# RADIO TEST REPORT

Report No: STS1706154W03

Issued for

XTR S.A.C.

### Av. Camino Real 1225 Of 201-A San Isidro Lima, Peru

Product Name:	3G Smartphone	
Brand Name:	EKS	
Model Name:	X4U+	
Series Model:	N/A	
FCC ID:	2AGAK-X4UP	
Test Standard:	FCC Part 15.247	

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### **TEST RESULT CERTIFICATION**

Applicant's name:	XTR S.A.C.
Address:	Av. Camino Real 1225 Of 201-A San Isidro Lima, Peru
Manufacture's Name:	Encorp Limited
Address:	FLAT/RM 5 , BLK B , 14/F WAH HEN COMMERCIAL CENTRE 383 HENNESSY ROAD, WANCHAI , HK
Product description	, , , , , , , , , , , , , , , , , , , ,
Product name:	3G Smartphone
Model and/or type reference .:	X4U+
Series Model:	N/A
Standards:	FCC Part15.247
Test procedure	. ANSI C63.10-2013
test (EUT) is in compliance with identified in the report. This report shall not be reproduct	s been tested by BZT, the test results show that the equipment under the FCC requirements. And it is applicable only to the tested sample sed except in full, without the written approval of BZT, this document T, personal only, and shall be noted in the revision of the document
Date of Test	
Date (s) of performance of tests.	
Date of Issue	,
Test Result	5. 54.ij. <u>-</u> 5
Testing Engine	
	(Sean she)
Technical Mar	hager: hatim. hou
	(Hakim.hou)
Authorized Siç	gnatory: Mali
	(Vita Li)

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**APPENDIX - PHOTOS OF TEST SETUP** 

### **Revision History**

Rev. Issue Date		Report NO.	Effect Page	Contents
00 07 July. 2017		STS1706154W03	ALL	Initial Issue

#### 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards: KDB 558074 D01 DTS Meas Guidance v04

FCC Part 15.247,Subpart C			
Standard Section	Judgment	Remark	
15.207	Conducted Emission	PASS	
15.247 (a)(2)	6dB Bandwidth	PASS	
15.247 (b)(3) Output Power		PASS	
15.247 (c) Radiated Spurious Emission		PASS	
15.247 (d)	Conducted Spurious & Band Edge Emission	PASS	
15.247 (e) Power Spectral Density		PASS	
15.205	Restricted Band Edge Emission	PASS	
Part 15.247(d)/part 15.209(a)	Band Edge Emission	PASS	
15.203	Antenna Requirement	PASS	

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#### NOTE:

- (1)" N/A" denotes test is not applicable in this Test Report
- (2) all tests are according to ANSI C63.10-2013.

#### 1.1 TEST FACTORY

BZT Testing Technology Co., Ltd.

Add.: Buliding 17, Xinghua Road Xingwei industrial Park Fuyong,

Baoan District, Shenzhen, Guangdong, China

FCC Registration No.: 701733

#### 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 %  $^{\circ}$ 

No.	Item	Uncertainty
1	Conducted Emission (9KHz-150KHz)	±2.88dB
2	Conducted Emission (150KHz-30MHz)	±2.67dB
3	RF power,conducted	±0.70dB
4	Spurious emissions,conducted	±1.19dB
5	All emissions,radiated(<30M) (9KHz-30MHz)	±2.45dB
6	All emissions,radiated(<1G) 30MHz-200MHz	±2.83dB
7	All emissions,radiated(<1G) 200MHz-1000MHz	±2.94dB
8	All emissions,radiated(>1G)	±3.03dB
9	Temperature	±0.5°C
10	Humidity	±2%

### 2. GENERAL INFORMATION

#### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	3G Smartphone			
Trade Name	EKS			
Model Name	X4U+			
Series Model	N/A			
Model Difference	N/A			
	The EUT is a 3G Sm	nartphone		
	Operation Frequency:	802.11b/g/n 20: 2412~2462 MHz		
	Modulation Type:	CCK/BPSK/QPSK/16QAM		
Product Description	Bit Rate of Transmitter:	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6 Mbps 802.11n(20MHz): 65/58.5/52/39/26/19.5/13/6.5 Mbps		
	Number Of Channel:	802.11b/g/n20: 11CH		
	Antenna Designation:	Please see Note 3.		
	Antenna Gain(dBi): 0.95dBi			
	Duty Cycle:	>98%		
Adapter	Input: AC 100-240V, 500mA, 50/60 Hz Output: DC 5V, 500mA			
Battery	Rated Voltage: 3.8V	,		
Battery	Capacity: 1500mAh			
Channel List	Please refer to the Note 2.			
Hardware version number	FS280-MB-V0.1			
Software version number	N/A.			
Connecting I/O Port(s)	Please refer to the User's Manual			

#### Note:

1 For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

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802.11b/g/n(20MHz)			
Channel	Frequency		
01	2412		
02	2417		
03	2422		
04	2427		
05	2432		
06	2437		
07	2442		
08	2447		
09	2452		
10	2457		
11	2462		

#### 3 Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Carrier Frequency Channel

#### 2.4GHz Test Frequency:

2.4GHz lest Flequency.			
For 802.11b/g/n (HT20)			
Channel	Freq.(MHz)		
01	2412		
06	2437		
11	2462		

3

F	∖nt	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
	1	EKS	X4U+	PIFA Antenna	N/A	0.95	WIFI Antenna

#### 2.2 DESCRIPTION OF TEST MODES

Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Worst Mode	Description	Data Rate
Mode 1	TX IEEE 802.11b CH1	1 Mbps
Mode 2	TX IEEE 802.11b CH6	1 Mbps
Mode 3	TX IEEE 802.11 b CH11	1 Mbps
Mode 4	TX IEEE 802.11g CH1	6 Mbps
Mode 5	TX IEEE 802.11g CH6	6 Mbps
Mode 6	TX IEEE 802.11g CH11	6 Mbps
Mode 7	TX IEEE 802.11n HT20 CH1	MCS 0
Mode 8	TX IEEE 802.11n HT20 CH6	MCS 0
Mode 9	TX IEEE 802.11n HT20 CH11	MCS 0

#### Note:

- (1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported
- (2) We have be tested for all avaiable U.S. voltage and frequencies(For 120V,50/60Hz and 240V, 50/60Hz) for which the device is capable of operation.
- (3) The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

#### AC Conducted Emission

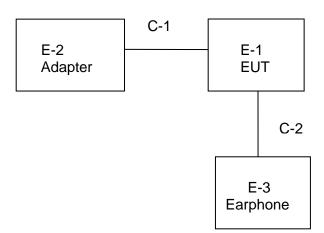
	Test Case			
AC Conducted	Mode 10: Keeping WIELTY			
Emission	Mode10: Keeping WIFI TX			

### 2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

#### Radiation Test Set

E-1 EUT

#### conduction Test Set



#### 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.	Serial No.	Note
E-1	3G Smartphone	EKS	X4U+	N/A	EUT
E-2	Adapter	EKS	X4U+	N/A	EUT
E-3	Earphone	N/A	N/A	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
C-1	USB Cable shielded line (Charging )	NO	100cm	N/A
C-2	Earphone Line	NO	110cm	N/A

#### 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 <code>"Length\_"</code> column.
- (3) "YES" is means "shielded" "with core"; "NO" is means "unshielded" "without core".

#### 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	2017.3.11	2018.3.10
Test Receiver	R&S	ESCI	101427	2016.10.23	2017.10.22
Bilog Antenna	TESEQ	CBL6111D	34678	2017.03.24	2018.03.23
Horn Antenna	Schwarzbeck	BBHA 9120D(1201)	9120D-1343	2017.03.06	2018.03.05
Horn Antenna	Schwarzbeck	BBHA 9170	9170-0741	2017.05.02	2018.05.01
PreAmplifier	Agilent	8449B	60538	2016.10.23	2017.10.22
Loop Antenna	EMCO	6502	9003-2485	N/A	N/A
Low frequency cable	EM	R01	N/A	2017.03.12	2018.03.11
Low frequency cable	EM	R06	N/A	2017.03.12	2018.03.11
High frequency cable	SCHWARZBECK	AK9515H	SN-96286/9628 7	2017.03.12	2018.03.11
Semi-anechoic chamber	Changling	966	N/A	2016.10.23	2017.10.22

### Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESCI	101427	2016.10.23	2017.10.22
LISN	R&S	ENV216	101242	2016.10.26	2017.10.25
LISN	EMCO	3810/2NM	000-23625	2016.10.26	2017.10.25
Conduction Cable	EM	C01	N/A	2017.03.12	2018.03.11
Shielding Room	Changling	854	N/A	2016.10.23	2017.10.22

### **RF Connected Test**

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2016.10.23	2017.10.22
Spectrum Analyzer	Agilent	E4407B	MY50140340	2017.03.11	2018.03.10
Signal Analyzer	Agilent	N9020A	MY49100060	2016.10.23	2017.10.22

#### 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. 207(a) limit in the table below has to be followed.

EDECLIENCY (MIL-)	Conducted Emission limit (dBuV)		
FREQUENCY (MHz)	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	
0.50 -5.0	56.00	46.00	
5.0 -30.0	60.00	50.00	

#### 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.

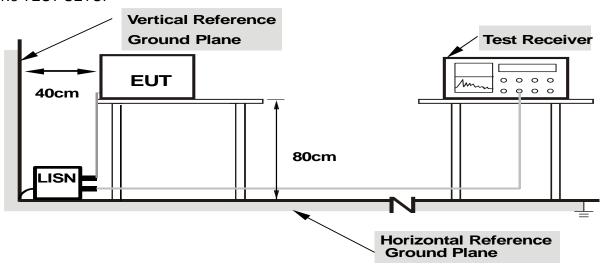
The following table is the setting of the receiver

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

#### 3.1.2 TEST PROCEDURE

- a. The EUT was 0.8 meters from the horizontal ground plane and 0.4 meters from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

#### 3.1.3 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

#### 3.1.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

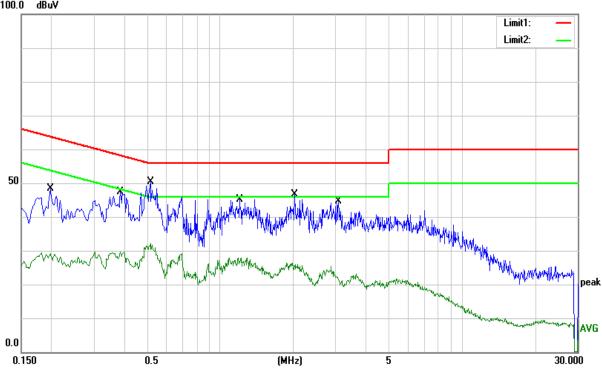
#### 3.1.5 TEST RESULT

Temperature:	<b>24.1</b> ℃	Relative Humidity:	59%
Pressure:	1010hPa	Phase:	L
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 10

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)	Remark
0.1980	39.16	9.23	48.39	63.69	-15.30	QP
0.1980	18.40	9.23	27.63	53.69	-26.06	AVG
0.3860	38.01	9.40	47.41	58.15	-10.74	QP
0.3860	19.83	9.40	29.23	48.15	-18.92	AVG
0.5140	41.15	9.15	50.30	56.00	-5.70	QP
0.5140	21.16	9.15	30.31	46.00	-15.69	AVG
1.1980	36.01	9.17	45.18	56.00	-10.82	QP
1.1980	17.52	9.17	26.69	46.00	-19.31	AVG
2.0260	37.27	9.26	46.53	56.00	-9.47	QP
2.0260	15.89	9.26	25.15	46.00	-20.85	AVG
3.0860	35.43	9.26	44.69	56.00	-11.31	QP
3.0860	11.22	9.26	20.48	46.00	-25.52	AVG

#### Remark:

- 1. All readings are Quasi-Peak and Average values.
  2. Margin = Result (Result = Reading + Factor )—Limit 100.0 dBuV

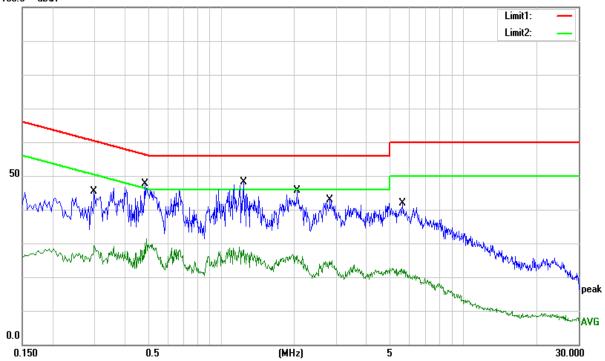


Temperature:	<b>24.1</b> ℃	Relative Humidity:	59%
Pressure:	1010hPa	Phase:	N
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 10

Frequency	Reading	Correct	Result	Limit	Margin	Domork
(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)	Remark
0.2980	36.28	9.13	45.41	60.30	-14.89	QP
0.2980	18.54	9.13	27.67	50.30	-22.63	AVG
0.4820	38.41	9.16	47.57	56.30	-8.73	QP
0.4820	18.68	9.16	27.84	46.30	-18.46	AVG
1.2420	38.95	9.25	48.20	56.00	-7.80	QP
1.2420	17.66	9.25	26.91	46.00	-19.09	AVG
2.0620	36.34	9.26	45.60	56.00	-10.40	QP
2.0620	15.49	9.26	24.75	46.00	-21.25	AVG
2.8220	33.49	9.26	42.75	56.00	-13.25	QP
2.8220	14.17	9.26	23.43	46.00	-22.57	AVG
5.6100	32.57	9.27	41.84	60.00	-18.16	QP
5.6100	12.88	9.27	22.15	50.00	-27.85	AVG

#### Remark:

- 1. All readings are Quasi-Peak and Average values.
  2. Margin = Result (Result = Reading + Factor )—Limit 100.0 dBuV



#### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 RADIATED EMISSION LIMITS

in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205(a)&209(a) limit in the table and according to ANSI C63.10-2013 below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

Envire of 10 (B) (12 B Environment ME) (0.000 Mile 1000 Mile)					
Frequencies	Field Strength	Measurement Distance			
(MHz)	(micorvolts/meter)	(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			

#### LIMITS OF RADIATED EMISSION MEASUREMENT (1000MHz-25GHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)		
FREQUENCT (MINZ)	PEAK	AVERAGE	
Above 1000	74	54	

#### Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

#### For Radiated Emission

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier hamonic(Peak/AV)
RB / VB (emission in restricted	1 MHz /3MHz
band)	i ivinz/3ivinz

#### For Band edge

or Barra dage				
Spectrum Parameter	Setting			
Detector	Peak			
Start/Ston Fraguency	Lower Band Edge: 2300 to 2412 MHz			
Start/Stop Frequency	Upper Band Edge: 2462 to 2500 MHz			
RB / VB (emission in restricted band)	1 MHz /3MHz			

Receiver Parameter	Setting		
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV		
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP		
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV		
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP		
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP		

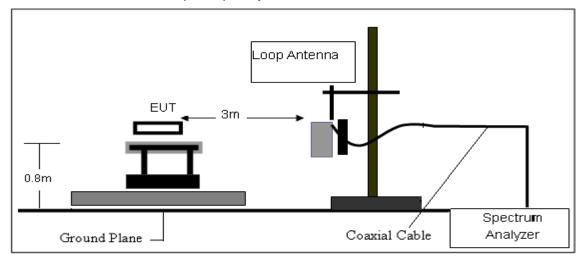
#### 3.2.2 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz
- b. The EUT was placed on the top of a rotating table 0.8 meters(above 1GHz is 1.5 m) above the ground at a 3 meter anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. 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:

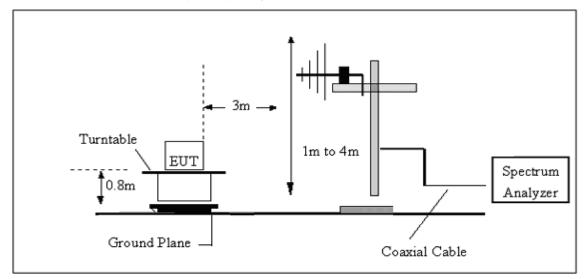
Both horizontal and vertical antenna polarities were tested and performed test to three orthogonal axis. The worst case emissions were reported

#### 3.2.3 TEST SETUP

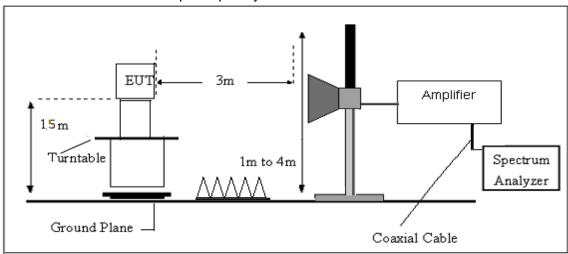
#### (A) Radiated Emission Test-Up Frequency Below 30MHz



#### (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

Temperature:	26 ℃	Relative Humidtity:	60%	
Pressure:	1010 hPa	Test Voltage:	DC 3.8V From Battery	
Test Mode:	TX Mode	Polarization:		

Freq.	Reading	Limit	Margin	State	Test
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F	Result
					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 (specific distance/test distance)(dB);

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

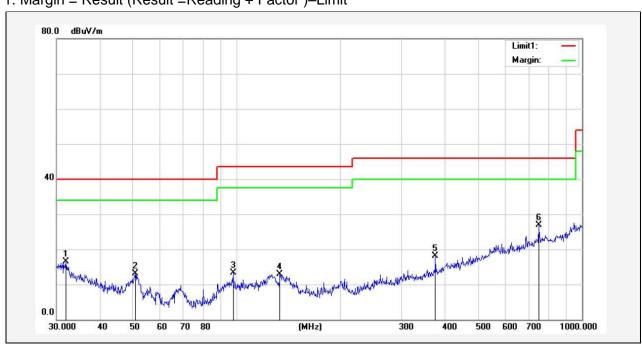
(30MHz - 1000MHz)

Temperature:	26 ℃	Relative Humidtity:	60%
Pressure:	1010 hPa	Test Voltage:	DC 3.8V From Battery
LIACT IVIDAD.	Mode 1/2/3/4/5/6/7/8/9 (Mode 3-1M worst mode)	Polarization:	Horizontal

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
31.9546	28.74	-12.20	16.54	40.00	-23.46	QP
50.7637	34.85	-21.70	13.15	40.00	-26.85	QP
97.4560	32.77	-19.44	13.33	43.50	-30.17	QP
133.1511	30.50	-17.54	12.96	43.50	-30.54	QP
375.9385	30.76	-12.73	18.03	46.00	-27.97	QP
750.1083	30.46	-3.56	26.90	46.00	-19.10	QP

#### Remark:

1. Margin = Result (Result = Reading + Factor )—Limit



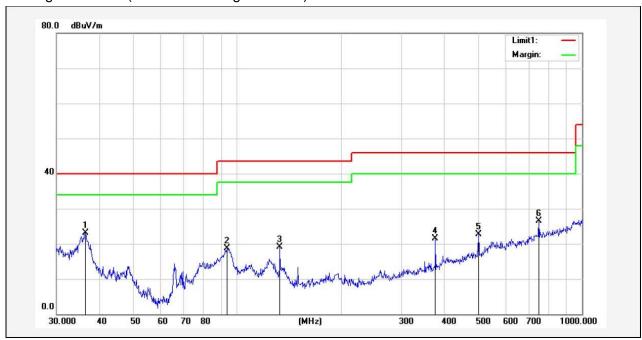
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Temperature:	26 ℃	Relative Humidtity:	60%
Pressure:	1010 hPa	Test Voltage:	DC 3.8V From Battery
LIDGE IVIDAD.	Mode 1/2/3/4/5/6/7/8/9 (Mode 3-1M worst mode)	Polarization:	Vertical

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
36.3814	37.64	-14.47	23.17	40.00	-16.83	QP
93.4402	38.57	-19.85	18.72	43.50	-24.78	QP
133.1511	36.58	-17.54	19.04	43.50	-24.46	QP
375.9385	34.25	-12.73	21.52	46.00	-24.48	QP
501.1790	31.67	-8.90	22.77	46.00	-23.23	QP
750.1083	30.00	-3.56	26.44	46.00	-19.56	QP

### Remark:.

1. Margin = Result (Result = Reading + Factor )-Limit



### (1000MHz-25GHz) Restricted band and Spurious emission Requirements

### 802.11b Low Channel

				Antenna	Corrected	Emission				
Frequency	Reading	Amplifier	Loss	Factor	Factor	Level	Limits	Margin	Detector	
(MHz)	(dBµV)	(dB)	(dB)	(dB/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	Comment
Low Channel (2412 MHz)										
3264.90	48.62	44.70	6.70	28.20	-9.80	38.82	74.00	-35.18	PK	Vertical
3264.90	38.59	44.70	6.70	28.20	-9.80	28.79	54.00	-25.21	AV	Vertical
3264.57	47.79	44.70	6.70	28.20	-9.80	37.99	74.00	-36.01	PK	Horizontal
3264.57	39.04	44.70	6.70	28.20	-9.80	29.24	54.00	-24.76	AV	Horizontal
4824.48	58.90	44.20	9.04	31.60	-3.56	55.34	74.00	-18.66	PK	Vertical
4824.48	38.14	44.20	9.04	31.60	-3.56	34.58	54.00	-19.42	AV	Vertical
4824.34	59.48	44.20	9.04	31.60	-3.56	55.92	74.00	-18.08	PK	Horizontal
4824.34	39.14	44.20	9.04	31.60	-3.56	35.58	54.00	-18.42	AV	Horizontal
5359.87	45.28	44.20	9.86	32.00	-2.34	42.94	74.00	-31.06	PK	Vertical
5359.87	37.95	44.20	9.86	32.00	-2.34	35.61	54.00	-18.39	AV	Vertical
5359.86	45.22	44.20	9.86	32.00	-2.34	42.88	74.00	-31.12	PK	Horizontal
5359.86	37.98	44.20	9.86	32.00	-2.34	35.64	54.00	-18.36	AV	Horizontal
7235.75	51.89	43.50	11.40	35.50	3.40	55.29	74.00	-18.71	PK	Vertical
7235.75	33.38	43.50	11.40	35.50	3.40	36.78	54.00	-17.22	AV	Vertical
7235.70	51.76	43.50	11.40	35.50	3.40	55.16	74.00	-18.84	PK	Horizontal
7235.70	33.73	43.50	11.40	35.50	3.40	37.13	54.00	-16.87	AV	Horizontal
11035.88	41.14	43.60	14.30	39.50	10.20	51.34	74.00	-22.66	PK	Vertical
11035.88	30.12	43.60	14.30	39.50	10.20	40.32	54.00	-13.68	AV	Vertical
11036.13	41.08	43.60	14.30	39.50	10.20	51.28	74.00	-22.72	PK	Horizontal
11036.13	30.69	43.60	14.30	39.50	10.20	40.89	54.00	-13.11	AV	Horizontal
13299.30	40.63	42.60	15.90	38.90	12.20	52.83	74.00	-21.17	PK	Vertical
13299.30	28.54	42.60	15.90	38.90	12.20	40.74	54.00	-13.26	AV	Vertical
13299.39	40.90	42.60	15.90	38.90	12.20	53.10	74.00	-20.90	PK	Horizontal
13299.39	29.98	42.60	15.90	38.90	12.20	42.18	54.00	-11.82	AV	Horizontal
15999.94	40.90	42.70	18.00	37.10	12.40	53.30	74.00	-20.70	PK	Vertical
15999.94	28.64	42.70	18.00	37.10	12.40	41.04	54.00	-12.96	AV	Vertical
15999.84	40.43	42.70	18.00	37.10	12.40	52.83	74.00	-21.17	PK	Horizontal
15999.84	29.41	42.70	18.00	37.10	12.40	41.81	54.00	-12.19	AV	Horizontal
17997.79	29.92	42.70	19.40	46.50	23.20	53.12	74.00	-20.88	PK	Vertical
17997.79	20.21	42.70	19.40	46.50	23.20	43.41	54.00	-10.59	AV	Vertical
17997.70	30.19	42.70	19.40	46.50	23.20	53.39	74.00	-20.61	PK	Horizontal
17997.70	18.15	42.70	19.40	46.50	23.20	41.35	54.00	-12.65	AV	Horizontal

## 802.11b Mid Channel

				Antenna	Corrected	Emission				
Frequency	Reading	Amplifier	Loss	Factor	Factor	Level	Limits	Margin	Detector	
(MHz)	(dBµV)	(dB)	(dB)	(dB/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	Comment
Mid Channel (2437 MHz)										
3264.64	48.89	44.70	6.70	28.20	-9.80	39.09	74.00	-34.91	PK	Vertical
3264.64	38.00	44.70	6.70	28.20	-9.80	28.20	54.00	-25.80	AV	Vertical
3264.58	48.76	44.70	6.70	28.20	-9.80	38.96	74.00	-35.04	PK	Horizontal
3264.58	39.03	44.70	6.70	28.20	-9.80	29.23	54.00	-24.77	AV	Horizontal
4874.56	59.59	44.20	9.04	31.60	-3.56	56.03	74.00	-17.97	PK	Vertical
4874.56	38.91	44.20	9.04	31.60	-3.56	35.35	54.00	-18.65	AV	Vertical
4874.61	59.31	44.20	9.04	31.60	-3.56	55.75	74.00	-18.25	PK	Horizontal
4874.61	39.31	44.20	9.04	31.60	-3.56	35.75	54.00	-18.25	AV	Horizontal
5359.67	45.59	44.20	9.86	32.00	-2.34	43.25	74.00	-30.75	PK	Vertical
5359.67	37.95	44.20	9.86	32.00	-2.34	35.61	54.00	-18.39	AV	Vertical
5359.72	46.45	44.20	9.86	32.00	-2.34	44.11	74.00	-29.89	PK	Horizontal
5359.72	37.57	44.20	9.86	32.00	-2.34	35.23	54.00	-18.77	AV	Horizontal
7310.95	50.57	43.50	11.40	35.50	3.40	53.97	74.00	-20.03	PK	Vertical
7310.95	33.38	43.50	11.40	35.50	3.40	36.78	54.00	-17.22	AV	Vertical
7310.90	50.76	43.50	11.40	35.50	3.40	54.16	74.00	-19.84	PK	Horizontal
7310.90	32.98	43.50	11.40	35.50	3.40	36.38	54.00	-17.62	AV	Horizontal
9747.85	40.87	43.60	14.30	39.50	10.20	51.07	74.00	-22.93	PK	Vertical
9747.85	30.45	43.60	14.30	39.50	10.20	40.65	54.00	-13.35	AV	Vertical
9748.15	40.91	43.60	14.30	39.50	10.20	51.11	74.00	-22.89	PK	Horizontal
9748.15	30.19	43.60	14.30	39.50	10.20	40.39	54.00	-13.61	AV	Horizontal
13299.36	40.00	42.60	15.90	38.90	12.20	52.20	74.00	-21.80	PK	Vertical
13299.36	28.54	42.60	15.90	38.90	12.20	40.74	54.00	-13.26	AV	Vertical
13299.26	40.01	42.60	15.90	38.90	12.20	52.21	74.00	-21.79	PK	Horizontal
13299.26	28.82	42.60	15.90	38.90	12.20	41.02	54.00	-12.98	AV	Horizontal
15999.83	40.40	42.70	18.00	37.10	12.40	52.80	74.00	-21.20	PK	Vertical
15999.83	28.64	42.70	18.00	37.10	12.40	41.04	54.00	-12.96	AV	Vertical
15999.63	40.78	42.70	18.00	37.10	12.40	53.18	74.00	-20.82	PK	Horizontal
15999.63	29.27	42.70	18.00	37.10	12.40	41.67	54.00	-12.33	AV	Horizontal
17997.83	30.58	42.70	19.40	46.50	23.20	53.78	74.00	-20.22	PK	Vertical
17997.83	18.90	42.70	19.40	46.50	23.20	42.10	54.00	-11.90	AV	Vertical
17997.77	29.95	42.70	19.40	46.50	23.20	53.15	74.00	-20.85	PK	Horizontal
17997.77	18.67	42.70	19.40	46.50	23.20	41.87	54.00	-12.13	AV	Horizontal

### 802.11b High Channel

002.11b High Chamle										
				Antenna	Corrected	Emission				
Frequency	Reading	Amplifier	Loss	Factor	Factor	Level	Limits	Margin	Detector	
(MHz)	(dBµV)	(dB)	(dB)	(dB/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	Comment
High Channel (2462 MHz)										
3264.89	48.92	44.70	6.70	28.20	-9.80	39.12	74.00	-34.88	PK	Vertical
3264.89	38.96	44.70	6.70	28.20	-9.80	29.16	54.00	-24.84	AV	Vertical
3264.71	48.10	44.70	6.70	28.20	-9.80	38.30	74.00	-35.70	PK	Horizontal
3264.71	38.65	44.70	6.70	28.20	-9.80	28.85	54.00	-25.15	AV	Horizontal
4924.34	58.51	44.20	9.04	31.60	-3.56	54.95	74.00	-19.05	PK	Vertical
4924.34	38.84	44.20	9.04	31.60	-3.56	35.28	54.00	-18.72	AV	Vertical
4924.35	58.46	44.20	9.04	31.60	-3.56	54.90	74.00	-19.10	PK	Horizontal
4924.35	38.53	44.20	9.04	31.60	-3.56	34.97	54.00	-19.03	AV	Horizontal
5359.70	46.12	44.20	9.86	32.00	-2.34	43.78	74.00	-30.22	PK	Vertical
5359.70	38.10	44.20	9.86	32.00	-2.34	35.76	54.00	-18.24	AV	Vertical
5359.67	46.39	44.20	9.86	32.00	-2.34	44.05	74.00	-29.95	PK	Horizontal
5359.67	38.35	44.20	9.86	32.00	-2.34	36.01	54.00	-17.99	AV	Horizontal
7385.75	51.17	43.50	11.40	35.50	3.40	54.57	74.00	-19.43	PK	Vertical
7385.75	33.15	43.50	11.40	35.50	3.40	36.55	54.00	-17.45	AV	Vertical
7385.79	50.69	43.50	11.40	35.50	3.40	54.09	74.00	-19.91	PK	Horizontal
7385.79	33.69	43.50	11.40	35.50	3.40	37.09	54.00	-16.91	AV	Horizontal
9847.99	40.33	43.60	14.30	39.50	10.20	50.53	74.00	-23.47	PK	Vertical
9847.99	30.79	43.60	14.30	39.50	10.20	40.99	54.00	-13.01	AV	Vertical
9848.24	40.06	43.60	14.30	39.50	10.20	50.26	74.00	-23.74	PK	Horizontal
9848.24	30.29	43.60	14.30	39.50	10.20	40.49	54.00	-13.51	AV	Horizontal
13299.16	40.32	42.70	18.00	37.10	12.40	52.72	74.00	-21.28	PK	Vertical
13299.16	28.54	42.70	18.00	37.10	12.40	40.94	54.00	-13.06	AV	Vertical
13299.51	40.70	42.70	18.00	37.10	12.40	53.10	74.00	-20.90	PK	Horizontal
13299.51	29.88	42.70	18.00	37.10	12.40	42.28	54.00	-11.72	AV	Horizontal
17997.93	30.43	42.70	19.40	46.50	23.20	53.63	74.00	-20.37	PK	Vertical
17997.93	19.16	42.70	19.40	46.50	23.20	42.36	54.00	-11.64	AV	Vertical
17997.55	30.45	42.70	19.40	46.50	23.20	53.65	74.00	-20.35	PK	Horizontal
17997.55	18.47	42.70	19.40	46.50	23.20	41.67	54.00	-12.33	AV	Horizontal

### Remark:

- 1. Corrected Factor = Amplifier.-Antenna Factor Cable Loss
- 2. Scan with 802.11b, 802.11g, 802.11n (HT-20) the worst case is 802.11b.

Emission Level = Reading + Factor

Margin = Limit - Emission Leve

3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

3.2.6 TEST RESULTS (Band edge Requirements)

				Antenna	Corrected	Emission				
Frequency	Reading	Amplifier	Loss	Factor	Factor	Level	Limits	Margin	Detector	
(MHz)	(dBµV)	(dB)	(dB)	(dB/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	Comment
					802.11b					
2390.00	68.13	43.80	4.91	25.90	-12.99	55.14	74.00	-18.86	PK	Vertical
2390.00	53.53	43.80	4.91	25.90	-12.99	40.54	54.00	-13.46	AV	Vertical
2390.00	68.43	43.80	4.91	25.90	-12.99	55.44	74.00	-18.56	PK	Horizontal
2390.00	52.44	43.80	4.91	25.90	-12.99	39.45	54.00	-14.55	AV	Horizontal
2483.50	69.65	43.80	5.12	25.90	-12.78	56.87	74.00	-17.13	PK	Vertical
2483.50	52.06	43.80	5.12	25.90	-12.78	39.28	54.00	-14.72	AV	Vertical
2483.50	69.24	43.80	5.12	25.90	-12.78	56.46	74.00	-17.54	PK	Horizontal
2483.50	53.29	43.80	5.12	25.90	-12.78	40.51	54.00	-13.49	AV	Horizontal
802.11g										
2390.00	67.44	43.80	4.91	25.90	-12.99	54.45	74.00	-19.55	PK	Vertical
2390.00	52.30	43.80	4.91	25.90	-12.99	39.31	54.00	-14.69	AV	Vertical
2390.00	65.20	43.80	4.91	25.90	-12.99	52.21	74.00	-21.79	PK	Horizontal
2390.00	53.63	43.80	4.91	25.90	-12.99	40.64	54.00	-13.36	AV	Horizontal
2483.50	65.40	43.80	5.12	25.90	-12.78	52.62	74.00	-21.38	PK	Vertical
2483.50	53.39	43.80	5.12	25.90	-12.78	40.61	54.00	-13.39	AV	Vertical
2483.50	66.44	43.80	5.12	25.90	-12.78	53.66	74.00	-20.34	PK	Horizontal
2483.50	52.61	43.80	5.12	25.90	-12.78	39.83	54.00	-14.17	AV	Horizontal
					802.11n20		1			1
2390.00	67.28	43.80	4.91	25.90	-12.99	54.29	74.00	-19.71	PK	Vertical
2390.00	53.31	43.80	4.91	25.90	-12.99	40.32	54.00	-13.68	AV	Vertical
2390.00	65.77	43.80	4.91	25.90	-12.99	52.78	74.00	-21.22	PK	Horizontal
2390.00	53.37	43.80	4.91	25.90	-12.99	40.38	54.00	-13.62	AV	Horizontal
2483.50	65.44	43.80	5.12	25.90	-12.78	52.66	74.00	-21.34	PK	Vertical
2483.50	53.27	43.80	5.12	25.90	-12.78	40.49	54.00	-13.51	AV	Vertical
2483.50	65.30	43.80	5.12	25.90	-12.78	52.52	74.00	-21.48	PK	Horizontal
2483.50	53.51	43.80	5.12	25.90	-12.78	40.73	54.00	-13.27	AV	Horizontal

Remark: Corrected Factor = Amplifier.-Antenna Factor - Cable Loss.

Low measurement frequencies is range from 2300 to 2412 MHz, high measurement frequencies is range from 2462 to 2500 MHz.

Only show the worst point data of the emissions in the frequency 2300-2412 MHz and 2462-2500 MHz.

#### 4. CONDUCTED SPURIOUS & BAND EDGE EMISSION

#### 4.1 APPLIED PROCEDURES / LIMIT

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

#### **4.2 TEST PROCEDURE**

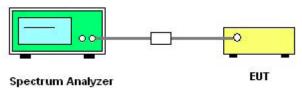
Spectrum Parameter	Setting		
Detector	Peak		
Start/Stop Frequency	30 MHz to 10th carrier harmonic		
RB / VB (emission in restricted band)	100 KHz/300 KHz		
Trace-Mode:	Max hold		

#### For Band edge

Spectrum Parameter	Setting		
Detector	Peak		
Stort/Ston Fraguency	Lower Band Edge: 2300 to 2412 MHz		
Start/Stop Frequency	Upper Band Edge: 2462 to 2500 MHz		
RB / VB (emission in restricted band)	100 KHz/300 KHz		
Trace-Mode:	Max hold		

# 4.3 DEVIATION FROM STANDARD No deviation.

#### 4.4 TEST SETUP



The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 500hm; the path loss as the factor is calibrated to correct the reading.

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

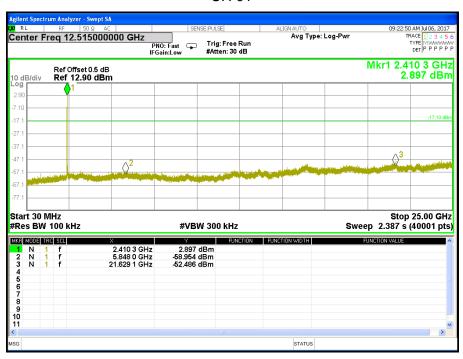
#### 4.5 EUT OPERATION CONDITIONS

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.

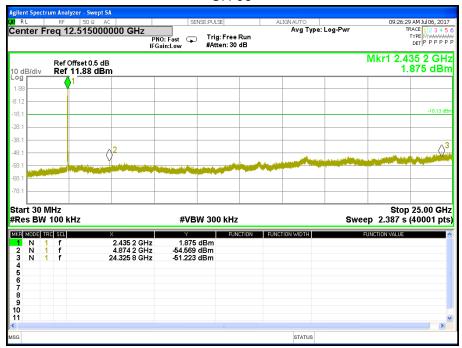
#### 4.6 TEST RESULTS

Temperature:	25 ℃	Relative Humidity:	60%				
Pressure:	1015 hPa	Test Voltage:	DC 3.8V				
Test Mode:	ode: TX b Mode /CH01, CH06, CH11						

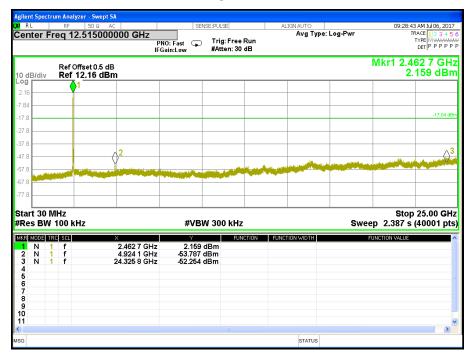
CH 01



CH 06



CH 11



CH 01



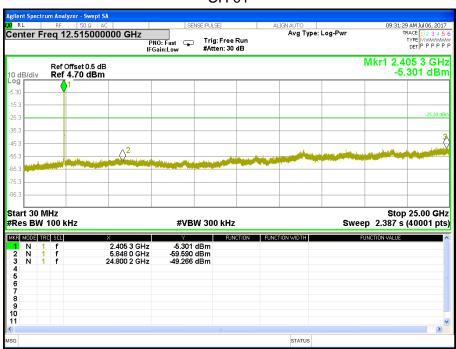
**CH 11** 



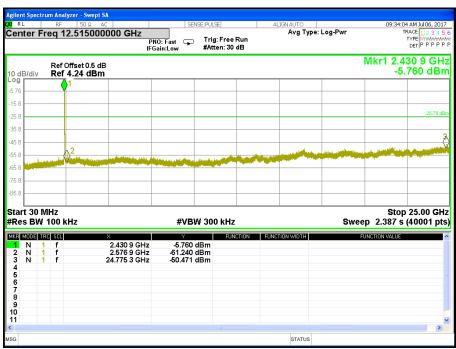
#### Page 32 of 56 Report No.: STS1706154W03

Temperature:	25 ℃	Relative Humidity:	60%			
Pressure:	1015 hPa	Test Voltage:	DC 3.8V			
Test Mode:	TX g Mode /CH01, CH06, CH11					

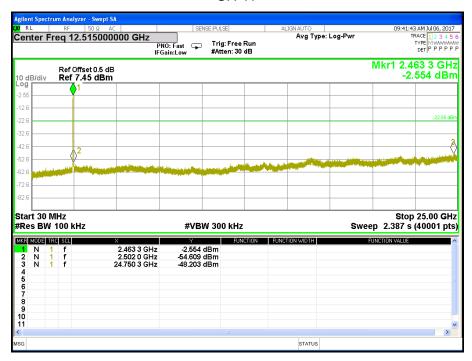
#### CH 01



#### CH06



CH 11



#### Band edge

CH 01



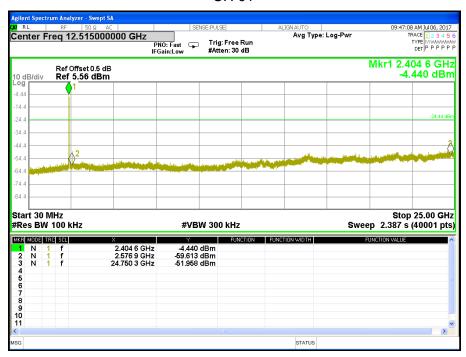
#### CH11



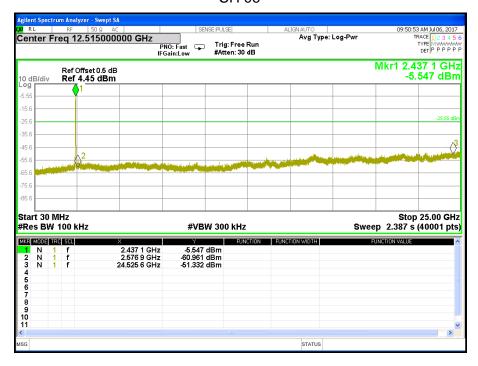
#### Page 35 of 56 Report No.: STS1706154W03

Temperature:	25 ℃	Relative Humidity:	60%				
Pressure:	1015 hPa	Test Voltage:	DC 3.8V				
Test Mode:	TX n Mode(20M) /CH01, CH06, CH11						

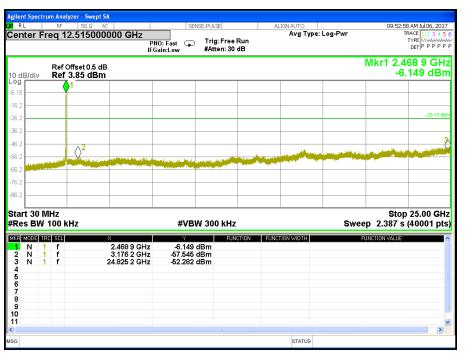
#### CH 01



#### CH 06



CH 11



#### Band edge

#### CH 01



#### CH 11



#### 5. POWER SPECTRAL DENSITY TEST

#### 5.1 APPLIED PROCEDURES / LIMIT

FCC Part15.247 , Subpart C				
Section Test Item Limit Frequency Range (MHz)				Result
15.247(e)	Power Spectral Density	≤8 dBm (RBW ≥ 3KHz)	2400-2483.5	PASS

#### **5.2 TEST PROCEDURE**

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. Set the span to 1.5 times the DTS channel bandwidth.
- 3. Set the 100 kHz  $\geq$  RBW  $\geq$  3 kHz.
- 4. Set the VBW ≥ 3 x RBW.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level.
- 10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

# 5.3 DEVIATION FROM STANDARD No deviation.

5.4 TEST SETUP



#### 5.5 EUT OPERATION 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.

## 5.6 TEST RESULTS

Temperature:	<b>25</b> ℃	Relative Humidity:	60%	
Pressure:	1015 hPa	Test Voltage:	DC 3.8V	
Test Mode:	TX b Mode /CH01, CH06, CH11			

Frequency	Power Density (dBm/3kHz)	Limit (dBm)	Result
2412 MHz	-11.173	≤8	PASS
2437 MHz	-11.601	≤8	PASS
2462 MHz	-10.587	≤8	PASS





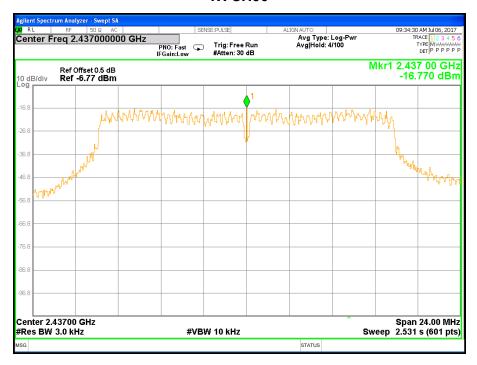


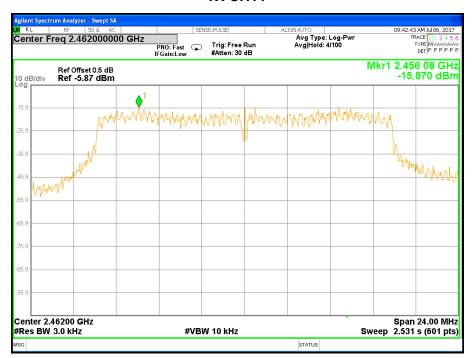
# Page 41 of 56 Report No.: STS1706154W03

Temperature:	25 ℃	Relative Humidity:	60%	
Pressure:	1015 hPa	Test Voltage:	DC 3.8V	
Test Mode:	TX g Mode /CH01, CH06, CH11			

Frequency	Power Density (dBm/3kHz)	Limit (dBm)	Result
2412 MHz	-15.724	≤8	PASS
2437 MHz	-16.770	≤8	PASS
2462 MHz	-15.870	≤8	PASS



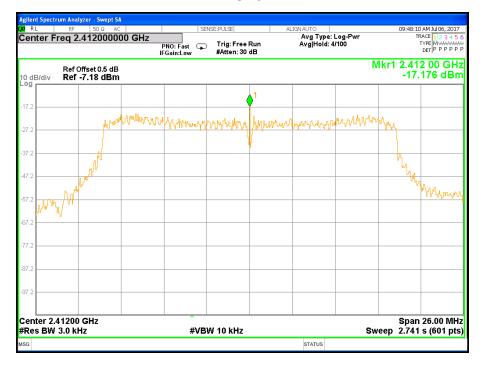




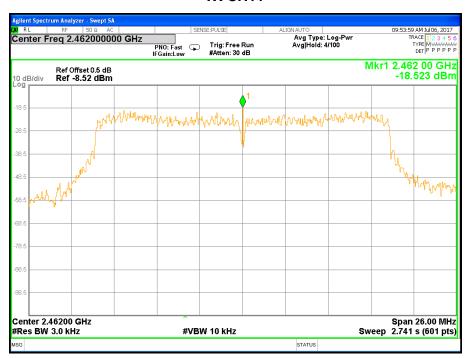
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Temperature:	25 ℃	Relative Humidity:	60%
Pressure:	1015 hPa	Test Voltage:	DC 3.8V
Test Mode:	TX n Mode(20M) /CH01, CH06, CH11		

Frequency	Power Density (dBm/3kHz)	Limit (dBm)	Result
2412 MHz	-17.176	≤8	PASS
2437 MHz	-17.890	≤8	PASS
2462 MHz	-18.523	≤8	PASS







#### 6. BANDWIDTH TEST

#### 6.1 APPLIED PROCEDURES / LIMIT

FCC Part 15.247,Subpart C				
Section Test Item Limit Frequency Range (MHz) Result				Result
15.247(a)(2)	Bandwidth	≥500KHz (6dB bandwidth)	2400-2483.5	PASS

# 6.2 TEST PROCEDURE

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW≥3RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be≥6 dB.

# 6.3 DEVIATION FROM STANDARD No deviation.

#### 6.4 TEST SETUP

EUT	SPECTRUM
	ANALYZER

#### 6.5 EUT OPERATION 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.

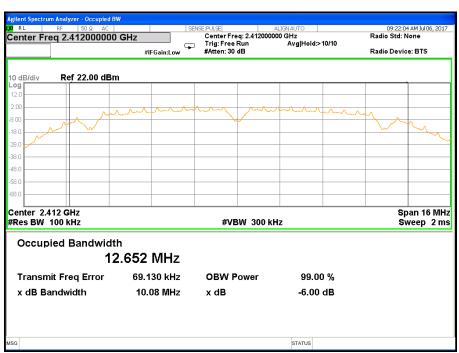
## 6.6 TEST RESULTS

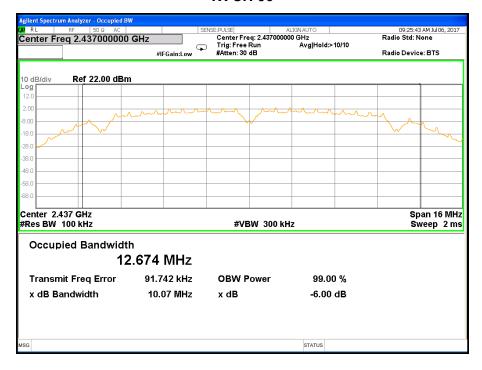
Temperature:	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage:	DC 3.8V
Test Mode:	TX b Mode /CH01, CH06, CH11		

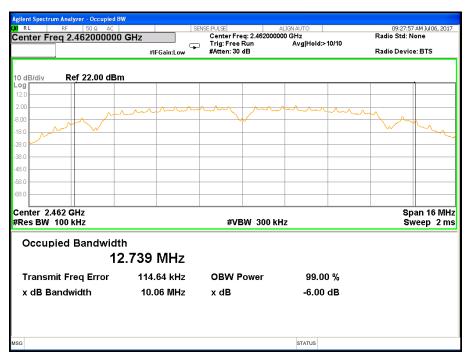
Remark: PEAK DETECTOR IS USED

Frequency	6dB Bandwidth (MHz)	Channel Separation (KHz)	Result
2412 MHz	10.08	≥500KHz	PASS
2437 MHz	10.07	≥500KHz	PASS
2462 MHz	10.06	≥500KHz	PASS

**TX CH 01** 



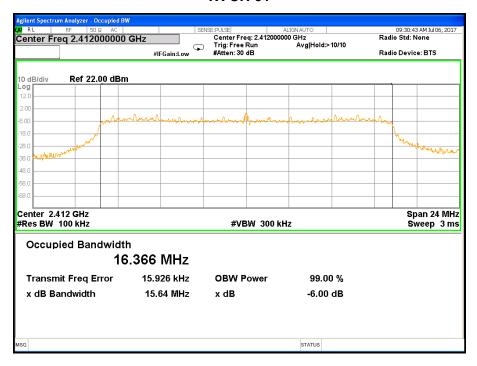


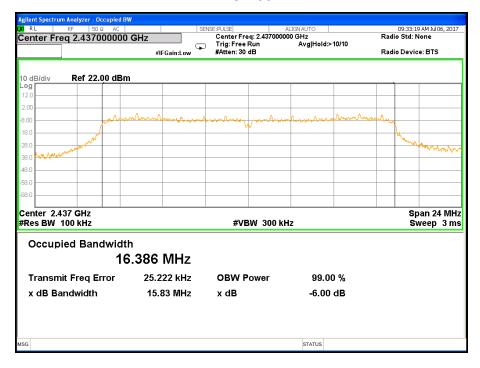


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Temperature:	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage:	DC 3.8V
Test Mode:	TX g Mode /CH01, CH06, CH11		

Frequency	6dB Bandwidth (MHz)	Channel Separation (KHz)	Result
2412 MHz	15.64	≥500KHz	PASS
2437 MHz	15.83	≥500KHz	PASS
2462 MHz	16.03	≥500KHz	PASS





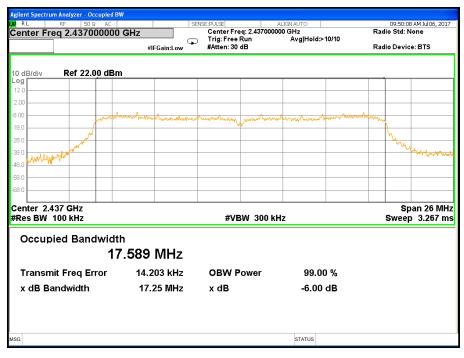


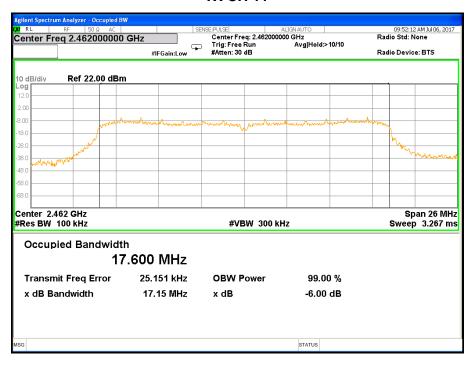
# Page 50 of 56 Report No.: STS1706154W03

Temperature:	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage:	DC 3.8V
Test Mode:	TX n Mode(20M) /CH01, CH06, CH11		

Frequency	6dB Bandwidth (MHz)	Channel Separation (KHz)	Result
2412 MHz	17.25	≥500KHz	PASS
2437 MHz	17.25	≥500KHz	PASS
2462 MHz	17.15	≥500KHz	PASS







# 7. PEAK OUTPUT POWER TEST

## 7.1 APPLIED PROCEDURES / LIMIT

FCC Part 15.247,Subpart C				
Section Test Item Limit Frequency Range (MHz) Result				
15.247(b)(3)	Output Power	1 watt or 30dBm	2400-2483.5	PASS

## 7.2 TEST PROCEDURE

a. The EUT was directly connected to the Power Sensor&PC

# 7.3 DEVIATION FROM STANDARD No deviation.

#### 7.4 TEST SETUP

EUT	Power Sensor
EUT	Power Sensor

# 7.5 EUT OPERATION 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.

# 7.6 TEST RESULTS

Temperature:	<b>25</b> ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage:	DC 3.8V

TX 802.11b Mode					
Test	Frequency	Conducted	Output Power	LIMIT	
Channel	(MHz)	Peak(dBm)	AVG(dBm)	dBm	
CH01	2412	16.91	15.82	30	
CH06	2437	17.06	16.03	30	
CH11	2462	17.22	16.14	30	

TX 802.11g Mode					
Test	Frequency	Conducted Output Power LIMIT			
Channel	(MHz)	Peak(dBm)	AVG(dBm)	dBm	
CH01	2412	13.27	12.19	30	
CH06	2437	13.39	12.33	30	
CH11	2462	13.51	12.47	30	

TX 802.11n20 Mode					
Test	Frequency	Conducted Output Power LIMIT			
Channel	(MHz)	Peak(dBm)	AVG(dBm)	dBm	
CH01	2412	10.99	8.94	30	
CH06	2437	11.31	9.25	30	
CH11	2462	11.28	9.17	30	

## 8. ANTENNA REQUIREMENT

## 8.1 STANDARD REQUIREMENT

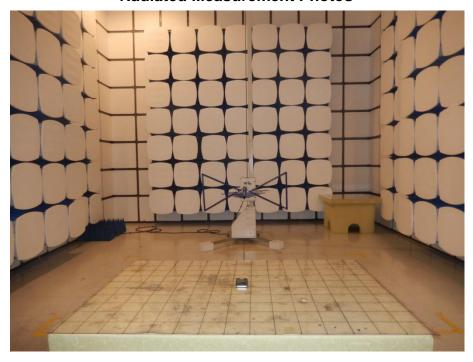
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

#### **8.2 EUT ANTENNA**

The EUT antenna is Internal PIFA Antenna. It comply with the standard requirement.

# APPENDIX - PHOTOS OF TEST SETUP







# **Conducted Measurement Photos**



\* \* \* \* \* END OF THE REPORT \* \* \* \* \*