FCC Test Report

Report No.:	RF151123E10
FCC ID:	2AD8UNBTM01
Test Model:	NBTM01
Received Date:	Nov. 23, 2015
Test Date:	Nov. 28 to Dec. 08, 2015
Issued Date:	Dec. 18, 2015
Applicant:	Nokia Solutions and Networks
Address:	1455 West Shure Drive, Arlington Heights, IL 60004, USA
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
RF151123E10	Original release.	Dec. 18, 2015

1 Certificate of Conformity

Product:	BT module
Brand:	Nokia
Test Model:	NBTM01
Sample Status:	ENGINEERING SAMPLE
Applicant:	Nokia Solutions and Networks
Test Date:	Nov. 28 to Dec. 08, 2015
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:** Dec. 18, 2015

Claire Kuan / Specialist

Approved by : _____ , **Date:** Dec. 18, 2015

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -14.66dB at 0.15937MHz.
15.247(a)(1)(iii)	Number of Hopping Frequency Used	PASS	Meet the requirement of limit.
15.247(a)(1)(iii)	Dwell Time on Each Channel	PASS	Meet the requirement of limit.
15.247(a)(1)	1. Hopping Channel Separation 2. Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power	PASS	Meet the requirement of limit.
15.205 15.209 15.247(d)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -3.7dB at 59.90MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is U.FL to RP SMA type (M) not a standard connector.

NOTE: If the Frequency Hopping System operating in 2400-2483.5MHz band and the output power less than 125mW. The hopping channel carrier frequencies separated by a minimum of 25kHz or two-thirds of the 20dB bandwidth of hopping channel whichever is greater.

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	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.19 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.40 dB
	6GHz ~ 18GHz	3.73 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

Product	BT module
Brand	Nokia
Test Model	NBTM01
Test Sample S/N	EB1543L0030
Hardware Version	X21
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	VDD_IN = 3.6 V, VDD_IO = 1.8 V 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	9.099mW
Antenna Type	Refer to note as below
Antenna Connector	Refer to note as below
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. There is BT technology used for the EUT.
2. The antennas provided to the EUT, please refer to the following table:

Antenna Spec.					
Antenna Condition	Brand	Model	Antenna Type	Gain(dBi)	Frequency (MHz)
Internal BT Ant	NA	Fz PICO	PCB	1.45	2400~2500
Antenna Condition	Brand	Model	Antenna Type	Gain(dBi) <Including cable loss>	Frequency (MHz)
External BT Ant	NA	NA	Dipole	0	2400~2500

Cable Spec.					
Brand	Model	Connector Type	Cable Loss(dB)	Cable Length (cm)	Note
NA	NA	U.FL to RP SMA type (M)	1	10	This cable will be equipped with dipole antenna

3. 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	PLC	APCM	
1	√	√	-	√	With PCB antenna
2	√	√	√	-	With Dipole antenna

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. "-"means no effect.
2. The EUT's PCB 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.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
1	0 to 78	0, 39, 78	FHSS	GFSK	DH5
	0 to 78	0, 39, 78	FHSS	8DPSK	3DH5
2	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.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
1	0 to 78	39	FHSS	8DPSK	3DH5
2	0 to 78	39	FHSS	8DPSK	3DH5

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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
2	0 to 78	39	FHSS	8DPSK	3DH5

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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
1	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	26deg. C, 65%RH	120Vac, 60Hz	Jyunchu Lin
RE<1G	26deg. C, 65%RH	120Vac, 60Hz	Jyunchu Lin
PLC	25deg. C, 66%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%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.

No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	NOTEBOOK COMPUTER	DELL	E5430	GM1SKV1	FCC DoC	Provided by Lab
B	TEST TOOLS	Nokia	NA	NA	NA	Provided by Lab
C	BLUETOOTH SIMULATOR	Anritsu	MT8852B	1218002	NA	Provided by Lab
D	ADAPTER	DVE	DSA-60PFB-12 1 120500	NA	NA	Supplied by Client

NOTE:

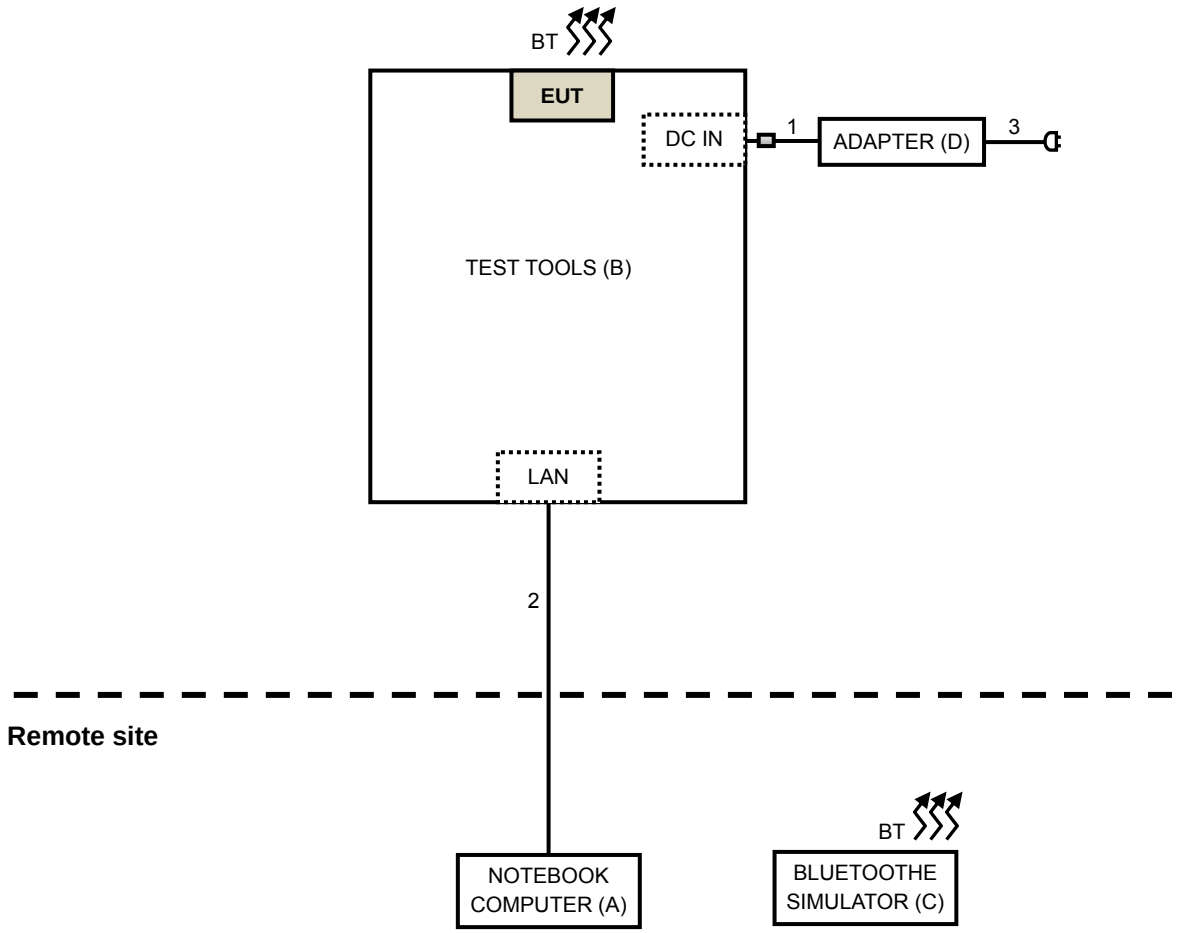
1. All power cords of the above support units are non-shielded (1.8 m).

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	DC	1	1.5	No	1	Supplied by Client
2	RJ-45	1	10	No	0	Provided by Lab
3	AC	1	1.8	No	0	Provided by Lab

NOTE:

1. The core(s) is(are) originally attached to the cable(s).

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

For above 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 12, 2015	Aug. 11, 2016
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Feb. 05, 2015	Feb. 04, 2016
Pre-Amplifier Agilent	8449B	3008A02465	Apr. 06, 2015	Apr. 05, 2016
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150317 150321 150322	Mar. 31, 2015	Mar. 30, 2016
Spectrum Analyzer Keysight	N9030A	MY54490520	July 26, 2015	July 25, 2016
Pre-Amplifier EMCI	EMC184045	980143	Jan. 16, 2015	Jan. 15, 2016
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Feb. 05, 2015	Feb. 04, 2016
RF Cable	SUCOFLEX104	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

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 horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. 3.
4. The FCC Site Registration No. is 147459
5. The CANADA Site Registration No. is 20331-1
6. Tested Date: Dec. 08, 2015

For below 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY54450088	July 24, 2015	July 23, 2016
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 13, 2014	Jan. 12, 2016
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2015	Jan. 17, 2016
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-06	Nov. 11, 2015	Nov. 10, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Feb. 03, 2015	Feb. 02, 2016
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 03, 2015	Apr. 02, 2016
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

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. Loop antenna was used for all emissions below 30 MHz.
4. The test was performed in 966 Chamber No. 4.
5. The FCC Site Registration No. is 292998
6. The CANADA Site Registration No. is 20331-2
7. Tested Date: Dec. 08, 2015

4.1.3 Test Procedures

a. The EUT was placed on the top of a rotating table 0.8 meters 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. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test

2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 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).

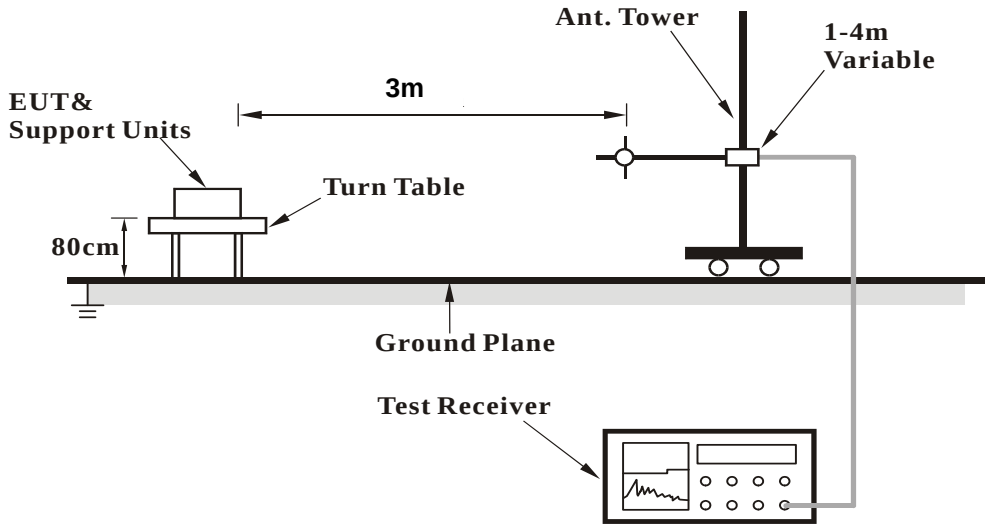
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

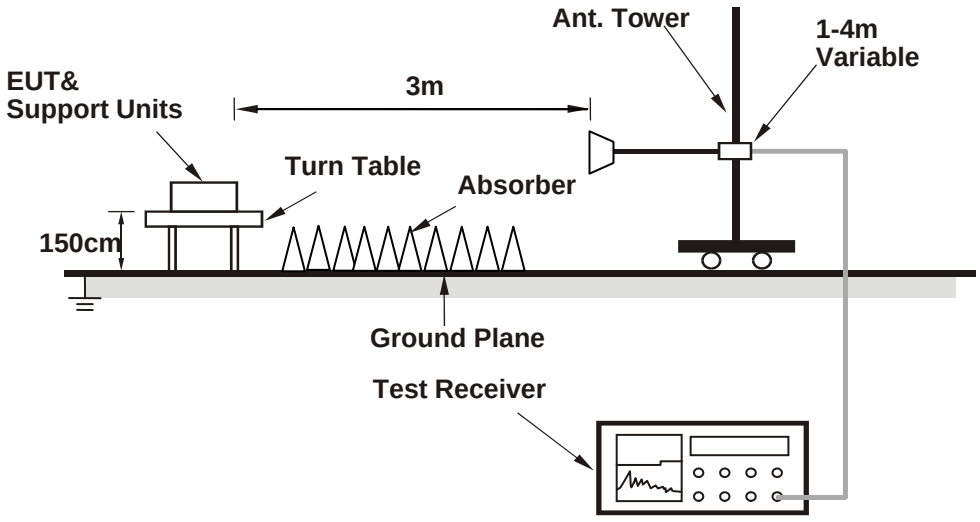
No deviation.

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

1. Connect the EUT with the support units A (Notebook Computer) which is placed in remote site.
2. The communication partner run test program “MT8852B” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

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	48.8 PK	74.0	-25.2	2.60 H	131	50.23	-1.43
2	2390.00	18.7 AV	54.0	-35.3	2.60 H	131	20.13	-1.43
3	*2402.00	104.9 PK			2.60 H	131	106.30	-1.40
4	*2402.00	74.8 AV			2.60 H	131	76.20	-1.40
5	4804.00	48.8 PK	74.0	-25.2	1.95 H	270	41.79	7.01
6	4804.00	18.7 AV	54.0	-35.3	1.95 H	270	11.69	7.01
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	48.1 PK	74.0	-25.9	1.10 V	162	49.53	-1.43
2	2390.00	18.0 AV	54.0	-36.0	1.10 V	162	19.43	-1.43
3	*2402.00	101.2 PK			1.10 V	162	102.60	-1.40
4	*2402.00	71.1 AV			1.10 V	162	72.50	-1.40
5	4804.00	50.1 PK	74.0	-23.9	1.50 V	140	43.09	7.01
6	4804.00	20.0 AV	54.0	-34.0	1.50 V	140	12.99	7.01

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	106.8 PK			2.77 H	125	106.82	-0.02
2	*2441.00	76.7 AV			2.77 H	125	76.72	-0.02
3	4882.00	49.6 PK	74.0	-24.4	1.98 H	273	40.67	8.93
4	4882.00	19.5 AV	54.0	-34.5	1.98 H	273	10.57	8.93
5	7323.00	50.7 PK	74.0	-23.3	1.87 H	288	34.21	16.49
6	7323.00	20.6 AV	54.0	-33.4	1.87 H	288	4.11	16.49
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	101.7 PK			1.91 V	166	101.72	-0.02
2	*2441.00	71.6 AV			1.91 V	166	71.62	-0.02
3	4882.00	50.5 PK	74.0	-23.5	1.49 V	145	41.57	8.93
4	4882.00	20.4 AV	54.0	-33.6	1.49 V	145	11.47	8.93
5	7323.00	51.8 PK	74.0	-22.2	1.51 V	198	35.31	16.49
6	7323.00	21.7 AV	54.0	-32.3	1.51 V	198	5.21	16.49

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) – 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	103.8 PK			2.00 H	136	105.01	-1.21
2	*2480.00	73.7 AV			2.00 H	136	74.91	-1.21
3	2483.50	50.1 PK	74.0	-23.9	1.00 H	136	51.31	-1.21
4	2483.50	20.0 AV	54.0	-34.0	1.00 H	136	21.21	-1.21
5	4960.00	48.7 PK	74.0	-25.3	2.00 H	269	41.06	7.64
6	4960.00	18.6 AV	54.0	-35.4	2.00 H	269	10.96	7.64
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	100.1 PK			1.46 V	159	101.31	-1.21
2	*2480.00	70.0 AV			1.46 V	159	71.21	-1.21
3	2483.50	48.6 PK	74.0	-25.4	1.46 V	159	49.81	-1.21
4	2483.50	18.5 AV	54.0	-35.5	1.46 V	159	19.71	-1.21
5	4960.00	49.9 PK	74.0	-24.1	1.46 V	156	42.26	7.64
6	4960.00	19.8 AV	54.0	-34.2	1.46 V	156	12.16	7.64
7	7440.00	51.9 PK	74.0	-22.1	1.49 V	207	37.39	14.51
8	7440.00	21.8 AV	54.0	-32.2	1.49 V	207	7.29	14.51

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	48.6 PK	74.0	-25.4	2.94 H	127	50.03	-1.43
2	2390.00	18.5 AV	54.0	-35.5	2.94 H	127	19.93	-1.43
3	*2402.00	104.1 PK			2.94 H	127	105.50	-1.40
4	*2402.00	74.0 AV			2.94 H	127	75.40	-1.40
5	4804.00	47.2 PK	74.0	-26.8	1.97 H	150	40.19	7.01
6	4804.00	17.1 AV	54.0	-36.9	1.97 H	150	10.09	7.01
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	47.8 PK	74.0	-26.2	1.49 V	168	49.23	-1.43
2	2390.00	17.7 AV	54.0	-36.3	1.49 V	168	19.13	-1.43
3	*2402.00	100.6 PK			1.49 V	168	102.00	-1.40
4	*2402.00	70.5 AV			1.49 V	168	71.90	-1.40
5	4804.00	48.8 PK	74.0	-25.2	1.47 V	171	41.79	7.01
6	4804.00	18.7 AV	54.0	-35.3	1.47 V	171	11.69	7.01

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	106.1 PK			2.83 H	131	107.41	-1.31
2	*2441.00	76.0 AV			2.83 H	131	77.31	-1.31
3	4882.00	48.1 PK	74.0	-25.9	2.05 H	121	40.83	7.27
4	4882.00	18.0 AV	54.0	-36.0	2.05 H	121	10.73	7.27
5	7323.00	48.8 PK	74.0	-25.2	2.00 H	284	34.32	14.48
6	7323.00	18.7 AV	54.0	-35.3	2.00 H	284	4.22	14.48
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	100.9 PK			1.54 V	160	102.21	-1.31
2	*2441.00	70.8 AV			1.54 V	160	72.11	-1.31
3	4882.00	49.2 PK	74.0	-24.8	1.49 V	140	41.93	7.27
4	4882.00	19.1 AV	54.0	-34.9	1.49 V	140	11.83	7.27
5	7323.00	50.3 PK	74.0	-23.7	1.51 V	129	35.82	14.48
6	7323.00	20.2 AV	54.0	-33.8	1.51 V	129	5.72	14.48

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	102.6 PK			2.82 H	137	103.81	-1.21
2	*2480.00	72.5 AV			2.82 H	137	73.71	-1.21
3	2483.50	49.6 PK	74.0	-24.4	2.82 H	137	50.81	-1.21
4	2483.50	19.5 AV	54.0	-34.5	2.82 H	137	20.71	-1.21
5	4960.00	48.3 PK	74.0	-25.7	2.08 H	132	40.66	7.64
6	4960.00	18.2 AV	54.0	-35.8	2.08 H	132	10.56	7.64
7	7440.00	49.1 PK	74.0	-24.9	2.06 H	288	34.59	14.51
8	7440.00	19.0 AV	54.0	-35.0	2.06 H	288	4.49	14.51
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	99.2 PK			1.50 V	147	100.41	-1.21
2	*2480.00	69.1 AV			1.50 V	147	70.31	-1.21
3	2483.50	48.3 PK	74.0	-25.7	1.50 V	147	49.51	-1.21
4	2483.50	18.2 AV	54.0	-35.8	1.50 V	147	19.41	-1.21
5	4960.00	49.1 PK	74.0	-24.9	1.43 V	142	41.46	7.64
6	4960.00	19.0 AV	54.0	-35.0	1.43 V	142	11.36	7.64
7	7440.00	50.1 PK	74.0	-23.9	1.52 V	136	35.59	14.51
8	7440.00	20.0 AV	54.0	-34.0	1.52 V	136	5.49	14.51

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 WORST-CASE DATA

BT_8DPSK

CHANNEL	TX Channel 39	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	59.85	35.6 QP	40.0	-4.4	2.00 H	221	51.27	-15.66
2	195.17	37.1 QP	43.5	-6.4	1.00 H	360	55.30	-18.21
3	288.29	37.0 QP	46.0	-9.0	1.00 H	245	51.55	-14.55
4	437.55	37.4 QP	46.0	-8.6	2.00 H	196	47.70	-10.30
5	500.01	39.9 QP	46.0	-6.1	2.00 H	216	49.21	-9.28
6	800.03	37.1 QP	46.0	-8.9	1.00 H	114	40.69	-3.57
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	88.95	34.3 QP	43.5	-9.2	2.00 V	0	55.27	-20.96
2	209.33	32.2 QP	43.5	-11.3	1.00 V	73	50.40	-18.22
3	285.60	35.2 QP	46.0	-10.8	1.50 V	303	49.79	-14.60
4	450.01	36.9 QP	46.0	-9.2	1.00 V	9	46.84	-9.99
5	800.03	33.9 QP	46.0	-12.1	1.50 V	13	37.47	-3.57
6	959.99	36.0 QP	46.0	-10.0	1.00 V	117	37.50	-1.49

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) – 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	47.9 PK	74.0	-26.1	1.20 H	165	48.06	-0.16
2	2390.00	17.8 AV	54.0	-36.2	1.20 H	165	17.96	-0.16
3	*2402.00	101.0 PK			1.20 H	165	101.13	-0.13
4	*2402.00	70.9 AV			1.20 H	165	71.03	-0.13
5	4804.00	47.7 PK	74.0	-26.3	1.32 H	89	39.01	8.69
6	4804.00	17.6 AV	54.0	-36.4	1.32 H	89	8.91	8.69
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	48.4 PK	74.0	-25.6	1.17 V	210	48.56	-0.16
2	2390.00	18.3 AV	54.0	-35.7	1.17 V	210	18.46	-0.16
3	*2402.00	101.3 PK			1.17 V	210	101.43	-0.13
4	*2402.00	71.2 AV			1.17 V	210	71.33	-0.13
5	4804.00	48.0 PK	74.0	-26.0	1.07 V	323	39.31	8.69
6	4804.00	17.9 AV	54.0	-36.1	1.07 V	323	9.21	8.69

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	101.3 PK			1.22 H	164	101.32	-0.02
2	*2441.00	71.2 AV			1.22 H	164	71.22	-0.02
3	4882.00	47.9 PK	74.0	-26.1	1.33 H	85	38.97	8.93
4	4882.00	17.8 AV	54.0	-36.2	1.33 H	85	8.87	8.93
5	7323.00	48.4 PK	74.0	-25.6	1.40 H	112	31.91	16.49
6	7323.00	18.3 AV	54.0	-35.7	1.40 H	112	1.81	16.49
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	101.6 PK			1.20 V	204	101.62	-0.02
2	*2441.00	71.5 AV			1.20 V	204	71.52	-0.02
3	4882.00	48.2 PK	74.0	-25.8	1.10 V	327	39.27	8.93
4	4882.00	18.1 AV	54.0	-35.9	1.10 V	327	9.17	8.93
5	7323.00	48.7 PK	74.0	-25.3	1.31 V	350	32.21	16.49
6	7323.00	18.6 AV	54.0	-35.4	1.31 V	350	2.11	16.49

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) – 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	100.6 PK			1.35 H	164	100.49	0.11
2	*2480.00	70.5 AV			1.35 H	164	70.39	0.11
3	2483.50	48.3 PK	74.0	-25.7	1.35 H	164	48.19	0.11
4	2483.50	18.2 AV	54.0	-35.8	1.35 H	164	18.09	0.11
5	4960.00	47.4 PK	74.0	-26.6	1.38 H	92	38.13	9.27
6	4960.00	17.3 AV	54.0	-36.7	1.38 H	92	8.03	9.27
7	7440.00	48.3 PK	74.0	-25.7	1.38 H	109	31.68	16.62
8	7440.00	18.2 AV	54.0	-35.8	1.38 H	109	1.58	16.62
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	100.9 PK			1.17 V	218	100.79	0.11
2	*2480.00	70.8 AV			1.17 V	218	70.69	0.11
3	2483.50	48.8 PK	74.0	-25.2	1.17 V	218	48.69	0.11
4	2483.50	18.7 AV	54.0	-35.3	1.17 V	218	18.59	0.11
5	4960.00	48.2 PK	74.0	-25.8	1.06 V	336	38.93	9.27
6	4960.00	18.1 AV	54.0	-35.9	1.06 V	336	8.83	9.27
7	7440.00	48.9 PK	74.0	-25.1	1.30 V	349	32.28	16.62
8	7440.00	18.8 AV	54.0	-35.2	1.30 V	349	2.18	16.62

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	48.1 PK	74.0	-25.9	1.83 H	153	49.53	-1.43
2	2390.00	18.0 AV	54.0	-36.0	1.83 H	153	19.43	-1.43
3	*2402.00	100.1 PK			1.83 H	153	101.50	-1.40
4	*2402.00	70.0 AV			1.83 H	153	71.40	-1.40
5	4804.00	48.1 PK	74.0	-25.9	1.42 H	77	41.09	7.01
6	4804.00	18.0 AV	54.0	-36.0	1.42 H	77	10.99	7.01
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	48.4 PK	74.0	-25.6	1.05 V	294	49.83	-1.43
2	2390.00	18.3 AV	54.0	-35.7	1.05 V	294	19.73	-1.43
3	*2402.00	101.6 PK			1.05 V	294	103.00	-1.40
4	*2402.00	71.5 AV			1.05 V	294	72.90	-1.40
5	4804.00	48.6 PK	74.0	-25.4	1.00 V	0	41.59	7.01
6	4804.00	18.5 AV	54.0	-35.5	1.00 V	0	11.49	7.01

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	100.4 PK			1.87 H	158	101.71	-1.31
2	*2441.00	70.3 AV			1.87 H	158	71.61	-1.31
3	4882.00	47.6 PK	74.0	-26.4	1.44 H	91	40.33	7.27
4	4882.00	17.5 AV	54.0	-36.5	1.44 H	91	10.23	7.27
5	7323.00	48.9 PK	74.0	-25.1	1.48 H	114	34.42	14.48
6	7323.00	18.8 AV	54.0	-35.2	1.48 H	114	4.32	14.48
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	101.8 PK			1.05 V	296	103.11	-1.31
2	*2441.00	71.7 AV			1.05 V	296	73.01	-1.31
3	4882.00	47.8 PK	74.0	-26.2	1.00 V	332	40.53	7.27
4	4882.00	17.7 AV	54.0	-36.3	1.00 V	332	10.43	7.27
5	7323.00	49.2 PK	74.0	-24.8	1.31 V	337	34.72	14.48
6	7323.00	19.1 AV	54.0	-34.9	1.31 V	337	4.62	14.48

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	100.0 PK			1.80 H	152	99.89	0.11
2	*2480.00	69.9 AV			1.80 H	152	69.79	0.11
3	2483.50	48.3 PK	74.0	-25.7	1.80 H	152	48.19	0.11
4	2483.50	18.2 AV	54.0	-35.8	1.80 H	152	18.09	0.11
5	4960.00	47.8 PK	74.0	-26.2	1.39 H	94	38.53	9.27
6	4960.00	17.7 AV	54.0	-36.3	1.39 H	94	8.43	9.27
7	7440.00	48.4 PK	74.0	-25.6	1.44 H	105	31.78	16.62
8	7440.00	18.3 AV	54.0	-35.7	1.44 H	105	1.68	16.62
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	101.4 PK			1.11 V	292	101.29	0.11
2	*2480.00	71.3 AV			1.11 V	292	71.19	0.11
3	2483.50	48.8 PK	74.0	-25.2	1.11 V	292	48.69	0.11
4	2483.50	18.7 AV	54.0	-35.3	1.11 V	292	18.59	0.11
5	4960.00	48.1 PK	74.0	-25.9	1.16 V	335	38.83	9.27
6	4960.00	18.0 AV	54.0	-36.0	1.16 V	335	8.73	9.27
7	7440.00	48.9 PK	74.0	-25.1	1.30 V	337	32.28	16.62
8	7440.00	18.8 AV	54.0	-35.2	1.30 V	337	2.18	16.62

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 WORST-CASE DATA

BT_8DPSK

CHANNEL	TX Channel 39	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	**59.90**	**36.3 QP**	**40.0**	**-3.7**	**2.00 H**	**109**	**51.95**	**-15.65**
2	196.31	36.8 QP	43.5	-6.7	1.00 H	54	55.07	-18.27
3	434.76	36.9 QP	46.0	-9.1	2.00 H	195	47.30	-10.41
4	500.04	40.7 QP	46.0	-5.3	2.00 H	226	49.98	-9.28
5	800.06	36.6 QP	46.0	-9.5	1.00 H	114	40.12	-3.57
6	959.99	36.8 QP	46.0	-9.2	2.00 H	360	38.30	-1.49
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	88.73	35.5 QP	43.5	-8.0	1.00 V	278	56.46	-20.99
2	115.09	34.0 QP	43.5	-9.5	1.00 V	0	51.41	-17.43
3	193.47	33.1 QP	43.5	-10.4	1.00 V	282	51.24	-18.13
4	285.72	33.0 QP	46.0	-13.0	1.50 V	296	47.56	-14.60
5	800.03	33.2 QP	46.0	-12.8	1.50 V	160	36.73	-3.57
6	959.99	36.0 QP	46.0	-10.1	1.00 V	118	37.44	-1.49

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	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.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100375	May 06, 2015	May 05, 2016
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 01, 2015	Aug. 31, 2016
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 11, 2015	June 10, 2016
RF Cable	5D-FB	COCCAB-001	Mar. 09, 2015	Mar. 08, 2016
50 ohms Terminator	N/A	EMC-03	Sep. 23, 2015	Sep. 22, 2016
50 ohms Terminator	N/A	EMC-02	Oct. 01, 2015	Sep. 30, 2016
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.
4. Tested Date: Nov. 28, 2015

4.2.3 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.

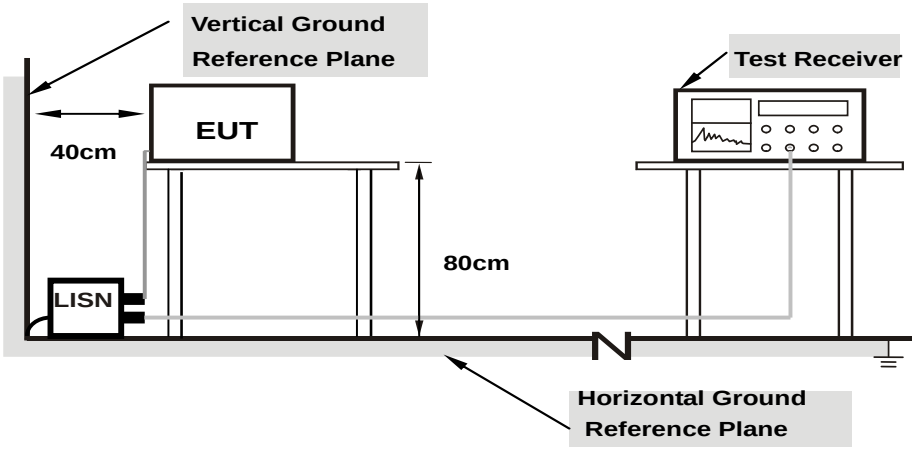
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 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).

4.2.6 EUT Operating Condition

Same as 4.1.6.

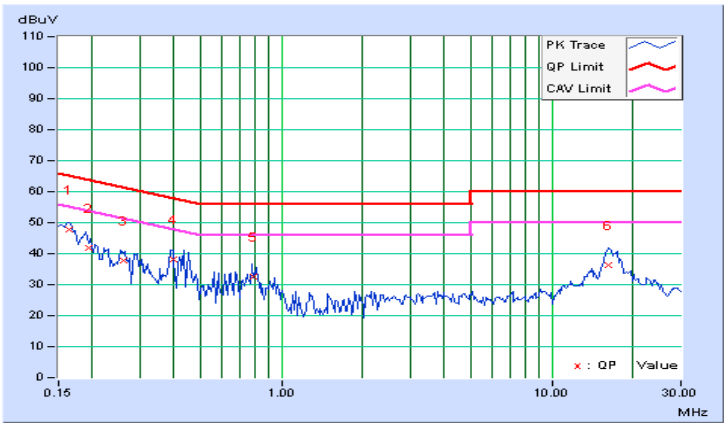
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16425	10.25	37.40	29.67	47.65	39.92	65.25	55.25	-17.60	-15.33
2	0.19456	10.22	31.49	25.47	41.71	35.69	63.84	53.84	-22.13	-18.15
3	0.26122	10.23	27.47	22.09	37.70	32.32	61.39	51.39	-23.70	-19.08
4	0.39628	10.24	28.07	20.04	38.31	30.28	57.93	47.93	-19.62	-17.65
5	0.78575	10.19	22.44	15.43	32.63	25.62	56.00	46.00	-23.37	-20.38
6	16.23828	10.81	25.48	16.24	36.29	27.05	60.00	50.00	-23.71	-22.95

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

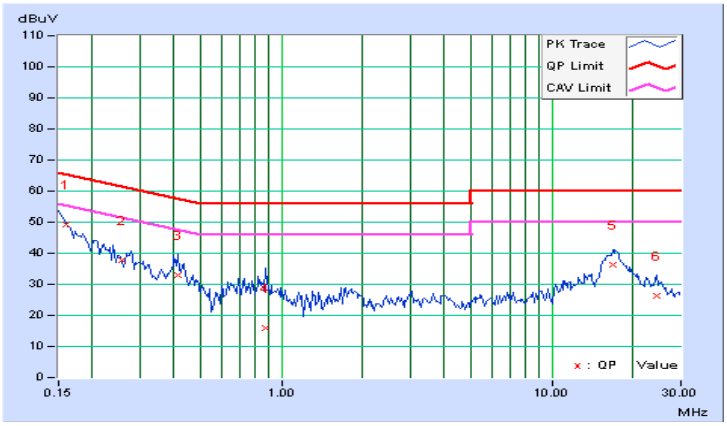


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15937**	**10.23**	**38.88**	**30.60**	**49.11**	**40.83**	**65.50**	**55.50**	**-16.38**	**-14.66**
2	0.25647	10.21	27.53	19.00	37.74	29.21	61.54	51.54	-23.81	-22.34
3	0.41563	10.22	22.62	16.65	32.84	26.87	57.54	47.54	-24.70	-20.67
4	0.87656	10.17	5.93	-1.77	16.10	8.40	56.00	46.00	-39.90	-37.60
5	16.72266	10.85	25.36	15.56	36.21	26.41	60.00	50.00	-23.79	-23.59
6	24.55469	10.99	15.47	8.60	26.46	19.59	60.00	50.00	-33.54	-30.41

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

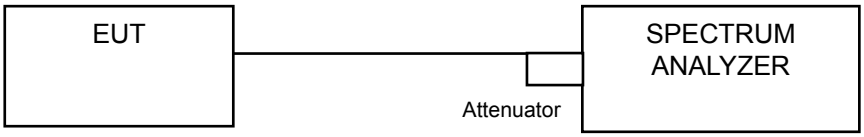


4.3 Number of Hopping Frequency Used

4.3.1 Limits of Hopping Frequency Used Measurement

At least 15 channels frequencies, and should be equally spaced.

4.3.2 Test Setup



4.3.3 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP40	100060	May 08, 2015	May 07, 2016

NOTE: 1. The test was performed in Oven room B.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Dec. 08, 2015

4.3.4 Test Procedure

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

b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.

c. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.

d. Set the SA on View mode and then plot the result on SA screen.

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

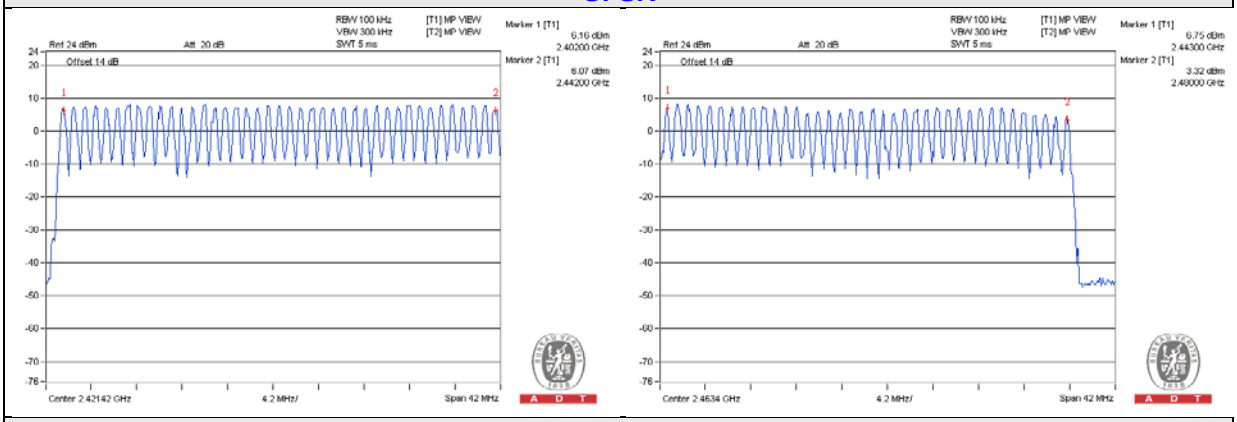
4.3.5 Deviation fromTest Standard

No deviation.

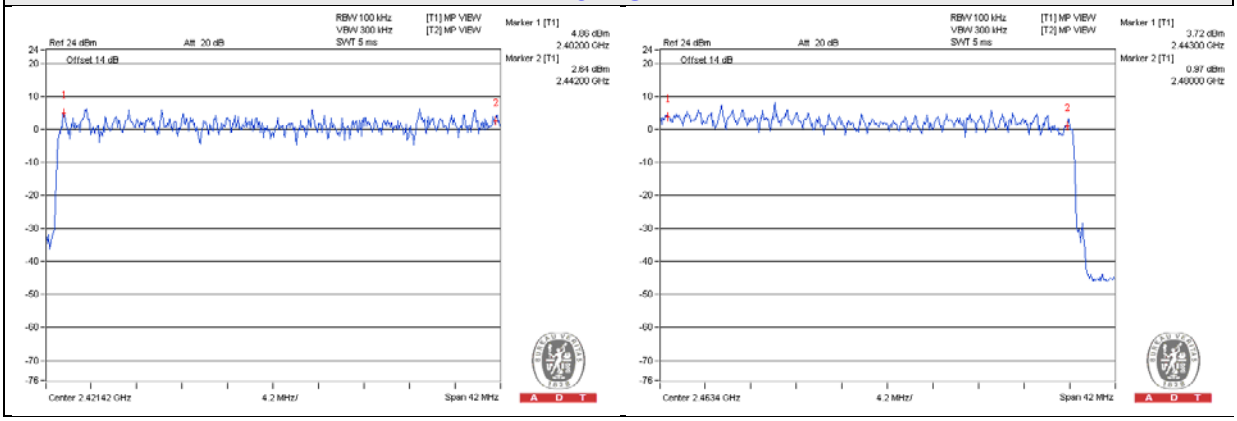
4.3.6 Test Results

There are 79 hopping frequencies in the hopping mode. Please refer to next page for the test result. On the plots, it shows that the hopping frequencies are equally spaced.

GFSK



8DPSK

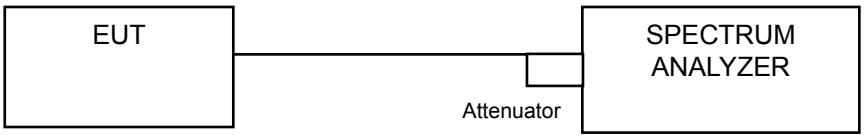


4.4 Dwell Time on Each Channel

4.4.1 Limits of Dwell Time on Each Channel Measurement

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

4.4.2 Test Setup



4.4.3 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP40	100060	May 08, 2015	May 07, 2016

NOTE: 1. The test was performed in Oven room B.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Dec. 08, 2015

4.4.4 Test Procedures

a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
c. Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
d. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
e. Repeat above procedures until all different time-slot modes have been completed.

.

4.4.5 Deviation from Test Standard

No deviation.

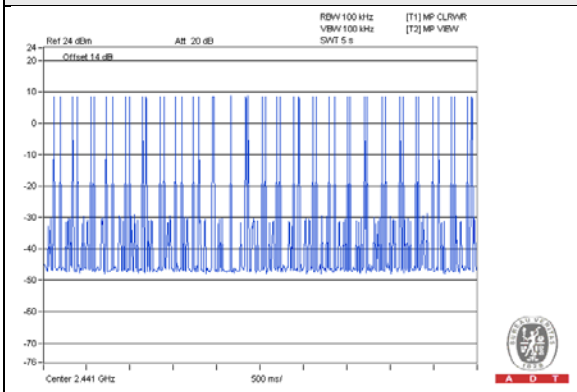
4.4.6 Test Results

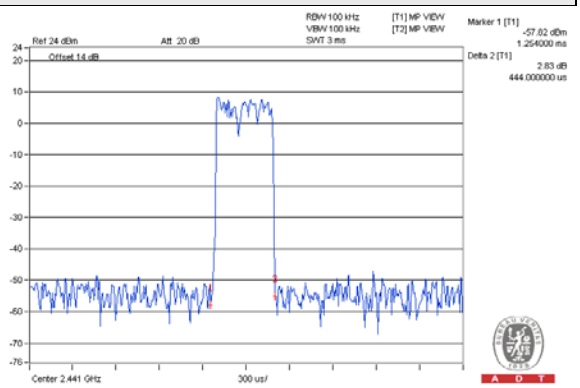
GFSK

Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	48 (times / 5 sec) * 6.32 = 303.36 times	0.444	134.69	400
DH3	20 (times / 5 sec) * 6.32 = 126.4 times	1.71	216.14	400
DH5	11 (times / 5 sec) * 6.32 = 69.52 times	3.024	210.23	400

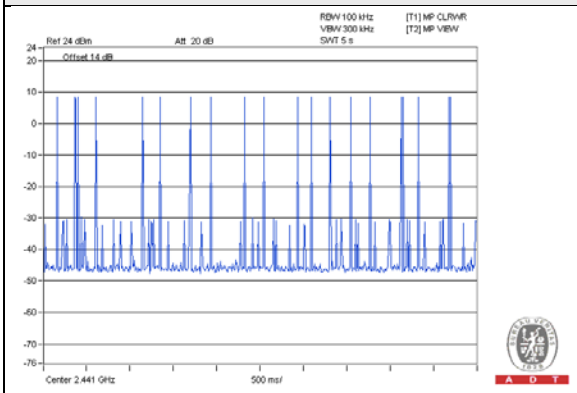
NOTE: Test plots of the transmitting time slot are shown on next page.

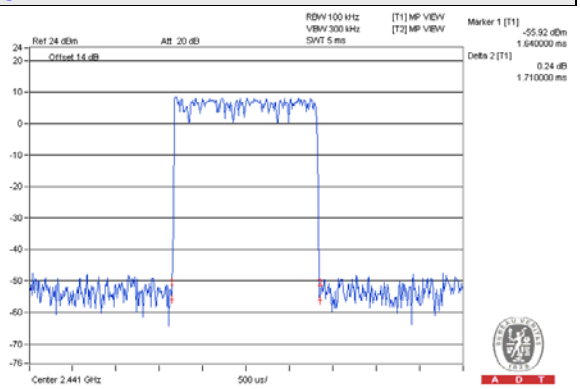
DH1


RBW 100 kHz
VBW 100 kHz
SWT 5 s
[T1] MP CLRWR
[T2] MP VIEW
Ref 24 dBm
Att 20 dB
Offset 14 dB
Center 2.441 GHz
500 ms/

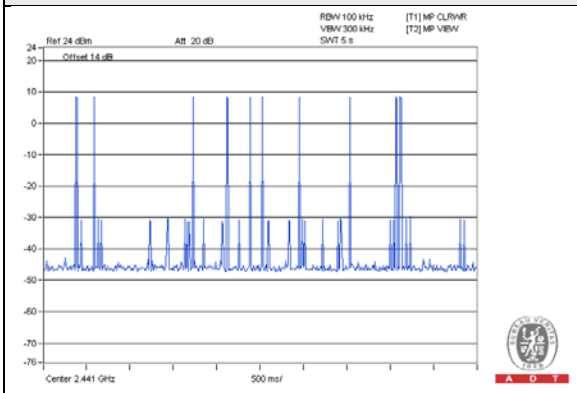

RBW 100 kHz
VBW 100 kHz
SWT 3 ms
[T1] MP VIEW
[T2] MP VIEW
Marker 1 [T1]
-57.02 dBm
1.254000 ms
Delta 2 [T1]
2.83 dB
444.000000 us
Ref 24 dBm
Att 20 dB
Offset 14 dB
Center 2.441 GHz
300 us/

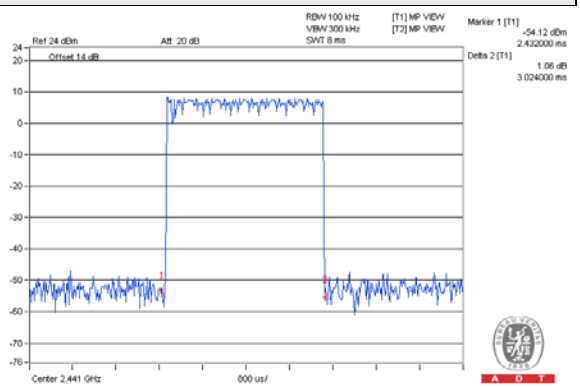
DH3


RBW 100 kHz
VBW 300 kHz
SWT 5 s
[T1] MP CLRWR
[T2] MP VIEW
Ref 24 dBm
Att 20 dB
Offset 14 dB
Center 2.441 GHz
500 ms/


RBW 100 kHz
VBW 300 kHz
SWT 5 ms
[T1] MP VIEW
[T2] MP VIEW
Marker 1 [T1]
-55.92 dBm
1.640000 ms
Delta 2 [T1]
0.24 dB
1.710000 ms
Ref 24 dBm
Att 20 dB
Offset 14 dB
Center 2.441 GHz
500 us/

DH5


RBW 100 kHz
VBW 300 kHz
SWT 5 s
[T1] MP CLRWR
[T2] MP VIEW
Ref 24 dBm
Att 20 dB
Offset 14 dB
Center 2.441 GHz
500 ms/

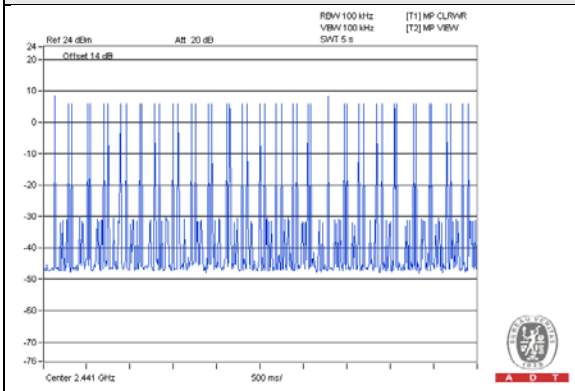

RBW 100 kHz
VBW 300 kHz
SWT 8 ms
[T1] MP VIEW
[T2] MP VIEW
Marker 1 [T1]
-54.12 dBm
2.432000 ms
Delta 2 [T1]
1.06 dB
3.024000 ms
Ref 24 dBm
Att 20 dB
Offset 14 dB
Center 2.441 GHz
800 us/

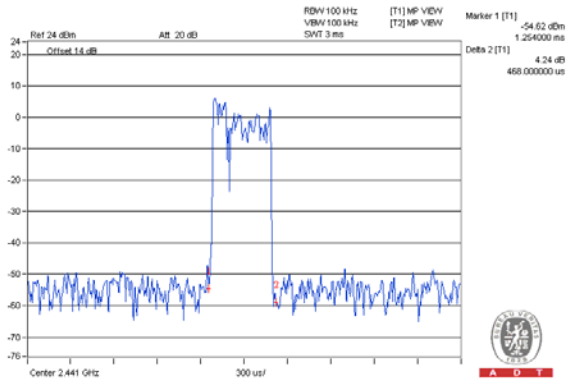
8DPSK

Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
3DH1	48 (times / 5 sec) * 6.32 = 303.36 times	0.468	141.97	400
3DH3	21 (times / 5 sec) * 6.32 = 132.72 times	1.72	228.28	400
3DH5	8 (times / 5 sec) * 6.32 = 50.56 times	3.04	153.7	400

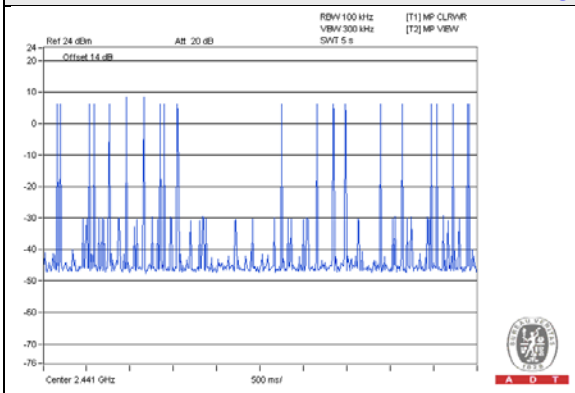
NOTE: Test plots of the transmitting time slot are shown on next page.

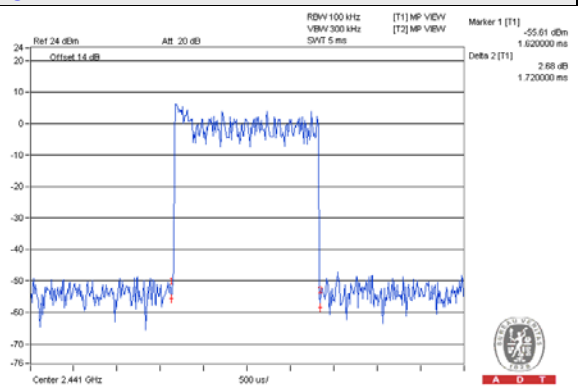
3DH1



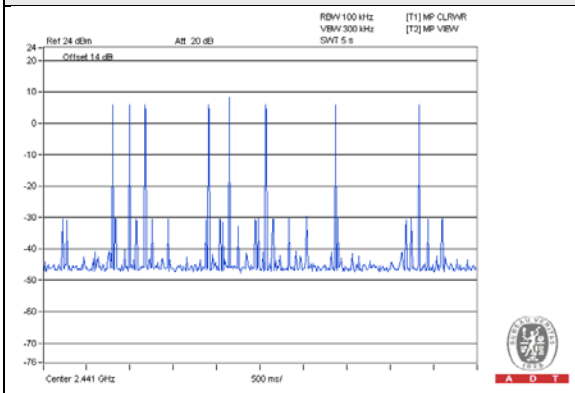


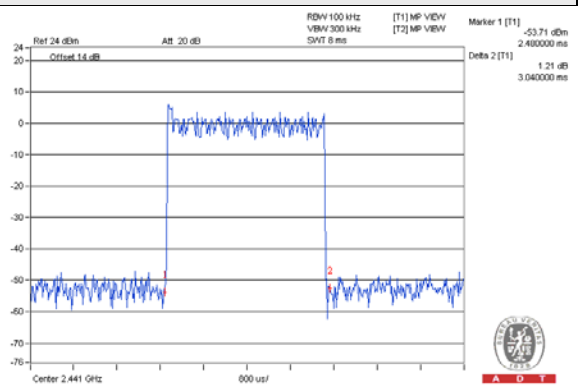
3DH3





3DH5





4.5 Channel Bandwidth

4.5.1 Limits of Channel Bandwidth Measurement

For frequency hopping system operating in the 2400-2483.5MHz, If the 20dB bandwidth of hopping channel is greater than 25kHz, two-thirds 20dBbandwidth of hopping channel shell be a minimum limit for the hopping channel separation.

4.5.2 Test Setup

4.5.3 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP40	100060	May 08, 2015	May 07, 2016

NOTE: 1. The test was performed in Oven room B.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Dec 08, 2015

4.5.4 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. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
d. Detector = peak.
e. Repeat above procedures until all frequencies measured were complete.

4.5.5 Deviation from Test Standard

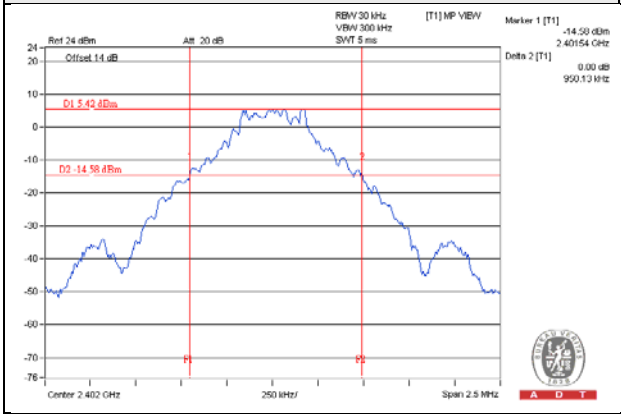
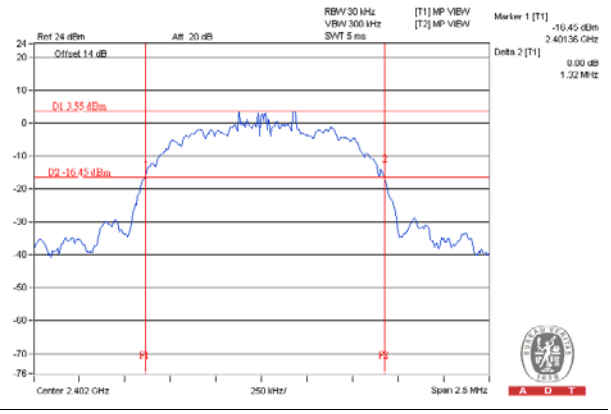
No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	
		GFSK	8DPSK
0	2402	0.95	1.32
39	2441	0.94	1.30
78	2480	0.94	1.27

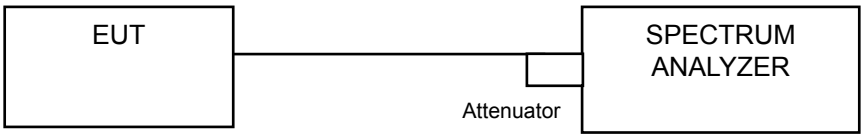
Spectrum Plot of Worst Value	
GFSK / CH0	8DPSK / CH0
	

4.6 Hopping Channel Separation

4.6.1 Limits of Hopping Channel Separation Measurement

At least 25kHz or two-third of 20dB hopping channel bandwidth (whichever is greater).

4.6.2 Test Setup



4.6.3 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP40	100060	May 08, 2015	May 07, 2016

NOTE: 1. The test was performed in Oven room B.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Dec. 08, 2015

4.6.4 Test Procedure

Measurement Procedure REF

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.

c. By using the MaxHold function record the separation of two adjacent channels.

d. Measure the frequency difference of these two adjacent channels by SA MARK function. And then plot the result on SA screen.

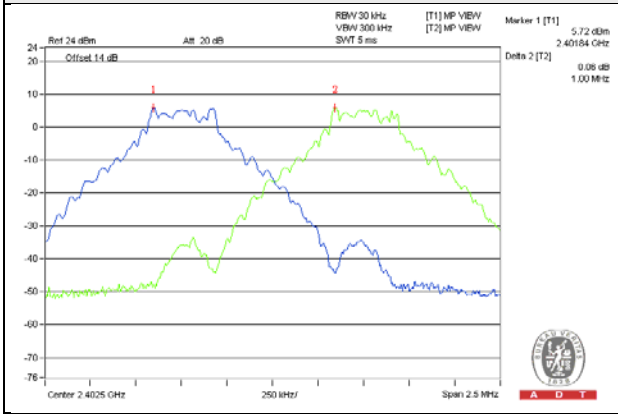
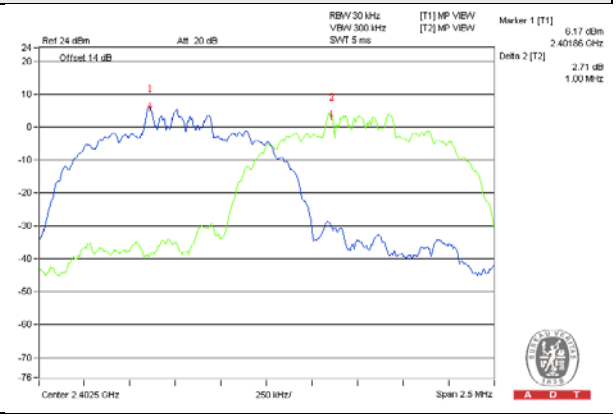
e. Repeat above procedures until all frequencies measured were complete.

4.6.5 Deviation from Test Standard
No deviation.

4.6.6 Test Results

Channel	Frequency (MHz)	Adjacent Channel Separation (MHz)		20dB Bandwidth (MHz)		Minimum Limit (MHz)		Pass / Fail
		GFSK	8DPSK	GFSK	8DPSK	GFSK	8DPSK	
0	2402	1.00	1.00	0.95	1.32	0.64	0.88	Pass
39	2441	1.01	1.00	0.94	1.30	0.63	0.87	Pass
78	2480	1.00	1.01	0.94	1.27	0.63	0.85	Pass

NOTE: The minimum limit is two-third 20dB bandwidth.

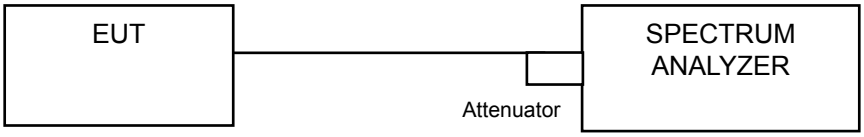
Spectrum Plot of Worst Value	
GFSK / CH0	8DPSK / CH0
	

4.7 Maximum Output Power

4.7.1 Limits of Maximum Output Power Measurement

The Maximum Output Power Measurement is 125mW.

4.7.2 Test Setup



4.7.3 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP40	100060	May 08, 2015	May 07, 2016

NOTE: 1. The test was performed in Oven room B.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Dec. 08, 2015

4.7.4 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. Detector = peak.

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

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

4.7.5 Deviation fromTest Standard

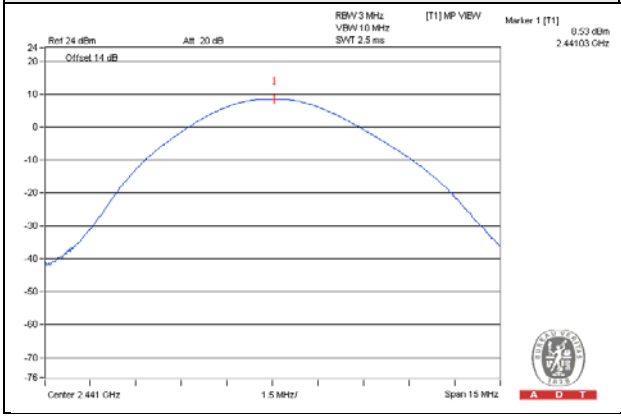
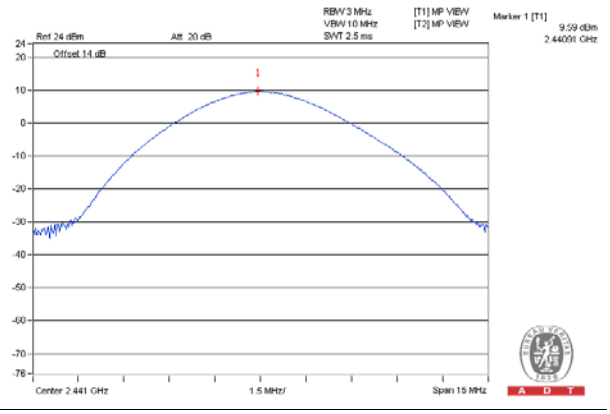
No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

Channel	Frequency (MHz)	Output Power (mW)		Output Power (dBm)		Power Limit (mW)	Pass/Fail
		GFSK	8DPSK	GFSK	8DPSK		
0	2402	6.053	7.798	7.82	8.92	125	PASS
39	2441	7.129	9.099	8.53	9.59	125	PASS
78	2480	6.012	5.715	7.79	7.57	125	PASS

Spectrum Plot of Worst Value	
GFSK / CH39	8DPSK / CH39
	

4.8 Conducted Out of Band Emission Measurement

4.8.1 Limits of Conducted Out of Band Emission Measurement

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

4.8.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP40	100060	May 08, 2015	May 07, 2016

NOTE:
1. The test was performed in Oven room B.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Dec. 08, 2015

4.8.3 Test Procedure

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz and 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

4.8.4 Deviation from Test Standard

No deviation.

4.8.5 EUT Operating Condition

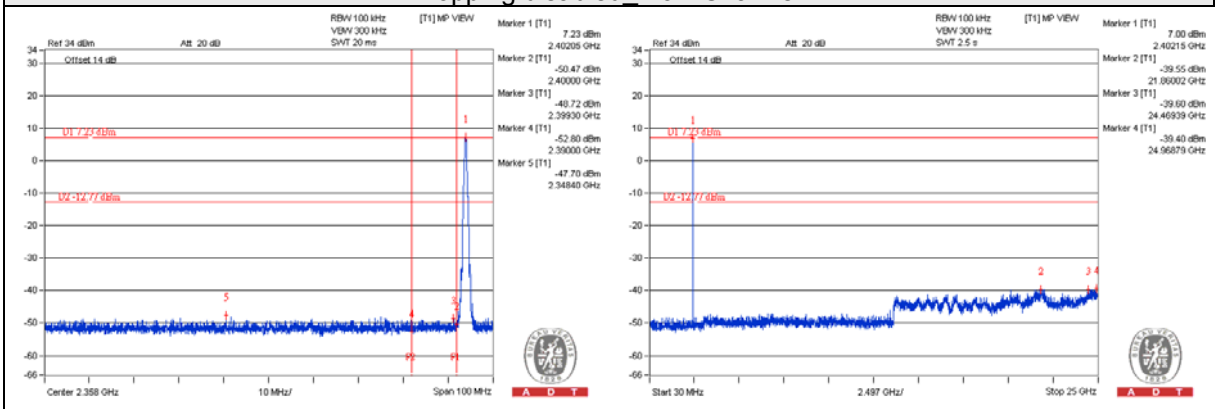
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.8.6 Test Results

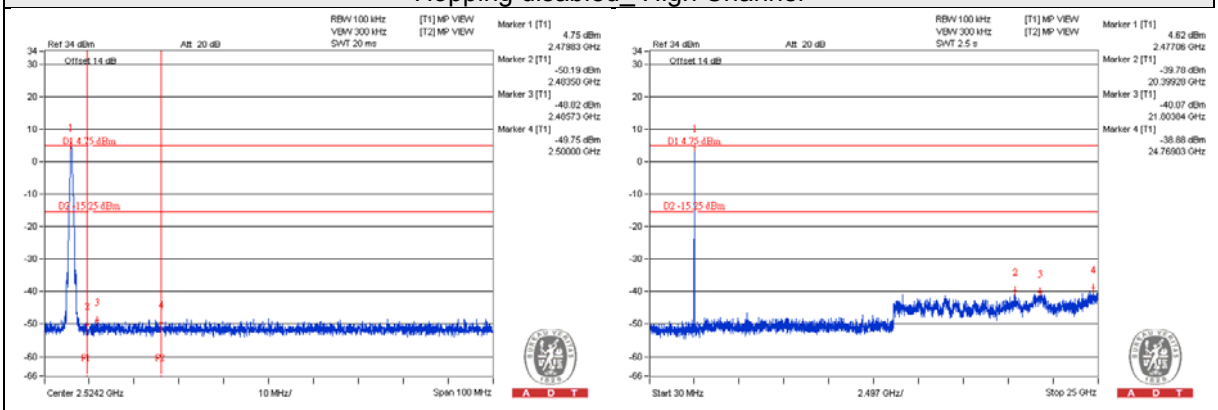
The spectrum plots are attached on the following images. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

GFSK

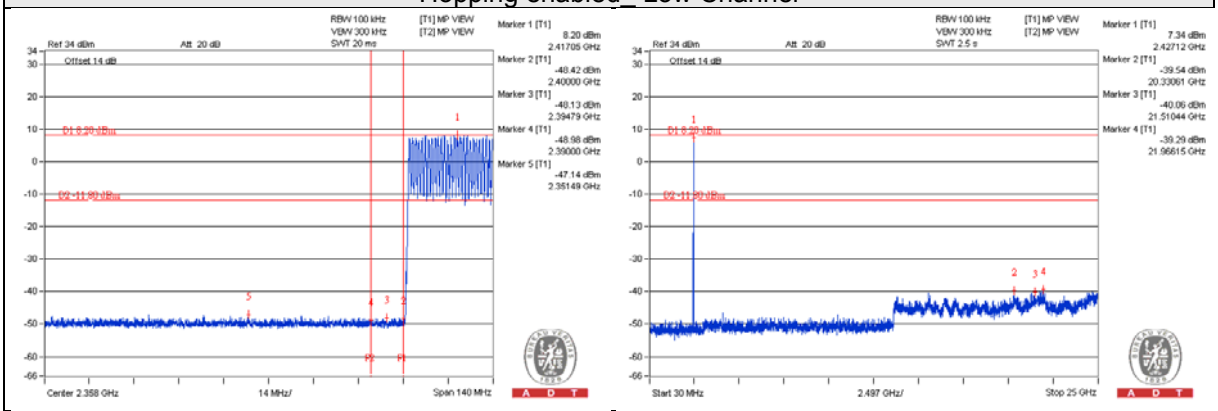
Hopping disabled_ Low Channel



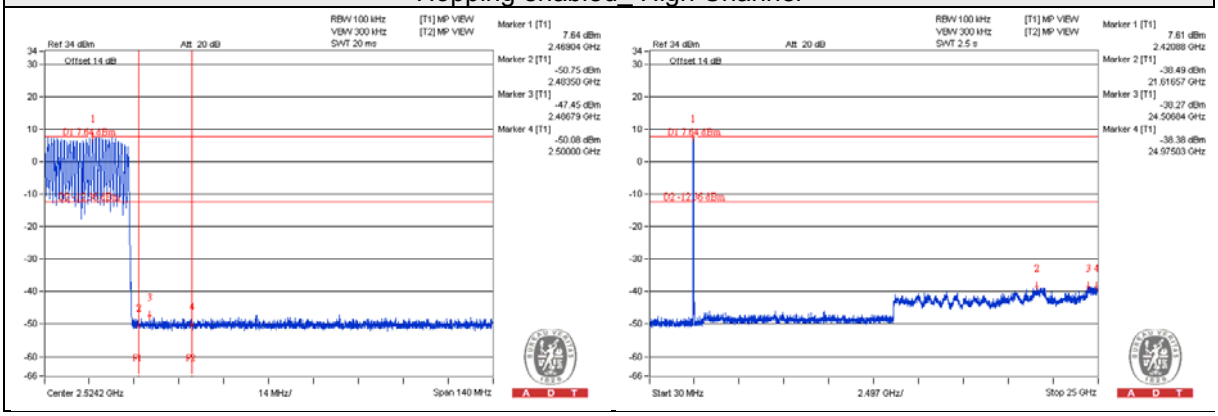
Hopping disabled_ High Channel



Hopping enabled_ Low Channel

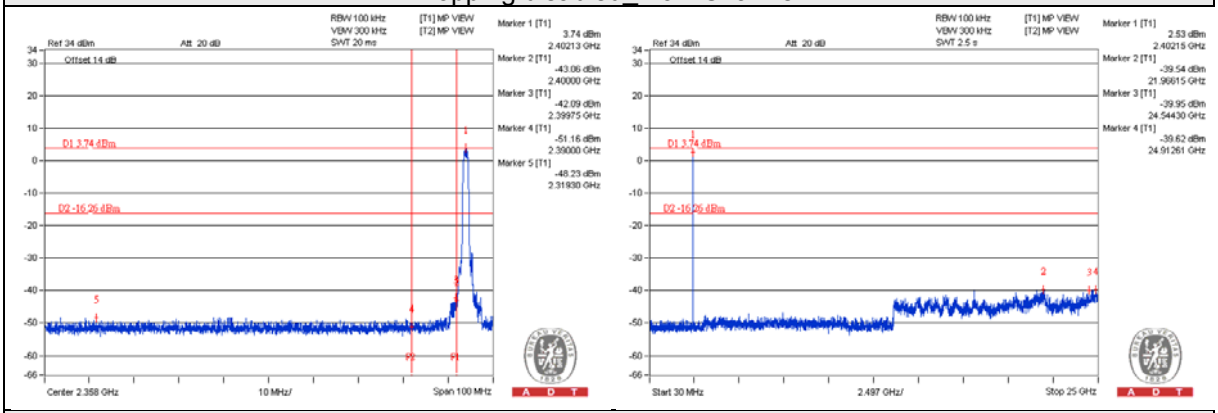


Hopping enabled_ High Channel

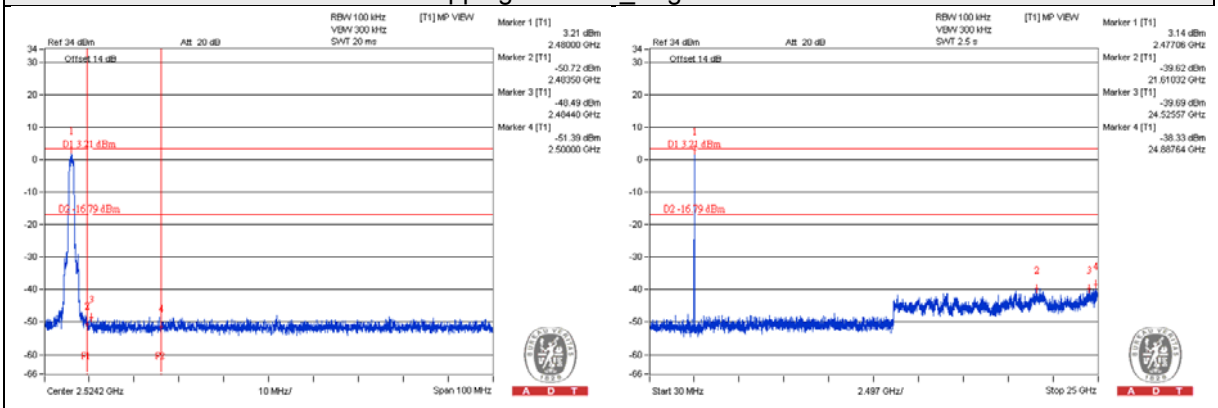


8DPSK

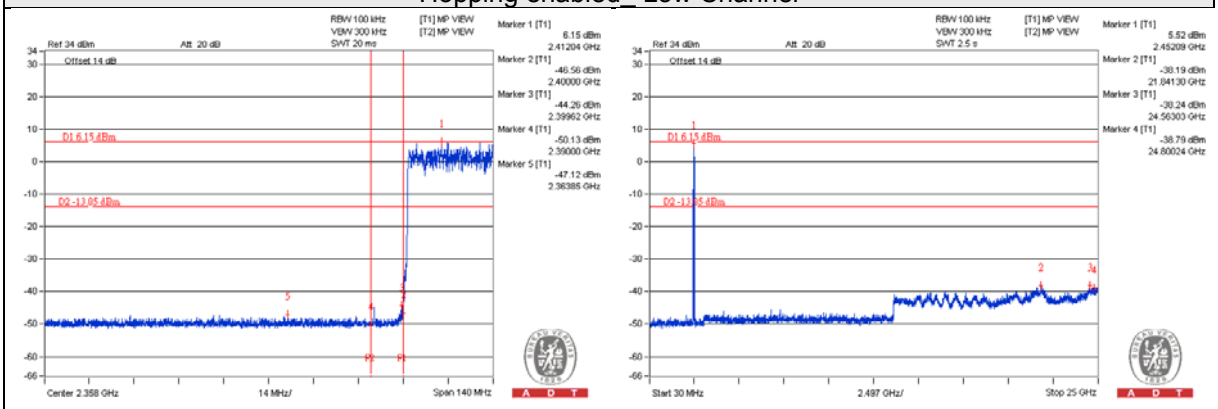
Hopping disabled_ Low Channel



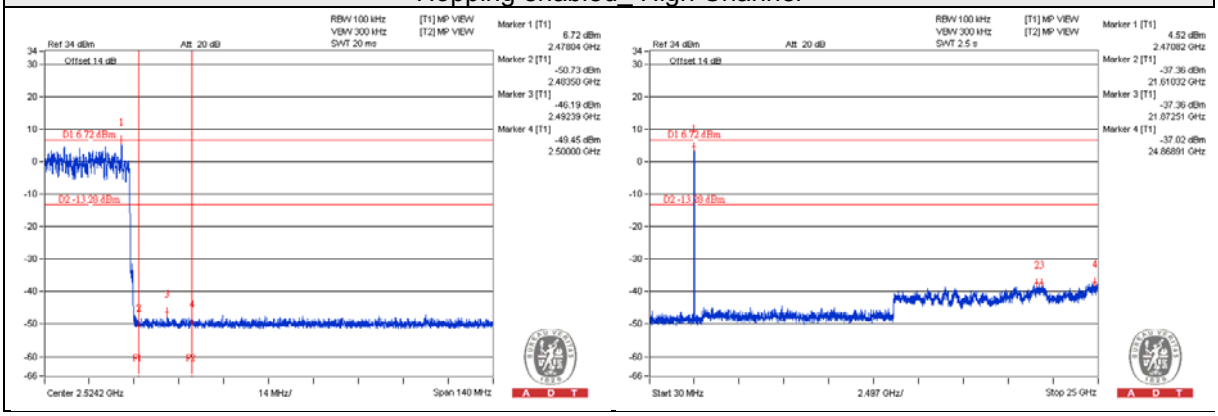
Hopping disabled_ High Channel



Hopping enabled_ Low Channel



Hopping enabled_ High Channel



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:

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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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