

7. Occupied Bandwidth

7.1. Test Equipment

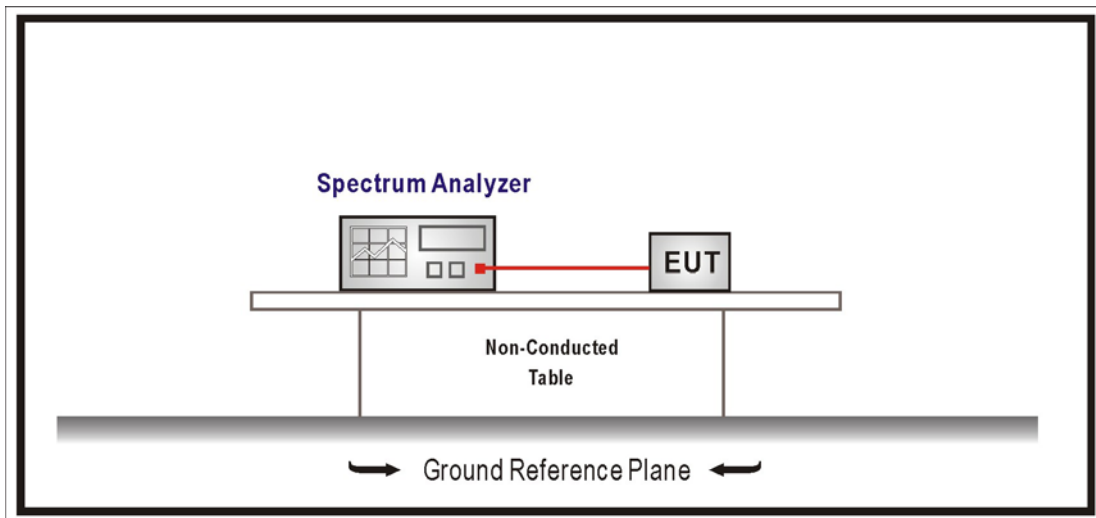
The following test equipments are used during the test:

Occupied Bandwidth / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2013/02/19

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

7.2. Test Setup



7.3. Test Procedures

The EUT was setup according to ANSI C63.4: 2009; tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements. Set RBW = 1% of EBW, Span greater than RBW.

7.4. Limits

The 6 dB bandwidth must be greater than 500 kHz.

7.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2011

7.6. Uncertainty

The measurement uncertainty is defined as $\pm 150\text{Hz}$

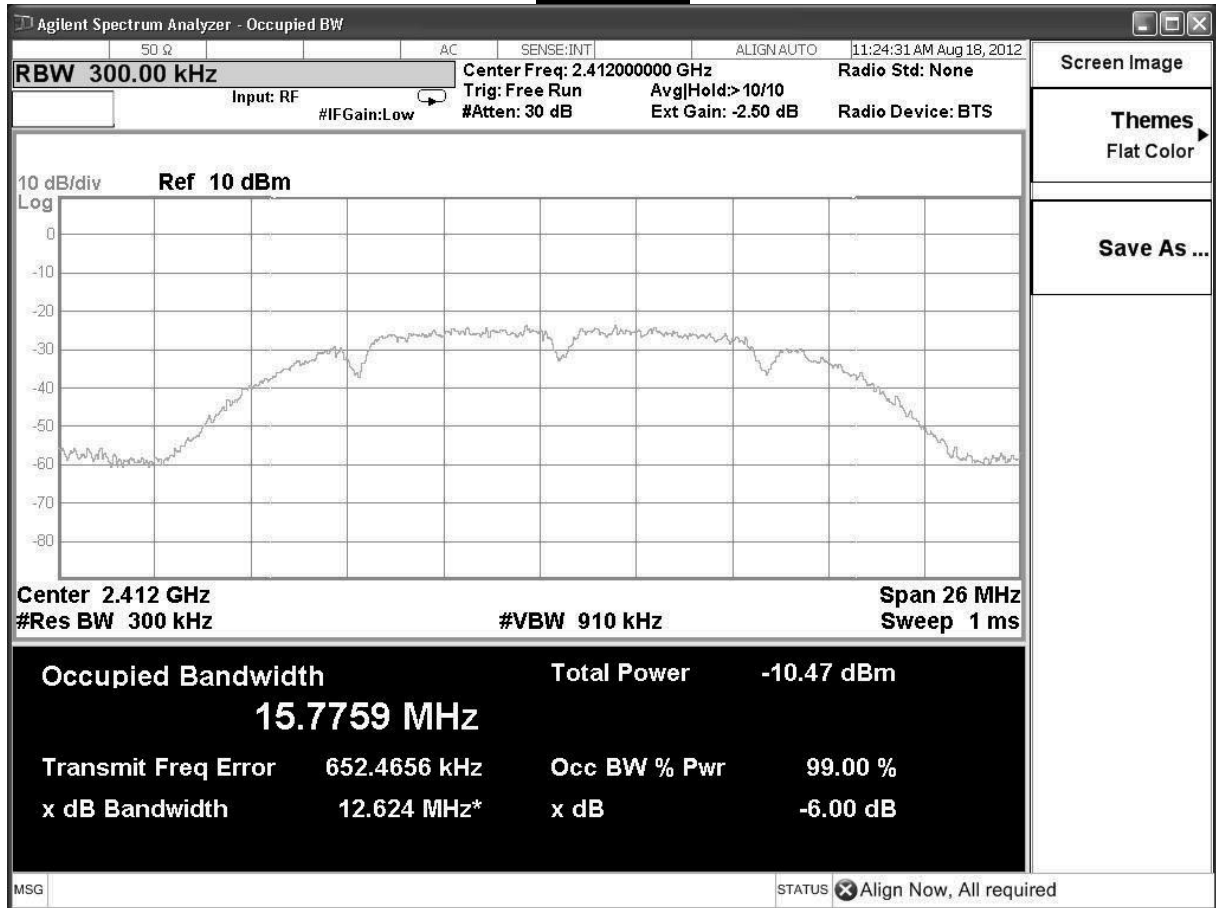
7.7. Test Result

Product	Outdoor AP		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/08/22	Test Site	SR7

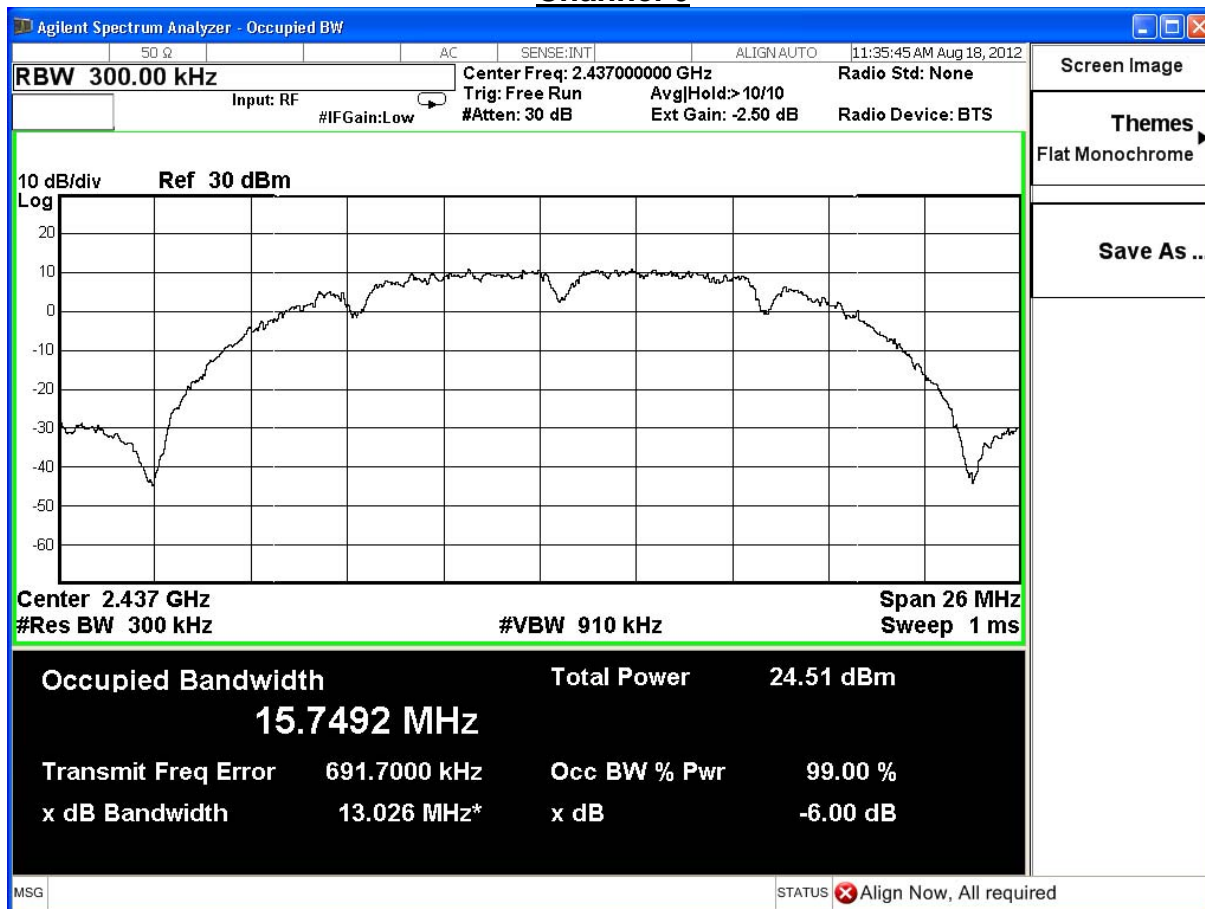
802.11 b

Channel No.	Frequency (MHz)	Measurement Level (MHz)	Required Limit (MHz)	Result
1	2412	12.624	≥ 0.5	Pass
6	2437	13.026	≥ 0.5	Pass
11	2462	12.204	≥ 0.5	Pass

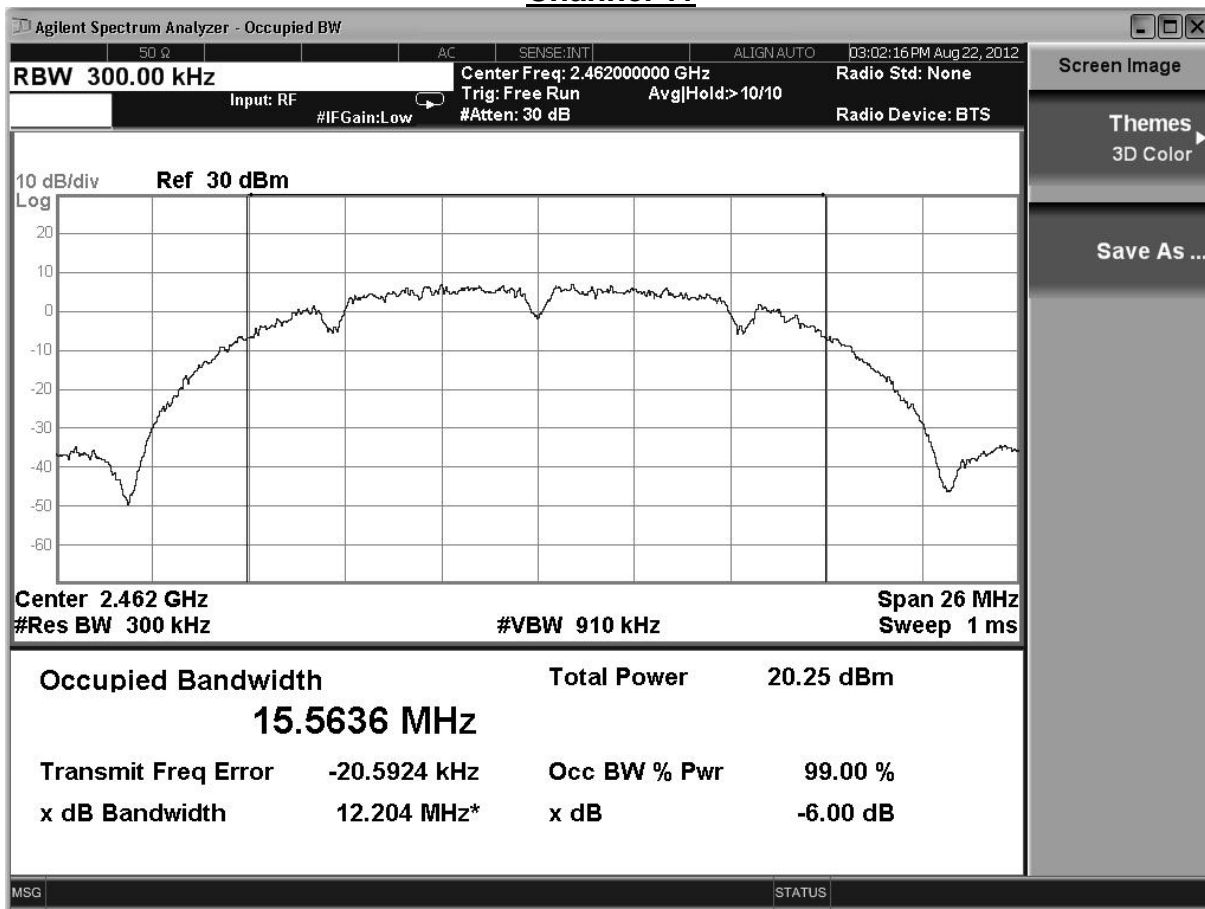
Channel 1



Channel 6



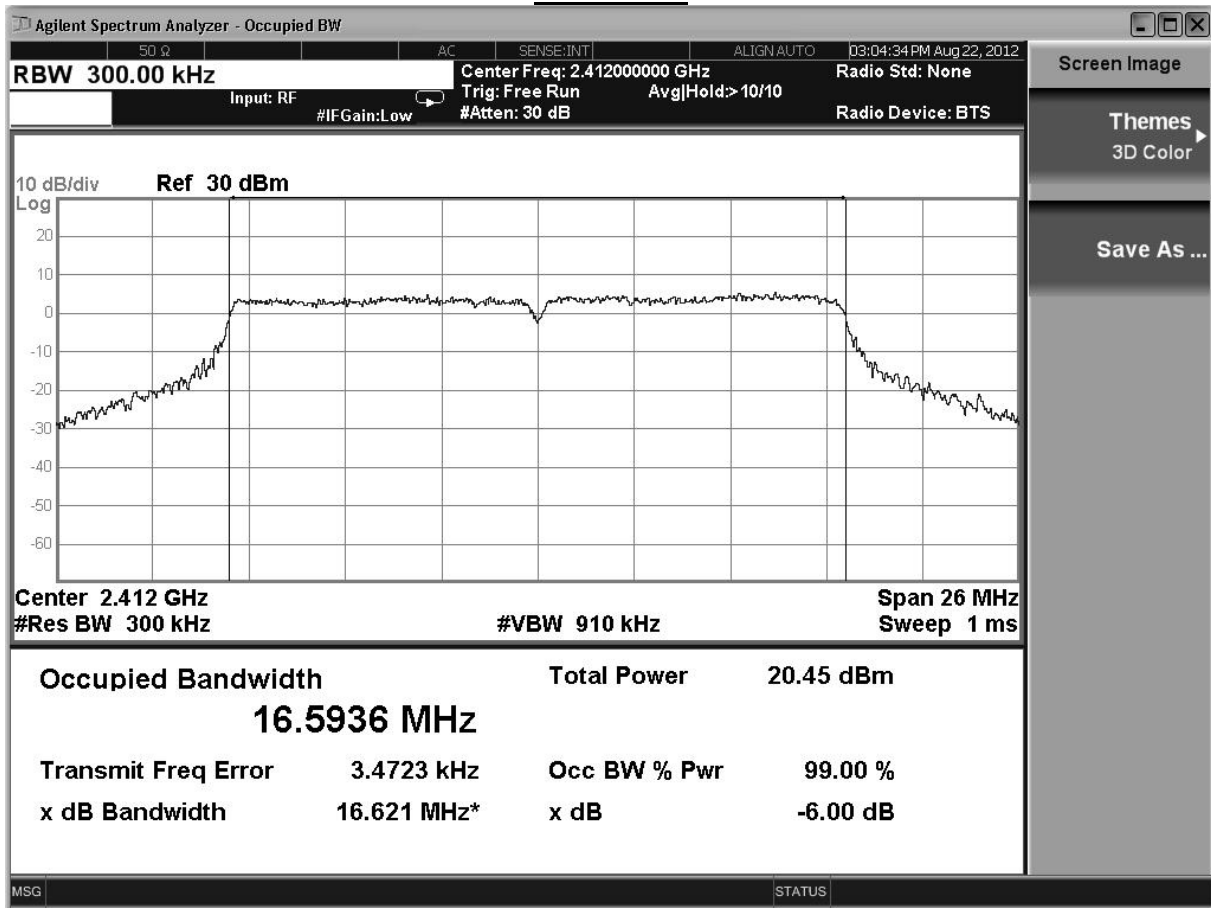
Channel 11



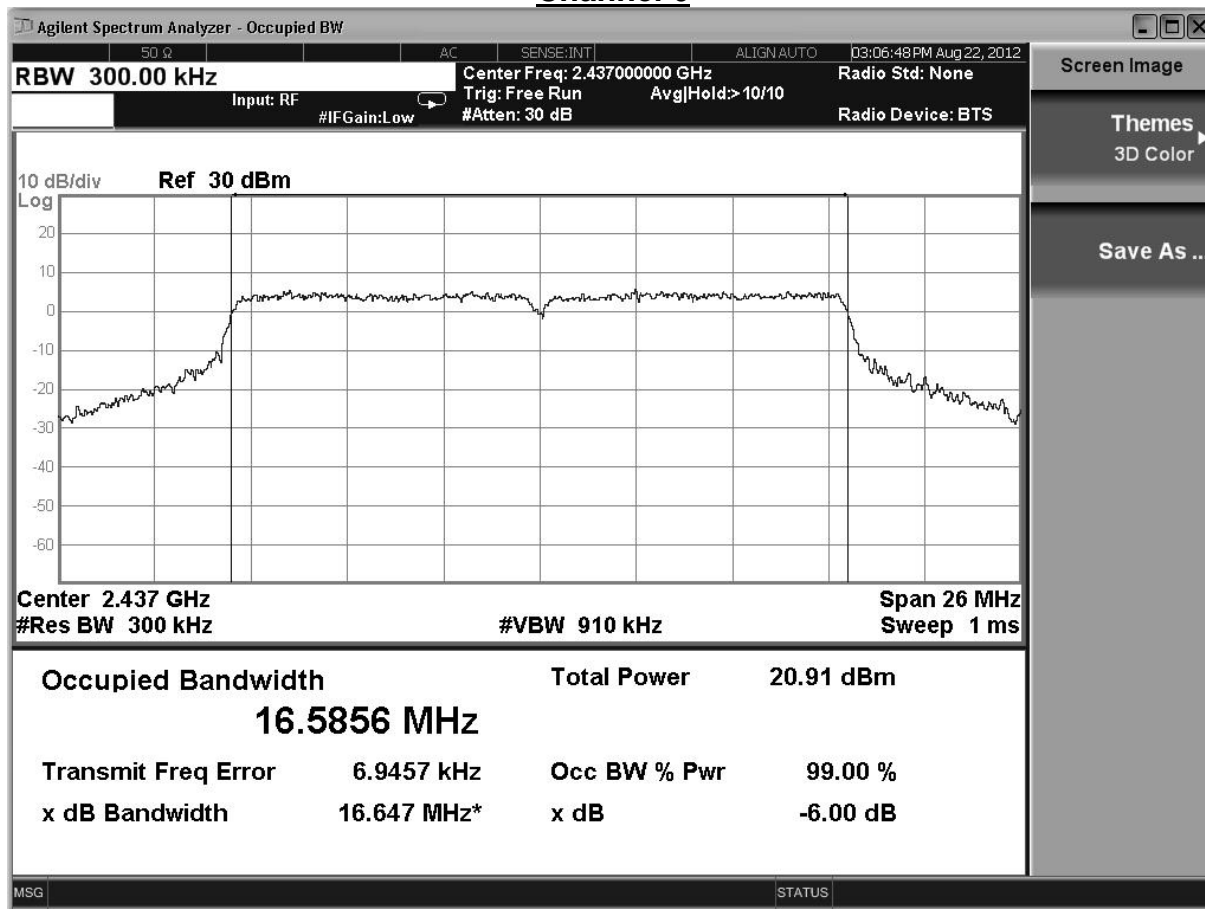
Product	Outdoor AP		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/08/22	Test Site	SR7

IEEE 802.11g				
Channel No.	Frequency (MHz)	Measurement Level (MHz)	Required Limit (MHz)	Result
1	2412	16.621	≥ 0.5	Pass
6	2437	16.647	≥ 0.5	Pass
11	2462	16.601	≥ 0.5	Pass

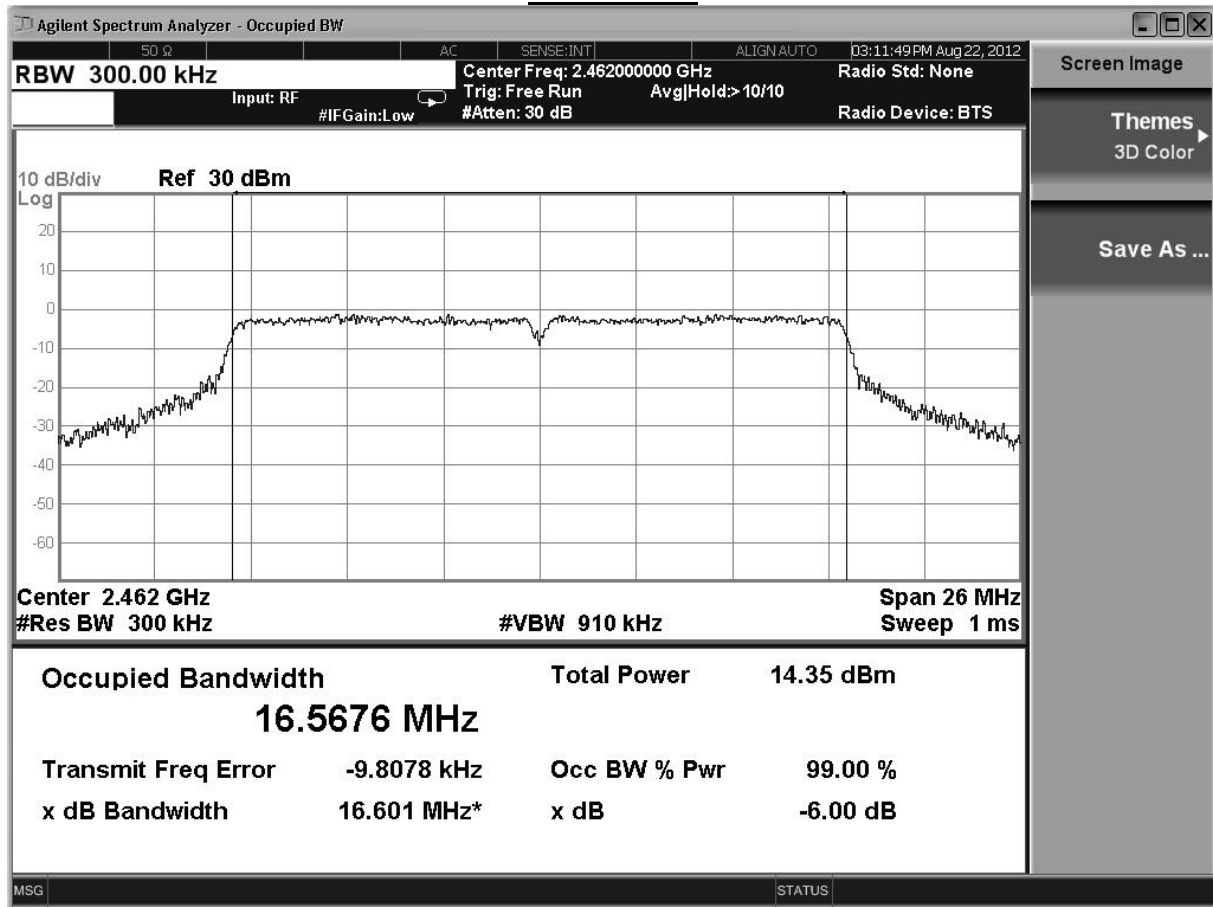
Channel 1



Channel 6



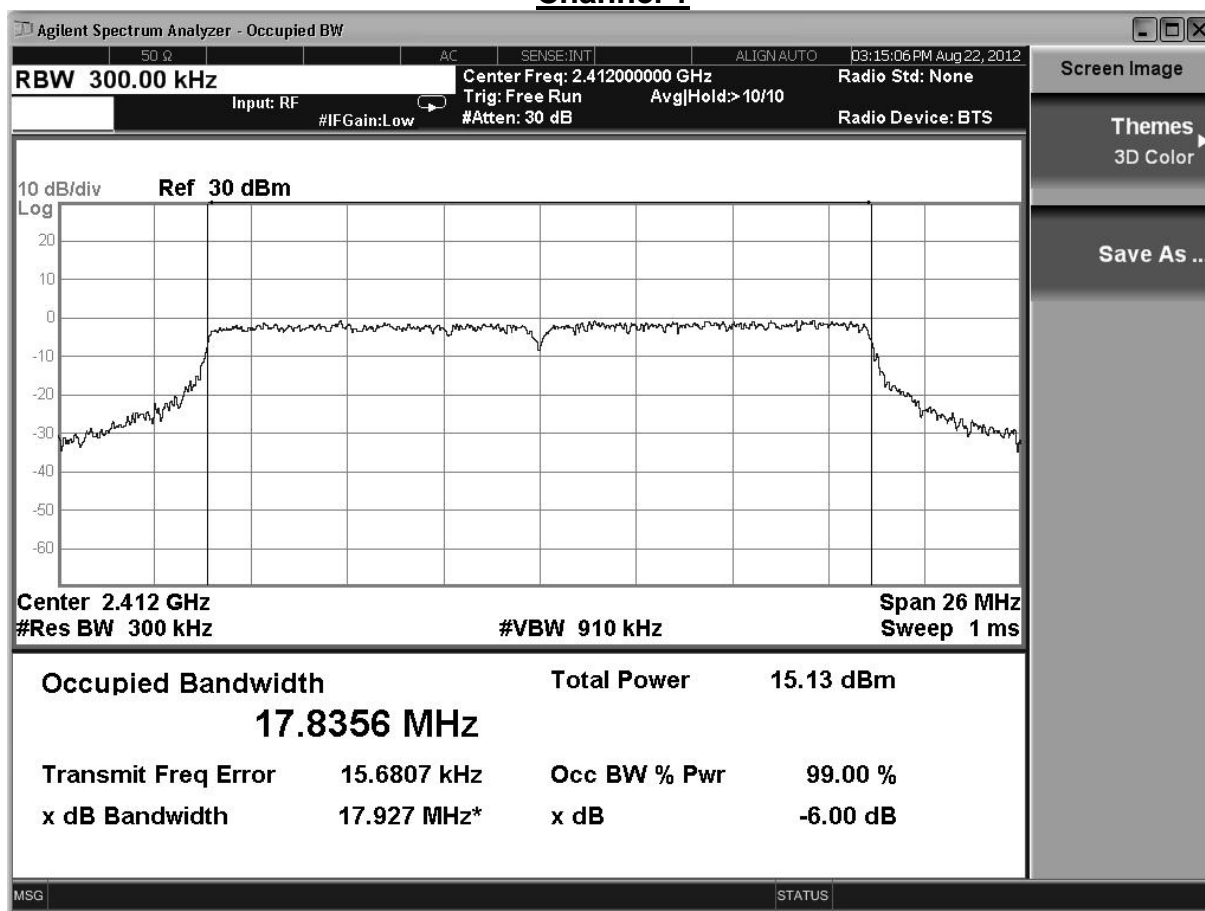
Channel 11



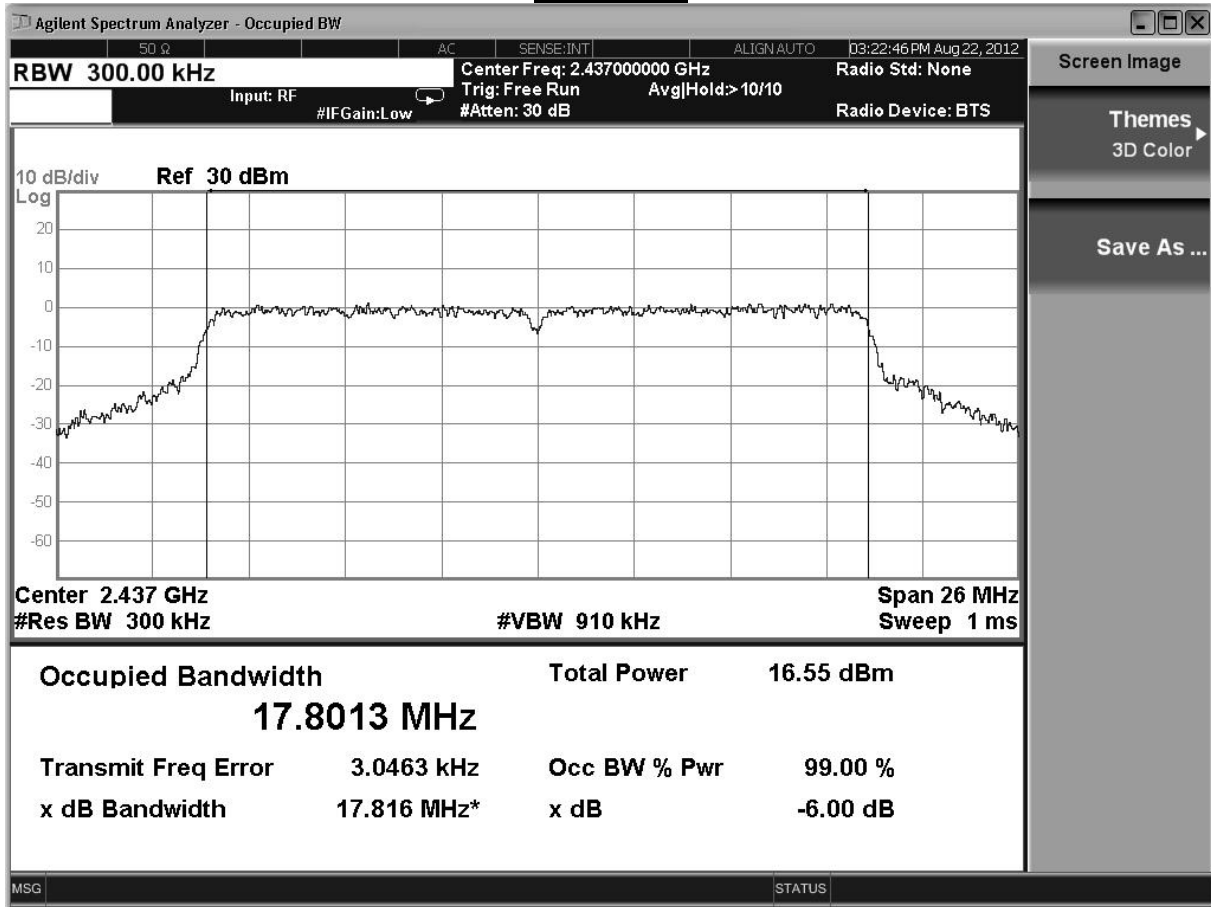
Product	Outdoor AP		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/08/22	Test Site	SR7

IEEE 802.11n (20MHz)(ANT 0)				
Channel No.	Frequency (MHz)	Measurement Level (MHz)	Required Limit (MHz)	Result
1	2412	17.927	≥ 0.5	Pass
6	2437	17.816	≥ 0.5	Pass
11	2462	17.873	≥ 0.5	Pass

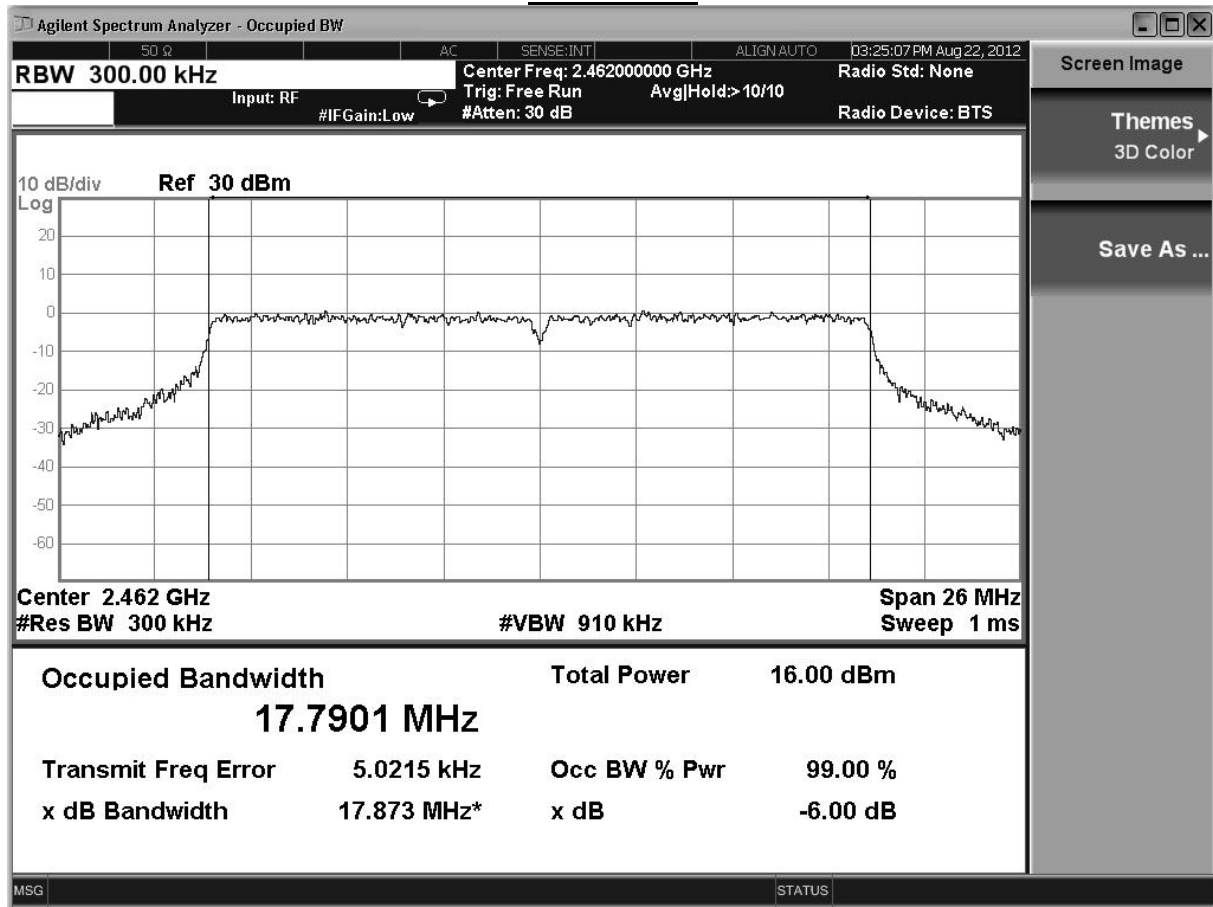
Channel 1



Channel 6



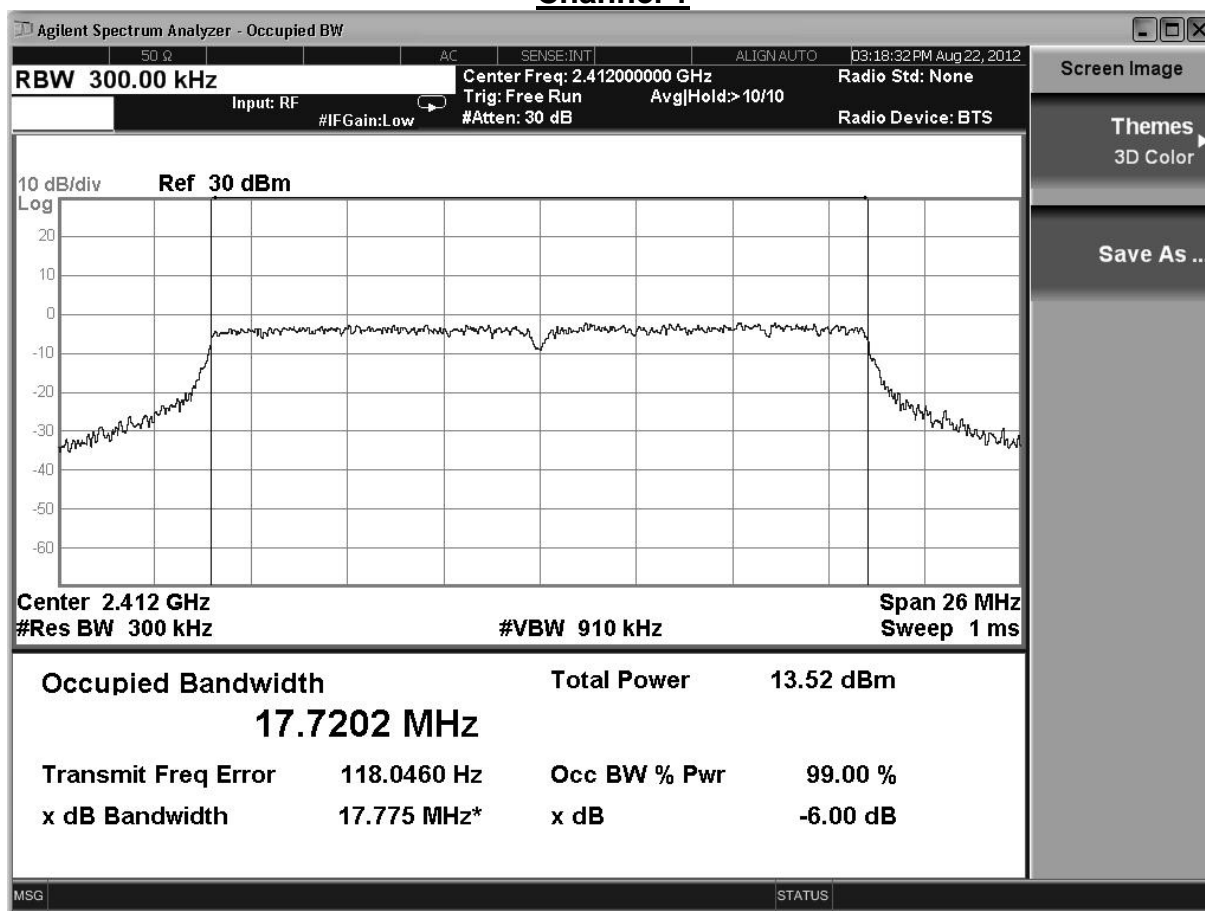
Channel 11



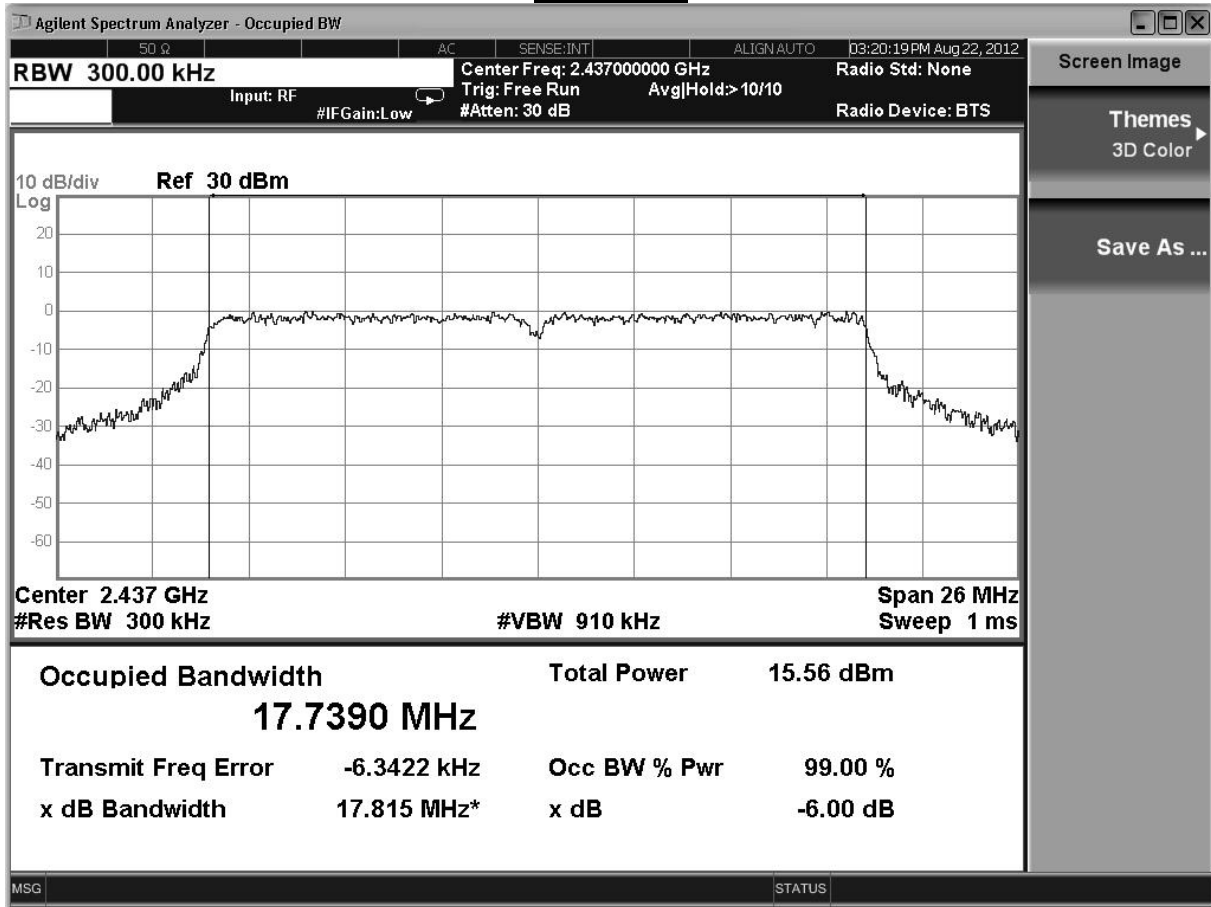
Product	Outdoor AP		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/08/22	Test Site	SR7

IEEE 802.11n (20MHz)(ANT 1)				
Channel No.	Frequency (MHz)	Measurement Level (MHz)	Required Limit (MHz)	Result
1	2412	17.775	≥ 0.5	Pass
6	2437	17.815	≥ 0.5	Pass
11	2462	17.783	≥ 0.5	Pass

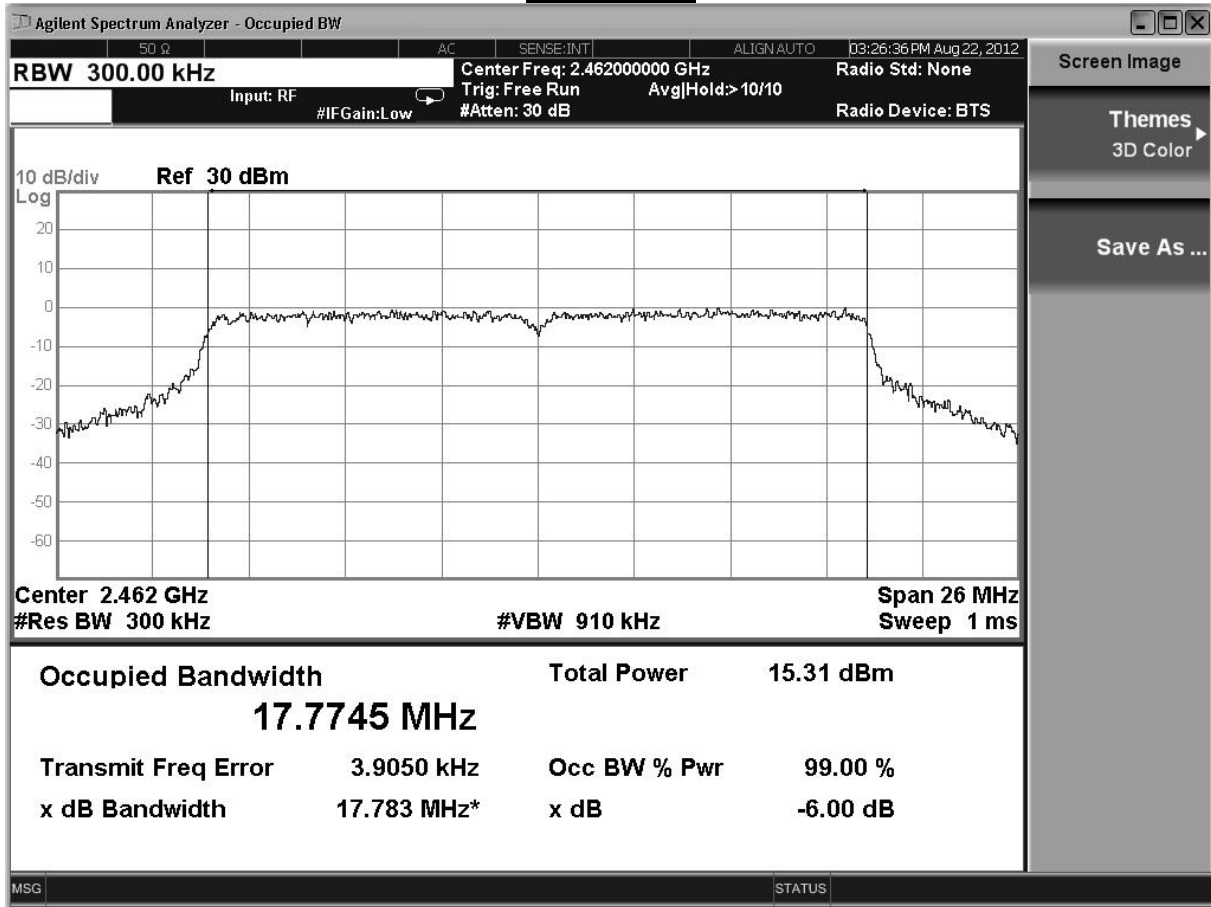
Channel 1



Channel 6



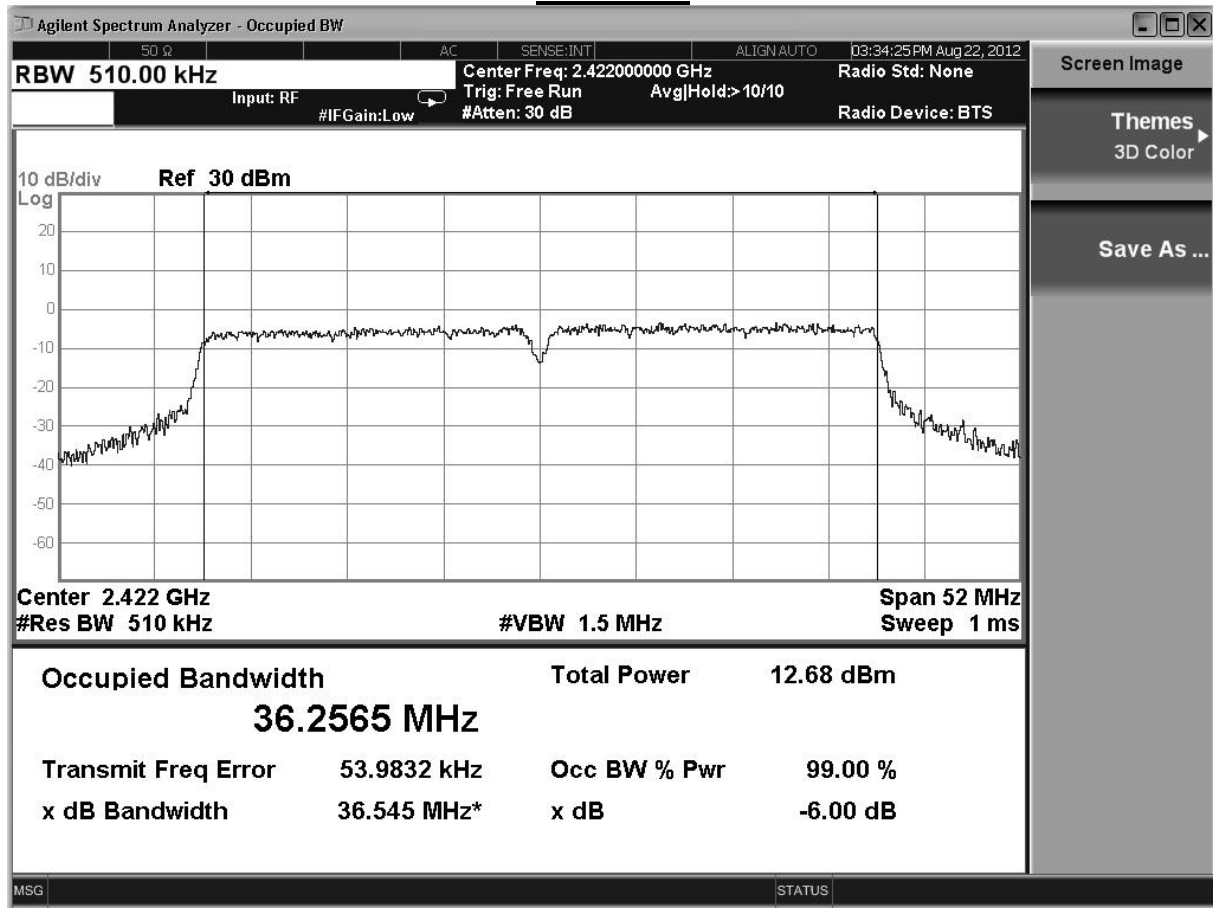
Channel 11



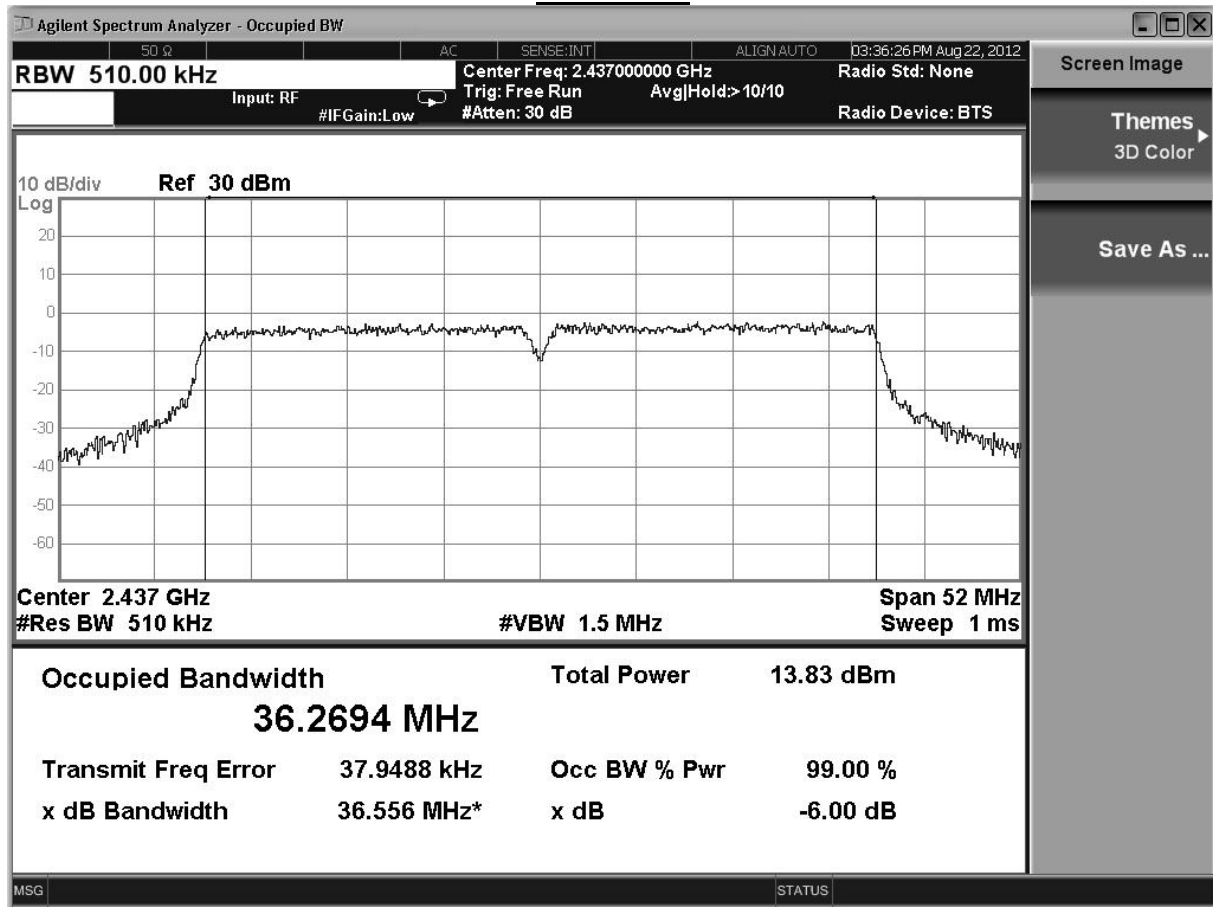
Product	Outdoor AP		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/08/22	Test Site	SR7

IEEE 802.11n (40MHz)(ANT 0)				
Channel No.	Frequency (MHz)	Measurement Level (MHz)	Required Limit (MHz)	Result
3	2422	36.545	≥ 0.5	Pass
6	2437	36.556	≥ 0.5	Pass
9	2452	36.549	≥ 0.5	Pass

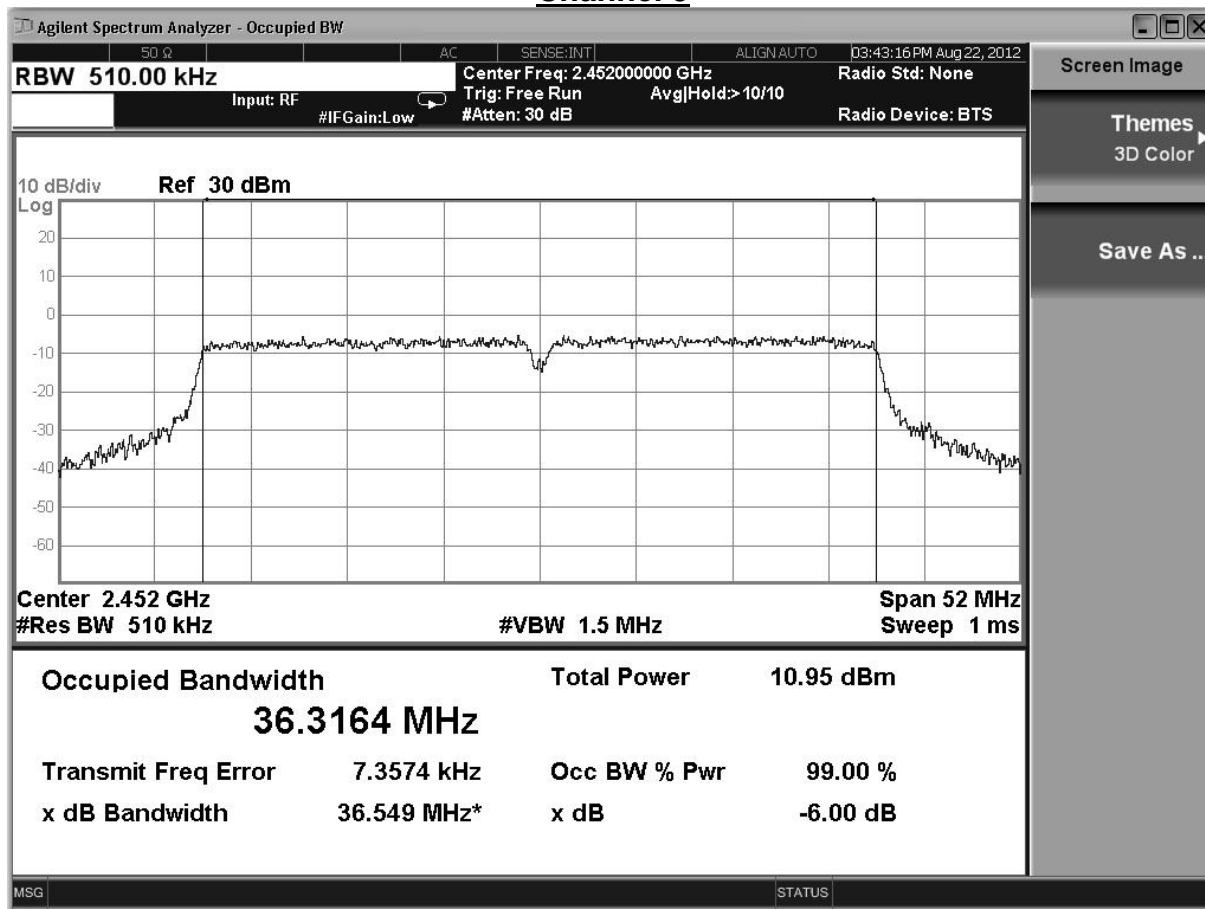
Channel 3



Channel 6



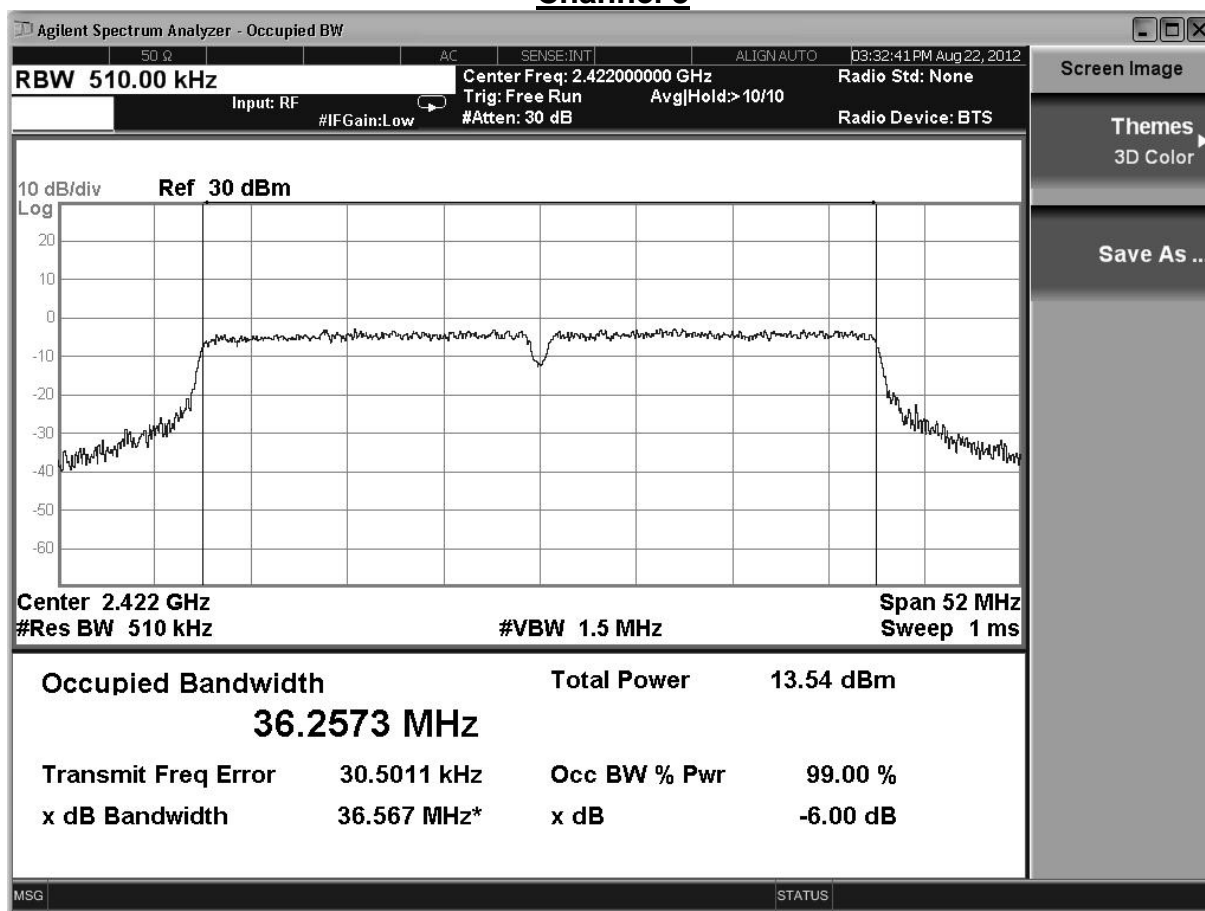
Channel 9



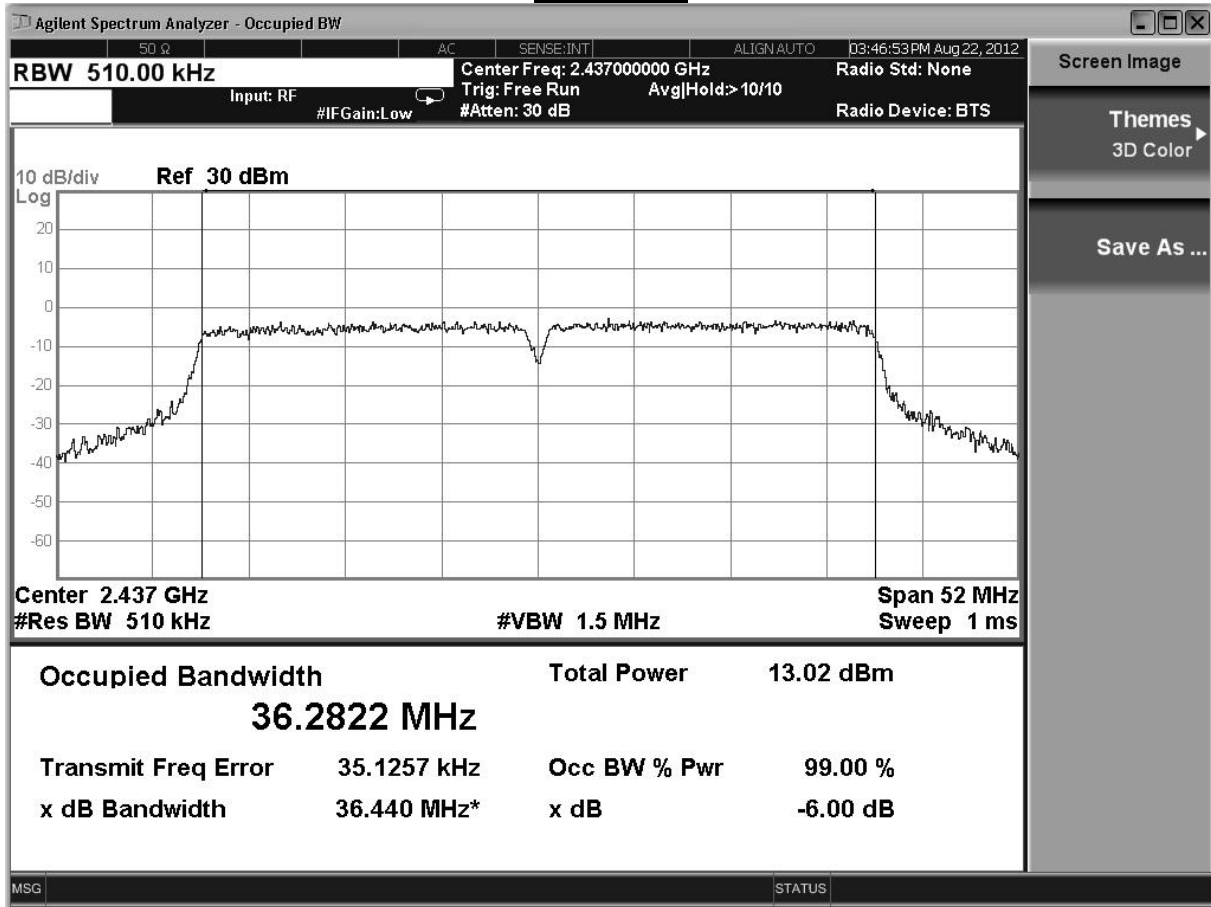
Product	Outdoor AP		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/08/22	Test Site	SR7

IEEE 802.11n (40MHz)(ANT 1)				
Channel No.	Frequency (MHz)	Measurement Level (MHz)	Required Limit (MHz)	Result
3	2422	36.567	≥ 0.5	Pass
6	2437	36.440	≥ 0.5	Pass
9	2452	36.442	≥ 0.5	Pass

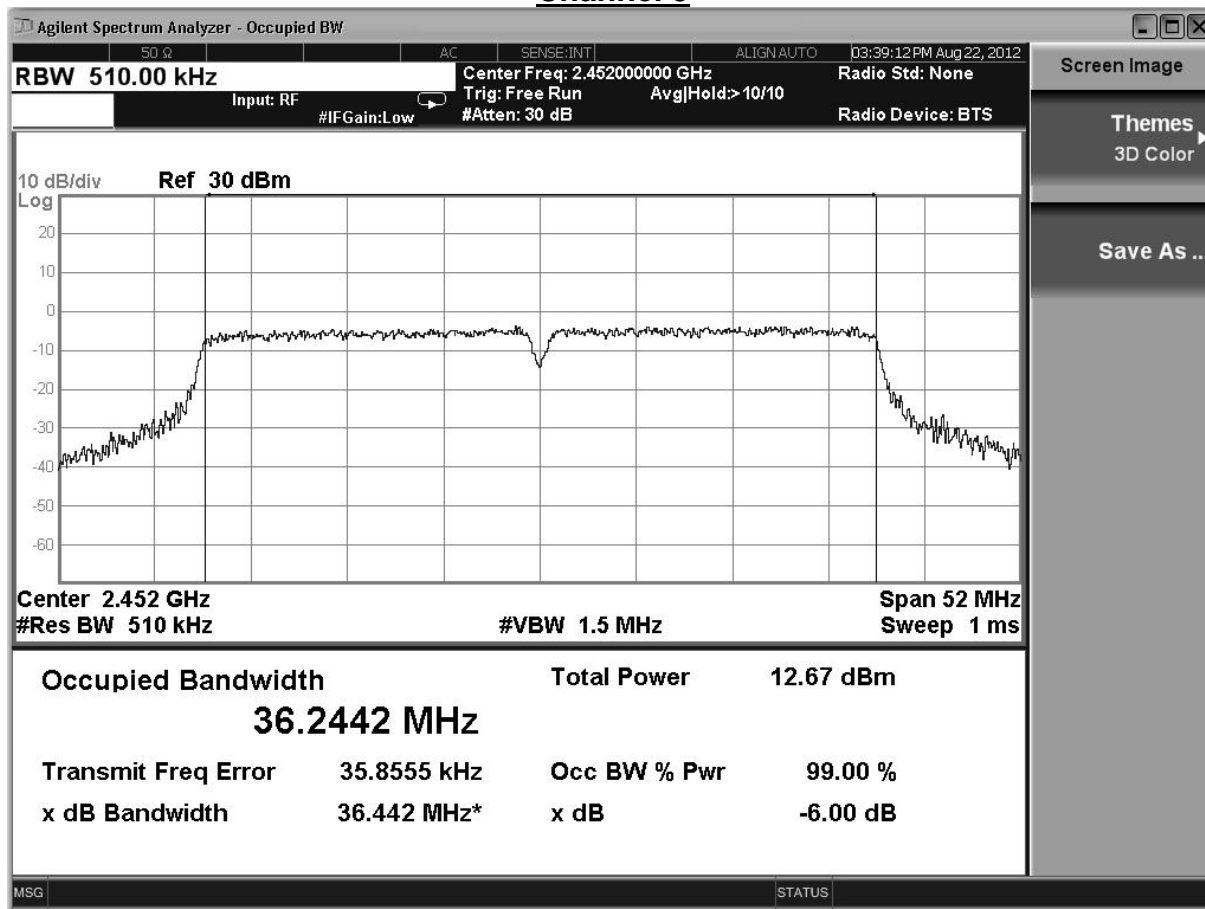
Channel 3



Channel 6



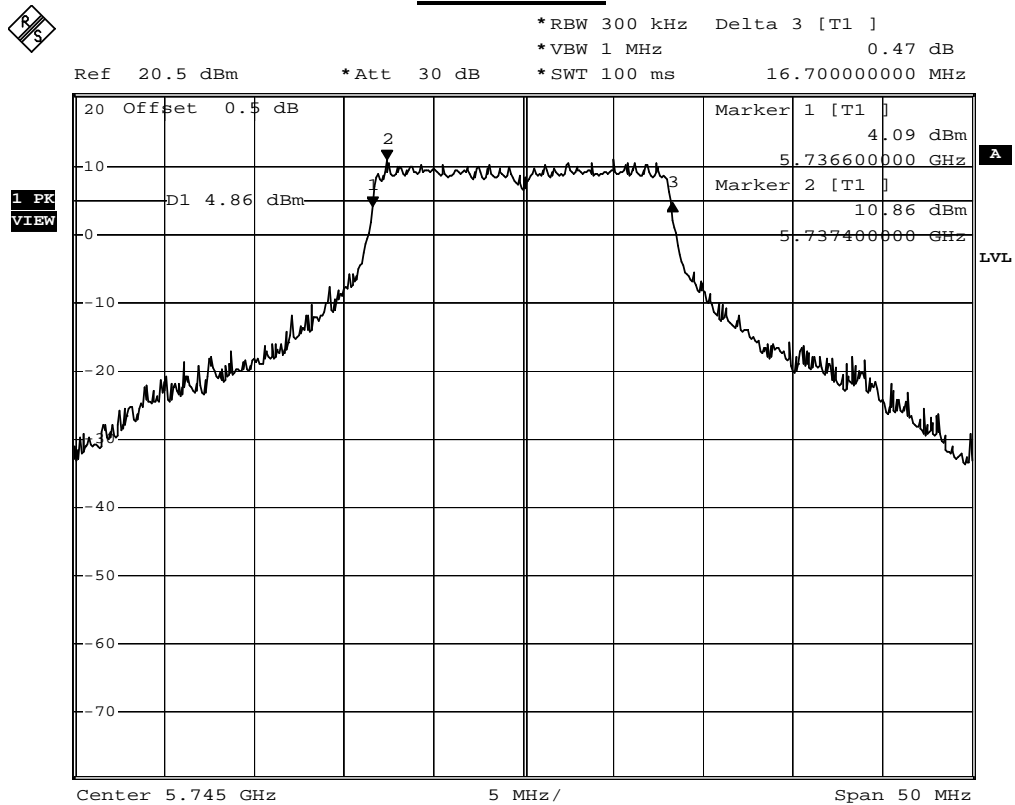
Channel 9



Product	Outdoor AP		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/10/05	Test Site	SR7

802.11 a				
Channel No.	Frequency (MHz)	Measurement Level (MHz)	Required Limit (MHz)	Result
149	5745	16.70	≥ 0.5	Pass
157	5785	16.70	≥ 0.5	Pass
165	5825	16.70	≥ 0.5	Pass

Channel 149



Comment: A:\2
 Date: 5.OCT.2012 15:16:51

Channel 157



*RBW 300 kHz Delta 3 [T1]

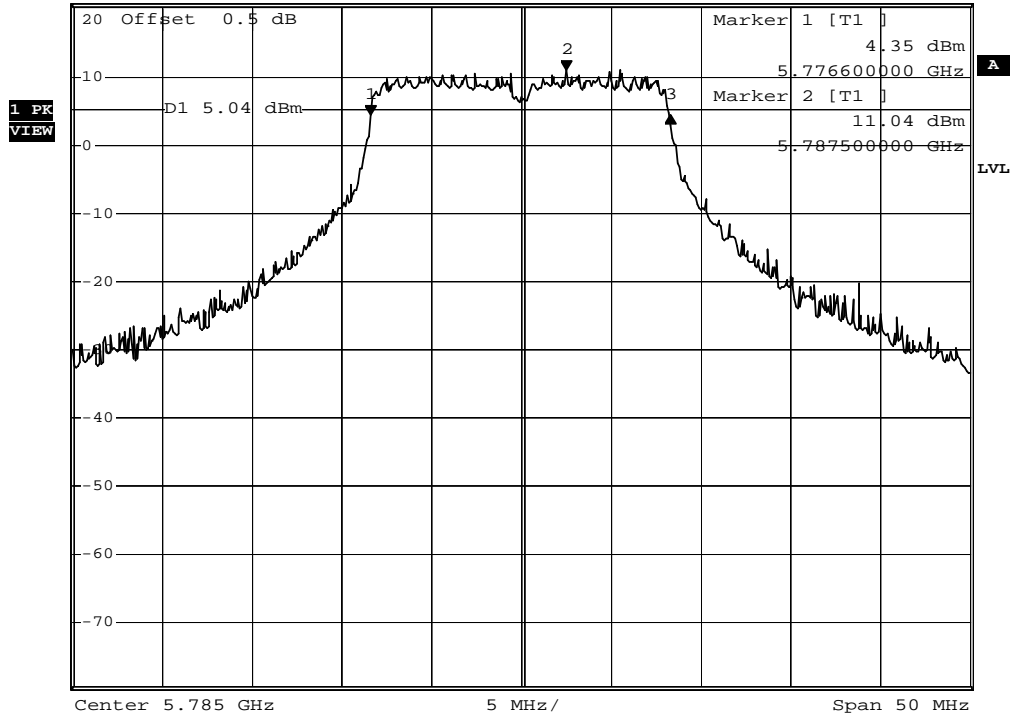
*VBW 1 MHz 0.08 dB

Ref 20.5 dBm

*Att 30 dB

*SWT 100 ms

16.700000000 MHz



Comment: A:\2

Date: 5.OCT.2012 15:24:46

Channel 165



*RBW 300 kHz Delta 3 [T1]

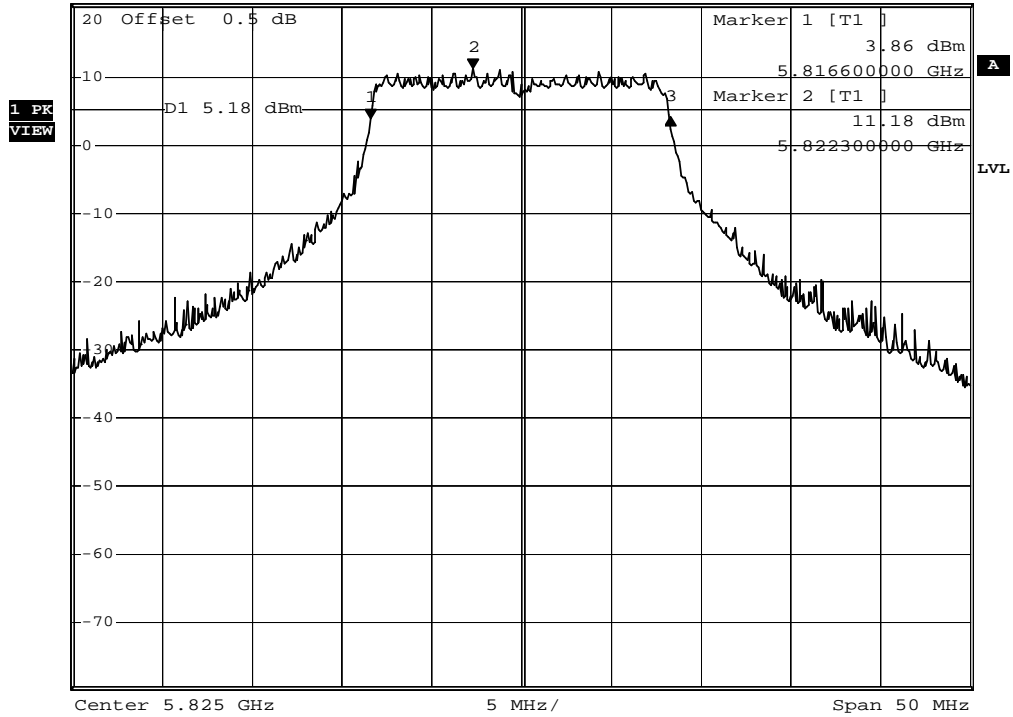
*VBW 1 MHz 0.24 dB

Ref 20.5 dBm

*Att 30 dB

*SWT 100 ms

16.700000000 MHz



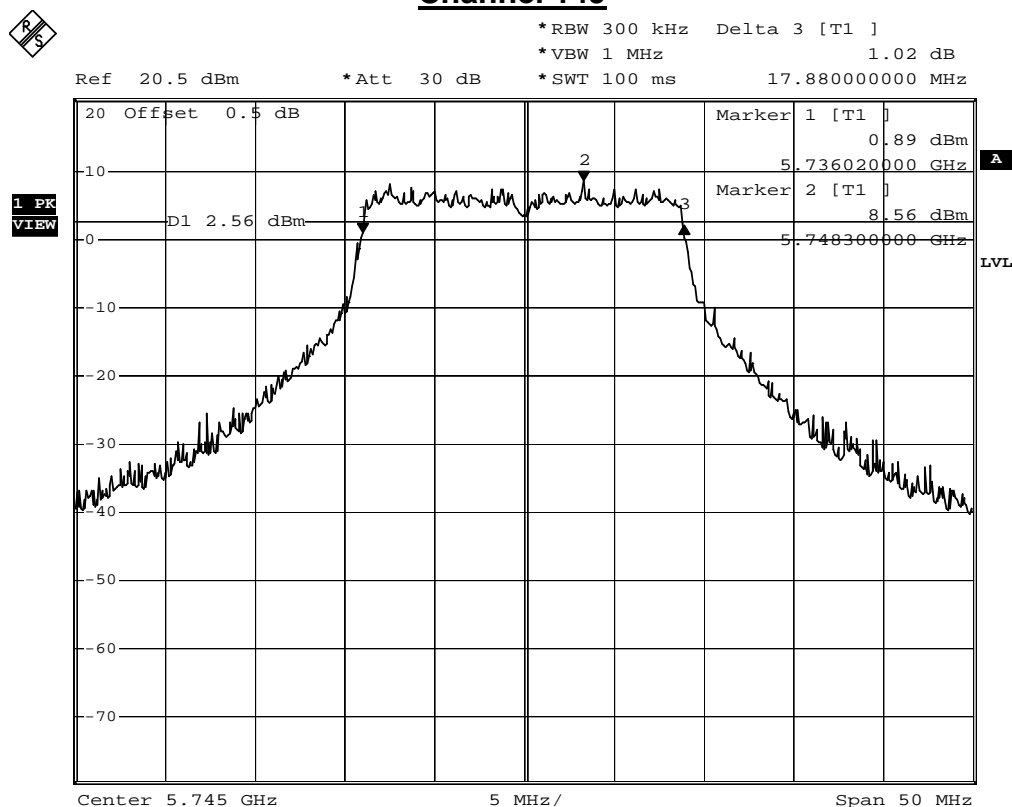
Comment: A:\2

Date: 5.OCT.2012 15:28:49

Product	Outdoor AP		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/10/05	Test Site	SR7

IEEE 802.11n (20MHz)(ANT 0)				
Channel No.	Frequency (MHz)	Measurement Level (MHz)	Required Limit (MHz)	Result
149	5745	17.88	≥ 0.5	Pass
157	5785	17.90	≥ 0.5	Pass
165	5825	18.00	≥ 0.5	Pass

Channel 149



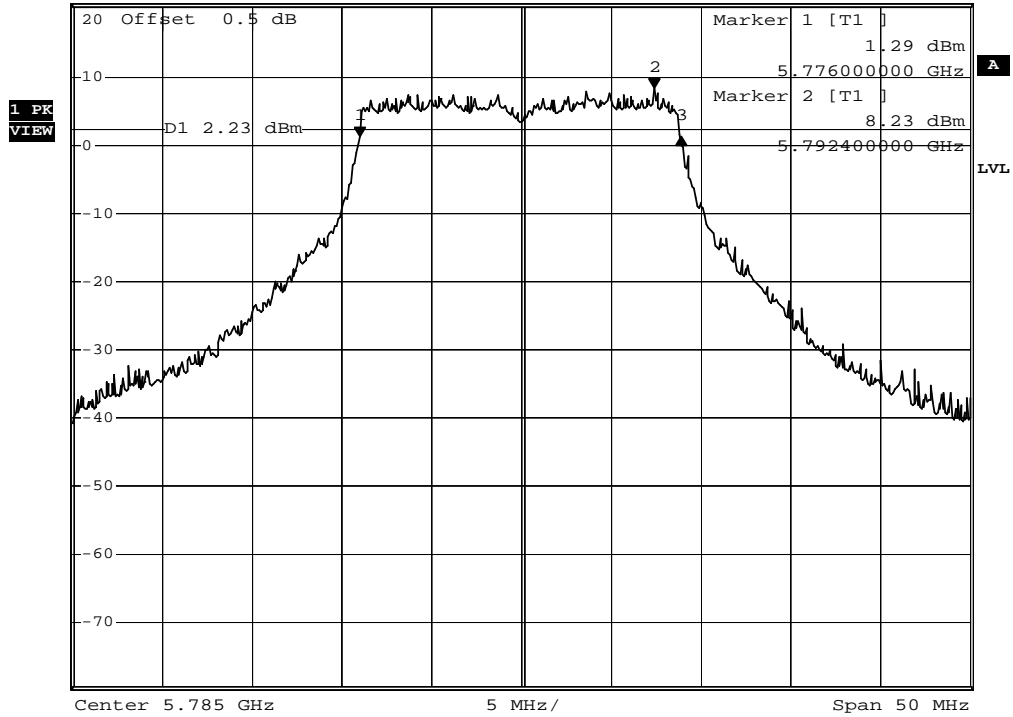
Comment: A:\2
 Date: 5.OCT.2012 16:11:47

Channel 157



*RBW 300 kHz Delta 3 [T1]
 *VBW 1 MHz -0.10 dB
 *SWT 100 ms 17.900000000 MHz

Ref 20.5 dBm *Att 30 dB



Comment: A:\2
 Date: 5.OCT.2012 15:42:09

Channel 165



*RBW 300 kHz Delta 3 [T1]

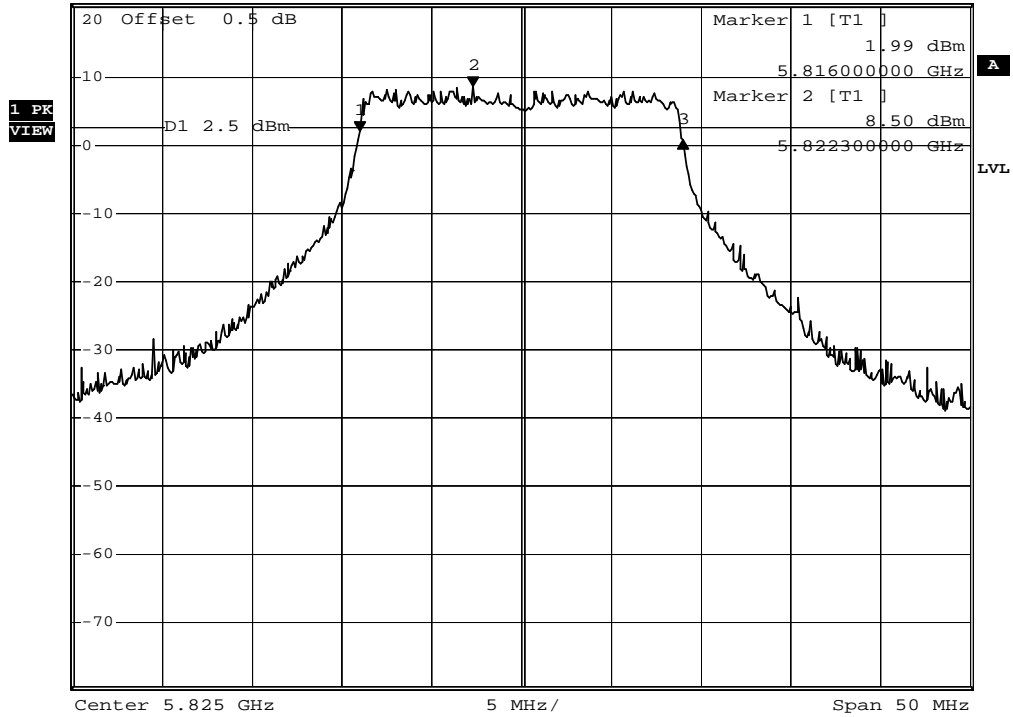
*VBW 1 MHz -1.41 dB

Ref 20.5 dBm

*Att 30 dB

*SWT 100 ms

18.000000000 MHz



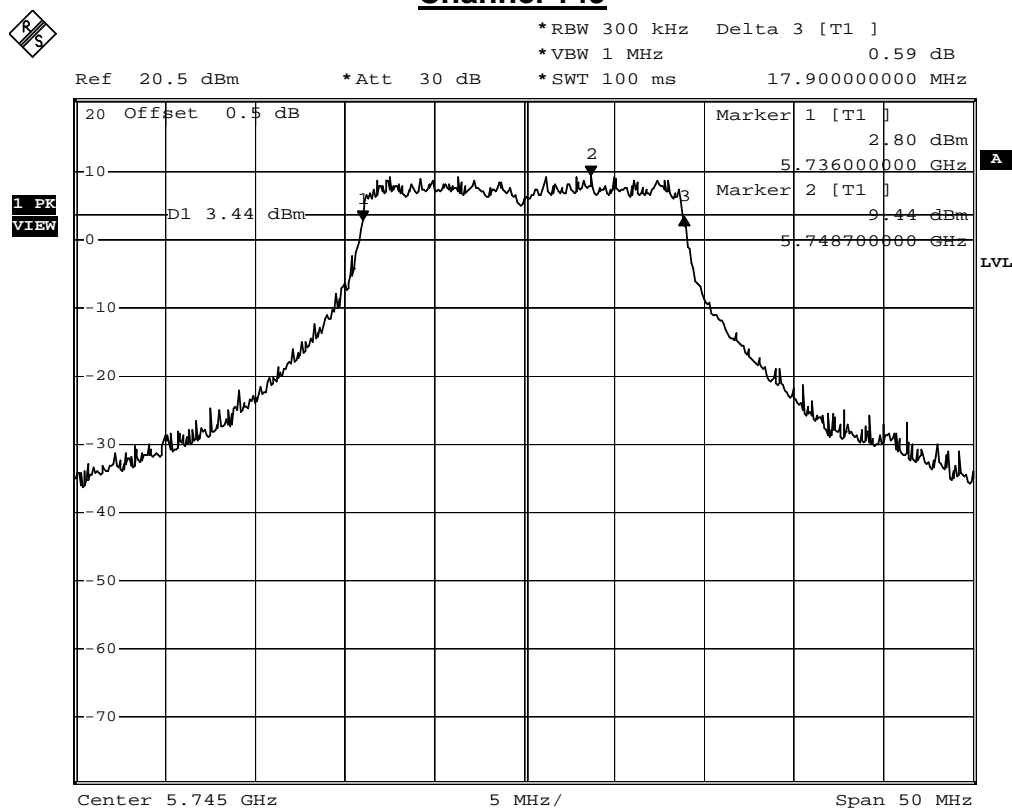
Comment: A:\2

Date: 5.OCT.2012 15:38:44

Product	Outdoor AP		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/10/05	Test Site	SR7

IEEE 802.11n (20MHz)(ANT 1)				
Channel No.	Frequency (MHz)	Measurement Level (MHz)	Required Limit (MHz)	Result
149	5745	17.90	≥ 0.5	Pass
157	5785	18.04	≥ 0.5	Pass
165	5825	18.00	≥ 0.5	Pass

Channel 149



Comment: A:\2
 Date: 5.OCT.2012 16:09:38

Channel 157



*RBW 300 kHz Delta 3 [T1]

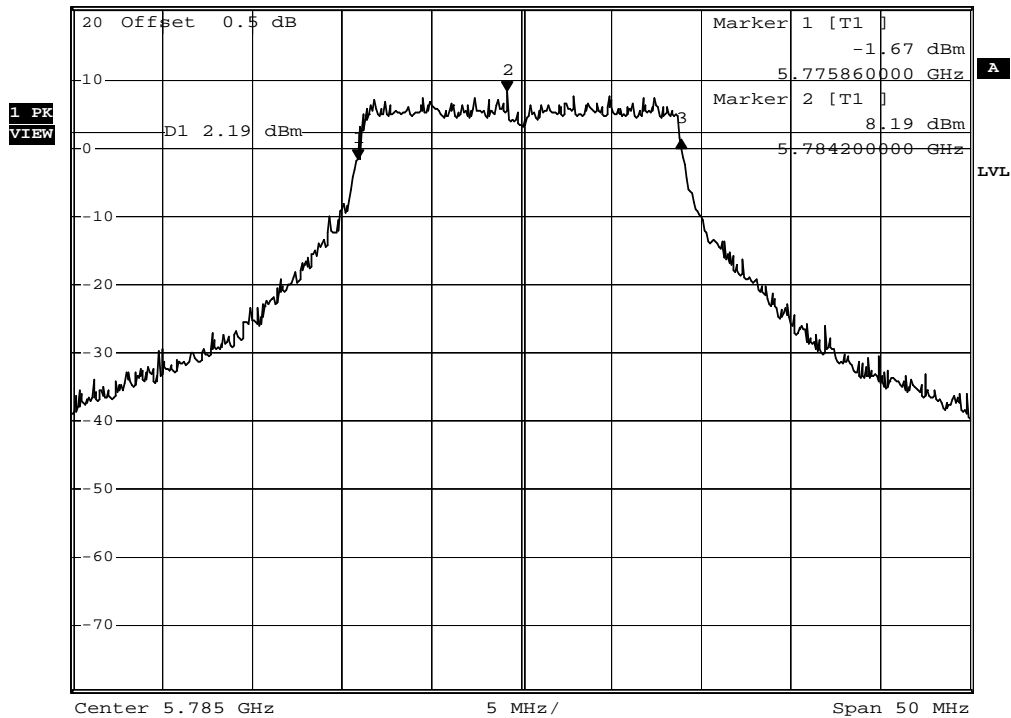
*VBW 1 MHz 2.78 dB

Ref 20.5 dBm

*Att 30 dB

*SWT 100 ms

18.04000000 MHz



Comment: A:\2

Date: 5.OCT.2012 15:44:52

Channel 165



*RBW 300 kHz Delta 3 [T1]

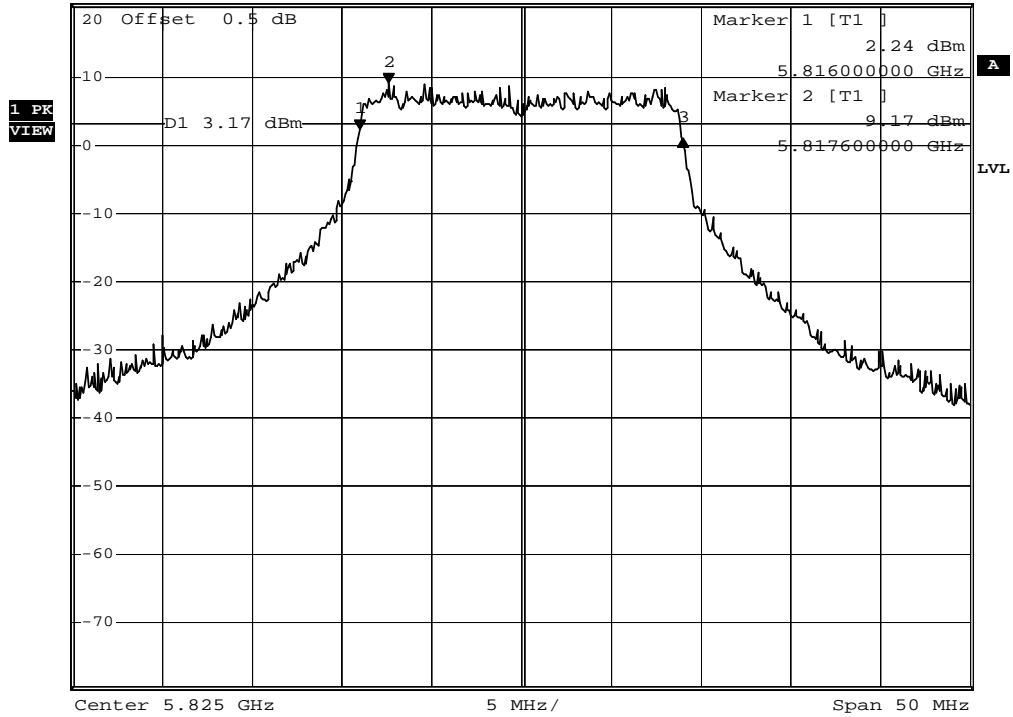
*VBW 1 MHz -1.35 dB

Ref 20.5 dBm

*Att 30 dB

*SWT 100 ms

18.000000000 MHz



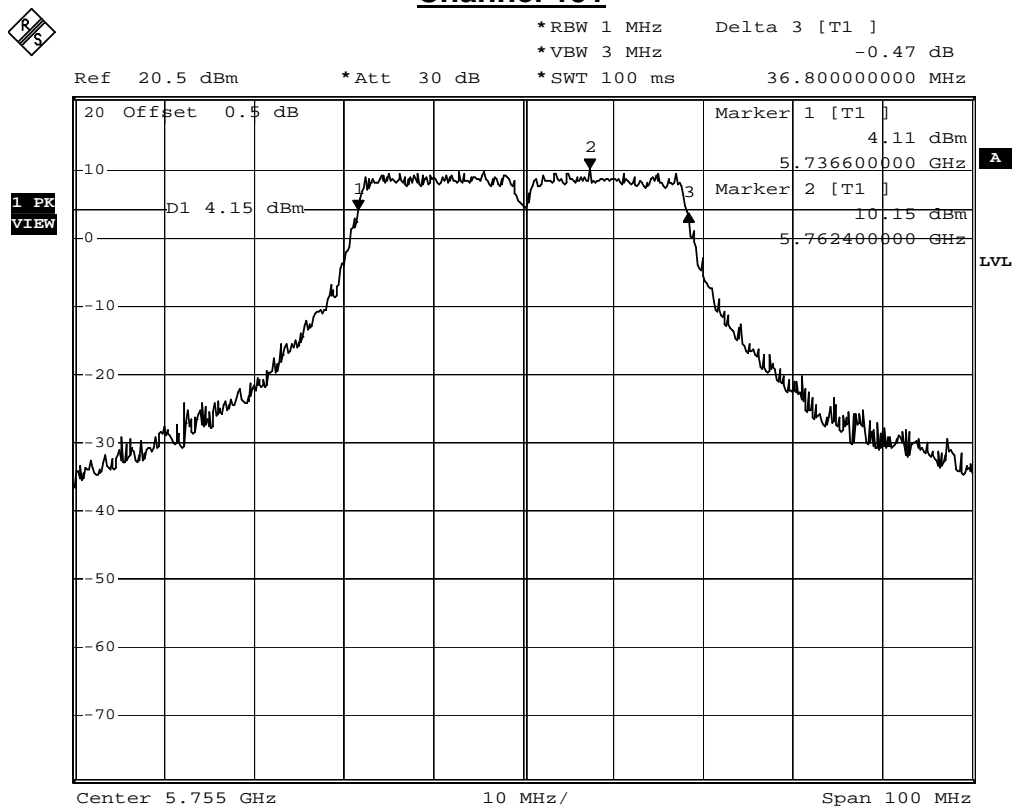
Comment: A:\2

Date: 5.OCT.2012 15:35:22

Product	Outdoor AP		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/10/05	Test Site	SR7

IEEE 802.11n (40MHz)(ANT 0)				
Channel No.	Frequency (MHz)	Measurement Level (MHz)	Required Limit (MHz)	Result
151	5755	36.80	≥ 0.5	Pass
159	5795	37.04	≥ 0.5	Pass

Channel 151



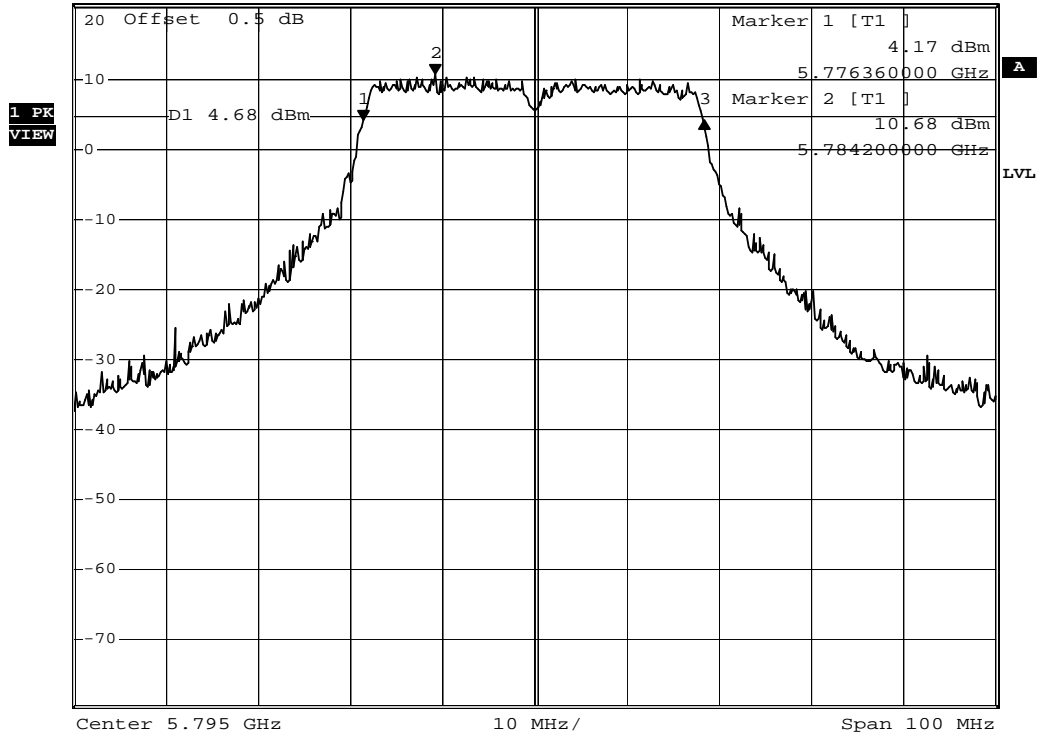
Comment: A:\2
 Date: 5.OCT.2012 17:09:51

Channel 159



*RBW 1 MHz Delta 3 [T1]
 *VBW 3 MHz -0.16 dB
 *SWT 100 ms

Ref 20.5 dBm *Att 30 dB 37.040000000 MHz

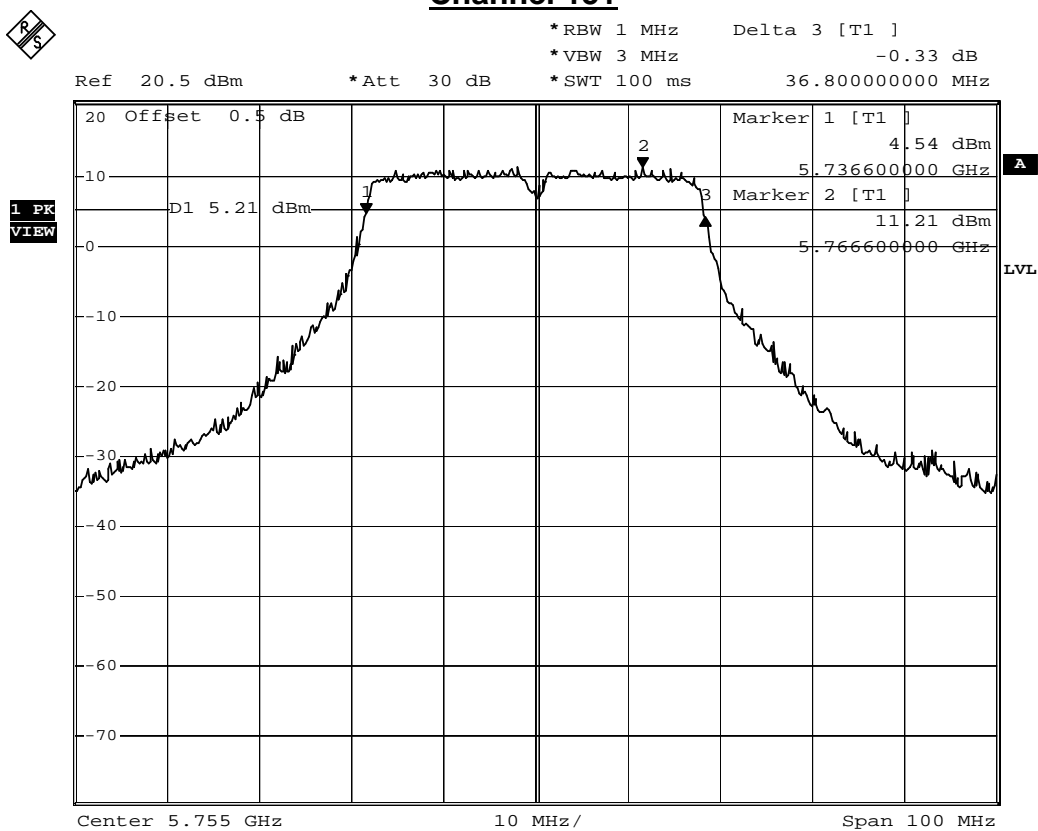


Date: 6.OCT.2012 11:17:11

Product	Outdoor AP		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2012/10/05	Test Site	SR7

IEEE 802.11n (40MHz)(ANT 1)				
Channel No.	Frequency (MHz)	Measurement Level (MHz)	Required Limit (MHz)	Result
151	5755	36.80	≥ 0.5	Pass
159	5795	37.00	≥ 0.5	Pass

Channel 151



Date: 6.OCT.2012 11:13:23

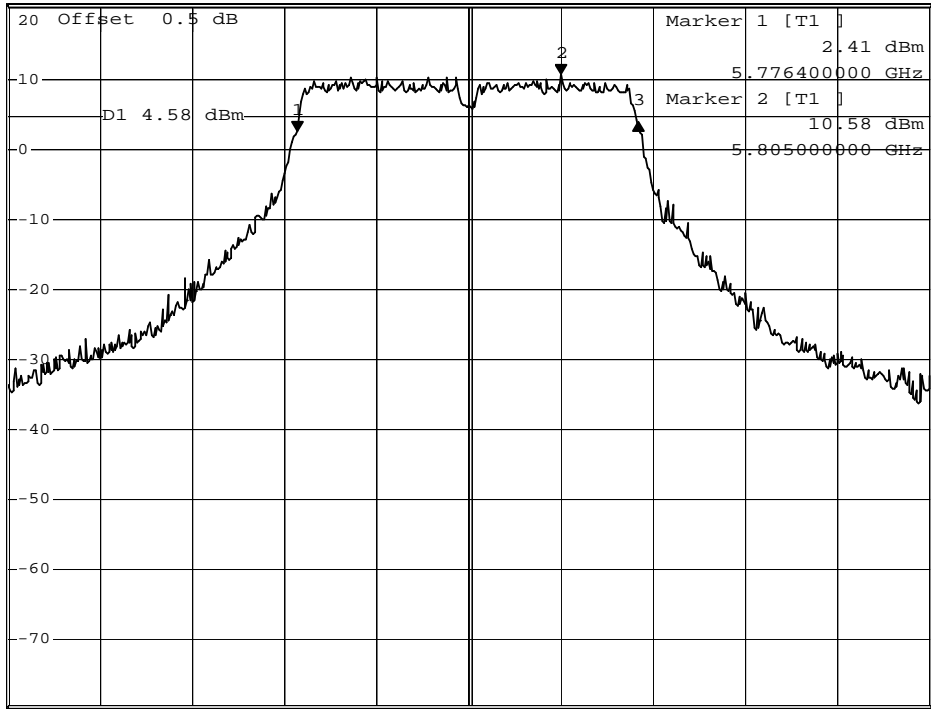
Channel 159



*RBW 1 MHz Delta 3 [T1]
 *VBW 3 MHz 1.32 dB
 *SWT 100 ms 37.000000000 MHz

Ref 20.5 dBm *Att 30 dB

1 PK
VIEW



Date: 6.OCT.2012 11:14:58

8. Power Density

8.1. Test Equipment

The following test equipment is used during the test:

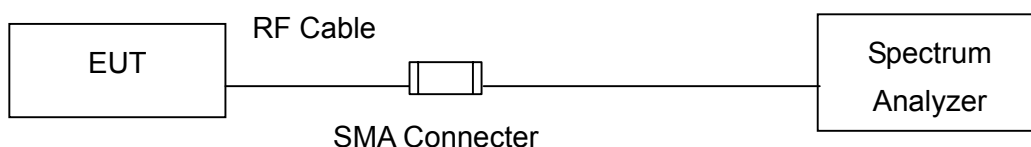
Power Density / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	R&S	FSP	100561	2013/02/19

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

8.2. Test Setup

IEEE 802.11 b / g / a / n (20M / 40M) MODE



8.3. Limits

The peak 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.

8.4. Test Procedures

The EUT was setup according to ANSI C63.4: 2009; tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW= 100 kHz, Set VBW= 300 kHz, Sweep time=Auto, Set detector=Peak detector.

Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log (3 \text{ kHz}/100 \text{ kHz} = -15.2 \text{ dB})$.

8.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2011

8.6. Uncertainty

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

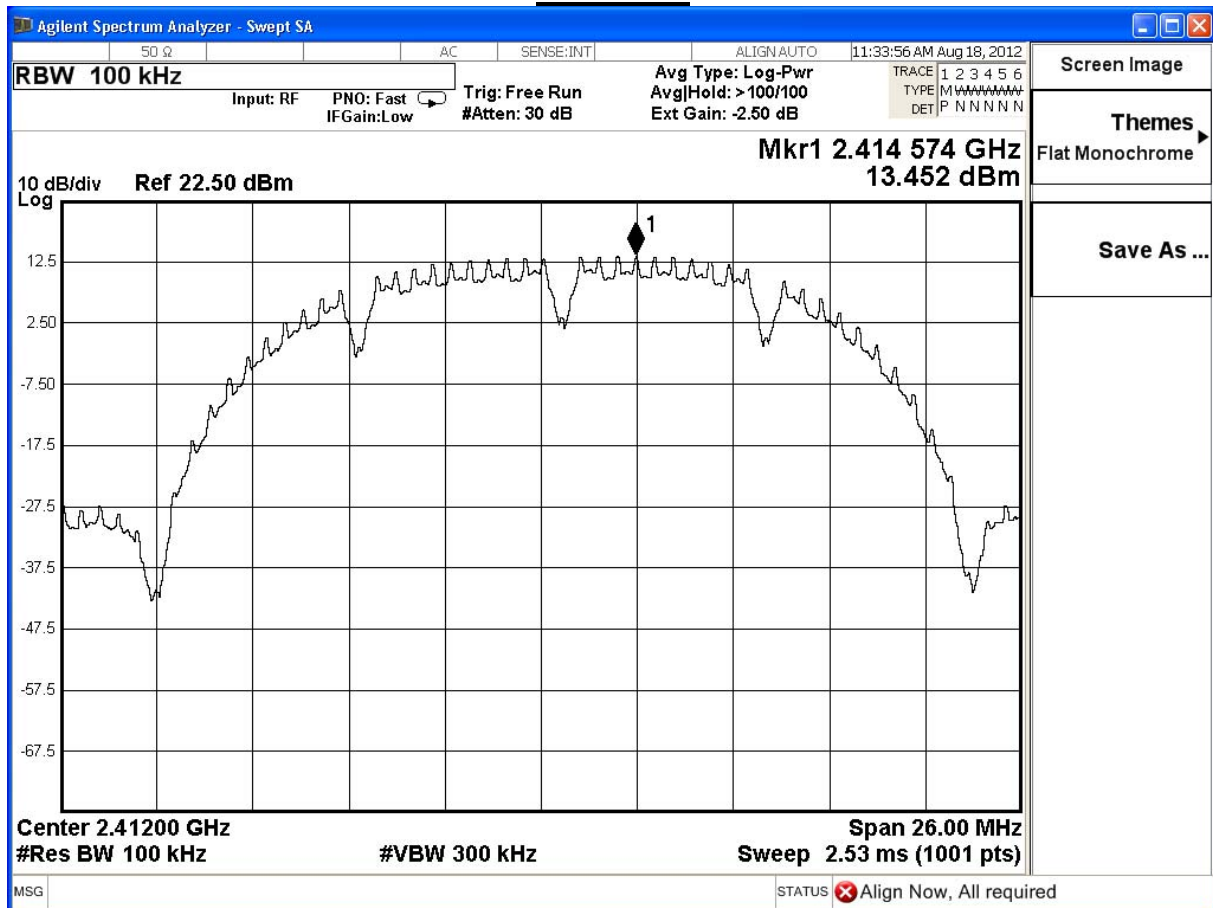
8.7. Test Result

Product	Outdoor AP		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2012/08/22	Test Site	SR7

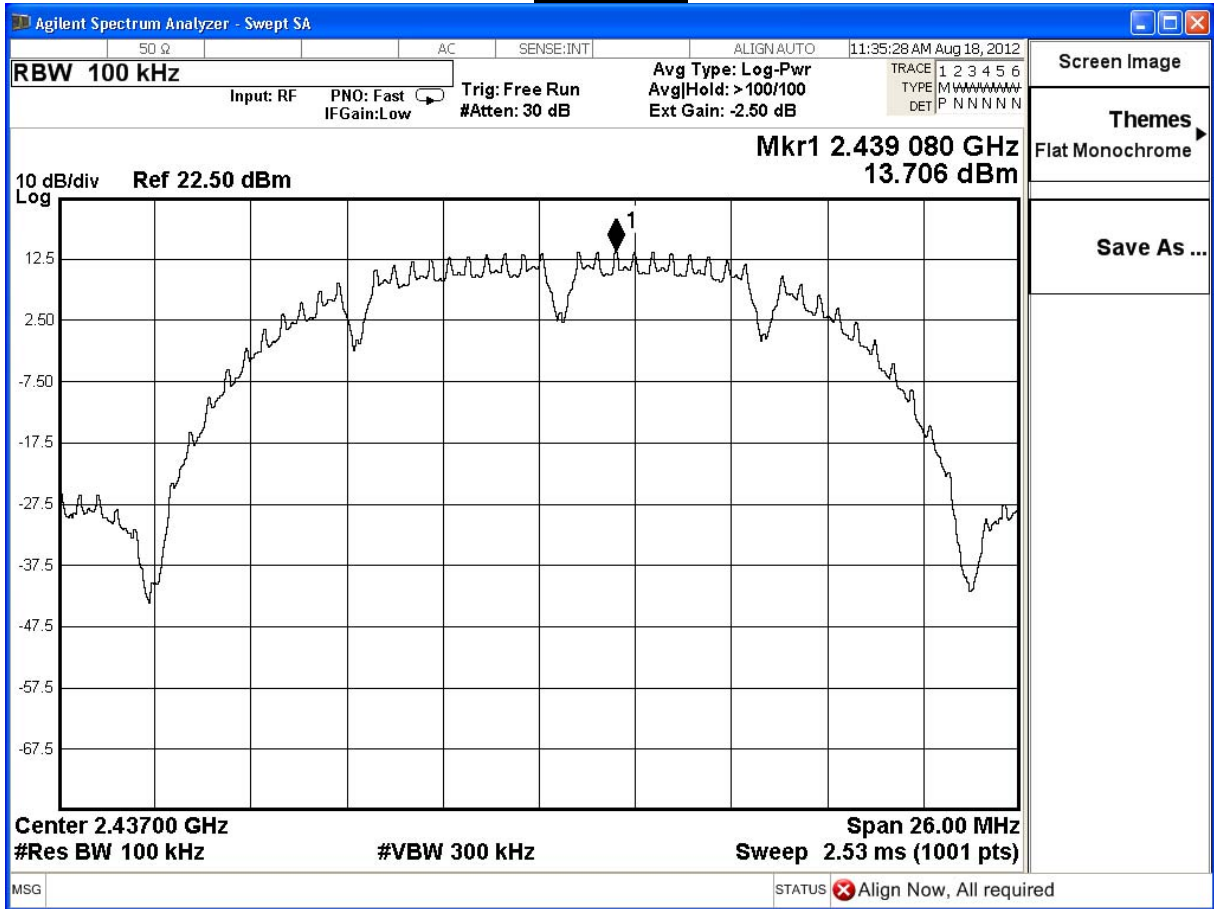
IEEE 802.11b					
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	13.452	-1.75	≤ 8	Pass
06	2437	13.706	-1.49	≤ 8	Pass
11	2462	9.517	-5.68	≤ 8	Pass

Note: Measure Level = Reading + BWCF = Reading Level -15.2dB
 Bandwidth correction factor (BWCF) = 10log (3kHz/100kHz)

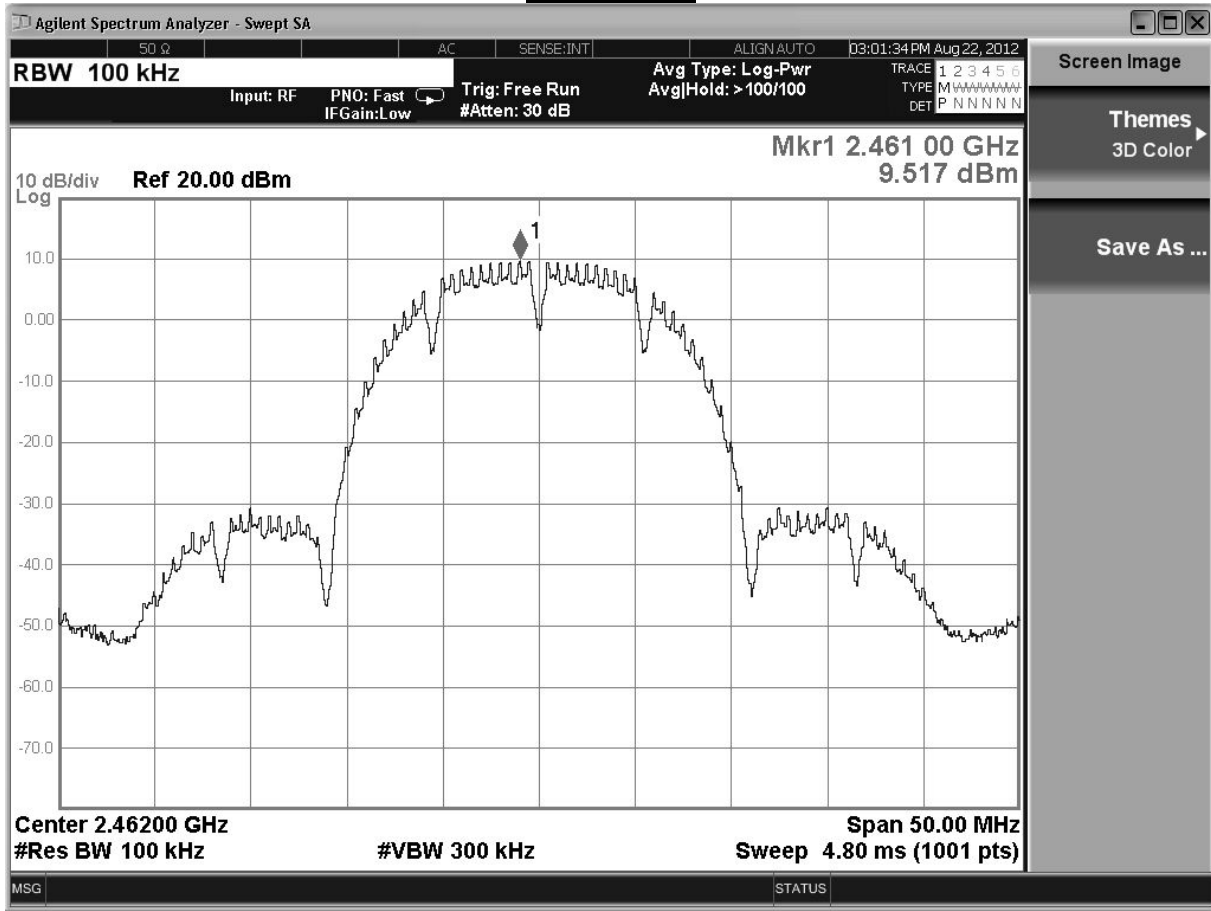
Channel 1



Channel 6



Channel 11

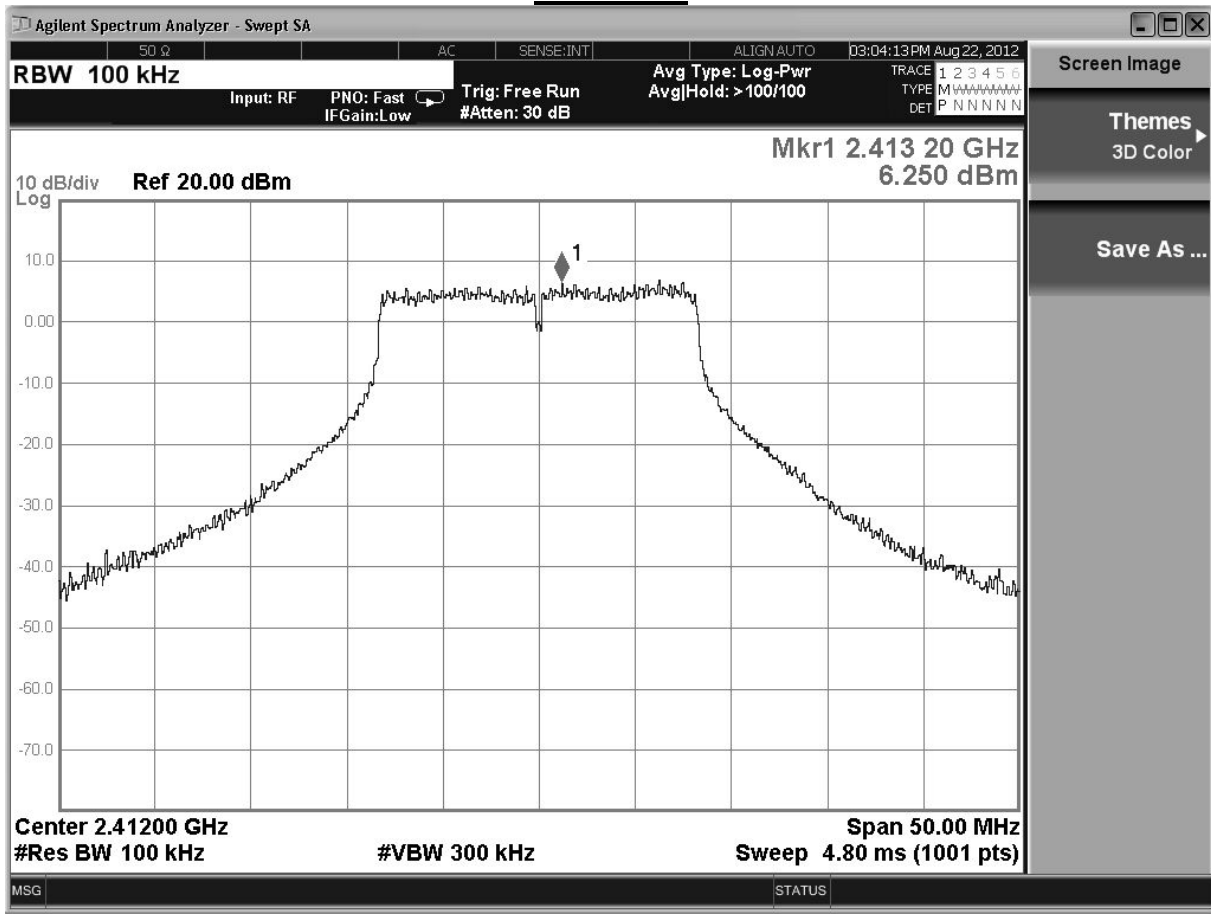


Product	Outdoor AP		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2012/08/22	Test Site	SR7

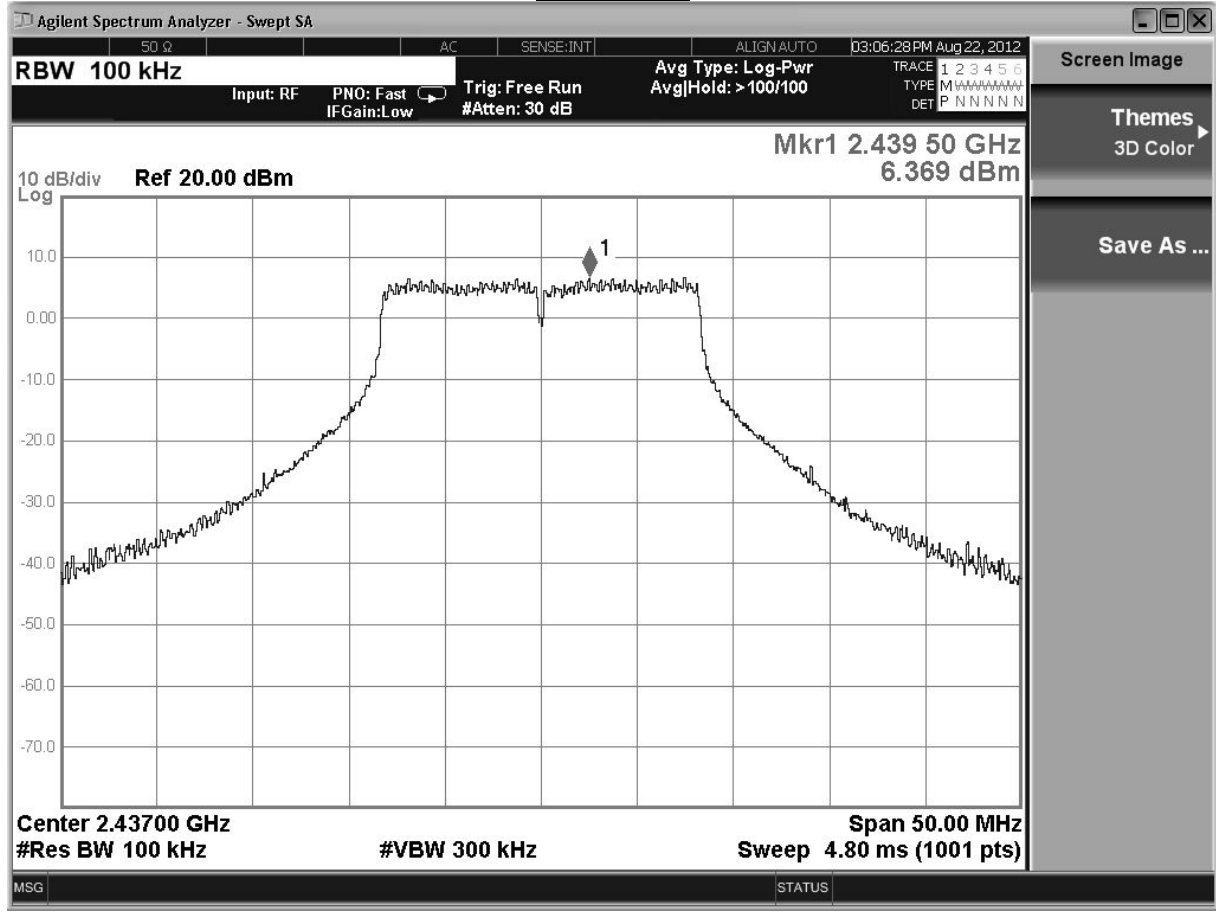
IEEE 802.11g					
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measurement (dBm)	Limit (dBm)	Result
01	2412	6.250	-8.95	≤ 8	Pass
06	2437	6.369	-8.83	≤ 8	Pass
11	2462	0.434	-14.77	≤ 8	Pass

Note: Measure Level = Reading + BWCF = Reading Level -15.2dB
 Bandwidth correction factor (BWCF) = 10log (3kHz/100kHz)

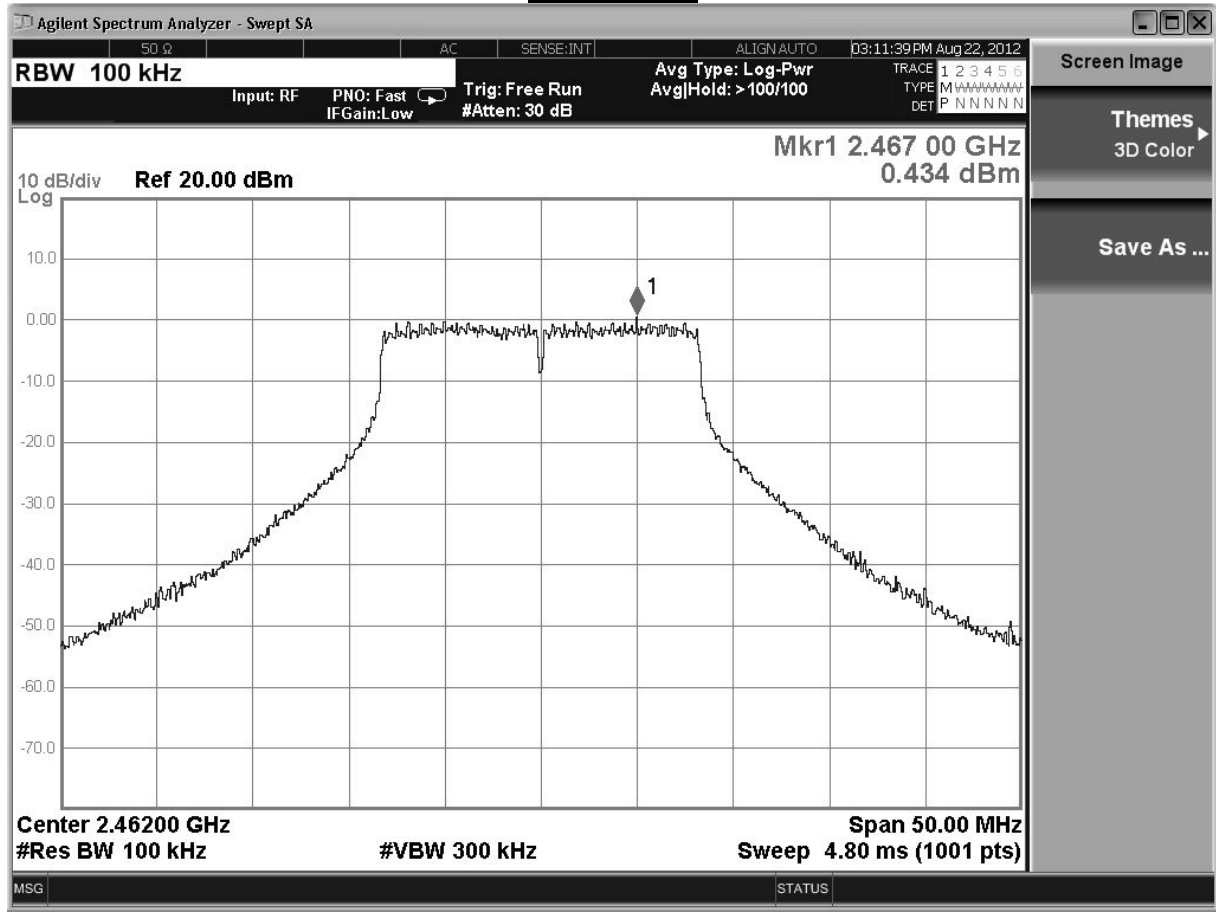
Channel 1



Channel 6



Channel 11

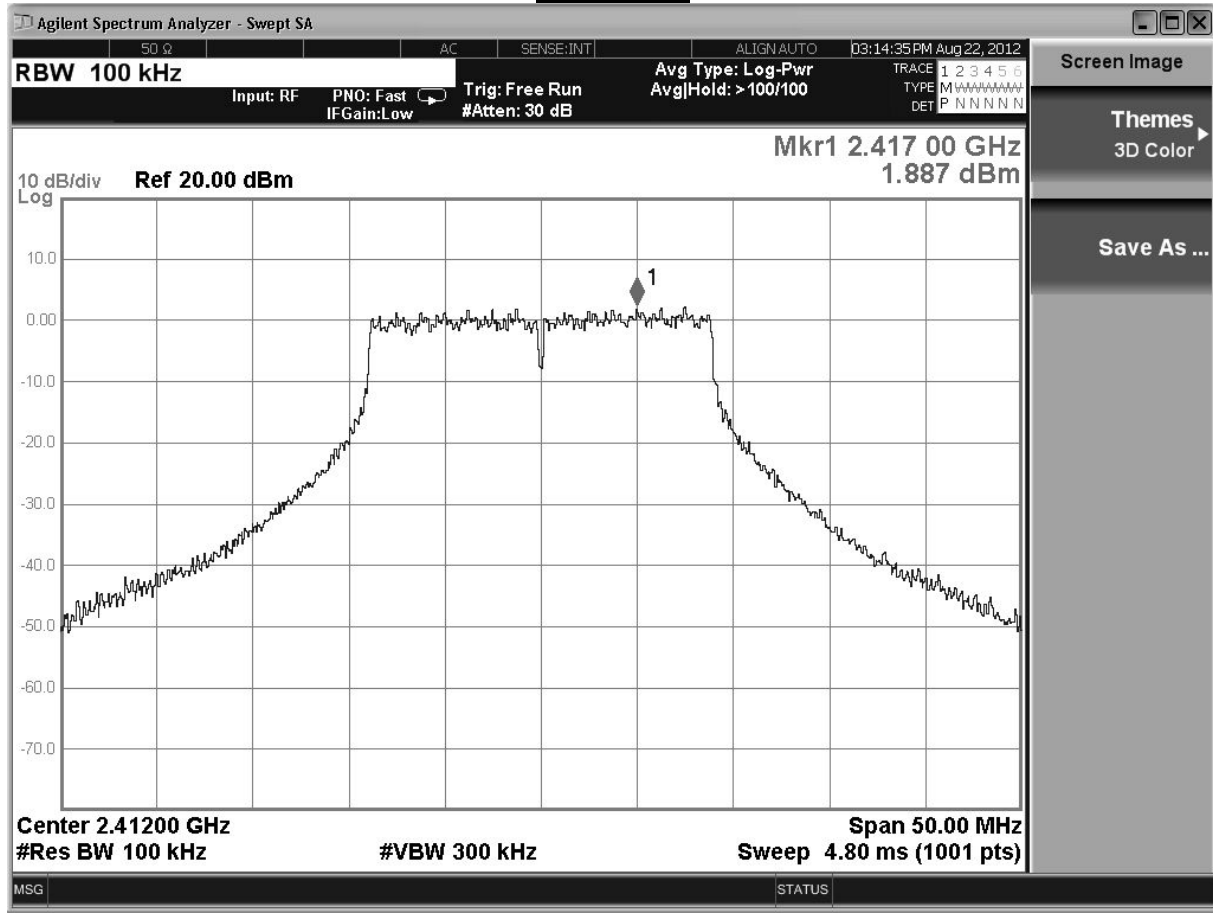


Product	Outdoor AP		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2012/08/22	Test Site	SR7

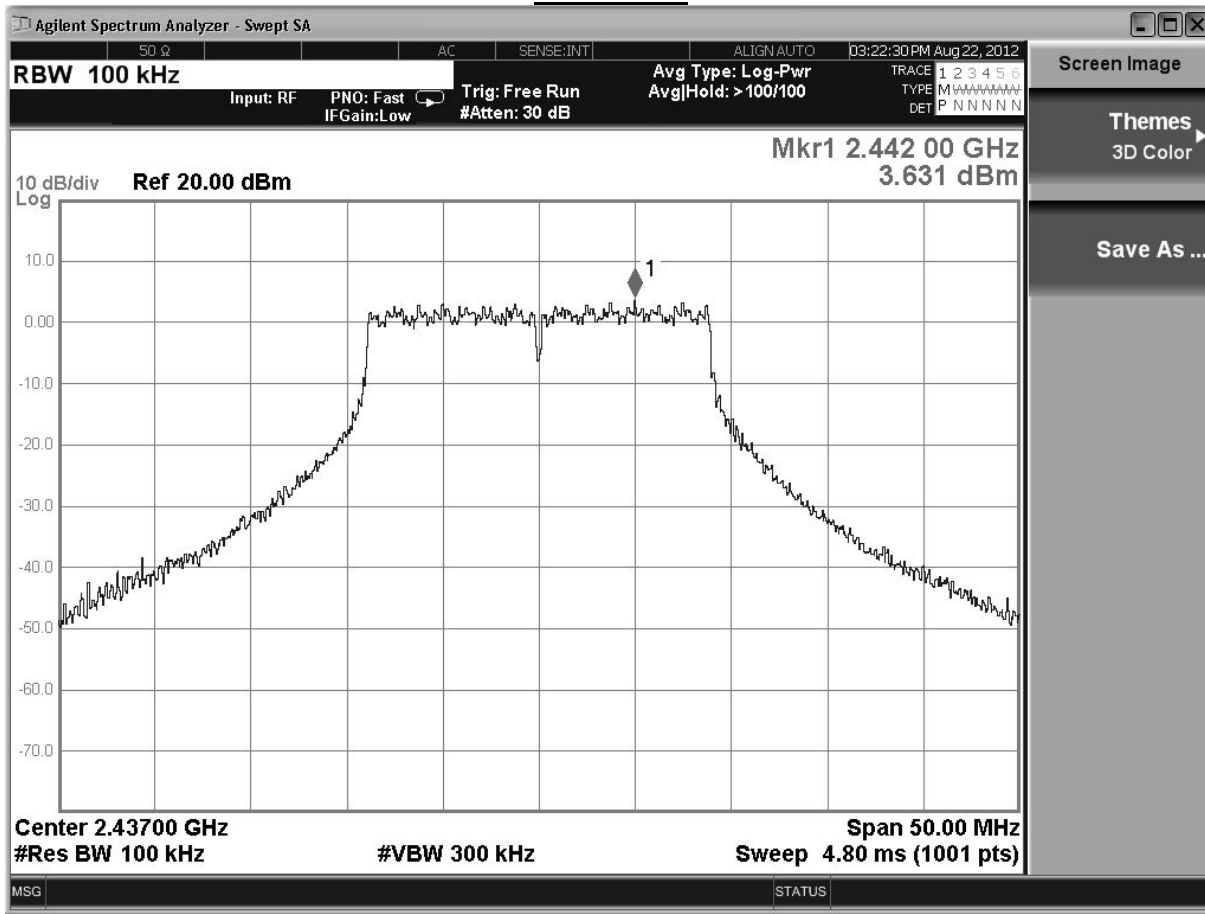
IEEE802.11n_20MHz_(ANT 0)					
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	1.887	-13.31	≤ 8	Pass
06	2437	3.631	-11.57	≤ 8	Pass
11	2462	2.870	-12.33	≤ 8	Pass

Note: Measure Level = Reading + BWCF = Reading Level -15.2dB
 Bandwidth correction factor (BWCF) = 10log (3kHz/100kHz)

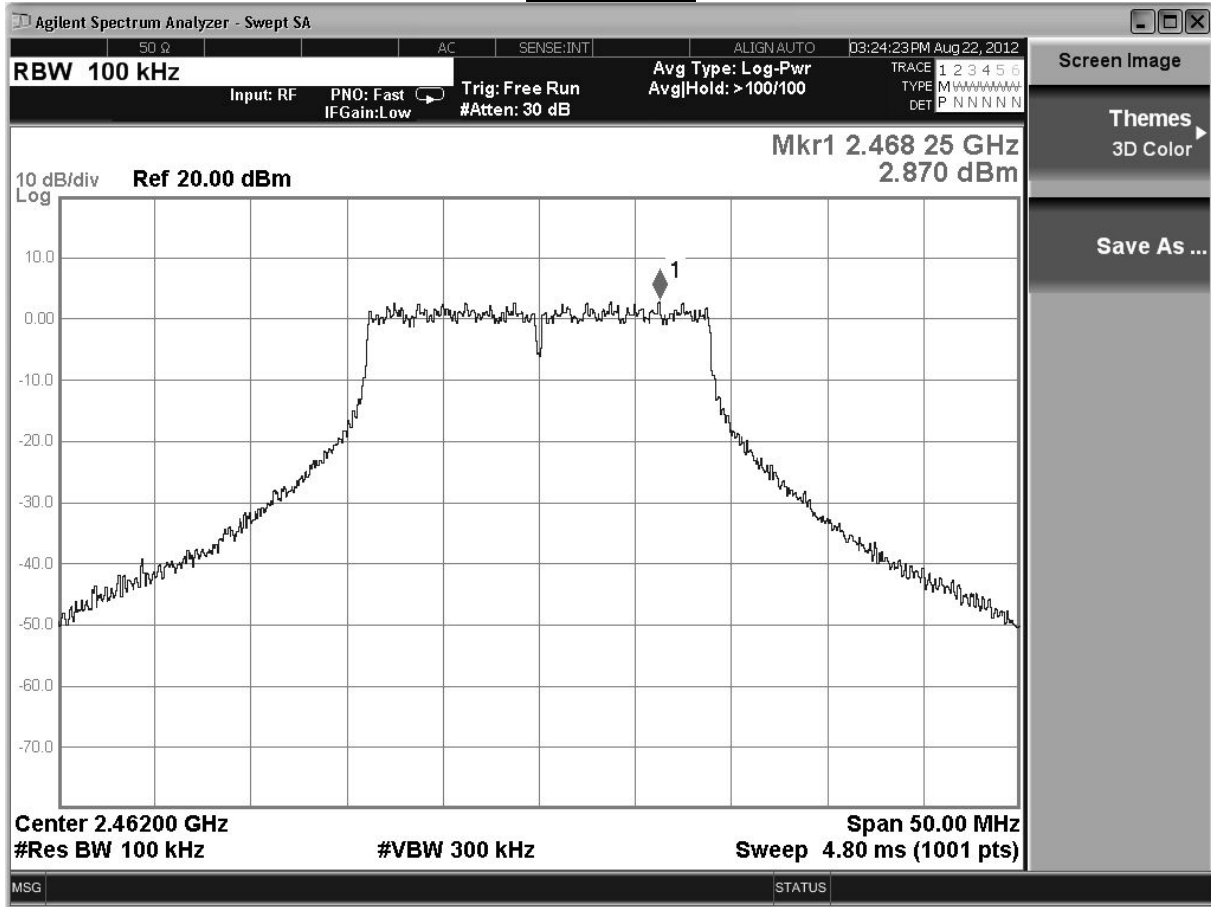
Channel 1



Channel 6



Channel 11



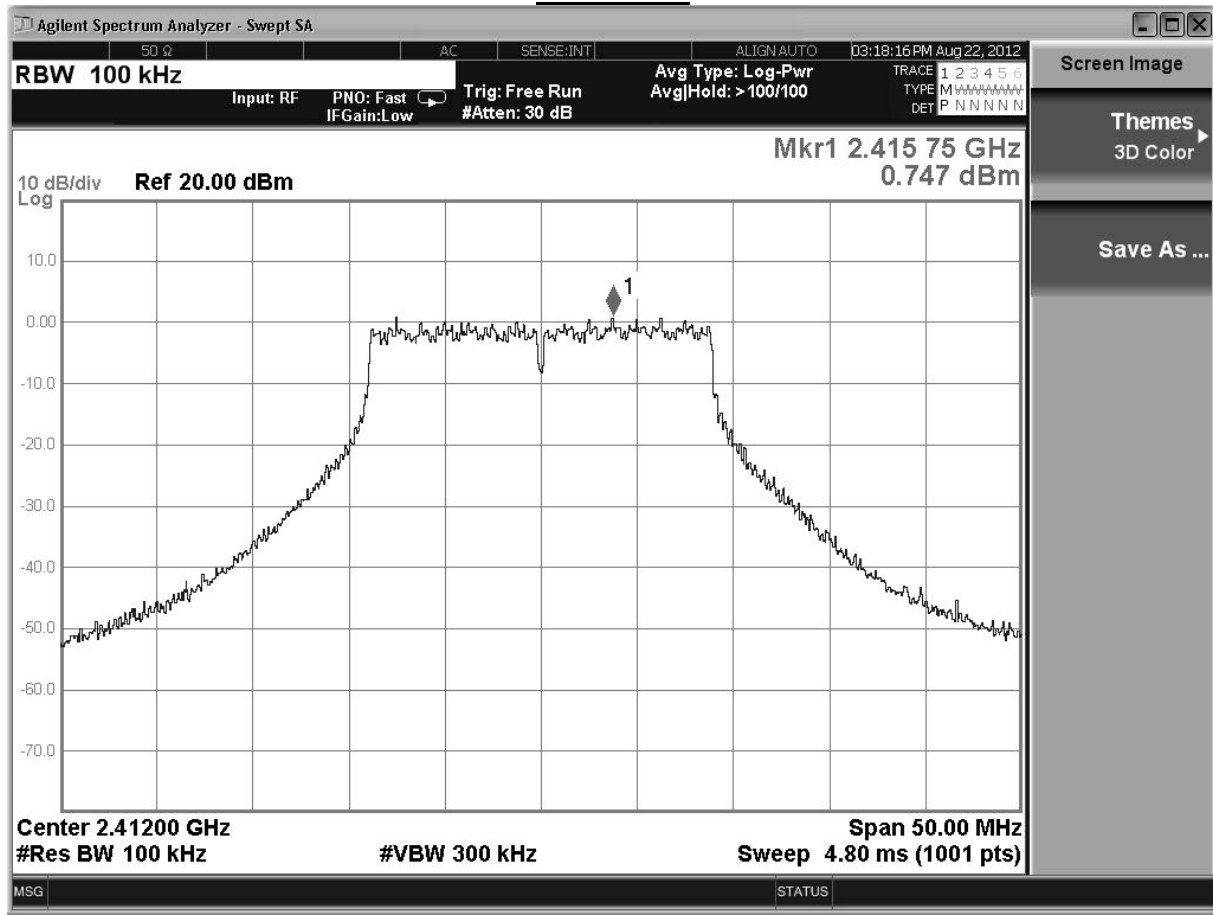
Product	Outdoor AP		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2012/08/22	Test Site	SR7

IEEE802.11n_20MHz_(ANT 1)

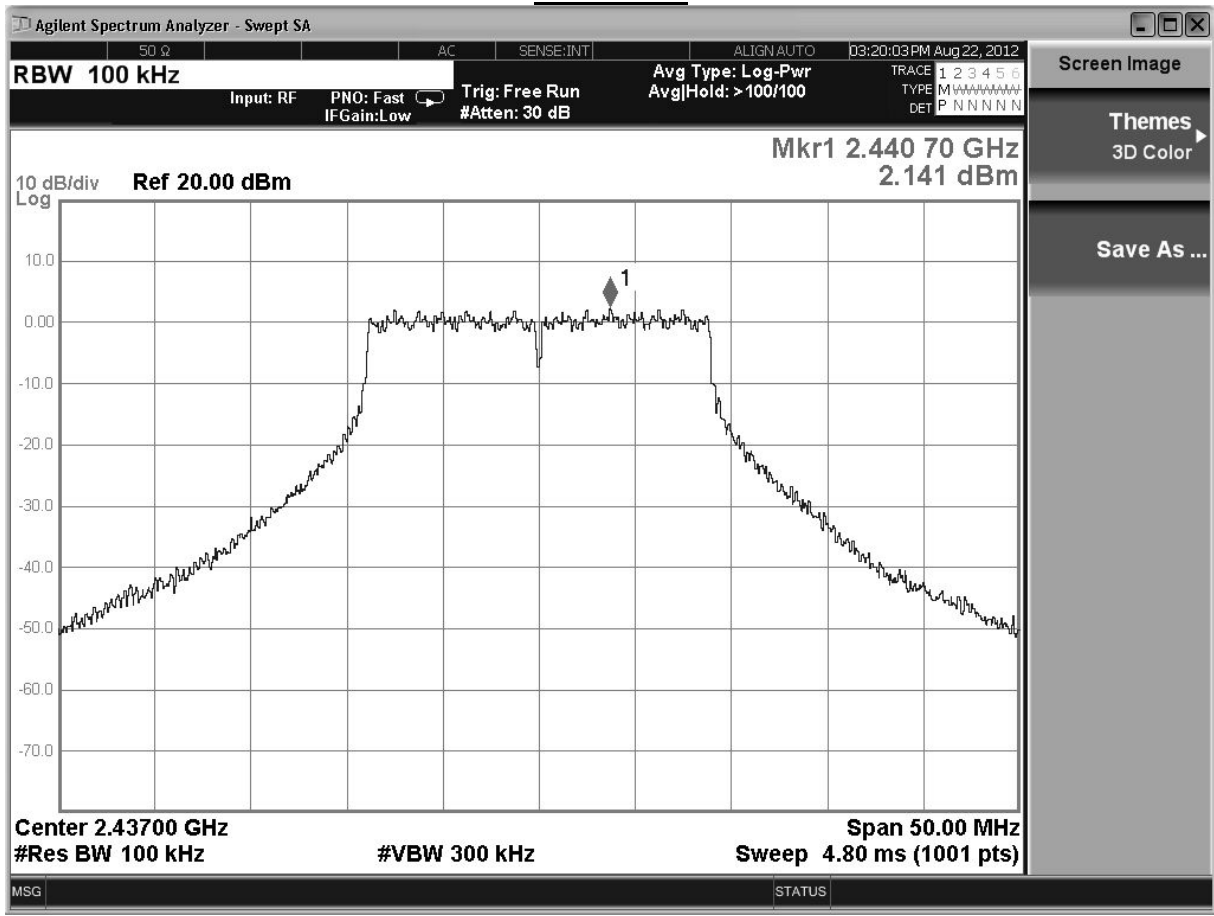
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measurement (dBm)	Limit (dBm)	Result
01	2412	0.747	-14.45	≤ 8	Pass
06	2437	2.141	-13.06	≤ 8	Pass
11	2462	2.064	-13.14	≤ 8	Pass

Note: Measure Level = Reading + BWCF = Reading Level -15.2dB
 Bandwidth correction factor (BWCF) = 10log (3kHz/100kHz)

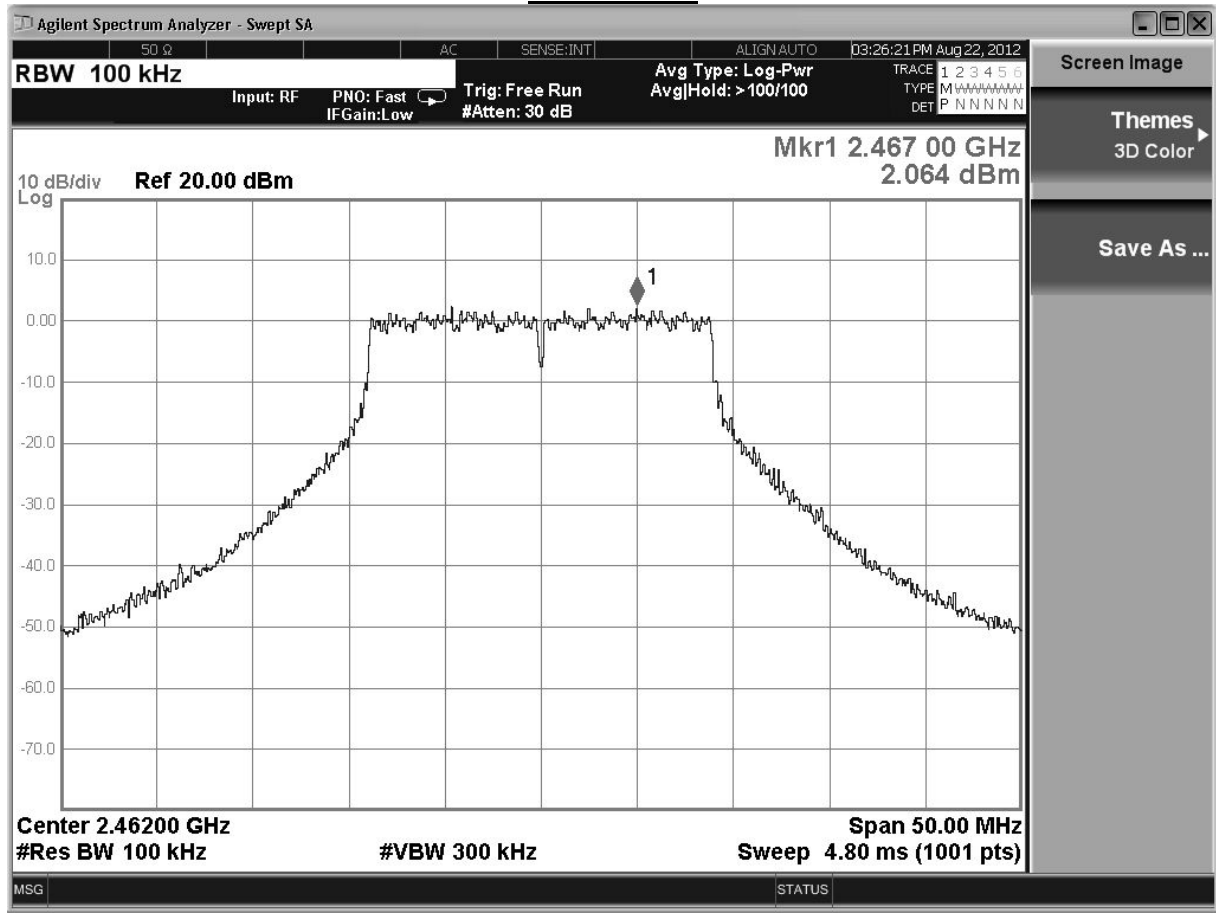
Channel 1



Channel 6



Channel 11



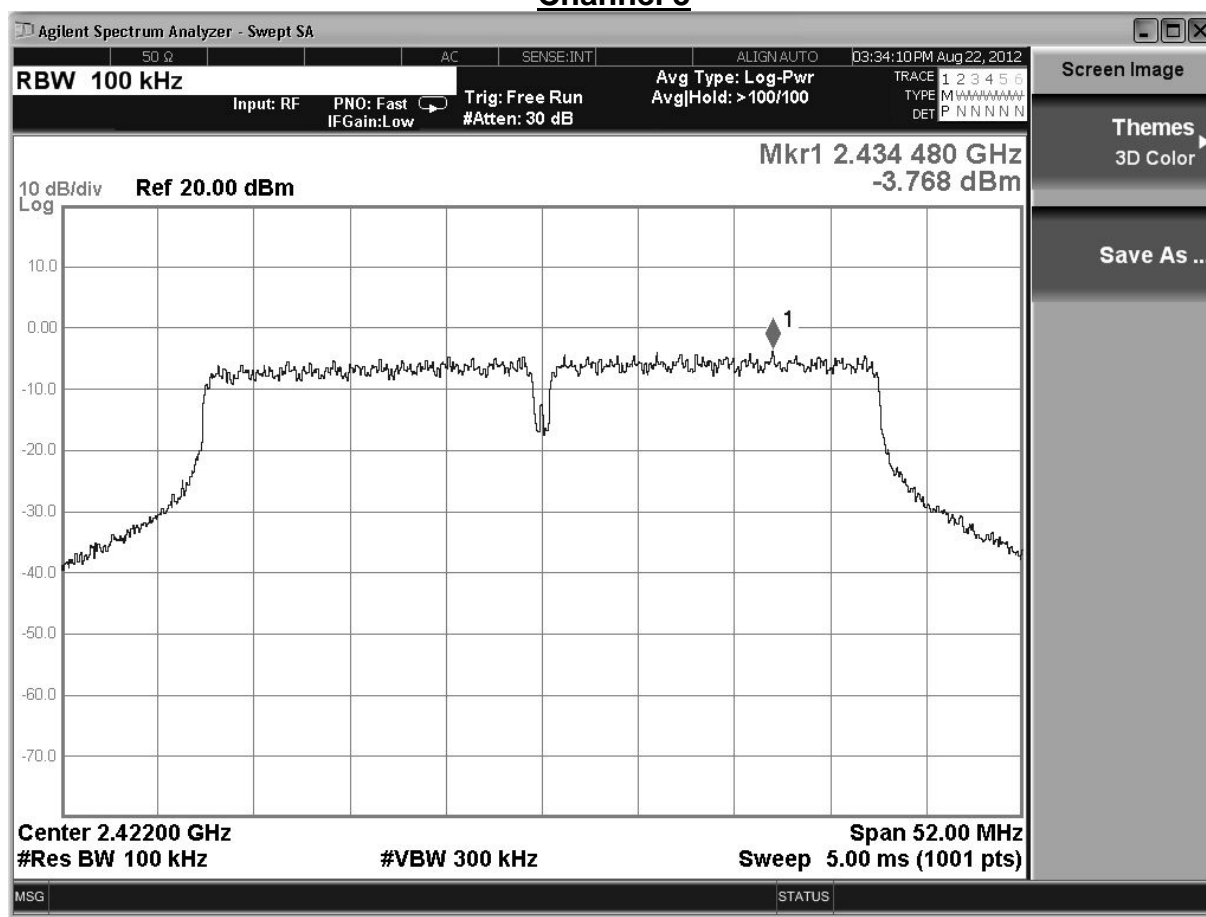
Product	Outdoor AP		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2012/08/22	Test Site	SR7

IEEE802.11n 20MHz (ANT 0+1)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	-10.83	≤ 8	Pass
06	2437	-9.24	≤ 8	Pass
11	2462	-9.71	≤ 8	Pass

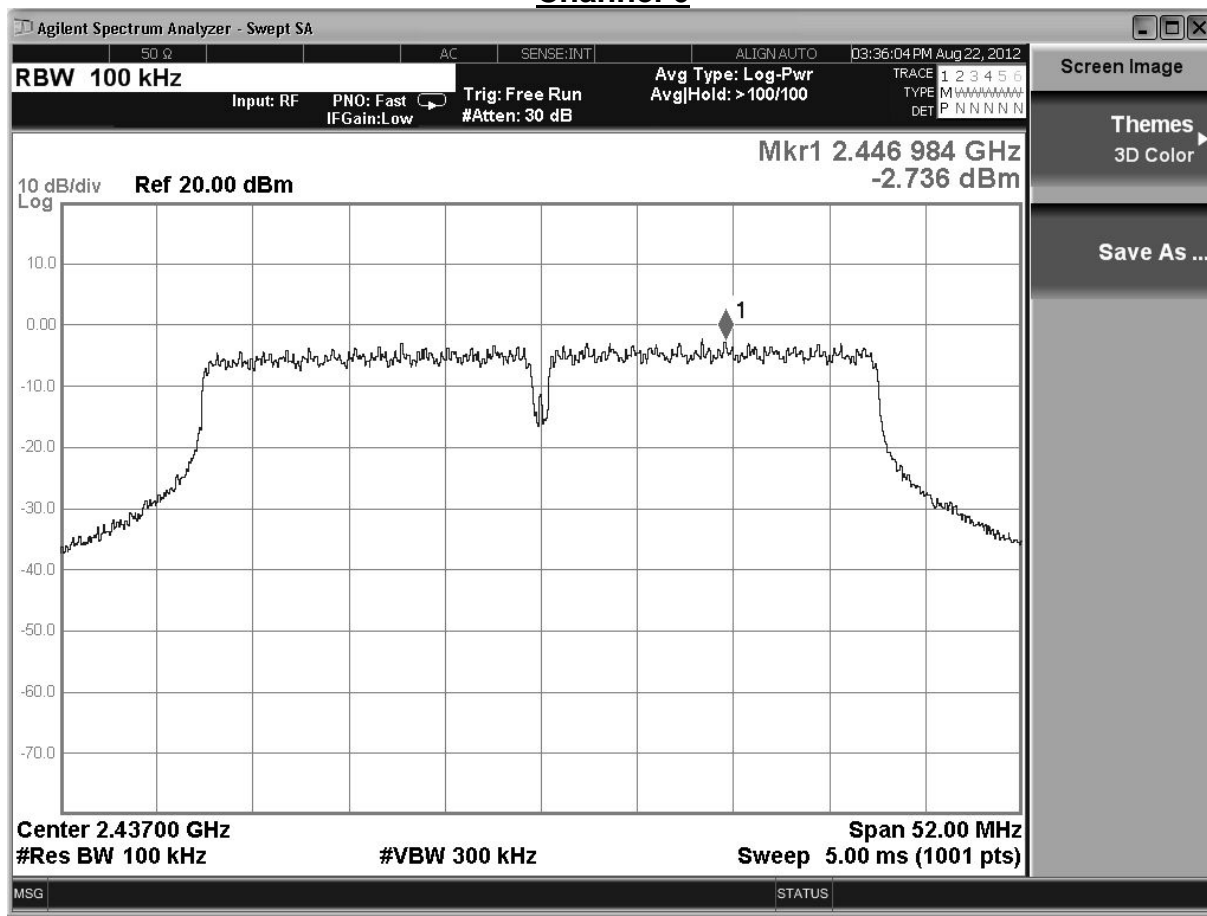
Product	Outdoor AP		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2012/08/22	Test Site	SR7

IEEE 802.11n_40MHz (ANT 0)					
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measurement (dBm)	Limit (dBm)	Result
03	2422	-3.768	-18.97	≤ 8	Pass
06	2437	-2.736	-17.94	≤ 8	Pass
09	2452	-5.519	-20.72	≤ 8	Pass

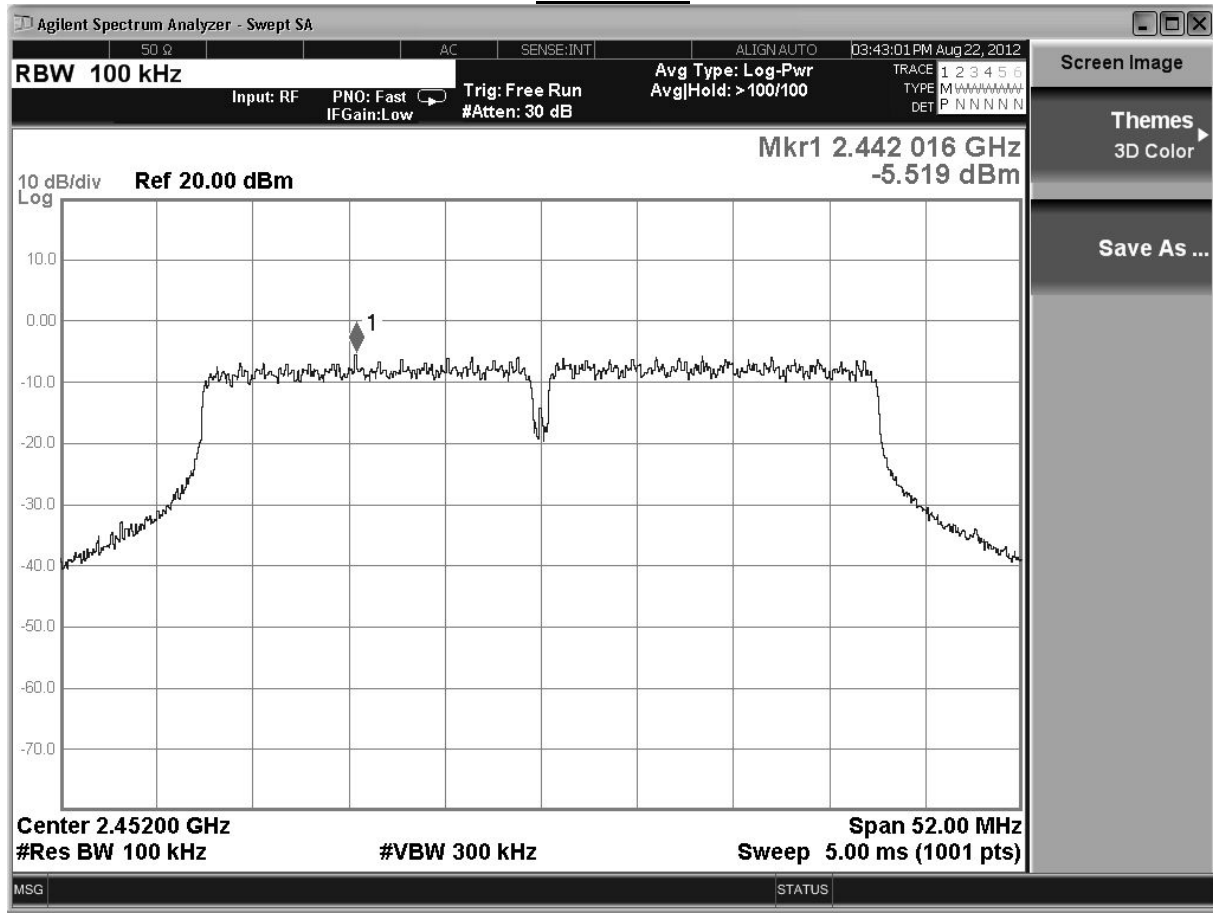
Channel 3



Channel 6



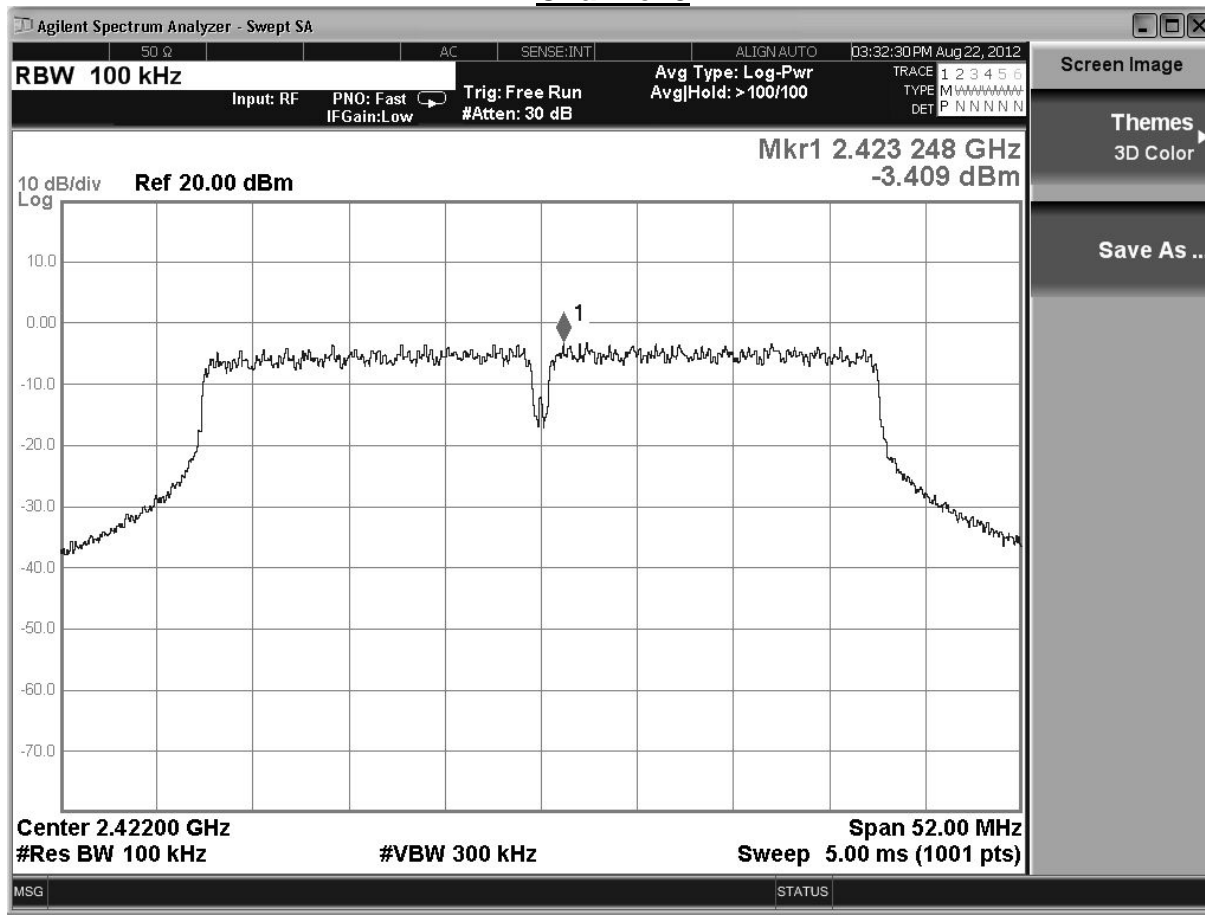
Channel 9



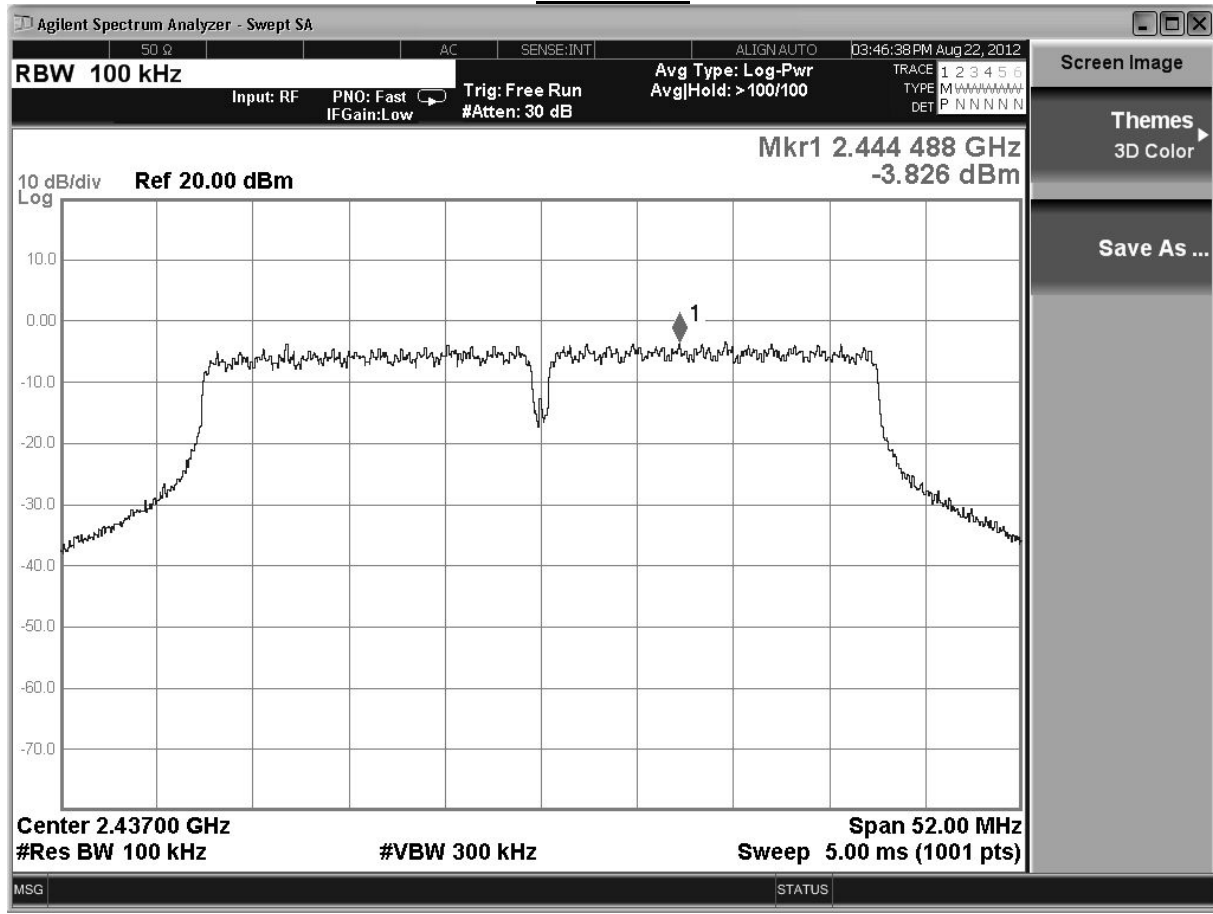
Product	Outdoor AP		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2012/08/22	Test Site	SR7

IEEE 802.11n_40MHz (ANT 1)					
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measure Level (dBm)	Limit (dBm)	Result
03	2422	-3.409	-18.61	≤ 8	Pass
06	2437	-3.826	-19.03	≤ 8	Pass
09	2452	-4.218	-19.42	≤ 8	Pass

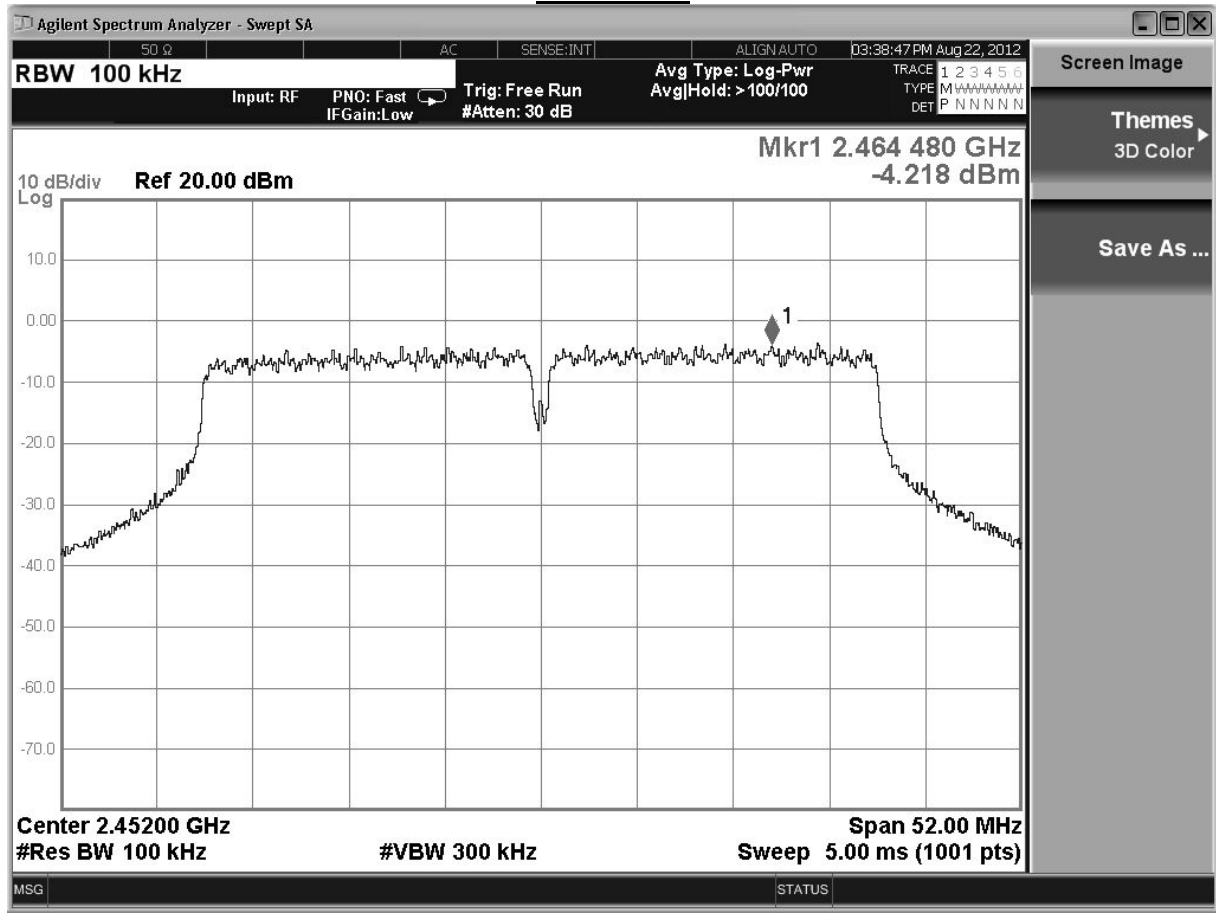
Channel 3



Channel 6



Channel 9



Product	Outdoor AP		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2012/08/22	Test Site	SR7

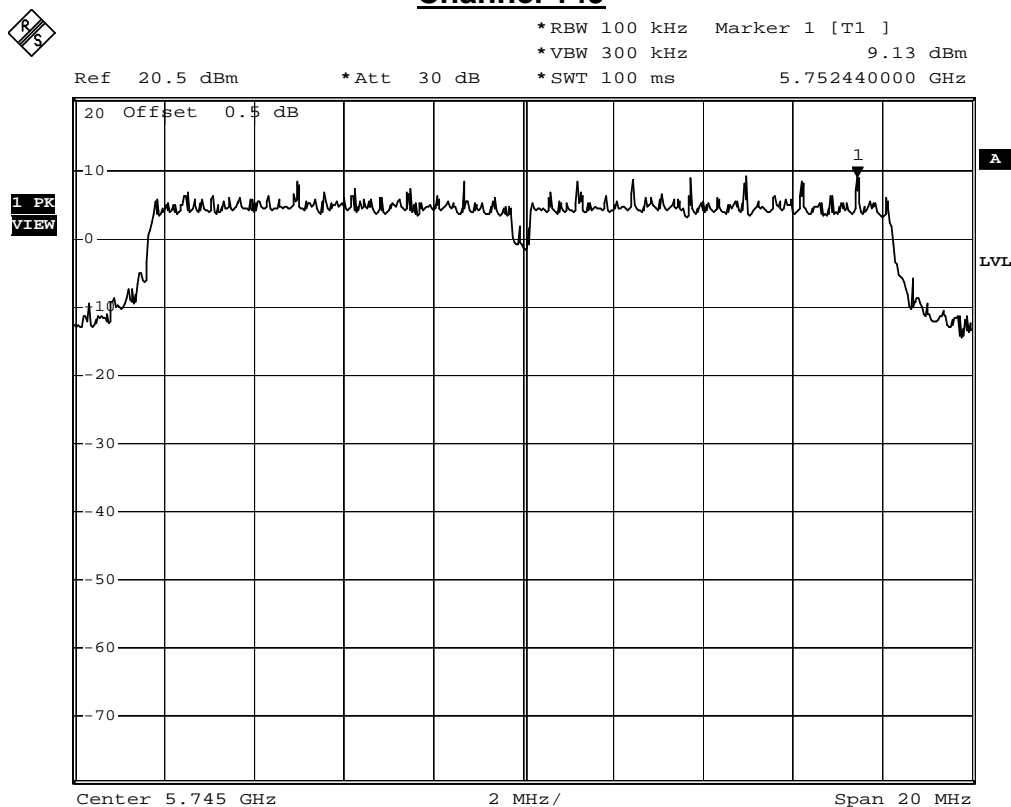
IEEE802.11n 40MHz(ANT 0+1)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
03	2422	-15.78	≤ 8	Pass
06	2437	-15.44	≤ 8	Pass
09	2452	-17.01	≤ 8	Pass

Product	Outdoor AP		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2012/10/05	Test Site	SR7

IEEE 802.11a					
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measure Level (dBm)	Limit (dBm)	Result
149	5745	9.13	-6.07	≤ 8	Pass
157	5785	7.30	-7.90	≤ 8	Pass
165	5825	6.34	-8.86	≤ 8	Pass

Channel 149



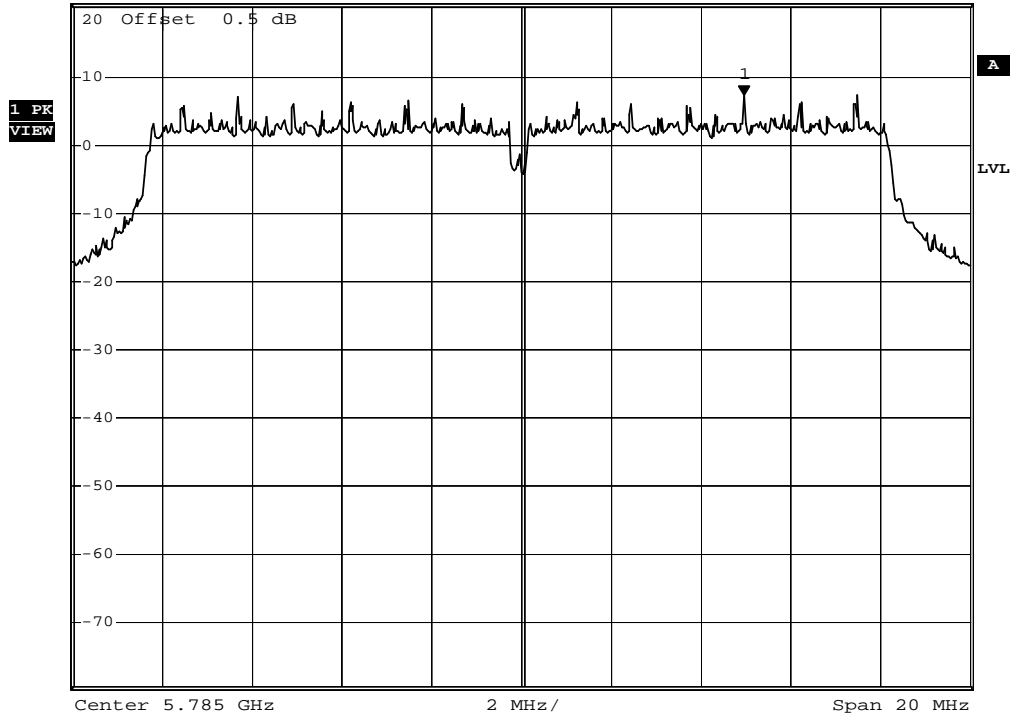
Comment: A:\2
 Date: 5.OCT.2012 15:13:06

Channel 157



*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 7.30 dBm
*SWT 100 ms 5.789960000 GHz

Ref 20.5 dBm *Att 30 dB



Comment: A:\2
Date: 5.OCT.2012 15:25:28

Channel 165



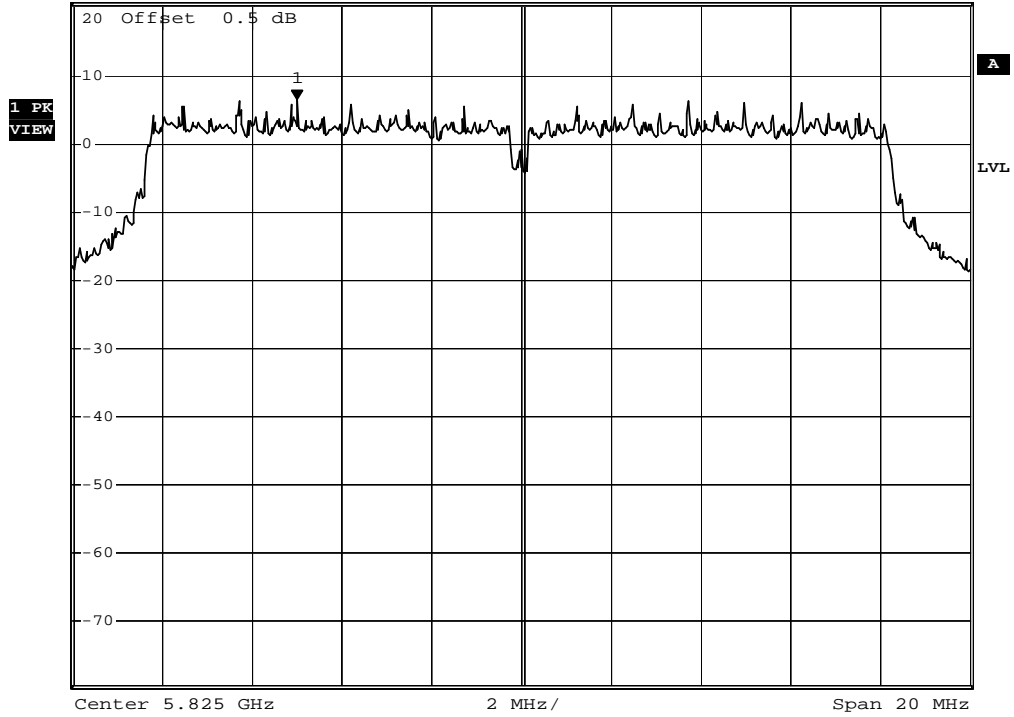
*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 6.34 dBm
*Att 30 dB *SWT 100 ms 5.82000000 GHz

Ref 20.5 dBm

*Att 30 dB

*SWT 100 ms

5.82000000 GHz



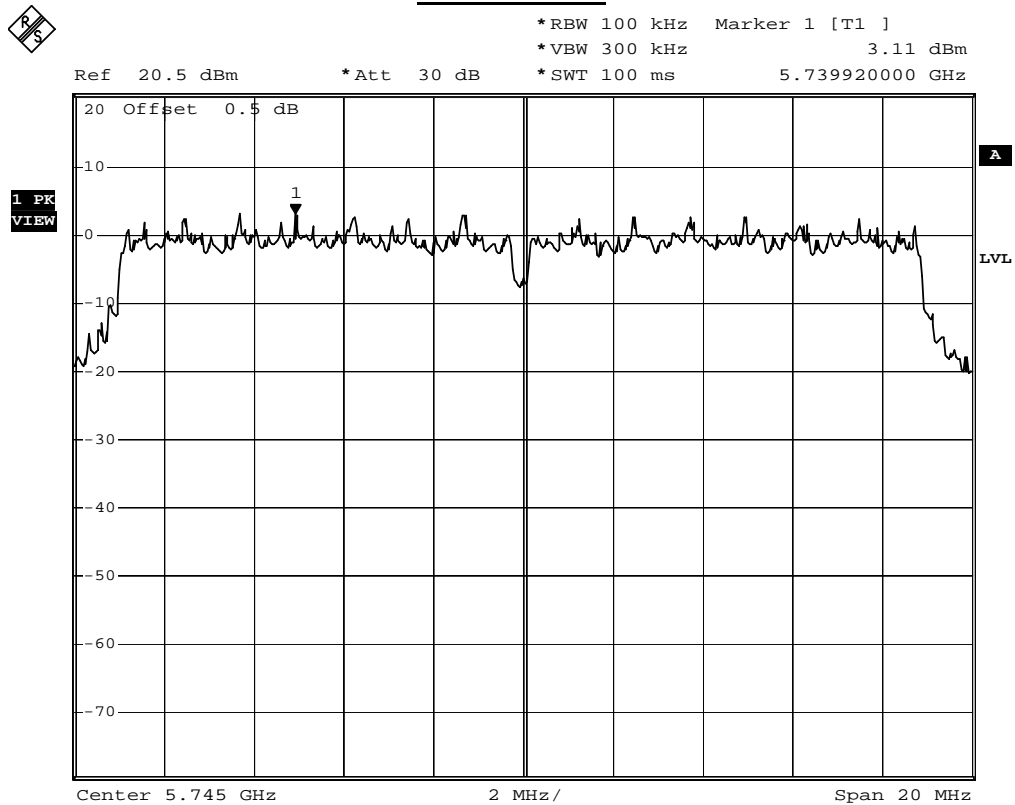
Comment: A:\2
Date: 5.OCT.2012 15:30:16

Product	Outdoor AP		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2012/10/05	Test Site	SR7

IEEE802.11n_20MHz_(ANT 0)

Channel No.	Frequency (MHz)	Reading Level (dBm)	Measurement (dBm)	Limit (dBm)	Result
149	5745	3.11	-12.09	≤ 8	Pass
157	5785	4.05	-11.15	≤ 8	Pass
165	5825	3.37	-11.83	≤ 8	Pass

Channel 149



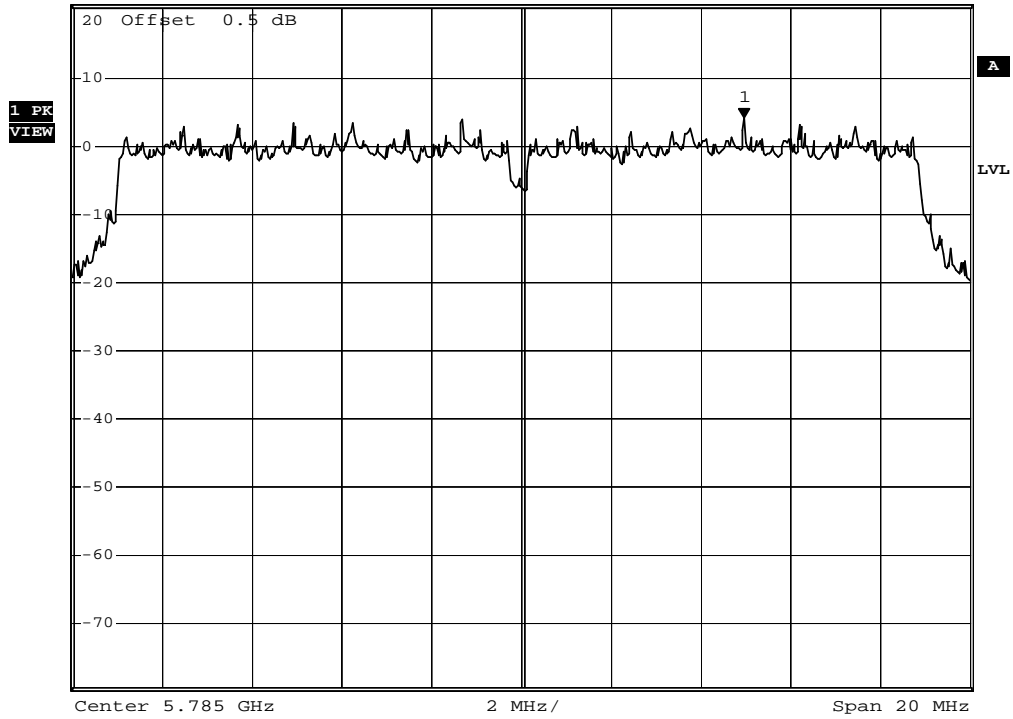
Comment: A:\2
 Date: 5.OCT.2012 16:11:06

Channel 157



*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 4.05 dBm
*SWT 100 ms 5.789960000 GHz

Ref 20.5 dBm *Att 30 dB



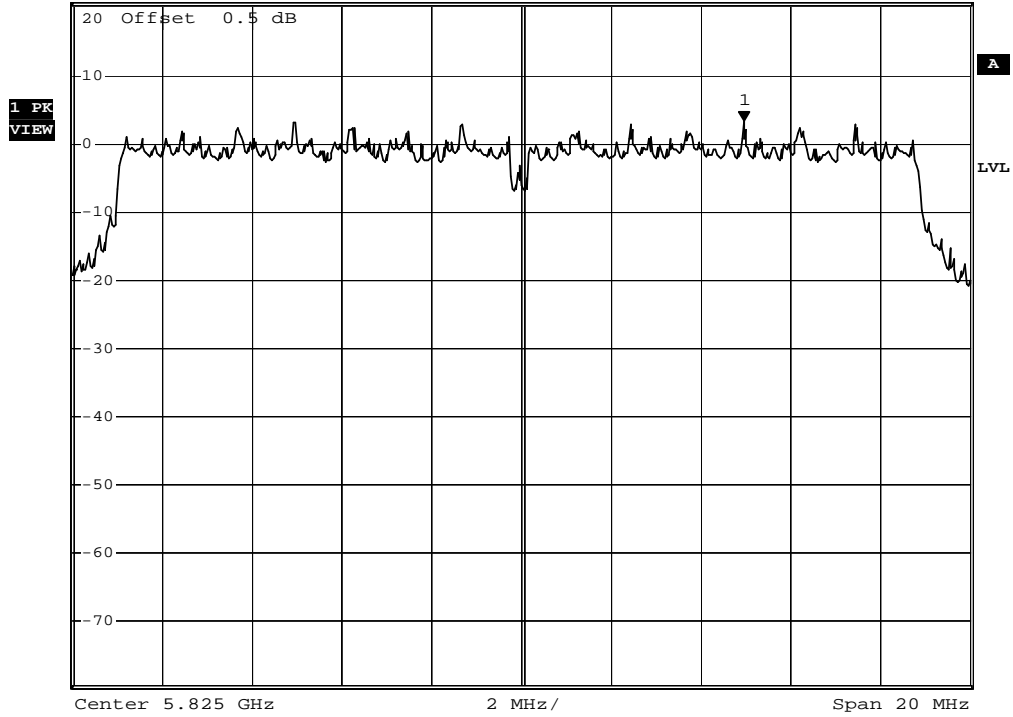
Comment: A:\2
Date: 5.OCT.2012 15:43:18

Channel 165



*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 3.37 dBm
*SWT 100 ms 5.829960000 GHz

Ref 20.5 dBm *Att 30 dB



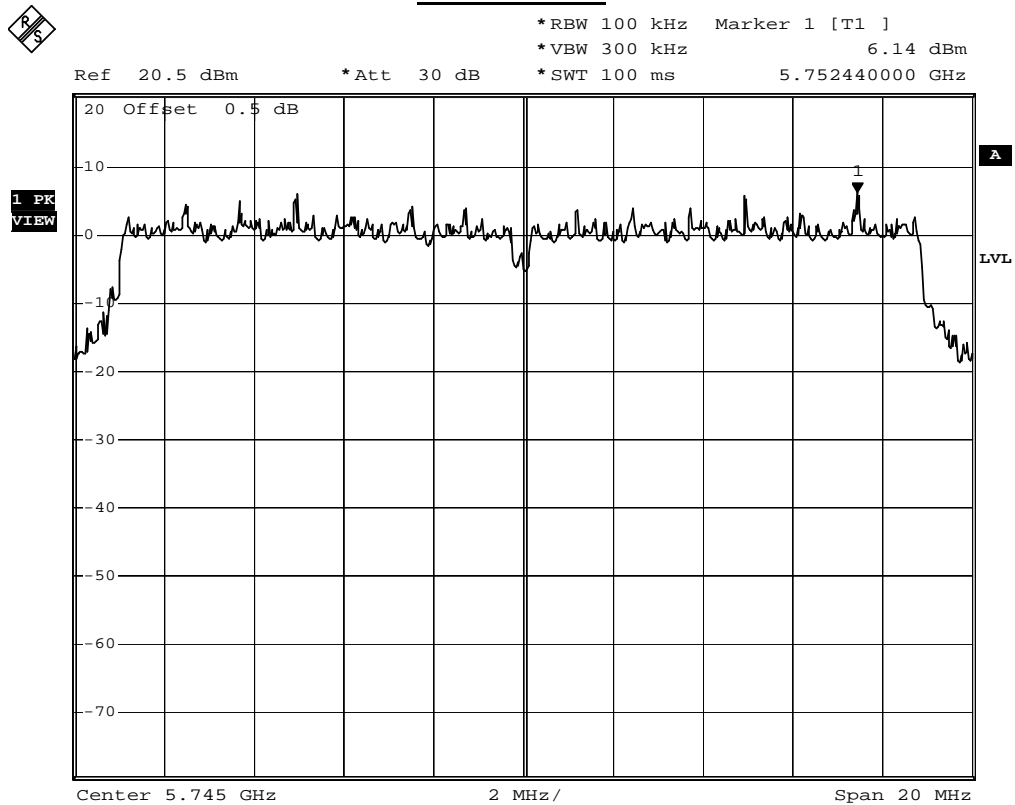
Comment: A:\2
Date: 5.OCT.2012 15:37:29

Product	Outdoor AP		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2012/10/05	Test Site	SR7

IEEE802.11n_20MHz_(ANT 1)

Channel No.	Frequency (MHz)	Reading Level (dBm)	Measure Level (dBm)	Limit (dBm)	Result
149	5745	6.14	-9.06	≤ 8	Pass
157	5785	4.38	-10.82	≤ 8	Pass
165	5825	6.04	-9.16	≤ 8	Pass

Channel 149



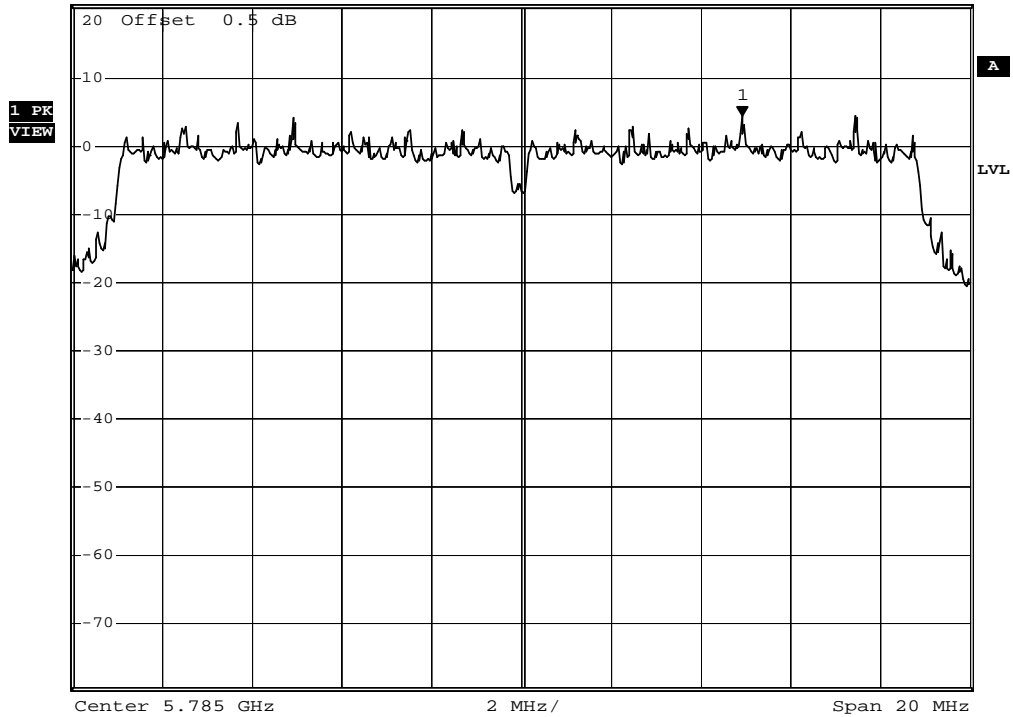
Comment: A:\2
 Date: 5.OCT.2012 16:10:36

Channel 157



*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 4.38 dBm
*SWT 100 ms 5.789920000 GHz

Ref 20.5 dBm *Att 30 dB



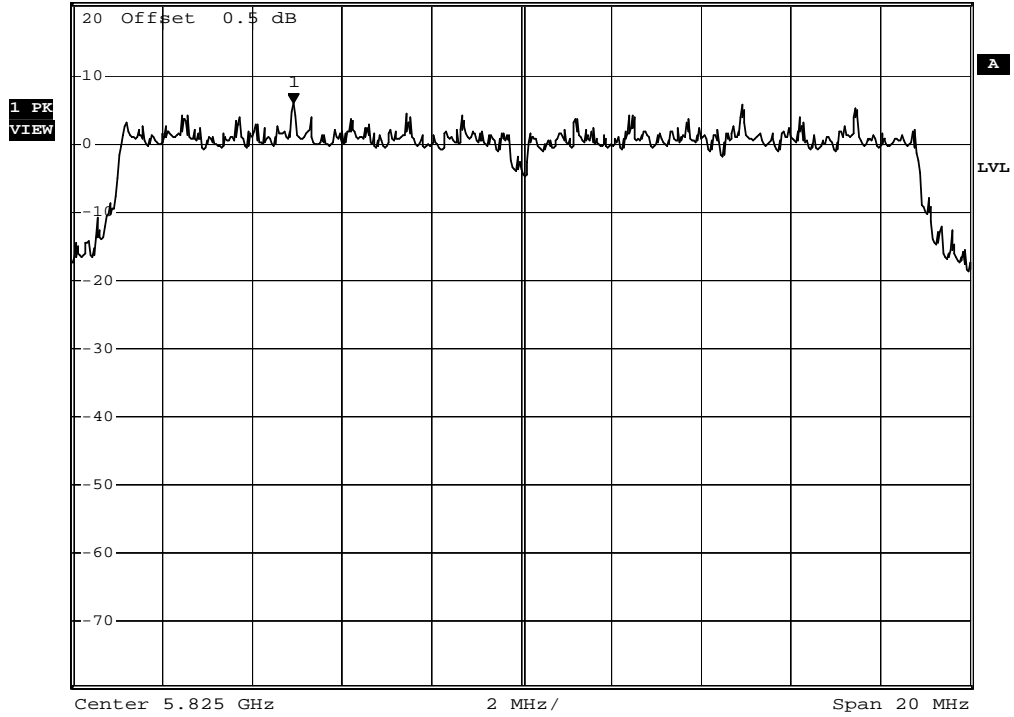
Comment: A:\2
Date: 5.OCT.2012 15:45:56

Channel 165



*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 6.04 dBm
*SWT 100 ms 5.819920000 GHz

Ref 20.5 dBm *Att 30 dB



Comment: A:\2
Date: 5.OCT.2012 15:36:47

Product	Outdoor AP		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2012/10/06	Test Site	SR7

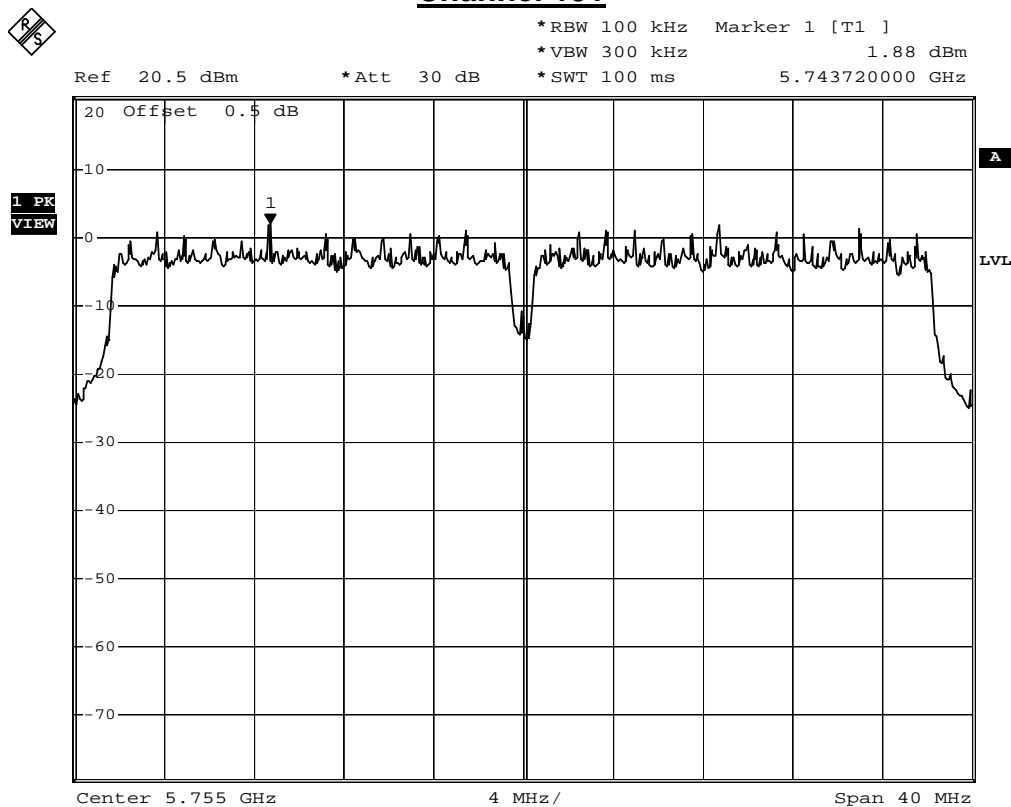
IEEE802.11n 20MHz(ANT 0+1)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
149	5745	-7.31	≤ 8	Pass
157	5785	-7.97	≤ 8	Pass
165	5825	-7.28	≤ 8	Pass

Product	Outdoor AP		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2012/10/06	Test Site	SR7

IEEE 802.11n_40MHz (ANT 0)					
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measurement (dBm)	Limit (dBm)	Result
151	5755	1.88	-13.32	≤ 8	Pass
159	5795	1.24	-13.96	≤ 8	Pass

Channel 151



Comment: A:\2
 Date: 5.OCT.2012 17:11:46

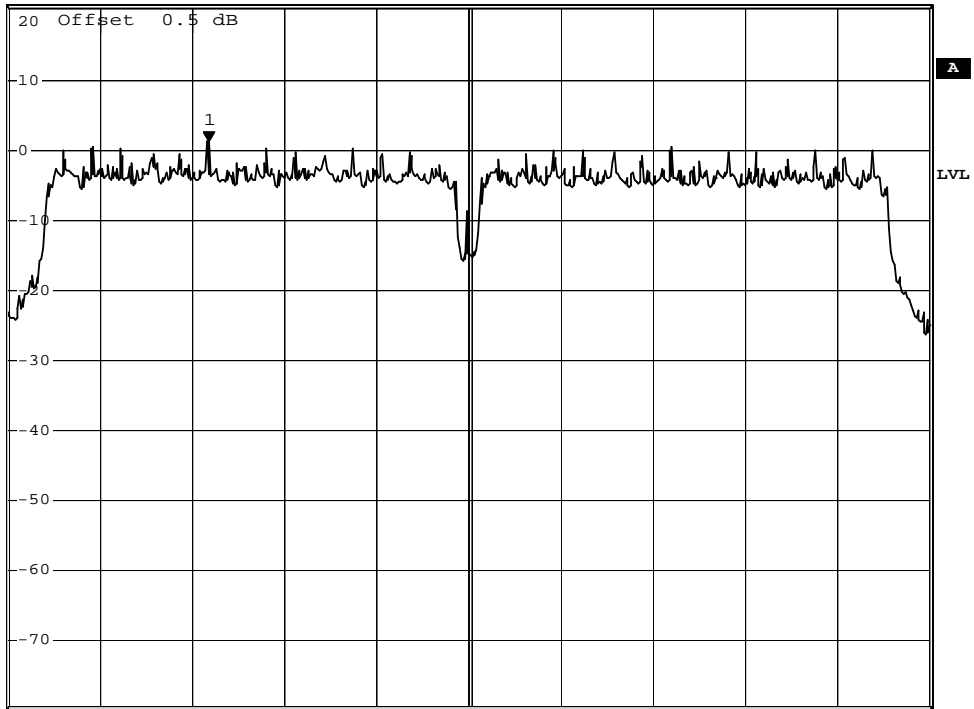
Channel 159



*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 1.24 dBm
*SWT 100 ms 5.783720000 GHz

Ref 20.5 dBm *Att 30 dB

1 PK
VIEW

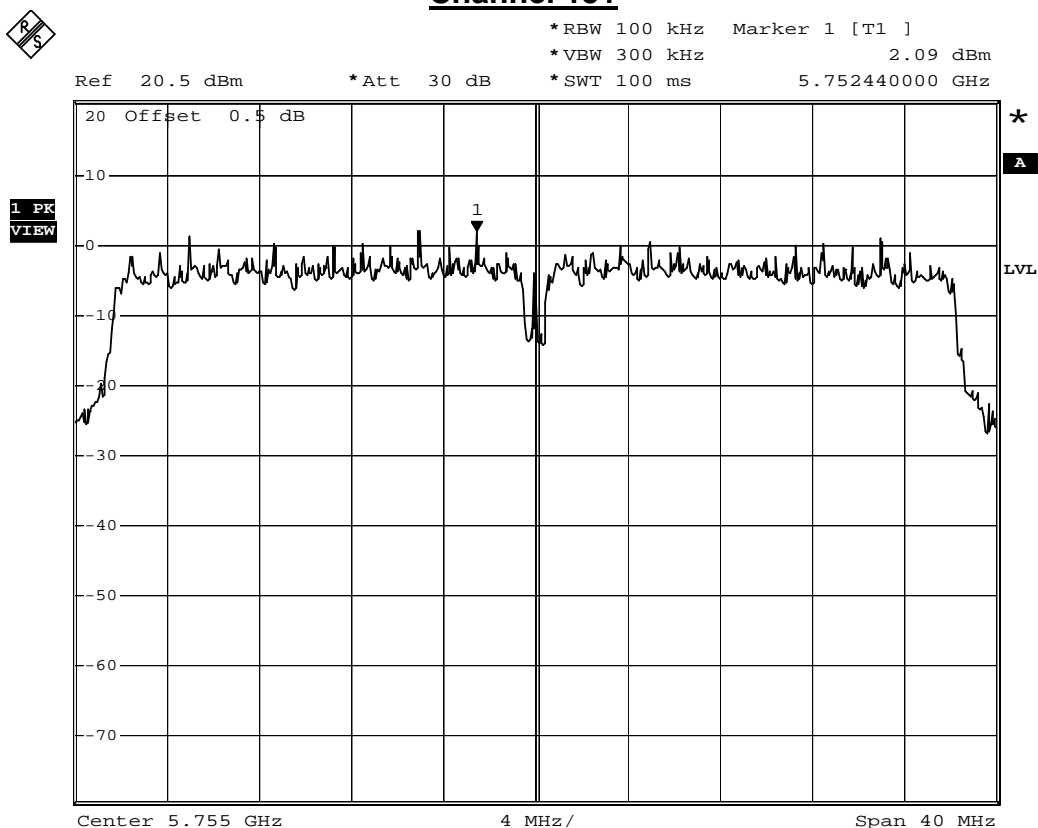


Date: 6.OCT.2012 11:18:05

Product	Outdoor AP		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2012/10/06	Test Site	SR7

IEEE 802.11n_40MHz (ANT 1)					
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measure Level (dBm)	Limit (dBm)	Result
151	5755	2.09	-13.11	≤ 8	Pass
159	5795	1.49	-13.71	≤ 8	Pass

Channel 151



Date: 6.OCT.2012 11:11:58

Channel 159

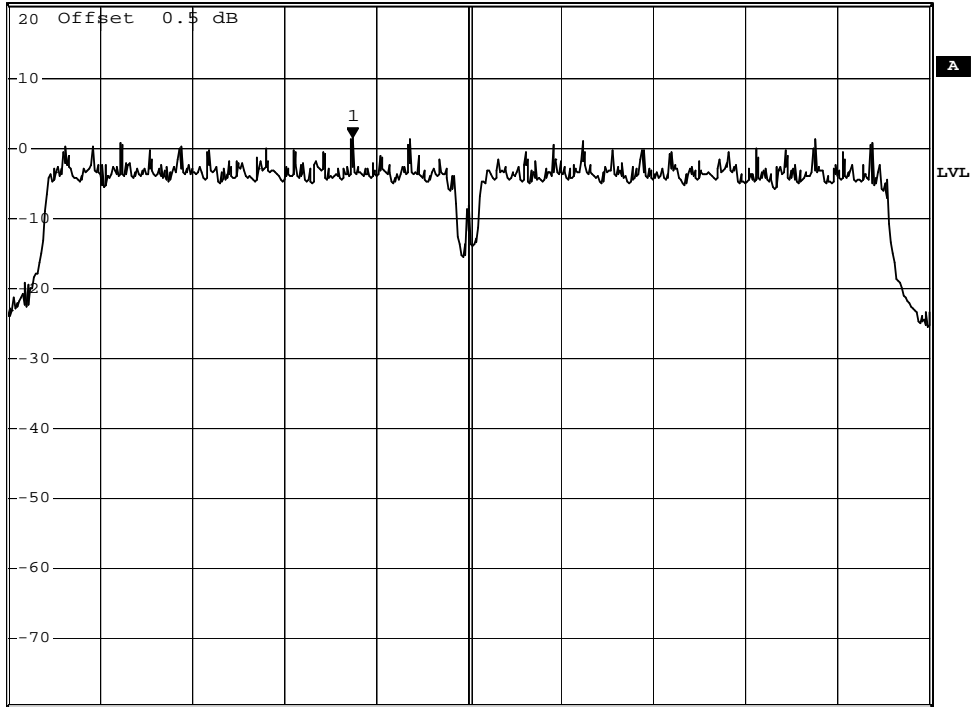


*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 1.49 dBm
*SWT 100 ms 5.789960000 GHz

Ref 20.5 dBm

*Att 30 dB

1 PK
VIEW



Date: 6.OCT.2012 11:15:54

Product	Outdoor AP		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2012/08/22	Test Site	SR7

IEEE802.11n 40MHz(ANT 0+1)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
151	5755	-10.20	≤ 8	Pass
159	5795	-10.82	≤ 8	Pass