



FCC TEST REPORT

Report No: STS1605114F01

Issued for

GODOX PHOTO EQUIPMENT CO.LTD

19th Floor,Room 1902,Building Jinshan,5033 Shennan East Road,Luohu District,Shenzhen China

Product Name:	Pioneering TTL Li-ion Camera Flash
Brand Name:	GOdOX
Model Name:	V860IIC
Series Model:	V860IIN,V860IIS
FCC ID:	2ABYNV860II
Test Standard:	FCC Part 15.249

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**TEST RESULT CERTIFICATION**

Applicant's name : GODOX PHOTO EQUIPMENT CO.LTD
Address : 19th Floor,Room 1902,Building Jinshan,5033 Shennan East Road,Luohu District,Shenzhen China
Manufacture's Name : GODOX PHOTO EQUIPMENT CO.LTD
Address : 19th Floor,Room 1902,Building Jinshan,5033 Shennan East Road,Luohu District,Shenzhen China

Product description

Product name : Pioneering TTL Li-ion Camera Flash
Brand name : GOdOX
Model and/or type reference : V860IIC
Standards : FCC Part15.249
Test procedure : ANSI C63.10-2013

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 of performance of tests : 16 May. 2016 ~26 May. 2016
Date of Issue : 27 May. 2016
Test Result : **Pass**

Testing Engineer :

(Tony Liu)

Technical Manager :

(Vita Li)

Authorized Signatory :

(Bovey Yang)





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**Revision History**

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	27 May. 2016	STS1605114F01	ALL	Initial Issue





1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.249) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	Pass	
15.203	Antenna Requirement	Pass	
15.249	Radiated Spurious Emission	Pass	
	conduction Spurious Emission	N/A	
15.205	Radiated Band Edge Emission	Pass	
	conduction Band Edge Emission	N/A	
15.249	20dB Bandwidth	Pass	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

(2)All tests are according to ANSI C63.4-2014 and ANSI C63.10-2013



1.1 TEST FACTORY

Shenzhen STS Test Services Co., Ltd.

Add. : 1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong, China

CNAS Registration No.: L7649;

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

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded 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 (9KHz-150KHz)	$\pm 2.88\text{Db}$
2	Conducted Emission (150KHz-30MHz)	$\pm 2.67\text{Db}$
3	RF power,conducted	$\pm 0.70\text{Db}$
4	Spurious emissions,conducted	$\pm 1.19\text{Db}$
5	All emissions,radiated(<1G) 30MHz-200MHz	$\pm 2.83\text{Db}$
6	All emissions,radiated(<1G) 200MHz-1000MHz	$\pm 2.94\text{Db}$
7	All emissions,radiated(>1G)	$\pm 3.03\text{Db}$
8	Temperature	$\pm 0.5^{\circ}\text{C}$
9	Humidity	$\pm 2\%$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Pioneering TTL Li-ion Camera Flash	
Trade Name	N/A	
Model Name	V860IIC	
Series Model	V860IIN,V860IIS	
Model Difference	Only different in model name	
Product Description	The EUT is a Pioneering TTL Li-ion Camera Flash	
	Operation Frequency:	2413-2465MHz
	Modulation Type:	MSK
	Antenna Designation:	PCB Antenna
	Antenna Gain(Peak)	0 dBi
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.	
Channel List	Please refer to the Note 2.	
Power Supply	Rated Voltage: 11.1V Charge Limit: 12.21V Capacity :2000mAh	

Note:

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



2.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2.412999634	17	2.439499908
02	2.414499664	18	2.440999939
03	2.415999695	19	2.442999847
04	2.418000000	20	2.444499878
05	2.419499634	21	2.445999908
06	2.420999664	22	2.447999817
07	2.422999969	23	2.449499847
08	2.424500000	24	2.450999878
09	2.425999634	25	2.452999786
10	2.427999939	26	2.454499817
11	2.429499969	27	2.455999847
12	2.431000000	28	2.457999756
13	2.432999908	29	2.459499786
14	2.434499939	30	2.460999817
15	2.435999969	31	2.462999725
16	2.437999878	32	2.465000000

3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	GOdOX	V860IIC	PCB	NA	0	Antenna

The EUT antenna is PCB Antenna. No antenna other than that furnished by the responsible party shall be used with the device.



2.2 DESCRIPTION OF TEST MODES

For conducted test items and radiated spurious emissions

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

Pretest Mode	Description	Data/Modulation
Mode 1	TX CH01	1 MHz/MSK
Mode 2	TX CH16	1 MHz/MSK
Mode 3	TX CH32	1 MHz/MSK

Note:

- (1) All above mode have been measurement, only worst data was reported.
- (2) We have be tested for all avaiable U.S. voltage and frequencies(For 120V,60Hz) for which the device is capable of operation.

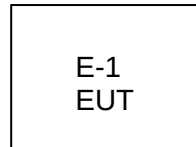
For AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 4 : Keeping TX

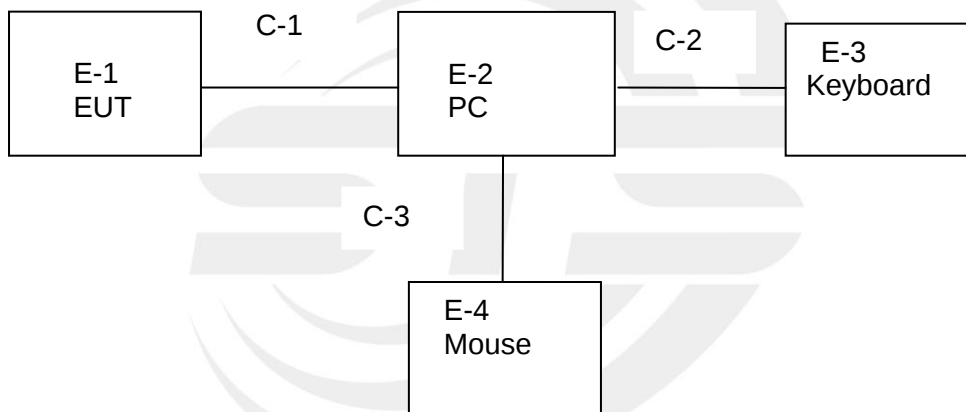
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

Radiated Spurious Emission Test



Conducted Emission Test





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	Pioneering TTL Li-ion Camera Flash	GOdOX	V860IIC	N/A	EUT
E-2	PC	4CV428DQXR	500-320cx	4CV428DQYN	N/A
E-3	Keyboard	HP	PR1101U	DKUSB1B06Q42209FBK800	N/A
E-4	Mouse	MOTOSPEED	F66	697738-001	N/A

Item	Shielded Type	Ferrite Core	Length	Note
C-1	USB Cable (FTP)	NO	90cm	N/A
C-2	USB Cable (FTP)	NO	100cm	N/A
C-3	USB Cable (FTP)	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 『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	2015.10.25	2016.10.24
Test Receiver	R&S	ESCI	101427	2015.10.25	2016.10.24
Bilog Antenna	TESEQ	CBL6111D	34678	2015.11.25	2016.11.24
Horn Antenna	Schwarzbeck	BBHA 9120D(1201)	9120D-1343	2016.03.06	2017.03.05
50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2015.06.06	2016.06.05
PreAmplifier	Agilent	8449B	60538	2015.10.25	2016.10.24
Loop Antenna	ARA	PLA-1030/B	1029	2015.06.08	2016.06.07
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2015.10.25	2016.10.24

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESPI	102086	2015.11.20	2016.11.19
LISN	R&S	ENV216	101242	2015.10.25	2016.10.24
LISN	EMCO	3810/2NM	000-23625	2015.10.25	2016.10.24



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 15.249 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.

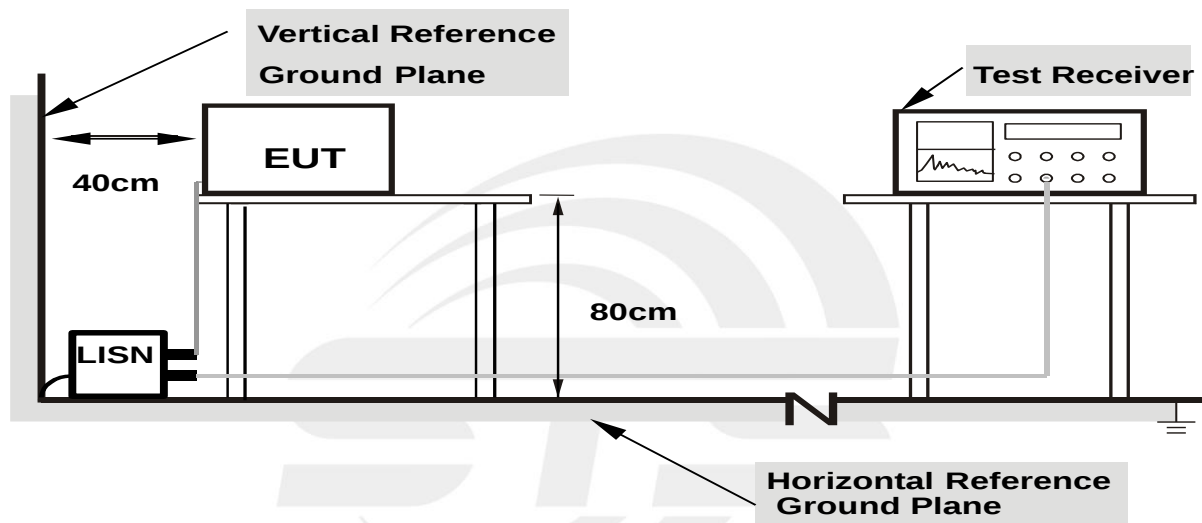
The following table is the setting of the receiver

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

3.1.2 TEST PROCEDURE

- The EUT was placed 0.4 meters from the horizontal 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.
- 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.
- 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.
- LISN at least 80 cm from nearest part of EUT chassis.
- 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 RESULTS

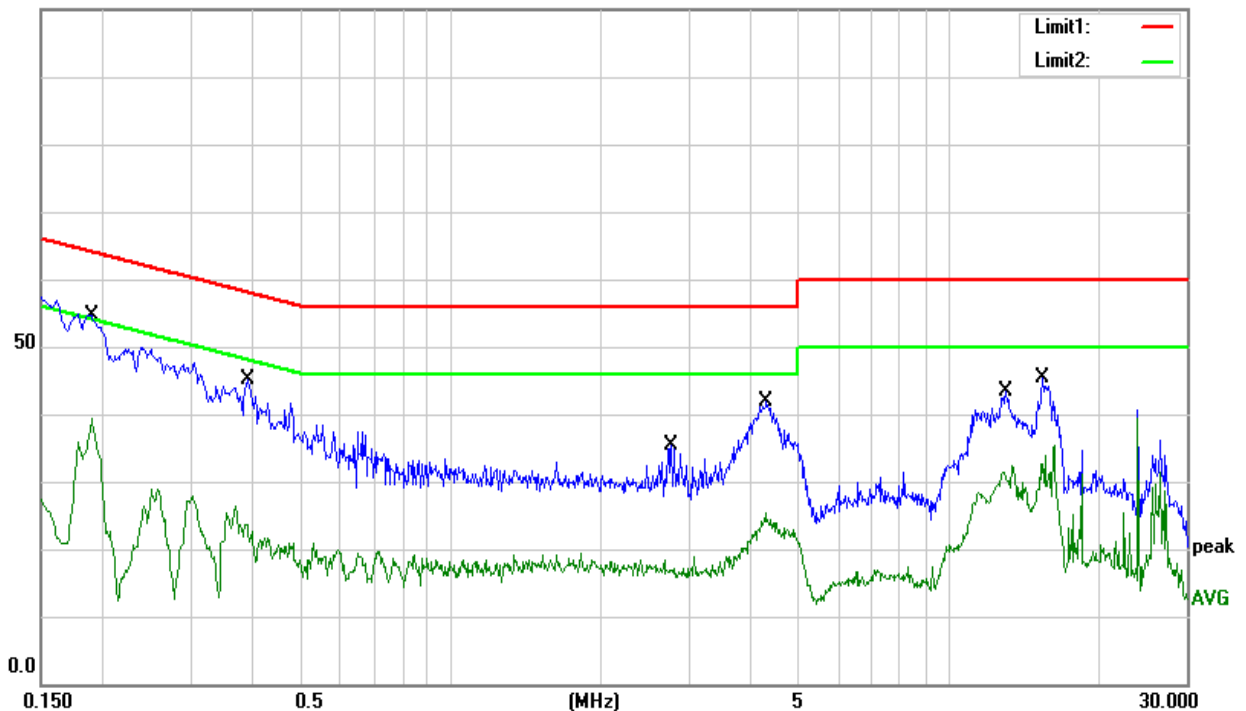
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase:	L
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 4

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1900	45.46	9.23	54.69	64.04	-9.35	QP
0.1900	30.04	9.23	39.27	54.04	-14.77	AVG
0.3900	35.67	9.41	45.08	58.06	-12.98	QP
0.3900	16.97	9.41	26.38	48.06	-21.68	AVG
2.7660	26.06	9.26	35.32	56.00	-20.68	QP
2.7660	9.18	9.26	18.44	46.00	-27.56	AVG
4.3100	32.54	9.27	41.81	56.00	-14.19	QP
4.3100	16.01	9.27	25.28	46.00	-20.72	AVG
13.0100	33.97	9.46	43.43	60.00	-16.57	QP
13.0100	22.83	9.46	32.29	50.00	-17.71	AVG
15.4340	35.89	9.48	45.37	60.00	-14.63	QP
15.4340	26.02	9.48	35.50	50.00	-14.50	AVG

Remark:

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

100.0 dBuV





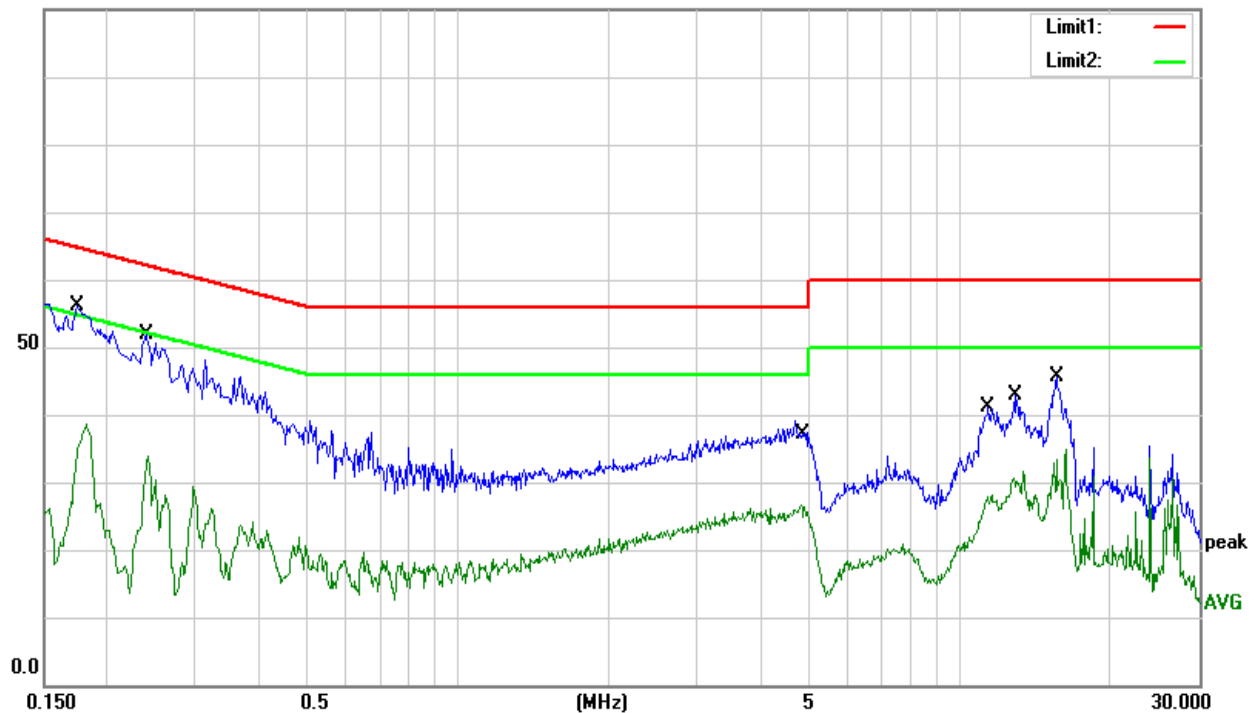
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase:	N
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 4

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1740	46.82	9.23	56.05	64.77	-8.72	QP
0.1740	29.32	9.23	38.55	54.77	-16.22	AVG
0.2391	42.59	9.19	51.78	62.13	-10.35	QP
0.2391	24.74	9.19	33.93	52.13	-18.20	AVG
4.8380	29.81	9.27	39.08	56.00	-16.92	QP
4.8380	17.33	9.27	26.60	46.00	-19.40	AVG
11.4180	31.60	9.48	41.08	60.00	-18.92	QP
11.4180	18.68	9.48	28.16	50.00	-21.84	AVG
12.9140	33.41	9.46	42.87	60.00	-17.13	QP
12.9140	22.14	9.46	31.60	50.00	-18.40	AVG
15.6180	36.04	9.50	45.54	60.00	-14.46	QP
15.6180	25.40	9.50	34.90	50.00	-15.10	AVG

Remark:

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

100.0 dBuV





3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on Part 15.205(a), then the Part 15.209(a) and Part 15.231(b) limit in the table below has to be followed.

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

Frequencies (MHz)	Field Strength (micovolts/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
30~40.66	100	3
40.70~70	100	3

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.249)

Frequency of Emission (MHz)	Field Strength of fundamental (millivolts /meter)	Field Strength of Harmonics (microvolts/meter)
2400 - 2483.5	50	500

Notes:

- (1) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

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

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
	150kHz~30MHz / RB 9kHz for QP
	30MHz~1000MHz / RB 100kHz for PK
	Above 1GHz / RB 1MHz VB 1M for PK

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,
- 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

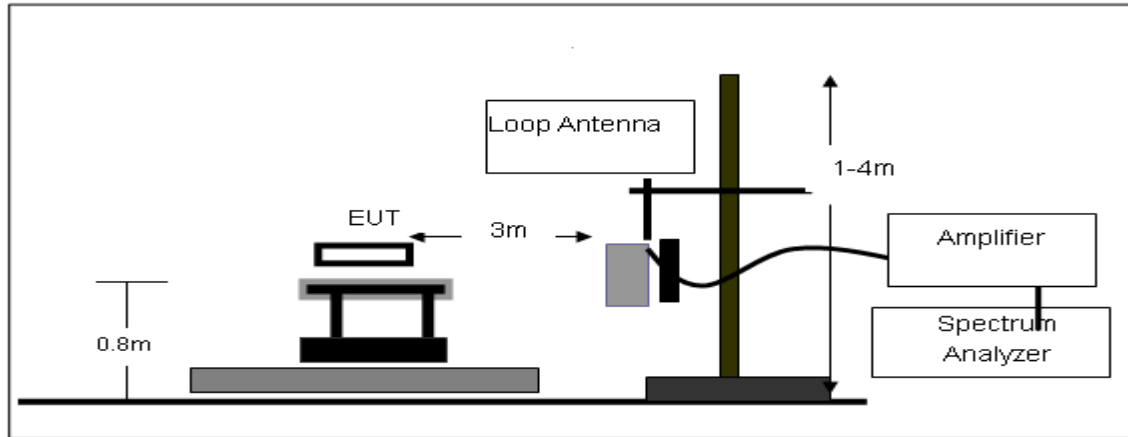
3.2.3 DEVIATION FROM TEST STANDARD

No deviation

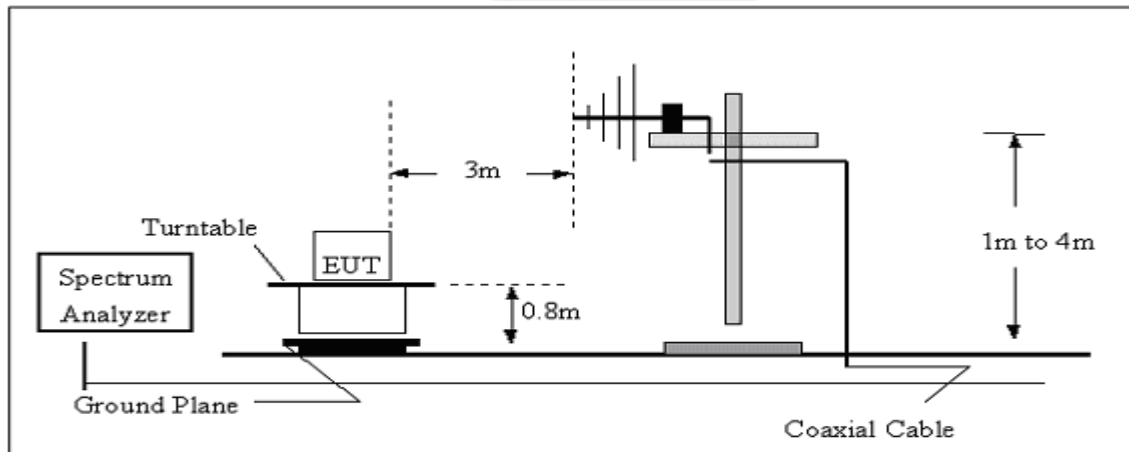


3.2.4 TEST SETUP

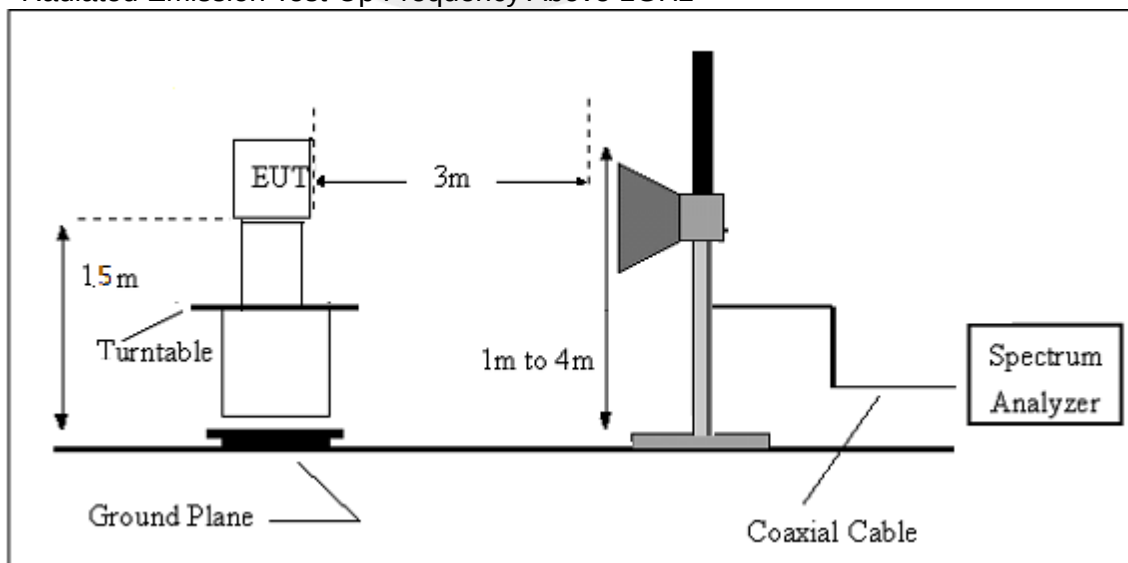
(A) Radiated Emission Test-Up Frequency Below 30MHz



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



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



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



Below 30 MHz

Temperature :	23 °C	Relative Humidity :	50%
Pressure :	1010 hPa	Polarization :	---
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX Mode		

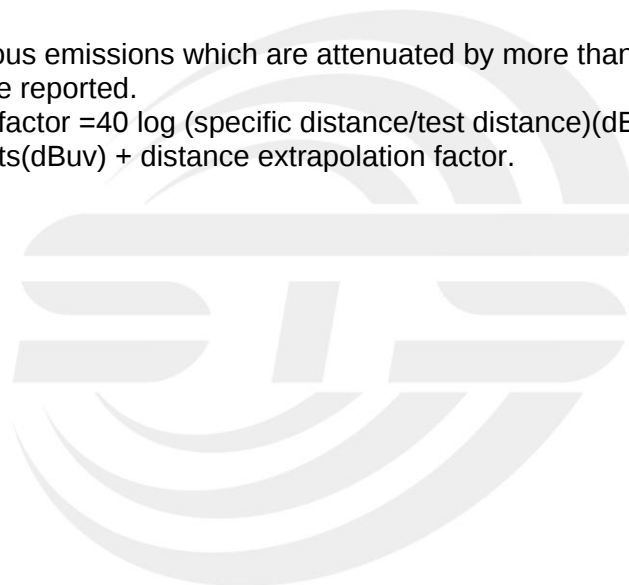
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

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

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





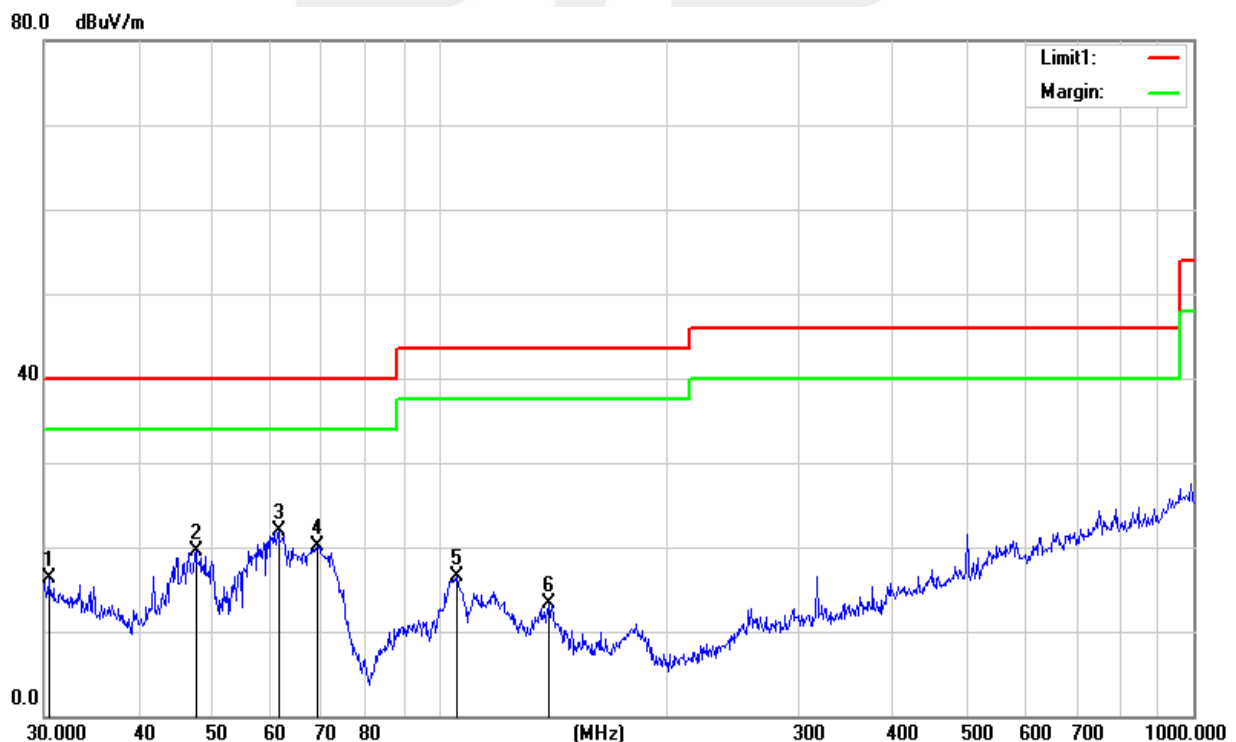
Between 30MHz – 1000 MHz Radiation Spurious

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase:	Horizontal
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 1/2/3(Model 1 worst)

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
30.4238	27.67	-11.41	16.26	40.00	-23.74	QP
47.6586	39.72	-20.27	19.45	40.00	-20.55	QP
61.3463	46.27	-24.31	21.96	40.00	-18.04	QP
69.1141	44.19	-24.12	20.07	40.00	-19.93	QP
105.6415	35.24	-18.71	16.53	43.50	-26.97	QP
139.8508	30.74	-17.51	13.23	43.50	-30.27	QP

Remark:

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





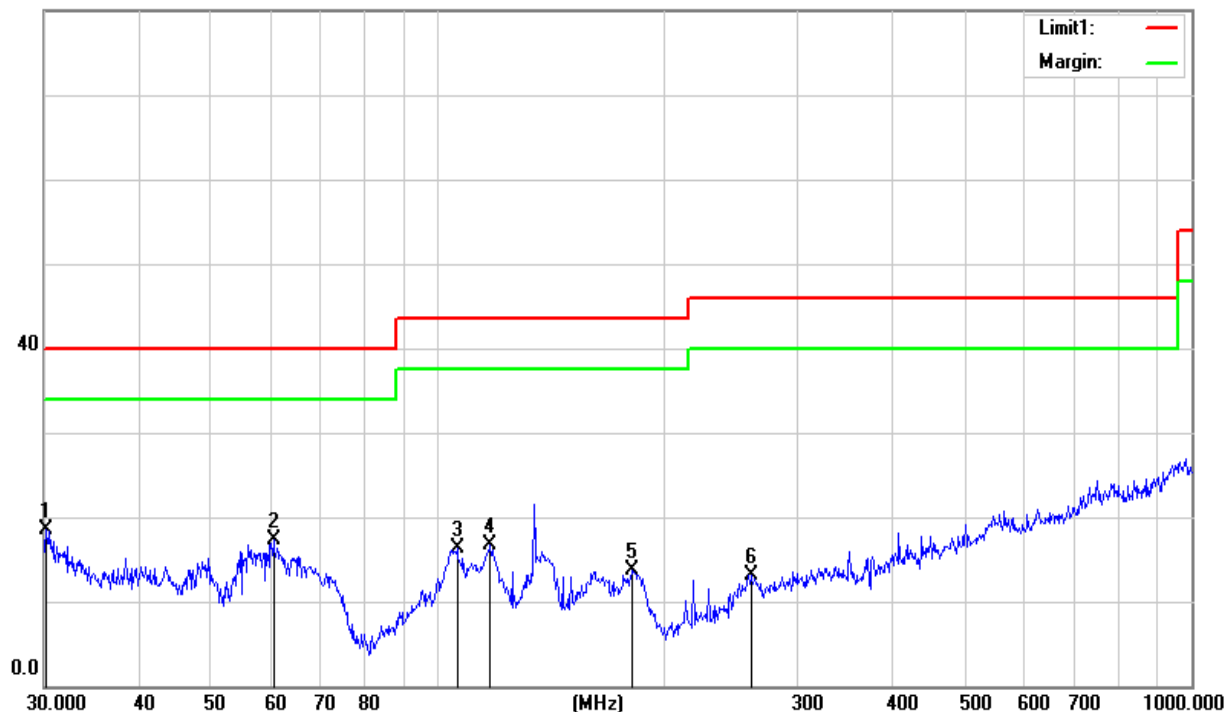
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase:	Vertical
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 1/2/3(Model 1 worst)

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
30.2111	29.87	-11.30	18.57	40.00	-21.43	QP
60.4920	41.66	-24.33	17.33	40.00	-22.67	QP
106.0126	34.99	-18.68	16.31	43.50	-27.19	QP
117.3603	34.49	-17.86	16.63	43.50	-26.87	QP
181.2834	33.27	-19.55	13.72	43.50	-29.78	QP
260.1444	28.24	-15.07	13.17	46.00	-32.83	QP

Remark:

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

80.0 dBuV/m





Radiation Power

Frequency (MHz)	Reading (dB μ V/m)		Factor(dB) Corr.	Result(dB μ V/m)		Limit(dB μ V/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
2413	75.44	95.72	-7.46	67.98	88.26	94	114	-26.02	-25.74	Vertical
2413	74.67	93.68	-7.46	67.21	86.22	94	114	-26.79	-27.78	Horizontal

Frequency (MHz)	Reading (dB μ V/m)		Factor(dB) Corr.	Result(dB μ V/m)		Limit(dB μ V/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
2438	67.88	87.16	-7.43	60.45	79.73	94	114	-33.55	-34.27	Vertical
2438	65.15	85.26	-7.43	57.72	77.83	94	114	-36.28	-36.17	Horizontal

Frequency (MHz)	Reading (dB μ V/m)		Factor(dB) Corr.	Result(dB μ V/m)		Limit(dB μ V/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
2465	71.88	91.41	-7.38	64.50	84.03	94	114	-29.50	-29.97	Vertical
2465	89.15	89.24	-7.38	81.77	81.86	94	114	-12.23	-32.14	Horizontal

Remark : Radiation Power PK/AV Spectrum Parameter RBW> 20 dBm BW, RBW=2MHz, VBW=2MHz



Above 1G Radiation Spurious

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector	Comment
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type	
Low Channel (2413MHz)							
3265.32	44.30	-9.80	34.50	74.00	-39.50	PK	Vertical
3265.30	42.23	-9.80	32.43	54.00	-21.57	AV	Vertical
3265.29	44.25	-9.80	34.45	74.00	-39.55	PK	Horizontal
3265.32	42.25	-9.80	32.45	54.00	-21.55	AV	Horizontal
3334.92	42.01	-9.75	32.26	74.00	-41.74	PK	Vertical
3335.10	40.05	-9.75	30.30	54.00	-23.70	AV	Vertical
3334.90	42.03	-9.75	32.28	74.00	-41.72	PK	Horizontal
3335.12	40.05	-9.75	30.30	54.00	-23.70	AV	Horizontal
3349.94	41.79	-9.75	32.04	74.00	-41.96	PK	Vertical
3350.05	39.78	-9.75	30.03	54.00	-23.97	AV	Vertical
3349.95	41.81	-9.75	32.06	74.00	-41.94	PK	Horizontal
3350.01	39.83	-9.75	30.08	54.00	-23.92	AV	Horizontal
4000.28	39.17	-6.60	32.57	74.00	-41.43	PK	Vertical
4000.17	37.17	-6.60	30.57	54.00	-23.43	AV	Vertical
4000.27	39.17	-6.60	32.57	74.00	-41.43	PK	Horizontal
4000.16	37.16	-6.60	30.56	54.00	-23.44	AV	Horizontal
4826.00	75.24	-5.83	69.41	74.00	-4.59	PK	Vertical
4826.00	55.42	-5.83	49.59	54.00	-4.41	AV	Vertical
4826.00	73.57	-5.83	67.74	74.00	-6.26	PK	Horizontal
4826.00	53.32	-5.83	47.49	54.00	-6.51	AV	Horizontal
7236.36	36.92	3.40	40.32	74.00	-33.68	PK	Vertical
7236.41	34.95	3.40	38.35	54.00	-15.65	AV	Vertical
7236.40	36.98	3.40	40.38	74.00	-33.62	PK	Horizontal
7236.42	34.95	3.40	38.35	54.00	-15.65	AV	Horizontal
8124.49	35.44	4.80	40.24	74.00	-33.76	PK	Vertical
8124.50	33.43	4.80	38.23	54.00	-15.77	AV	Vertical
8124.48	35.42	4.80	40.22	74.00	-33.78	PK	Horizontal
8124.51	33.44	4.80	38.24	54.00	-15.76	AV	Horizontal
9105.18	34.25	5.00	39.25	74.00	-34.75	PK	Vertical
9105.31	32.23	5.00	37.23	54.00	-16.77	AV	Vertical
9105.20	34.22	5.00	39.22	74.00	-34.78	PK	Horizontal
9105.27	32.21	5.00	37.21	54.00	-16.79	AV	Horizontal



11489.98	32.37	10.90	43.27	54.00	-10.73	AV	Vertical
11489.98	41.05	10.90	51.95	74.00	-22.05	PK	Horizontal
11490.03	29.76	10.90	40.66	54.00	-13.34	AV	Horizontal
13299.95	32.07	12.20	44.27	74.00	-29.73	PK	Vertical
13299.92	30.08	12.20	42.28	54.00	-11.72	AV	Vertical
13299.94	32.03	12.20	44.23	74.00	-29.77	PK	Horizontal
13299.96	30.06	12.20	42.26	54.00	-11.74	AV	Horizontal
14480.29	30.97	13.40	44.37	74.00	-29.63	PK	Vertical
14480.44	28.96	13.40	42.36	54.00	-11.64	AV	Vertical
14480.28	30.94	13.40	44.34	74.00	-29.66	PK	Horizontal
14480.44	28.97	13.40	42.37	54.00	-11.63	AV	Horizontal
16000.30	30.12	12.40	42.52	74.00	-31.48	PK	Vertical
16000.38	28.08	12.40	40.48	54.00	-13.52	AV	Vertical
16000.28	30.10	12.40	42.50	74.00	-31.50	PK	Horizontal
16000.38	28.09	12.40	40.49	54.00	-13.51	AV	Horizontal
17235.04	37.16	23.10	60.26	74.00	-13.74	PEAK	Vertical
17235.00	26.99	23.10	50.09	54.00	-3.91	AVG	Vertical
17234.98	37.16	23.10	60.26	74.00	-13.74	PEAK	Vertical
17234.99	27.02	23.10	50.12	54.00	-3.88	AVG	Vertical
17998.36	27.27	23.10	50.37	74.00	-23.63	PK	Vertical
17998.25	25.25	23.10	48.35	54.00	-5.65	AV	Vertical
17998.24	27.27	23.10	50.37	74.00	-23.63	PK	Horizontal
17998.14	25.25	23.10	48.35	54.00	-5.65	AV	Horizontal
Mid Channel (2438 MHz)							
3265.24	44.19	-9.80	34.39	74.00	-38.54	PK	Vertical
3265.25	42.18	-9.80	32.38	54.00	-21.62	AV	Vertical
3265.23	44.21	-9.80	34.41	74.00	-39.59	PK	Horizontal
3265.26	42.16	-9.80	32.36	54.00	-21.64	AV	Horizontal
3334.82	41.95	-9.75	32.20	74.00	-41.80	PK	Vertical
3335.02	39.95	-9.75	30.20	54.00	-23.80	AV	Vertical
3334.85	41.95	-9.75	32.20	74.00	-41.80	PK	Horizontal
3335.12	40.06	-9.75	30.31	54.00	-23.69	AV	Horizontal
3349.89	41.73	-9.75	31.98	74.00	-42.02	PK	Vertical
3349.96	39.74	-9.75	29.99	54.00	-24.01	AV	Vertical
3349.86	41.75	-9.75	32.00	74.00	-42.00	PK	Horizontal
3349.96	39.73	-9.75	29.98	54.00	-24.02	AV	Horizontal
4000.22	39.14	-6.60	32.54	74.00	-41.46	PK	Vertical



4000.11	37.09	-6.60	30.49	54.00	-23.51	AV	Vertical
4000.20	39.09	-6.60	32.49	74.00	-41.51	PK	Horizontal
4000.16	37.17	-6.60	30.57	54.00	-23.43	AV	Horizontal
4876.00	67.24	-5.79	61.45	74.00	-12.55	PK	Vertical
4876.00	47.68	-5.79	41.89	54.00	-12.11	AV	Vertical
4876.00	65.38	-5.79	59.59	74.00	-14.41	PK	Horizontal
4876.00	45.91	-5.79	40.12	54.00	-13.88	AV	Horizontal
7236.27	36.86	3.40	40.26	74.00	-33.74	PK	Vertical
7236.41	34.92	3.40	38.32	54.00	-15.68	AV	Vertical
7236.34	36.92	3.40	40.32	74.00	-33.68	PK	Horizontal
7236.42	34.97	3.40	38.37	54.00	-15.63	AV	Horizontal
8124.42	35.41	4.80	40.21	74.00	-33.79	PK	Vertical
8124.50	33.34	4.80	38.14	54.00	-15.86	AV	Vertical
8124.48	35.43	4.80	40.23	74.00	-33.77	PK	Horizontal
8124.44	33.36	4.80	38.16	54.00	-15.84	AV	Horizontal
9105.18	34.24	5.00	39.24	74.00	-34.76	PK	Vertical
9105.31	32.20	5.00	37.20	54.00	-16.80	AV	Vertical
9105.11	34.20	5.00	39.20	74.00	-34.80	PK	Horizontal
9105.27	32.13	5.00	37.13	54.00	-16.87	AV	Horizontal
11036.35	33.25	10.20	43.45	74.00	-30.55	PK	Vertical
11036.60	31.11	10.20	41.31	54.00	-12.69	AV	Vertical
11036.34	33.13	10.20	43.33	74.00	-30.67	PK	Horizontal
11036.56	31.08	10.20	41.28	54.00	-12.72	AV	Horizontal
11570.35	43.18	10.20	53.38	74.00	-20.62	PK	Vertical
11570.53	37.20	10.20	47.40	54.00	-6.60	AV	Vertical
11570.44	43.15	10.20	53.35	74.00	-20.65	PK	Horizontal
11570.57	37.14	10.20	47.34	54.00	-6.66	AV	Horizontal
13299.88	31.99	12.20	44.19	74.00	-29.81	PK	Vertical
13299.85	30.00	12.20	42.20	54.00	-11.80	AV	Vertical
13299.88	32.04	12.20	44.24	74.00	-29.76	PK	Horizontal
13299.87	29.95	12.20	42.15	54.00	-11.85	AV	Horizontal
14480.29	30.95	13.40	44.35	74.00	-29.65	PK	Vertical
14480.44	29.00	13.40	42.40	54.00	-11.60	AV	Vertical
14480.20	30.90	13.40	44.30	74.00	-29.70	PK	Horizontal
14480.34	29.00	13.40	42.40	54.00	-11.60	AV	Horizontal
17355.36	37.21	23.10	60.31	74.00	-13.69	PK	Vertical
17355.17	25.26	23.10	48.36	54.00	-5.64	AV	Vertical



17355.14	37.20	23.10	60.30	74.00	-13.70	PK	Horizontal
17355.09	25.22	23.10	48.32	54.00	-5.68	AV	Horizontal
17998.26	37.18	23.10	60.28	74.00	-13.72	PK	Vertical
17998.15	25.18	23.10	48.28	54.00	-5.72	AV	Vertical
17998.19	27.19	23.10	50.29	74.00	-23.71	PK	Horizontal
17998.07	25.17	23.10	48.27	54.00	-5.73	AV	Horizontal
Mid Channel (2465 MHz)							
3265.32	44.18	-9.80	34.38	74.00	-39.62	PK	Vertical
3265.30	42.18	-9.80	32.38	54.00	-21.62	AV	Vertical
3265.29	44.20	-9.80	34.40	74.00	-39.60	PK	Horizontal
3265.32	42.20	-9.80	32.40	54.00	-21.60	AV	Horizontal
3334.92	41.94	-9.75	32.19	74.00	-41.81	PK	Vertical
3335.10	39.95	-9.75	30.20	54.00	-23.80	AV	Vertical
3334.90	41.98	-9.75	32.23	74.00	-41.77	PK	Horizontal
3335.12	39.98	-9.75	30.23	54.00	-23.77	AV	Horizontal
3349.94	41.72	-9.75	31.97	74.00	-42.03	PK	Vertical
3350.05	39.70	-9.75	29.95	54.00	-24.05	AV	Vertical
3349.95	41.72	-9.75	31.97	74.00	-42.03	PK	Horizontal
3350.01	39.70	-9.75	29.95	54.00	-24.05	AV	Horizontal
4000.28	39.07	-6.60	32.47	74.00	-41.53	PK	Vertical
4000.17	37.09	-6.60	30.49	54.00	-23.51	AV	Vertical
4000.27	39.05	-6.60	32.45	74.00	-41.55	PK	Horizontal
4000.16	37.08	-6.60	30.48	54.00	-23.52	AV	Horizontal
4930.00	71.44	-5.47	65.97	74.00	-8.03	PK	Vertical
4930.00	51.50	-5.47	46.03	54.00	-7.97	AV	Vertical
4930.00	69.20	-5.47	63.73	74.00	-10.27	PK	Horizontal
4930.00	49.73	-5.47	44.26	54.00	-9.74	AV	Horizontal
7236.36	36.85	3.40	40.25	74.00	-33.75	PK	Vertical
7236.41	34.88	3.40	38.28	54.00	-15.72	AV	Vertical
7236.40	36.88	3.40	40.28	74.00	-33.72	PK	Horizontal
7236.42	34.90	3.40	38.30	54.00	-15.70	AV	Horizontal
8124.49	35.35	4.80	40.15	74.00	-33.85	PK	Vertical
8124.50	33.34	4.80	38.14	54.00	-15.86	AV	Vertical
8124.48	35.34	4.80	40.14	74.00	-33.86	PK	Horizontal
8124.51	33.31	4.80	38.11	54.00	-15.89	AV	Horizontal
11036.43	33.11	10.20	43.31	74.00	-30.69	PK	Vertical
11036.60	31.10	10.20	41.30	54.00	-12.70	AV	Vertical
11036.44	33.10	10.20	43.30	74.00	-30.70	PK	Horizontal



11036.62	31.10	10.20	41.30	54.00	-12.70	AV	Horizontal
11650.43	43.15	10.20	53.35	74.00	-20.65	PK	Vertical
11650.60	37.16	10.20	47.36	54.00	-6.64	AV	Vertical
11650.44	43.13	10.20	53.33	74.00	-20.67	PK	Horizontal
11650.62	37.11	10.20	47.31	54.00	-6.69	AV	Horizontal
13299.95	31.98	12.20	44.18	74.00	-29.82	PK	Vertical
13299.92	29.96	12.20	42.16	54.00	-11.84	AV	Vertical
13299.94	31.96	12.20	44.16	74.00	-29.84	PK	Horizontal
13299.96	29.98	12.20	42.18	54.00	-11.82	AV	Horizontal
14480.29	30.88	13.40	44.28	74.00	-29.72	PK	Vertical
14480.44	28.90	13.40	42.30	54.00	-11.70	AV	Vertical
14480.28	30.89	13.40	44.29	74.00	-29.71	PK	Horizontal
14480.44	28.88	13.40	42.28	54.00	-11.72	AV	Horizontal
16000.30	30.01	12.40	42.41	74.00	-31.59	PK	Vertical
16000.38	27.99	12.40	40.39	54.00	-13.61	AV	Vertical
16000.28	30.00	12.40	42.40	74.00	-31.60	PK	Horizontal
16000.38	27.98	12.40	40.38	54.00	-13.62	AV	Horizontal
17475.36	37.18	23.10	60.28	74.00	-13.72	PK	Vertical
17475.25	25.18	23.10	48.28	54.00	-5.72	AV	Vertical
17475.24	37.19	23.10	60.29	74.00	-13.71	PK	Horizontal
17475.14	25.18	23.10	48.28	54.00	-5.72	AV	Horizontal
17998.36	27.16	23.10	50.26	74.00	-23.74	PK	Vertical
17998.25	25.16	23.10	48.26	54.00	-5.74	AV	Vertical
17998.24	27.19	23.10	50.29	74.00	-23.71	PK	Horizontal
17998.14	25.16	23.10	48.26	54.00	-5.74	AV	Horizontal



(Radiation Band edge)

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector	Comment
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type	
MSK							
2400.0	60.79	-2.50	58.29	74	-15.71	PEAK	Vertical
2400.0	47.61	-2.50	45.11	54	-8.89	AVG	Vertical
2400.0	59.96	-2.50	57.46	74	-16.54	PEAK	Horizontal
2400.0	45.84	-2.50	43.34	54	-10.66	AVG	Horizontal
2483.5	60.13	-2.50	57.63	74	-16.37	PEAK	Vertical
2483.5	45.75	-2.50	43.25	54	-10.75	AVG	Vertical
2483.5	61.14	-2.50	58.64	74	-15.36	PEAK	Horizontal
2483.5	46.63	-2.50	44.13	54	-9.87	AVG	Horizontal

Low measurement frequencies is range from 2310 to 2400 MHz, high measurement frequencies is range from 2483.5 to 2500 MHz.

Only show the worst point data of the emissions in the frequency 2310-2400 MHz and 2483.5-2500 MHz.

4. CONDUCTED SPURIOUS & BAND EDGE EMISSION

4.1 REQUIREMENT

According to FCC section 15.249, 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 50dB 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.

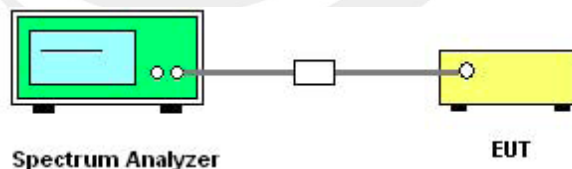
4.2 TEST PROCEDURE

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
Start/Stop Frequency	Lower Band Edge: 2310 – 2404 MHz Upper Band Edge: 2478 – 2500 MHz
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

4.3 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 50 Ohm; 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.

4.4 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.



4.5 TEST RESULTS

Temperature :	25 °C	Relative Humidity :	50%
Pressure :	1012 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	N/A		

Do not apply.



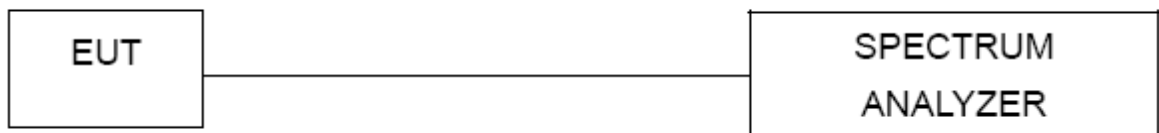


5. BANDWIDTH TEST

5.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 100KHz, VBW $\geq$ RBW, Sweep time = Auto.

5.2 TEST SETUP



5.3 EUT OPERATION CONDITIONS

TX mode.



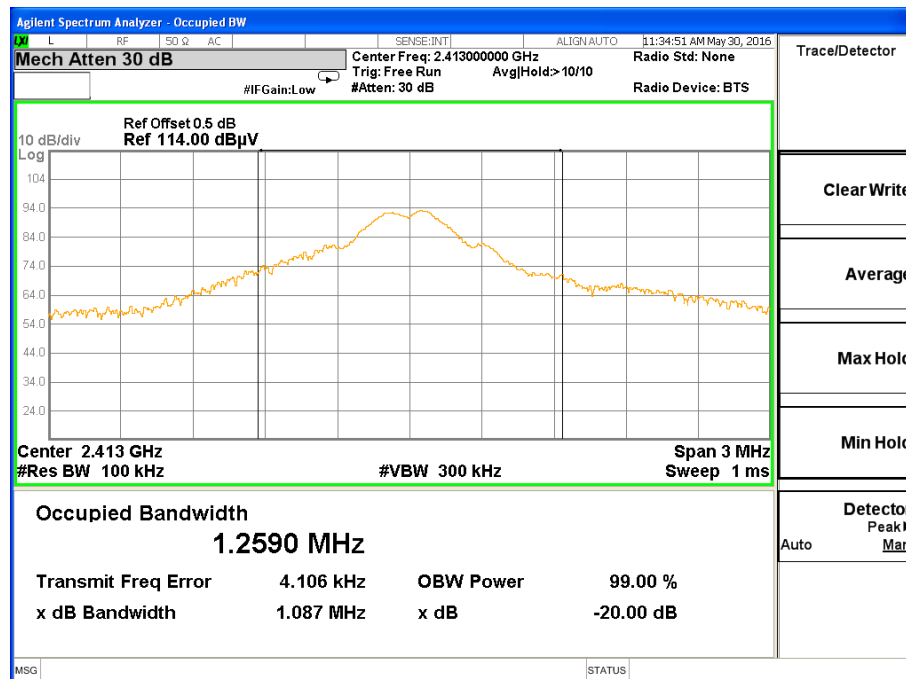


5.4 TEST RESULTS

Temperature :	25 °C	Relative Humidity :	50%
Pressure :	1012 hPa	Test Voltage :	AC 120V/60Hz

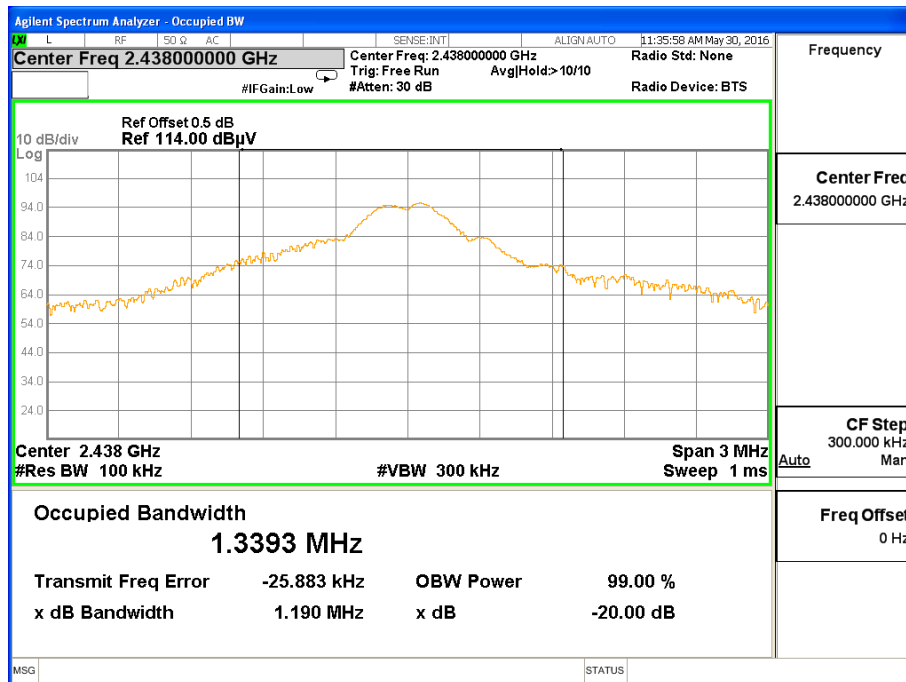
Test Channel	Frequency (MHz)	20 dBc Bandwidth (MHz)	99% Bandwidth (MHz)
CH01	2413	1.087	1.2590
CH16	2438	1.190	1.3393
CH32	2465	1.188	1.2986

The Lowest Channel:2413MHz

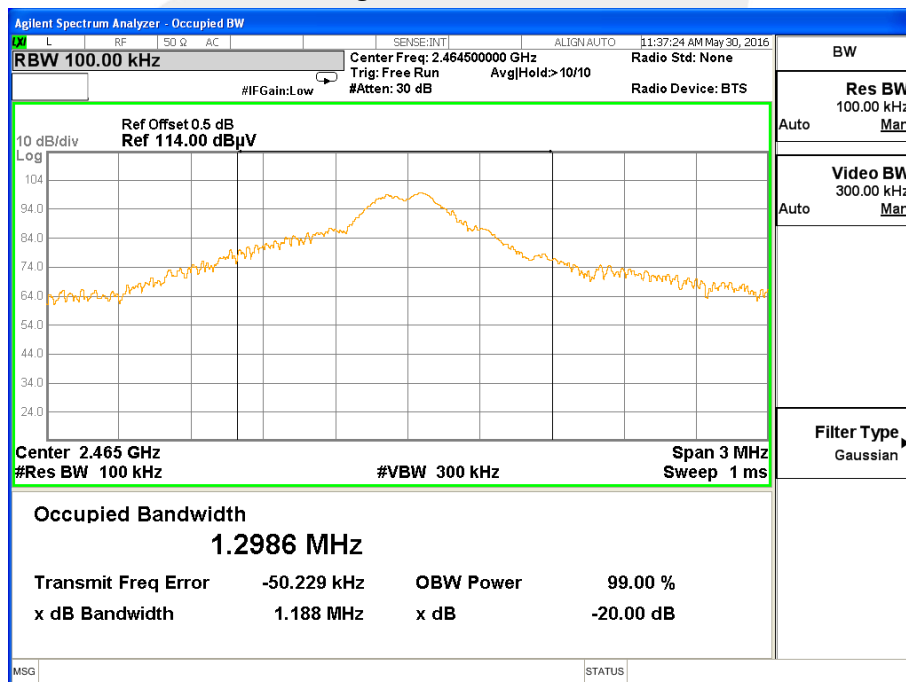




The Middle Channel: 2438MHz



The High Channel: 2465MHz





6. ANTENNA REQUIREMENT

6.1 STANDARD REQUIREMENT

According to the FCC Part 15 Paragraph 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna to the intentional radiator shall be considered sufficient to comply with the provisions of this section. This product use a permanent ceramic printed antenna, fulfill the requirement of this section

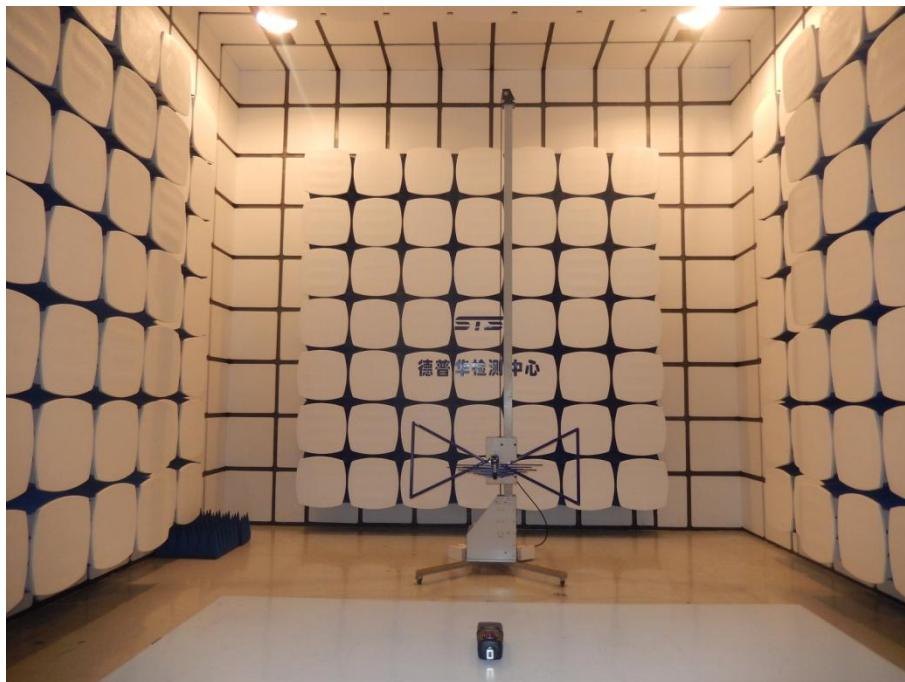
6.2 EUT ANTENNA

The EUT antenna is PCB Antenna.It conforms to the standard requirements.



APPENDIX- PHOTOS OF TEST SETUP

Radiated Measurement Photos





Conduction Measurement Photos



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

