



7.2.2.2. TEST INSTRUMENTS

Radiated Emission Test Site 966 (2)					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	02/28/2015	02/27/2016
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	02/28/2015	02/27/2016
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2015	03/18/2016
High Noise Amplifier	Agilent	8449B	3008A01838	02/28/2015	02/27/2016
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	02/28/2015	02/27/2016
Bilog Antenna	SCHAFFNER	CBL6143	5082	02/28/2015	02/27/2016
Horn Antenna	SCHWARZBECK	BBHA9120	D286	02/28/2015	02/27/2016
Loop Antenna	COM-POWER	AL-130	121044	09/25/2014	09/24/2015
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/28/2015	02/27/2016
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The FCC Site Registration number is 101879.
3. N.C.R = No Calibration Required.



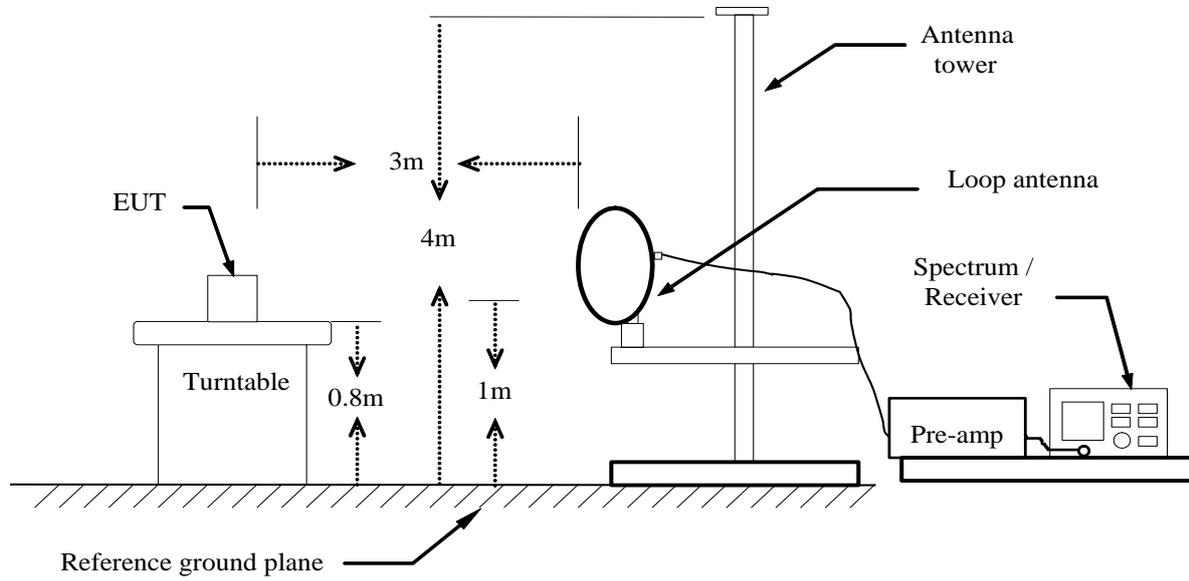
7.2.2.3. TEST PROCEDURE (please refer to measurement standard)

1. The EUT is placed on a turntable, which is 0.8m or 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:
Below 1GHz:
RBW=100kHz / VBW=300kHz / Sweep=AUTO
Above 1GHz:
(a) PEAK: RBW=1MHz,VBW=3MHz / Sweep=AUTO
(b) AVERAGE: RBW=1MHz / VBW=3MHz / Sweep=AUTO / Detector=RMS
7. Repeat above procedures until the measurements for all frequencies
8. are complete.

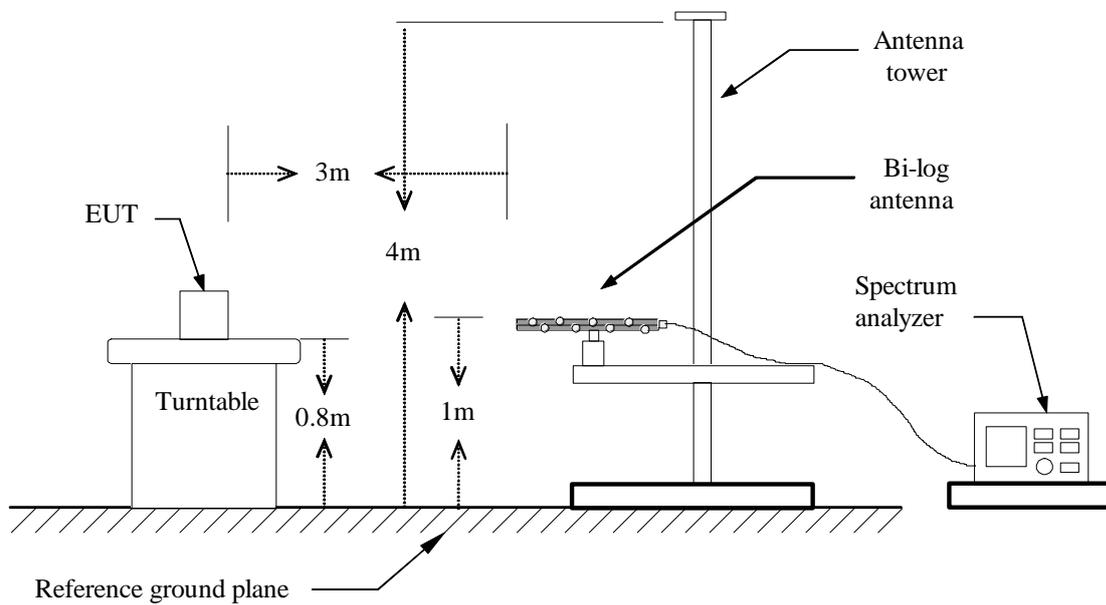


7.2.2.4. TEST SETUP

Below 30MHz

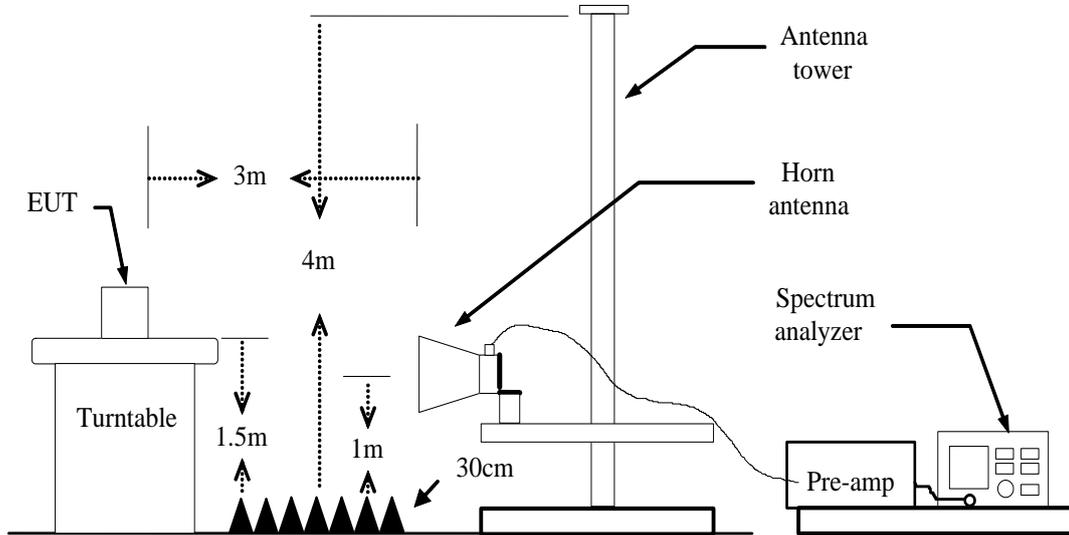


Below 1 GHz





Above 1 GHz



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.



7.2.2.5. DATA SAPLE

Below 1GHz

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXX.XXXX	36.37	-12.20	24.17	40.00	-15.83	V	QP

Frequency (MHz) = Emission frequency in MHz
 Reading (dBuV) = Uncorrected Analyzer / Receiver reading
 Correct Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
 Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
 Limit (dBuV/m) = Limit stated in standard
 Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
 Q.P. = Quasi-peak Reading

Above 1GHz

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXXX.XXXX	62.09	-11.42	50.67	74.00	-23.33	V	Peak
XXXX.XXXX	49.78	-11.42	38.36	54.00	-15.64	V	AVG

Frequency (MHz) = Emission frequency in MHz
 Reading (dBuV) = Uncorrected Analyzer / Receiver reading
 Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
 Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
 Limit (dBuV/m) = Limit stated in standard
 Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
 Peak = Peak Reading
 AVG = Average Reading

Calculation Formula

Margin (dB) = Result (dBuV/m) – Limits (dBuV/m)
 Result (dBuV/m) = Reading (dBuV) + Correction Factor

**7.2.2.6. TEST RESULTS****Below 1 GHz****Test Mode:** TX**Tested by:** Sun Guo**Ambient temperature:** 24°C**Relative humidity:** 52% RH**Date:** June 5, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
199.7500	44.76	-22.73	22.03	43.50	-21.47	V	QP
337.4900	40.83	-18.21	22.62	46.00	-23.38	V	QP
418.9700	38.70	-15.44	23.26	46.00	-22.74	V	QP
600.3600	32.54	-12.86	19.68	46.00	-26.32	V	QP
664.3800	32.38	-12.27	20.11	46.00	-25.89	V	QP
818.6100	34.35	-10.45	23.90	46.00	-22.10	V	QP
198.7800	48.14	-22.75	25.39	43.50	-18.11	H	QP
321.9700	39.87	-18.83	21.04	46.00	-24.96	H	QP
431.5800	41.72	-15.60	26.12	46.00	-19.88	H	QP
598.4200	33.50	-12.90	20.60	46.00	-25.40	H	QP
666.3200	37.57	-12.22	25.35	46.00	-20.65	H	QP
828.3100	33.28	-10.55	22.73	46.00	-23.27	H	QP

****Remark:** No emission found between lowest internal used/generated frequency to 30MHz.

Notes:

- Radiated emissions measured in frequency range from 9kHz to 1GHz were made with an instrument using Quasi-peak detector mode.
- Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- The IF bandwidth of Receiver between 30MHz to 1GHz was 120kHz.
- | | |
|------------------------|--|
| Frequency (MHz). | = Emission frequency in MHz |
| Reading (dBuV/m) | = Receiver reading |
| Correction Factor (dB) | = Antenna factor + Cable loss – Amplifier gain |
| Limit (dBuV/m) | = Limit stated in standard |
| Margin (dB) | = Measured (dBuV/m) – Limits (dBuV/m) |
| Antenna Pole (H/V) | = Current carrying line of reading |

**Above 1 GHz****Antenna 1****Test Mode:** TX / IEEE 802.11b(CH Low)**Tested by:** Sun Guo**Ambient temperature:** 24°C **Relative humidity:** 52% RH**Date:** July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2557.000	45.17	-2.16	43.01	74.00	-30.99	V	peak
4150.000	41.62	2.12	43.74	74.00	-30.26	V	peak
5032.000	40.10	5.04	45.14	74.00	-28.86	V	peak
5977.000	40.24	6.07	46.31	74.00	-27.69	V	peak
6715.000	40.26	7.24	47.50	74.00	-26.50	V	peak
7588.000	40.17	8.85	49.02	74.00	-24.98	V	peak
2836.000	44.57	-1.66	42.91	74.00	-31.09	H	Peak
4150.000	42.22	2.12	44.34	74.00	-29.66	H	Peak
4825.000	50.18	4.41	54.59	74.00	-19.41	H	Peak
4825.000	46.84	4.41	51.25	54.00	-2.75	H	AVG
5743.000	40.37	5.97	46.34	74.00	-27.66	H	peak
6256.000	40.87	6.49	47.36	74.00	-26.64	H	peak
7768.000	41.04	9.20	50.24	74.00	-23.76	H	peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Test Mode: TX / IEEE 802.11b (CH Mid)

Tested by: Sun Guo

Ambient temperature: 24°C Relative humidity: 52% RH

Date: July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2818.000	44.45	-1.69	42.76	74.00	-31.24	V	Peak
3322.000	42.87	-0.82	42.05	74.00	-31.95	V	Peak
4150.000	41.21	2.12	43.33	74.00	-30.67	V	Peak
4942.000	40.95	4.79	45.74	74.00	-28.26	V	Peak
6139.000	40.51	6.31	46.82	74.00	-27.18	V	Peak
6949.000	40.52	7.62	48.14	74.00	-25.86	V	Peak
2593.000	44.55	-2.09	42.46	74.00	-31.54	H	Peak
4159.000	41.54	2.15	43.69	74.00	-30.31	H	Peak
4870.000	45.24	4.56	49.80	74.00	-24.20	H	Peak
5536.000	39.79	5.89	45.68	74.00	-28.32	H	Peak
6067.000	40.02	6.19	46.21	74.00	-27.79	H	Peak
7012.000	40.25	7.72	47.97	74.00	-26.03	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Test Mode: TX / IEEE 802.11b (CH High)

Tested by: Sun Guo

Ambient temperature: 24°C Relative humidity: 52% RH

Date: July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2854.000	44.59	-1.62	42.97	74.00	-31.03	V	Peak
3331.000	43.29	-0.80	42.49	74.00	-31.51	V	Peak
4852.000	40.86	4.50	45.36	74.00	-28.64	V	Peak
5347.000	40.87	5.60	46.47	74.00	-27.53	V	Peak
5770.000	40.99	5.98	46.97	74.00	-27.03	V	Peak
6463.000	40.21	6.83	47.04	74.00	-26.96	V	Peak
2566.000	44.77	-2.14	42.63	74.00	-31.37	H	Peak
4924.000	45.91	4.73	50.64	74.00	-23.36	H	Peak
5491.000	40.30	5.85	46.15	74.00	-27.85	H	Peak
5986.000	40.21	6.07	46.28	74.00	-27.72	H	Peak
6652.000	41.43	7.14	48.57	74.00	-25.43	H	Peak
7516.000	41.01	8.71	49.72	74.00	-24.28	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Antenna 2**

Test Mode: TX / IEEE 802.11b(CH Low)

Tested by: Sun Guo

Ambient temperature: 24°C Relative humidity: 52% RH

Date: July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2566.000	44.76	-2.14	42.62	74.00	-31.38	V	peak
3322.000	43.26	-0.82	42.44	74.00	-31.56	V	peak
4366.000	41.48	2.88	44.36	74.00	-29.64	V	peak
5320.000	40.45	5.55	46.00	74.00	-28.00	V	peak
5833.000	40.74	6.01	46.75	74.00	-27.25	V	peak
6688.000	39.57	7.19	46.76	74.00	-27.24	V	peak
1999.000	46.83	-5.01	41.82	74.00	-32.18	H	Peak
2575.000	44.81	-2.12	42.69	74.00	-31.31	H	Peak
4024.000	40.86	1.67	42.53	74.00	-31.47	H	Peak
4825.000	47.68	4.41	52.09	74.00	-21.91	H	peak
5761.000	39.62	5.98	45.60	74.00	-28.40	H	peak
6571.000	39.76	7.01	46.77	74.00	-27.23	H	peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Test Mode: TX / IEEE 802.11b (CH Mid)

Tested by: Sun Guo

Ambient temperature: 24°C Relative humidity: 52% RH

Date: July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2557.000	44.42	-2.16	42.26	74.00	-31.74	V	Peak
3655.000	43.44	0.13	43.57	74.00	-30.43	V	Peak
4699.000	40.85	4.00	44.85	74.00	-29.15	V	Peak
5581.000	41.53	5.90	47.43	74.00	-26.57	V	Peak
6004.000	39.98	6.09	46.07	74.00	-27.93	V	Peak
6958.000	40.07	7.63	47.70	74.00	-26.30	V	Peak
2602.000	44.03	-2.08	41.95	74.00	-32.05	H	Peak
4060.000	41.55	1.80	43.35	74.00	-30.65	H	Peak
4870.000	45.72	4.56	50.28	74.00	-23.72	H	Peak
6265.000	40.61	6.51	47.12	74.00	-26.88	H	Peak
6994.000	39.95	7.69	47.64	74.00	-26.36	H	Peak
7678.000	40.07	9.02	49.09	74.00	-24.91	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Test Mode: TX / IEEE 802.11b (CH High)

Tested by: Sun Guo

Ambient temperature: 24°C Relative humidity: 52% RH

Date: July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2566.000	44.71	-2.14	42.57	74.00	-31.43	V	Peak
4213.000	42.30	2.34	44.64	74.00	-29.36	V	Peak
4879.000	40.83	4.59	45.42	74.00	-28.58	V	Peak
5356.000	40.58	5.61	46.19	74.00	-27.81	V	Peak
6490.000	39.34	6.87	46.21	74.00	-27.79	V	Peak
7084.000	39.92	7.86	47.78	74.00	-26.22	V	Peak
1999.000	47.15	-5.01	42.14	74.00	-31.86	H	Peak
2773.000	45.15	-1.77	43.38	74.00	-30.62	H	Peak
4924.000	46.48	4.73	51.21	74.00	-22.79	H	Peak
5482.000	40.20	5.84	46.04	74.00	-27.96	H	Peak
6310.000	41.16	6.58	47.74	74.00	-26.26	H	Peak
6922.000	40.73	7.57	48.30	74.00	-25.70	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Antenna 1**

Test Mode: TX / IEEE 802.11g(CH Low)

Tested by: Sun Guo

Ambient temperature: 24°C Relative humidity: 52% RH

Date: July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1504.000	49.62	-6.87	42.75	74.00	-31.25	V	Peak
2512.000	44.51	-2.24	42.27	74.00	-31.73	V	Peak
3331.000	43.01	-0.80	42.21	74.00	-31.79	V	Peak
4447.000	42.11	3.16	45.27	74.00	-28.73	V	Peak
5581.000	40.14	5.90	46.04	74.00	-27.96	V	Peak
7579.000	39.63	8.83	48.46	74.00	-25.54	V	Peak
1999.000	46.99	-5.01	41.98	74.00	-32.02	H	Peak
4015.000	41.43	1.64	43.07	74.00	-30.93	H	Peak
4825.000	44.27	4.41	48.68	74.00	-25.32	H	Peak
5572.000	39.99	5.90	45.89	74.00	-28.11	H	Peak
6697.000	39.75	7.21	46.96	74.00	-27.04	H	Peak
7930.000	39.54	9.51	49.05	74.00	-24.95	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Test Mode: TX / IEEE 802.11g (CH Mid)

Tested by: Sun Guo

Ambient temperature: 24°C Relative humidity: 52% RH

Date: July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1495.000	47.59	-6.89	40.70	74.00	-33.30	V	Peak
2557.000	45.33	-2.16	43.17	74.00	-30.83	V	Peak
3655.000	42.49	0.13	42.62	74.00	-31.38	V	Peak
4879.000	40.72	4.59	45.31	74.00	-28.69	V	Peak
5437.000	40.30	5.76	46.06	74.00	-27.94	V	Peak
6904.000	40.74	7.54	48.28	74.00	-25.72	V	Peak
1495.000	48.74	-6.89	41.85	74.00	-32.15	H	Peak
1999.000	46.88	-5.01	41.87	74.00	-32.13	H	Peak
2854.000	44.15	-1.62	42.53	74.00	-31.47	H	Peak
4879.000	41.79	4.59	46.38	74.00	-27.62	H	Peak
6634.000	40.27	7.11	47.38	74.00	-26.62	H	Peak
7129.000	39.74	7.95	47.69	74.00	-26.31	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Test Mode: TX / IEEE 802.11g (CH High)

Tested by: Sun Guo

Ambient temperature: 24°C Relative humidity: 52% RH

Date: July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1495.000	48.39	-6.89	41.50	74.00	-32.50	V	Peak
2539.000	44.66	-2.19	42.47	74.00	-31.53	V	Peak
4222.000	41.85	2.37	44.22	74.00	-29.78	V	Peak
4708.000	41.02	4.03	45.05	74.00	-28.95	V	Peak
5887.000	40.46	6.03	46.49	74.00	-27.51	V	Peak
7201.000	40.14	8.09	48.23	74.00	-25.77	V	Peak
1162.000	49.41	-7.94	41.47	74.00	-32.53	H	Peak
1765.000	48.93	-6.35	42.58	74.00	-31.42	H	Peak
2575.000	44.59	-2.12	42.47	74.00	-31.53	H	Peak
4924.000	42.20	4.73	46.93	74.00	-27.07	H	Peak
5761.000	40.28	5.98	46.26	74.00	-27.74	H	Peak
6337.000	40.99	6.63	47.62	74.00	-26.38	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Antenna 2**

Test Mode: TX / IEEE 802.11g(CH Low)

Tested by: Sun Guo

Ambient temperature: 24°C Relative humidity: 52% RH

Date: July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1495.000	48.03	-6.89	41.14	74.00	-32.86	V	Peak
2854.000	43.97	-1.62	42.35	74.00	-31.65	V	Peak
3898.000	42.56	1.16	43.72	74.00	-30.28	V	Peak
4924.000	40.92	4.73	45.65	74.00	-28.35	V	Peak
5968.000	40.60	6.07	46.67	74.00	-27.33	V	Peak
7489.000	41.88	8.65	50.53	74.00	-23.47	V	Peak
1504.000	49.09	-6.87	42.22	74.00	-31.78	H	Peak
2548.000	45.32	-2.17	43.15	74.00	-30.85	H	Peak
3376.000	43.19	-0.73	42.46	74.00	-31.54	H	Peak
4825.000	43.51	4.41	47.92	74.00	-26.08	H	Peak
5689.000	39.90	5.95	45.85	74.00	-28.15	H	Peak
7192.000	39.57	8.07	47.64	74.00	-26.36	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Test Mode: TX / IEEE 802.11g (CH Mid)

Tested by: Sun Guo

Ambient temperature: 24°C Relative humidity: 52% RH

Date: July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1432.000	48.10	-7.00	41.10	74.00	-32.90	V	Peak
2620.000	44.80	-2.04	42.76	74.00	-31.24	V	Peak
3655.000	42.84	0.13	42.97	74.00	-31.03	V	Peak
4924.000	40.92	4.73	45.65	74.00	-28.35	V	Peak
5500.000	40.04	5.87	45.91	74.00	-28.09	V	Peak
6787.000	39.63	7.35	46.98	74.00	-27.02	V	Peak
1162.000	49.42	-7.94	41.48	74.00	-32.52	H	Peak
1990.000	46.99	-5.06	41.93	74.00	-32.07	H	Peak
2530.000	46.54	-2.21	44.33	74.00	-29.67	H	Peak
4879.000	42.08	4.59	46.67	74.00	-27.33	H	Peak
7021.000	40.30	7.74	48.04	74.00	-25.96	H	Peak
7543.000	39.95	8.76	48.71	74.00	-25.29	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Test Mode: TX / IEEE 802.11g (CH High)

Tested by: Sun Guo

Ambient temperature: 24°C Relative humidity: 52% RH

Date: July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1495.000	48.15	-6.89	41.26	74.00	-32.74	V	Peak
2566.000	45.69	-2.14	43.55	74.00	-30.45	V	Peak
2863.000	44.77	-1.61	43.16	74.00	-30.84	V	Peak
4537.000	40.96	3.47	44.43	74.00	-29.57	V	Peak
5437.000	41.26	5.76	47.02	74.00	-26.98	V	Peak
6904.000	40.99	7.54	48.53	74.00	-25.47	V	Peak
1162.000	48.44	-7.94	40.50	74.00	-33.50	H	Peak
1990.000	46.82	-5.06	41.76	74.00	-32.24	H	Peak
2773.000	45.59	-1.77	43.82	74.00	-30.18	H	Peak
4933.000	43.39	4.76	48.15	74.00	-25.85	H	Peak
5527.000	40.59	5.88	46.47	74.00	-27.53	H	Peak
6985.000	40.36	7.68	48.04	74.00	-25.96	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Combine with Antenna 1 and Antenna 2****Test Mode:** TX / IEEE 802.11n HT20 MHz (CH Low)**Tested by:** Sun Guo**Ambient temperature:** 24°C **Relative humidity:** 52% RH**Date:** July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1774.000	47.82	-6.33	41.49	74.00	-32.51	V	Peak
2602.000	44.73	-2.08	42.65	74.00	-31.35	V	Peak
3322.000	44.10	-0.82	43.28	74.00	-30.72	V	Peak
4537.000	41.55	3.47	45.02	74.00	-28.98	V	Peak
5581.000	40.22	5.90	46.12	74.00	-27.88	V	Peak
6247.000	39.81	6.48	46.29	74.00	-27.71	V	Peak
1495.000	48.59	-6.89	41.70	74.00	-32.30	H	Peak
1999.000	47.87	-5.01	42.86	74.00	-31.14	H	Peak
2530.000	44.64	-2.21	42.43	74.00	-31.57	H	Peak
4150.000	41.51	2.12	43.63	74.00	-30.37	H	Peak
4825.000	41.51	4.41	45.92	74.00	-28.08	H	Peak
5473.000	40.66	5.82	46.48	74.00	-27.52	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Test Mode: TX / IEEE 802.11n HT20 MHz (CH Mid)Tested by: Sun GuoAmbient temperature: 24°C Relative humidity: 52% RHDate: July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1783.000	48.64	-6.31	42.33	74.00	-31.67	V	Peak
2530.000	44.58	-2.21	42.37	74.00	-31.63	V	Peak
3331.000	43.54	-0.80	42.74	74.00	-31.26	V	Peak
4996.000	42.00	4.97	46.97	74.00	-27.03	V	Peak
5887.000	40.12	6.03	46.15	74.00	-27.85	V	Peak
6841.000	39.76	7.44	47.20	74.00	-26.80	V	Peak
1999.000	46.96	-5.01	41.95	74.00	-32.05	H	Peak
2512.000	44.82	-2.24	42.58	74.00	-31.42	H	Peak
2818.000	44.32	-1.69	42.63	74.00	-31.37	H	Peak
4879.000	41.74	4.59	46.33	74.00	-27.67	H	Peak
6274.000	40.04	6.52	46.56	74.00	-27.44	H	Peak
6913.000	40.42	7.56	47.98	74.00	-26.02	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Test Mode: TX / EEE 802.11n HT20 MHz (CH High)

Tested by: Sun Guo

Ambient temperature: 24°C Relative humidity: 52% RH

Date: July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1495.000	48.42	-6.89	41.53	74.00	-32.47	V	Peak
2593.000	44.54	-2.09	42.45	74.00	-31.55	V	Peak
5050.000	41.16	5.07	46.23	74.00	-27.77	V	Peak
5599.000	40.27	5.91	46.18	74.00	-27.82	V	Peak
6265.000	40.31	6.51	46.82	74.00	-27.18	V	Peak
7723.000	39.97	9.11	49.08	74.00	-24.92	V	Peak
1999.000	46.97	-5.01	41.96	74.00	-32.04	H	Peak
2575.000	45.19	-2.12	43.07	74.00	-30.93	H	Peak
4915.000	41.54	4.70	46.24	74.00	-27.76	H	Peak
6211.000	39.45	6.42	45.87	74.00	-28.13	H	Peak
6850.000	39.82	7.46	47.28	74.00	-26.72	H	Peak
7741.000	40.60	9.14	49.74	74.00	-24.26	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Combine with Antenna 1 and Antenna 2

Test Mode: TX/ IEEE 802.11n HT40 MHz (CH Low)

Tested by: Sun Guo

Ambient temperature: 24°C **Relative humidity:** 52% RH

Date: July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1495.000	48.27	-6.89	41.38	74.00	-32.62	V	Peak
2512.000	45.67	-2.24	43.43	74.00	-30.57	V	Peak
3772.000	41.70	0.63	42.33	74.00	-31.67	V	Peak
4870.000	41.02	4.56	45.58	74.00	-28.42	V	Peak
5851.000	40.02	6.02	46.04	74.00	-27.96	V	Peak
6220.000	40.20	6.44	46.64	74.00	-27.36	V	Peak
1999.000	45.70	-5.01	40.69	74.00	-33.31	H	Peak
2539.000	44.40	-2.19	42.21	74.00	-31.79	H	Peak
3790.000	42.26	0.70	42.96	74.00	-31.04	H	Peak
4879.000	41.30	4.59	45.89	74.00	-28.11	H	Peak
5761.000	40.16	5.98	46.14	74.00	-27.86	H	Peak
6931.000	39.71	7.59	47.30	74.00	-26.70	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Test Mode: TX / IEEE 802.11n HT40 MHz (CH Mid)

Tested by: Sun Guo

Ambient temperature: 24°C Relative humidity: 52% RH

Date: July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1495.000	47.85	-6.89	40.96	74.00	-33.04	V	Peak
3322.000	44.66	-0.82	43.84	74.00	-30.16	V	Peak
4150.000	41.51	2.12	43.63	74.00	-30.37	V	Peak
5041.000	41.57	5.05	46.62	74.00	-27.38	V	Peak
6319.000	40.34	6.60	46.94	74.00	-27.06	V	Peak
7471.000	39.76	8.62	48.38	74.00	-25.62	V	Peak
1162.000	49.59	-7.94	41.65	74.00	-32.35	H	Peak
1828.000	47.76	-6.09	41.67	74.00	-32.33	H	Peak
3898.000	43.01	1.16	44.17	74.00	-29.83	H	Peak
5374.000	40.26	5.65	45.91	74.00	-28.09	H	Peak
6319.000	39.84	6.60	46.44	74.00	-27.56	H	Peak
7012.000	39.73	7.72	47.45	74.00	-26.55	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Test Mode: TX/ IEEE 802.11n HT40 MHz (CH High)

Tested by: Sun Guo

Ambient temperature: 24°C Relative humidity: 52% RH

Date: July 21, 2015

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2530.000	45.39	-2.21	43.18	74.00	-30.82	V	Peak
3682.000	42.73	0.25	42.98	74.00	-31.02	V	Peak
5041.000	40.97	5.05	46.02	74.00	-27.98	V	Peak
5356.000	40.80	5.61	46.41	74.00	-27.59	V	Peak
5752.000	40.79	5.98	46.77	74.00	-27.23	V	Peak
6526.000	40.05	6.93	46.98	74.00	-27.02	V	Peak
1162.000	49.77	-7.94	41.83	74.00	-32.17	H	Peak
1837.000	48.12	-6.03	42.09	74.00	-31.91	H	Peak
2755.000	45.01	-1.80	43.21	74.00	-30.79	H	Peak
3970.000	41.75	1.46	43.21	74.00	-30.79	H	Peak
4915.000	41.27	4.70	45.97	74.00	-28.03	H	Peak
5527.000	40.13	5.88	46.01	74.00	-27.99	H	Peak

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



7.3. 6dB BANDWIDTH MEASUREMENT

7.3.1. LIMITS

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz. The minimum 6 dB bandwidth shall be at least 500 kHz.

7.3.2. TEST INSTRUMENTS

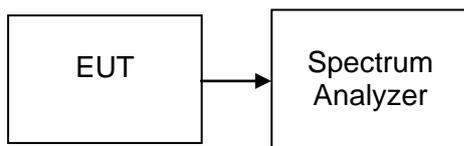
Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US44300399	02/28/2015	02/27/2016

7.3.3. TEST PROCEDURES (please refer to measurement standard)

8.1 Option 1:

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.3.4. TEST SETUP





7.3.5. TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b (Antenna 1)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	10163	>500	PASS
Mid	2437	10150		PASS
High	2462	10159		PASS

Test mode: IEEE 802.11b (Antenna 2)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	10173	>500	PASS
Mid	2437	10166		PASS
High	2462	10144		PASS

Test mode: IEEE 802.11g (Antenna 1)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	16403	>500	PASS
Mid	2437	16327		PASS
High	2462	16335		PASS

Test mode: IEEE 802.11g (Antenna 2)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	16356	>500	PASS
Mid	2437	16383		PASS
High	2462	16331		PASS



Test mode: IEEE 802.11n HT20 MHz (Antenna 1)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	17557	>500	PASS
Mid	2437	17316		PASS
High	2462	17620		PASS

Test mode: IEEE 802.11n HT20 MHz (Antenna 2)

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	17642	>500	PASS
Mid	2437	17637		PASS
High	2462	17636		PASS

Test mode: IEEE 802.11n HT40 MHz (Antenna 1)

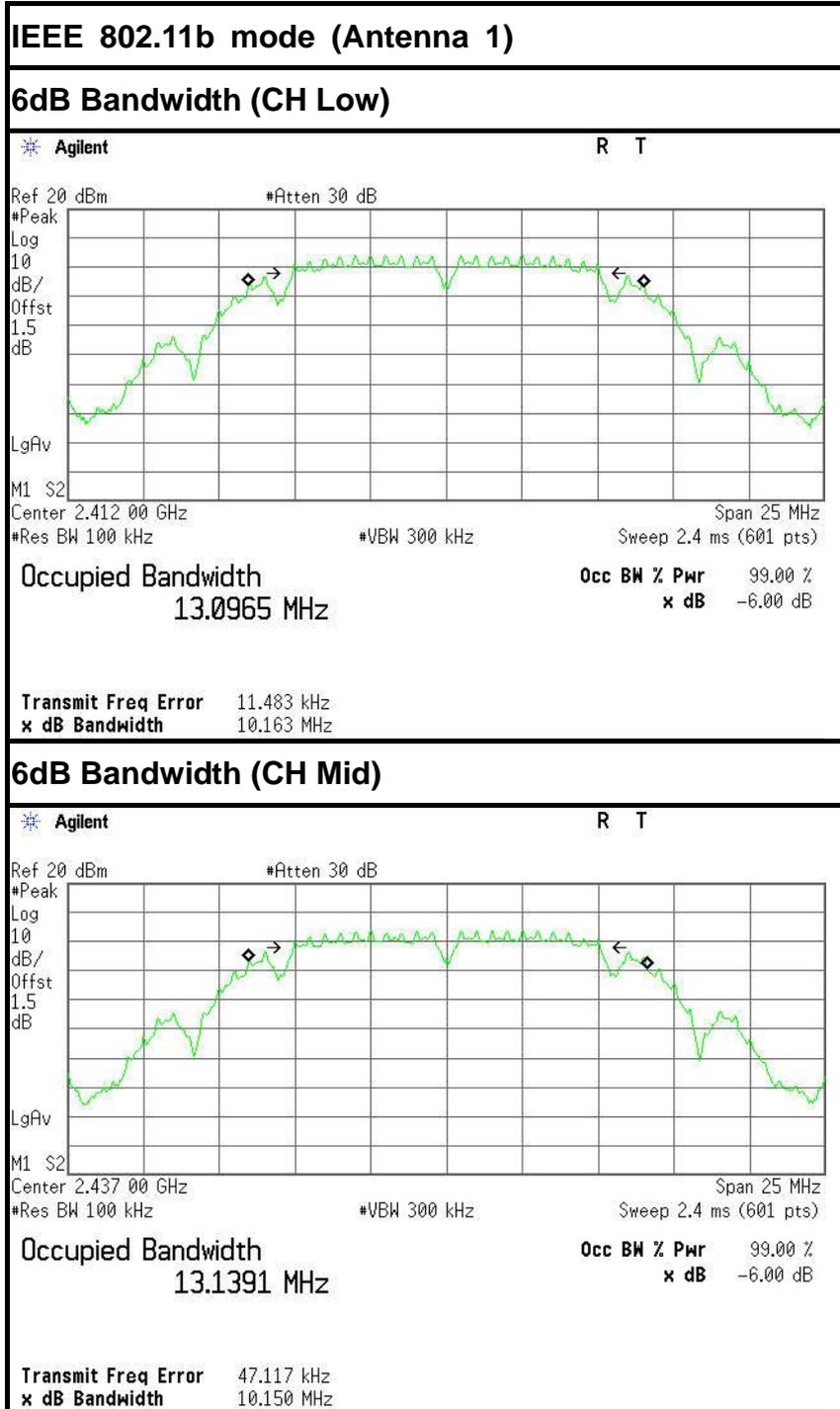
Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2422	36199	>500	PASS
Mid	2437	36173		PASS
High	2452	36157		PASS

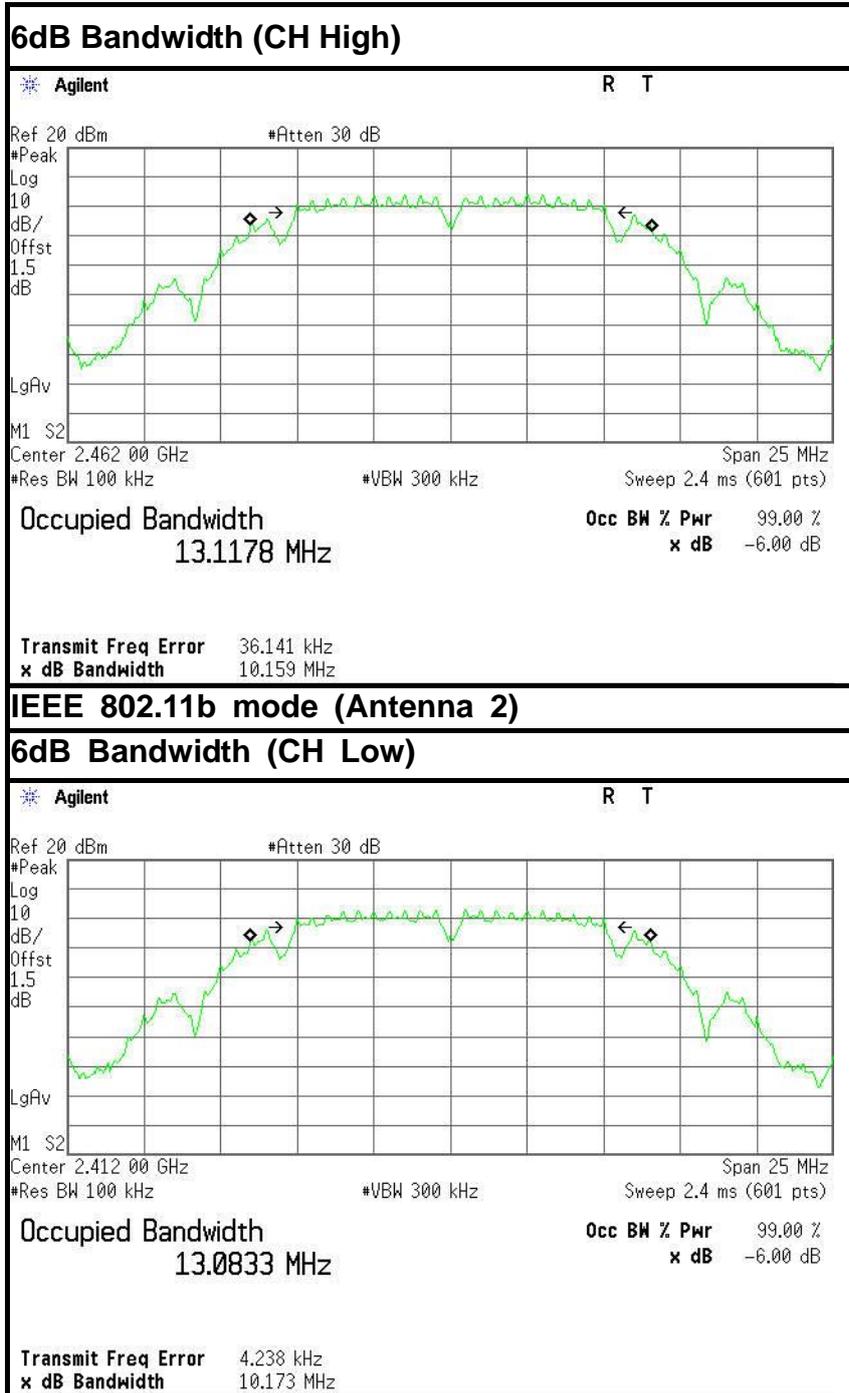
Test mode: IEEE 802.11n HT40 MHz (Antenna 2)

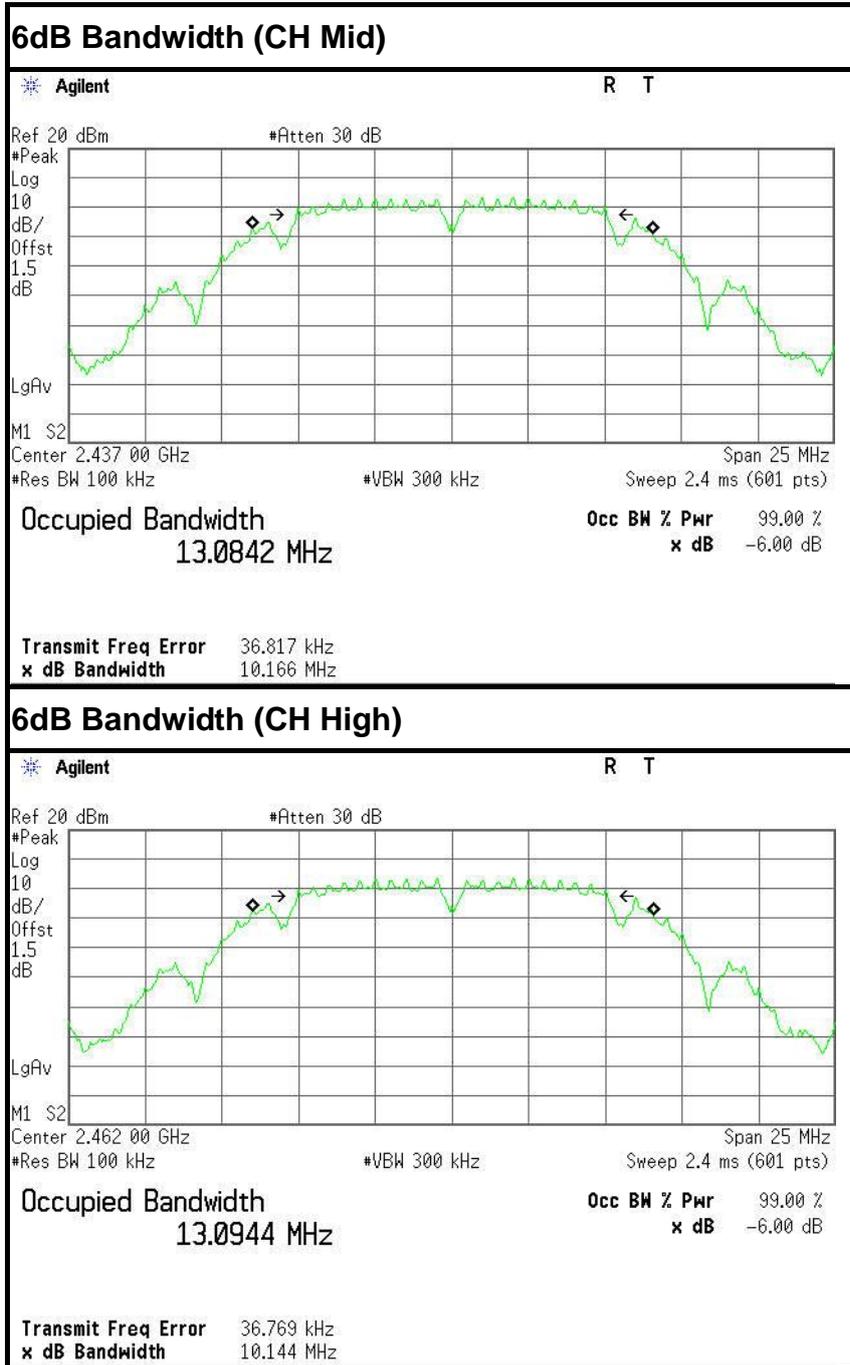
Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2422	36418	>500	PASS
Mid	2437	36386		PASS
High	2452	36427		PASS

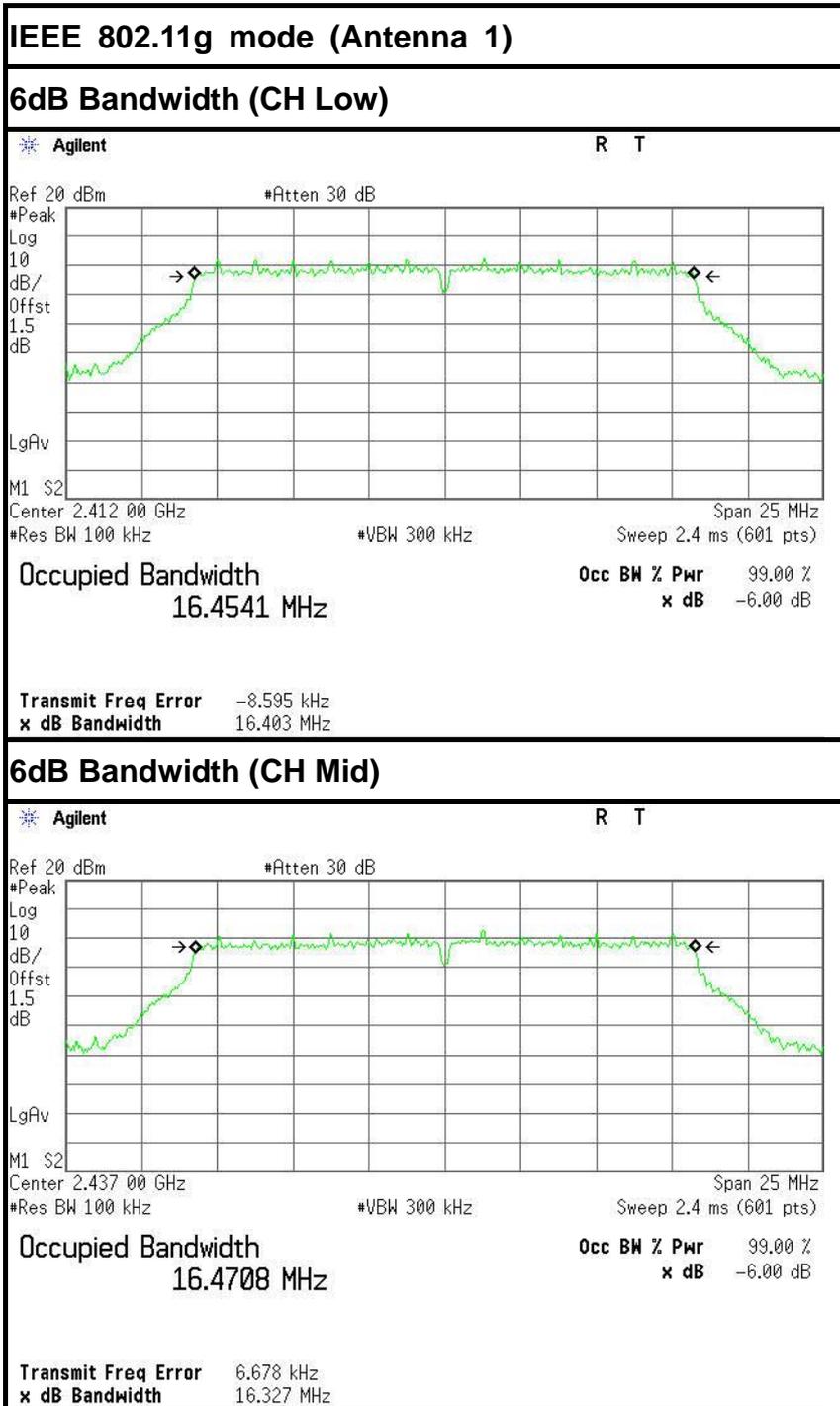


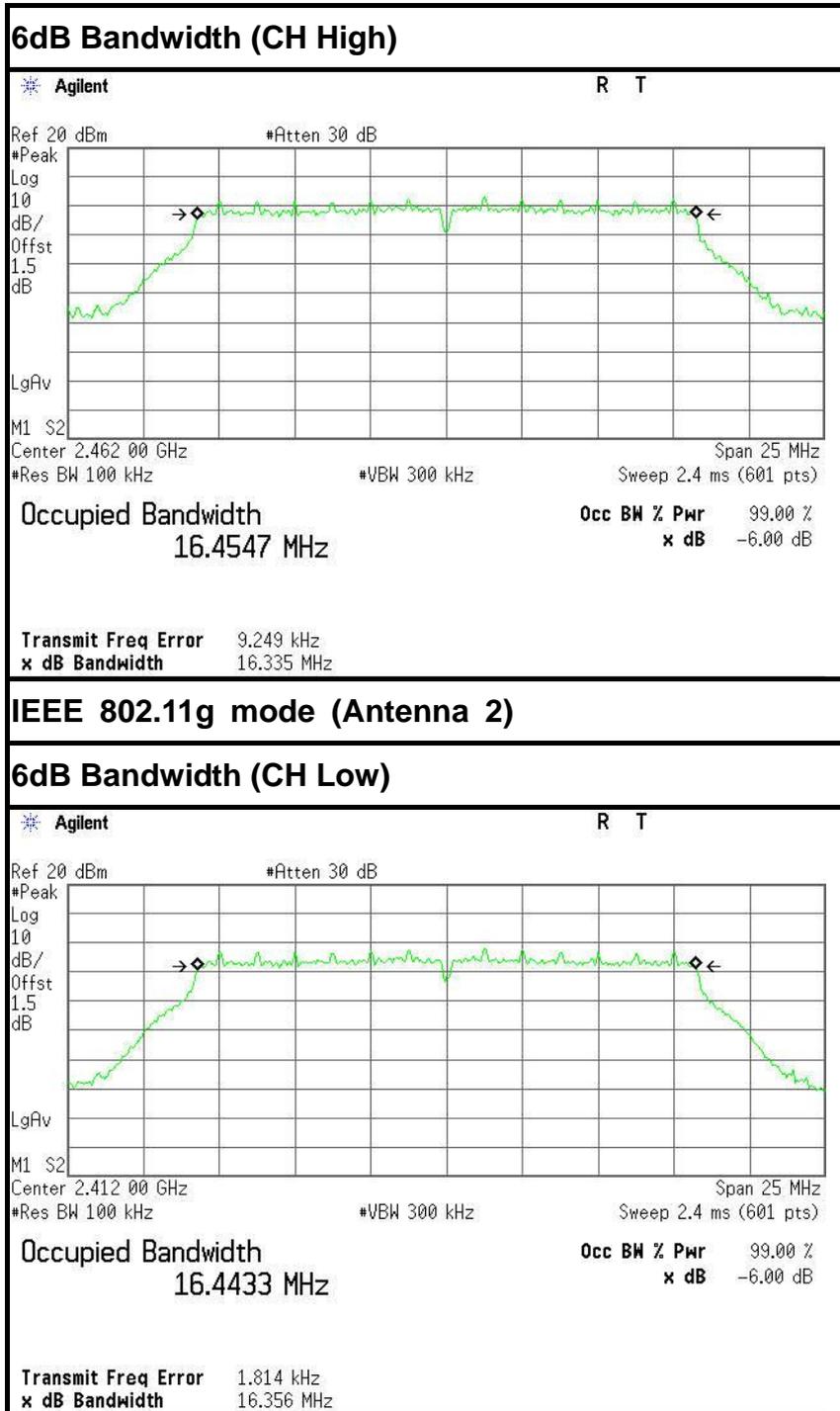
Test Plot

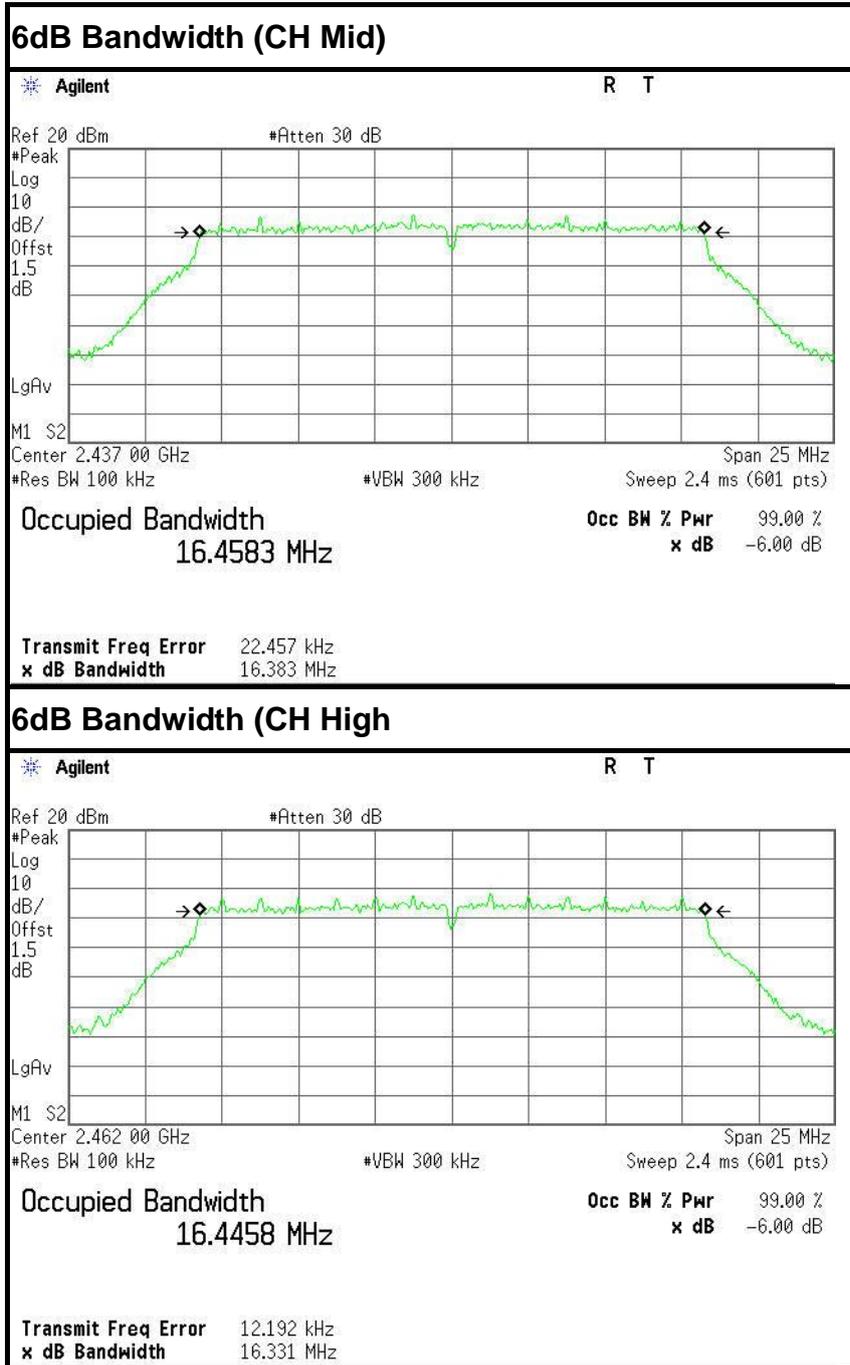








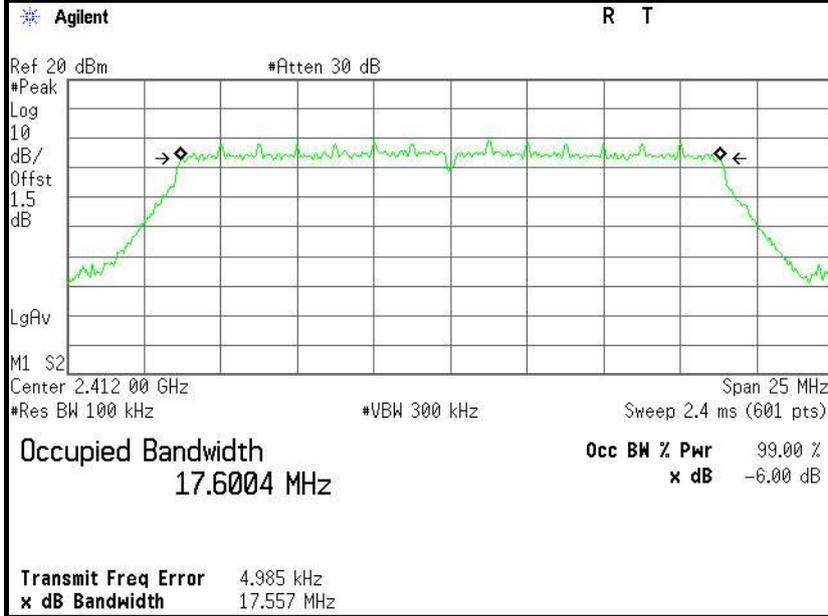




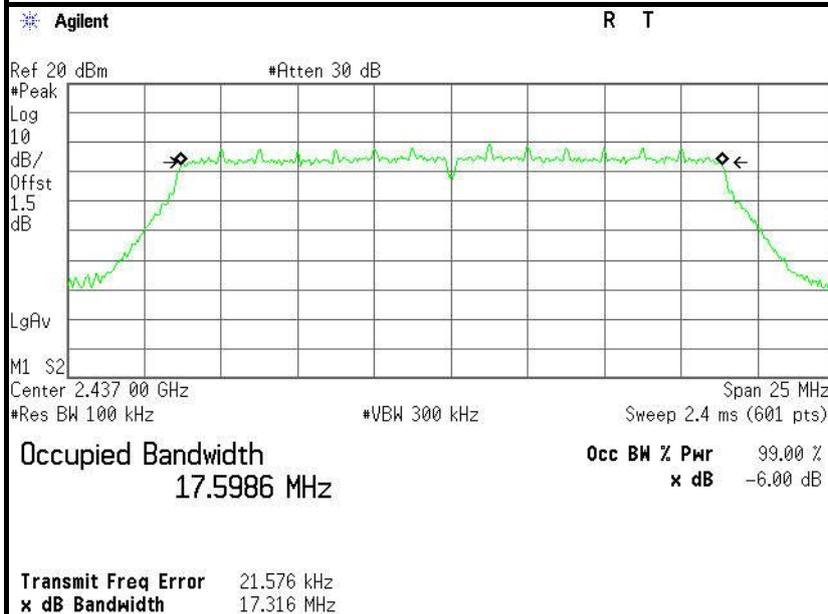


IEEE 802.11n HT20 MHz mode (Antenna 1)

6dB Bandwidth (CH Low)

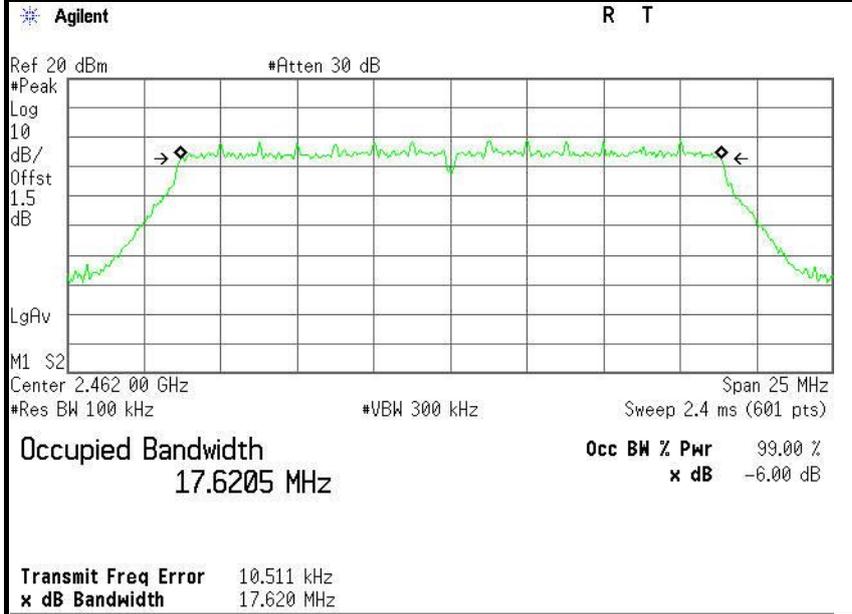


6dB Bandwidth (CH Mid)



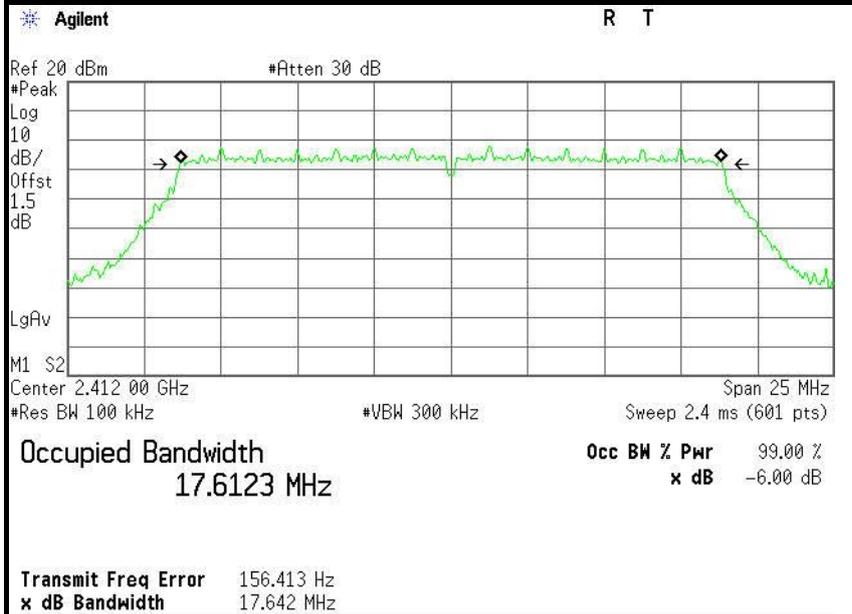


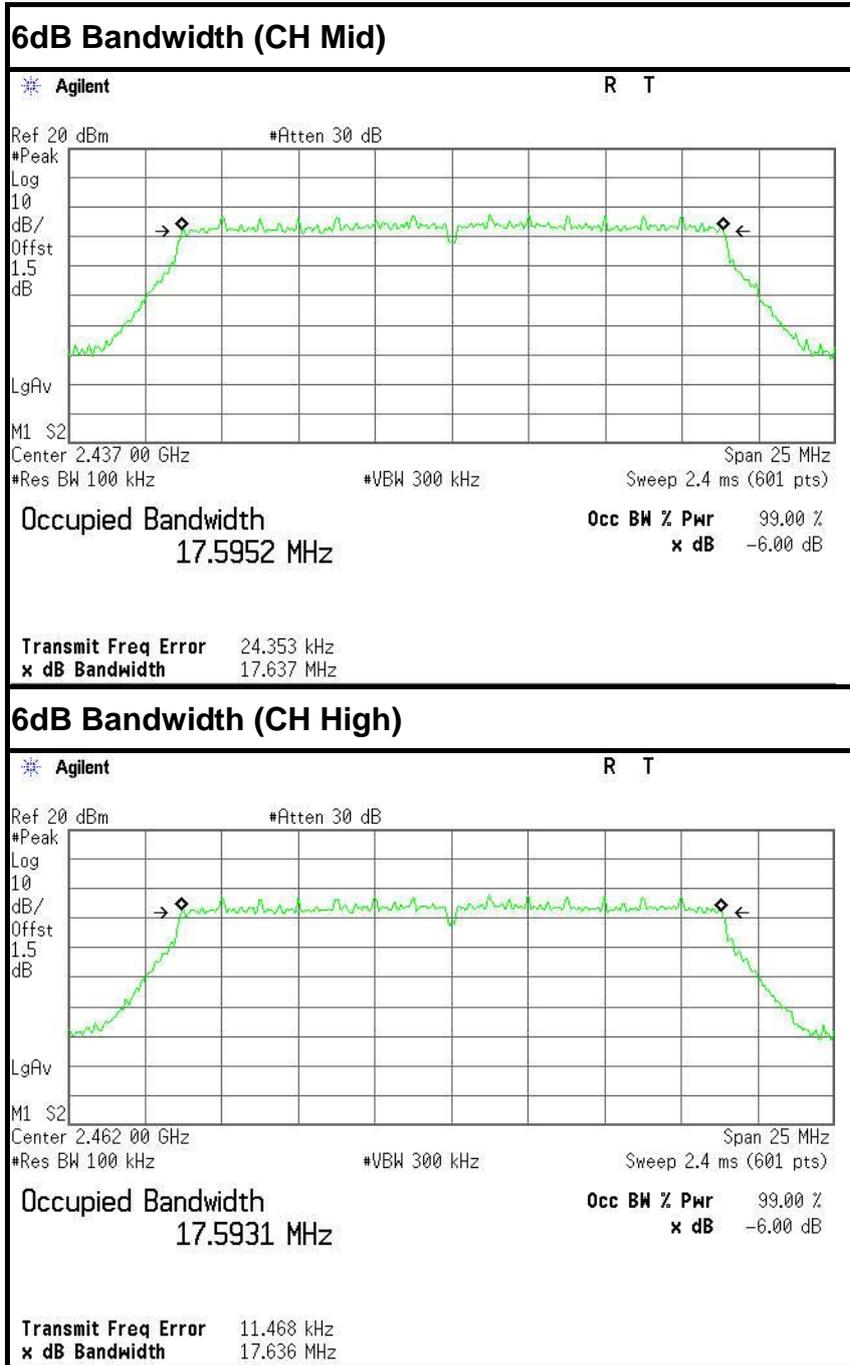
6dB Bandwidth (CH High)



IEEE 802.11n HT20 MHz mode (Antenna 2)

6dB Bandwidth (CH Low)

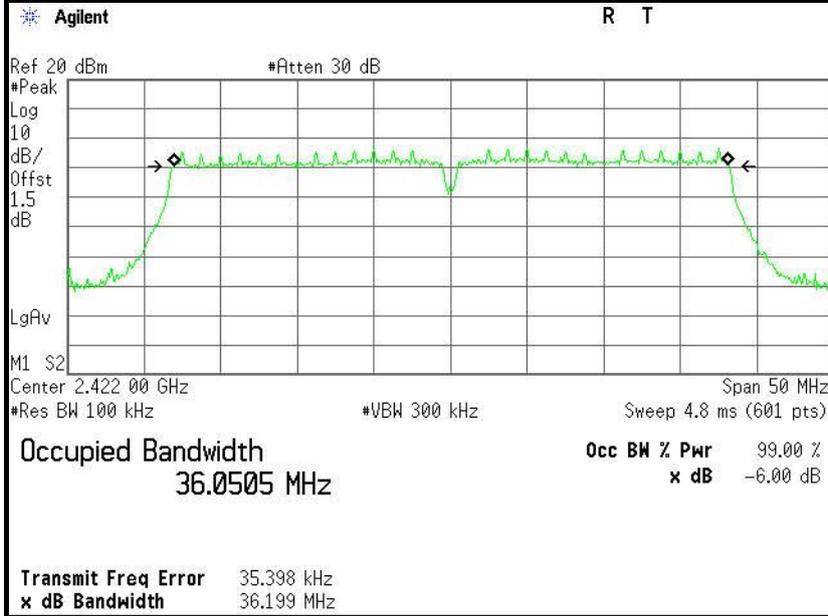




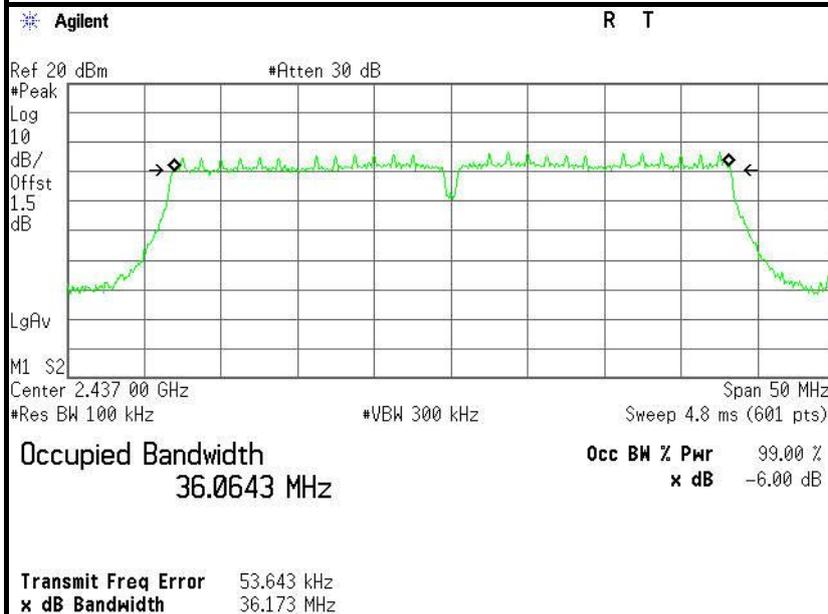


IEEE 802.11n HT40 MHz mode (Antenna 1)

6dB Bandwidth (CH Low)

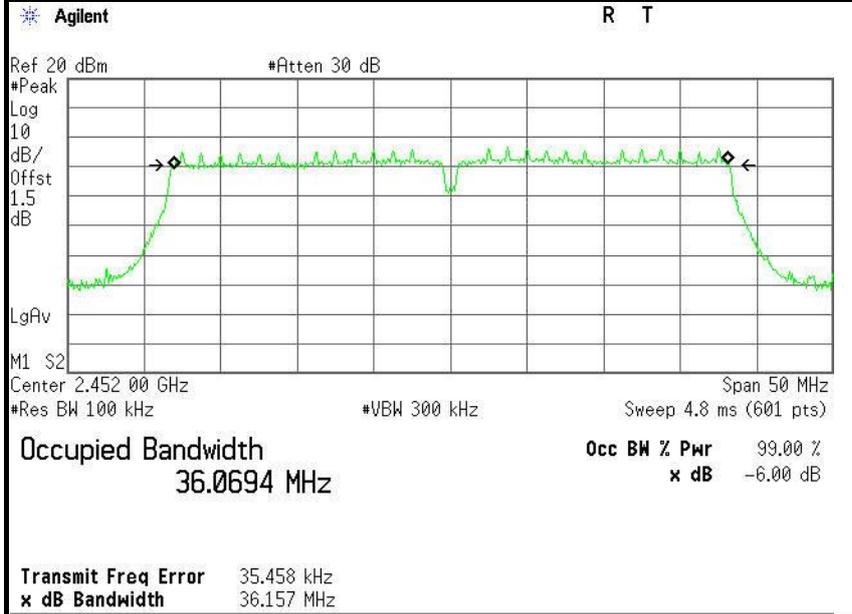


6dB Bandwidth (CH Mid)



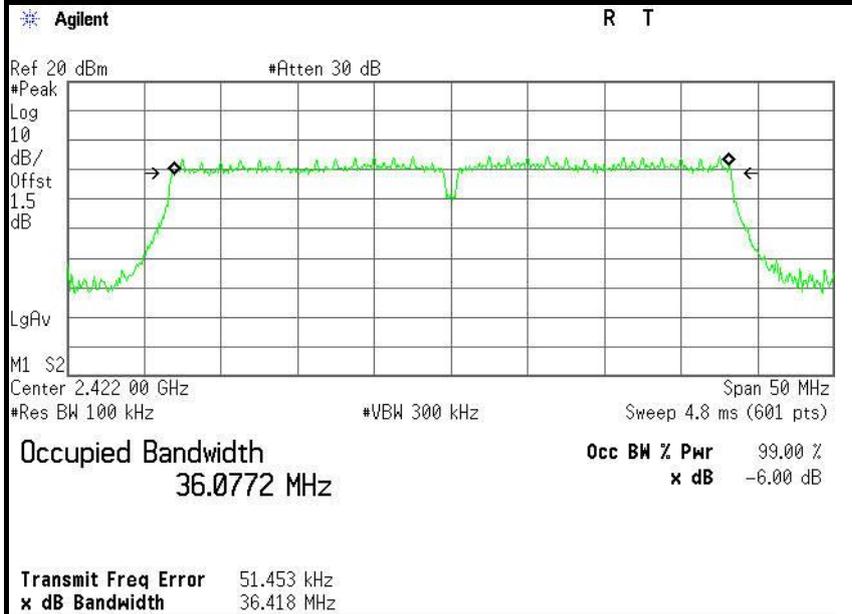


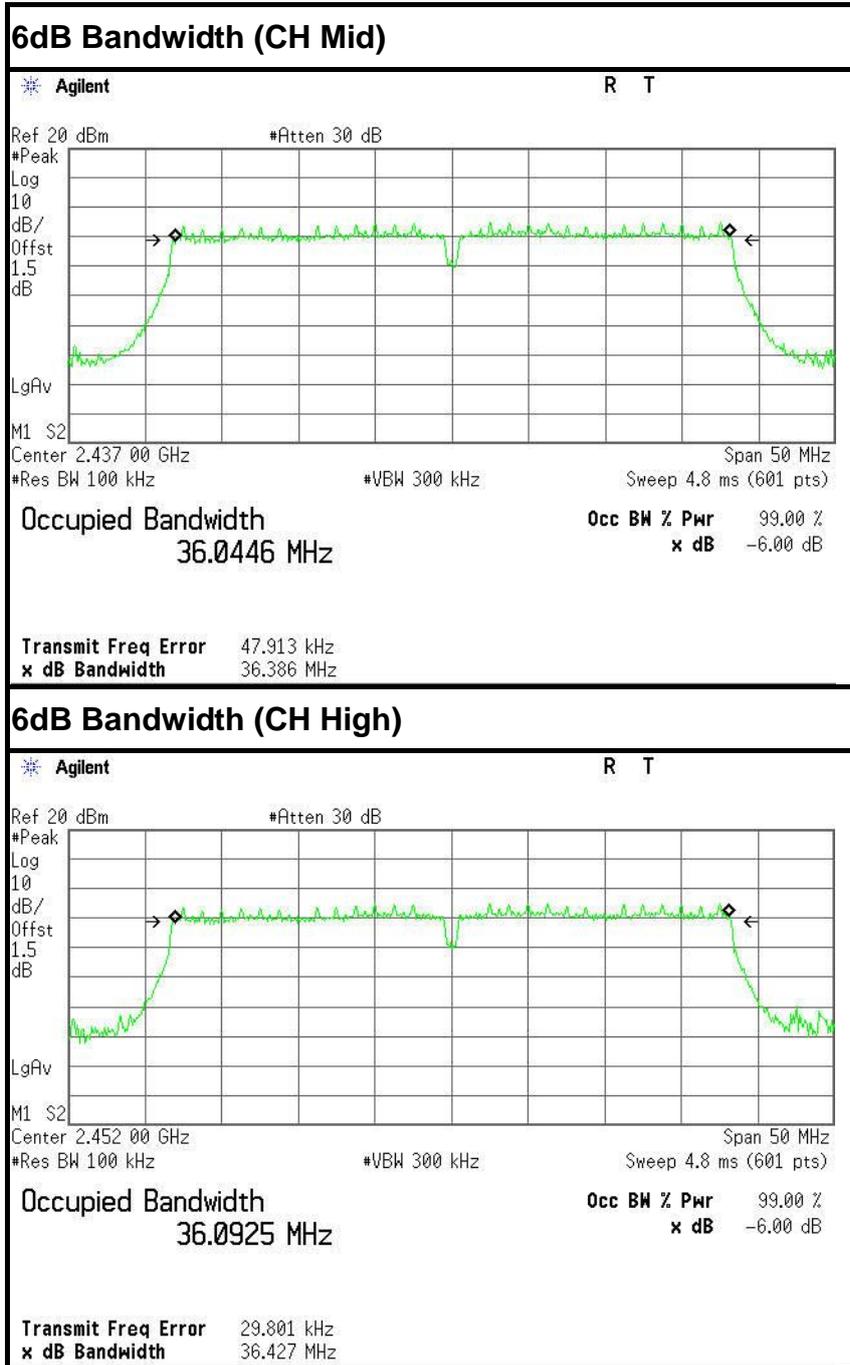
6dB Bandwidth (CH High)



IEEE 802.11n HT40 MHz mode (Antenna 2)

6dB Bandwidth (CH Low)







7.4. ANTENNA GAIN

MEASUREMENT

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module. For normal WLAN devices, the DSSS mode is used.

MEASUREMENT PARAMETERS

Measurement parameter	
Detector	Peak
Sweep time	Auto
Resolution bandwidth	3 MHz
Video bandwidth	3 MHz
Trace-Mode	Max hold

LIMITS

FCC	IC
Antenna Gain	
6 dBi	