



FCC Test Report

FCC ID: 2ANLH-X5105

Product: HF+50MHz transceiver

Trade Mark: 

Model Number: X5105

Serial Model: N/A

Report No.: NTEK-2017NT08185845F

Prepared for

Chongqing Xiegu Technology Co.,Ltd.
7-6, Incubator Building, Shuitu High-tech Park, Beibei District,
Chongqing, China.

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.
1/F, Building E, Fenda Science Park, Sanwei Community,
Xixiang Street Bao'an District, Shenzhen P.R. China
Tel.: +86-755-6115 9388
Fax.: +86-755-6115 6599
Website:<http://www.ntek.org.cn>

TEST RESULT CERTIFICATION

Applicant's name : Chongqing Xiegu Technology Co.,Ltd.
Address : 7-6, Incubator Building, Shuitu High-tech Park, Beibei District, Chongqing, China.

Manufacturer's Name : Shenzhen Xiegu Telecommunication Co.,Ltd.
Address : 4th floor, building B, No. 12, Baoshi Road, Jiaoyitang, Tangxia town, Dongguan, China.

Product description

Product name : HF+50MHz transceiver

Model and/or type reference : X5105

FCC Part15B:Apr 11.2017

Standards : ANSI C63.4:2014

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with Part 15 of FCC Rules. And it is applicable only to the tested sample identified in the report.

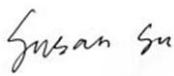
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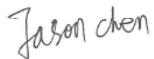
Date of Test :

Date (s) of performance of tests : 18 Aug. 2017 ~ 05 Sep. 2017

Date of Issue : 05 Sep. 2017

Test Result : **Pass**

Testing Engineer : 
(Susan Su)

Technical Manager : 
(Jason Chen)

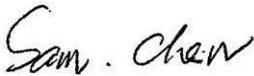
Authorized Signatory : 
(Sam Chen)

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1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC Part15B:2017 ANSI C63.4: 2014	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	

NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report
- (2) For client's request and manual description, the test will not be executed.

1.1 TEST FACILITY

Shenzhen NTEK Testing Technology Co., Ltd

Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen 518126 P.R. China.

FCC Registration Number: 463705; IC Registration Number: 9270A-1

CNAS Registration Number: L5516

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95 %**.

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
NTEKC01	ANSI	150 KHz ~ 30MHz	3.2	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
NTEKA01	ANSI	30MHz ~ 1000MHz	4.7	
		1GHz ~ 12.4GHz	5.0	

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	HF+50MHz transceiver	
Trade Mark		
Model Name	X5105	
Serial Model	N/A	
Model Difference	N/A	
Product Description	<p>The EUT is a HF+50MHz transceiver.</p> <p>Connecting I/O port: DC in, Antenna interface, External speaker / earphone interface, DC power interface, ACC interface, KEY interface, ATU interface, COM interface, MIC interface, IF signal output port</p> <p>Operation Frequency: receive: 1MHz-55MHz</p> <p>Modulation Type: SSB, AM, FM, CW</p>	
Power Source	DC13.8V±15% V	
Adapter	N/A	
Battery	DC12V/3800mAh	
HW Version	N/A	
SW Version	N/A	

2.1.1 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Charging +Working

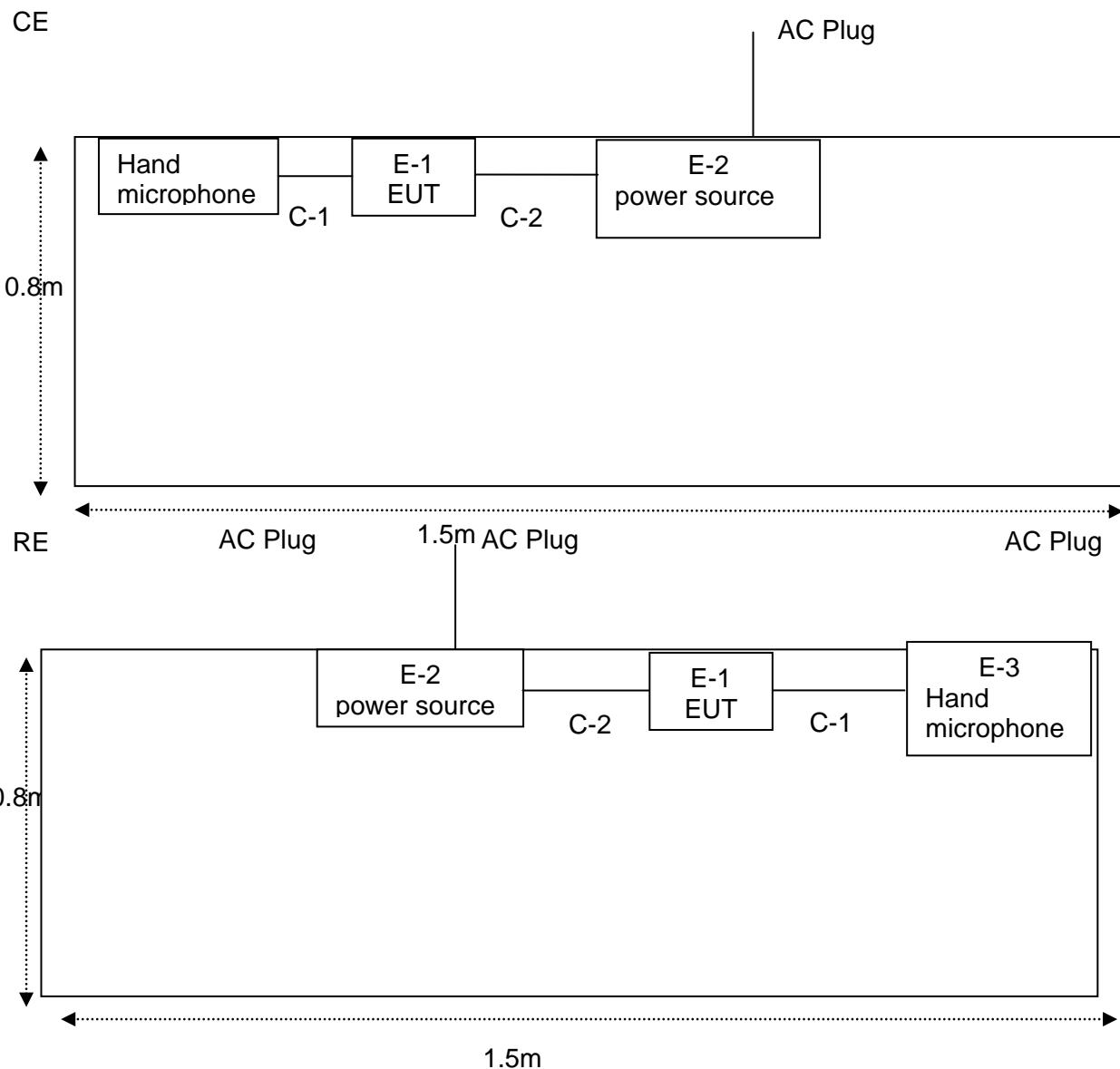
For Conducted Test	
Final Test Mode	Description
Mode 1	Charging +Working

For Radiated Test	
Final Test Mode	Description
Mode 1	Charging +Working

Note: Final Test Mode: Through Pre-scan, find the mode 1 is the worst case.

Only the worst case mode is recorded in the report.

2.2 DESCRIPTION OF TEST SETUP



2.3 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	HF+50MHz transceiver		X5105	N/A	EUT
E-2	Personal computer	MAISHENG	power source	MS-303D	Peripherals
E-3	Hand microphone		X5105	N/A	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length	Note
C-1	microphone Cable	NO	NO	1.0m	
C-2	Power Cable	NO	NO	1.2m	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) "YES" means "shielded" "with core"; "NO" means "unshielded" "without core".

2.4 MEASUREMENT INSTRUMENTS LIST

Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2017.06.06	2018.06.05	1 year
2	Test Receiver	R&S	ESPI	101318	2017.06.06	2018.06.05	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2017.04.09	2018.04.08	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2017.06.06	2018.06.05	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2017.06.06	2018.06.05	1 year
6	Horn Antenna	EM	EM-AH-10180	2011071402	2017.04.09	2018.04.08	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2017.07.06	2018.07.05	1 year
8	Amplifier	EMC	EMC051835SE	980246	2016.08.09	2017.08.08	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2017.06.06	2018.06.05	1 year
10	Power Meter	DARE	RPR3006W	15I00041S NO84	2016.08.09	2017.08.08	1 year
11	Power Sensor	R&S	URV5-Z4	0395.1619.05	2016.07.06	2017.07.05	1 year
12	Test Cable (30MHz-1GHz)	N/A	R-02	N/A	2017.04.21	2020.04.20	3 year
13	High Test Cable(1G-40 GHz)	N/A	R-03	N/A	2017.04.21	2020.04.20	3 year
14	High Test Cable(1G-40 GHz)	N/A	R-04	N/A	2017.04.21	2020.04.20	3 year

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2017.06.06	2018.06.05	1 year
2	LISN	R&S	ENV216	101313	2017.04.19	2018.04.18	1 year
3	LISN	SCHWARZBECK	NNLK 8129	8129245	2017.06.06	2018.06.05	1 year
4	50Ω Coaxial Switch	ANRITSU CORP	MP59B	6200983704	2017.06.06	2018.06.05	1 year
5	Test Cable (9KHz-30MHz)	N/A	C01	N/A	2017.04.21	2020.04.20	3 year
6	Test Cable (9KHz-30MHz)	N/A	C02	N/A	2017.04.21	2020.04.20	3 year
7	Test Cable (9KHz-30MHz)	N/A	C03	N/A	2017.04.21	2020.04.20	3 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

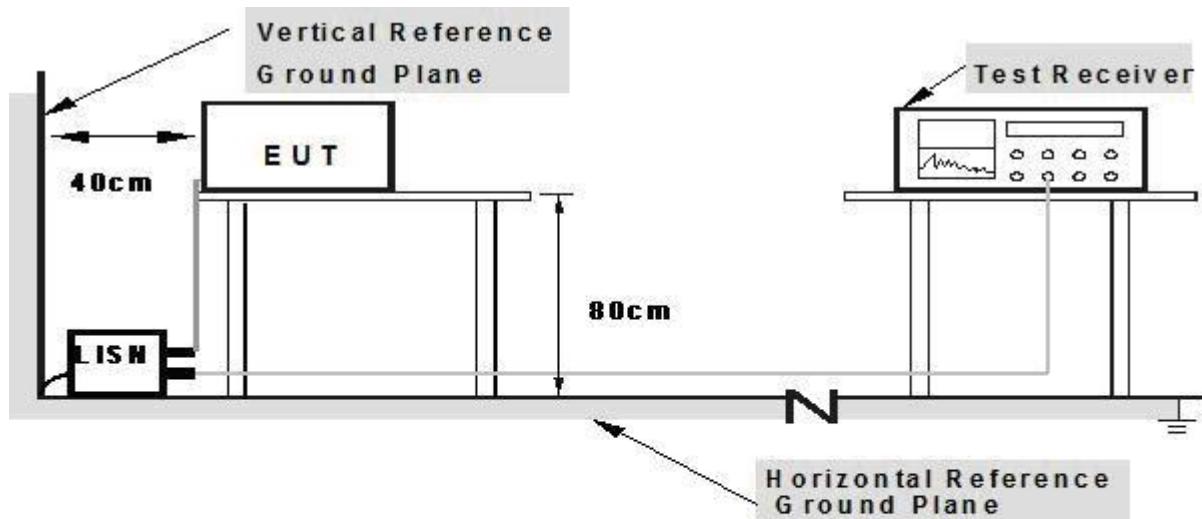
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMH) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

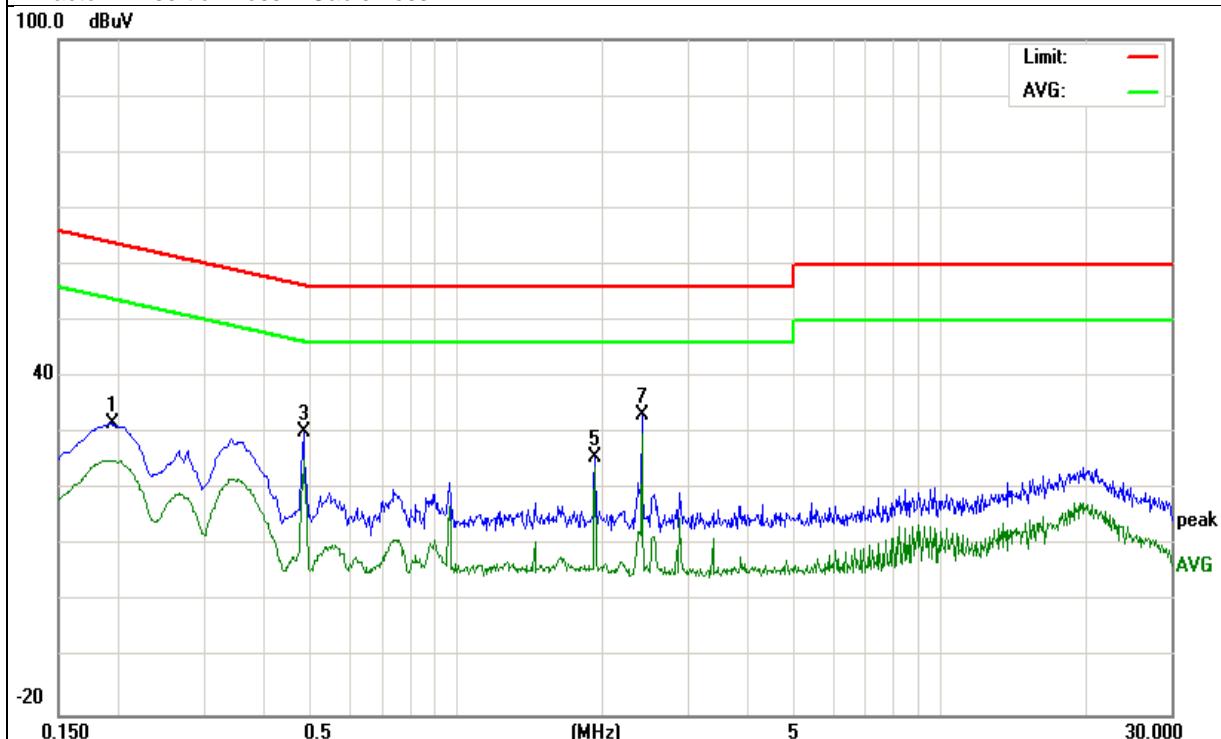
3.1.5 TEST RESULTS

EUT:	HF+50MHz transceiver	Model Name. :	X5105
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2017-8-18
Test Mode:	Mode 1	Phase :	L
Test Voltage:	DC 13.8V from Power source AC120V/60Hz		

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dB μ V)	(dB)	(dB μ V)	(dB μ V)	(dB)	
0.1940	21.81	9.82	31.63	63.86	-32.23	QP
0.1940	15.41	9.82	25.23	53.86	-28.63	AVG
0.4820	20.38	9.83	30.21	56.30	-26.09	QP
0.4820	15.72	9.83	25.55	46.30	-20.75	AVG
1.9300	15.86	9.85	25.71	56.00	-30.29	QP
1.9300	14.00	9.85	23.85	46.00	-22.15	AVG
2.4140	23.35	9.92	33.27	56.00	-22.73	QP
2.4140	20.15	9.92	30.07	46.00	-15.93	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

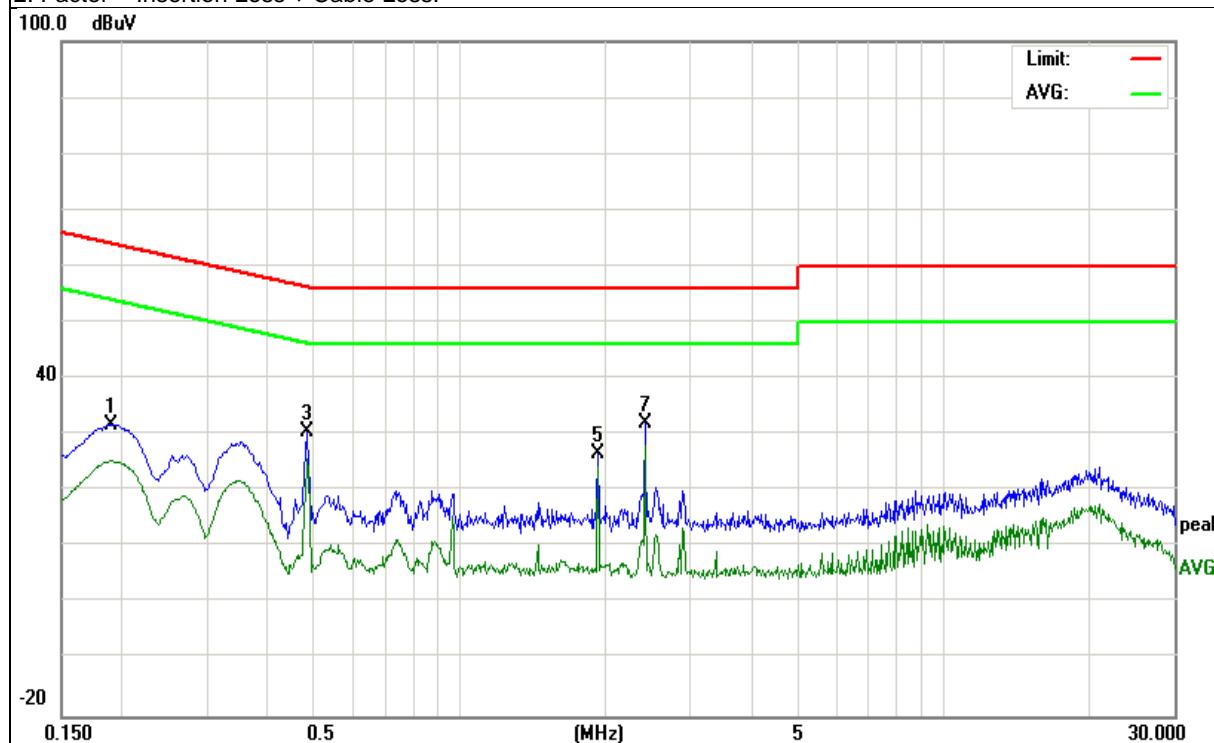


EUT:	HF+50MHz transceiver	Model Name. :	X5105
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2017-8-18
Test Mode:	Mode 1	Phase :	N
Test Voltage:	DC 13.8V from Power source AC120V/60Hz		

Frequency (MHz)	Reading Level (dB μ V)	Correct Factor (dB)	Measure-ment (dB μ V)	Limits	Margin	Remark
				(dB μ V)	(dB)	
0.1900	21.80	9.92	31.72	64.03	-32.31	QP
0.1900	15.46	9.92	25.38	54.03	-28.65	AVG
0.4820	20.63	9.93	30.56	56.30	-25.74	QP
0.4820	15.85	9.93	25.78	46.30	-20.52	AVG
1.9340	16.59	9.94	26.53	56.00	-29.47	QP
1.9340	14.45	9.94	24.39	46.00	-21.61	AVG
2.4180	22.11	9.94	32.05	56.00	-23.95	QP
2.4180	18.08	9.94	28.02	46.00	-17.98	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

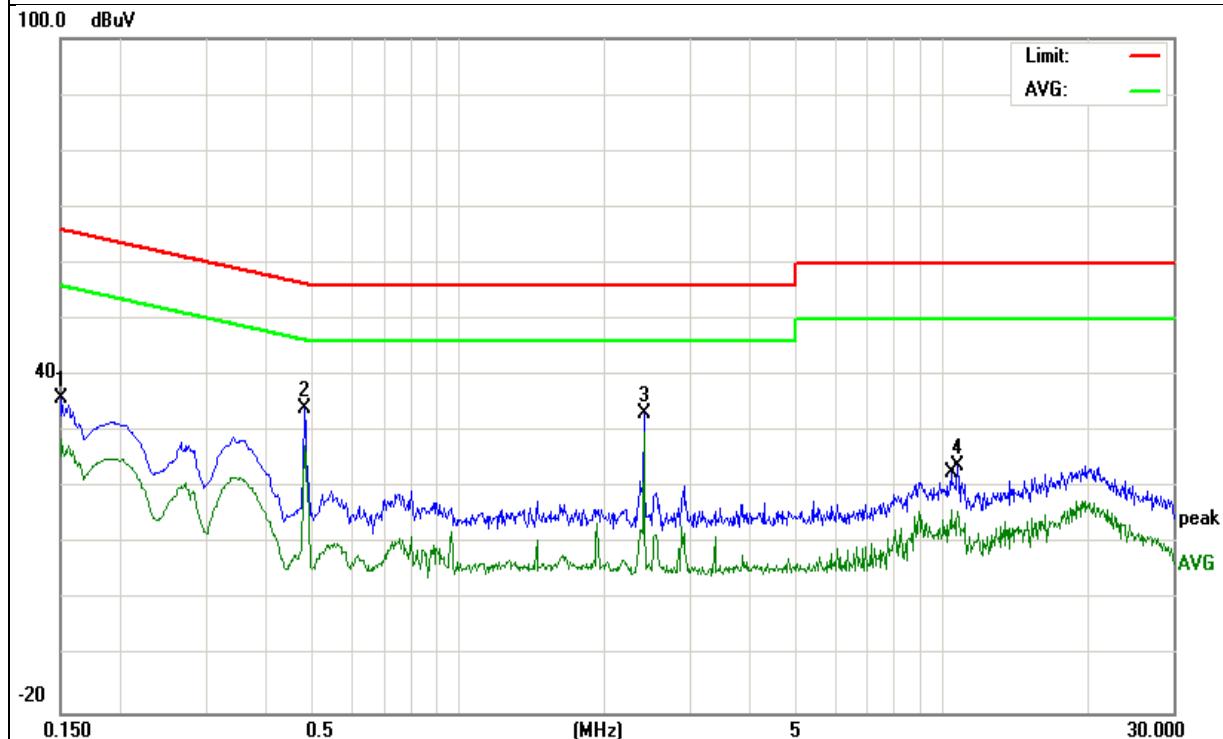


EUT:	HF+50MHz transceiver	Model Name. :	X5105
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2017-8-18
Test Mode:	Mode 1	Phase :	L
Test Voltage:	DC 13.8V from Power source AC240V/60Hz		

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dB μ V)	(dB)	(dB μ V)	(dB μ V)	(dB)	
0.1507	26.28	9.82	36.10	65.96	-29.86	QP
0.4786	24.27	9.83	34.10	56.36	-22.26	QP
2.4140	23.35	9.92	33.27	56.00	-22.73	QP
10.7858	14.09	10.01	24.10	60.00	-35.90	QP
0.1507	19.03	9.82	28.85	55.96	-27.11	AVG
0.4786	17.75	9.83	27.58	46.36	-18.78	AVG
2.4140	20.15	9.92	30.07	46.00	-15.93	AVG
10.4138	6.16	10.00	16.16	50.00	-33.84	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

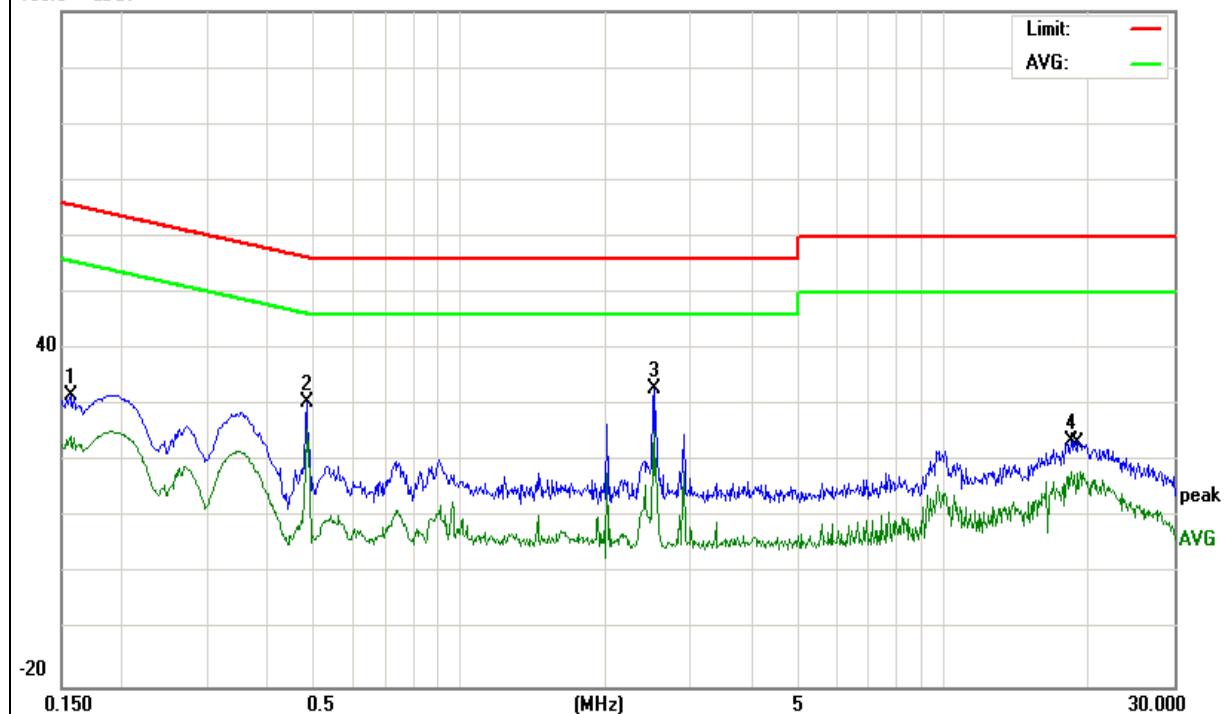


EUT:	HF+50MHz transceiver	Model Name.:	X5105
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2017-8-18
Test Mode:	Mode 1	Phase :	N
Test Voltage:	DC 13.8V from Power source AC240V/60Hz		

Frequency (MHz)	Reading Level (dB μ V)	Correct Factor (dB)	Measure-ment (dB μ V)	Limits (dB μ V)	Margin (dB)	Remark
0.1564	21.88	9.92	31.80	65.65	-33.85	QP
0.4819	20.63	9.93	30.56	56.31	-25.75	QP
2.5259	23.06	9.94	33.00	56.00	-23.00	QP
18.4139	13.55	10.25	23.80	60.00	-36.20	QP
0.4819	15.85	9.93	25.78	46.31	-20.53	AVG
2.5259	15.52	9.94	25.46	46.00	-20.54	AVG
19.1859	8.00	10.25	18.25	50.00	-31.75	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

100.0 dB μ V

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 3m)
	dBuV/m	dBuV/m
30 ~ 88	39.0	40.0
88 ~ 216	43.5	43.5
216 ~ 960	46.5	46.0
Above 960	49.5	54.0

Notes:

- (1) The limit for radiated test was performed according to as following:
FCC PART 15B /ICES-003.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

Test Arrangement for Radiated Emissions up to 1 GHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited test facility. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for quasi-peak detection (QP) at frequency below 1GHz.

Test Arrangement for Radiated Emissions above 1 GHz.

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna can be varied from one meter to four meters, the height of adjustment depends on the EUT height and the antenna 3dB beamwidth both, to detect the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

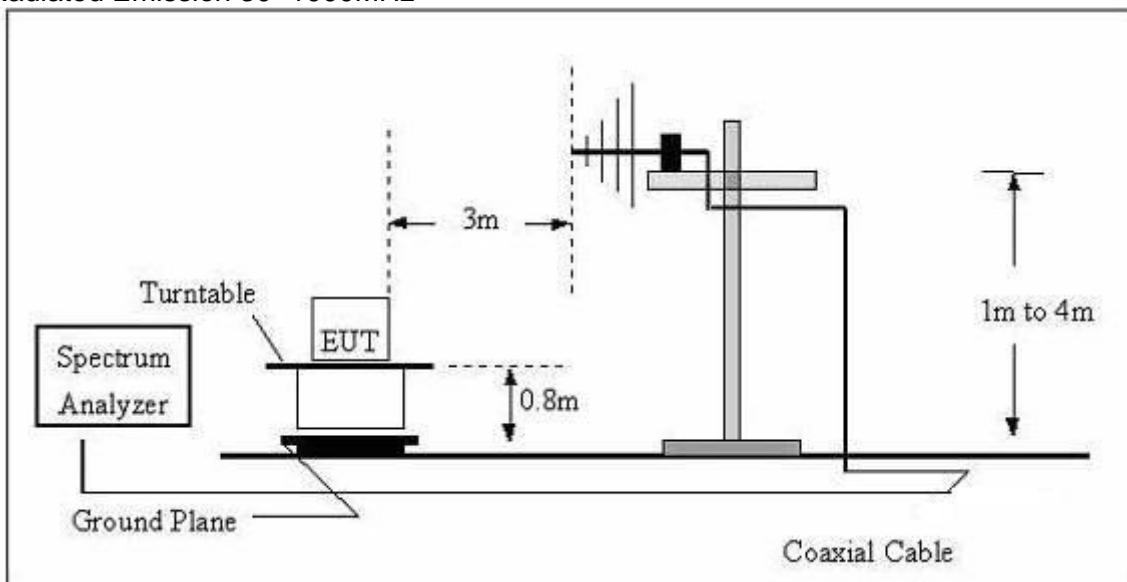
Note: For the hand-held device, the EUT should be measured for all 3 axes and only the worst case is recorded in the report

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

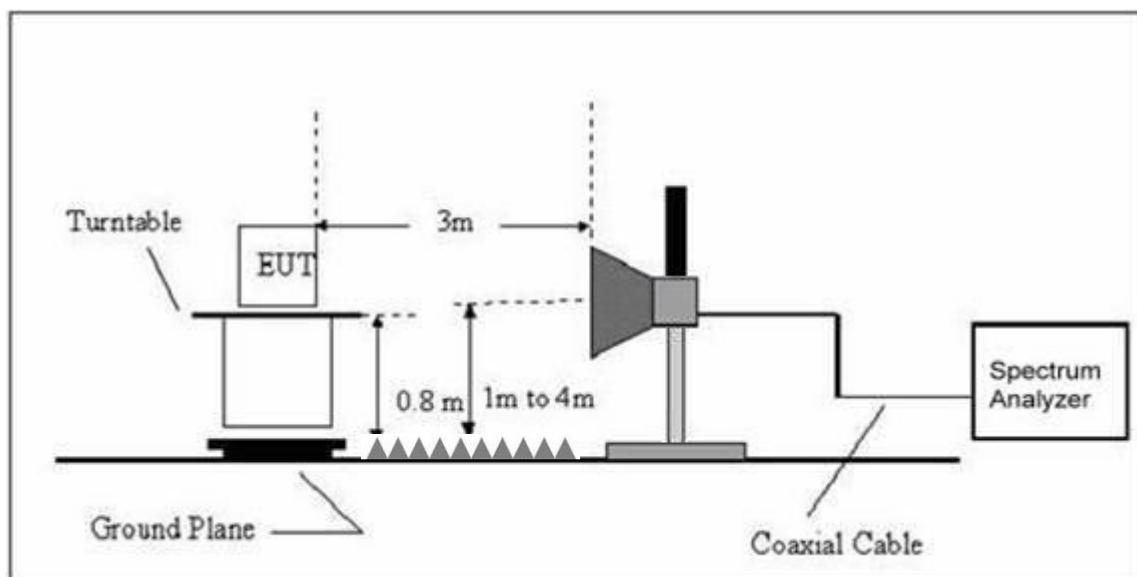
Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Avg	1 MHz	10 Hz

3.2.3 TEST SETUP

For Radiated Emission 30~1000MHz



(B) Radiated Emission Test Set-Up Frequency Above 1GHz



3.2.4 TEST RESULTS

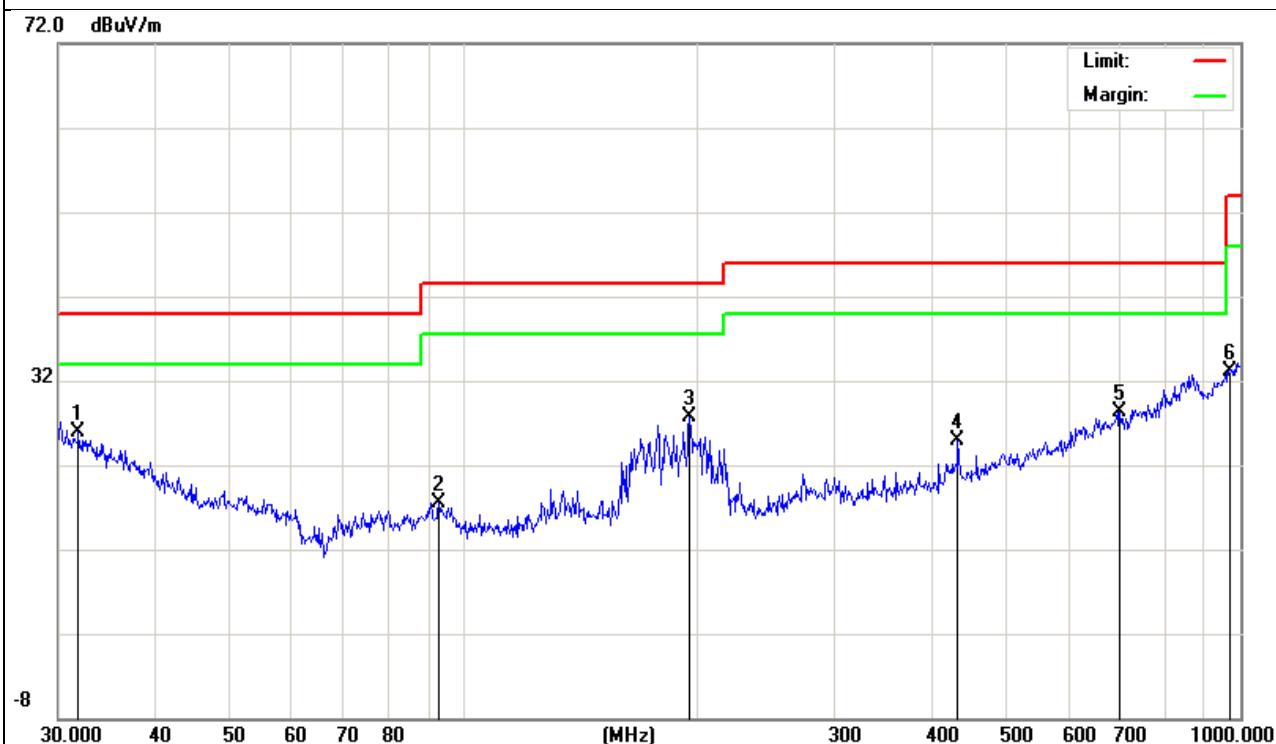
TEST RESULTS (30~1000 MHz)

EUT:	HF+50MHz transceiver	Model Name:	X5105
Temperature:	24 °C	Relative Humidity:	54%
Pressure:	1010 hPa	Test Date :	2017-8-18
Test Mode :	Mode 1	Polarization :	Horizontal
Test Power :	DC 13.8V from Power source AC120V/60Hz		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	31.8427	5.42	20.41	25.83	40.00	-14.17	QP
H	92.7871	5.62	11.97	17.59	43.50	-25.91	QP
H	195.1365	13.90	13.74	27.64	43.50	-15.86	QP
H	432.5457	8.46	16.47	24.93	46.00	-21.07	QP
H	699.3046	6.94	21.36	28.30	46.00	-17.70	QP
H	968.9338	6.03	27.17	33.20	54.00	-20.80	QP

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.

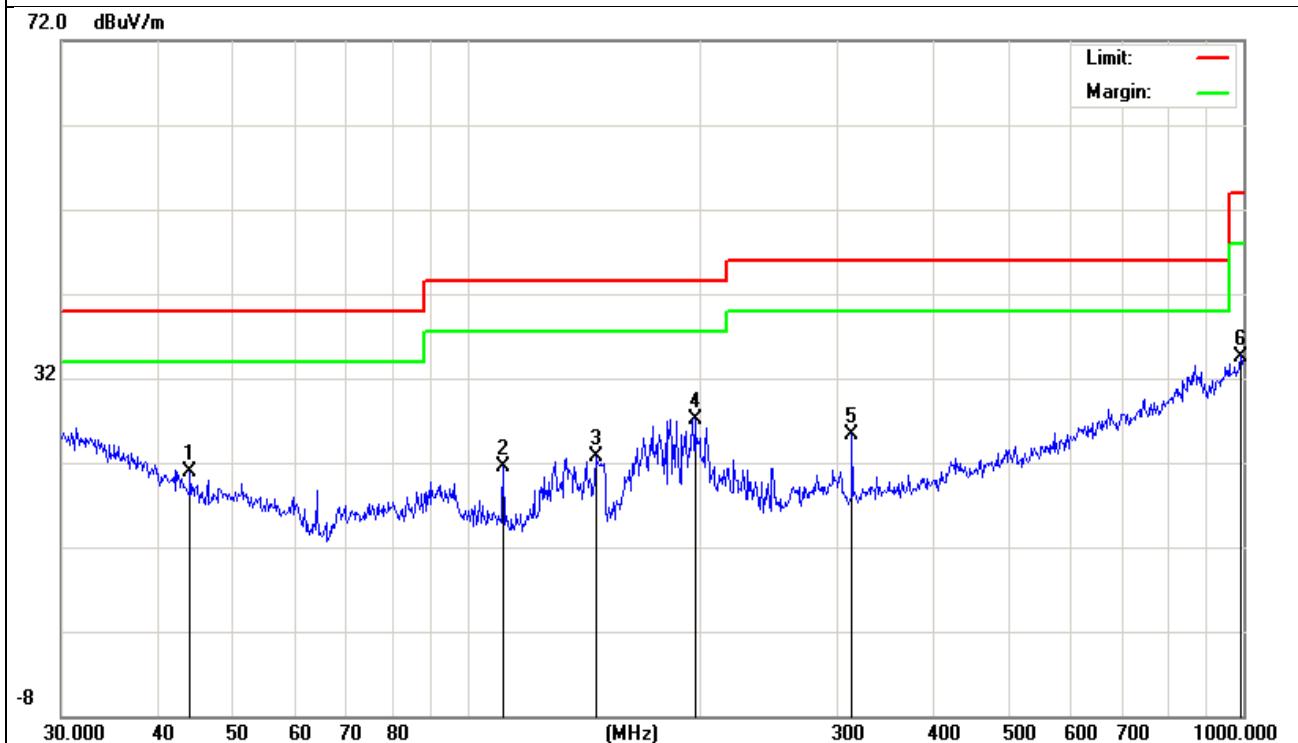


EUT:	HF+50MHz transceiver	Model Name :	X5105
Temperature:	24 °C	Relative Humidity:	54%
Pressure:	1010 hPa	Test Date :	2017-8-18
Test Mode :	Mode 1	Polarization :	Vertical
Test Power :	DC 13.8V from Power source AC120V/60Hz		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	43.9658	6.42	14.40	20.82	40.00	-19.18	QP
V	111.3468	11.27	10.17	21.44	43.50	-22.06	QP
V	146.3735	11.36	11.33	22.69	43.50	-20.81	QP
V	196.5098	13.28	13.75	27.03	43.50	-16.47	QP
V	313.2760	11.96	13.31	25.27	46.00	-20.73	QP
V	993.0113	6.70	27.90	34.60	54.00	-19.40	QP

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.



END OF REPORT