

APPLICATION CERTIFICATION FCC Part 15C
On Behalf of

Shenzhen Mingzong Technology Co., Ltd

Digital Backup Camera System
Model No.: MS-508RSW

FCC ID: 2AOPG-MS-508RSW

Prepared for : SHENZHEN MINGZONG TECHNOLOGY CO., LTD
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Report Number : ATE20172469
Date of Test : December 28, 2017
Date of Report : December 30, 2017

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Test Report Certification

Applicant : Shenzhen Mingzong Technology Co., Ltd
Address : 3rd Yangwu Road, Liantangmian, Huinan Avenue, Huiyang Economic Development Zone, Huizhou, Guangdong Province, China
Manufacturer : Huizou Miangshang Technology Co., Ltd
Address : 3rd Yangwu Road, Liantangmian, Huinan Avenue, Huiyang Economic Development Zone, Huizhou, Guangdong Province, China
Product : Digital Backup Camera System
Model No. : MS-508RSW
Trade name : MINGSHANG

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.249 ANSI C63.10: 2013

The EUT was tested according to FCC 47CFR 15.249 for compliance to FCC 47CFR 15.249 requirements

The device described above is tested by Shenzhen Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.249 limits. The measurement results are contained in this test report and Shenzhen Accurate Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Accurate Technology Co., Ltd.

Date of Test : December 28, 2017
Date of Report : December 30, 2017

Prepared by :

Bob Wang

(Bob Wang, Engineer)

Approved & Authorized Signer :



(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Product	:	Digital Backup Camera System
Main test model Number	:	MS-508RSW
Frequency Range	:	2407MHz-2473.5MHz
Channel frequency	:	2407MHz, 2412MHz, 2417MHz, 2422MHz, 2427MHz, 2432MHz, 2437MHz, 2442MHz, 2447MHz, 2452MHz, 2457MHz, 2462MHz, 2467MHz, 2473.5MHz
Number of Channels	:	14
Modulation Type	:	GFSK
Type of Antenna	:	Integral Antenna
Max antenna gain	:	5dBi
Power Supply	:	DC 10-32V

1.2. Special Accessory and Auxiliary Equipment

N/A

1.3.Description of Test Facility

EMC Lab	: Recognition of accreditation by Federal Communications Commission (FCC) The Designation Number is CN1189 The Registration Number is 708358 Listed by Innovation, Science and Economic Development Canada (ISED) The Registration Number is 5077A-2 Accredited by China National Accreditation Service for Conformity Assessment (CNAS) The Registration Number is CNAS L3193 Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 4297.01
Name of Firm	: Shenzhen Accurate Technology Co., Ltd.
Site Location	: 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

1.4.Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty (9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	=	4.06dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 07, 2017	Jan. 06, 2018
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 07, 2017	Jan. 06, 2018
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 07, 2017	Jan. 06, 2018
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 07, 2017	Jan. 06, 2018
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 13, 2017	Jan. 12, 2018
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 13, 2017	Jan. 12, 2018
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 13, 2017	Jan. 12, 2018
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 13, 2017	Jan. 12, 2018
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 07, 2017	Jan. 06, 2018
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 07, 2017	Jan. 06, 2018
Highpass Filter	Wainwright Instruments	WHKX3.6/18 G-10SS	N/A	Jan. 07, 2017	Jan. 06, 2018
Band Reject Filter	Wainwright Instruments	WRCG2400/2 485-2375/2510 -60/11SS	N/A	Jan. 07, 2017	Jan. 06, 2018

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

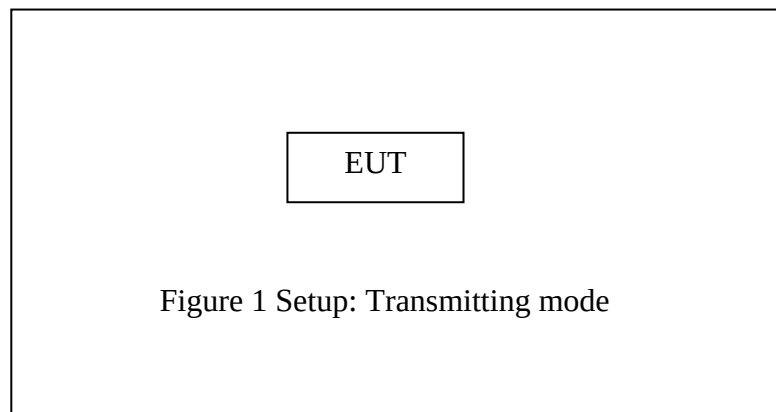
The mode is used: **Transmitting mode**

Low Channel: 2407MHz

Middle Channel: 2442MHz

High Channel: 2473.5MHz

3.2.Configuration and peripherals



4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.215(c)	20dB Bandwidth	Compliant
Section 15.249(d)	Band Edge Compliance Test	Compliant
Section 15.205(a), Section 15.209(a), Section 15.249, Section 15.35	Radiated Spurious Emission Test	Compliant
Section 15.207	AC Power Line Conducted Emission Test	N/A
Section 15.203	Antenna Requirement	Compliant

Note: The power supply mode of the module is DC 10-32V, According to the FCC standard requirements, conducted emission is not applicable.

5. 20DB BANDWIDTH MEASUREMENT

5.1. Block Diagram of Test Setup



5.2. The Requirement For Section 15.215(c)

The bandwidth of a frequency hopping channel is the 20 dB emission bandwidth, measured with the hopping stopped. The system RF bandwidth is equal to the channel bandwidth multiplied by the number of channels in the hopset. The hopset shall be such that the near-term distribution of frequencies appears random, with sequential hops randomly distributed in both direction and magnitude of change in the hopset while the long-term distribution appears evenly distributed.

5.3. Operating Condition of EUT

5.3.1. Setup the EUT and simulator as shown as Section 5.1.

5.3.2. Turn on the power of all equipment.

5.3.3. Let the EUT work in TX modes measure it. The transmit frequency are 2407-2473.5 MHz. We select 2407MHz, 2442MHz, and 2473.5MHz TX frequency to transmit.

5.4. Test Procedure

5.4.1. Place the EUT on the table and set it in transmitting mode.

5.4.2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

5.4.3. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz, Detector function=peak, Trace=max hold, Sweep=auto.

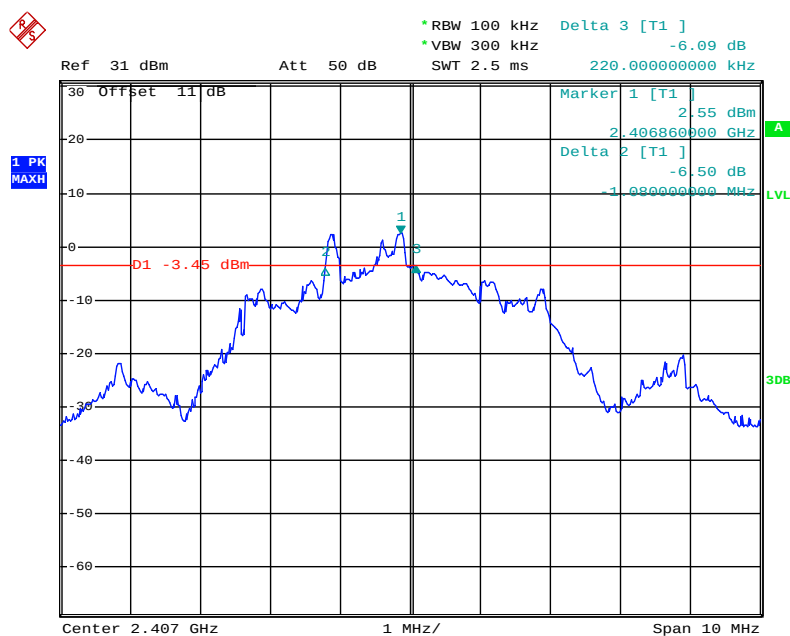
5.4.4. Set the measured low, middle and high frequency and test 20dB bandwidth with spectrum analyzer.

5.5. Test Result

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2407	1.30
Middle	2442	1.30
High	2437.5	1.30

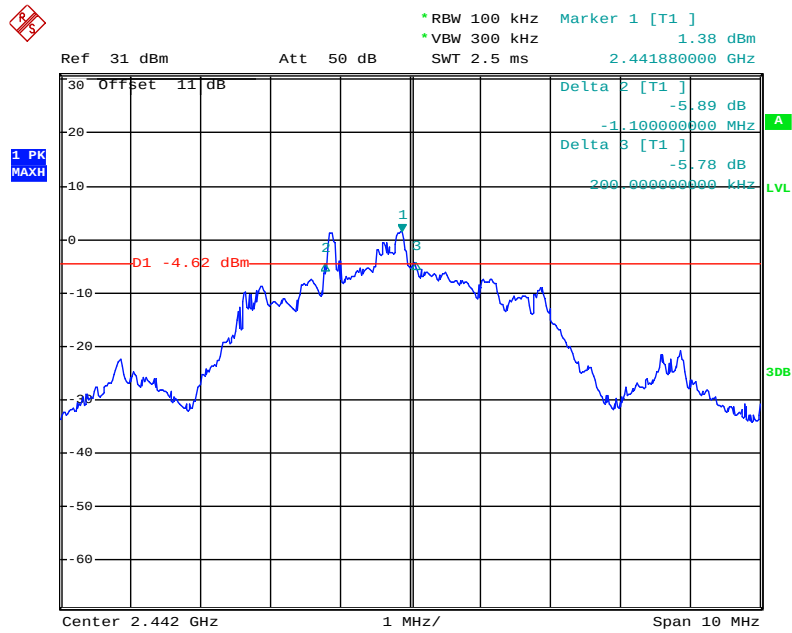
The spectrum analyzer plots are attached as below.

Low channel



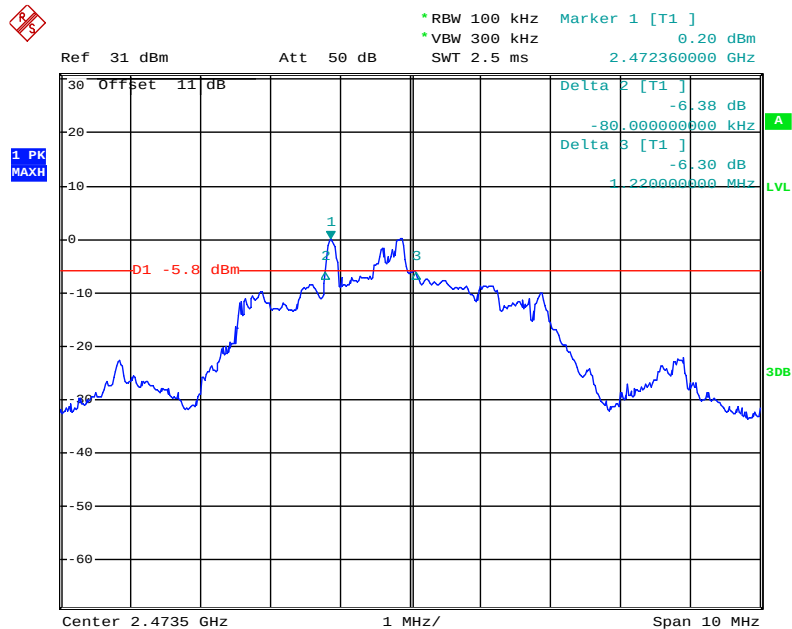
Date: 28.DEC.2017 18:07:13

Middle channel



Date: 28.DEC.2017 18:05:45

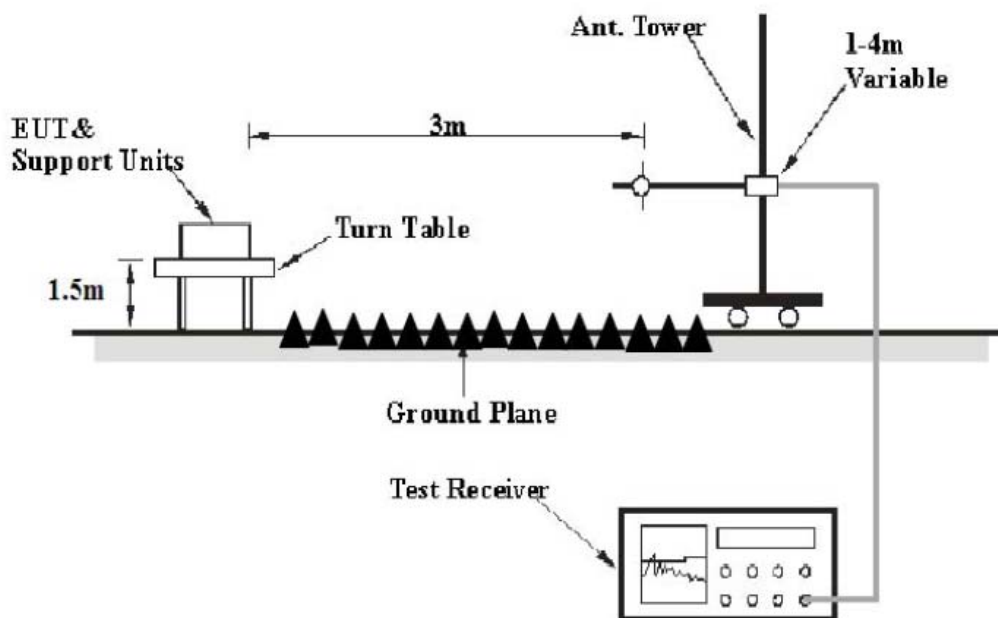
High channel



Date: 28.DEC.2017 18:03:54

6. BAND EDGE COMPLIANCE TEST

6.1. Block Diagram of Test Setup



6.2. The Requirement For Section 15.249

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

6.3. EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.4. Operating Condition of EUT

6.4.1. Setup the EUT and simulator as shown as Section 6.1.

6.4.2. Turn on the power of all equipment.

6.4.3. Let the EUT work in TX modes measure it. The transmit frequency are 2407-2473.5 MHz. We select 2407MHz, 2473.5MHz TX frequency to transmit.

6.5. Test Procedure

Radiate Band Edge:

6.5.1. The EUT is placed on a turntable, which is 1.5m above the ground plane and worked at highest radiated power.

6.5.2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.

6.5.3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

6.5.4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

RBW=1MHz, VBW=1MHz

6.5.5. The band edges was measured and recorded.

6.6. Test Result

Pass

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.

2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

3. Display the measurement of peak values.

4. The average measurement was not performed when peak measured data under the limit of average detection.

The spectral diagrams are attached as below.

Job No.: FRANK #1140

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: Digital Backup Camera System

Mode: TX2407MHz

Model: MS-508RSW

Manufacturer: Huizhou Mingshang Industrial Co.,LtdRepo

Polarization: Vertical

Power Source: DC 24V

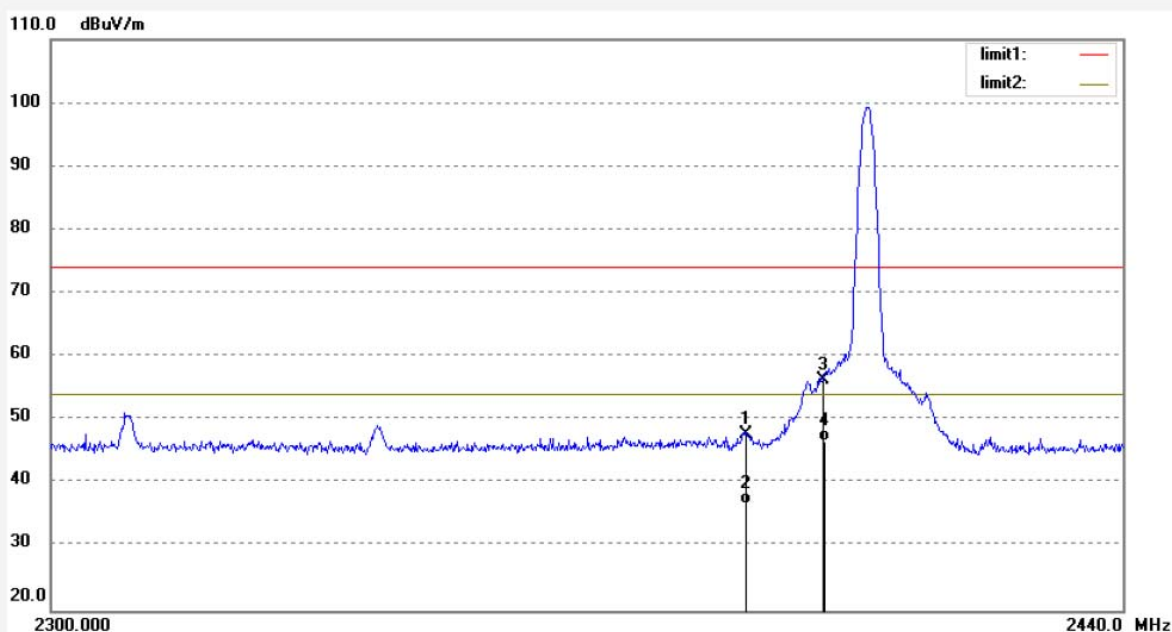
Date: 17/12/28/

Time: 17/36/20

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20172469



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	8.63	39.23	47.86	74.00	-26.14	peak	200	349	
2	2390.000	-2.45	39.23	36.78	54.00	-17.22	AVG	250	93	
3	2400.000	16.96	39.28	56.24	74.00	-17.76	peak	250	59	
4	2400.000	7.31	39.28	46.59	54.00	-7.41	AVG	200	137	

Job No.: FRANK #1141

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: Digital Backup Camera System

Mode: TX2407MHz

Model: MS-508RSW

Manufacturer: Huizhou Mingshang Industrial Co.,LtdRepo

Polarization: Horizontal

Power Source: DC 24V

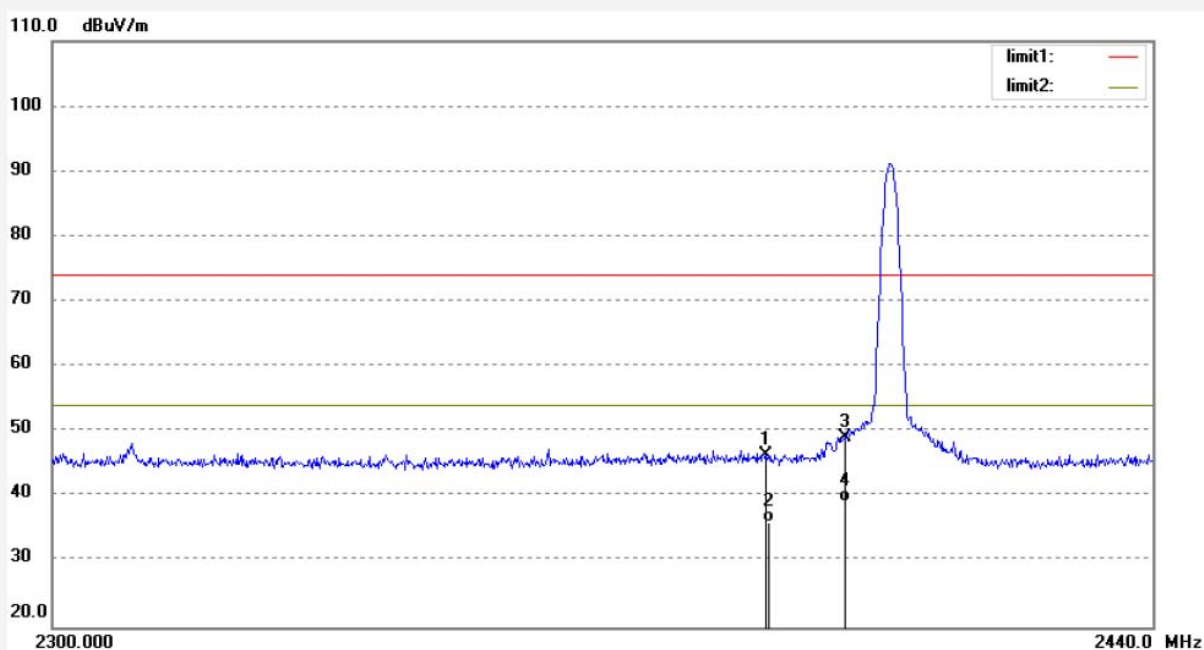
Date: 17/12/28/

Time: 17/37/54

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20172469



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	7.14	39.23	46.37	74.00	-27.63	peak	200	332	
2	2390.000	-3.04	39.23	36.19	54.00	-17.81	AVG	200	198	
3	2400.000	9.79	39.28	49.07	74.00	-24.93	peak	250	27	
4	2400.000	-0.14	39.28	39.14	54.00	-14.86	AVG	200	203	

Job No.: FRANK #1142

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: Digital Backup Camera System

Mode: TX2473.5MHz

Model: MS-508RSW

Manufacturer: Huizhou Mingshang Industrial Co.,LtdRepo

Polarization: Horizontal

Power Source: DC 24V

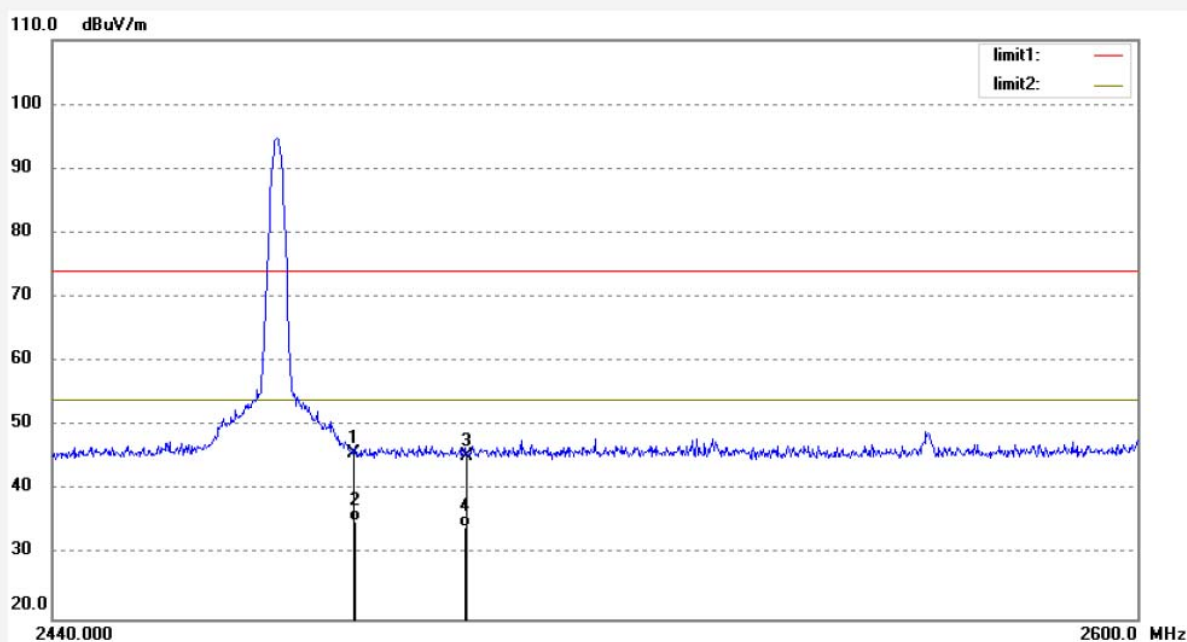
Date: 17/12/28/

Time: 17/40/50

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20172469



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	6.22	39.63	45.85	74.00	-28.15	peak	200	137	
2	2483.500	-4.50	39.63	35.13	54.00	-18.87	AVG	250	258	
3	2500.000	5.68	39.70	45.38	74.00	-28.62	peak	250	314	
4	2500.000	-5.46	39.70	34.24	54.00	-19.76	AVG	250	35	

Job No.: FRANK #1143

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: Digital Backup Camera System

Mode: TX2473.5MHz

Model: MS-508RSW

Manufacturer: Huizhou Mingshang Industrial Co.,LtdRepo

Polarization: Vertical

Power Source: DC 24V

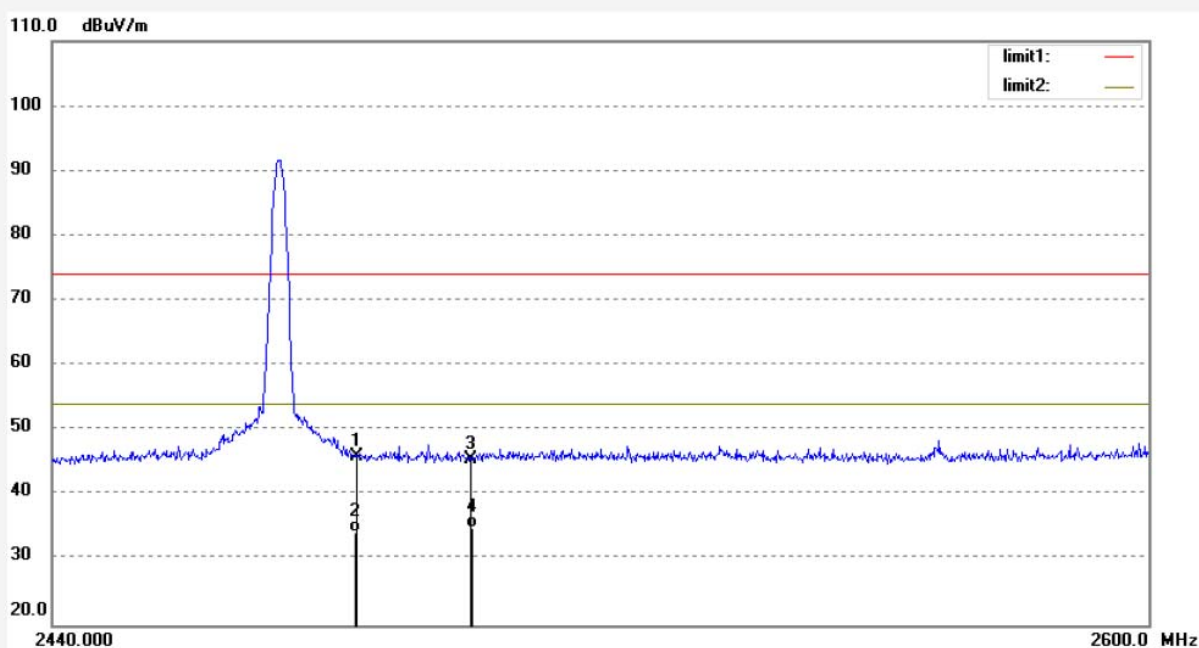
Date: 17/12/28/

Time: 17/42/38

Engineer Signature:

Distance: 3m

Note: Report NO.:ATE20172469

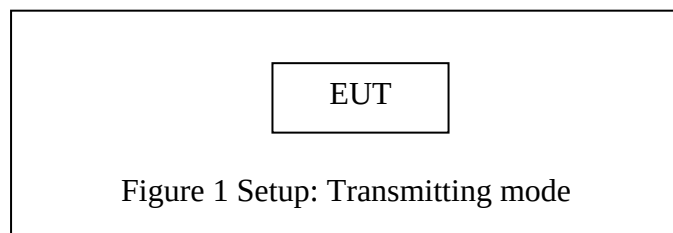


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	6.35	39.63	45.98	74.00	-28.02	peak	200	134	
2	2483.500	-5.40	39.63	34.23	54.00	-19.77	AVG	250	212	
3	2500.000	5.83	39.70	45.53	74.00	-28.47	peak	250	85	
4	2500.000	-4.85	39.70	34.85	54.00	-19.15	AVG	300	153	

7. RADIATED SPURIOUS EMISSION TEST

7.1. Block Diagram of Test Setup

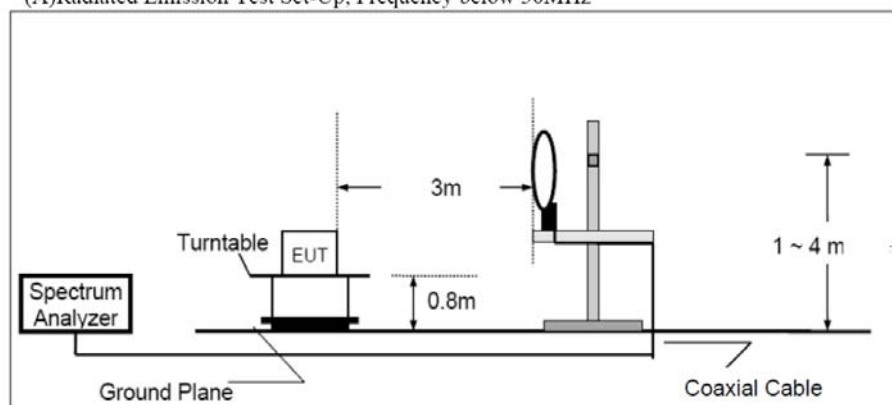
7.1.1. Block diagram of connection between the EUT and peripherals



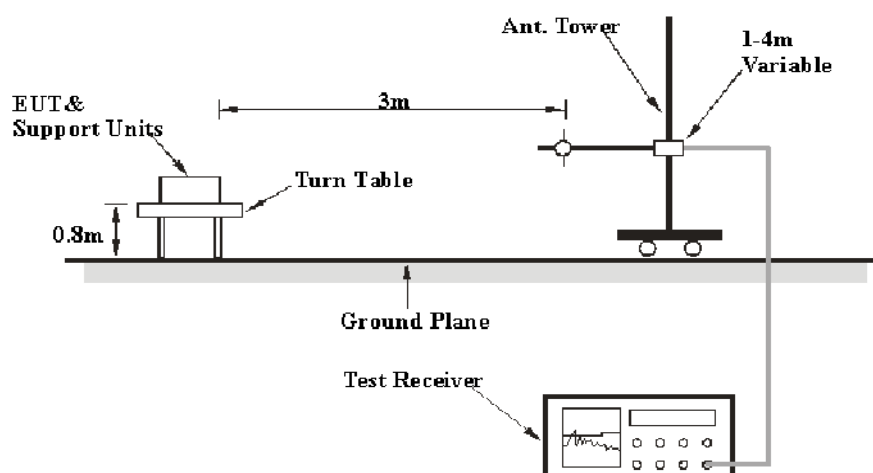
(EUT: Digital Backup Camera System)

7.1.2. Semi-Anechoic Chamber Test Setup Diagram

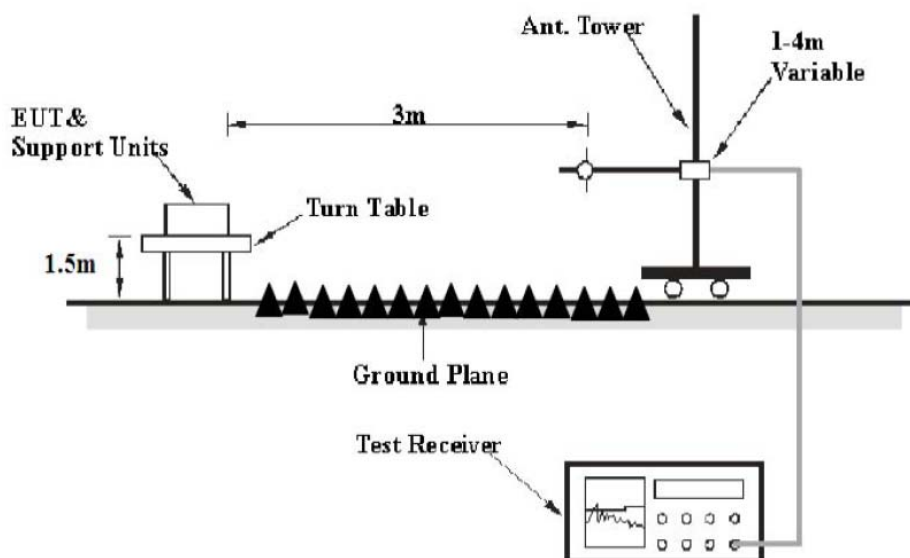
(A) Radiated Emission Test Set-Up, Frequency below 30MHz



(B) Radiated Emission Test Set-Up, Frequency 30-1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1GHz



7.2.The Limit For Section 15.249

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph A8.4(4), the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

7.3.Restricted bands of operation

7.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

¹Until February 1, 1999, this restricted band shall be 0.490-0.510

²Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

7.4.Configuration of EUT on Measurement

The equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.5. Operating Condition of EUT

7.5.1. Setup the EUT and simulator as shown as Section 7.1.

7.5.2. Turn on the power of all equipment.

7.5.3. Let the EUT work in TX modes measure it. The transmit frequency are 2407-2473 MHz. We select 2407MHz, 2442MHz, and 2473.5MHz TX frequency to transmit.

7.6. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground (Below 1GHz). The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground (Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. This EUT was tested in 3 orthogonal positions and the worst case position data was reported.

The bandwidth of test receiver is set at 9 kHz in below 30MHz. and set at 120 kHz in 30-1000MHz, and 1MHz in above 1000MHz.

The final measurement in band 9-90 kHz, 110-490 kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

RBW (120 kHz), VBW (300 kHz) for QP detector below 1GHz

Peak detector above 1GHz

RBW (1 MHz), VBW (3MHz) for Peak measurement

RBW (1 MHz), VBW (10Hz) for AV measurement

7.7.Data Sample

Frequency(MHz)	Reading (dB μ v)	Factor (dB/m)	Result (dB μ v/m)	Limit (dB μ v/m)	Margin (dB)	Remark
X.XX	30.21	-17.87	12.34	40.00	-27.66	QP

Frequency(MHz) = Emission frequency in MHz

Reading(dB μ v) = Uncorrected Analyzer/Receiver reading

Factor (dB/m) = Antenna factor + Cable Loss – Amplifier gain

Result(dB μ v/m) = Reading(dB μ v) + Factor(dB/m)

Limit (dB μ v/m) = Limit stated in standard

Margin (dB) = Result(dB μ v/m) - Limit (dB μ v/m)

QP = Quasi-peak Reading

Calculation Formula:

Margin(dB) = Result (dB μ V/m)–Limit(dB μ V/m)

Result(dB μ V/m)= Reading(dB μ V)+ Factor(dB/m)

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit.

7.8.The Field Strength of Radiation Emission Measurement Results

PASS.

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.

2. *: Denotes restricted band of operation.

3. The EUT is tested radiation emission at Low, Middle, High channel in three axes. The worst emissions are reported in all channels.

4. The test frequency is from 9KHz to 26.5GHz, The 9KHz-30MHz and 18-26.5GHz emissions are not reported, because the levels are too low against the limit.

Job No.: frank2017 #1973

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Digital Backup Camera System

Mode: TX2407MHz

Model: MS-508RSW

Manufacturer: Huizhou Mingshang Industrial Co.,Ltd

Polarization: Horizontal

Power Source: DC 24V

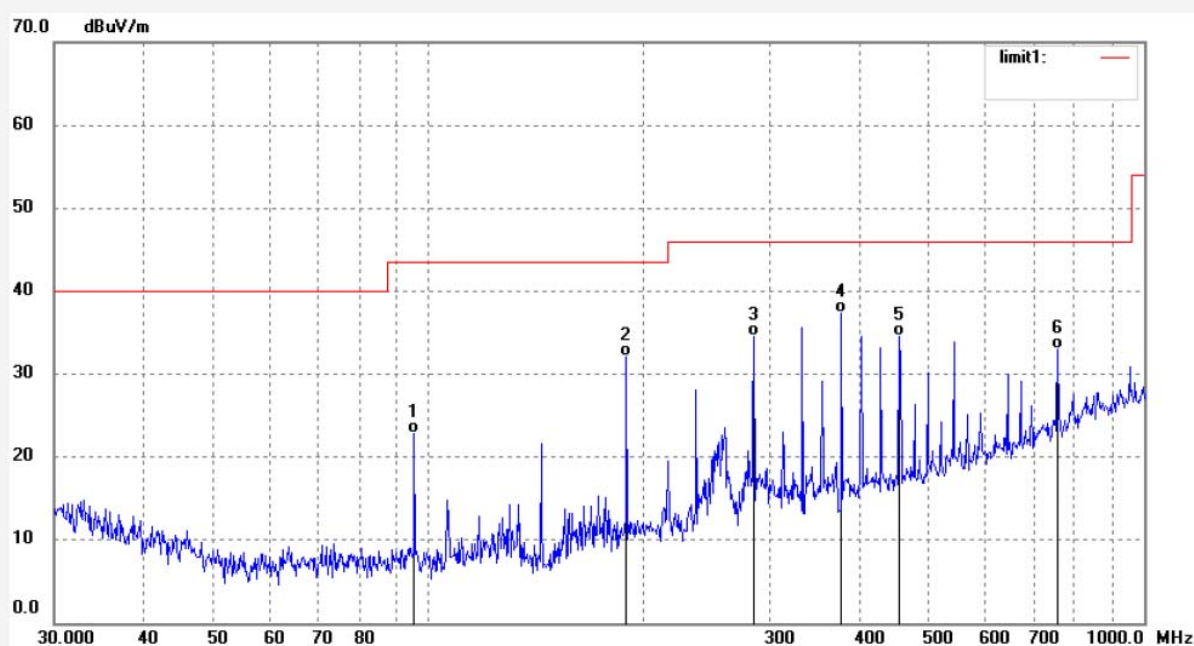
Date: 17/12/28/

Time: 16/10/41

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20172469

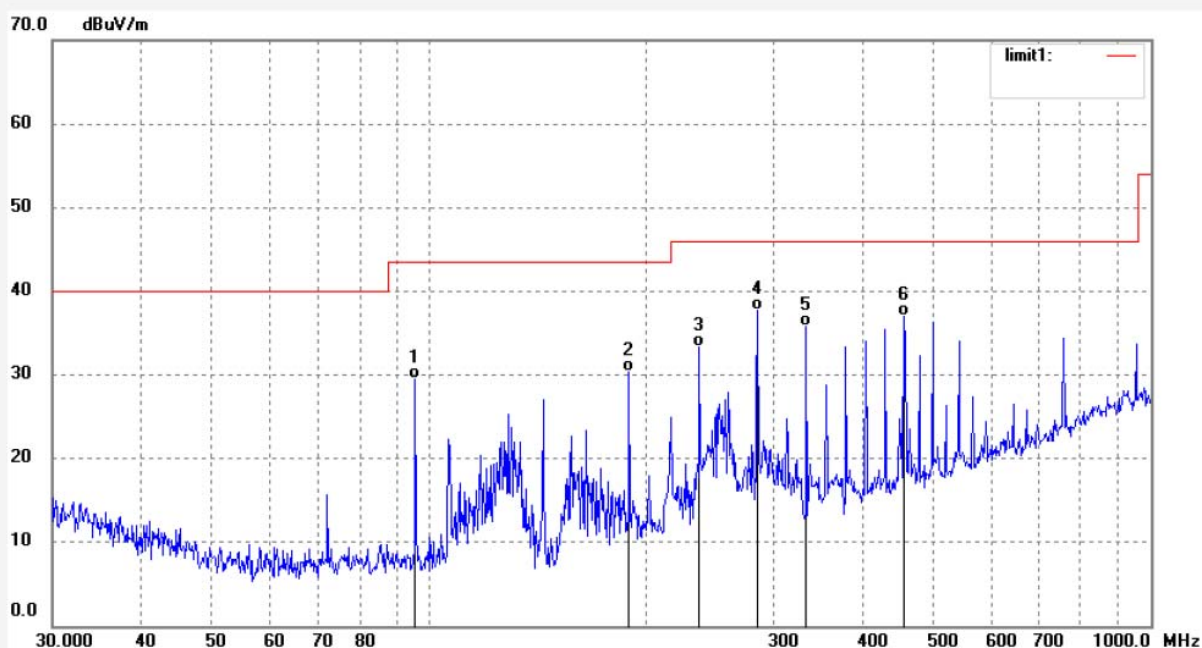


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	95.6483	50.26	-27.49	22.77	43.50	-20.73	QP	100	127	
2	189.1074	57.38	-25.19	32.19	43.50	-11.31	QP	100	110	
3	285.2610	56.38	-21.87	34.51	46.00	-11.49	QP	100	320	
4	377.8480	56.01	-18.66	37.35	46.00	-8.65	QP	100	201	
5	455.1888	51.73	-17.11	34.62	46.00	-11.38	QP	100	45	
6	757.6200	43.08	-10.12	32.96	46.00	-13.04	QP	100	123	

Job No.: frank2017 #1972
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Digital Backup Camera System
Mode: TX2407MHz
Model: MS-508RSW
Manufacturer: Huizhou Mingshang Industrial Co.,Ltd

Polarization: Vertical
Power Source: DC 24V
Date: 17/12/28/
Time: 16/10/14
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20172469



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	95.6483	56.92	-27.49	29.43	43.50	-14.07	QP	200	40	
2	189.1074	55.57	-25.19	30.38	43.50	-13.12	QP	200	131	
3	236.7924	57.11	-23.78	33.33	46.00	-12.67	QP	200	75	
4	285.2610	59.64	-21.87	37.77	46.00	-8.23	QP	200	145	
5	332.9534	55.69	-19.99	35.70	46.00	-10.30	QP	200	245	
6	455.1888	54.14	-17.11	37.03	46.00	-8.97	QP	200	31	

Job No.: frank2017 #1971

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Digital Backup Camera System

Mode: TX2442MHz

Model: MS-508RSW

Manufacturer: Huizhou Mingshang Industrial Co.,Ltd

Polarization: Vertical

Power Source: DC 24V

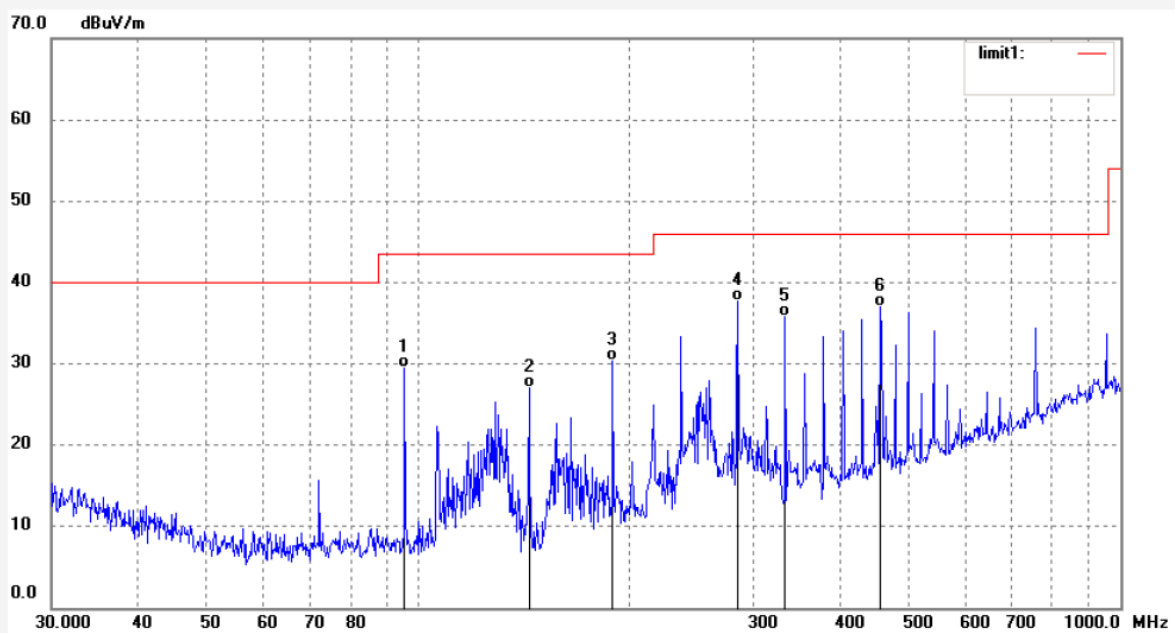
Date: 17/12/28/

Time: 16/10/14

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20172469



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	95.6483	56.92	-27.49	29.43	43.50	-14.07	QP	200	124	
2	143.7760	55.12	-28.03	27.09	43.50	-16.41	QP	200	54	
3	189.1074	55.57	-25.19	30.38	43.50	-13.12	QP	200	327	
4	285.2610	59.64	-21.87	37.77	46.00	-8.23	QP	200	127	
5	332.9534	55.69	-19.99	35.70	46.00	-10.30	QP	200	90	
6	455.1888	54.14	-17.11	37.03	46.00	-8.97	QP	200	135	

Job No.: frank2017 #1970

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Digital Backup Camera System

Mode: TX2442MHz

Model: MS-508RSW

Manufacturer: Huizhou Mingshang Industrial Co.,Ltd

Polarization: Horizontal

Power Source: DC 24V

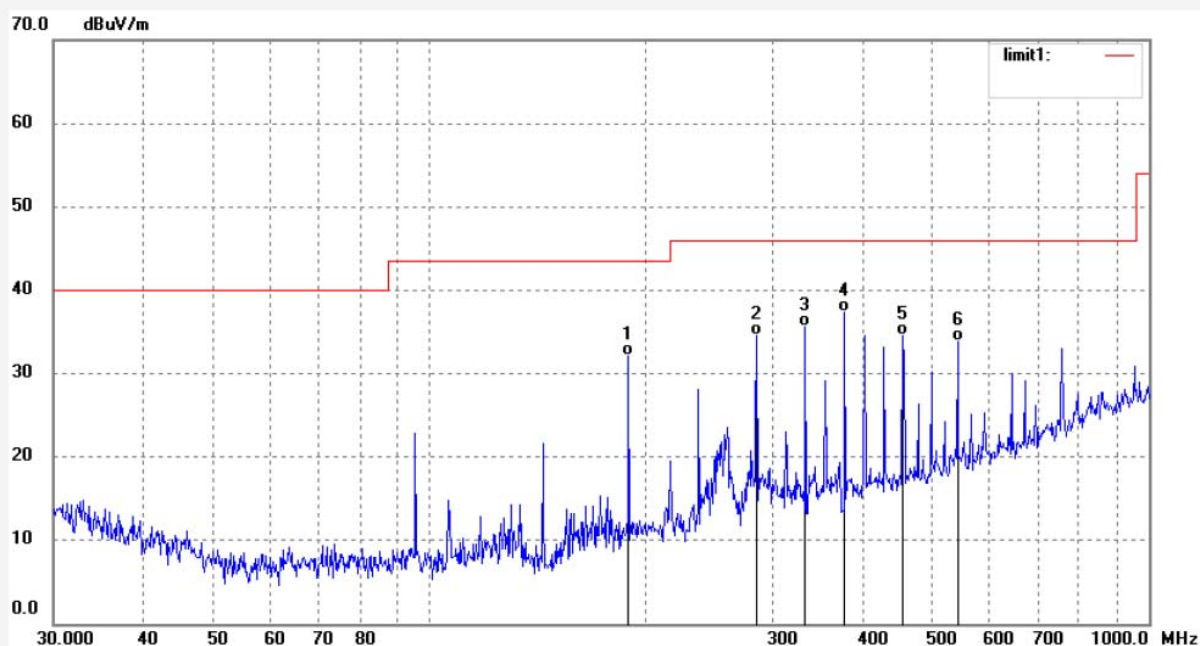
Date: 17/12/28/

Time: 16/10/41

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20172469



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	189.1074	57.38	-25.19	32.19	43.50	-11.31	QP	100	245	
2	285.2610	56.38	-21.87	34.51	46.00	-11.49	QP	100	97	
3	332.9534	55.60	-19.99	35.61	46.00	-10.39	QP	100	79	
4	377.8480	56.01	-18.66	37.35	46.00	-8.65	QP	100	65	
5	455.1888	51.73	-17.11	34.62	46.00	-11.38	QP	100	157	
6	542.6104	48.92	-15.03	33.89	46.00	-12.11	QP	100	321	

Job No.: frank2017 #1969

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Digital Backup Camera System

Mode: TX2473.5MHz

Model: MS-508RSW

Manufacturer: Huizhou Mingshang Industrial Co.,Ltd

Polarization: Horizontal

Power Source: DC 24V

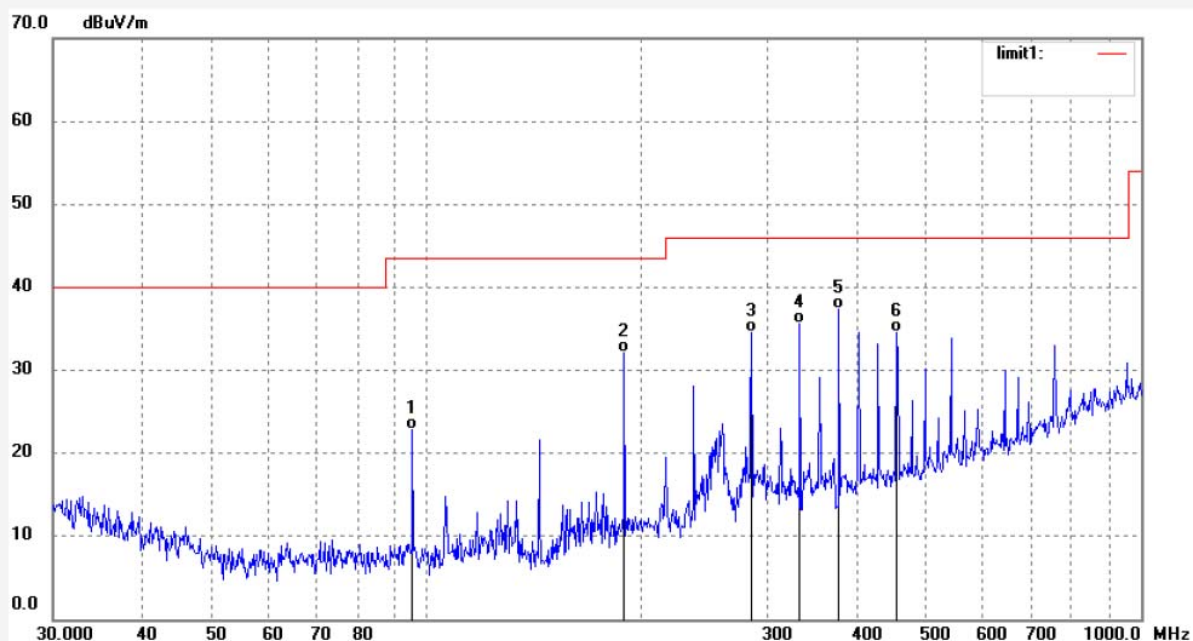
Date: 17/12/28/

Time: 16/10/41

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20172469



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	95.6483	50.26	-27.49	22.77	43.50	-20.73	QP	100	157	
2	189.1075	57.38	-25.19	32.19	43.50	-11.31	QP	100	34	
3	285.2610	56.38	-21.87	34.51	46.00	-11.49	QP	100	247	
4	332.9534	55.60	-19.99	35.61	46.00	-10.39	QP	100	97	
5	377.8480	56.01	-18.66	37.35	46.00	-8.65	QP	100	120	
6	455.1888	51.73	-17.11	34.62	46.00	-11.38	QP	100	121	

Job No.: frank2017 #1968

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Digital Backup Camera System

Mode: TX2473.5MHz

Model: MS-508RSW

Manufacturer: Huizhou Mingshang Industrial Co.,ltd

Polarization: Vertical

Power Source: DC 24V

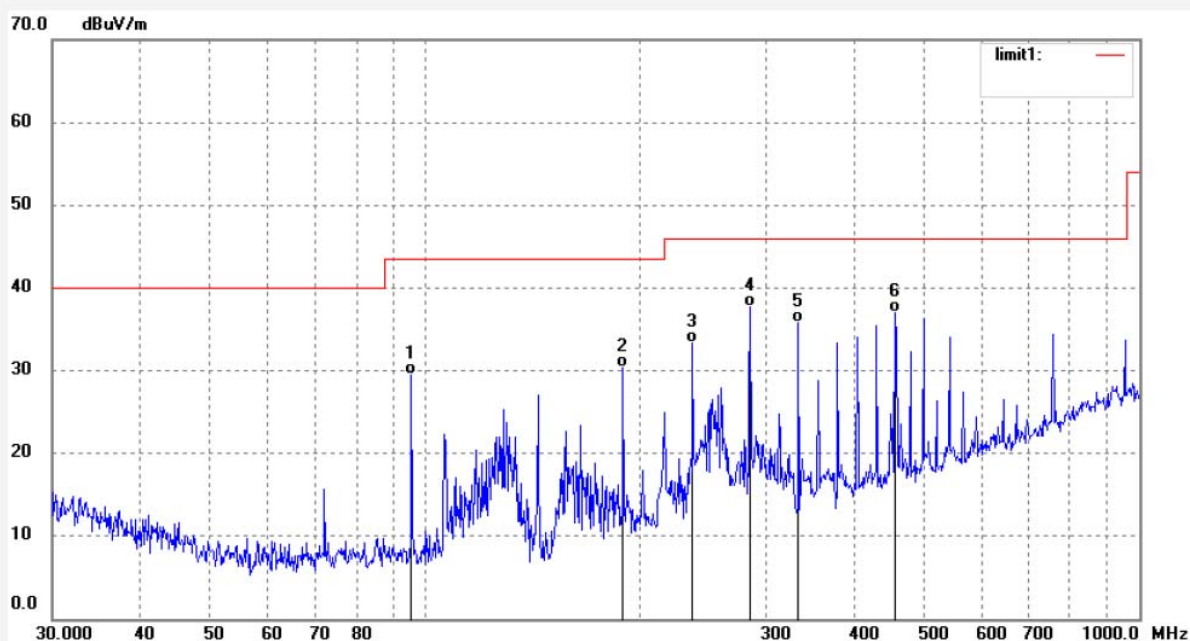
Date: 17/12/28/

Time: 16/10/14

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20172469



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	95.6483	56.92	-27.49	29.43	43.50	-14.07	QP	200	95	
2	189.1074	55.57	-25.19	30.38	43.50	-13.12	QP	200	148	
3	236.7925	57.11	-23.78	33.33	46.00	-12.67	QP	200	225	
4	285.2610	59.64	-21.87	37.77	46.00	-8.23	QP	200	78	
5	332.9534	55.69	-19.99	35.70	46.00	-10.30	QP	200	45	
6	455.1888	54.14	-17.11	37.03	46.00	-8.97	QP	200	321	

Job No.: frank2017 #1974

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Digital Backup Camera System

Mode: TX2407MHz

Model: MS-508RSW

Manufacturer: Huizhou Mingshang Industrial Co.,ltd

Polarization: Horizontal

Power Source: DC 24V

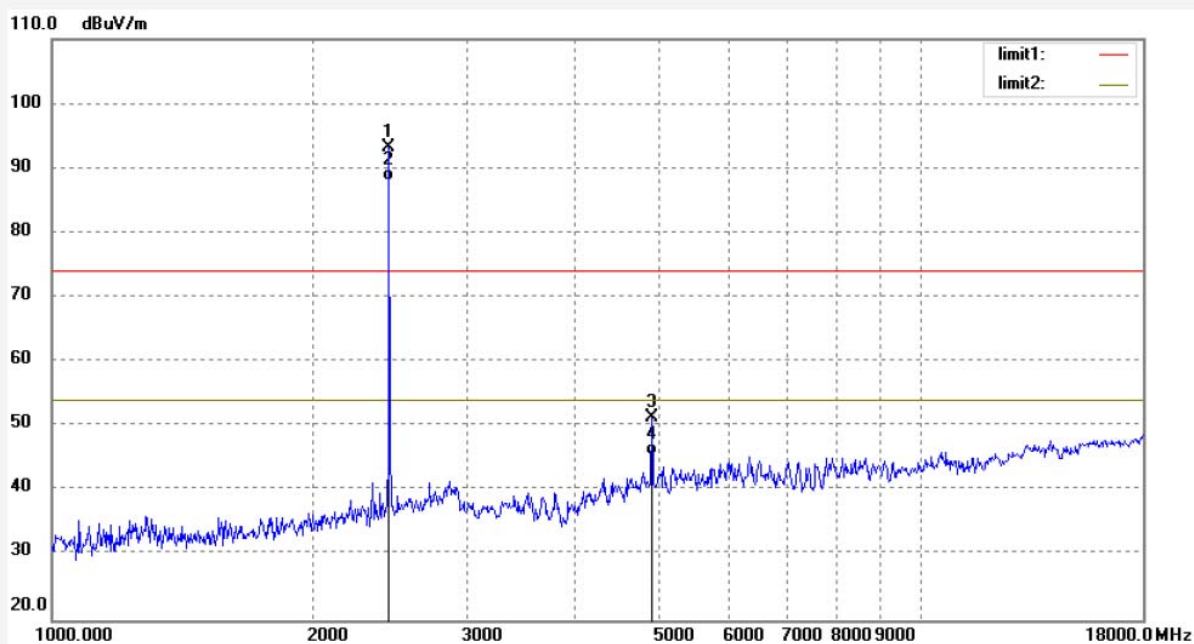
Date: 17/12/28/

Time: 16/14/57

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20172469



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2407.000	97.39	-4.07	93.32	114.00	-20.68	peak	200	97	
2	2407.000	92.12	-4.07	88.05	94.00	-5.95	AVG	200	348	
3	4814.000	47.89	3.43	51.32	74.00	-22.68	peak	200	123	
4	4814.000	42.18	3.43	45.61	54.00	-8.39	AVG	250	154	

Job No.: frank2017 #1975

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Digital Backup Camera System

Mode: TX2407MHz

Model: MS-508RSW

Manufacturer: Huizhou Mingshang Industrial Co.,Ltd

Polarization: Vertical

Power Source: DC 24V

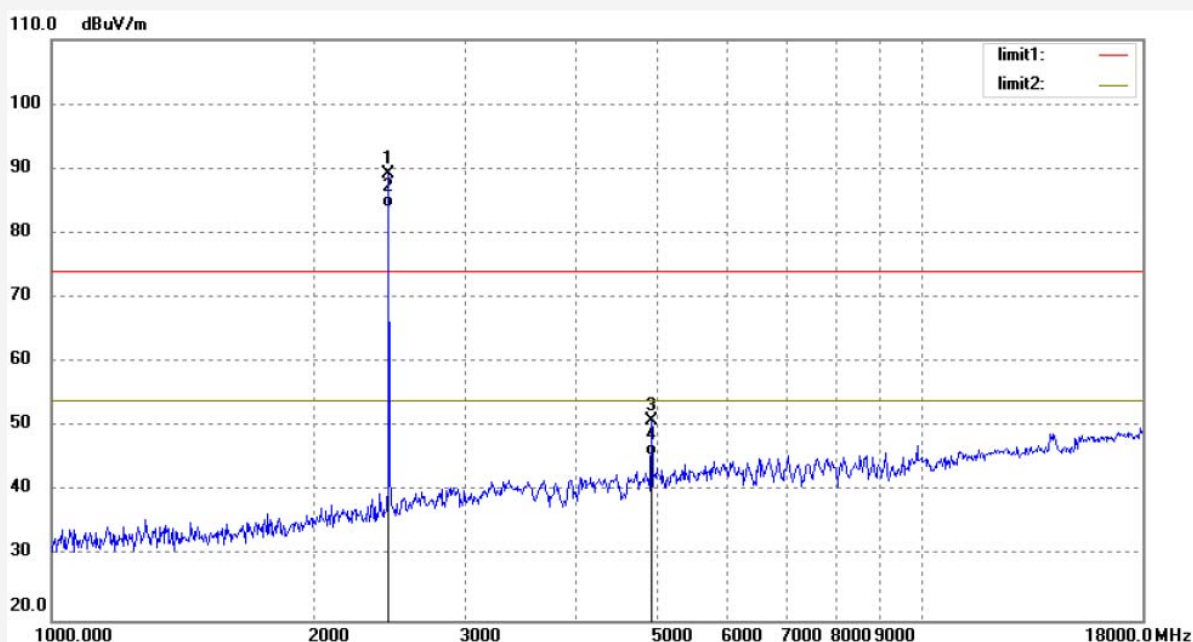
Date: 17/12/28/

Time: 16/15/51

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20172469



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2407.000	93.31	-4.07	89.24	114.00	-24.76	peak	150	19	
2	2407.000	88.15	-4.07	84.08	94.00	-9.92	AVG	150	128	
3	4814.000	47.58	3.43	51.01	74.00	-22.99	peak	150	132	
4	4814.000	42.12	3.43	45.55	74.00	-28.45	AVG	150	22	



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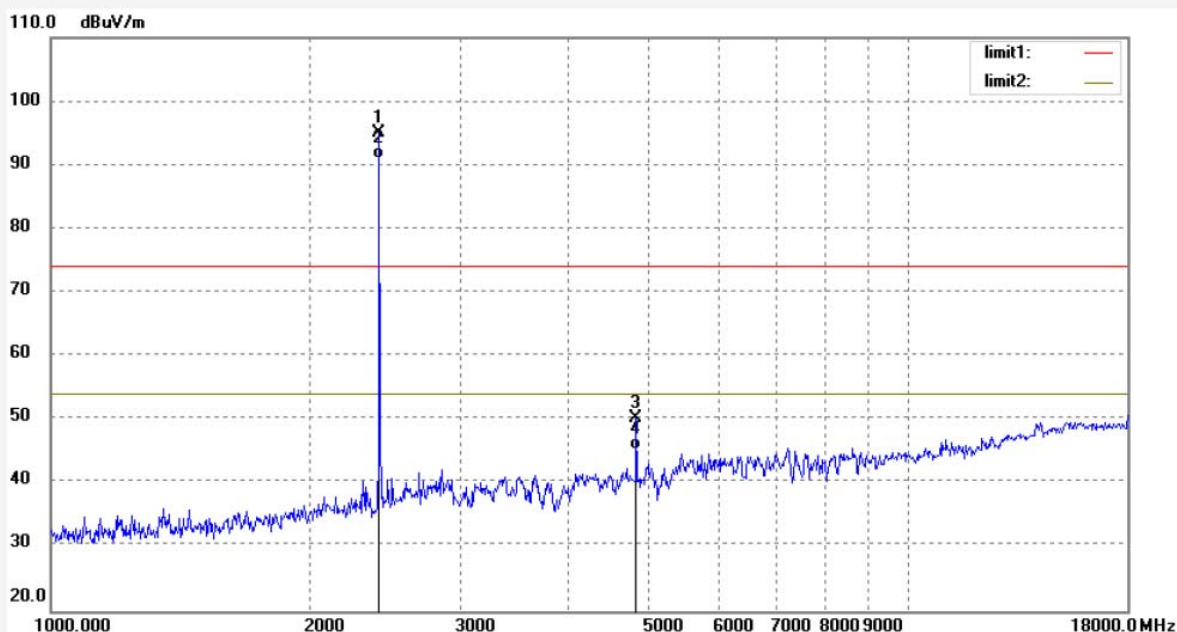
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: frank2017 #1976
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Digital Backup Camera System
Mode: TX2442MHz
Model: MS-508RSW
Manufacturer: Huizhou Mingshang Industrial Co.,Ltd

Polarization: Vertical
Power Source: DC 24V
Date: 17/12/28/
Time: 16/16/57
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20172469



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2442.000	99.25	-4.20	95.05	114.00	-18.95	peak	150	19	
2	2442.000	95.14	-4.20	90.94	94.00	-3.06	QP	150	124	
3	4884.000	47.27	3.07	50.34	74.00	-23.66	peak	150	123	
4	4884.000	42.15	3.07	45.22	74.00	-28.78	QP	150	32	

Job No.: frank2017 #1977

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Digital Backup Camera System

Mode: TX2442MHz

Model: MS-508RSW

Manufacturer: Huizhou Mingshang Industrial Co.,Ltd

Polarization: Horizontal

Power Source: DC 24V

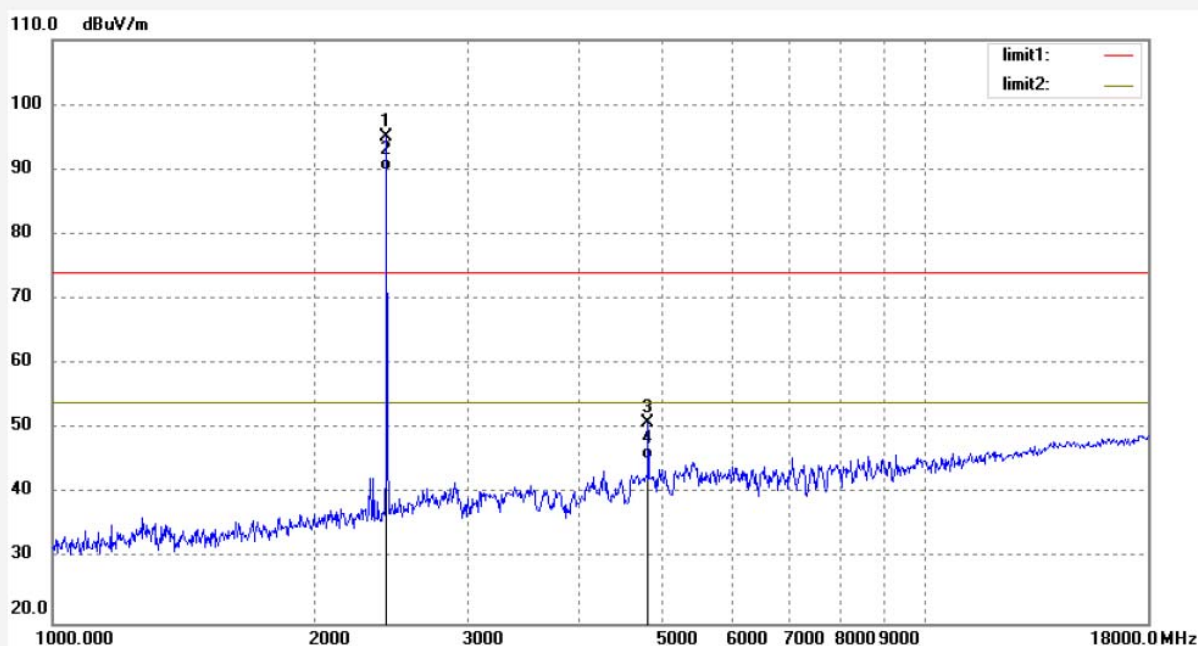
Date: 17/12/28/

Time: 16/17/44

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20172469



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2442.000	99.15	-4.20	94.95	114.00	-19.55	peak	250	213	
2	2442.000	94.15	-4.20	89.95	94.00	-4.05	AVG	250	110	
3	4884.000	47.78	3.07	50.85	74.00	-23.15	peak	250	124	
4	4884.000	42.15	3.07	45.22	54.00	-8.78	AVG	250	131	

Job No.: frank2017 #1978

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Digital Backup Camera System

Mode: TX2473.5MHz

Model: MS-508RSW

Manufacturer: Huizhou Mingshang Industrial Co.,Ltd

Polarization: Horizontal

Power Source: DC 24V

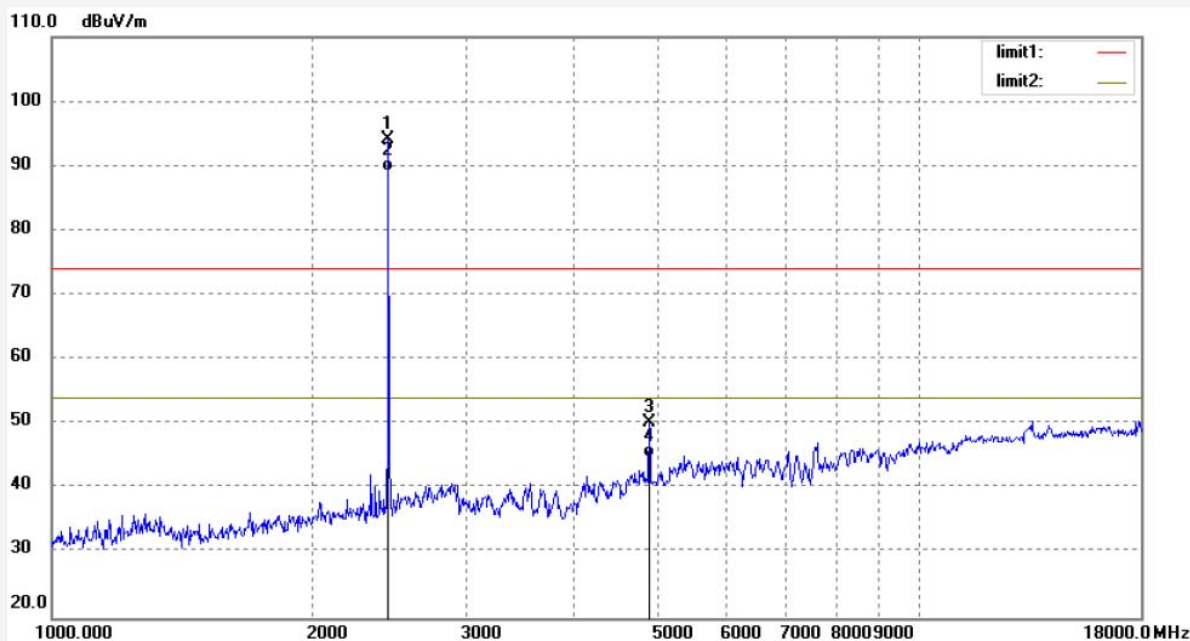
Date: 17/12/28/

Time: 16/18/47

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20172469



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2473.500	98.20	-4.07	94.13	114.00	-19.87	peak	250	23	
2	2473.500	93.21	-4.07	89.14	94.00	-4.86	AVG	250	321	
3	4947.000	46.94	3.36	50.30	74.00	-23.70	peak	250	27	
4	4947.000	41.48	3.36	44.84	54.00	-9.16	AVG	250	222	

Job No.: frank2017 #1979

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Digital Backup Camera System

Mode: TX2473.5MHz

Model: MS-508RSW

Manufacturer: Huizhou Mingshang Industrial Co.,Ltd

Polarization: Vertical

Power Source: DC 24V

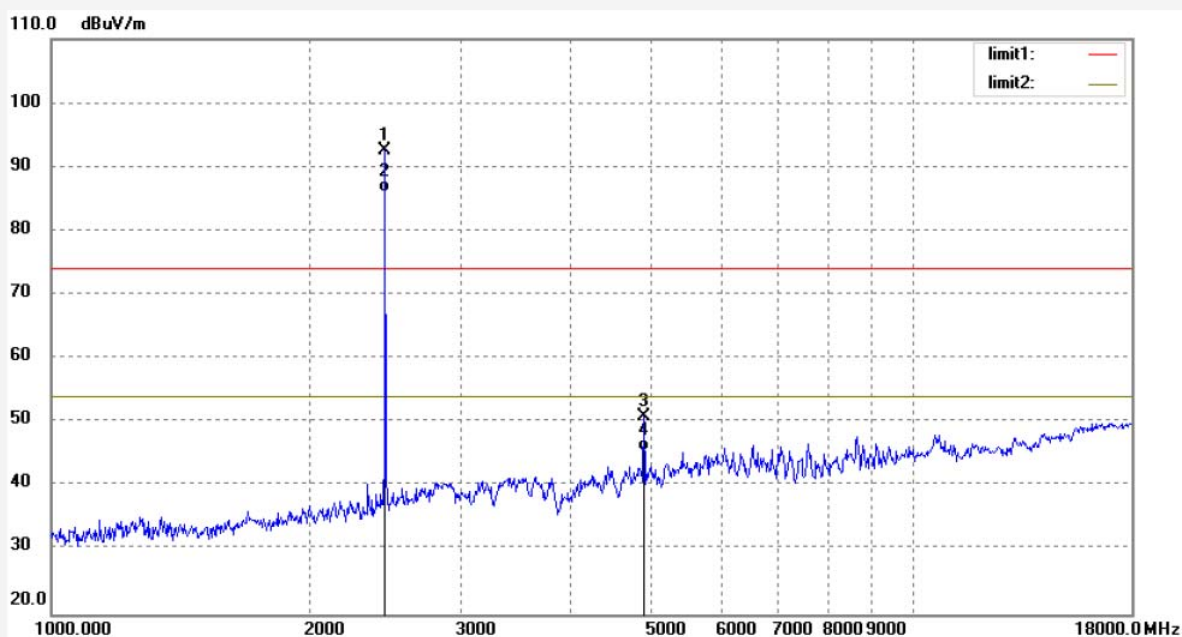
Date: 17/12/28/

Time: 16/19/55

Engineer Signature: Frank

Distance: 3m

Note: Report NO.:ATE20172469



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2473.500	96.56	-4.07	92.49	114.00	-21.51	peak	150	123	
2	2473.500	90.12	-4.07	86.05	94.00	-7.95	AVG	150	41	
3	4947.000	47.54	3.36	50.90	74.00	-23.10	peak	150	124	
4	4947.000	42.12	3.36	45.48	54.00	-8.52	AVG	150	231	

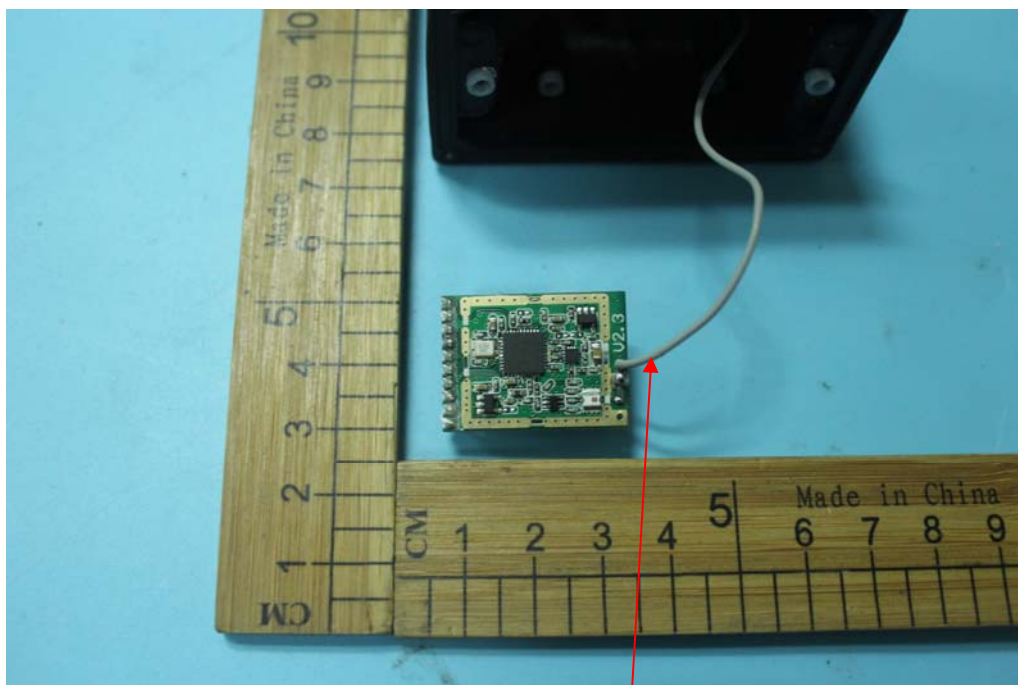
8. ANTENNA REQUIREMENT

8.1.The Requirement

According to Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

8.2.Antenna Construction

Device is equipped with unique antenna, which isn't displaced by other antenna. The Antenna gain of EUT is 5.0dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna

----- THE END OF TEST REPORT -----