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## FCC TEST REPORT

Report No: STS1503041F01

Issued for

Product Name:	Wireless AC600 Dual-Band USB Mini Adapter
Brand Name:	IOGEAR
Model No.:	GWU635
FCC ID:	QLE-GWU635
Test Standard:	FCC Part 15, Subpart B

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## TEST RESULT CERTIFICATION

**Applicant's name**.....: ATEN Technology, Inc., dba IOGEAR  
**Address** .....: 19641 Da Vinci, Foothill Ranch, CA 92610  
**Manufacture's Name** .....: Winstars Technology Limited  
**Address** .....: Block 4, Taisong Industrial Park, Dalang Street, Longhua Town,  
Bao'an District, Shenzhen, China

### Product description

**Product name** .....: Wireless AC600 Dual-Band USB Mini Adapter  
**Model and/or type reference** ..: GWU635

**Standards** .....: FCC Part 15, Subpart B

**Test procedure**.....: ANSI C63.10-2009

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

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**Date of Test**.....:

**Date (s) of performance of tests** .....: 10 Feb . 2015 ~11 March . 2015

**Date of Issue**.....: 12 March. 2015

**Test Result** .....: **Pass**

Testing Engineer :

(Tony Liu)

Technical Manager :

(Vita Li)

Authorized Signatory :

(Bovey Yang)





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## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 , Subpart B			
Standard Section	Test Item	Judgment	Remark
15.107	Conducted Emission	PASS	
15.109	Radiated Emission	PASS	

### 1.1 TEST FACILITY

Shenzhen STS Test Services Co., Ltd.

Add. : 1/F, Building 2, Zhuoke Science Park, Chongqing Road, Fuyong, Bao'an District, Shenzhen, China.

FCC Registration No.: 842334; IC Registration No.: 12108A-1

### 1.2 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
3	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
4	Temperature	$\pm 0.5^{\circ}\text{C}$
5	Humidity	$\pm 2\%$



## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless AC600 Dual-Band USB Mini Adapter
Trade Name	IOGEAR
Model Name	GWU635
Product Description	The EUT is a wireless USB Mini Adapter
Ratings	DC 5V from USB Port
Hardware version number	N/A
Software versioning number	N/A
Connecting I/O Port(s)	Please refer to the User's Manual



## 2.2 DESCRIPTION OF TEST MODES

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

Pretest Mode	Description
Mode 1	Connected to PC for data exchanging

For Conducted Emission	
Final Test Mode	Description
Mode 1	Connected to PC for data exchanging

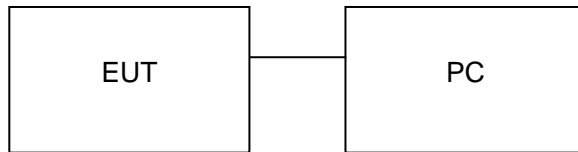
For Radiated Emission	
Final Test Mode	Description
Mode 1	Connected to PC for data exchanging





## 2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TEST

**Configure:**



## 2.4 DESCRIPTION OF SUPPORT UNITS

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

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Wireless AC600 Dual-Band USB Mini Adapter	IOGEAR	GWU635	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	YES	1.5m	

**Note:**

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



## 2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

## Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Spectrum Analyzer	Agilent	E4407B	MY50140340	2014.10.25	2015.10.24
Test Receiver	R&S	ESCI	101427	2014.10.25	2015.10.24
Bilog Antenna	TESEQ	CBL6111D	34678	2014.10.27	2015.10.26
Horn Antenna	R&S	9120D	152265	2014.10.27	2015.10.26
Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2014.07.06	2015.07.05
Amplifier	Agilent	8449B	60538	2014.10.25	2015.10.24
Loop Antenna	ARA	PLA-1030/B	1029	2014.06.08	2015.06.07
Power Meter	Anritsu	ML2495A	1204003	2014.10.25	2015.10.24
Power Sensor	Anritsu	MA2411B	100309	2014.10.25	2015.10.24
Low frequency cable	N/A	R01	N/A	2014.10.25	2015.10.24
High frequency cable	N/A	R02	N/A	2014.10.25	2015.10.24

## Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	102086	2014.10.25	2015.10.24
LISN	R&S	ENV216	101242	2014.10.25	2015.10.24
LISN	EMCO	3810/2NM	000-23625	2014.10.25	2015.10.24
Conduction Cable	HUBER+SU HNER	C01	N/A	2014.10.25	2015.10.24





### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

Operating frequency band. In case the emission fall within the restricted band specified on Part 15.247&207(a) limit in the table below has to be followed.

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

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

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

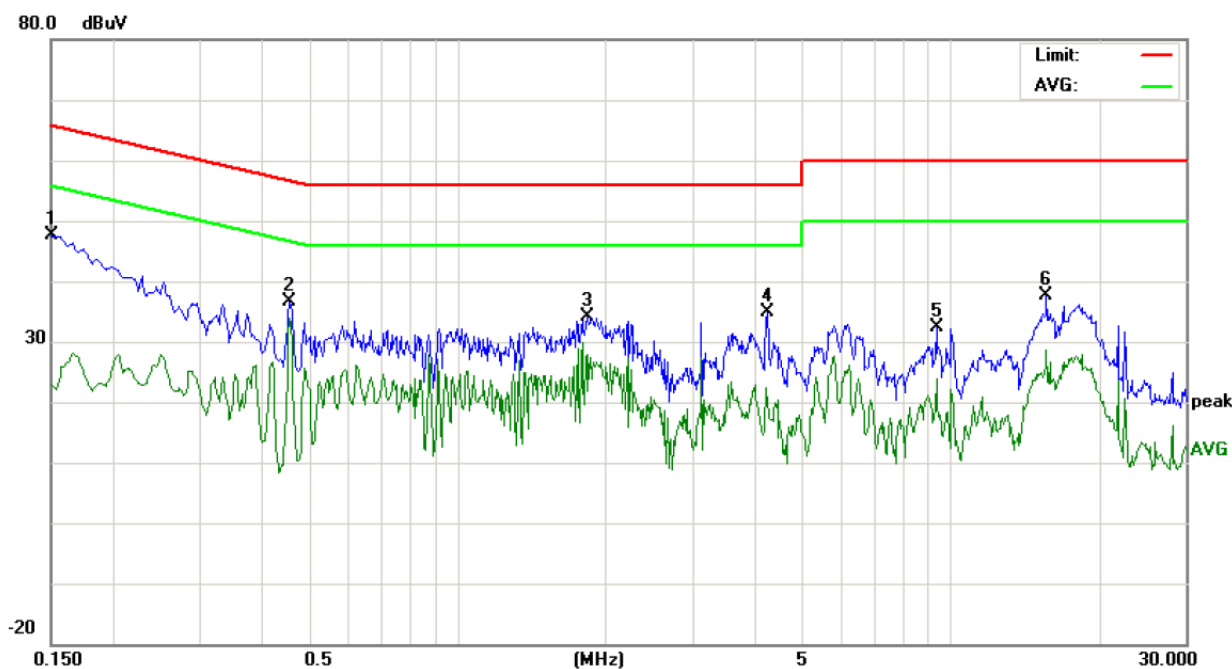
The following table is the setting of the receiver

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



## 3.1.2 TEST RESULTS

EUT:	Wireless AC600 Dual-Band USB Mini Adapter	Model Name. :	GWU635
Temperature :	23 °C	Relative Humidity :	50%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V	Test Mode :	Mode 1



Site: Conduction

Phase: **L1**

Temperature: 26

Limit: FCC Class B Conduction(QP)

Power: AC 120V/60Hz

Humidity: 60 %

EUT: Wireless AC600 Dual-Band USB Mini Adapter

M/N: GWU635

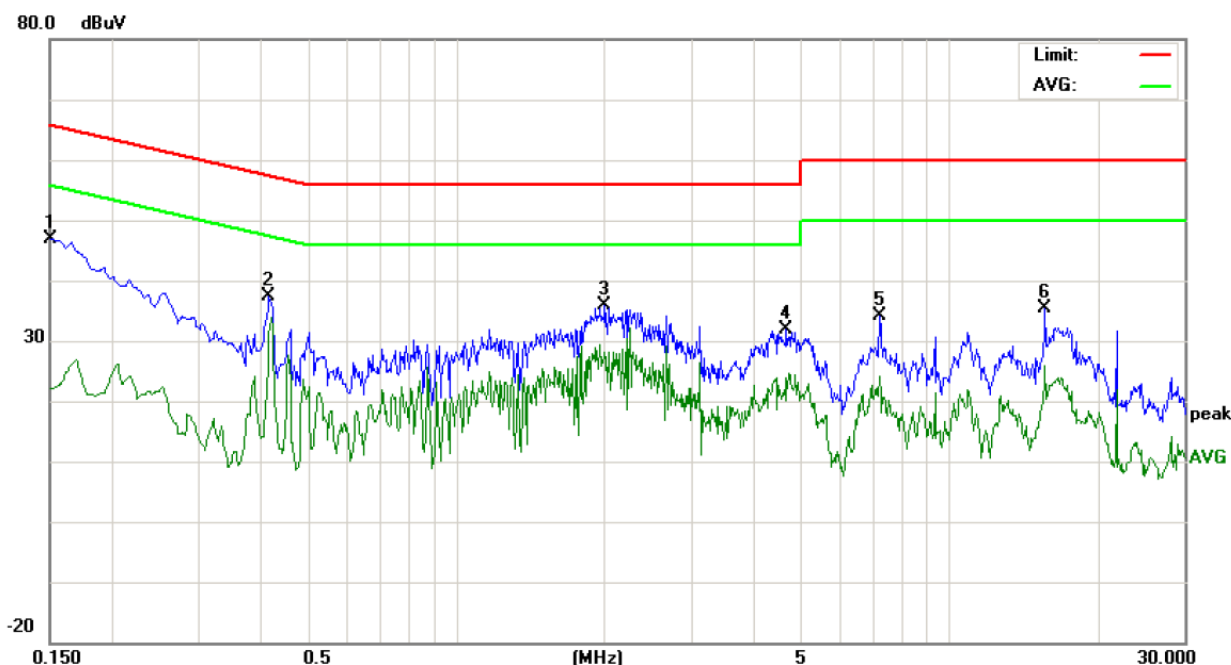
Mode: Mode 1

Note:

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1500	37.36		12.83	10.16	47.52		22.99	65.99	55.99	-18.47	-33.00	P	
2	0.4580	26.29		23.54	10.37	36.66		33.91	56.73	46.73	-20.07	-12.82	P	
3	1.8300	23.76		17.61	10.27	34.03		27.88	56.00	46.00	-21.97	-18.12	P	
4	4.2500	24.62		9.57	10.32	34.94		19.89	56.00	46.00	-21.06	-26.11	P	
5	9.3820	21.96		13.60	10.34	32.30		23.94	60.00	50.00	-27.70	-26.06	P	
6	15.6380	27.56		18.47	10.11	37.67		28.58	60.00	50.00	-22.33	-21.42	P	



EUT:	Wireless AC600 Dual-Band USB Mini Adapter	Model Name. :	GWU635
Temperature :	23 °C	Relative Humidity :	50%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V	Test Mode :	Mode 1



Site: Conduction

Phase: **N**

Temperature: 26

Limit: FCC Class B Conduction(QP)

Power: AC 120V/60Hz

Humidity: 60 %

EUT: Wireless AC600 Dual-Band USB Mini Adapter

M/N: GWU635

Mode: Mode 1

Note:

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1500	36.73		11.96	10.16	46.89		22.12	65.99	55.99	-19.10	-33.87	P	
2	0.4180	27.07		21.09	10.34	37.41		31.43	57.49	47.49	-20.08	-16.06	P	
3	2.0100	25.56		17.93	10.22	35.78		28.15	56.00	46.00	-20.22	-17.85	P	
4	4.6820	21.70		13.64	10.22	31.92		23.86	56.00	46.00	-24.08	-22.14	P	
5	7.2500	23.79		13.83	10.34	34.13		24.17	60.00	50.00	-25.87	-25.83	P	
6	15.6420	25.27		15.86	10.11	35.38		25.97	60.00	50.00	-24.62	-24.03	P	



### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 RADIATED EMISSION LIMITS

##### FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak
Start Frequency	1000 MHz (Peak/AV)
Stop Frequency	10th carrier harmonic(Peak/AV)
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=1 MHz / 10Hz

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

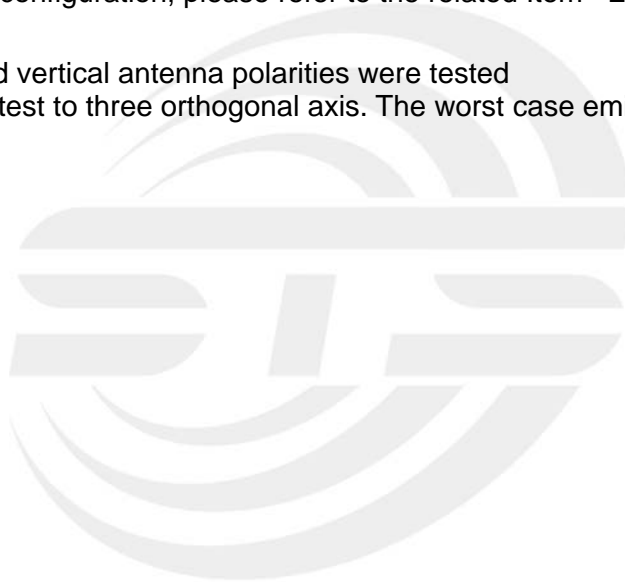


### 3.2.2 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

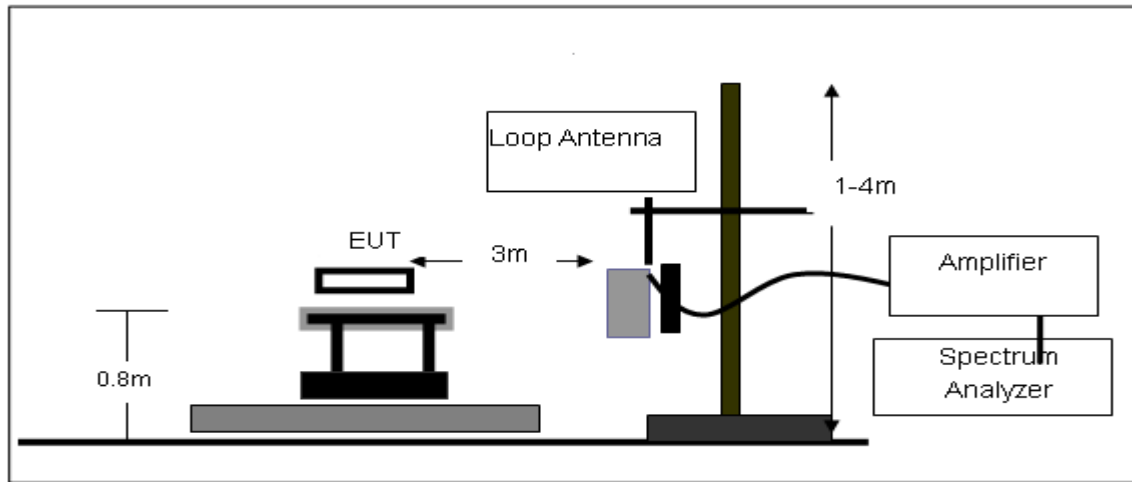
Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

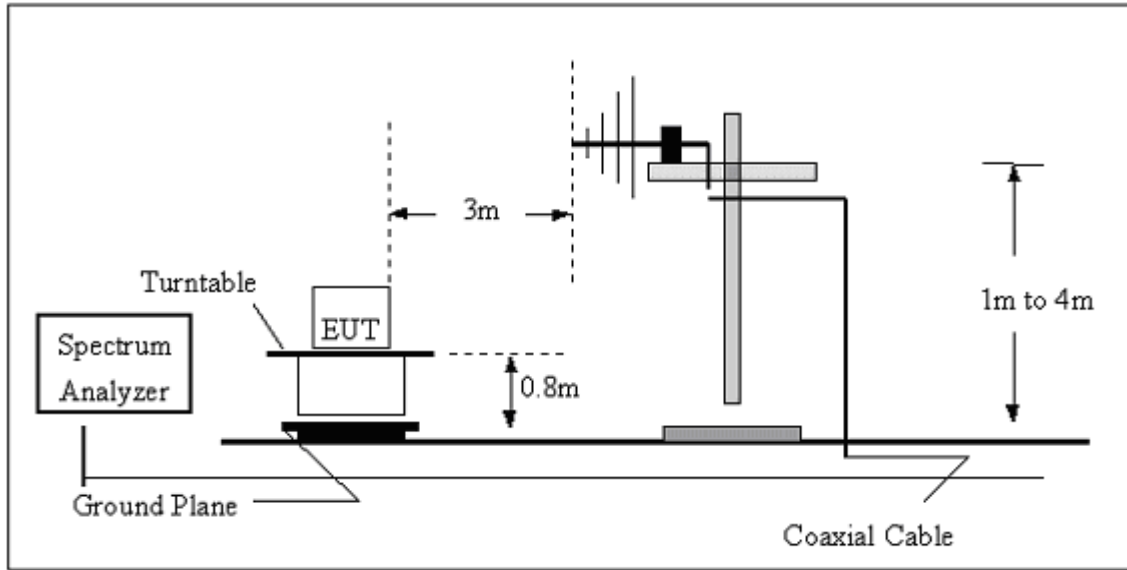


### 3.2.3 TEST SETUP

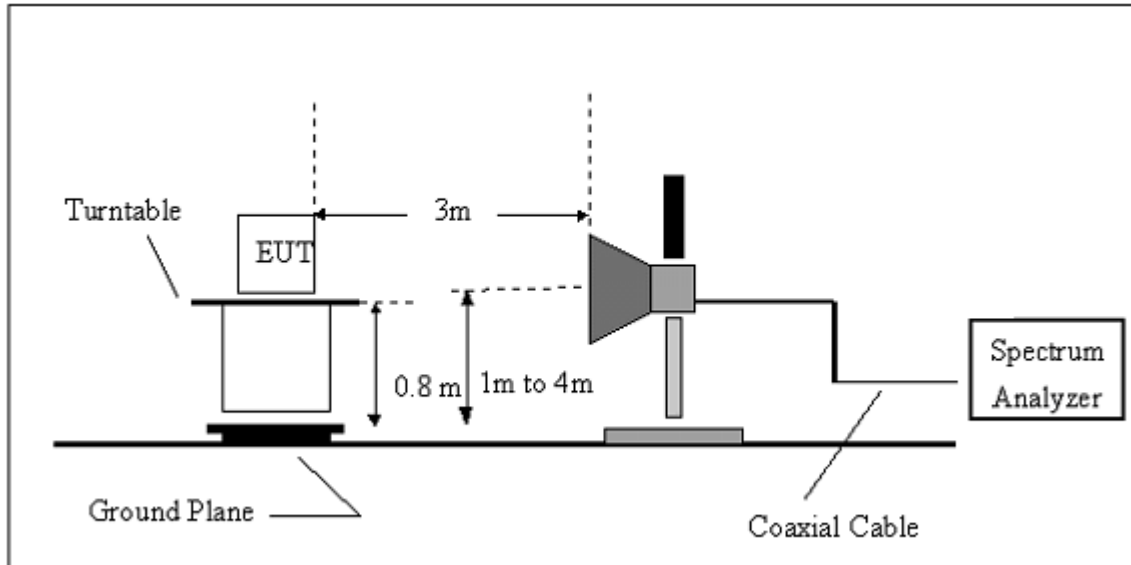
#### (A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



### 3.2.4 EUT OPERATING CONDITIONS

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



## 3.2.5 TEST RESULT

9KHz-30MHz

EUT:	Wireless AC600 Dual-Band USB Mini Adapter	Model Name. :	GWU635
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 5V
Test Mode :	Mode 1	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

## NOTE:

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

Distance extrapolation factor =  $40 \log (\text{specific distance}/\text{test distance})(\text{dB})$ ;

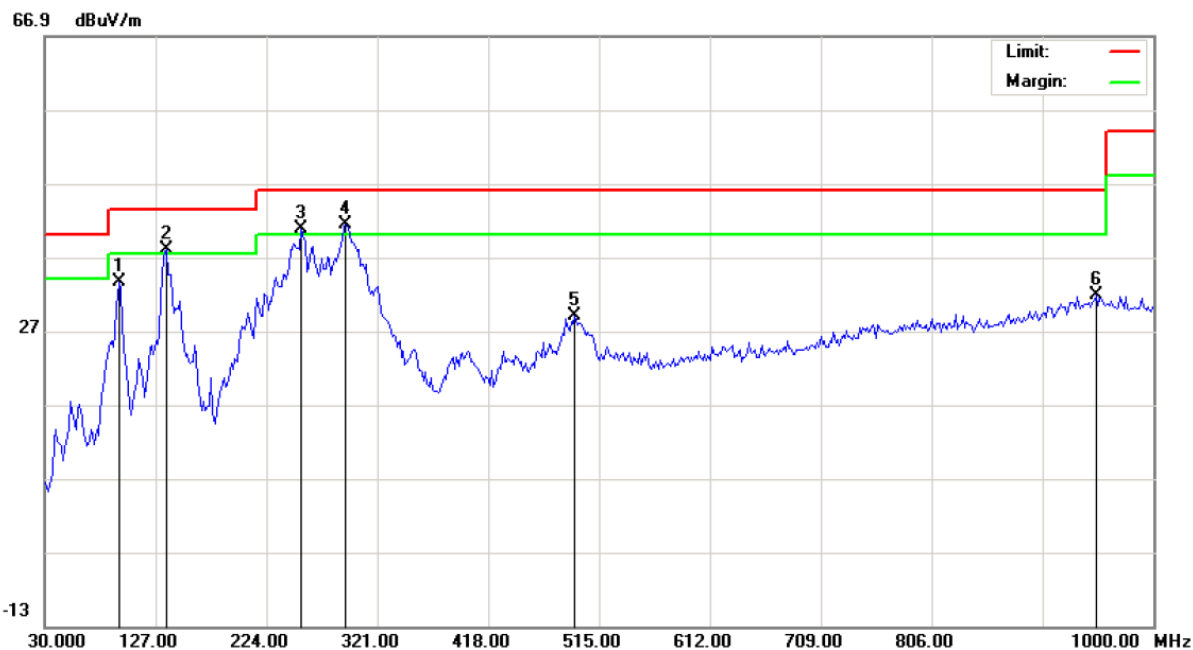
Limit line = specific limits(dBuv) + distance extrapolation factor.





30MHz - 1000MHz

EUT :	Wireless AC600 Dual-Band USB Mini Adapter	Model Name. :	GWU635
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V
Test Mode :	Mode 1	Polarization :	Horizontal



Site: site #1

Polarization: **Horizontal**

Temperature: 26

Limit: FCC Class B 3M Radiation

Power: DC 5V

Humidity: 60 %

EUT: Wireless AC600 Dual-Band USB Mini Adapter Distance:

M/N: GWU635

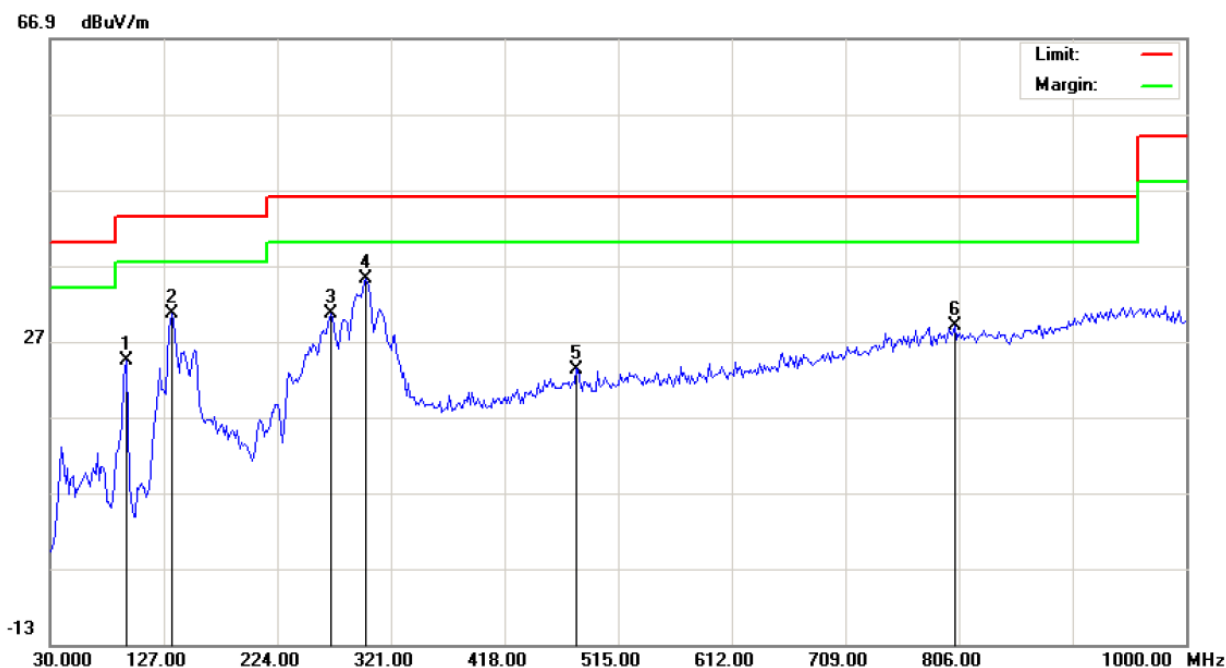
Mode: Mode 1

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		94.6667	23.76	9.89	33.65	43.50	-9.85	peak			
2	!	136.7000	23.43	14.65	38.08	43.50	-5.42	peak			
3	!	254.7167	26.69	14.04	40.73	46.00	-5.27	peak			
4	*	293.5167	26.25	15.21	41.46	46.00	-4.54	peak			
5		493.9833	7.85	21.07	28.92	46.00	-17.08	peak			
6		949.8833	1.90	30.00	31.90	46.00	-14.10	peak			



EUT :	Wireless AC600 Dual-Band USB Mini Adapter	Model Name. :	GWU635
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V
Test Mode :	Mode 1	Polarization :	Vertical



Site: site #1 Polarization: **Vertical** Temperature: 26  
Limit: FCC Class B 3M Radiation Power: DC 5V Humidity: 60 %  
EUT: Wireless AC600 Dual-Band USB Mini Adapter Distance:  
M/N: GWU635  
Mode: Mode 1  
Note:

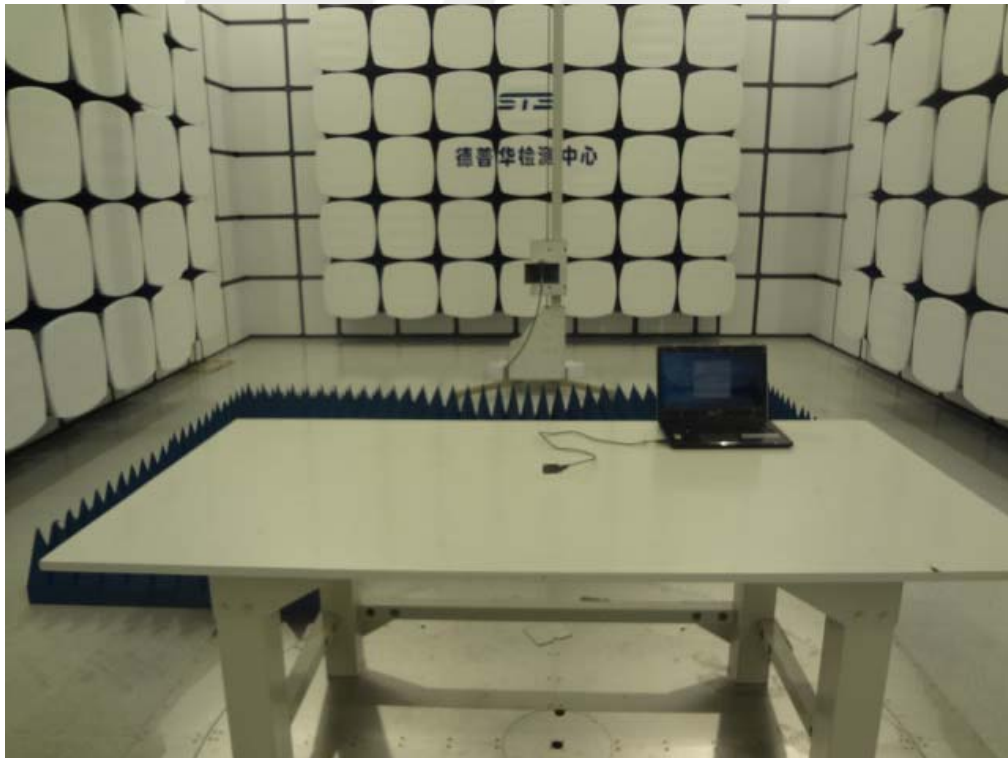
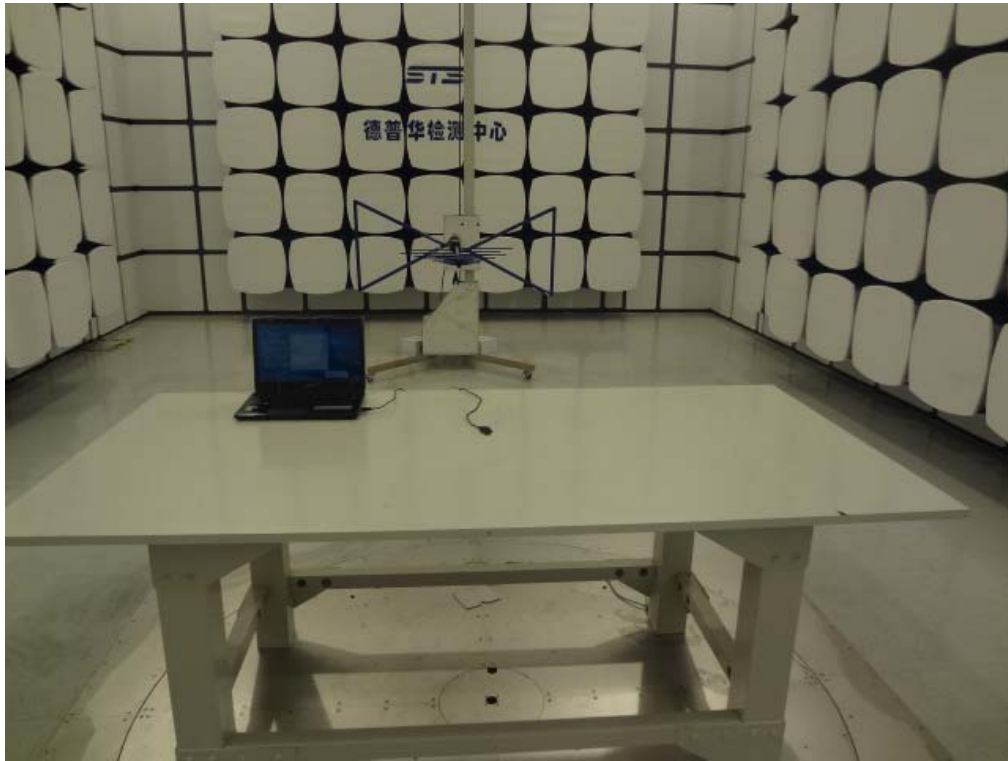
No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		94.6667	23.03	1.42	24.45	43.50	-19.05	peak			
2		133.4667	18.11	12.48	30.59	43.50	-12.91	peak			
3		269.2667	16.07	14.48	30.55	46.00	-15.45	peak			
4	*	299.9833	19.79	15.41	35.20	46.00	-10.80	peak			
5		479.4333	2.39	20.91	23.30	46.00	-22.70	peak			
6		802.7667	1.74	27.32	29.06	46.00	-16.94	peak			

## RESULT: PASS

Note: The data above 1GHz have more than 20db margin, no recording in the report

Measurement = Reading + Factor, Over = Measurement – Limit.

## APPENDIX - PHOTOS OF TEST SETUP

**Radiated Measurement Photos**

### Conducted Measurement Photos

