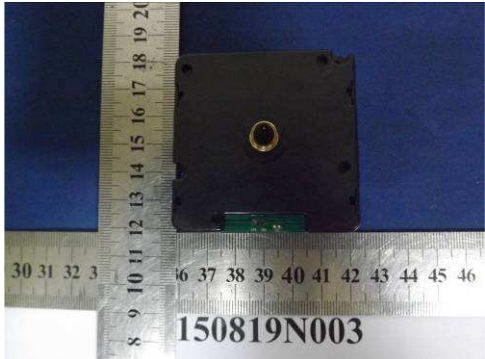


TEST REPORT



Applicant:	Shengbang Electronics Technology Co., Ltd Fujian
Address:	Shihu Industrial Park, Hanjiang Town, Shishi City, Fujian, China

Manufacturer or Supplier	Shengbang Electronics Technology Co., Ltd Fujian	
Address	Shihu Industrial Park, Hanjiang Town, Shishi City, Fujian, China	
Product	radio controlled movement	
Brand Name	N/A	
Model	HD-1688	
Additional Model & Model Difference	N/A	
Date of tests	Aug. 20, 2015 ~ Aug. 25, 2015	

The submitted sample of the above equipment has been tested for according to following European Directive - Radio Equipment and Telecommunications Terminal Equipment directive 1999/5/EC article 3.2 and the tests have been carried out according to the requirements of the following standards:

- EN 300 330-1 V1.7.1 (2010-02)
- EN 300 330-2 V1.5.1 (2010-02)

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Breeze Jiang Project Engineer / EMC Department	Approved by Chris Chen Assistant Manager / EMC Department
	
Date: Aug. 26, 2015	

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification



TABLE OF CONTENTS

RELEASE CONTROL RECORD	3
1. SUMMARY OF TEST RESULTS.....	4
1.1. TEST INSTRUMENTS	5
1.1 MEASUREMENT UNCERTAINTY	6
1.2 MAXIMUM MEASUREMENT UNCERTAINTY	6
2. GENERAL INFORMATION	7
2.1 GENERAL DESCRIPTION OF EUT	7
2.2 DESCRIPTION OF TEST MODES	8
2.3 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	8
2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS	9
2.5 DESCRIPTION OF SUPPORT UNITS	9
3. TEST PROCEDURES AND RESULTS.....	10
RECEIVER PARAMETERS.....	10
3.1 RECEIVER SPURIOUS RADIATION.....	10
3.1.1 LIMITS OF RECEIVER SPURIOUS RADIATION (<30MHz)	10
3.1.2 LIMITS OF RECEIVER SPURIOUS RADIATION (>30MHz)	10
3.1.3 TEST PROCEDURES	10
3.1.4 DEVIATION FROM TEST STANDARD.....	10
3.1.5 TEST SETUP.....	10
3.1.6 TEST RESULTS	11
4. PHOTOGRAPHS OF THE TEST CONFIGURATION.....	17
5. APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	18



**BUREAU
VERITAS**

Test Report No.: RE150819N003

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RE150819N003	Original release	Aug. 26, 2015



1. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: ETSI EN 300 330-2 V1.5.1			
CLAUSE IN ETSI EN 300 330-1	TEST PARAMETER	TEST APPLICABILITY	PASS/FAIL
	TRANSMITTER PARAMETERS		
7.2	Transmitter carrier output levels	N/A	N/A
7.3	Permitted range of operating frequency	N/A	N/A
7.4	Permitted frequency range of the modulation bandwidth	N/A	N/A
7.5	Spurious domain emission limits	N/A	N/A
	RECEIVER PARAMETERS		
8.2	Blocking or desensitization	Not Applicable	N/A
8.3	Receiver spurious radiation	Applicable	PASS



1.1. TEST INSTRUMENTS

For 9KHz-30MHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	100962	Mar. 05,15	Mar. 04,16
Loop antenna (9kHz~30MHz)	Daze	ZN30900A	0708	Dec. 22,14	Dec. 21,15
Pre-Amplifier (9kHz~1GHz)	Burgeon	BPA-530	100210	Apr.. 22,15	Apr.. 21,16
Test Software	ADT	ADT_Radiated_V8.7.x	N/A	N/A	N/A

- NOTE:** 1. The test was performed in 10m Chamber.
 2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

For 30MHz-1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Apr 27,15	Apr 26,16
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Apr 23,15	Apr 22,16
Bilog Antenna	Teseq	CBL 6111D	30643	Jul. 16, 15	Jul. 15, 16
Horn Antenna	ETS-Lindgren	3117	00062558	May 30,14	May 29,16
Amplifier (9kHz-1GHz)	SONOMA	310D	186955	Mar. 04,15	Mar. 03, 16
Pre-Amplifier (0.5~18GHz)	SCHWARZBECK	BBV 9718	9718-266	Mar 26,14	Mar 25,16
GPS Generator+ Antenna	TOJOIN	GNSS-5000A	E1-010119	Aug. 08, 15	Aug. 07, 16
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	April. 19,14	April. 18,16
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
 2. The test was performed in 966 Chamber



1.1 MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Radio frequency	$\pm 1.06 \times 10^{-8}$
RF power (Radiated)	$\pm 3.294\text{dB}$
Temperature	$\pm 0.23 \text{ }^\circ\text{C}$
Humidity	$\pm 0.3 \%$

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

1.2 MAXIMUM MEASUREMENT UNCERTAINTY

For the test methods, according to ETSI EN 300 330-1 standard, the measurement uncertainty figures shall be calculated in accordance with TR 100 028 [5] and shall correspond to an expansion factor (coverage factor) k = 1.96 or k = 2 (which provide confidence levels of respectively 95 % and 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Maximum measurement uncertainty

PARAMETER	UNCERTAINTY
RF frequency	$\pm 1 \times 10^{-5}$
RF power (Radiated)	$\pm 6.0 \text{ dB}$
Temperature	$\pm 1 \text{ }^\circ\text{C}$
Humidity	$\pm 5.0 \%$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	radio controlled movement
MODEL NO.	HD-1688
POWER SUPPLY	DC 1.5V from battery
MODULATION TYPE	DCF
OPERATING FREQUENCY	77.5KHz
NUMBER OF CHANNEL	1
H-FIELD STRENGTH	N/A
ANTENNA TYPE	PCB antenna with 0dBi gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A
PRODUCT CLASSES	category 3

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: 150819N003) for detailed product photo.



2.2 DESCRIPTION OF TEST MODES

The EUT only have 1 channel.

CHANNEL	FREQUENCY (KHz)	MODE
1	77.5	Receiving

2.3 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO								DESCRIPTION
	TCOL	PROF	PFRMB	SE<1G	SE≥1G	RSE<1G	RSE≥1G	RB	
1	-	-	-	-	-	√	-	-	DC 1.5V from battery

Where **TCOL:** Transmitter Carrier Output Levels **SE≥1G:** Transmitter Spurious Emissions above 1GHz
PROF: Permitted range of operating frequency **SE<1G:** Transmitter Spurious Emissions below 1GHz
PFRMB: Permitted Frequency Range of the Modulation Bandwidth
RB: Receiver Blocking
RSE≥1G: Receiver Spurious Emissions above 1GHz. **RSE<1G:** Receiver Spurious Emissions below 1GHz

RECEIVER SPURIOUS EMISSIONS TEST (BELOW 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	OPERATING FREQUENCY (KHz)	MODULATION TYPE
-	1	77.5	DCF

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
TCOL	N/A	N/A	N/A
PROF	N/A	N/A	N/A
PFRMB	N/A	N/A	N/A
SE<1G	N/A	N/A	N/A
RSE<1G	25deg. C, 55%RH	RX: DC 1.5V From Battery	Bob Chen
RB	N/A	N/A	N/A



2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standard:

EN 300 330-2 V1.5.1 (2010-02)

EN 300 330-1 V1.7.1 (2010-02)

All test items have been performed and recorded as per the above standard.

2.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together without other necessary accessories or support units.



3. TEST PROCEDURES AND RESULTS

RECEIVER PARAMETERS

3.1 RECEIVER SPURIOUS RADIATION

3.1.1 LIMITS OF RECEIVER SPURIOUS RADIATION (<30MHz)

FREQUENCY RANGE	9 kHz ≤ f < 10MHz	10MHz ≤ f < 30MHz
Limit	5.5 dBμA/m descending 3 dB/oct	-25 dBμA/m
	57 dBμV/m descending 3 dB/oct	26.5 dBμV/m

3.1.2 LIMITS OF RECEIVER SPURIOUS RADIATION (>30MHz)

FREQUENCY RANGE	FREQUENCIES BELOW 1GHz
Limit	2nW or -57dBm

3.1.3 TEST PROCEDURES

Please refer to Subclause 8.3.2 of EN 300 330-1 V1.7.1 (2010-02)

3.1.4 DEVIATION FROM TEST STANDARD

No deviation.

3.1.5 TEST SETUP

For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration).

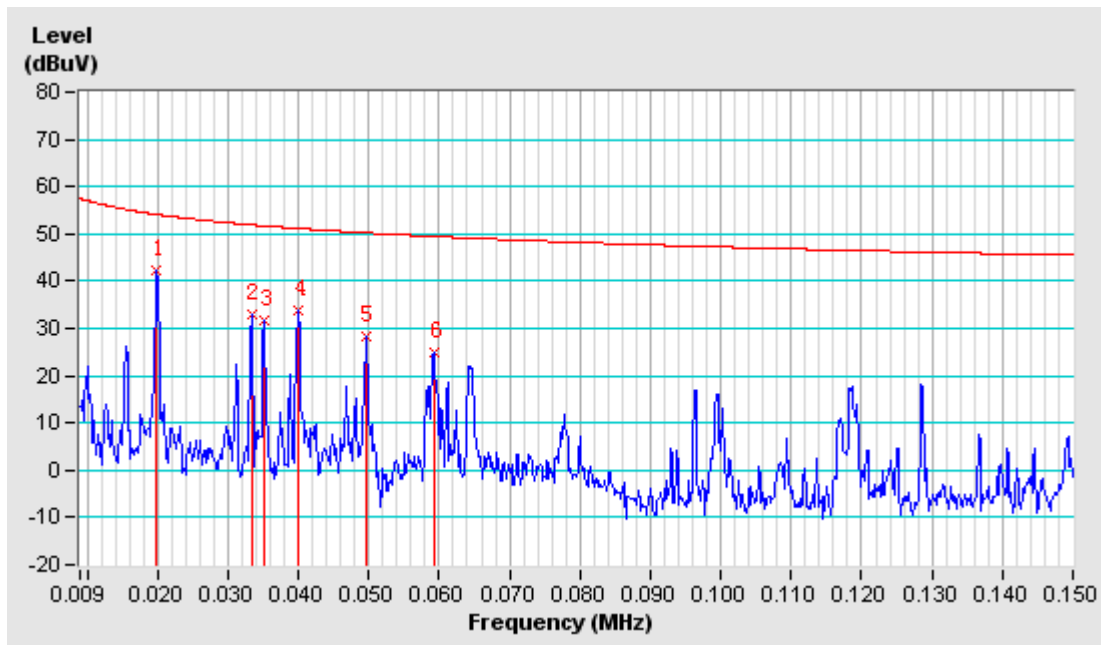


3.1.6 TEST RESULTS

SPURIOUS EMISSION FREQUENCY RANGE	9KHz ~ 150KHz	OPERATING STATE	Receiving
--	---------------	------------------------	-----------

SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBμV)	Limit (dBμV)	Margin (dBμV)
0.0199	H	42.41	54.11	-11.70
0.0333	H	33.06	51.92	-18.86
0.0351	H	31.73	51.70	-19.97
0.0400	H	33.90	51.14	-17.24
0.0495	H	28.35	50.23	-21.88
0.0592	H	24.86	49.46	-24.60

NOTE: The emission behavior belongs to narrowband spurious emission.

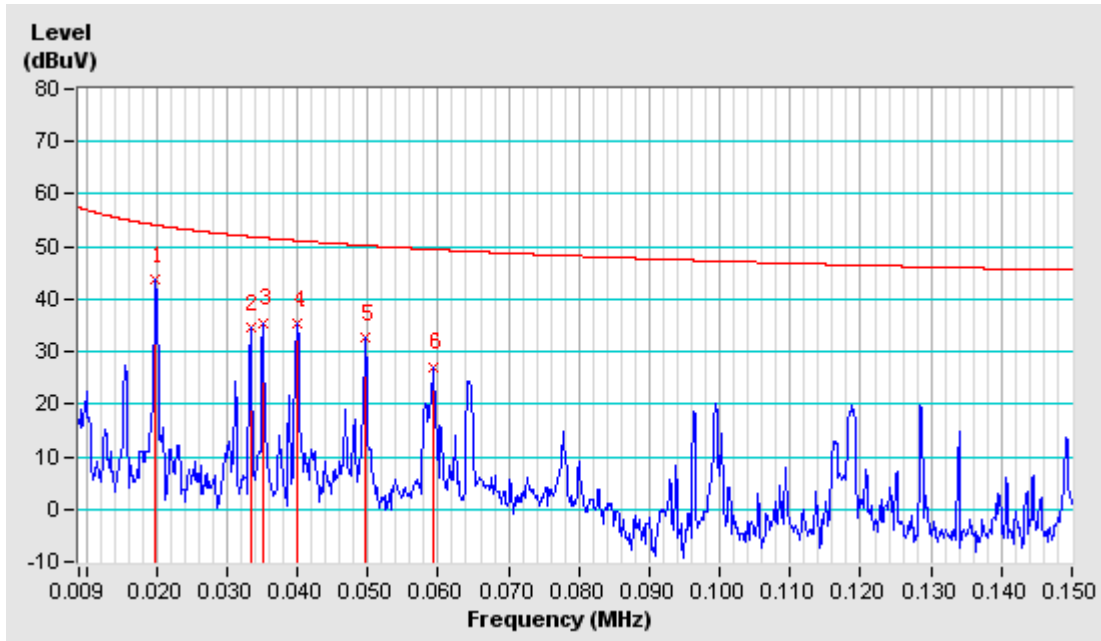




SPURIOUS EMISSION FREQUENCY RANGE	9KHz ~ 150KHz	OPERATING STATE	Receiving
--	---------------	------------------------	-----------

SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBμV)	Limit (dBμV)	Margin (dBμV)
0.0199	V	43.71	54.11	-10.40
0.0333	V	34.52	51.92	-17.40
0.0351	V	35.54	51.70	-16.16
0.0400	V	35.45	51.14	-15.69
0.0497	V	32.83	50.21	-17.38
0.0594	V	27.17	49.45	-22.28

NOTE: The emission behavior belongs to narrowband spurious emission.

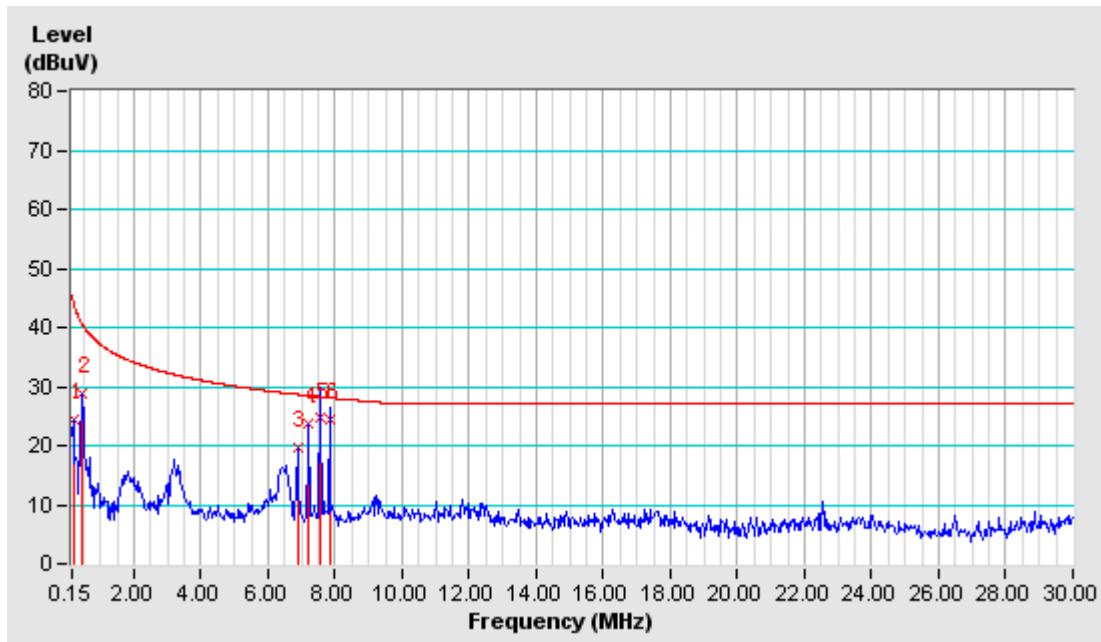




SPURIOUS EMISSION FREQUENCY RANGE	150KHz ~ 30MHz	OPERATING STATE	Receiving
--	----------------	------------------------	-----------

SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBμV)	Limit (dBμV)	Margin (dBμV)
0.1873	H	24.49	44.52	-20.03
0.4485	H	28.89	40.68	-11.79
6.8662	H	19.63	28.66	-9.03
7.2021	H	23.85	28.45	-4.60
7.5379	H	24.60	28.25	-3.65
7.8364	H	24.43	28.07	-3.64

NOTE: The emission behavior belongs to narrowband spurious emission.

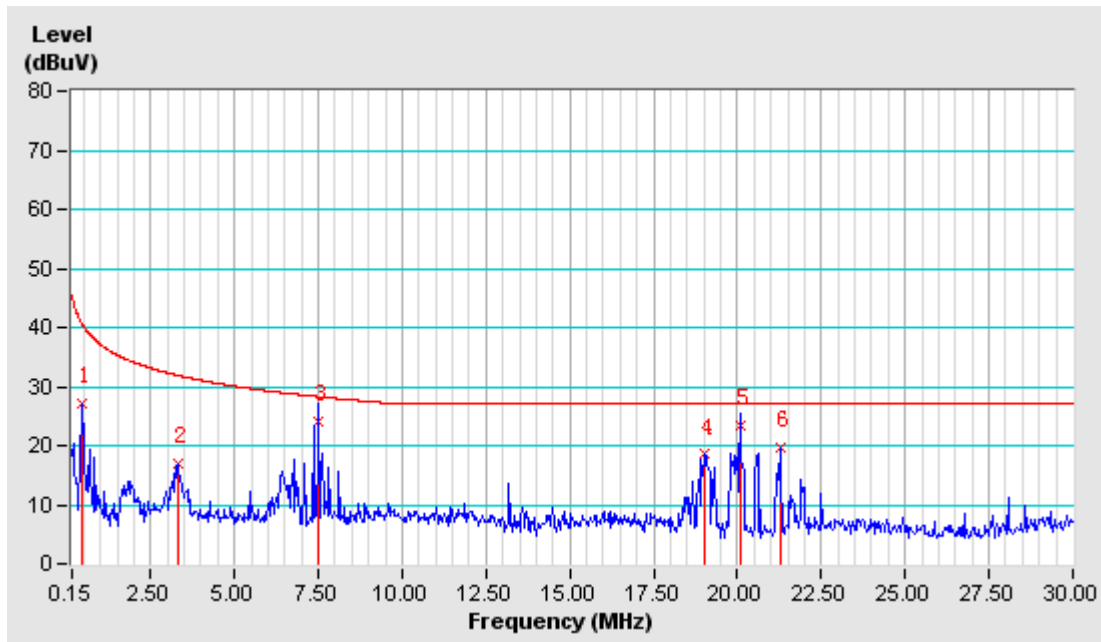




SPURIOUS EMISSION FREQUENCY RANGE	150KHz ~ 30MHz	OPERATING STATE	Receiving
--	----------------	------------------------	-----------

SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBμV)	Limit (dBμV)	Margin (dBμV)
0.4485	V	27.28	40.68	-13.40
3.2843	V	16.93	31.90	-14.97
7.5006	V	24.06	28.27	-4.21
18.9928	V	18.48	27.00	-8.52
20.0749	V	23.45	27.00	-3.55
21.2689	V	19.78	27.00	-7.22

NOTE: The emission behavior belongs to narrowband spurious emission.

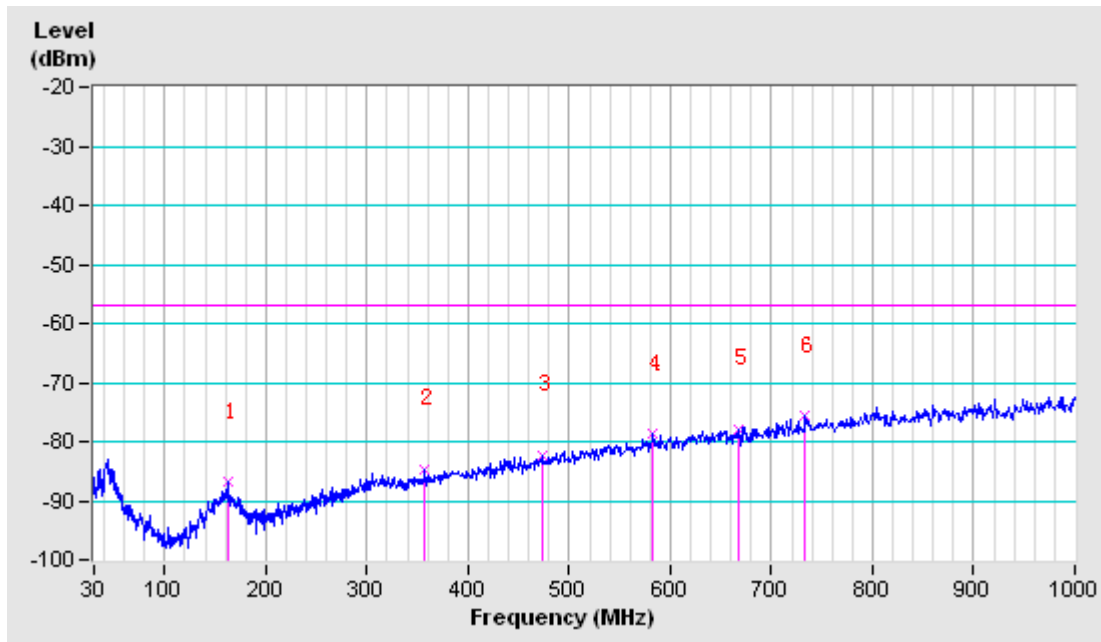




SPURIOUS EMISSION FREQUENCY RANGE	30MHz ~ 1GHz	OPERATING STATE	Receiving
--	--------------	------------------------	-----------

SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
161.87	H	-86.93	-57.00	-29.93
356.81	H	-84.80	-57.00	-27.80
473.48	H	-82.25	-57.00	-25.25
583.04	H	-78.80	-57.00	-21.80
667.25	H	-77.81	-57.00	-20.81
733.19	H	-75.74	-57.00	-18.74

NOTE: The emission behavior belongs to narrowband spurious emission.

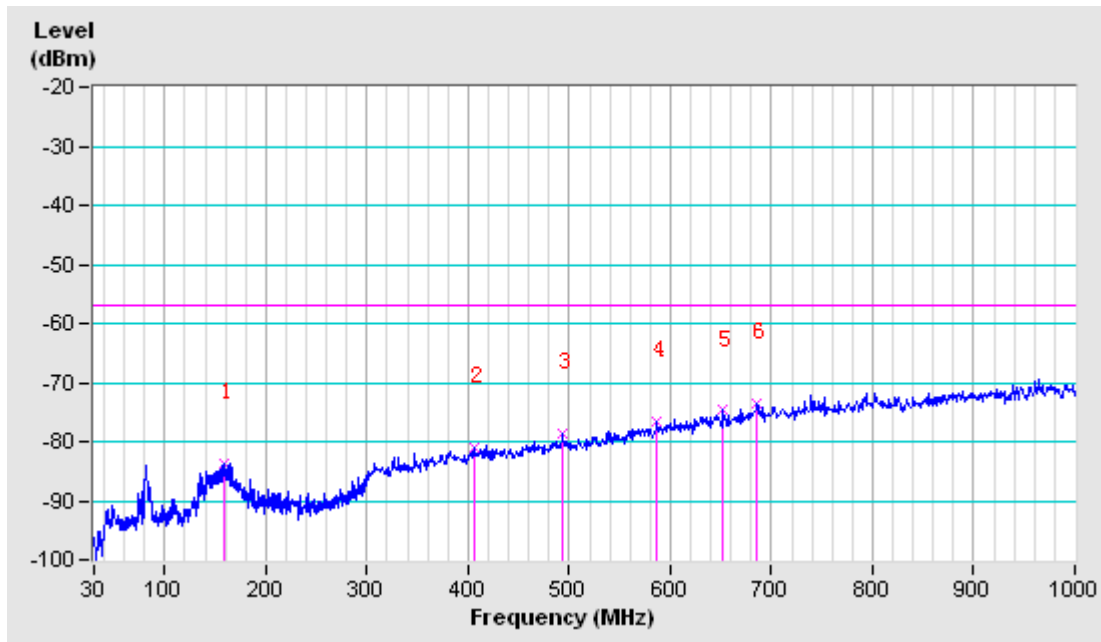




SPURIOUS EMISSION FREQUENCY RANGE	30MHz ~ 1GHz	OPERATING STATE	Receiving
--	--------------	------------------------	-----------

SPURIOUS EMISSION LEVEL				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
158.35	V	-83.58	-57.00	-26.58
405.51	V	-80.91	-57.00	-23.91
493.77	V	-78.65	-57.00	-21.65
587.10	V	-76.51	-57.00	-19.51
652.03	V	-74.67	-57.00	-17.67
685.51	V	-73.61	-57.00	-16.61

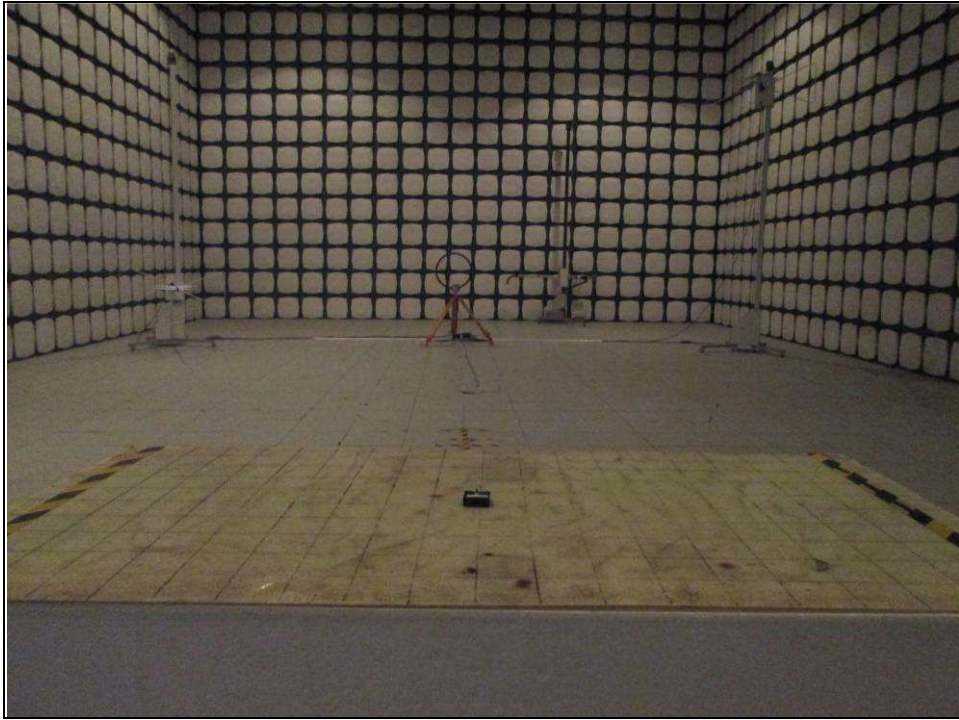
NOTE: The emission behavior belongs to narrowband spurious emission.



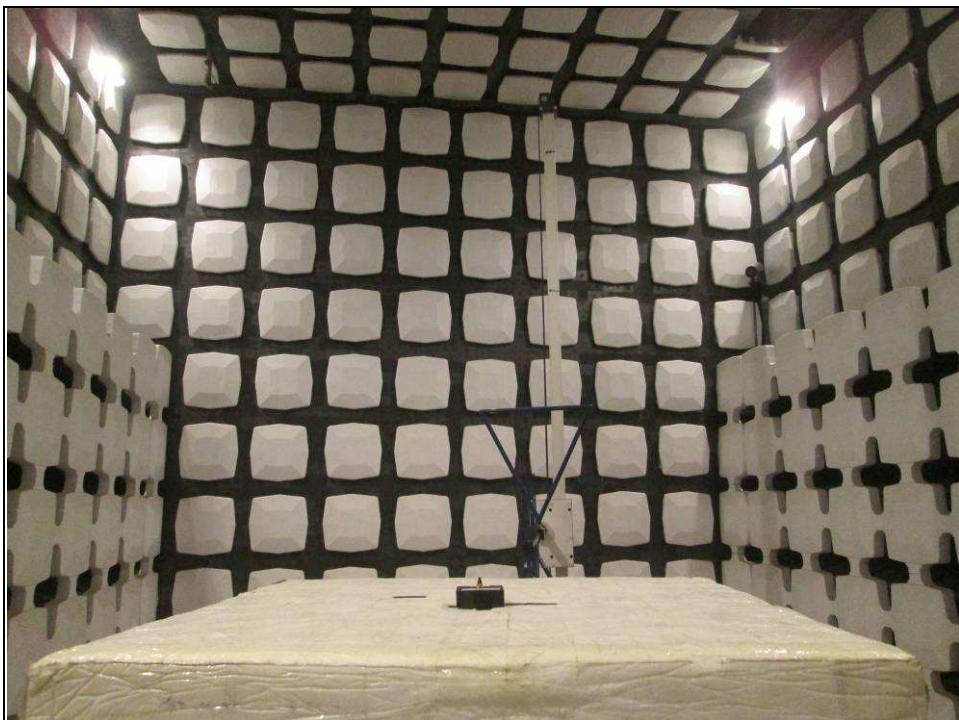


4. PHOTOGRAPHS OF THE TEST CONFIGURATION

RX SPURIOUS EMISSION (9KHz-30MHz)



RX SPURIOUS EMISSION (30MHz-1GHz)





**BUREAU
VERITAS**

Test Report No.: RE150819N003

5. APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications were made to the EUT by the lab during the test.

--- END ---