

FCC Part 15C

MEASUREMENT AND TEST REPORT

For

Shenzhen V4 Electronic Co., Ltd.

F2 Yikang Building, Minkang Rd Minzhi, Baoan District, Shenzhen,
Guangdong Province, China

Model: DPF-A70-H

Jul. 15, 2009

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: WI-FI Inch Digital Photo Frame
Test Engineer: Cawen. He	
Report Number: MTI090706002RF	
Test Date: Jul. 06~Jul. 13, 2009	
Reviewed By: Hebe. LEE	
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of MTI Technology Laboratory Ltd.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Applicant:	Shenzhen V4 Electronic Co., Ltd.
Address of applicant:	F2 Yikang Building, Minkang Rd Minzhi, Baoan District, Shenzhen, Guangdong Province, China
Manufacturer:	Shenzhen HOYOME Technology Co., Ltd.
Address of manufacturer:	Block 2C, Chuangfuyuan Industrial Zone, Zili Road 52. Baoyuan Community, Shiyan Town, Baoan, Shenzhen, China
Equipment Under Test:	WI-FI Inch Digital Photo Frame
Tested Model No.:	DPF-A70-H
Supplementary Models No:	N/A
	Remark: supplementary models are only different in exterior with tested Model and with the same circuit construction
Type of Modulation:	DSSS, OFDM
Frequency Band:	2412 MHz ~ 2462MHz
Transfer Rate:	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps
Number of Channels:	11
Temperature Range (Operating):	-20 ~ 65 °C
Power Supply:	DC 5V from adaptor

Remark: * The test data gathered are from the production sample provided by the manufacturer.

1.2 Related Submittal(s) / Grant (s)

This submittal(s) is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4 - 2003.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.207, and 15.247 rules.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 - 2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

All measurement required was performed at laboratory of MTI Technology Laboratory Ltd. at 10F, Yinxing Business Building, Xixiang Road, Bao'an District, Shenzhen, P.R.China. The test facility is recognized, certified, or accredited by the following organizations:

FCC – Registration No.: 167003

MTI Technology Laboratory Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 167003, May 04, 2009.

2. SYSTEM TEST CONFIGURATION

The tests documented in this report were performed in accordance with ANSI C63.4-2003 and FCC CFR 47 Part 15 Subpart C.

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 or 10 meters from the leading edge of the turntable.

2.3 General Test Procedures

Conducted Emissions The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 7.1 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

Radiated Emissions The EUT is placed on a turntable, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

2.4 List of Measuring Equipments Used

Items	Equipment	Manufacturer	Model No.	Serial No.	Last Cal	Calibration Period
For Radiated Spurious Emission (30~25GHz) test: SGS-CSTC Shenzhen Branch						
1	EMI Test Receiver	ROHDE & SCHWARZ	ESI 26	100079	2009/6	1 year
2	Horn Antenna	R/S	CH14-H052	1091698	2009/6	1 year
3	3m Semi- Anechoic Chamber	ETS	N/A	N/A	2009/6	1 year
For other test: Shenzhen Huatongwei International Inspection Co., Ltd						
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	100038	2008/11	1 year
2	EMI Test Receiver	ROHDE & SCHWARZ	ESI 26	100009	2008/11	1 year
3	Receiver/ Spectrum Analyzer	ROHDE & SCHWARZ	ESCI	100106	2008/11	1 year
4	Spectrum Analyzer	Agilent	E7405A	US41160415	2008/11	1 year
5	Artificial Mains	ROHDE & SCHWARZ	ESH2-Z5	100028	2008/11	1 year
6	Pulse Limiter	ROHDE & SCHWARZ	ESHSZ2	100044	2008/11	1 year
7	LISN	COM Power	LI-200	12212	2008/11	1 year
8	LISN	COM Power	LI-200	12019	2008/11	1 year
9	3m/5m Semi-Anechoic Chamber	ETS	N/A	N/A	2008/11	1 year
10	Ultra-Broadband Antenna	R/S	HL562	100015	2008/11	1 year
11	Horn Antenna	R/S	HF906	100039	2008/11	1 year
12	RF Test Panel	R/S	TS / RSP	335015/ 0017	N/A	N/A
13	Turntable	ETS	2088	2149	N/A	N/A
14	Antenna Mast	ETS	2075	2346	N/A	N/A

3. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
15.203/15.247(b)/(c)	Antenna Requirement	Pass
15.207	AC Power Line Conducted Emission	Pass
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System	Pass
15.247(e)	Power Spectral Density	Pass
15.247(b)(1)	Maximum Peak Output Power	Pass
15.247(d)	Band Edges Emission	Pass
15.247(d)	Radiated Emission	Pass

4. ANTENNA REQUIREMENT

4.1 Standard Applicable

Section 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. 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 provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Section 15.247(b)/(c):

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

If the intentional radiator is used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

4.2 Antenna Connected Construction

The antennas used in this product are Monopole. Monopole antenna with UFL connector, The maximum Gain of the antenna is 4.80dBi.

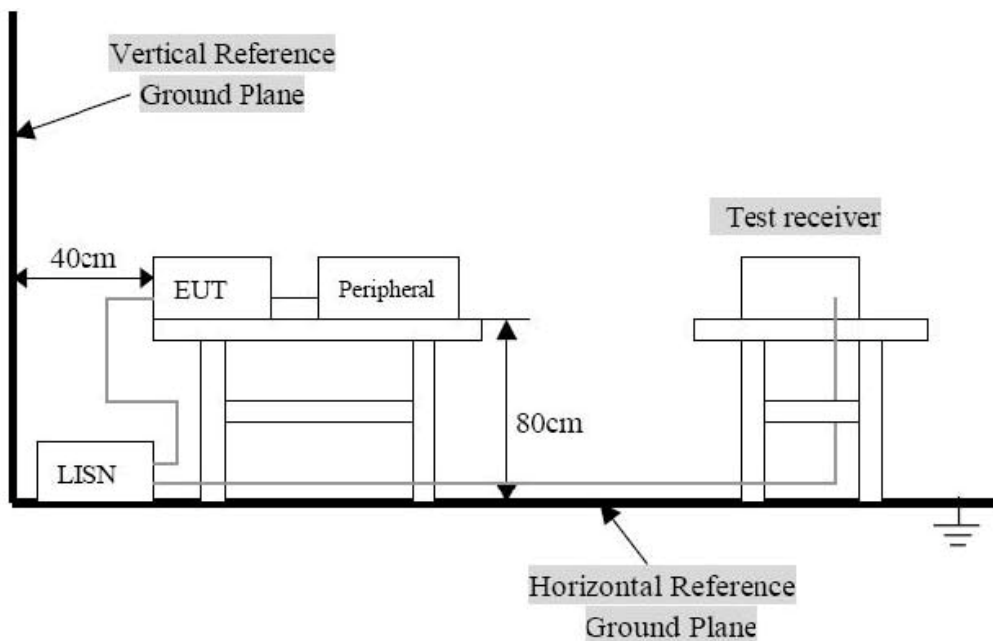
5. CONDUCTED EMISSION Measurement

5.1 Limits of Conducted Emission

Section 15.207: For a Low-power Radio-frequency Device is designed to be connected to the 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 below limits table.

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150~0.500	66~56	56~46
0.500~5.000	56	46
5.000~30.00	60	50

5.2 Test Setup Diagram



5.3 Instrument Setting

The test receiver was set with the following configurations:

Test Receiver Setting:

Frequency Range.....150 KHz to 30 MHz
Detector.....Peak & Quasi-Peak & Average
Sweep Speed.....Auto
IF Band Width.....9 KHz

5.4 Test Equipment List and Details

See section 2.4 of this report.

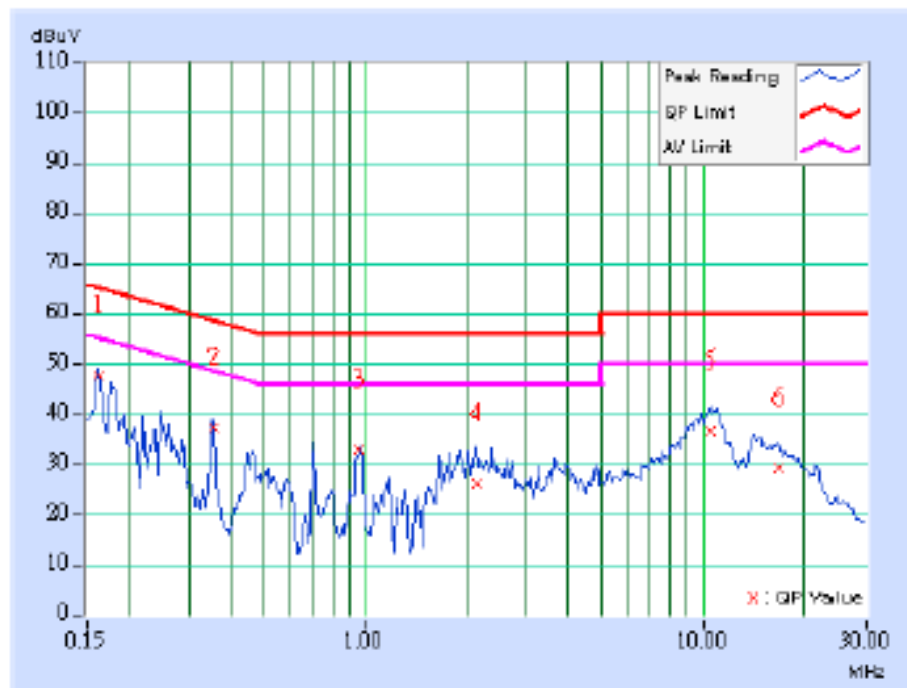
5.5 Test Procedure

1. Configure the EUT according to ANSI C63.4.
2. The EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and 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 connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
5. The frequency range from 150 KHz to 30 MHz was searched.
6. Use the Channel & Power Controlling software to make the EUT working on selected channel and expected output power, then use the "H" Patter Generator software to make the supporting equipments stay on working condition.
7. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
8. The measurement has to be done between each power line and ground at the power terminal for each RF channel. Only one RF channel has to be investigated since this test is independent with the RF channel selection.

5.6 Test Result

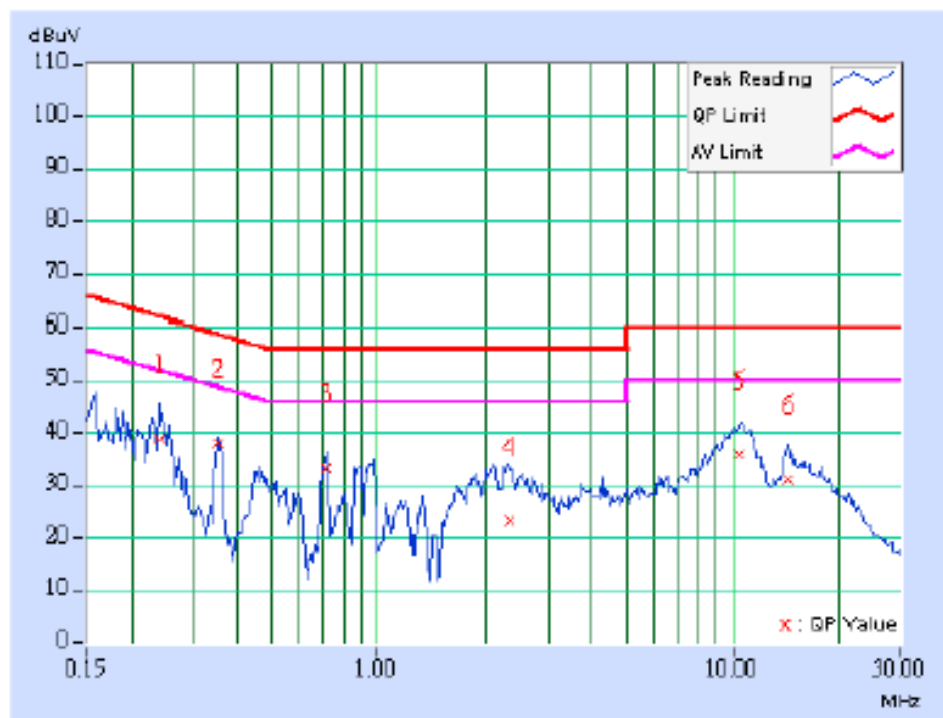
Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Channel: Low(2412MHz)	Phase: L
Modulation Type: BPSK	Transfer Rate: 6Mbps
Barometric Pressure (mbar) : 950~1000	Power: 120Vac, 60 Hz

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.21	47.01	-	47.22	-	65.38	55.38	-18.16	-
2	0.357	0.21	36.52	-	36.73	-	58.80	48.80	-22.07	-
3	0.959	0.24	31.98	-	32.22	-	56.00	46.00	-23.78	-
4	2.145	0.27	25.61	-	25.88	-	56.00	46.00	-30.12	-
5	10.547	0.56	35.87	-	36.43	-	60.00	50.00	-23.57	-
6	16.820	0.85	28.50	-	29.35	-	60.00	50.00	-30.65	-



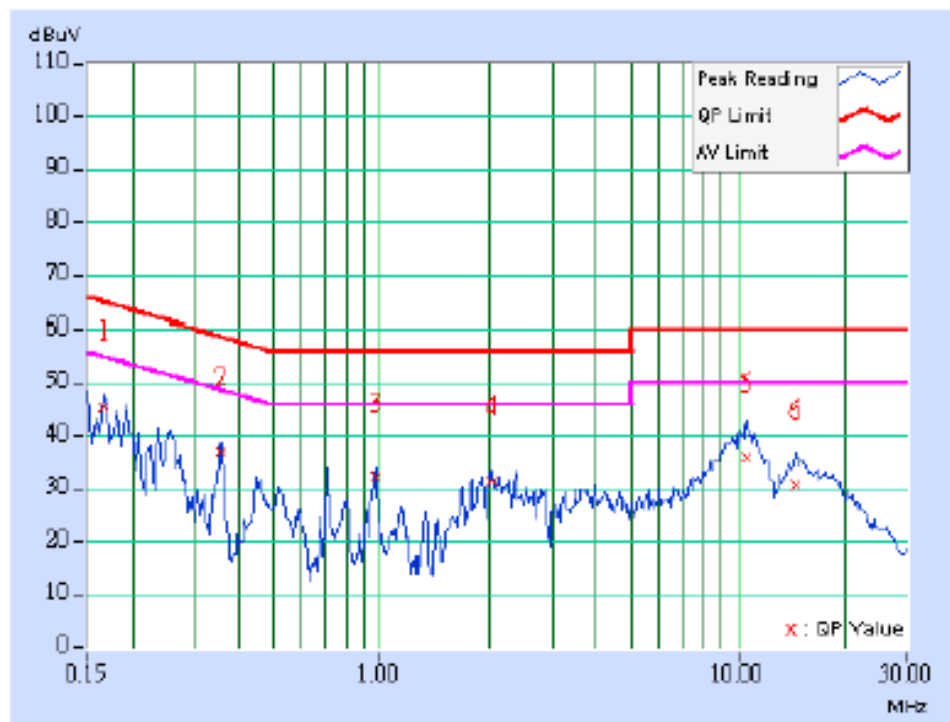
Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Channel: Low(2412MHz)	Phase: N
Modulation Type: BPSK	Transfer Rate: 6Mbps
Barometric Pressure (mbar) : 950~1000	Power: 120Vac, 60 Hz

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.240	0.21	38.45	-	38.66	-	62.10	52.10	-23.44	-
2	0.353	0.21	37.55	-	37.76	-	58.89	48.89	-21.13	-
3	0.713	0.23	33.01	-	33.24	-	56.00	46.00	-22.76	-
4	2.323	0.28	22.71	-	22.99	-	56.00	46.00	-33.01	-
5	10.473	0.53	35.58	-	36.11	-	60.00	50.00	-23.89	-
6	14.445	0.46	30.54	-	31.00	-	60.00	50.00	-29.00	-



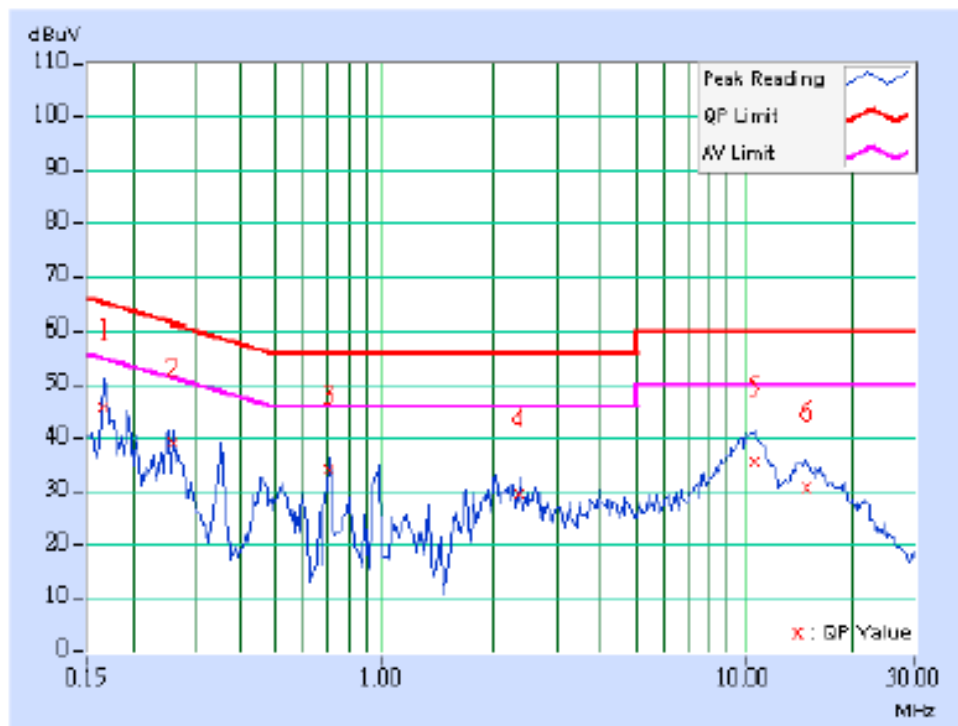
Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Channel: Mid.(2437MHz)	Phase: L
Modulation Type: BPSK	Transfer Rate: 6Mbps
Barometric Pressure (mbar) : 950~1000	Power: 120Vac, 60 Hz

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.166	0.21	44.84	-	45.05	-	65.18	55.18	-20.13	-
2	0.357	0.21	36.26	-	36.47	-	58.80	48.80	-22.33	-
3	0.966	0.24	31.51	-	31.75	-	56.00	46.00	-24.25	-
4	2.023	0.26	30.82	-	31.08	-	56.00	46.00	-24.92	-
5	10.602	0.57	35.16	-	35.73	-	60.00	50.00	-24.27	-
6	14.539	0.73	30.12	-	30.85	-	60.00	50.00	-29.15	-



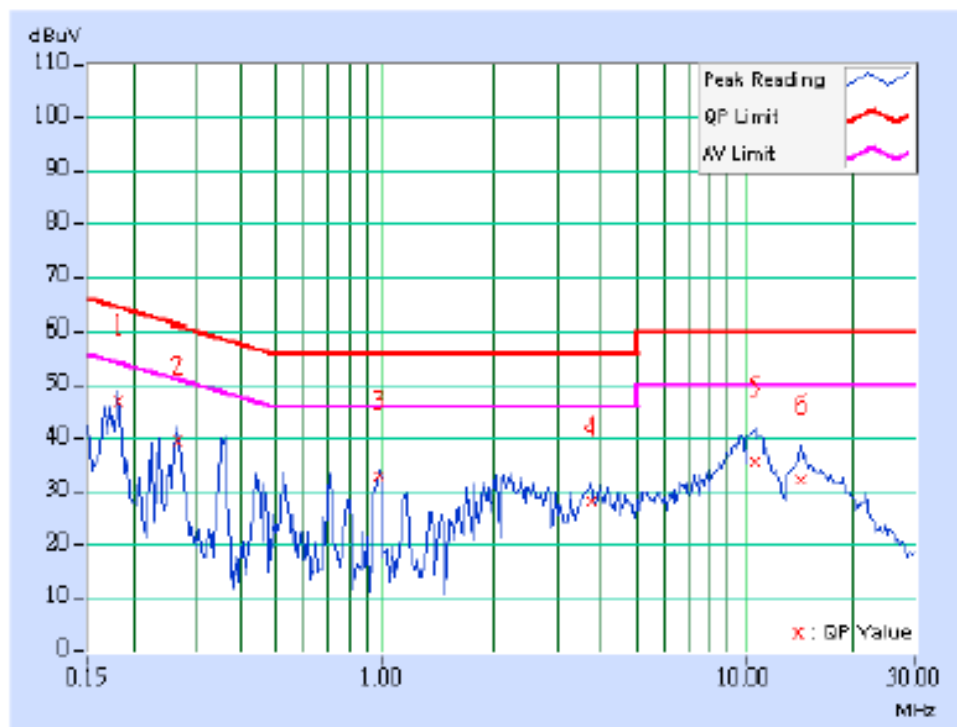
Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Channel: Mid.(2437MHz)	Phase: N
Modulation Type: BPSK	Transfer Rate: 6Mbps
Barometric Pressure (mbar) : 950~1000	Power: 120Vac, 60 Hz

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.166	0.21	45.54	-	45.75	-	65.18	55.18	-19.43	-
2	0.259	0.21	38.90	-	39.11	-	61.45	51.45	-22.34	-
3	0.709	0.23	33.64	-	33.87	-	56.00	46.00	-22.13	-
4	2.363	0.28	29.25	-	29.53	-	56.00	46.00	-26.47	-
5	10.691	0.53	34.99	-	35.52	-	60.00	50.00	-24.48	-
6	14.977	0.45	30.24	-	30.69	-	60.00	50.00	-29.31	-



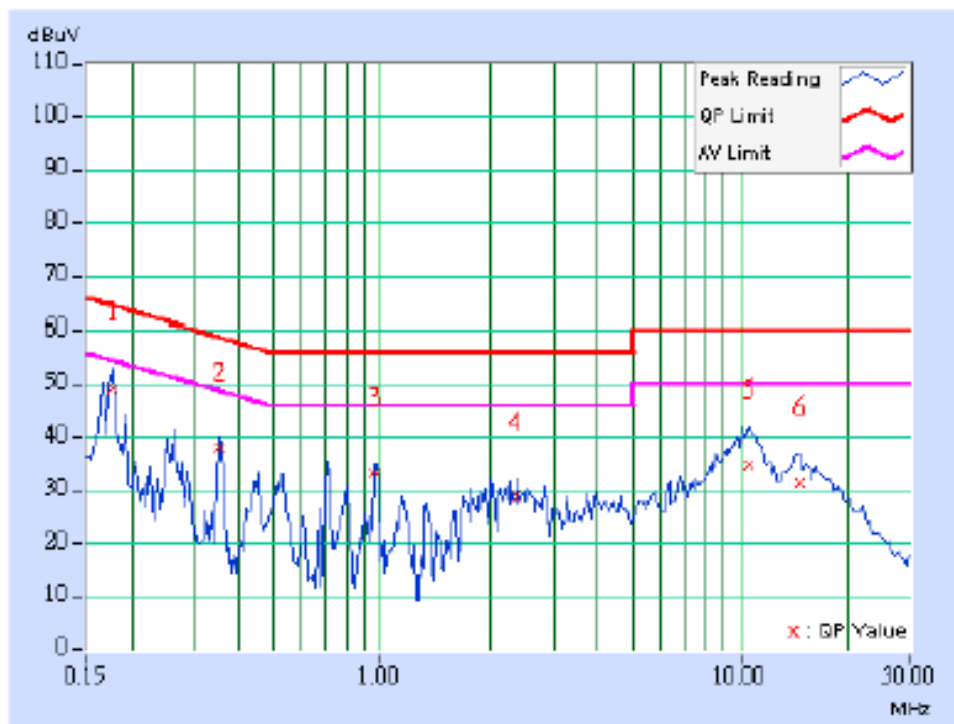
Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Channel: High(2462MHz)	Phase: L
Modulation Type: BPSK	Transfer Rate: 6Mbps
Barometric Pressure (mbar) : 950~1000	Power: 120Vac, 60 Hz

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.181	0.21	46.29	-	46.50	-	64.43	54.43	-17.93	-
2	0.267	0.21	38.93	-	39.14	-	61.20	51.20	-22.06	-
3	0.966	0.24	32.30	-	32.54	-	56.00	46.00	-23.46	-
4	3.719	0.37	27.35	-	27.72	-	56.00	46.00	-28.28	-
5	10.773	0.57	34.75	-	35.32	-	60.00	50.00	-24.68	-
6	14.348	0.72	31.59	-	32.31	-	60.00	50.00	-27.69	-



Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Channel: High(2462MHz)	Phase: N
Modulation Type: BPSK	Transfer Rate: 6Mbps
Barometric Pressure (mbar) : 950~1000	Power: 120Vac, 60 Hz

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.177	0.21	48.75	-	48.96	-	64.61	54.61	-15.65	-
2	0.349	0.21	37.84	-	38.05	-	58.98	48.98	-20.93	-
3	0.963	0.24	32.70	-	32.94	-	56.00	46.00	-23.06	-
4	2.367	0.28	28.30	-	28.58	-	56.00	46.00	-27.42	-
5	10.570	0.53	34.40	-	34.93	-	60.00	50.00	-25.07	-
6	14.691	0.46	30.91	-	31.37	-	60.00	50.00	-28.63	-

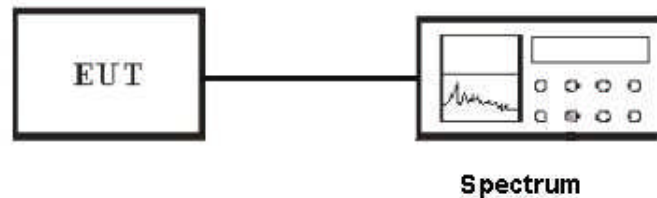


6. 6dB Bandwidth Measurement

6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

6.2 EUT Setup



6.3 Test Equipment List and Details

See section 2.4.

6.4 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

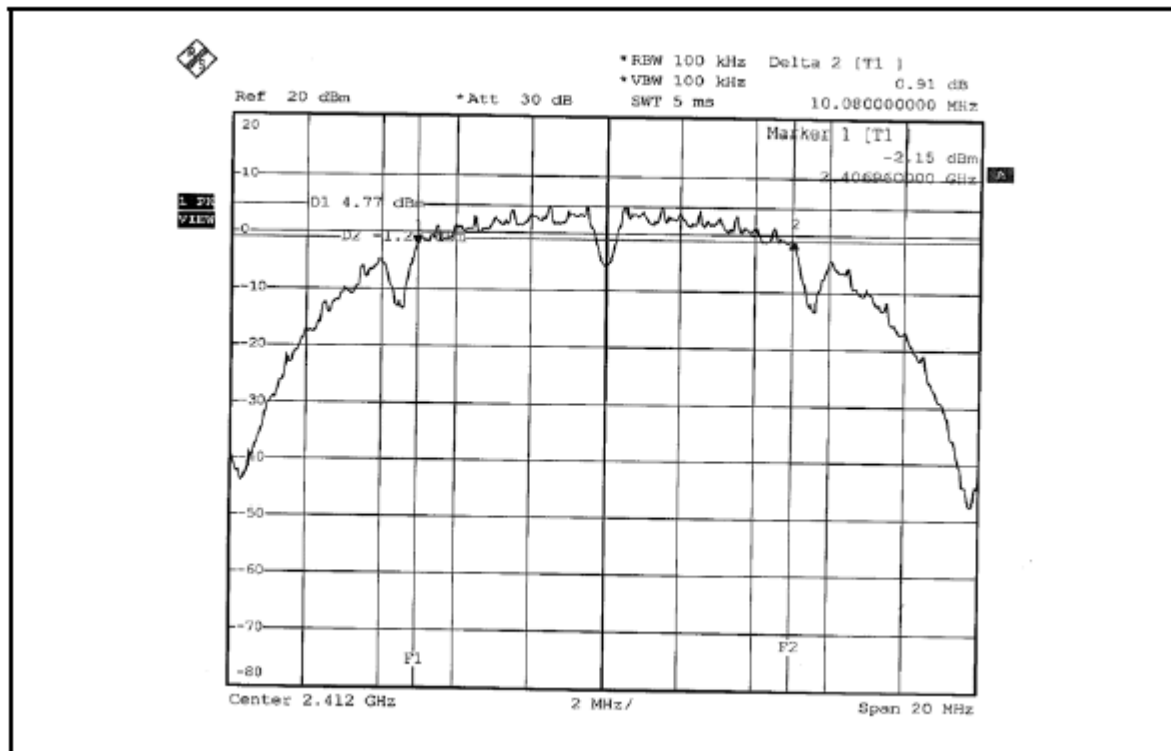
6.5 Test Result

802.11b DSSS MODULATION

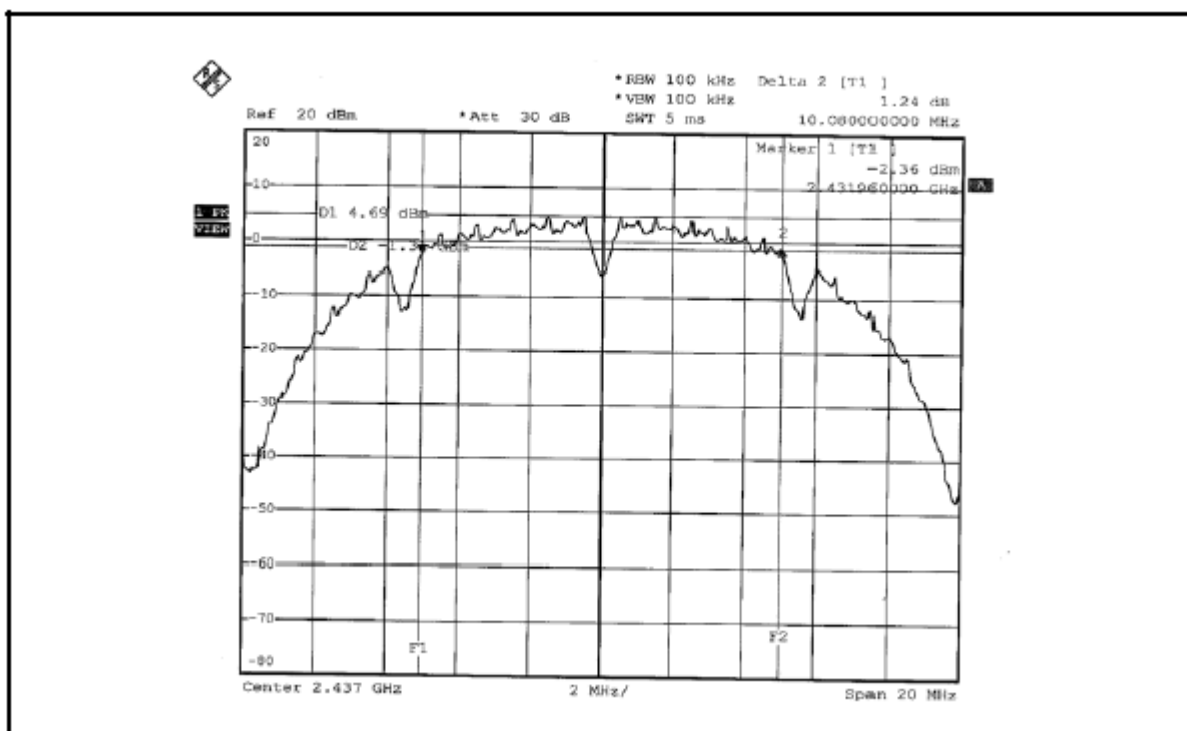
Modulation Type: DBPSK	Transfer Rate: 1Mbps
Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx/Rx Mode

Modulation Type	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Min. Limit (MHz)
DBPSK	LOW	2412	10.08	0.5
DBPSK	Mid	2437	10.08	0.5
DBPSK	High	2462	10.08	0.5

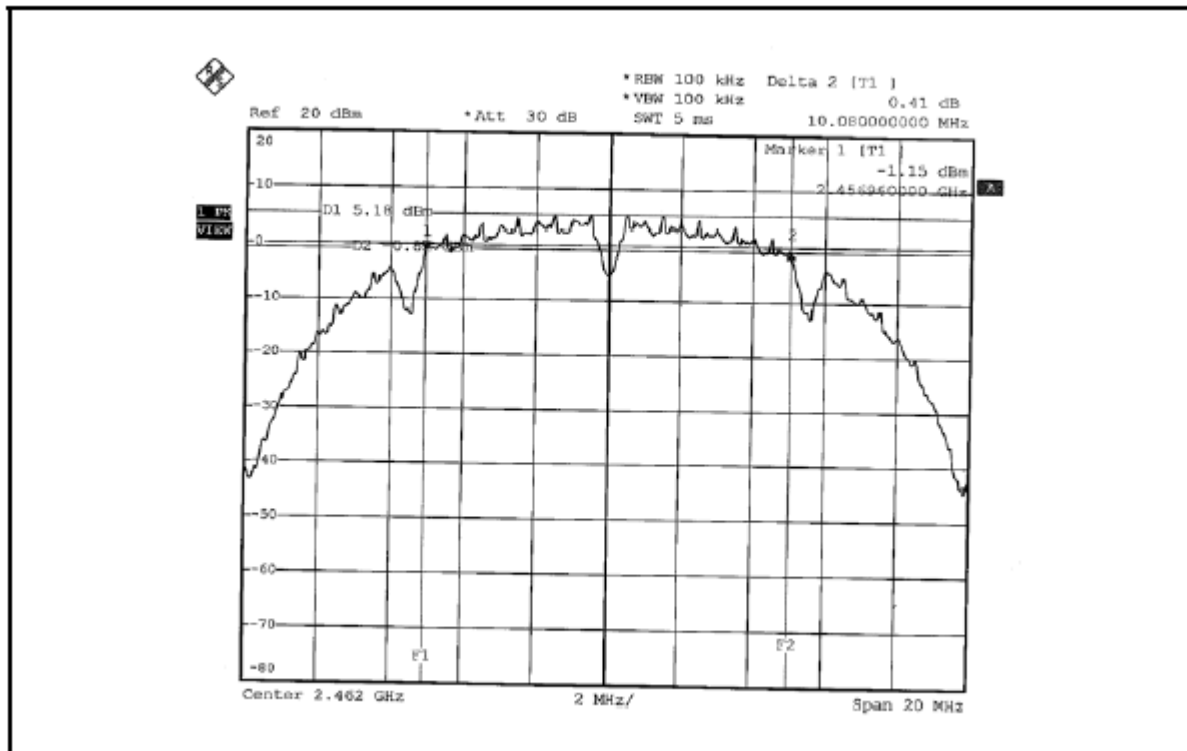
Channel Low :



Channel Mid :



Channel High :

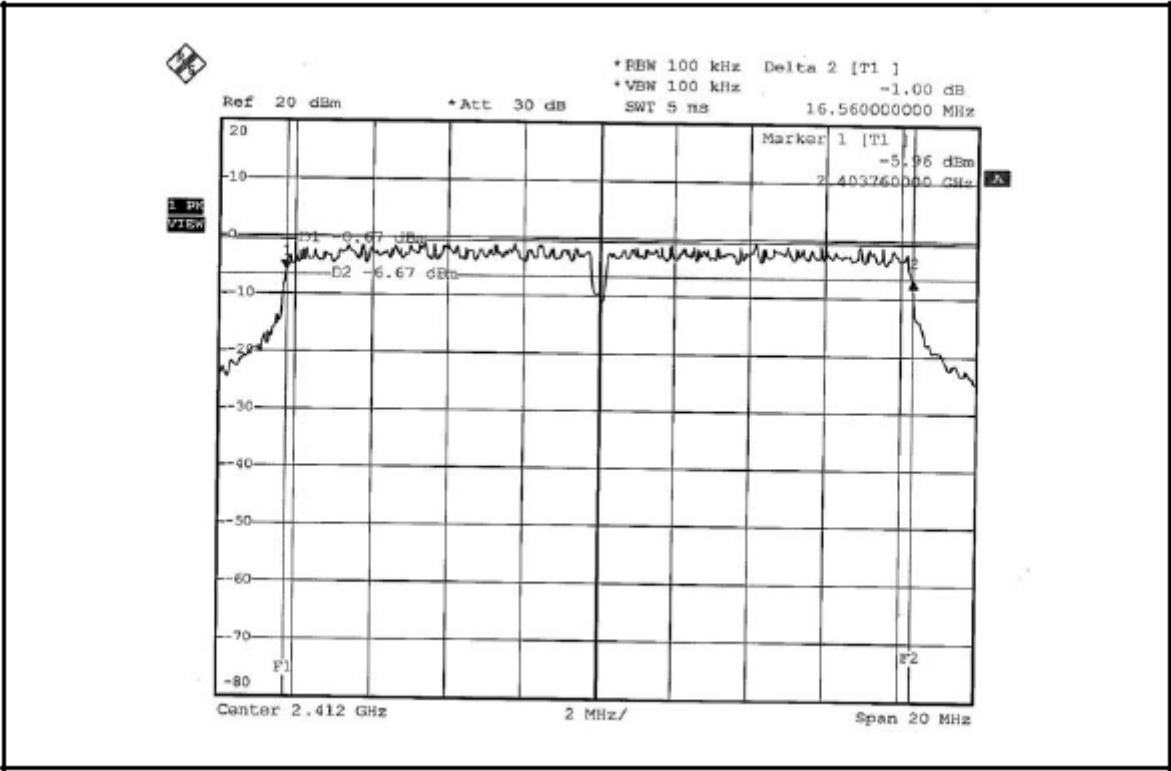


802.11g OFDM MODULATION

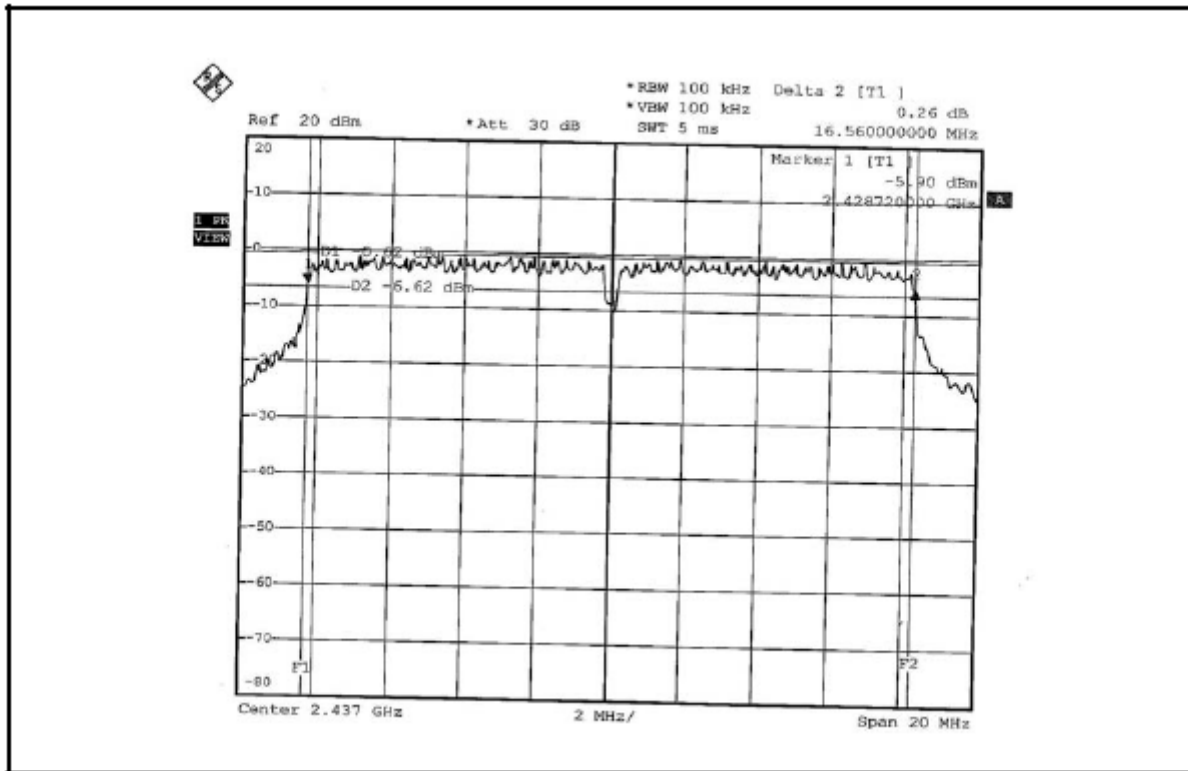
Modulation Type: BPSK	Transfer Rate: 6Mbps
Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx/Rx Mode

Modulation Type	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Min. Limit (MHz)
BPSK	LOW	2412	16.56	0.5
BPSK	Mid	2437	16.56	0.5
BPSK	High	2462	16.56	0.5

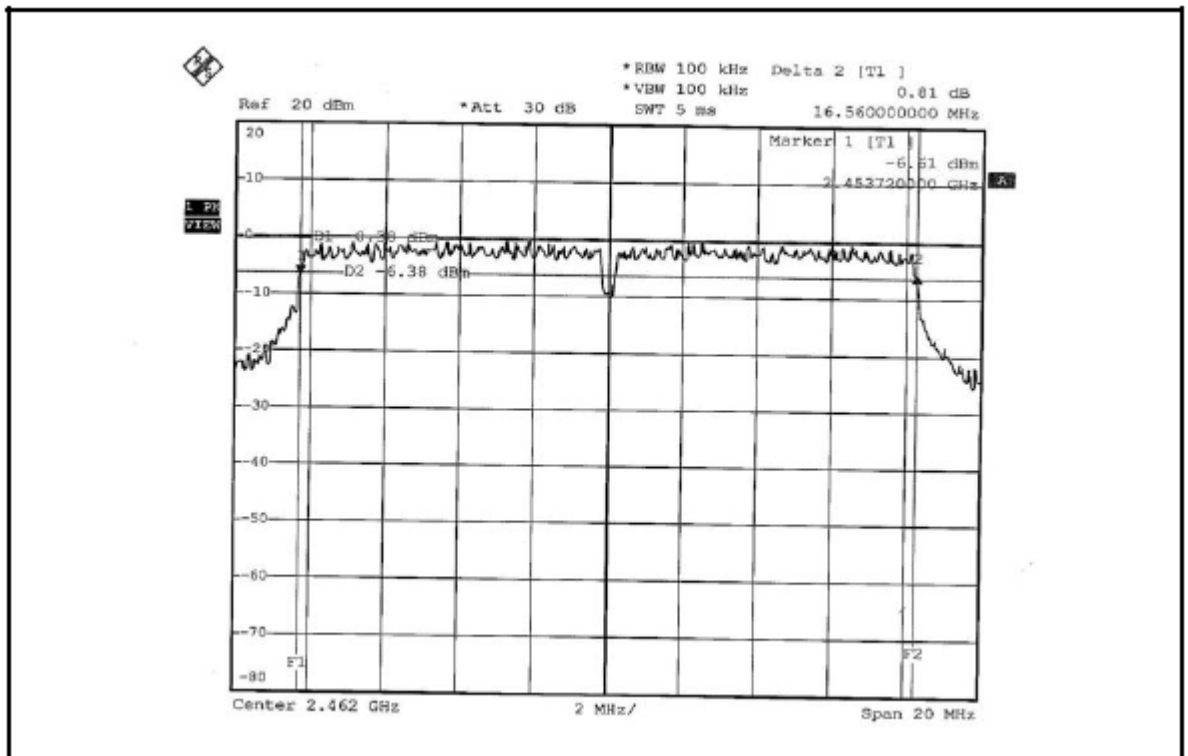
Channel Low :



Channel Mid. :



Channel High :

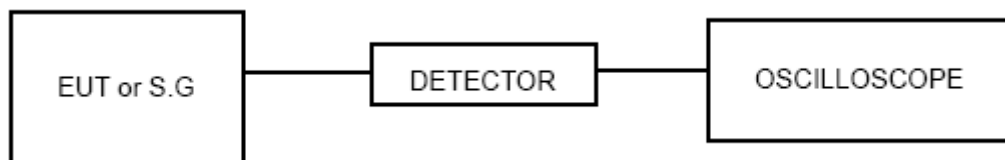


7. Maximum Peak Output Power

7.1 Limits of Maximum Peak Output Power Measurement

The Maximum Peak Output Power Measurement is 28.2dBm.

7.2 EUT Setup



7.3 Test Equipment List and Details

See section 2.4.

7.4 Test Procedure

1. A detector was used on the output port of the EUT. An oscilloscope was used to read the response of the detector.
2. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.
3. Adjusted the power to have the same reading on oscilloscope. Record the power level.

7.5 Test Result

802.11b DSSS MODULATION

Modulation Type: DBPSK	Transfer Rate: 1Mbps
Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx/Rx Mode

Channel No.	Frequency (MHz)	PEAK POWEROUTPUT (mW)	PEAK POWEROUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
LOW	2412	50.816	17.06	30	PASS
Mid	2437	51.050	17.08	30	PASS
High	2462	50.582	17.04	30	PASS

802.11g OFDM MODULATION

Modulation Type: BPSK	Transfer Rate: 6Mbps
Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx/Rx Mode

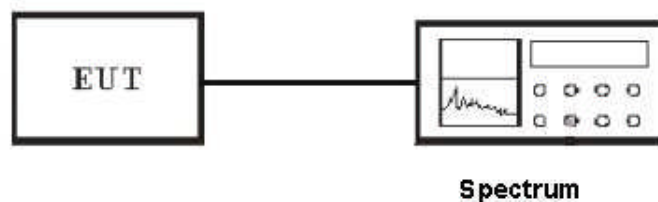
Channel No.	Frequency (MHz)	PEAK POWEROUTPUT (mW)	PEAK POWEROUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
LOW	2412	54.828	17.39	30	PASS
Mid	2437	54.325	17.35	30	PASS
High	2462	54.075	17.33	30	PASS

8. Power Spectral Density Measurement

8.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 6.2dBm.

8.2 EUT Setup



8.3 Test Equipment List and Details

See section 2.4.

8.4 Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded. The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

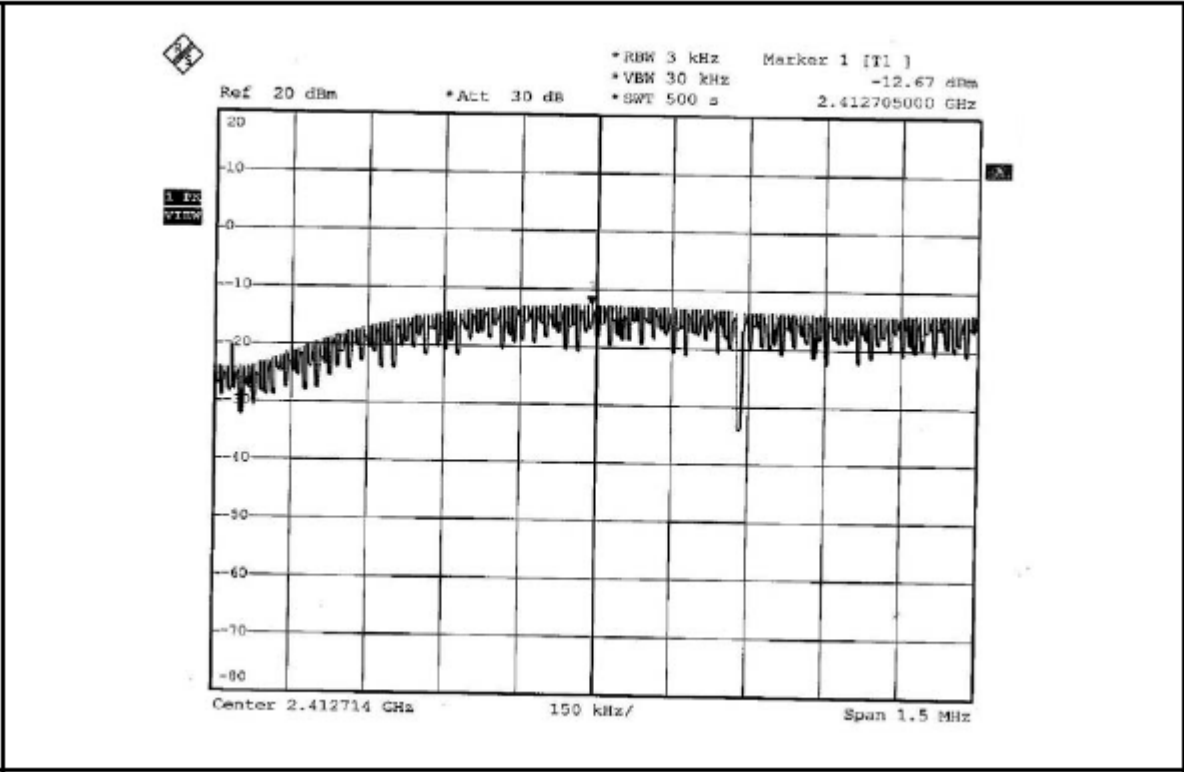
8.5 Test Result

802.11b DSSS MODULATION

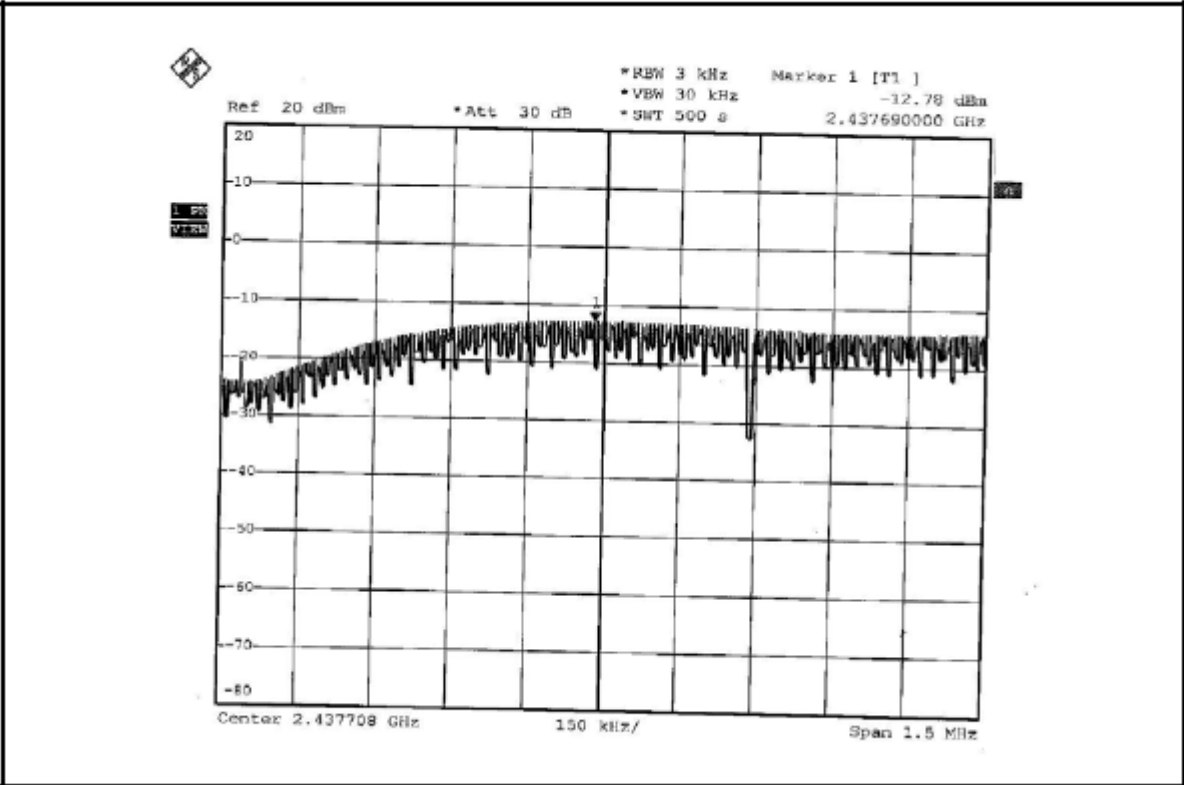
Modulation Type: DBPSK	Transfer Rate: 1Mbps
Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx/Rx Mode

Channel No.	Frequency (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
LOW	2412	-12.67	8	PASS
Mid	2437	-12.78	8	PASS
High	2462	-12.59	8	PASS

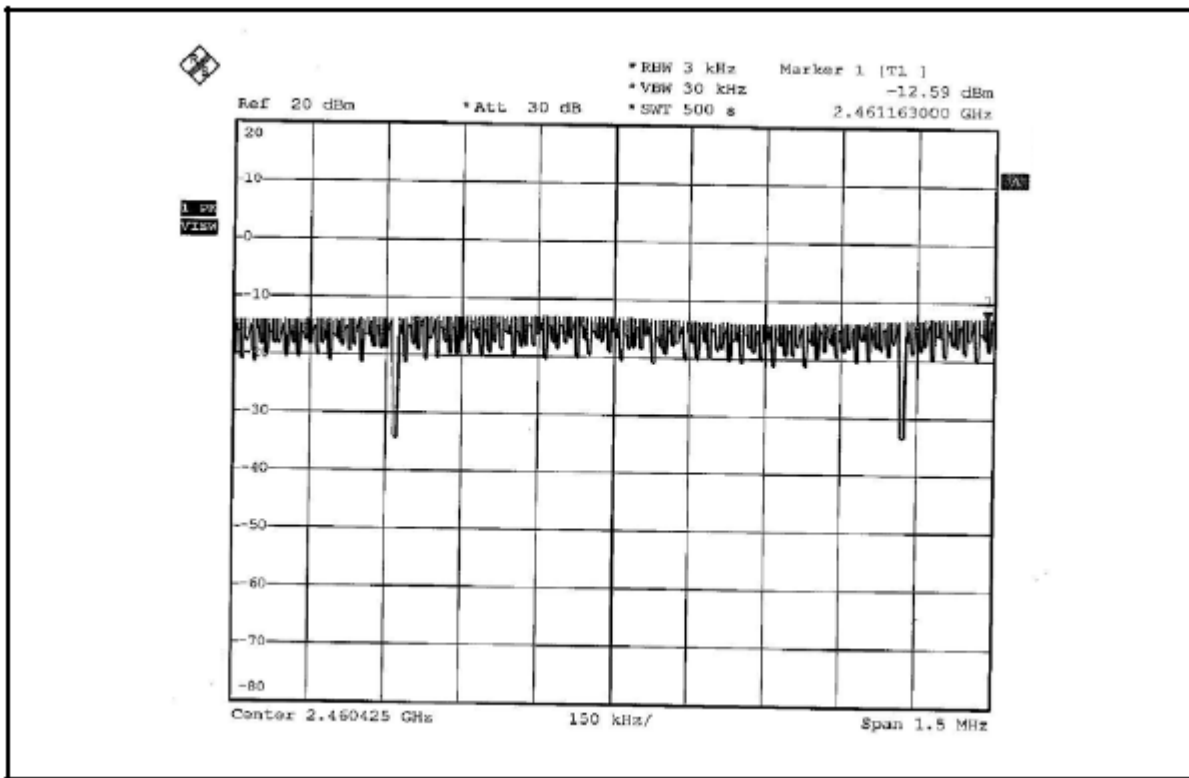
Channel Low :



Channel Mid. :



Channel High :

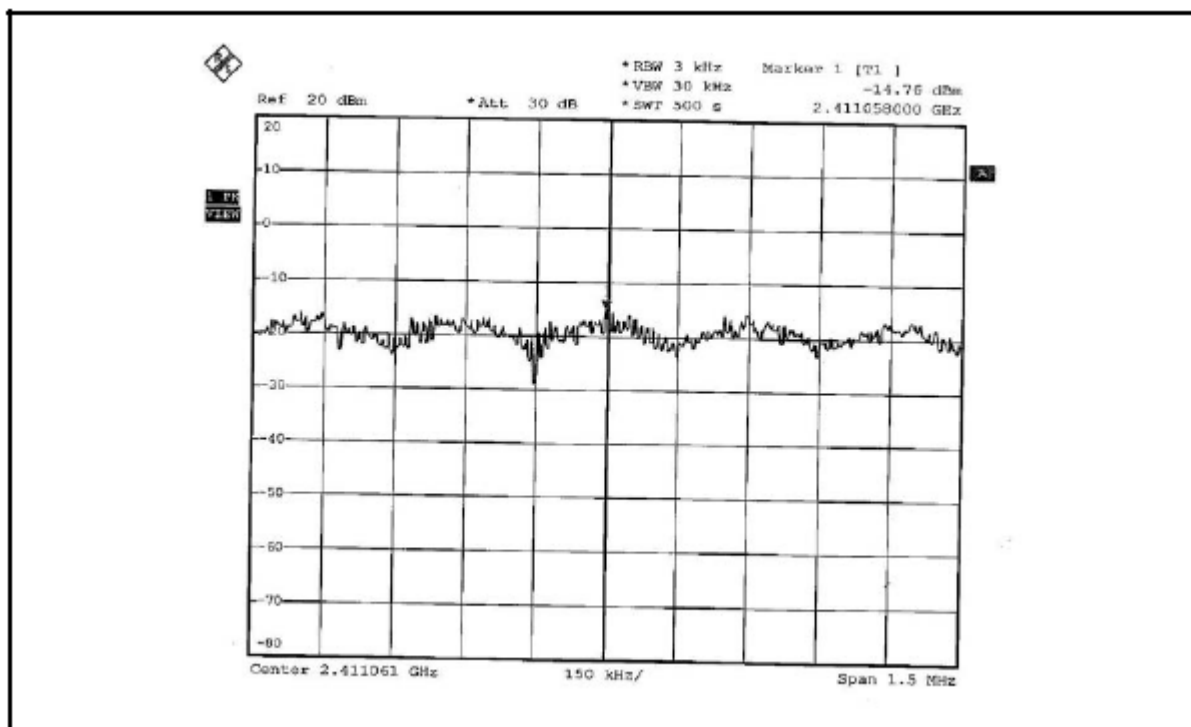


802.11g OFDM MODULATION

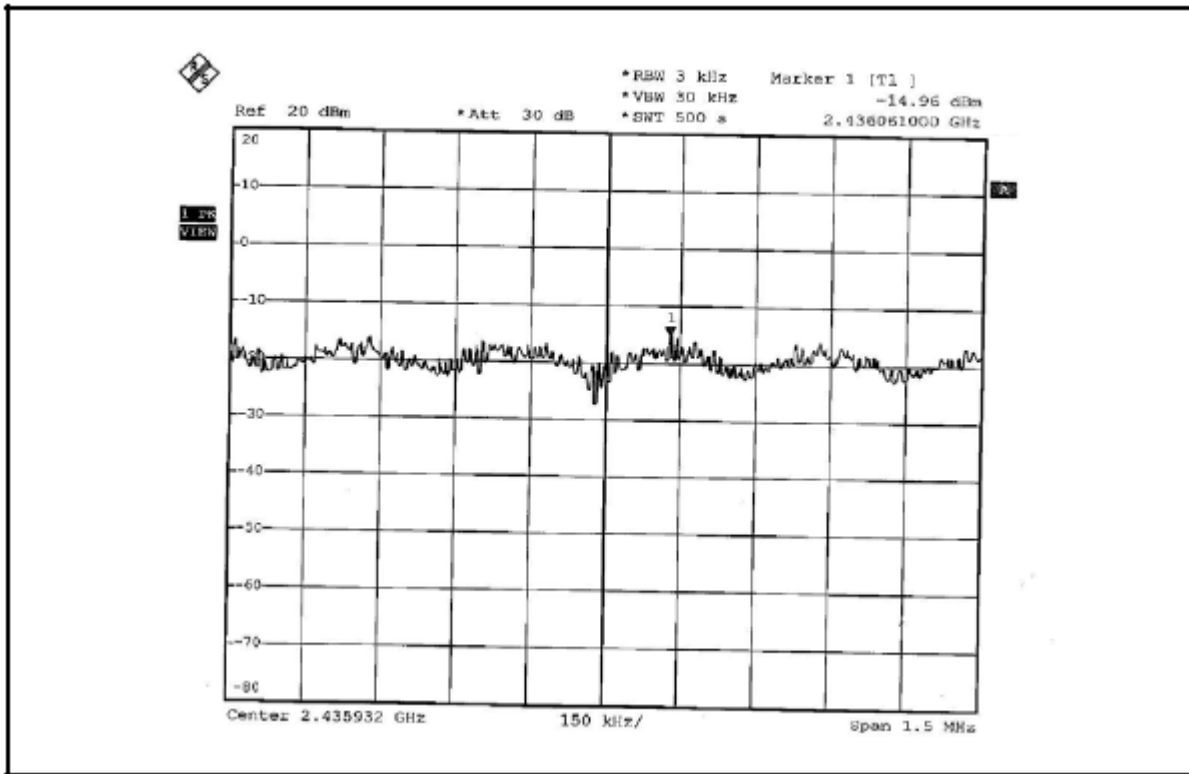
Modulation Type: BPSK	Transfer Rate: 6Mbps
Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx/Rx Mode

Channel No.	Frequency (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
LOW	2412	-14.76	8	PASS
Mid	2437	-14.96	8	PASS
High	2462	-14.88	8	PASS

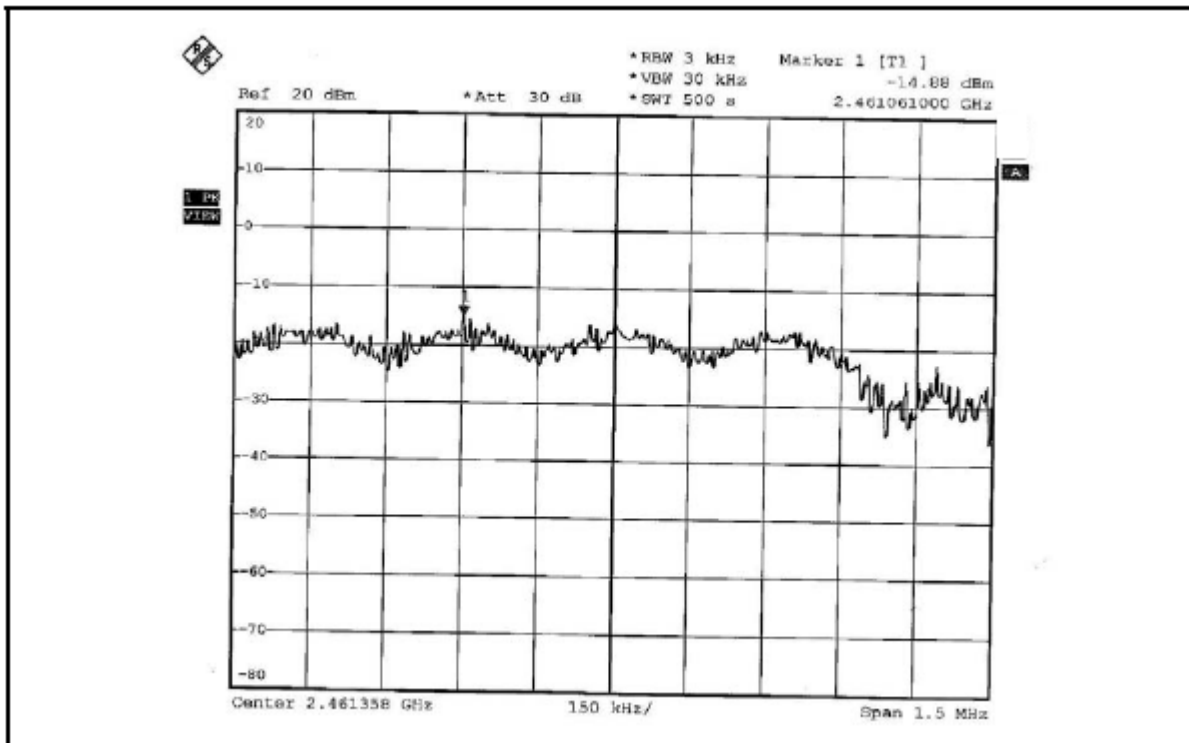
Channel Low :



Channel Mid. :



Channel High :



9. Band Edges Measurement

9.1 Limits of Band Edges Measurement

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

9.2 Test Equipment List and Details

See section 2.4.

9.3 Test Procedure

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded. The spectrum plots (Peak RBW=VBW=100kHz; Average RBW=1MHz, VBW=10Hz) are attached on the following pages.

9.4 Test Result

The spectrum plots are attached on the following 12 images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

Due to Chip antenna has the worst emission value, therefore the following test results came out from this.

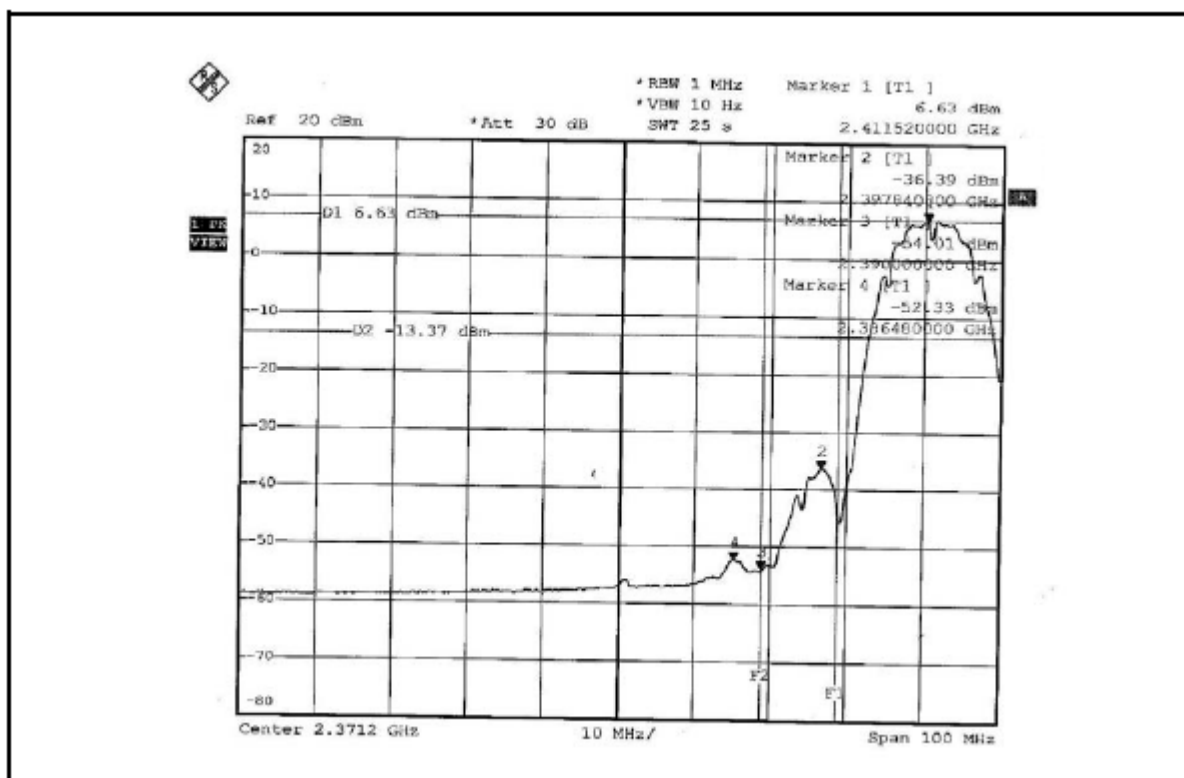
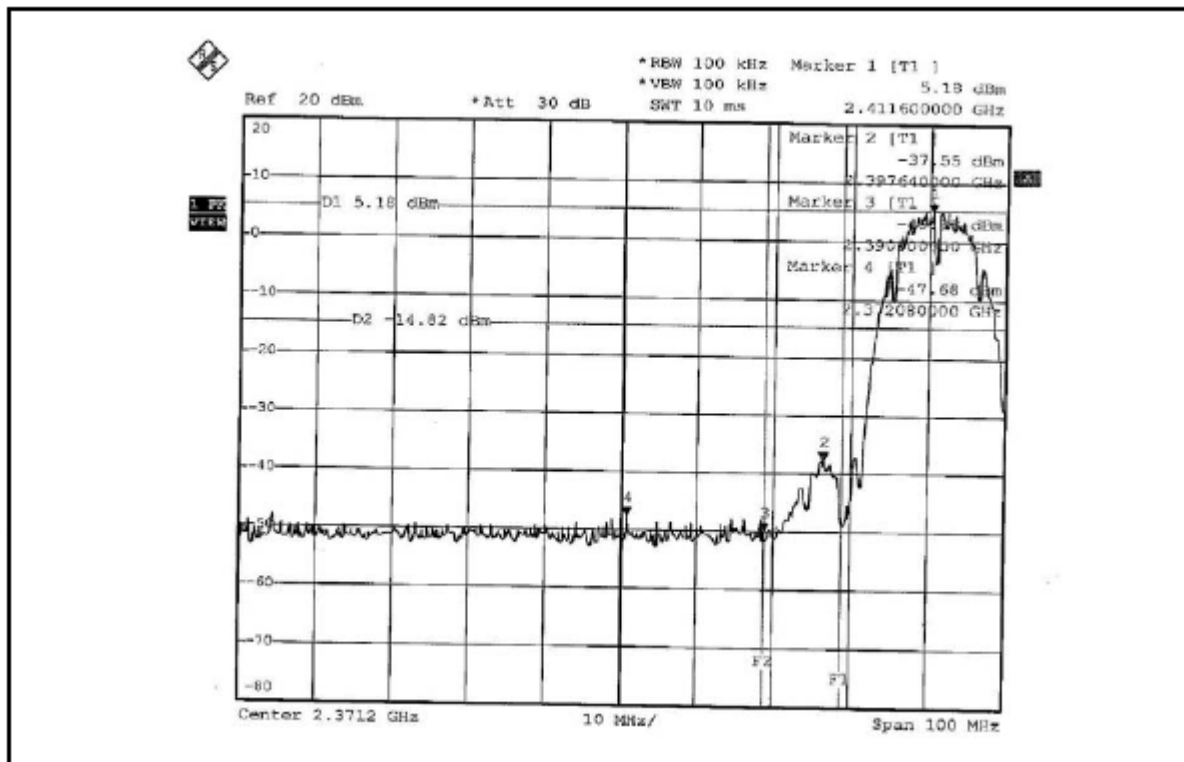
802.11b DSSS MODULATION

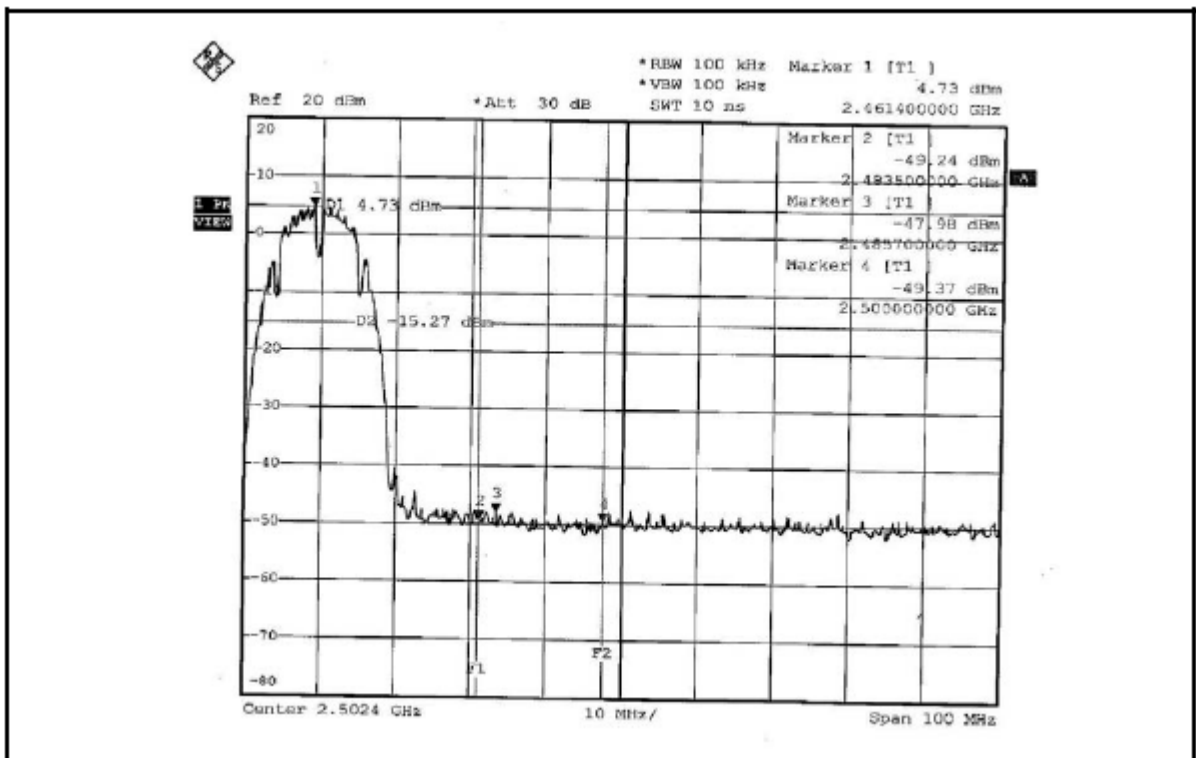
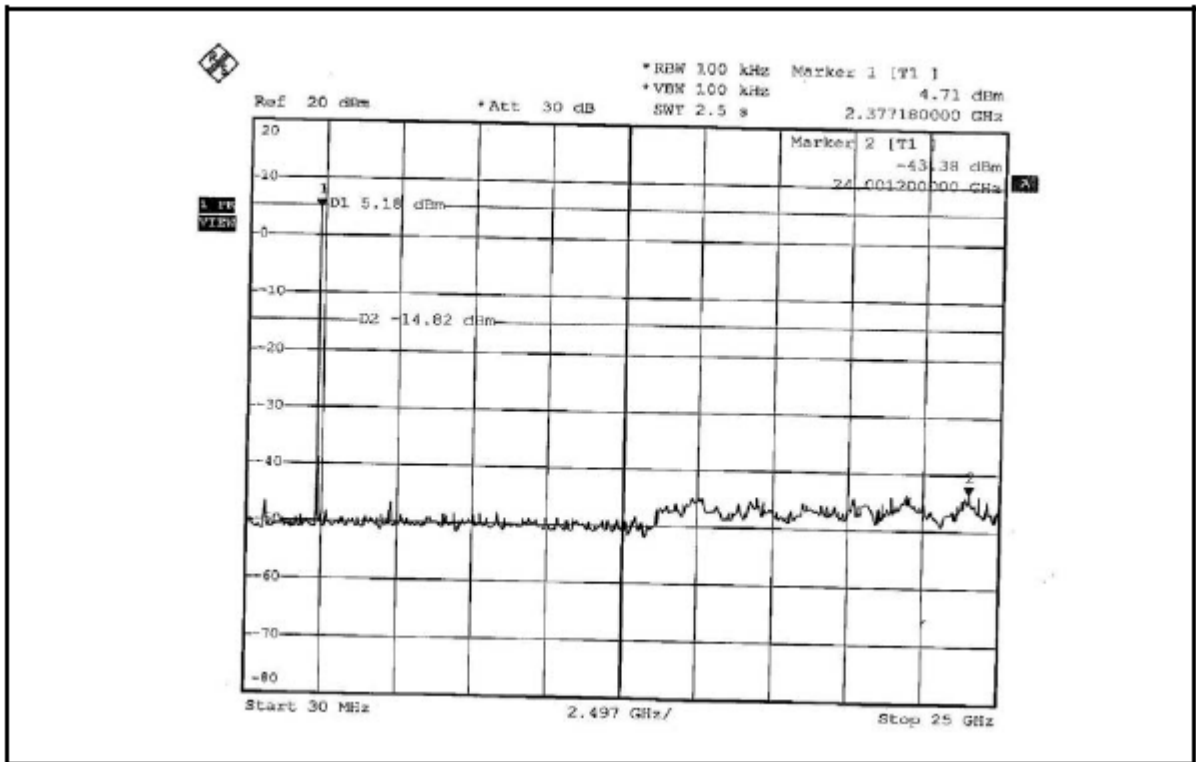
NOTE 1: The band edge emission plot on following first page shows 52.86dBc delta between carrier maximum power and local maximum emission in restrict band (2.37208GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 109.02dBuV/m (Peak), so the maximum field strength in restrict band is $109.02 - 52.86 = 56.16$ dBuV/m which is under 74dBuV/m limit.

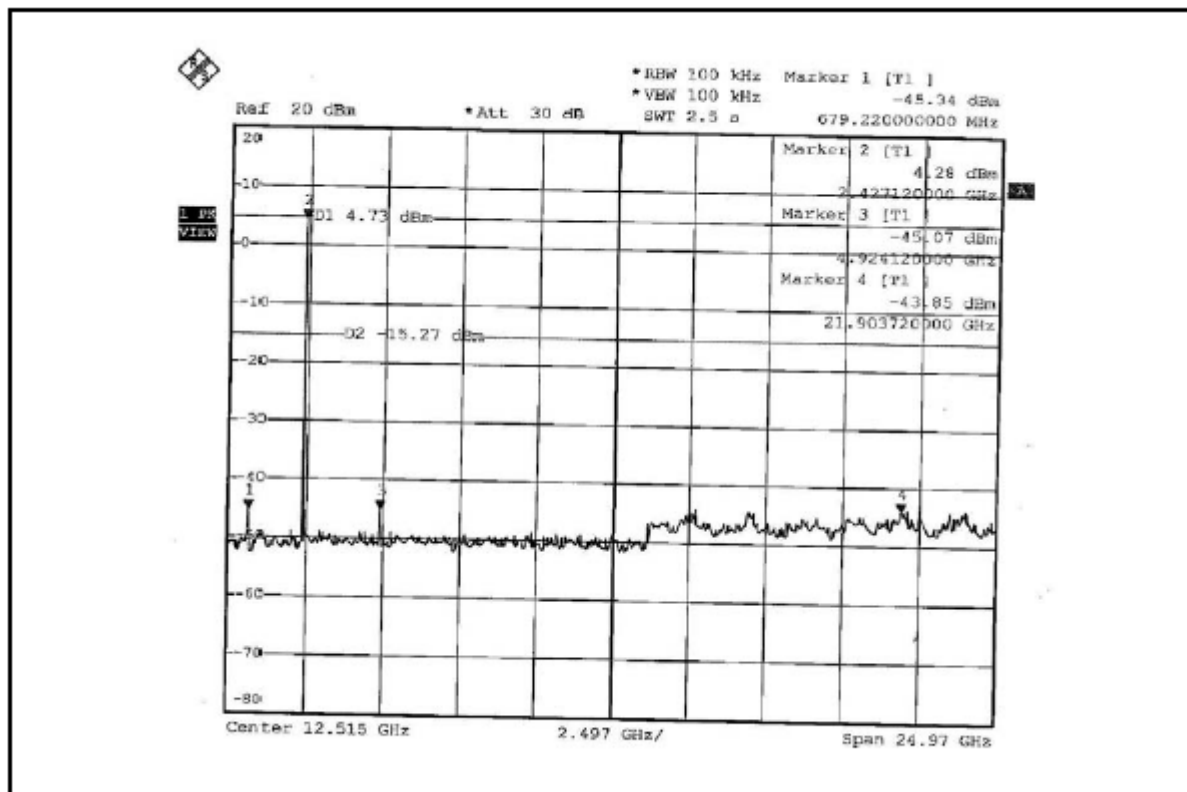
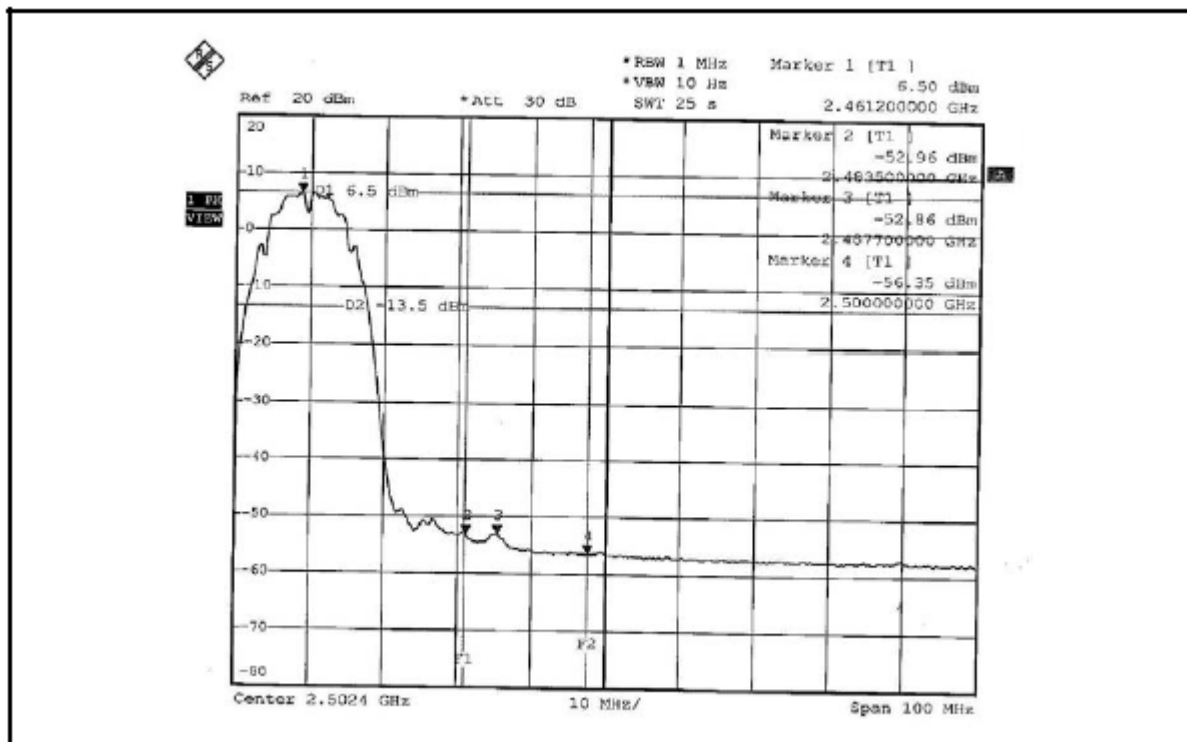
The band edge emission plot on following first page shows 58.96dBc delta between carrier maximum power and local maximum emission in restrict band (2.38648GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 104.62dBuV/m (Average), so the maximum field strength in restrict band is $104.62 - 58.96 = 45.66$ dBuV/m which is under 54dBuV/m limit.

NOTE 2: The band edge emission plot on following second page shows 52.71dBc delta between carrier maximum power and local maximum emission in restrict band (2.48570GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 109.56dBuV/m (Peak), so the maximum field strength in restrict band is $109.56 - 52.71 = 56.85$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on following third page shows 59.36dBc delta between carrier maximum power and local maximum emission in restrict band (2.48770GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 105.08dBuV/m (Average), so the maximum field strength in restrict band is $105.08 - 59.36 = 45.72$ dBuV/m which is under 54dBuV/m limit.







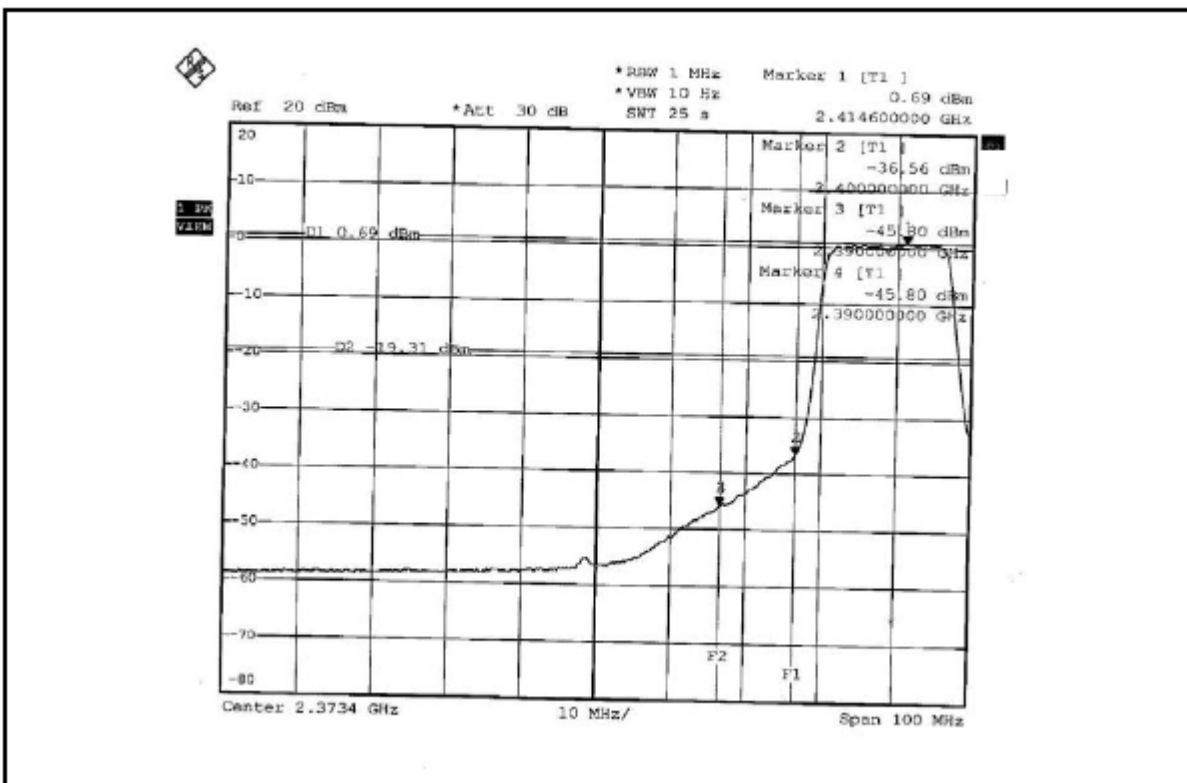
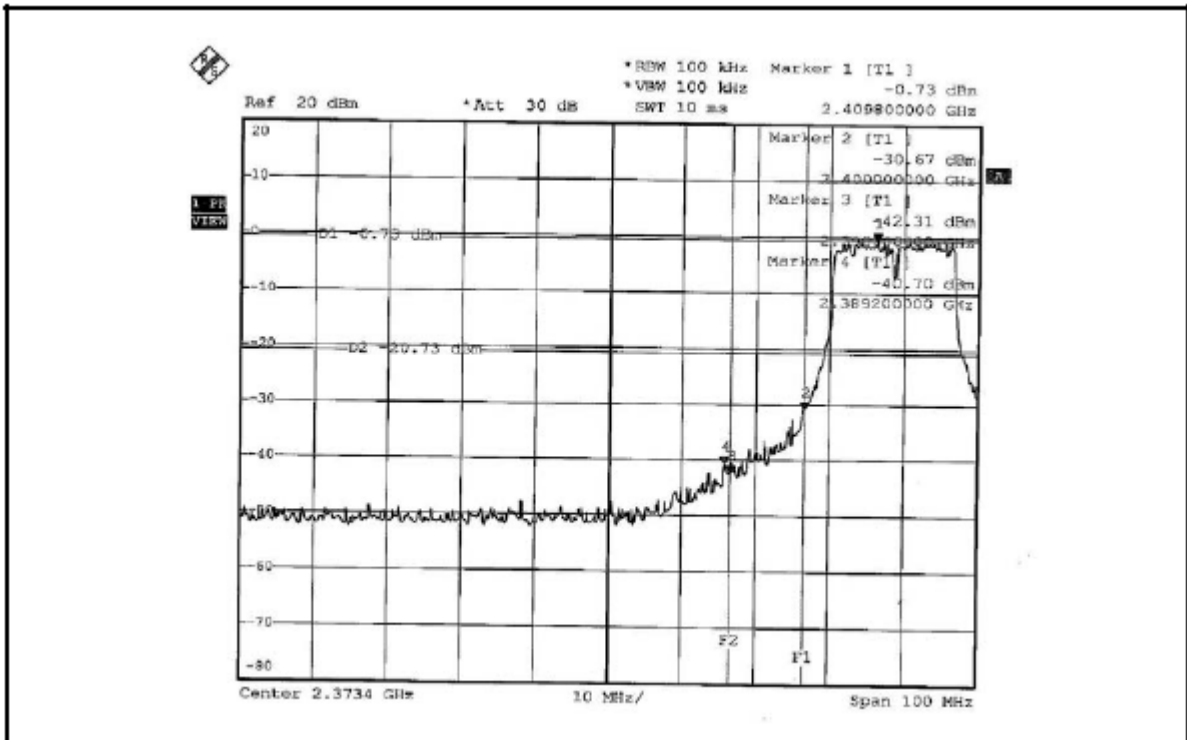
802.11g OFDM MODULATION

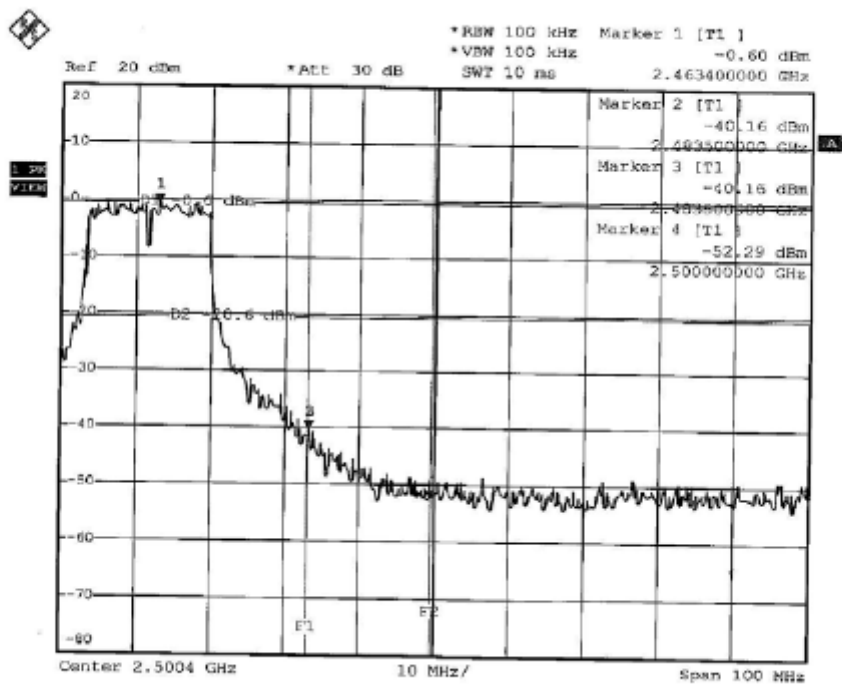
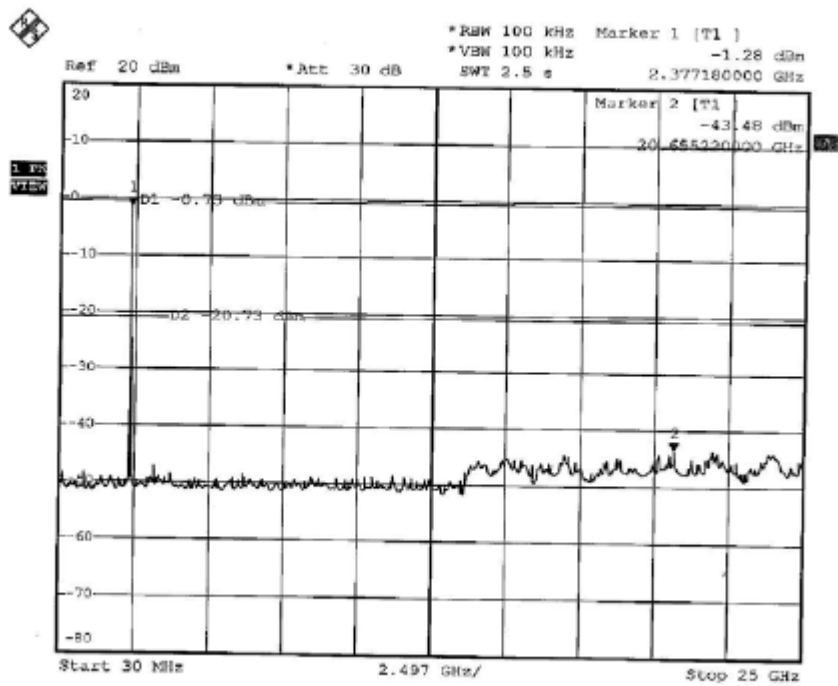
NOTE 1: The band edge emission plot on following first page shows 39.97dBc delta between carrier maximum power and local maximum emission in restrict band (2.38920GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 108.78dBuV/m (Peak), so the maximum field strength in restrict band is $108.78 - 39.97 = 68.81$ dBuV/m which is under 74dBuV/m limit.

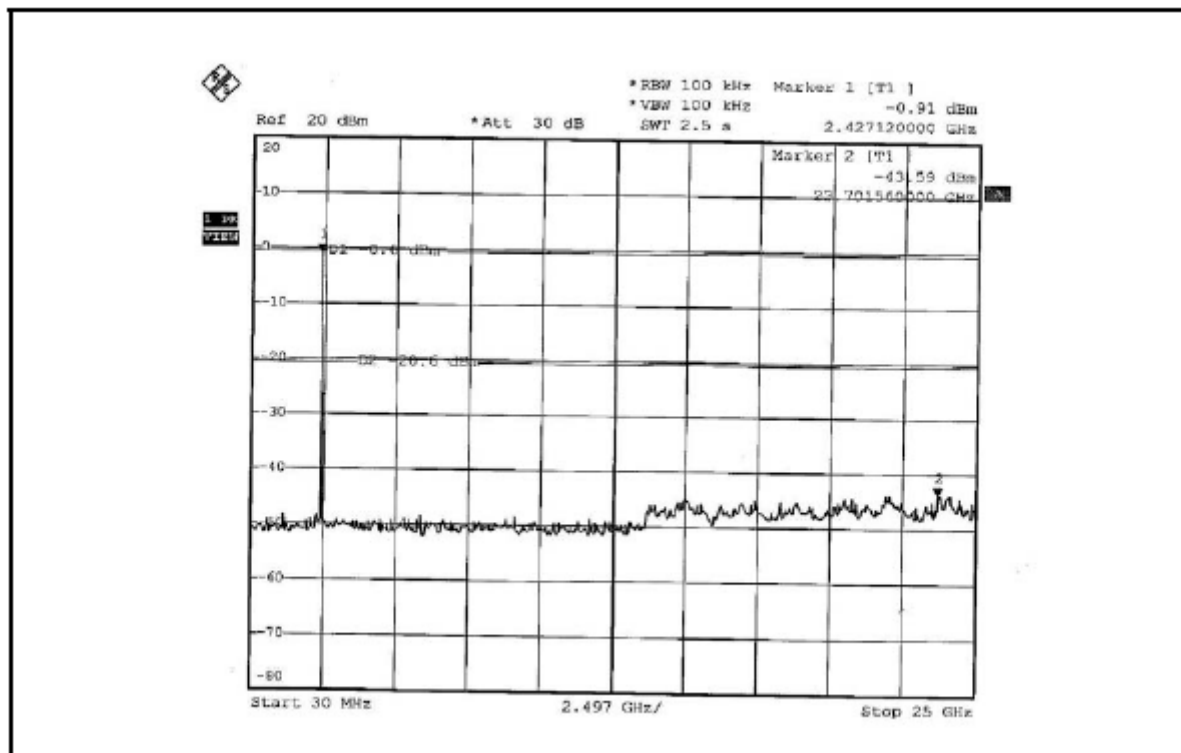
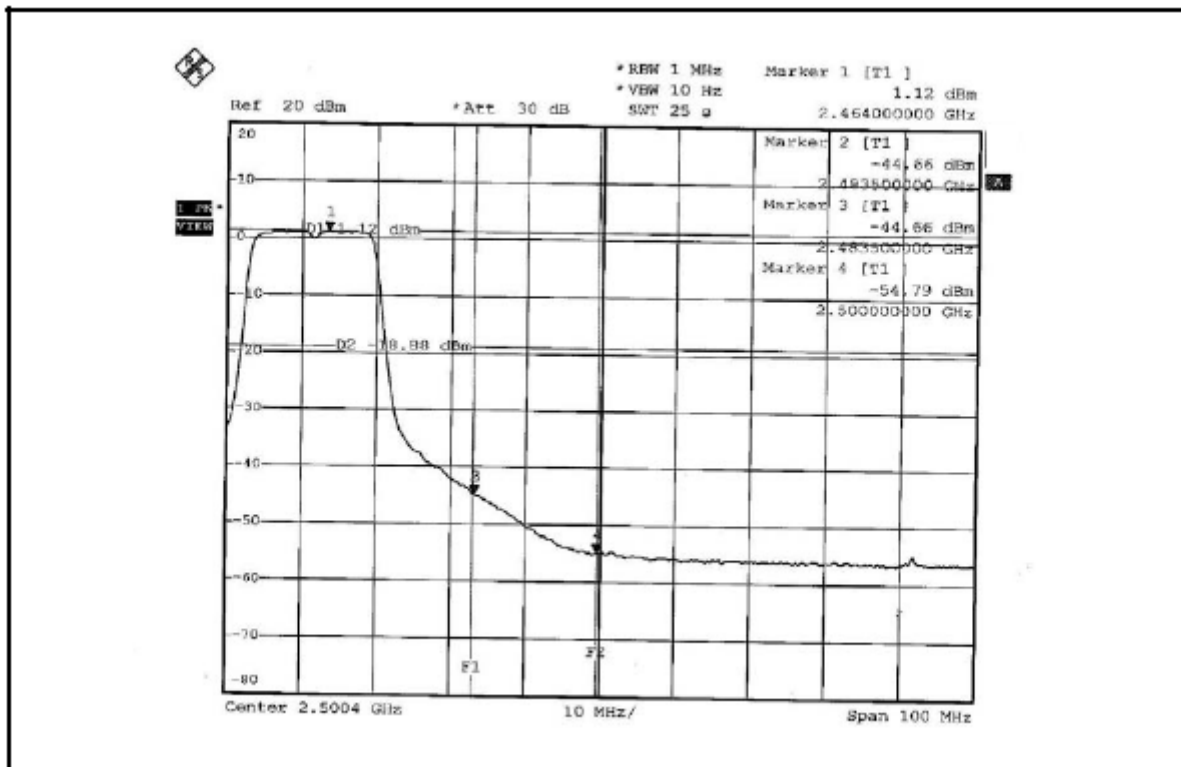
The band edge emission plot on following first page shows 46.49dBc delta between carrier maximum power and local maximum emission in restrict band (2.39000GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 98.09dBuV/m (Average), so the maximum field strength in restrict band is $98.09 - 46.49 = 51.60$ dBuV/m which is under 54dBuV/m limit.

NOTE 2: The band edge emission plot on following second page shows 39.56dBc delta between carrier maximum power and local maximum emission in restrict band (2.48350GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 108.28dBuV/m (Peak), so the maximum field strength in restrict band is $108.28 - 39.56 = 68.72$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on following third page shows show 45.78dBc delta between carrier maximum power and local maximum emission in restrict band (2.48350GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 98.00dBuV/m (Average), so the maximum field strength in restrict band is $98.00 - 45.78 = 52.22$ dBuV/m which is under 54dBuV/m limit.







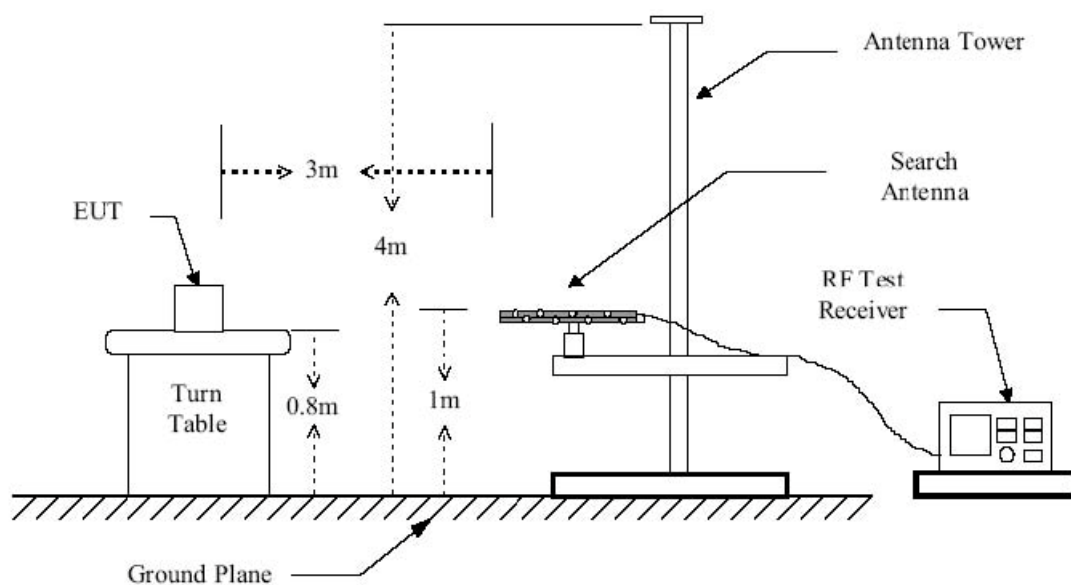
10. Radiated Emission Measurement

10.1 Limits of Radiated Emission Measurement

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209

10.2 EUT Setup

Radiated Measurement Setup



10.3 Test Equipment List and Details

See section 2.4.

10.4 Test Procedure

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

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

6. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.

10.5 Test Result

For MONOPOLE Antenna:

Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx / Rx
Channel: High(2462MHz)	Modulation Type: BPSK
Transfer Rate: 6Mbps	Frequency Range: Below 1000MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	119.42	32.95 QP	43.50	-10.55	1.50 H	340	21.45	11.50
2	133.03	36.32 QP	43.50	-7.18	1.00 H	244	24.27	12.05
3	199.12	41.70 QP	43.50	-1.80	1.00 H	244	31.31	10.39
4	239.94	31.64 QP	46.00	-14.36	2.00 H	70	19.53	12.10
5	465.43	32.82 QP	46.00	-13.18	1.50 H	286	15.13	17.69
6	720.08	32.07 QP	46.00	-13.93	1.00 H	229	9.59	22.47
7	799.78	32.92 QP	46.00	-13.08	1.50 H	208	8.56	24.36

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	115.53	27.96 QP	43.50	-15.54	1.50 V	343	16.94	11.03
2	134.97	27.21 QP	43.50	-16.29	1.00 V	142	15.09	12.12
3	199.12	31.24 QP	43.50	-12.26	1.00 V	268	20.84	10.39
4	465.43	33.82 QP	46.00	-12.18	1.00 V	142	16.13	17.69
5	799.78	29.34 QP	46.00	-16.66	1.00 V	73	4.98	24.36
6	863.93	30.15 QP	46.00	-15.85	1.50 V	13	5.18	24.98
7	933.91	29.04 QP	46.00	-16.96	1.00 V	136	3.44	25.60

802.11b DSSS Modulation

For MONOPOLE Antenna:

Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx / Rx
Channel: Low(2412MHz)	Modulation Type: DBPSK
Transfer Rate: 1Mbps	Frequency Range: 1~25GHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	53.61 PK	74.00	-20.39	1.40 H	360	22.40	31.21
2	2390.00	44.41 AV	54.00	-9.59	1.40 H	360	13.20	31.21
3	*2412.00	102.54 PK			1.40 H	360	71.34	31.20
4	*2412.00	98.00 AV			1.40 H	360	66.80	31.20
5	4824.00	47.84 PK	74.00	-26.16	1.22 H	112	11.41	36.42
6	4824.00	41.95 AV	54.00	-12.05	1.22 H	112	5.52	36.42

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2386.00	54.93 PK	74.00	-19.07	1.04 V	78	23.72	31.21
2	2386.00	46.42 AV	54.00	-7.58	1.04 V	78	15.21	31.21
3	*2412.00	108.79 PK			1.04 V	78	77.59	31.20
4	*2412.00	104.27 AV			1.04 V	78	73.07	31.20
5	4824.00	52.39 PK	74.00	-21.61	1.08 V	315	15.96	36.42
6	4824.00	49.37 AV	54.00	-4.63	1.08 V	315	12.94	36.42

Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx / Rx
Channel: Mid.(2437MHz)	Modulation Type: DBPSK
Transfer Rate: 1Mbps	Frequency Range: 1~25GHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	102.42 PK			1.33 H	345	71.21	31.21
2	*2437.00	98.11 AV			1.33 H	345	66.90	31.21
3	4874.00	47.68 PK	74.00	-26.32	1.03 H	241	11.15	36.53
4	4874.00	41.61 AV	54.00	-12.39	1.03 H	241	5.08	36.53

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	108.16 PK			1.05 V	293	76.95	31.21
2	*2437.00	103.63 AV			1.05 V	293	72.42	31.21
3	4874.00	53.40 PK	74.00	-20.60	1.05 V	207	16.87	36.53
4	4874.00	49.90 AV	54.00	-4.10	1.05 V	207	13.37	36.53

Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx / Rx
Channel: High(2462MHz)	Modulation Type: DBPSK
Transfer Rate: 1Mbps	Frequency Range: 1~25GHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	103.42 PK			1.21 H	120	72.20	31.22
2	*2462.00	98.86 AV			1.21 H	120	67.64	31.22
3	2483.50	54.93 PK	74.00	-19.07	1.21 H	120	23.70	31.23
4	2483.50	43.31 AV	54.00	-10.69	1.21 H	120	12.08	31.23
5	4924.00	48.24 PK	74.00	-25.76	1.02 H	112	11.61	36.63
6	4924.00	42.36 AV	54.00	-11.64	1.02 H	112	5.73	36.63

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	109.27 PK			1.16 V	4	78.05	31.22
2	*2462.00	104.78 AV			1.16 V	4	73.56	31.22
3	2483.50	60.78 PK	74.00	-13.22	1.15 V	13	29.55	31.23
4	2483.50	49.23 AV	54.00	-4.77	1.15 V	13	18.00	31.23
5	4924.00	52.57 PK	74.00	-21.43	1.07 V	57	15.93	36.63
6	4924.00	49.09 AV	54.00	-4.91	1.07 V	57	12.45	36.63

802.11g OFDM Modulation
For MONOPOLE Antenna:

Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx / Rx
Channel: Low(2412MHz)	Modulation Type: BPSK
Transfer Rate: 6Mbps	Frequency Range: 1~25GHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	63.12 PK	74.00	-10.88	1.35 H	308	31.91	31.21
2	2390.00	47.16 AV	54.00	-6.84	1.35 H	308	15.95	31.21
3	*2412.00	101.12 PK			1.35 H	308	69.92	31.20
4	*2412.00	92.37 AV			1.35 H	308	61.17	31.20
5	4824.00	43.34 PK	74.00	-30.66	1.10 H	156	6.91	36.42
6	4824.00	32.90 AV	54.00	-21.10	1.10 H	156	-3.53	36.42

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	68.84 PK	74.00	-5.16	1.07 V	78	37.63	31.21
2	2390.00	50.59 AV	54.00	-3.41	1.07 V	78	19.38	31.21
3	*2412.00	106.11 PK			1.05 V	75	74.91	31.20
4	*2412.00	97.28 AV			1.05 V	75	66.08	31.20
5	4824.00	45.79 PK	74.00	-28.21	1.10 V	349	9.36	36.42
6	4824.00	34.82 AV	54.00	-19.18	1.10 V	349	-1.61	36.42

Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx / Rx
Channel: Mid.(2437MHz)	Modulation Type: BPSK
Transfer Rate: 6Mbps	Frequency Range: 1~25GHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	101.21 PK			1.35 H	289	70.00	31.21
2	*2437.00	92.27 AV			1.35 H	289	61.06	31.21
3	4874.00	43.56 PK	74.00	-30.44	1.00 H	59	7.03	36.53
4	4874.00	32.97 AV	54.00	-21.03	1.00 H	59	-3.56	36.53

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	107.31 PK			1.05 V	295	76.10	31.21
2	*2437.00	97.80 AV			1.05 V	295	66.59	31.21
3	4874.00	45.86 PK	74.00	-28.14	1.08 V	233	9.33	36.53
4	4874.00	34.90 AV	54.00	-19.10	1.08 V	233	-1.63	36.53

Temperature (°C) : 22~23	EUT: WI-FI Inch Digital Photo Frame
Humidity (%RH) : 50~54	M/N: DPF-A70-H
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx / Rx
Channel: High(2462MHz)	Modulation Type: BPSK
Transfer Rate: 6Mbps	Frequency Range: 1~25GHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	100.41 PK			1.34 H	308	69.19	31.22
2	*2462.00	91.49 AV			1.34 H	308	60.27	31.22
3	2483.50	60.08 PK	74.00	-13.92	1.34 H	308	28.85	31.23
4	2483.50	47.82 AV	54.00	-6.18	1.34 H	308	16.59	31.23
5	4924.00	43.31 PK	74.00	-30.69	1.00 H	360	6.67	36.63
6	4924.00	32.50 AV	54.00	-21.50	1.00 H	360	-4.14	36.63

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	107.12 PK			1.40 V	13	75.90	31.22
2	*2462.00	98.05 AV			1.40 V	13	66.83	31.22
3	2483.50	71.23 PK	74.00	-2.77	1.39 V	24	40.00	31.23
4	2483.50	51.88 AV	54.00	-2.12	1.39 V	24	20.65	31.23
5	4924.00	46.23 PK	74.00	-27.77	1.07 V	360	9.59	36.63
6	4924.00	33.72 AV	54.00	-20.28	1.07 V	360	-2.92	36.63

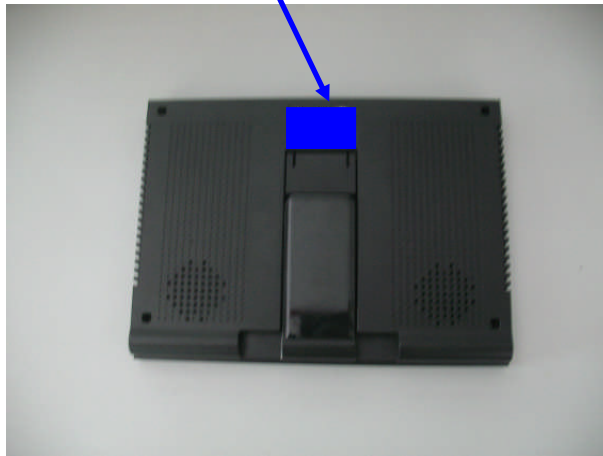
APPENDIX A - PRODUCT LABELING

ID Label Specification

Specification: Text is Black or white in color and is left justified. Labels are printed in indelible ink on permanent adhesive backing and shall be affixed at a conspicuous location on the EUT or silk-screened onto the EUT.

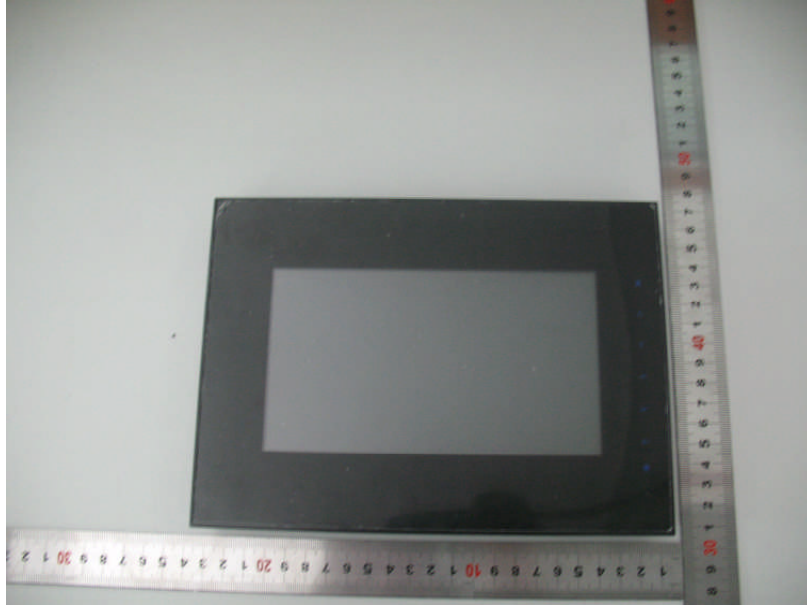
Proposed Label Location on EUT

Proposed ID Label Location on the EUT

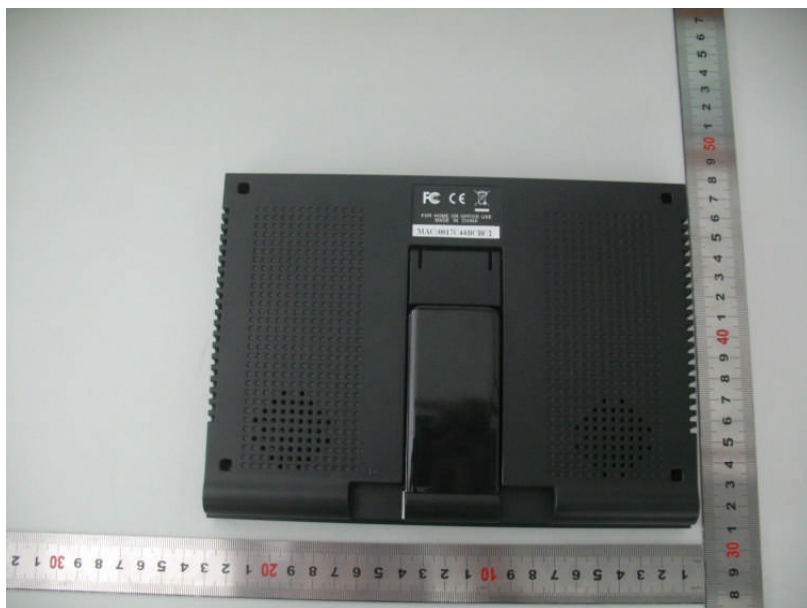


APPENDIX B - EUT PHOTOGRAPHS

EUT - Front View



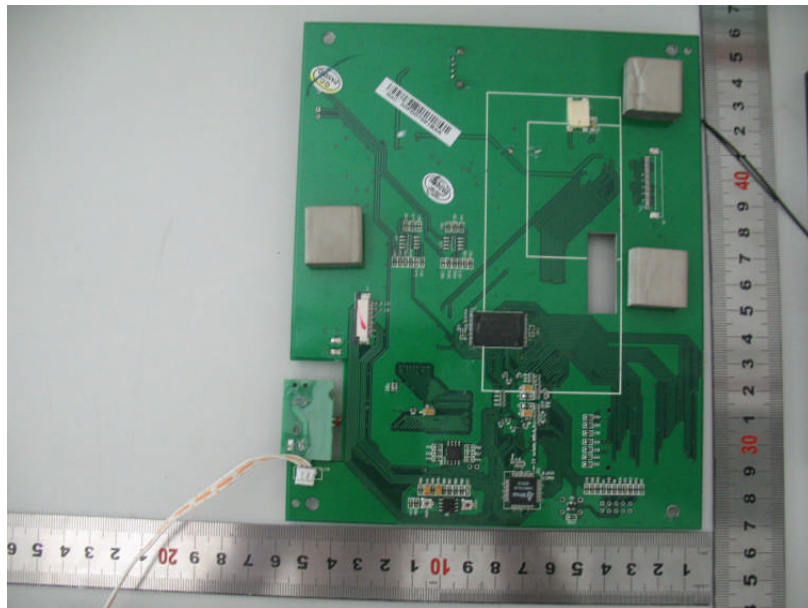
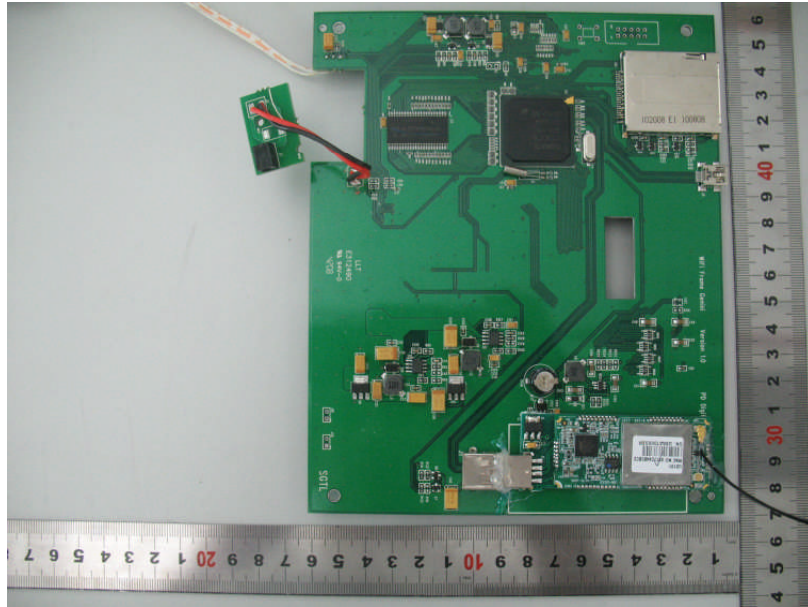
EUT - Rear View



EUT – Uncover View

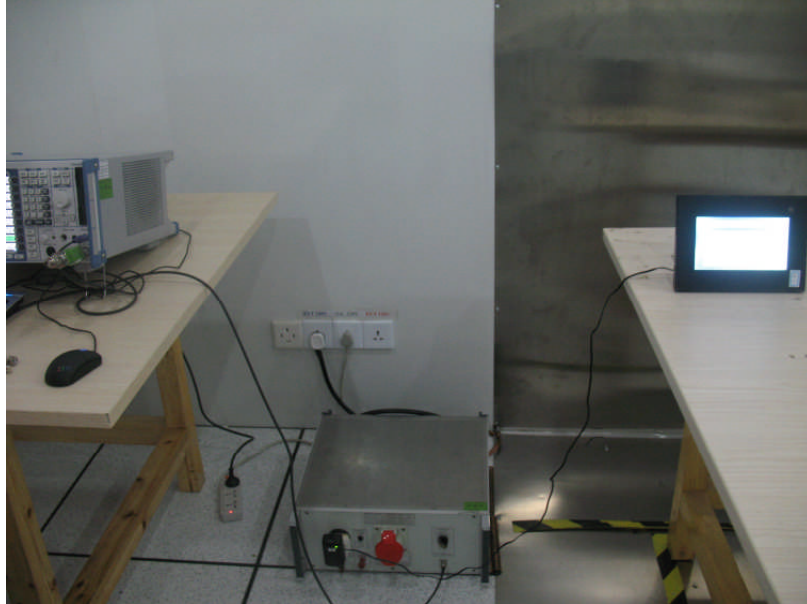


EUT – PCB View



APPENDIX C - TEST SETUP PHOTOGRAPHS

Conducted Emission



Radiated Emission

