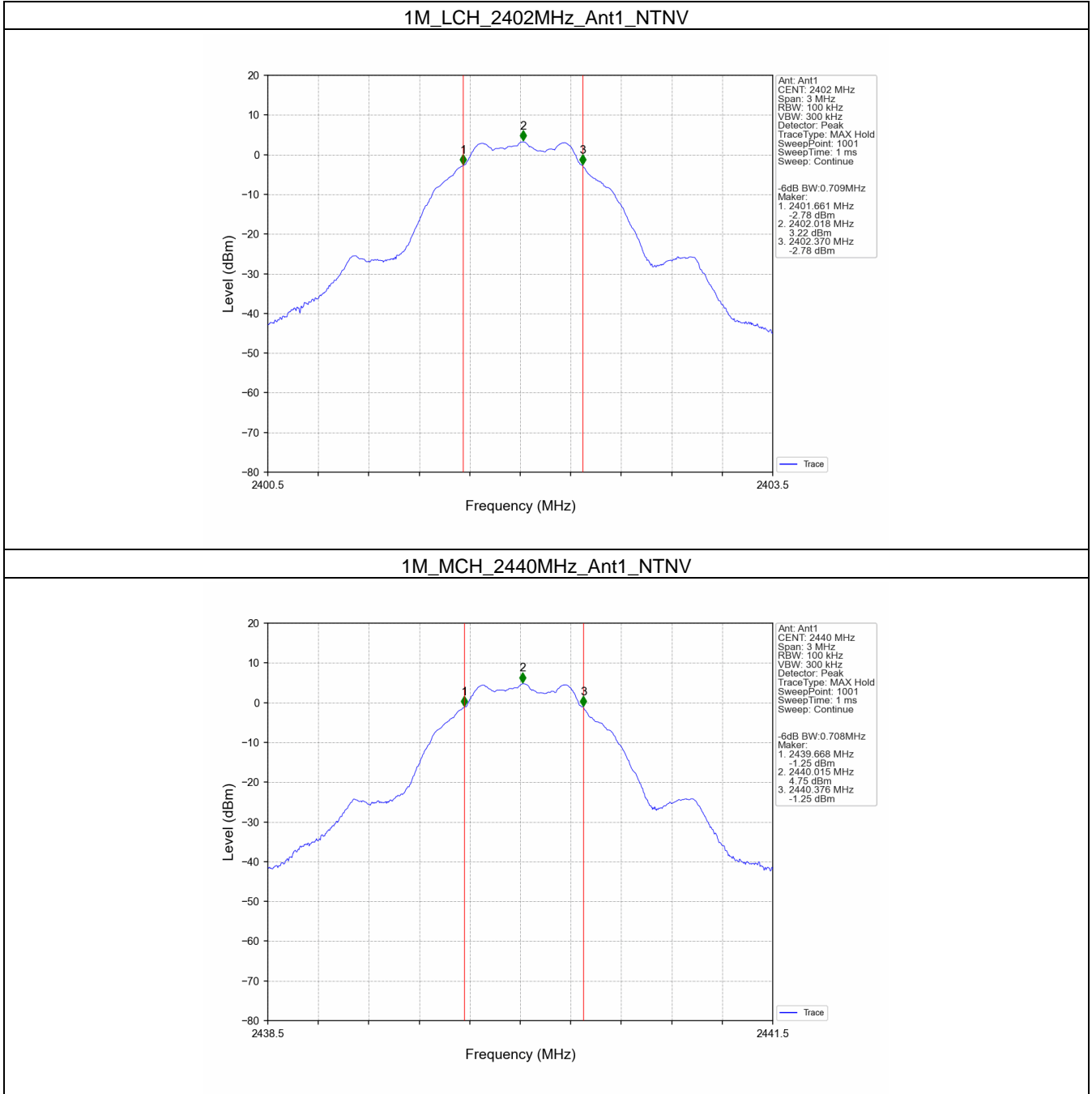
2M\_MCH\_2440MHz\_Ant1\_NTNV



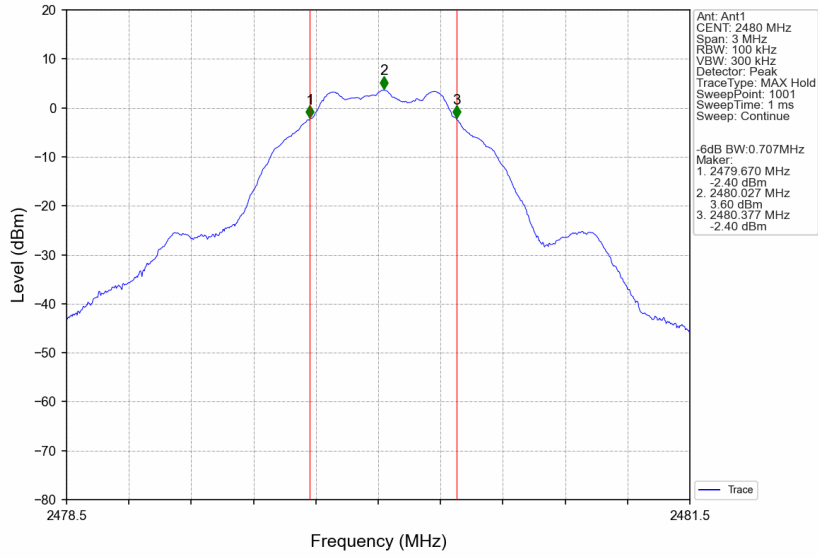
2M\_HCH\_2480MHz\_Ant1\_NTNV



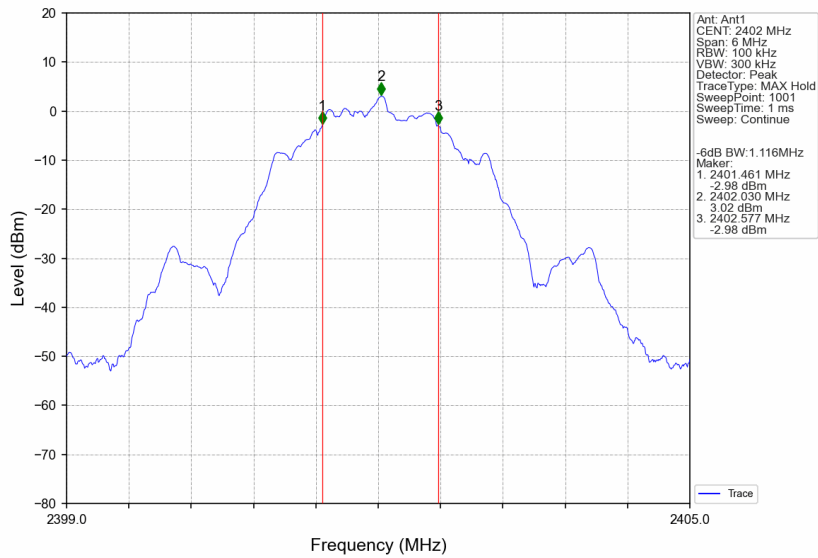
### 2.2.2 6dB BW



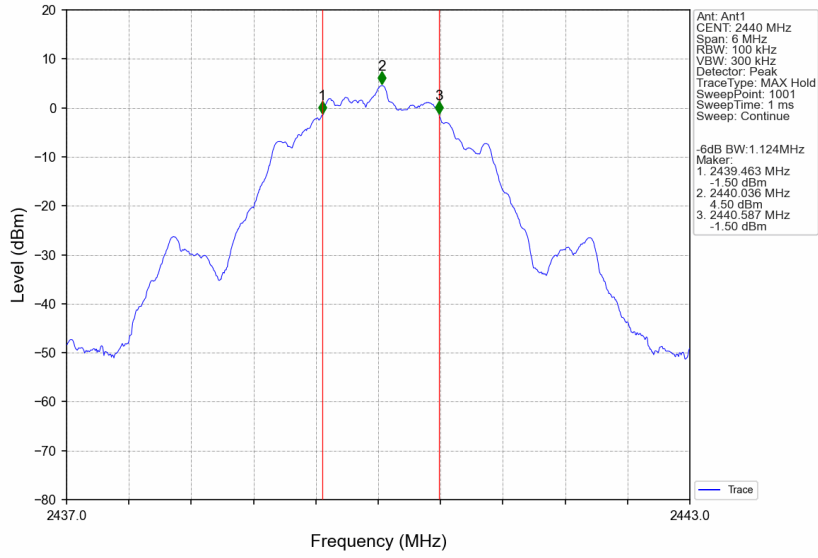
1M\_HCH\_2480MHz\_Ant1\_NTNV



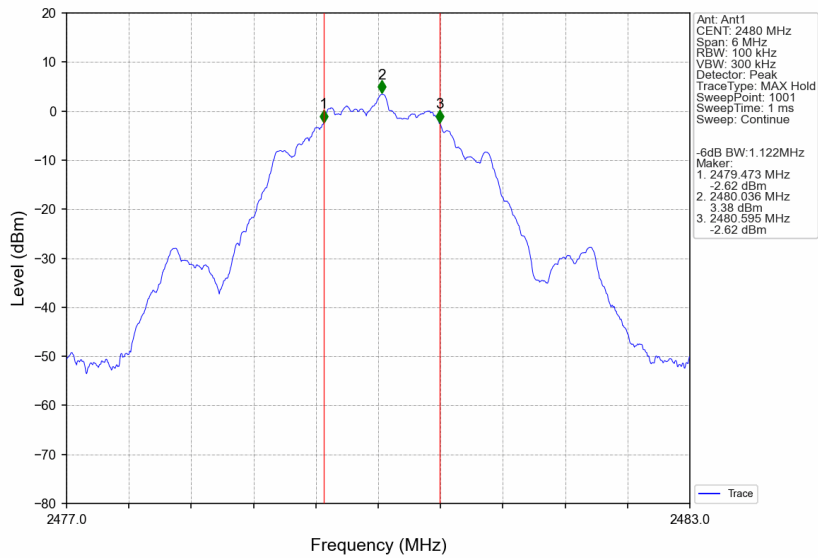
2M\_LCH\_2402MHz\_Ant1\_NTNV



2M\_MCH\_2440MHz\_Ant1\_NTNV



2M\_HCH\_2480MHz\_Ant1\_NTNV



## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 69 of 85

### 3. Maximum Conducted Output Power

#### 3.1 Test Result

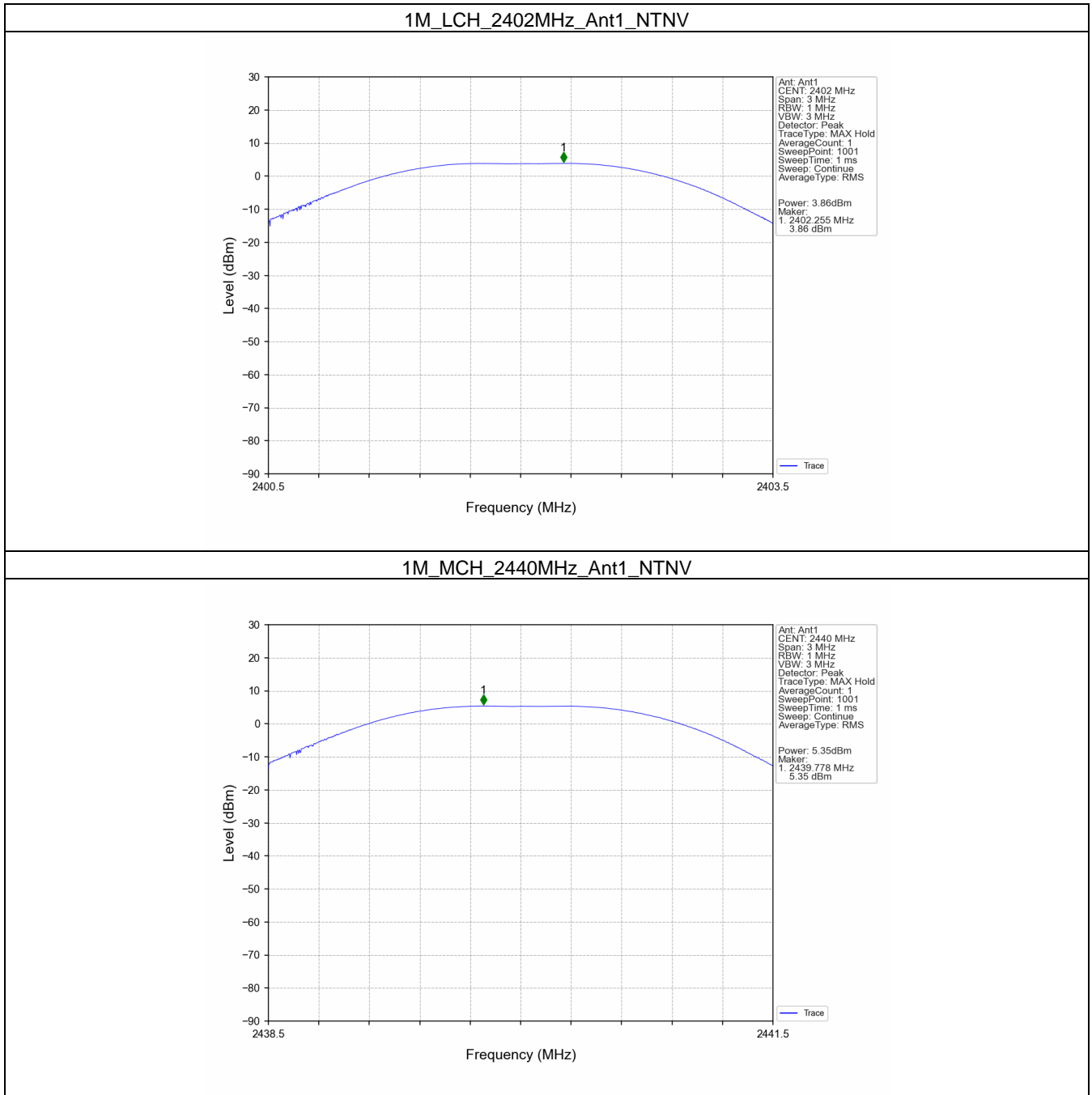
##### 3.1.1 Power

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
1M	SISO	2402	3.86	<=30	Pass
		2440	5.35	<=30	Pass
		2480	4.21	<=30	Pass
2M	SISO	2402	3.90	<=30	Pass
		2440	5.41	<=30	Pass
		2480	4.28	<=30	Pass

Note1: Antenna Gain: Ant1: 4.50dBi;

### 3.2 Test Graph

#### 3.2.1 Power





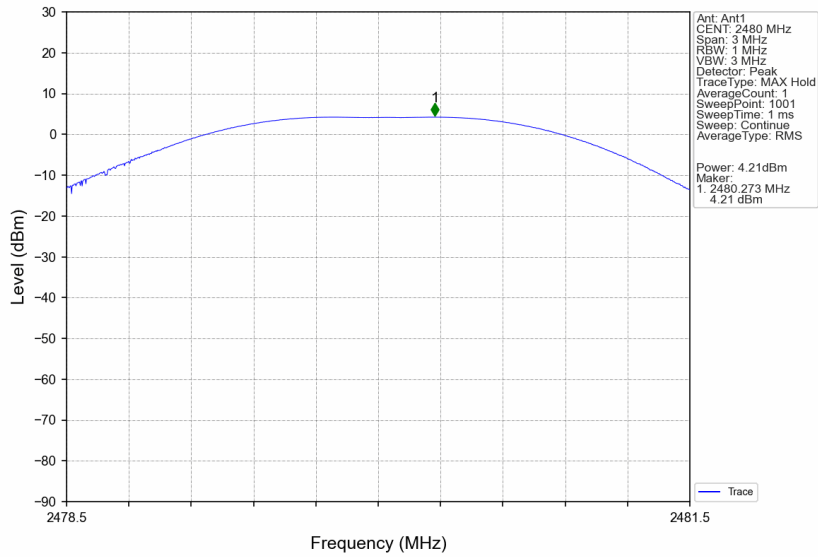
# Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

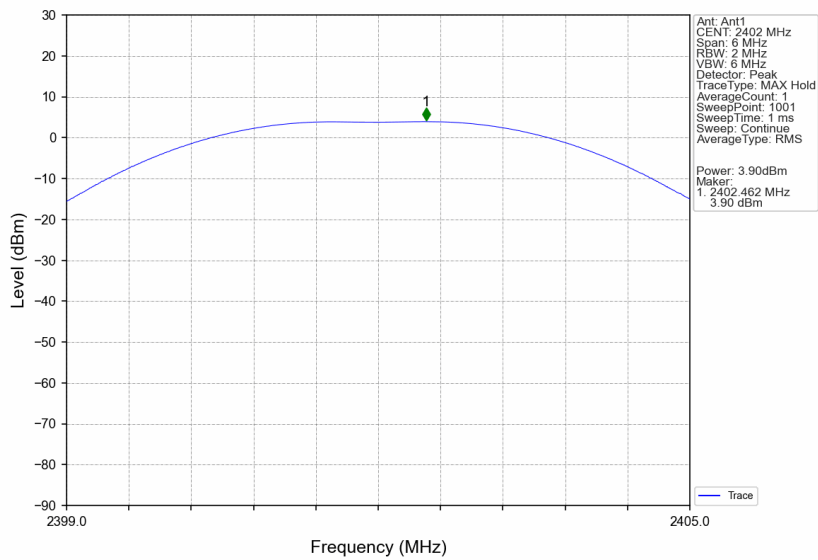
Report No.: KSCR240800150201

Page: 71 of 85

### 1M\_HCH\_2480MHz\_Ant1\_NTNV



### 2M\_LCH\_2402MHz\_Ant1\_NTNV





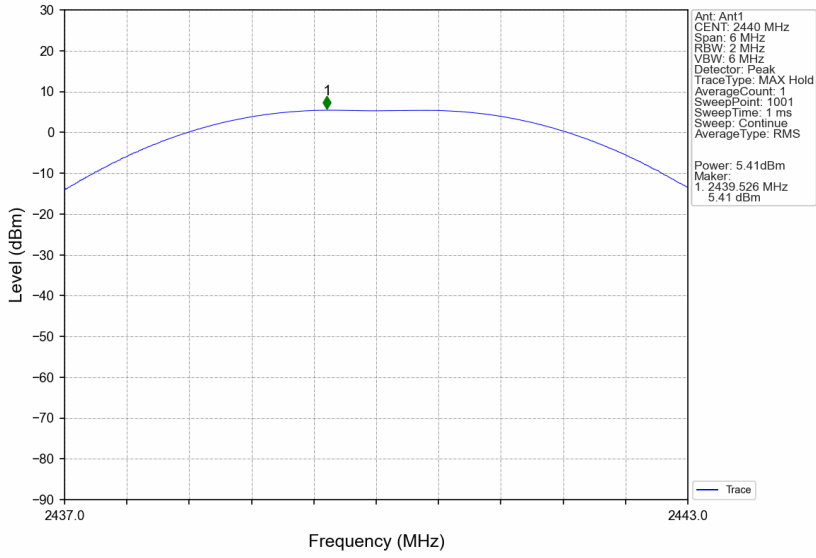
# Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

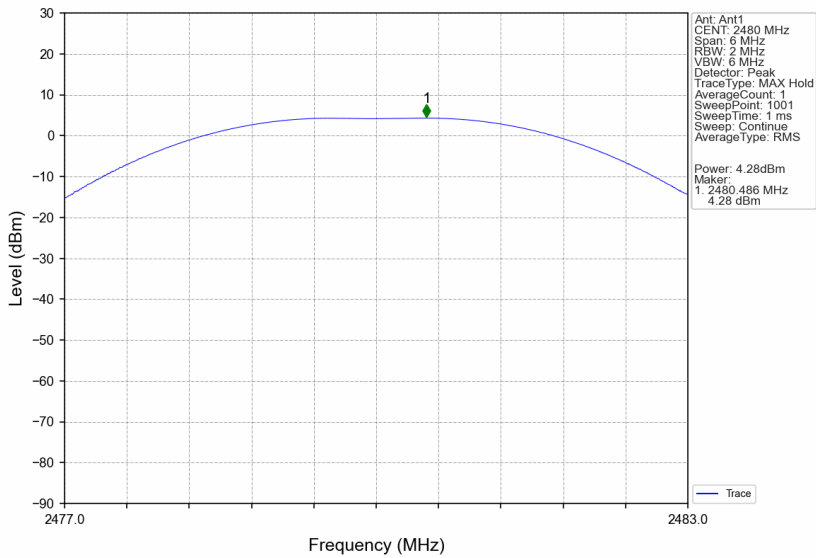
Report No.: KSCR240800150201

Page: 72 of 85

### 2M\_MCH\_2440MHz\_Ant1\_NTNV



### 2M\_HCH\_2480MHz\_Ant1\_NTNV







## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 73 of 85

### 4. Maximum Power Spectral Density

#### 4.1 Test Result

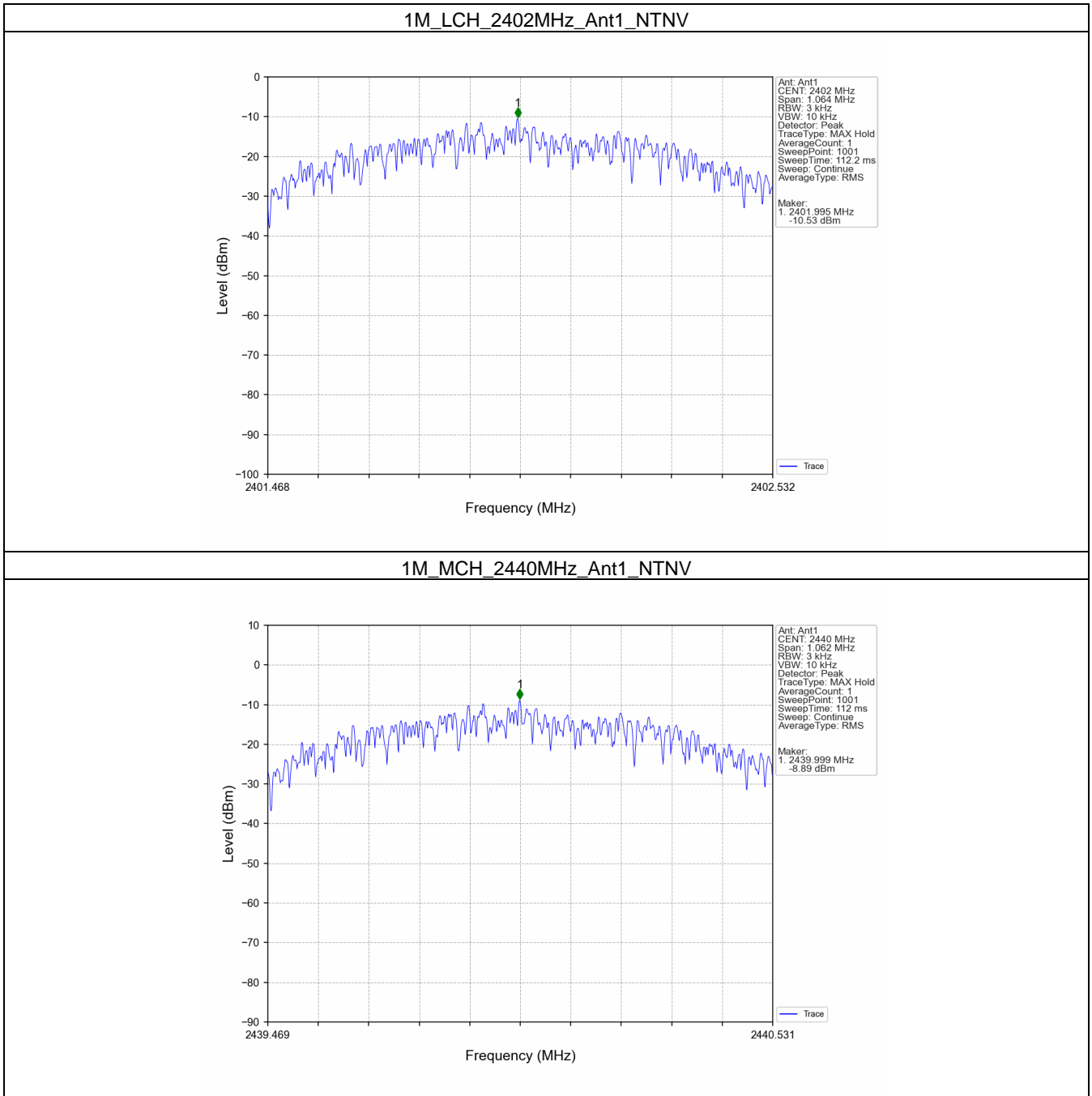
##### 4.1.1 PSD

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
1M	SISO	2402	-10.53	<=8	Pass
		2440	-8.89	<=8	Pass
		2480	-10.02	<=8	Pass
2M	SISO	2402	-13.65	<=8	Pass
		2440	-11.76	<=8	Pass
		2480	-12.82	<=8	Pass

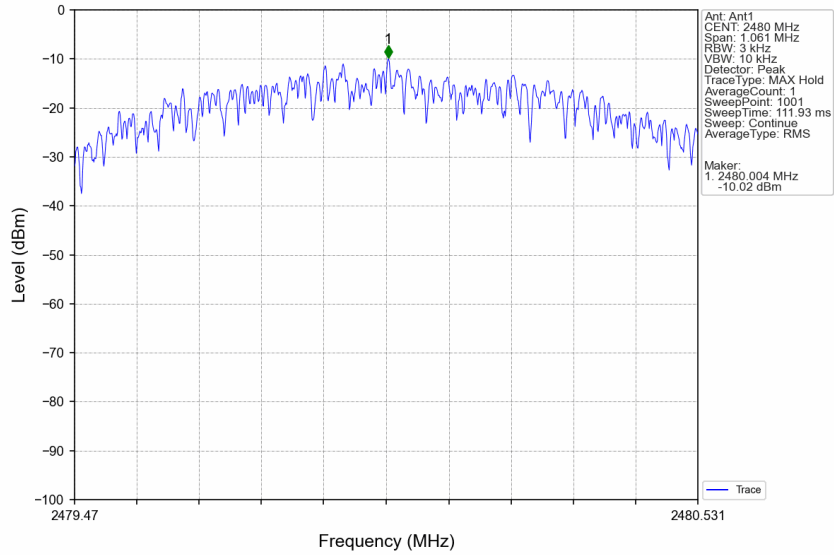
Note1: Antenna Gain: Ant1: 4.50dBi;

### 4.2 Test Graph

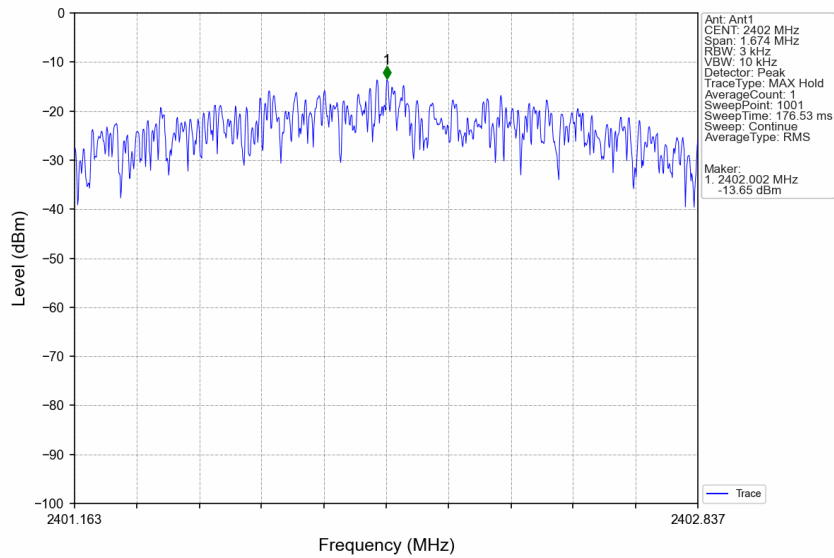
#### 4.2.1 PSD



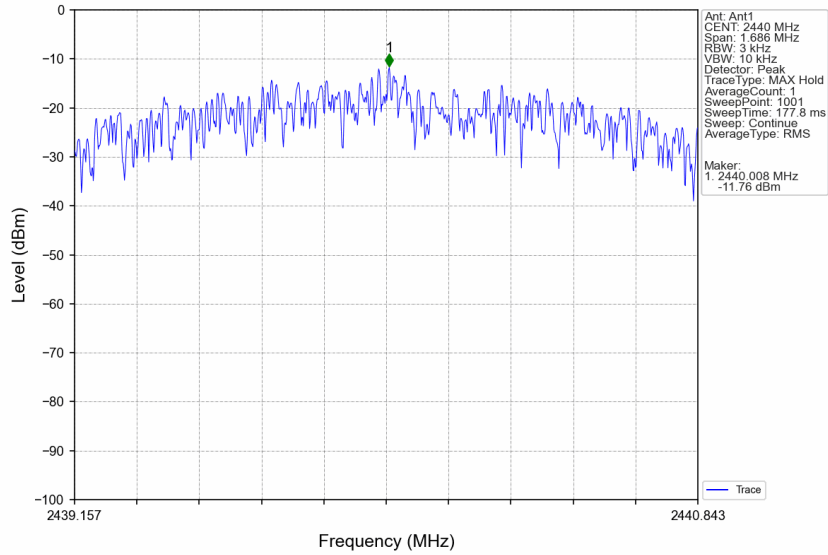
1M\_HCH\_2480MHz\_Ant1\_NTNV



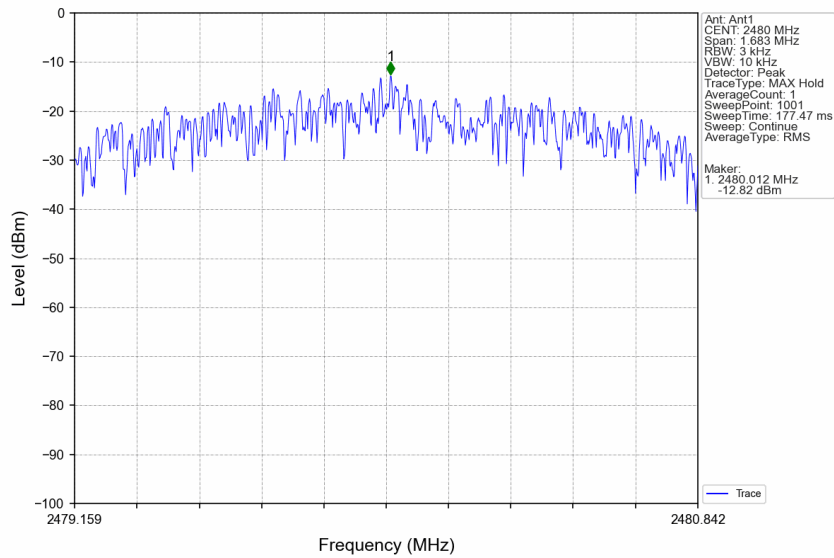
2M\_LCH\_2402MHz\_Ant1\_NTNV



2M\_MCH\_2440MHz\_Ant1\_NTNV



2M\_HCH\_2480MHz\_Ant1\_NTNV





## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800150201

Page: 77 of 85

### 5. Unwanted Emissions In Non-restricted Frequency Bands

#### 5.1 Test Result

##### 5.1.1 Ref

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)
1M	SISO	2402	1	3.21
		2440	1	4.72
		2480	1	3.57
2M	SISO	2402	1	3.08
		2440	1	4.60
		2480	1	3.47

Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.

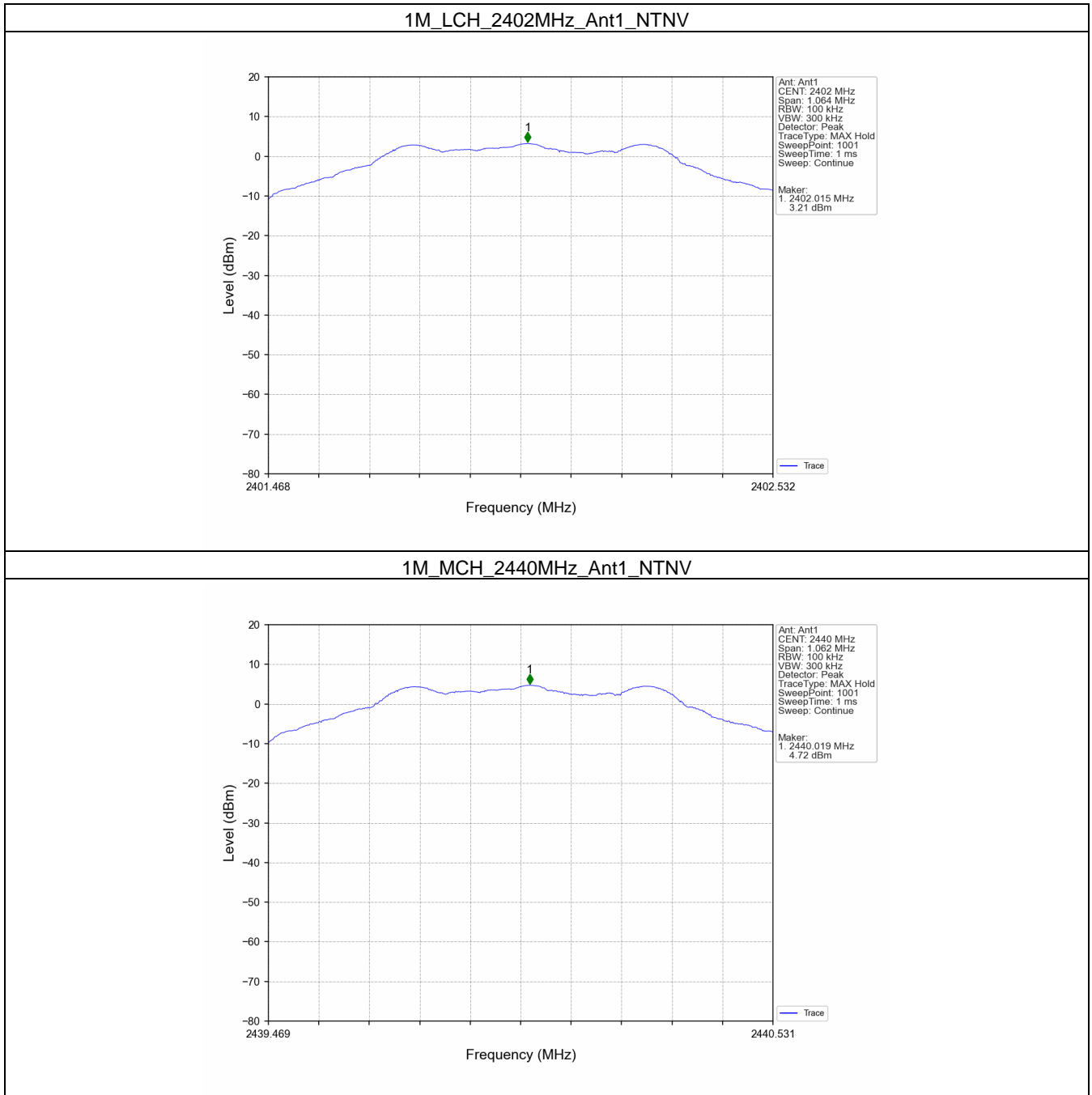
##### 5.1.2 CSE

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
1M	SISO	2402	1	4.72	-15.28	Pass
		2440	1	4.72	-15.28	Pass
		2480	1	4.72	-15.28	Pass
2M	SISO	2402	1	4.60	-15.40	Pass
		2440	1	4.60	-15.40	Pass
		2480	1	4.60	-15.40	Pass

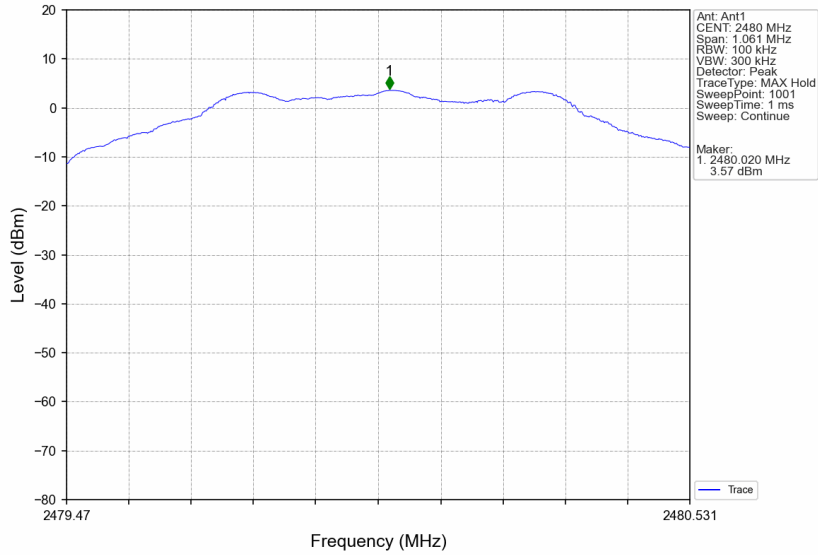
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.

### 5.2 Test Graph

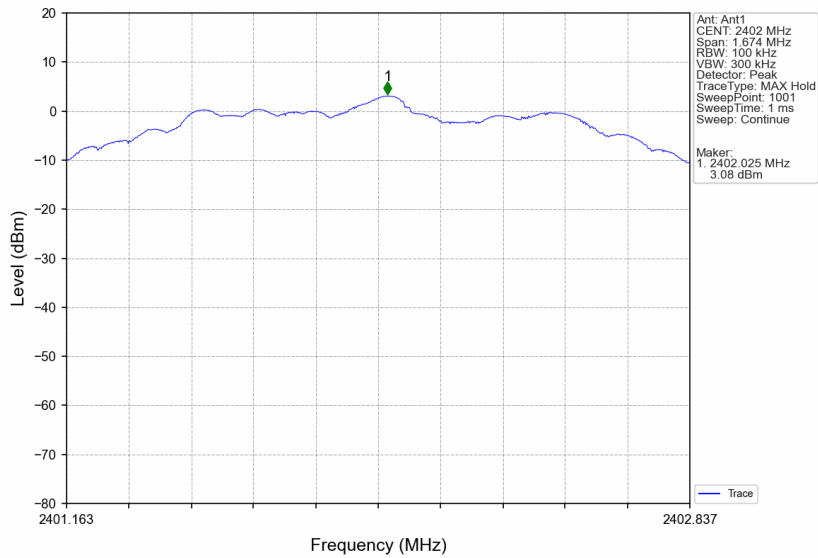
#### 5.2.1 Ref



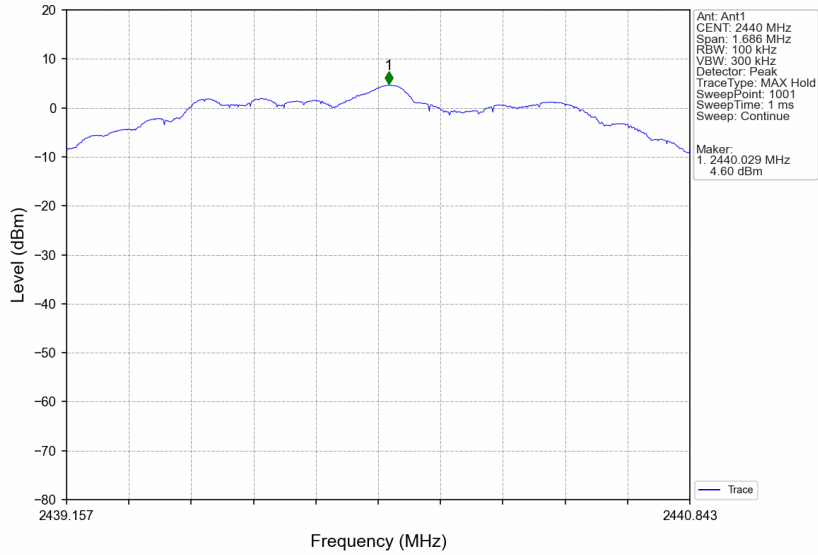
1M\_HCH\_2480MHz\_Ant1\_NTNV



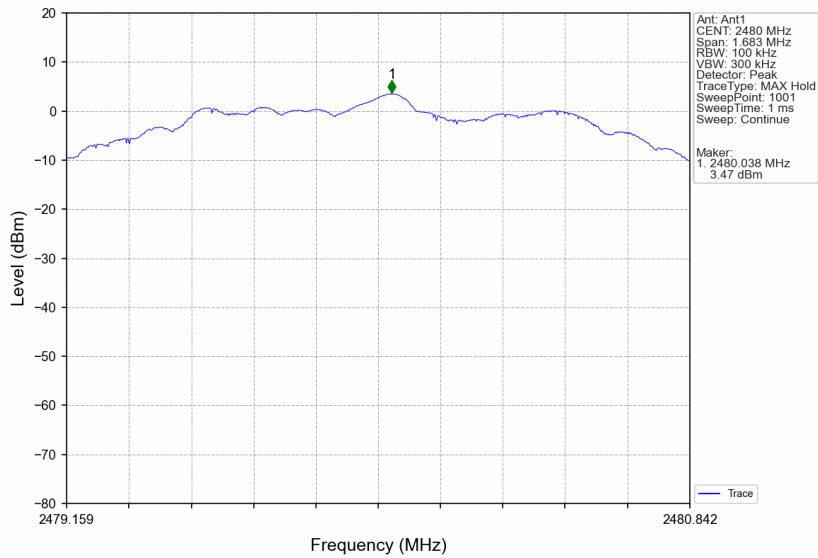
2M\_LCH\_2402MHz\_Ant1\_NTNV



2M\_MCH\_2440MHz\_Ant1\_NTNV

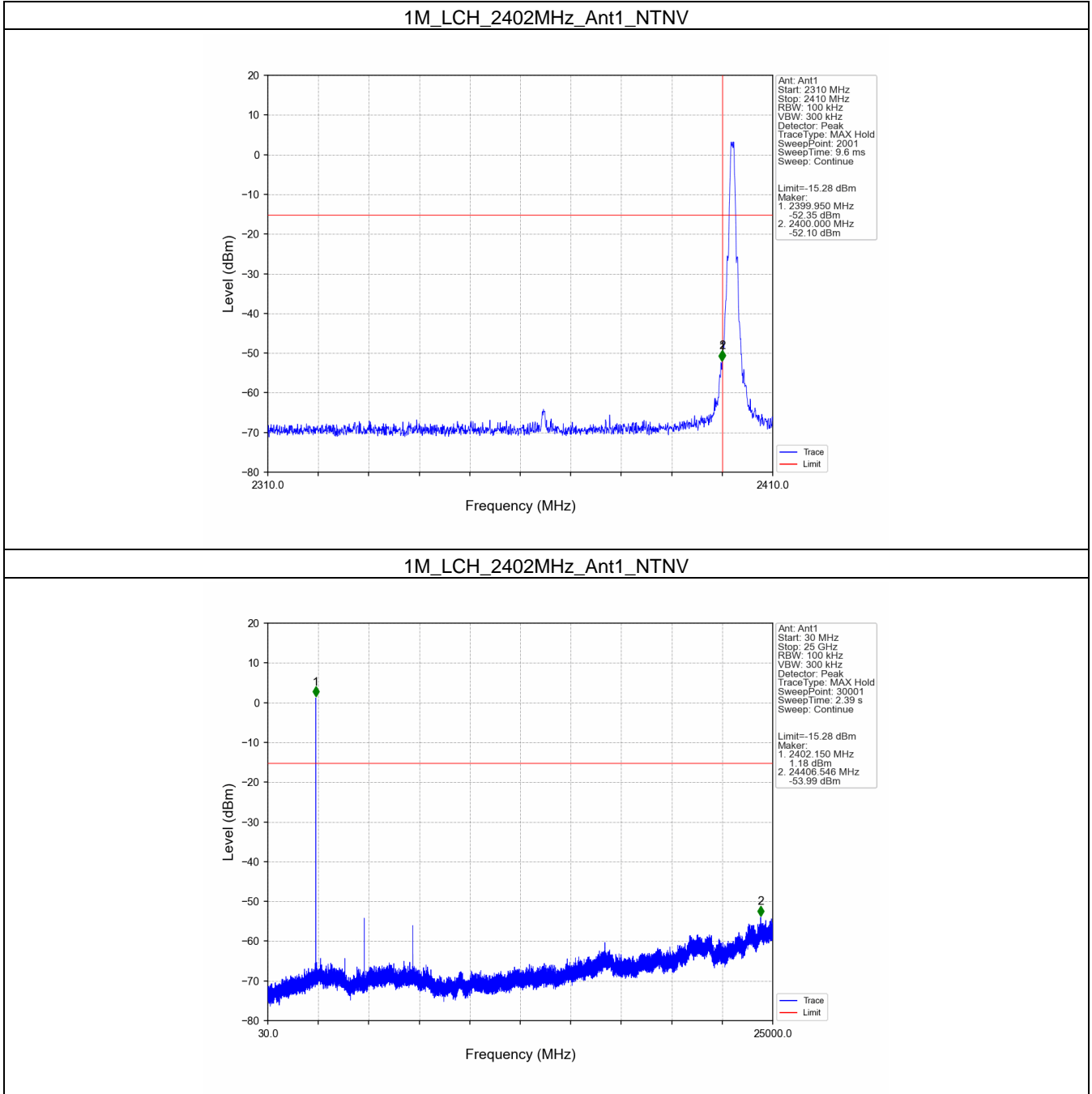


2M\_HCH\_2480MHz\_Ant1\_NTNV

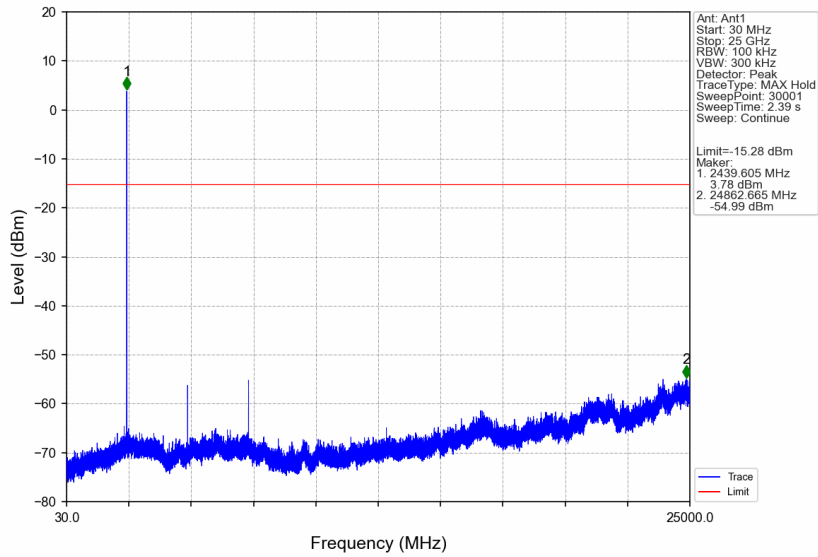




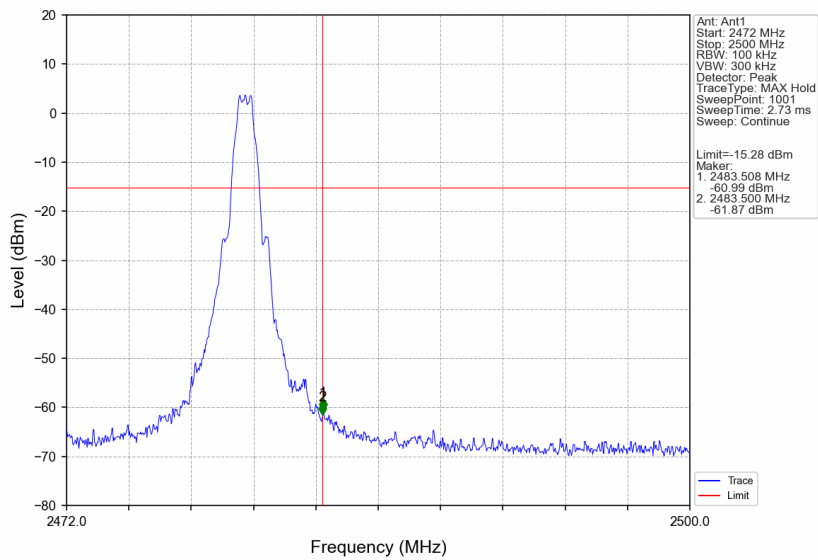
### 5.2.2 CSE



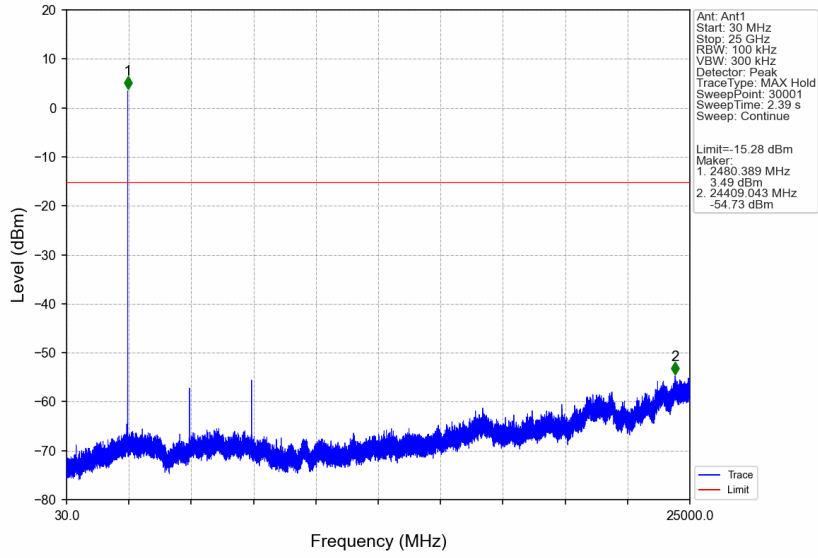
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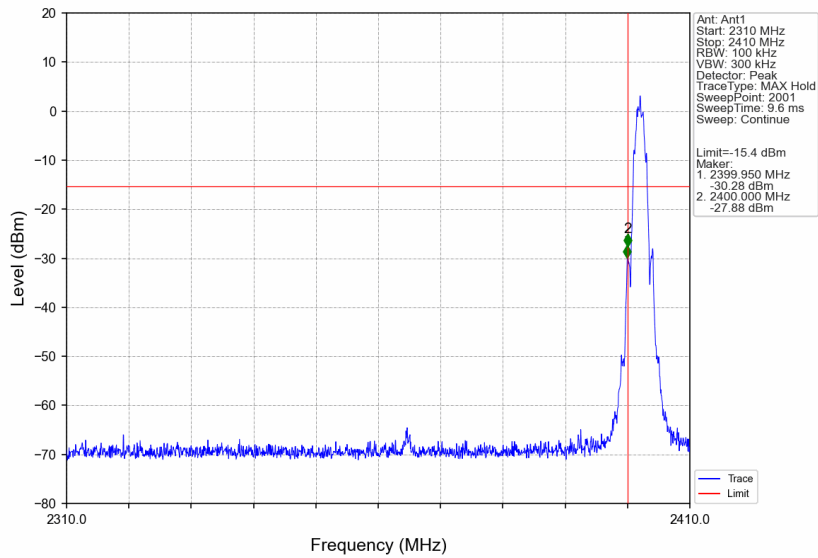
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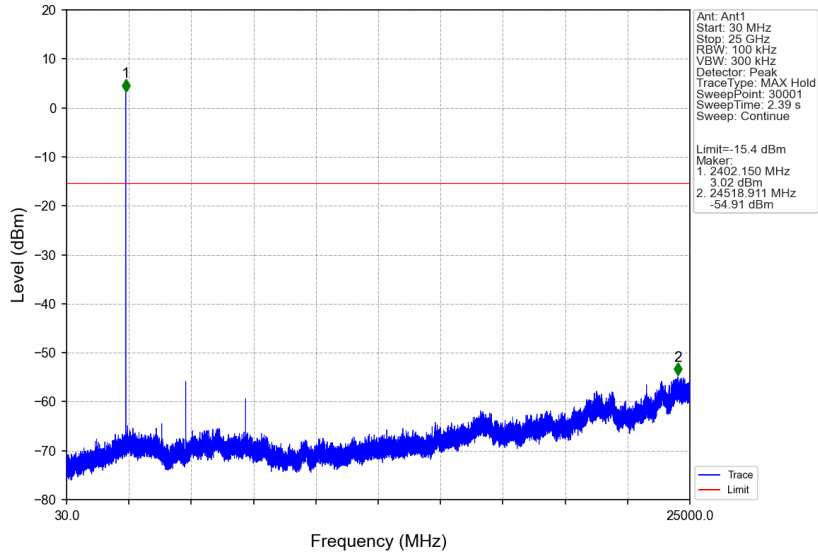
1M\_HCH\_2480MHz\_Ant1\_NTNV



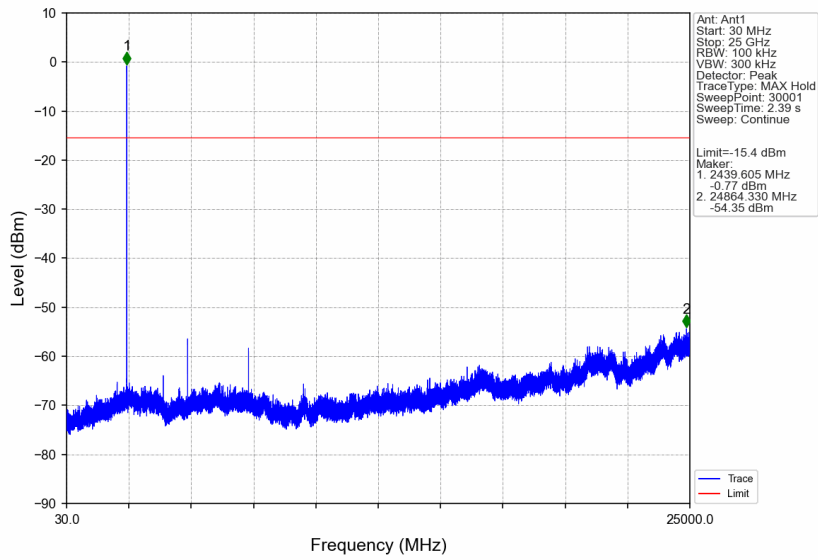
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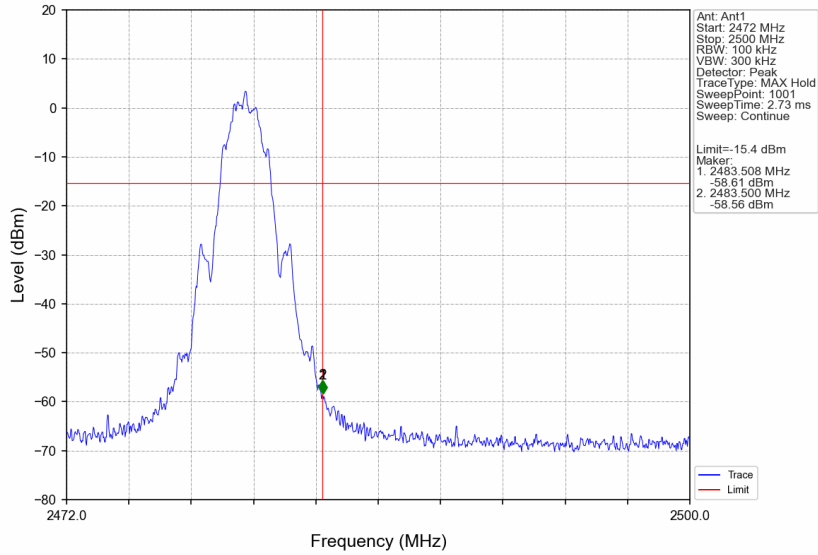
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2M\_MCH\_2440MHz\_Ant1\_NTNV



2M\_HCH\_2480MHz\_Ant1\_NTNV



2M\_HCH\_2480MHz\_Ant1\_NTNV

