# **FCC Test Report**

Report No.: AGC01765141101FE04

**FCC ID** : W3DVT-C6109

**APPLICATION PURPOSE**: Original Equipment

**PRODUCT DESIGNATION**: WIFI Camera

**BRAND NAME** : VDT

MODEL NAME : VT-C6109

**CLIENT**: VIDEOTECH TECHNOLOGY DEVELOPMENT CO.,LIMITED

**DATE OF ISSUE** : Dec.05, 2014

**STANDARD(S) TEST PROCEDURE(S)**FCC Part 15.247
KDB 558074 v03r02

**REPORT VERSION**: V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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## **Report Revise Record**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Dec.05, 2014	Valid	Original Report

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## 1. VERIFICATION OF CONFORMITY

Applicant	VIDEOTECH TECHNOLOGY DEVELOPMENT CO.,LIMITED			
Address	Bldg. 12, Section B, Baosheng Industrial Area, Bainikeng, Pinghu Town, Shenzhen, China			
Manufacturer	VIDEOTECH TECHNOLOGY DEVELOPMENT CO.,LIMITED			
Address	Bldg. 12, Section B, Baosheng Industrial Area, Bainikeng, Pinghu Town, Shenzhen, China			
Product Designation	WIFI Camera			
Brand Name	VDT			
Test Model	VT-C6109			
Date of test	Nov.27, 2014 to Dec.04, 2014			
Deviation	None			
Condition of Test Sample	Normal			
Report Template	AGCRT-US-BGN/RF			

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with requirement of FCC Part 15 Rules requirement.

Prepared By

Max Zhang Dec.05, 2014

Checked By

Kidd Yang Dec.05, 2014

Authorized By

Solger Zhang Dec.05, 2014

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### 2. GENERAL INFORMATION

## 2.1. PRODUCT DESCRIPTION

The EUT is designed as "WIFI Camera". It is designed by way of utilizing the DSSS and OFDM technology to achieve the system operation.

A major technical description of EUT is described as following

A major technical description of EOT is described as following				
Operation Frequency	2.412 GHz~2.462GHz			
Output Bower	IEEE 802.11b:12.97dBm; IEEE 802.11g:12.33dBm;			
Output Power	IEEE 802.11n(20):12.69dBm; IEEE 802.11n(40):10.93dBm			
Modulation	DSSS(DBPSK/DQPSK/CCK);OFDM(BPSK/QPSK/16-QAM/64-QAM)			
Number of channels	11			
Hardware Version	V1.1			
Software Version	V1.2			
Antenna Designation	Integral Antenna			
Antenna Gain	2.5dBi			
Power Supply	DC3.7V by Built-in Li-ion Battery			

### 2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
	1	2412 MHZ
	2	2417 MHZ
	3	2422 MHZ
	4	2427 MHZ
	5	2432 MHZ
2400~2483.5MHZ	6	2437 MHZ
	7	2442 MHZ
	8	2447 MHZ
	9	2452 MHZ
	10	2457 MHZ
	11	2462 MHZ

Note: For 20MHZ bandwidth system use Channel 1 to Channel 11 For 40MHZ bandwidth system use Channel 3 to Channel 9

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#### 2.3. IEEE 802.11N MODULATION SCHEME

MCS Index	Nss	Modulation	R	NBPSC	NCBPS N		NDI	NDBPS		Data rate(Mbps) 800nsGl	
					20MHz	40MHz	20MHz	40MHz	20MHz	40MHz	
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5	
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0	
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5	
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0	
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0	
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0	
6	1	64-QAM	3/4	6	312	648	234	489	58.5	121.5	
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0	

Symbol	Explanation	
NSS	Number of spatial streams	
R	Code rate	
NBPSC	Number of coded bits per single carrier	
NCBPS	Number of coded bits per symbol	
NDBPS	Number of data bits per symbol	
GI	Guard interval	

### 2.4. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: W3DVT-C6109** filing to comply with the FCC Part 15 requirements.

#### 2.5. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

Others testing (listed at item 5.3) was performed according to the procedures in FCC Part 15.247 rules KDB 558074 D01 DTS Meas Guidance v03r02.

### 2.6. SPECIAL ACCESSORIES

Refer to section 5.2.

## 2.7. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

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#### 3. MEASUREMENT UNCERTAINTY

Conducted measurement: +/- 2.75dB Radiated measurement: +/- 3.2dB

#### 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel TX
2	Middle channel TX
3	High channel TX
4	Normal operating(WIFI)

#### Note:

Transmit by 802.11b with Date rate (1/2/5.5/11)

Transmit by 802.11g with Date rate (6/9/12/18/24/36/48/54)

Transmit by 802.11n (20MHz) with Date rate (6.5/13/19.5/26/39/52/58.5/65)

Transmit by 802.11n (40MHz) with Date rate

(13.5/27/40.5/54/81/108/121.5/135)

#### Note:

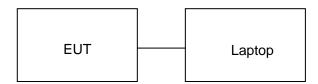
- 1. The EUT has been set to operate continuously on the lowest, middle and highest operation frequency Individually, and the eut is operating at its maximum duty cycle>or equal 98%
- 2. All modes under which configure applicable have been tested and the worst mode test data recording in the test report, if no other mode data.
- 3. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

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## 5. SYSTEM TEST CONFIGURATION

## **5.1. CONFIGURATION OF EUT SYSTEM**

Configure:



### **5.2. EQUIPMENT USED IN EUT SYSTEM**

Item	Equipment	Model No.	ID or Specification	Remark
1	WIFI Camera	VDT	VT-C6109	EUT
2	Laptop	Dell	INSPIRON	A.E

Note: All the accessories have been used during the test in conduction emission test.

## **5.3. SUMMARY OF TEST RESULTS**

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.247	Peak Output Power	Compliant
§15.247	6 dB Bandwidth	Compliant
§15.247	Conducted Spurious Emission	Compliant
§15.247	Maximum Conducted Output Power SPECTRAL Density	Compliant
§15.209	Radiated Emission	Compliant
§15.247	Band Edges	Compliant
§15.207	Line Conduction Emission	Compliant

Note: The EUT received power from DC3.7V lithium battery.

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## **6. TEST FACILITY**

Site	Attestation of Global Compliance (Shenzhen) Co., Ltd		
Location	2/F., Building 2, No.1-No.4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District, Shenzhen, Guangdong, China		
Description	The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2003.		

## **ALL TEST EQUIPMENT LIST**

Description	Manufacturer	Model	Cal. Date	Cal. Due
Power Probe	R&S	NRP-Z23	07/25/2014	07/24/2015
Power Meter	Agilent	N1911A	04/20/2014	04/20/2015
RF attenuator	WEINSCHEL CORP	58-30-33	07/25/2014	07/24/2015
Spectrum Analyzer	Agilent	E4440A	07/16/2014	07/15/2015
Amplifier	EM	BBV 9718	07/30/2014	07/29/2015
HORN ANTENNA	Schwarzbeck	3117	08/17/2014	08/16/2015
HORN ANTENNA	A.H. SYSTEMS INC.	SAS-574	07/16/2014	07/15/2015
EMI Test Receiver	Rohde & Schwarz	ESCI	07/25/2014	07/24/2015
Bilogical Antenna	EMCO	3142C	08/17/2014	08/16/2015
Loop Antenna	LAPLACE	RF300	07/30/2014	07/29/2015
LISN	R&S	ESH3-Z5	09/05/2014	09/04/2015
RF CABLE	SUIRONG	9KHZ-30MHZ	07/15/2014	07/14/2015
RF CABLE	SUIRONG	30MHZ-18GHZ	07/15/2014	07/14/2015
Conduction Cable	Sat	CE1	07/15/2014	07/14/2015

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## 7. PEAK OUTPUT POWER

### 7.1. MEASUREMENT PROCEDURE

For peak power test:

- 1. Use a direct connection between the antenna port of the transmitter and the power meter, through suitable attenuation
- 2. Set the bandwidth of the power meter is 40MHz
- 3. Record the peak value

For average power test:

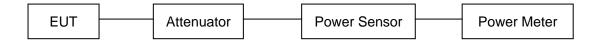
- 1. Connect EUT RF output port to power probe through an RF attenuator.
- 2. Connect the power probe to the PC.
- 3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 4. Record the maximum power from the software.
- 5. The maximum peak power shall be less 1 Watt (30dBm).

**Note**: The EUT was tested according to KDB 558074v03r02 for compliance to FCC 47CFR 15.247 requirements.

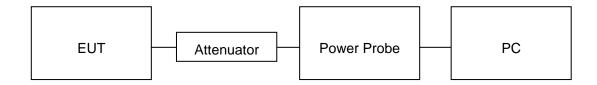
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## 7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

## **PEAK POWER TEST SETUP**



## **AVERAGE POWER SETUP**



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## 7.3. LIMITS AND MEASUREMENT RESULT

TEST ITEM	PEAK POWER
TEST MODE	802.11b with data rate 1

LIMITS AND MEASUREMENT RESULT				
Frequency (GHz)	Average Power (dBm)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	10.99	12.97	30	Pass
2.437	10.92	12.9	30	Pass
2.462	10.58	12.56	30	Pass

TEST ITEM	PEAK POWER
TEST MODE	802.11g with data rate 6

LIMITS AND MEASUREMENT RESULT				
Frequency (GHz)	Average Power (dBm)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	10.35	12.33	30	Pass
2.437	10.08	12.06	30	Pass
2.462	10.02	12	30	Pass

TEST ITEM	PEAK POWER
TEST MODE	802.11n 20 with data rate 6.5

	LIMITS AND MEASUREMENT RESULT			
Frequency (GHz)	Average Power (dBm)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	9.89	11.87	30	Pass
2.437	10.71	12.69	30	Pass
2.462	9.02	11	30	Pass

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TEST ITEM	PEAK POWER
TEST MODE	802.11n 40 with data rate 13.5

LIMITS AND MEASUREMENT RESULT				
Frequency (GHz)	Average Power (dBm)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.422	8.54	10.52	30	Pass
2.437	8.95	10.93	30	Pass
2.452	8.36	10.34	30	Pass

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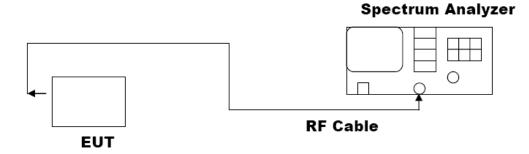
## 8. 6DB BANDWIDTH

### **8.1. MEASUREMENT PROCEDURE**

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW ≥ 3×RBW.
- 4. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

## 8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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## **8.3. LIMITS AND MEASUREMENT RESULTS**

TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11b with data rate 11

LIMITS AND MEASUREMENT RESULT			
Aunticoldo I imito	Applicable Limits		
Applicable Limits	Test Data (MHz) Criteria		
	Low Channel	7.069	PASS
>500KHZ	Middle Channel	7.075	PASS
	High Channel	7.046	PASS

TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11g with data rate 54

LIMITS AND MEASUREMENT RESULT				
Amuliankla Limita	Applicable Limits			
Applicable Limits	Test Da	ta (MHz)	Criteria	
	Low Channel	16.54	PASS	
>500KHZ	Middle Channel	16.54	PASS	
	High Channel	16.54	PASS	

TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11n 20 with data rate 65

LIMITS AND MEASUREMENT RESULT			
Applicable Limite		Applicable Limits	
Applicable Limits	Test Data (MHz)		Criteria
>500KHZ	Low Channel	17.76	PASS
	Middle Channel	17.76	PASS
	High Channel	17.72	PASS

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TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11n 40 with data rate 135

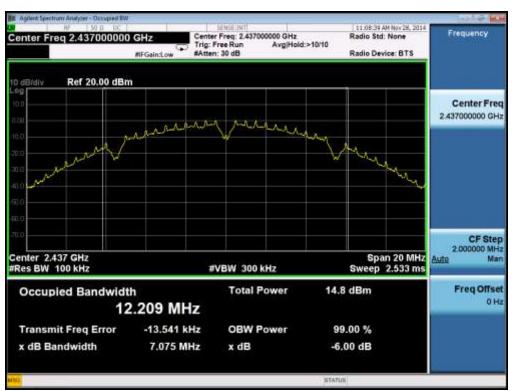
LIMITS AND MEASUREMENT RESULT				
Applicable Limits				
Applicable Limits	Test Data (MHz)		Criteria	
>500KHZ	Low Channel	36.31	PASS	
	Middle Channel	36.34	PASS	
	High Channel	36.33	PASS	

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**802.11b TEST RESULT**TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

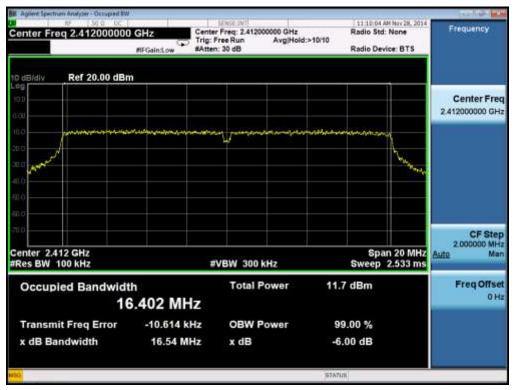


#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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## **802.11g TEST RESULT**TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

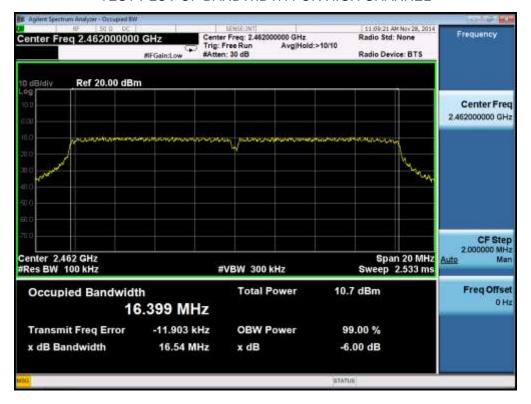


#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



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#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

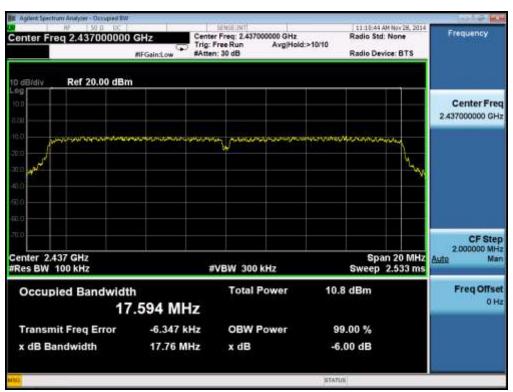


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## 802.11n (20) TEST RESULT TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

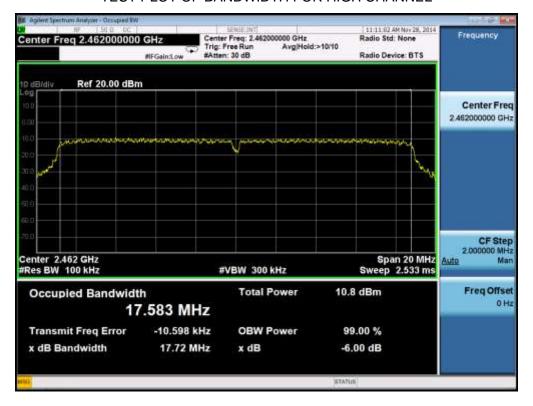


#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



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#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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## **802.11n(40) TEST RESULT**TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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### 9. CONDUCTED SPURIOUS EMISSION

### 9.1. MEASUREMENT PROCEDURE

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set SPA Trace 1 Max hold, then View.

**Note:** The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements. Owing to satisfy the requirements of the number of measurement points, we set the RBW=1MHz, VBW>RBW, scan up through 10th harmonic, and consider the tested results as the worst case, if the tested results conform to the requirement, we can deem that the real tested results(set the RBW=100KHz, VBW>RBW) are conform to the requirement.

## 9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 8.2.

#### 9.3. MEASUREMENT EQUIPMENT USED

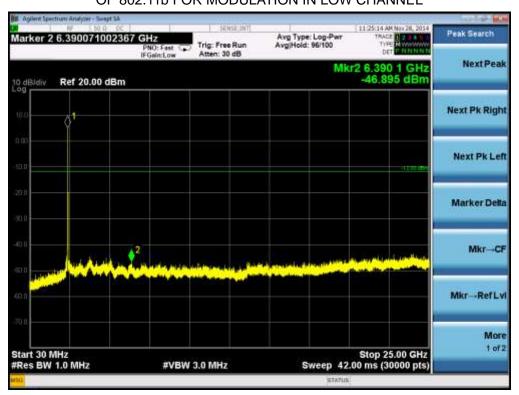
The same as described in section 6.

#### 9.4. LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT				
Applicable Limite	Measurement Result			
Applicable Limits	Test Data	Criteria		
In any 100 KHz Bandwidth Outside the	At least -20dBc than the limit			
frequency band in which the spread spectrum	Specified on the BOTTOM	PASS		
intentional radiator is operating, the radio frequency	Channel			
power that is produce by the intentional radiator				
shall be at least 20 dB below that in 100KHz				
bandwidth within the band that contains the highest				
level of the desired power.	At least -20dBc than the limit	PASS		
In addition, radiation emissions which fall in the	Specified on the TOP Channel	PASS		
restricted bands, as defined in §15.205(a), must also				
comply with the radiated emission limits specified				
in§15.209(a))				

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## TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE OF 802.11b FOR MODULATION IN LOW CHANNEL

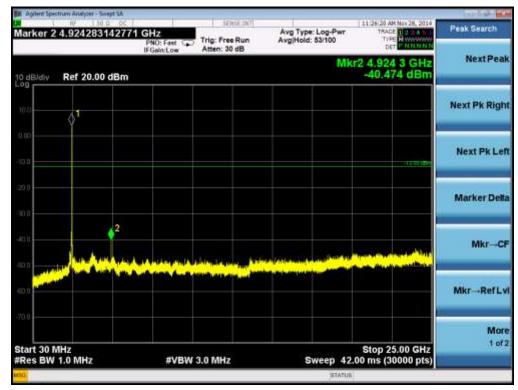


## TEST PLOT OF OUT OF BAND EMISSIONS OF 802.11b FOR MODULATION IN MIDDLE CHANNEL



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## TEST PLOT OF OUT OF BAND EMISSIONS OF 802.11b FOR MODULATION IN HIGH CHANNEL



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## 10. MAXIMUM CONDUCTED OUTPUT PEAK POWER SPECTRAL DENSITY

### **10.1 MEASUREMENT PROCEDURE**

- (1). Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- (2). Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- (3). Set SPA Trace 1 Max hold, then View.

Note: The method of PKPSD in the KDB 558074 item 10.2 was used in this testing.

## 10.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

Refer To Section 8.2.

## **10.3 MEASUREMENT EQUIPMENT USED**

Refer To Section 6.

### **10.4 LIMITS AND MEASUREMENT RESULT**

TEST ITEM	POWER PECTRAL DENSITY
TEST MODE	802.11b with data rate 1

Channel No.	PSD (dBm)	Limit (dBm)	Result
Low Channel	-12.22	8	Pass
Middle Channel	-13.34	8	Pass
High Channel	-14.25	8	Pass

TEST ITEM	POWER PECTRAL DENSITY
TEST MODE	802.11g with data rate 6

Channel No.	PSD (dBm)	Limit (dBm)	Result
Low Channel	-19.22	8	Pass
Middle Channel	-19.71	8	Pass
High Channel	-19.54	8	Pass

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TEST ITEM	POWER PECTRAL DENSITY
TEST MODE	802.11n 20 with data rate 6.5

Channel No.	PSD (dBm)	Limit (dBm)	Result
Low Channel	-19.70	8	Pass
Middle Channel	-20.32	8	Pass
High Channel	-19.93	8	Pass

TEST ITEM	POWER PECTRAL DENSITY
TEST MODE	802.11n 40 with data rate 13.5

Channel No.	PSD (dBm)	Limit (dBm)	Result
Low Channel	-22.89	8	Pass
Middle Channel	-23.48	8	Pass
High Channel	-23.16	8	Pass

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**802.11b TEST RESULT**TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL



TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL



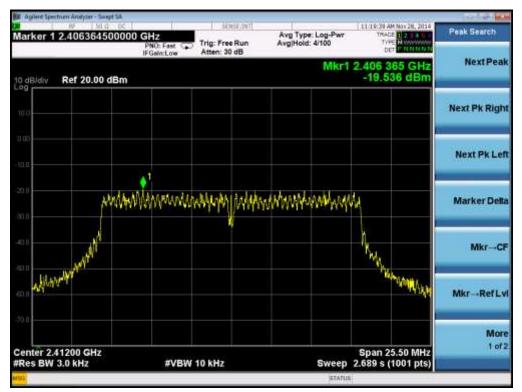
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## TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL

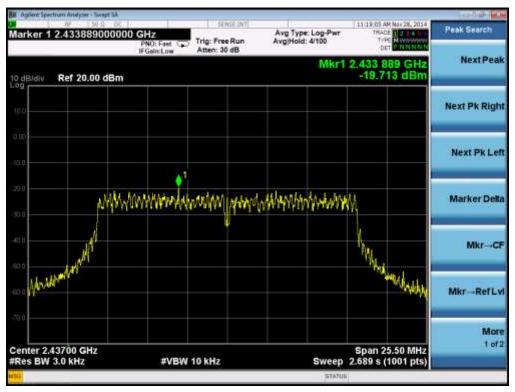


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**802.11g TEST RESULT**TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL

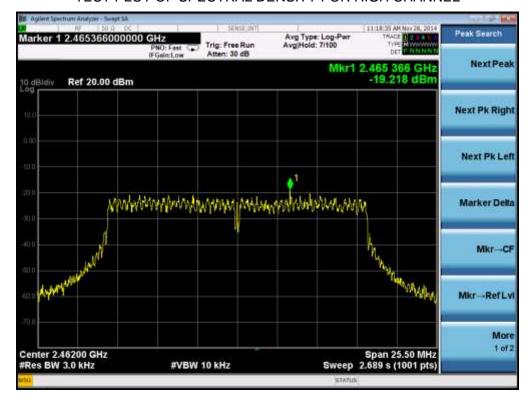


TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL



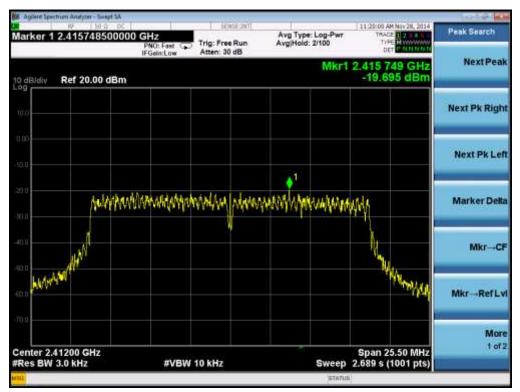
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## TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL

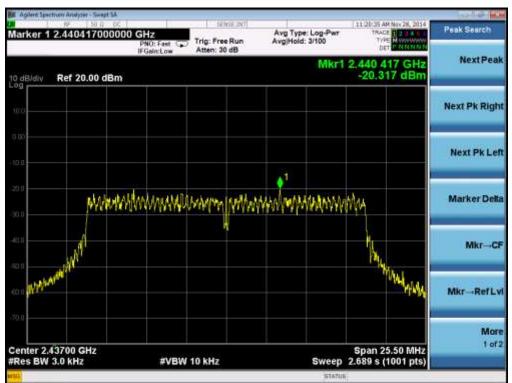


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**802.11n 20 TEST RESULT**TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL

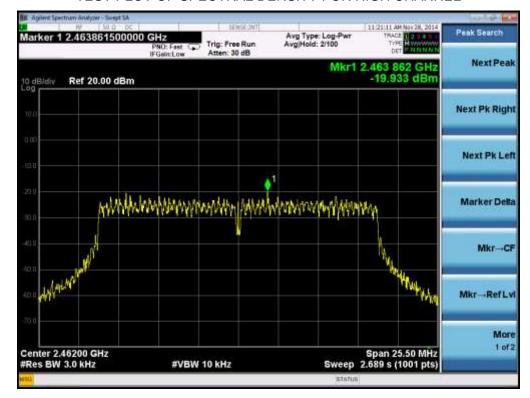


TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL



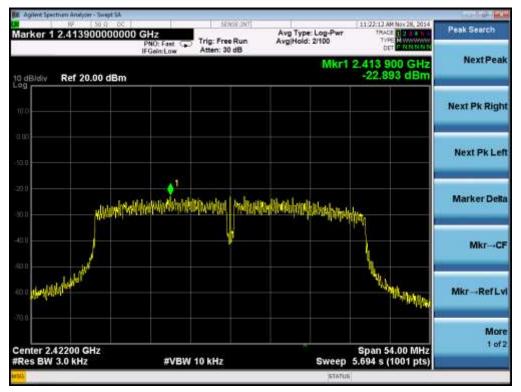
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## TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL

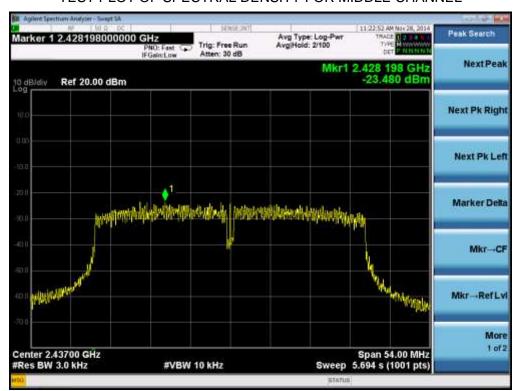


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**802.11n 40 TEST RESULT**TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL

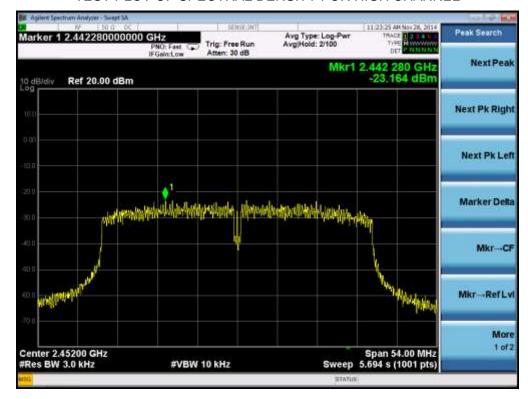


TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL



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## TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL



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#### 11. RADIATED EMISSION

#### 11.1. MEASUREMENT PROCEDURE

- 1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8.If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.

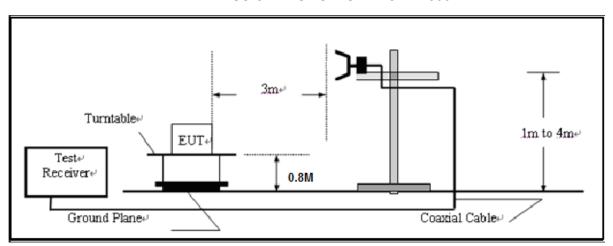
Report No.: AGC01765141101FE04 Page 40 of 72

## 11.2. TEST SETUP

## RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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## 11.3. LIMITS AND MEASUREMENT RESULT

15.209(a) Limit in the below table has to be followed

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note: All modes were tested For restricted band radiated emission,

the test records reported below are the worst result compared to other modes.

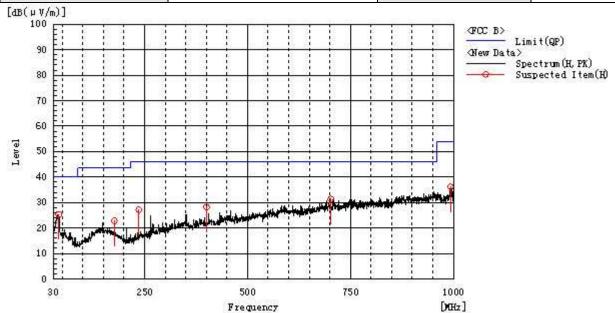
## 11.4. TEST RESULT

#### **RADIATED EMISSION BELOW 30MHZ**

No emission found between lowest internal used/generated frequencies to 30MHz.

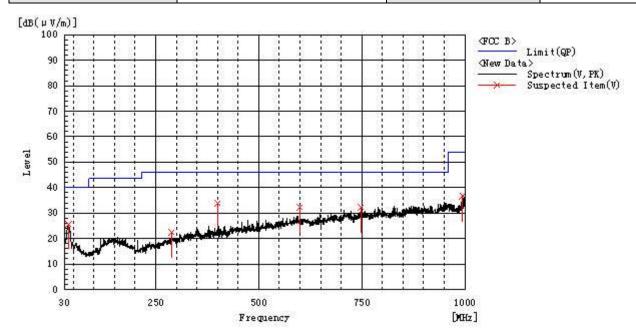
# **RADIATED EMISSION BELOW 1GHZ**

EUT	WIFI Camera	Model Name	VT-C6109
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2412MHZ	Antenna	Horizontal



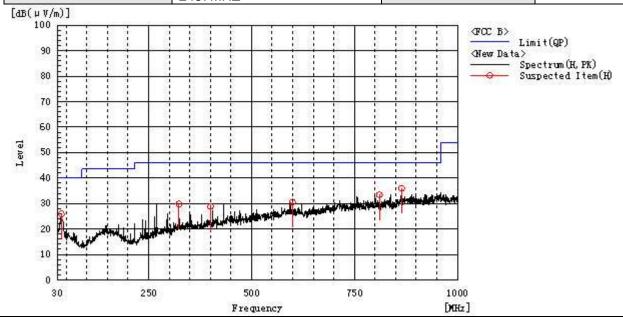
Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) QP	Margin dB	Pass/Fail	Height cm	Angle deg
41.640	Н	6.3	19.0	25.3	40.0	14.7	Pass	100.0	108.3
236.125	Н	13.9	13.3	27.2	46.0	18.8	Pass	200.0	183.0
400.540	Н	9.5	18.7	28.2	46.0	17.8	Pass	100.0	71.9
993.210	Н	7.8	28.4	36.2	54.0	17.8	Pass	200.0	35.8
702.210	Н	6.9	24.5	31.4	46.0	14.6	Pass	200.0	250.6
176.955	Н	8.6	14.2	22.8	43.5	20.7	Pass	100.0	289.6

EUT	WIFI Camera	Model Name	VT-C6109
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2412MHZ	Antenna	Vertical



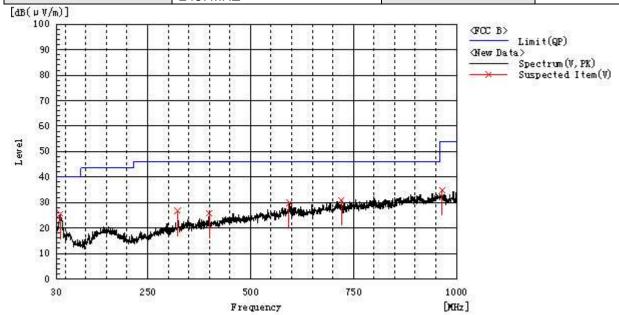
Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) QP	Margin dB	Pass/Fail	Height cm	Angle deg
38.730	V	4.8	21.0	25.8	40.0	14.2	Pass	100.0	34.1
400.540	V	15.2	18.7	33.9	46.0	12.1	Pass	100.0	211.0
599.875	V	9.3	22.9	32.2	46.0	13.8	Pass	200.0	75.4
994.180	V	8.3	28.4	36.7	54.0	17.3	Pass	100.0	181.1
288.505	V	6.8	15.6	22.4	46.0	23.6	Pass	100.0	181.1
748.285	V	6.5	25.7	32.2	46.0	13.8	Pass	200.0	146.3

EUT	WIFI Camera	Model Name	VT-C6109
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2437MHZ	Antenna	Horizontal



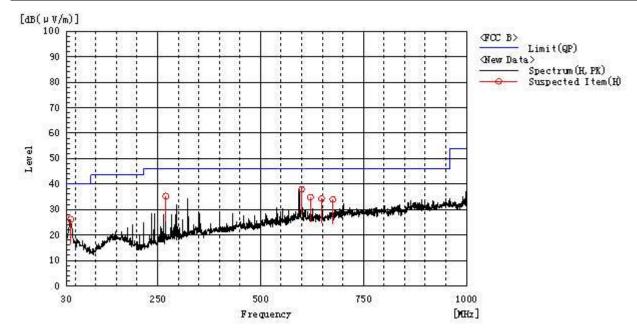
Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) QP	Margin dB	Pass/Fail	Height cm	Angle deg
38.730	Н	5.0	21.0	26.0	40.0	14.0	Pass	100.0	218.9
323.910	Н	12.8	17.0	29.8	46.0	16.2	Pass	100.0	183.7
400.540	Н	10.1	18.7	28.8	46.0	17.2	Pass	100.0	39.4
599.875	Н	7.7	22.9	30.6	46.0	15.4	Pass	200.0	71.9
810.365	Н	7.9	25.5	33.4	46.0	12.6	Pass	100.0	39.4
864.200	Н	8.4	27.5	35.9	46.0	10.1	Pass	200.0	71.9

EUT	WIFI Camera	Model Name	VT-C6109
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2437MHZ	Antenna	Vertical



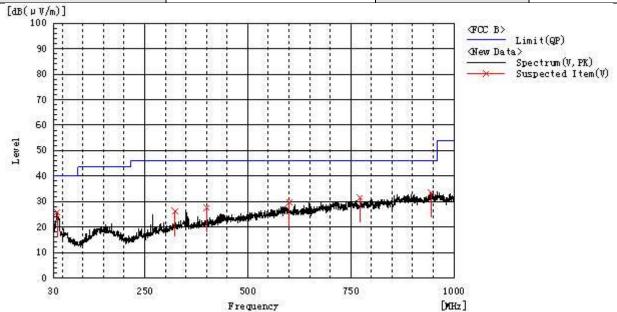
Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) QP	Margin dB	Pass/Fail	Height cm	Angle deg
38.245	V	4.4	21.2	25.6	40.0	14.4	Pass	200.0	182.0
323.910	V	9.8	17.0	26.8	46.0	19.2	Pass	100.0	250.5
594.055	V	6.9	23.0	29.9	46.0	16.1	Pass	100.0	69.2
964.595	V	6.1	28.7	34.8	54.0	19.2	Pass	100.0	178.6
721.125	V	5.8	25.0	30.8	46.0	15.2	Pass	100.0	250.5
400.540	V	7.1	18.7	25.8	46.0	20.2	Pass	100.0	32.3

EUT	WIFI Camera	Model Name	VT-C6109
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2462MHZ	Antenna	Horizontal



Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) QP	Margin dB	Pass/Fail	Height cm	Angle deg
39.215	Н	5.5	20.7	26.2	40.0	13.8	Pass	200.0	3.7
270.075	Н	20.8	14.5	35.3	46.0	10.7	Pass	200.0	183.0
599.875	Н	15.0	22.9	37.9	46.0	8.1	Pass	200.0	327.1
621.215	Н	12.0	22.8	34.8	46.0	11.2	Pass	200.0	216.5
648.375	Н	11.2	23.1	34.3	46.0	11.7	Pass	100.0	249.5
675.535	Н	9.7	24.2	33.9	46.0	12.1	Pass	100.0	144.0

EUT	WIFI Camera	Model Name	VT-C6109
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2462MHZ	Antenna	Vertical



Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) QP	Margin dB	Pass/Fail	Height cm	Angle deg
38.245	V	4.6	21.2	25.8	40.0	14.2	Pass	100.0	181.2
323.910	V	9.3	17.0	26.3	46.0	19.7	Pass	100.0	107.9
400.540	V	9.0	18.7	27.7	46.0	18.3	Pass	200.0	215.8
772.050	V	6.3	25.2	31.5	46.0	14.5	Pass	100.0	35.8
600.360	V	6.7	23.0	29.7	46.0	16.3	Pass	200.0	72.2
944.710	V	5.1	28.5	33.6	46.0	12.4	Pass	200.0	72.2

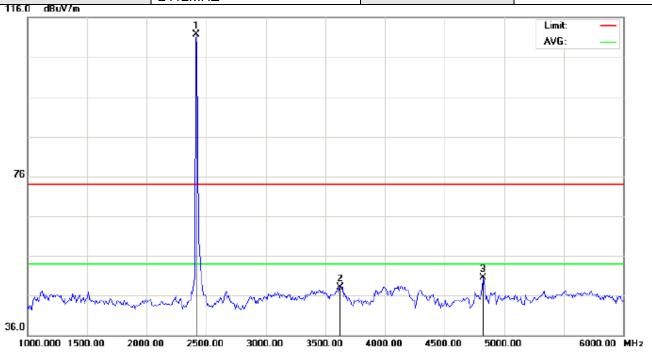
**Note:** 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

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## **RADIATED EMISSION ABOVE 1GHZ**

EUT	WIFI Camera	Model Name	VT-C6109
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2412MHZ	Antenna	Horizontal



Site: site #1 Polarization: Horizontal Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: AC 120V/60Hz Humidity: 60 %

EUT: WIFI Camera Distance: 3m

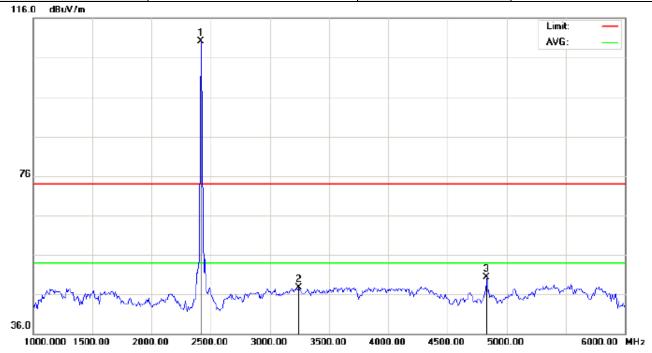
M/N: VT-C6109

Mode: 802.11g Low Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu\//m	dBu∀/m	dB		cm	degree	
1	*	2416.667	121.27	-9.66	111.61	74.00	37.61	peak			
2		3625.000	55.30	-7.12	48.18	74.00	-25.82	peak			
3		4825.000	52.74	-2.26	50.48	74.00	-23.52	peak			

EUT	WIFI Camera	Model Name	VT-C6109
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2412MHZ	Antenna	Vertical



Site: site #1 Polarization: Vertical Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: AC 120V/60Hz Humidity: 60 %

EUT: WIFI Camera Distance: 3m

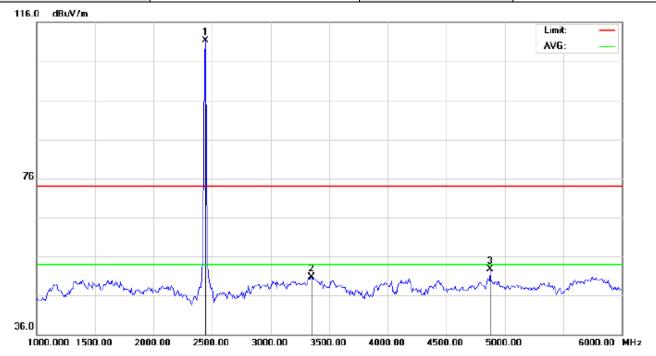
M/N: VT-C6109

Mode: 802.11g Low Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1	*	2416.667	119.77	-9.66	110.11	74.00	36.11	peak			
2		3241.667	55.82	-8.13	47.69	74.00	-26.31	peak			
3		4833.333	52.45	-2.24	50.21	74.00	-23.79	peak			

EUT	WIFI Camera	Model Name	VT-C6109
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2437MHZ	Antenna	Horizontal



Site: site #1 Polarization: Horizontal Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: AC 120V/60Hz Humidity: 60 %

EUT: WIFI Camera Distance: 3m

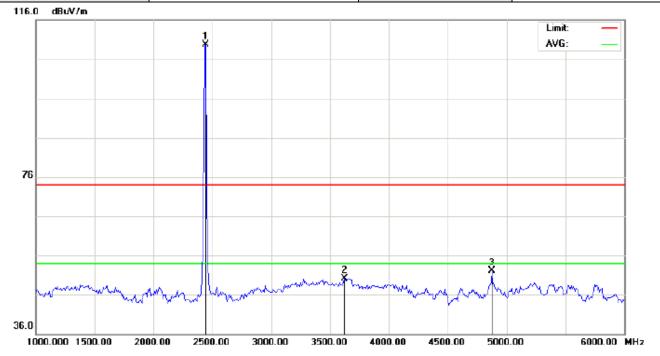
M/N: VT-C6109

Mode: 802.11g Middle Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1	*	2441.667	120.84	-9.63	111.21	74.00	37.21	peak			
2		3350.000	58.76	-8.03	50.73	74.00	-23.27	peak			
3		4875.000	54.83	-2.13	52.70	74.00	-21.30	peak			

EUT	WIFI Camera	Model Name	VT-C6109
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2437MHZ	Antenna	Vertical



Site: site #1 Polarization: Vertical Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: AC 120V/60Hz Humidity: 60 %

EUT: WIFI Camera Distance: 3m

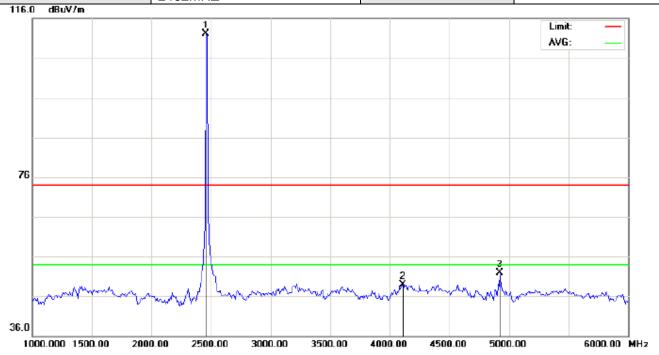
M/N: VT-C6109

Mode: 802.11g Middle Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu\//m	dBu∀/m	dB		cm	degree	
1	*	2441.667	119.34	-9.63	109.71	74.00	35.71	peak			
2		3625.000	57.30	-7.12	50.18	74.00	-23.82	peak			
3		4875.000	54.33	-2.13	52.20	74.00	-21.80	peak			

EUT	WIFI Camera	Model Name	VT-C6109
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2462MHZ	Antenna	Horizontal



Site: site #1 Polarization: Horizontal Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: AC 120V/60Hz Humidity: 60 %

EUT: WIFI Camera Distance: 3m

M/N: VT-C6109

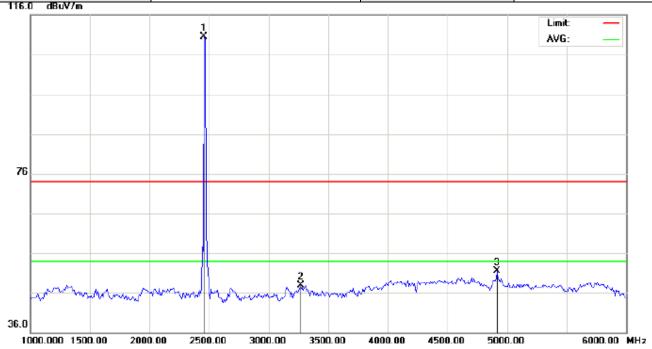
Mode: 802.11b High Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu\//m	dBu∀/m	dB		cm	degree	
1	*	2458.333	121.71	-9.62	112.09	74.00	38.09	peak			
2		4108.333	53.34	-4.44	48.90	74.00	-25.10	peak			
3		4925.000	54.00	-2.00	52.00	74.00	-22.00	peak			

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EUT	WIFI Camera	Model Name	VT-C6109
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2462MHZ	Antenna	Vertical



Site: site #1 Polarization: Vertical Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: AC 120V/60Hz Humidity: 60 %

EUT: WIFI Camera Distance: 3m

M/N: VT-C6109

Mode: 802.11b High Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBuV/m	dBu∀/m	dB		cm	degree	
1	*	2458.333	120.21	-9.62	110.59	74.00	36.59	peak			
2		3266.667	56.10	-8.11	47.99	74.00	-26.01	peak			
3		4916.667	53.45	-2.02	51.43	74.00	-22.57	peak			

## **RESULT: PASS**

Note: The other modes radiation emissions have more than 20dB margin.

All modes radiation emission from 6GHz to 25GHz at least have 20dB margin.

Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

The "Factor" value can be calculated automatically by software of measurement system.

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## 12. BAND EDGE EMISSION

## 12.1. MEASUREMENT PROCEDURE

1)Radiated restricted band edge measurements

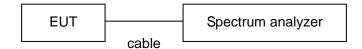
The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting

- 2)Conducted Emissions at the bang edge
  - a)The transmitter output was connected to the spectrum analyzer
  - b)Set RBW=100kHz,VBW=300kHz
  - c)Suitable frequency span including 100kHz bandwidth from band edge

## 12.2. TEST SET-UP

Radiated same as 11.2

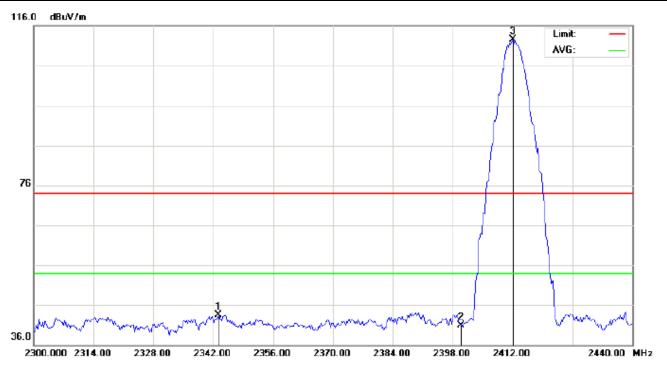
Conducted set up



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## 12.3. Radiated Test Result

EUT	WIFI Camera	Model Name	VT-C6109
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2412MHZ	Antenna	Horizontal



Site: site #1 Polarization: Horizontal Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT: WIFI Camera Distance: 3m

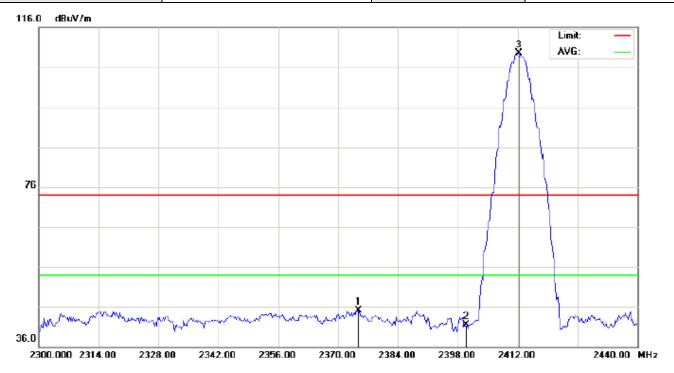
M/N: VT-C6109

Mode: 802.11b Low Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1		2343.167	53.30	-9.74	43.56	74.00	-30.44	peak			
2		2400.000	50.61	-9.68	40.93	74.00	-33.07	peak			
3	*	2412.000	122.08	-9.67	112.41	74.00	38.41	peak			

EUT	WIFI Camera	Model Name	VT-C6109
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2412MHZ	Antenna	Vertical



Site: site #1 Polarization: Vertical Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT: WIFI Camera Distance: 3m

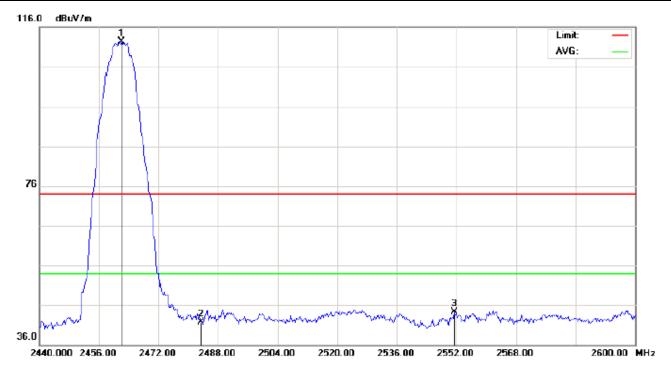
M/N: VT-C6109

Mode: 802.11b Low Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu\//m	dBu∀/m	dB		cm	degree	
1		2374.667	54.88	-9.71	45.17	74.00	-28.83	peak			
2		2400.000	51.11	-9.68	41.43	74.00	-32.57	peak			
3	*	2412.233	119.14	-9.67	109.47	74.00	35.47	peak			

EUT	WIFI Camera	Model Name	VT-C6109
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2462MHZ	Antenna	Horizontal



Site: site #1 Polarization: Horizontal Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT: WIFI Camera Distance: 3m

M/N: VT-C6109

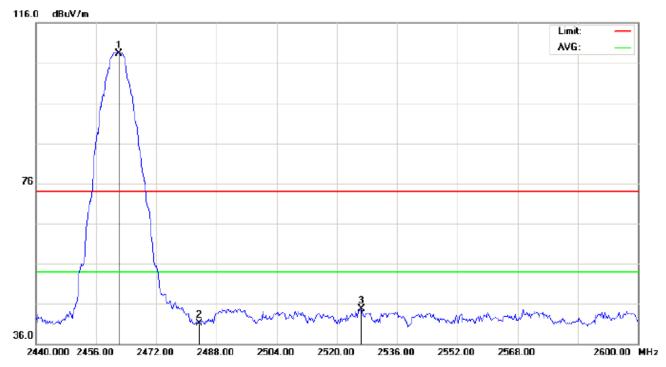
Mode: 802.11b High Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu\//m	dBu∀/m	dB		cm	degree	
1	*	2462.000	121.92	-9.61	112.31	74.00	38.31	peak			
2		2483.500	51.22	-9.59	41.63	74.00	-32.37	peak			
3		2551.467	53.75	-9.45	44.30	74.00	-29.70	peak			

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EUT	WIFI Camera	Model Name	VT-C6109	
Temperature	25°C	Relative Humidity	55.4%	
Pressure	960hPa	Test Voltage	Normal Voltage	
Test Mode	802.11b with data rate 1 2462MHZ	Antenna	Vertical	



Site: site #1 Polarization: Vertical Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT: WIFI Camera Distance: 3m

M/N: VT-C6109

Mode: 802.11b High Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1	*	2462.000	117.92	-9.61	108.31	74.00	34.31	peak			
2		2483.500	50.72	-9.59	41.13	74.00	-32.87	peak			
3		2526.400	54.12	-9.51	44.61	74.00	-29.39	peak			

#### **RESULT: PASS**

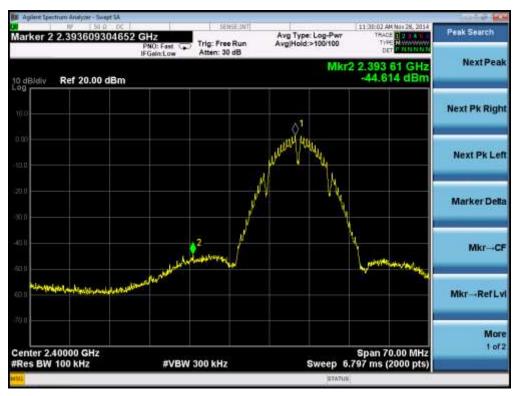
Note: The other modes radiation emission have enough 20dB margin.

Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

The "Factor" value can be calculated automatically by software of measurement system.

## 12.4. Conducted Test Result

802.11b-CH1



802.11b-CH11



802.11g- CH1



802.11g- CH11



802.11n-CH1



802.11n-CH11



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## 13. FCC LINE CONDUCTED EMISSION TEST

## 13.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Francisco	Maximum RF Line Voltage						
Frequency	Q.P.( dBuV)	Average( dBuV)					
150kHz~500kHz	66-56	56-46					
500kHz~5MHz	56	46					
5MHz~30MHz	60	50					

## Note:

- 1. The lower limit shall apply at the transition frequency.
- 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

## 13.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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#### 13.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.

- 2. Support equipment, if needed, was placed as per ANSI C63.4.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4. All support equipments received AC120V/60Hz power from a LISN, if any.
- 5. The EUT received charging voltage by adapter which received 120V/60Hzpower by a LISN..
- 6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 8. During the above scans, the emissions were maximized by cable manipulation.
- 9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

## 13.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- 2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
- 3. The test data of the worst case condition(s) was reported on the Summary Data page.

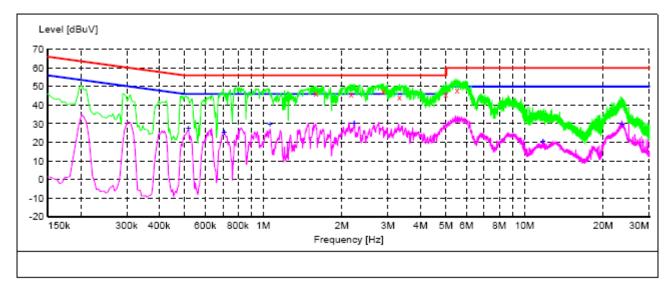
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## 13.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

## LINE CONDUCTED EMISSION TEST LINE 1-L

SCAN TABLE: "Voltage (150K-30M) FIN"

Short Description: 9k-30M Voltage



### MEASUREMENT RESULT

Frequency	Level	Transd	Limit	Margin	Detector	Line	PE	AUX STATE
MHz	dBuV	dB	dBuV	dB				
1.590000	46.60	0.2	56	9.4	_	L1	GND	ON
2.170000	45.70	0.3	56	10.3	QP	L1	GND	ON
2.878000	47.30	0.3	56	8.7	QP	L1	GND	ON
3.326000	44.30	0.3	56	11.7	QP	L1	GND	ON
4.998000	45.70	0.3	56	10.3	QP	L1	GND	ON
5.522000	48.10	0.4	60	11.9	QP	L1	GND	ON

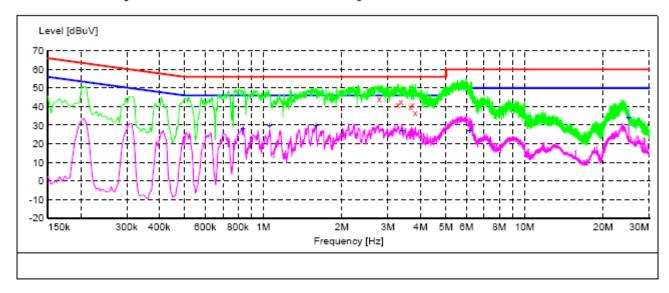
### MEASUREMENT RESULT

Frequency	Level	Transd	Limit	Margin	Detector	Line	PE	AUX STATE
MHz	dBuV	dB	dBuV	dB				
0.518000	27.60	0.2	46	18.4	AV	L1	GND	ON
0.710000	25.40	0.2	46	20.6	AV	L1	GND	ON
1.062000	29.90	0.2	46	16.1	AV	L1	GND	ON
2.230000	30.40	0.3	46	15.6	AV	L1	GND	ON
11.774000	20.40	0.5	50	29.6	AV	L1	GND	ON
23.666000	29.80	0.8	50	20.2	AV	L1	GND	ON

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## Line Conducted Emission Test Line 2-N

SCAN TABLE: "Voltage (150K-30M) FIN"
Short Description: 9k-30M Voltage



#### MEASUREMENT RESULT

Frequency	Level	Transd	Limit	Margin	Detector	Line	PE	AUX STATE
MHz	dBuV	dB	dBuV	dB				
2.778000	44.20	0.3	56	11.8	QP	N	GND	ON
3.274000	40.90	0.3	56	15.1	QP	N	GND	ON
3.370000	42.90	0.3	56	13.1	QP	N	GND	ON
3.666000	40.20	0.3	56	15.8	QP	N	GND	ON
3.726000	40.80	0.3	56	15.2	QP	N	GND	ON
3.822000	36.60	0.3	56	19.4	QP	N	GND	ON

#### MEASUREMENT RESULT

Frequency	Level	Transd	Limit	Margin	Detector	Line	PE	AUX STATE
MHz	dBuV	dB	dBuV	dB				SIAIE
0.838000 1.058000 1.594000 3.402000 6.170000 25.002000	27.90 29.70 29.90 27.20 27.20 34.30	0.2 0.2 0.2 0.3 0.4	46 46 46 50	18.1 16.3 16.1 18.8 22.8 15.7	AV AV AV AV AV	N N N N N	GND GND GND GND GND GND	ON ON ON ON ON

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# **APPENDIX A: PHOTOGRAPHS OF TEST SETUP**

FCC LINE CONDUCTED EMISSION TEST SETUP



FCC RADIATED EMISSION TEST SETUP



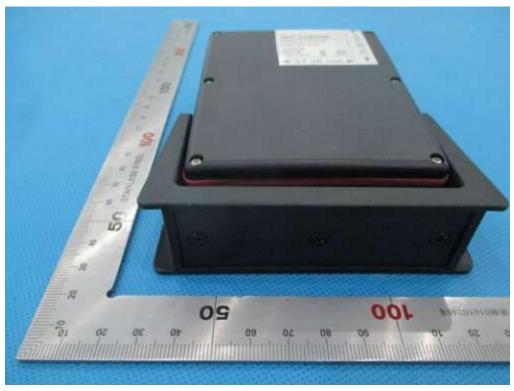
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# **APPENDIX B: PHOTOGRAPHS OF EUT**

TOP VIEW OF EUT



**BOTTOM VIEW OF EUT** 



FRONT VIEW OF EUT



**BACK VIEW OF EUT** 



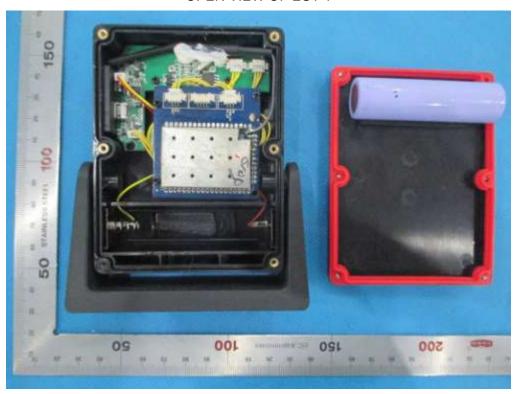
LEFT VIEW OF EUT



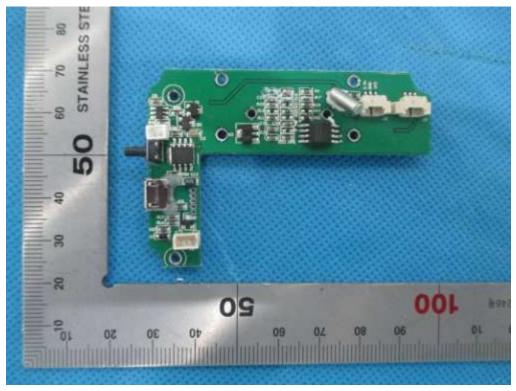
RIGHT VIEW OF EUT



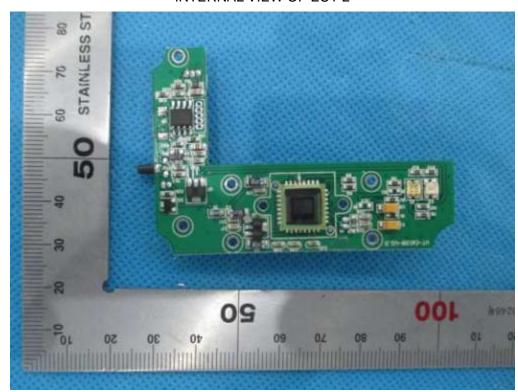
**OPEN VIEW OF EUT-1** 



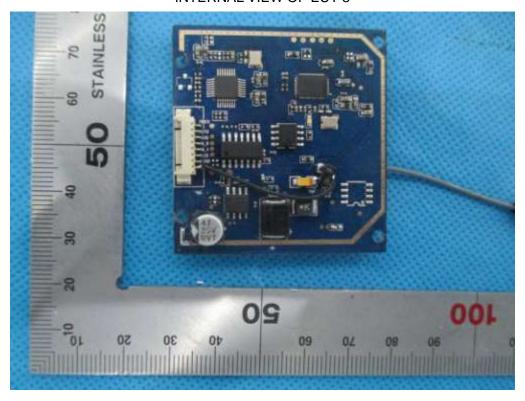
**INTERNAL VIEW OF EUT-1** 



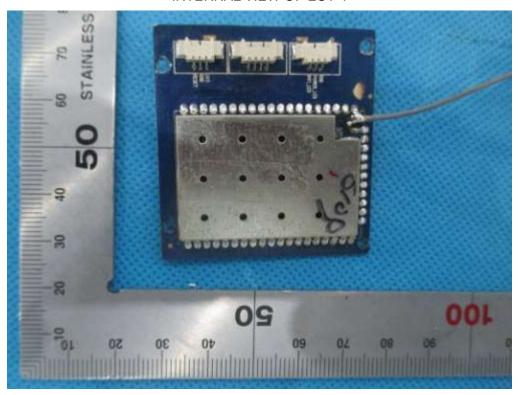
**INTERNAL VIEW OF EUT-2** 



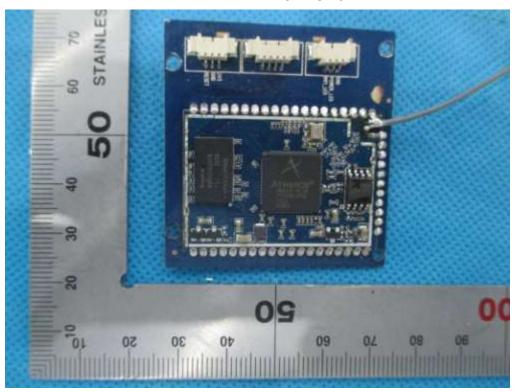
**INTERNAL VIEW OF EUT-3** 



# **INTERNAL VIEW OF EUT-4**



**INTERNAL VIEW OF EUT-5** 



----END OF REPORT----