TEST REPORT

CERTIFICATE OF CONFORMITY

Standard:	**47 CFR FCC Part 15, Subpart C (Section 15.247)**
Report No.:	RFBWIN-WTW-P22110682F
FCC ID:	J9C-QCNCM865
Product:	Qualcomm WiFi 7/BT Combo module
Brand:	Qualcomm
Model No.:	QCNCM865
Received Date:	2023/10/17
Test Date:	2023/11/9 ~ 2023/11/23
Issued Date:	2023/12/28
Applicant:	Qualcomm Technologies, Inc.
Address:	5775 Morehouse Drive, San Diego, CA 92121-1714
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

Approved by: _____ , **Date:** 2023/12/28

Wen Yu / Assistant Manager

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Prepared by : Phoenix Huang / Specialist

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Release Control Record

Issue No.	Description	Date Issued
RFBWIN-WTW-P22110682F	Original release.	2023/12/28

1 Certificate

Product:	Qualcomm WiFi 7/BT Combo module
Brand:	Qualcomm
Test Model:	QCNCM865
Sample Status:	Engineering sample
Applicant:	Qualcomm Technologies, Inc.
Test Date:	2023/11/9 ~ 2023/11/23
Standard:	47 CFR FCC Part 15, Subpart C (Section 15.247)
Measurement procedure:	ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02 KDB 662911 D01 Multiple Transmitter Output v02r01

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
Standard / Clause	Test Item	Result	Remark
15.247 (a)(1)	RF Output Power	Pass	Meet the requirement of limit.
15.247(a)(1) (iii)	Number of Hopping Frequency Used	Pass	Meet the requirement of limit.
15.247(a)(1) (iii)	Dwell Time on Each Channel	Pass	Meet the requirement of limit.
15.247(a)(1)	Hopping Channel Separation	Pass	Meet the requirement of limit.
15.247(a)(1)	20 dB Bandwidth	-	Refer to Note 1
15.247(d)	Conducted Out of Band Emissions	Pass	Meet the requirement of limit.
15.207	AC Power Conducted Emissions	Pass	Minimum passing margin is -8.55 dB at 25.06641 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions below 1 GHz	Pass	Minimum passing margin is -3.5 dB at 305.64 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	Pass	Minimum passing margin is -5.42 dB at 22146.2 MHz
15.203	Antenna Requirement	Pass	Antenna connector is MHF 4L not a standard connector.

Notes:

1. If the Frequency Hopping System operating in 2400-2483.5 MHz band and the output power less than 125 mW. The hopping channel carrier frequencies separated by a minimum of 25 kHz or two-thirds of the 20 dB bandwidth of hopping channel whichever is greater.
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Specification	Expanded Uncertainty (k=2) (±)
RF Output Power	-	1.1 dB
Number of Hopping Frequency Used	-	1050.00 Hz
Dwell Time on Each Channel	-	2.2 ms
Hopping Channel Separation	-	1050.00 Hz
20 dB Bandwidth	-	1050.00 Hz
Conducted Out of Band Emissions	9 kHz ~ 40 GHz	2.6 dB
AC Power Conducted Emissions	150 kHz ~ 30 MHz	1.9 dB
Unwanted Emissions below 1 GHz	9 kHz ~ 30 MHz	3.1 dB
	30 MHz ~ 1 GHz	5.1 dB
Unwanted Emissions above 1 GHz	1 GHz ~ 18 GHz	5.1 dB
	18 GHz ~ 40 GHz	5.3 dB

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

3 General Information

3.1 General Description

Product	Qualcomm WiFi 7/BT Combo module
Brand	Qualcomm
Test Model	QCNCM865
Status of EUT	Engineering sample
Power Supply Rating	3.3 Vdc from host equipment
Modulation Type	π/4 QPSK (HSL2, HSL3) π/4 DQPSK (HSL4) 8PSK (HSL5) D8PSK (HSL6)
Modulation Technology	FHSS
Transfer Rate	Up to 6 Mbps
Operating Frequency	2.404 GHz ~ 2.478 GHz
Number of Channel	Mode A: 37 Mode B: 38
Output Power	**1Tx:** 34.914 mW (15.43 dBm) **2Tx Beamforming:** 35.149 mW (15.46 dBm)

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the original design is as the following:
   - ◆ Add QHS function (Qualcomm Bluetooth High Speed Link) by software.
2. According to above conditions, all test items need to be performed. And all data are verified to meet the requirement.
3. There are Bluetooth and WLAN (2.4 GHz & 5 GHz & 5.9 GHz & 6 GHz) technology used for the EUT.
4. Simultaneously transmission condition.

DBS			
Condition	Technology		
1	WLAN(2.4GHz)_Ant 0+1	WLAN(5GHz) _Ant 0+1	
2	WLAN(2.4GHz) _Ant 0+1	WLAN(6GHz) _Ant 0+1	
HBS+BT			
Condition	Technology		
3	Bluetooth_Ant 0+1	WLAN(5GHz) _Ant 0+1	
4	Bluetooth_Ant 0+1	WLAN(6GHz) _Ant 0+1	
5	WLAN(5GHz_U-NII-1, U-NII-2A) _Ant 0+1	WLAN(5GHz_U-NII-2C, U-NII-3, U-NII-4) _Ant 0+1	Bluetooth
6	WLAN(5GHz_U-NII-1, U-NII-2A) _Ant 0+1	WLAN(6GHz) _Ant 0+1	Bluetooth

5. This module supports two modes, as shown in the table below. Since the power setting parameters and RF characteristics are the same, the test mainly uses mode A as the main representative mode. For additional details please refer to the document - "Theory of Operation" exhibit.

Mode	The Number of Channels
A	37
B	38

6. QCNCM865 has HW variant SKUs below to support different Microsoft Windows platform system and feature:

SKU	Support platform system and feature
NCM865	**X86 platform, support DBS and HBS**
NCM865A	Qualcomm platform, support DBS and HBS
NCM835	X86 platform, support DBS
NCM835A	Qualcomm platform, support DBS
Note: In original report, from the above SKUs, the worst was found in **SKU (NCM865)**. Therefore only the test data of the modes were recorded in this report.	

7. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 Antenna Description of EUT

1. The antenna information is listed as below.

Antenna Set	RF Chain No.	Brand	Model	Antenna Net Gain (dBi)	Frequency Range (GHz)	Cable Loss (dB)	Antenna Type	Connector Type	Cable Length (mm)
1	Chain0/1	Hong-Bo	260-25094	3.53 3.06 3.07 4.81 4.2	2.4~2.4835 5.15~5.25 5.25~5.35 5.47~5.725 5.725~5.850	0.74 1.16 1.18 1.26 1.28	PIFA	MHF 4L	300
2	Chain0/1	Hong-Bo	260-25083	5.09 5.14 5.09 5.16 5.12	5.850~5.895 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	1.29 1.35 1.38 1.45 1.50	PIFA	MHF 4L	300
3	Chain0/1	Hong-Bo	260-25084	3.22 3.35 3.42 4.77 4.72 4.71 4.75 4.29 4.81 4.74	2.4~2.4835 5.150~5.250 5.250~5.350 5.470~5.725 5.725~5.850 5.850~5.895 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	0.49 0.76 0.77 0.80 0.84 0.84 0.86 0.91 0.96 0.98	Monopole	MHF 4L	200

Note:
1. QHS has diversity function and transmit chain 0 and chain 1 have been evaluated, the chain 0 will be used as representative test.
2. Max. gain was selected for the final test.

* Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

3.3 Channel List

QHS channels:

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
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		
10	2422	20	2442	30	2462		

Note. *Advertising channel and only mode B supported.

3.4 Test Mode Applicability and Tested Channel Detail

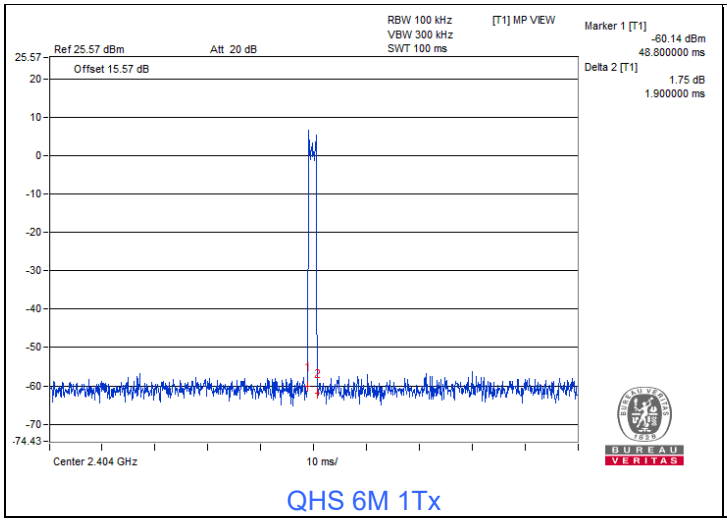
Pre-Scan:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below:

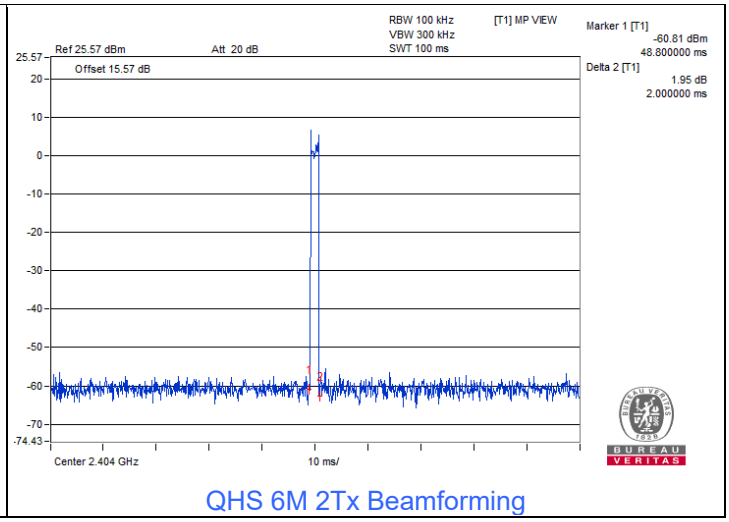
Test Item	EUT Configure Mode	Mode	Tx/Rx Antenna	Tested Channel	Modulation	Data Rate Parameter
RF Output Power	A	QHS	1Tx / 2Tx Beamforming	1, 18, 38	D8PSK	6Mbps
Number of Hopping Frequency Used	A	QHS	1Tx / 2Tx Beamforming	Hopping	D8PSK	6Mbps
Dwell Time on Each Channel	A	QHS	1Tx / 2Tx Beamforming	Hopping	D8PSK	6Mbps
Hopping Channel Separation	A	QHS	1Tx / 2Tx Beamforming	1, 18, 38	D8PSK	6Mbps
20 dB Bandwidth	A	QHS	1Tx / 2Tx Beamforming	1, 18, 38	D8PSK	6Mbps
Conducted Out of Band Emissions	A	QHS	1Tx / 2Tx Beamforming	Hopping 1, 38	D8PSK	6Mbps
AC Power Conducted Emissions	C	QHS	1Tx / 2Tx Beamforming	18	D8PSK	6Mbps
Unwanted Emissions below 1 GHz	A, B	QHS	1Tx / 2Tx Beamforming	18	D8PSK	6Mbps
Unwanted Emissions above 1 GHz	A, B	QHS	1Tx / 2Tx Beamforming	1, 18, 38	D8PSK	6Mbps
EUT Configure Mode:	A	EUT only (remove 50 ohm terminator and Connect to the appropriate equipment)				
	B	EUT with 50 ohm terminator				
	C	EUT with antenna				

3.5 Duty Cycle of Test Signal

QHS 6M 1Tx: Duty cycle = 1.9 ms / 100 ms x 100% = 1.9%
QHS 6M 2Tx Beamforming: Duty cycle = 2 ms / 100 ms x 100% = 2.0%



QHS 6M 1Tx



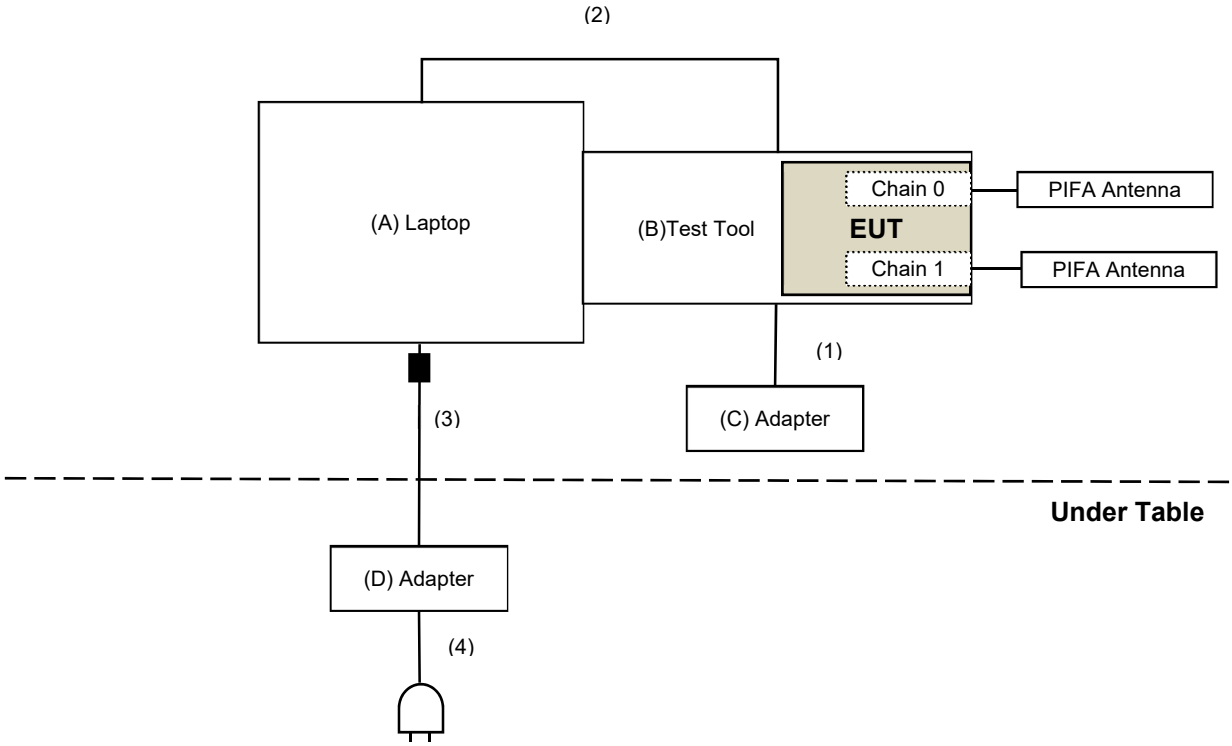
QHS 6M 2Tx Beamforming

3.6 Test Program Used and Operation Descriptions

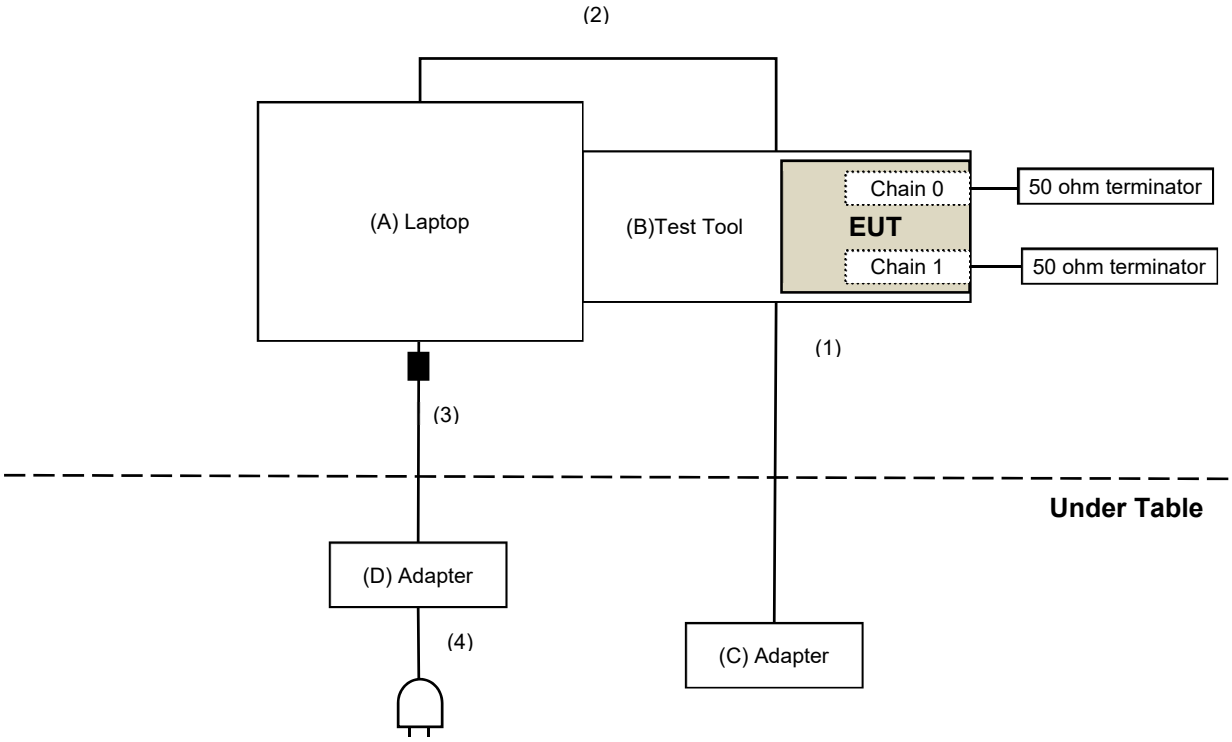
Controlling software (QRCT 4.0.00159.1) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

3.7 Connection Diagram of EUT and Peripheral Devices

For AC Power Conducted Emission test



For Unwanted Emission test



3.8 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Laptop	Dell	E5420	6FGHKV1	N/A	Provided by Lab
B	Test Tool	Qualcomm	N/A	N/A	N/A	Supplied by applicant
C	Adapter	PHIHONG	PSAA12A-120L6	N/A	N/A	Supplied by applicant
D	Adapter	Dell	LLA65NS2-01	N/A	N/A	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	DC Cable	1	1.2	No	0	Supplied by applicant
2	USB Cable	1	0.6	Yes	0	Provided by Lab
3	DC Cable	1	1.8	No	1	Provided by Lab
4	AC Cable	1	1.5	No	0	Provided by Lab

4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1 RF Output Power

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Power Meter Anritsu	ML2495A	1529002	2023/6/17	2024/6/16
Pulse Power Sensor Anritsu	MA2411B	1726434	2023/6/19	2024/6/18

Notes:

1. The test was performed in Oven room 2.
2. Tested Date: 2023/11/20

4.2 Number of Hopping Frequency Used

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
MXA Signal Analyzer Keysight	N9020B	MY60112409	2023/2/18	2024/2/17
Software	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in Oven room 2.
2. Tested Date: 2023/11/20

4.3 Dwell Time on Each Channel

Refer to section 4.2 to get information of the instruments.

4.4 Hopping Channel Separation

Refer to section 4.2 to get information of the instruments.

4.5 20 dB Bandwidth

Refer to section 4.2 to get information of the instruments.

4.6 Conducted Out of Band Emissions

Refer to section 4.2 to get information of the instruments.

4.7 AC Power Conducted Emissions

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
50 ohm terminal resistance Telegartner	50 ohm	3	2023/10/20	2024/10/19
EMI Test Receiver R&S	ESCS 30	847124/029	2023/10/18	2024/10/17
Fixed Attenuator STI	STI02-2200-10	005	2023/7/1	2024/6/30
LISN R&S	ESH3-Z5	835239/001	2023/4/6	2024/4/5
		848773/004	2023/10/13	2024/10/12
RF Coaxial Cable JYEBAO	5D-FB	COCCAB-001	2023/7/1	2024/6/30
Software BVADT	BVADT_Cond_V7.3.7.4	N/A	N/A	N/A

Notes:

1. The test was performed in Conduction 1
2. Tested Date: 2023/11/23

4.8 Unwanted Emissions below 1 GHz

Mode A

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
MXA Signal Analyzer Keysight	N9020B	MY60112409	2023/2/18	2024/2/17
Software	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in Oven room 2.
2. Tested Date: 2023/11/9

Mode B

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-0842	2023/10/12	2024/10/11
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	N/A	N/A
EMI Test Receiver R&S	ESR3	102528	2023/2/10	2024/2/9
Fixed Attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-02	2022/12/28	2023/12/27
Loop Antenna Electro-Metrics	EM-6879	264	2023/2/21	2024/2/20
MXA Signal Analyzer Keysight	N9020B	MY60112410	2023/3/6	2024/3/5
Preamplifier EMCI	EMC330N	980538	2023/4/6	2024/4/5
	EMC001340	980142	2023/5/8	2024/5/7
PXA Signal Analyzer Keysight	N9030B	MY57141948	2023/5/19	2024/5/18
RF Coaxial Cable JYEBAO	5D-FB	LOOPCAB-001	2022/12/19	2023/12/18
		LOOPCAB-002	2022/12/19	2023/12/18
RF Coaxial Cable PEWC	8D	966-5-1	2023/4/6	2024/4/5
		966-5-2	2023/4/6	2024/4/5
		966-5-3	2023/4/6	2024/4/5
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A

Notes:

1. The test was performed in 966 Chamber No. 5.
2. Tested Date: 2023/11/23

4.9 Unwanted Emissions above 1 GHz

Mode A

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
MXA Signal Analyzer Keysight	N9020B	MY60112409	2023/2/18	2024/2/17
Software	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in Oven room 2.
2. Tested Date: 2023/11/9 ~ 2023/11/23

Mode B

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	N/A	N/A
EMI Test Receiver R&S	ESR3	102528	2023/2/10	2024/2/9
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-1819	2023/11/12	2024/11/11
	BBHA 9170	9170-739	2023/11/12	2024/11/11
MXA Signal Analyzer Keysight	N9020B	MY60112410	2023/3/6	2024/3/5
Preamplifier EMCI	EMC12630SE	980509	2023/4/7	2024/4/6
	EMC184045SE	980387	2023/8/9	2024/8/8
RF Coaxial Cable EMCI	EMC-KM-KM-4000	200214	2023/2/20	2024/2/19
	EMC102-KM-KM-1200	160924	2023/8/9	2024/8/8
	EMC104-SM-SM-1500	180503	2023/4/7	2024/4/6
	EMC104-SM-SM-2000	180501	2023/4/7	2024/4/6
	EMC104-SM-SM-6000	180506	2023/4/7	2024/4/6
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A

Notes:

1. The test was performed in 966 Chamber No. 5.
2. Tested Date: 2023/11/23

5 Limits of Test Items

5.1 RF Output Power

The Maximum Output Power Measurement is 125 mW (21 dBm).

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

5.2 Number of Hopping Frequency Used

At least 15 channels frequencies, and should be equally spaced.

5.3 Dwell Time on Each Channel

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

5.4 Hopping Channel Separation

At least 25 kHz or two-third of 20 dB hopping channel bandwidth (whichever is greater).

5.5 20 dB Bandwidth

Maximum bandwidth is not specified.

5.6 Conducted Out of Band Emissions

Below 20 dB of the highest emission level of operating band (in 100 kHz Resolution Bandwidth).

5.7 AC Power Conducted Emissions

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Notes:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

5.8 Unwanted Emissions below 1 GHz

Radiated emissions up to 1 GHz which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

Frequencies (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

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

5.9 Unwanted Emissions above 1 GHz

Radiated emissions above 1 GHz which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
Above 960	500	3

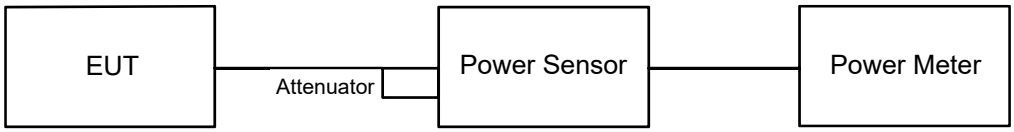
Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, 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.

6 Test Arrangements

6.1 RF Output Power

6.1.1 Test Setup



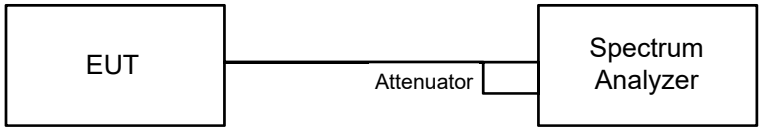
6.1.2 Test Procedure

Peak Power:
A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

Average Power:
Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

6.2 Number of Hopping Frequency Used

6.2.1 Test Setup

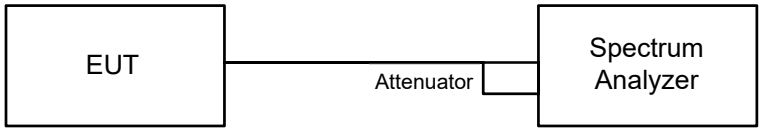


6.2.2 Test Procedure

a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
c. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
d. Set the SA on View mode and then plot the result on SA screen.
e. Repeat above procedures until all frequencies measured were complete.

6.3 Dwell Time on Each Channel

6.3.1 Test Setup

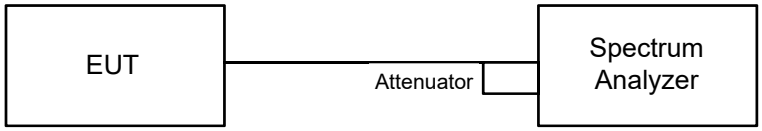


6.3.2 Test Procedure

a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
c. Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
d. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
e. Repeat above procedures until all different time-slot modes have been completed.

6.4 Hopping Channel Separation

6.4.1 Test Setup

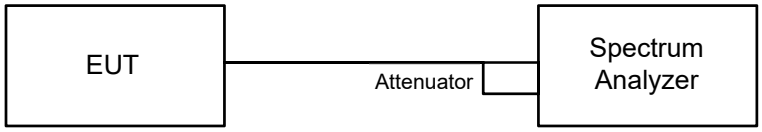


6.4.2 Test Procedure

a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
c. By using the MaxHold function record the separation of two adjacent channels.
d. Measure the frequency difference of these two adjacent channels by SA MARK function. And then plot the result on SA screen.
e. Repeat above procedures until all frequencies measured were complete.

6.5 20 dB Bandwidth

6.5.1 Test Setup

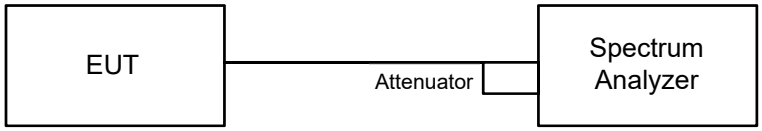


6.5.2 Test Procedure

a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
c. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
d. Repeat above procedures until all frequencies measured were complete.

6.6 Conducted Out of Band Emissions

6.6.1 Test Setup



6.6.2 Test Procedure

MEASUREMENT PROCEDURE REF

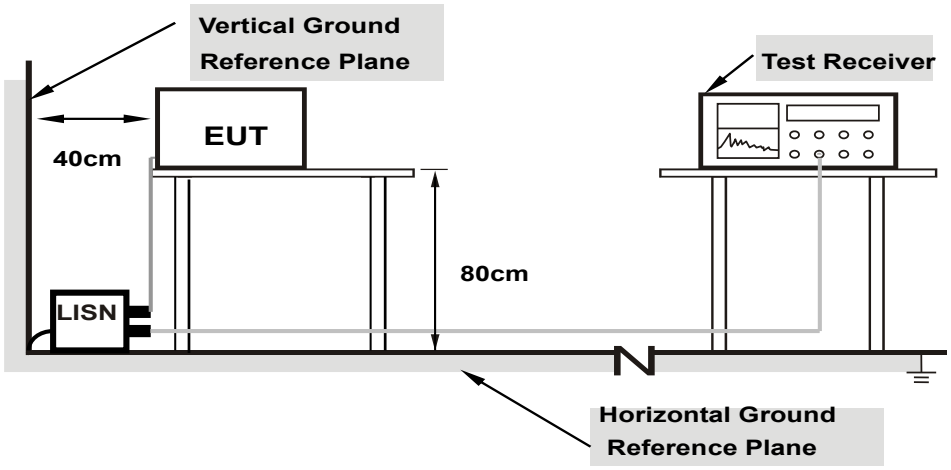
a. Set the RBW = 100 kHz.
b. Set the VBW ≥ 300 kHz.
c. Detector = peak.
d. Sweep time = auto couple.
e. Trace mode = max hold.
f. Allow trace to fully stabilize.
g. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

a. Set RBW = 100 kHz.
b. Set VBW ≥ 300 kHz.
c. Detector = peak.
d. Sweep = auto couple.
e. Trace Mode = max hold.
f. Allow trace to fully stabilize.
g. Use the peak marker function to determine the maximum amplitude level.

6.7 AC Power Conducted Emissions

6.7.1 Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.7.2 Test Procedure

a. The EUT was placed on a 0.8 meter to the top of table and placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50 uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

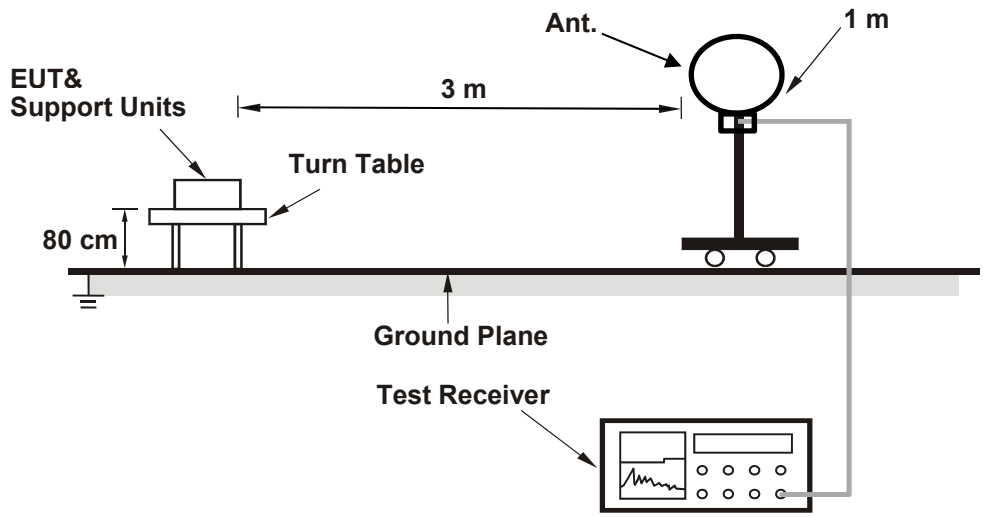
Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz-30 MHz.

6.8 Unwanted Emissions below 1 GHz

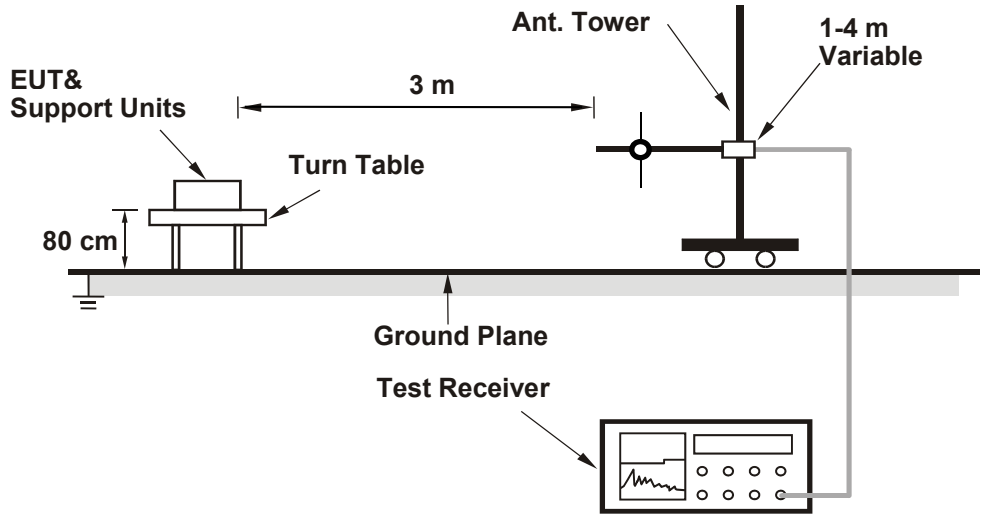
6.8.1 Test Setup

For Radiated Configuration:

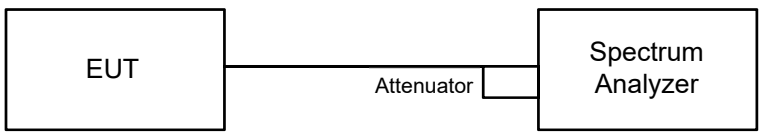
For Radiated emission below 30 MHz



For Radiated emission above 30 MHz



For Conducted Configuration:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.8.2 Test Procedure

Radiated versus Conducted Measurement.
The unwanted emission limits in both the restricted and non-restricted bands are based on antenna-port conducted measurements in conjunction with cabinet emissions tests are permitted to demonstrate compliance.
The following steps was performed:

a. Cabinet emissions measurements. Radiated measurement was performed to ensure that cabinet emissions are below the emission limits. For the cabinet-emission measurements the antenna was replaced by a termination matching the nominal impedance of the antenna.
b. Conducted tests was performed using equipment that matches the nominal impedance of the antenna assembly used with the EUT.
c. EIRP calculation. A value representative of an upper bound on out-of-band antenna gain (in dBi) shall be added to the measured antenna-port conducted emission power to compute EIRP within the specified measurement bandwidth. (For emissions in the restricted bands, additional calculations are required to convert EIRP to field strength at the specified distance.) The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 2 dBi, whichever is greater.
d. EIRP adjustments for multiple outputs. (Follow the procedures specified in FCC KDB Publication 662911)
e. For all of Radiation emission test

For Radiated emission below 30 MHz

e-1.1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

e-1.2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

e-1.3. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

e-1.4. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e-1.5. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode, except for the frequency band (9 kHz to 90 kHz and 110 kHz to 490 kHz) set to average detect function and peak detect function.

Notes:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 200 Hz at frequency below 150 kHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz or 10 kHz at frequency (150 kHz to 30 MHz).
3. All modes of operation were investigated and the worst-case emissions are reported.
4. KDB 414788 OATS and Chamber Correlation Justification

   -Based on FCC 15.31(f)(2):measurements may be performed at a distance closer than that specified in the regulations; however, an attempts should be made to avoid making measurements in the near field.

   -OATs and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

For Radiated emission above 30 MHz

e-2.1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

e-2.2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

e-2.3. 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.

e-2.4. 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.

e-2.5. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

Notes:

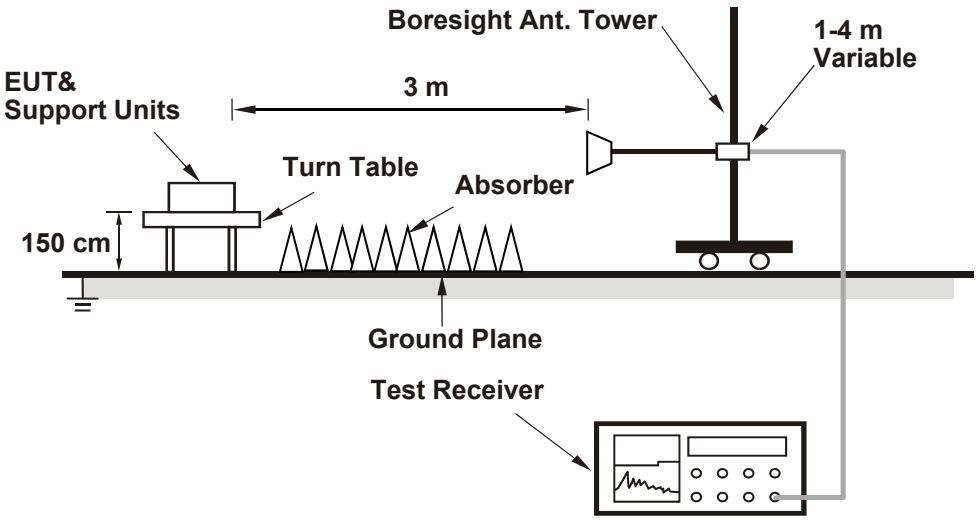
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

Radiated versus Conducted Measurement
For Radiated measurement: The level of unwanted emissions was measured when radiated by the cabinet or structure of the equipment with the antenna connector(s) terminated by a specified load (cabinet radiation). For Conducted measurement: The level of unwanted emissions was measured as their power in a specified load (conducted spurious emissions).
Conducted Unwanted Emission Convert Formula
a. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8 d = measurement distance in 3 meters. b. EIRP Level (dBm) = Raw Value(dBm) + Correction Factor(dB) c. Correction Factor is directional gain, and the composite gain will be used when signal support the correlated signal For the out of band spurious the gain for the specific band may have been used rather than the highest gain across all bands. For the band edge the gain for the specific band may have been used. Notes: 1. In restricted bands below 1000 MHz, add upper bound on ground plane reflection: For frequencies between 30 MHz and 1000 MHz, add 4.7 dB. 2. The conducted emission test was considered some factor to compute test result.

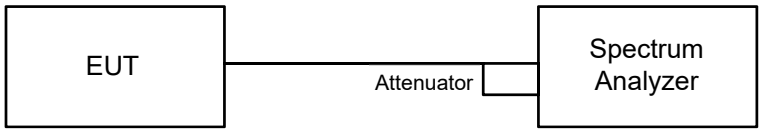
6.9 Unwanted Emissions above 1 GHz

6.9.1 Test Setup

For Radiated Configuration:



For Conducted Configuration:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.9.2 Test Procedure

Radiated versus Conducted Measurement.
The unwanted emission limits in both the restricted and non-restricted bands are based on antenna-port conducted measurements in conjunction with cabinet emissions tests are permitted to demonstrate compliance.
The following steps was performed:

a. Cabinet emissions measurements. Radiated measurement was performed to ensure that cabinet emissions are below the emission limits. For the cabinet-emission measurements the antenna was replaced by a termination matching the nominal impedance of the antenna.
b. Conducted tests was performed using equipment that matches the nominal impedance of the antenna assembly used with the EUT.
c. EIRP calculation. A value representative of an upper bound on out-of-band antenna gain (in dBi) shall be added to the measured antenna-port conducted emission power to compute EIRP within the specified measurement bandwidth. (For emissions in the restricted bands, additional calculations are required to convert EIRP to field strength at the specified distance.) The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 2 dBi, whichever is greater.
d. EIRP adjustments for multiple outputs. (Follow the procedures specified in FCC KDB Publication 662911)
e. For all of Radiation emission test

e-1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

e-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.

e-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.

e-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.

e-5. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Notes:

1. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) and Average detection (AV) at frequency above 1 GHz.
2. For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10 Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1 GHz.
3. All modes of operation were investigated and the worst-case emissions are reported.

Radiated versus Conducted Measurement
For Radiated measurement: The level of unwanted emissions was measured when radiated by the cabinet or structure of the equipment with the antenna connector(s) terminated by a specified load (cabinet radiation). For Conducted measurement: The level of unwanted emissions was measured as their power in a specified load (conducted spurious emissions). For Verified radiated measurement: The level of unwanted emissions was measured when radiated by the cabinet or structure of the equipment with the antenna connector(s) terminated by a specified load (cabinet radiation).
Conducted Unwanted Emission Convert Formula
a. Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8 d = measurement distance in 3 meters. b. EIRP Level (dBm) = Raw Value(dBm) + Correction Factor(dB). c. Correction Factor is directional gain, and the composite gain will be used when signal support the correlated signal For the out of band spurious the gain for the specific band may have been used rather than the highest gain across all bands. For the band edge the gain for the specific band may have been used. Note: The conducted emission test was considered some factor to compute test result.

7 Test Results of Test Item

7.1 RF Output Power

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Kevin Ko

For Peak Power

QHS 6M 1Tx

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
1	2404	33.189	15.21	21	Pass
18	2438	34.914	15.43	21	Pass
38	2478	32.063	15.06	21	Pass

Note: The antenna gain is 3.53 dBi < 6 dBi, so the output power limit shall not be reduced.

QHS 6M 2Tx Beamforming

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
1	2404	13.16	11.31	34.222	15.34	20.46	Pass
18	2438	13.20	11.54	35.149	15.46	20.46	Pass
38	2478	12.95	11.25	33.059	15.19	20.46	Pass

Notes:

1. Directional gain = gain of antenna element + 10 log (2 of TX antenna elements)
2. The directional gain is 6.54 dBi > 6 dBi, so the output power limit shall be reduced to 21-(6.54-6) = 20.46 dBm.

For Average Power

QHS 6M 1Tx

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
1	2404	22.856	13.59
18	2438	23.55	13.72
38	2478	22.751	13.57

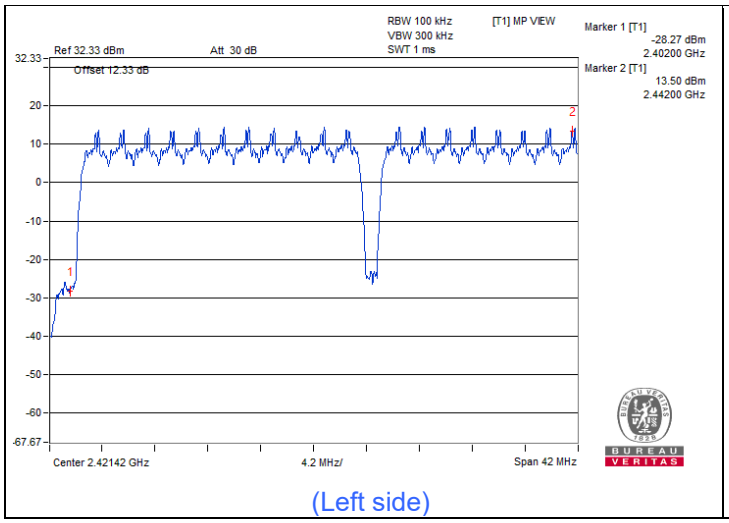
QHS 6M 2Tx Beamforming

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Average Power (mW)	Total Average Power (dBm)
		Chain 0	Chain 1		
1	2404	11.08	11.27	26.22	14.19
18	2438	11.35	11.46	27.642	14.42
38	2478	11.03	11.11	25.589	14.08

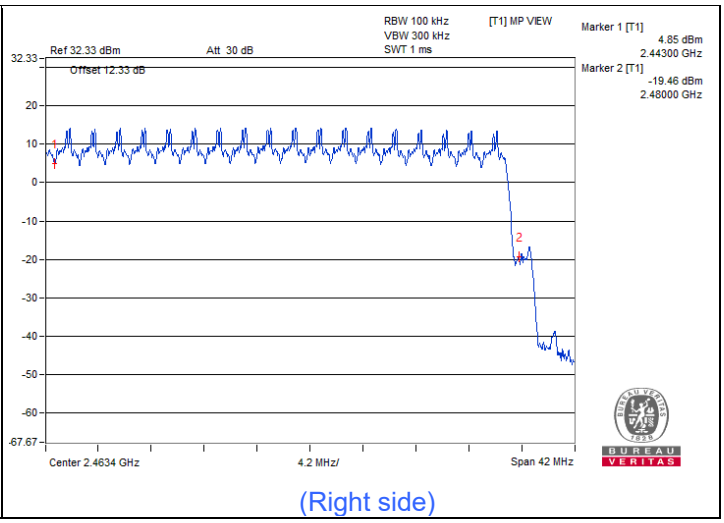
7.2 Number of Hopping Frequency Used

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Kevin Ko

QHS 6M 1Tx



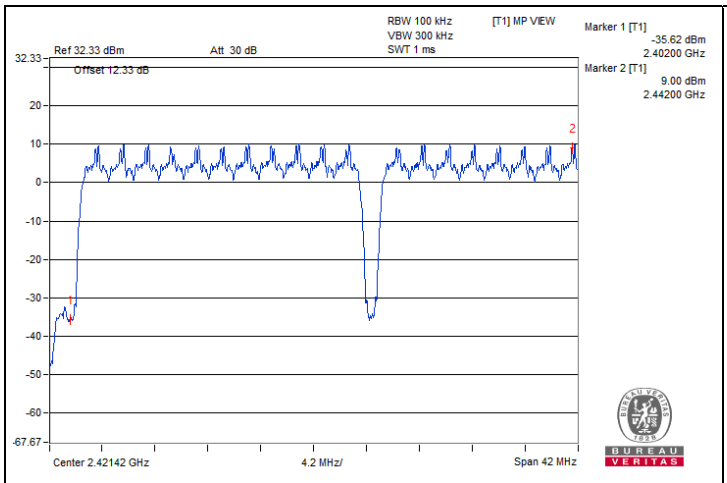
(Left side)



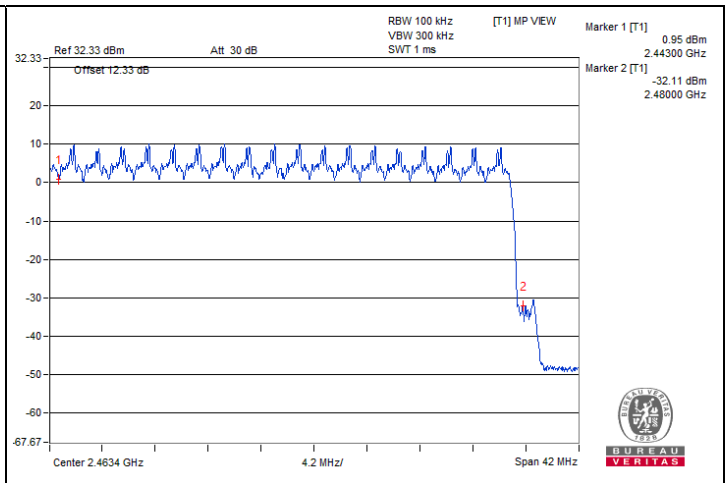
(Right side)

Note: There are 37 hopping frequencies in the hopping mode. On the plots, it shows that the hopping frequencies are equally spaced.

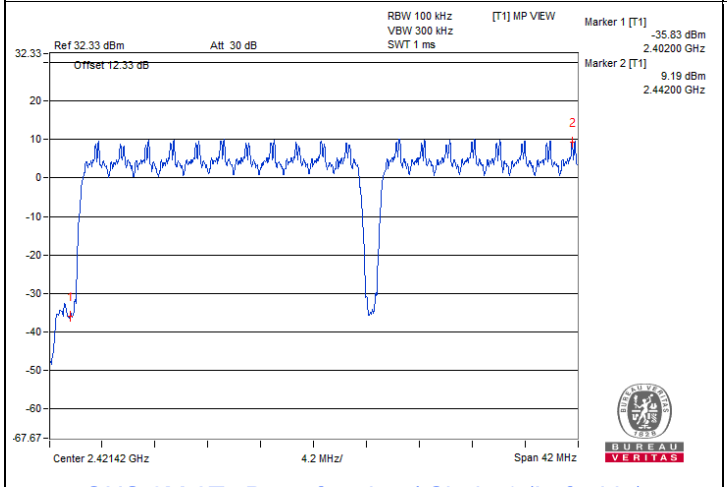
QHS 6M 2Tx Beamforming



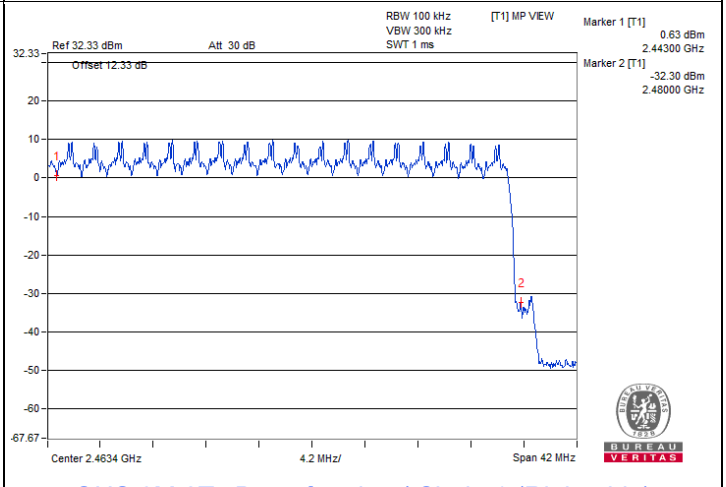
QHS 6M 2Tx Beamforming / Chain 0 (Left side)



QHS 6M 2Tx Beamforming / Chain 0 (Right side)



QHS 6M 2Tx Beamforming / Chain 1 (Left side)



QHS 6M 2Tx Beamforming / Chain 1 (Right side)

Note: There are 37 hopping frequencies in the hopping mode. On the plots, it shows that the hopping frequencies are equally spaced.

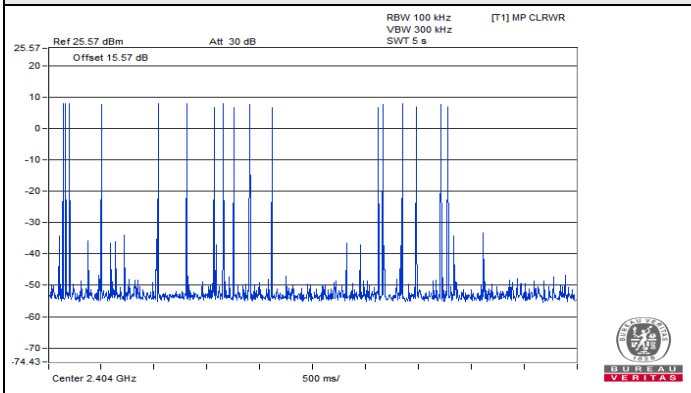
7.3 Dwell Time on Each Channel

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Kevin Ko

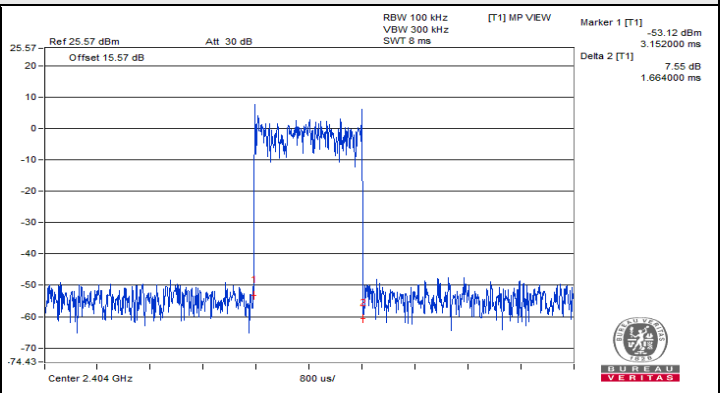
QHS 6M 1Tx

Mode	Number of transmission in 14.8 sec	Length of transmission time (msec)	Result (msec)	Limit (msec)	Test Result
FHSS	17 (times / 5 sec) * 2.96 = 51 times	1.664	84.864	400	Pass

Spectrum plots of Dwell Time



QHS 6M 1Tx FHSS

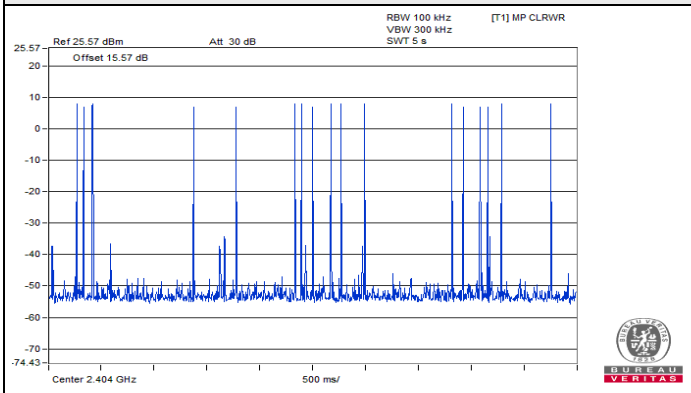


QHS 6M 1Tx FHSS

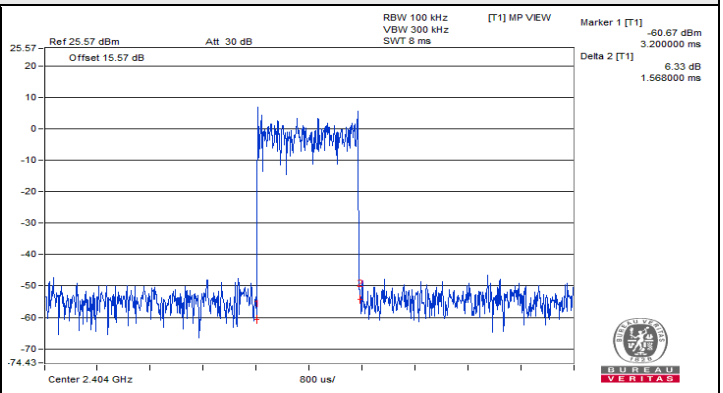
QHS 6M 2Tx Beamforming

Mode	Number of transmission in 14.8 sec	Length of transmission time (msec)	Result (msec)	Limit (msec)	Test Result
FHSS	17 (times / 5 sec) * 2.96 = 51 times	1.568	79.968	400	Pass

Spectrum plots of Dwell Time



QHS 6M 2Tx FHSS



QHS 6M 2Tx Beamforming FHSS

7.4 Hopping Channel Separation

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Kevin Ko

QHS 6M 1Tx

Channel	Frequency (MHz)	Hopping Channel Separation (MHz)	Minimum Limit (MHz)	Test Result
1	2404	2.00	1.68	Pass
18	2438	2.01	1.68	Pass
38	2478	2.01	1.69	Pass

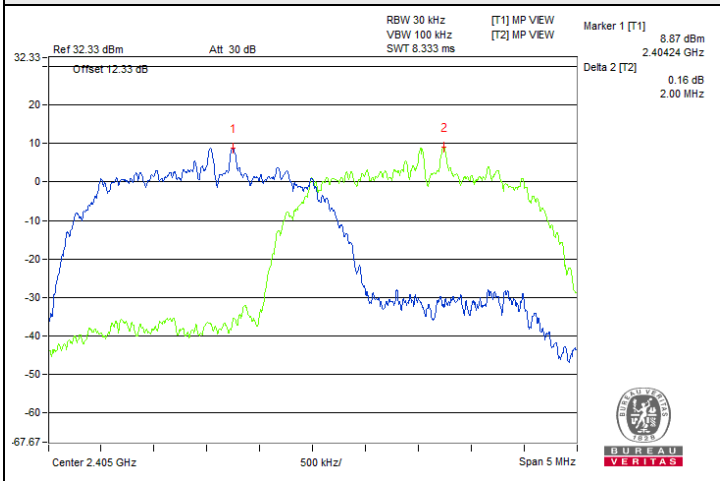
Note: The minimum limit is two-third 20dB bandwidth.

QHS 6M 2Tx Beamforming

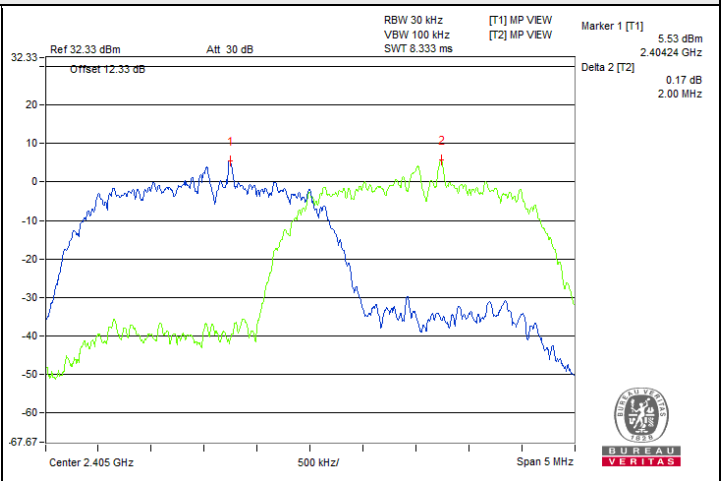
Channel	Frequency (MHz)	Hopping Channel Separation (MHz)		Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1		
1	2404	2.00	2.00	1.68	Pass
18	2438	2.01	2.00	1.68	Pass
38	2478	2.00	2.01	1.68	Pass

Note: The minimum limit is two-third 20dB bandwidth.

Spectrum Plot of Minimum Value



QHS 6M 1Tx / Chain 0 : CH 1



QHS 6M 2Tx Beamforming / Chain 0 : CH 1

7.5 20 dB Bandwidth

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Kevin Ko

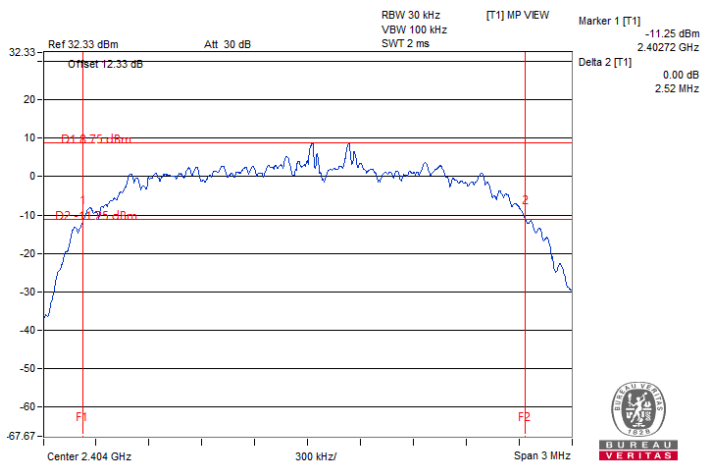
QHS 6M 1Tx

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
1	2404	2.52
18	2438	2.52
38	2478	2.53

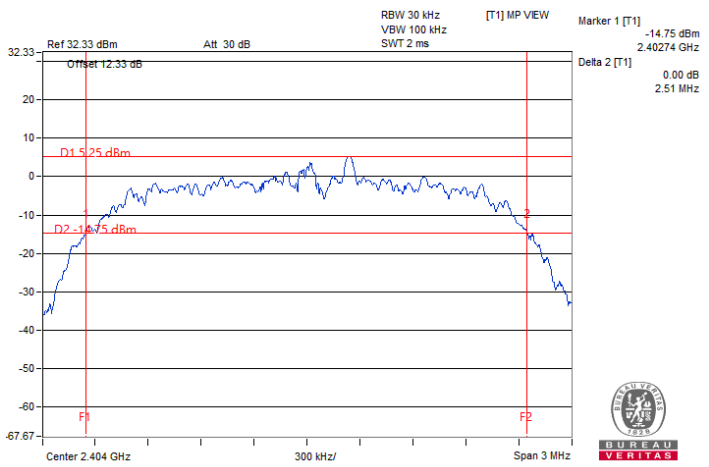
QHS 6M 2Tx Beamforming

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	
		Chain 0	Chain 1
1	2404	2.51	2.52
18	2438	2.51	2.52
38	2478	2.55	2.52

Spectrum Plot of Minimum Value



QHS 6M 1Tx / Chain 0 : CH 1

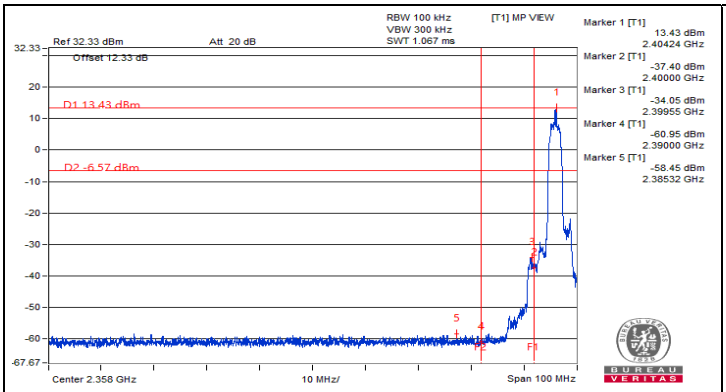


QHS 6M 2Tx Beamforming / Chain 0 : CH 1

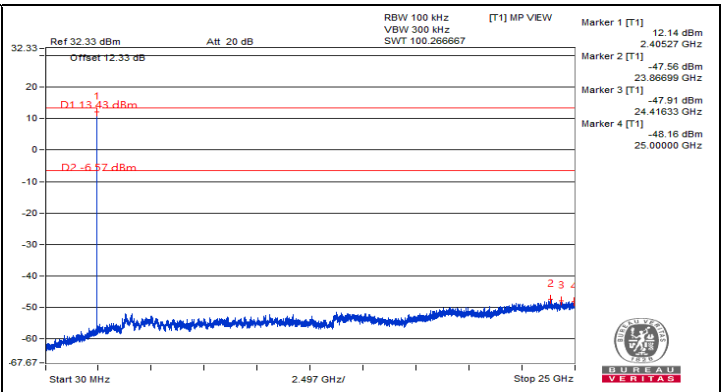
7.6 Conducted Out of Band Emissions

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Kevin Ko

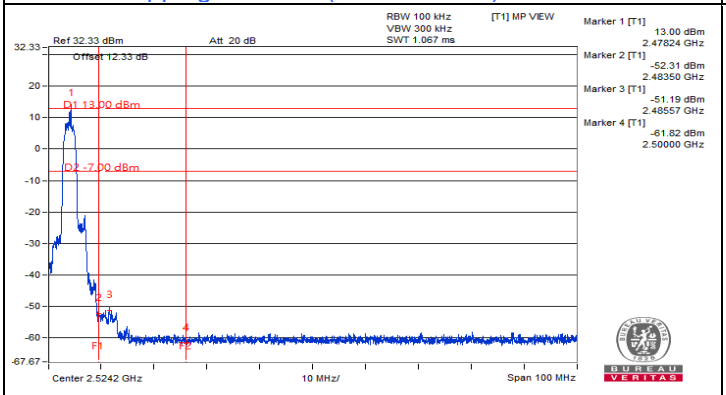
QHS 6M 1Tx



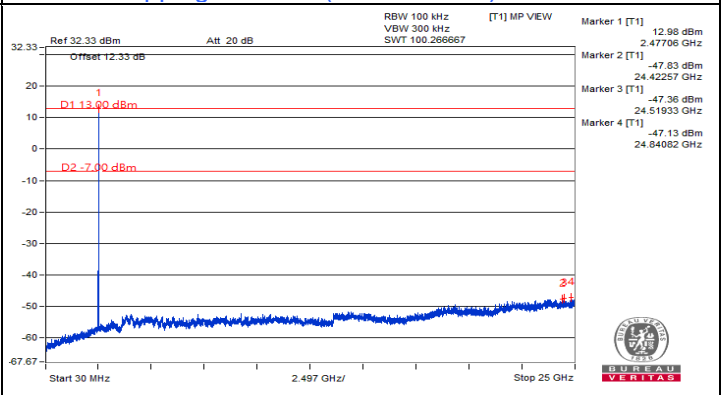
Hopping disabled (Low Channel) / Chain 0



Hopping disabled (Low Channel) / Chain 0



Hopping disabled (High Channel) / Chain 0



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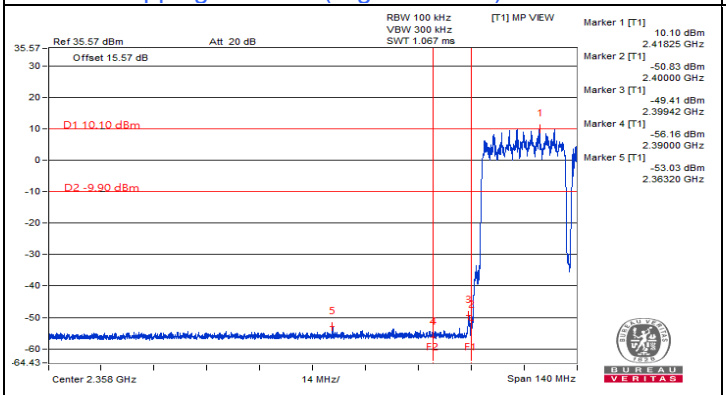

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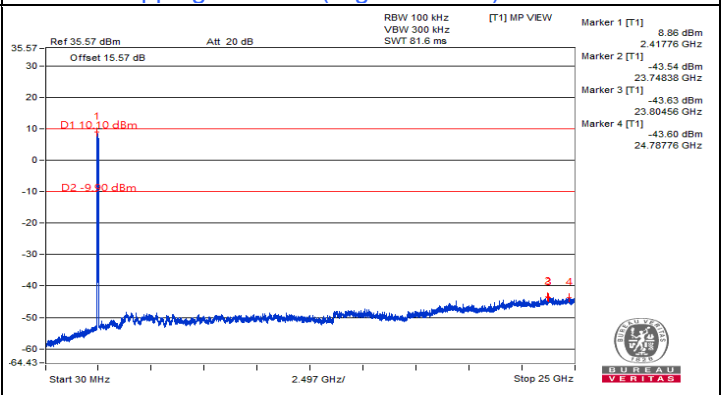

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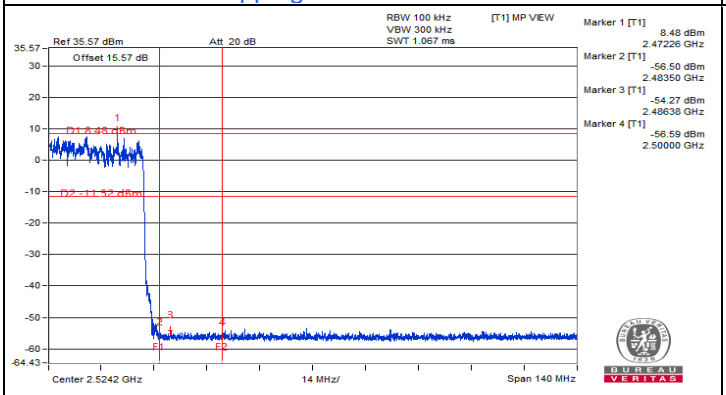

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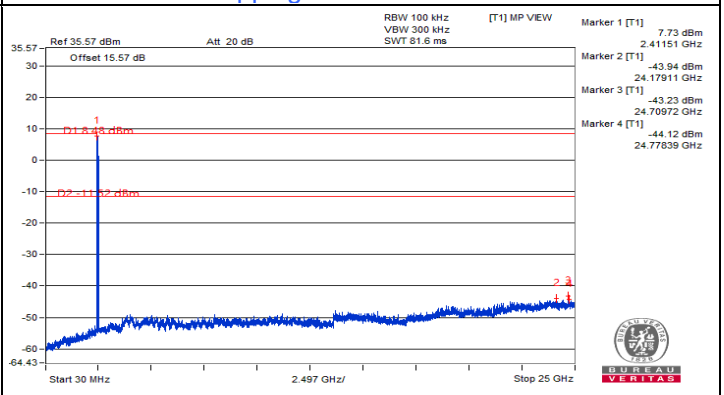

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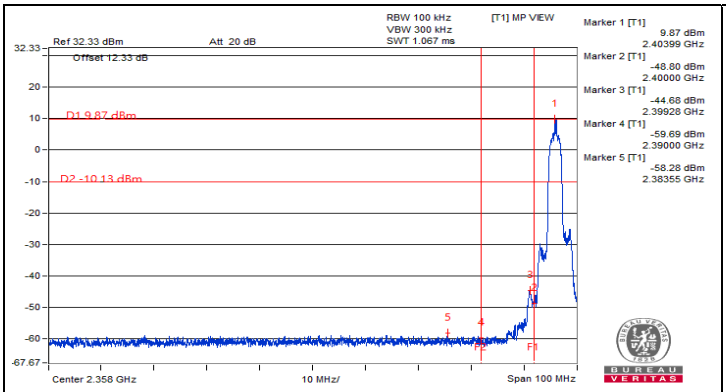
QHS 6M 2Tx Beamforming



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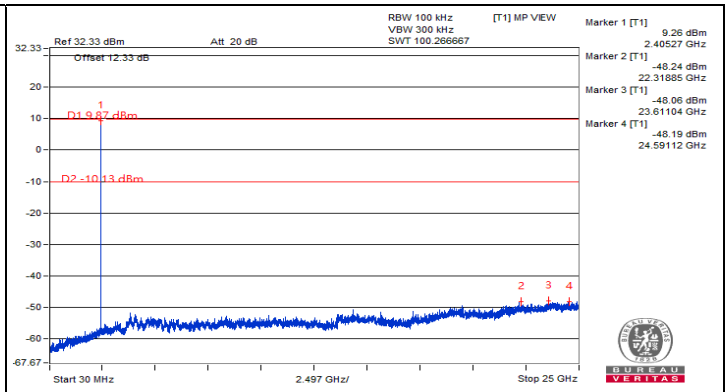

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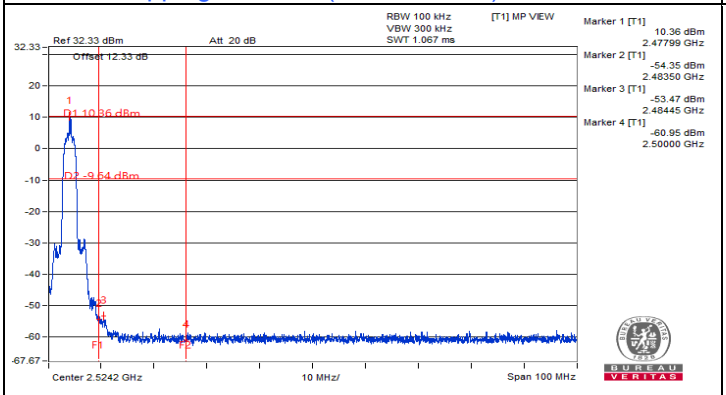

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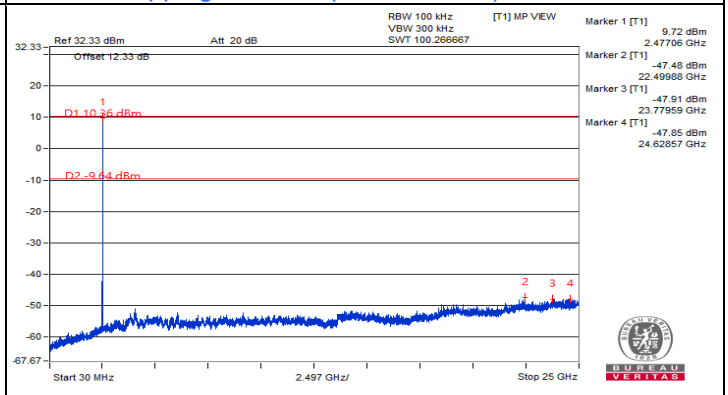

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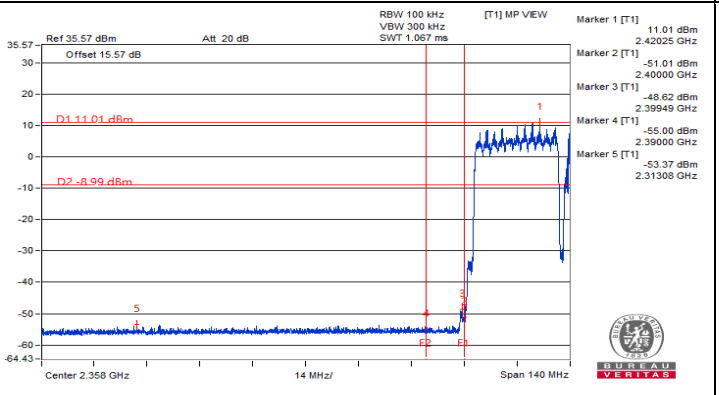

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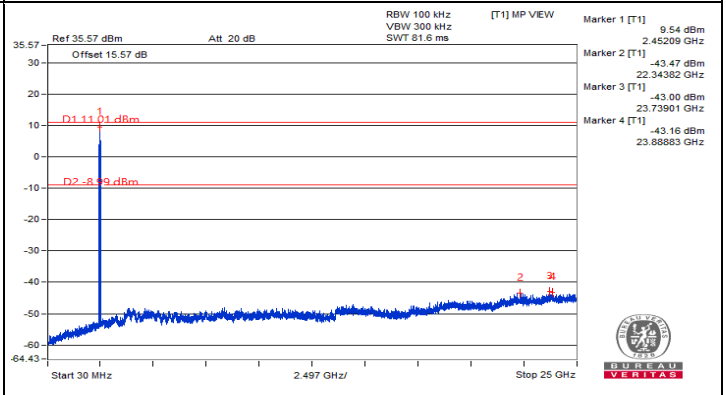
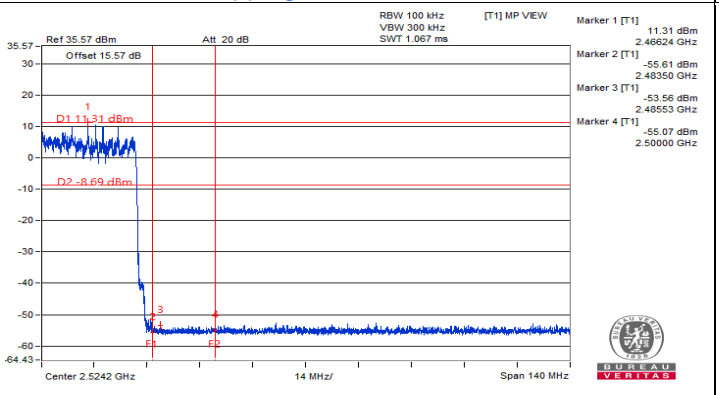
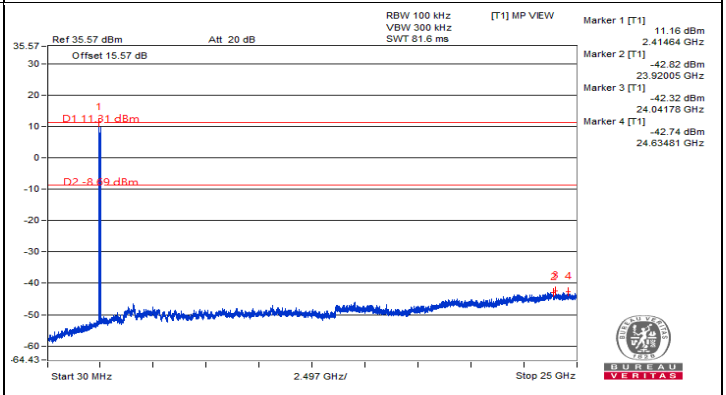


Hopping enabled / Chain 0



Hopping enabled / Chain 0



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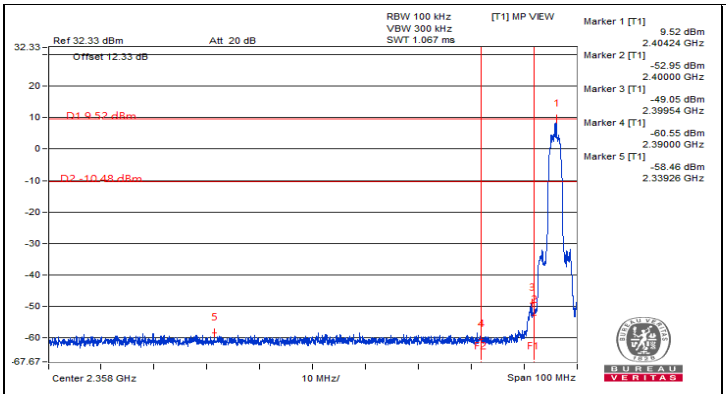

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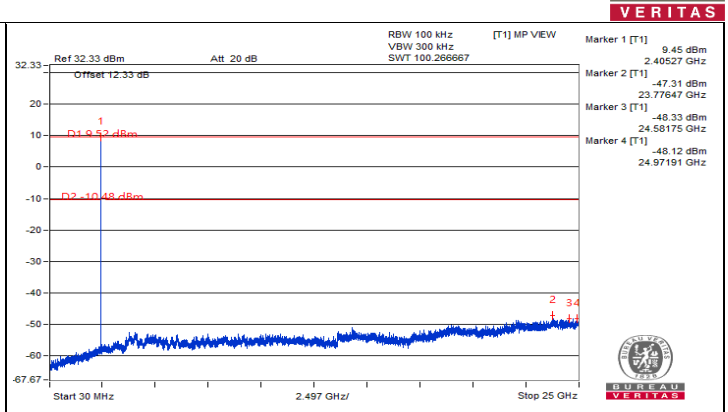

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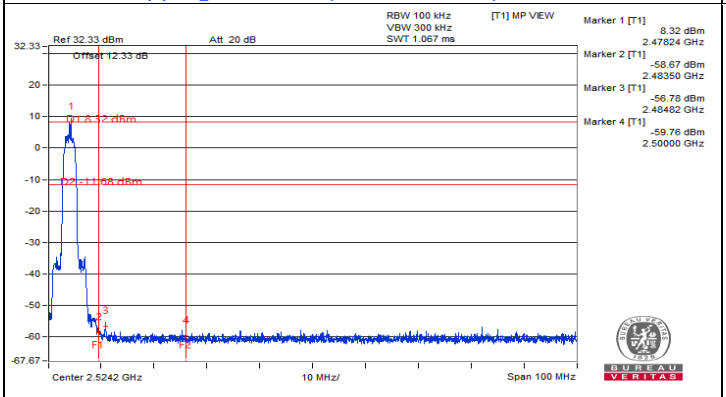

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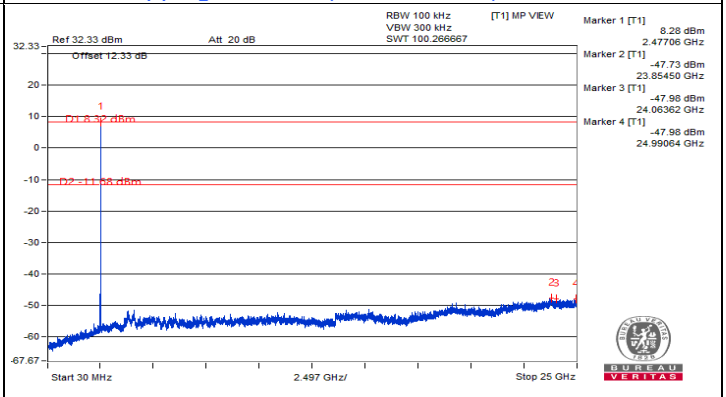

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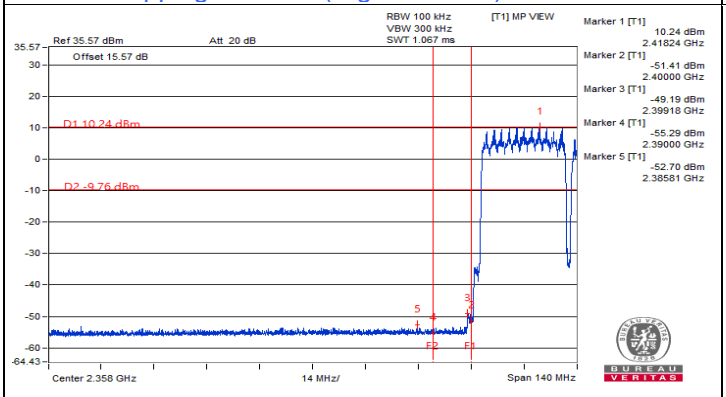

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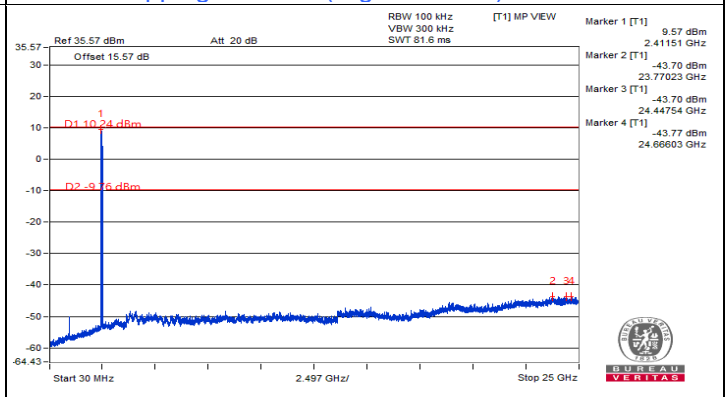
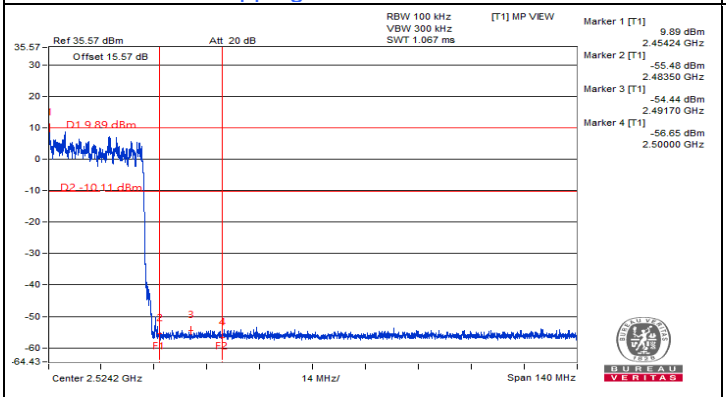
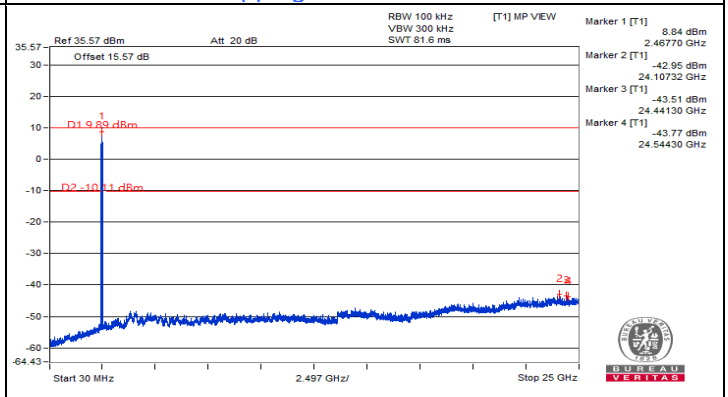


Hopping enabled / Chain 1



Hopping enabled / Chain 1



Hopping enabled / Chain 1

7.7 AC Power Conducted Emissions

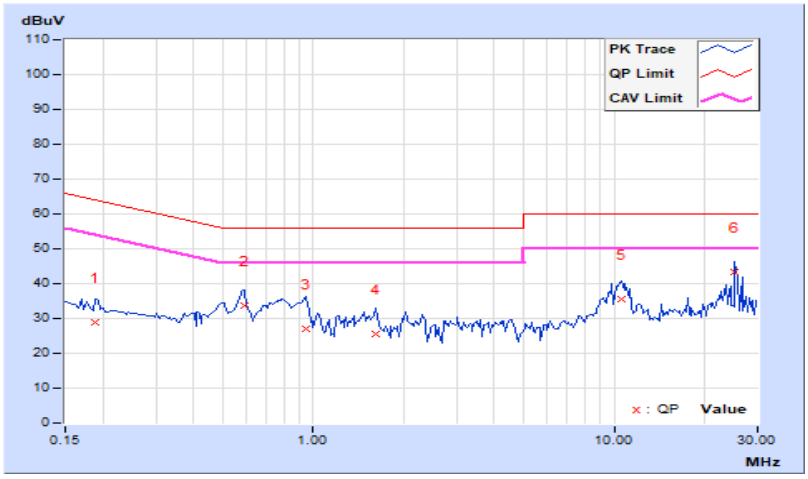
1Tx

RF Mode	QHS 6M	Channel	CH 18：2438 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	28°C, 75% RH
Tested By	Sampson Chen		

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18906	9.94	18.97	6.50	28.91	16.44	64.08	54.08	-35.17	-37.64
2	0.59141	9.96	23.77	10.02	33.73	19.98	56.00	46.00	-22.27	-26.02
3	0.94297	9.99	17.07	5.15	27.06	15.14	56.00	46.00	-28.94	-30.86
4	1.61328	10.01	15.60	1.68	25.61	11.69	56.00	46.00	-30.39	-34.31
5	10.61328	10.69	25.03	16.43	35.72	27.12	60.00	50.00	-24.28	-22.88
6	25.07031	11.58	31.86	26.78	43.44	38.36	60.00	50.00	-16.56	-11.64

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

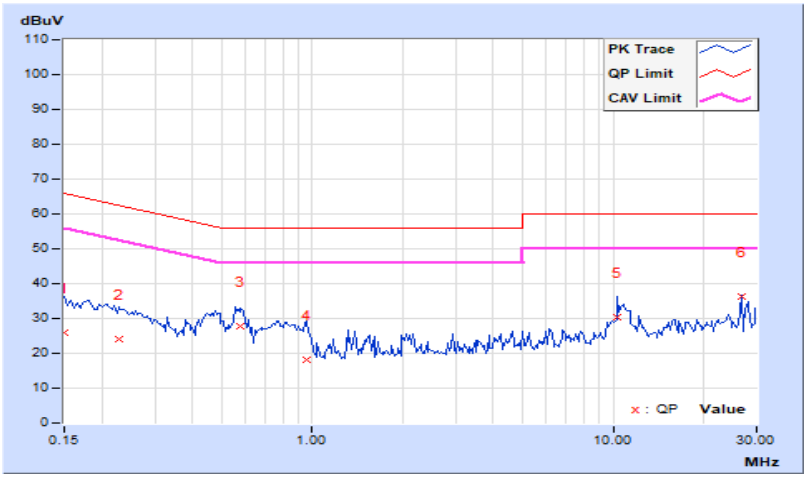


RF Mode	QHS 6M	**Channel**	CH 18：2438 MHz
Frequency Range	150 kHz ~ 30 MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power (System)	120 Vac, 60 Hz	**Environmental Conditions**	28°C, 75% RH
Tested By	Sampson Chen		

Phase Of Power : Neutral (N)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.15000	10.01	15.92	-1.30	25.93	8.71	66.00	56.00	-40.07	-47.29
2	0.22812	10.00	14.02	-4.11	24.02	5.89	62.52	52.52	-38.50	-46.63
3	0.57969	10.02	17.92	1.25	27.94	11.27	56.00	46.00	-28.06	-34.73
4	0.95859	10.04	8.12	-7.48	18.16	2.56	56.00	46.00	-37.84	-43.44
5	10.35938	10.63	19.88	11.40	30.51	22.03	60.00	50.00	-29.49	-27.97
6	26.58984	11.30	25.10	19.96	36.40	31.26	60.00	50.00	-23.60	-18.74

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



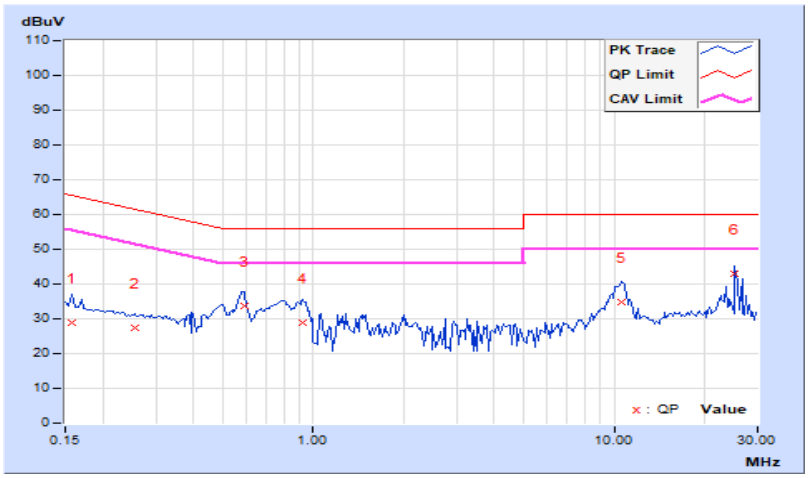
2Tx Beamforming

RF Mode	QHS 6M	Channel	CH 18：2438 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	28°C, 75% RH
Tested By	Sampson Chen		

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	9.94	18.91	6.44	28.85	16.38	65.58	55.58	-36.73	-39.20
2	0.25547	9.94	17.56	5.71	27.50	15.65	61.58	51.58	-34.08	-35.93
3	0.59141	9.96	23.77	9.98	33.73	19.94	56.00	46.00	-22.27	-26.06
4	0.92734	9.99	18.79	6.52	28.78	16.51	56.00	46.00	-27.22	-29.49
5	10.63672	10.69	24.16	16.38	34.85	27.07	60.00	50.00	-25.15	-22.93
6	**25.06641**	**11.58**	**31.52**	**29.87**	**43.10**	**41.45**	**60.00**	**50.00**	**-16.90**	**-8.55**

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

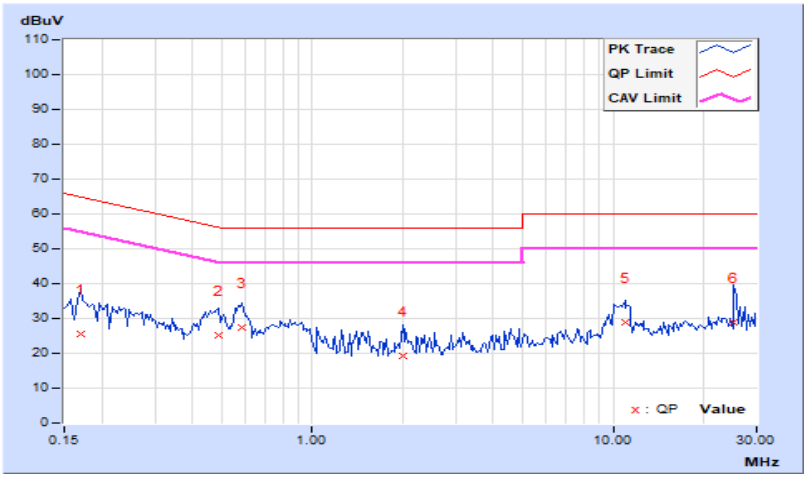


RF Mode	QHS 6M	**Channel**	CH 18：2438 MHz
Frequency Range	150 kHz ~ 30 MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power (System)	120 Vac, 60 Hz	**Environmental Conditions**	28°C, 75% RH
Tested By	Sampson Chen		

Phase Of Power : Neutral (N)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.16953	10.00	15.67	-2.26	25.67	7.74	64.98	54.98	-39.31	-47.24
2	0.48984	10.01	15.20	-1.00	25.21	9.01	56.17	46.17	-30.96	-37.16
3	0.58750	10.02	17.27	0.71	27.29	10.73	56.00	46.00	-28.71	-35.27
4	2.00000	10.09	9.03	-6.67	19.12	3.42	56.00	46.00	-36.88	-42.58
5	10.93750	10.66	18.26	8.70	28.92	19.36	60.00	50.00	-31.08	-30.64
6	25.12500	11.26	17.49	4.02	28.75	15.28	60.00	50.00	-31.25	-34.72

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



7.8 Unwanted Emissions below 1 GHz

Mode A

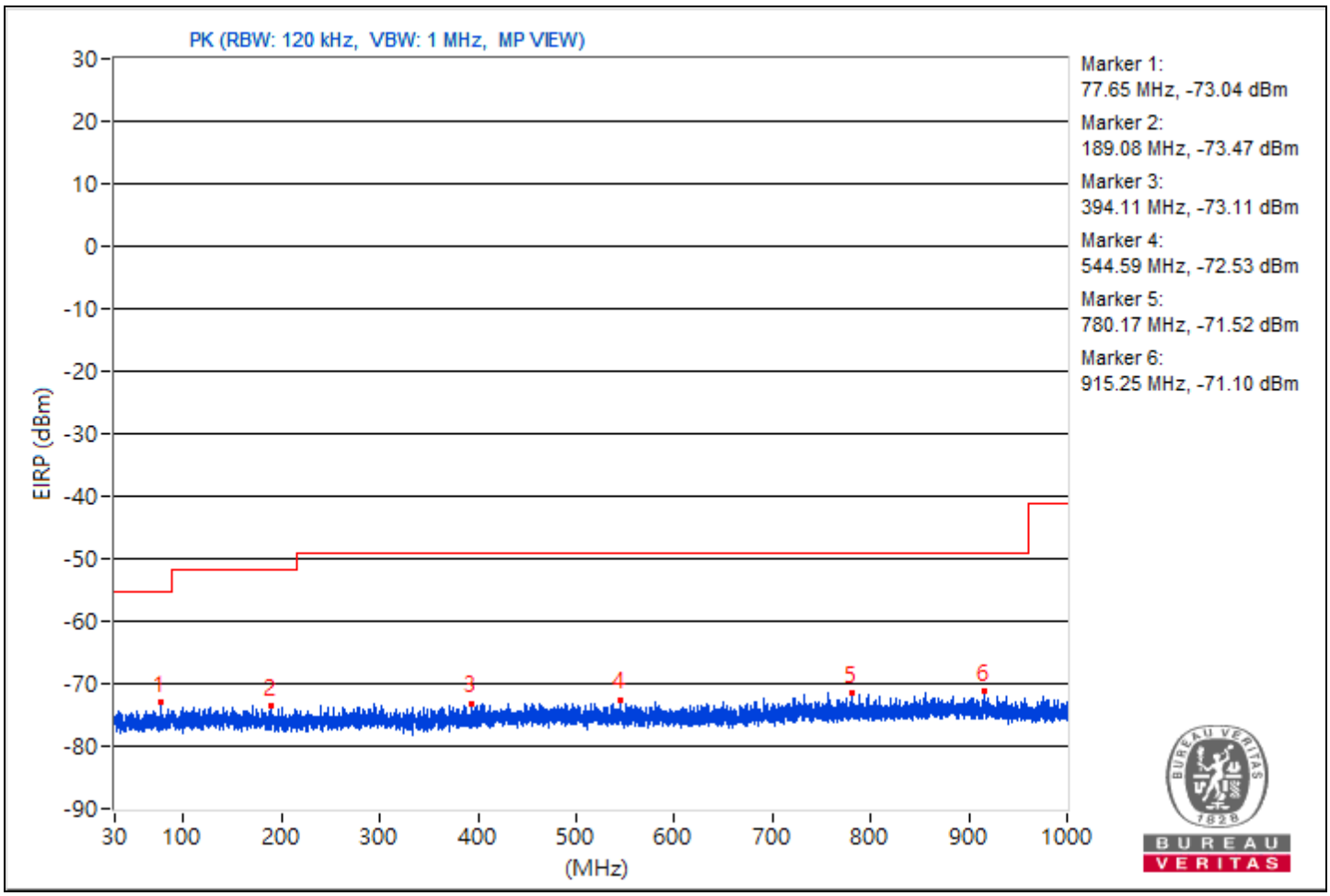
1Tx

RF Mode	QHS 6M	Channel	CH 18：2438 MHz
Frequency Range	30 MHz ~ 1 GHz	Input Power (System)	120 Vac, 60 Hz
Environmental Conditions	22°C, 55% RH	Tested By	Kevin Ko

Conducted Unwanted Emissions							
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value Chain 0 (dBm)	Correction Factor (dB)	EIRP Level (dBm)
1	77.65	22.22 PK	40	-17.78	-82.9	9.86	-73.04
2	189.08	21.79 PK	43.5	-21.71	-83.33	9.86	-73.47
3	394.11	22.15 PK	46	-23.85	-82.97	9.86	-73.11
4	544.59	22.73 PK	46	-23.27	-82.39	9.86	-72.53
5	780.17	23.74 PK	46	-22.26	-81.38	9.86	-71.52
6	915.25	24.16 PK	46	-21.84	-80.96	9.86	-71.1

Notes:

1. Margin value = Emission Level - Limit value
2. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



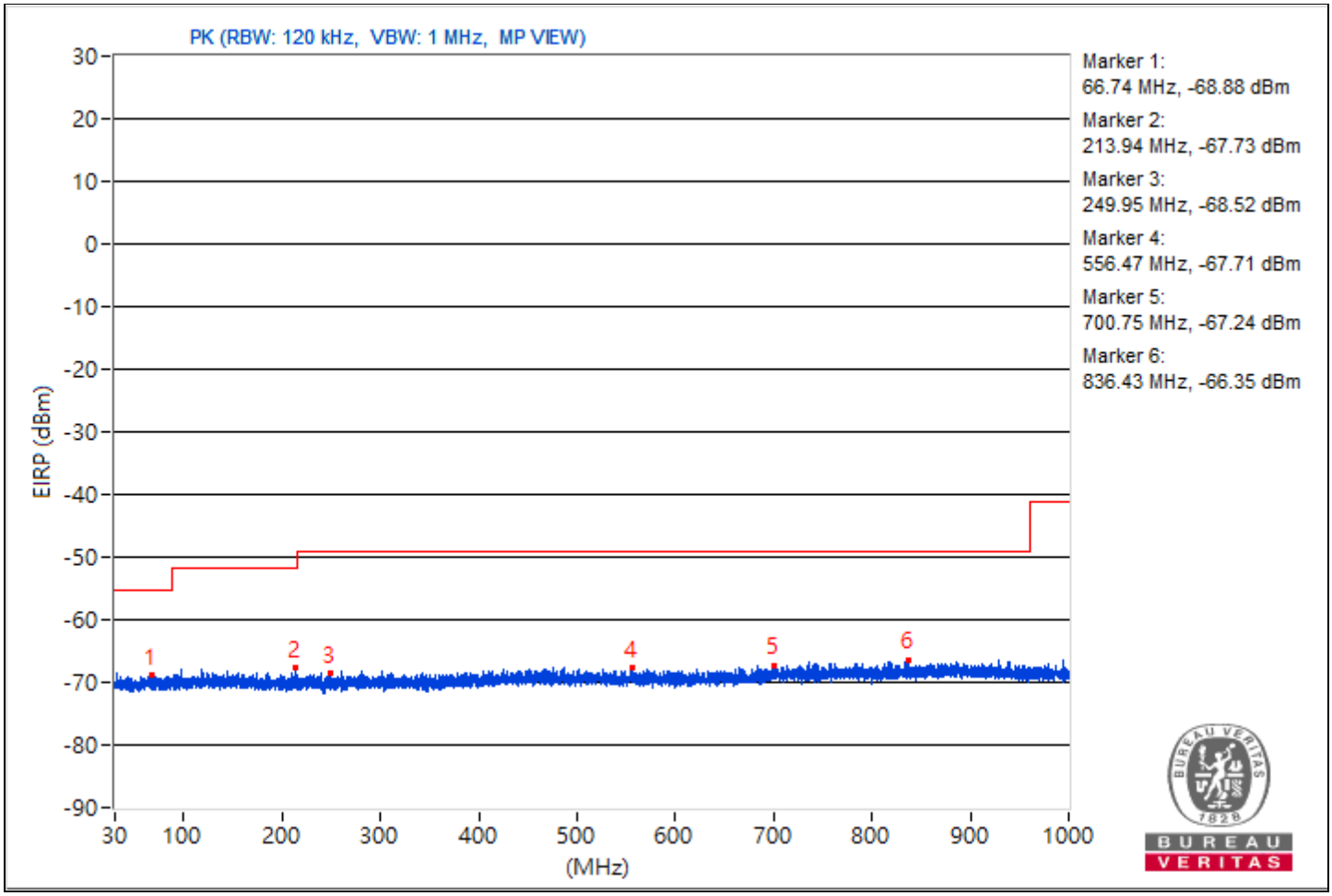
2Tx Beamforming

RF Mode	QHS 6M	Channel	CH 18：2438 MHz
Frequency Range	30 MHz ~ 1 GHz	Input Power (System)	120 Vac, 60 Hz
Environmental Conditions	22°C, 55% RH	Tested By	Kevin Ko

Conducted Unwanted Emissions								
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value Chain 0 (dBm)	Raw Value Chain 1 (dBm)	Correction Factor (dB)	EIRP Level (dBm)
1	66.74	26.38 PK	40	-13.62	-86.02	-83.34	12.87	-68.88
2	213.94	27.53 PK	43.5	-15.97	-82.69	-84.71	12.87	-67.73
3	249.95	26.74 PK	46	-19.26	-85.74	-83.38	12.87	-68.52
4	556.47	27.55 PK	46	-18.45	-85.48	-82.28	12.87	-67.71
5	700.75	28.02 PK	46	-17.98	-81.74	-84.53	12.87	-67.24
6	836.43	28.91 PK	46	-17.09	-80.77	-84.23	12.87	-66.35

Notes:

1. Margin value = Emission Level - Limit value
2. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



Mode B

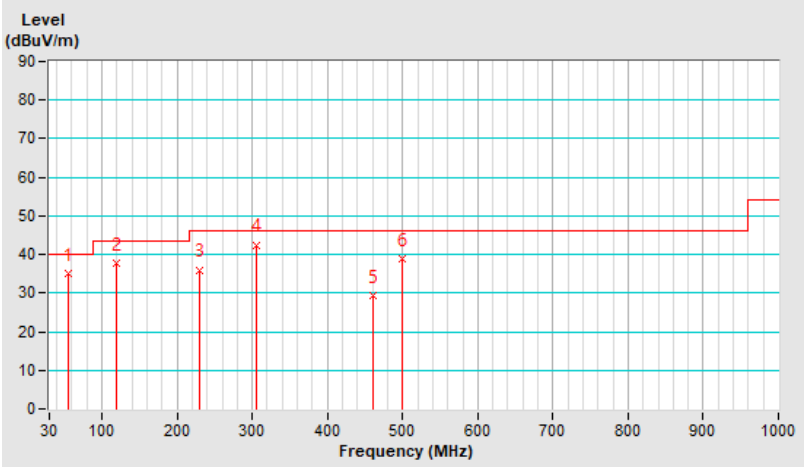
1Tx

RF Mode	QHS 6M	Channel	CH 18：2438 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	23°C, 73% RH
Tested By	Sampson Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	54.34	35.0 QP	40.0	-5.0	1.50 H	84	47.8	-12.8
2	119.23	37.8 QP	43.5	-5.7	1.00 H	205	52.7	-14.9
3	230.67	36.0 QP	46.0	-10.0	1.50 H	146	51.2	-15.2
4	**305.64**	**42.5 QP**	**46.0**	**-3.5**	**1.50 H**	**207**	**54.3**	**-11.8**
5	460.02	29.2 QP	46.0	-16.8	1.50 H	97	37.1	-7.9
6	500.04	38.9 QP	46.0	-7.1	2.00 H	257	46.0	-7.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

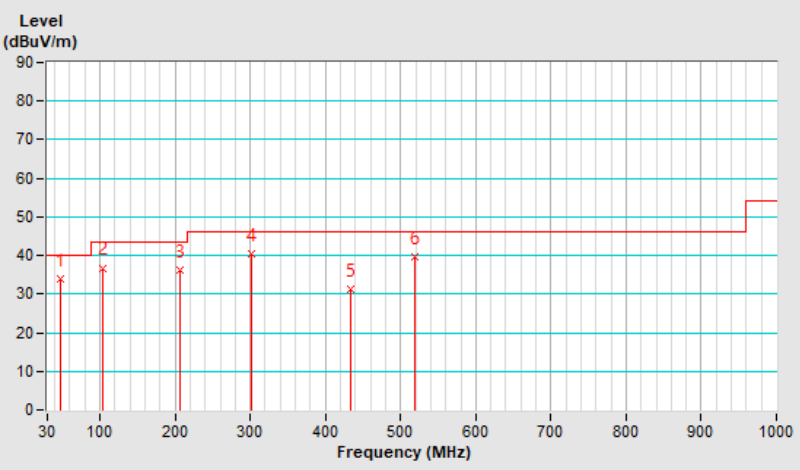


RF Mode	QHS 6M	Channel	CH 18：2438 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	25°C, 68% RH
Tested By	Sampson Chen		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	46.64	34.0 QP	40.0	-6.0	1.00 V	207	46.6	-12.6
2	104.00	36.8 QP	43.5	-6.7	2.00 V	307	53.3	-16.5
3	206.27	36.2 QP	43.5	-7.3	2.00 V	164	52.3	-16.1
4	301.38	40.5 QP	46.0	-5.5	1.50 V	165	52.4	-11.9
5	433.31	31.2 QP	46.0	-14.8	1.50 V	207	39.6	-8.4
6	519.19	39.5 QP	46.0	-6.5	2.00 V	260	46.1	-6.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



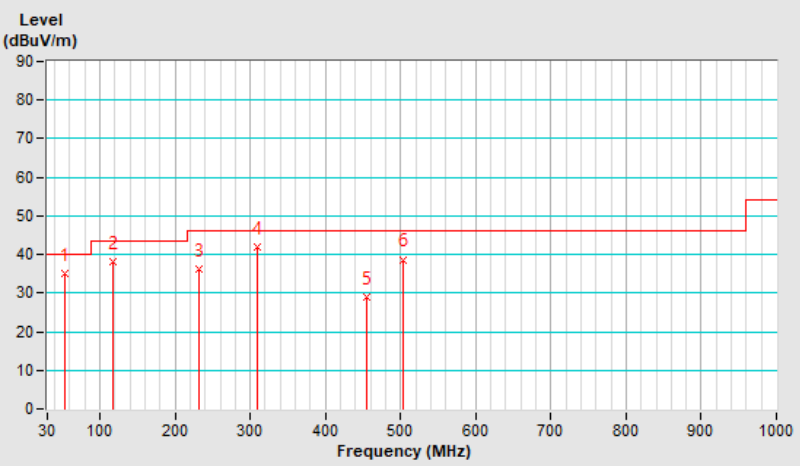
2Tx Beamforming

RF Mode	QHS 6M	Channel	CH 18：2438 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	23°C, 73% RH
Tested By	Sampson Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	53.01	35.0 QP	40.0	-5.0	1.00 H	64	47.7	-12.7
2	117.64	38.1 QP	43.5	-5.4	1.50 H	155	53.1	-15.0
3	231.53	36.3 QP	46.0	-9.7	2.00 H	100	51.4	-15.1
4	310.10	42.0 QP	46.0	-4.0	2.00 H	155	53.5	-11.5
5	454.42	29.0 QP	46.0	-17.0	2.00 H	94	36.9	-7.9
6	504.20	38.7 QP	46.0	-7.3	1.50 H	241	45.7	-7.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

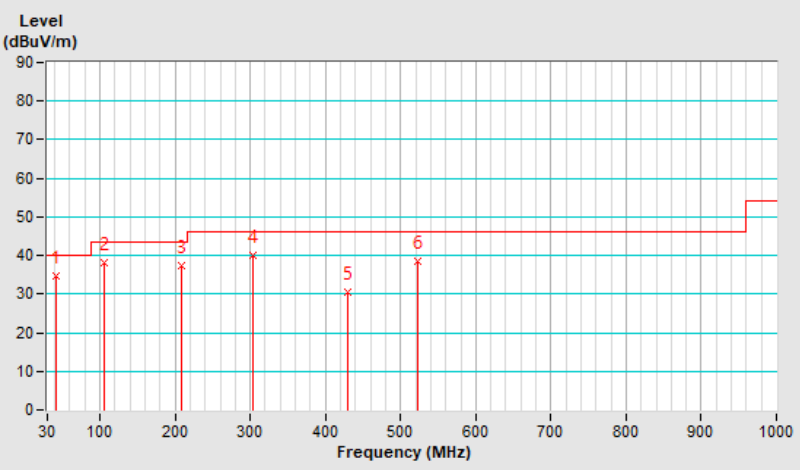


RF Mode	QHS 6M	Channel	CH 18：2438 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	25°C, 68% RH
Tested By	Sampson Chen		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	42.28	34.6 QP	40.0	-5.4	1.50 V	111	47.4	-12.8
2	105.21	38.2 QP	43.5	-5.3	1.50 V	205	54.6	-16.4
3	208.84	37.3 QP	43.5	-6.2	1.50 V	165	53.4	-16.1
4	302.71	40.0 QP	46.0	-6.0	1.50 V	207	51.9	-11.9
5	430.01	30.5 QP	46.0	-15.5	1.00 V	167	39.0	-8.5
6	522.53	38.6 QP	46.0	-7.4	1.00 V	209	45.2	-6.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



7.9 Unwanted Emissions above 1 GHz

Mode A

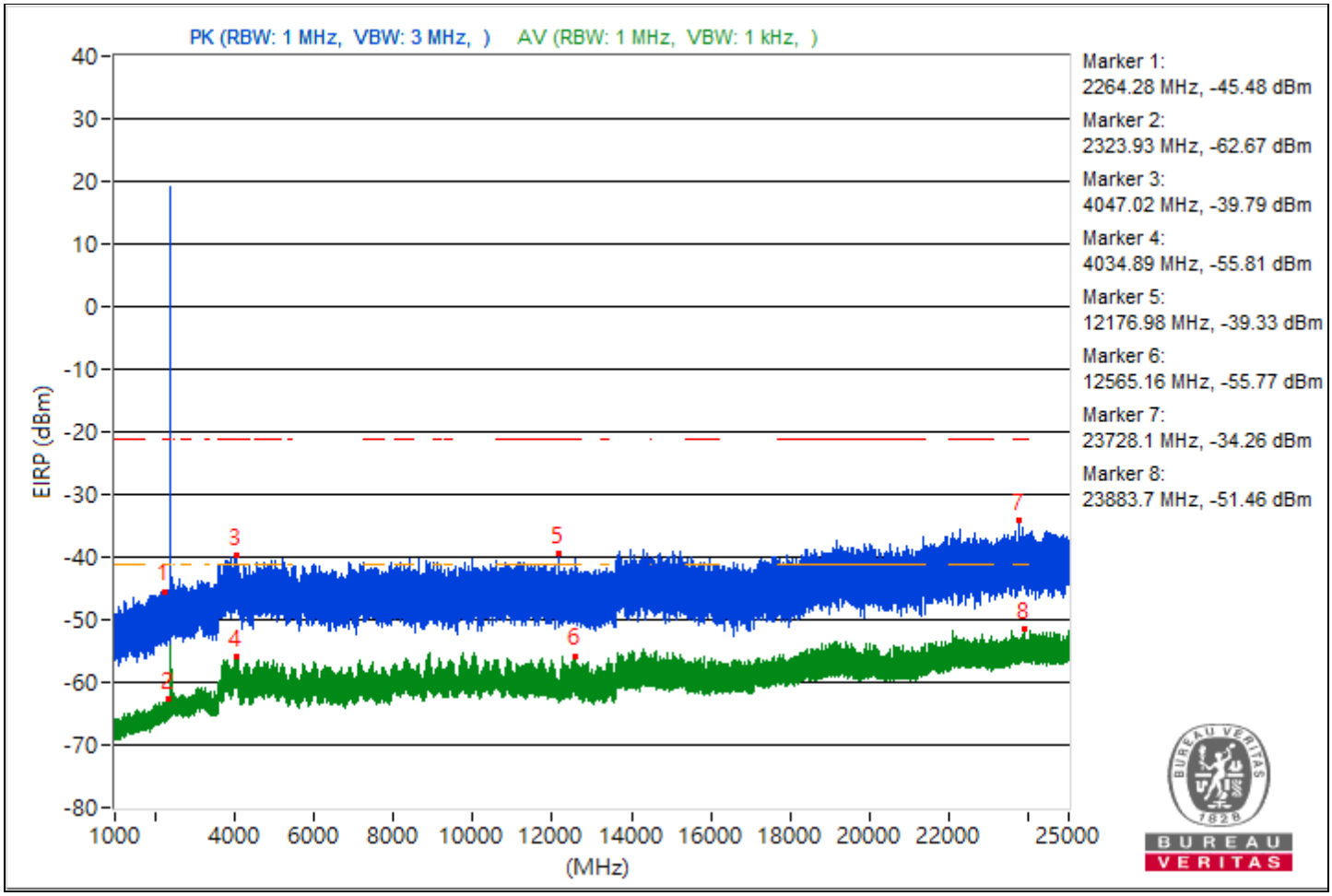
1Tx

Conducted Unwanted Emissions

RF Mode	QHS 6M	Channel	CH 1：2404 MHz
Frequency Range	1 GHz ~ 25 GHz	Input Power (System)	120 Vac, 60 Hz
Environmental Conditions	22°C, 55% RH	Tested By	Kevin Ko

Conducted Unwanted Emissions							
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value Chain 0 (dBm)	Correction Factor (dB)	EIRP Level (dBm)
1	2264.28	49.78 PK	74	-24.22	-50.64	5.16	-45.48
2	2323.93	32.59 AV	54	-21.41	-67.83	5.16	-62.67
3	4047.02	55.47 PK	74	-18.53	-44.95	5.16	-39.79
4	4034.89	39.45 AV	54	-14.55	-60.97	5.16	-55.81
5	12176.98	55.93 PK	74	-18.07	-44.49	5.16	-39.33
6	12565.16	39.49 AV	54	-14.51	-60.93	5.16	-55.77
7	23728.1	61 PK	74	-13	-39.42	5.16	-34.26
8	23883.7	43.8 AV	54	-10.2	-56.62	5.16	-51.46

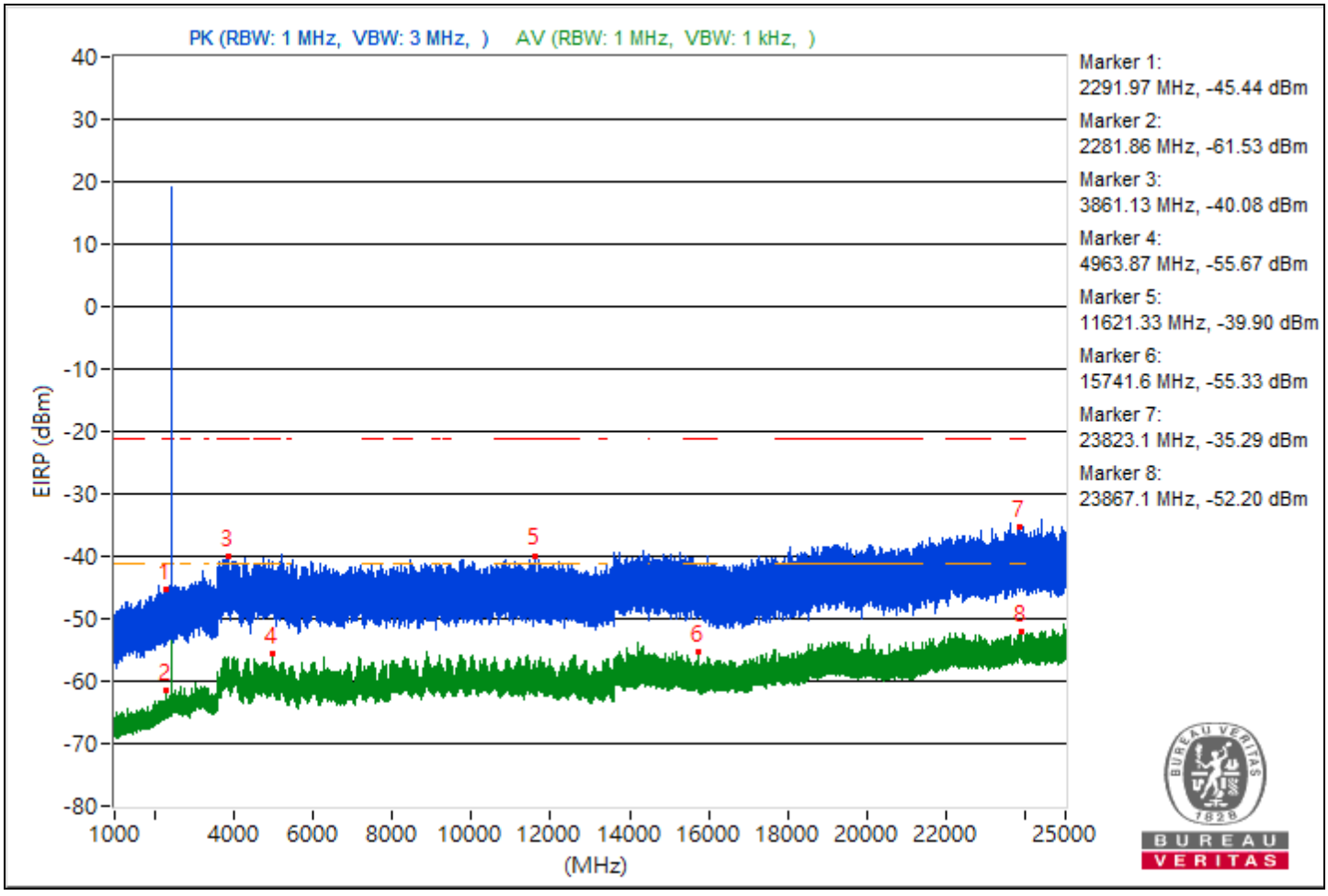
Note: Margin value = Emission Level - Limit value



RF Mode	QHS 6M	Channel	CH 18：2438 MHz
Frequency Range	1 GHz ~ 25 GHz	Input Power (System)	120 Vac, 60 Hz
Environmental Conditions	22°C, 55% RH	Tested By	Kevin Ko

Conducted Unwanted Emissions							
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value Chain 0 (dBm)	Correction Factor (dB)	EIRP Level (dBm)
1	2291.97	49.82 PK	74	-24.18	-50.6	5.16	-45.44
2	2281.86	33.73 AV	54	-20.27	-66.69	5.16	-61.53
3	3861.13	55.18 PK	74	-18.82	-45.24	5.16	-40.08
4	4963.87	39.59 AV	54	-14.41	-60.83	5.16	-55.67
5	11621.33	55.36 PK	74	-18.64	-45.06	5.16	-39.9
6	15741.6	39.93 AV	54	-14.07	-60.49	5.16	-55.33
7	23823.1	59.97 PK	74	-14.03	-40.45	5.16	-35.29
8	23867.1	43.06 AV	54	-10.94	-57.36	5.16	-52.2

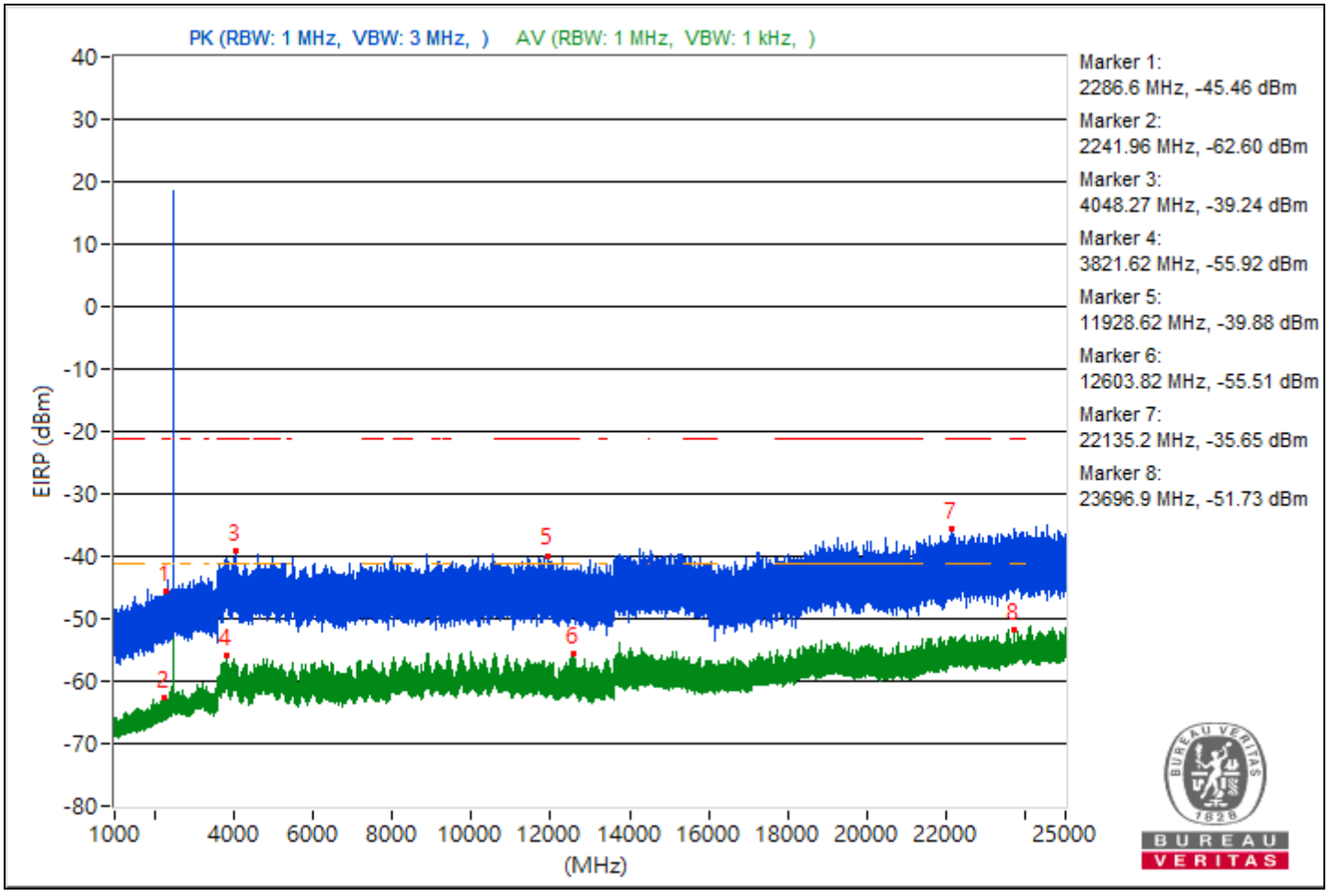
Note: Margin value = Emission Level - Limit value



RF Mode	QHS 6M	Channel	CH 38：2478 MHz
Frequency Range	1 GHz ~ 25 GHz	Input Power (System)	120 Vac, 60 Hz
Environmental Conditions	22°C, 55% RH	Tested By	Kevin Ko

Conducted Unwanted Emissions							
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value Chain 0 (dBm)	Correction Factor (dB)	EIRP Level (dBm)
1	2286.6	49.8 PK	74	-24.2	-50.62	5.16	-45.46
2	2241.96	32.66 AV	54	-21.34	-67.76	5.16	-62.6
3	4048.27	56.02 PK	74	-17.98	-44.4	5.16	-39.24
4	3821.62	39.34 AV	54	-14.66	-61.08	5.16	-55.92
5	11928.62	55.38 PK	74	-18.62	-45.04	5.16	-39.88
6	12603.82	39.75 AV	54	-14.25	-60.67	5.16	-55.51
7	22135.2	59.61 PK	74	-14.39	-40.81	5.16	-35.65
8	23696.9	43.53 AV	54	-10.47	-56.89	5.16	-51.73

Note: Margin value = Emission Level - Limit value



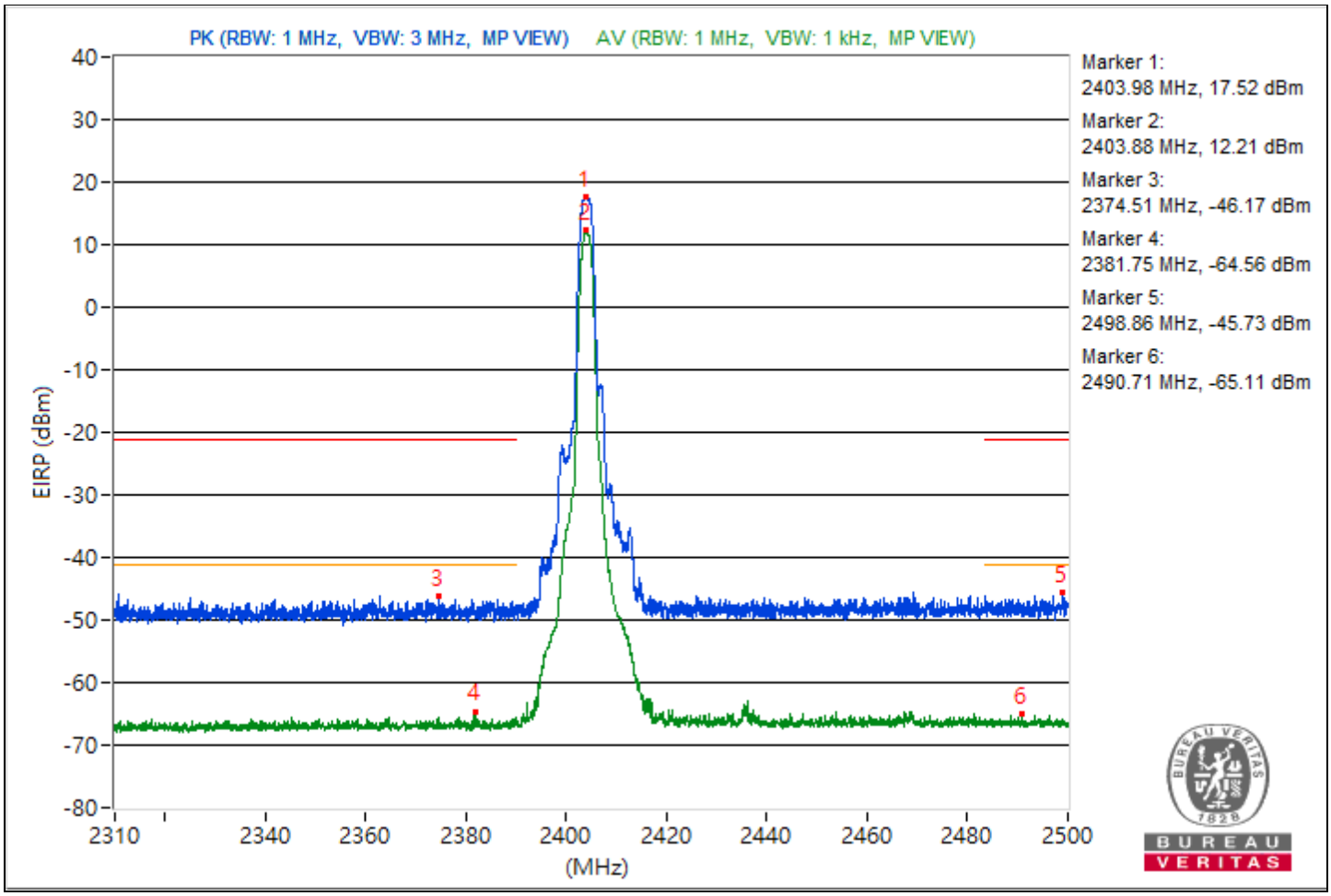
Conducted Band Edges

RF Mode	QHS 6M	Channel	CH 1：2404 MHz
Frequency Range	2.31 GHz ~ 2.5 GHz	Input Power (System)	120 Vac, 60 Hz
Environmental Conditions	22°C, 55% RH	Tested By	Kevin Ko

Conducted Band Edge							
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value Chain 0 (dBm)	Correction Factor (dB)	EIRP Level (dBm)
1	*2403.98	112.78 PK			13.99	3.53	17.52
2	*2403.88	107.47 AV			8.68	3.53	12.21
3	2374.51	49.09 PK	74	-24.91	-49.7	3.53	-46.17
4	2381.75	30.7 AV	54	-23.3	-68.09	3.53	-64.56
5	2498.86	49.53 PK	74	-24.47	-49.26	3.53	-45.73
6	2490.71	30.15 AV	54	-23.85	-68.64	3.53	-65.11

Notes:

1. Margin value = Emission Level - Limit value
2. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.

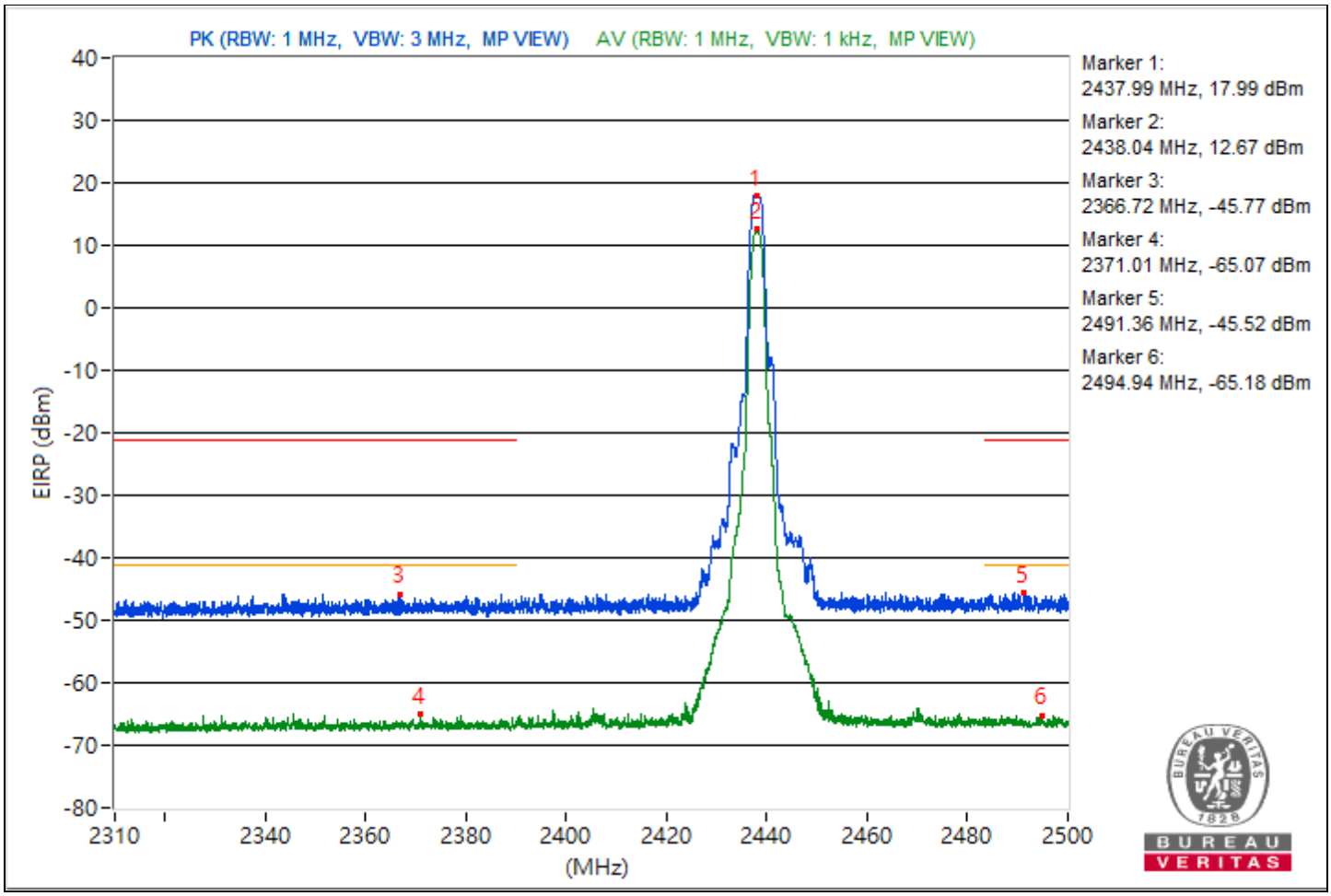


RF Mode	QHS 6M	Channel	CH 18：2438 MHz
Frequency Range	2.31 GHz ~ 2.5 GHz	Input Power (System)	120 Vac, 60 Hz
Environmental Conditions	22°C, 55% RH	Tested By	Kevin Ko

Conducted Band Edge							
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value Chain 0 (dBm)	Correction Factor (dB)	EIRP Level (dBm)
1	*2437.99	113.25 PK			14.46	3.53	17.99
2	*2438.04	107.93 AV			9.14	3.53	12.67
3	2366.72	49.49 PK	74	-24.51	-49.3	3.53	-45.77
4	2371.01	30.19 AV	54	-23.81	-68.6	3.53	-65.07
5	2491.36	49.74 PK	74	-24.26	-49.05	3.53	-45.52
6	2494.94	30.08 AV	54	-23.92	-68.71	3.53	-65.18

Notes:

1. Margin value = Emission Level - Limit value
2. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.

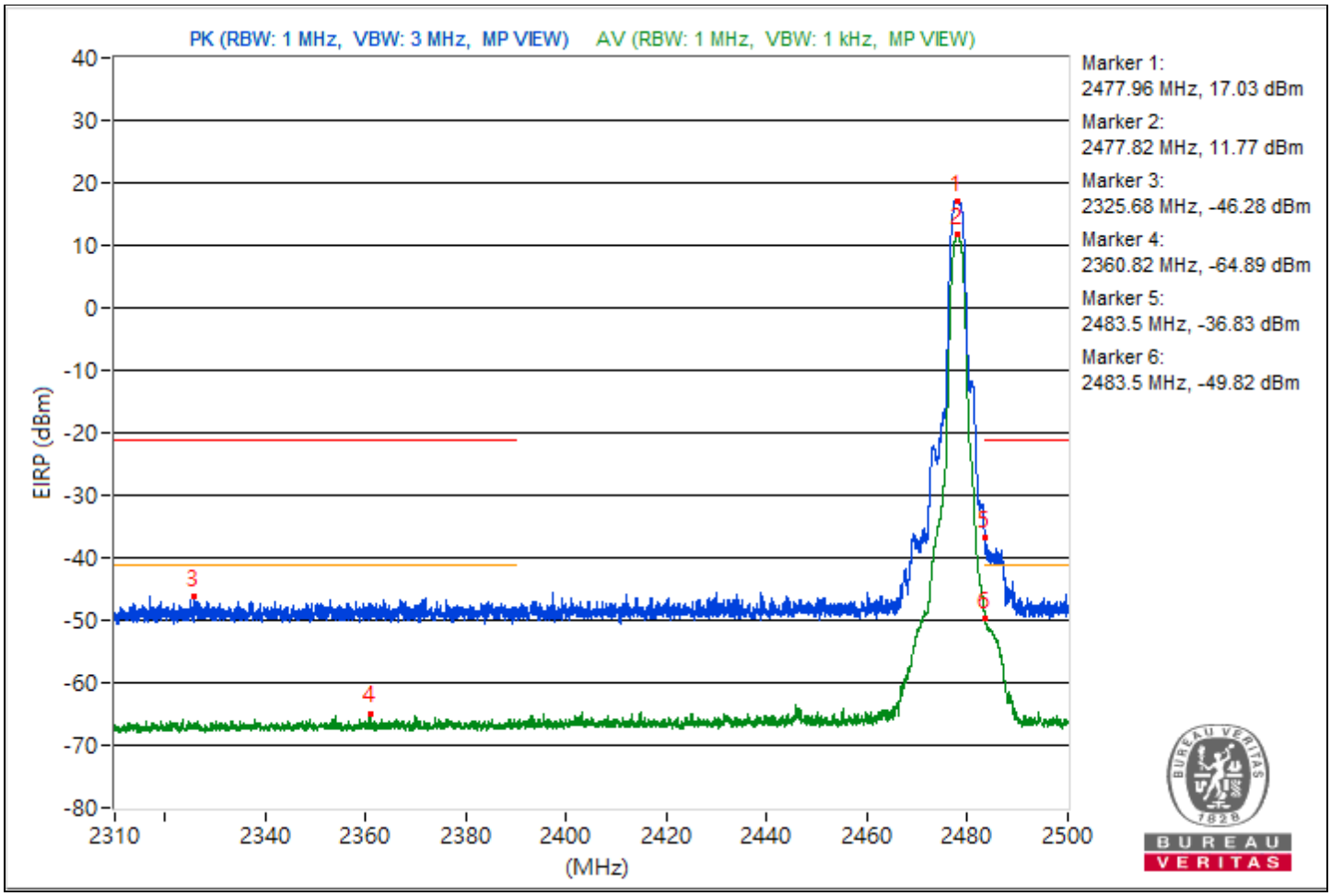


RF Mode	QHS 6M	Channel	CH 38：2478 MHz
Frequency Range	2.31 GHz ~ 2.5 GHz	Input Power (System)	120 Vac, 60 Hz
Environmental Conditions	22°C, 55% RH	Tested By	Kevin Ko

Conducted Band Edge							
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value Chain 0 (dBm)	Correction Factor (dB)	EIRP Level (dBm)
1	*2477.96	112.29 PK			13.5	3.53	17.03
2	*2477.82	107.03 AV			8.24	3.53	11.77
3	2325.68	48.98 PK	74	-25.02	-49.81	3.53	-46.28
4	2360.82	30.37 AV	54	-23.63	-68.42	3.53	-64.89
5	2483.5	58.43 PK	74	-15.57	-40.36	3.53	-36.83
6	2483.5	45.44 AV	54	-8.56	-53.35	3.53	-49.82

Notes:

1. Margin value = Emission Level - Limit value
2. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.



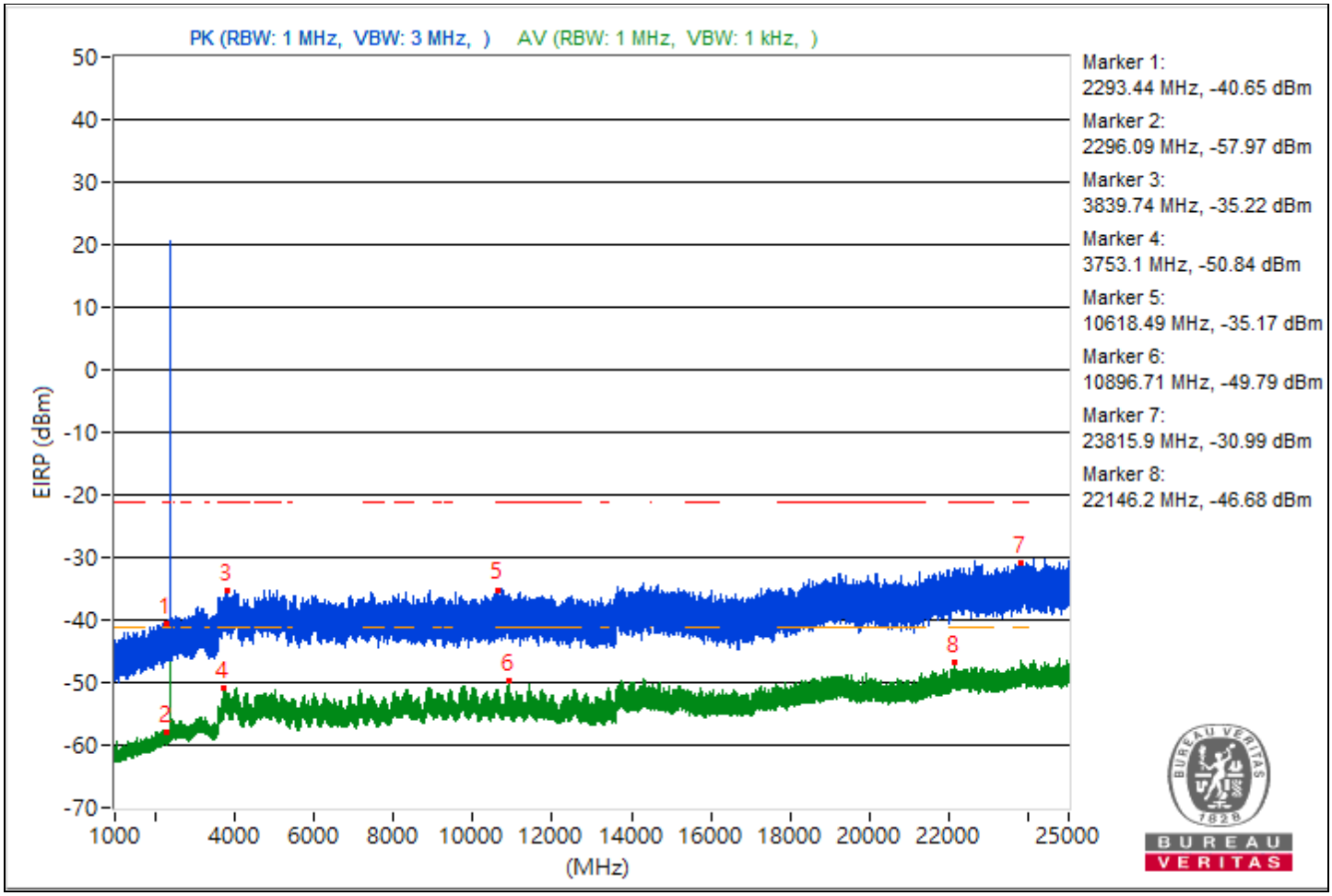
2Tx Beamforming

Conducted Unwanted Emissions

RF Mode	QHS 6M	Channel	CH 1：2404 MHz
Frequency Range	1 GHz ~ 25 GHz	Input Power (System)	120 Vac, 60 Hz
Environmental Conditions	22°C, 55% RH	Tested By	Kevin Ko

Conducted Unwanted Emissions								
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value Chain 0 (dBm)	Raw Value Chain 1 (dBm)	Correction Factor (dB)	EIRP Level (dBm)
1	2293.44	54.61 PK	74	-19.39	-50.72	-53.22	8.17	-40.65
2	2296.09	37.29 AV	54	-16.71	-69.21	-68.34	8.17	-57.97
3	3839.74	60.04 PK	74	-13.96	-48.78	-44.82	8.17	-35.22
4	3753.1	44.42 AV	54	-9.58	-64.2	-60.5	8.17	-50.84
5	10618.49	60.09 PK	74	-13.91	-48.43	-44.53	8.17	-35.17
6	10896.71	45.47 AV	54	-8.53	-61.35	-60.62	8.17	-49.79
7	23815.9	64.27 PK	74	-9.73	-40.21	-45.86	8.17	-30.99
8	**22146.2**	**48.58 AV**	**54**	**-5.42**	**-60.45**	**-56.25**	**8.17**	**-46.68**

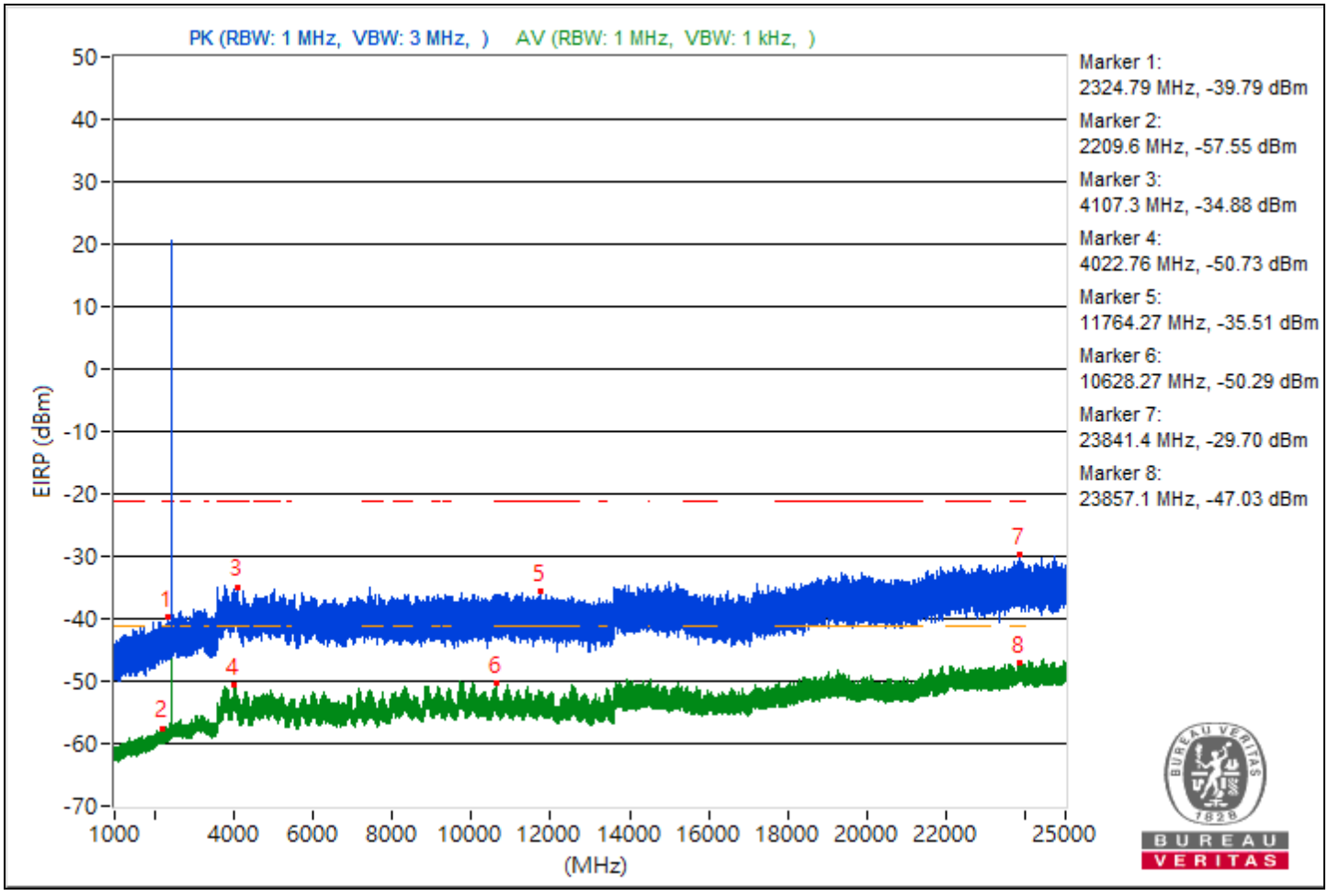
Note: Margin value = Emission Level - Limit value



RF Mode	QHS 6M	Channel	CH 18：2438 MHz
Frequency Range	1 GHz ~ 25 GHz	Input Power (System)	120 Vac, 60 Hz
Environmental Conditions	22°C, 55% RH	Tested By	Kevin Ko

Conducted Unwanted Emissions								
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value Chain 0 (dBm)	Raw Value Chain 1 (dBm)	Correction Factor (dB)	EIRP Level (dBm)
1	2324.79	55.47 PK	74	-18.53	-51.55	-50.45	8.17	-39.79
2	2209.6	37.71 AV	54	-16.29	-67.44	-70.58	8.17	-57.55
3	4107.3	60.38 PK	74	-13.62	-44.28	-49.1	8.17	-34.88
4	4022.76	44.53 AV	54	-9.47	-61.03	-63.01	8.17	-50.73
5	11764.27	59.75 PK	74	-14.25	-50.22	-44.77	8.17	-35.51
6	10628.27	44.97 AV	54	-9.03	-64.83	-59.53	8.17	-50.29
7	23841.4	65.56 PK	74	-8.44	-42.3	-39.82	8.17	-29.7
8	23857.1	48.23 AV	54	-5.77	-56.69	-60.36	8.17	-47.03

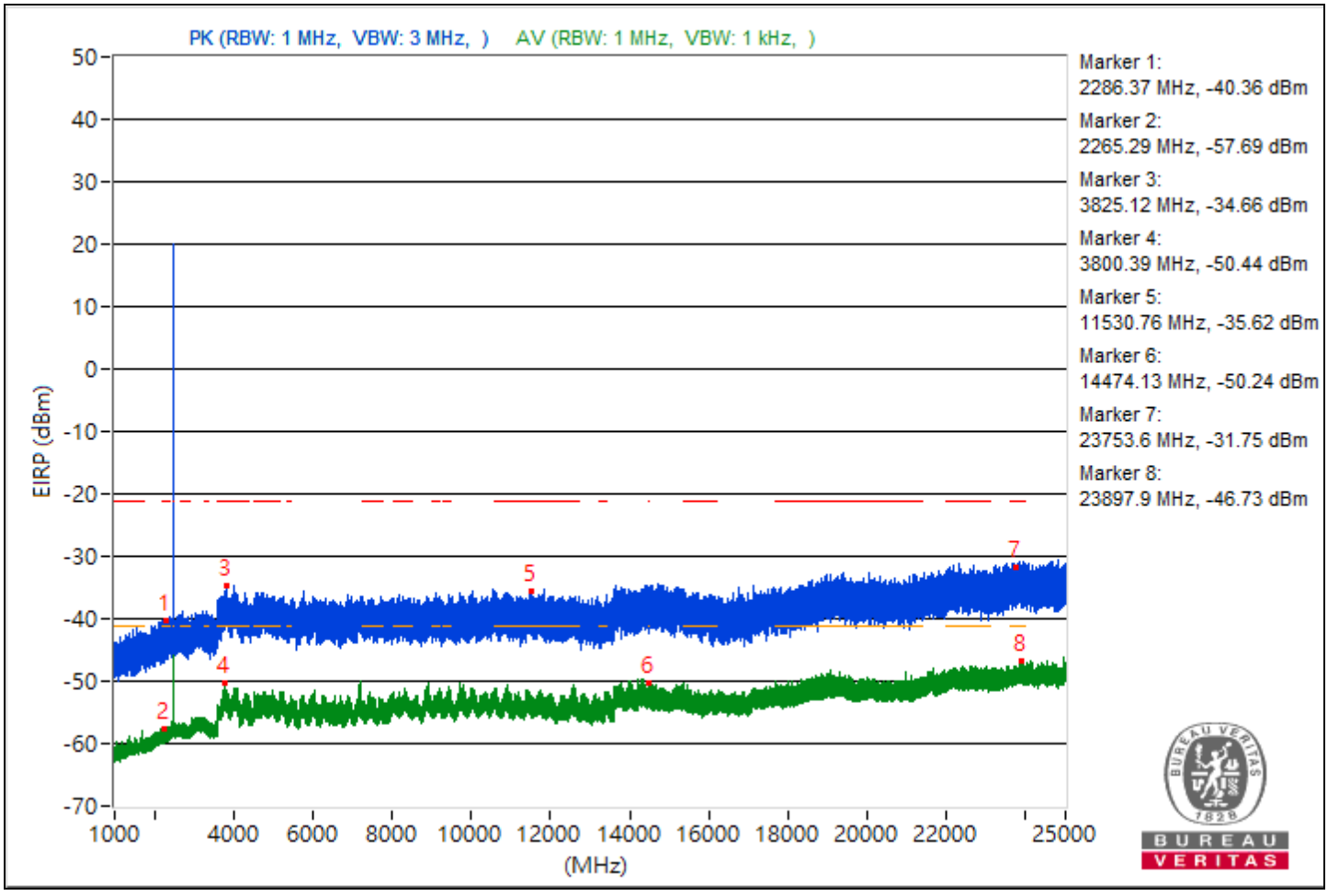
Note: Margin value = Emission Level - Limit value



RF Mode	QHS 6M	Channel	CH 38：2478 MHz
Frequency Range	1 GHz ~ 25 GHz	Input Power (System)	120 Vac, 60 Hz
Environmental Conditions	22°C, 55% RH	Tested By	Kevin Ko

Conducted Unwanted Emissions								
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value Chain 0 (dBm)	Raw Value Chain 1 (dBm)	Correction Factor (dB)	EIRP Level (dBm)
1	2286.37	54.9 PK	74	-19.1	-53.95	-49.98	8.17	-40.36
2	2265.29	37.57 AV	54	-16.43	-69.95	-67.84	8.17	-57.69
3	3825.12	60.6 PK	74	-13.4	-43.32	-51.72	8.17	-34.66
4	3800.39	44.82 AV	54	-9.18	-64.46	-59.91	8.17	-50.44
5	11530.76	59.64 PK	74	-14.36	-44.68	-51.09	8.17	-35.62
6	14474.13	45.02 AV	54	-8.98	-64.45	-59.65	8.17	-50.24
7	23753.6	63.51 PK	74	-10.49	-47.56	-40.74	8.17	-31.75
8	23897.9	48.53 AV	54	-5.47	-56.31	-59.87	8.17	-46.73

Note: Margin value = Emission Level - Limit value



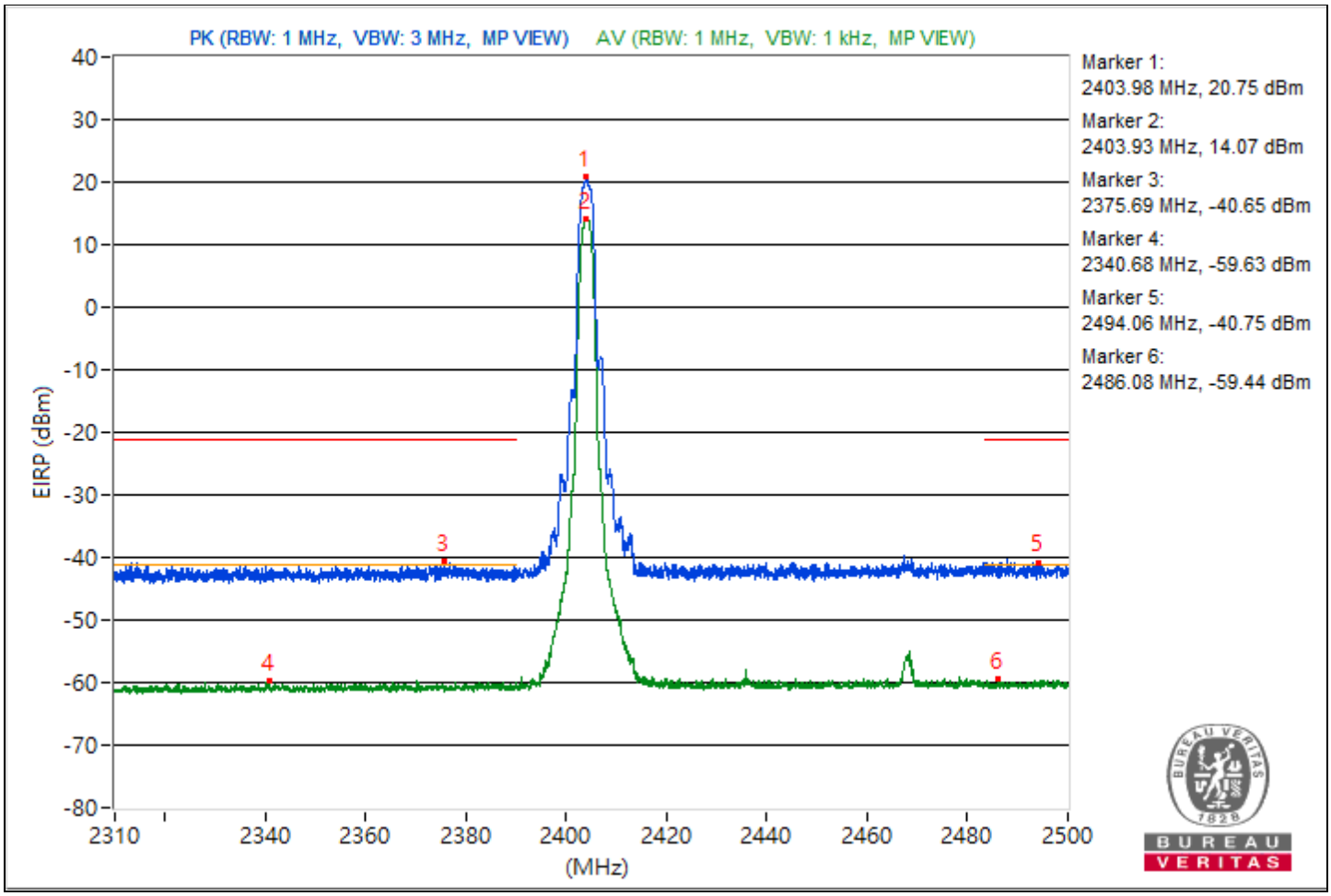
Conducted Band Edges

RF Mode	QHS 6M	Channel	CH 1：2404 MHz
Frequency Range	2.31 GHz ~ 2.5 GHz	Input Power (System)	120 Vac, 60 Hz
Environmental Conditions	22°C, 55% RH	Tested By	Kevin Ko

Conducted Band Edge								
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value Chain 0 (dBm)	Raw Value Chain 1 (dBm)	Correction Factor (dB)	EIRP Level (dBm)
1	*2403.98	116.01 PK			12.28	9.75	6.54	20.75
2	*2403.93	109.33 AV			4.46	4.57	6.54	14.07
3	2375.69	54.61 PK	74	-19.39	-49.28	-51.25	6.54	-40.65
4	2340.68	35.63 AV	54	-18.37	-69.85	-68.57	6.54	-59.63
5	2494.06	54.51 PK	74	-19.49	-51.7	-49.23	6.54	-40.75
6	2486.08	35.82 AV	54	-18.18	-68.52	-69.52	6.54	-59.44

Notes:

1. Margin value = Emission Level - Limit value
2. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.

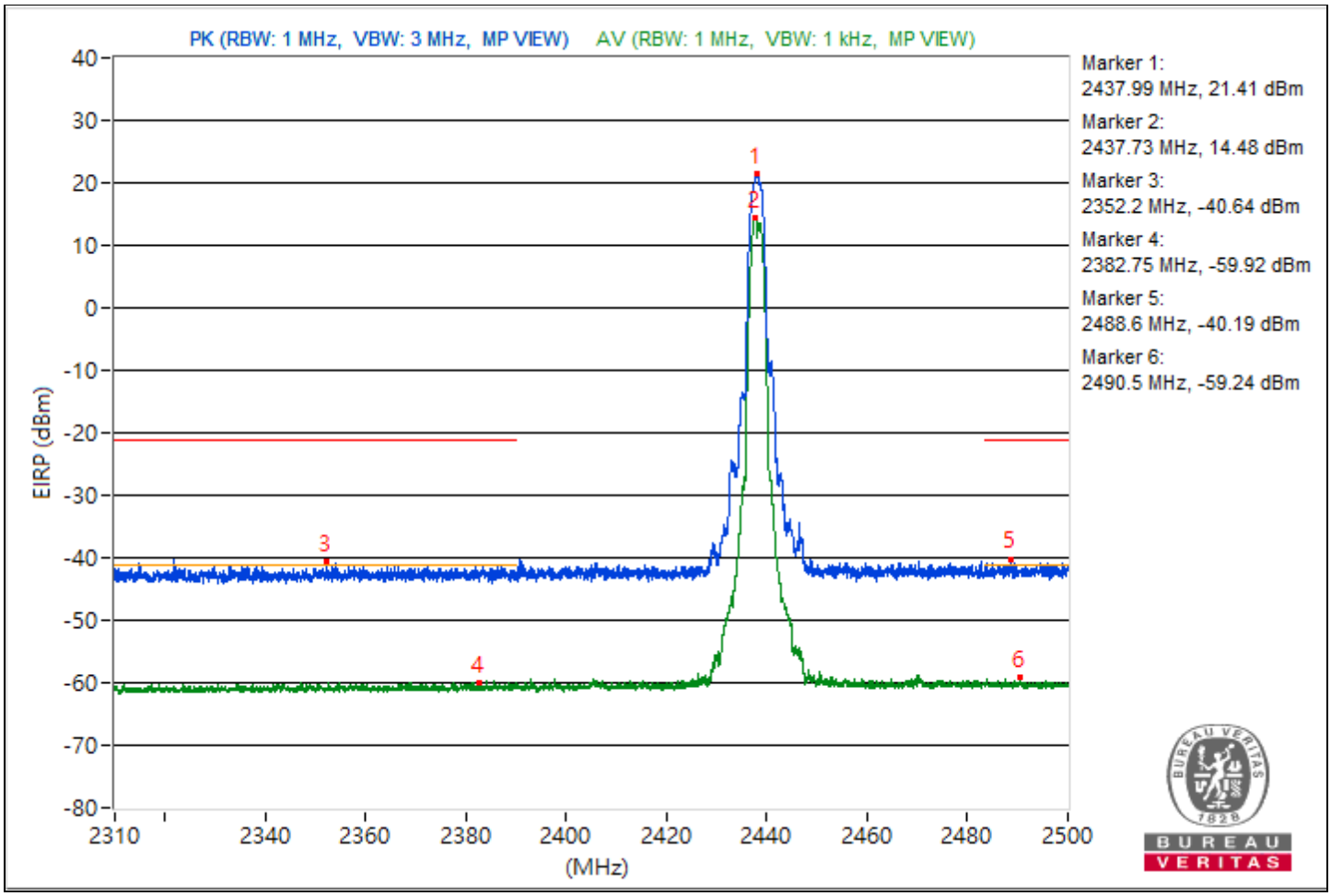


RF Mode	QHS 6M	Channel	CH 18：2438 MHz
Frequency Range	2.31 GHz ~ 2.5 GHz	Input Power (System)	120 Vac, 60 Hz
Environmental Conditions	22°C, 55% RH	Tested By	Kevin Ko

Conducted Band Edge								
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value Chain 0 (dBm)	Raw Value Chain 1 (dBm)	Correction Factor (dB)	EIRP Level (dBm)
1	*2437.99	116.67 PK			12.92	10.45	6.54	21.41
2	*2437.73	109.74 AV			4.78	5.14	6.54	14.48
3	2352.2	54.62 PK	74	-19.38	-51.02	-49.42	6.54	-40.64
4	2382.75	35.34 AV	54	-18.66	-70.53	-68.47	6.54	-59.92
5	2488.6	55.07 PK	74	-18.93	-50.75	-48.8	6.54	-40.19
6	2490.5	36.02 AV	54	-17.98	-69.58	-68.06	6.54	-59.24

Notes:

1. Margin value = Emission Level - Limit value
2. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.

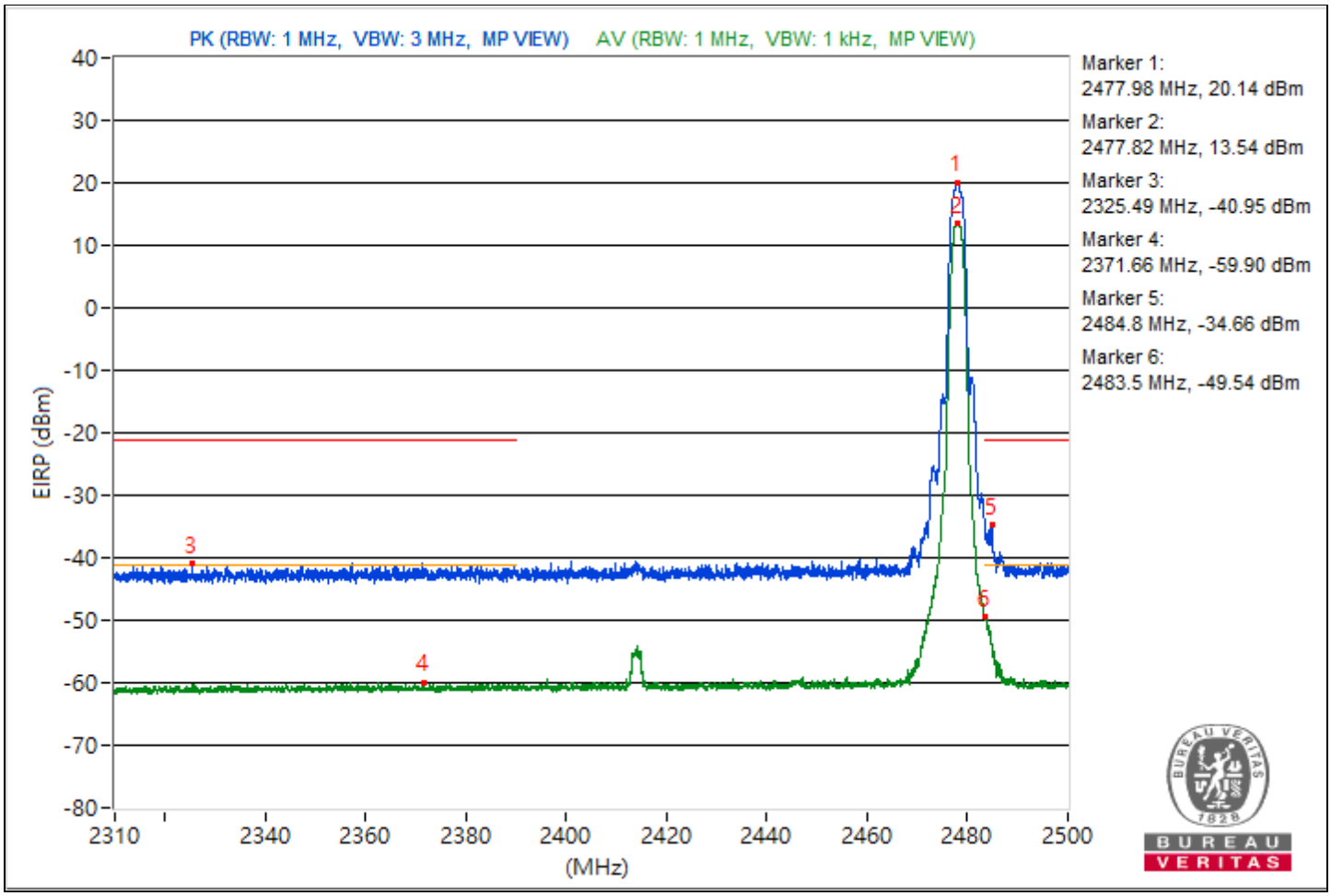


RF Mode	QHS 6M	Channel	CH 38：2478 MHz
Frequency Range	2.31 GHz ~ 2.5 GHz	Input Power (System)	120 Vac, 60 Hz
Environmental Conditions	22°C, 55% RH	Tested By	Kevin Ko

Conducted Band Edge								
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value Chain 0 (dBm)	Raw Value Chain 1 (dBm)	Correction Factor (dB)	EIRP Level (dBm)
1	*2477.98	115.4 PK			11.7	9.11	6.54	20.14
2	*2477.82	108.8 AV			4.11	3.93	6.54	13.54
3	2325.49	54.31 PK	74	-19.69	-49.38	-51.92	6.54	-40.95
4	2371.66	35.36 AV	54	-18.64	-68.51	-70.66	6.54	-59.9
5	2484.8	60.6 PK	74	-13.4	-42.37	-47.47	6.54	-34.66
6	2483.5	45.72 AV	54	-8.28	-57.44	-61.77	6.54	-49.54

Notes:

1. Margin value = Emission Level - Limit value
2. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.



Mode B

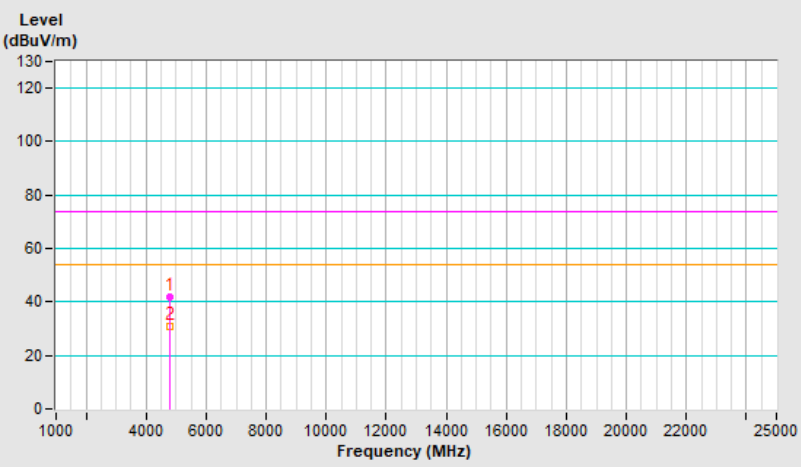
1Tx

RF Mode	QHS 6M	Channel	CH 1：2404 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	23°C, 67% RH
Tested By	Sampson Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	4808.00	41.8 PK	74.0	-32.2	1.32 H	306	39.5	2.3
2	4808.00	30.8 AV	54.0	-23.2	1.32 H	306	28.5	2.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

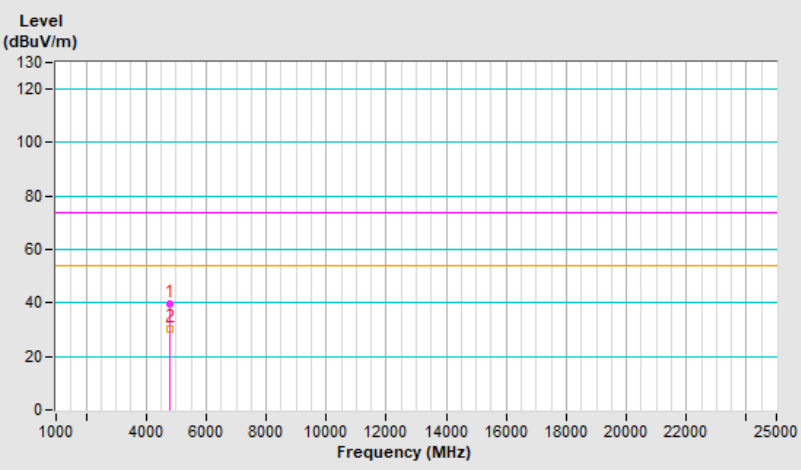


RF Mode	QHS 6M	**Channel**	CH 1：2404 MHz
Frequency Range	1 GHz ~ 25 GHz	**Detector Function & Bandwidth**	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	**Environmental Conditions**	23°C, 67% RH
Tested By	Sampson Chen		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	4808.00	39.8 PK	74.0	-34.2	1.70 V	133	37.5	2.3
2	4808.00	30.1 AV	54.0	-23.9	1.70 V	133	27.8	2.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

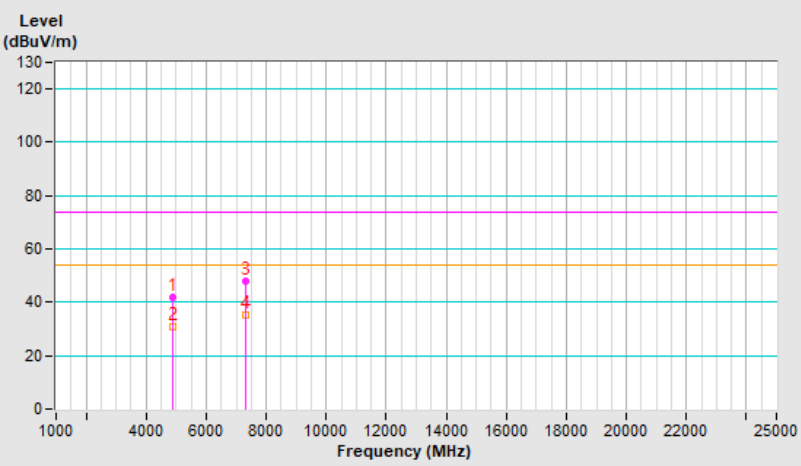


RF Mode	QHS 6M	**Channel**	CH 18：2438 MHz
Frequency Range	1 GHz ~ 25 GHz	**Detector Function & Bandwidth**	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	**Environmental Conditions**	23°C, 67% RH
Tested By	Sampson Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	4876.00	41.7 PK	74.0	-32.3	1.31 H	297	39.5	2.2
2	4876.00	30.6 AV	54.0	-23.4	1.31 H	297	28.4	2.2
3	7314.00	47.9 PK	74.0	-26.1	1.86 H	190	40.2	7.7
4	7314.00	35.4 AV	54.0	-18.6	1.86 H	190	27.7	7.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

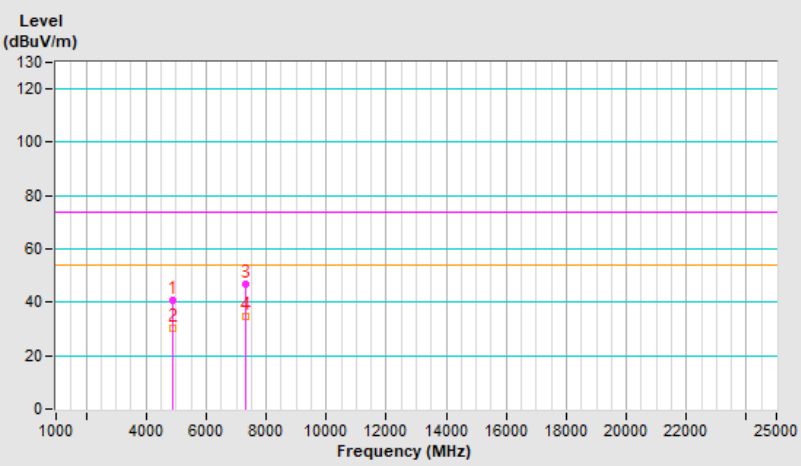


RF Mode	QHS 6M	Channel	CH 18：2438 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	23°C, 67% RH
Tested By	Sampson Chen		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	4876.00	40.6 PK	74.0	-33.4	1.55 V	143	38.4	2.2
2	4876.00	30.5 AV	54.0	-23.5	1.55 V	143	28.3	2.2
3	7314.00	46.7 PK	74.0	-27.3	1.87 V	261	39.0	7.7
4	7314.00	34.5 AV	54.0	-19.5	1.87 V	261	26.8	7.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

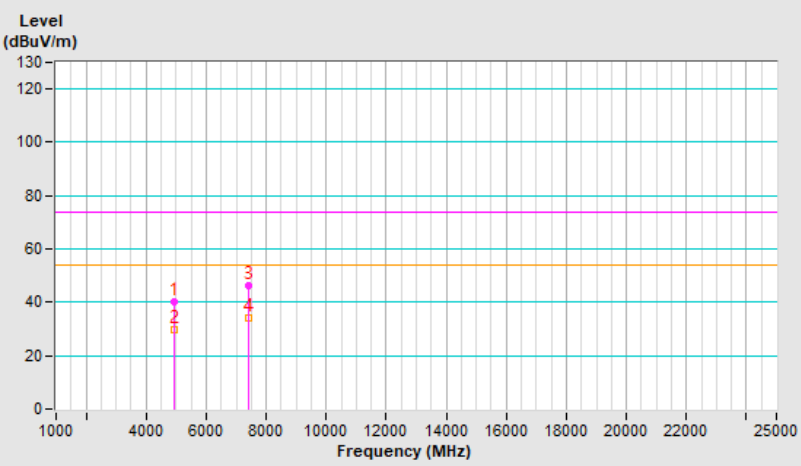


RF Mode	QHS 6M	**Channel**	CH 38：2478 MHz
Frequency Range	1 GHz ~ 25 GHz	**Detector Function & Bandwidth**	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	**Environmental Conditions**	23°C, 67% RH
Tested By	Sampson Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	4956.00	40.1 PK	74.0	-33.9	1.33 H	295	37.8	2.3
2	4956.00	29.9 AV	54.0	-24.1	1.33 H	295	27.6	2.3
3	7434.00	46.0 PK	74.0	-28.0	1.87 H	197	38.2	7.8
4	7434.00	34.0 AV	54.0	-20.0	1.87 H	197	26.2	7.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

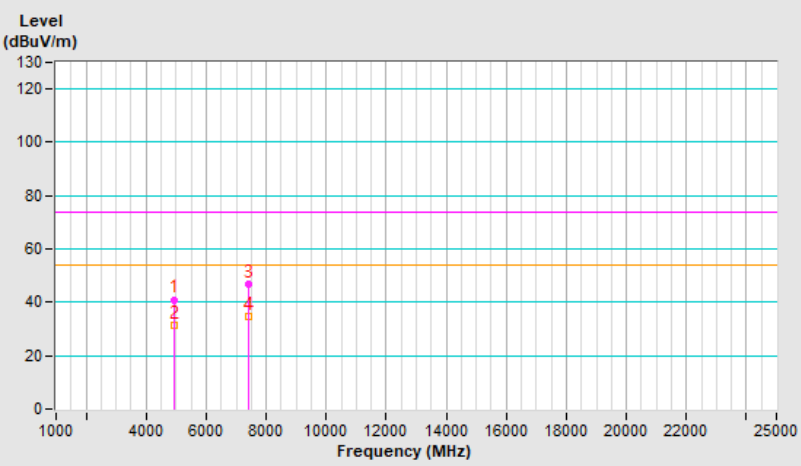


RF Mode	QHS 6M	**Channel**	CH 38：2478 MHz
Frequency Range	1 GHz ~ 25 GHz	**Detector Function & Bandwidth**	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	**Environmental Conditions**	23°C, 67% RH
Tested By	Sampson Chen		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	4956.00	41.0 PK	74.0	-33.0	1.54 V	141	38.7	2.3
2	4956.00	31.2 AV	54.0	-22.8	1.54 V	141	28.9	2.3
3	7434.00	46.7 PK	74.0	-27.3	1.93 V	249	38.9	7.8
4	7434.00	34.8 AV	54.0	-19.2	1.93 V	249	27.0	7.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



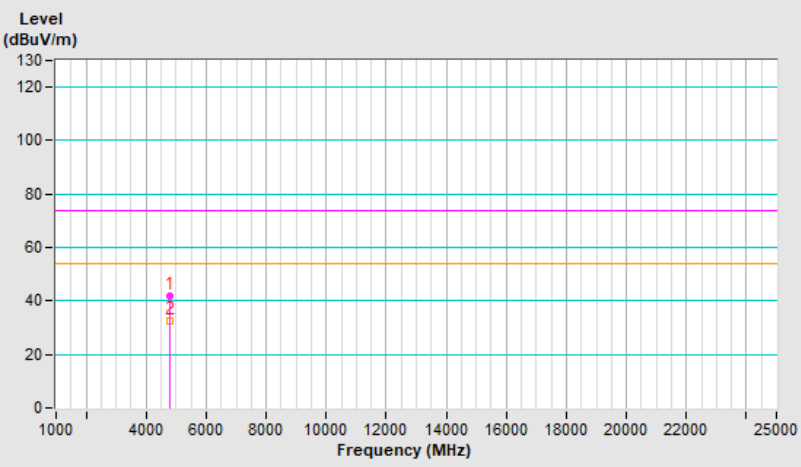
2Tx Beamforming

RF Mode	QHS 6M	Channel	CH 1：2404 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	23°C, 67% RH
Tested By	Sampson Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	4808.00	41.7 PK	74.0	-32.3	1.35 H	313	39.4	2.3
2	4808.00	32.3 AV	54.0	-21.7	1.35 H	313	30.0	2.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

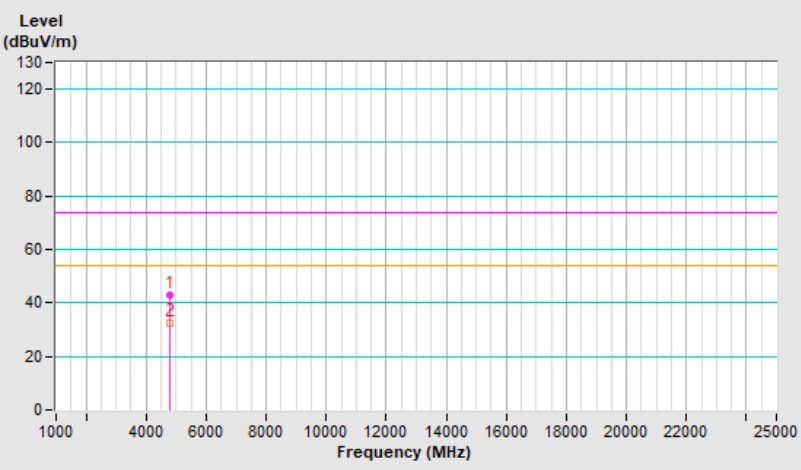


RF Mode	QHS 6M	**Channel**	CH 1：2404 MHz
Frequency Range	1 GHz ~ 25 GHz	**Detector Function & Bandwidth**	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	**Environmental Conditions**	23°C, 67% RH
Tested By	Sampson Chen		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	4808.00	42.7 PK	74.0	-31.3	1.65 V	119	40.4	2.3
2	4808.00	32.3 AV	54.0	-21.7	1.65 V	119	30.0	2.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

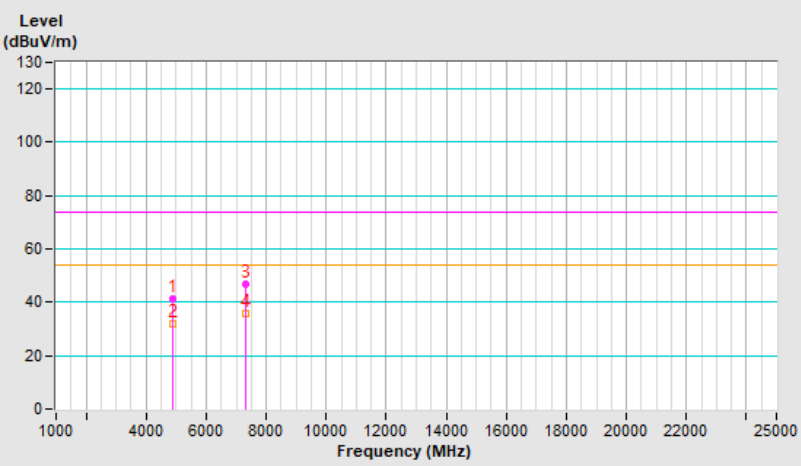


RF Mode	QHS 6M	**Channel**	CH 18：2438 MHz
Frequency Range	1 GHz ~ 25 GHz	**Detector Function & Bandwidth**	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	**Environmental Conditions**	23°C, 67% RH
Tested By	Sampson Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	4876.00	41.3 PK	74.0	-32.7	1.35 H	308	39.1	2.2
2	4876.00	32.0 AV	54.0	-22.0	1.35 H	308	29.8	2.2
3	7314.00	46.6 PK	74.0	-27.4	1.73 H	146	38.9	7.7
4	7314.00	35.7 AV	54.0	-18.3	1.73 H	146	28.0	7.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

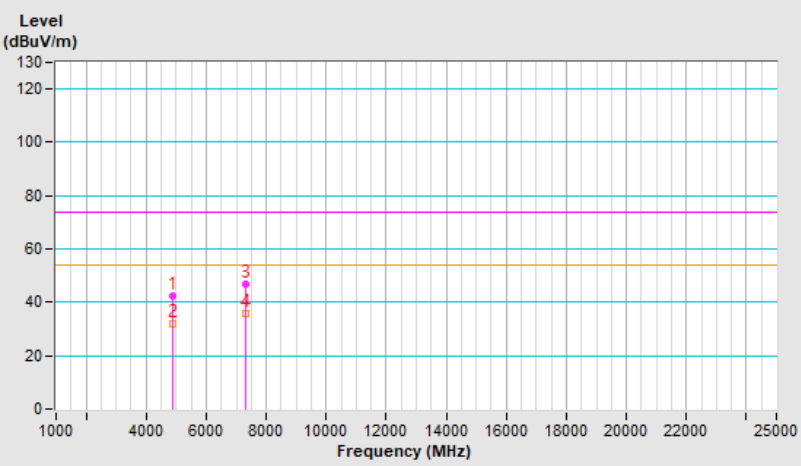


RF Mode	QHS 6M	**Channel**	CH 18：2438 MHz
Frequency Range	1 GHz ~ 25 GHz	**Detector Function & Bandwidth**	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	**Environmental Conditions**	23°C, 67% RH
Tested By	Sampson Chen		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	4876.00	42.4 PK	74.0	-31.6	1.69 V	143	40.2	2.2
2	4876.00	32.0 AV	54.0	-22.0	1.69 V	143	29.8	2.2
3	7314.00	46.9 PK	74.0	-27.1	1.93 V	281	39.2	7.7
4	7314.00	35.9 AV	54.0	-18.1	1.93 V	281	28.2	7.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

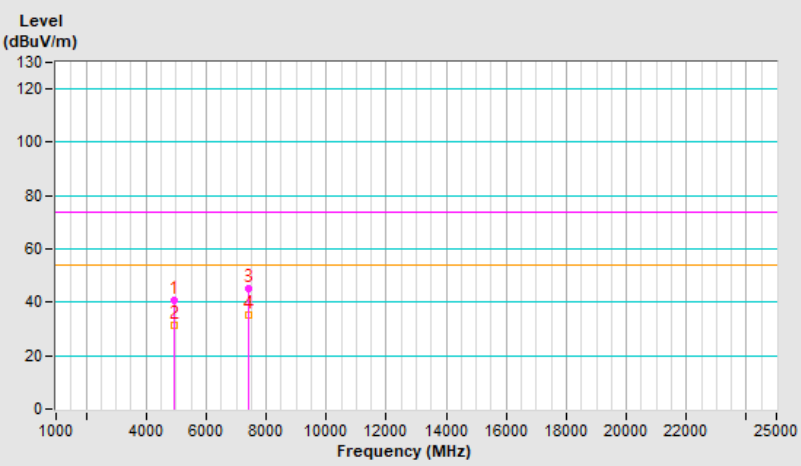


RF Mode	QHS 6M	**Channel**	CH 38：2478 MHz
Frequency Range	1 GHz ~ 25 GHz	**Detector Function & Bandwidth**	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	**Environmental Conditions**	23°C, 67% RH
Tested By	Sampson Chen		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	4956.00	40.6 PK	74.0	-33.4	1.33 H	310	38.3	2.3
2	4956.00	31.5 AV	54.0	-22.5	1.33 H	310	29.2	2.3
3	7434.00	45.4 PK	74.0	-28.6	1.75 H	129	37.6	7.8
4	7434.00	35.3 AV	54.0	-18.7	1.75 H	129	27.5	7.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

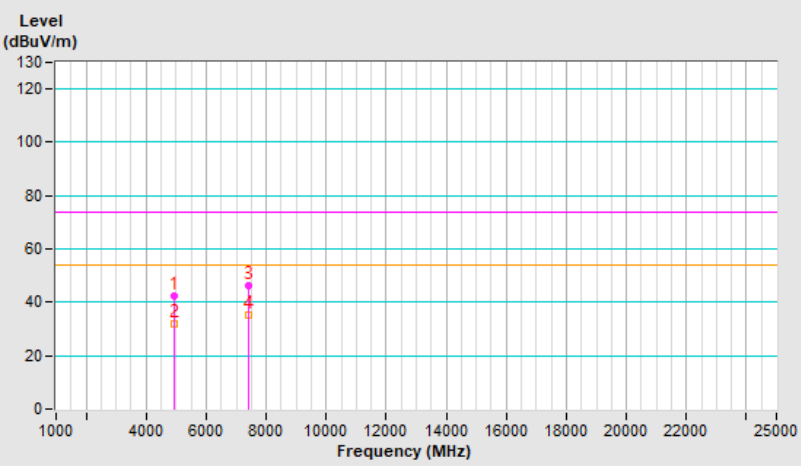


RF Mode	QHS 6M	**Channel**	CH 38：2478 MHz
Frequency Range	1 GHz ~ 25 GHz	**Detector Function & Bandwidth**	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	**Environmental Conditions**	23°C, 67% RH
Tested By	Sampson Chen		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	4956.00	42.6 PK	74.0	-31.4	1.63 V	152	40.3	2.3
2	4956.00	32.0 AV	54.0	-22.0	1.63 V	152	29.7	2.3
3	7434.00	46.1 PK	74.0	-27.9	1.83 V	228	38.3	7.8
4	7434.00	35.1 AV	54.0	-18.9	1.83 V	228	27.3	7.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



8 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo)

9 Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Tel: 886-3-6668565
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Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@bureauveritas.com
Web Site: http://ee.bureauveritas.com.tw

The address and road map of all our labs can be found in our web site also.

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