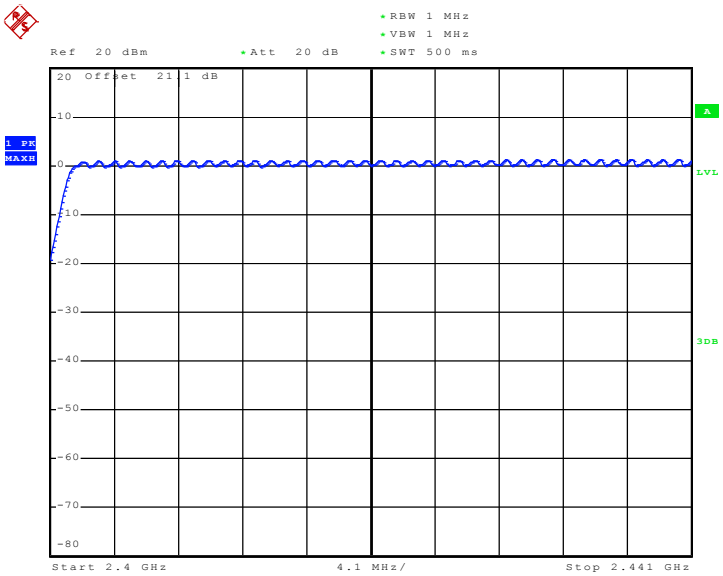
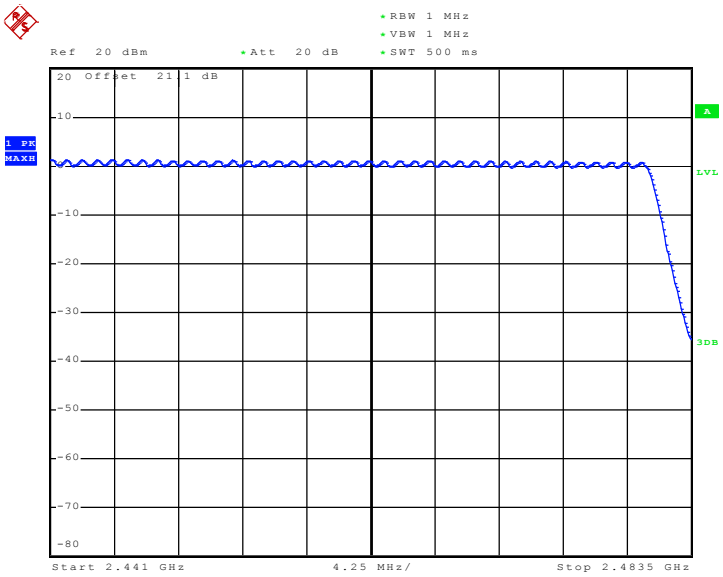
Number of Hopping Channel Plot on Channel 00 - 78



Date: 22.DEC.2010 20:48:43



Date: 22.DEC.2010 20:56:58

3.2 20dB and 99% Bandwidth Measurement

3.2.1 Limit of 20dB Bandwidth

N/A

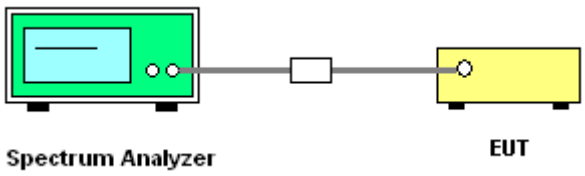
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. Use the following spectrum analyzer settings:
   Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel;
   RBW ≥ 1% of the 20 dB bandwidth; VBW ≥ RBW; Sweep = auto; Detector function = peak;
   Trace = max hold.
5. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

3.2.4 Test Setup

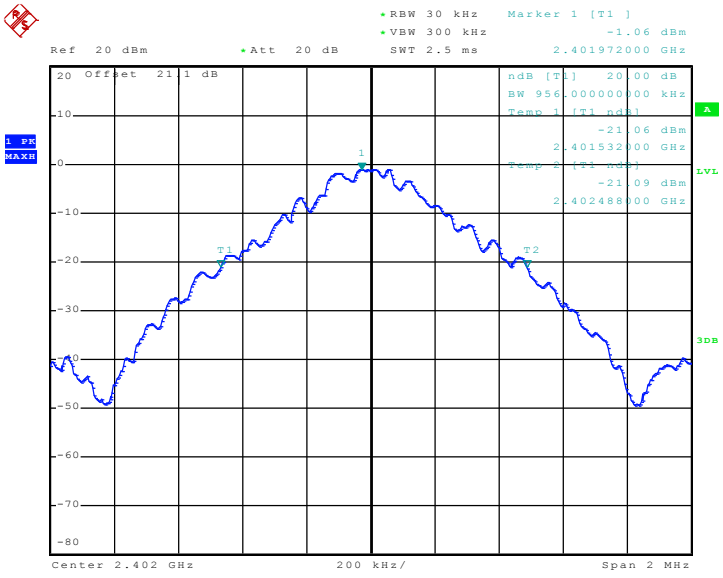


3.2.5 Test Result of 20dB Bandwidth

Test Mode :	Mode 1~3	Temperature :	22~24℃
Test Engineer :	Hank Yu	Relative Humidity :	40~43%

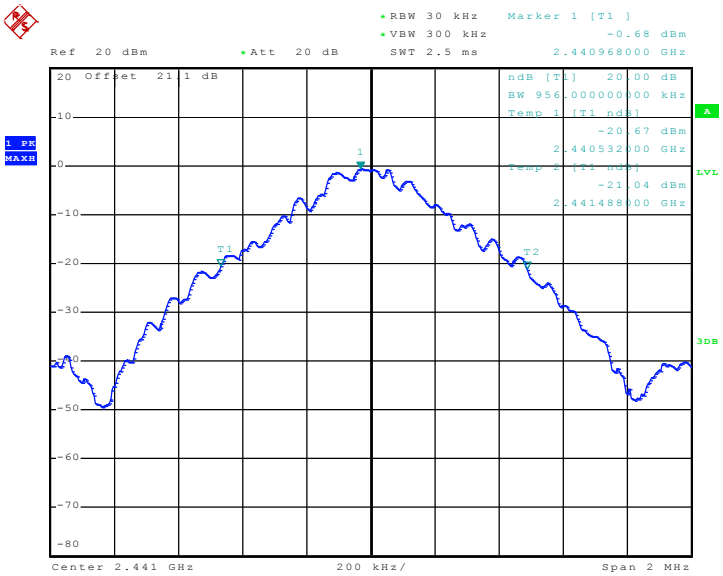
Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	0.956
39	2441	0.956
78	2480	0.956

20 dB Bandwidth Plot on Channel 00



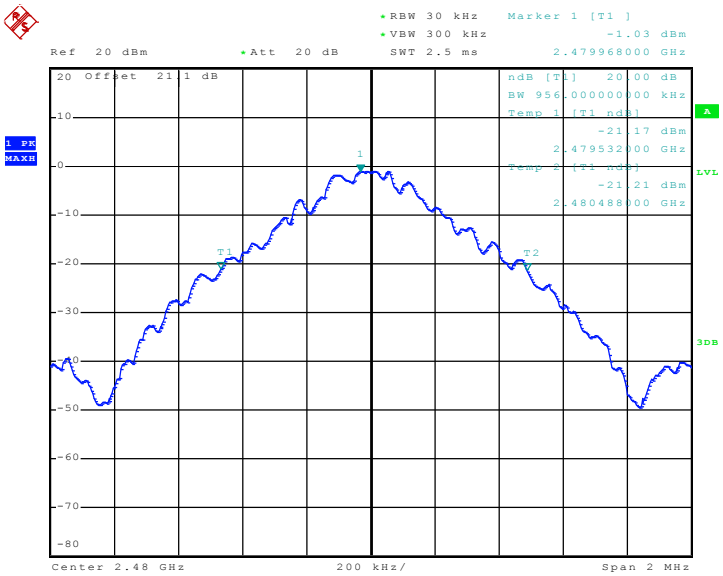
Date: 22.DEC.2010 21:17:52

20 dB Bandwidth Plot on Channel 39



Date: 22.DEC.2010 21:16:42

20 dB Bandwidth Plot on Channel 78

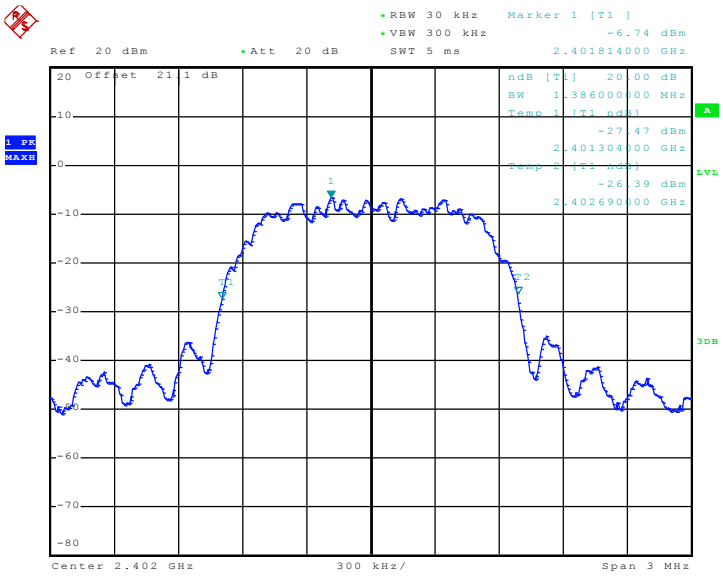


Date: 22.DEC.2010 21:15:03

Test Mode :	Mode 4~6	Temperature :	22~24℃
Test Engineer :	Hank Yu	Relative Humidity :	40~43%

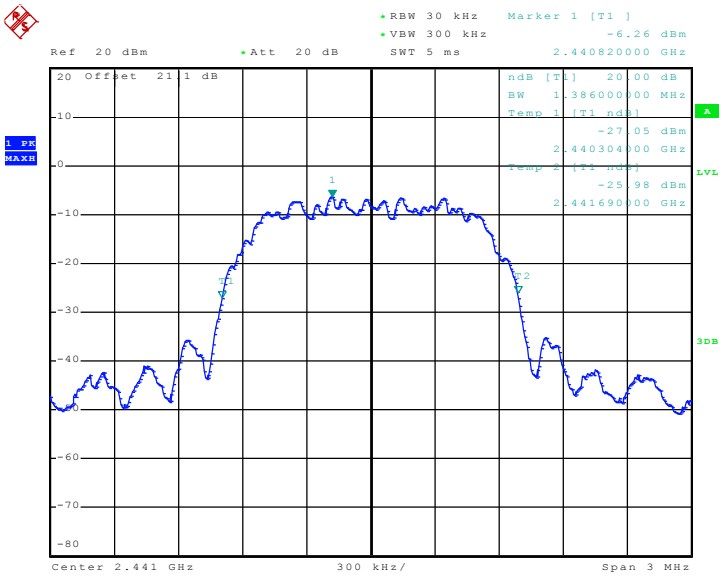
Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.386
39	2441	1.386
78	2480	1.386

20 dB Bandwidth Plot on Channel 00



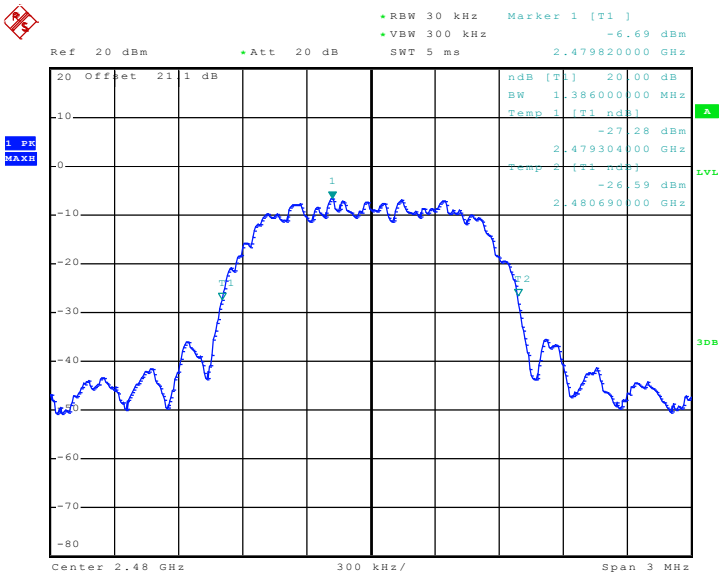
Date: 22.DEC.2010 21:11:35

20 dB Bandwidth Plot on Channel 39



Date: 22.DEC.2010 21:12:46

20 dB Bandwidth Plot on Channel 78

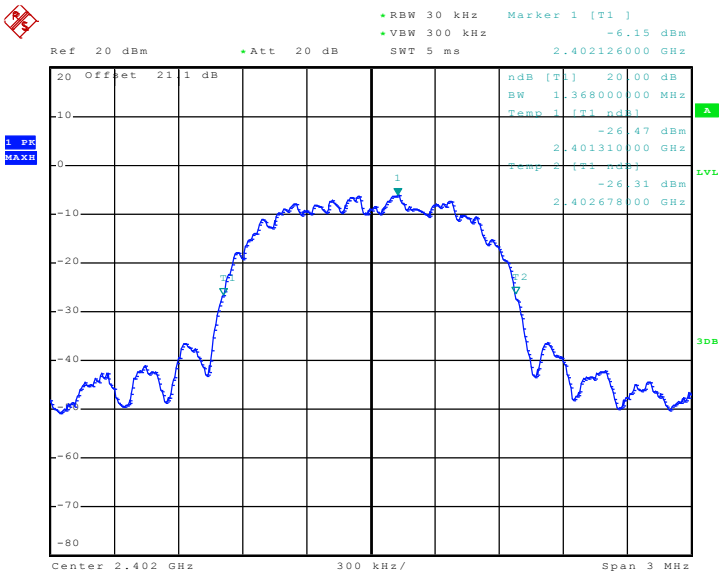


Date: 22.DEC.2010 21:13:48

Test Mode :	Mode 7~9	Temperature :	22~24℃
Test Engineer :	Hank Yu	Relative Humidity :	40~43%

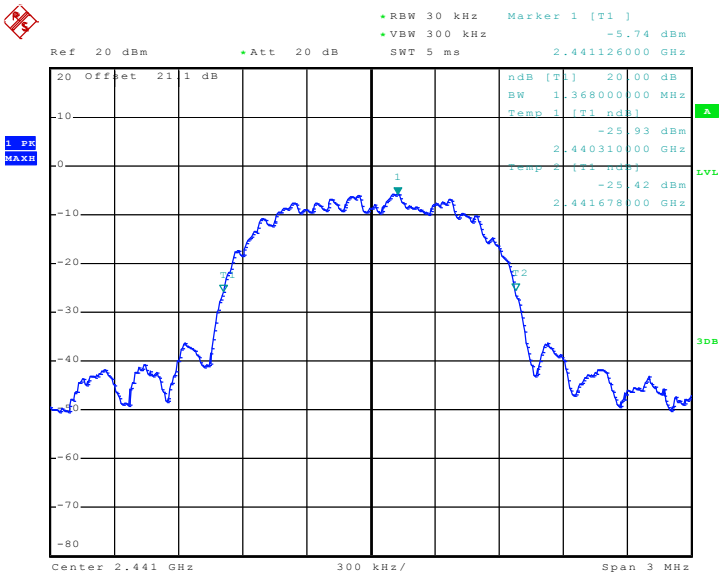
Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.368
39	2441	1.368
78	2480	1.362

20 dB Bandwidth Plot on Channel 00



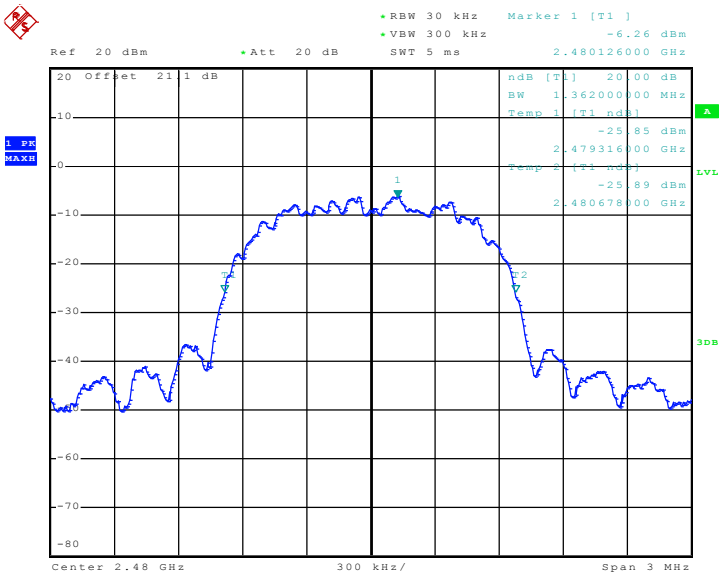
Date: 22.DEC.2010 21:10:24

20 dB Bandwidth Plot on Channel 39



Date: 22.DEC.2010 21:07:42

20 dB Bandwidth Plot on Channel 78



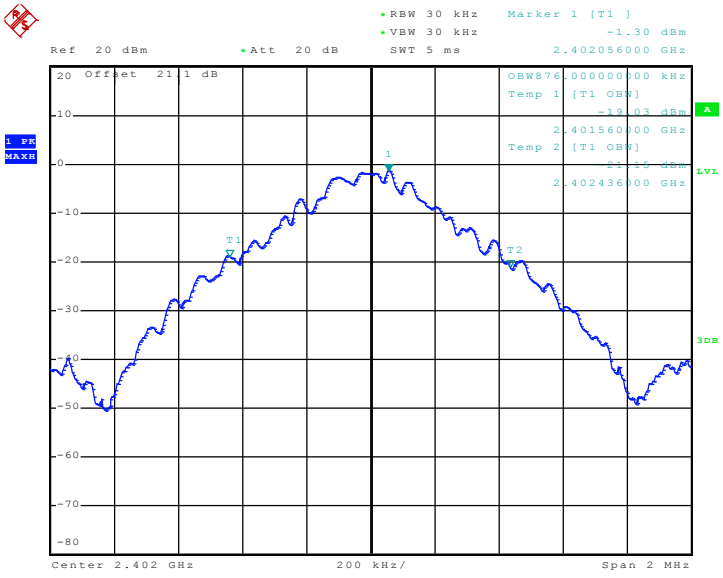
Date: 22.DEC.2010 21:09:11

3.2.6 Test Result of 99% Occupied Bandwidth

Test Mode :	Mode 1~3	Temperature :	22~24℃
Test Engineer :	Hank Yu	Relative Humidity :	40~43%

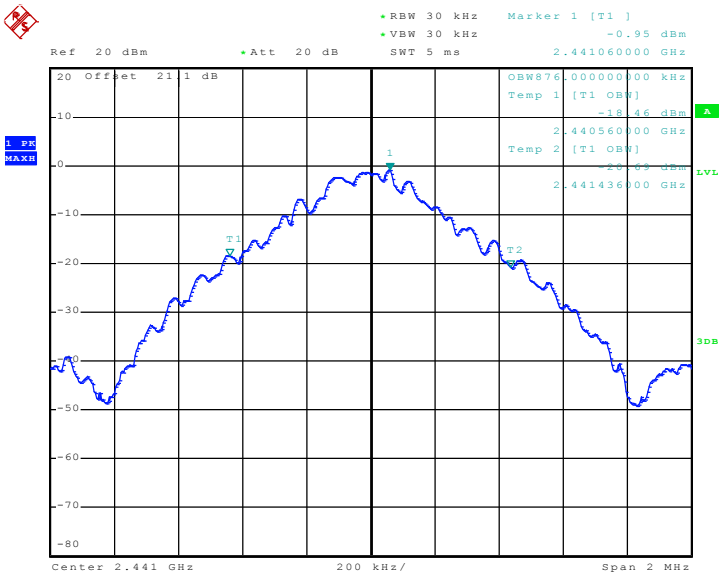
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	0.876
39	2441	0.876
78	2480	0.876

99% Bandwidth Plot on Channel 00



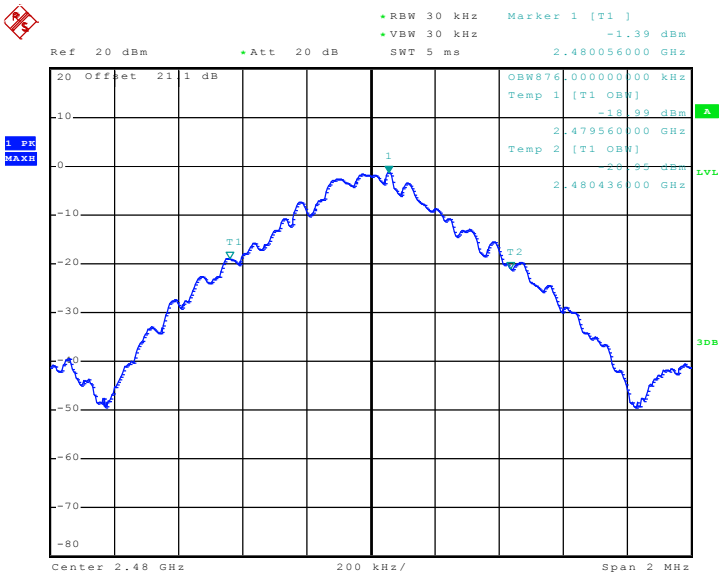
Date: 22.DEC.2010 21:28:00

99% Occupied Bandwidth Plot on Channel 39



Date: 22.DEC.2010 21:29:14

99% Occupied Bandwidth Plot on Channel 78

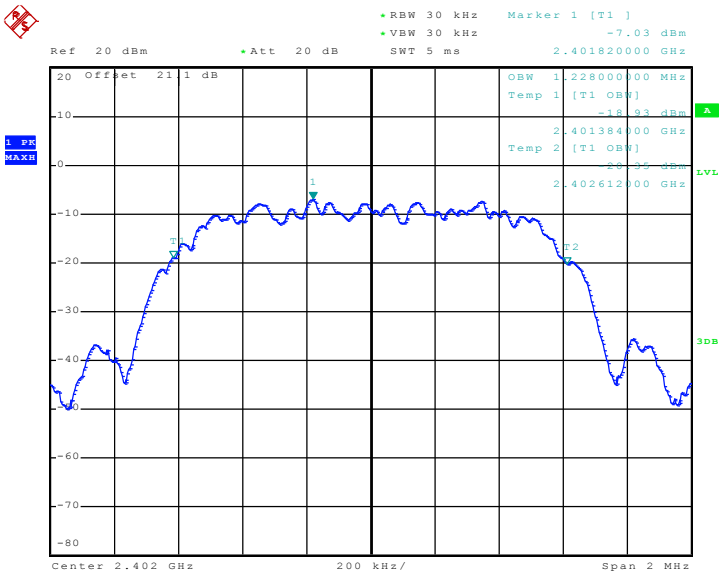


Date: 22.DEC.2010 21:26:54

Test Mode :	Mode 4~6	Temperature :	22~24℃
Test Engineer :	Hank Yu	Relative Humidity :	40~43%

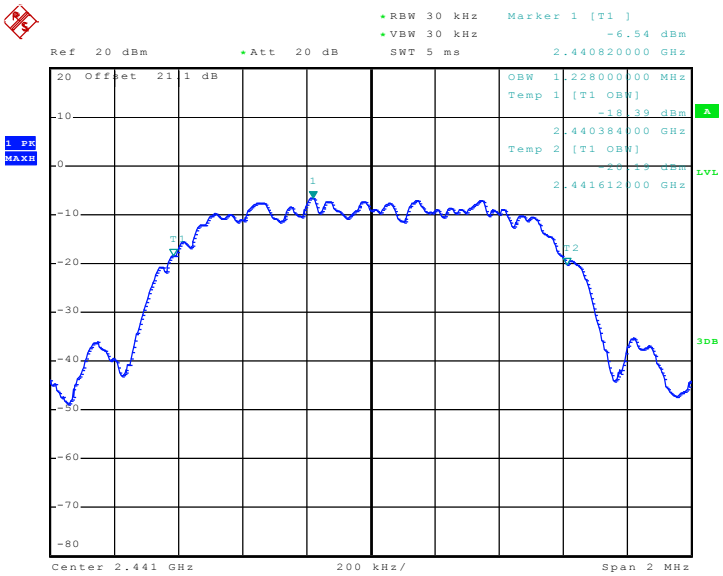
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	1.228
39	2441	1.228
78	2480	1.228

99% Bandwidth Plot on Channel 00



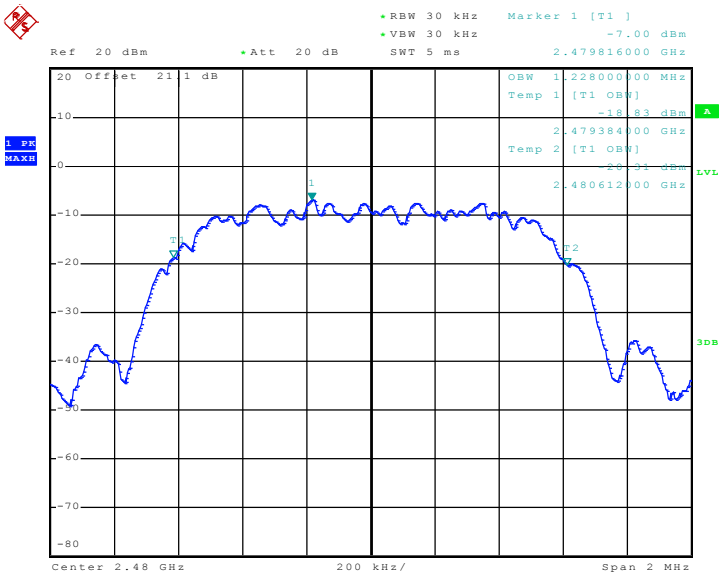
Date: 22.DEC.2010 21:35:19

99% Occupied Bandwidth Plot on Channel 39



Date: 22.DEC.2010 21:30:37

99% Occupied Bandwidth Plot on Channel 78

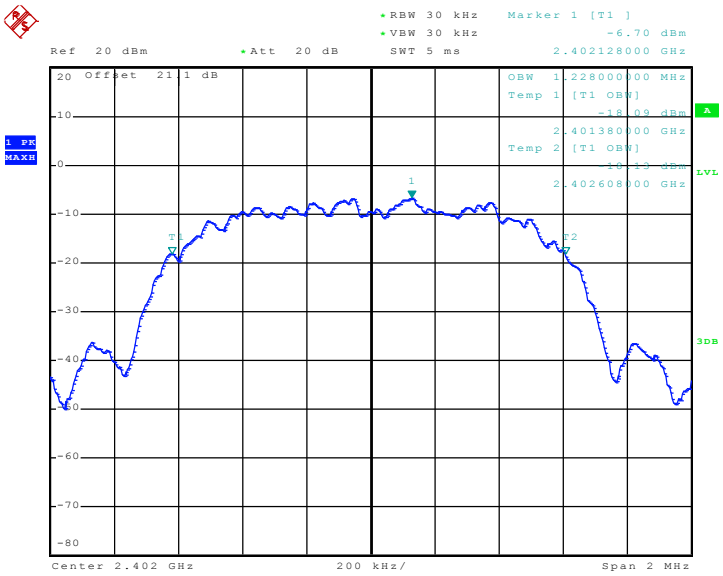


Date: 22.DEC.2010 21:34:21

Test Mode :	Mode 7~9	Temperature :	22~24℃
Test Engineer :	Hank Yu	Relative Humidity :	40~43%

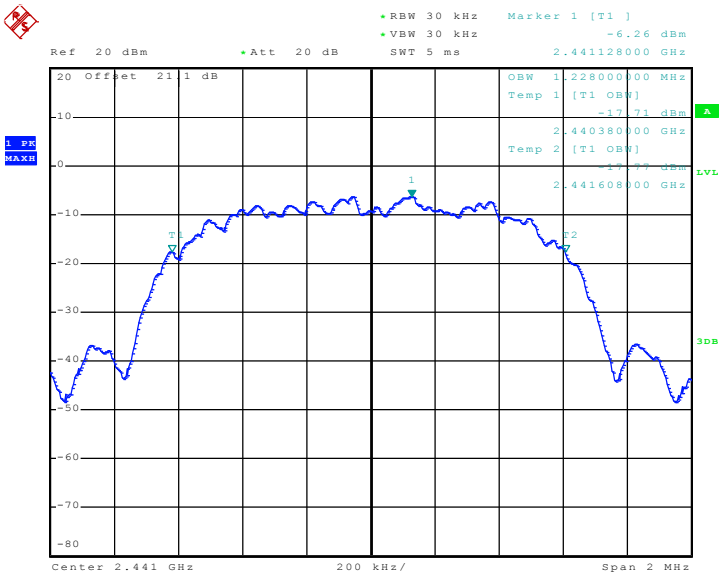
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
00	2402	1.228
39	2441	1.228
78	2480	1.228

99% Bandwidth Plot on Channel 00



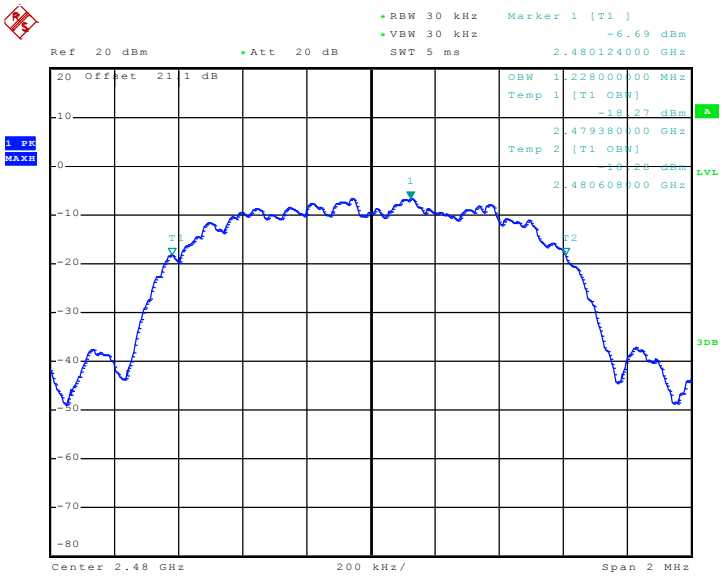
Date: 22.DEC.2010 21:36:18

99% Occupied Bandwidth Plot on Channel 39



Date: 22.DEC.2010 21:32:19

99% Occupied Bandwidth Plot on Channel 78



Date: 22.DEC.2010 21:33:19

3.3 Hopping Channel Separation Measurement

3.3.1 Limit of Hopping Channel Separation

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.

3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. Please refer FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peaks of two adjacent channels; RBW ≥ 1% of the span; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
5. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

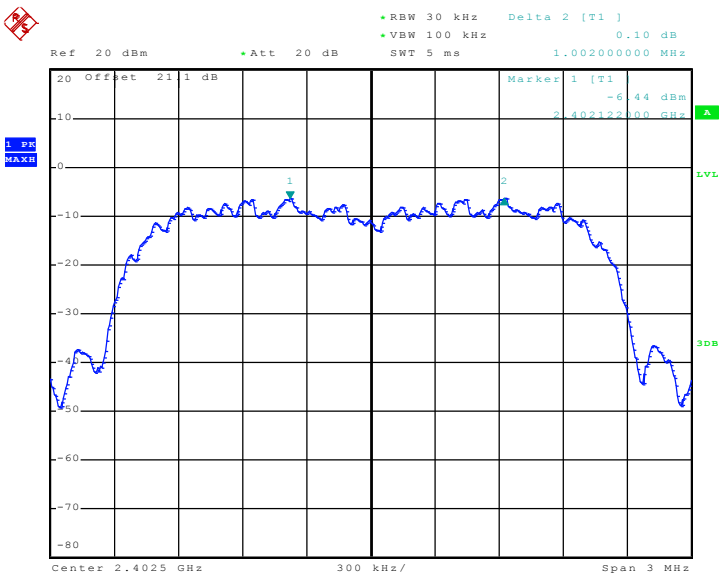
3.3.4 Test Setup

3.3.5 Test Result of Hopping Channel Separation

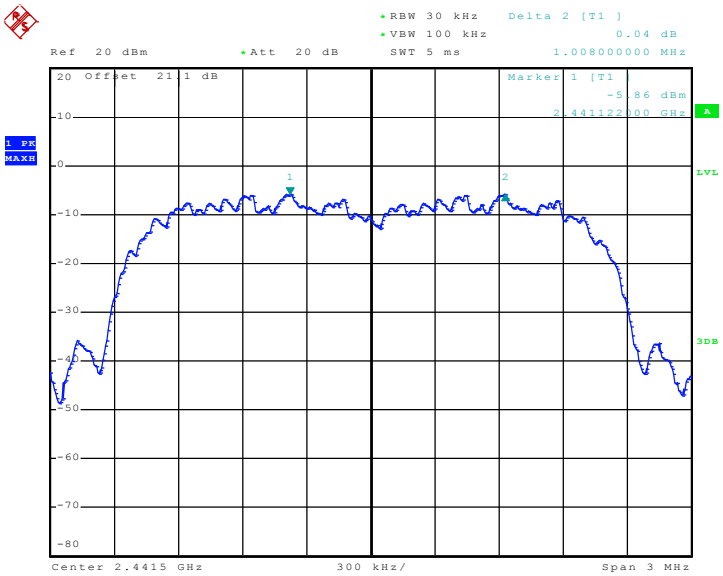
Test Mode :	Mode 7~9	Temperature :	22~24℃
Test Engineer :	Hank Yu	Relative Humidity :	40~43%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.002	0.912	Pass
39	2441	1.008	0.912	Pass
78	2480	1.002	0.908	Pass

Channel Separation Plot on Channel 00 - 01

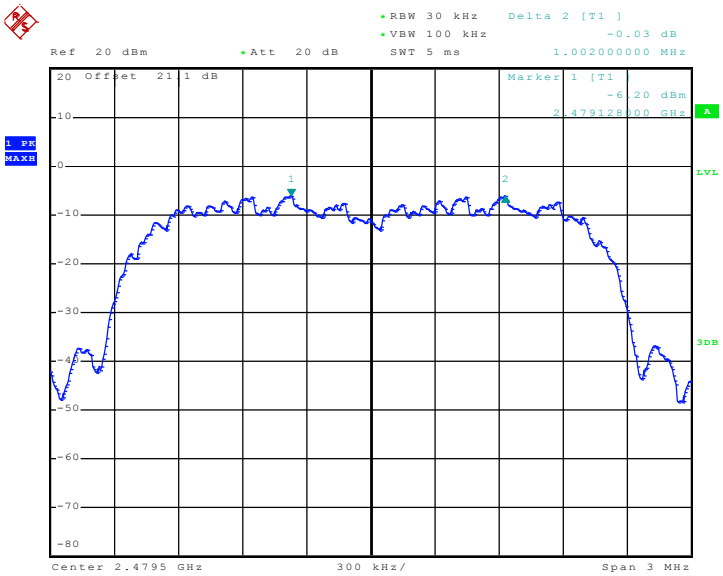


Channel Separation Plot on Channel 39 - 40



Date: 22.DEC.2010 22:24:29

Channel Separation Plot on Channel 77 - 78



Date: 22.DEC.2010 22:20:51

3.4 Dwell Time Measurement

3.4.1 Limit of Dwell Time

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.

3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW ≥ RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.
5. Use the marker-delta function to calculate the dwell time.

3.4.4 Test Setup

3.4.5 Test Result of Dwell Time

Test Mode :	Mode 8	Temperature :	22~24℃
Test Engineer :	Hank Yu	Relative Humidity :	40~43%

Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
3DH5	3.30	1176.50	0.12	0.4	Pass

Remark:

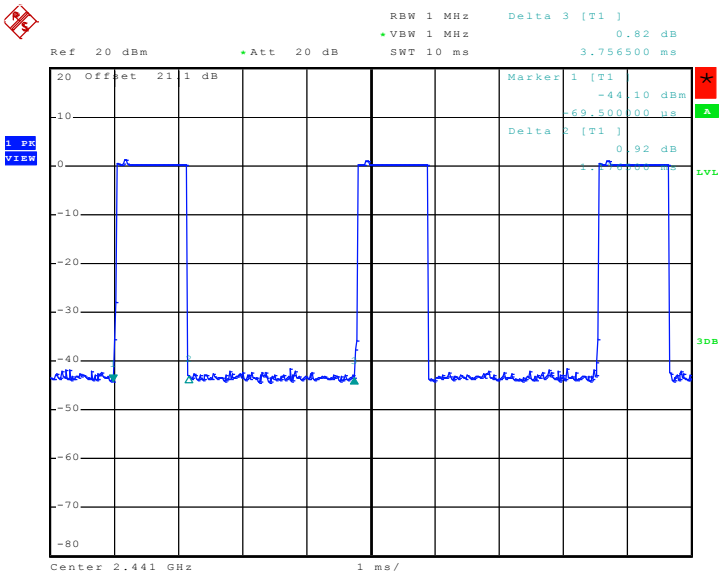
1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time

2. 79 channels come from the Hopping Channel number.

3. Average Hopping Channel = hops/sweep time

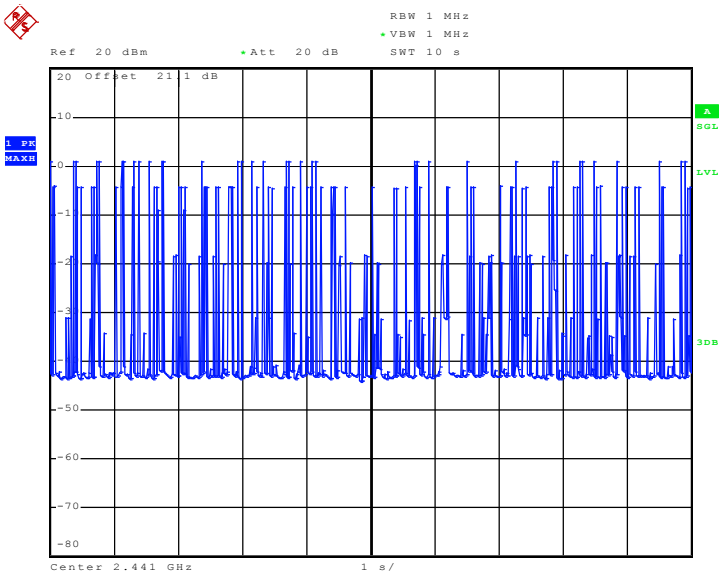
4. t: Package Transfer Time(us)

3DH5 Dwell Time (One Pulse) Plot on Channel 39



Date: 22.DEC.2010 19:37:16

3DH5 Dwell Time (Count Pulses) Plot on Channel 39



Date: 22.DEC.2010 19:53:24

3.5 Peak Output Power Measurement

3.5.1 Limit of Peak Output Power

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, provided the systems operate with an output power no greater than 125 mW (20.97dBm).

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.

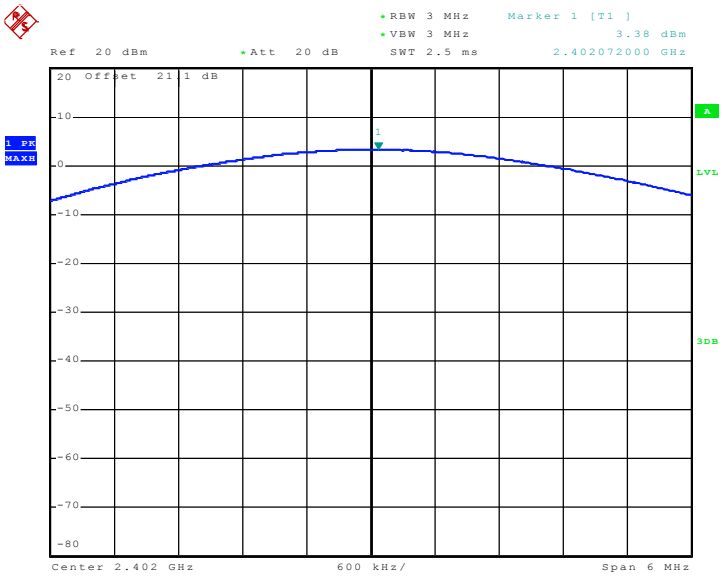
3.5.4 Test Setup

3.5.5 Test Result of Peak Output Power

Test Mode :	Mode 7~9	Temperature :	22~24℃
Test Engineer :	Hank Yu	Relative Humidity :	40~43%

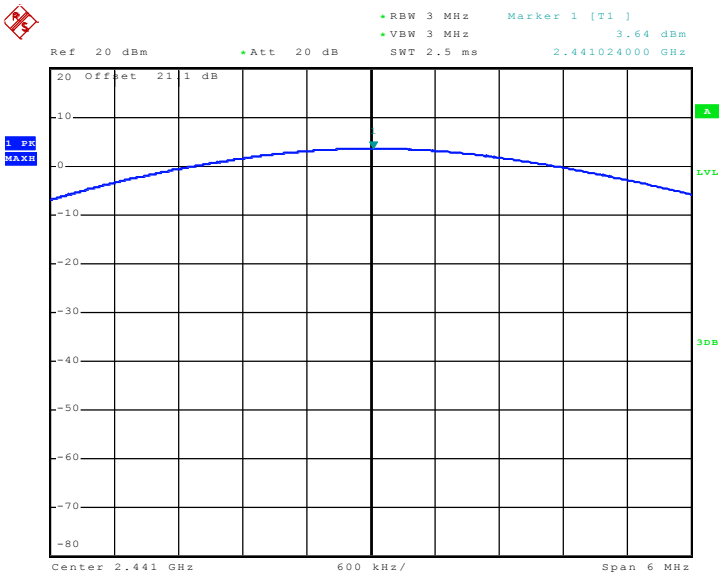
Channel	Frequency (MHz)	RF Power (dBm)		
		8-DPSK	Max. Limits	Pass/Fail
		3 Mbps	(dBm)	
00	2402	3.38	20.97	Pass
39	2441	3.64	20.97	Pass
78	2480	3.23	20.97	Pass

Peak Output Power Plot on Channel 00



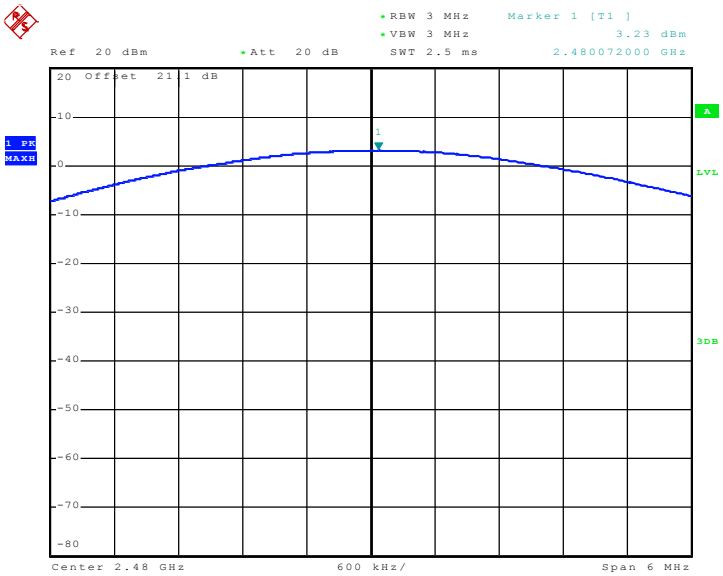
Date: 17.DEC.2010 16:45:32

Peak Output Power Plot on Channel 39



Date: 17.DEC.2010 16:51:09

Peak Output Power Plot on Channel 78



Date: 17.DEC.2010 16:53:09

3.6 Band Edges Measurement

3.6.1 Limit of Band Edges

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

3.6.2 Measuring Instruments

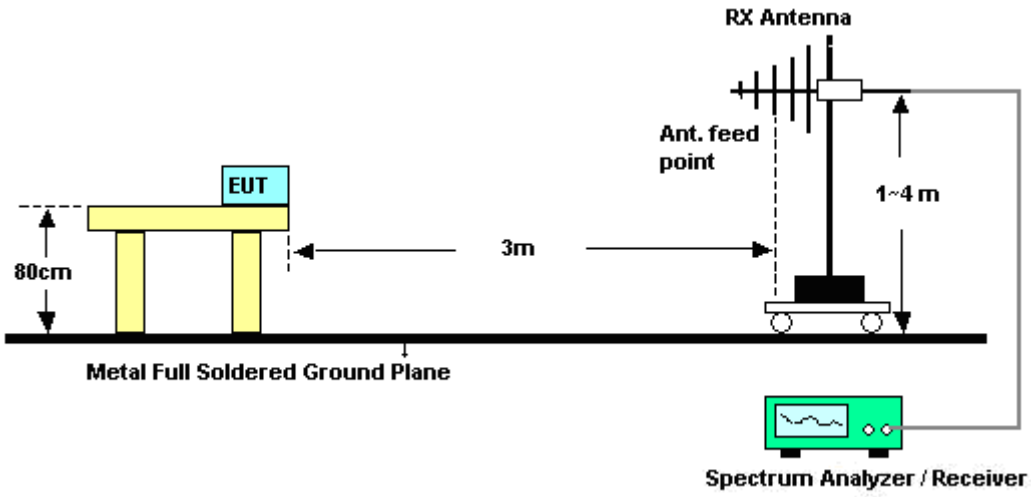
See list of measuring instruments of this test report.

3.6.3 Test Procedures

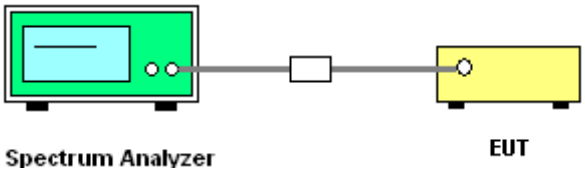
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC Public Notice DA 00-705 Measurement Guidelines.
2. RF antenna conducted test: Set RBW = 300kHz, Video bandwidth (VBW) ≥ RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 300k Hz RBW. Note: If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.
3. Radiated emission test: Applies to band edge emissions that fall in the restricted bands listed in FCC Section 15.205. The maximum permitted average field strength is listed in FCC Section 15.209. A pre-amp is necessary for this measurement. For measurements above 1 GHz, set RBW = 1MHz, VBW = 1MHz, Sweep: Auto for Peak; set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto for Average. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation. See FCC Section 15.35(b) and (c).
4. In case the emission is fail due to the used RBW / VBW is too wide, marker-delta method of FCC Public Notice DA 00-705 will be followed.

3.6.4 Test Setup

<Radiated Band Edges>



<Conducted Band Edges>



3.6.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	**Temperature :**	22~23°C
Test Channel :	00	**Relative Humidity :**	49~50%
		Test Engineer :	Ivan Jiang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	**Level (dBuV/m)**	**Over Limit (dB)**	**Limit Line (dBuV/m)**	**Read Level (dBuV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2367.57	47.33	-26.67	74.00	43.05	32.13	5.99	33.84	100	300	Peak
2367.57	32.88	-21.12	54.00	28.60	32.13	5.99	33.84	100	300	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	**Level (dBuV/m)**	**Over Limit (dB)**	**Limit Line (dBuV/m)**	**Read Level (dBuV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2338.69	45.72	-28.28	74.00	41.49	32.11	5.95	33.83	100	357	Peak
2338.69	33.27	-20.73	54.00	29.04	32.11	5.95	33.83	100	357	Average

Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	49~50%
		Test Engineer :	Ivan Jiang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.50	65.06	-8.94	74.00	60.50	32.28	6.18	33.90	100	320	Peak
2483.50	46.82	-7.18	54.00	42.26	32.28	6.18	33.90	100	320	Average

Summary results of marker-delta method:

Test mode	Maximum field strength of the fundamental emission (dBµV/m)	Delta Result (dB)	Average Result (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
Single Carrier Mode	96.73	49.91	46.82	54.00	-7.18	Pass
Hopping Mode	96.73	51.58	45.15	54.00	-8.85	Pass

Note : Average result = Maximum field strength – Delta result

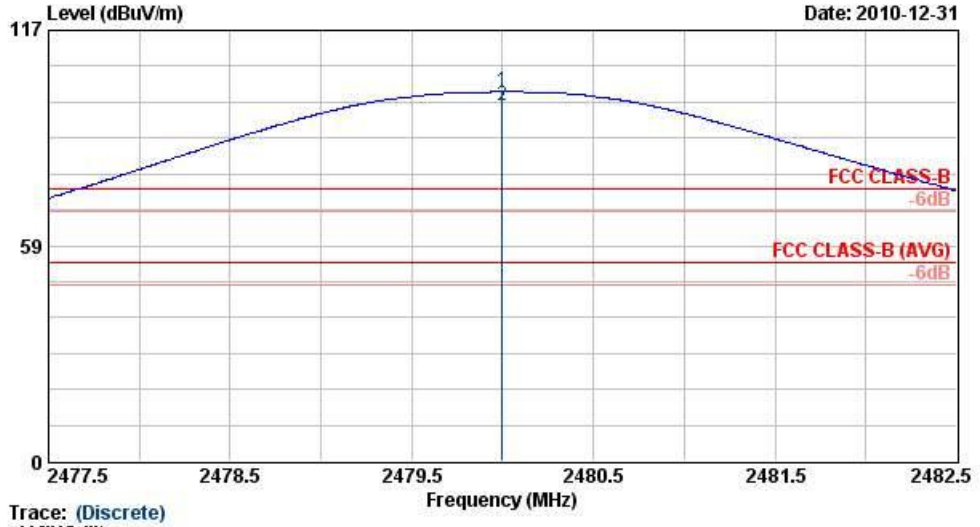
ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.50	58.65	-15.35	74.00	54.09	32.28	6.18	33.90	100	6	Peak
2483.50	42.59	-11.41	54.00	38.03	32.28	6.18	33.90	100	6	Average

Summary results of marker-delta method:

Test mode	Maximum field strength of the fundamental emission (dBµV/m)	Delta Result (dB)	Average Result (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
Single Carrier Mode	90.11	47.52	42.59	54.00	-11.41	Pass
Hopping Mode	90.11	50.34	39.77	54.00	-14.23	Pass

Note : Average result = Maximum field strength – Delta result

Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	49~50%
Test Engineer :	Ivan Jiang	Polarization :	Horizontal

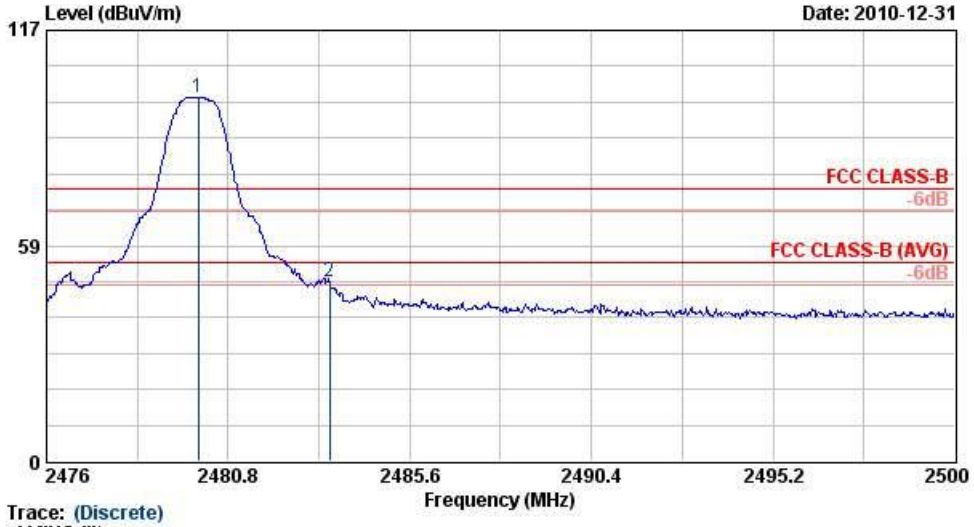


Site : 03CH07-HY
Condition : FCC CLASS-B HF_ANT_100824 HORIZONTAL
Project : FR 0D0904-02
Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2480.00	100.34	26.34	74.00	95.78	32.28	6.18	33.90	100	320	Peak
2 @	2480.00	96.73	42.73	54.00	92.17	32.28	6.18	33.90	100	320	Average

* Maximum field strength of the fundamental emission

Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	49~50%
Test Engineer :	Ivan Jiang	Polarization :	Horizontal



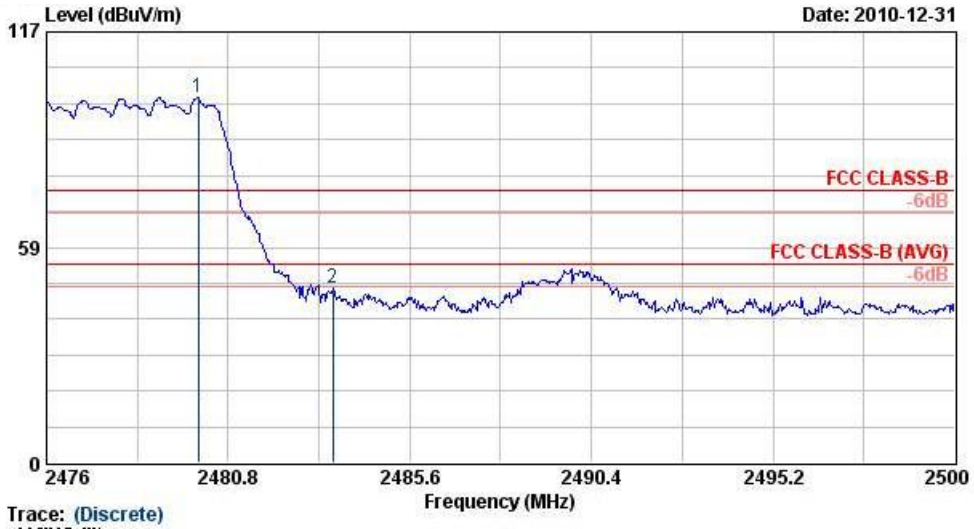
Trace: (Discrete)

Site : 03CH07-HY
Condition : FCC CLASS-B HF_ANT_100824 HORIZONTAL
Project : FR 0D0904-02
Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2480.00	98.73	24.73	74.00	94.17	32.28	6.18	33.90	100	320	Peak
2	2483.49	48.82	-25.18	74.00	44.26	32.28	6.18	33.90	100	320	Peak

* Marker-Delta Method (RBW/VBW=100KHz): 49.91 dB , single carrier Mode

Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	49~50%
Test Engineer :	Ivan Jiang	Polarization :	Horizontal

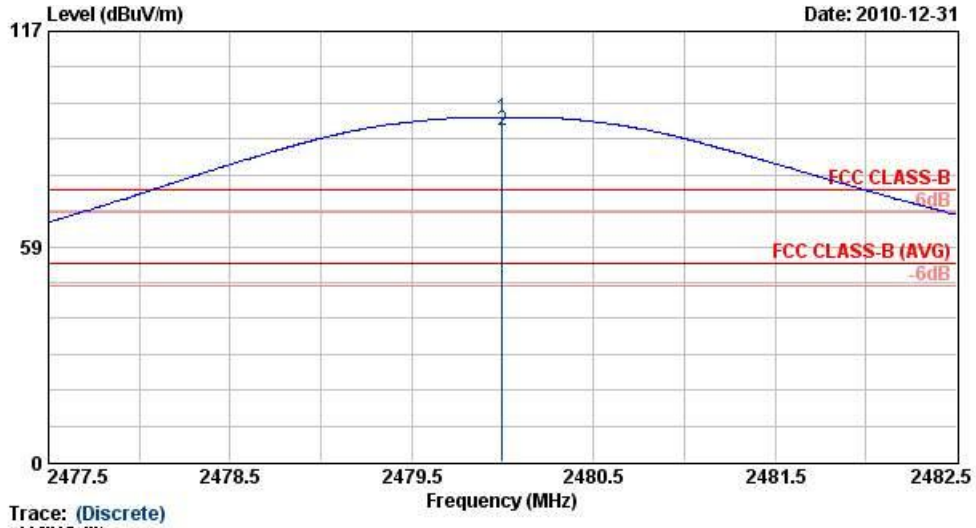


Site : 03CH07-HY
Condition : FCC CLASS-B HF_ANT_100824 HORIZONTAL
Project : FR 0D0904-02
Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2480.00	99.02	25.02	74.00	94.46	32.28	6.18	33.90	100	320	Peak
2	2483.56	47.44	-26.56	74.00	42.88	32.28	6.18	33.90	100	320	Peak

* Marker-Delta Method (RBW/VBW=100KHz): 51.58 dB , Hopping Mode

Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	49~50%
Test Engineer :	Ivan Jiang	Polarization :	Vertical

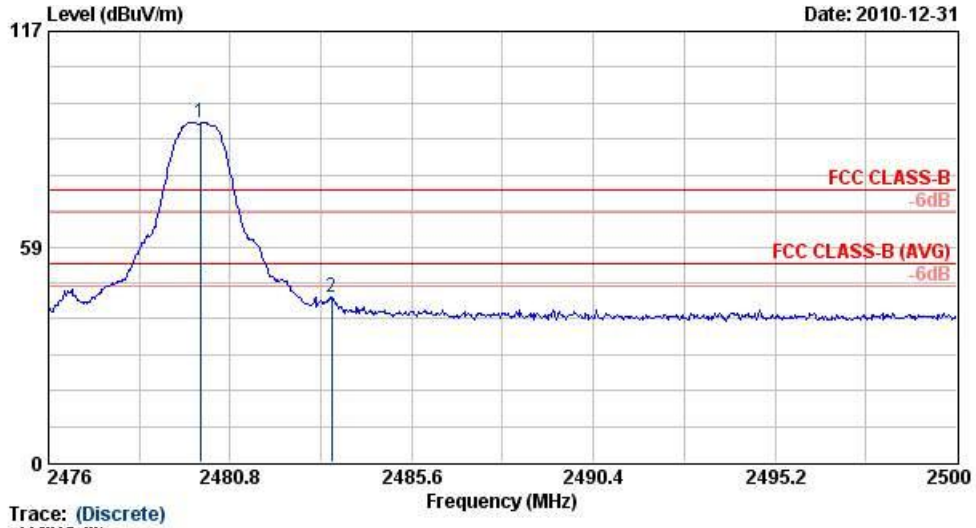


Site : 03CH07-HY
Condition : FCC CLASS-B HF_ANT_100824 VERTICAL
Project : FR 0D0904-02
Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2480.00	93.73	19.73	74.00	89.17	32.28	6.18	33.90	100	6	Peak
2 @	2480.00	90.11	36.11	54.00	85.55	32.28	6.18	33.90	100	6	Average

* Maximum field strength of the fundamental emission

Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	49~50%
Test Engineer :	Ivan Jiang	Polarization :	Vertical



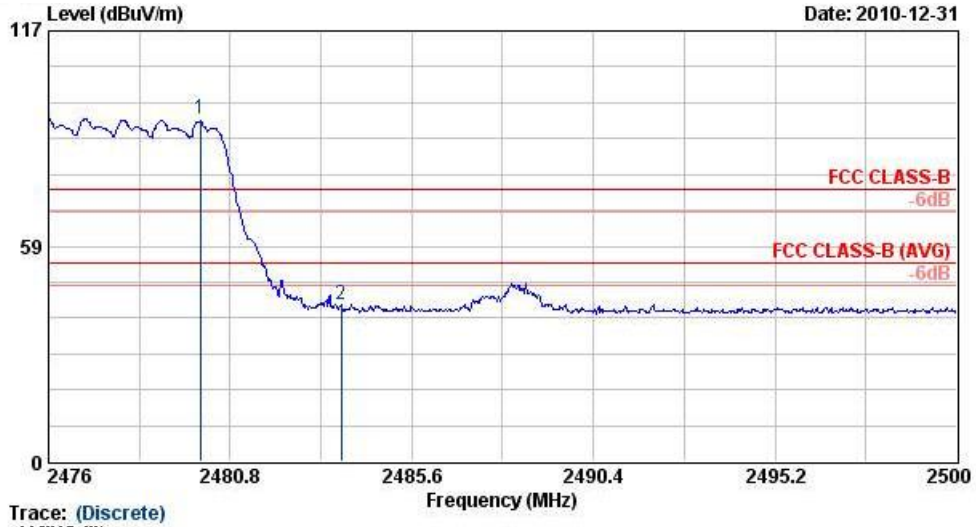
Trace: (Discrete)

Site : 03CH07-HY
Condition : FCC CLASS-B HF_ANT_100824 VERTICAL
Project : FR 0D0904-02
Mode : Mode 3

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 X	2480.00	92.11	18.11	74.00	87.55	32.28	6.18	33.90	100	6	Peak
2	2483.49	44.59	-29.41	74.00	40.03	32.28	6.18	33.90	100	6	Peak

* Marker-Delta Method (RBW/VBW=100KHz): 47.52 dB , single carrier Mode

Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	49~50%
Test Engineer :	Ivan Jiang	Polarization :	Vertical



Trace: (Discrete)

Site : 03CH07-HY
Condition : FCC CLASS-B HF_ANT_100824 VERTICAL
Project : FR 0D0904-02
Mode : Mode 3

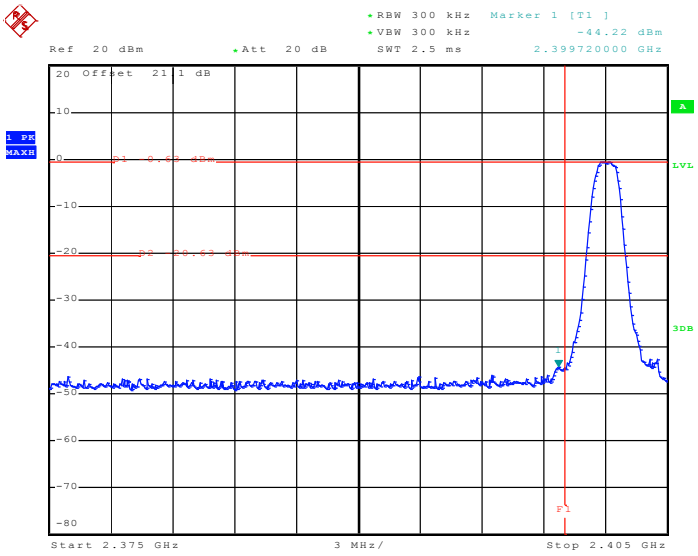
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	2480.00	93.16	19.16	74.00	88.60	32.28	6.18	33.90	100	6	Peak
2	2483.73	42.82	-31.18	74.00	38.26	32.28	6.18	33.90	100	6	Peak

* Marker-Delta Method (RBW/VBW=100KHz): 50.34 dB , Hopping Mode

3.6.6 Test Result of Conducted Band Edges

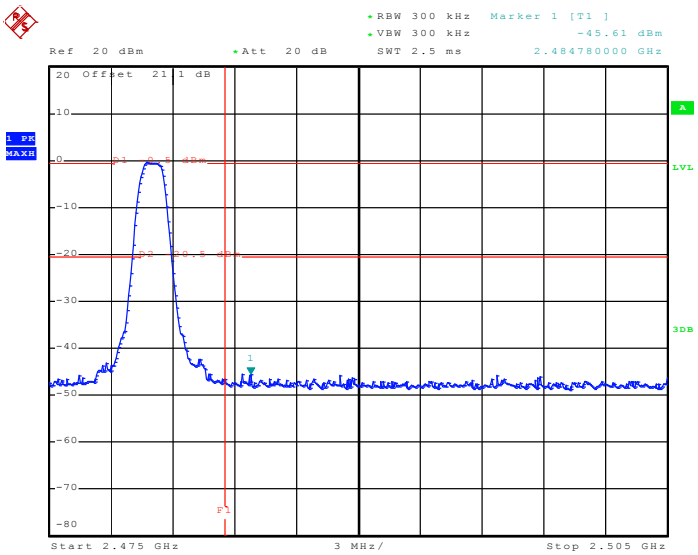
Test Mode :	Mode 7 and 9	**Temperature :**	22~24℃
Test Channel :	00 and 78	**Relative Humidity :**	40~43%
		Test Engineer :	Hank Yu

Low Band Edge Plot on Channel 00



Date: 22.DEC.2010 23:13:25

High Band Edge Plot on Channel 78



Date: 22.DEC.2010 23:03:52

3.7 Spurious Emission Measurement

3.7.1 Limit of Spurious Emission Measurement

All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band.

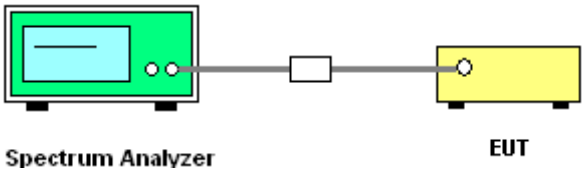
3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

3.7.3 Test Procedure

1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set RBW = 100 kHz, Video bandwidth (VBW) ≥ RBW, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.

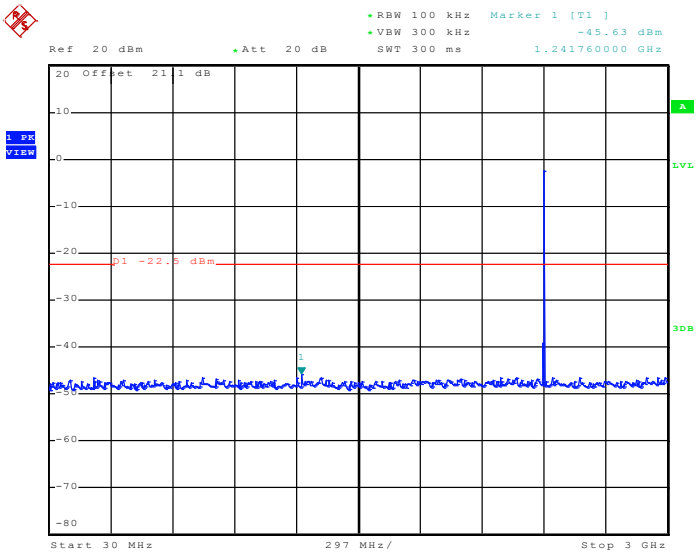
3.7.4 Test Setup



3.7.5 Test Result

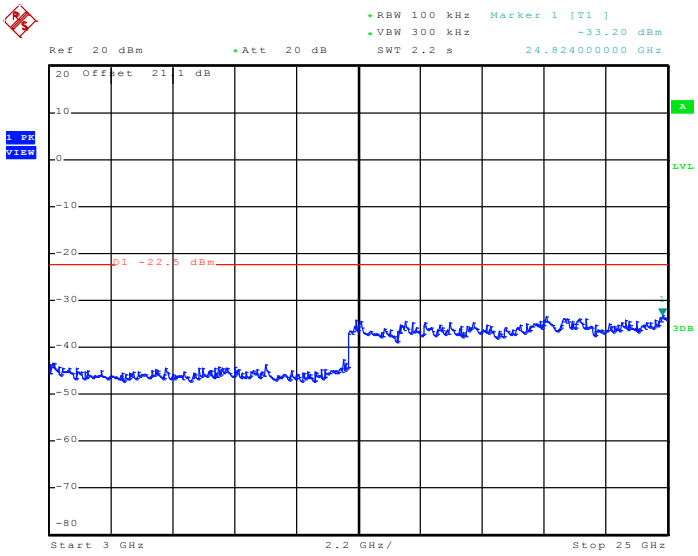
Test Mode :	Mode 7	Temperature :	22~24℃
Test Channel :	00	Relative Humidity :	40~43%
		Test Engineer :	Hank Yu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 22.DEC.2010 23:57:33

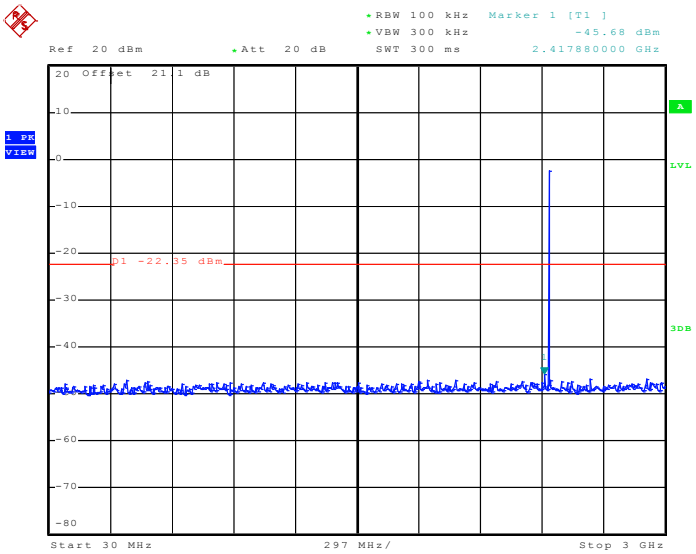
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 22.DEC.2010 23:58:42

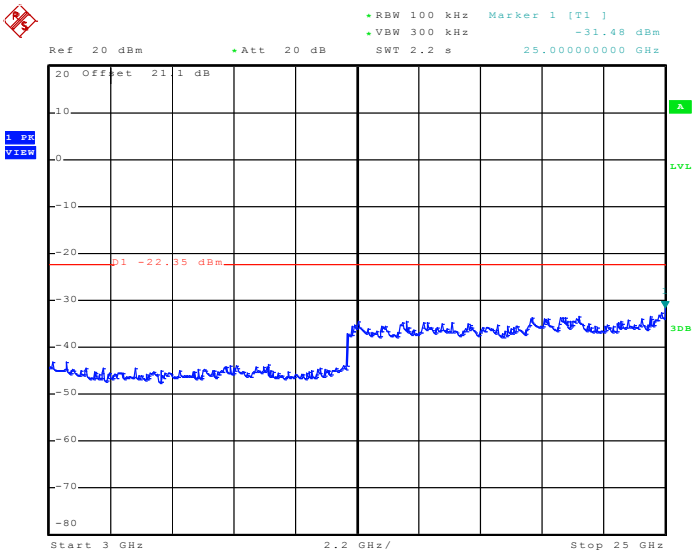
Test Mode :	Mode 8	**Temperature :**	22~24℃
Test Channel :	39	**Relative Humidity :**	40~43%
		Test Engineer :	Hank Yu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 23.DEC.2010 00:03:43

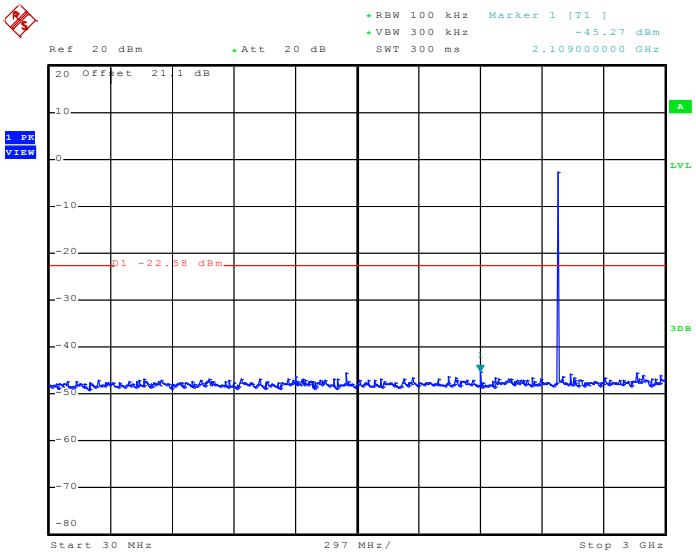
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 23.DEC.2010 00:04:21

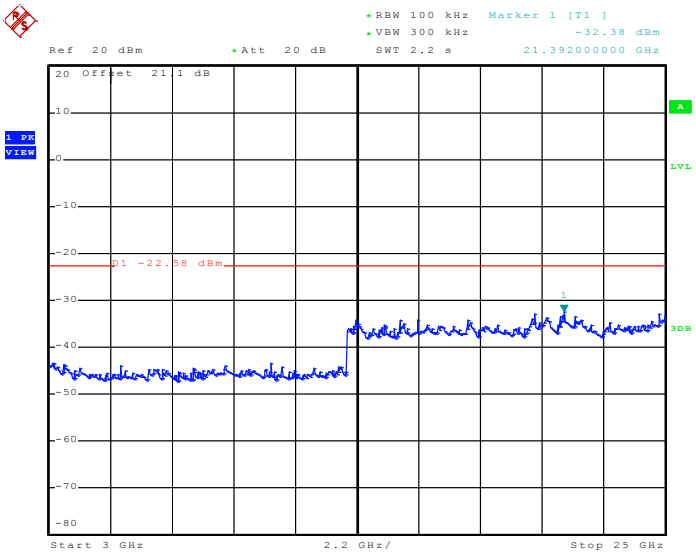
Test Mode :	Mode 9	**Temperature :**	22~24℃
Test Channel :	78	**Relative Humidity :**	40~43%
		Test Engineer :	Hank Yu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 23.DEC.2010 00:01:37

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 23.DEC.2010 00:02:17

3.8 AC Conducted Emission Measurement

3.8.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

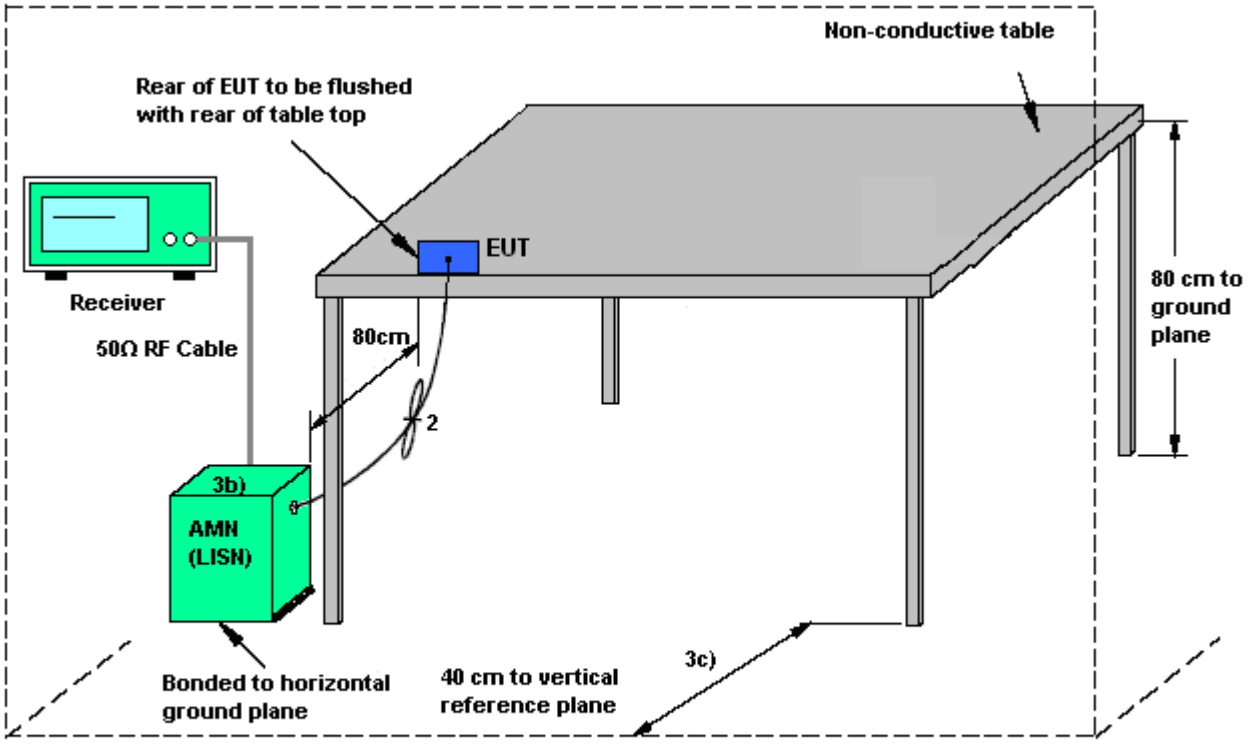
3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

3.8.3 Test Procedures

1. Please follow the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 kHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

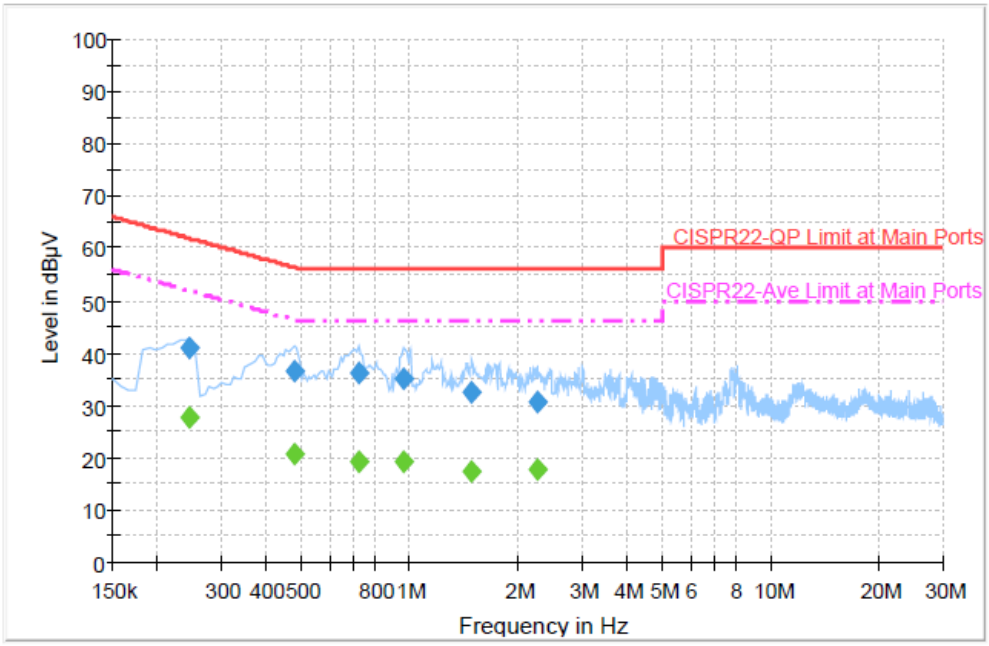
3.8.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.8.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	**Temperature :**	20~22℃
Test Engineer :	Cona Huang	**Relative Humidity :**	30~32%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	Bluetooth Link + WLAN (2.4G) Link + GPS Rx + Scanner + Cradle + Adapter + RS232 Terminal + USB Cable (Link with Notebook)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



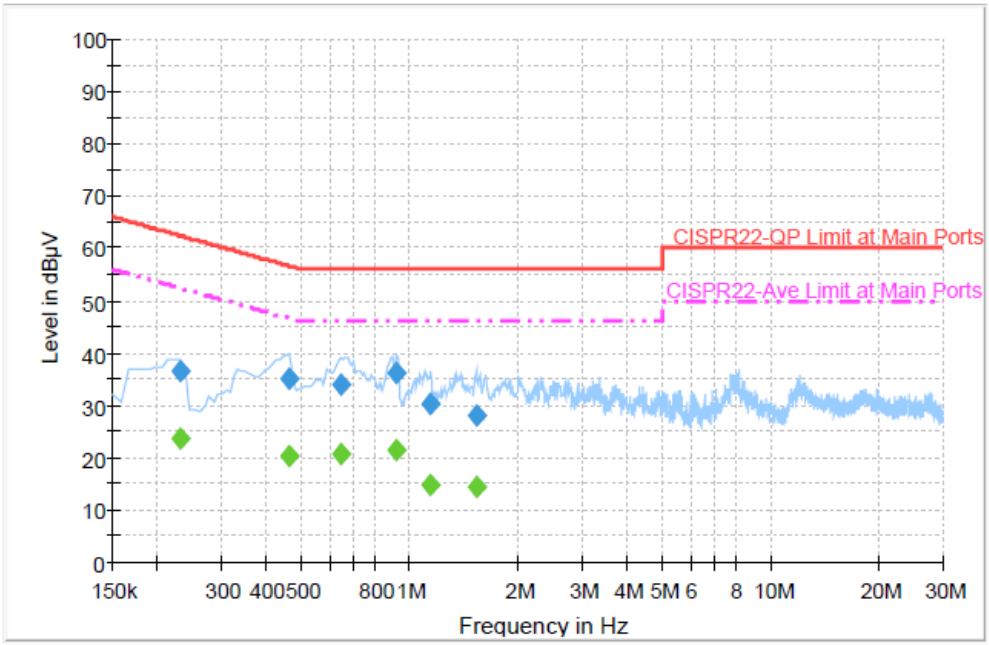
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.246000	40.9	Off	L1	19.4	21.0	61.9
0.478000	36.5	Off	L1	19.4	19.9	56.4
0.726000	36.1	Off	L1	19.4	19.9	56.0
0.966000	34.9	Off	L1	19.4	21.1	56.0
1.486000	32.4	Off	L1	19.4	23.6	56.0
2.246000	30.5	Off	L1	19.5	25.5	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.246000	27.7	Off	L1	19.4	24.2	51.9
0.478000	20.6	Off	L1	19.4	25.8	46.4
0.726000	19.0	Off	L1	19.4	27.0	46.0
0.966000	19.1	Off	L1	19.4	26.9	46.0
1.486000	17.5	Off	L1	19.4	28.5	46.0
2.246000	17.5	Off	L1	19.5	28.5	46.0

Test Mode :	Mode 1	**Temperature :**	20~22℃
Test Engineer :	Cona Huang	**Relative Humidity :**	30~32%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	Bluetooth Link + WLAN (2.4G) Link + GPS Rx + Scanner + Cradle + Adapter + RS232 Terminal + USB Cable (Link with Notebook)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.230000	36.6	Off	N	19.4	25.8	62.4
0.462000	35.2	Off	N	19.3	21.5	56.7
0.646000	34.1	Off	N	19.3	21.9	56.0
0.918000	36.1	Off	N	19.4	19.9	56.0
1.142000	30.1	Off	N	19.4	25.9	56.0
1.526000	28.1	Off	N	19.4	27.9	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.230000	23.8	Off	N	19.4	28.6	52.4
0.462000	20.4	Off	N	19.3	26.3	46.7
0.646000	20.6	Off	N	19.3	25.4	46.0
0.918000	21.4	Off	N	19.4	24.6	46.0
1.142000	14.8	Off	N	19.4	31.2	46.0
1.526000	14.4	Off	N	19.4	31.6	46.0

3.9 Radiated Emission Measurement

3.9.1 Limit of Radiated Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (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

3.9.2 Measuring Instruments

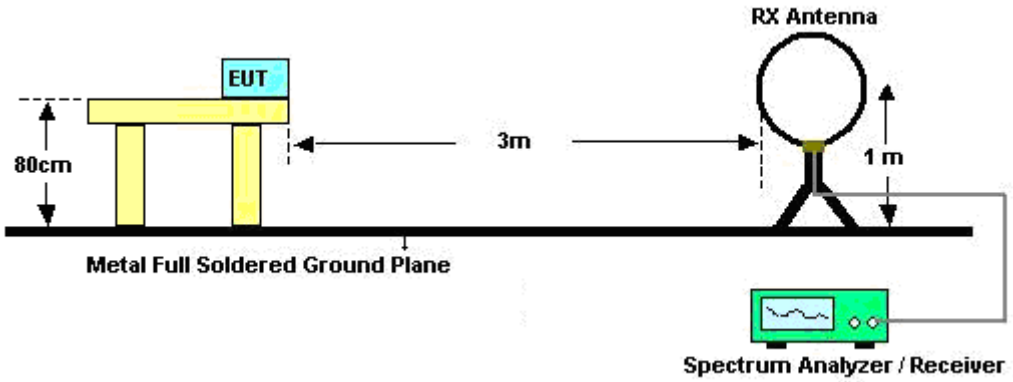
See list of measuring instruments of this test report.

3.9.3 Test Procedures

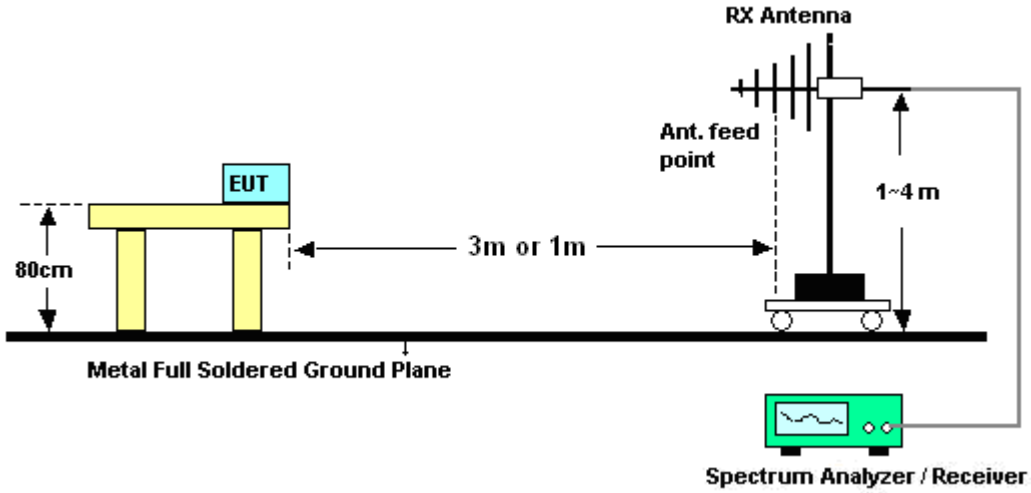
1. The testing follows the guidelines in FCC Public Notice DA 00-705 Measurement Guidelines.
2. Use the following spectrum analyzer settings:
   (1) Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
   (2) Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.
   Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB)
3. Follow the guidelines in ANSI C63.4-2003 with respect to maximizing the emission by rotating the EUT, measuring the emission for three EUT orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for this test in order to get the good signal level.

3.9.4 Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz



3.9.5 Test Results of Radiated Emissions (9 kHz ~ 30 MHz)

Test Engineer :	Ivan Jiang	Temperature :	22~23°C
		Relative Humidity :	49~50%

Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

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

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

3.9.6 Test Result of Radiated Emission (30 MHz ~ 10th Harmonic)

Test Mode :	Mode 1	**Temperature :**	22~23°C
Test Channel :	00	**Relative Humidity :**	49~50%
Test Engineer :	Ivan Jiang	**Polarization :**	Horizontal
Remark :	2402 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
118.02	31.26	-12.24	43.50	50.37	11.36	1.09	31.56	106	231	Peak
135.30	27.15	-16.35	43.50	45.94	11.59	1.18	31.56	-	-	Peak
226.29	28.76	-17.24	46.00	47.80	10.95	1.46	31.45	-	-	Peak
766.90	23.58	-22.42	46.00	29.23	21.95	3.09	30.69	-	-	Peak
897.10	25.68	-20.32	46.00	29.44	23.60	3.34	30.70	-	-	Peak
995.80	26.91	-27.09	54.00	29.14	24.84	3.51	30.58	-	-	Peak
2367.57	47.33	-26.67	74.00	43.05	32.13	5.99	33.84	100	300	Peak
2367.57	32.88	-21.12	54.00	28.60	32.13	5.99	33.84	100	300	Average
2402.00	99.98	-	-	95.62	32.18	6.03	33.85	100	300	Peak
2402.00	96.77	-	-	92.41	32.18	6.03	33.85	100	300	Average
2492.00	33.17	-20.83	54.00	28.59	32.30	6.18	33.90	100	300	Average
2492.00	45.07	-28.93	74.00	40.49	32.30	6.18	33.90	100	300	Peak

Test Mode :	Mode 1	Temperature :	22~23°C
Test Channel :	00	Relative Humidity :	49~50%
Test Engineer :	Ivan Jiang	Polarization :	Vertical
Remark :	2402 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
98.58	29.39	-14.11	43.50	50.26	9.68	0.99	31.54	-	-	Peak
118.83	31.83	-11.67	43.50	50.84	11.45	1.10	31.56	159	185	Peak
223.05	22.97	-23.03	46.00	42.23	10.75	1.44	31.45	-	-	Peak
589.80	24.94	-21.06	46.00	33.60	19.61	2.66	30.93	-	-	Peak
794.90	24.41	-21.59	46.00	29.57	22.39	3.13	30.68	-	-	Peak
995.80	26.94	-27.06	54.00	29.17	24.84	3.51	30.58	-	-	Peak
2338.69	45.72	-28.28	74.00	41.49	32.11	5.95	33.83	100	357	Peak
2338.69	33.27	-20.73	54.00	29.04	32.11	5.95	33.83	100	357	Average
2402.00	92.01	-	-	87.65	32.18	6.03	33.85	100	357	Peak
2402.00	88.80	-	-	84.44	32.18	6.03	33.85	100	357	Average
2492.00	33.17	-20.83	54.00	28.59	32.30	6.18	33.90	100	357	Average
2492.00	45.53	-28.47	74.00	40.95	32.30	6.18	33.90	100	357	Peak

Test Mode :	Mode 2	Temperature :	22~23°C
Test Channel :	39	Relative Humidity :	49~50%
Test Engineer :	Ivan Jiang	Polarization :	Horizontal
Remark :	2441 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
118.29	31.66	-11.84	43.50	50.77	11.36	1.09	31.56	103	229	Peak
135.30	27.44	-16.06	43.50	46.23	11.59	1.18	31.56	-	-	Peak
222.78	27.99	-18.01	46.00	47.25	10.75	1.44	31.45	-	-	Peak
760.60	24.58	-21.42	46.00	30.36	21.84	3.08	30.70	-	-	Peak
909.70	26.29	-19.71	46.00	29.85	23.75	3.36	30.67	-	-	Peak
987.40	26.95	-27.05	54.00	29.30	24.73	3.50	30.58	-	-	Peak
2350.00	44.97	-29.03	74.00	40.74	32.11	5.95	33.83	100	357	Peak
2350.00	32.85	-21.15	54.00	28.62	32.11	5.95	33.83	100	357	Average
2441.00	101.32	-	-	96.85	32.24	6.11	33.88	100	357	Peak
2441.00	97.80	-	-	93.33	32.24	6.11	33.88	100	357	Average
2486.00	44.66	-29.34	74.00	40.10	32.28	6.18	33.90	100	357	Peak
2486.00	33.30	-20.70	54.00	28.74	32.28	6.18	33.90	100	357	Average

Test Mode :	Mode 2	Temperature :	22~23°C
Test Channel :	39	Relative Humidity :	49~50%
Test Engineer :	Ivan Jiang	Polarization :	Vertical
Remark :	2441 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
99.66	32.12	-11.38	43.50	52.88	9.79	0.99	31.54	135	78	Peak
118.29	27.23	-16.27	43.50	46.34	11.36	1.09	31.56	-	-	Peak
225.21	23.86	-22.14	46.00	42.97	10.89	1.45	31.45	-	-	Peak
724.90	23.14	-22.86	46.00	29.63	21.27	3.00	30.76	-	-	Peak
878.20	25.49	-20.51	46.00	29.52	23.37	3.31	30.71	-	-	Peak
998.60	26.82	-27.18	54.00	29.01	24.88	3.51	30.58	-	-	Peak
2358.00	45.68	-28.32	74.00	41.40	32.13	5.99	33.84	125	11	Peak
2358.00	33.05	-20.95	54.00	28.77	32.13	5.99	33.84	125	11	Average
2441.00	94.82	-	-	90.35	32.24	6.11	33.88	125	11	Peak
2441.00	91.23	-	-	86.76	32.24	6.11	33.88	125	11	Average
2494.00	44.78	-29.22	74.00	40.20	32.30	6.18	33.90	125	11	Peak
2494.00	33.13	-20.87	54.00	28.55	32.30	6.18	33.90	125	11	Average

Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	49~50%
Test Engineer :	Ivan Jiang	Polarization :	Horizontal
Remark :	2480 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
117.21	31.58	-11.92	43.50	50.77	11.28	1.09	31.56	150	37	Peak
134.49	28.02	-15.48	43.50	46.82	11.59	1.17	31.56	-	-	Peak
225.21	27.33	-18.67	46.00	46.44	10.89	1.45	31.45	-	-	Peak
716.50	22.93	-23.07	46.00	29.58	21.15	2.98	30.78	-	-	Peak
861.40	25.16	-20.84	46.00	29.41	23.18	3.29	30.72	-	-	Peak
976.90	27.68	-26.32	54.00	30.17	24.60	3.49	30.58	-	-	Peak
2332.00	45.18	-28.82	74.00	40.97	32.09	5.95	33.83	100	320	Peak
2332.00	33.17	-20.83	54.00	28.96	32.09	5.95	33.83	100	320	Average
2480.00	96.72	-	-	92.16	32.28	6.18	33.90	100	320	Average
2480.00	100.36	-	-	95.80	32.28	6.18	33.90	100	320	Peak
2483.50	65.06	-8.94	74.00	60.50	32.28	6.18	33.90	100	320	Peak
2483.50	46.82	-7.18	54.00	42.26	32.28	6.18	33.90	100	320	Average

Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	78	Relative Humidity :	49~50%
Test Engineer :	Ivan Jiang	Polarization :	Vertical
Remark :	2480 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
103.17	29.94	-13.56	43.50	50.43	10.04	1.01	31.54	133	276	Peak
118.29	27.92	-15.58	43.50	47.03	11.36	1.09	31.56	-	-	Peak
226.29	23.59	-22.41	46.00	42.63	10.95	1.46	31.45	-	-	Peak
696.90	22.61	-23.39	46.00	29.64	20.86	2.93	30.82	-	-	Peak
830.60	26.10	-19.90	46.00	30.77	22.82	3.22	30.71	-	-	Peak
973.40	26.97	-27.03	54.00	29.50	24.56	3.48	30.57	-	-	Peak
2332.00	45.25	-28.75	74.00	41.04	32.09	5.95	33.83	100	6	Peak
2332.00	33.13	-20.87	54.00	28.92	32.09	5.95	33.83	100	6	Average
2480.00	90.29	-	-	85.73	32.28	6.18	33.90	100	6	Average
2480.00	93.73	-	-	89.17	32.28	6.18	33.90	100	6	Peak
2483.50	58.65	-15.35	74.00	54.09	32.28	6.18	33.90	100	6	Peak
2483.50	42.59	-11.41	54.00	38.03	32.28	6.18	33.90	100	6	Average

3.10 Antenna Requirements

3.10.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

3.10.2 Antenna Connected Construction

The antennas type used in this product is PIFA Antenna without connector and it is considered to meet antenna requirement.

3.10.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP30	101329	9kHz~30GHz	Apr. 26, 2010	Apr. 25, 2011	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 13, 2010	Sep. 12, 2011	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 14, 2010	Sep. 13, 2011	Conducted (TH02-HY)
EMI Test Receive	R&S	ESCS 30	100356	9KHz – 2.75GHz	Aug. 16, 2010	Aug. 15, 2011	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz – 30MHz	Dec. 03, 2010	Dec. 02, 2011	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz – 30MHz	Dec. 01, 2010	Nov. 30, 2011	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
GPS Station	T&E	GS-50	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 31, 2010	Oct. 30, 2011	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP	101067	9KHz ~ 30GHz	Dec. 03, 2010	Dec. 02, 2011	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 19, 2010	Aug. 18, 2011	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 18, 2010	Oct. 17, 2011	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec. 06, 2010	Dec. 05, 2011	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32 dB.GAIN	Mar. 27, 2010	Mar. 26, 2011	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Jul. 28, 2011	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.10	Normal (k=2)	0.05
Cable Loss	0.10	Normal (k=2)	0.05
AMN Insertion Loss	2.50	Rectangular	0.63
Receiver Specification	1.50	Rectangular	0.43
Site Imperfection	1.39	Rectangular	0.80
Mismatch	+0.34 / -0.35	U-Shape	0.24
Combined Standard Uncertainty Uc(y)	**1.13**		
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.26**		

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
Combined Standard Uncertainty Uc(y)	**1.27**		
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.54**		

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Contribution	Uncertainty of X_i		$u(X_i)$	C_i	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	±0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	±1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	±0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site Imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR Γ1 = 0.197 Antenna VSWR Γ2 = 0.194 Uncertainty = 20Log(1-Γ1*Γ2)	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty Uc(y)	**2.36**				
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.72**				

Appendix A. Photographs of EUT

Please refer to Sporton report number EP0D0904-02 as below.

1. External Photograph of EUT

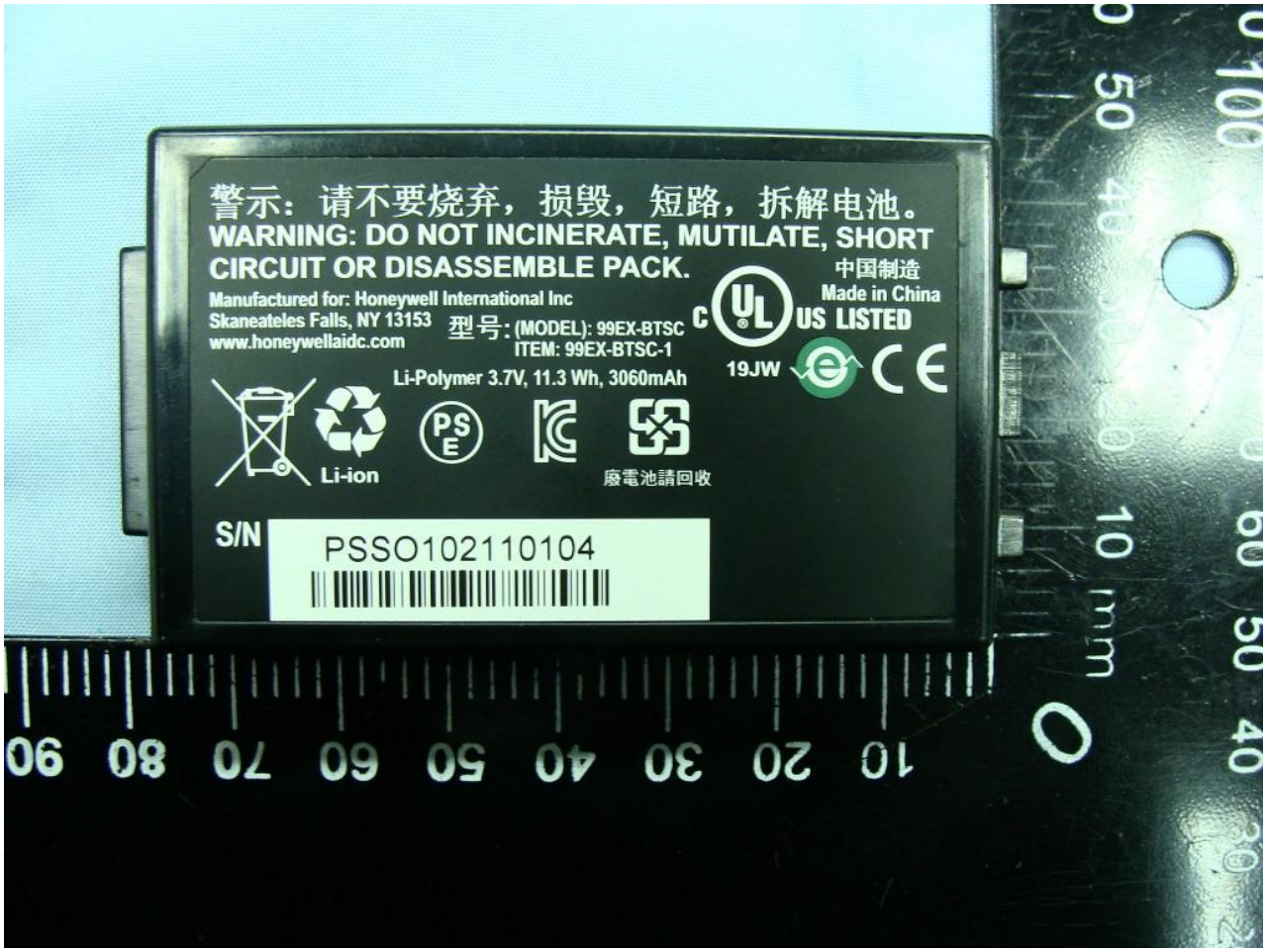
2. Photograph of Accessory

List of Accessory:

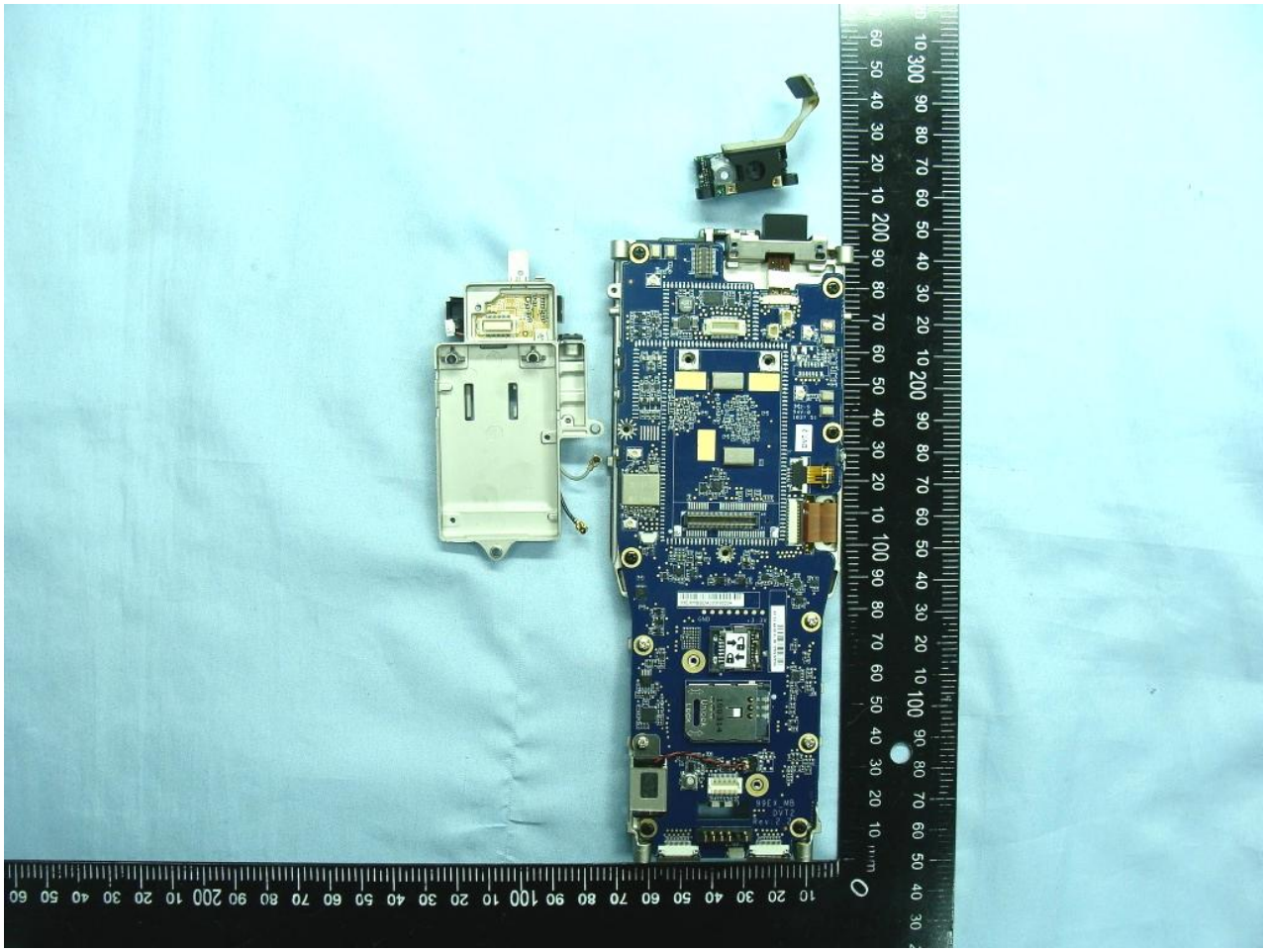
Specification of Accessory		
Battery	**Brand Name**	Honeywell
	Model Name	99EX-BTSC
Holster	**Model Name**	99EX-Holster
LCD Panel	**Brand Name**	Casio
	Model Name	OM37H3M04XLC
Camera	**Brand Name**	LITE-ON Semiconductor Corp.
	Model Name	DCM-300MCB

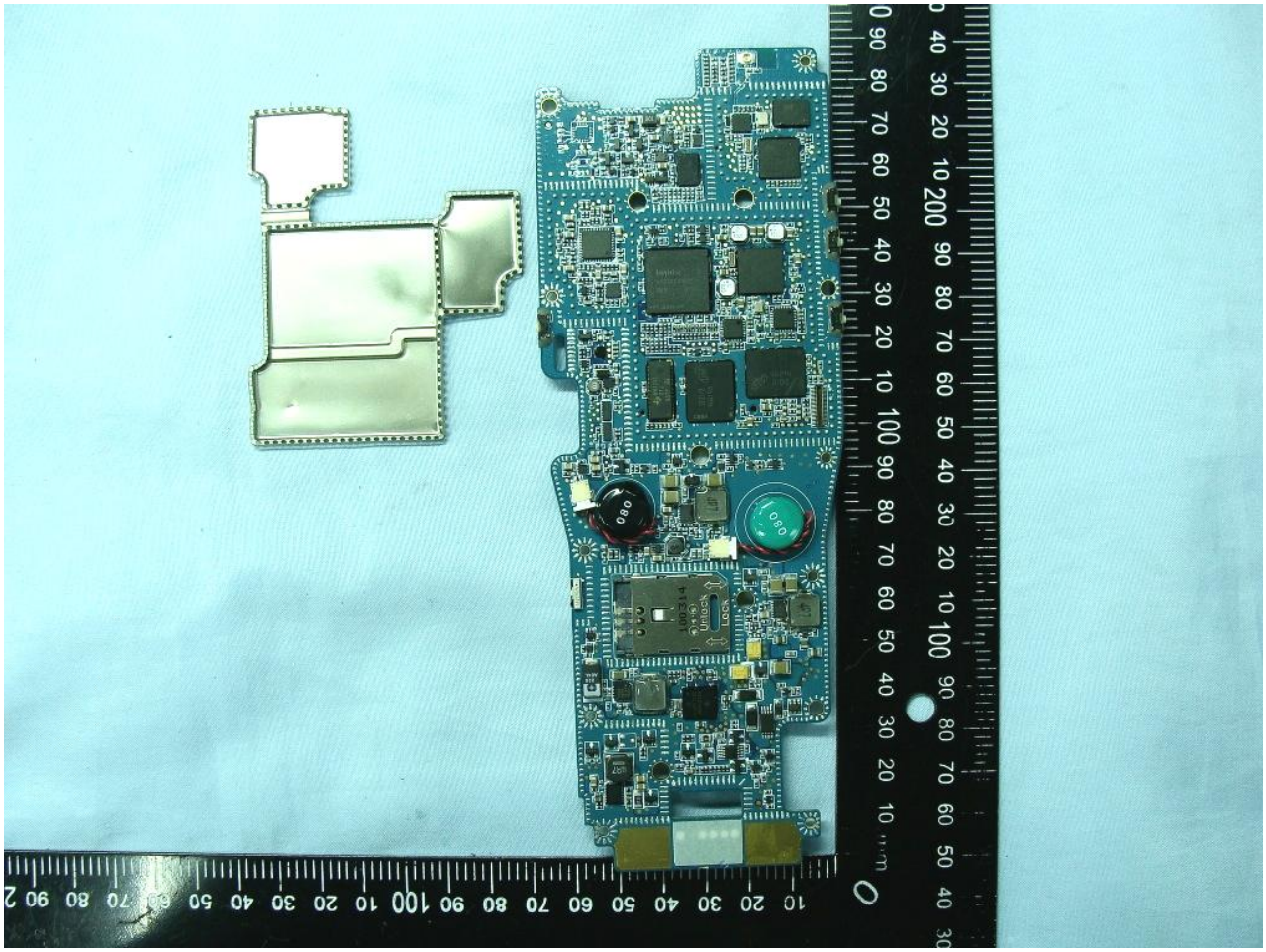
Remark: For accessories equipped with this EUT, please refer to the following photos.

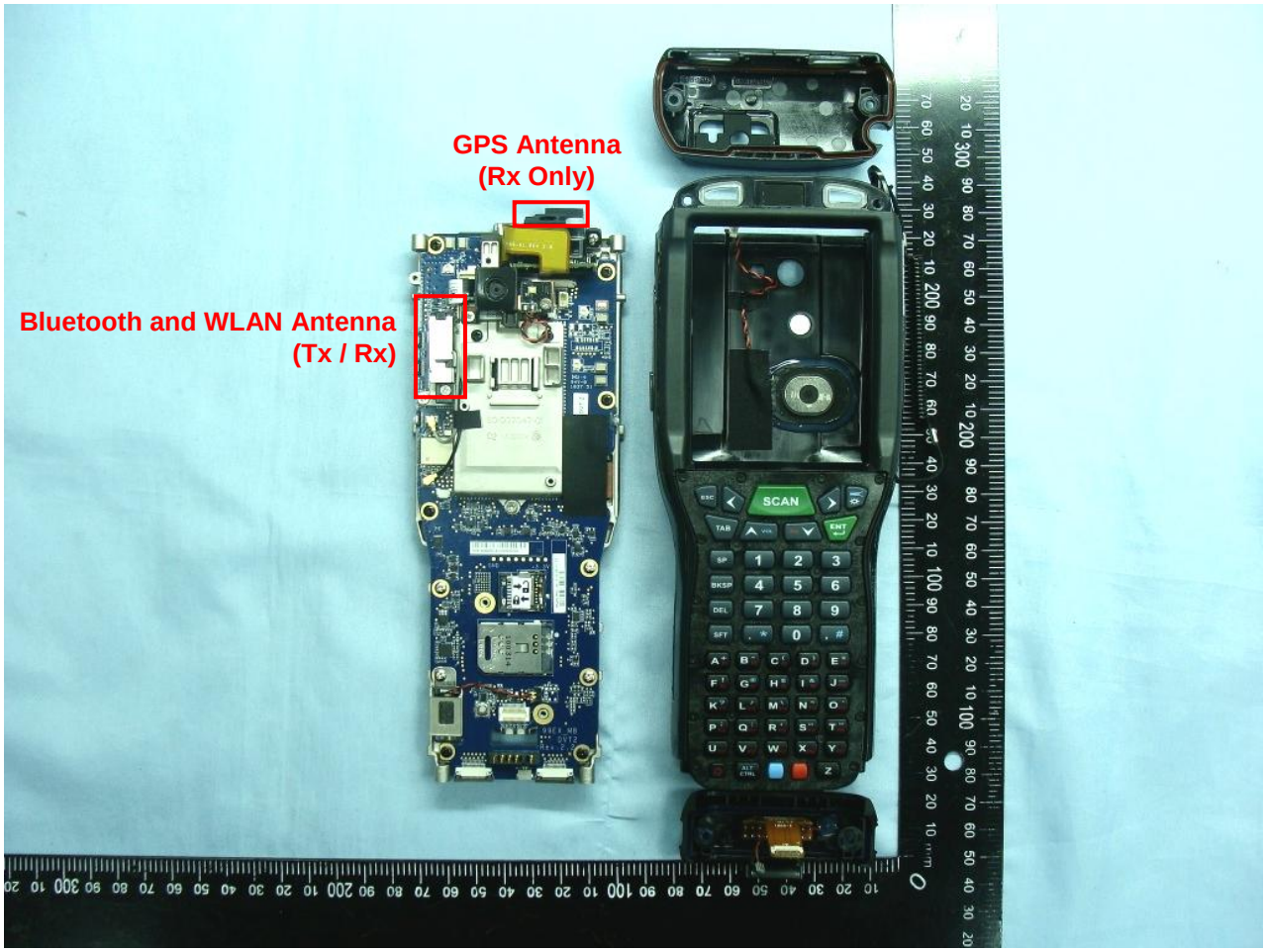

Honeywell
SCAN


警示：请不要烧弃，损毁，短路，拆解电池。
WARNING: DO NOT INCINERATE, MUTILATE, SHORT CIRCUIT OR DISASSEMBLE PACK.
中国制造
Made in China
Manufactured for: Honeywell International Inc
Skaneateles Falls, NY 13153
www.honeywellaidc.com
型号: (MODEL): 99EX-BTSC
ITEM: 99EX-BTSC-1
US LISTED
19JW
Li-Polymer 3.7V, 11.3 Wh, 3060mAh
Li-ion
廢電池請回收
S/N
PSSO102110104

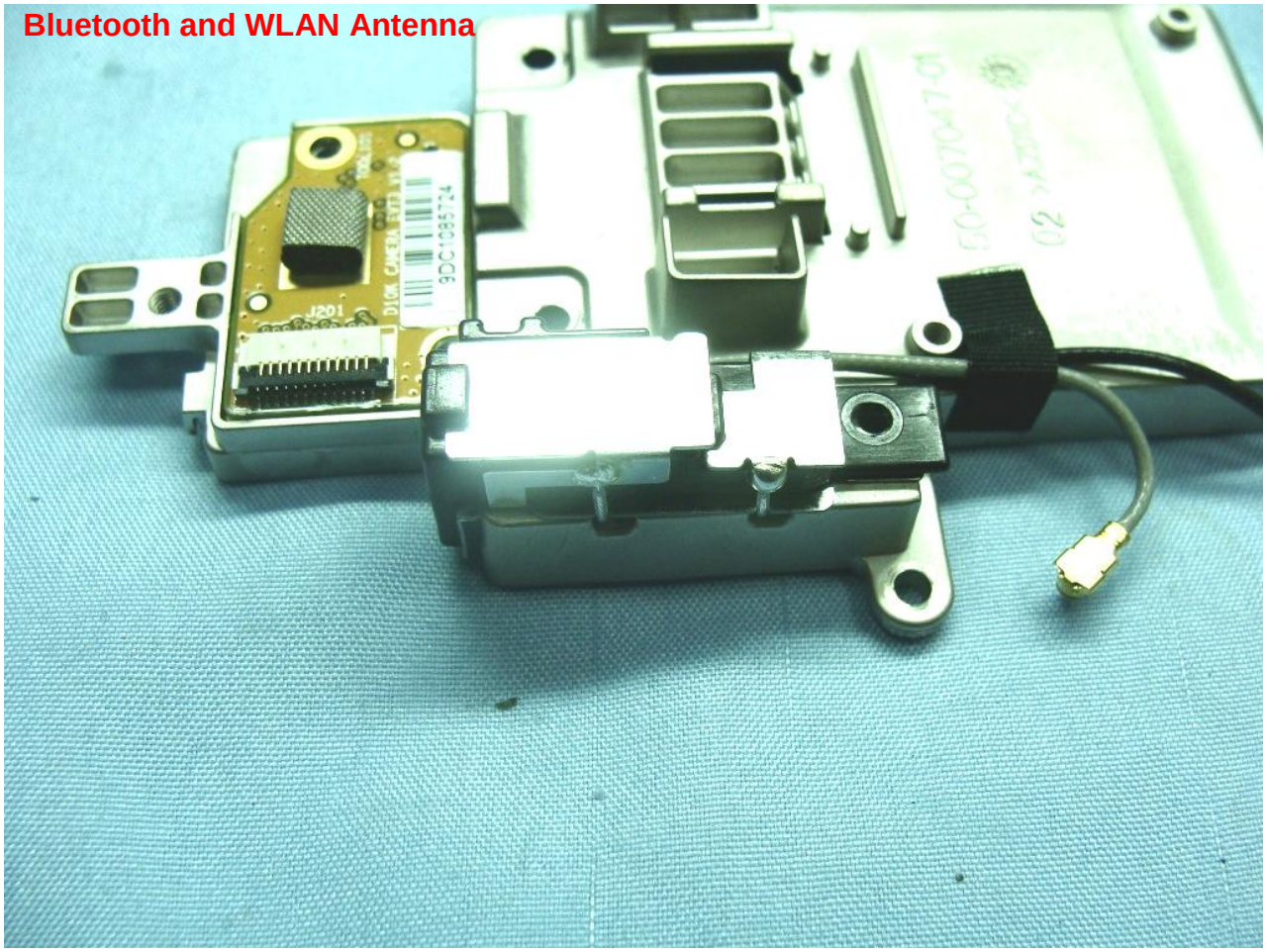
3. Internal Photograph of EUT

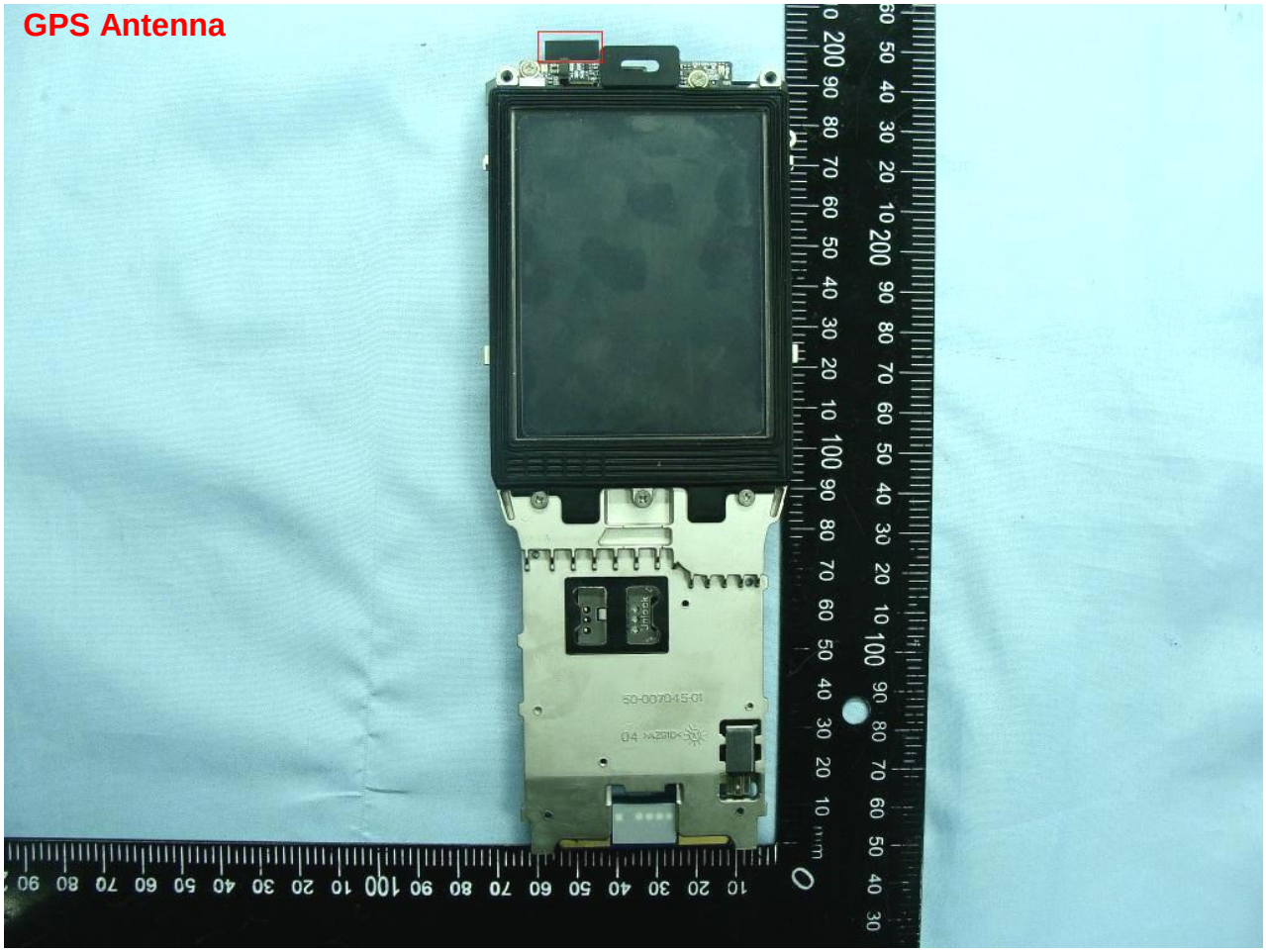





GPS Antenna
(Rx Only)
Bluetooth and WLAN Antenna
(Tx / Rx)
SCAN

Bluetooth and WLAN Antenna




GPS Antenna

Appendix B. Setup Photographs

<Conducted Emission>

<Radiated Emission>