



Issued Date : Dec. 10, 2012



FCC Part 15 RF Test Report For Rugged PDA

Applicant	: WINMATE Communication INC.
Address	: 9F, No.111-6, Shing-De Rd., San-Chung District, New Taipei City, Taiwan
Equipment	: Rugged PDA
Model No.	: C350T-3GB2 , C350XXXXXXXXX (X=a~z,A~Z,0~9,''-','blank or Slash)
Trade Name	: WINMATE

This report applied to above tested sample only. This report shall not be reproduced in part without written approval of EMC & Radio Equipment Testing Lab, Chunghwa Telecom Co. Ltd.





CERTIFICATE

Applicant	WINMATE Communication INC.
Address	9F, No.111-6, Shing-De Rd., San-Chung District, New Taipei City, Taiwan
Equipment	Rugged PDA
Model No.	C350T-3GB2 , C350XXXXXXXXX (X=a~z,A~Z,0~9,'-' ,blank or Slash)
Trade Name	WINMATE
Manufacturer	WINMATE Communication INC.
Address of Manufacturer	9F, No.111-6, Shing-De Rd., San-Chung District, New Taipei City, Taiwan

I HEREBY CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in [FCC Part 15 Subpart C §15.247](#) 、 [Industry Canada RSS-210](#)

The device described above was tested by EMC & Radio Equipment Testing Lab, Chunghwa Telecom Co. Ltd. The test data, data evaluation, test procedures and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4-2003. The energy emitted by EUT is tested as described in this report is in compliance with conducted and radiated emission limits of [FCC Part 15 Subpart C §15.247](#) and IC [RSS-210 Issue 7](#)

Date of Issue : Dec. 10, 2012

Date of Test : Dec. 01, 2012

Tester by : Rou-Fei Chaw

Approved by : Ming-Hong Ko

Technical Manager

Rou-Fei Chaw
Ko Ming Hong

Test results given in this report apply only to the specific sample(s) tested under stated test conditions.

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1. GENERAL INFORMATION

1.1 Applicant description

Applicant	WINMATE Communication INC
Address:	9F, No.111-6, Shing-De Rd., San-Chung District, New Taipei City, Taiwan

1.2 EUT description

Applicant	WINMATE Communication INC
Product	Rugged PDA
Brand Name	WINNATE
Model No	C350T-3GB2 , C350XXXXXXXXX (X=a~z,A~Z,0~9,''-'',blank or Slash)
FCC ID	PX93500WBW
Frequency Range	2412~2462MHz
Number of Channels	11
Maximum Output Power to Antenna(Normal condition)	19.6dBm
Modulation ty	802.11b : DSSS (BPSK / QPSK / CCK) ; 802.11g : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
Antenna Type:	Integral Antenna
Power supply	12Vdc from AC/DC Adapter
Manufacture	WINMATE Communication INC.

1.3 Operating Condition of EUT

Test mode : Normal Operation

1.4 Test Conditions

Temperature : 24 ±2°C

Test report No. : XTSC-101-11-AP-25(wlan) TAF Accredited Laboratory
 No. : 4 of 86





Humidity : 51 ±3 % R.H.

1.5 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). Pre-scanned tests were conducted to determine the final configuration from all possible combinations. The following tables are showing the test modes as the worst cases and recorded in this report.

Test Cases			
Test Item	Data Rate / Modulation		
	802.11b/DSS	802.11g/OFDM	802.11n(20MHz)/OFDM
Conducted TCs	■ Mode 1: CH01_2412 MHz ■ Mode 2: CH06_2437 MHz ■ Mode 3: CH11_2462 MHz	■ Mode 4: CH01_2412 MHz ■ Mode 5: CH06_2437 MHz ■ Mode 6: CH11_2462 MHz	■ Mode 7: CH01_2412 MHz ■ Mode 8: CH06_2437 MHz ■ Mode 9: CH11_2462 MHz
Radiated TCs	■ Mode 1: CH01_2412 MHz ■ Mode 2: CH06_2437 MHz ■ Mode 3: CH11_2462 MHz	■ Mode 4: CH01_2412 MHz ■ Mode 5: CH06_2437 MHz ■ Mode 6: CH11_2462 MHz	■ Mode 7: CH01_2412 MHz ■ Mode 8: CH06_2437 MHz ■ Mode 9: CH11_2462 MHz
AC Conducted Emission	■ 802.11g CH06_2437 MHz in worst case.		
Remark : EUT all TCs with adapter.			

2. Summary of Test Results

Test report No. : XTSC-101-11-AP-25(wlan) TAF Accredited Laboratory
 No. : 5 of 86





Report Section	FCC Rule	IC Rule	Description	Limit	Result
4.1	15.247(b)	A8.4	Output Power	$\leq 30\text{dBm}$	pass
4.2	15.247(d)	A8.5	Band Edges	$\leq 20\text{dBc}$	pass
4.3	15.247(a)(2)	A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass
4.4	15.247(e)	A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}$	Pass
4.5	15.207	Gen 7.2.2	AC Conducted Emission	Fcc 15.207(a)	Pass
4.6	15.247(d)	A8.5	Radiated Emission	Fcc 15.209(a) & Fcc 15.247(d)	Pass
4.7	15.203 & 15.247(b)	A8.4	Antenna Requirement	NA	Pass





3. Instrument Calibration

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

3.1 Equipment Used during Test

Manufacturer	Description	Model	Calibration Date	Calibration Due Date
EMI Receiver	R&S	ESIB 40	2012.05.17	1 year
Amplifier	EMC	051845	2012.10.27	1 year
Spectrum Analyzer	HP	8593E	2012.06.04	1 year
BiLog Antenna	SUNOL	JB3	2012.07.03	1 year
Horn Antenna	EMCO	3115	2012.06.08	1 year
Horn Antenna	EMCO	3116	2012.05.14	1 year
Broadband Antenna	EMCO	3142B	2012.05.22	1 year
LISN Network	EMCO	3850/2	2012.06.22	1 year

4 Measurements

4.1. Output Power Measurement

4.1.1. Required and Limits

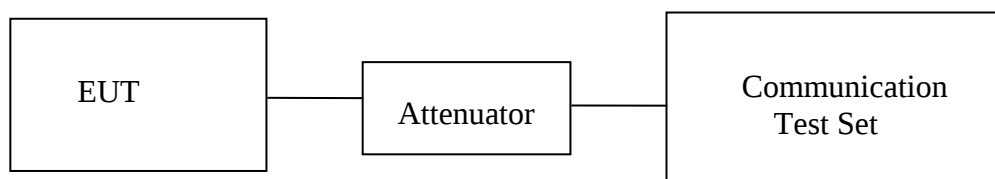
For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi are used





the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

4.1.2. Test Configuration and Procedure



1. The EUT was connected to Communication Test Set.
2. Measure the power either by power meter or spectrum analyzer

4.1.3. Test Results

Mode 1, Mode 2, Mode 3

Modulation : CCK

Data Rate : 11Mbps

Channel	Frequency (MHz)	Reading (dBm)	Cable loss (dB)	Measure (dBm)	limits (dBm)	Pass/Fail
1	2412	18.0	0.8	18.8	30	Pass
6	2437	18.8	0.8	19.6	30	Pass
11	2462	18.0	0.8	18.8	30	Pass
Uncertainty : $\pm 0.6\text{dB}$						

Mode 4, Mode 5, Mode 6

Modulation : 64QAM

Data Rate : 54Mbps

Channel	Frequency (MHz)	Reading (dBm)	Cable loss (dB)	Measure (dBm)	limits (dBm)	Pass/Fail
1	2412	13.4	0.8	14.2	30	Pass
6	2437	13.3	0.8	14.1	30	Pass
11	2462	13.6	0.8	14.4	30	Pass
Uncertainty : $\pm 0.6\text{dB}$						

note : Measure = Reading + Cable loss °



Mode 7, Mode 8, Mode 9

Modulation : 64QAM

Data Rate : 65Mbps

Channel	Frequency (MHz)	Reading (dBm)	Cable loss (dB)	Measure (dBm)	limits (dBm)	Pass/ Fail
1	2412	10.9	0.8	11.7	30	Pass
6	2437	10.1	0.8	10.9	30	Pass
11	2462	10.2	0.8	11.0	30	Pass
Uncertainty : $\pm 0.6\text{dB}$						

note : Measure = Reading + Cable loss °

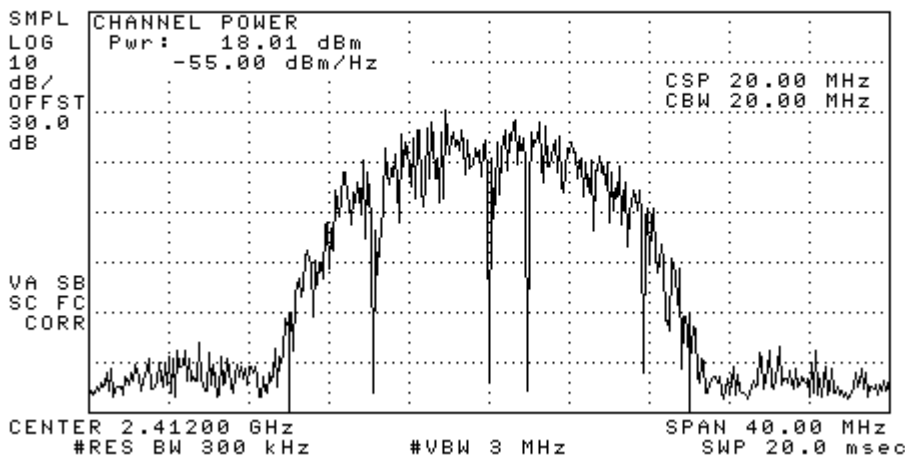




Mode 1, Mode 2, Mode 3

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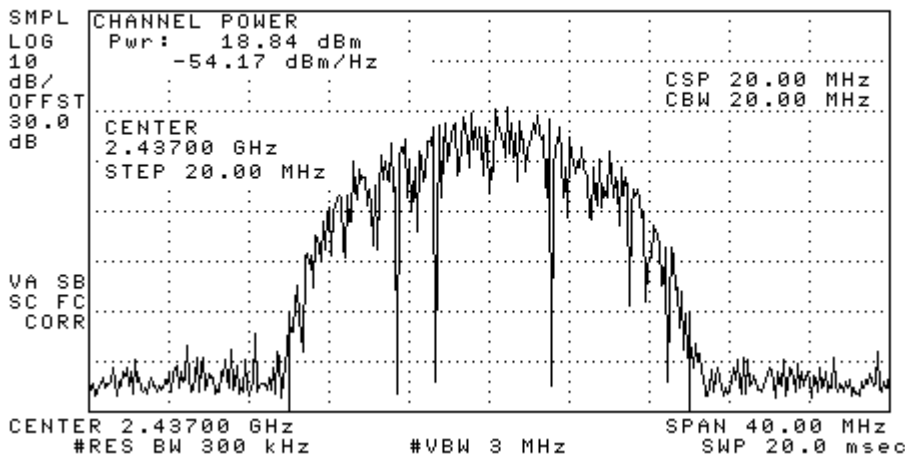
REF 30.0 dBm AT 10 dB



RL

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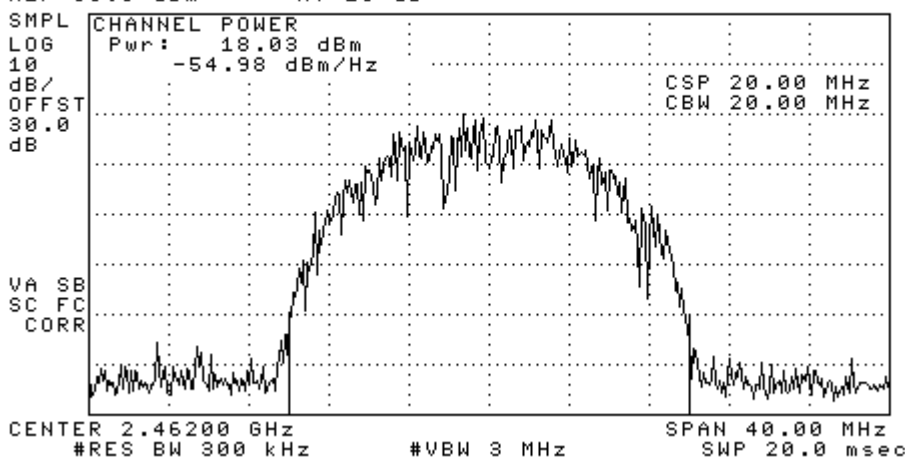
REF 30.0 dBm AT 10 dB



RL

11:01:21 DEC 06, 2012

REF 30.0 dBm AT 10 dB



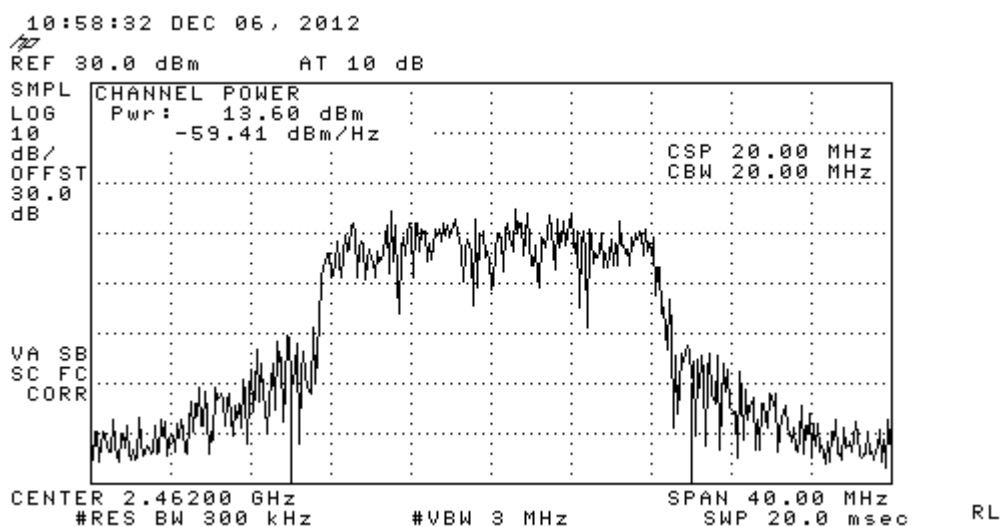
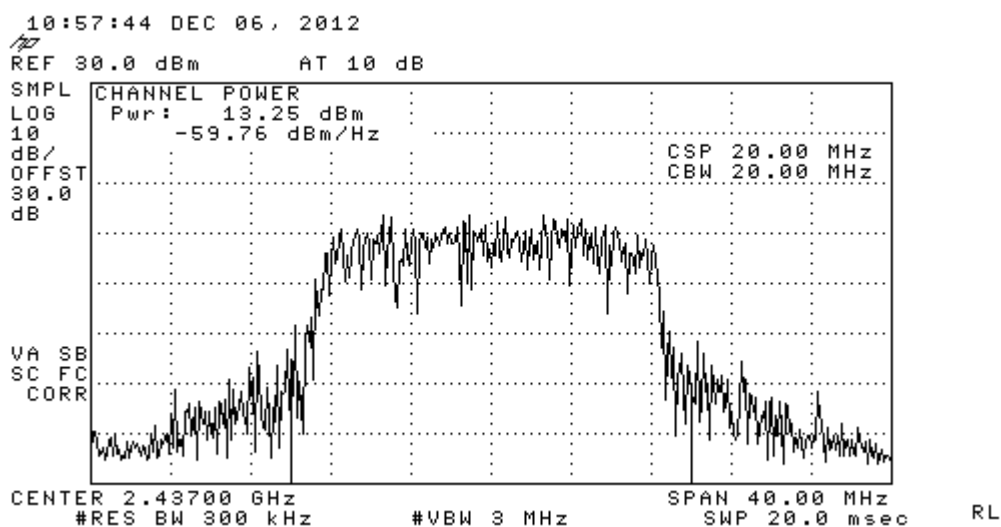
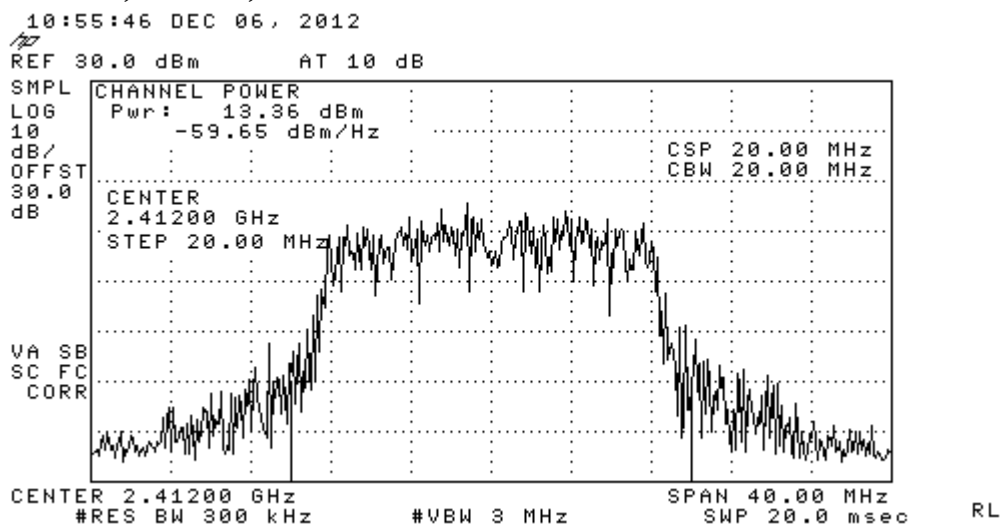
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Output power (Modulatio : CCK)





Mode 4, Mode 5, Mode 6

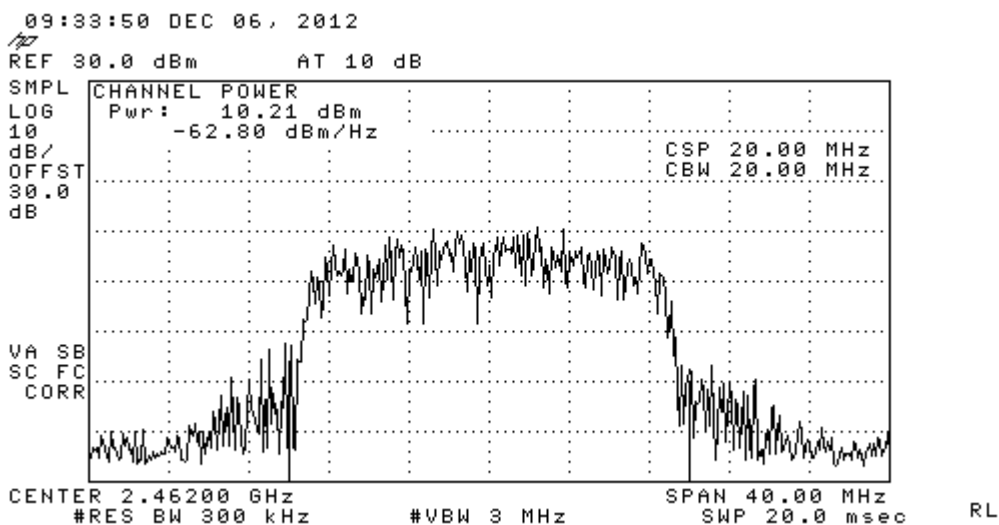
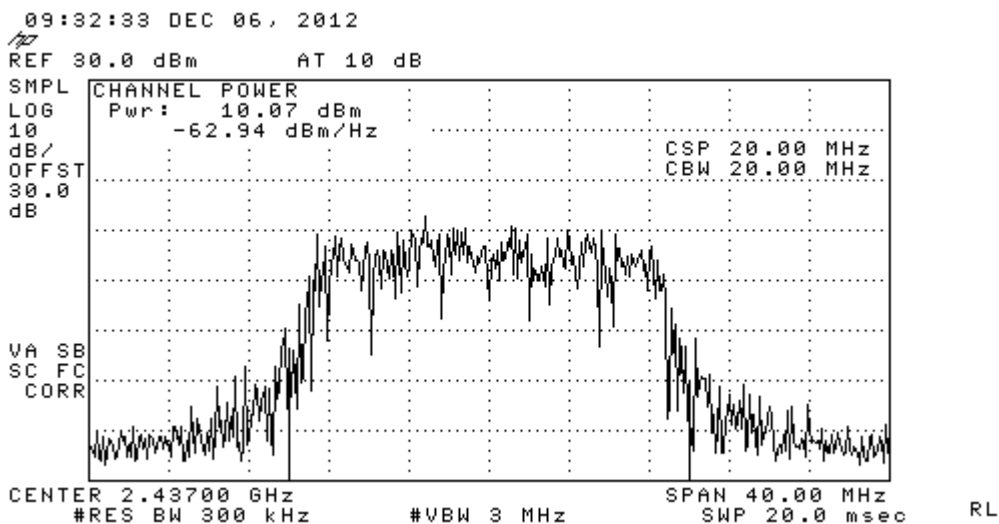
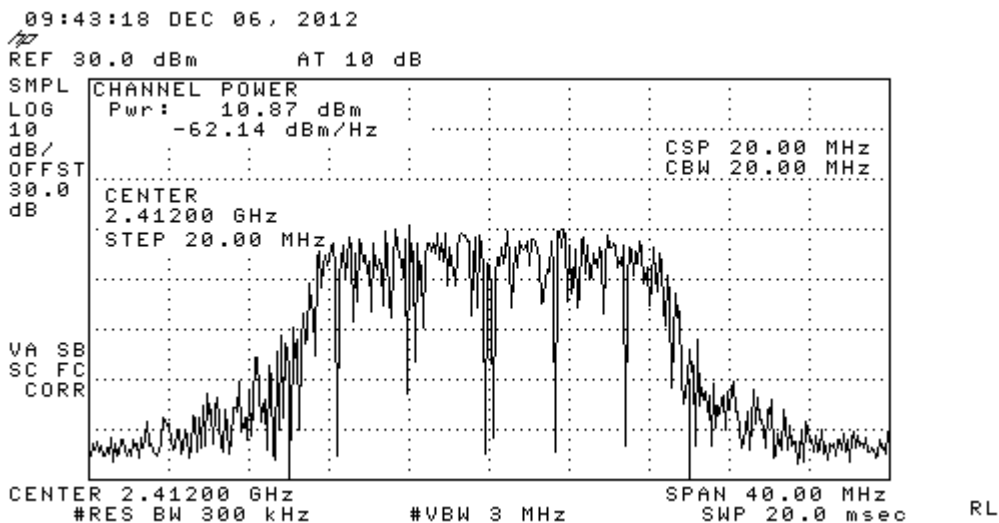


Output power (Modulatio : 64QAM)





Mode 7, Mode 8, Mode 9



Output power (Modulatio : 64QAM)

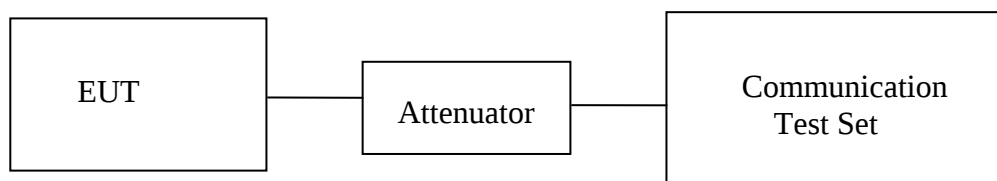


4.2. Band Edges Measurement

4.2.1 Required and Limits

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. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB.

4.2.2 Test Configuration and Procedure



1. The EUT was connected to Communication Test Set.
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) > RBW, scan up through 10th harmonic. Band edge emissions must be at least 20 dB below the highest emission level within the authorized band as measured with a 100 kHz RBW. Note: If the output power of this device was measured by power meter, the attenuation under this paragraph shall be 30 dB instead of 20 dB
- 3.. Radiated emission test: Apply 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 = 10 Hz, Sweep=Auto. 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 as in FCC Section 15.35(b) and (c).



4.2.3 Test Results

Mode 1, Mode 3

Modulation : CCK

Data Rate : 11Mbps

Result			
Low Band Edge emission	High Band Edge emission	Limits(dB)	Pass/Fail
35.4 dB	47.06 dB	least 20 dB below the highest level of the radiated powe	Pass

Mode 4, Mode 6

Modulation : 64QAM

Data Rate : 54Mbps

Result			
Low Band Edge emission	High Band Edge emission	Limits(dB)	Pass/Fail
44.25 dB	44.88 dB	least 20 dB below the highest level of the radiated powe	Pass

Mode 7, Mode 9

Modulation : 64QAM

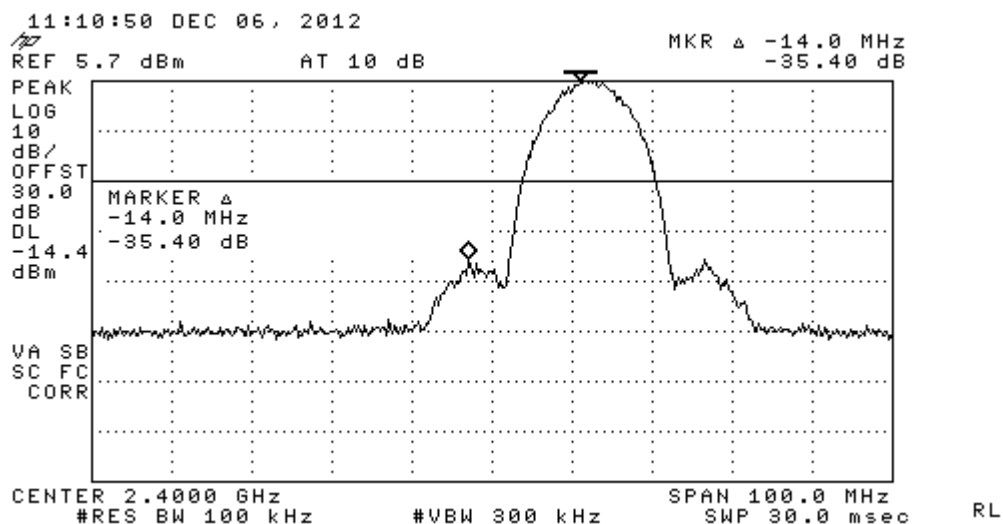
Data Rate : 65Mbps

Result			
Low Band Edge emission	High Band Edge emission	Limits(dB)	Pass/Fail
39.7 dB	46.21 dB	least 20 dB below the highest level of the radiated powe	Pass

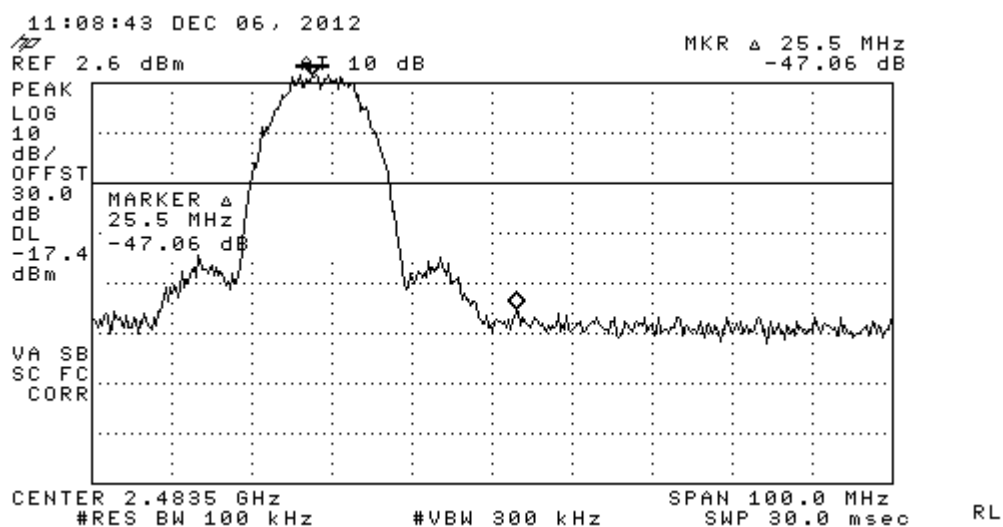




Mode 1, Mode 3



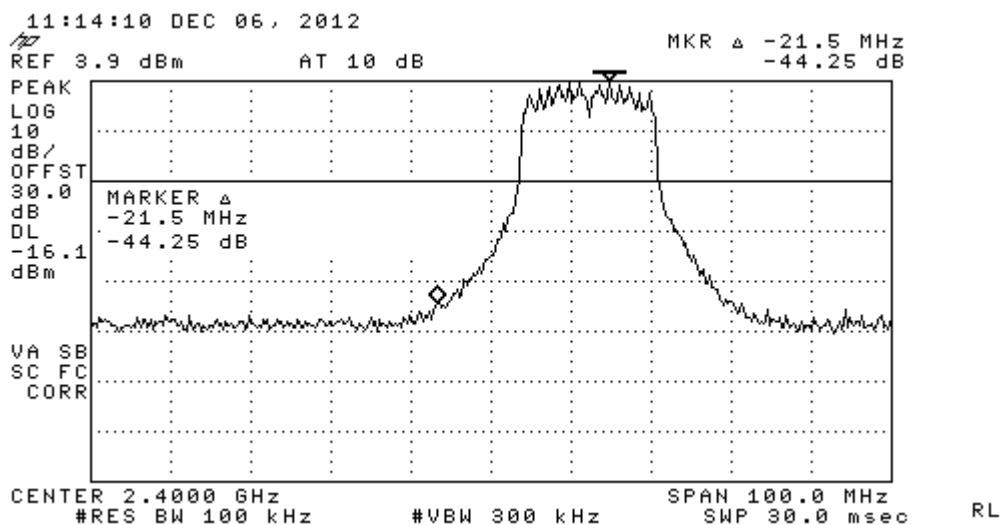
Low Band Edge(802.11b mode Modulation : CCK)



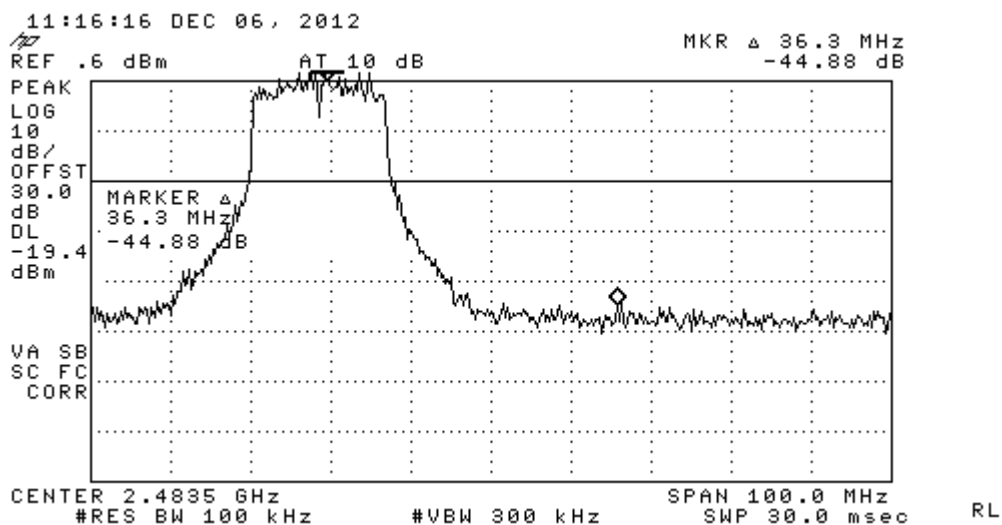
High Band Edge(802.11b mode Modulation : CCK)



Mode 4, Mode 6



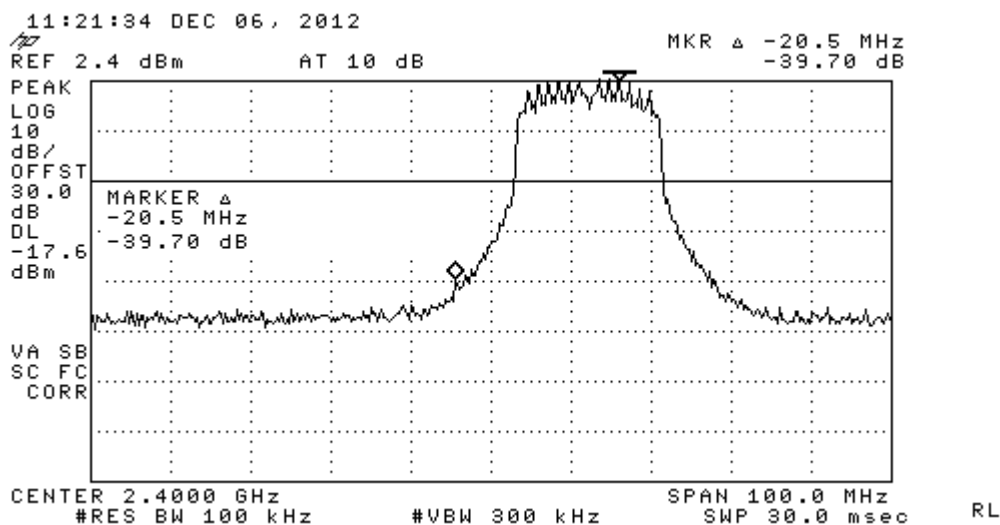
Low Band Edge(802.11g mode Modulation : : 64QAM)



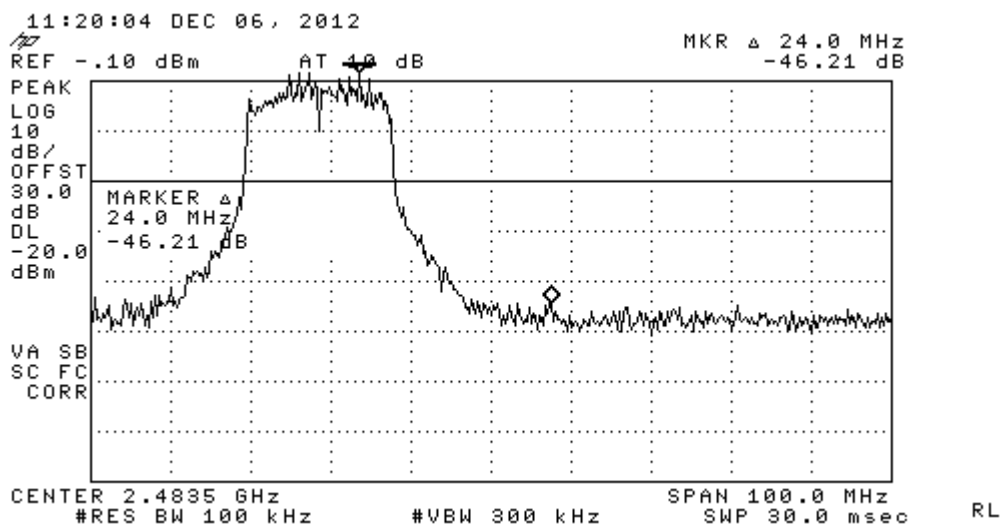
High Band Edge(802.11g mode Modulation : 64QAM)



Mode 7, Mode 9



Low Band Edge(802.11n mode Modulation : : 64QAM)



highow Band Edge(802.11n mode Modulation : : 64QAM)



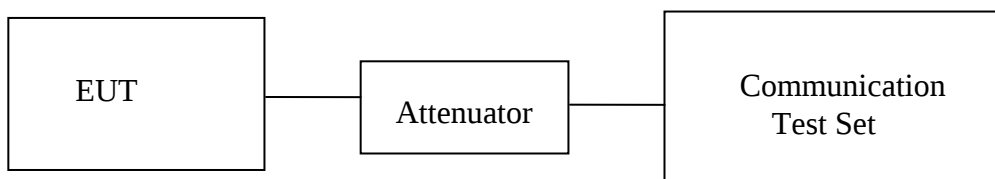


4.3. 6dB Bandwidth Measurement

4.3.1. Required and Limits

The minimum 6 dB bandwidth shall be at least 500 kHz.

4.3.2. Test Configuration and Procedure



1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW. The 6 dB bandwidth must be greater than 500 kHz.
3. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

4.3.3. Test Results

Mode 1, Mode 2, Mode 3

Modulation : CCK

Data Rate : 11Mbps

Channel	Frequency (MHz)	Measure (kHz)	Limits (kHz)	Pass/Fail
1	2412	9350	500	Pass
6	2437	9150	500	Pass
11	2462	9750	500	Pass
Uncertainty : $\pm 13.8\%$				



Mode 4, Mode 5, Mode 6

Modulation : 64QAM

Data Rate : 54Mbps

Channel	Frequency (MHz)	Measure (kHz)	Limits (kHz)	Pass/ Fail
1	2412	16350	500	Pass
6	2437	16350	500	Pass
11	2462	16450	500	Pass
Uncertainty± 13.8%				

Mode 7, Mode 8, Mode 9

Modulation : 64QAM

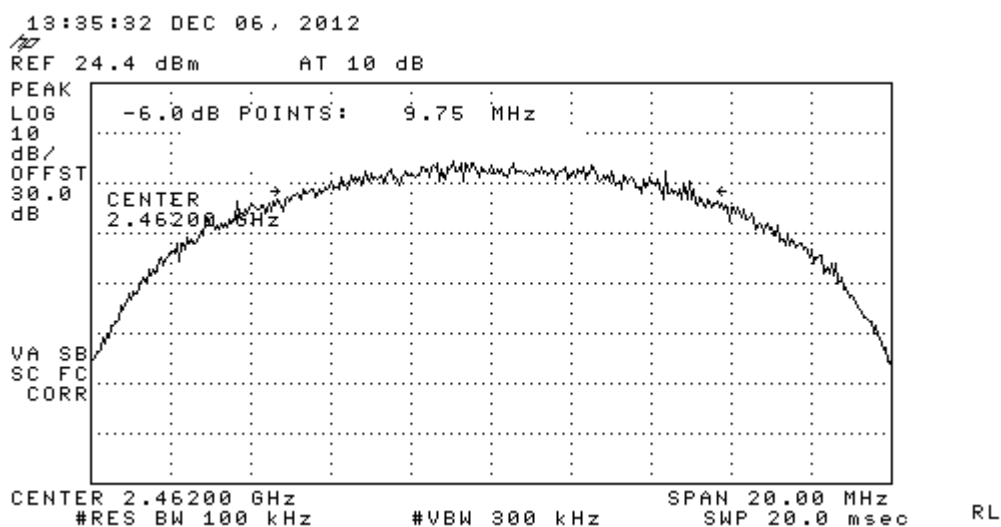
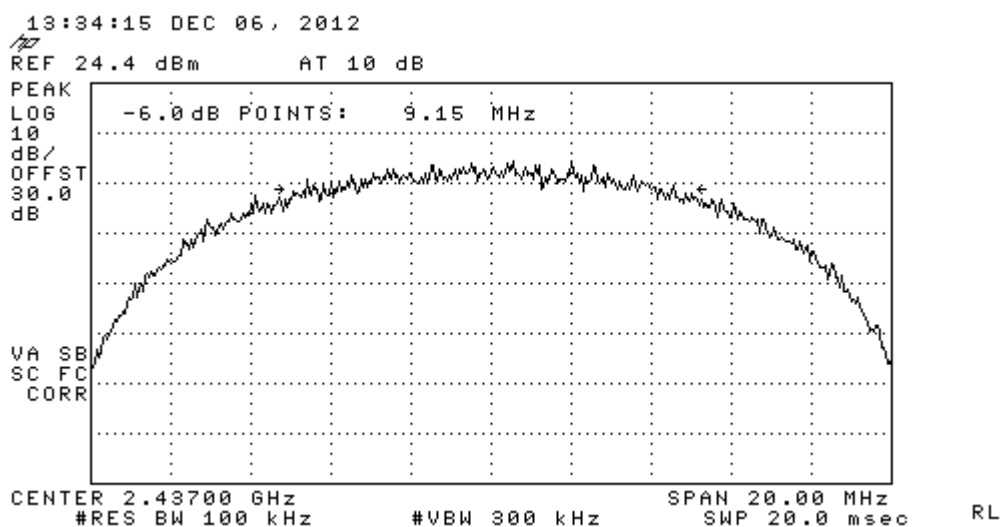
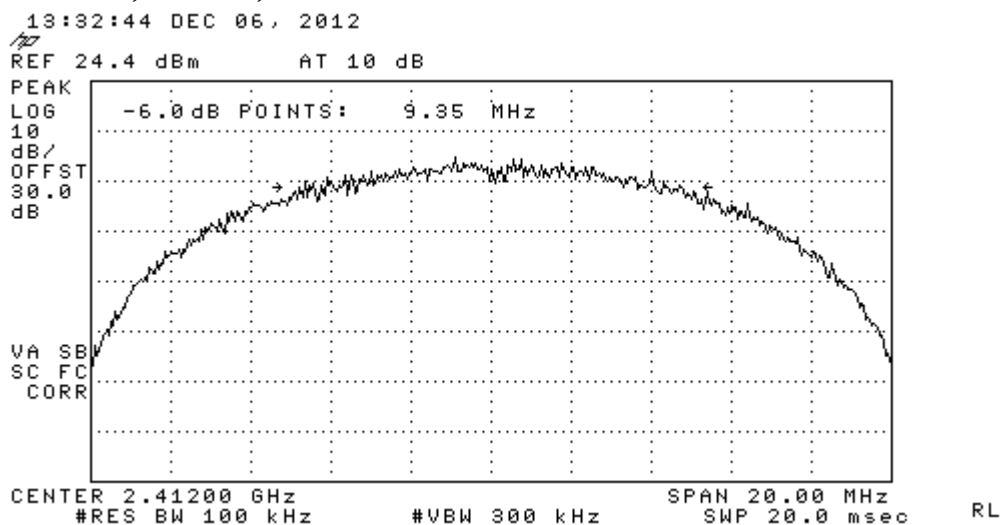
Data Rate : 65Mbps

Channel	Frequency (MHz)	Measure (kHz)	Limits (kHz)	Pass/ Fail
1	2412	17700	500	Pass
6	2437	17600	500	Pass
11	2462	17650	500	Pass
Uncertainty± 13.8%				





Mode 1, Mode 2, Mode 3

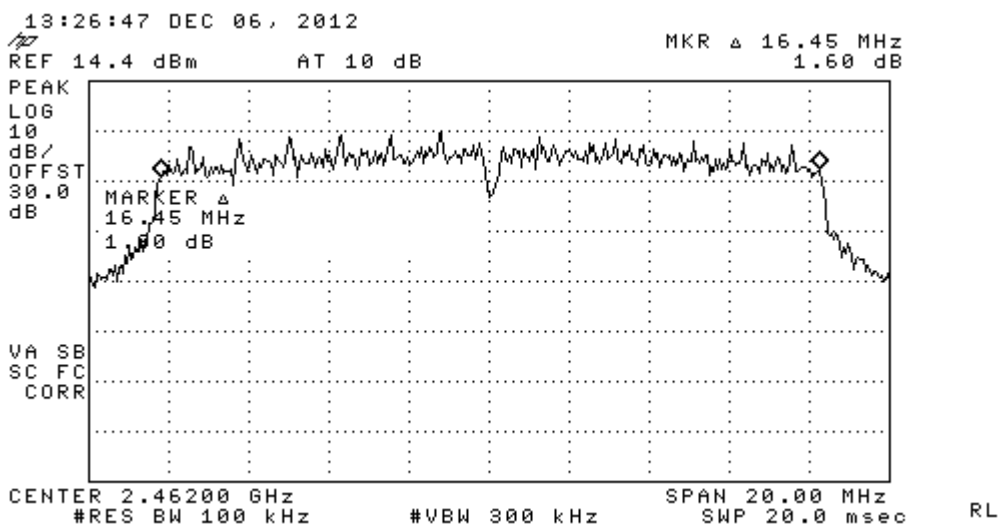
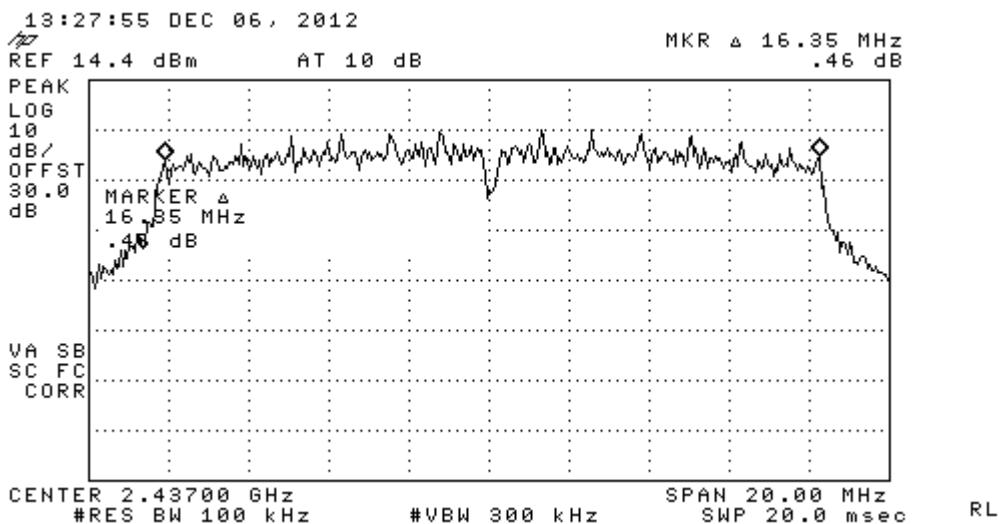
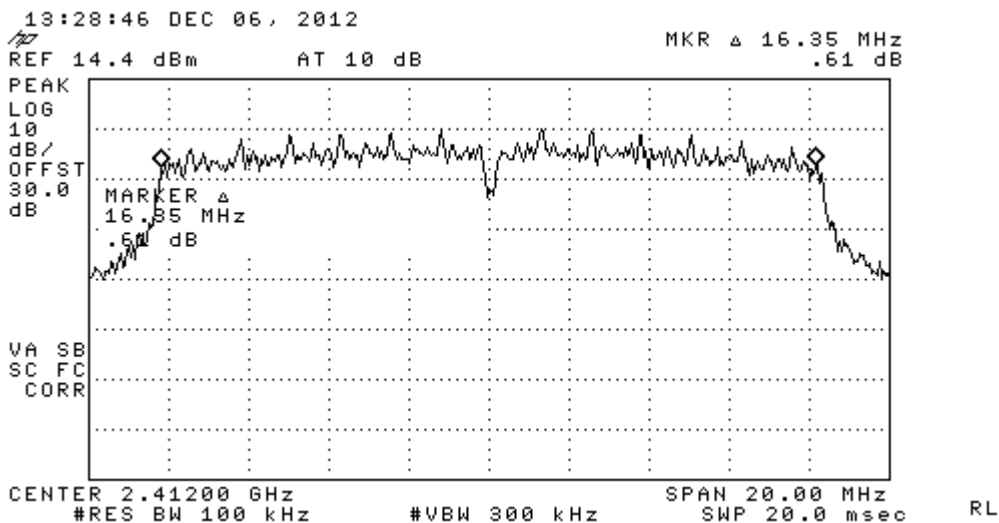


6dB bandwidth (Modulation : CCK)





Mode 4, Mode 5, Mode 6

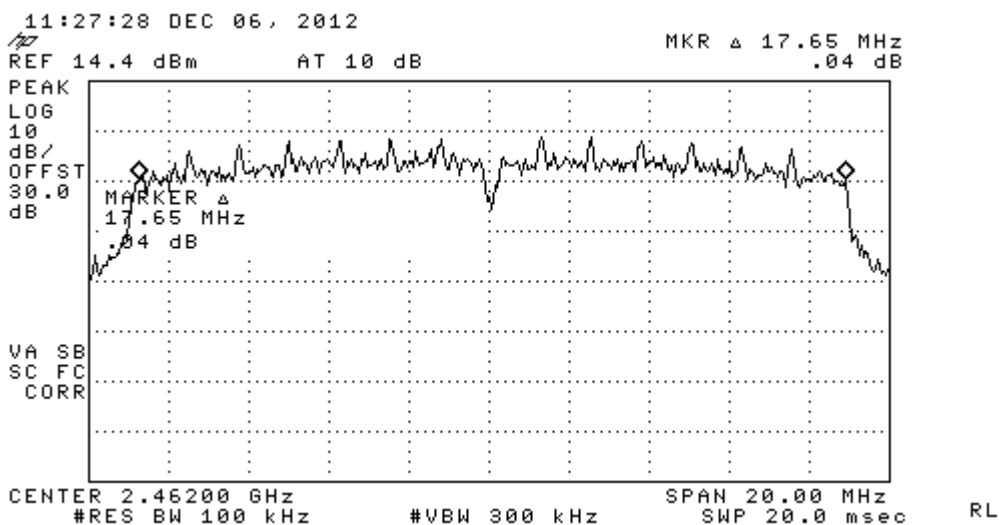
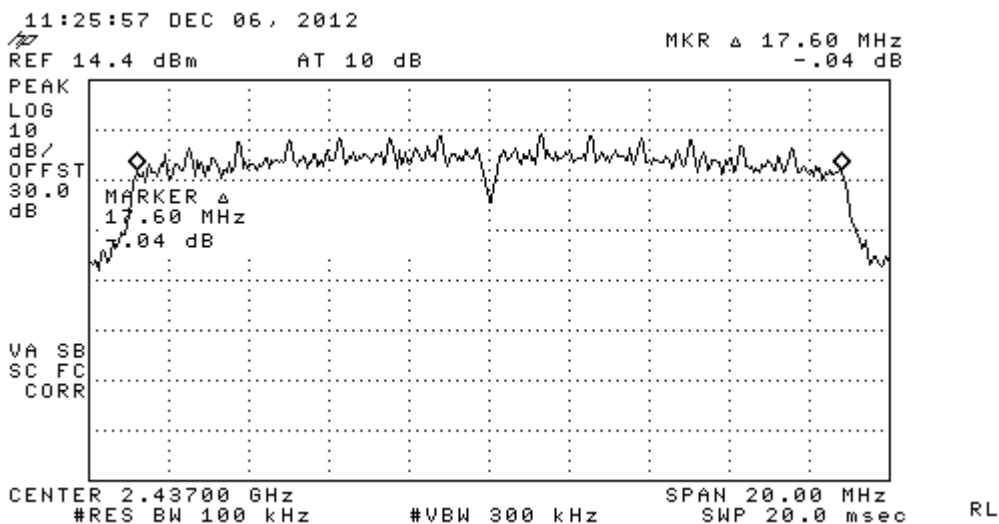
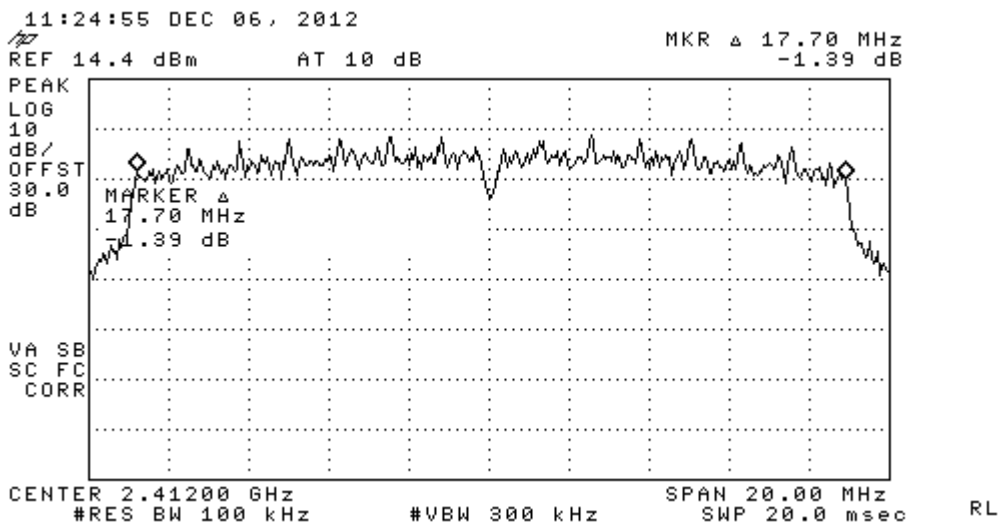


6dB bandwidth (Modulation : 64QAM)





Mode 7, Mode 8, Mode 9



6dB bandwidth (Modulation : 64QAM)

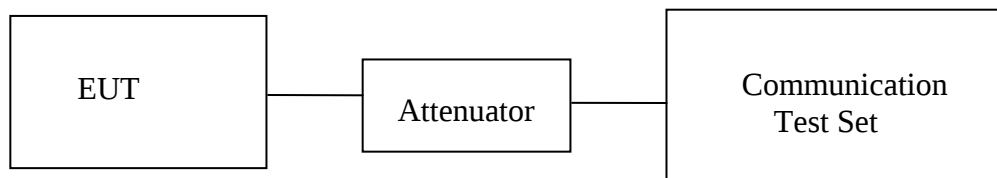


4.4. Power Spectral Density Measurement

4.6.1 Required and Limits

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission

4.6.2 Test Configuration and Procedure



- 1.The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Take the measured data from spectrum analyzer

4.6.3 Test Results

Mode 1, Mode 2, Mode 3

Modulation : CCK

Data Rate : 11Mbps

Channel	Frequency (MHz)	Reading (dBm)	Cable loss (dB)	Measure (dBm)	limits (dBm)	Pass/ Fail
1	2412	-3.4	0.8	-2.6	8.0	Pass
6	2437	-3.4	0.8	-2.6	8.0	Pass
11	2462	-3.6	0.8	-2.8	8.0	Pass
Uncertainty : $\pm 0.6\text{dB}$						

note : Measur=Reading+Cable loss °



Mode 4, Mode 5, Mode 6

Modulation : 64QAM

Data Rate : 54Mbps

Channel	Frequency (MHz)	Reading (dBm)	Cable loss (dB)	Measure (dBm)	limits (dBm)	Pass/ Fail
1	2412	-15.3	0.8	-14.5	8.0	Pass
6	2437	-15.4	0.8	-14.6	8.0	Pass
11	2462	-15.4	0.8	-14.6	8.0	Pass
Uncertainty : $\pm 0.6\text{dB}$						

note : Measure = Reading + Cable loss °

Mode 7, Mode 8, Mode 9

Modulation : 64QAM

Data Rate : 65Mbps

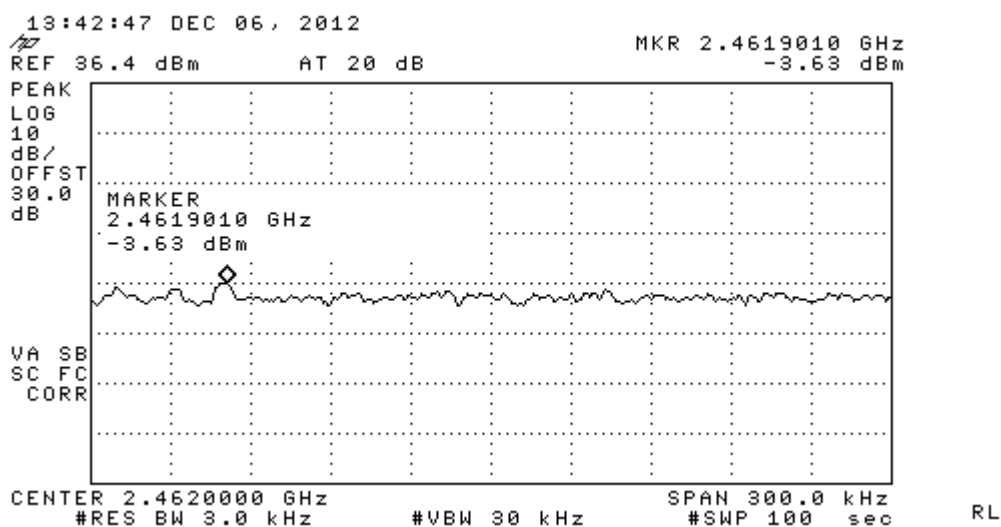
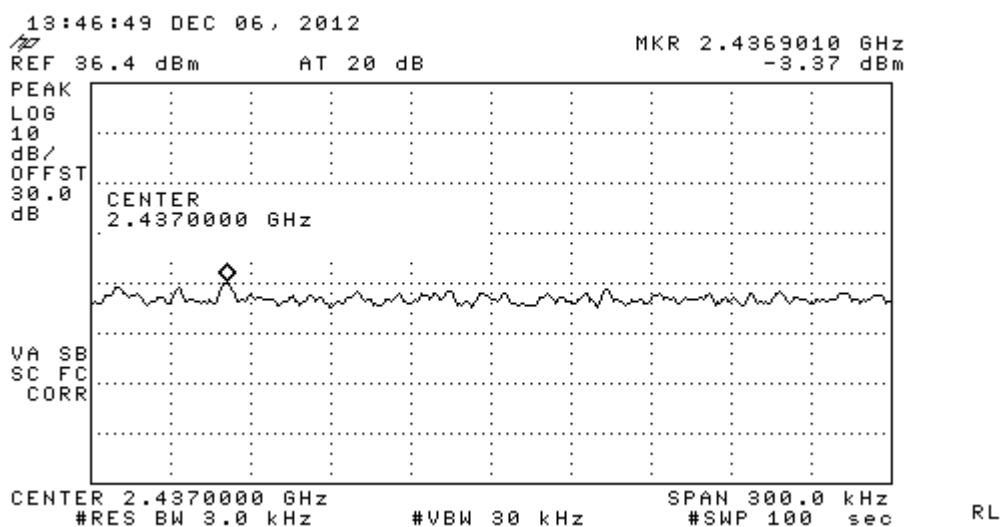
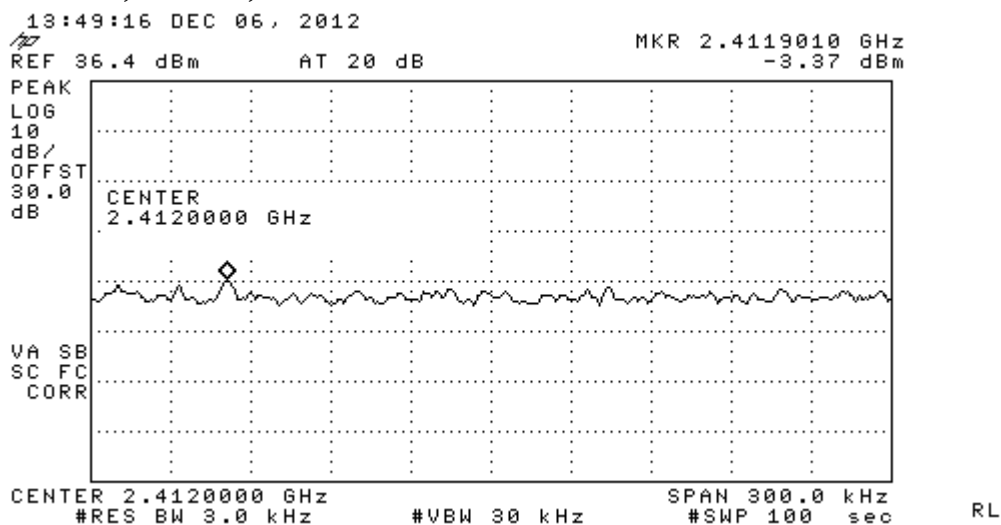
Channel	Frequency (MHz)	Reading (dBm)	Cable loss (dB)	Measure (dBm)	limits (dBm)	Pass/ Fail
1	2412	-18.3	0.8	-17.5	8.0	Pass
6	2437	-18.2	0.8	-17.4	8.0	Pass
11	2462	-18.3	0.8	-17.5	8.0	Pass
Uncertainty : $\pm 0.6\text{dB}$						

note : Measur=Reading+Cable loss °





Mode 1, Mode 2, Mode 3

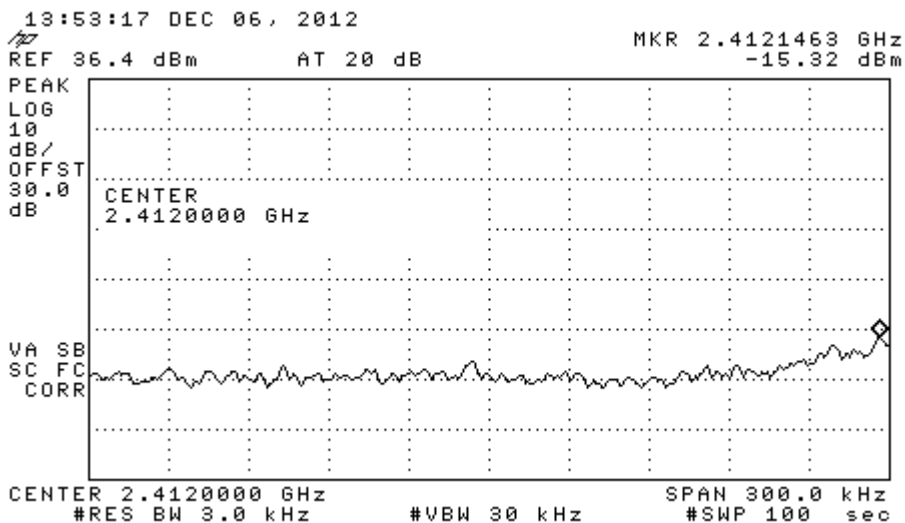


Power Spectral Density (Modulation : CCK)

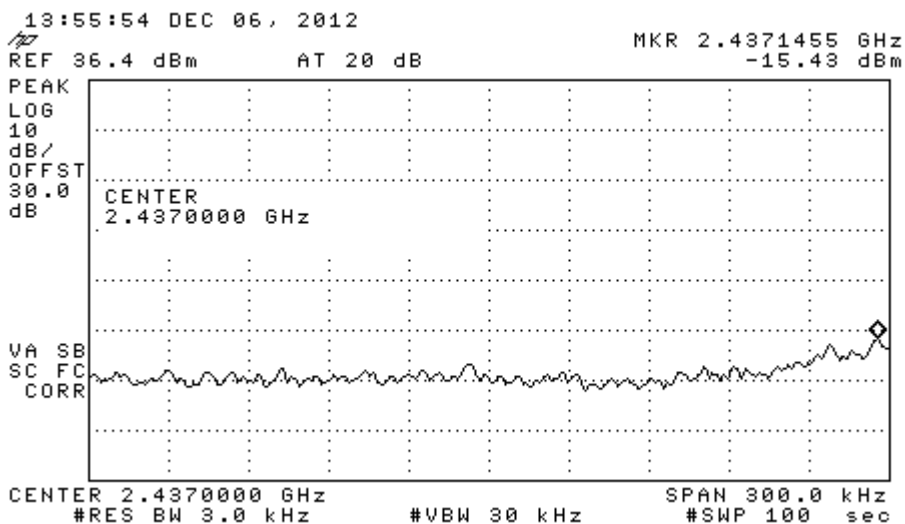




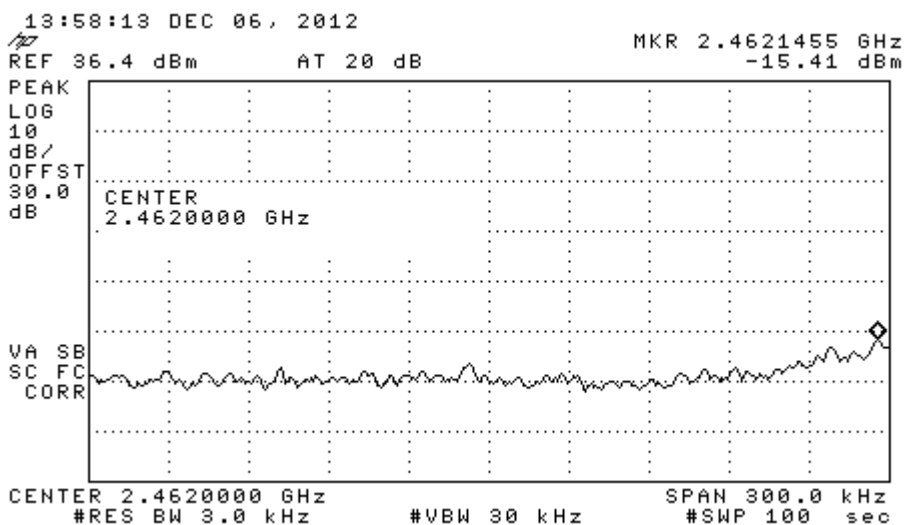
Mode 4, Mode 5, Mode 6



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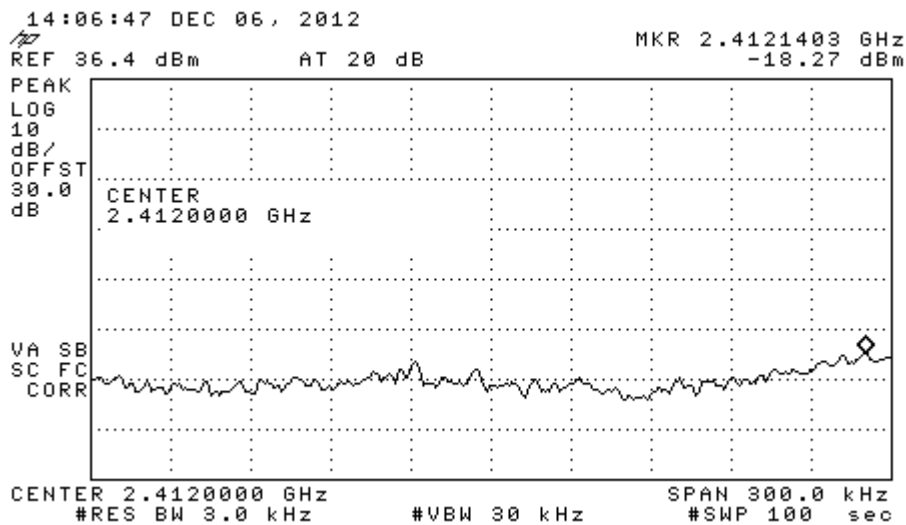
RL

Power Spectral Density (Modulation : 64QAM)

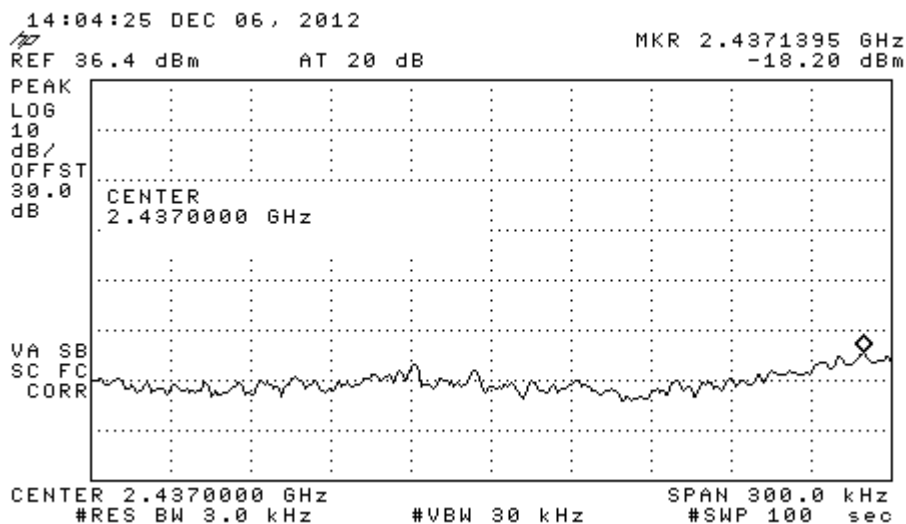




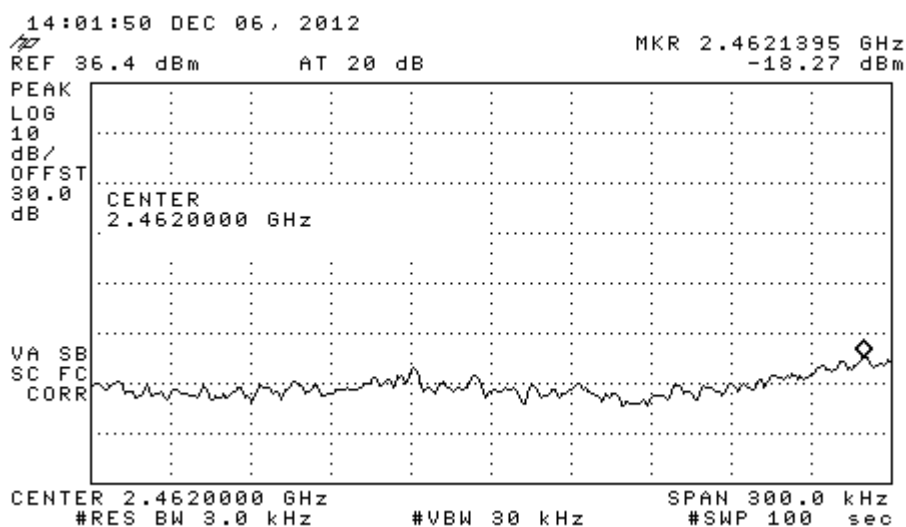
Mode 7, Mode 8, Mode 9



RL



RL



RL

Power Spectral Density (Modulation : 64QAM)





4.5. AC Conducted Emission Measurement

4.6.1 Required and Limits

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

Test Configuration and Procedure

1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it 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.





4.6.2 Test Results

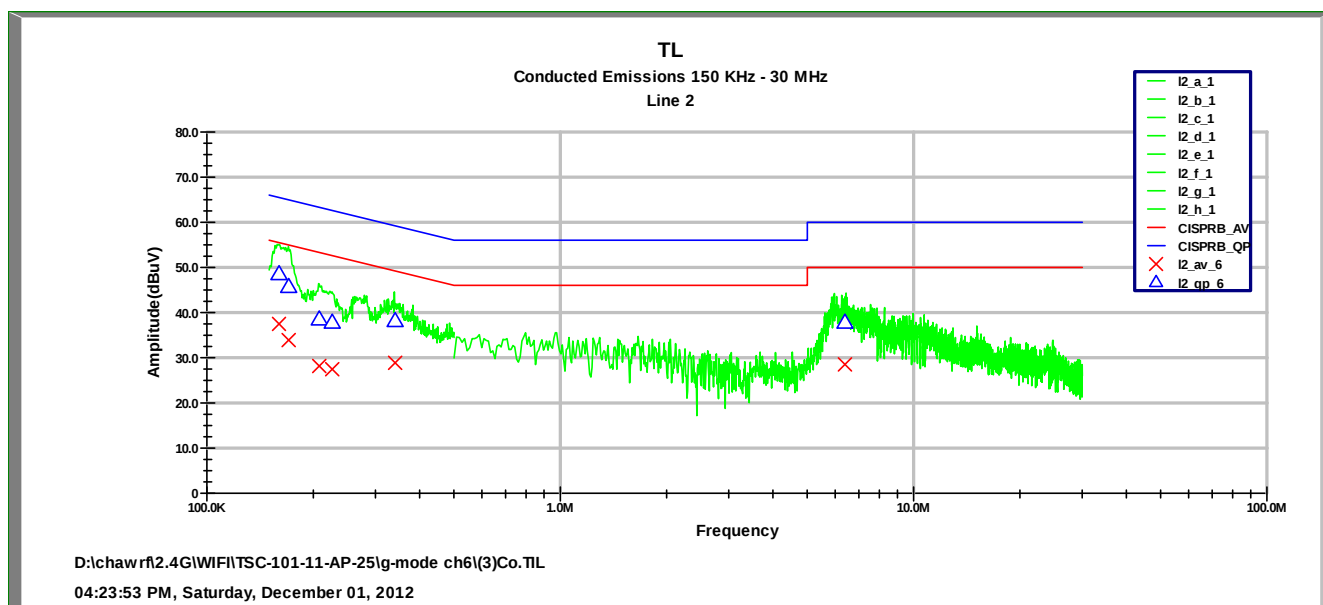
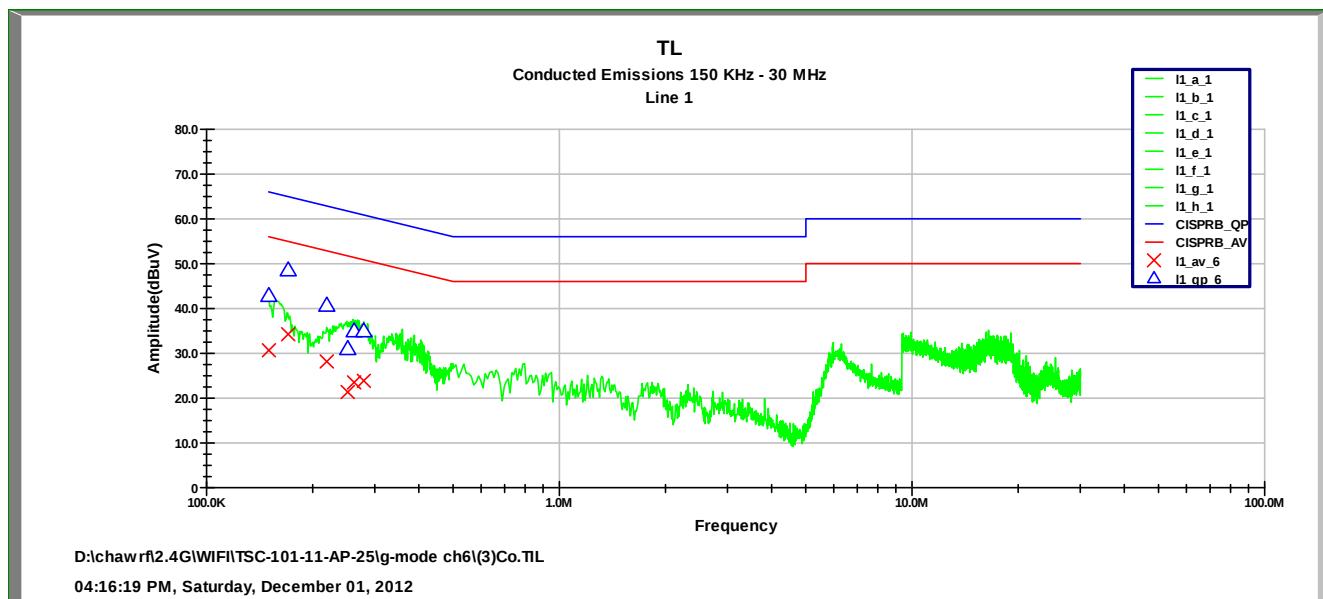
Operation Mode : Mode 5(in worst case)

Frequency (MHz)	Measure LINE 1		Limits		Margin		Pass/ Fail
	Quasi- Peak (dB μ V)	Average (dB μ V)	Quasi- Peak (dB μ V)	Average (dB μ V)	Quasi- Peak (dB)	Average (dB)	
0.1504	42.8	30.6	66.0	56.0	-23.2	-25.4	Pass
0.1700	48.5	34.4	65.4	55.4	-16.9	-21.0	Pass
0.2190	40.8	28.1	64.0	54.0	-23.2	-25.9	Pass
0.2500	30.9	21.3	63.1	53.1	-32.2	-31.8	Pass
0.2613	35.1	23.5	62.8	52.8	-27.7	-29.3	Pass
0.2776	35.1	23.9	62.4	52.4	-27.3	-28.5	Pass
Uncertainty : ± 4.7 dB							

Frequency (MHz)	Measure LINE 2		Limits		Margin		Pass/ Fail
	Quasi- Peak (dB μ V)	Average (dB μ V)	Quasi- Peak (dB μ V)	Average (dB μ V)	Quasi- Peak (dB)	Average (dB)	
0.1600	48.5	37.4	65.7	55.7	-17.2	-18.3	Pass
0.1709	45.8	33.9	65.4	55.4	-19.6	-21.5	Pass
0.2080	38.7	28.4	64.3	54.3	-25.6	-25.9	Pass
0.2260	37.8	27.3	63.8	53.8	-26.0	-26.5	Pass
0.3390	38.1	28.7	60.6	50.6	-22.5	-21.9	Pass
6.4039	38.0	28.4	60.0	50.0	-22.0	-21.6	Pass
Uncertainty : ± 4.7 dB							

Note : 1. All test values includes Quasi-Peak and average °
 2. Margin = Measure - Limits





AC Conducted Emission



4.6. Radiated Emission Measurement

4.6.1 Required and Limits

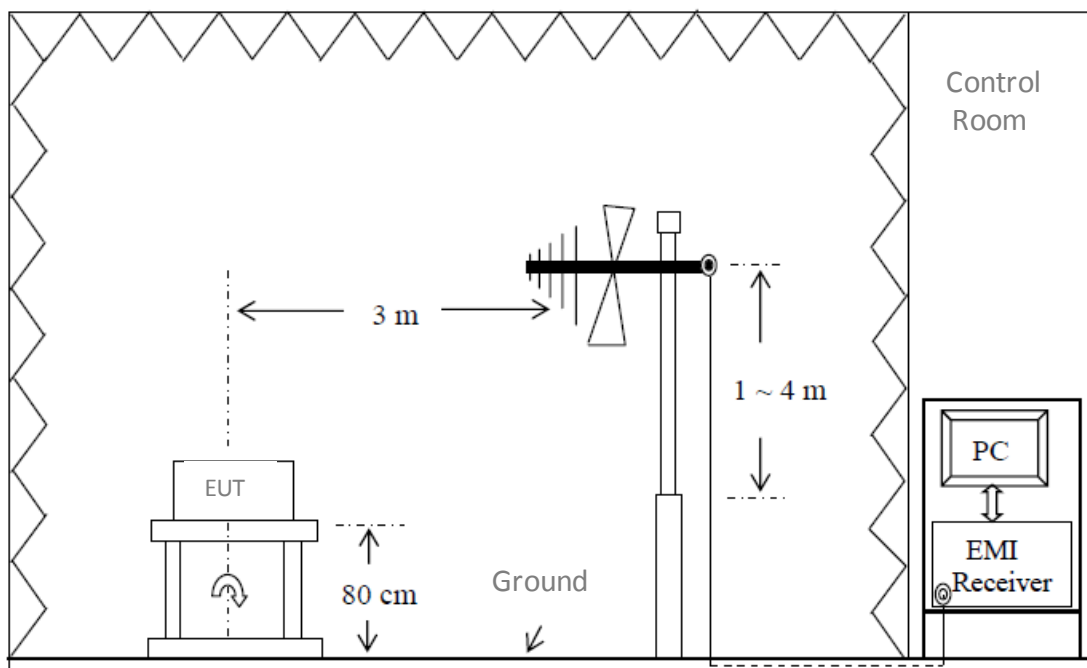
In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. 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

4.6.2 Test Configuration and Procedure

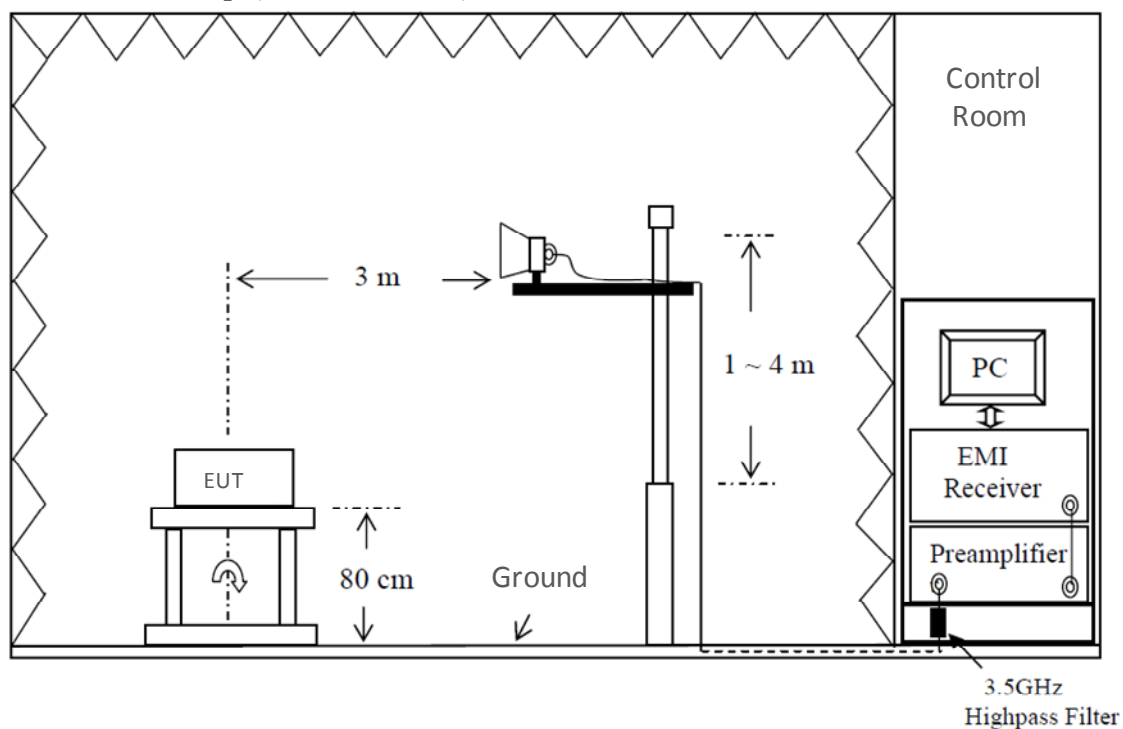
4.6.2.1 Test set up (below 3.5GHz)





Note : 1. 30~1000MHz range: use Broadband antenna °
2 1GHz~3.5GHz range: use Horn antenna °

4.6.2.2 Test set up (above 3.5GHz)



Note : 1. 30~1000MHz range: use Broadband antenna °
2 1GHz~3.5GHz range: use Horn antenna °



1. The testing follows the guidelines in ANSI C63.4-2003.
2. Use the following spectrum analyzer settings:
 Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = maxhold.
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.

4.6.3 Test Results

Mode 1, Mode 2, Mode 3

Frequency : 2412 MHz

Harmonic	Frequency (MHz)	reading (dB μ V)		Calibration factor (dB)	Measure@3m (dB μ V/m)		limits (dB μ V/m)	Margin (dB)		Pass/Fail
		H	V		H	V		H	V	
2	4824	---	---	---	---	---	---	---	---	---
3	7236	---	---	---	---	---	---	---	---	---
4	9648	---	---	---	---	---	---	---	---	---
5	12060	---	---	---	---	---	---	---	---	---
6	14472	---	---	---	---	---	---	---	---	---
7	16884	---	---	---	---	---	---	---	---	---
8	19296	---	---	---	---	---	---	---	---	---
9	21708	---	---	---	---	---	---	---	---	---
10	24120	---	---	---	---	---	---	---	---	---





Outband

Frequency (MHz)	Polarization (H/V)	Reading (dBμV)	calibration (dB)	Measure@3m (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Pass/Fail
181.6	H	26.1	10.9	37.0	43.5	-6.5	Pass
195.2	H	25.6	11.5	37.1	43.5	-6.4	Pass
201.1	H	24.9	11.7	36.6	43.5	-6.9	Pass
206.9	H	31.1	12.0	43.1	43.5	-0.4	Pass
214.7	H	29.7	12.3	42.0	43.5	-1.5	Pass
259.4	H	26.5	14.0	40.5	46.0	-5.5	Pass
53.3	V	24.3	8.5	32.8	40.0	-7.2	Pass
214.7	V	24.5	12.3	36.8	43.5	-6.7	Pass
253.5	V	26.1	13.9	40.0	46.0	-6.0	Pass
259.4	V	26.0	14.0	40.0	46.0	-6.0	Pass
273.0	V	24.4	14.3	38.7	46.0	-7.3	Pass
881.4	V	15.9	25.5	41.4	46.0	-4.6	Pass
Uncertainty : ±4.3dB							

- note :
1. Means that the transmitted signal is lower than the instrument background noise
 2. calibration = antenna factor+cable loss(below 3.5GHz)
 3. calibration = antenna factor+cable loss-pre amplifier Gain ° (above 3.5GHz)
 4. Measure = Reading + calibration
 5. Margin= Measure -limits





Frequency : 2437MHz

Harmonic	Frequency (MHz)	reading (dBμV)		Calibration factor (dB)	Measure@3m (dBμV/m)		limits (dBμV/m)	Margin (dB)		Pass/Fail
		H	V		H	V		H	V	
2	4874	---	---	---	---	---	---	---	---	---
3	7311	---	---	---	---	---	---	---	---	---
4	9748	---	---	---	---	---	---	---	---	---
5	12185	---	---	---	---	---	---	---	---	---
6	14622	---	---	---	---	---	---	---	---	---
7	17059	---	---	---	---	---	---	---	---	---
8	19496	---	---	---	---	---	---	---	---	---
9	21933	---	---	---	---	---	---	---	---	---
10	24370	---	---	---	---	---	---	---	---	---

Outband

Frequency (MHz)	Polarization (H/V)	Reading (dBμV)	calibration (dB)	Measure@3m (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Pass/Fail
195.2	H	26.5	11.5	38.0	43.5	-5.5	Pass
206.9	H	31.3	12.0	43.3	43.5	-0.2	Pass
220.5	H	29.6	12.5	42.1	46.0	-3.9	Pass
253.5	H	28.3	13.9	42.2	46.0	-3.8	Pass
259.4	H	27.2	14.0	41.2	46.0	-4.8	Pass
---	---	---	---	---	---	---	---
66.9	V	25.1	8.3	33.4	40.0	-6.6	Pass
195.2	V	25.3	11.5	36.8	43.5	-6.7	Pass
239.9	V	26.0	13.3	39.3	46.0	-6.7	Pass
245.8	V	25.7	13.6	39.3	46.0	-6.7	Pass
259.4	V	27.8	14.0	41.8	46.0	-4.2	Pass
624.8	V	16.2	22.7	38.9	46.0	-7.1	Pass
Uncertainty : ±4.3dB							

- note : 1. Means that the transmitted signal is lower than the instrument background noise
 2. calibration = antenna factor+cable loss(below 3.5GHz)
 3. calibration = antenna factor+cable loss-pre amplifier Gain ° (above 3.5GHz)
 4. Measure = Reading + calibration
 5. Margin= Measure -limits





Frequency : 2462 MHz

Harmonic	Frequency (MHz)	reading (dBμV)		Calibration factor (dB)	Measure@3m (dBμV/m)		limits (dBμV/m)	Margin (dB)		Pass/ Fail
		H	V		H	V		H	V	
2	4924	---	---	---	---	---	---	---	---	---
3	7386	---	---	---	---	---	---	---	---	---
4	9848	---	---	---	---	---	---	---	---	---
5	12310	---	---	---	---	---	---	---	---	---
6	14772	---	---	---	---	---	---	---	---	---
7	17234	---	---	---	---	---	---	---	---	---
8	19696	---	---	---	---	---	---	---	---	---
9	22158	---	---	---	---	---	---	---	---	---
10	24620	---	---	---	---	---	---	---	---	---

Outband

Frequency (MHz)	Polarization (H/V)	Reading (dBμV)	calibration (dB)	Measure@3m (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Pass/ Fail
195.2	H	26.6	11.5	38.1	43.5	-5.4	Pass
214.7	H	30.0	12.3	42.3	43.5	-1.2	Pass
247.7	H	26.7	13.7	40.4	46.0	-5.6	Pass
259.4	H	26.3	14.0	40.3	46.0	-5.7	Pass
286.6	H	26.7	14.7	41.4	46.0	-4.6	Pass
---	---	---	---	---	---	---	---
66.9	V	25.2	8.3	33.5	40.0	-6.5	Pass
195.2	V	25.1	11.5	36.6	43.5	-6.9	Pass
220.5	V	28.5	12.5	41.0	46.0	-5.0	Pass
234.1	V	26.4	13.1	39.5	46.0	-6.5	Pass
253.5	V	28.4	13.9	42.3	46.0	-3.7	Pass
259.4	V	25.5	14.0	39.5	46.0	-6.5	Pass
Uncertainty : ±4.3dB							

- note : 1. Means that the transmitted signal is lower than the instrument background noise
 2. calibration = antenna factor+cable loss(below 3.5GHz)
 3. calibration = antenna factor+cable loss-pre amplifier Gain ° (above 3.5GHz)
 4. Measure = Reading + calibration
 5. Margin= Measure -limits





Mode 4, Mode 5, Mode 6

Frequency : 2412MHz

Harmonic	Frequency (MHz)	reading (dBμV)		Calibration factor (dB)	Measure@3m (dBμV/m)		limits (dBμV/m)	Margin (dB)		Pass/Fail
		H	V		H	V		H	V	
2	4824	---	---	---	---	---	---	---	---	---
3	7236	---	---	---	---	---	---	---	---	---
4	9648	---	---	---	---	---	---	---	---	---
5	12060	---	---	---	---	---	---	---	---	---
6	14472	---	---	---	---	---	---	---	---	---
7	16884	---	---	---	---	---	---	---	---	---
8	19296	---	---	---	---	---	---	---	---	---
9	21708	---	---	---	---	---	---	---	---	---
10	24120	---	---	---	---	---	---	---	---	---

Outband

Frequency (MHz)	Polarization (H/V)	Reading (dBμV)	calibration (dB)	Measure@3m (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Pass/Fail
195.2	H	28.1	11.5	39.6	43.5	-3.9	Pass
201.1	H	27.2	11.7	38.9	43.5	-4.6	Pass
253.5	H	25.7	13.9	39.6	46.0	-6.4	Pass
871.7	H	14.8	25.4	40.2	46.0	-5.8	Pass
---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---
214.7	V	26.3	12.3	38.6	43.5	-4.9	Pass
220.5	V	26.3	12.5	38.8	46.0	-7.2	Pass
247.7	V	25.8	13.7	39.5	46.0	-6.5	Pass
253.5	V	25.7	13.9	39.6	46.0	-6.4	Pass
259.4	V	25.2	14.0	39.2	46.0	-6.8	Pass
933.9	V	15.4	25.9	41.3	46.0	-4.7	Pass
Uncertainty : ±4.3dB							

- note : 1. Means that the transmitted signal is lower than the instrument background noise
 2. calibration = antenna factor+cable loss(below 3.5GHz)
 3. calibration = antenna factor+cable loss-pre amplifier Gain ° (above 3.5GHz)
 4. Measure = Reading + calibration
 5. Margin= Measure -limits





Frequency : 2437MHz

Harmonic	Frequency (MHz)	reading (dBμV)		Calibration factor (dB)	Measure@3m (dBμV/m)		limits (dBμV/m)	Margin (dB)		Pass/Fail
		H	V		H	V		H	V	
2	4874	---	---	---	---	---	---	---	---	---
3	7311	---	---	---	---	---	---	---	---	---
4	9748	---	---	---	---	---	---	---	---	---
5	12185	---	---	---	---	---	---	---	---	---
6	14622	---	---	---	---	---	---	---	---	---
7	17059	---	---	---	---	---	---	---	---	---
8	19496	---	---	---	---	---	---	---	---	---
9	21933	---	---	---	---	---	---	---	---	---
10	24370	---	---	---	---	---	---	---	---	---

Outband

Frequency (MHz)	Polarization (H/V)	Reading (dBμV)	calibration (dB)	Measure@3m (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Pass/Fail
195.2	H	29.6	11.5	41.1	43.5	-2.4	Pass
201.1	H	31.5	11.7	43.2	43.5	-0.3	Pass
214.7	H	27.2	12.3	39.5	43.5	-4.0	Pass
253.5	H	27.2	13.9	41.1	46.0	-4.9	Pass
259.4	H	26.4	14.0	40.4	46.0	-5.6	Pass
---	---	---	---	---	---	---	---
206.9	V	29.0	12.0	41.0	43.5	-2.5	Pass
214.7	V	24.8	12.3	37.1	43.5	-6.4	Pass
239.9	V	25.9	13.3	39.2	46.0	-6.8	Pass
247.7	V	26.4	13.7	40.1	46.0	-5.9	Pass
253.5	V	27.8	13.9	41.7	46.0	-4.3	Pass
259.4	V	27.0	14.0	41.0	46.0	-5.0	Pass
Uncertainty : ±4.3dB							

- note : 1. Means that the transmitted signal is lower than the instrument background noise
 2. calibration = antenna factor+cable loss(below 3.5GHz)
 3. calibration = antenna factor+cable loss-pre amplifier Gain ° (above 3.5GHz)
 4. Measure = Reading + calibration
 5. Margin= Measure -limits





Frequency : 2462 MHz

Harmonic	Frequency (MHz)	reading (dBμV)		Calibration factor (dB)	Measure@3m (dBμV/m)		limits (dBμV/m)	Margin (dB)		Pass/ Fail
		H	V		H	V		H	V	
2	4924	---	---	---	---	---	---	---	---	---
3	7386	---	---	---	---	---	---	---	---	---
4	9848	---	---	---	---	---	---	---	---	---
5	12310	---	---	---	---	---	---	---	---	---
6	14772	---	---	---	---	---	---	---	---	---
7	17234	---	---	---	---	---	---	---	---	---
8	19696	---	---	---	---	---	---	---	---	---
9	22158	---	---	---	---	---	---	---	---	---
10	24620	---	---	---	---	---	---	---	---	---

Outband

Frequency (MHz)	Polarization (H/V)	Reading (dBμV)	calibration (dB)	Measure@3m (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Pass/ Fail
259.4	H	27.5	14.0	41.5	46.0	-4.5	Pass
267.2	H	30.4	14.2	44.6	46.0	-1.4	Pass
273.0	H	31.2	14.3	45.5	46.0	-0.5	Pass
278.8	H	28.9	14.5	43.4	46.0	-2.6	Pass
286.6	H	27.9	14.7	42.6	46.0	-3.4	Pass
292.4	H	28.6	14.8	43.4	46.0	-2.6	Pass
181.6	V	24.5	10.9	35.4	43.5	-8.1	Pass
187.5	V	24.2	11.2	35.4	43.5	-8.1	Pass
195.2	V	28.2	11.5	39.7	43.5	-3.8	Pass
201.1	V	23.9	11.7	35.6	43.5	-7.9	Pass
206.9	V	24.9	12.0	36.9	43.5	-6.6	Pass
832.8	V	14.5	24.8	39.3	46.0	-6.7	Pass
Uncertainty : ±4.3dB							

- note : 1. Means that the transmitted signal is lower than the instrument background noise
 2. calibration = antenna factor+cable loss(below 3.5GHz)
 3. calibration = antenna factor+cable loss-pre amplifier Gain ° (above 3.5GHz)
 4. Measure = Reading + calibration
 5. Margin= Measure -limits





Mode 7, Mode 8, Mode 9

Frequency : 2412 MHz

Harmonic	Frequency (MHz)	reading (dBμV)		Calibration factor (dB)	Measure@3m (dBμV/m)		limits (dBμV/m)	Margin (dB)		Pass/ Fail
		H	V		H	V		H	V	
2	4824	---	---	---	---	---	---	---	---	---
3	7236	---	---	---	---	---	---	---	---	---
4	9648	---	---	---	---	---	---	---	---	---
5	12060	---	---	---	---	---	---	---	---	---
6	14472	---	---	---	---	---	---	---	---	---
7	16884	---	---	---	---	---	---	---	---	---
8	19296	---	---	---	---	---	---	---	---	---
9	21708	---	---	---	---	---	---	---	---	---
10	24120	---	---	---	---	---	---	---	---	---

Outband

Frequency (MHz)	Polarization (H/V)	Reading (dBμV)	calibration (dB)	Measure@3m (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Pass/ Fail
201.1	H	25.3	11.7	37.0	43.5	-6.5	Pass
206.9	H	29.3	12.0	41.3	43.5	-2.2	Pass
253.5	H	25.0	13.9	38.9	46.0	-7.1	Pass
267.2	H	25.6	14.2	39.8	46.0	-6.2	Pass
273.0	H	28.0	14.3	42.3	46.0	-3.7	Pass
278.8	H	25.9	14.5	40.4	46.0	-5.6	Pass
57.2	V	26.5	8.4	34.9	40.0	-5.1	Pass
187.5	V	25.4	11.2	36.6	43.5	-6.9	Pass
195.2	V	25.9	11.5	37.4	43.5	-6.1	Pass
206.9	V	24.9	12.0	36.9	43.5	-6.6	Pass
214.7	V	24.1	12.3	36.4	43.5	-7.1	Pass
953.3	V	14.8	26.0	40.8	46.0	-5.2	Pass
Uncertainty : ±4.3dB							

- note : 1. Means that the transmitted signal is lower than the instrument background noise
 2. calibration = antenna factor+cable loss(below 3.5GHz)
 3. calibration = antenna factor+cable loss-pre amplifier Gain ° (above 3.5GHz)
 4. Measure = Reading + calibration
 5. Margin= Measure -limits





Frequency : 2437MHz

Harmonic	Frequency (MHz)	reading (dBμV)		Calibration factor (dB)	Measure@3m (dBμV/m)		limits (dBμV/m)	Margin (dB)		Pass/Fail
		H	V		H	V		H	V	
2	4874	---	---	---	---	---	---	---	---	---
3	7311	---	---	---	---	---	---	---	---	---
4	9748	---	---	---	---	---	---	---	---	---
5	12185	---	---	---	---	---	---	---	---	---
6	14622	---	---	---	---	---	---	---	---	---
7	17059	---	---	---	---	---	---	---	---	---
8	19496	---	---	---	---	---	---	---	---	---
9	21933	---	---	---	---	---	---	---	---	---
10	24370	---	---	---	---	---	---	---	---	---

Outband

Frequency (MHz)	Polarization (H/V)	Reading (dBμV)	calibration (dB)	Measure@3m (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Pass/Fail
195.2	H	26.2	11.5	37.7	43.5	-5.8	Pass
201.1	H	27.2	11.7	38.9	43.5	-4.6	Pass
206.9	H	28.3	12.0	40.3	43.5	-3.2	Pass
253.5	H	26.4	13.9	40.3	46.0	-5.7	Pass
273.0	H	26.7	14.3	41.0	46.0	-5.0	Pass
278.8	H	26.4	14.5	40.9	46.0	-5.1	Pass
55.3	V	26.0	8.5	34.5	40.0	-5.5	Pass
181.6	V	26.1	10.9	37.0	43.5	-6.5	Pass
187.5	V	25.5	11.2	36.7	43.5	-6.8	Pass
206.9	V	25.4	12.0	37.4	43.5	-6.1	Pass
253.5	V	25.3	13.9	39.2	46.0	-6.8	Pass
729.8	V	15.1	23.9	39.0	46.0	-7.0	Pass
Uncertainty : ±4.3dB							

- note : 1. Means that the transmitted signal is lower than the instrument background noise
 2. calibration = antenna factor+cable loss(below 3.5GHz)
 3. calibration = antenna factor+cable loss-pre amplifier Gain ° (above 3.5GHz)
 4. Measure = Reading + calibration
 5. Margin= Measure -limits





Frequency : 2462 MHz

Harmonic	Frequency (MHz)	reading (dBμV)		Calibration factor (dB)	Measure@3m (dBμV/m)		limits (dBμV/m)	Margin (dB)		Pass/ Fail
		H	V		H	V		H	V	
2	4924	---	---	---	---	---	---	---	---	---
3	7386	---	---	---	---	---	---	---	---	---
4	9848	---	---	---	---	---	---	---	---	---
5	12310	---	---	---	---	---	---	---	---	---
6	14772	---	---	---	---	---	---	---	---	---
7	17234	---	---	---	---	---	---	---	---	---
8	19696	---	---	---	---	---	---	---	---	---
9	22158	---	---	---	---	---	---	---	---	---
10	24620	---	---	---	---	---	---	---	---	---

Outband

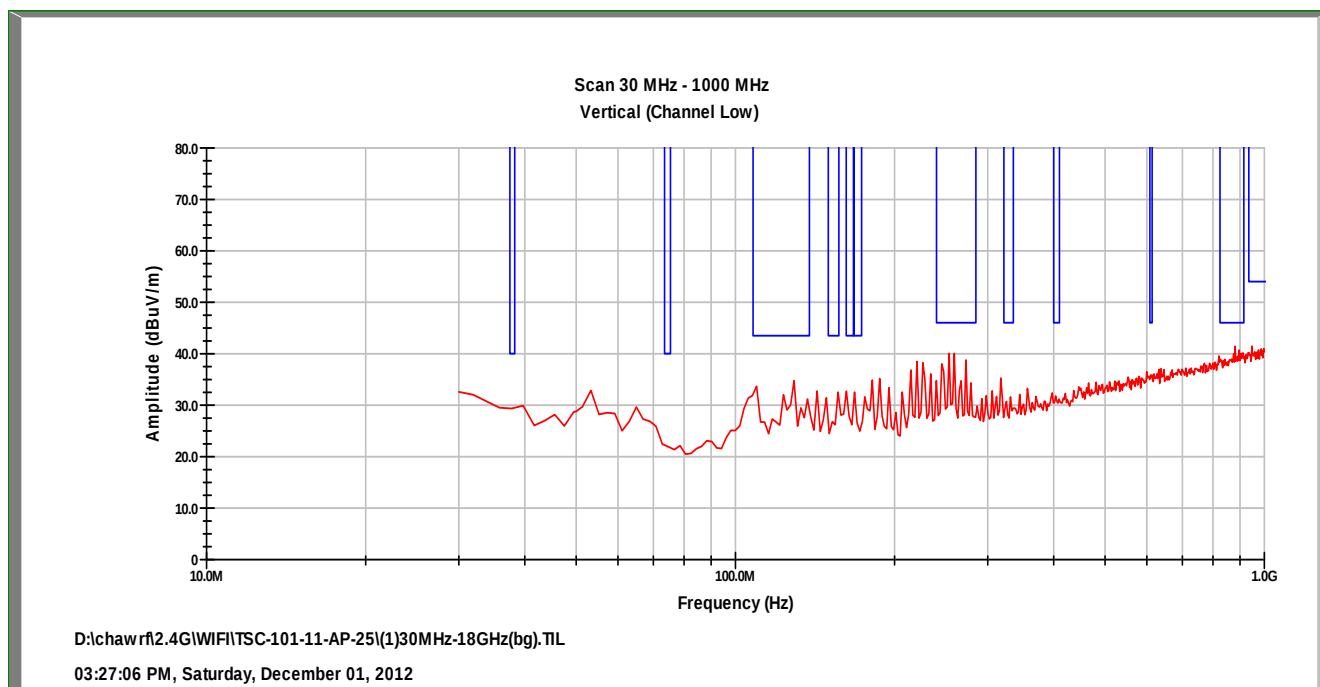
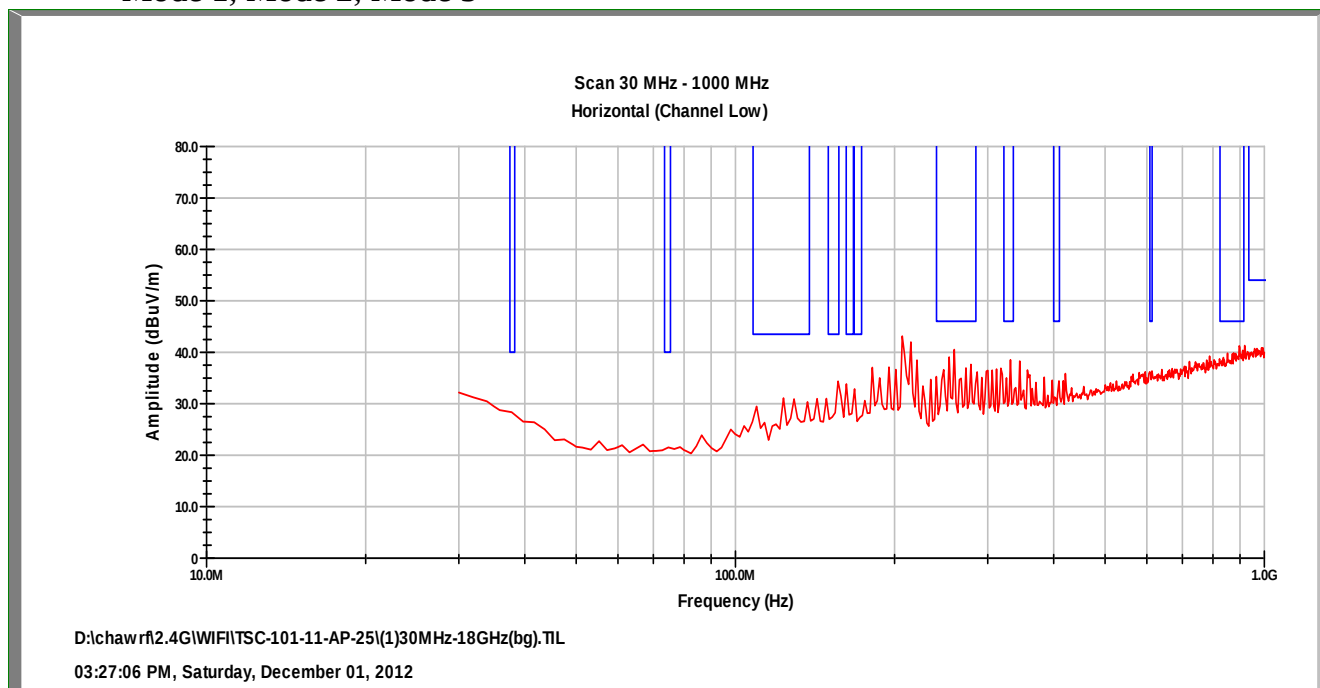
Frequency (MHz)	Polarization (H/V)	Reading (dBμV)	calibration (dB)	Measure@3m (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Pass/ Fail
195.2	H	27.0	11.5	38.5	43.5	-5.0	Pass
201.1	H	28.0	11.7	39.7	43.5	-3.8	Pass
214.7	H	25.9	12.3	38.2	43.5	-5.3	Pass
253.5	H	26.7	13.9	40.6	46.0	-5.4	Pass
823.1	H	16.3	24.6	40.9	46.0	-5.1	Pass
---	---	---	---	---	---	---	---
57.2	V	25.3	8.4	33.7	40.0	-6.3	Pass
65.0	V	25.6	8.3	33.9	40.0	-6.1	Pass
187.5	V	24.8	11.2	36.0	43.5	-7.5	Pass
195.2	V	26.3	11.5	37.8	43.5	-5.7	Pass
206.9	V	24.7	12.0	36.7	43.5	-6.8	Pass
245.8	V	25.3	13.6	38.9	46.0	-7.1	Pass
Uncertainty : ±4.3dB							

- note : 1. Means that the transmitted signal is lower than the instrument background noise
 2. calibration = antenna factor+cable loss(below 3.5GHz)
 3. calibration = antenna factor+cable loss-pre amplifier Gain ° (above 3.5GHz)
 4. Measure = Reading + calibration
 5. Margin= Measure -limits

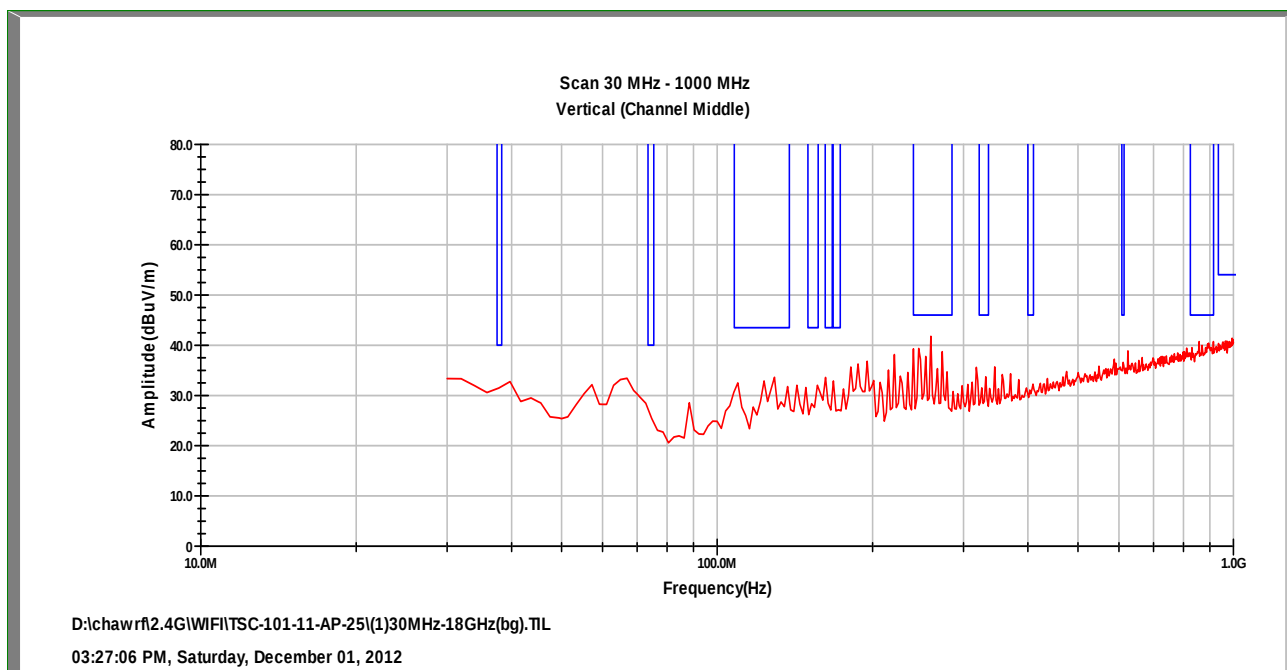
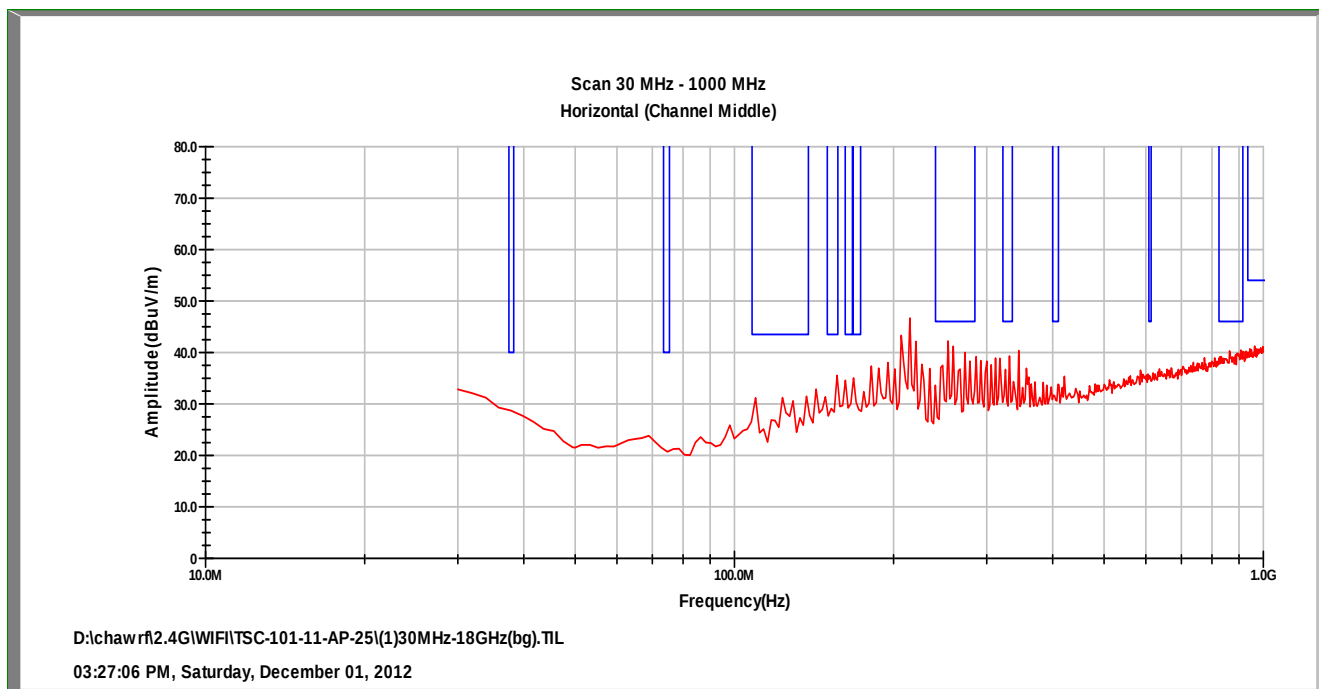


4.5 繪圖資料

Mode 1, Mode 2, Mode 3

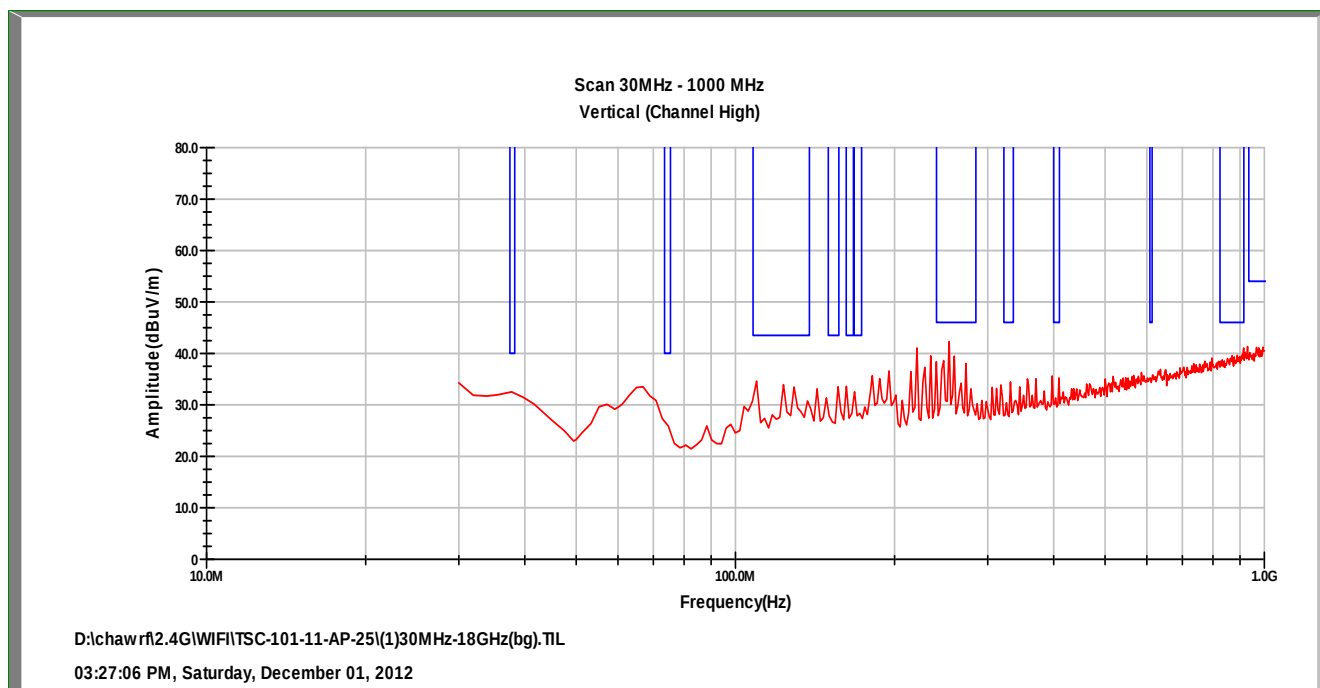
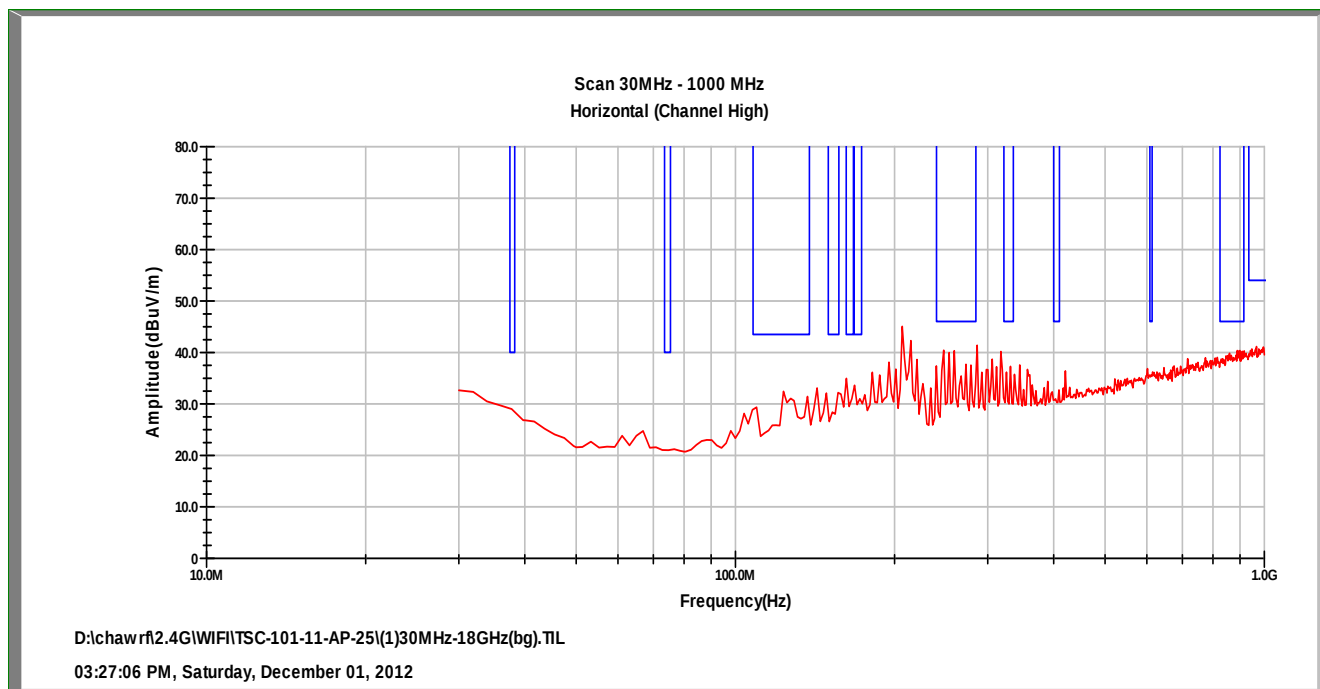


Below 1GHz radiation (Frequency 2412MHz)

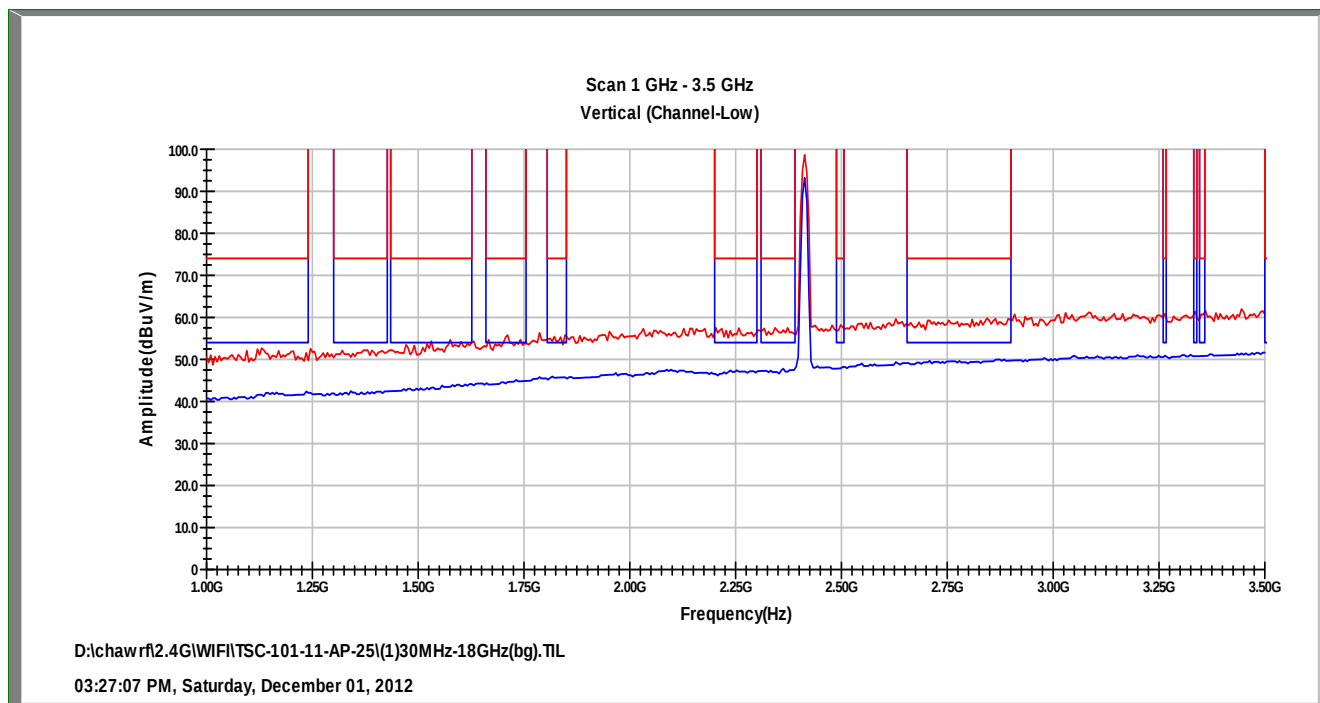
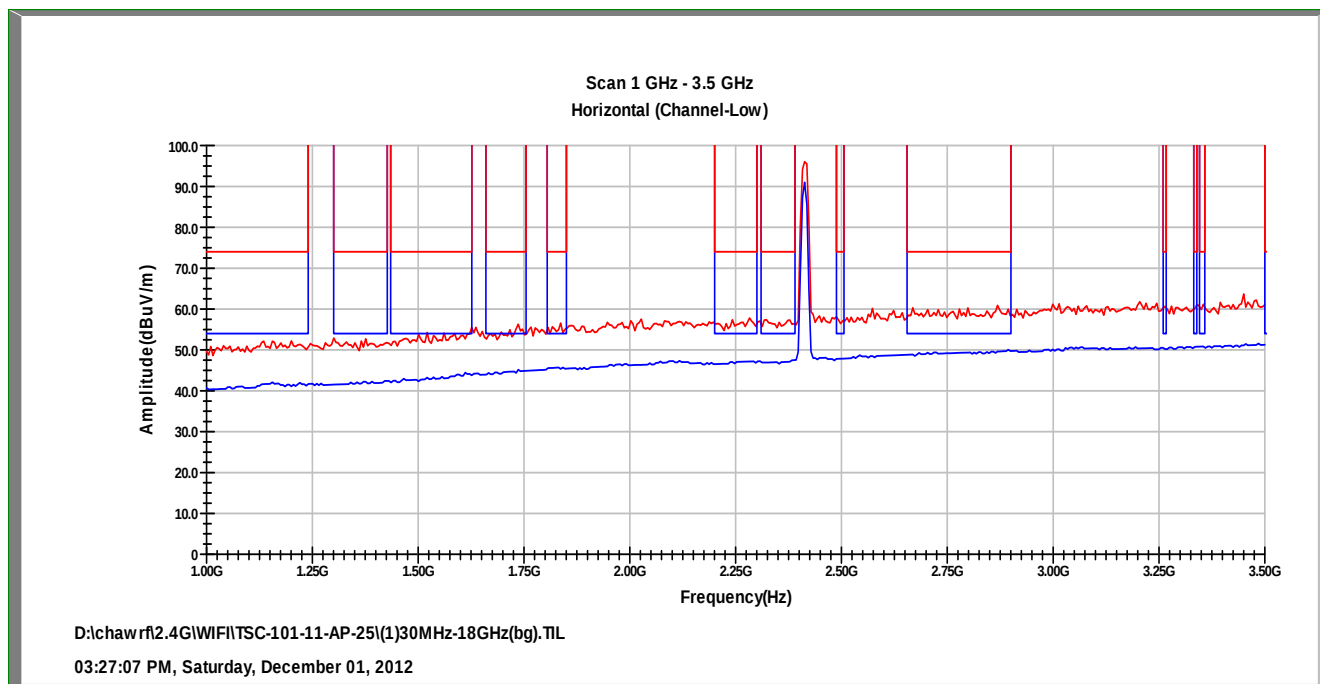


Below 1GHz radiation (Frequency 2437MHz)

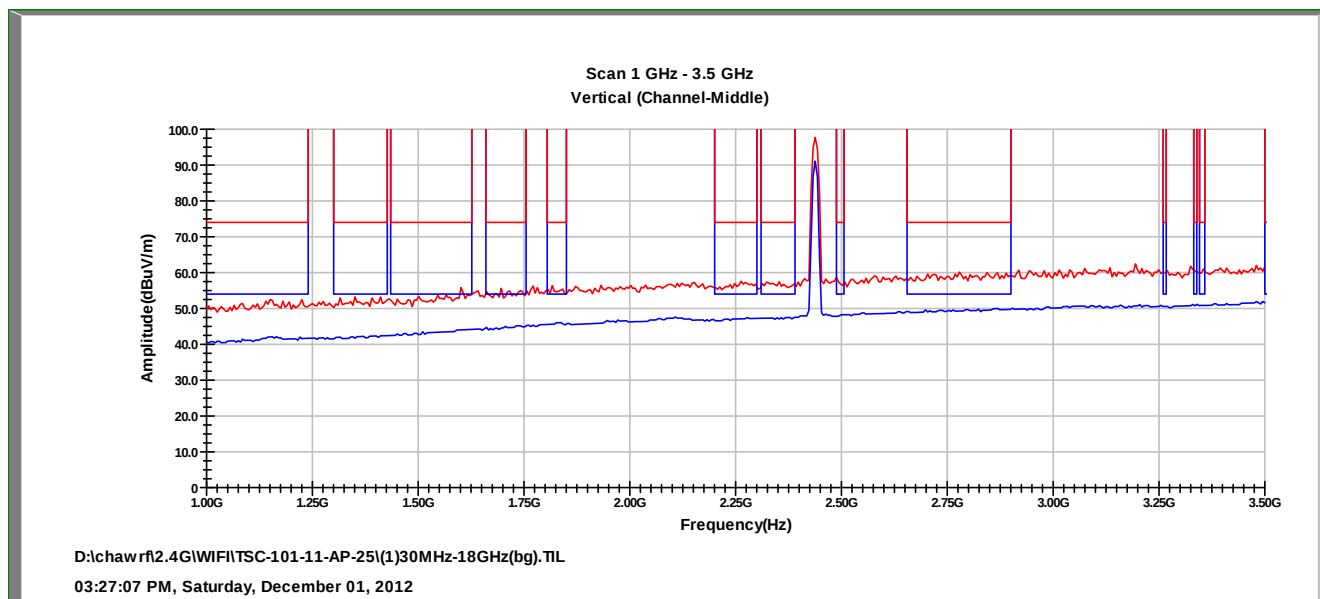
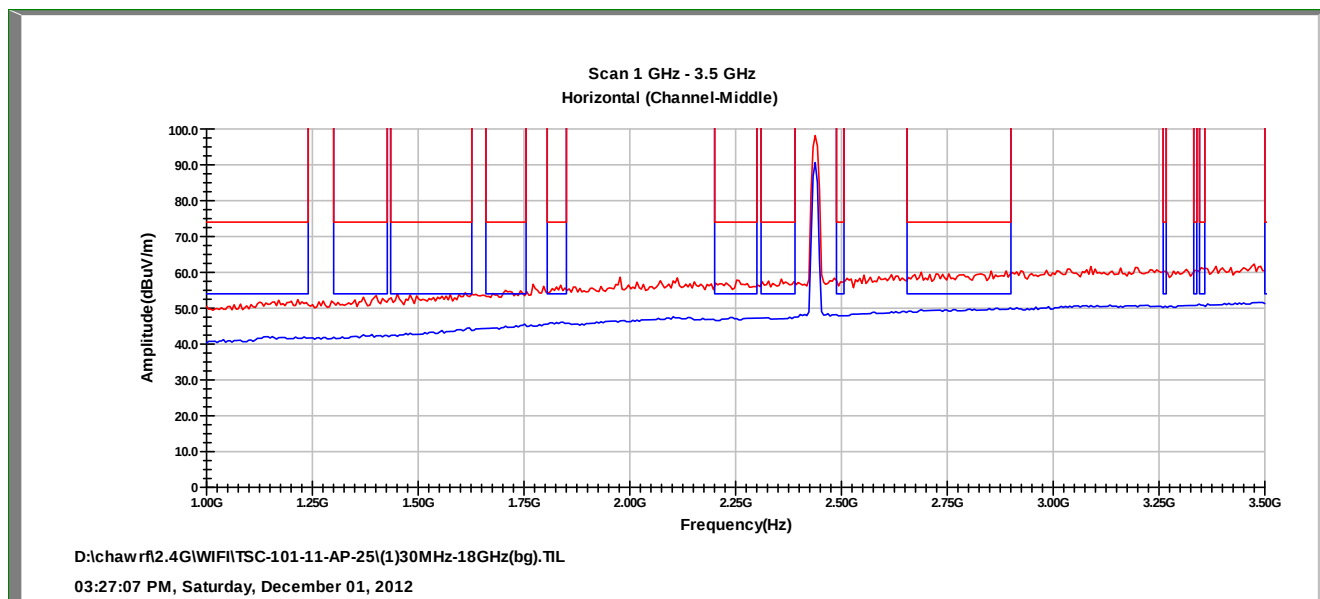




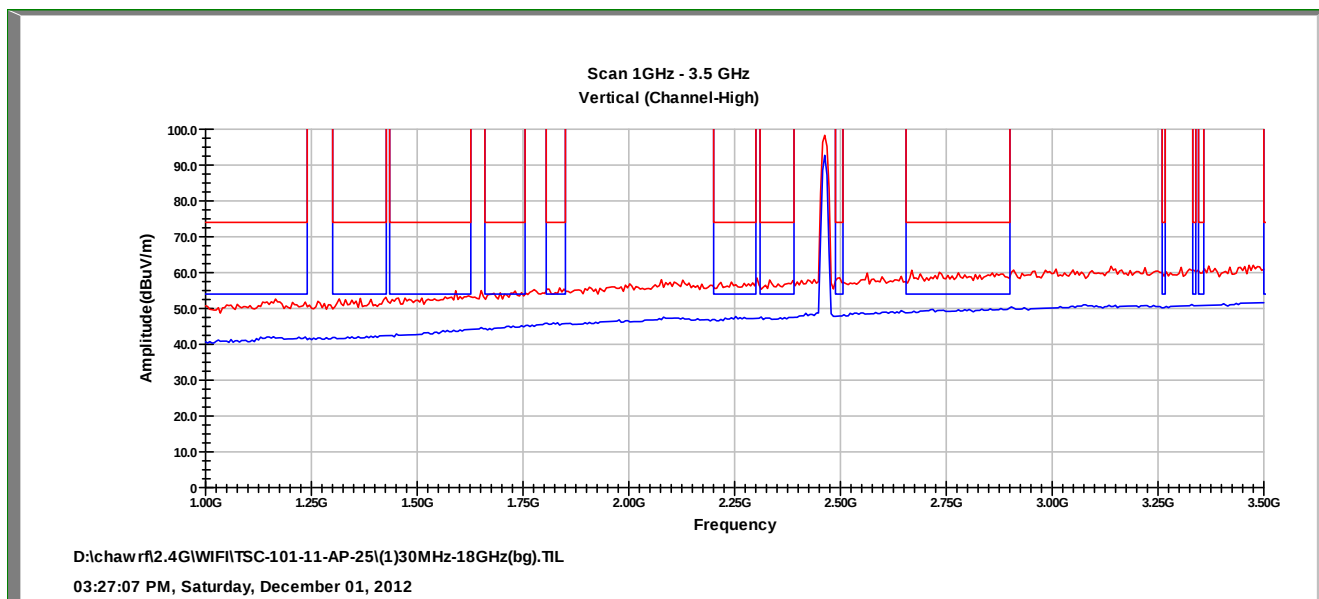
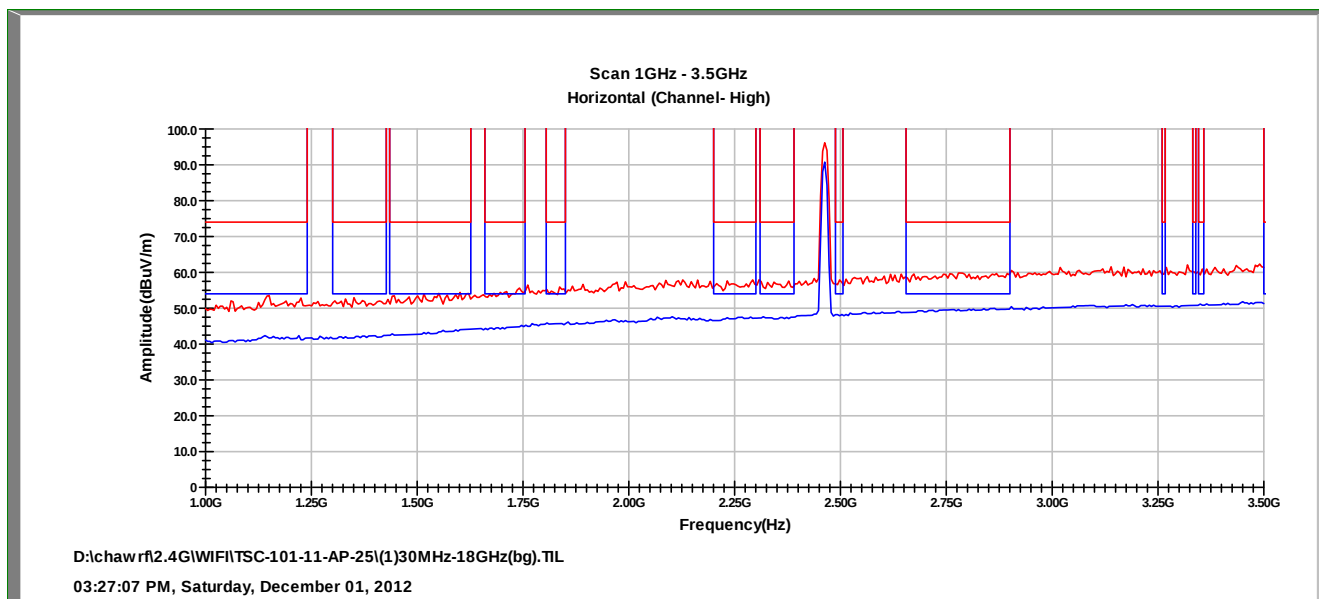
Below 1GHz radiation (Frequency 2462MHz)



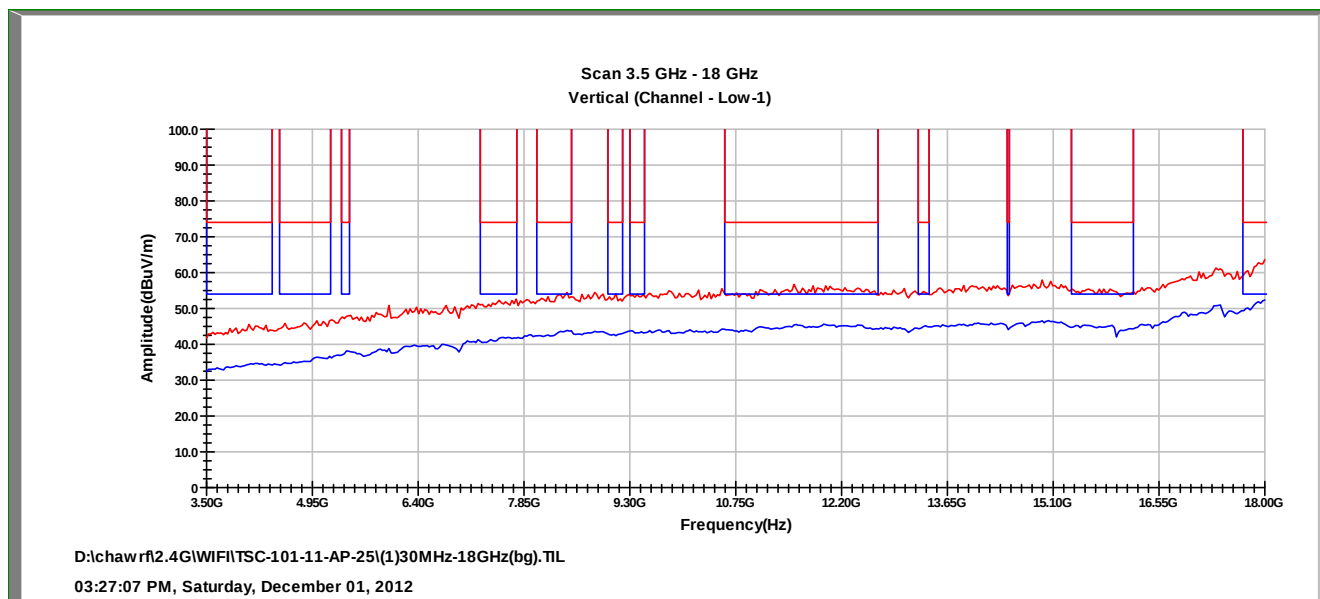
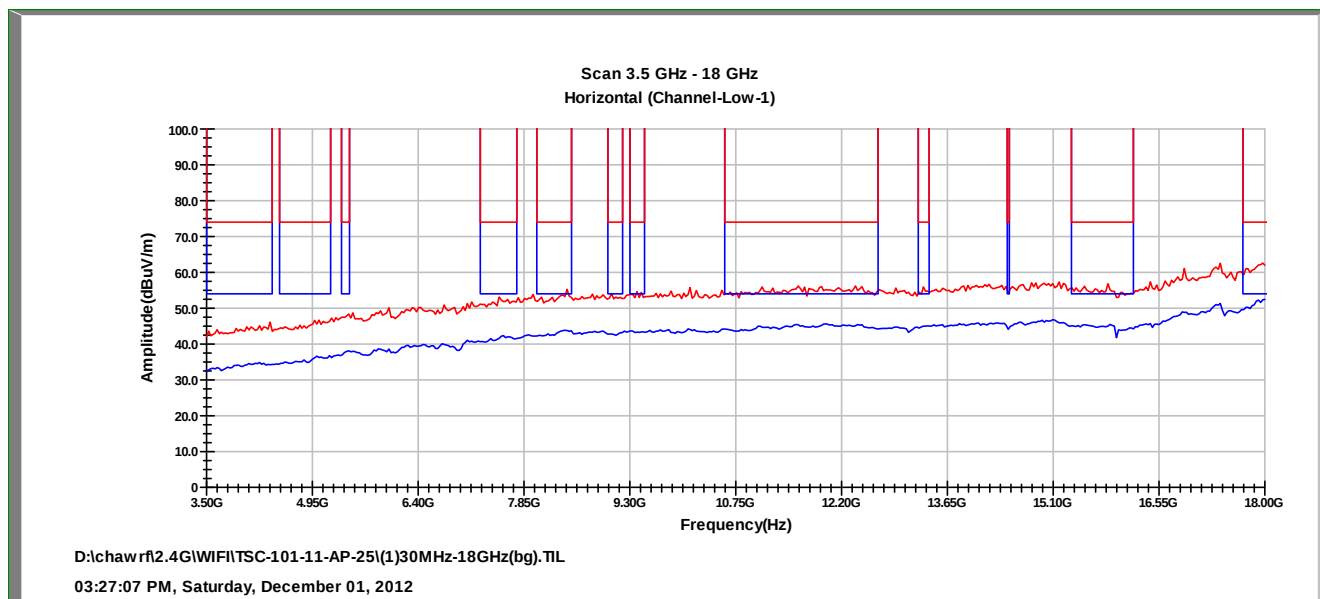
1 ~ 3.5GH radiation (Frequency 2422MHz)



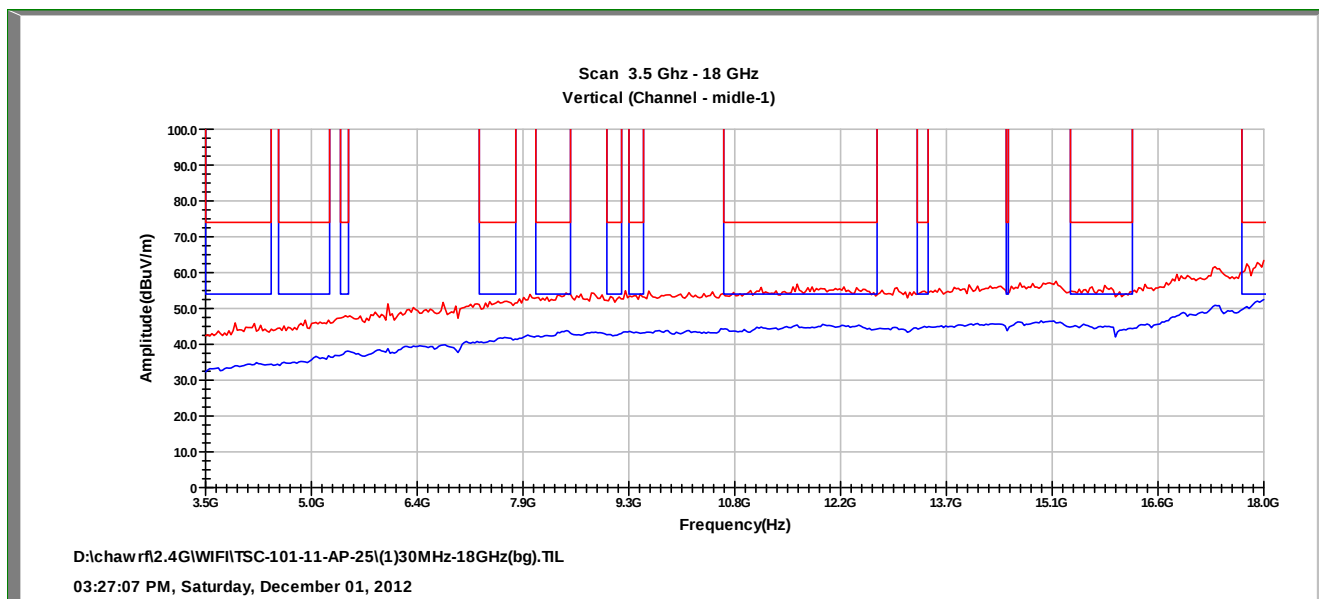
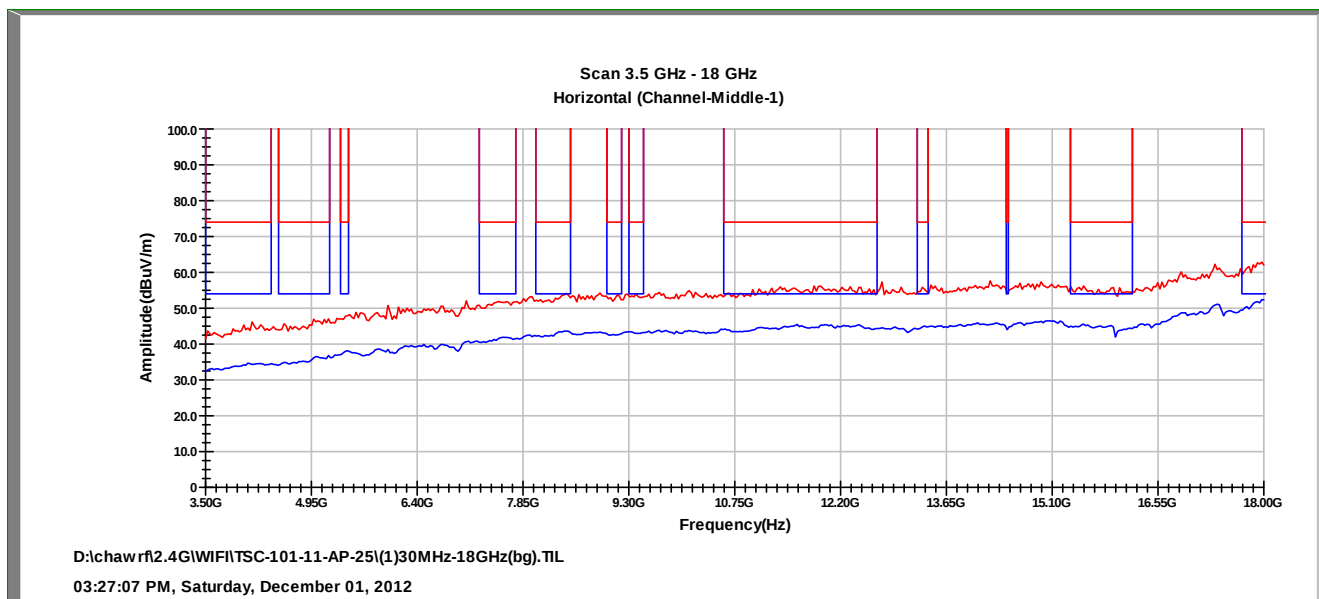
1 ~ 3.5GHz radiation (Frequency 2437MHz)



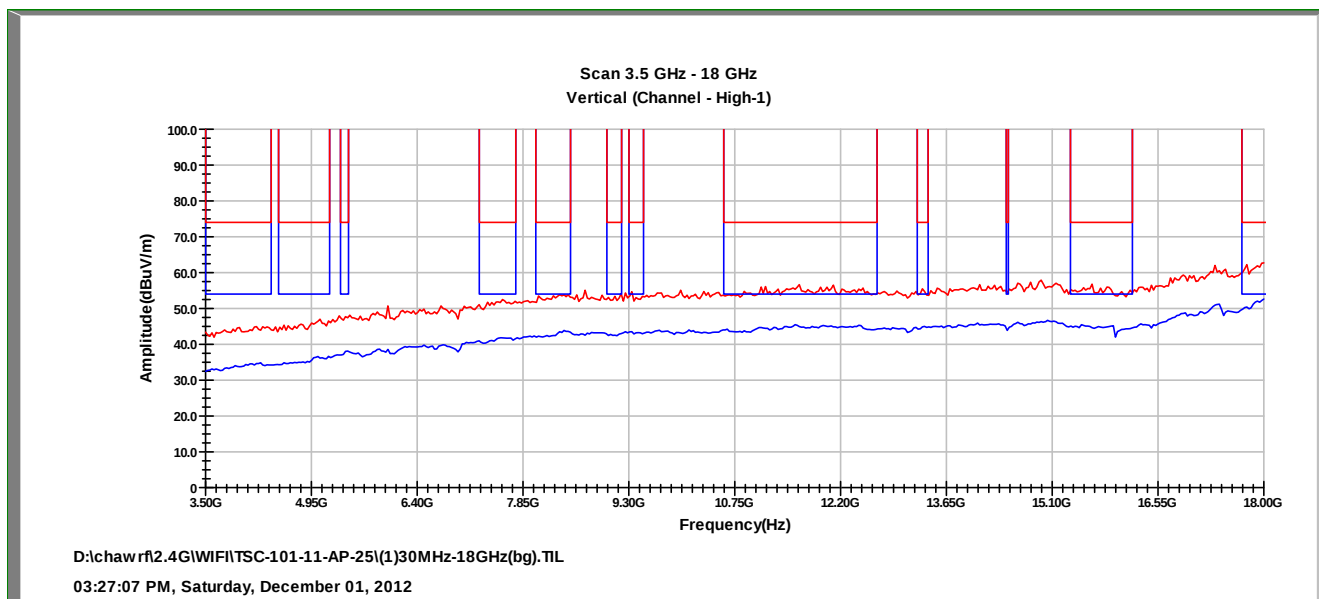
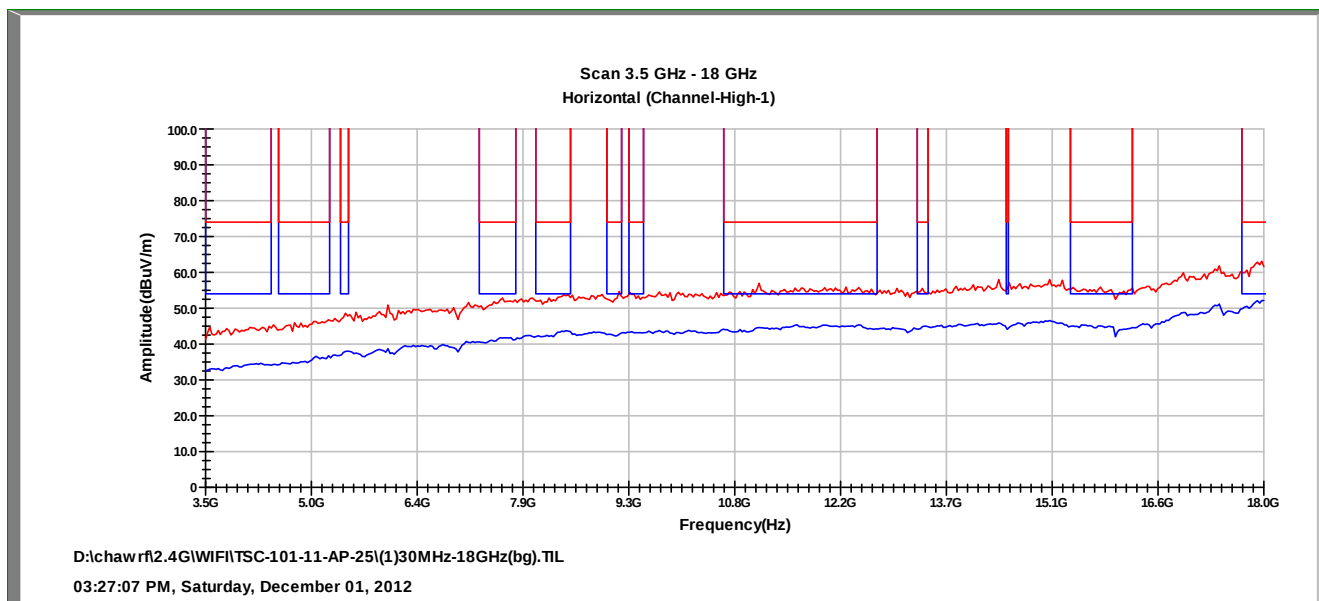
1 ~ 3.5GHz radiation (Frequency 2462MHz)



3.5 ~ 18GH radiation (Frequency 2422MHz)

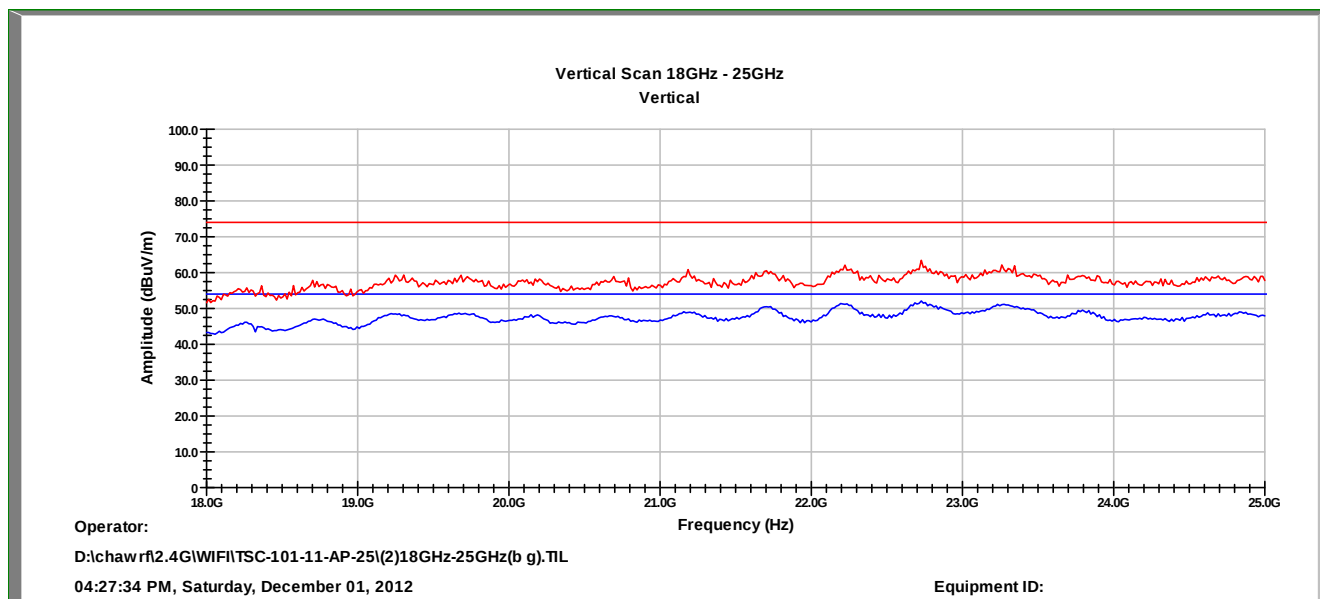
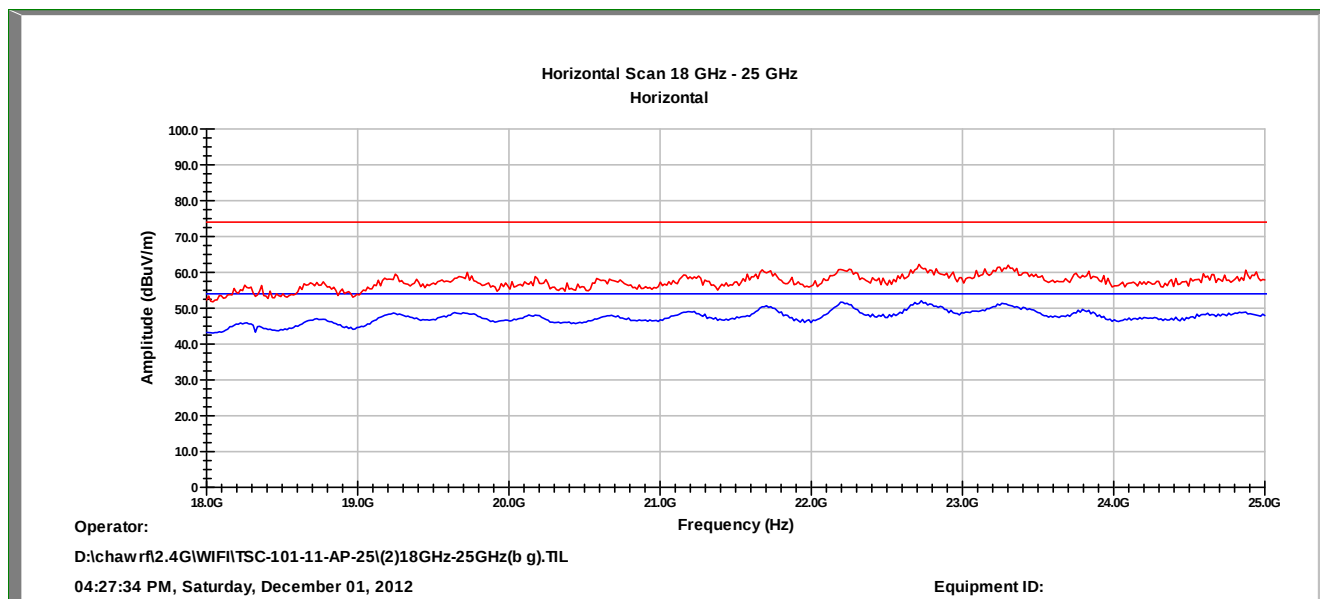


3.5 ~ 18GHz radiation (Frequency 2437MHz)



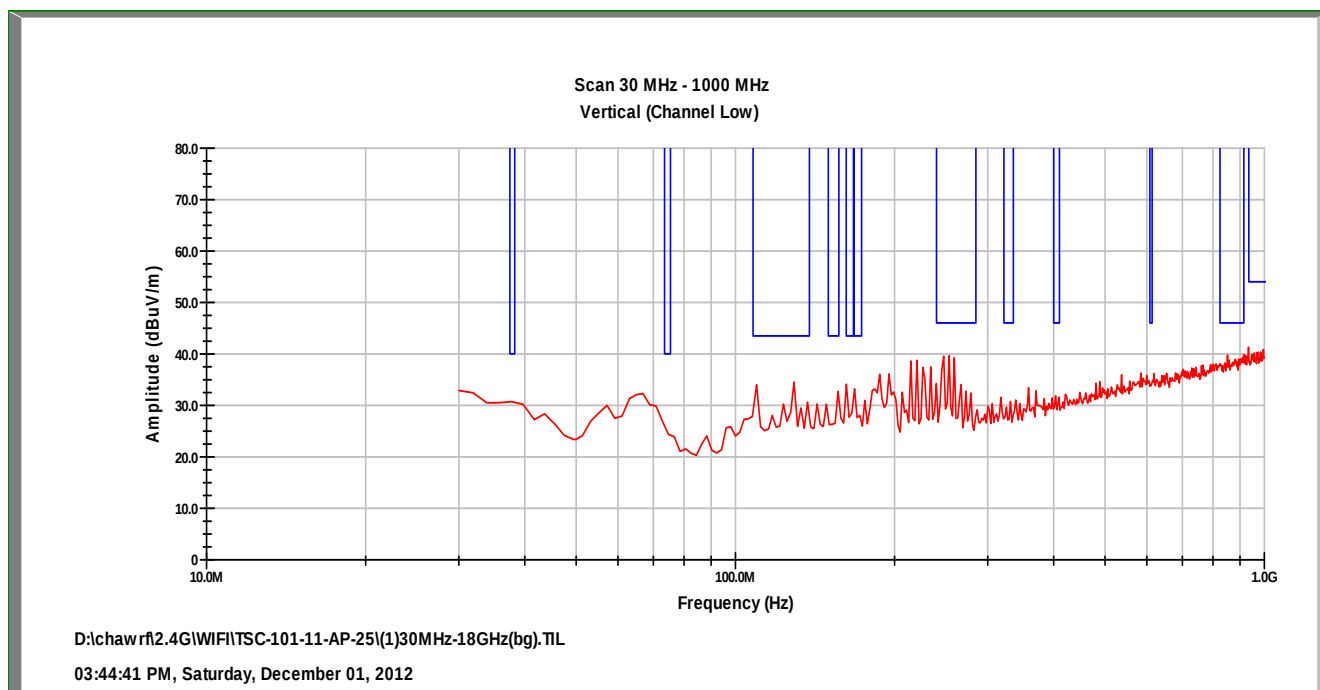
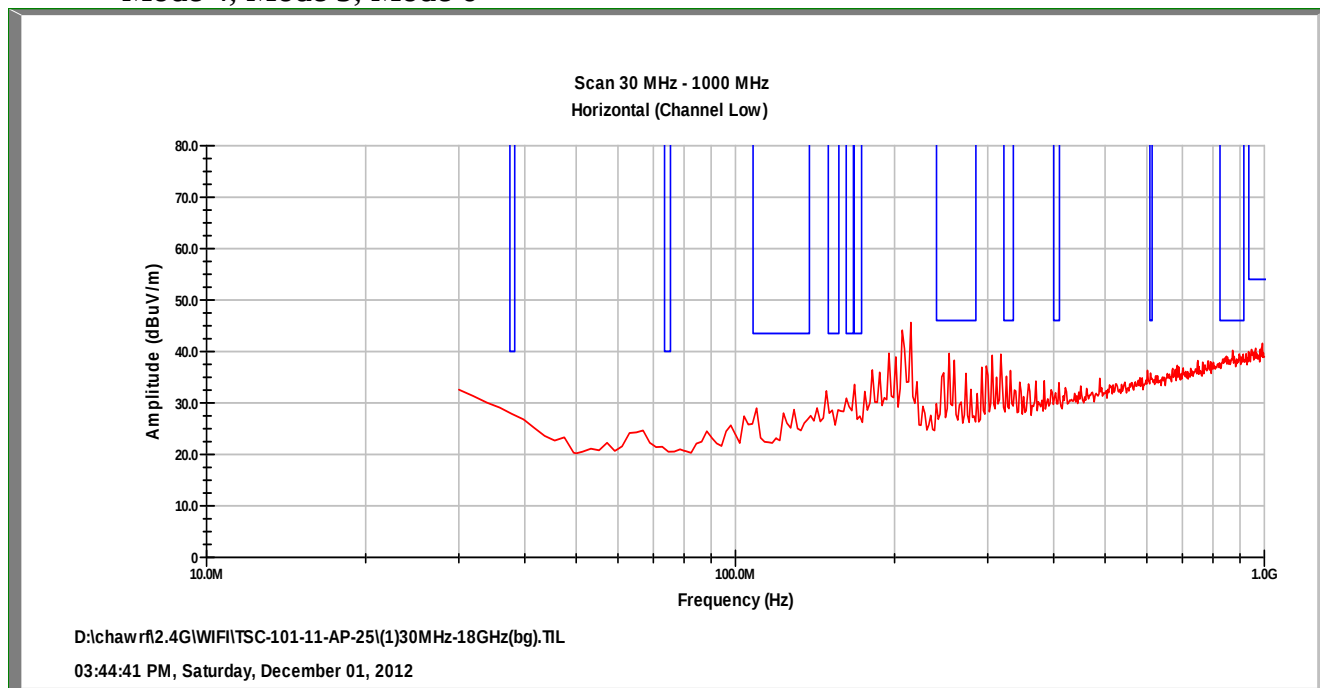
3.5 ~ 18GHz radiation (Frequency 2462MHz)



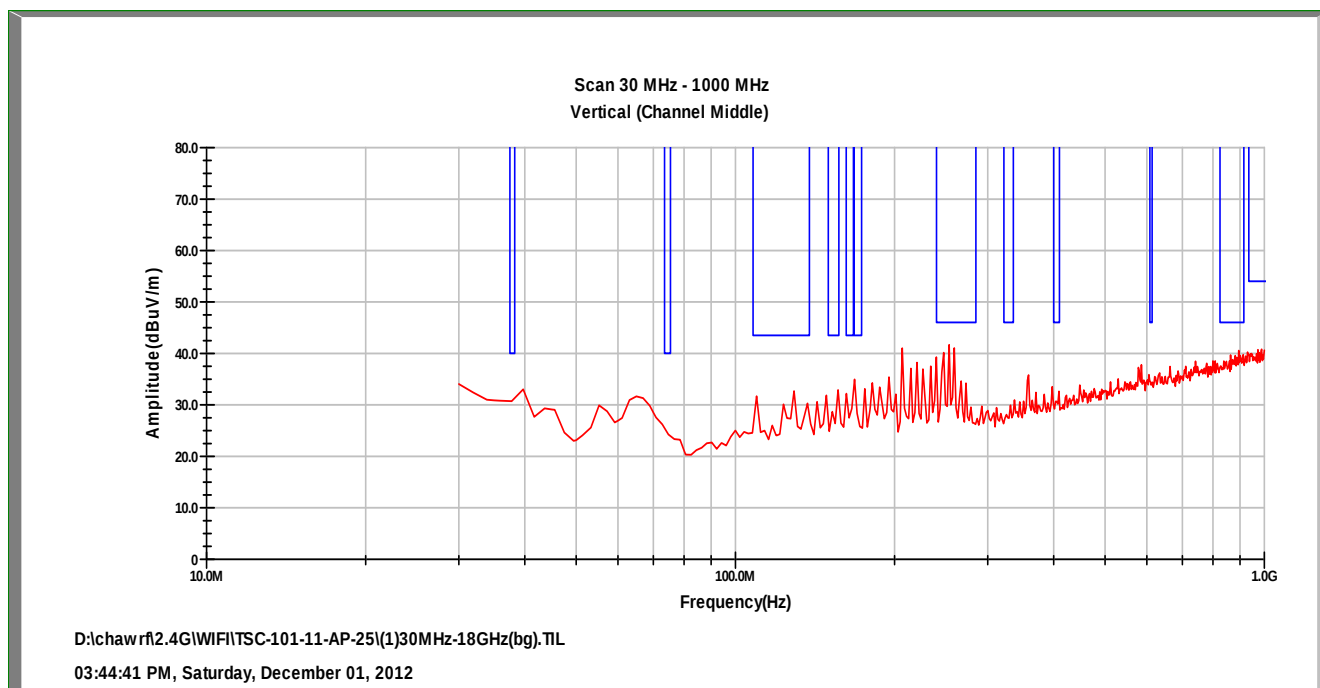
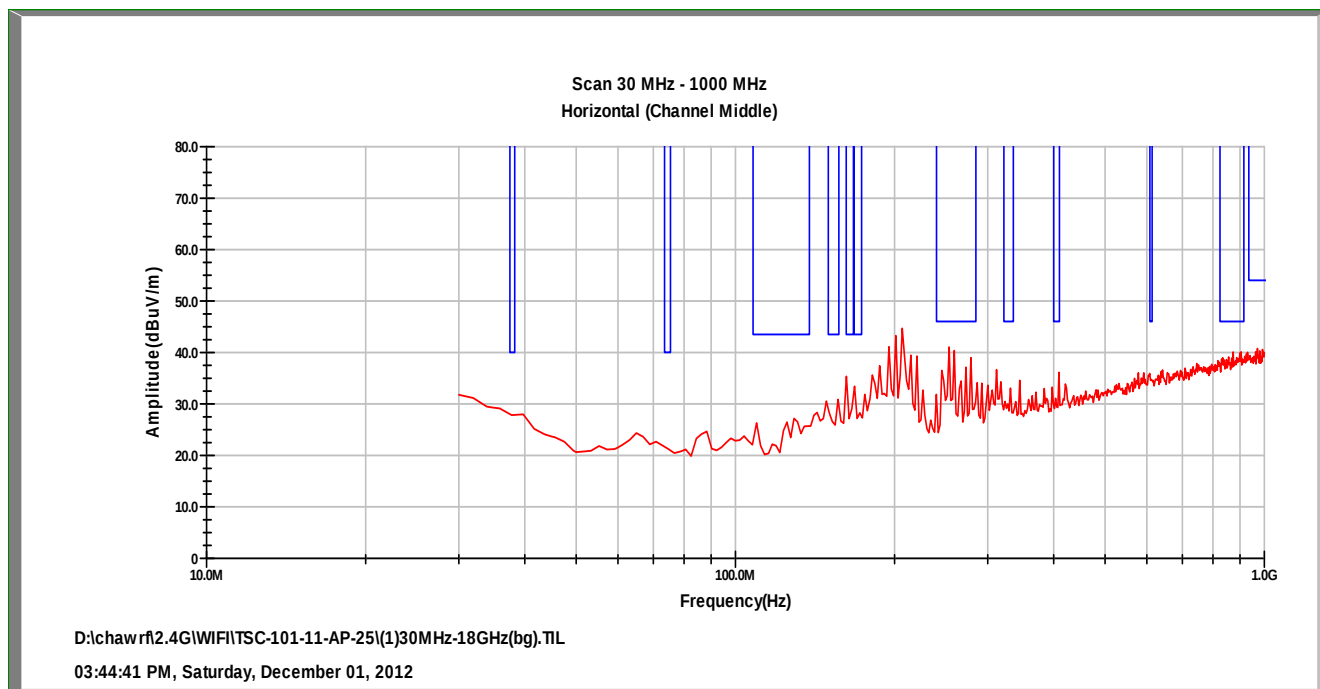


18 ~ 25GHz radiation (Frequency for High、Mid、Low)

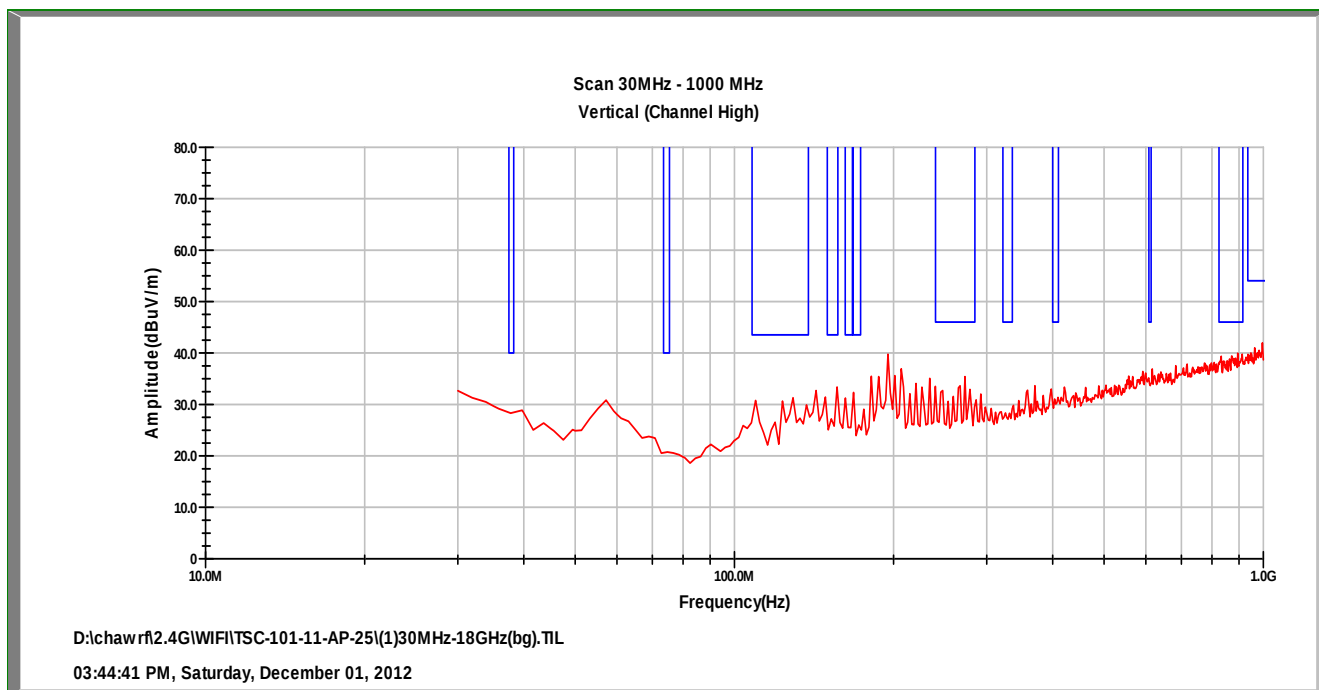
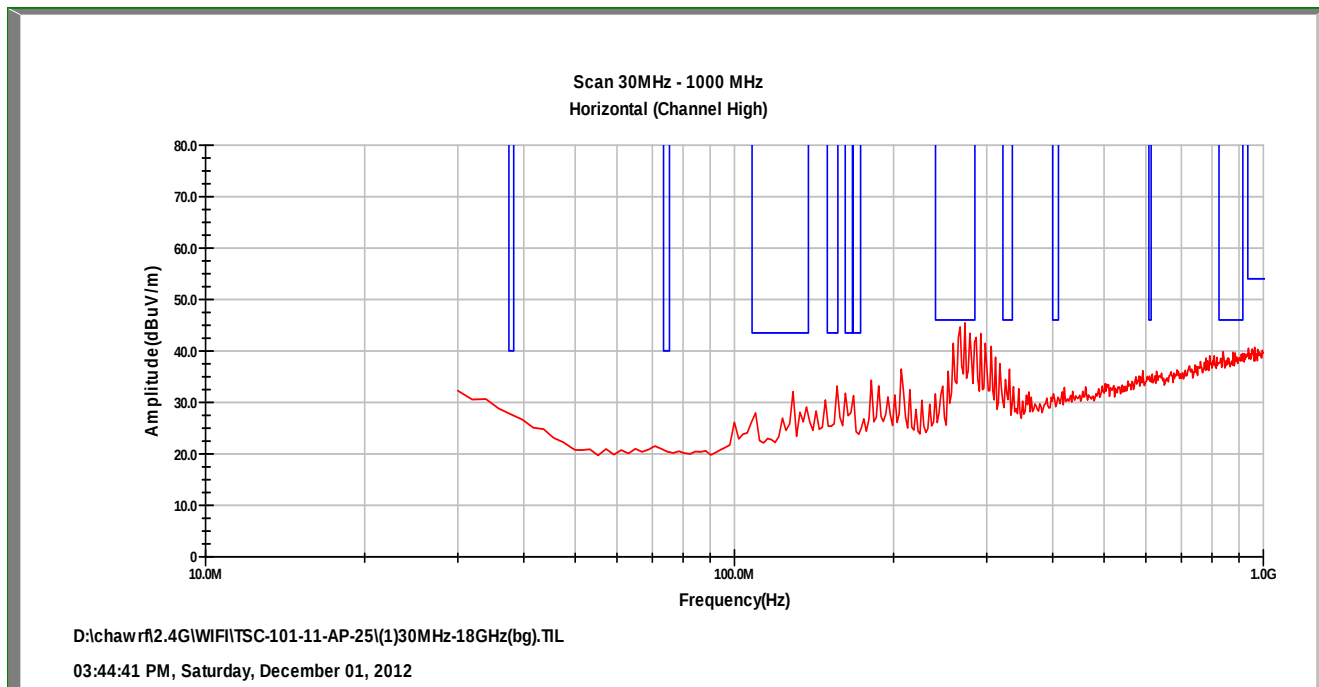
Mode 4, Mode 5, Mode 6



Below 1GHz radiation (Frequency 2412MHz)



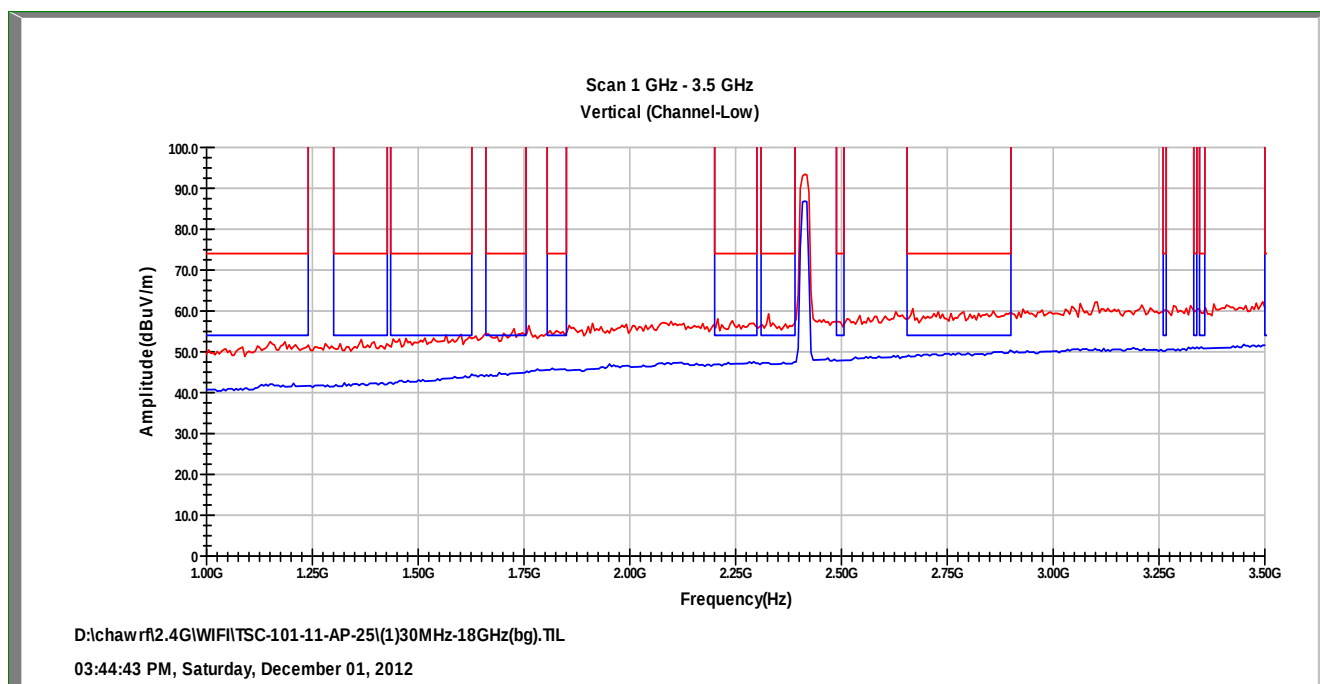
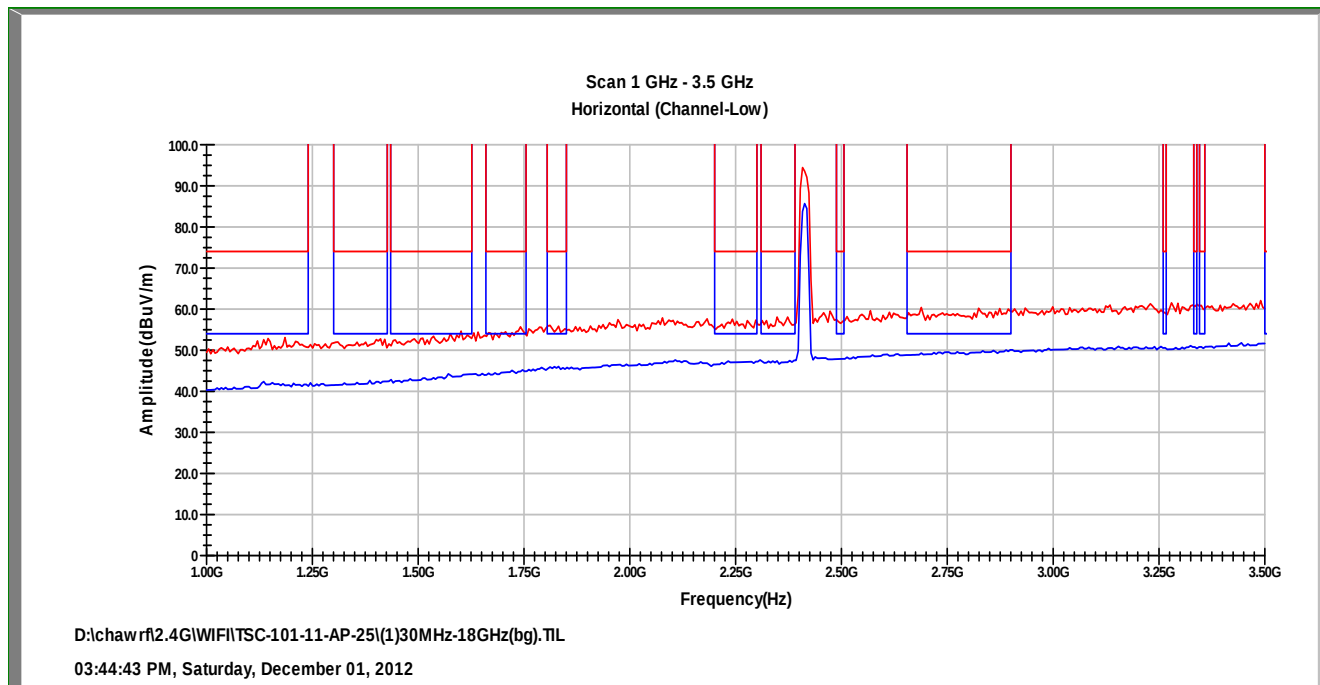
Below 1GHz radiation (Frequency 2437MHz)



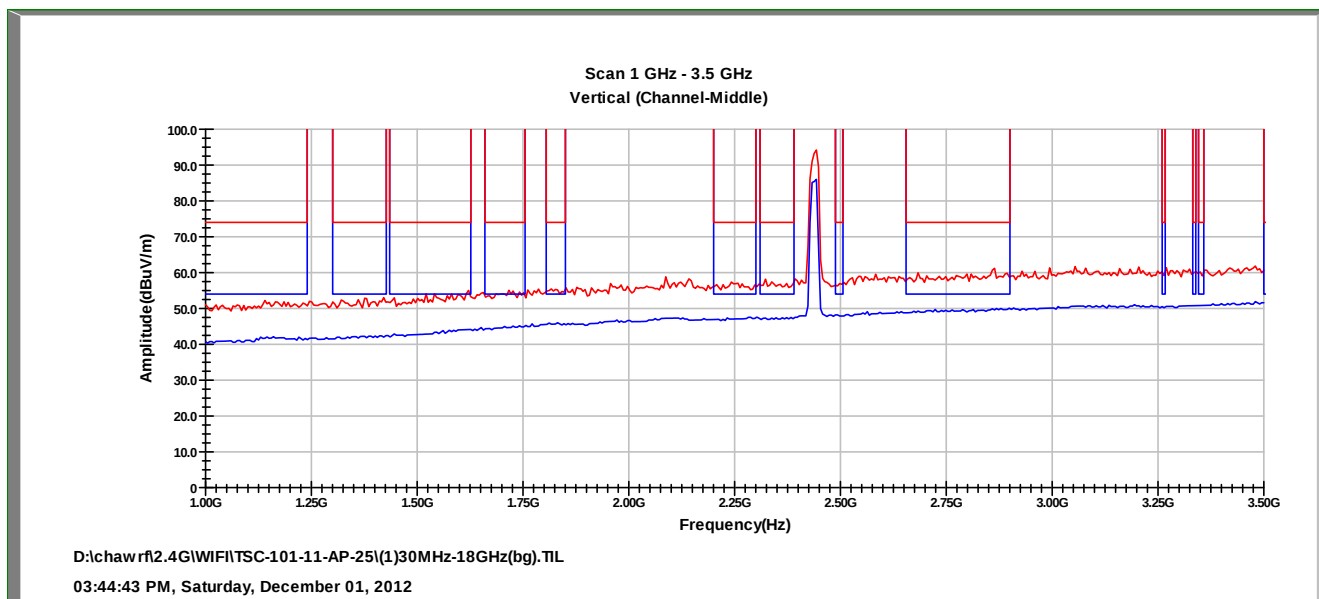
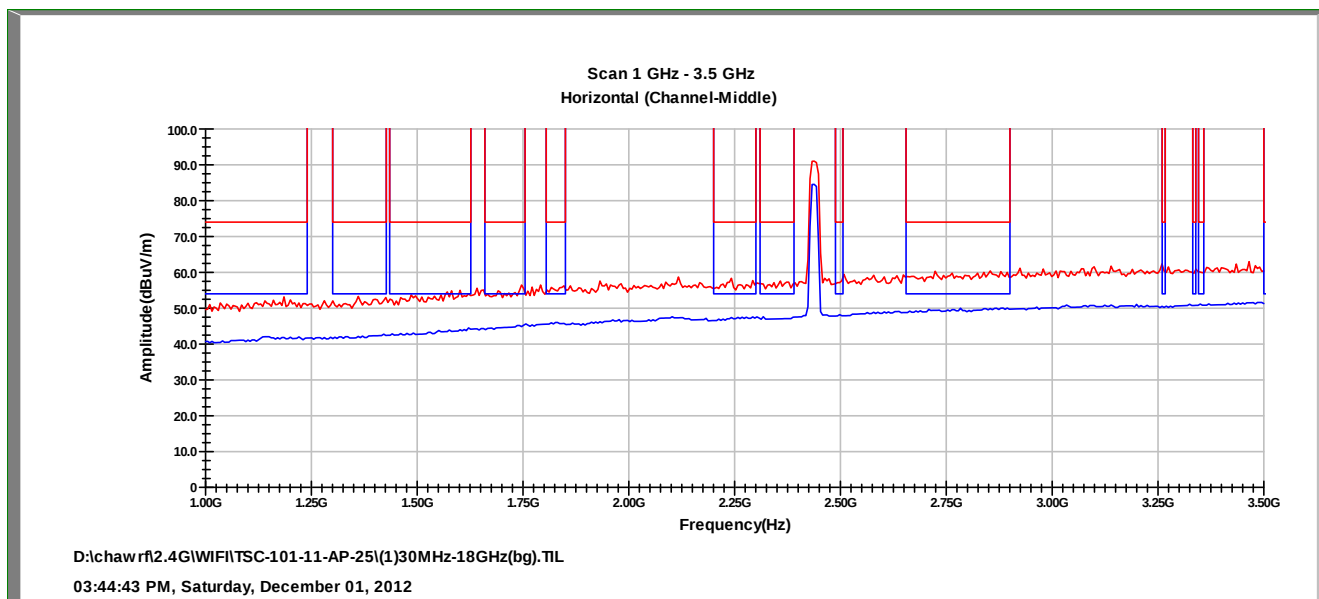
Below 1GHz radiation (Frequency 2462MHz)

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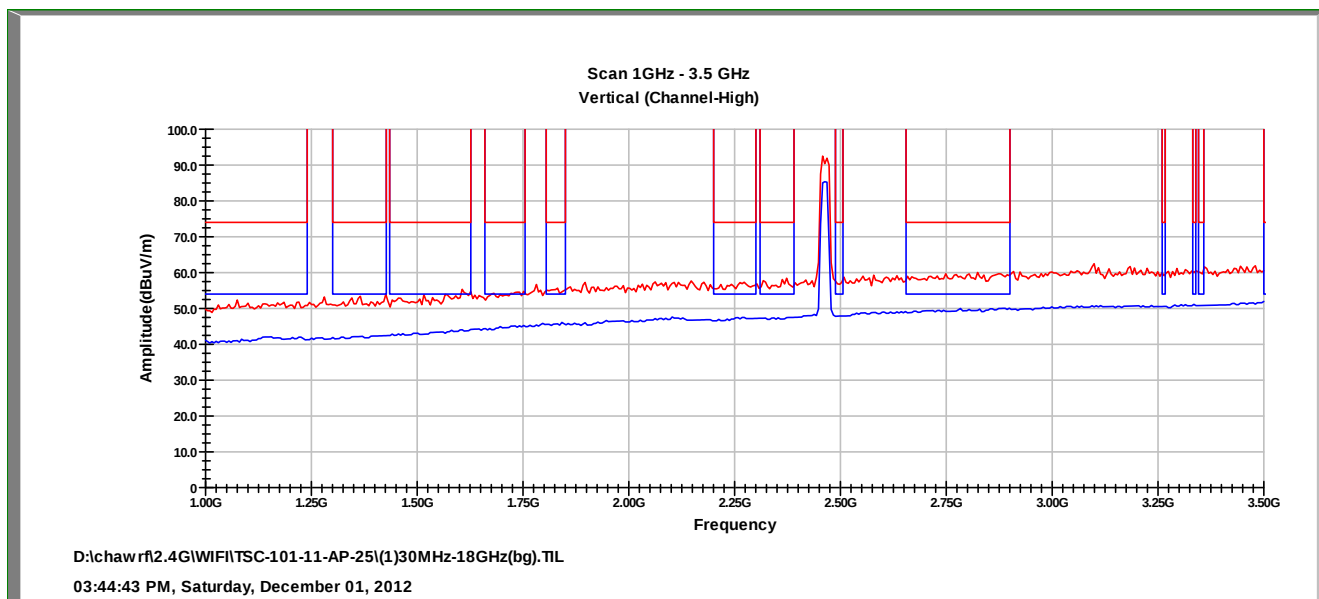
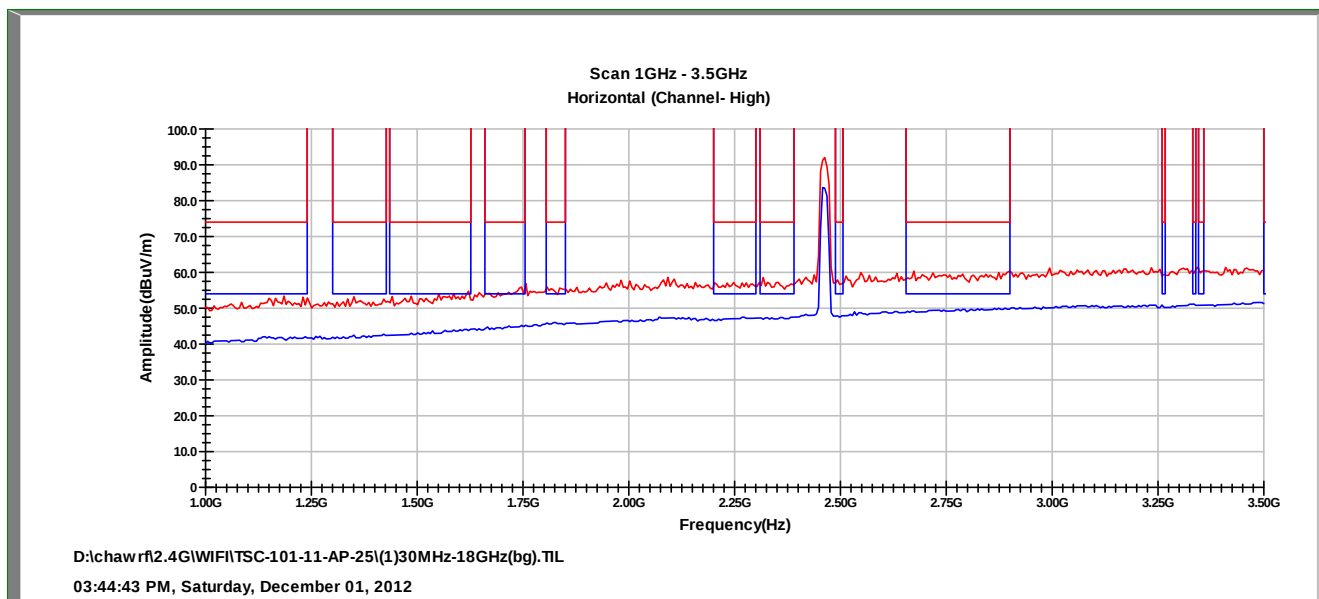




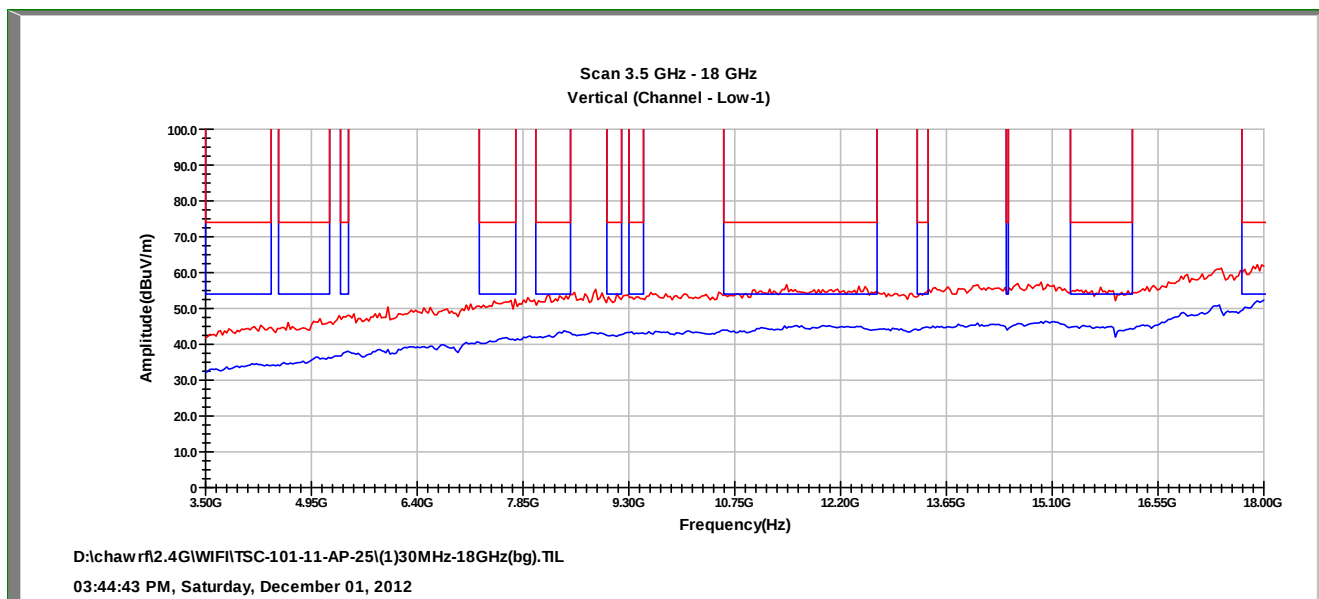
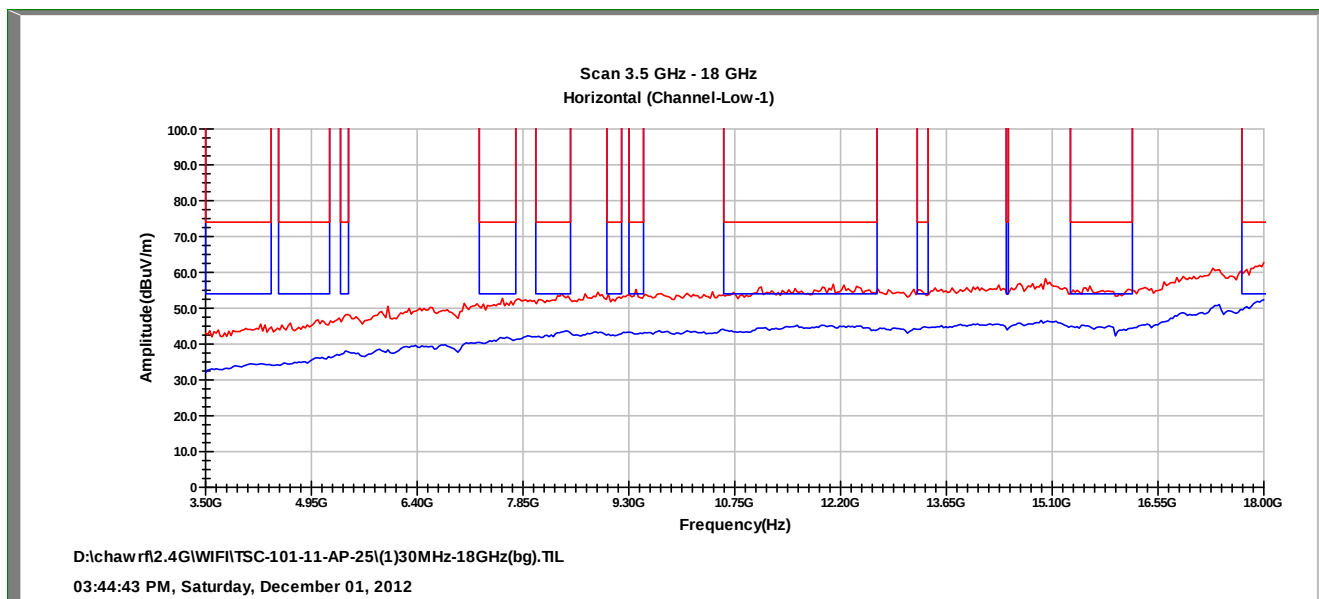
1 ~ 3.5GH radiation (Frequency 2412MHz)



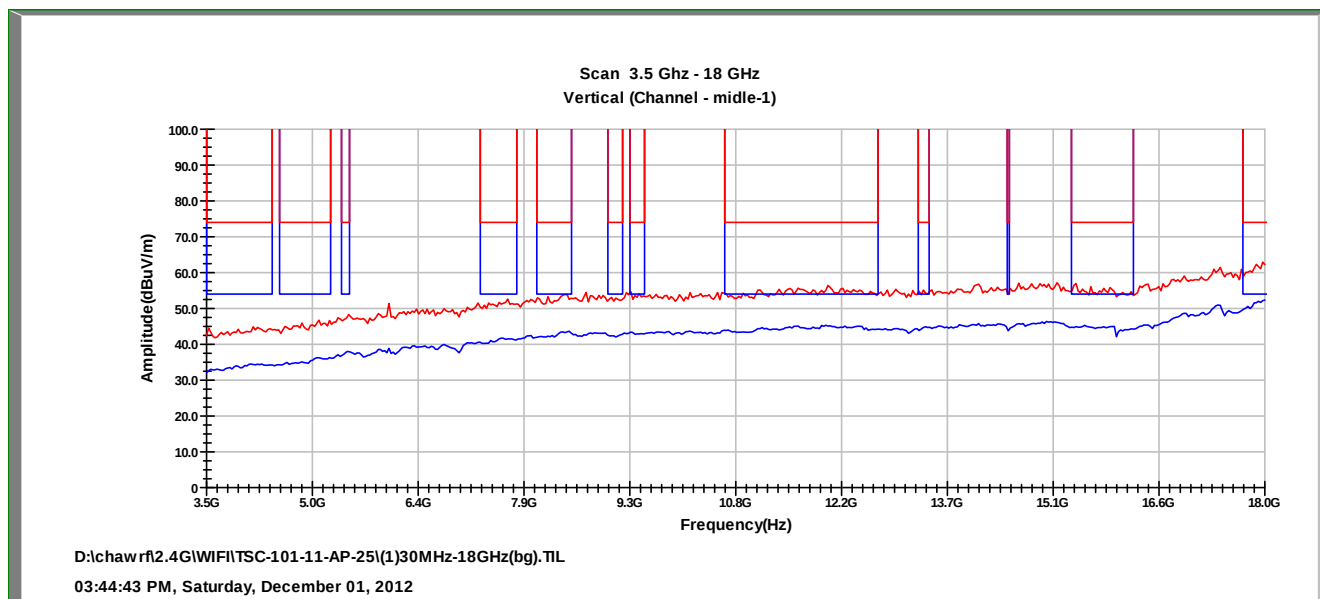
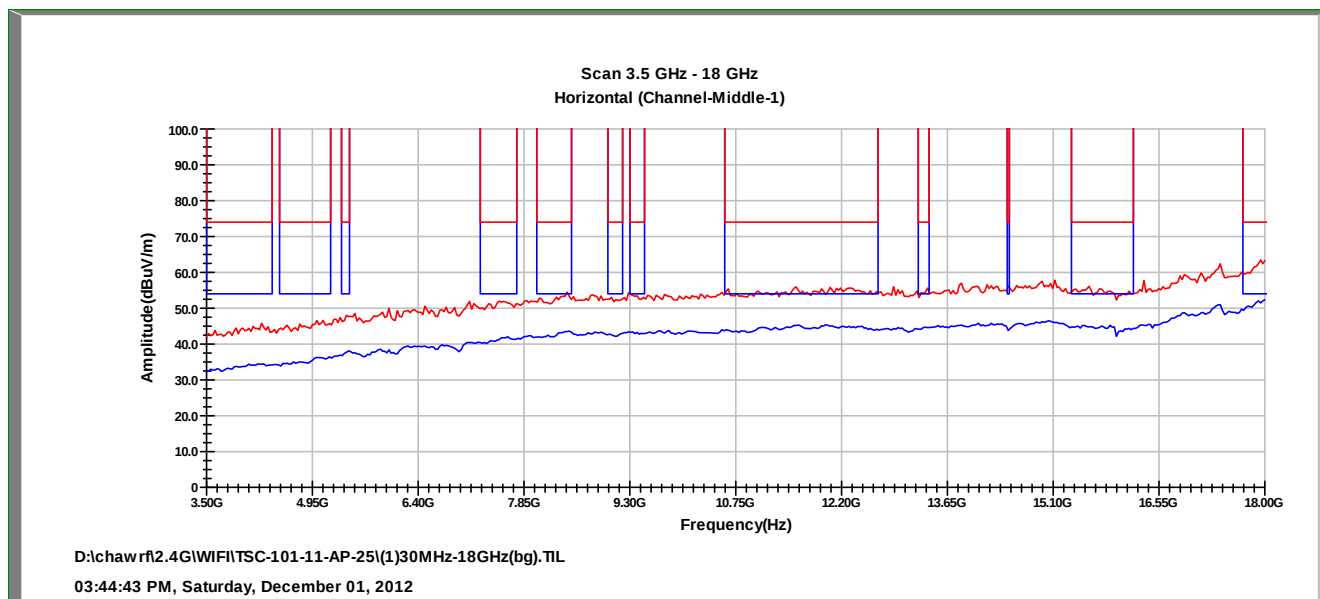
1 ~ 3.5GHz radiation (Frequency 2437MHz)



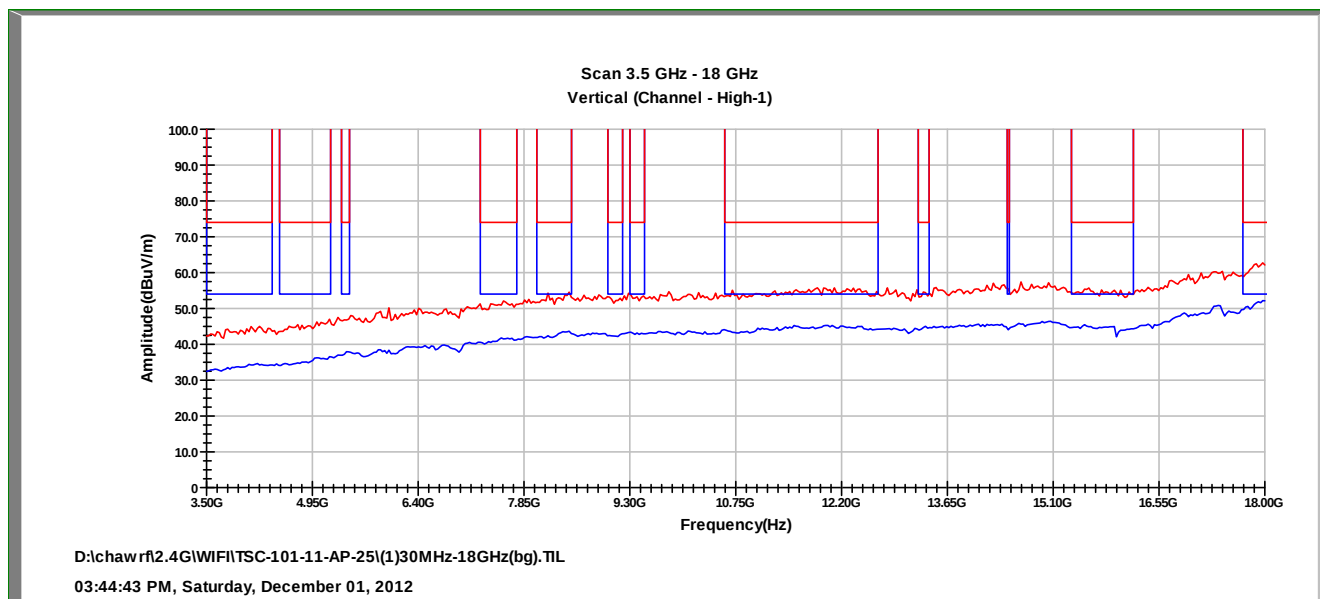
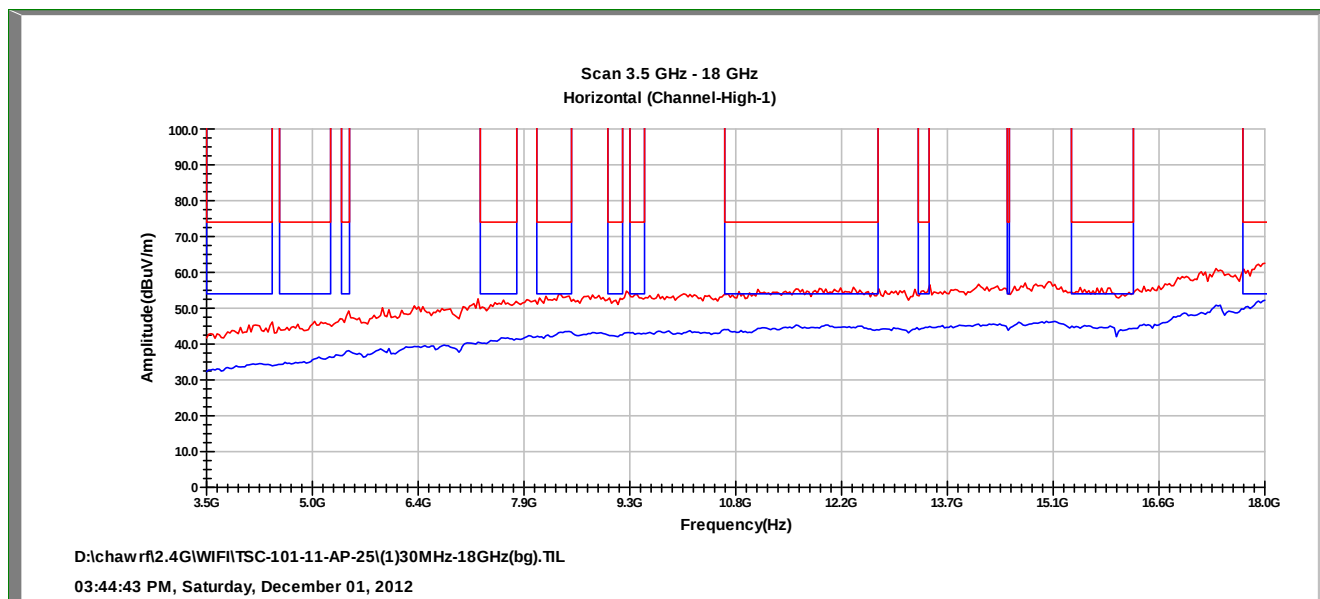
1 ~ 3.5GHz radiation (Frequency 2462MHz)



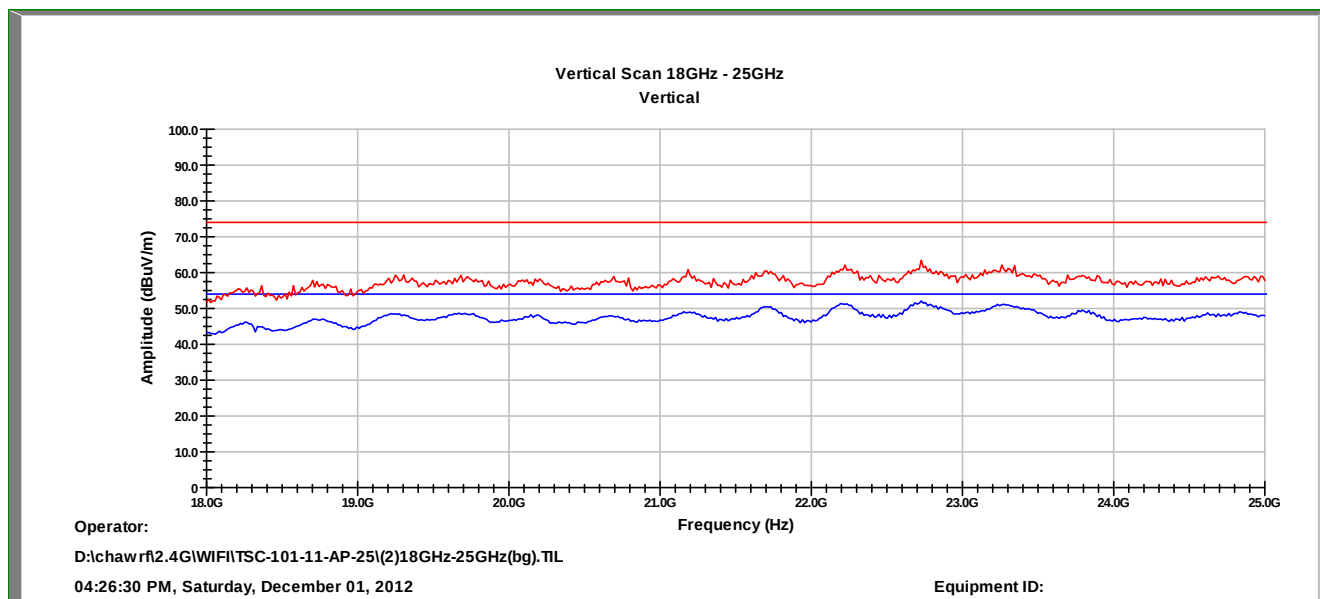
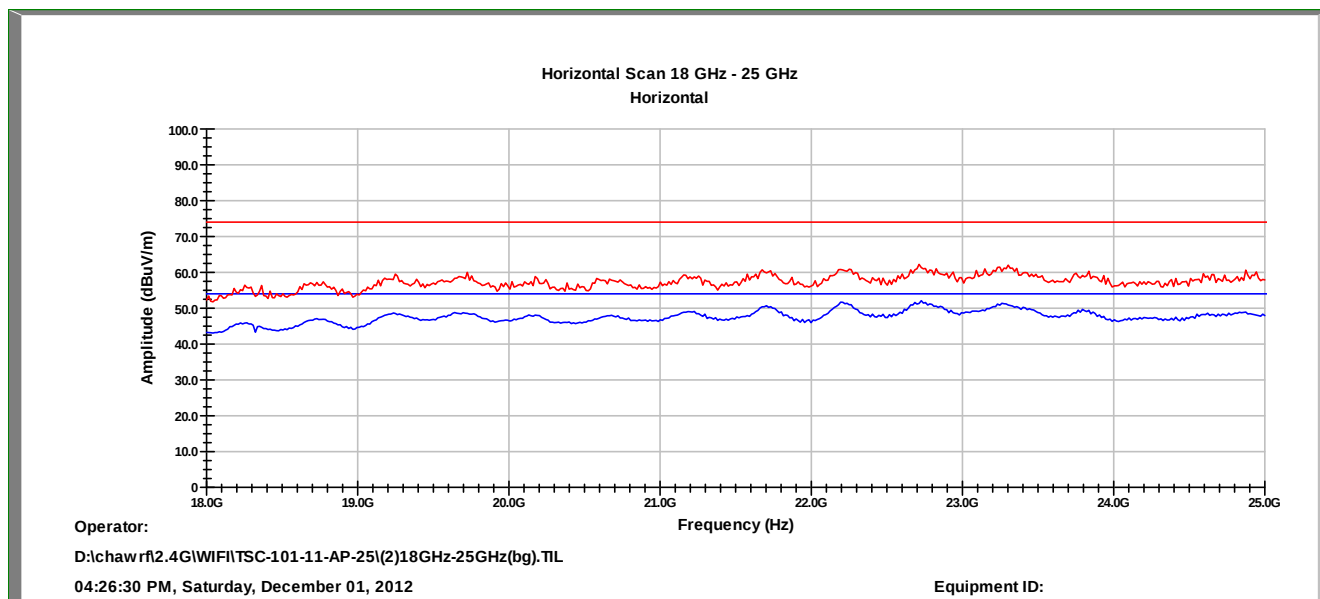
3.5 ~ 18GH radiation (Frequency 2412MHz)



3.5 ~ 18GHz radiation (Frequency 2437MHz)

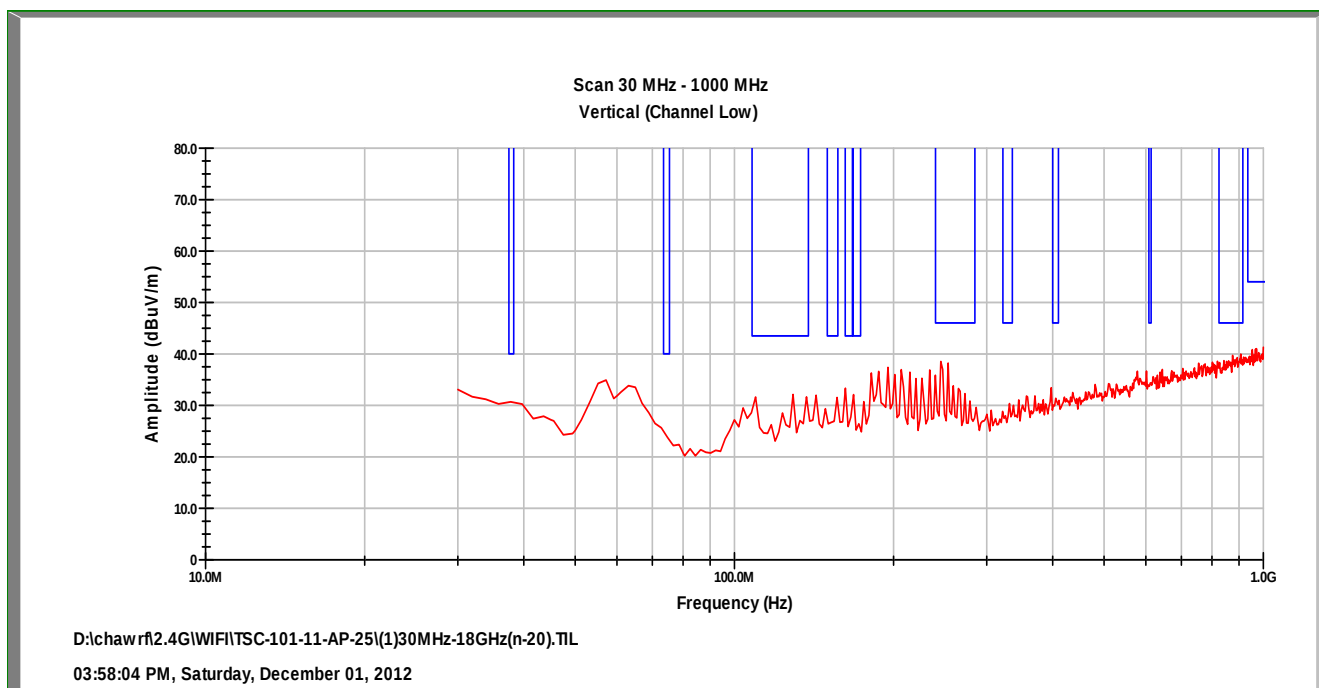
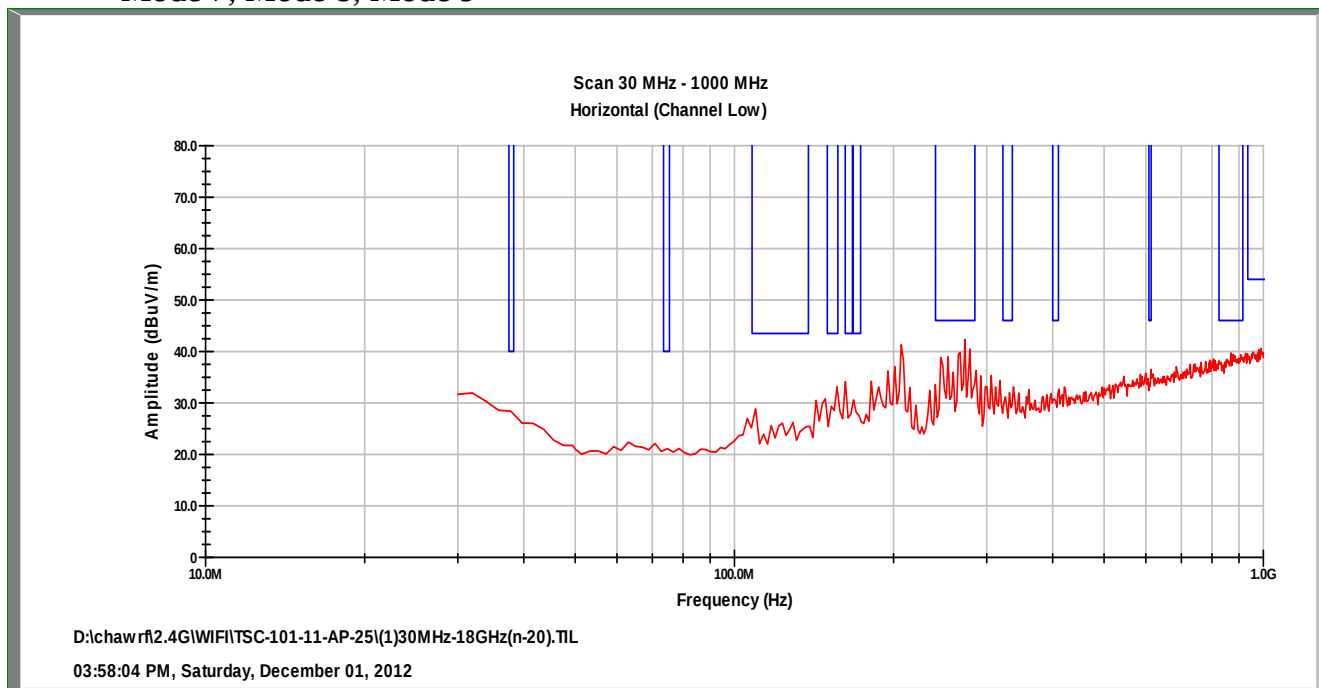


3.5 ~ 18GHz radiation (Frequency 2462MHz)

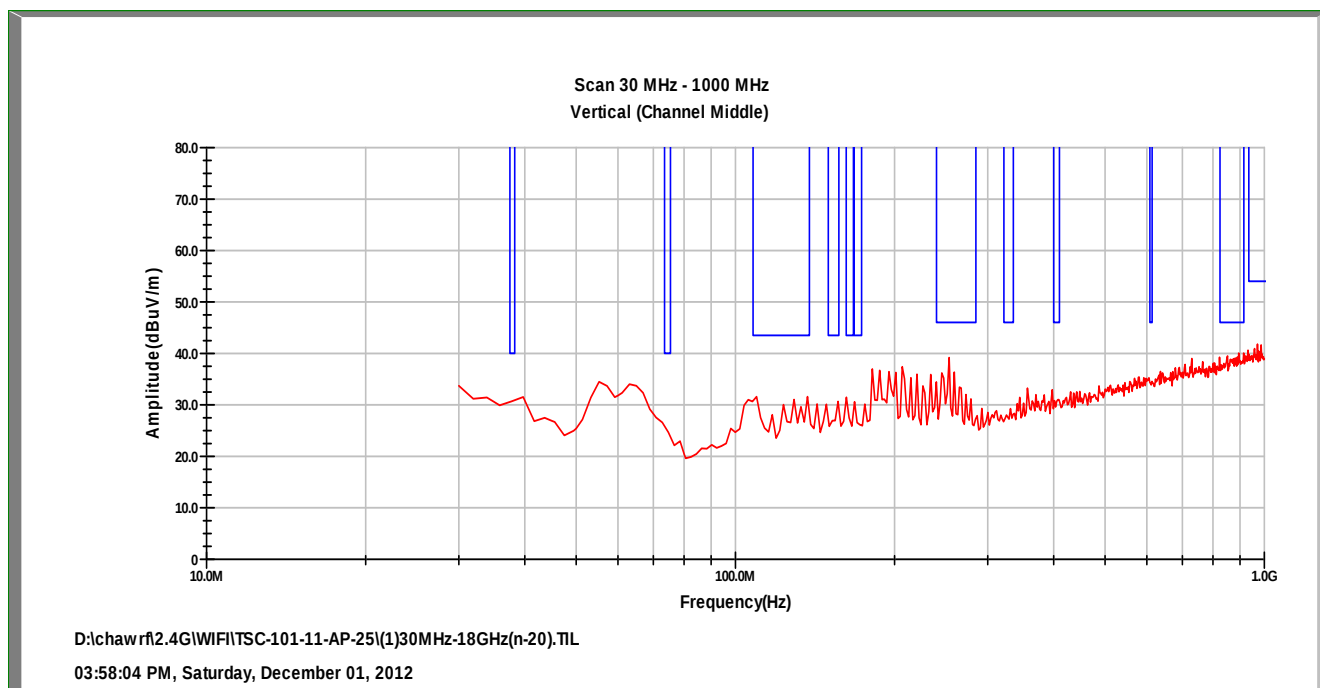
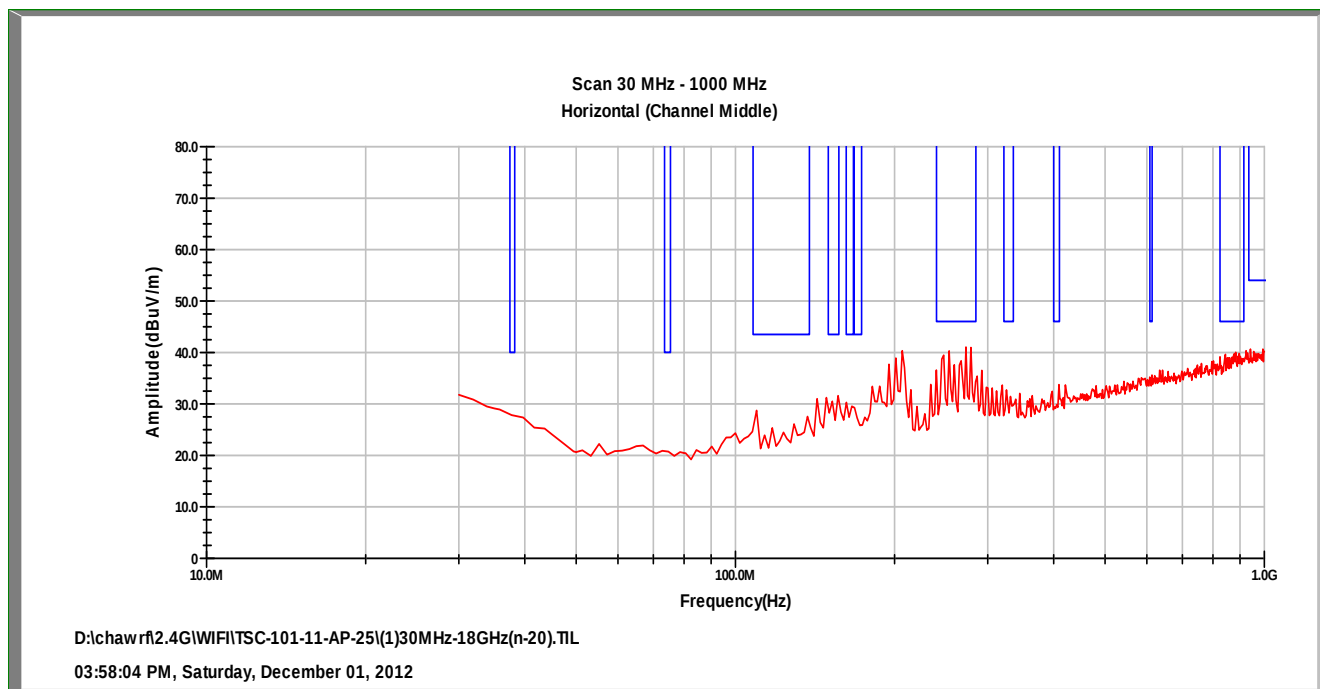


18 ~ 25GHz radiation (Frequency for High、Mid、Low)

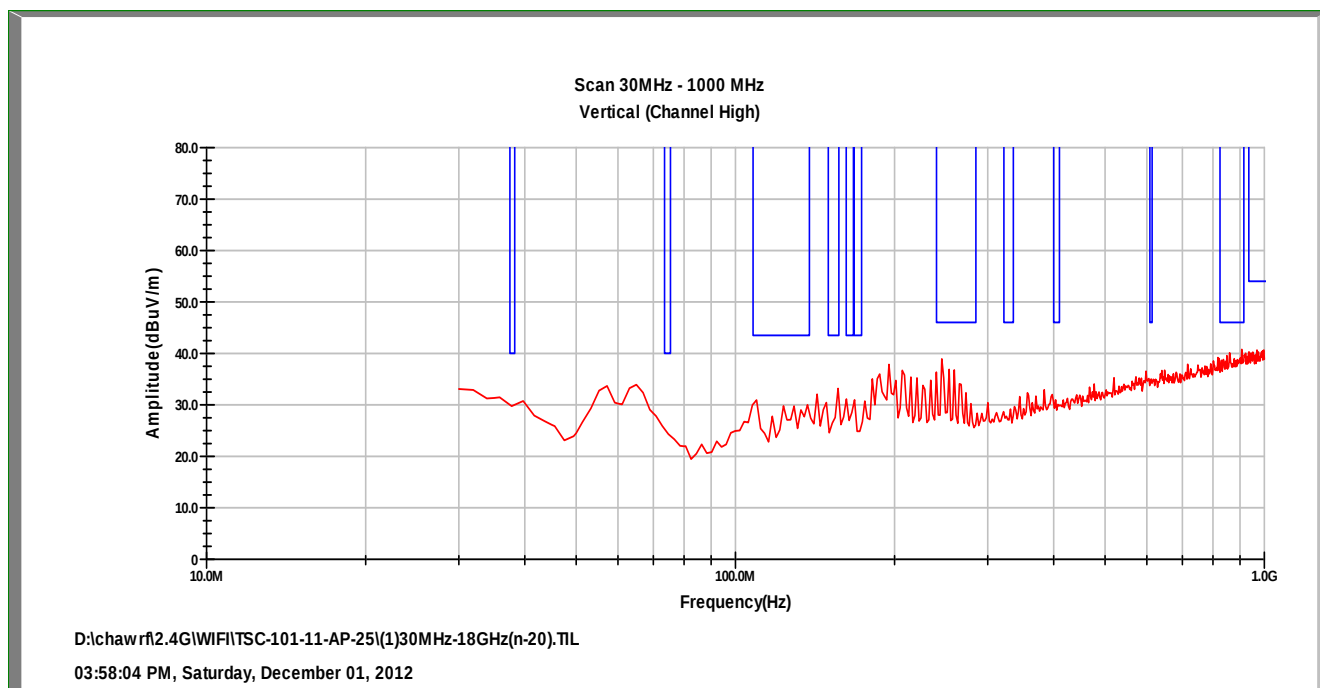
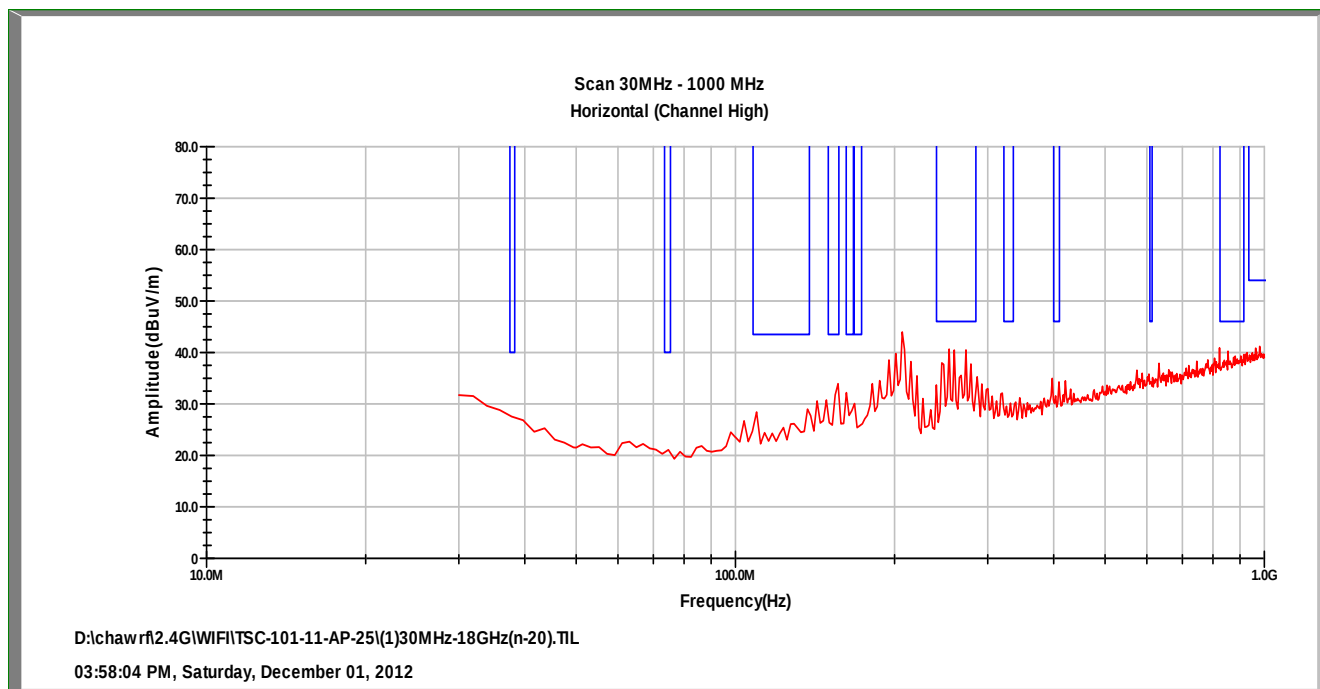
Mode 7, Mode 8, Mode 9



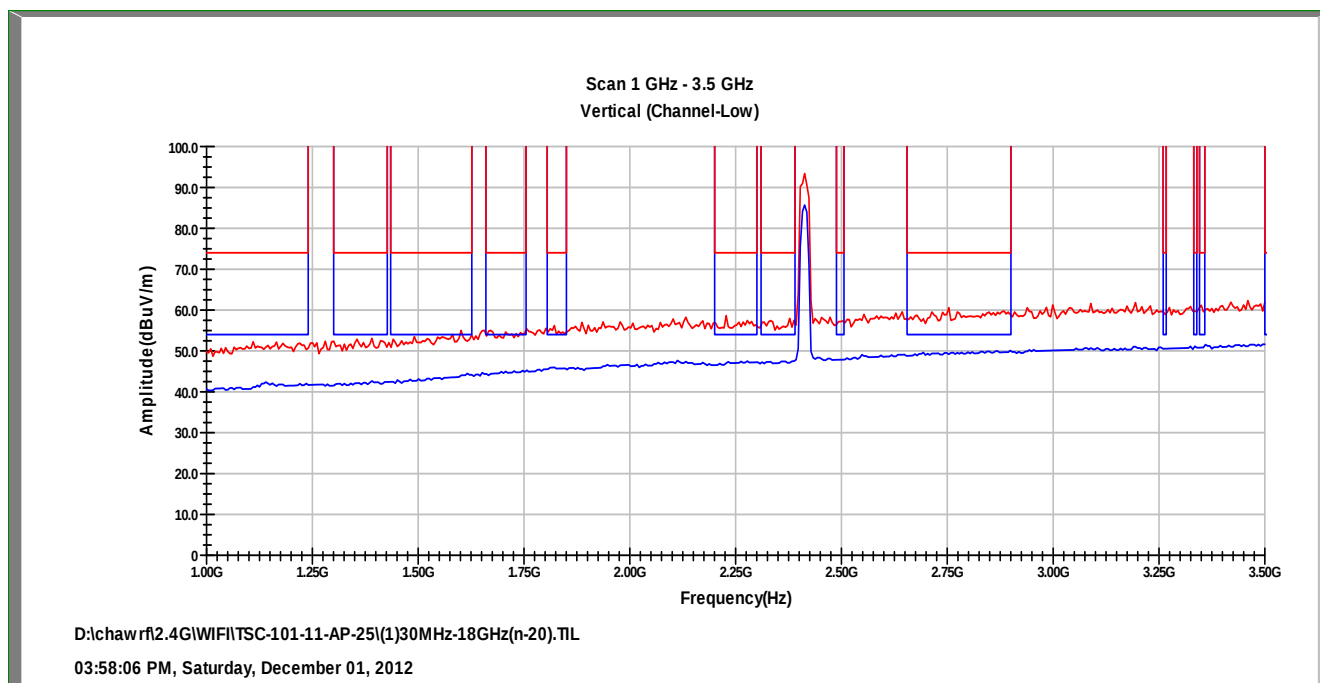
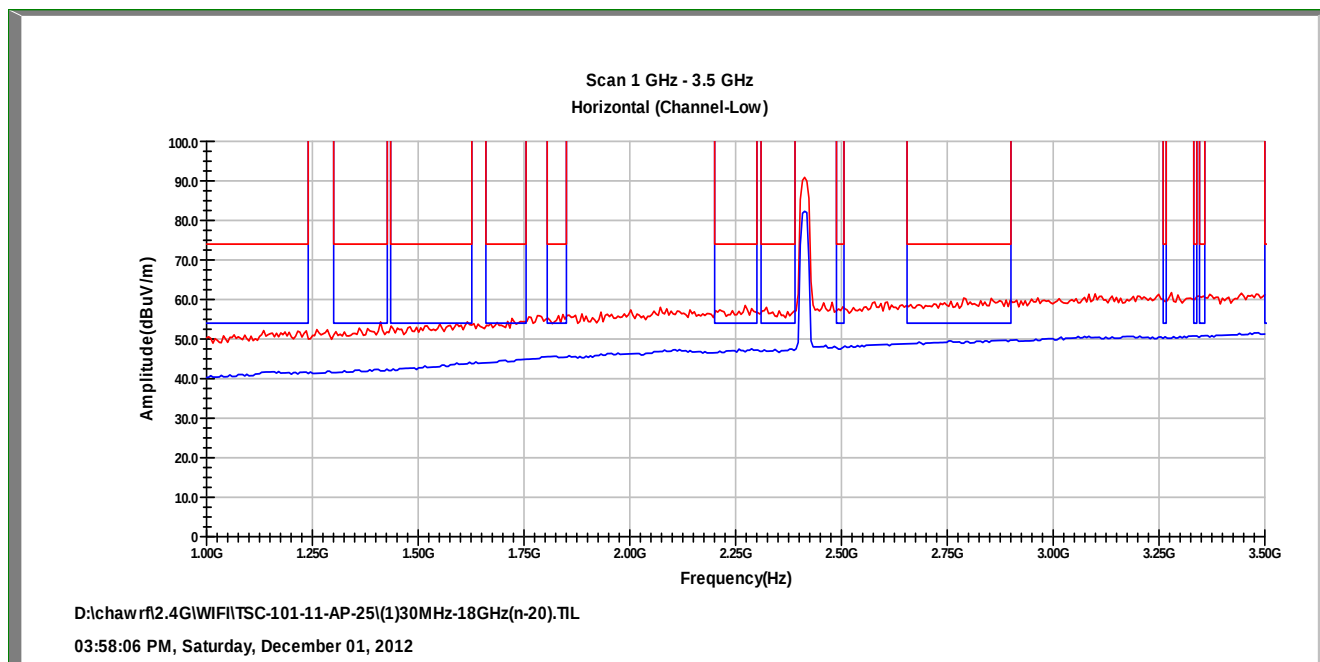
Below 1GHz radiation (Frequency 2412MHz)



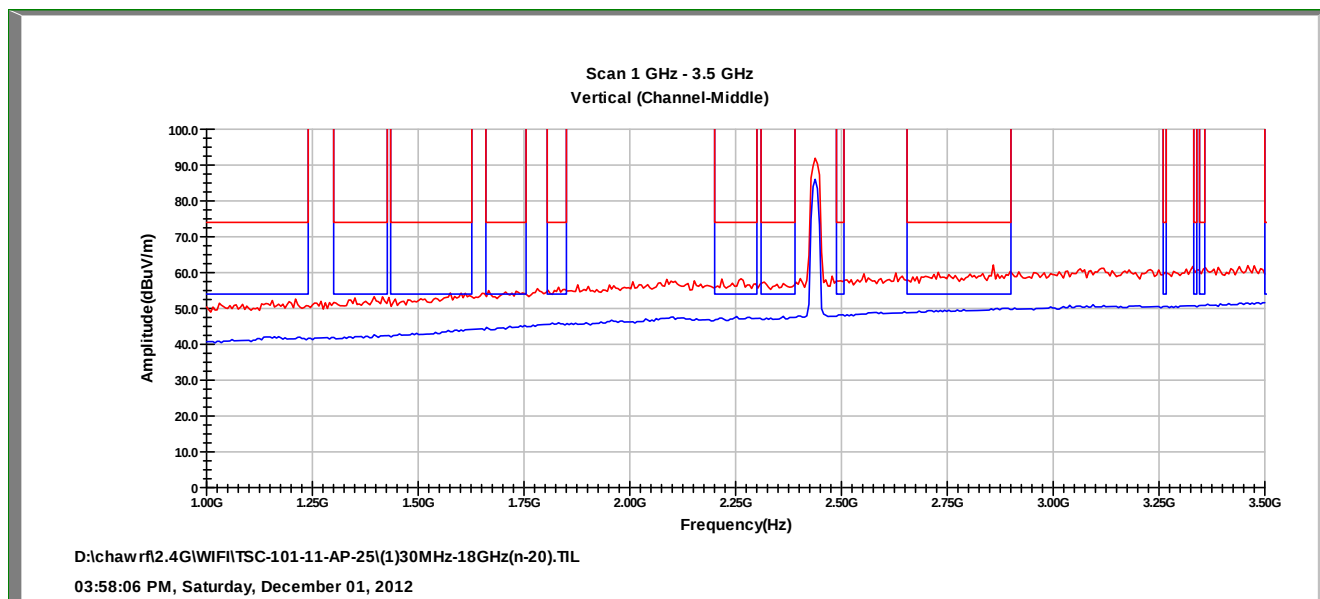
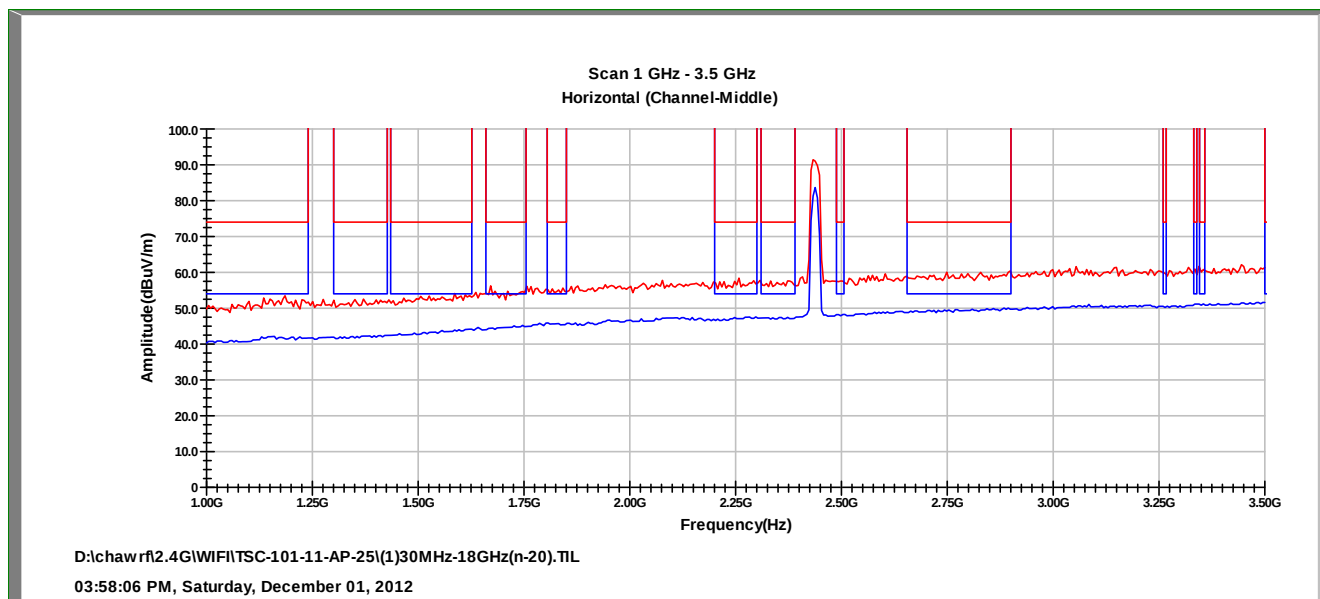
Below 1GHz radiation (Frequency 2437MHz)



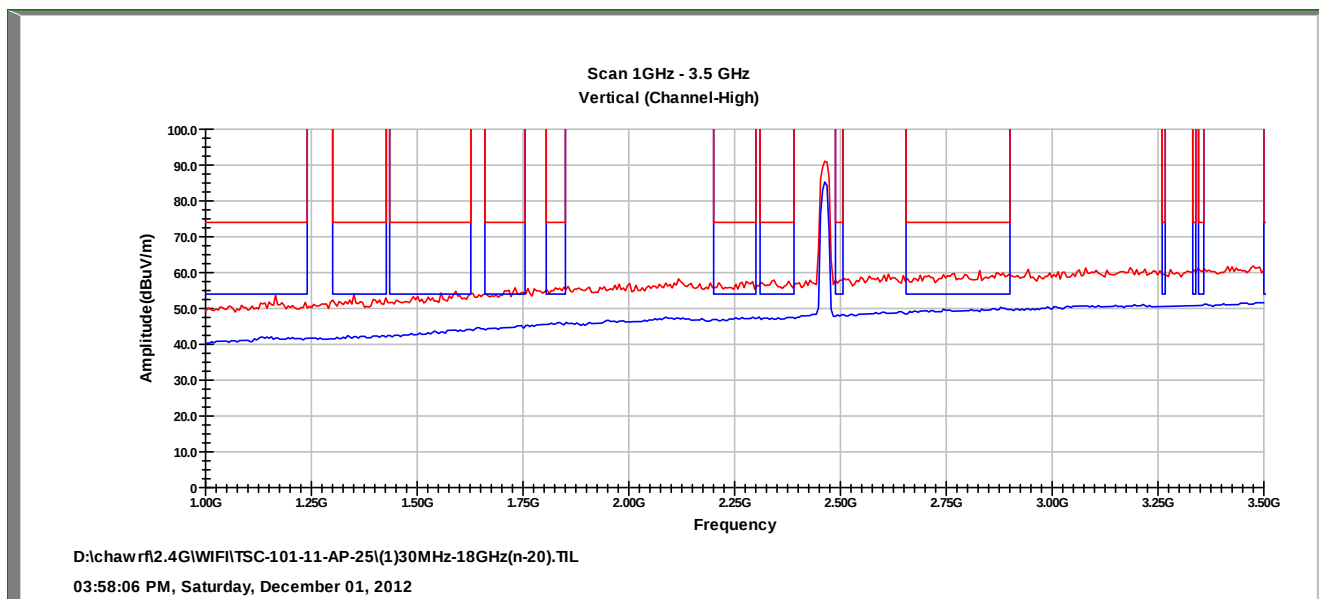
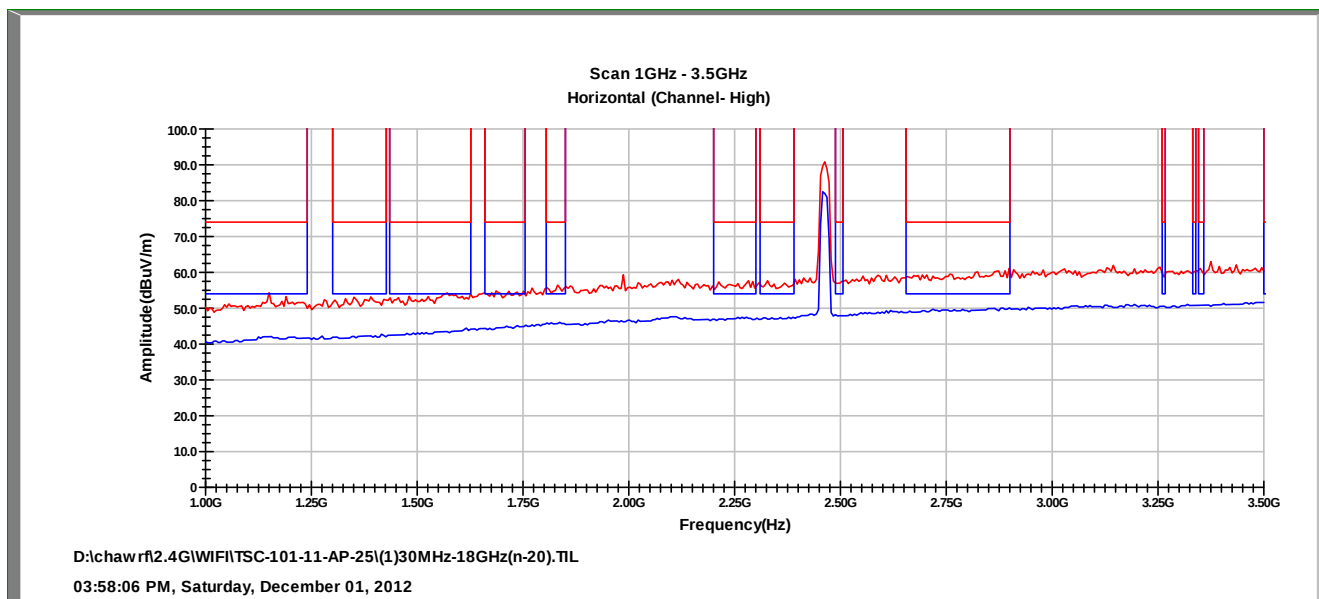
Below 1GHz radiation (Frequency 2462MHz)



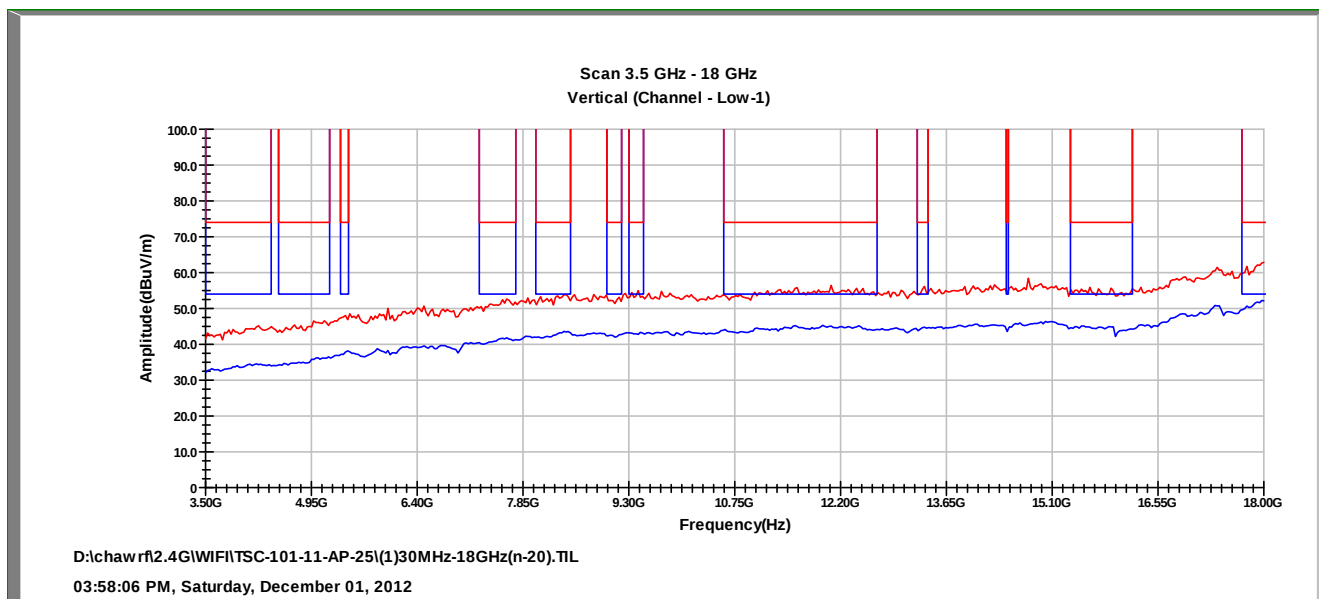
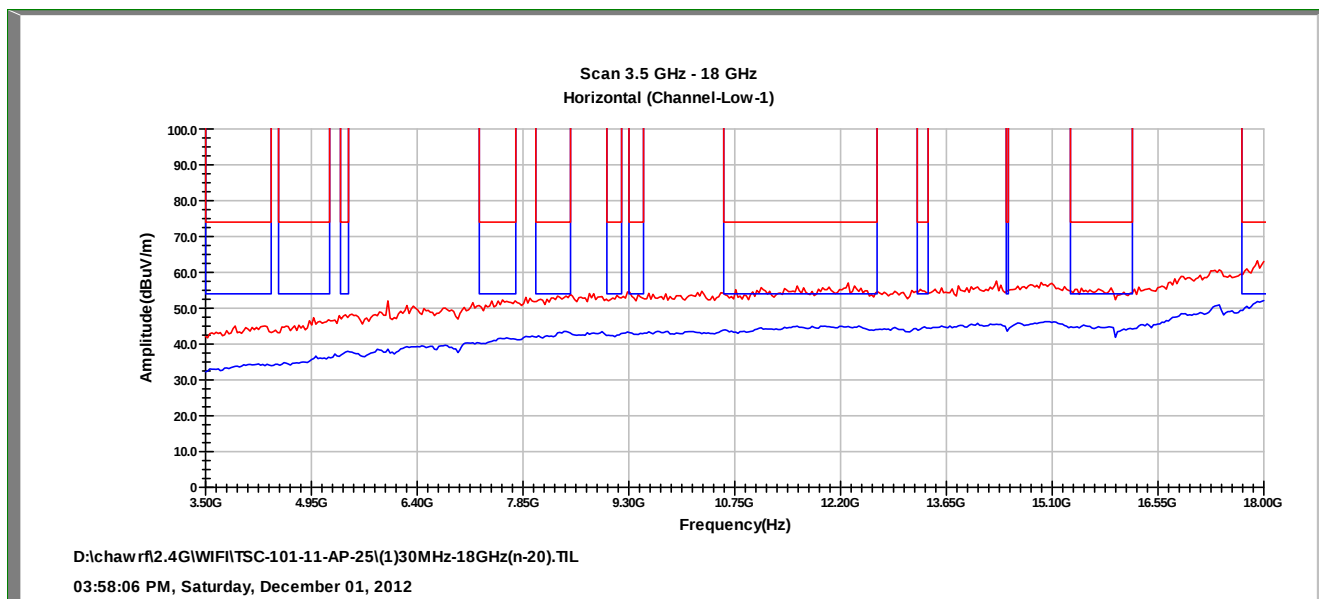
1 ~ 3.5GH radiation (Frequency 2412MHz)



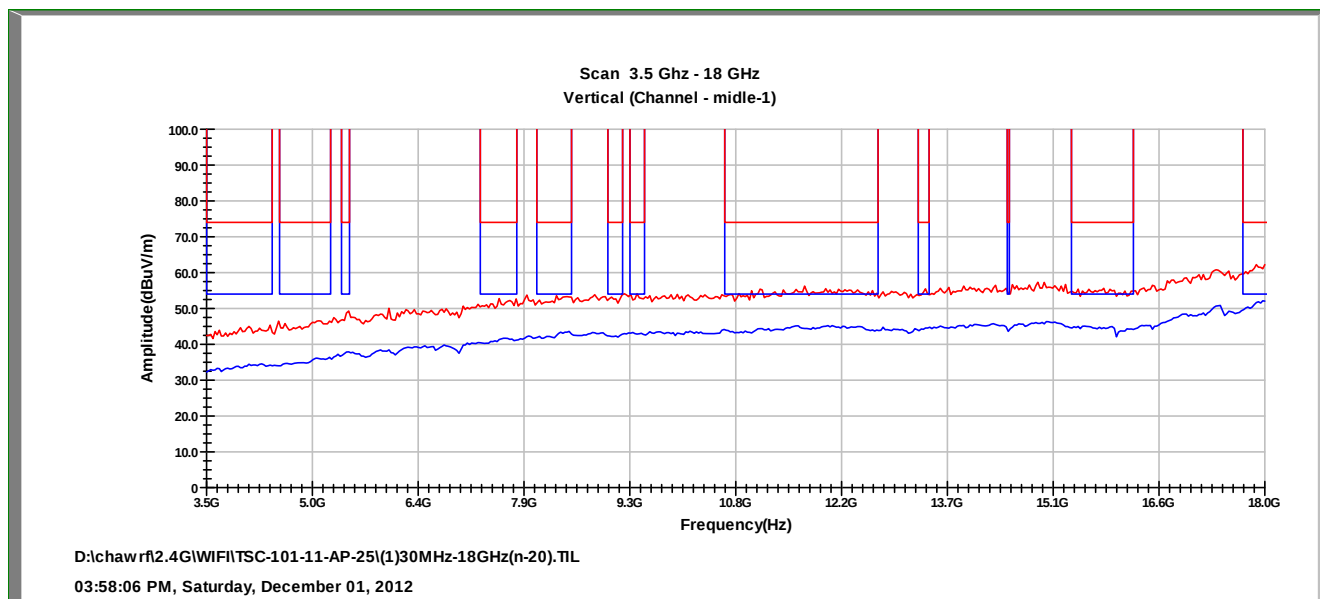
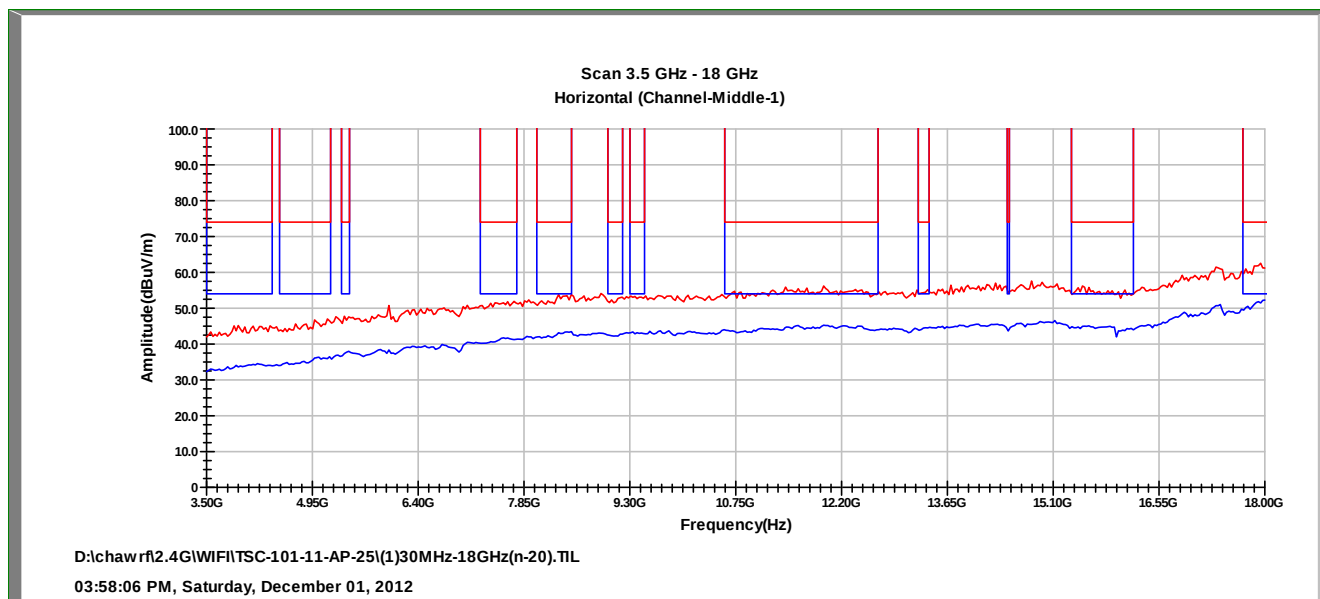
1 ~ 3.5GHz radiation (Frequency 2437MHz)



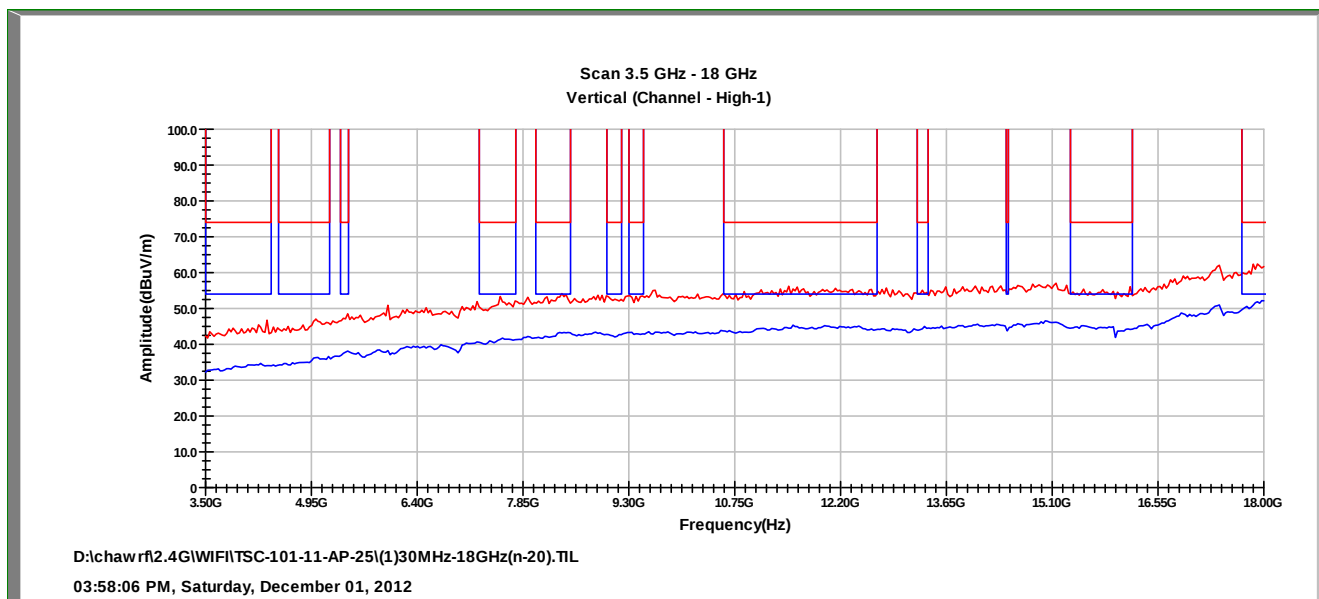
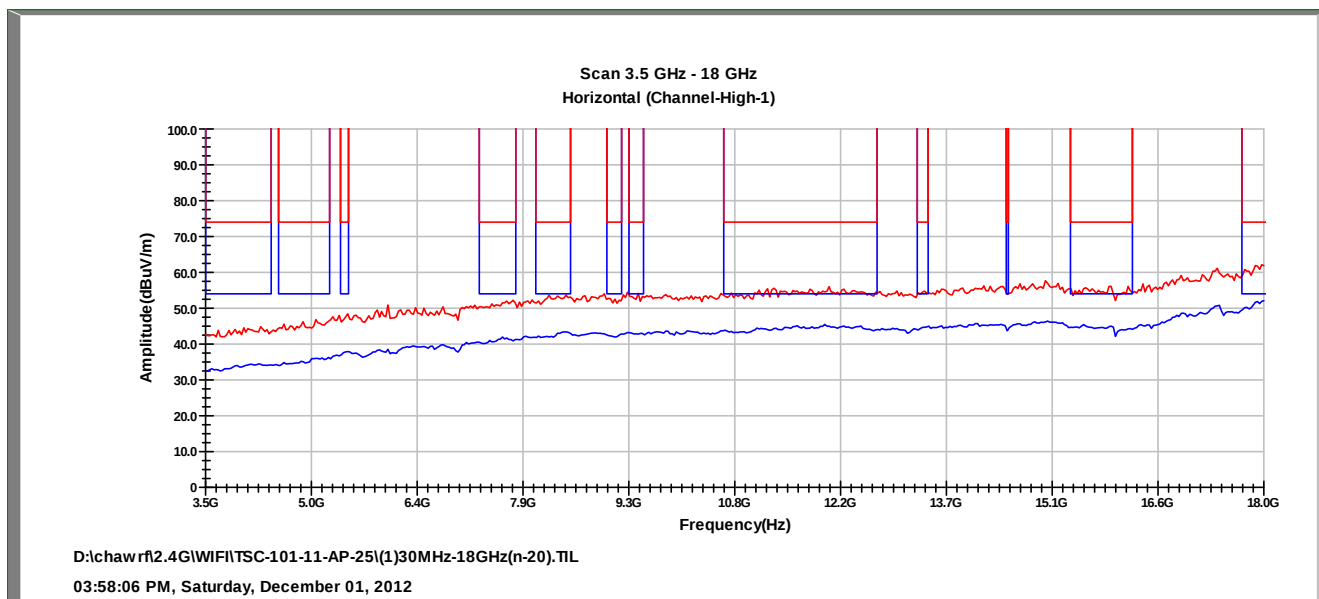
1 ~ 3.5GHz radiation (Frequency 2462MHz)



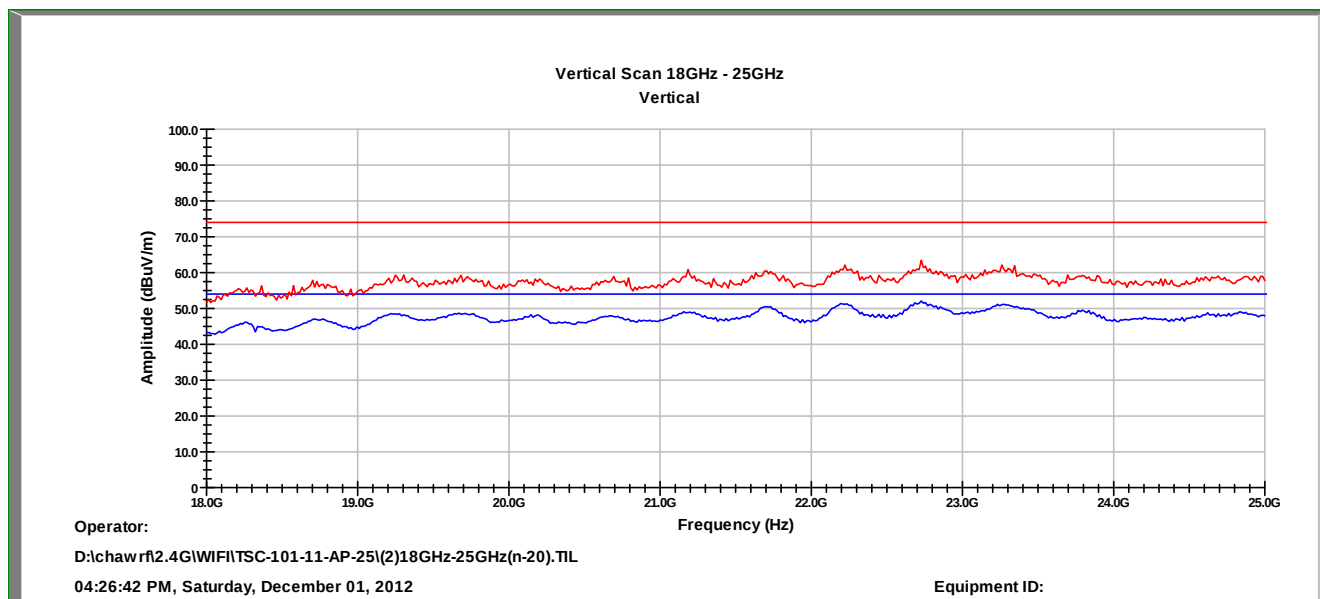
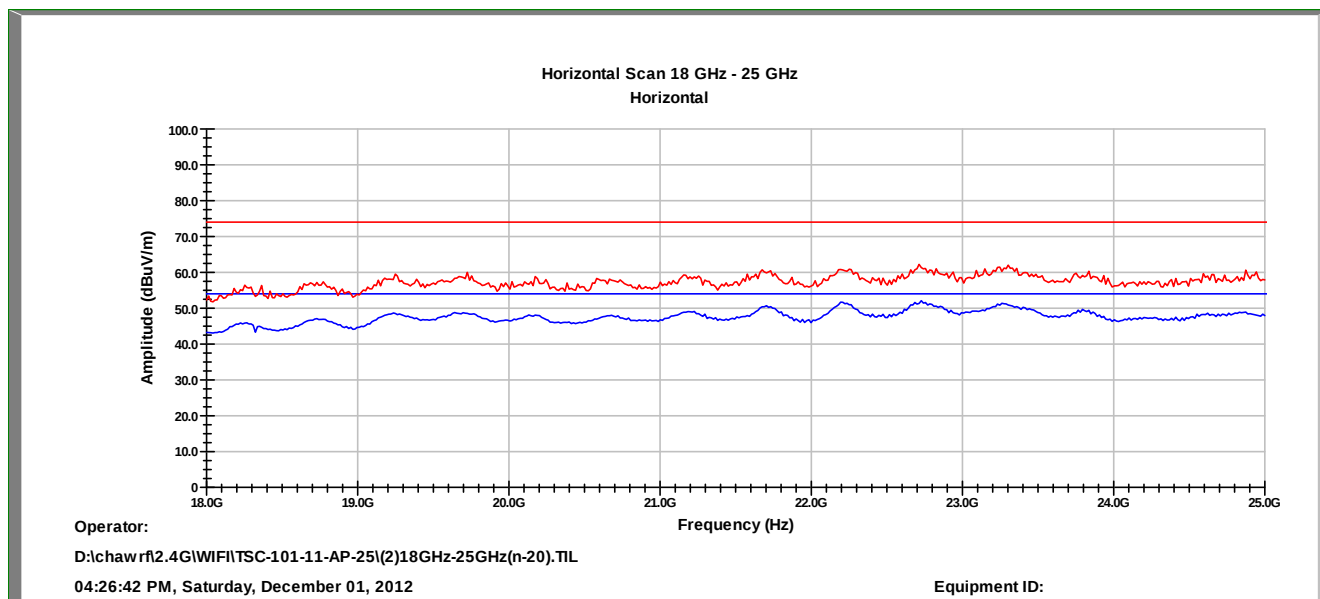
3.5 ~ 18GH radiation (Frequency 2412MHz)



3.5 ~ 18GHz radiation (Frequency 2437MHz)



3.5 ~ 18GHz radiation (Frequency 2462MHz)



18 ~ 25GHz radiation (Frequency for High、Mid、Low)



4.7. Antenna Requirements

4.6.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6 dBi, 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.

4.6.2 Antenna Connected Construction

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

4.6.3 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.

