FCC Test Report (BT-EDR)

Report No.:	RF140407E07D-3
FCC ID:	TLZ-CM389NF
Test Model:	AW-CM389NF
Received Date:	Apr. 14, 2016
Test Date:	May 18 to June 06, 2016
Issued Date:	June 17, 2016
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 (1):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
RF140407E07D-3	Original release.	June 17, 2016

1 Certificate of Conformity

Product:	IEEE 802.11 2X2 MIMO a/b/g/n/ac Wireless LAN + Bluetooth + NFC NGFF Module
Brand:	AzureWave
Test Model:	AW-CM389NF
Sample Status:	ENGINEERING SAMPLE
Applicant:	AzureWave Technologies, Inc.
Test Date:	May 18 to June 06, 2016
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:** June 17, 2016

Claire Kuan / Specialist

Approved by : _____ **Date:** June 17, 2016

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 Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -3.70dB at 887.99MHz.

NOTE: This report is prepared for FCC Class II change. Only Maximum Peak Output Power / Radiated Emissions were presented in this test report

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	5.43 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.72 dB
	6GHz ~ 18GHz	4.00 dB
	18GHz ~ 40GHz	4.11 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 2X2 MIMO a/b/g/n/ac Wireless LAN + Bluetooth + NFC NGFF Module
Brand	AzureWave
Test Model	AW-CM389NF
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	2402MHz ~ 2480MHz
Number of Channel	79
Output Power	9.016mW
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 differences between them are as below information:

   ◆ Added three sets of antennas as below table:

Original

For WLAN / BT

Antenna Set.	Transmitter Circuit	Brand	Model	Antenna Gain(dBi) < including cable loss>	Frequency range (MHz to MHz)	Antenna Type	Connecter Type	Cable Length (cm)
1	Chain (0)	MAG.LAYERS	MSA-4008-25GC1-A1	2.98	2400~2500	PIFA	i-pex(MHF)	15
				5.16	4900~5900			
	Chain (1)	MAG.LAYERS	MSA-4008-25GC1-A1	2.98	2400~2500	PIFA	i-pex(MHF)	15
				5.16	4900~5900			
2	Main Antenna Chain 0	Wistron Neweb Corporation	DC33001KT00 (81EAAL15.G92)	1.54	2400~2500	PIFA	i-pex(MHF)	36.3
				1.26	5150~5850			
	Aux Antenna Chain 1	Wistron Neweb Corporation	DC33001KT10 (81EAAL15.G75)	0.63	2400~2500	PIFA	i-pex(MHF)	59.3
				1.84	5150~5850			

Newly

For WLAN / BT

Antenna Set.	Transmitter Circuit	Brand	Model	Antenna Gain(dBi)	Frequency range (MHz to MHz)	Antenna Type	Connecter Type	Cable Loss (dB)
3	Chain (0)	TE connectivity	2195487	-0.77	2400~2500	Dipole	i-pex(MHF)	0.4
				3.64	5150~5850			0.5
	Chain (1)	TE connectivity	2195487	-0.77	2400~2500	Dipole	i-pex(MHF)	0.4
				3.64	5150~5850			0.5
4	Chain (0)	TE connectivity	2195501-1	2.35	2400~2500	Slot	i-pex(MHF)	0.35
				4.08	5150~5850			0.45
	Chain (1)	TE connectivity	2195501-1	2.35	2400~2500	Slot	i-pex(MHF)	0.35
				4.08	5150~5850			0.45
5	Chain (0)	TE connectivity	2195505-1	0.41	2400~2500	Slot	i-pex(MHF)	0.35
				4.82	5150~5850			0.45
	Chain (1)	TE connectivity	2195505-1	0.41	2400~2500	Slot	i-pex(MHF)	0.35
				4.82	5150~5850			0.45

From the above newly antenna sets, the **Set 3, Set 4** were selected as representative antenna for the test and its data was recorded in this report.

2. According to above condition, Only Maximum Peak Output Power / Radiated Emissions test items need to be performed. And all data were verified to meet the requirements.
3. There are Bluetooth, WLAN and NFC technology used for the EUT.
4. The NFC antenna provided to the EUT, please refer to the following table:

Brand	Model	Antenna Gain(dBi)	Frequency Range (MHz)	Antenna Type	Connecter Type
Marvell	30X40X4T_PCB	0.5	13.56	PCB	i-pex(MHF)

5. WLAN/BT/NFC coexistence mode:

Condition	Technology		
1	WLAN(2.4GHz) 1Tx only	BT	NFC
2	WLAN(5GHz) 1Tx only	BT	NFC

From above coexistence mode, radiated emission of the simultaneous operation has been evaluated and no non-compliance was found.

6. 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	
1	√	√	-	EUT With Dipole antenna
2	√	√	√	EUT With Slot antenna

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

NOTE: 1. **For Dipole antenna:** The EUT's antenna had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane.**
2. **For Slot antenna:** The EUT's antenna had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-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	0	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 (SYSTEM)	TESTED BY
RE≥1G	25deg. C, 69%RH	120Vac, 60Hz	Andy Ho
RE<1G	26deg. C, 69%RH	120Vac, 60Hz	Andy Ho
APCM	23deg. C, 63%RH	120Vac, 60Hz	Anderson Chen

3.3 Description of Support Units

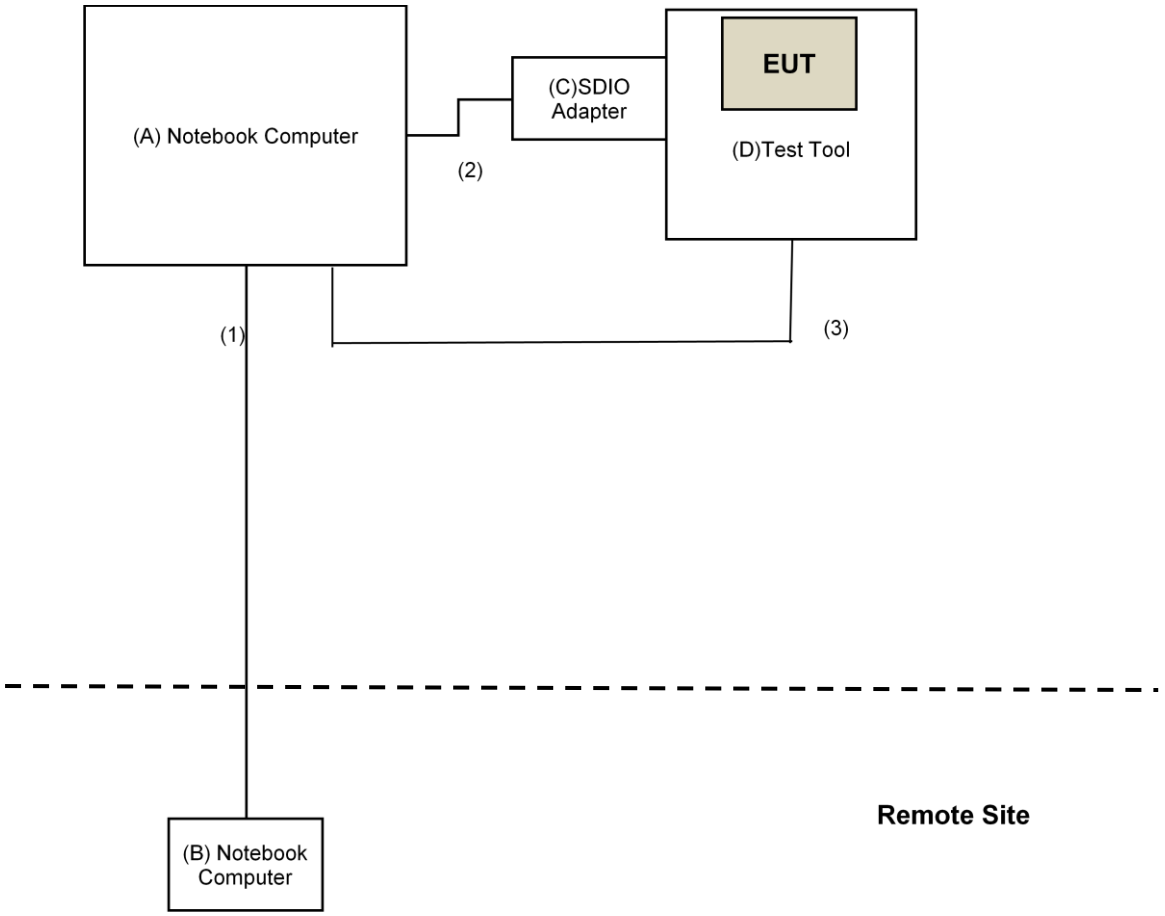
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	NOTEBOOK COMPUTER	Lenovo	769	L3-BE428 08/01	NA	Provided by Lab
B.	NOTEBOOK COMPUTER	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab
C.	SDIO ADAPTER	AzureWave	CK77 94V-0	NA	NA	Supplied by client
D.	TEST TOOLS	AzureWave	1280NF I03	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.	RJ45	1	10	No	0	Provided by Lab
2.	USB	1	1.5	Yes	0	Provided by Lab
3.	USB	1	1.8	Yes	0	Provided by Lab

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)
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 Agilent	N9038A	MY51210202	Dec. 16, 2015	Dec. 15, 2016
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-04	Nov. 11, 2015	Nov. 10, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Jan. 07, 2016	Jan. 06, 2017
RF Cable	8D-FB	CHHCAB-001-1 CHHCAB-001-2	Oct. 04, 2015	Oct. 03, 2016
	RF-141	CHHCAB-004	Oct. 04, 2015	Oct. 03, 2016
Horn_Antenna AISI	AIH.8018	0000220091110	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Agilent	8449B	3008A01923	Oct. 27, 2015	Oct. 26, 2016
RF Cable	NA	131206 131213 131215 SNMY23685/4	Jan. 15, 2016	Jan. 14, 2017
Spectrum Analyzer Agilent	E4446A	MY48250254	Nov. 25, 2015	Nov. 24, 2016
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Dec. 11, 2015	Dec. 10, 2016
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Jan. 18, 2016	Jan. 17, 2017
RF Cable	SUCOFLEX 102	36442/2 36434/2	Dec. 10, 2015	Dec. 09, 2016
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	CM100	NA	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-WD02	NA	NA
Spectrum Analyzer R&S	FSP40	100060	May 11, 2016	May 10, 2017

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. H.
4. The FCC Site Registration No. is 797305.
5. The CANADA Site Registration No. is IC 7450H-3.
6. Tested Date: May 18 to June 06, 2016

4.1.3 Test Procedures

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 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 detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

Note:

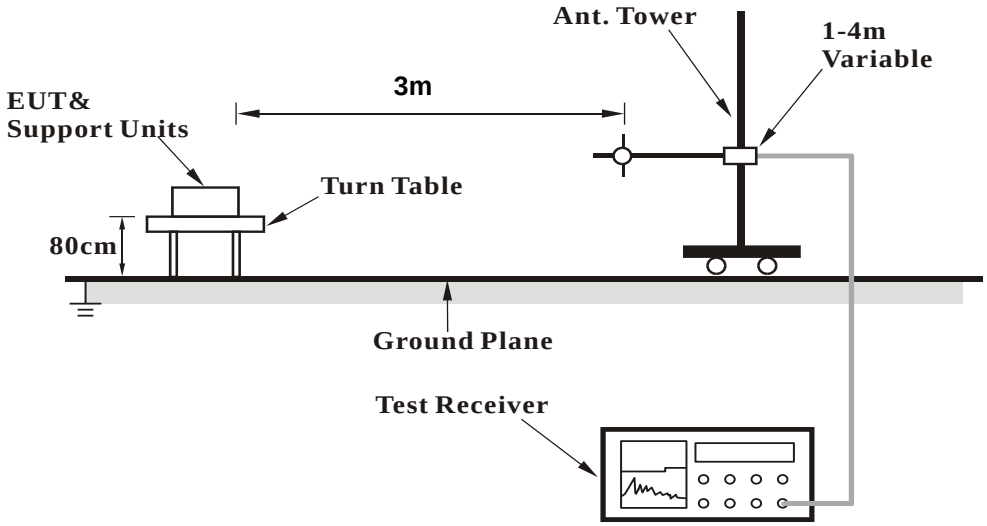
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. For Average measurement, due to 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, therefore Average value = peak reading + 20log(duty cycle).
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

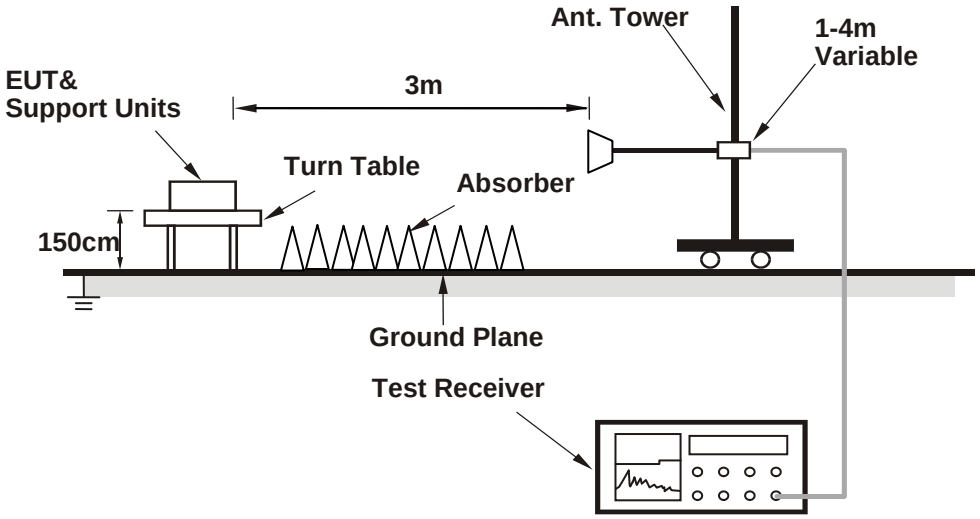
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range 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 support unit A (Notebook Computer) which is placed on remote site.
b. Contorlling software (DutApiMimoBtFmBrdigeEth.exe[ver 2.0.0.47]) has been activated to set the EUT on specific status.

4.1.7 Test Results (Mode 1)

Above 1GHz Data:

BT_GFSK

CHANNEL	TX Channel 0	**DETECTOR FUNCTION**	Peak (PK)
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	53.80 PK	74.00	-20.20	1.27 H	147	56.20	-2.40
2	2390.00	23.70 AV	54.00	-30.30	1.27 H	147	26.10	-2.40
3	*2402.00	103.90 PK			1.21 H	140	106.30	-2.40
4	*2402.00	73.80 AV			1.21 H	140	76.20	-2.40
5	4804.00	53.50 PK	74.00	-20.50	1.43 H	86	47.60	5.90
6	4804.00	23.40 AV	54.00	-30.60	1.43 H	86	17.50	5.90
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	58.20 PK	74.00	-15.80	1.21 V	360	60.60	-2.40
2	2390.00	28.10 AV	54.00	-25.90	1.21 V	360	30.50	-2.40
3	*2402.00	113.50 PK			1.22 V	351	115.90	-2.40
4	*2402.00	83.40 AV			1.22 V	351	85.80	-2.40
5	4804.00	53.70 PK	74.00	-20.30	1.49 V	202	47.80	5.90
6	4804.00	23.60 AV	54.00	-30.40	1.49 V	202	17.70	5.90

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. Average value = peak reading + 20log(duty cycle).

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK)
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	104.30 PK			1.21 H	138	106.70	-2.40
2	*2441.00	74.20 AV			1.21 H	138	76.60	-2.40
3	4882.00	54.00 PK	74.00	-20.00	1.46 H	86	47.90	6.10
4	4882.00	23.90 AV	54.00	-30.10	1.46 H	86	17.80	6.10
5	7323.00	59.10 PK	74.00	-14.90	1.45 H	113	48.60	10.50
6	7323.00	29.00 AV	54.00	-25.00	1.45 H	113	18.50	10.50
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	113.60 PK			1.25 V	360	116.00	-2.40
2	*2441.00	83.50 AV			1.25 V	360	85.90	-2.40
3	4882.00	53.70 PK	74.00	-20.30	1.53 V	187	47.60	6.10
4	4882.00	23.60 AV	54.00	-30.40	1.53 V	187	17.50	6.10
5	7323.00	59.60 PK	74.00	-14.40	1.48 V	198	49.10	10.50
6	7323.00	29.50 AV	54.00	-24.50	1.48 V	198	19.00	10.50

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. Average value = peak reading + 20log(duty cycle).

CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK)
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	104.00 PK			1.22 H	135	106.30	-2.30
2	*2480.00	73.90 AV			1.22 H	135	76.20	-2.30
3	2483.50	53.20 PK	74.00	-20.80	1.22 H	135	55.60	-2.40
4	2483.50	23.10 AV	54.00	-30.90	1.22 H	135	25.50	-2.40
5	4960.00	53.90 PK	74.00	-20.10	1.44 H	100	47.70	6.20
6	4960.00	23.80 AV	54.00	-30.20	1.44 H	100	17.60	6.20
7	7440.00	58.90 PK	74.00	-15.10	1.50 H	122	47.80	11.10
8	7440.00	28.80 AV	54.00	-25.20	1.50 H	122	17.70	11.10
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	113.30 PK			1.23 V	357	115.60	-2.30
2	*2480.00	83.20 AV			1.23 V	357	85.50	-2.30
3	2483.50	58.40 PK	74.00	-15.60	1.23 V	357	60.80	-2.40
4	2483.50	28.30 AV	54.00	-25.70	1.23 V	357	30.70	-2.40
5	4960.00	53.30 PK	74.00	-20.70	1.48 V	193	47.10	6.20
6	4960.00	23.20 AV	54.00	-30.80	1.48 V	193	17.00	6.20
7	7440.00	59.80 PK	74.00	-14.20	1.50 V	200	48.70	11.10
8	7440.00	29.70 AV	54.00	-24.30	1.50 V	200	18.60	11.10

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. Average value = peak reading + 20log(duty cycle).

BT_8DPSK

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK)
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	53.30 PK	74.00	-20.70	1.51 H	110	55.70	-2.40
2	2390.00	23.20 AV	54.00	-30.80	1.51 H	110	25.60	-2.40
3	*2402.00	100.00 PK			1.35 H	117	102.40	-2.40
4	*2402.00	69.90 AV			1.35 H	117	72.30	-2.40
5	4804.00	54.50 PK	74.00	-19.50	1.44 H	119	48.60	5.90
6	4804.00	24.40 AV	54.00	-29.60	1.44 H	119	18.50	5.90
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	58.20 PK	74.00	-15.80	1.25 V	358	60.60	-2.40
2	2390.00	28.10 AV	54.00	-25.90	1.25 V	358	30.50	-2.40
3	*2402.00	108.80 PK			1.31 V	360	111.20	-2.40
4	*2402.00	78.70 AV			1.31 V	360	81.10	-2.40
5	4804.00	52.60 PK	74.00	-21.40	1.37 V	197	46.70	5.90
6	4804.00	22.50 AV	54.00	-31.50	1.37 V	197	16.60	5.90

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. Average value = peak reading + 20log(duty cycle).

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK)
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	100.20 PK			1.30 H	114	102.60	-2.40
2	*2441.00	70.10 AV			1.30 H	114	72.50	-2.40
3	4882.00	53.30 PK	74.00	-20.70	1.42 H	103	47.20	6.10
4	4882.00	23.20 AV	54.00	-30.80	1.42 H	103	17.10	6.10
5	7323.00	59.60 PK	74.00	-14.40	1.48 H	104	49.10	10.50
6	7323.00	29.50 AV	54.00	-24.50	1.48 H	104	19.00	10.50
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	109.20 PK			1.27 V	359	111.60	-2.40
2	*2441.00	79.10 AV			1.27 V	359	81.50	-2.40
3	4882.00	53.00 PK	74.00	-21.00	1.43 V	205	46.90	6.10
4	4882.00	22.90 AV	54.00	-31.10	1.43 V	205	16.80	6.10
5	7323.00	59.60 PK	74.00	-14.40	1.46 V	193	49.10	10.50
6	7323.00	29.50 AV	54.00	-24.50	1.46 V	193	19.00	10.50

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. Average value = peak reading + 20log(duty cycle).

CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK)
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	100.10 PK			1.30 H	120	102.40	-2.30
2	*2480.00	70.00 AV			1.30 H	120	72.30	-2.30
3	2483.50	53.40 PK	74.00	-20.60	1.30 H	120	55.80	-2.40
4	2483.50	23.30 AV	54.00	-30.70	1.30 H	120	25.70	-2.40
5	4960.00	53.90 PK	74.00	-20.10	1.42 H	112	47.70	6.20
6	4960.00	23.80 AV	54.00	-30.20	1.42 H	112	17.60	6.20
7	7440.00	59.10 PK	74.00	-14.90	1.53 H	118	48.00	11.10
8	7440.00	29.00 AV	54.00	-25.00	1.53 H	118	17.90	11.10
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	108.90 PK			1.25 V	360	111.20	-2.30
2	*2480.00	78.80 AV			1.25 V	360	81.10	-2.30
3	2483.50	58.60 PK	74.00	-15.40	1.25 V	360	61.00	-2.40
4	2483.50	28.50 AV	54.00	-25.50	1.25 V	360	30.90	-2.40
5	4960.00	53.00 PK	74.00	-21.00	1.43 V	194	46.80	6.20
6	4960.00	22.90 AV	54.00	-31.10	1.43 V	194	16.70	6.20
7	7440.00	59.30 PK	74.00	-14.70	1.46 V	197	48.20	11.10
8	7440.00	29.20 AV	54.00	-24.80	1.46 V	197	18.10	11.10

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. Average value = peak reading + 20log(duty cycle).

Below 1GHz Data:

BT_GFSK

CHANNEL	TX Channel 0	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	Below 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	165.78	31.20 QP	43.50	-12.30	2.00 H	48	39.40	-8.20
2	324.01	37.20 QP	46.00	-8.80	1.00 H	318	42.90	-5.70
3	552.01	35.60 QP	46.00	-10.40	1.50 H	129	36.30	-0.70
4	792.01	38.00 QP	46.00	-8.00	1.00 H	95	34.00	4.00
5	**887.99**	**42.30 QP**	**46.00**	**-3.70**	**1.00 H**	**175**	**36.80**	**5.50**
6	984.00	41.90 QP	54.00	-12.10	1.00 H	175	34.60	7.30
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	132.75	29.70 QP	43.50	-13.80	1.00 V	93	38.70	-9.00
2	184.84	35.10 QP	43.50	-8.40	1.00 V	92	45.00	-9.90
3	312.00	33.20 QP	46.00	-12.80	1.00 V	73	39.20	-6.00
4	528.00	39.00 QP	46.00	-7.00	1.50 V	102	40.10	-1.10
5	648.01	37.60 QP	46.00	-8.40	1.50 V	72	36.10	1.50
6	984.02	37.80 QP	54.00	-16.20	1.00 V	56	30.50	7.30

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

4.1.8 Test Results (Mode 2)

Above 1GHz Data:

BT_GFSK

CHANNEL	TX Channel 0	**DETECTOR FUNCTION**	Peak (PK)
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	50.30 PK	74.00	-23.70	1.78 H	158	52.20	-1.90
2	2390.00	20.20 AV	54.00	-33.80	1.78 H	158	22.10	-1.90
3	*2402.00	106.30 PK			1.78 H	158	108.10	-1.80
4	*2402.00	76.20 AV			1.78 H	158	78.00	-1.80
5	4804.00	47.40 PK	74.00	-26.60	1.00 H	287	40.80	6.60
6	4804.00	17.30 AV	54.00	-36.70	1.00 H	287	10.70	6.60
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	48.50 PK	74.00	-25.50	1.18 V	209	50.40	-1.90
2	2390.00	18.40 AV	54.00	-35.60	1.18 V	209	20.30	-1.90
3	*2402.00	103.90 PK			1.18 V	209	105.70	-1.80
4	*2402.00	73.80 AV			1.18 V	209	75.60	-1.80
5	4804.00	49.70 PK	74.00	-24.30	1.71 V	39	43.10	6.60
6	4804.00	19.60 AV	54.00	-34.40	1.71 V	39	13.00	6.60

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. Average value = peak reading + 20log(duty cycle).

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK)
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	105.70 PK			1.74 H	151	107.50	-1.80
2	*2441.00	75.60 AV			1.74 H	151	77.40	-1.80
3	4882.00	47.30 PK	74.00	-26.70	1.09 H	286	40.50	6.80
4	4882.00	17.20 AV	54.00	-36.80	1.09 H	286	10.40	6.80
5	7323.00	52.30 PK	74.00	-21.70	1.16 H	291	41.10	11.20
6	7323.00	22.20 AV	54.00	-31.80	1.16 H	291	11.00	11.20
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	103.80 PK			1.18 V	197	105.60	-1.80
2	*2441.00	73.70 AV			1.18 V	197	75.50	-1.80
3	4882.00	49.90 PK	74.00	-24.10	1.79 V	41	43.10	6.80
4	4882.00	19.80 AV	54.00	-34.20	1.79 V	41	13.00	6.80
5	7323.00	52.20 PK	74.00	-21.80	1.28 V	73	41.00	11.20
6	7323.00	22.10 AV	54.00	-31.90	1.28 V	73	10.90	11.20

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. Average value = peak reading + 20log(duty cycle).

CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK)
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	104.30 PK			2.08 H	161	106.00	-1.70
2	*2480.00	74.20 AV			2.08 H	161	75.90	-1.70
3	2483.50	53.10 PK	74.00	-20.90	2.08 H	161	54.90	-1.80
4	2483.50	23.00 AV	54.00	-31.00	2.08 H	161	24.80	-1.80
5	4960.00	48.10 PK	74.00	-25.90	1.06 H	273	41.20	6.90
6	4960.00	18.00 AV	54.00	-36.00	1.06 H	273	11.10	6.90
7	7440.00	52.50 PK	74.00	-21.50	1.19 H	287	40.70	11.80
8	7440.00	22.40 AV	54.00	-31.60	1.19 H	287	10.60	11.80
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	102.80 PK			1.18 V	206	104.50	-1.70
2	*2480.00	72.70 AV			1.18 V	206	74.40	-1.70
3	2483.50	52.40 PK	74.00	-21.60	1.18 V	206	54.20	-1.80
4	2483.50	22.30 AV	54.00	-31.70	1.18 V	206	24.10	-1.80
5	4960.00	49.00 PK	74.00	-25.00	1.81 V	37	42.10	6.90
6	4960.00	18.90 AV	54.00	-35.10	1.81 V	37	12.00	6.90
7	7440.00	53.10 PK	74.00	-20.90	1.24 V	81	41.30	11.80
8	7440.00	23.00 AV	54.00	-31.00	1.24 V	81	11.20	11.80

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. Average value = peak reading + 20log(duty cycle).

BT_8DPSK

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK)
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	50.20 PK	74.00	-23.80	1.78 H	163	52.10	-1.90
2	2390.00	20.10 AV	54.00	-33.90	1.78 H	163	22.00	-1.90
3	*2402.00	103.50 PK			1.78 H	163	105.30	-1.80
4	*2402.00	73.40 AV			1.78 H	163	75.20	-1.80
5	4804.00	47.80 PK	74.00	-26.20	1.04 H	281	41.20	6.60
6	4804.00	17.70 AV	54.00	-36.30	1.04 H	281	11.10	6.60
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	48.80 PK	74.00	-25.20	1.23 V	196	50.70	-1.90
2	2390.00	18.70 AV	54.00	-35.30	1.23 V	196	20.60	-1.90
3	*2402.00	101.70 PK			1.23 V	196	103.50	-1.80
4	*2402.00	71.60 AV			1.23 V	196	73.40	-1.80
5	4804.00	49.60 PK	74.00	-24.40	1.78 V	11	43.00	6.60
6	4804.00	19.50 AV	54.00	-34.50	1.78 V	11	12.90	6.60

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. Average value = peak reading + 20log(duty cycle).

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK)
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	103.10 PK			1.77 H	161	104.90	-1.80
2	*2441.00	73.00 AV			1.77 H	161	74.80	-1.80
3	4882.00	46.90 PK	74.00	-27.10	1.00 H	281	40.10	6.80
4	4882.00	16.80 AV	54.00	-37.20	1.00 H	281	10.00	6.80
5	7323.00	51.80 PK	74.00	-22.20	1.15 H	294	40.60	11.20
6	7323.00	21.70 AV	54.00	-32.30	1.15 H	294	10.50	11.20
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	101.60 PK			1.22 V	197	103.40	-1.80
2	*2441.00	71.50 AV			1.22 V	197	73.30	-1.80
3	4882.00	49.40 PK	74.00	-24.60	1.72 V	22	42.60	6.80
4	4882.00	19.30 AV	54.00	-34.70	1.72 V	22	12.50	6.80
5	7323.00	53.10 PK	74.00	-20.90	1.26 V	84	41.90	11.20
6	7323.00	23.00 AV	54.00	-31.00	1.26 V	84	11.80	11.20

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. Average value = peak reading + 20log(duty cycle).

CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK)
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	102.30 PK			1.82 H	158	104.00	-1.70
2	*2480.00	72.20 AV			1.82 H	158	73.90	-1.70
3	2483.50	50.30 PK	74.00	-23.70	1.82 H	158	52.10	-1.80
4	2483.50	20.20 AV	54.00	-33.80	1.82 H	158	22.00	-1.80
5	4960.00	47.80 PK	74.00	-26.20	1.06 H	277	40.90	6.90
6	4960.00	17.70 AV	54.00	-36.30	1.06 H	277	10.80	6.90
7	7440.00	52.20 PK	74.00	-21.80	1.22 H	285	40.40	11.80
8	7440.00	22.10 AV	54.00	-31.90	1.22 H	285	10.30	11.80
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	102.00 PK			1.17 V	197	103.70	-1.70
2	*2480.00	71.90 AV			1.17 V	197	73.60	-1.70
3	2483.50	49.60 PK	74.00	-24.40	1.17 V	197	51.40	-1.80
4	2483.50	19.50 AV	54.00	-34.50	1.17 V	197	21.30	-1.80
5	4960.00	49.30 PK	74.00	-24.70	1.78 V	18	42.40	6.90
6	4960.00	19.20 AV	54.00	-34.80	1.78 V	18	12.30	6.90
7	7440.00	52.60 PK	74.00	-21.40	1.27 V	93	40.80	11.80
8	7440.00	22.50 AV	54.00	-31.50	1.27 V	93	10.70	11.80

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. Average value = peak reading + 20log(duty cycle).

Below 1GHz Data:

BT_GFSK

CHANNEL	TX Channel 0	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	Below 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	96.01	33.20 QP	43.50	-10.30	1.50 H	1	46.20	-13.00
2	359.99	38.80 QP	46.00	-7.20	1.00 H	251	43.90	-5.10
3	431.99	38.70 QP	46.00	-7.30	2.00 H	140	41.50	-2.80
4	600.00	38.70 QP	46.00	-7.30	1.50 H	207	38.00	0.70
5	791.98	37.90 QP	46.00	-8.10	1.00 H	94	33.90	4.00
6	984.00	41.40 QP	54.00	-12.60	1.00 H	180	34.10	7.30
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	136.89	28.00 QP	43.50	-15.50	1.00 V	83	36.60	-8.60
2	184.35	34.40 QP	43.50	-9.10	1.00 V	86	44.20	-9.80
3	264.01	30.10 QP	46.00	-15.90	1.50 V	89	38.30	-8.20
4	432.02	32.00 QP	46.00	-14.00	1.00 V	124	34.80	-2.80
5	648.01	38.60 QP	46.00	-7.40	1.50 V	68	37.10	1.50
6	984.00	38.20 QP	54.00	-15.80	1.50 V	95	30.90	7.30

REMARKS:

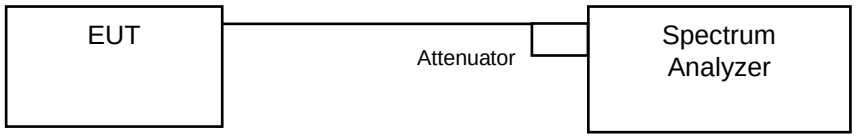
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

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. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.

c. The center frequency of the spectrum analyzer is set to the fundamental frequency and using 3MHz RBW and 10 MHz VBW.

d. Measure the captured power within the band and recording the plot.

e. Repeat above procedures until all frequencies required were complete.

4.2.5 Deviation from Test Standard

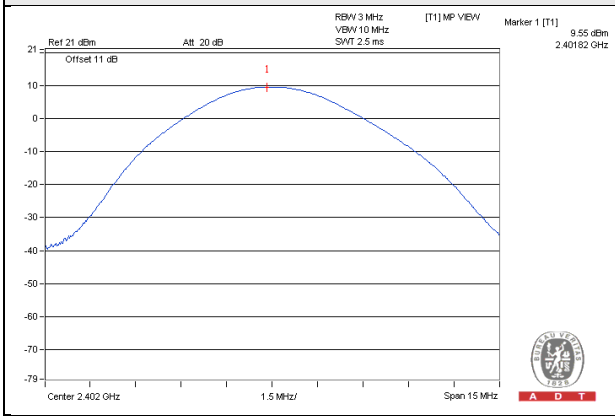
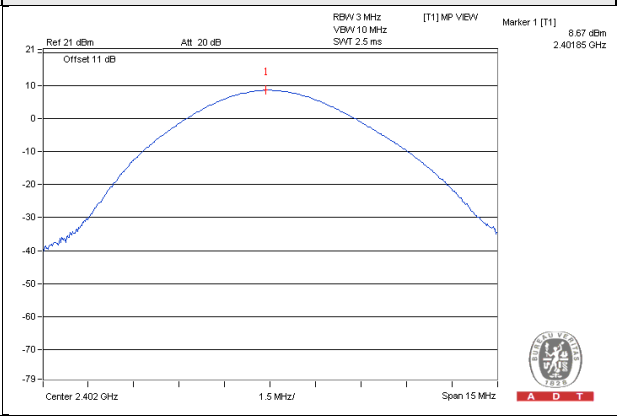
No deviation.

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

Channel	Frequency (MHZ)	Output Power (mW)		Output Power (dBm)		Power Limit (mW)	Pass / Fail
		GFSK	8DPSK	GFSK	8DPSK		
0	2402	9.016	7.362	9.55	8.67	21.00	Pass
39	2441	8.531	6.855	9.31	8.36	21.00	Pass
78	2480	7.379	6.471	8.68	8.11	21.00	Pass

Spectrum Plot of Worst Value	
GFSK / CH0	8DPSK / CH0
	

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 accredited and approved according to ISO/IEC 17025.

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

Linko EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

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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