EMC TEST REPORT	
TEST REPORT NUMBER	DBN 1604TEL544-A
TEST REPORT DATE	10-Jun-2016
TEST REPORT VERSION	1.0
MANUFACTURER	Cambium Networks
PRODUCT NAME	ePMP2000
PRODUCT MODEL	C050900P031A
CONDITION OF EUT WHEN RECEIVED	GOOD and in proper working condition
ISSUED TO	Cambium Networks, 3800 Golf Road, Suite 360, Rolling Meadows, IL, USA 60008
ISSUED BY	**TARANG Lab** Wipro Technologies, SJP2, Survey#70,77,78/8A, Dodda Kanelli, Sarjapur road, Bangalore. Karnataka. India - 560 035 Tel: +91-80-30292929 Fax: +91-80-30298200 Email: tarang.planet@wipro.com Web: www.wipro.com

AMENDMENT HISTORY

Amendment Number	Amendment Date	Author of Amendment	Previous Report Version	Previous Report Date
Amendment Details				

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1 TEST REPORT SUMMARY

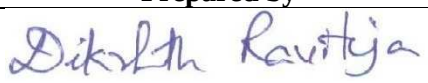
Applicant	Cambium Networks
Manufacturer	Cambium Networks
Product Name	ePMP2000
Product Model	C050900P031A
Product Serial Number	000456D18469
Date of Test	22nd Jan 2016 to 30th Mar 2016
Venue of Test	Tarang Lab

Applicable Standard	Description	Results
47 CFR Part 15 Feb 2016	Duty cycle and Transmission Duration	NA
	§15.407 (a) (1)- 26 dB Bandwidth measurement	NA
	§15.407 (a) (1)- Maximum Conducted Output Power	PASS
	§15.407 (a) (1)- Power Spectral Density	PASS
	§15.407 b (1) –Transmitter unwanted emission (Conducted)	PASS
	§15.407 b(1)- Band Edge Emissions	PASS
	99% Occupied Channel Bandwidth	NA

ePMP2000 was tested by Tarang Lab as per the standards that are listed in the table above. Based on the observations during the test and interpretations by Tarang lab, results have been indicated. The test results produced in this report shall apply only to the above sample that has been tested under the specific conditions and modes of testing as described in the report. Other similar equipment may not necessarily reproduce same result due to production tolerances and measurement uncertainties. Any measurement uncertainties listed in this report are for information purpose only.

The results shall stand invalid, in case there are any modifications / additions / removals to the hardware or software or end use atmosphere to the product tested. This report shall not be modified or in any way revised unless it is expressly permitted and endorsed by Tarang lab, through a duly authorized representative. Particulars on Manufacturer / Supplier / Product configuration / performance criteria, given in this report, are based on the information given by the customer, along with test request. Tarang does not assume any responsibility for the correctness of such information for the above mentioned equipment under test.

Customer acknowledges that this is a test report and not a certificate to gain market access for the product. To gain market access, Customer needs appropriate clearance from the Government or authorized agency for the target market. For markets that allow self-declaration, customer needs to follow the procedure defined by the target market.

Prepared by	Reviewed by	Approved by
		
Dikshit Raviteja	Narendra M	Satheesh I
EMI/EMC Test Engineer	**Lead EMI/EMC Test Engineer**	**Technical Manager**

2 GENERAL INFORMATION

2.1 ACCREDITATION DETAILS

Following are the accreditation and listing details for Tarang.

Accreditation / Listing body	Registration / Company / Certificate Number
NABL, India	Certificate No: T-1533, T-1534 http://www.nabl-india.org/
FCC (Federal Communications Commission)	Registration Number: 799247 http://www.fcc.gov/
IC (Industry Canada)	Company Number: 9023A-1 http://www.ic.gc.ca

2.2 MEASUREMENT UNCERTAINTY

NA

3 INSTRUMENTATION AND CALIBRATION

3.1 TEST AND MEASURING EQUIPMENT

The list of following measuring equipment used for this testing conforms to the applicable standards. Performance of all test and measuring equipment including any accessories are checked periodically to ensure accuracy.

3.2 EQUIPMENTS USED

Name of Equipment	Manufacturer	Model No	Serial No	Calibration Due
Spectrum Analyzer	Keysight Technologies	N9020A	MY54420183	31st Mar 2016
X series USB Peak and Average Power sensor	Keysight Technologies	U2021XA	MY55050001	31st Mar 2016
X series USB Peak and Average Power sensor	Keysight Technologies	U2021XA	MY54390014	31st Mar 2016
EMI Test Receiver	R&S	ESIB40	100306	21st Jan 2017

Table 1: List of Equipment used for Conducted RF Test

4 PRODUCT INFORMATION

4.1 DESCRIPTION OF THE PRODUCT

EUT is a point to point & point to multipoint fixed outdoor Transceiver with the following defined channels.

40 MHz channel for 17 dBi and 6 dBi antenna	**5 MHz channel for 17 dBi and 6 dBi antenna**
Low – 5180 MHz	Low – 5155 MHz
Mid - 5200 MHz	Mid – 5200 MHz
High - 5220 MHz	High – 5245 MHz

Product	ePMP2000
Model Number	C050900P031A
Serial Number	000456D18469
Product Category / Type of Equipment	ITE
EUT Operating Voltage	120 V AC
EUT Operating frequency range	60 Hz
Max EUT Operating Current	<1 A

Table 2: EUT details

Cable No.	**Cable Name**	**Cable Length**	**Power / Interconnection cable**	**Shielded / Unshielded**
Cable - 1	Power cable	0.8 meter	Power	Unshielded
Cable - 2	Ethernet Cable	1.5 meter	Interconnection	Unshielded
Cable - 3	Ethernet Cable	3.0 meter	Interconnection	Unshielded

Table 3: List of cables

4.2 SOFTWARE AND FIRMWARE DETAILS

Atheros Radio Test 2 (ART2-GUI) Version 2.3

5 TEST DETAILS

5.1 PRODUCT AND TEST SETUP

5.1.1 PRODUCT CONFIGURATION

The EUT was powered through AC power supply (120 V AC / 60 Hz). The EUT was connected to Ethernet switch by using RJ45 cable. Figure 1 shows the product configuration during the tests. POE module was used during the test to power ON the EUT.

The 5.1 GHz ePMP Integrated Radio was configured with test software and configured to have the following settings during the course of testing:

- 40 MHz modulation bandwidth for low, mid & high channels
    - Rate - HT40,
    - 54 Mbps OFDM, MCS15 / 270 Mbps
    - Tx Power is 11 dBm Tx99 for 17 dBi antenna configuration-Low channel
    - Tx Power is 18 dBm Tx100 for 17 dBi antenna configuration-Mid channel
    - Tx Power is 11 dBm Tx99 for 17 dBi antenna configuration-High channel
    - Tx Power is 20 dBm Tx99 for 6 dBi antenna configuration-Low channel
    - Tx Power is 17.5 dBm Tx100 for 6 dBi antenna configuration-Mid channel
    - Tx Power is 22.5 dBm Tx100 for 6 dBi antenna configuration-High channel

- 5 MHz modulation bandwidth for low, mid & high channels
    - Rate – Legacy,
    - 54 Mbps OFDM, MCS15 / 130 Mbps
    - Tx Power is 12.5 dBm Tx99 for 17 dBi antenna configuration-Low channel
    - Tx Power is 14 dBm Tx99 for 17 dBi antenna configuration-Mid channel
    - Tx Power is 11.5 dBm Tx99 for 17 dBi antenna configuration-High channel
    - Tx Power is 22 dBm Tx99 for 6 dBi antenna configuration-Low channel
    - Tx Power is 24 dBm Tx99 for 6 dBi antenna configuration-Mid channel
    - Tx Power is 22 dBm Tx99 for 6 dBi antenna configuration-High channel

The unit was continuously monitored for transmission using an auxiliary antenna during the radiated tests.

5.1.2 TEST SETUP DETAILS

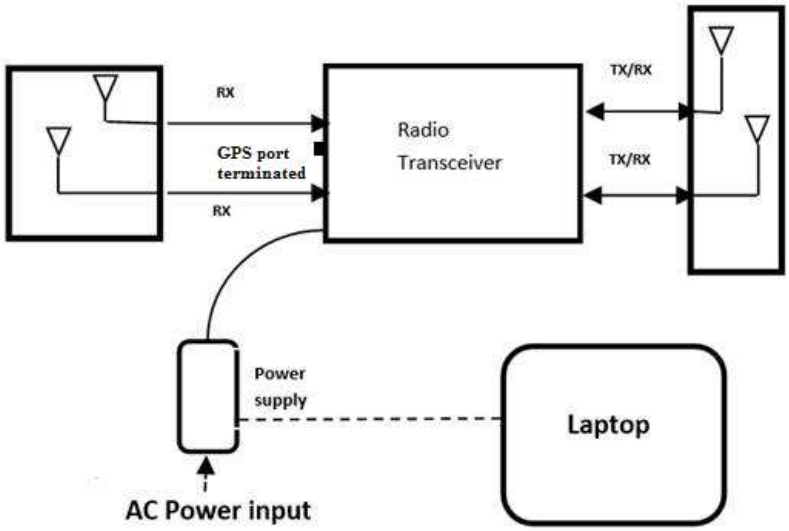


Figure 1: Block diagram of the EUT test setup

5.1.3 ACCESSORIES

Name of the Equipment	Manufacturer	Model Number	Serial Number
17 dBi Antenna Beam steer- Rx	Cambium Networks	C050900D020A	NA
17 dBi Antenna sector- Tx	Cambium Networks	C050900D021A	NA
Power Supply	Cambium Networks	NET P30 56	031-326-6719
6 dBi Antenna	Cambium Networks	C005095D360A	NA
Switching Power Supply Gigabit Compatible	Cambium Networks	NET-P30-56	N000000L034A

5.2 APPLICABLE TESTS

Applicable Standard	Description	Test level / Test Voltage	Applicability
47 CFR Part 15, Feb 2016	Duty Cycle and transmission duration	NA	Antenna port
	26 dB Bandwidth measurement	NA	Antenna port
	Maximum Conducted Output Power	≤ 1 Watts	Antenna port
	Power Spectral Density	Power spectral density should be ≤ 17 dBm in 1 MHz bandwidth	Antenna port
	Transmitter Unwanted emission (Conducted)	9 kHz to 40 GHz	Antenna port
	Band Edge Emissions	≤ -27 dBm in any 1MHz band Limit,(for 6 dBi antenna configuration) : ≤ -36 dBm/MHz Limit (for 17 dBi antenna configuration) : ≤ 47 dBm/MHz	Antenna port
	99% Occupied Channel Bandwidth	NA	Antenna port

5.3 TEST RESULT

5.3.1 DUTY CYCLE (X) AND TRANSMISSION DURATION (T)

5.3.1.1 TEST SPECIFICATION

Test Standard	47 CFR, Part 15 Feb 2016
Test Procedure	789033 D2 General U-NII Test Procedures New Rule V01r01
Resolution Bandwidth	3 MHz
Video Bandwidth	50 MHz
Sweep Time	Auto
Attenuation	Auto
Test Mode	Conducted
Detector	RMS
Input Voltage	120 V AC
Input Frequency	60 Hz
Temperature	21.0 °C
Humidity	54.0 %
Tested By	Nishanth
Test Date	8th Feb 2016

5.3.1.2 LIMITS

Standard	Reference section	Frequency range	Limit
47 CFR, Part 15,Feb 2016	NA	5150 MHz to 5250 MHz	NA

5.3.1.3 TEST SETUP

Figure 2: Typical test setup for Conducted RF Test

5.3.1.4 TEST PROCEDURE

The Conducted test was performed using the Spectrum analyzer. Measurements were done as per section II B of **"789033 D2 General U-NII Test Procedures New Rule V01r01".** The RF output of the EUT was connected to the input port of Spectrum analyzer using an attenuator. The graph and data captured from spectrum analyzer and recorded.

5.3.1.5 MEASUREMENT GRAPHS / DATA

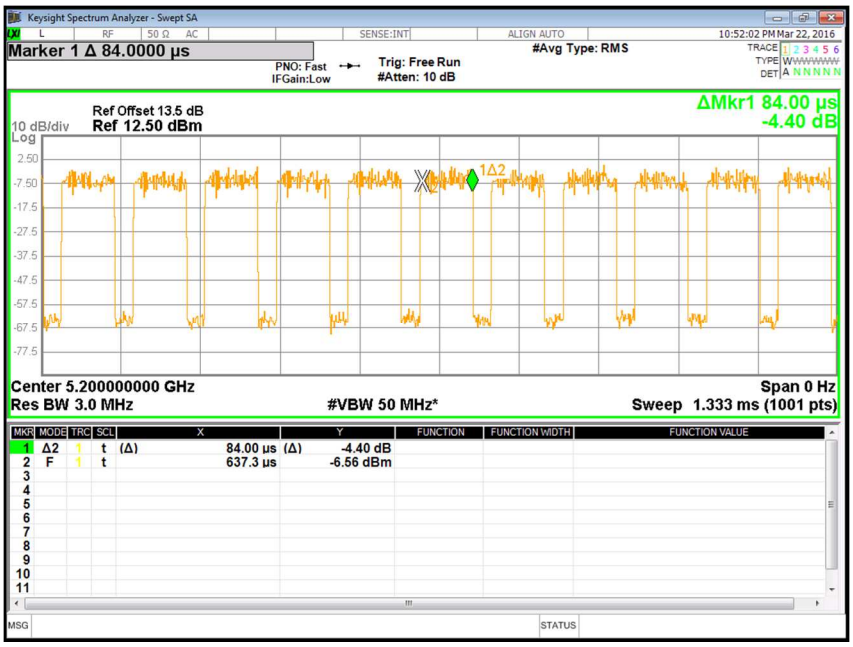


Figure 3: Measured ON time

Figure 4: Measured Transmission Period (T)

5.3.1.6 RESULT

The Duty cycle and Transmission duration data were recorded.

Mode	ON time (µsec)	T (µsec)	Duty Cycle X (Linear)	Duty Cycle (%)	50/T Minimum RBW and VBW (kHz)
Tx ON	84	114.7	0.732	73.2%	435.92

*Note: Duty cycle = (ON time / Period)*100*

5.3.2 26 DB BANDWIDTH MEASUREMENT

5.3.2.1 TEST SPECIFICATION

Test Standard	47 CFR Part 15 Feb 2016
Test Procedure	789033 D2 General U-NII Test Procedures New Rule V01r01
Resolution Bandwidth	30 kHz, 300 kHz
Video Bandwidth	100 kHz, 1 MHz
Sweep Time	Auto
Attenuation	Auto
Test Mode	Conducted
Detector	Peak
Input Voltage	120 V AC
Input Frequency	60 Hz
Temperature	24.0 °C
Humidity	55.0 %
Tested By	Nishanth / Suresh GN
Test Date	8th Feb 2016

5.3.2.2 LIMITS

Standard	Reference section	Frequency range	Limit
47 CFR, Part 15, Feb 2016	§15.407 (a) (1)	5150 MHz to 5250 MHz	NA

5.3.2.3 TEST SETUP

Figure 5: Typical test setup for Conducted RF Test

5.3.2.4 TEST PROCEDURE

The Conducted test was performed using the Spectrum analyzer. Measurements were done as per the **"789033 D2 General U-NII Test Procedures New Rule V01r01".** The RF output of the EUT was connected to the input port of Spectrum analyzer using an attenuator. The graph and data captured from spectrum analyzer and recorded.

5.3.2.5 MEASUREMENT GRAPHS / DATA

5.3.2.5.1 40 MHz MODULATION BANDWIDTH, 17 dBi ANTENNA, LOW CHANNEL - 5180 MHz

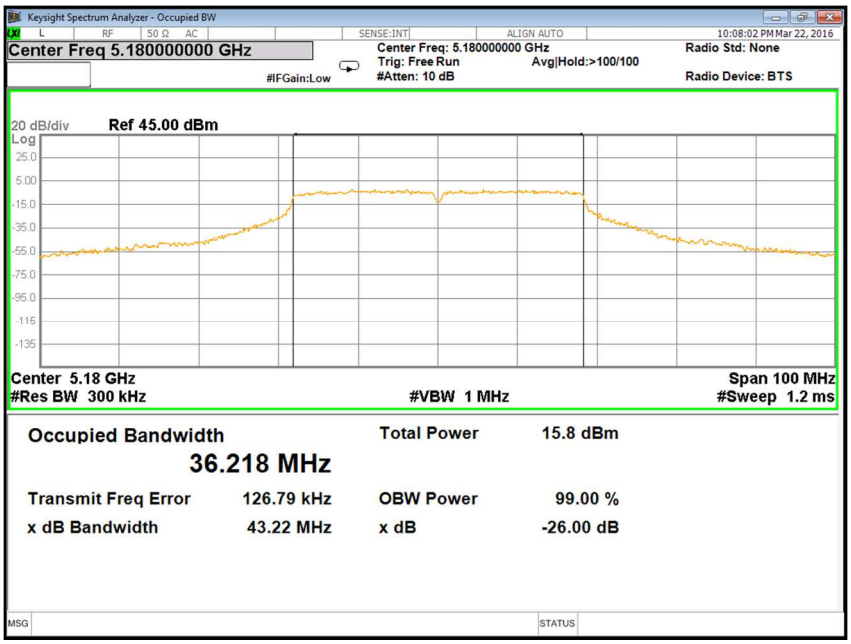


Figure 6: 40MHz, 17dBi, Low Channel: 26 dB Bandwidth: Measured at Ch.0

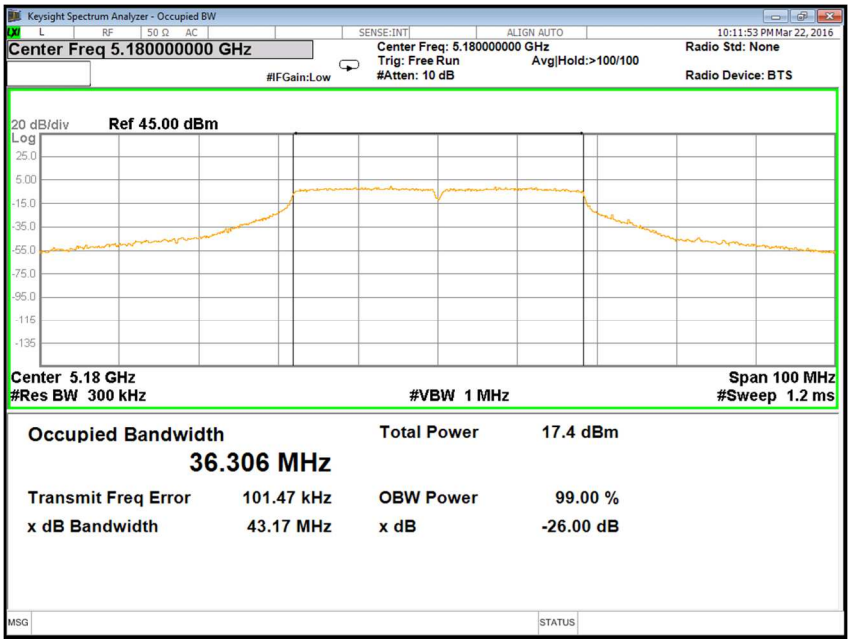


Figure 7: 40MHz, 17dBi, Low Channel: 26 dB Bandwidth: Measured at Ch.1

5.3.2.5.2 40 MHz Modulation Bandwidth, 17 dBi Antenna, Mid Channel - 5200 MHz

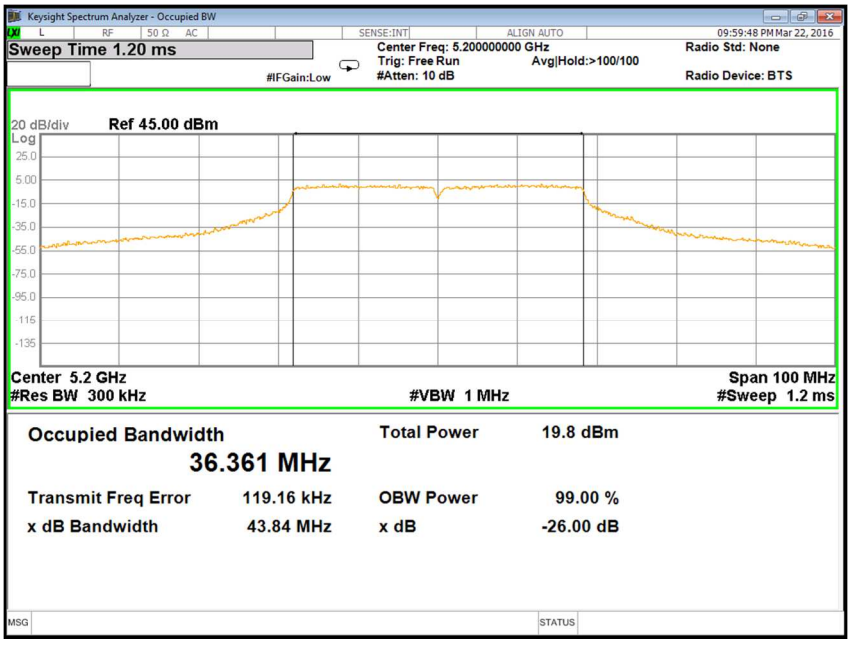


Figure 8: 40MHz, 17dBi, Mid Channel: 26 dB Bandwidth: Measured at Ch.0

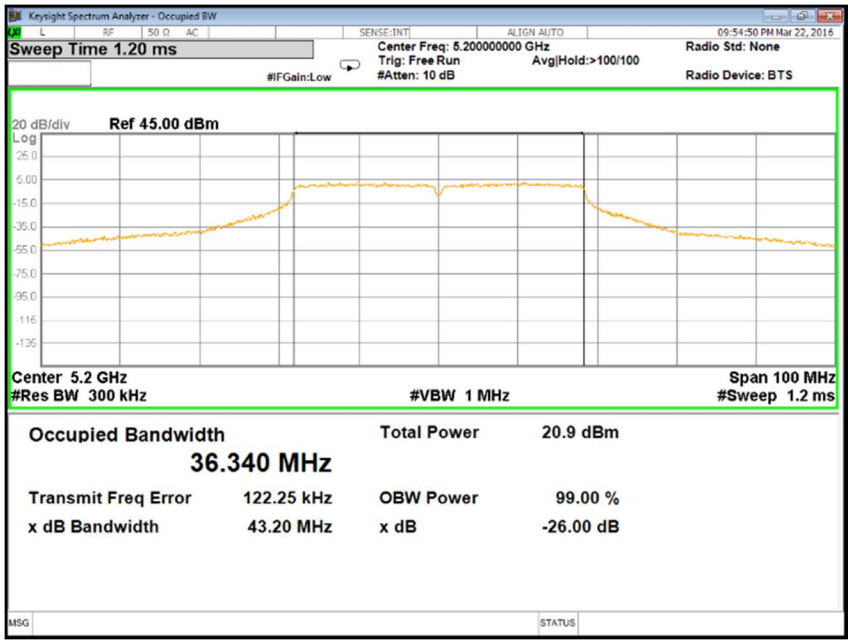


Figure 9: 40MHz, 17dBi, Mid Channel: 26 dB Bandwidth: Measured at Ch.1

5.3.2.5.3 40 MHZ MODULATION BANDWIDTH, 17 DBI ANTENNA, HIGH CHANNEL - 5220 MHZ

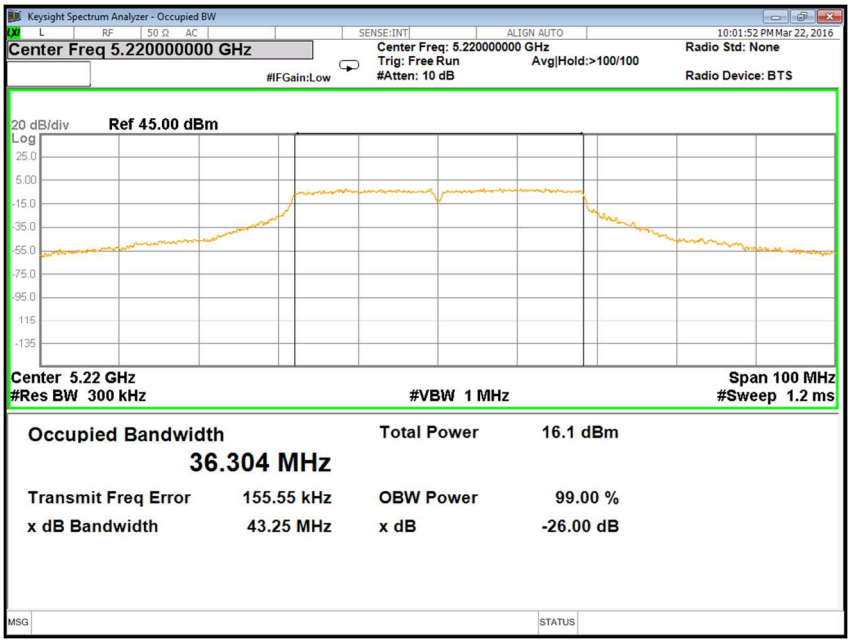


Figure 10: 40MHz, 17dBi, High Channel: 26 dB Bandwidth: Measured at Ch.0

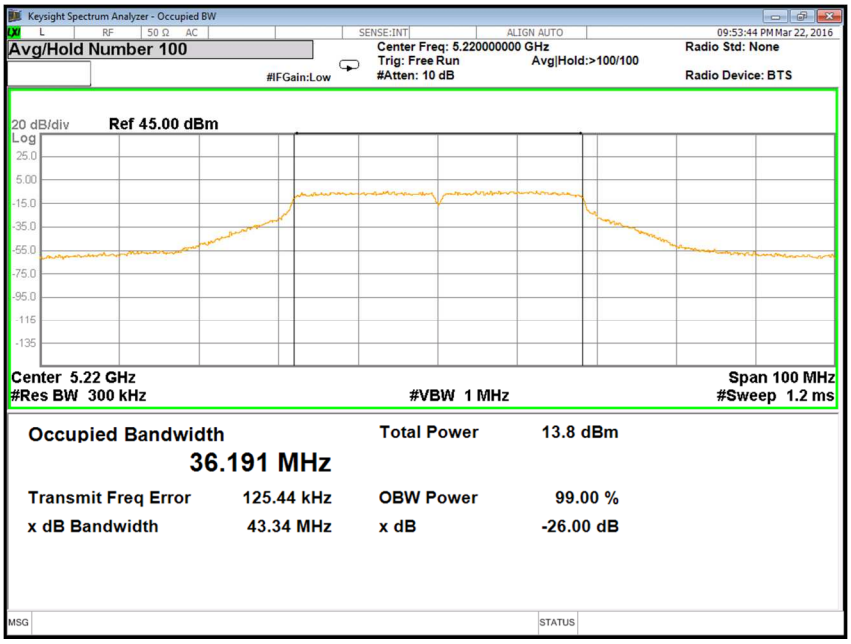


Figure 11: 40MHz, 17dBi, High Channel: 26 dB Bandwidth: Measured at Ch.1

5.3.2.5.4 40 MHZ MODULATION BANDWIDTH, 6 DBI POWER, LOW CHANNEL - 5180 MHZ

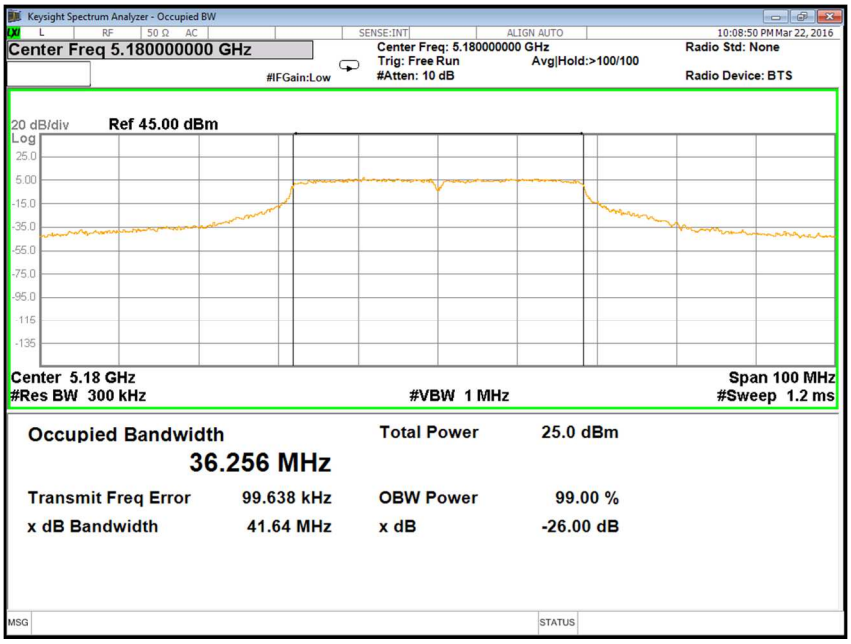


Figure 12: 40MHz, 6dBi, Low Channel: 26 dB Bandwidth: Measured at Ch.0

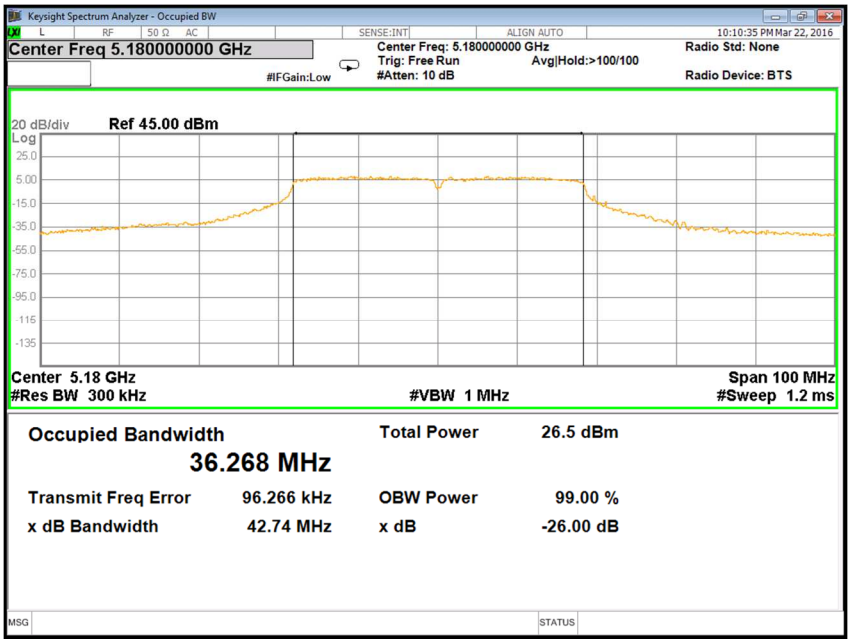


Figure 13: 40MHz, 6dBi, Low Channel: 26 dB Bandwidth: Measured at Ch.1

5.3.2.5.5 40 MHz Modulation Bandwidth, 6 dBi Power, Mid Channel - 5200 MHz

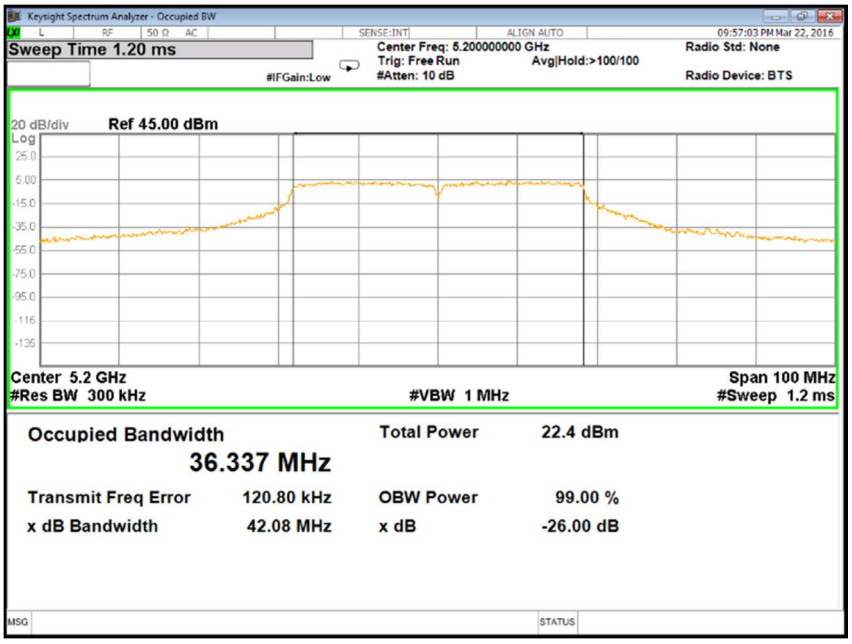
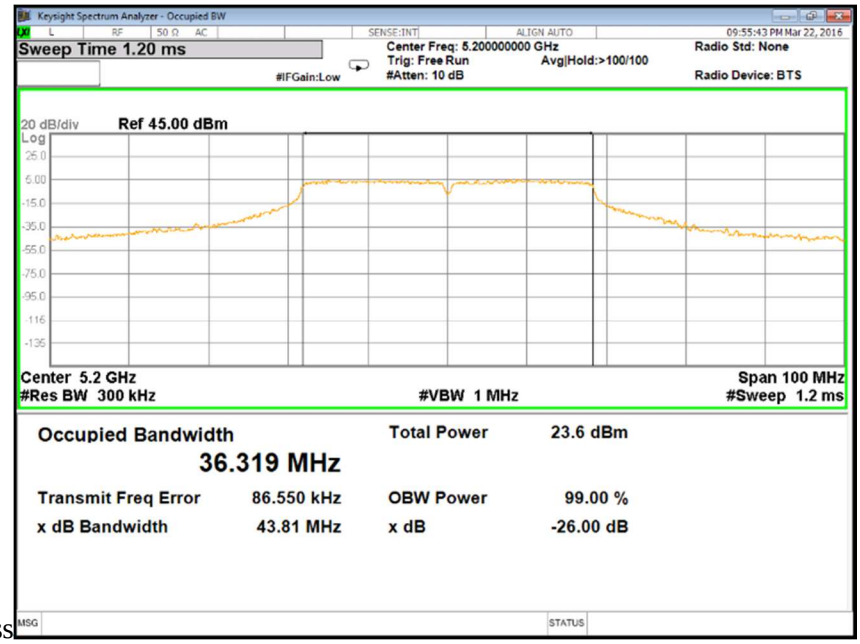


Figure 14: 40MHz, 6dBi, Mid Channel: 26 dB Bandwidth: Measured at Ch.0



SSSSS

Figure 15: 40MHz, 6dBi, Mid Channel: 26 dB Bandwidth: Measured at Ch.1

5.3.2.5.6 40 MHZ MODULATION BANDWIDTH, 6 DBI POWER, HIGH CHANNEL - 5220 MHZ

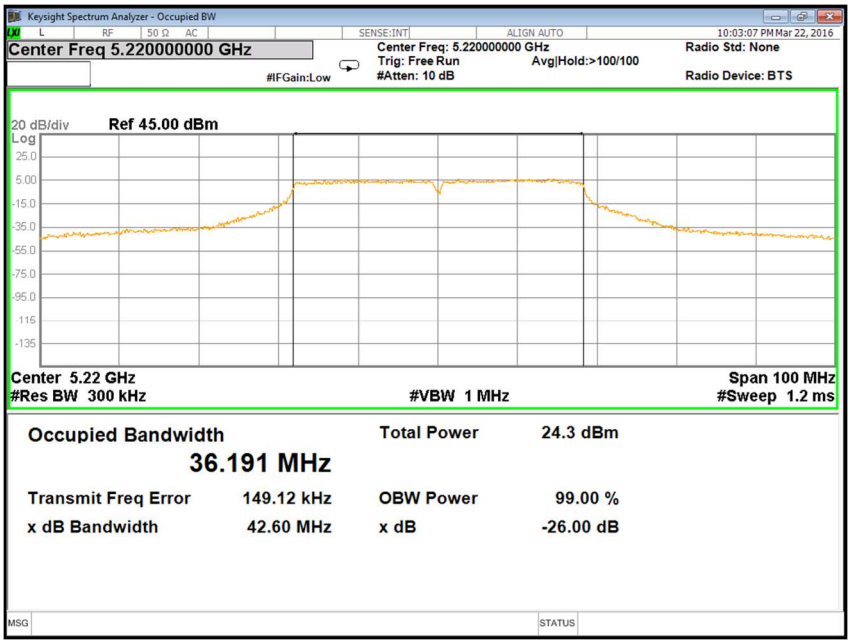


Figure 16: 40MHz, 6dBi, High Channel: 26 dB Bandwidth: Measured at Ch.0

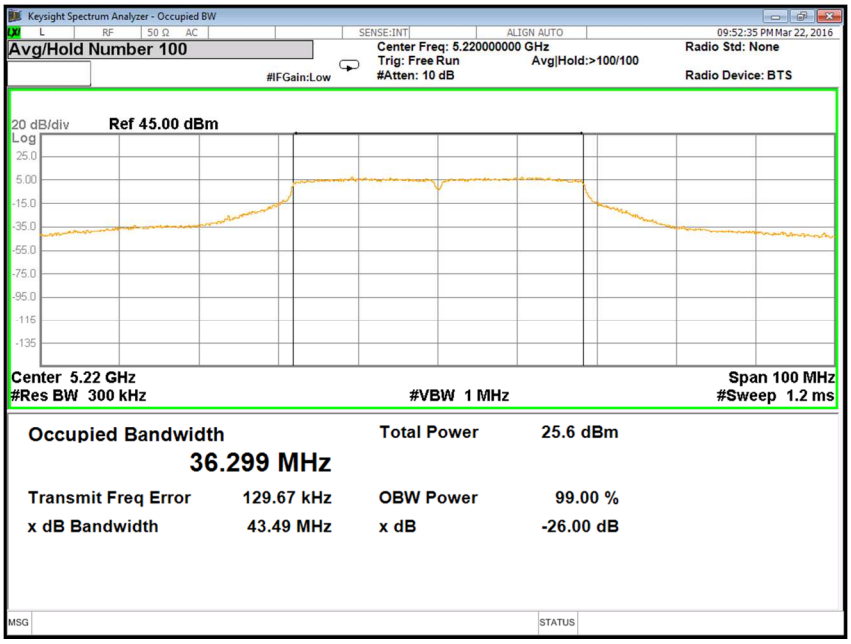


Figure 17: 40MHz, 6dBi, High Channel: 26 dB Bandwidth: Measured at Ch.1

5.3.2.5.7 5 MHz Modulation Bandwidth, 17 dBi Antenna, Low Channel - 5115 MHz

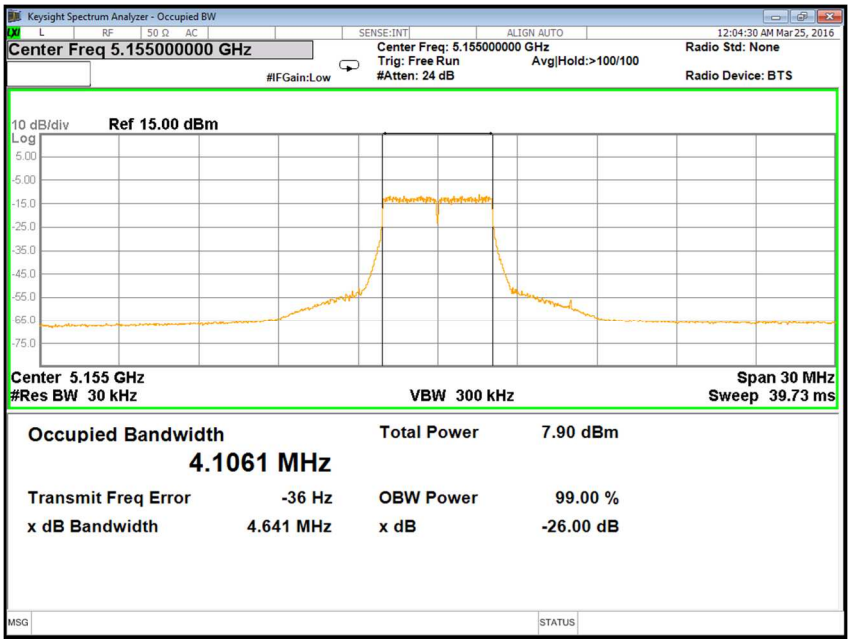


Figure 18: 5MHz, 17dBi, Low Channel: 26 dB Bandwidth: Measured at Ch.0

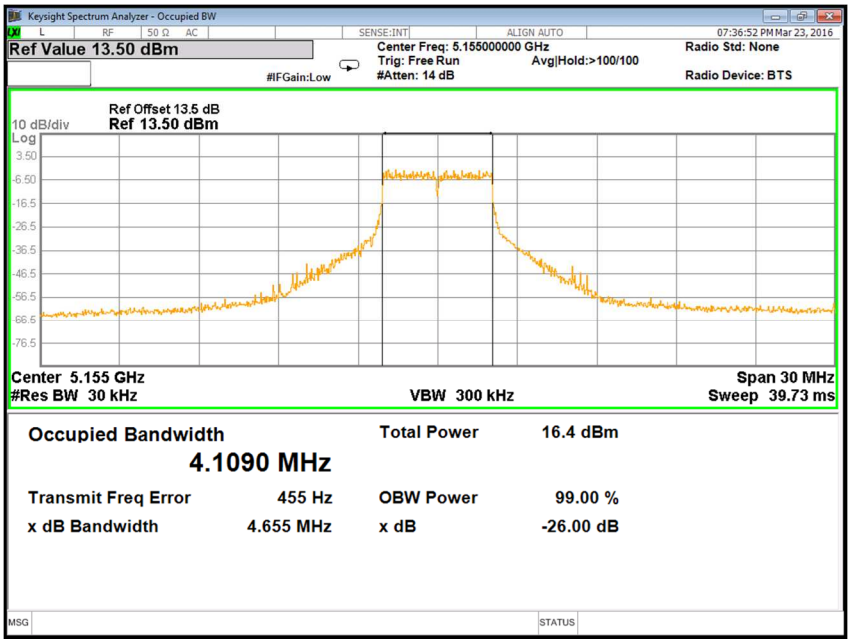


Figure 19: 5MHz, 17dBi, Low Channel: 26 dB Bandwidth: Measured at Ch.1

5.3.2.5.8 5 MHZ MODULATION BANDWIDTH, 17 DBI ANTENNA, MID CHANNEL - 5200 MHZ

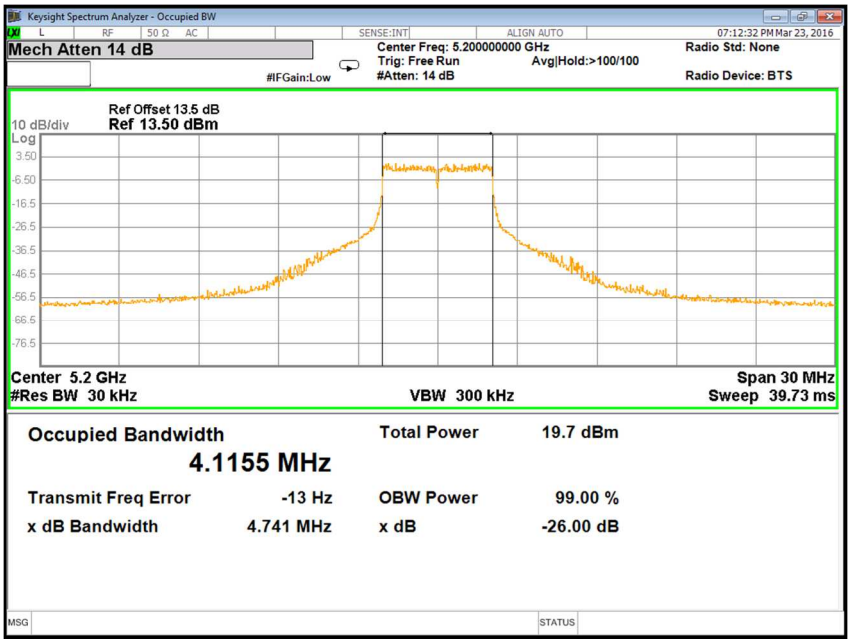


Figure 20: 5MHz, 17dBi, Mid Channel: 26 dB Bandwidth: Measured at Ch.0

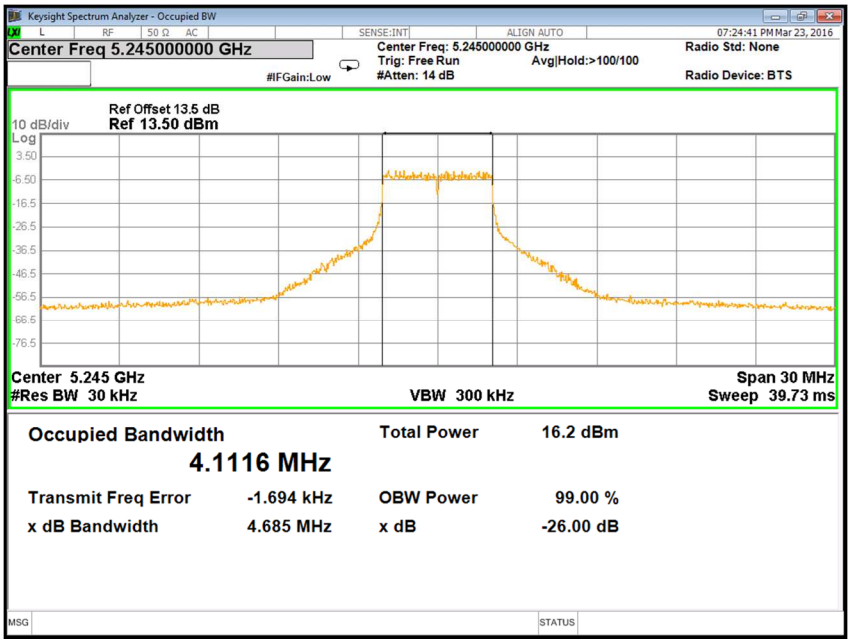


Figure 21: 5MHz, 17dBi, Mid Channel: 26 dB Bandwidth: Measured at Ch.1

5.3.2.5.9 5 MHz Modulation Bandwidth, 17 dBi Antenna, High Channel - 5245 MHz

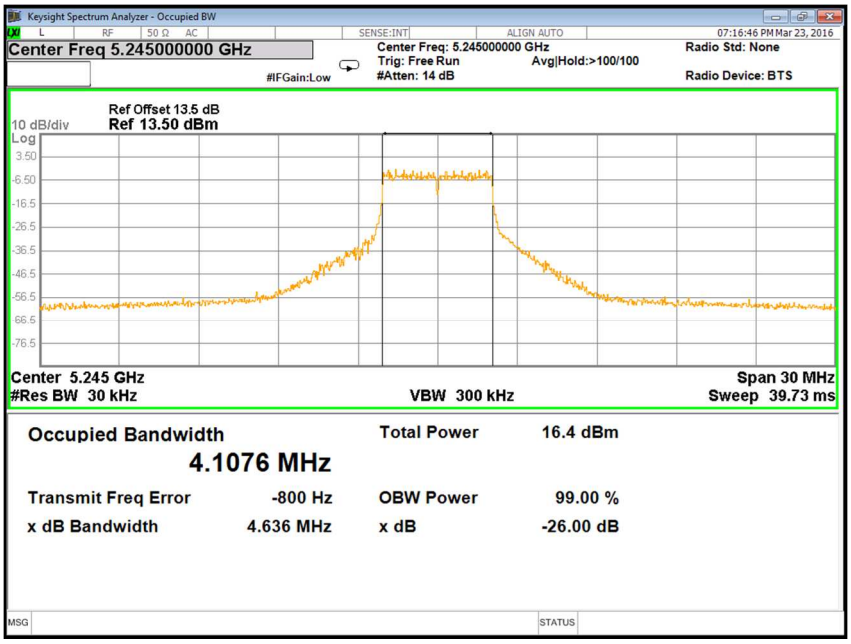


Figure 22: 5MHz, 17dBi, High Channel: 26 dB Bandwidth: Measured at Ch.0

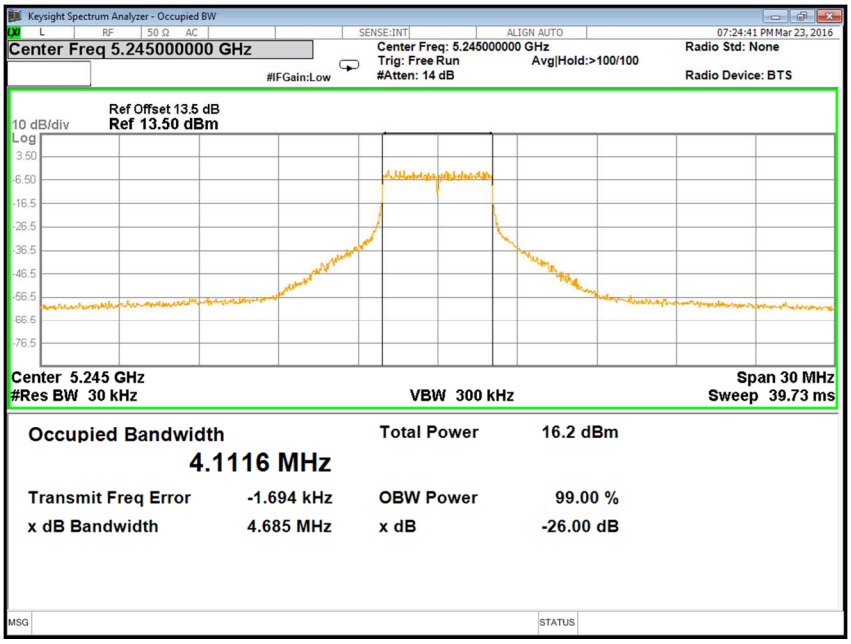


Figure 23: 5MHz, 17dBi, High Channel: 26 dB Bandwidth: Measured at Ch.1

5.3.2.5.10 5 MHz Modulation Bandwidth, 6 dBi Power, Low Channel - 5115 MHz

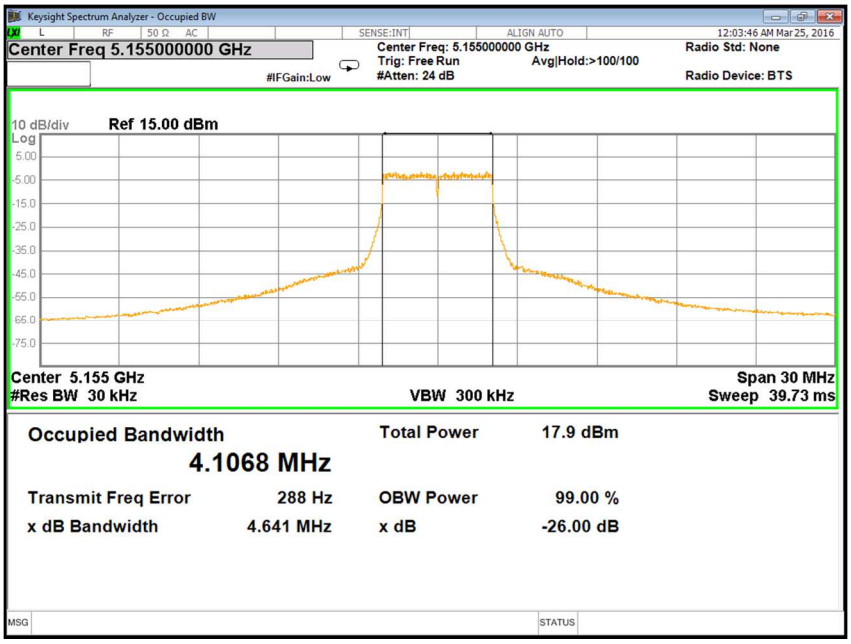


Figure 24: 5MHz, 6dBi, Low Channel: 26 dB Bandwidth: Measured at Ch.0

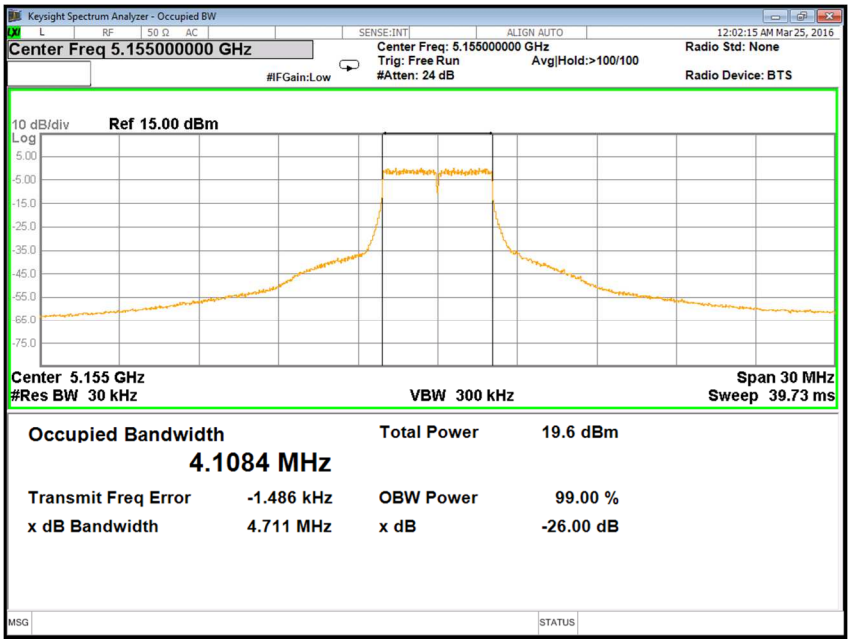


Figure 25: 5MHz, 6dBi, Low Channel: 26 dB Bandwidth: Measured at Ch.1

5.3.2.5.11 5 MHz Modulation Bandwidth, 6 dBi Power, Mid Channel - 5200 MHz

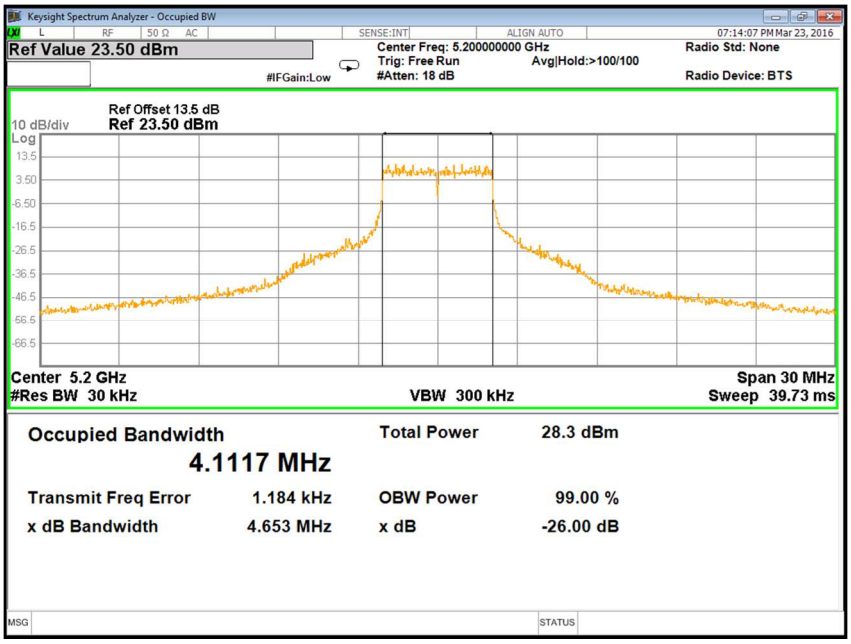


Figure 26: 5MHz, 6dBi, Mid Channel: 26 dB Bandwidth: Measured at Ch.0

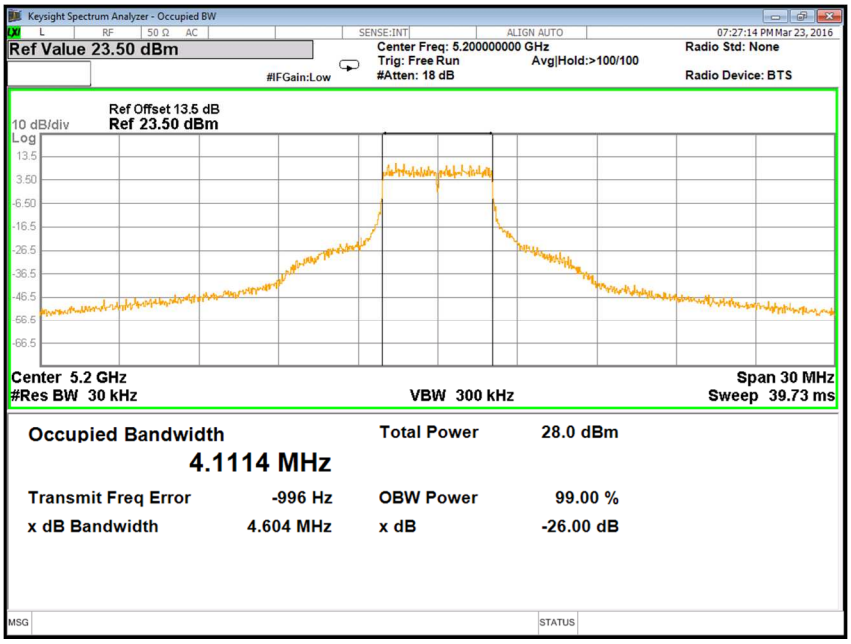


Figure 27: 5MHz, 6dBi, Mid Channel: 26 dB Bandwidth: Measured at Ch.1

5.3.2.5.12 5 MHZ MODULATION BANDWIDTH, 6 DBI POWER, HIGH CHANNEL - 5245 MHZ

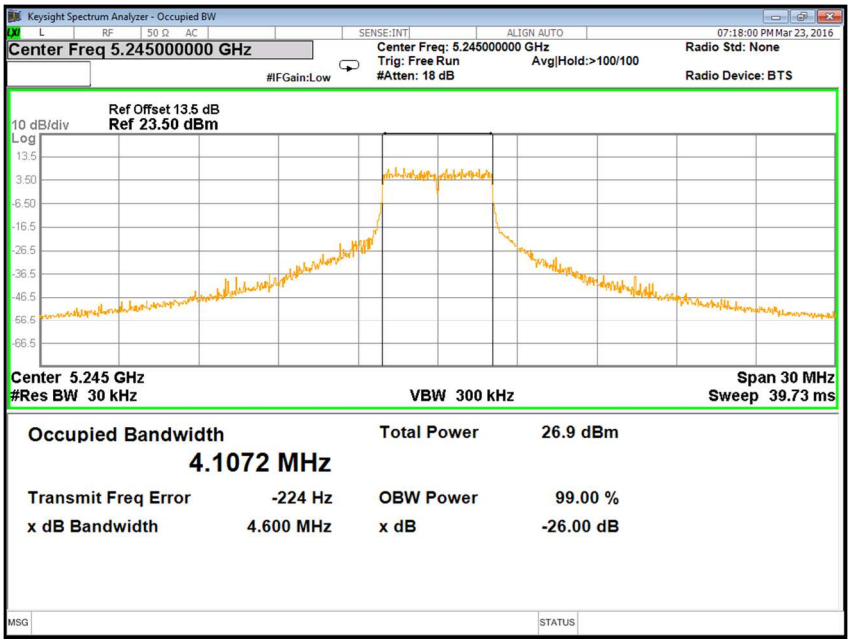


Figure 28: 5MHz, 6dBi, High Channel: 26 dB Bandwidth: Measured at Ch.0

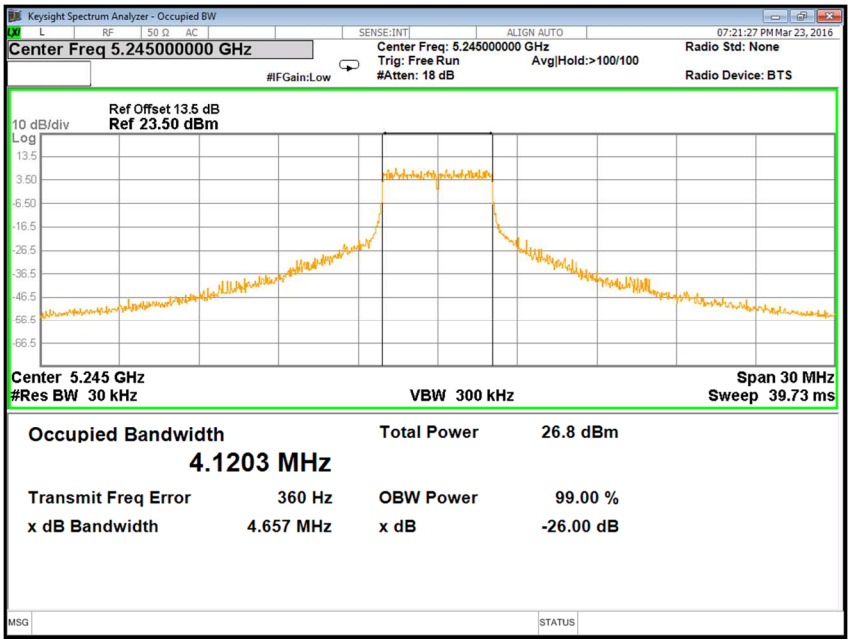


Figure 29: 5MHz, 6dBi, High Channel: 26 dB Bandwidth: Measured at Ch.1

5.3.2.6 RESULT

The 26 dB bandwidth for all channels in both 40 MHz & 5 MHz modulation bandwidth is more than 500 kHz. Refer below table for consolidated data.

Configuration	Modulation Bandwidth (MHz)	Antenna path	Channel Frequency (MHz)	Recorded value (MHz)	Limit (kHz)	Result
17 dBi	40	Ch. 0	5180	43.22	NA	NA
	40	Ch. 0	5180	43.17	NA	NA
	40	Ch. 0	5200	43.84	NA	NA
	40	Ch. 1	5200	43.20	NA	NA
	40	Ch. 1	5220	43.25	NA	NA
	40	Ch. 1	5220	43.34	NA	NA
	5	Ch. 0	5155	4.64	NA	NA
	5	Ch. 0	5155	4.65	NA	NA
	5	Ch. 0	5200	4.74	NA	NA
	5	Ch. 1	5200	4.68	NA	NA
	5	Ch. 1	5245	4.63	NA	NA
	5	Ch. 1	5245	4.68	NA	NA
6 dBi	40	Ch. 0	5180	41.64	NA	NA
	40	Ch. 0	5180	42.74	NA	NA
	40	Ch. 0	5200	42.08	NA	NA
	40	Ch. 1	5200	43.81	NA	NA
	40	Ch. 1	5220	42.60	NA	NA
	40	Ch. 1	5220	43.49	NA	NA
	5	Ch. 0	5155	4.64	NA	NA
	5	Ch. 0	5155	4.71	NA	NA
	5	Ch. 0	5200	4.65	NA	NA
	5	Ch. 1	5200	4.60	NA	NA
	5	Ch. 1	5245	4.60	NA	NA
	5	Ch. 1	5245	4.65	NA	NA

Table 4: Result for 6 dB Bandwidth in both 40 MHz and 5 MHz modulation bandwidth

5.3.3 MAXIMUM CONDUCTED OUTPUT POWER

5.3.3.1 TEST SPECIFICATION

Test Standard	47 CFR Part 15 Feb 2016
Test Procedure	789033 D2 General U-NII Test Procedures New Rule V01r01
Test Mode	Conducted
Detector	Average
Input Voltage	120 V AC
Input Frequency	60 Hz
Temperature	24.0 °C
Humidity	55.0 %
Tested By	Nishanth / Suresh GN
Test Date	08th Feb 2016

5.3.3.2 LIMITS

Standard	Reference section	Frequency range	Limit
47 CFR Part 15 Feb 2016	§15.407 a (1)(i) 905462 D0 6802.11 Channel plans New rules v01	5150 MHz to 5250 MHz	Max conducted Tx power ≤ 30 dBm (1W) Max Limit (for 6 dBi antenna configuration) : ≤ 30 dBm Max Limit (for 17 dBi antenna) : ≤ 19 dBm

5.3.3.3 TEST SETUP

Figure 30: Typical test setup for Conducted RF Test

5.3.3.4 TEST PROCEDURE

The Conducted test was performed using the power meter. Measurements were done as per Section II E 3.b (Method PM-G) of KDB **"789033 DO2 General UNII Test Procedures New Rules v01r01".** The RF output of the EUT was connected to the input port of Power meter using an attenuator. The graph and data captured from power meter and compared with the limits specified in the standard.

5.3.3.5 MEASUREMENT GRAPHS / DATA

5.3.3.5.1 40 MHz MODULATION BANDWIDTH, 17 dBi ANTENNA, LOW CHANNEL - 5180 MHz

Figure 31: 40MHz, 17dBi, Low Channel: Maximum Conducted Output power Measured at Ch.0 & Ch.1

5.3.3.5.2 40 MHz Modulation Bandwidth, 17 dBi Antenna, Mid Channel - 5200 MHz

Figure 32: 40MHz, 17dBi, Mid Channel: Maximum Conducted Output power Measured at Ch.0 & Ch.1

5.3.3.5.3 40 MHz Modulation Bandwidth, 17 dBi Antenna, High Channel - 5220 MHz

Figure 33: 40MHz, 17dBi, High Channel: Maximum Conducted Output power Measured at Ch.0 & Ch.1

5.3.3.5.4 40 MHz Modulation Bandwidth, 6 dBi Power, Low Channel - 5180 MHz

Figure 34: 40MHz, 6dBi, Low Channel: Maximum Conducted Output power Measured at Ch.0 & Ch.1

5.3.3.5.5 40 MHz Modulation Bandwidth, 6 dBi Power, Mid Channel - 5200 MHz

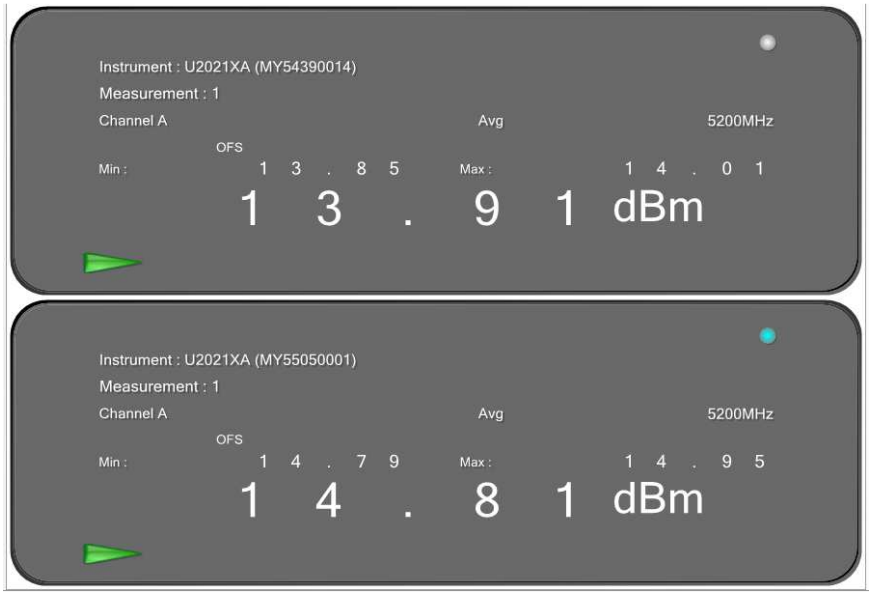


Figure 35: 40MHz, 6dBi, Mid Channel: Maximum Conducted Output power Measured at Ch.0 & Ch.1

5.3.3.5.6 40 MHz Modulation Bandwidth, 6 dBi Power, High Channel - 5220 MHz

Figure 36: 40MHz, 6dBi, High Channel: Maximum Conducted Output power Measured at Ch.0 & Ch.1

5.3.3.5.7 5 MHz Modulation Bandwidth, 17 dBi Antenna, Low Channel - 5115 MHz

Figure 37: 5MHz, 17dBi, Low Channel: Maximum Conducted Output power Measured at Ch.0 & Ch.1

5.3.3.5.8 5 MHz Modulation Bandwidth, 17 dBi Antenna, Mid Channel - 5200 MHz

Figure 38: 5MHz, 17dBi, Mid Channel: Maximum Conducted Output power Measured at Ch.0 & Ch.1

5.3.3.5.9 5 MHz Modulation Bandwidth, 17 dBi Antenna, High Channel - 5245 MHz

Figure 39: 5MHz, 17dBi, High Channel: Maximum Conducted Output power Measured at Ch.0 & Ch.1

5.3.3.5.10 5 MHz Modulation Bandwidth, 6 dBi Power, Low Channel - 5115 MHz

Figure 40: 5MHz, 6dBi, Low Channel: Maximum Conducted Output power Measured at Ch.0 & Ch.1

5.3.3.5.11 5 MHz Modulation Bandwidth, 6 dBi Power, Mid Channel - 5200 MHz

Figure 41: 5MHz, 6dBi, Mid Channel: Maximum Conducted Output power Measured at Ch.0 & Ch.1

5.3.3.5.12 5 MHZ MODULATION BANDWIDTH, 6 DBI POWER, HIGH CHANNEL - 5245 MHZ

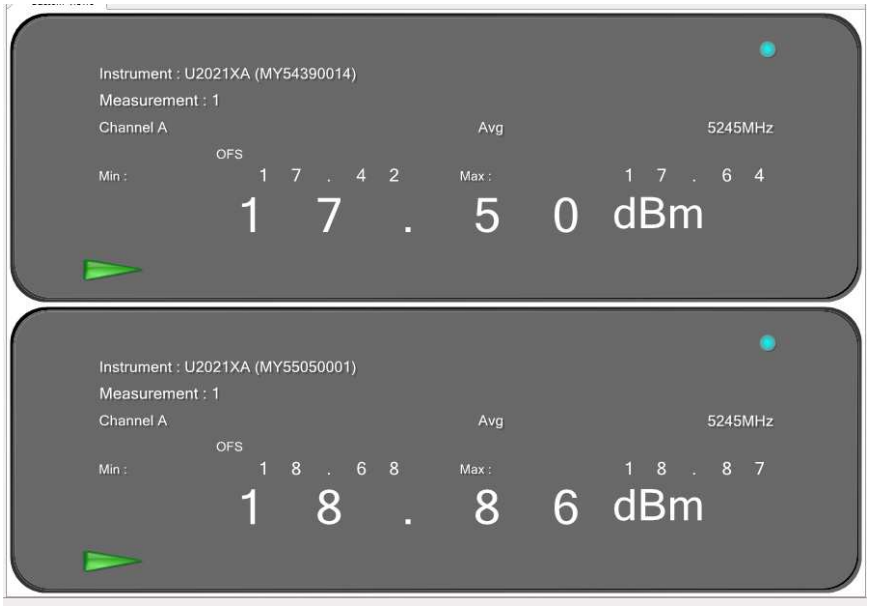


Figure 42: 5MHz, 6dBi, High Channel: Maximum Conducted Output power Measured at Ch.0 & Ch.1

5.3.3.6 RESULT

Maximum Conducted Output Power for all channels in both 40 MHz & 5 MHz modulation bandwidth is within the specified limits. Refer below table for consolidated data.

Modulation Bandwidth (MHz)	Antenna path	Channel Frequency (MHz)	Recorded value (dBm)
40	Ch. 0	5180	6.22
40	Ch. 1	5180	7.87
40	Ch. 0	5200	12.69
40	Ch. 1	5200	13.47
40	Ch. 0	5245	7.03
40	Ch. 1	5245	8.77
5	Ch. 0	5155	7.88
5	Ch. 1	5155	8.94
5	Ch. 0	5200	9.30
5	Ch. 1	5200	10.91
5	Ch. 0	5245	6.75
5	Ch. 1	5245	8.20

Table 5: Max RF out power for 17 dBi configuration

Modulation Bandwidth (MHz)	Antenna path	Channel Frequency (MHz)	Consolidated Power (dBm)	Limit (dBm)	Result
40	Ch. 0 & Ch. 1	5180	10.13	19	PASS
40	Ch. 0 & Ch. 1	5200	16.11	19	PASS
40	Ch. 0 & Ch. 1	5220	10.99	19	PASS
5	Ch. 0 & Ch. 1	5155	11.45	19	PASS
5	Ch. 0 & Ch. 1	5200	13.19	19	PASS
5	Ch. 0 & Ch. 1	5254	10.54	19	PASS

Table 6: Consolidated values across channels and final power for 17 dBi configuration

Modulation Bandwidth (MHz)	Antenna path	Channel Frequency (MHz)	Recorded value (dBm)
40	Ch. 0	5180	15.70
40	Ch. 1	5180	17.34
40	Ch. 0	5200	13.91
40	Ch. 1	5200	14.91
40	Ch. 0	5245	16.78
40	Ch. 1	5245	18.27
5	Ch. 0	5155	17.89
5	Ch. 1	5155	18.69
5	Ch. 0	5200	19.62
5	Ch. 1	5200	21.11
5	Ch. 0	5245	17.50
5	Ch. 1	5245	18.86

Table 7: Max RF out power for 6 dBi configuration

Modulation Bandwidth (MHz)	Antenna path	Channel Frequency (MHz)	Consolidated Power (dBm)	Limit (dBm)	Result
40	Ch. 0 & Ch. 1	5180	19.61	30	PASS
40	Ch. 0 & Ch. 1	5200	17.45	30	PASS
40	Ch. 0 & Ch. 1	5220	20.59	30	PASS
5	Ch. 0 & Ch. 1	5155	21.32	30	PASS
5	Ch. 0 & Ch. 1	5200	23.44	30	PASS
5	Ch. 0 & Ch. 1	5254	21.24	30	PASS

Table 8: Consolidated values across channels and final power for 6 dBi configuration

The recorded power in dBm was converted into Watt, and then added and convert the result back to dBm
*dBm to mW =log(mW)*10*
mW to dBm = 10^(dBm/10)

5.3.4 POWER SPECTRAL DENSITY

5.3.4.1 TEST SPECIFICATION

Test Standard	47 CFR, Part 15, Feb 2016
Test Procedure	789033 D2 General U-NII Test Procedures New Rule V01r01
Frequency Range	5725 MHz to 5850 MHz
Resolution Bandwidth	1 MHz
Video Bandwidth	3 MHz
Sweep Time	1 ms
Attenuation	Auto
Test Mode	Conducted
Detector	RMS
Input Voltage	120 V AC
Input Frequency	60 Hz
Temperature	24.0 °C
Humidity	55.0 %
Tested By	Nishanth/Suresh GN
Test Date	8th Feb 2016

5.3.4.2 LIMITS

Standard	Reference section	Frequency range	Limit
47 CFR, Part 15, Feb 2016	§15.407 a(1)	5150 MHz to 5250 MHz	≤ 17 dBm in any 1MHz band Limit (for 6 dBi antenna configuration) : ≤ 17 dBm/MHz Limit (for 17 dBi antenna configuration) : ≤ 6 dBm/MHz

5.3.4.3 TEST SETUP

Figure 43: Typical test setup for Conducted Test

5.3.4.4 TEST PROCEDURE

The Conducted test was performed using the Spectrum analyzer. Measurements were done as per Section II F (PSD) of KDB **'789033 D02 General UNII Test Procedures New Rules v01r01".** The RF output of the EUT was connected to the input port of Spectrum analyzer using an attenuator. The graph and data captured from spectrum analyzer and compared with the limits specified in the standard.

5.3.4.5 MEASUREMENT GRAPHS / DATA

5.3.4.5.1 40 MHz MODULATION BANDWIDTH, 17 dBi ANTENNA, LOW CHANNEL - 5180 MHz

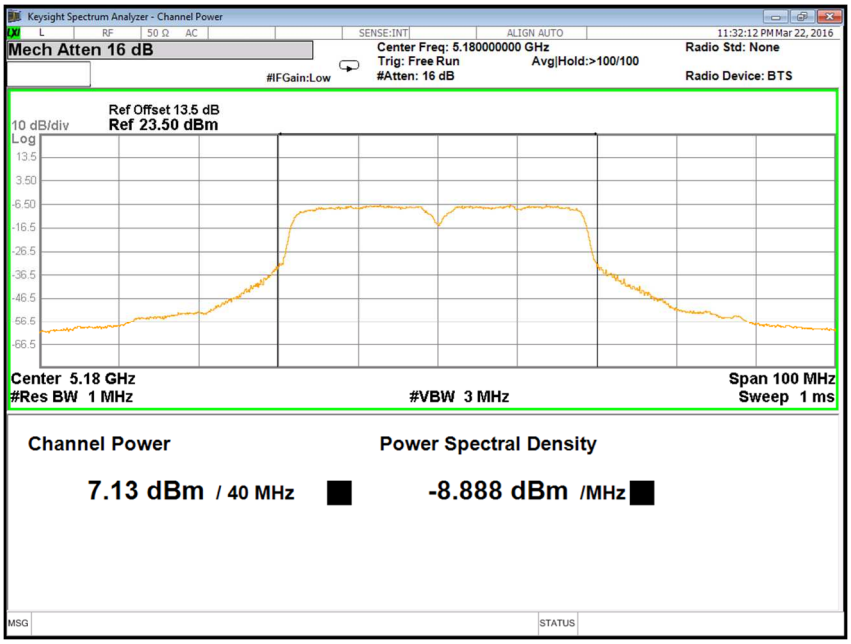


Figure 44: 40MHz, 17dBi, Low Channel: Power Spectral density Measured at Ch. 0

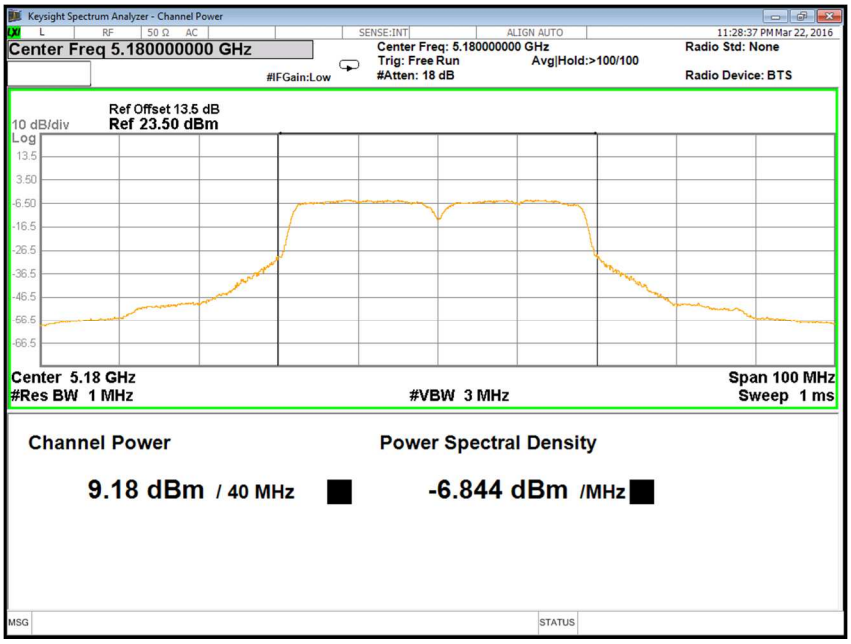


Figure 45: 40MHz, 17dBi, Low Channel: Power Spectral density Measured at Ch. 1

5.3.4.5.2 40 MHz Modulation Bandwidth, 17 dBi Antenna, Mid Channel - 5200 MHz

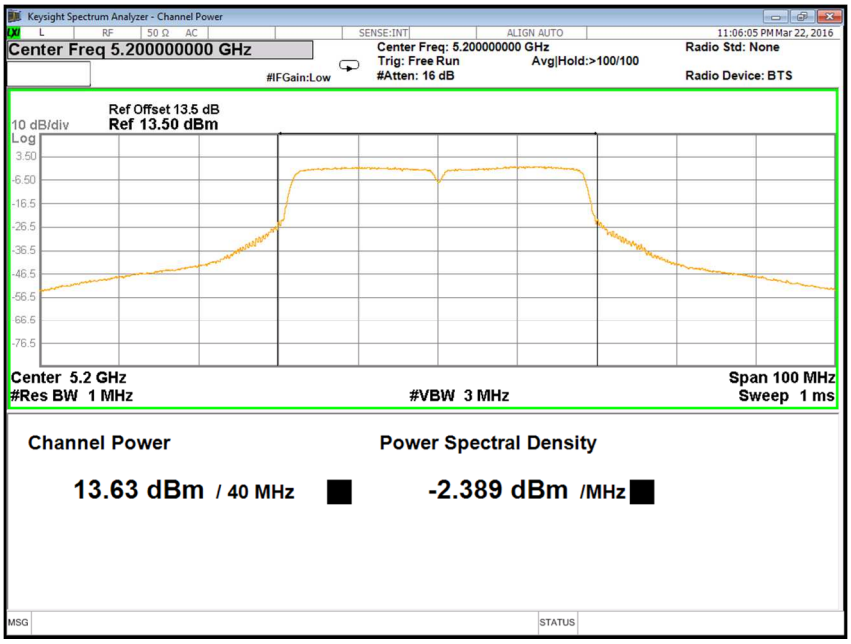


Figure 46: 40MHz, 17dBi, Mid Channel: Power Spectral density Measured at Ch. 0

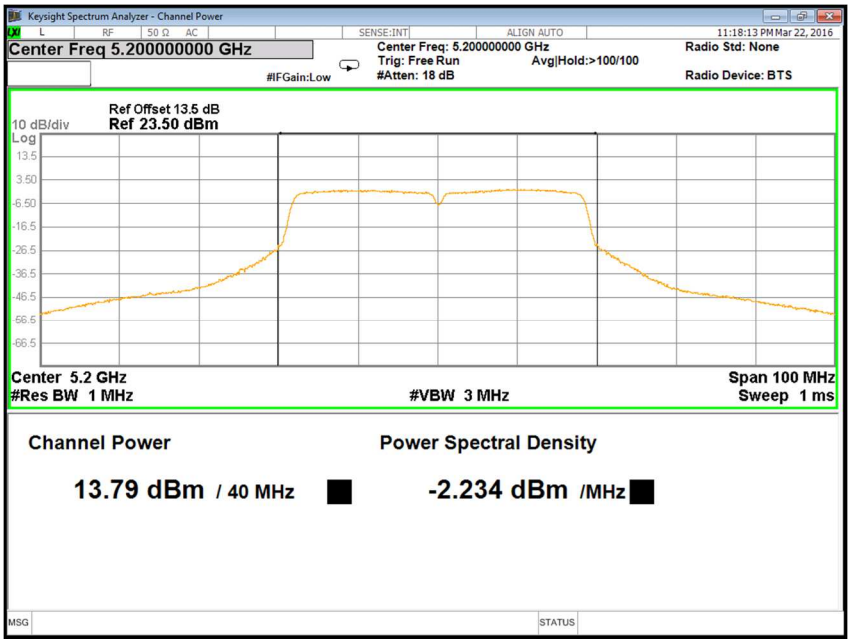


Figure 47: 40MHz, 17dBi, Mid Channel: Power Spectral density Measured at Ch. 1

5.3.4.5.3 40 MHz Modulation Bandwidth, 17 dBi Antenna, High Channel - 5220 MHz

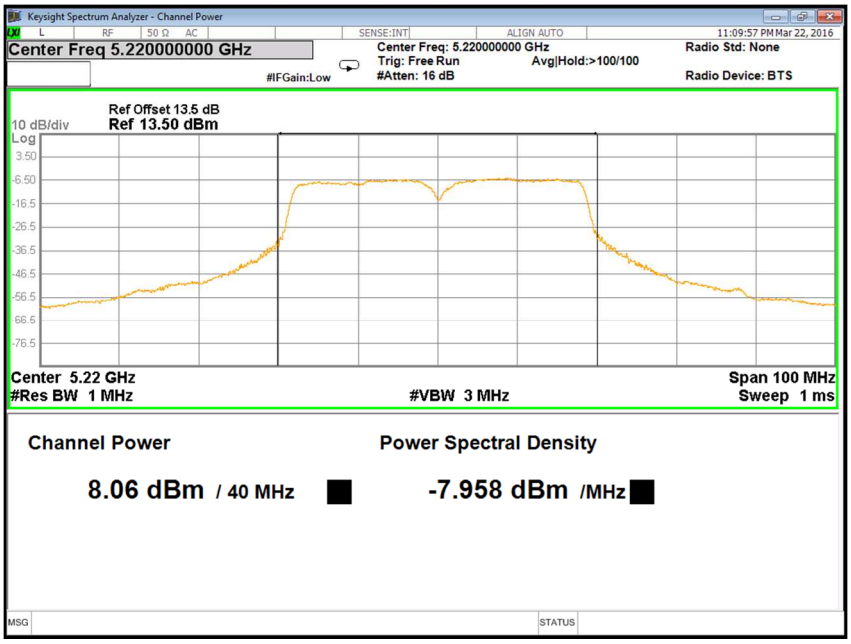


Figure 48: 40MHz, 17dBi, High Channel: Power Spectral density Measured at Ch. 0

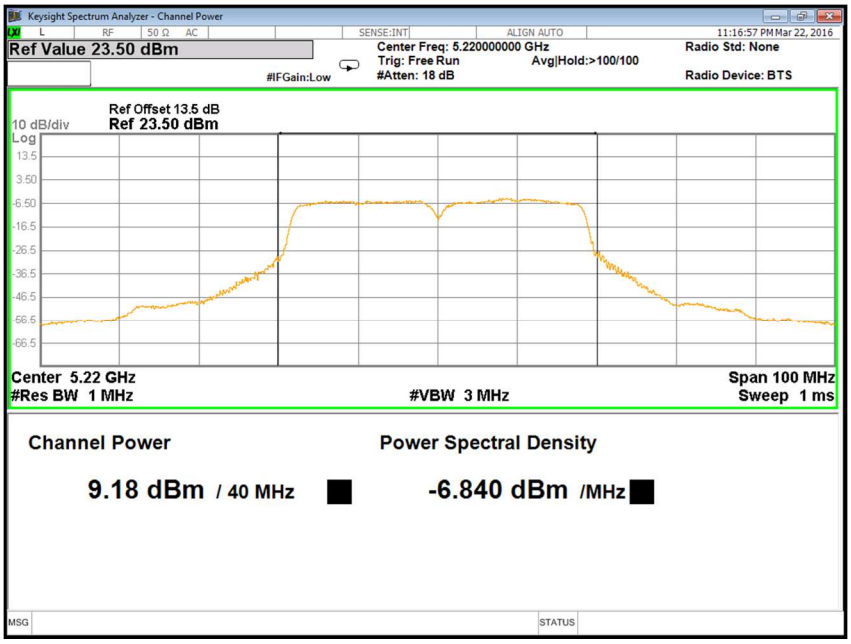


Figure 49: 40MHz, 17dBi, High Channel: Power Spectral density Measured at Ch. 1

5.3.4.5.4 40 MHz Modulation Bandwidth, 6 dBi Power, Low Channel - 5180 MHz

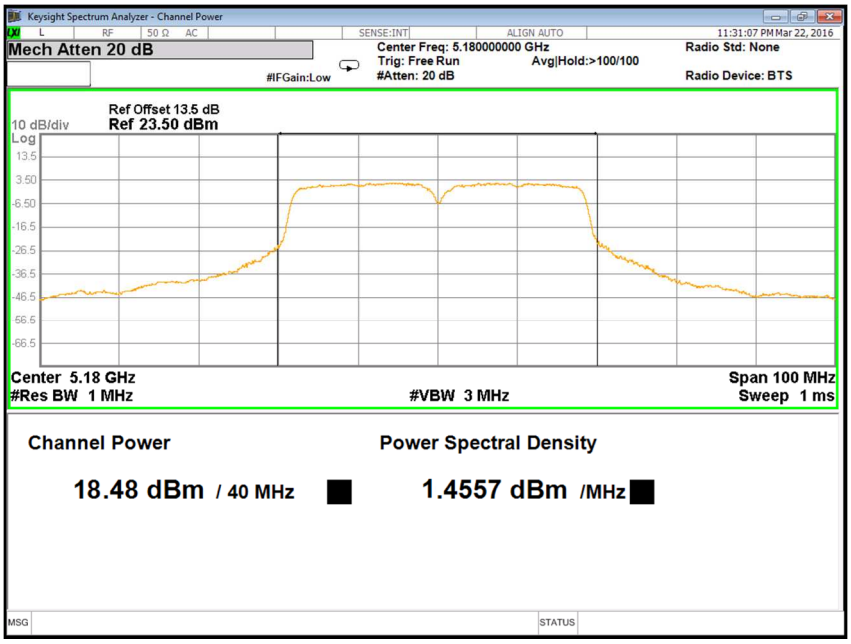


Figure 50: 40MHz, 6dBi, Low Channel: Power Spectral density Measured at Ch. 0