

Variant FCC Test Report

Report No.: RFBFKV-WTW-P20100027-1

FCC ID: L6AITC100-1

Test Model: ITC100-1

Received Date: Oct. 06, 2020

Test Date: Jan. 15 ~ Jan. 21, 2021

Issued Date: Jan. 26, 2021

Applicant: BlackBerry Limited

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 788550 / TW0003



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Release Control Record


Issue No.	Description	Date Issued
RFBFKV-WTW-P20100027-1	Original Release	Jan. 26, 2021

1 Certificate of Conformity

Product: Asset Tracker
Brand: BlackBerry
Test Model: ITC100-1
Sample Status: Identical Prototype
Applicant: BlackBerry Limited
Test Date: Jan. 15 ~ Jan. 21, 2021
Standards: 47 CFR FCC Part 15, Subpart C (Section 15.249)
ANSI C63.10: 2013

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.

Prepared by :  , Date: Jan. 26, 2021
Lena Wang / Specialist

Approved by :  , Date: Jan. 26, 2021
Dylan Chiou / Senior Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.249)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	N/A	Without AC Power port of the EUT.
15.215 (c)	20dB Bandwidth	PASS	Meet the requirement of limit.
15.209 15.249 15.249 (d)	Radiated Emission Test Band Edge Measurement Limit: 50 dB less than the peak value of fundamental frequency or meet radiated emission limit in section 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -6.2 dB at 863.23 MHz.
15.203	Antenna Requirement	PASS	No antenna connector is used.

N/A: Not Applicable

Note: 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	Frequency	Expanded Uncertainty (k=2) (\pm)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.79 dB
Radiated Emissions up to 1 GHz	9 kHz ~ 30 MHz	3.04 dB
	30 MHz ~ 200 MHz	3.59 dB
	200 MHz ~ 1000 MHz	3.60 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.29 dB
	18 GHz ~ 40 GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Asset Tracker
Brand	BlackBerry
Test Model	ITC100-1
Status of EUT	Identical Prototype
Power Supply Rating	7.2 Vdc (Battery)
Modulation Type	2GFSK, OQPSK ,half-sine shaped OQPSK
Transfer Rate	Refer to Note as below
Operating Frequency	902 ~ 928 MHz
Number of Channel	27
Antenna Type	Monopole Antenna with -5.4 dBi gain
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	N/A

Note:

1. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report to BV CPS report no. RF180904C01-1. The difference compared with original report is adding more radio configurations by SW, therefore the EUT is re-tested in this report.

	Transfer Rate
Original Rate	0.6 kbps, 50 kbps, 100 kbps, 400 kbps
Add Rate	32 kbps, 40 kbps, 48 kbps, 50 kbps, 56 kbps, 75 kbps, 80bps, 100bps, 150bps, 250bps, 500 kbps, 800 kbps,

2. The EUT contains following accessory devices.

Product	Brand	Model	Description
Battery 1	BlackBerry	BAT-63320-001	7.2 Vdc, 38 Ah, Non-rechargeable Manufacturer: EVE Energy Co., Ltd.
Battery 2	BlackBerry	BAT-63318-001	7.2 Vdc, 19 Ah, Non-rechargeable Manufacturer: EVE Energy Co., Ltd.

- Above batteries had been pre-tested, and the worst case was found when EUT with Battery 1. Therefore, only this configuration was as a representative for final test.
3. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
 4. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

27 channels are provided to this EUT:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	902	10	911	19	920
2	903	11	912	20	921
3	904	12	913	21	922
4	905	13	914	22	923
5	906	14	915	23	924
6	907	15	916	24	925
7	908	16	917	25	926
8	909	17	918	26	927
9	910	18	919	27	928

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE \geq 1G	RE $<$ 1G	PLC	APCM	
-	√	√	-	√	-

Where **RE \geq 1G**: Radiated Emission above 1 GHz **RE $<$ 1G**: Radiated Emission below 1 GHz
PLC: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

Note: 1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
2. "-" means no effect.
3. For radiated emission test, pre-tested 2GFSK, 4GFSK modulation type and found 2GFSK was the worse, therefore chosen for the final test and presented in the test report.

Radiated Emission Test (Above 1 GHz) and Band Edge Measurement:

- 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.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (kbps)
-	1 to 27	2, 14, 26	2GFSK	55

Radiated Emission Test (Below 1 GHz):

- 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.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (kbps)
-	1 to 27	2	2GFSK	55

Antenna Port Conducted Measurement:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- 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.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (kbps)
-	1 to 27	2, 14, 26	2GFSK	55

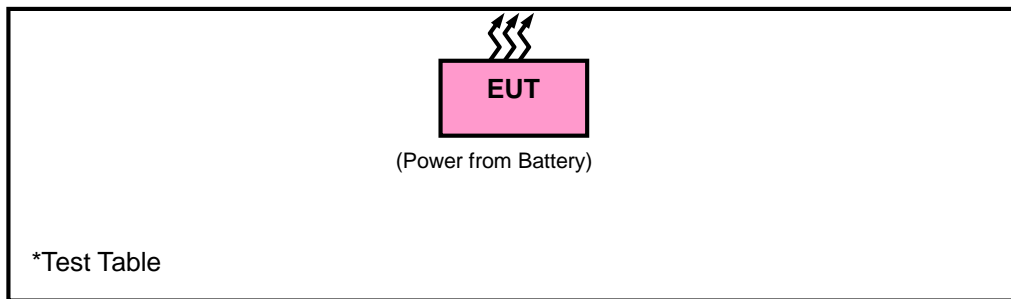
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 65 % RH	7.2 Vdc	Rex Wang
RE<1G	25 deg. C, 65 % RH	7.2 Vdc	Rex Wang
APCM	25 deg. C, 65 % RH	7.2 Vdc	Frank FL Liu

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

3.3.1 Configuration of System under Test



3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.249)

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 ~ 928 MHz	50	500
2400 ~ 2483.5 MHz	50	500
5725 ~ 5875 MHz	50	500
24 ~ 24.25 GHz	250	2500

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits as below table, whichever is the lesser attenuation

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

NOTE:

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 20dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver KEYSIGHT	N9038A	MY55420137	Apr. 16, 2020	Apr. 15, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSV40	100979	Mar. 18, 2020	Mar. 17, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jun. 12, 2020	Jun. 11, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Nov. 06, 2020	Nov. 05, 2021
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 22, 2020	Nov. 21, 2021
Loop Antenna TESEQ	HLA 6121	45745	Jul. 06, 2020	Jul. 05, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Jun. 08, 2020	Jun. 07, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02367	Feb. 18, 2020	Feb. 17, 2021
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM- SM8000	CABLE-CH9-02 (248780+171006)	Jan. 18, 2020	Jan. 17, 2021
			Jan. 16, 2021	Jan. 15, 2022
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9- (250795/4)	Jan. 18, 2020	Jan. 17, 2021
			Jan. 16, 2021	Jan. 15, 2022
RF signal cable Woken	8D-FB	Cable-CH9-01	Jun. 08, 2020	Jun. 07, 2021
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 9.

4.1.3 Test Procedures

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 a 3 meter chamber room. 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. Both 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.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.

For Radiated emission above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) 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.
- f. The test-receiver system was set to peak and average detected 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.

Note:

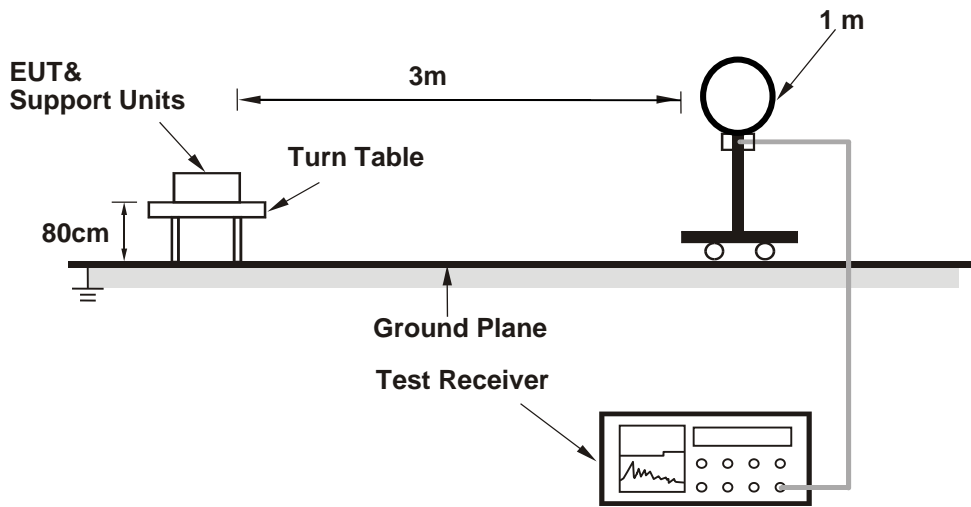
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98 %) or 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

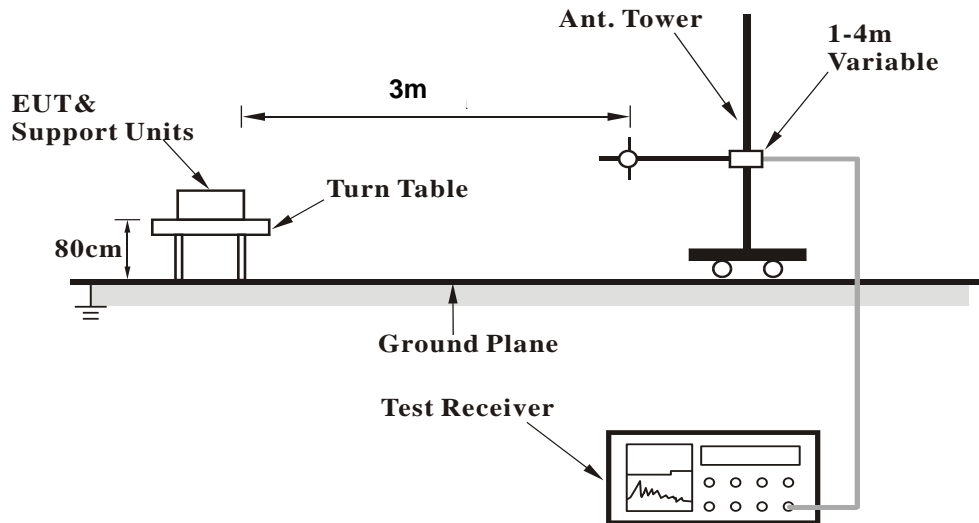
No deviation.

4.1.5 Test Set Up

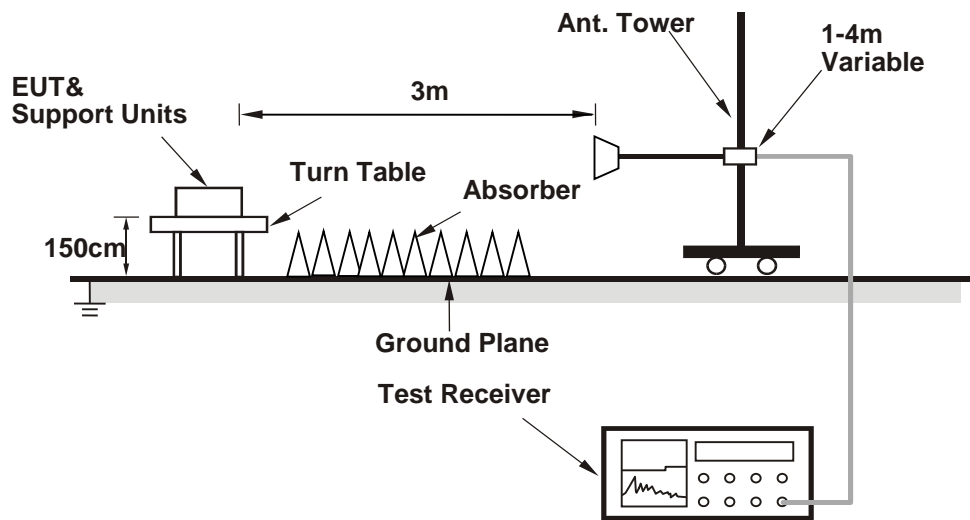
<Radiated Emission below 30 MHz>



<Radiated Emission 30 MHz to 1 GHz>



<Radiated Emission above 1 GHz>



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

4.1.6 EUT Operating Conditions

Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1 GHz WORST-CASE DATA:

EUT Test Condition		Measurement Detail	
Channel	Channel 2	Frequency Range	1 GHz ~ 10 GHz
Input Power	7.2 Vdc	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	22 deg. C, 68 % RH	Tested By	Rex Wang

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	1804.00	39.8 PK	74.0	-34.2	2.16 H	149	45.4	-5.6
2	1804.00	26.3 AV	54.0	-27.7	2.16 H	149	31.9	-5.6
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	1804.00	42.1 PK	74.0	-31.9	3.56 V	16	47.7	-5.6
2	1804.00	24.2 AV	54.0	-29.8	3.56 V	16	29.8	-5.6

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 14	Frequency Range	1 GHz ~ 10 GHz
Input Power	7.2 Vdc	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	22 deg. C, 68 % RH	Tested By	Rex Wang

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	1830.00	42.8 PK	74.0	-31.2	2.05 H	142	48.2	-5.4
2	1830.00	25.3 AV	54.0	-28.7	2.05 H	142	30.7	-5.4
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	1830.00	42.5 PK	74.0	-31.5	3.20 V	11	47.9	-5.4
2	1830.00	24.9 AV	54.0	-29.1	3.20 V	11	30.3	-5.4

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 26	Frequency Range	1 GHz ~ 10 GHz
Input Power	7.2 Vdc	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	22 deg. C, 68 % RH	Tested By	Rex Wang

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	1856.00	42.3 PK	74.0	-31.7	1.96 H	147	47.6	-5.3
2	1856.00	25.6 AV	54.0	-28.4	1.96 H	147	30.9	-5.3
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	1856.00	40.9 PK	74.0	-33.1	3.43 V	8	46.2	-5.3
2	1856.00	24.4 AV	54.0	-29.6	3.43 V	8	29.7	-5.3

Remarks:

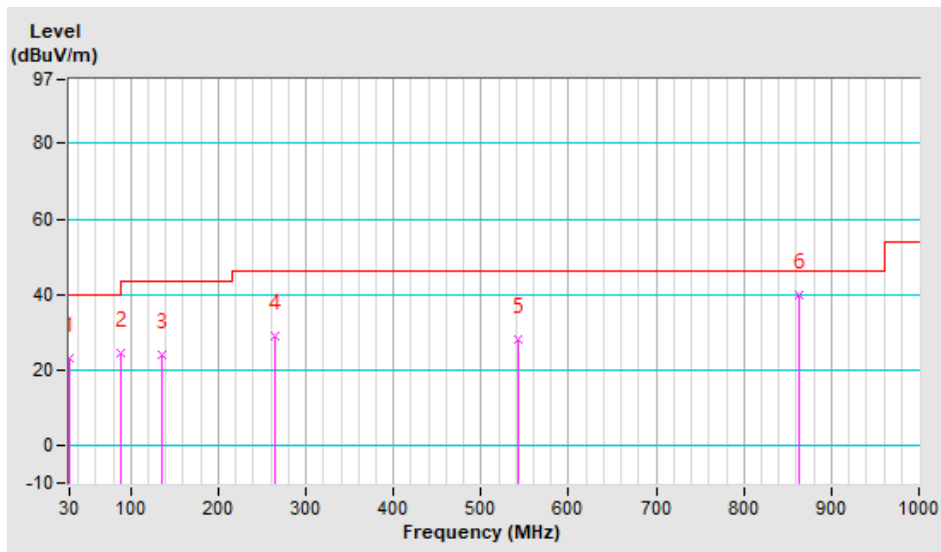
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- The emission levels of other frequencies were very low against the limit.

Below 1 GHz WORST-CASE DATA:

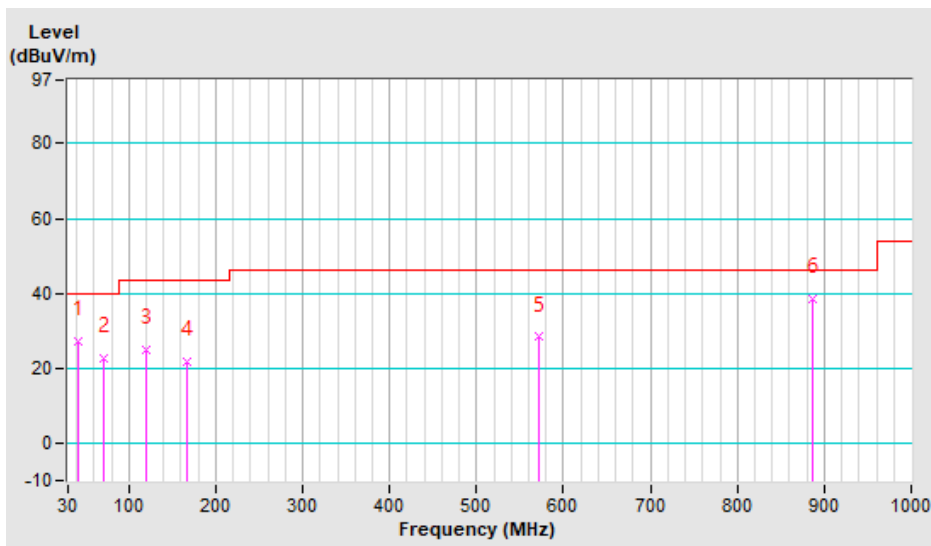
<Spurious Emissions Measurement>

EUT Test Condition		Measurement Detail	
Channel	Channel 2	Frequency Range	30 MHz ~ 1 GHz
Input Power	7.2 Vdc	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	22 deg. C, 68 % RH	Tested By	Rex Wang

Horizontal



Vertical



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	30.00	22.9 QP	40.0	-17.1	2.00 H	16	33.2	-10.3
2	88.20	24.5 QP	43.5	-19.0	1.00 H	66	38.8	-14.3
3	135.73	23.9 QP	43.5	-19.6	1.25 H	12	33.2	-9.3
4	263.77	29.2 QP	46.0	-16.8	1.50 H	168	37.2	-8.0
5	543.13	27.9 QP	46.0	-18.1	1.25 H	331	29.8	-1.9
6	863.23	39.8 QP	46.0	-6.2	1.00 H	198	35.7	4.1

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	41.64	27.0 QP	40.0	-13.0	1.25 V	328	36.3	-9.3
2	71.71	22.5 QP	40.0	-17.5	1.00 V	86	33.6	-11.1
3	120.21	24.9 QP	43.5	-18.6	1.50 V	345	35.7	-10.8
4	167.74	21.9 QP	43.5	-21.6	2.00 V	328	30.4	-8.5
5	571.26	28.3 QP	46.0	-17.7	1.25 V	259	29.6	-1.3
6	886.51	38.5 QP	46.0	-7.5	1.00 V	355	34.0	4.5

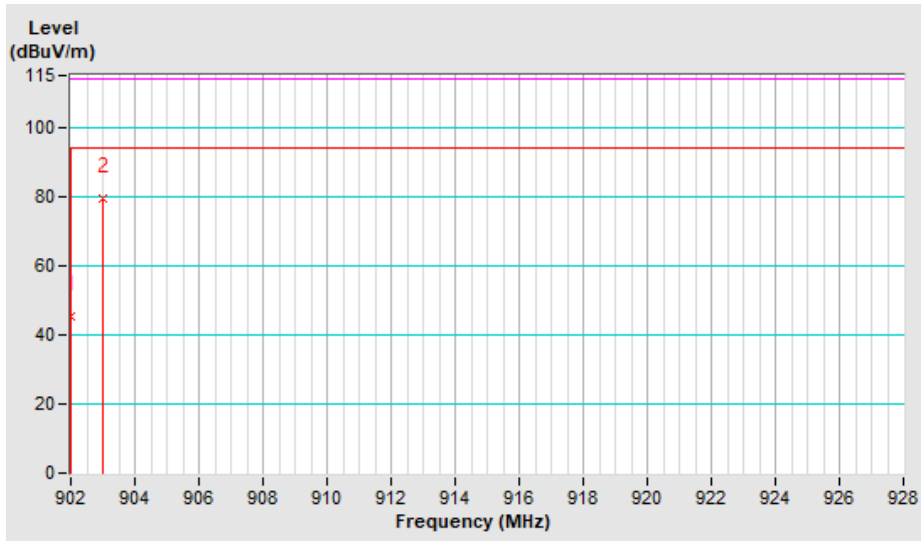
Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- The emission levels of other frequencies were very low against the limit.

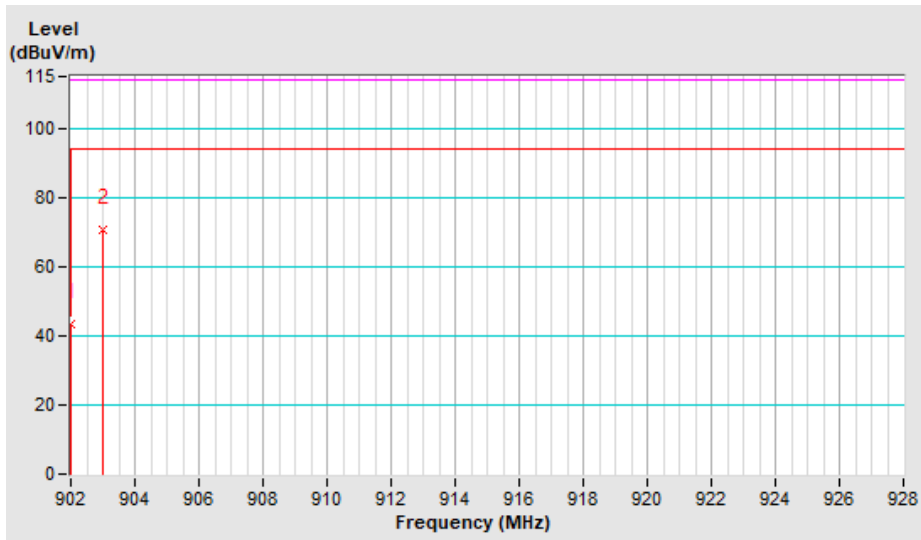
<Band Edge Measurement>

EUT Test Condition		Measurement Detail	
Channel	Channel 2	Frequency Range	902 MHz ~ 928 MHz
Input Power	7.2 Vdc	Detector Function	Quasi-peak (QP)
Environmental Conditions	22 deg. C, 68 % RH	Tested By	Rex Wang

Horizontal



Vertical



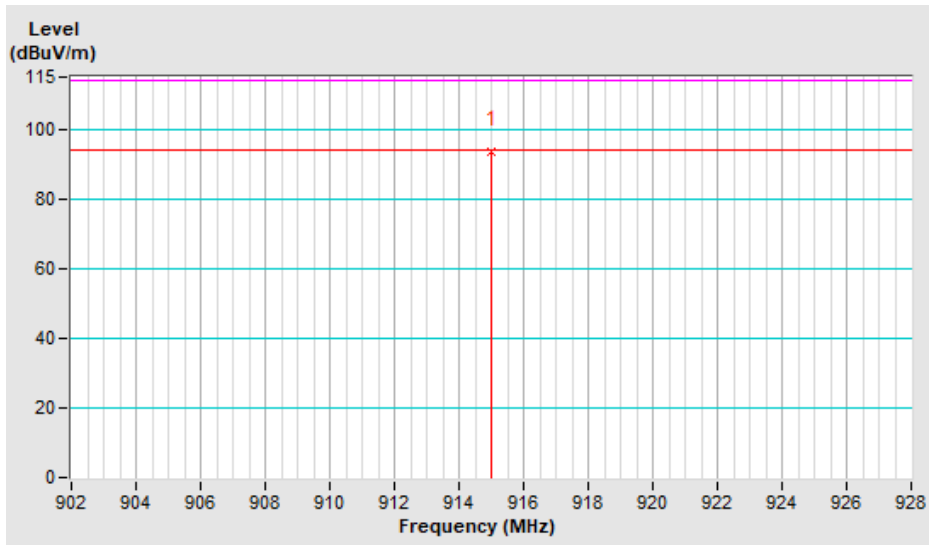
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	902.00	45.2 QP	46.0	-0.8	1.51 H	300	12.3	32.9
2	903.00	79.3 QP	94.0	-14.7	1.51 H	300	46.4	32.9
Antenna Polarity & Test Distance : Vertical at 3m								
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	902.00	43.2 QP	46.0	-2.8	1.38 V	47	10.3	32.9
2	903.00	70.7 QP	94.0	-23.3	1.38 V	47	37.8	32.9

Remarks:

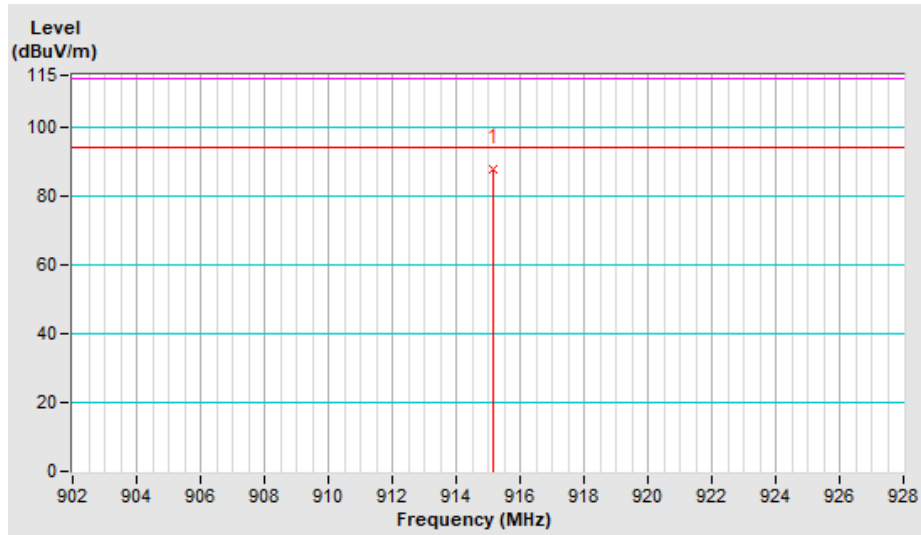
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 14	Frequency Range	902 MHz ~ 928 MHz
Input Power	7.2 Vdc	Detector Function	Quasi-peak (QP)
Environmental Conditions	22 deg. C, 68 % RH	Tested By	Rex Wang

Horizontal



Vertical



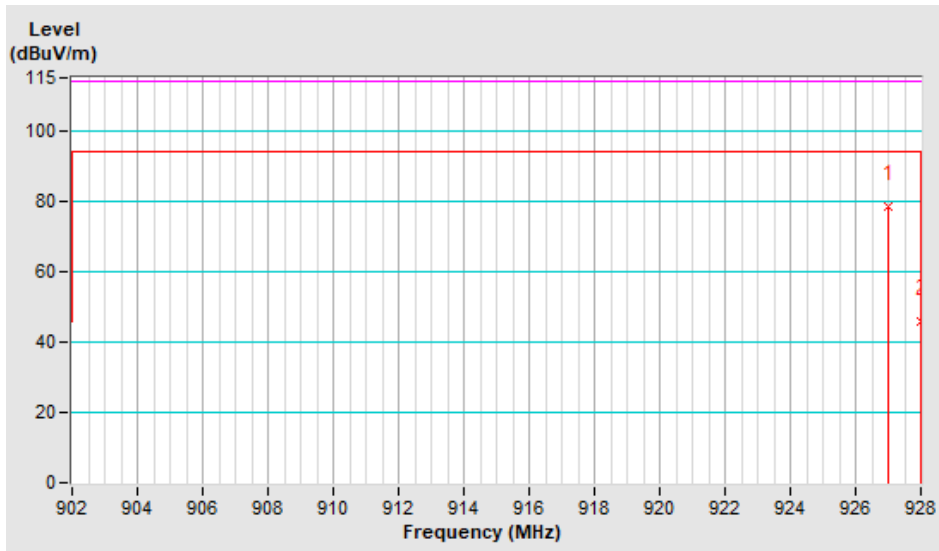
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	915.00	93.6 QP	94.0	-0.4	1.51 H	303	60.4	33.2
Antenna Polarity & Test Distance : Vertical at 3m								
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	915.00	87.8 QP	94.0	-6.2	1.39 V	45	54.6	33.2

Remarks:

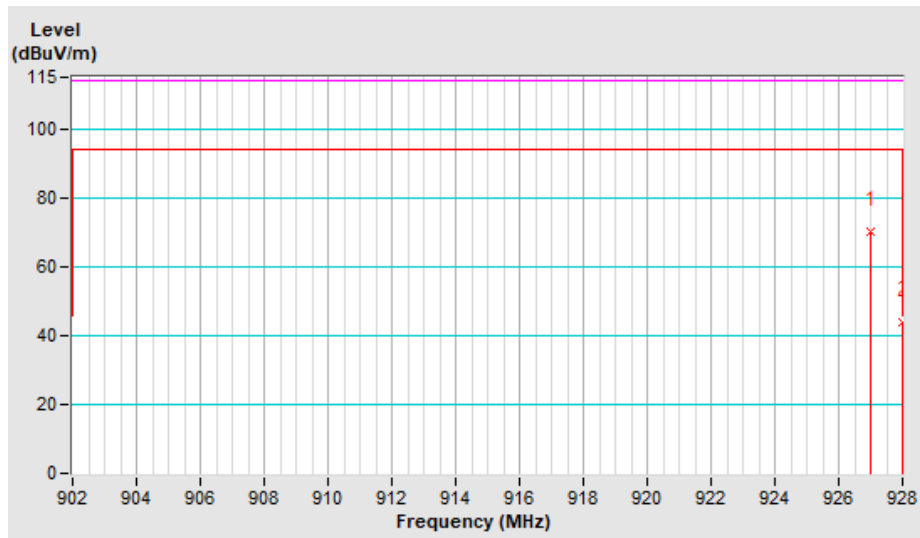
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 26	Frequency Range	902 MHz ~ 928 MHz
Input Power	7.2 Vdc	Detector Function	Quasi-peak (QP)
Environmental Conditions	22 deg. C, 68 % RH	Tested By	Rex Wang

Horizontal



Vertical



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	927.00	78.5 QP	94.0	-15.5	1.32 H	295	45.1	33.4
2	928.00	45.7 QP	46.0	-0.3	1.32 H	295	12.3	33.4
Antenna Polarity & Test Distance : Vertical at 3m								
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	927.00	70.0 QP	94.0	-24.0	1.44 V	52	36.6	33.4
2	928.00	43.7 QP	46.0	-2.3	1.44 V	52	10.3	33.4

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- The emission levels of other frequencies were very low against the limit.

4.2 20 dB Bandwidth Measurement

4.2.1 Limits of 20 dB Bandwidth Measurement

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.2.2 Test Setup



4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.4 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.
- Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- Repeat above procedures until all frequencies measured were complete.

4.2.5 Deviation from Test Standard

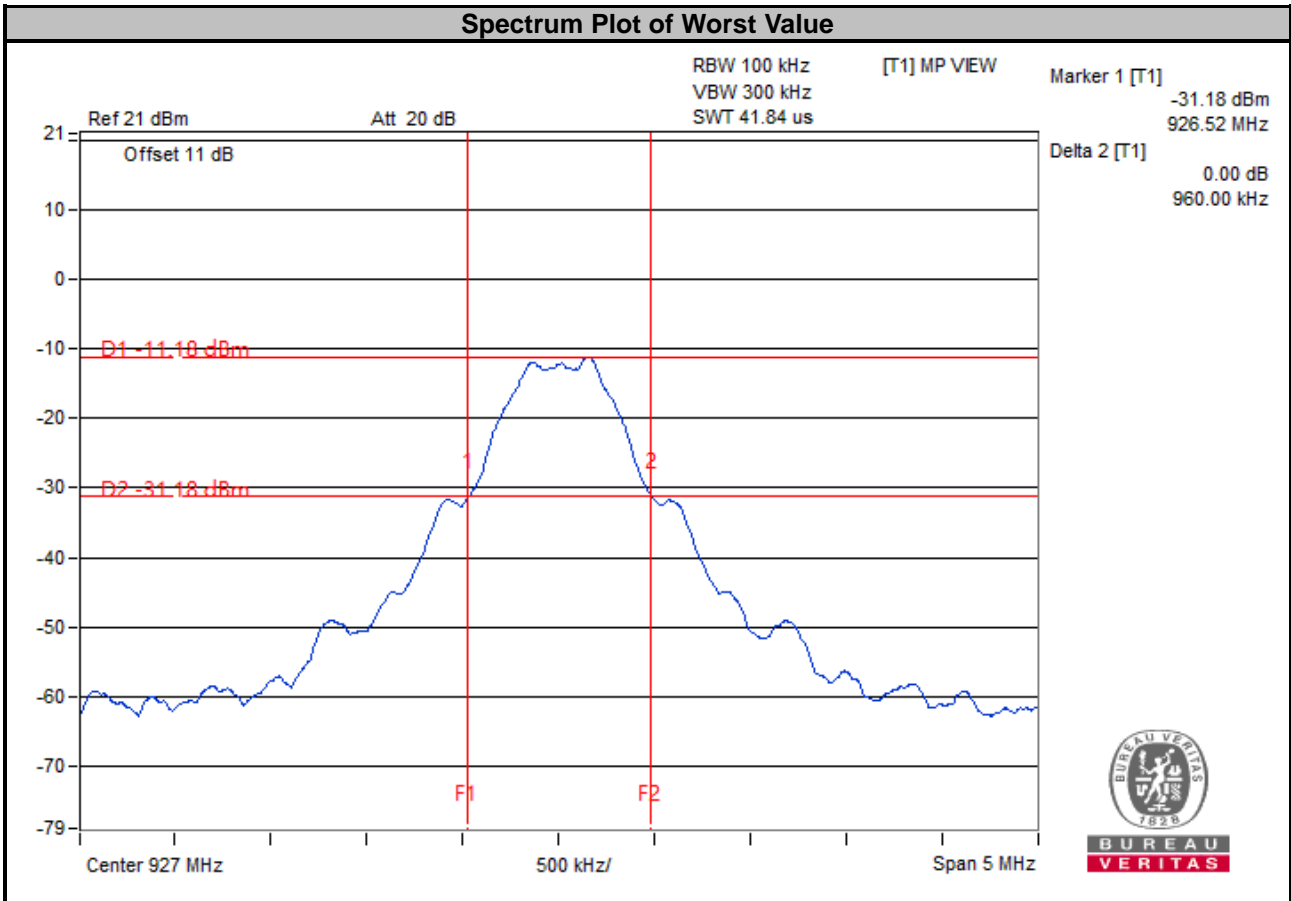
No deviation.

4.2.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at channel frequencies individually.

4.2.7 Test Result

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	Pass / Fail
2	903	0.94	Pass
14	915	0.94	Pass
26	927	0.96	Pass



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on 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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Web Site: www.bureauveritas-adt.com

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

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