FCC TEST REPORT

(BLUETOOTH)

REPORT NO.:	RF120723C24A-3
MODEL NO.:	Quattro 4.5 HD
FCC ID:	YHLBLUQT45HD
RECEIVED:	Jul. 23, 2012
TESTED:	Aug. 30, 2012
ISSUED:	Sep. 11, 2012

APPLICANT:	CT Asia
ADDRESS:	Unit 01, 15/F, Seaview Centre,139-141 Hoi bun road, Kwun Tong, Kowloon, Hongkong
ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
LAB ADDRESS:	No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.
TEST LOCATION:	No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF120723C24A-3	Original release	Sep. 11, 2012

1. CERTIFICATION

PRODUCT:	GSM/WCDMA mobile
MODEL NO.:	Quattro 4.5 HD
BRAND:	BLU
APPLICANT:	CT Asia
TESTED:	Aug. 30, 2012
TEST SAMPLE:	Identical Prototype
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)**
	ANSI C63.10-2009

The above equipment (model: Quattro 4.5 HD) 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 : Pettie Chen / Senior Specialist **DATE :** Sep. 11, 2012

APPROVED BY : Gary Chang / Technical Manager **DATE :** Sep. 11, 2012

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
STANDARD SECTION	**TEST TYPE AND LIMIT**	**RESULT**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -2.91dB at 0.18253MHz.
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.
15.247(d)	Transmitter Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -7.78dB at 2496.00MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

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	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	GSM/WCDMA mobile
MODEL NO.	Quattro 4.5 HD
POWER SUPPLY	5.0Vdc (adapter or host equipment) 3.7Vdc (battery)
MODULATION TYPE	GFSK, π/4-DQPSK, 8DPSK
MODULATION TECHNOLOGY	FHSS
TRANSFER RATE	1/2/3Mbps
OPERATING FREQUENCY	2402 ~ 2480MHz
NUMBER OF CHANNEL	79
MAX. OUTPUT POWER	0.0063W
ANTENNA TYPE	Chip antenna with -5.8dBi gain
ANTENNA CONNECTOR	NA
I/O PORTS	Refer to user's manual
DATA CABLE	Refer to Note as below
ACCESSORY DEVICES	Refer to Note as below

NOTE:

1. The EUT contains the following accessories.

ITEM	BRAND	MODEL	SPECIFICATION
Adapter	BLU	US-02-001	Input: 100-240Vac, 150mA Output: 5Vdc, 800mA
Battery	BLU	NA	Rating: 3.7Vdc, 1820mAh Type: Li-ion
Earphone	BLU	NA	1.1m non-shielded cable without ferrite core
USB Cable	BLU	NA	0.9m shielded cable without ferrite core

2. 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 to this EUT:

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	
-	√	√	√	√	-

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

NOTE:
The EUT 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 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture) and packet type.
☒ 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
-	0 to 78	0, 39, 78	FHSS	GFSK	DH5

RADIATED EMISSION TEST (BELOW 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture) and packet type.
☒ 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
-	0 to 78	78	FHSS	GFSK	DH5

POWER LINE CONDUCTED EMISSION TEST:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture), and packet types.
☒ 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
-	0 to 78	78	FHSS	GFSK	DH5

BANDEDGE MEASUREMENT:

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

☒ 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
-	0 to 78	0, 78	FHSS	GFSK	DH5

ANTENNA PORT CONDUCTED MEASUREMENT:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

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

☒ 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
-	0 to 78	0, 39, 78	FHSS	GFSK	DH5
-	0 to 78	0, 39, 78	FHSS	π/4-DQPSK	DH5
-	0 to 78	0, 39, 78	FHSS	8DPSK	DH5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Kay Wu
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Kay Wu
PLC	25deg. C, 63%RH	120Vac, 60Hz	Jones Chang
APCM	25deg. C, 65%RH	120Vac, 60Hz	Howard Kao

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.

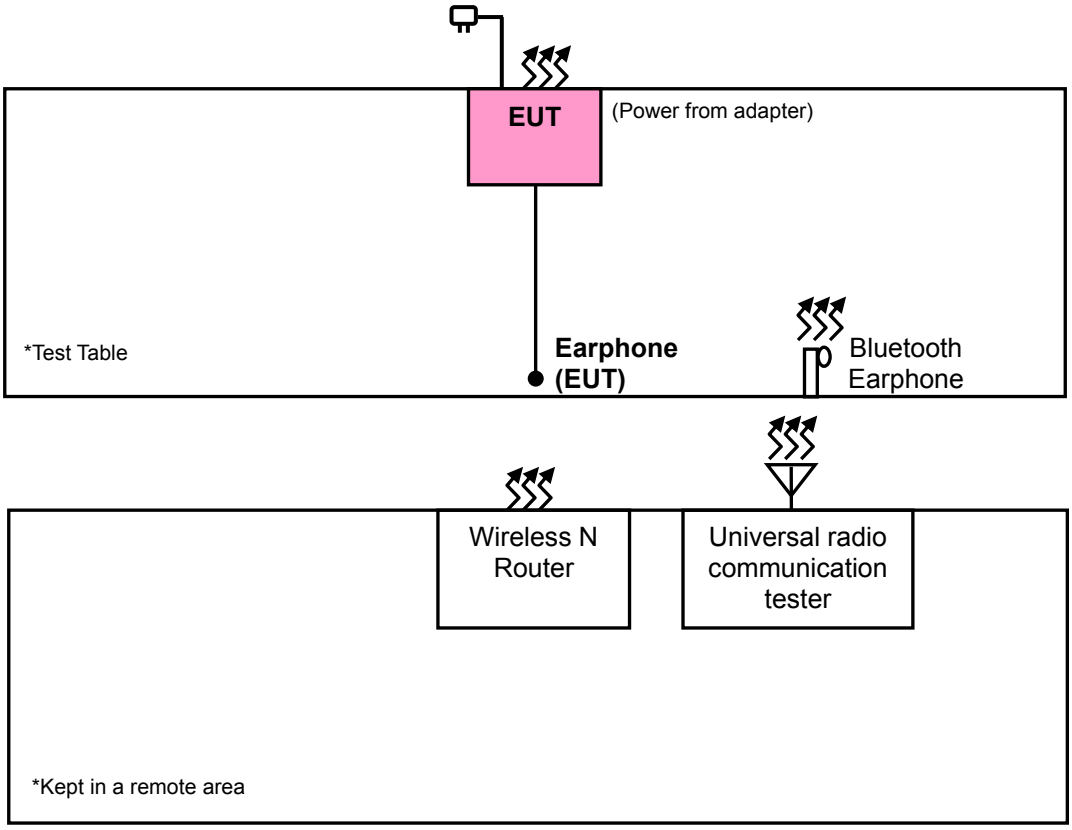
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	24" LCD Monitor	DELL	U2410	CN082WXD-72872-0CR-06FL	FCC DoC Approved
2	PC	DELL	Precision 490	99G7N1S	NA
3	Keyboard	DELL	SK-8115	MY-OJ4635-71619-548-0467	FCC DoC Approved
4	Mouse	DELL	MOA8BO	H0G00889	NA
5	Printer	EPSON	LQ-300+	DCGY054009	FCC DoC Approved
6	Modem	ACEEX	1414V/3	0401008252	IFAXDM1414
7	Universal Radio Communication Tester	R&S	CMU200	123121	NA
8	Wireless N Router	D-Link	DIR-615	F3O8188007995	NA
9	Bluetooth earphone	ELECOM	LBT-MPHS400	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	2 m shielded D-Sub cable
2	NA
3	2m foil shielded wire, USB Connector, with core.
4	NA
5	1.8m braid shielded wire, DB25 connector, w/o core.
6	1.2m braid shielded wire, DB25 & DB9 connector, w/o core.
7	NA
8	NA
9	NA

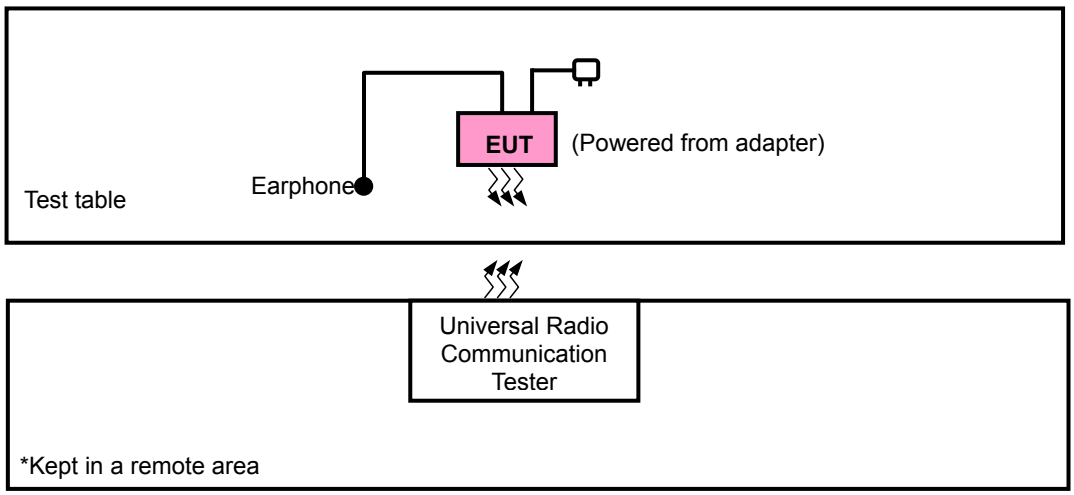
NOTE:
1. All power cords of the above support units are non shielded (1.8m).
2. Items 7-8 acted as communication partners.

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST

For Power Line Conducted Emission Test



For all tests except Power Line Conducted Emission 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)
FCC Public Notice DA 00-705
ANSI C63.10-2009

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.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver Agilent	N9038A	MY51210203	Dec. 22, 2011	Dec. 21, 2012
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 21, 2011	Dec. 20, 2012
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 20, 2011	Dec. 19, 2012
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Dec. 20, 2011	Dec. 19, 2012
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 20, 2011	Dec. 19, 2012
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier EMCI	EMC 012645	980115	Dec. 30, 2011	Dec. 29, 2012
Preamplifier EMCI	EMC 330H	980112	Dec. 30, 2011	Dec. 29, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4	Oct. 21, 2011	Oct. 20, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Jan. 02, 2012	Jan. 01, 2013
RF signal cable Worken	RG-213	NA	Jan. 02, 2012	Jan. 01, 2013
Software	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Mini-Circuits Power Splitter	ZN2PD-9G	NA	Mar. 23, 2012	Mar. 22, 2013
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
Communications Tester-Wireless	E5515C	MY50266653	Sep. 28, 2011	Sep. 27, 2012
Radio Communication Analyzer	MT8820C	6201127458	May 25, 2012	May 24, 2013

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 loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.

3. The test was performed in HwaYa Chamber 9.

4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

5. The FCC Site Registration No. is 460141.

6. The IC Site Registration No. is IC 7450F-4.

4.1.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

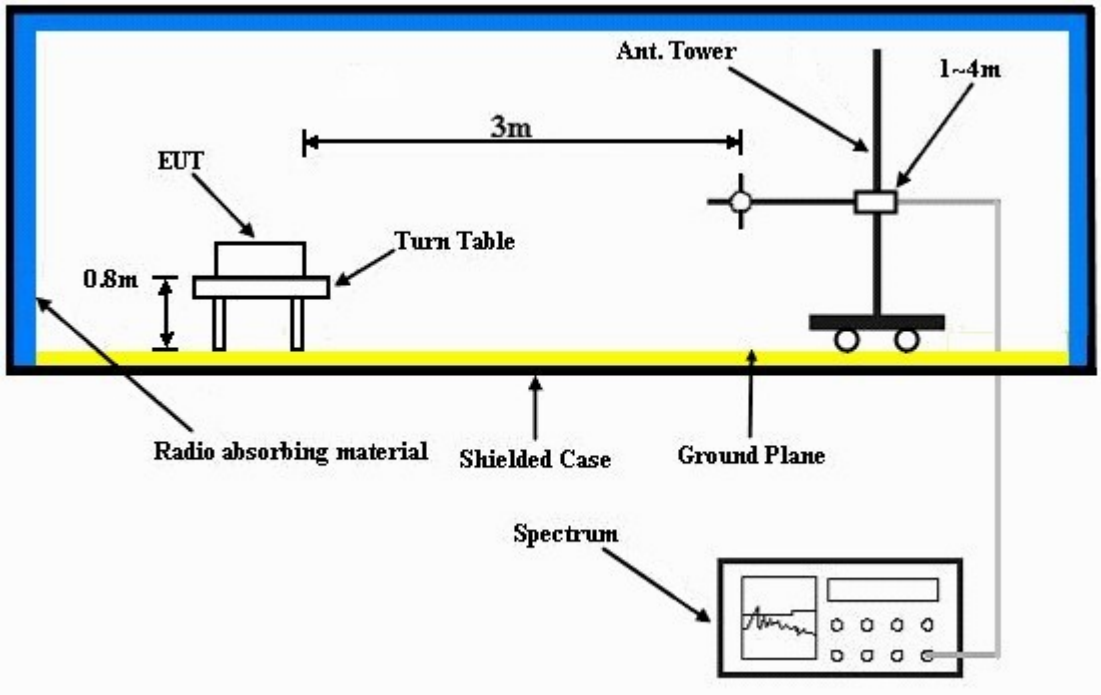
NOTE:

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 TEST SETUP



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

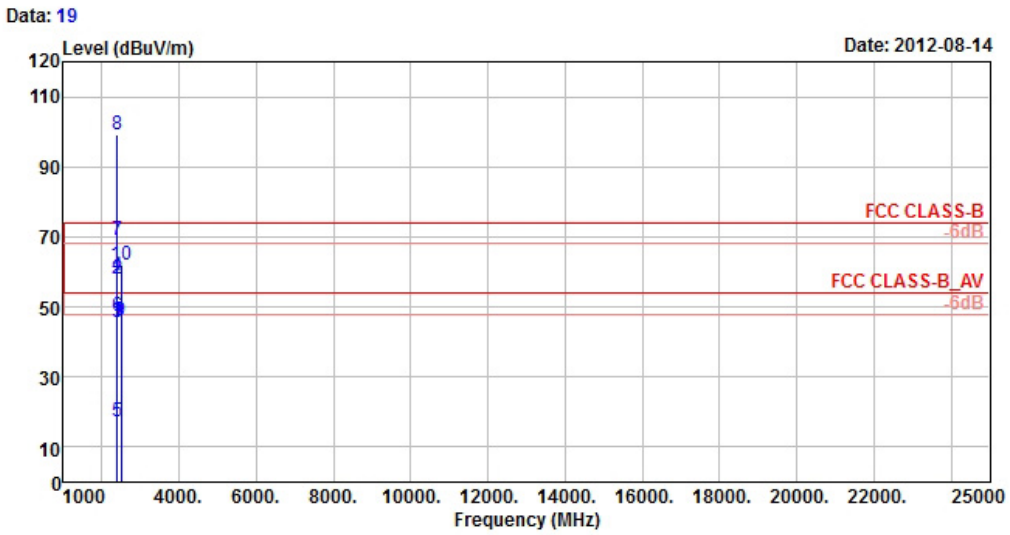
4.1.6 EUT OPERATING CONDITIONS

Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 TEST RESULTS

ABOVE 1GHz WORST-CASE DATA：GFSK

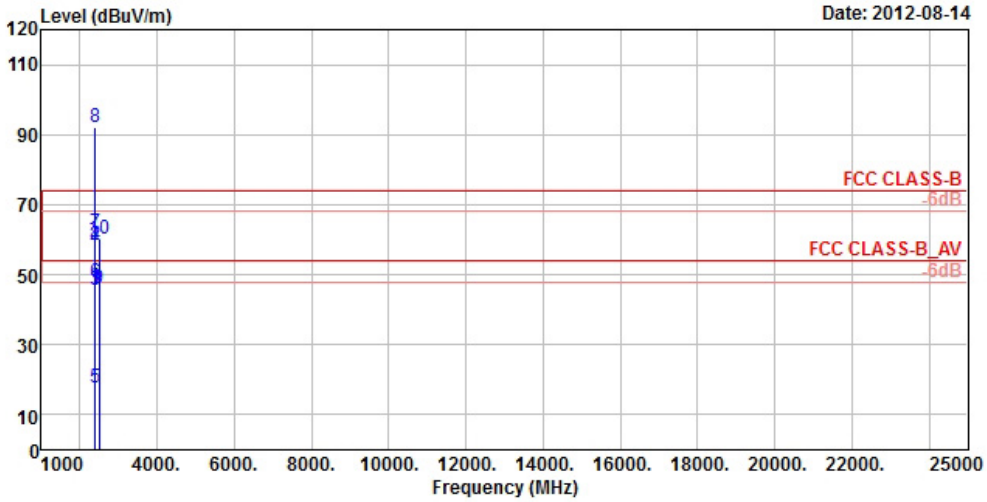
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition : FCC CLASS-B 3m ANT_18G~40G_HF HORIZONTAL
Brand/Model: Quarrro 4.5HD
Remark : BT TX GFSK CH00
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : X
Rate : DH5

	Freq	Level	Read Level	Limit Line	Over Limit	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB	dB	cm	deg	
1	2390.00	45.68	51.07	54.00	-8.32	27.26	4.87	37.52	104	48	Average
2	2390.00	58.05	63.44	74.00	-15.95	27.26	4.87	37.52	104	48	Peak
3	2398.00	45.69	51.08	54.00	-8.31	27.26	4.87	37.52	104	48	Average
4	2398.00	58.82	64.21	74.00	-15.18	27.26	4.87	37.52	104	48	Peak
5	2400.00	17.36	22.75	54.00	-36.64	27.26	4.87	37.52	104	48	Average
6	2400.00	47.46	52.85	74.00	-26.54	27.26	4.87	37.52	104	48	Peak
7 av	2402.00	69.00	74.39			27.26	4.87	37.52	104	48	Average
8 pp	2402.00	99.10	104.49			27.26	4.87	37.52	104	48	Peak
9	2496.00	46.05	50.81	54.00	-7.95	27.55	4.94	37.25	104	48	Average
10	2496.00	61.77	66.53	74.00	-12.23	27.55	4.94	37.25	104	48	Peak

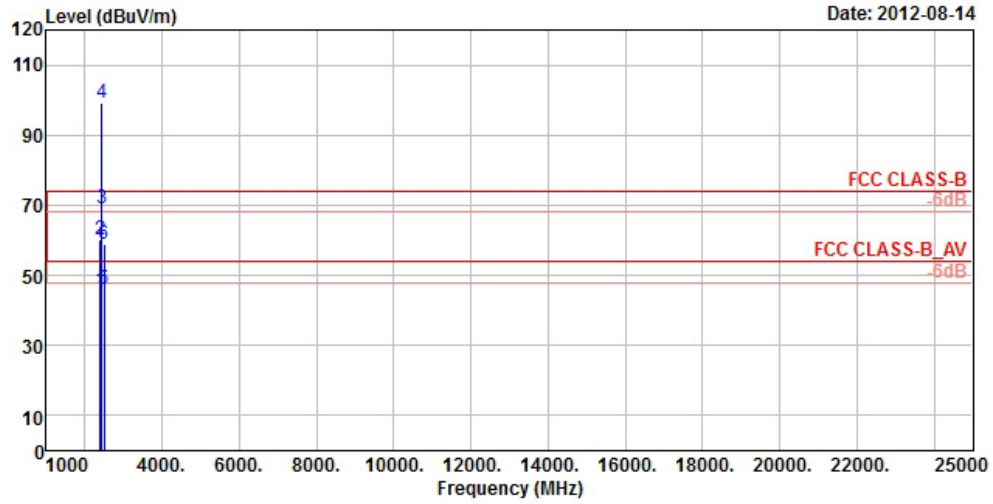
Data: 20



Site : 966 Chamber 5
Condition : FCC CLASS-B 3m ANT_18G~40G_HF VERTICAL
Brand/Model: Quarrro 4.5HD
Remark : BT TX GFSK CH00
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : X
Rate : DH5

	Freq	Level	Read Level	Limit Line	Over Limit	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB	dB	cm	deg	
1	2390.00	45.71	51.10	54.00	-8.29	27.26	4.87	37.52	103	296	Average
2	2390.00	58.39	63.78	74.00	-15.61	27.26	4.87	37.52	103	296	Peak
3	2398.00	45.65	51.04	54.00	-8.35	27.26	4.87	37.52	103	296	Average
4	2398.00	58.66	64.05	74.00	-15.34	27.26	4.87	37.52	103	296	Peak
5	2400.00	17.65	23.04	54.00	-36.35	27.26	4.87	37.52	103	296	Average
6	2400.00	47.75	53.14	74.00	-26.25	27.26	4.87	37.52	103	296	Peak
7 av	2402.00	62.05	67.44			27.26	4.87	37.52	103	296	Average
8 pp	2402.00	92.15	97.54			27.26	4.87	37.52	103	296	Peak
9	2498.00	46.21	50.97	54.00	-7.79	27.55	4.94	37.25	103	296	Average
10	2498.00	60.16	64.92	74.00	-13.84	27.55	4.94	37.25	103	296	Peak

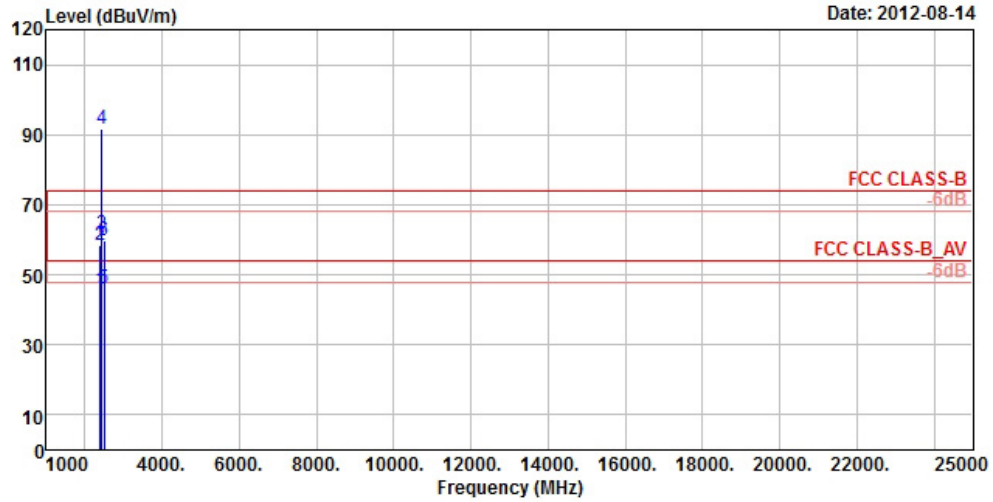
Data: 19



Site : 966 Chamber 5
Condition : FCC CLASS-B 3m ANT_18G~40G_HF HORIZONTAL
Brand/Model: Quarrro 4.5HD
Remark : BT TX GFSK CH39
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : X
Rate : DH5

	Freq	Level	Read Level	Limit Line	Over Limit	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB	dB	cm	deg	
1	2390.00	45.69	51.08	54.00	-8.31	27.26	4.87	37.52	102	48	Average
2	2390.00	60.29	65.68	74.00	-13.71	27.26	4.87	37.52	102	48	Peak
3 av	2441.00	69.29	74.37			27.40	4.91	37.39	102	48	Average
4 pp	2441.00	99.39	104.47			27.40	4.91	37.39	102	48	Peak
5	2485.50	46.17	51.07	54.00	-7.83	27.50	4.92	37.32	102	48	Average
6	2485.50	58.89	63.79	74.00	-15.11	27.50	4.92	37.32	102	48	Peak

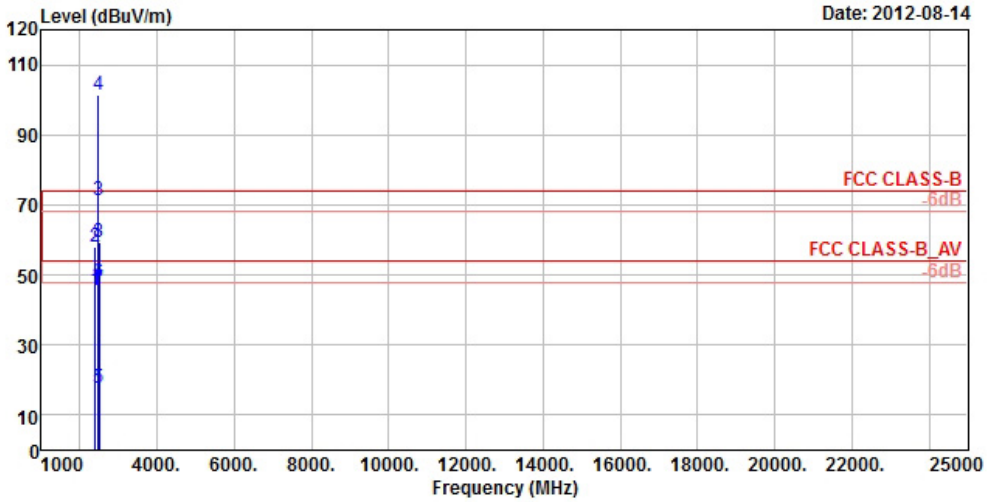
Data: 20



Site : 966 Chamber 5
Condition : FCC CLASS-B 3m ANT_18G~40G_HF VERTICAL
Brand/Model: Quarrro 4.5HD
Remark : BT TX GFSK CH39
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : X
Rate : DH5

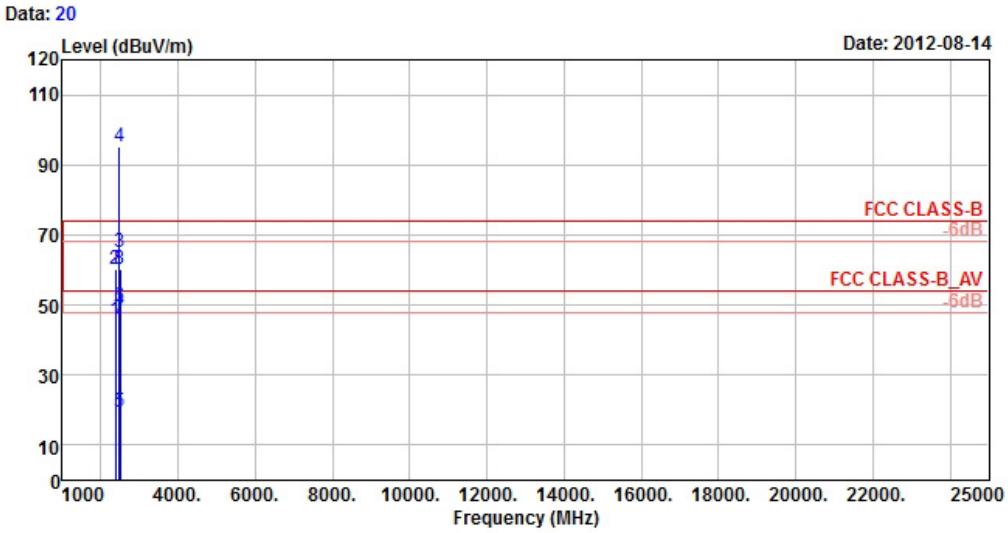
	Freq	Level	Read Level	Limit Line	Over Limit	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB	dB	cm	deg	
1	2390.00	45.68	51.07	54.00	-8.32	27.26	4.87	37.52	100	296	Average
2	2390.00	58.43	63.82	74.00	-15.57	27.26	4.87	37.52	100	296	Peak
3 av	2441.00	61.43	66.51			27.40	4.91	37.39	100	296	Average
4 pp	2441.00	91.53	96.61			27.40	4.91	37.39	100	296	Peak
5	2485.50	46.15	51.05	54.00	-7.85	27.50	4.92	37.32	100	296	Average
6	2485.50	59.86	64.76	74.00	-14.14	27.50	4.92	37.32	100	296	Peak

Data: 19



Site : 966 Chamber 5
Condition : FCC CLASS-B 3m ANT_18G~40G_HF HORIZONTAL
Brand/Model: Quarrro 4.5HD
Remark : BT TX GFSK CH78
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : X
Rate : DH5

	Freq	Level	Read Level	Limit Line	Over Limit	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB	dB	cm	deg	
1	2390.00	45.68	51.07	54.00	-8.32	27.26	4.87	37.52	102	48	Average
2	2390.00	58.01	63.40	74.00	-15.99	27.26	4.87	37.52	102	48	Peak
3 av	2480.00	71.23	76.13			27.50	4.92	37.32	102	48	Average
4 pp	2480.00	101.33	106.23			27.50	4.92	37.32	102	48	Peak
5	2483.50	17.90	22.80	54.00	-36.10	27.50	4.92	37.32	102	48	Average
6	2483.50	48.00	52.90	74.00	-26.00	27.50	4.92	37.32	102	48	Peak
7	2485.50	46.18	51.08	54.00	-7.82	27.50	4.92	37.32	102	48	Average
8	2485.50	59.37	64.27	74.00	-14.63	27.50	4.92	37.32	102	48	Peak

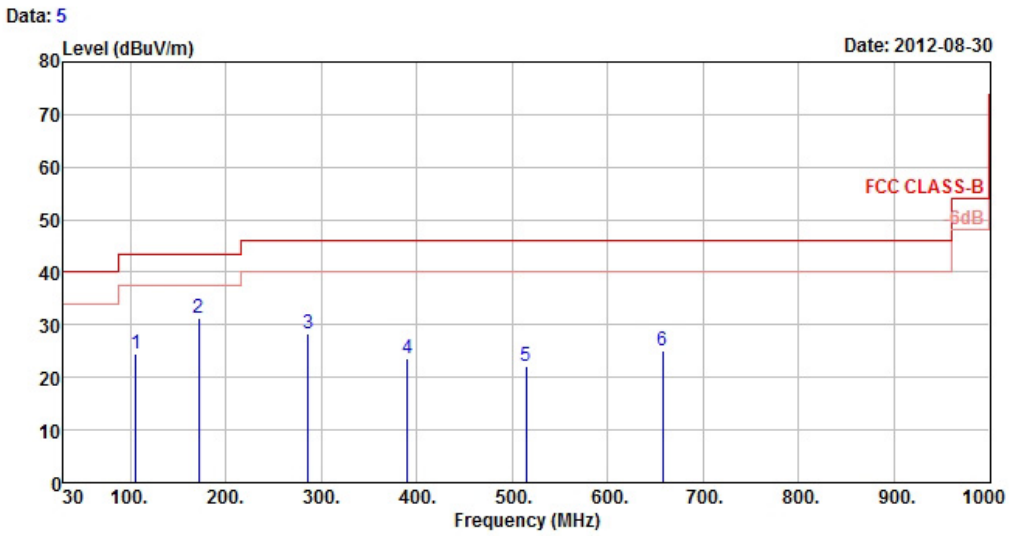


Site : 966 Chamber 5
Condition : FCC CLASS-B 3m ANT_18G~40G_HF VERTICAL
Brand/Model: Quarrro 4.5HD
Remark : BT TX GFSK CH78
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : X
Rate : DH5

	Freq	Level	Read Level	Limit Line	Over Limit	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB	dB	cm	deg	
1	2374.00	45.62	51.06	54.00	-8.38	27.21	4.85	37.50	106	274	Average
2	2374.00	60.19	65.63	74.00	-13.81	27.21	4.85	37.50	106	274	Peak
3 av	2480.00	64.99	69.89			27.50	4.92	37.32	106	274	Average
4 pp	2480.00	95.09	99.99			27.50	4.92	37.32	106	274	Peak
5	2483.50	19.60	24.50	54.00	-34.40	27.50	4.92	37.32	106	274	Average
6	2483.50	49.70	54.60	74.00	-24.30	27.50	4.92	37.32	106	274	Peak
7	2496.00	46.22	50.98	54.00	-7.78	27.55	4.94	37.25	106	274	Average
8	2496.00	60.20	64.96	74.00	-13.80	27.55	4.94	37.25	106	274	Peak

BELOW 1GHz WORST-CASE DATA：

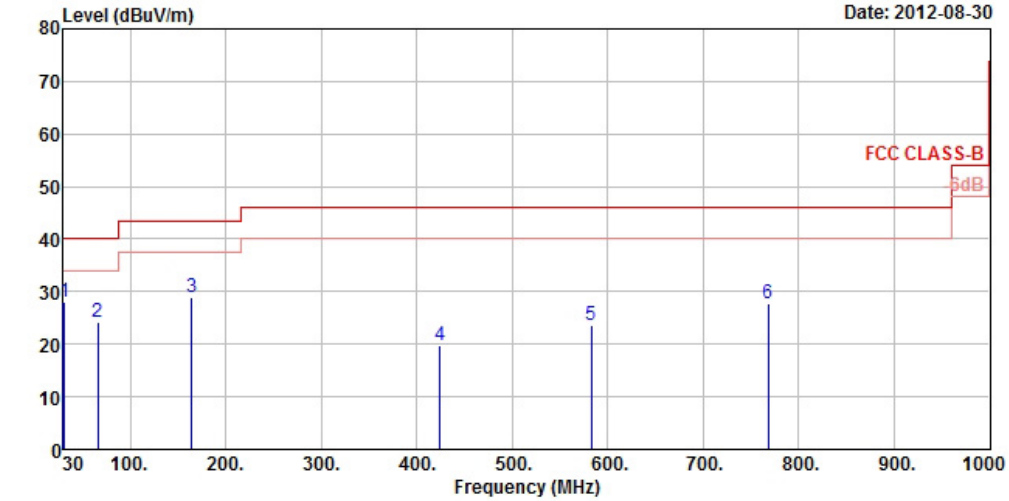
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition : FCC CLASS-B 3m ANT_30M~1G_LF HORIZONTAL
Brand/Model: Quarrro 4.5HD
Remark : BT TX LF
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : X

	Freq	Level	Read Level	Limit Line	Over Limit	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB	dB	cm	deg	
1	106.14	24.52	45.69	43.50	-18.98	9.62	1.10	31.89	100	156	Peak
2 pp	171.75	31.19	49.92	43.50	-12.31	11.57	1.45	31.75	100	263	Peak
3	286.50	28.45	45.65	46.00	-17.55	12.54	1.99	31.73	100	184	Peak
4	390.30	23.59	38.15	46.00	-22.41	15.10	2.38	32.04	100	133	Peak
5	514.90	22.07	33.16	46.00	-23.93	17.66	2.83	31.58	100	184	Peak
6	657.70	25.17	33.56	46.00	-20.83	20.30	3.27	31.96	100	175	Peak

Data: 6



Site : 966 Chamber 5
Condition : FCC CLASS-B 3m ANT_30M~1G_LF VERTICAL
Brand/Model: Quarrro 4.5HD
Remark : BT TX LF
Tested by : Kay Wu
Temprature : 25℃
Humidity : 65%
Plane : X

	Freq	Level	Read Level	Limit Line	Over Limit	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB	dB	cm	deg	
1 pp	31.08	28.03	46.44	40.00	-11.97	12.14	0.57	31.12	100	239	Peak
2	65.64	24.12	43.65	40.00	-15.88	11.24	0.87	31.64	100	147	Peak
3	164.46	29.01	47.15	43.50	-14.49	12.25	1.42	31.81	100	126	Peak
4	424.60	19.93	33.61	46.00	-26.07	15.83	2.52	32.03	100	136	Peak
5	582.80	23.52	33.40	46.00	-22.48	19.21	3.04	32.13	100	223	Peak
6	768.30	27.80	33.73	46.00	-18.20	21.78	3.62	31.33	100	315	Peak

4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

NOTE: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100291	Nov. 23, 2011	Nov. 22, 2012
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 29, 2011	Dec. 28, 2012
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 02, 2012	Jul. 01, 2013
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 07, 2012	Feb. 06, 2013
Software ADT	BV ADT_Cond_ V7.3.7.3	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 test was performed in HwaYa Shielded Room 1.

3. The VCCI Site Registration No. is C-2047.

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.

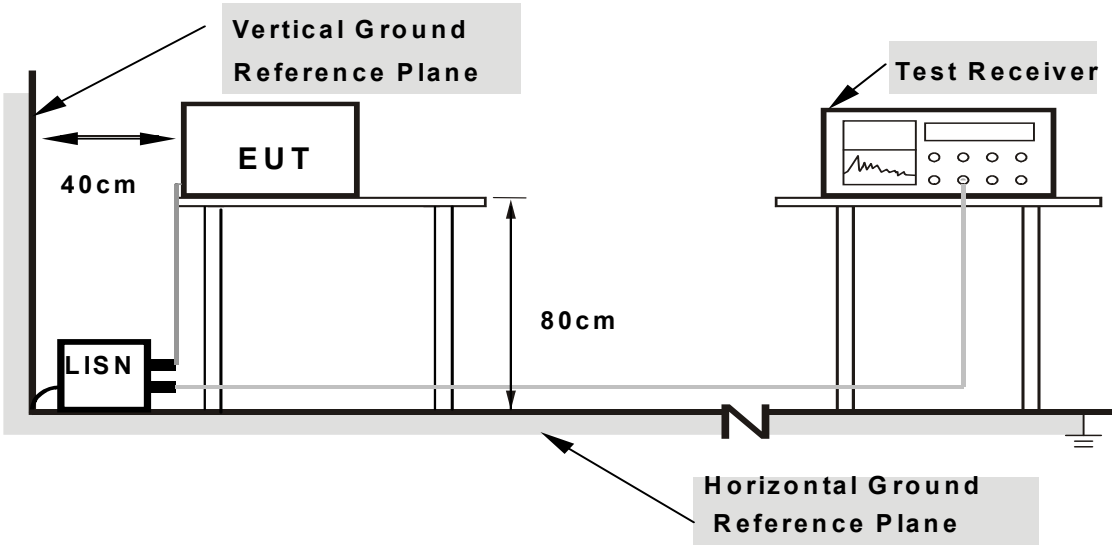
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

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 CONDITIONS

a. Placed the EUT and Bluetooth earphone on a testing table.
b. The EUT link with Bluetooth earphone in idle mode.
c. The EUT sent audio signal to the earphone.
d. The EUT ran MPEG4.
e. The EUT communicated data with the wireless AP and Universal Radio Communication Tester, which acted as communication partners.
f. The communication partner connected with EUT via PCS1900 and WLAN function and run a test program (provided by manufacturer) to enable EUT under receiving condition continuously at specific channel frequency.
g. The necessary accessories enable the system in full functions.

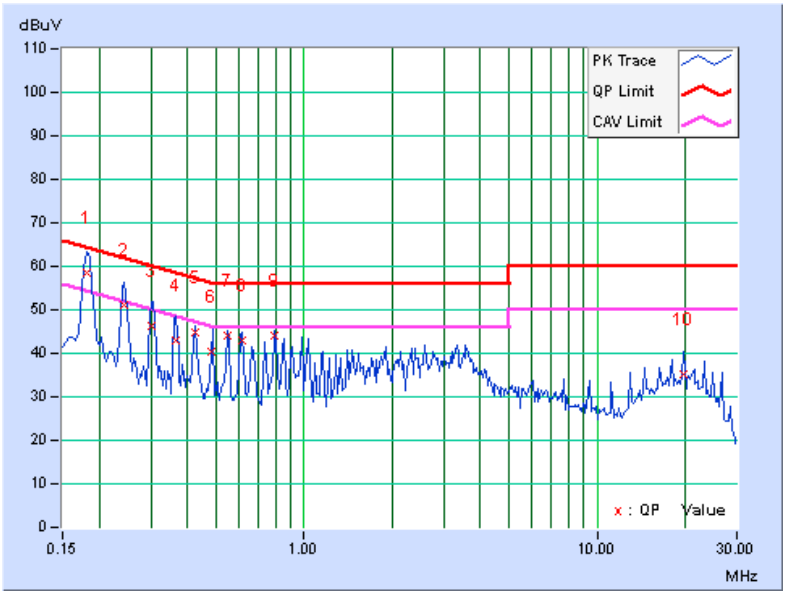
4.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA：GFSK

PHASE	Line 1	6dB BANDWIDTH	9kHz

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.18253**	**0.20**	**58.50**	**51.26**	**58.70**	**51.46**	**64.37**	**54.37**	**-5.67**	**-2.91**
2	0.24375	0.21	50.84	43.71	51.05	43.92	61.97	51.97	-10.91	-8.04
3	0.30354	0.19	46.23	41.41	46.42	41.60	60.15	50.15	-13.72	-8.54
4	0.36484	0.17	42.76	35.32	42.93	35.49	58.62	48.62	-15.69	-13.13
5	0.42492	0.16	44.67	38.34	44.83	38.50	57.35	47.35	-12.52	-8.85
6	0.48562	0.17	40.30	32.93	40.47	33.10	56.24	46.24	-15.78	-13.15
7	0.54844	0.17	43.80	34.62	43.97	34.79	56.00	46.00	-12.03	-11.21
8	0.61094	0.18	42.96	33.41	43.14	33.59	56.00	46.00	-12.86	-12.41
9	0.79334	0.19	43.75	33.39	43.94	33.58	56.00	46.00	-12.06	-12.42
10	19.76681	0.87	34.46	26.88	35.33	27.75	60.00	50.00	-24.67	-22.25

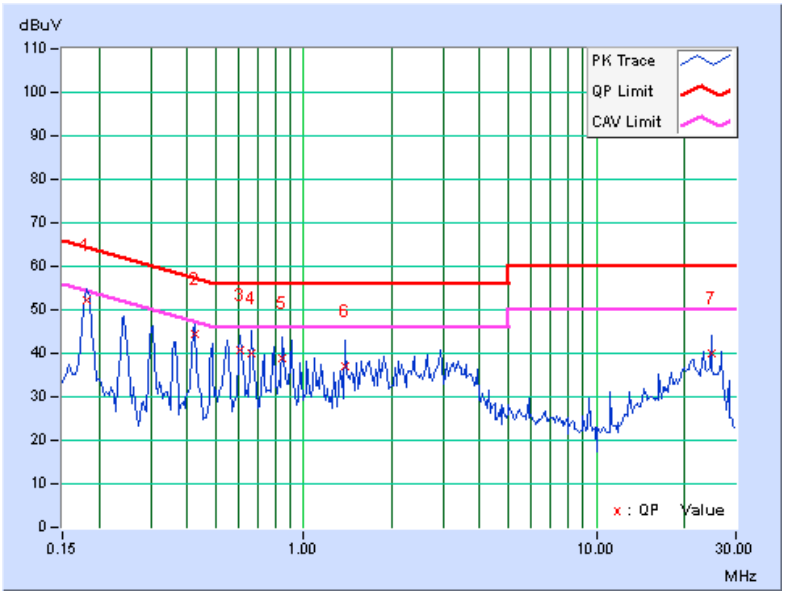
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading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



PHASE	Line 2	6dB BANDWIDTH	9kHz

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18125	0.28	51.93	44.53	52.21	44.81	64.43	54.43	-12.22	-9.62
2	0.42344	0.25	44.02	37.06	44.27	37.31	57.38	47.38	-13.11	-10.07
3	0.60506	0.27	40.33	34.02	40.60	34.29	56.00	46.00	-15.40	-11.71
4	0.66563	0.27	39.77	33.09	40.04	33.36	56.00	46.00	-15.96	-12.64
5	0.84531	0.29	38.72	32.20	39.01	32.49	56.00	46.00	-16.99	-13.51
6	1.38672	0.32	36.81	26.47	37.13	26.79	56.00	46.00	-18.87	-19.21
7	24.92044	1.15	38.87	28.76	40.02	29.91	60.00	50.00	-19.98	-20.09

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.

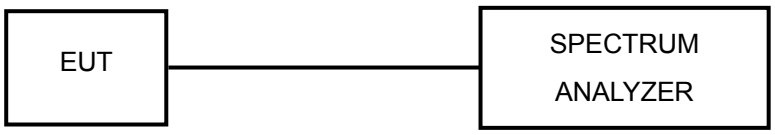


4.3 NUMBER OF HOPPING FREQUENCY USED

4.3.1 LIMIT OF HOPPING FREQUENCY USED

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

4.3.2 TEST SETUP



4.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.3.4 TEST PROCEDURES

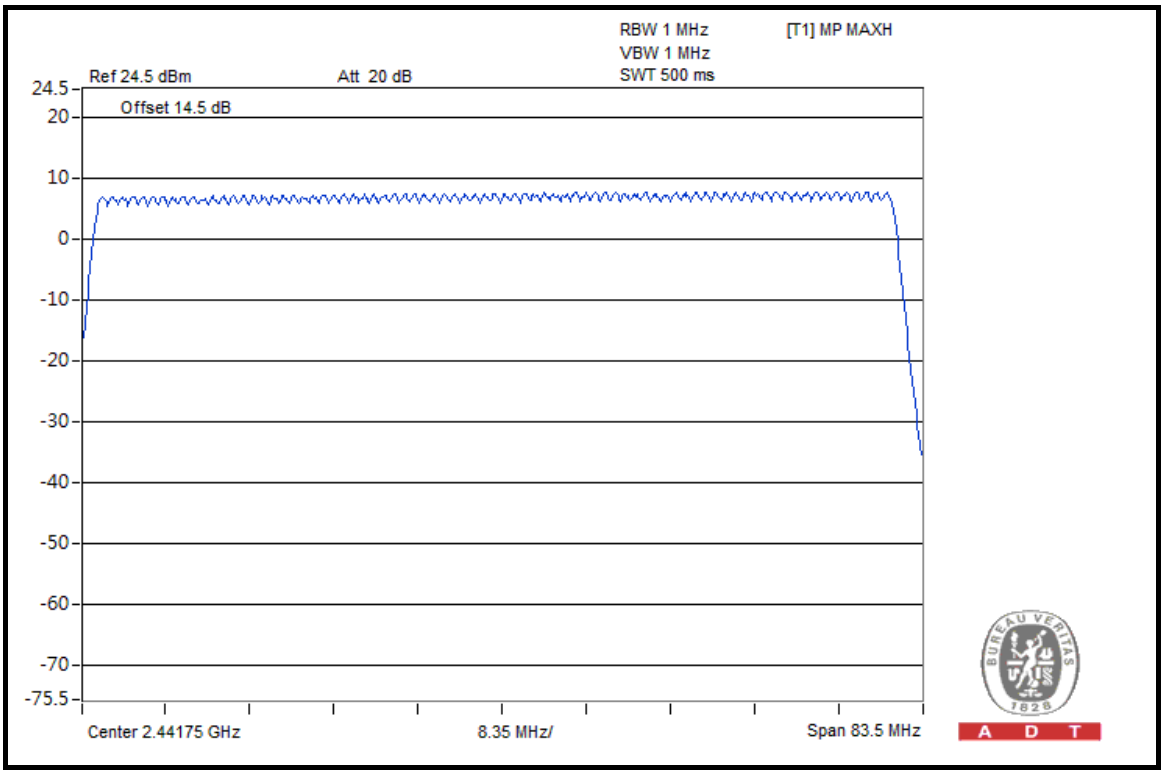
a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
c. 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 FROM TEST STANDARD

No deviation.

4.3.6 TEST RESULTS

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

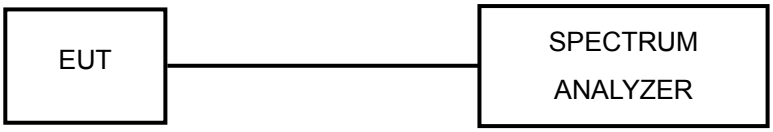

RBW 1 MHz
VBW 1 MHz
SWT 500 ms
[T1] MP MAXH
Ref 24.5 dBm
Att 20 dB
Offset 14.5 dB
24.5
20
10
0
-10
-20
-30
-40
-50
-60
-70
-75.5
Center 2.44175 GHz
8.35 MHz/
Span 83.5 MHz

4.4 DWELL TIME ON EACH CHANNEL

4.4.1 LIMIT OF DWELL TIME USED

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

Refer to section 4.1.2 to get information of above instrument.

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

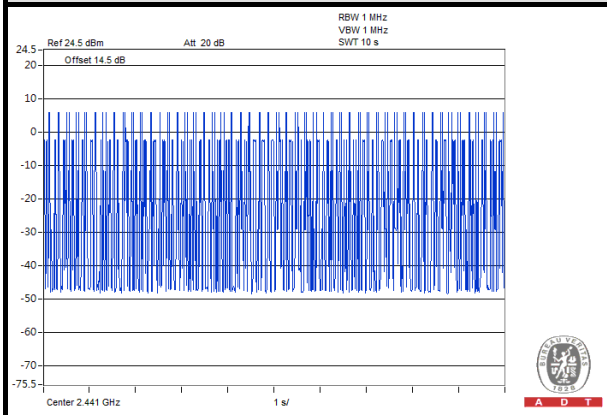
GFSK

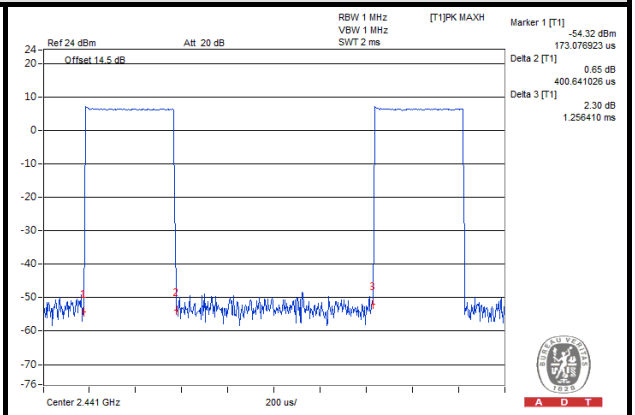
Mode	Average Hopping Channel	Package Transfer Time (usec)	Result (sec)	Limit (sec)
DH1	8.20	400.641	0.10	0.4
DH3	3.70	1666.667	0.19	0.4
DH5	2.80	2932.692	0.26	0.4

NOTE:

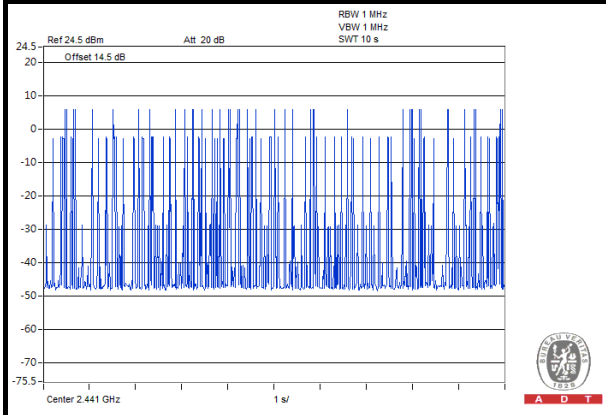
1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time
2. 79 channels come from the Hopping Channel number
3. Average Hopping Channel = hops/sweep time
4. t: Package Transfer Time(us)
5. Test plots of the transmitting time slot are shown on next page.

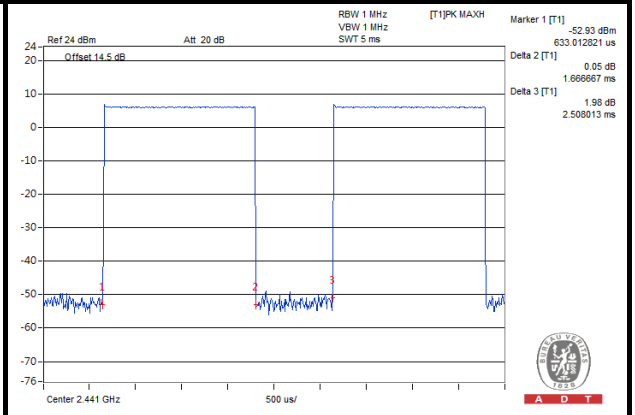
DH1


RBW 1 MHz
VBW 1 MHz
SWT 10 s
Ref 24.5 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
1 s/

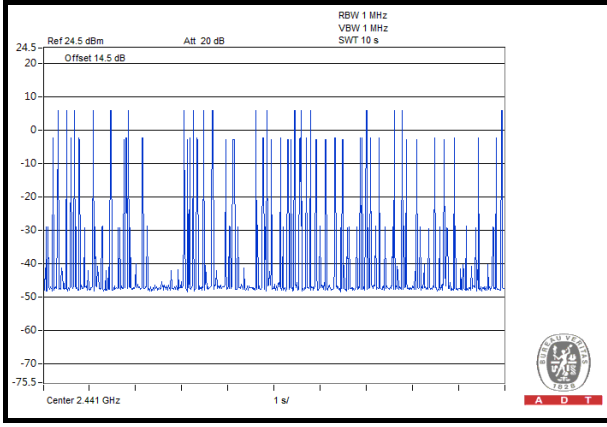

RBW 1 MHz
VBW 1 MHz
SWT 2 ms
[T1]PK MAXH
Marker 1 [T1]
-54.32 dBm
173.076923 us
Delta 2 [T1]
0.65 dB
400.641026 us
Delta 3 [T1]
2.30 dB
1.256410 ms
Ref 24 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
200 us/

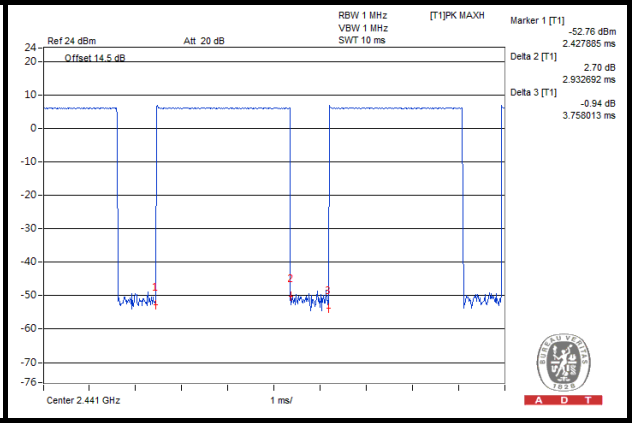
DH3


RBW 1 MHz
VBW 1 MHz
SWT 10 s
Ref 24.5 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
1 s/


RBW 1 MHz
VBW 1 MHz
SWT 5 ms
[T1]PK MAXH
Marker 1 [T1]
-52.93 dBm
633.012821 us
Delta 2 [T1]
0.05 dB
1.666667 ms
Delta 3 [T1]
1.98 dB
2.508013 ms
Ref 24 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
500 us/

DH5


RBW 1 MHz
VBW 1 MHz
SWT 10 s
Ref 24.5 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
1 s/


RBW 1 MHz
VBW 1 MHz
SWT 10 ms
[T1]PK MAXH
Marker 1 [T1]
-52.76 dBm
2.427885 ms
Delta 2 [T1]
2.70 dB
2.932692 ms
Delta 3 [T1]
-0.94 dB
3.758013 ms
Ref 24 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
1 ms/

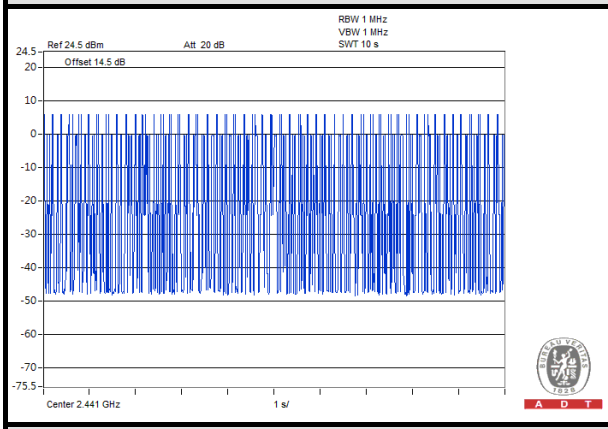
π/4-DQPSK

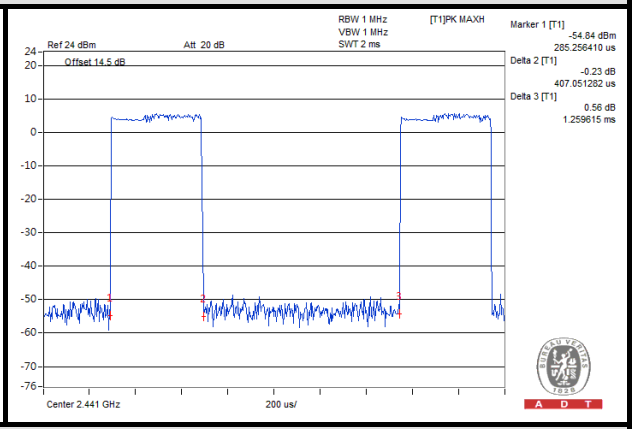
Mode	Average Hopping Channel	Package Transfer Time (usec)	Result (sec)	Limit (sec)
DH1	7.40	407.051282	0.10	0.4
DH3	3.50	1673.077	0.19	0.4
DH5	2.10	2939.103	0.20	0.4

NOTE:

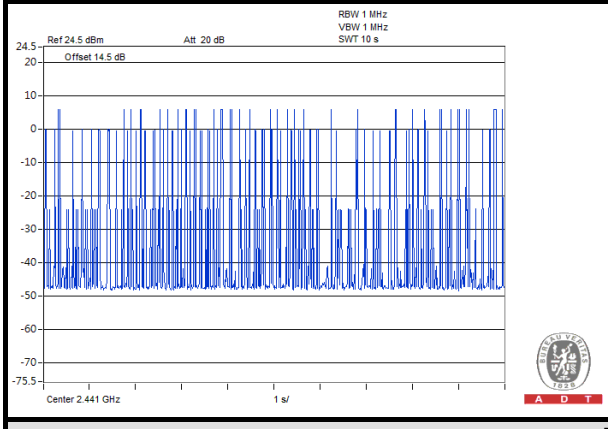
1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time
2. 79 channels come from the Hopping Channel number
3. Average Hopping Channel = hops/sweep time
4. t: Package Transfer Time(us)
5. Test plots of the transmitting time slot are shown on next page.

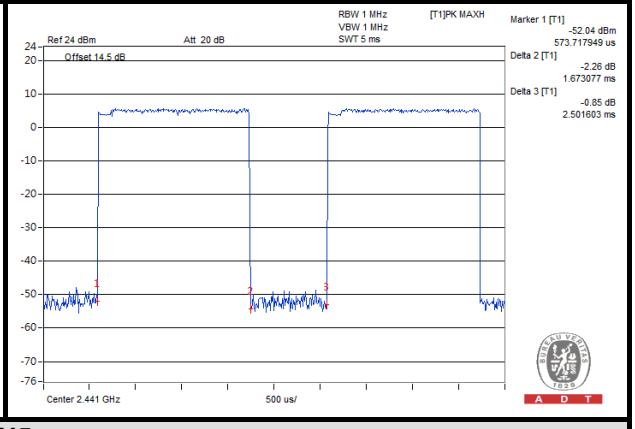
DH1


RBW 1 MHz
VBW 1 MHz
SWT 10 s
Ref 24.5 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
1 s/

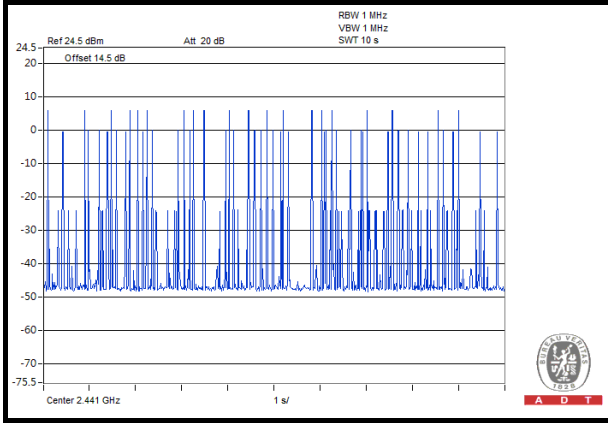

RBW 1 MHz
VBW 1 MHz
SWT 2 ms
[T1]PK MAXH
Marker 1 [T1]
-54.84 dBm
285.256410 us
Delta 2 [T1]
-0.23 dB
407.051282 us
Delta 3 [T1]
0.56 dB
1.259615 ms
Ref 24 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
200 us/

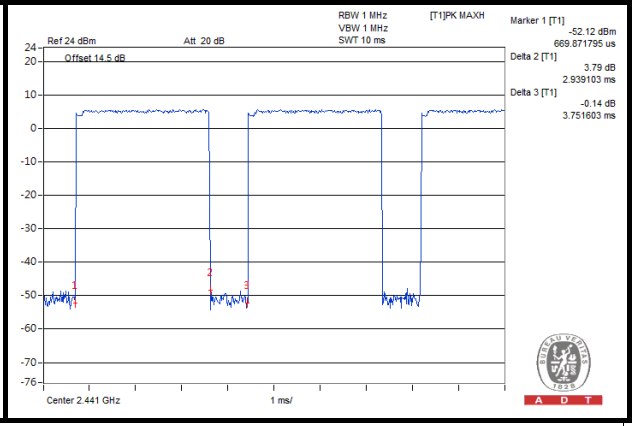
DH3


RBW 1 MHz
VBW 1 MHz
SWT 10 s
Ref 24.5 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
1 s/


RBW 1 MHz
VBW 1 MHz
SWT 5 ms
[T1]PK MAXH
Marker 1 [T1]
-52.04 dBm
573.717949 us
Delta 2 [T1]
-2.26 dB
1.673077 ms
Delta 3 [T1]
-0.85 dB
2.501603 ms
Ref 24 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
500 us/

DH5


RBW 1 MHz
VBW 1 MHz
SWT 10 s
Ref 24.5 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
1 s/


RBW 1 MHz
VBW 1 MHz
SWT 10 ms
[T1]PK MAXH
Marker 1 [T1]
-52.12 dBm
669.871795 us
Delta 2 [T1]
3.79 dB
2.939103 ms
Delta 3 [T1]
-0.14 dB
3.751603 ms
Ref 24 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
1 ms/

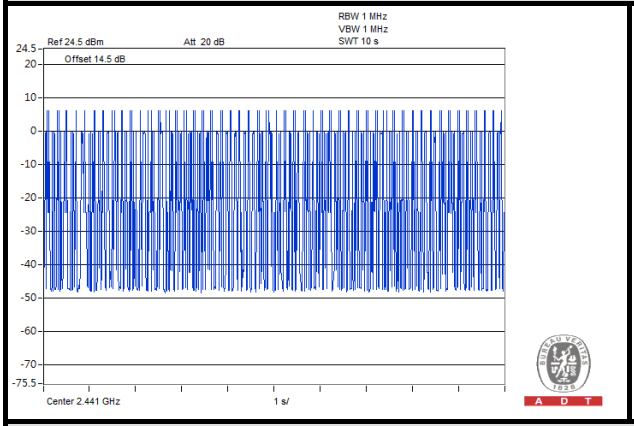
8DPSK

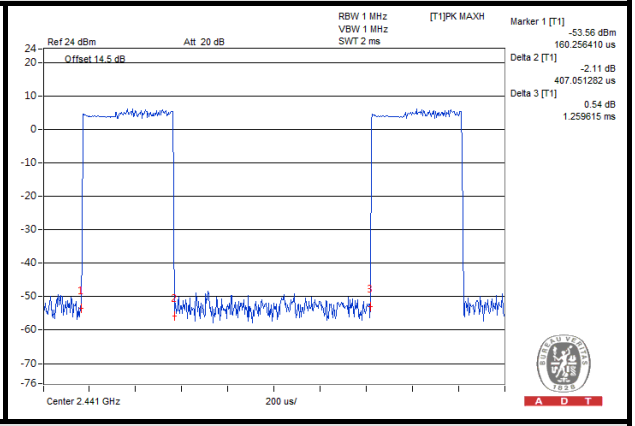
Mode	Average Hopping Channel	Package Transfer Time (usec)	Result (sec)	Limit (sec)
DH1	8.30	407.051	0.11	0.4
DH3	2.60	1665.064	0.14	0.4
DH5	2.10	2963.141	0.20	0.4

NOTE:

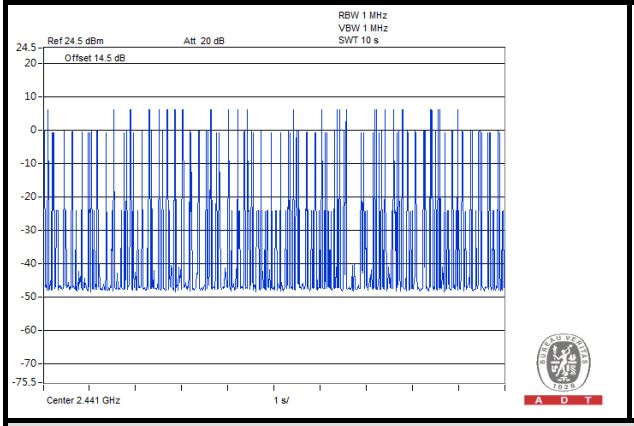
1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time
2. 79 channels come from the Hopping Channel number
3. Average Hopping Channel = hops/sweep time
4. t: Package Transfer Time(us)
5. Test plots of the transmitting time slot are shown on next page.

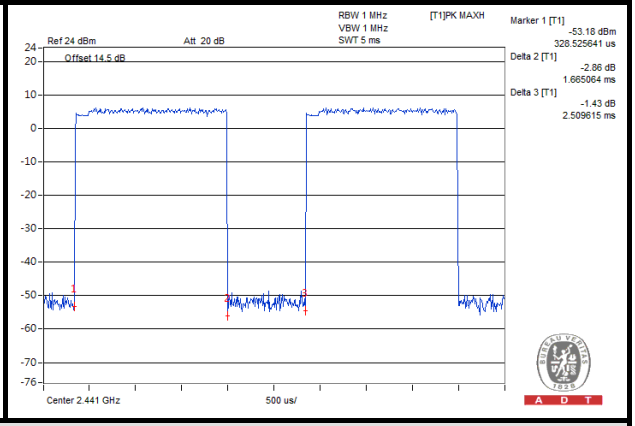
DH1


RBW 1 MHz
VBW 1 MHz
SWT 10 s
Ref 24.5 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
1 s/

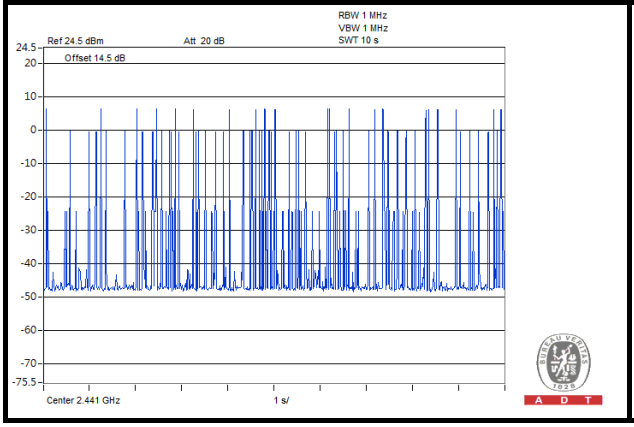

RBW 1 MHz
VBW 1 MHz
SWT 2 ms
[T1]PK MAXH
Marker 1 [T1]
-53.56 dBm
160.256410 us
Delta 2 [T1]
-2.11 dB
407.051282 us
Delta 3 [T1]
0.54 dB
1.259615 ms
Ref 24 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
200 us/

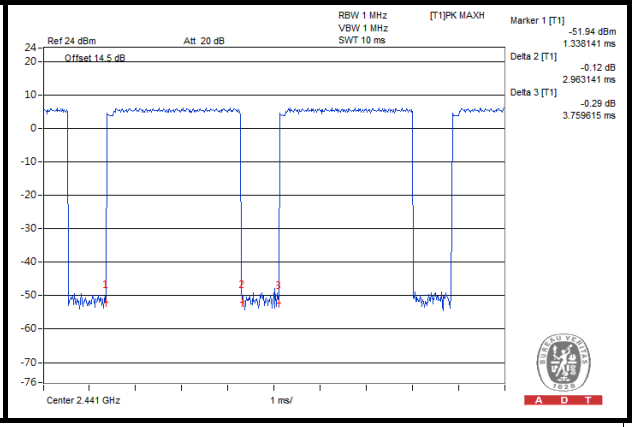
DH3


RBW 1 MHz
VBW 1 MHz
SWT 10 s
Ref 24.5 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
1 s/


RBW 1 MHz
VBW 1 MHz
SWT 5 ms
[T1]PK MAXH
Marker 1 [T1]
-53.18 dBm
326.525641 us
Delta 2 [T1]
-2.86 dB
1.665064 ms
Delta 3 [T1]
-1.43 dB
2.509615 ms
Ref 24 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
500 us/

DH5


RBW 1 MHz
VBW 1 MHz
SWT 10 s
Ref 24.5 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
1 s/

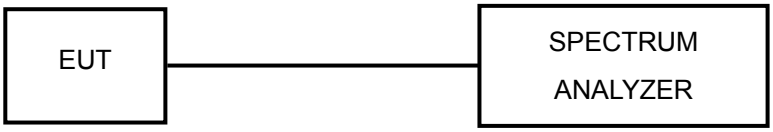

RBW 1 MHz
VBW 1 MHz
SWT 10 ms
[T1]PK MAXH
Marker 1 [T1]
-51.94 dBm
1.338141 ms
Delta 2 [T1]
-0.12 dB
2.963141 ms
Delta 3 [T1]
-0.29 dB
3.759615 ms
Ref 24 dBm
Att 20 dB
Offset 14.5 dB
Center 2.441 GHz
1 ms/

4.5 CHANNEL BANDWIDTH

4.5.1 LIMITS OF CHANNEL BANDWIDTH

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

Refer to section 4.1.2 to get information of above instrument.

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. Repeat above procedures until all frequencies measured were complete.

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITION

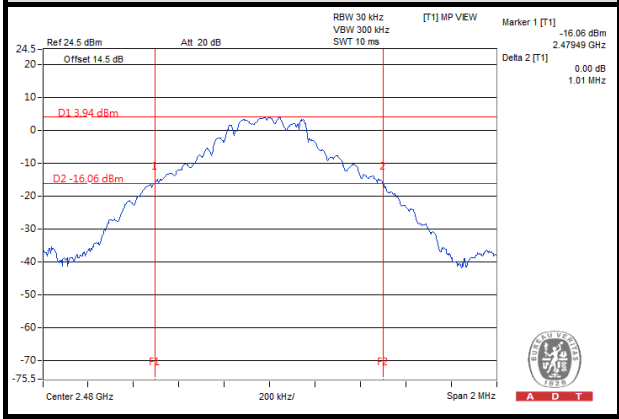
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.5.7 TEST RESULTS

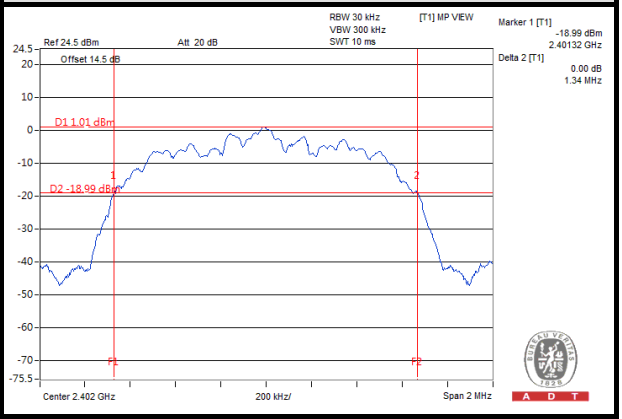
CHANNEL	FREQUENCY (MHz)	20dB BANDWIDTH (MHz)		
		GFSK	π/4-DQPSK	8DPSK
0	2402	0.985	1.340	1.340
39	2441	1.010	1.340	1.330
78	2480	1.010	1.340	1.330

SPECTRUM PLOT OF WORST VALUE

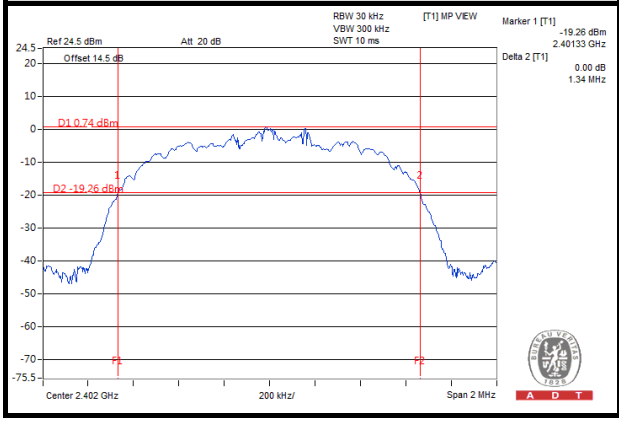
GFSK



π/4-DQPSK



8DPSK

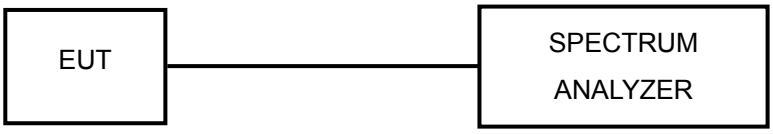


4.6 HOPPING CHANNEL SEPARATION

4.6.1 LIMIT OF HOPPING CHANNEL SEPARATION

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

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.6.4 TEST PROCEDURES

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

GFSK

CHANNEL	FREQUENCY (MHZ)	ADJACENT CHANNEL SEPARATION (MHz)	20dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	1.000	0.985	0.657	PASS
39	2441	1.010	1.010	0.673	PASS
78	2480	1.000	1.010	0.673	PASS

π/4-DQPSK

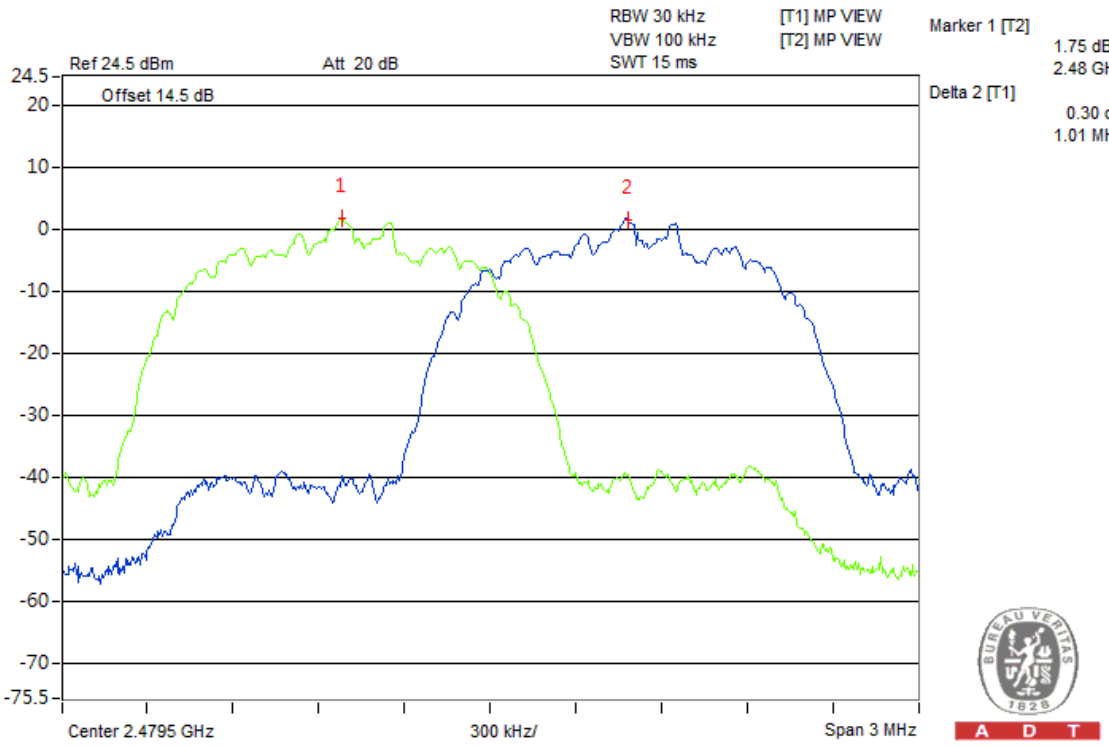
CHANNEL	FREQUENCY (MHZ)	ADJACENT CHANNEL SEPARATION (MHz)	20dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	1.000	1.340	0.893	PASS
39	2441	1.000	1.340	0.893	PASS
78	2480	1.000	1.340	0.893	PASS

8DPSK

CHANNEL	FREQUENCY (MHz)	ADJACENT CHANNEL SEPARATION (MHz)	20dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	1.010	1.340	0.893	PASS
39	2441	1.000	1.330	0.887	PASS
78	2480	1.010	1.330	0.887	PASS

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

SPECTRUM PLOT OF WORST VALUE

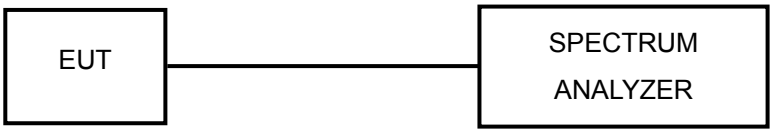


4.7 MAXIMUM OUTPUT POWER

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

Refer to section 4.1.2 to get information of above instrument.

4.7.4 TEST PROCEDURES

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.

4.7.5 DEVIATION FROM TEST 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

GFSK

CHANNEL	CHANNEL FREQUENCY (MHz)	OUTPUT POWER (W)	OUTPUT POWER (dBm)	POWER LIMIT (mW)	PASS/FAIL
0	2402	0.0053	7.28	125	PASS
39	2441	0.0061	7.83	125	PASS
78	2480	0.0063	8.01	125	PASS

π/4-DQPSK

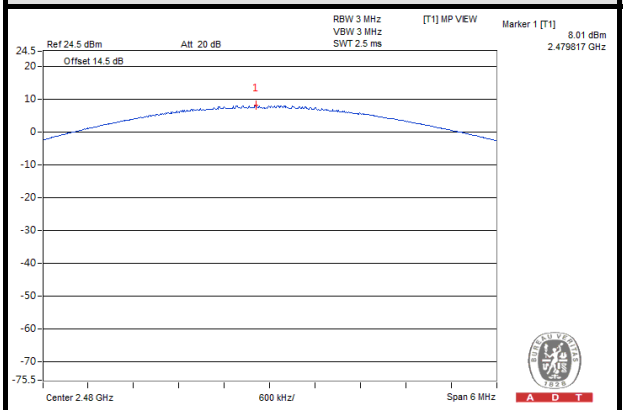
CHANNEL	CHANNEL FREQUENCY (MHz)	OUTPUT POWER (W)	OUTPUT POWER (dBm)	POWER LIMIT (mW)	PASS/FAIL
0	2402	0.0044	6.41	125	PASS
39	2441	0.0050	6.98	125	PASS
78	2480	0.0054	7.30	125	PASS

8DPSK

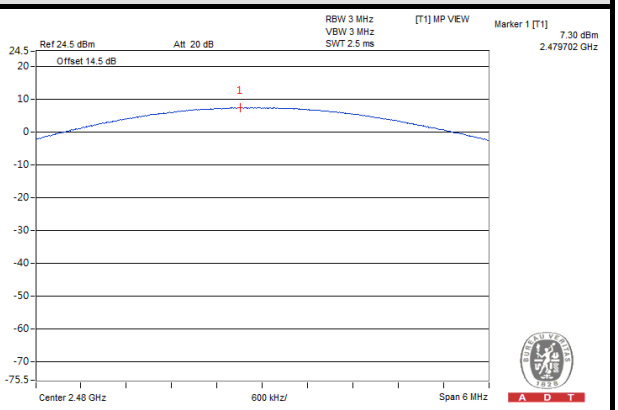
CHANNEL	CHANNEL FREQUENCY (MHz)	OUTPUT POWER (W)	OUTPUT POWER (dBm)	POWER LIMIT (mW)	PASS/FAIL
0	2402	0.0050	7.00	125	PASS
39	2441	0.0056	7.51	125	PASS
78	2480	0.0059	7.74	125	PASS

SPECTRUM PLOT OF WORST VALUE

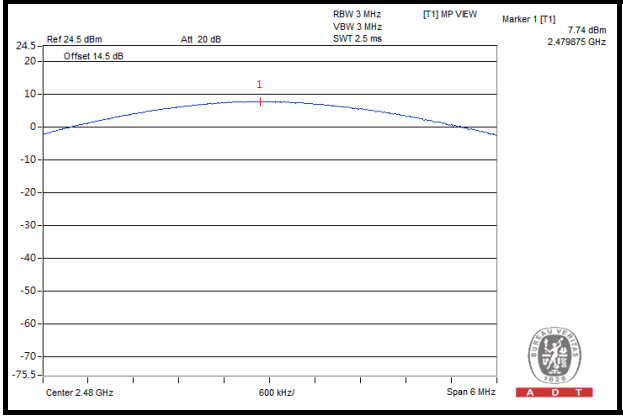
GFSK



π/4-DQPSK



8DPSK



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

Refer to section 4.1.2 to get information of above instrument.

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 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

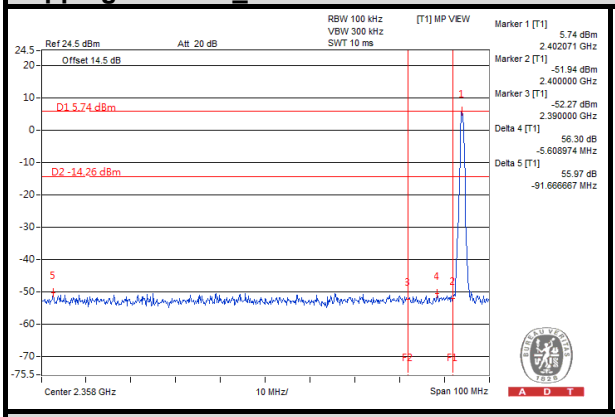
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

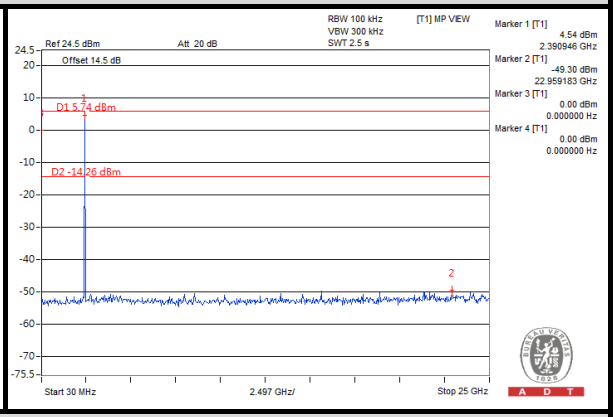
4.8.6 TEST RESULTS

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.

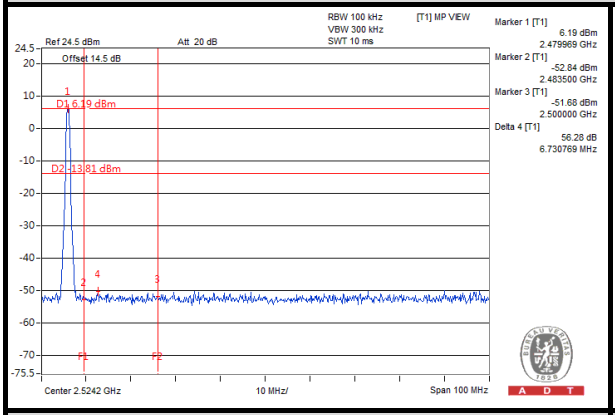
GFSK

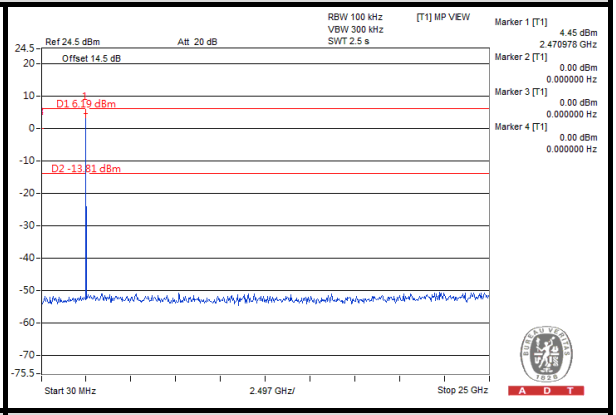
Hopping disabled_ Low Channel



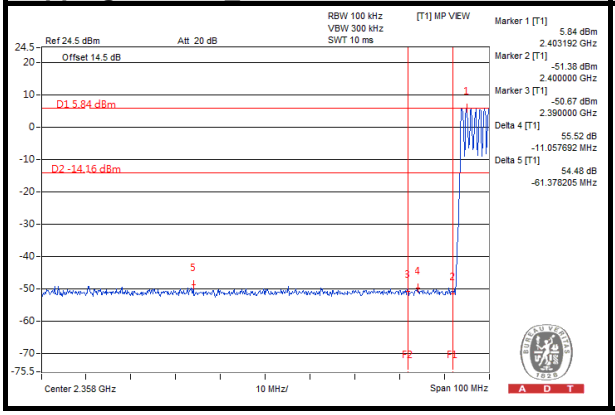


Hopping disabled_ High Channel

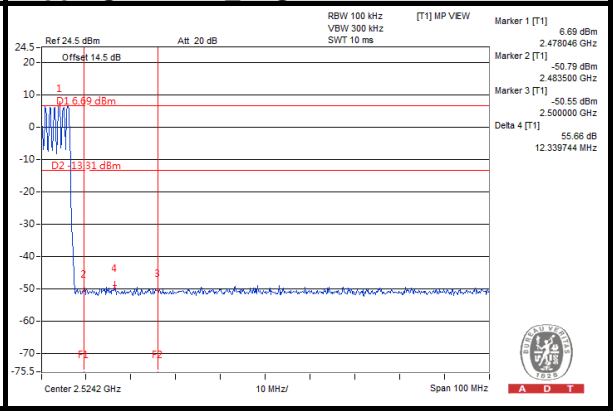




Hopping enabled_ Low Channel

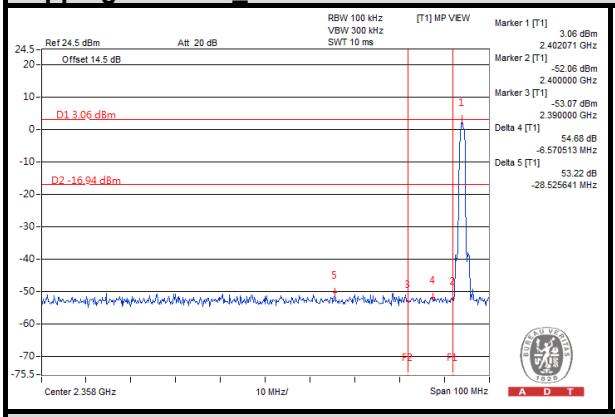


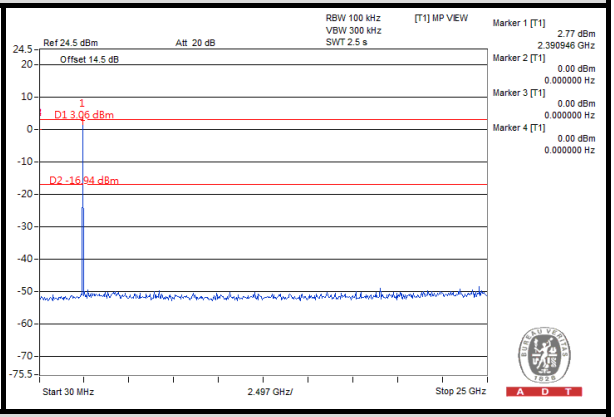
Hopping enabled_ High Channel



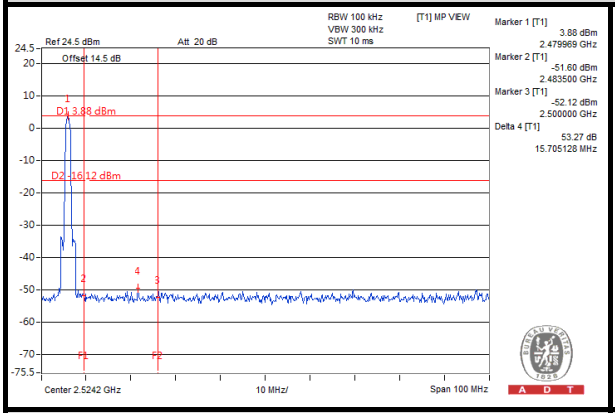
π/4-DQPSK

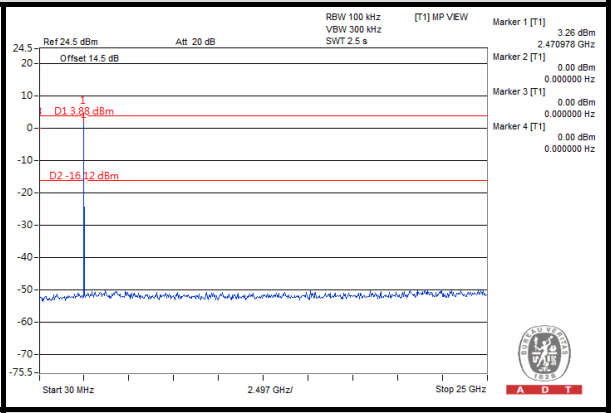
Hopping disabled_ Low Channel



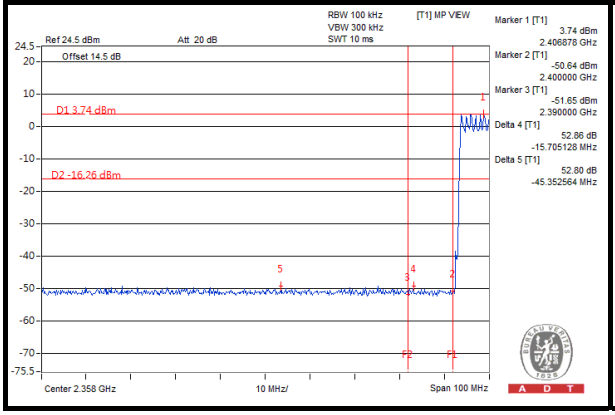


Hopping disabled_ High Channel

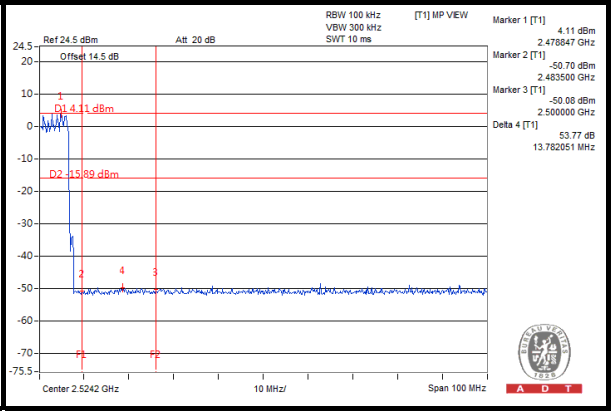




Hopping enabled_ Low Channel

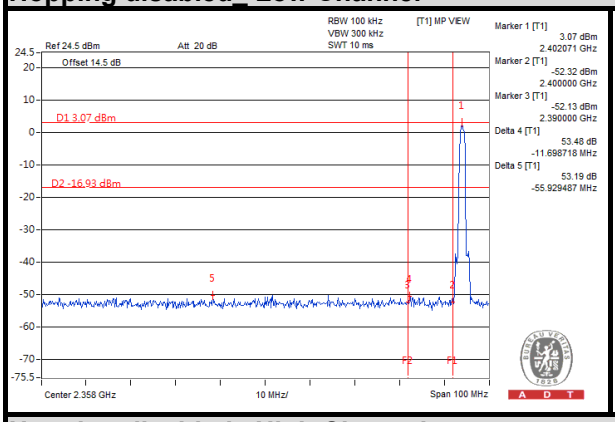


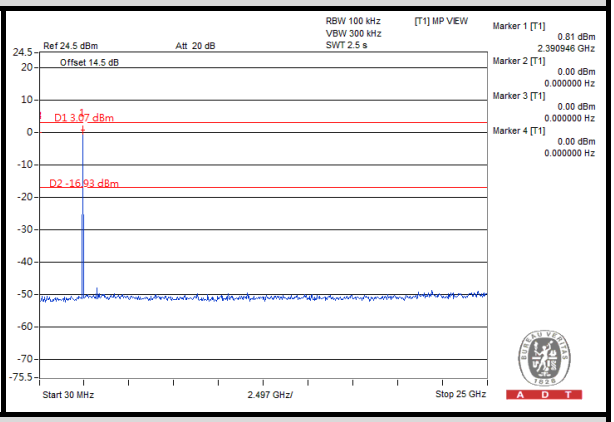
Hopping enabled_ High Channel



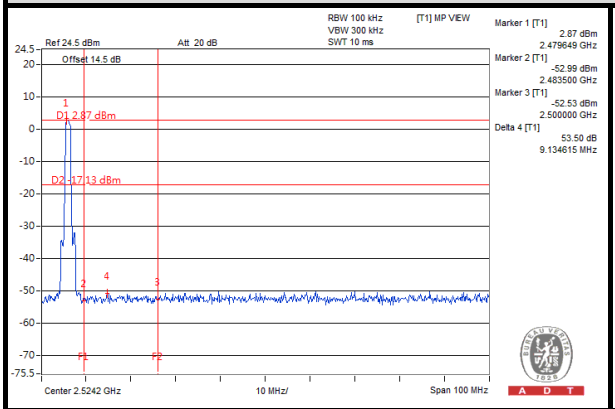
8DPSK

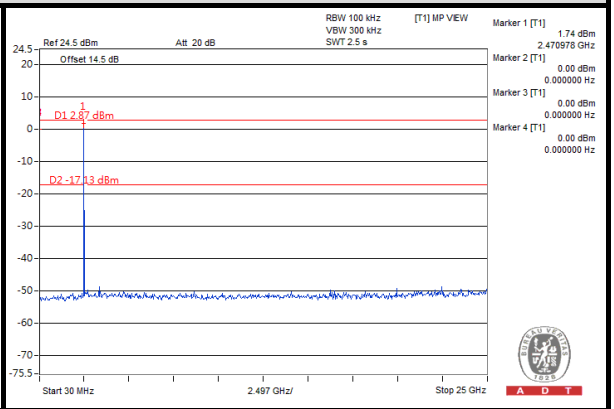
Hopping disabled_ Low Channel



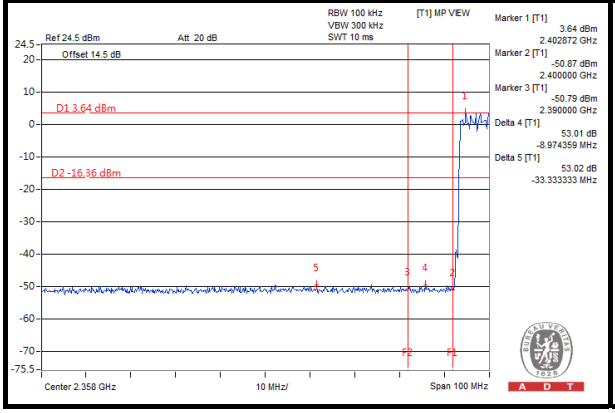


Hopping disabled_ High Channel

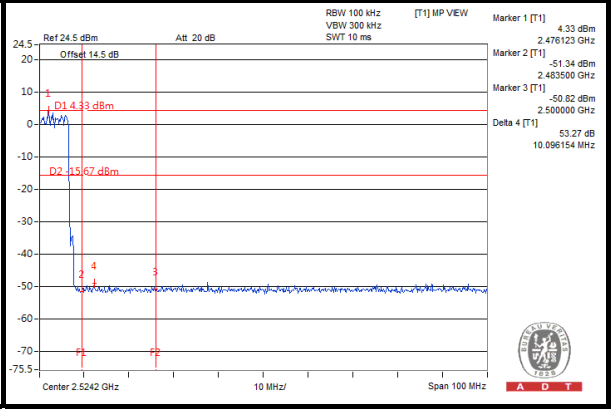




Hopping enabled_ Low Channel



Hopping enabled_ High Channel



5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6. 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 Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom 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.

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

No any modifications are made to the EUT by the lab during the test.

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