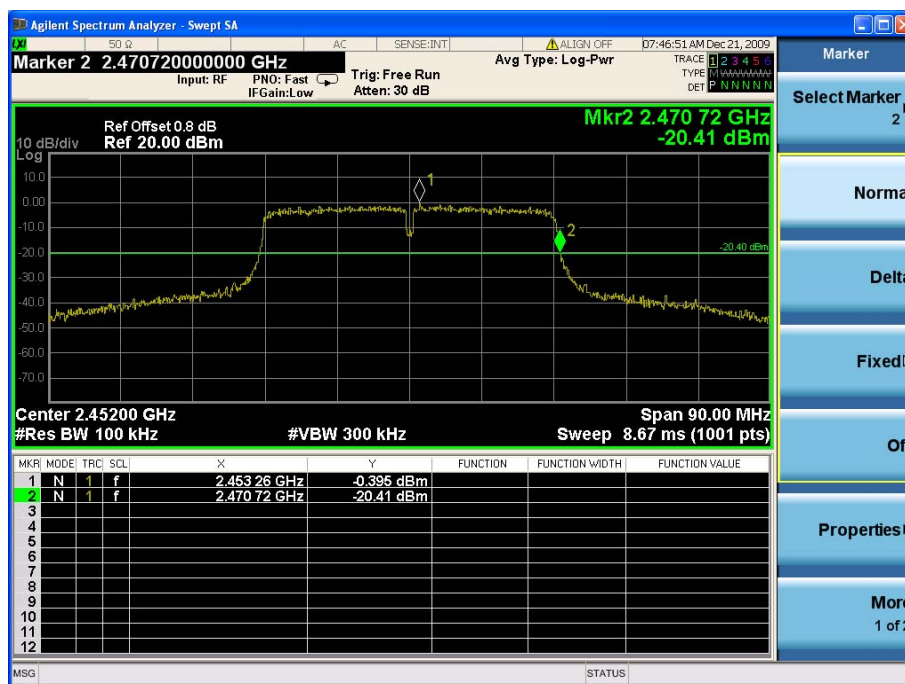


Product	:	Home Gateway
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Mode	:	Mode 4: Transmit at 802.11n (40MHz) (Chain 1)

Channel 03 (2422MHz)



Channel 09 (2452MHz)



8. Occupied Bandwidth

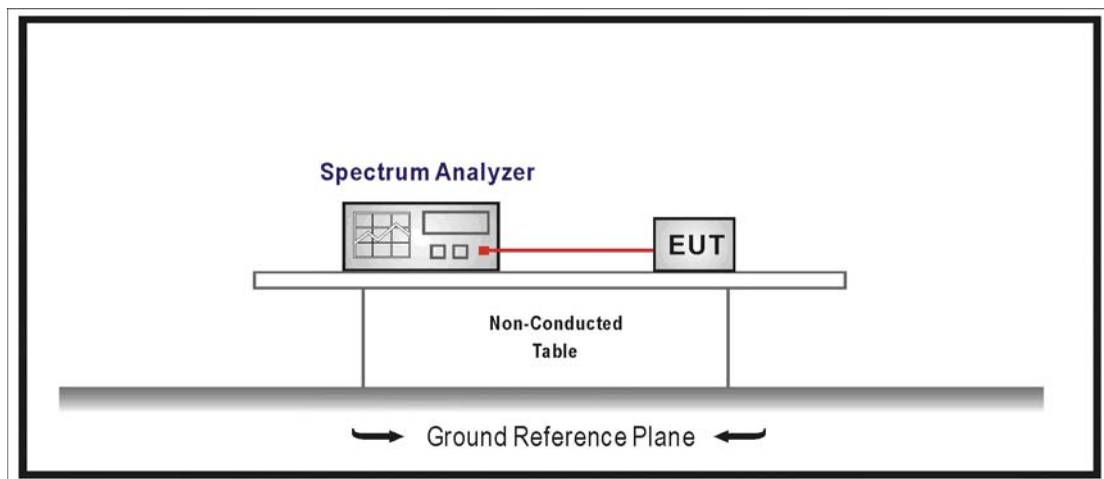
8.1. Test Equipment

Occupied Bandwidth / AC-6

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	N9020A	MY49100159	2009/05/06
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2009/03/30

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

8.2. Test Setup



8.3. Limit

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

8.4. Test Procedure

The EUT was tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Span greater than RBW.

8.5. Uncertainty

The measurement uncertainty is defined as ± 1 kHz

Product	:	Home Gateway
Test Item	:	6dB Occupied Bandwidth
Test Mode	:	Mode 1: Transmit by 802.11b (Chain 0)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	12031	500	Pass
06	2437	12081	500	Pass
11	2462	12056	500	Pass



Channel 06 (2437MHz)



Channel 11 (2462MHz)



Product	:	Home Gateway
Test Item	:	6dB Occupied Bandwidth
Test Mode	:	Mode 2: Transmit by 802.11g (Chain 0)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	16508	500	Pass
06	2437	16483	500	Pass
11	2462	16508	500	Pass

Channel 01 (2412MHz)



Channel 06 (2437MHz)



Channel 11 (2462MHz)



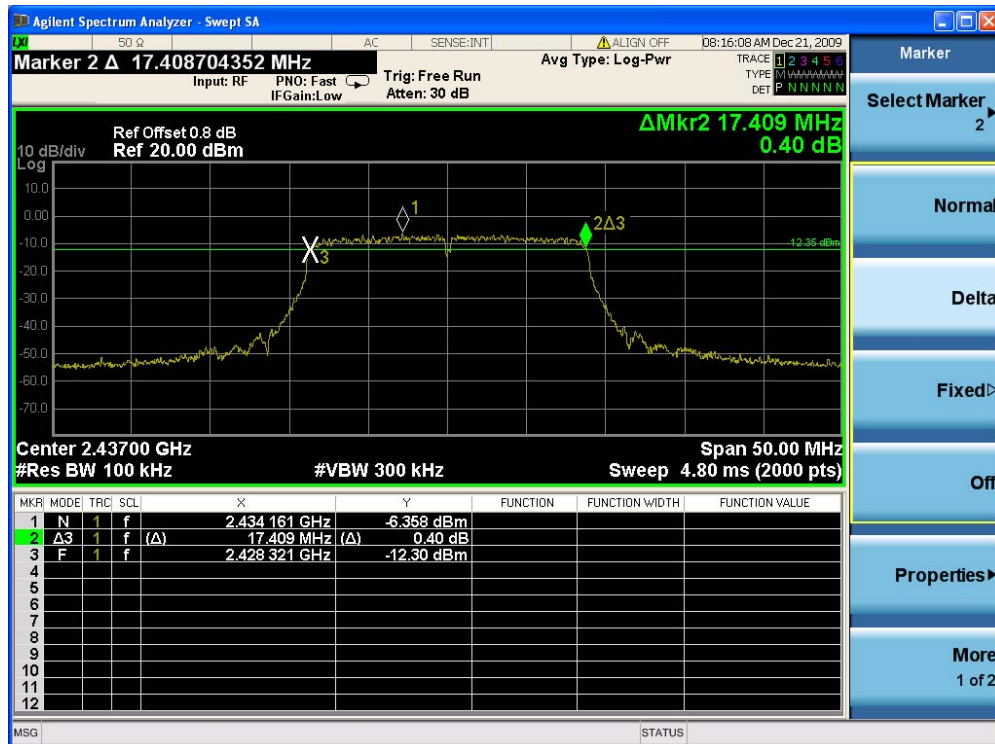
Product	:	Home Gateway
Test Item	:	6dB Occupied Bandwidth
Test Mode	:	Mode 3: Transmit by 802.11n (20MHz) (Chain 0)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	17584	500	Pass
06	2437	17409	500	Pass
11	2462	17409	500	Pass

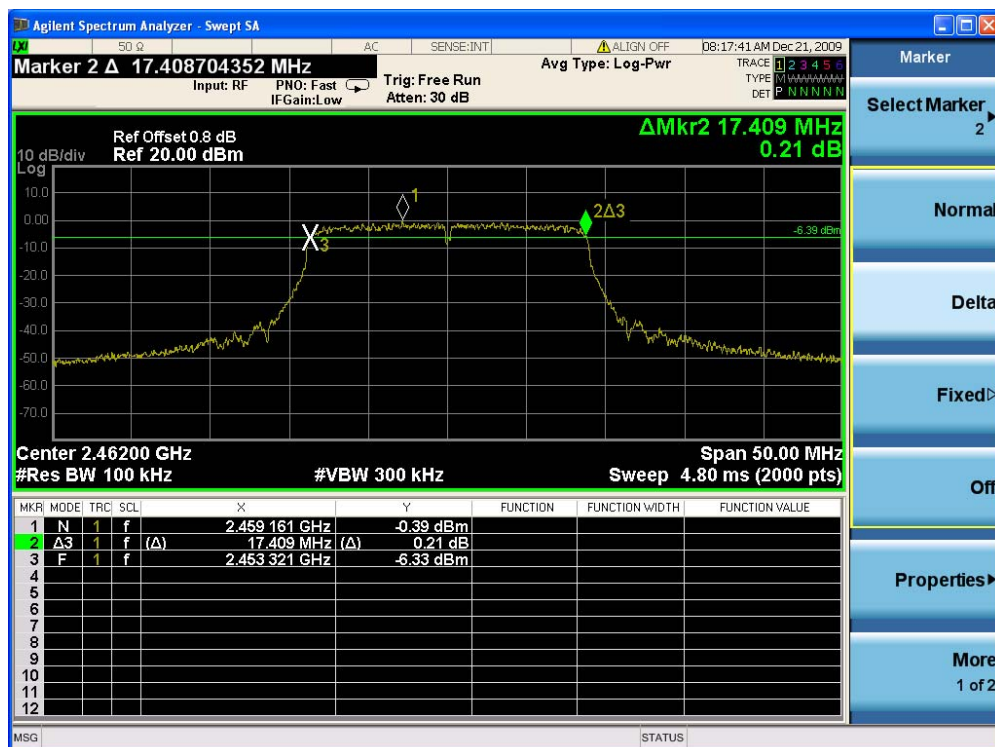
Channel 01 (2412MHz)



Channel 06 (2437MHz)



Channel 11 (2462MHz)



Product	:	Home Gateway
Test Item	:	6dB Occupied Bandwidth
Test Mode	:	Mode 4: Transmit by 802.11n (40MHz) (Chain 0)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
03	2422	36200	500	Pass
06	2437	36200	500	Pass
09	2452	36290	500	Pass

Channel 03 (2422MHz)



Agilent Spectrum Analyzer - Sweep SA

Frequency: 36.198099050 MHz
 Input: RF PNO: Fast IF Gain: Low Trig: Free Run Atten: 30 dB
 AC SENSE: INT ALIGN OFF DB: 26:15 AM Dec 21, 2009

Avg Type: Log-Pwr Ref Offset 0.8 dB Ref 20.00 dBm

Marker 2 Δ 36.20 MHz -0.22 dB

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.441 75 GHz	-4.325 dBm			
2	Δ3	1	f (Δ)	36.20 MHz	-0.22 dB			
3	F	1	f	2.419 04 GHz	-10.12 dBm			

Agilent Spectrum Analyzer - Sweep SA

Frequency: 36.288144072 MHz
 Input: RF PNO: Fast IFGain: Low Trig: Free Run Atten: 30 dB
 Avg Type: Log-Pwr Ref Offset 0.8 dB Ref 20.00 dBm

Span 90.00 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 8.66 ms (2000 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f	f	2.456 75 GHz	-4.095 dBm			
2	Δ3	f	(Δ)	36.29 MHz	0.39 dB			
3	F	f	f	2.433 90 GHz	-10.38 dBm			

Product	:	Home Gateway
Test Item	:	Occupied Bandwidth
Test Mode	:	Mode 1: Transmit by 802.11b (Chain 1)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	12056	500	Pass
06	2437	12006	500	Pass
11	2462	12006	500	Pass

Channel 01 (2412MHz)



Channel 06 (2437MHz)



Channel 11 (2462MHz)



Product	:	Home Gateway
Test Item	:	Occupied Bandwidth
Test Mode	:	Mode 2: Transmit at 802.11g (Chain 1)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	16483	500	Pass
06	2437	16458	500	Pass
11	2462	16508	500	Pass

Channel 01 (2412MHz)



Channel 06 (2437MHz)



Channel 11 (2462MHz)



Product	:	Home Gateway
Test Item	:	Occupied Bandwidth
Test Mode	:	Mode 3: Transmit at 802.11n (20MHz) (Chain 1)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	17459	500	Pass
06	2437	17409	500	Pass
11	2462	17334	500	Pass

Channel 01 (2412MHz)



Channel 06 (2437MHz)



Channel 11 (2462MHz)



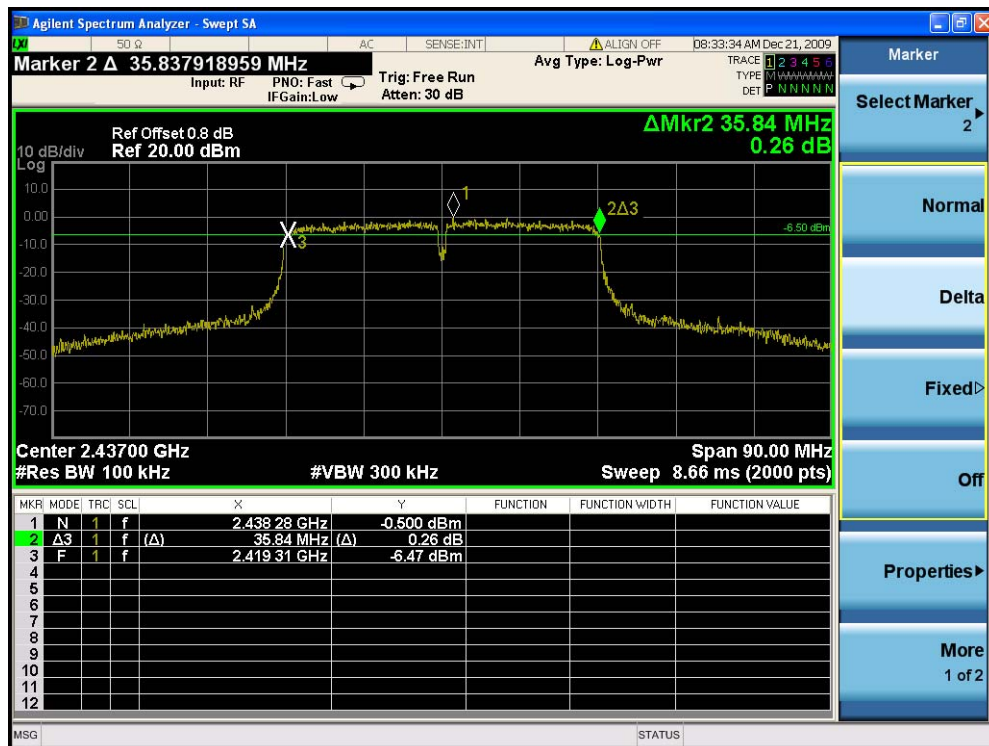
Product	:	Home Gateway
Test Item	:	Occupied Bandwidth
Test Mode	:	Mode 4: Transmit at 802.11n (40MHz) (Chain 1)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
03	2422	35790	500	Pass
06	2437	35840	500	Pass
09	2452	35790	500	Pass

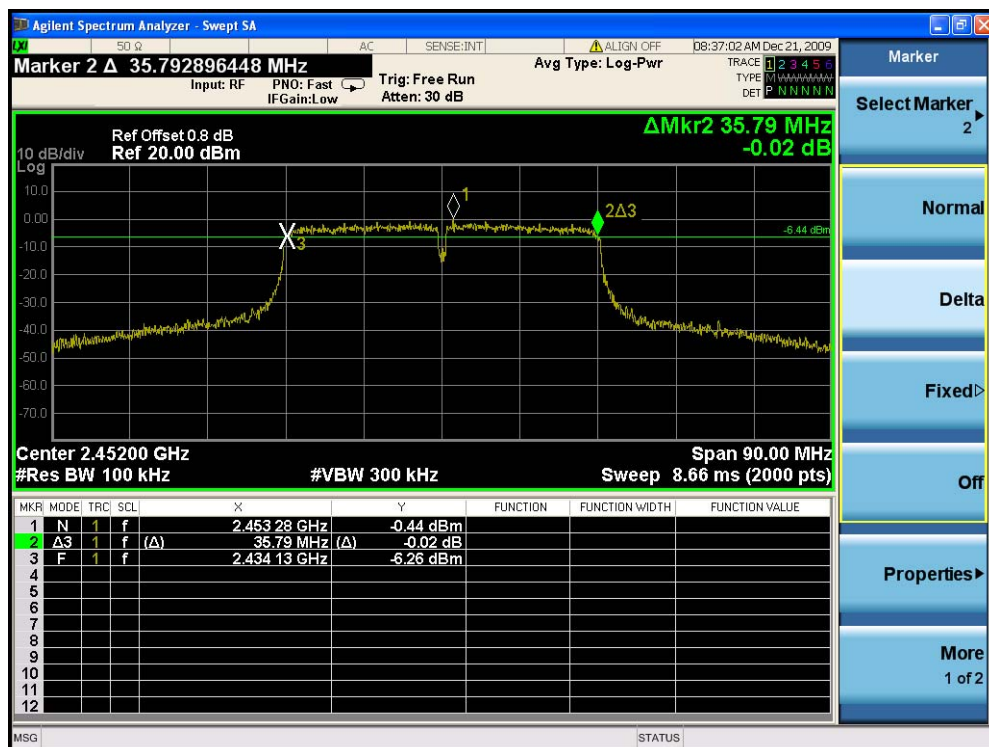
Channel 03 (2422MHz)



Channel 06 (2437MHz)



Channel 09 (2452MHz)



9. Power Output

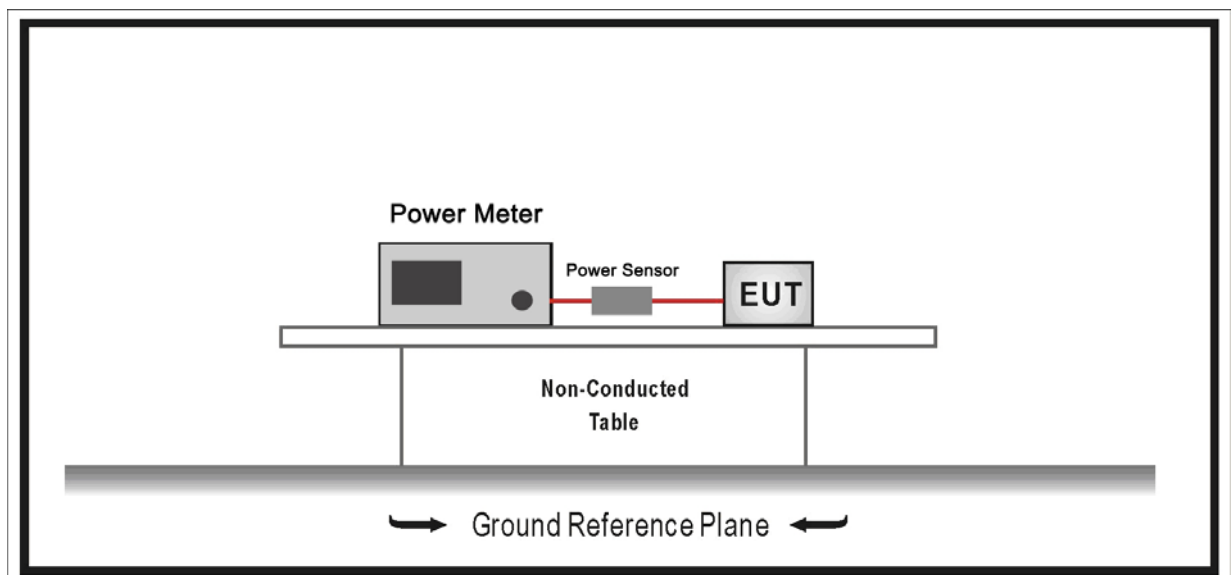
9.1. Test Equipment

Power Output / AC-6

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Wideband Peak Power Meter	Anritsu	ML2495A	0905006	2009/02/12
Power Sensor	Anritsu	MA2411B	0846014	2009/01/12
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2009/03/09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

9.2. Test Setup



9.3. Limit

The maximum peak power shall be less 1 Watt (30dBm).

Note: the conducted output power limit specified above is based on the use the antennas with directional gains that do not exceed 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values above, as appropriate, by the amount in dB that the directional gain of antenna exceeds 6 dBi.

9.4. Test Procedure

The EUT was tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Use the wideband power meter to test peak power and record the result.

9.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

9.6. Test Result

Power output test was verified over all data rates of each mode shown as below, and then choose the maximum power output (blue marker) for final test of each channel.

MCS Index for 802.11n	Spatial Streams	Data Rate (Mbps)					
		802.11b	802.11g	20MHz Bandwidth		40MHz Bandwidth	
				800ns GI	400ns GI	800ns GI	400ns GI
0	1	1	6	6.5	7.2	13.5	15.0
1	1	2	9	13.0	14.4	27.0	30.0
2	1	5.5	12	19.5	21.7	40.5	45.0
3	1	11	18	26.0	28.9	54.0	60.0
4	1	---	24	39.0	43.3	81.0	90.0
5	1	---	36	52.0	57.8	108.0	120.0
6	1	---	48	58.5	65.0	121.5	135.0
7	1	---	54	65.0	72.2	135.0	150.0

Power output at various data rates:

Test Mode	Chain	Frequency (MHz)	Channel	Data Rate	Peak Power (dBm)
802.11b	0	2437	6	1	11.73
				2	11.65
				5.5	11.52
				11	11.43
802.11g	0	2437	6	6	17.76
				9	17.64
				12	17.56
				18	17.43
				24	17.28
				36	17.16
				48	17.04
				54	16.82
802.11n (20M)	0	2437	6	6.5	17.89
				13.0	17.72
				19.5	17.54
				26.0	17.35
				39.0	17.23
				52.0	17.14
				58.5	17.02
				65.0	16.79
802.11n (40M)	0	2437	6	13.5	19.81
				27.0	19.58
				40.5	19.32
				54.0	19.06
				81.0	18.78
				108.0	18.52
				121.5	18.19
				135.0	17.75

Product	:	Home Gateway
Test Item	:	Power Output
Test Mode	:	Mode 1: Transmit by 802.11b(Chain 0)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Cable Loss (dBm)	Total Power (dBm)	Limit (dBm)	Result
1	2412	16.37	0.8	17.17	30.00	Pass
6	2437	10.93	0.8	11.73	30.00	Pass
11	2462	17.00	0.8	17.80	30.00	Pass

Product	:	Home Gateway
Test Item	:	Power Output
Test Mode	:	Mode 1: Transmit by 802.11b(Chain 1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Cable Loss (dBm)	Total Power (dBm)	Limit (dBm)	Result
1	2412	12.65	0.8	13.45	30.00	Pass
6	2437	13.85	0.8	13.65	30.00	Pass
11	2462	13.88	0.8	14.68	30.00	Pass

Product	:	Home Gateway
Test Item	:	Power Output
Test Mode	:	Mode 2: Transmit by 802.11g(Chain 0)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Cable Loss (dBm)	Total Power (dBm)	Limit (dBm)	Result
1	2412	22.45	0.8	23.25	30.00	Pass
6	2437	16.96	0.8	17.76	30.00	Pass
11	2462	23.05	0.8	23.85	30.00	Pass

Product	:	Home Gateway
Test Item	:	Power Output
Test Mode	:	Mode 2: Transmit by 802.11g(Chain 1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Cable Loss (dBm)	Total Power (dBm)	Limit (dBm)	Result
1	2412	21.32	0.8	22.12	30.00	Pass
6	2437	22.36	0.8	23.16	30.00	Pass
11	2462	21.98	0.8	22.78	30.00	Pass

Product	:	Home Gateway
Test Item	:	Power Output
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz) (Chain 0)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Cable Loss (dBm)	Total Power (dBm)	Limit (dBm)	Result
1	2412	21.26	0.8	22.06	30.00	Pass
6	2437	17.09	0.8	17.89	30.00	Pass
11	2462	21.82	0.8	22.62	30.00	Pass

Product	:	Home Gateway
Test Item	:	Power Output
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz) (Chain 1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Cable Loss (dBm)	Total Power (dBm)	Limit (dBm)	Result
1	2412	20.42	0.8	21.22	30.00	Pass
6	2437	21.28	0.8	22.08	30.00	Pass
11	2462	21.32	0.8	22.12	30.00	Pass

Product	:	Home Gateway
Test Item	:	Power Output
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz) (Chain 0+1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Cable Loss (dBm)	Total Power (dBm)	Limit (dBm)	Result
		Chain 0	Chain 1				
1	2412	21.12	20.20	0.8	24.49	30.00	Pass
6	2437	16.87	21.09	0.8	23.28	30.00	Pass
11	2462	21.71	21.47	0.8	25.40	30.00	Pass

Product	:	Home Gateway
Test Item	:	Power Output
Test Mode	:	Mode 4: Transmit by 802.11n(40MHz) (Chain 0)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Cable Loss (dBm)	Total Power (dBm)	Limit (dBm)	Result
3	2422	18.81	0.8	19.61	30.00	Pass
6	2437	19.01	0.8	19.81	30.00	Pass
9	2452	19.04	0.8	19.84	30.00	Pass

Product	:	Home Gateway
Test Item	:	Power Output
Test Mode	:	Mode 4: Transmit by 802.11n(40MHz) (Chain 1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Cable Loss (dBm)	Total Power (dBm)	Limit (dBm)	Result
3	2422	21.12	0.8	21.92	30.00	Pass
6	2437	21.43	0.8	22.23	30.00	Pass
9	2452	21.60	0.8	22.40	30.00	Pass

Product	:	Home Gateway
Test Item	:	Power Output
Test Mode	:	Mode 4: Transmit by 802.11n(40MHz) (Chain 0+1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Cable Loss (dBm)	Total Power (dBm)	Limit (dBm)	Result
		Chain 0	Chain 1				
3	2422	18.61	20.87	0.8	23.70	30.00	Pass
6	2437	18.90	21.31	0.8	24.08	30.00	Pass
9	2452	19.10	21.41	0.8	24.22	30.00	Pass

10. Power Spectral Density

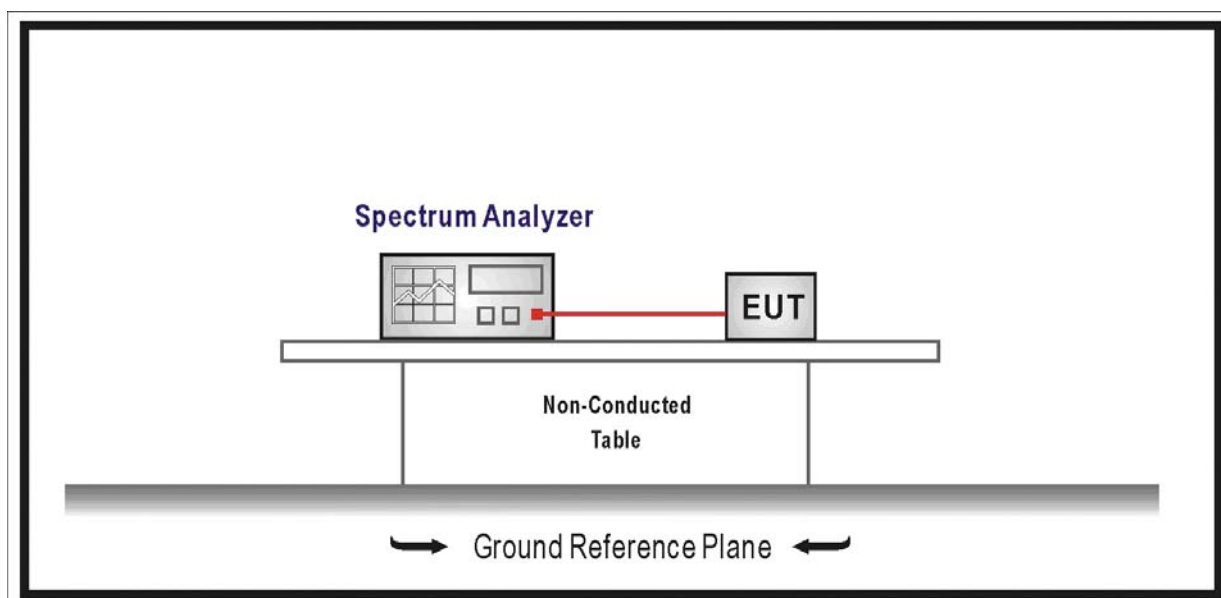
10.1. Test Equipment

Power Spectral Density / AC-6

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	N9020A	MY49100159	2009/05/06
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH007	2009/03/30

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

10.2. Test Setup



10.3. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiated to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

10.4. Test Procedure

The EUT was tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW= 3 kHz, Set VBW $\geq$ 10 kHz, Sweep time=100s, Set detector=Peak detector.

10.5. Uncertainty

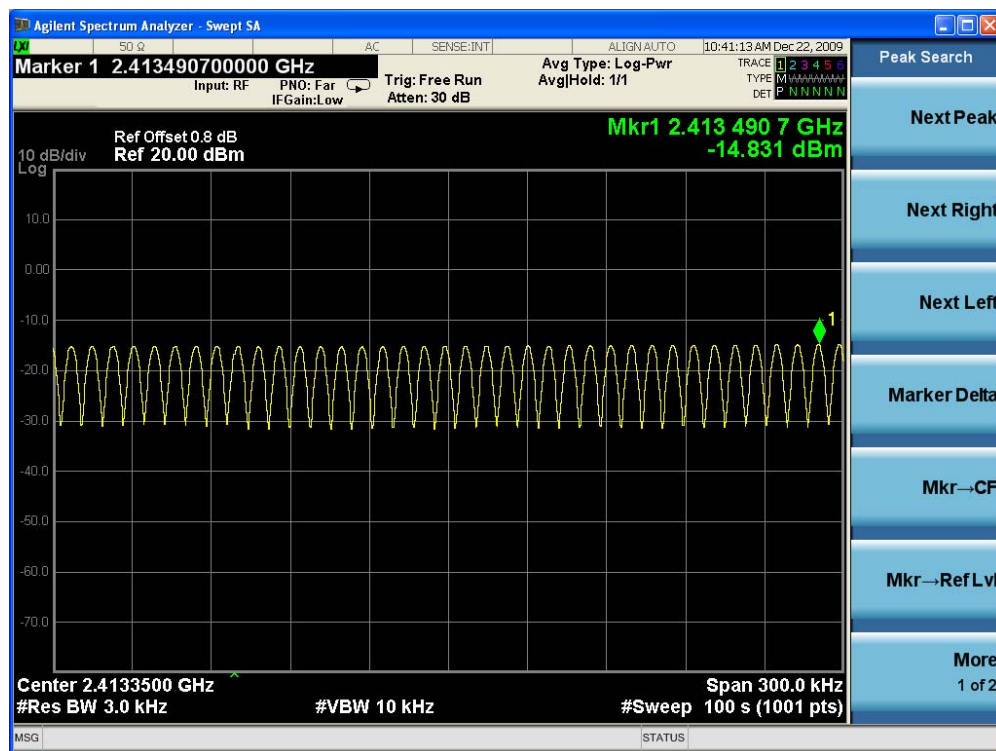
The measurement uncertainty is defined as ± 1.27 dB

10.6. Test Result

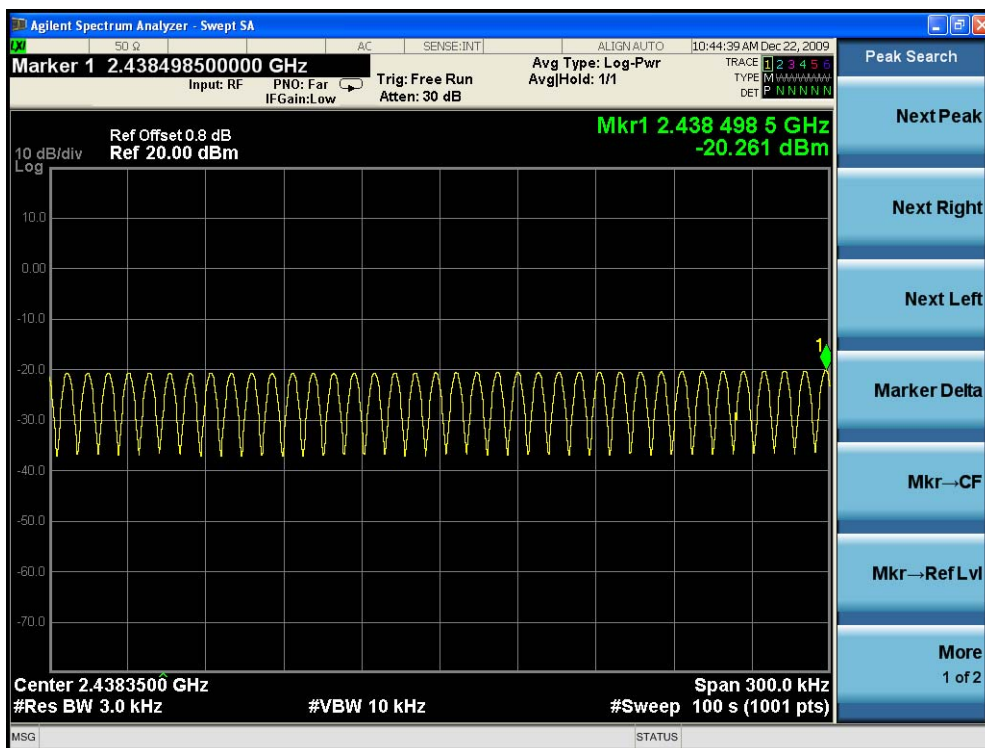
Product	:	Home Gateway
Test Item	:	Power Spectral Density
Test Mode	:	Mode 1: Transmit at 802.11b (Chain 0)

Channel No.	Frequency (MHz)	Measurement PPSD (dBm)		Total PPSD (dBm)	Limit (dBm/3kHz)	Result
		Chain 0	Chain 1			
01	2412	-14.83	N/A	-14.83	8	Pass
06	2437	-20.26	N/A	-20.26	8	Pass
11	2462	-14.15	N/A	-14.15	8	Pass

Channel 01 (2412MHz)



Channel 06 (2437MHz)



Channel 11 (2462MHz)

