

FCC RADIO TEST REPORT-BT 3.0 FCC ID: 2ACH9HM-1406M

Product: Tablet pc

Trade Name: Trio

Model Name: HM-1406M

Serial Model: Stealth G4-10.1, WH101F, WH10XX

Report No.: NTEK-2014NT10201783F2

Prepared for

WeiHeng Digital Company Limited.

Rm732, 3rd session, Build B, Mingyou Industrial, Products Exhibitionand Purchasing Center, Baoyuan Road, Bao'an District, Shenzhen, China

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.

1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street Bao'an District, Shenzhen P.R. China

Tel.: +86-0755-61156588 Fax.: +86-0755-61156599 Website:www.ntek.org.cn

Applicant's name WeiHeng Digital Company Limited.



TEST RESULT CERTIFICATION

Address	Rm732, 3rd session, Build B, Mingyou Industrial, Products Exhibitionand Purchasing Center, Baoyuan Road, Bao'an District, Shenzhen, China		
Manufacture's Name	WeiHeng Digital Company Limited		
Address	Build 3,Fengquan Industry Area YaoShan, XieGang Town DongGuan GuangDong, China		
Product description			
Product name	. Tablet pc		
Model and/or type reference	HM-1406M		
Serial Model:	Stealth G4-10.1,WH101F,WH10XX		
Standards	FCC Part15.247: 01 Oct. 2013		
Test procedure	. ANSI C63.4-2003		
	has been tested by NTEK, and the test results show that the in compliance with the FCC requirements. And it is applicable only I in the report.		
•	luced except in full, without the written approval of NTEK, this evised by NTEK, personal only, and shall be noted in the revision of		
Date of Test	:		
Date (s) of performance of test	ts 20 Oct. 2014 ~29 Oct. 2014		
Date of Issue	29 Oct. 2014		
Test Result	Pass		
Testing Engi	neer: Danny Grany		
	Denny Huang		
Technical Ma	anager: $\mathbb{Z}_{\mathcal{W}_{\mathcal{N}}} \ell_{\mathcal{N}}$		
	(Brown Lu)		
Authorized S			
	(Bill Yao)		



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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C				
Standard Section	Test Item	Judgment	Remark	
15.207	Conducted Emission	PASS		
15.247(a)(1)	Hopping Channel Separation	PASS		
15.247(b)(1)	Peak Output Power	PASS		
15.247(c)	Radiated Spurious Emission	PASS		
15.247(a)(iii)	Number of Hopping Frequency	PASS		
15.247(a)(iii)	Dwell Time	PASS		
15.247(a)(1)	Bandwidth	PASS		
15.205	Band Edge Emission	PASS		
15.203	Antenna Requirement	PASS		

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report



1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd

Add.: 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

FCC Registration No.:238937; IC Registration No.:9270A-1

CNAS Registration No.:L5516

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $\mathbf{y} \pm \mathbf{U}$, where expended uncertainty \mathbf{U} is based on a standard uncertainty multiplied by a coverage factor of $\mathbf{k=2}$, providing a level of confidence of approximately 95 % $^{\circ}$

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Tablet pc		
Trade Name	Trio		
Model Name	HM-1406M		
Serial Model	Stealth G4-10.1,WH101	F,WH10XX	
Model Difference		me circuit and RF module, and colour and shell technology.	
Product Description	except the model name and colour and shell technolo The EUT is a Tablet pc Operation Frequency: 2402~2480 MHz Modulation Type: BT(1Mbps): GFSK BT EDR(2Mbps): π /4-DQPS BT EDR(3Mbps): 8-DPSK Bit Rate of Transmitter 1Mbps/2Mbps/3Mbps Number Of Channel 79 CH Antenna Designation: Please see Note 3. Output BT(1Mbps): 2.802 dBm BT EDR(2Mbps): 2.802 dBm BT EDR(2Mbps): 2.839 dBm BT EDR(3Mbps): 2.539 dBm Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as		
0	ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.		
Channel List	Please refer to the Note 2.		
Adapter	Model: PGAE0500200U1UL Input: 100-240V~, 50/60Hz, 0.3A Output: 5.0V===, 2.0A		
Battery	DC 3.7V, 5000mAh		
Connecting I/O Port(s)	Please refer to the User's Manual		

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



2

		Chann	el List		
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	N/A	FPCB Antenna	N/A	1.0	BT Antenna



2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	CH00
Mode 2	CH39
Mode 3	CH78
Mode 4	normal link

For Conducted Emission			
Final Test Mode Description			
Mode 4	normal link		

For Radiated Emission			
Final Test Mode Description			
Mode 1	CH00		
Mode 2	CH39		
Mode 3	CH78		

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The EUT use new battery.
- (3)The data rate was set in 2Mbps for radiated emission due to the highest RF output power.

2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

Test software Version	Test program: Broadcom			
Frequency	2402 MHz 2441 MHz 2480 MHz			
Parameters(1/2/3Mbps)	DEF DEF DEF			



2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted Emission Test



Radiated Spurious Emission Test

E-1 EUT



2.5 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Tablet pc	Trio	HM-1406M	N/A	EUT
E-2	Adapter	N/A	PGAE0500200U1UL	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.2m	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in <code>"Length_"</code> column.
- (3) "YES" is means "shielded" "with core"; "NO" is means "unshielded" "without core".



2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibratio n period
1	Spectrum Analyzer	Agilent	E4407B	MY4510804 0	2014.07.06	2015.07.05	1 year
2	Test Receiver	R&S	ESPI	101318	2014.06.07	2015.06.06	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2014.07.06	2015.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	620026441 6	2014.06.07	2015.06.06	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2014.06.07	2015.06.06	1 year
6	Horn Antenna	EM	EM-AH-101 80	2011071402	2014.07.06	2015.07.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2014.07.06	2015.07.05	1 year
8	Amplifier	EM	EM-30180	060538	2013.12.22	2014.12.21	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2014.06.08	2015.06.07	1 year
10	Power Meter	R&S	NRVS	100696	2014.07.06	2015.07.05	1 year
11	Power Sensor	R&S	URV5-Z4	0395.1619. 05	2014.07.06	2015.07.05	1 year

Conduction Test equipment

Item	Kind of Equipment	Manufactu rer	Type No.	Serial No.	Last calibration	Calibrated until	Calibratio n period
1	Test Receiver	R&S	ESCI	101160	2014.06.06	2015.06.05	1 year
2	LISN	R&S	ENV216	101313	2014.08.24	2015.08.23	1 year
2*	LISN	R&S	ENV216	101313	2014.08.24	2015.08.23	1 year
3	LISN	EMCO	3816/2	00042990	2014.08.24	2015.08.23	1 year
3*	LISN	EMCO	3816/2	00042990	2014.08.24	2015.08.23	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	620026441 7	2014.06.07	2015.06.06	1 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2014.06.07	2015.06.06	1 year
6	Absorbing clamp	R&S	MOS-21	100423	2014.06.08	2015.06.07	1 year

1	Attenuation	MCE	24-10-34	BN9258	2014.06.08	2015.06.07	1 year
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3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B	Ctondord	
	Quasi-peak	Average	Quasi-peak	Average	Standard
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz



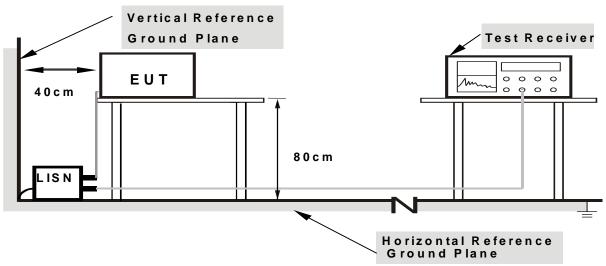
3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 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

3.1.5 EUT OPERATING CONDITIONS

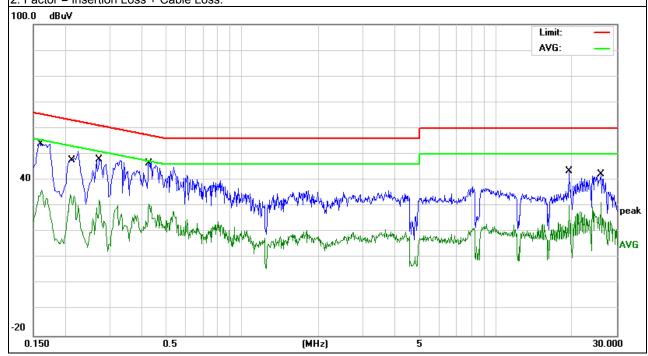
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



3.1.6 TEST RESULTS

EUT:	Tablet pc	Model Name :	HM-1406M
Temperature :	26 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	L
TASI VOHADA .	DC 5.0V from Adapter AC 120V/60Hz	Test Mode:	Mode 4

		1		l	l	l
Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	Remaik
0.1620	44.32	9.60	53.92	65.36	-11.44	QP
0.1620	26.55	9.60	36.15	55.36	-19.21	AVG
0.2099	37.80	9.49	47.29	63.21	-15.92	QP
0.2099	25.04	9.49	34.53	53.21	-18.68	AVG
0.2740	38.04	9.49	47.53	60.99	-13.46	QP
0.2740	22.98	9.49	32.47	50.99	-18.52	AVG
0.4299	31.75	9.51	41.26	57.25	-15.99	QP
0.4299	21.24	9.51	30.75	47.25	-16.50	AVG
19.5095	33.24	10.26	43.50	60.00	-16.50	QP
19.5095	19.88	10.26	30.14	50.00	-19.86	AVG
25.9980	32.03	10.15	42.18	60.00	-17.82	QP
26.0017	21.42	10.15	31.57	50.00	-18.43	AVG



All readings are Quasi-Peak and Average values.
 Factor = Insertion Loss + Cable Loss.

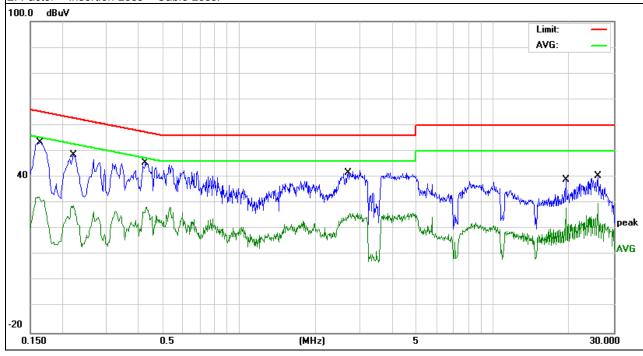


EUT:	Tablet pc	Model Name :	HM-1406M
Temperature :	26 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	N
LIEST VOITAGE .	DC 5.0V from Adapter AC 120V/60Hz	Test Mode :	Mode 4

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Domark
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	Remark
0.1620	43.39	9.62	53.01	65.36	-12.35	QP
0.1620	22.80	9.62	32.42	55.36	-22.94	AVG
0.2220	37.69	9.50	47.19	62.74	-15.55	QP
0.2220	19.70	9.50	29.20	52.74	-23.54	AVG
0.4299	34.88	9.52	44.40	57.25	-12.85	QP
0.4299	18.99	9.52	28.51	47.25	-18.74	AVG
2.7219	31.55	9.57	41.12	56.00	-14.88	QP
2.7219	16.58	9.57	26.15	46.00	-19.85	AVG
19.5017	28.71	10.14	38.85	60.00	-21.15	QP
19.5017	18.15	10.14	28.29	50.00	-21.71	AVG
26.0018	30.24	10.28	40.52	60.00	-19.48	QP
26.0018	19.61	10.28	29.89	50.00	-20.11	AVG

Remark:

- All readings are Quasi-Peak and Average values.
 Factor = Insertion Loss + Cable Loss.





3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies	Field Strength	Measurement Distance
(MHz)	(micorvolts/meter)	(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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

	Class B (dBuV/m) (at 3M)		
FREQUENCY (MHz)	PEAK	AVERAGE	
Above 1000	74	54	

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 th harmonic of the highest frequency or 40 GHz, whichever is lower



Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted	1 MHz / 1 MHz for Dook 1 MHz / 10Hz for Average
band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos. Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function Resolution bandwidth		Video Bandwidth
30 to 1000	Peak ,QP	120 kHz	300 kHz
	Peak	1 MHz	1 MHz
Above 1000	AV	1 MHz	10 Hz

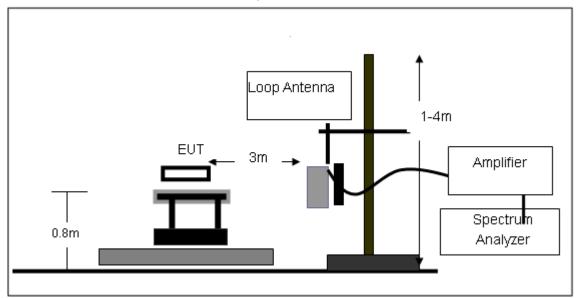
3.2.3 DEVIATION FROM TEST STANDARD

No deviation

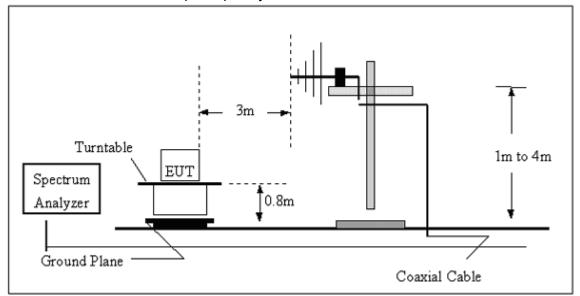


3.2.4 TEST SETUP

(A) Radiated Emission Test-Up Frequency Below 30MHz

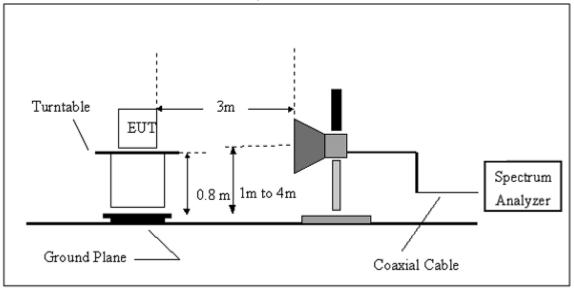


(B) Radiated Emission Test-Up Frequency 30MHz~1GHz





(C) Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



3.2.6 TEST RESULTS (BELOW 30 MHZ)

EUT:	Tablet pc	Model Name :	HM-1406M
Temperature :	20 ℃	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX	Polarization :	

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
				N/A
				N/A

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =20 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.



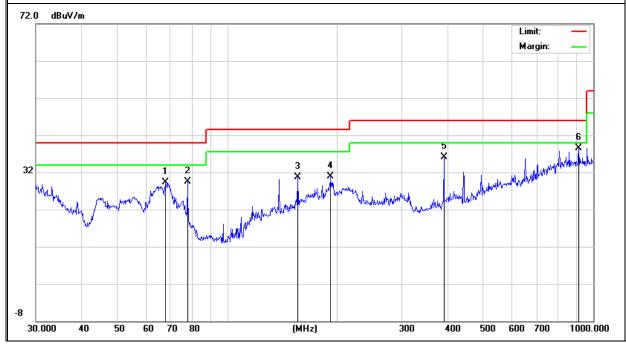
3.2.7 TEST RESULTS (BETWEEN 30M - 1000 MHZ)

EUT:	Tablet pc	Model Name :	HM-1406M
Temperature :	20 ℃	Relative Humidity:	48%
Pressure :	1010hPa	Test Mode:	TX
Test Voltage :	DC 3.7V		

Polar	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(H/V)	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Roman
V	67.9128	23.34	6.04	29.38	40.00	-10.62	QP
V	77.8653	23.77	5.79	29.56	40.00	-10.44	QP
V	155.9099	20.32	10.45	30.77	43.50	-12.73	QP
V	191.7450	20.19	10.71	30.90	43.50	-12.60	QP
V	390.7225	18.18	17.93	36.11	46.00	-9.89	QP
V	912.8618	11.45	27.09	38.54	46.00	-7.46	QP

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit





Polar	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(H/V)	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Roman
Н	64.6594	20.31	6.78	27.09	40.00	-12.91	QP
Н	234.1682	19.21	13.09	32.30	46.00	-13.70	QP
Н	289.0020	19.46	14.02	33.48	46.00	-12.52	QP
Н	351.7078	18.91	16.31	35.22	46.00	-10.78	QP
Н	390.7225	21.12	17.93	39.05	46.00	-6.95	QP
Н	807.4288	10.30	27.38	37.68	46.00	-8.32	QP

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit





3.2.8 TEST RESULTS (ABOVE 1000 MHZ)

EUT:	Tablet pc	Model Name :	HM-1406M
Temperature :	20 ℃	Relative Humidity:	48%
Pressure :	1010hPa	Test Mode:	TX
Test Mode :	DC 3.7V		

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Damani	Comment
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Remark	Comment
		Low Ch	annel (2402 MHz)-A	Above 1G			
4804.133	58.5	-3.64	62.14	74.00	-11.86	Pk	Vertical
4804.133	39.79	-3.64	43.43	54.00	-10.57	AV	Vertical
7206.206	51.65	-0.95	52.60	74.00	-21.40	Pk	Vertical
7206.206	36.73	-0.95	37.68	54.00	-16.32	AV	Vertical
4804.124	58.94	-3.64	62.58	74.00	-11.42	Pk	Horizontal
4804.124	39.71	-3.64	43.35	54.00	-10.65	AV	Horizontal
7206.096	52.85	-0.95	53.80	74.00	-20.20	Pk	Horizontal
7206.096	36.66	-0.95	37.61	54.00	-16.39	AV	Horizontal
		Mid Cha	annel (2441 MHz)-A	Above 1G		1	
4882.142	60.13	-3.68	63.81	74.00	-10.19	Pk	Vertical
4882.142	40.21	-3.68	43.89	54.00	-10.11	AV	Vertical
7323.211	54.56	-0.82	55.38	74.00	-18.62	Pk	Vertical
7323.211	39.41	-0.82	40.23	54.00	-13.77	AV	Vertical
4882.326	59.06	-3.68	62.74	74.00	-11.26	Pk	Horizontal
4882.326	40.21	-3.68	43.89	54.00	-10.11	AV	Horizontal
7323.088	54.46	-0.82	55.28	74.00	-18.72	Pk	Horizontal
7323.088	38.73	-0.82	39.55	54.00	-14.45	AV	Horizontal
		High Ch	annel (2480MHz)-	Above 1G		1	
4960.136	58.55	-3.59	62.14	74.00	-11.86	Pk	Vertical
4960.136	39.39	-3.59	42.98	54.00	-11.02	AV	Vertical
7440.231	52.02	-0.68	52.70	74.00	-21.30	Pk	Vertical
7440.231	36.24	-0.68	36.92	54.00	-17.08	AV	Vertical
4960.142	58.42	-3.59	62.01	74.00	-11.99	Pk	Horizontal
4960.142	39.54	-3.59	43.13	54.00	-10.87	AV	Horizontal
7440.015	51.89	-0.68	52.57	74.00	-21.43	Pk	Horizontal
7440.015	35.75	-0.68	36.43	54.00	-17.57	AV	Horizontal

Note: Mode 1Mbps is the worst mod.



4. NUMBER OF HOPPING CHANNEL

4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C					
Section	Test Item	Limit	Frequency Range (MHz)	Result	
15.247 (a)(1)(iii)	Number of Hopping Channel	≥15	2400-2483.5	PASS	

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	= the frequency band of operation
RB	RBW=100kHz
VB	$VBW \ge RBW$
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b. Spectrum Setting: RBW= 100kHz, VBW=100kHz, Sweep time = Auto.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



4.1.4 EUT OPERATION CONDITIONS

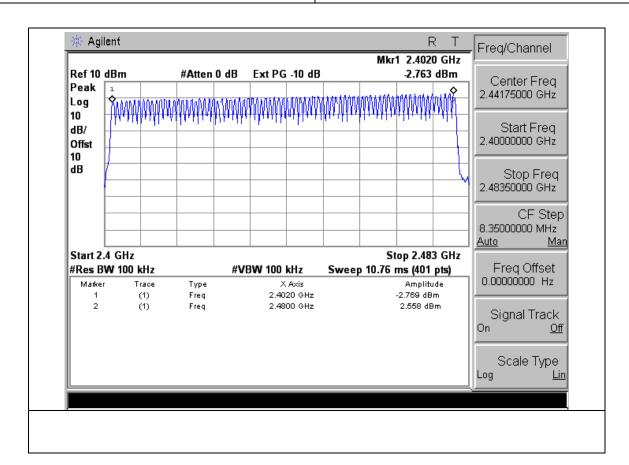
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



4.1.5 TEST RESULTS

EUT:	Tablet pc	Model Name :	HM-1406M
Temperature :	25 ℃	Relative Humidity:	60%
Pressure :	1015 hPa	Test Voltage :	DC 3.7V
Test Mode :	Hopping Mode		

Number of Hopping Channel 79





5. AVERAGE TIME OF OCCUPANCY

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C					
Section	Test Item	Limit	Frequency Range (MHz)	Result	
15.247 (a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS	

5.1.1 TEST PROCEDURE

- a. The transmitter output (antenna port) was connected to the spectrum analyzer
- b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
- d. Sweep Time is more than once pulse time.
- e. Set the center frequency on any frequency would be measure and set the frequency span to
- f. Measure the maximum time duration of one single pulse.
- g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
- h. Measure the maximum time duration of one single pulse.
- i. A Period Time = (channel number)*0.4

 - DH1 Time Slot: Reading * (1600/2)*31.6/(channel number) DH3 Time Slot: Reading * (1600/4)*31.6/(channel number)
 - DH5 Time Slot: Reading * (1600/6)*31.6/(channel number)

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP

EUT	SPECTRUM
	ANALYZER

5.1.4 EUT OPERATION CONDITIONS

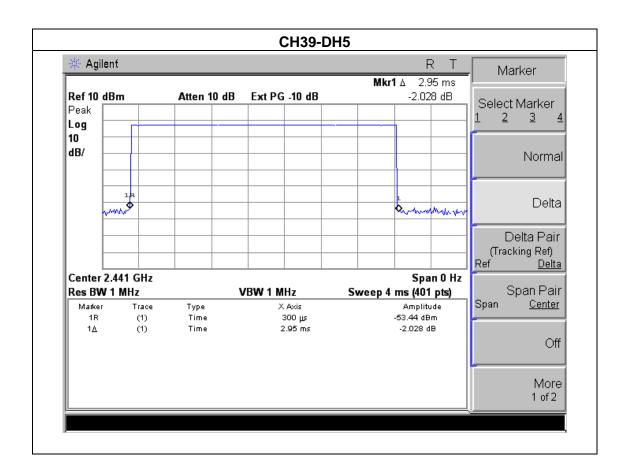
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



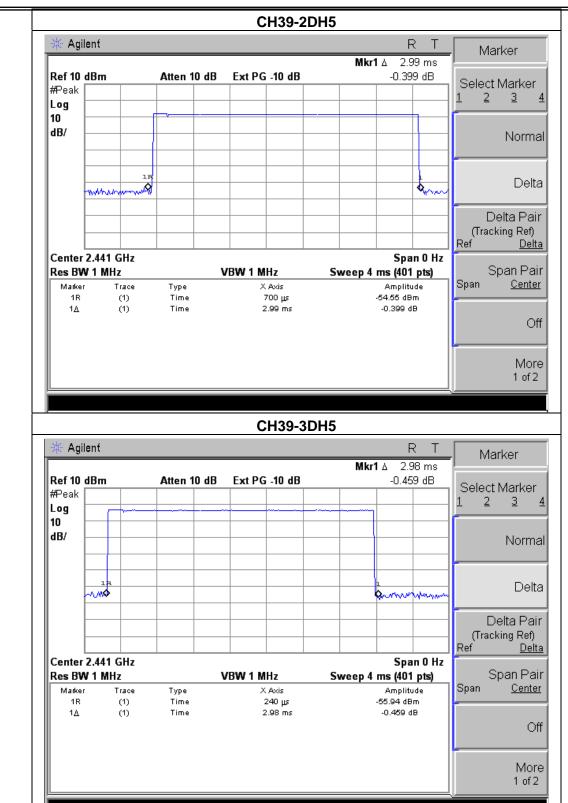
5.1.5 TEST RESULTS

EUT:	Tablet pc	Model Name :	HM-1406M
Temperature :	25 ℃	Relative Humidity:	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH39-DH5 ,2DH5,3DH5	•	

Data Packet	Frequency	Pulse Duration	Dwell Time	Limits
		(ms)	(s)	(s)
DH5	2441 MHz	2.95	0.31	0.4
2DH5	2441 MHz	2.99	0.32	0.4
3DH5	2441 MHz	2.98	0.32	0.4



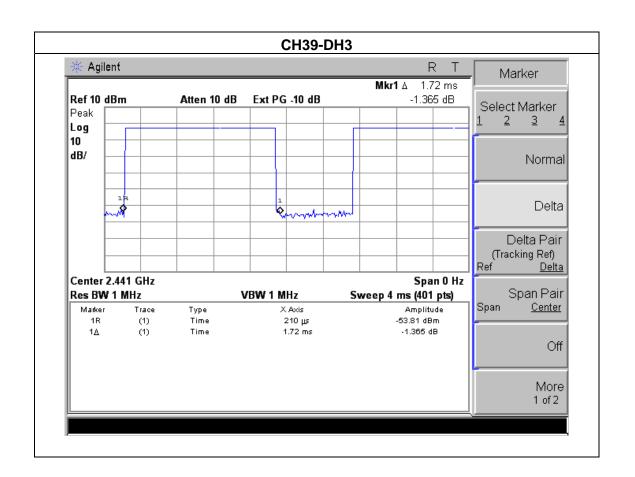




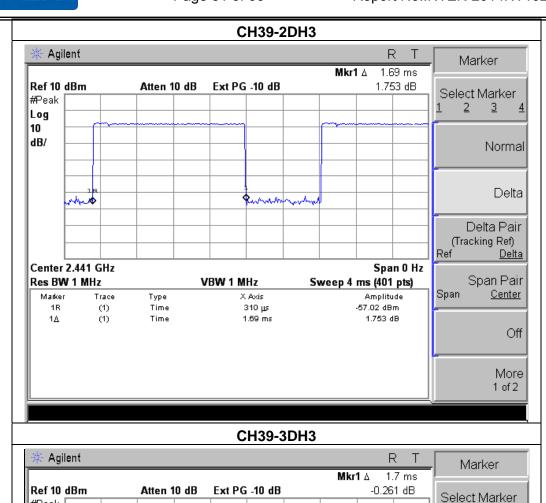


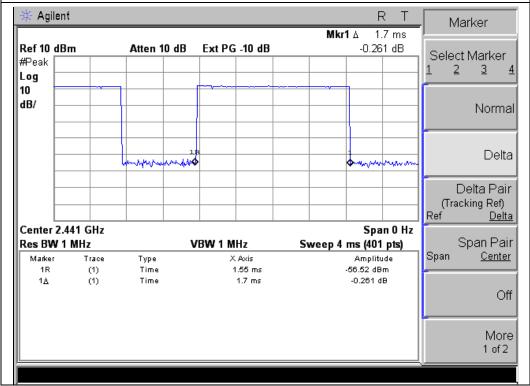
EUT:	Tablet pc	Model Name :	HM-1406M
Temperature :	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH39-DH3,2DH3,3DH3	•	

Data Packet	Frequency	Pulse Duration	Dwell Time	Limits
		(ms)	(s)	(s)
DH3	2441 MHz	1.72	0.28	0.4
2DH3	2441 MHz	1.69	0.27	0.4
3DH3	2441 MHz	1.70	0.27	0.4





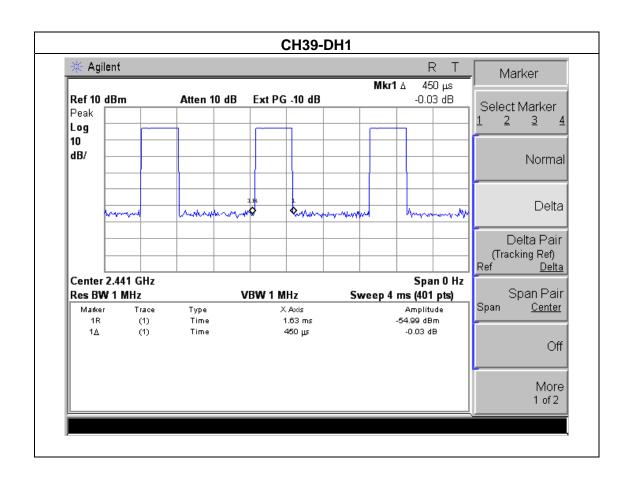




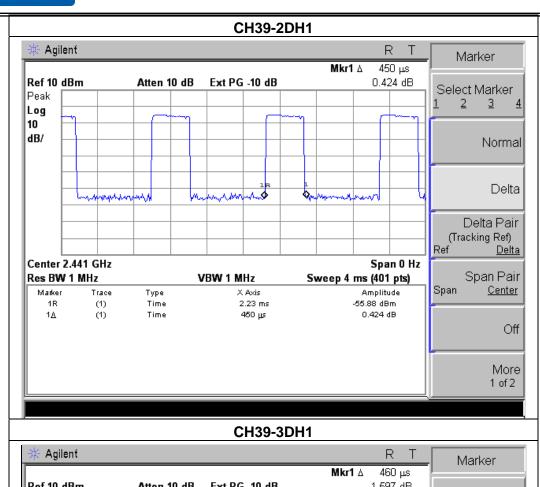


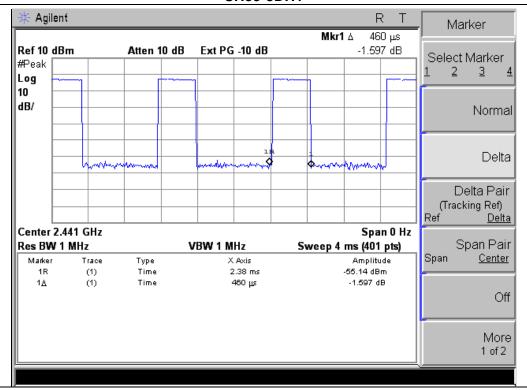
EUT:	Tablet pc	Model Name :	HM-1406M
Temperature :	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH39-DH1,2DH1,3DH1		

Data Packet	Frequency	Pulse Duration	Dwell Time	Limits
		(ms)	(s)	(s)
DH1	2441 MHz	0.45	0.14	0.4
2DH1	2441 MHz	0.45	0.14	0.4
3DH1	2441 MHz	0.46	0.15	0.4











6. HOPPING CHANNEL SEPARATION MEASUREMENT

6.1 APPLIED PROCEDURES / LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

Spectrum Parameter	Setting	
Attenuation	Auto	
Span Frequency	> Measurement Bandwidth or Channel Separation	
RB	30 kHz (Channel Separation)	
VB	100 kHz (Channel Separation)	
Detector	Peak	
Trace	Max Hold	
Sweep Time	Auto	

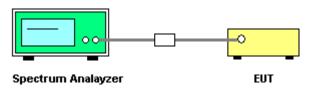
6.1.1 TEST PROCEDURE

- a. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
- b. The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for channel separation measurement.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

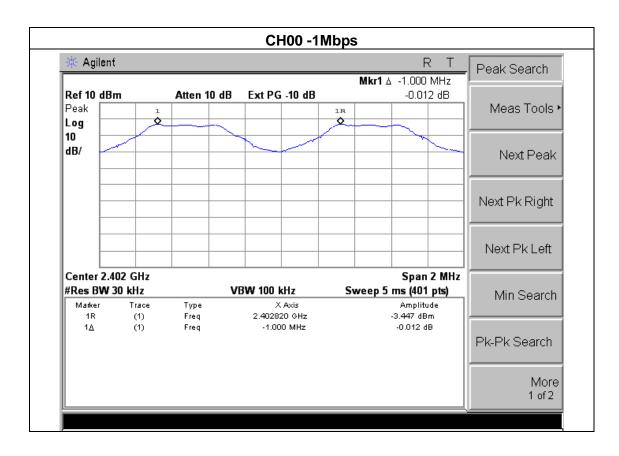


6.1.5 TEST RESULTS

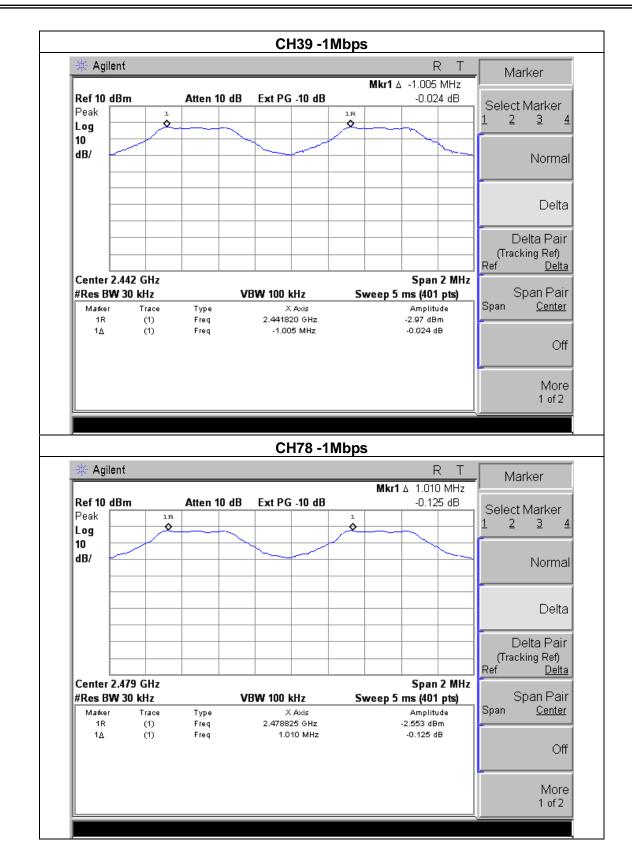
EUT:	Tablet pc	Model Name :	HM-1406M
Temperature:	25 ℃	Relative Humidity:	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /CH78 (1Mbps Mode)		

Frequency	Ch. Separation (MHz)	Result
2402 MHz	1.000	Complies
2441 MHz	1.005	Complies
2480 MHz	1.010	Complies

Ch. Separation Limits: > 20dB bandwidth





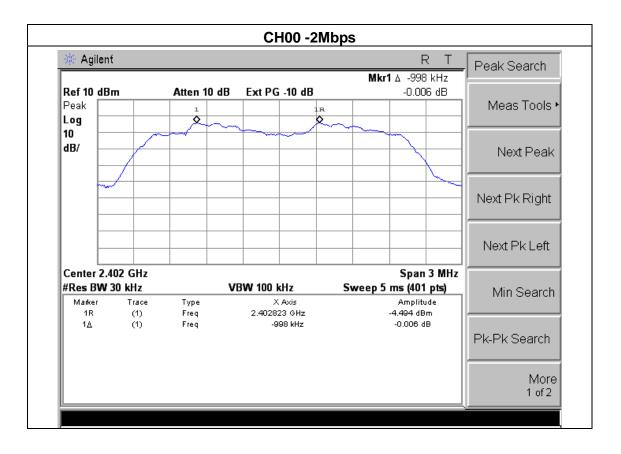




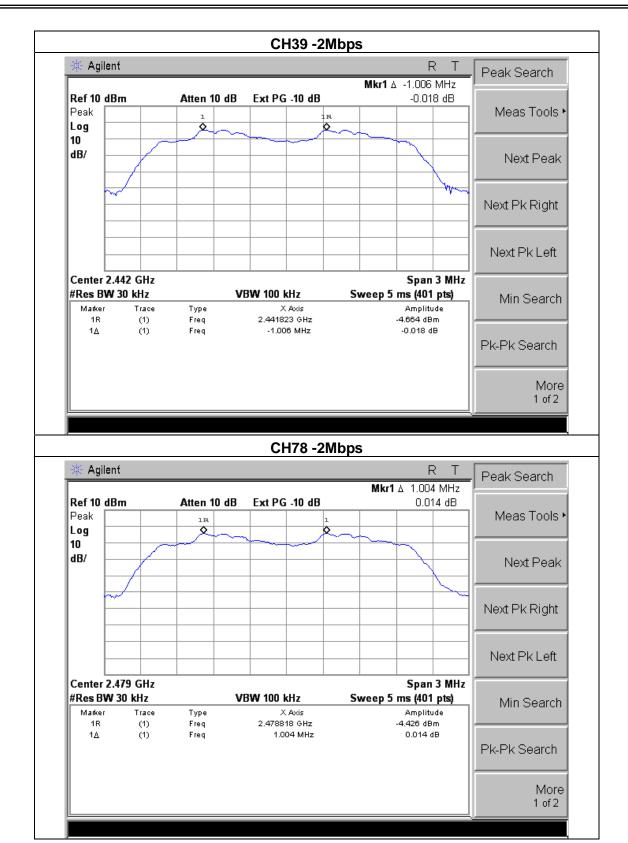
EUT:	Tablet pc	Model Name :	HM-1406M
Temperature :	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /CH78 (2Mbps Mode)		

Frequency	Ch. Separation (MHz)	Result
2402 MHz	0.998	Complies
2441 MHz	1.006	Complies
2480 MHz	1.004	Complies

Ch. Separation Limits: >2/3 of 20dB bandwidth





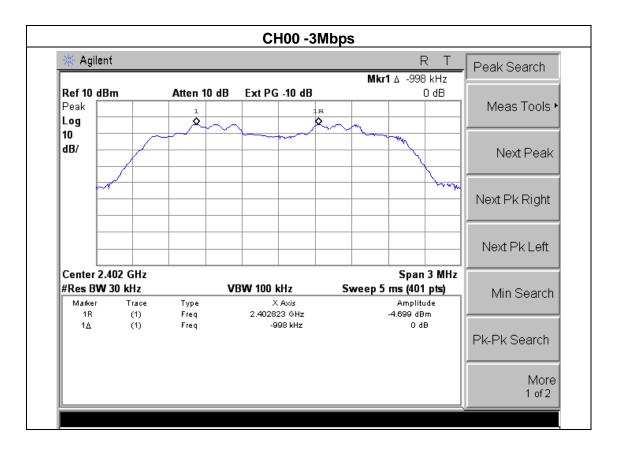




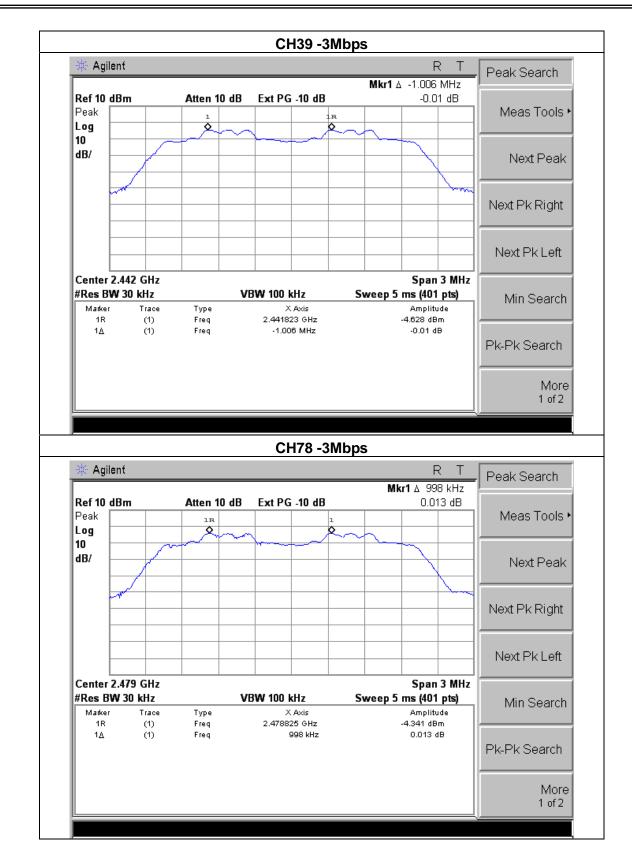
EUT:	Tablet pc	Model Name :	HM-1406M
Temperature :	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /CH78 (3Mbps Mode)		

Frequency	Ch. Separation (MHz)	Result
2402 MHz	0.998	Complies
2441 MHz	1.006	Complies
2480 MHz	0.998	Complies

Ch. Separation Limits: >2/3 of 20dB bandwidth









7. BANDWIDTH TEST

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section Test Item Limit Frequency Range (MHz) Result				
15.247 (a)(1)	Bandwidth	(20dB bandwidth)	2400-2483.5	PASS

Spectrum Parameter	Setting	
Attenuation	Auto	
Span Frequency	> Measurement Bandwidth or Channel Separation	
RB	10/30 kHz	
VB	30/100 kHz	
Detector	Peak	
Trace	Max Hold	
Sweep Time	Auto	

7.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 10/30KHz, VBW=30/100KHz, Sweep time = Auto.

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 EUT OPERATION CONDITIONS

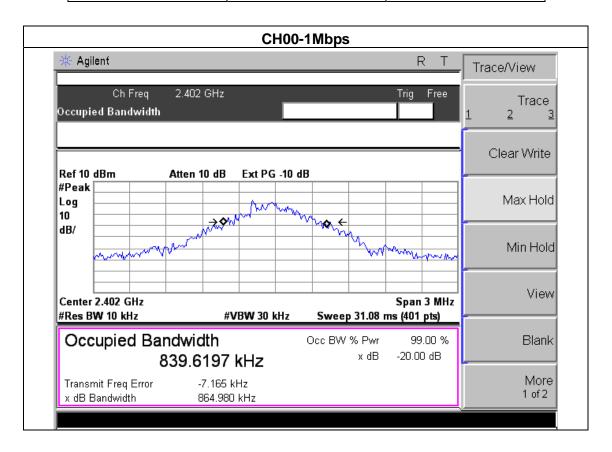
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



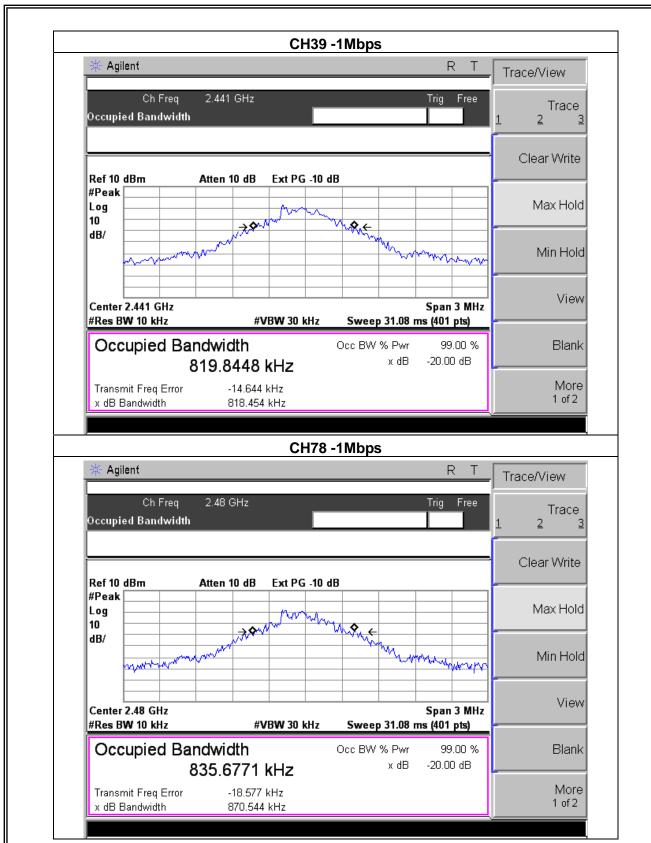
7.1.5 TEST RESULTS

EUT:	Tablet pc	Model Name :	HM-1406M
Temperature :	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /C78(1Mbps)		

Frequency	20dB Bandwidth (kHz)	Result
2402 MHz	864.980	PASS
2441 MHz	818.454	PASS
2480 MHz	870.544	PASS



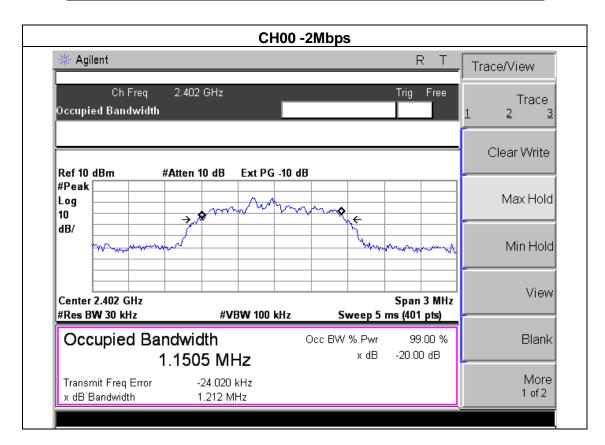




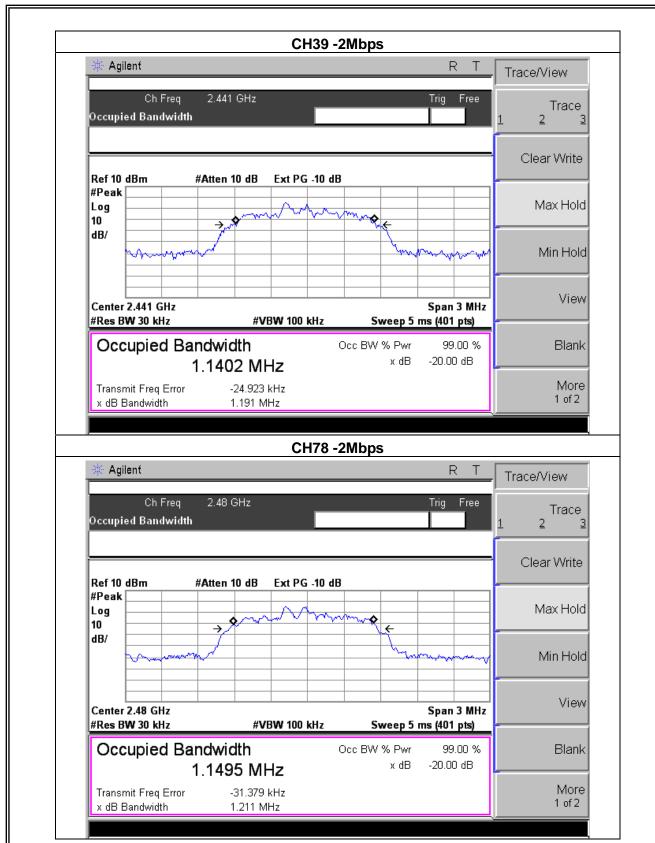


EUT:	Tablet pc	Model Name :	HM-1406M
Temperature :	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /C78(2Mbps)		

Frequency	20dB Bandwidth (MHz)	Result
2402 MHz	1.212	PASS
2441 MHz	1.191	PASS
2480 MHz	1.211	PASS



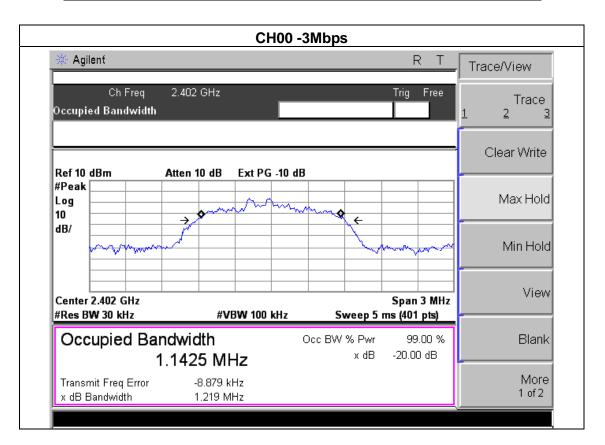




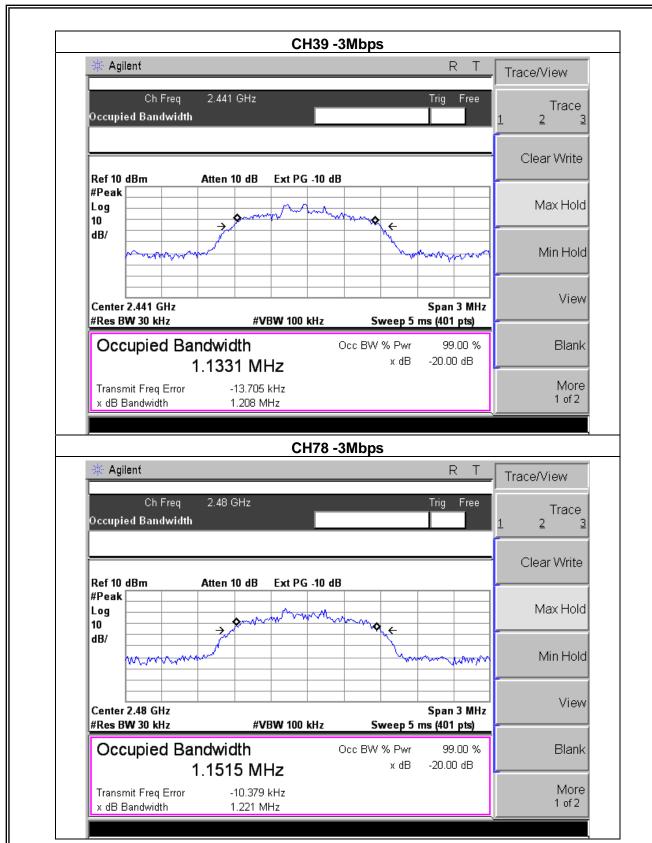


EUT:	Tablet pc	Model Name :	HM-1406M
Temperature :	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /C78 (3Mbps)		

Frequency	20dB Bandwidth (MHz)	Result
2402 MHz	1.219	PASS
2441 MHz	1.208	PASS
2480 MHz	1.221	PASS









8. PEAK OUTPUT POWER TEST

8.1 APPLIED PROCEDURES / LIMIT

	FCC	Part15 (15.247) , Sub	part C	
Section Test Item Limit		Frequency Range (MHz)	Result	
15.247 (b)(i)	Peak Output Power	0.125w or 1W	2400-2483.5	PASS

8.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW > the 20 dB bandwidth of the emission being measured

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

 $VBW \geq RBW$

Sweep = auto

Detector function = peak

Trace = max hold

8.1.2 DEVIATION FROM STANDARD

No deviation.

8.1.3 TEST SETUP

EUT	SPECTRUM
	ANALYZER

8.1.4 EUT OPERATION CONDITIONS

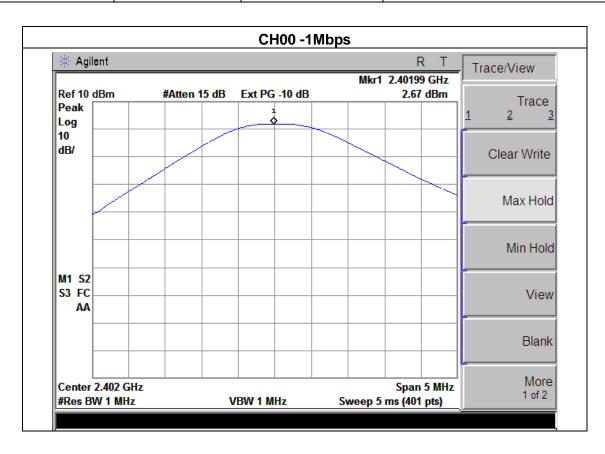
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



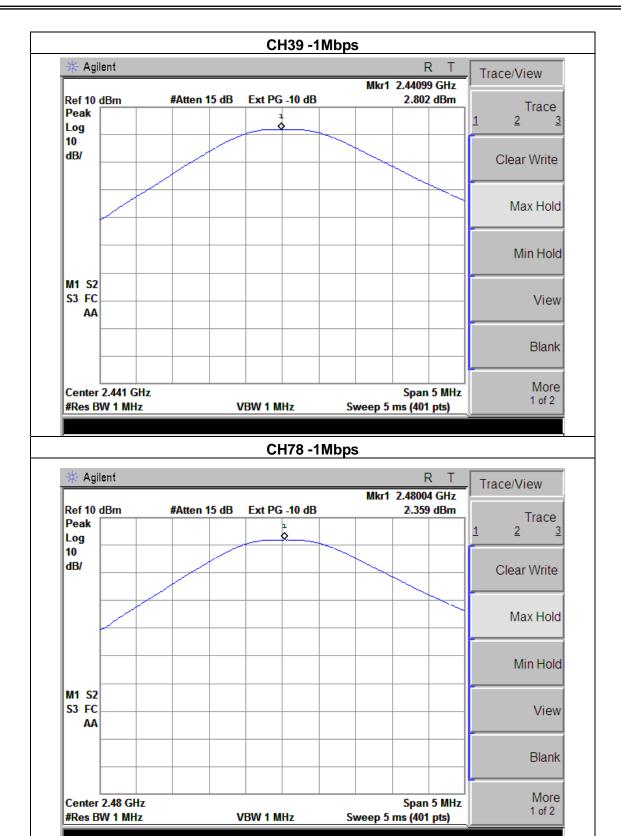
8.1.5 TEST RESULTS

EUT:	Tablet pc	Model Name :	HM-1406M
Temperature :	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00/ CH39 /CH78 (1M/2M/3N	/lbps Mode)	

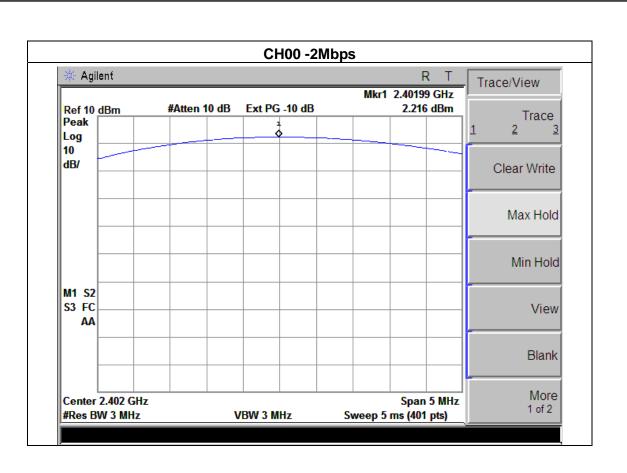
		1Mbps	
Test Channel	Frequency	Peak Output Power	LIMIT
TOST OTIAITIE	(MHz)	(dBm)	(dBm)
CH00	2402	2.670	30
CH39	2441	2.802	30
CH78	2480	2.359	30
		2Mbps	
CH00	2402	2.216	20.96
CH39	2441	2.423	20.96
CH78	2480	2.889	20.96
		3Mbps	
CH00	2402	2.385	20.96
CH39	2441	2.539	20.96
CH78	2480	2.192	20.96



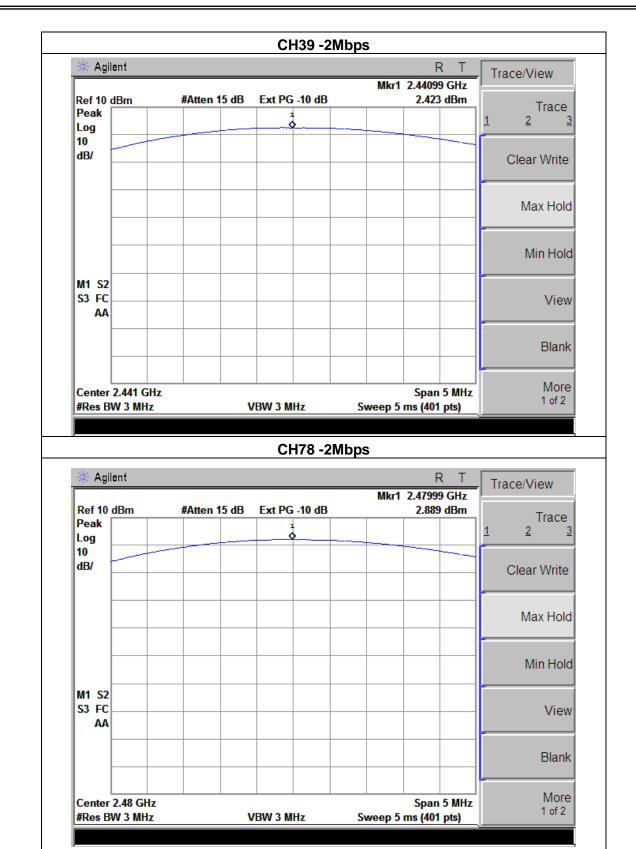




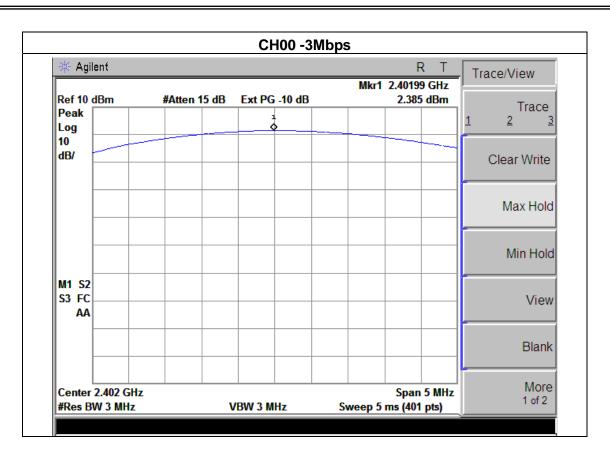




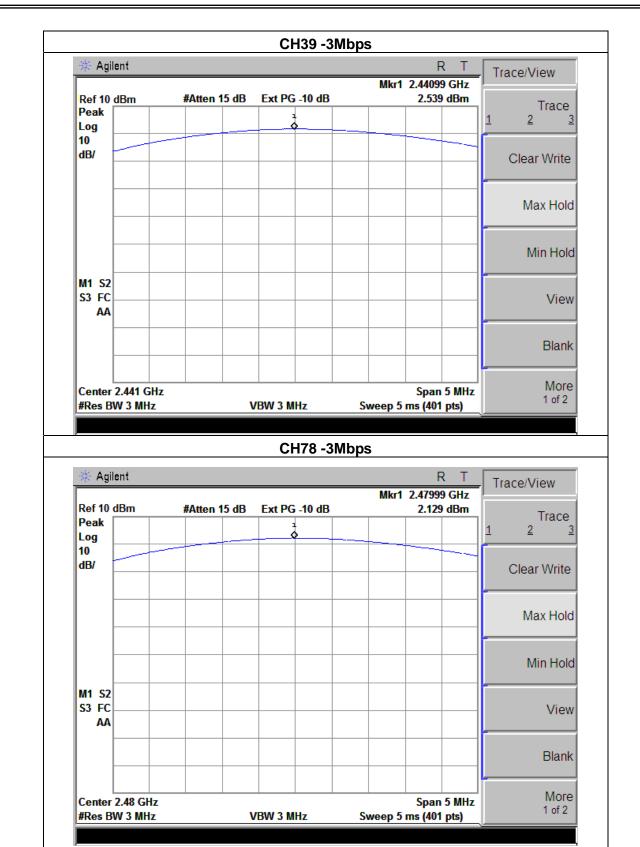














9. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE APPLICABLE STANDARD

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

TEST PROCEDURE

- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument 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 RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- e) Repeat above procedures until all measured frequencies were complete.

9.1 DEVIATION FROM STANDARD

No deviation.

9.2 TEST SETUP

EUT	SPECTRUM
	ANALYZER

9.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



9.4 TEST RESULTS

EUT:	Tablet pc	Model Name :	HM-1406M
Temperature :	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00/ CH78 (1M/2M/3Mbps M	ode)	

Frequency Band	Delta Peak to band emission (dBc)	>Limit (dBc)	Result
	1Mbps Non-hopp	oing	
Left-band	50.17	20	Pass
Right-band	53.44	20	Pass
	2Mbps Non-hopp	oing	
Left-band	50.90	20	Pass
Right-band	52.13	20	Pass
	3Mbps Non-hopp	ping	
Left-band	50.84	20	Pass
Right-band	51.68	20	Pass
	1Mbps hopping	g	
Left-band	50.33	20	Pass
Right-band	44.10	20	Pass
	2Mbps hopping	g	
Left-band	48.99	20	Pass
Right-band	48.11	20	Pass
	3Mbps hopping	g	
Left-band	49.52	20	Pass
Right-band	51.26	20	Pass



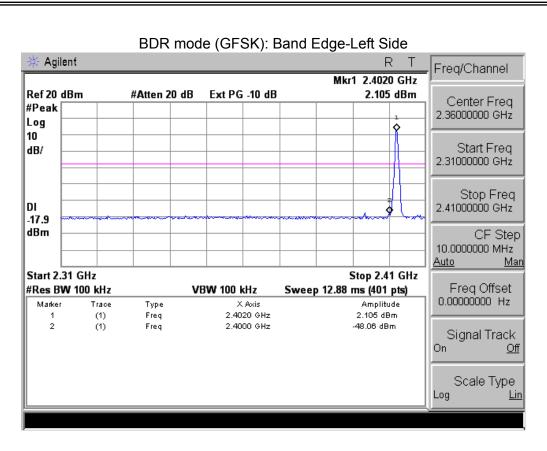
Radiated band edge:

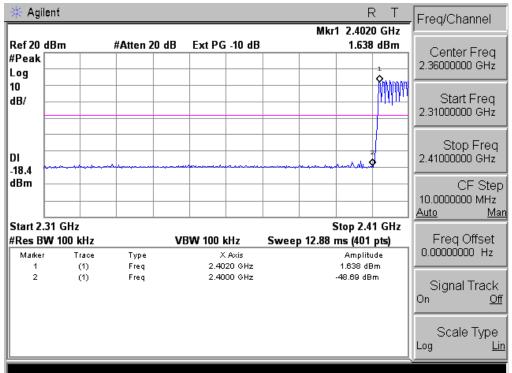
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector	Cammant
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	Comment
			1Mbps(Non-FHSS)			
2390	56.49	-13.06	43.43	74.00	-30.57	peak	Vertical
2390	55.62	-13.06	42.56	74.00	-31.44	peak	Horizontal
2483.5	56.37	-12.78	43.59	74.00	-30.41	peak	Vertical
2483.5	55.68	-12.78	42.90	74.00	-31.10	peak	Horizontal
			2Mbps(Non-FHSS)			
2390	55.28	-13.06	42.22	74.00	-31.78	peak	Vertical
2390	55.61	-13.06	42.55	74.00	-31.45	peak	Horizontal
2483.5	57.14	-12.78	44.36	74.00	-29.64	peak	Vertical
2483.5	57.51	-12.78	44.73	74.00	-29.27	peak	Horizontal
			3Mbps(Non-FHSS)			
2390	57.71	-13.06	44.65	74.00	-29.35	peak	Vertical
2390	56.88	-13.06	43.82	74.00	-30.18	peak	Horizontal
2483.5	55.67	-12.78	42.89	74.00	-31.11	peak	Vertical
2483.5	36.59	-12.78	23.81	74.00	-50.19	peak	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector	Commont
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	Comment
			1Mbps(FHSS)				
2390	55.64	-13.06	42.58	74.00	-31.42	peak	Vertical
2390	54.77	-13.06	41.71	74.00	-32.29	peak	Horizontal
2483.5	55.52	-12.78	42.74	74.00	-31.26	peak	Vertical
2483.5	54.83	-12.78	42.05	74.00	-31.95	peak	Horizontal
			2Mbps(FHSS)				
2390	54.37	-13.06	41.31	74.00	-32.69	peak	Vertical
2390	54.7	-13.06	41.64	74.00	-32.36	peak	Horizontal
2483.5	56.23	-12.78	43.45	74.00	-30.55	peak	Vertical
2483.5	56.6	-12.78	43.82	74.00	-30.18	peak	Horizontal
			3Mbps(FHSS)				
2390	56.82	-13.06	43.76	74.00	-30.24	peak	Vertical
2390	55.99	-13.06	42.93	74.00	-31.07	peak	Horizontal
2483.5	54.78	-12.78	42.00	74.00	-32.00	peak	Vertical
2483.5	35.7	-12.78	22.92	74.00	-51.08	peak	Horizontal

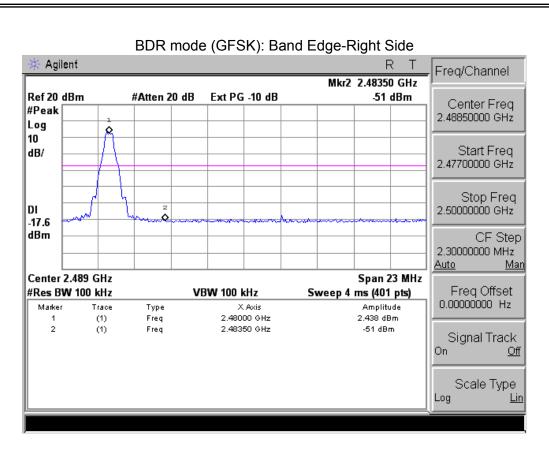
Note: Refer to chapter 3.2 test method, When PK value is lower than the Average value limit, average didn't record.

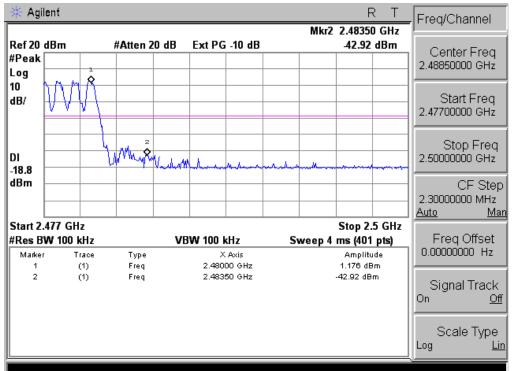




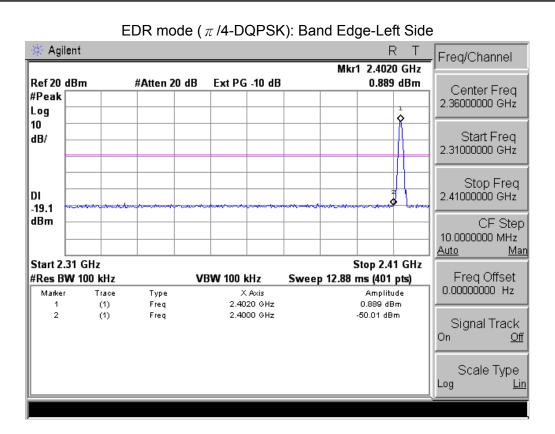


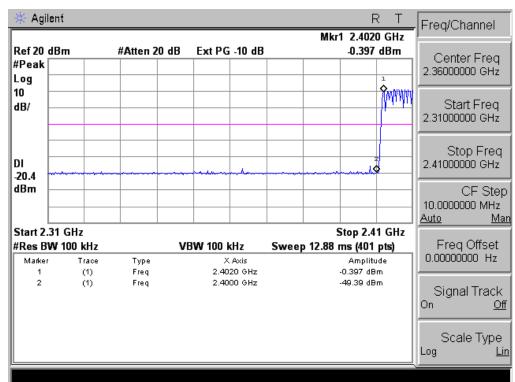




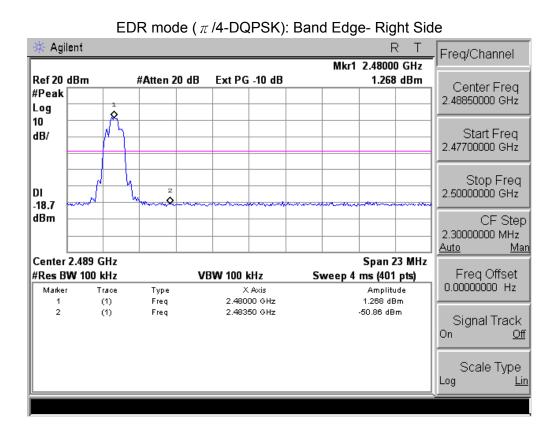


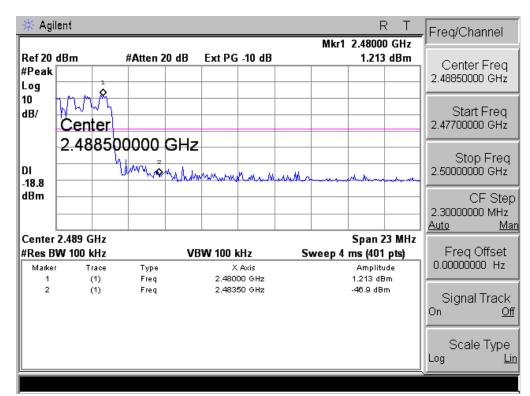




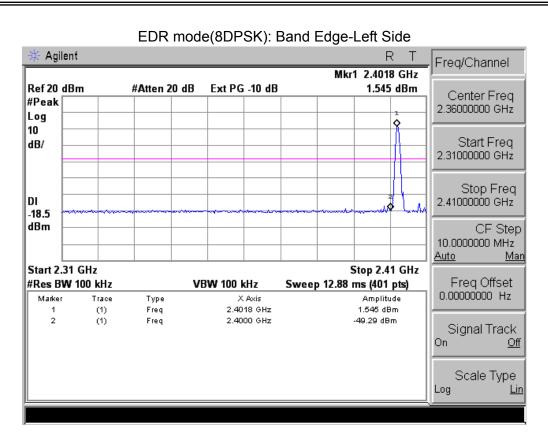


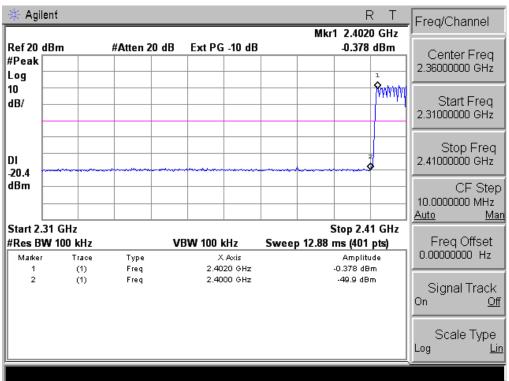




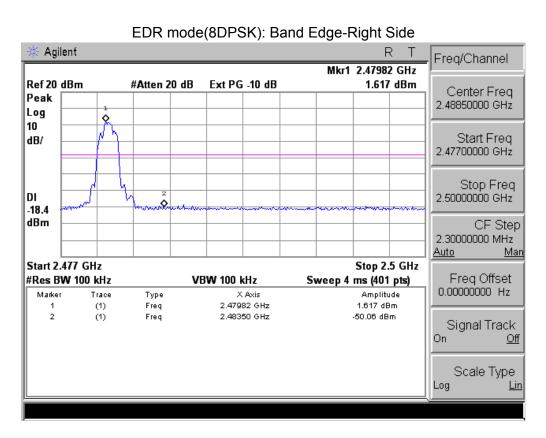


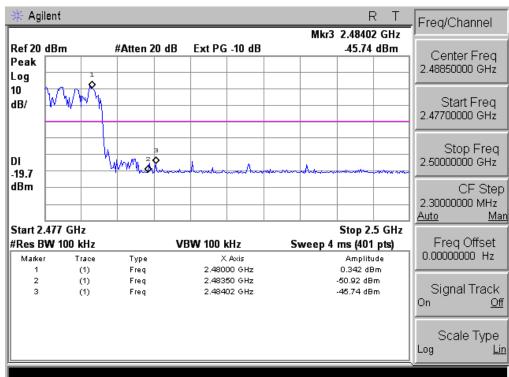












NOTE: Hopping enabled and disabled have evaluated, and the wortest data was reported



10. ANTENNA REQUIREMENT

10.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

10.2 EUT ANTENNA

The EUT antenna is FPCB Antenna. It comply with the standard requirement



11. EUT TEST PHOTO

