TEST RESULTS

Below 1 GHz (9kHz ~ 30MHz)

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

Below 1 GHz (30MHz ~ 1GHz)

Product Name	3T3R Wireless-N Dual Band Gigabit Router	Test By	John Chen
Model	N450R	Test Date	2011/12/31
Test Mode	TX Mode	TEMP & Humidity	23.1°C, 59%

Horizontal

Frequency	Meter Reading	Antenna Factor	Cable Loss	Emission Level	Limits	Margin	Detector Mode
(MHz)	(dBμV)	(dB/M)	(dB)	(dBμV/M)	(dBμV/M)	(dB)	PK/QP
125.00	12.08	14.13	3.12	29.33	43.50	-14.18	QP
250.00	8.40	12.80	3.96	25.16	46.00	-20.84	QP
320.00	18.91	14.73	4.32	37.95	46.00	-8.05	QP
500.00	19.67	18.43	5.60	43.70	46.00	-2.30	QP
625.01	8.42	19.89	5.76	34.07	46.00	-11.93	QP
833.33	14.93	22.63	5.94	43.50	46.00	-2.50	QP
N/A	-----	-----	-----	-----	-----	-----	-----

Vertical

Frequency	Meter Reading	Antenna Factor	Cable Loss	Emission Level	Limits	Margin	Detector Mode
(MHz)	(dBμV)	(dB/M)	(dB)	(dBμV/M)	(dBμV/M)	(dB)	PK/QP
48.62	17.61	9.53	2.01	29.15	40.00	-10.85	QP
125.00	19.38	14.13	3.12	36.63	43.50	-6.88	QP
249.99	15.37	12.80	3.96	32.13	46.00	-13.87	QP
320.00	16.37	14.73	4.32	35.41	46.00	-10.59	QP
375.00	14.88	15.98	4.64	35.50	46.00	-10.51	QP
833.33	15.24	22.63	5.94	43.81	46.00	-2.19	QP
N/A	-----	-----	-----	-----	-----	-----	-----

REMARK: Emission level (dBμV/m) =Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV).

Above 1 GHz

Product Name	3T3R Wireless-N Dual Band Gigabit Router	Test By	John Chen
Model	N450R	Test Date	Dec. 21, 2011
Test Mode	IEEE 802.11a TX / CH Low	TEMP & Humidity	23.1°C, 54%

Measurement Distance at 3m Horizontal polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6906.69	55.71	38.00	4.79	41.79	0.90	57.60	74.00	-16.40	P
6906.69	45.03	38.00	4.79	41.79	0.90	46.92	54.00	-7.08	A
10360.00	51.29	39.24	6.04	37.28	0.54	59.83	74.00	-14.17	P
10360.00	40.38	39.24	6.04	37.28	0.54	48.92	54.00	-5.08	A

Measurement Distance at 3m Vertical polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6906.66	56.91	38.00	4.79	41.79	0.90	58.80	74.00	-15.20	P
6906.66	46.88	38.00	4.79	41.79	0.90	48.77	54.00	-5.23	A
10360.01	51.93	39.24	6.04	37.28	0.54	60.47	74.00	-13.53	P
10360.01	41.32	39.24	6.04	37.28	0.54	49.86	54.00	-4.14	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	3T3R Wireless-N Dual Band Gigabit Router	Test By	John Chen
Model	N450R	Test Date	Dec. 21, 2011
Test Mode	IEEE 802.11a TX / CH Middle	TEMP & Humidity	23.1°C, 54%

Measurement Distance at 3m Horizontal polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6960.00	55.83	38.28	4.81	41.77	0.92	58.07	74.00	-15.93	P
6960.00	45.69	38.28	4.81	41.77	0.92	47.93	54.00	-6.07	A
10440.00	51.22	39.28	6.10	37.17	0.58	60.00	74.00	-14.00	P
10440.00	40.70	39.28	6.10	37.17	0.58	49.48	54.00	-4.52	A

Measurement Distance at 3m Vertical polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6960.00	57.39	38.28	4.81	41.77	0.92	59.63	74.00	-14.37	P
6960.00	48.02	38.28	4.81	41.77	0.92	50.26	54.00	-3.74	A
10439.98	52.31	39.28	6.10	37.17	0.58	61.09	74.00	-12.91	P
10439.98	42.64	39.28	6.10	37.17	0.58	51.42	54.00	-2.58	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	3T3R Wireless-N Dual Band Gigabit Router	Test By	John Chen
Model	N450R	Test Date	Dec. 21, 2011
Test Mode	IEEE 802.11a TX / CH High	TEMP & Humidity	23.1°C, 54%

Measurement Distance at 3m Horizontal polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6986.65	56.33	38.43	4.82	41.76	0.93	58.74	74.00	-15.26	P
6986.65	46.28	38.43	4.82	41.76	0.93	48.69	54.00	-5.31	A
10480.02	51.03	39.29	6.13	37.12	0.59	59.92	74.00	-14.08	P
10480.02	40.80	39.29	6.13	37.12	0.59	49.69	54.00	-4.31	A

Measurement Distance at 3m Vertical polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6986.70	57.61	38.43	4.82	41.76	0.93	60.02	74.00	-13.98	P
6986.70	47.52	38.43	4.82	41.76	0.93	49.93	54.00	-4.07	A
10480.01	51.88	39.29	6.13	37.12	0.59	60.77	74.00	-13.23	P
10480.01	41.44	39.29	6.13	37.12	0.59	50.33	54.00	-3.67	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	3T3R Wireless-N Dual Band Gigabit Router	Test By	John Chen
Model	N450R	Test Date	Dec. 21, 2011
Test Mode	IEEE 802.11n HT20 TX / CH Low	TEMP & Humidity	23.1°C, 54%

Measurement Distance at 3m Horizontal polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6906.67	56.82	38.00	4.79	41.79	0.90	58.71	74.00	-15.29	P
6906.67	46.33	38.00	4.79	41.79	0.90	48.22	54.00	-5.78	A
10360.04	50.29	39.24	6.04	37.28	0.54	58.83	74.00	-15.17	P
10360.04	40.83	39.24	6.04	37.28	0.54	49.37	54.00	-4.63	A

Measurement Distance at 3m Vertical polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6906.64	57.31	38.00	4.79	41.79	0.90	59.20	74.00	-14.80	P
6906.64	47.69	38.00	4.79	41.79	0.90	49.58	54.00	-4.42	A
10359.96	51.09	39.24	6.04	37.28	0.54	59.63	74.00	-14.37	P
10359.96	40.87	39.24	6.04	37.28	0.54	49.41	54.00	-4.59	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	3T3R Wireless-N Dual Band Gigabit Router	Test By	John Chen
Model	N450R	Test Date	Dec. 21, 2011
Test Mode	IEEE 802.11n HT20 TX / CH Middle	TEMP & Humidity	23.1°C, 54%

Measurement Distance at 3m Horizontal polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6959.97	55.86	38.28	4.81	41.77	0.92	58.10	74.00	-15.90	P
6959.97	45.71	38.28	4.81	41.77	0.92	47.95	54.00	-6.05	A
10439.96	50.25	39.28	6.10	37.17	0.58	59.03	74.00	-14.97	P
10439.96	39.65	39.28	6.10	37.17	0.58	48.43	54.00	-5.57	A

Measurement Distance at 3m Vertical polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6960.01	58.93	38.28	4.81	41.77	0.92	61.17	74.00	-12.83	P
6960.01	47.59	38.28	4.81	41.77	0.92	49.83	54.00	-4.17	A
10439.99	50.24	39.28	6.10	37.17	0.58	59.02	74.00	-14.98	P
10439.99	39.99	39.28	6.10	37.17	0.58	48.77	54.00	-5.23	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	3T3R Wireless-N Dual Band Gigabit Router	Test By	John Chen
Model	N450R	Test Date	Dec. 21, 2011
Test Mode	IEEE 802.11n HT20 TX / CH High	TEMP & Humidity	23.1°C, 54%

Measurement Distance at 3m Horizontal polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6986.65	56.24	38.43	4.82	41.76	0.93	58.65	74.00	-15.35	P
6986.65	45.81	38.43	4.82	41.76	0.93	48.22	54.00	-5.78	A
10480.02	51.36	39.29	6.13	37.12	0.59	60.25	74.00	-13.75	P
10480.02	41.14	39.29	6.13	37.12	0.59	50.03	54.00	-3.97	A

Measurement Distance at 3m Vertical polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6986.65	58.62	38.43	4.82	41.76	0.93	61.03	74.00	-12.97	P
6986.65	48.33	38.43	4.82	41.76	0.93	50.74	54.00	-3.26	A
10480.00	51.80	39.29	6.13	37.12	0.59	60.69	74.00	-13.31	P
10480.00	41.02	39.29	6.13	37.12	0.59	49.91	54.00	-4.09	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	3T3R Wireless-N Dual Band Gigabit Router	Test By	John Chen
Model	N450R	Test Date	Dec. 21, 2011
Test Mode	IEEE 802.11n HT40 TX / CH Low	TEMP & Humidity	23.1°C, 54%

Measurement Distance at 3m Horizontal polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6906.64	56.61	38.00	4.79	41.79	0.90	58.50	74.00	-15.50	P
6906.64	46.23	38.00	4.79	41.79	0.90	48.12	54.00	-5.88	A
10359.98	51.43	39.24	6.04	37.28	0.54	59.97	74.00	-14.03	P
10359.98	40.50	39.24	6.04	37.28	0.54	49.04	54.00	-4.96	A

Measurement Distance at 3m Vertical polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6906.66	57.99	38.00	4.79	41.79	0.90	59.88	74.00	-14.12	P
6906.66	46.82	38.00	4.79	41.79	0.90	48.71	54.00	-5.29	A
10360.00	50.68	39.24	6.04	37.28	0.54	59.22	74.00	-14.78	P
10360.00	40.77	39.24	6.04	37.28	0.54	49.31	54.00	-4.69	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	3T3R Wireless-N Dual Band Gigabit Router	Test By	John Chen
Model	N450R	Test Date	Dec. 21, 2011
Test Mode	IEEE 802.11n HT40 TX / CH Middle	TEMP & Humidity	23.1°C, 54%

Measurement Distance at 3m Horizontal polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6933.30	56.37	38.14	4.80	41.78	0.91	58.44	74.00	-15.56	P
6933.30	46.28	38.14	4.80	41.78	0.91	48.35	54.00	-5.65	A
10400.01	51.90	39.26	6.07	37.23	0.56	60.56	74.00	-13.44	P
10400.01	40.68	39.26	6.07	37.23	0.56	49.34	54.00	-4.66	A

Measurement Distance at 3m Vertical polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6933.33	58.99	38.14	4.80	41.78	0.91	61.06	74.00	-12.94	P
6933.33	48.46	38.14	4.80	41.78	0.91	50.53	54.00	-3.47	A
10400.02	51.24	39.26	6.07	37.23	0.56	59.90	74.00	-14.10	P
10400.02	40.76	39.26	6.07	37.23	0.56	49.42	54.00	-4.58	A

REMARK:

1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Product Name	3T3R Wireless-N Dual Band Gigabit Router	Test By	John Chen
Model	N450R	Test Date	Dec. 21, 2011
Test Mode	IEEE 802.11n HT40 TX / CH High	TEMP & Humidity	23.1°C, 54%

Measurement Distance at 3m Horizontal polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6973.33	56.99	38.36	4.82	41.77	0.92	59.32	74.00	-14.68	P
6973.33	47.13	38.36	4.82	41.77	0.92	49.46	54.00	-4.54	A
10460.00	50.24	39.28	6.11	37.15	0.58	59.07	74.00	-14.93	P
10460.00	39.87	39.28	6.11	37.15	0.58	48.70	54.00	-5.30	A

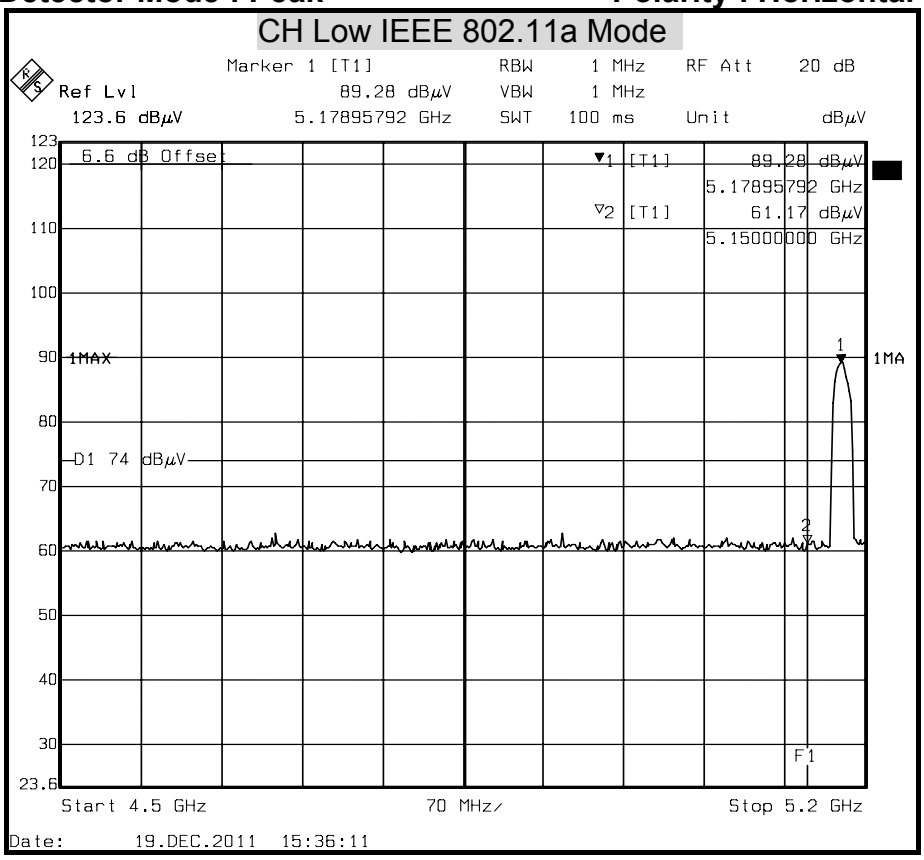
Measurement Distance at 3m Vertical polarity									
Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
6973.34	57.62	38.36	4.82	41.77	0.92	59.95	74.00	-14.05	P
6973.34	48.33	38.36	4.82	41.77	0.92	50.66	54.00	-3.34	A
10460.00	50.55	39.28	6.11	37.15	0.58	59.38	74.00	-14.62	P
10460.00	40.81	39.28	6.11	37.15	0.58	49.64	54.00	-4.36	A

REMARK:

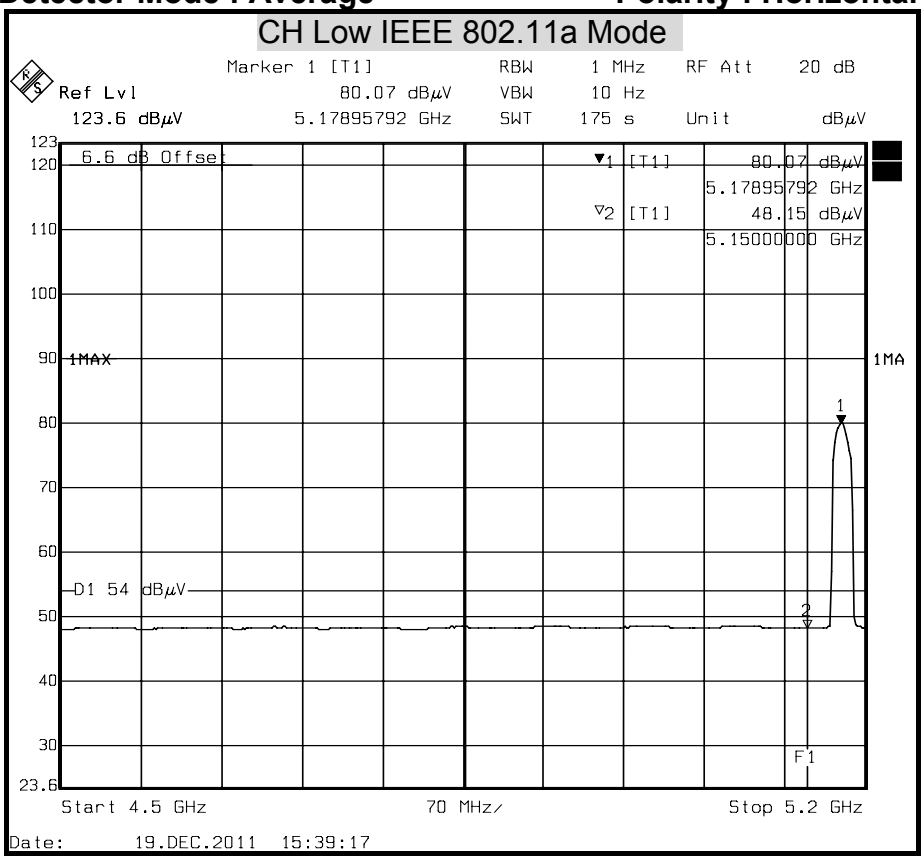
1. *AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss*
2. *Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz*
3. *The result basic equation calculation is as follow:*
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. *The other emission levels were 20dB below the limit*
5. *The test limit distance is 3M limit.*

Restricted Band Edges

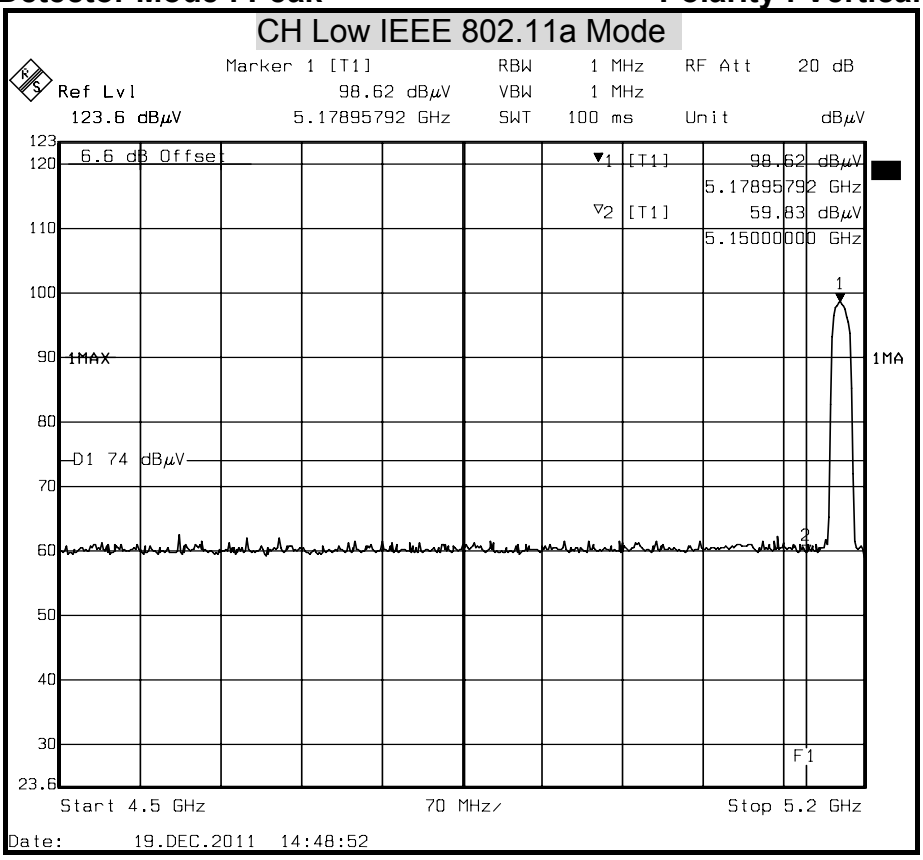
Detector Mode : Peak **Polarity : Horizontal**



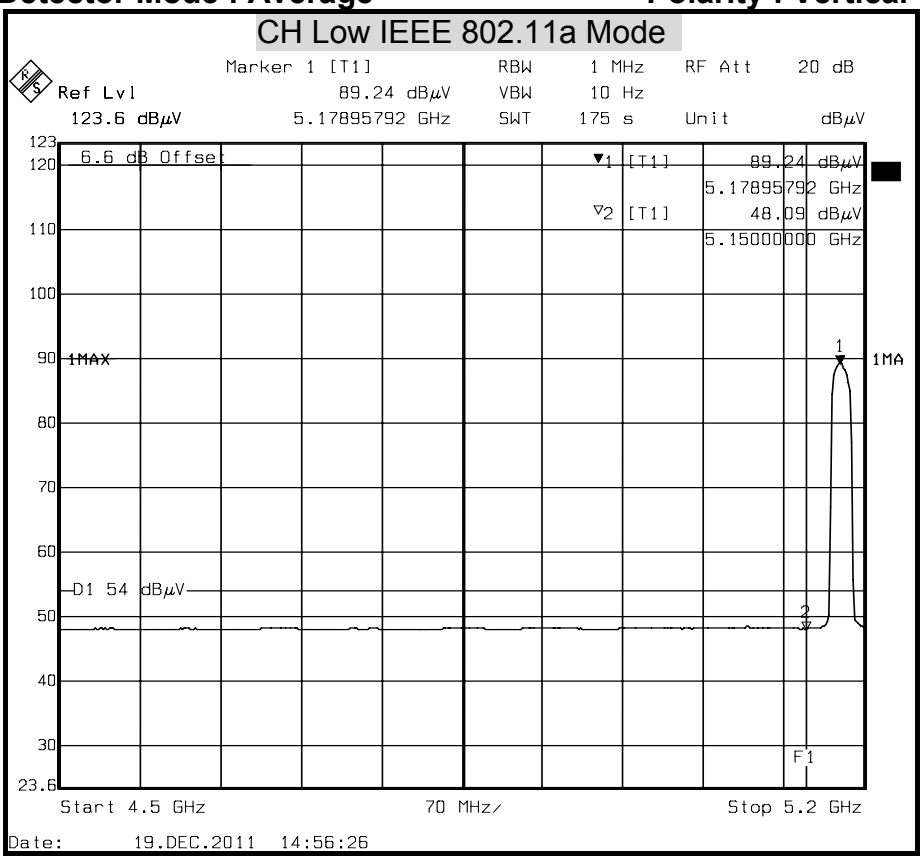
Detector Mode : Average **Polarity : Horizontal**



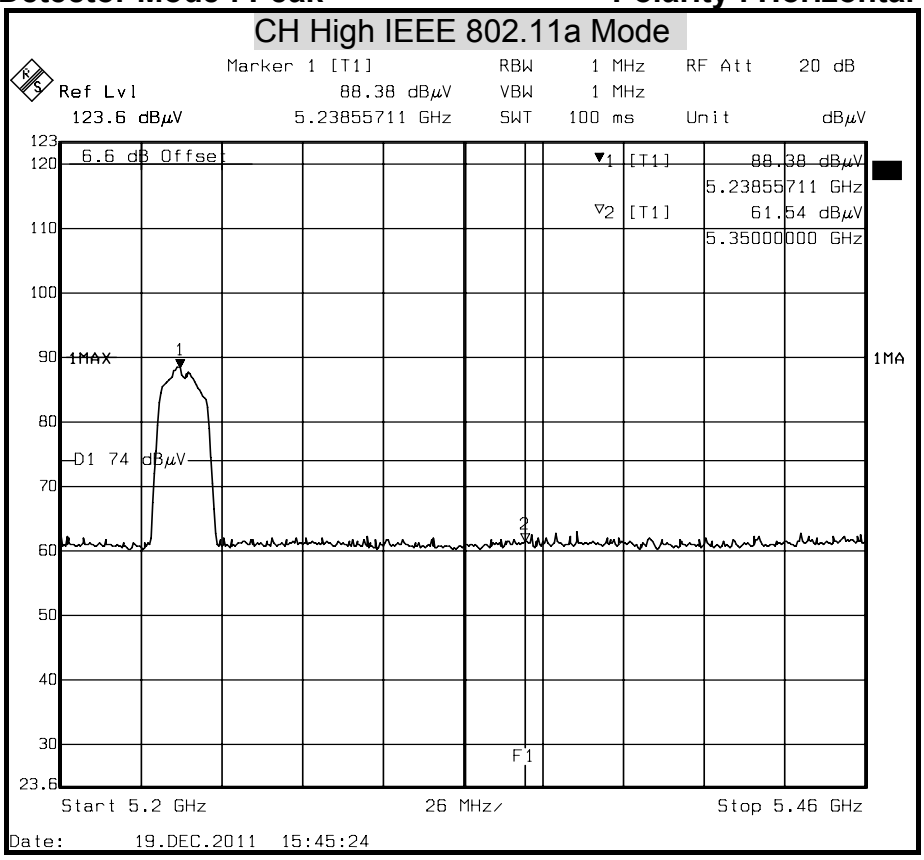
Detector Mode : Peak **Polarity : Vertical**



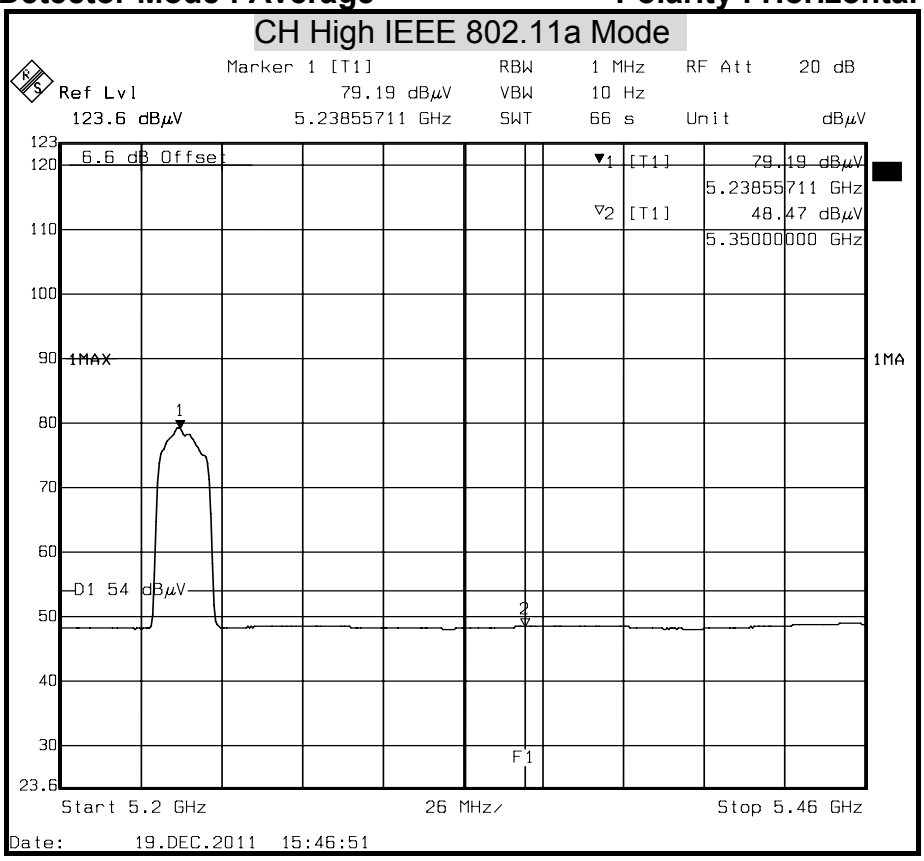
Detector Mode : Average **Polarity : Vertical**



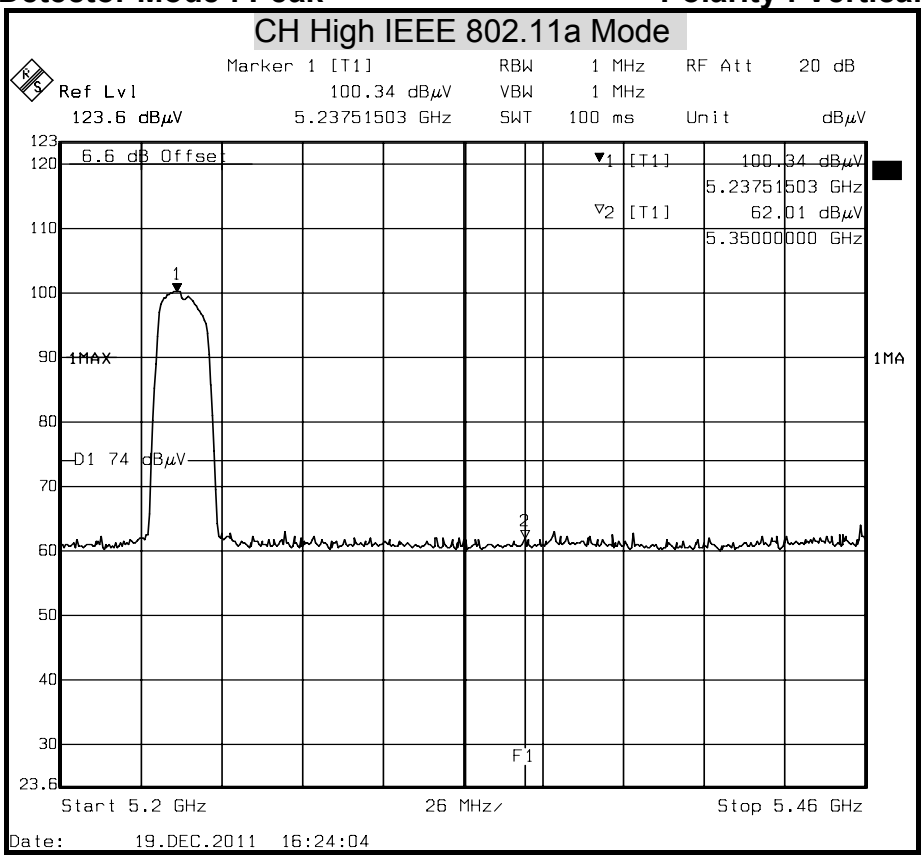
Detector Mode : Peak **Polarity : Horizontal**



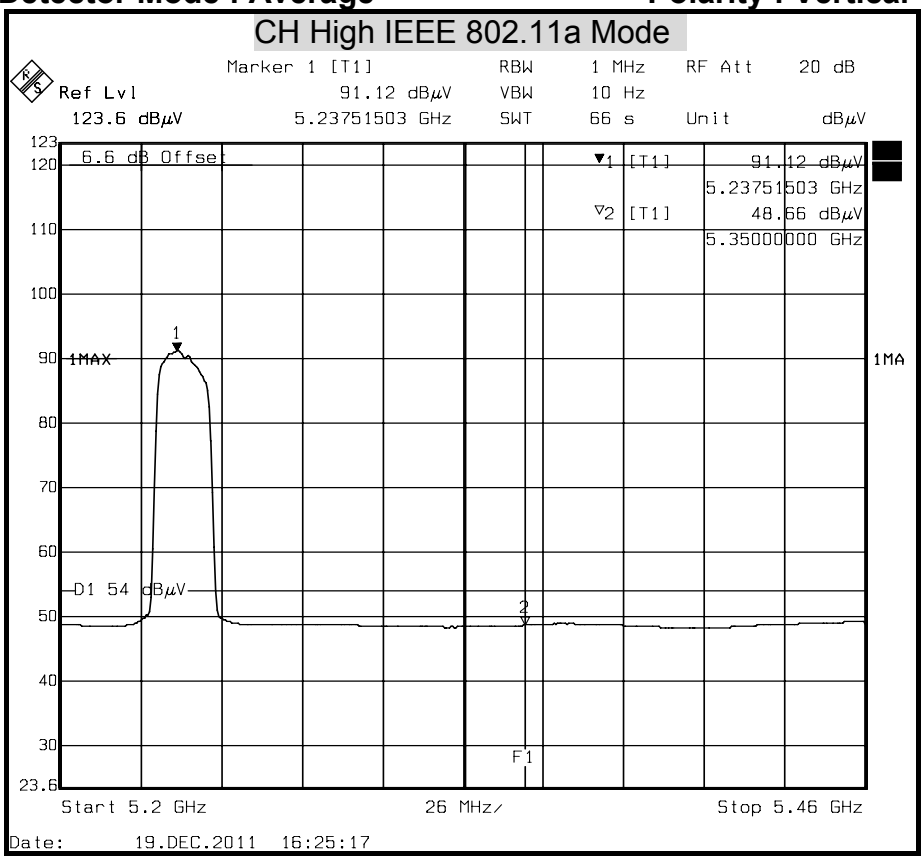
Detector Mode : Average **Polarity : Horizontal**



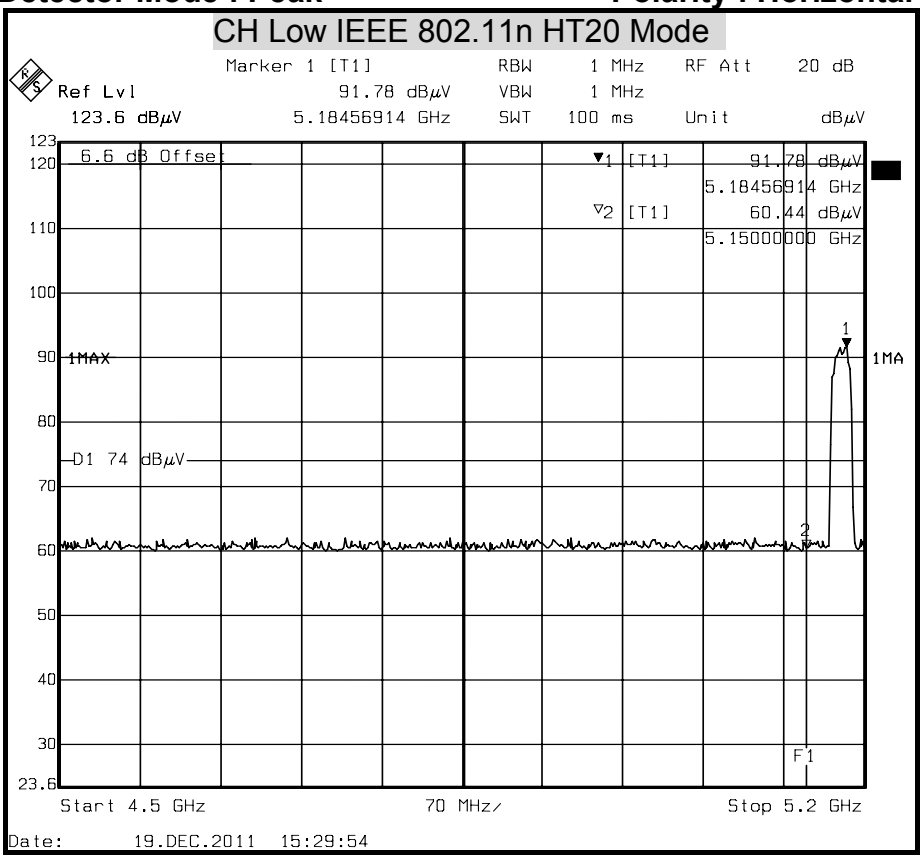
Detector Mode : Peak **Polarity : Vertical**



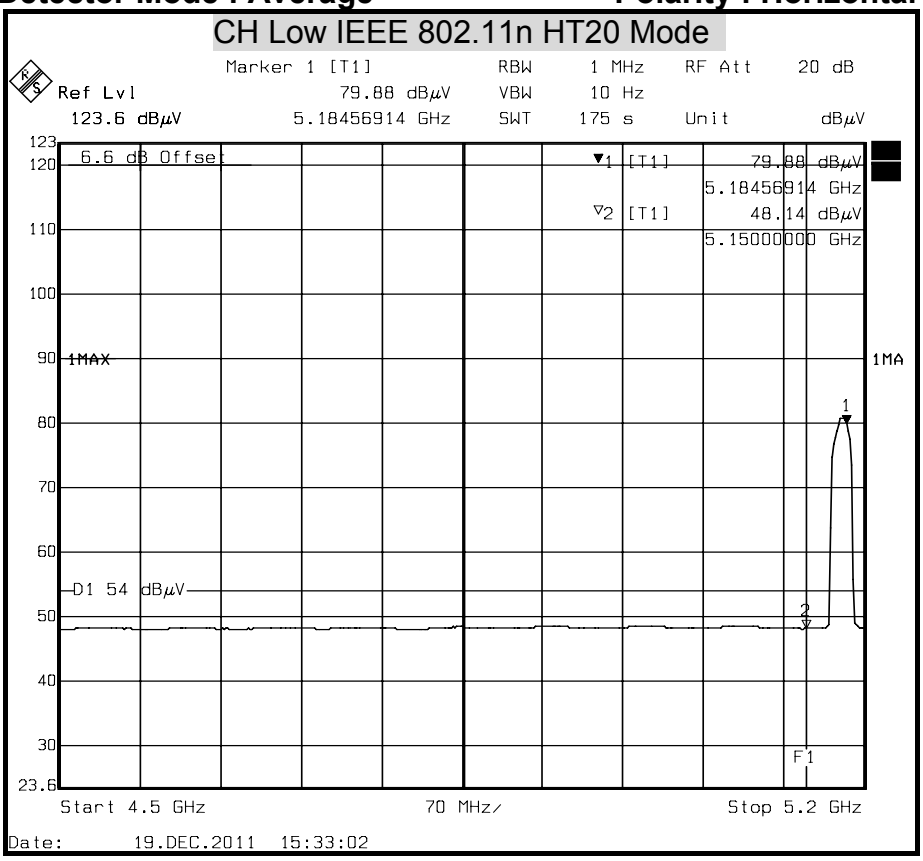
Detector Mode : Average **Polarity : Vertical**



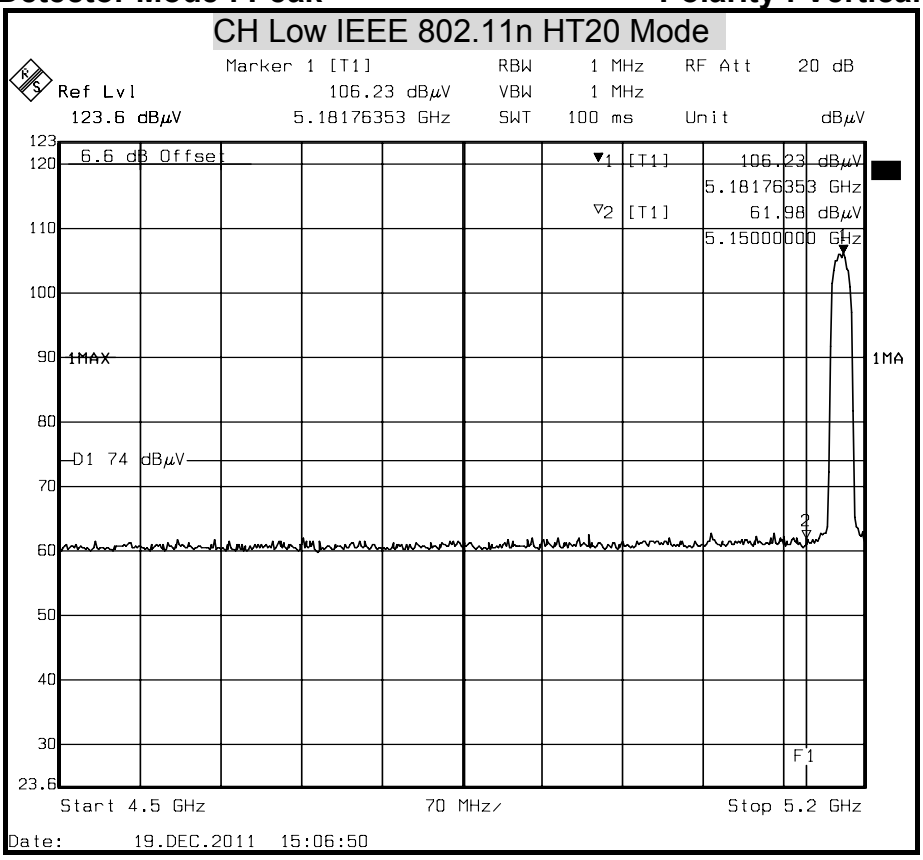
Detector Mode : Peak **Polarity : Horizontal**



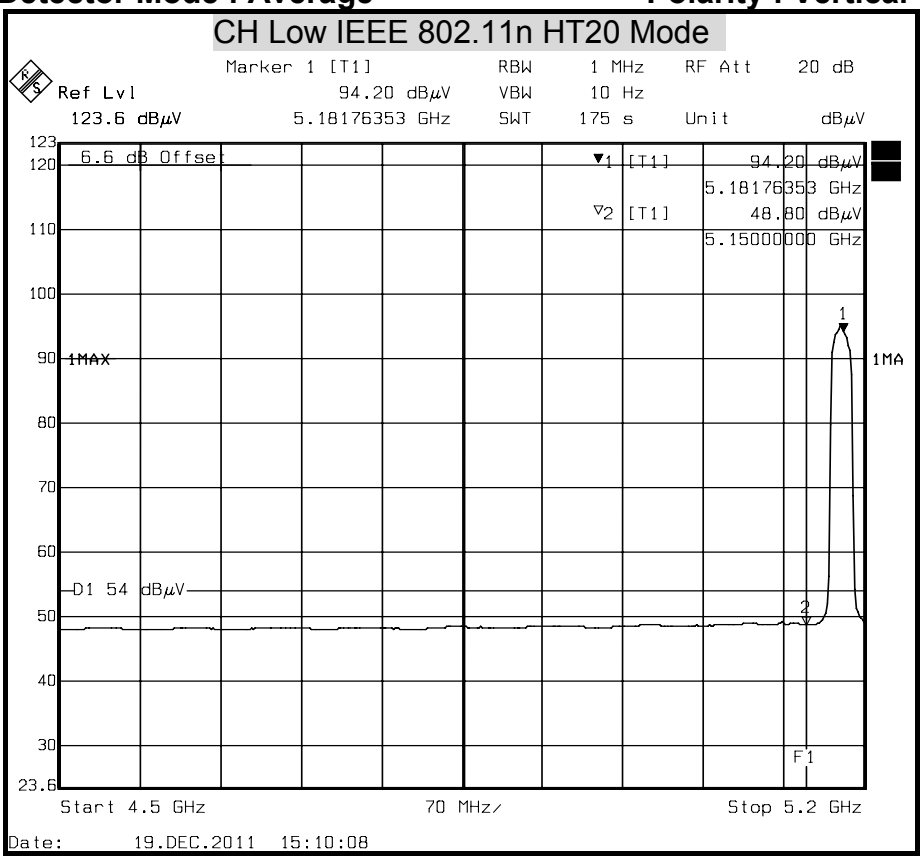
Detector Mode : Average **Polarity : Horizontal**



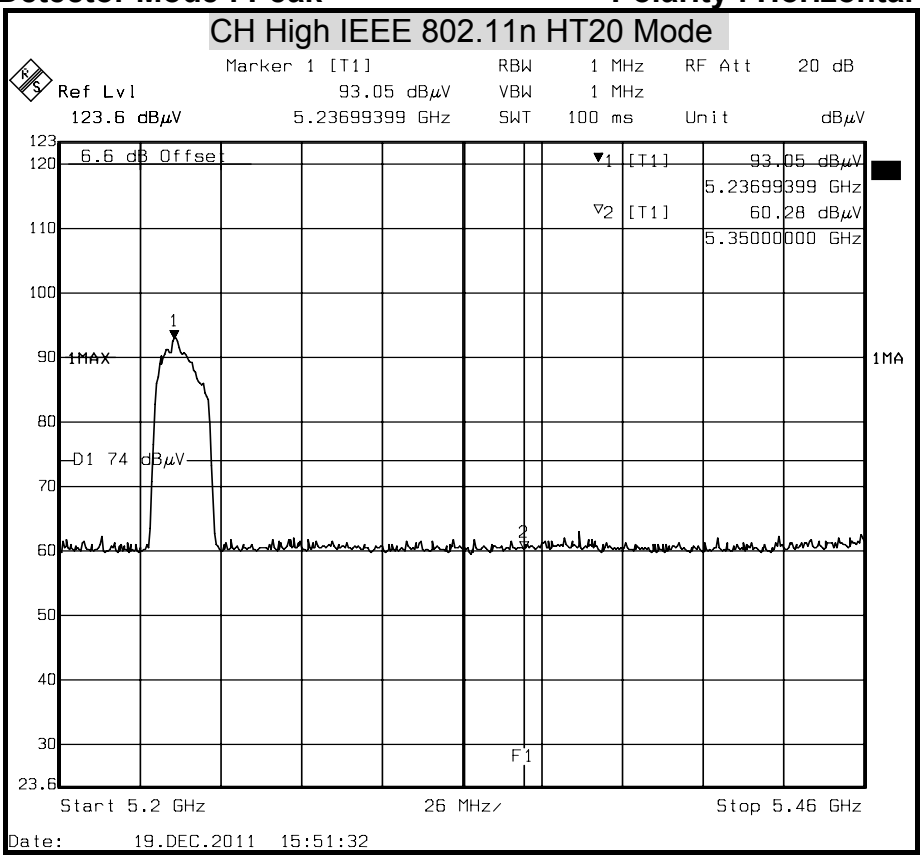
Detector Mode : Peak **Polarity : Vertical**



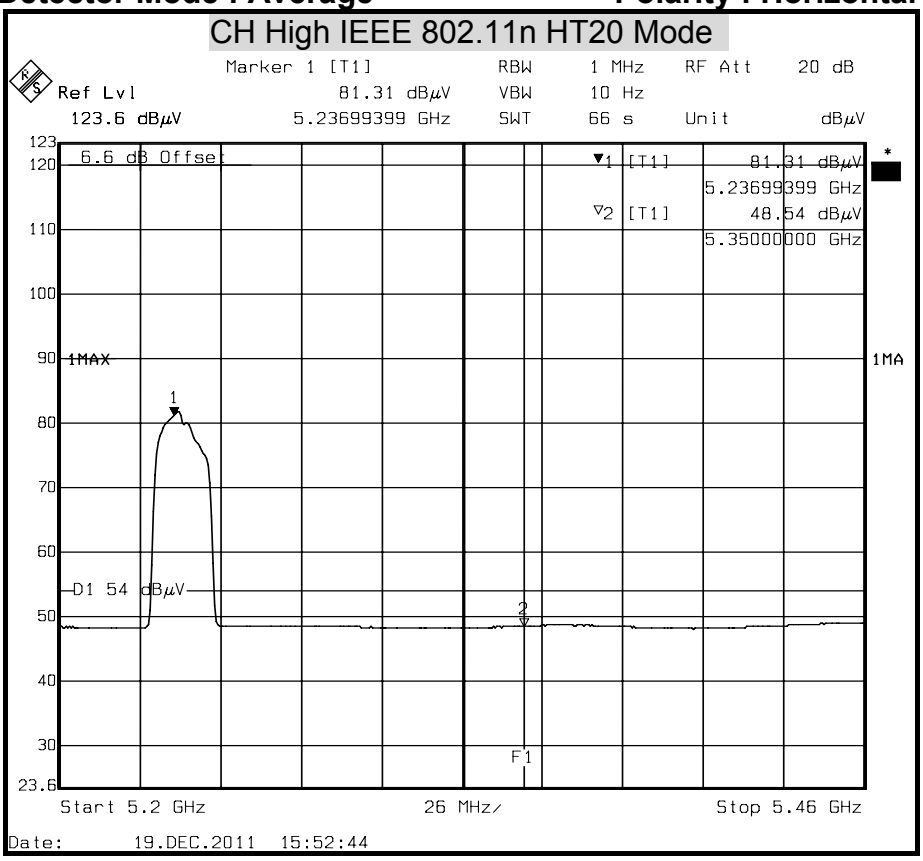
Detector Mode : Average **Polarity : Vertical**



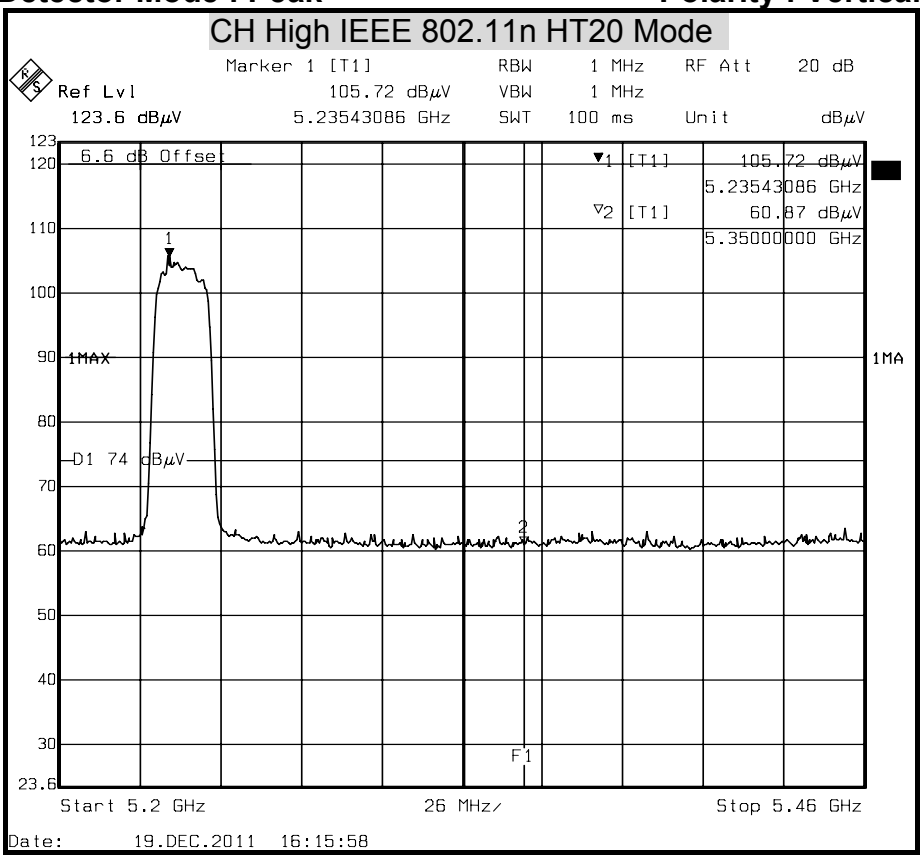
Detector Mode : Peak **Polarity : Horizontal**



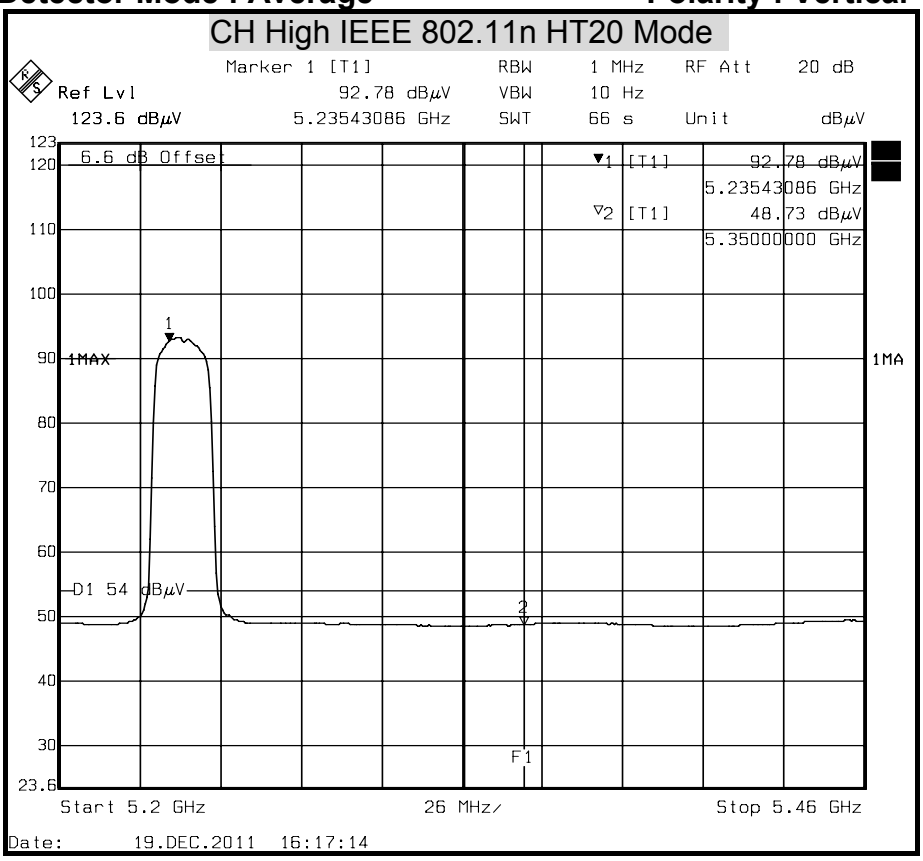
Detector Mode : Average **Polarity : Horizontal**



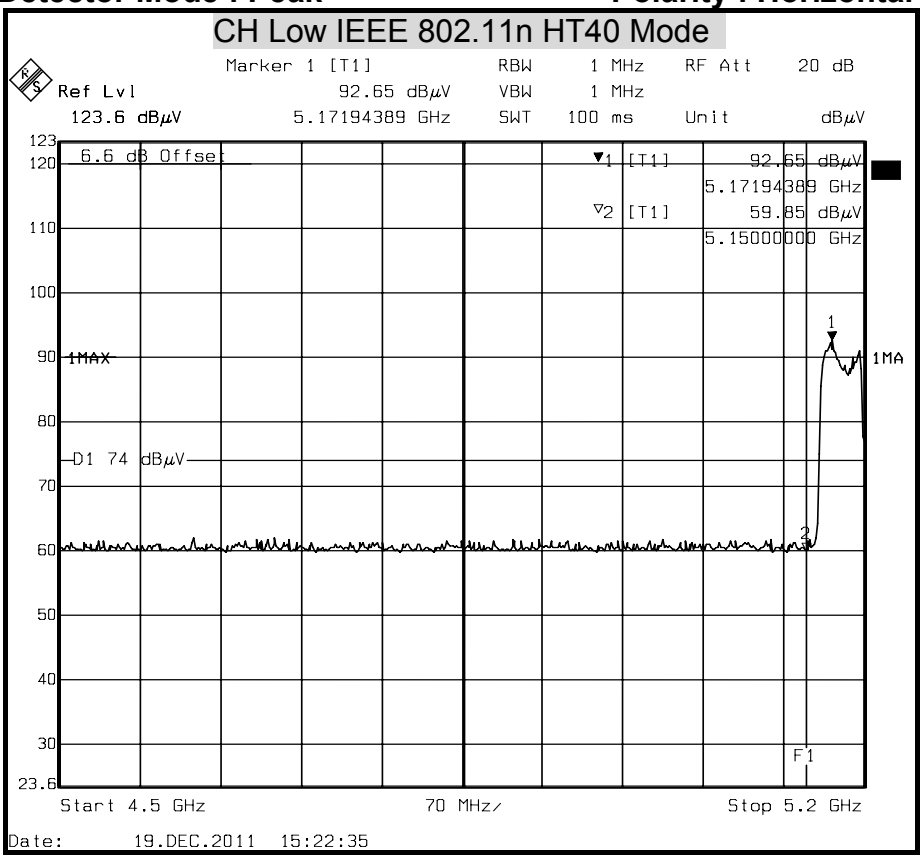
Detector Mode : Peak **Polarity : Vertical**



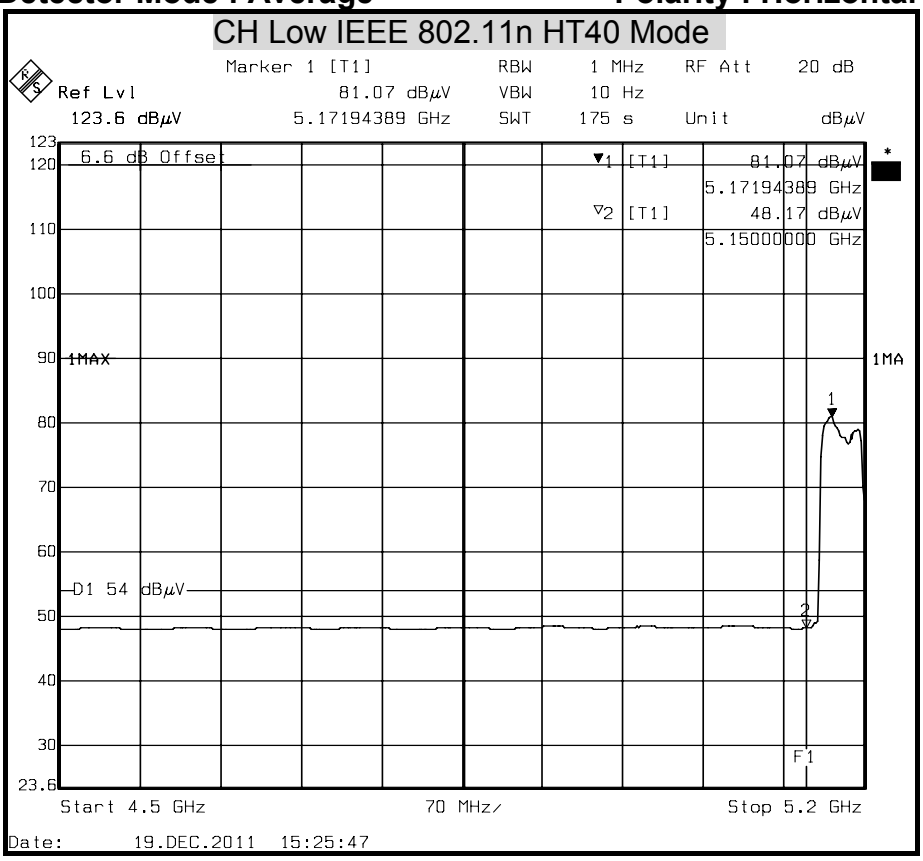
Detector Mode : Average **Polarity : Vertical**



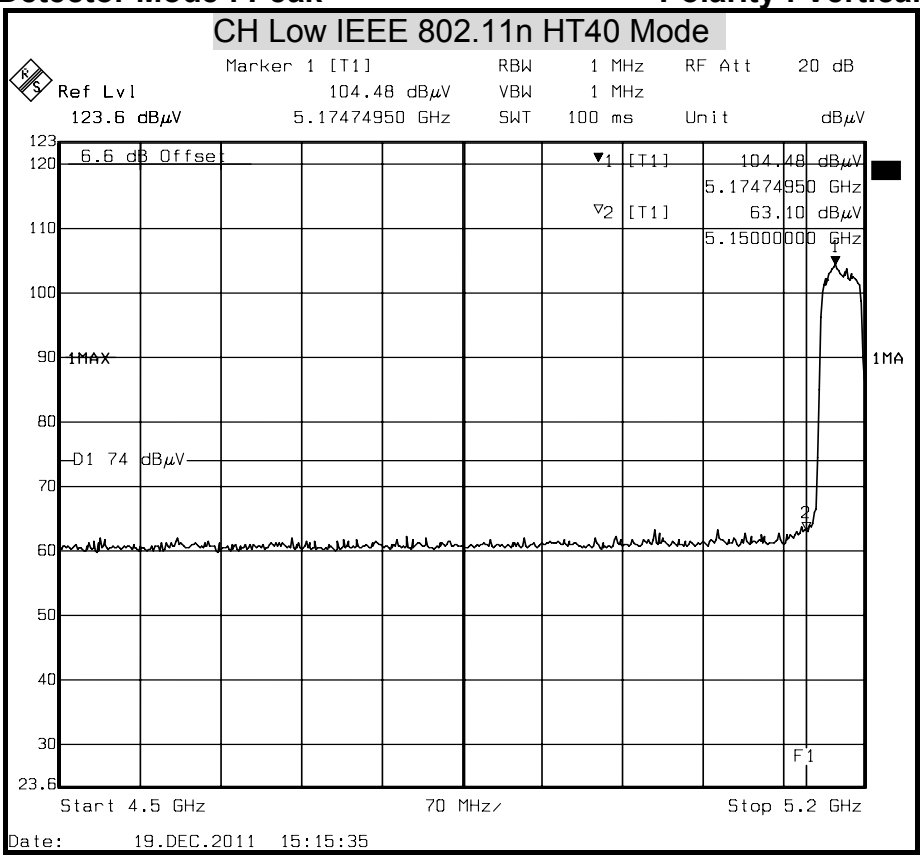
Detector Mode : Peak **Polarity : Horizontal**



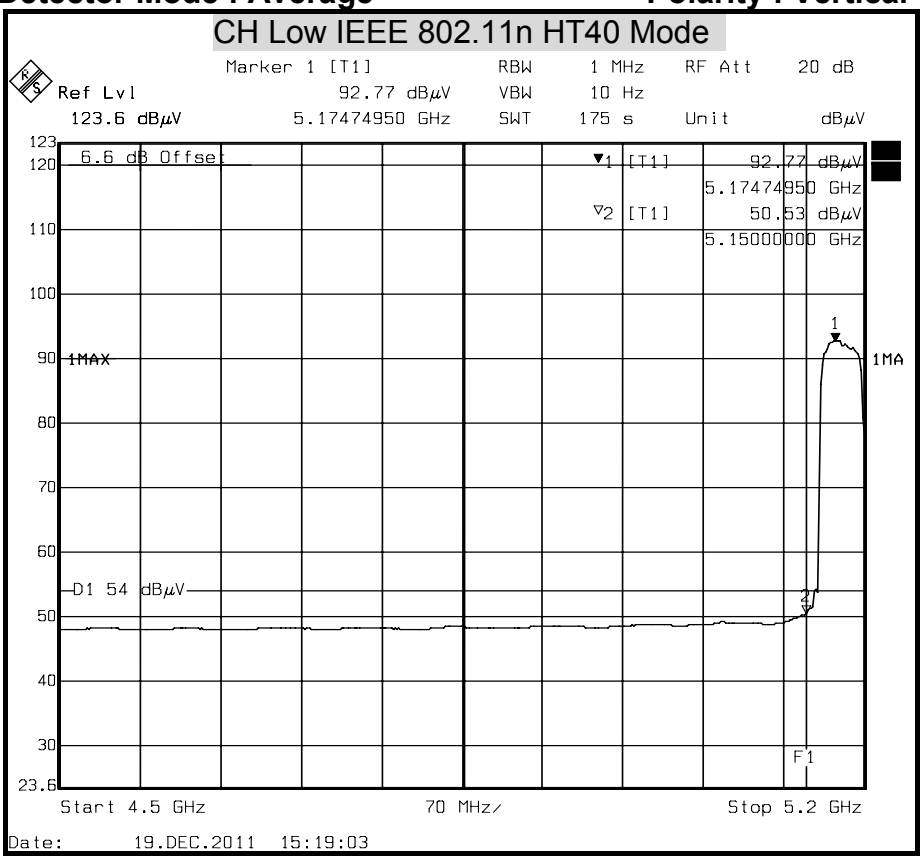
Detector Mode : Average **Polarity : Horizontal**



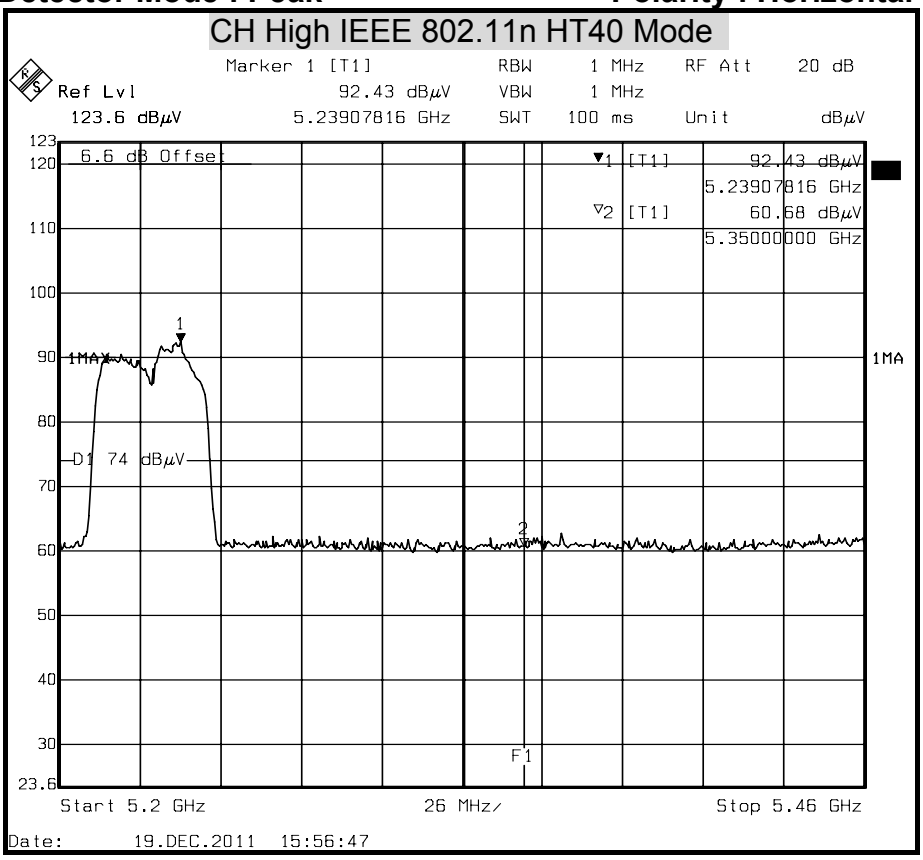
Detector Mode : Peak **Polarity : Vertical**



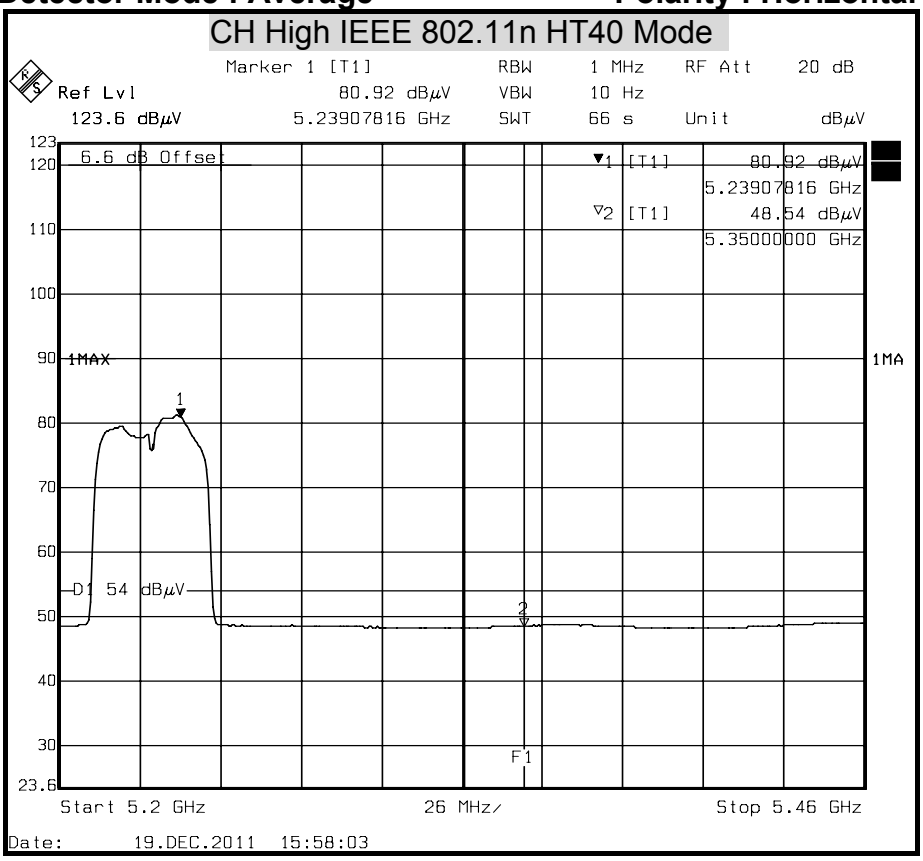
Detector Mode : Average **Polarity : Vertical**



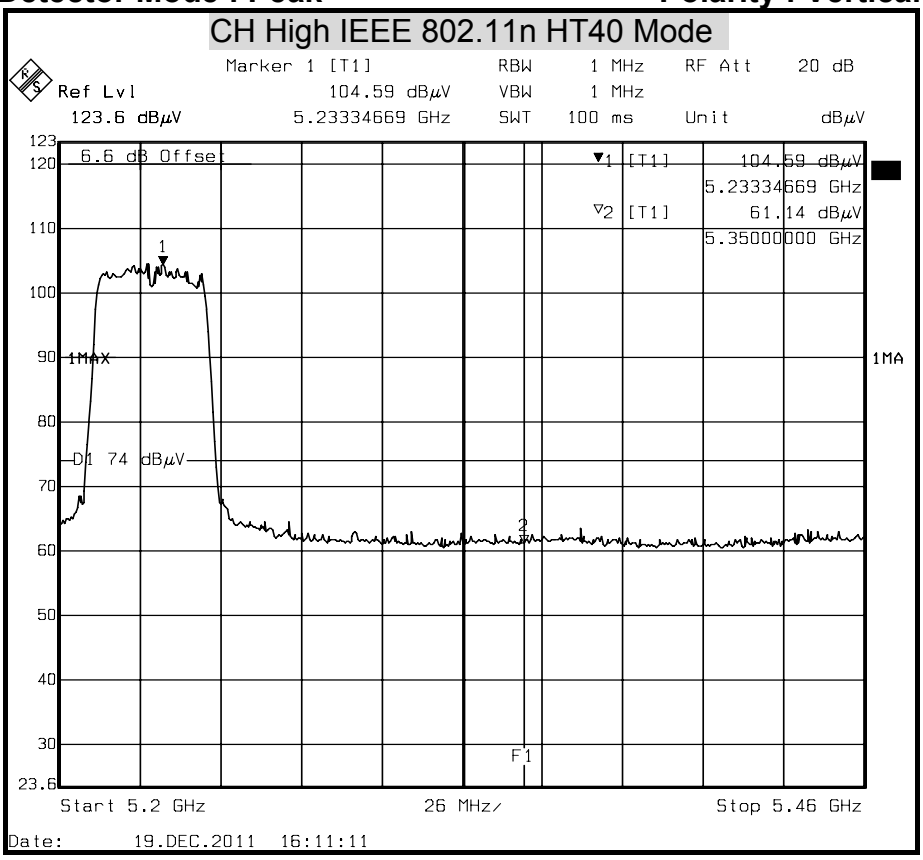
Detector Mode : Peak **Polarity : Horizontal**



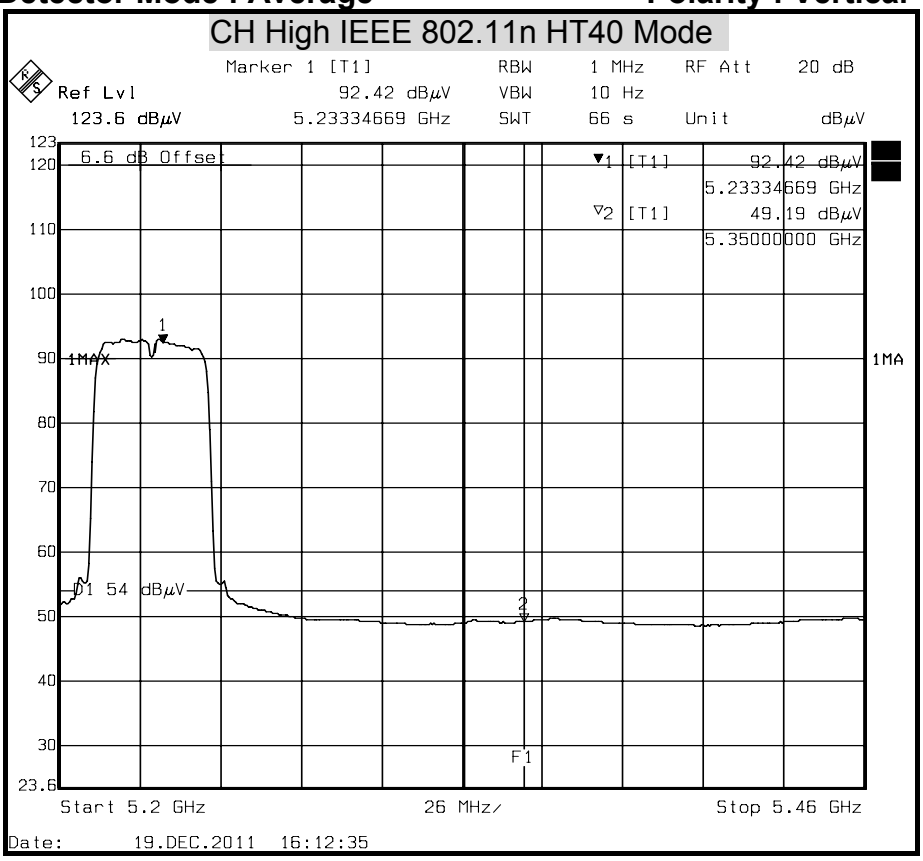
Detector Mode : Average **Polarity : Horizontal**



Detector Mode : Peak **Polarity : Vertical**



Detector Mode : Average **Polarity : Vertical**



7.7 CONDUCTED EMISSION

LIMITS

§ 15.207 (a) Except as shown in paragraph (b) and (c) this section, for an intentional radiator 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, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

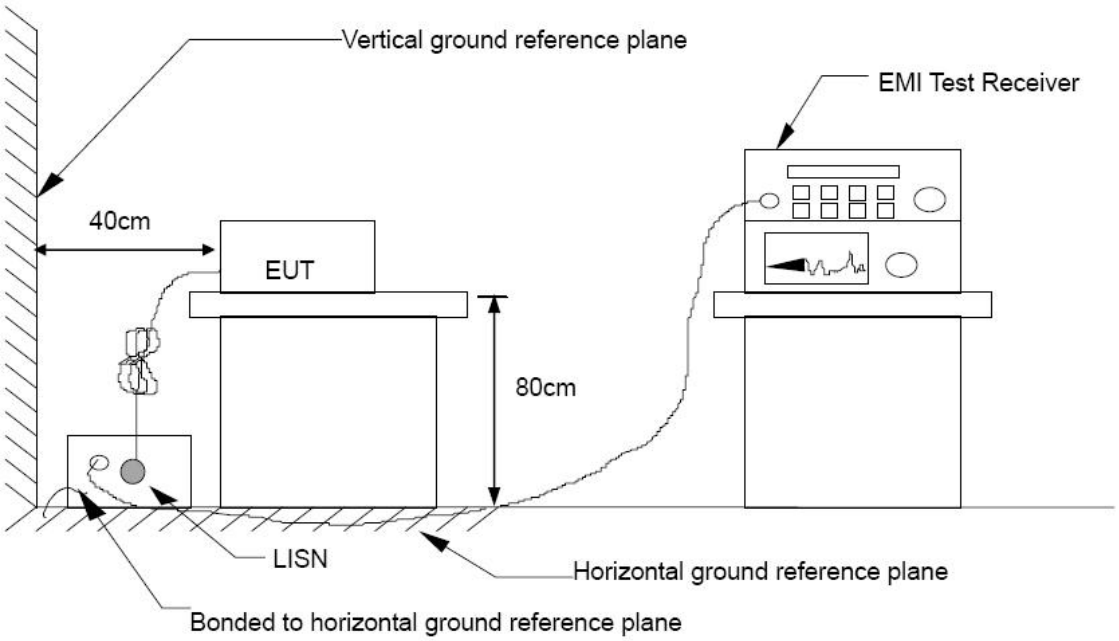
Frequency Range (MHz)	Conducted Limit (dBμv)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5.00	56	46
5.00 - 30.0	60	50

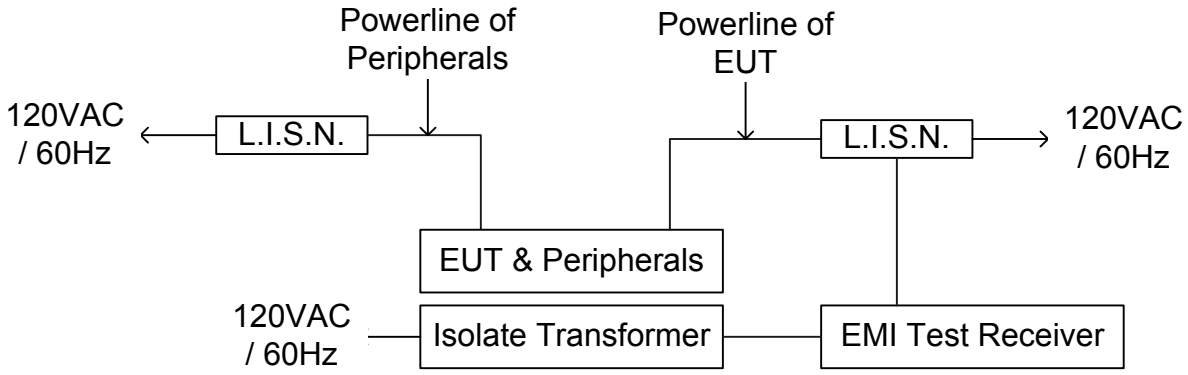
TEST EQUIPMENT

Conducted Emission room #1				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
L.I.S.N.	SCHWARZBECK	NNLK 8130	8130124	SEP. 25, 2012
	Rohde & Schwarz	ESH 3-Z5	840062/021	AUG. 02, 2012
TEST RECEIVER	Rohde & Schwarz	ESCS 30	100348	JUL. 03, 2012
BNC COAXIAL CABLE	CCS	BNC50	11	OCT. 30, 2012
Test S/W	e-3 (5.04211c) R&S (2.27)			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST SETUP





TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.4:2003.

The test procedure is performed in a 4m × 3m × 2.4m (L×W×H) shielded room.

The EUT along with its peripherals were placed on a 1.0m (W) × 1.5m (L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.

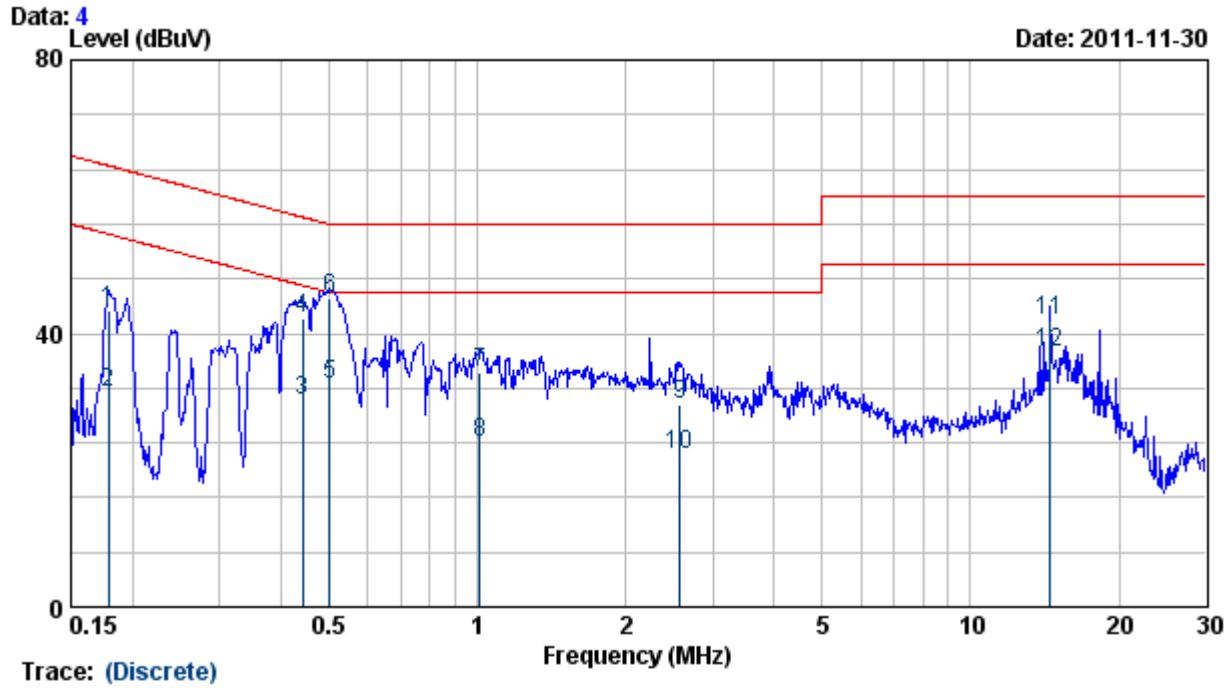
The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.

The EUT was located so that the distance between the boundary of the EUT and the closest surface of the LISN is 0.8 m. Where a mains flexible cord was provided by the manufacturer shall be 1 m long, or if in excess of 1 m, the excess cable was folded back and forth as far as possible so as to form a bundle not exceeding 0.4 m in length.

TEST RESULTS

Product Name	3T3R Wireless-N Dual Band Gigabit Router	Test By	Ted Huang
Model	N450R	Test Date	Nov. 30, 2011
Test Mode	TX Mode	Temp. & Humidity	25.1°C, 67%

LINE



Trace: (Discrete)

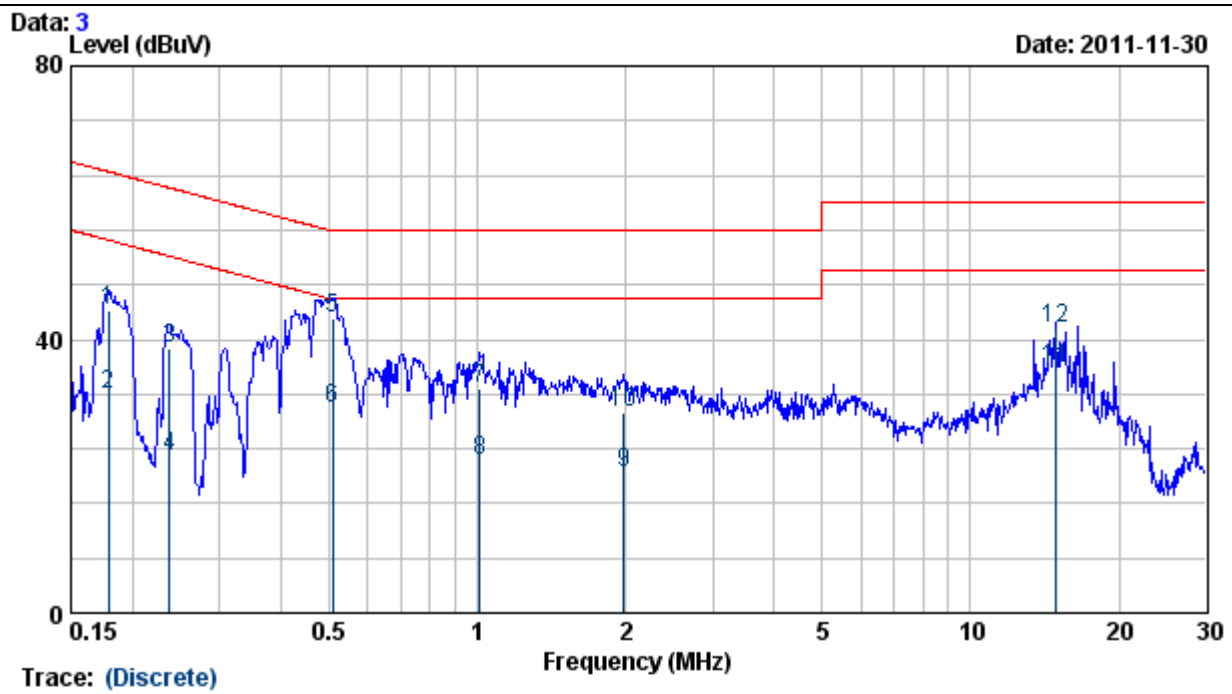
Freq. MHz	LISN Factor dB	Cable Loss dB	Meter Reading dBuV	Measured Level dBuV	Limits dBuV	Over Limits dBuV	Detector
0.18	9.89	0.22	33.40	43.51	64.55	-21.04	QP
0.18	9.89	0.22	21.18	31.29	54.55	-23.26	AVERAGE
0.44	9.99	0.22	20.08	30.30	47.02	-16.73	AVERAGE
0.44	9.99	0.22	32.04	42.26	57.02	-14.77	QP
0.50	10.01	0.23	22.33	32.57	46.00	-13.43	AVERAGE
0.50	10.01	0.23	35.02	45.26	56.00	-10.74	QP
1.01	10.05	0.20	24.14	34.39	56.00	-21.61	QP
1.01	10.05	0.20	13.68	23.93	46.00	-22.07	AVERAGE
2.58	10.00	0.24	19.50	29.74	56.00	-26.26	QP
2.58	10.00	0.24	12.07	22.31	46.00	-23.69	AVERAGE
14.49	10.06	0.26	31.58	41.90	60.00	-18.10	QP
14.49	10.06	0.26	26.90	37.22	50.00	-12.78	AVERAGE

Remark:

1. Correction Factor = Insertion loss + Cable loss
2. Emission level = Reading Value + Correction factor
3. Margin value = Emission level – Limit value

Product Name	3T3R Wireless-N Dual Band Gigabit Router	Test By	Ted Huang
Model	N450R	Test Date	Nov. 30, 2011
Test Mode	TX Mode	Temp. & Humidity	25.1°C, 67%

NEUTRAL



Freq. MHz	LISN Factor dB	Cable Loss dB	Meter Reading dBuV	Measured Level dBuV	Limits dBuV	Over Limits dBuV	Detector
0.18	9.89	0.22	34.18	44.29	64.55	-20.26	QP
0.18	9.89	0.22	21.78	31.89	54.55	-22.66	AVERAGE
0.24	9.93	0.23	28.56	38.72	62.17	-23.45	QP
0.24	9.93	0.23	12.66	22.82	52.17	-29.35	AVERAGE
0.51	10.01	0.23	32.76	43.00	56.00	-13.00	QP
0.51	10.01	0.23	19.77	30.01	46.00	-15.99	AVERAGE
1.01	10.05	0.20	22.58	32.83	56.00	-23.17	QP
1.01	10.05	0.20	12.11	22.36	46.00	-23.64	AVERAGE
1.98	10.05	0.23	10.19	20.47	46.00	-25.53	AVERAGE
1.98	10.05	0.23	18.92	29.20	56.00	-26.80	QP
14.84	10.06	0.25	25.35	35.66	50.00	-14.34	AVERAGE
14.84	10.06	0.25	31.32	41.63	60.00	-18.37	QP

Remark:

1. Correction Factor = Insertion loss + Cable loss
2. Emission level = Reading Value + Correction factor
3. Margin value = Emission level – Limit value

7.8 FREQUENCY STABILITY

LIMITS

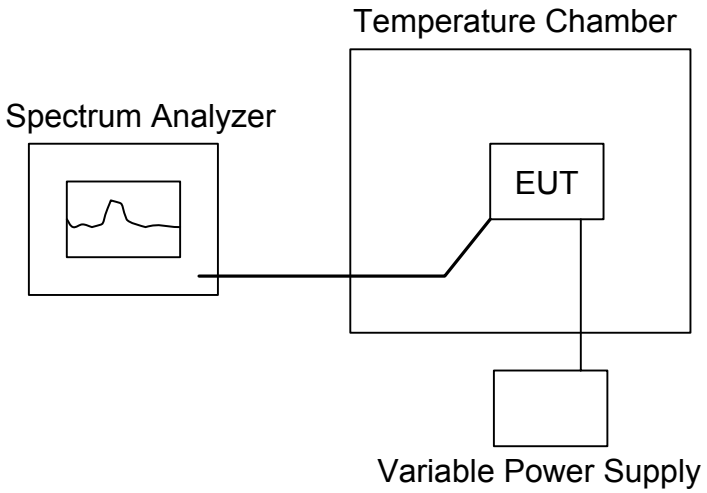
§ 15.407 (g) manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSEK 30	835253/002	SEP. 29, 2012
Temp./Humidity Chamber	K.SON	THS-M1	242	AUG. 09, 2012

Remark: *Each piece of equipment is scheduled for calibration once a year*

TEST SETUP



TEST PROCEDURE

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20℃ operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -20℃. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10℃ increased per stage until the highest temperature of +50℃ reached.

TEST RESULTS

IEEE 802.11a mode

CH Low				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	120	5180.011832	5150-5250	PASS
40		5180.010238	5150~5250	
30		5180.010953	5150~5250	
20		5180.011349	5150~5250	
10		5180.011542	5150~5250	
0		5180.011832	5150~5250	
-10		5180.011714	5150~5250	
-20		5180.011936	5150~5250	
20	108	5180.011743	5150~5250	PASS
	120	5180.011639	5150~5250	
	132	5180.010650	5150~5250	

CH Middle				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	120	5220.008426	5150~5250	PASS
40		5220.006111	5150~5250	
30		5220.009424	5150~5250	
20		5220.007692	5150~5250	
10		5220.012636	5150~5250	
0		5220.010366	5150~5250	
-10		5220.011370	5150~5250	
-20		5220.009472	5150~5250	
20	108	5220.010362	5150~5250	PASS
	120	5220.009510	5150~5250	
	132	5220.011325	5150~5250	

CH High				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	120	5240.007624	5150~5250	PASS
40		5240.009620	5150~5250	
30		5240.009444	5150~5250	
20		5240.008624	5150~5250	
10		5240.090418	5150~5250	
0		5240.011526	5150~5250	
-10		5240.012395	5150~5250	
-20		5240.010547	5150~5250	
20	108	5240.009473	5150~5250	PASS
	120	5240.007450	5150~5250	
	132	5540.010488	5150~5250	

IEEE 802.11n HT20 mode

CH Low				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	120	5180.006610	5150~5250	PASS
40		5180.004325	5150~5250	
30		5180.009324	5150~5250	
20		5180.010299	5150~5250	
10		5180.010650	5150~5250	
0		5180.012701	5150~5250	
-10		5180.013527	5150~5250	
-20		5180.012354	5150~5250	
20	108	5180.011743	5150~5250	PASS
	120	5180.011639	5150~5250	
	132	5180.010650	5150~5250	

CH Middle				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	120	5220.010324	5150~5250	PASS
40		5220.009498	5150~5250	
30		5220.007047	5150~5250	
20		5220.006941	5150~5250	
10		5220.011517	5150~5250	
0		5220.007584	5150~5250	
-10		5220.009149	5150~5250	
-20		5220.008450	5150~5250	
20	108	5220.009413	5150~5250	PASS
	120	5220.010980	5150~5250	
	132	5220.012153	5150~5250	

CH High				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	120	5240.008412	5150~5250	PASS
40		5240.009640	5150~5250	
30		5240.007358	5150~5250	
20		5240.007488	5150~5250	
10		5240.010366	5150~5250	
0		5240.011258	5150~5250	
-10		5240.010116	5150~5250	
-20		5240.009340	5150~5250	
20	108	5240.010358	5150~5250	PASS
	120	5240.009974	5150~5250	
	132	5240.008203	5150~5250	

IEEE 802.11n HT40 mode

CH Low				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	120	5180.007621	5150~5250	PASS
40		5180.008359	5150~5250	
30		5180.008649	5150~5250	
20		5180.009460	5150~5250	
10		5180.010557	5150~5250	
0		5180.009673	5150~5250	
-10		5180.008669	5150~5250	
-20		5180.008470	5150~5250	
20	108	5180.009413	5150~5250	PASS
	120	5180.010622	5150~5250	
	132	5180.010358	5150~5250	

CH Middle				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	120	5200.006944	5150~5250	PASS
40		5200.007983	5150~5250	
30		5200.008310	5150~5250	
20		5200.008846	5150~5250	
10		5200.009322	5150~5250	
0		5200.009410	5150~5250	
-10		5200.009570	5150~5250	
-20		5200.009832	5150~5250	
20	108	5200.008329	5150~5250	PASS
	120	5200.009314	5150~5250	
	132	5200.011207	5150~5250	

CH High				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	120	5230.010352	5150~5250	PASS
40		5230.008657	5150~5250	
30		5230.009460	5150~5250	
20		5230.010391	5150~5250	
10		5230.010298	5150~5250	
0		5230.011490	5150~5250	
-10		5230.008466	5150~5250	
-20		5230.010332	5150~5250	
20	108	5230.004628	5150~5250	PASS
	120	5230.006371	5150~5250	
	132	5230.008647	5150~5250	

APPENDIX I MAXIMUM PERMISSIBLE EXPOSURE

According to FCC 1.1310 : The criteria listed in the following table shall be used to evaluate theenvironment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time
(A) Limits for Occupational / Control Exposures				
300-1,500	--	--	F/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Population / Uncontrol Exposures				
300-1,500	--	--	F/1500	6
1,500-100,000	--	--	1	30

CALCULATIONS

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where *E = Field strength in Volts / meter*
P = Power in Watts
G = Numeric antenna gain
d = Distance in meters
S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and
d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$

Where *d = Distance in cm*
P = Power in mW
G = Numeric antenna gain
S = Power density in mW / cm2

LIMIT

Power Density Limit, S=1.0mW/cm^2

TEST RESULTS

Once Antenna Gain: 4.13 dBi = 2.588213 mW

No non-compliance noted: (MPE distance equals 20 cm)

IEEE 802.11a	=	0.0796 *	2.8054	*	2.58821292	÷ 400 =	0.001445
IEEE 802.11n HT20	=	0.0796 *	10.9722	*	2.58821292	÷ 400 =	0.005651
IEEE 802.11n HT40	=	0.0796 *	18.8768	*	2.58821292	÷ 400 =	0.009723

Mode	Antenna Gain (dBi)	Minimum separation distance (cm)	Output Power (dBm)	Numeric antenna gain (mW)	Power Density Limit (mW/cm^2)	Power Density at 20cm (mW/cm^2)
IEEE 802.11a	4.13	20.0	4.48	2.81	1.00	0.001445
IEEE 802.11n HT20	4.13	20.0	10.40	10.97	1.00	0.005651
IEEE 802.11n HT40	4.13	20.0	12.76	18.88	1.00	0.009723

Remark: *For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm^2 even if the calculation indicates that the power density would be larger.*