

6. OCCUPIED BANDWIDTH

6.1. Applicable Standard

Requirements: CFR 47, Section 27.53(m)(6) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

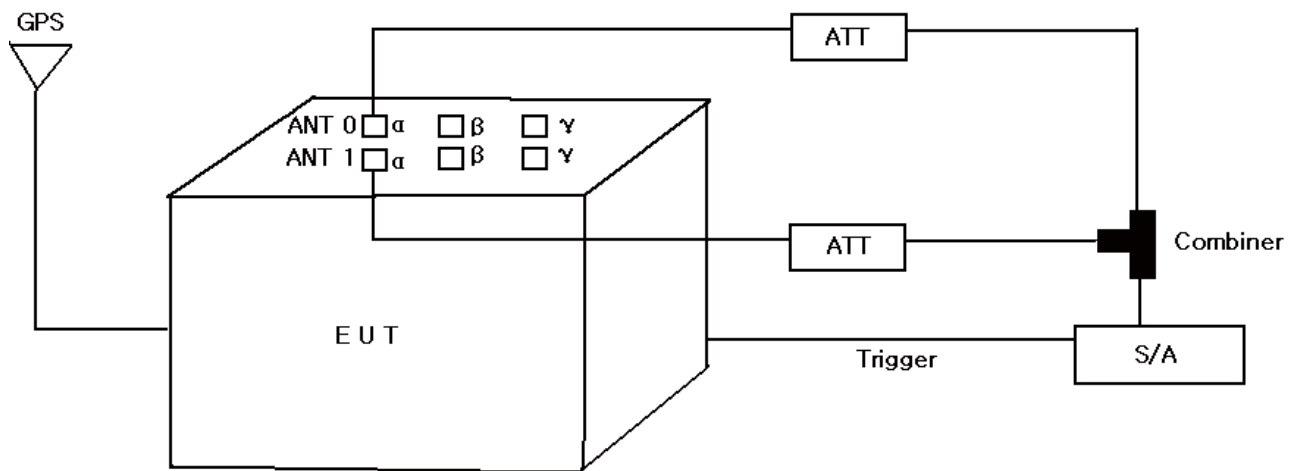
6.2. Test Equipment List and Details

Manufacturer	Model / Equipment	Serial No.	Calibration Due
Agilent	87302C / Power Divider	3239A01051	03/16/2010
Agilent	6674A / DC Power Supply	3501A00901	05/14/2011
WEINSCHEL	67-30-33 / Attenuator	BU5347	12/29/2011
WEINSCHEL	67-30-33 / Attenuator	BR0530	12/29/2011
WEINSCHEL	AF9003-69-31 / STEP ATTENUATOR	11787	11/12/2011
WEINSCHEL	AF9003-69-31 / STEP ATTENUATOR	639	11/12/2011
Agilent	N9020A / MXA Signal Analyzer	US46220219	03/03/2011

6.3. Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 64 of 240



The EUT was connected to a spectrum analyzer enabled with an occupied bandwidth function via its antenna port. Measurements were performed to determine the occupied bandwidth in accordance with FCC Part 2.1049. The occupied bandwidth was measured from the fundamental emission at the bottom, middle and top channels. The occupied bandwidth was measured using the built in occupied bandwidth function of the spectrum analyzer. It was set to measure the bandwidth where 99% of the signal power was contained. The analyzer automatically configures the measurement bandwidths to make an accurate measurement based on the channel bandwidth and channel spacing of the EUT.

6.3.1. Environmental Conditions:

Temperature:	20 °C
Relative Humidity:	19 %

6.4. Test Result

: PASS

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 65 of 240

6.4.1. Test Data at Output Alpha 1

Modulation	Channel	Frequency	Measured Bandwidth	
			99 %	26 dB
QPSK	Low	2499.00	4.5890	4.856
	Middle	2543.25	4.5885	4.858
	High	2593.00	4.5885	4.857
16QAM	Low	2499.00	4.5887	4.857
	Middle	2543.25	4.5884	4.857
	High	2593.00	4.5889	4.855
64QAM	Low	2499.00	4.5886	4.859
	Middle	2543.25	4.5881	4.859
	High	2593.00	4.5887	4.857

6.4.2. Test Data at Output Port Alpha 2

Modulation	Channel	Frequency	Measured Bandwidth	
			99 %	26 dB
QPSK	Low	2499.00	4.5889	4.859
	Middle	2543.25	4.5889	4.859
	High	2593.00	4.5886	4.861
16QAM	Low	2499.00	4.5892	4.858
	Middle	2543.25	4.5947	4.874
	High	2593.00	4.5884	4.858
64QAM	Low	2499.00	4.5887	4.862
	Middle	2543.25	4.6017	4.874
	High	2593.00	4.5887	4.858

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 66 of 240

6.4.3. Combined Test Data at Output Port

Modulation	Channel	Frequency	Measured Bandwidth	
			99 %	26 dB
QPSK	Low	2499.00	4.5726	4.851
	Middle	2543.25	4.6441	4.863
	High	2593.00	4.5505	4.836
16QAM	Low	2499.00	4.5733	4.851
	Middle	2543.25	4.5312	4.829
	High	2593.00	4.5503	4.838
64QAM	Low	2499.00	4.5719	4.850
	Middle	2543.25	4.5310	4.830
	High	2593.00	4.5532	4.841

6.4.4. Test Data at Output Beta 1

Modulation	Channel	Frequency	Measured Bandwidth	
			99 %	26 dB
QPSK	Low	2627.25	4.5831	4.853
	Middle	2660.25	4.5837	4.854
	High	2686.75	4.5834	4.854
16QAM	Low	2627.25	4.5837	4.856
	Middle	2660.25	4.5834	4.857
	High	2686.75	4.5834	4.853
64QAM	Low	2627.25	4.5836	4.856
	Middle	2660.25	4.5847	4.856
	High	2686.75	4.5832	4.854

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 67 of 240

6.4.5. Test Data at Output Port Beta 2

Modulation	Channel	Frequency	Measured Bandwidth	
			99 %	26 dB
QPSK	Low	2627.25	4.5837	4.854
	Middle	2660.25	4.5850	4.855
	High	2686.75	4.5843	4.856
16QAM	Low	2627.25	4.5838	4.854
	Middle	2660.25	4.5970	7.426
	High	2686.75	4.5841	4.853
64QAM	Low	2627.25	4.5844	4.852
	Middle	2660.25	4.5835	4.853
	High	2686.75	4.5839	4.855

6.4.6. Combined Test Data at Output Port

Modulation	Channel	Frequency	Measured Bandwidth	
			99 %	26 dB
QPSK	Low	2627.25	4.5578	4.839
	Middle	2660.25	4.5589	4.839
	High	2686.75	4.5614	4.843
16QAM	Low	2627.25	4.5574	4.839
	Middle	2660.25	4.5589	4.839
	High	2686.75	4.5614	4.852
64QAM	Low	2627.25	4.5569	4.840
	Middle	2660.25	4.5595	4.841
	High	2686.75	4.5617	4.842

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 68 of 240

6.4.7. Test Data at Output Gamma 1

Modulation	Channel	Frequency	Measured Bandwidth	
			99 %	26 dB
QPSK	Low	2648.75	4.5953	4.876
	Middle	2653.75	4.5946	4.876
	High	2665.25	4.5943	4.875
16QAM	Low	2648.75	4.5958	4.875
	Middle	2653.75	4.5953	4.875
	High	2665.25	4.5942	4.875
64QAM	Low	2648.75	4.5951	4.875
	Middle	2653.75	4.5945	4.876
	High	2665.25	4.5935	4.876

6.4.8. Test Data at Output Port Gamma 2

Modulation	Channel	Frequency	Measured Bandwidth	
			99 %	26 dB
QPSK	Low	2648.75	4.5841	4.853
	Middle	2653.75	4.5833	4.853
	High	2665.25	4.5886	4.871
16QAM	Low	2648.75	4.5835	4.853
	Middle	2653.75	4.5833	4.854
	High	2665.25	4.5917	4.873
64QAM	Low	2648.75	4.5831	4.852
	Middle	2653.75	4.5828	4.854
	High	2665.25	4.5907	4.873

FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 69 of 240

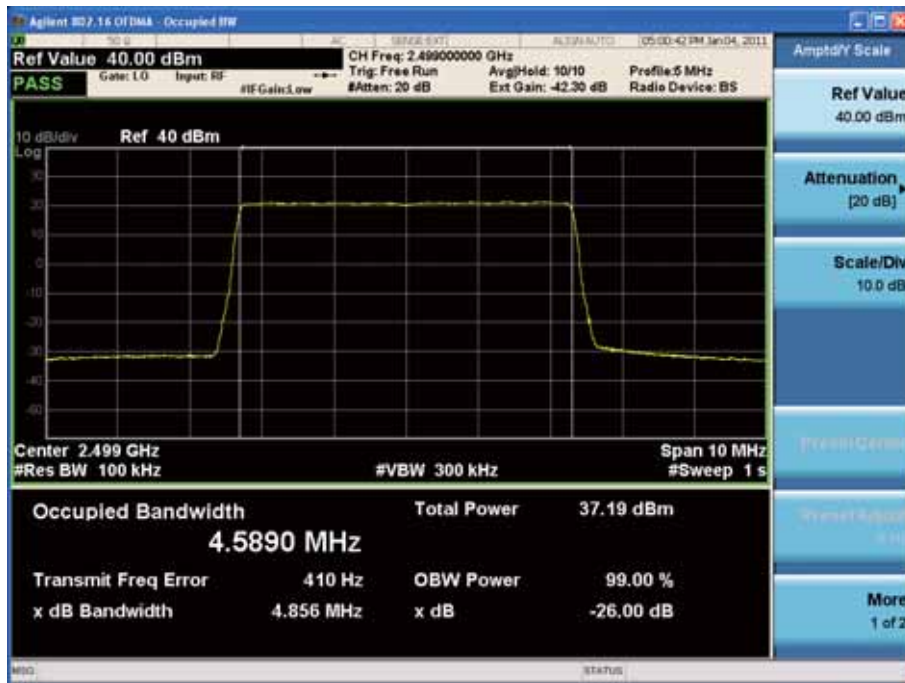
6.4.9. Combined Test Data at Output Port

Modulation	Channel	Frequency	Measured Bandwidth	
			99 %	26 dB
QPSK	Low	2648.75	4.3504	4.794
	Middle	2653.75	4.4082	4.803
	High	2665.25	4.4774	4.820
16QAM	Low	2648.75	4.3510	4.795
	Middle	2653.75	4.4042	4.802
	High	2665.25	4.4763	4.822
64QAM	Low	2648.75	4.3535	4.793
	Middle	2653.75	4.4133	4.801
	High	2665.25	4.4754	4.821

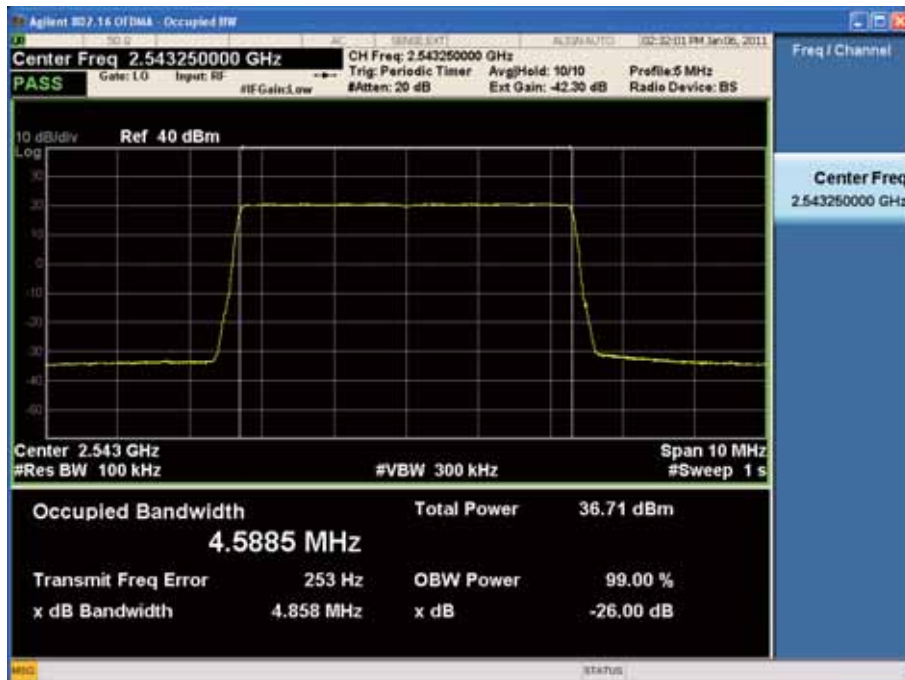
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 70 of 240

6.4.10. Test Plot at Output Port Alpha 1

(QPSK Low Channel)

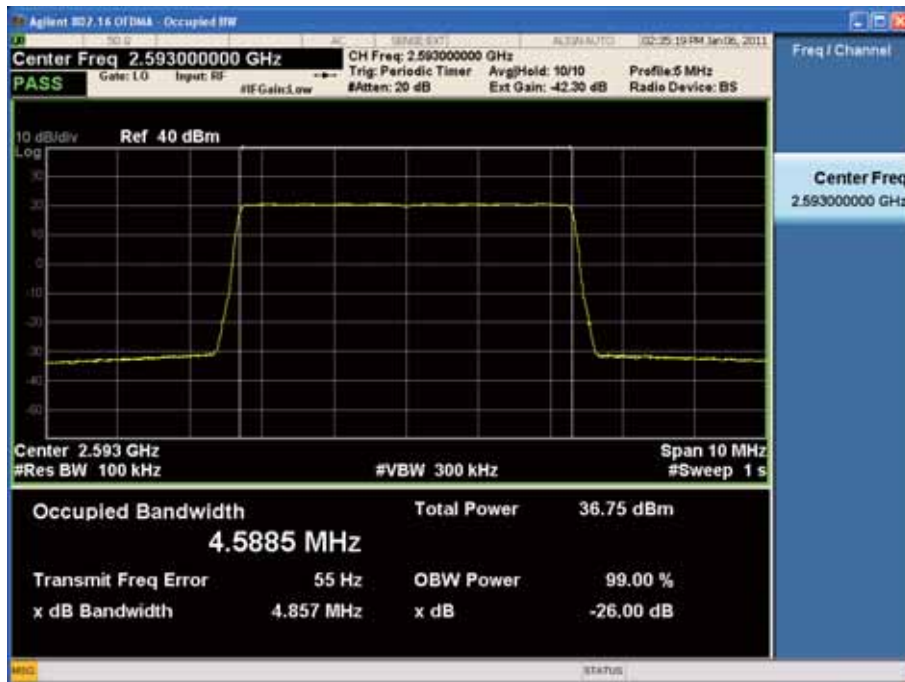


(QPSK Middle Channel)

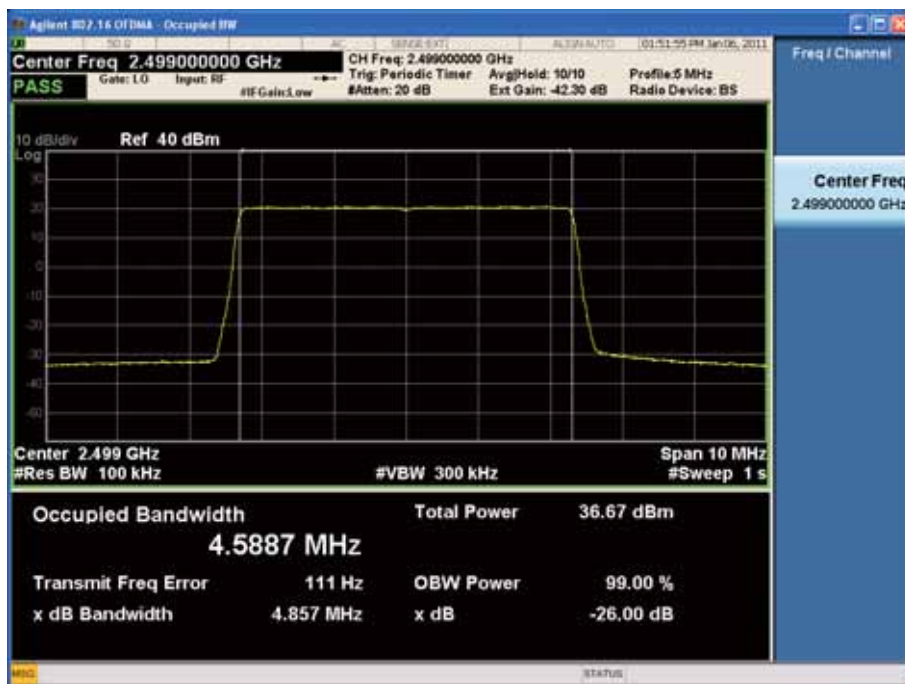


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 71 of 240

(QPSK High Channel)

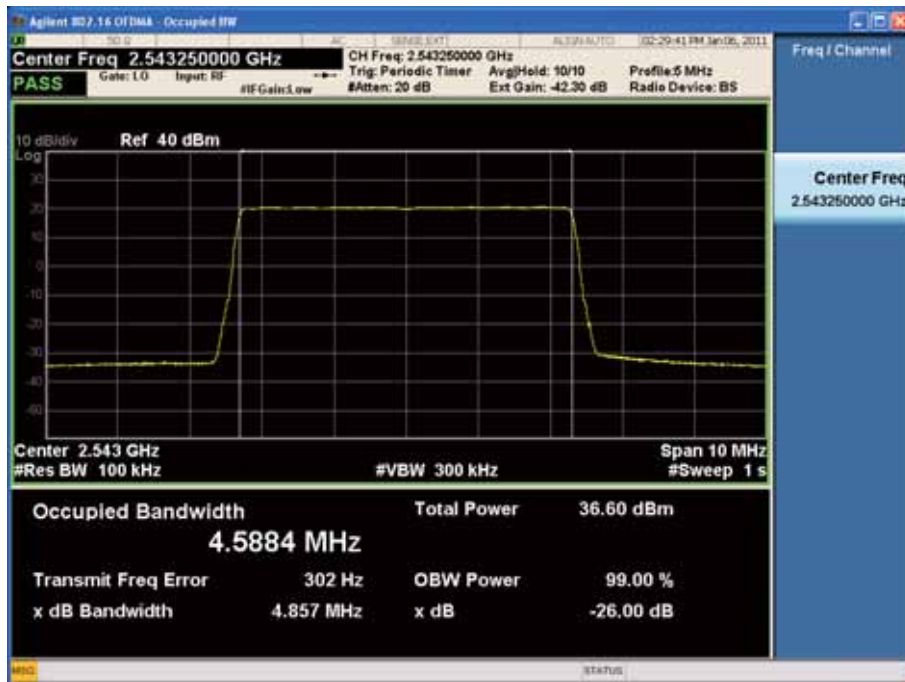


(16QAM Low Channel)

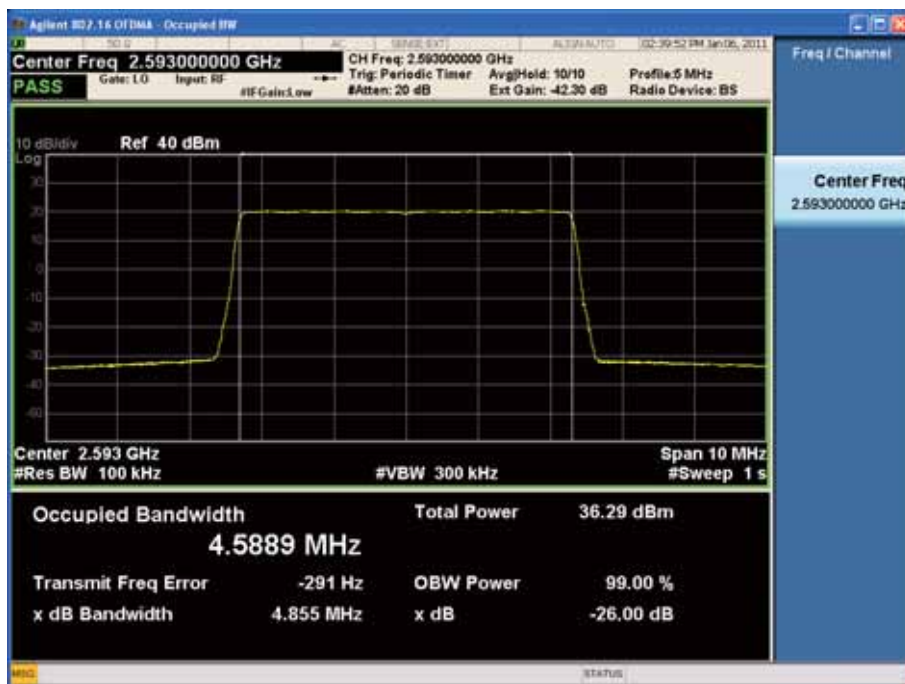


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 72 of 240

(16QAM Middle Channel)

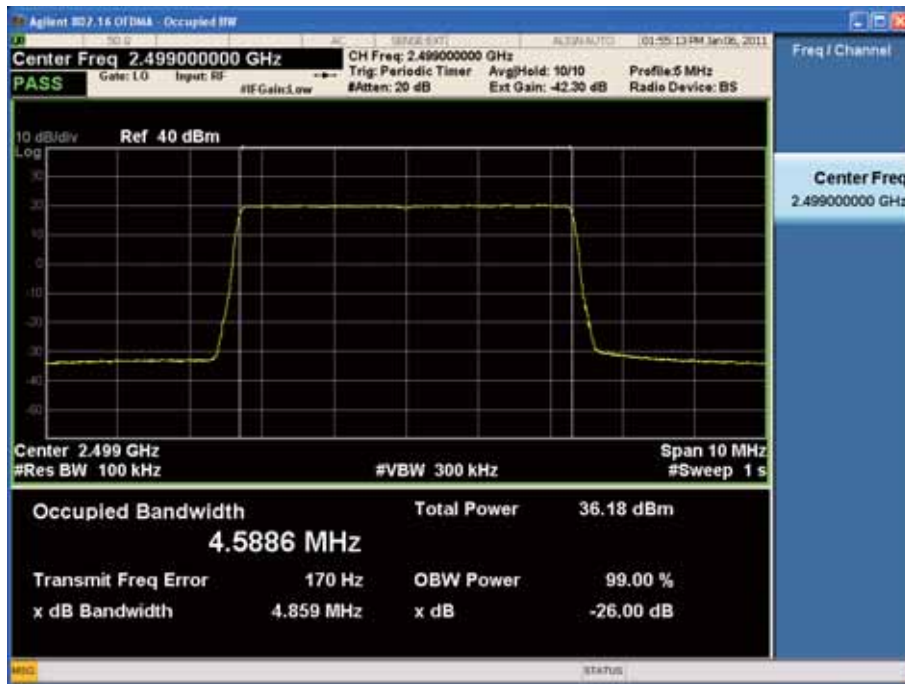


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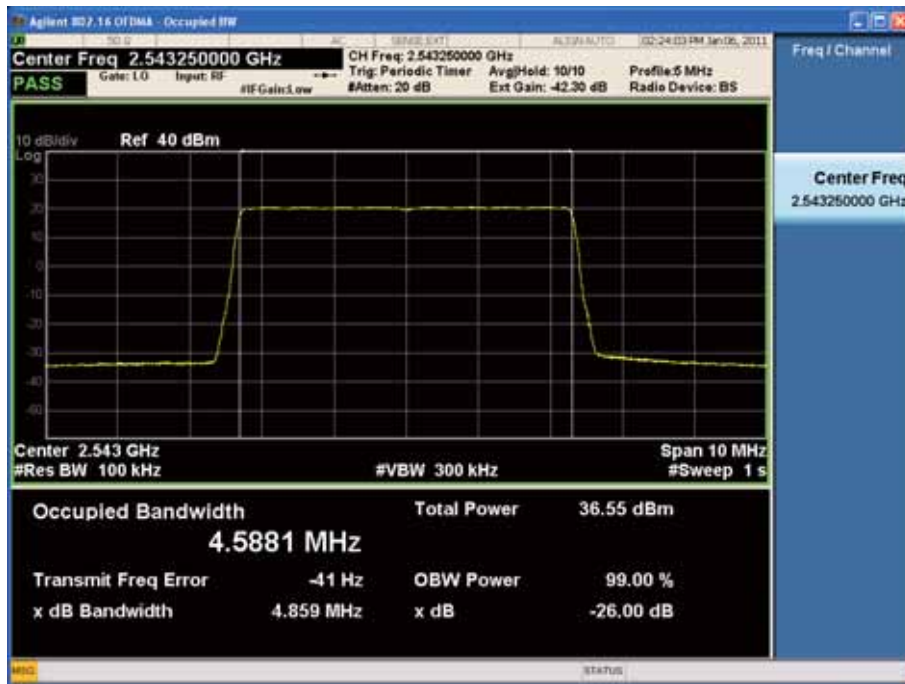


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 73 of 240

(64QAM Low Channel)

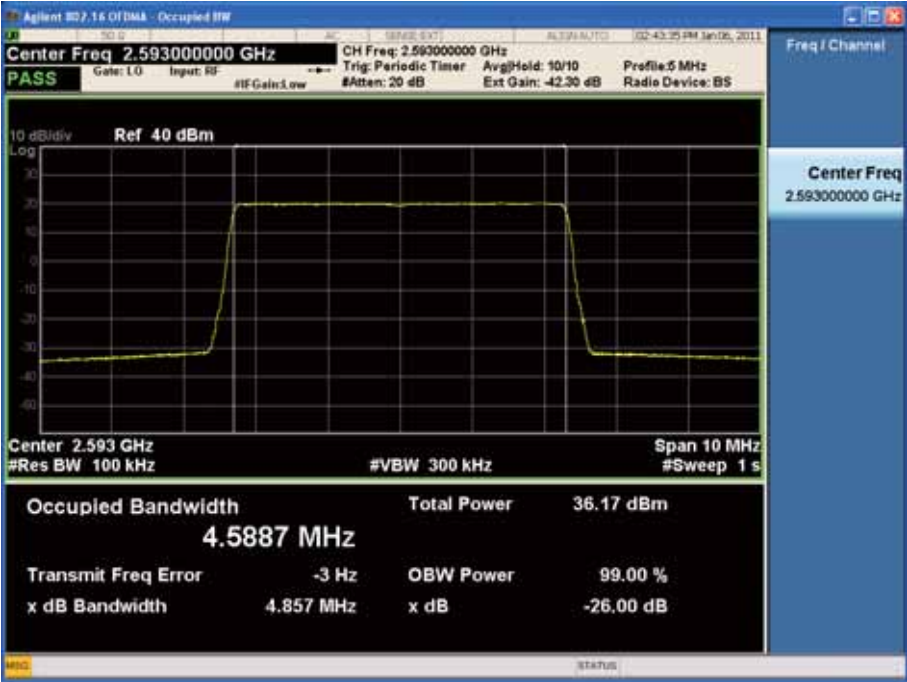


(64QAM Middle Channel)



FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 74 of 240

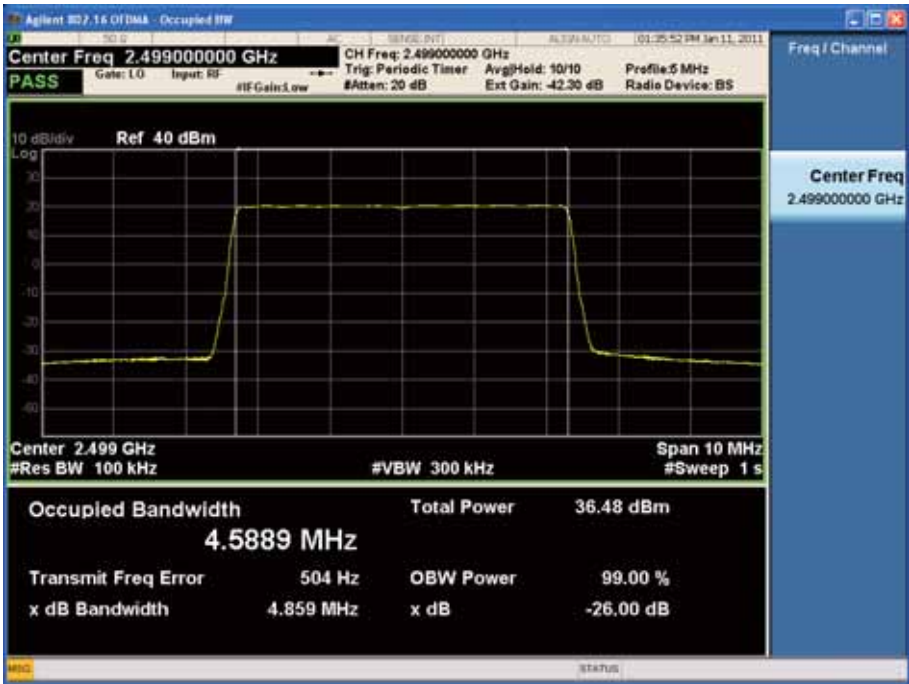
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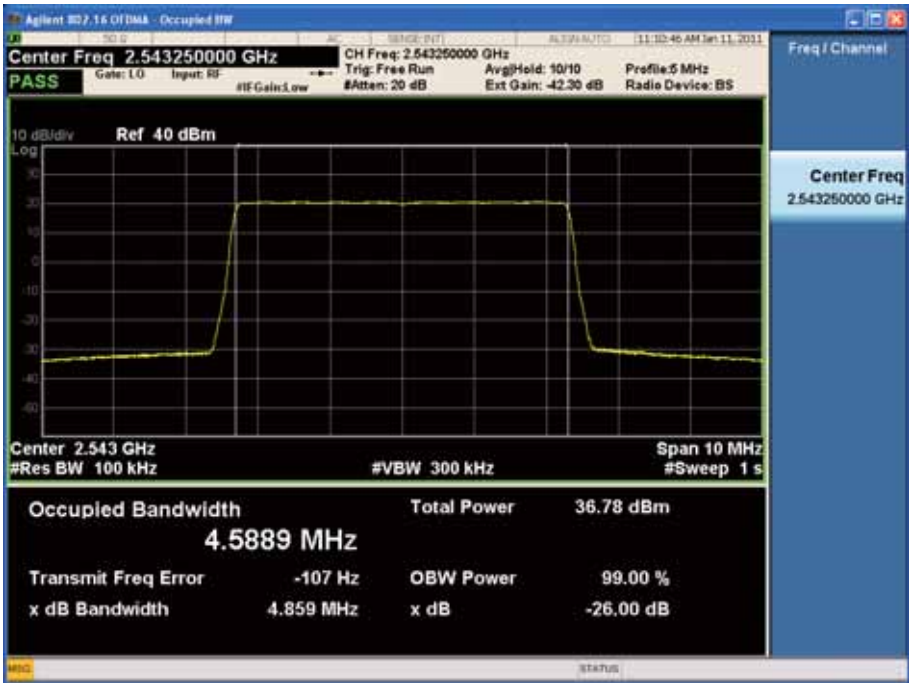
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Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 75 of 240

6.4.11. Test Plot at Output Port Alpha 2

(QPSK Low Channel)

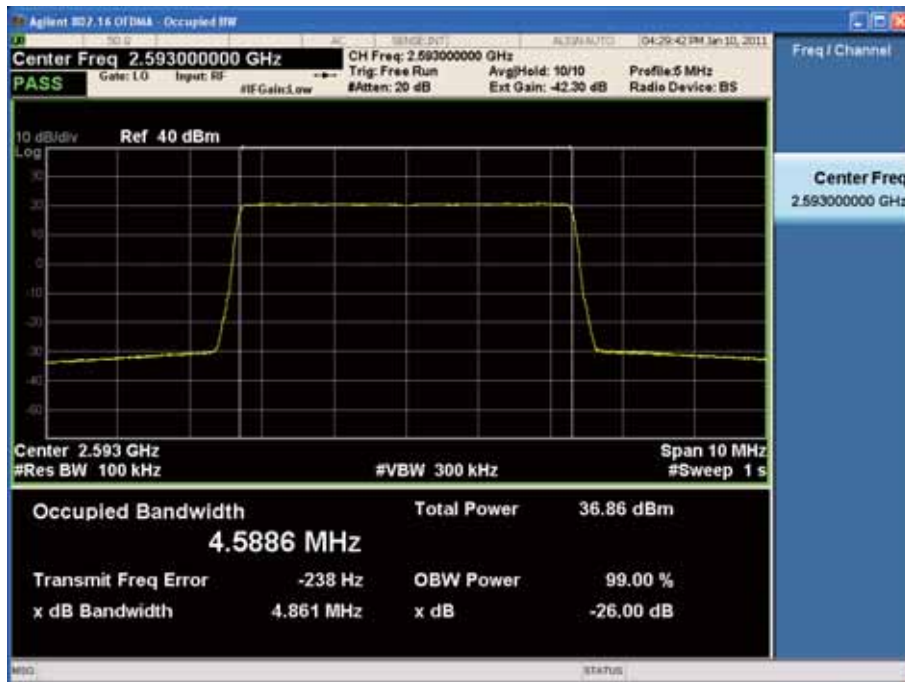


(QPSK Middle Channel)

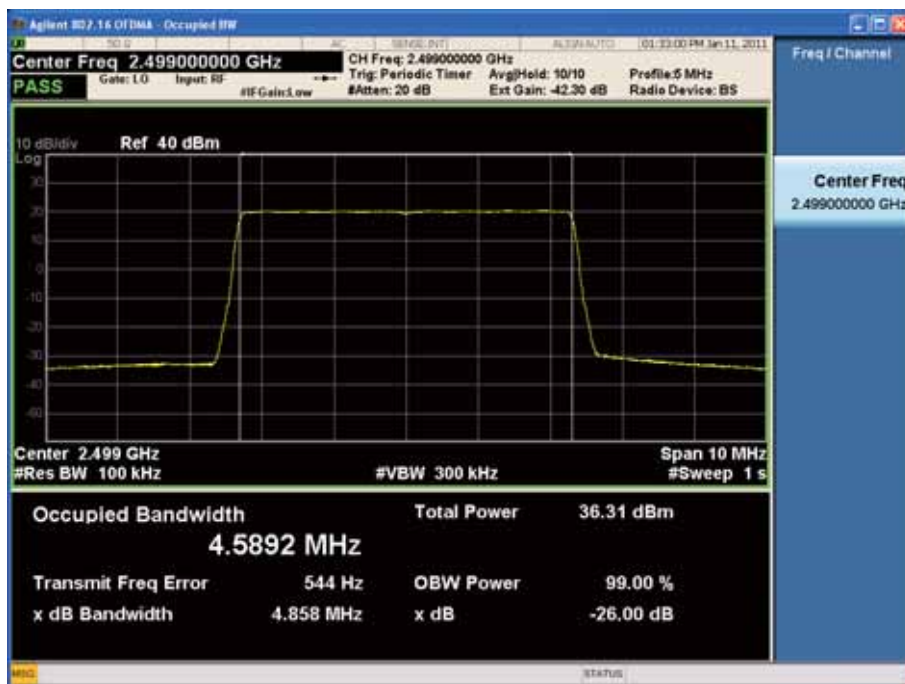


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 76 of 240

(QPSK High Channel)

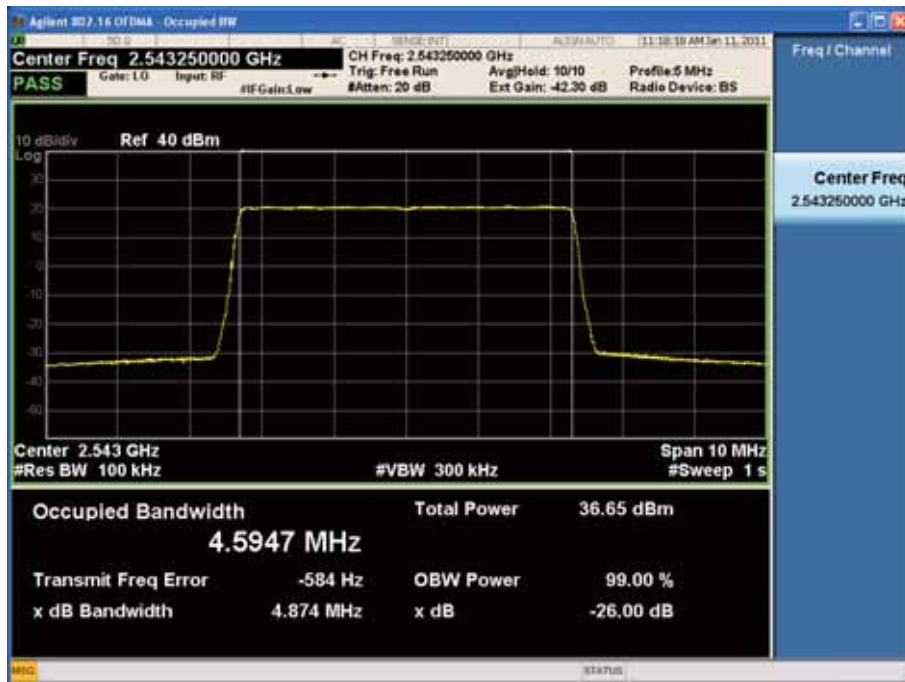


(16QAM Low Channel)

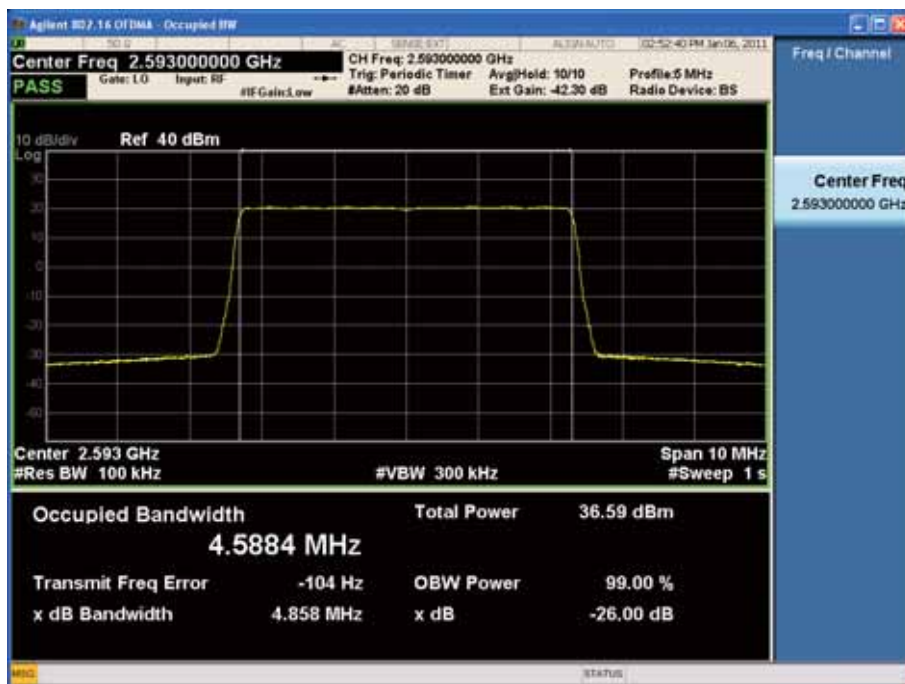


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 77 of 240

(16QAM Middle Channel)

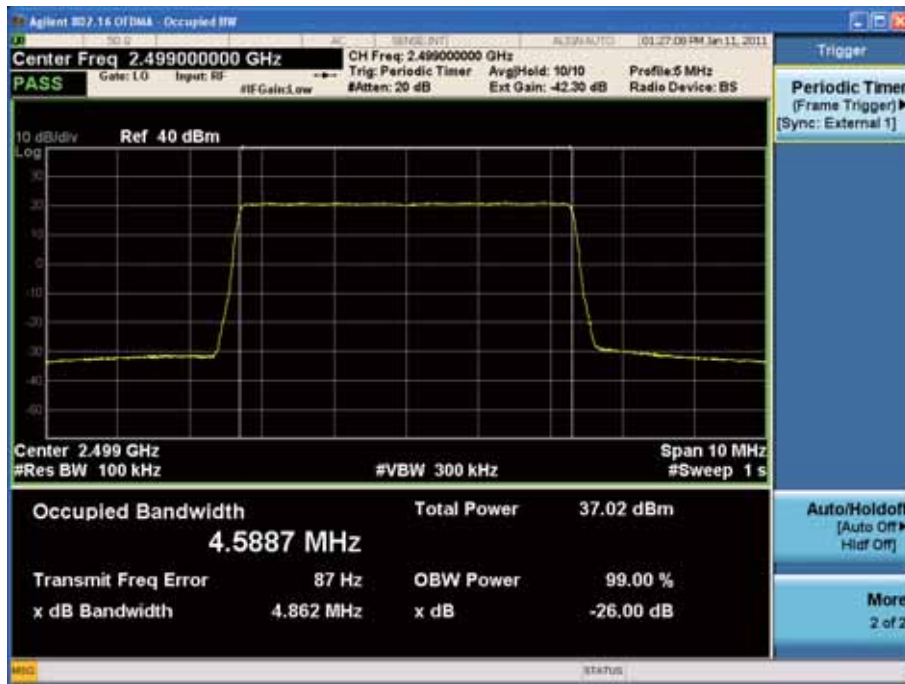


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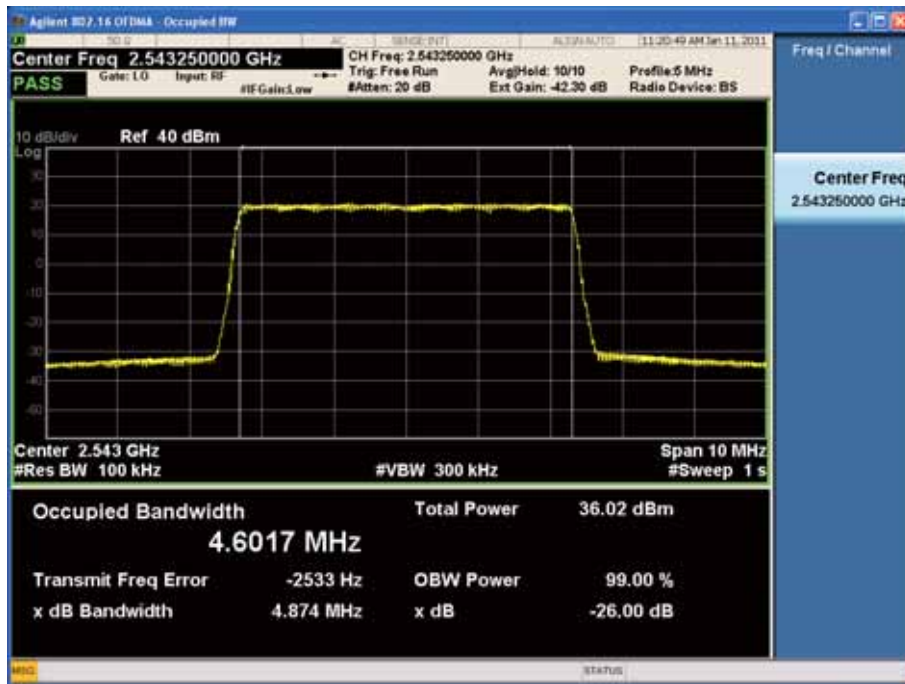


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 78 of 240

(64QAM Low Channel)

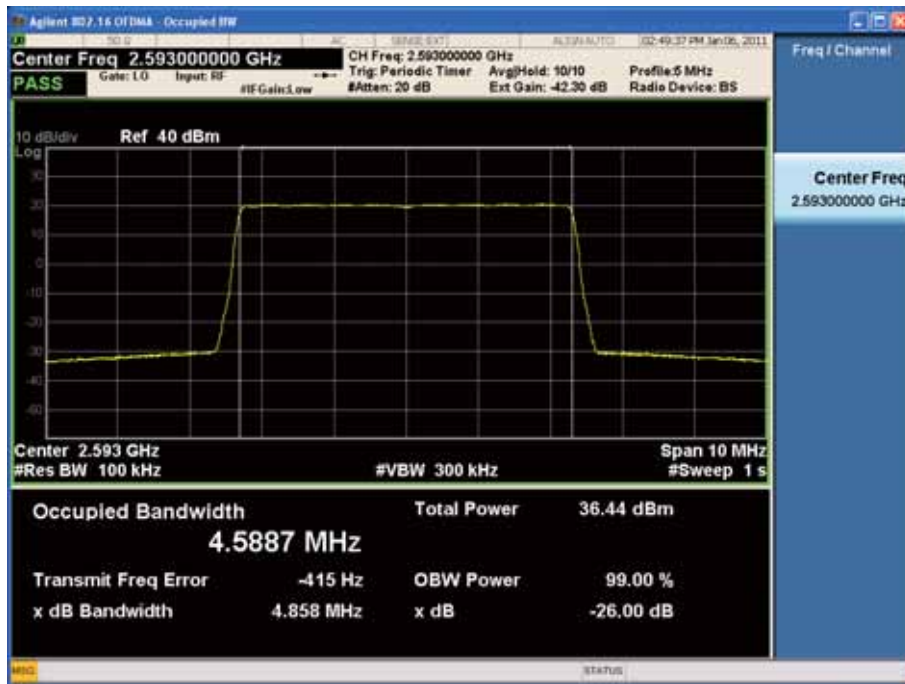


(64QAM Middle Channel)



FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 79 of 240

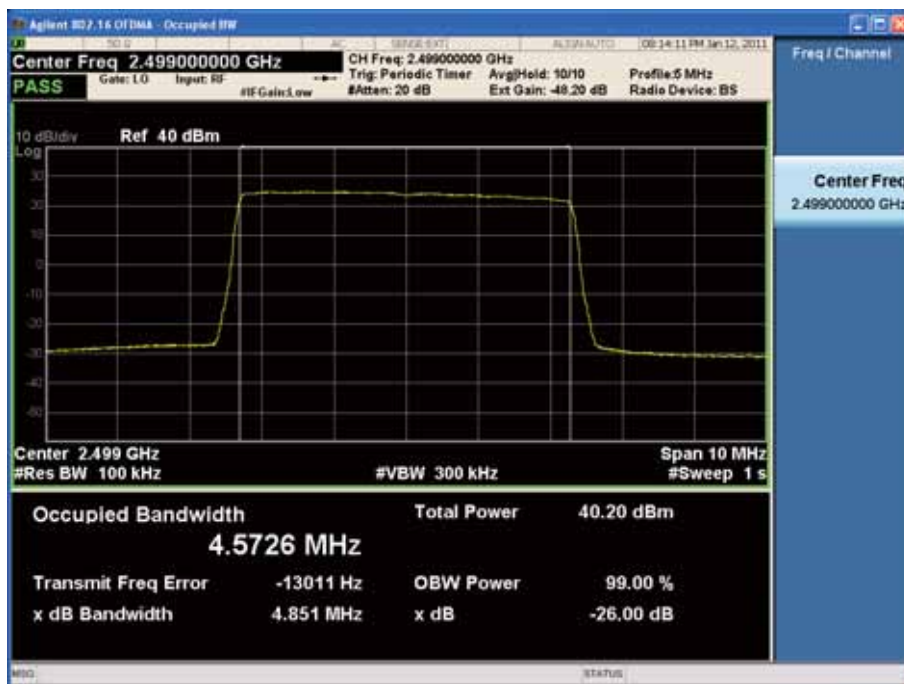
(64QAM High Channel)



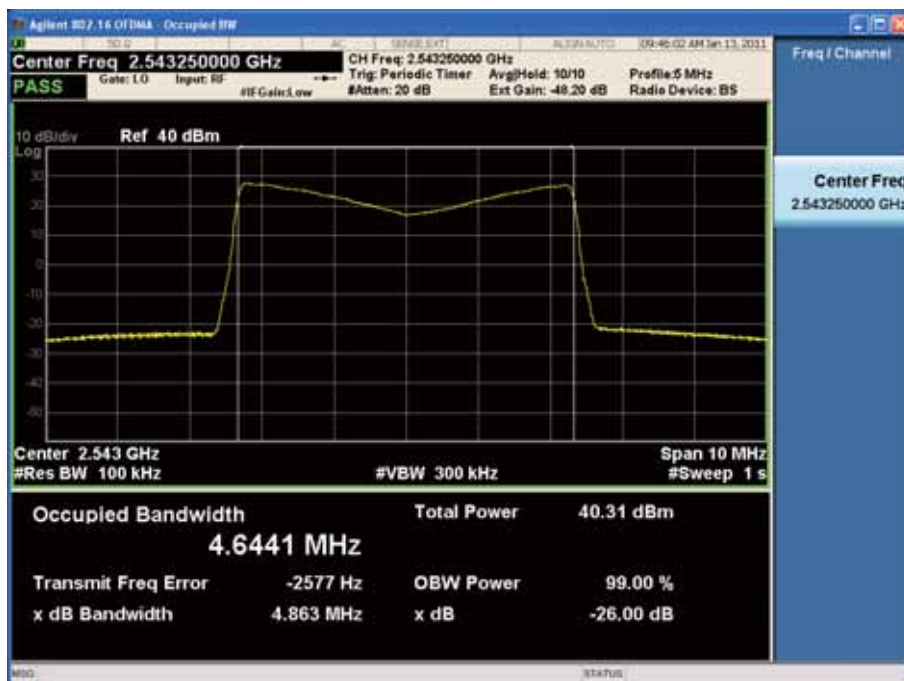
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 80 of 240

6.4.12. Combined Test Plot at Output Port

(QPSK Low Channel)

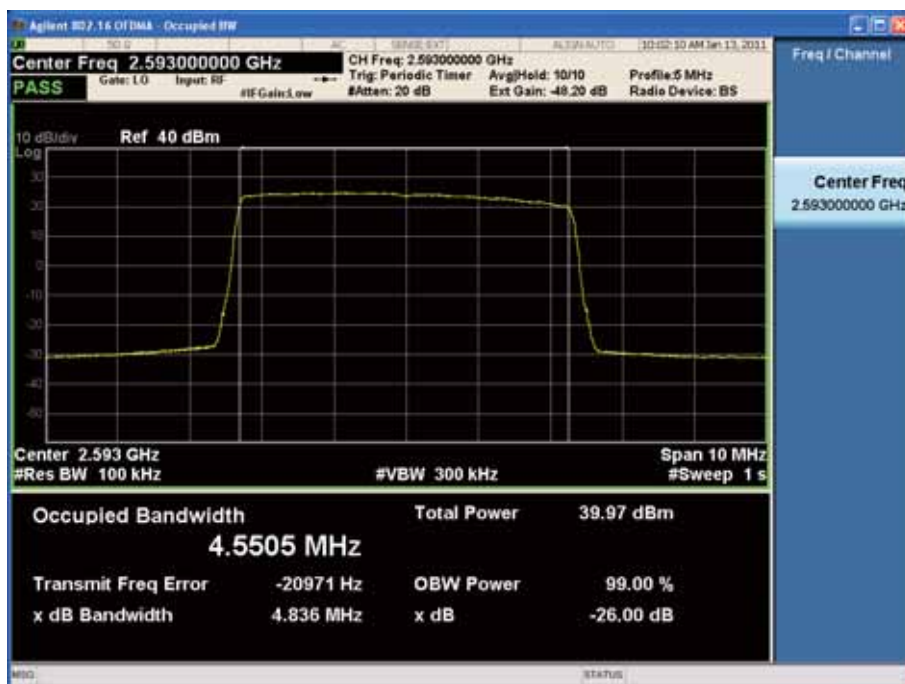


(QPSK Middle Channel)

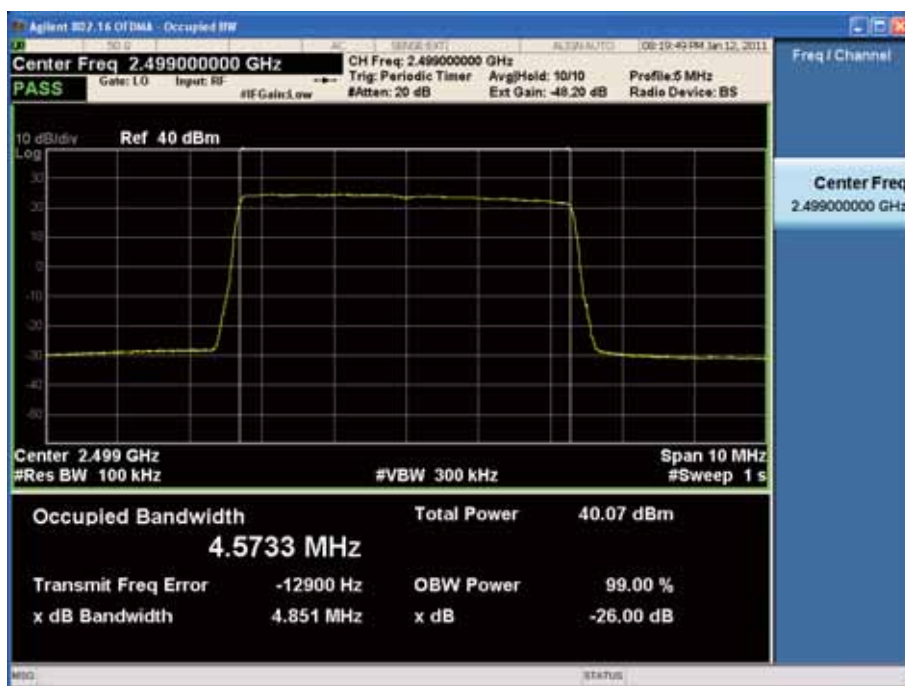


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 81 of 240

(QPSK High Channel)

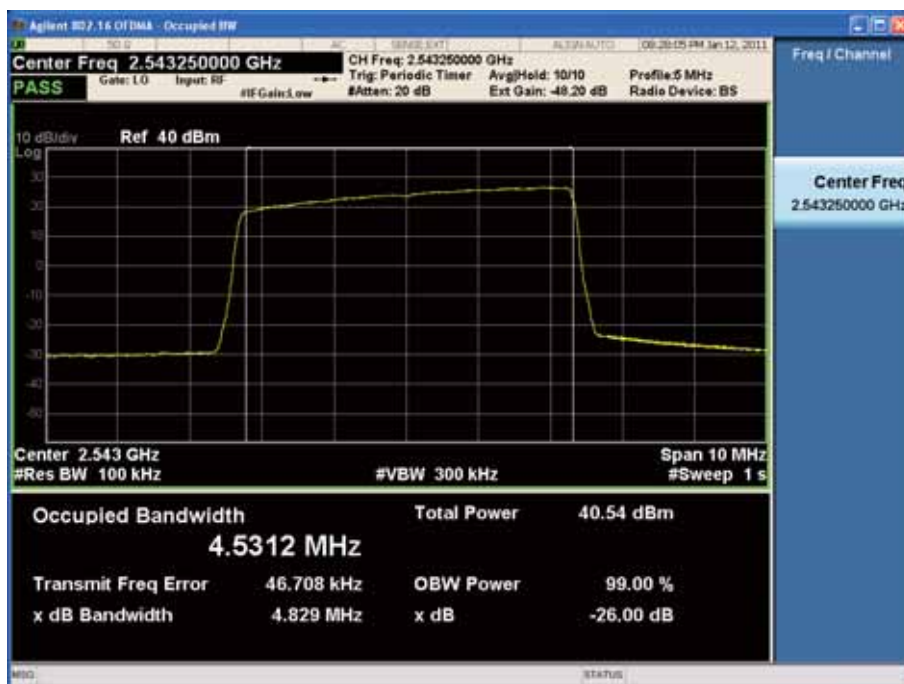


(16QAM Low Channel)

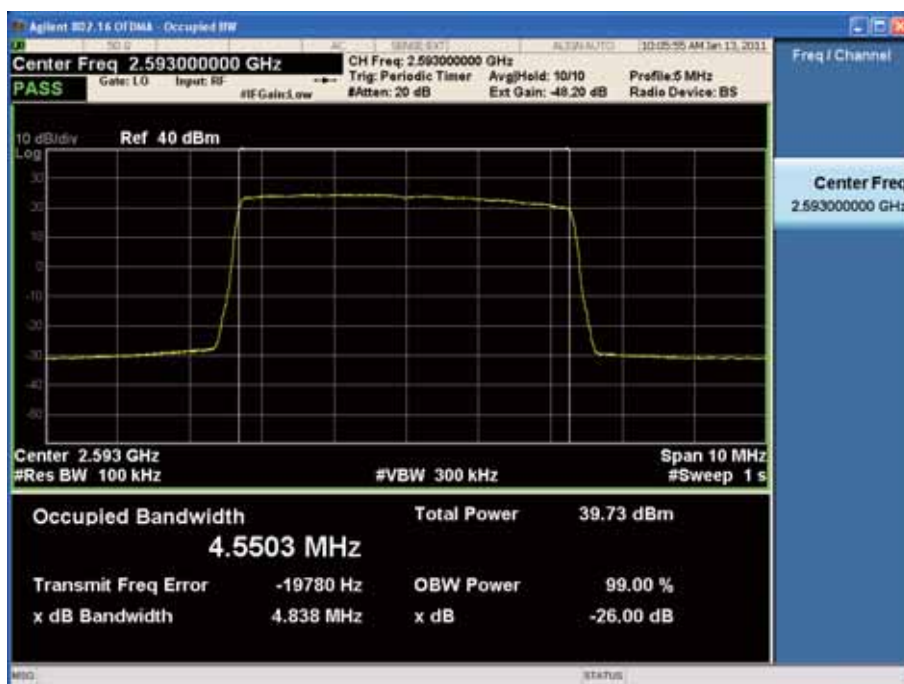


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 82 of 240

(16QAM Middle Channel)

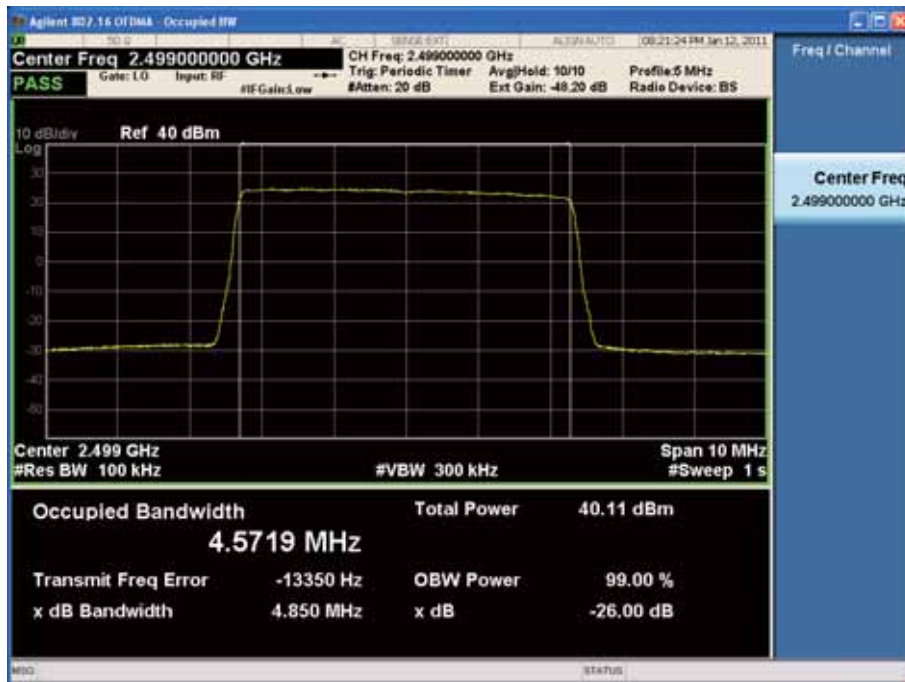


(16QAM High Channel)

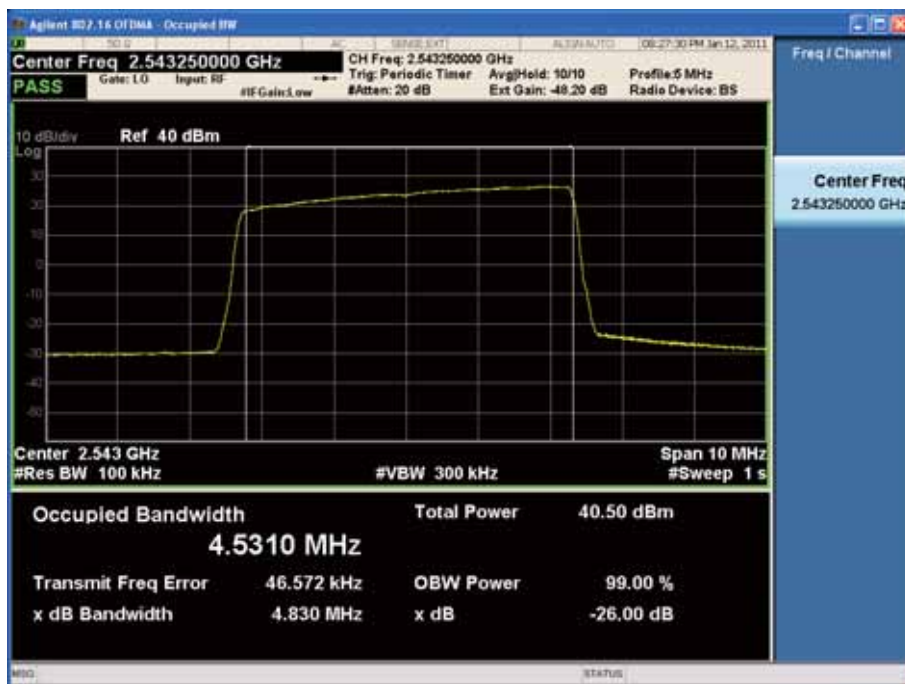


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 83 of 240

(64QAM Low Channel)

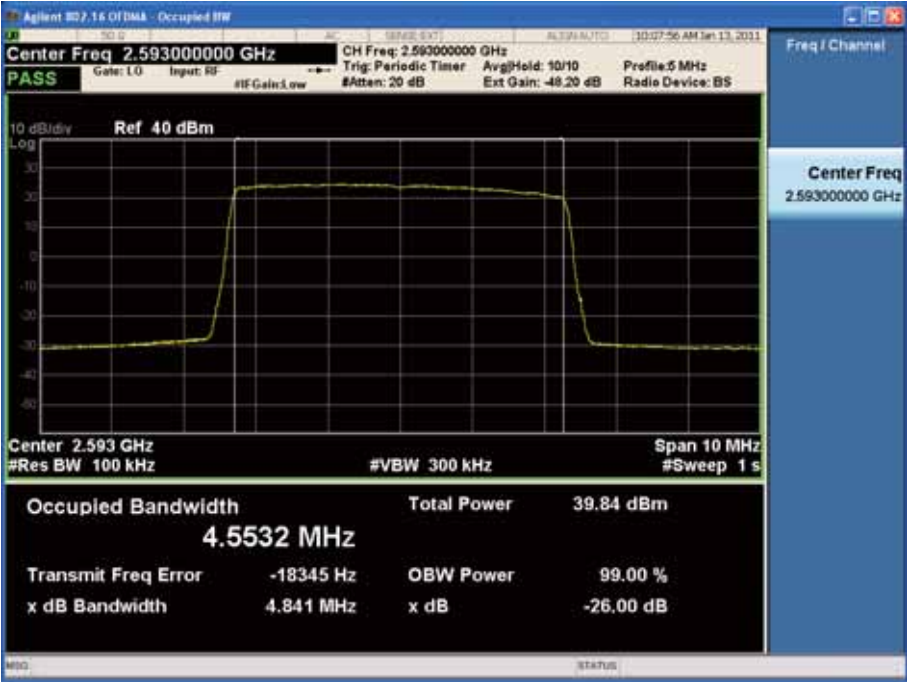


(64QAM Middle Channel)



FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 84 of 240

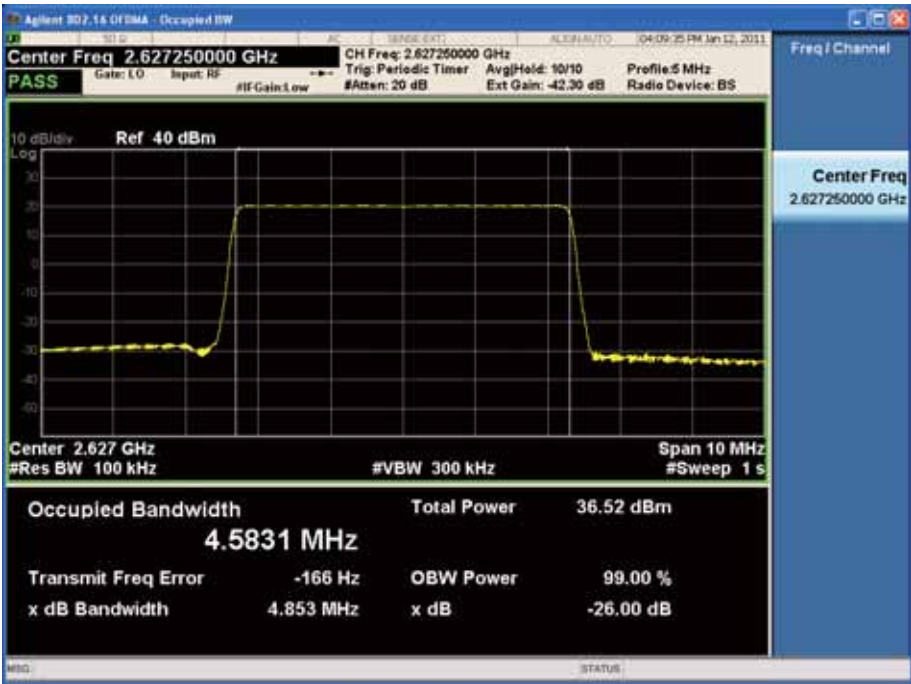
(64QAM High Channel)



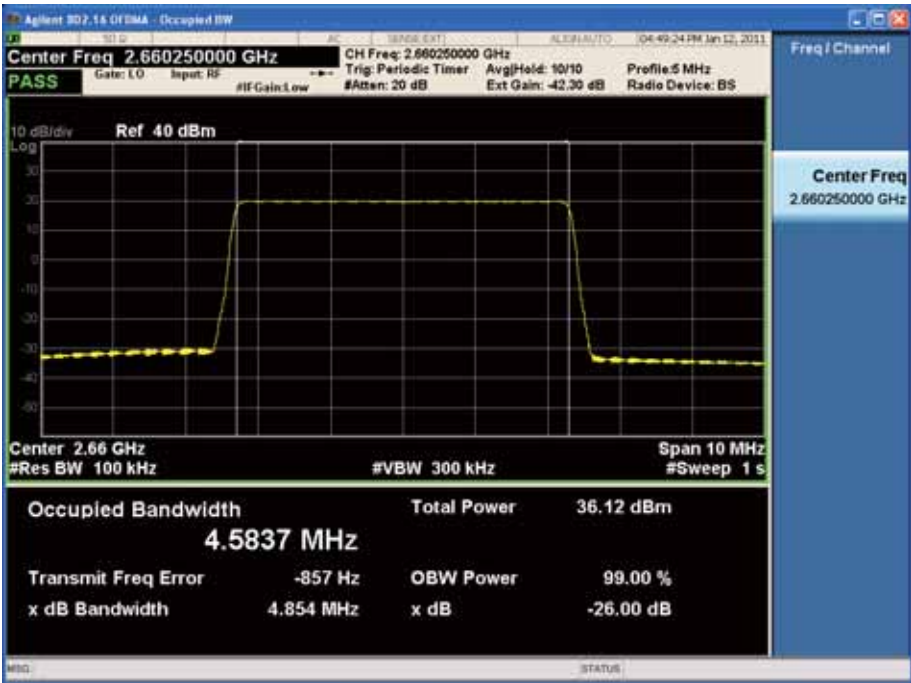
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 85 of 240

6.4.13. Test Plot at Output Port Beta 1

(QPSK Low Channel)

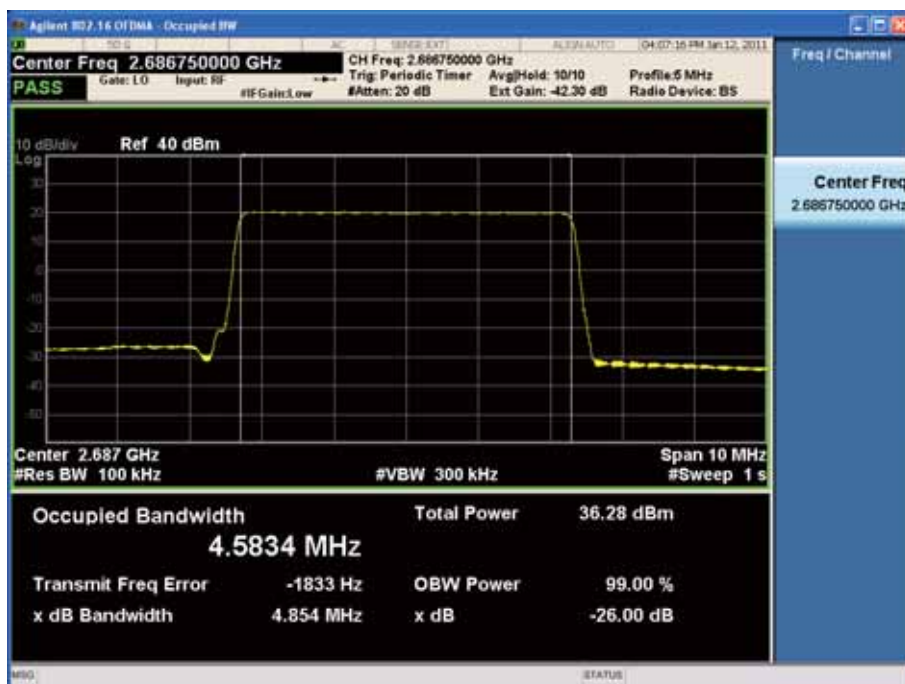


(QPSK Middle Channel)

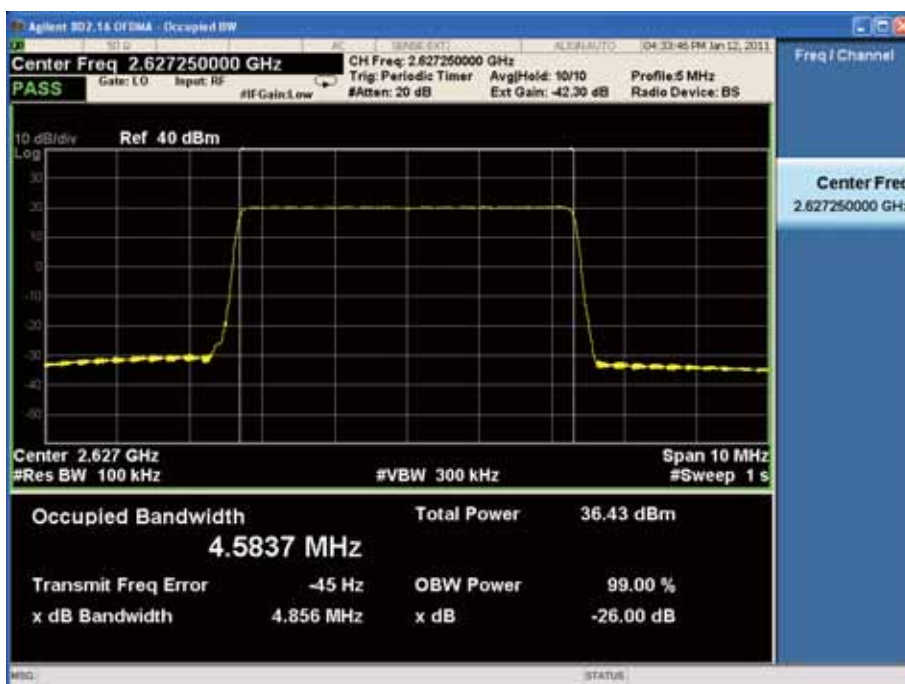


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 86 of 240

(QPSK High Channel)

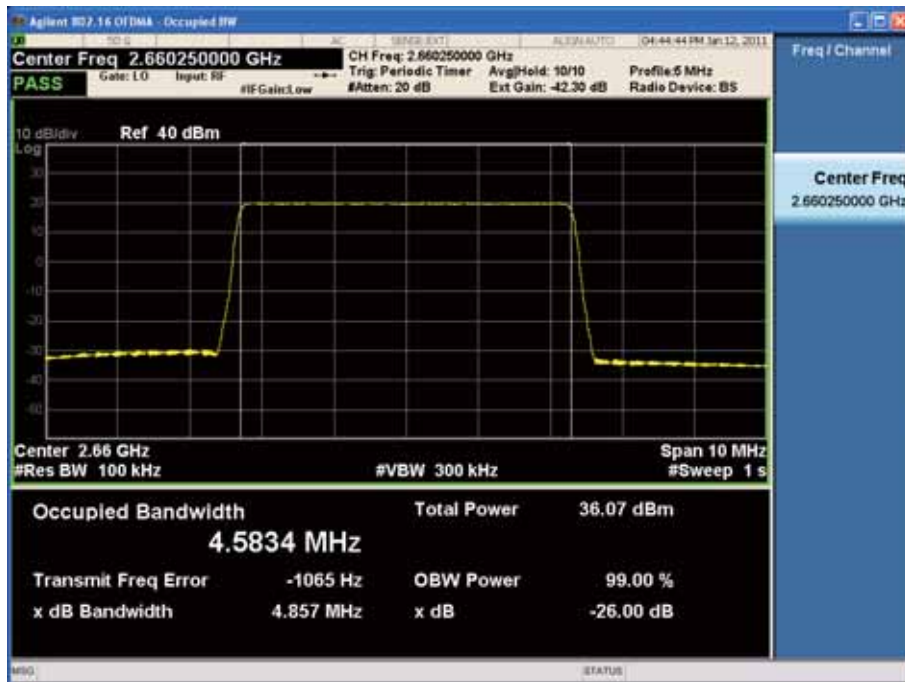


(16QAM Low Channel)

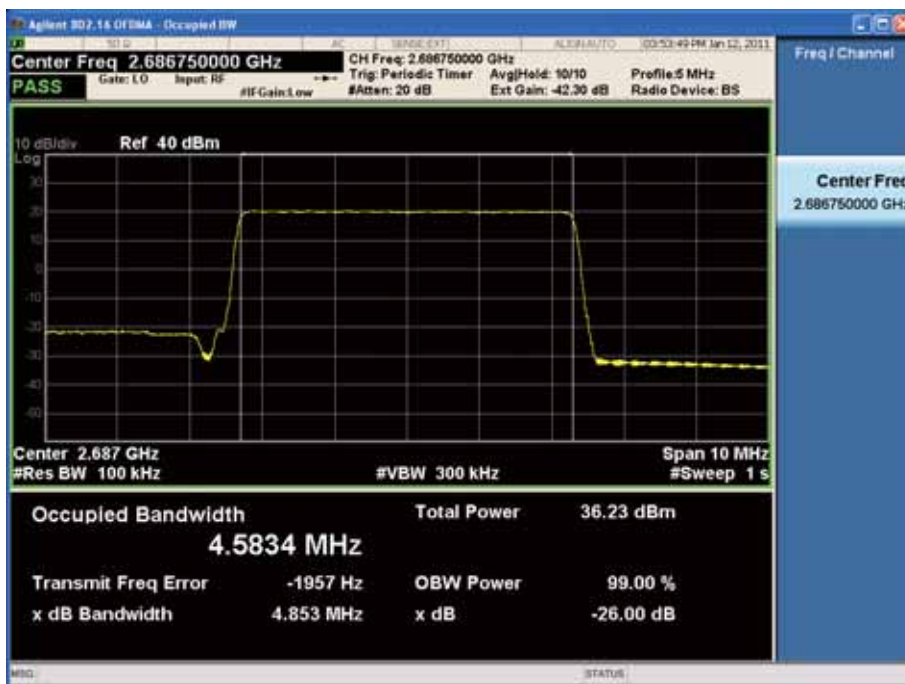


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 87 of 240

(16QAM Middle Channel)

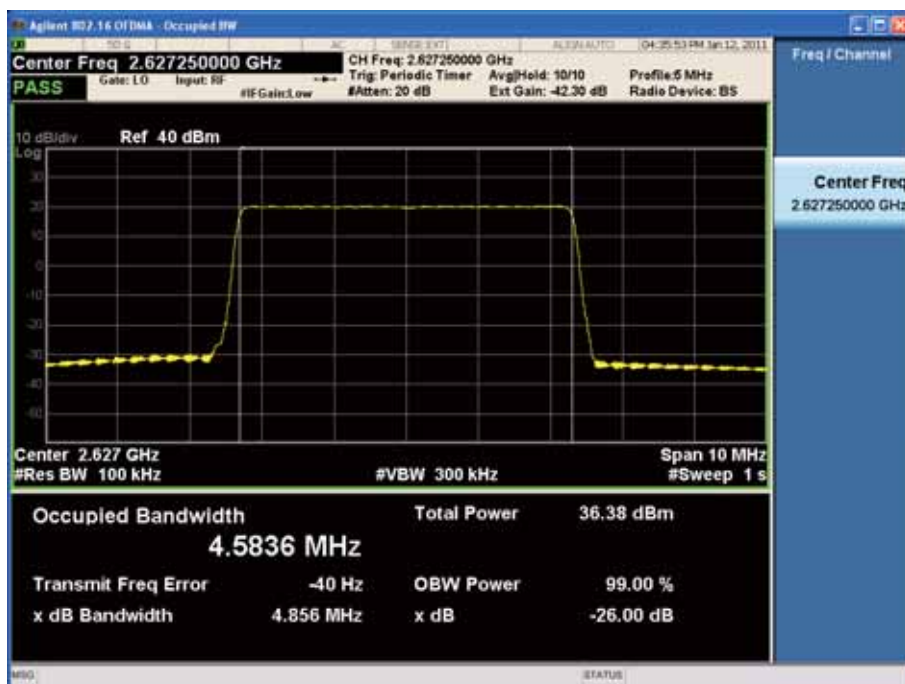


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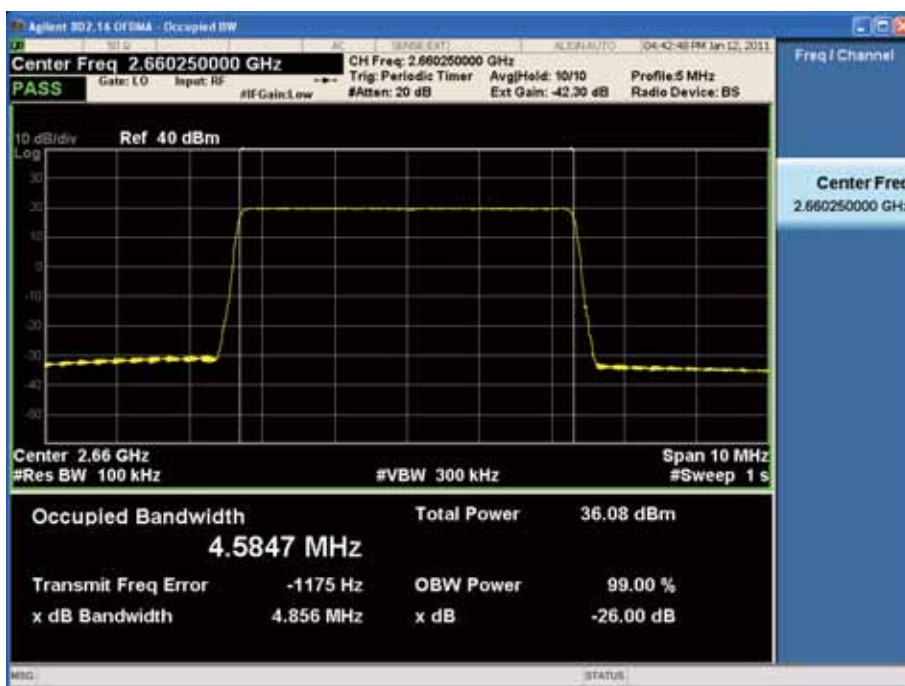


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Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 88 of 240

(64QAM Low Channel)

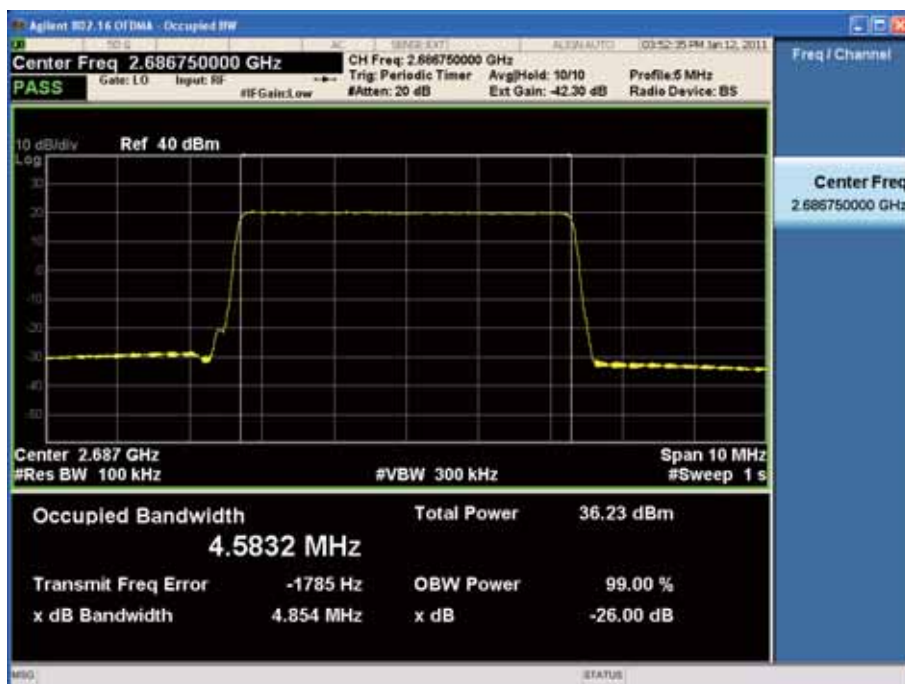


(64QAM Middle Channel)



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Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 89 of 240

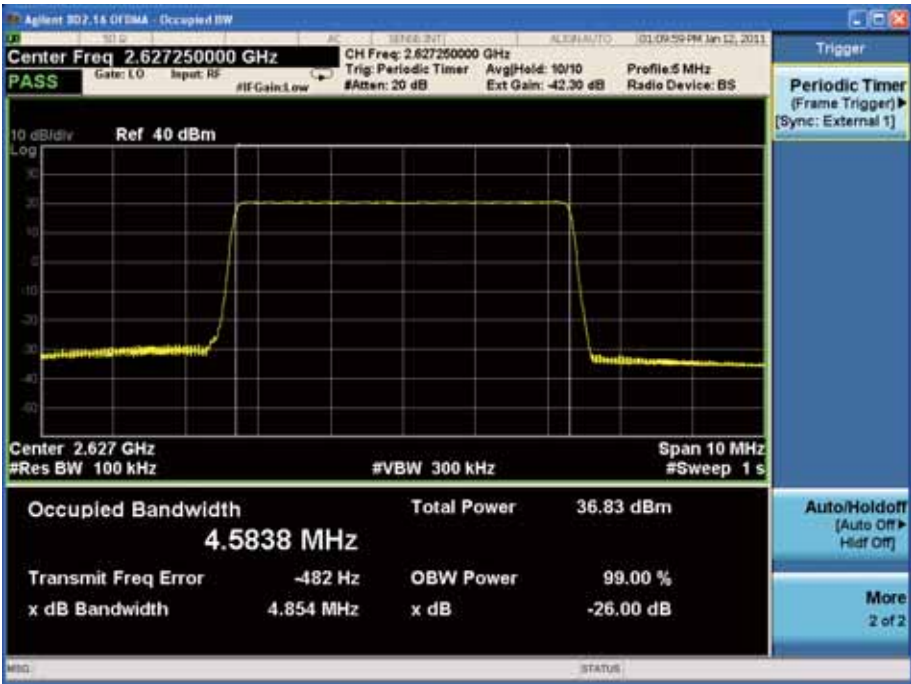
(64QAM High Channel)



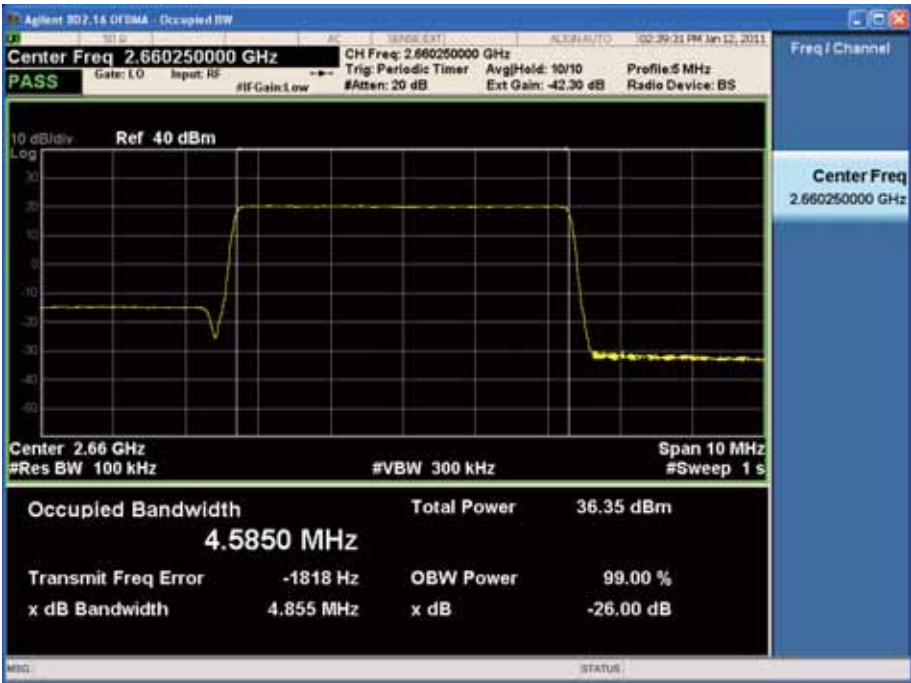
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 90 of 240

6.4.14. Test Plot at Output Port Beta 2

(QPSK Low Channel)

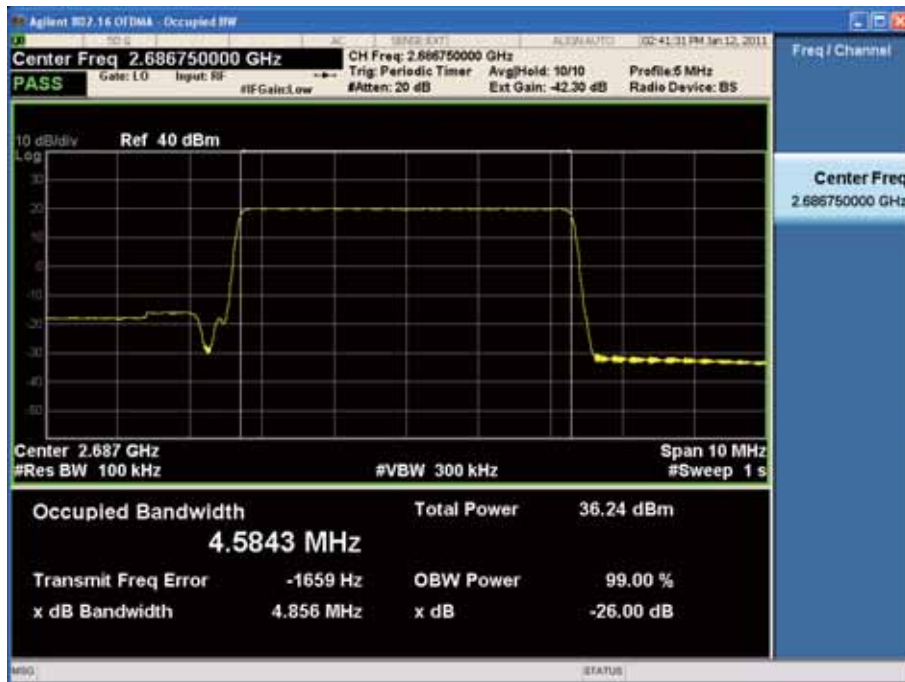


(QPSK Middle Channel)

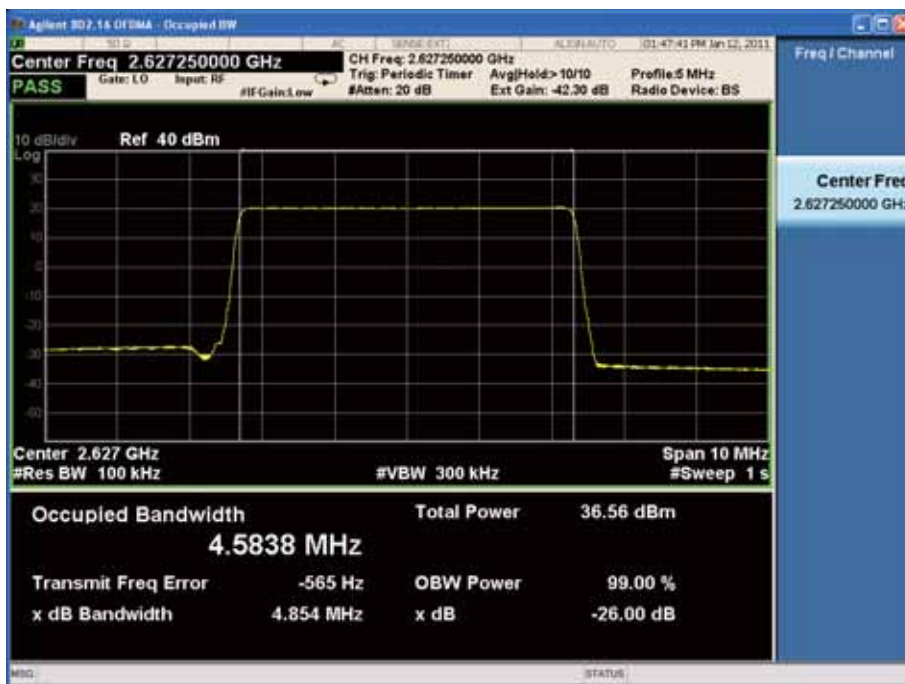


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 91 of 240

(QPSK High Channel)



(16QAM Low Channel)

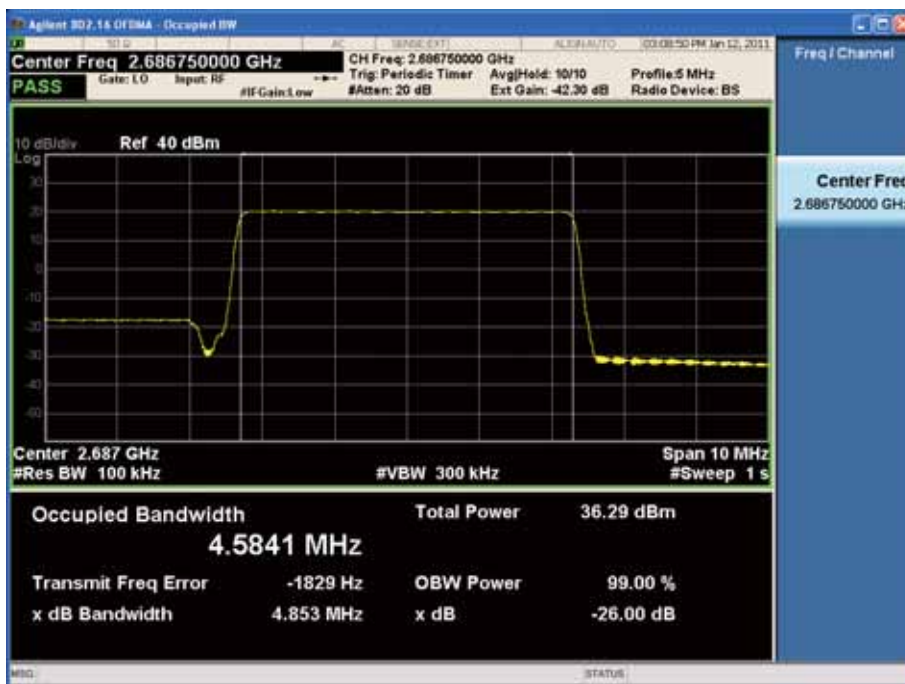


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 92 of 240

(16QAM Middle Channel)

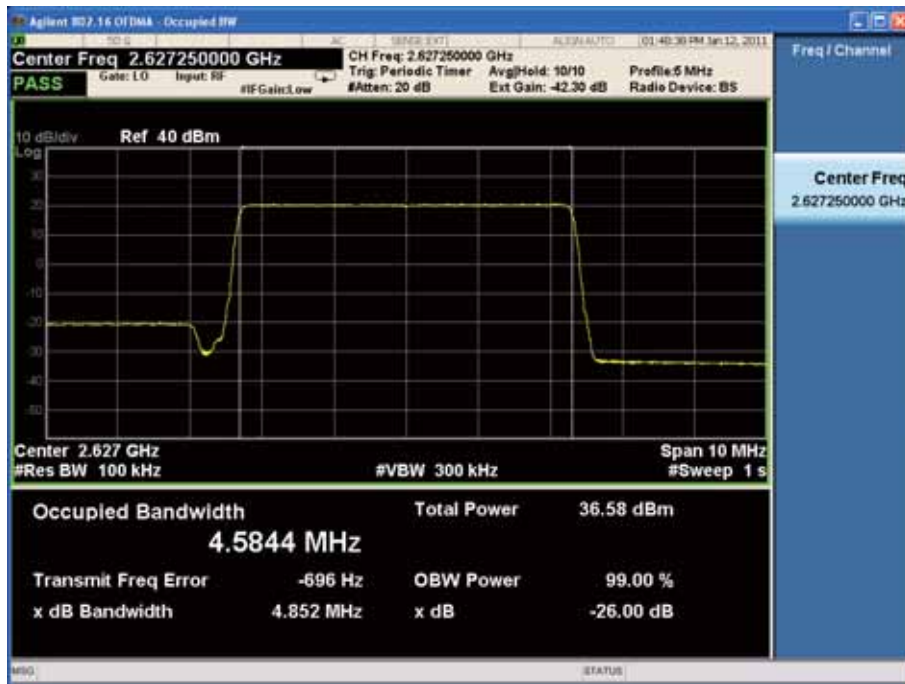


(16QAM High Channel)

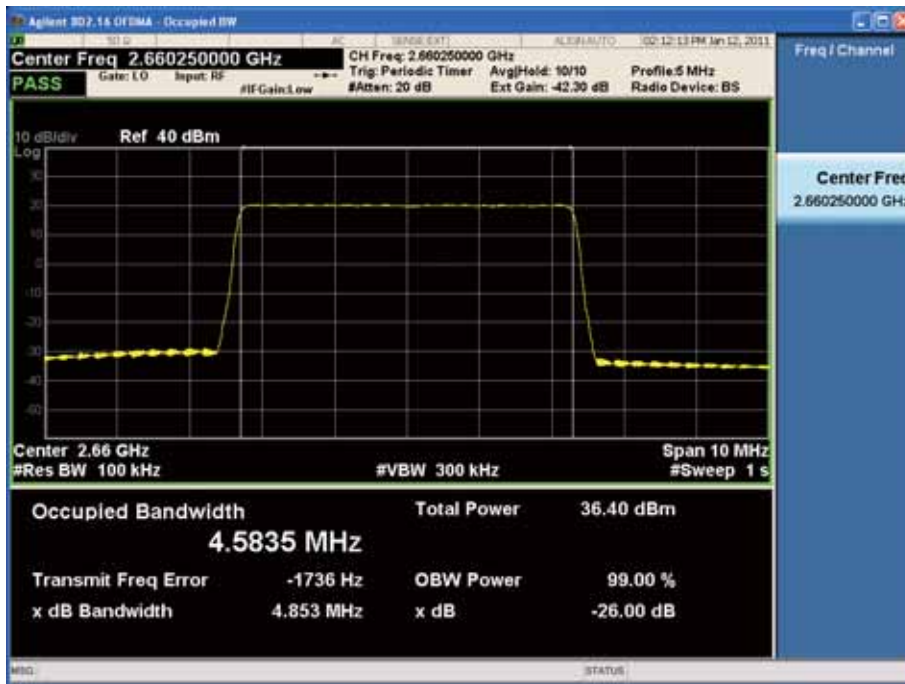


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 93 of 240

(64QAM Low Channel)

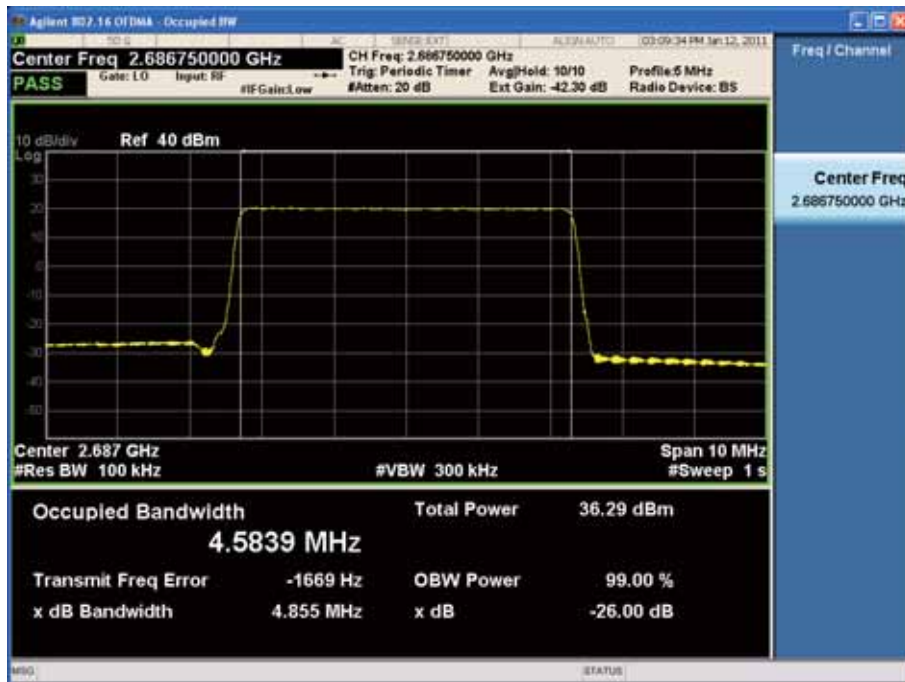


(64QAM Middle Channel)



FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 94 of 240

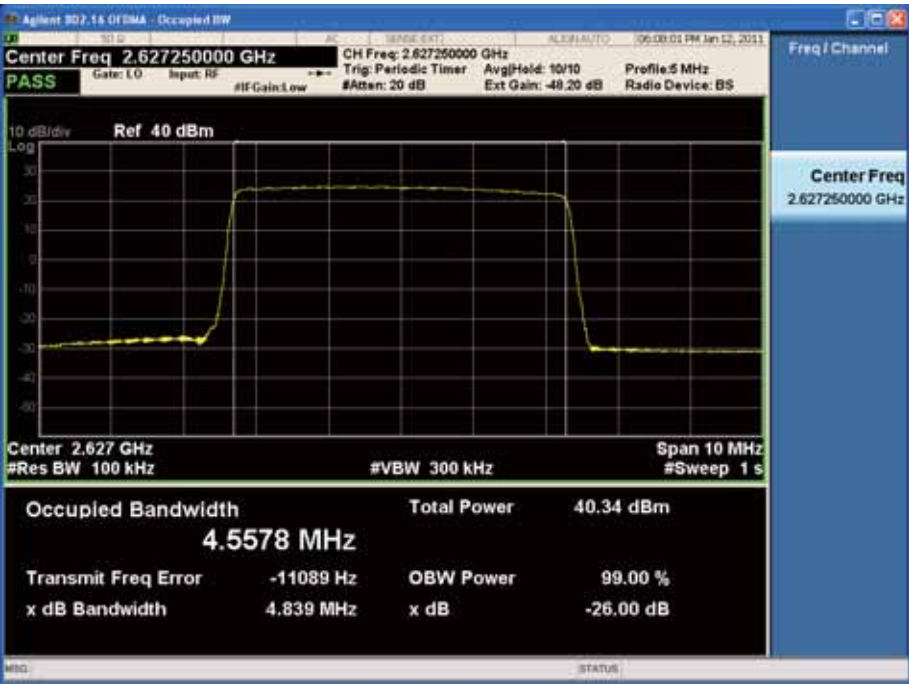
(64QAM High Channel)



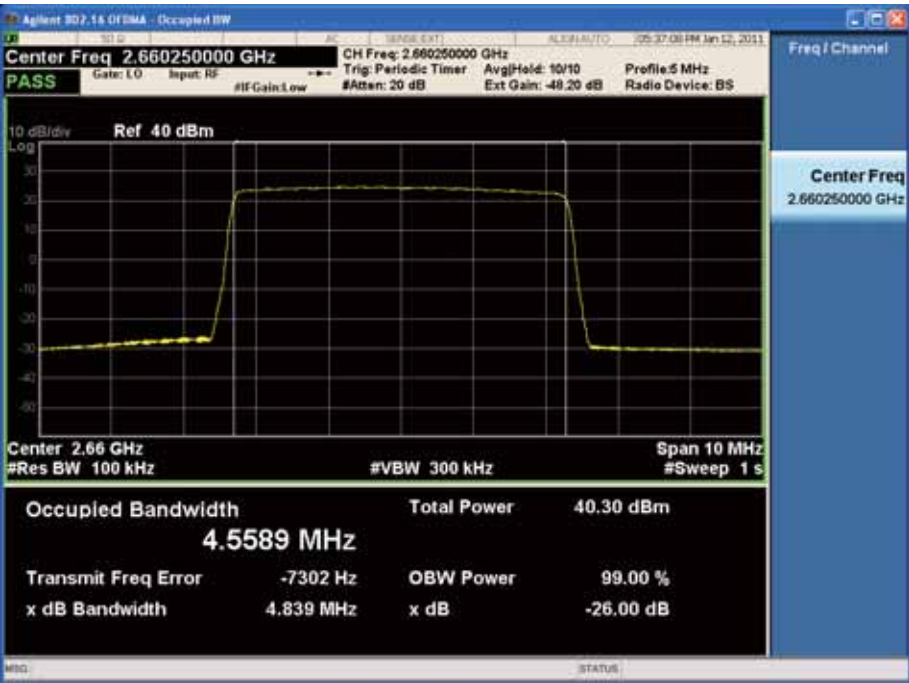
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 95 of 240

6.4.15. Combined Test Plot at Output Port

(QPSK Low Channel)

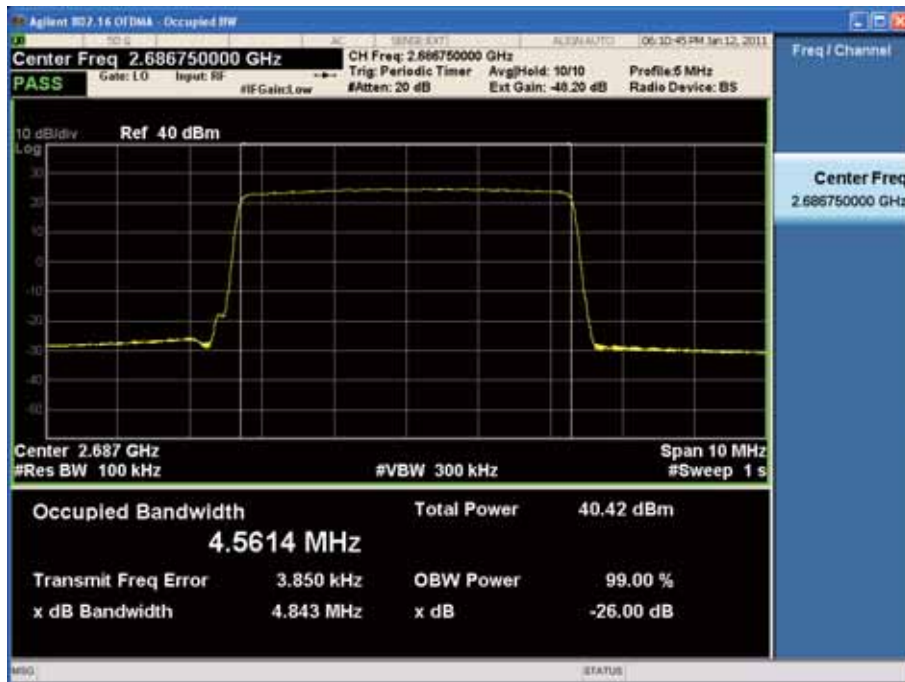


(QPSK Middle Channel)

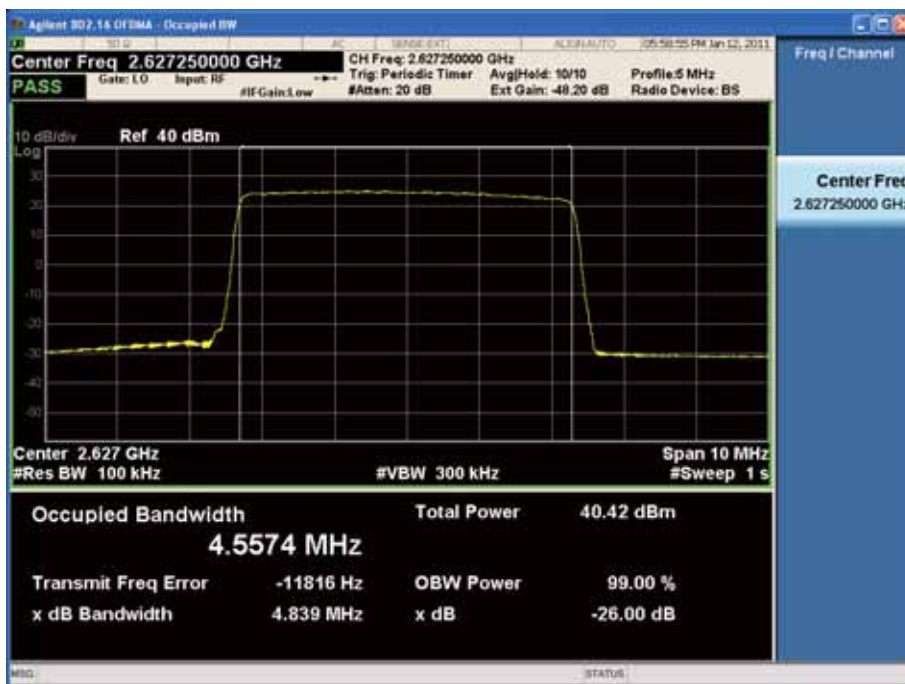


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 96 of 240

(QPSK High Channel)

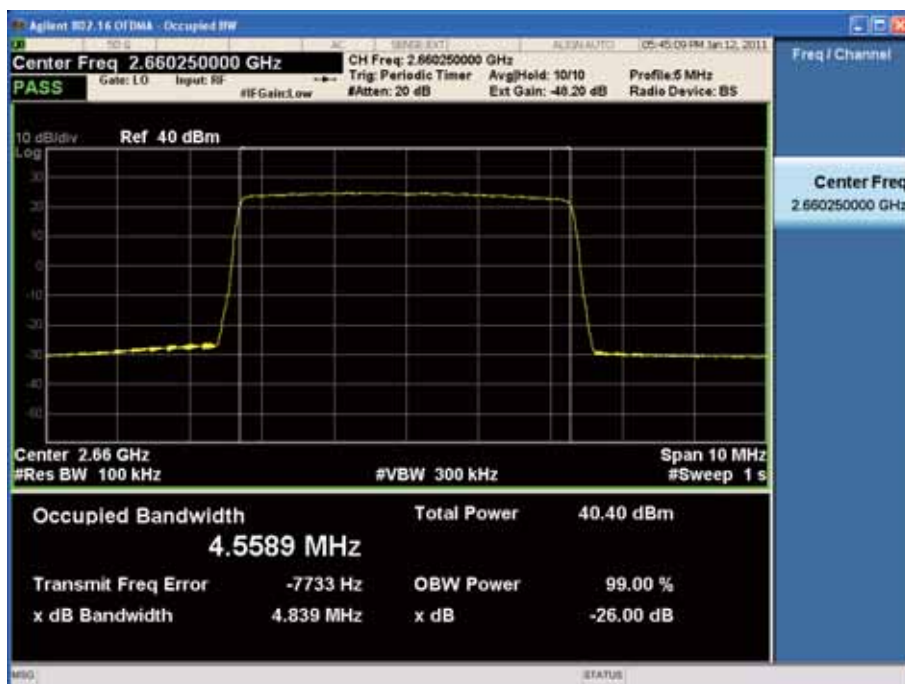


(16QAM Low Channel)

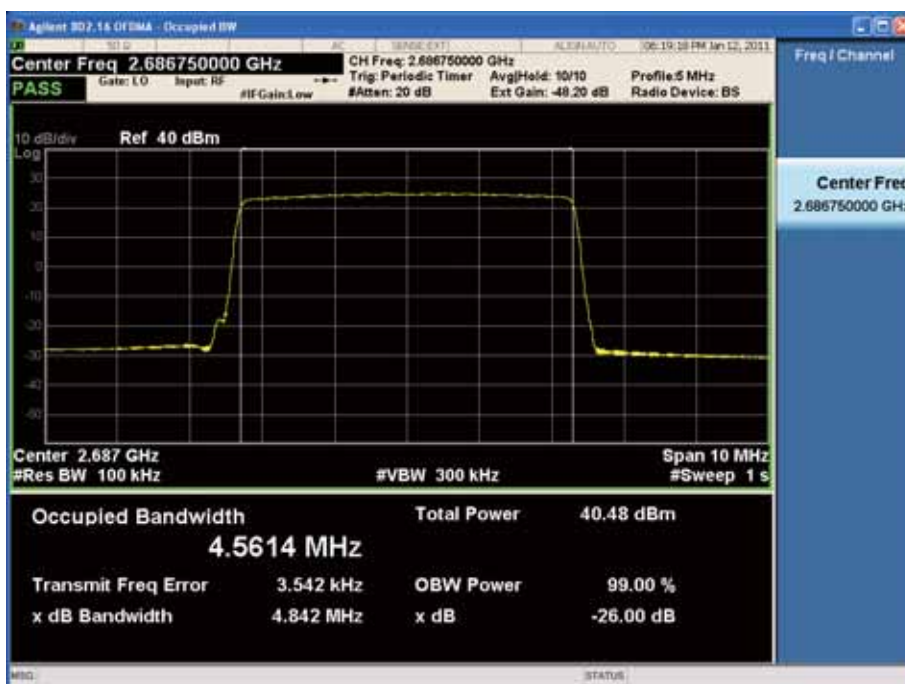


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 97 of 240

(16QAM Middle Channel)

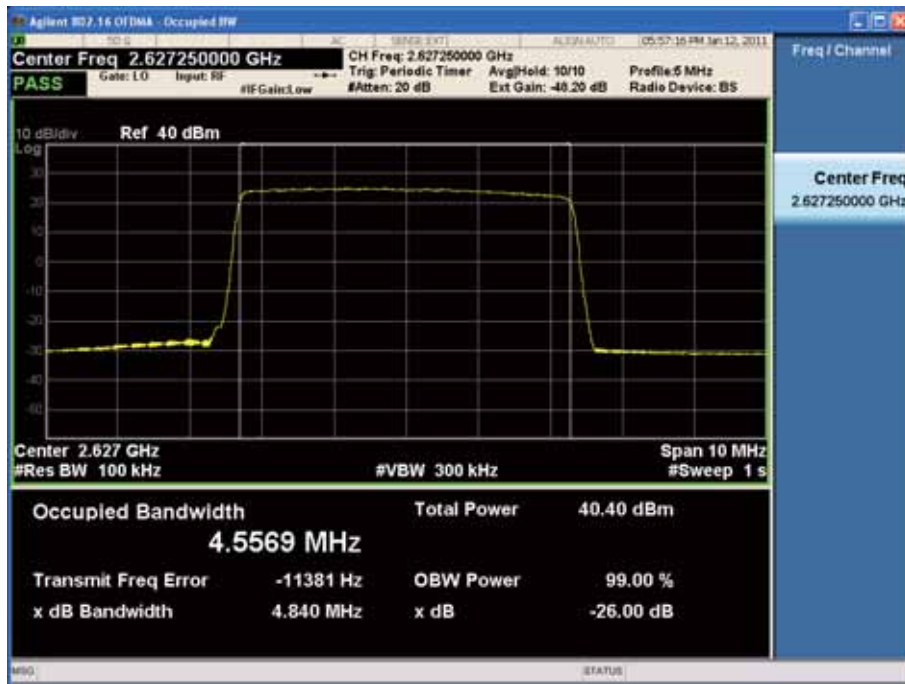


(16QAM High Channel)

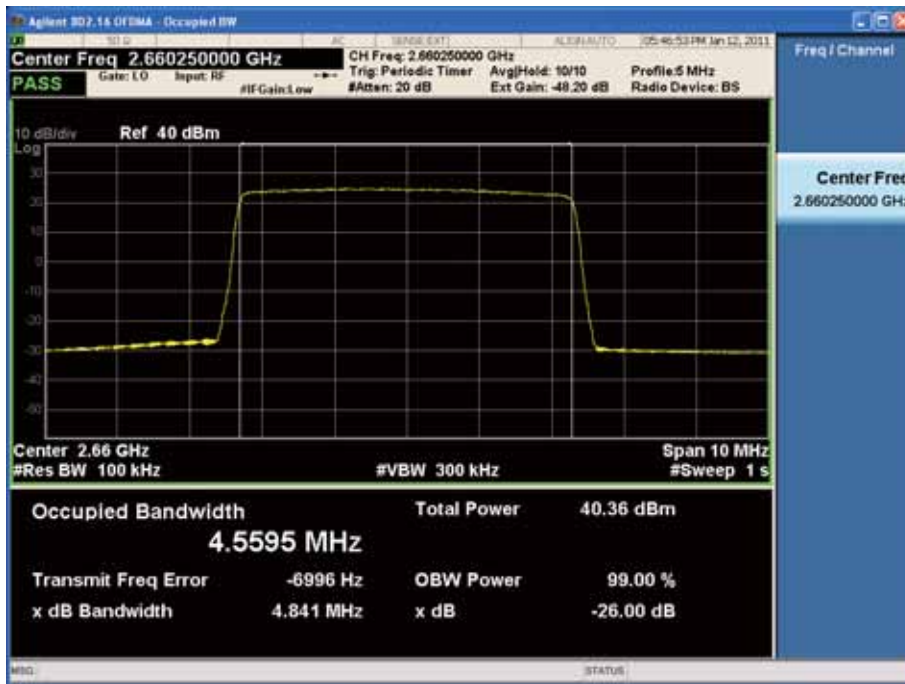


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 98 of 240

(64QAM Low Channel)

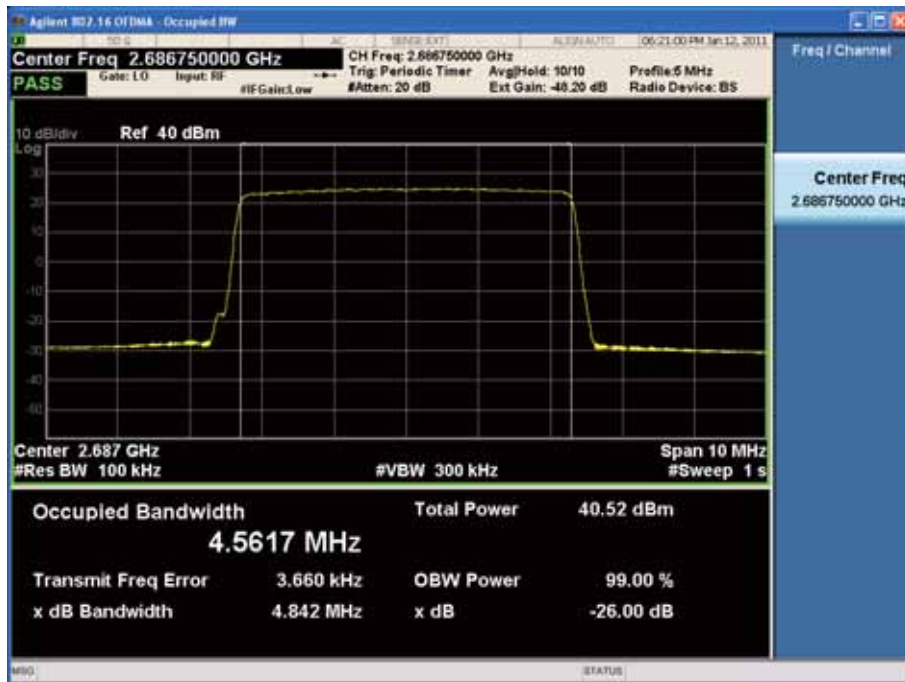


(64QAM Middle Channel)



FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 99 of 240

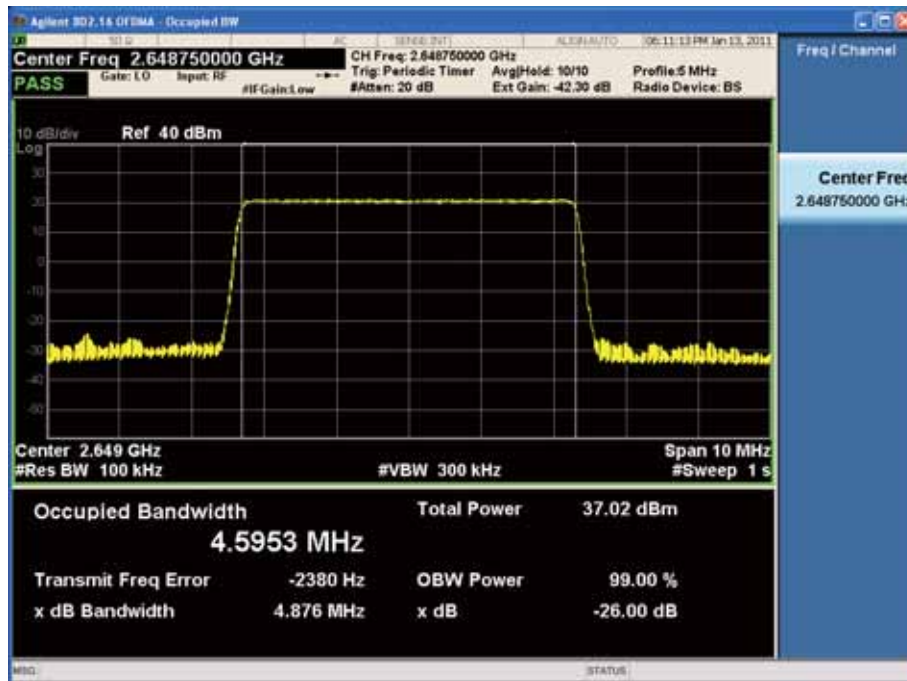
(64QAM High Channel)



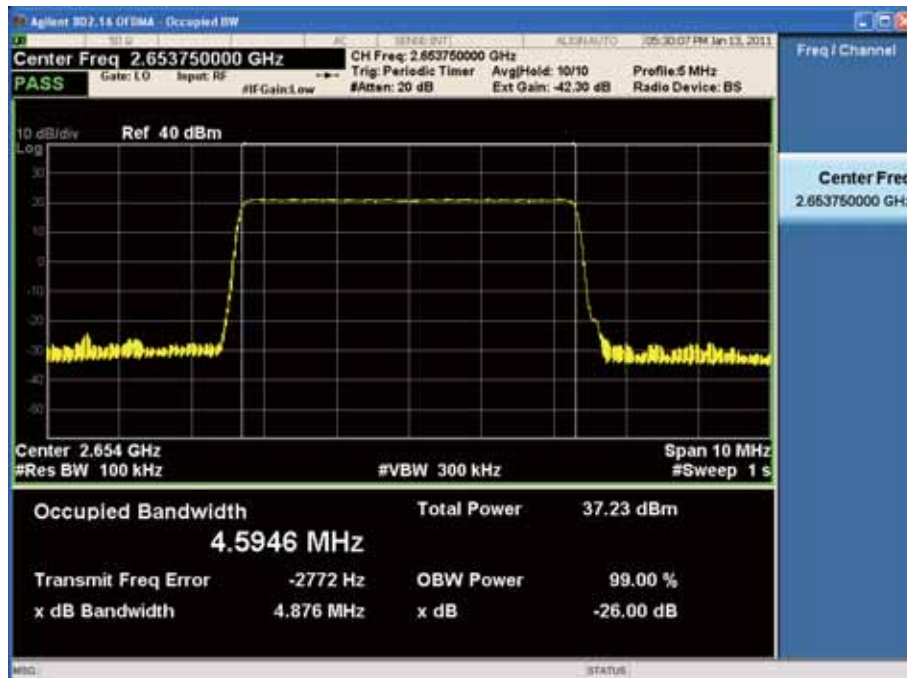
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 100 of 240

6.4.16. Test Plot at Output Port Gamma 1

(QPSK Low Channel)

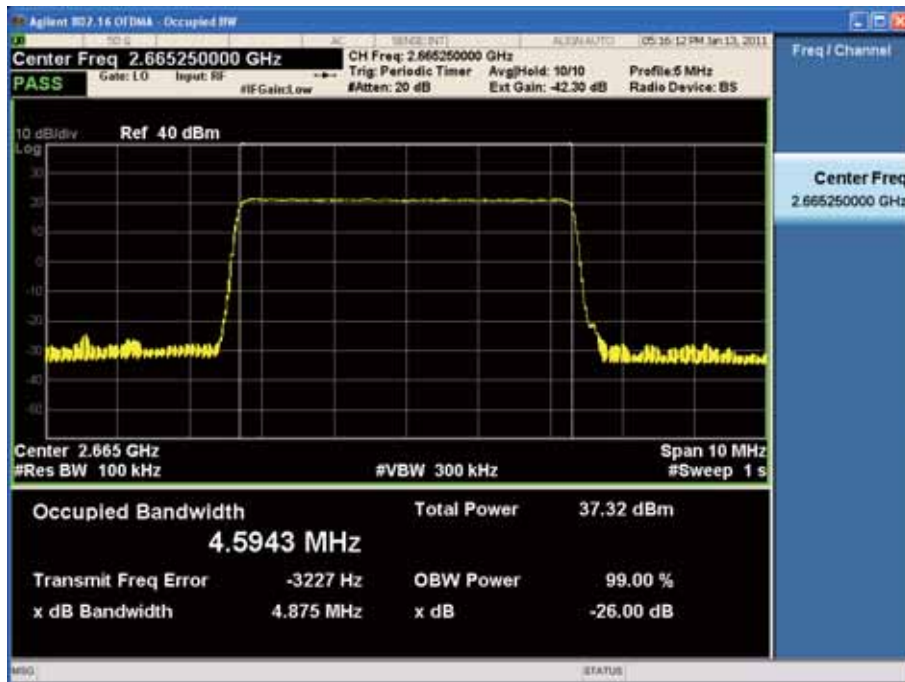


(QPSK Middle Channel)

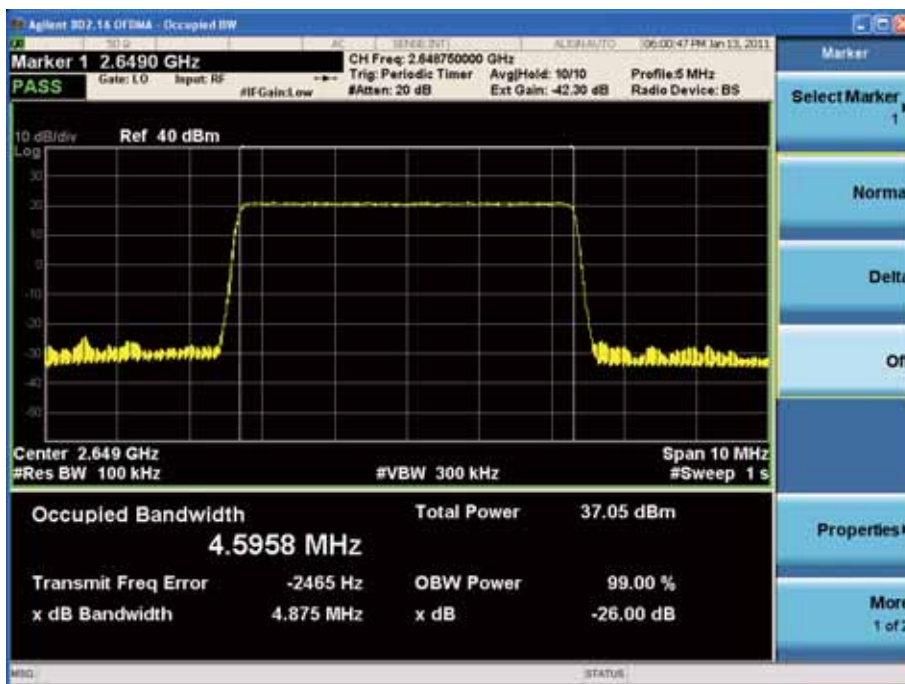


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 101 of 240

(QPSK High Channel)

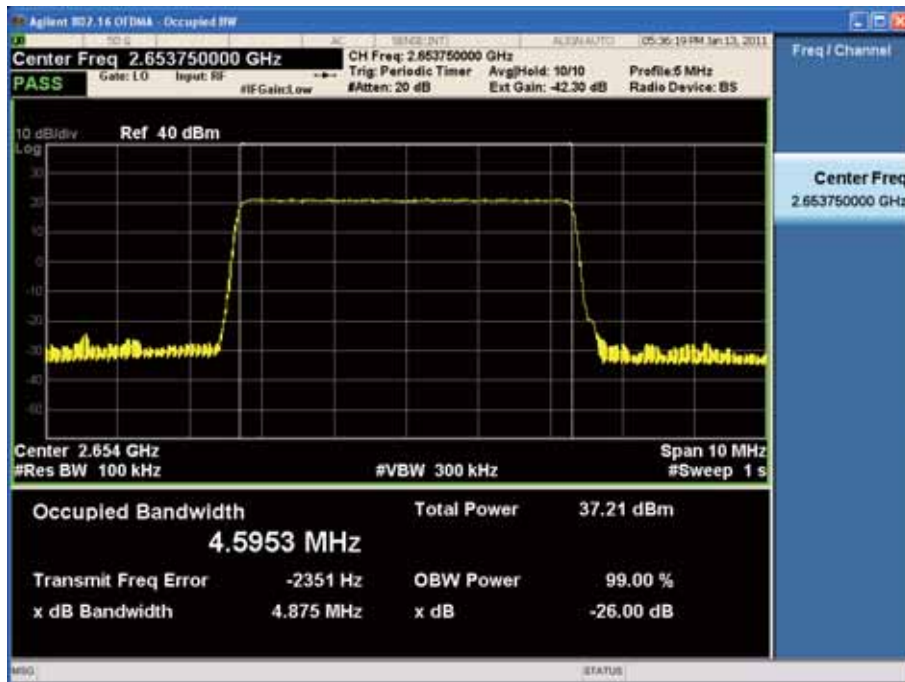


(16QAM Low Channel)

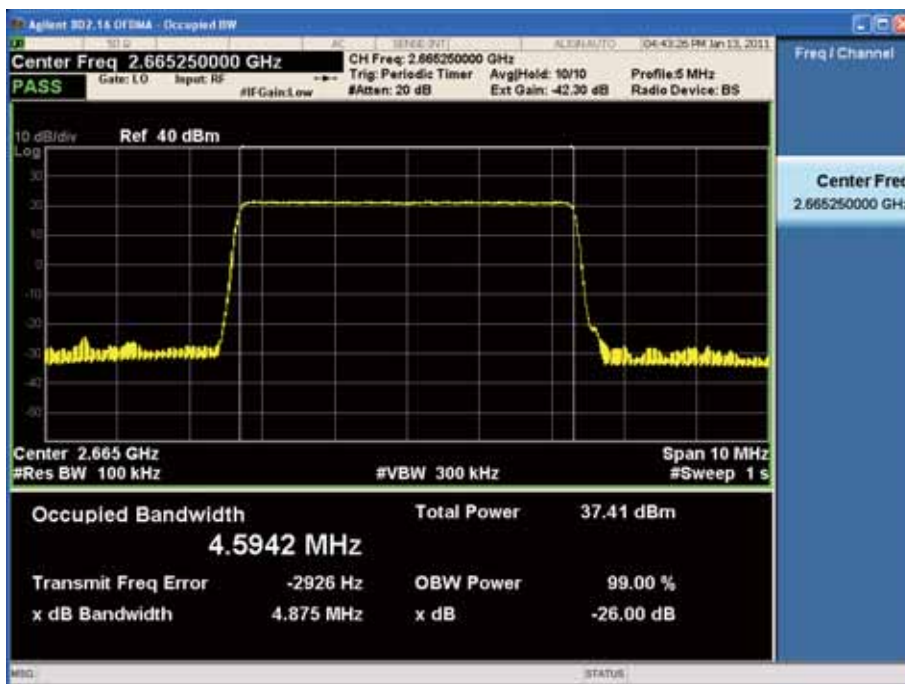


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 102 of 240

(16QAM Middle Channel)

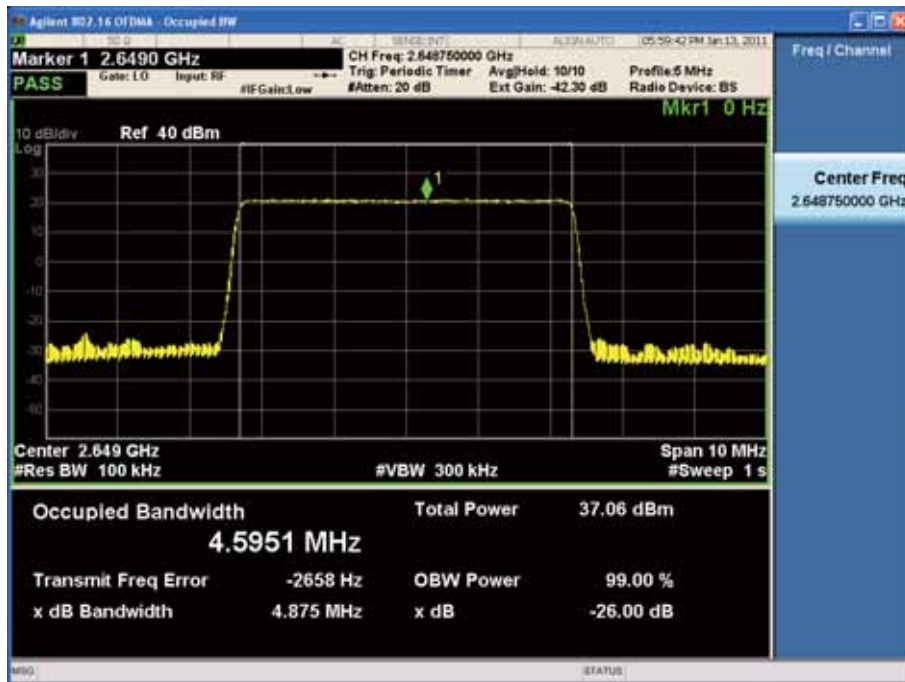


(16QAM High Channel)

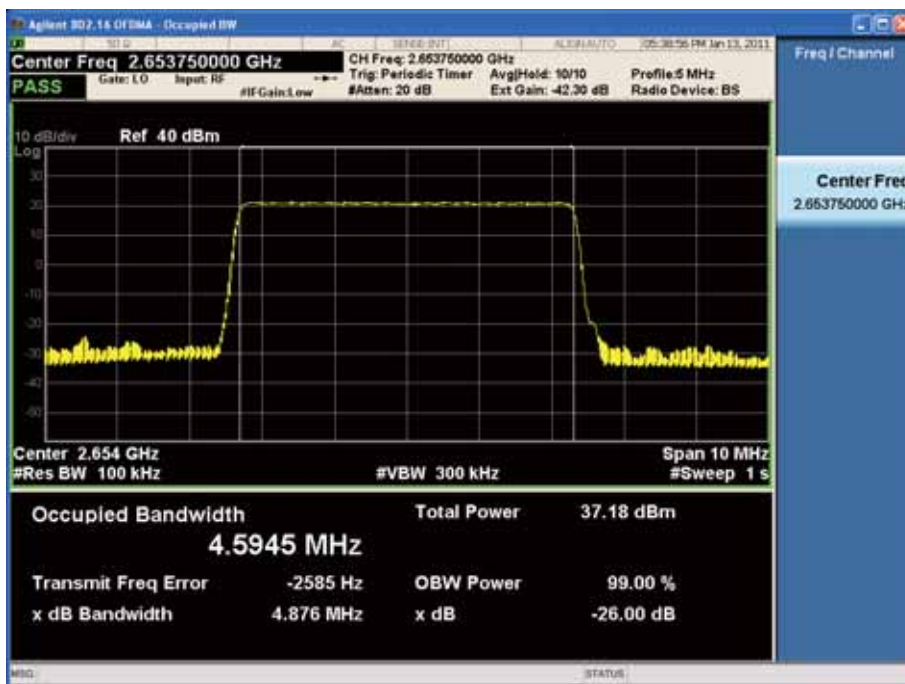


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 103 of 240

(64QAM Low Channel)

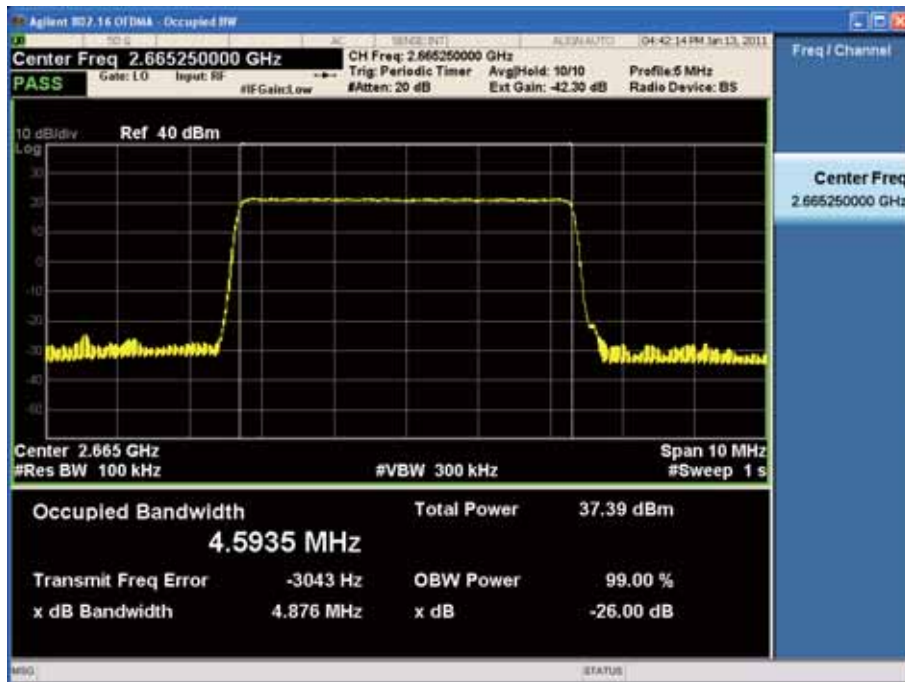


(64QAM Middle Channel)



FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 104 of 240

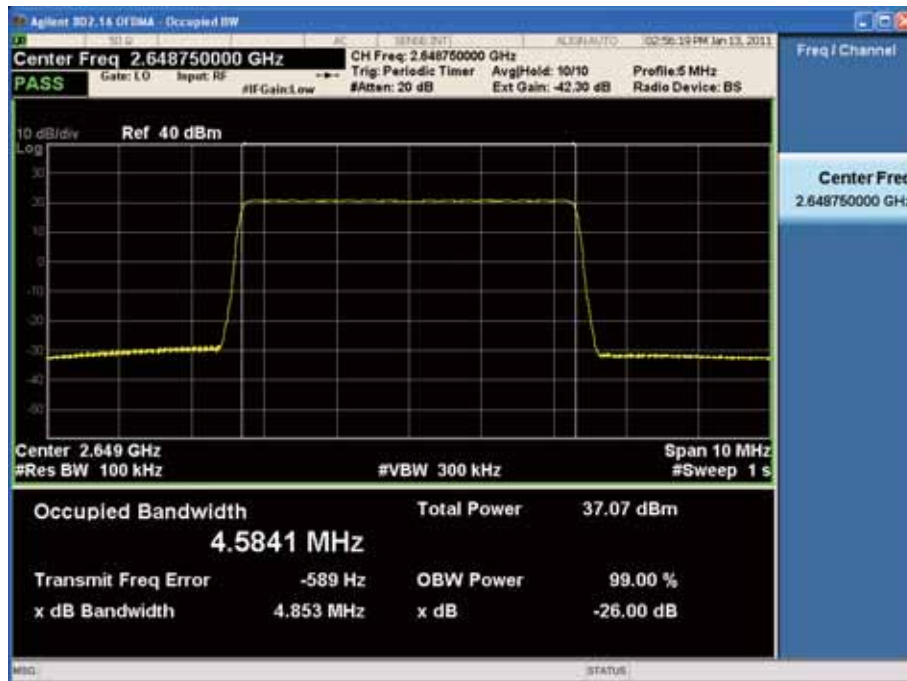
(64QAM High Channel)



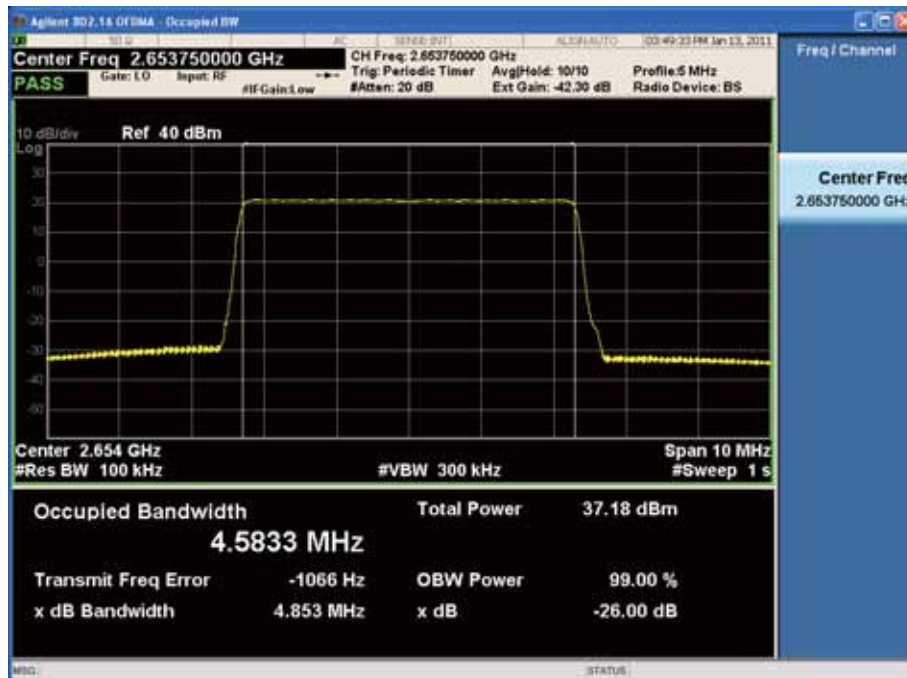
FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 105 of 240

6.4.17. Test Plot at Output Port Gamma 2

(QPSK Low Channel)

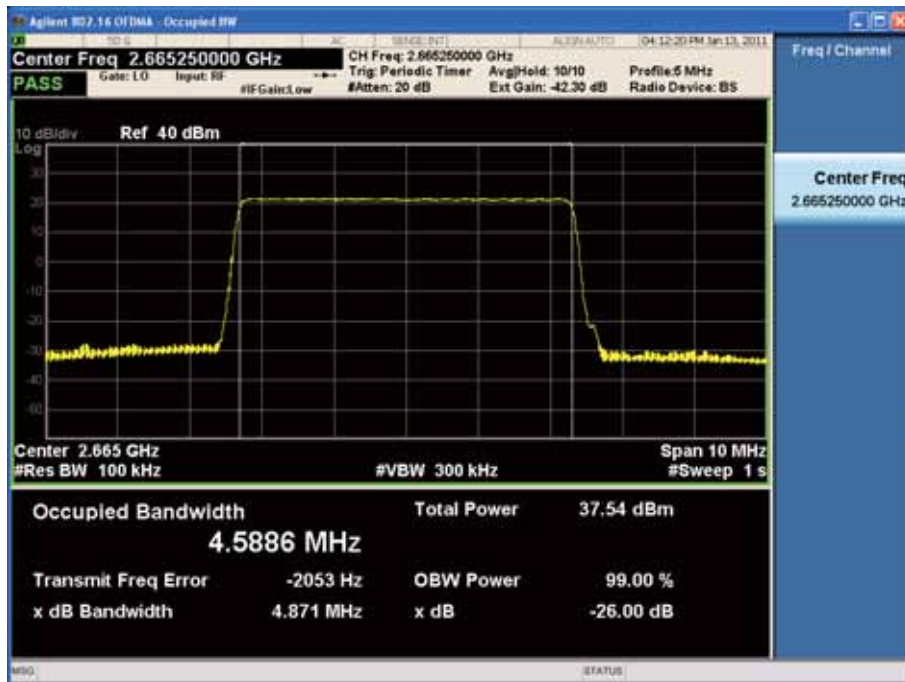


(QPSK Middle Channel)

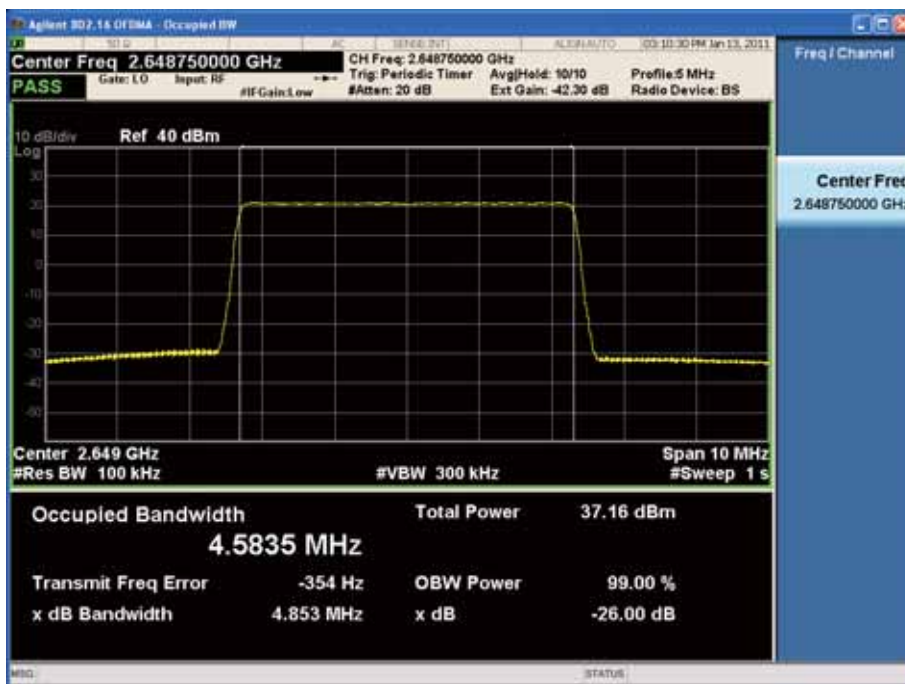


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 106 of 240

(QPSK High Channel)

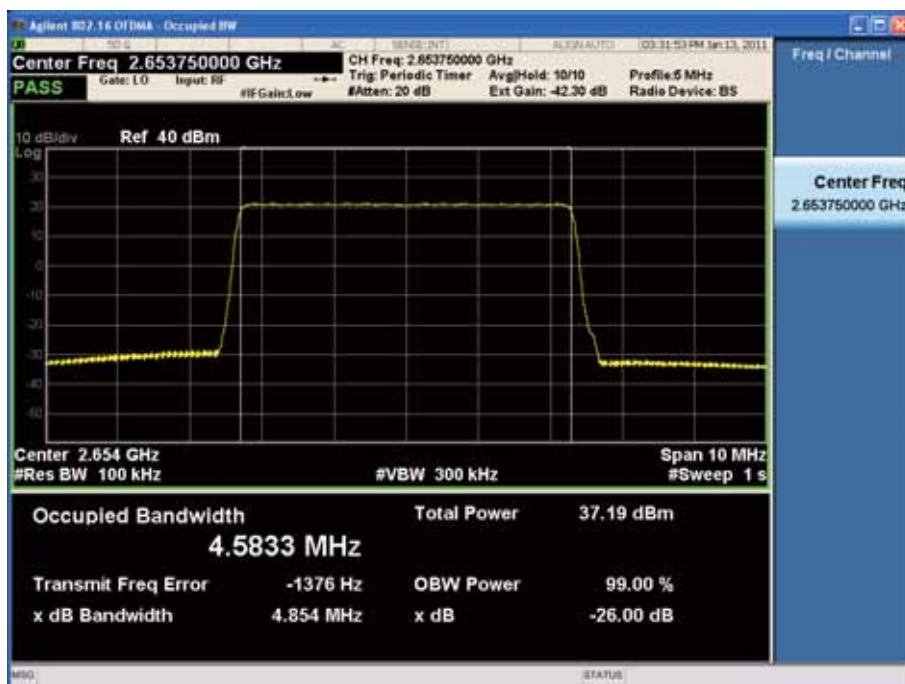


(16QAM Low Channel)

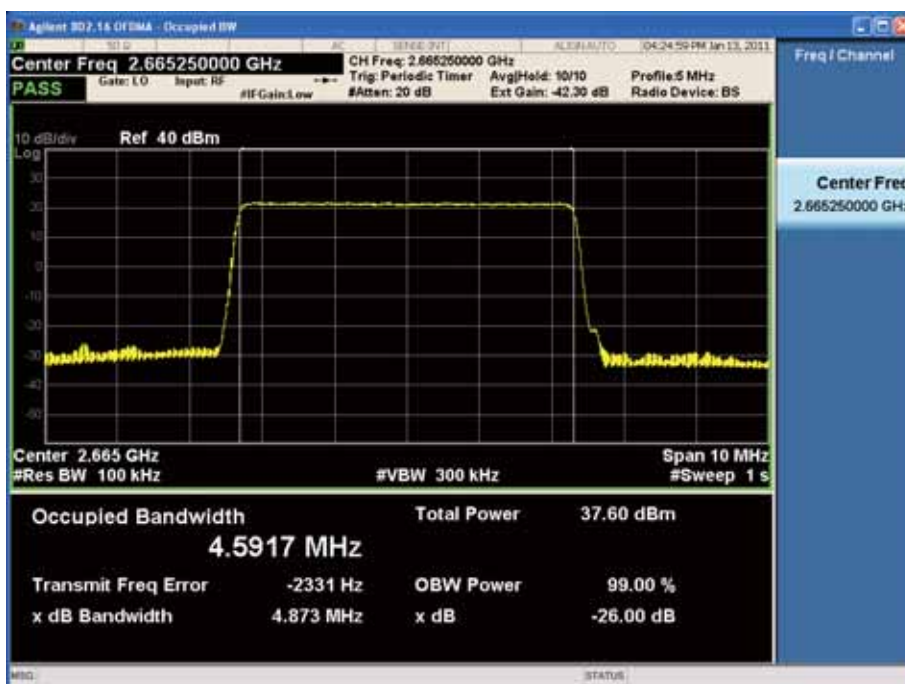


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 107 of 240

(16QAM Middle Channel)

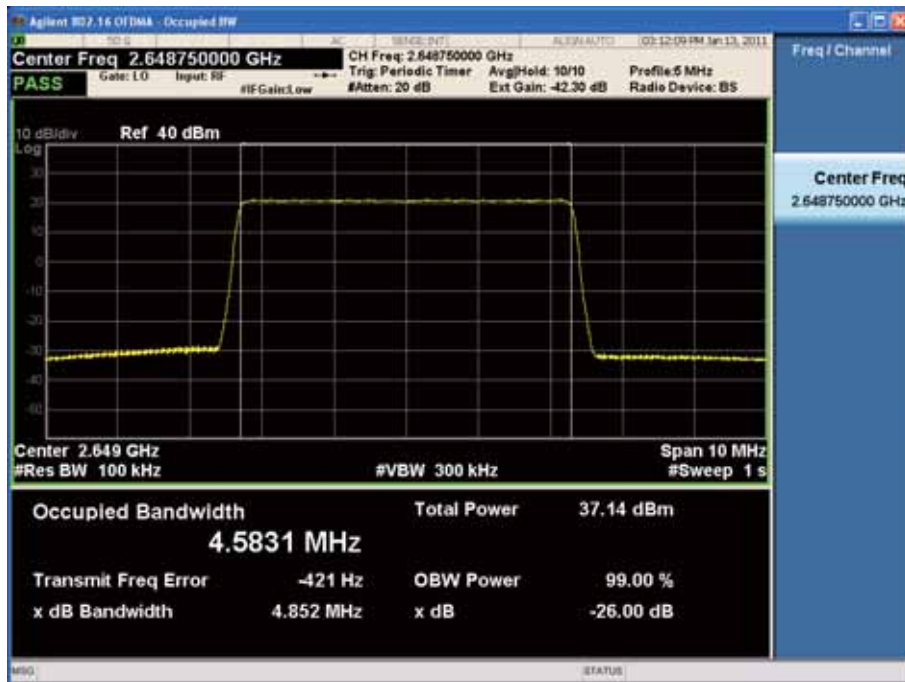


(16QAM High Channel)

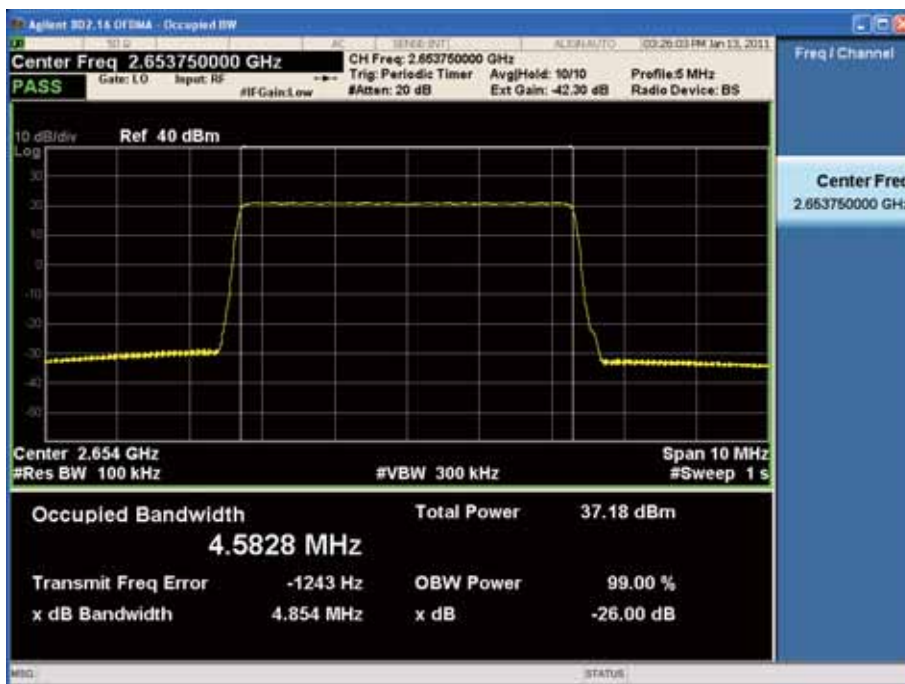


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 108 of 240

(64QAM Low Channel)

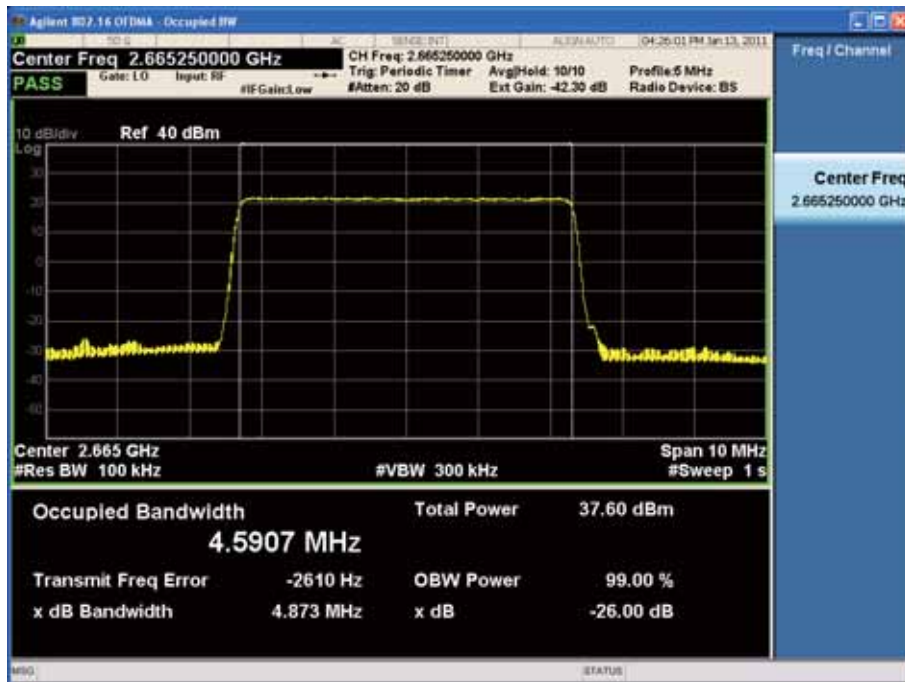


(64QAM Middle Channel)



FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 109 of 240

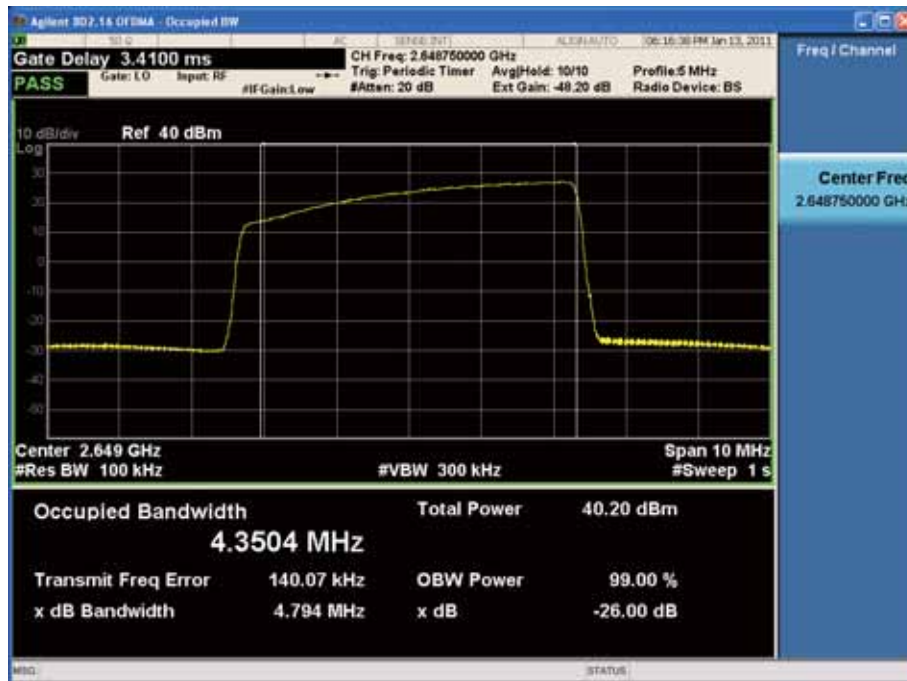
(64QAM High Channel)



FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 110 of 240

6.4.18. Combined Test Plot at Output Port

(QPSK Low Channel)

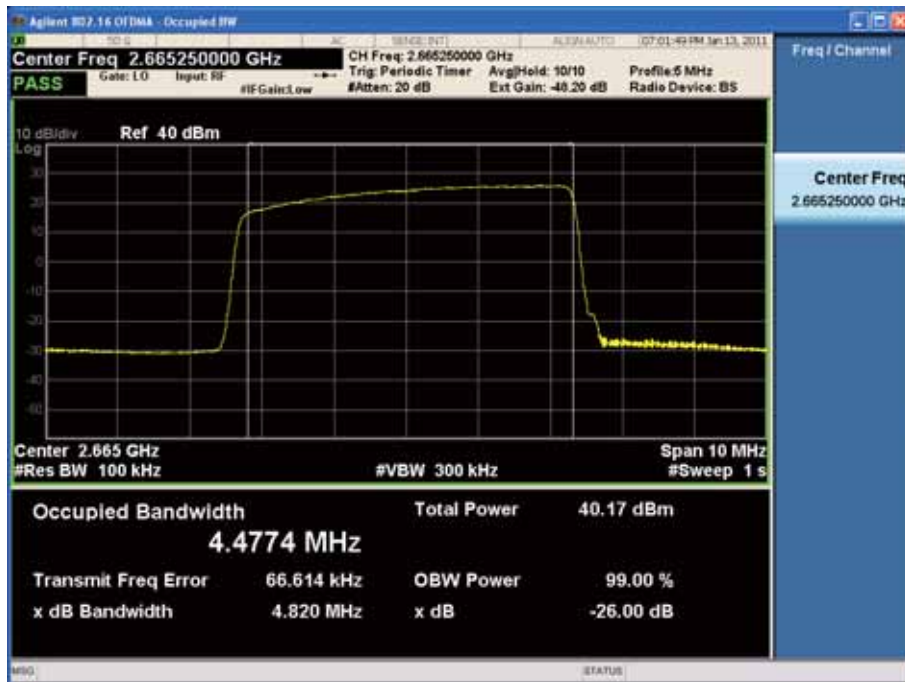


(QPSK Middle Channel)

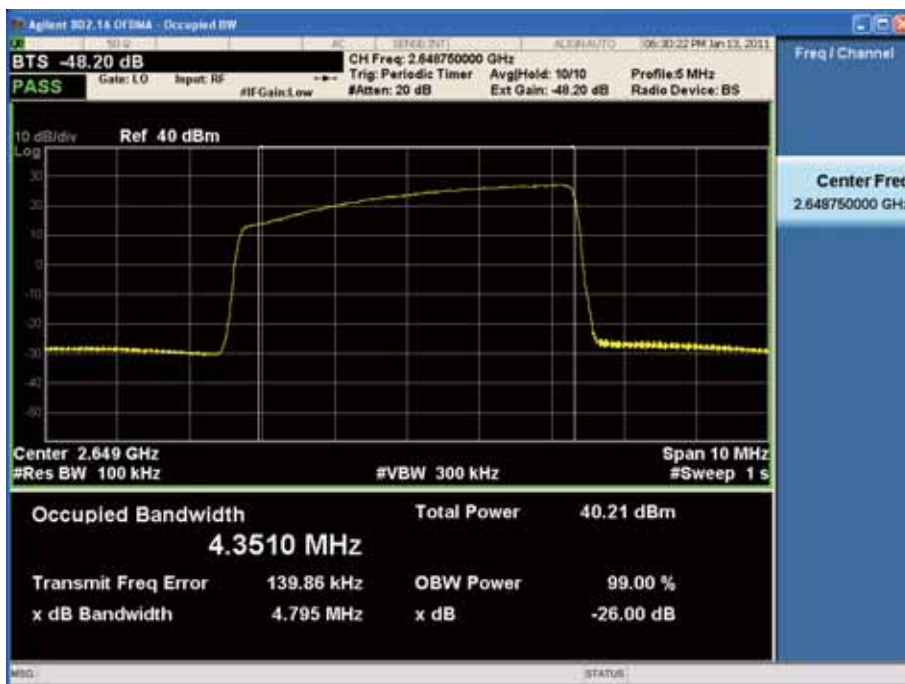


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 111 of 240

(QPSK High Channel)

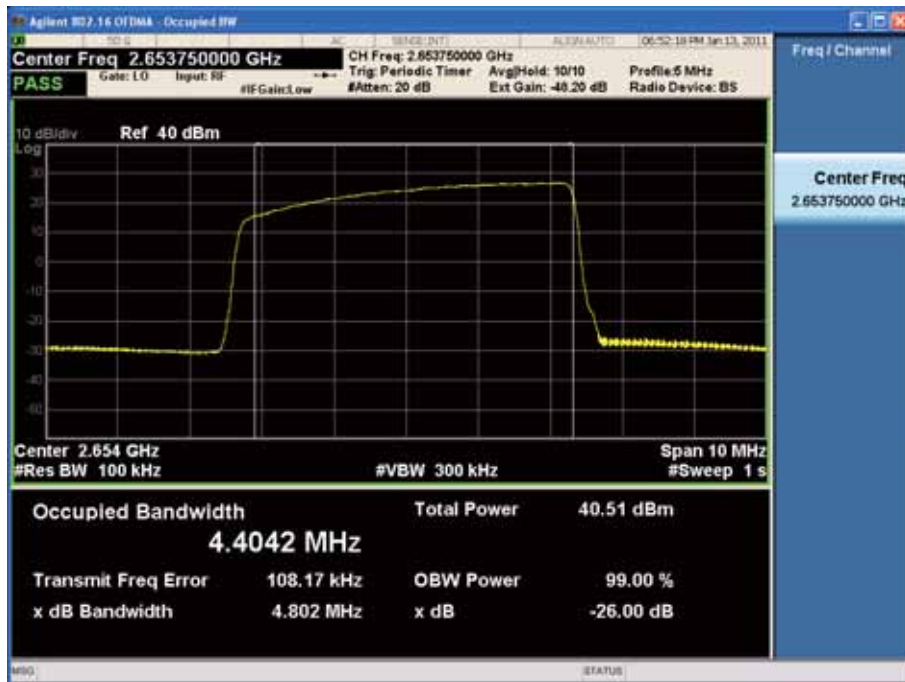


(16QAM Low Channel)

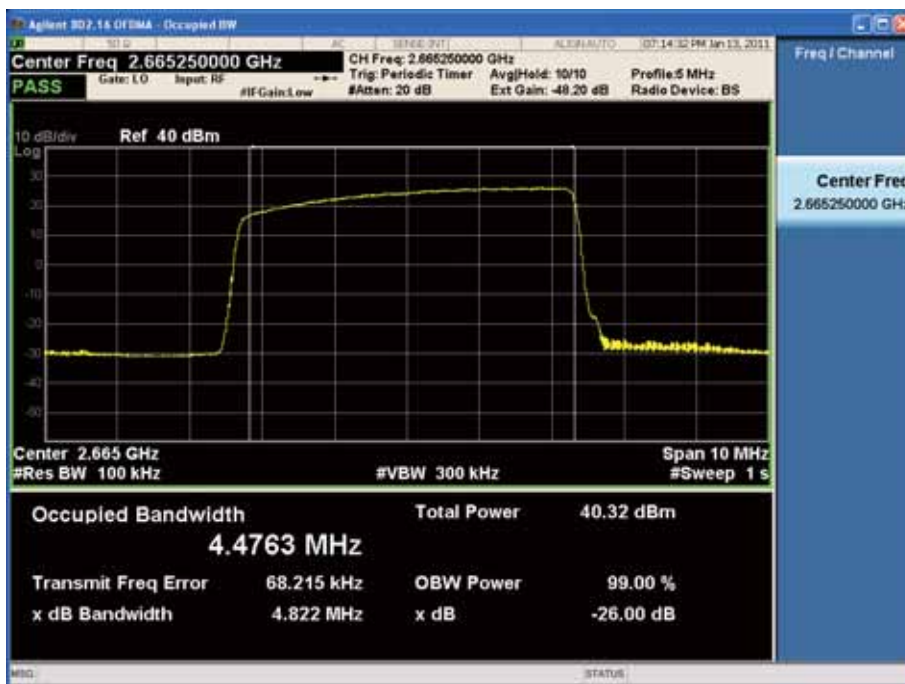


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 112 of 240

(16QAM Middle Channel)

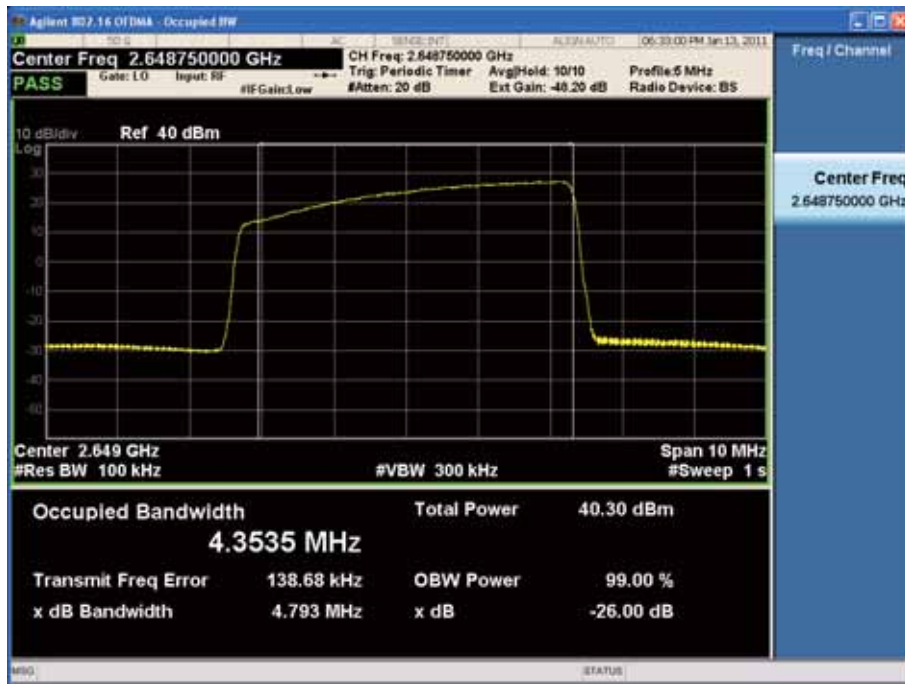


(16QAM High Channel)

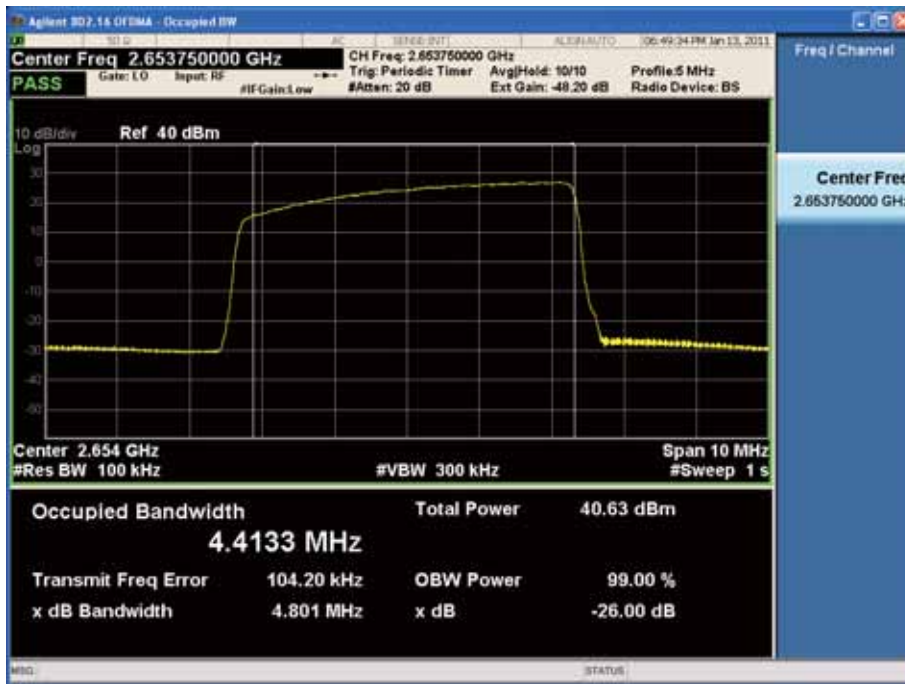


FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 113 of 240

(64QAM Low Channel)

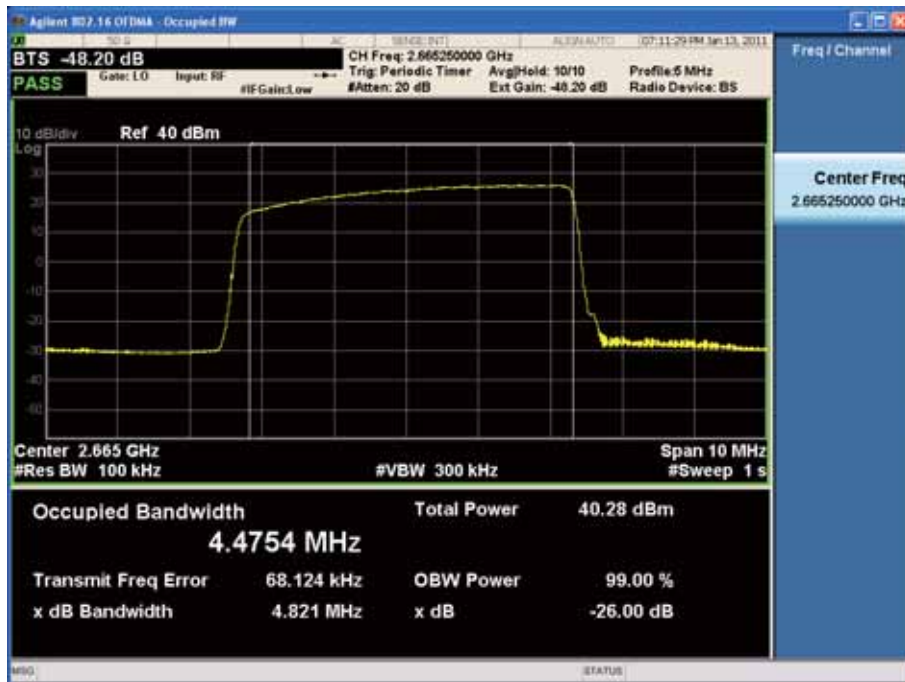


(64QAM Middle Channel)



FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 114 of 240

(64QAM High Channel)



FCC PT.27 TEST REPORT	FCC CERTIFICATION REPORT			HCT PT.27 TEST REPORT
Test Report No. HCTR1101FR19	Date of Issue: January 26, 2011	EUT Type: Mobile WiMAX Indoor RAS	FCC ID: A3LSPI-2210012502	Page 115 of 240