



REPORT No. : SZ17120157W01

TEST REPORT

APPLICANT : MiMOMax Wireless Limited

PRODUCT NAME : 700MHz Upper A Block Pyxis Transceiver

MODEL NAME : MWL-PYXIS-*H A/B/C*

BRAND NAME : MiMOMax Wireless

FCC ID : XMK-MMXPYXH001

STANDARD(S) : 47 CFR Part 2
47 CFR Part 27

TEST DATE : 2017-12-28 to 2018-01-11

ISSUE DATE : 2018-01-15

Tested by: Tu Yanan
Tu Yanan (Test Engineer)

Approved by: Andy Yeh
Andy Yeh (Technical Director)

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MORLAB

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Change History		
Issue	Date	Reason for change
1.0	2018-01-10	First edition
1.1	2018-01-11	Add 2.7 Radio Frequency safety
1.2	2018-01-13	Add test pictures



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	MiMOMax Wireless Limited
Applicant Address:	540 Wairakei Road, Christchurch, 8053 New Zealand
Manufacturer:	MiMOMax Wireless Limited
Manufacturer Address:	540 Wairakei Road, Christchurch, 8053 New Zealand

1.2. Equipment Under Test (EUT) Description

Product Name:	700MHz Upper A Block Pyxis Transceiver
Serial No:	23002476
Hardware Version:	MWL-PYXIS-BHCA-IP010/Digital-IP002/RF-IP006
Software Version:	02.00.52
Operating Frequency Range:	757-758 MHz; 787-788 MHz
Channel Bandwidth:	12.5kHz; 25kHz; 50kHz
Modulation Type:	2GFSK;4GFSK
Operating Voltage:	10.5-60Vdc(Isolated)
Antenna Type:	Omni Antenna
Antenna Gain:	4.0dBi
Emission Designator:	12.5kHz:10K0W1W 25.0kHz:20K0W1W 50.0kHz:40K0W1W

1.3. Test Frequencies

Frequency Bands (MHz)	Channel Space (kHz)	Transmit Frequency (MHz)	Receiver Frequency (MHz)
757-758	12.5, 25.0, 50.0 respectively	757.0500	787.9500
787-788	12.5, 25.0, 50.0 respectively	787.9500	757.0500

Note : The EUT is operating at 757-758 MHz and 787-788 MHz. We test the two transmit frequencies 757.05 and 787.95MHz.



1.4. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2 and Part 27 for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 27	Miscellaneous Wireless Communications Services

Test detailed items/section required by FCC rules and results are listed as below:

No.	Section	Description	Test Date	Test Engineer	Result
1	27.50 2.1046	Power and antenna height limits Radio frequency power output	Dec 28, 2017	Tu Yanan	Complies Noted
2	2.1049	Occupied bandwidth	Dec 28, 2017	Tu Yanan	PASS
3	2.1051 27.53 27.53(c) 27.53(c)(1) 27.53(c)(2) 27.53(c)(3) 27.53(c)(5) 27.53(c)(6)	Conducted spurious emissions at antenna terminals with DUT Operations in the 746 - 758 MHz band 776 - 788 MHz band emissions in 763 - 775 MHz and 793 – 805MHz band	Dec 28, 2017	Tu Yanan	PASS
4	2.1053 27.53 27.53(c) 27.53(c)(1) 27.53(c)(2) 27.53(c)(3) 27.53(c)(5) 27.53(c)(6)	Field strength of radiated spurious emissions with DUT Operations in the 746 - 758 MHz band 776 - 788 MHz band Emissions in 763 - 775 MHz and 793 – 805MHz band	Jan07, 2018	Wen Zhichao	PASS
5	27.53(f)	Equivalent isotropic radiated power in 1559 -1610 MHz band	Jan 05, 2018	Wen Zhichao	PASS
6	27.54 2.1055	Frequency stability	Dec 29, 2017	Tu Yanan	PASS



The MiMOMax MWL-PYXIS-*H A/B/C* 700MHz Upper A Block Pyxis complies with FCC 47 CFR Part 2 and Part 27 when tested in-accordance with the test methods described in 47 CFR Part 2 and Part 27

1.5. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86-106



2.47 CFR Part 2 and Part 27 Requirements

2.1. Radio Frequency Power Output

2.1.1. Test result

Nominal Frequency: 757.050 MHz

Channel Bandwidth (KHz)	Modulation Type	Voltage (Vdc)	Measured Power (dBm)	Rated Power (Watts)
12.5	2GFSK	24	30.1	1.0
12.5	4GFSK	24	29.9	1.0
12.5	Unmodulated	24	29.9	1.0
25.0	2GFSK	24	30.0	1.0
25.0	4GFSK	24	29.9	1.0
25.0	Unmodulated	24	29.9	1.0
50.0	2GFSK	24	30.0	1.0
50.0	4GFSK	24	29.9	1.0
50.0	Unmodulated	24	29.9	1.0



Nominal Frequency: 787.950 MHz

Channel Bandwidth (KHz)	Modulation Type	Voltage (Vdc)	Measured Power (dBm)	Rated Power (Watts)
12.5	2GFSK	24	30.0	1.0
12.5	4GFSK	24	30.3	1.0
12.5	Unmodulated	24	30.2	1.0
25.0	2GFSK	24	30.0	1.0
25.0	4GFSK	24	30.1	1.0
25.0	Unmodulated	24	30.3	1.0
50.0	2GFSK	24	30.0	1.0
50.0	4GFSK	24	30.2	1.0
50.0	Unmodulated	24	30.3	1.0

Note 1: Measurements were carried out at the RF output terminals of the transmitter using spectrum analyzer and a 10 dB power attenuator.

Note 2: The transmitter has a rated output power of 1 watt(30dBm). The measured power has been shown to be within +/- 1 dB of the rated power.

Note3: Part 27 does not specify the transmitter output power.

Subpart C Section 27.50 (b)(1) states that fixed and base station transmitters in the 757 - 758 MHz band must not exceed 1000 watts ERP.

Subpart C Section 27.50 (b)(4) states that fixed and base station transmitters in the 776 - 787 MHz band must not exceed 1000 watts ERP.

Note4: Therefore the gain of any antenna system attached to this transmitter shall not exceed 30 dBi



2.2. Occupied Bandwidth

2.2.1. Definition

The client has declared the following occupied bandwidths for each channel bandwidth:

Frequency(MHz)	Channel Bandwidth(kHz)	Occupied Bandwidth(kHz)
757.050	12.5, 25.0, 50.0	10.0, 20.0, 40.0
787.950	12.5, 25.0, 50.0	10.0, 20.0, 40.0

According to FCC section 2.1049, the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Occupied bandwidth is also known as the 99% emission bandwidth.

2.2.2. Test Description

Measurements have been made to verify these declared bandwidths using the generic frequencies that are listed in the table above.

The occupied bandwidth has been measured and compared against the occupied bandwidth declared by the client.

Measurements have been made of each modulation type using a spectrum analyzer operating in occupied bandwidth mode.

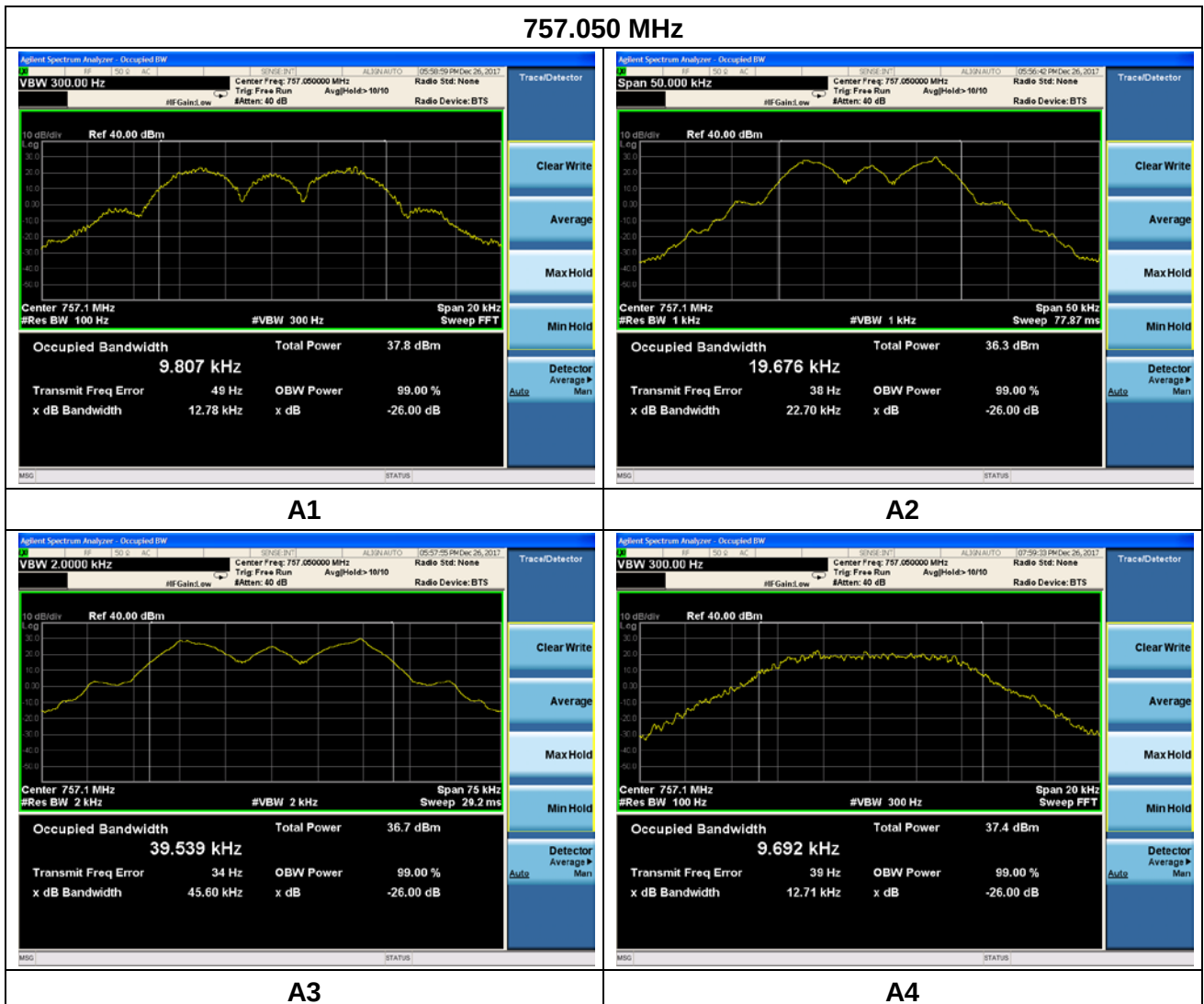
Tabular results are provided with selected results plot provided of the worst case measurement for channel bandwidths of 12.5, 25.0 and 50.0 kHz.



2.2.3. Test Result

Nominal Frequency: 757.050 MHz

Emission Type	Channel Bandwidth(kHz)	Occupied Bandwidth(kHz)	Plot
2GFSK	12.5	9.807	A1
	25.0	19.676	A2
	50.0	39.539	A3
4GFSK	12.5	9.692	A4
	25.0	19.376	A5
	50.0	38.908	A6

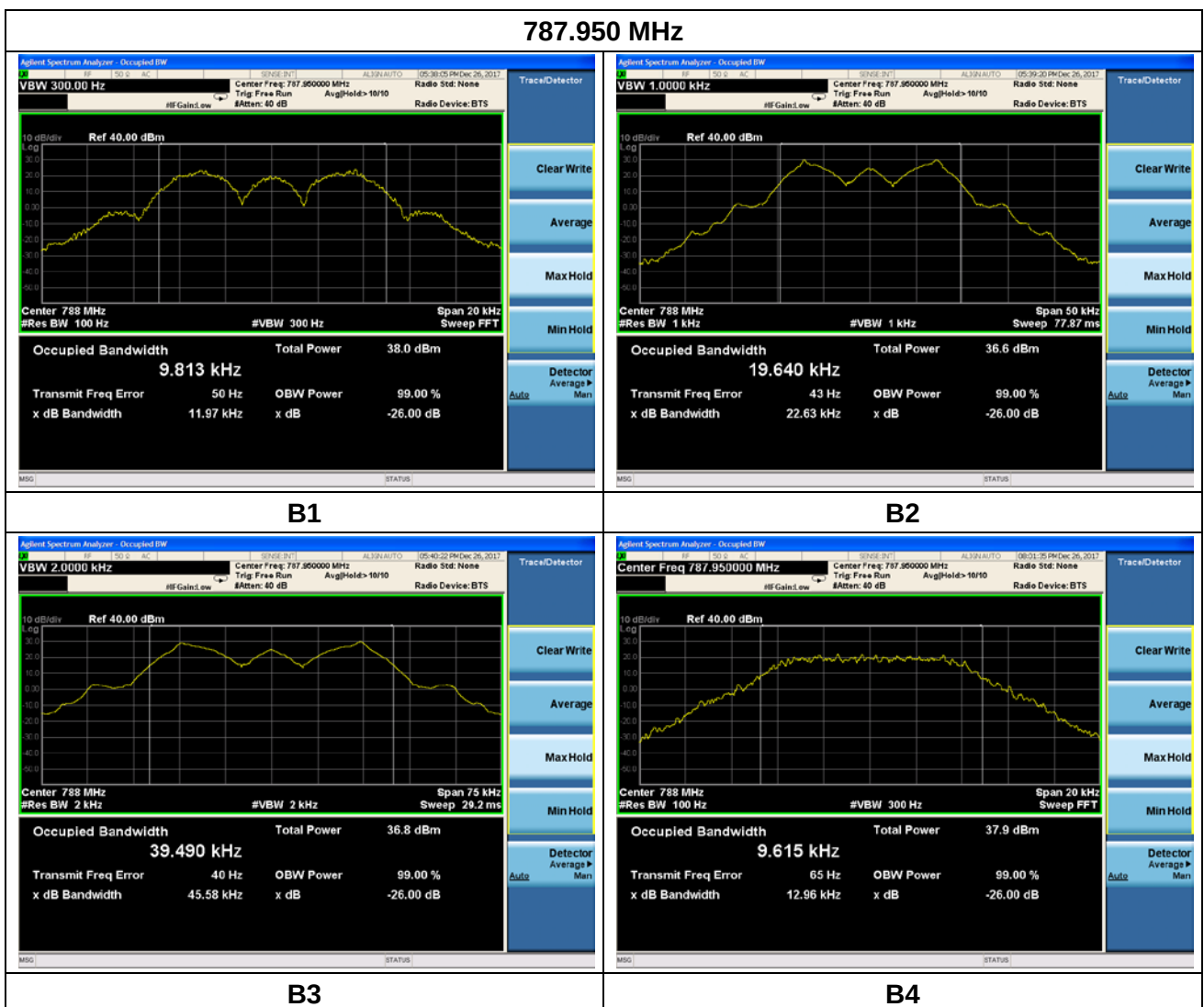






Nominal Frequency: 787.950 MHz

Emission Type	Channel Bandwidth (kHz)	Occupied Bandwidth (kHz)	Plot
2GFSK	12.5	9.813	B1
	25.0	19.640	B2
	50.0	39.490	B3
4GFSK	12.5	9.615	B4
	25.0	19.340	B5
	50.0	38.656	B6







2.3. Spurious Emissions At Antenna Terminals

2.3.1. Test Requirement

According to FCC section 2.1051 and section 27.53(c). For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;
- (6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.



2.3.2. Test Result

Tabular results are provided with selected results plot provided of the worst case measurement for channel bandwidths of 12.5, 25.0 and 50.0 kHz. The worst case is 2GFSK 12.5kHz.

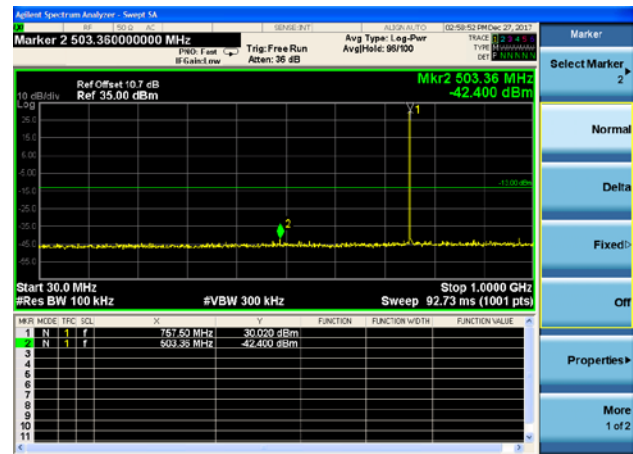
Emission Type: 2GFSK 12.5kHz

Frequency (MHz)	Complied limits	Spurious Span (MHz)	Emission Level (dBm)	Limit (dBm)	Result	Plot
757.050	27.53(c)(1)(5) 100KHz Resolution Bandwidth	30 - 1000	-42.4	-13	Pass	A1
		1000-8000	-28.2		Pass	A2
	27.53(c)(1)(5) 30KHz Resolution Bandwidth	756.9-757	-21.0	-13	Pass	A3
		758-758.1	-50.7		Pass	A4
	27.53(c)(3)(6) 6.25KHz Resolution Bandwidth	763-775	-67.3	-46	Pass	A5
		793-805	-69.6		Pass	A6
787.950	27.53(c)(2)(5) 100KHz Resolution Bandwidth	30-1000	-43.1	-13	Pass	B1
		1000-8000	-28.2		Pass	B2
	27.53(c)(2)(5) 30KHz Resolution Bandwidth	786.9-787	-66.0	-13	Pass	B3
		788-788.1	-20.4		Pass	B4
	27.53(c)(3)(6) 6.25KHz Resolution Bandwidth	763-775	-67.4	-46	Pass	B5
		793-805	-60.8		Pass	B6



Attach pictures of wide span spectrum with 100KHz RBW here:

757.050 MHz

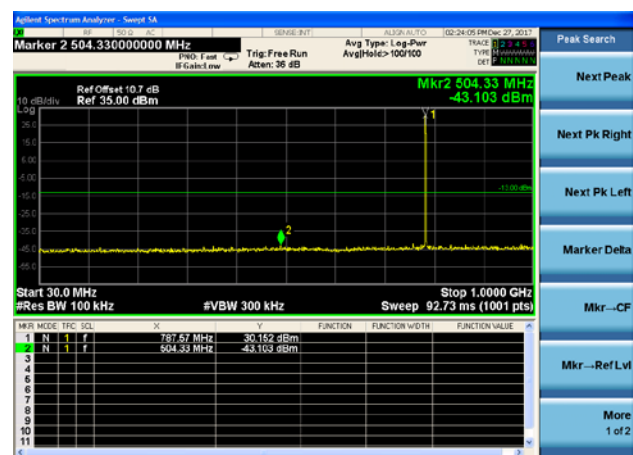


A1

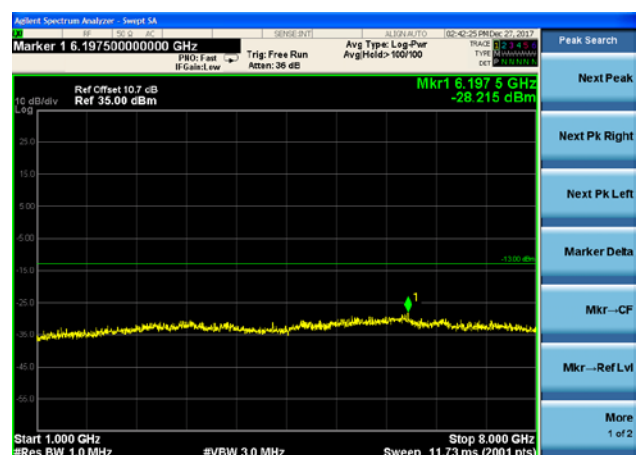


A2

787.950 MHz



B1

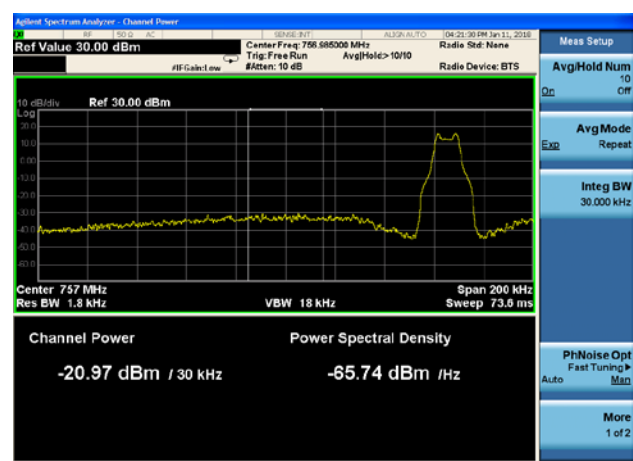


B2

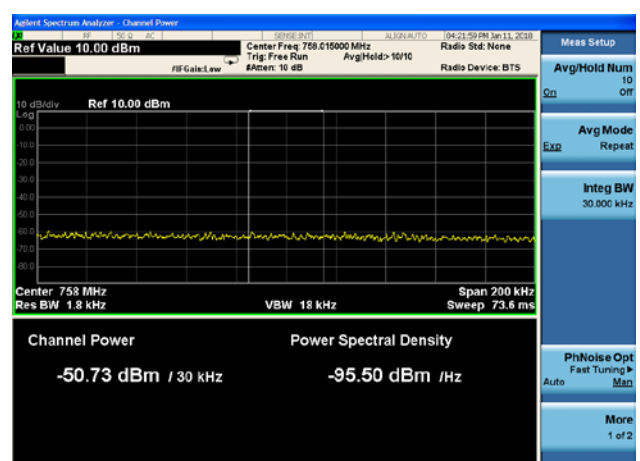


Attach pictures of close span spectrum with 30KHz RBW here:

757.050 MHz

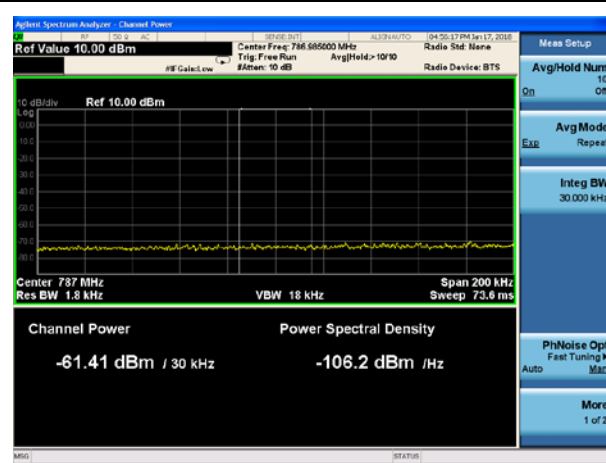


A3

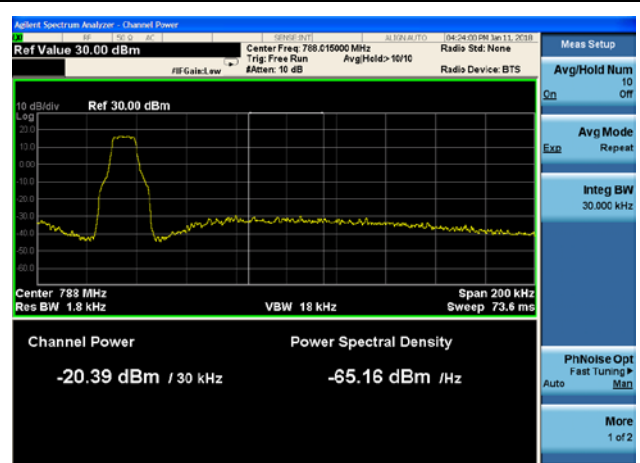


A4

787.950 MHz



B3

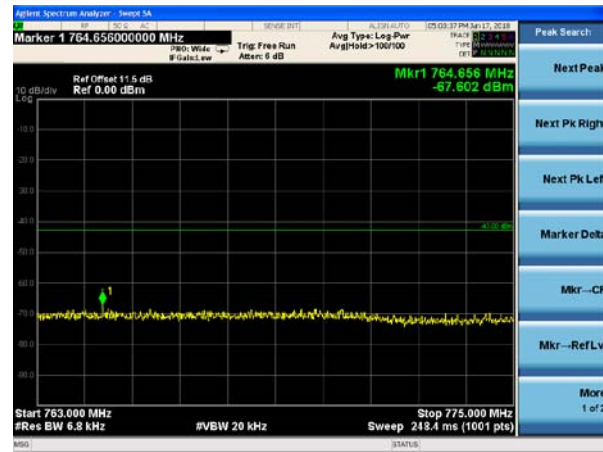


B4

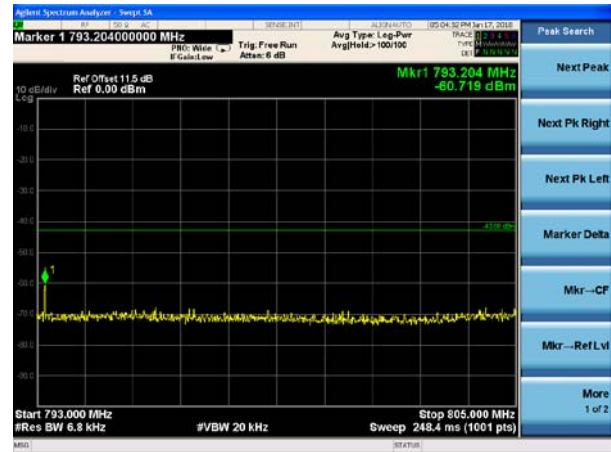


Attach pictures of specified span spectrum with 6.25KHz RBW here:

757.050 MHz

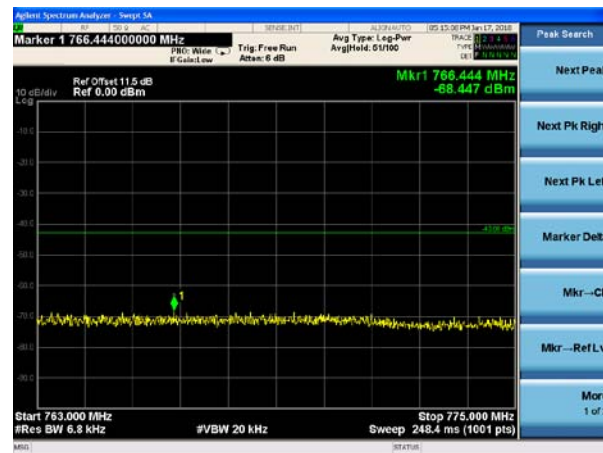


A5

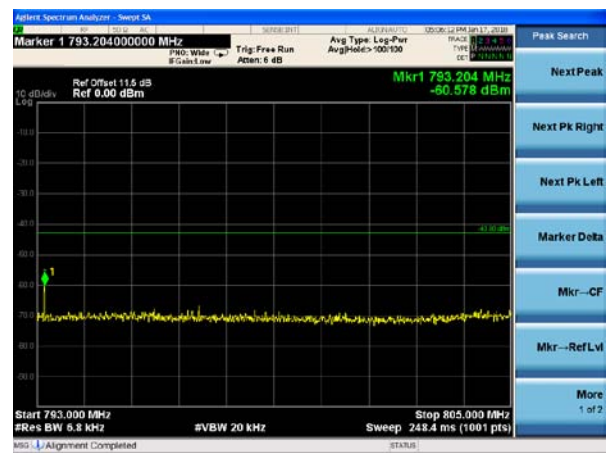


A6

787.950 MHz



B5



B6



2.4. Field Strength Of Spurious Radiations

2.4.1. Requirement

According to FCC section 2.1053 and section 27.53(c). For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;
- (6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.



2.4.2. Test Result

Tabular results are provided with selected results plot provided of the worst case measurement for channel bandwidths of 12.5, 25.0 and 50.0 kHz. The worst case is 2GFSK 12.5kHz.

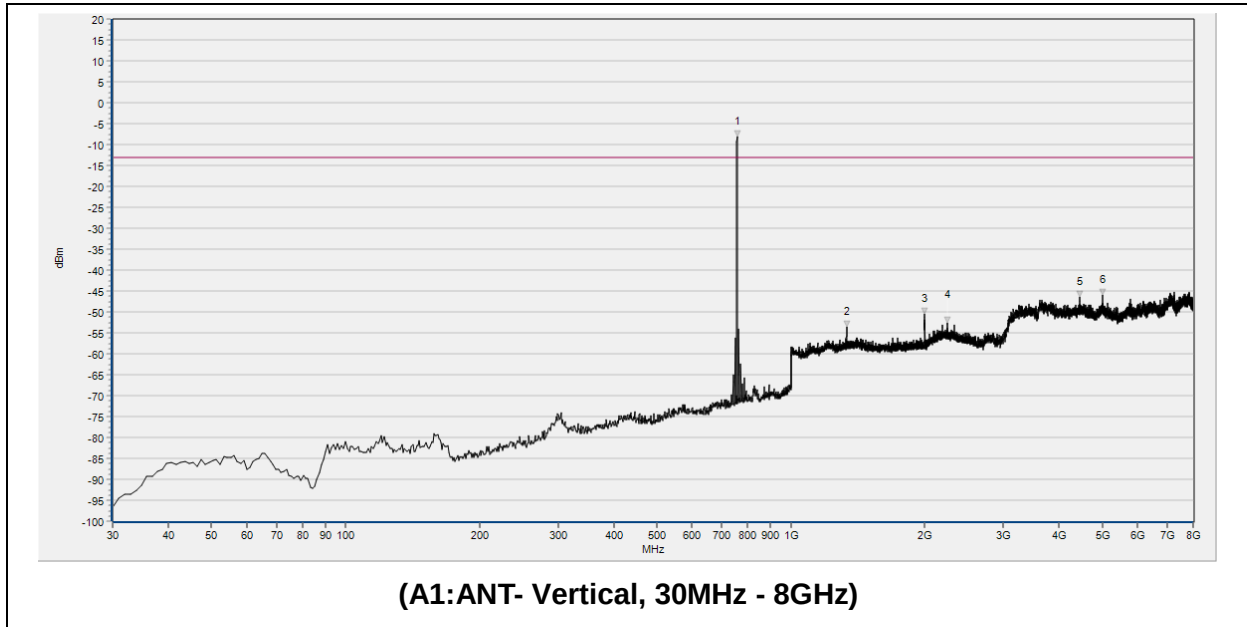
All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.

Emission Type: 2GFSK 12.5kHz

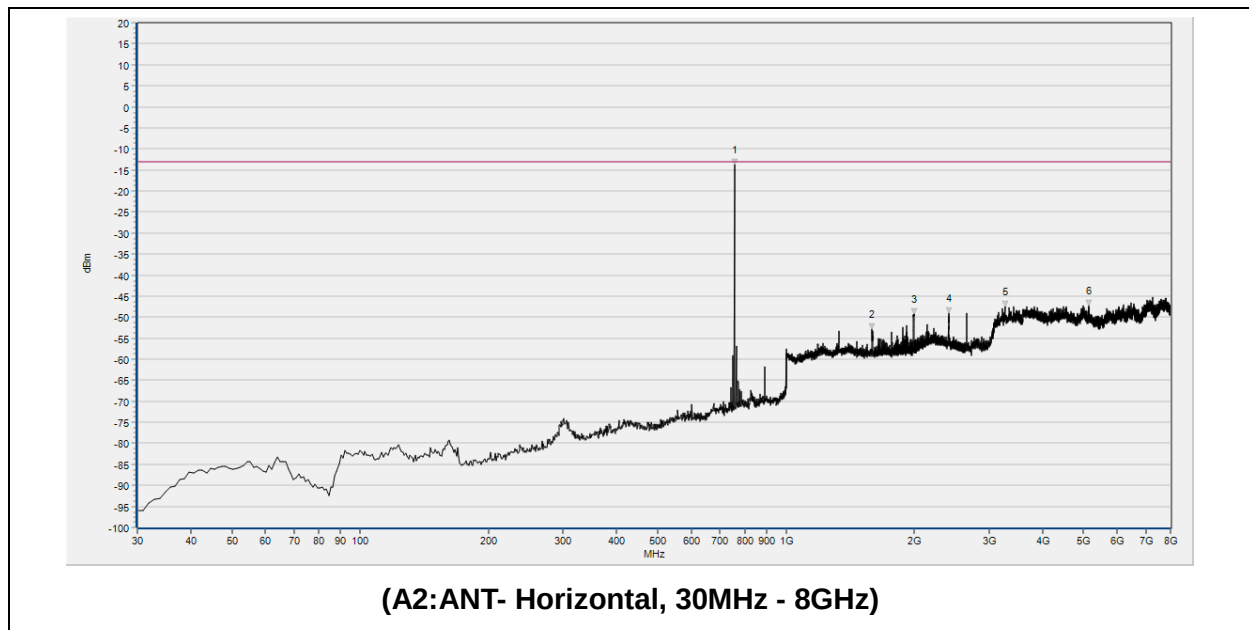
Frequency (MHz)	Complied limits	Spurious Span (MHz)	Emission Level (dBm)	Limit (dBm)	Polarity	Result	Plot
757.05	27.53(c)(1)(5) 100KHz Resolution Bandwidth	30-8000	-46.1	-13	Vertical	Pass	A1
			-47.3		Horizontal		A2
	27.53(c)(1)(5) 30KHz Resolution Bandwidth	756.9-757	-15.8	-13	Vertical	Pass	A3
			-15.8		Horizontal		A4
		758-758.1	-52.8	-13	Vertical	Pass	A5
			-58.1		Horizontal		A6
	27.53(c)(3)(6) 6.25KHz Resolution Bandwidth	763-775	-72.2	-46	Vertical	Pass	A7
			-69.8		Horizontal		A8
		793-805	-76.0	-46	Vertical	Pass	A9
			-70.7		Horizontal		A10
787.95	27.53(c)(2)(5) 100KHz Resolution Bandwidth	30-8000	-39.3	-13	Vertical	Pass	B1
			-46.2		Horizontal		B2
	27.53(c)(2)(5) 30KHz Resolution Bandwidth	786.9-787	-48.5	-13	Vertical	Pass	B3
			-57.0		Horizontal		B4
		787-787.1	-15.7	-13	Vertical	Pass	B5
			-15.6		Horizontal		B6
	27.53(c)(3)(6) 6.25KHz Resolution Bandwidth	763-775	-71.4	-46	Vertical	Pass	B7
			-68.0		Horizontal		B8
		793-805	-73.1	-46	Vertical	Pass	B9
			-71.2		Horizontal		B10



Attach pictures of widespan spectrum with 100KHz RBW for 757.05MHz here:



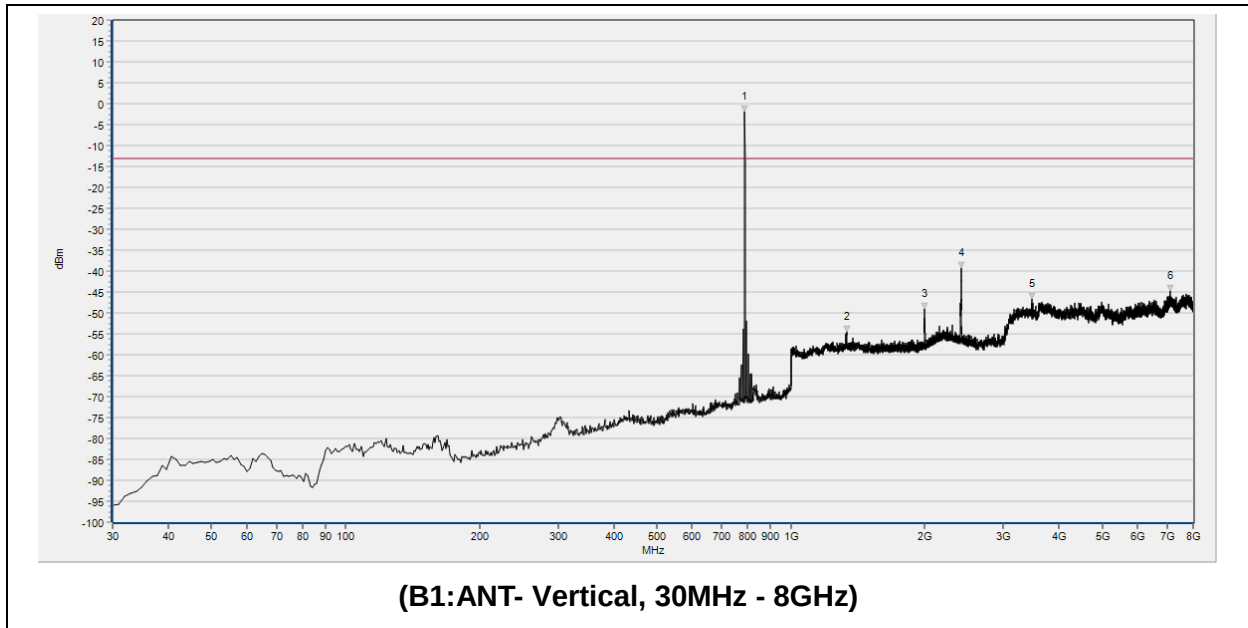
No.	Fre. MHz	Pk dBm	QP dBm	AV dBm	Limit-PK dBm	Limit-QP dBm	Limit-AV dBm	ANT	Verdict
1	757.500	-8.09	N.A	N.A	-13	N.A	N.A	V	N.A
2	1332.933	-53.58	N.A	N.A	-13	N.A	N.A	V	PASS
3	1998.800	-50.39	N.A	N.A	-13	N.A	N.A	V	PASS
4	2242.097	-52.52	N.A	N.A	-13	N.A	N.A	V	PASS
5	4456.865	-46.55	N.A	N.A	-13	N.A	N.A	V	PASS
6	5005.065	-46.06	N.A	N.A	-13	N.A	N.A	V	PASS



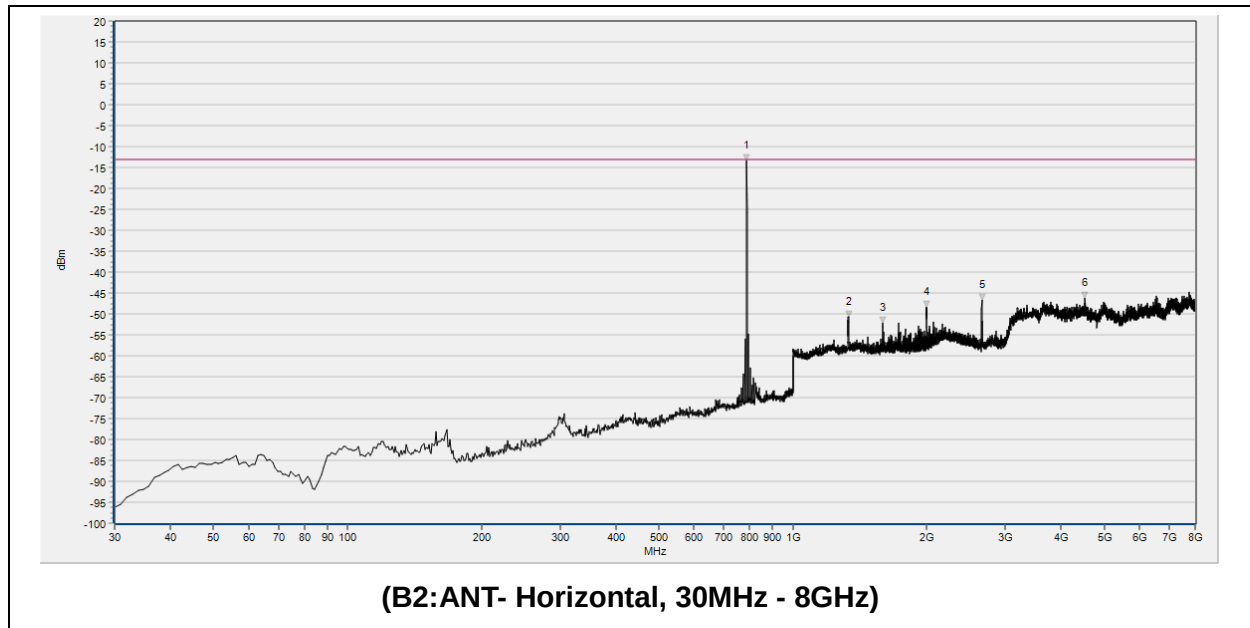
No.	Fre. MHz	Pk dBm	QP dBm	AV dBm	Limit-PK dBm	Limit-QP dBm	Limit-AV dBm	ANT	Verdict
1	757.500	-13.73	N.A	N.A	-13	N.A	N.A	H	N.A
2	1592.877	-52.75	N.A	N.A	-13	N.A	N.A	H	PASS
3	1996.879	-49.35	N.A	N.A	-13	N.A	N.A	H	PASS
4	2409.204	-48.99	N.A	N.A	-13	N.A	N.A	H	PASS
5	3266.330	-47.49	N.A	N.A	-13	N.A	N.A	H	PASS
6	5139.807	-47.25	N.A	N.A	-13	N.A	N.A	H	PASS



Attach pictures of widespan spectrum with 100KHz RBW for 787.95MHz here:



No.	Fre. MHz	Pk dBm	QP dBm	AV dBm	Limit-PK dBm	Limit-QP dBm	Limit-AV dBm	ANT	Verdict
1	787.570	-2.02	N.A	N.A	-13	N.A	N.A	V	N.A
2	1332.933	-54.62	N.A	N.A	-13	N.A	N.A	V	PASS
3	1994.958	-48.98	N.A	N.A	-13	N.A	N.A	V	PASS
4	2409.844	-39.26	N.A	N.A	-13	N.A	N.A	V	PASS
5	3469.367	-46.65	N.A	N.A	-13	N.A	N.A	V	PASS
6	7120.340	-44.77	N.A	N.A	-13	N.A	N.A	V	PASS

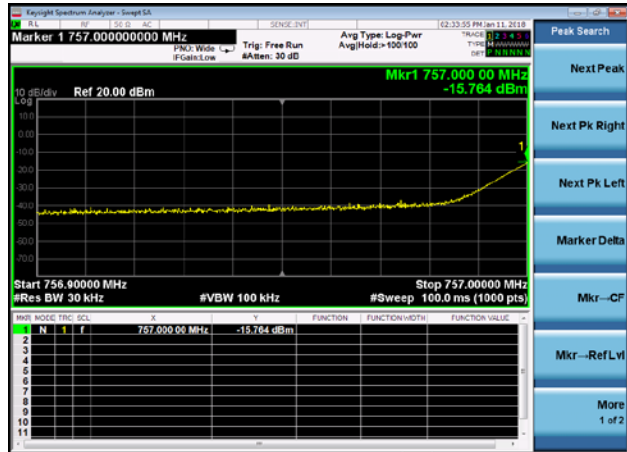


No.	Fre. MHz	Pk dBm	QP dBm	AV dBm	Limit-PK dBm	Limit-QP dBm	Limit-AV dBm	ANT	Verdict
1	787.570	-13.22	N.A	N.A	-13	N.A	N.A	H	N.A
2	1332.293	-50.61	N.A	N.A	-13	N.A	N.A	H	PASS
3	1592.877	-52.19	N.A	N.A	-13	N.A	N.A	H	PASS
4	1994.318	-48.43	N.A	N.A	-13	N.A	N.A	H	PASS
5	2655.374	-46.67	N.A	N.A	-13	N.A	N.A	H	PASS
6	4530.696	-46.20	N.A	N.A	-13	N.A	N.A	H	PASS



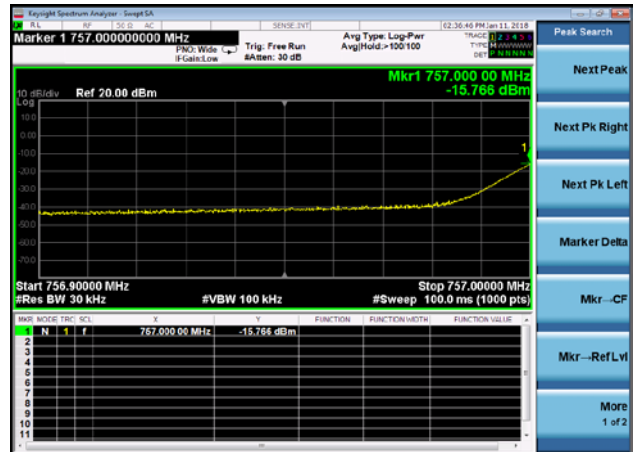
Attach pictures of close span spectrum with 30KHz RBW for 757.05MHz here:

ANT- Vertical756.9-757MHz



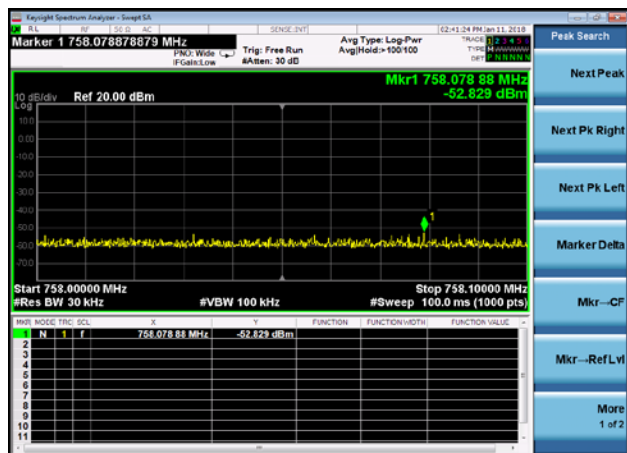
A3

ANT- Horizontal756.9-757MHz



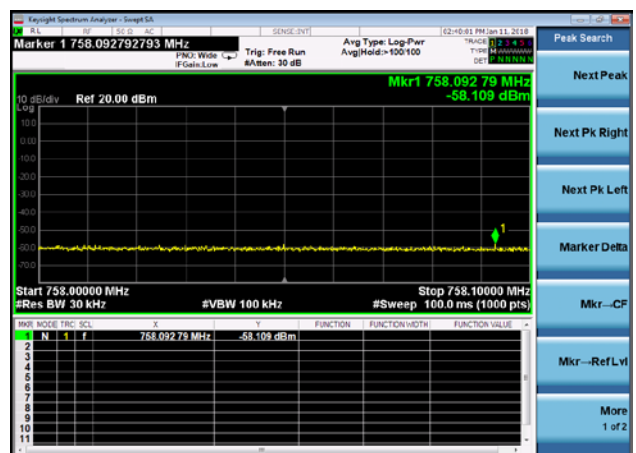
A4

ANT- Vertical758-758.1MHz



A5

ANT- Horizontal758-758.1MHz

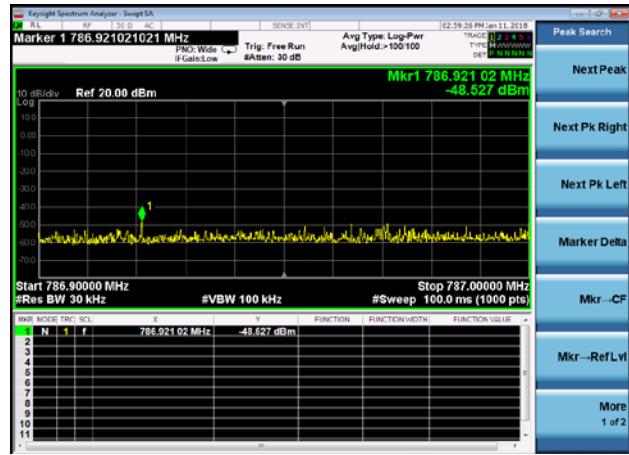


A6



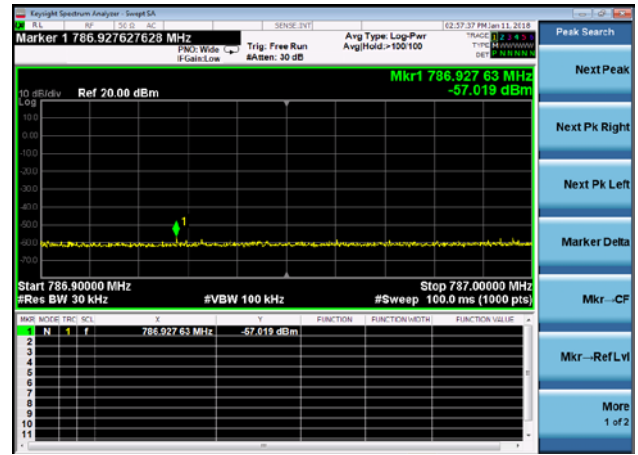
Attach pictures of close span spectrum with 30KHz RBW for 787.95MHz here:

ANT- Vertical786.9-787MHz



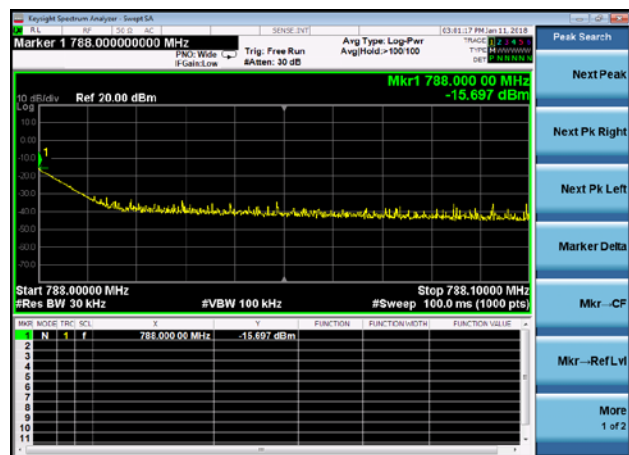
B3

ANT- Horizontal786.9-787MHz



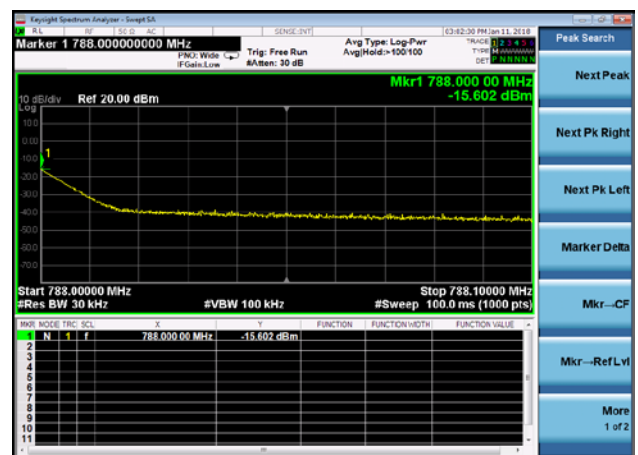
B4

ANT- Vertical788.0-788.1MHz



B5

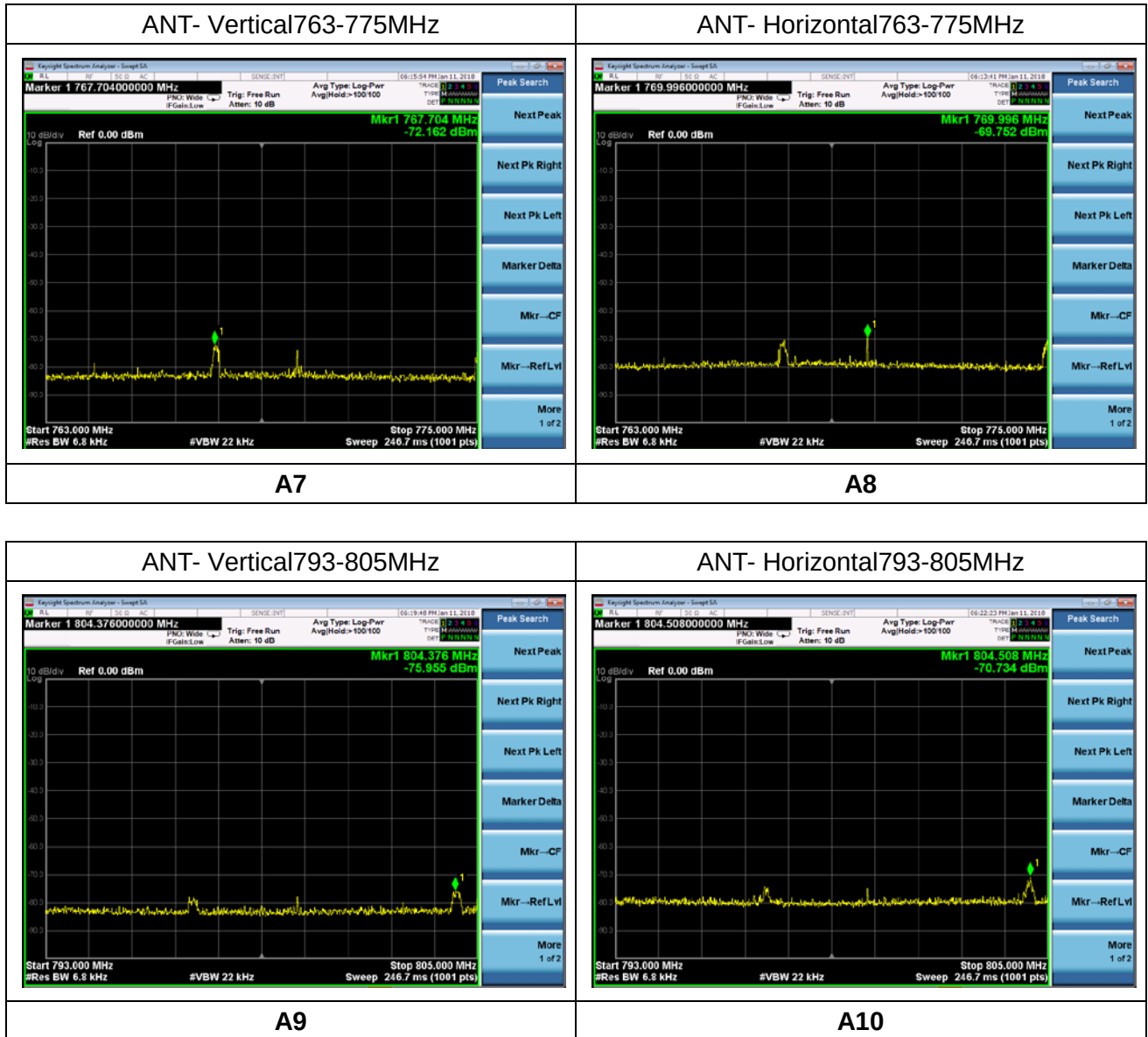
ANT- Horizontal788.0-788.1MHz



B6

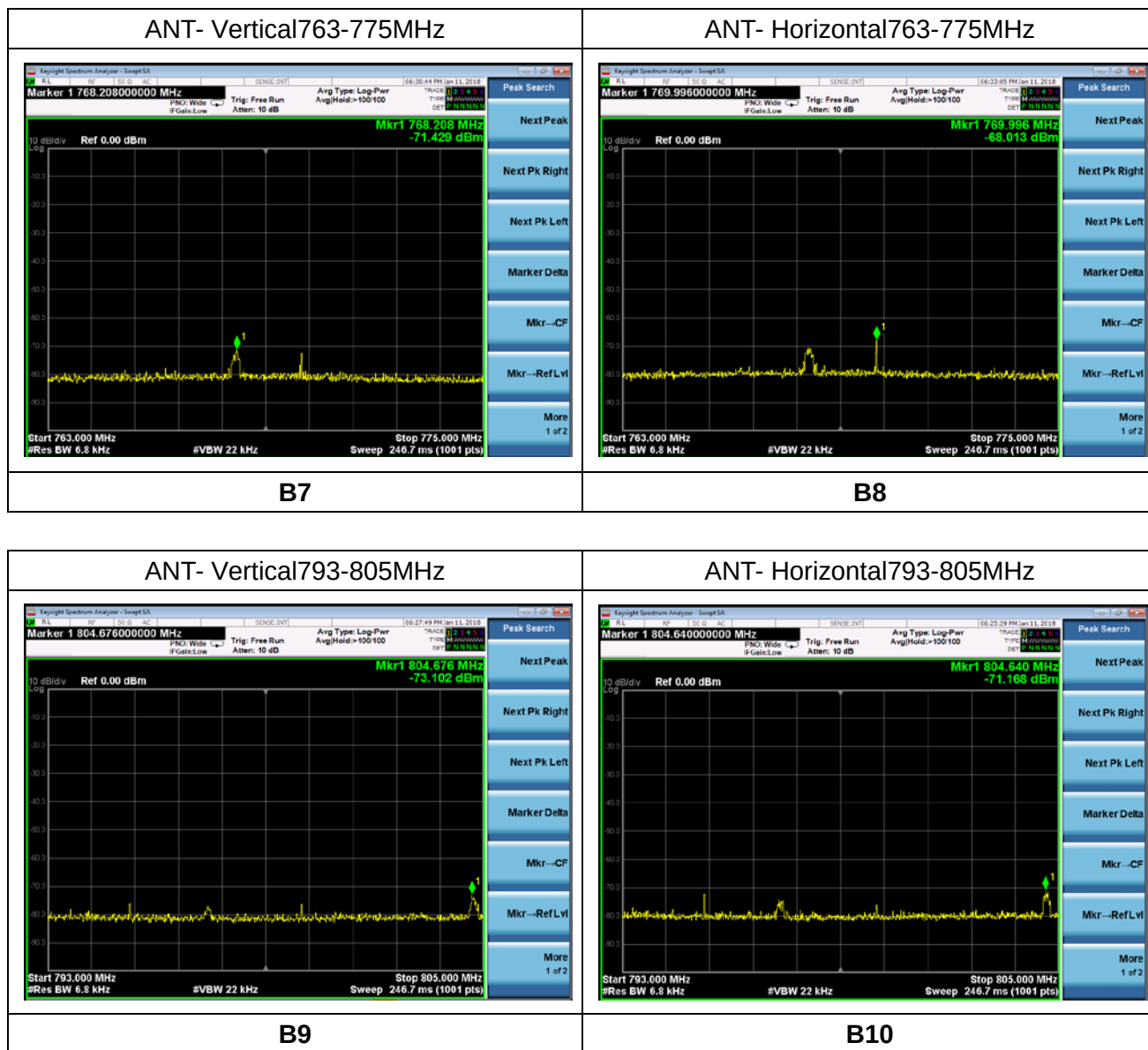


Attach pictures of specified span spectrum with 6.25KHz RBW for 757.05MHz here:





Attach pictures of specified span spectrum with 6.25KHz RBW for 787.95MHz here:





2.5. Equivalent Isotropic Radiated Power

2.5.1. Requirement

According to FCC section 27.53(f), for operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

2.5.2. Test Result

An Omni 4dBi antenna was attached to the transmitter which was considered to be typical. Testing was carried out at the test site between 1559 - 1610 MHz using a peak detector with 1 MHz and 1 kHz resolution bandwidth using both vertical and horizontal polarizations. Test result: Complies, no wideband or discrete emissions were detected.

Tabular results are provided with selected results plots provided of the worst case measurement for vertical or horizontal polarizations with channel bandwidth 12.5kHz, 25kHz, 50kHz.

Nominal Frequency: 757.050MHz						
Observation Band(MHz)	Modulation Type	Bandwidth (kHz)	Level (dBuV/m)	Limit (dBuV/m)	Polarity	RBW
1559.0-1610.0	2GFSK	12.5	49.3	55.2	Vertical	1MHz
		25	51.0	55.2	Vertical	
		50	51.2	55.2	Vertical	
		12.5	16.9	45.2	Vertical	1kHz
		25	16.9	45.2	Horizontal	
		50	16.9	45.2	Vertical	
1559.0-1610.0	4GFSK	12.5	49.3	55.2	Vertical	1MHz
		25	51.1	55.2	Vertical	
		50	50.0	55.2	Vertical	
		12.5	17.2	45.2	Vertical	1kHz
		25	17.4	45.2	Horizontal	
		50	17.2	45.2	Vertical	



Nominal Frequency: 787.950MHz						
Observation Band(MHz)	Modulation Type	Bandwidth (kHz)	Level (dBuV/m)	Limit (dBuV/m)	Polarity	RBW
1559.0-1610.0	2GFSK	12.5	45.8	55.2	Vertical	1MHz
		25	45.6	55.2	Vertical	
		50	46.4	55.2	Vertical	
		12.5	17.2	45.2	Vertical	1kHz
		25	17.6	45.2	Horizontal	
		50	17.2	45.2	Vertical	
1559.0-1610.0	4GFSK	12.5	46.4	55.2	Vertical	1MHz
		25	46.1	55.2	Horizontal	
		50	50.2	55.2	Vertical	
		12.5	16.7	45.2	Vertical	1kHz
		25	19.1	45.2	Horizontal	
		50	22.9	45.2	Vertical	

Note 1: Measurements were attempted at a distance of 3 meters which gave the following limits using the formula:

Field strength (V/m) = (square root (30 * power (watts)))/ distance (meters)

This gave limits of 55.2 dBuV/m for wideband emissions and 45.2 for discrete emissions.



2.6. Frequency Stability

2.6.1. Requirement

According to FCC section 2.1055 and FCC section 27.54, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

- (a) The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.
- (b) frequency stability also measured at extreme temperature -40°C and +65°C, which the applicant specified.

2.6.2. Test Results

The nominal, highest and lowest extreme voltages are separately 24VDC, 60VDC and 10.5VDC which are specified by the applicant. the normal temperature here used is 20°C.

The testing was made when the transmitter was modulated 2GFSK and 4GFSK when operating at 757.05MHz and 787.950MHz with a 12.5kHz, 25kHz, 50.0 kHz channel bandwidths.

The test results show a maximum frequency deviation of 137Hz which equates to an error of 131 Hz / 787.950 MHz = 0.174ppm

Nominal Frequency: 757.050MHz2GFSK 12.5kHz			
Power(VDC)	Temp(°C)	Fre. Dev.(Hz)	Result
24	+65	+110.0	PASS
	+60	+95.0	
	+50	+55.0	
	+40	+54.0	
	+30	+76.0	
	+20	+10.0	
	+10	-40.0	
	0	+6.0	
	-10	-51.0	
	-20	+41.0	
	-30	-55.0	
	-40	+68.0	
10.5	+20	+38.0	PASS
60.0	+20	+14.0	



Nominal Frequency: 757.050MHz2GFSK 25kHz			
Power(VDC)	Temp(°C)	Fre. Dev.(Hz)	Result
24	+65	+125.0	PASS
	+60	+103.0	
	+50	+31.0	
	+40	-19.0	
	+30	+55.0	
	+20	+14.0	
	+10	-23.0	
	0	-11.0	
	-10	+16.0	
	-20	+38.0	
	-30	-58.0	
	-40	+67	
10.5	+20	+25.0	PASS
60.0	+20	+21.0	

Nominal Frequency: 757.050MHz 2GFSK 50kHz			
Power(VDC)	Temp(°C)	Fre. Dev.(Hz)	Result
24	+65	+94.0	PASS
	+60	+78.0	
	+50	+34.0	
	+40	+28.0	
	+30	+86.0	
	+20	+57.0	
	+10	-33.0	
	0	-62.0	
	-10	+28.0	
	-20	+71.0	
	-30	+59.0	
	-40	+45.0	
10.5	+20	-54.0	PASS
60.0	+20	-28.0	



Nominal Frequency: 757.050MHz 4GFSK 12.5kHz			
Power(VDC)	Temp(°C)	Fre. Dev.(Hz)	Result
24	+65	+131.0	PASS
	+60	+89.0	
	+50	+32.0	
	+40	+38.0	
	+30	+98.0	
	+20	+25.0	
	+10	+45.0	
	0	-33.0	
	-10	-59.0	
	-20	-21.0	
	-30	+35.0	
	-40	+61.0	
10.5	+20	+38.0	PASS
60.0	+20	+27.0	

Nominal Frequency: 787.950MHz4GFSK 25kHz			
Power(VDC)	Temp(°C)	Fre. Dev.(Hz)	Result
24	+65	+137.0	PASS
	+60	+101.0	
	+50	+56.0	
	+40	-45.0	
	+30	+38.0	
	+20	+25.0	
	+10	-84.0	
	0	+55.0	
	-10	+86.0	
	-20	+54.0	
	-30	-52.0	
	-40	+68.0	
10.5	+20	+75.0	PASS
60.0	+20	+39.0	



Nominal Frequency: 757.050MHz 4GFSK 50kHz			
Power(VDC)	Temp(°C)	Fre. Dev.(Hz)	Result
24	+65	+99.0	PASS
	+60	+84.0	
	+50	+75.0	
	+40	+51.0	
	+30	+77.0	
	+20	+67.0	
	+10	+53.0	
	0	+28.0	
	-10	-65.0	
	-20	+57.0	
	-30	+86.0	
	-40	+97.0	
10.5	+20	-25.0	PASS
60.0	+20	+88.0	

Nominal Frequency: 787.950MHz 2GFSK 12.5kHz			
Power(VDC)	Temp(°C)	Fre. Dev.(Hz)	Result
24.0	+65	+124.0	PASS
	+60	+87.0	
	+50	+76.0	
	+40	+54.0	
	+30	+76.0	
	+20	+10.0	
	+10	+102.0	
	0	+61.0	
	-10	-51.0	
	-20	+71.0	
	-30	-85.0	
	-40	+74.0	
10.5	+20	+38.0	PASS
60.0	+20	+14.0	



Nominal Frequency: 787.950MHz2GFSK 25kHz			
Power(VDC)	Temp(°C)	Fre. Dev.(Hz)	Result
24.0	+65	+94.0	PASS
	+60	+79.0	
	+50	+66.0	
	+40	+54.0	
	+30	+76.0	
	+20	+10.0	
	+10	-40.0	
	0	+61.0	
	-10	-51.0	
	-20	+71.0	
	-30	+54.0	
	-40	+68.0	
10.5	+20	+45.0	PASS
60.0	+20	+65.0	

Nominal Frequency: 787.950MHz2GFSK 50kHz			
Power(VDC)	Temp(°C)	Fre. Dev.(Hz)	Result
24.0	+65	+93.0	PASS
	+60	+80.0	
	+50	+42.0	
	+40	+58.0	
	+30	+71.0	
	+20	+35.0	
	+10	-75.0	
	0	+58.0	
	-10	-92.0	
	-20	+94.0	
	-30	-78.0	
	-40	+61.0	
10.5	+20	+19.0	PASS
60.0	+20	+45.0	



Nominal Frequency: 787.950MHz4GFSK 12.5kHz			
Power(VDC)	Temp(°C)	Fre. Dev.(Hz)	Result
24.0	+65	+95.0	PASS
	+60	+83.0	
	+50	+78.0	
	+40	+59.0	
	+30	+56.0	
	+20	+33.0	
	+10	+57.0	
	0	+91.0	
	-10	-68.0	
	-20	-57.0	
	-30	+54.0	
	-40	+63.0	
10.5	+20	+28.0	PASS
60.0	+20	+65.0	

Nominal Frequency: 787.950MHz4GFSK 25kHz			
Power(VDC)	Temp(°C)	Fre. Dev.(Hz)	Result
24.0	+65	+94.0	PASS
	+60	76.0	
	+50	+26.0	
	+40	+54.0	
	+30	+76.0	
	+20	+10.0	
	+10	-40.0	
	0	+61.0	
	-10	-51.0	
	-20	+71.0	
	-30	+87.0	
	-40	+91.0	
10.5	+20	+59.0	PASS
60.0	+20	+78.0	



Nominal Frequency: 787.950MHz4GFSK 50kHz			
Power(VDC)	Temp(°C)	Fre. Dev.(Hz)	Result
24.0	+65	+84.0	PASS
	+60	+67.0	
	+50	+32.0	
	+40	+51.0	
	+30	+94.0	
	+20	-20.0	
	+10	-38.0	
	0	+65.0	
	-10	-51.0	
	-20	+71.0	
	-30	+77.0	
	-40	+64.0	
10.5	+20	-57.0	PASS
60.0	+20	+23.0	

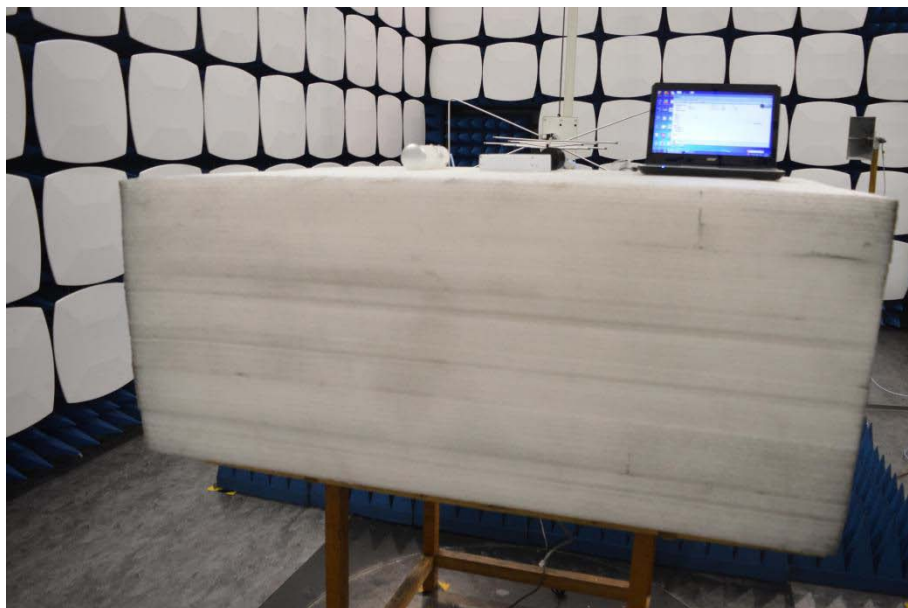
Note 1: Part 27.54 states that the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Annex A Photographs of Test Setup

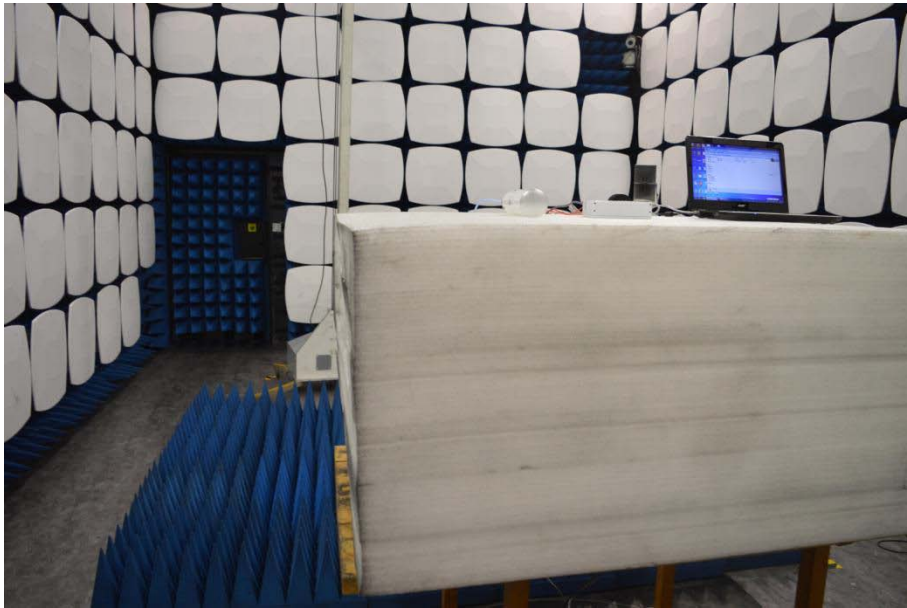
1. Conducted Emission Test



2. Radiated Emission Test



3. EIRP Test



4. Frequency Stability Test





Annex B Test Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

Test items	Uncertainty
Peak Output Power	$\pm 2.22\text{dB}$
Bandwidth	$\pm 5\%$
Conducted Spurious Emission	$\pm 2.77\text{ dB}$
Radiated Spurious Emissions	$\pm 4.15\text{ dB}$
Occupied Channel Bandwidth	$\pm 5\%$
Frequency stability	$\pm 30\text{Hz}$

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$



Annex C Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Department:	Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, Guangdong Province, P. R. China
Responsible Test Lab Manager:	Mr. Su Feng
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, Guangdong Province, P. R. China

3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1192.



4. Test Equipments Utilized

4.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
EXA Signal Analyzer	MY50200655	N9020A	Agilent	2017.12.28	2018.12.17
Attenuator	(N/A)	10dB	Resnet	2017.05.24	2018.05.23
DC Power Supply	RPS3005D-2 -BHAB008	RPS3005 D-2	Rek	2017.05.24	2018.05.23
High and low temperature heat chamber	HA06-21216 2-3-1- II	HUT405P	Harding Technology	2017.06.01	2018.05.31
RF cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
SMA connector	CN01	RF03	HUBER-SUHNER	N/A	N/A

4.2 Auxiliary Test Equipment

Equipment Name	Model No.	Brand Name	Manufacturer	Cal.Date	Cal.Due Date
Computer	T430i	Think Pad	Lenovo	N/A	N/A



4.3 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal.Due Date
Receiver	MY54130016	N9038A	Agilent	2017.05.17	2018.05.16
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2017.05.14	2018.05.13
Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2017.09.13	2018.09.12
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2017.03.07	2018.03.06
Test Antenna - Horn	01774	BBHA 9120D	Schwarzbeck	2017.09.13	2018.09.12
Coaxial cable (N male) (9KHz-30MHz)	CB04	EMC04	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
Coaxial cable(N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
1-18GHz pre-Amplifier	MA02	TS-PR18	Rohde& Schwarz	2017.05.17	2018.05.16
18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde& Schwarz	2017.05.17	2018.05.16
Anechoic Chamber	N/A	9m*6m*6m	CRT	2017.11.19	2020.11.18

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