

TEST REPORT

CERTIFICATE OF CONFORMITY

Standard: 47 CFR FCC Part 15, Subpart C (Section 15.247)

Report No.: RFBHAA-WTW-P23080666 R1

FCC ID: 2BBFJC58U0

Product: Vehicle-mounted equipment that performs overall control of vehicle information display, video and audio playback, etc.

Brand: AISIN

Model No.: C58U0

Received Date: 2024/3/1

Test Date: 2024/10/19 ~ 2024/12/3

Issued Date: 2025/1/7

Applicant: AISIN CORPORATION

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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FCC Registration / 788550 / TW0003 for Test Location(1)

Designation Number: 281270 / TW0032 for Test Location(2)

Approved by:



Jeremy Lin / Project Engineer

, Date:

2025/1/7

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Prepared by : Gina Liu / Specialist



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Release Control Record

Issue No.	Description	Date Issued
RFBHAA-WTW-P23080666	Original release.	2025/1/6
RFBHAA-WTW-P23080666 R1	Add Note 1 on section 3.1	2025/1/7

1 Certificate

Product: Vehicle-mounted equipment that performs overall control of vehicle information display, video and audio playback, etc.

Brand: AISIN

Test Model: C58U0

Sample Status: Production Prototype

Applicant: AISIN CORPORATION

Test Date: 2024/10/19 ~ 2024/12/3

Standard: 47 CFR FCC Part 15, Subpart C (Section 15.247)

Measurement ANSI C63.10-2013

procedure: KDB 558074 D01 15.247 Meas Guidance v05r02

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.
15.205 / 15.209 / 15.247(d)	Unwanted Emissions below 1 GHz	Pass	Minimum passing margin is -1.3 dB at 197.81 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	Pass	Minimum passing margin is -15.5 dB at 2390.00 MHz
15.203	Antenna Requirement	Pass	No antenna connector is used.

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	-	1.371 dB
Dwell Time on Each Channel	-	0.0218
Hopping Channel Separation	-	390 Hz
20 dB Bandwidth	-	206.5 Hz
Conducted Out of Band Emissions	9 kHz ~ 40 GHz	2.79 dB
Unwanted Emissions below 1 GHz	9 kHz ~ 30 MHz	3 dB
	30 MHz ~ 1 GHz	2.93 dB
Unwanted Emissions above 1 GHz	1 GHz ~ 18 GHz	1.76 dB
	18 GHz ~ 40 GHz	1.77 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	Vehicle-mounted equipment that performs overall control of vehicle information display, video and audio playback, etc.
Brand	AISIN
Test Model	C58U0
EUT RF Test Tool	EUT RF Test Tool
Status of EUT	Production Prototype
Power Supply Rating	12Vdc
Modulation Type	GFSK, $\pi/4$ -DQPSK, 8DPSK
Modulation Technology	FHSS
Transfer Rate	Up to 3 Mbps
Operating Frequency	2.402 GHz ~ 2.48 GHz
Number of Channel	79
Output Power	1.426 mW (1.54 dBm)

Note:

- The following models are provided to this EUT. Since series 1 and 2 consist identical hardware, series 1 was selected for final test.

Model	Series	Hardware Variations	Bluetooth (Ver. 5.0 w/o BLE)	WLAN 5GHz (W58)	GNSS(GPS/ GLONASS/ Galileo)	AM	FM
C58U0	series 1	V-R01	✓	n/ac HT/VHT20 (149ch)	✓	✓ (9kHz)	✓
	series 2		✓	n/ac HT/VHT20 (149ch)	✓	✓ (10kHz) *2	✓

*2-AM frequency range and step frequency different.

- 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

- The antenna information is listed as below.

Antenna NO.	Brand	Model	Antenna Net Gain(dBi)	Frequency range (GHz)	Antenna Type	Connector Type
WLAN (5G) Ant 0	N/A	N/A	-1.50	5.725 ~ 5.85	PCB	none(like solder)
BT Ant1	N/A	N/A	1.90	2.4 ~ 2.4835	PCB	none(like solder)

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

3.3 Channel List

79 channels are provided for BT-EDR:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

3.4 Power Setting

Channel	FREQ. (MHz)	Power Setting
0	2402	Default
39	2441	Default
78	2480	Default

Note: The EUT had been per-tested on the modulation 1DH/2DH/3DH, The worst case was found on 1DH/3DH.

3.5 Test Mode Applicability and Tested Channel Detail

Worst Case:	The EUT was positioned on the X-axis during testing.
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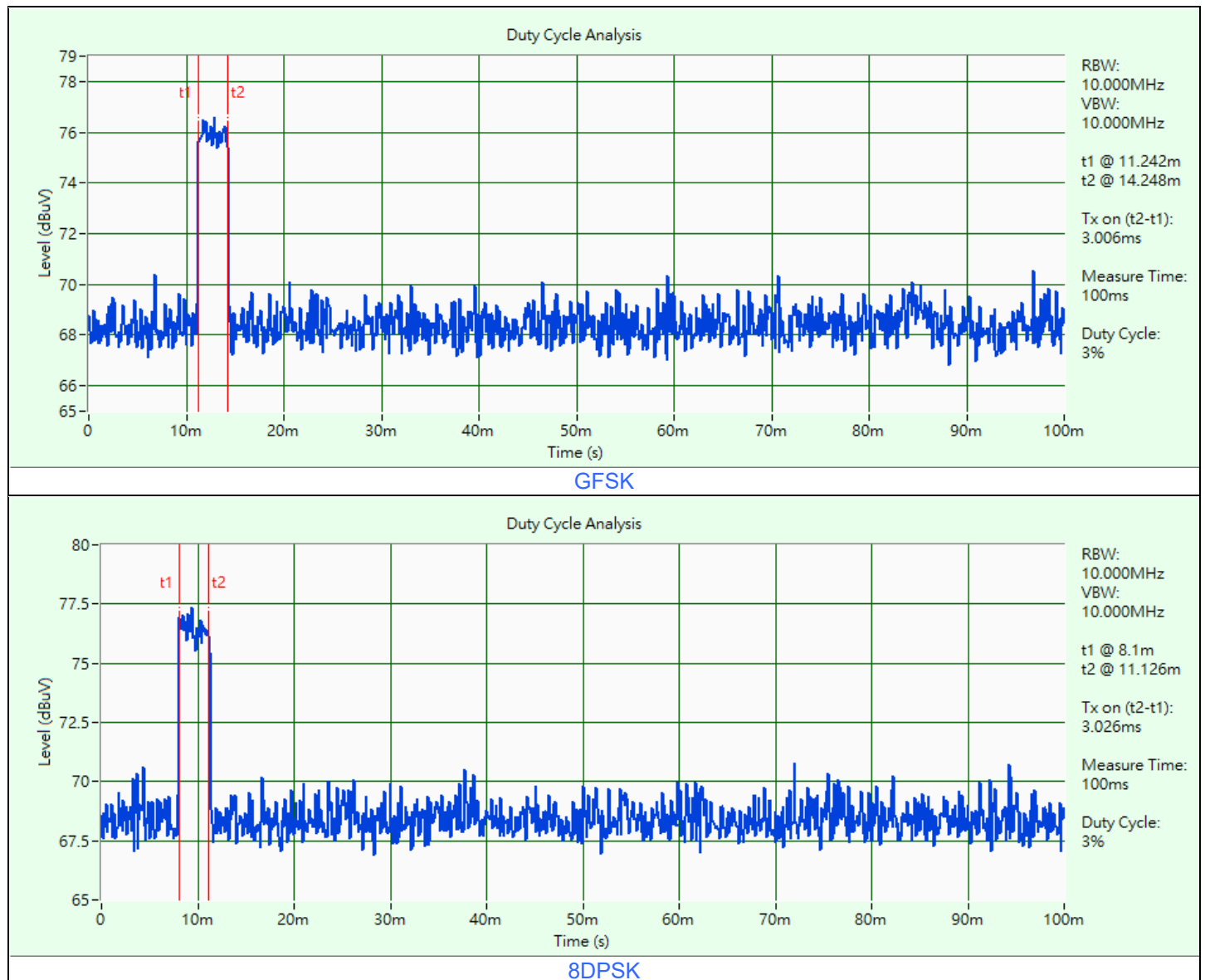
Following channel(s) was (were) selected for the final test as listed below:

Test Item	Tested Channel	Modulation	Data Rate Parameter
RF Output Power	0, 39, 78	GFSK	DH5
		8DPSK	3DH5
Number of Hopping Frequency Used	Hopping	GFSK	DH5
		8DPSK	3DH5
Dwell Time on Each Channel	Hopping	GFSK	DH1/DH3/DH5
		8DPSK	3DH1/3DH3/3DH5
Hopping Channel Separation / 20 dB Bandwidth	0, 39, 78	GFSK	DH5
		8DPSK	3DH5
Conducted Out of Band Emissions	Hopping 0, 78	GFSK	DH5
		8DPSK	3DH5
Unwanted Emissions below 1 GHz	39	GFSK	DH5
Unwanted Emissions above 1 GHz	0, 39, 78	GFSK	DH5
		8DPSK	3DH5

3.6 Duty Cycle of Test Signal

GFSK: Duty cycle = 3.006 ms / 100 ms x 100% = 3.0%

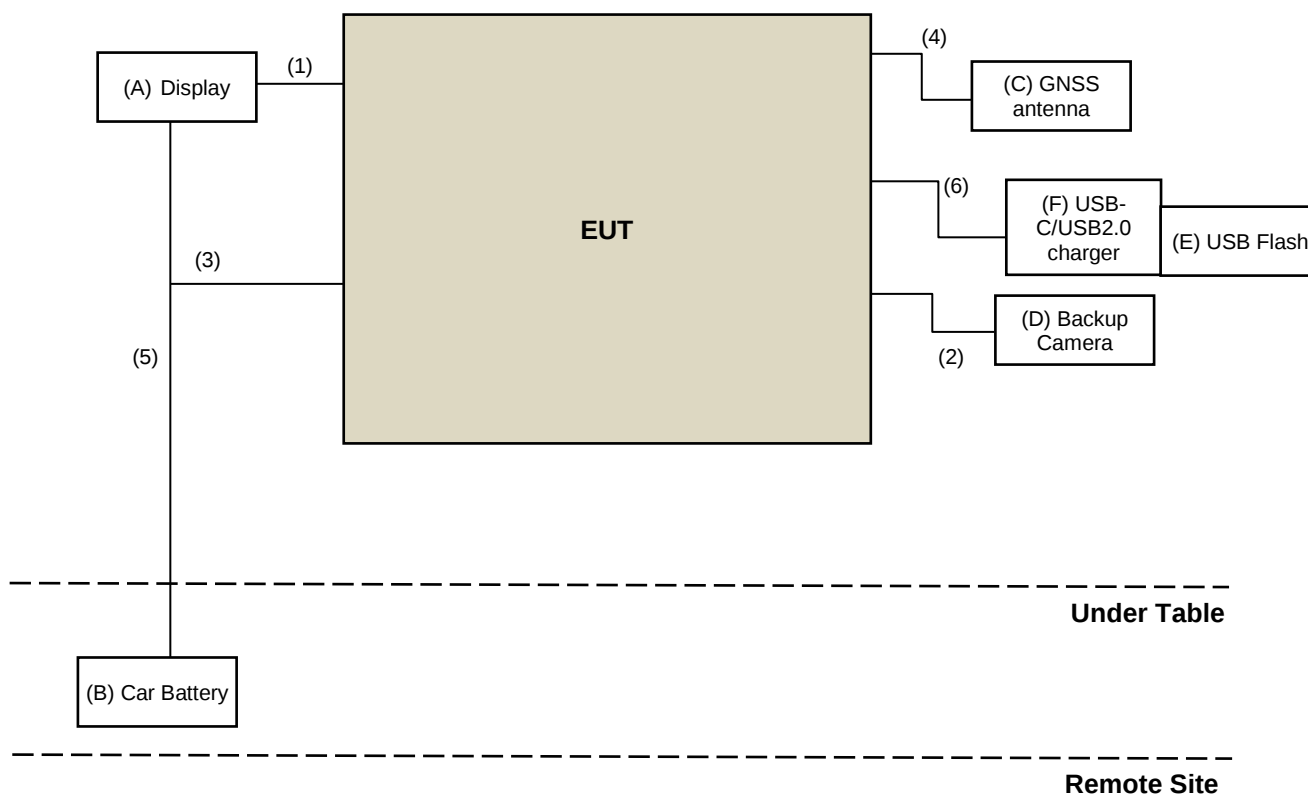
8DPSK: Duty cycle = 3.026 ms / 100 ms x 100% = 3.0%



3.7 Test Program Used and Operation Descriptions

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

3.8 Connection Diagram of EUT and Peripheral Devices



3.9 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Display	DESAY	86111-VR55A1 (for left-hand drive car), 86111-VR55A2 (for right-hand drive car)	N/A	N/A	Supplied by applicant
B	Car Battery	Global	Global_NX120-7L	N/A	N/A	Provided by Lab
C	GNSS antenna	MinebeaMitsumi	3A500-58U10	N/A	N/A	Supplied by applicant
D	Backup Camera	TTE	3A760-58UX0	N/A	N/A	Supplied by applicant
E	USB Flash	SanDisk	SDDDC3	N/A	N/A	Provided by Lab
F	USB-C/USB2.0 charger	n/a	39470-64P00	N/A	N/A	Supplied by applicant

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	LVDS cable	1	0.8	No	N/A	Supplied by applicant
2	Backup Camera	1	0.6	No	N/A	Supplied by applicant
3	Harness	1	2	No	N/A	Supplied by applicant
4	FAKRA/SMA cable (For GNSS antenna port)	1	0.5	No	NA	Supplied by applicant
5	DC Cable	1	0.5	No	N/A	Provided by Lab
6	FAKRA Cable (For USB-C/USB2.0 charger)	1	0.5	No	NA	Supplied by applicant

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
Peak Power Analyzer Keysight	8990B	MY51000485	2024/1/21	2025/1/20
Wideband Power Sensor Keysight	N1923A	MY58020002	2024/1/18	2025/1/17
		MY58140009	2024/1/18	2025/1/17

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2024/12/3

4.2 Number of Hopping Frequency Used

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Signal & Spectrum Analyzer R&S	FSV3044	101105	2024/2/27	2025/2/26
Software BV	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2024/12/3

4.3 Dwell Time on Each Channel

Refer to section 4.2 to get the tested date and information of the instruments.

4.4 Hopping Channel Separation

Refer to section 4.2 to get the tested date and information of the instruments.

4.5 20 dB Bandwidth

Refer to section 4.2 to get the tested date and information of the instruments.

4.6 Conducted Out of Band Emissions

Refer to section 4.2 to get the tested date and information of the instruments.

4.7 Unwanted Emissions below 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower Max-Full	MFT-151SS-0.5T	N/A	N/A	N/A
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-1213	2024/10/14	2025/10/13
EMI Test Receiver R&S	ESR3	102782	2023/12/7	2024/12/6
Loop Antenna TESEQ	HLA 6121	45745	2024/8/21	2025/8/20
MXA Signal Analyzer Keysight	N9020B	MY60110513	2023/12/22	2024/12/21
Preamplifier EMCI	EMC330N	980782	2024/1/15	2025/1/14
	EMC001340	980201	2024/9/24	2025/9/23
RF Coaxial Cable EMCI	EMCCFD400-NM-NM-500	201233	2024/1/15	2025/1/14
	EMCCFD400-NM-NM-3000	201235	2024/1/15	2025/1/14
	EMCCFD400-NM-NM-9000	201236(with PAD)	2024/1/15	2025/1/14
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Turn Table Max-Full	MF-7802BS	N/A	N/A	N/A
Turn Table Controller Max-Full	MF-7802BS	MF780208674	N/A	N/A

Notes:

1. The test was performed in WM - 966 chamber 8.
2. Tested Date: 2024/10/19

4.8 Unwanted Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower Max-Full	MFT-151SS-0.5T	N/A	N/A	N/A
EMI Test Receiver R&S	ESR3	102782	2023/12/7	2024/12/6
Horn Antenna RFSPIN	DRH18-E	210103A18E	2023/11/12	2024/11/11
Horn Antenna Schwarzbeck	BBHA 9170	9170-1049	2023/11/12	2024/11/11
MXA Signal Analyzer Keysight	N9020B	MY60110513	2023/12/22	2024/12/21
Preamplifier EMCI	EMC118A45SE	980808	2023/12/28	2024/12/27
	EMC184045SE	980788	2024/1/15	2025/1/14
RF Coaxial Cable EMCI	EMC101G-KM-KM-2000	201254	2024/1/15	2025/1/14
	EMC101G-KM-KM-3000	201258	2024/1/15	2025/1/14
	EMC101G-KM-KM-5000	201261	2024/1/15	2025/1/14
	EMC104-SM-SM-1000	210102	2024/1/15	2025/1/14
	EMC104-SM-SM-3000	201231	2024/1/15	2025/1/14
	EMC104-SM-SM-9000	201243	2024/1/15	2025/1/14
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Turn Table Max-Full	MF-7802BS	N/A	N/A	N/A
Turn Table Controller Max-Full	MF-7802BS	MF780208674	N/A	N/A

Notes:

1. The test was performed in WM - 966 chamber 8.
2. Tested Date: 2024/10/19

5 Limits of Test Items

5.1 RF Output Power

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

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 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).

5.8 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

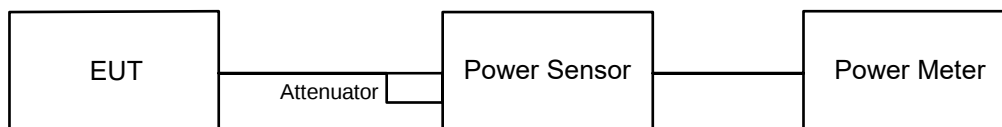
Notes:

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



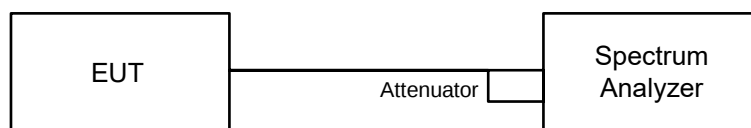
6.1.2 Test Procedure

- Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
- RBW > 20 dB bandwidth of the emission being measured.
- VBW $\geq$ RBW.
- Sweep: Auto.
- Detector function: Peak.
- Trace: Max hold

NOTE—A peak responding power meter may be used, where the power meter and sensor system video bandwidth is greater than the occupied bandwidth of the unlicensed wireless device, rather than a spectrum analyzer.

6.2 Number of Hopping Frequency Used

6.2.1 Test Setup

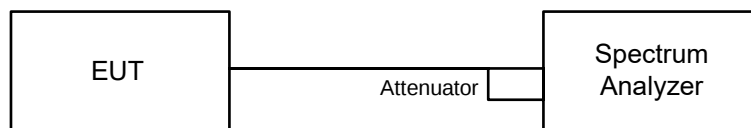


6.2.2 Test Procedure

- Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- 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.
- Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
- RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
- VBW $\geq$ RBW.
- Set the SA Sweep time = Auto, Detector function = Peak.
- Set the SA trace on Max hold mode and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
- Set the SA on View mode and then plot the result on SA screen.
- Repeat above procedures until all frequencies measured were complete.

6.3 Dwell Time on Each Channel

6.3.1 Test Setup

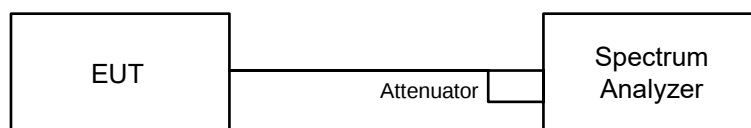


6.3.2 Test Procedure

- Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- 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.
- Span: Zero span, centered on a hopping channel.
- RBW shall be $\leq$ channel spacing and where possible RBW should be set $\gg 1/T$, where T is the expected dwell time per channel.
- Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.
- Detector function: Peak.
- Trace: Max hold.
- 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.
- Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
- 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

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
- Span: Wide enough to capture the peaks of two adjacent channels.
- RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
- Video (or average) bandwidth (VBW) $\geq$ RBW.
- Set the SA Sweep time = Auto, Detector function = Peak.
- Set the SA trace on Max hold mode and record the separation of two adjacent channels.
- Measure the frequency difference of these two adjacent channels by SA marker-delta function. And then plot the result on SA screen.
- Repeat above procedures until all frequencies measured were complete.

6.5 20 dB Bandwidth

6.5.1 Test Setup

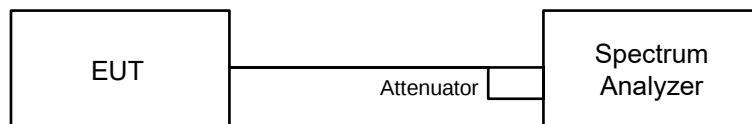


6.5.2 Test Procedure

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 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.
- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = peak.
- Trace mode = max hold.
- Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
- 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

- Set the RBW = 100 kHz.
- Set the VBW $\geq$ 300 kHz.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

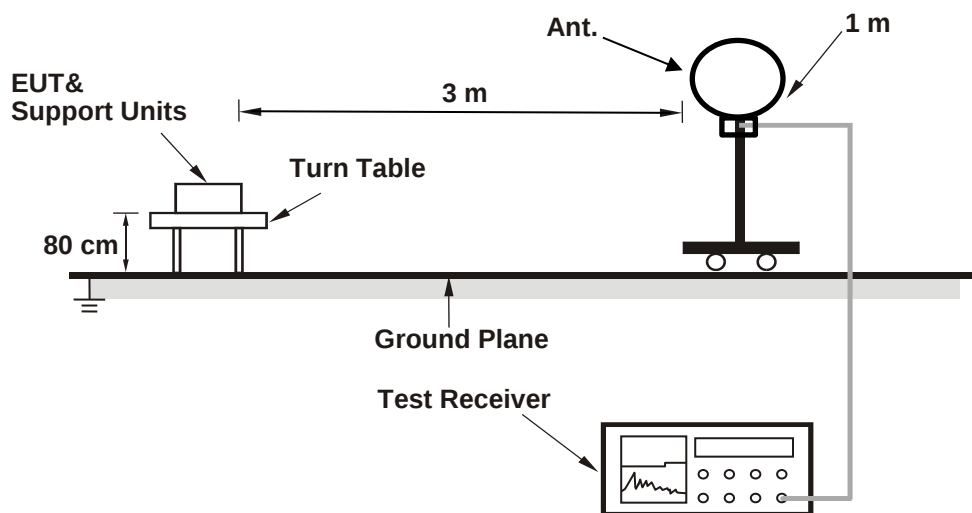
MEASUREMENT PROCEDURE OOB

- Set RBW = 100 kHz.
- Set VBW $\geq$ 300 kHz.
- Detector = peak.
- Sweep = auto couple.
- Trace Mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level.

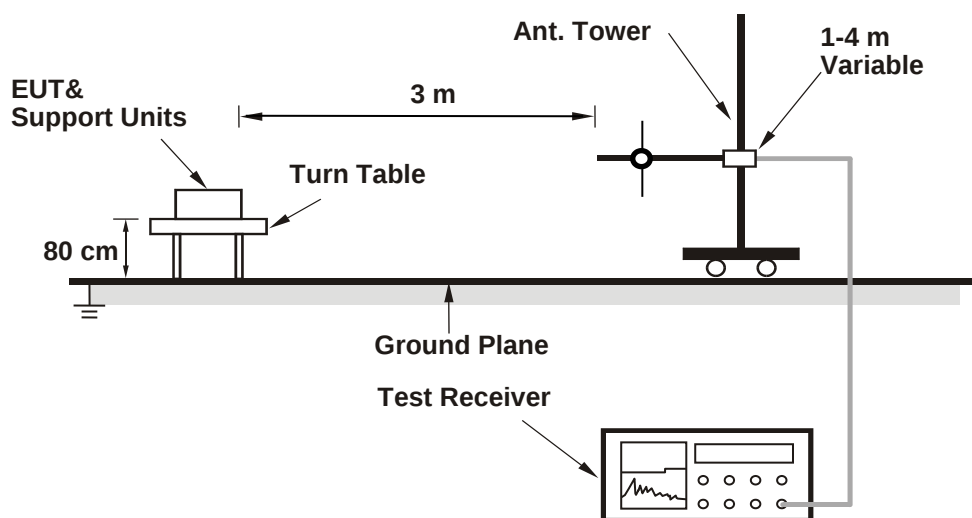
6.7 Unwanted Emissions below 1 GHz

6.7.1 Test Setup

For Radiated emission below 30 MHz



For Radiated emission above 30 MHz



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

6.7.2 Test Procedure

For Radiated emission below 30 MHz

- a. 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.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. 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. 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.

For Radiated emission above 30 MHz

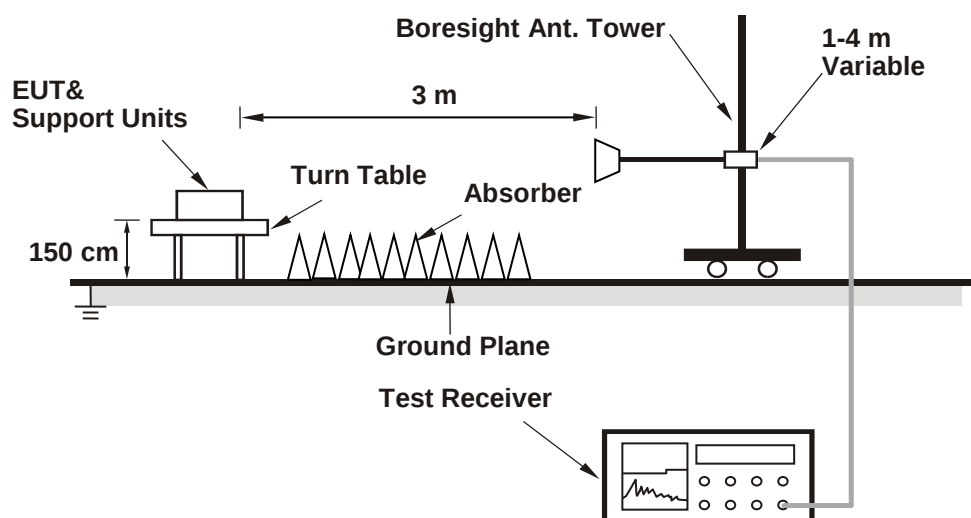
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The 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.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to 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.

6.8 Unwanted Emissions above 1 GHz

6.8.1 Test Setup



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

6.8.2 Test Procedure

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

- 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.
- According to ANSI C63.10 section 6.6.4 and 4.1.4.2.2. For fundamental and harmonic signal measurement, according to ANSI C63.10 section 7.5, the average value = peak value + duty cycle correction factor. For duty cycle correction factor values, see the Test Signal Duty Cycle section in this report.
- All modes of operation were investigated and the worst-case emissions are reported.

7 Test Results of Test Item

7.1 RF Output Power

Input Power:	12 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Gary Lin, Jisyong Wang
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For Peak Power

GFSK

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
0	2402	1.148	0.60	21	Pass
39	2441	1.426	1.54	21	Pass
78	2480	1.321	1.21	21	Pass

Note: The antenna gain is 1.9 dBi < 6 dBi, so the output power limit shall not be reduced.

$\pi/4$ -DQPSK

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
0	2402	1.045	0.19	21	Pass
39	2441	1.25	0.97	21	Pass
78	2480	1.143	0.58	21	Pass

Note: The antenna gain is 1.9 dBi < 6 dBi, so the output power limit shall not be reduced.

8DPSK

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
0	2402	1.05	0.21	21	Pass
39	2441	1.268	1.03	21	Pass
78	2480	1.153	0.62	21	Pass

Note: The antenna gain is 1.9 dBi < 6 dBi, so the output power limit shall not be reduced.

For Average Power

GFSK

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	1.102	0.42
39	2441	1.358	1.33
78	2480	1.265	1.02

$\pi/4$ -DQPSK

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	1.023	0.10
39	2441	1.227	0.89
78	2480	1.125	0.51

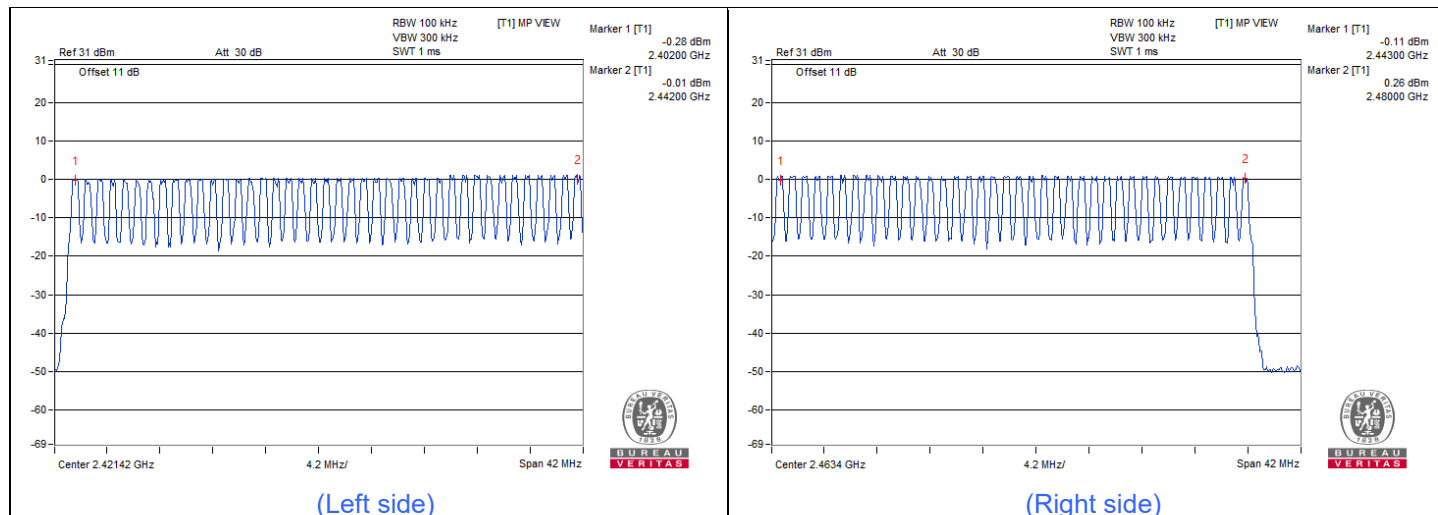
8DPSK

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	1.026	0.11
39	2441	1.242	0.94
78	2480	1.132	0.54

7.2 Number of Hopping Frequency Used

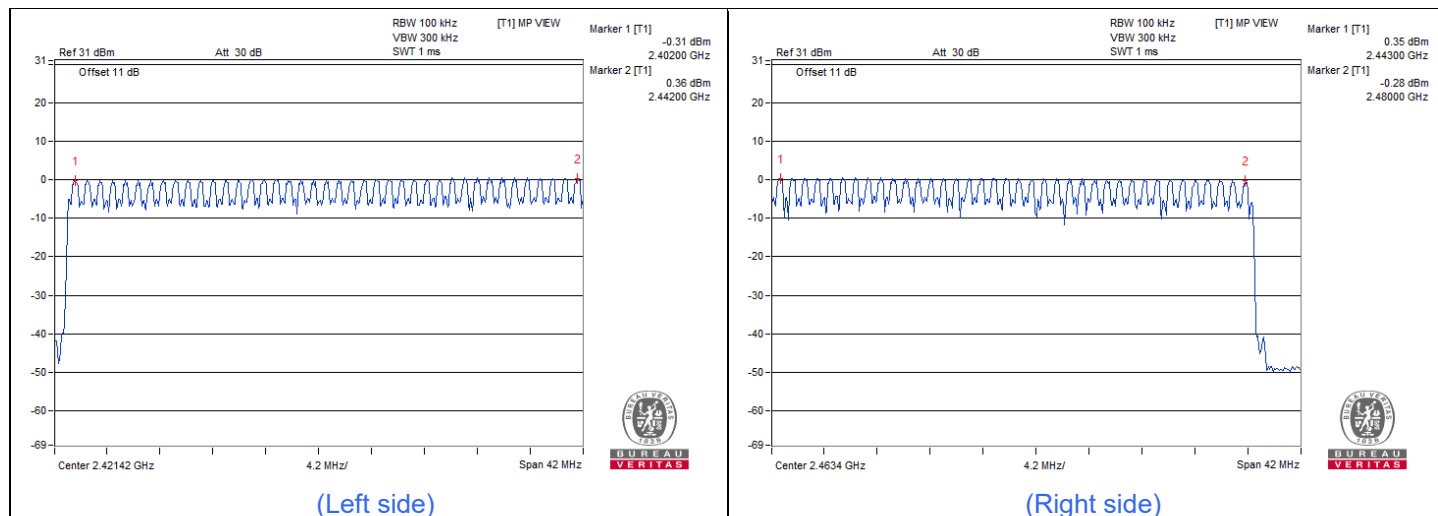
Input Power:	12 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Gary Lin, Jisyong Wang
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GFSK



Note: There are 79 hopping frequencies in the hopping mode. On the plots, it shows that the hopping frequencies are equally spaced.

8DPSK



Note: There are 79 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:	12 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Gary Lin, Jisyong Wang
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GFSK

Mode	Number of transmission in 31.6 sec	Length of transmission time (msec)	Dwell Time (msec)	Limit (msec)	Test Result
DH1	51 (times / 5 sec) * 6.32 = 323 times	0.468	151.16	400	Pass
DH3	27 (times / 5 sec) * 6.32 = 171 times	1.725	294.98	400	Pass
DH5	18 (times / 5 sec) * 6.32 = 114 times	3.016	343.82	400	Pass

Spectrum plots of Dwell Time



8DPSK

Mode	Number of transmission in 31.6 sec	Length of transmission time (msec)	Dwell Time (msec)	Limit (msec)	Test Result
3DH1	50 (times / 5 sec) * 6.32 = 316 times	0.468	147.89	400	Pass
3DH3	25 (times / 5 sec) * 6.32 = 158 times	1.72	271.76	400	Pass
3DH5	17 (times / 5 sec) * 6.32 = 108 times	2.968	320.54	400	Pass

Spectrum plots of Dwell Time



7.4 Hopping Channel Separation

Input Power:	12 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Gary Lin, Jisong Wang
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GFSK

Channel	Frequency (MHz)	Hopping Channel Separation (MHz)	Minimum Limit (MHz)	Test Result
0	2402	1.01	0.47	Pass
39	2441	1.01	0.47	Pass
78	2480	1.00	0.47	Pass

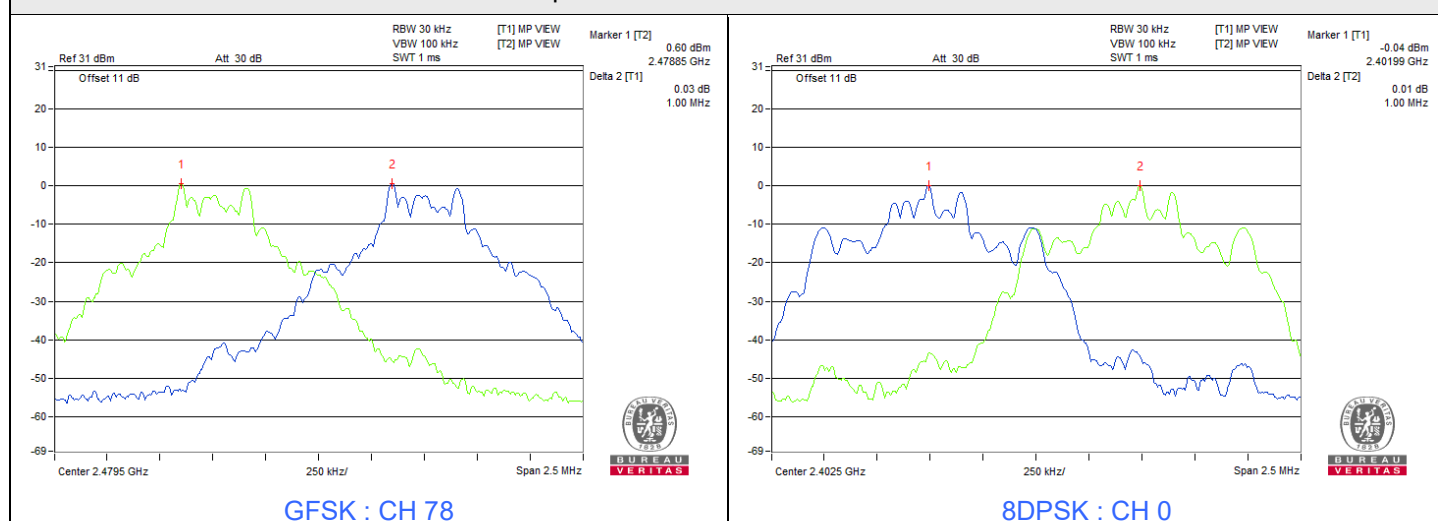
Note: The minimum limit is two-third 20dB bandwidth.

8DPSK

Channel	Frequency (MHz)	Hopping Channel Separation (MHz)	Minimum Limit (MHz)	Test Result
0	2402	1.00	0.75	Pass
39	2441	1.00	0.75	Pass
78	2480	1.01	0.75	Pass

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

Spectrum Plot of Minimum Value



7.5 20 dB Bandwidth

Input Power:	12 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Gary Lin, Jisyong Wang
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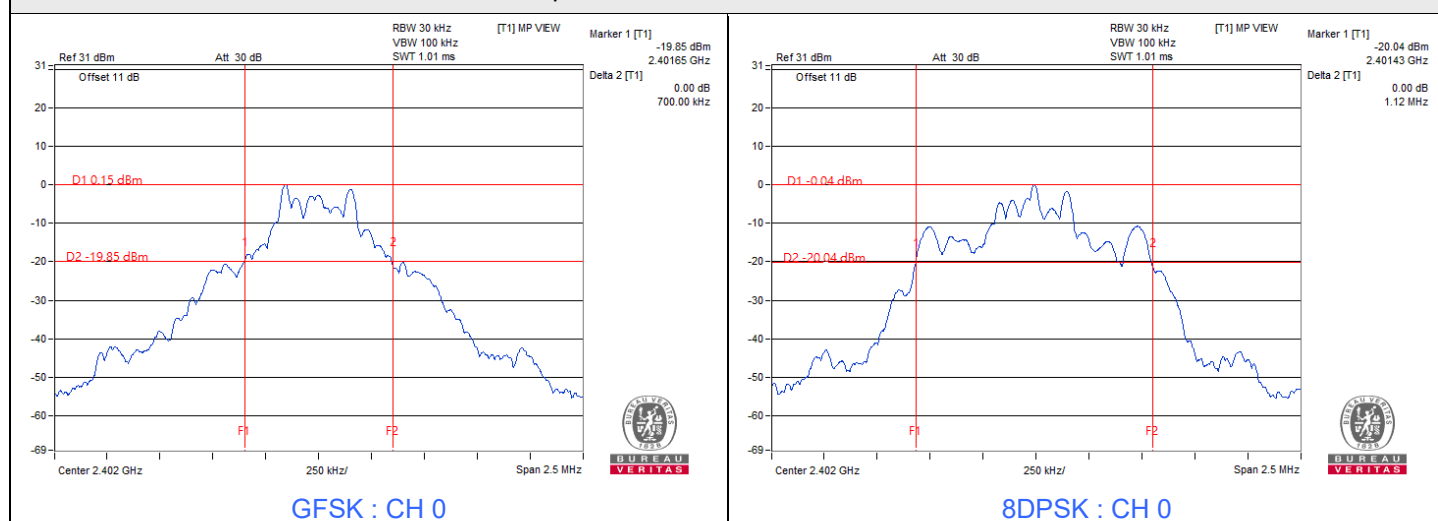
GFSK

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
0	2402	0.7
39	2441	0.7
78	2480	0.7

8DPSK

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
0	2402	1.12
39	2441	1.12
78	2480	1.12

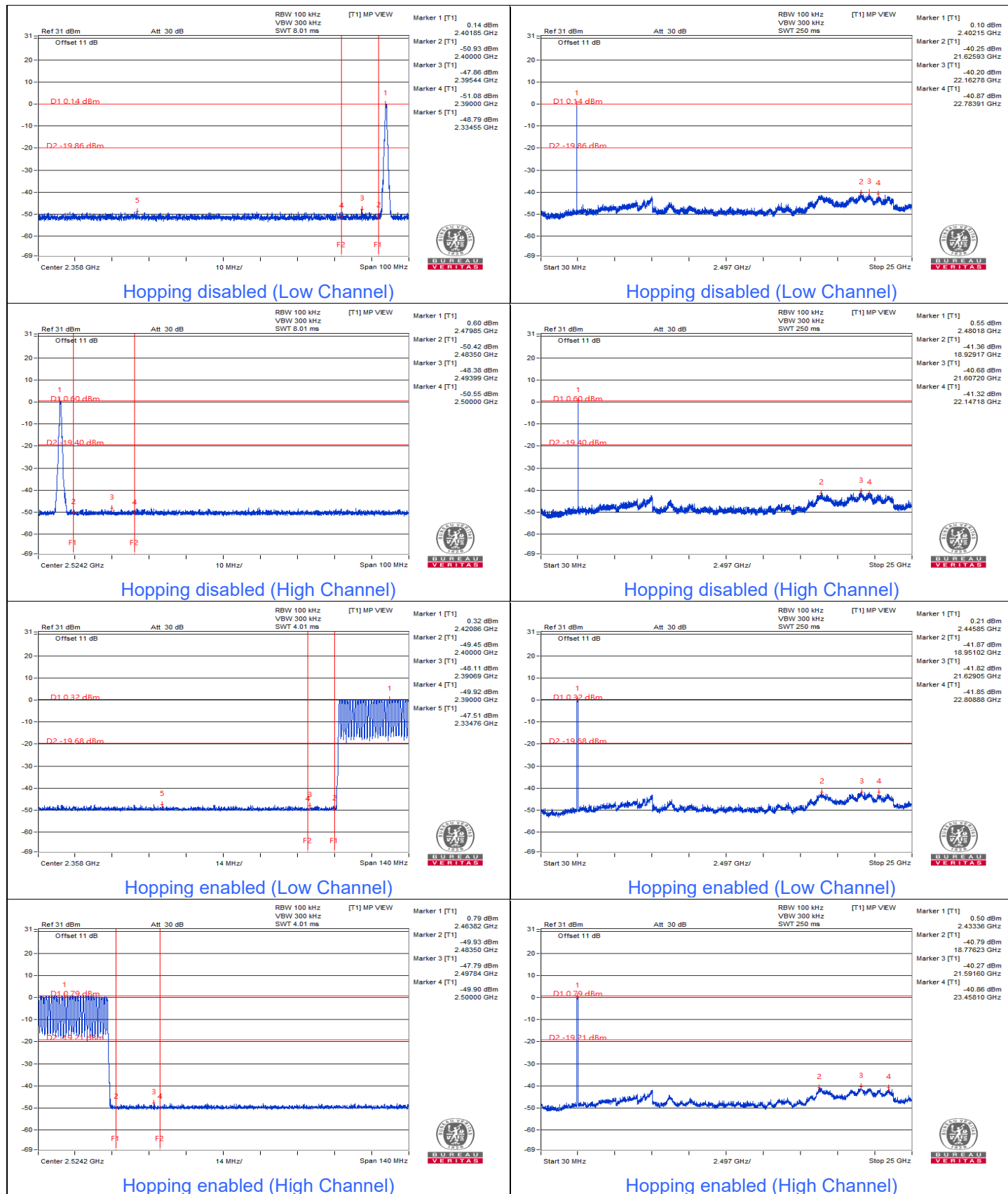
Spectrum Plot of Minimum Value



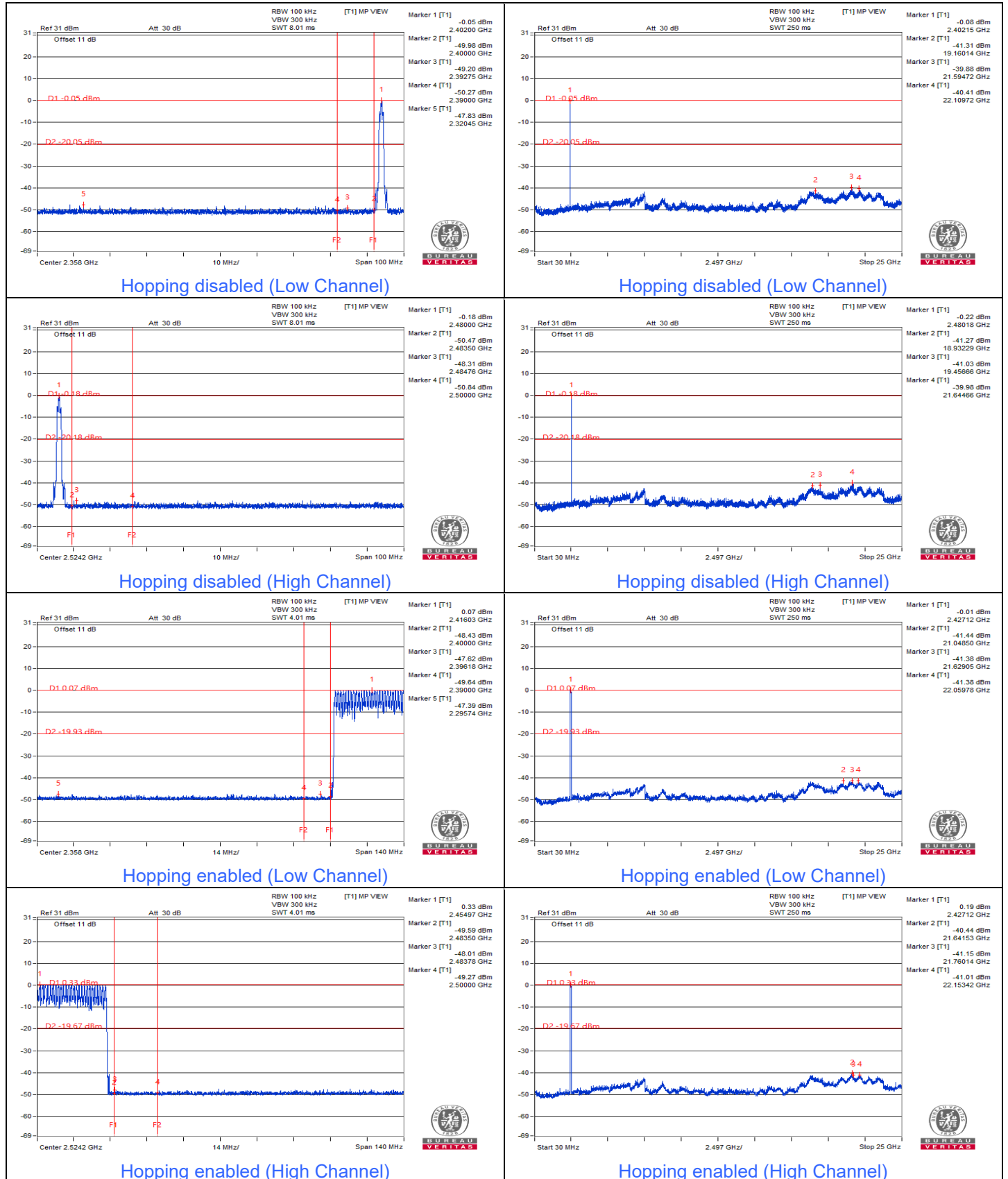
7.6 Conducted Out of Band Emissions

Input Power:	12 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Gary Lin, Jisyoung Wang
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GFSK



8DPSK



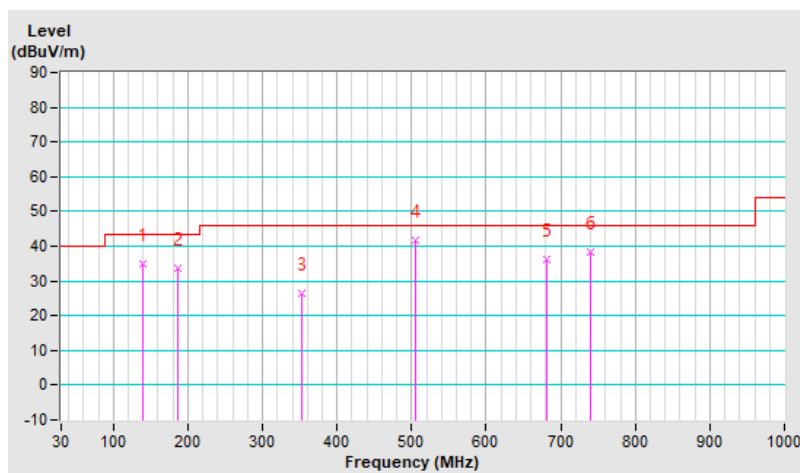
7.7 Unwanted Emissions below 1 GHz

RF Mode	BT GFSK	Channel	CH 39 : 2441 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Karl Lee		

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	138.64	34.9 QP	43.5	-8.6	1.20 H	191	48.3	-13.4
2	187.14	33.6 QP	43.5	-9.9	1.42 H	180	49.1	-15.5
3	352.04	26.4 QP	46.0	-19.6	2.36 H	184	37.8	-11.4
4	505.30	41.8 QP	46.0	-4.2	1.72 H	201	49.4	-7.6
5	681.84	36.1 QP	46.0	-9.9	1.55 H	304	40.3	-4.2
6	739.07	38.4 QP	46.0	-7.6	1.94 H	132	41.4	-3.0

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.

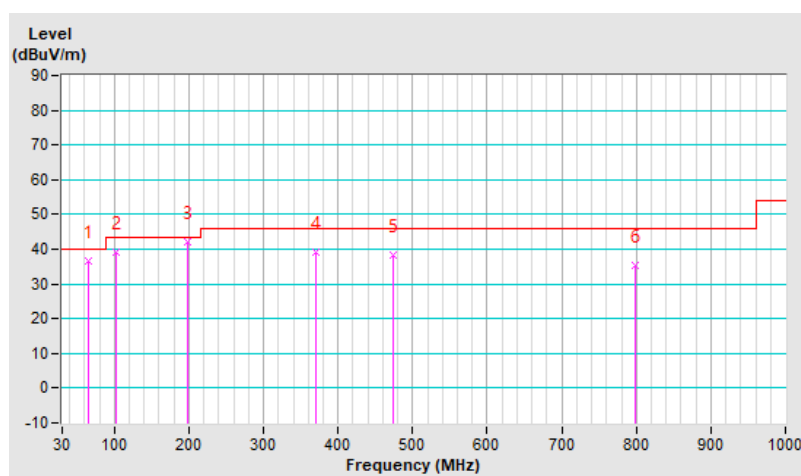


RF Mode	BT GFSK	Channel	CH 39 : 2441 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Karl Lee		

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	65.89	36.4 QP	40.0	-3.6	1.64 V	209	51.2	-14.8
2	101.78	39.2 QP	43.5	-4.3	1.34 V	110	56.4	-17.2
3	197.81	42.2 QP	43.5	-1.3	1.49 V	192	58.7	-16.5
4	370.47	39.2 QP	46.0	-6.8	1.82 V	155	49.9	-10.7
5	473.29	38.2 QP	46.0	-7.8	1.60 V	316	46.2	-8.0
6	799.21	35.3 QP	46.0	-10.7	1.82 V	221	37.6	-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 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.



7.8 Unwanted Emissions above 1 GHz

RF Mode	BT GFSK	Channel	CH 0 : 2402 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=3 MHz, DET=RMS
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Karl Lee		

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	2390.00	56.6 PK	74.0	-17.4	1.16 H	297	60.2	-3.6
2	2390.00	26.1 AV	54.0	-27.9	1.16 H	297	29.7	-3.6
3	*2402.00	94.1 PK			1.16 H	297	61.8	32.3
4	*2402.00	63.6 AV			1.16 H	297	31.3	32.3
5	4799.98	53.0 PK	74.0	-21.0	1.00 H	299	49.9	3.1
6	4799.98	22.5 AV	54.0	-31.5	1.00 H	299	19.4	3.1
7	4804.00	50.5 PK	74.0	-23.5	2.14 H	106	47.4	3.1
8	4804.00	20.0 AV	54.0	-34.0	2.14 H	106	16.9	3.1

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	2390.00	58.0 PK	74.0	-16.0	1.37 V	184	61.6	-3.6
2	2390.00	27.5 AV	54.0	-26.5	1.37 V	184	31.1	-3.6
3	*2402.00	91.1 PK			1.37 V	184	58.8	32.3
4	*2402.00	60.6 AV			1.37 V	184	28.3	32.3
5	4799.98	50.8 PK	74.0	-23.2	1.44 V	129	47.7	3.1
6	4799.98	20.3 AV	54.0	-33.7	1.44 V	129	17.2	3.1
7	4804.00	50.7 PK	74.0	-23.3	1.53 V	249	47.6	3.1
8	4804.00	20.2 AV	54.0	-33.8	1.53 V	249	17.1	3.1

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.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.
6. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle) Where the duty cycle correction factor is calculated from following formula:

$$20 \log(\text{Duty cycle}) = 20 \log(3 \text{ ms} / 100 \text{ ms}) = -30.5 \text{ dB}$$

RF Mode	BT GFSK	Channel	CH 39 : 2441 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=3 MHz, DET=RMS
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Karl Lee		

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	*2441.00	94.5 PK			1.16 H	284	62.3	32.2
2	*2441.00	64.0 AV			1.16 H	284	31.8	32.2
3	4799.98	52.6 PK	74.0	-21.4	1.00 H	299	49.5	3.1
4	4799.98	22.1 AV	54.0	-31.9	1.00 H	299	19.0	3.1
5	4882.00	50.5 PK	74.0	-23.5	2.05 H	141	47.3	3.2
6	4882.00	20.0 AV	54.0	-34.0	2.05 H	141	16.8	3.2
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	*2441.00	88.4 PK			1.35 V	177	56.2	32.2
2	*2441.00	57.9 AV			1.35 V	177	25.7	32.2
3	4799.98	50.5 PK	74.0	-23.5	1.44 V	129	47.4	3.1
4	4799.98	20.0 AV	54.0	-34.0	1.44 V	129	16.9	3.1
5	4882.00	50.3 PK	74.0	-23.7	1.62 V	342	47.1	3.2
6	4882.00	19.8 AV	54.0	-34.2	1.62 V	342	16.6	3.2

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.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.
6. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle) Where the duty cycle correction factor is calculated from following formula:

$$20 \log(\text{Duty cycle}) = 20 \log(3 \text{ ms} / 100 \text{ ms}) = -30.5 \text{ dB}$$

RF Mode	BT GFSK	Channel	CH 78 : 2480 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=3 MHz, DET=RMS
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Karl Lee		

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	*2480.00	95.6 PK			1.01 H	294	63.2	32.4
2	*2480.00	65.1 AV			1.01 H	294	32.7	32.4
3	2483.50	57.3 PK	74.0	-16.7	1.01 H	294	60.7	-3.4
4	2483.50	26.8 AV	54.0	-27.2	1.01 H	294	30.2	-3.4
5	4799.98	52.5 PK	74.0	-21.5	1.00 H	299	49.4	3.1
6	4799.98	22.0 AV	54.0	-32.0	1.00 H	299	18.9	3.1
7	4960.00	50.7 PK	74.0	-23.3	1.42 H	166	47.4	3.3
8	4960.00	20.2 AV	54.0	-33.8	1.42 H	166	16.9	3.3
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	*2480.00	93.0 PK			1.34 V	201	60.6	32.4
2	*2480.00	62.5 AV			1.34 V	201	30.1	32.4
3	2483.50	57.7 PK	74.0	-16.3	1.34 V	201	61.1	-3.4
4	2483.50	27.2 AV	54.0	-26.8	1.34 V	201	30.6	-3.4
5	4799.98	50.2 PK	74.0	-23.8	1.44 V	129	47.1	3.1
6	4799.98	19.7 AV	54.0	-34.3	1.44 V	129	16.6	3.1
7	4960.00	50.7 PK	74.0	-23.3	2.53 V	120	47.4	3.3
8	4960.00	20.2 AV	54.0	-33.8	2.53 V	120	16.9	3.3

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.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.
6. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle) Where the duty cycle correction factor is calculated from following formula:
 $20 \log(\text{Duty cycle}) = 20 \log(3 \text{ ms} / 100 \text{ ms}) = -30.5 \text{ dB}$

RF Mode	BT 8DPSK	Channel	CH 0 : 2402 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=3 MHz, DET=RMS
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Karl Lee		

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	2390.00	58.2 PK	74.0	-15.8	1.16 H	297	61.8	-3.6
2	2390.00	27.7 AV	54.0	-26.3	1.16 H	297	31.3	-3.6
3	*2402.00	94.1 PK			1.16 H	297	61.8	32.3
4	*2402.00	63.6 AV			1.16 H	297	31.3	32.3
5	4799.98	52.6 PK	74.0	-21.4	1.00 H	299	49.5	3.1
6	4799.98	22.1 AV	54.0	-31.9	1.00 H	299	19.0	3.1
7	4804.00	50.3 PK	74.0	-23.7	2.14 H	106	47.2	3.1
8	4804.00	19.8 AV	54.0	-34.2	2.14 H	106	16.7	3.1
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	2390.00	58.5 PK	74.0	-15.5	1.37 V	184	62.1	-3.6
2	2390.00	28.0 AV	54.0	-26.0	1.37 V	184	31.6	-3.6
3	*2402.00	91.6 PK			1.37 V	184	59.3	32.3
4	*2402.00	61.1 AV			1.37 V	184	28.8	32.3
5	4799.98	50.4 PK	74.0	-23.6	1.44 V	129	47.3	3.1
6	4799.98	19.9 AV	54.0	-34.1	1.44 V	129	16.8	3.1
7	4804.00	50.7 PK	74.0	-23.3	1.53 V	249	47.6	3.1
8	4804.00	20.2 AV	54.0	-33.8	1.53 V	249	17.1	3.1

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.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.
6. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle) Where the duty cycle correction factor is calculated from following formula:
 $20 \log(\text{Duty cycle}) = 20 \log(3 \text{ ms} / 100 \text{ ms}) = -30.5 \text{ dB}$

RF Mode	BT 8DPSK	Channel	CH 39 : 2441 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=3 MHz, DET=RMS
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Karl Lee		

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	*2441.00	94.4 PK			1.16 H	284	62.2	32.2
2	*2441.00	63.9 AV			1.16 H	284	31.7	32.2
3	4799.98	52.5 PK	74.0	-21.5	1.00 H	299	49.4	3.1
4	4799.98	22.0 AV	54.0	-32.0	1.00 H	299	18.9	3.1
5	4882.00	50.7 PK	74.0	-23.3	2.05 H	141	47.5	3.2
6	4882.00	20.2 AV	54.0	-33.8	2.05 H	141	17.0	3.2
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	*2441.00	92.0 PK			1.35 V	177	59.8	32.2
2	*2441.00	61.5 AV			1.35 V	177	29.3	32.2
3	4799.98	50.6 PK	74.0	-23.4	1.44 V	129	47.5	3.1
4	4799.98	20.1 AV	54.0	-33.9	1.44 V	129	17.0	3.1
5	4882.00	50.4 PK	74.0	-23.6	1.62 V	342	47.2	3.2
6	4882.00	19.9 AV	54.0	-34.1	1.62 V	342	16.7	3.2

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.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.
6. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle) Where the duty cycle correction factor is calculated from following formula:
 $20 \log(\text{Duty cycle}) = 20 \log(3 \text{ ms} / 100 \text{ ms}) = -30.5 \text{ dB}$

RF Mode	BT 8DPSK	Channel	CH 78 : 2480 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=3 MHz, DET=RMS
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Karl Lee		

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	*2480.00	94.3 PK			1.01 H	294	61.9	32.4
2	*2480.00	63.8 AV			1.01 H	294	31.4	32.4
3	2483.50	57.5 PK	74.0	-16.5	1.01 H	294	60.9	-3.4
4	2483.50	27.0 AV	54.0	-27.0	1.01 H	294	30.4	-3.4
5	4799.98	52.6 PK	74.0	-21.4	1.00 H	299	49.5	3.1
6	4799.98	22.1 AV	54.0	-31.9	1.00 H	299	19.0	3.1
7	4960.00	50.5 PK	74.0	-23.5	1.42 H	166	47.2	3.3
8	4960.00	20.0 AV	54.0	-34.0	1.42 H	166	16.7	3.3
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	*2480.00	92.2 PK			1.34 V	201	59.8	32.4
2	*2480.00	61.7 AV			1.34 V	201	29.3	32.4
3	2483.50	57.8 PK	74.0	-16.2	1.34 V	201	61.2	-3.4
4	2483.50	27.3 AV	54.0	-26.7	1.34 V	201	30.7	-3.4
5	4799.98	50.6 PK	74.0	-23.4	1.44 V	129	47.5	3.1
6	4799.98	20.1 AV	54.0	-33.9	1.44 V	129	17.0	3.1
7	4960.00	50.4 PK	74.0	-23.6	2.53 V	120	47.1	3.3
8	4960.00	19.9 AV	54.0	-34.1	2.53 V	120	16.6	3.3

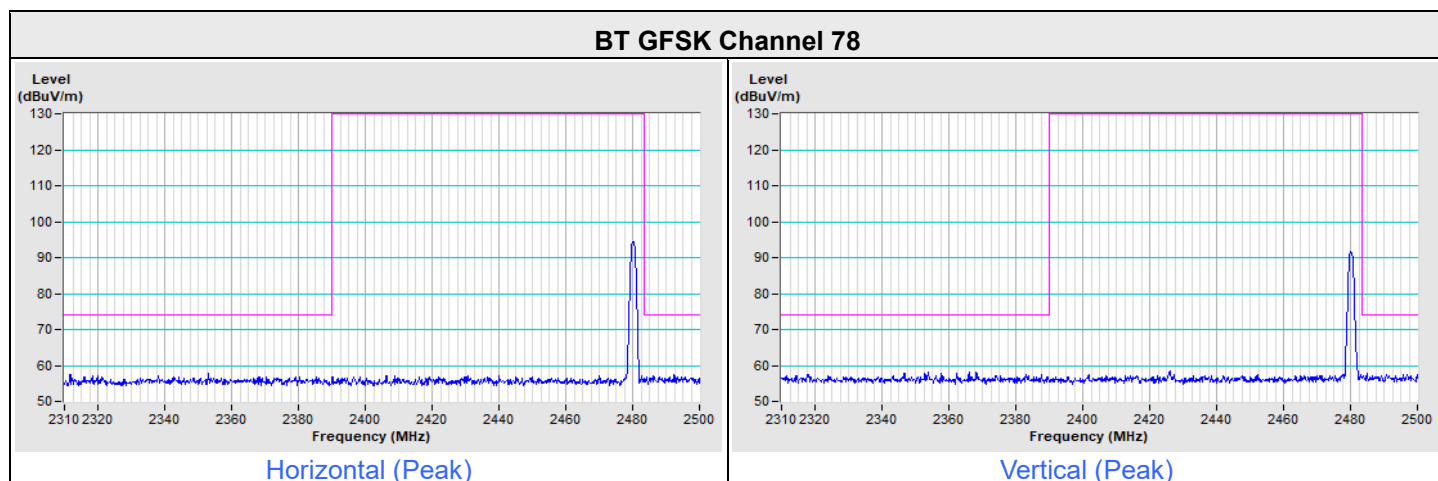
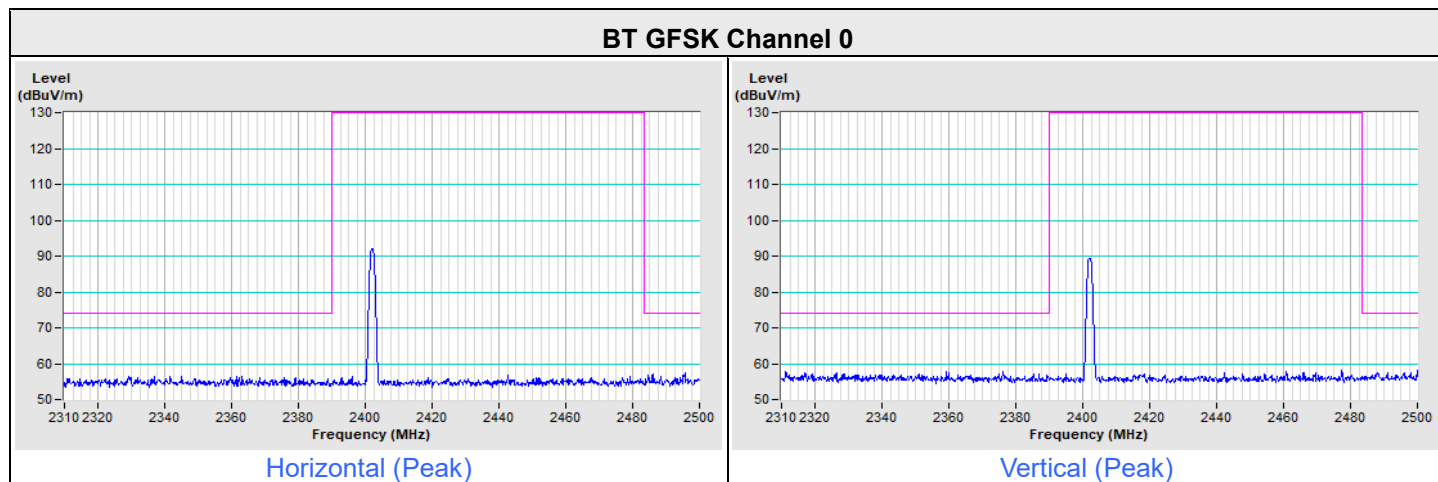
Remarks:

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.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.
6. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle) Where the duty cycle correction factor is calculated from following formula:

$$20 \log(\text{Duty cycle}) = 20 \log(3 \text{ ms} / 100 \text{ ms}) = -30.5 \text{ dB}$$

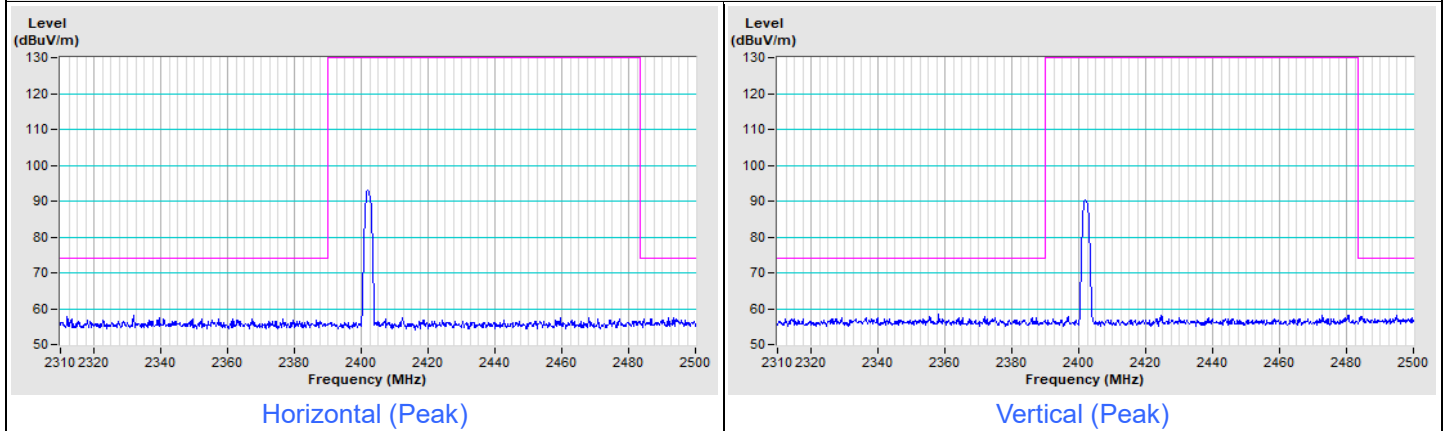
Plot of Band Edge

Frequency Range	2.31 GHz ~ 2.5 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak
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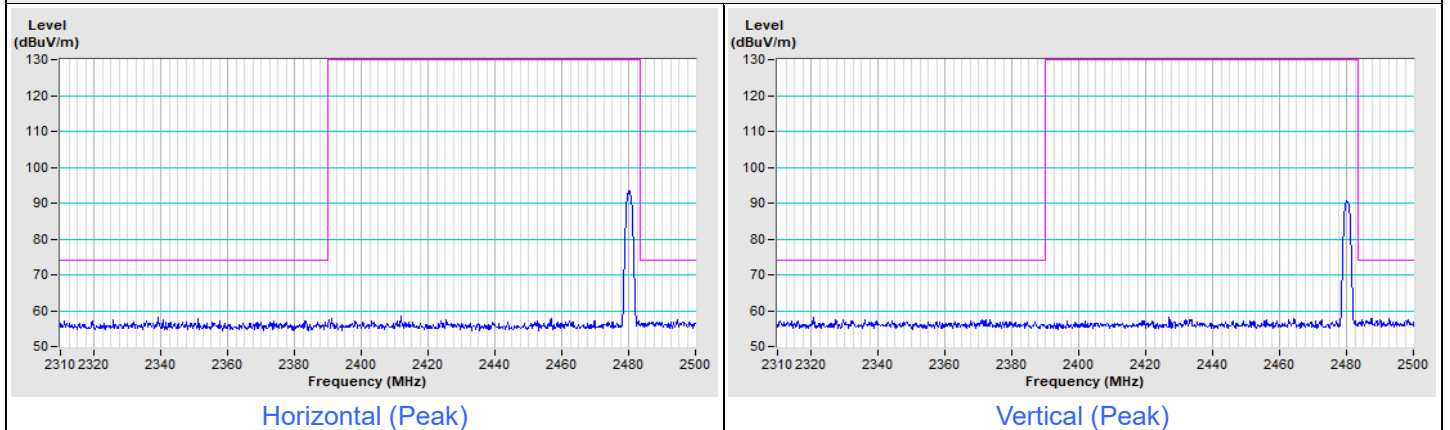


Frequency Range	2.31 GHz ~ 2.5 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak
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BT 8DPSK Channel 0



BT 8DPSK Channel 78



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.

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

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