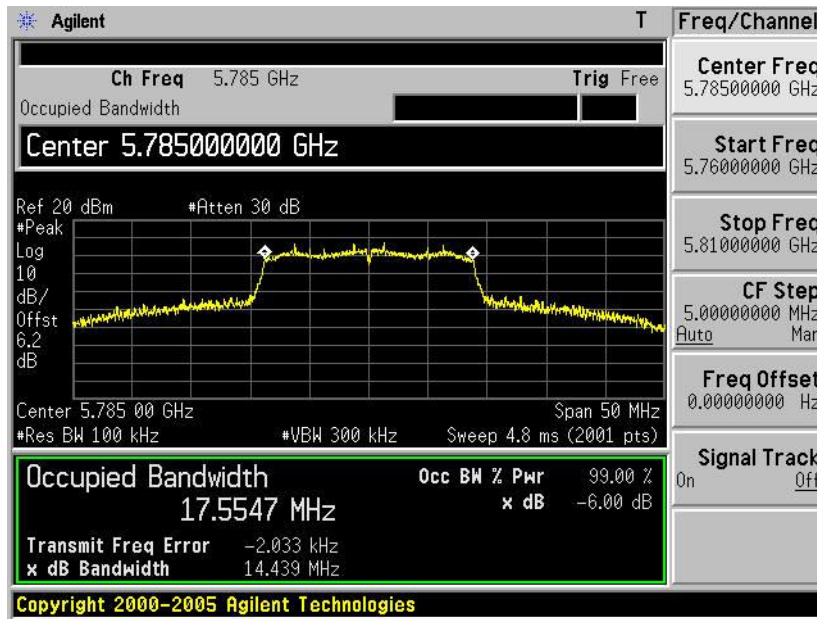
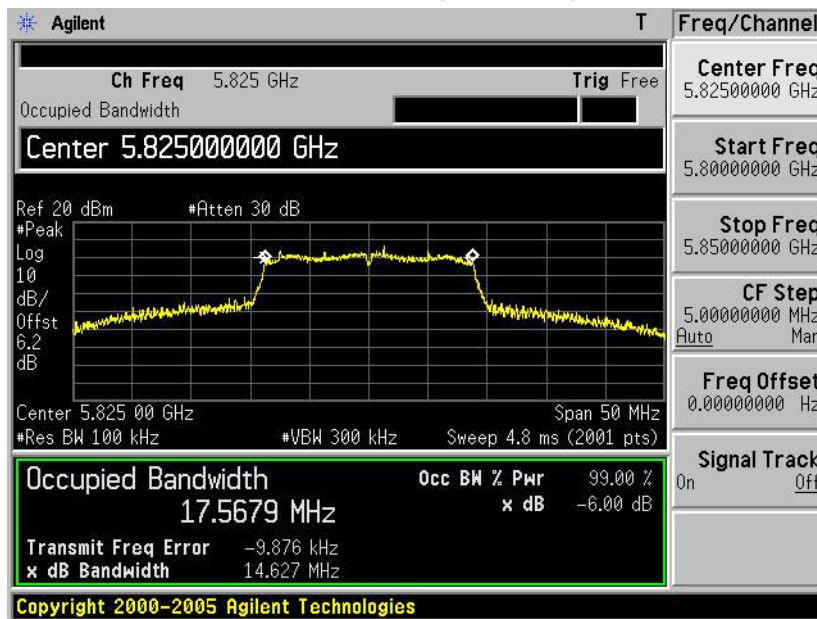


Channel 157 (5785MHz)



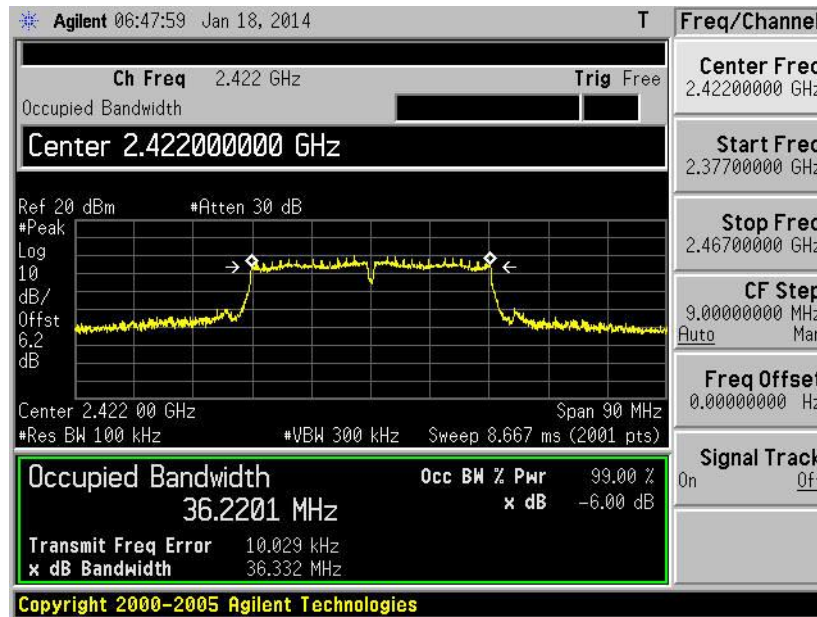
Channel 165 (5825MHz)



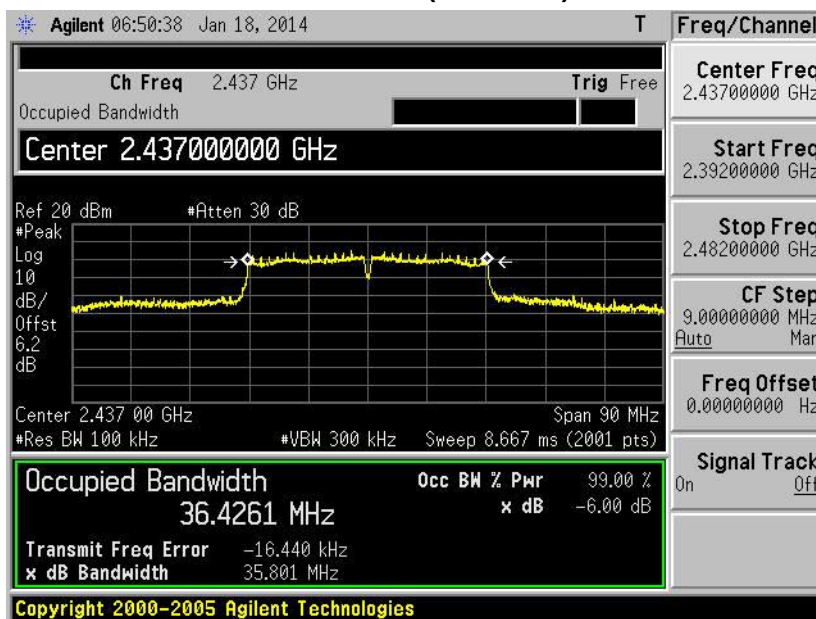
Product	: IP-STB
Test Item	: 6dB Occupied Bandwidth
Test Site	: TR-8
Test Mode	: Mode 6: Transmit by 802.11n(40MHz) (Ant 0)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
03	2422	36332	500	Pass
06	2437	35801	500	Pass
09	2452	36109	500	Pass
151	5755	36312	500	Pass
159	5795	36004	500	Pass

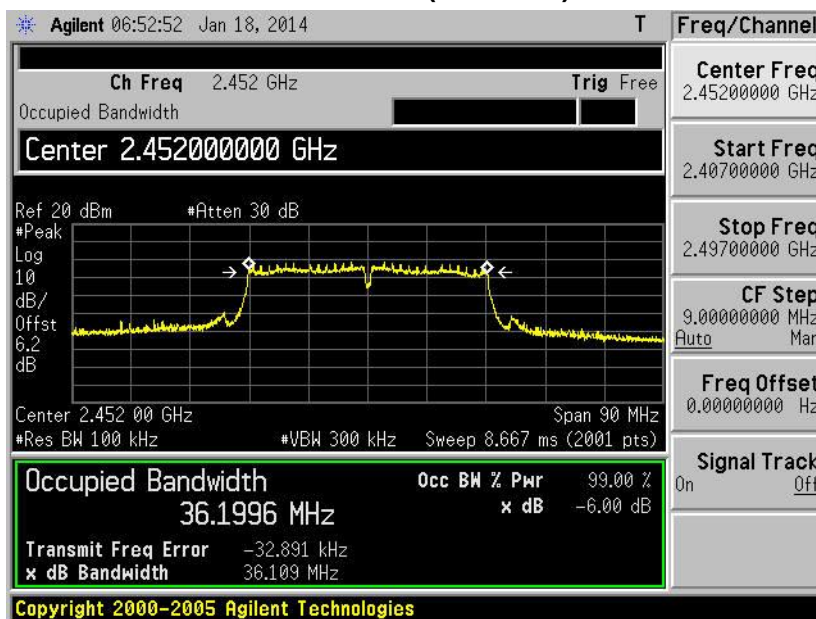
Channel 03 (2422MHz)



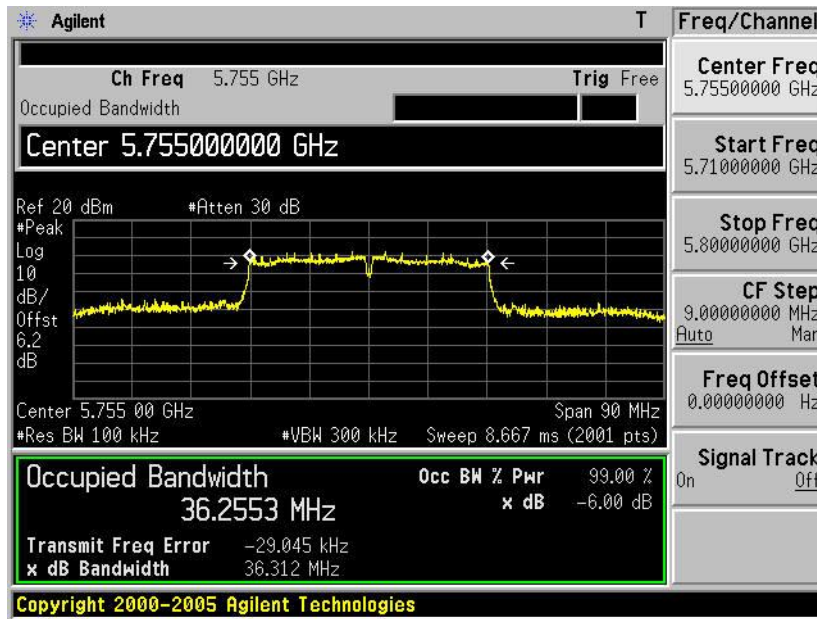
Channel 06 (2437MHz)



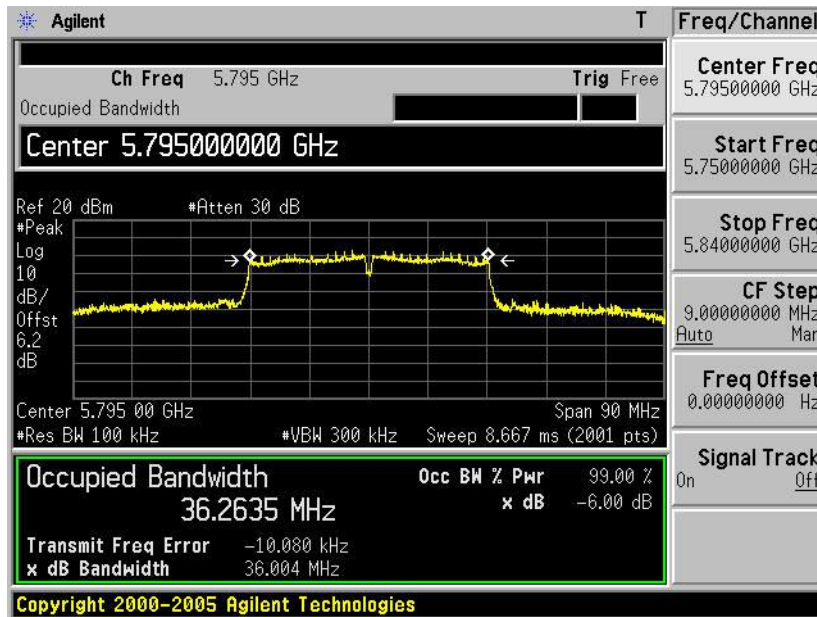
Channel 09 (2452MHz)



Channel 151 (5755MHz)



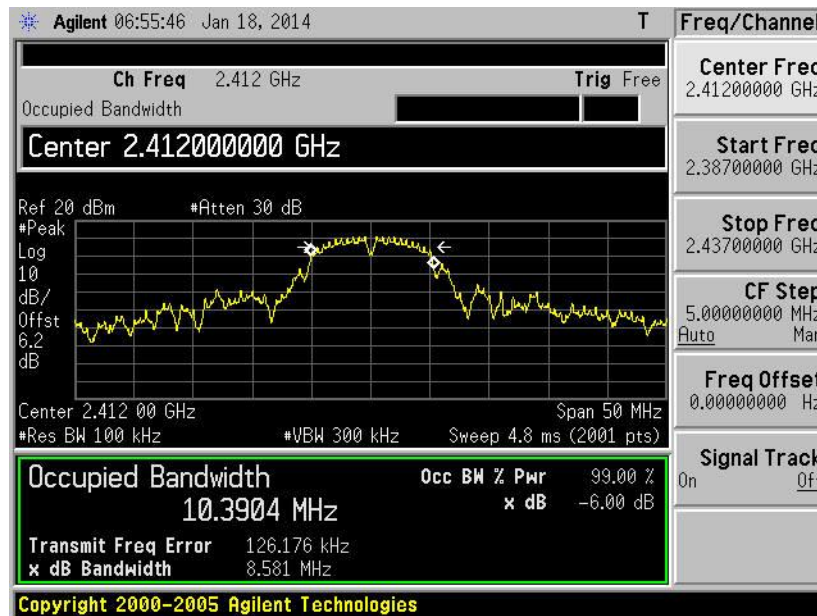
Channel 159 (5795MHz)



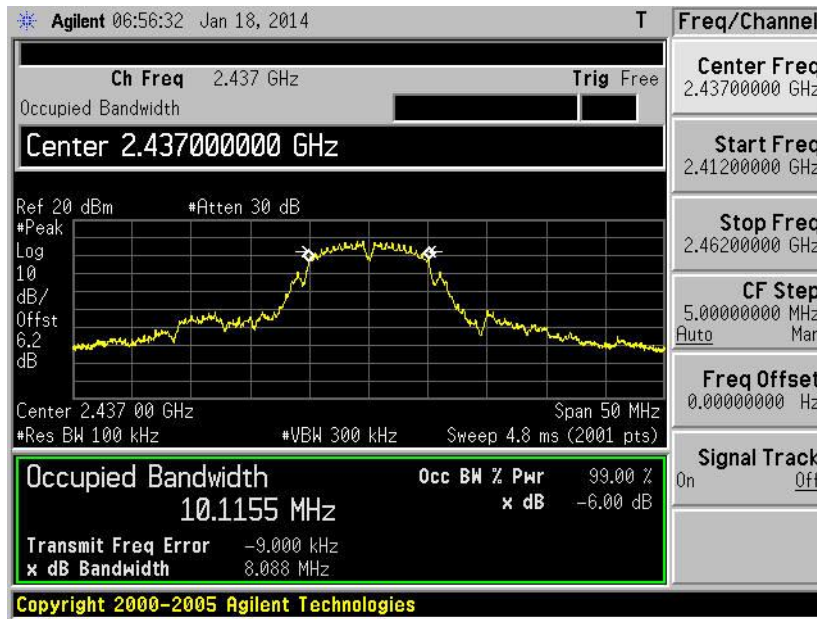
Product	: IP-STB
Test Item	: 6dB Occupied Bandwidth
Test Site	: TR-8
Test Mode	: Mode 1: Transmit by 802.11b (Ant 1)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	8581	500	Pass
06	2437	8088	500	Pass
11	2462	8096	500	Pass

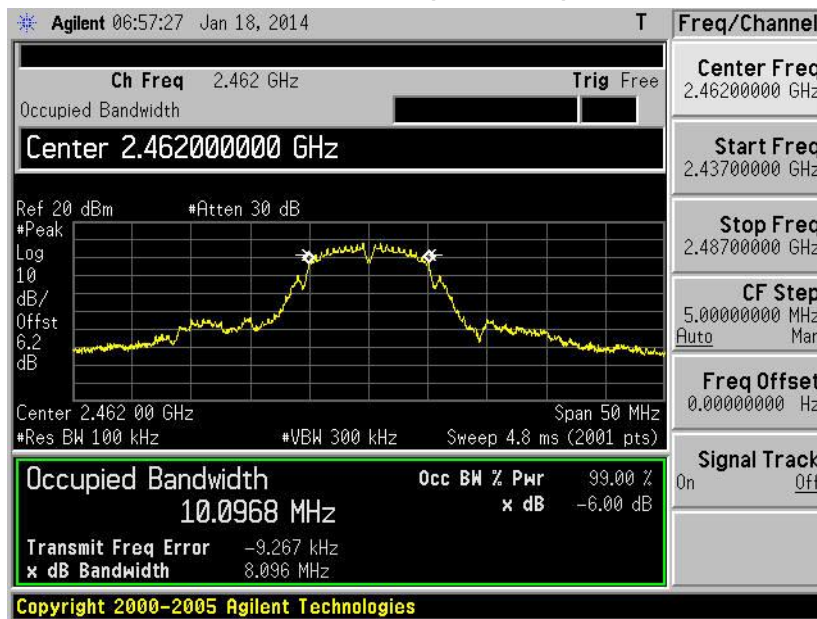
Channel 01 (2412MHz)



Channel 06 (2437MHz)



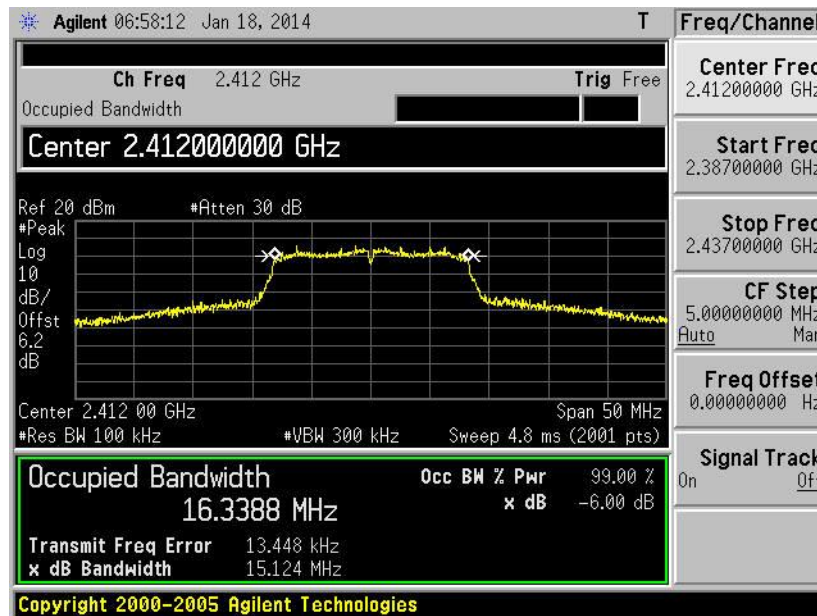
Channel 11 (2462MHz)



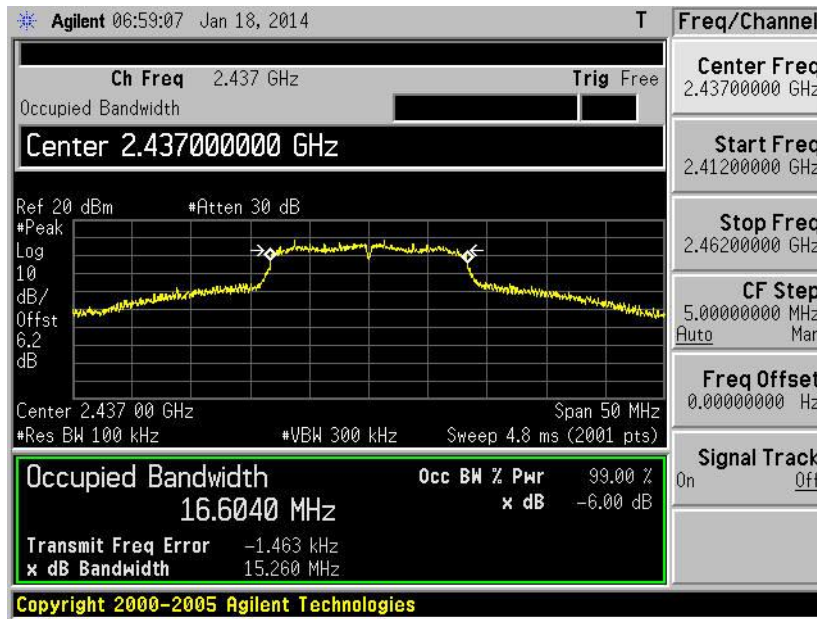
Product	: IP-STB
Test Item	: 6dB Occupied Bandwidth
Test Site	: TR-8
Test Mode	: Mode 2: Transmit by 802.11g (Ant 1)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	15124	500	Pass
06	2437	15260	500	Pass
11	2462	15051	500	Pass

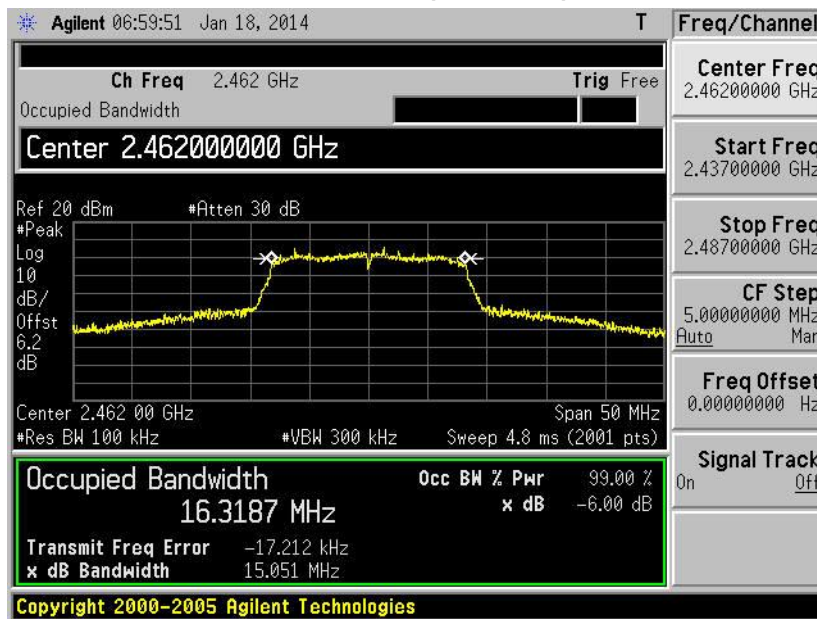
Channel 01 (2412MHz)



Channel 06 (2437MHz)



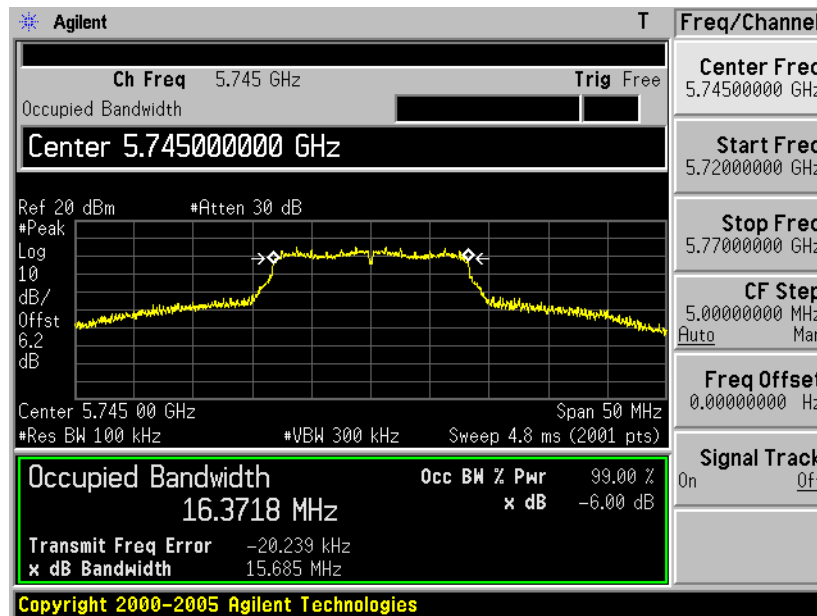
Channel 11 (2462MHz)



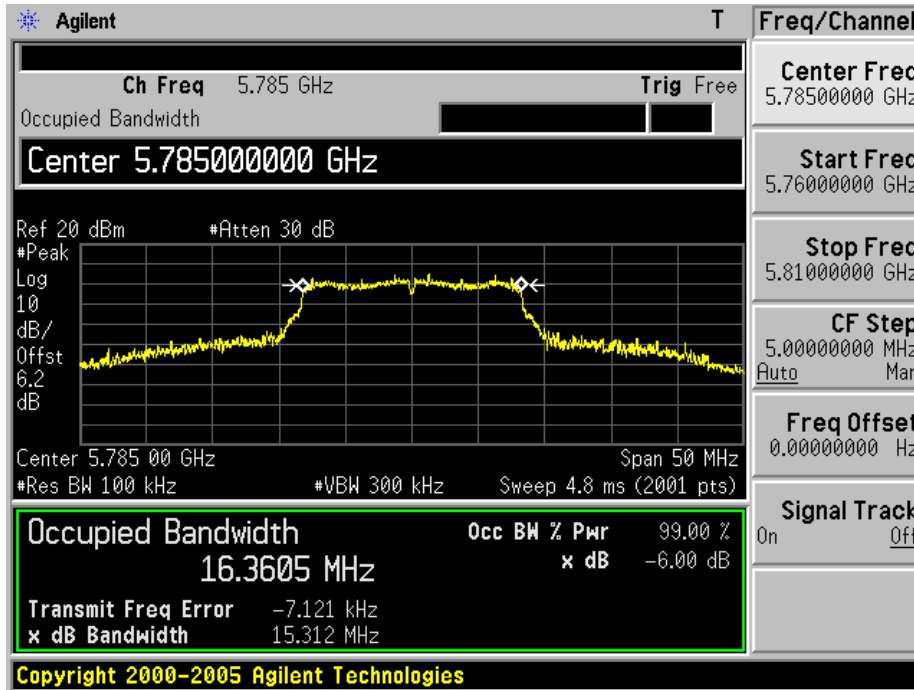
Product	: IP-STB
Test Item	: 6dB Occupied Bandwidth
Test Site	: TR-8
Test Mode	: Mode 3: Transmit by 802.11a (Ant 1)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
149	5745	15685	500	Pass
157	5785	15312	500	Pass
165	5825	15101	500	Pass

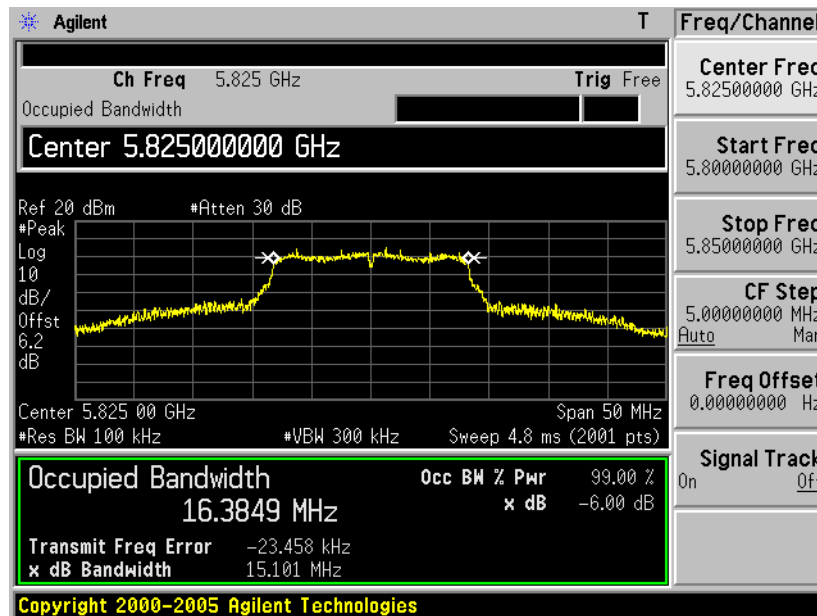
Channel 149 (5745MHz)



Channel 157 (5785MHz)



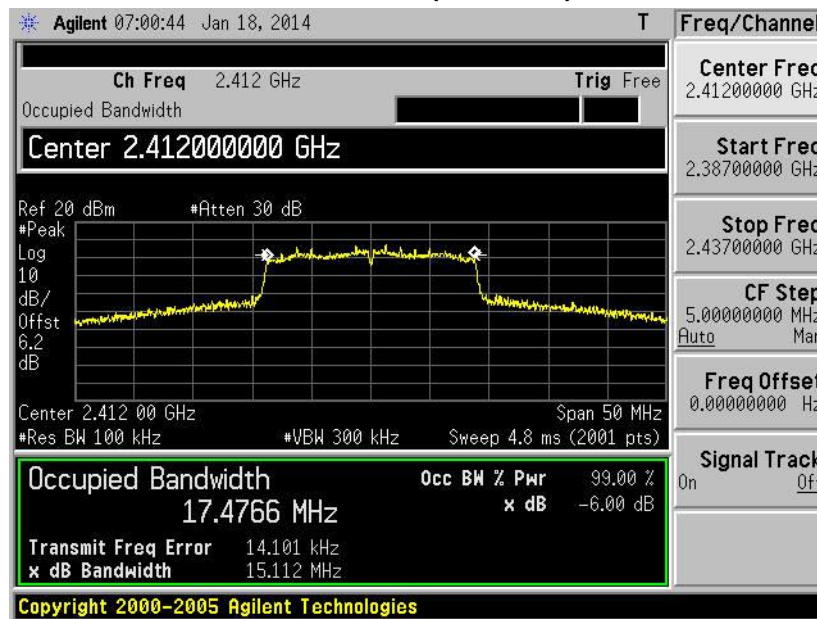
Channel 165 (5825MHz)



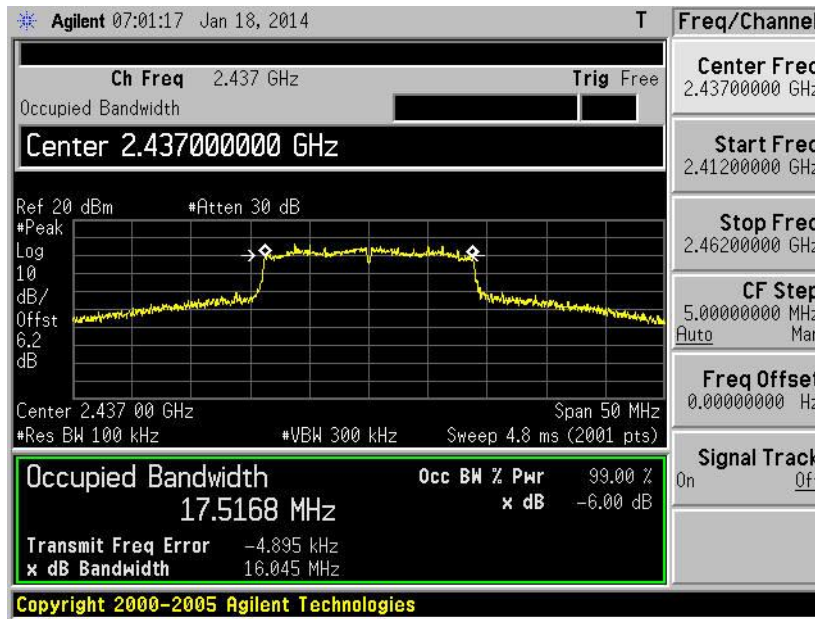
Product	: IP-STB
Test Item	: 6dB Occupied Bandwidth
Test Site	: TR-8
Test Mode	: Mode 4: Transmit by 802.11n(20MHz) (Ant 1)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	14101	500	Pass
06	2437	16045	500	Pass
11	2462	15122	500	Pass
149	5745	14855	500	Pass
157	5785	16189	500	Pass
165	5825	15126	500	Pass

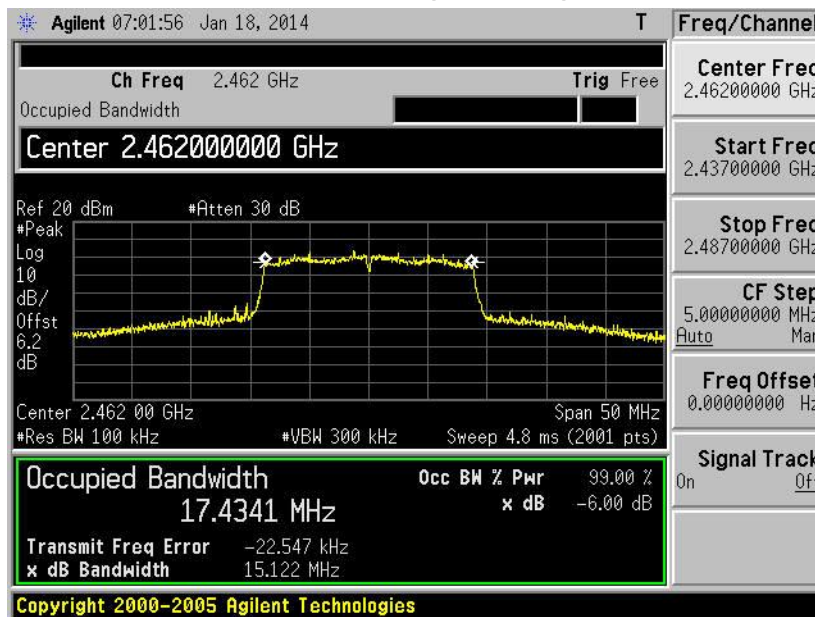
Channel 01 (2412MHz)



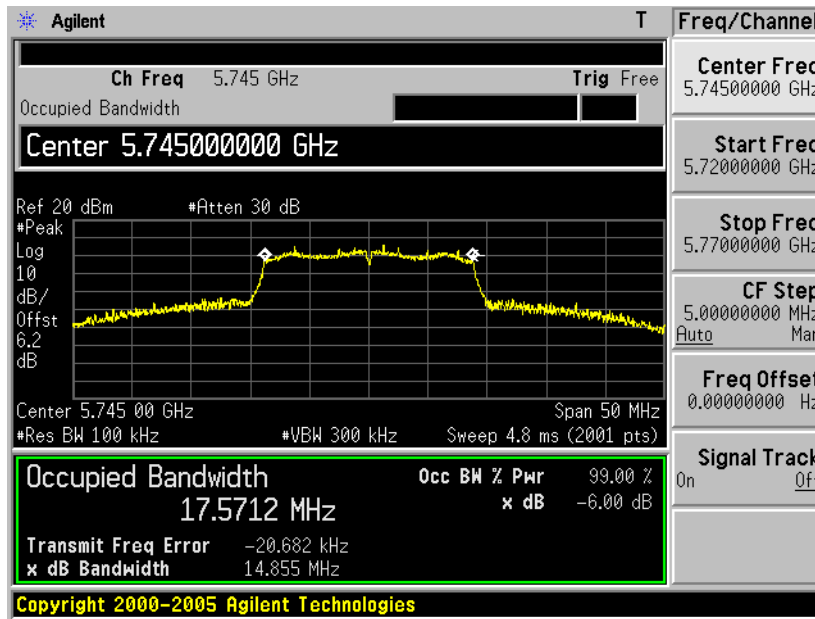
Channel 06 (2437MHz)



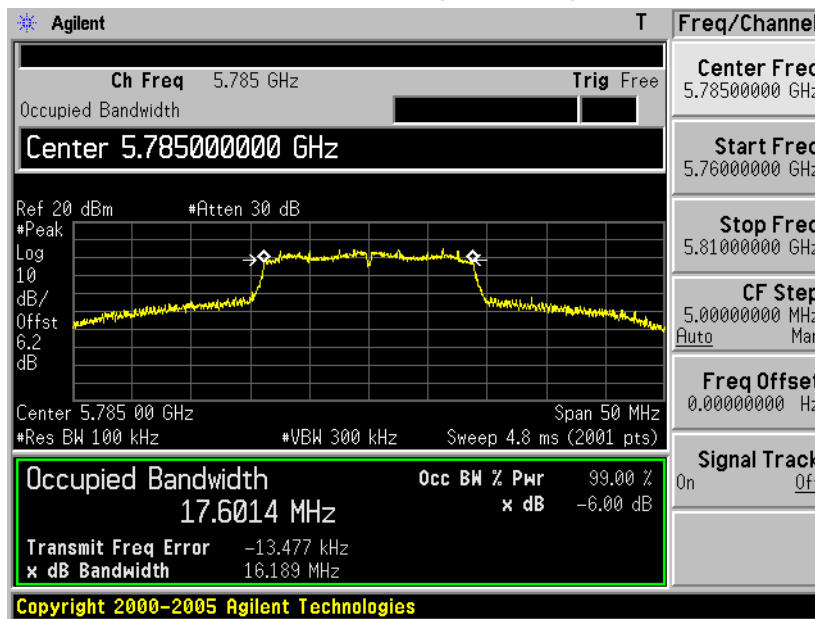
Channel 11 (2462MHz)



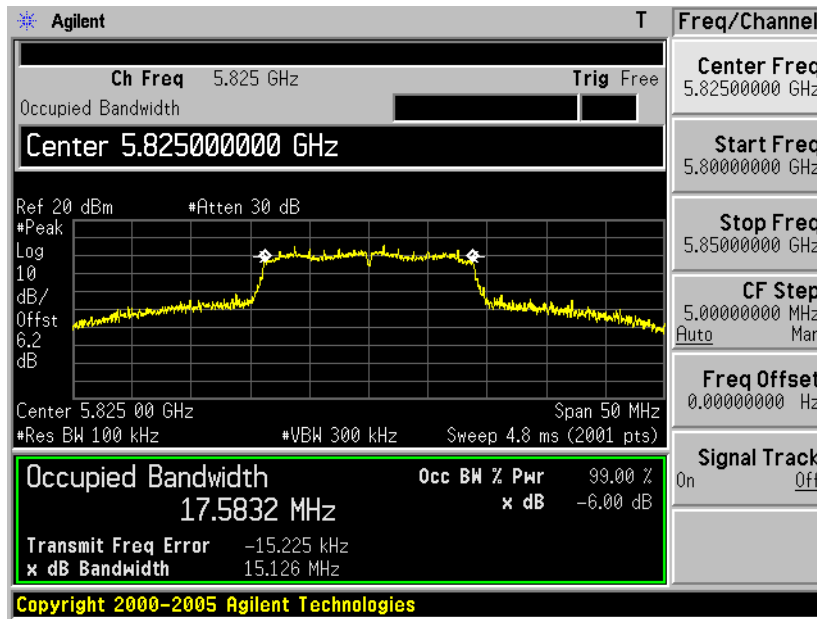
Channel 149 (5745MHz)



Channel 157 (5785MHz)



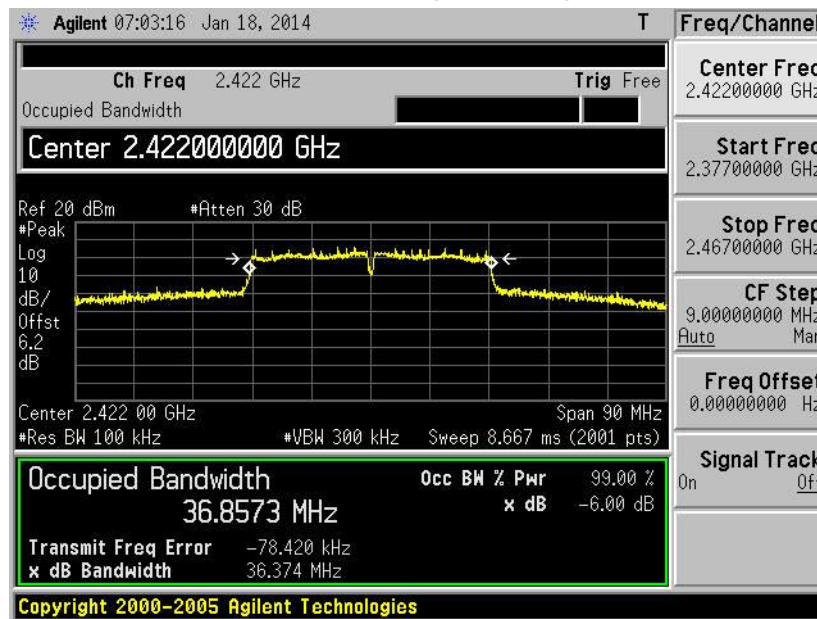
Channel 165 (5825MHz)



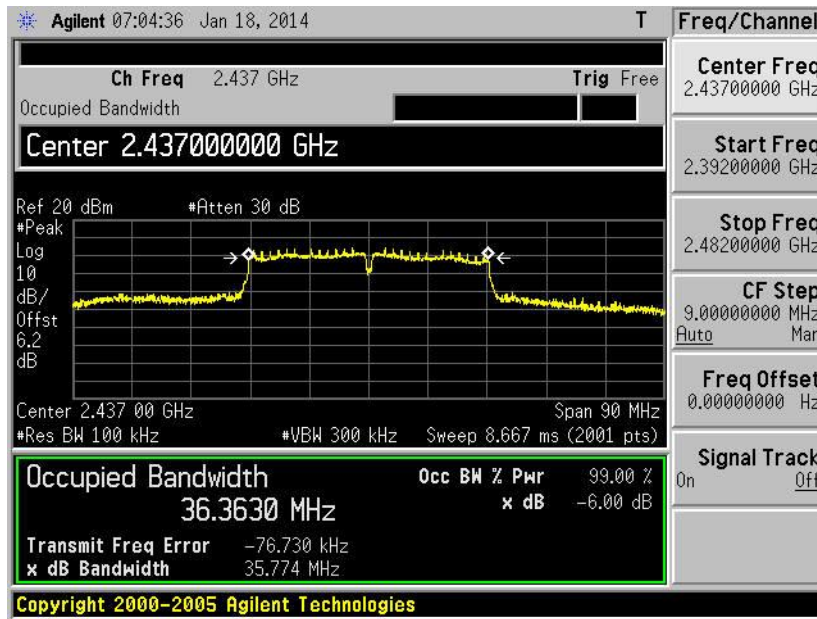
Product	: IP-STB
Test Item	: 6dB Occupied Bandwidth
Test Site	: TR-8
Test Mode	: Mode 6: Transmit by 802.11n(40MHz) (Ant 1)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
03	2422	36374	500	Pass
06	2437	35774	500	Pass
09	2452	36329	500	Pass
151	5755	35728	500	Pass
159	5795	36292	500	Pass

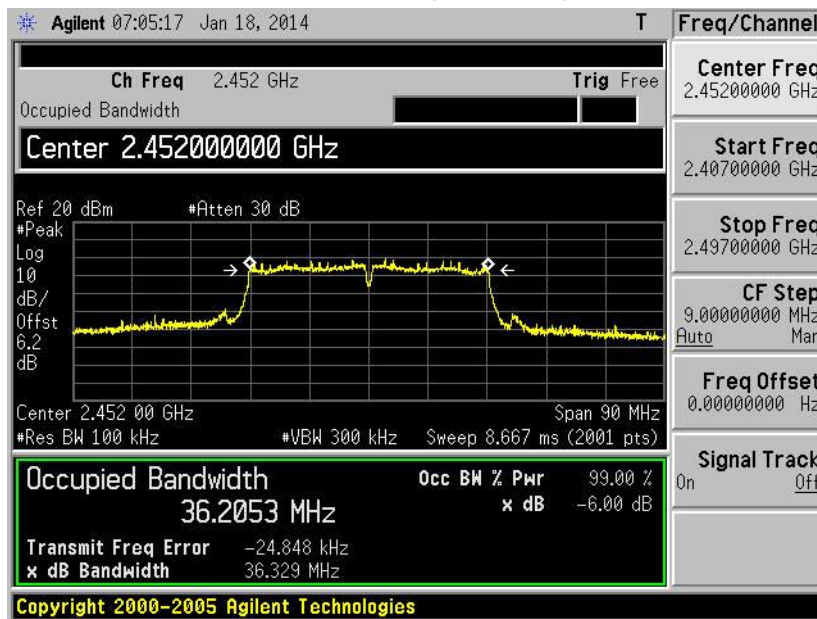
Channel 03 (2422MHz)



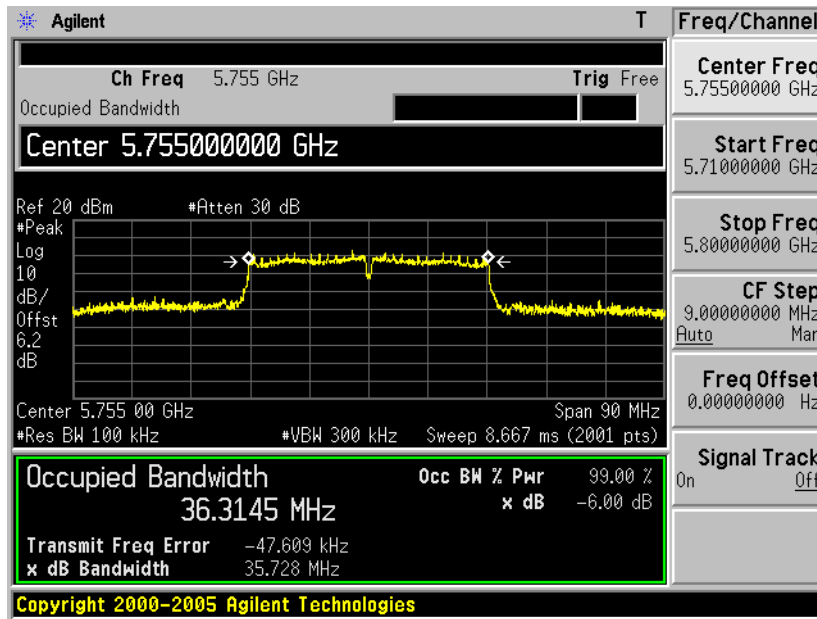
Channel 06 (2437MHz)



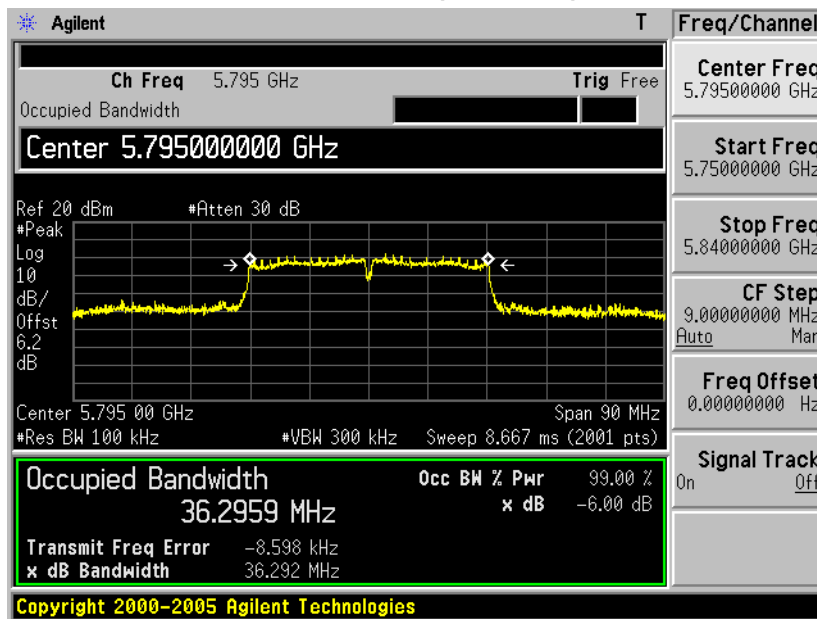
Channel 09 (2452MHz)



Channel 151 (5755MHz)



Channel 159 (5795MHz)



9. Power Output

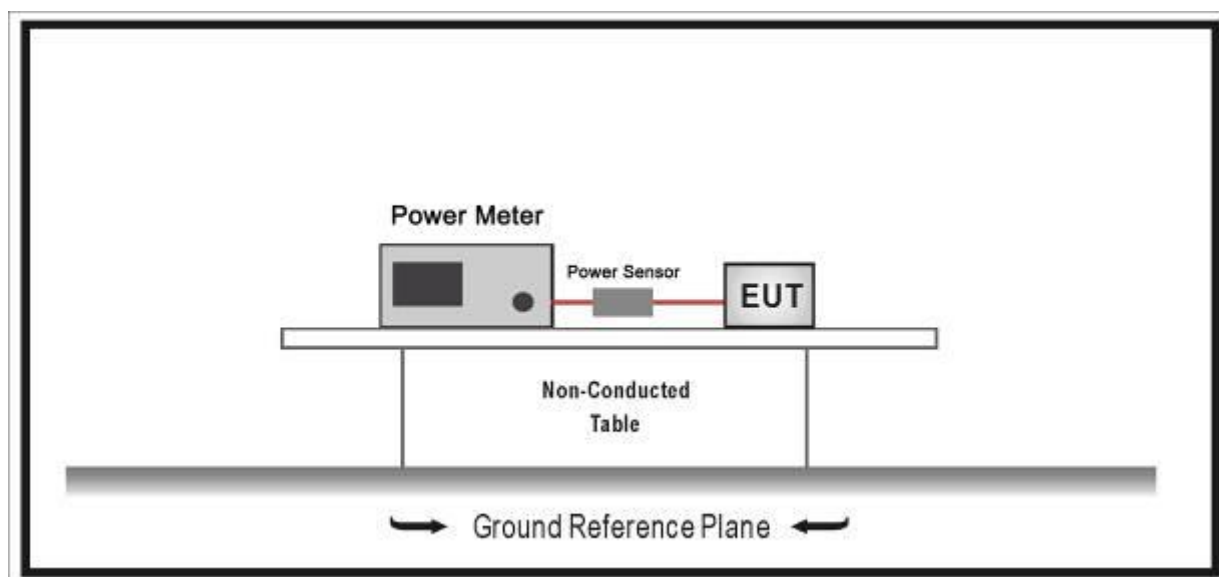
9.1. Test Equipment

Power Output / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Wideband Peak Power Meter	Anritsu	ML2495A	0905006	2014.11.01
Power Sensor	Anritsu	MA2411B	0846014	2014.11.01
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2014.05.07

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 KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

Use the broadband peak RF 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	802.11a	20MHz Bandwidth		40MHz Bandwidth	
					800ns GI	400ns GI	800ns GI	400ns GI
0	1	1	6	6	6.5	7.2	13.5	15.0
1	1	2	9	9	13.0	14.4	27.0	30.0
2	1	5.5	12	12	19.5	21.7	40.5	45.0
3	1	11	18	18	26.0	28.9	54.0	60.0
4	1	---	24	24	39.0	43.3	81.0	90.0
5	1	---	36	36	52.0	57.8	108.0	120.0
6	1	---	48	48	58.5	65.0	121.5	135.0
7	1	---	54	54	65.0	72.2	135.0	150.0
8	2	---	---	---	13.0	14.4	27.0	30.0
9	2	---	---	---	26.0	28.9	54.0	60.0
10	2	---	---	---	39.0	43.3	81.0	90.0
11	2	---	---	---	52.0	57.8	108.0	120.0
12	2	---	---	---	78.0	86.7	162.0	180.0
13	2	---	---	---	104.0	115.6	216.0	240.0
14	2	---	---	---	117.0	130.0	243.0	270.0
15	2	---	---	---	130.0	144.0	270.0	300.0

Power output at various data rates:

Test Mode	Bandwidth	Frequency (MHz)	Channel	Data Rate	Peak Power (dBm)
802.11b(Ant 0)	20	2437	6	1	20.14
				5.5	20.04
				11	20.12
802.11g(Ant 0)	20	2437	6	6	24.25
				24	23.90
				54	23.98
802.11a(Ant 0)	20	5785	157	6	23.01
				24	22.86
				54	22.41
802.11n (Ant 0)	20	2437	6	MCS0	23.93
				MCS4	23.40
				MCS7	23.32
		5785	157	MCS0	23.16
				MCS4	23.04
				MCS7	22.87
802.11n (Ant 0)	40	2437	6	MCS0	23.83
				MCS4	22.98
				MCS7	22.91
		5755	151	MCS0	22.13
				MCS4	22.04
				MCS7	22.00

Product	: IP-STB
Test Item	: Power Output
Test Site	: TR8
Test Mode	: Mode 1: Transmit by 802.11b (Ant 0)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
1	2412	23.41	N/A	23.41	30.00	Pass
6	2437	20.14	N/A	20.14	30.00	Pass
11	2462	19.58	N/A	19.58	30.00	Pass

Product	: IP-STB
Test Item	: Power Output
Test Site	: TR8
Test Mode	: Mode 1: Transmit by 802.11b (Ant 1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
1	2412	N/A	22.16	22.16	30.00	Pass
6	2437	N/A	20.11	20.11	30.00	Pass
11	2462	N/A	18.98	18.98	30.00	Pass

Product	: IP-STB
Test Item	: Power Output
Test Site	: TR8
Test Mode	: Mode 2: Transmit by 802.11g (Ant 0)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
1	2412	23.82	N/A	23.82	30.00	Pass
6	2437	24.25	N/A	24.25	30.00	Pass
11	2462	23.57	N/A	23.57	30.00	Pass

Product	: IP-STB
Test Item	: Power Output
Test Site	: TR8
Test Mode	: Mode 2: Transmit by 802.11g (Ant 1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
1	2412	N/A	22.89	22.89	30.00	Pass
6	2437	N/A	22.65	22.65	30.00	Pass
11	2462	N/A	22.37	22.37	30.00	Pass

Product	: IP-STB
Test Item	: Power Output
Test Site	: TR8
Test Mode	: Mode 3: Transmit by 802.11a (Ant 0)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
149	5745	22.51	N/A	22.51	30.00	Pass
157	5785	23.01	N/A	23.01	30.00	Pass
165	5825	22.26	N/A	22.26	30.00	Pass

Product	: IP-STB
Test Item	: Power Output
Test Site	: TR8
Test Mode	: Mode 3: Transmit by 802.11a (Ant 1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
149	5745	N/A	21.98	21.98	30.00	Pass
157	5785	N/A	22.85	22.85	30.00	Pass
165	5825	N/A	22.31	22.31	30.00	Pass

Product	:	IP-STB
Test Item	:	Power Output
Test Site	:	TR8
Test Mode	:	Mode 4: Transmit by 802.11n(20MHz) (Ant 0)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
1	2412	23.91	N/A	23.91	30.00	Pass
6	2437	23.93	N/A	23.93	30.00	Pass
11	2462	22.47	N/A	22.47	30.00	Pass
149	5745	22.46	N/A	22.46	30.00	Pass
157	5785	23.16	N/A	23.16	30.00	Pass
165	5825	22.24	N/A	22.24	30.00	Pass

Product	:	IP-STB
Test Item	:	Power Output
Test Site	:	TR8
Test Mode	:	Mode 4: Transmit by 802.11n(20MHz) (Ant 1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
1	2412	N/A	22.58	22.58	30.00	Pass
6	2437	N/A	22.38	22.38	30.00	Pass
11	2462	N/A	21.41	21.41	30.00	Pass
149	5745	N/A	22.73	22.73	30.00	Pass
157	5785	N/A	23.69	23.69	30.00	Pass
165	5825	N/A	22.56	22.56	30.00	Pass

Product	:	IP-STB
Test Item	:	Power Output
Test Site	:	TR8
Test Mode	:	Mode 4: Transmit by 802.11n(20MHz) (Ant 0+1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
1	2412	24.93	22.78	27.00	30.00	Pass
6	2437	24.41	22.13	26.43	30.00	Pass
11	2462	24.51	22.88	26.78	30.00	Pass
149	5745	22.37	22.11	25.25	30.00	Pass
157	5785	23.01	22.98	26.01	30.00	Pass
165	5825	22.31	22.09	25.21	30.00	Pass

Product	:	IP-STB
Test Item	:	Power Output
Test Site	:	TR8
Test Mode	:	Mode 6: Transmit by 802.11n(40MHz) (Ant 0)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
3	2422	22.67	N/A	22.67	30.00	Pass
6	2437	23.83	N/A	23.83	30.00	Pass
9	2452	21.63	N/A	21.63	30.00	Pass
151	5755	22.13	N/A	22.13	30.00	Pass
159	5795	21.89	N/A	21.89	30.00	Pass

Product	:	IP-STB
Test Item	:	Power Output
Test Site	:	TR8
Test Mode	:	Mode 6: Transmit by 802.11n(40MHz) (Ant 1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
3	2422	N/A	22.16	22.16	30.00	Pass
6	2437	N/A	23.21	23.21	30.00	Pass
9	2452	N/A	22.81	22.81	30.00	Pass
151	5755	N/A	21.48	21.48	30.00	Pass
159	5795	N/A	21.33	21.33	30.00	Pass

Product	:	IP-STB
Test Item	:	Power Output
Test Site	:	TR8
Test Mode	:	Mode 6: Transmit by 802.11n(40MHz) (Ant 0+1)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)		Total Power (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
3	2422	22.26	21.49	24.90	30.00	Pass
6	2437	22.77	22.43	25.61	30.00	Pass
9	2452	21.52	20.52	24.06	30.00	Pass
151	5755	22.14	21.87	25.02	30.00	Pass
159	5795	22.90	21.94	25.46	30.00	Pass

10. Power Spectral Density

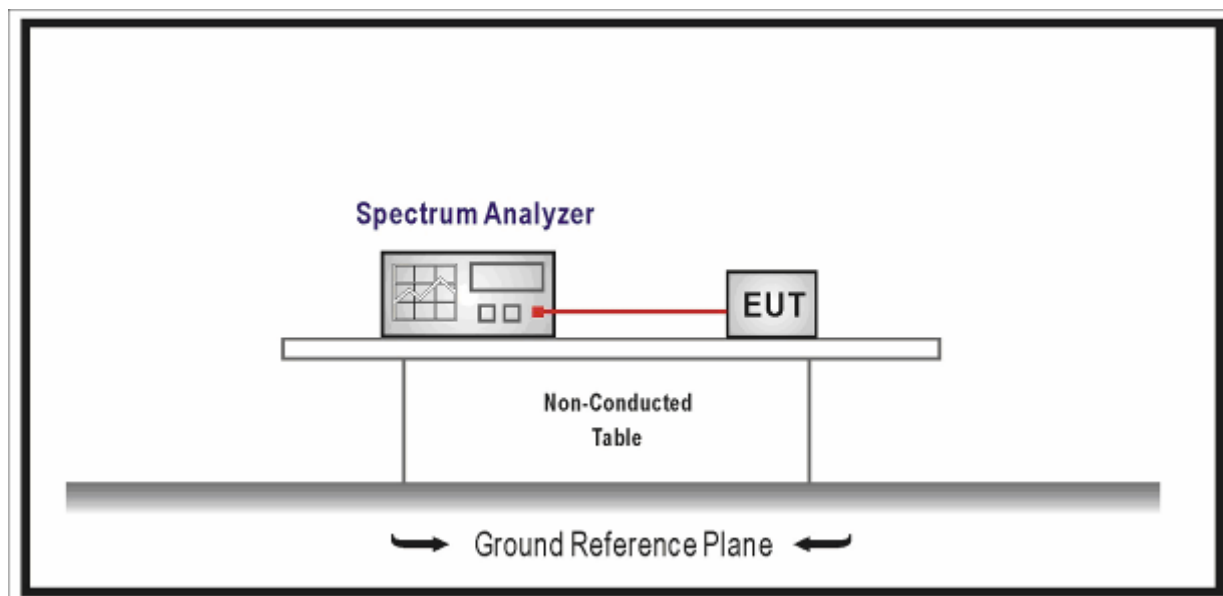
10.1. Test Equipment

Power Spectral Density / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2015.01.07
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2014.05.07

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 KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

Set analyzer center frequency to DTS channel center frequency, the span to 1.5 times the DTS channel bandwidth, Set $100 \text{ kHz} \geq \text{RBW} \geq 3 \text{ kHz}$, Set $\text{VBW} \geq 3 * \text{RBW}$, Sweep time = auto couple, Detector = peak, Trace mode = max hold, Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level. If measured value exceed limit reduce RBW (no less than 3kHz) and repeat.

10.5. Uncertainty

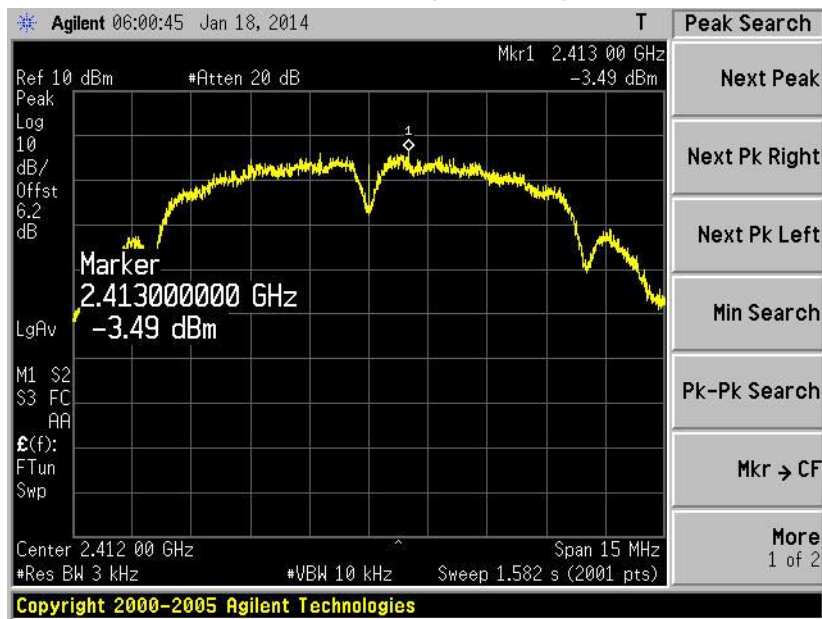
The measurement uncertainty is defined as $\pm 1.27 \text{ dB}$

10.6. Test Result

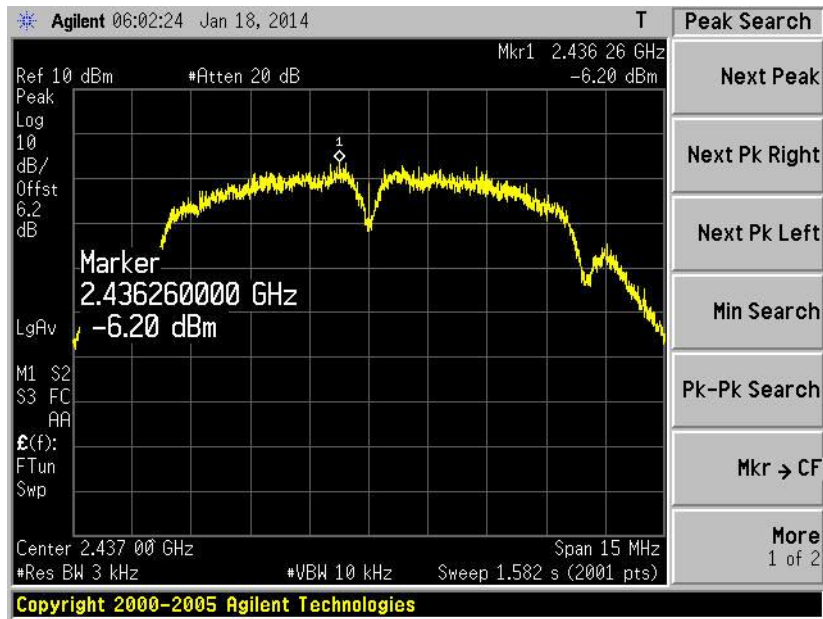
Product	:	IP-STB
Test Item	:	Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11b (Ant 0)

Channel No.	Frequency (MHz)	Measurement PPSD (dBm)		Total PPSD (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
01	2412	-3.49	N/A	-3.49	8	Pass
06	2437	-6.20	N/A	-6.20	8	Pass
11	2462	-5.83	N/A	-5.83	8	Pass

Channel 01 (2412MHz)



Channel 06 (2437MHz)



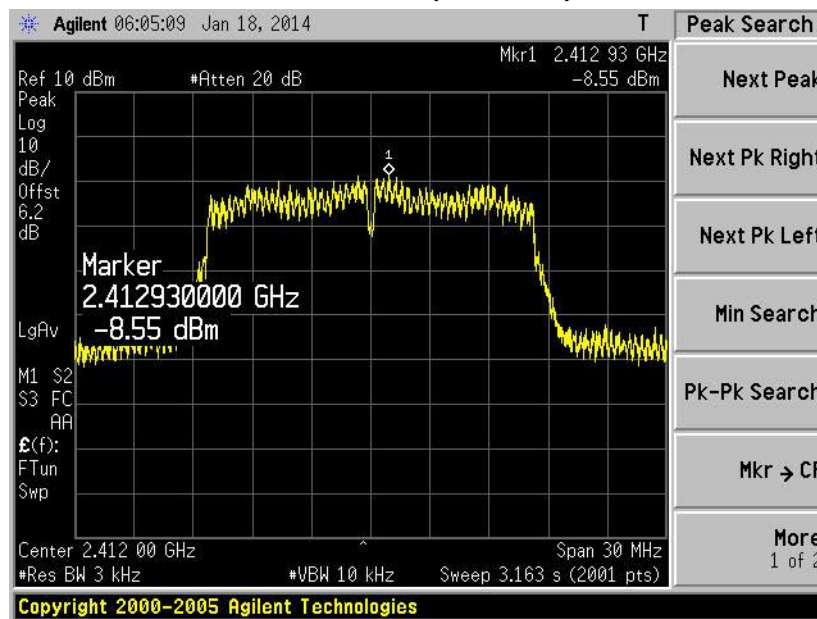
Channel 11 (2462MHz)



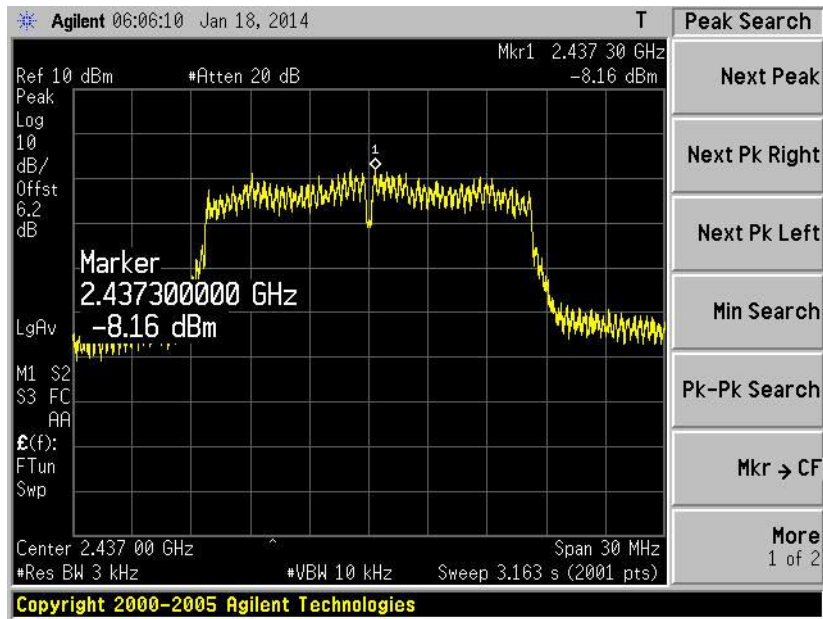
Product	:	IP-STB
Test Item	:	Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11g (Ant 0)

Channel No.	Frequency (MHz)	Measurement PPSD (dBm)		Total PPSD (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
01	2412	-8.55	N/A	-8.55	8	Pass
06	2437	-8.16	N/A	-8.16	8	Pass
11	2462	-9.56	N/A	-9.56	8	Pass

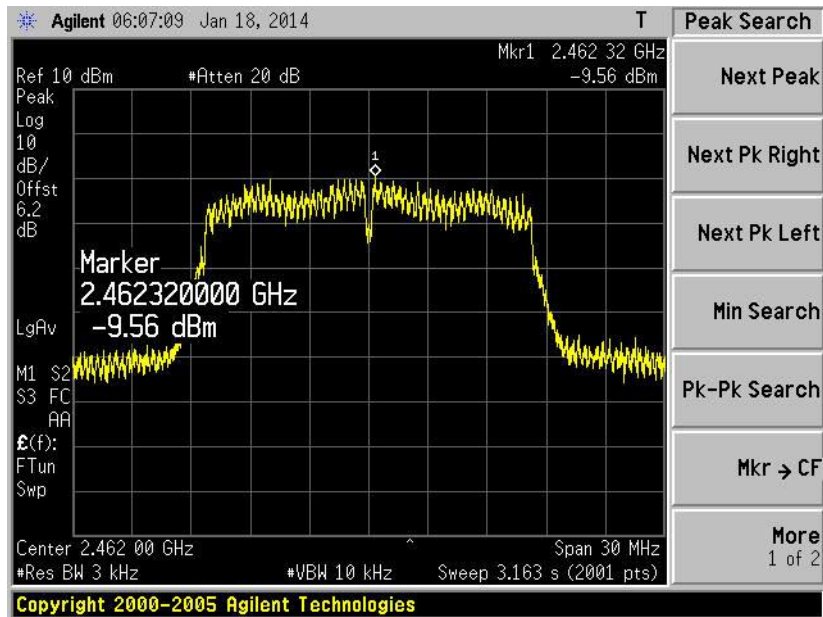
Channel 01 (2412MHz)



Channel 06 (2437MHz)



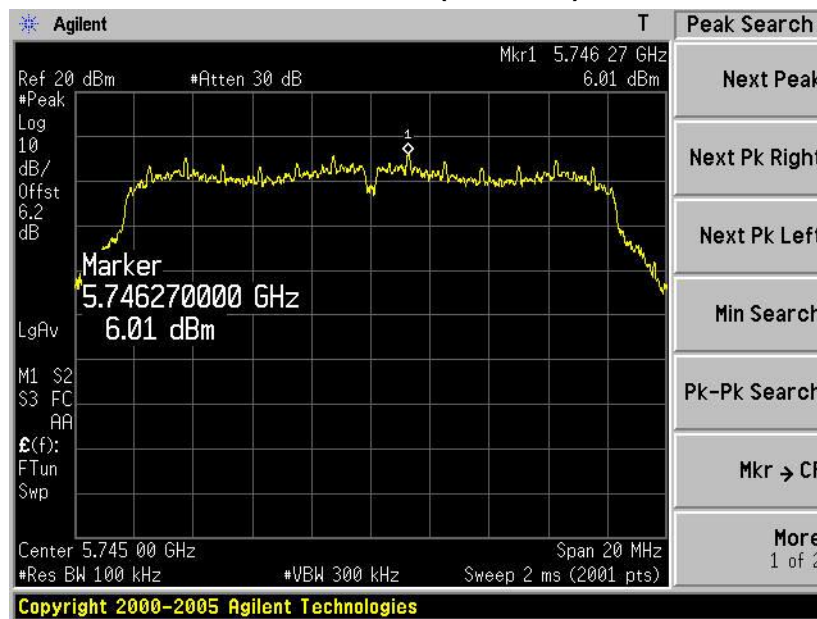
Channel 11 (2462MHz)



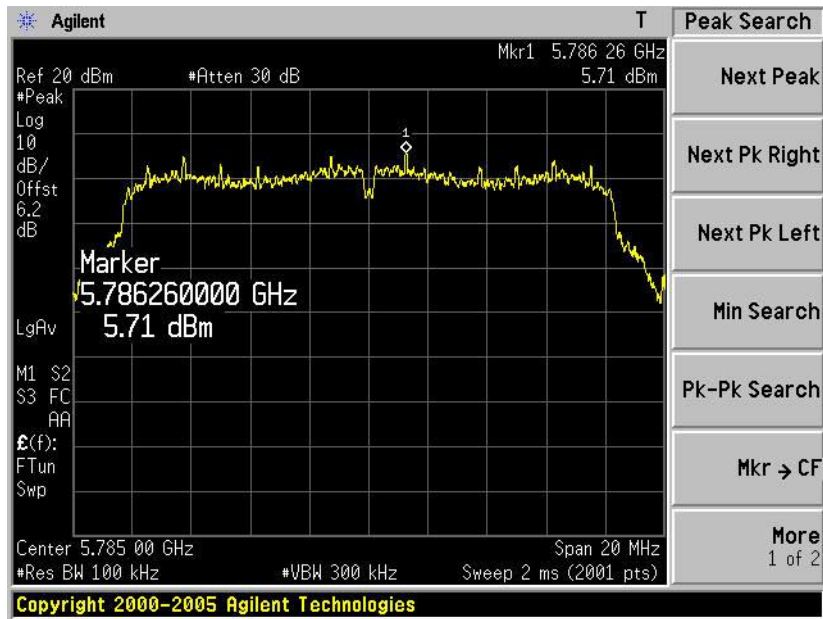
Product	:	IP-STB
Test Item	:	Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11a (Ant 0)

Channel No.	Frequency (MHz)	Measurement PPSD (dBm)		Total PPSD (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
149	5745	6.01	N/A	6.01	8	Pass
157	5785	5.71	N/A	5.71	8	Pass
165	5825	5.01	N/A	5.01	8	Pass

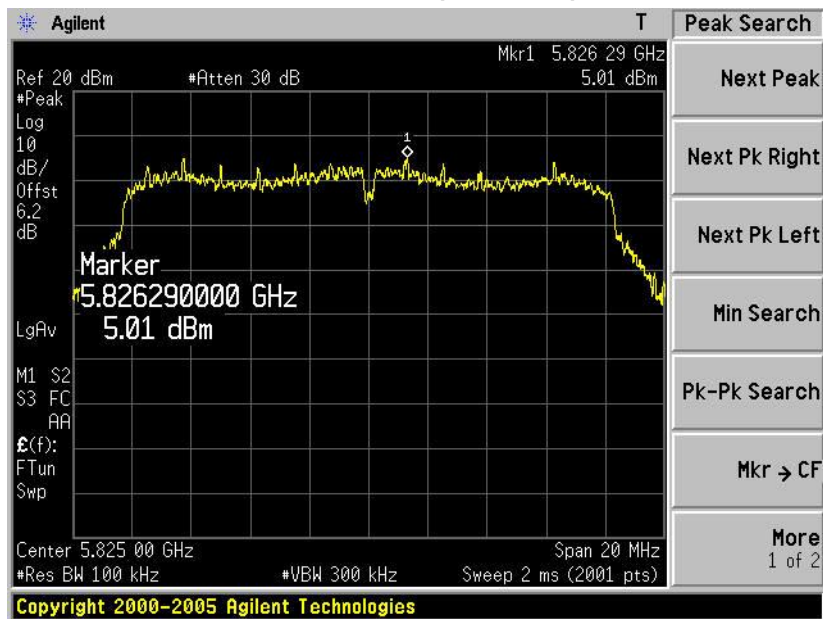
Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)



Product	:	IP-STB
Test Item	:	Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 4: Transmit by 802.11n(20MHz) (Ant 0)

Channel No.	Frequency (MHz)	Measurement PPSD (dBm)		Total PPSD (dBm)	Limit (dBm)	Result
		Ant 0	Ant 1			
01	2412	-10.45	N/A	-10.45	8	Pass
06	2437	-7.55	N/A	-7.55	8	Pass
11	2462	-11.21	N/A	-11.21	8	Pass
149	5745	5.99	N/A	5.99	8	Pass
157	5785	7.55	N/A	7.55	8	Pass
165	5825	4.04	N/A	4.04	8	Pass

Channel 01 (2412MHz)

