FCC Test Report (BT-EDR)

Report No.:	RF150126E05K-2
FCC ID:	TLZ-CM2XXNF
Test Model:	AW-CM195NF
Series Model:	AW-CM217NF, AW-CM235NF, AW-CM240NF
Received Date:	Aug. 17, 2018
Test Date:	Oct. 23 to 31, 2018
Issued Date:	Nov. 06, 2018
Applicant:	AzureWave Technologies, Inc.
Address:	8F., No.94, Baozhong Rd. , Xindian Dist., New Taipei City , Taiwan 231
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RF150126E05K-2	Original release.	Nov. 06, 2018

1 Certificate of Conformity

Product:	IEEE 802.11 a/b/g/n/ac Wireless LAN and Bluetooth M.2 Combo Module
Brand:	AzureWave
Test Model:	AW-CM195NF
Series Model:	AW-CM217NF, AW-CM235NF, AW-CM240NF
Sample Status:	ENGINEERING SAMPLE
Applicant:	AzureWave Technologies, Inc.
Test Date:	Oct. 23 to 31, 2018
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : _____, **Date:** Nov. 06, 2018
Phoenix Huang / Specialist

Approved by : _____, **Date:** Nov. 06, 2018
May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)			
FCC Clause	Test Item	Result	Remarks
15.247(b)	Maximum Peak Output Power	PASS	Meet the requirement of limit.
15.205 & 209 & 15.247(d)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -5.6dB at 292.94MHz.

2.1 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	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.33 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.10 dB
	6GHz ~ 18GHz	4.85 dB
	18GHz ~ 40GHz	5.24 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (BT-EDR)

Product	IEEE 802.11 a/b/g/n/ac Wireless LAN and Bluetooth M.2 Combo Module
Brand	AzureWave
Test Model	AW-CM195NF
Series Model	AW-CM217NF, AW-CM235NF, AW-CM240NF
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	3.3Vdc from host equipment
Modulation Type	GFSK, π/4-DQPSK, 8DPSK
Modulation Technology	FHSS
Transfer Rate	Up to 3Mbps
Operating Frequency	2.402 ~ 2.480GHz
Number of Channel	79
Output Power	9.661mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II change. The difference compared with the Report No.: RF150126E05C-2 as the following:
   - ◆ Upgraded standard version.
   - ◆ Added six sets of antennas as below table:

Original

Antenna No	Chain No.	Brand	Model	Gain (dBi)	Antenna Type	Connector Type	Frequency range (GHz to GHz)	Cable Length (External only)
1	Chain (0) (Aux)	MAG.LAYERS	MSA-4008-25GC1-A1	2.98	PIFA	i-pex(MHF4)	2.4~2.5	15cm
				5.16			4.9~5.9	
	Chain (1) (Main)	MAG.LAYERS	MSA-4008-25GC1-A1	2.98	PIFA	i-pex(MHF4)	2.4~2.5	15cm
				5.16			4.9~5.9	
2	Chain (0) (Aux)	LUXSHARE ICT	Speedy	1.43	PIFA	i-pex(MHF4)	2.4~2.5	507mm
				-3.12			4.9~5.9	
	Chain (1) (Main)	LUXSHARE ICT	Speedy	-2.46	PIFA	i-pex(MHF4)	2.4~2.5	472mm
				-0.02			4.9~5.9	
3	Chain (0) (Aux)	Amphenol	867-00013	-3.8	PIFA	i-pex(MHF4)	2.4~2.5	70mm
				3.5			4.9~5.9	
	Chain (1) (Main)	Amphenol	867-00014	-5.1	PIFA	i-pex(MHF4)	2.4~2.5	220mm
				0.2			4.9~5.9	

Newly

Antenna Set No	Chain No.	Brand	Model	Gain (dBi) Including cable loss	Cable Loss (dBi)	Antenna Type	Connector Type	Frequency range (GHz to GHz)	Cable Length (External only)
4	Chain (0) (Aux)	TONGDA	T-543-3010450-2	-4.23	0.46	PIFA	i-pex-MFH4	2.4~2.5	79.5mm
				5.15-5.35 GHz:2.13 5.47-5.725 GHz:-1.32 5.725-5.850 GHz:-2.77	0.73			4.9~5.9	
	Chain (1)	TONGDA	T-543-3010450-1	-4.56	0.28	PIFA	i-pex-	2.4~2.5	43mm

	(Main)			5.15-5.35 GHz:-3.53 5.47-5.725 GHz:-1.87 5.725-5.850 GHz:-1.87	0.44		MFH4	4.9~5.9	
5	Chain (0) (Aux)	HONGLIN	260-26080	-4.39	0.46	PIFA	i-pex-MFH4	2.4~2.5	79.5mm
				5.15-5.35 GHz:1.29 5.47-5.725 GHz:0.41 5.725-5.850 GHz:-3.41	0.73			4.9~5.9	
	Chain (1) (Main)	HONGLIN	260-26079	-4.71	0.28	PIFA	i-pex-MFH4	2.4~2.5	43mm
				5.15-5.35 GHz:-3.73 5.47-5.725 GHz:-2.26 5.725-5.850 GHz:-2.23	0.44			4.9~5.9	
6	Chain 0 (Aux)	Taoglas	GW20.54.0400A.km	2.29	NA	Dipole	IPEX MHF4L	2400~2500	400mm
				1.73				5150~5850	
	Chain 1 (Main)	Taoglas	GW20.54.0400A.km	2.29	NA	Dipole	IPEX MHF4L	2400~2500	400mm
				1.73				5150~5850	
7	Chain 0 (Aux)	Taoglas	GW20.54.0180A.km	2.47	NA	Dipole	IPEX MHF4L	2400~2500	180mm
				2.62				5150~5850	
	Chain 1 (Main)	Taoglas	GW20.54.0180A.km	2.47	NA	Dipole	IPEX MHF4L	2400~2500	180mm
				2.62				5150~5850	
8	Chain 0 (Aux)	Taoglas	GW20.54.0180A.km	2.47	NA	Dipole	IPEX MHF4L	2400~2500	180mm
				2.62				5150~5850	
	Chain 1 (Main)	Taoglas	GW20.54.0400A.km	2.29	NA	Dipole	IPEX MHF4L	2400~2500	400mm
				1.73				5150~5850	
9	Chain 0 (Aux)	Taoglas	GW20.54.0400A.km	2.29	NA	Dipole	IPEX MHF4L	2400~2500	400mm
				1.73				5150~5850	
	Chain 1 (Main)	Taoglas	GW20.54.0180A.km	2.47	NA	Dipole	IPEX MHF4L	2400~2500	180mm
				2.62				5150~5850	

Note:
1. For radiated emission (below 1GHz), the Dipole (Antenna Set 7) was selected as representative adapter for the test and its data was recorded in this report.
2. For radiated emission (above 1GHz), the PIFA antenna (Antenna Set 1) and Dipole (Antenna Set 7) were selected as representative adapter for the test and its data was recorded in this report.

2. According to above condition, only Radiated Emissions and Conducted power test items need to be performed. And all data weres verified to meet the requirements.
3. There are Bluetooth technology and WLAN technology used for the EUT.
4. For WLAN, 2.4GHz and 5GHz technology can not transmit at same time.
5. WLAN (5GHz) and Bluetooth technology can transmit at same time.

6. The EUT has four model names which are identical to each other in all aspects except for the following table. These solutions have same RF circuit /parameter and are pin to pin compatible. (Detail information please refer declaration letter by client)

AW model name	Difference. Broadcom solution
AW-CM195NF	BCM43540
AW-CM217NF	BCM4356
AW-CM235NF	BCM4354
AW-CM240NF	BCM4356 (Change the Interface of PCIE+UART)
Note: In original report, from the above models, model: **AW-CM195NF** was selected as representative model for the test and its data was recorded in this report.	

7. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 Description of Test Modes

79 channels are provided for BT-EDR mode:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO			DESCRIPTION
	RE≥1G	RE<1G	APCM	
-	√	√	√	-

Where **RE≥1G:** Radiated Emission above 1GHz **RE<1G:** Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

Note:
1. In the original report, the EUT's antenna (PIFA) had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.

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 and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
0 to 78	0, 39, 78	FHSS	GFSK	DH5
0 to 78	0, 39, 78	FHSS	8DPSK	3DH5

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 and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
0 to 78	78	FHSS	GFSK	DH5

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.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
0 to 78	0, 39, 78	FHSS	GFSK	DH5
0 to 78	0, 39, 78	FHSS	8DPSK	3DH5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	24deg. C, 68%RH	120Vac, 60Hz (System)	Steven Chiang
	21deg. C, 63%RH	120Vac, 60Hz (System)	Steven Chiang
RE<1G	23deg. C, 65%RH	120Vac, 60Hz (System)	Steven Chiang
APCM	25deg. C, 60%RH	3.3Vdc	Weiwei Lo

3.3 Description of Support Units

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

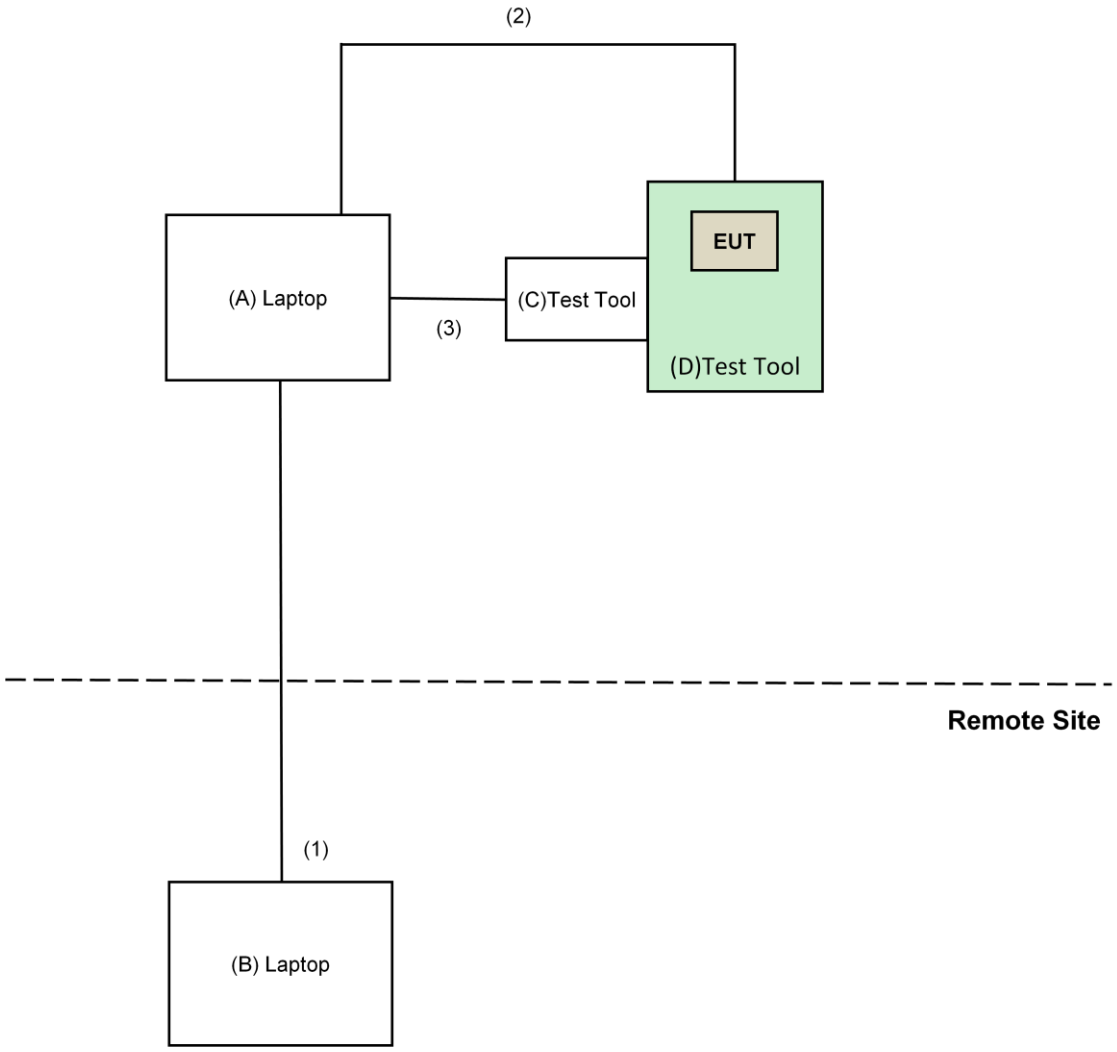
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	HP	Pavilion 14-ab023TU	5CD5340WXZ	NA	Provided by Lab
B.	Laptop	ASUS	AA2SJ.AVBoW202	NA	NA	Supplied by client
C.	Test Tool	AzureWave	9027-V01	NA	NA	Supplied by client
D.	Test Tool	AzureWave	2218-17	NA	NA	Supplied by client

Note:

1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	USB Cable	1	1.8	No	0	Provided by Lab
3.	USB Cable	1	1	No	0	Supplied by client

3.3.1 Configuration of System under Test



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 (15.247)
KDB 558074 D01 15.247 Meas Guidance v05
ANSI C63.10-2013

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

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. 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.

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 05, 2018	July 04, 2019
Pre-Amplifier EMCI	EMC001340	980142	Feb. 09, 2018	Feb. 08, 2019
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001	Jan. 15, 2018	Jan. 14, 2019
RF Cable	NA	LOOPCAB-002	Jan. 15, 2018	Jan. 14, 2019
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 09, 2017	Nov. 08, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-4-1	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-2	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-3	Mar. 21, 2018	Mar. 20, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Sep. 27, 2018	Sep. 26, 2019
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier Mini-Circuits	ZVA-183-S+	AMP-ZVA-03	May 10, 2018	May 09, 2019
RF Cable	EMC104-SM-SM-1200	160923	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-2000	150318	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-5000	150321	Jan. 29, 2018	Jan. 28, 2019
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160925	Jan. 29, 2018	Jan. 28, 2019
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 20, 2018	June 19, 2019
Power meter Anritsu	ML2495A	1014008	May 09, 2018	May 08, 2019
Power sensor Anritsu	MA2411B	0917122	May 09, 2018	May 08, 2019

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Oct. 23 to 31, 2018

4.1.3 Test Procedures

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case 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 Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. 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 height of antenna 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

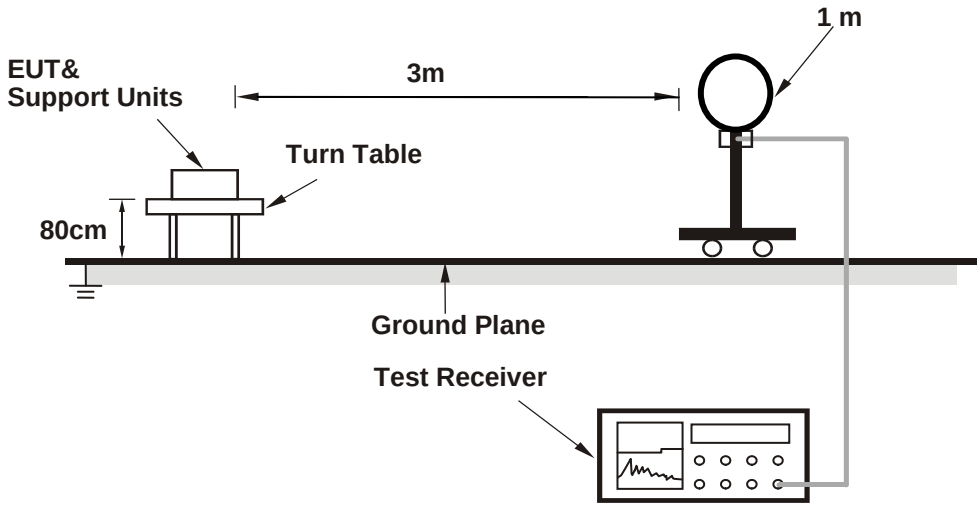
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

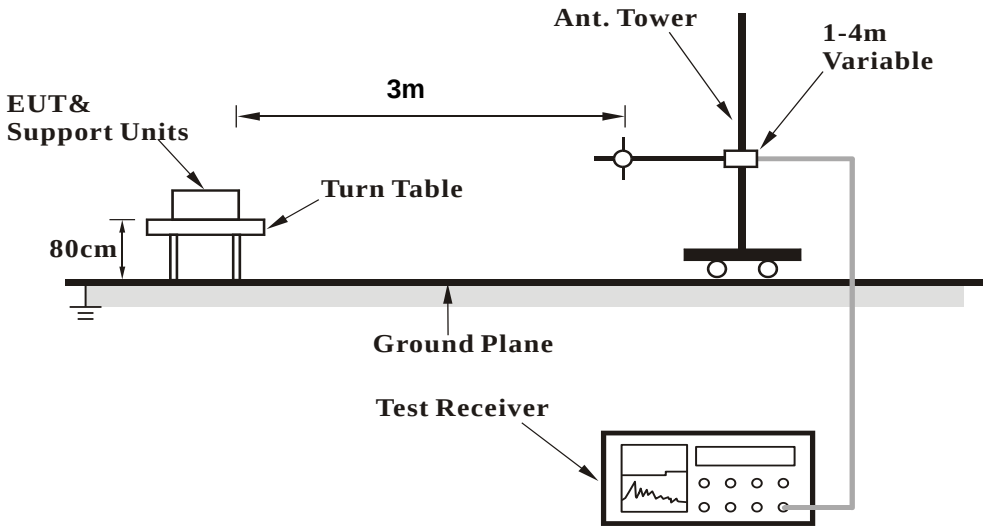
No deviation.

4.1.5 Test Setup

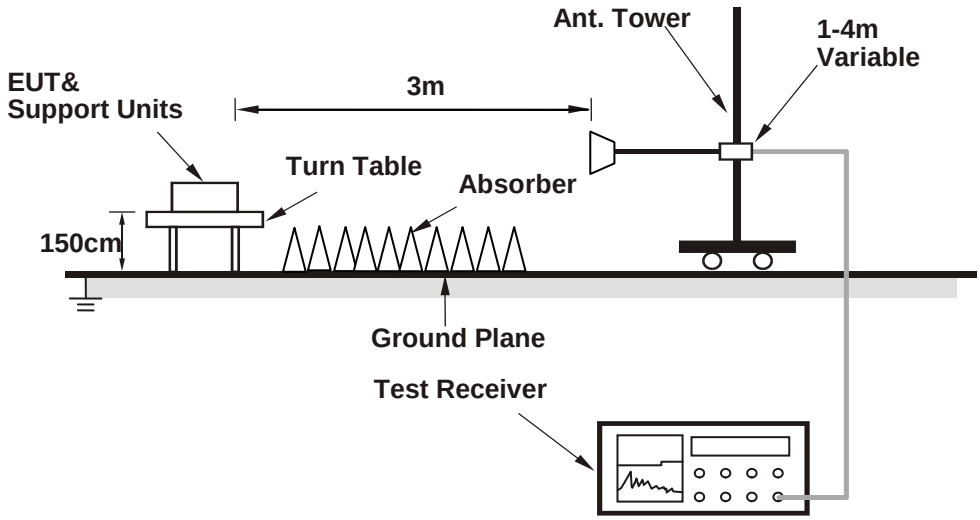
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

a. Connected the EUT with the Laptop which is placed on the testing table.
b. Controlling software (wl.exe[paste XXX.sh command]) has been activated to set the EUT on specific status.

4.1.7 Test Results (PIFA Antenna)

Above 1GHz Data:

BT_GFSK

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

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	46.2 PK	74.0	-27.8	1.45 H	153	48.4	-2.2
2	2390.00	36.5 AV	54.0	-17.5	1.45 H	153	38.7	-2.2
3	*2402.00	101.6 PK			1.45 H	153	103.9	-2.3
4	*2402.00	71.5 AV			1.45 H	153	73.8	-2.3
5	4804.00	52.5 PK	74.0	-21.5	1.36 H	314	50.7	1.8
6	4804.00	22.4 AV	54.0	-31.6	1.36 H	314	20.6	1.8
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	45.8 PK	74.0	-28.2	1.68 V	335	48.0	-2.2
2	2390.00	35.6 AV	54.0	-18.4	1.68 V	335	37.8	-2.2
3	*2402.00	98.6 PK			1.68 V	335	100.9	-2.3
4	*2402.00	68.5 AV			1.68 V	335	70.8	-2.3
5	4804.00	50.8 PK	74.0	-23.2	2.00 V	200	49.0	1.8
6	4804.00	20.7 AV	54.0	-33.3	2.00 V	200	18.9	1.8

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB
7. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle)

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

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	*2441.00	102.0 PK			1.44 H	160	104.6	-2.6
2	*2441.00	71.9 AV			1.44 H	160	74.5	-2.6
3	4882.00	51.9 PK	74.0	-22.1	1.39 H	298	49.9	2.0
4	4882.00	21.8 AV	54.0	-32.2	1.39 H	298	19.8	2.0
5	7323.00	54.9 PK	74.0	-19.1	1.02 H	316	46.5	8.4
6	7323.00	24.8 AV	54.0	-29.2	1.02 H	316	16.4	8.4
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	*2441.00	98.6 PK			1.63 V	323	101.2	-2.6
2	*2441.00	68.5 AV			1.63 V	323	71.1	-2.6
3	4882.00	49.2 PK	74.0	-24.8	2.05 V	187	47.2	2.0
4	4882.00	19.1 AV	54.0	-34.9	2.05 V	187	17.1	2.0
5	7323.00	55.2 PK	74.0	-18.8	2.06 V	226	46.8	8.4
6	7323.00	25.1 AV	54.0	-28.9	2.06 V	226	16.7	8.4

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB
7. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle)

CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	102.5 PK			1.40 H	166	105.1	-2.6
2	*2480.00	72.4 AV			1.40 H	166	75.0	-2.6
3	2483.50	45.5 PK	74.0	-28.5	1.40 H	166	47.9	-2.4
4	2483.50	15.4 AV	54.0	-38.6	1.40 H	166	17.8	-2.4
5	4960.00	53.4 PK	74.0	-20.6	1.37 H	318	51.3	2.1
6	4960.00	23.3 AV	54.0	-30.7	1.37 H	318	21.2	2.1
7	7440.00	55.9 PK	74.0	-18.1	1.45 H	302	47.1	8.8
8	7440.00	25.8 AV	54.0	-28.2	1.45 H	302	17.0	8.8
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	98.0 PK			1.73 V	342	100.6	-2.6
2	*2480.00	67.9 AV			1.73 V	342	70.5	-2.6
3	2483.50	45.8 PK	74.0	-28.2	1.73 V	342	48.2	-2.4
4	2483.50	15.7 AV	54.0	-38.3	1.73 V	342	18.1	-2.4
5	4960.00	51.3 PK	74.0	-22.7	2.00 V	205	49.2	2.1
6	4960.00	21.2 AV	54.0	-32.8	2.00 V	205	19.1	2.1
7	7440.00	54.4 PK	74.0	-19.6	2.16 V	221	45.6	8.8
8	7440.00	24.3 AV	54.0	-29.7	2.16 V	221	15.5	8.8

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB
7. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle)

BT_8DPSK

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

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	46.0 PK	74.0	-28.0	1.23 H	153	48.2	-2.2
2	2390.00	36.6 AV	54.0	-17.4	1.23 H	153	38.8	-2.2
3	*2402.00	101.4 PK			1.23 H	153	103.7	-2.3
4	*2402.00	71.3 AV			1.23 H	153	73.6	-2.3
5	4804.00	52.8 PK	74.0	-21.2	1.36 H	337	51.0	1.8
6	4804.00	22.7 AV	54.0	-31.3	1.36 H	337	20.9	1.8
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	46.0 PK	74.0	-28.0	1.15 V	332	48.2	-2.2
2	2390.00	35.8 AV	54.0	-18.2	1.15 V	332	38.0	-2.2
3	*2402.00	98.1 PK			1.73 V	330	100.4	-2.3
4	*2402.00	68.0 AV			1.73 V	330	70.3	-2.3
5	4804.00	50.2 PK	74.0	-23.8	1.99 V	189	48.4	1.8
6	4804.00	20.1 AV	54.0	-33.9	1.99 V	189	18.3	1.8

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB
7. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle)

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

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	*2441.00	101.9 PK			1.21 H	154	104.5	-2.6
2	*2441.00	71.8 AV			1.21 H	154	74.4	-2.6
3	4882.00	53.0 PK	74.0	-21.0	1.39 H	341	51.0	2.0
4	4882.00	22.9 AV	54.0	-31.1	1.39 H	341	20.9	2.0
5	7323.00	54.8 PK	74.0	-19.2	1.99 H	291	46.4	8.4
6	7323.00	24.7 AV	54.0	-29.3	1.99 H	291	16.3	8.4
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	*2441.00	97.8 PK			1.66 V	330	100.4	-2.6
2	*2441.00	67.7 AV			1.66 V	330	70.3	-2.6
3	4882.00	51.0 PK	74.0	-23.0	2.02 V	194	49.0	2.0
4	4882.00	20.9 AV	54.0	-33.1	2.02 V	194	18.9	2.0
5	7323.00	55.3 PK	74.0	-18.7	2.00 V	212	46.9	8.4
6	7323.00	25.2 AV	54.0	-28.8	2.00 V	212	16.8	8.4

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB
7. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle)

CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	102.8 PK			1.26 H	153	105.4	-2.6
2	*2480.00	72.7 AV			1.26 H	153	75.3	-2.6
3	2483.50	45.5 PK	74.0	-28.5	1.26 H	153	47.9	-2.4
4	2483.50	15.4 AV	54.0	-38.6	1.26 H	153	17.8	-2.4
5	4960.00	52.0 PK	74.0	-22.0	1.36 H	326	49.9	2.1
6	4960.00	21.9 AV	54.0	-32.1	1.36 H	326	19.8	2.1
7	7440.00	55.0 PK	74.0	-19.0	1.98 H	299	46.2	8.8
8	7440.00	24.9 AV	54.0	-29.1	1.98 H	299	16.1	8.8
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	98.2 PK			1.65 V	333	100.8	-2.6
2	*2480.00	68.1 AV			1.65 V	333	70.7	-2.6
3	2483.50	44.5 PK	74.0	-29.5	1.65 V	333	46.9	-2.4
4	2483.50	14.4 AV	54.0	-39.6	1.65 V	333	16.8	-2.4
5	4960.00	51.0 PK	74.0	-23.0	2.06 V	172	48.9	2.1
6	4960.00	20.9 AV	54.0	-33.1	2.06 V	172	18.8	2.1
7	7440.00	55.4 PK	74.0	-18.6	2.03 V	238	46.6	8.8
8	7440.00	25.3 AV	54.0	-28.7	2.03 V	238	16.5	8.8

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB
7. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle)

4.1.8 Test Results (Dipole Antenna)

Above 1GHz Data:

BT_GFSK

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

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	54.8 PK	74.0	-19.2	1.13 H	356	57.0	-2.2
2	2390.00	43.2 AV	54.0	-10.8	1.13 H	356	45.4	-2.2
3	*2402.00	92.0 PK			1.13 H	356	94.3	-2.3
4	*2402.00	61.9 AV			1.13 H	356	64.2	-2.3
5	4804.00	50.4 PK	74.0	-23.6	1.07 H	208	48.6	1.8
6	4804.00	20.3 AV	54.0	-33.7	1.07 H	208	18.5	1.8
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	55.4 PK	74.0	-18.6	1.05 V	159	57.6	-2.2
2	2390.00	43.7 AV	54.0	-10.3	1.05 V	159	45.9	-2.2
3	*2402.00	101.8 PK			1.05 V	159	104.1	-2.3
4	*2402.00	71.7 AV			1.05 V	159	74.0	-2.3
5	4804.00	52.7 PK	74.0	-21.3	1.10 V	307	50.9	1.8
6	4804.00	22.6 AV	54.0	-31.4	1.10 V	307	20.8	1.8

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB
7. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle)

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

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	*2441.00	91.8 PK			1.14 H	359	94.4	-2.6
2	*2441.00	61.7 AV			1.14 H	359	64.3	-2.6
3	4882.00	49.8 PK	74.0	-24.2	1.12 H	198	47.8	2.0
4	4882.00	19.7 AV	54.0	-34.3	1.12 H	198	17.7	2.0
5	7323.00	55.1 PK	74.0	-18.9	1.39 H	222	46.7	8.4
6	7323.00	25.0 AV	54.0	-29.0	1.39 H	222	16.6	8.4
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	*2441.00	102.1 PK			1.03 V	154	104.7	-2.6
2	*2441.00	72.0 AV			1.03 V	154	74.6	-2.6
3	4882.00	52.1 PK	74.0	-21.9	1.11 V	298	50.1	2.0
4	4882.00	22.0 AV	54.0	-32.0	1.11 V	298	20.0	2.0
5	7323.00	55.6 PK	74.0	-18.4	1.05 V	329	47.2	8.4
6	7323.00	25.5 AV	54.0	-28.5	1.05 V	329	17.1	8.4

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB
7. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle)

CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	92.8 PK			1.12 H	360	95.4	-2.6
2	*2480.00	62.7 AV			1.12 H	360	65.3	-2.6
3	2483.50	54.6 PK	74.0	-19.4	1.12 H	360	57.0	-2.4
4	2483.50	24.5 AV	54.0	-29.5	1.12 H	360	26.9	-2.4
5	4960.00	50.6 PK	74.0	-23.4	1.07 H	192	48.5	2.1
6	4960.00	20.5 AV	54.0	-33.5	1.07 H	192	18.4	2.1
7	7440.00	54.4 PK	74.0	-19.6	1.29 H	208	45.6	8.8
8	7440.00	24.3 AV	54.0	-29.7	1.29 H	208	15.5	8.8
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	102.6 PK			1.01 V	160	105.2	-2.6
2	*2480.00	72.5 AV			1.01 V	160	75.1	-2.6
3	2483.50	54.8 PK	74.0	-19.2	1.01 V	160	57.2	-2.4
4	2483.50	24.7 AV	54.0	-29.3	1.01 V	160	27.1	-2.4
5	4960.00	52.6 PK	74.0	-21.4	1.12 V	289	50.5	2.1
6	4960.00	22.5 AV	54.0	-31.5	1.12 V	289	20.4	2.1
7	7440.00	55.6 PK	74.0	-18.4	1.08 V	328	46.8	8.8
8	7440.00	25.5 AV	54.0	-28.5	1.08 V	328	16.7	8.8

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB
7. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle)

BT_8DPSK

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

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	55.0 PK	74.0	-19.0	1.17 H	360	57.2	-2.2
2	2390.00	43.4 AV	54.0	-10.6	1.17 H	360	45.6	-2.2
3	*2402.00	91.3 PK			1.17 H	360	93.6	-2.3
4	*2402.00	61.2 AV			1.17 H	360	63.5	-2.3
5	4804.00	50.3 PK	74.0	-23.7	1.17 H	207	48.5	1.8
6	4804.00	20.2 AV	54.0	-33.8	1.17 H	207	18.4	1.8
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	55.2 PK	74.0	-18.8	1.10 V	146	57.4	-2.2
2	2390.00	43.6 AV	54.0	-10.4	1.10 V	146	45.8	-2.2
3	*2402.00	101.2 PK			1.10 V	146	103.5	-2.3
4	*2402.00	71.1 AV			1.10 V	146	73.4	-2.3
5	4804.00	52.2 PK	74.0	-21.8	1.16 V	285	50.4	1.8
6	4804.00	22.1 AV	54.0	-31.9	1.16 V	285	20.3	1.8

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB
7. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle)

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

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	*2441.00	91.9 PK			1.12 H	360	94.5	-2.6
2	*2441.00	61.8 AV			1.12 H	360	64.4	-2.6
3	4882.00	50.4 PK	74.0	-23.6	1.11 H	200	48.4	2.0
4	4882.00	20.3 AV	54.0	-33.7	1.11 H	200	18.3	2.0
5	7323.00	54.2 PK	74.0	-19.8	1.39 H	228	45.8	8.4
6	7323.00	24.1 AV	54.0	-29.9	1.39 H	228	15.7	8.4
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	*2441.00	102.0 PK			1.02 V	157	104.6	-2.6
2	*2441.00	71.9 AV			1.02 V	157	74.5	-2.6
3	4882.00	51.9 PK	74.0	-22.1	1.06 V	285	49.9	2.0
4	4882.00	21.8 AV	54.0	-32.2	1.06 V	285	19.8	2.0
5	7323.00	55.1 PK	74.0	-18.9	1.04 V	316	46.7	8.4
6	7323.00	25.0 AV	54.0	-29.0	1.04 V	316	16.6	8.4

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB
7. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle)

CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	93.7 PK			1.12 H	355	96.3	-2.6
2	*2480.00	63.6 AV			1.12 H	355	66.2	-2.6
3	2483.50	54.3 PK	74.0	-19.7	1.12 H	355	56.7	-2.4
4	2483.50	24.2 AV	54.0	-29.8	1.12 H	355	26.6	-2.4
5	4960.00	50.7 PK	74.0	-23.3	1.12 H	192	48.6	2.1
6	4960.00	20.6 AV	54.0	-33.4	1.12 H	192	18.5	2.1
7	7440.00	54.7 PK	74.0	-19.3	1.34 H	228	45.9	8.8
8	7440.00	24.6 AV	54.0	-29.4	1.34 H	228	15.8	8.8
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	103.4 PK			1.01 V	170	106.0	-2.6
2	*2480.00	73.3 AV			1.01 V	170	75.9	-2.6
3	2483.50	55.8 PK	74.0	-18.2	1.01 V	170	58.2	-2.4
4	2483.50	25.7 AV	54.0	-28.3	1.01 V	170	28.1	-2.4
5	4960.00	52.8 PK	74.0	-21.2	1.16 V	284	50.7	2.1
6	4960.00	22.7 AV	54.0	-31.3	1.16 V	284	20.6	2.1
7	7440.00	55.9 PK	74.0	-18.1	1.01 V	316	47.1	8.8
8	7440.00	25.8 AV	54.0	-28.2	1.01 V	316	17.0	8.8

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB
7. The average value of fundamental and harmonic frequency is: Average = Peak value + 20 log(Duty cycle)

Below 1GHz Data:

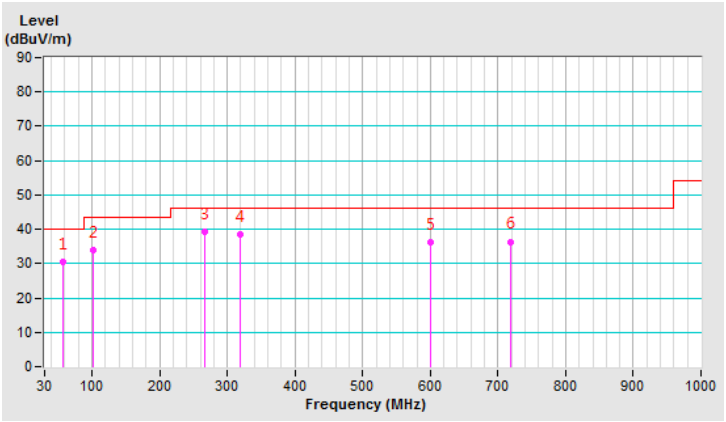
BT_8DPSK

CHANNEL	TX Channel 78	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	57.14	30.6 QP	40.0	-9.4	1.00 H	63	38.7	-8.1
2	101.63	34.0 QP	43.5	-9.5	1.00 H	360	46.0	-12.0
3	266.83	39.1 QP	46.0	-6.9	1.00 H	360	47.4	-8.3
4	318.50	38.3 QP	46.0	-7.7	1.50 H	313	44.7	-6.4
5	600.02	36.2 QP	46.0	-9.8	2.00 H	33	35.4	0.8
6	718.94	36.4 QP	46.0	-9.6	2.00 H	92	34.4	2.0

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) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

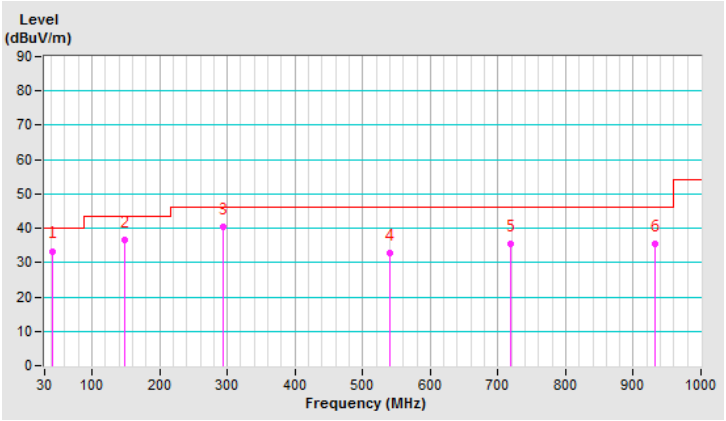


CHANNEL	TX Channel 78	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	41.37	33.4 QP	40.0	-6.6	1.00 V	360	41.5	-8.1
2	148.66	36.4 QP	43.5	-7.1	1.00 V	360	44.1	-7.7
3	**292.94**	**40.4 QP**	**46.0**	**-5.6**	**1.00 V**	**70**	**47.7**	**-7.3**
4	540.71	32.9 QP	46.0	-13.1	1.00 V	182	33.9	-1.0
5	718.92	35.3 QP	46.0	-10.7	1.00 V	253	33.3	2.0
6	932.05	35.3 QP	46.0	-10.7	1.50 V	316	29.3	6.0

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) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.2 Maximum Output Power

4.2.1 Limits of Maximum Output Power Measurement

The Maximum Output Power Measurement is 125mW.

4.2.2 Test Setup

4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.4 Test Procedure

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

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Condition

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.2.7 Test Results

FOR PEAK POWER

GFSK

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	8.414	9.25	21	Pass
39	2441	8.531	9.31	21	Pass
78	2480	9.661	9.85	21	Pass

8DPSK

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	6.471	8.11	21	Pass
39	2441	6.683	8.25	21	Pass
78	2480	7.482	8.74	21	Pass

FOR AVERAGE POWER

GFSK

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	8.241	9.16
39	2441	8.356	9.22
78	2480	9.441	9.75

8DPSK

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	3.281	5.16
39	2441	3.357	5.26
78	2480	3.656	5.63

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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