

TEST REPORT

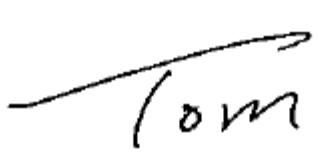
Applicant	SZ Telstar CO.,LTD
Address	Telstar Technology Park No.12~14,Gangbei Industrial Zone, Ailian, Longgang District, ShenZhen

Manufacturer or Supplier	SZ Telstar CO.,LTD
Address	Telstar Technology Park No.12~14,Gangbei Industrial Zone, Ailian, Longgang District, ShenZhen
Product	Projector
Brand Name	miroir, Brookstone
Model	MP318
Additional Model & Model Difference	MP300A, see item 3.1
Date of tests	Nov. 05, 2016 ~ Nov. 29, 2016

The tests have been carried out according to the requirements of the following standard:

☒ **FCC Part 15, Subpart C, Section 15.247**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Tom Chen Project Engineer / EMC Department	Approved by Glyn He Supervisor/ EMC Department
	 Date: Dec. 02, 2016

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF161013N029-2	Original release	Dec. 02, 2016

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used

2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.70dB
Radiated emissions	9KHz ~ 30MHz	2.90dB
	30MHz ~ 1GMHz	3.83dB
	1GHz ~ 18GHz	4.93dB
	18GHz ~ 40GHz	4.80dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.



3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Projector
MODEL NO.	MP318
ADDITIONAL NO.	MP300A
FCC ID	2AFOW-MP300A318
NOMINAL VOLTAGE	DC 11.1V From Li-ion Battery or DC14.5V/2.48A From Adapter
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM BT-LE(GFSK) for DTS
MODULATION TECHNOLOGY	DSSS, OFDM, DTS
OPERATING FREQUENCY	2412-2462MHz for 11b/g/n(HT20) 2402-2480MHz for BT-LE(GFSK)
PEAK POWER	WLAN: 20.38dBm(Maximum) BT-LE: 8.38dBm(Maximum)
ANTENNA TYPE	Integral FPCB Antenna, 2.89dBi Gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	HDMI cable: Shielded, Detachable, 0.7m

NOTE:

1. The EUT incorporates a SISO function. Physically, the EUT provides one transmitter and one receiver.

MODULATION MODE	FUNCTION
802.11b	1TX/1RX
802.11g	1TX/1RX
802.11n (HT20)	1TX/1RX
BT-LE	1TX/1RX

2. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
4. Please refer to the EUT photo document (Reference No.: 161013N029) for detailed product photo.
5. Additional mode MP300A is identical with the test model MP318, except the model number and brand name for marketing purpose.

6. The EUT can be powered by adapter as list as following:

ADAPTER	
BRAND:	N/A
MODEL:	FJ-SW360AN
INPUT:	AC 100-240V 50/60Hz 1.2A Max
OUTPUT:	DC14.5V 2.48A Max
CABLE:	USB cable: Shielded, Detachable, 1.8m

3.2 DESCRIPTION OF TEST MODES

11 channels are provided for 802.11b, 802.11g and 802.11n(HT20):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

40 channels are provided for BT-LE(GFSK):

CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

Please see section 5 photographs of the test configuration for reference.

3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports.

The worst case was found when positioned on X axis for radiated emission. Following test modes were selected for the final test, and the final worst case is marked in boldface and recorded in the report:

EUT CONFIGURE MODE	APPLICABLE TO				MODE
	RE<1G	RE≥1G	PLC	APCM	
A	√	√	√	-	Powered by Adapter with (WIFI + BT) function
B	-	-	-	√	Powered by Fully Battery with (WIFI + BT) function

Where **RE<1G**: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

RE≥1G: Radiated Emission above 1GHz

APCM: Antenna Port Conducted Measurement

POWER LINE CONDUCTED EMISSION TEST:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CONDITION
A	BT Link+ WIFI (2.4G) Link

RADIATED EMISSION TEST (BELOW 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1	OFDM	DBPSK	1.0
A	BT-LE	0 to 39	39	DTS	GFSK	1.0



RADIATED EMISSION TEST (ABOVE 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 6, 11	CCK	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
A	BT-LE	0 to 39	0,19, 39	DTS	GFSK	1.0

BANDEDGE MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 11	CCK	DBPSK	1.0
A	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
A	802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
A	BT-LE	0 to 39	0,19, 39	DTS	GFSK	1.0

ANTENNA PORT CONDUCTED MEASUREMENT:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
B	802.11b	1 to 11	1, 11	CCK	DBPSK	1.0
B	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
B	802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
B	BT-LE	0 to 39	0,19, 39	DTS	GFSK	1.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	25deg. C, 55%RH	DC 14.5V From Adapter	Hardy Leng
RE≥1G	25deg. C, 55%RH	DC 14.5V From Adapter	Hardy Leng
PLC	20deg. C, 56%RH	DC 14.5V From Adapter	Sen He
APCM	20deg. C, 55%RH	DC 11.1V From fully battery	Sen He

3.3 DUTY CYCLE OF TEST SIGNAL

Duty cycle of test signal is 100 %



3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C, Section 15.247

KDB 558074 D01 DTS Meas Guidance v03r05

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

NOTE: It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B(DoC). The test report has been issued separately.

3.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together without other necessary accessories or support units.

4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101588	Jan. 22,16	Jan. 21,17
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Mar. 04,16	Mar. 03,17
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Apr. 05,16	Apr. 04,17
Voltage probe	SCHWARZBECK	TK 9421	TK 9421-176	Jan. 08,16	Jan. 07,17
Test software	ADT	ADT_Cond_V7.3.7	N/A	N/A	N/A

- NOTE:**
1. The test was performed in shielded room 553.
 2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

4.1.3 TEST PROCEDURES

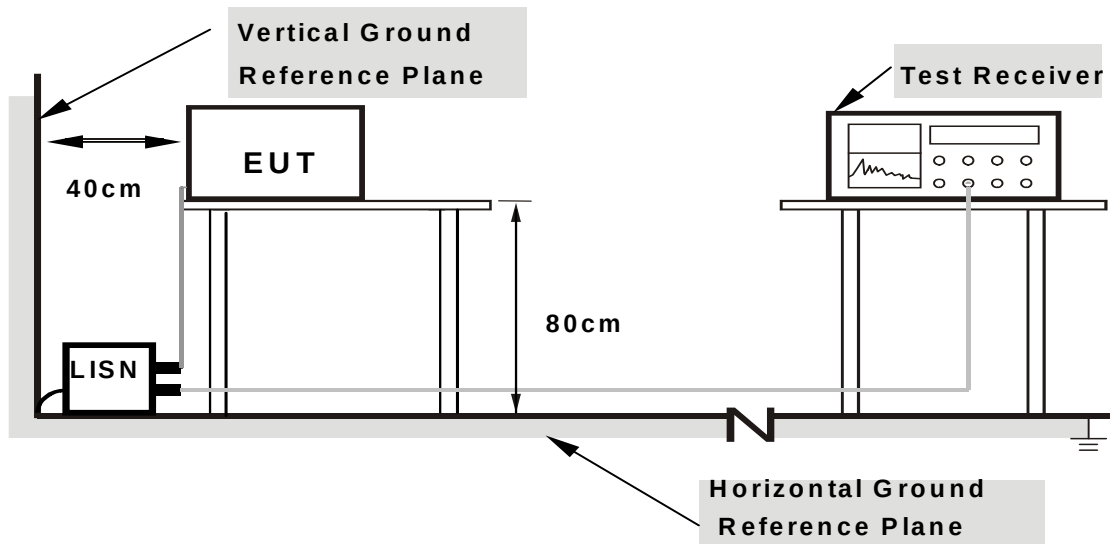
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 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

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

- a. Turned on the power and connected of all equipment.
- b. EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.



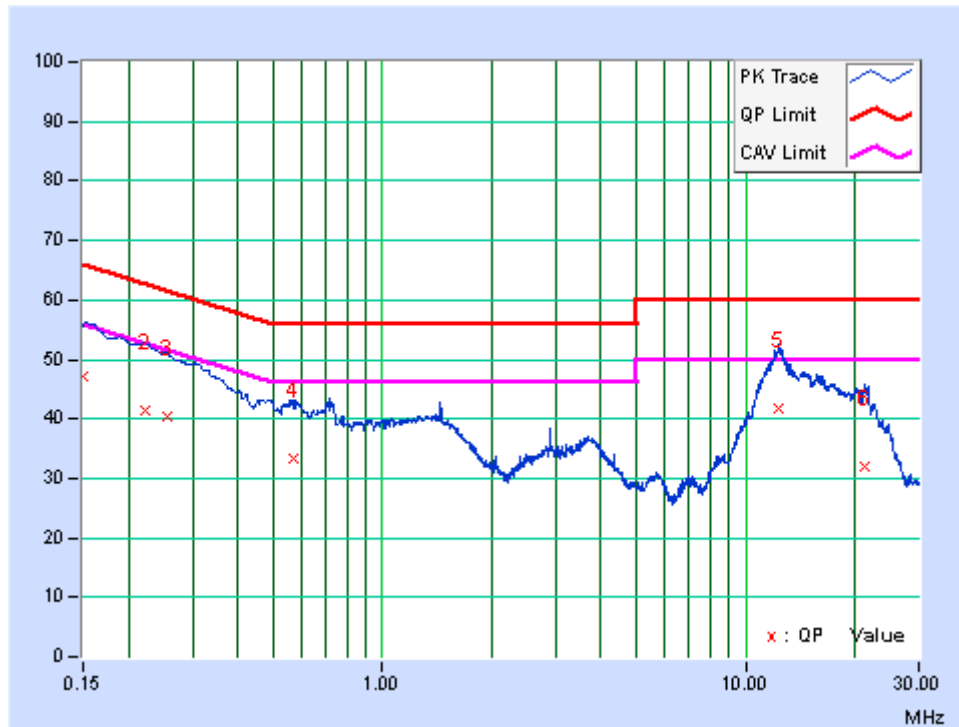
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA: BT+WIFI

PHASE	Line	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.11	37.11	18.85	47.22	28.96	66.00	56.00	-18.78	-27.04
2	0.22200	10.13	31.17	14.29	41.30	24.42	62.74	52.74	-21.44	-28.32
3	0.25575	10.15	30.21	16.28	40.36	26.43	61.57	51.57	-21.21	-25.14
4	0.56703	10.29	23.11	13.81	33.40	24.10	56.00	46.00	-22.60	-21.90
5	12.34275	10.52	31.37	22.27	41.89	32.79	60.00	50.00	-18.11	-17.21
6	21.40125	10.72	21.38	4.13	32.10	14.85	60.00	50.00	-27.90	-35.15

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.

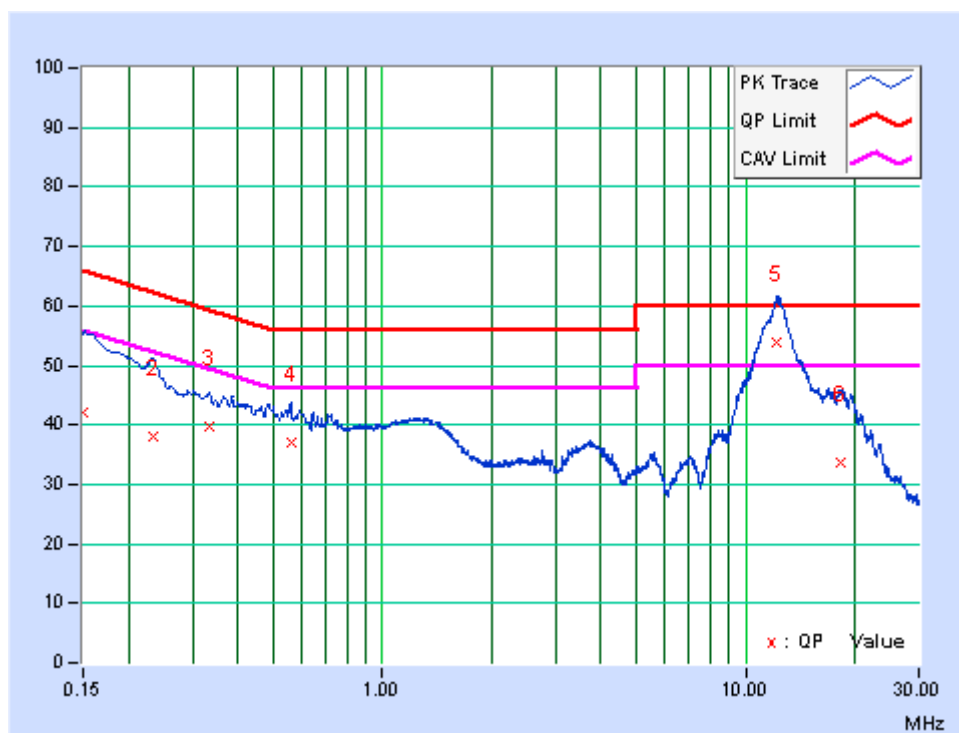




PHASE	Neutral	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.86	32.31	14.38	42.17	24.24	66.00	56.00	-23.83	-31.76
2	0.23290	9.88	28.03	12.34	37.91	22.22	62.35	52.35	-24.44	-30.13
3	0.33264	9.89	29.91	13.95	39.80	23.84	59.39	49.39	-19.58	-25.54
4	0.55959	9.93	27.21	14.77	37.14	24.70	56.00	46.00	-18.86	-21.30
5	12.14925	10.44	43.39	34.54	53.83	44.98	60.00	50.00	-6.17	-5.02
6	18.16575	10.56	23.27	14.93	33.83	25.49	60.00	50.00	-26.17	-24.51

- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Apr. 05,16	Apr. 04,17
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	Nov. 04,16	Nov. 03,17
Bilog Antenna	Teseq	CBL 6111D	30643	Jul. 14, 16	Jul. 13, 17
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 18,16	May 17,17
GPS Generator+ Antenna	TOJOIN	GNSS-5000A	E1-010119	Aug. 08, 16	Aug. 07, 17
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Mar. 12,16	Mar. 11,18
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170242	Mar. 12,16	Mar. 11,17
Amplifier (9kHz-1GHz)	SONOMA	310D	186955	Mar. 04,16	Mar. 03, 17
Pre-Amplifier(1-18G)	HP	8449B	3008A00409	Apr. 25,16	Apr. 24,17
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 04,16	Nov. 03,17
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug. 08,16	Aug. 07,17

NOTE:

1. The test was performed in 966 Chamber.
2. The calibration interval of the above test instruments is 12 or 24 months and the calibrations are traceable to CEPREI/CHINA, GREGT/CHINA and NIM/CHINA.
3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 494399.

4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 meters (above 1GHz) and 0.8 meters (below 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its 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.
- d. 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 and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
4. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

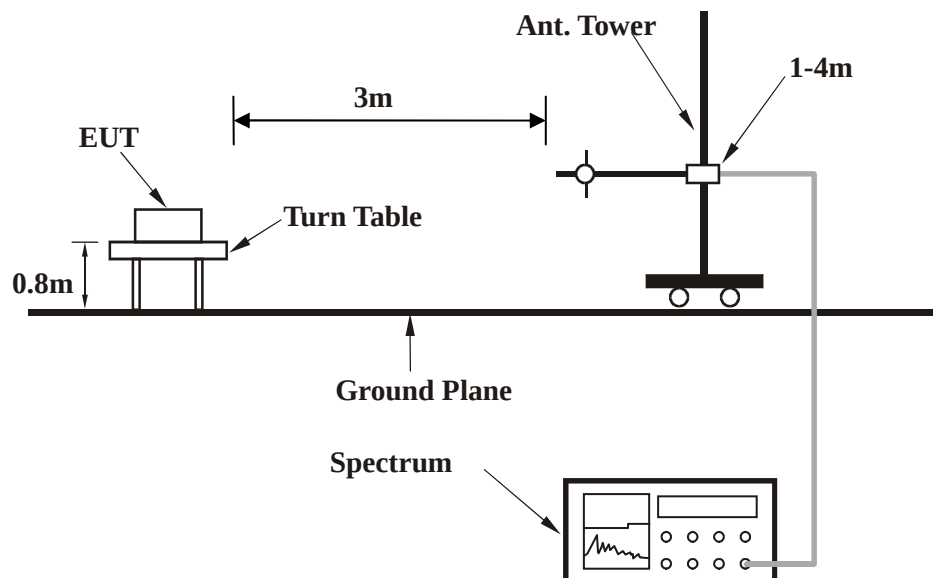
4.2.4 DEVIATION FROM TEST STANDARD

No deviation.



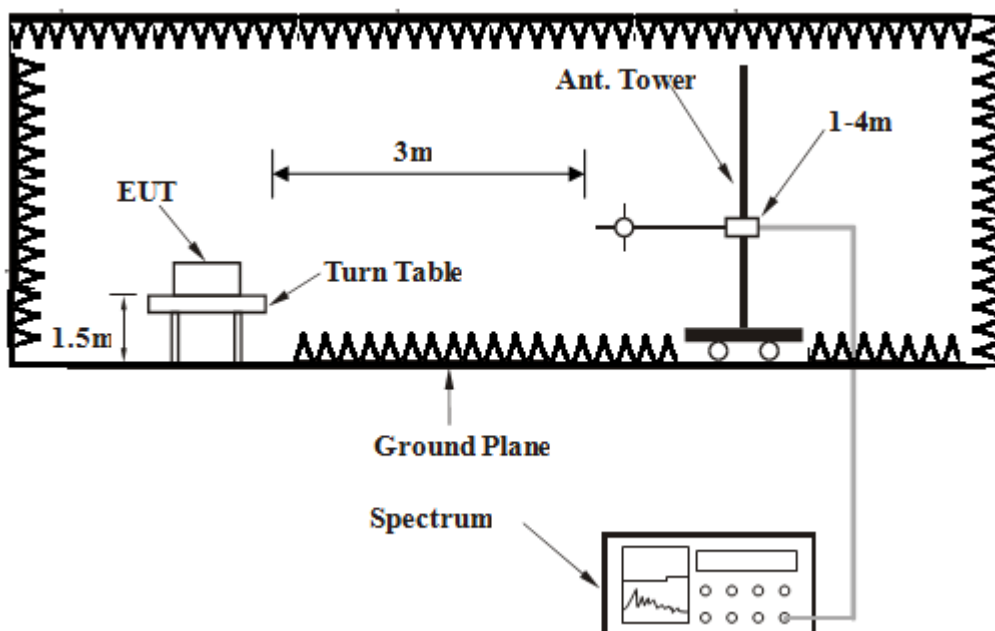
4.2.5 TEST SETUP

Below 1GHz test setup



Note: For the actual test configuration, please refer to the attached file (Test Setup Photo).

Above 1GHz test setup



Note: For the actual test configuration, please refer to the attached file (Test Setup Photo).



4.2.6 EUT OPERATING CONDITIONS

- a. Placed the EUT on a testing table.
- b. Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.
- c. The necessary accessories enable the EUT in full functions.



4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA:

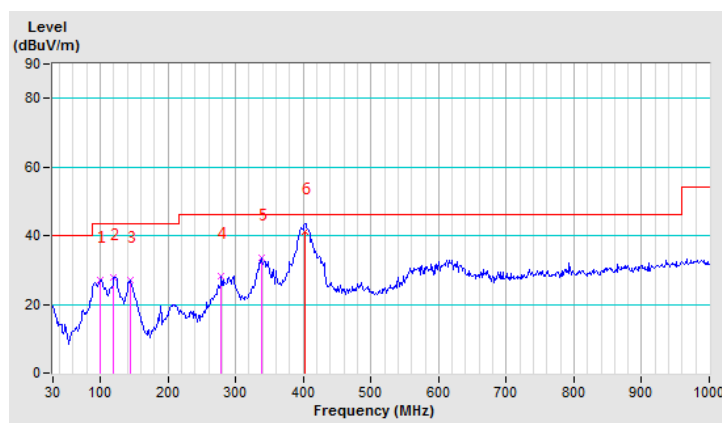
802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	100.29	27.2 QP	43.5	-16.3	1.00 H	0	45.69	-18.47
2	119.97	27.7 QP	43.5	-15.8	1.00 H	0	44.17	-16.49
3	143.87	27.0 QP	43.5	-16.5	1.00 H	0	44.06	-17.04
4	278.83	28.0 QP	46.0	-18.0	1.00 H	0	42.00	-13.97
5	337.87	33.6 QP	46.0	-12.4	1.00 H	0	46.03	-12.46
6	402.00	41.2 QP	46.0	-4.8	1.00 H	231	49.69	-8.49

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



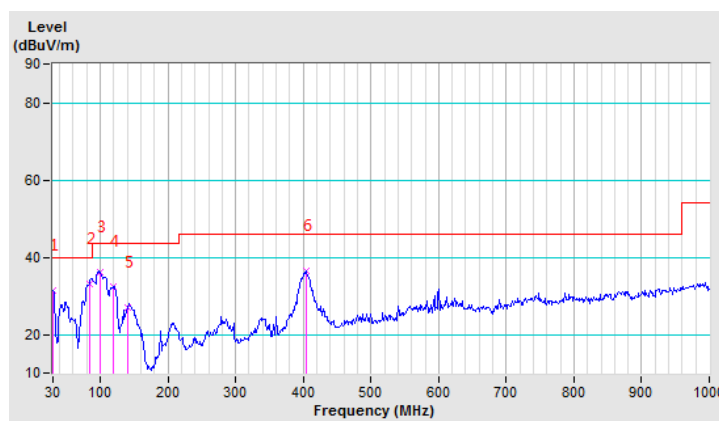


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.00	31.4 QP	40.0	-8.7	2.00 V	0	42.62	-11.27
2	83.42	33.1 QP	40.0	-6.9	2.00 V	0	54.24	-21.11
3	100.29	36.0 QP	43.5	-7.5	2.00 V	0	54.49	-18.47
4	119.97	32.4 QP	43.5	-11.1	2.00 V	0	48.89	-16.49
5	139.65	26.9 QP	43.5	-16.6	2.00 V	0	44.26	-17.36
6	405.35	36.5 QP	46.0	-9.5	2.00 V	0	44.91	-8.40

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.





ABOVE 1GHz DATA

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.89 PK	74.00	-19.11	2.08 H	265	51.02	3.87
2	2390.00	45.26 AV	54.00	-8.74	2.08 H	265	41.39	3.87
3	*2412.00	107.21 PK			2.08 H	265	103.27	3.94
4	*2412.00	104.11 AV			2.08 H	265	100.17	3.94
5	4824.00	45.56 PK	74.00	-28.44	1.55 H	52	37.55	8.01
6	4824.00	31.59 AV	54.00	-22.41	1.55 H	52	23.58	8.01
7	7236.00	51.22 PK	74.00	-22.78	1.00 H	250	37.22	14.00
8	7236.00	36.88 AV	54.00	-17.12	1.00 H	250	22.88	14.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.24 PK	74.00	-19.76	1.00 V	122	50.37	3.87
2	2390.00	44.80 AV	54.00	-9.20	1.00 V	122	40.93	3.87
3	*2412.00	108.25 PK			1.00 V	122	104.31	3.94
4	*2412.00	104.56 AV			1.00 V	122	100.62	3.94
5	4824.00	45.99 PK	74.00	-28.01	1.55 V	21	37.98	8.01
6	4824.00	32.48 AV	54.00	-21.52	1.55 V	21	24.47	8.01
7	7236.00	51.56 PK	74.00	-22.44	1.88 V	94	37.56	14.00
8	7236.00	37.45 AV	54.00	-16.55	1.88 V	94	23.45	14.00

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	109.58 PK			2.56 H	247	105.57	4.01
2	*2437.00	106.12 AV			2.56 H	247	102.11	4.01
3	4874.00	45.58 PK	74.00	-28.42	1.22 H	17	37.50	8.08
4	4874.00	31.09 AV	54.00	-22.91	1.22 H	17	23.01	8.08
5	7311.00	51.99 PK	74.00	-22.01	1.88 H	51	37.86	14.13
6	7311.00	36.98 AV	54.00	-17.02	1.88 H	51	22.85	14.13
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	107.21 PK			1.31 V	123	103.20	4.01
2	*2437.00	103.33 AV			1.31 V	123	99.32	4.01
3	4874.00	45.57 PK	74.00	-28.43	1.99 V	65	37.49	8.08
4	4874.00	34.58 AV	54.00	-19.42	1.99 V	65	26.50	8.08
5	7311.00	51.99 PK	74.00	-22.01	1.55 V	158	37.86	14.13
6	7311.00	37.88 AV	54.00	-16.12	1.55 V	158	23.75	14.13

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.89 PK			2.51 H	241	104.80	4.09
2	*2462.00	105.55 AV			2.51 H	241	101.46	4.09
3	2483.50	52.24 PK	74.00	-21.76	2.51 H	241	48.08	4.16
4	2483.50	40.22 AV	54.00	-13.78	2.51 H	241	36.06	4.16
5	4924.00	45.69 PK	74.00	-28.31	1.66 H	54	37.55	8.14
6	4924.00	31.67 AV	54.00	-22.33	1.66 H	54	23.53	8.14
7	7386.00	51.67 PK	74.00	-22.33	3.12 H	210	37.42	14.25
8	7386.00	37.19 AV	54.00	-16.81	3.12 H	210	22.94	14.25
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.45 PK			2.04 V	61	103.36	4.09
2	*2462.00	104.05 AV			2.04 V	61	99.96	4.09
3	2483.50	52.05 PK	74.00	-21.95	2.04 V	61	47.89	4.16
4	2483.50	40.26 AV	54.00	-13.74	2.04 V	61	36.10	4.16
5	4924.00	45.76 PK	74.00	-28.24	1.00 V	251	37.62	8.14
6	4924.00	31.26 AV	54.00	-22.74	1.00 V	251	23.12	8.14
7	7386.00	51.76 PK	74.00	-22.24	1.88 V	51	37.51	14.25
8	7386.00	37.78 AV	54.00	-16.22	1.88 V	51	23.53	14.25

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.13 PK	74.00	-7.87	3.00 H	257	62.26	3.87
2	2390.00	47.12 AV	54.00	-6.88	3.00 H	257	43.25	3.87
3	*2412.00	109.05 PK			3.00 H	257	105.11	3.94
4	*2412.00	96.79 AV			3.00 H	257	92.85	3.94
5	4824.00	45.33 PK	74.00	-28.67	1.44 H	54	37.32	8.01
6	4824.00	30.45 AV	54.00	-23.55	1.44 H	54	22.44	8.01
7	7236.00	50.64 PK	74.00	-23.36	1.00 H	258	36.64	14.00
8	7236.00	35.33 AV	54.00	-18.67	1.00 H	258	21.33	14.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.33 PK	74.00	-6.67	1.00 V	118	63.46	3.87
2	2390.00	49.22 AV	54.00	-4.78	1.00 V	118	45.35	3.87
3	*2412.00	105.66 PK			1.00 V	118	101.72	3.94
4	*2412.00	95.16 AV			1.00 V	118	91.22	3.94
5	4824.00	45.58 PK	74.00	-28.42	1.01 V	260	37.57	8.01
6	4824.00	30.55 AV	54.00	-23.45	1.01 V	260	22.54	8.01
7	7236.00	50.55 PK	74.00	-23.45	1.55 V	65	36.55	14.00
8	7236.00	36.12 AV	54.00	-17.88	1.55 V	65	22.12	14.00

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	110.91 PK			3.47 H	247	106.90	4.01
2	*2437.00	98.59 AV			3.47 H	247	94.58	4.01
3	4874.00	45.56 PK	74.00	-28.44	1.66 H	68	37.48	8.08
4	4874.00	31.09 AV	54.00	-22.91	1.66 H	68	23.01	8.08
5	7311.00	51.16 PK	74.00	-22.84	1.00 H	188	37.03	14.13
6	7311.00	37.27 AV	54.00	-16.73	1.00 H	188	23.14	14.13
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	108.26 PK			1.46 V	119	104.25	4.01
2	*2437.00	96.22 AV			1.46 V	119	92.21	4.01
3	4874.00	45.87 PK	74.00	-28.13	1.55 V	41	37.79	8.08
4	4874.00	31.25 AV	54.00	-22.75	1.55 V	41	23.17	8.08
5	7311.00	50.51 PK	74.00	-23.49	1.52 V	210	36.38	14.13
6	7311.00	38.33 AV	54.00	-15.67	1.52 V	210	24.20	14.13

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.25 PK			2.97 H	244	104.16	4.09
2	*2462.00	98.28 AV			2.97 H	244	94.19	4.09
3	2483.50	70.72 PK	74.00	-3.28	2.97 H	244	66.56	4.16
4	2483.50	51.75 AV	54.00	-2.25	2.97 H	244	47.59	4.16
5	4924.00	44.66 PK	74.00	-29.34	1.00 H	146	36.52	8.14
6	4924.00	30.88 AV	54.00	-23.12	1.00 H	146	22.74	8.14
7	7386.00	52.87 PK	74.00	-21.13	1.55 H	155	38.62	14.25
8	7386.00	39.33 AV	54.00	-14.67	1.55 H	41	25.08	14.25
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.15 PK			2.45 V	62	102.06	4.09
2	*2462.00	95.55 AV			2.45 V	62	91.46	4.09
3	2483.50	69.15 PK	74.00	-4.85	2.45 V	62	64.99	4.16
4	2483.50	49.28 AV	54.00	-4.72	2.45 V	62	45.12	4.16
5	4924.00	45.95 PK	74.00	-28.05	1.00 V	261	37.81	8.14
6	4924.00	31.19 AV	54.00	-22.81	1.00 V	261	23.05	8.14
7	7386.00	49.97 PK	74.00	-24.03	1.00 V	135	35.72	14.25
8	7386.00	41.81 AV	54.00	-12.19	1.00 V	135	27.56	14.25

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



802.11n 20MHz

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.79 PK	74.00	-7.21	2.99 H	273	62.92	3.87
2	2390.00	47.78 AV	54.00	-6.22	2.99 H	273	43.91	3.87
3	*2412.00	105.90 PK			2.98 H	273	101.96	3.94
4	*2412.00	95.03 AV			2.98 H	273	91.09	3.94
5	4824.00	44.12 PK	74.00	-29.88	1.00 H	254	36.11	8.01
6	4824.00	30.02 AV	54.00	-23.98	1.00 H	254	22.01	8.01
7	7236.00	50.31 PK	74.00	-23.69	1.66 H	64	36.31	14.00
8	7236.00	36.34 AV	54.00	-17.66	1.66 H	64	22.34	14.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.32 PK	74.00	-4.68	1.00 V	121	65.45	3.87
2	2390.00	49.25 AV	54.00	-4.75	1.00 V	121	45.38	3.87
3	*2412.00	103.26 PK			1.00 V	121	99.32	3.94
4	*2412.00	92.49 AV			1.00 V	121	88.55	3.94
5	4824.00	45.11 PK	74.00	-28.89	1.00 V	344	37.10	8.01
6	4824.00	30.84 AV	54.00	-23.16	1.00 V	344	22.83	8.01
7	7236.00	50.65 PK	74.00	-23.35	1.00 V	215	36.65	14.00
8	7236.00	36.46 AV	54.00	-17.54	1.00 V	215	22.46	14.00

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	109.66 PK			2.56 H	248	105.65	4.01
2	*2437.00	96.89 AV			2.56 H	248	92.88	4.01
3	4874.00	45.66 PK	74.00	-28.34	1.22 H	251	37.58	8.08
4	4874.00	31.21 AV	54.00	-22.79	1.22 H	251	23.13	8.08
5	7311.00	51.82 PK	74.00	-22.18	2.10 H	25	37.69	14.13
6	7311.00	37.89 AV	54.00	-16.11	2.10 H	25	23.76	14.13
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	107.25 PK			1.00 V	123	103.24	4.01
2	*2437.00	94.85 AV			1.00 V	123	90.84	4.01
3	4874.00	46.41 PK	74.00	-27.59	1.55 V	54	38.33	8.08
4	4874.00	31.62 AV	54.00	-22.38	1.55 V	54	23.54	8.08
5	7311.00	51.46 PK	74.00	-22.54	1.52 V	214	37.33	14.13
6	7311.00	37.86 AV	54.00	-16.14	1.52 V	214	23.73	14.13

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	103.25 PK			2.88 H	251	99.16	4.09
2	*2462.00	95.31 AV			2.88 H	251	91.22	4.09
3	2483.50	71.11 PK	74.00	-2.89	2.88 H	251	66.95	4.16
4	2483.50	50.96 AV	54.00	-3.04	2.88 H	251	46.80	4.16
5	4924.00	36.14 PK	74.00	-37.86	1.69 H	255	28.00	8.14
6	4924.00	23.14 AV	54.00	-30.86	1.69 H	144	15.00	8.14
7	7386.00	50.85 PK	74.00	-23.15	1.00 H	210	36.60	14.25
8	7386.00	37.46 AV	54.00	-16.54	1.00 H	58	23.21	14.25
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.12 PK			1.40 V	116	100.03	4.09
2	*2462.00	93.76 AV			1.40 V	116	89.67	4.09
3	2483.50	68.33 PK	74.00	-5.67	1.40 V	116	64.17	4.16
4	2483.50	47.83 AV	54.00	-6.17	1.40 V	116	43.67	4.16
5	4924.00	47.11 PK	74.00	-26.89	1.00 V	251	38.97	8.14
6	4924.00	34.45 AV	54.00	-19.55	1.00 V	251	26.31	8.14
7	7386.00	50.48 PK	74.00	-23.52	1.55 V	54	36.23	14.25
8	7386.00	37.39 AV	54.00	-16.61	1.55 V	54	23.14	14.25

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



BELOW 1GHz WORST-CASE DATA:

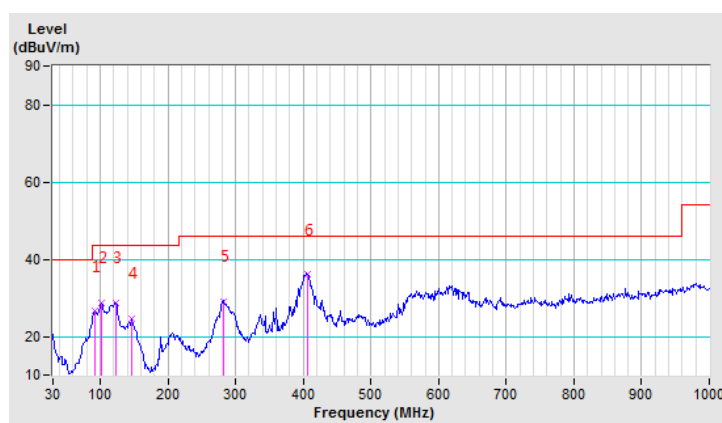
BT-LE (GFSK)

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	91.86	26.5 QP	43.5	-17.0	1.00 H	0	45.51	-19.05
2	101.70	28.7 QP	43.5	-14.9	1.00 H	0	47.03	-18.38
3	122.78	28.7 QP	43.5	-14.8	1.00 H	0	45.32	-16.62
4	146.68	24.6 QP	43.5	-19.0	1.00 H	0	41.33	-16.78
5	283.04	29.1 QP	46.0	-16.9	1.00 H	0	43.03	-13.91
6	406.75	36.0 QP	46.0	-10.1	1.00 H	0	44.31	-8.36

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



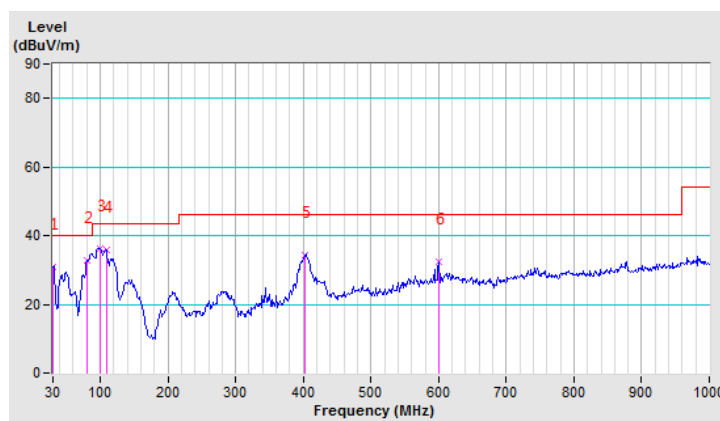


CHANNEL	TX Channel 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.00	30.8 QP	40.0	-9.2	1.00 V	0	42.10	-11.27
2	80.61	32.7 QP	40.0	-7.3	1.00 V	0	54.53	-21.86
3	100.29	36.3 QP	43.5	-7.2	1.00 V	0	54.79	-18.47
4	108.72	35.7 QP	43.5	-7.8	1.00 V	0	53.65	-17.92
5	402.54	34.4 QP	46.0	-11.6	1.00 V	0	42.92	-8.48
6	600.75	32.5 QP	46.0	-13.5	1.00 V	0	36.30	-3.84

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.





ABOVE 1GHz TEST DATA:

BT-LE (GFSK)

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	36.54 PK	74.0	-37.46	1.19 H	249	32.67	3.87
2	2390.00	24.57 AV	54.0	-29.43	1.19 H	249	20.70	3.87
3	*2402.00	87.29 PK			1.19 H	249	83.39	3.90
4	*2402.00	64.44 AV			1.19 H	249	60.54	3.90
5	4804.00	47.99 PK	74.0	-26.01	1.77 H	328	40.01	7.98
6	4804.00	36.73 AV	54.0	-17.27	1.77 H	328	28.75	7.98
7	7206.00	48.52 PK	74.0	-25.48	1.85 H	332	34.57	13.95
8	7206.00	34.31 AV	54.0	-19.69	1.85 H	332	20.36	13.95
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	30.10 PK	74.0	-43.90	1.52 V	230	26.23	3.87
2	2390.00	18.94 AV	54.0	-35.06	1.52 V	230	15.07	3.87
3	*2402.00	82.43 PK			1.52 V	230	78.53	3.90
4	*2402.00	58.96 AV			1.52 V	230	55.06	3.90
5	4804.00	41.70 PK	74.0	-32.30	1.13 V	259	33.72	7.98
6	4804.00	27.58 AV	54.0	-26.42	1.13 V	259	19.60	7.98
7	7206.00	48.09 PK	74.0	-25.91	1.54 V	100	34.14	13.95
8	7206.00	34.20 AV	54.0	-19.80	1.54 V	100	20.25	13.95

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



CHANNEL	TX Channel 19	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	89.75 PK			1.85 H	302	85.73	4.02
2	*2440.00	66.21 AV			1.85 H	302	62.19	4.02
3	4880.00	40.25 PK	74.0	-33.75	1.54 H	110	32.16	8.09
4	4880.00	27.65 AV	54.0	-26.35	1.54 H	110	19.56	8.09
5	7320.00	47.67 PK	74.0	-26.33	1.50 H	98	33.53	14.14
6	7320.00	35.11 AV	54.0	-18.89	1.50 H	98	20.97	14.14
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	84.13 PK			1.52 V	265	80.11	4.02
2	*2440.00	59.61 AV			1.52 V	265	55.59	4.02
3	4880.00	40.30 PK	74.0	-33.70	1.95 V	206	32.21	8.09
4	4880.00	27.68 AV	54.0	-26.32	1.95 V	206	19.59	8.09
5	7320.00	47.71 PK	74.0	-26.29	1.25 V	263	33.57	14.14
6	7320.00	35.06 AV	54.0	-18.94	1.25 V	263	20.92	14.14

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	88.55 PK			1.98 H	247	84.40	4.15
2	*2480.00	63.64 AV			1.98 H	247	59.49	4.15
3	2483.50	35.48 PK	74.0	-38.52	1.98 H	247	31.32	4.16
4	2483.50	20.30 AV	54.0	-33.70	1.98 H	247	16.14	4.16
5	4960.00	43.36 PK	74.0	-30.64	1.85 H	263	35.17	8.19
6	4960.00	31.25 AV	54.0	-22.75	1.85 H	263	23.06	8.19
7	7440.00	49.59 PK	74.0	-24.41	1.64 H	237	35.25	14.34
8	7440.00	35.20 AV	54.0	-18.80	1.64 H	237	20.86	14.34
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	84.20 PK			1.64 V	224	80.05	4.15
2	*2480.00	60.72 AV			1.64 V	224	56.57	4.15
3	2483.50	32.06 PK	74.0	-41.94	1.64 V	224	27.90	4.16
4	2483.50	19.65 AV	54.0	-34.35	1.64 V	224	15.49	4.16
5	4960.00	41.29 PK	74.0	-32.71	1.52 V	203	33.10	8.19
6	4960.00	27.82 AV	54.0	-26.18	1.52 V	203	19.63	8.19
7	7440.00	47.86 PK	74.0	-26.14	1.89 V	203	33.52	14.34
8	7440.00	35.22 AV	54.0	-18.78	1.89 V	203	20.88	14.34

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 04,16	May 03,17
Power Sensor	Keysight	U2021XA	MY55060018	May 04,16	May 03,17
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 13, 16	Oct.12, 17
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.05,16	Sep. 04,17
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 04,16	Nov. 03,17
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 04,16	Nov. 03,17
Signal Generator	Agilent	N5183A	MY50140980	Nov. 04,16	Nov. 03,17
Agile Signal Generator	Agilent	8645A	Agilent	Aug.08, 16	Aug.07, 17
ESG Vector Signal Generator	Agilent	E4438C	MY49072505	Apr. 22, 16	Apr. 21, 17
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug.08, 16	Aug.07, 17

NOTE:

1. The test was performed in RF Oven room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

4.3.3 TEST PROCEDURE

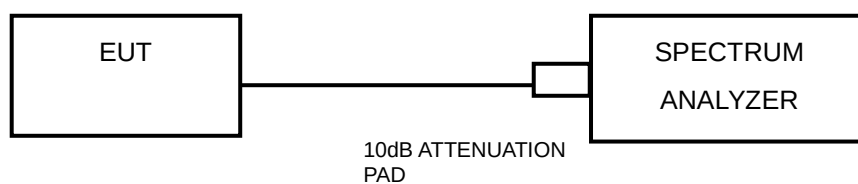
1. Set resolution bandwidth (RBW) = 100KHz
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.



4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

**4.3.7 TEST RESULTS****802.11b**

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	9.06	0.5	PASS
6	2437	8.55	0.5	PASS
11	2462	9.06	0.5	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.04	0.5	PASS
6	2437	15.71	0.5	PASS
11	2462	15.84	0.5	PASS

802.11n 20MHz

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.95	0.5	PASS
6	2437	16.62	0.5	PASS
11	2462	17.34	0.5	PASS

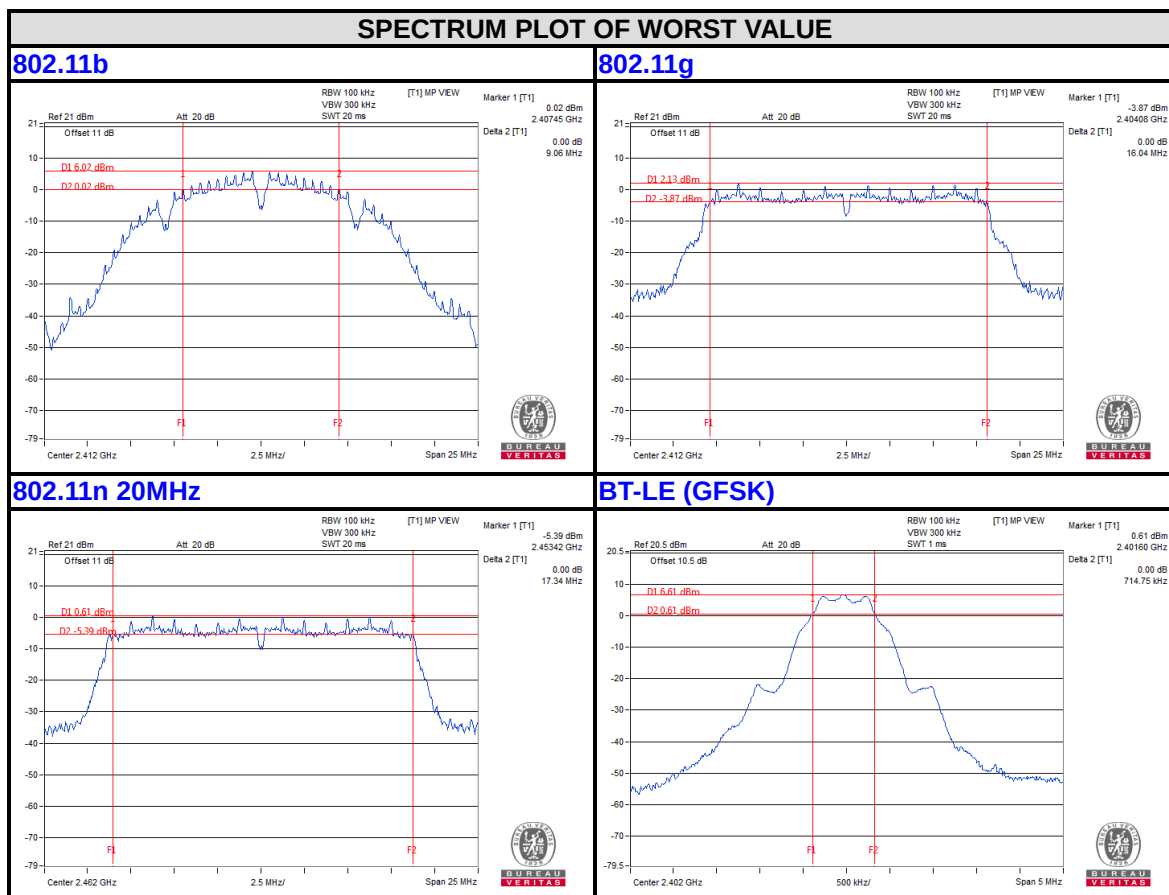
BT-LE (GFSK)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	0.71	0.5	PASS
19	2440	0.70	0.5	PASS
39	2480	0.69	0.5	PASS



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VERITAS

Test Report No.: RF161013N029-2

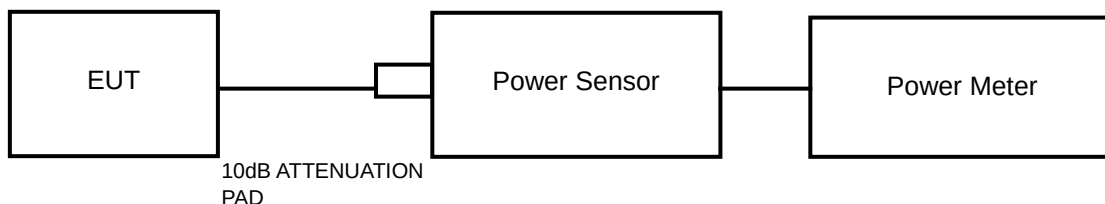


4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz band: 1 Watt (30dBm).

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 04,16	May 03,17
Power Sensor	Keysight	U2021XA	MY55060018	May 04,16	May 03,17
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 13, 16	Oct.12, 17
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.05,16	Sep. 04,17
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 04,16	Nov. 03,17
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 04,16	Nov. 03,17
Signal Generator	Agilent	N5183A	MY50140980	Nov. 04,16	Nov. 03,17
Agile Signal Generator	Agilent	8645A	Agilent	Aug.08, 16	Aug.07, 17
ESG Vector Signal Generator	Agilent	E4438C	MY49072505	Apr. 22, 16	Apr. 21, 17
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug.08, 16	Aug.07, 17

NOTE:

1. The test was performed in RF Oven room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GREGT/CHINA and NIM/CHINA.



4.4.4 TEST PROCEDURES

A peak power sensor was used on the output port of the EUT. A peak power meter was used to read the response of the peak power sensor. Record the peak power level.

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



4.4.7 TEST RESULTS

MAXIMUM PEAK OUTPUT POWER

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
1	2412	17.23	52.845	1	PASS
6	2437	17.48	55.976	1	PASS
11	2462	17.39	54.828	1	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
1	2412	20.38	109.144	1	PASS
6	2437	20.11	102.565	1	PASS
11	2462	20.26	106.17	1	PASS

802.11n 20MHz

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
1	2412	18.91	77.804	1	PASS
6	2437	18.77	75.336	1	PASS
11	2462	18.68	73.790	1	PASS

BT-LE (GFSK)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
0	2402	8.38	6.887	1	PASS
19	2440	8.09	6.442	1	PASS
39	2480	7.16	5.200	1	PASS

**4.4.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)**

The average power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)	PEAK POWER LIMIT (W)	PASS / FAIL
1	2412	13.61	22.961	1	PASS
6	2437	13.82	24.099	1	PASS
11	2462	13.78	23.878	1	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)	PEAK POWER LIMIT (W)	PASS / FAIL
1	2412	11.61	14.488	1	PASS
6	2437	11.44	13.932	1	PASS
11	2462	11.46	13.996	1	PASS

802.11n 20MHz

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)	PEAK POWER LIMIT (W)	PASS / FAIL
1	2412	10.66	11.641	1	PASS
6	2437	10.15	10.351	1	PASS
11	2462	10.02	10.046	1	PASS

BT-LE (GFSK)

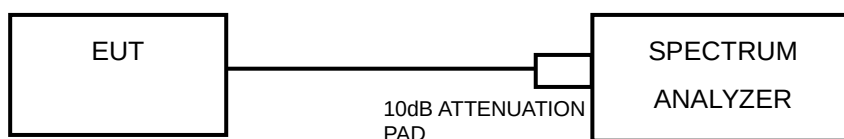
CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)
0	2402	5.07	3.214
19	2440	4.93	3.112
39	2480	3.94	2.477

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm/3KHz.

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.3.2 to get information of above instrument.

4.5.4 TEST PROCEDURE

- a) Set instrument center frequency to DTS channel center frequency.
- b) Set span to at least 1.5 times the OBW.
- c) Set RBW to: 3KHz
- d) Set VBW $\geq 3 \times$ RBW.
- e) Detector = peak
- f) Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW.
- g) Sweep time = auto couple.
- h) Use the peak marker function to determine the maximum amplitude level.

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITION

Same as item 4.3.6.

4.5.7 TEST RESULTS

802.11b

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-7.98	8.00	PASS
6	2437	-8.06	8.00	PASS
11	2462	-7.71	8.00	PASS

802.11g

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-11.88	8.00	PASS
6	2437	-12.43	8.00	PASS
11	2462	-12.86	8.00	PASS

802.11n 20MHz

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-13.99	8.00	PASS
6	2437	-14.51	8.00	PASS
11	2462	-13.91	8.00	PASS

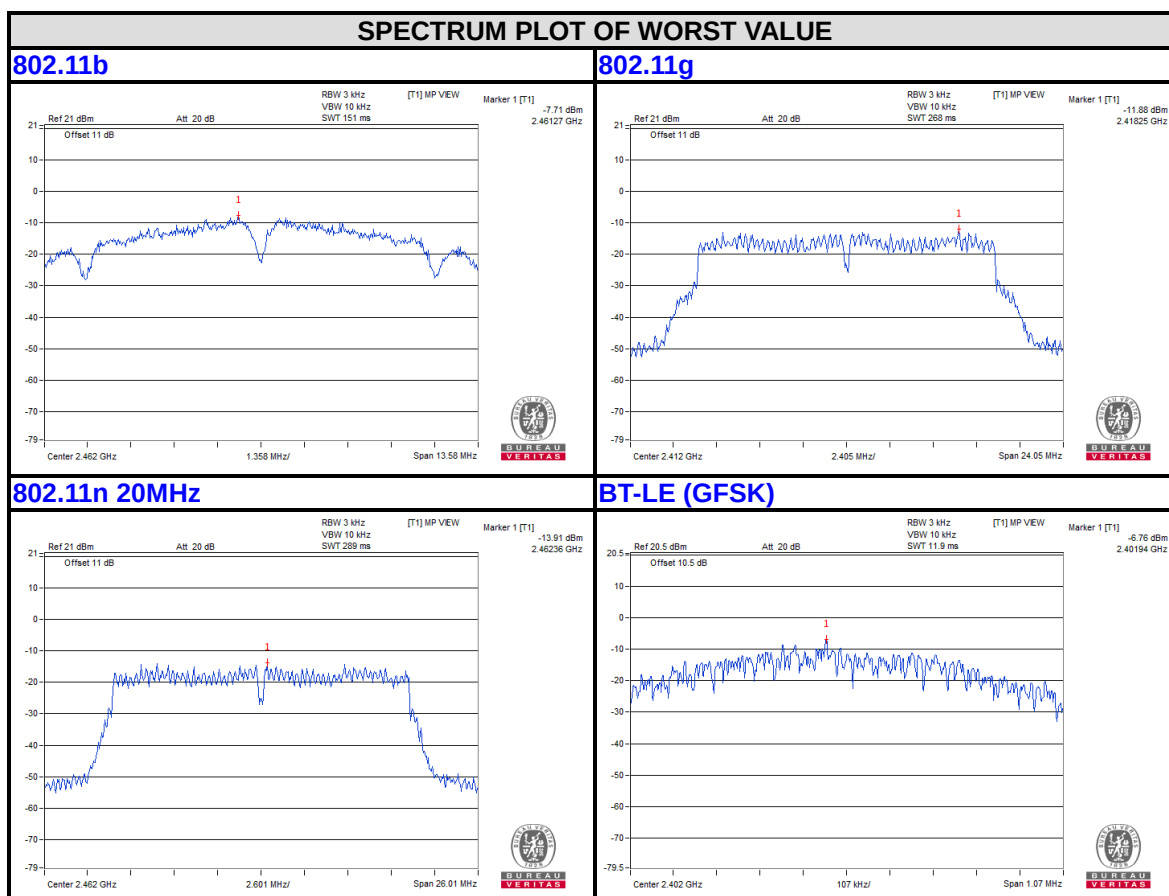
BT-LE (GFSK)

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	2402	-6.76	8.00	PASS
19	2440	-6.87	8.00	PASS
39	2480	-7.79	8.00	PASS



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4.6 OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.3.2 to get information of above instrument.

4.6.4 TEST PROCEDURE

Measurement Procedure - Reference Level

1. Set the RBW = 100 kHz.
2. Set the VBW $\geq$ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.



Measurement Procedure –Unwanted Emission Level

1. Set RBW = 100 kHz.
2. Set VBW $\geq$ 300 kHz.
3. Set span to encompass the spectrum to be examined
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

Same as item 4.3.6



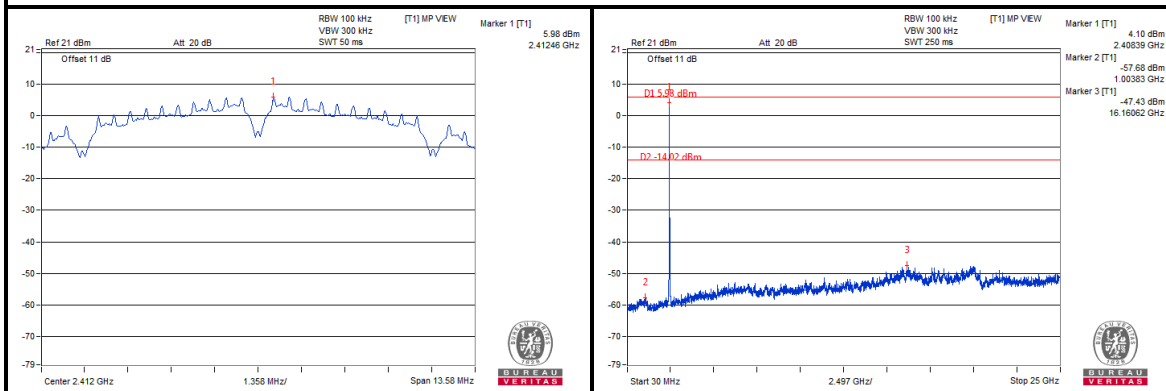
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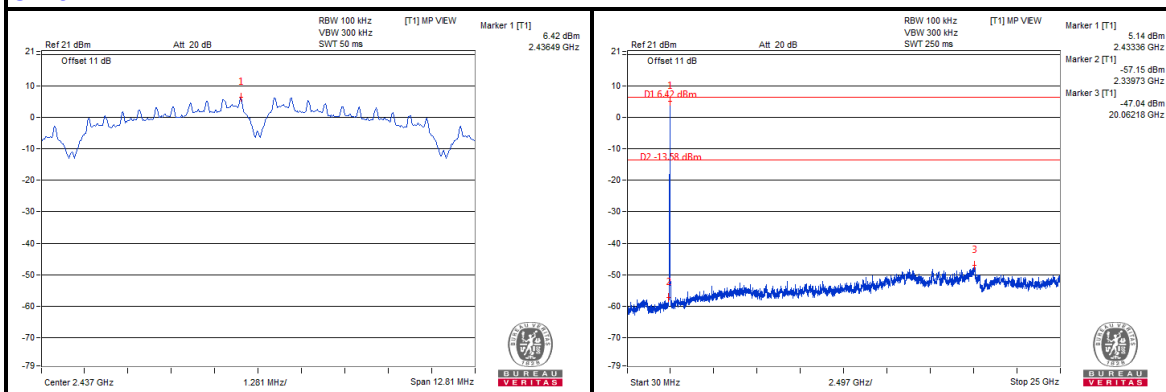
4.6.7 TEST RESULTS

802.11b

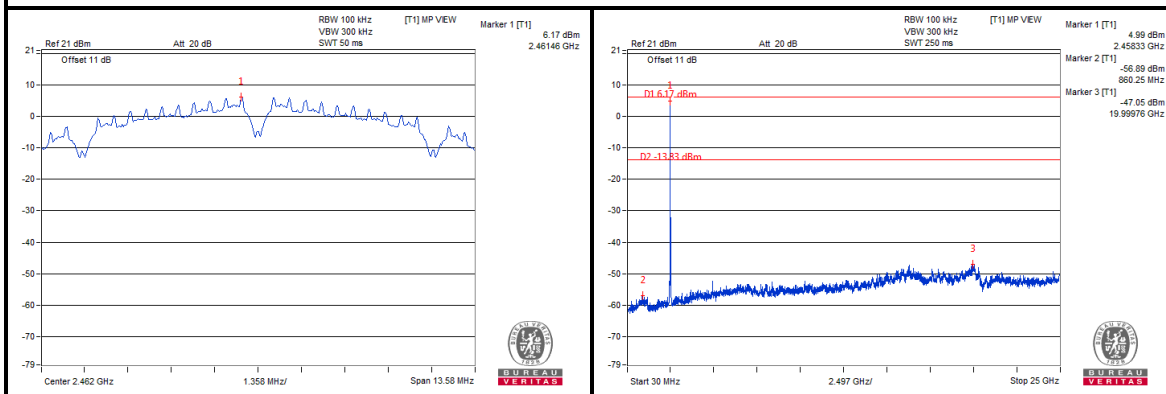
CH 1



CH 6



CH 11



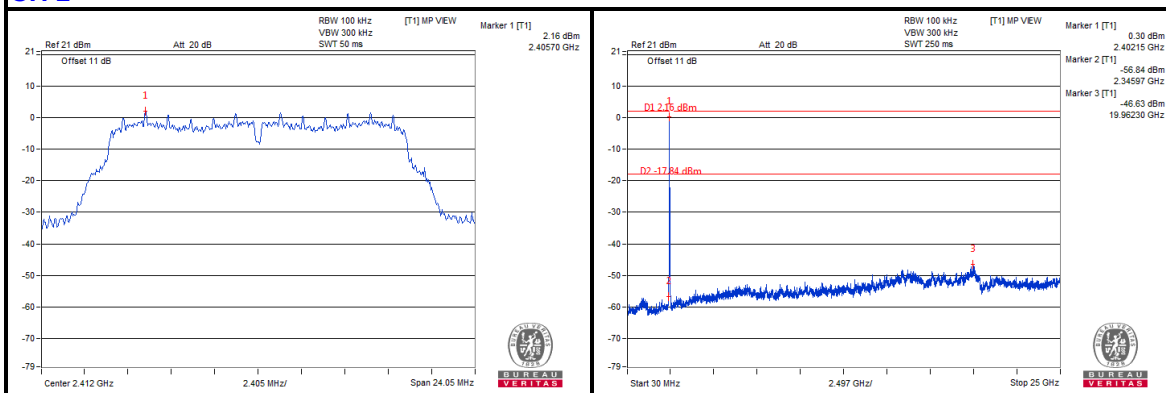


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VERITAS

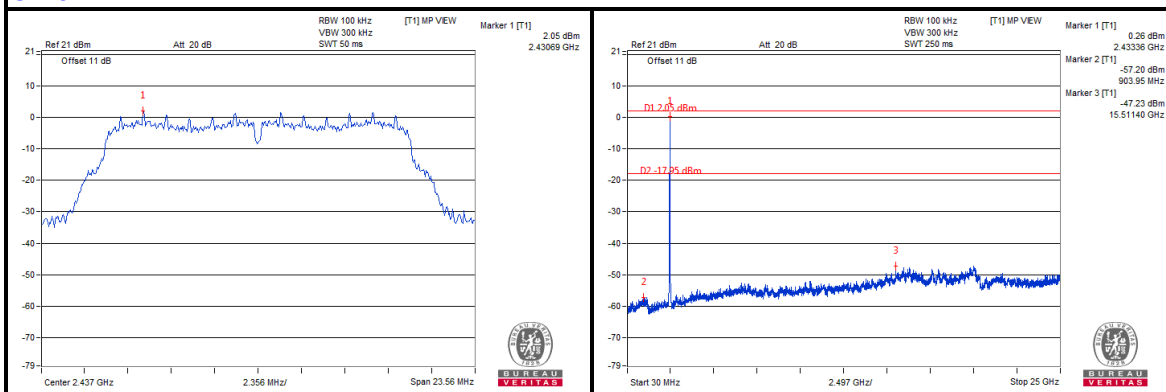
Test Report No.: RF161013N029-2

802.11g

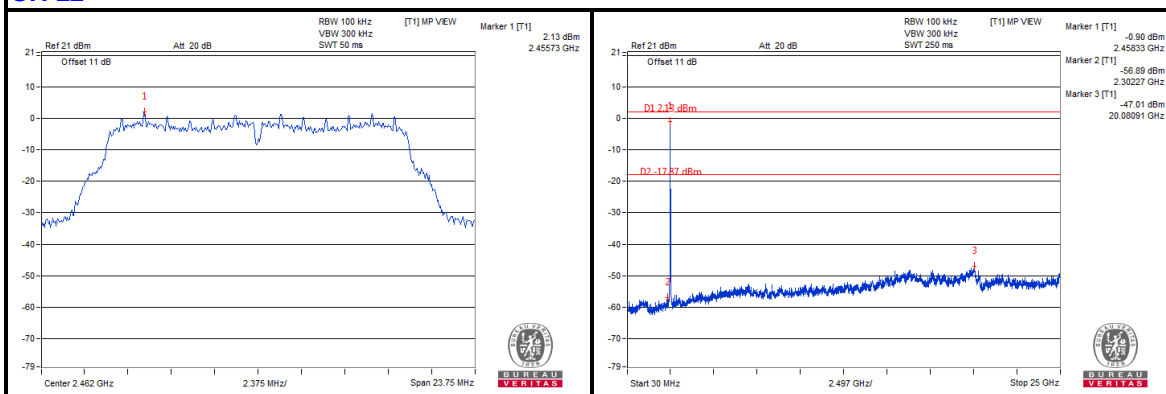
CH 1



CH 6



CH 11



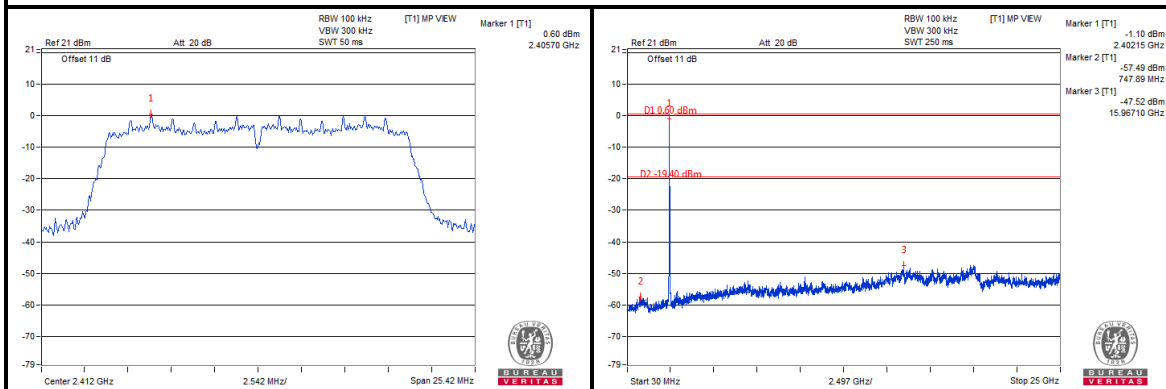


BUREAU
VERITAS

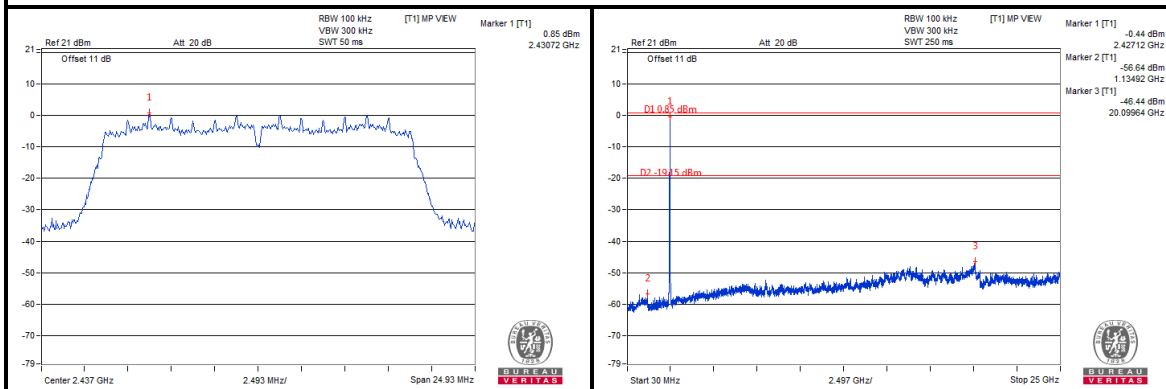
Test Report No.: RF161013N029-2

802.11n 20MHz

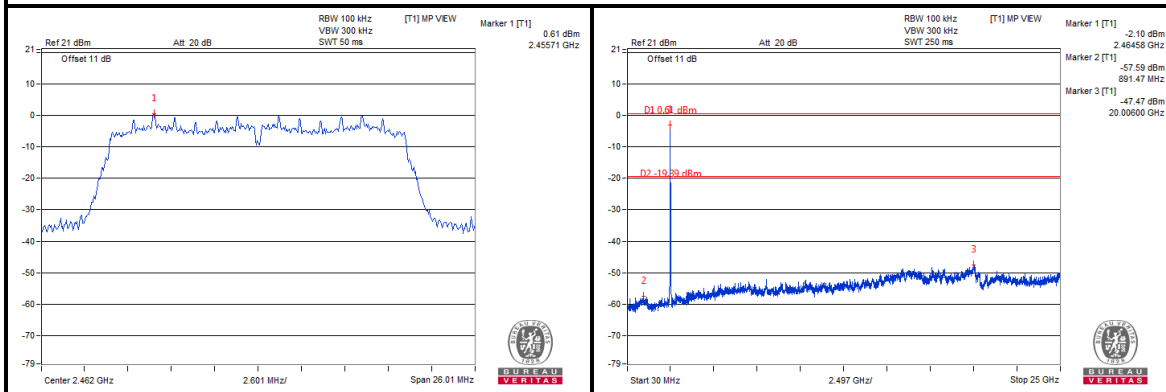
CH 1



CH 6



CH 11



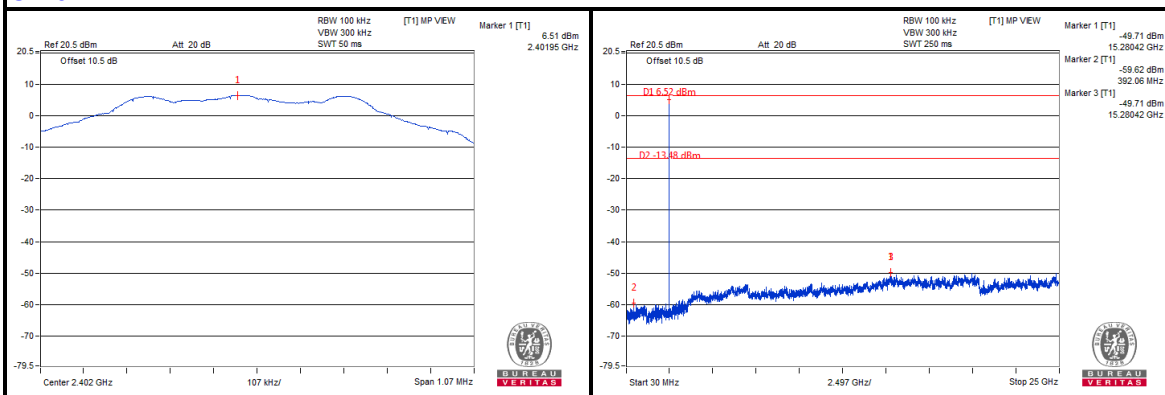


BUREAU
VERITAS

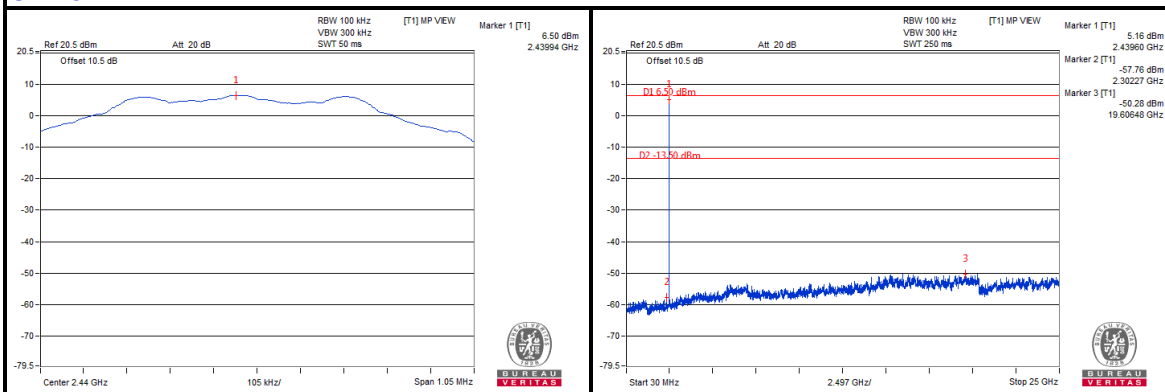
Test Report No.: RF161013N029-2

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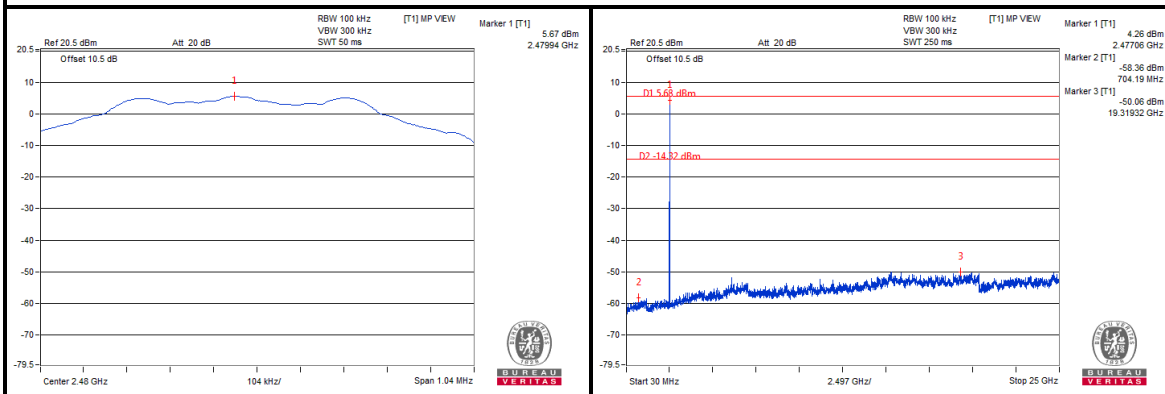
CH 0



CH 19



CH 39

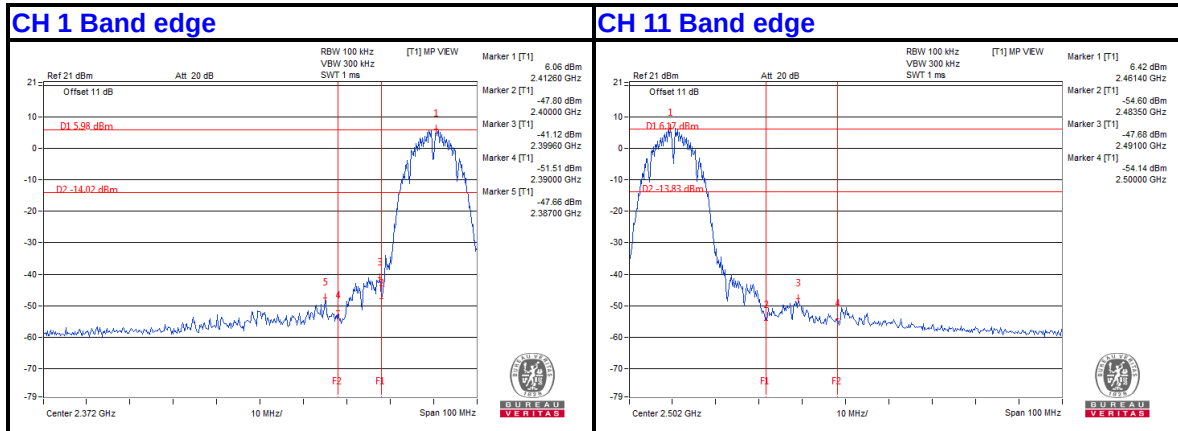




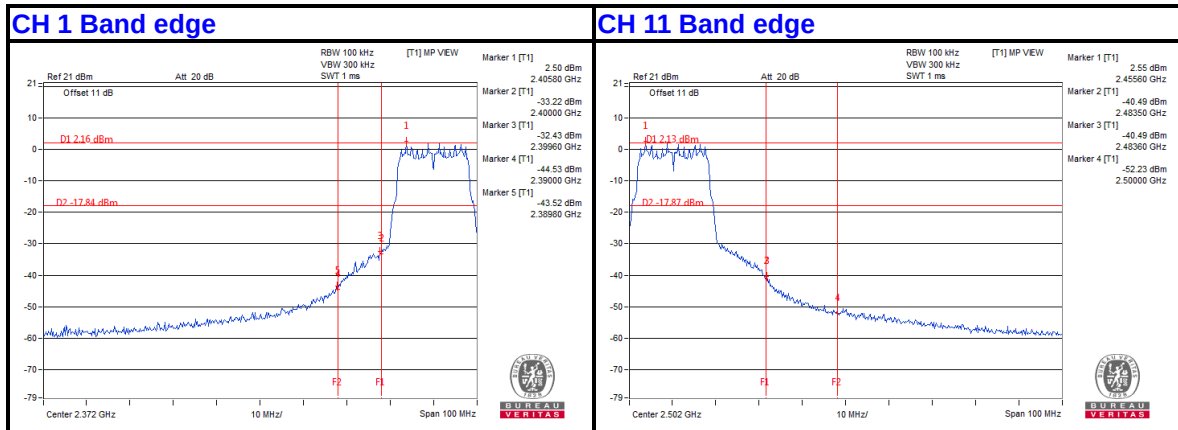
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VERITAS

Test Report No.: RF161013N029-2

802.11b



802.11g

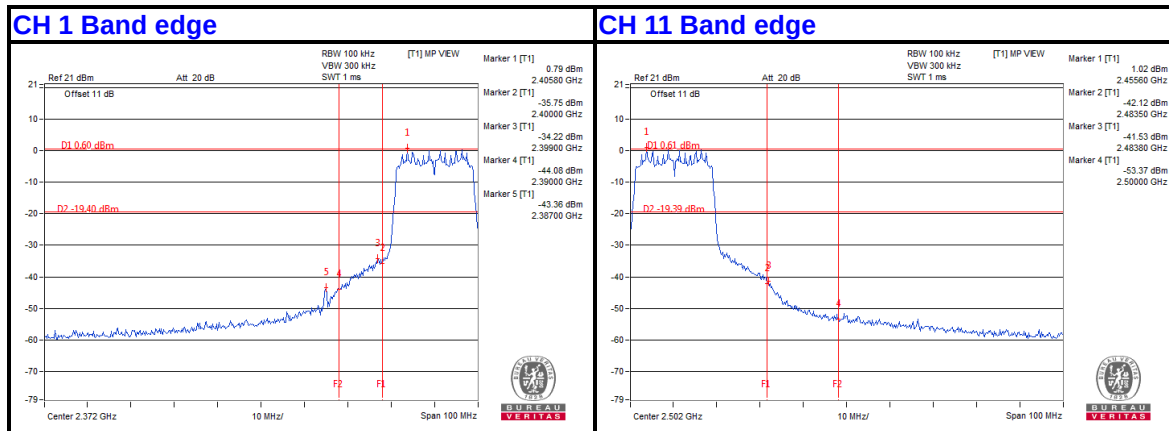




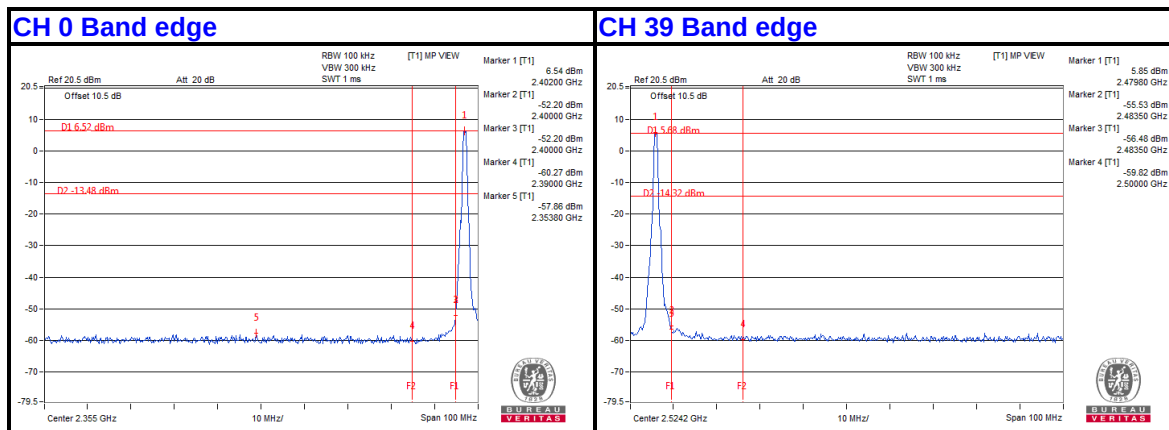
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Test Report No.: RF161013N029-2

802.11n 20MHz



BT-LE (GFSK)





5 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

6 APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

Modifications are made to the EUT by the lab during the test.

See material declaration.

---END---