



FCC Part 15E Test Report

FCC ID: 2BKP3-V1

Applicant: Guangzhou Weijie Electronic Technology Co., Ltd

Address: No.07, 15 / F, Guangzhou Zhanwang Digital Plaza, No.8 Shipai West Road, Tianhe District, Guangzhou

Manufacturer: Guangzhou Weijie Electronic Technology Co., Ltd

Address: No.07, 15 / F, Guangzhou Zhanwang Digital Plaza, No.8 Shipai West Road, Tianhe District, Guangzhou

EUT: Projector

Trade Mark: N/A

Model Number: V1
V1pro, HY300, HY300A, C3, C1, C5, C6, C8

Date of Receipt: Aug. 21, 2024

Test Date: Aug. 21, 2024 - Sep.05, 2024

Date of Report: Sep.05, 2024

Prepared By: Shenzhen DL Testing Technology Co., Ltd.

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Applicable Standards: FCC PART 15 E 15.407
ANSI C63.10:2013

Test Result: Pass

Report Number: DL-240821024ER

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Reviewer (Supervisor): Jack Bu

Approved (Manager): Jade Yang



This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.



Table of Contents	Page
1 . SUMMARY OF TEST RESULTS	4
1.1 MEASUREMENT UNCERTAINTY	4
2 . GENERAL INFORMATION	5
2.1 GENERAL DESCRIPTION OF EUT	5
2.2 DESCRIPTION OF TEST MODES	6
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	7
2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)	7
2.5 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING	7
2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS	8
3 . EMC EMISSION TEST	9
3.1 CONDUCTED EMISSION MEASUREMENT	9
3.1.1 POWER LINE CONDUCTED EMISSION LIMITS	9
3.1.2 TEST PROCEDURE	9
3.1.3 DEVIATION FROM TEST STANDARD	9
3.1.4 TEST SETUP	10
3.1.5 EUT OPERATING CONDITIONS	10
3.1.6 TEST RESULTS	10
3.2 RADIATED EMISSION MEASUREMENT	13
3.2.1 RADIATED EMISSION LIMITS	13
3.2.2 TEST PROCEDURE	14
3.2.3 DEVIATION FROM TEST STANDARD	14
3.2.4 TEST SETUP	15
3.2.5 EUT OPERATING CONDITIONS	16
3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)	17
3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)	18
3.2.8 TEST RESULTS (1GHZ~40GHZ)	20
3.3 CONDUCTED BAND EMISSION MEASUREMENT	25
3.3.1 TEST REQUIREMENT:	25
3.3.2 TEST PROCEDURE	25
3.3.3 DEVIATION FROM TEST STANDARD	25
3.3.4 TEST SETUP	25
3.3.5 EUT OPERATING CONDITIONS	25
4 . AVERAGING OUTPUT POWER	26
4.1 APPLIED PROCEDURES / LIMIT	26
4.1.1 TEST PROCEDURE	26
4.1.2 DEVIATION FROM STANDARD	26
4.1.3 TEST SETUP	26
4.1.4 EUT OPERATION CONDITIONS	26
4.1.5 TEST RESULTS	26



Table of Contents	Page
5 . POWER SPECTRAL DENSITY TEST	27
5.1 APPLIED PROCEDURES / LIMIT	27
5.1.1 TEST PROCEDURE	27
5.1.2 DEVIATION FROM STANDARD	27
5.1.3 TEST SETUP	27
5.1.4 EUT OPERATION CONDITIONS	27
5.1.5 TEST RESULTS	28
6 . 6DB&26DB&99% BANDWIDTH TEST	28
6.1 APPLIED PROCEDURES / LIMIT	28
6.1.1 TEST PROCEDURE	28
6.1.2 DEVIATION FROM STANDARD	28
6.1.3 TEST SETUP	28
6.1.4 EUT OPERATION CONDITIONS	29
6.1.5 TEST RESULTS	29
7 . DUTY CYCLE TEST SIGNAL	30
7.1 APPLIED PROCEDURES / LIMIT	30
7.1.1 TEST PROCEDURE	30
7.1.2 DEVIATION FROM STANDARD	30
7.1.3 TEST SETUP	30
7.1.4 EUT OPERATION CONDITIONS	30
7.1.5 TEST RESULTS	30
8 . FREQUENCY STABILITY	31
8.1 APPLIED PROCEDURES / LIMIT	31
8.1.1 TEST PROCEDURE	31
8.1.2 DEVIATION FROM STANDARD	31
8.1.3 TEST SETUP	31
8.1.4 EUT OPERATION CONDITIONS	31
8.1.5 TEST RESULTS	32
9 . TRANSMISSION IN THE ABSENCE OF DATA	33
9.1 STANDARD REQUIREMENT	33
9.2 TEST RESULT	33
10 . ANTENNA REQUIREMENT	33
10.1 STANDARD REQUIREMENT	33
10.2 EUT ANTENNA	33
11 . TEST SEUUP PHOTO	33
12 . EUT PHOTO	33



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.407) , Subpart E			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.407(b), 15.209	Radiated Spurious Emission	PASS	
15.407 (b)	Band Edge Emission	PASS	
15.407 (a)	Peak Output Power	PASS	
15.407 (a)	Power Spectral Density	PASS	
15.403(i) 15.407(e)	26dB bandwidth and 99%dB Bandwidth 6dB bandwidth and 99%dB Bandwidth	PASS	
15.407(g)	Frequency Stability	PASS	
15.407(c)	Transmission in case of Absence of Information	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

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

Test lab: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China

FCC Test Firm Registration Number: 854456

Designation Number: CN1307

IC Registered No.: 27485

CAB ID.: CN0118

1.1 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	$\pm 2.56\text{dB}$
2	RF power,conducted	$\pm 0.42\text{dB}$
3	Spurious emissions,conducted	$\pm 2.76\text{dB}$
4	All emissions,radiated(<1G)	$\pm 3.65\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$
8	Bandwidth	$\pm 0.2\text{MHz}$
9	PSD	$\pm 0.42\text{dB}$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name:	Projector
Trademark	N/A
Model No.:	V1 V1pro, HY300, HY300A, C3, C1, C5, C6, C8
Model Difference	The product's different for model number and appearance color.
Operation Frequency:	5745-5825MHz(802.11a/n/ac(HT20)) 5755-5795MHz(802.11n/ac(HT40))
Channel numbers:	See channel list
Channel separation:	20MHz/40MHz
Modulation technology:	64QAM, 16QAM, QPSK, BPSK for OFDM
Rate of Transmitter	802.11a: 6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps 802.11n: Up to 300Mbps 802.11ac: up to 867Mbps
Antenna Type:	Internal Antenna
Antenna gain:	1.69dBi
Power Supply:	DC 19V from adapter DC 14.4V from battery
Adapter:	Model: CW1903000US Input: 100-240V~ 50/60Hz 1.2A MAX Output: 19.0V  3000mA

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. The EUT's all information provided by client.

2. Channel List

Channel List for 802.11a/n(HT20)/ac(HT20)			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	161	5805
153	5765	165	5825
157	5785		

Channel List for 802.11n(HT40)/ac(HT40)			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795



2.2 DESCRIPTION OF TEST MODES

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

Description			
Pretest Mode	Channel	Band 4	
Mode 1	802.11a/n/acHT20	CH149, CH157, CH165	
Mode 2	802.11n/acHT40	CH151, CH159	
Mode 3	Link Mode		

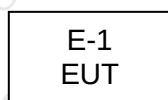
For Radiated Emission			
Pretest Mode	Channel	Band 4	
Mode 1	802.11a/n/acHT20	CH149, CH157, CH165	
Mode 2	802.11n/acHT40	CH151, CH159	
Mode 3	Link Mode		

- Note: 1. The measurements are performed at the highest, middle, lowest available channels.
2. During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.

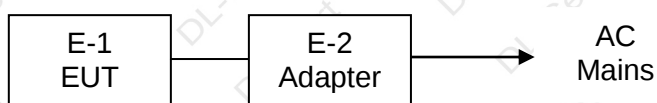


2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



Power Line Conducted Emission Test



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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	Model/Type No.	Series No.	Note
E-1	Projector	V1	N/A	EUT
E-2	Adapter	CW1903000US	N/A	

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.5 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

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 end product.

Max output power Setting				
Test software Version	Test program: SecureCRT 8.1			
Mode	802.11a	802.11n HT20	802.11n HT40	802.11ac HT20/HT40
Data Rate	6Mbps	MSC0	MSC0	MSC0
Power Setting of Softwave	60	60	66	66



2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation test, Band-edge test and 6db bandwidth test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4408B	MY50140780	Nov. 04, 2023	Nov. 03, 2024
2	Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Nov. 04, 2023	Nov. 03, 2024
3	Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Nov. 04, 2023	Nov. 03, 2024
4	Horn Antenna (1GHz-18GHz)	Schwarzbeck	BBHA9120D	02139	Nov. 04, 2023	Nov. 03, 2024
5	Horn Antenna (18GHz-40GHz)	A.H. Systems	SAS-574	588	Nov. 04, 2023	Nov. 03, 2024
6	Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Nov. 04, 2023	Nov. 03, 2024
7	Amplifier (1GHz-18GHz)	EMEC	EM01G8GA	00270	Nov. 04, 2023	Nov. 03, 2024
8	Amplifier (18GHz-40GHz)	Quanjuda	DLE-161	97	Nov. 04, 2023	Nov. 03, 2024
9	Loop Antenna (9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Nov. 04, 2023	Nov. 03, 2024
10	RF cables1 (9kHz-1GHz)	ChengYu	966	004	Nov. 04, 2023	Nov. 03, 2024
11	RF cables2 (1GHz-40GHz)	ChengYu	966	003	Nov. 04, 2023	Nov. 03, 2024
12	Antenna connector	Florida RF Labs	N/A	RF 01#	Nov. 04, 2023	Nov. 03, 2024
13	Power probe	KEYSIGHT	U2021XA	MY55210018	Nov. 04, 2023	Nov. 03, 2024
14	Signal Analyzer 9kHz-26.5GHz	Agilent	N9020A	MY55370280	Nov. 04, 2023	Nov. 03, 2024
15	Test Receiver 20kHz-40GHz	R&S	ESU 40	100376	Nov. 04, 2023	Nov. 03, 2024
16	D.C. Power Supply	LongWei	PS-305D	010964729	Nov. 04, 2023	Nov. 03, 2024
17	Temperature & humidity chamber	Changfeng	CF-150-40-P	CF170802-01	Nov. 03, 2023	Nov. 02, 2024

Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	843 Shielded Room	YIHENG	843 Room	843	Nov. 05, 2023	Nov. 04, 2024
2	EMI Receiver	R&S	ESR	101421	Nov. 04, 2023	Nov. 03, 2024
3	LISN	R&S	ENV216	102417	Nov. 04, 2023	Nov. 03, 2024
4	843 Cable 1#	ChengYu	CE Cable	001	Nov. 04, 2023	Nov. 03, 2024

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	FALA	EZ EMC	EMC-CON 3A1.1
2	EMC radiation test system	FALA	EZ EMC	FA-03A2
3	RF test system	MAIWEI	MTS8310	2.0.0.0
4	RF communication test system	MAIWEI	MTS8200	2.0.0.0



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Limit (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.5 -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

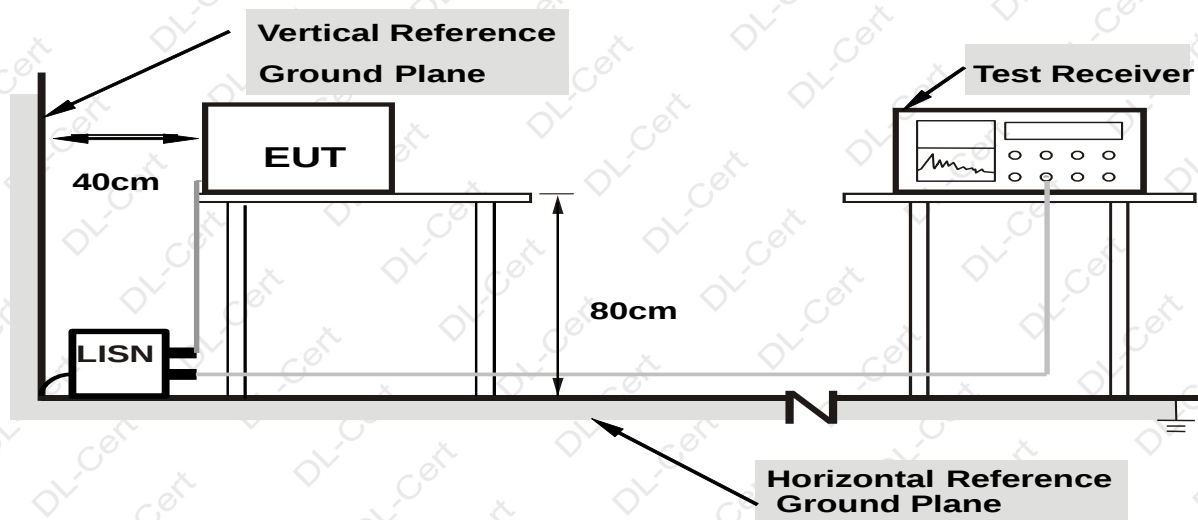
- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- 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 DEVIATION FROM TEST STANDARD

No deviation



3.1.4 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

3.1.5 EUT OPERATING CONDITIONS

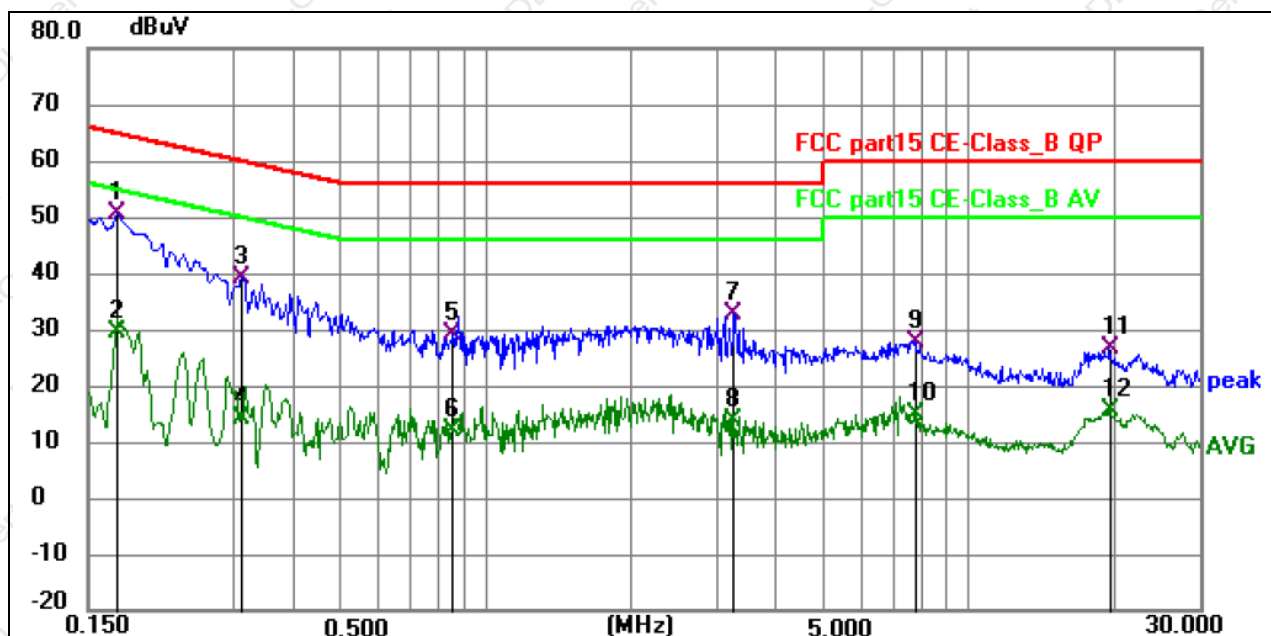
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

We pretest AC 120V and AC 230V, the worst voltage was AC 120V and the data recording in the report.

3.1.6 TEST RESULTS



Temperature:	25 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	L
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 3



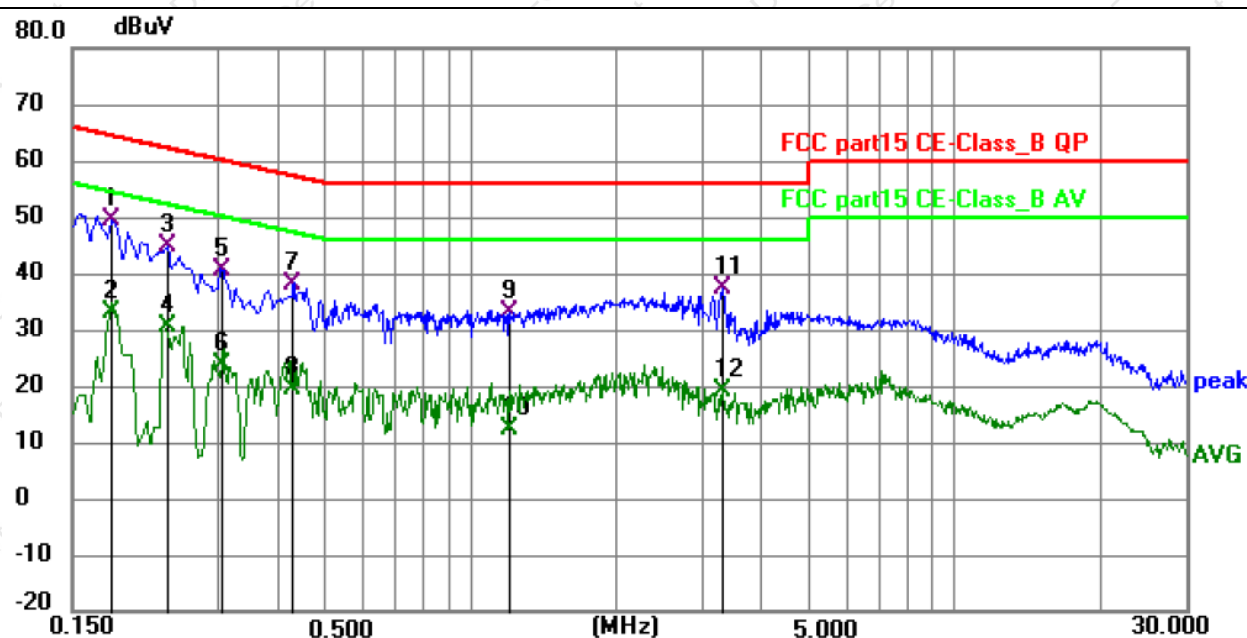
Remark:

Margin = Limit – Level, Correct Factor = Cable lose + LISN insertion loss, Level= Reading + Correct factor

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.1724	41.03	9.55	50.58	64.84	-14.26	QP	P	
2	0.1724	19.78	9.55	29.33	54.84	-25.51	AVG	P	
3	0.3120	29.18	9.92	39.10	59.92	-20.82	QP	P	
4	0.3120	4.03	9.92	13.95	49.92	-35.97	AVG	P	
5	0.8565	19.07	9.95	29.02	56.00	-26.98	QP	P	
6	0.8565	2.15	9.95	12.10	46.00	-33.90	AVG	P	
7	3.2730	22.65	9.93	32.58	56.00	-23.42	QP	P	
8	3.2730	3.79	9.93	13.72	46.00	-32.28	AVG	P	
9	7.7324	17.56	9.99	27.55	60.00	-32.45	QP	P	
10	7.7324	4.78	9.99	14.77	50.00	-35.23	AVG	P	
11	19.5945	16.69	10.03	26.72	60.00	-33.28	QP	P	
12	19.5945	5.43	10.03	15.46	50.00	-34.54	AVG	P	



Temperature:	25 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	N
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 3



Remark:

Margin = Limit – Level, Correct Factor = Cable lose + LISN insertion loss, Level= Reading + Correct factor

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.1815	39.87	9.67	49.54	64.42	-14.88	QP	P	
2	0.1815	23.45	9.67	33.12	54.42	-21.30	AVG	P	
3	0.2355	34.97	9.95	44.92	62.25	-17.33	QP	P	
4	0.2355	20.73	9.95	30.68	52.25	-21.57	AVG	P	
5	0.3075	30.76	9.92	40.68	60.04	-19.36	QP	P	
6	0.3075	13.98	9.92	23.90	50.04	-26.14	AVG	P	
7	0.4290	28.08	9.88	37.96	57.27	-19.31	QP	P	
8	0.4290	9.56	9.88	19.44	47.27	-27.83	AVG	P	
9	1.2030	23.20	9.98	33.18	56.00	-22.82	QP	P	
10	1.2030	2.41	9.98	12.39	46.00	-33.61	AVG	P	
11	3.3135	27.25	9.93	37.18	56.00	-18.82	QP	P	
12	3.3135	9.10	9.93	19.03	46.00	-26.97	AVG	P	



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

15.407(b) Undesirable emission limits. Except as shown in paragraph (b) (10) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating solely in the 5.725-5.850GHz band:
All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micromvolts/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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	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).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40GHz
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average



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

Below 1GHz test procedure as below:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

- Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
- Test the EUT in the lowest channel, the middle channel, the Highest channel

Note:

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

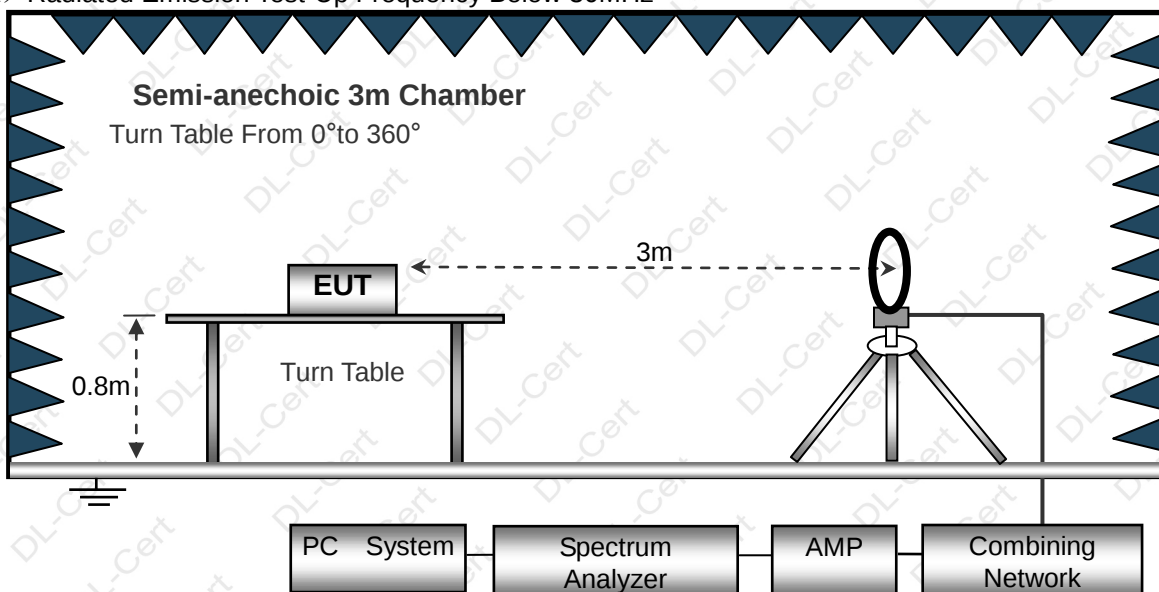
3.2.3 DEVIATION FROM TEST STANDARD

No deviation

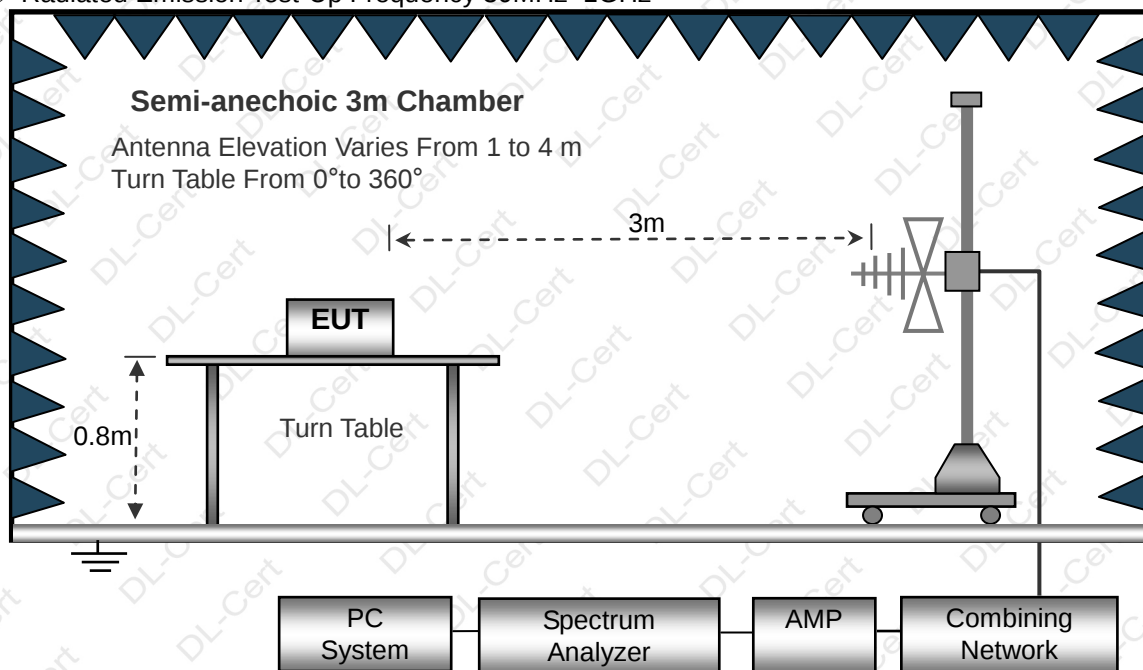


3.2.4 TEST SETUP

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

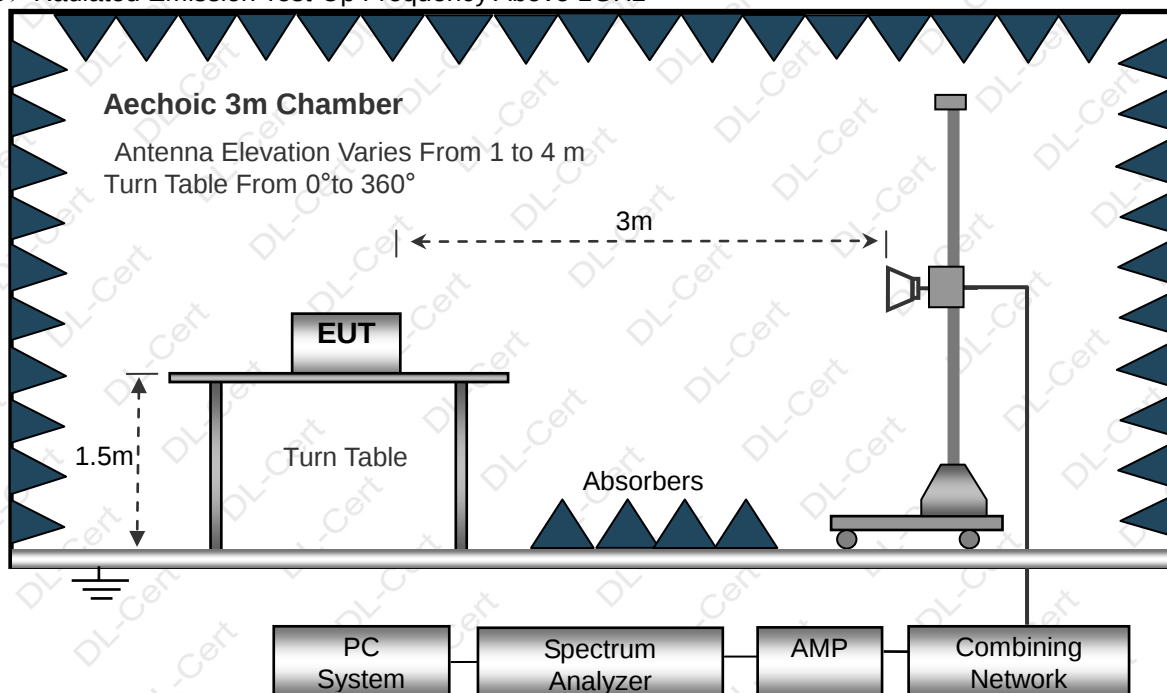


(B) Radiated Emission Test-Up Frequency 30MHz~1GHz





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

**3.2.5 EUT OPERATING CONDITIONS**

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

**3.2.6 TEST RESULTS (Between 9KHz – 30 MHz)**

Temperature:	20°C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Mode 3	Polarization :	--

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

NOTE:

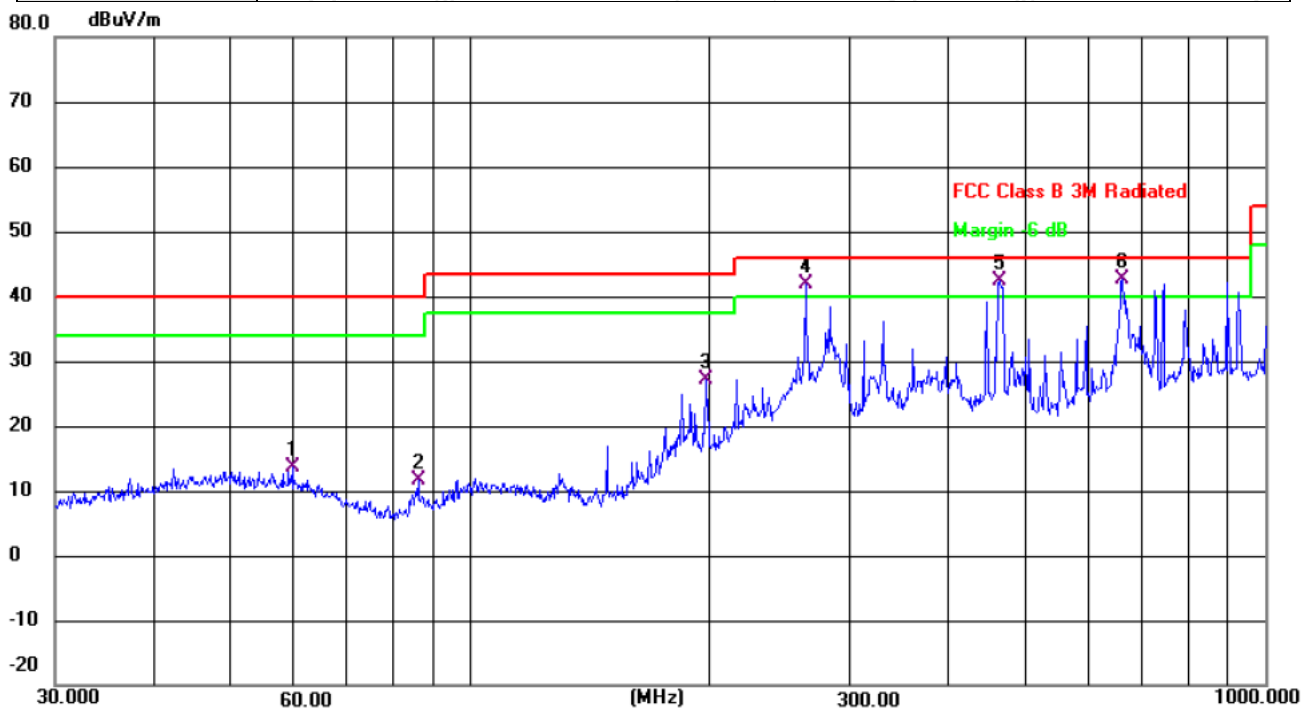
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

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

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

**3.2.7 TEST RESULTS (Between 30MHz – 1GHz)**

Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Horizontal
Test Voltage :	DC 14.4V		
Test Mode :	Mode 3		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		59.6493	27.14	-13.61	13.53	40.00	-26.47	QP
2		85.8983	29.73	-18.00	11.73	40.00	-28.27	QP
3		197.8928	42.06	-14.85	27.21	43.50	-16.29	QP
4	!	263.8190	54.84	-12.92	41.92	46.00	-4.08	QP
5	!	462.3455	50.51	-8.12	42.39	46.00	-3.61	QP
6	*	661.1504	47.03	-4.35	42.68	46.00	-3.32	QP

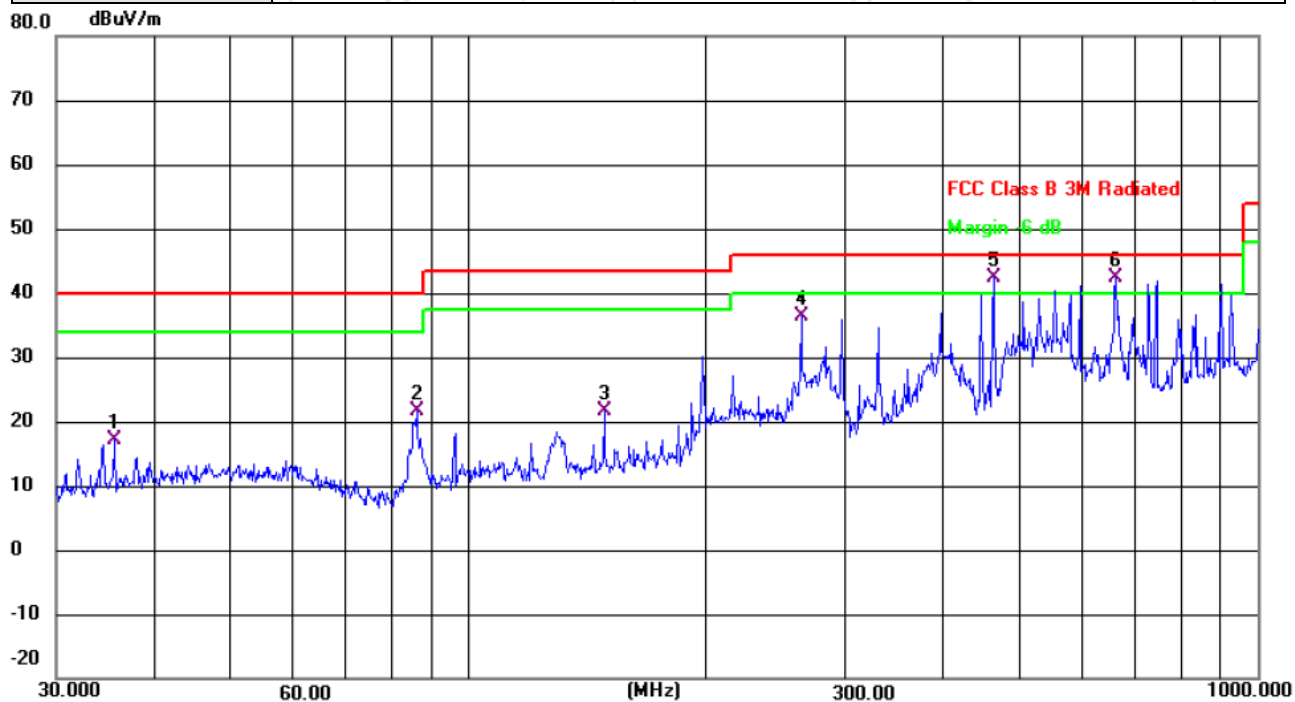
Remark:

Correct Factor = Cable loss + Antenna factor – Preamplifier;

Level = Reading Level + Correct Factor; Margin = Level - Limit;



Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Vertical
test voltage :	DC 14.4V		
Test Mode :	Mode 3		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		35.4992	32.72	-15.66	17.06	40.00	-22.94	QP
2		85.8983	39.74	-18.00	21.74	40.00	-18.26	QP
3		148.4410	40.08	-18.46	21.62	43.50	-21.88	QP
4		263.8190	49.38	-12.92	36.46	46.00	-9.54	QP
5	!	462.3455	50.52	-8.12	42.40	46.00	-3.60	QP
6	*	661.1504	46.77	-4.35	42.42	46.00	-3.58	QP

Remark:

Correct Factor = Cable loss + Antenna factor – Preamplifier;

Level = Reading Level + Correct Factor; Margin = Level - Limit;

**3.2.8 TEST RESULTS (1ghz~40ghz)**

802.11a band 4

Polar (H/V)	Frequency (MHz)	Meter Reading (dBUV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Detector Type
operation frequency:5745									
V	11490	54.91	49.05	15.3	37.39	58.55	74	-15.45	PK
V	11490	41.59	49.05	15.3	37.39	45.23	54	-8.77	AV
V	17235	55.70	49.16	15.27	40.45	62.26	68.2	-5.94	PK
V	17235	41.13	49.16	15.27	40.45	47.69	54	-6.31	AV
H	11490	52.66	49.05	15.3	37.39	56.30	74	-17.70	PK
H	11490	42.95	49.05	15.3	37.39	46.59	54	-7.41	AV
H	17235	52.17	49.16	15.27	40.45	58.73	68.2	-9.47	PK
H	17235	40.64	49.16	15.27	40.45	47.20	54	-6.80	AV
operation frequency:5785									
V	11570	51.83	49.09	15.34	37.42	55.50	74	-18.50	PK
V	11570	41.88	49.09	15.34	37.42	45.55	54	-8.45	AV
V	17355	50.45	49.18	15.29	40.47	57.03	68.2	-11.17	PK
V	17355	40.83	49.18	15.29	40.47	47.41	54	-6.59	AV
H	11570	51.17	49.09	15.34	37.42	54.84	74	-19.16	PK
H	11570	42.30	49.09	15.34	37.42	45.97	54	-8.03	AV
H	17355	49.07	49.18	15.29	40.47	55.65	68.2	-12.55	PK
H	17355	40.91	49.18	15.29	40.47	47.49	54	-6.51	AV
operation frequency:5825									
V	11650	53.17	49.11	15.37	37.46	56.89	74	-17.11	PK
V	11650	41.38	49.11	15.37	37.46	45.10	54	-8.90	AV
V	17475	49.82	49.21	15.34	40.51	56.46	68.2	-11.74	PK
V	17475	40.58	49.21	15.34	40.51	47.22	54	-6.78	AV
H	11650	57.93	49.11	15.37	31.31	55.50	74	-18.50	PK
H	11650	48.86	49.11	15.37	31.31	46.43	54	-7.57	AV
H	17475	49.67	49.21	15.34	40.51	56.31	68.2	-11.89	PK
H	17475	41.11	49.21	15.34	40.51	47.75	54	-6.25	AV

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



802.11n HT20

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:5745									
V	11490	49.98	49.05	15.3	37.39	53.62	74	-20.38	PK
V	11490	42.62	49.05	15.3	37.39	46.26	54	-7.74	AV
V	17235	49.14	49.16	15.27	40.45	55.70	68.2	-12.50	PK
V	17235	40.68	49.16	15.27	40.45	47.24	54	-6.76	AV
H	11490	49.88	49.05	15.3	37.39	53.52	74	-20.48	PK
H	11490	41.41	49.05	15.3	37.39	45.05	54	-8.95	AV
H	17235	49.15	49.16	15.27	40.45	55.71	68.2	-12.49	PK
H	17235	41.20	49.16	15.27	40.45	47.76	54	-6.24	AV
operation frequency:5785									
V	11570	52.95	49.09	15.34	37.42	56.62	74	-17.38	PK
V	11570	42.40	49.09	15.34	37.42	46.07	54	-7.93	AV
V	17355	50.19	49.18	15.29	40.47	56.77	68.2	-11.43	PK
V	17355	40.90	49.18	15.29	40.47	47.48	54	-6.52	AV
H	11570	50.26	49.09	15.34	37.42	53.93	74	-20.07	PK
H	11570	43.85	49.09	15.34	37.42	47.52	54	-6.48	AV
H	17355	50.05	49.18	15.29	40.47	56.63	68.2	-11.57	PK
H	17355	40.91	49.18	15.29	40.47	47.49	54	-6.51	AV
operation frequency:5825									
V	11650	52.01	49.11	15.37	37.46	55.73	74	-18.27	PK
V	11650	41.50	49.11	15.37	37.46	45.22	54	-8.78	AV
V	17475	48.50	49.21	15.34	40.51	55.14	68.2	-13.06	PK
V	17475	41.21	49.21	15.34	40.51	47.85	54	-6.15	AV
H	11650	58.09	49.11	15.37	31.31	55.66	74	-18.34	PK
H	11650	44.93	49.11	15.37	31.31	42.50	54	-11.50	AV
H	17475	49.98	49.21	15.34	40.51	56.62	68.2	-11.58	PK
H	17475	41.18	49.21	15.34	40.51	47.82	54	-6.18	AV

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



802.11n HT40

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:5755									
V	11510	50.17	49.07	15.33	37.41	53.84	74	-20.16	PK
V	11510	41.61	49.07	15.33	37.41	45.28	54	-8.72	AV
V	17265	50.18	49.17	15.28	40.46	56.75	68.2	-11.45	PK
V	17265	40.59	49.17	15.28	40.46	47.16	54	-6.84	AV
H	11510	49.05	49.07	15.33	37.41	52.72	74	-21.28	PK
H	11510	41.44	49.07	15.33	37.41	45.11	54	-8.89	AV
H	17265	49.98	49.17	15.28	40.46	56.55	68.2	-11.65	PK
H	17265	40.69	49.17	15.28	40.46	47.26	54	-6.74	AV
operation frequency:5795									
V	11590	49.49	49.11	15.37	37.46	53.21	74	-20.79	PK
V	11590	41.50	49.11	15.37	37.46	45.22	54	-8.78	AV
V	17385	48.74	49.21	15.34	40.51	55.38	68.2	-12.82	PK
V	17385	41.21	49.21	15.34	40.51	47.85	54	-6.15	AV
H	11590	58.02	49.11	15.37	31.31	55.59	74	-18.41	PK
H	11590	45.11	49.11	15.37	31.31	42.68	54	-11.32	AV
H	17385	48.55	49.21	15.34	40.51	55.19	68.2	-13.01	PK
H	17385	40.58	49.21	15.34	40.51	47.22	54	-6.78	AV
Remark: 1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit 2. If peak below the average limit, the average emission was no test. 3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.									



802.11ac HT20

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:5745									
V	11490	49.58	49.05	15.3	37.39	53.22	74	-20.78	PK
V	11490	42.69	49.05	15.3	37.39	46.33	54	-7.67	AV
V	17235	48.69	49.16	15.27	40.45	55.25	68.2	-12.95	PK
V	17235	40.89	49.16	15.27	40.45	47.45	54	-6.55	AV
H	11490	48.56	49.05	15.3	37.39	52.20	74	-21.80	PK
H	11490	41.54	49.05	15.3	37.39	45.18	54	-8.82	AV
H	17235	49.15	49.16	15.27	40.45	55.71	68.2	-12.49	PK
H	17235	41.18	49.16	15.27	40.45	47.74	54	-6.26	AV
operation frequency:5785									
V	11570	49.15	49.09	15.34	37.42	52.82	74	-21.18	PK
V	11570	41.44	49.09	15.34	37.42	45.11	54	-8.89	AV
V	17355	50.14	49.18	15.29	40.47	56.72	68.2	-11.48	PK
V	17355	40.50	49.18	15.29	40.47	47.08	54	-6.92	AV
H	11570	50.26	49.09	15.34	37.42	53.93	74	-20.07	PK
H	11570	43.70	49.09	15.34	37.42	47.37	54	-6.63	AV
H	17355	49.47	49.18	15.29	40.47	56.05	68.2	-12.15	PK
H	17355	41.21	49.18	15.29	40.47	47.79	54	-6.21	AV
operation frequency:5825									
V	11650	49.98	49.11	15.37	37.46	53.70	74	-20.30	PK
V	11650	42.12	49.11	15.37	37.46	45.84	54	-8.16	AV
V	17475	48.71	49.21	15.34	40.51	55.35	68.2	-12.85	PK
V	17475	41.18	49.21	15.34	40.51	47.82	54	-6.18	AV
H	11650	58.18	49.11	15.37	31.31	55.75	74	-18.25	PK
H	11650	44.46	49.11	15.37	31.31	42.03	54	-11.97	AV
H	17475	48.94	49.21	15.34	40.51	55.58	68.2	-12.62	PK
H	17475	41.08	49.21	15.34	40.51	47.72	54	-6.28	AV

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



802.11ac HT40

Polar (H/V)	Frequency	Meter Reading	Pre- amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:5755									
V	11510	49.97	49.07	15.33	37.41	53.64	74	-20.36	PK
V	11510	42.82	49.07	15.33	37.41	46.49	54	-7.51	AV
V	17265	48.62	49.17	15.28	40.46	55.19	68.2	-13.01	PK
V	17265	41.72	49.17	15.28	40.46	48.29	54	-5.71	AV
H	11510	48.96	49.07	15.33	37.41	52.63	74	-21.37	PK
H	11510	43.22	49.07	15.33	37.41	46.89	54	-7.11	AV
H	17265	48.71	49.17	15.28	40.46	55.28	68.2	-12.92	PK
H	17265	40.48	49.17	15.28	40.46	47.05	54	-6.95	AV
operation frequency:5795									
V	11590	49.77	49.11	15.37	37.46	53.49	74	-20.51	PK
V	11590	41.64	49.11	15.37	37.46	45.36	54	-8.64	AV
V	17385	48.85	49.21	15.34	40.51	55.49	68.2	-12.71	PK
V	17385	41.08	49.21	15.34	40.51	47.72	54	-6.28	AV
H	11590	58.24	49.11	15.37	31.31	55.81	74	-18.19	PK
H	11590	45.02	49.11	15.37	31.31	42.59	54	-11.41	AV
H	17385	48.52	49.21	15.34	40.51	55.16	68.2	-13.04	PK
H	17385	41.12	49.21	15.34	40.51	47.76	54	-6.24	AV
Remark: 1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit 2. If peak below the average limit, the average emission was no test. 3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.									



3.3 CONDUCTED BAND EMISSION MEASUREMENT

3.3.1 TEST REQUIREMENT:

FCC Part15 C Section 15.209 and 15.407

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Spectrum Parameter	Setting	
Attenuation	Auto	
Start Frequency	5150MHz	5725MHz
Stop Frequency	5250MHz	5850MHz
RB / VB (emission in restricted band)	1 MHz / 3 MHz for Peak, 1 MHz / 10Hz for Average	

3.3.2 TEST PROCEDURE

Test method: FCC KDB 789033 G)& Parts 15.407(b)(4) & 15.209(a)

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP



3.3.5 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.

3.3.6 TEST RESULT

The antenna gain is compensated in the test data.
Please see annex 1.



4. AVERAGING OUTPUT POWER

4.1 APPLIED PROCEDURES / LIMIT

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

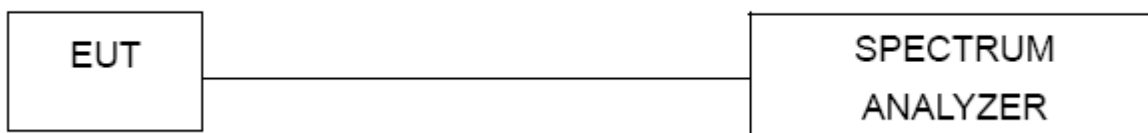
4.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW = 1MHz
Span $\geq 99\%$ OBW(30MHz/60MHz/120MHz etc.)
VBW $\geq 3 \times$ RBW
Sweep = auto
Detector function = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
Trace = max hold

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



4.1.4 EUT OPERATION 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.

4.1.5 TEST RESULTS

Please see annex 1.



5. POWER SPECTRAL DENSITY TEST

5.1 APPLIED PROCEDURES / LIMIT

In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.
In addition, the maximum power spectral density shall not exceed 30 dBm in any 500 kHz band.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	= the frequency band of operation
RB	RBW $\geq$ 1MHz for band 1 RBW $\geq$ 510KHz for band 4
VB	VBW $\geq$ 3RBW
Detector	RMS (i.e., power averaging).
Trace	Max Hold
Sweep Time	Auto

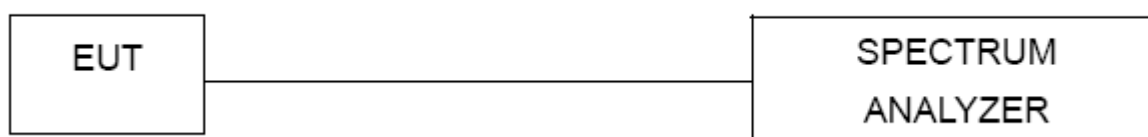
5.1.1 TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
4. For U-NII1, U-NII-2A, U-NII-2C Band:
Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
For U-NII-3 Band:
Set RBW=510 kHz, VBW=3*RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
5. Use the cursor on spectrum to peak search the highest level of trace
6. Record the max. reading and add 10 log(1/duty cycle).
we test all antennas, the antenna 1 was worst mode and the data recording in the report.
7. Duty factor Reference is made to the test results in Section 7.1.5.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION 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.



5.1.5 TEST RESULTS

Please see annex 1.

6. 6DB&26DB&99% BANDWIDTH TEST

6.1 APPLIED PROCEDURES / LIMIT

The 26 dB bandwidth is used to determine the conducted power limits.

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C.

The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

6.1.1 TEST PROCEDURE

6dB Bandwidth	
Spectrum Parameters	Setting
RBW	100KHz
VBW	300KHz
Span	30MHz(20MHz Bandwidth mode) 60MHz(40MHz Bandwidth mode) 120MHz(80MHz Bandwidth mode)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

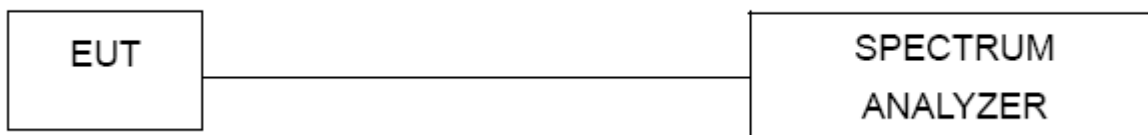
26dB Bandwidth	
Spectrum Parameters	Setting
RBW	approximately 1% of the emission bandwidth
VBW	>RBW
Span	30MHz(20MHz Bandwidth mode) 60MHz(40MHz Bandwidth mode) 120MHz(80MHz Bandwidth mode)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

99% Occupied Bandwidth	
Spectrum Parameters	Setting
RBW	1% to 5% of the OBW
VBW	Approximately three times the RBW
Span	between 1.5 times and 5.0 times the OBW
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP





6.1.4 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.

6.1.5 TEST RESULTS

Please see annex 1.



7. DUTY CYCLE TEST SIGNAL

7.1 APPLIED PROCEDURES / LIMIT

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle. All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

7.1.1 TEST PROCEDURE

1. Set RBW = 1 MHz.
2. Set the video bandwidth (VBW) $\geq$ RBW.
3. Detector = Peak.
4. Sweep = auto couple.
5. Allow the trace to stabilize.
6. Span=0

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 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.

7.1.5 TEST RESULTS

Please see annex 1.



8. FREQUENCY STABILITY

8.1 APPLIED PROCEDURES / LIMIT

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

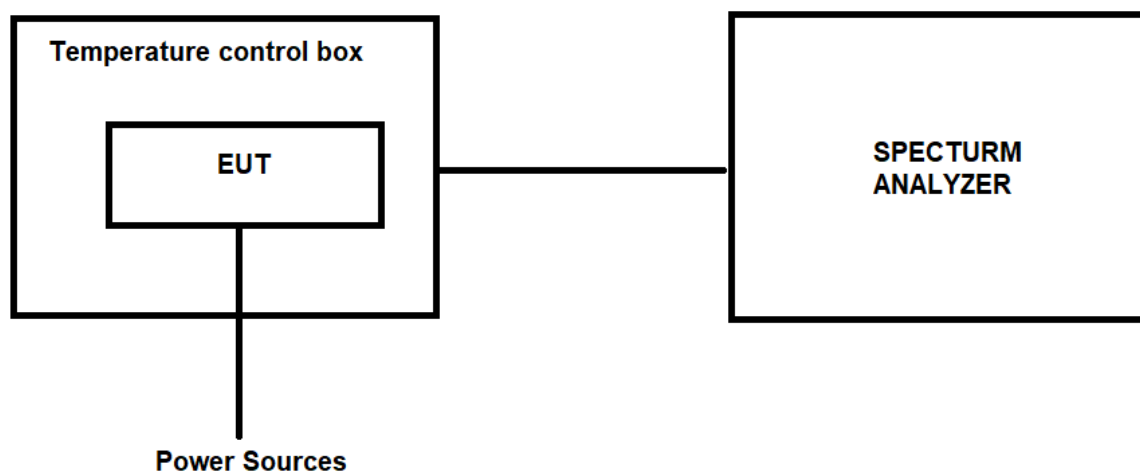
8.1.1 TEST PROCEDURE

1. The EUT was placed inside temperature chamber and powered and powered by nominal DC voltage.
2. Set EUT as normal operation.
3. Turn the EUT on and couple its output to spectrum.
4. Turn the EUT off and set the chamber to the highest temperature specified.
5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT and measure the operating frequency.
6. Repeat step with the temperature chamber set to the lowest temperature.

8.1.2 DEVIATION FROM STANDARD

No deviation.

8.1.3 TEST SETUP



8.1.4 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.



8.1.5 TEST RESULTS

Test Voltage	Test Temp.	Measured Frequency	Spectrum Frequency (MHz)			Δ Frequency (ppm)		
		(MHz)	802.11a	802.11n HT20	802.11ac HT20	802.11a	802.11n HT20	802.11ac HT20
16.56V	-20℃	5745	5745.0402	5745.0348	5745.0344	7.0015	6.0615	5.9919
		5785	5785.0398	5785.0356	5785.0373	6.8860	6.1600	6.4538
		5825	5825.0380	5825.0353	5825.0382	6.5318	6.0682	6.5661
12.24V		5745	5745.0280	5745.0280	5745.0280	4.8779	4.8779	4.8779
		5785	5785.0358	5785.0395	5785.0372	6.1946	6.8341	6.4366
		5825	5825.0434	5825.0458	5825.0429	7.4588	7.8708	7.3730
14.4V	25℃	5745	5745.0371	5745.0339	5745.0342	6.4619	5.9049	5.9571
		5785	5785.0453	5785.0453	5785.0483	7.8367	7.8367	8.3553
		5825	5825.0235	5825.0240	5825.0241	4.0425	4.1283	4.1455
16.56V	45℃	5745	5745.0680	5745.0675	5745.0658	11.8405	11.7534	11.4575
		5785	5785.0445	5785.0443	5785.0460	7.6984	7.6639	7.9577
		5825	5825.0661	5825.0642	5825.0684	11.3558	11.0296	11.7506
12.24V		5745	5745.0480	5745.0441	5745.0479	8.3592	7.6803	8.3418
		5785	5785.0277	5785.0280	5785.0271	4.7907	4.8425	4.6870
		5825	5825.0722	5825.0719	5825.0746	12.3867	12.3352	12.7987

Test Voltage	Test Temp.	Measured Frequency (MHz)	Spectrum Frequency (MHz)		Δ Frequency (ppm)	
			802.11n HT40	802.11ac HT40	802.11n HT40	802.11ac HT40
16.56V	-20℃	5755	5755.0591	5755.0602	10.2739	10.4651
		5795	5795.0669	5795.0681	11.5511	11.7582
12.24V		5755	5755.0250	5755.0680	4.3487	11.8204
		5795	5795.0468	5795.0461	8.0826	7.9618
14.4V	25℃	5755	5755.0272	5755.0231	4.7309	4.0185
		5795	5795.0585	5795.0551	10.1016	9.5148
16.56V	45℃	5755	5755.0484	5755.0501	8.4147	8.7101
		5795	5795.0343	5795.0352	5.9255	6.0808
12.24V		5755	5755.0375	5755.0380	6.5207	6.6076
		5795	5795.0502	5795.0505	8.6693	8.7211



9. TRANSMISSION IN THE ABSENCE OF DATA

9.1 STANDARD REQUIREMENT

According to §15.407(c)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

9.2 TEST RESULT

No non-compliance noted:
Refer to the theory of operation.

10. ANTENNA REQUIREMENT

10.1 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.

10.2 EUT ANTENNA

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

11. TEST SEUUP PHOTO

Reference to the appendix I for details.

12. EUT PHOTO

Reference to the appendix II for details.

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