



RF TEST REPORT

Report No.: SET2015-06776

Product Name: SPY TRACKER

FCC ID: 2AB4XAMP10524T

Model No. : 10524

Applicant: Atomic Monkey Products Ltd.

Applicant Address: Room 811, 8/F., Corporation Park, No.11 On Lai Street, Shatin, N.
T., HongKong

Issued by: CCIC-SET

Lab Location: Electronic Testing Building, Shahe Road, Xili, Nanshan District,
Shenzhen, 518055, P. R. China

Tel: 86 755 26627338 **Fax:** 86 755 26627238

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Test Report

Product Name : SPY TRACKER

Trade Name : N/A

Brand Name : N/A

Applicant : Atomic Monkey Products Ltd.

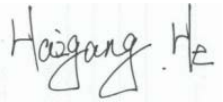
Applicant Address : Room 811, 8/F., Corporation Park, No.11 On Lai Street, Shek
hatin, N.T., HongKong


Manufacturer : Atomic Monkey Products Ltd.

Manufacturer Address : Room 811, 8/F., Corporation Park, No.11 On Lai Street, S
hatin, N.T., HongKong

Test Standards : 47 CFR Part 15 Subpart C(Section 15.249): Radio
Frequency Devices
ANSI C63.10:2009
ANSI C63.4:2009

Test Result : PASS

Tested by : 
2015.05.05
Haigang He, Test Engineer

Reviewed by : 
2015.05.05
Zhu Qi, Senior Engineer

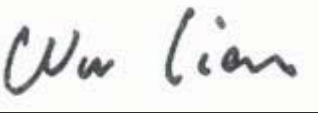
Approved by : 
2015.05.05
Wu Li'an, Manager



TABLE OF CONTENTS

1.	GENERAL INFORMATION	4
1.1	EUT Description	4
1.2	Support Equipment	5
1.3	Test Standards and Results	5
1.4	Facilities and Accreditations	5
1.4.1	Facilities	6
1.4.2	Test Environment Conditions	6
2.	47 CFR PART 15C REQUIREMENTS	7
2.1	Antenna requirement	7
2.1.1	Applicable Standard	7
2.1.2	Antenna Information	7
2.1.3	Result: comply	7
2.2	20 dB Bandwidth Testing	8
2.2.1	Limit	8
2.2.2	Test Description	8
2.2.3	Test Result	8
2.3	Conducted Emission	11
2.3.1	Requirement	11
2.3.2	Test Description	11
2.3.3	Test Result	12
2.4	Field Strength of Fundamental Emissions and Radiated Spurious Emission	13
2.4.1	Limits	13
2.4.2	Test Description	14
2.4.3	Test Procedure	16
2.4.4	Test Result	16

Change History		
Issue	Date	Reason for change
1.0	2015.05.05	First edition



1. GENERAL INFORMATION

1.1 EUT Description

EUT Type : SPY TRACKER
Hardware Version..... : N/A
Software Version : N/A
Frequency Range..... : 2412MHz~2472MHz (at interval of 4MHz)
Number of channel..... : 16
Modulation Type : GFSK
Antenna Type : PIFA
Antenna Gain : 1.5dBi
Power supply..... : DC 3V(battery)

Note 1: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.



1.2 Support Equipment

N/A

1.3 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15 Subpart C 2014	Radio Frequency Devices
2	ANSI C63.10 2009	American National Standard for Testing Unlicensed Wireless Devices
3	ANSI C63.4 2009	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

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

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207	Conduction Emission	N/A
§15.215(c)	20 dB Occupied Bandwidth	Compliant
§15.249(a)	Field strength of the fundamental signal	Compliant
§15.249(a)/(d) §15.209	Radiated Spurious Emission	Compliant

NOTE:

“N/A” denotes test is not applicable in this test report.

1.4 Description of Test Mode

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2412	9	2444
2	2416	10	2448
3	2420	11	2452
4	2424	12	2456
5	2428	13	2460
6	2432	14	2464



7	2436	15	2468
8	2440	16	2472

Frequency	Test channel
2412~2472MHz	1channel , 8 channel, 16channel

1.5 Facilities and Accreditations

1.5.1 Facilities

CNAS-Lab Code: L1659

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. CCIC is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659. A 12.8*6.8*6.4 (m) fully anechoic chamber was used for the radiated spurious emissions test.

FCC-Registration No.: 406086

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 406086, valid time is until October 28, 2017.

IC-Registration No.: 11185A-1

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on July. 15, 2013, valid time is until July. 15, 2016.

1.5.2 Test Environment Conditions

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

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



2. 47 CFR PART 15C REQUIREMENTS

2.1 Antenna requirement

2.1.1 Applicable Standard

According to FCC 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

2.1.2 Antenna Information

Antenna Category: Integral antenna

Antenna General Information:

No.	EUT Model	Ant. Cat.	Gain(dBi)
1	10524	PIFA antenna	1.5

2.1.3 Result: comply

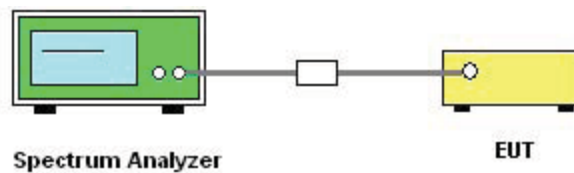
The EUT has a permanently antenna which complies with the Part 15.203. Please refer to the EUT internal photos.

2.2 20 dB Bandwidth Testing

2.2.1 Limit

Intentional radiators must be designed to ensure that the 20dB bandwidth of the emission in the specific band.

2.2.2 Test Description



- (1) The transmitter output(antenna port) was connected to the spectrum analyzer in peak hold mode.
- (2) The resolution bandwidth of 100 kHz and the video bandwidth of 100 kHz were used.
- (3) Measured the spectrum width with power higher than 6dB below carrier.

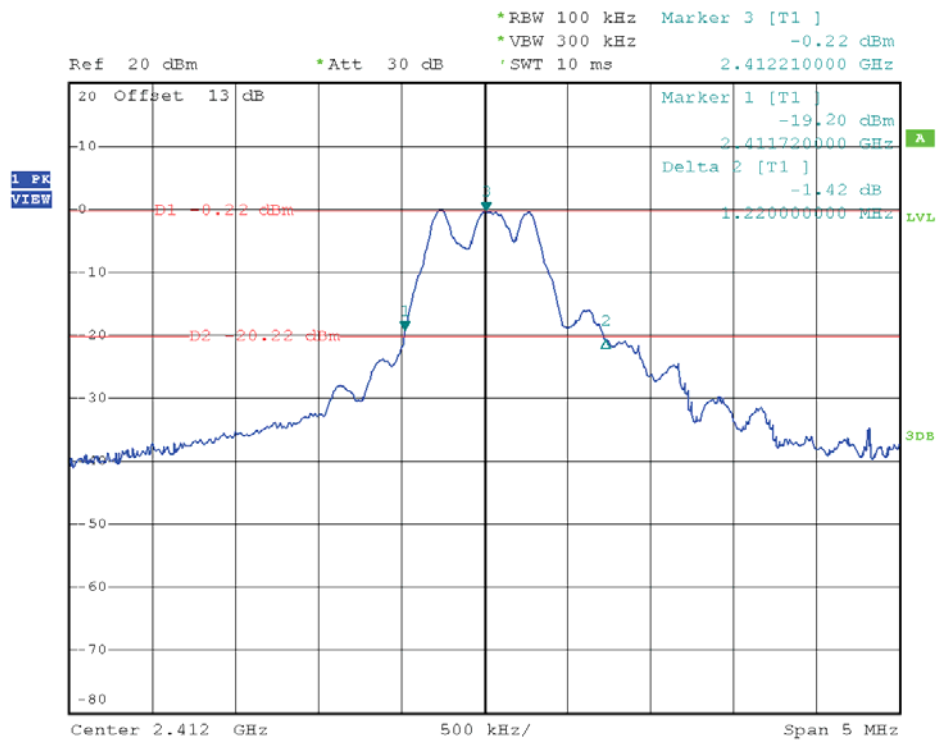
Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 20Db Bandwidth
RBW	100 kHz
VBW	300 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

Equipments List:

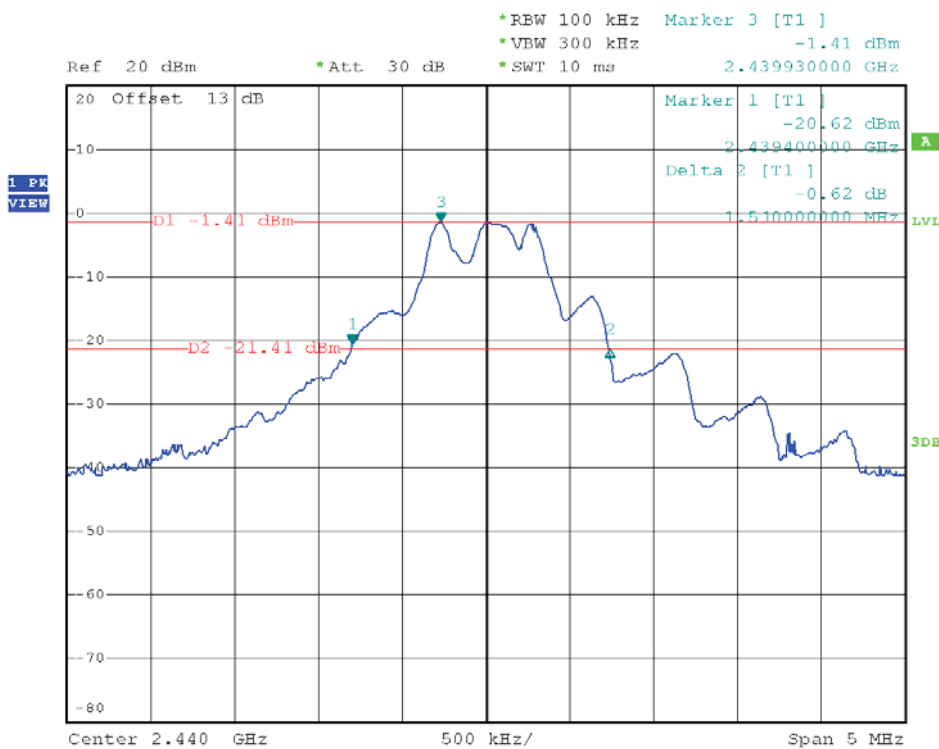
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal.Due Date
Spectrum Analyzer	R&S	FSP40	1164.4391.40	2014.06.11	2015.06.10

2.2.3 Test Result

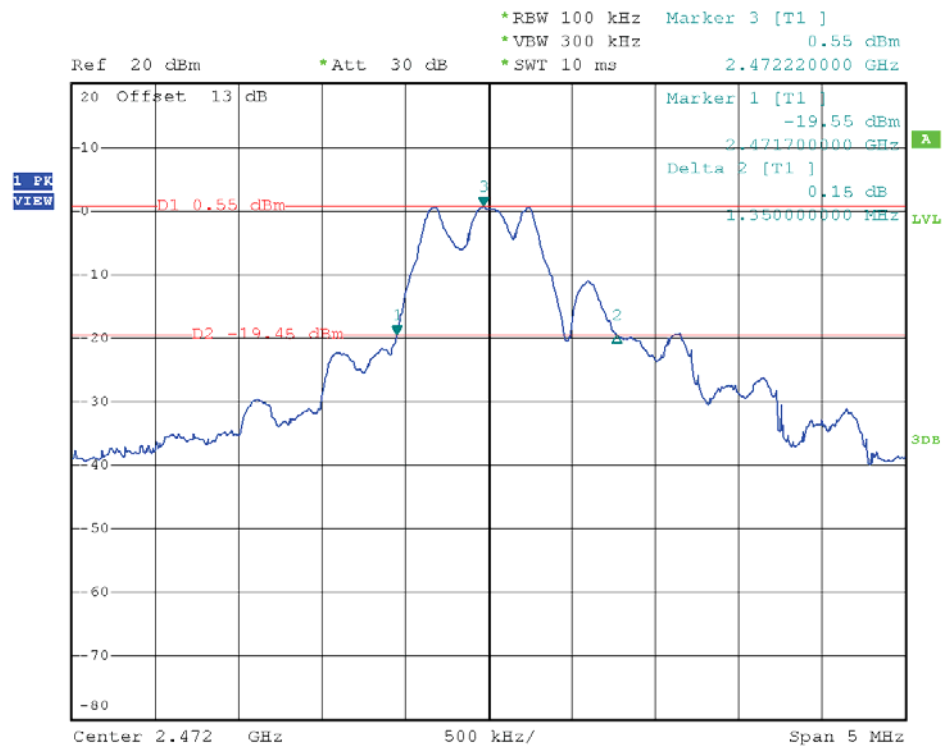
Frequency	20dB Bandwidth (MHz)
2412MHz	1.22
2440MHz	1.51
2472MHz	1.35



2412MHz 20 dB Bandwidth



2440MHz 20 dB Bandwidth



2472MHz 20 dB Bandwidth

2.3 Conducted Emission

2.3.1 Requirement

According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

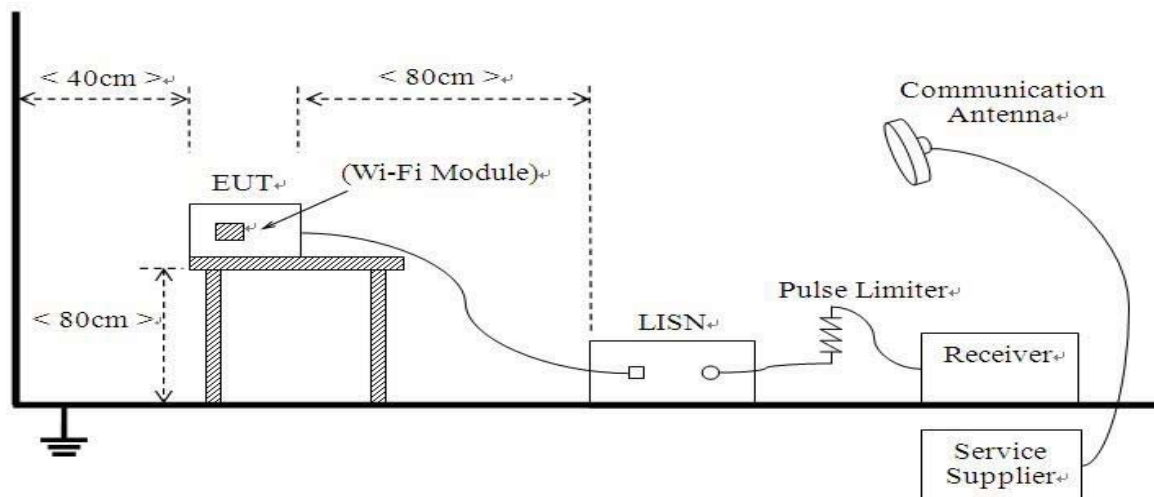
Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

NOTE:

- The lower limit shall apply at the band edges.
- The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

2.3.2 Test Description

A. Test Setup:



The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10:2009

The EUT is powered by Battery. The factors of the site are calibrated to correct the reading. During the measurement.

**B. Equipments List:**

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due Date
Test Receiver	ROHDE&SCHWARZ	ESCS30	A0304260	2014.06.11	2015.06.10
LISN	ROHDE&SCHWARZ	ESH2-Z5	A0304221	2014.06.11	2015.06.10

2.3.3 Test Result

Not apply for products powered by DC systems.

2.4 Field Strength of Fundamental Emissions and Radiated Spurious Emission

2.4.1 Limits

The field strength measured at 3 meters shall not exceed the limits in the following table:

Fundamental Frequencies(MHz)	Field Strength(millivolts/m)	
	Fundamental	Harmonics
902~928	50	0.5
2400~2483.5	50	0.5
5725~5875	50	0.5

Note: The limits shown in the above table are based on measurements using an average detector, except for the fundamental emission in the frequency band 902~928MHz, which is based on measurements using a CISPR quasi-peak detector.

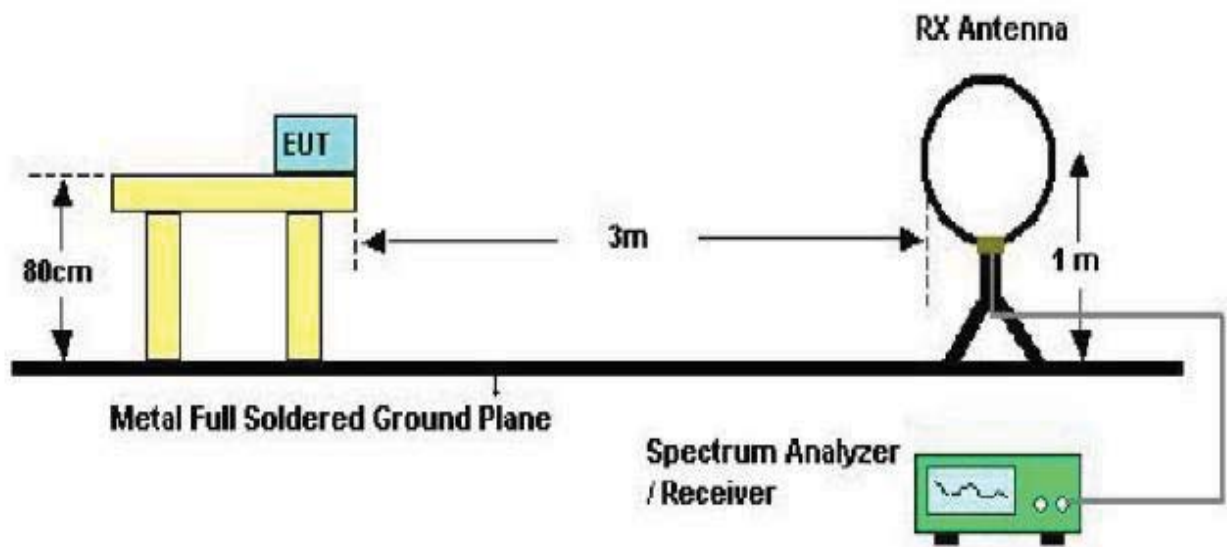
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB, below the level of the fundamental or to the general field strength limits listed in 15.209 as below, whichever is less stringent.

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Field Strength ($\text{dB}\mu\text{V/m}$)	Measurement Distance (m)
0.009 - 0.490	$2400/\text{F}(\text{kHz})$	$20\log(2400/\text{F}(\text{KHz}))+80$	300
0.490 - 1.705	$24000/\text{F}(\text{kHz})$	$20\log(24000/\text{F}(\text{KHz}))+40$	30
1.705 - 30.0	30	$20\log(30)+40$	30
30 - 88	100	40.0	3
88 - 216	150	43.5	3
216 - 960	200	46.0	3
Above 960	500	54.0	3

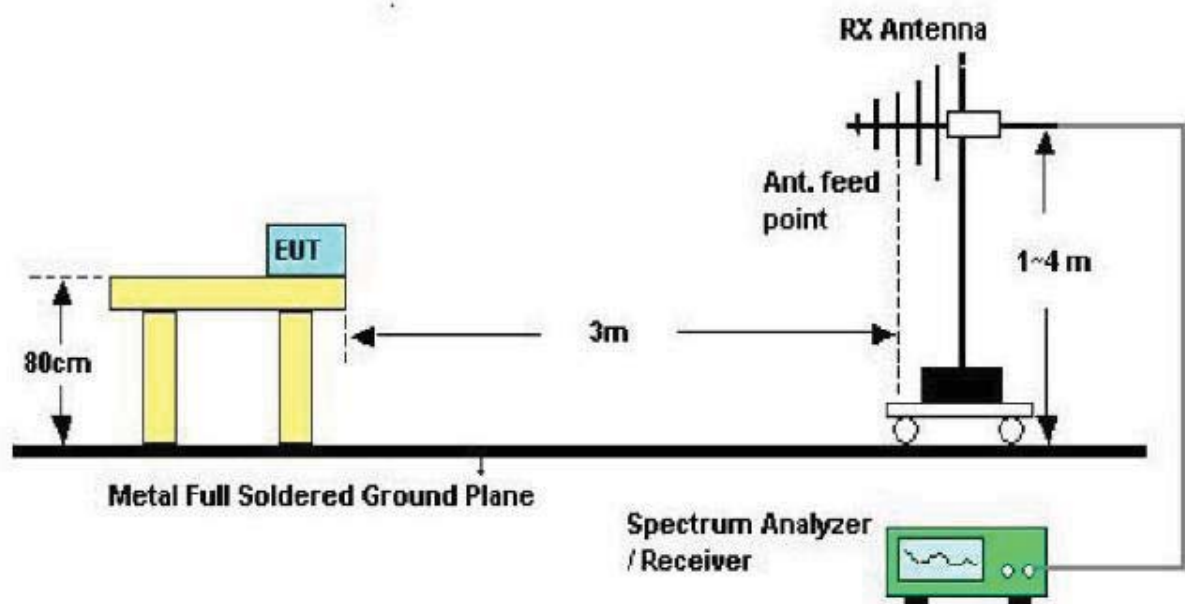
Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level($\text{dB}\mu\text{V/m}$)= $20\log$ Emission level ($\mu\text{V/m}$).

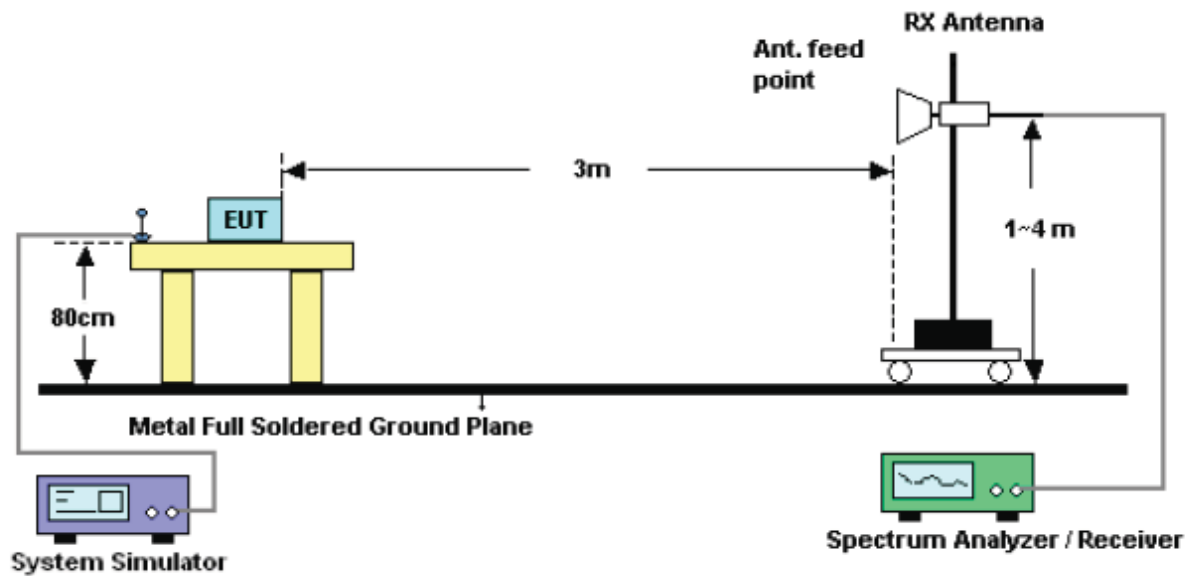
2.4.2 Test Description



Radiated emissions from 9kHz to 30MHz



Radiated emissions from 30MHz to 1GHz



Radiated emissions above 1GHz

Equipments List:

Description	Manufacturer	Model	Serial No.	Cal.Date	Cal.Due Date
Receiver	R&S	ESIB26	A0304218	2014.06.08	2015.06.07
Full-Anechoic Chamber	Albatross	12.8m*6.8m*6.4m	A0412372	2014.06.08	2015.06.07
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2014.06.10	2015.06.09
Loop Antenna	Schwarzbeck	HFH2-Z2	0837.1866.54	2014.06.11	2015.06.10
Test Antenna - Horn	R&S	HF906	100150	2014.06.09	2015.06.08
Test Antenna – Horn (18-25GHz)	ETS	UG-596A/U	A0902607	2014.06.05	2015.06.04
Ampilier 1G~18GHz	R&S	MITEQ AFS42-00101 800	25-S-42	2014.06.05	2015.06.04
Ampilier 18G~40GHz	R&S	JS42-180026 00-28-5A	12111.0980.00	2014.06.05	2015.06.04
amplifier 20M~3GHz	R&S	PAP-0203H	22018	2014.06.10	2015.06.09

2.4.3 Test Procedure

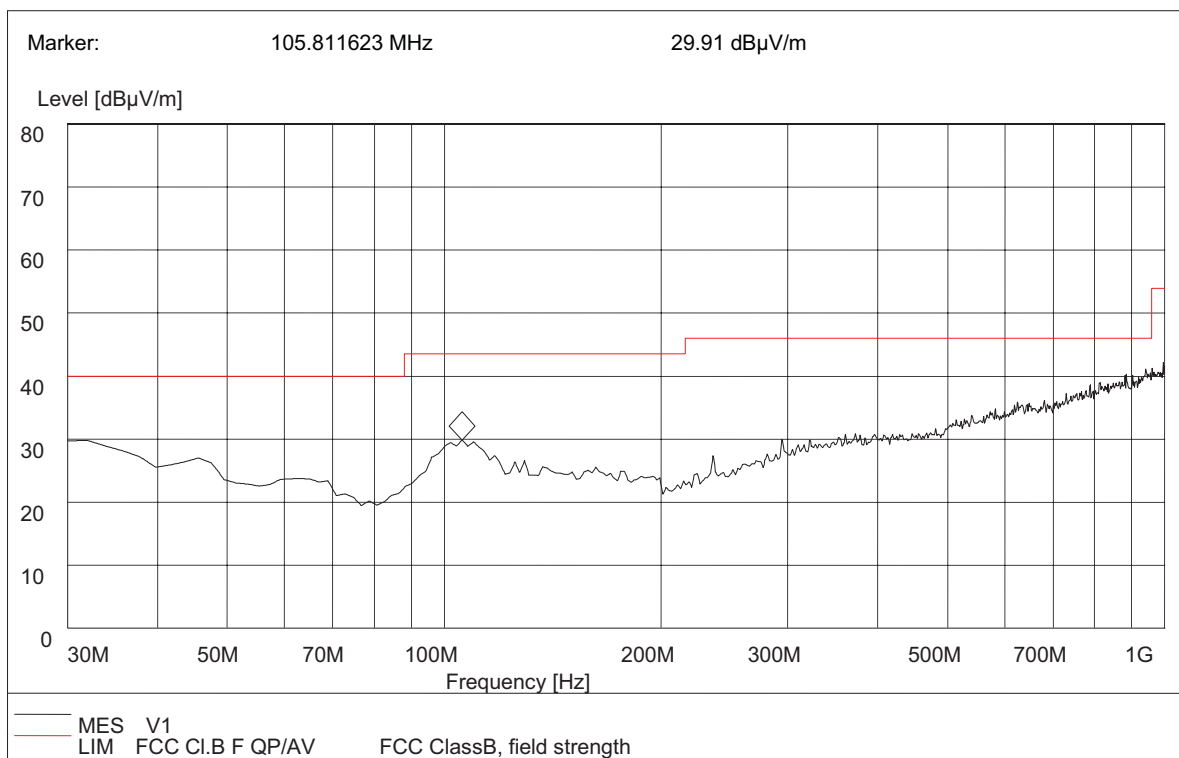
- The EUT was placed on a turn table with 0.8 meter above ground.
- The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
- For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1m to 4m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
- Set to the maximum power setting and enable the EUT transmit continuously.
- New battery is used during test.
- 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.

2.4.4 Test Result

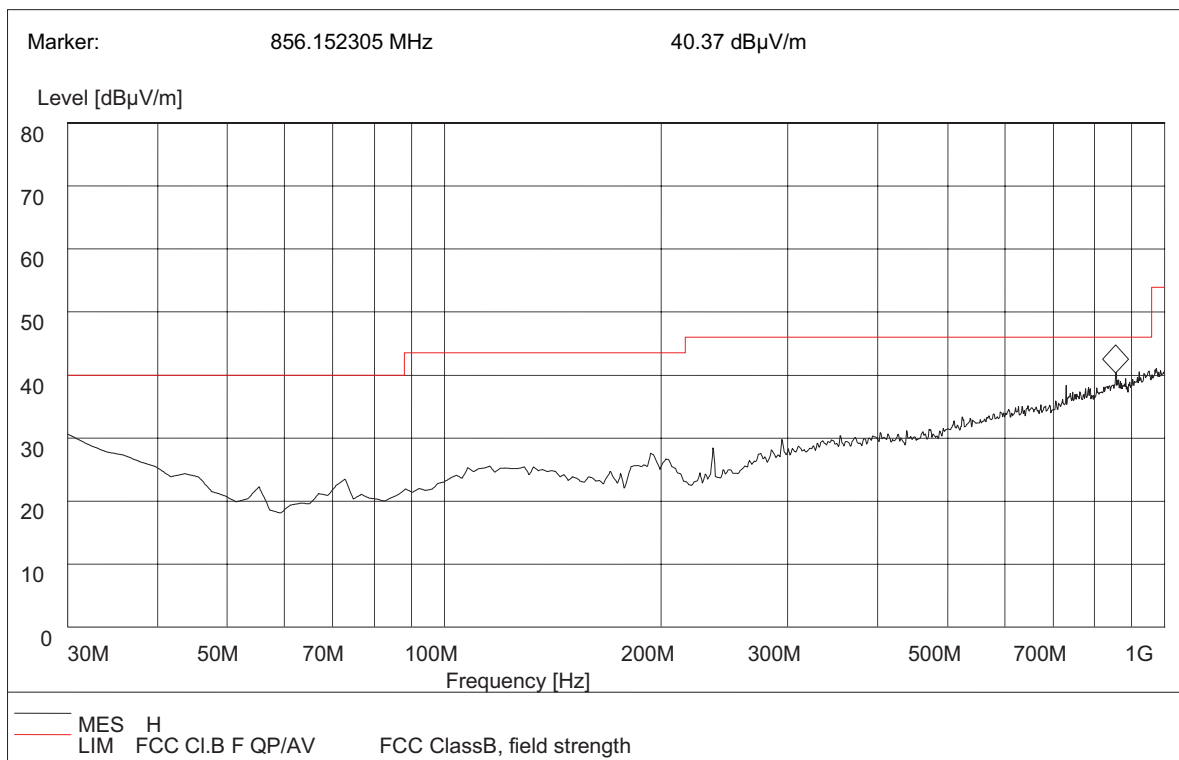
Test Results 9 kHz to 30 MHz

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

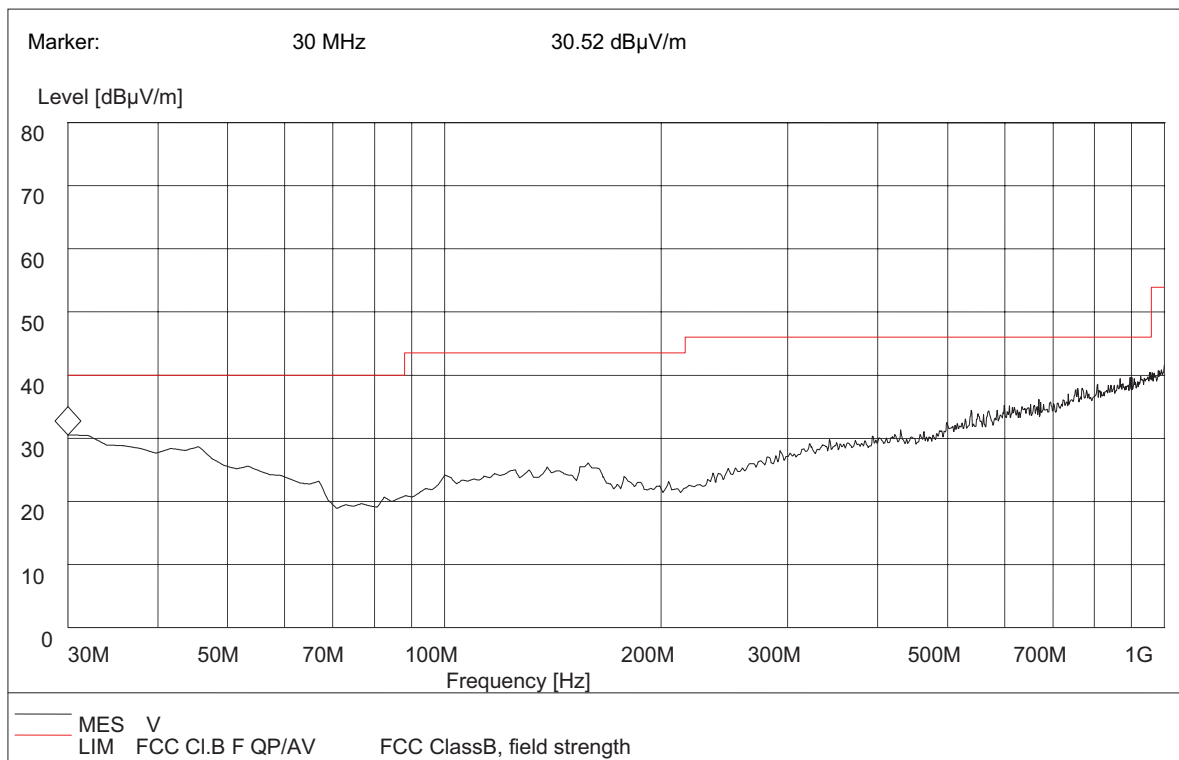
Test Results 30MHz to 1000 MHz



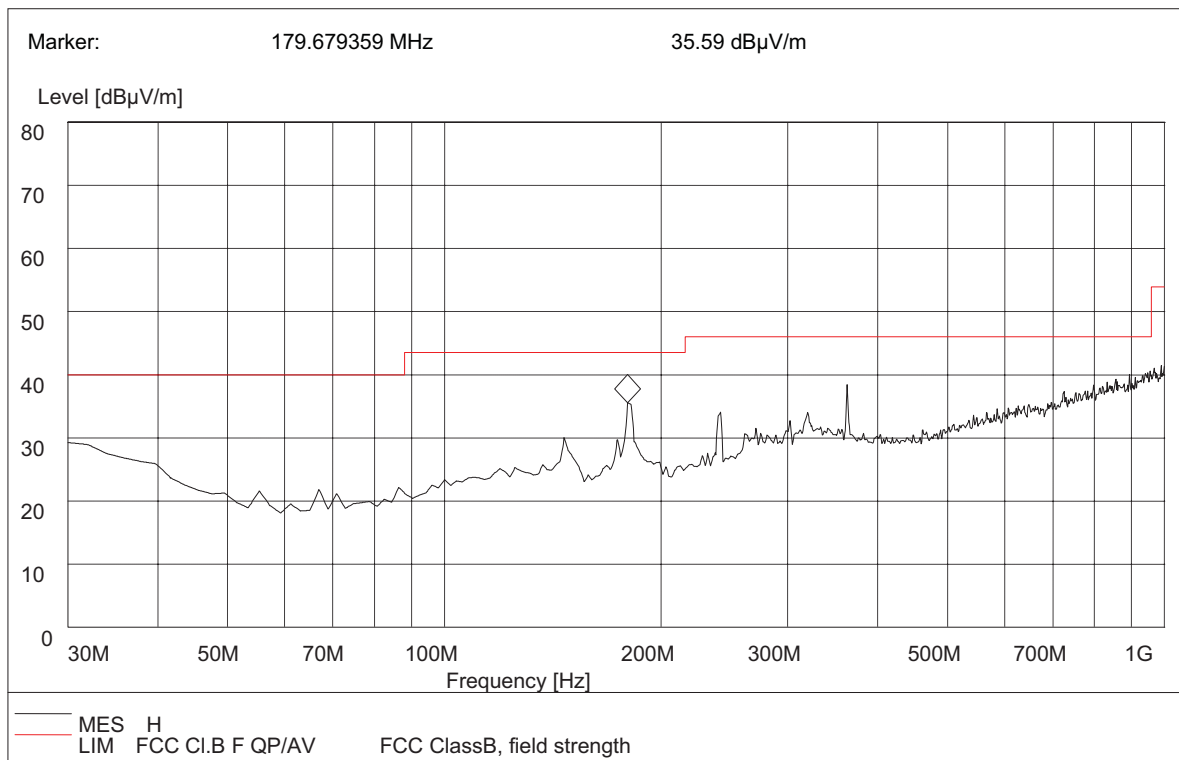
2412MHz - Vertical



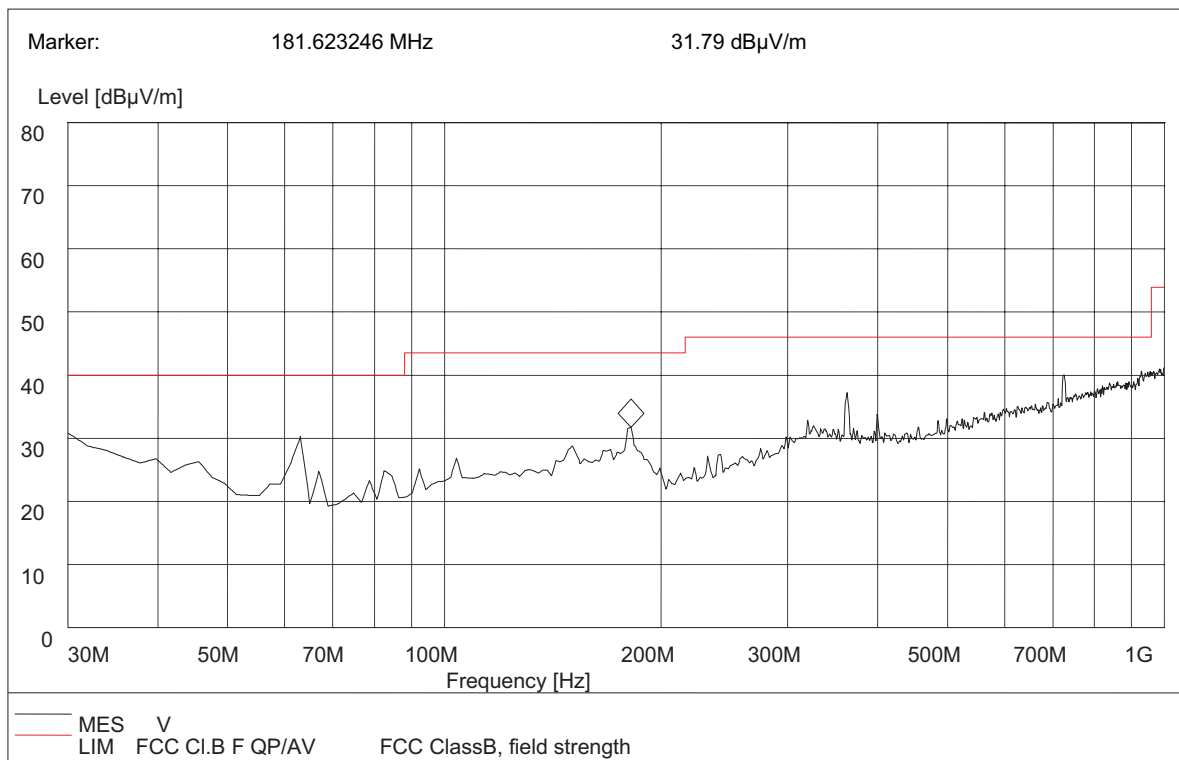
2412MHz – Horizontal



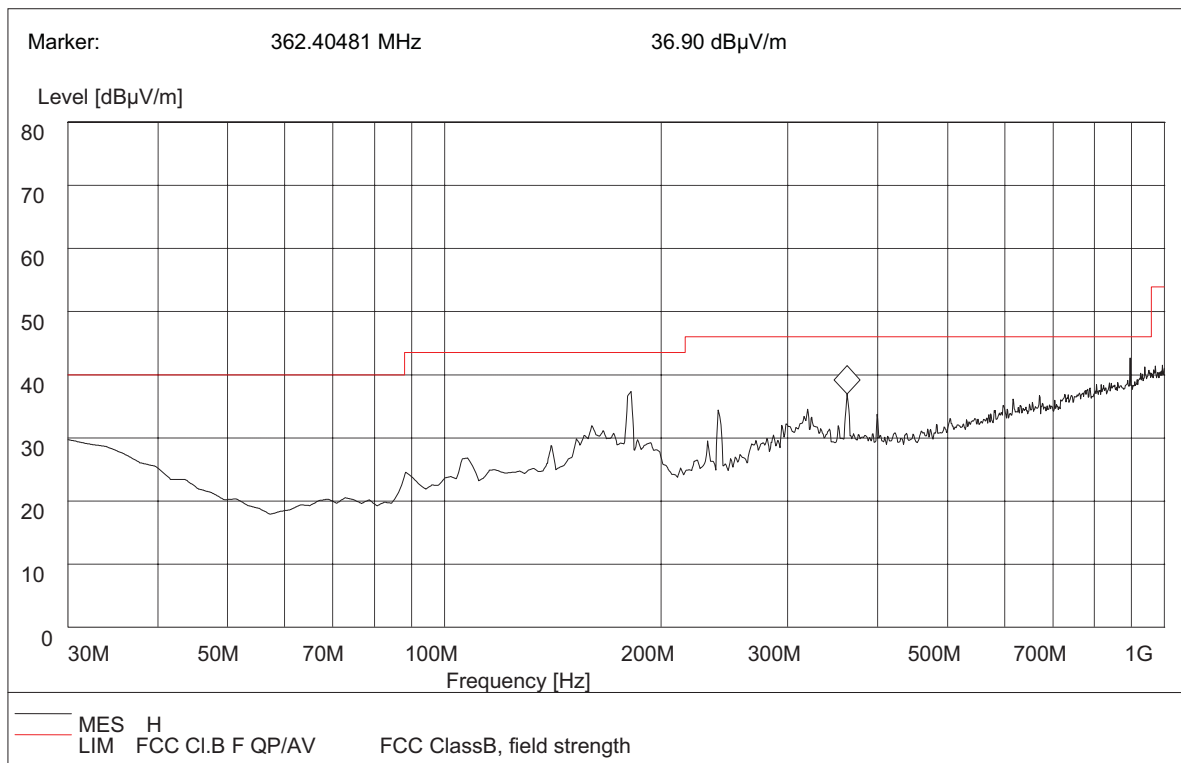
2440MHz - Vertical



2440MHz – Horizontal



2472MHz – Vertical



2472MHz - Horizontal

channel	Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dB μ V/m)	Antenna	Verdict
L channel	105.812	29.91	120.000	100.0	43.50	Vertical	Pass
	856.152	40.37	120.000	100.0	46.00	Horizontal	Pass
M channel	30.000	30.52	120.000	100.0	40.00	Vertical	Pass
	179.679	35.59	120.000	100.0	43.50	Horizontal	Pass
H channel	181.623	31.79	120.000	100.0	43.50	Vertical	Pass
	362.405	36.90	120.000	100.0	46.00	Horizontal	Pass

**Test Results above 1GHz****Test mode: TX 2412MHz**

Frequency (MHz)	Ant. Pol. H/V	Reading		Correction Factor(dB)	Level (dBuV/m)		Limit (dBuV/m)	
		Peak (dBuV)	AV (dBuV)		Peak (dBuV)	AV (dBuV)	Peak (dBuV)	AV (dBuV)
2390	H	22.63	4.54	24.09	46.72	28.63	74.00	54.00
	V	22.94	3.85	24.09	47.03	27.94	74.00	54.00
2400	H	23.75	5.57	24.10	47.85	29.67	74.00	54.00
	V	24.14	4.89	24.10	48.24	28.99	74.00	54.00
2412	H	41.52	22.54	24.18	65.70	46.72	114.00	94.00
	V	40.24	21.47	24.18	64.42	45.65	114.00	94.00
4824	H	39.52	23.54	8.52	48.04	32.06	74.00	54.00
	V	41.24	24.47	8.52	49.76	32.99	74.00	54.00

Test mode: TX 2440MHz

Frequency (MHz)	Ant. Pol. H/V	Reading		Correction Factor(dB)	Level (dBuV/m)		Limit (dBuV/m)	
		Peak (dBuV)	AV (dBuV)		Peak (dBuV)	AV (dBuV)	Peak (dBuV)	AV (dBuV)
2440	H	45.61	24.25	24.24	69.85	48.49	114.00	94.00
	V	47.51	25.14	24.24	71.75	49.38	114.00	94.00
4880	H	43.21	23.24	8.60	51.81	31.84	74.00	54.00
	V	42.85	23.04	8.60	51.45	31.64	74.00	54.00

Test mode: TX 2472MHz

Frequency (MHz)	Ant. Pol. H/V	Reading		Correction Factor(dB)	Level (dBuV/m)		Limit (dBuV/m)	
		Peak (dBuV)	AV (dBuV)		Peak (dBuV)	AV (dBuV)	Peak (dBuV)	AV (dBuV)
2472	H	44.51	23.24	24.35	68.86	47.59	114.00	94.00
	V	45.28	22.45	24.35	69.63	46.8	114.00	94.00
2483.50	H	22.14	5.24	24.54	46.68	29.78	74.00	54.00
	V	23.34	4.27	24.54	47.88	28.81	74.00	54.00
4944	H	43.21	22.07	8.79	52.00	30.86	74.00	54.00
	V	42.68	23.14	8.79	51.47	31.93	74.00	54.00



Remark : About spurious emission :RBW 1MHz VBW 3MHz Peak detector for PK value , RBW 1MHz VBW 10Hz Peak detector for AV value; About fundamental frequency ,RBW is bigger than 20dB BW ,so RBW 3MHz VBW 10MHz Peak detector for PK value , RBW 3MHz VBW10MHz RMS detector for AV value.

**** END OF REPORT ****