RADIO TEST REPORT

Test Report No. : 10662332H-C-R1

Applicant	:	**Murata Manufacturing Company, Ltd.**
Type of Equipment	:	**Communication Module**
Model No.	:	**LBEE5ZZ1CK**
FCC ID	:	**VPYLB1CK**
Test regulation	:	**FCC Part 15 Subpart E: 2015**
Test Result	:	**Complied**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with above regulation.
4. The test results in this report are traceable to the national or international standards.
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6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 10662332H-C. 10662332H-C is replaced with this report.

Date of test: January 6 to July 9, 2015

Representative test engineer:
T. Shimada
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Approved by:
Takayuki Shimada
Engineer
Consumer Technology Division

NVLAP LAB CODE: 200572-0

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REVISION HISTORY

Original Test Report No.: 10662332H-C

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10662332H-C	July 13, 2015	-	-
1	10662332H-C-R1	July 28, 2015	P.6	Correction of FCC Part 15.203/212 Antenna requirement sentence

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SECTION 1: Customer information

Company Name	:	Murata Manufacturing Company, Ltd.
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Telephone Number	:	+81-75-955-6736
Facsimile Number	:	+81-75-955-6634
Contact Person	:	Motoo Hayashi

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	Communication Module
Model No.	:	LBEE5ZZ1CK
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	VBAT: Typ. 3.6V, Min. 3.2V, Max. 4.4V VIO: Typ. 1.8V, Min. 1.71V, Max. 1.89V (This doesn't influence the RF Characteristic.)
Receipt Date of Sample	:	December 26, 2014
Country of Mass-production	:	China, Japan
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

General Specification

Clock frequency(ies) in the system	:	37.4MHz
Operating temperature	:	-20deg. C to +80deg. C

Radio Specification

Radio Type : Transceiver
Power Supply (inner) : DC 1.35 V / DC 3.3 V

Specification of Wireless LAN (IEEE802.11b/g/a/n-20/n-40/ac-20/ac-40/ac-80)

Type of radio	**IEEE802.11b**	**IEEE802.11g/n**	**IEEE802.11a/n/ac (20 M band)**	**IEEE802.11n/ac (40 M band)**	**IEEE802.11ac (80 M band)**
Frequency of operation	2412-2462MHz	2412-2462MHz	5180-5240MHz *1) 5260-5320MHz *1) 5500-5700MHz *1) 5745-5825MHz *1)	5190-5230MHz *1) 5270-5310MHz *1) 5510-5670MHz *1) 5755-5795MHz *1)	5210MHz *1) 5290MHz *1) 5530-5610MHz *1) 5775MHz *1)
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK, 256QAM(IEEE802.11ac only))		
Channel spacing	5MHz		20MHz	40MHz	80MHz
Antenna type	Pattern Antenna				
Antenna Gain	2.4GHz: 0.0dBi 5GHz: 0.7dBi				

*1) 5GHz Band is applied to this test report.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart E: 2015, final revised on June 12, 2015 and effective July 13, 2015
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart E Unlicensed National Information Infrastructure Devices Section 15.407 General technical requirements

* The revision on June 12, 2015 does not affect the test specification applied to the EUT.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	**FCC :**ANSI C63.4:2009	**FCC:** 15.407(b)(6) / 15.207	**QP** 15.7dB, 20.25804MHz, L **AV** 5.7dB, 20.25804MHz, L	Complied	-
	IC: RSS-Gen 8.8	**IC:** RSS-Gen 8.8			
26dB Emission Bandwidth	**FCC :**ANSI C63.4:2009, FCC KDB Publication Number 789033	**FCC :** 15.407(a)(1)(2)(3)	See data	N/A	Conducted
	IC: -	**IC:** -			
Maximum Conducted Output Power	**FCC :**ANSI C63.4:2009, FCC KDB Publication Number 789033	**FCC :** 15.407(a)(1)(2)(3)		Complied	Conducted
	IC: -	**IC:** RSS-247 6.2.1(1) 6.2.2(1) 6.2.3(1) 6.2.4(1)			
Maximum Power Spectral Density	**FCC :**ANSI C63.4:2009, FCC KDB Publication Number 789033	**FCC :** 15.407(a)(1)(2)(3)		Complied	Conducted
	IC: -	**IC:** RSS-247 6.2.1(1) 6.2.2(1) 6.2.3(1) 6.2.4(1)			
Spurious Emission Restricted Band Edge	**FCC:** ANSI C63.4:2009	**FCC :** 15.407(b), 15.205 and 15.209	0.2dB 5470.000MHz, AV, Vert.	Complied	Conducted (below 30MHz) / Radiated (above 30MHz) *1)
	IC: -	**IC:** RSS-247 6.2.1(2) 6.2.2(2) 6.2.3(2) 6.2.4(2)			
6dB Emission Bandwidth	**FCC :**ANSI C63.4:2009	**FCC :** 15.407(e)	See data	Complied	Conducted
	IC: -	**IC:** RSS-247 6.2.4(1)			

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.
* For DFS tests, please see the test report number 10662332H-E-R1 issued by UL Japan, Inc.
*1) Radiated test was selected over 30 MHz based on section FCC15.407(b) and KDB 789033 D02 G.3.b).

FCC Part 15.31 (e)

The RF Module has own regulator.
The RF Module is constantly provided voltage (DC 1.35 V / DC 3.3 V) through own regulator regardless of input voltage.
Therefore, this EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

The antenna is not removable from the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203/212.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Band Width	RSS-Gen 6.6	**IC:** -	N/A	N/A	Conducted

Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

EMI
The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

Test room (semi-anechoic chamber)	**Conducted emission (±dB)**
	150kHz-30MHz
No.1	3.5dB
No.2	3.5dB
No.3	3.6dB
No.4	3.5dB

Test room (semi-anechoic chamber)	**Radiated emission**						
	(3m*)(±dB)				**(1m*)(±dB)**		**(0.5m*)(±dB)**
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.0dB	5.1dB	5.0dB	5.1dB	6.0dB	4.9dB	4.3dB
No.2	3.9dB	5.2dB	5.0dB	4.9dB	5.9dB	4.7dB	4.2dB
No.3	4.3dB	5.1dB	5.2dB	5.2dB	6.0dB	4.8dB	4.2dB
No.4	4.6dB	5.2dB	5.0dB	5.2dB	6.0dB	5.7dB	4.2dB

*3m/1m/0.5m = Measurement distance

Antenna terminal conducted emission and Power density (±dB)			**Antenna terminal conducted emission (±dB)**		**Channel power (±dB)**
Below 1GHz	1GHz-3GHz	3GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz	
1.5dB	1.7dB	2.8dB	2.8dB	2.9dB	2.6dB

Conducted Emission test
The data listed in this test report has enough margin, more than the site margin.

Radiated emission test (3m)
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

3.5 Test Location

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	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	4.0 x 4.5 x 2.7m	4.0 x 4.5 m	-
No.6 measurement room	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	8.8 x 4.6 x 2.8m	2.4 x 2.4m	-
No.11 measurement room	-	6.2 x 4.7 x 3.0m	4.8 x 4.6m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Data of EMI, Test instruments, and Test set up

Refer to APPENDIX.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

Test operating mode was determined as follows according to "Section 1 of 6 802.11 a/b/g/n testing - Managing Complex Regulatory Approvals - " of TCB Council Workshop October 2009 and also was judged the necessity of 802.11ac mode by the pre-test.

Mode	Remarks*
IEEE 802.11a (11a)	9Mbps, PN9
IEEE 802.11n 20MHz BW (11n-20)	MCS 0, PN9
IEEE 802.11ac 20MHz BW (11ac-20)	MCS 5, PN9
IEEE 802.11n 40MHz BW (11n-40)	MCS 7, PN9
IEEE 802.11ac 40MHz BW (11ac-40)	MCS 5, PN9
IEEE 802.11ac 80MHz BW (11ac-80)	MCS 0, PN9

*The worst condition was determined based on the test result of Maximum Conducted Output Power.
*EUT has the power settings by the software as follows;
Power settings: 11a: 12dBm, 11n-20: 12dBm, 11ac-20: 12dBm,
11n-40: 11.5dBm, 11ac-40: 11.5dBm, 11ac-80: 11dBm
Software: mfgtest RC37.32.31
*EUT does not have TPC function, and EUT is slave device without a Radar Interference Detection function.
*This setting of software is the worst case.
Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

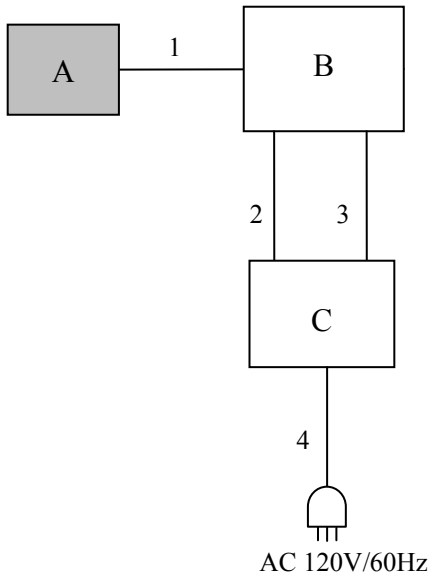
*The details of Operating mode(s)

Test Item	Operating Mode	Tested Frequency			
		Low Band	Middle Band	Additional Band	Upper Band
Conducted emission	11n-20 Tx *1)	-	5260MHz *1)	-	-
26dB Emission Bandwidth	11a Tx 11n-20 Tx 11ac-20 Tx	-	5260MHz 5300MHz 5320MHz	5500MHz 5580MHz 5700MHz	-
	11n-40 Tx 11ac-40 Tx	-	5270MHz 5310MHz	5510MHz 5550MHz 5670MHz	-
	11ac-80 Tx	-	5290MHz	5530MHz 5610MHz	-
99% Occupied Bandwidth, Maximum Conducted Output Power, Maximum Power Spectral Density, 20dB Bandwidth	11a Tx 11n-20 Tx 11ac-20 Tx	5180MHz 5220MHz 5240MHz	5260MHz 5300MHz 5320MHz	5500MHz 5580MHz 5700MHz	5745MHz 5785MHz 5825MHz
	11n-40 Tx 11ac-40 Tx	5190MHz 5230MHz	5270MHz 5310MHz	5510MHz 5550MHz 5670MHz	5755MHz 5795MHz
	11ac-80 Tx	5210MHz	5290MHz	5530MHz 5610MHz	5775MHz
Radiated Spurious Emission (Below 1GHz)	11n-20 Tx *1)	-	5260MHz *1)	-	-
Radiated Spurious Emission (Above 1GHz)	11a Tx *2) 11ac-20 Tx *2)	5180MHz	5320MHz	5500MHz 5700MHz	5745MHz 5825MHz
	11n-20 Tx	5180MHz	5260MHz 5320MHz	5500MHz 5580MHz 5700MHz	5745MHz 5785MHz 5825MHz
	11n-40 Tx	5190MHz	5310MHz	5510MHz 5670MHz	5755MHz 5795MHz
	11ac-40 Tx *2)	5190MHz	5270MHz 5310MHz	5510MHz 5550MHz 5670MHz	5755MHz 5795MHz
	11ac-80 Tx	5210MHz	5290MHz	5530MHz 5610MHz	5775MHz
Conducted Spurious Emission	11n-20 Tx *1)	-	5260MHz *1)	-	-
6dB Bandwidth	11a Tx 11n-20 Tx 11ac-20 Tx	-	-	-	5745MHz 5785MHz 5825MHz
	11n-40 Tx 11ac-40 Tx	-	-	-	5755MHz 5795MHz
	11ac-80 Tx	-	-	-	5775MHz

*1) The operating mode and tested frequency were tested as a representative, because it had the highest power at antenna terminal test.
*2) Only band edge was tested on this mode according to “Section 1 of 6 802.11 a/b/g/n testing- Managing Complex Regulatory Approvals - ” of TCB Council Workshop October 2009 and also was judged the necessity of 802.11ac mode by the pre-test.

4.2 Configuration and peripherals

Conducted Emission test only



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

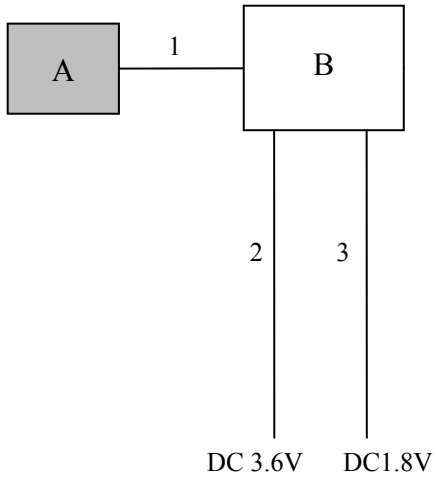
Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Communication Module	LBEE5ZZ1CK	Conducted No.1	Murata Manufacturing Company, Ltd.	EUT
B	Jig	-	-	Murata Manufacturing Company, Ltd.	-
C	DC Power Supply	PL330QMD	48943	Thurlby Thandar	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Flat Cable	0.1	Unshielded	Unshielded	-
2	DC Cable	1.5	Unshielded	Unshielded	-
3	DC Cable	1.5	Unshielded	Unshielded	-
4	AC Cable	1.5	Unshielded	Unshielded	-

Other than Conducted Emission test



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Communication Module	LBEE5ZZ1CK	Conducted No.1 for AT* Radiated No.1 for RE*	Murata Manufacturing Company, Ltd.	EUT
B	Jig	-	-	Murata Manufacturing Company, Ltd.	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Flat Cable	0.1	Unshielded	Unshielded	-
2	DC Cable	1.5	Unshielded	Unshielded	-
3	DC Cable	1.5	Unshielded	Unshielded	-

*AT: Antenna Terminal Conducted test, RE: Radiated Spurious Emission test

SECTION 5: Conducted Emission

Test Procedure

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

For the tests on EUT with other peripherals (as a whole system)
I/O cable and AC cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. All unused 50ohm connectors of the LISN(AMN) were resistivity terminated in 50ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber or a Measurement Room.
The EUT was connected to a LISN (AMN).
An overview sweep with peak detection has been performed.

Detector	**: QP and CISPR AV**
Measurement range	**: 0.15-30MHz**
Test data	**: APPENDIX**
Test result	**: Pass**

SECTION 6: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.
The height of the measuring antenna varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The test was made with the detector (RBW/VBW) in the following table.
When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Below 1GHz
The result also satisfied with the general limits specified in section 15.209(a).

Above 1GHz

Inside of restricted bands(Section 15.205):	Apply to limit in the Section 15.209(a).
Outside of the restricted bands:	Apply to limit 68.2dBuV/m(–27dBm e.i.r.p.*) in the Section 15.407(b)(1)(2)(3).
	Apply to limit 68.2dBuV/m(–27dBm e.i.r.p.*) or 78.2dBuV/m(-17dBm e.i.r.p.*) in the Section 15.407(b).
Restricted bandedge:	Apply to limit in the Section 15.209(a). Since this limit is severer than the limit of the inside of restricted bands.

*Electric Field Strength to e.i.r.p. Conversion

$$E = \frac{1000000\sqrt{30P}}{3} \text{ (uV/m)}$$:P is the e.i.r.p. (Watts)

Test Antennas are used as below;

Frequency	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Biconical	Logperiodic	Horn

Frequency	Below 1GHz	Above 1GHz	
Instrument used	Test Receiver	Spectrum Analyzer	
Detector	QP	PK	AV
IF Bandwidth	BW 120kHz(T/R)	RBW: 1MHz VBW: 3MHz	Method AD *1) RBW: 1MHz VBW: 3MHz Detector: Power Averaging (RMS) Duty factor was added to the results. Integration Method RBW: 100kHz VBW: 300kHz Band Power: 1MHz Detector: Power Averaging (RMS) Trace: 100 traces Duty factor was added to the results.
Test Distance	3m	3m (below 10GHz), 1m*2) (above 10GHz), 0.5m*3) (above 26.5GHz)	

*1) The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E (Issued on June 6, 2014)".
*2) Distance Factor: 20 x log (3.0m/1.0m) = 9.5dB
*3) Distance Factor: 20 x log (3.0m/0.5m) = 15.6dB

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Measurement range : **30M-40GHz**
Test data : **APPENDIX**
Test result : **Pass**

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

The tests were made with below setting connected to the antenna port with Spectrum Analyzer.

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
26dB Bandwidth	40MHz, 80MHz, 160MHz	Close to 1% of EBW	Greater than RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5% of OBW	≥ 3 RBW	Auto	Peak	Max Hold	Spectrum Analyzer
6dB Bandwidth	40MHz, 80MHz, 160MHz	100kHz	300kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Conducted Output Power	-	-	-	Auto	Averaging	-	Power Meter (Sensor: 80MHz BW) (Method PM-G)
Maximum Power Spectral Density	40MHz, 80MHz, 160MHz	1MHz or 470kHz *2)	3MHz or 1.5MHz	Auto	Sample Power Averaging (200 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*3)	9kHz-150kHz	200Hz	620Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz-30MHz	9.1kHz	27kHz				
Band Edge confirmation *4)	80 MHz, 200 MHz	1 MHz	≥ 1/T	Auto	Peak	Max Hold	Spectrum Analyzer (Method VB)

* The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E (Issued on June 6, 2014)".

*1) Peak hold was applied as Worst-case measurement.
*2) FCC standard says that RBW is set to be 500kHz for 5.725-5.850GHz, but it is not possible with spectrum analyzer, so 10log(500kHz/470kHz) was added to the test result.
*3) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was low enough as shown in the chart.(9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=9.1kHz).
*4) Reference data

The test results and limit are rounded off to two decimals place, so some differences might be observed.

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Data of EMI test

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

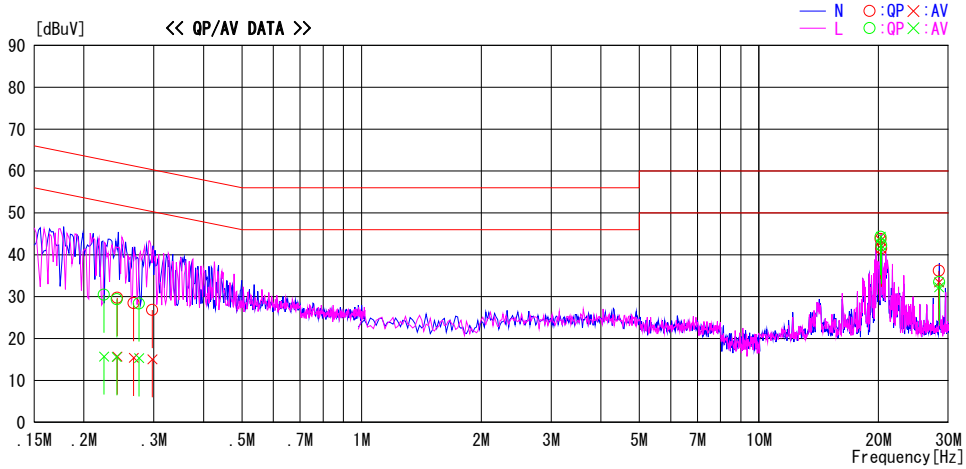
UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/02/10

Report No. : 10662332H

Temp./Humi. : 21deg. C / 34% RH
Engineer : Takafumi Noguchi

Mode / Remarks : Tx 11n-20 5260MHz

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.22466	17.2	2.4	13.3	30.5	15.7	62.6	52.6	32.1	36.9	L	
0.24186	16.1	2.3	13.3	29.4	15.6	62.0	52.0	32.6	36.4	L	
0.24271	16.4	2.4	13.3	29.7	15.7	62.0	52.0	32.3	36.3	N	
0.26690	15.2	2.1	13.3	28.5	15.4	61.2	51.2	32.7	35.8	N	
0.27517	15.1	2.0	13.3	28.4	15.3	61.0	51.0	32.6	35.7	L	
0.29727	13.5	1.8	13.3	26.8	15.1	60.3	50.3	33.5	35.2	N	
20.25804	29.1	29.1	15.2	44.3	44.3	60.0	50.0	15.7	5.7	L	
20.25758	28.5	28.2	15.2	43.7	43.4	60.0	50.0	16.3	6.6	N	
20.31971	26.4	26.3	15.2	41.6	41.5	60.0	50.0	18.4	8.5	N	
20.31816	27.1	27.0	15.2	42.3	42.2	60.0	50.0	17.7	7.8	L	
28.43162	17.7	16.4	15.8	33.5	32.2	60.0	50.0	26.5	17.8	L	
28.38438	20.4	17.6	15.8	36.2	33.4	60.0	50.0	23.8	16.6	N	

CHART : WITH FACTOR, Peak hold data. CALCULATION : RESULT[dBuV] = READING[dBuV] + C.F[dB] (LISN + CABLE + ATTEN.)
Except for the above table : adequate margin data below the limits.

26dB Emission Bandwidth and 99% Occupied Bandwidth

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10662332H
Date	01/22/2015
Temperature/ Humidity	25deg. C / 31% RH
Engineer	Shinichi Miyazono
Mode	11a/n-20/ac-20 Tx

11a

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5180	-	17.4538	-
5220	-	17.4878	-
5240	-	17.4784	-
5260	21.167	17.4687	-
5300	21.326	17.4103	-
5320	21.248	17.3742	-
5500	21.462	17.4908	-
5580	21.389	17.5267	-
5700	21.371	17.4493	-
5745	-	17.5178	-
5785	-	17.5751	-
5825	-	17.4487	-

11n-20

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5180	-	18.3854	-
5220	-	18.3715	-
5240	-	18.4015	-
5260	21.479	18.4054	-
5300	21.454	18.4184	-
5320	21.522	18.3692	-
5500	21.570	18.3938	-
5580	21.561	18.4046	-
5700	21.293	18.4380	-
5745	-	18.4327	-
5785	-	18.4046	-
5825	-	18.3877	-

11ac-20

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5180	-	18.1612	-
5220	-	18.1691	-
5240	-	18.1890	-
5260	21.347	18.1541	-
5300	21.519	18.1786	-
5320	21.367	18.1450	-
5500	21.373	18.1658	-
5580	21.452	18.1858	-
5700	21.450	18.1661	-
5745	-	18.1921	-
5785	-	18.1828	-
5825	-	18.2519	-

26dB Emission Bandwidth and 99% Occupied Bandwidth

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10662332H
Date	01/22/2015
Temperature/ Humidity	25deg. C / 31% RH
Engineer	Shinichi Miyazono
Mode	11n-40/ac-40/ac-80 Tx

11n-40

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5190	-	36.5263	-
5230	-	36.5504	-
5270	39.155	36.5159	-
5310	39.373	36.4323	-
5510	39.261	36.5227	-
5550	39.251	36.4288	-
5670	39.651	36.4782	-
5755	-	36.4548	-
5795	-	36.5065	-

11ac-40

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5190	-	36.5400	-
5230	-	36.4365	-
5270	39.481	36.4715	-
5310	39.455	36.4477	-
5510	39.646	36.4682	-
5550	39.497	36.3558	-
5670	39.418	36.4896	-
5755	-	36.3946	-
5795	-	36.4232	-

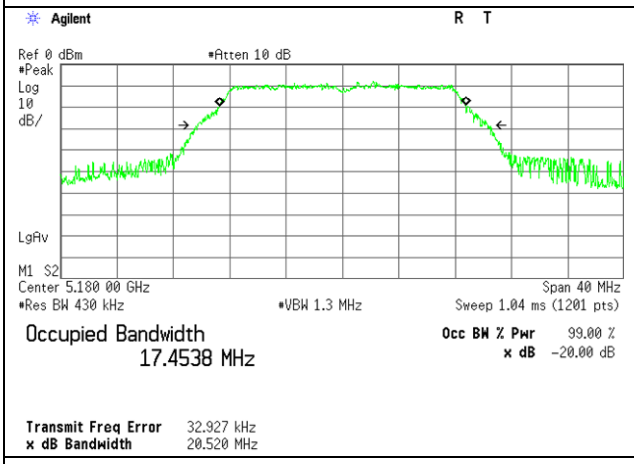
11ac-80

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5210	-	75.8437	-
5290	81.654	75.8143	-
5530	81.498	75.9041	-
5610	81.468	75.9708	-
5775	-	75.9281	-

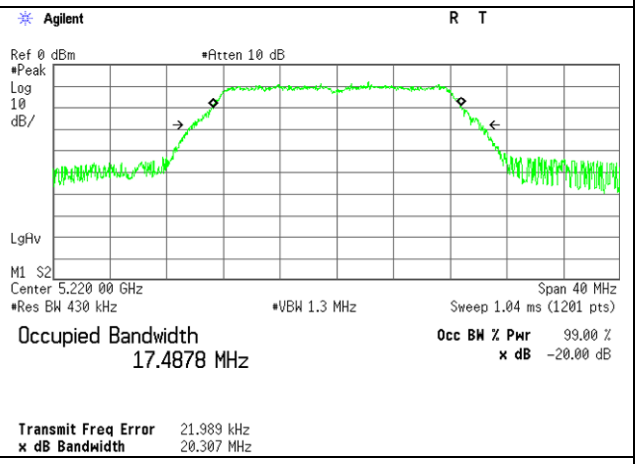
99% Occupied Bandwidth

11a

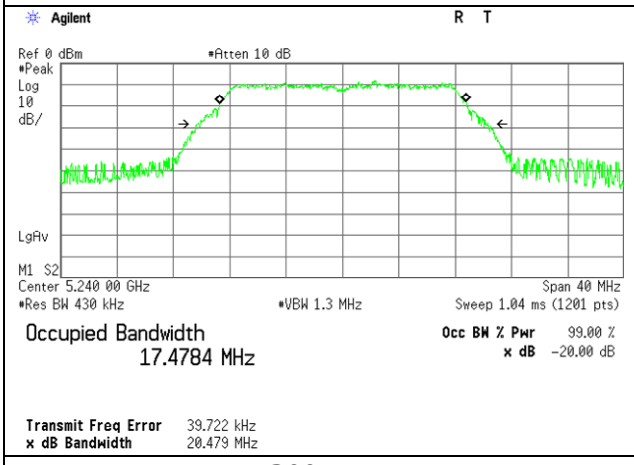
5180MHz



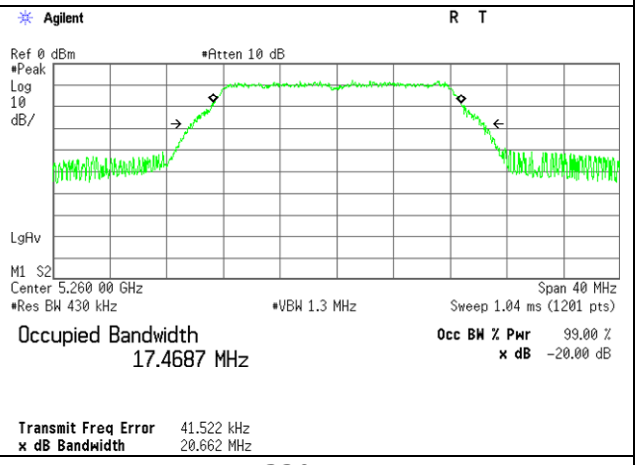
5220MHz



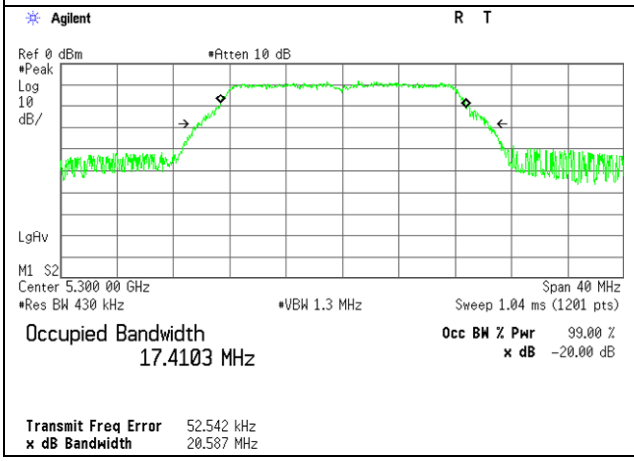
5240MHz



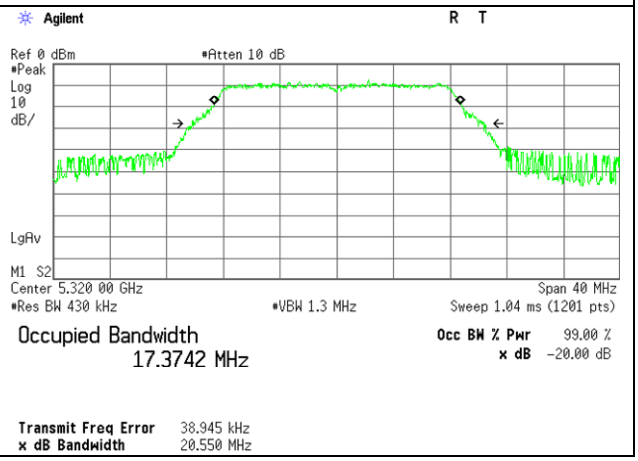
5260MHz



5300MHz



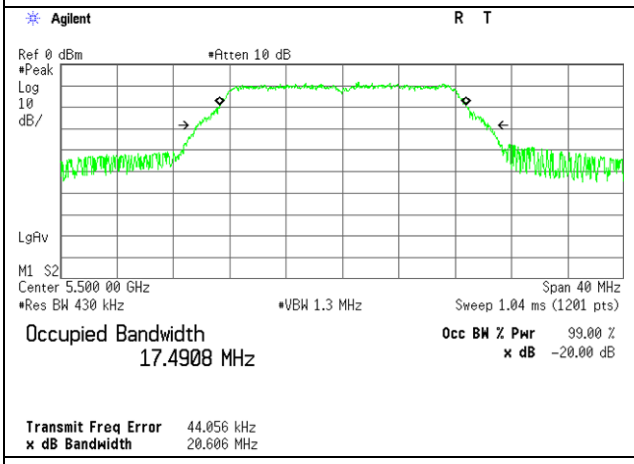
5320MHz



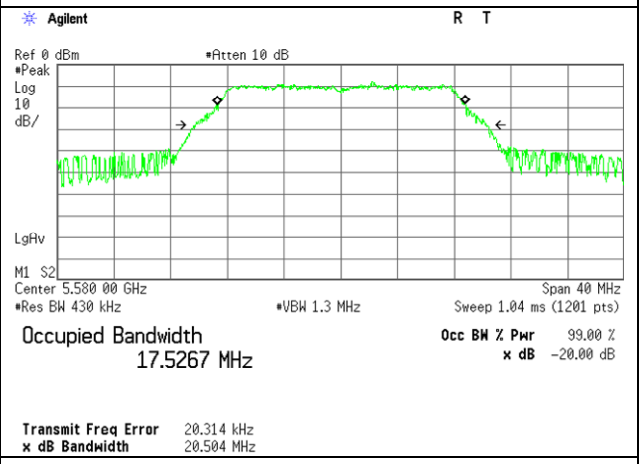
99% Occupied Bandwidth

11a

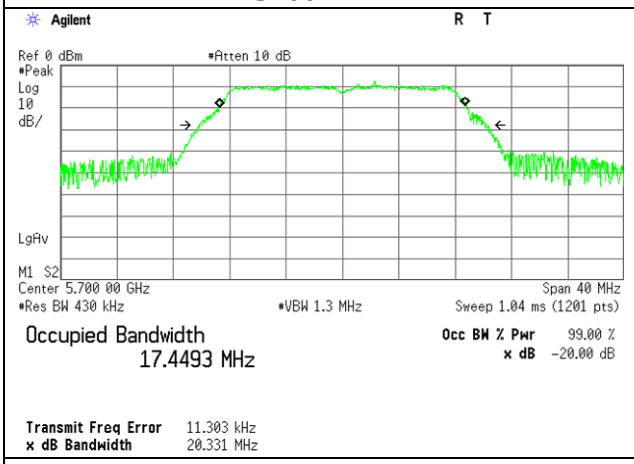
5500MHz



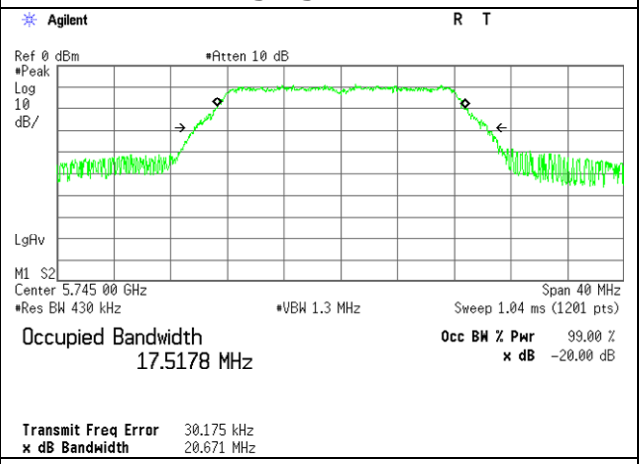
5580MHz



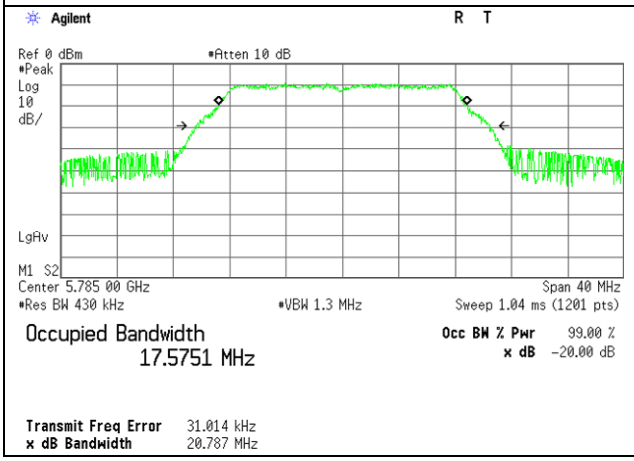
5700MHz



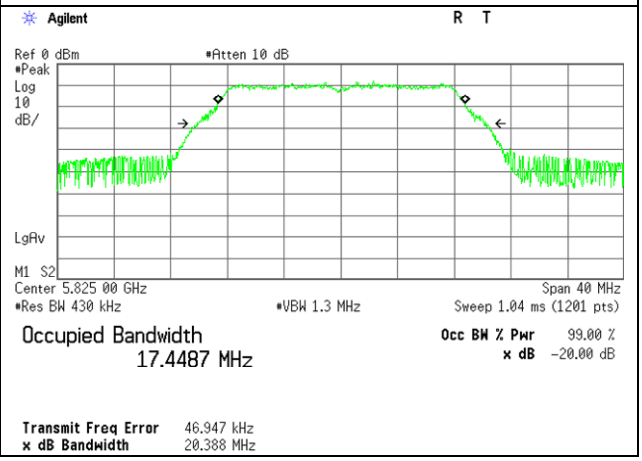
5745MHz



5785MHz



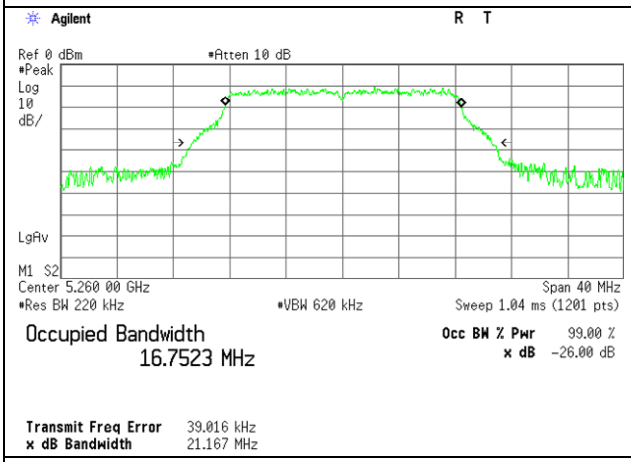
5825MHz



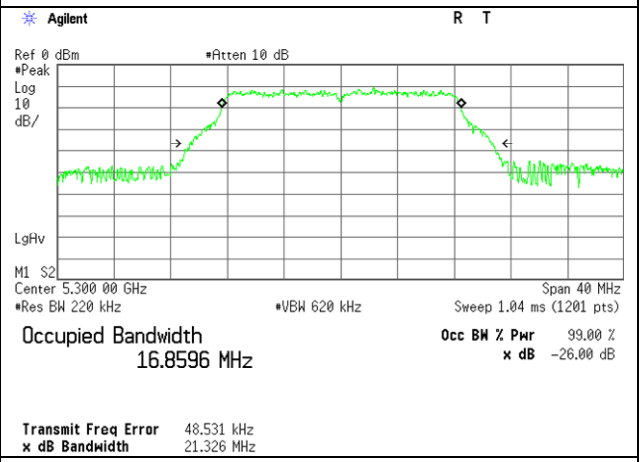
26dB Emission Bandwidth

11a

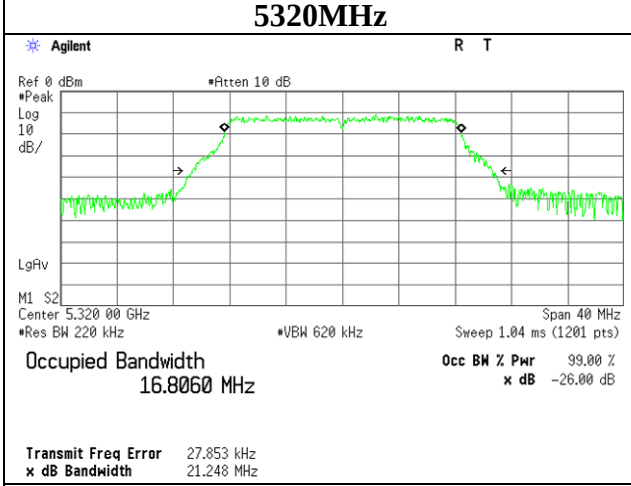
5260MHz



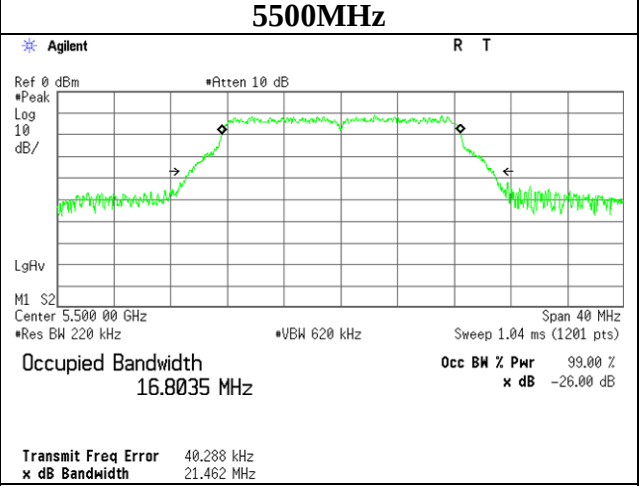
5300MHz



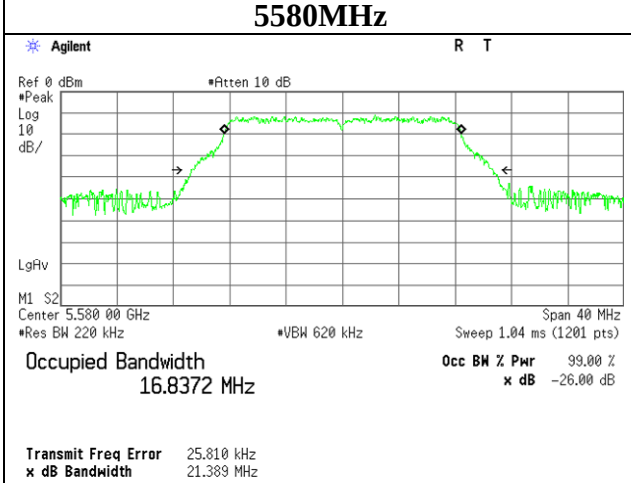
5320MHz



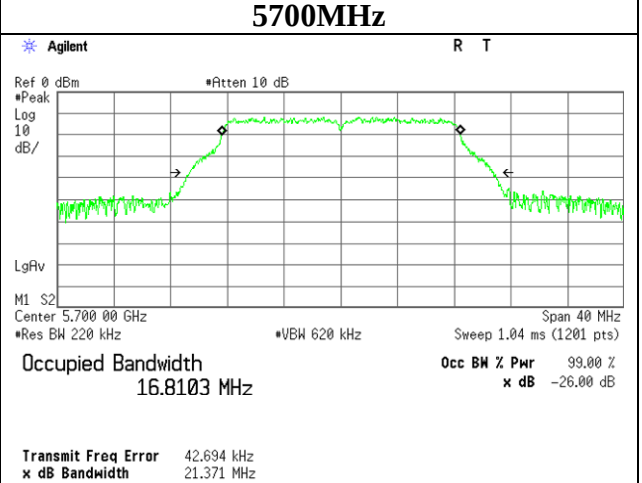
5500MHz



5580MHz



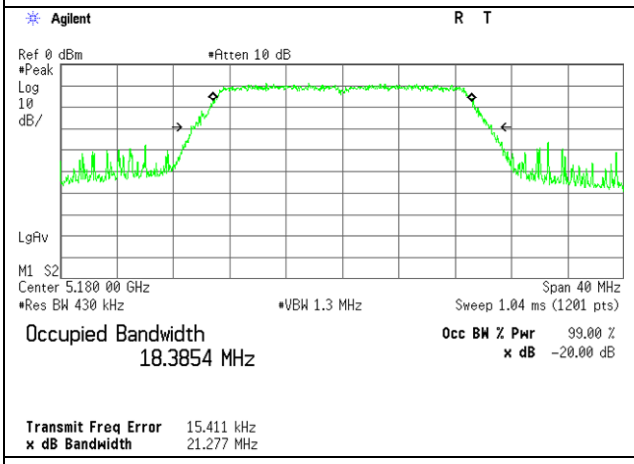
5700MHz



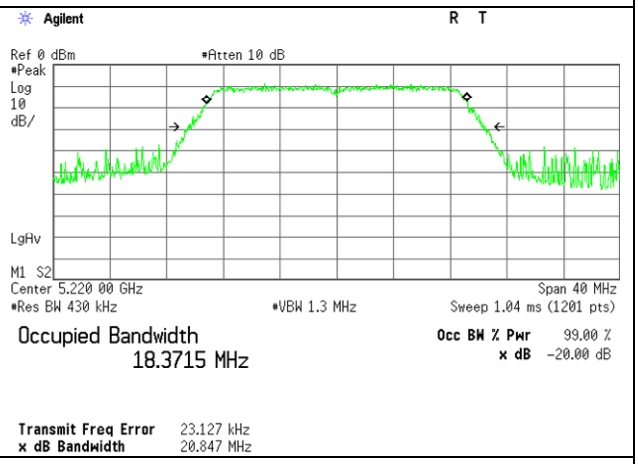
99% Occupied Bandwidth

11n-20

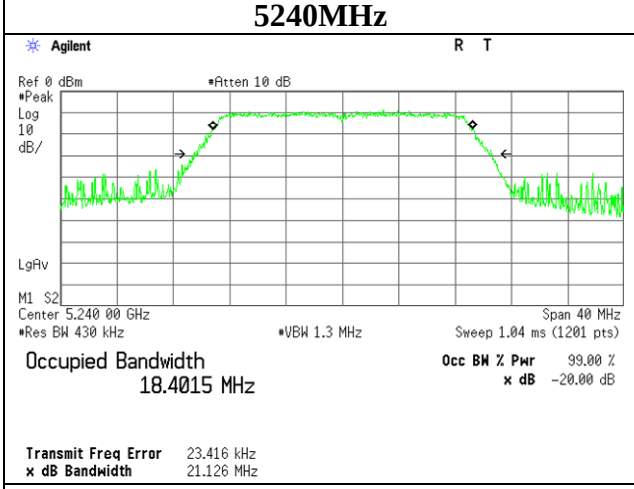
5180MHz



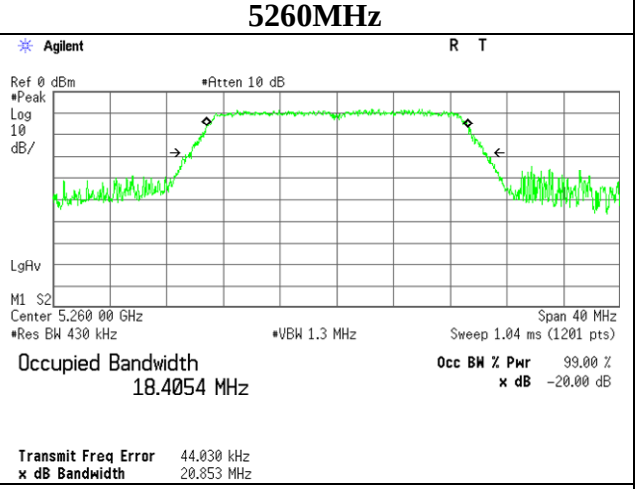
5220MHz



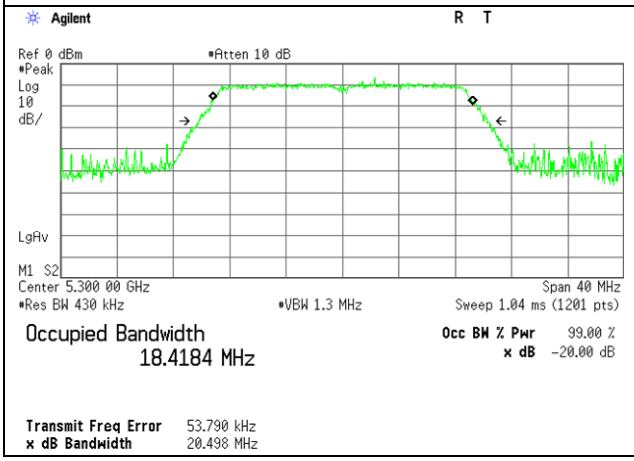
5240MHz



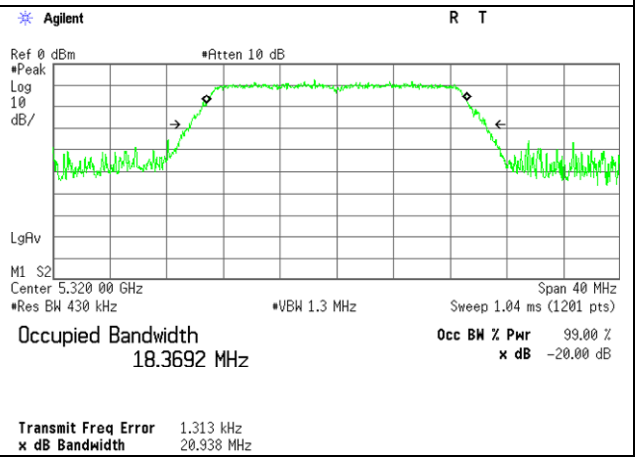
5260MHz



5300MHz



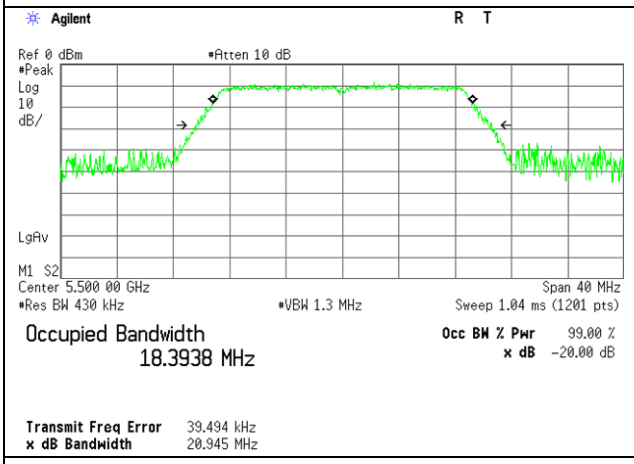
5320MHz



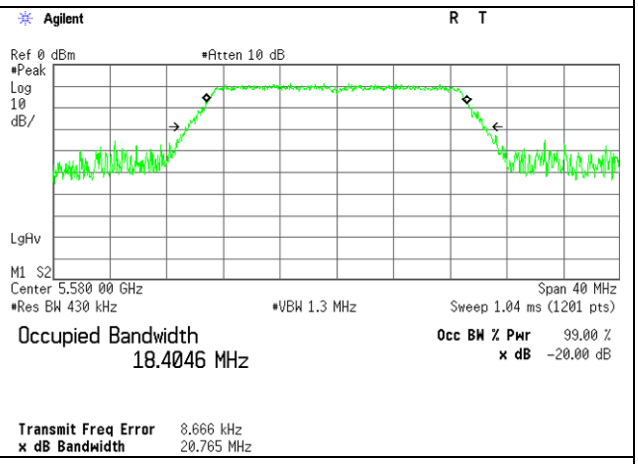
99% Occupied Bandwidth

11n-20

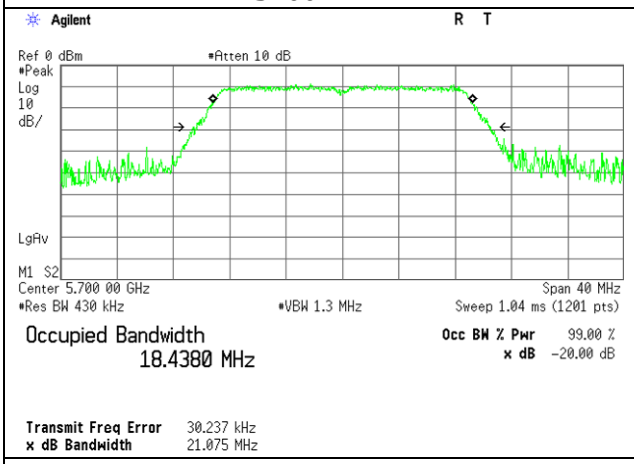
5500MHz



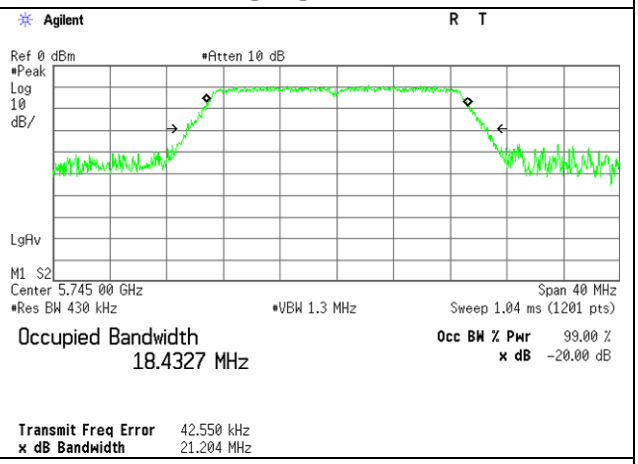
5580MHz



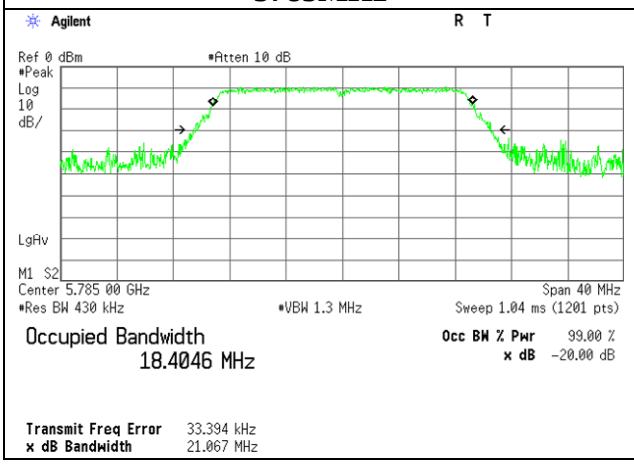
5700MHz



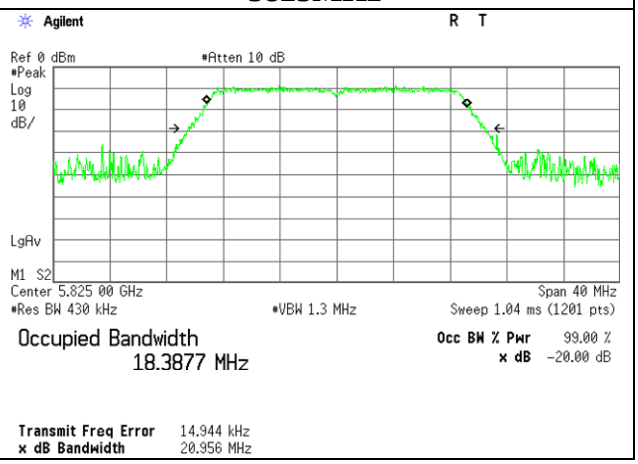
5745MHz



5785MHz



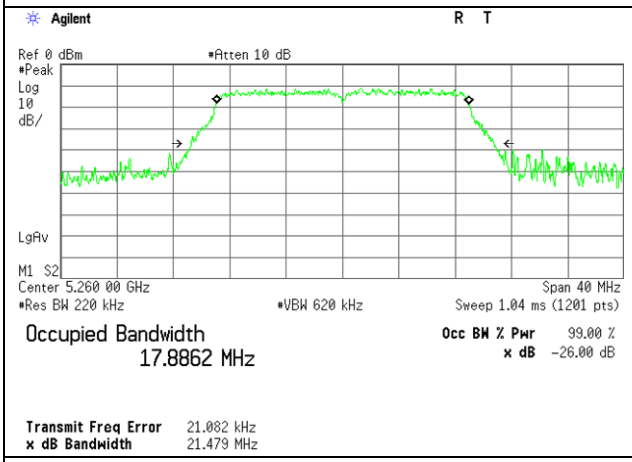
5825MHz



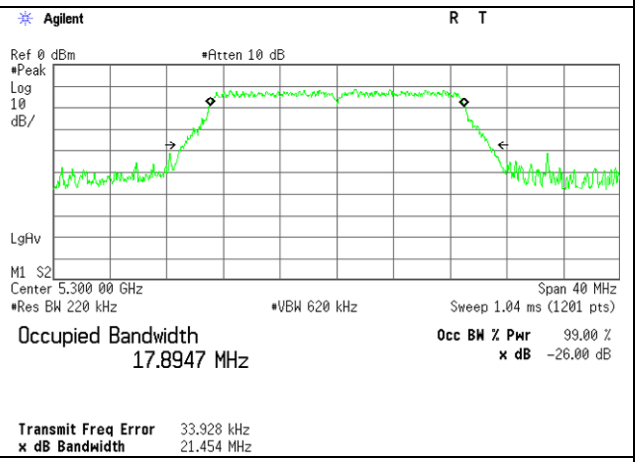
26dB Emission Bandwidth

11n-20

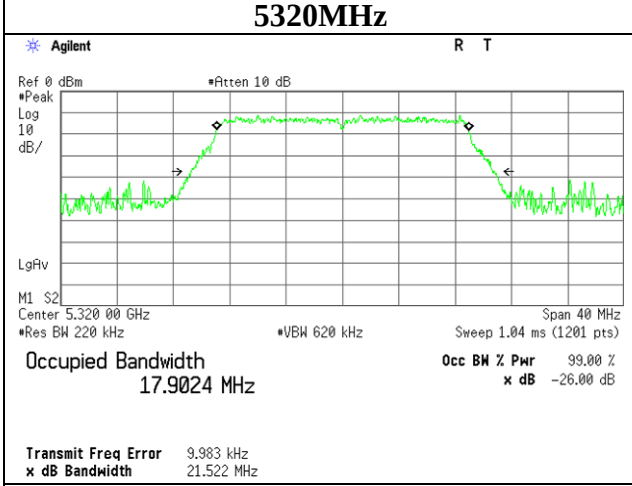
5260MHz



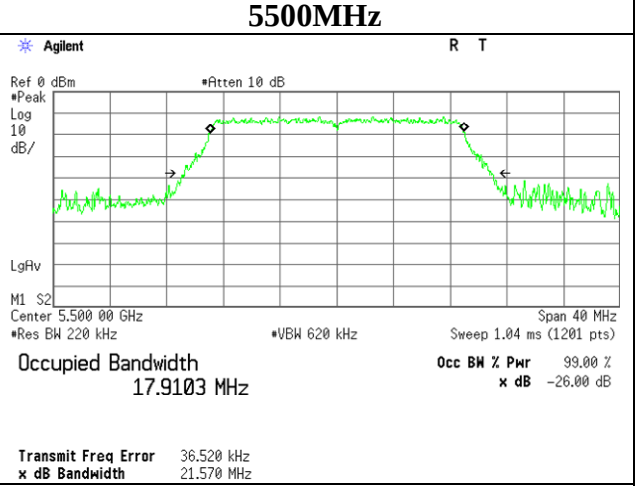
5300MHz



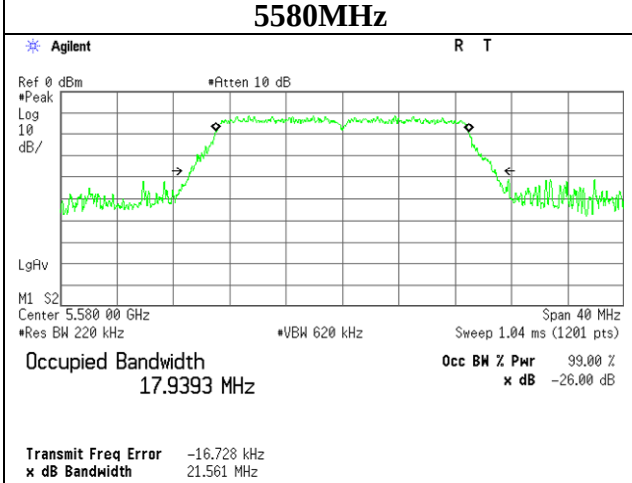
5320MHz



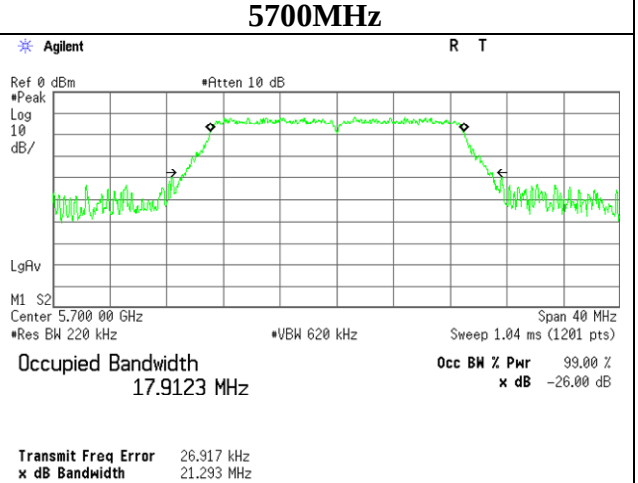
5500MHz



5580MHz



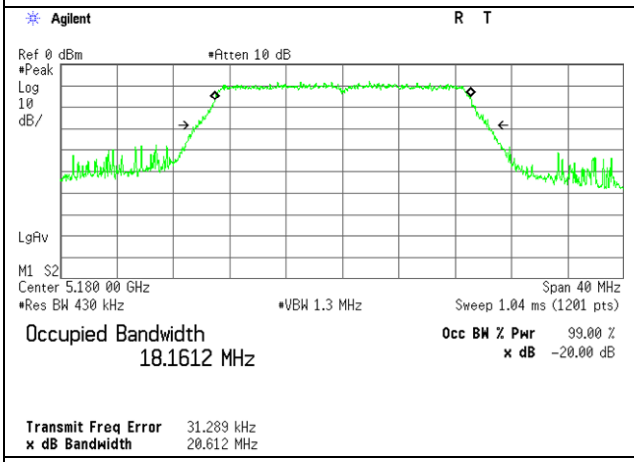
5700MHz



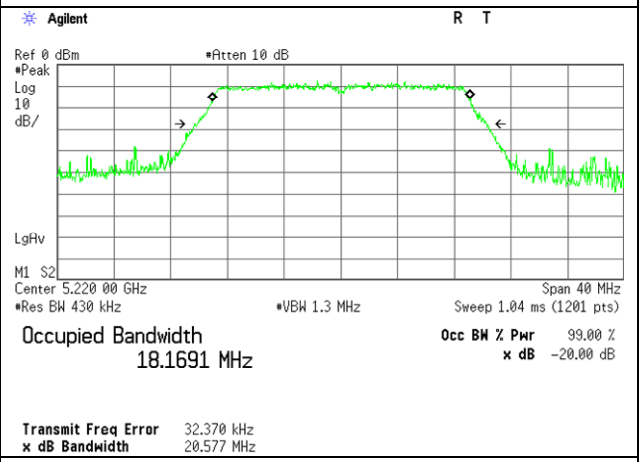
99% Occupied Bandwidth

11ac-20

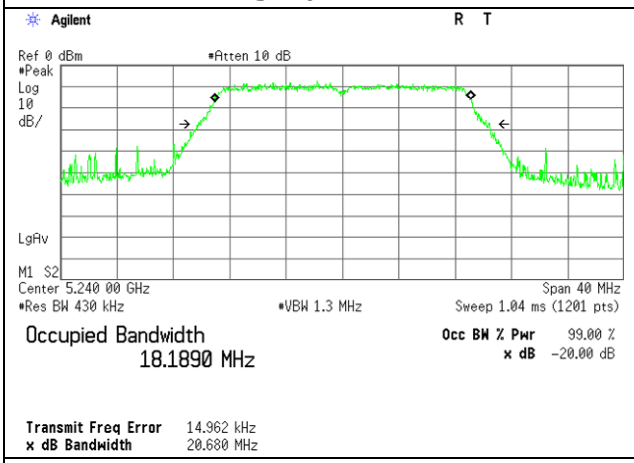
5180MHz



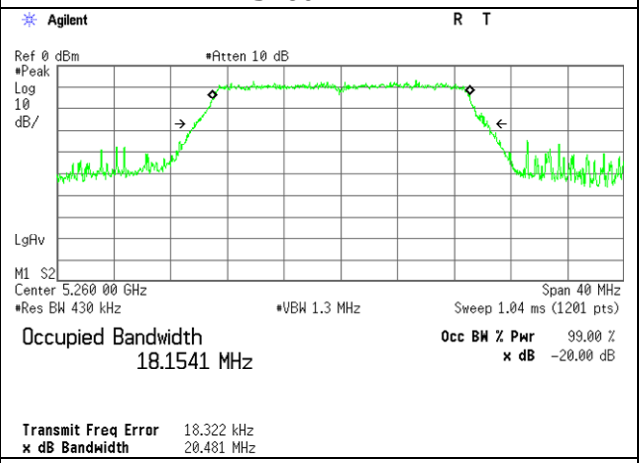
5220MHz



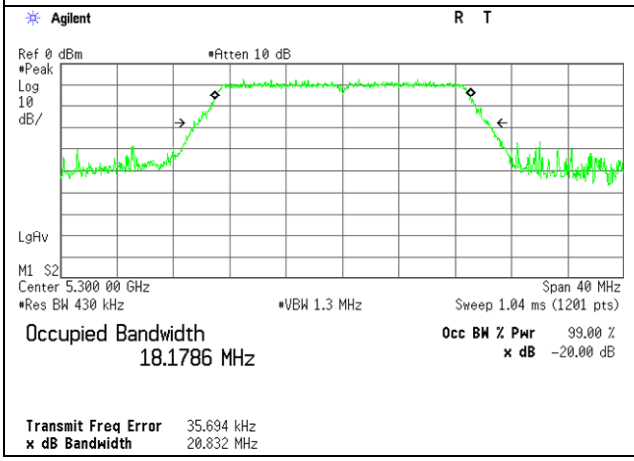
5240MHz



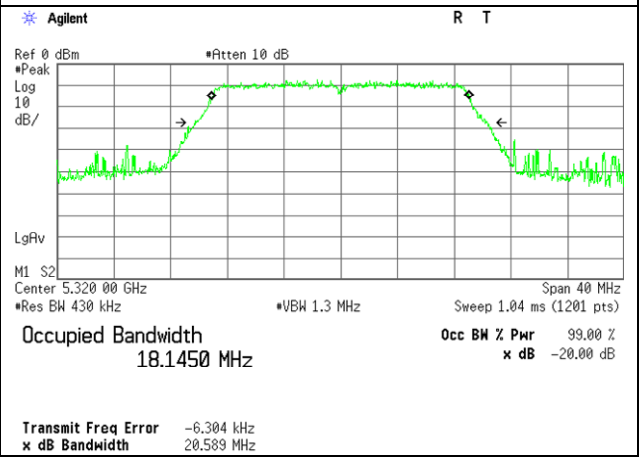
5260MHz



5300MHz



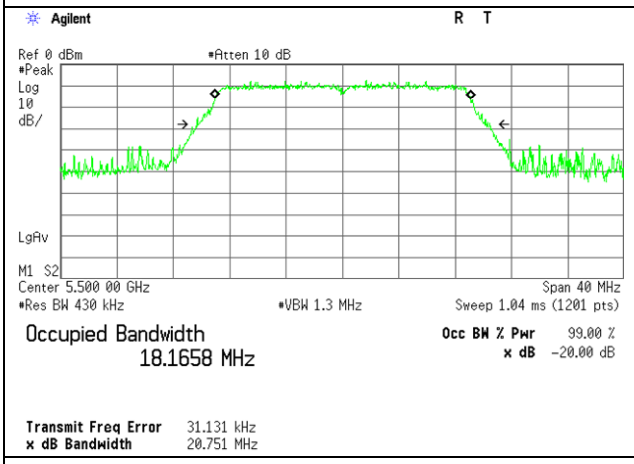
5320MHz



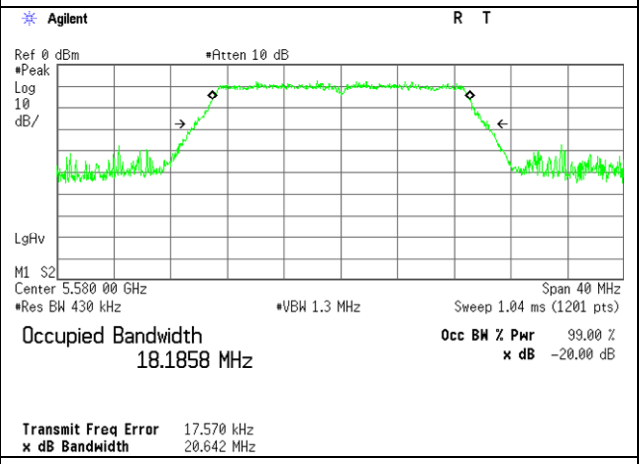
99% Occupied Bandwidth

11ac-20

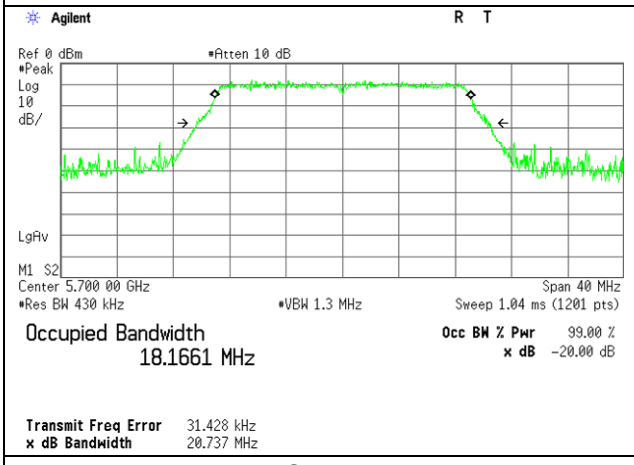
5500MHz



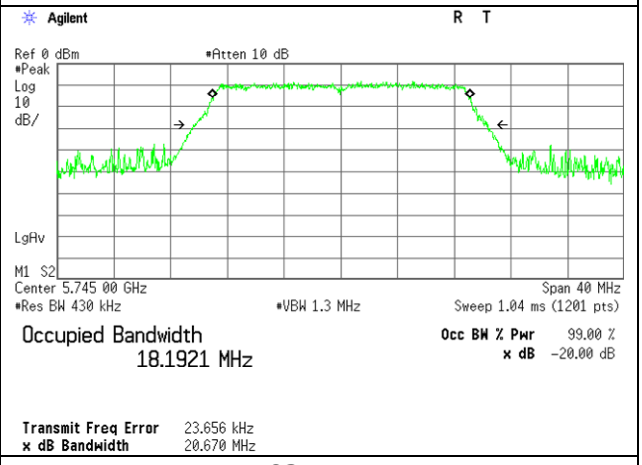
5580MHz



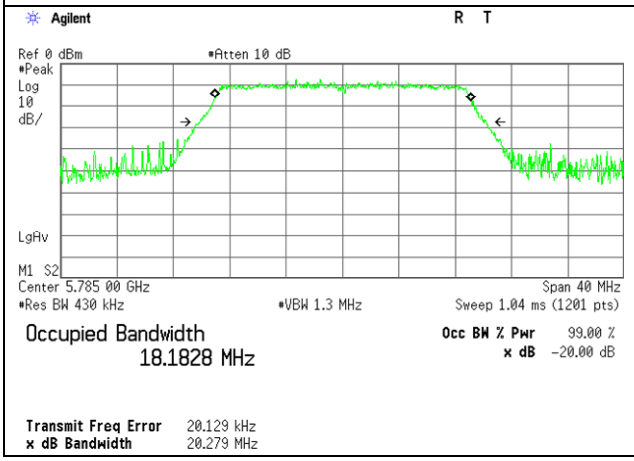
5700MHz



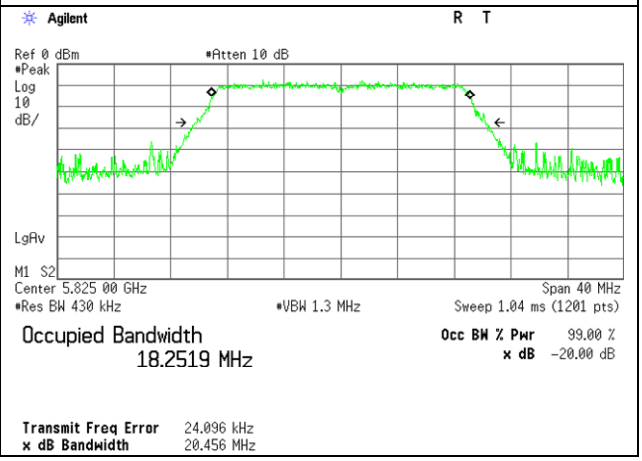
5745MHz



5785MHz



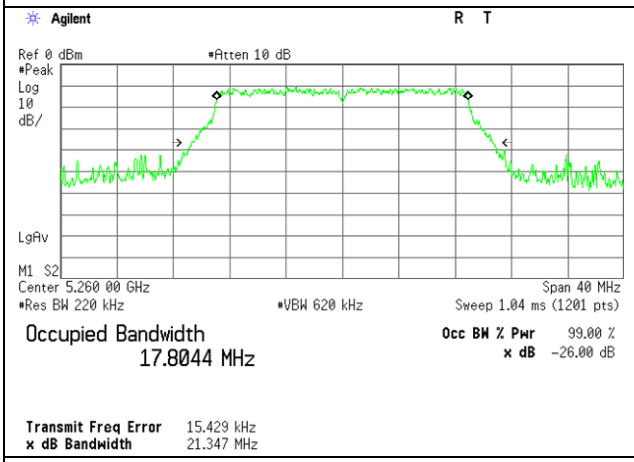
5825MHz



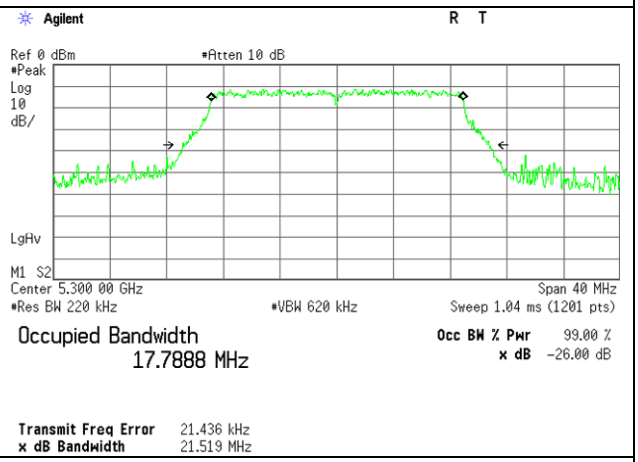
26dB Emission Bandwidth

11ac-20

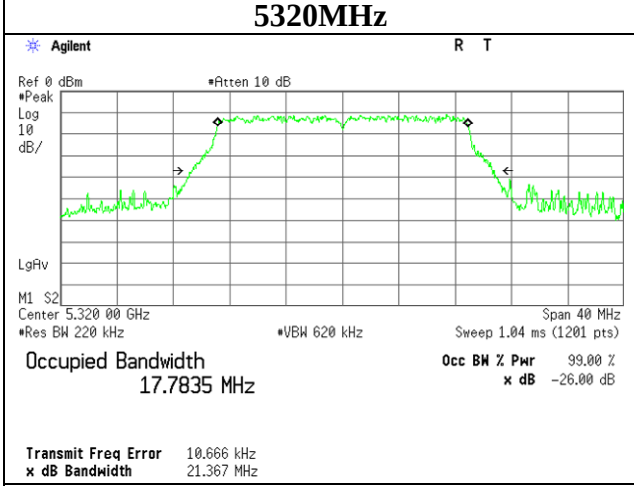
5260MHz



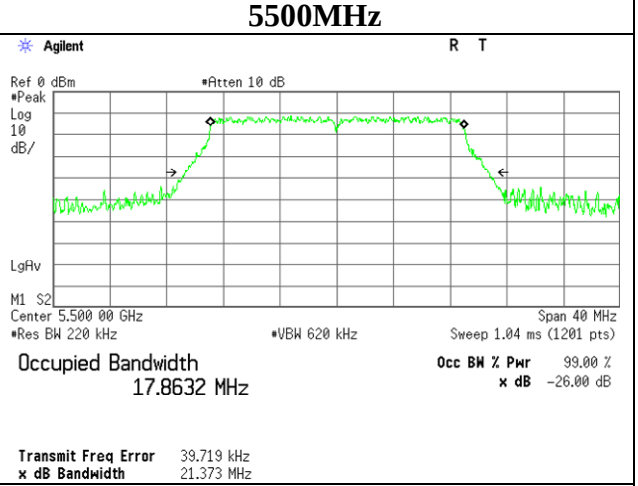
5300MHz



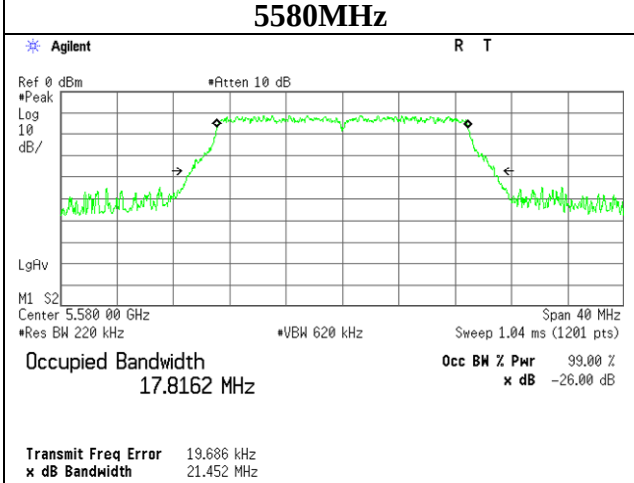
5320MHz



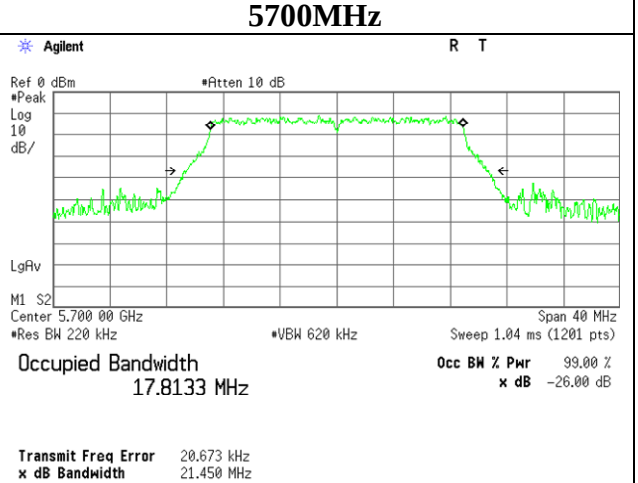
5500MHz



5580MHz



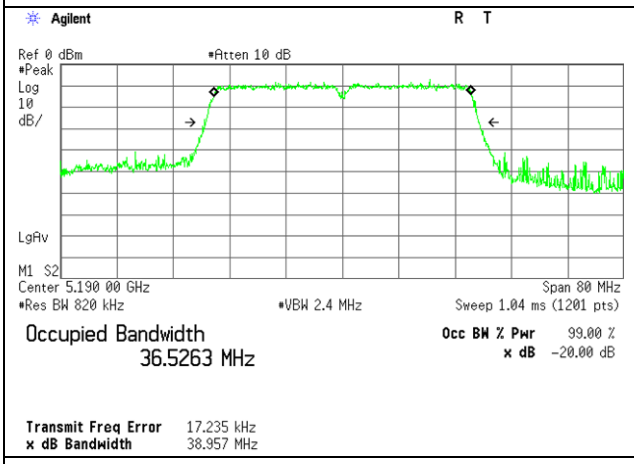
5700MHz



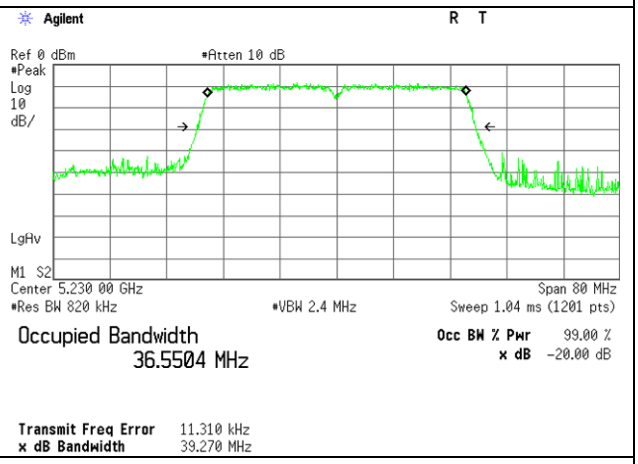
99% Occupied Bandwidth

11n-40

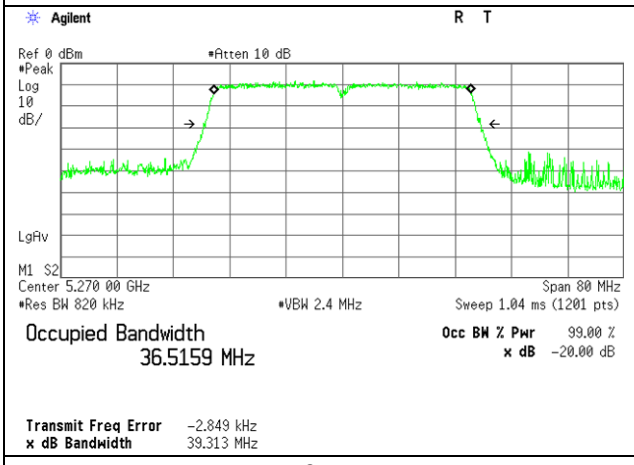
5190MHz



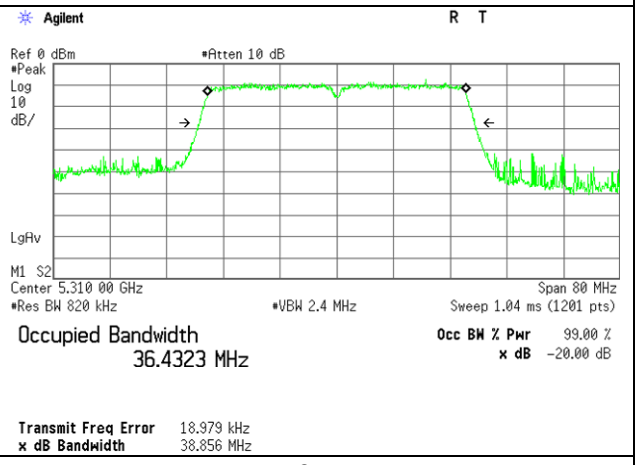
5230MHz



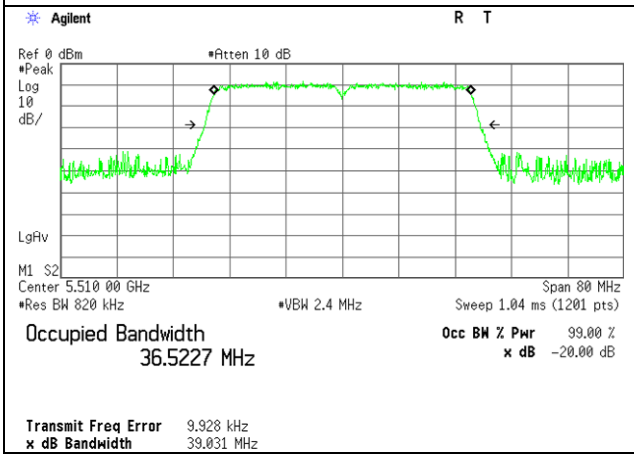
5270MHz



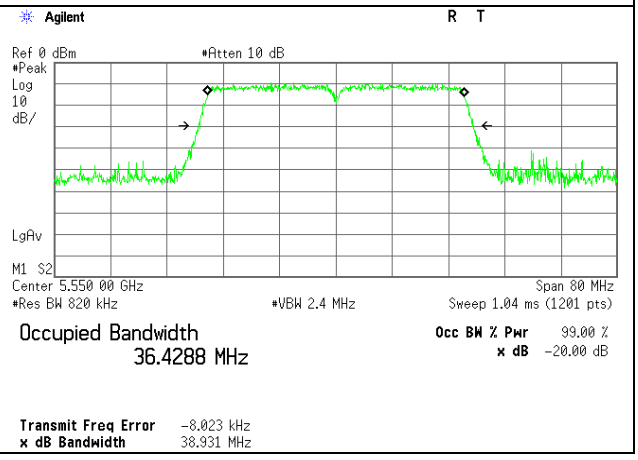
5310MHz



5510MHz



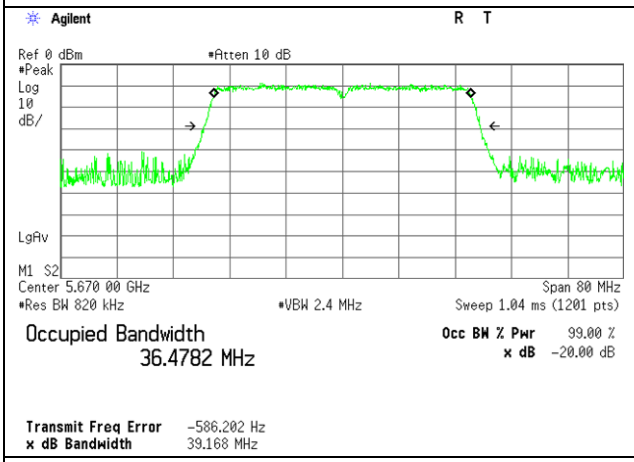
5550MHz



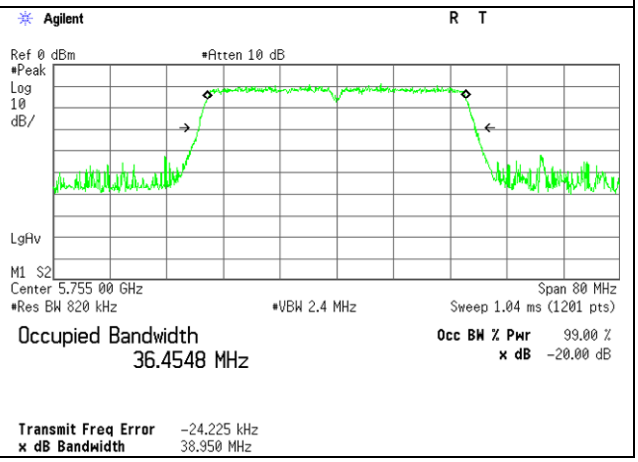
99% Occupied Bandwidth

11n-40

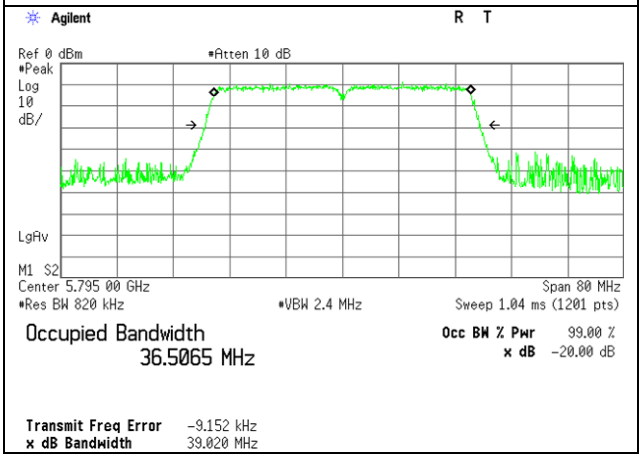
5670MHz



5755MHz



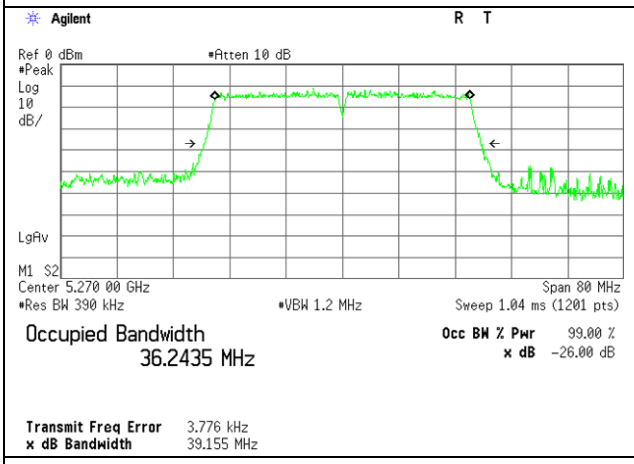
5795MHz



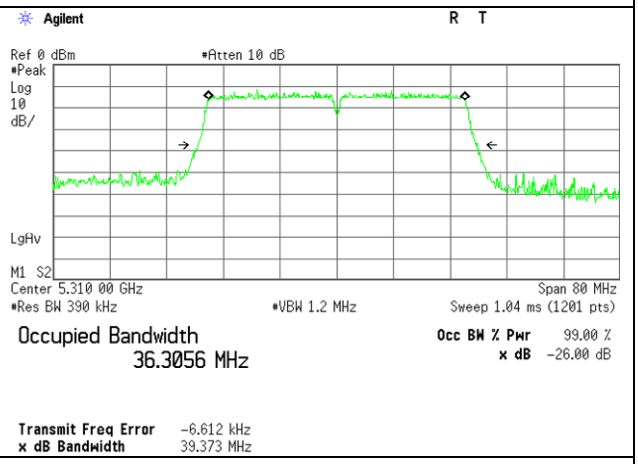
26dB Emission Bandwidth

11n-40

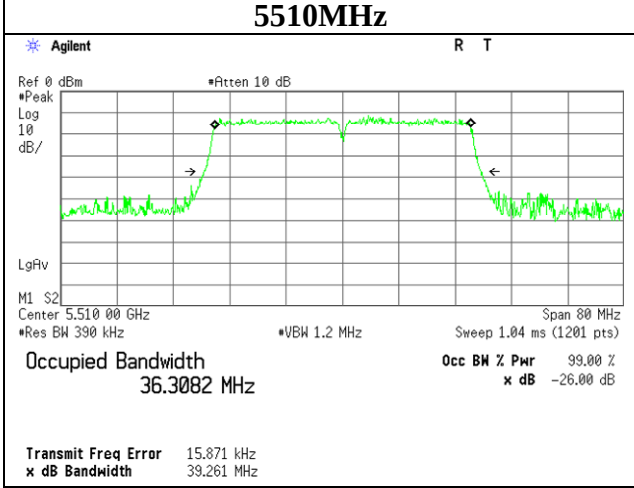
5270MHz



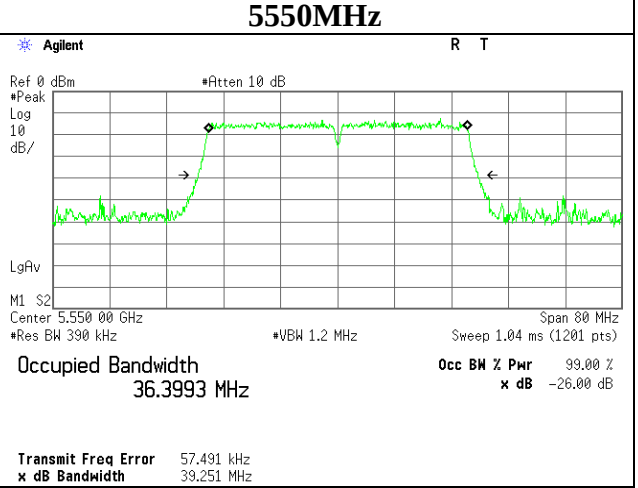
5310MHz



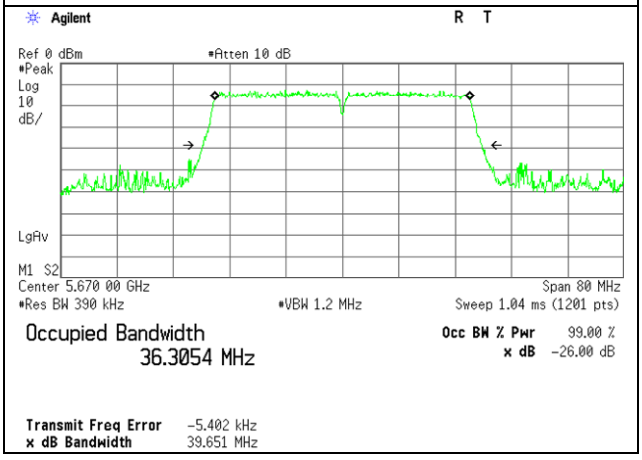
5510MHz



5550MHz



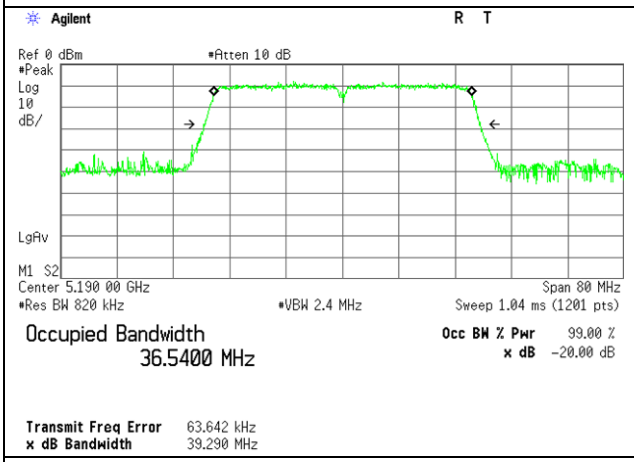
5670MHz



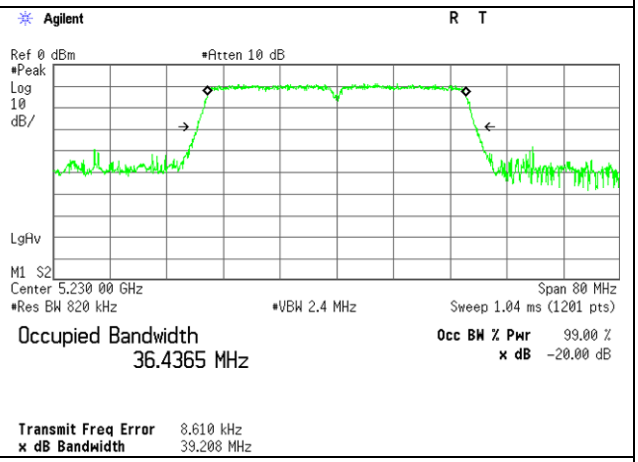
99% Occupied Bandwidth

11ac-40

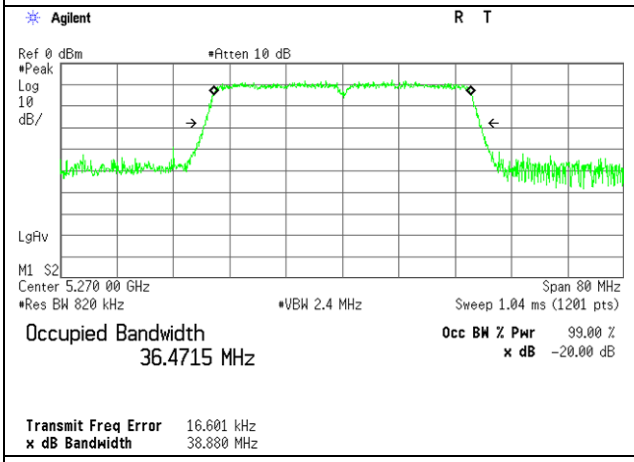
5190MHz



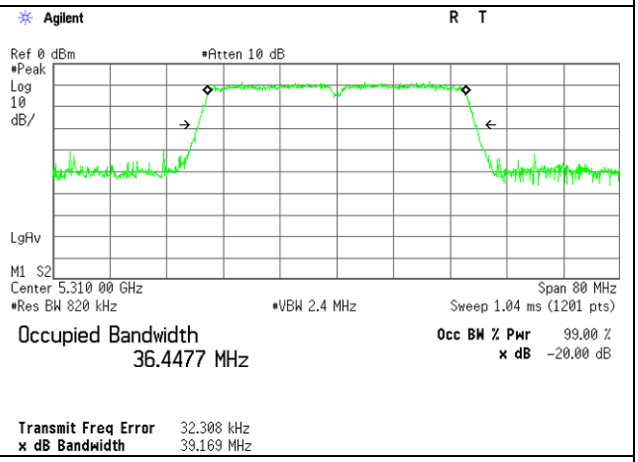
5230MHz



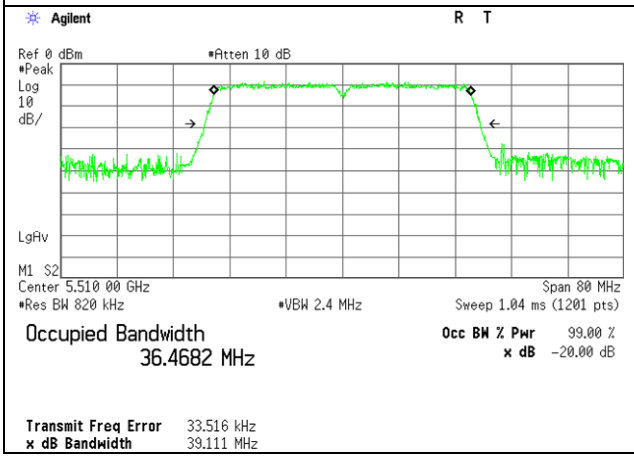
5270MHz



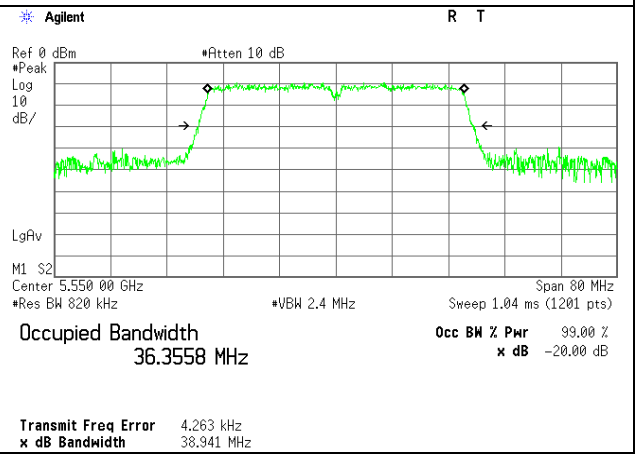
5310MHz



5510MHz



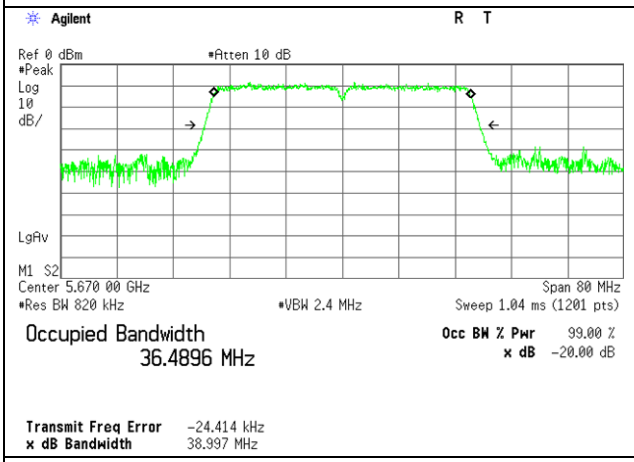
5550MHz



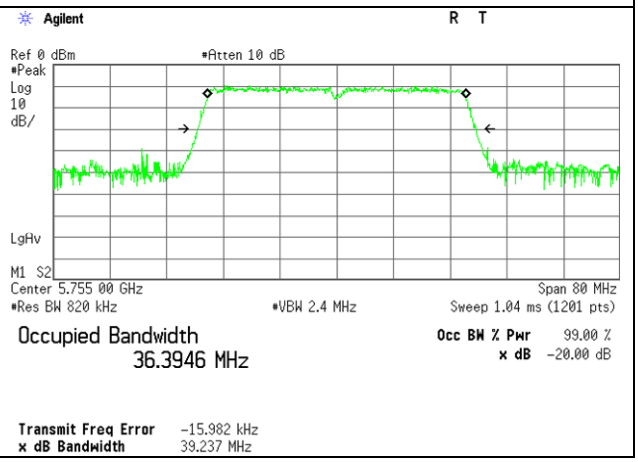
99% Occupied Bandwidth

11ac-40

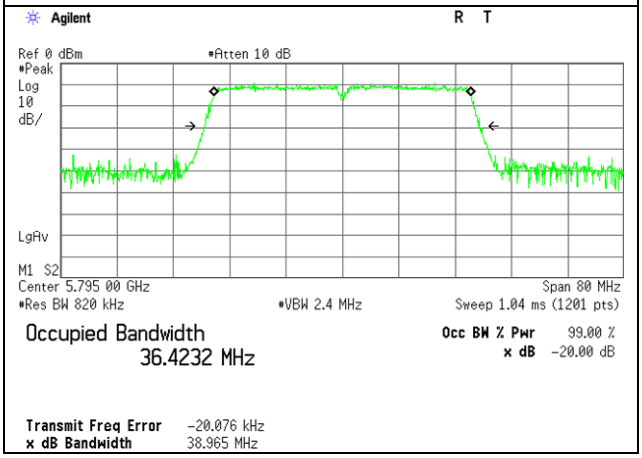
5670MHz



5755MHz



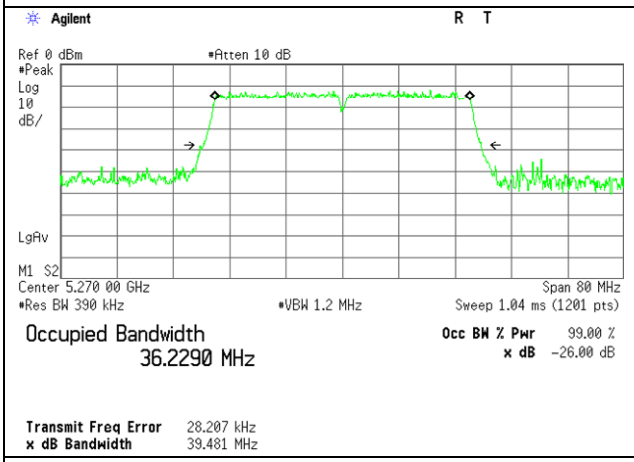
5795MHz



26dB Emission Bandwidth

11ac-40

5270MHz



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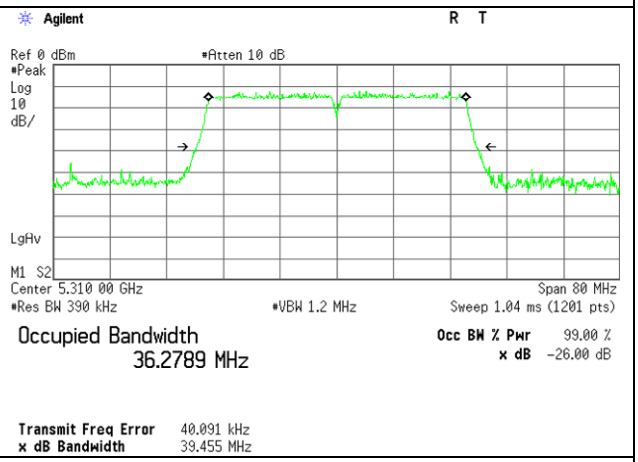

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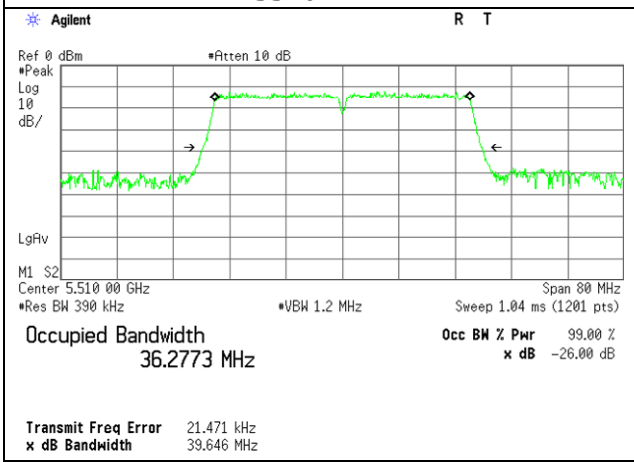

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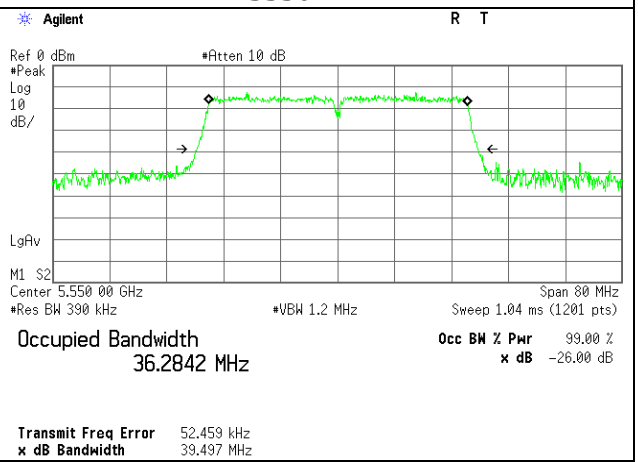

5670MHz