



## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 1 of 45

**Applicant:** AUDIVO GmbH  
Irrenloher Damm 30, 92521 Schwarzenfeld, Germany

**Supplier / Manufacturer:** AUDIVO GmbH  
Irrenloher Damm 30, 92521 Schwarzenfeld, Germany

**Description of Sample(s):** Submitted sample(s) said to be  
Product: KleerNet Transceiver Module  
Brand Name: KleerNet  
Model No.: DWAM83TB  
FCC ID: ZUC-DWAM83TB

**Date Samples Received:** 2020-07-20

**Date Tested:** 2020-07-21 to 2020-08-07

**Investigation Requested:** Perform Electromagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2019 and ANSI C63.10:2013 for FCC Certification.

**Conclusions:** The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

**Remarks:** 5150 – 5250 MHz band

  
  
LEUNG Kwun Hang, Joey  
Authorized Signatory



## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 2 of 45

### CONTENT:

Cover	Page 1 of 45
Content	Page 2 of 45
<b><u>1.0 General Details</u></b>	
1.1 Test Laboratory	Page 3 of 45
1.2 Equipment Under Test [EUT] Description of EUT operation	Page 3 of 45
1.3 Date of Order	Page 3 of 45
1.4 Submitted Sample(s)	Page 3 of 45
1.5 Test Duration	Page 3 of 45
1.6 Country of Origin	Page 3 of 45
1.7 RF Module Details	Page 4 of 45
1.8 Channel List	Page 4 of 45
<b><u>2.0 Technical Details</u></b>	
2.1 Investigations Requested	Page 5 of 45
2.2 Test Standards and Results Summary	Page 5 of 45
<b><u>3.0 Test Results</u></b>	
3.1 Emission	Page 6-30 of 45
<b><u>Appendix A</u></b>	
List of Measurement Equipment	Page 31 of 45
<b><u>Appendix B</u></b>	
Scan Plot of Unwanted Emission	Page 32-41 of 45
<b><u>Appendix C</u></b>	
Scan Plot of 99% Bandwidth Measurement	Page 42-45 of 45



## Test Report

**Date : 2020-10-08**  
**No. : HM20070018**

**Page 3 of 45**

### **1.0 General Details**

#### **1.1 Test Laboratory**

The Hong Kong Standards and Testing Centre Ltd.  
EMC Laboratory  
Head Office: 10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong  
Telephone: 852 2666 1888  
Fax: 852 2664 4353

#### **1.2 Equipment Under Test [EUT]**

##### **Description of Sample(s)**

Product: KleerNet Transceiver Module  
Manufacturer: AUDIVO GmbH  
Irrenloher Damm 30, 92521 Schwarzenfeld, Germany  
Brand Name: KleerNet  
Model Number: DWAM83TB  
Sample Serial Number: 1812AM83A250400  
Rating: 3.3Vd.c

##### **1.2.1 Description of EUT Operation**

The Equipment Under Test (EUT) is a wireless module. The tests were conducted under RF Test mode to maintain continuous transmission with Max. duty cycle during test. The transmission signal is digital modulated with channel frequency range 5150 -5250 MHz and 5725-5850 MHz. The EUT does not supported Ad-Hoc function.

#### **1.3 Date of Order**

2020-07-20

#### **1.4 Submitted Sample(s):**

1 Sample

#### **1.5 Test Duration**

2020-07-21 to 2020-08-07

#### **1.6 Country of Origin**

China

The Hong Kong Standards and Testing Centre Limited  
10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.  
For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 4 of 45

### 1.7 RF Module Details

Module Model Number: N/A  
Module FCC ID: N/A  
Module Transmission Type: N/A  
Modulation: DARR-83: QPSK  
Data Rates: N/A  
Tested Frequency Range: 5150 -5250 MHz  
Carrier Frequencies: Refer to channel list below  
Antenna Type: Printed PIFA antennas  
Antenna Gain: Ant. A: 3dBi, Ant. B: 3dBi  
Firmware Version: 2.3

### 1.8 Tested Frequency Channel List

Channel	Frequency (GHz)	Channel	Frequency (GHz)
	5180		
	5200		
	5240		



## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 5 of 45

### 2.0 Technical Details

#### **2.1 Investigations Requested**

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2017 Regulations and ANSI C63.10:2013 for FCC Certification. According FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. The device was realized by test software.

#### **2.2 Test Standards and Results Summary Tables**

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Maximum Peak Output Power	FCC 47CFR 407 (a)	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Spurious Emissions	FCC 47CFR 15.209	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AC Mains Conducted Emissions	FCC 47CFR 15.207	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power Spectral Density	FCC 47CFR 15.407(a)	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6dB and 26dB Bandwidth	FCC 47CFR 15.407 (i)	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unwanted Emissions	FCC 47CFR 15.407 (b)	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Antenna requirement	FCC 47CFR 15.203 &407 (a)	N/A	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RF Exposure	FCC 47CFR 2.1093	N/A	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable

The Hong Kong Standards and Testing Centre Limited  
10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 6 of 45

### **3.0 Test Results**

#### **3.1 Emission**

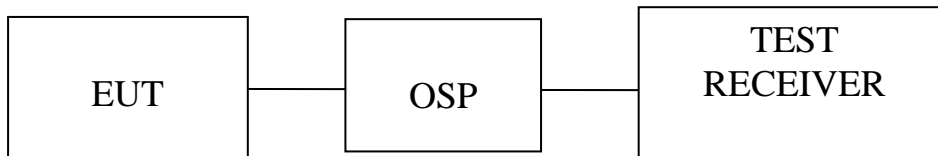
##### **3.1.1 Maximum Peak Output Power**

Test Requirement:	FCC 47CFR 15.407(a)
Test Method:	ANSI C63.10: 2013
Test Date:	2020-07-24
Mode of Operation:	Tx mode

#### **Test Method:**

The RF output of the EUT was connected to the Open Switch and Control Platform (OSP) and test receiver. All the attenuation or cable loss will be added to the measured maximum output power. The results are recorded in dBm.

#### **Test Setup:**





## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 7 of 45

Results of Tx Mode: Pass (TX Unit)  
Maximum conducted output power

Antenna A		
Frequency(MHz)	Total Output Power (dBm)	Limit (dBm)
5180	11.6	24.0
5200	11.8	24.0
5240	10.5	24.0

Antenna B		
Frequency(MHz)	Total Output Power (dBm)	Limit (dBm)
5180	8.4	24.0
5200	7.3	24.0
5240	7.0	24.0

Calculated measurement uncertainty : 30MHz to 1GHz 1.7dB  
1GHz to 26GHz 1.7dB

The Hong Kong Standards and Testing Centre Limited  
10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.  
For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.

## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 8 of 45

### 3.1.2 Radiated Emissions

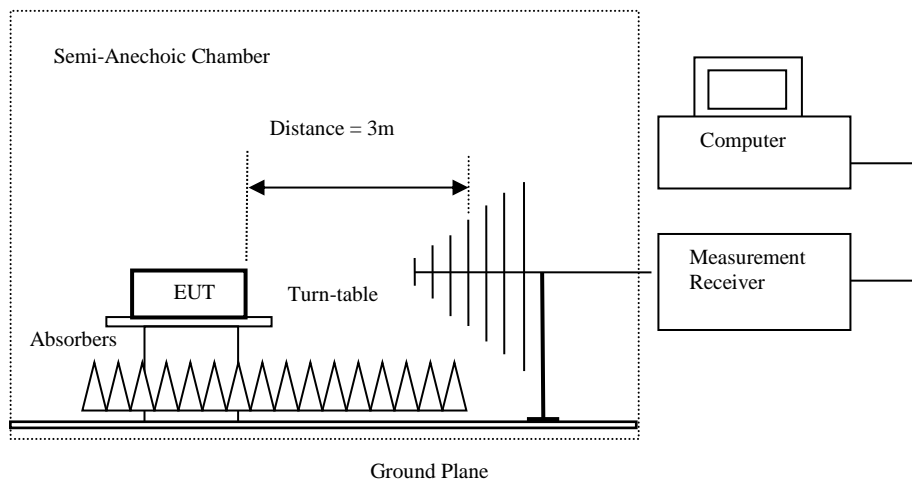
Test Requirement:	FCC 47CFR 15.209 and FCC 47CFR 15.407
Test Method:	ANSI C63.10:2013
Test Date:	2020-07-27 to 2020-08-07
Mode of Operation:	Tx mode

#### Test Method:

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber\*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber\*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. The measured field strength would be calculated as EIRP.

\*: Semi-anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd.  
FCC Test Firm Registration Number 723883  
Designation Number HK0001

#### Test Setup:



- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used, 9kHz to 30MHz loop antennas are used.
- For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m.

The Hong Kong Standards and Testing Centre Limited  
10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.





## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 9 of 45

Limits for Radiated Emissions FCC 47 CFR 15.209 Class B:

Frequency Range	Quasi-Peak Limits
[MHz]	[ $\mu$ V/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Limit for unwanted Emission for out of band emission above 1GHz:

Frequency Range	Peak Limits
[MHz]	[dBm]
Above 1GHz	-27dBm

The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



## Test Report

Date : 2020-10-08  
 No. : HM20070018

Page 10 of 45

**Antenna A**

**Result of Tx mode (5180.0 MHz) (1GHz to 40GHz): Pass**

<b>Unwanted Emissions Peak Value</b>					
Frequency MHz	Measuring Bandwidth (MHz)	Measured Level @3m dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	E-Field Polarity
10360.0	1	43.1	68.2	25.1	Vertical
15540.0	1	53.1	68.2	15.1	Vertical
20720.0	1	35.3	68.2	32.9	Vertical
10360.0	1	43.1	68.2	25.1	Horizontal
15540.0	1	52.2	68.2	16.0	Horizontal
20720.0	1	35.1	68.2	33.1	Horizontal

**Result of Tx mode (5200.0 MHz) (1GHz to 40GHz): Pass**

<b>Unwanted Emissions Peak Value</b>					
Frequency MHz	Measuring Bandwidth (MHz)	Measured Level @3m dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	E-Field Polarity
10400.0	1	43.6	68.2	24.6	Vertical
15600.0	1	52.4	68.2	15.8	Vertical
20800.0	1	35.9	68.2	32.3	Vertical
10400.0	1	42.6	68.2	25.6	Horizontal
15600.0	1	51.1	68.2	17.1	Horizontal
20800.0	1	36.3	68.2	31.9	Horizontal

**Result of Tx mode (5240.0 MHz) (1GHz to 40GHz): Pass**

<b>Unwanted Emissions Peak Value</b>					
Frequency MHz	Measuring Bandwidth (MHz)	Measured Level @3m dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	E-Field Polarity
10480.0	1	44.3	68.2	23.9	Vertical
15720.0	1	52.3	68.2	15.9	Vertical
20960.0	1	35.8	68.2	32.4	Vertical
10480.0	1	45.0	68.2	23.2	Horizontal
15720.0	1	52.2	68.2	16.0	Horizontal
20960.0	1	36.4	68.2	31.8	Horizontal

Remarks: 68.2 dB $\mu$ V/m = -27.0 dBm, peak value below the 15.209 average limit (54.0 dB $\mu$ V/m)  
 Frequency not list are more than 20dB below the limit, details refer to Appendix B



## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 11 of 45

### Antenna B

#### Result of Tx mode (5180.0 MHz) (1GHz to 40GHz): Pass

Unwanted Emissions Peak Value					
Frequency MHz	Measuring Bandwidth (MHz)	Measured Level @3m dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	E-Field Polarity
10360.0	1	42.7	68.2	25.5	Vertical
15540.0	1	52.1	68.2	16.1	Vertical
20720.0	1	35.0	68.2	33.2	Vertical
10360.0	1	42.9	68.2	25.3	Horizontal
15540.0	1	52.3	68.2	15.9	Horizontal
20720.0	1	35.1	68.2	33.1	Horizontal

#### Result of Tx mode (5200.0 MHz) (1GHz to 40GHz): Pass

Unwanted Emissions Peak Value					
Frequency MHz	Measuring Bandwidth (MHz)	Measured Level @3m dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	E-Field Polarity
10400.0	1	44.2	68.2	24.0	Vertical
15600.0	1	51.9	68.2	16.3	Vertical
20800.0	1	35.3	68.2	32.9	Vertical
10400.0	1	45.3	68.2	22.9	Horizontal
15600.0	1	52.4	68.2	15.8	Horizontal
20800.0	1	35.5	68.2	32.7	Horizontal

#### Result of Tx mode (5240.0 MHz) (1GHz to 40GHz): Pass

Unwanted Emissions Peak Value					
Frequency MHz	Measuring Bandwidth (MHz)	Measured Level @3m dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	E-Field Polarity
10480.0	1	43.4	68.2	24.8	Vertical
15720.0	1	53.3	68.2	14.9	Vertical
20960.0	1	35.6	68.2	32.6	Vertical
10480.0	1	44.1	68.2	24.1	Horizontal
15720.0	1	51.6	68.2	16.6	Horizontal
20960.0	1	36.4	68.2	31.8	Horizontal

Remarks: 68.2 dB $\mu$ V/m = -27.0 dBm, peak value below the 15.209 average limit (54.0 dB $\mu$ V/m)  
Frequency not list are more than 20dB below the limit, details refer to Appendix B

The Hong Kong Standards and Testing Centre Limited  
10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



## Test Report

**Date : 2020-10-08**  
**No. : HM20070018**

**Page 12 of 45**

Limits for Radiated Emissions FCC 47 CFR 15.209 Class B]:

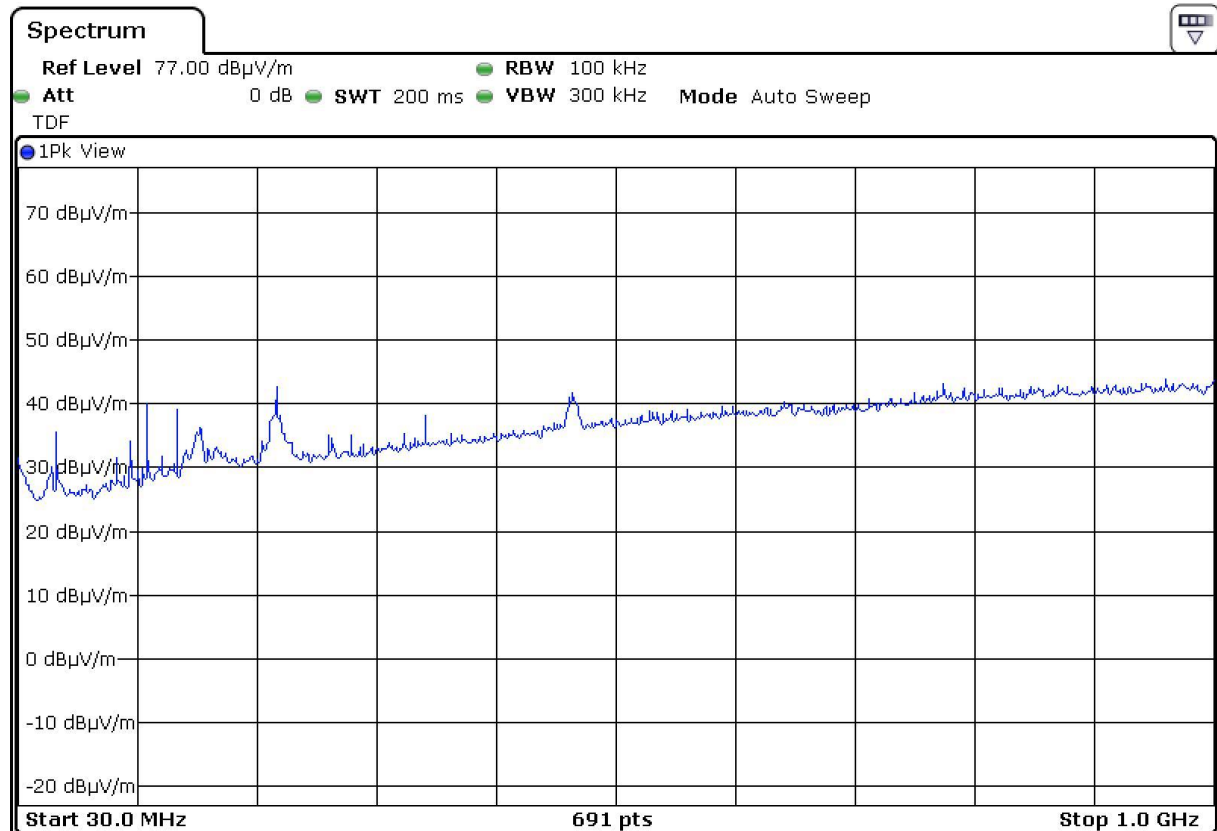
Frequency Range	Quasi-Peak Limits
[MHz]	[ $\mu$ V/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

**Results of Tx mode (30MHz – 1GHz): Pass**

Please refer to the following table for result details(The data is the worst cases)

Horizontal

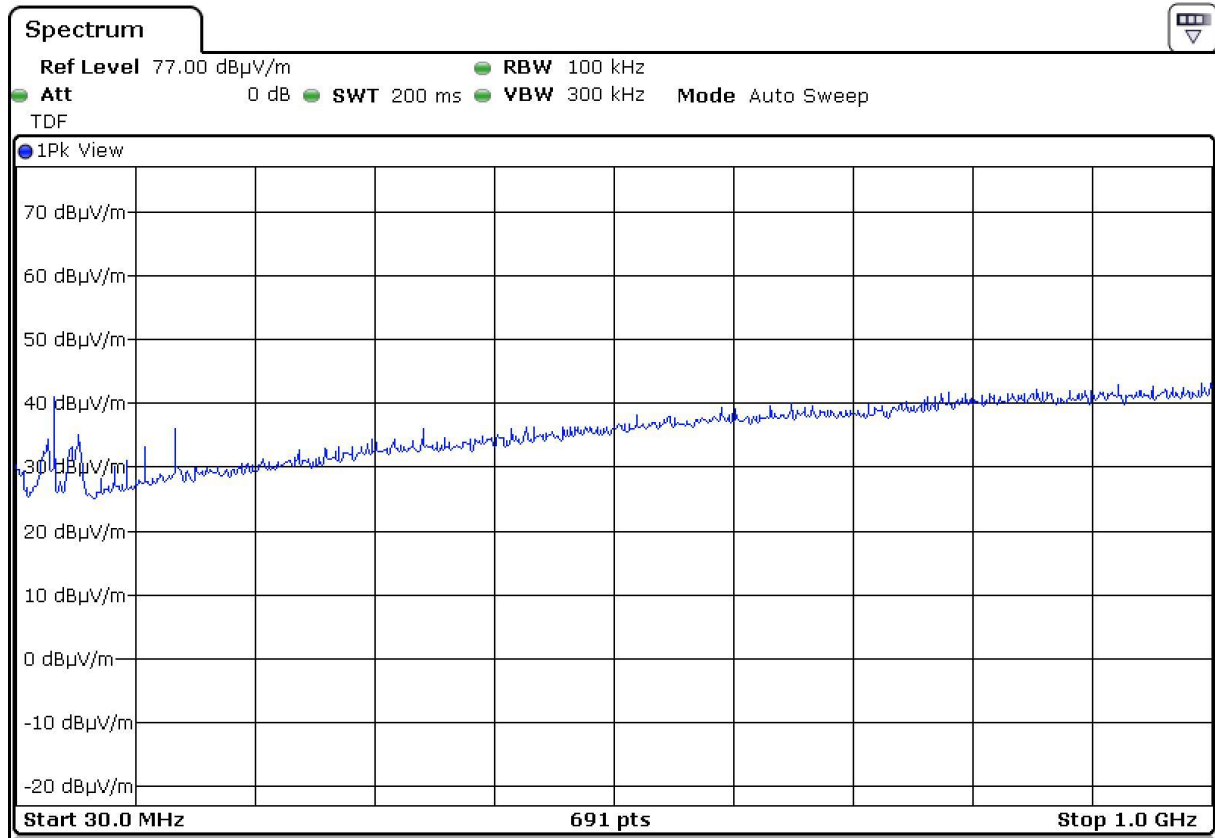


# Test Report

Date : 2020-10-08  
No. : HM20070018

Page 13 of 45

Vertical





## Test Report

**Date : 2020-10-08**  
**No. : HM20070018**

**Page 14 of 45**

The six highest emissions for each polarization (H/V) in the frequency range 30 MHz – 1000 MHz are as following:

Frequency [MHz]	Detector	Antenna polarization	Radiated emission [dB $\mu$ V/m]	Limit [dB $\mu$ V/m] (3 m)	Result
55.90	QP	V	34.4	43.5	PASS
61.60	QP	V	38.4	43.5	PASS
81.20	QP	V	35.0	43.5	PASS
134.60	QP	V	33.1	46.0	PASS
159.80	QP	V	35.9	46.0	PASS
360.60	QP	V	36.0	46.0	PASS
61.60	QP	H	35.5	43.5	PASS
121.90	QP	H	34.1	43.5	PASS
134.60	QP	H	39.9	43.5	PASS
159.80	QP	H	39.1	46.0	PASS
239.90	QP	H	42.6	46.0	PASS
479.90	QP	H	41.7	46.0	PASS

**Result of Tx mode (9kHz – 30MHz): Pass**

Field Strength of Spurious Emissions						
Peak Value						
Frequency	Measured Level	Correction Factor	Field Strength	Field Strength	Limit	E-Field Polarity
MHz	dBuV	dB/m	dBuV/m	$\mu$ V/m	$\mu$ V/m	
<b>Emissions detected are more than 20 dB below the Limits</b>						

Remarks:

Calculated measurement uncertainty : 9kHz-30MHz 3.3dB  
 30MHz -1GHz 4.6dB



## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 15 of 45

### 3.1.4 Power Spectral Density

Test Requirement: FCC 47CFR 15.407(a)  
Test Method: ANSI C63.10:2013  
Test Date: 2020-07-27 to 2020-08-07  
Mode of Operation: Tx mode

#### Test Method:

The RF output of the EUT was connected to the spectrum analyzer. Set the fundamental frequency as the center frequency of the spectral analyzer. Use RBW=500kHz/1MHz , VBW= 1MHz/3MHz , Set the span to 1.5 times the DTS channel bandwidth. Detector = peak, Sweep time = auto couple , Trace mode = max hold.

#### Test Setup:

As Test Setup of clause 3.1.1 in this test report.

#### Results of Tx Mode: Pass

##### Maximum power spectral density

Antenna A

RBW = 1 MHz VBW = 3 MHz

Transmitter Frequency (MHz)	PSD value (dBm)	Limit (dBm)
5180	2.08	11.0
5200	1.76	11.0
5240	4.51	11.0

Antenna B

RBW = 1 MHz VBW = 3 MHz

Transmitter Frequency (MHz)	PSD value (dBm)	Limit (dBm)
5180	-2.21	11.0
5200	-3.63	11.0
5240	-3.48	11.0

The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.

## Test Report

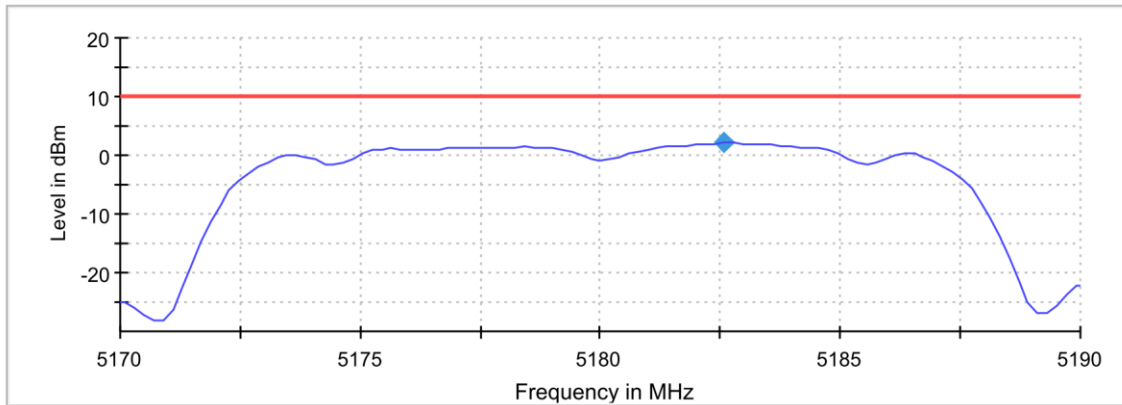
Date : 2020-10-08  
 No. : HM20070018

Page 16 of 45

**Antenna A**

**5180 MHz**  
**RBW = 1 MHz**                      **VBW = 3 MHz**

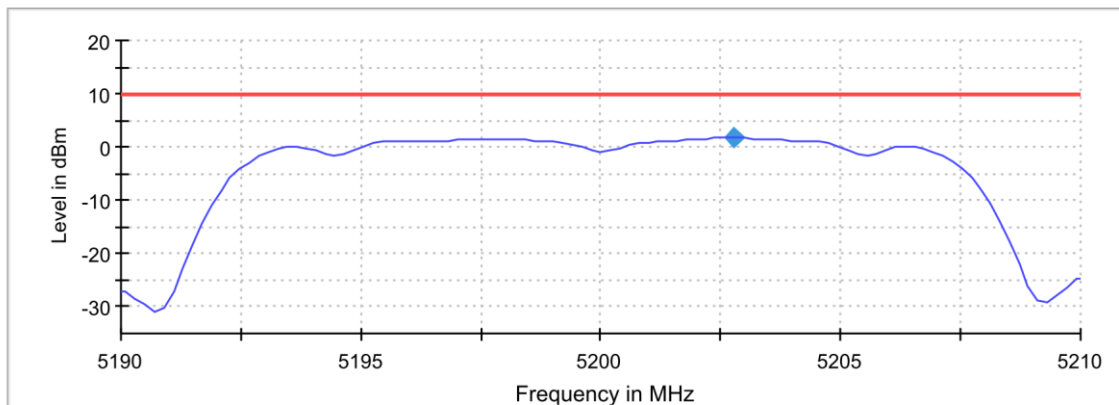
Power Spectral Density



— Limit      ◆ PSD      — Sum Level

**5200MHz**  
**RBW = 1 MHz**                      **VBW = 3 MHz**

Power Spectral Density



— Limit      ◆ PSD      — Sum Level



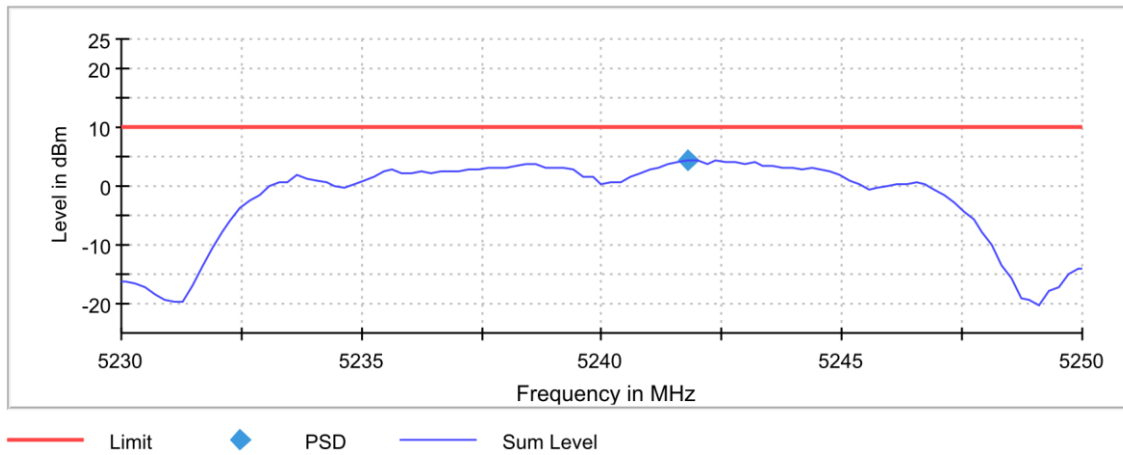
## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 17 of 45

5240 MHz  
RBW = 1 MHz      VBW = 3 MHz

Power Spectral Density



The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.

## Test Report

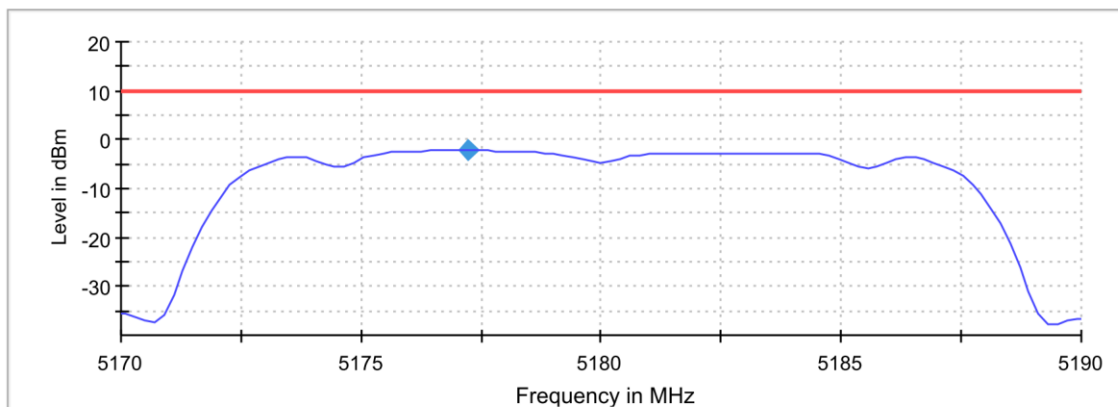
Date : 2020-10-08  
 No. : HM20070018

Page 18 of 45

**Antenna B**

**5180 MHz**  
**RBW = 1 MHz**                      **VBW = 3 MHz**

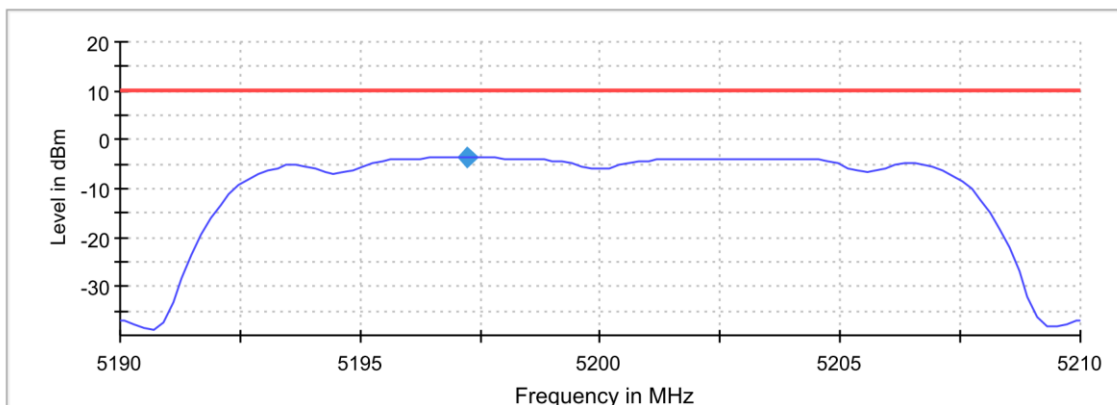
Power Spectral Density



— Limit      ◆ PSD      — Sum Level

**5200MHz**  
**RBW = 1 MHz**                      **VBW = 3 MHz**

Power Spectral Density



— Limit      ◆ PSD      — Sum Level

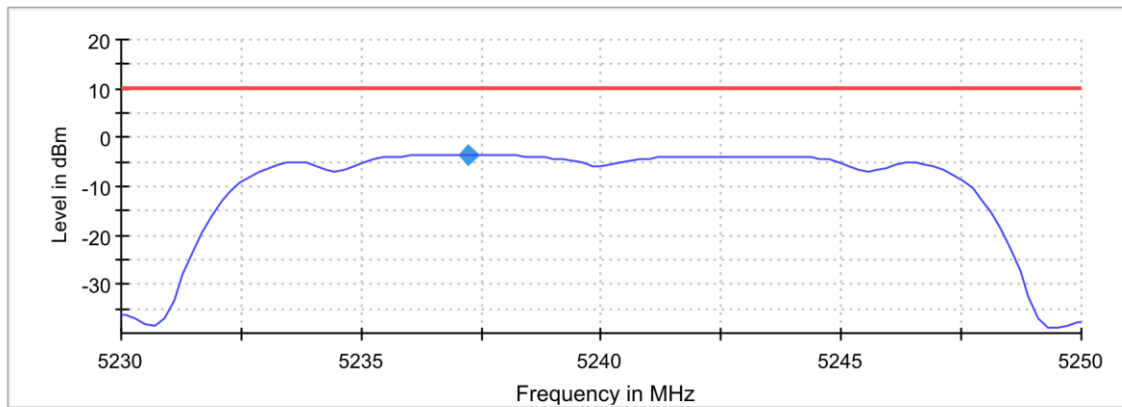
## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 19 of 45

5240 MHz  
RBW = 1 MHz      VBW = 3 MHz

Power Spectral Density



— Limit      ◆ PSD      — Sum Level

The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 20 of 45

### 3.1.5 6dB and 26dB Bandwidth Measurement

Test Requirement:	FCC 47CFR 15.407(a)
Test Method:	ANSI C63.10:2013
Test Date:	2020-07-27 to 2020-08-07
Mode of Operation:	Tx mode

#### **Test Method:**

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

#### **Test Setup:**

As Test Setup of clause 3.1.1 in this test report.

## Test Report

Date : 2020-10-08  
 No. : HM20070018

Results of Tx Mode : Pass

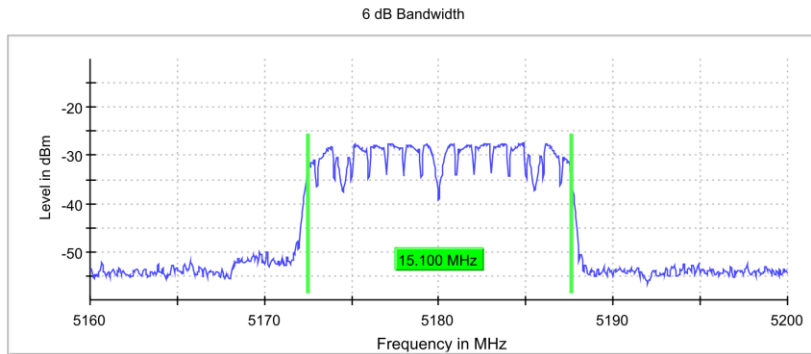
Antenna A  
 5180 MHz  
 RBW = 100 kHz      VBW = 300 kHz      Sweep time = 94.9  $\mu$ s

### 6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5180.000000	15.100000	---	---	5172.475000	5187.575000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
5180.000000	-27.4	PASS



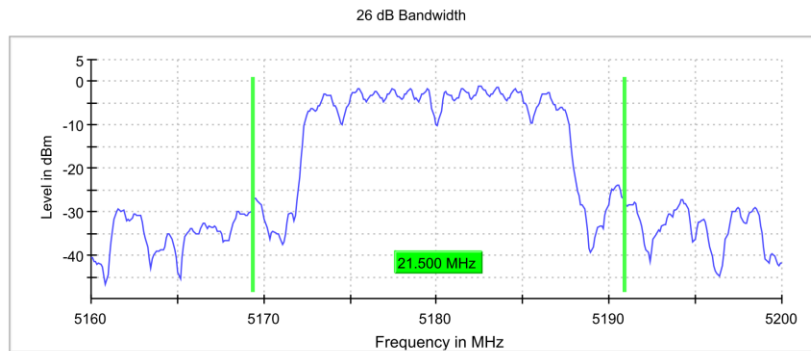
RBW = 200 kHz      VBW = 1 MHz      Sweep time = 47.3  $\mu$ s

### 26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5180.000000	21.500000	---	---	5169.350000	5190.850000

(continuation of the "26 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
5180.000000	-1.1	PASS



## Test Report

Date : 2020-10-08  
 No. : HM20070018

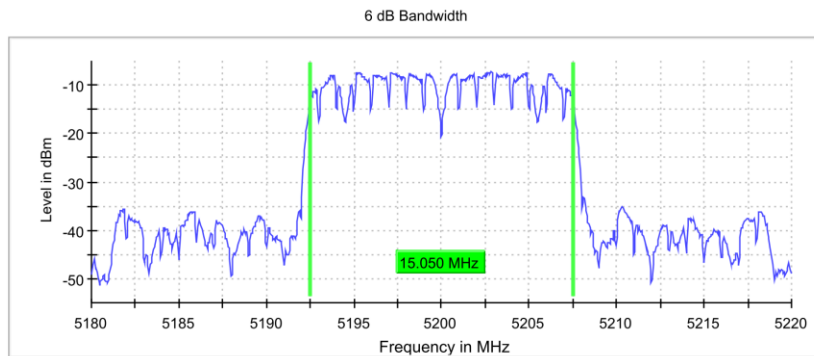
5200MHz  
 RBW = 100 kHz      VBW = 300 kHz      Sweep time = 94.9  $\mu$ s

### 6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5200.000000	15.050000	---	---	5192.475000	5207.525000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
5200.000000	-7.3	PASS



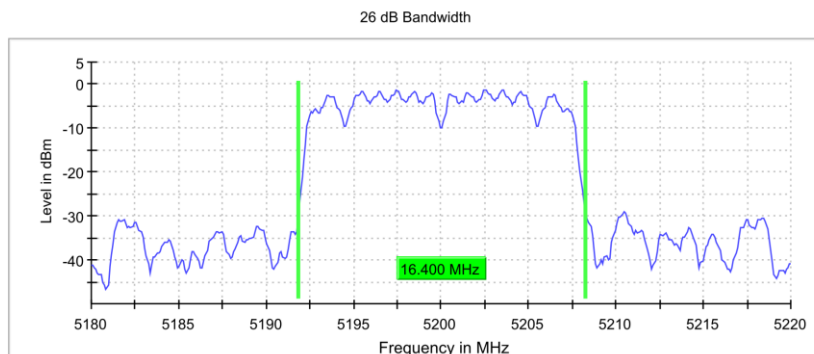
RBW = 200 kHz      VBW = 1 MHz      Sweep time = 47.3  $\mu$ s

### 26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5200.000000	16.400000	---	---	5191.850000	5208.250000

(continuation of the "26 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
5200.000000	-1.3	PASS



## Test Report

Date : 2020-10-08  
 No. : HM20070018

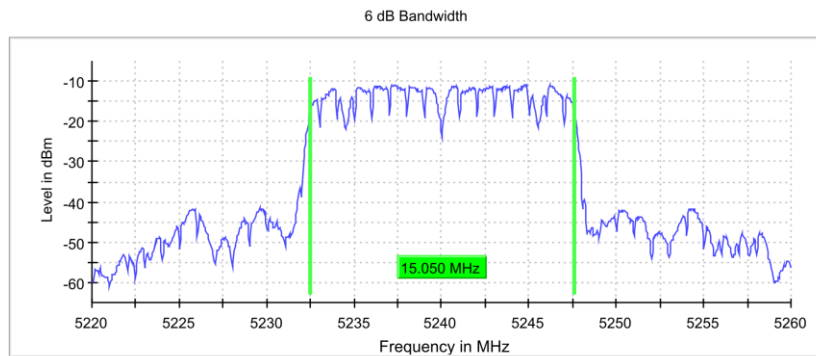
5240MHz  
 RBW = 100 kHz      VBW = 300 kHz      Sweep time = 94.9  $\mu$ s

### 6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5240.000000	15.050000	---	---	5232.525000	5247.575000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
5240.000000	-11.1	PASS



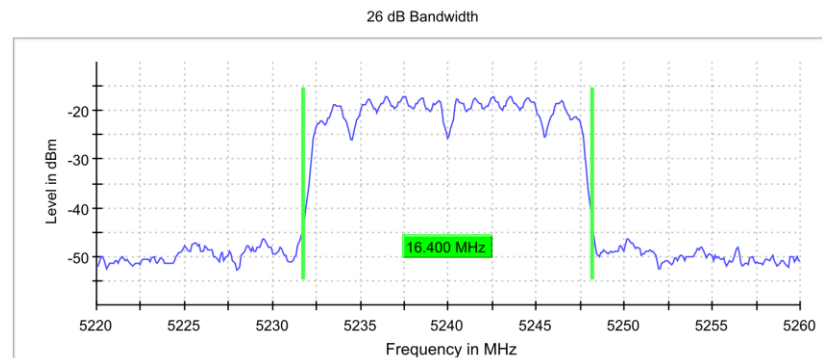
RBW = 200 kHz      VBW = 1 MHz      Sweep time = 47.3  $\mu$ s

### 26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5240.000000	16.400000	---	---	5231.750000	5248.150000

(continuation of the "26 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
5240.000000	-17.1	PASS



## Test Report

Date : 2020-10-08  
 No. : HM20070018

Page 24 of 45

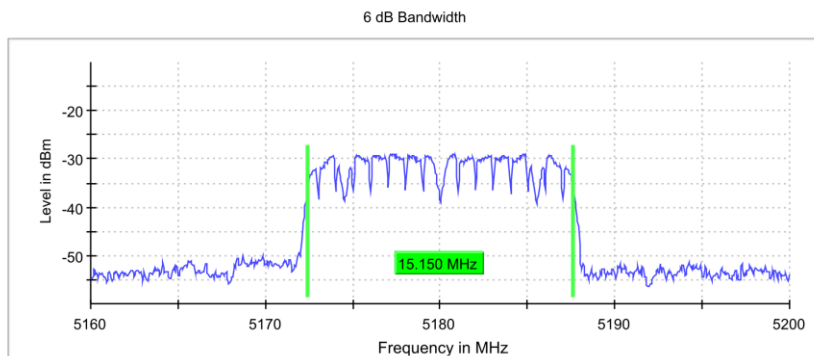
Antenna B  
 5180 MHz  
 RBW = 100 kHz      VBW = 300 kHz      Sweep time = 94.9  $\mu$ s

### 6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5180.000000	15.150000	---	---	5172.425000	5187.575000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
5180.000000	-29.0	PASS



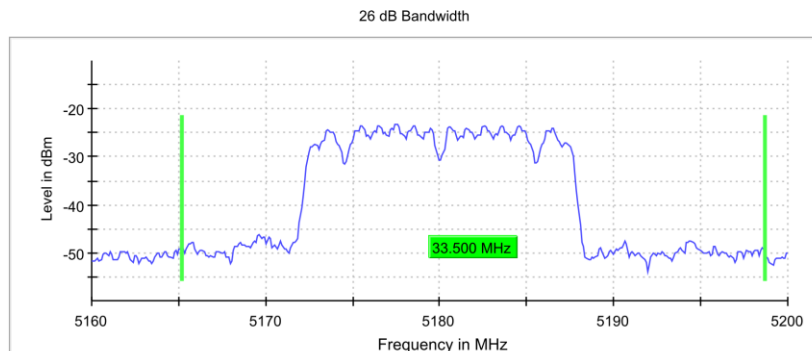
RBW = 200 kHz      VBW = 1 MHz      Sweep time = 47.3  $\mu$ s

### 26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5180.000000	33.500000	---	---	5165.150000	5198.650000

(continuation of the "26 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
5180.000000	-23.2	PASS





## Test Report

Date : 2020-10-08  
 No. : HM20070018

Page 25 of 45

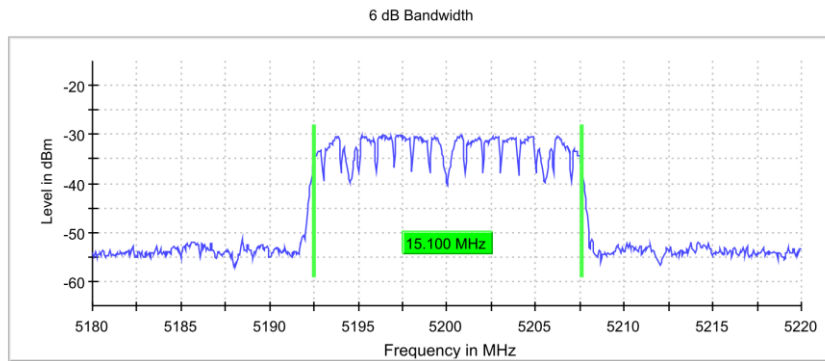
5200MHz  
 RBW = 100 kHz      VBW = 300 kHz      Sweep time = 94.9  $\mu$ s

### 6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5200.000000	15.100000	---	---	5192.475000	5207.575000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
5200.000000	-30.1	PASS



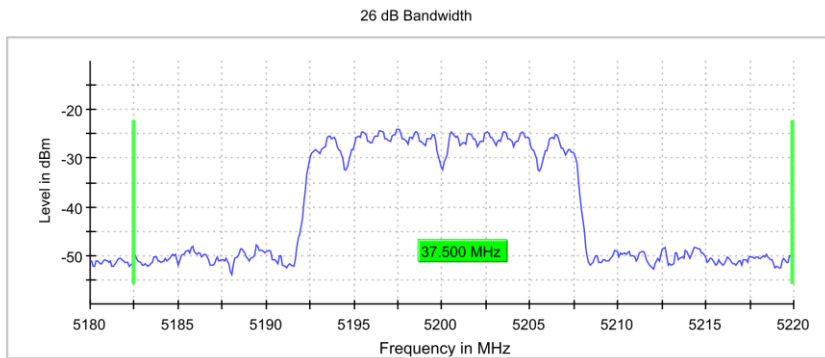
RBW = 200 kHz      VBW = 1 MHz      Sweep time = 47.3  $\mu$ s

### 26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5200.000000	37.500000	---	---	5182.450000	5219.950000

(continuation of the "26 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
5200.000000	-24.1	PASS



## Test Report

Date : 2020-10-08  
 No. : HM20070018

5240MHz  
 RBW = 100 kHz      VBW = 300 kHz      Sweep time = 94.9  $\mu$ s

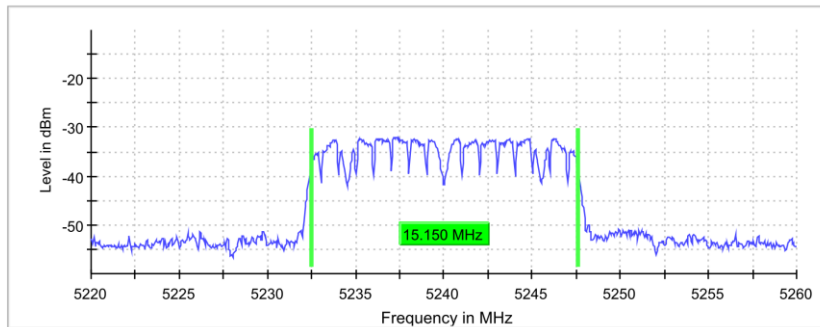
### 6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5240.000000	15.150000	---	---	5232.475000	5247.625000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
5240.000000	-32.2	PASS

6 dB Bandwidth



RBW = 200 kHz      VBW = 1 MHz      Sweep time = 47.3  $\mu$ s

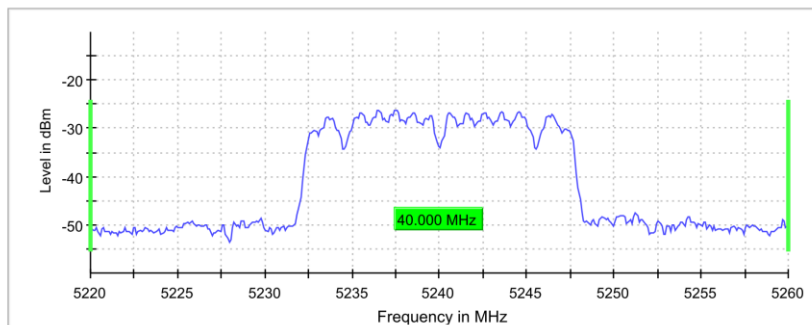
### 26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5240.000000	40.000000	---	---	5220.000000	5260.000000

(continuation of the "26 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
5240.000000	-26.2	PASS

26 dB Bandwidth



## Test Report

**Date : 2020-10-08**  
**No. : HM20070018**

**Page 27 of 45**

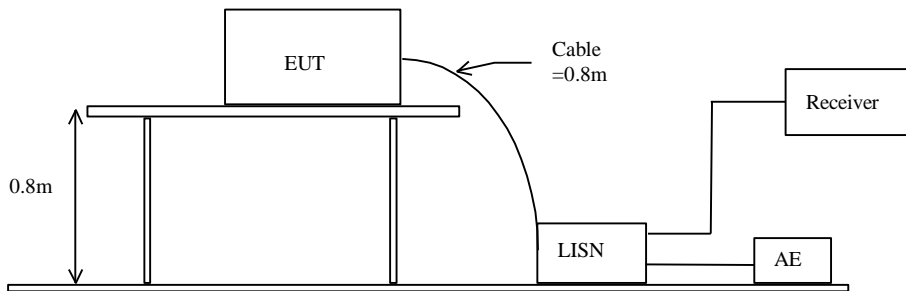
### 3.1.6 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207 Class B
Test Method:	ANSI C63.10: 2013
Test Date:	2020-07-27 to 2020-08-07
Mode of Operation:	Tx mode

#### Test Method:

The test was performed in accordance with ANSI C63.10: 2013, with the following: initial measurements were performed in peak and average detection modes on the live line, any emissions recorded within 30dB of the relevant limit lines were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

#### Test Setup:



#### Limits for Conducted Emissions (FCC 47 CFR 15.207):

Frequency Range [MHz]	Quasi-Peak Limits [dBμV]	Average [dBμV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

\* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.



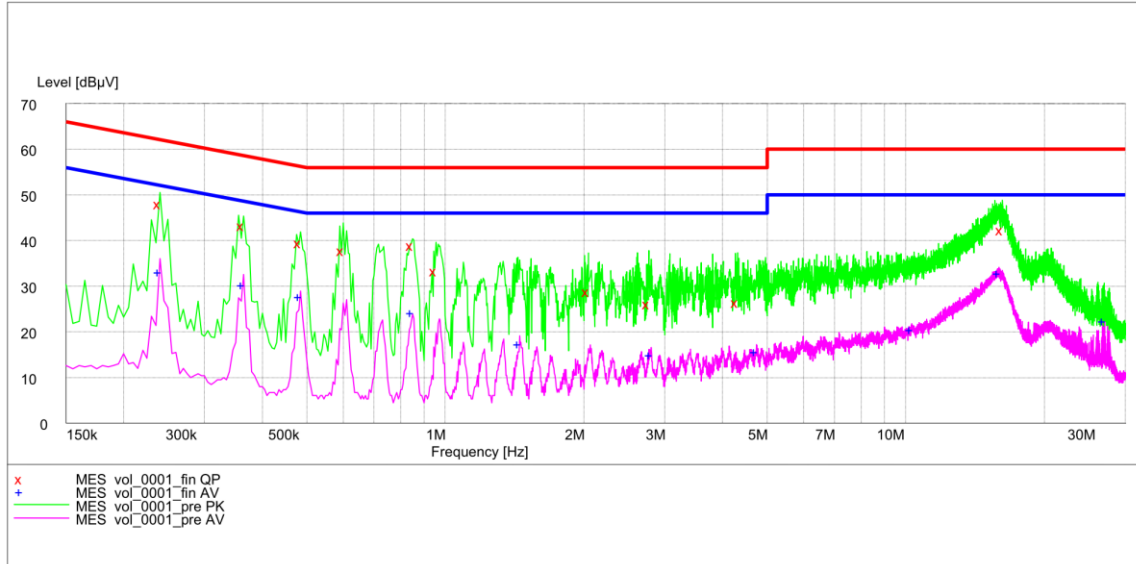
## Test Report

**Date : 2020-10-08**  
**No. : HM20070018**

**Page 28 of 45**

**Results of Tx mode: PASS**

Please refer to the following diagram for individual results.



**MEASUREMENT RESULT: "vol\_0001\_fin QP"**

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.240000	48.30	9.9	62	13.8	L1	GND
0.365000	43.50	10.0	59	15.1	L1	GND
0.485000	39.80	10.0	56	16.5	N	GND
0.600000	38.10	10.0	56	17.9	L1	GND
0.850000	39.20	10.0	56	16.8	N	GND
0.955000	33.60	10.0	56	22.4	N	GND
2.045000	29.10	10.1	56	26.9	N	GND
2.765000	26.40	10.1	56	29.6	L1	GND
4.320000	26.70	10.2	56	29.3	N	GND
16.240000	42.60	10.5	60	17.4	L1	GND

**MEASUREMENT RESULT: "vol\_0001\_fin AV"**

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.240000	33.20	9.9	52	18.9	N	GND
0.365000	30.40	10.0	49	18.3	N	GND
0.485000	27.80	10.0	46	18.5	L1	GND
0.850000	24.30	10.0	46	21.7	N	GND
1.450000	17.50	10.0	46	28.5	N	GND
2.800000	15.10	10.1	46	30.9	L1	GND
4.745000	15.80	10.3	46	30.2	L1	GND
10.305000	20.60	10.5	50	29.4	N	GND
15.950000	33.00	10.6	50	17.0	N	GND
27.000000	22.50	10.7	50	27.5	L1	GND

The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: hkstc@stc.group Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



## Test Report

**Date : 2020-10-08**  
**No. : HM20070018**

**Page 29 of 45**

### 3.1.7 RF Exposure

#### RF Exposure

Test Requirement: FCC 47CFR 2.1093  
 Test Date: 2020-08-07  
 Mode of Operation: Tx mode

#### Requirements:

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission’s guidelines.

According to § 1.1310: The criteria listed in table 1 shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	* 100	6
3.0-30	1842/f	4.89/f	* 900/f <sup>2</sup>	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	* 100	30
1.34-30	824/f	2.19/f	* 180/f <sup>2</sup>	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz \* = Plane-wave equivalent power density



## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 30 of 45

An MPE evaluation for was performed in order to show that the device was compliant with §2.1091. The maximum power density was calculated for each transmitter at a separation distance of 20cm. For each transmitter the maximum RF exposure at a 20 cm distance using the formula:

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density  
P = power input to the antenna  
G = power gain of the antenna in the direction of interest relative to an isotropic radiator  
R = distance to the center of radiation of the antenna

### Results:

Maximum conducted output power = 11.8dBm (15.14 mW) @ 5200 MHz  
Antenna gain = 3.0 dBi = 1.995  
EIRP = 14.8 dBm (30.20 mW)

Applicant stated minimum distance = 20 cm  
MPE Limit at 5200MHz = 1.0 mW/cm<sup>2</sup>

Power Density = 0.006mW/cm<sup>2</sup>



## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 31 of 45

### Appendix A

#### List of Measurement Equipment

##### Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-LINDGREN	FACT-3	--	2020/04/13	2021/04/13
EM356	ANTENNA POSITIONING TOWER	ETS-LINDGREN	2171B	00150346	N/A	N/A
EM355	BICONILOG ANTENNA	ETS-LINDGREN	3143B	00201783	2020/06/17	2022/06/17
EM276	BROADBAND HORN ANTENNA	A-INFOMW	JXTXLB-10180-SF	J2031090903007	2018/04/27	2020/04/27
EM299	Double-Ridged Waveguide Horn Antenna	ETS-Lindgren	3115	00114120	2018/08/08	2020/08/08
EM300	Pyramidal Standard Gain Horn Antenna	ETS-Lindgren	3160-09	00130130	2018/08/08	2020/08/08
EM301	Pyramidal Standard Gain Horn Antenna	ETS-Lindgren	3160-10	00130988	2018/08/08	2020/08/08
EM318	USB WIDEBAND POWER SENSOR	AGILENT	U2022XA	MY53470001	2019/03/23	2021/03/23
EM353	LOOP ANTENNA	ETS_LINDGREN	6502	00206533	2019/11/30	2021/11/30
EM363	SIGNAL AND SPECTRUM ANALYZER	R&S	FSV 40	1321.3008K39-101231-EK	2019/09/06	2020/09/06
EM364	OPEN SWITCH AND CONTROL PLATFORM	R&S	OSP-B157W8	101002	2019/05/03	2021/05/03
EM527	COAXIAL CABLE	HUBER + SUHNER	SUCOFLEX 102	24514/2	2019-04-19	2022-04-19
EM528	COAXIAL CABLE	HUBER + SUHNER	SUCOFLEX 102	24515/2	2019-04-19	2022-04-19
EM530	COAXIAL CABLE	HUBER + SUHNER	SUCOFLEX 102	24970/2	2019-04-19	2022-04-19
EM531	COAXIAL CABLE	HUBER + SUHNER	SUCOFLEX 102	24969/2	2019-04-19	2022-04-19

##### Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM119	LISN	R & S	ESH3-Z5	0831.5518.52	2020/06/30	2021/06/30
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2020/05/13	2021/05/13
EM179	IMPULSE LIMITER	ROHDE & SCHWARZ	ESH3-Z2	357-8810.52/54	2019/01/16	2021/01/16
EM501	COAXIAL CABLE	-	-	-	2019/01/16	2021/01/16
EM154	SHIELDING ROOM	SIEMENS MATSUSHITA COMPONENTS	N/A	803-740-057-99A	2017/02/06	2022/02/06
N/A	MEASUREMENT AND EVALUATION SOFTWARE	ROHDE & SCHWARZ	ESIB-K1	V1.20	N/A	N/A

Remarks:-

CM Corrective Maintenance  
N/A Not Applicable  
TBD To Be Determined

The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.

## Test Report

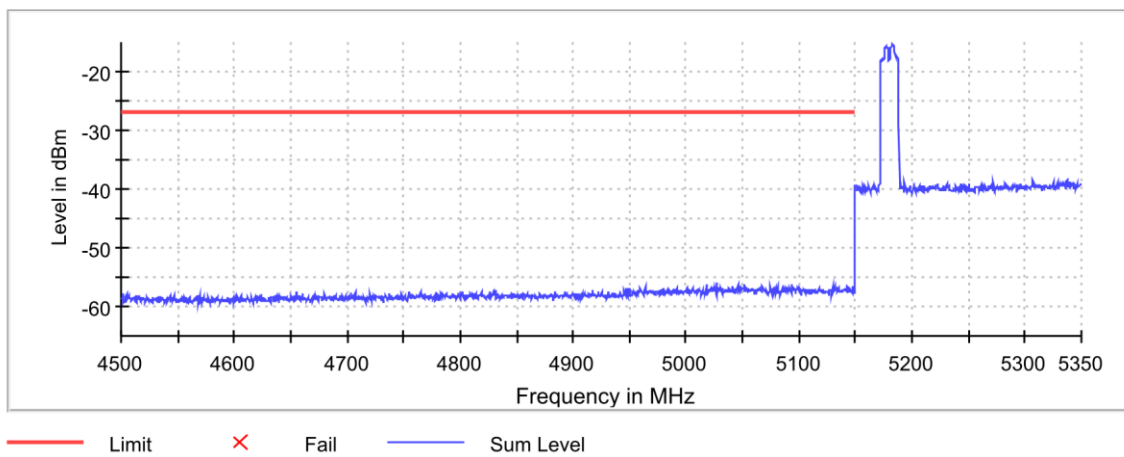
Date : 2020-10-08  
No. : HM20070018

Page 32 of 45

### Appendix B

Unwanted emission  
Antenna A  
5180 MHz

#### Band edge measurement Band Edge





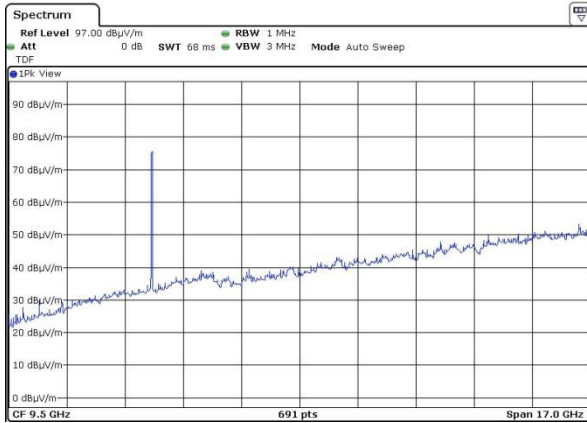
# Test Report

Date : 2020-10-08  
 No. : HM20070018

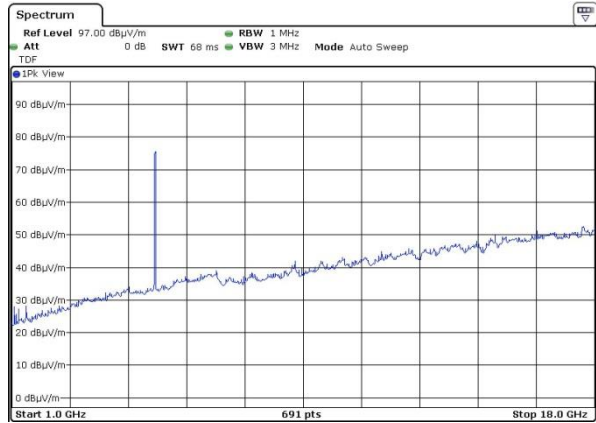
Page 33 of 45

5180 MHz

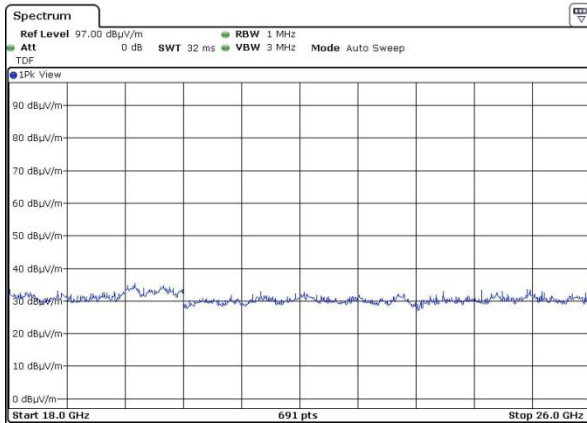
1GHz to 18GHz V



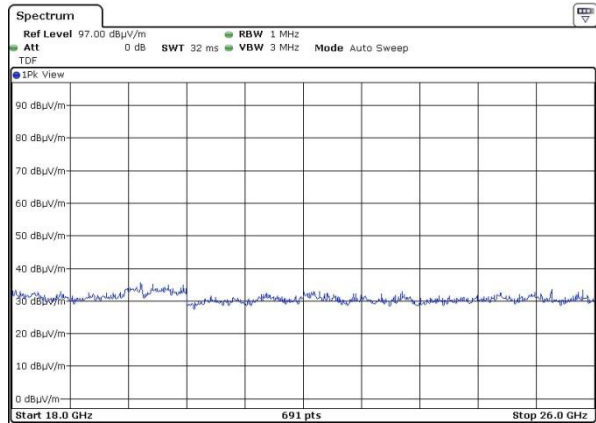
1GHz to 18GHz H



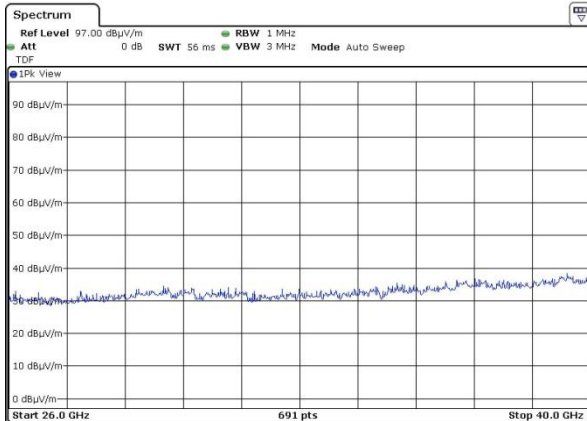
18GHz to 26GHz V



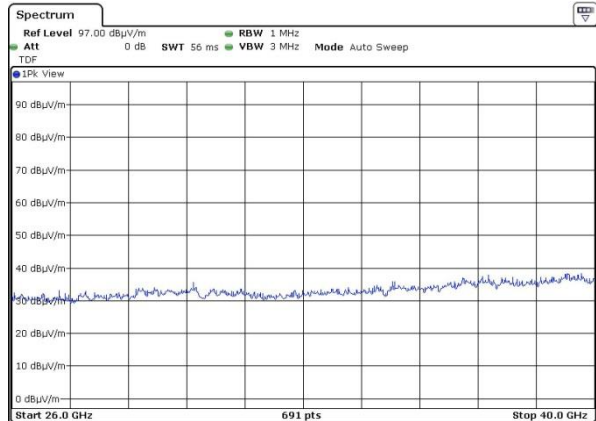
18GHz to 26GHz H



26GHz to 40GHz V



26GHz to 40GHz H



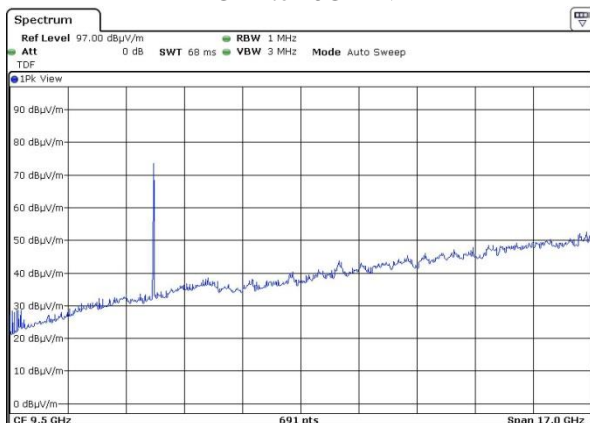
## Test Report

Date : 2020-10-08  
No. : HM20070018

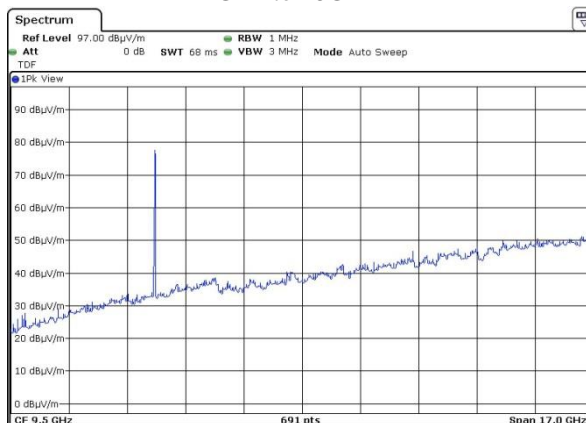
Page 34 of 45

### 5200 MHz

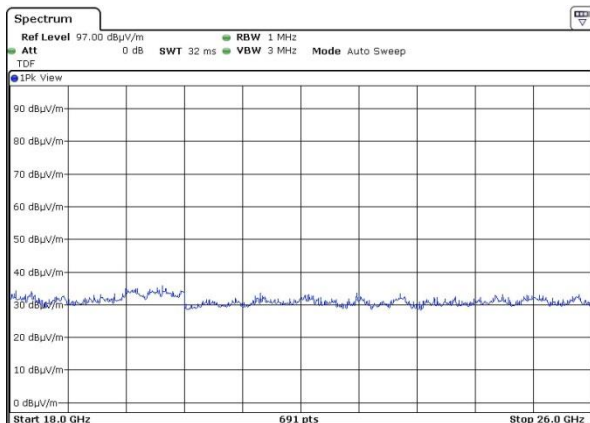
1GHz to 18GHz V



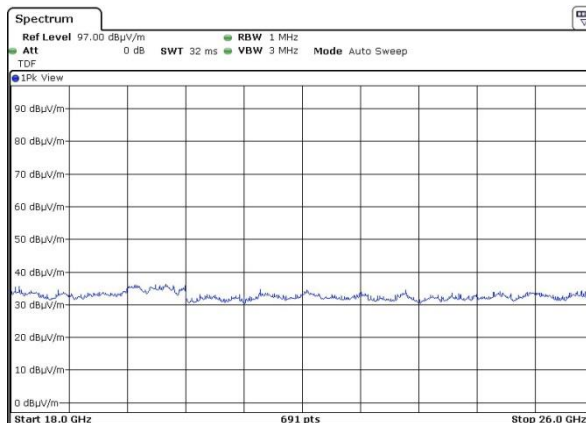
1GHz to 18GHz H



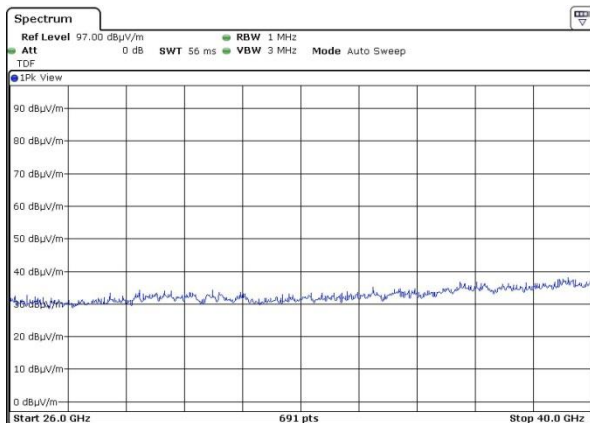
18GHz to 26GHz V



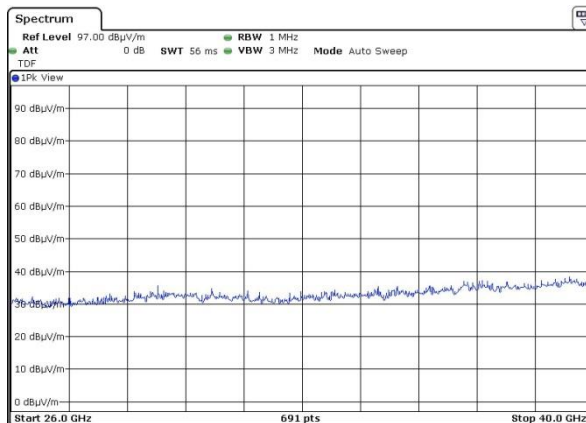
18GHz to 26GHz H



26GHz to 40GHz V



26GHz to 40GHz H



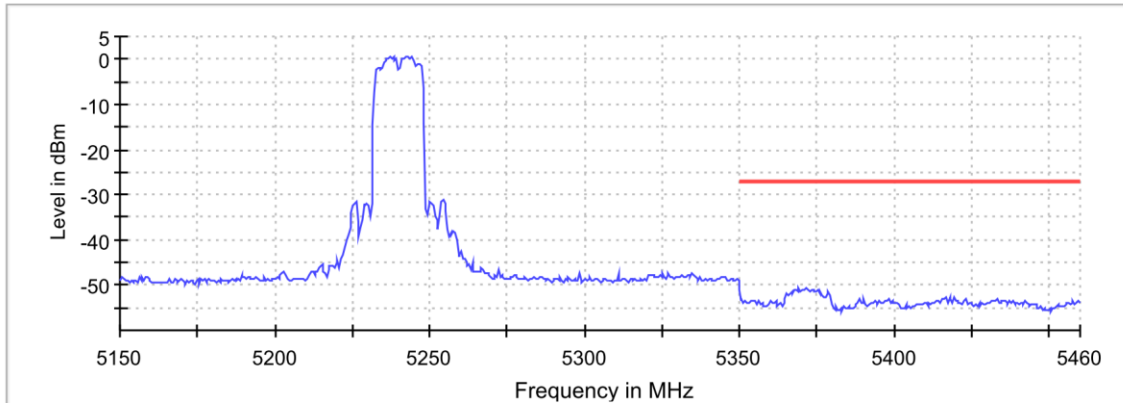
## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 35 of 45

5240 MHz

Band edge measurement  
Band Edge



— Limit    × Fail    — Sum Level

The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.

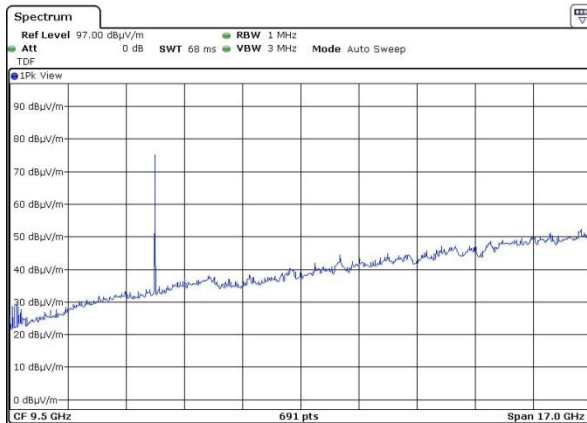
# Test Report

Date : 2020-10-08  
 No. : HM20070018

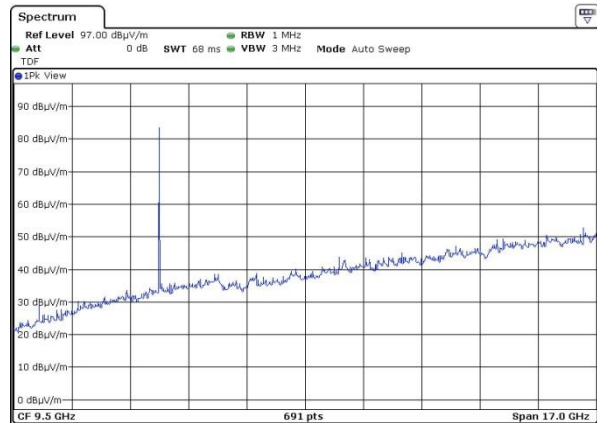
Page 36 of 45

5240 MHz

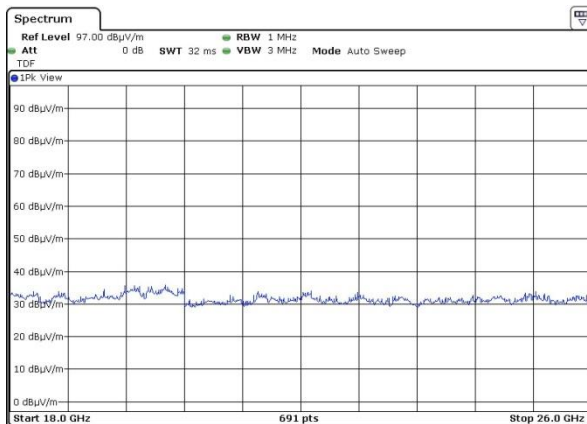
1GHz to 18GHz V



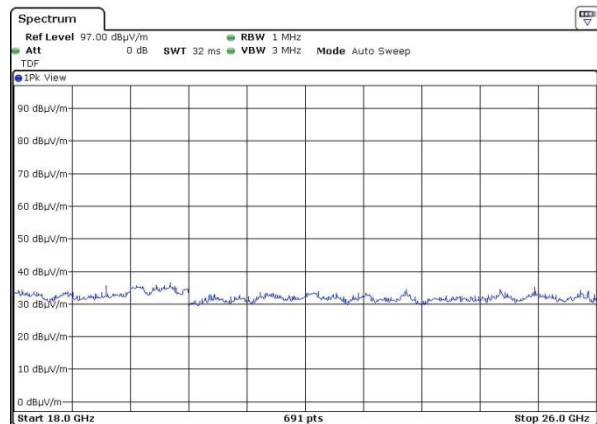
1GHz to 18GHz H



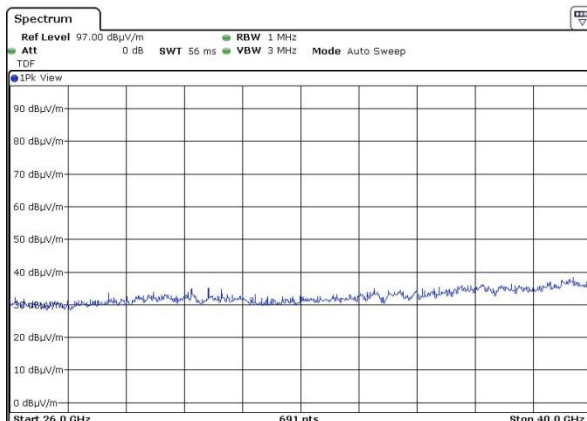
18GHz to 26GHz V



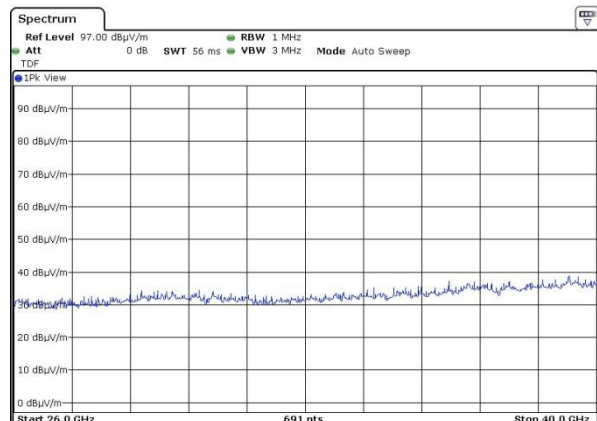
18GHz to 26GHz H



26GHz to 40GHz V



26GHz to 40GHz H



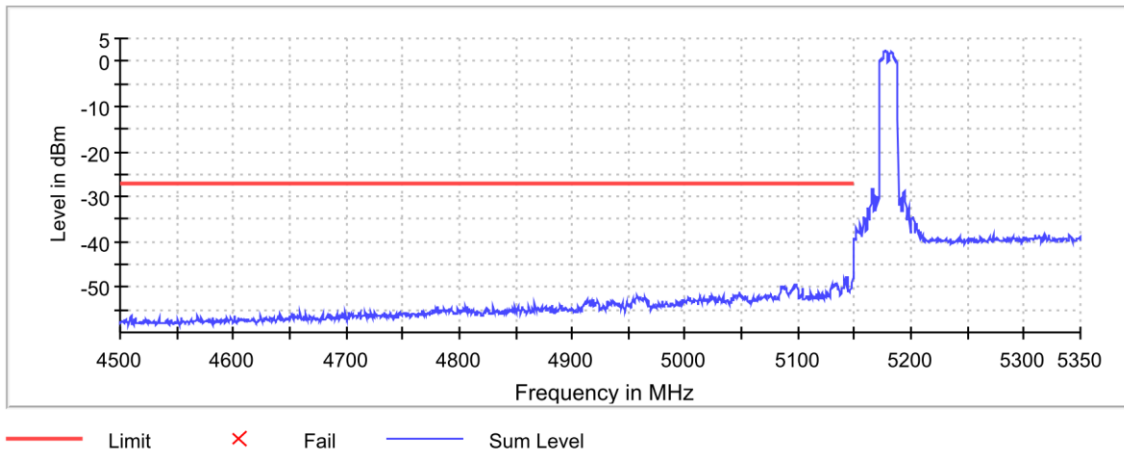
## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 37 of 45

Unwanted emission  
Antenna B  
5180 MHz

Band edge measurement  
Band Edge



The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.

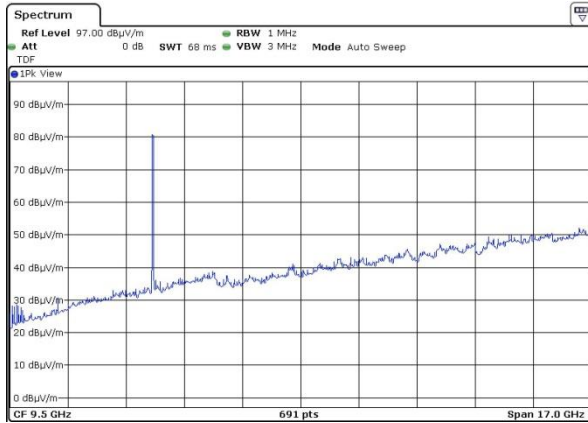
# Test Report

Date : 2020-10-08  
 No. : HM20070018

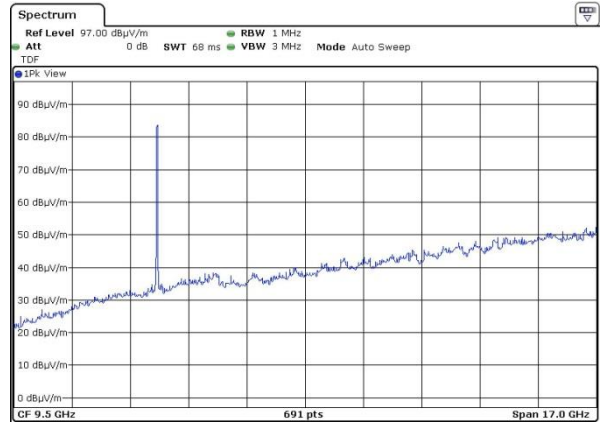
Page 38 of 45

## 5180 MHz

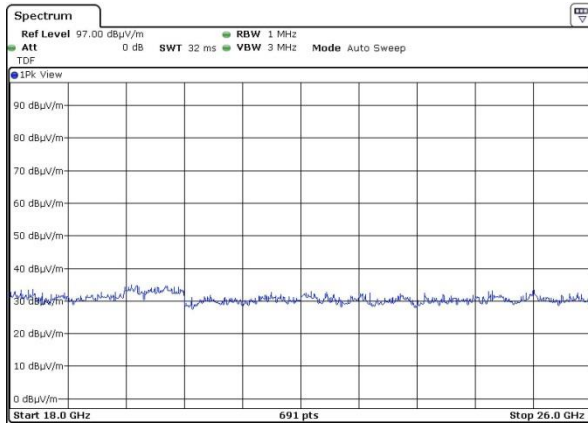
1GHz to 18GHz V



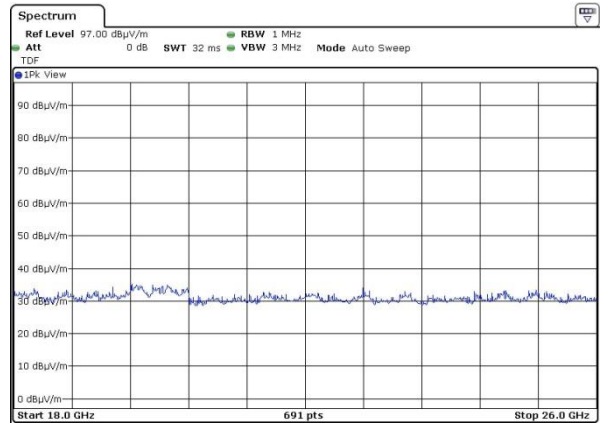
1GHz to 18GHz H



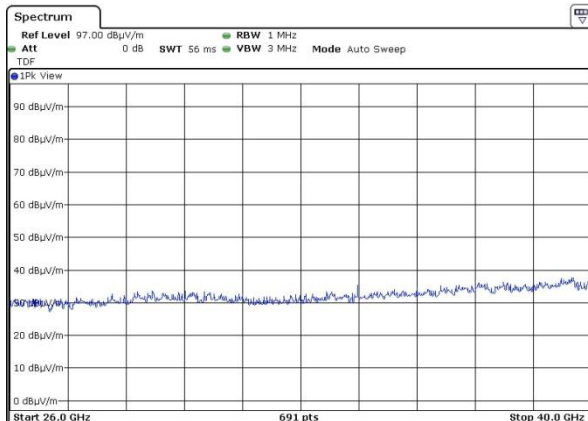
18GHz to 26GHz V



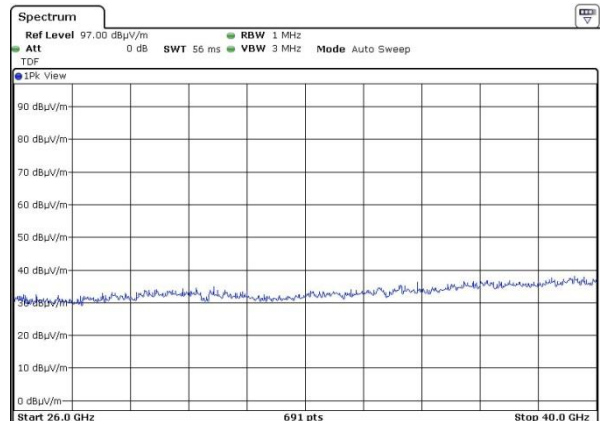
18GHz to 26GHz H



26GHz to 40GHz V



26GHz to 40GHz H



The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



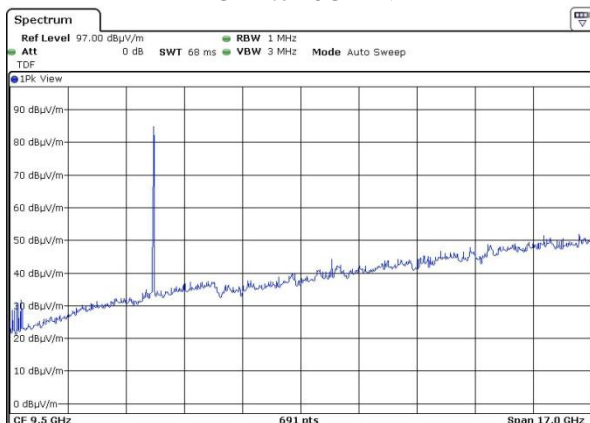
# Test Report

Date : 2020-10-08  
No. : HM20070018

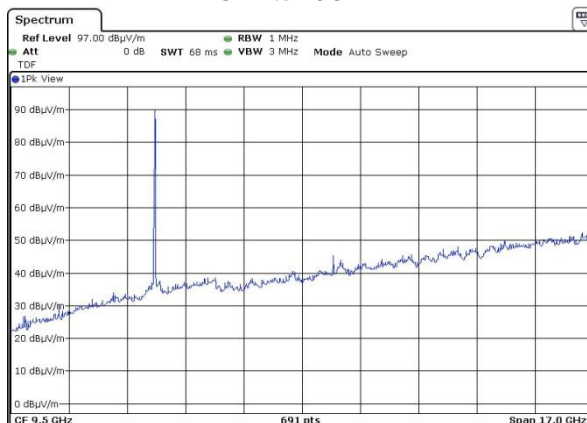
Page 39 of 45

## 5200 MHz

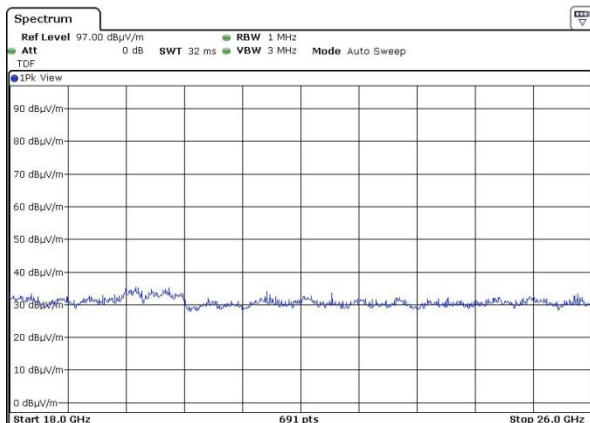
1GHz to 18GHz V



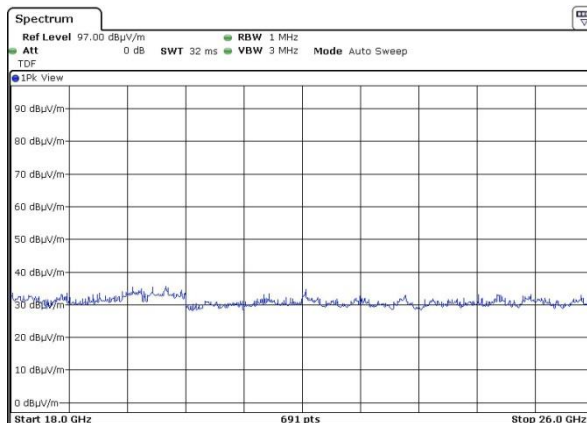
1GHz to 18GHz H



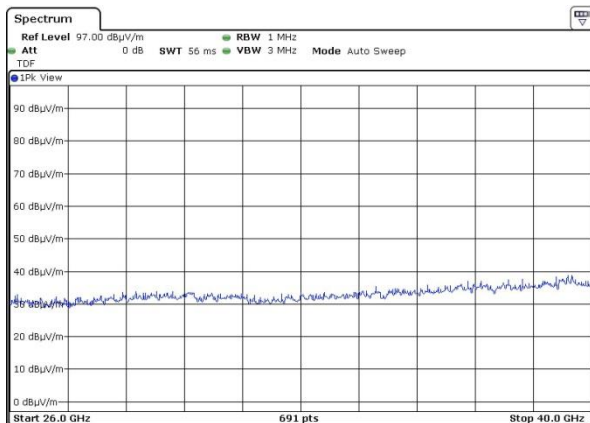
18GHz to 26GHz V



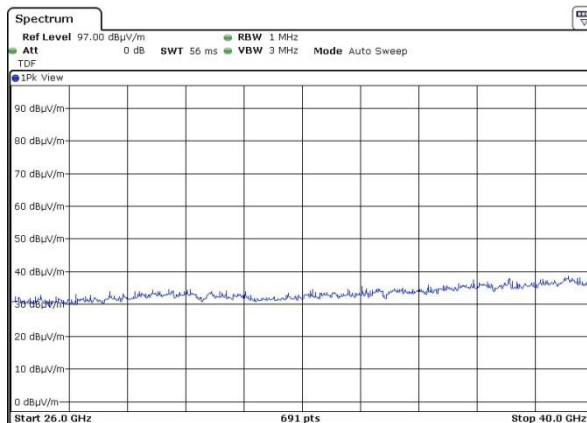
18GHz to 26GHz H



26GHz to 40GHz V



26GHz to 40GHz H



The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



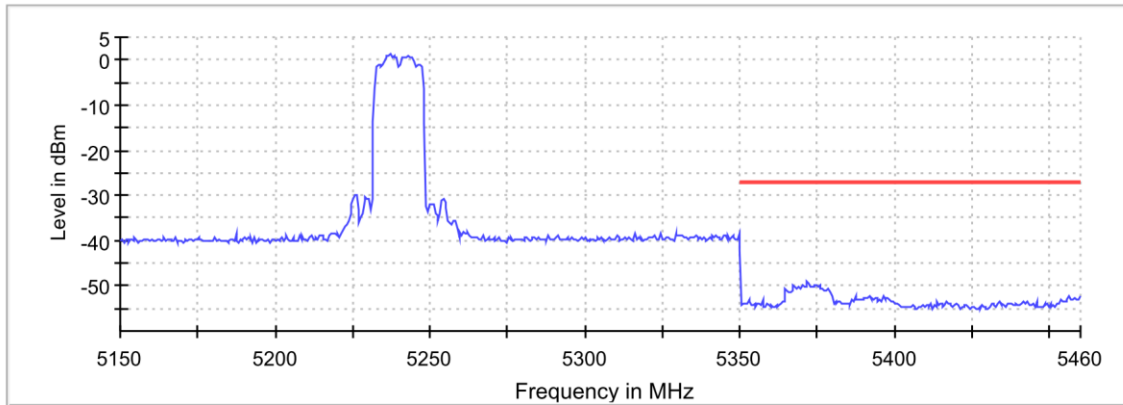
## Test Report

Date : 2020-10-08  
No. : HM20070018

Page 40 of 45

5240 MHz

Band edge measurement  
Band Edge



— Limit    × Fail    — Sum Level

The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.





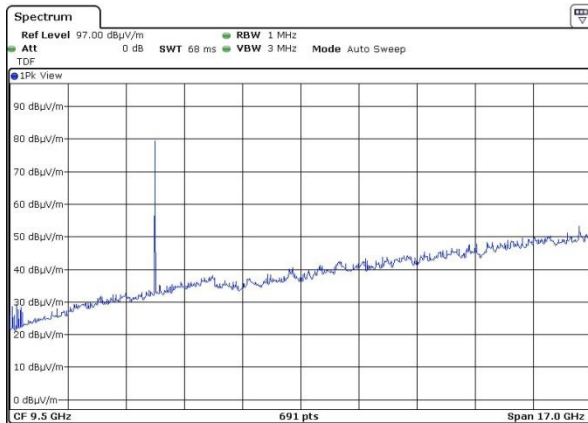
# Test Report

Date : 2020-10-08  
No. : HM20070018

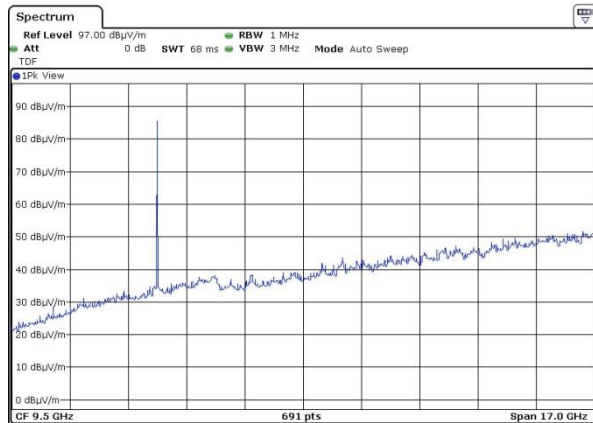
Page 41 of 45

5240 MHz

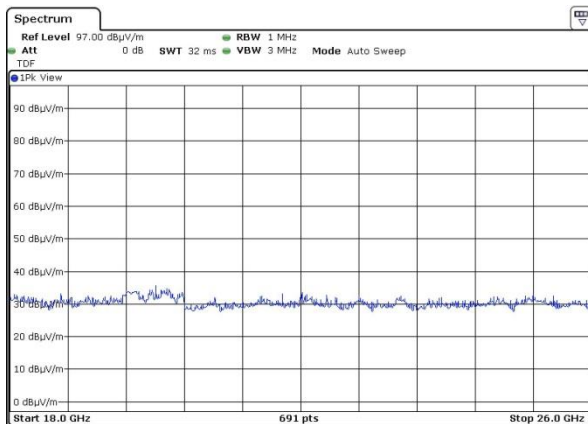
1GHz to 18GHz V



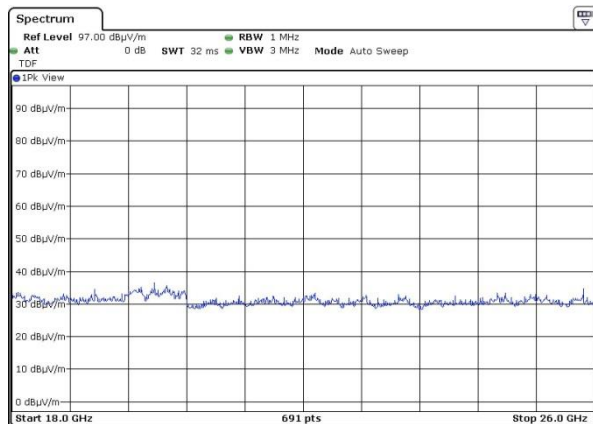
1GHz to 18GHz H



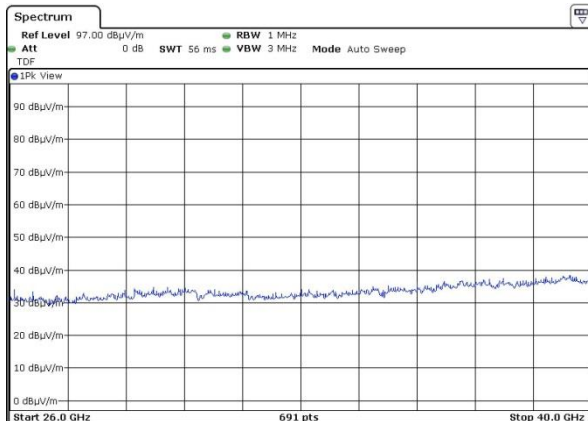
18GHz to 26GHz V



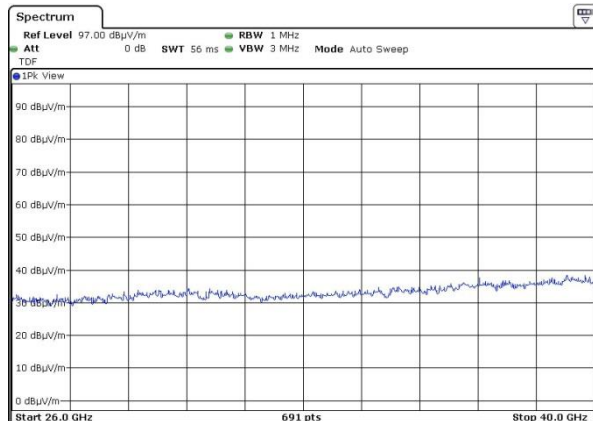
18GHz to 26GHz H



26GHz to 40GHz V



26GHz to 40GHz H



The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



## Test Report

Date : 2020-10-08  
 No. : HM20070018

Page 42 of 45

### Appendix C

#### 99% Bandwidth Measurement

Antenna A

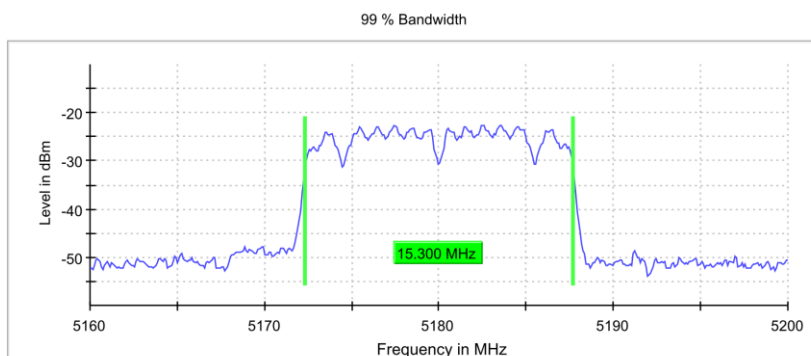
RBW = 200 kHz      VBW = 1 MHz      Sweep time = 47.3  $\mu$ s      Span = 40 MHz

#### 99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5180.000000	15.300000	---	---	5172.350000	5187.650000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
5180.000000	PASS

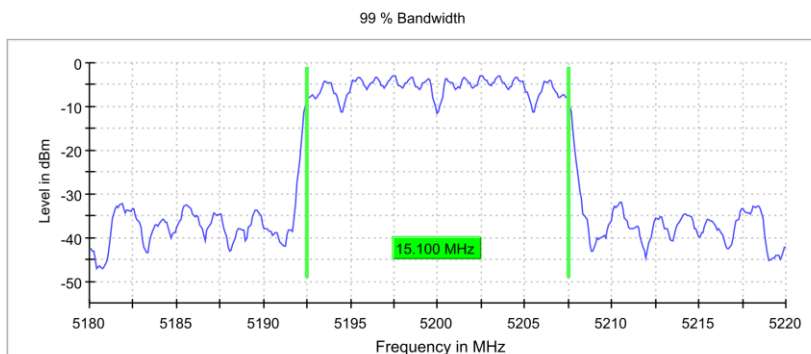


#### 99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5200.000000	15.100000	---	---	5192.450000	5207.550000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
5200.000000	PASS



The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



## Test Report

Date : 2020-10-08  
 No. : HM20070018

Page 43 of 45

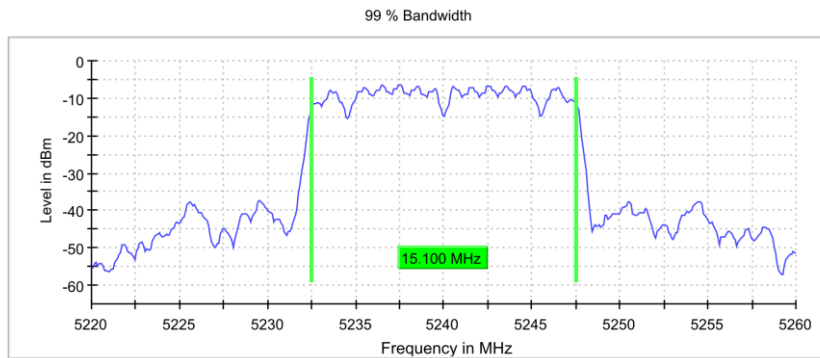
RBW = 200 kHz      VBW = 1 MHz      Sweep time = 47.3  $\mu$ s      Span = 40 MHz

### 99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5240.000000	15.100000	---	---	5232.450000	5247.550000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
5240.000000	PASS



The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.

## Test Report

Date : 2020-10-08  
 No. : HM20070018

Page 44 of 45

**Antenna B**

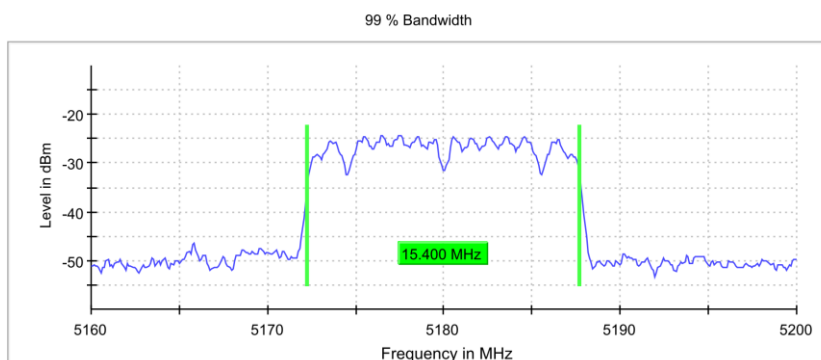
RBW = 200 kHz      VBW = 1 MHz      Sweep time = 47.3  $\mu$ s      Span = 40 MHz

**99 % Bandwidth**

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5180.000000	15.400000	---	---	5172.250000	5187.650000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
5180.000000	PASS

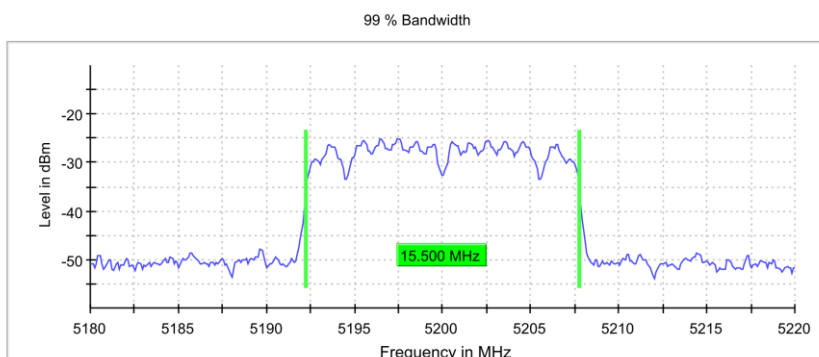


**99 % Bandwidth**

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5200.000000	15.500000	---	---	5192.250000	5207.750000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
5200.000000	PASS





## Test Report

Date : 2020-10-08  
 No. : HM20070018

Page 45 of 45

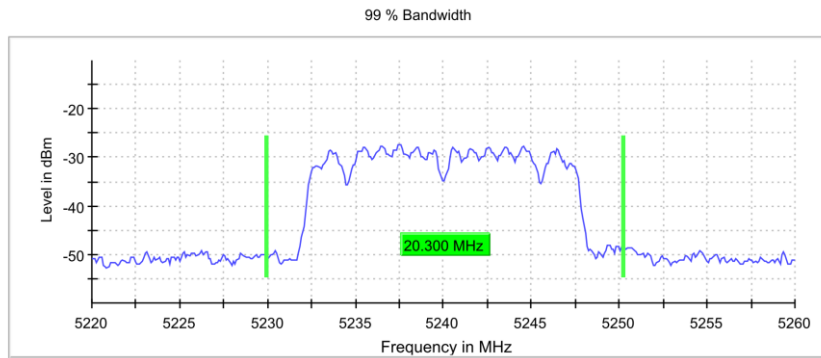
RBW = 200 kHz      VBW = 1 MHz      Sweep time = 47.3  $\mu$ s      Span = 40 MHz

### 99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
5240.000000	20.300000	---	---	5229.950000	5250.250000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
5240.000000	PASS



\*\*\*\*\* End of Test Report \*\*\*\*\*

The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: [hkstc@stc.group](mailto:hkstc@stc.group) Website: [www.stc.group](http://www.stc.group)

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.

## Conditions of Issuance of Test Reports

1. All samples and goods are accepted by The Hong Kong Standards & Testing Centre Limited (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The Company provides its services on the basis that such terms and conditions constitute express agreement between the Company and any person, firm or company requesting its services (the "Clients").
2. Any report issued by the Company as a result of this application for testing service (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to his customer, supplier or other persons directly concerned. Subject to clause 3, the Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3. The Company shall be at liberty to disclose the testing-related documents and/or files anytime to any third-party accreditation and/or recognition bodies for audit or other related purposes. No liabilities whatsoever shall attach to the Company's act of disclosure.
4. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
5. The results in Report apply only to the sample as received and do not apply to the bulk, unless the sampling has been carried out by the Company and is stated as such in the Report.
6. When a statement of conformity to a specification or standard is provided, the ILAC-G8 Guidance document (and/or IEC Guide 115 in the electrotechnical sector) will be adopted as a decision rule for the determination of conformity unless it is inherent in the requested specification or standard, or otherwise specified in the Report.
7. In the event of the improper use the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
8. Sample submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
9. The Company will not be liable for or accept responsibility for any loss or damage howsoever arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
10. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
11. Subject to the variable length of retention time for test data and report stored hereinto as to otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of this test report for a period of three years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after the retention period. Under no circumstances shall we be liable for damages of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.
12. Issuance records of the Report are available on the internet at [www.stc.group](http://www.stc.group). Further enquiry of validity or verification of the Reports should be addressed to the Company.