



**CFR 47 FCC PART 15 SUBPART E  
ISED RSS-247 ISSUE 2**

**TEST REPORT**

*For*

**CHAMPe Bingo Handset**

**MODEL NUMBER: VK7**

**FCC ID: 2AUX7-VK7**

**IC: 25598- VK7**

**REPORT NUMBER: 4789391992-4**

**ISSUE DATE: May 14, 2020**

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	05/14/2020	Initial Issue	



Summary of Test Results			
Clause	Test Items	FCC/IC Rules	Test Results
1	6dB/26dB Bandwidth	FCC 15.407 (a)&(e) RSS-247 Clause 6.2	PASS
2	99% Occupied Bandwidth	RSS-Gen Clause 6.6	PASS
3	Maximum Conducted Output Power	FCC 15.407 (a) RSS-247 Clause 6.2	PASS
4	Power Spectral Density	FCC 15.407 (a) RSS-247 Clause 6.2	PASS
5	Radiated Bandedge and Spurious Emission	FCC 15.407 (b) FCC 15.209 FCC 15.205 RSS-247 Clause 6.2 RSS-GEN Clause 8.9	PASS
6	Conducted Emission Test For AC Power Port	FCC 15.207 RSS-GEN Clause 8.8	PASS
7	Frequency Stability	FCC 15.407 (g)	PASS
8	Dynamic Frequency Selection	FCC 15.407 (h) RSS-247 Clause 6.3	PASS
9	Antenna Requirement	FCC 15.203 RSS-GEN Clause 8.3	PASS
Note: This test report is only published to and used by the applicant, and it is not for evidence purpose in China.			



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## 1. ATTESTATION OF TEST RESULTS

### Applicant Information

Company Name: Estone Technology LTD  
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Shenzhen China

### Manufacturer Information

Company Name: Estone Technology LTD  
Address: 2F,Bldg#1, Jia'an Industrial Park,No.2 Long Chang Rd,Bao'an  
Shenzhen China

### EUT Description

EUT Name: CHAMPe Bingo Handset  
Model: VK7  
Sample Status: Normal  
Sample ID: 2916641  
Sample Received Date: February 27, 2020  
Date of Tested: February 28~May 14, 2020

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 FCC PART 15 SUBPART E	PASS
ISED RSS-247 Issue 2	PASS
ISED RSS-GEN Issue 5	PASS

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## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, CFR 47 FCC Part 2, CFR 47 FCC Part 15, KDB 789033 D02 v02r01, RSS-GEN Issue 5, RSS-247 Issue 2, KDB414788 D01 Radiated Test Site v01, KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02 and KDB 905462 D03 UNII clients without radar detection New Rules v01r02. KDB 905462 D04 Operational Modes for DFS Testing New Rules v01

## 3. FACILITIES AND ACCREDITATION

Accreditation Certificate	<p><b>A2LA (Certificate No.: 4102.01)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA.</p> <p><b>FCC (FCC Designation No.: CN1187)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules</p> <p><b>ISED(Company No.: 21320)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320.</p> <p><b>VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011</p>
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Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Note 2: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

Note 3: For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30MHz had been correlated to measurements performed on an OFS.



## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognize national standards.

### 4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Uncertainty for Conduction emission test	3.62dB
Uncertainty for Radiation Emission test(include Fundamental emission) (9KHz-30MHz)	2.2dB
Uncertainty for Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.00dB
Uncertainty for Radiation Emission test (1GHz to 26GHz)( include Fundamental emission)	5.78dB (1GHz-18Gz)
	5.23dB (18GHz-26Gz)
	5.64dB (26GHz-40Gz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	





## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

EUT Name	CHAMPe Bingo Handset
Model	VK7
Radio Technology	IEEE802.11a 20 IEEE802.11n HT20/n HT40 IEEE802.11ac VHT20/VHT40/VHT80
Operation frequency	UNII-1/UNII-2A/UNII-2C/UNII-3
Modulation	OFDM(BPSK,QPSK,16QAM,64QAM, 256QAM only for 11 ac mode)
Power Supply	DC 3.7V



## 5.2. MAXIMUM EIRP

### UNII-1 BAND

IEE Std.	Frequency (MHz)	Max Power (dBm)	Max EIRP (dBm)
802.11a 20	5150-5250	15.43	21.61
802.11n HT20	5150-5250	14.34	20.52
802.11n HT40	5150-5250	14.37	20.55
802.11ac VHT20	5150-5250	13.38	19.56
802.11ac VHT40	5150-5250	13.32	19.50
802.11ac VHT80	5150-5250	13.47	19.65

### UNII-2A BAND

IEE Std.	Frequency (MHz)	Max Power (dBm)
802.11a 20	5250-5350	15.49
802.11n HT20	5250-5350	14.29
802.11n HT40	5250-5350	12.82
802.11ac VHT20	5250-5350	13.32
802.11ac VHT40	5250-5350	12.42
802.11ac VHT80	5250-5350	13.44

### UNII-2C BAND

IEE Std.	Frequency (MHz)	Max Power (dBm)
802.11a 20	5470-5725	13.32
802.11n HT20	5470-5725	11.93
802.11n HT40	5470-5725	9.87
802.11ac VHT20	5470-5725	11.86
802.11ac VHT40	5470-5725	9.92
802.11ac VHT80	5470-5725	10.50

### UNII-3 BAND

IEE Std. 802.11	Frequency (MHz)	Max Power (dBm)
802.11a 20	5725-5850	13.88
802.11n HT20	5725-5850	13.59
802.11n HT40	5725-5850	13.16
802.11ac VHT20	5725-5850	13.14
802.11ac VHT40	5725-5850	13.13
802.11ac VHT80	5725-5850	12.81



### 5.3. CHANNEL LIST

20 MHz Bandwidth Channel frequencies		
Band	Channel	Frequency (MHz)
UNII-1	36	5180
	40	5200
	44	5220
	48	5240
UNII-2A	52	5260
	56	5280
	60	5300
	64	5320
UNII-2C	100	5500
	104	5520
	108	5540
	112	5560
	116	5580
	132	5660
	136	5680
	140	5700
UNII-3	149	5745
	153	5765
	157	5785
	161	5805
	165	5825

40 MHz Bandwidth Channel frequencies		
Band	Channel	Frequency (MHz)
UNII-1	38	5190
	46	5230
UNII-2	54	5270
	62	5310
UNII-2C	102	5510
	110	5550
	134	5670
UNII-3	151	5755
	159	5795



80 MHz Bandwidth Channel frequencies		
Band	Channel	Frequency (MHz)
UNII-1	42	5210
UNII-2A	58	5290
UNII-2C	106	5530
	122	5610
UNII-3	155	5775

Straddle Channel frequencies		
Bandwidth	Channel	Frequency (MHz)
20MHz	144	5720
40MHz	142	5710
80MHz	138	5690



#### 5.4. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter	
Test Software	Ampak RFTTestTool

UNII-1

Mode	Rate	Channel	Soft set value
11a 20	6M	36	72
		40	72
		48	72
11n HT20	MCS0	36	70
		40	70
		48	70
11n HT40	MCS0	38	73
		46	73
11ac VHT20	MCS0	36	65
		40	65
		48	66
11ac VHT40	MCS0	38	70
		46	70
11ac VHT80	MCS0	42	70

UNII-2A

Mode	Rate	Channel	Soft set value
11a	6M	52	72
		60	72
		64	72
11n HT20	MCS0	52	72
		60	74
		64	76
11n HT40	MCS0	54	71
		62	71
11ac VHT20	MCS0	52	68
		60	70
		64	64
11ac VHT40	MCS0	54	69
		62	69
11ac VHT80	MCS0	58	71



## UNII-2C

Mode	Rate	Channel	Soft set value
11a 20	6M	100	70
		120	68
		140	63
		144	68
11n HT20	MCS0	100	64
		120	64
		140	60
		144	62
11n HT40	MCS0	102	60
		118	60
		134	57
		142	56
11ac VHT20	MCS0	100	64
		120	64
		140	58
		144	68
11ac VHT40	MCS0	102	58
		118	58
		134	57
		142	54
11ac VHT80	MCS0	106	62
		122	62
		138	70

## UNII-3

Mode	Rate	Channel	Soft set value
11a 20	6M	149	72
		157	72
		165	72
11n HT20	MCS0	149	72
		157	72
		165	74
11n HT40	MCS0	151	71
		159	71
11ac VHT20	MCS0	149	70
		157	71
		165	72
11ac VHT40	MCS0	151	72
		159	72
11ac VHT80	MCS0	155	70



## 5.5. THE WORSE CASE CONFIGURATIONS

Worst-case data rates as provided by the client were:

802.11a 20 mode: 6 Mbps  
802.11n HT20 mode: MCS0  
802.11n HT40 mode: MCS0  
802.11ac VHT20 mode: MCS0  
802.11ac VHT40 mode: MCS0  
802.11ac VHT80 mode: MCS0

802.11ac VHT20 and VHT40 mode are different from 802.11nHT20 and HT40 only in control messages, so for these 4 modes, only 802.11nHT20 and 802.11nHT40 worst case power modes data are recorded in the report .



## 5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna No.	Frequency (MHz)	Antenna Type	Max Antenna Gain (dBi)
1	5150-5250	PCB Antenna	2.95
1	5250-5350	PCB Antenna	2.09
1	5470-5725	PCB Antenna	6.18
1	5725-5850	PCB Antenna	6.18

IEE Std. 802.11	Transmit and Receive Mode	Description
802.11a 20	<input checked="" type="checkbox"/> 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.
802.11n HT20	<input checked="" type="checkbox"/> 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.
802.11n HT40	<input checked="" type="checkbox"/> 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.
802.11ac VHT20	<input checked="" type="checkbox"/> 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.
802.11ac VHT40	<input checked="" type="checkbox"/> 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.
802.11ac VHT80	<input checked="" type="checkbox"/> 1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.

Note:

1. BT&WLAN 2.4G and BT&WLAN 5G can transmit simultaneously, WLAN 2.4G and WLAN 5G can't transmit simultaneously. (declared by client)





## 5.7. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	Remarks
1	Adapter	/	PS30D120K2000UD	Input: AC 120-240V 50/60Hz 0.8A Output: DC 12V/2A

### I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
/1	/	/	/	/	/

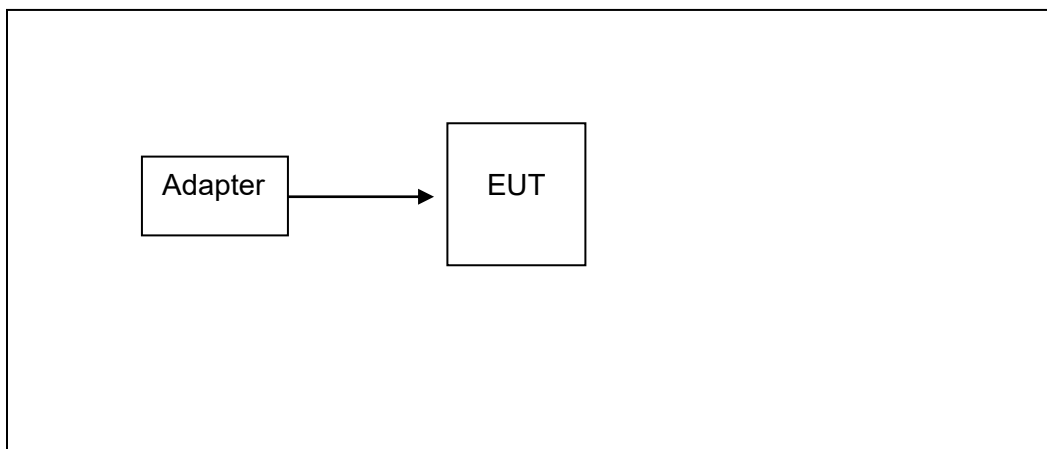
### ACCESSORIES

Item	Accessory	Brand Name	Model Name	Description
/	/	/	/	/

### TEST SETUP

The EUT can work in engineering mode with a software.

### SETUP DIAGRAM FOR TESTS



**6. MEASURING INSTRUMENT AND SOFTWARE USED**

Conducted Emissions						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	EMI Test Receiver	R&S	ESR3	101961	Dec.05,2019	Dec.05,2020
<input checked="" type="checkbox"/>	Two-Line V-Network	R&S	ENV216	101983	Dec.05,2019	Dec.05,2020
<input checked="" type="checkbox"/>	Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Dec.05,2019	Dec.05,2020
Software						
Used	Description		Manufacturer	Name	Version	
<input checked="" type="checkbox"/>	Test Software for Conducted disturbance		Farad	EZ-EMC	Ver. UL-3A1	
Radiated Emissions						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Dec.06,2019	Dec.06,2020
<input checked="" type="checkbox"/>	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Sep.17, 2018	Sep.17, 2021
<input checked="" type="checkbox"/>	Preamplifier	HP	8447D	2944A09099	Dec.05,2019	Dec.05,2020
<input checked="" type="checkbox"/>	EMI Measurement Receiver	R&S	ESR26	101377	Dec.05,2019	Dec.05,2020
<input checked="" type="checkbox"/>	Horn Antenna	TDK	HRN-0118	130939	Sep.17, 2018	Sep.17, 2021
<input checked="" type="checkbox"/>	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Aug.11, 2018	Aug.11, 2021
<input checked="" type="checkbox"/>	Preamplifier	TDK	PA-02-0118	TRS-305-00066	Dec.05,2019	Dec.05,2020
<input checked="" type="checkbox"/>	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec.05,2019	Dec.05,2020
<input checked="" type="checkbox"/>	Preamplifier	TDK	PA-02-3	TRS-308-00002	Dec.05,2019	Dec.05,2020
<input checked="" type="checkbox"/>	Loop antenna	Schwarzbeck	1519B	00008	Jan.07, 2019	Jan.07, 2022
<input checked="" type="checkbox"/>	Band Reject Filter	Wainwright	WRCJV12-5695-5725-5850-5880-40SS	4	Dec.05,2019	Dec.05,2020
<input checked="" type="checkbox"/>	Band Reject Filter	Wainwright	WRCJV20-5120-5150-5350-5380-60SS	2	Dec.05,2019	Dec.05,2020
<input checked="" type="checkbox"/>	Band Reject Filter	Wainwright	WRCJV20-5440-5470-5725-5755-60SS	1	Dec.05,2019	Dec.05,2020



<input checked="" type="checkbox"/>	High Pass Filter	Wainwright	WHKX10-5850-6500-1800-40SS	4	Dec.05,2019	Dec.05,2020
Software						
Used	Description		Manufacturer	Name		Version
<input checked="" type="checkbox"/>	Test Software for Radiated disturbance		Farad	EZ-EMC		Ver. UL-3A1
Other instruments						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	Spectrum Analyzer	Keysight	N9030A	MY55410512	Dec.06,2019	Dec.06,2020
<input checked="" type="checkbox"/>	Power sensor, Power Meter	R&S	OSP120	100921	Dec.06,2019	Dec.06,2020



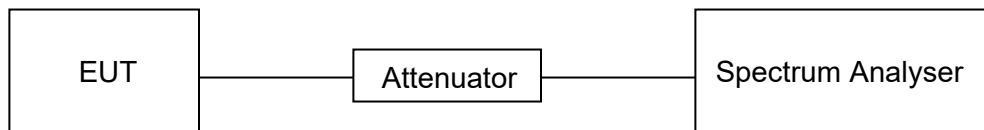
## 7. ANTENNA PORT TEST RESULTS

### 7.1. ON TIME AND DUTY CYCLE

#### LIMITS

None; for reporting purposes only

#### TEST SETUP



#### TEST ENVIRONMENT

Temperature	25.5°C	Relative Humidity	59%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V

#### RESULTS

Mode	ON Time (ms)	Period (ms)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (KHz)
802.11a 20	1.395	1.440	0.9688	96.88%	0.1377	1
802.11n HT20	1.310	1.350	0.9704	97.04%	0.1305	1
802.11ac VHT20	1.320	1.360	0.9706	97.06%	0.1296	1
802.11n HT40	0.649	0.689	0.9419	94.19%	0.2600	2
802.11ac VHT40	0.657	0.696	0.9440	94.40%	0.2503	2
802.11ac VHT80	0.323	0.365	0.8849	88.49%	0.5311	4

Note:

Duty Cycle Correction Factor=10log (1/x).

Where: x is Duty Cycle (Linear)

Where: T is On Time

If that calculated VBW is not available on the analyzer then the next higher value should be used.



802.11a 20



802.11n HT20



802.11ac VHT20



802.11ac VHT40



802.11n HT40



802.11ac HT80



## 7.2. 6/26/99% dB BANDWIDTH

### LIMITS

CFR 47 FCC Part15, Subpart E ISED RSS-247		
Test Item	Limit	Frequency Range (MHz)
Bandwidth	26 dB Bandwidth	5150-5250
	26 dB Bandwidth	5250-5350
	26 dB Bandwidth	For FCC:5470-5725 For IC:5470-5600 5650-5725
	Minimum 500kHz 6dB Bandwidth	5725-5850

ISED RSS-247		
RSS-Gen Clause 6.6	99% Bandwidth	For reporting purposes only.

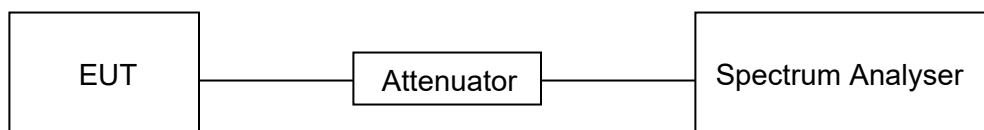
### TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	For 6dB Bandwidth: RBW=100kHz For 26dB Bandwidth: approximately 1% of the emission bandwidth. For 99dB Bandwidth: approximately 1%~5% of the emission bandwidth.
VBW	For 6dB Bandwidth : VBW=300kHz For 26dB Bandwidth : >3RBW For 99%dB Bandwidth : >3RBW
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6dB/26dB&99% Occupied Bandwidth relative to the maximum level measured in the fundamental emission.

### TEST SETUP





## **TEST ENVIRONMENT**

Temperature	25.5°C	Relative Humidity	59%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V

## **RESULTS**



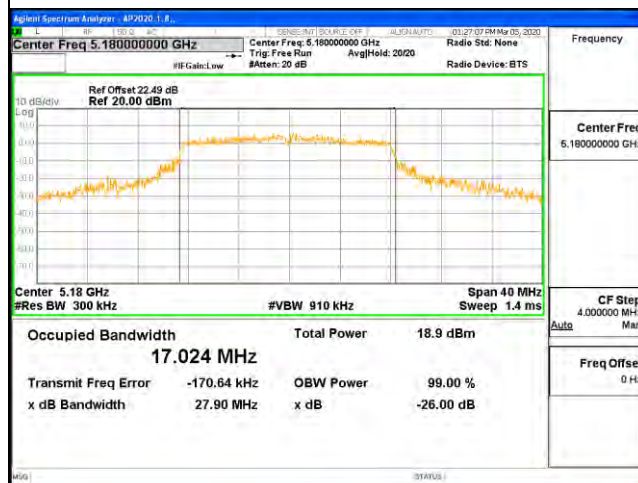


### 7.2.1. 802.11a 20 MODE

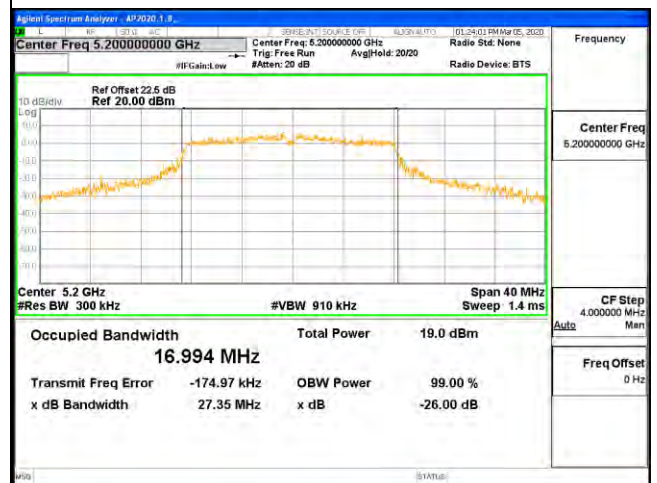
#### UNII-1 BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5180	27.90	17.024
Mid	5200	27.35	16.994
High	5240	24.87	16.911

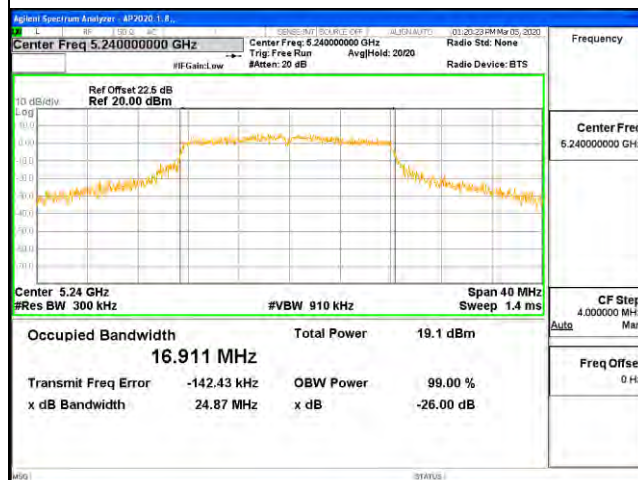
#### Low CHANNEL



#### Mid CHANNEL



#### High CHANNEL



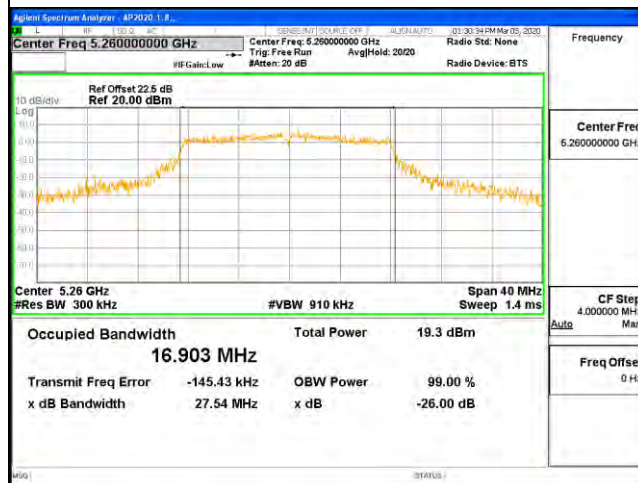




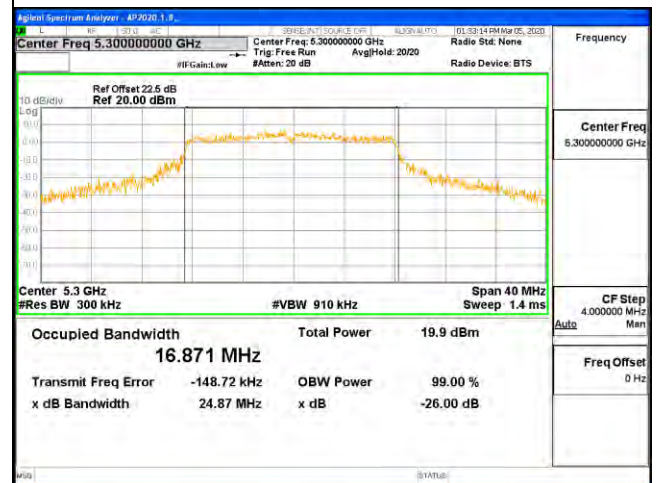
### UNII-2A BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5260	27.54	16.903
Mid	5300	24.87	16.871
High	5320	22.83	16.725

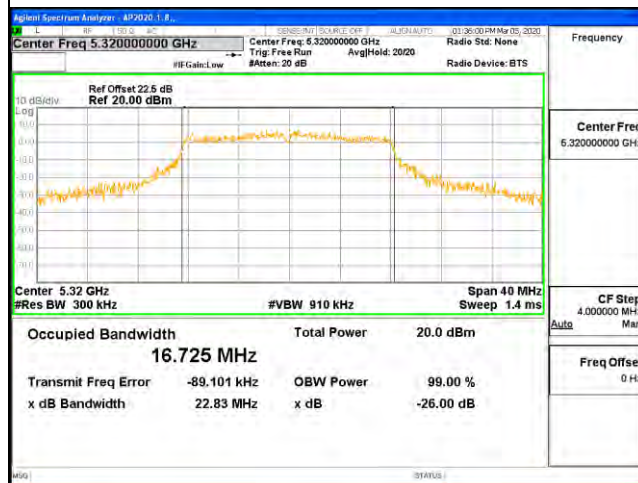
#### Low CHANNEL



#### Mid CHANNEL



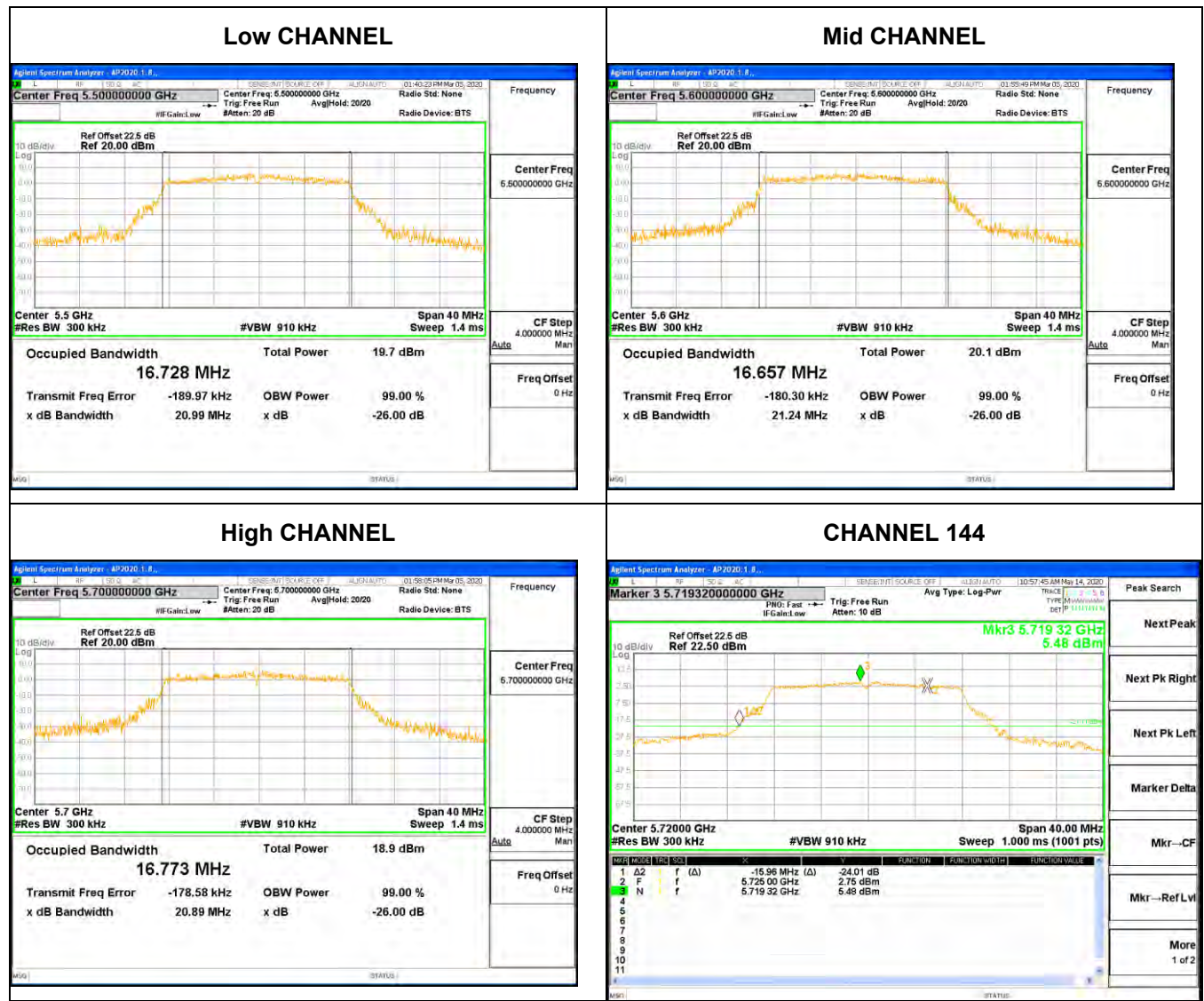
#### High CHANNEL

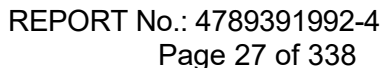




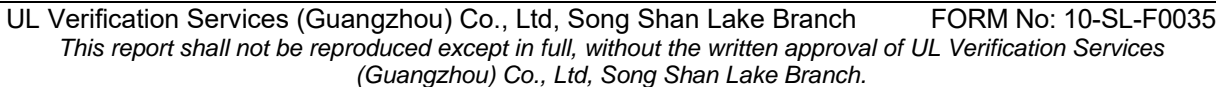
### UNII-2C BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5500	20.99	16.728
Mid	5600	21.24	16.657
High	5700	20.89	16.773
CH144	5720	15.96	/





Channel	Frequency (MHz)	6 dB BW (MHz)	99% BW (MHz)	Limit For 6dB BW (KHz)	Result
Low	5745	16.330	16.831	500	PASS
Mid	5785	16.055	16.674	500	PASS
High	5825	16.050	16.695	500	PASS
CH144	5720	3.125	/	500	PASS







Note: All the modes and antenna ports had been tested, only the worst data recorded in the report.



## 7.2.2. 802.11n HT20 MODE

### UNII-1 BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5180	21.43	17.775
Mid	5200	21.35	17.867
High	5240	20.98	17.783

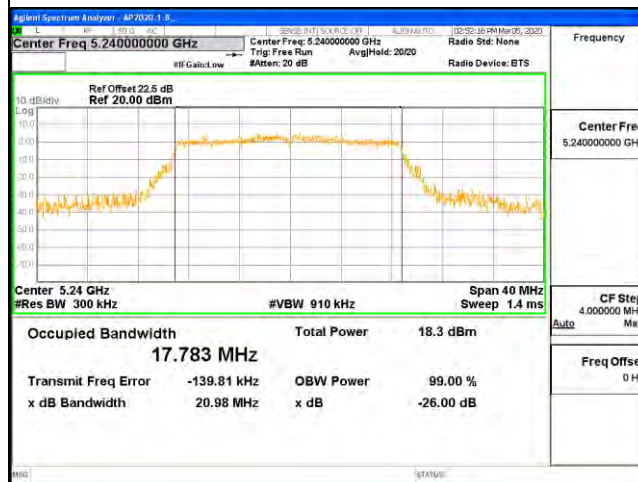
#### Low CHANNEL



#### Mid CHANNEL



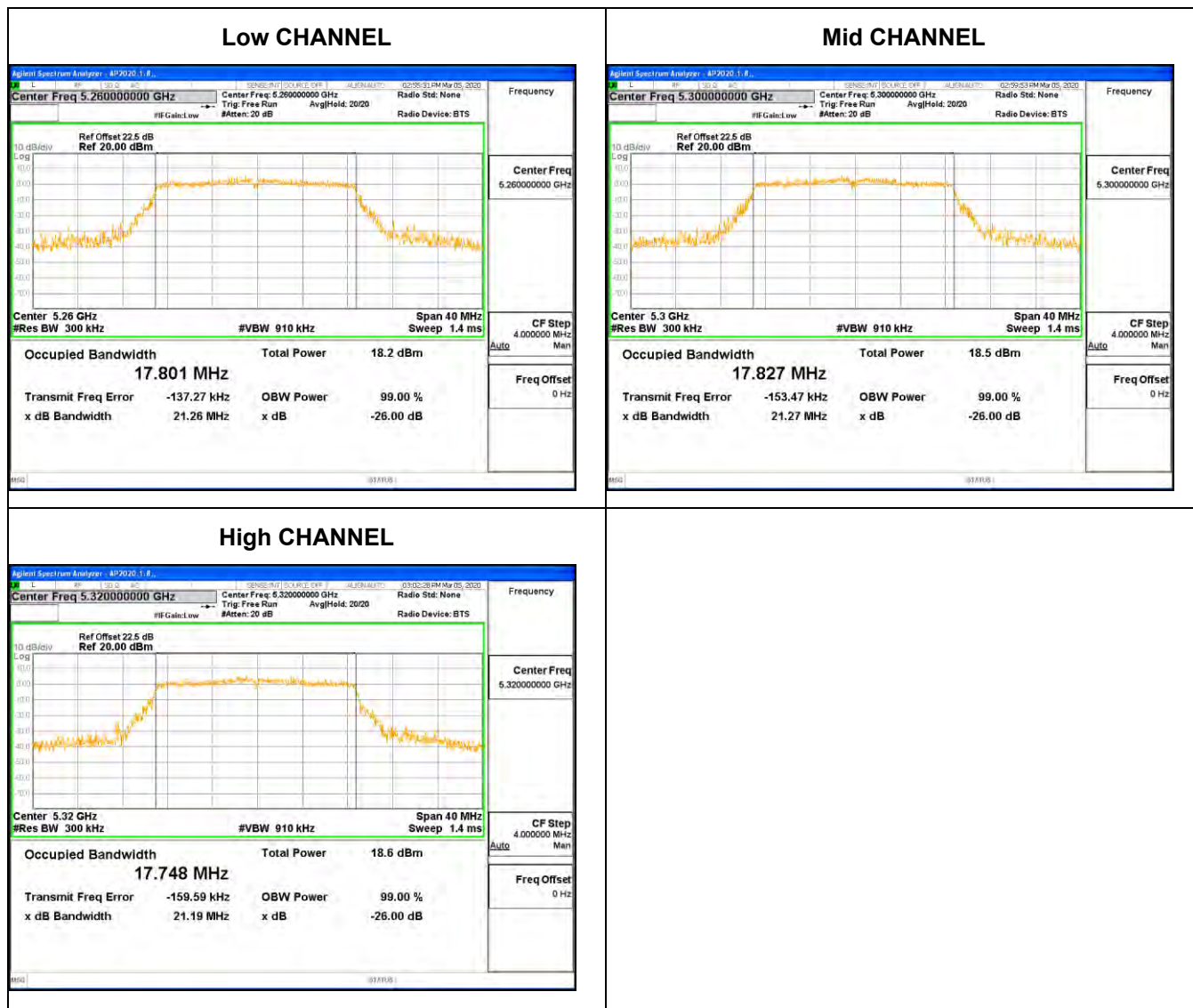
#### High CHANNEL





### UNII-2A BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5260	21.26	17.801
Mid	5300	21.27	17.827
High	5320	21.19	17.748

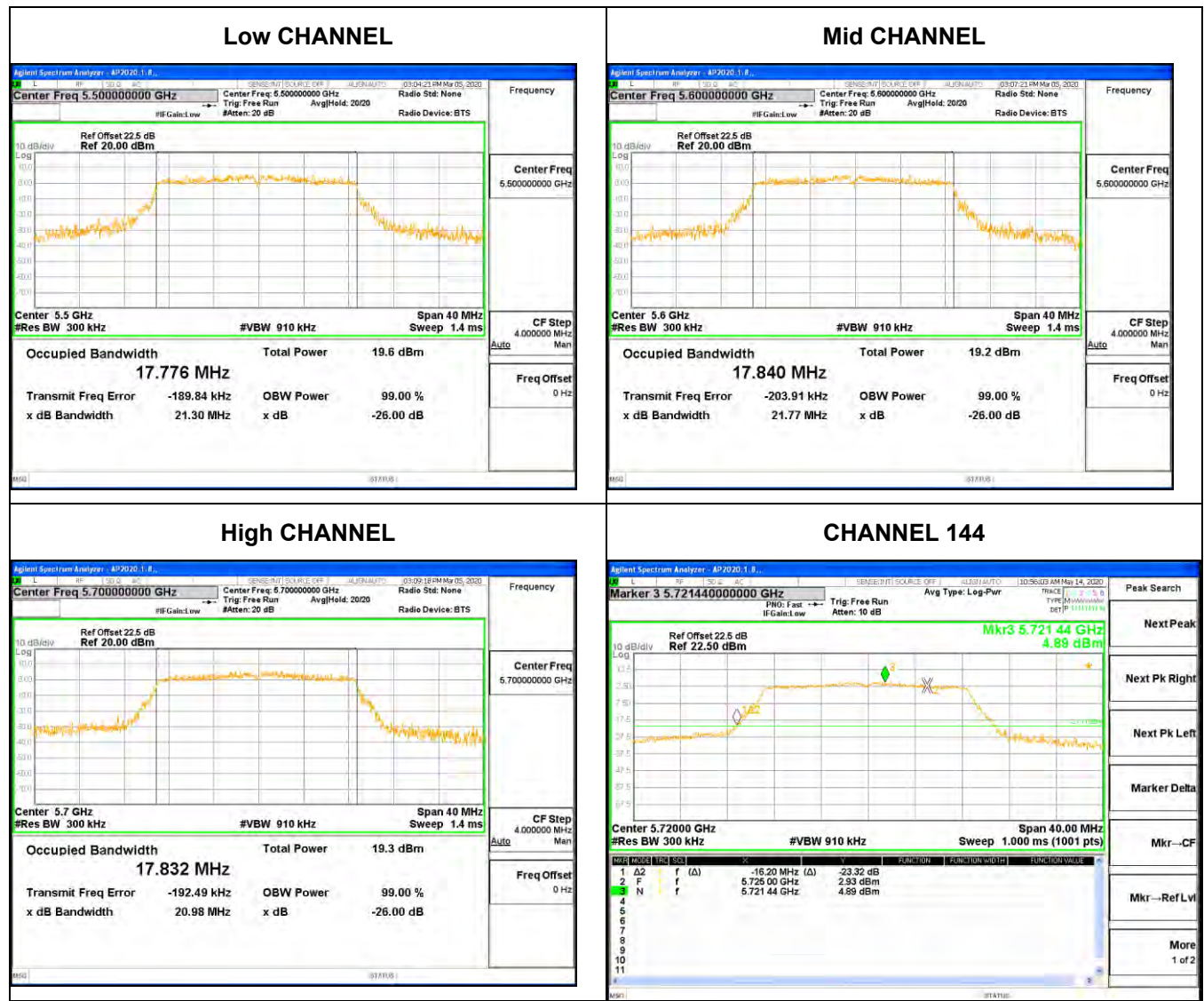






### UNII-2C BAND

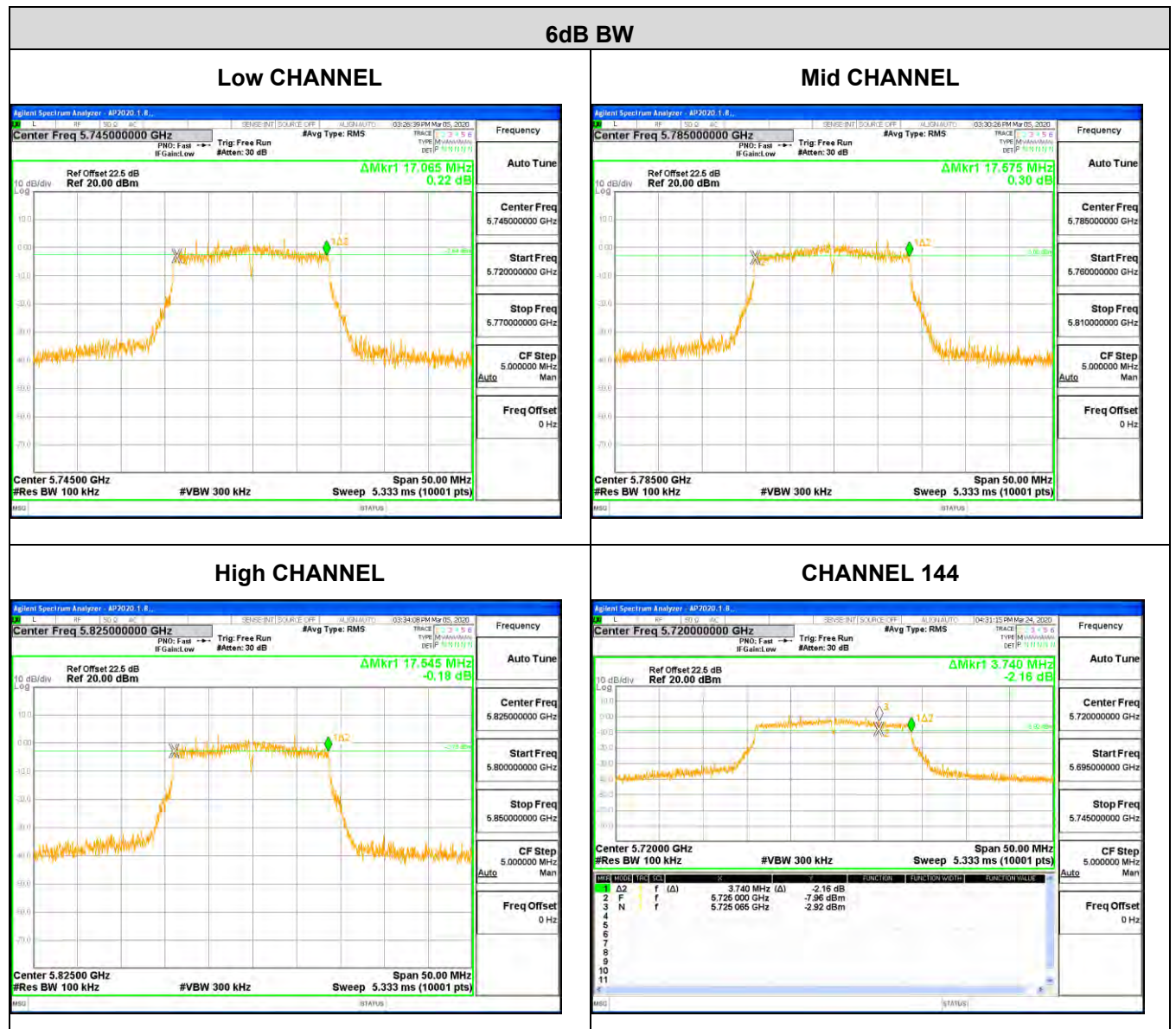
Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5500	21.30	17.776
Mid	5600	21.77	17.840
High	5700	20.98	17.832
CH144	5720	16.20	/



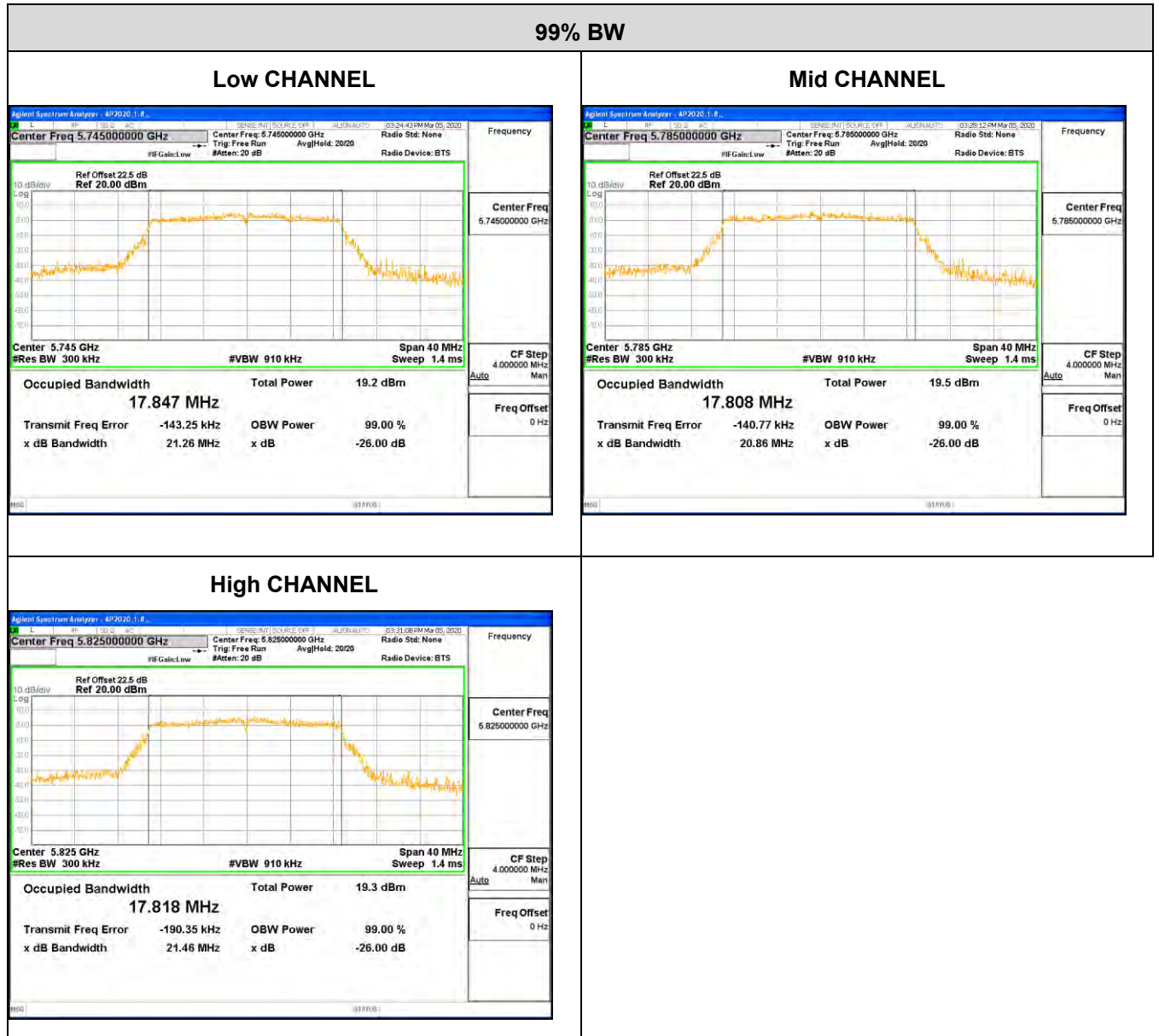


### UNII-3 BAND

Channel	Frequency (MHz)	6 dB BW (MHz)	99% BW (MHz)	Limit For 6dB BW (KHz)	Result
Low	5745	17.065	17.847	500	PASS
Mid	5785	17.575	17.808	500	PASS
High	5825	17.545	17.818	500	PASS
CH144	5720	3.740	/	500	PASS







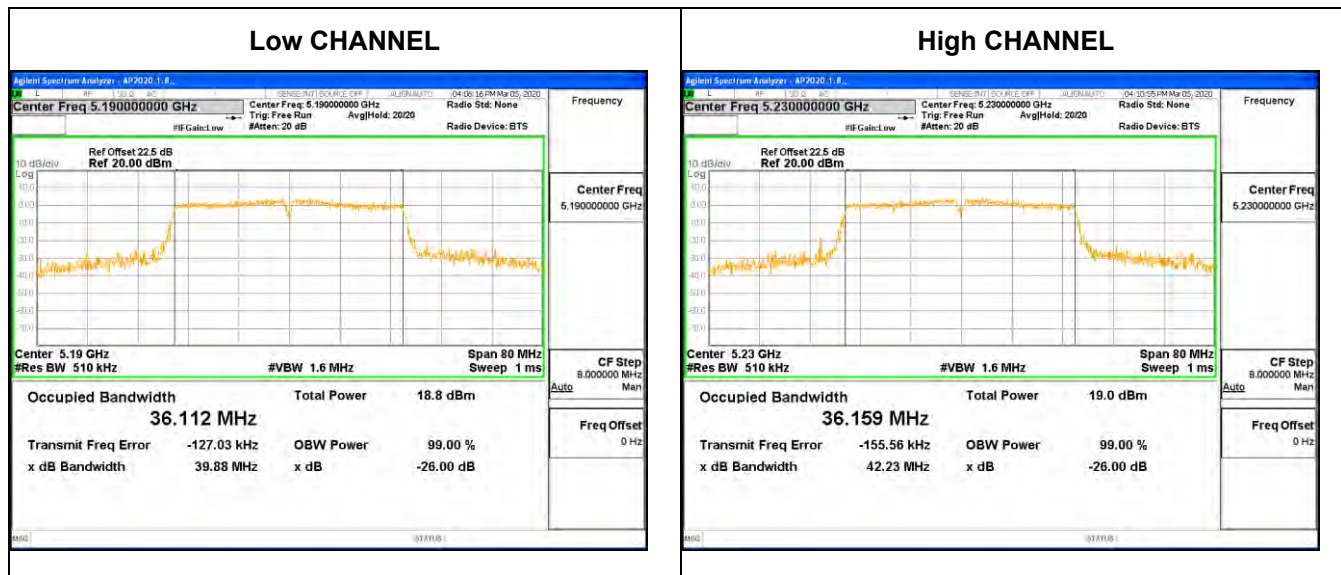
Note: All the modes and antenna ports had been tested, only the worst data recorded in the report.



### 7.2.3. 802.11n HT40 MODE

#### UNII-1 BAND

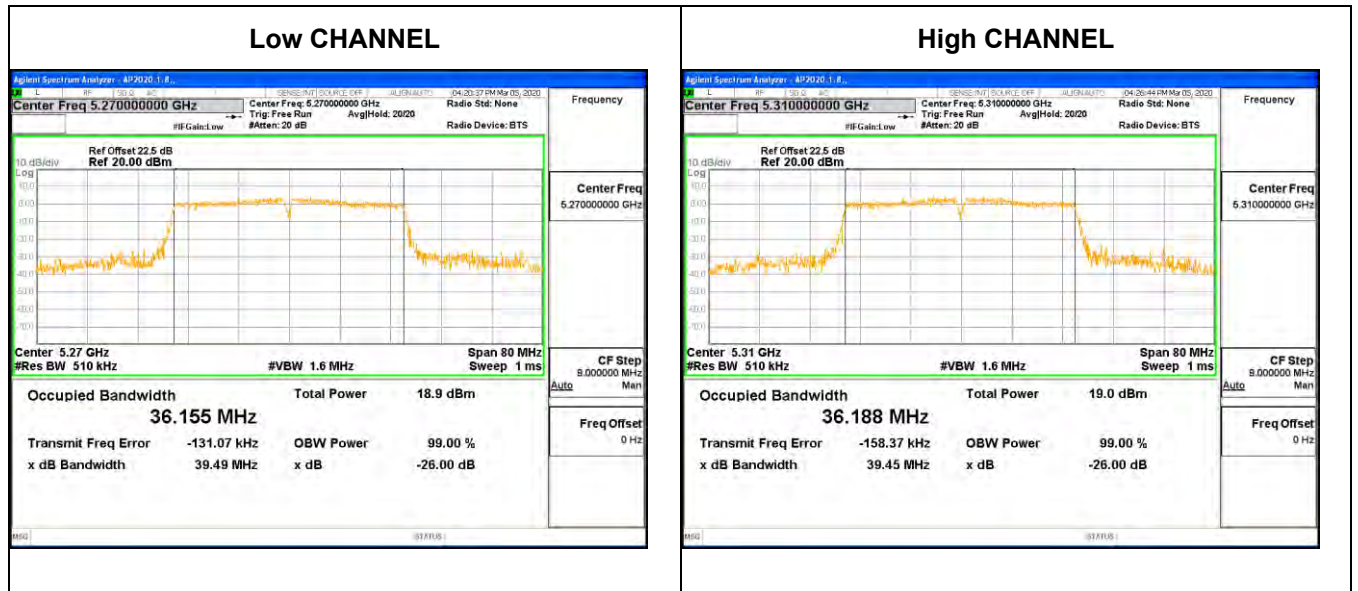
Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5190	39.88	36.112
High	5230	42.23	36.159





### UNII-2A BAND

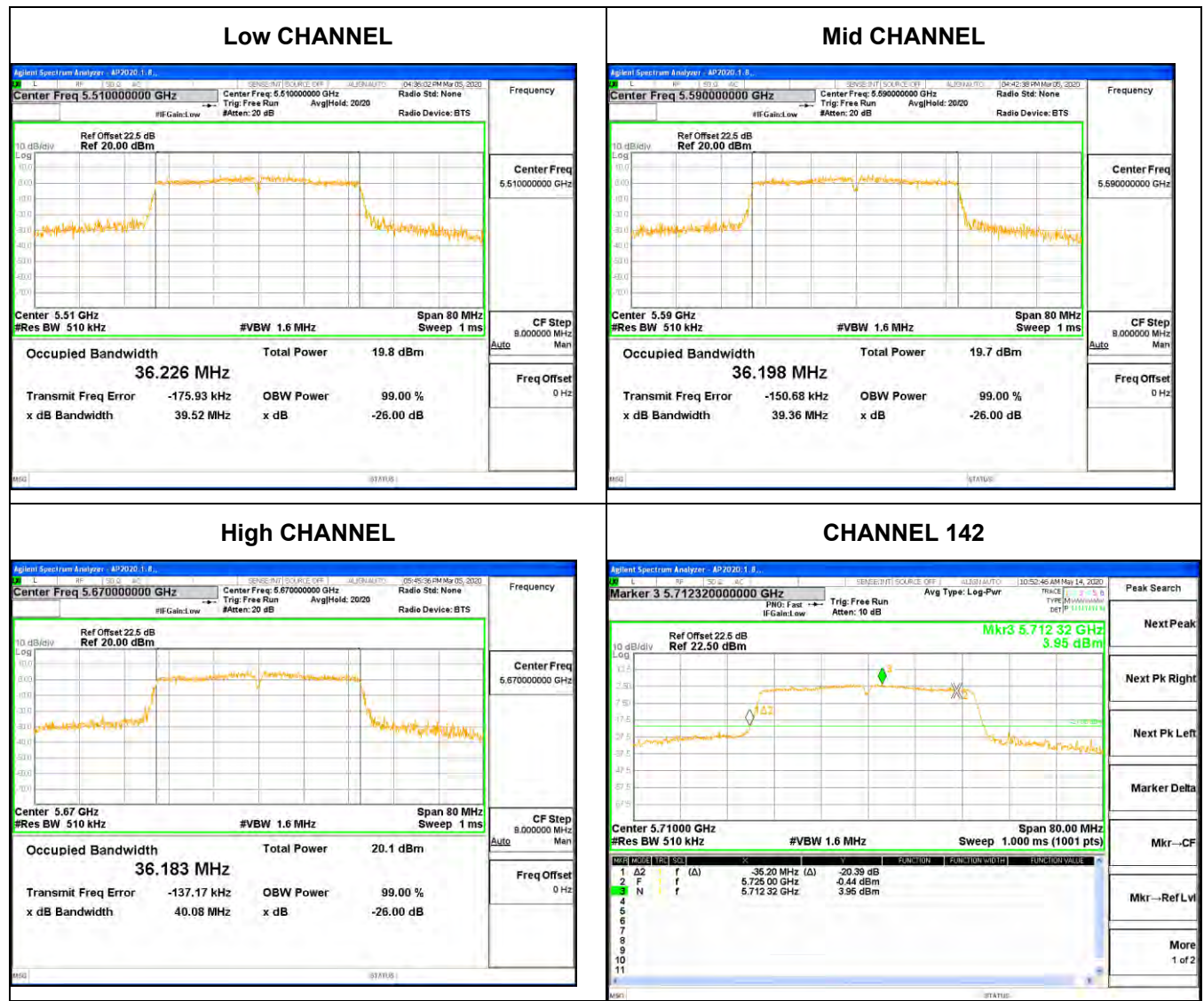
Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5270	39.49	36.155
High	5310	39.45	36.188



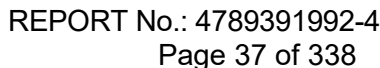


### UNII-2C BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5510	39.52	36.226
Mid	5590	39.36	36.198
High	5670	40.08	36.183
CH142	5710	35.20	36.157







Channel	Frequency (MHz)	6 dB BW (MHz)	99% BW (MHz)	Limit (KHz)	Result
Low	5755	34.95	36.264	500	PASS
High	5795	34.82	36.245	500	PASS
CH142	5710	2.96	/	500	PASS

## 6dB BW

### Low CHANNEL

Agilent Spectrum Analyzer - M7200.1.0

Center Freq 5.75500000 GHz

Ref Offset 22.5 dB  
Ref 20.00 dBm

ΔMkr1 34.95 MHz  
0.88 dB

Center Freq 5.75500000 GHz

Start Freq 5.705000000 GHz

Stop Freq 5.805000000 GHz

CF Step 10.000000 MHz

Freq Offset 0 Hz

Center 5.75500 GHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 10.00 ms (10001 pts)

### High CHANNEL

Agilent Spectrum Analyzer - M7200.1.0

Center Freq 5.79500000 GHz

Ref Offset 22.5 dB  
Ref 20.00 dBm

ΔMkr1 34.82 MHz  
0.19 dB

Center Freq 5.79500000 GHz

Start Freq 5.745000000 GHz

Stop Freq 5.845000000 GHz

CF Step 10.000000 MHz

Freq Offset 0 Hz

Center 5.79500 GHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 10.00 ms (10001 pts)

### CHANNEL 142

Agilent Spectrum Analyzer - M7200.1.0

Center Freq 5.71000000 GHz

Ref Offset 22.5 dB  
Ref 20.00 dBm

ΔMkr1 2.96 MHz  
0.20 dB

Center Freq 5.71000000 GHz

Start Freq 5.660000000 GHz

Stop Freq 5.760000000 GHz

CF Step 10.000000 MHz

Freq Offset 0 Hz

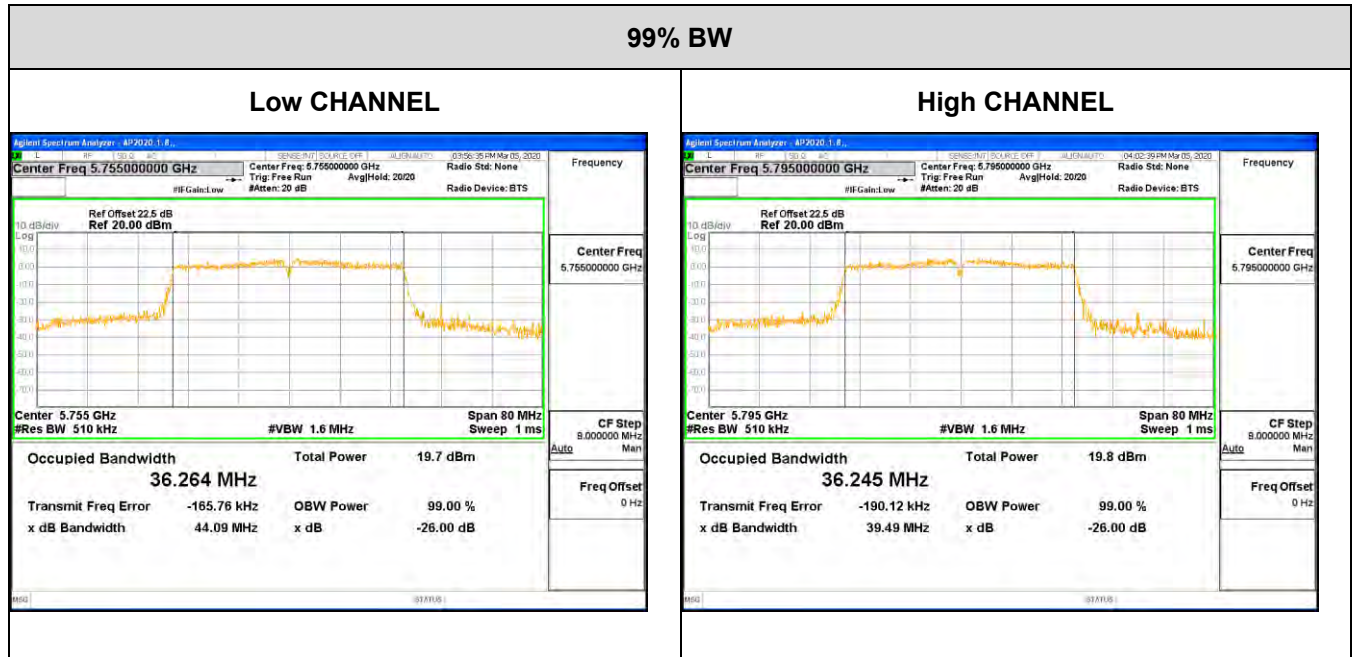
Center 5.71000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 10.00 ms (10001 pts)

MR	MODE	TRG	SQL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	f	(Δ)		2.96 MHz (Δ)			0.20 dB
2	F	f	(Δ)		5.728 00 GHz			-10.47 dBm
3	N	f	(Δ)		5.728 00 GHz			-4.53 dBm

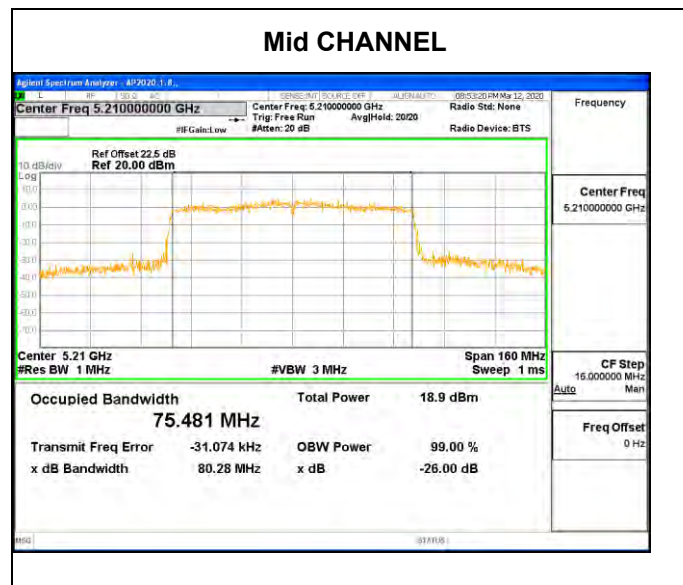


Note: All the modes and antenna ports had been tested, only the worst data recorded in the report.

## 7.2.4. 802.11ac VHT80 MODE

### UNII-1 BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Mid	5210	80.28	75.481

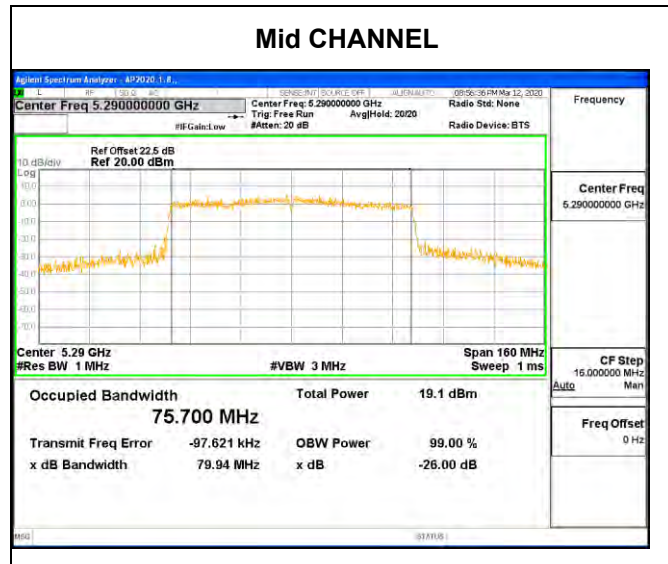




### UNII-2A BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Mid	5290	79.94	75.700

### Mid CHANNEL



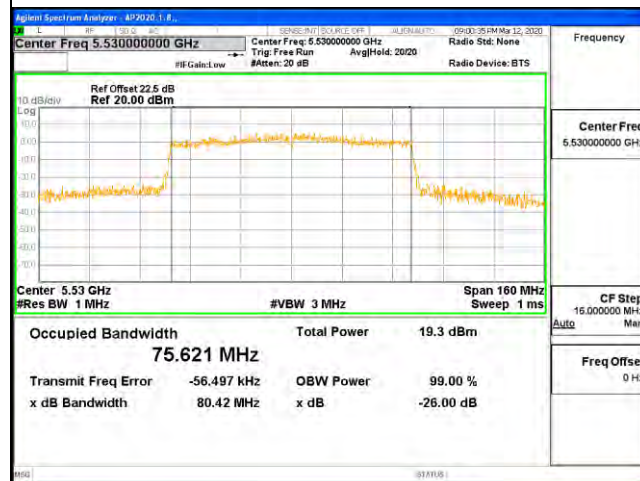




### UNII-2C BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5530	80.42	75.621
High	5610	79.85	75.412
CH138	5690	76.00	/

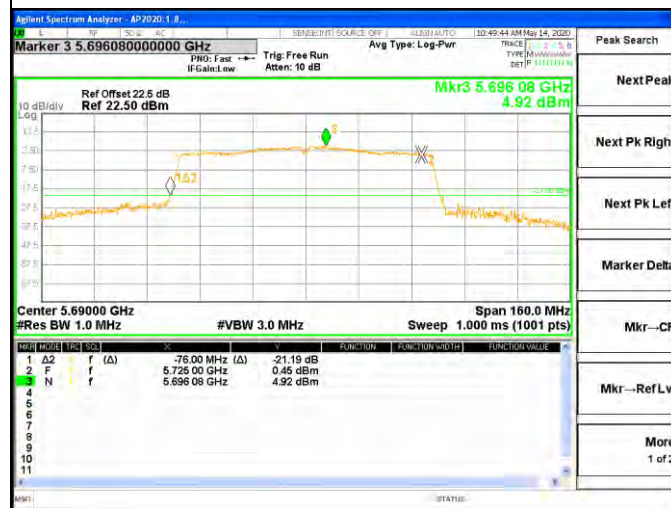
#### Low CHANNEL 100



#### Mid CHANNEL 116



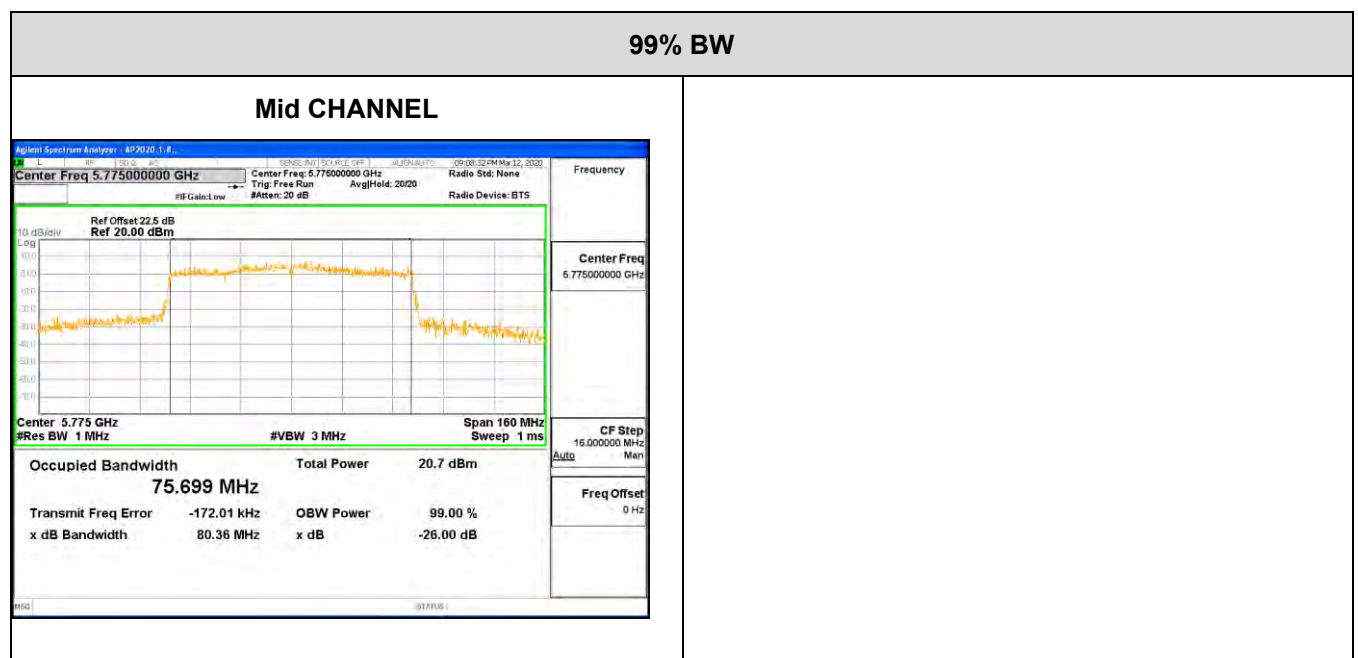
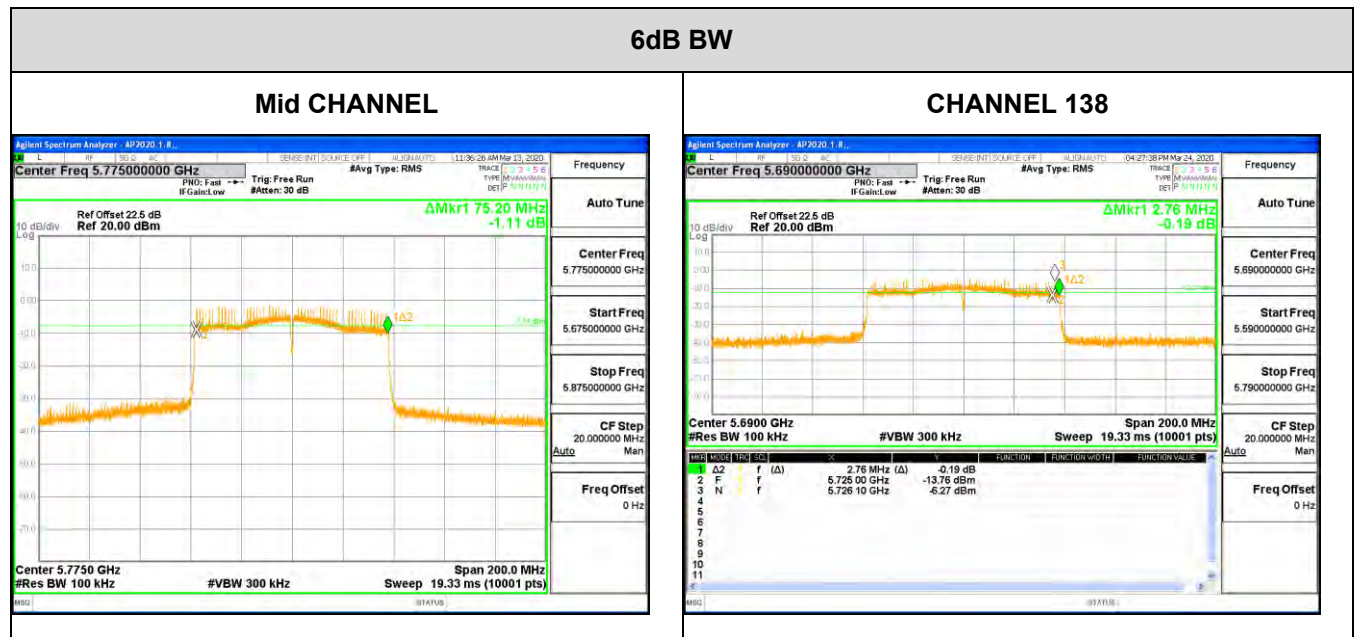
#### CHANNEL 138





### UNII-3 BAND

Channel	Frequency (MHz)	6 dB BW (MHz)	99% BW (MHz)	Limit For 6dB BW (KHz)	Result
Mid	5775	75.20	75.699	500	PASS
CH138	5690	2.76	/	500	PASS



Note: All the modes and antenna ports had been tested, only the worst data recorded in the report.



### 7.3. MAXIMUM CONDUCTED OUTPUT POWER

#### LIMITS

CFR 47 FCC Part15, Subpart E		
Test Item	Limit	Frequency Range (MHz)
Conducted Output Power	For FCC client devices:250mW (24dBm)	5150-5250
	Not exceed the lesser of 250 mW or 11 dBm + 10 log B whichever is less where B is the 26 dB emission bandwidth in megahertz	5250-5350
	Not exceed the lesser of 250 mW or 11 dBm + 10 log B whichever is less where B is the 26 dB emission bandwidth in megahertz	5470-5725
	1 Watt (30dBm)	5725-5850

ISED RSS-247		
Test Item	Limit	Frequency Range (MHz)
Conducted Output Power	Maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log <sub>10</sub> B, dBm, whichever is less where B is the 99% emission bandwidth in megahertz	5150-5250
	Not exceed 250 mW or 11 + 10 log <sub>10</sub> B, where B is the 99% emission bandwidth in megahertz	5250-5350
	Not exceed 250 mW or 11 + 10 log <sub>10</sub> B, where B is the 99% emission bandwidth in megahertz	5470-5600 5650-5725
	1 Watt (30dBm)	5725-5850

Note: If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.



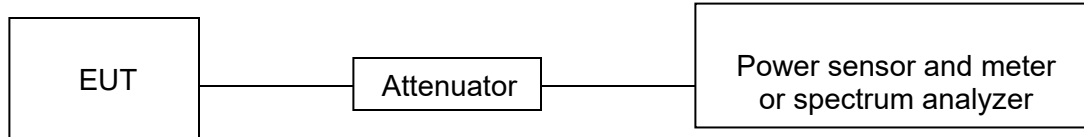
### **TEST PROCEDURE**

Refer to KDB 789033 D02 General UNII Test Procedures New Rules v02r01

Connect the EUT to the a broadband average RF power meter, the power meter shall have a video bandwidth that is greater than or equal to the bandwidth and shall utilize a fast-responding diode detector.

Straddle channel power is measured using PXA spectrum analyzer.

### **TEST SETUP**



### **TEST ENVIRONMENT**

Temperature	25.5°C	Relative Humidity	59%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V



## RESULTS

### 7.3.1. UNII-1 BAND

Mode	Frequency (MHz)	Antenna	CONDUCTED POWER (dBm)	FCC Limit (dBm)	EIRP (dBm)	ISED EIRP Limit (dBm)	Result
802.11a20	5180	1	15.21	24	18.16	23	PASS
	5200	1	15.38	24	18.33	23	PASS
	5240	1	15.43	24	18.38	23	PASS
802.11n HT20	5180	1	14.34	24	17.29	23	PASS
	5200	1	14.31	24	17.26	23	PASS
	5240	1	14.27	24	17.22	23	PASS
802.11ac VHT20	5180	1	13.11	24	16.06	23	PASS
	5200	1	13.24	24	16.19	23	PASS
	5240	1	13.38	24	16.33	23	PASS
802.11n HT40	5190	1	14.27	24	17.22	23	PASS
	5230	1	14.37	24	17.32	23	PASS
802.11ac VHT40	5190	1	13.32	24	16.27	23	PASS
	5230	1	13.29	24	16.24	23	PASS
802.11ac VHT80	5210	1	13.47	24	16.42	23	PASS

Note: 1. Conducted Power=Meas. Level+ Correction Factor

2. EIRP=conducted Power + Antenna Gain

3. The test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1



### 7.3.2. UNII-2A BAND

Mode	Frequency (MHz)	Antenna	CONDUCTED POWER (dBm)	FCC Limit (dBm)	ISED Limit (dBm)	Result
802.11a20	5260	1	15.32	24	23.3	PASS
	5300	1	15.49	24	23.3	PASS
	5320	1	15.31	24	23.3	PASS
802.11n HT20	5260	1	14.29	24	23.5	PASS
	5300	1	14.14	24	23.5	PASS
	5320	1	14.26	24	23.5	PASS
802.11ac VHT20	5260	1	13.28	24	23.5	PASS
	5300	1	13.11	24	23.5	PASS
	5320	1	13.32	24	23.5	PASS
802.11n HT40	5270	1	12.82	24	24	PASS
	5310	1	12.06	24	24	PASS
802.11ac VHT40	5270	1	12.42	24	24	PASS
	5310	1	11.84	24	24	PASS
802.11ac VHT80	5290	1	13.44	24	24	PASS

Note: 1. Conducted Power = Meas. Level + Correction Factor

2. The test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1



### 7.3.3. UNII-2C BAND

Mode	Frequency (MHz)	Antenna	CONDUCTED POWER (dBm)	FCC Limit (dBm)	ISED Limit (dBm)	Result
802.11a20	5500	1	12.16	24	23.2	PASS
	5600	1	13.32	24	23.2	PASS
	5700	1	12.37	24	23.2	PASS
802.11n HT20	5500	1	10.33	24	23.5	PASS
	5600	1	11.93	24	23.5	PASS
	5700	1	11.22	24	23.5	PASS
802.11ac VHT20	5500	1	10.26	24	23.5	PASS
	5600	1	11.81	24	23.5	PASS
	5700	1	10.96	24	23.5	PASS
802.11n HT40	5510	1	8.39	24	24	PASS
	5590	1	9.86	24	24	PASS
	5670	1	9.87	24	24	PASS
802.11ac VHT40	5510	1	8.26	24	24	PASS
	5590	1	9.41	24	24	PASS
	5670	1	9.92	24	24	PASS
802.11ac VHT80	5530	1	9.21	24	24	PASS
	5610	1	10.50	24	24	PASS

Note: 1. Conducted Power=Meas. Level+ Correction Factor

2. The test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1



### 7.3.4. UNII-3 BAND

Mode	Frequency (MHz)	Antenna	CONDUCTED POWER (dBm)	Limit (dBm)	Result
802.11a20	5745	1	13.88	30	PASS
	5785	1	12.37	30	PASS
	5825	1	12.45	30	PASS
802.11n HT20	5745	1	13.53	30	PASS
	5785	1	13.42	30	PASS
	5825	1	13.59	30	PASS
802.11ac VHT20	5745	1	13.06	30	PASS
	5785	1	12.92	30	PASS
	5825	1	13.14	30	PASS
802.11n HT40	5755	1	13.16	30	PASS
	5795	1	12.94	30	PASS
802.11ac VHT40	5755	1	13.13	30	PASS
	5795	1	12.82	30	PASS
802.11ac VHT80	5775	1	12.81	30	PASS

Note: 1. Conducted Power = Meas. Level + Correction Factor

2. The test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1





### 7.3.5. STRADDLE CHANNEL UNII-2C BAND

Mode	Frequency (MHz)	Conducted Output Power (dBm)	Min 26dB BW(MHz)	FCC Limit (dBm)	ISED Limit (dBm)
802.11a 20	5720	12.799	15.89	23	24
802.11n HT20	5720	11.385	15.75	23	24
802.11ac VHT20	5720	11.217	15.54	23	24
802.11n HT40	5710	9.616	34.99	24	24
802.11ac VHT40	5710	9.109	34.54	24	24
802.11ac VHT80	5690	9.126	75.18	24	24

Note:

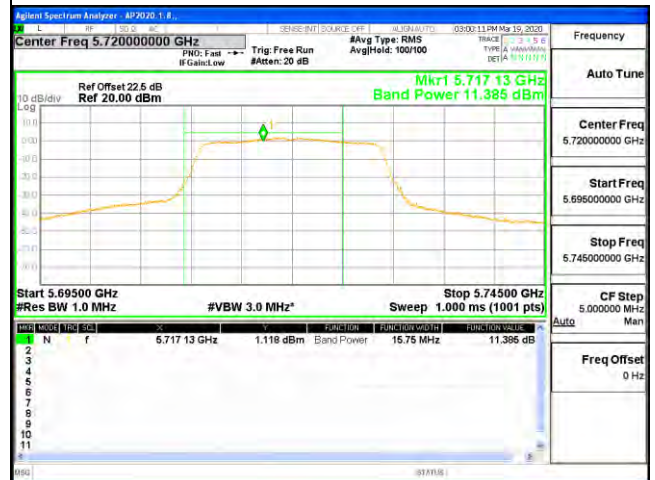
1. For test plots, it does not include the duty cycle correction factor.
2. Conducted Power=Test plots result+ Correction Factor
3. The test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.



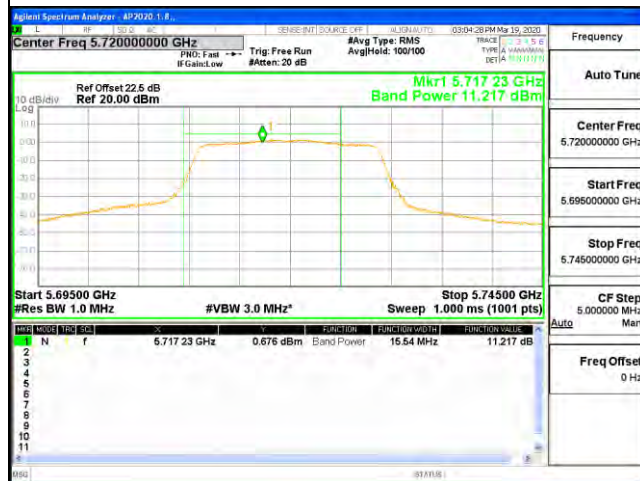
### 802.11a 20



### 802.11n HT20



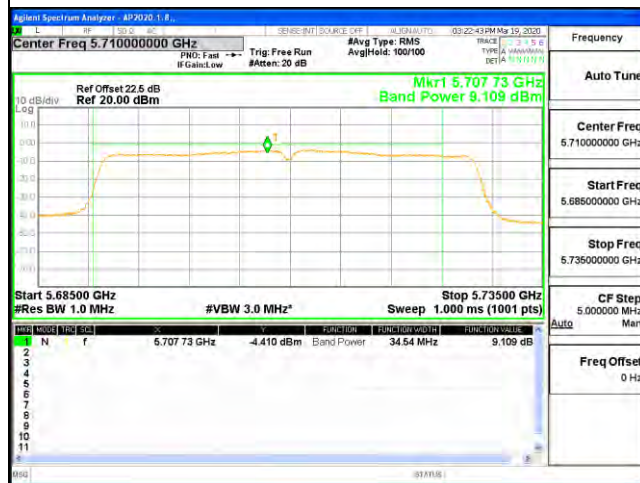
### 802.11ac VHT20



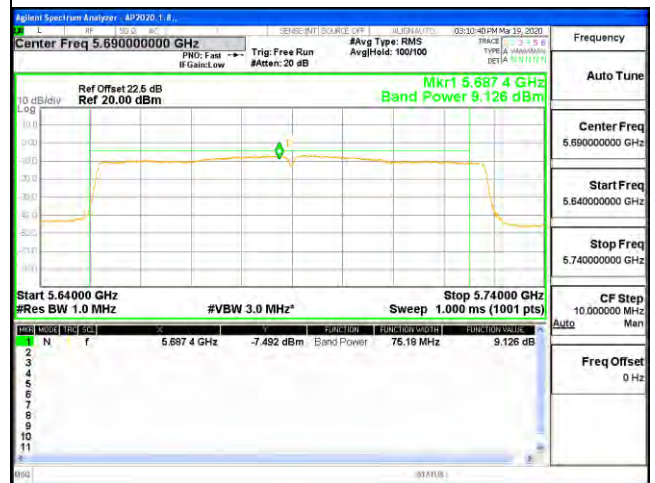
### 802.11n HT40



### 802.11ac VHT40



### 802.11ac VHT80





**UNII-3 BAND**

Mode	Frequency (MHz)	Conducted Output Power (dBm)	Min 26dB BW(MHz)	Limit (dBm)
802.11a 20	5720	5.079	5.885	30
802.11n HT20	5720	4.208	5.745	30
802.11ac VHT20	5720	3.967	5.535	30
802.11n HT40	5710	-2.082	4.985	30
802.11ac VHT40	5710	-2.682	4.535	30
802.11ac VHT80	5690	-6.613	5.175	30

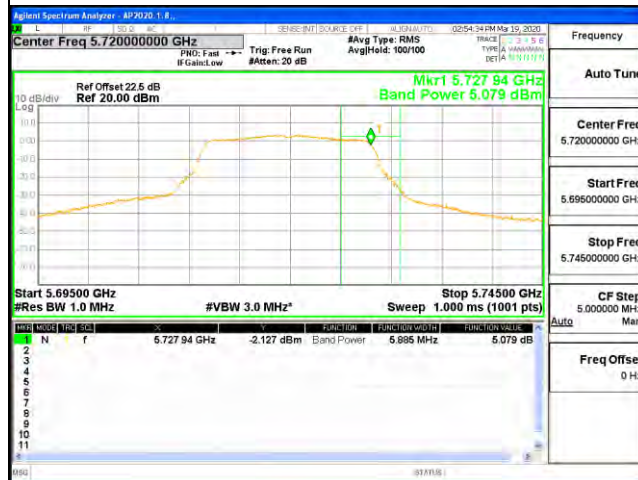
Note:

1. For test plots, it does not include the duty cycle correction factor.
2. Conducted Power=Test plots result+ Correction Factor
3. The test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.





### 802.11a 20



### 802.11n HT20



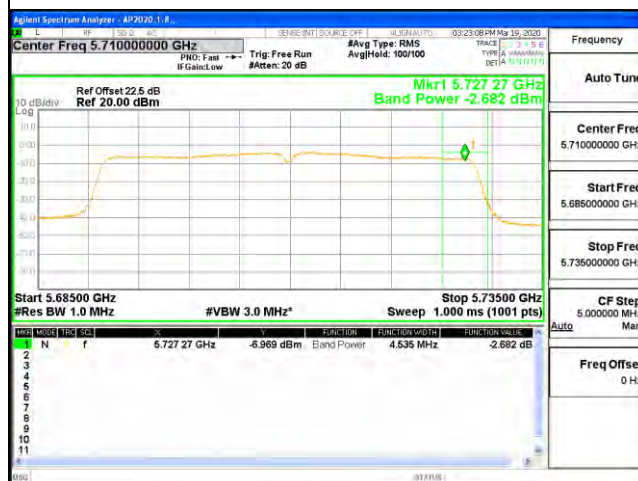
### 802.11ac VHT20



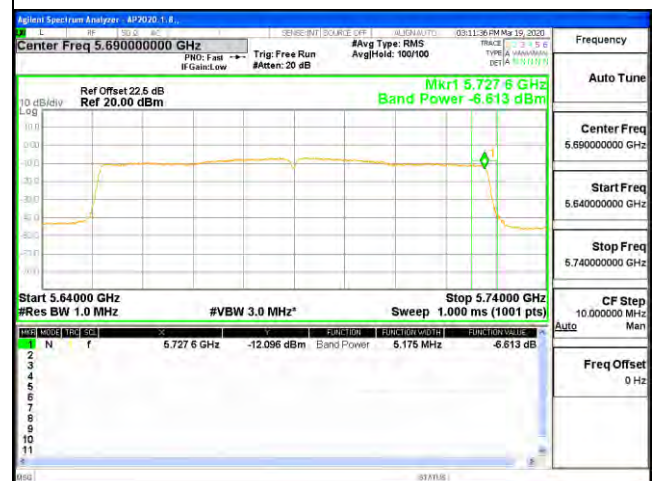
### 802.11n HT40



### 802.11ac VHT40



### 802.11ac VHT80





## 7.4. POWER SPECTRAL DENSITY

### LIMITS

CFR 47 FCC Part15, Subpart E ISED RSS-247		
Test Item	Limit	Frequency Range (MHz)
Power Spectral Density	For FCC: Other than Mobile and portable:17dBm/MHz Mobile and portable:11dBm/MHz	5150-5250
	For RSS: e.i.r.p. 10dBm/MHz	
	11dBm/MHz	5250-5350
	11dBm/MHz	For FCC:5470-5725 For IC:5470-5600 5650-5725
	30dBm/500kHz	5725-5850
Note: 1. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.		

### TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

For U-NII-1, U-NII-2A and U-NII-2C band:

Center Frequency	The center frequency of the channel under test
Detector	RMS
RBW	1MHz
VBW	$\geq 3 \times \text{RBW}$
Span	Encompass the entire emissions bandwidth (EBW) of the signal
Trace	Max hold
Sweep time	Auto

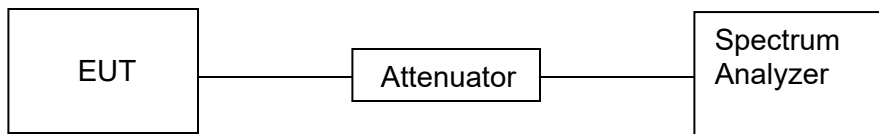
For U-NII-3:

Center Frequency	The center frequency of the channel under test
Detector	RMS
RBW	500kHz
VBW	$\geq 3 \times \text{RBW}$
Span	Encompass the entire emissions bandwidth (EBW) of the signal
Trace	Max hold
Sweep time	Auto

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.



## **TEST SETUP**



## **TEST ENVIRONMENT**

Temperature	25.5°C	Relative Humidity	59%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V

## **RESULTS**





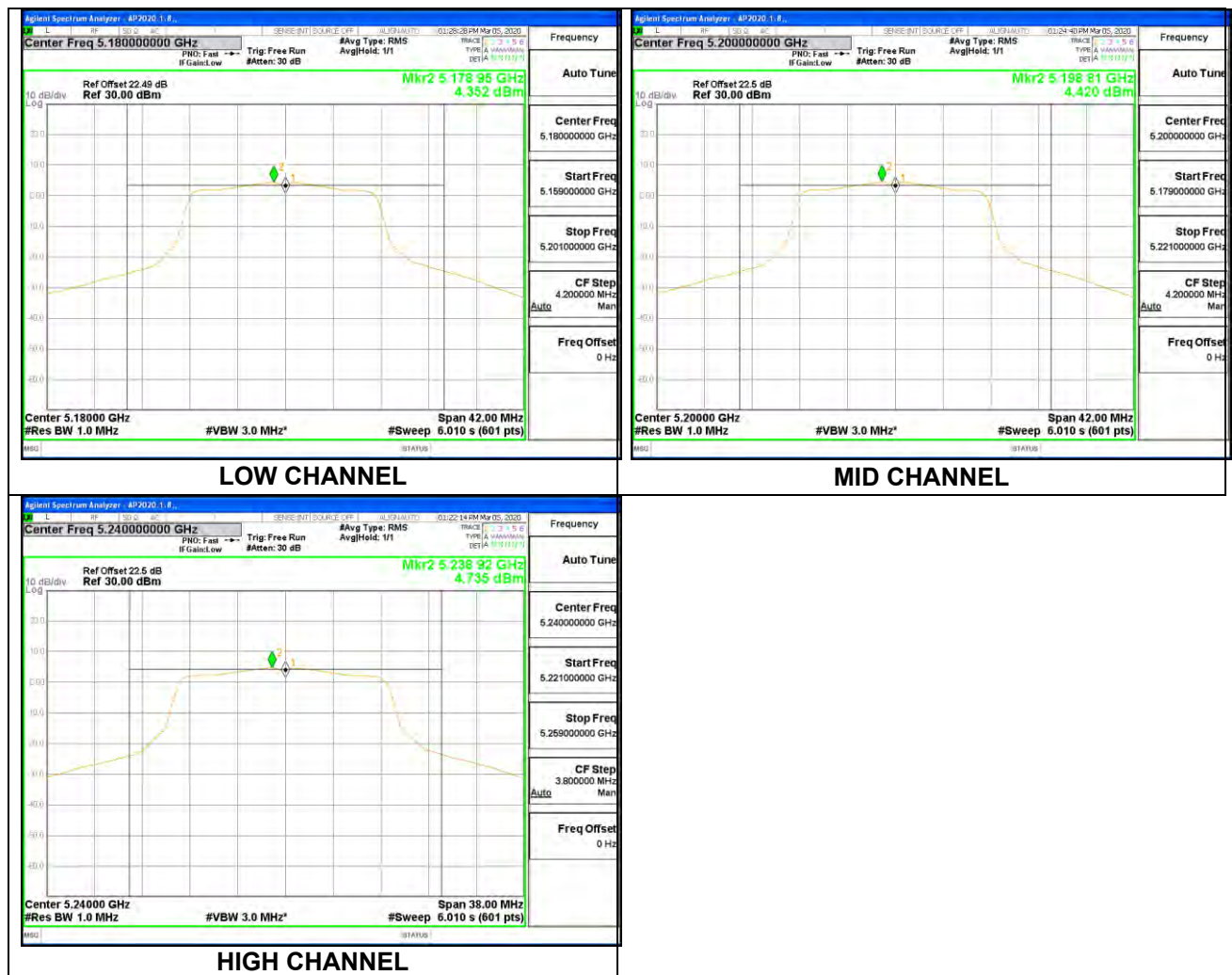
### 7.4.1. 802.11a 20 MODE

#### UNII-1 BAND

Test Channel	Frequency (MHz)	ANT	DCCF (dB)	PSD Result (dBm/MHz)	FCC Limit (dBm/MHz)	EIRP Result (dBm/MHz)	ISED EIRP Limit (dBm/MHz)
Low	5180	1	0.1377	4.490	11	7.440	10
Mid	5200	1	0.1377	4.558		7.508	
High	5240	1	0.1377	4.873		7.823	

Note:

1. For test plots, it does not include the duty cycle correction factor.
2. PSD result=Test plots result+ Duty Cycle Correction Factor
3. The test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.



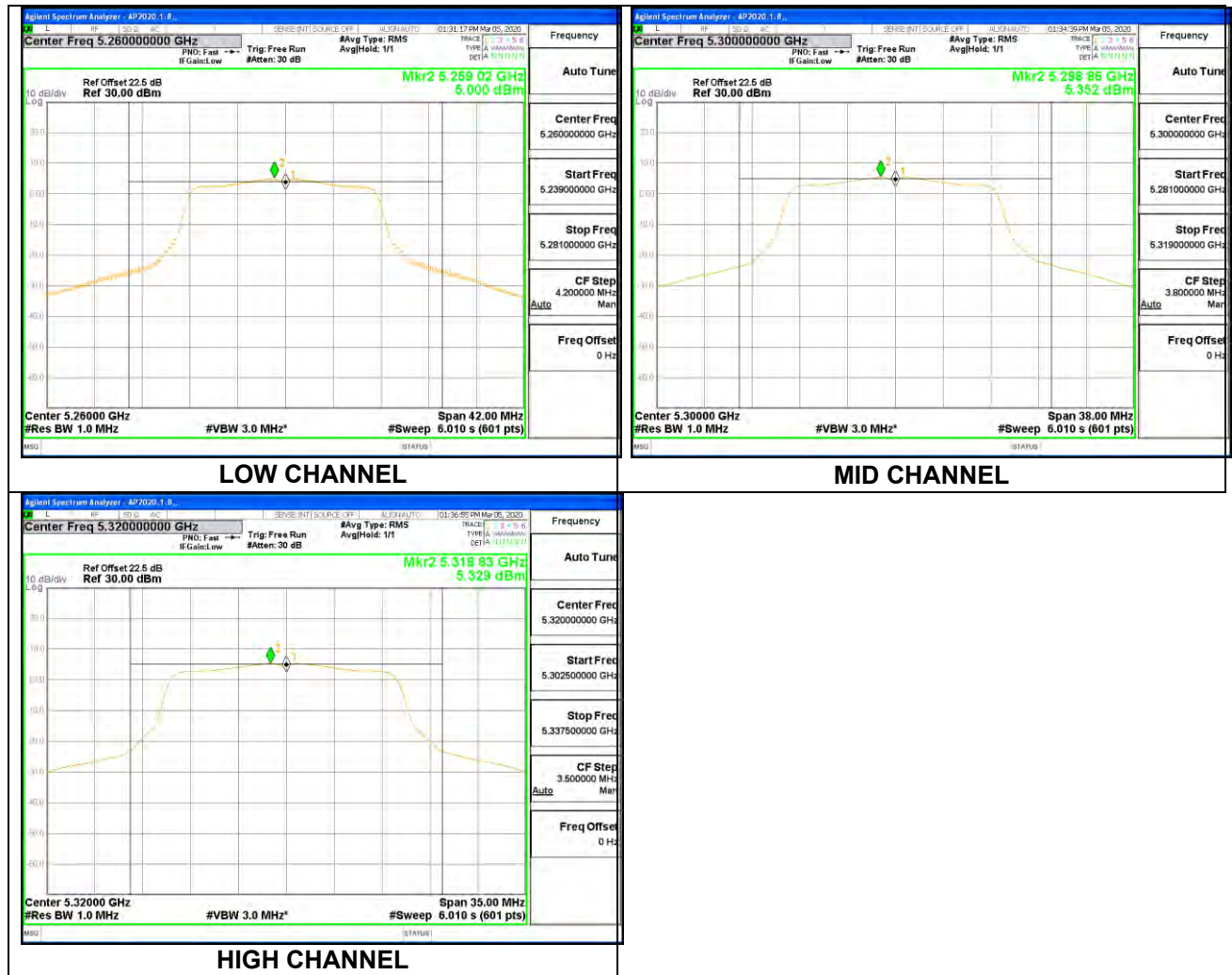


## UNII-2A BAND

Test Channel	Frequency (MHz)	ANT	DCCF (dB)	PSD Result (dBm/MHz)	Limit (dBm/MHz)
Low	5260	1	0.1377	5.138	11
Mid	5300	1	0.1377	5.490	
High	5320	1	0.1377	5.467	

Note:

1. For test plots, it does not include the duty cycle correction factor.
2. PSD result=Test plots result+ Correction Factor
3. The test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.



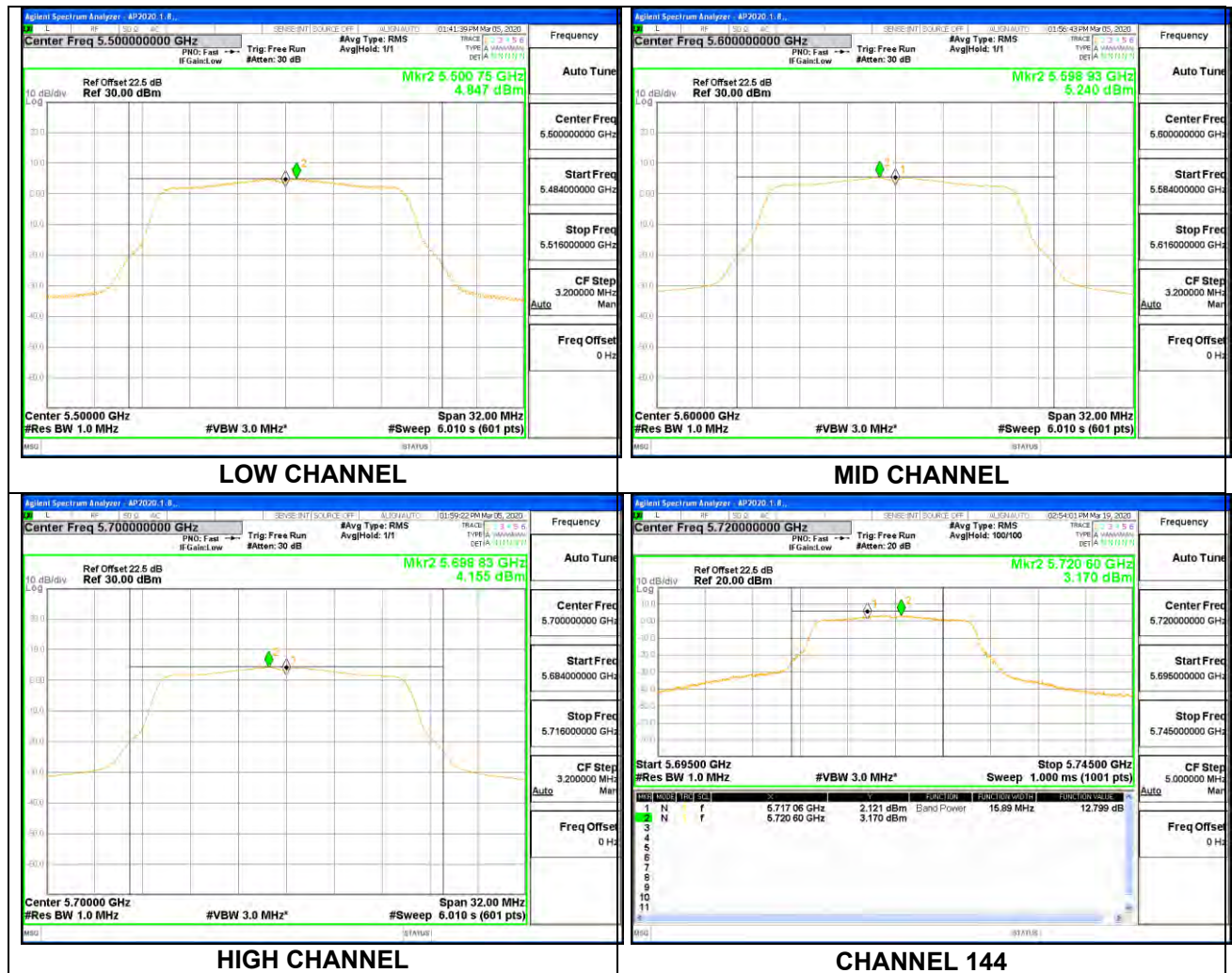


## UNII-2C BAND

Test Channel	Frequency (MHz)	ANT	DCCF (dB)	PSD Result (dBm/MHz)	Limit (dBm/MHz)
Low	5500	1	0.1377	4.985	11
Mid	5600	1	0.1377	5.378	
High	5700	1	0.1377	4.293	
Channel 144	5720	1	0.1377	3.308	

Note:

1. For test plots, it does not include the duty cycle correction factor.
2. PSD result=Test plots result+ Correction Factor
3. The test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.





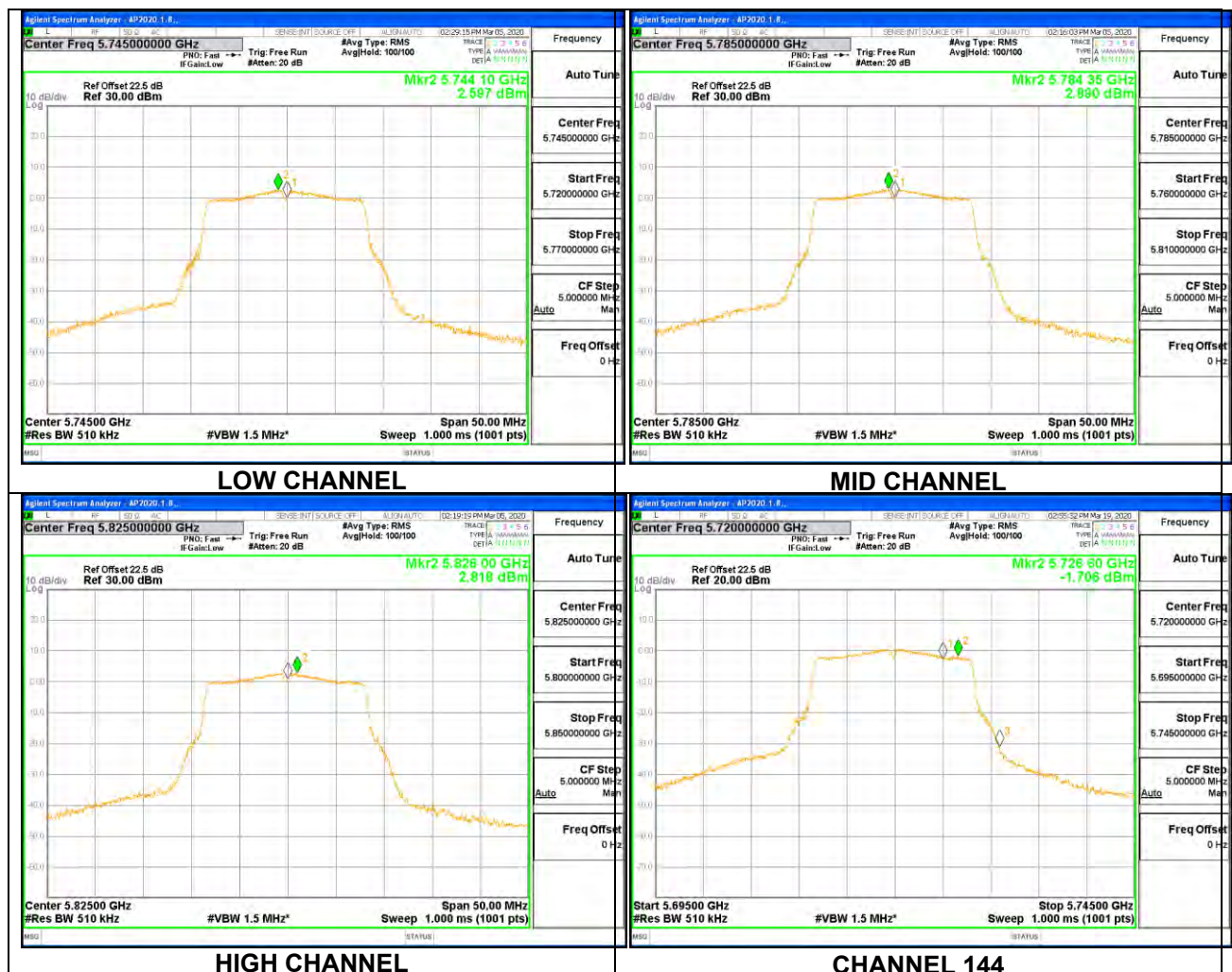


### UNII-3 BAND

Test Channel	Frequency (MHz)	ANT	DCCF (dB)	PSD Result (dBm/500KHz)	Limit (dBm/500KHz)
Low	5745	1	0.1377	2.735	30
Mid	5785	1	0.1377	3.028	
High	5825	1	0.1377	2.956	
Channel 144	5720	1	0.1377	-1.568	

Note:

1. For test plots, it does not include the duty cycle correction factor.
2. PSD result=Test plots result+ Correction Factor
3. The test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.





## 7.4.2. 802.11n HT20 MODE

### UNII-1 BAND

Test Channel	Frequency (MHz)	ANT	DCCF (dB)	PSD Result (dBm/MHz)	FCC Limit (dBm/MHz)	EIRP Result (dBm/MHz)	EIRP Limit (dBm/MHz)
Low	5180	1	0.1305	3.813	11	6.763	10
Mid	5200	1	0.1305	3.980		6.930	
High	5240	1	0.1305	3.753		6.703	

Note:

1. For test plots, it does not include the duty cycle correction factor.
2. PSD result=Test plots result+ Correction Factor
3. The PSD test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.



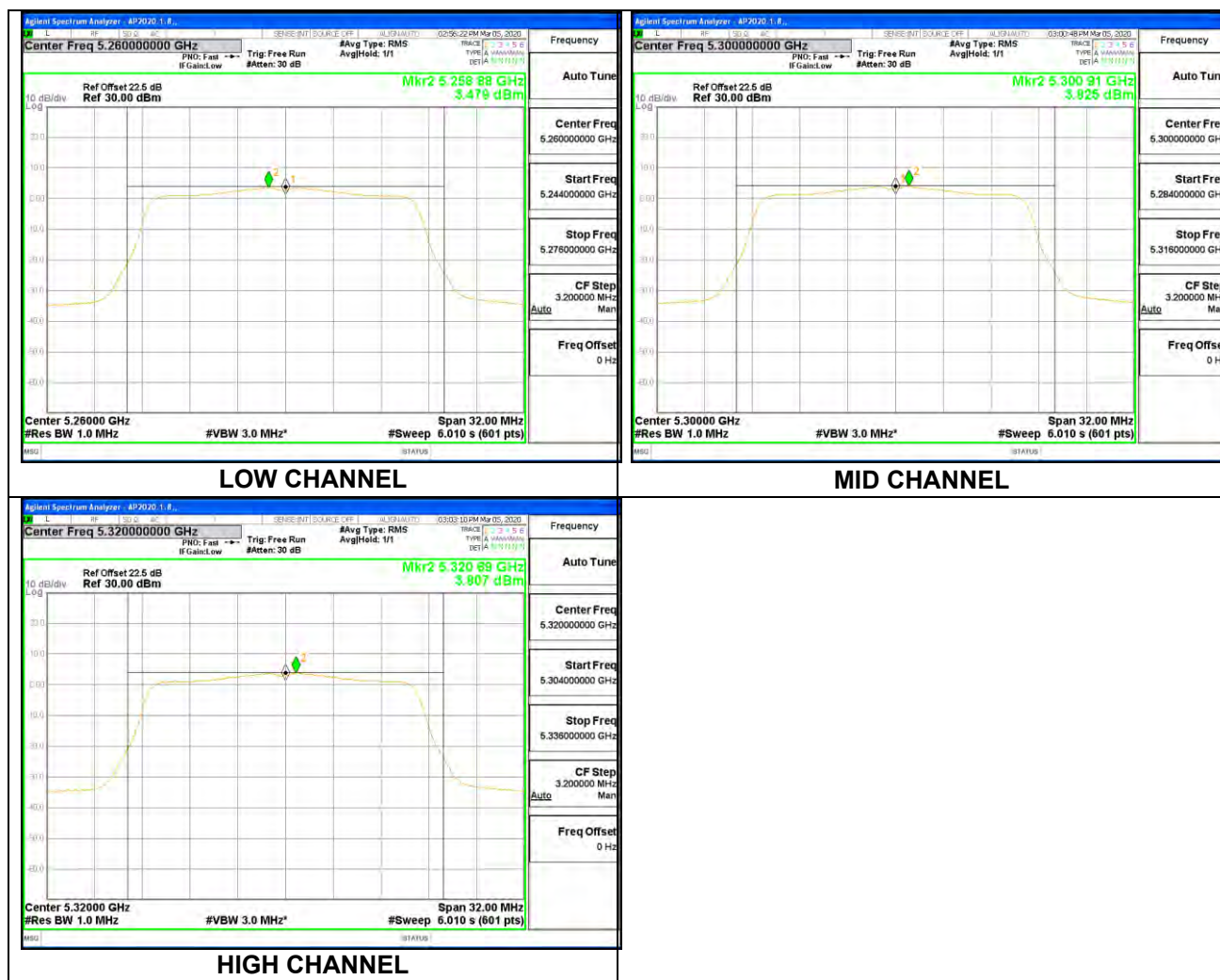


## UNII-2A BAND

Test Channel	Frequency (MHz)	ANT	DCCF (dB)	PSD Result (dBm/MHz)	Limit (dBm/MHz)
Low	5260	1	0.1305	3.610	11
Mid	5300	1	0.1305	3.956	
High	5320	1	0.1305	3.938	

Note:

1. For test plots, it does not include the duty cycle correction factor.
2. PSD result=Test plots result+ Correction Factor
3. The PSD test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.





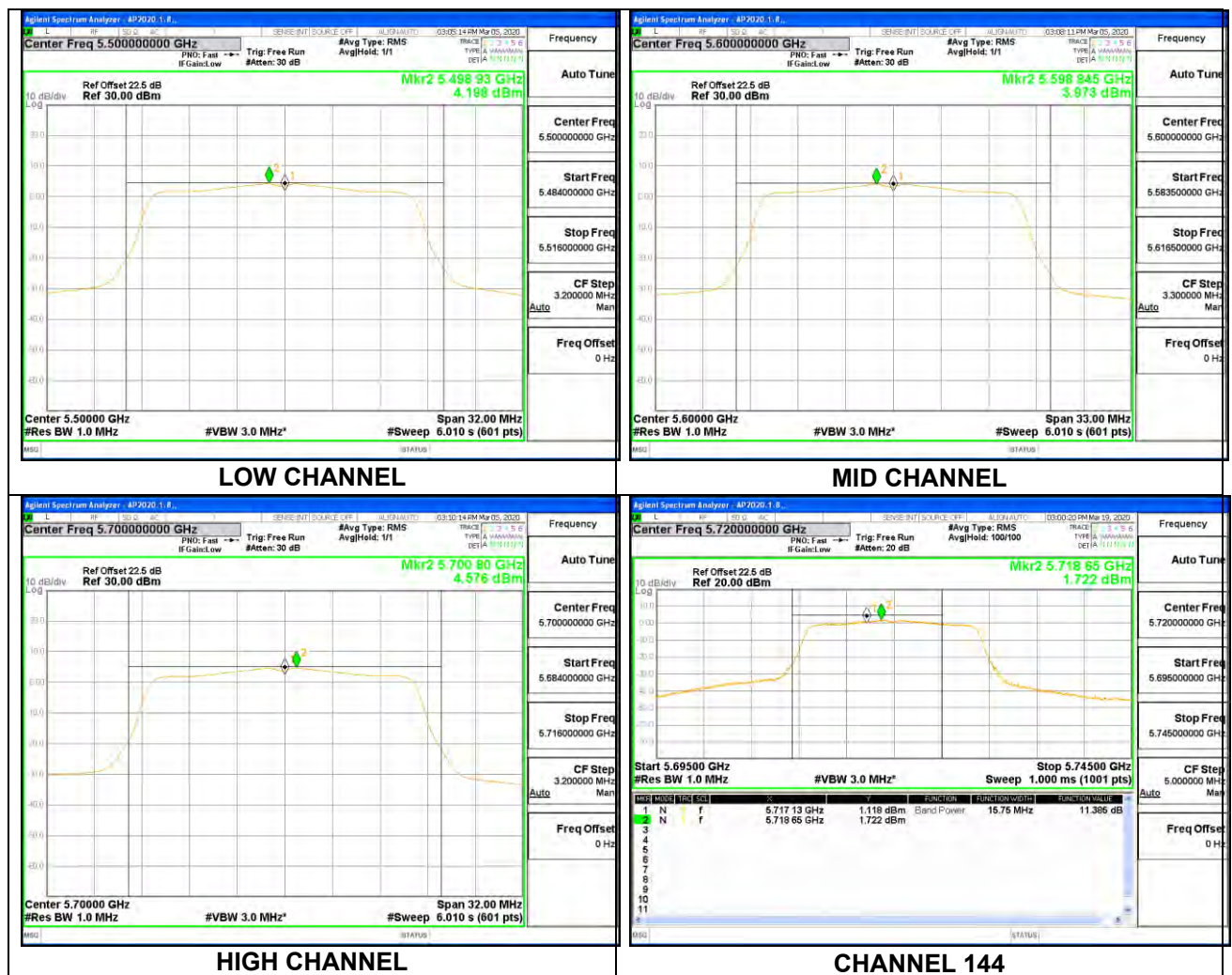


## UNII-2C BAND

Test Channel	Frequency (MHz)	ANT	DCCF (dB)	PSD Result (dBm/MHz)	Limit (dBm/MHz)
Low	5500	1	0.1305	4.329	11
Mid	5600	1	0.1305	4.104	
High	5700	1	0.1305	4.707	
Channel 144	5720	1	0.1305	1.853	

Note:

1. For test plots, it does not include the duty cycle correction factor.
2. PSD result=Test plots result+ Correction Factor
3. The PSD test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.



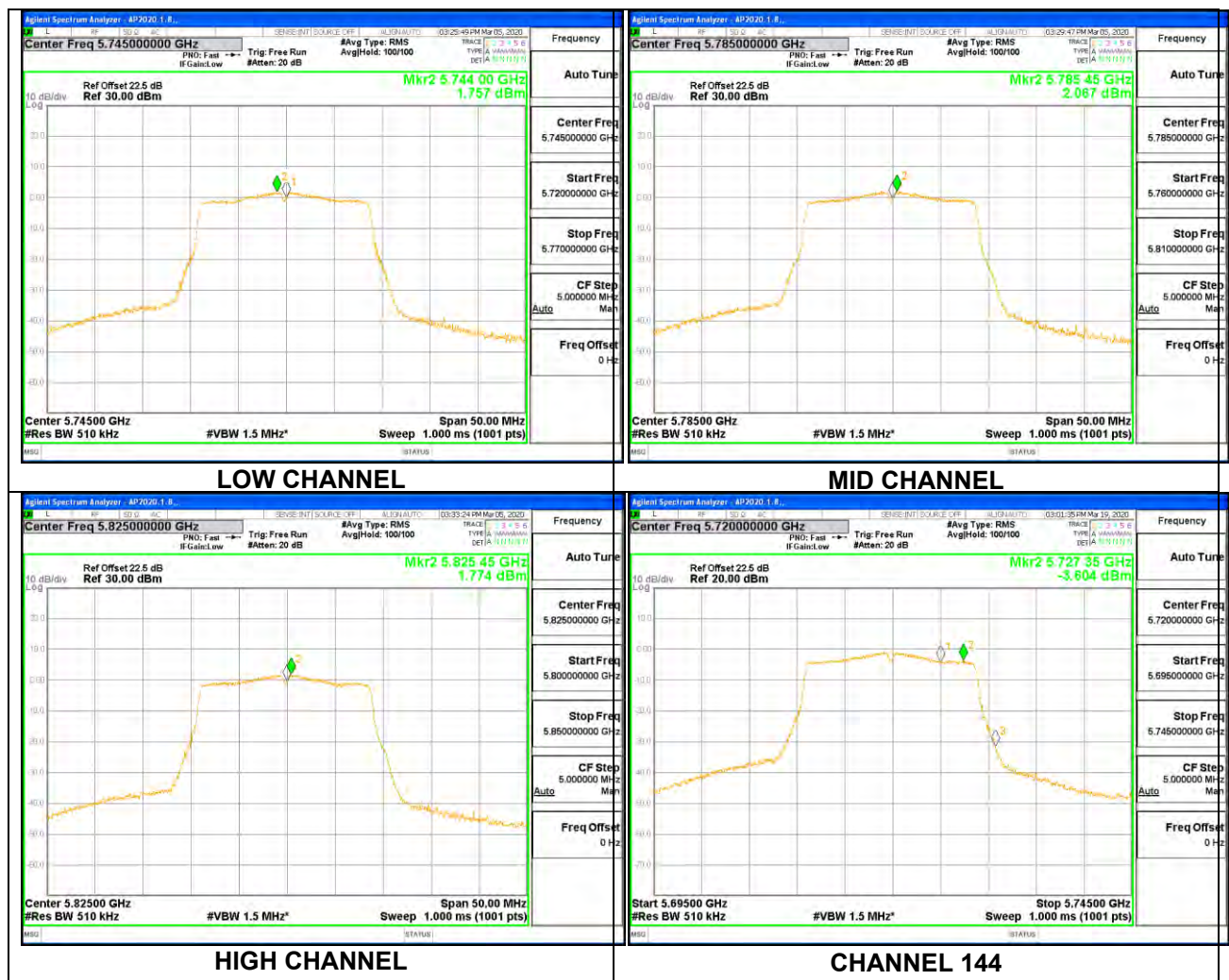


### UNII-3 BAND

Test Channel	Frequency (MHz)	ANT	DCCF (dB)	PSD Result (dBm/500KHz)	Limit (dBm/500KHz)
Low	5745	1	0.1305	1.888	30
Mid	5785	1	0.1305	2.198	
High	5825	1	0.1305	1.905	
Channel 144	5720	1	0.1305	-3.474	

Note:

1. For test plots, it does not include the duty cycle correction factor.
2. PSD result=Test plots result+ Correction Factor
3. The PSD test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.





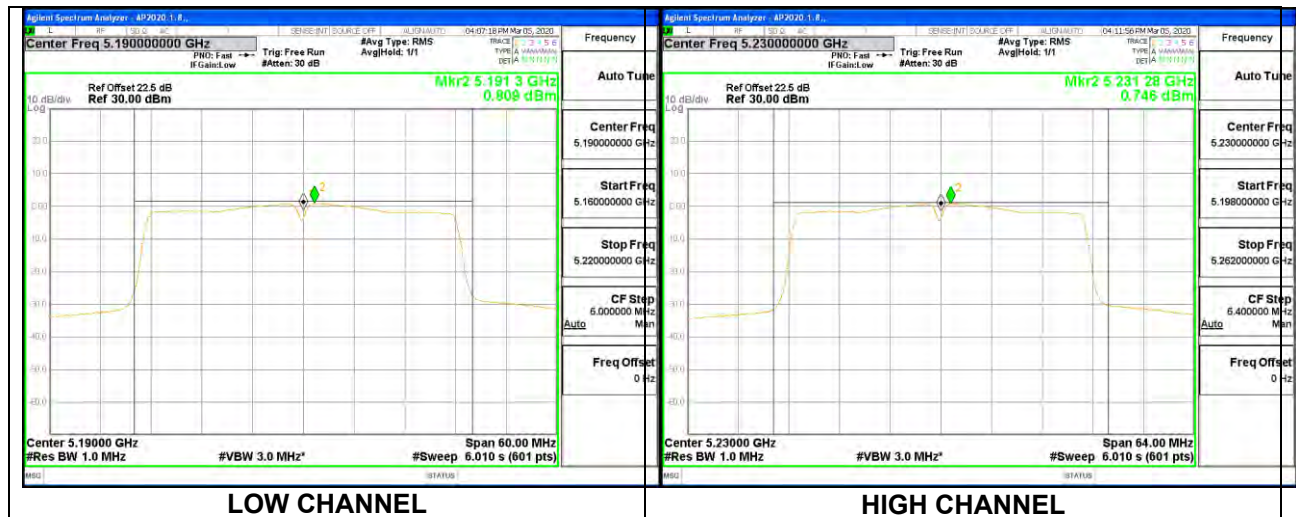
### 7.4.3. 802.11n HT40 MODE

#### UNII-1 BAND

Test Channel	Frequency (MHz)	ANT	DCCF (dB)	PSD Result (dBm/MHz)	Limit (dBm/MHz)	EIRP Result (dBm/MHz)	EIRP Limit (dBm/MHz)
Low	5190	1	0.2600	1.069	11	4.019	10
High	5230	1	0.2600	1.006		3.956	10

Note:

1. For test plots, it does not include the duty cycle correction factor.
2. PSD result=Test plots result+ Correction Factor
3. The PSD test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.





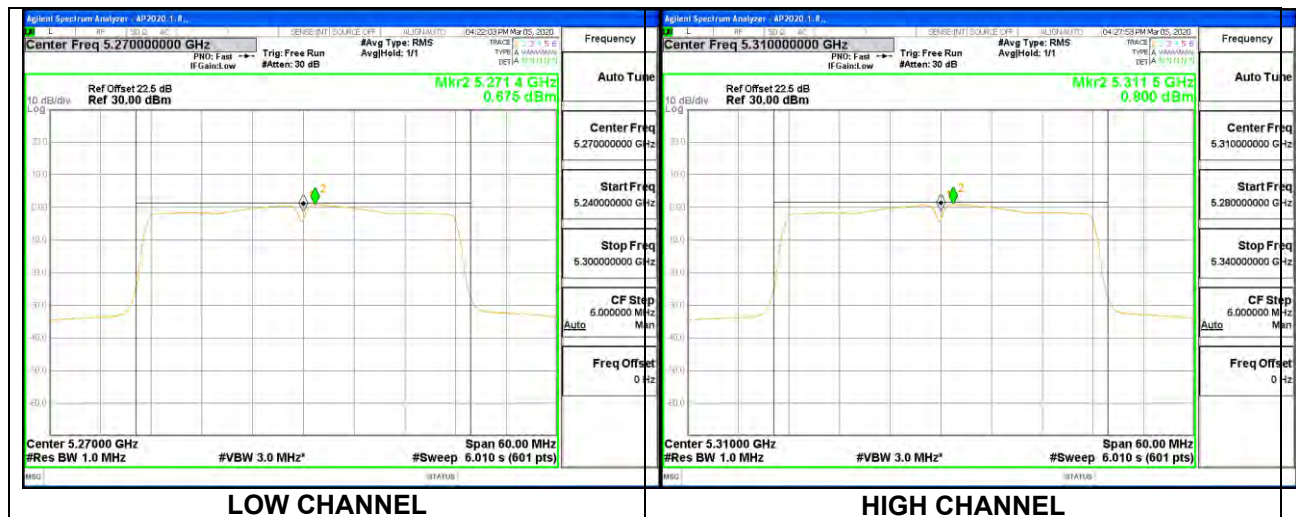


### UNII-2A BAND

Test Channel	Frequency (MHz)	ANT	DCCF (dB)	PSD Result (dBm/MHz)	Limit (dBm/MHz)
Low	5270	1	0.2600	0.935	11
High	5310	1	0.2600	1.060	

Note:

1. For test plots, it does not include the duty cycle correction factor.
2. PSD result=Test plots result+ Correction Factor
3. The PSD test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.



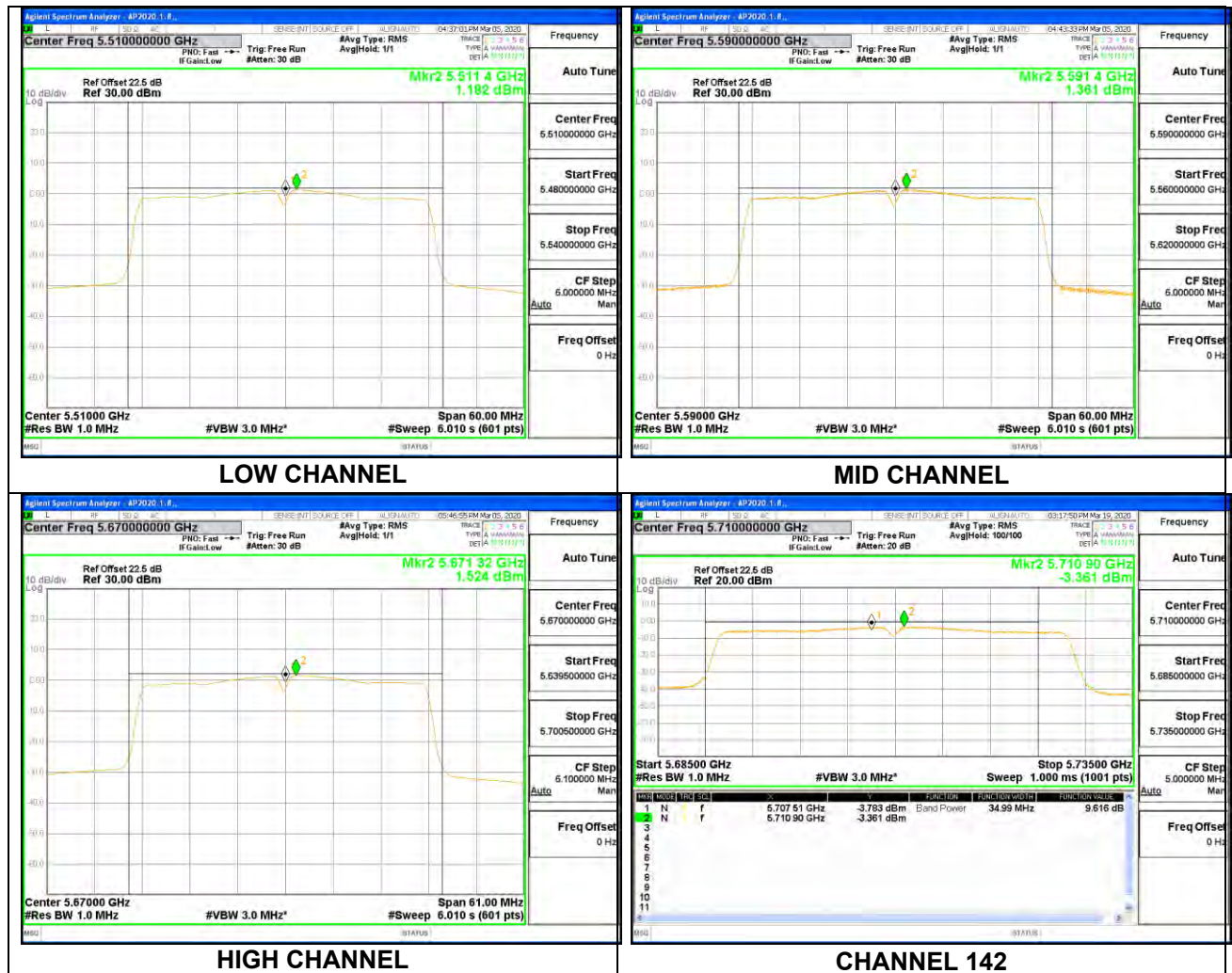


## UNII-2C BAND

Test Channel	Frequency (MHz)	ANT	DCCF (dB)	PSD Result (dBm/MHz)	Limit (dBm/MHz)
Low	5510	1	0.2600	1.442	11
Mid	5590	1	0.2600	1.621	
High	5670	1	0.2600	1.784	
Channel 142	5710	1	0.2600	-3.101	

Note:

1. For test plots, it does not include the duty cycle correction factor.
2. PSD result=Test plots result+ Correction Factor
3. The PSD test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.



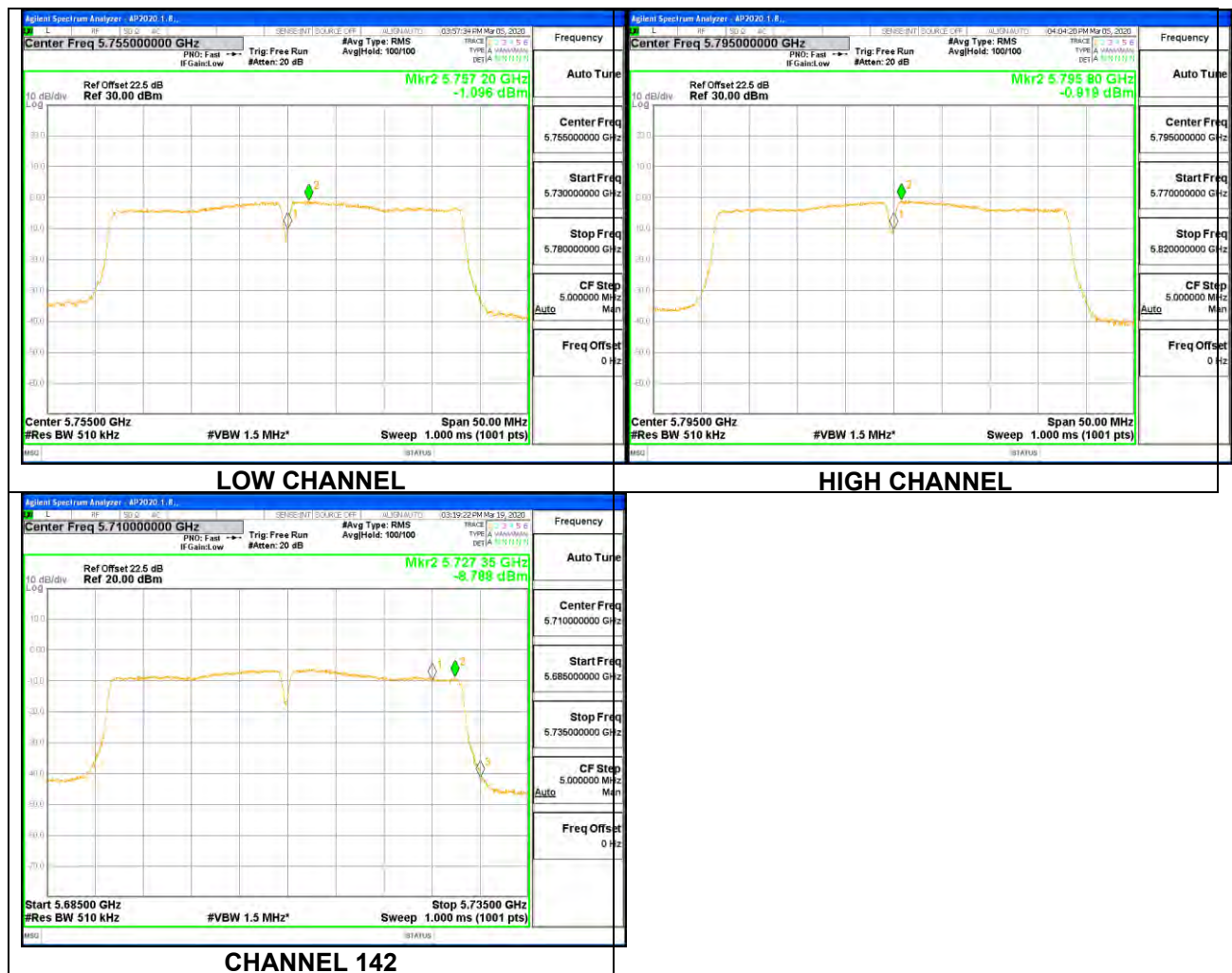


### UNII-3 BAND

Test Channel	Frequency (MHz)	ANT	DCCF (dB)	Meas. Level (dBm/500KHz)	Limit (dBm/500KHz)
Low	5755	1	0.2600	-0.836	11
High	5795	1	0.2600	-0.659	
Channel 142	5710	1	0.2600	-8.528	

Note:

1. For test plots, it does not include the duty cycle correction factor.
2. PSD result=Test plots result+ Correction Factor
3. The PSD test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.







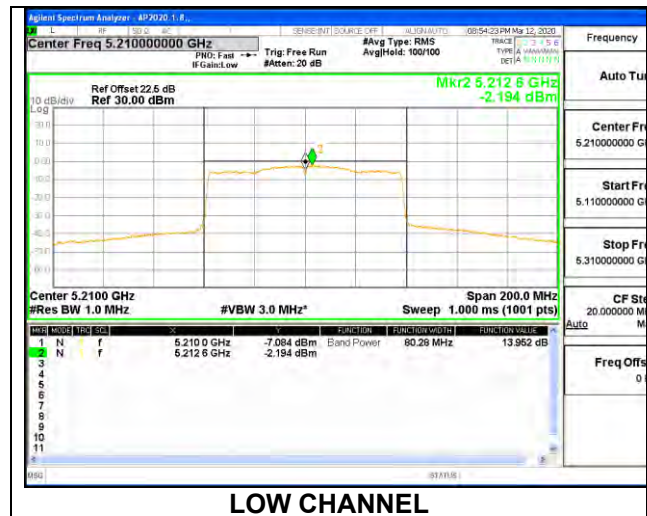
#### 7.4.4. 802.11ac VHT80 MODE

##### UNII-1 BAND

Test Channel	Frequency (MHz)	ANT	DCCF (dB)	PSD Result (dBm/MHz)	Limit (dBm/MHz)	EIRP Result (dBm/MHz)	EIRP Limit (dBm/MHz)
Mid	5210	1	0.5311	-1.663	11	1.287	10

Note:

1. For test plots, it does not include the duty cycle correction factor.
2. PSD result=Test plots result+ Correction Factor
3. The PSD test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.



LOW CHANNEL

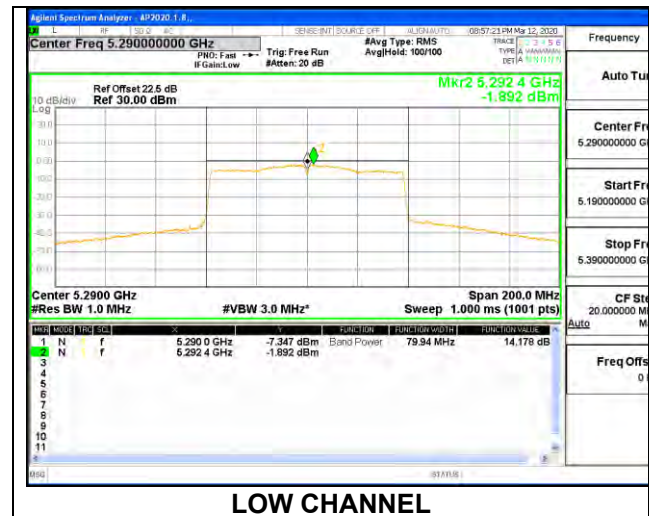


**UNII-2A BAND**

Test Channel	Frequency (MHz)	ANT	DCCF (dB)	Meas. Level (dBm/MHz)	Limit (dBm/MHz)
Mid	5290	1	0.5311	-1.361	11

Note:

1. For test plots, it does not include the duty cycle correction factor.
2. PSD result=Test plots result+ Correction Factor
3. The PSD test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.



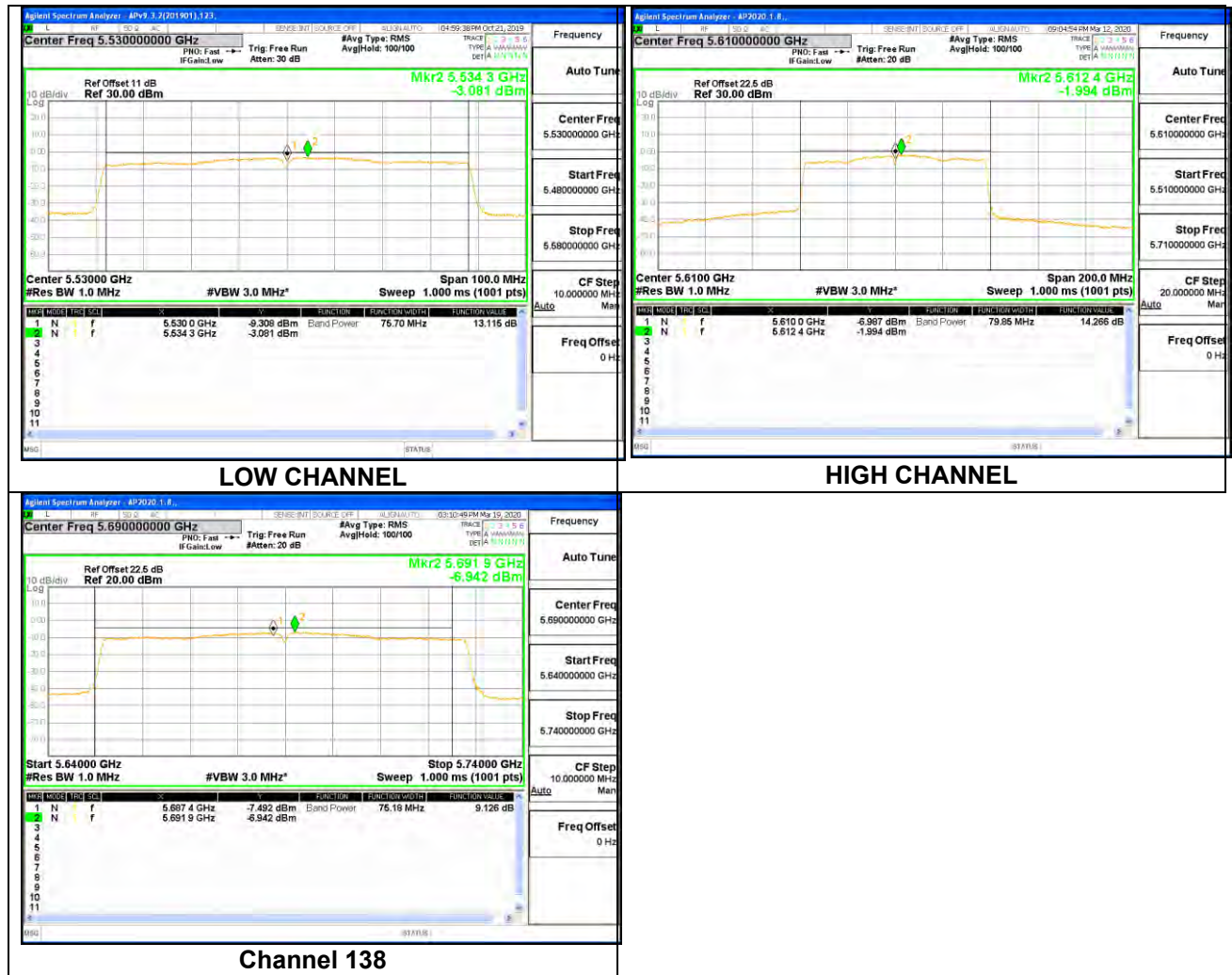


## UNII-2C BAND

Test Channel	Frequency (MHz)	ANT	DCCF (dB)	Meas. Level (dBm/MHz)	Limit (dBm/MHz)
Low	5530	1	0.5311	-2.550	11
High	5610	1	0.5311	-1.463	
Channel 138	5690	1	0.5311	-6.411	

Note:

1. For test plots, it does not include the duty cycle correction factor.
2. PSD result=Test plots result+ Correction Factor
3. The PSD test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.



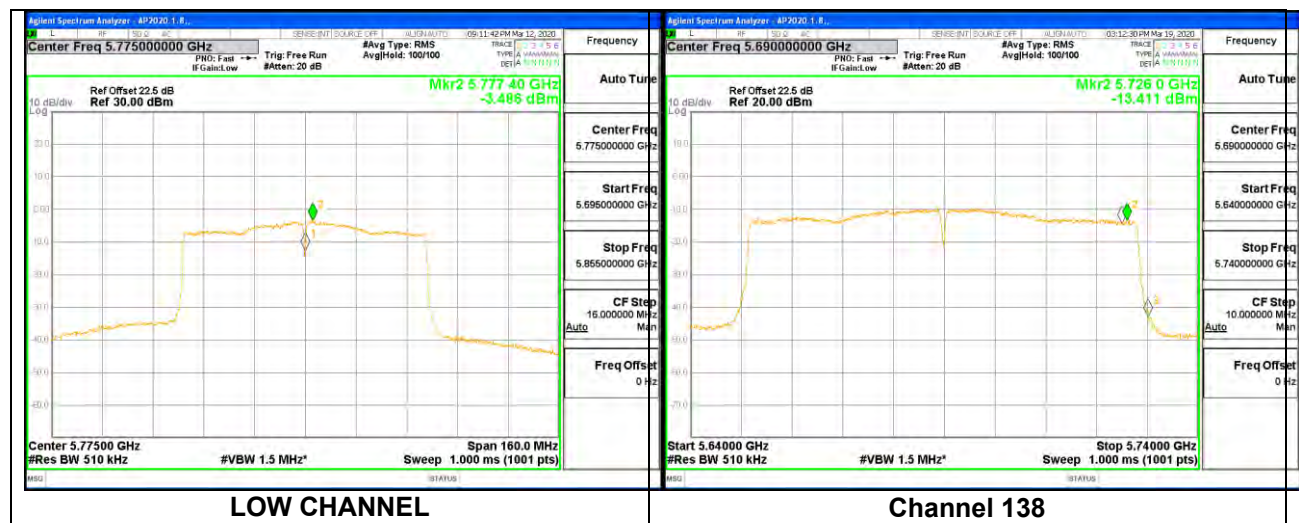


### UNII-3 BAND

Test Channel	Frequency (MHz)	ANT	DCCF (dB)	Meas. Level (dBm/500KHz)	Limit (dBm/500KHz)
Mid	5775	1	0.5311	-2.955	11
Channel 138	5690	1	0.5311	-12.880	

Note:

1. For test plots, it does not include the duty cycle correction factor.
2. PSD result=Test plots result+ Correction Factor
3. The PSD test results have already included the duty cycle correction factor. About correction Factor please refer to section 7.1.



Note: All the modes and antenna ports had been tested, only the worst data recorded in the report.



## 8. RADIATED TEST RESULTS

### LIMITS

Please refer to CFR 47 FCC §15.205, §15.209 and §15.407(b) (4)

Please refer to ISED RSS-GEN Clause 8.9

Radiation Disturbance Test Limit for FCC (Class B)(9kHz-1GHz)

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

Note: 1) At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

(2) At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). This paragraph (f) shall not apply to Access BPL devices operating below 30 MHz.





## ISED General field strength limits at frequencies below 30 MHz

Table 6 – General field strength limits at frequencies below 30 MHz		
Frequency	Magnetic field strength (H-Field) (μA/m)	Measurement distance (m)
9 - 490 kHz <sup>Note 1</sup>	6.37/F (F in kHz)	300
490 - 1705 kHz	63.7/F (F in kHz)	30
1.705 - 30 MHz	0.08	30

**Note 1:** The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

IC Restricted bands please refer to ISED RSS-GEN Clause 8.10.  
FCC Restricted bands please refer to CFR 47 FCC 15.209.

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1GHz)			
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m	
		Quasi-Peak	
30 - 88	100	40	
88 - 216	150	43.5	
216 - 960	200	46	
Above 960	500	54	
Above 1000	500	Peak	Average
		74	54

Limits of unwanted emission out of the restricted bands

LIMITS OF RADIATED EMISSION MEASUREMENT ( Above 1GHz)		
Frequency Range (MHz)	EIRP Limit	Field Strength Limit (dBuV/m) at 3 m
5150~5250 MHz	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
5250~5350 MHz		
5470~5725 MHz		
5725~5850 MHz	PK:-27 (dBm/MHz) *1 PK:10 (dBm/MHz) *2 PK:15.6 (dBm/MHz) *3 PK:27 (dBm/MHz) *4	PK: 68.2(dBμV/m) *1 PK:105.2 (dBμV/m) *2 PK: 110.8(dBμV/m) *3 PK:122.2 (dBμV/m) *4

Note:

\*1 beyond 75 MHz or more above of the band edge.

\*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

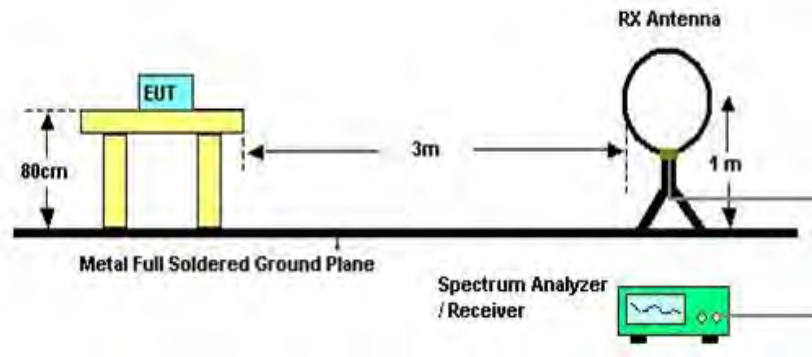
\*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

\*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.



## TEST SETUP AND PROCEDURE

Below 30MHz

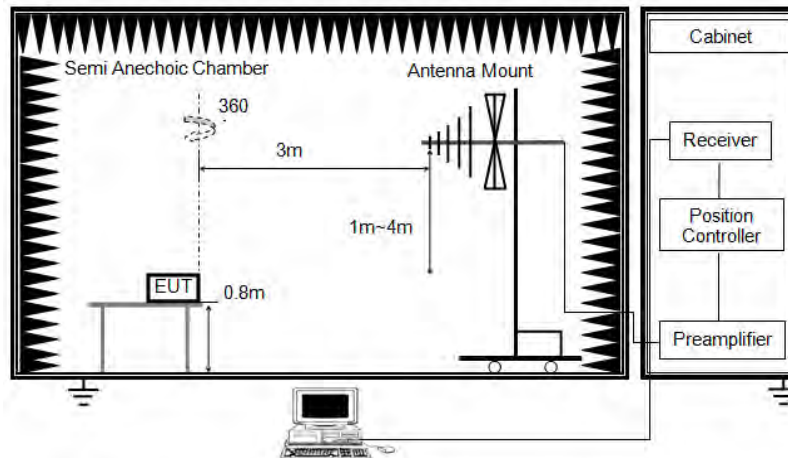


The setting of the spectrum analyser

RBW	200Hz (From 9kHz to 0.15MHz)/ 9kHz (From 0.15MHz to 30MHz)
VBW	200Hz (From 9kHz to 0.15MHz)/ 9kHz (From 0.15MHz to 30MHz)
Sweep	Auto
Detector	Peak/QP/ Average
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013
2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
6. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KDB 414788.

Below 1G

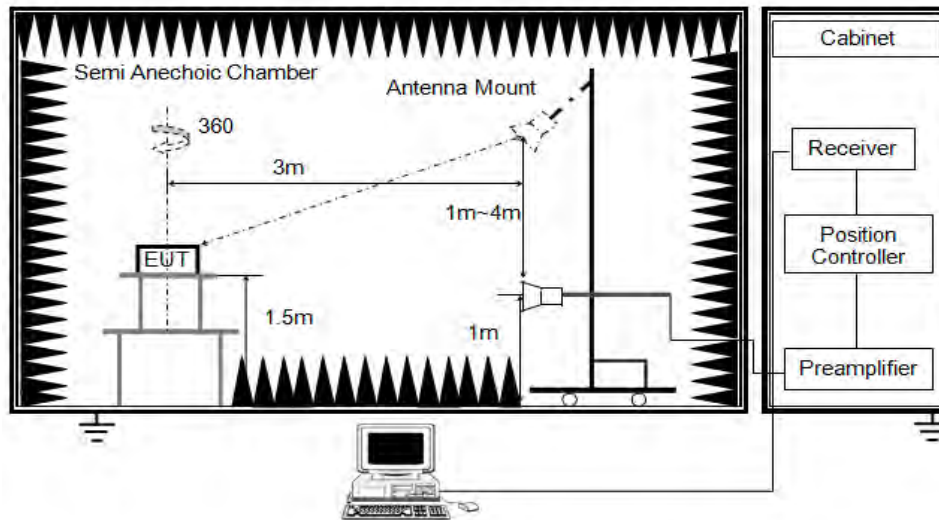


The setting of the spectrum analyser

RBW	120kHz
VBW	300kHz
Sweep	Auto
Detector	Peak/QP
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

Above 1G



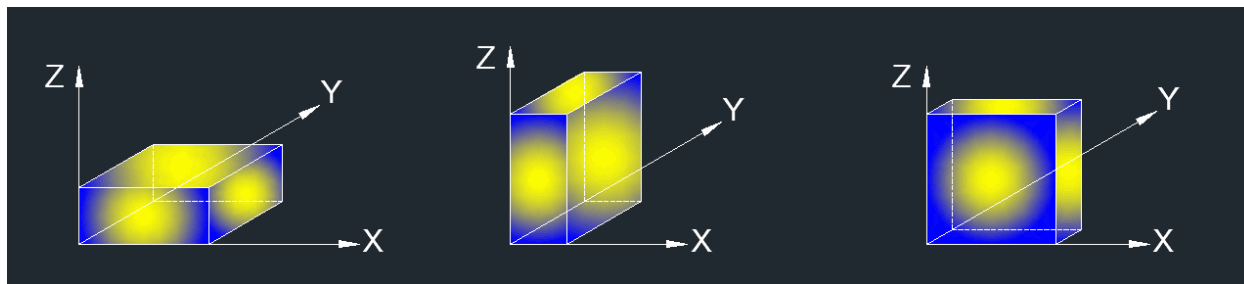
The setting of the spectrum analyser

RBW	1MHz
VBW	PEAK: 3MHz AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 1.5m above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.
6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 7.1.ON TIME AND DUTY CYCLE.



X axis, Y axis, Z axis positions:



Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

Note 2: All the EUT's emissions had been evaluated for simultaneous transmission with the other WIFI 2.4GHz, WIFI 5GHz and BT transmitter and there were no any additional or worse emissions found. The worst case data has been recorded in the WIFI test report. (4789391992-3/-4).

#### **TEST ENVIRONMENT**

Temperature	24.2°C	Relative Humidity	62%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V

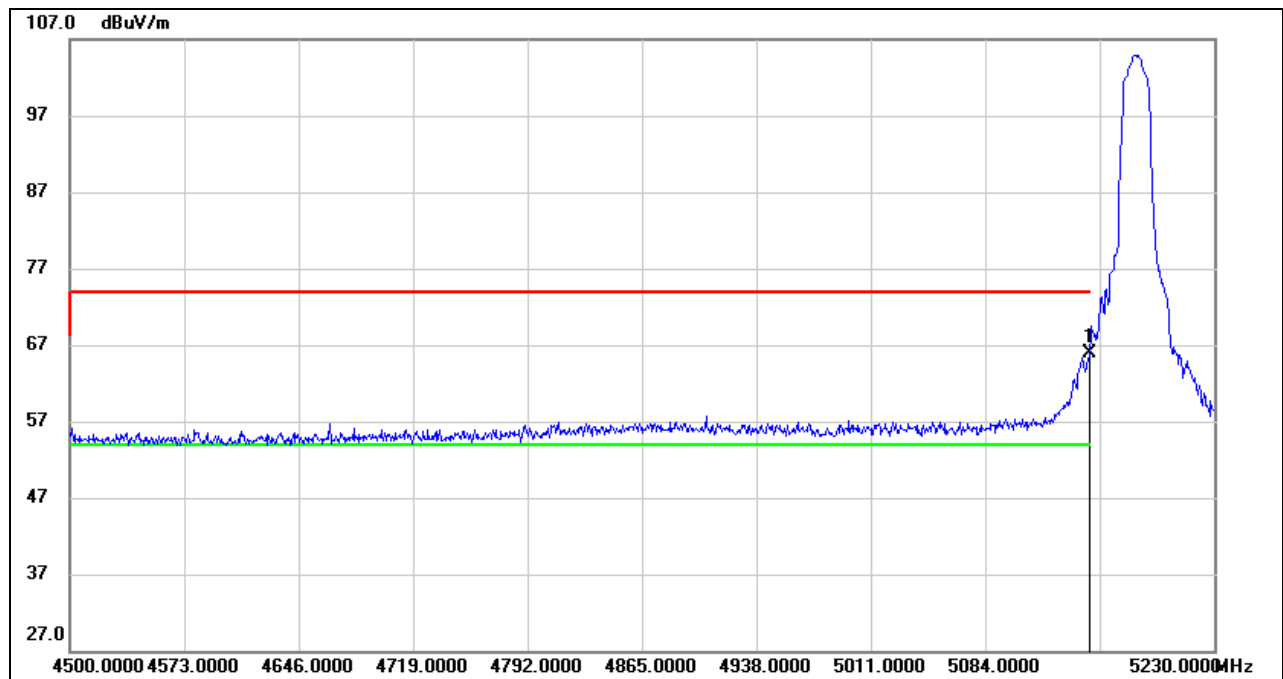


## 8.1. 802.11a 20 MODE

### 8.1.1. UNII-1 BAND

#### RESTRICTED BANDEGE LOW CHANNEL

#### HORIZONTAL RESULTS PEAK

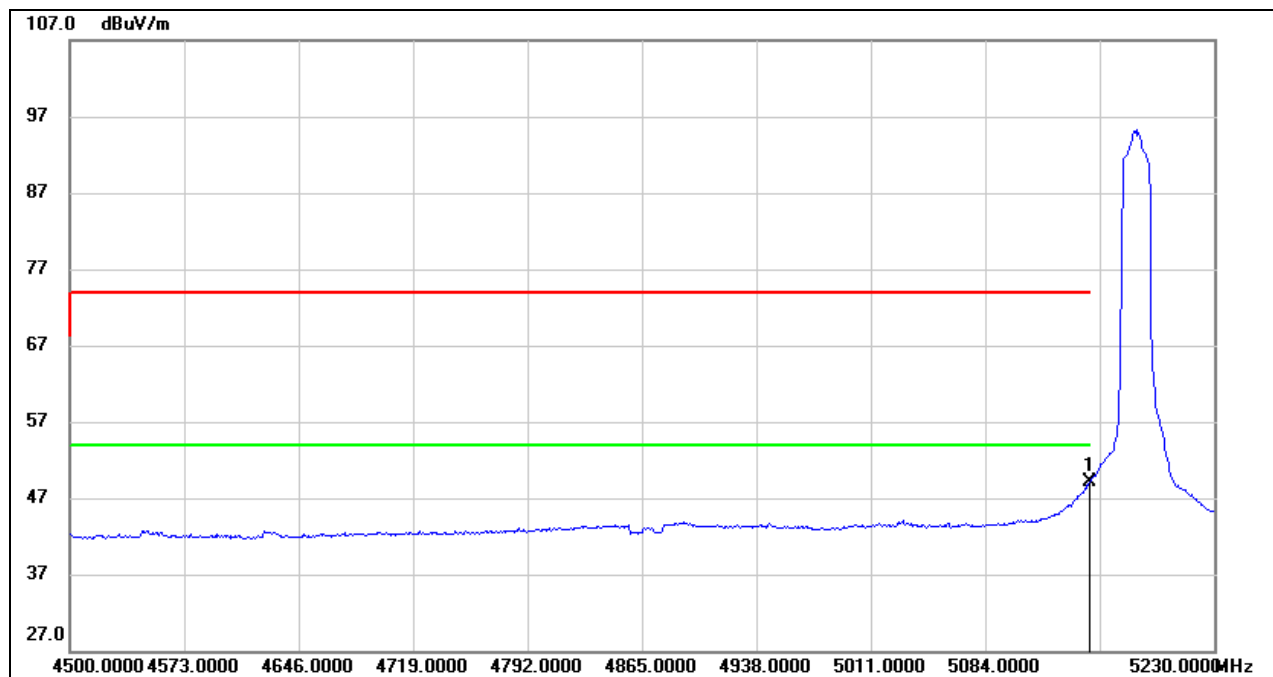


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5150.000	25.40	40.46	65.86	74.00	-8.14	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.



**AVG**



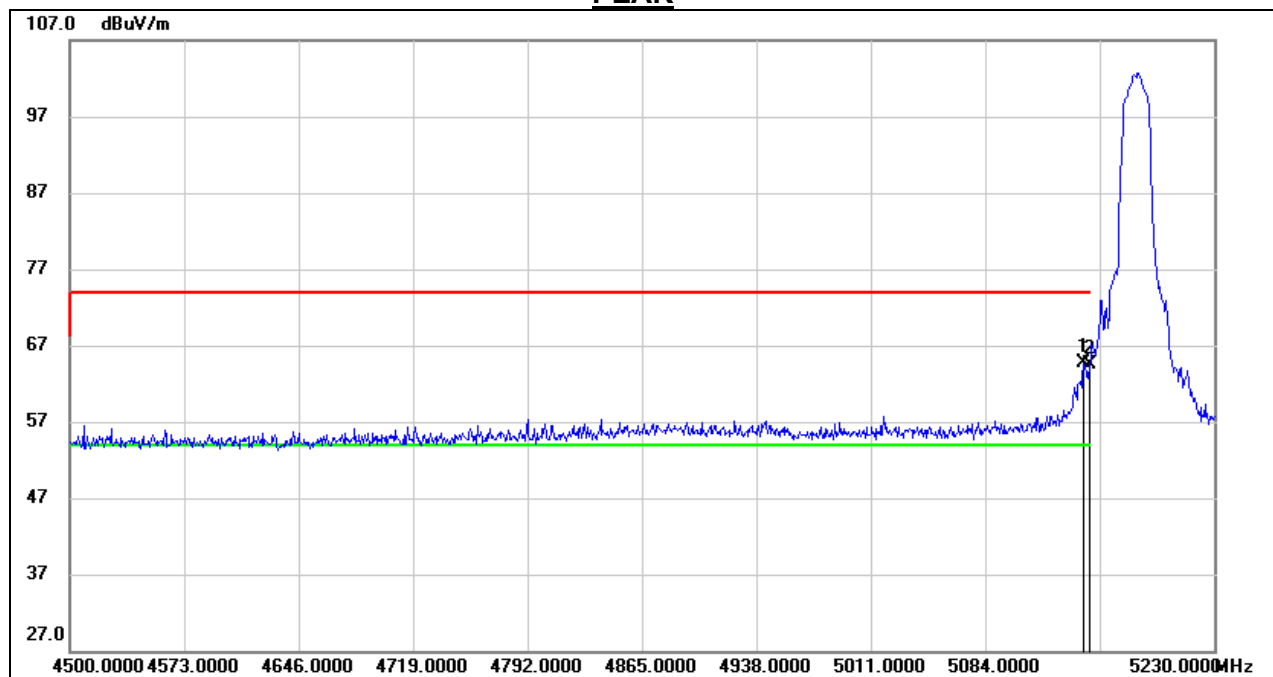
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5150.000	8.55	40.46	49.01	54.00	-4.99	AVG

Note: 1. Measurement = Reading Level + Correct Factor.  
2. AVG:  $VBW=1/Ton$  where: ton is transmit duration.  
3. For duty cycle, please refer to clause 7.1.  
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.





**VERTICAL RESULTS**  
**PEAK**

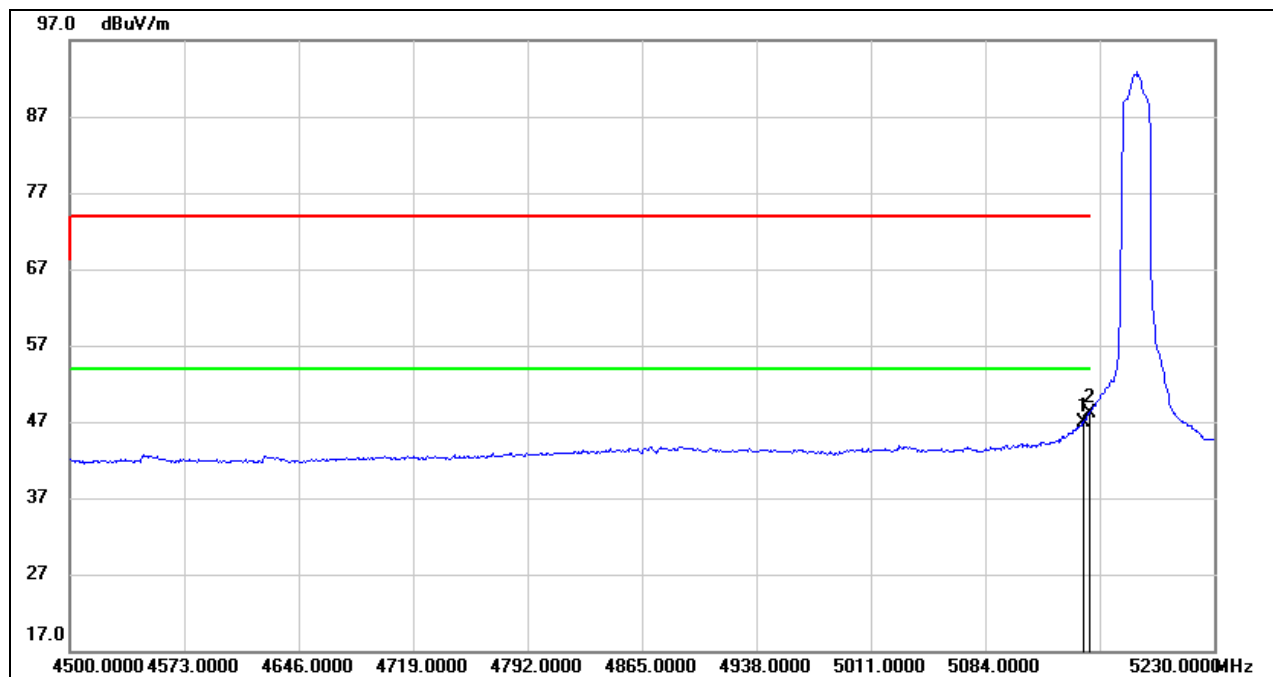


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5146.780	24.20	40.45	64.65	74.00	-9.35	peak
2	5150.000	24.05	40.46	64.51	74.00	-9.49	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.



**AVG**



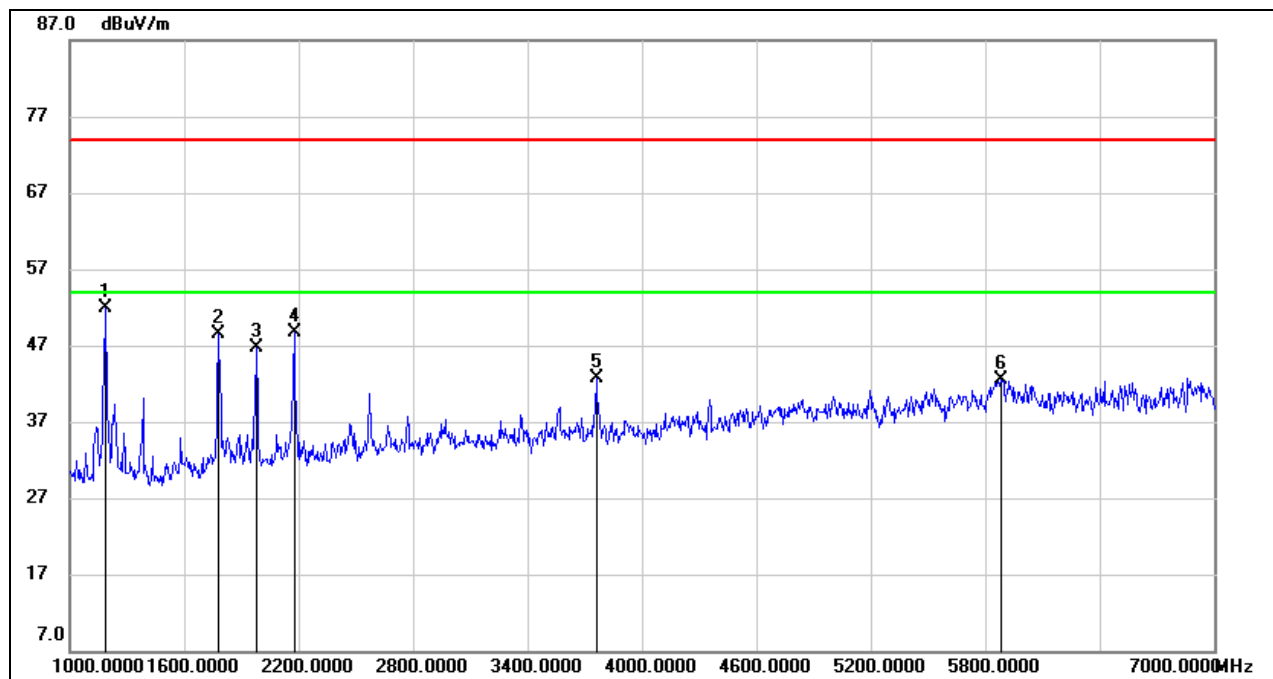
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5146.780	6.47	40.45	46.92	54.00	-7.08	AVG
2	5150.000	7.64	40.46	48.10	54.00	-5.90	AVG

Note: 1. Measurement = Reading Level + Correct Factor.  
2. AVG: VBW=1/Ton where: ton is transmit duration.  
3. For duty cycle, please refer to clause 7.1.  
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.



**HARMONICS AND SPURIOUS EMISSIONS LOW CHANNEL**

**HORIZONTAL RESULTS**  
**1-7GHz**

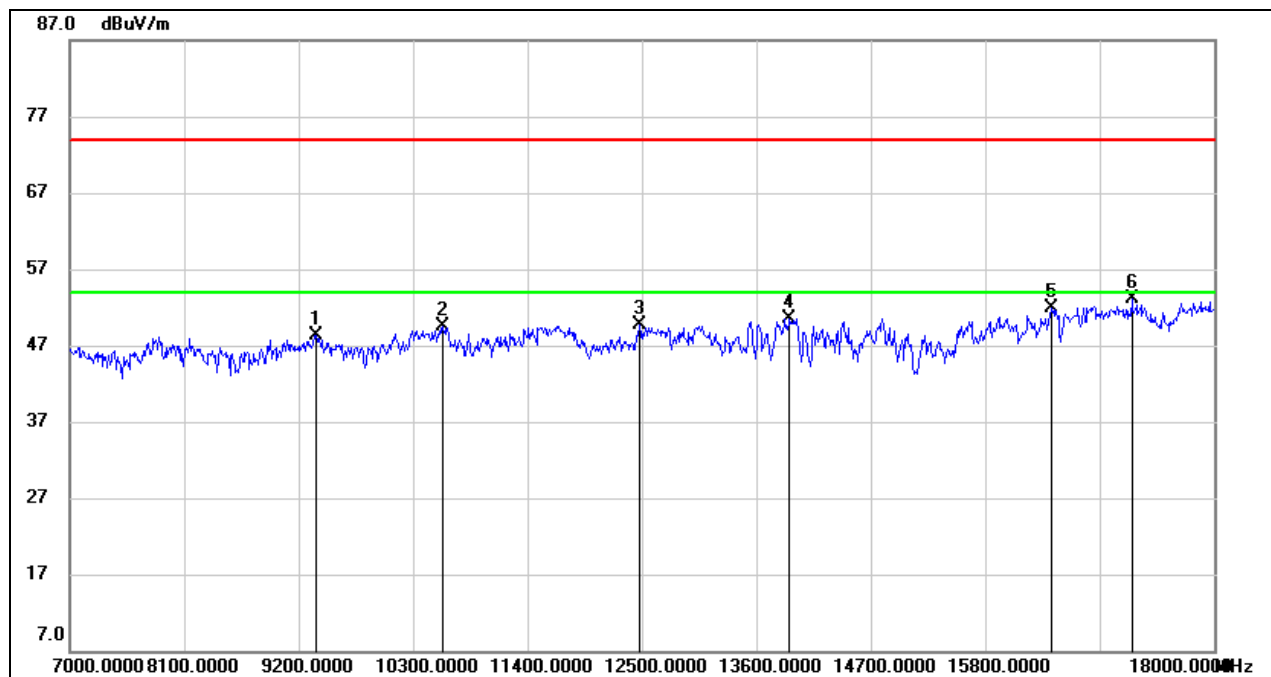


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1186.000	65.32	-13.39	51.93	74.00	-22.07	peak
2	1780.000	59.54	-10.94	48.60	74.00	-25.40	peak
3	1978.000	57.30	-10.67	46.63	74.00	-27.37	peak
4	2176.000	58.40	-9.76	48.64	74.00	-25.36	peak
5	3760.000	46.92	-4.23	42.69	74.00	-31.31	peak
6	5884.000	38.41	4.03	42.44	74.00	-31.56	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



**HORIZONTAL RESULTS**  
**7-18GHz**

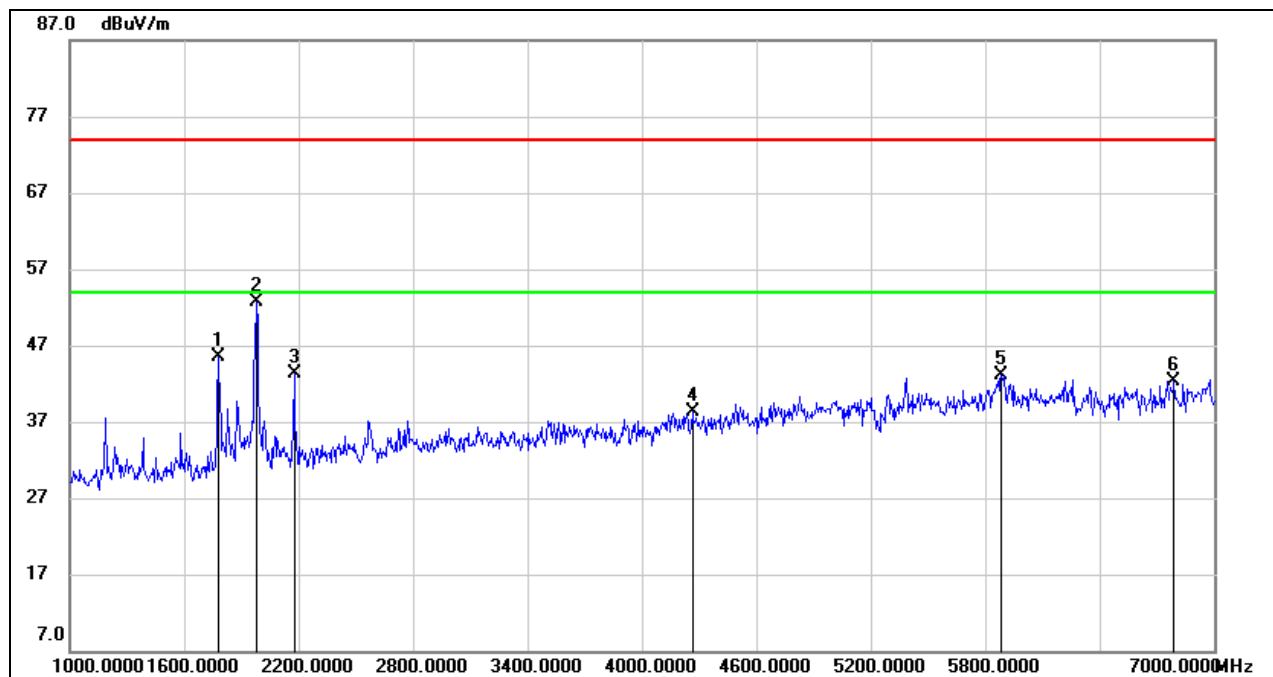


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	9365.000	38.95	9.38	48.33	74.00	-25.67	peak
2	10586.000	37.70	11.87	49.57	74.00	-24.43	peak
3	12478.000	35.16	14.45	49.61	74.00	-24.39	peak
4	13919.000	34.34	16.17	50.51	74.00	-23.49	peak
5	16438.000	32.87	18.94	51.81	74.00	-22.19	peak
6	17208.000	32.20	20.98	53.18	74.00	-20.82	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



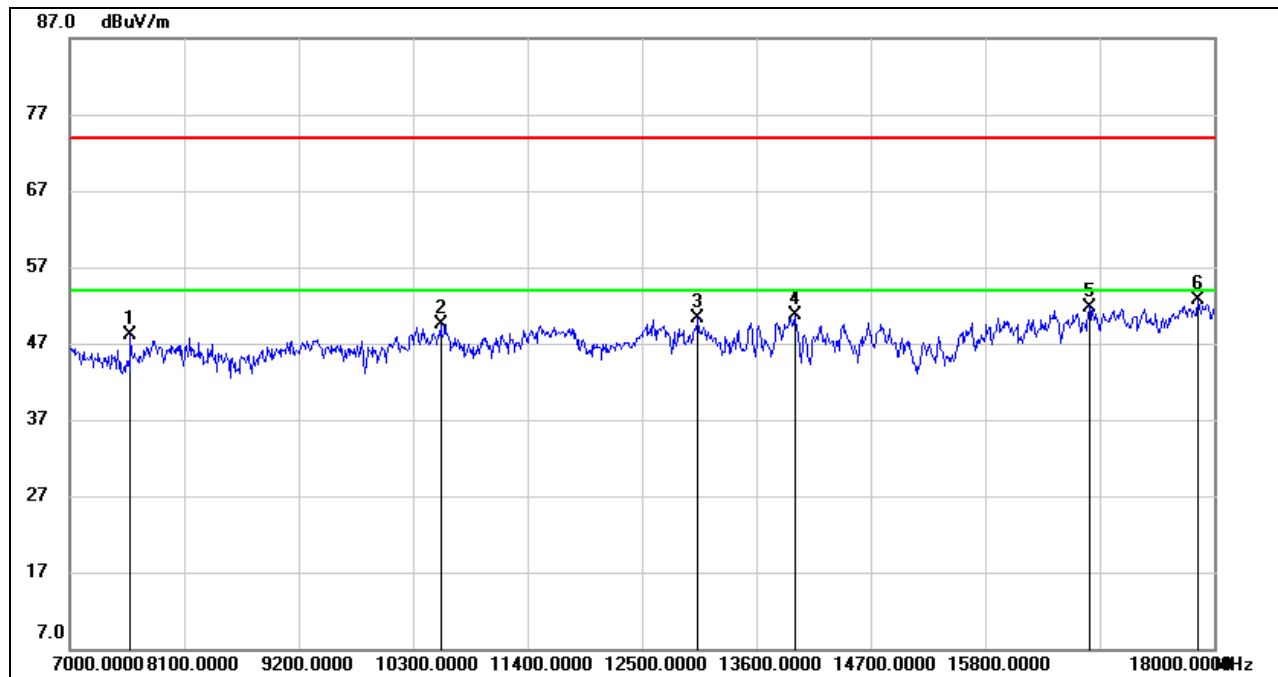
**VERTICAL RESULTS**  
**1-7GHz**



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1780.000	56.37	-10.94	45.43	74.00	-28.57	peak
2	1978.000	63.28	-10.67	52.61	74.00	-21.39	peak
3	2176.000	53.10	-9.76	43.34	74.00	-30.66	peak
4	4264.000	41.20	-2.97	38.23	74.00	-35.77	peak
5	5884.000	39.13	4.03	43.16	74.00	-30.84	peak
6	6790.000	37.78	4.54	42.32	74.00	-31.68	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



**7-18GHz**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7583.000	41.59	6.48	48.07	74.00	-25.93	peak
2	10564.000	37.84	11.75	49.59	74.00	-24.41	peak
3	13039.000	35.28	15.04	50.32	74.00	-23.68	peak
4	13974.000	34.60	16.07	50.67	74.00	-23.33	peak
5	16801.000	31.85	19.95	51.80	74.00	-22.20	peak
6	17846.000	29.39	23.32	52.71	74.00	-21.29	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.

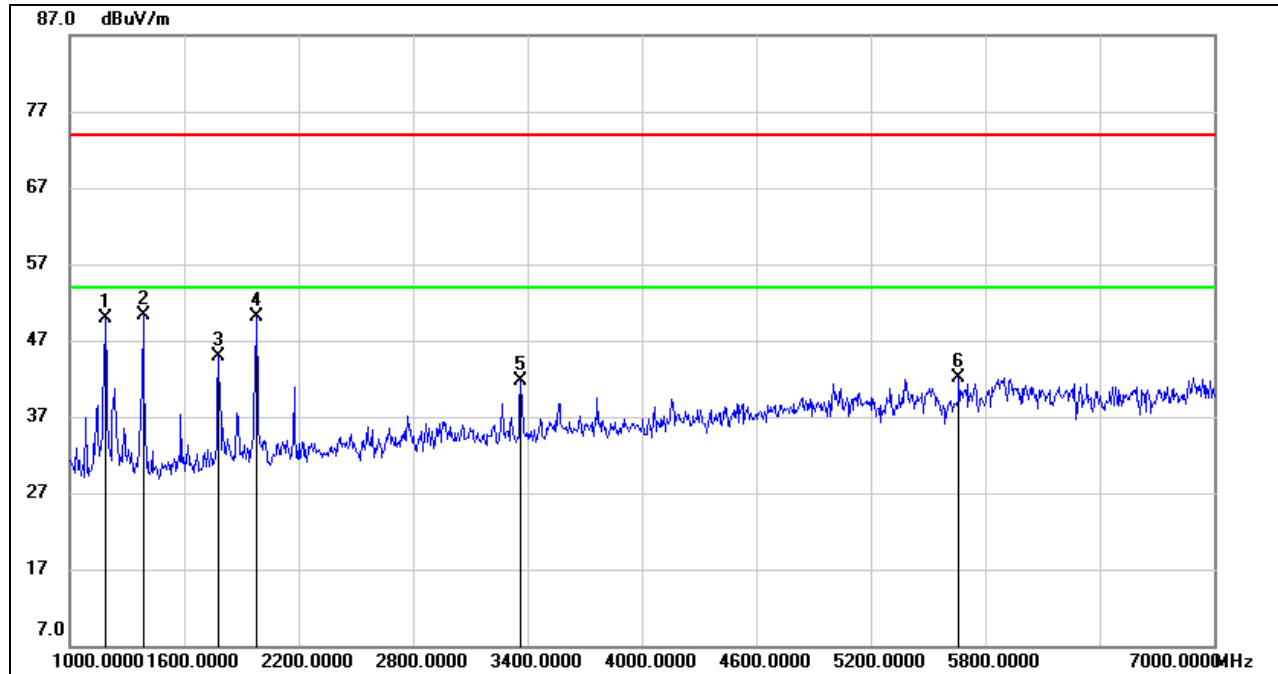
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



## HARMONICS AND SPURIOUS EMISSIONS MID CHANNEL

### HORIZONTAL RESULTS 1-7GHz

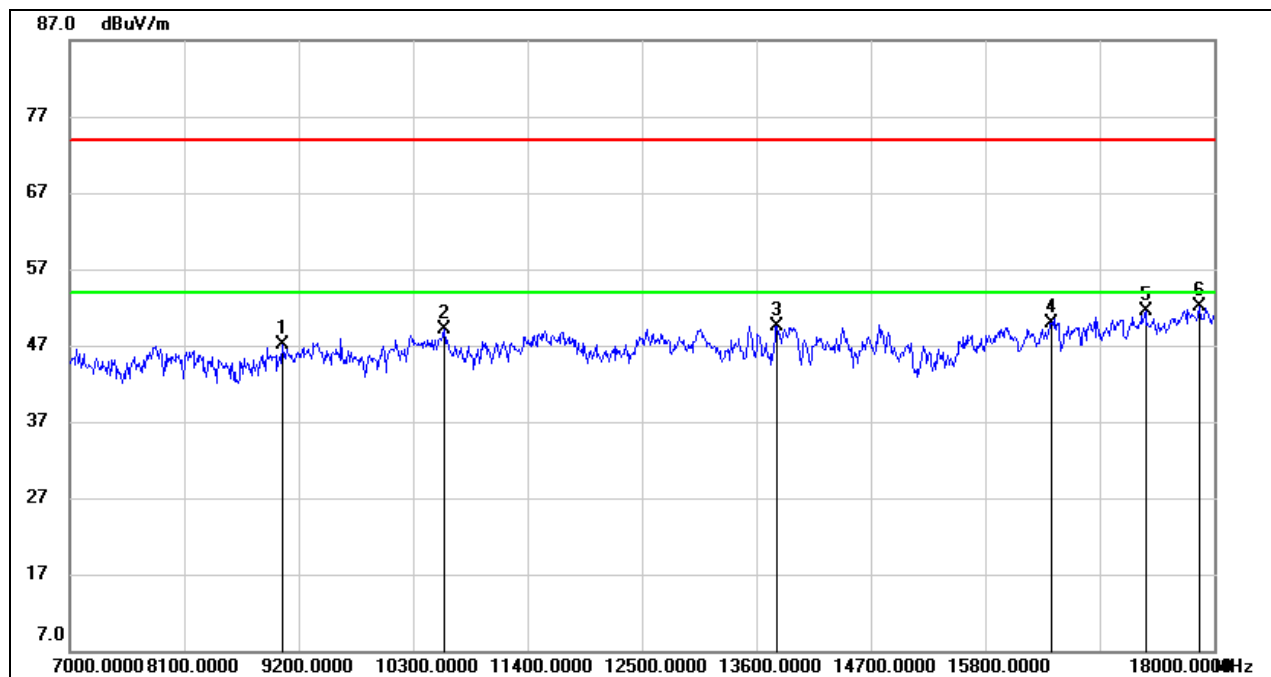


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1186.000	63.39	-13.39	50.00	74.00	-24.00	peak
2	1384.000	63.43	-13.05	50.38	74.00	-23.62	peak
3	1780.000	55.84	-10.94	44.90	74.00	-29.10	peak
4	1978.000	60.72	-10.67	50.05	74.00	-23.95	peak
5	3364.000	47.36	-5.73	41.63	74.00	-32.37	peak
6	5662.000	40.21	1.98	42.19	74.00	-31.81	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



**HORIZONTAL RESULTS**  
**7-18GHz**

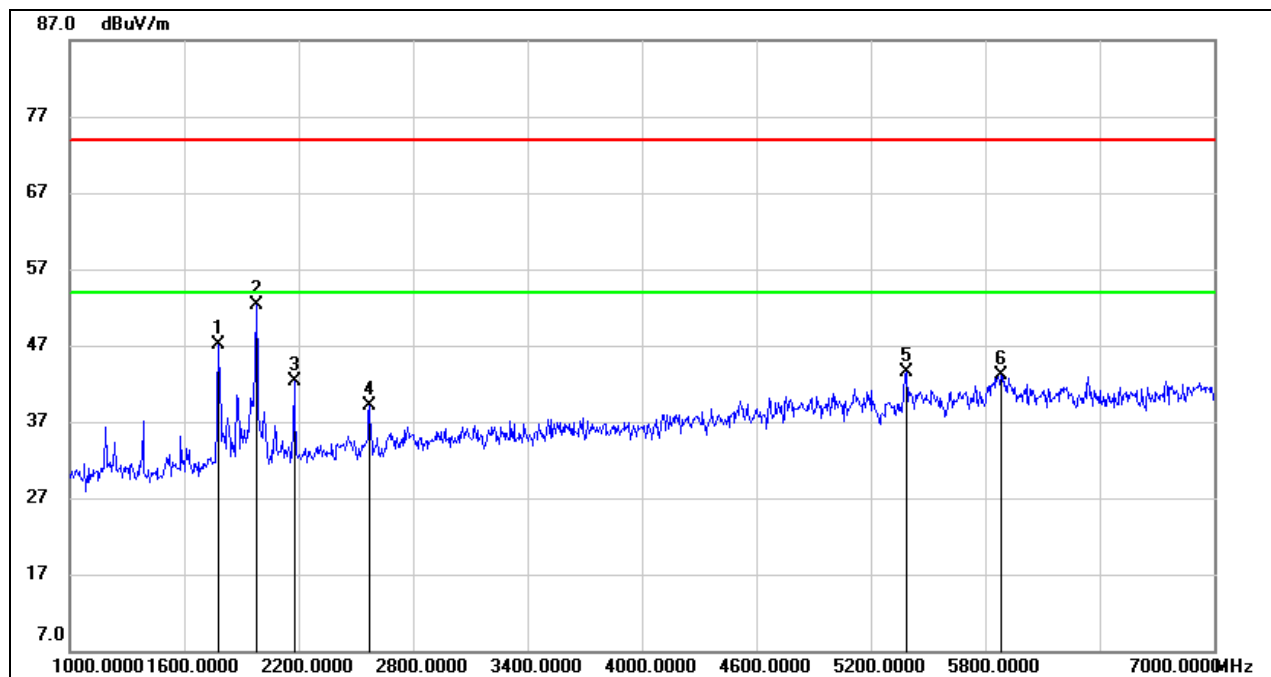


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	9046.000	37.88	9.29	47.17	74.00	-26.83	peak
2	10597.000	37.09	11.94	49.03	74.00	-24.97	peak
3	13798.000	32.49	17.07	49.56	74.00	-24.44	peak
4	16438.000	30.93	18.94	49.87	74.00	-24.13	peak
5	17340.000	29.90	21.61	51.51	74.00	-22.49	peak
6	17857.000	28.75	23.33	52.08	74.00	-21.92	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



**VERTICAL RESULTS**  
**1-7GHz**

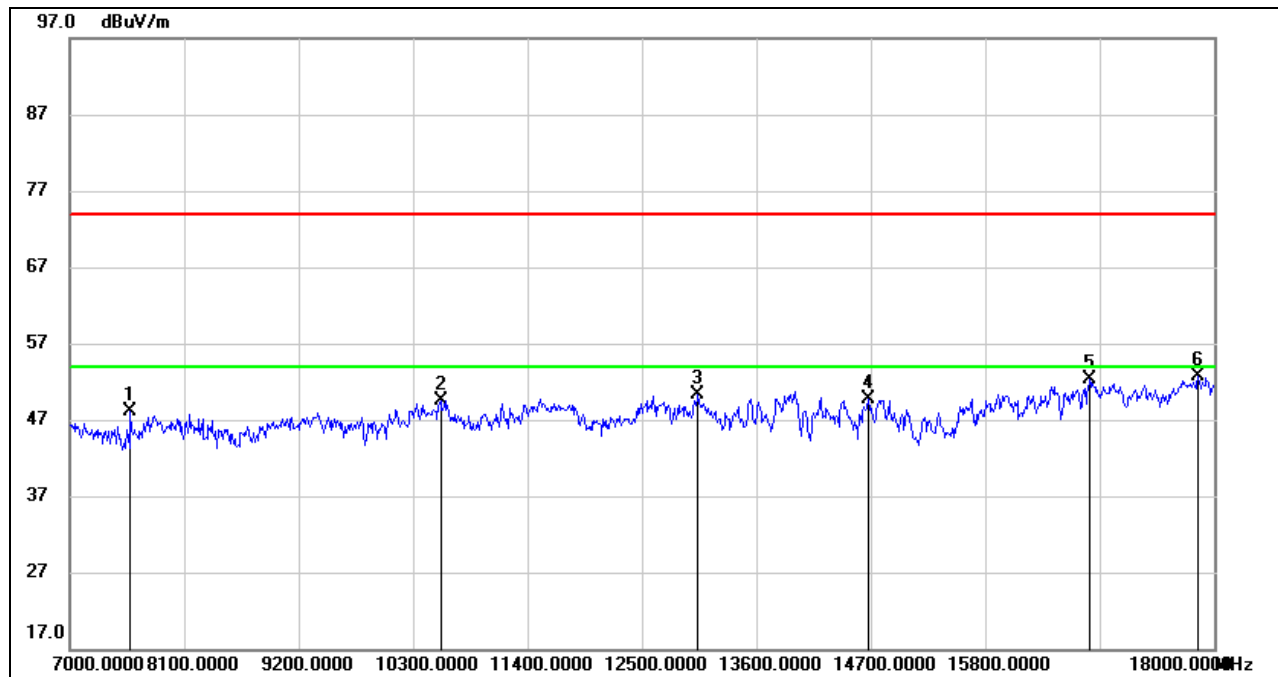


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1780.000	58.07	-10.94	47.13	74.00	-26.87	peak
2	1978.000	62.89	-10.67	52.22	74.00	-21.78	peak
3	2176.000	52.13	-9.76	42.37	74.00	-31.63	peak
4	2572.000	47.50	-8.42	39.08	74.00	-34.92	peak
5	5386.000	42.40	1.08	43.48	74.00	-30.52	peak
6	5884.000	38.99	4.03	43.02	74.00	-30.98	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



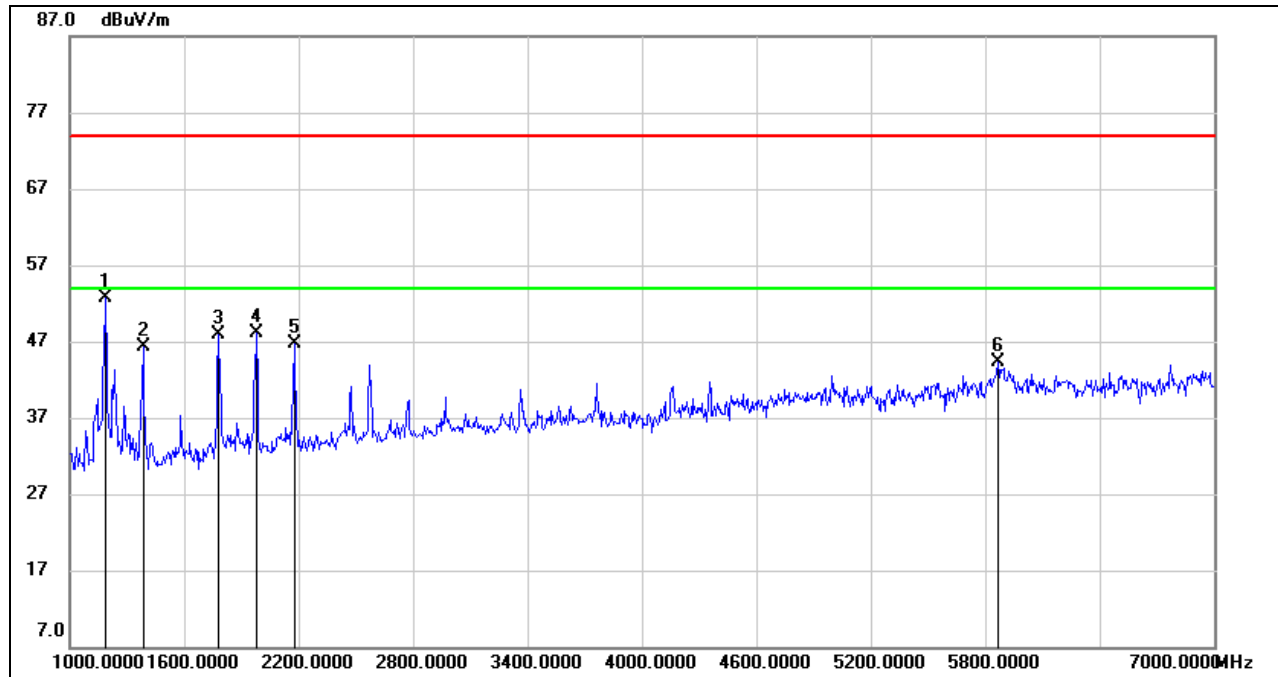
**7-18GHz**



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7583.000	41.59	6.48	48.07	74.00	-25.93	peak
2	10564.000	37.84	11.75	49.59	74.00	-24.41	peak
3	13039.000	35.28	15.04	50.32	74.00	-23.68	peak
4	14678.000	33.67	16.02	49.69	74.00	-24.31	peak
5	16801.000	32.35	19.95	52.30	74.00	-21.70	peak
6	17846.000	29.39	23.32	52.71	74.00	-21.29	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



**HARMONICS AND SPURIOUS EMISSIONS HIGH CHANNEL****HORIZONTAL RESULTS**  
**1-7GHz**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1186.000	66.02	-13.39	52.63	74.00	-21.37	peak
2	1384.000	59.34	-13.05	46.29	74.00	-27.71	peak
3	1780.000	58.92	-10.94	47.98	74.00	-26.02	peak
4	1978.000	58.71	-10.67	48.04	74.00	-25.96	peak
5	2176.000	56.49	-9.76	46.73	74.00	-27.27	peak
6	5866.000	40.56	3.70	44.26	74.00	-29.74	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

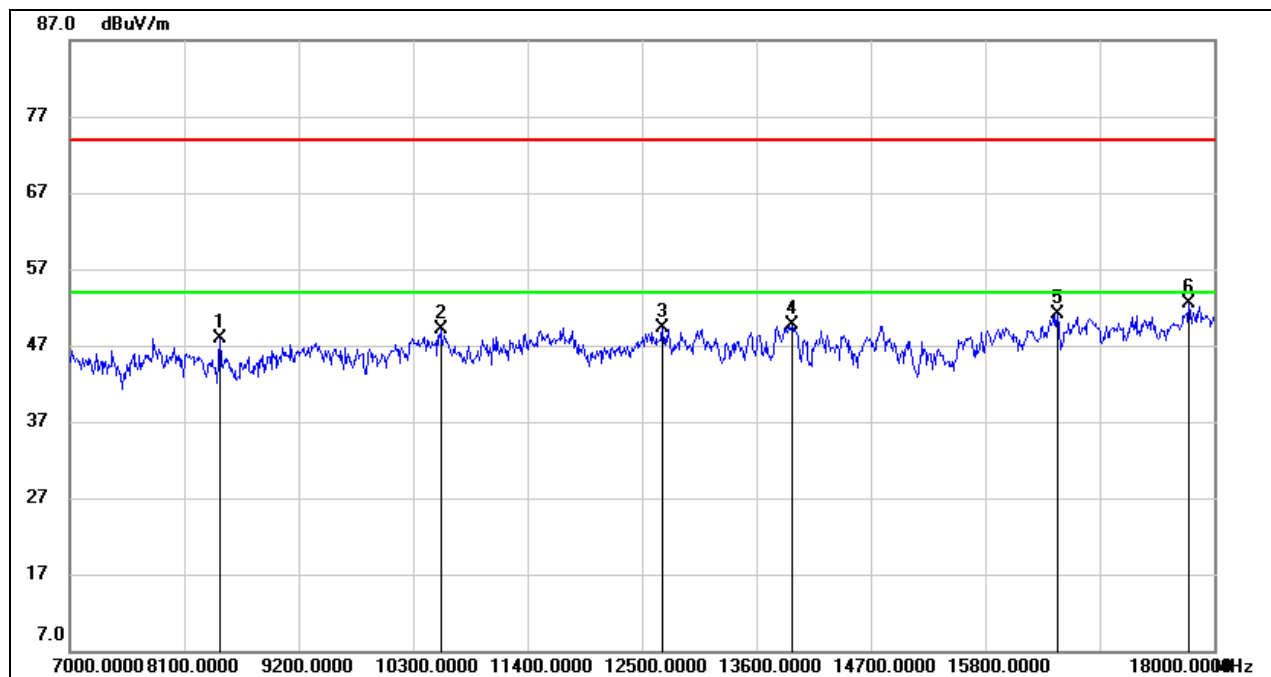
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



**HORIZONTAL RESULTS**  
**7-18GHz**

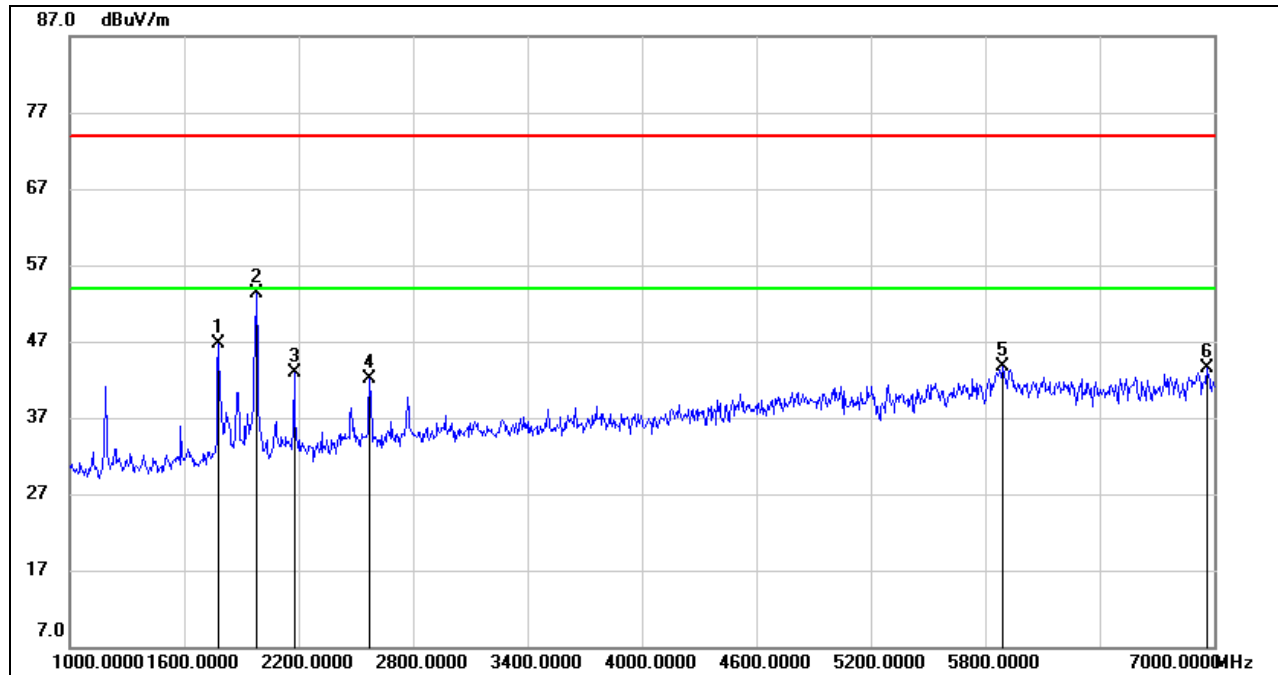


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8441.000	40.41	7.54	47.95	74.00	-26.05	peak
2	10564.000	37.30	11.75	49.05	74.00	-24.95	peak
3	12698.000	35.00	14.29	49.29	74.00	-24.71	peak
4	13941.000	33.54	16.13	49.67	74.00	-24.33	peak
5	16493.000	31.93	19.16	51.09	74.00	-22.91	peak
6	17758.000	29.51	22.94	52.45	74.00	-21.55	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



**VERTICAL RESULTS**  
**1-7GHz**

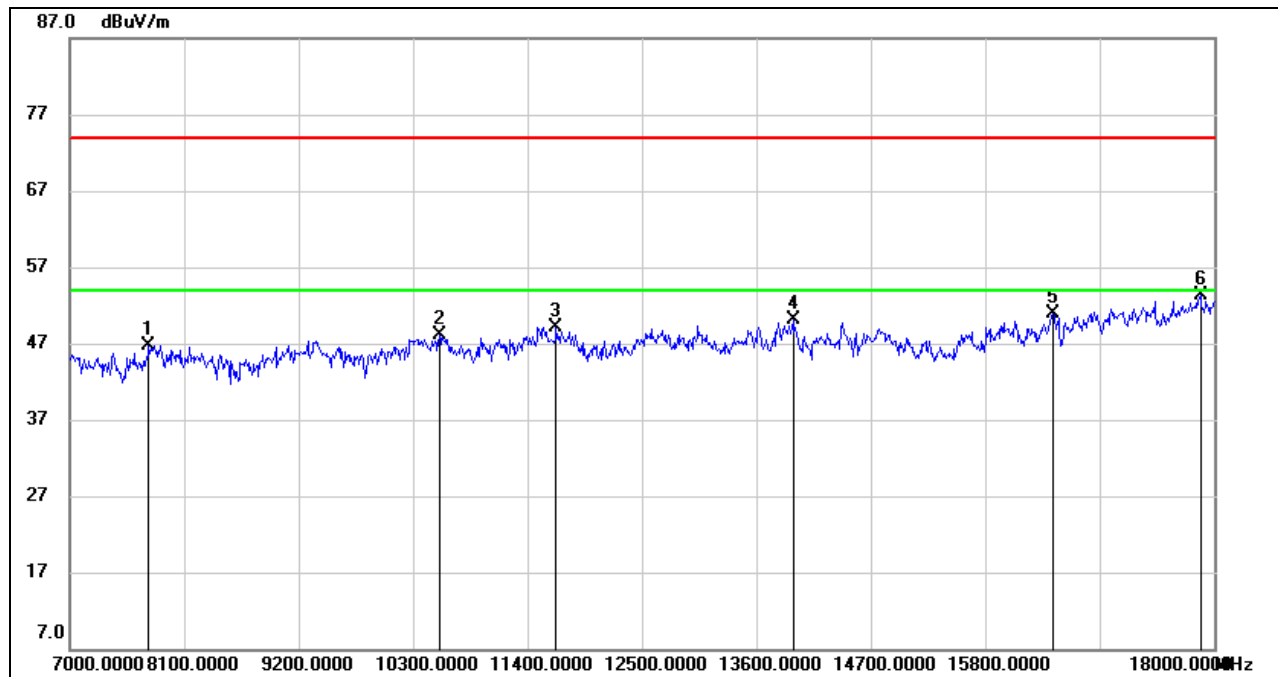


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1780.000	57.69	-10.94	46.75	74.00	-27.25	peak
2	1978.000	63.97	-10.67	53.30	74.00	-20.70	peak
3	2176.000	52.63	-9.76	42.87	74.00	-31.13	peak
4	2572.000	50.54	-8.42	42.12	74.00	-31.88	peak
5	5890.000	39.63	4.15	43.78	74.00	-30.22	peak
6	6964.000	38.23	5.25	43.48	74.00	-30.52	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



**7-18GHz**



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7759.000	39.45	7.35	46.80	74.00	-27.20	peak
2	10553.000	36.38	11.68	48.06	74.00	-25.94	peak
3	11675.000	36.13	13.00	49.13	74.00	-24.87	peak
4	13952.000	33.92	16.11	50.03	74.00	-23.97	peak
5	16449.000	31.86	18.98	50.84	74.00	-23.16	peak
6	17868.000	29.89	23.33	53.22	74.00	-20.78	peak

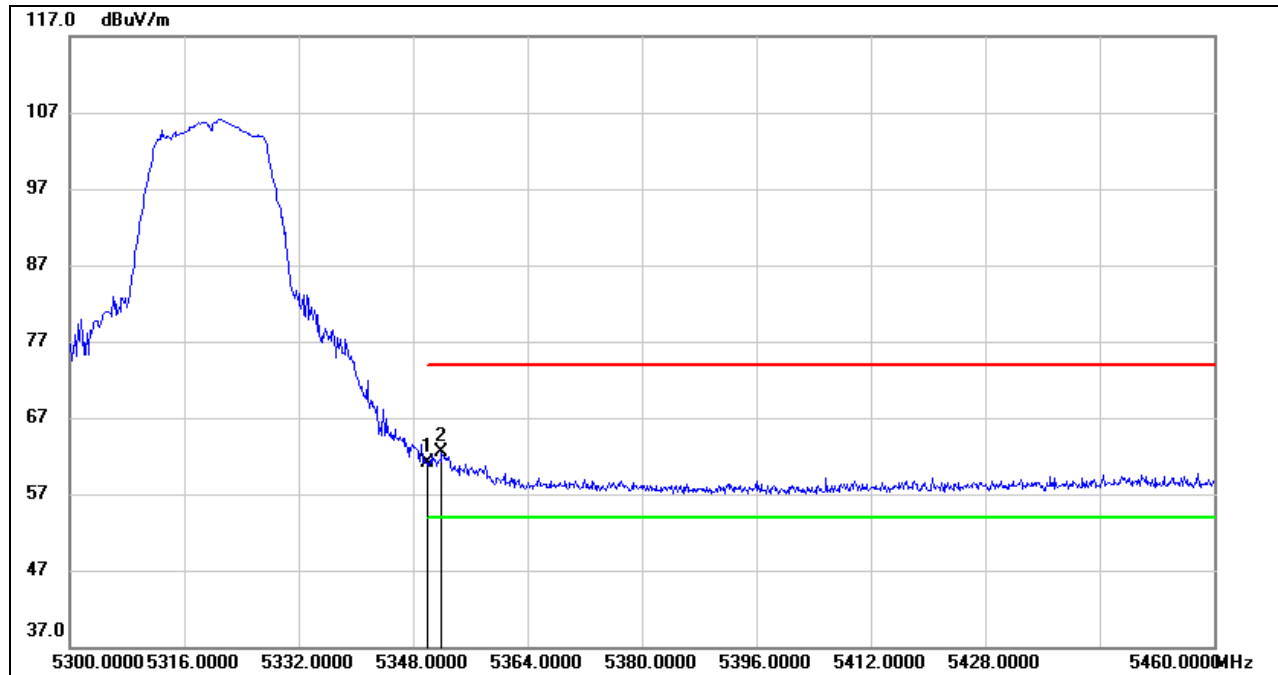
Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



### 8.1.2. UNII-2A BAND

#### RESTRICTED BANDEDGE HIGH CHANNEL

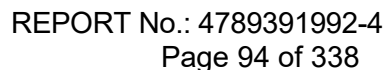
#### HORIZONTAL RESULTS PEAK



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	20.52	40.64	61.16	74.00	-12.84	peak
2	5352.000	21.90	40.63	62.53	74.00	-11.47	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.





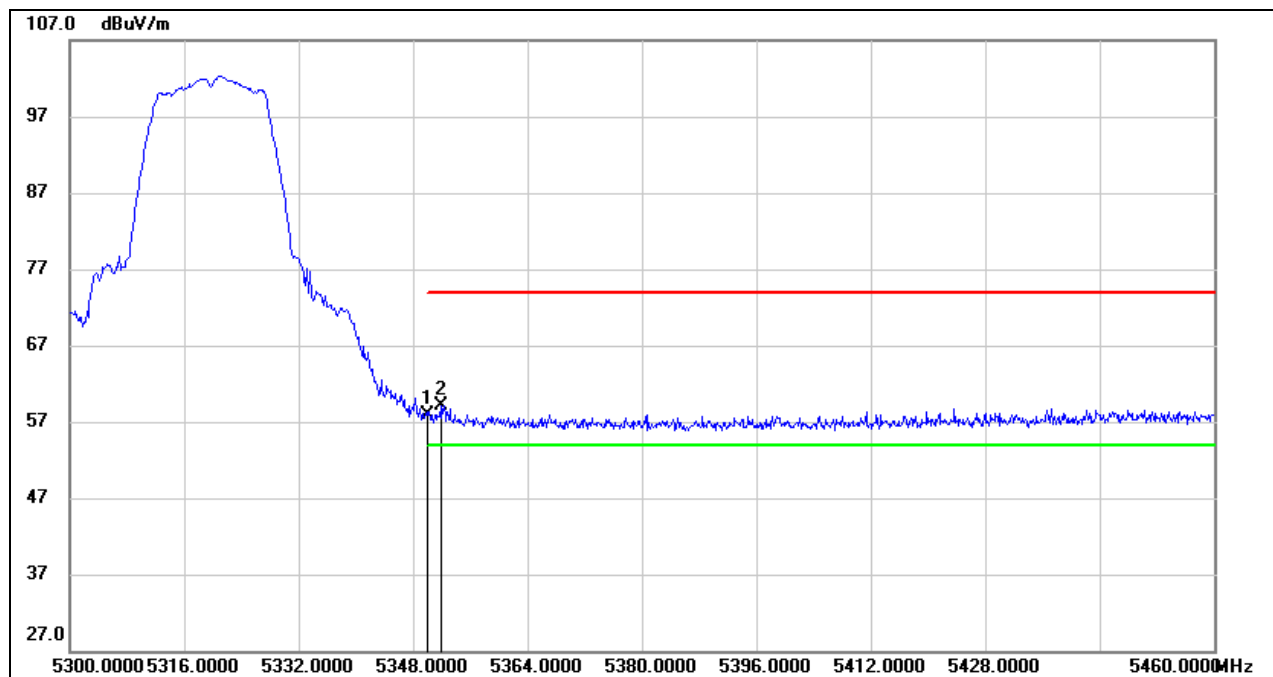
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	4.99	40.64	45.63	54.00	-8.37	AVG
2	5352.000	4.70	40.63	45.33	54.00	-8.67	AVG

Note:

1. Measurement = Reading Level + Correct Factor.
2. AVG:  $VBW=1/Ton$  where: ton is transmit duration.
3. For duty cycle, please refer to clause 7.1.
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.



**VERTICAL RESULTS**  
**PEAK**

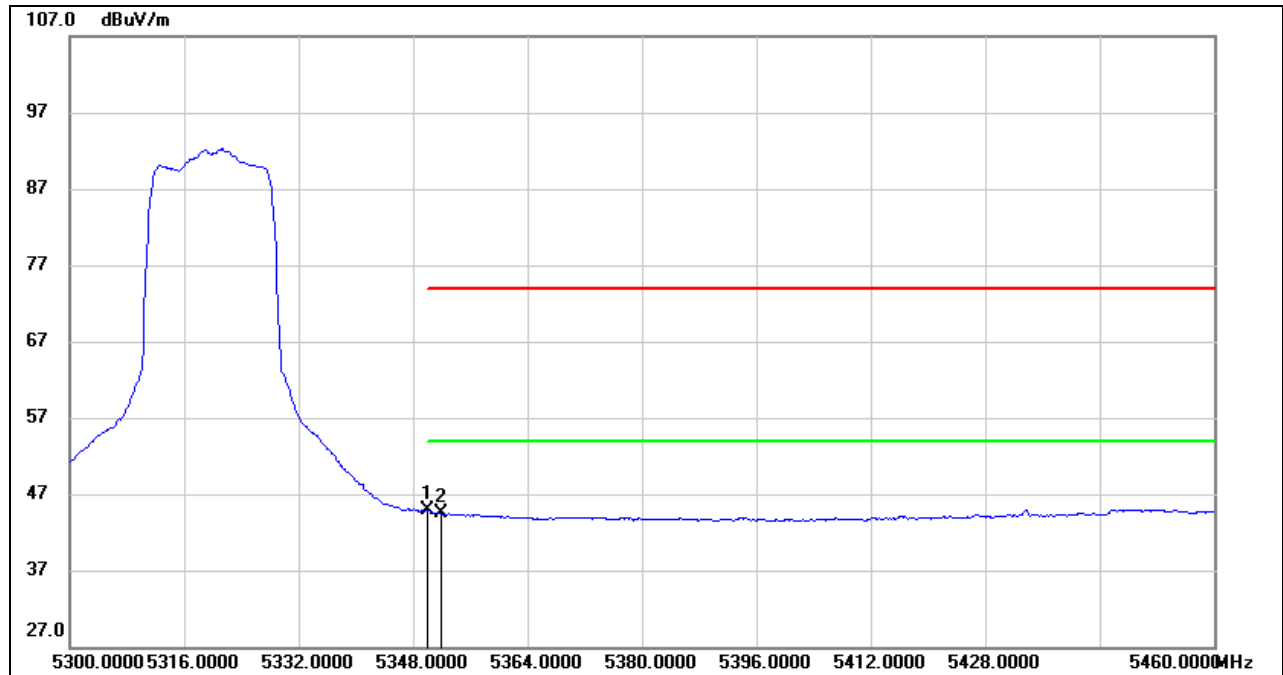


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	17.31	40.64	57.95	74.00	-16.05	peak
2	5351.840	18.54	40.63	59.17	74.00	-14.83	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.



**AVG**



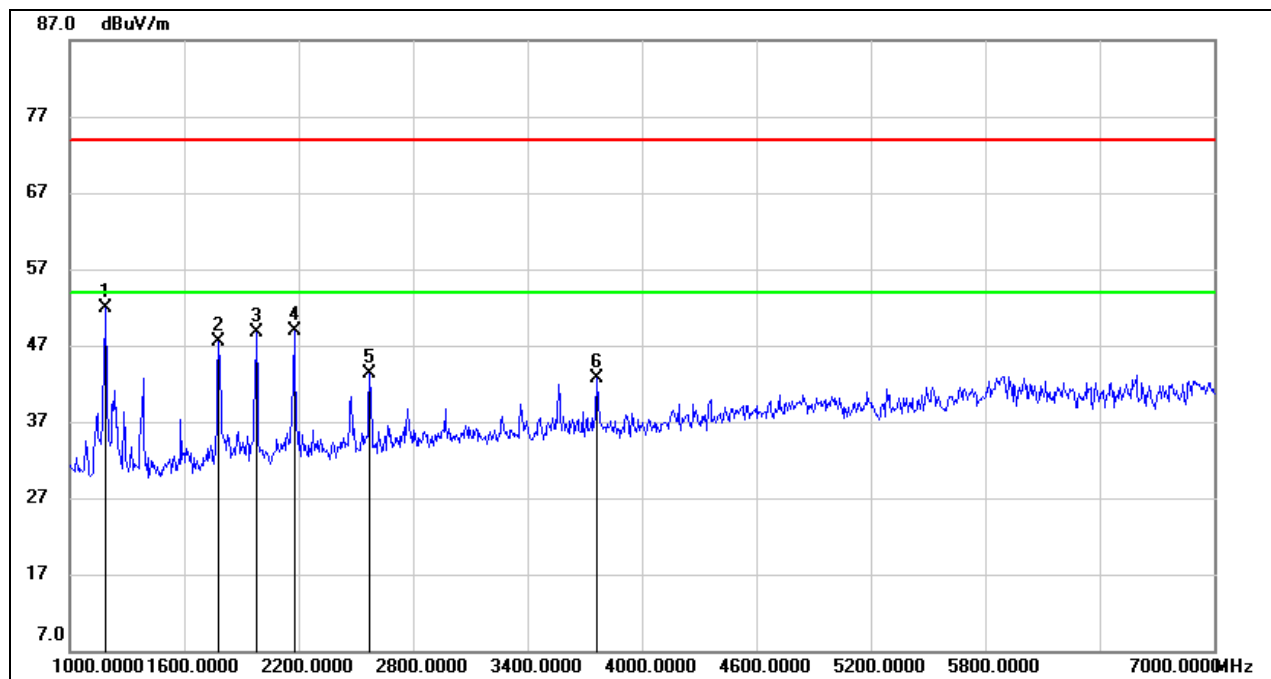
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	4.26	40.64	44.90	54.00	-9.10	AVG
2	5351.840	3.80	40.63	44.43	54.00	-9.57	AVG

Note: 1. Measurement = Reading Level + Correct Factor.  
2. AVG: VBW=1/Ton where: ton is transmit duration.  
3. For duty cycle, please refer to clause 7.1.  
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.



**HARMONICS AND SPURIOUS EMISSIONS LOW CHANNEL**

**HORIZONTAL RESULTS**  
**1-7GHz**



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1186.000	65.22	-13.39	51.83	74.00	-22.17	peak
2	1780.000	58.41	-10.94	47.47	74.00	-26.53	peak
3	1978.000	59.32	-10.67	48.65	74.00	-25.35	peak
4	2176.000	58.57	-9.76	48.81	74.00	-25.19	peak
5	2572.000	51.70	-8.42	43.28	74.00	-30.72	peak
6	3760.000	46.95	-4.23	42.72	74.00	-31.28	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

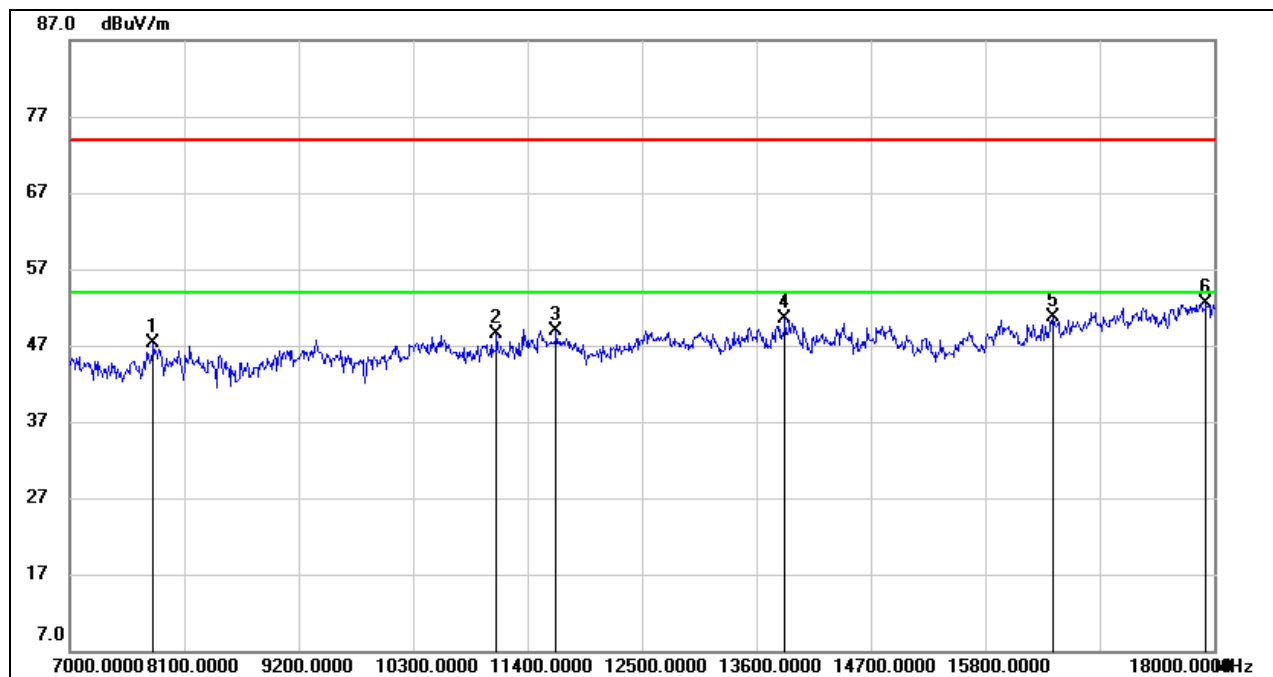
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



**HORIZONTAL RESULTS**  
**7-18GHz**



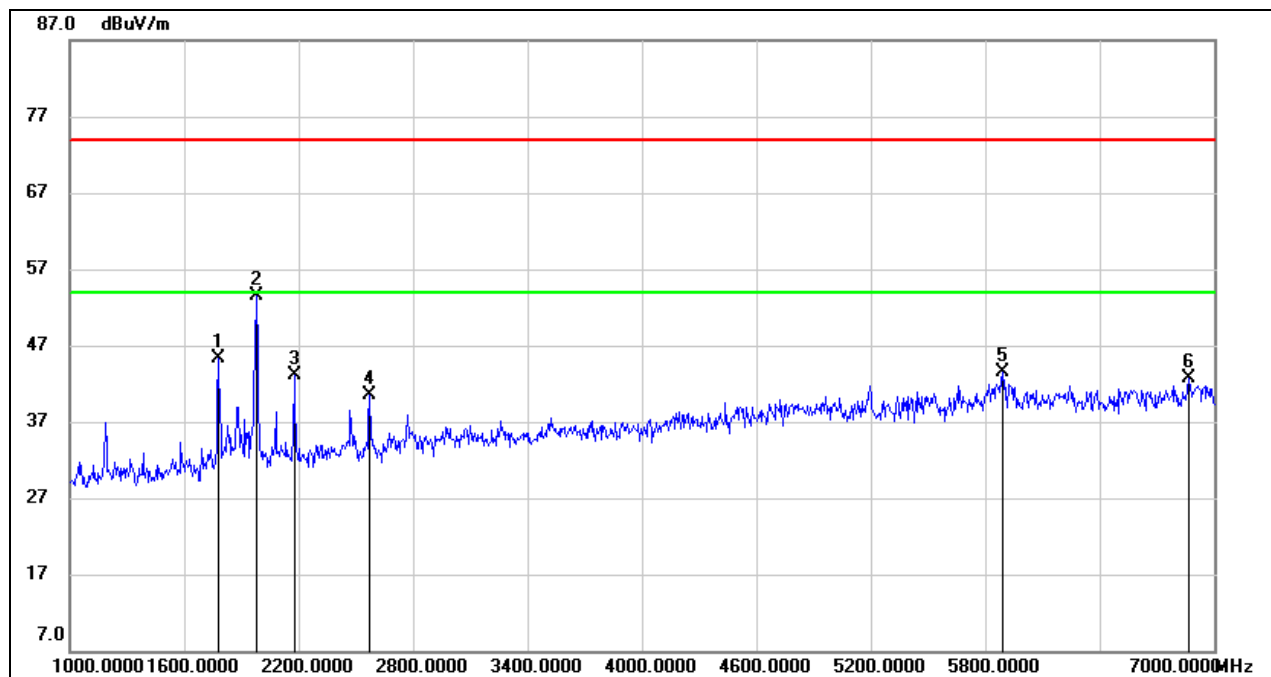
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7803.000	39.44	7.91	47.35	74.00	-26.65	peak
2	11103.000	35.90	12.56	48.46	74.00	-25.54	peak
3	11675.000	35.87	13.00	48.87	74.00	-25.13	peak
4	13875.000	34.08	16.44	50.52	74.00	-23.48	peak
5	16449.000	31.66	18.98	50.64	74.00	-23.36	peak
6	17923.000	29.19	23.36	52.55	74.00	-21.45	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.





**VERTICAL RESULTS**  
**1-7GHz**

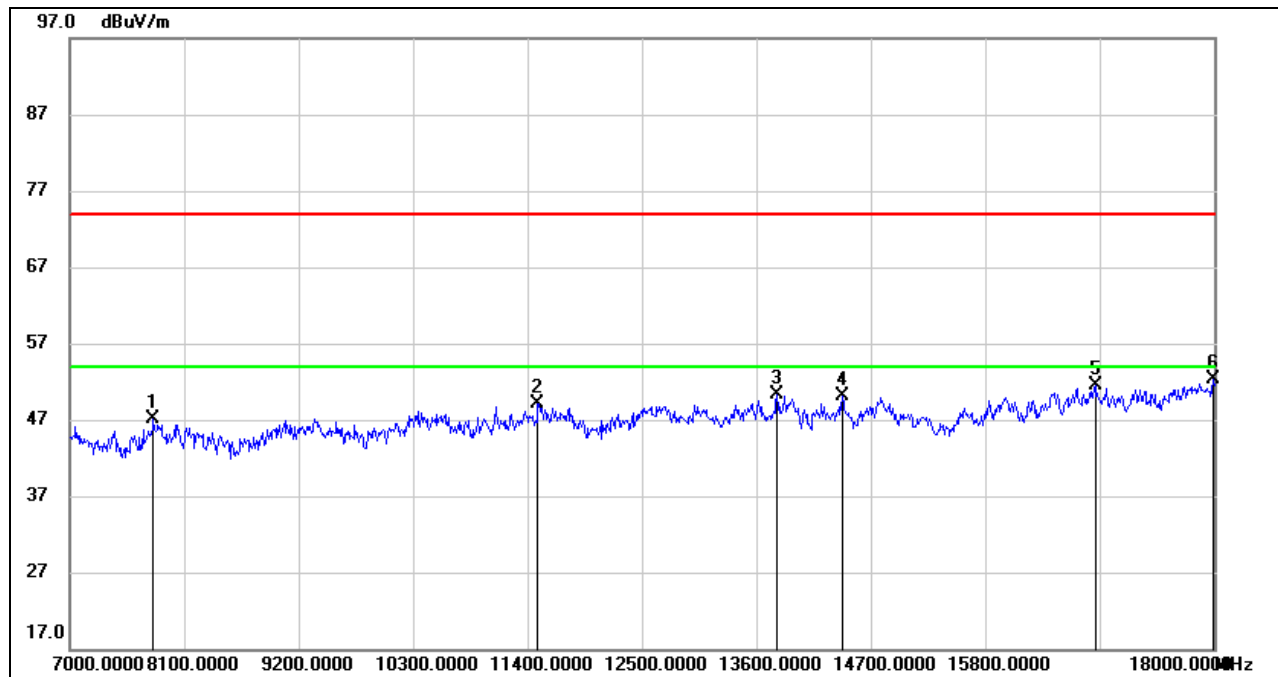


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1780.000	56.24	-10.94	45.30	74.00	-28.70	peak
2	1978.000	64.22	-10.67	53.55	74.00	-20.45	peak
3	2176.000	52.92	-9.76	43.16	74.00	-30.84	peak
4	2572.000	49.00	-8.42	40.58	74.00	-33.42	peak
5	5890.000	39.30	4.15	43.45	74.00	-30.55	peak
6	6868.000	37.80	4.98	42.78	74.00	-31.22	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



**7-18GHz**



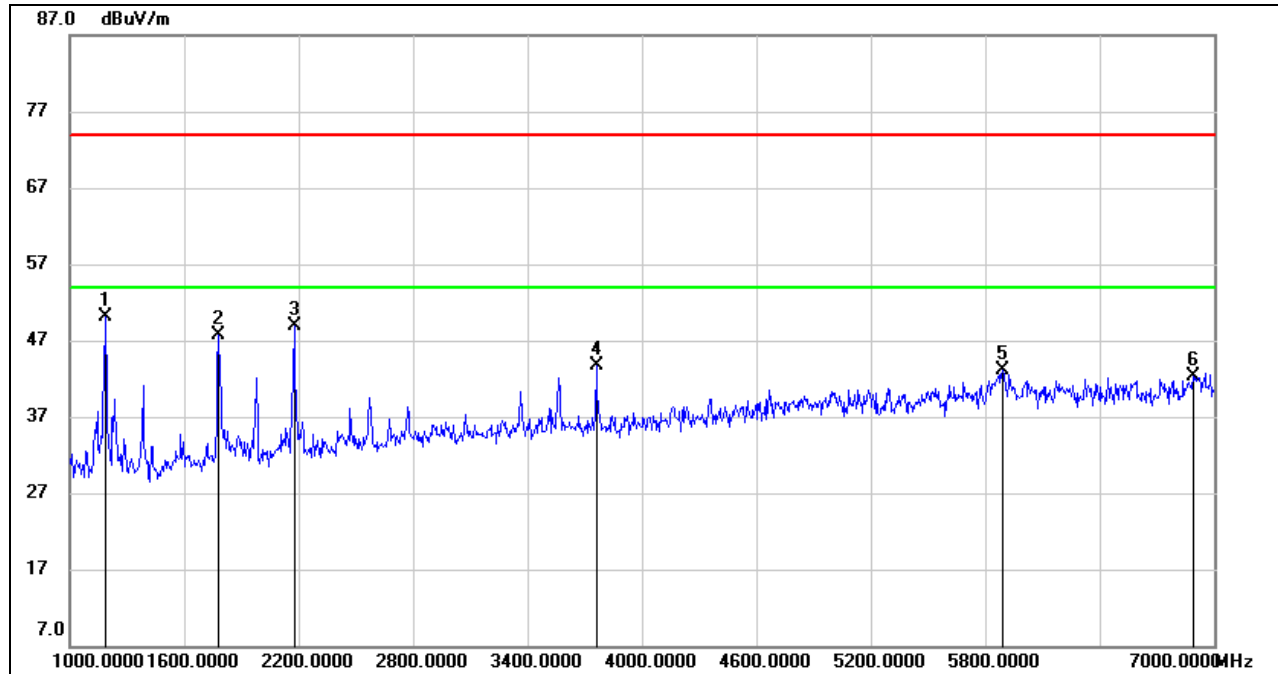
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7803.000	39.16	7.91	47.07	74.00	-26.93	peak
2	11499.000	35.65	13.41	49.06	74.00	-24.94	peak
3	13798.000	33.17	17.07	50.24	74.00	-23.76	peak
4	14425.000	33.66	16.35	50.01	74.00	-23.99	peak
5	16856.000	31.52	19.95	51.47	74.00	-22.53	peak
6	17989.000	28.80	23.44	52.24	74.00	-21.76	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



## HARMONICS AND SPURIOUS EMISSIONS MID CHANNEL

### HORIZONTAL RESULTS 1-7GHz

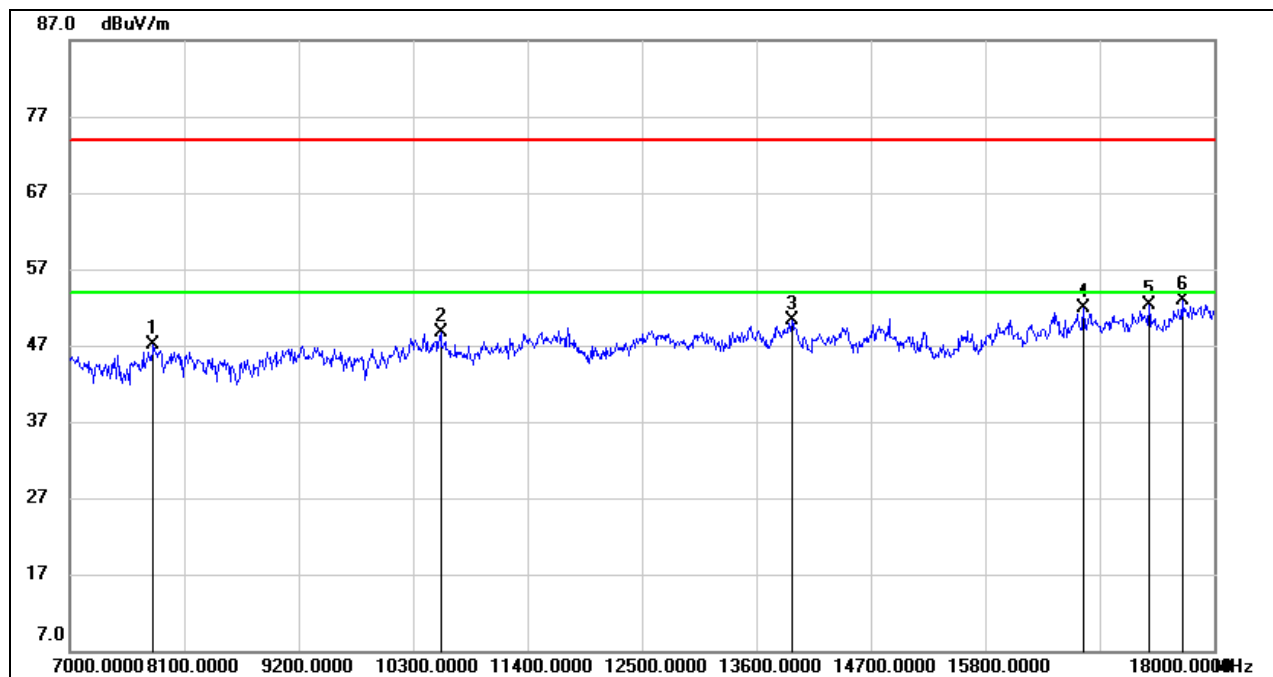


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1186.000	63.46	-13.39	50.07	74.00	-23.93	peak
2	1780.000	58.73	-10.94	47.79	74.00	-26.21	peak
3	2176.000	58.75	-9.76	48.99	74.00	-25.01	peak
4	3760.000	47.86	-4.23	43.63	74.00	-30.37	peak
5	5890.000	39.01	4.15	43.16	74.00	-30.84	peak
6	6892.000	37.09	5.14	42.23	74.00	-31.77	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



**HORIZONTAL RESULTS**  
**7-18GHz**

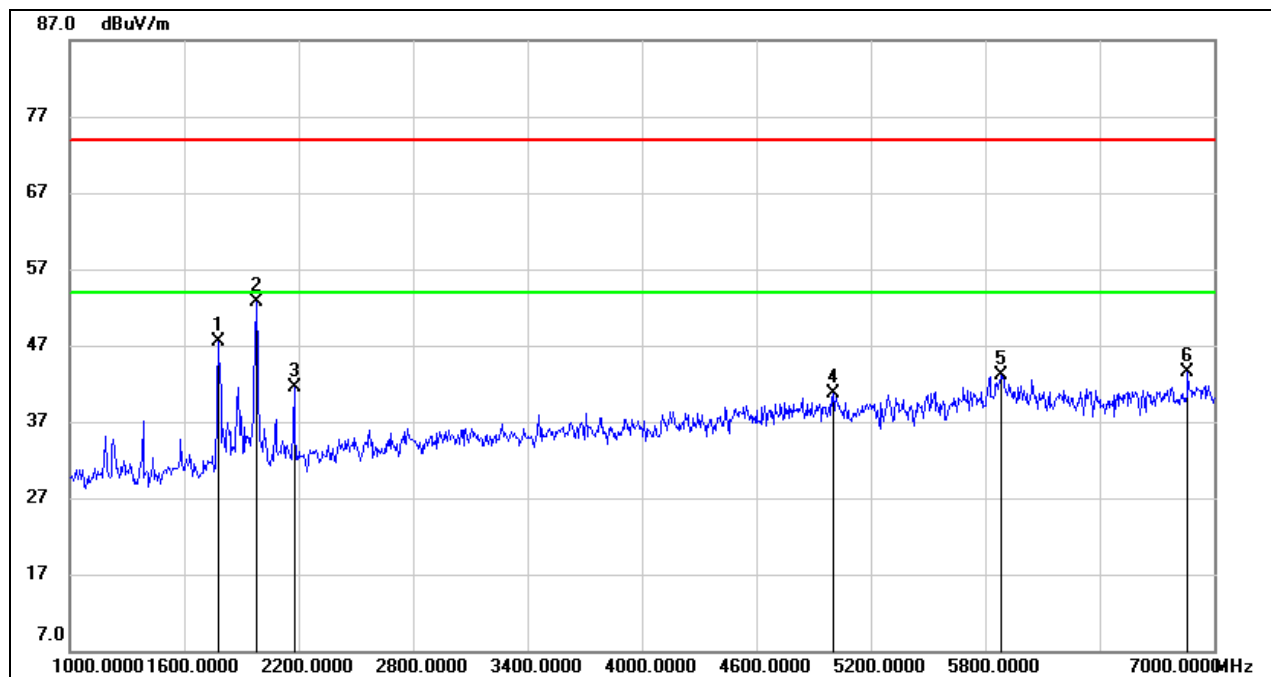


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7803.000	39.18	7.91	47.09	74.00	-26.91	peak
2	10564.000	37.03	11.75	48.78	74.00	-25.22	peak
3	13941.000	34.27	16.13	50.40	74.00	-23.60	peak
4	16746.000	31.95	19.94	51.89	74.00	-22.11	peak
5	17373.000	30.82	21.50	52.32	74.00	-21.68	peak
6	17692.000	30.49	22.38	52.87	74.00	-21.13	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.

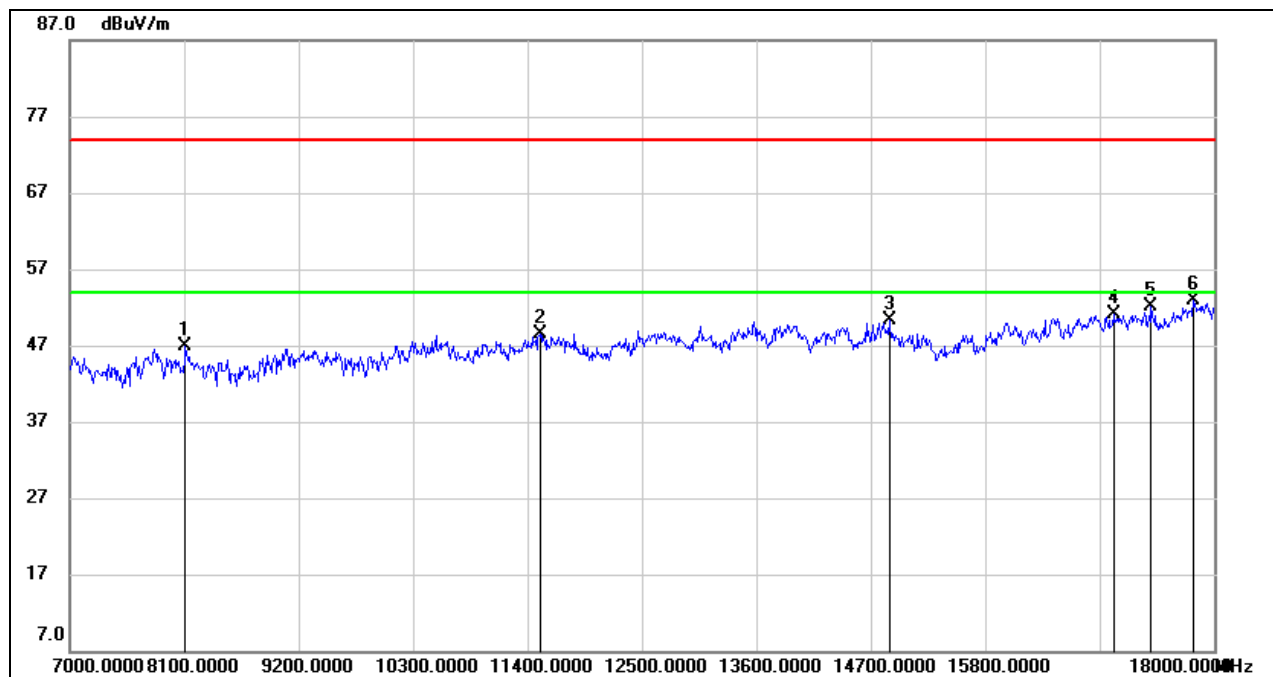


**VERTICAL RESULTS**  
**1-7GHz**



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1780.000	58.35	-10.94	47.41	74.00	-26.59	peak
2	1978.000	63.42	-10.67	52.75	74.00	-21.25	peak
3	2176.000	51.23	-9.76	41.47	74.00	-32.53	peak
4	5002.000	40.01	0.71	40.72	74.00	-33.28	peak
5	5884.000	39.13	4.03	43.16	74.00	-30.84	peak
6	6862.000	38.64	4.95	43.59	74.00	-30.41	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.

**7-18GHz**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8111.000	39.09	7.88	46.97	74.00	-27.03	peak
2	11521.000	35.23	13.37	48.60	74.00	-25.40	peak
3	14876.000	34.28	15.99	50.27	74.00	-23.73	peak
4	17032.000	30.58	20.48	51.06	74.00	-22.94	peak
5	17395.000	30.61	21.42	52.03	74.00	-21.97	peak
6	17802.000	29.61	23.30	52.91	74.00	-21.09	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

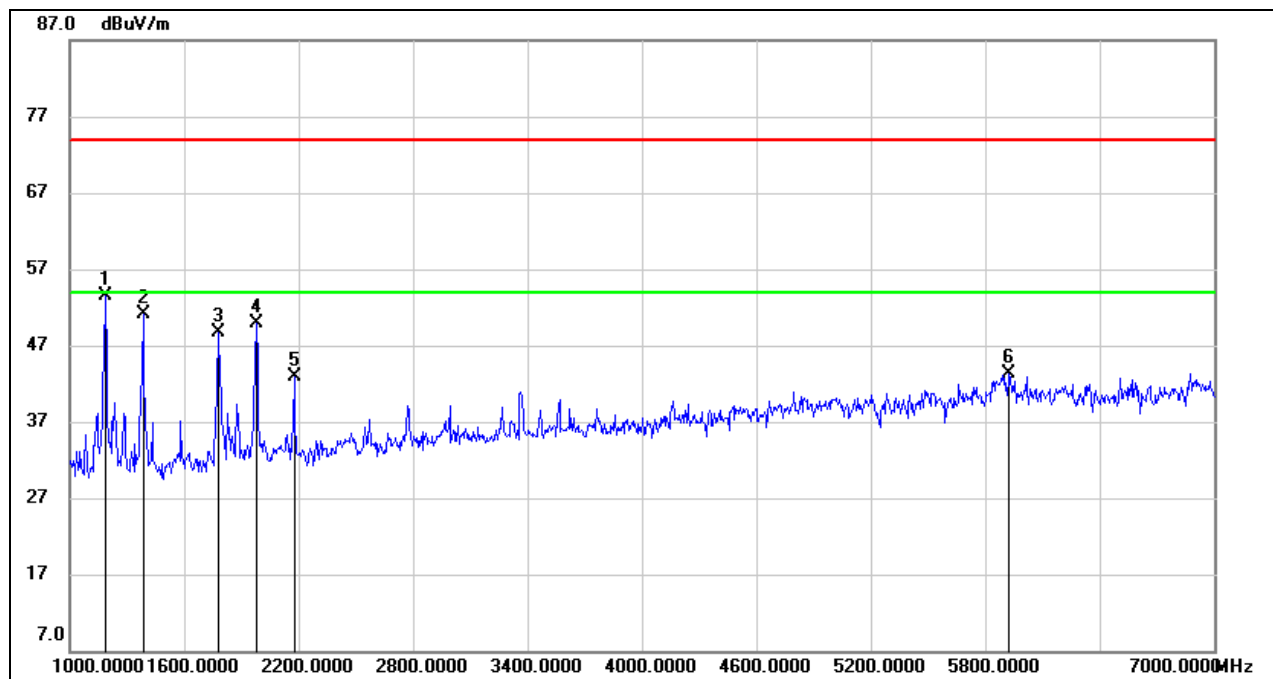
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.





**HARMONICS AND SPURIOUS EMISSIONS HIGH CHANNEL**

**HORIZONTAL RESULTS**  
**1-7GHz**



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1186.000	66.86	-13.39	53.47	74.00	-20.53	peak
2	1384.000	64.11	-13.05	51.06	74.00	-22.94	peak
3	1780.000	59.63	-10.94	48.69	74.00	-25.31	peak
4	1978.000	60.50	-10.67	49.83	74.00	-24.17	peak
5	2176.000	52.76	-9.76	43.00	74.00	-31.00	peak
6	5926.000	39.48	3.87	43.35	74.00	-30.65	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

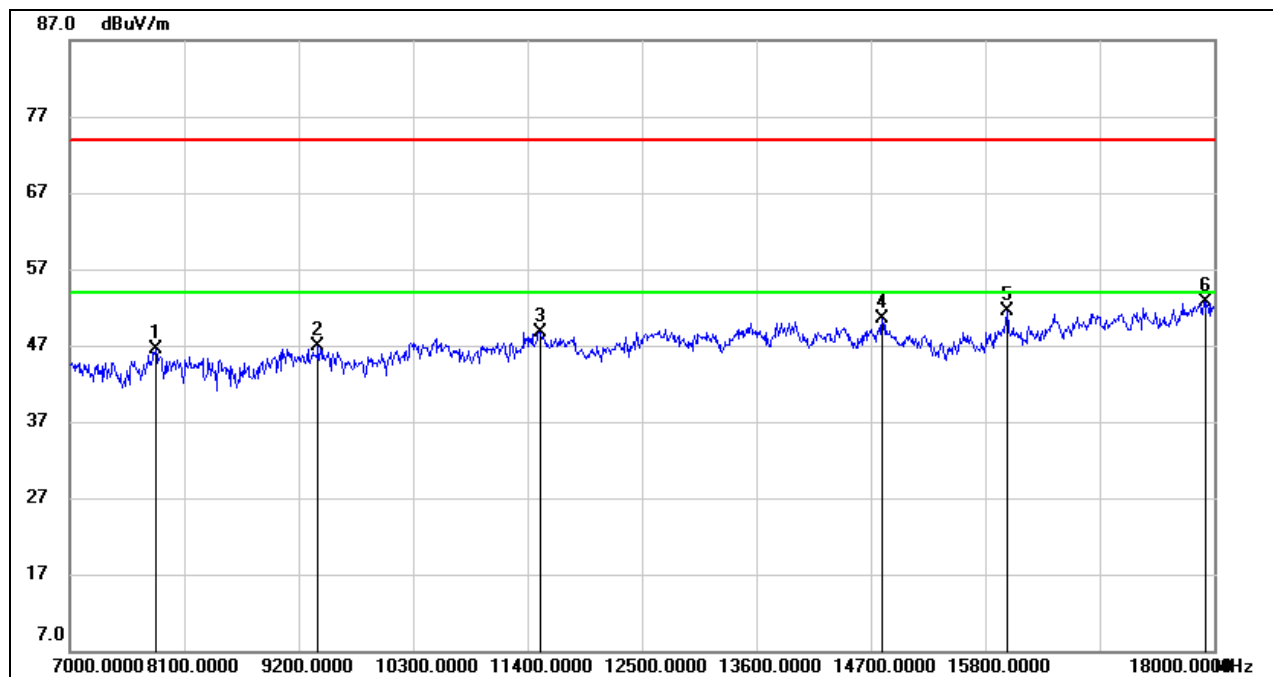
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



**HORIZONTAL RESULTS**  
**7-18GHz**

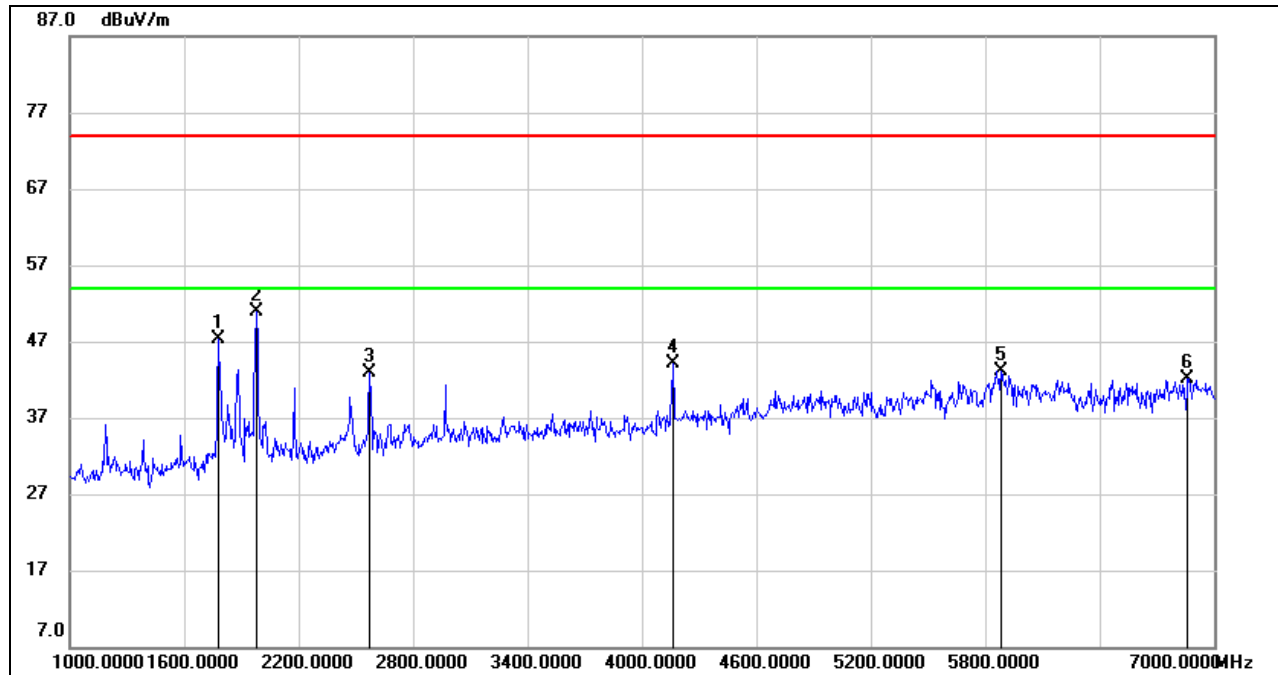


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7825.000	38.69	7.76	46.45	74.00	-27.55	peak
2	9387.000	37.35	9.52	46.87	74.00	-27.13	peak
3	11521.000	35.31	13.37	48.68	74.00	-25.32	peak
4	14810.000	34.49	15.93	50.42	74.00	-23.58	peak
5	16009.000	33.84	17.73	51.57	74.00	-22.43	peak
6	17923.000	29.32	23.36	52.68	74.00	-21.32	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.

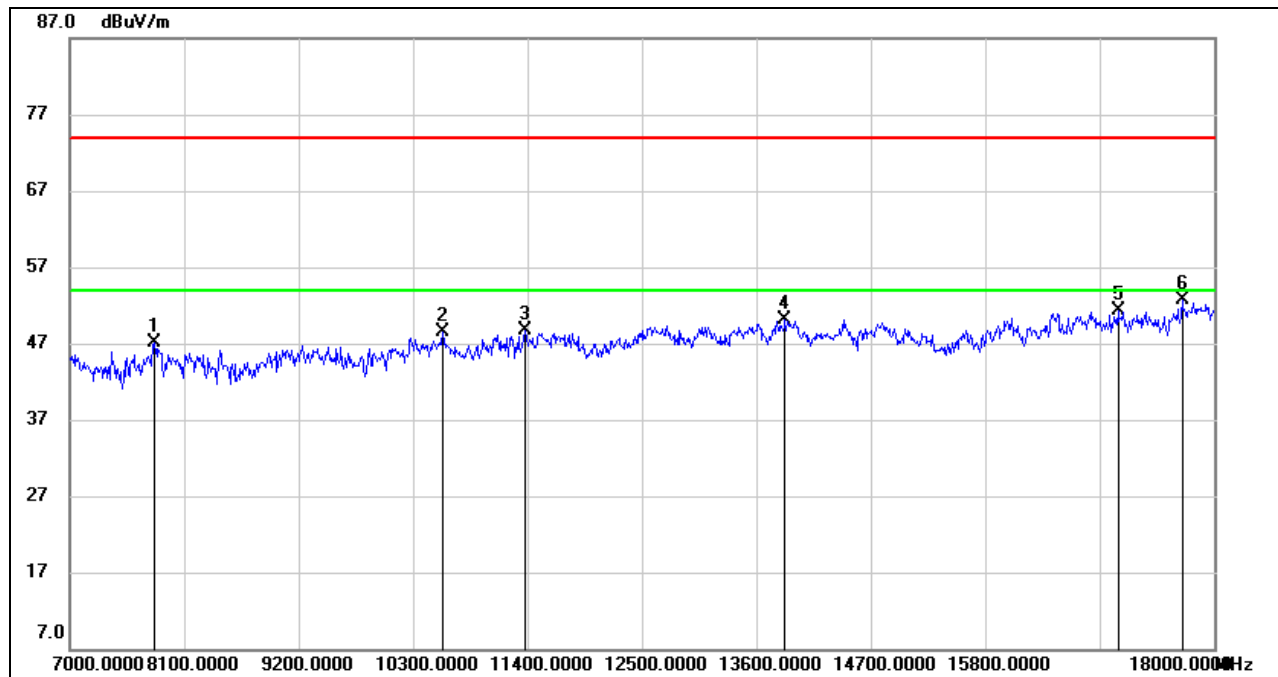


**VERTICAL RESULTS**  
**1-7GHz**



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1780.000	58.16	-10.94	47.22	74.00	-26.78	peak
2	1978.000	61.53	-10.67	50.86	74.00	-23.14	peak
3	2572.000	51.24	-8.42	42.82	74.00	-31.18	peak
4	4162.000	47.25	-3.18	44.07	74.00	-29.93	peak
5	5884.000	39.02	4.03	43.05	74.00	-30.95	peak
6	6862.000	37.12	4.95	42.07	74.00	-31.93	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.  
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.

**7-18GHz**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7814.000	39.31	7.84	47.15	74.00	-26.85	peak
2	10586.000	36.62	11.87	48.49	74.00	-25.51	peak
3	11378.000	36.10	12.56	48.66	74.00	-25.34	peak
4	13875.000	33.72	16.44	50.16	74.00	-23.84	peak
5	17076.000	30.75	20.58	51.33	74.00	-22.67	peak
6	17692.000	30.37	22.38	52.75	74.00	-21.25	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

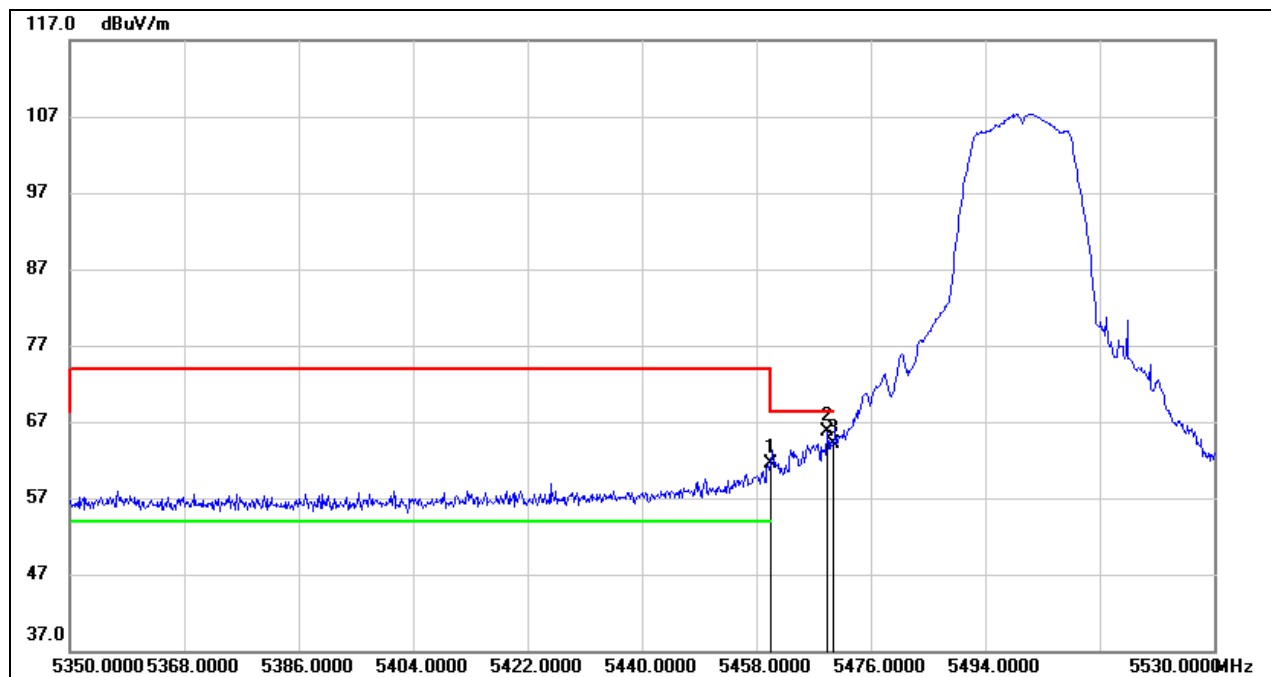
6. Owing to the highest peak level of unwanted emission out of the restricted bands complies with the lowest limit(54dBuV/m), so all the test point were deemed to comply with the limits list in the standard.



### 8.1.3. UNII-2C BAND

#### RESTRICTED BANDEDGE LOW CHANNEL

#### HORIZONTAL RESULTS PEAK

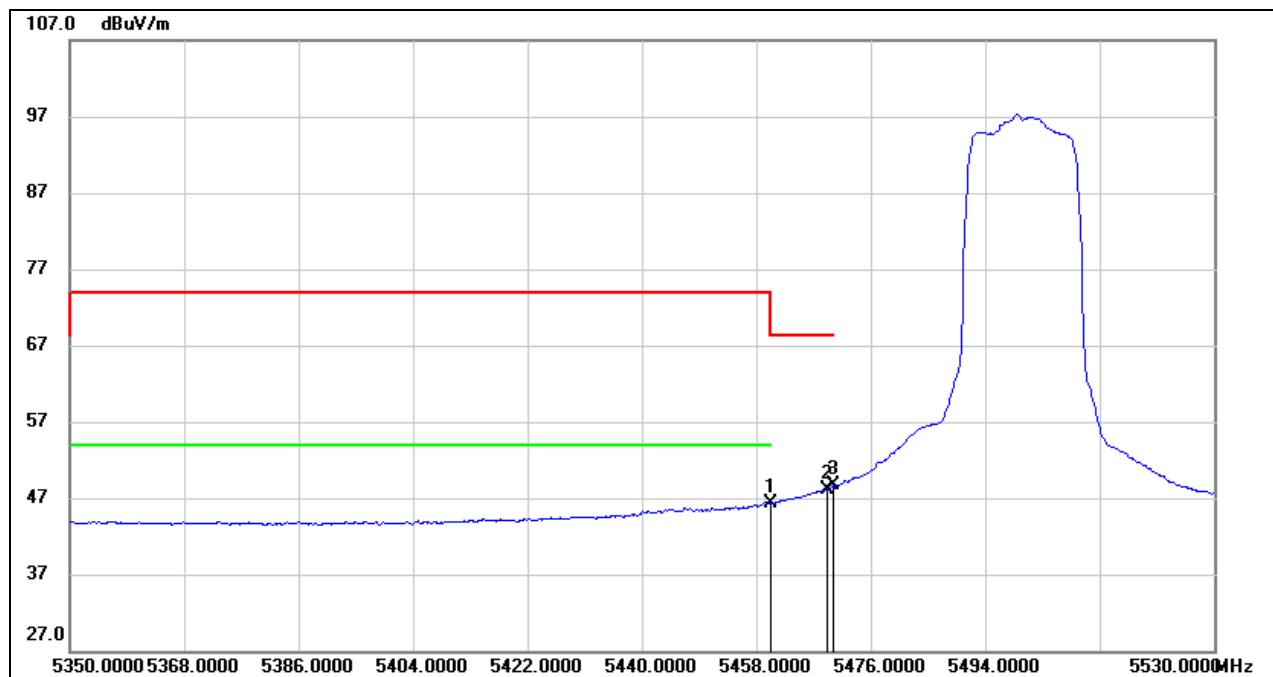


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5460.000	20.27	41.28	61.55	68.20	-6.65	peak
2	5469.160	24.35	41.40	65.75	68.20	-2.45	peak
3	5470.000	22.77	41.41	64.18	68.20	-4.02	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4.\*indicates frequency out of the restricted bands  
5. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.



**AVG**



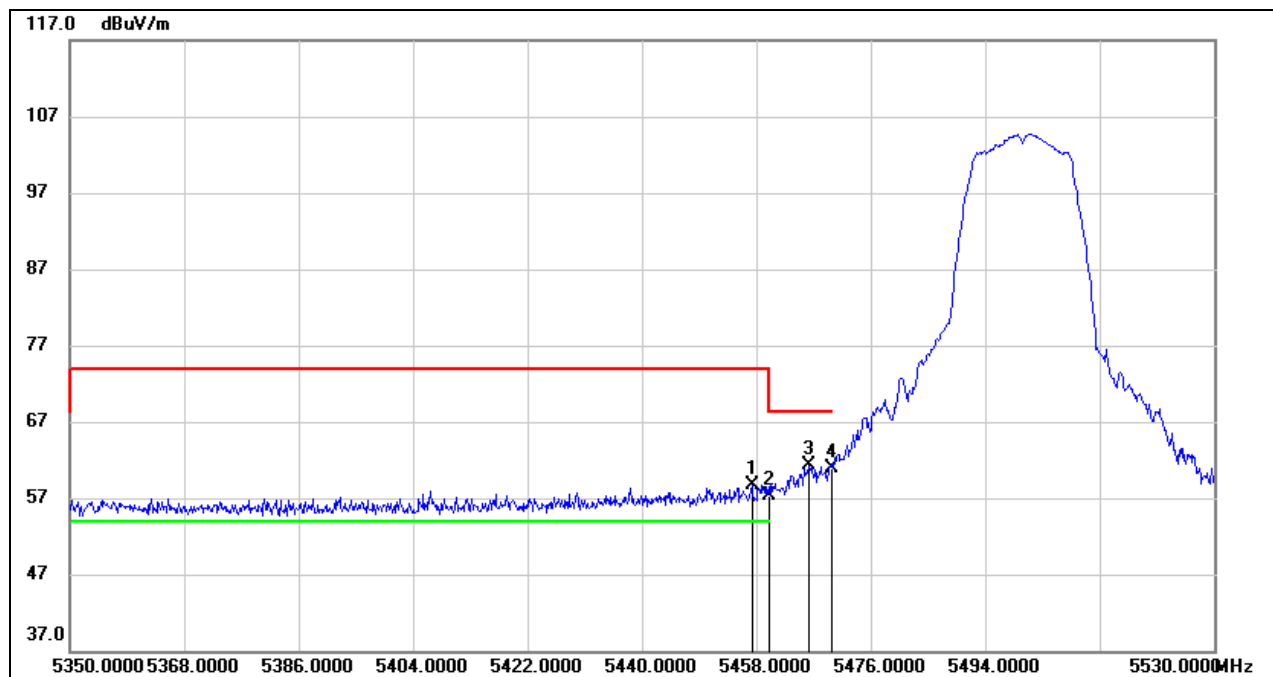
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5460.000	5.09	41.28	46.37	54.00	-7.63	AVG
2	5469.160	6.77	41.40	48.17	68.20	-20.03	AVG
3	5470.000	7.20	41.41	48.61	68.20	-19.59	AVG

Note: 1. Measurement = Reading Level + Correct Factor.  
2. AVG: VBW=1/Ton where: ton is transmit duration.  
3. For duty cycle, please refer to clause 7.1.  
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.





**VERTICAL RESULTS**  
**PEAK**

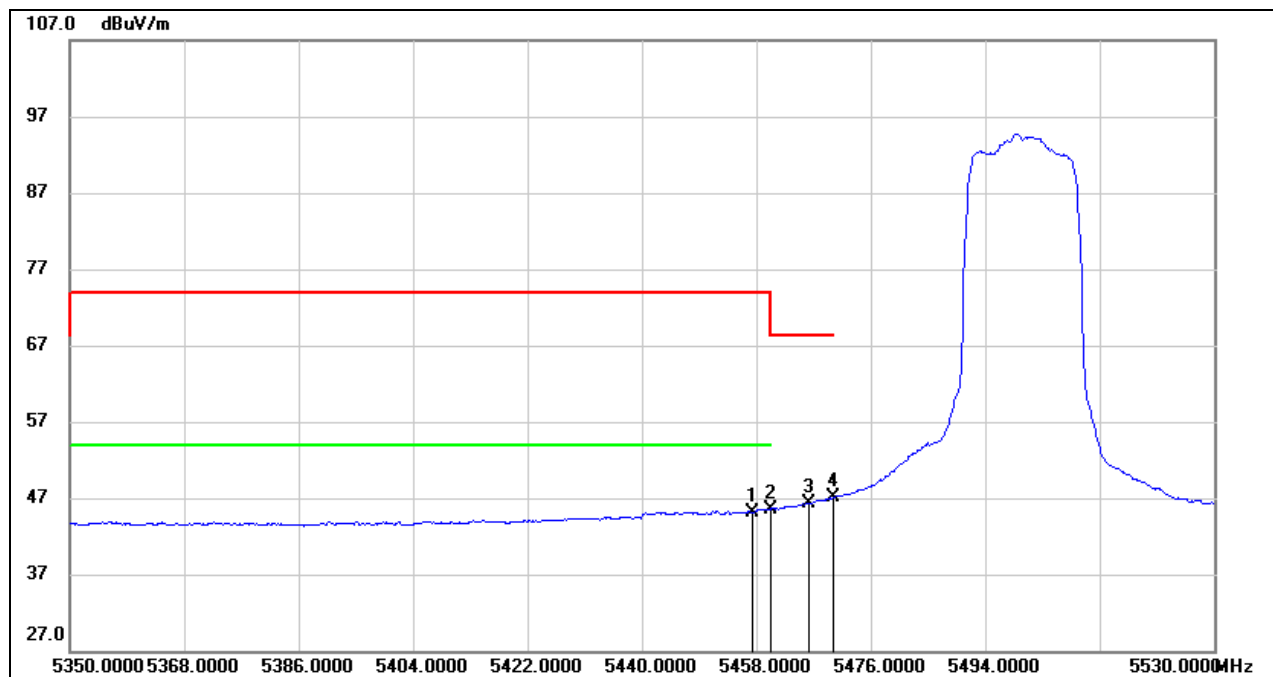


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5457.280	17.41	41.25	58.66	74.00	-15.34	peak
2	5460.000	15.96	41.28	57.24	68.20	-10.96	peak
3	5466.280	19.92	41.37	61.29	68.20	-6.91	peak
4	5470.000	19.42	41.41	60.83	68.20	-7.37	peak

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4.\*indicates frequency out of the restricted bands  
5. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.



**AVG**



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5457.280	3.90	41.25	45.15	54.00	-8.85	AVG
2	5460.000	4.21	41.28	45.49	54.00	-8.51	AVG
3	5466.280	4.86	41.37	46.23	68.20	-21.97	AVG
4	5470.000	5.63	41.41	47.04	68.20	-21.16	AVG

Note: 1. Measurement = Reading Level + Correct Factor.  
2. AVG: VBW=1/Ton where: ton is transmit duration.  
3. For duty cycle, please refer to clause 7.1.  
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.