



RADIO TEST REPORT

Test Report No. : 10004954H-F-R2

Applicant : Sony Corporation
Type of Equipment : Personal Computer
Model No. : SVD132A1WL
FCC ID : AK8SVD132A1WL
Test regulation : FCC Part 15 Subpart E: 2012
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 report is a revised version of 10004954H-F-R1. 10004954H-F-R1 is replaced with this report.

Date of test:

April 5 to 30, 2013

Representative test engineer:


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Approved by:


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Leader of WiSE Japan,
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13-EM-F0429

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SECTION 1: Customer information

Company Name : Sony Corporation.
Address : 1-7-1 Konan, Minato-ku, Tokyo, 399-8282 Japan
Telephone Number : +81-3-6748-2569
Facsimile Number : +81-3-6748-2574
Contact Person : Hirofumi Kojima

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

2.1 Identification of E.U.T.

Type of Equipment : Personal Computer
Model No. : SVD132A1WL
Serial No. : Refer to Clause 4.2
Rating : INPUT: 100-240V, 1.2A, 50/60Hz
OUTPUT: DC 10.5V, 3.8A, 39.9W
DC 5V, 1A, 5W
Receipt Date of Sample : February 27, 2013
Country of Mass-production : Japan
Condition of EUT : Engineering 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

Feature of EUT	This model is co-located with Wireless LAN and Bluetooth module(IEEE802.11 a/b/g/n, Bluetooth) and Wireless-WAN module(GSM850/PCS/UMTS/LTE) and NFC module. Each antenna is included in the Personal computer. This model can co-operate Wireless LAN(5GHz band) + Bluetooth + Wireless WAN + NFC.
Operation Clock	CPU: 1.0GHz

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Radio Specification

Bluetooth (BDR/EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Type	PIFA
Antenna Gain	-0.56 dBi (peak) (Including Cable Loss)

Bluetooth (Low Energy)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	GFSK
Bandwidth & Channel spacing	1MHz & 2MHz
Antenna Type	PIFA
Antenna Gain	-0.56 dBi (peak) (Including Cable Loss)

WLAN (IEEE802.11a/b/g/n-20)

Equipment Type	Transceiver	
Frequency of Operation	2412-2462MHz	5180-5320MHz 5500-5700MHz * 5745-5825MHz
Type of Modulation	DSSS, OFDM	OFDM
Bandwidth & Channel spacing	20MHz & 5MHz	20MHz & 20MHz
Antenna Type	PIFA	
Antenna Gain	Ant 0: -0.56dBi (peak) Ant 1: -4.07dBi (peak) (Including Cable Loss)	Ant 0: 5150-5350MHz -0.46dBi (peak) 5470-5725MHz -1.25dBi (peak) 5825-5850MHz -2.63dBi (peak) Ant 1: 5150-5350MHz +1.32dBi (peak) 5470-5725MHz +1.20dBi (peak) 5825-5850MHz -2.73dBi (peak) (Including Cable Loss)

*5600MHz-5640MHz is not used in Canada.

WLAN (IEEE802.11n-40)

Equipment Type	Transceiver	
Frequency of Operation	2422-2452MHz	5190-5310MHz 5510-5670MHz * 5755-5795MHz
Type of Modulation	OFDM	OFDM
Bandwidth & Channel spacing	40MHz & 5MHz	40MHz & 40MHz
Antenna Type	PIFA	
Antenna Gain	Ant 0: -0.56dBi (peak) Ant 1: -4.07dBi (peak) (Including Cable Loss)	Ant 0: 5150-5350MHz -0.46dBi (peak) 5470-5725MHz -1.25dBi (peak) 5825-5850MHz -2.63dBi (peak) Ant 1: 5150-5350MHz +1.32dBi (peak) 5470-5725MHz +1.20dBi (peak) 5825-5850MHz -2.73dBi (peak) (Including Cable Loss)

*5590MHz-5630MHz is not used in Canada.

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GSM

Equipment Type	Transceiver
Frequency of Operation	[Up Link] GSM850: 824 – 849MHz PCS: 1850 – 1910MHz [Down Link] GSM850: 869 – 894MHz PCS: 1930 – 1990MHz
Type of Modulation	GMSK , 8PSK
Emission Designator	GSM850: 249KGXW, 248KG7W PCS: 247KGXW, 247KG7W
Antenna Type	PIFA
Antenna Gain	GSM850: 824-849MHz: +0.64dBi (peak) PCS: 1850-1910MHz: +1.21dBi (peak) (Including Cable Loss)

W-CDMA

Equipment Type	Transceiver
Frequency of Operation	[Up Link] Band V: 824 – 849MHz Band II: 1850 – 1910MHz [Down Link] Band V: 869 – 894MHz Band II: 1930 – 1990MHz
Type of Modulation	QPSK
Emission Designator	Band V: 4M17F9W Band II: 4M16F9W
Antenna Type	PIFA
Antenna Gain	Band V: 824-849MHz: +0.64dBi (peak) Band II: 1850-1910MHz: +1.21dBi (peak) (Including Cable Loss)

LTE

Equipment Type	Transceiver
Frequency of Operation	[Up Link] Band IV: 1710 – 1755MHz Band X VII: 704 – 716MHz [Down Link] Band IV: 2110 – 2155MHz Band X VII: 734 – 746MHz
Type of Modulation	QPSK, 16QAM
Emission Designator	Band IV: 1M11G7D, 1M09W7D, 2M71G7D, 2M70W7D, 4M50G7D, 4M50W7D, 8M97G7D, 8M98W7D, 13M43G7D, 13M45W7D, 17M95G7D, 17M95W7D Band X VII: 4M51G7D, 4M52W7D, 8M96G7D, 8M97W7D
Antenna Type	PIFA
Antenna Gain	Band IV: 1710-1755MHz: +1.21dBi (peak) Band X VII: 704-716MHz: -1.35dBi (peak) (Including Cable Loss)

NFC (FCC ID: NKR-DFCN67H)

Equipment Type	Transceiver
Frequency of Operation	13.56MHz
Type of Modulation	ASK

*This test report applies for WLAN (IEEE802.11a/n-20/n-40[5180-5700MHz]).

*NFC module was operated by polling mode during the testing.

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart E: 2012, final revised on December 27, 2012 and effective January 28, 2013

Title : FCC 47CFR Part15 Radio Frequency Device Subpart E
Unlicensed National Information Infrastructure Devices
Section 15.407 General technical requirements

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC :ANSI C63.4:2003	FCC: 15.407(b)(6) / 15.207	QP 20.9dB, 0.15000MHz, L AV 16.6dB, 18.66177MHz, L	Complied	-
	IC: RSS-Gen 7.2.4	IC: RSS-Gen 7.2.4			
26dB Emission Bandwidth	FCC :ANSI C63.4:2003 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 C63.4:2003, FCC KDB Publication Number 789033	FCC : 15.407(a)(1)(2)(3)		Complied	Conducted
	IC: -	IC: RSS-210 A9.2(1)(2)(3)			
Peak Power Spectral Density	FCC :ANSI C63.4:2003, FCC KDB Publication Number 789033	FCC : 15.407(a)(1)(2)(3)		Complied	Conducted
	IC: -	IC: RSS-210 A9.2(1)(2)(3)			
Peak Excursion Ratio	FCC :ANSI C63.4:2003, FCC KDB Publication Number 789033	FCC : 15.407(a)(6)		Complied	Conducted
	IC: -	IC: -			
Spurious Emission Restricted Band Edge	FCC: ANSI C63.4:2003	FCC : 15.407(b), 15.205 and 15.209	0.2dB 5725.000MHz, PK, Hori.	Complied	Conducted / Radiated
	IC: -	IC: RSS-210 A.9.2(1)(2)(3)			
20dB Emission Bandwidth	FCC :ANSI C63.4:2003	FCC : 15.215(c)	See data	Complied	Conducted

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 10004954H-G issued by UL Japan, Inc.

FCC 15.31 (e)

This EUT provides stable voltage(DC3.3V) constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Band Width	RSS-Gen 4.6.1	RSS-210 A9.2 (1)(2)(3)	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	3.6dB
No.3	3.6dB
No.4	3.6dB

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	4.3dB	5.0dB	5.1dB	4.9dB	5.8dB	4.4dB	4.3dB
No.2	4.3dB	5.2dB	5.1dB	5.0dB	5.7dB	4.3dB	4.2dB
No.3	4.6dB	5.0dB	5.1dB	5.0dB	5.7dB	4.5dB	4.2dB
No.4	4.8dB	5.2dB	5.0dB	5.0dB	5.7dB	5.2dB	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.

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3.5 Test Location

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	FCC Registration Number	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	313583	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	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	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	134570	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	4.75 x 5.4 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	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* 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.

Mode	Remarks*
IEEE 802.11a (11a)	36Mbps, PN9
IEEE 802.11n MISO 20MHz BW (11n-20)	MCS 6, PN9
IEEE 802.11n MIMO 20MHz BW (11n-20)	MCS 8, PN9
IEEE 802.11n MISO 40MHz BW (11n-40)	MCS 4, PN9
IEEE 802.11n MIMO 40MHz BW (11n-40)	MCS 8, PN9

*The worst condition was determined based on the test result of Maximum Peak Output Power.

*For 11a, 11n-20(MISO), and 11n-40(MISO):
Only Antenna 0 can be used as transmitting and receiving antenna.

*For 11n-20(MIMO), 11n-40(MIMO):
Both Antenna 0 and Antenna 1 can be used as transmitting and receiving antenna.
Antenna 0 and Antenna 1 can both transmit/receive simultaneously.

*EUT has the power settings by the software as follows;
Power settings: See below Tables
Software: 43241_B4_mfg_tool_package, Version 1.3

Table 1: Power Settings for 20MHz bandwidth system:

Channel	Frequency [MHz]	11a	11n-20 MISO	11n-20 MIMO
36	5180	24	27	14
44	5220	28	29	15
48	5240	29	27	15
52	5260	100	95	57
60	5300	109	102	48
64	5320	63	63	30
100	5500	39	41	28
116	5580	103	104	86
136	5680	100	100	79
140	5700	52	52	21

Table 2: Power Settings for 40MHz bandwidth system:

Channel	Frequency [MHz]	11n-40 MISO	11n-40 MIMO
38	5190	26	18
46	5230	54	21
54	5270	82	48
62	5310	30	20
102	5510	20	16
110	5550	44	38
134	5590	46	25

*The power settings of software are 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.

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*The details of Operating mode(s)

Test Item	Operating Mode	Tested Antenna	Tested Frequency		
			Low Band	Middle Band	Additional Band
Conducted emission, Spurious Emission (Radiated)(Below 1GHz)	11n-20 Tx *1)	0+1 (Multi out)	-	-	5580MHz
Spurious Emission (Radiated)(Above 1GHz)	11n-20 Tx *2)	0+1 (Multi out)	5180MHz	5260MHz 5320MHz	5500MHz 5580MHz 5700MHz
	11n-40 Tx	0+1 (Multi out)	5190MHz	5270MHz 5310MHz	5510MHz 5550MHz 5670MHz
Spurious Emission (Radiated)	11n-20 Tx, MIMO + Bluetooth DH5 2441MHz *3)	0+1 (Multi out)	-	-	5580MHz
26dB Emission Bandwidth, 99% Occupied Bandwidth, Maximum Conducted Output Power, Peak Power Spectral Density	11a Tx	0	5180MHz 5220MHz 5240MHz	5260MHz 5300MHz 5320MHz	5500MHz 5580MHz 5700MHz
	11n-20 Tx, MISO	0,1	5180MHz 5220MHz 5240MHz	5260MHz 5300MHz 5320MHz	5500MHz 5580MHz 5700MHz
	11n-40 Tx, MISO	0	5190MHz 5230MHz	5270MHz 5310MHz	5510MHz 5550MHz 5670MHz
	11n-40 Tx, MIMO	0,1	5190MHz 5230MHz	5270MHz 5310MHz	5510MHz 5550MHz 5670MHz
Spurious Emission (Conducted)(Below 30MHz)	11a Tx	0	5180MHz 5220MHz 5240MHz	5260MHz 5300MHz 5320MHz	5500MHz 5580MHz 5700MHz
	11n-20 Tx, MIMO	0 *4)	5180MHz 5220MHz 5240MHz	5260MHz 5300MHz 5320MHz	5500MHz 5580MHz 5700MHz
	11n-40 Tx, MISO	0	5190MHz 5230MHz	5270MHz 5310MHz	5510MHz 5550MHz 5670MHz
	11n-40 Tx, MIMO	0 *4)	5190MHz 5230MHz	5270MHz 5310MHz	5510MHz 5550MHz 5670MHz
20dB Bandwidth	11a Tx	0	5240MHz	5260MHz	5580MHz 5660MHz
	11n-20 Tx, MISO	0,1	5240MHz	5260MHz	5580MHz 5660MHz
	11n-20 Tx, MIMO	0,1	5240MHz	5260MHz	5580MHz 5660MHz
	11n-40 Tx, MISO	0	5230MHz	5270MHz	5550MHz 5670MHz
Peak Excursion Ratio	11a Tx	0	-	5300MHz	-
	11n-20 Tx, MISO	0,1	-	5300MHz	-
	11n-20 Tx, MIMO	0,1	-	5300MHz	-
	11n-40 Tx, MIMO	0,1	-	5310MHz	-

- *1) The mode was tested as a representative, because it had the highest power at antenna terminal test.
*2) Since 11a and 11n-20 have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest peak output power.
*3) EUT can transmit 2.4GHz Bluetooth and 5GHz WLAN simultaneously. Therefore, co-location tests are added for simultaneous transmitting of 2.4GHz / 5GHz WLAN function and Bluetooth function.
*4) After the comparison between Antenna 0 and Antenna 1, test was performed with the antenna that had higher conducted power as a representative.

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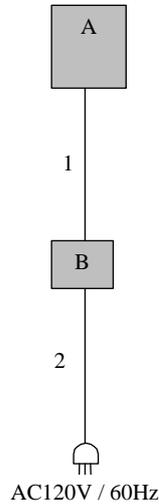
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4.2 Configuration and peripherals



* 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	Remarks
A	Personal Computer	SVD132A1WL	ZOPJJPB 11 *1) XTS3-2 3 *2) XTS2-1 8 *3)	SONY	EUT
B	AC Adaptor	VGP-AC10V10	000006701 0000346	SONY	EUT

*1) Used for Radiated Spurious Emission test on Bluetooth LE mode and 11n-20 MIMO Tx +Bluetooth DH5 2441MHz mode

*2) Used for Conducted Emission and Radiated Spurious Emission on other modes than above

*3) Used for Antenna Terminal Conducted test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	1.7	Unshielded	Unshielded	-
2	AC Cable	1.5	Unshielded	Unshielded	-

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SECTION 5: Conducted Emission

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 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

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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).

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

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

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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.
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 D01 UNII General Test Procedures v01r02 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E(Issued on September 26, 2012)".

*2) Distance Factor: $20 \times \log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$

*3) Distance Factor: $20 \times \log(3.0\text{m}/0.5\text{m}) = 15.6\text{dB}$

- KDB 644545 D01 Guidance for IEEE802.11ac v01r01, G)2)a)i) and ii) was applied due to 20dB bandwidth test result and product specification of the EUT that is 5GHz band and is restricted to indoor operation.

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of Tablet Style and Laptop Style 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

UL Japan, Inc.

Head Office EMC Lab.

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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	50MHz / 100MHz	Close to 1% of EBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	50MHz / 100MHz	Close to 1% of Span	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
20dB Bandwidth	30MHz / 50MHz	Close to 1% of Span	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Conducted Output Power	(Wideband RF Average Power Meter)	-	-	Auto	Average	-	Power Meter Method PM
Peak Power Spectral Density	40 / 45 / 80 / 90MHz	1MHz	3MHz	Auto	Sample Power Averaging (100 times)	Clear Write	Spectrum Analyzer Method SA-2
Peak Excursion Ratio	50MHz	1MHz	3MHz	Auto	Peak Sample Power Averaging (100 times)	Max Hold Clear Write	Spectrum Analyzer
Conducted Spurious Emission	9kHz – 150kHz 150kHz – 30MHz	200Hz 9.1kHz	620kHz 27kHz	Auto	Peak	Max Hold	Spectrum Analyzer

*The test method was also referred to KDB 789033 D01 UNII General Test Procedures v01r02 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E(Issued on September 26, 2012)".

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

Test data : APPENDIX
Test result : Pass

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Head Office EMC Lab.

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APPENDIX 1: Data of EMI test

Conducted Emission

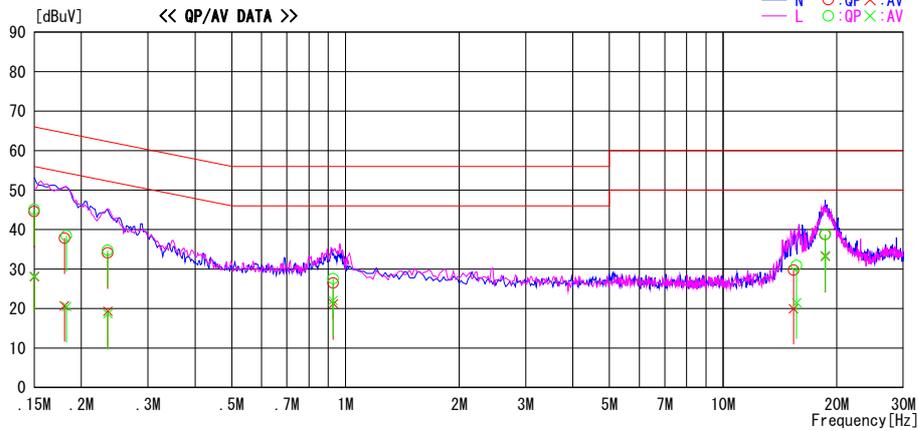
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
 Date : 2013/04/11

Report No. : 10004954H
 Temp./Humi. : 21deg. C / 38% RH
 Engineer : Kazuya Yoshioka

Mode / Remarks : Tx 11n-20 MCS8 5580MHz MIMO

LIMIT : FCC15.207 QP
 FCC15.207 AV



Frequency [MHz]	Reading		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15000	31.3	14.8	13.3	44.6	28.1	66.0	56.0	21.4	27.9	N	
0.18045	24.5	7.4	13.3	37.8	20.7	64.5	54.5	26.7	33.8	N	
0.23483	20.8	6.0	13.3	34.1	19.3	62.3	52.3	28.2	33.0	N	
0.92827	13.0	7.7	13.5	26.5	21.2	56.0	46.0	29.5	24.8	N	
15.36351	15.0	5.3	14.7	29.7	20.0	60.0	50.0	30.3	30.0	N	
18.62164	23.8	18.3	14.9	38.7	33.2	60.0	50.0	21.3	16.8	N	
0.15000	31.8	14.9	13.3	45.1	28.2	66.0	56.0	20.9	27.8	L	
0.18263	25.2	7.2	13.3	38.5	20.5	64.4	54.4	25.9	33.9	L	
0.23483	21.4	5.4	13.3	34.7	18.7	62.3	52.3	27.6	33.6	L	
0.92760	14.1	8.6	13.5	27.6	22.1	56.0	46.0	28.4	23.9	L	
15.65351	16.2	6.8	14.7	30.9	21.5	60.0	50.0	29.1	28.5	L	
18.66177	23.9	18.5	14.9	38.8	33.4	60.0	50.0	21.2	16.6	L	

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

26dB Emission Bandwidth and 99% Occupied Bandwidth

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 10004954H
Date 04/05/2013 04/10/2013 04/11/2013
Temperature/ Humidity 20deg. C / 53% RH 25deg. C / 26% RH 18deg. C / 44% RH
Engineer Yutaka Yoshida Yutaka Yoshida Yutaka Yoshida
Mode 11a Tx

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5180	20.549	17.6179	-
5220	20.546	17.6370	-
5240	20.159	16.7603	-
5260	31.110	17.5171	-
5300	34.068	18.6640	-
5320	26.437	16.9602	-
5500	21.807	16.8110	-
5580	35.419	20.0612	-
5700	26.079	16.9279	-

UL Japan, Inc.

Head Office EMC Lab.

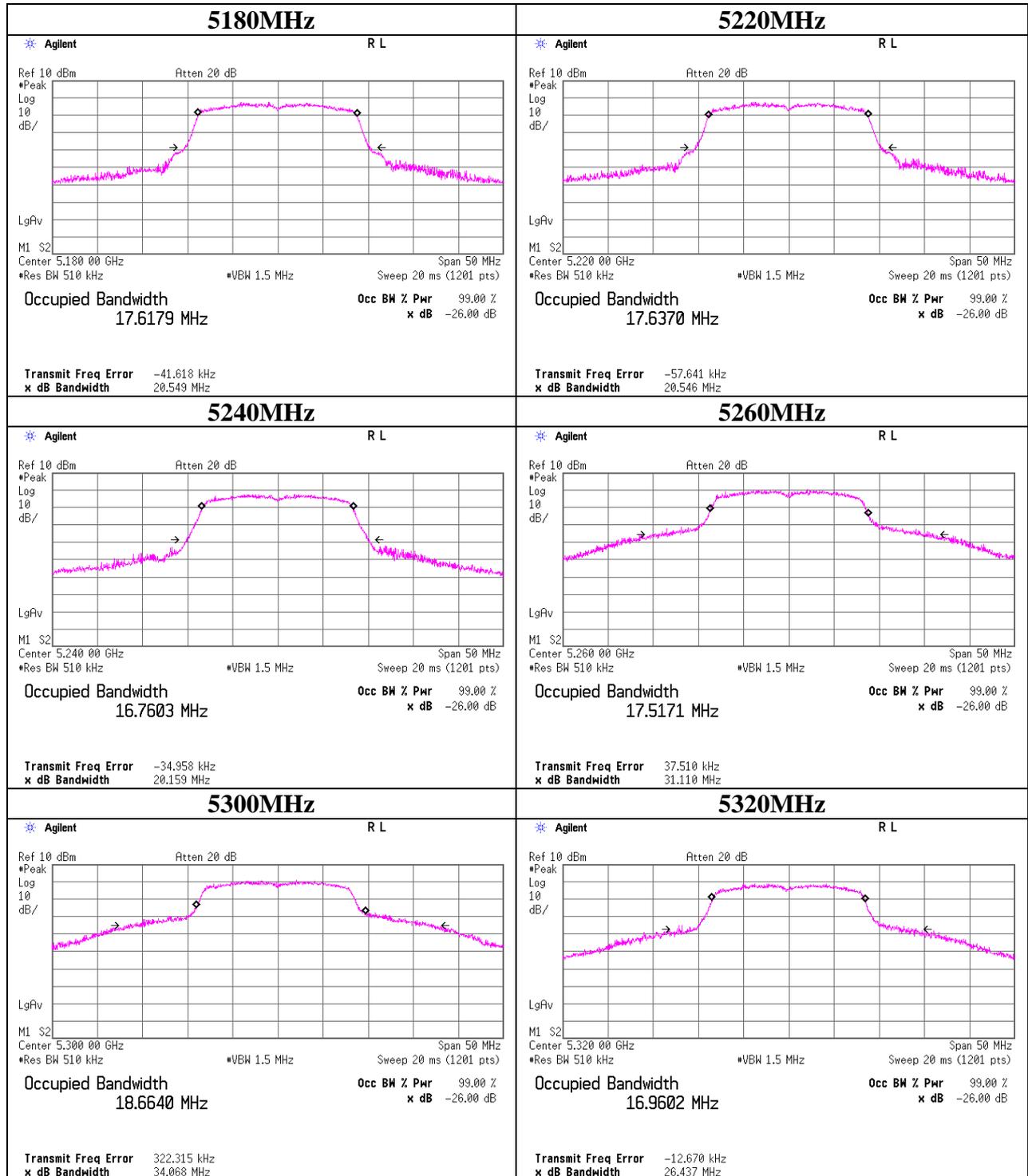
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26dB Emission Bandwidth and 99% Occupied Bandwidth

11a Antenna 0



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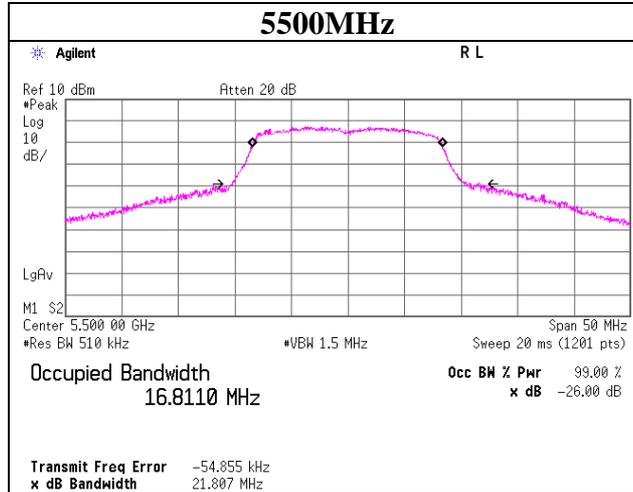
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

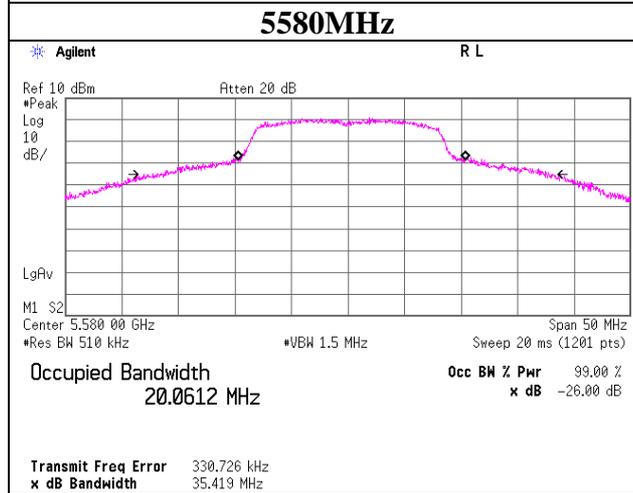
26dB Emission Bandwidth

11a Antenna 0

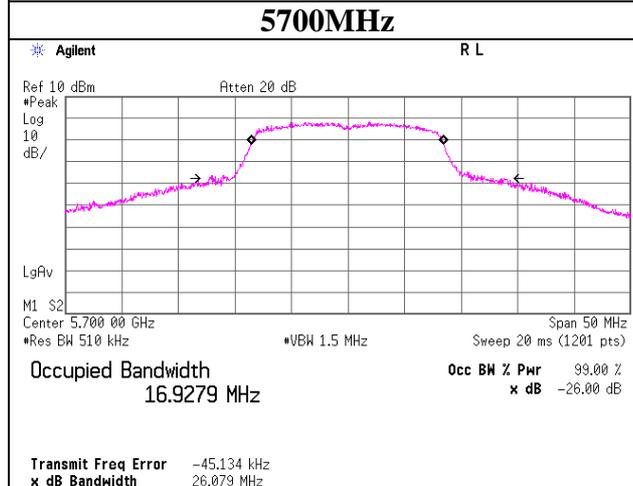
5500MHz



5580MHz



5700MHz



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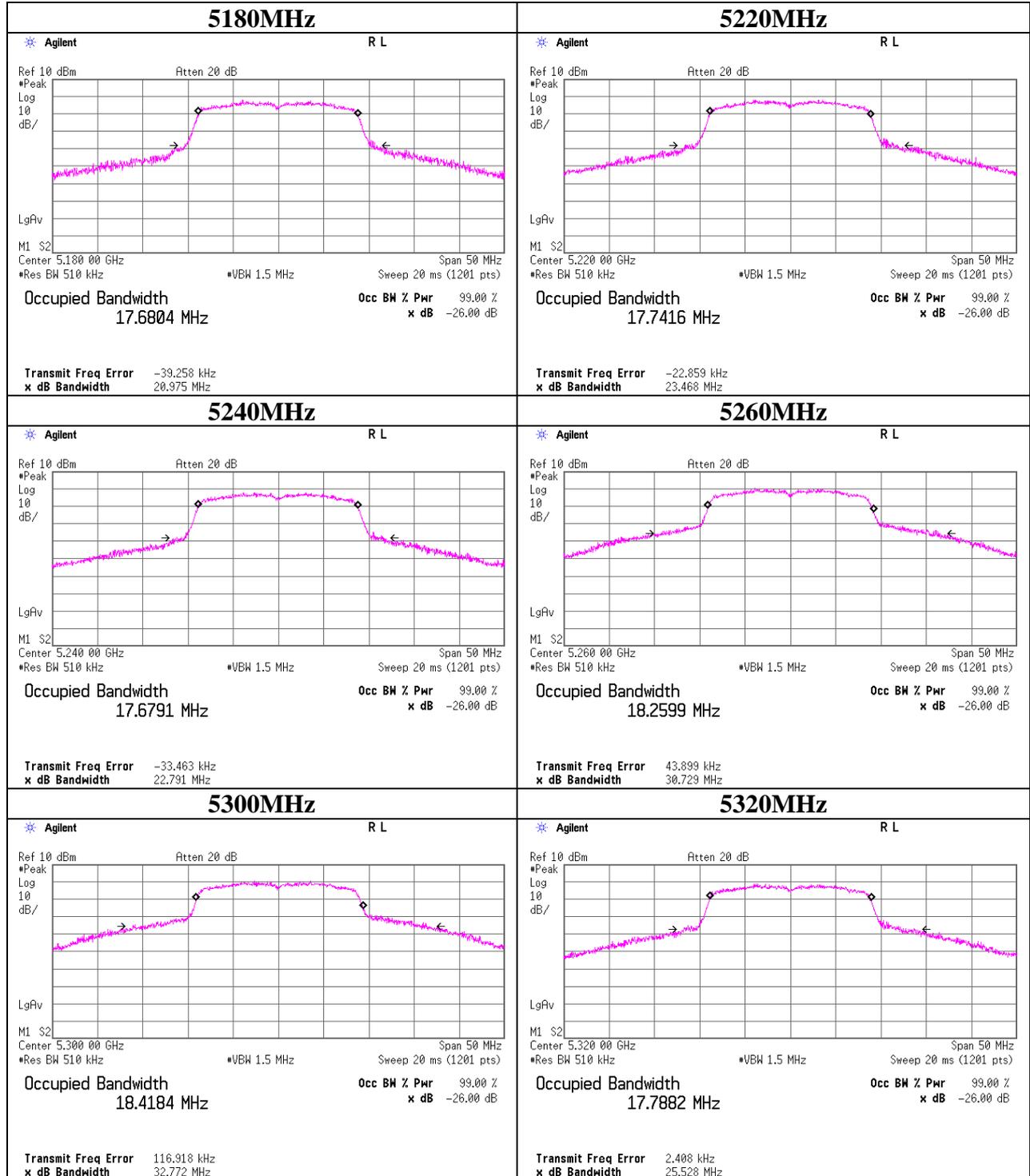
26dB Emission Bandwidth and 99% Occupied Bandwidth

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 10004954H
Date 04/05/2013 04/10/2013 04/11/2013
Temperature/ Humidity 20deg. C / 53% RH 25deg. C / 26% RH 18deg. C / 44% RH
Engineer Yutaka Yoshida Yutaka Yoshida Yutaka Yoshida
Mode 11n-20 Tx, MISO, Antenna 0

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5180	20.975	17.6804	-
5220	23.468	17.7416	-
5240	22.791	17.6791	-
5260	30.729	18.2599	-
5300	32.772	18.4184	-
5320	25.528	17.7882	-
5500	21.623	17.6751	-
5580	37.886	19.9937	-
5700	23.198	17.7640	-

26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-20 MISO Antenna 0



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Head Office EMC Lab.

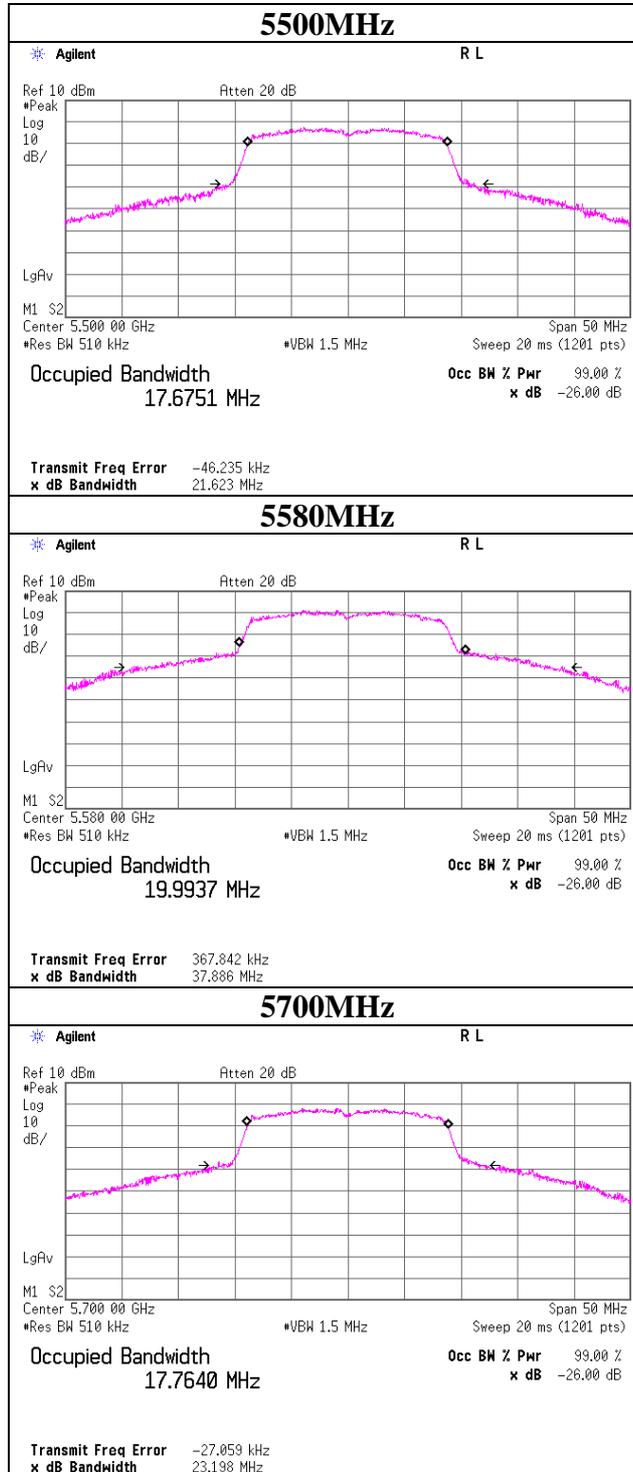
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26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-20 MISO Antenna 0



26dB Emission Bandwidth and 99% Occupied Bandwidth

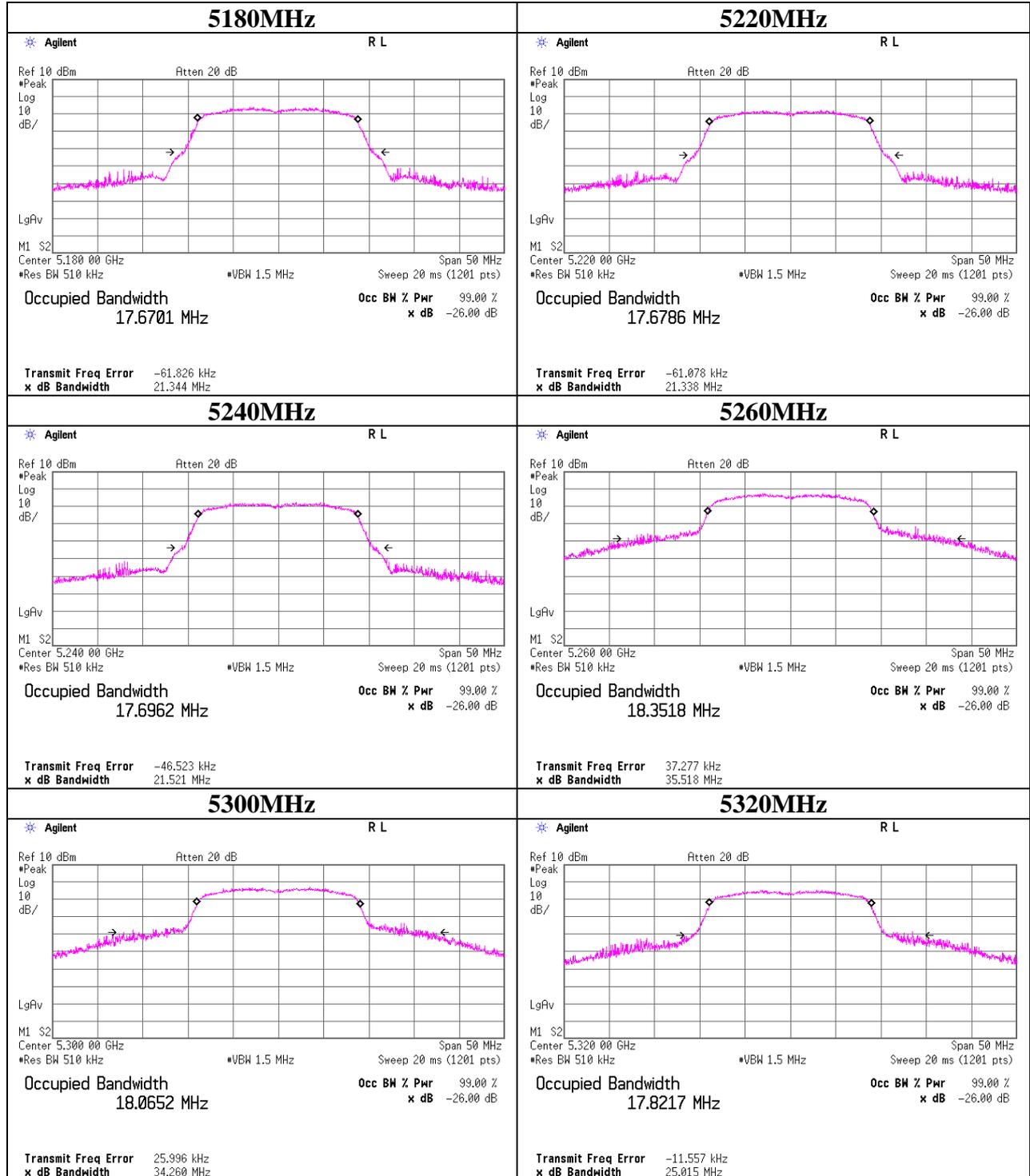
Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 10004954H
Date 04/05/2013 04/10/2013 04/11/2013
Temperature/ Humidity 20deg. C / 53% RH 25deg. C / 26% RH 18deg. C / 44% RH
Engineer Yutaka Yoshida Yutaka Yoshida Yutaka Yoshida
Mode 11n-20 Tx, MIMO

Antenna	Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
0	5180	21.344	17.6701	-
	5220	21.338	17.6786	-
	5240	21.521	17.6962	-
	5260	35.518	18.3518	-
	5300	34.260	18.0652	-
	5320	25.015	17.8217	-
	5500	31.339	17.9542	-
	5580	42.387	25.5996	-
	5700	21.662	17.7572	-

Antenna	Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
1	5180	20.603	17.5569	-
	5220	20.720	17.5322	-
	5240	20.557	17.5360	-
	5260	32.236	17.9501	-
	5300	32.266	17.7538	-
	5320	20.734	17.5795	-
	5500	20.722	17.5972	-
	5580	38.922	23.3340	-
	5700	20.759	17.5860	-

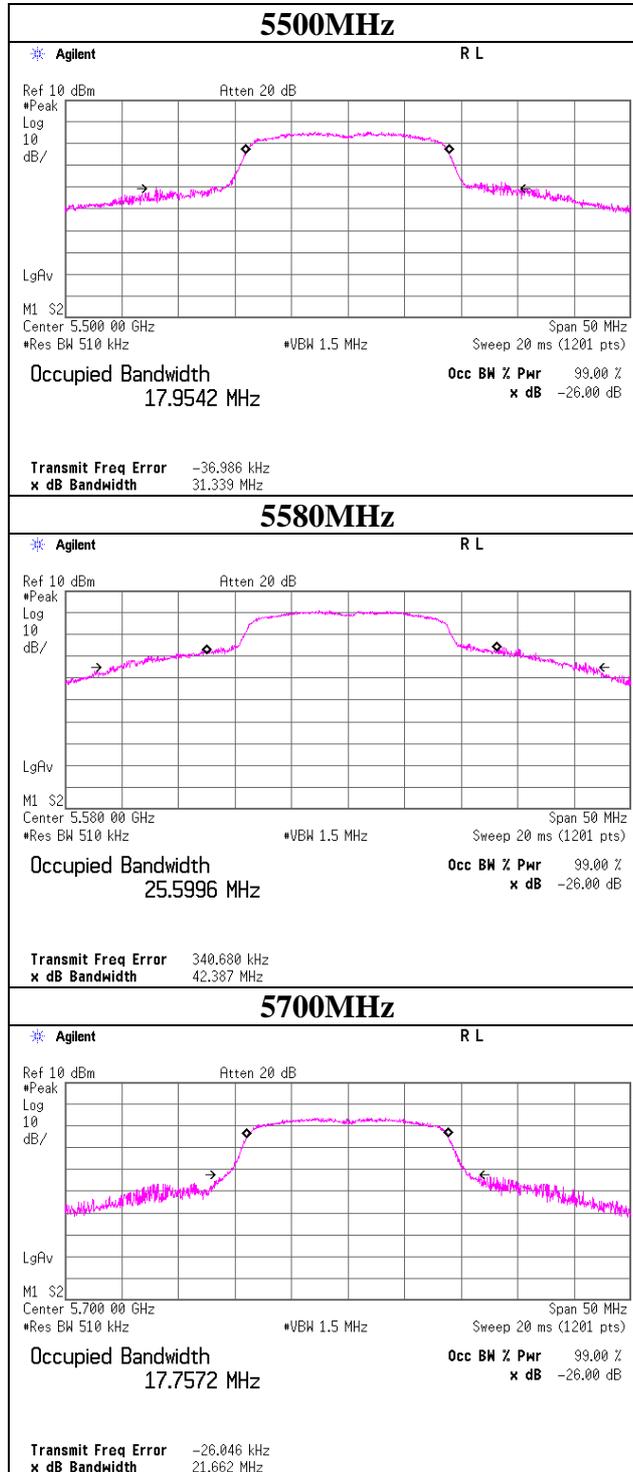
26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-20 MIMO Antenna 0



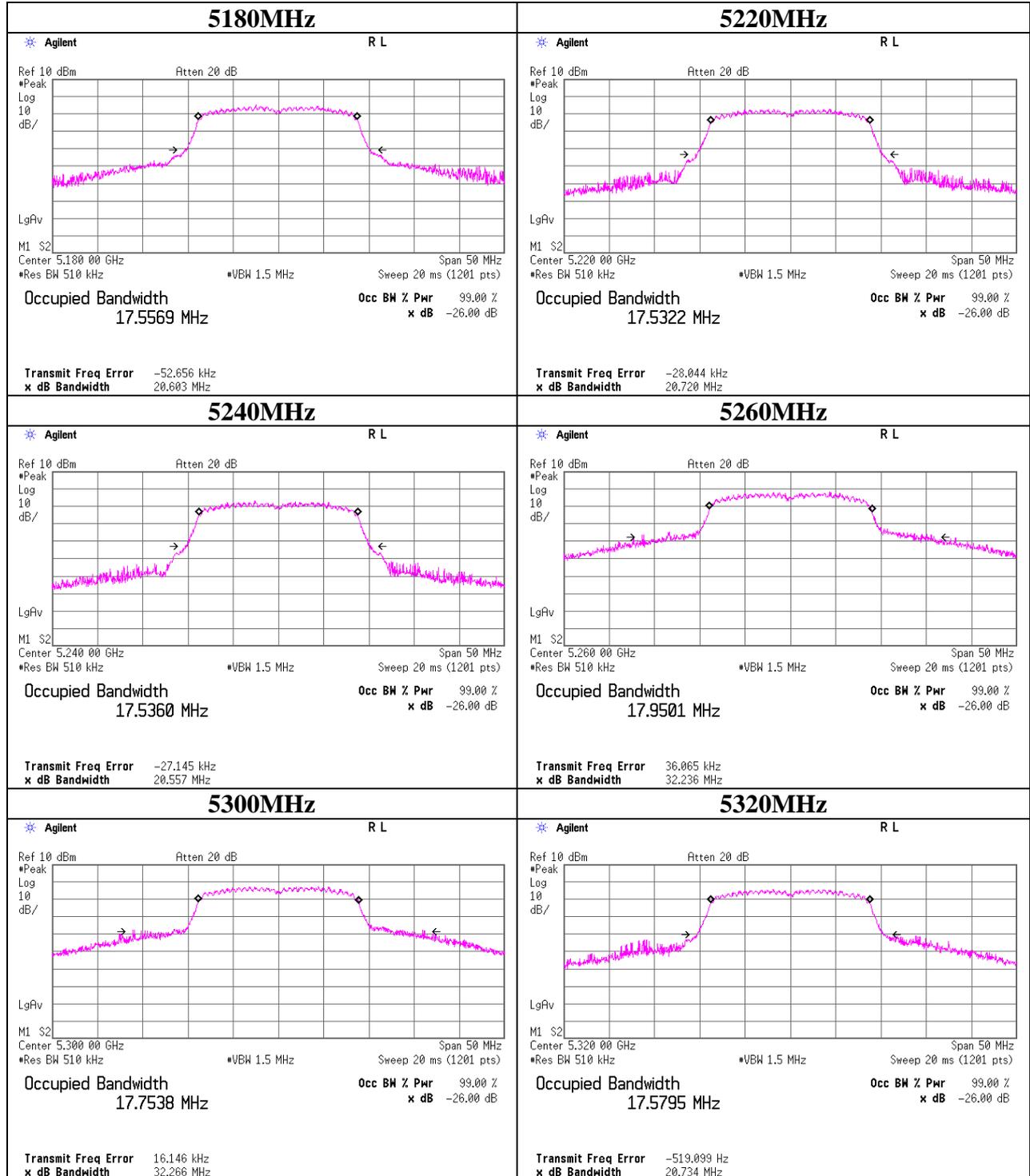
26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-20 MIMO Antenna 0



26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-20 MIMO Antenna 1



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Head Office EMC Lab.

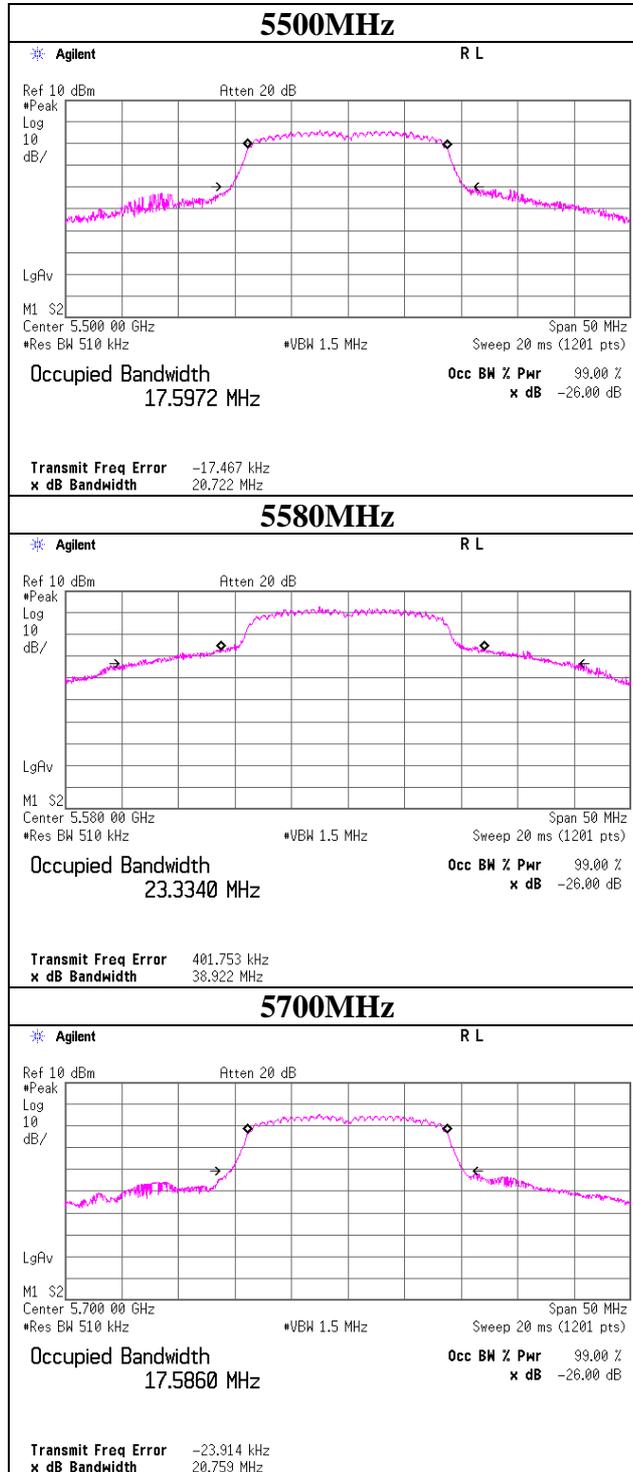
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-20 MIMO Antenna 1



26dB Emission Bandwidth and 99% Occupied Bandwidth

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 10004954H
Date 04/05/2013 04/10/2013
Temperature/ Humidity 20deg. C / 53% RH 25deg. C / 26% RH
Engineer Yutaka Yoshida Yutaka Yoshida
Mode 11n-40 Tx, MISO, Antenna 0

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5190	45.429	36.8198	-
5230	50.519	37.1174	-
5270	76.359	38.9135	-
5310	45.756	36.8991	-
5510	45.410	36.8381	-
5550	50.067	37.1186	-
5670	52.939	37.1224	-

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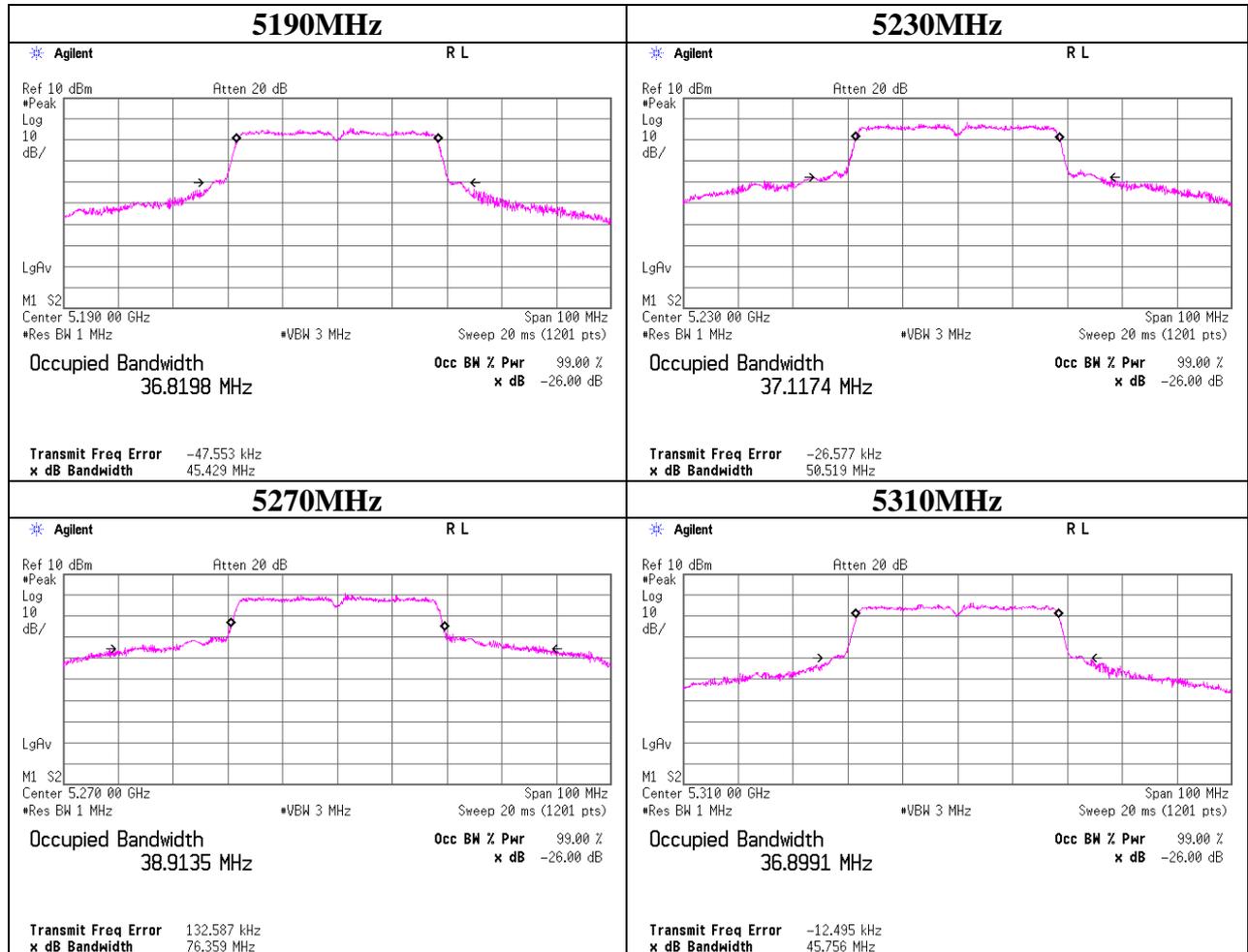
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26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-40 MISO Antenna 0



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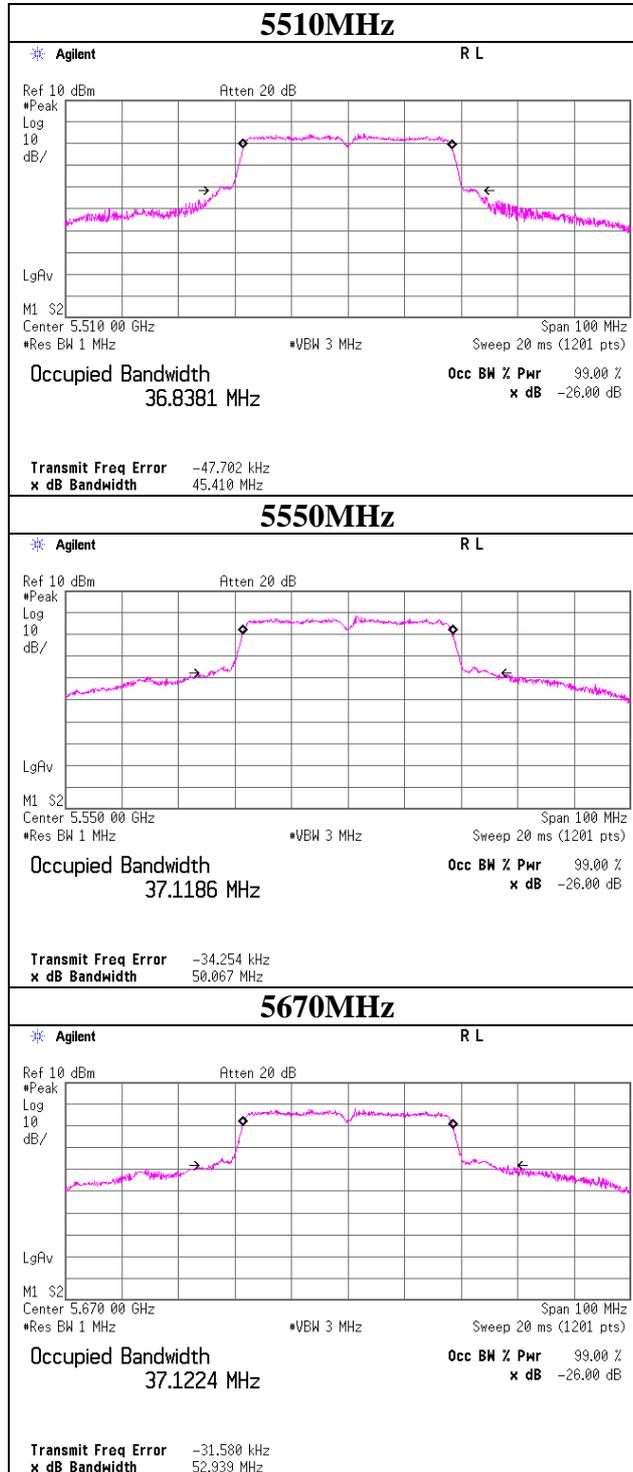
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26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-40 MISO Antenna 0



26dB Emission Bandwidth and 99% Occupied Bandwidth

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 10004954H
Date 04/05/2013 04/10/2013
Temperature/ Humidity 20deg. C / 53% RH 25deg. C / 26% RH
Engineer Yutaka Yoshida Yutaka Yoshida
Mode 11n-40 Tx, MIMO

Antenna	Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
0	5190	50.596	37.1664	-
	5230	46.124	36.9896	-
	5270	75.025	37.4161	-
	5310	46.066	36.9910	-
	5510	45.418	37.0891	-
	5550	81.269	37.8177	-
	5670	46.423	37.1047	-

Antenna	Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
1	5190	46.360	36.7789	-
	5230	49.839	36.8397	-
	5270	85.710	38.1212	-
	5310	49.447	36.8049	-
	5510	47.035	36.7762	-
	5550	67.046	36.9751	-
	5670	65.558	37.0174	-

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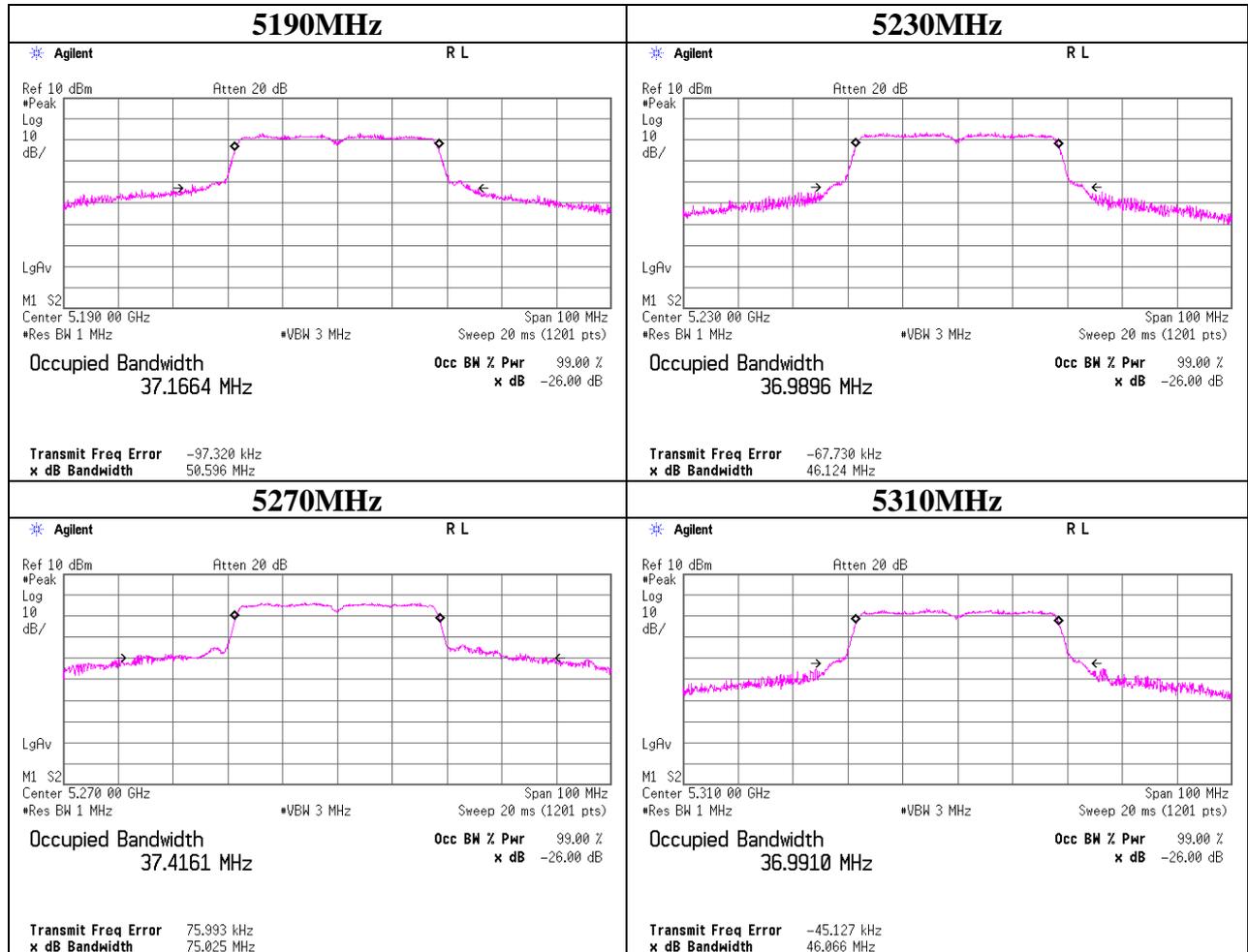
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-40 MIMO Antenna 0



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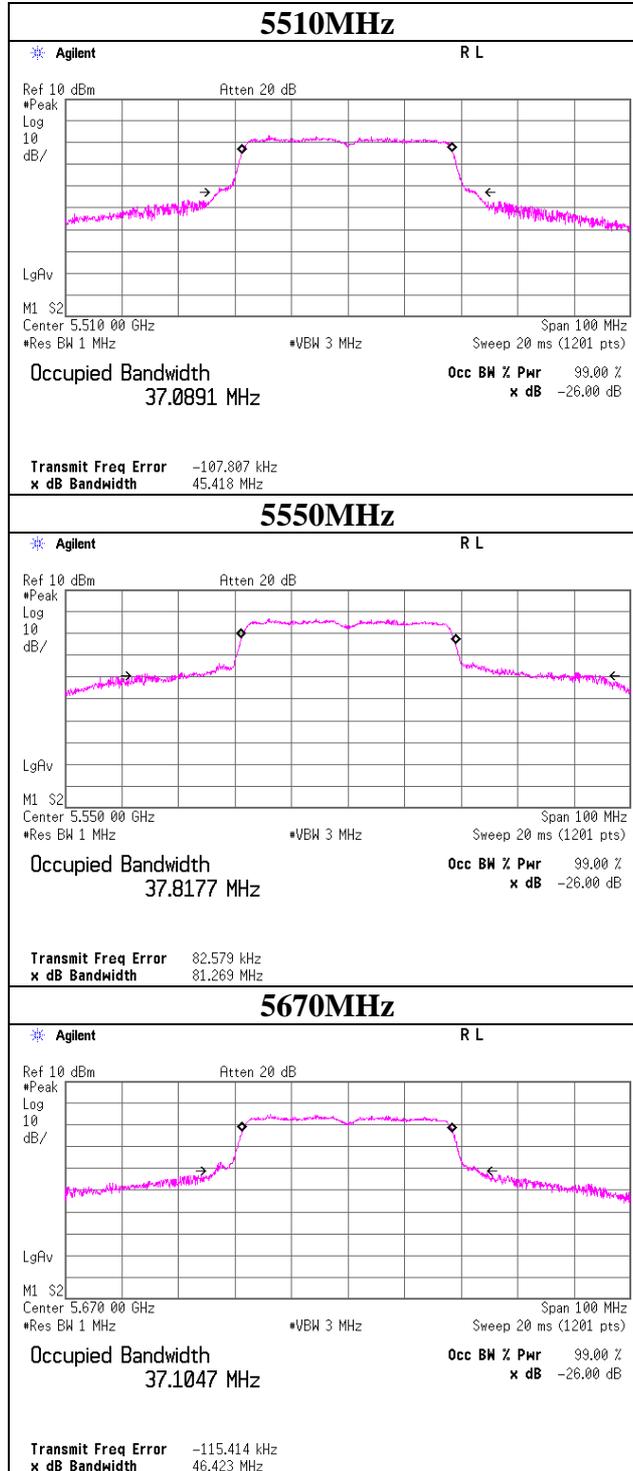
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

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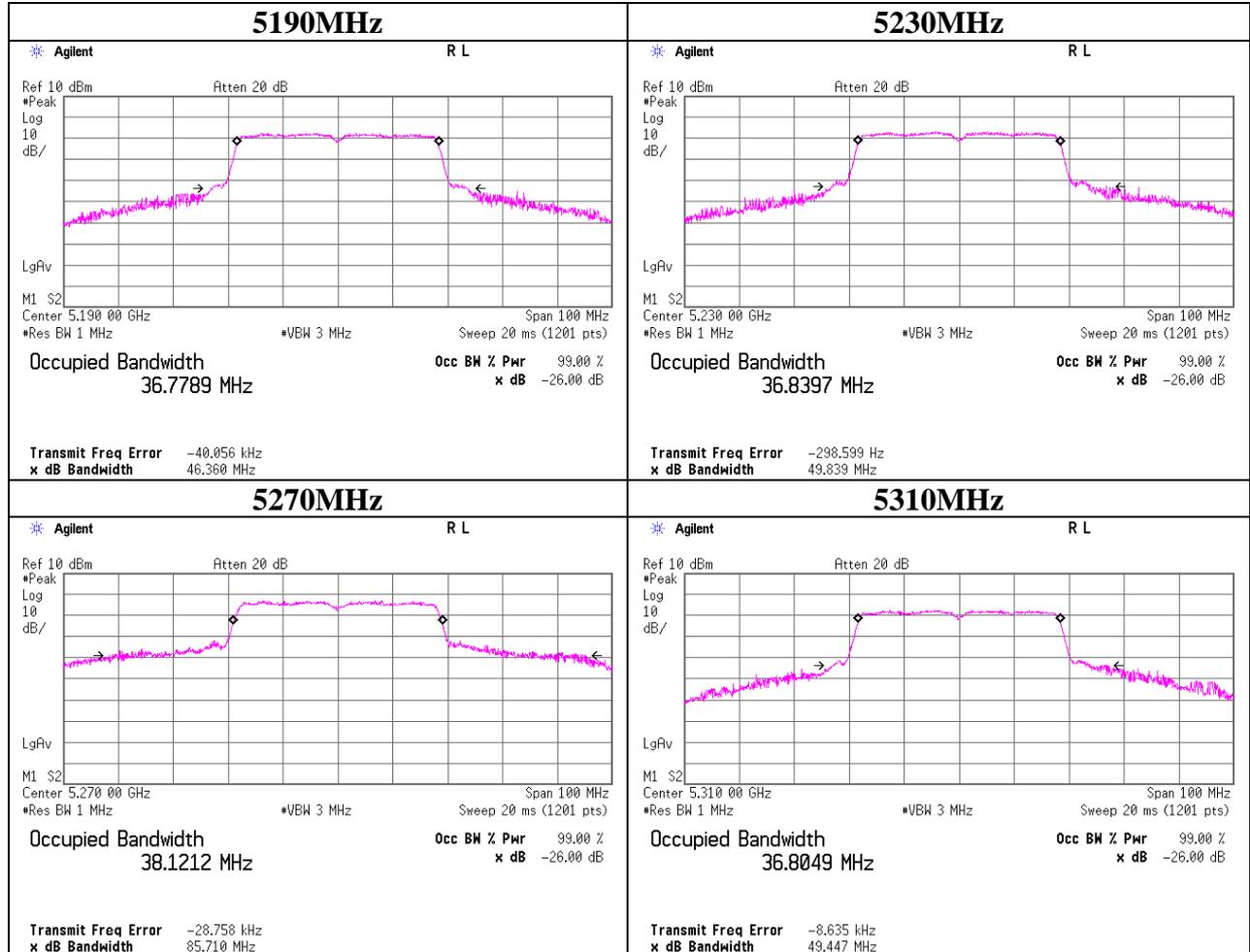
26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-40 MIMO Antenna 0



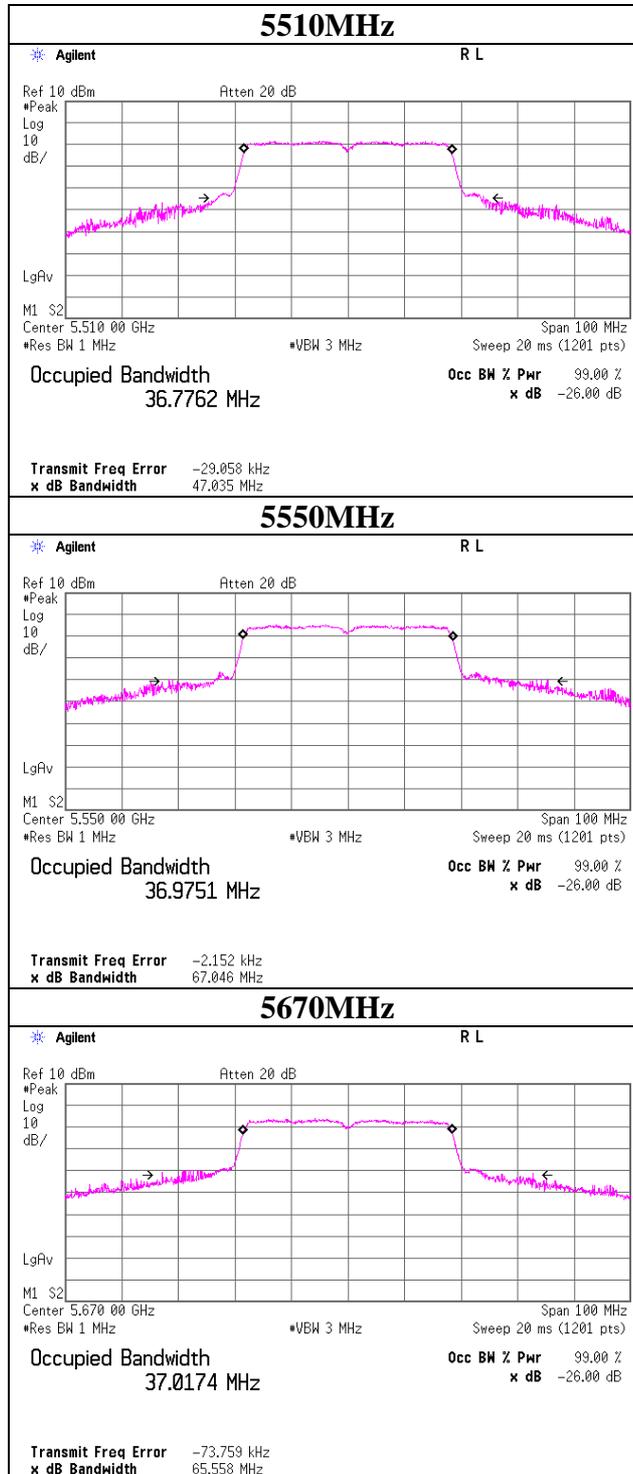
26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-40 MIMO Antenna 1



26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-40 MIMO Antenna 1



20dB Bandwidth

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 10004954H
Date 04/05/2013 04/10/2013
Temperature/ Humidity 20deg. C / 53% RH 25deg. C / 26% RH
Engineer Yutaka Yoshida Yutaka Yoshida
Mode Tx 11a / 11n-20

11a

Frequency [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
5240	18.295	-
5260	18.786	-
5580	22.610	-
5660	19.524	-

11n-20, MISO, Antenna 0

Frequency [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
5240	18.779	-
5260	19.800	-
5580	21.470	-
5660	19.834	-

11n-20, MIMO, Antenna 0

Frequency [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
5240	19.163	-
5260	19.486	-
5580	26.582	-
5660	19.924	-

11n-20, MIMO, Antenna 1

Frequency [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
5240	18.808	-
5260	19.152	-
5580	26.160	-
5660	19.377	-

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4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

20dB Bandwidth

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 10004954H
Date 04/05/2013 04/10/2013
Temperature/ Humidity 20deg. C / 53% RH 25deg. C / 26% RH
Engineer Yutaka Yoshida Yutaka Yoshida
Mode Tx 11n-40

11n-40, MISO Antenna 0

Frequency [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
5230	38.401	-
5270	38.624	-
5550	38.560	-
5670	38.441	-

11n-40, MIMO Antenna 0

Frequency [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
5230	39.295	-
5270	39.362	-
5550	39.272	-
5670	39.273	-

11n-40, MIMO Antenna 1

Frequency [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
5230	38.517	-
5270	38.590	-
5550	38.618	-
5670	38.540	-

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Head Office EMC Lab.

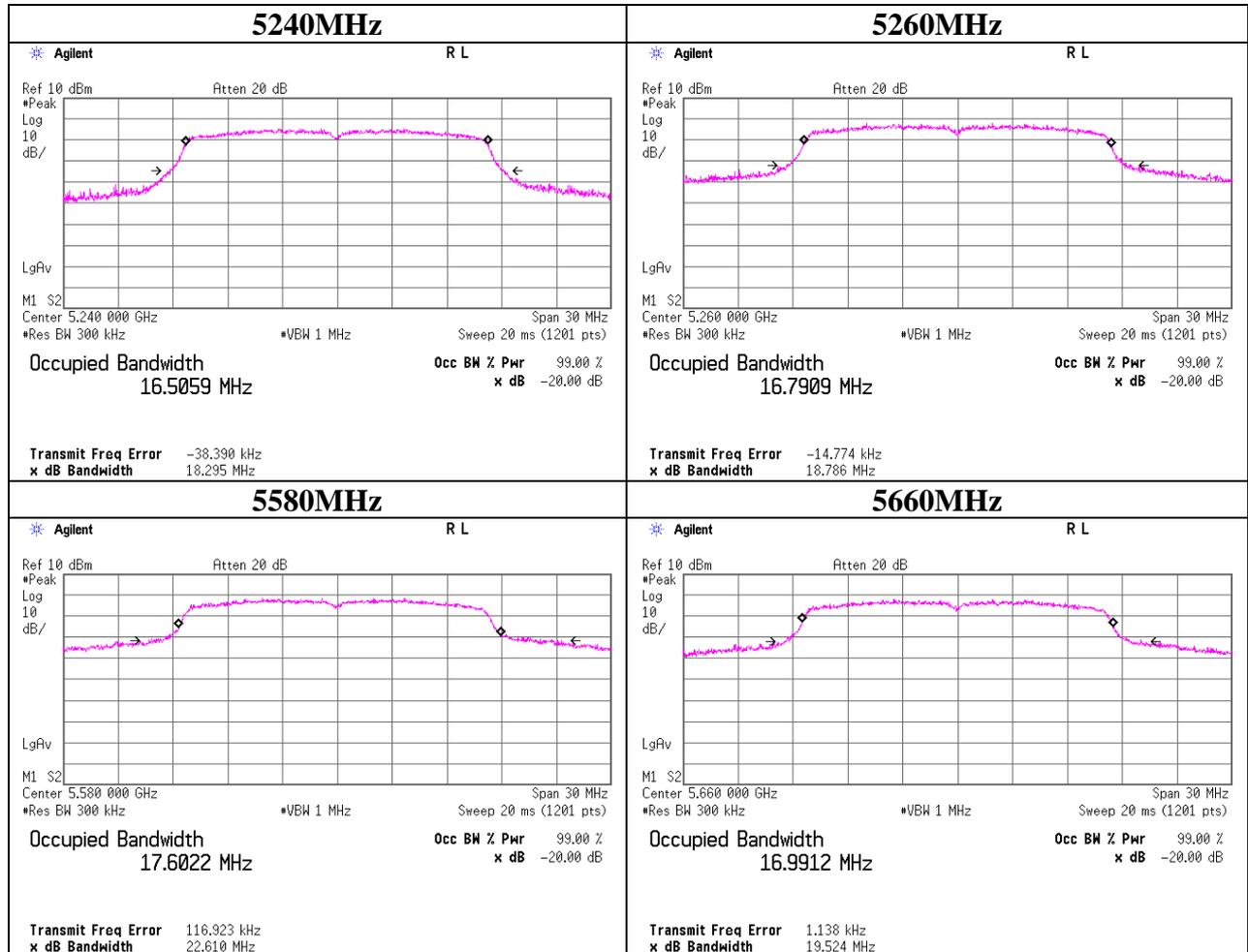
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

20dB Bandwidth

11a Antenna 0



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Head Office EMC Lab.

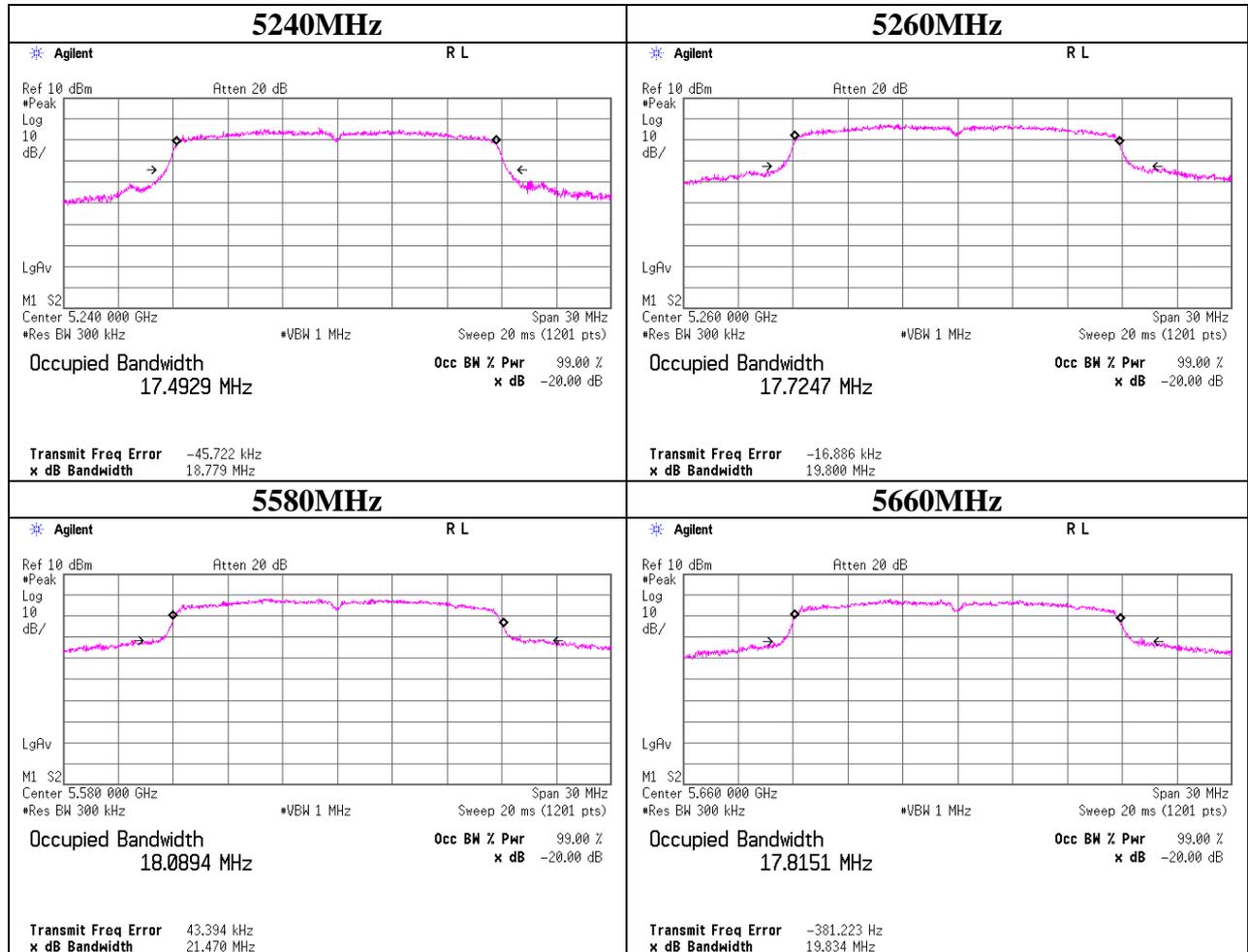
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

20dB Bandwidth

11n-20 MISO Antenna 0



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Head Office EMC Lab.

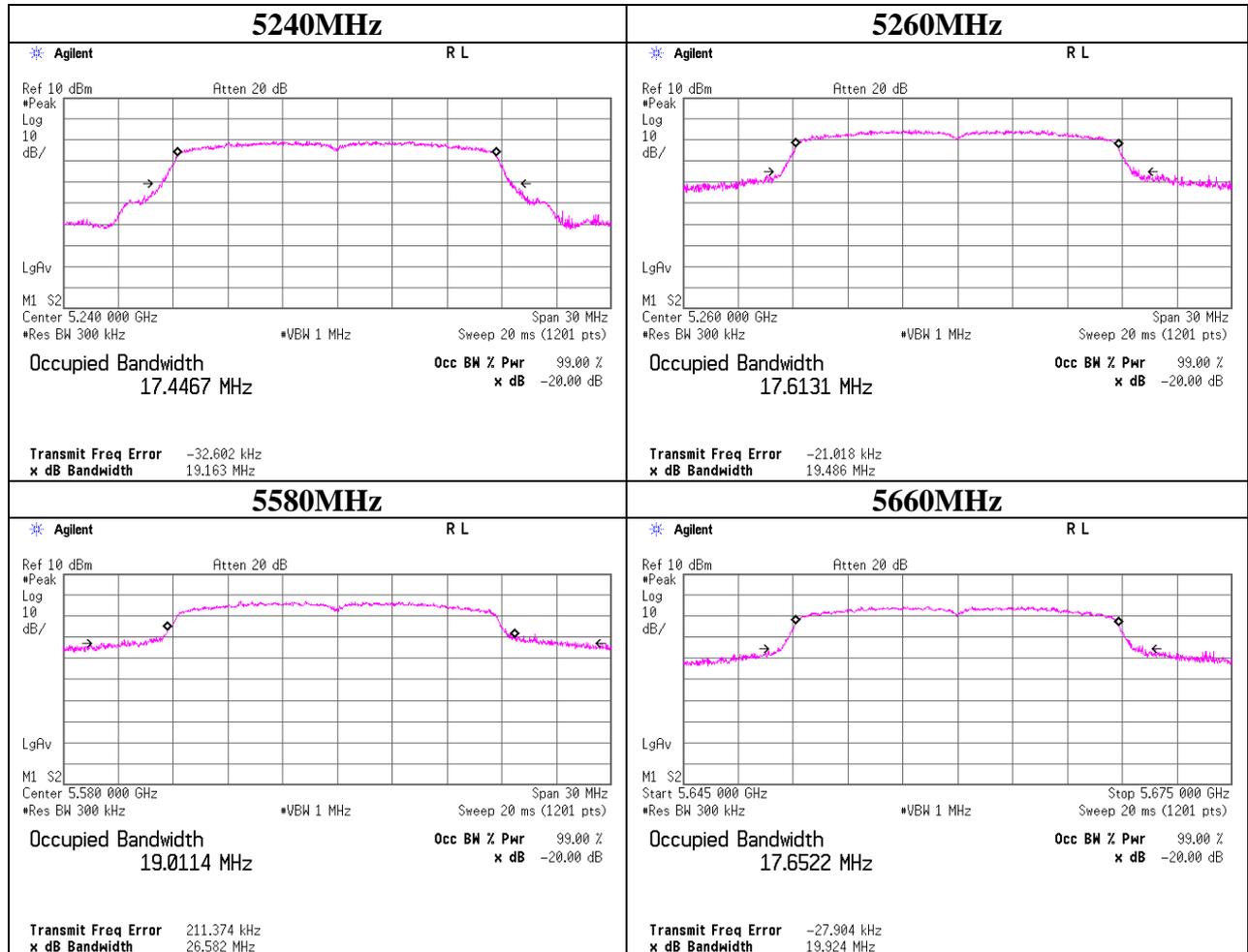
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

20dB Bandwidth

11n-20 MIMO Antenna 0



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Head Office EMC Lab.

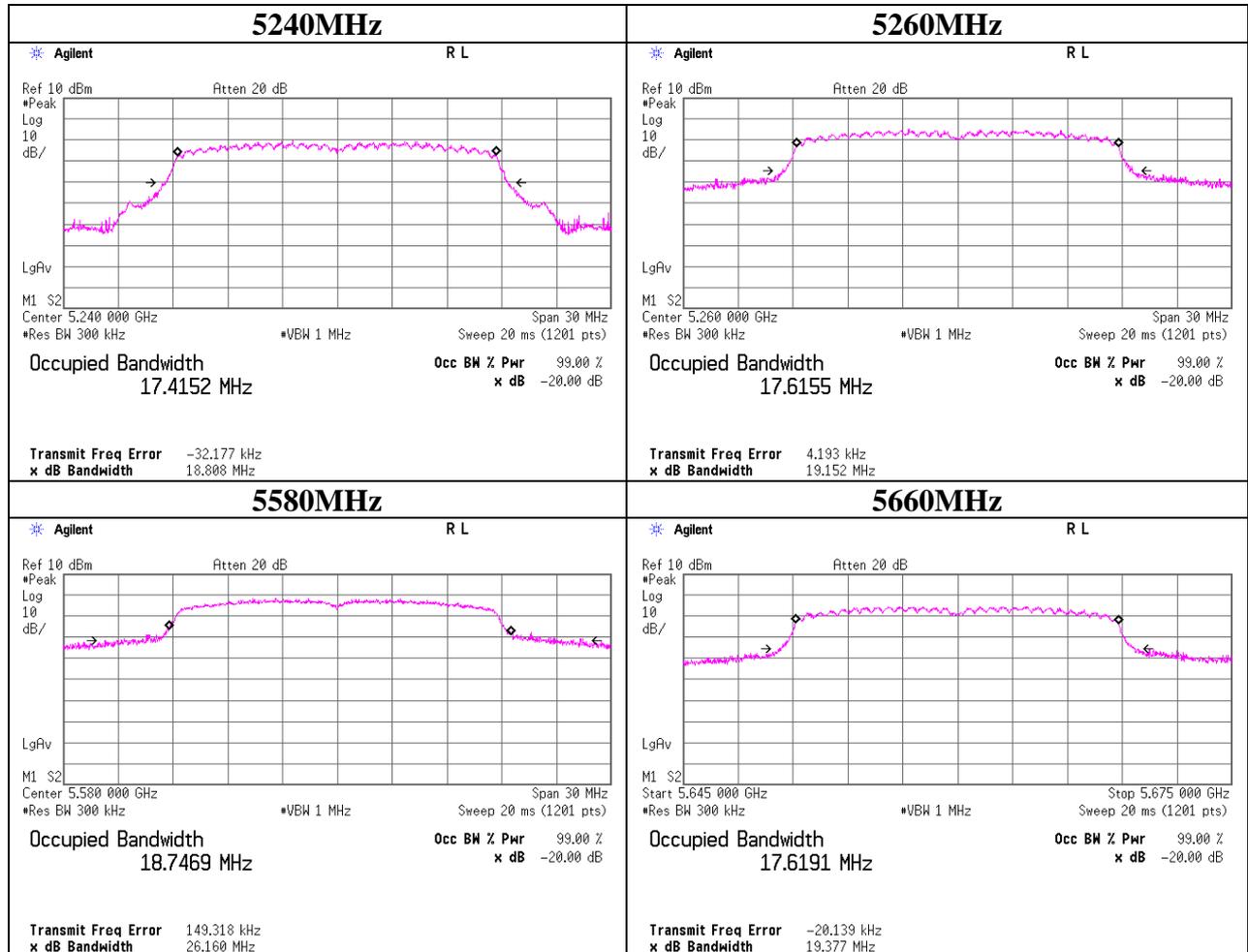
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

20dB Bandwidth

11n-20 MIMO Antenna 1



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Head Office EMC Lab.

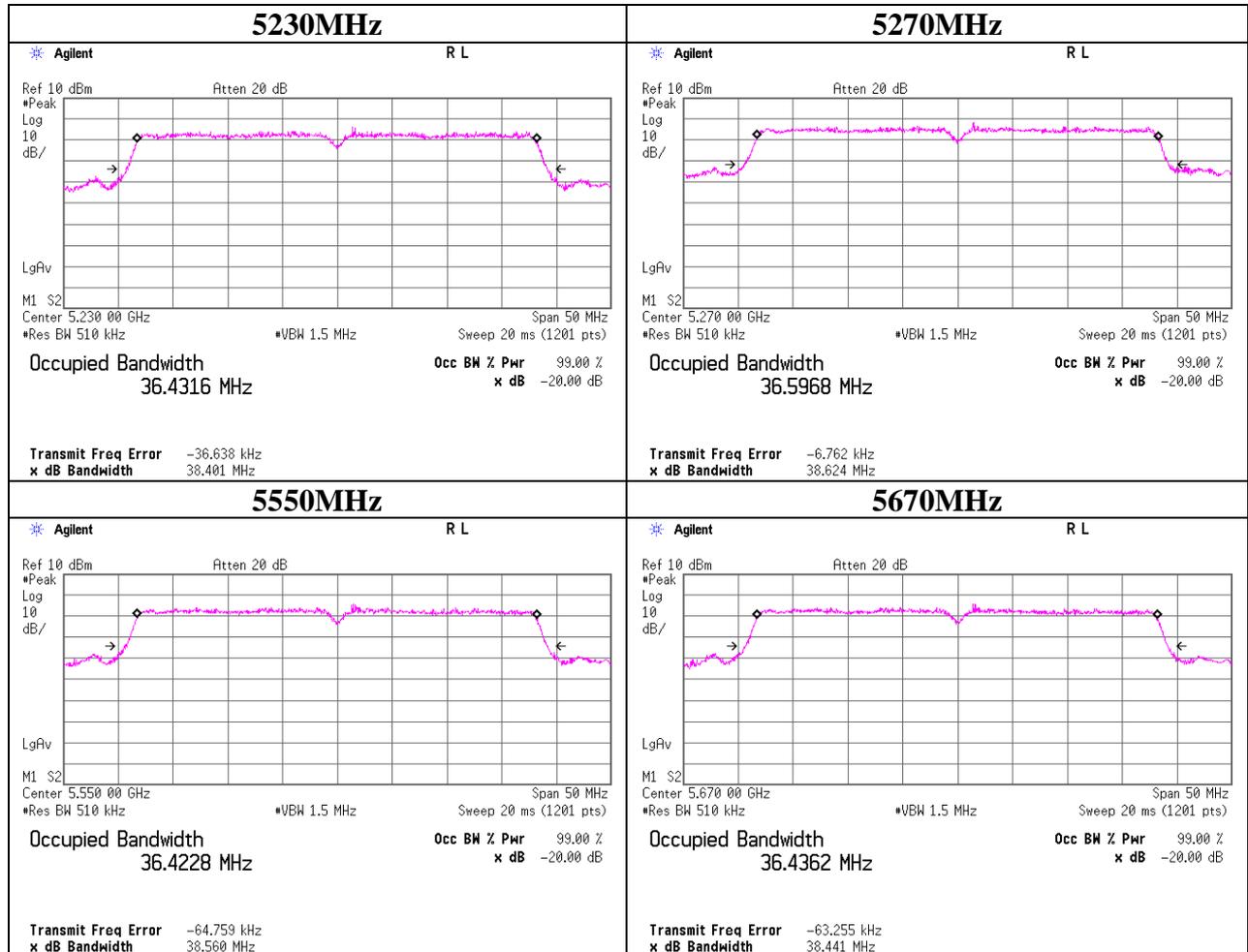
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

20dB Bandwidth

11n-40 MISO Antenna 0



UL Japan, Inc.

Head Office EMC Lab.

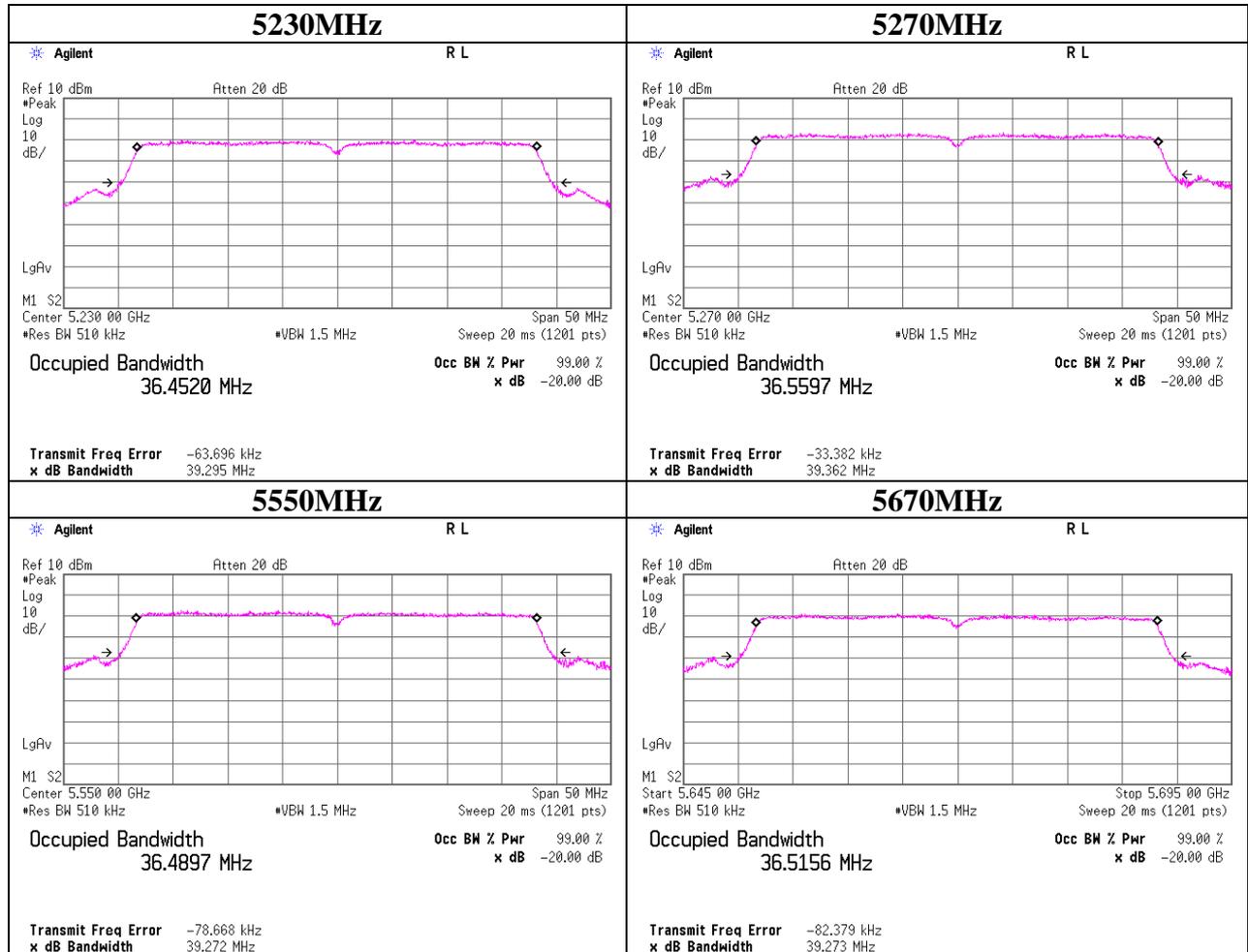
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

20dB Bandwidth

11n-40 MIMO Antenna 0



UL Japan, Inc.

Head Office EMC Lab.

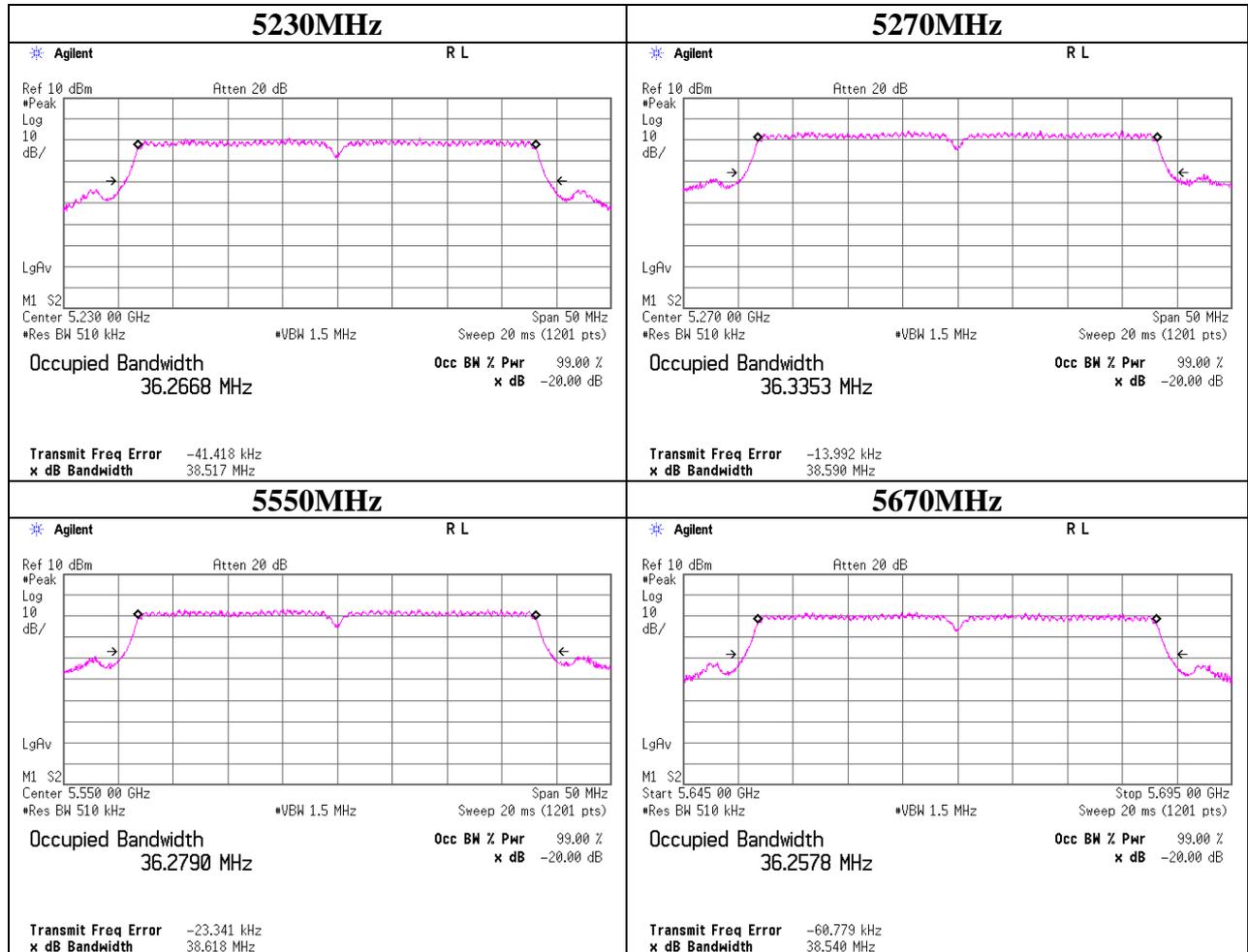
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

20dB Bandwidth

11n-40 MIMO Antenna 1



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Maximum Conducted Output Power

Test place Head Office EMC Lab. No.6 Semi Anechoic Chamber
Report No. 10004954H
Date 04/09/2013 04/10/2013 04/11/2013
Temperature/ Humidity 21deg. C / 49% RH 25deg. C / 26% RH 18deg. C / 44% RH
Engineer Yutaka Yoshida Yutaka Yoshida Yutaka Yoshida
Mode 11a Tx

Antenna 0

Freq. [MHz]	P/M AV Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Duty Factor [dB]	Result (Cond.) [dBm]	Result (e.i.r.p.) [dBm]	Limit (Cond.) [dBm]	Limit (e.i.r.p.) [dBm]	Margin (Cond.) [dB]	Margin (e.i.r.p.) [dB]
5180.0	-0.50	2.89	10.13	-0.46	1.36	13.88	13.42	16.98	-	3.10	-
5220.0	0.45	2.76	10.13	-0.46	1.36	14.70	14.24	16.98	-	2.28	-
5240.0	0.49	2.76	10.13	-0.46	1.36	14.74	14.28	16.98	-	2.24	-
5260.0	5.45	2.87	10.13	-0.46	1.36	19.81	19.35	23.97	-	4.16	-
5300.0	5.68	3.17	10.13	-0.46	1.36	20.34	19.88	23.97	-	3.63	-
5320.0	3.57	3.05	10.13	-0.46	1.36	18.11	17.65	23.97	-	5.86	-
5500.0	2.03	2.99	10.14	-1.25	1.36	16.52	15.27	23.97	-	7.45	-
5580.0	5.78	2.93	10.14	-1.25	1.36	20.21	18.96	23.97	-	3.76	-
5700.0	2.88	3.27	10.14	-1.25	1.36	17.65	16.40	23.97	-	6.32	-

Result(Cond.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Duty Factor

Result(e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Duty Factor + Antenna Gain

15.407(a)(1) Limit(Cond.) = 16.98dBm(50mW) or 4 + 10log(26dB BW) dBm

15.407(a)(2) Limit(Cond.) = 23.97dBm(250mW) or 11 + 10log(26dB BW) dBm

UL Japan, Inc.

Head Office EMC Lab.

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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Maximum Conducted Output Power

Test place	Head Office EMC Lab. No.6 Semi Anechoic Chamber	
Report No.	10004954H	
Date	04/09/2013	04/10/2013
Temperature/ Humidity	21deg. C / 49% RH	25deg. C / 26% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	11n-20 Tx, MISO	

Antenna 0

Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Duty Factor [dB]	Result (Cond.) [dBm]	Result (e.i.r.p.) [dBm]	Limit (Cond.) [dBm]	Limit (e.i.r.p.) [dBm]	Margin (Cond.) [dB]	Margin (e.i.r.p.) [dB]
5180.0	-0.56	2.89	10.13	-0.46	1.91	14.37	13.91	16.98	-	2.61	-
5220.0	-0.22	2.76	10.13	-0.46	1.91	14.58	14.12	16.98	-	2.40	-
5240.0	-0.35	2.76	10.13	-0.46	1.91	14.45	13.99	16.98	-	2.53	-
5260.0	4.49	2.87	10.13	-0.46	1.91	19.40	18.94	23.97	-	4.57	-
5300.0	4.82	3.17	10.13	-0.46	1.91	20.03	19.57	23.97	-	3.94	-
5320.0	2.98	3.05	10.13	-0.46	1.91	18.07	17.61	23.97	-	5.90	-
5500.0	1.61	2.99	10.14	-1.25	1.91	16.65	15.40	23.97	-	7.32	-
5580.0	5.13	2.93	10.14	-1.25	1.91	20.11	18.86	23.97	-	3.86	-
5700.0	2.19	3.27	10.14	-1.25	1.91	17.51	16.26	23.97	-	6.46	-

Result(Cond.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Duty Factor

Result(e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Duty Factor + Antenna Gain

15.407(a)(1) Limit(Cond.) = 16.98dBm(50mW) or 4 + 10log(26dB BW) dBm

15.407(a)(2) Limit(Cond.) = 23.97dBm(250mW) or 11 + 10log(26dB BW) dBm

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Maximum Conducted Output Power

Test place	Head Office EMC Lab. No.6 Semi Anechoic Chamber	
Report No.	10004954H	
Date	04/09/2013	04/10/2013
Temperature/ Humidity	21deg. C / 49% RH	25deg. C / 26% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	11n-20 Tx, MIMO	

Antenna 0+1

Freq. [MHz]	Result (Cond.) [dBm]	Result (e.i.r.p.) [dBm]	Limit (Cond.) [dBm]	Limit (e.i.r.p.) [dBm]	Margin (Cond.) [dB]	Margin (e.i.r.p.) [dB]
5180.0	14.22	14.65	16.98	-	2.76	-
5220.0	14.53	14.94	16.98	-	2.45	-
5240.0	14.56	14.96	16.98	-	2.42	-
5260.0	20.04	20.46	23.97	-	3.93	-
5300.0	19.56	19.95	23.97	-	4.41	-
5320.0	17.64	18.03	23.97	-	6.33	-
5500.0	17.63	17.59	23.97	-	6.34	-
5580.0	21.64	21.67	23.97	-	2.33	-
5700.0	16.65	16.69	23.97	-	7.32	-

Result [dBm] = 10 x log (10 ^ (Ant0 Result [dBm] / 10) + 10 ^ (Ant1 Result [dBm] / 10))

Antenna 0

Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Duty Factor [dB]	Result (Cond.) [dBm]	Result (e.i.r.p.) [dBm]	Limit (Cond.) [dBm]	Limit (e.i.r.p.) [dBm]	Margin (Cond.) [dB]	Margin (e.i.r.p.) [dB]
5180.0	-1.92	2.89	10.13	-0.46	0.53	11.63	11.17	16.98	-	5.35	-
5220.0	-1.35	2.76	10.13	-0.46	0.53	12.07	11.61	16.98	-	4.91	-
5240.0	-1.32	2.76	10.13	-0.46	0.53	12.10	11.64	16.98	-	4.88	-
5260.0	3.97	2.87	10.13	-0.46	0.53	17.50	17.04	23.97	-	6.47	-
5300.0	3.28	3.17	10.13	-0.46	0.53	17.11	16.65	23.97	-	6.86	-
5320.0	1.54	3.05	10.13	-0.46	0.53	15.25	14.79	23.97	-	8.72	-
5500.0	1.55	2.99	10.14	-1.25	0.53	15.21	13.96	23.97	-	8.76	-
5580.0	5.44	2.93	10.14	-1.25	0.53	19.04	17.79	23.97	-	4.93	-
5700.0	0.07	3.27	10.14	-1.25	0.53	14.01	12.76	23.97	-	9.96	-

Antenna 1

Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Duty Factor [dB]	Result (Cond.) [dBm]	Result (e.i.r.p.) [dBm]	Limit (Cond.) [dBm]	Limit (e.i.r.p.) [dBm]	Margin (Cond.) [dB]	Margin (e.i.r.p.) [dB]
5180.0	-2.77	2.89	10.09	1.32	0.53	10.74	12.06	16.98	-	6.24	-
5220.0	-2.48	2.76	10.09	1.32	0.53	10.90	12.22	16.98	-	6.08	-
5240.0	-2.46	2.76	10.09	1.32	0.53	10.92	12.24	16.98	-	6.06	-
5260.0	3.01	2.87	10.09	1.32	0.53	16.50	17.82	23.97	-	7.47	-
5300.0	2.11	3.17	10.09	1.32	0.53	15.90	17.22	23.97	-	8.07	-
5320.0	0.24	3.05	10.09	1.32	0.53	13.91	15.23	23.97	-	10.06	-
5500.0	0.31	2.99	10.10	1.20	0.53	13.93	15.13	23.97	-	10.04	-
5580.0	4.62	2.93	10.10	1.20	0.53	18.18	19.38	23.97	-	5.79	-
5700.0	-0.66	3.27	10.10	1.20	0.53	13.24	14.44	23.97	-	10.73	-

Result(Cond.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Duty Factor

Result(e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Duty Factor + Antenna Gain
15.407(a)(1) Limit(Cond.) = 16.98dBm(50mW) or 4 + 10log(26dB BW) dBm

15.407(a)(2) Limit(Cond.) = 23.97dBm(250mW) or 11 + 10log(26dB BW) dBm

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Maximum Conducted Output Power

Test place	Head Office EMC Lab. No.6 Semi Anechoic Chamber	
Report No.	10004954H	
Date	04/09/2013	04/10/2013
Temperature/ Humidity	21deg. C / 49% RH	25deg. C / 26% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	11n-40 Tx, MISO	

Antenna 0

Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Duty Factor [dB]	Result (Cond.) [dBm]	Result (e.i.r.p.) [dBm]	Limit (Cond.) [dBm]	Limit (e.i.r.p.) [dBm]	Margin (Cond.) [dB]	Margin (e.i.r.p.) [dB]
5190.0	-1.24	2.84	10.13	-0.46	2.38	14.11	13.65	16.98	-	2.87	-
5230.0	1.69	2.75	10.13	-0.46	2.38	16.95	16.49	16.98	-	0.03	-
5270.0	3.77	2.97	10.13	-0.46	2.38	19.25	18.79	23.97	-	4.72	-
5310.0	-0.38	3.14	10.13	-0.46	2.38	15.27	14.81	23.97	-	8.70	-
5510.0	-1.99	3.04	10.14	-1.25	2.38	13.57	12.32	23.97	-	10.40	-
5550.0	1.31	3.02	10.14	-1.25	2.38	16.85	15.60	23.97	-	7.12	-
5670.0	1.32	3.29	10.14	-1.25	2.38	17.13	15.88	23.97	-	6.84	-

Result(Cond.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Duty Factor

Result(e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Duty Factor + Antenna Gain

15.407(a)(1) Limit(Cond.) = 16.98dBm(50mW) or 4 + 10log(26dB BW) dBm

15.407(a)(2) Limit(Cond.) = 23.97dBm(250mW) or 11 + 10log(26dB BW) dBm

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Maximum Conducted Output Power

Test place	Head Office EMC Lab. No.6 Semi Anechoic Chamber	
Report No.	10004954H	
Date	04/09/2013	04/10/2013
Temperature/ Humidity	21deg. C / 49% RH	25deg. C / 26% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	11n-40 Tx, MIMO	

Antenna 0+1

Freq. [MHz]	Result (Cond.) [dBm]	Result (e.i.r.p.) [dBm]	Limit (Cond.) [dBm]	Limit (e.i.r.p.) [dBm]	Margin (Cond.) [dB]	Margin (e.i.r.p.) [dB]
5190.0	15.03	15.46	16.98	-	1.95	-
5230.0	15.87	16.28	16.98	-	1.11	-
5270.0	19.41	19.81	23.97	-	4.56	-
5310.0	15.82	16.18	23.97	-	8.15	-
5510.0	15.00	14.92	23.97	-	8.97	-
5550.0	18.74	18.72	23.97	-	5.23	-
5670.0	17.20	17.22	23.97	-	6.77	-

Result [dBm] = 10 x log (10 ^ (Ant0 Result [dBm] / 10) + 10 ^ (Ant1 Result [dBm] / 10))

Antenna 0

Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Duty Factor [dB]	Result (Cond.) [dBm]	Result (e.i.r.p.) [dBm]	Limit (Cond.) [dBm]	Limit (e.i.r.p.) [dBm]	Margin (Cond.) [dB]	Margin (e.i.r.p.) [dB]
5190.0	-1.60	2.84	10.13	-0.46	1.05	12.42	11.96	16.98	-	4.56	-
5230.0	-0.56	2.75	10.13	-0.46	1.05	13.37	12.91	16.98	-	3.61	-
5270.0	2.82	2.97	10.13	-0.46	1.05	16.97	16.51	23.97	-	7.00	-
5310.0	-0.80	3.14	10.13	-0.46	1.05	13.52	13.06	23.97	-	10.45	-
5510.0	-1.52	3.04	10.14	-1.25	1.05	12.71	11.46	23.97	-	11.26	-
5550.0	2.07	3.02	10.14	-1.25	1.05	16.28	15.03	23.97	-	7.69	-
5670.0	0.14	3.29	10.14	-1.25	1.05	14.62	13.37	23.97	-	9.35	-

Antenna 1

Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Duty Factor [dB]	Result (Cond.) [dBm]	Result (e.i.r.p.) [dBm]	Limit (Cond.) [dBm]	Limit (e.i.r.p.) [dBm]	Margin (Cond.) [dB]	Margin (e.i.r.p.) [dB]
5190.0	-2.41	2.84	10.09	1.32	1.05	11.57	12.89	16.98	-	5.41	-
5230.0	-1.61	2.75	10.09	1.32	1.05	12.28	13.60	16.98	-	4.70	-
5270.0	1.64	2.97	10.09	1.32	1.05	15.75	17.07	23.97	-	8.22	-
5310.0	-2.32	3.14	10.09	1.32	1.05	11.96	13.28	23.97	-	12.01	-
5510.0	-3.07	3.04	10.10	1.20	1.05	11.12	12.32	23.97	-	12.85	-
5550.0	0.93	3.02	10.10	1.20	1.05	15.10	16.30	23.97	-	8.87	-
5670.0	-0.72	3.29	10.10	1.20	1.05	13.72	14.92	23.97	-	10.25	-

Result(Cond.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Duty Factor
Result(e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten.Loss + Duty Factor + Antenna Gain
15.407(a)(1) Limit(Cond.) = 16.98dBm(50mW) or 4 + 10log(26dB BW) dBm
15.407(a)(2) Limit(Cond.) = 23.97dBm(250mW) or 11 + 10log(26dB BW) dBm

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Peak Power Spectral Density

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/11/2013
Temperature/ Humidity : 18deg. C / 44% RH
Engineer : Yutaka Yoshida
Mode : 11a Tx

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
5180.0	-10.83	2.89	10.13	1.36	-0.46	3.55	4.00	0.45
5220.0	-10.32	2.76	10.13	1.36	-0.46	3.93	4.00	0.07
5240.0	-10.29	2.76	10.13	1.36	-0.46	3.96	4.00	0.04
5260.0	-5.31	2.87	10.13	1.36	-0.46	9.05	11.00	1.95
5300.0	-5.14	3.17	10.13	1.36	-0.46	9.52	11.00	1.48
5320.0	-6.84	3.05	10.13	1.36	-0.46	7.70	11.00	3.30
5500.0	-8.68	2.99	10.14	1.36	-1.25	5.81	11.00	5.19
5580.0	-5.02	2.93	10.14	1.36	-1.25	9.41	11.00	1.59
5700.0	-7.74	3.27	10.14	1.36	-1.25	7.03	11.00	3.97

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator + Duty Factor

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Peak Power Spectral Density

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/11/2013
Temperature/ Humidity : 18deg. C / 44% RH
Engineer : Yutaka Yoshida
Mode : 11n-20 Tx MISO

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
5180.0	-11.14	2.89	10.13	1.91	-0.46	3.79	4.00	0.21
5220.0	-10.95	2.76	10.13	1.91	-0.46	3.85	4.00	0.15
5240.0	-11.02	2.76	10.13	1.91	-0.46	3.78	4.00	0.22
5260.0	-6.44	2.87	10.13	1.91	-0.46	8.47	11.00	2.53
5300.0	-5.66	3.17	10.13	1.91	-0.46	9.55	11.00	1.45
5320.0	-7.73	3.05	10.13	1.91	-0.46	7.36	11.00	3.64
5500.0	-9.09	2.99	10.14	1.91	-1.25	5.95	11.00	5.05
5580.0	-5.30	2.93	10.14	1.91	-1.25	9.68	11.00	1.32
5700.0	-8.64	3.27	10.14	1.91	-1.25	6.68	11.00	4.32

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator + Duty Factor

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Peak Power Spectral Density

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	10004954H
Date	04/11/2013
Temperature/ Humidity	18deg. C / 44% RH
Engineer	Yutaka Yoshida
Mode	11n-20 Tx MIMO

Antenna 0+1

Freq.	Result	Limit	Margin
[MHz]	[dBm]	[dBm]	[dB]
5180.0	3.84	4.00	0.16
5220.0	3.90	4.00	0.10
5240.0	3.86	4.00	0.14
5260.0	9.33	11.00	1.67
5300.0	9.02	11.00	1.98
5320.0	7.02	11.00	3.98
5500.0	6.84	11.00	4.16
5580.0	10.83	11.00	0.17
5700.0	5.80	11.00	5.20

Result [dBm] = 10 x log (10 ^ (Ant0 Result [dBm] / 10) + 10 ^ (Ant1 Result [dBm] / 10))

Antenna 0

Freq.	Reading	Cable Loss	Atten.	Duty Factor	Antenna Gain	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dB]
5180.0	-12.34	2.89	10.13	0.53	-0.46	1.21	4.00	2.79
5220.0	-12.28	2.76	10.13	0.53	-0.46	1.14	4.00	2.86
5240.0	-11.91	2.76	10.13	0.53	-0.46	1.51	4.00	2.49
5260.0	-6.79	2.87	10.13	0.53	-0.46	6.74	11.00	4.26
5300.0	-7.21	3.17	10.13	0.53	-0.46	6.62	11.00	4.38
5320.0	-9.31	3.05	10.13	0.53	-0.46	4.40	11.00	6.60
5500.0	-9.16	2.99	10.14	0.53	-1.25	4.50	11.00	6.50
5580.0	-5.46	2.93	10.14	0.53	-1.25	8.14	11.00	2.86
5700.0	-10.76	3.27	10.14	0.53	-1.25	3.19	11.00	7.82

Antenna 1

Freq.	Reading	Cable Loss	Atten.	Duty Factor	Antenna Gain	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dB]
5180.0	-13.13	2.89	10.13	0.53	1.32	0.42	4.00	3.58
5220.0	-12.80	2.76	10.13	0.53	1.32	0.62	4.00	3.38
5240.0	-13.35	2.76	10.13	0.53	1.32	0.07	4.00	3.93
5260.0	-7.67	2.87	10.13	0.53	1.32	5.86	11.00	5.14
5300.0	-8.52	3.17	10.13	0.53	1.32	5.32	11.00	5.69
5320.0	-10.12	3.05	10.13	0.53	1.32	3.59	11.00	7.41
5500.0	-10.63	2.99	10.14	0.53	1.20	3.04	11.00	7.97
5580.0	-6.13	2.93	10.14	0.53	1.20	7.47	11.00	3.53
5700.0	-11.59	3.27	10.14	0.53	1.20	2.35	11.00	8.65

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator + Duty Factor

*ENBW: Equivalent Noise Band Width

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Peak Power Spectral Density

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 10004954H
Date 04/11/2013
Temperature/ Humidity 18deg. C / 44% RH
Engineer Yutaka Yoshida
Mode 11n-40 Tx MISO

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
5190.0	-14.93	2.84	10.13	2.38	-0.46	0.42	4.00	3.58
5230.0	-12.05	2.75	10.13	2.38	-0.46	3.21	4.00	0.79
5270.0	-10.51	2.97	10.13	2.38	-0.46	4.97	11.00	6.03
5310.0	-14.65	3.14	10.13	2.38	-0.46	1.00	11.00	10.00
5510.0	-16.42	3.04	10.14	2.38	-1.25	-0.86	11.00	11.86
5550.0	-12.79	3.02	10.14	2.38	-1.25	2.75	11.00	8.25
5670.0	-12.60	3.29	10.14	2.38	-1.25	3.21	11.00	7.79

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator + Duty Factor

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Peak Power Spectral Density

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	10004954H
Date	04/11/2013
Temperature/ Humidity	18deg. C / 44% RH
Engineer	Yutaka Yoshida
Mode	11n-40 Tx MIMO

Antenna 0+1

Freq.	Result	Limit	Margin
[MHz]	[dBm]	[dBm]	[dB]
5190.0	1.12	4.00	2.88
5230.0	1.70	4.00	2.30
5270.0	5.34	11.00	5.66
5310.0	1.87	11.00	9.13
5510.0	0.81	11.00	10.19
5550.0	4.59	11.00	6.41
5670.0	3.21	11.00	7.79

Result [dBm] = 10 x log (10 ^ (Ant0 Result [dBm] / 10) + 10 ^ (Ant1 Result [dBm] / 10))

Antenna 0

Freq.	Reading	Cable Loss	Atten.	Duty Factor	Antenna Gain	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dB]
5190.0	-15.65	2.84	10.13	1.05	-0.46	-1.63	4.00	5.63
5230.0	-14.69	2.75	10.13	1.05	-0.46	-0.76	4.00	4.76
5270.0	-11.41	2.97	10.13	1.05	-0.46	2.74	11.00	8.26
5310.0	-14.73	3.14	10.13	1.05	-0.46	-0.41	11.00	11.41
5510.0	-15.88	3.04	10.14	1.05	-1.25	-1.65	11.00	12.65
5550.0	-11.92	3.02	10.14	1.05	-1.25	2.29	11.00	8.71
5670.0	-13.77	3.29	10.14	1.05	-1.25	0.71	11.00	10.29

Antenna 1

Freq.	Reading	Cable Loss	Atten.	Duty Factor	Antenna Gain	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dB]
5190.0	-16.19	2.84	10.13	1.05	1.32	-2.17	4.00	6.17
5230.0	-15.88	2.75	10.13	1.05	1.32	-1.95	4.00	5.95
5270.0	-12.26	2.97	10.13	1.05	1.32	1.89	11.00	9.11
5310.0	-16.33	3.14	10.13	1.05	1.32	-2.01	11.00	13.01
5510.0	-17.06	3.04	10.14	1.05	1.20	-2.83	11.00	13.83
5550.0	-13.47	3.02	10.14	1.05	1.20	0.74	11.00	10.26
5670.0	-14.86	3.29	10.14	1.05	1.20	-0.38	11.00	11.38

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator + Duty Factor

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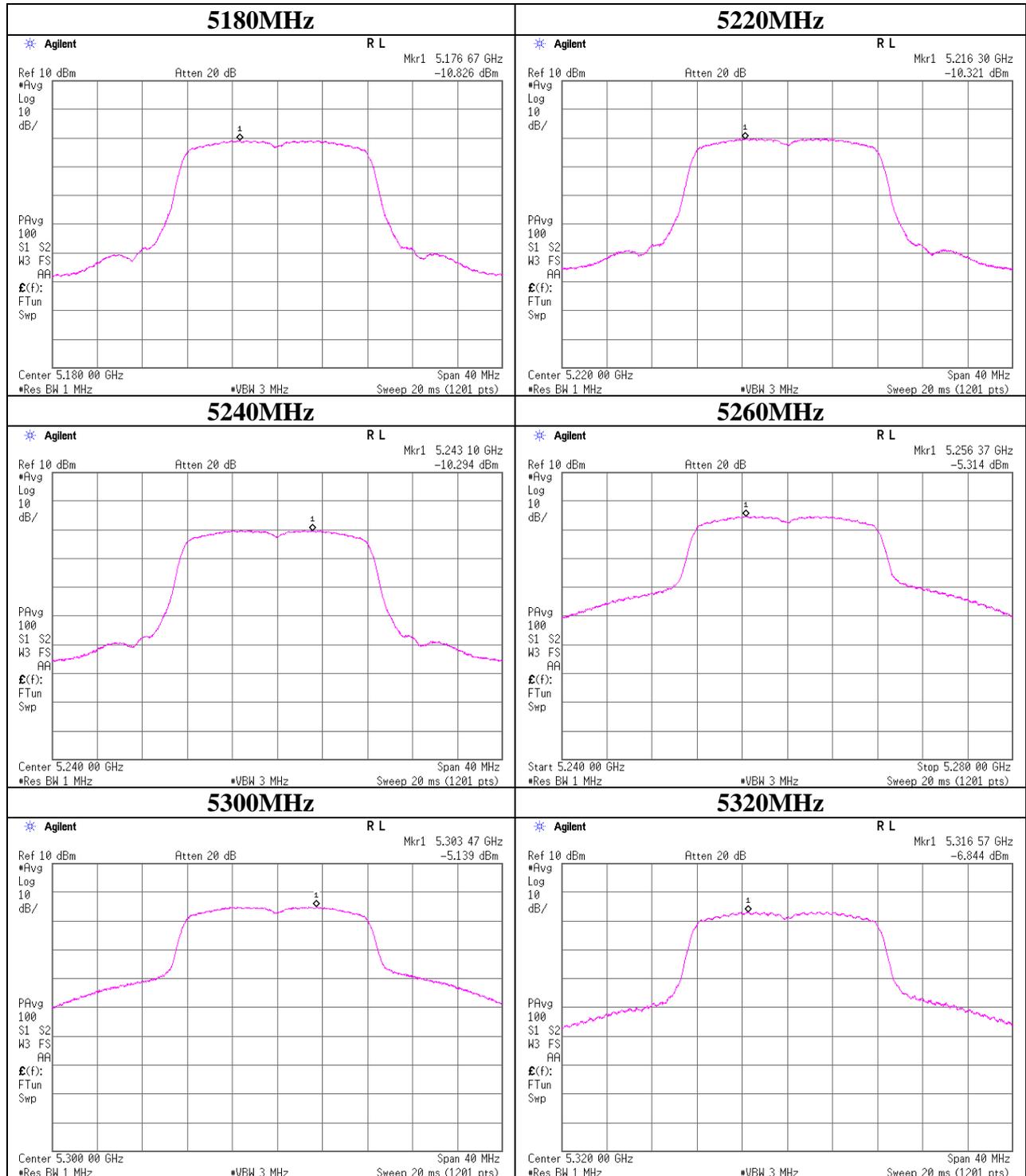
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Peak Power Spectral Density

11a Antenna 0



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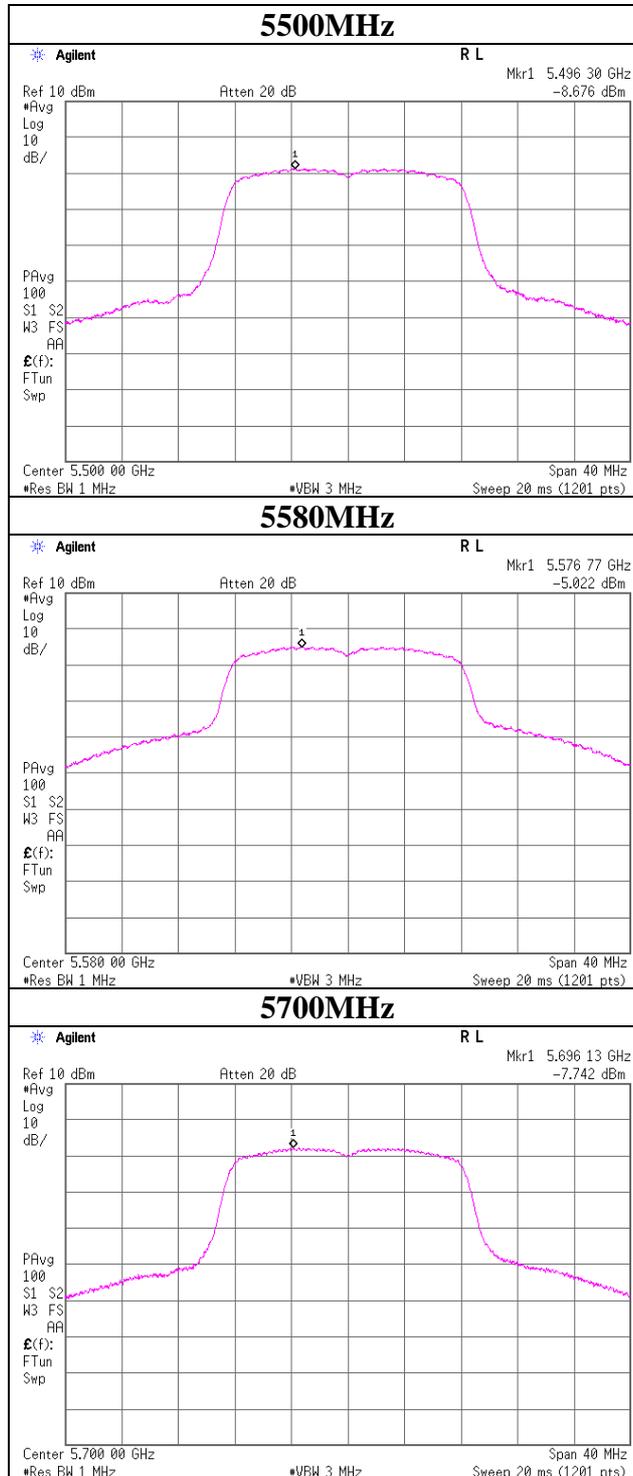
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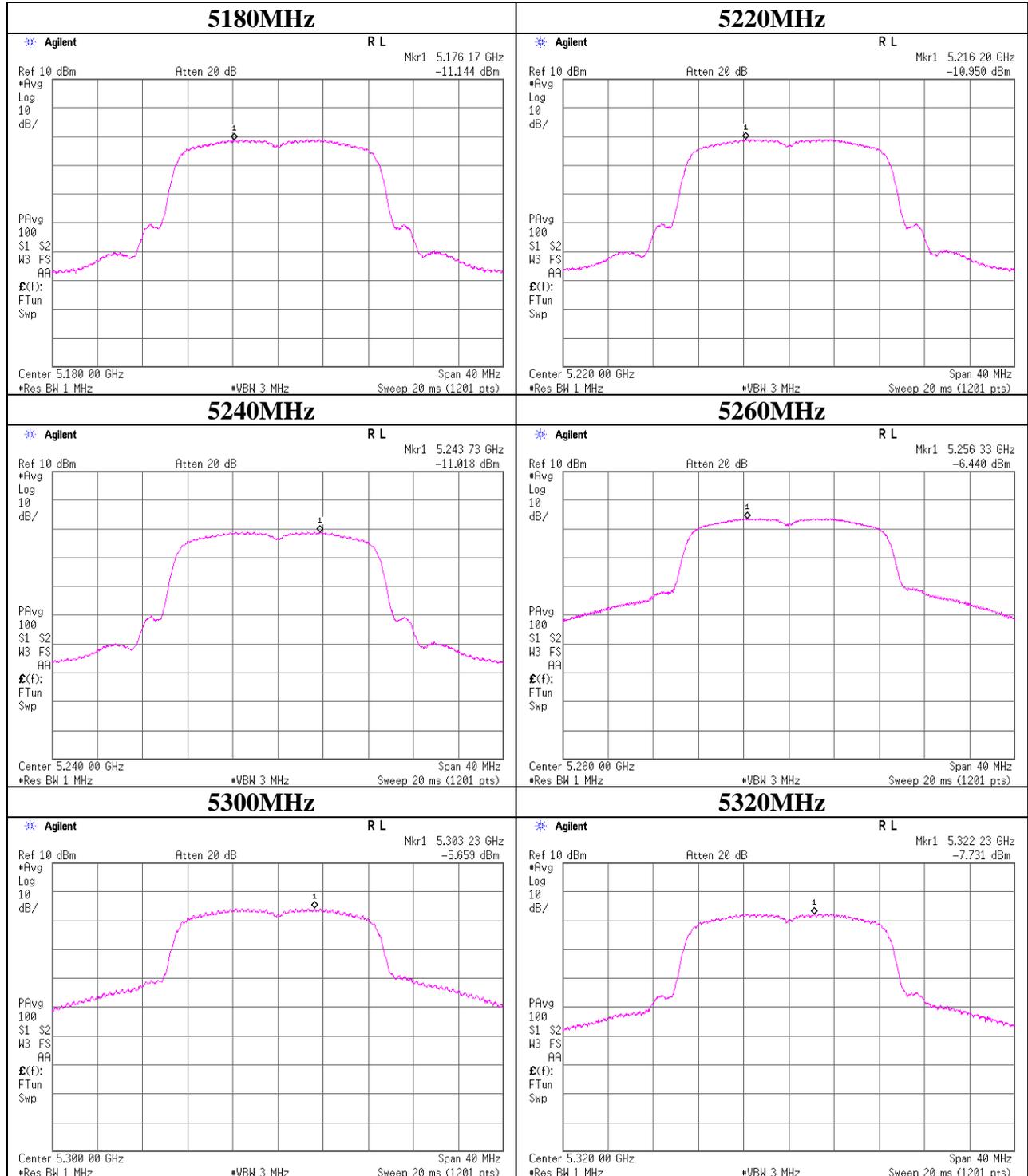
Peak Power Spectral Density

11a Antenna 0



Peak Power Spectral Density

11n-20 MISO Antenna 0



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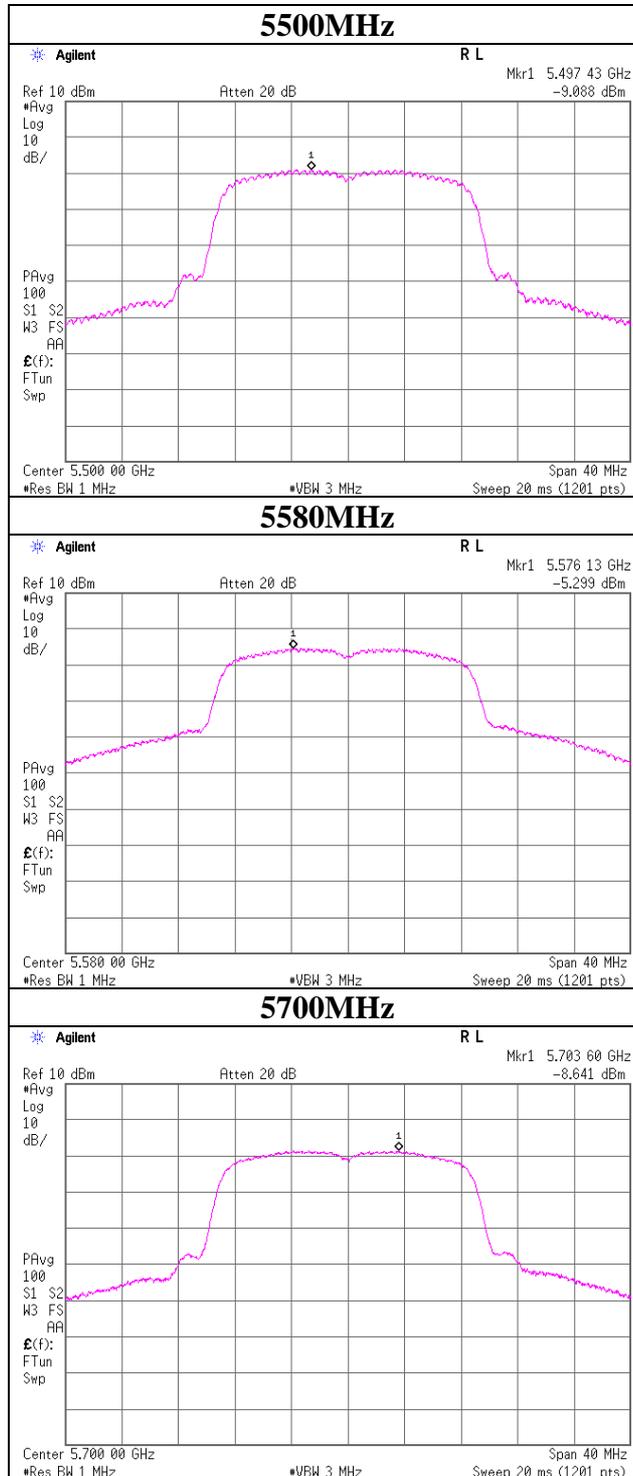
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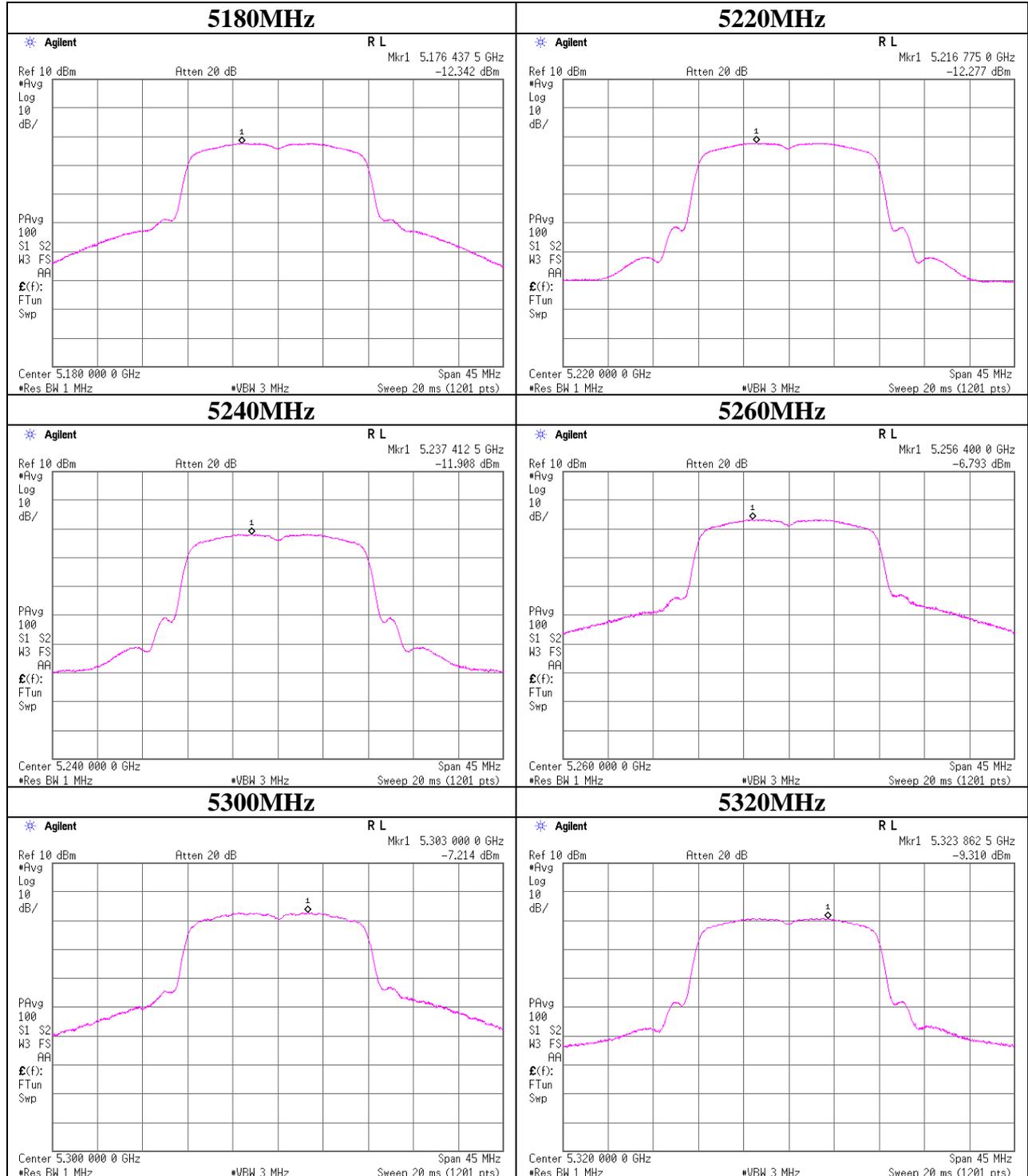
Peak Power Spectral Density

11n-20 MISO Antenna 0



Peak Power Spectral Density

11n-20 MIMO Antenna 0



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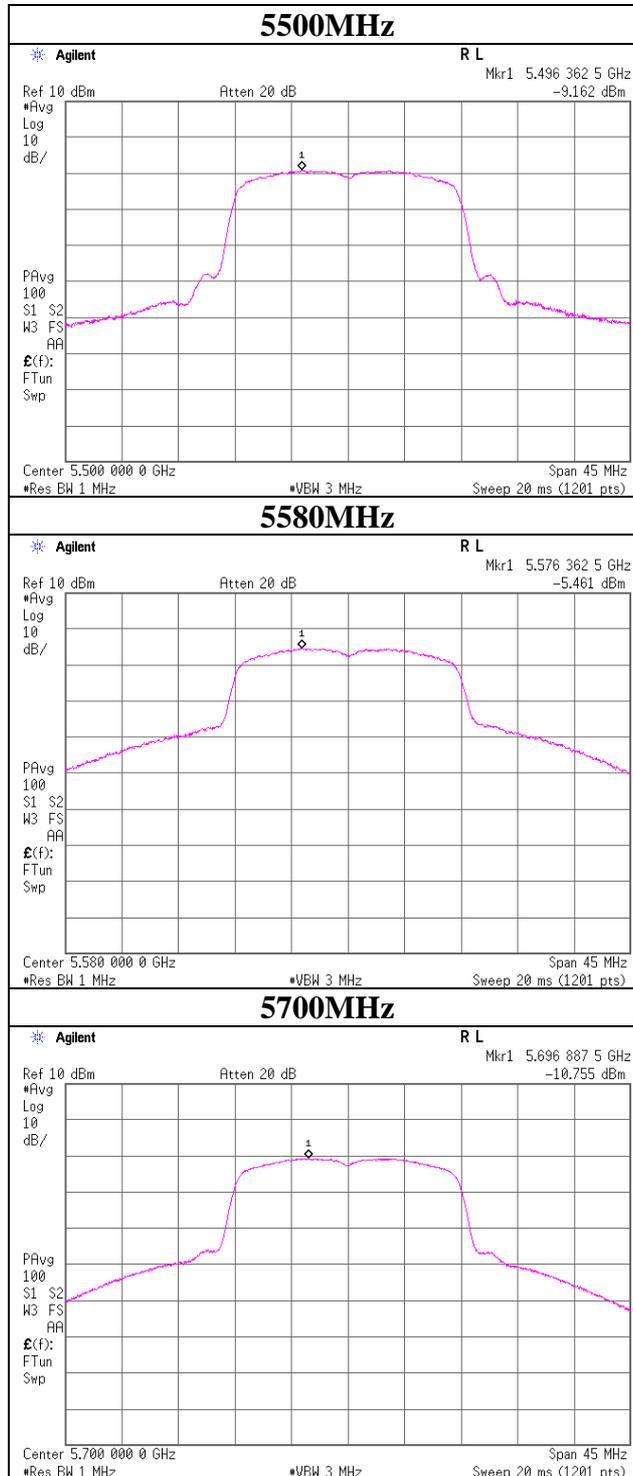
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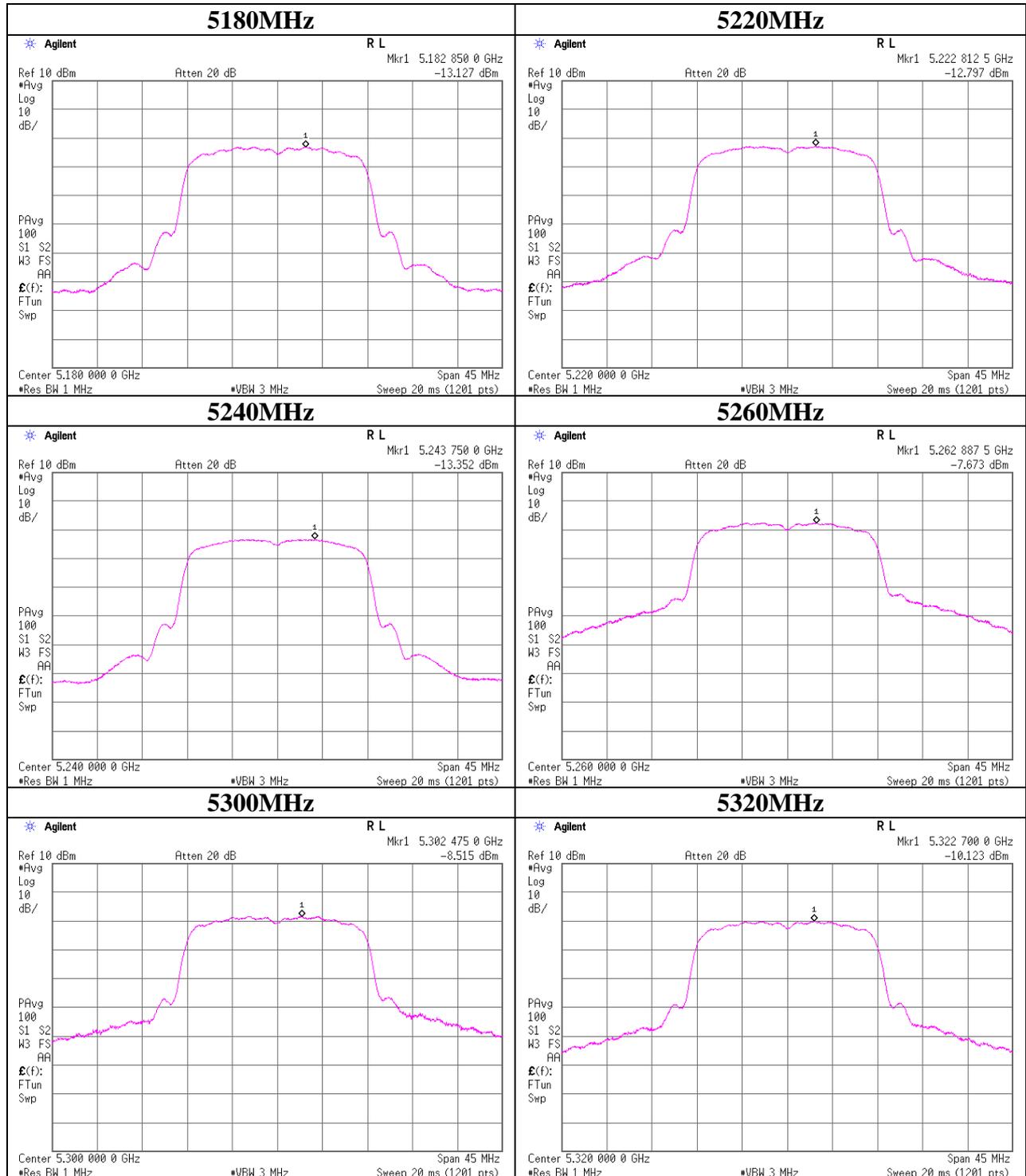
Peak Power Spectral Density

11n-20 MIMO Antenna 0



Peak Power Spectral Density

11n-20 MIMO Antenna 1



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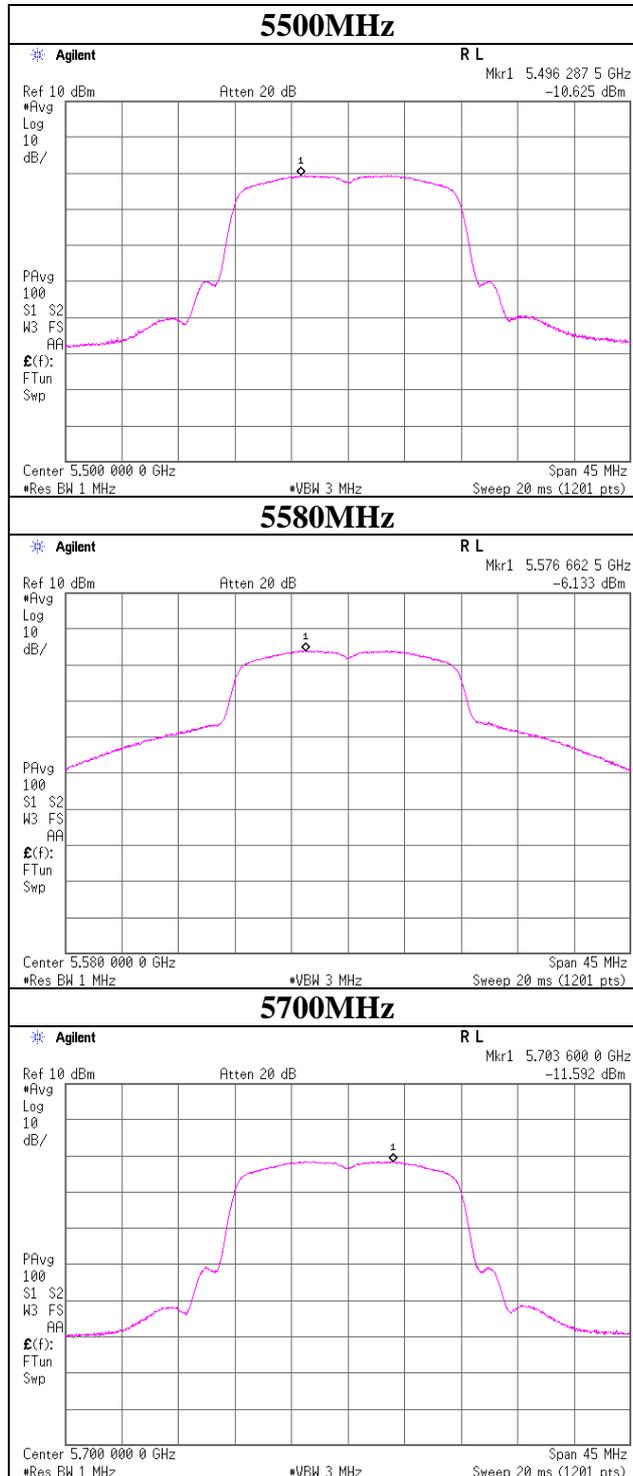
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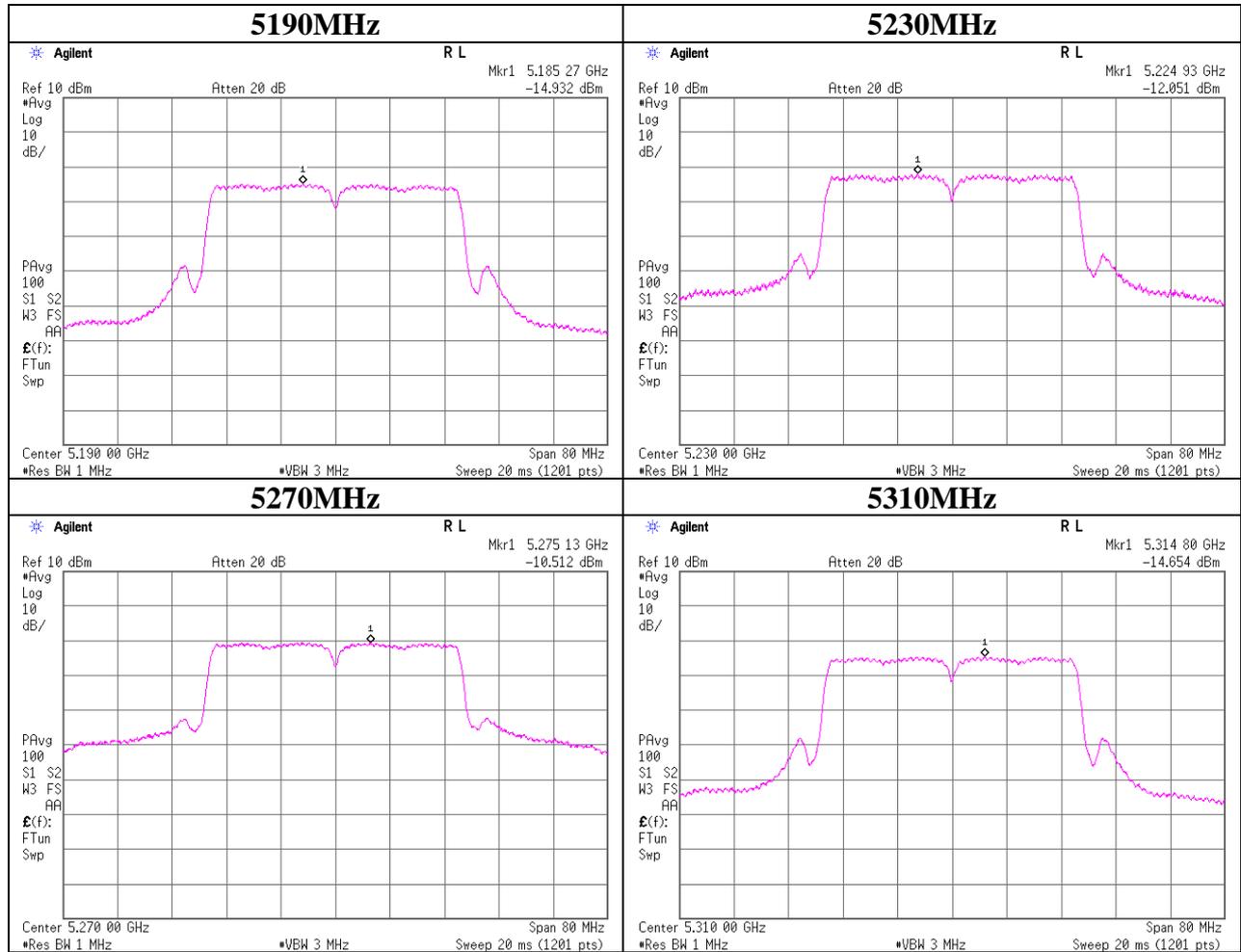
Peak Power Spectral Density

11n-20 MIMO Antenna 1



Peak Power Spectral Density

11n-40 MISO Antenna 0



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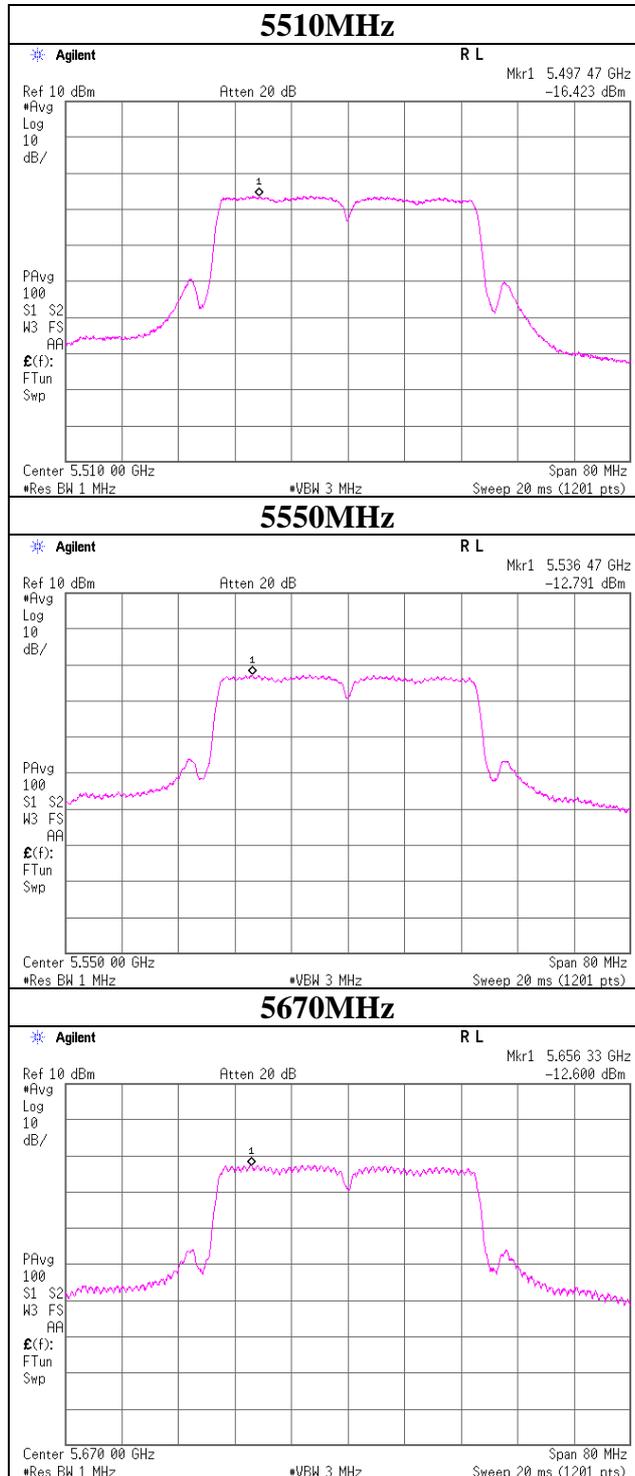
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Peak Power Spectral Density

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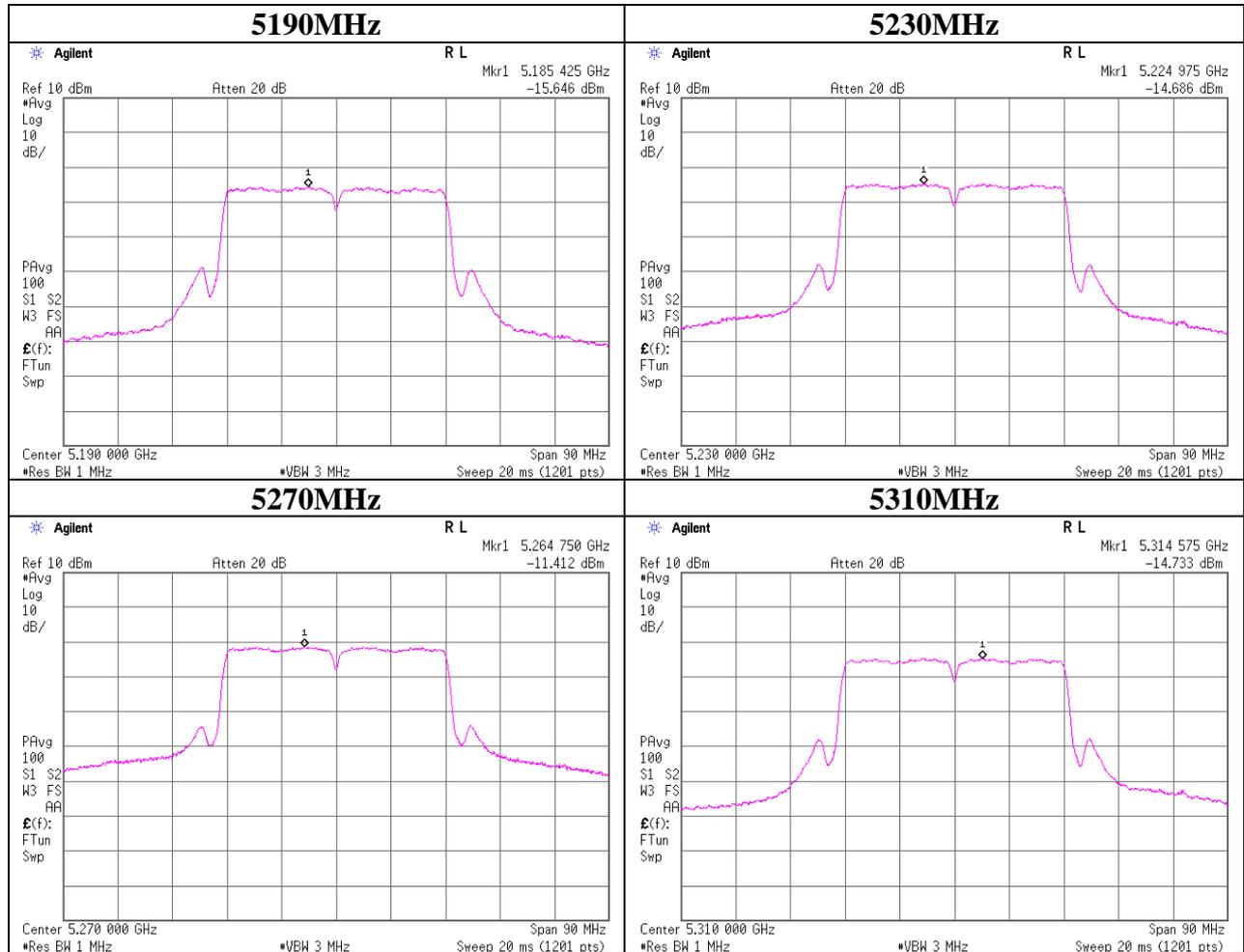
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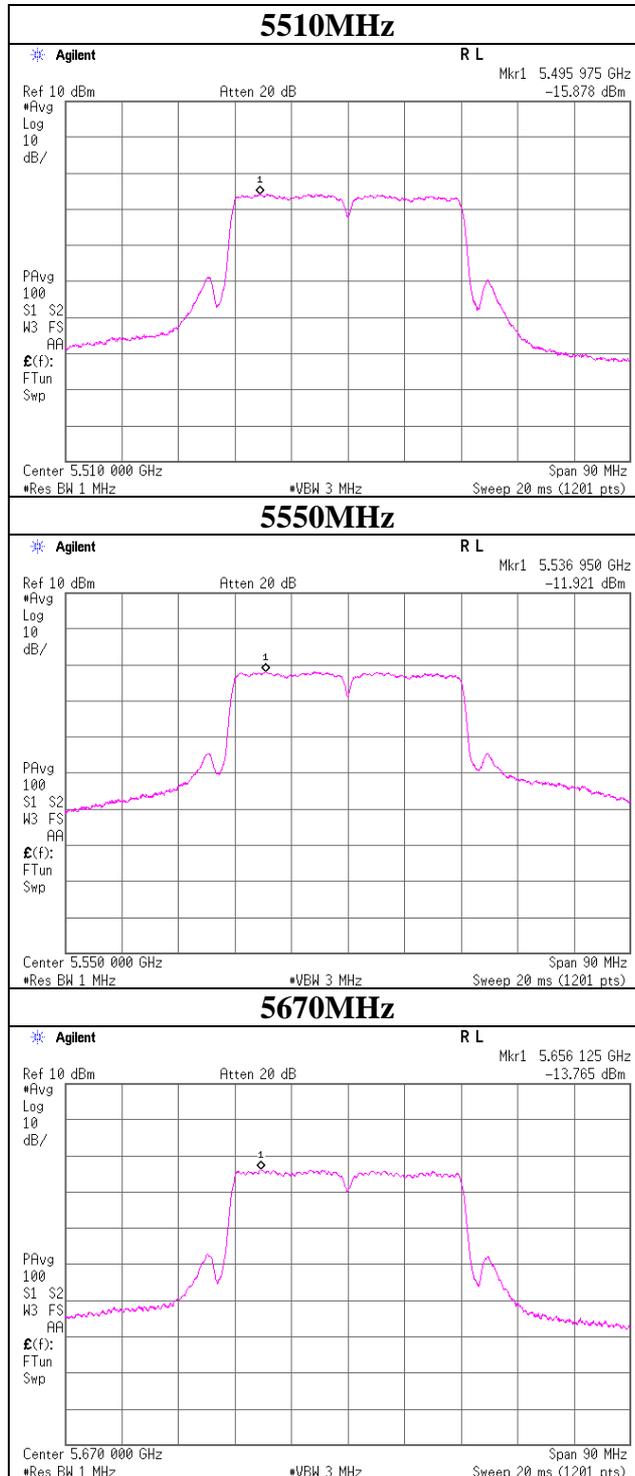
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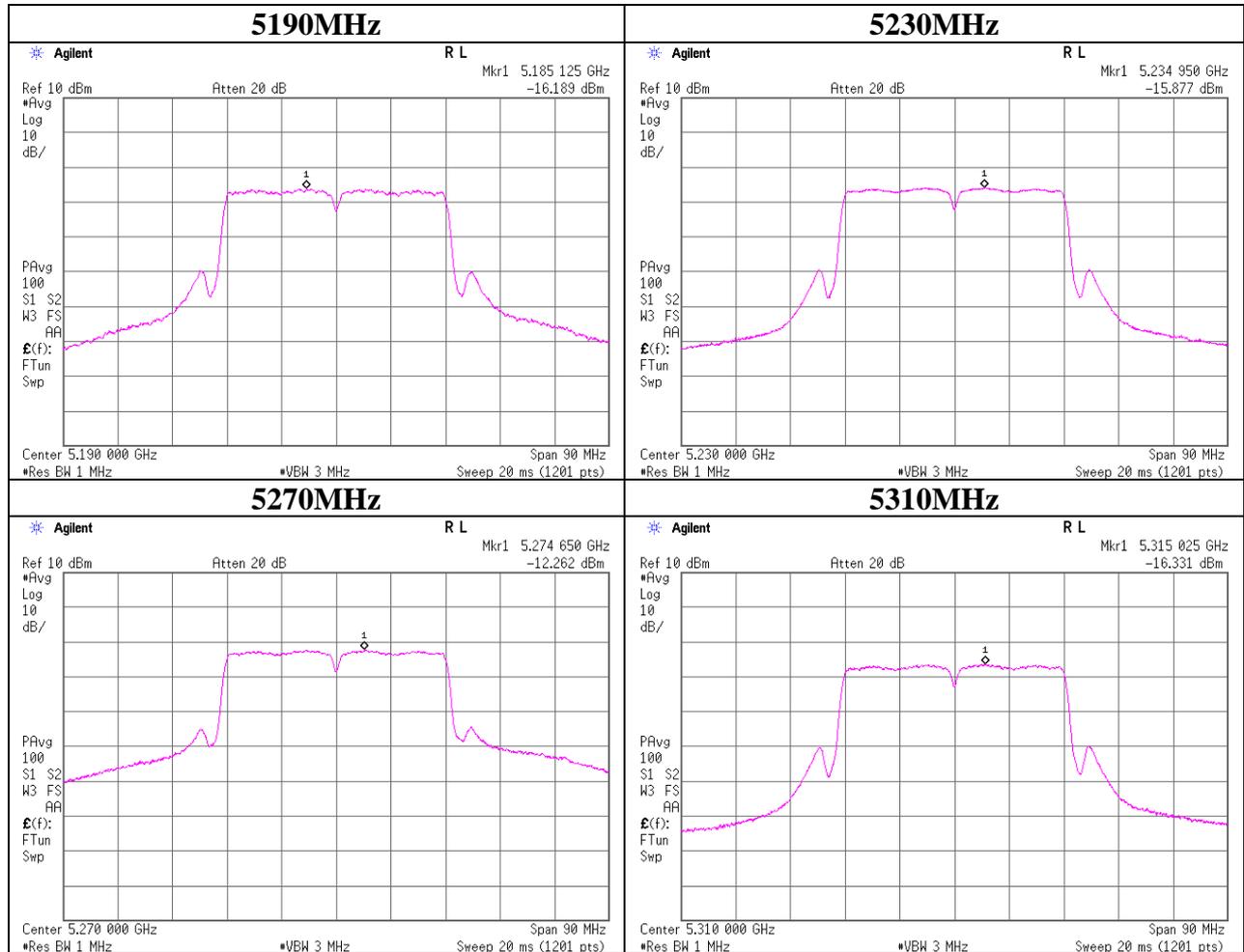
Peak Power Spectral Density

11n-40 MIMO Antenna 0



Peak Power Spectral Density

11n-40 MIMO Antenna 1



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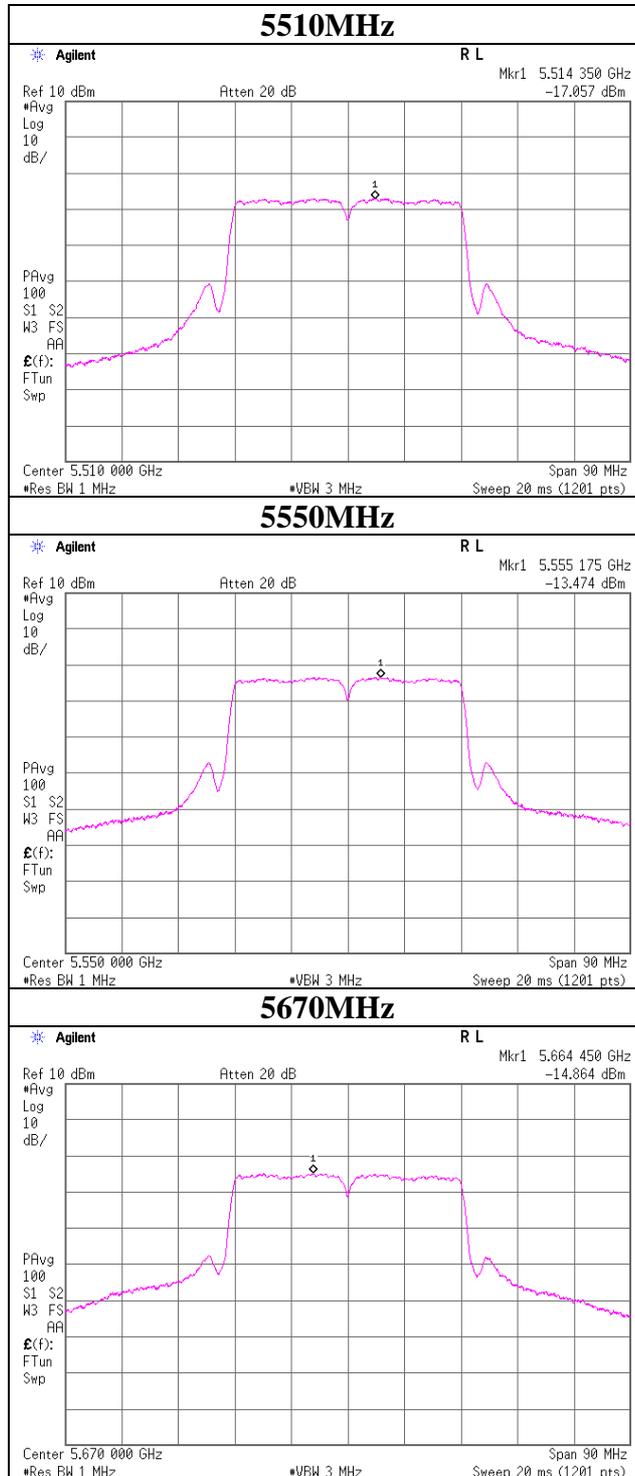
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Peak Power Spectral Density

11n-40 MIMO Antenna 1



Worst Data Rate Mode
(Reference data)

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/05/2013
Temperature/ Humidity : 20deg. C / 53% RH
Engineer : Yutaka Yoshida
Mode : 11n20 Tx

11n20, 5260MHz

MCS Number	Antenna	Reading AV [dBm]	Duty	Reading Total [dBm]	Remark
			Factor [dB]		
0	0	7.57	0.30	7.87	
1	0	7.28	0.57	7.85	
2	0	7.04	0.82	7.86	
3	0	6.87	1.03	7.90	
4	0	6.50	1.45	7.95	
5	0	6.20	1.77	7.97	
6	0	6.15	1.91	8.06	*(MISO)
7	0	5.97	2.07	8.04	
8	0	4.92	0.53	7.99	*(MIMO)
	1	3.93			
9	0	4.38	1.03	7.98	
	1	3.44			
10	0	3.99	1.43	7.95	
	1	2.96			
11	0	3.64	1.75	7.95	
	1	2.69			
12	0	3.07	2.26	7.92	
	1	2.18			
13	0	2.68	2.66	7.90	
	1	1.72			
14	0	2.55	2.82	7.92	
	1	1.58			
15	0	2.32	2.97	7.91	
	1	1.50			

*: Worst MCS

Result = Reading + Duty Factor

All comparison were carried out on same frequency and measurement factors.

*Difference between worst rate check data and formal test result is due to the different test condition.

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Worst Data Rate Mode
(Reference data)

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/05/2013
Temperature/ Humidity : 20deg. C / 53% RH
Engineer : Yutaka Yoshida
Mode : 11n40 Tx

11n40, 5270MHz

MCS Number	Antenna	Reading AV	Duty Factor	Reading Total	Remark
		[dBm]	[dB]	[dBm]	
0	0	5.76	0.59	6.35	
1	0	5.24	1.07	6.31	
2	0	4.82	1.49	6.31	
3	0	4.50	1.82	6.32	
4	0	4.07	2.38	6.45	*(MISO)
5	0	3.66	2.75	6.41	
6	0	3.36	3.01	6.37	
7	0	3.29	3.09	6.38	
8	0	2.73	1.05	6.23	*(MIMO)
	1	1.52			
9	0	1.99	1.77	6.17	
	1	0.69			
10	0	1.40	2.31	6.15	
	1	0.17			
11	0	1.02	2.69	6.16	
	1	-0.18			
12	0	0.38	3.33	6.09	
	1	-0.99			
13	0	-0.07	3.67	6.04	
	1	-1.29			
14	0	-0.27	3.85	6.04	
	1	-1.44			
15	0	-0.31	4.02	6.16	
	1	-1.52			

*: Worst MCS

Result = Reading + Duty Factor

All comparison were carried out on same frequency and measurement factors.

*Difference between worst rate check data and formal test result is due to the different test condition.

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Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
 Report No. : 10004954H
 Date : 04/09/2013
 Temperature/ Humidity : 21deg. C / 40% RH
 Engineer : Katsunori Okai
 (Above 1GHz)
 Mode : 11n-20(MIMO) Tx 5260MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	10520.000	PK	42.3	39.6	-2.3	33.6	-	46.0	68.2	22.2	Outside	
Hori	15780.000	PK	49.5	38.5	-0.6	32.5	-	54.9	73.9	19.0	Inside	
Hori	15780.000	AV	40.2	38.5	-0.6	32.5	0.53	46.1	53.9	7.8	Inside	
Vert	10520.000	PK	46.5	39.6	-2.3	33.6	-	50.2	68.2	18.0	Outside	
Vert	15780.000	PK	48.8	38.5	-0.6	32.5	-	54.2	73.9	19.7	Inside	
Vert	15780.000	AV	39.8	38.5	-0.6	32.5	0.53	45.7	53.9	8.2	Inside	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor(AV)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
 26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
Report No. : 10004954H
Date : 04/09/2013
Temperature/ Humidity : 21deg. C / 40% RH
Engineer : Katsunori Okai
(Above 1GHz)
Mode : 11n-20(MIMO) Tx 5320MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5350.000	PK	61.1	32.1	3.7	31.6	-	65.3	68.2	2.9	Bandedge	
Hori	10640.000	PK	41.9	39.8	-2.3	33.6	-	45.8	73.9	28.1	Inside	
Hori	15960.000	PK	49.1	37.7	-0.5	32.5	-	53.8	73.9	20.1	Inside	
Hori	5350.000	AV	44.3	32.1	3.7	31.6	0.53	49.0	53.9	4.9	Bandedge	
Hori	10640.000	AV	33.5	39.8	-2.3	33.6	0.53	37.9	53.9	16.0	Inside	
Hori	15960.000	AV	40.0	37.7	-0.5	32.5	0.53	45.2	53.9	8.7	Inside	
Vert	5350.000	PK	59.2	32.1	3.7	31.6	-	63.4	68.2	4.8	Bandedge	
Vert	10640.000	PK	43.2	39.8	-2.3	33.6	-	47.1	73.9	26.8	Inside	
Vert	15960.000	PK	46.5	37.7	-0.5	32.5	-	51.2	73.9	22.7	Inside	
Vert	5350.000	AV	43.4	32.1	3.7	31.6	0.53	48.1	53.9	5.8	Bandedge	
Vert	10640.000	AV	34.8	39.8	-2.3	33.6	0.53	39.2	53.9	14.7	Inside	
Vert	15960.000	AV	38.2	37.7	-0.5	32.5	0.53	43.4	53.9	10.5	Inside	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor(AV)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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Radiated Spurious Emission

Test place	Head Office EMC Lab. No.4 Anechoic Chamber
Report No.	10004954H
Date	04/10/2013
Temperature/ Humidity	22deg. C / 34% RH
Engineer	Katsunori Okai (Above 1GHz)
Mode	11n-20(MIMO) Tx 5500MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5460.000	PK	55.8	32.2	3.8	31.7	-	60.1	73.9	13.8	Inside	
Hori	5470.000	PK	59.2	32.2	3.8	31.7	-	63.5	68.2	4.7	Outside	
Hori	11000.000	PK	50.8	40.4	-2.2	33.7	-	55.3	73.9	18.6	Inside	
Hori	16500.000	PK	55.3	38.8	-0.6	32.6	-	60.9	68.2	7.3	Outside	
Hori	5460.000	AV	40.2	32.2	3.8	31.7	0.53	45.0	53.9	8.9	Inside	
Hori	11000.000	AV	39.8	40.4	-2.2	33.7	0.53	44.8	53.9	9.1	Inside	
Vert	5460.000	PK	62.5	32.2	3.8	31.7	-	66.8	73.9	7.1	Inside	
Vert	5470.000	PK	63.2	32.2	3.8	31.7	-	67.5	68.2	0.7	Outside	
Vert	11000.000	PK	52.1	40.4	-2.2	33.7	-	56.6	73.9	17.3	Inside	
Vert	16500.000	PK	53.4	38.8	-0.6	32.6	-	59.0	68.2	9.2	Outside	
Vert	5460.000	AV	44.2	32.2	3.8	31.7	0.53	49.0	53.9	4.9	Inside	
Vert	11000.000	AV	40.6	40.4	-2.2	33.7	0.53	45.6	53.9	8.3	Inside	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor(AV)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
 26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
Report No. : 10004954H
Date : 04/10/2013 04/11/2013
Temperature/ Humidity : 22deg. C / 34% RH 21deg. C / 38% RH
Engineer : Katsunori Okai Kazuya Yoshioka
(Above 1GHz) (Below 1GHz)
Mode : 11n-20(MIMO) Tx 5580MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	55.986	QP	27.9	9.4	7.5	32.2	12.6	40.0	27.4	Outside	
Hori	77.310	QP	32.4	6.6	7.8	32.1	14.7	40.0	25.3	Outside	
Hori	259.650	QP	40.6	18.0	9.5	31.9	36.2	46.0	9.8	Inside	
Hori	304.025	QP	39.0	16.4	9.8	32.0	33.2	46.0	12.8	Outside	
Hori	336.025	QP	40.4	16.9	10.1	32.0	35.4	46.0	10.6	Outside	
Hori	352.028	QP	40.9	17.2	10.2	32.0	36.3	46.0	9.7	Outside	
Vert	56.030	QP	39.7	9.4	7.5	32.2	24.4	40.0	15.6	Outside	
Vert	90.350	QP	39.4	8.3	8.0	32.0	23.7	43.5	19.8	Outside	
Vert	260.310	QP	36.7	18.0	9.5	31.9	32.3	46.0	13.7	Inside	
Vert	304.024	QP	35.5	16.4	9.8	32.0	29.7	46.0	16.3	Outside	
Vert	336.026	QP	32.7	16.9	10.1	32.0	27.7	46.0	18.3	Outside	
Vert	352.029	QP	34.0	17.2	10.2	32.0	29.4	46.0	16.6	Outside	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	11160.000	PK	54.1	40.3	-2.2	33.6	-	58.6	73.9	15.3	Inside	
Hori	16740.000	PK	59.2	39.3	-0.7	32.6	-	65.2	68.2	3.0	Outside	
Hori	11160.000	AV	42.6	40.3	-2.2	33.6	0.53	47.6	53.9	6.3	Inside	
Vert	11160.000	PK	56.8	40.3	-2.2	33.6	-	61.3	73.9	12.6	Inside	
Vert	16740.000	PK	57.5	39.3	-0.7	32.6	-	63.5	68.2	4.7	Outside	
Vert	11160.000	AV	44.9	40.3	-2.2	33.6	0.53	49.9	53.9	4.0	Inside	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor(AV)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
 26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

UL Japan, Inc.

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Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
Report No. : 10004954H
Date : 04/10/2013
Temperature/ Humidity : 22deg. C / 34% RH
Engineer : Katsunori Okai
(Above 1GHz)
Mode : 11n-20(MIMO) Tx 5700MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5725.000	PK	63.2	32.6	3.9	31.7	-	68.0	68.2	0.2	Outside	
Hori	11400.000	PK	45.9	40.0	-2.2	33.6	-	50.1	73.9	23.8	Inside	
Hori	17100.000	PK	49.9	40.4	-0.6	32.6	-	57.1	68.2	11.1	Outside	
Hori	11400.000	AV	35.4	40.0	-2.2	33.6	0.53	40.1	53.9	13.8	Inside	
Vert	5725.000	PK	62.1	32.6	3.9	31.7	-	66.9	68.2	1.3	Outside	
Vert	11400.000	PK	42.8	40.0	-2.2	33.6	-	47.0	73.9	26.9	Inside	
Vert	17100.000	PK	47.9	40.4	-0.6	32.6	-	55.1	68.2	13.1	Outside	
Vert	11400.000	AV	33.0	40.0	-2.2	33.6	0.53	37.7	53.9	16.2	Inside	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor(AV)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
Report No. : 10004954H
Date : 04/09/2013
Temperature/ Humidity : 21deg. C / 40% RH
Engineer : Katsunori Okai
(Above 1GHz)
Mode : 11n-40(MIMO) Tx 5190MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5150.000	PK	61.8	32.0	3.7	31.6	-	65.9	68.2	2.3	Bandedge	
Hori	10380.000	PK	40.9	39.3	-2.3	33.6	-	44.3	68.2	23.9	Outside	
Hori	15570.000	PK	43.7	39.3	-0.7	32.6	-	49.7	73.9	24.2	Inside	
Hori	5150.000	AV	45.2	32.0	3.7	31.6	1.05	50.4	53.9	3.6	Bandedge	
Hori	15570.000	AV	34.7	39.3	-0.7	32.6	1.05	41.8	53.9	12.2	Inside	
Vert	5150.000	PK	59.4	32.0	3.7	31.6	-	63.5	68.2	4.7	Bandedge	
Vert	10380.000	PK	41.2	39.3	-2.3	33.6	-	44.6	68.2	23.6	Outside	
Vert	15570.000	PK	43.6	39.3	-0.7	32.6	-	49.6	73.9	24.3	Inside	
Vert	5150.000	AV	44.2	32.0	3.7	31.6	1.05	49.4	53.9	4.6	Bandedge	
Vert	15570.000	AV	34.4	39.3	-0.7	32.6	1.05	41.5	53.9	12.5	Inside	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor(AV)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
 26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
Report No. : 10004954H
Date : 04/09/2013
Temperature/ Humidity : 21deg. C / 40% RH
Engineer : Katsunori Okai
(Above 1GHz)
Mode : 11n-40(MIMO) Tx 5270MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	10540.000	PK	41.6	39.6	-2.3	33.6	-	45.3	68.2	22.9	Outside	
Hori	15810.000	PK	48.2	38.3	-0.6	32.5	-	53.4	73.9	20.5	Inside	
Hori	15810.000	AV	39.2	38.3	-0.6	32.5	1.05	45.5	53.9	8.5	Inside	
Vert	10540.000	PK	41.3	39.6	-2.3	33.6	-	45.0	68.2	23.2	Outside	
Vert	15810.000	PK	46.2	38.3	-0.6	32.5	-	51.4	73.9	22.5	Inside	
Vert	15810.000	AV	37.8	38.3	-0.6	32.5	1.05	44.1	53.9	9.9	Inside	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor(AV)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
 26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
Report No. : 10004954H
Date : 04/09/2013
Temperature/ Humidity : 21deg. C / 40% RH
Engineer : Katsunori Okai
(Above 1GHz)
Mode : 11n-40(MIMO) Tx 5310MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5350.000	PK	60.9	32.1	3.7	31.6	-	65.1	68.2	3.1	Bandedge	
Hori	10620.000	PK	40.2	39.7	-2.3	33.6	-	44.0	73.9	29.9	Inside	
Hori	15930.000	PK	44.7	37.8	-0.5	32.5	-	49.5	73.9	24.4	Inside	
Hori	5350.000	AV	42.3	32.1	3.7	31.6	1.05	47.6	53.9	6.3	Bandedge	
Hori	10620.000	AV	33.2	39.7	-2.3	33.6	1.05	38.1	53.9	15.9	Inside	
Hori	15930.000	AV	36.2	37.8	-0.5	32.5	1.05	42.1	53.9	11.9	Inside	
Vert	5350.000	PK	59.3	32.1	3.7	31.6	-	63.5	68.2	4.7	Bandedge	
Vert	10620.000	PK	41.4	39.7	-2.3	33.6	-	45.2	73.9	28.7	Inside	
Vert	15930.000	PK	44.2	37.8	-0.5	32.5	-	49.0	73.9	24.9	Inside	
Vert	5350.000	AV	42.8	32.1	3.7	31.6	1.05	48.1	53.9	5.8	Bandedge	
Vert	10620.000	AV	33.1	39.7	-2.3	33.6	1.05	38.0	53.9	16.0	Inside	
Vert	15930.000	AV	36.1	37.8	-0.5	32.5	1.05	42.0	53.9	12.0	Inside	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor(AV)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
 26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
Report No. : 10004954H
Date : 04/10/2013
Temperature/ Humidity : 22deg. C / 34% RH
Engineer : Katsunori Okai
(Above 1GHz)
Mode : 11n-40(MIMO) Tx 5510MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5460.000	PK	55.6	32.2	3.8	31.7	-	59.9	73.9	14.0	Inside	
Hori	5470.000	PK	58.6	32.2	3.8	31.7	-	62.9	68.2	5.3	Outside	
Hori	11020.000	PK	45.2	40.4	-2.2	33.7	-	49.7	73.9	24.2	Inside	
Hori	16530.000	PK	46.8	38.8	-0.6	32.6	-	52.4	68.2	15.8	Outside	
Hori	5460.000	AV	40.6	32.2	3.8	31.7	1.05	46.0	53.9	8.0	Inside	
Hori	11020.000	AV	35.9	40.4	-2.2	33.7	1.05	41.5	53.9	12.5	Inside	
Vert	5460.000	PK	58.7	32.2	3.8	31.7	-	63.0	73.9	10.9	Inside	
Vert	5470.000	PK	61.5	32.2	3.8	31.7	-	65.8	68.2	2.4	Outside	
Vert	11020.000	PK	43.2	40.4	-2.2	33.7	-	47.7	73.9	26.2	Inside	
Vert	16530.000	PK	48.2	38.8	-0.6	32.6	-	53.8	68.2	14.4	Outside	
Vert	5460.000	AV	44.0	32.2	3.8	31.7	1.05	49.4	53.9	4.6	Inside	
Vert	11020.000	AV	35.2	40.4	-2.2	33.7	1.05	40.8	53.9	13.2	Inside	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor(AV)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
 26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
 Report No. : 10004954H
 Date : 04/10/2013
 Temperature/ Humidity : 22deg. C / 34% RH
 Engineer : Katsunori Okai
 (Above 1GHz)
 Mode : 11n-40(MIMO) Tx 5550MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	11100.000	PK	46.2	40.3	-2.2	33.6	-	50.7	73.9	23.2	Inside	
Hori	16650.000	PK	51.8	39.1	-0.6	32.6	-	57.7	68.2	10.5	Outside	
Hori	11100.000	AV	36.2	40.3	-2.2	33.6	1.05	41.8	53.9	12.2	Inside	
Vert	11100.000	PK	47.4	40.3	-2.2	33.6	-	51.9	73.9	22.0	Inside	
Vert	16650.000	PK	51.1	39.1	-0.6	32.6	-	57.0	68.2	11.2	Outside	
Vert	11100.000	AV	37.1	40.3	-2.2	33.6	1.05	42.7	53.9	11.3	Inside	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor(AV)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
 26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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Radiated Spurious Emission

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
Report No. : 10004954H
Date : 04/10/2013
Temperature/ Humidity : 22deg. C / 34% RH
Engineer : Katsunori Okai
(Above 1GHz)
Mode : 11n-40(MIMO) Tx 5670MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5725.000	PK	60.5	32.6	3.9	31.7	-	65.3	68.2	2.9	Outside	
Hori	11340.000	PK	43.8	40.1	-2.2	33.6	-	48.1	73.9	25.8	Inside	
Hori	17010.000	PK	48.2	40.0	-0.6	32.6	-	55.0	68.2	13.2	Outside	
Hori	11340.000	AV	33.4	40.1	-2.2	33.6	1.05	38.8	53.9	15.2	Inside	
Vert	5725.000	PK	63.0	32.6	3.9	31.7	-	67.8	68.2	0.4	Outside	
Vert	11340.000	PK	41.7	40.1	-2.2	33.6	-	46.0	73.9	27.9	Inside	
Vert	17010.000	PK	47.6	40.0	-0.6	32.6	-	54.4	68.2	13.8	Outside	
Vert	11340.000	AV	33.6	40.1	-2.2	33.6	1.05	39.0	53.9	15.0	Inside	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor(AV)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi-anechoic Chamber
Report No. 10004954H
Date 04/29/2013 04/30/2013
Temperature/ Humidity 22deg. C / 32% RH 22deg. C / 32% RH
Engineer Motoya Imura Tomohisa Nakagawa
(1-40GHz) Below 1GHz
Mode 11n-20(MIMO) Tx 5580MHz + Bluetooth DH5 2441MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	48.330	QP	29.2	11.3	7.0	28.6	18.9	40.0	21.1	Outside	
Hori	54.342	QP	35.8	9.5	7.0	28.6	23.7	40.0	16.3	Outside	
Hori	110.376	QP	33.9	11.6	7.5	28.3	24.7	43.5	18.8	Inside	
Hori	118.778	QP	32.1	12.8	7.6	28.2	24.3	43.5	19.2	Inside	
Hori	199.251	QP	38.0	16.6	8.1	27.8	34.9	43.5	8.6	Outside	
Hori	336.020	QP	35.8	15.3	9.0	27.9	32.2	46.0	13.8	Outside	
Vert	51.282	QP	46.0	10.4	7.0	28.6	34.8	40.0	5.2	Outside	
Vert	54.353	QP	46.3	9.5	7.0	28.6	34.2	40.0	5.8	Outside	
Vert	110.320	QP	39.9	11.6	7.5	28.3	30.7	43.5	12.8	Inside	
Vert	123.787	QP	33.8	13.2	7.7	28.2	26.5	43.5	17.0	Inside	
Vert	199.234	QP	29.3	16.6	8.1	27.8	26.2	43.5	17.3	Outside	
Vert	336.020	QP	30.8	15.3	9.0	27.9	27.2	46.0	18.8	Outside	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	3142.250	PK	60.2	27.8	2.7	35.1	-	55.6	68.2	12.6	Outside	
Hori	11160.000	PK	48.2	39.5	-2.3	34.5	-	50.9	73.9	23.0	Inside	
Hori	16740.000	PK	56.5	39.3	-0.7	34.2	-	60.9	68.2	7.3	Outside	
Hori	11160.000	AV	37.0	39.5	-2.3	34.5	0.53	40.2	53.9	13.7	Inside	
Vert	3142.250	PK	58.2	27.8	2.7	35.1	-	53.6	68.2	14.6	Outside	
Vert	11160.000	PK	48.9	39.5	-2.3	34.5	-	51.6	73.9	22.3	Inside	
Vert	16740.000	PK	57.2	39.3	-0.7	34.2	-	61.6	68.2	6.6	Outside	
Vert	11160.000	AV	37.2	39.5	-2.3	34.5	0.53	40.4	53.9	13.5	Inside	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor(AV)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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Head Office EMC Lab.

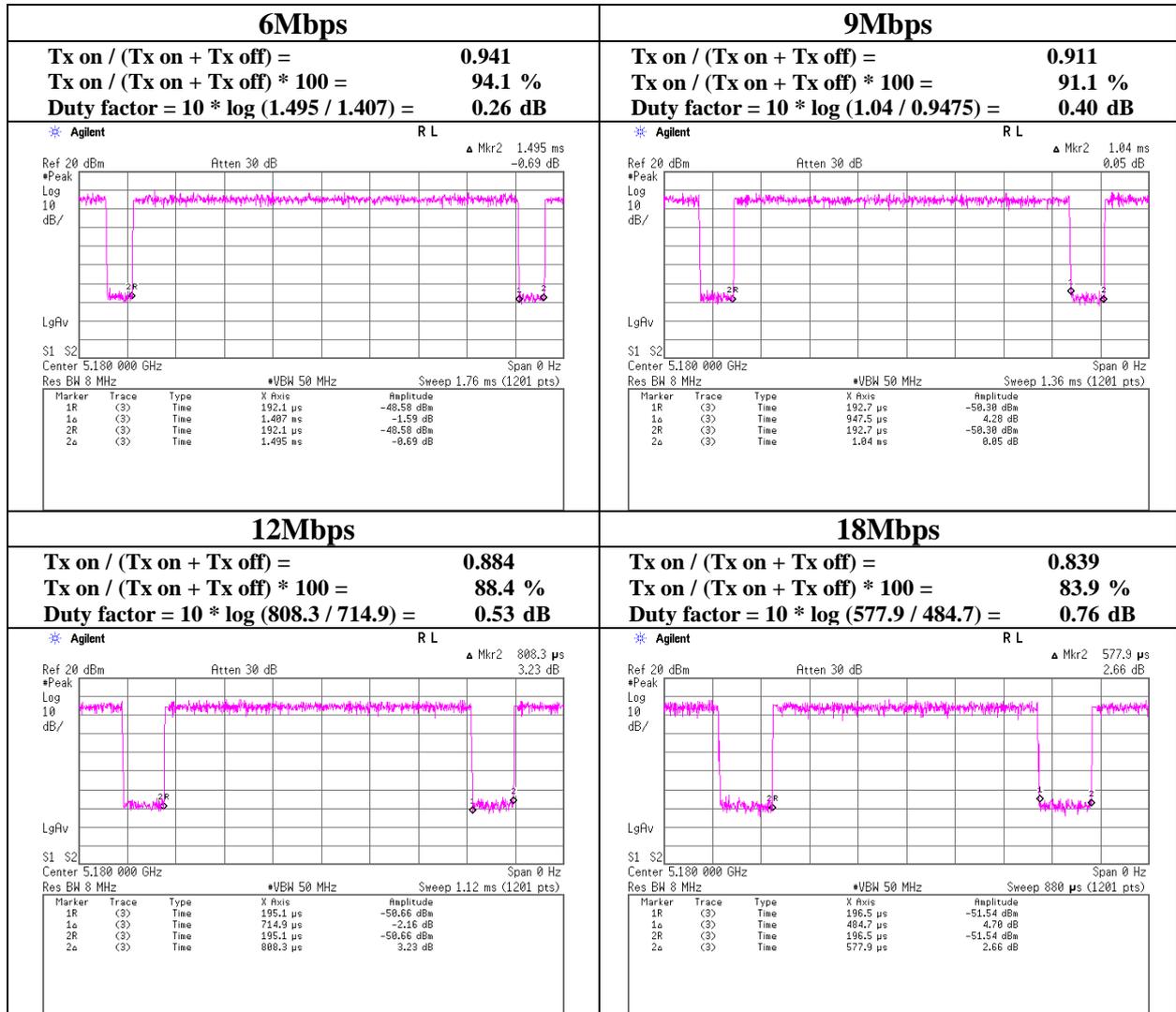
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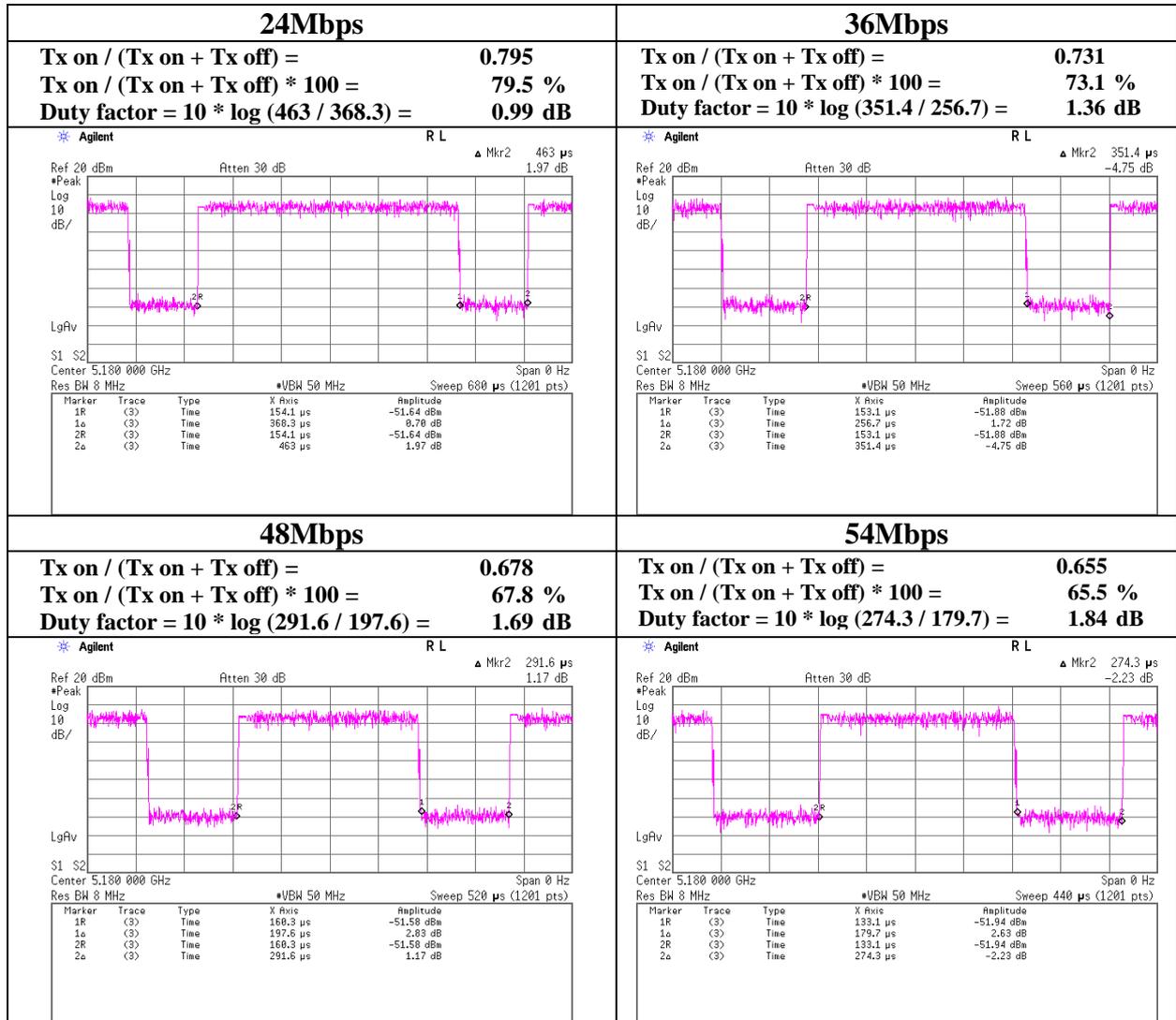
Duty Cycle

11a



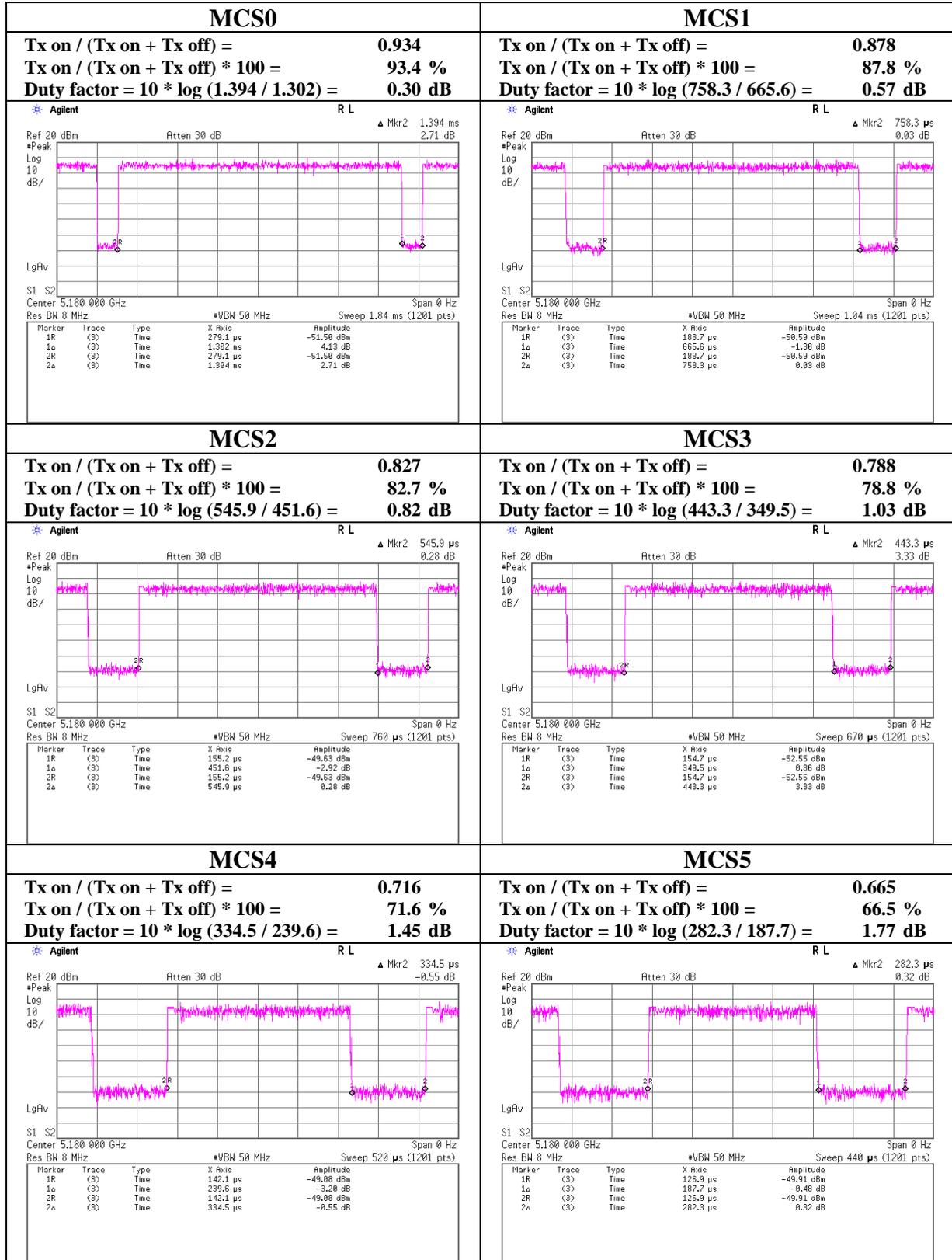
Duty Cycle

11a



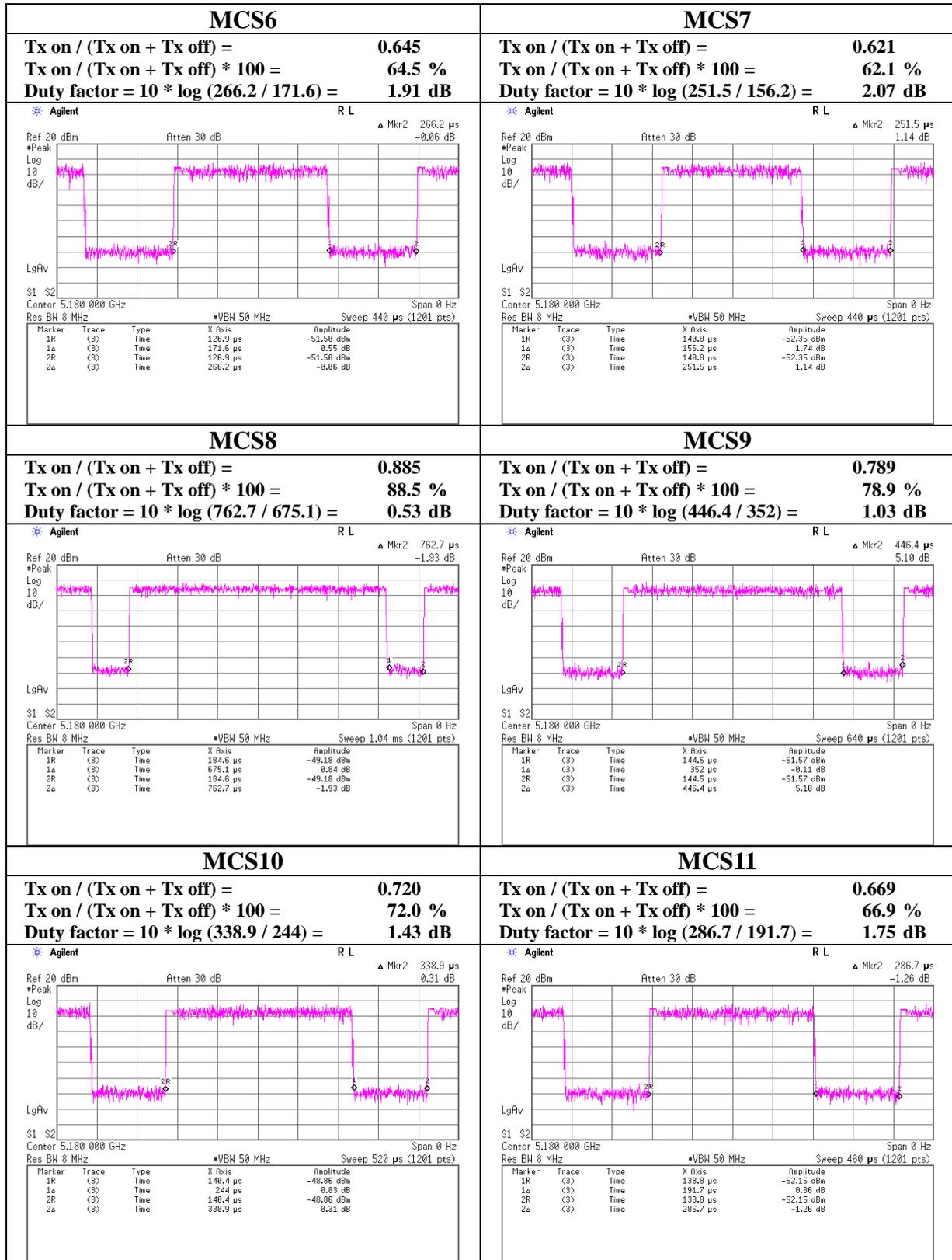
Duty Cycle

11n-20



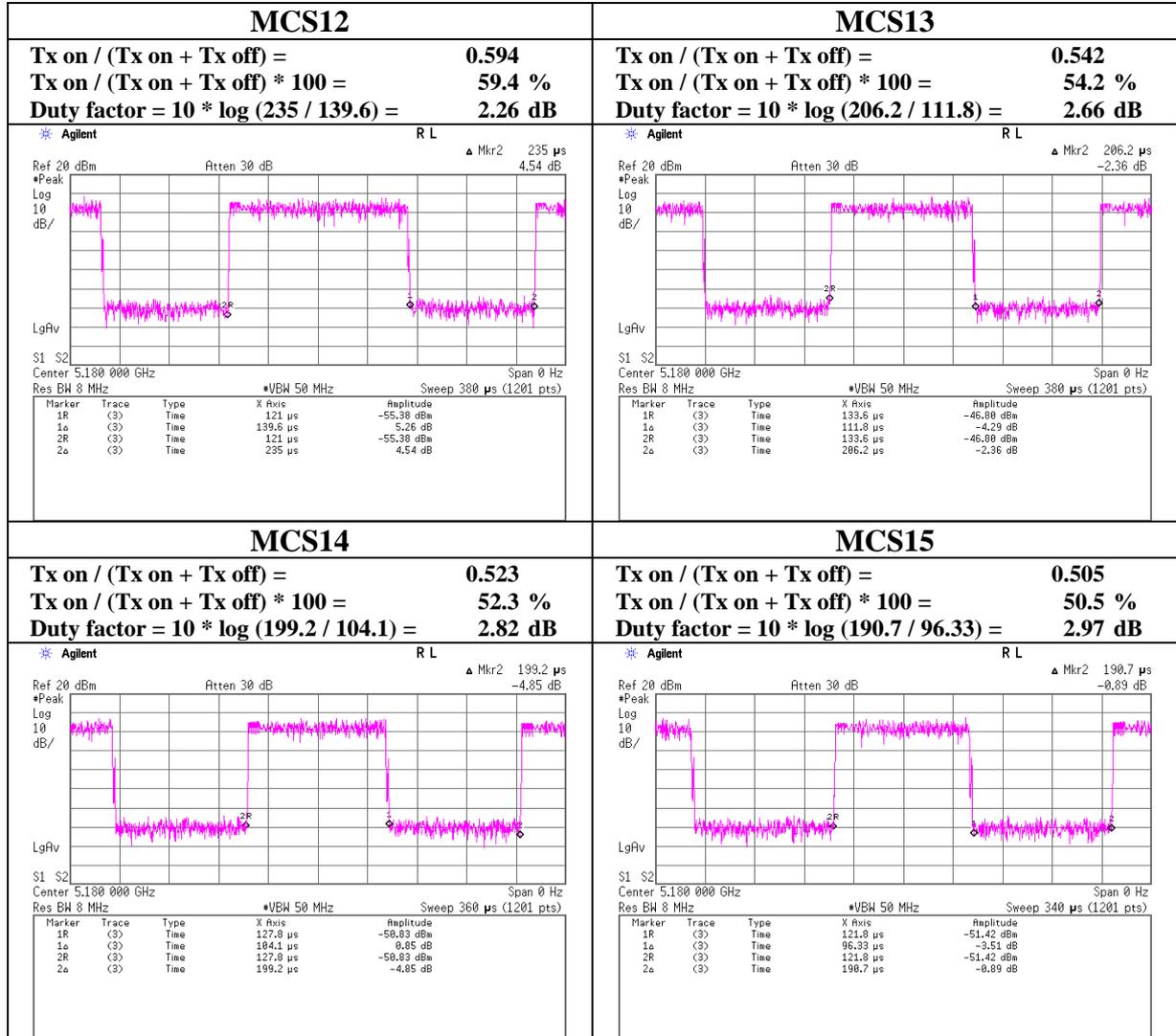
Duty Cycle

11n-20



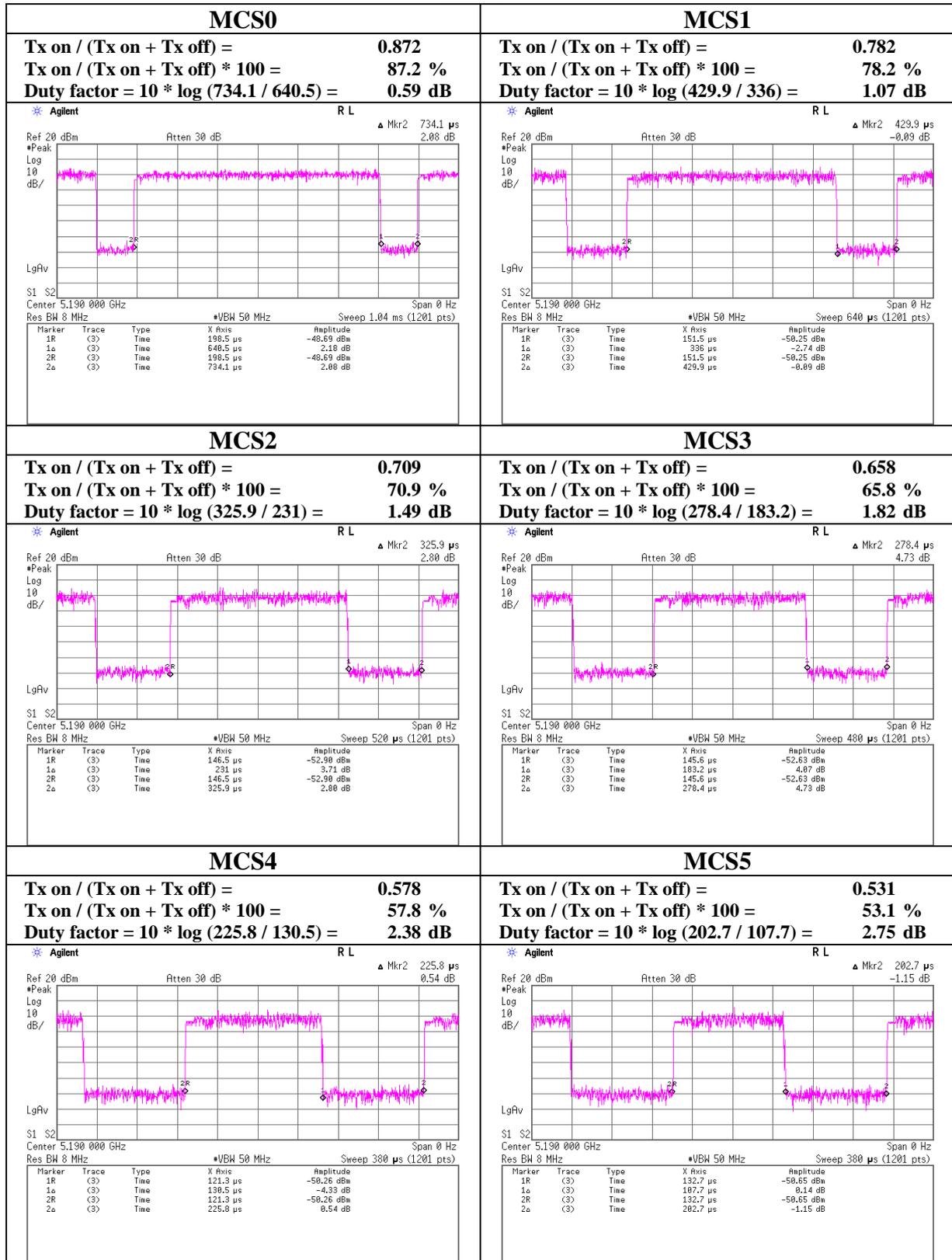
Duty Cycle

11n-20



Duty Cycle

11n-40



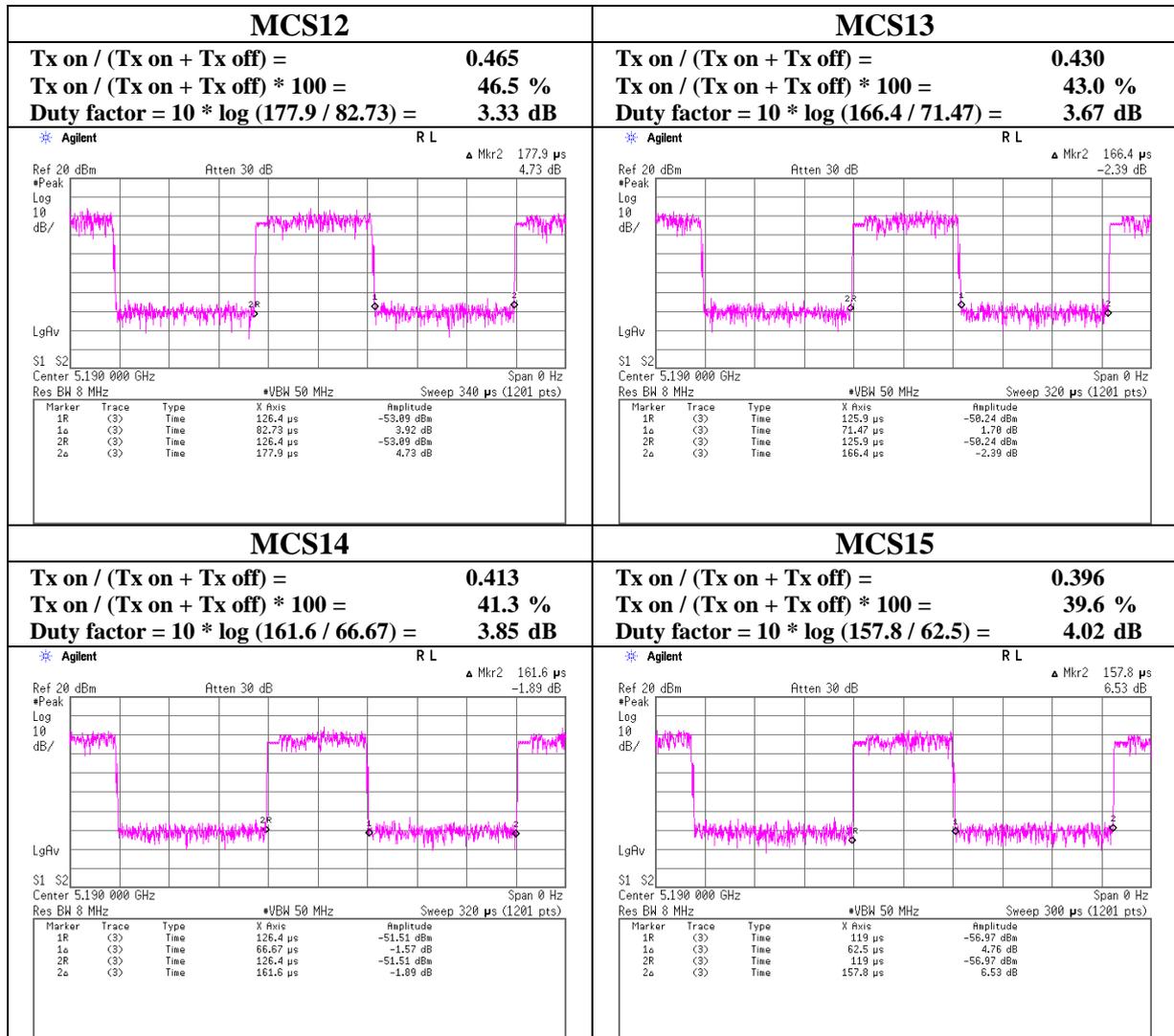
Duty Cycle

11n-40

MCS6	MCS7																																																		
<p> $Tx\ on / (Tx\ on + Tx\ off) = 0.500$ $Tx\ on / (Tx\ on + Tx\ off) * 100 = 50.0\ \%$ $Duty\ factor = 10 * \log(189.8 / 94.92) = 3.01\ dB$ </p>	<p> $Tx\ on / (Tx\ on + Tx\ off) = 0.491$ $Tx\ on / (Tx\ on + Tx\ off) * 100 = 49.1\ \%$ $Duty\ factor = 10 * \log(185.3 / 90.95) = 3.09\ dB$ </p>																																																		
<p> *Agilent R L Ref 20 dBm Atten 30 dB #Peak Log 10 dB/ LgAv S1 S2 Center 5.190 000 GHz Span 0 Hz Res BW 8 MHz #VBW 50 MHz Sweep 340 μs (1201 pts) </p> <table border="1" style="width: 100%; font-size: small;"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1R</td> <td>(3)</td> <td>Time</td> <td>123.5 μs</td> <td>-50.02 dBm</td> </tr> <tr> <td>1a</td> <td>(3)</td> <td>Time</td> <td>94.92 μs</td> <td>-1.11 dB</td> </tr> <tr> <td>2R</td> <td>(3)</td> <td>Time</td> <td>123.5 μs</td> <td>-50.02 dBm</td> </tr> <tr> <td>2a</td> <td>(3)</td> <td>Time</td> <td>109.0 μs</td> <td>-2.66 dB</td> </tr> </tbody> </table>	Marker	Trace	Type	X Axis	Amplitude	1R	(3)	Time	123.5 μs	-50.02 dBm	1a	(3)	Time	94.92 μs	-1.11 dB	2R	(3)	Time	123.5 μs	-50.02 dBm	2a	(3)	Time	109.0 μs	-2.66 dB	<p> *Agilent R L Ref 20 dBm Atten 30 dB #Peak Log 10 dB/ LgAv S1 S2 Center 5.190 000 GHz Span 0 Hz Res BW 8 MHz #VBW 50 MHz Sweep 340 μs (1201 pts) </p> <table border="1" style="width: 100%; font-size: small;"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1R</td> <td>(3)</td> <td>Time</td> <td>123.5 μs</td> <td>-50.00 dBm</td> </tr> <tr> <td>1a</td> <td>(3)</td> <td>Time</td> <td>90.95 μs</td> <td>-4.30 dB</td> </tr> <tr> <td>2R</td> <td>(3)</td> <td>Time</td> <td>123.5 μs</td> <td>-50.00 dBm</td> </tr> <tr> <td>2a</td> <td>(3)</td> <td>Time</td> <td>105.3 μs</td> <td>-2.93 dB</td> </tr> </tbody> </table>	Marker	Trace	Type	X Axis	Amplitude	1R	(3)	Time	123.5 μs	-50.00 dBm	1a	(3)	Time	90.95 μs	-4.30 dB	2R	(3)	Time	123.5 μs	-50.00 dBm	2a	(3)	Time	105.3 μs	-2.93 dB
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MCS8	MCS9																																																		
<p> $Tx\ on / (Tx\ on + Tx\ off) = 0.786$ $Tx\ on / (Tx\ on + Tx\ off) * 100 = 78.6\ \%$ $Duty\ factor = 10 * \log(433.6 / 340.8) = 1.05\ dB$ </p>	<p> $Tx\ on / (Tx\ on + Tx\ off) = 0.665$ $Tx\ on / (Tx\ on + Tx\ off) * 100 = 66.5\ \%$ $Duty\ factor = 10 * \log(281.4 / 187.1) = 1.77\ dB$ </p>																																																		
<p> *Agilent R L Ref 20 dBm Atten 30 dB #Peak Log 10 dB/ LgAv S1 S2 Center 5.190 000 GHz Span 0 Hz Res BW 8 MHz #VBW 50 MHz Sweep 640 μs (1201 pts) </p> <table border="1" style="width: 100%; font-size: small;"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1R</td> <td>(3)</td> <td>Time</td> <td>150.4 μs</td> <td>-50.10 dBm</td> </tr> <tr> <td>1a</td> <td>(3)</td> <td>Time</td> <td>340.8 μs</td> <td>-0.42 dB</td> </tr> <tr> <td>2R</td> <td>(3)</td> <td>Time</td> <td>150.4 μs</td> <td>-50.10 dBm</td> </tr> <tr> <td>2a</td> <td>(3)</td> <td>Time</td> <td>433.6 μs</td> <td>1.07 dB</td> </tr> </tbody> </table>	Marker	Trace	Type	X Axis	Amplitude	1R	(3)	Time	150.4 μs	-50.10 dBm	1a	(3)	Time	340.8 μs	-0.42 dB	2R	(3)	Time	150.4 μs	-50.10 dBm	2a	(3)	Time	433.6 μs	1.07 dB	<p> *Agilent R L Ref 20 dBm Atten 30 dB #Peak Log 10 dB/ LgAv S1 S2 Center 5.190 000 GHz Span 0 Hz Res BW 8 MHz #VBW 50 MHz Sweep 400 μs (1201 pts) </p> <table border="1" style="width: 100%; font-size: small;"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1R</td> <td>(3)</td> <td>Time</td> <td>136.5 μs</td> <td>-48.57 dBm</td> </tr> <tr> <td>1a</td> <td>(3)</td> <td>Time</td> <td>187.1 μs</td> <td>-2.60 dB</td> </tr> <tr> <td>2R</td> <td>(3)</td> <td>Time</td> <td>136.5 μs</td> <td>-48.57 dBm</td> </tr> <tr> <td>2a</td> <td>(3)</td> <td>Time</td> <td>281.4 μs</td> <td>-1.50 dB</td> </tr> </tbody> </table>	Marker	Trace	Type	X Axis	Amplitude	1R	(3)	Time	136.5 μs	-48.57 dBm	1a	(3)	Time	187.1 μs	-2.60 dB	2R	(3)	Time	136.5 μs	-48.57 dBm	2a	(3)	Time	281.4 μs	-1.50 dB
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MCS10	MCS11																																																		
<p> $Tx\ on / (Tx\ on + Tx\ off) = 0.588$ $Tx\ on / (Tx\ on + Tx\ off) * 100 = 58.8\ \%$ $Duty\ factor = 10 * \log(229.7 / 135) = 2.31\ dB$ </p>	<p> $Tx\ on / (Tx\ on + Tx\ off) = 0.538$ $Tx\ on / (Tx\ on + Tx\ off) * 100 = 53.8\ \%$ $Duty\ factor = 10 * \log(205.8 / 110.7) = 2.69\ dB$ </p>																																																		
<p> *Agilent R L Ref 20 dBm Atten 30 dB #Peak Log 10 dB/ LgAv S1 S2 Center 5.190 000 GHz Span 0 Hz Res BW 8 MHz #VBW 50 MHz Sweep 400 μs (1201 pts) </p> <table border="1" style="width: 100%; font-size: small;"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1R</td> <td>(3)</td> <td>Time</td> <td>130.3 μs</td> <td>-52.56 dBm</td> </tr> <tr> <td>1a</td> <td>(3)</td> <td>Time</td> <td>135 μs</td> <td>1.64 dB</td> </tr> <tr> <td>2R</td> <td>(3)</td> <td>Time</td> <td>130.3 μs</td> <td>-52.56 dBm</td> </tr> <tr> <td>2a</td> <td>(3)</td> <td>Time</td> <td>229.7 μs</td> <td>0.64 dB</td> </tr> </tbody> </table>	Marker	Trace	Type	X Axis	Amplitude	1R	(3)	Time	130.3 μs	-52.56 dBm	1a	(3)	Time	135 μs	1.64 dB	2R	(3)	Time	130.3 μs	-52.56 dBm	2a	(3)	Time	229.7 μs	0.64 dB	<p> *Agilent R L Ref 20 dBm Atten 30 dB #Peak Log 10 dB/ LgAv S1 S2 Center 5.190 000 GHz Span 0 Hz Res BW 8 MHz #VBW 50 MHz Sweep 300 μs (1201 pts) </p> <table border="1" style="width: 100%; font-size: small;"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1R</td> <td>(3)</td> <td>Time</td> <td>123.3 μs</td> <td>-48.47 dBm</td> </tr> <tr> <td>1a</td> <td>(3)</td> <td>Time</td> <td>110.7 μs</td> <td>-0.45 dB</td> </tr> <tr> <td>2R</td> <td>(3)</td> <td>Time</td> <td>123.3 μs</td> <td>-48.47 dBm</td> </tr> <tr> <td>2a</td> <td>(3)</td> <td>Time</td> <td>205.8 μs</td> <td>-1.00 dB</td> </tr> </tbody> </table>	Marker	Trace	Type	X Axis	Amplitude	1R	(3)	Time	123.3 μs	-48.47 dBm	1a	(3)	Time	110.7 μs	-0.45 dB	2R	(3)	Time	123.3 μs	-48.47 dBm	2a	(3)	Time	205.8 μs	-1.00 dB
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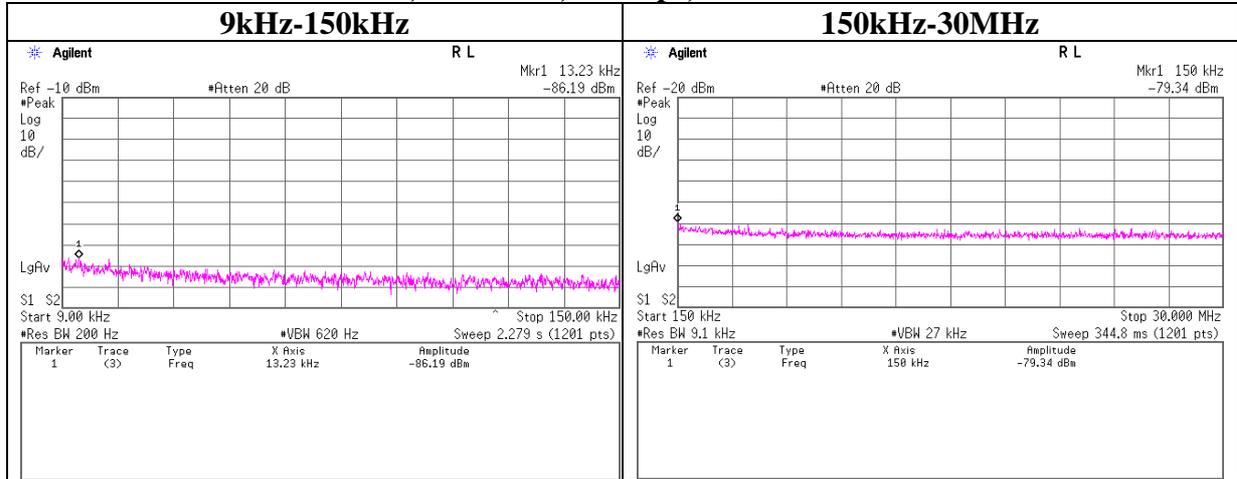
Duty Cycle

11n-40



Conducted Spurious Emission

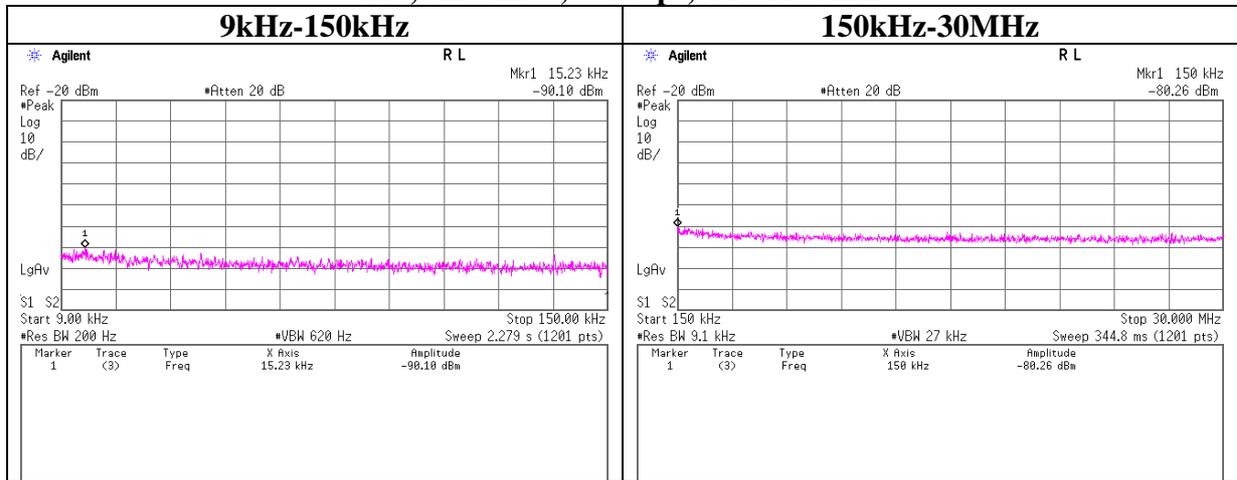
11a, Antenna0, 36Mbps, Tx 5180MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
13.23	-86.2	0.0	10.1	2.0	37.0	-37.1	-27.0	10.1	
150.00	-79.3	0.2	10.1	2.0	20.4	-46.7	-27.0	19.7	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

11a, Antenna0, 36Mbps, Tx 5220MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
15.23	-90.1	0.0	10.1	2.0	37.0	-41.0	-27.0	14.0	
175.00	-80.3	0.2	10.1	2.0	20.4	-47.7	-27.0	20.7	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW facto

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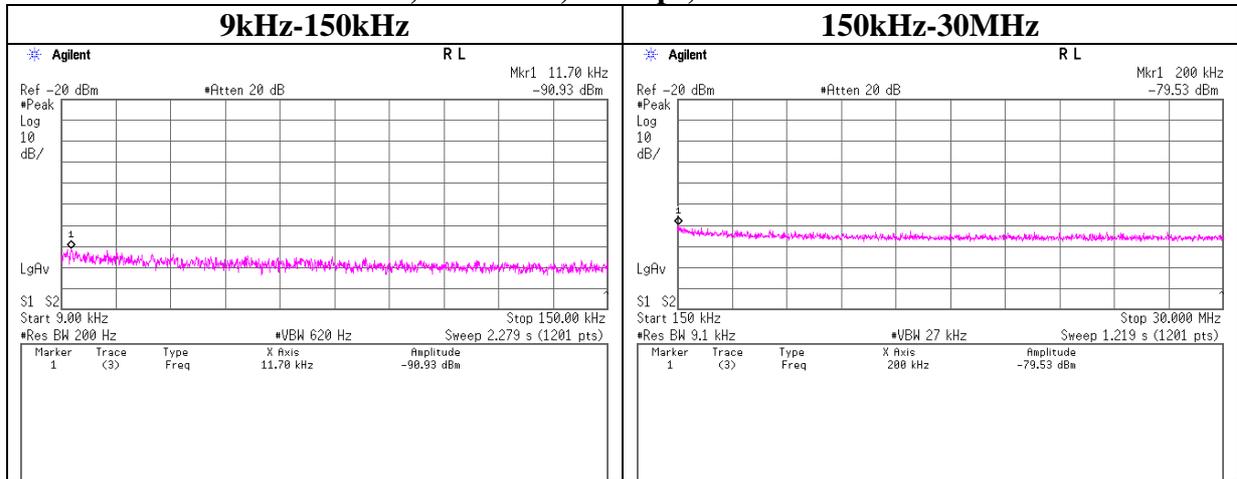
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Conducted Spurious Emission

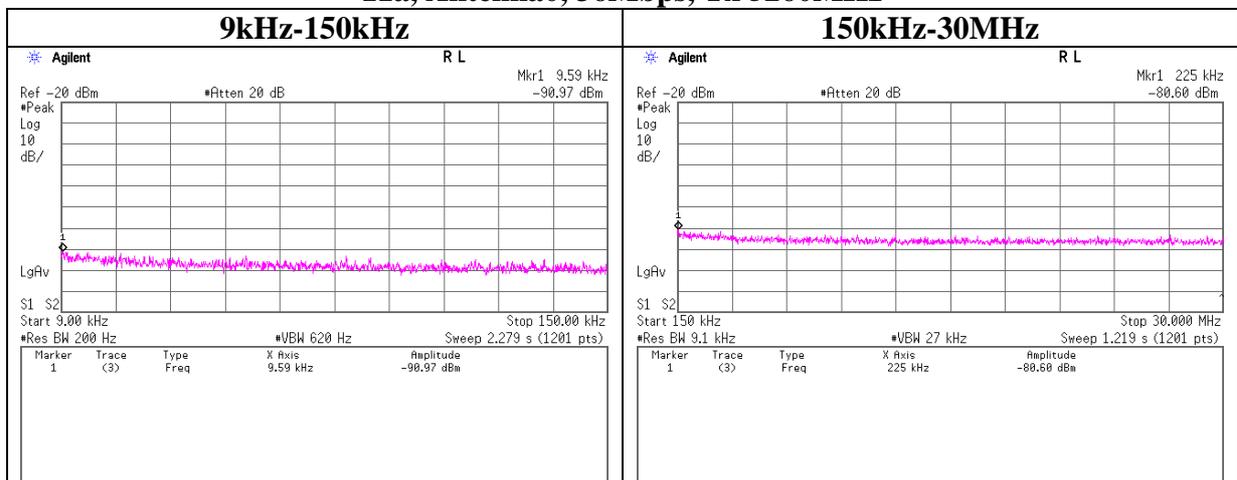
11a, Antenna0, 36Mbps, Tx 5240MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
11.70	-90.9	0.0	10.1	2.0	37.0	-41.9	-27.0	14.9	
200.00	-79.5	0.2	10.1	2.0	20.4	-46.9	-27.0	19.9	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

11a, Antenna0, 36Mbps, Tx 5260MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.59	-91.0	0.0	10.1	2.0	37.0	-41.9	-27.0	14.9	
225.00	-80.6	0.2	10.1	2.0	20.4	-48.0	-27.0	21.0	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

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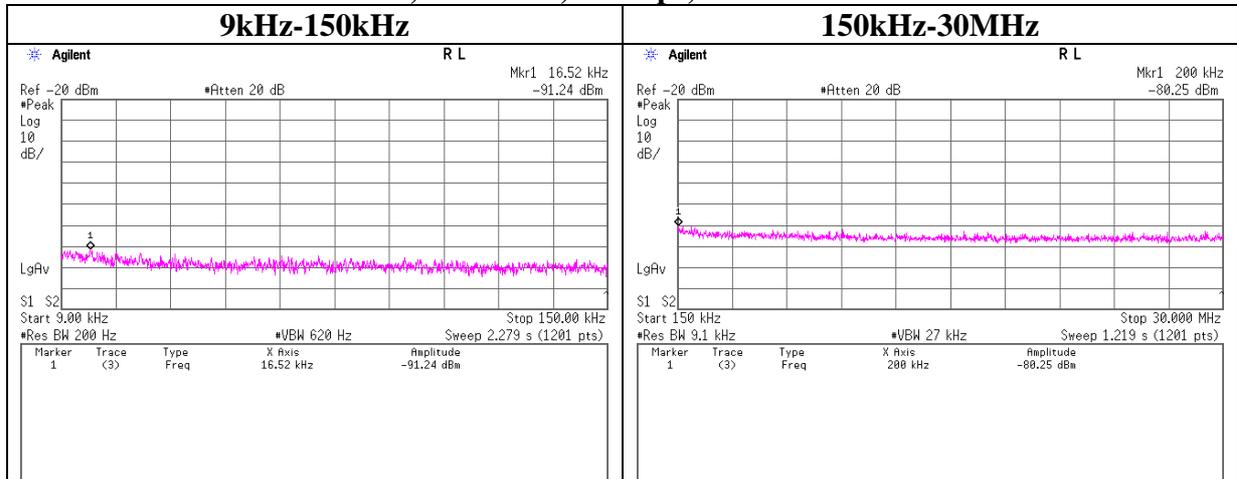
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Conducted Spurious Emission

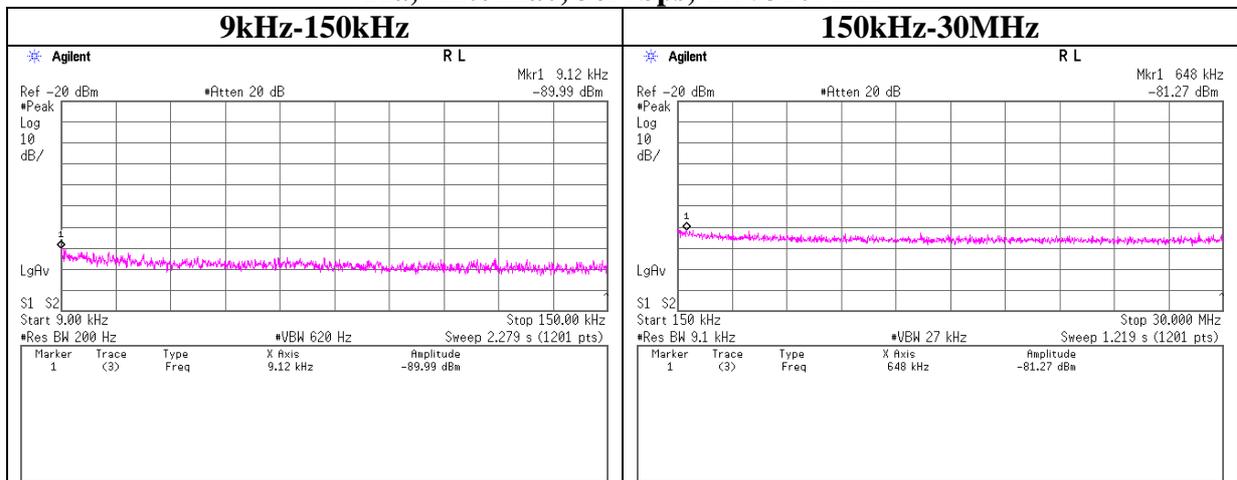
11a, Antenna0, 36Mbps, Tx 5300MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
16.52	-91.2	0.0	10.1	2.0	37.0	-42.2	-27.0	15.2	
200.00	-80.3	0.2	10.1	2.0	20.4	-47.6	-27.0	20.6	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

11a, Antenna0, 36Mbps, Tx 5320MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.12	-90.0	0.0	10.1	2.0	37.0	-40.9	-27.0	13.9	
648.00	-81.3	0.2	10.1	2.0	20.4	-48.7	-27.0	21.7	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW facto

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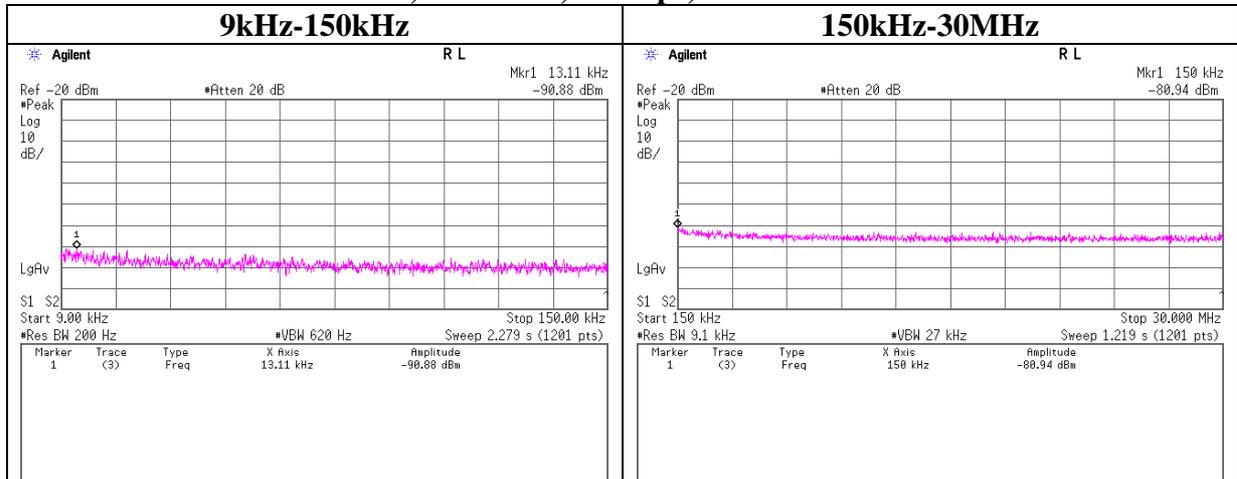
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Conducted Spurious Emission

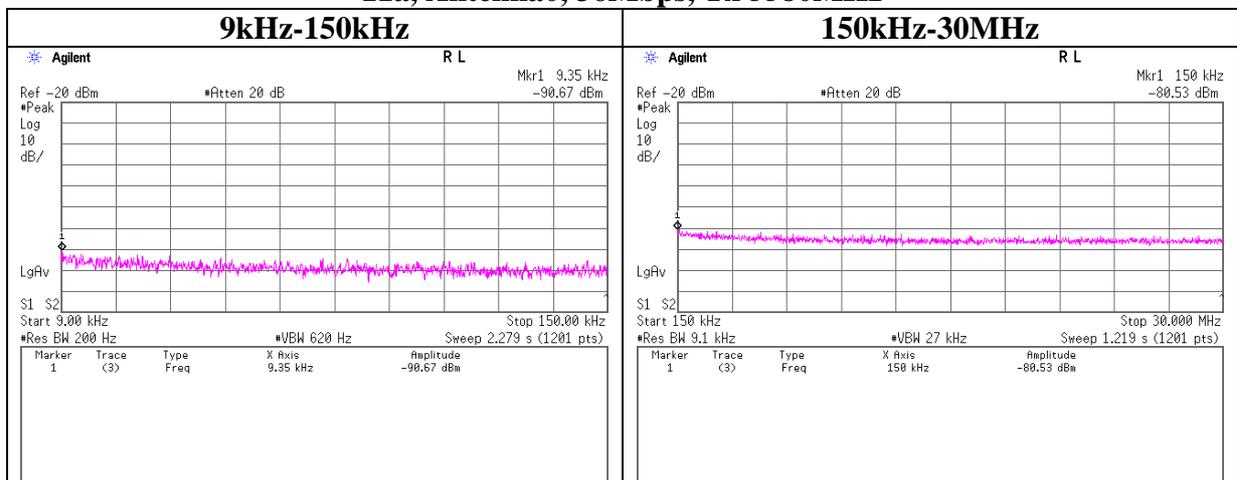
11a, Antenna0, 36Mbps, Tx 5500MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
13.11	-90.9	0.0	10.1	2.0	37.0	-41.8	-27.0	14.8	
150.00	-80.9	0.2	10.1	2.0	20.4	-48.3	-27.0	21.3	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

11a, Antenna0, 36Mbps, Tx 5580MHz

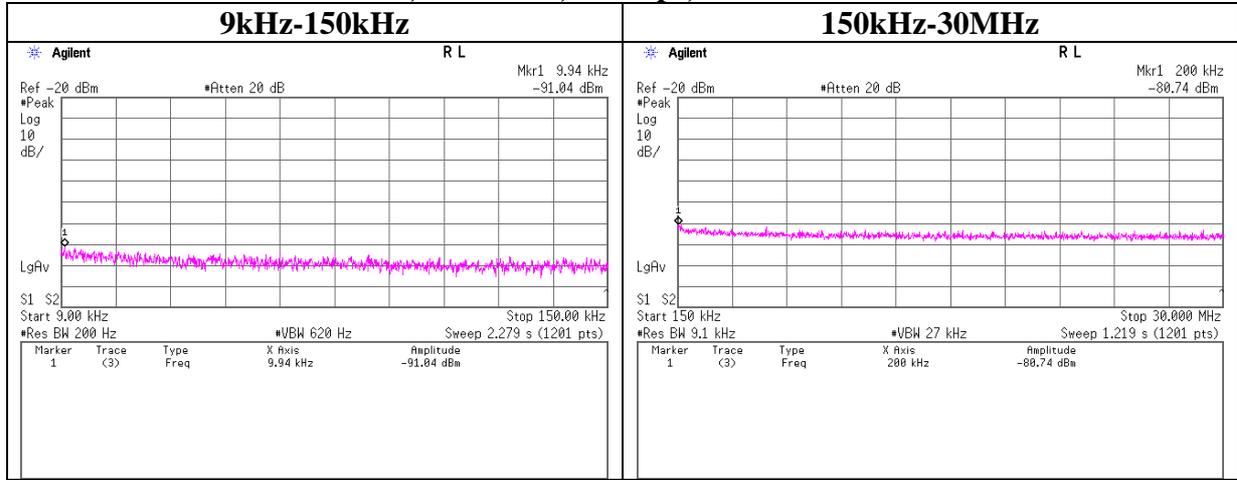


Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.35	-90.7	0.0	10.1	2.0	37.0	-41.6	-27.0	14.6	
150.00	-80.5	0.2	10.1	2.0	20.4	-47.9	-27.0	20.9	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW facto

Conducted Spurious Emission

11a, Antenna0, 36Mbps, Tx 5700MHz

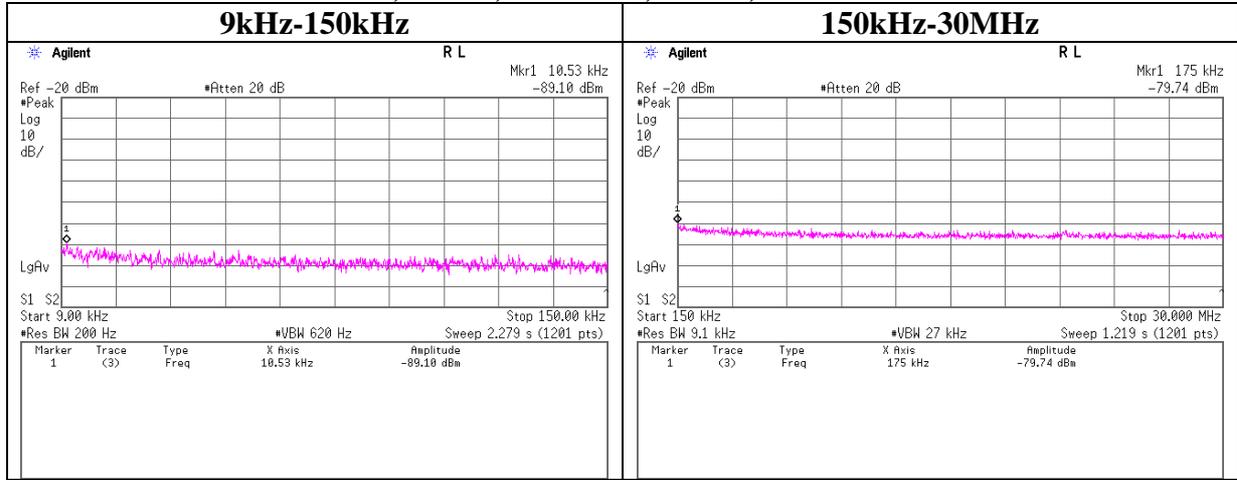


Frequency	Reading	Cable Loss	Attenuator	Antenna Gain	RBW factor	EIRP	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dBi]	[dB]	[dBm]	[dBm]	[dB]	
9.94	-91.0	0.0	10.1	2.0	37.0	-42.0	-27.0	15.0	
200.00	-80.7	0.2	10.1	2.0	20.4	-48.1	-27.0	21.1	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

Conducted Spurious Emission

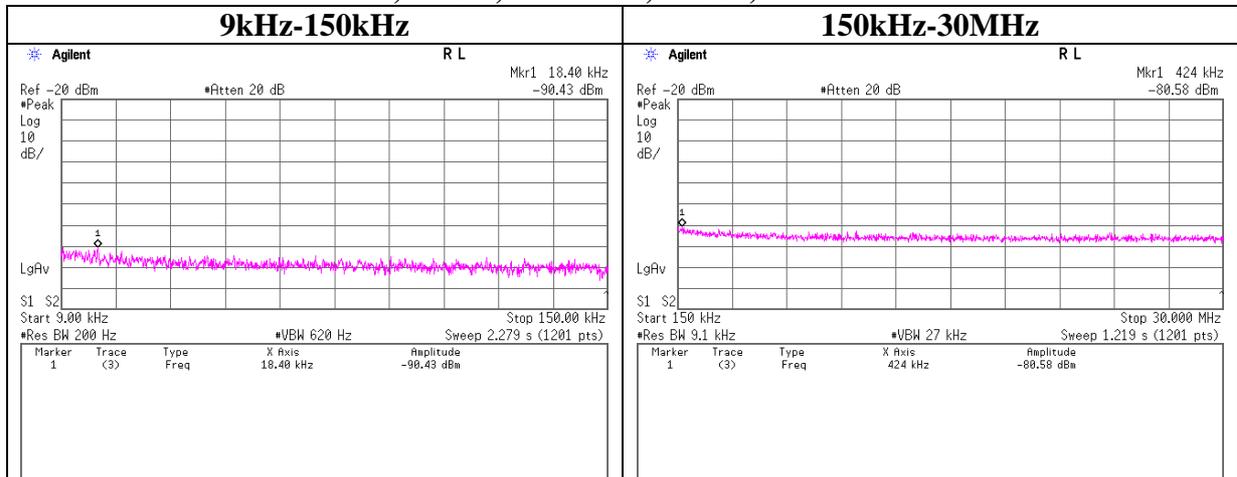
11n-20, MISO, Antenna0, MCS6, Tx 5180MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
10.53	-89.1	0.0	10.1	2.0	37.0	-40.0	-27.0	13.0	
175.00	-79.7	0.2	10.1	2.0	20.4	-47.1	-27.0	20.1	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

11n-20, MISO, Antenna0, MCS6, Tx 5220MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
18.40	-90.4	0.0	10.1	2.0	37.0	-41.4	-27.0	14.4	
424.00	-80.6	0.2	10.1	2.0	20.4	-48.0	-27.0	21.0	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW facto

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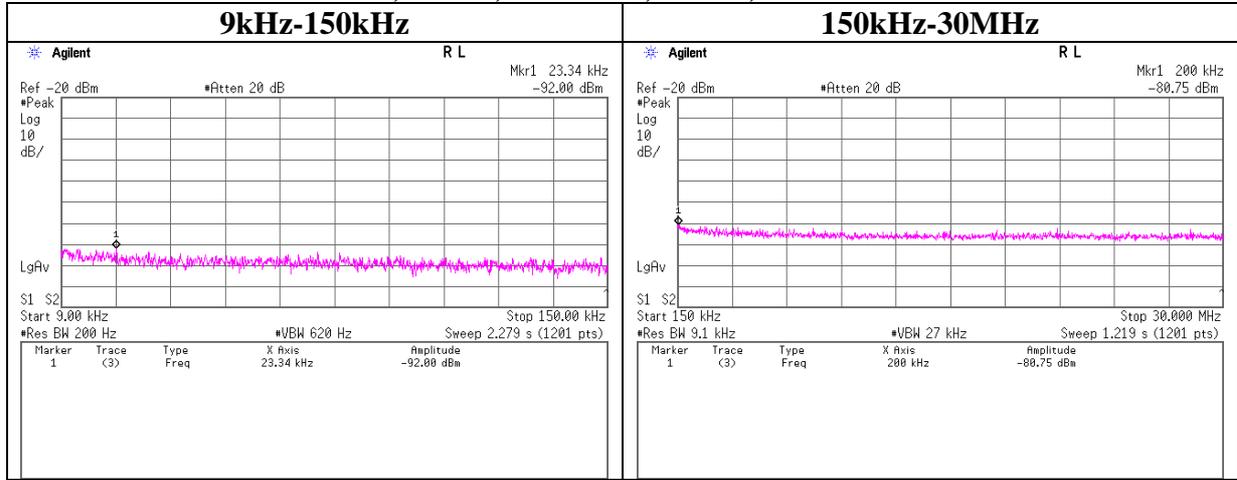
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Conducted Spurious Emission

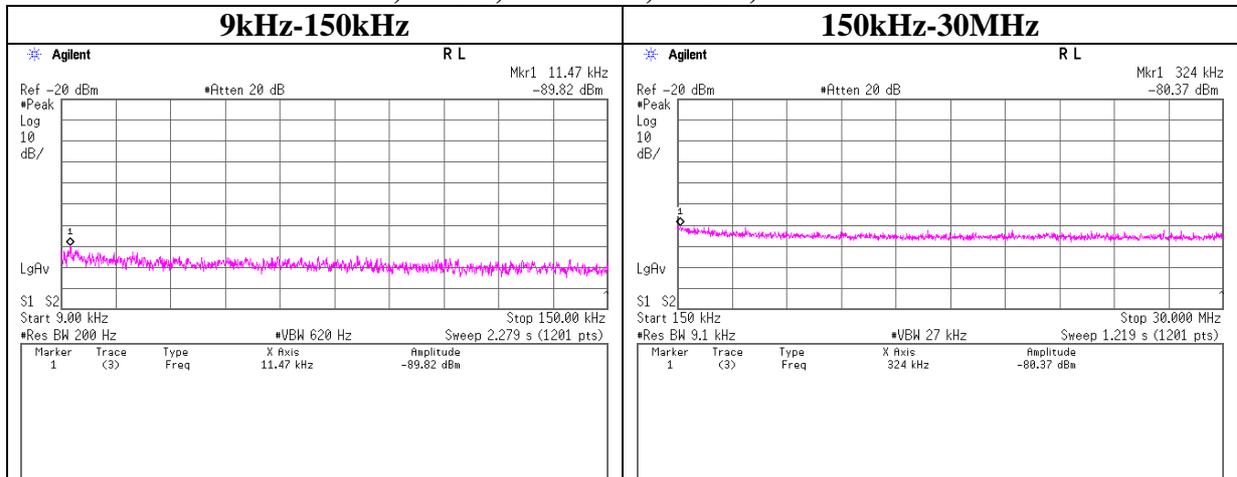
11n-20, MISO, Antenna0, MCS6, Tx 5240MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
23.34	-92.0	0.0	10.1	2.0	37.0	-42.9	-27.0	15.9	
200.00	-80.8	0.2	10.1	2.0	20.4	-48.1	-27.0	21.1	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

11n-20, MISO, Antenna0, MCS6, Tx 5260MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
11.47	-89.8	0.0	10.1	2.0	37.0	-40.8	-27.0	13.8	
324.00	-80.4	0.2	10.1	2.0	20.4	-47.8	-27.0	20.8	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW facto

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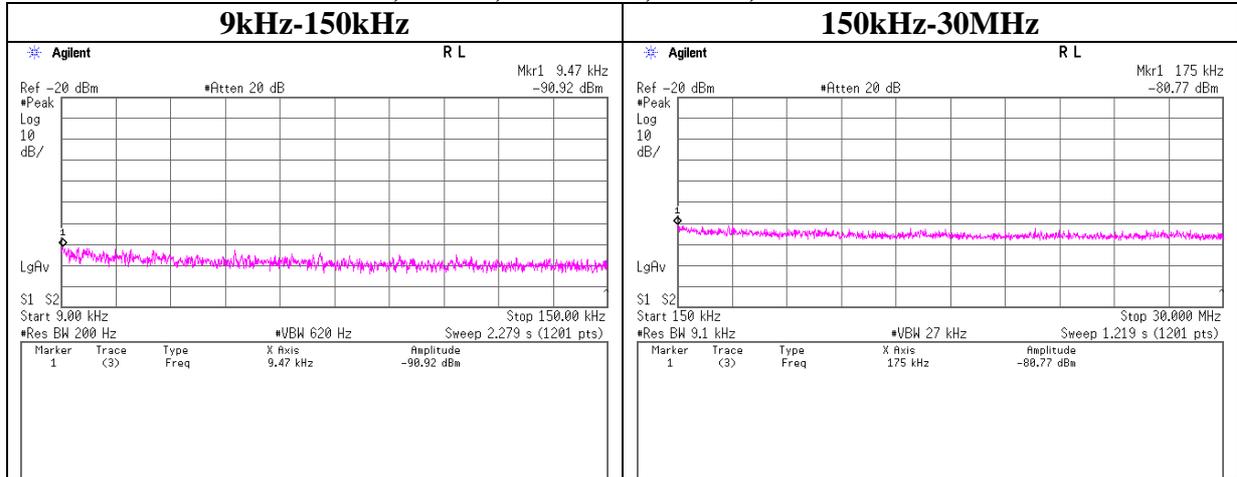
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Conducted Spurious Emission

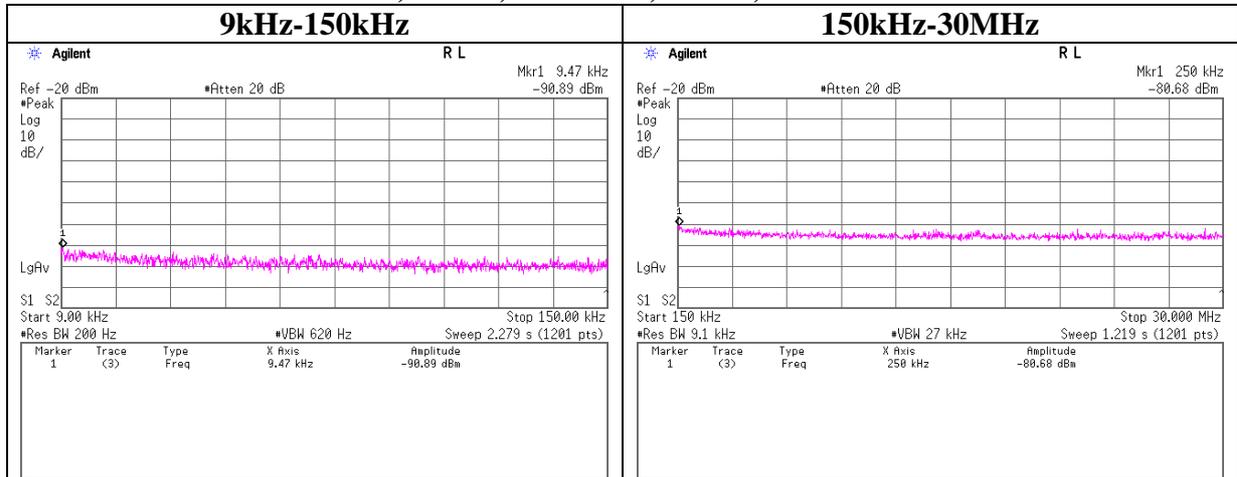
11n-20, MISO, Antenna0, MCS6, Tx 5300MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.47	-90.9	0.0	10.1	2.0	37.0	-41.9	-27.0	14.9	
175.00	-80.8	0.2	10.1	2.0	20.4	-48.2	-27.0	21.2	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

11n-20, MISO, Antenna0, MCS6,Tx 5320MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.47	-90.9	0.0	10.1	2.0	37.0	-41.8	-27.0	14.8	
250.00	-80.7	0.2	10.1	2.0	20.4	-48.1	-27.0	21.1	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW facto

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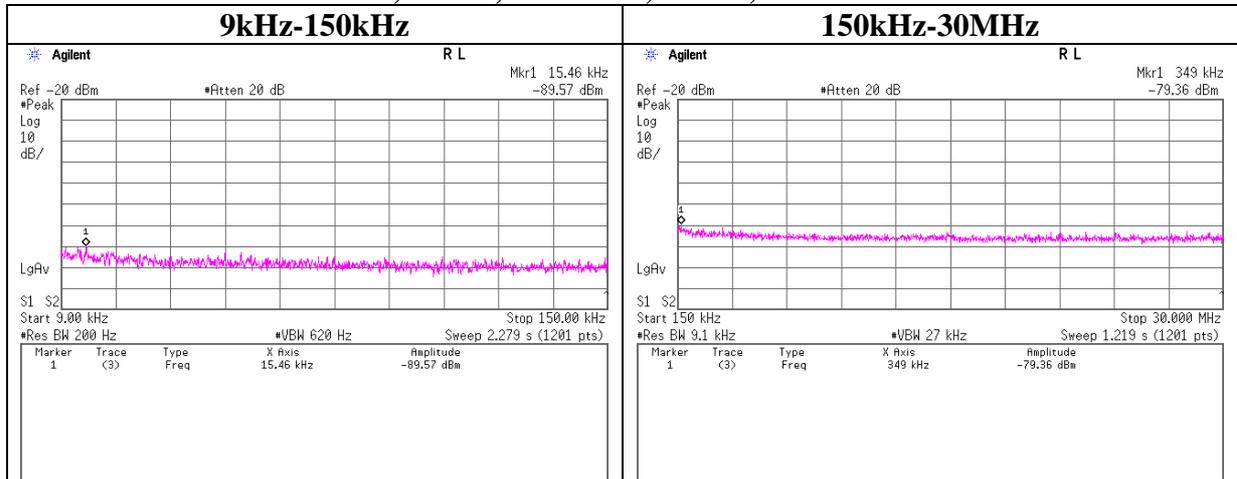
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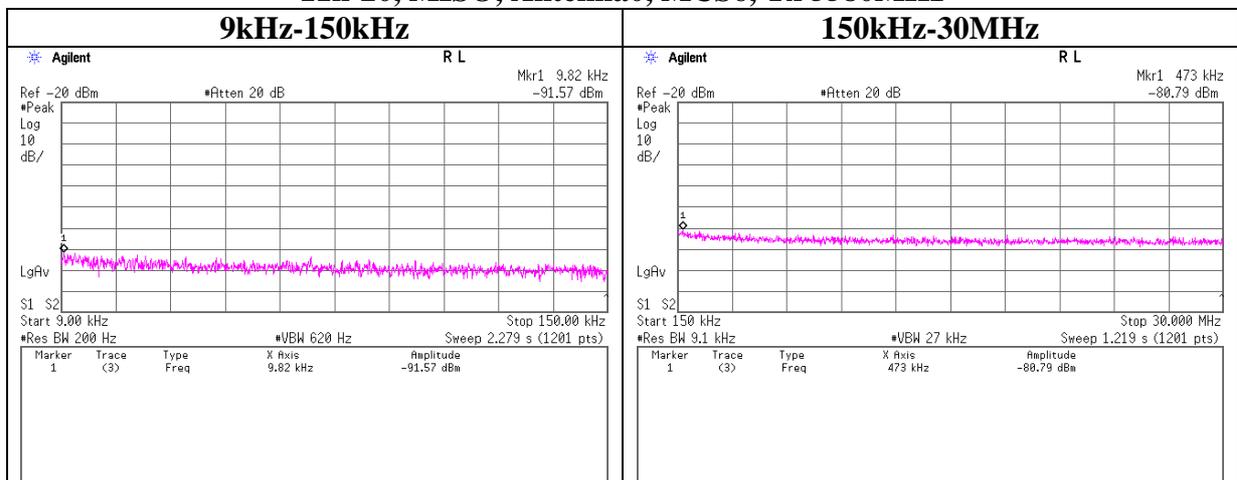
11n-20, MISO, Antenna0, MCS6, Tx 5500MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
15.46	-89.6	0.0	10.1	2.0	37.0	-40.5	-27.0	13.5	
349.00	-79.4	0.2	10.1	2.0	20.4	-46.8	-27.0	19.8	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

11n-20, MISO, Antenna0, MCS6, Tx 5580MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.82	-91.6	0.0	10.1	2.0	37.0	-42.5	-27.0	15.5	
473.00	-80.8	0.2	10.1	2.0	20.4	-48.2	-27.0	21.2	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW facto

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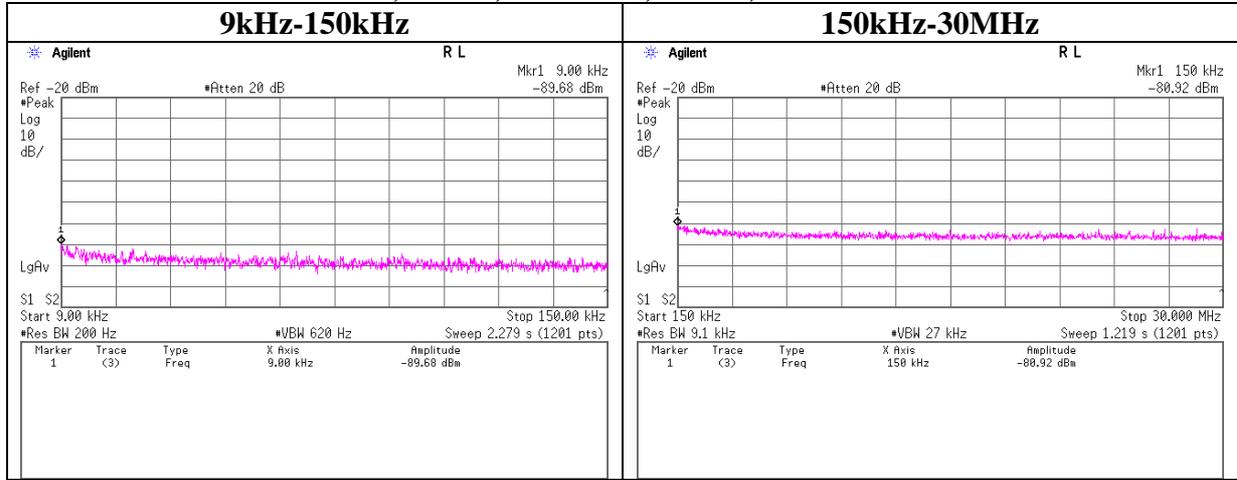
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11n-20, MISO, Antenna0, MCS6, Tx 5700MHz

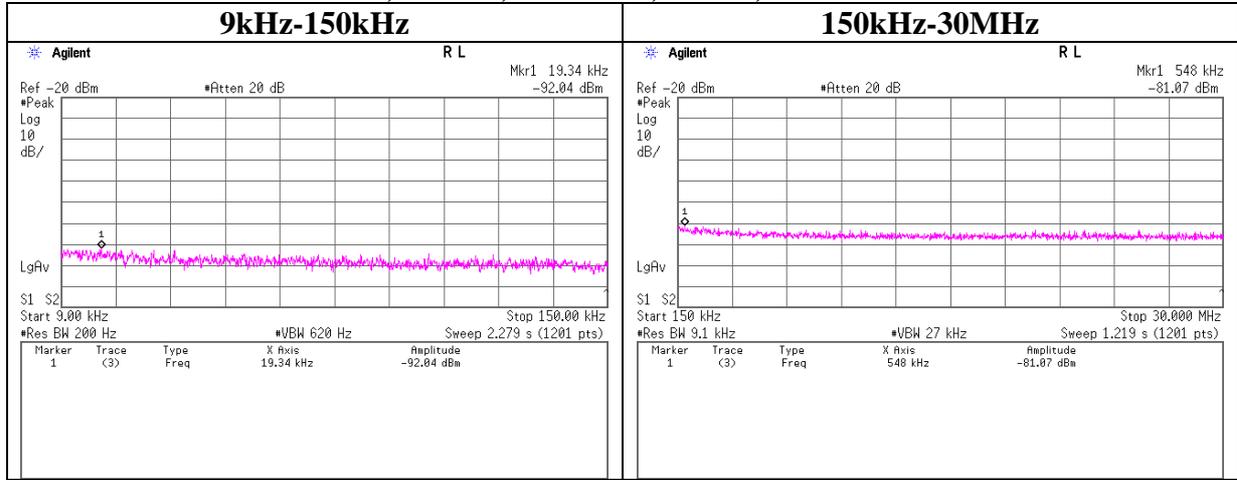


Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.00	-89.7	0.0	10.1	2.0	37.0	-40.6	-27.0	13.6	
150.00	-80.9	0.2	10.1	2.0	20.4	-48.3	-27.0	21.3	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

Conducted Spurious Emission

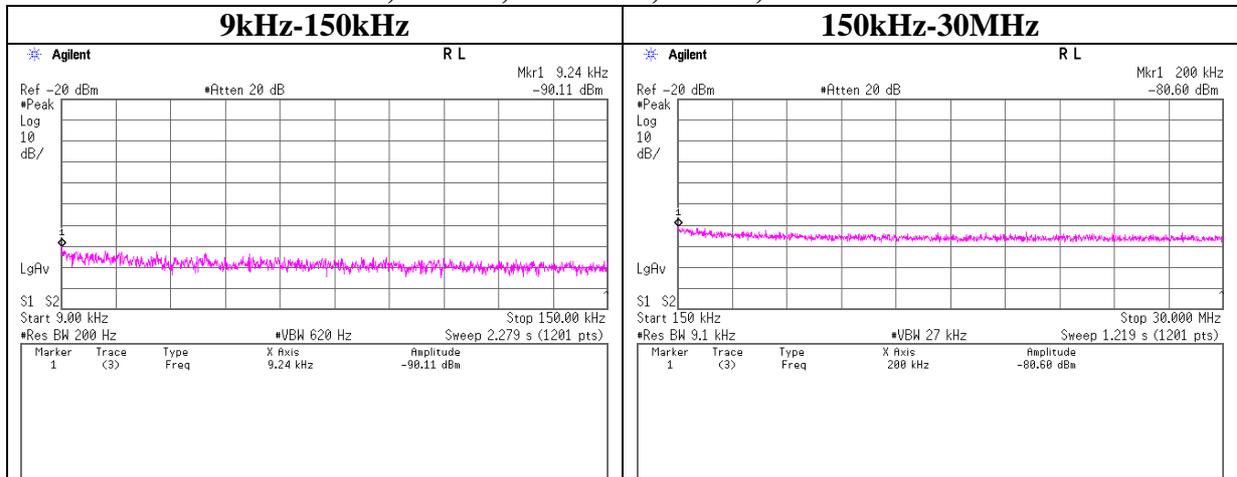
11n-20, MIMO, Antenna0, MCS8, Tx 5180MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
19.34	-92.0	0.0	10.1	3.53	2	37.0	-38.4	-27.0	11.4	
548.00	-81.1	0.2	10.1	3.53	2	20.4	-43.9	-27.0	16.9	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + 10*LOG(N) + RBW factor

11n-20, MIMO, Antenna0, MCS8, Tx 5220MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.24	-90.1	0.0	10.1	3.53	2	37.0	-36.5	-27.0	9.5	
200.00	-80.6	0.2	10.1	3.53	2	20.4	-43.4	-27.0	16.4	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + 10*LOG(N) + RBW factor

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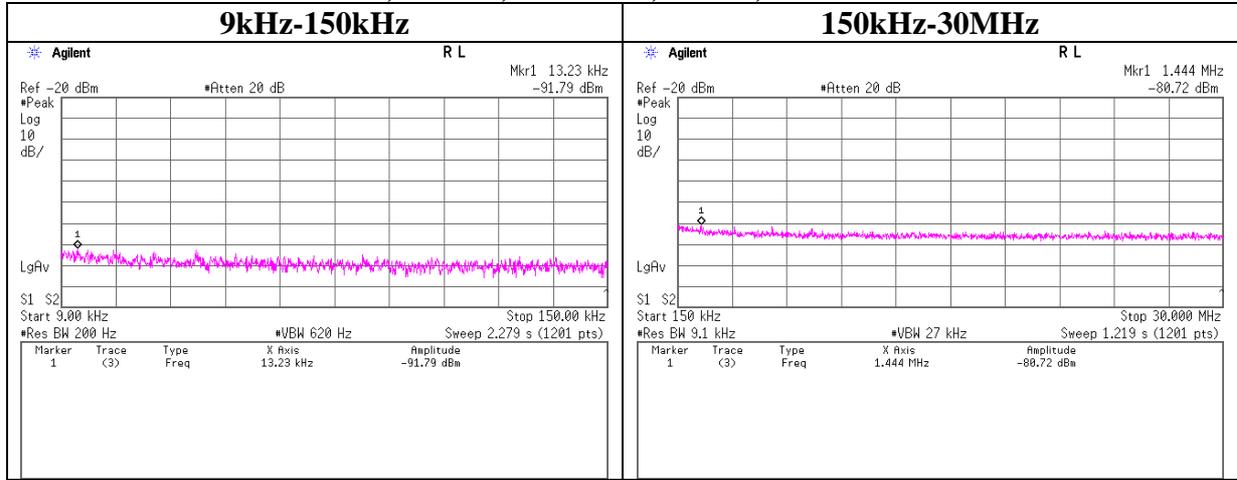
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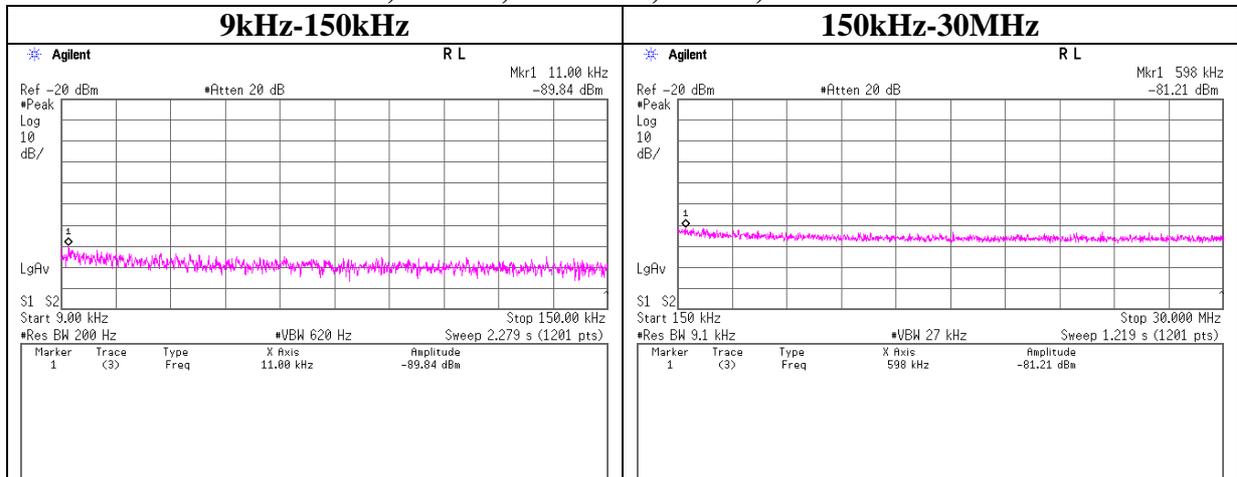
11n-20, MIMO, Antenna0, MCS8, Tx 5240MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
13.23	-91.8	0.0	10.1	3.53	2	37.0	-38.2	-27.0	11.2	
1444.00	-80.7	0.2	10.1	3.53	2	20.4	-43.6	-27.0	16.6	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + 10*LOG(N) + RBW factor

11n-20, MIMO, Antenna0, MCS8, Tx 5260MHz

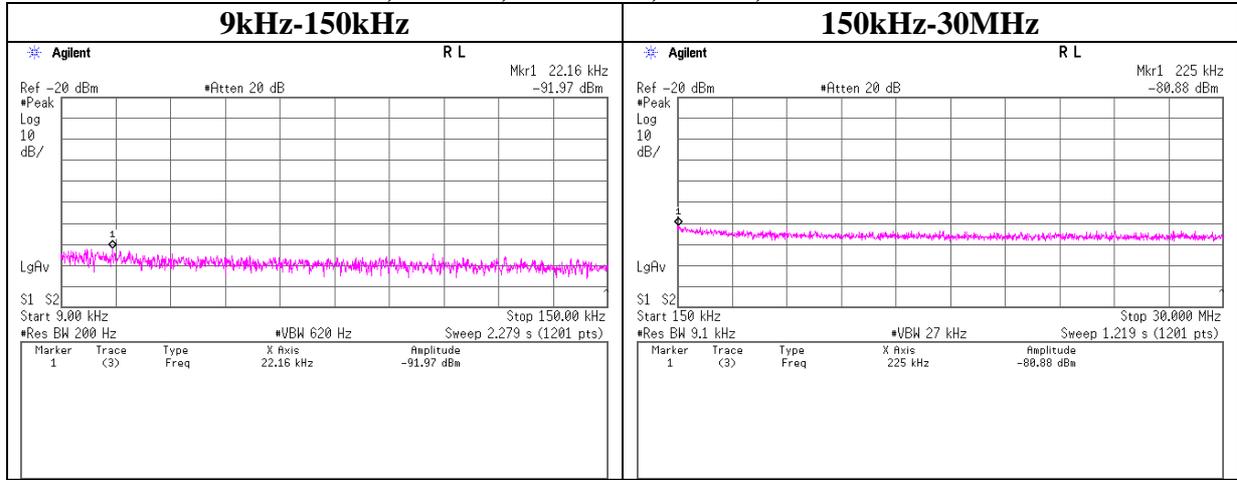


Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
11.00	-89.8	0.0	10.1	3.53	2	37.0	-36.2	-27.0	9.2	
598.00	-81.2	0.2	10.1	3.53	2	20.4	-44.1	-27.0	17.1	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + 10*LOG(N) + RBW factor

Conducted Spurious Emission

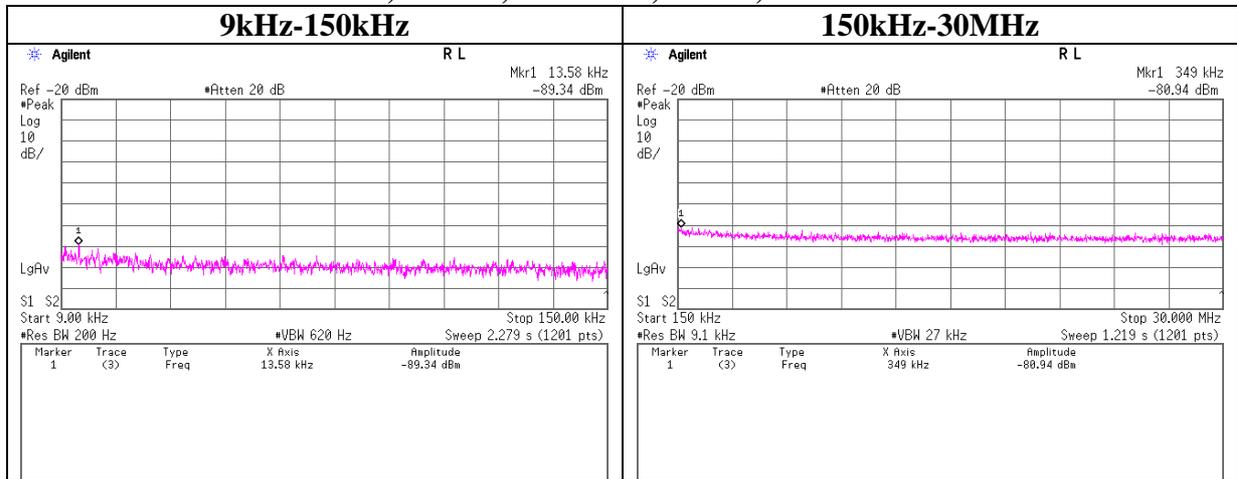
11n-20, MIMO, Antenna0, MCS8, Tx 5300MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
22.16	-92.0	0.0	10.1	3.53	2	37.0	-38.4	-27.0	11.4	
225.00	-80.9	0.2	10.1	3.53	2	20.4	-43.7	-27.0	16.7	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + 10*LOG(N) + RBW factor

11n-20, MIMO, Antenna0, MCS8, Tx 5320MHz

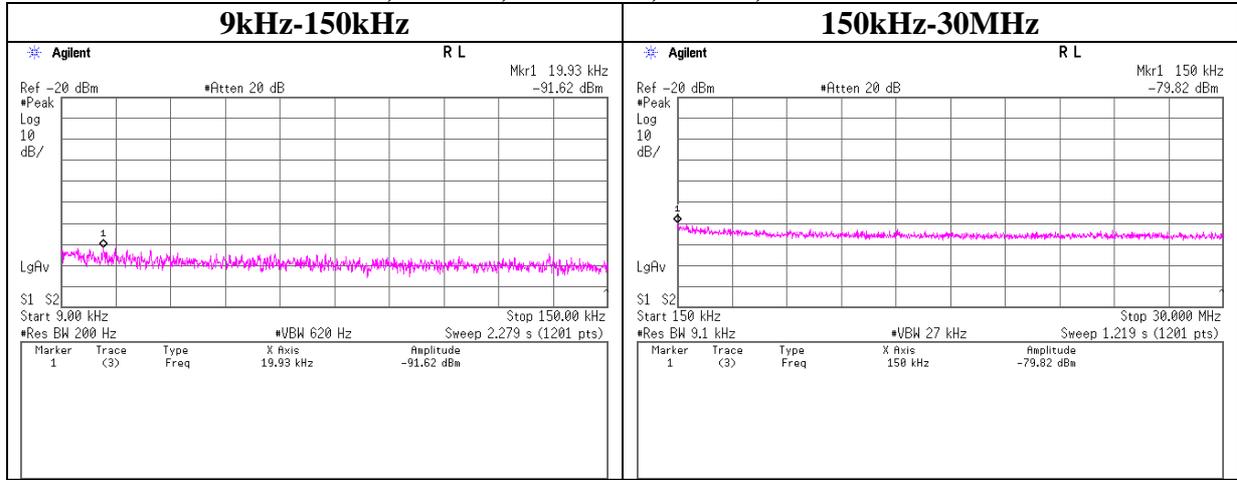


Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
13.58	-89.3	0.0	10.1	3.53	2	37.0	-35.7	-27.0	8.7	
349.00	-80.9	0.2	10.1	3.53	2	20.4	-43.8	-27.0	16.8	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + 10*LOG(N) + RBW factor

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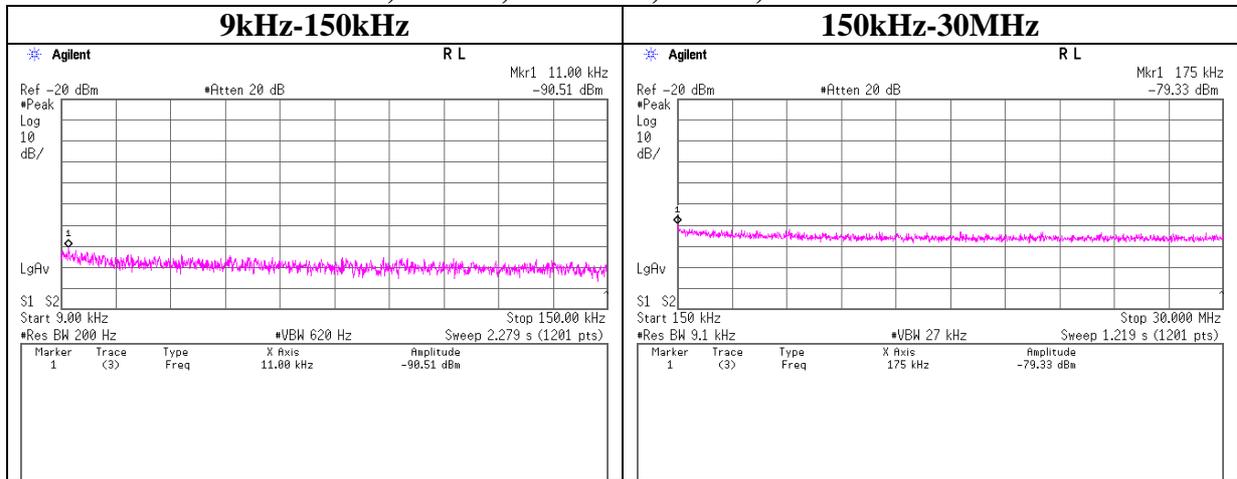
11n-20, MIMO, Antenna0, MCS8, Tx 5500MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
19.93	-91.6	0.0	10.1	3.16	2	37.0	-38.4	-27.0	11.4	
150.00	-79.8	0.2	10.1	3.16	2	20.4	-43.0	-27.0	16.0	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + 10*LOG(N) + RBW factor

11n-20, MIMO, Antenna0, MCS8, Tx 5580MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
11.00	-90.5	0.0	10.1	3.16	2	37.0	-37.3	-27.0	10.3	
175.00	-79.3	0.2	10.1	3.16	2	20.4	-42.5	-27.0	15.5	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + 10*LOG(N) + RBW factor

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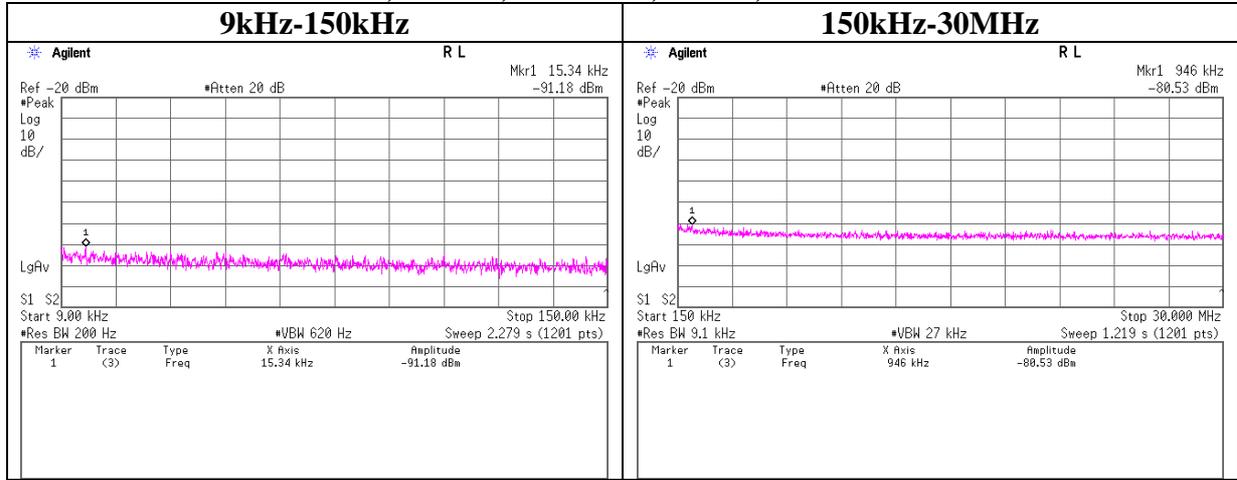
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11n-20, MIMO, Antenna0, MCS8, Tx 5700MHz

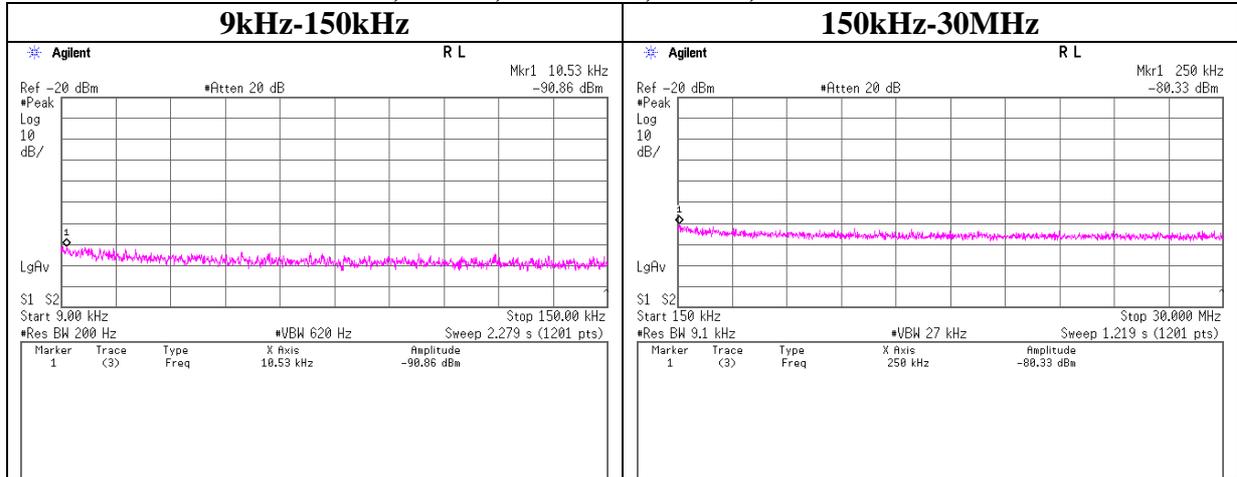


Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
15.34	-91.2	0.0	10.1	3.16	2	37.0	-37.9	-27.0	10.9	
946.00	-80.5	0.2	10.1	3.16	2	20.4	-43.7	-27.0	16.7	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + 10*LOG(N) + RBW factor

Conducted Spurious Emission

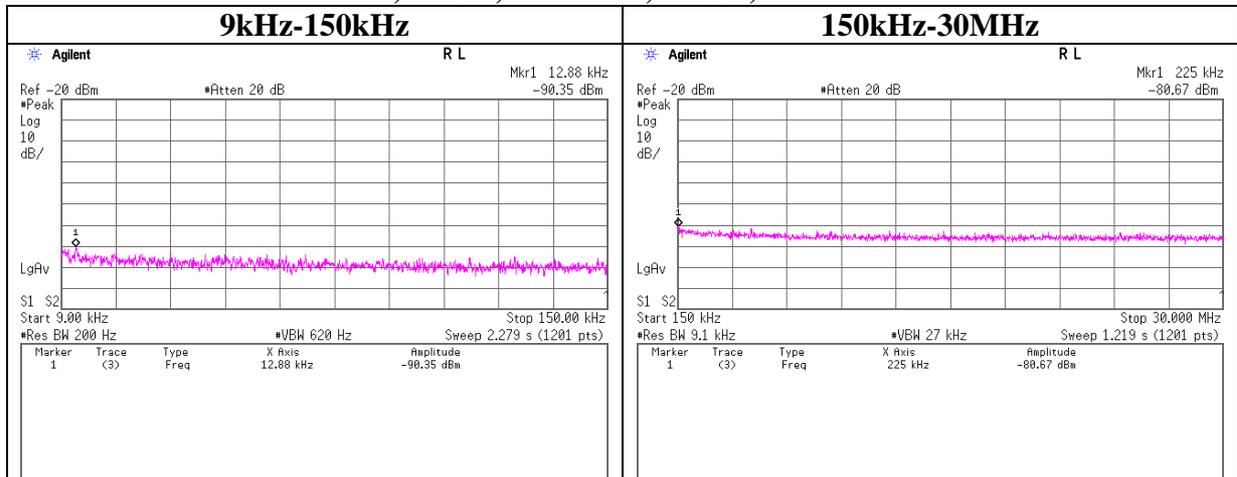
11n-40, MISO, Antenna0, MCS4, Tx 5190MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
10.53	-90.9	0.0	10.1	2.0	37.0	-41.8	-27.0	14.8	
250.00	-80.3	0.2	10.1	2.0	20.4	-47.7	-27.0	20.7	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

11n-40, MISO, Antenna0, MCS4, Tx 5230MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
12.88	-90.4	0.0	10.1	2.0	37.0	-41.3	-27.0	14.3	
225.00	-80.7	0.2	10.1	2.0	20.4	-48.1	-27.0	21.1	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW facto

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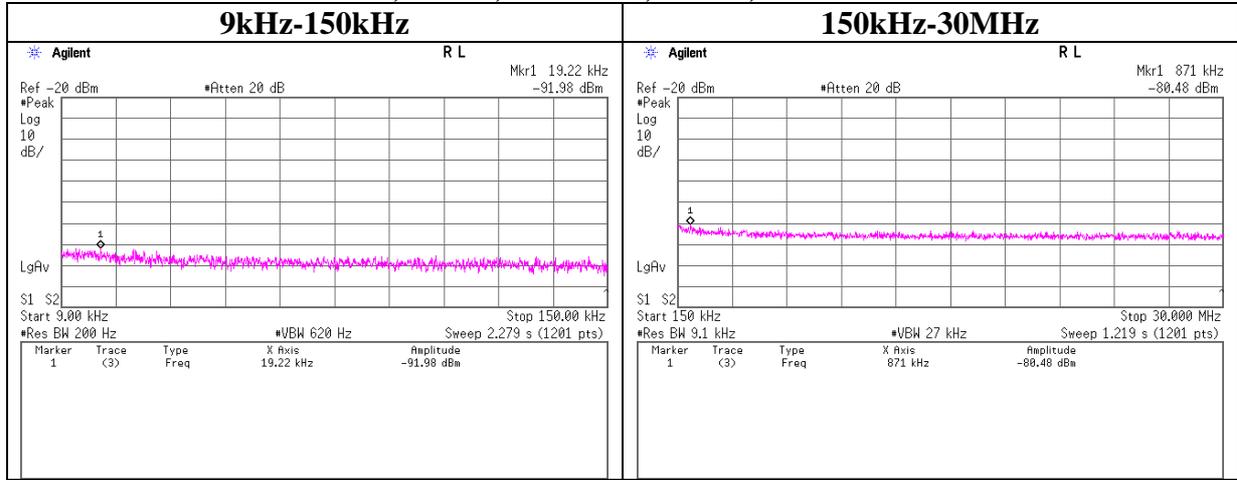
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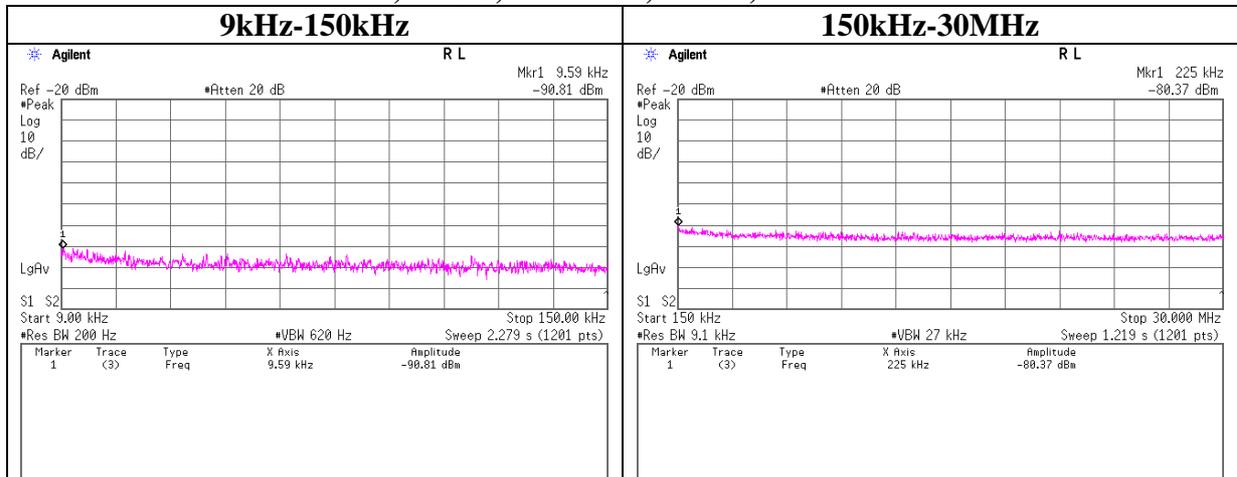
11n-40, MISO, Antenna0, MCS4, Tx 5270MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
19.22	-92.0	0.0	10.1	2.0	37.0	-42.9	-27.0	15.9	
871.00	-80.5	0.2	10.1	2.0	20.4	-47.9	-27.0	20.9	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

11n-40, MISO, Antenna0, MCS4, Tx 5310MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.59	-90.8	0.0	10.1	2.0	37.0	-41.8	-27.0	14.8	
225.00	-80.4	0.2	10.1	2.0	20.4	-47.8	-27.0	20.8	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW facto

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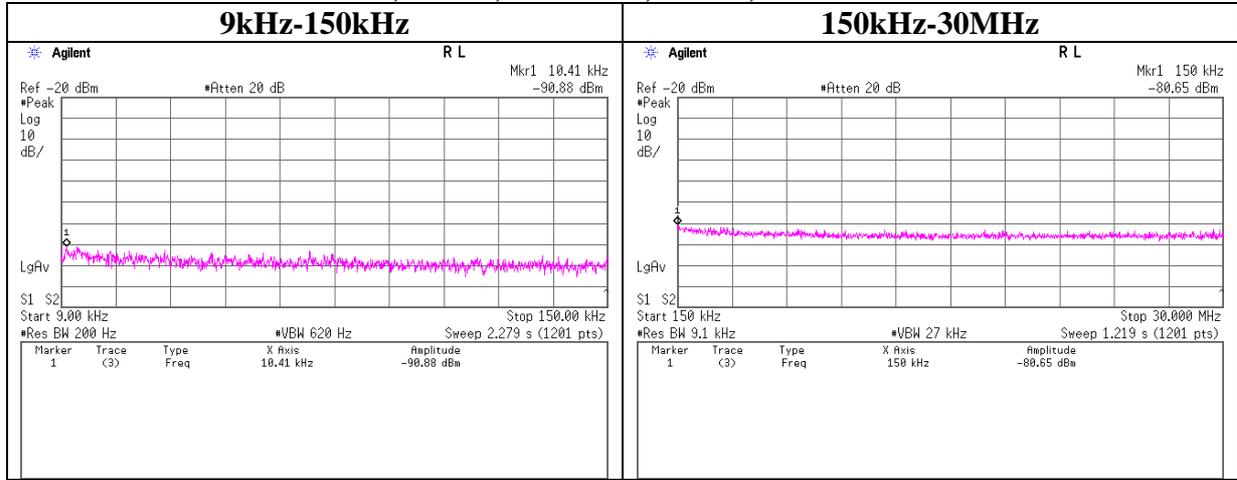
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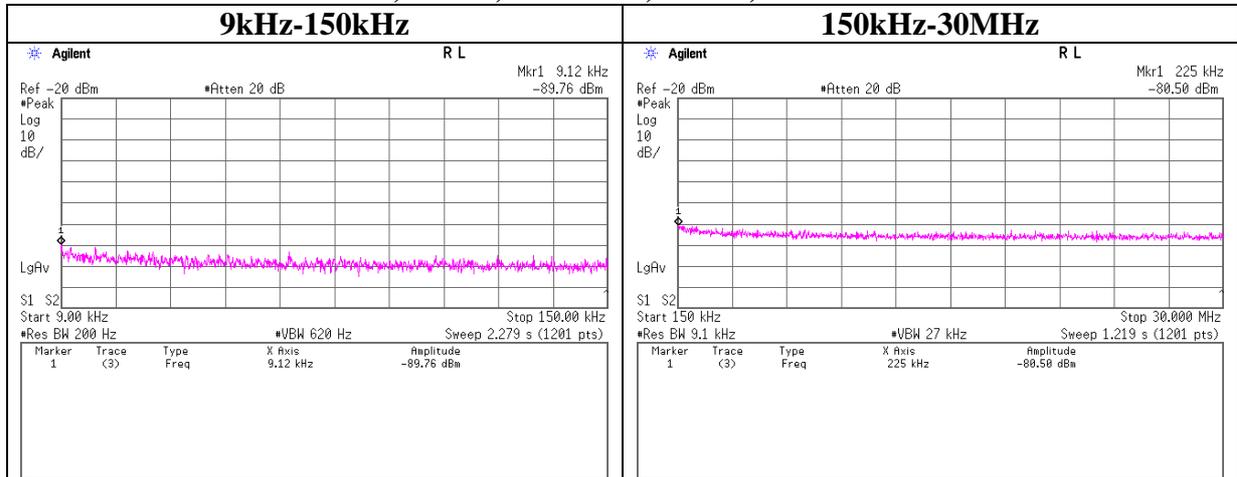
11n-40, MISO, Antenna0, MCS4, Tx 5510MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
10.41	-90.9	0.0	10.1	2.0	37.0	-41.8	-27.0	14.8	
150.00	-80.7	0.2	10.1	2.0	20.4	-48.0	-27.0	21.0	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

11n-40, MISO, Antenna0, MCS4, Tx 5550MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.12	-89.8	0.0	10.1	2.0	37.0	-40.7	-27.0	13.7	
225.00	-80.5	0.2	10.1	2.0	20.4	-47.9	-27.0	20.9	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW facto

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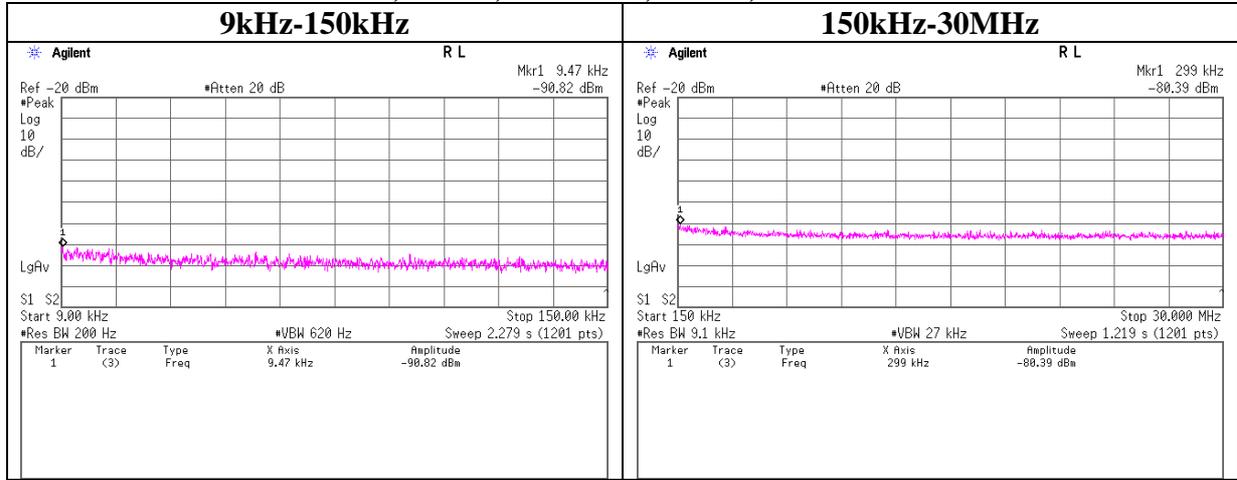
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11n-40, MISO, Antenna0, MCS4, Tx 5670MHz

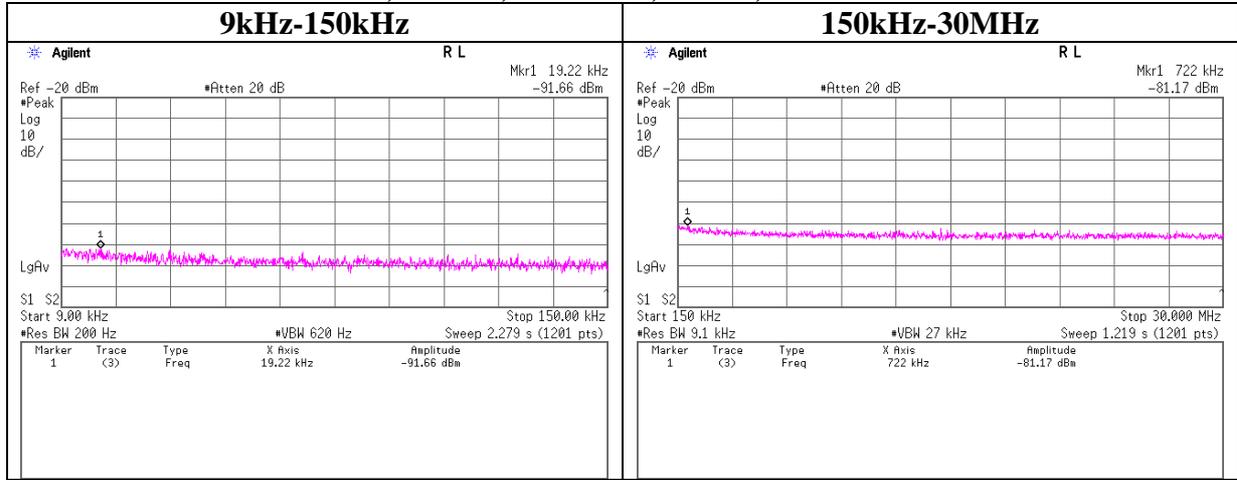


Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dB]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.47	-90.8	0.0	10.1	2.0	37.0	-41.8	-27.0	14.8	
299.00	-80.4	0.2	10.1	2.0	20.4	-47.8	-27.0	20.8	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

Conducted Spurious Emission

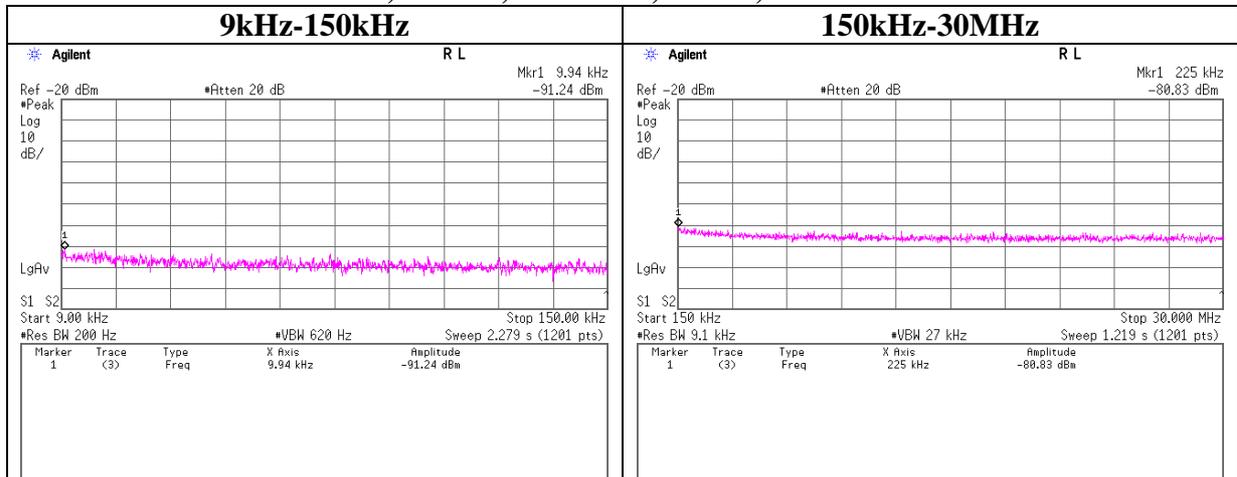
11n-40, MIMO, Antenna0, MCS8, Tx 5190MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
19.22	-91.7	0.0	10.1	3.53	2	37.0	-38.1	-27.0	11.1	
722.00	-81.2	0.2	10.1	3.53	2	20.4	-44.0	-27.0	17.0	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + 10*LOG(N) + RBW factor

11n-40, MIMO, Antenna0, MCS8, Tx 5230MHz

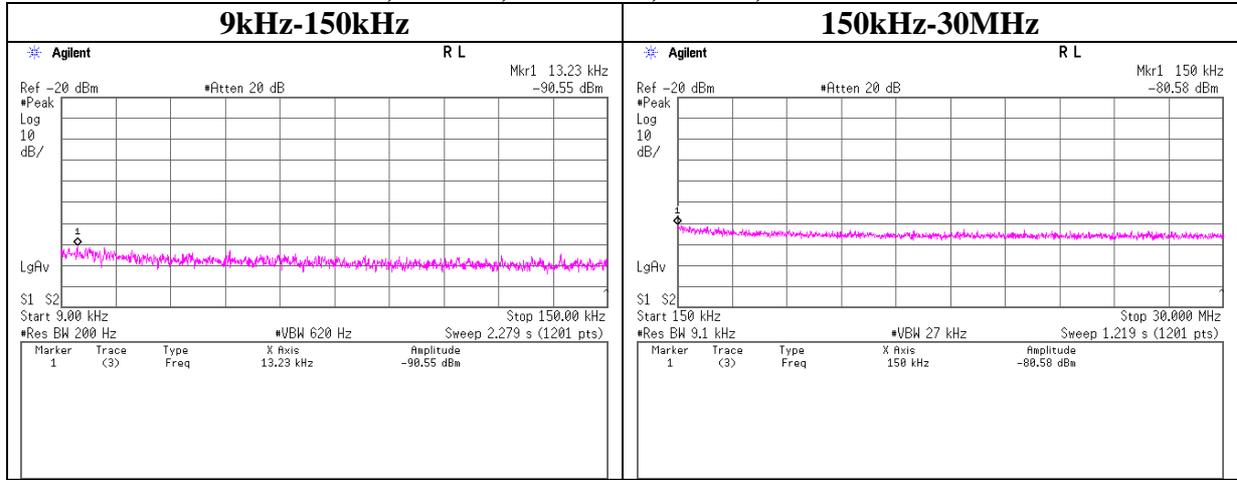


Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.94	-91.2	0.0	10.1	3.53	2	37.0	-37.6	-27.0	10.6	
225.00	-80.8	0.2	10.1	3.53	2	20.4	-43.7	-27.0	16.7	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + 10*LOG(N) + RBW factor

Conducted Spurious Emission

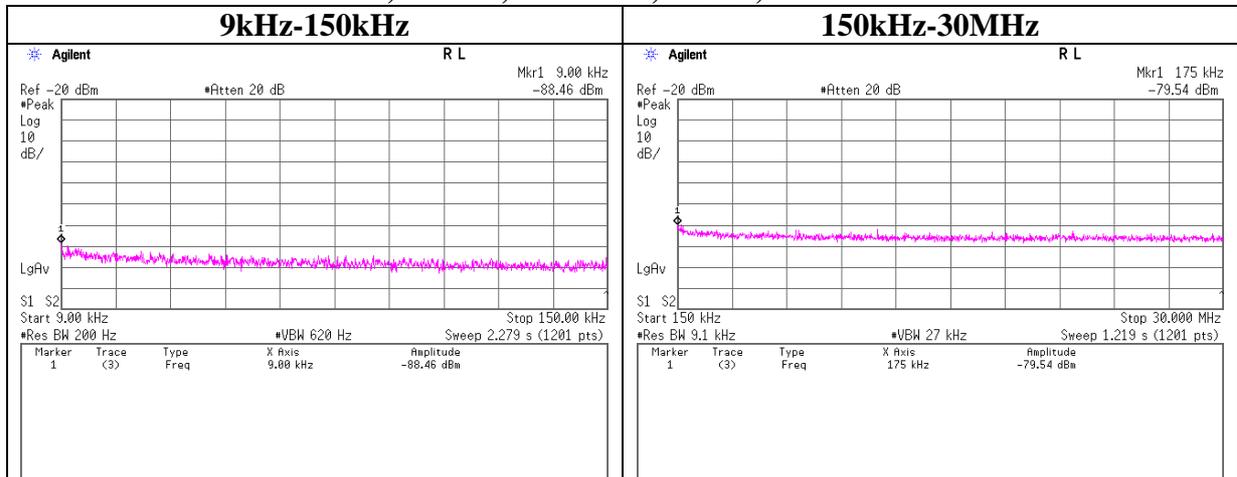
11n-40, MIMO, Antenna0, MCS8, Tx 5270MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
13.23	-90.6	0.0	10.1	3.53	2	37.0	-36.9	-27.0	9.9	
150.00	-80.6	0.2	10.1	3.53	2	20.4	-43.4	-27.0	16.4	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + 10*LOG(N) + RBW factor

11n-40, MIMO, Antenna0, MCS8, Tx 5310MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.00	-88.5	0.0	10.1	3.53	2	37.0	-34.9	-27.0	7.9	
175.00	-79.5	0.2	10.1	3.53	2	20.4	-42.4	-27.0	15.4	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + 10*LOG(N) + RBW factor

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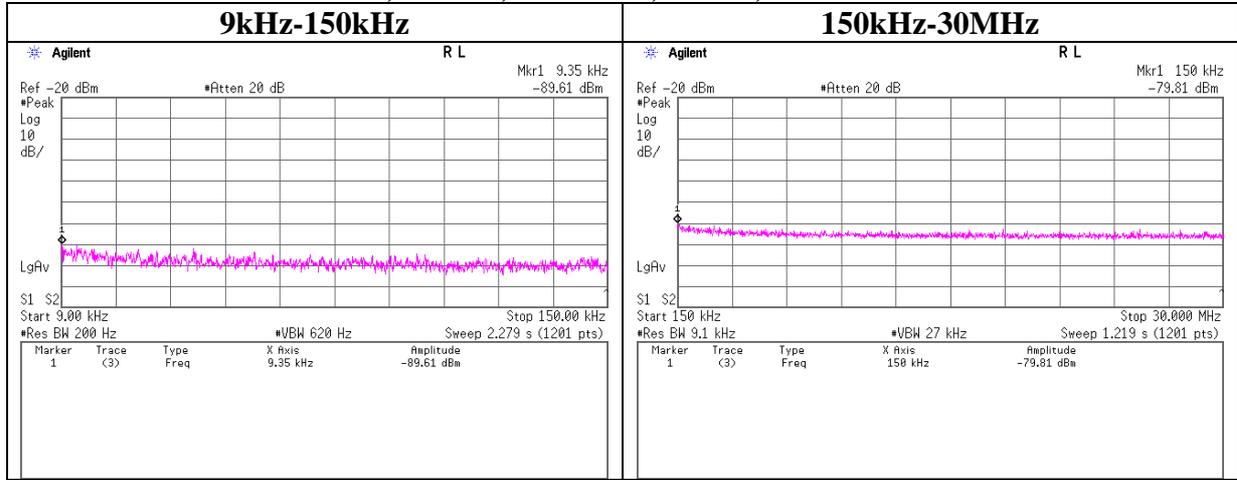
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Conducted Spurious Emission

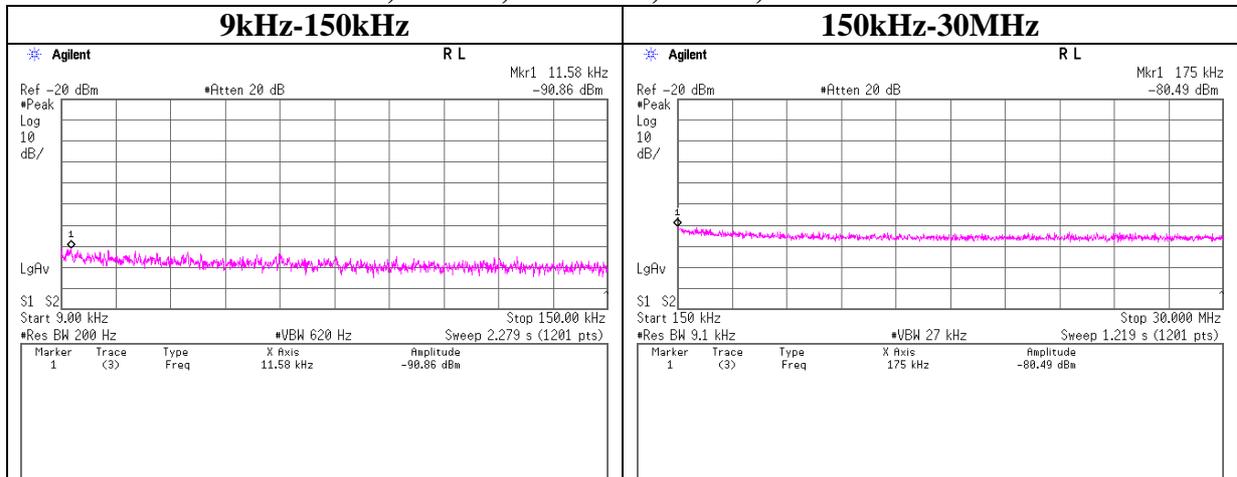
11n-40, MIMO, Antenna0, MCS8, Tx 5510MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.35	-89.6	0.0	10.1	3.16	2	37.0	-36.4	-27.0	9.4	
150.00	-79.8	0.2	10.1	3.16	2	20.4	-43.0	-27.0	16.0	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + 10*LOG(N) + RBW factor

11n-40, MIMO, Antenna0, MCS8, Tx 5550MHz

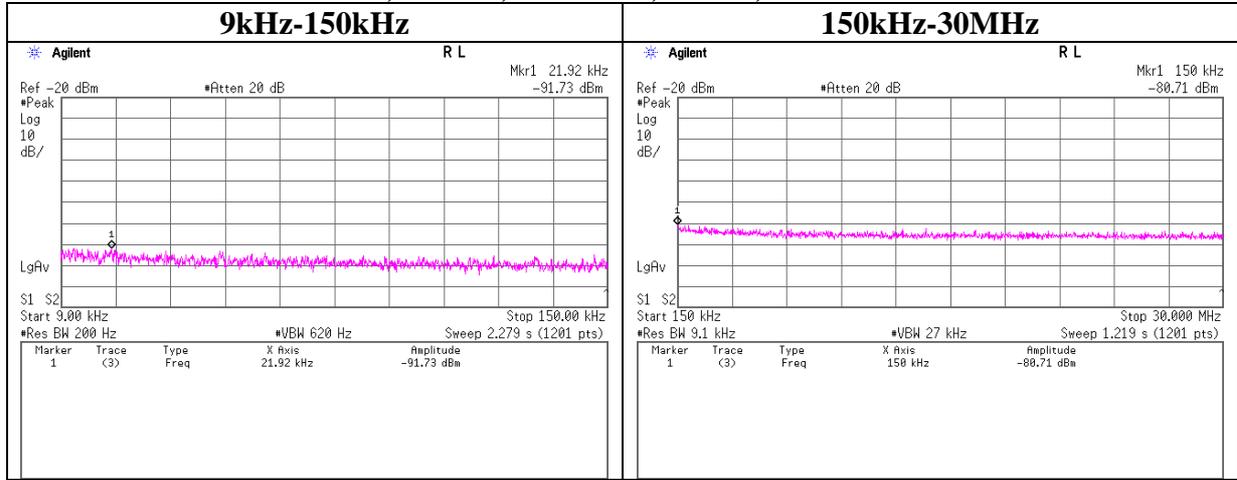


Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
11.58	-90.9	0.0	10.1	3.16	2	37.0	-37.6	-27.0	10.6	
175.00	-80.5	0.2	10.1	3.16	2	20.4	-43.7	-27.0	16.7	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + 10*LOG(N) + RBW factor

Conducted Spurious Emission

11n-40, MIMO, Antenna0, MCS8, Tx 5670MHz



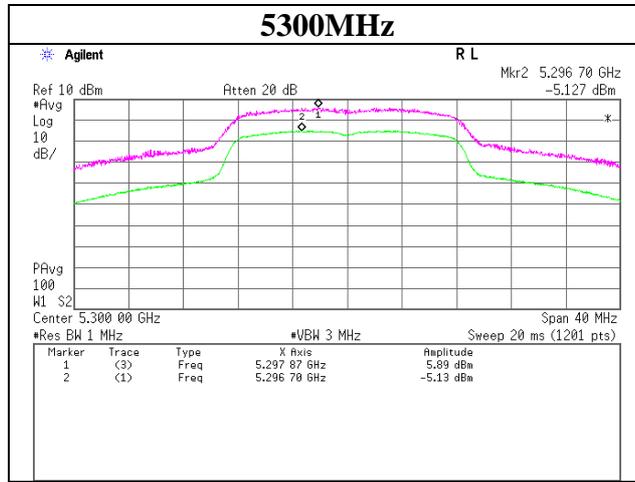
Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
21.92	-91.7	0.0	10.1	3.16	2	37.0	-38.5	-27.0	11.5	
150.00	-80.7	0.2	10.1	3.16	2	20.4	-43.9	-27.0	16.9	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + 10*LOG(N) + RBW factor

Peak Excursion Ratio

11a Antenna 0

5300MHz



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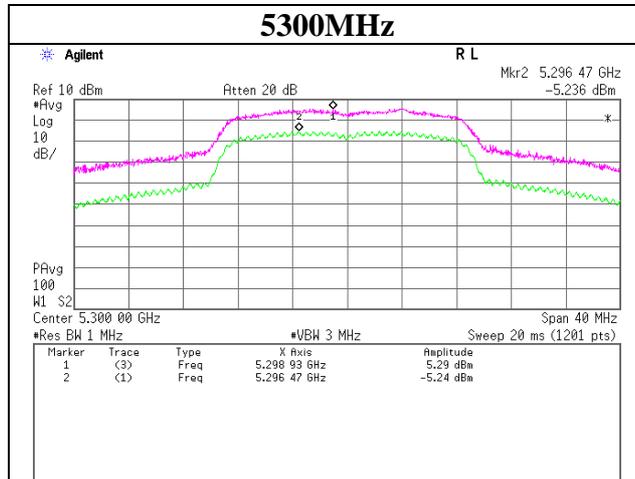
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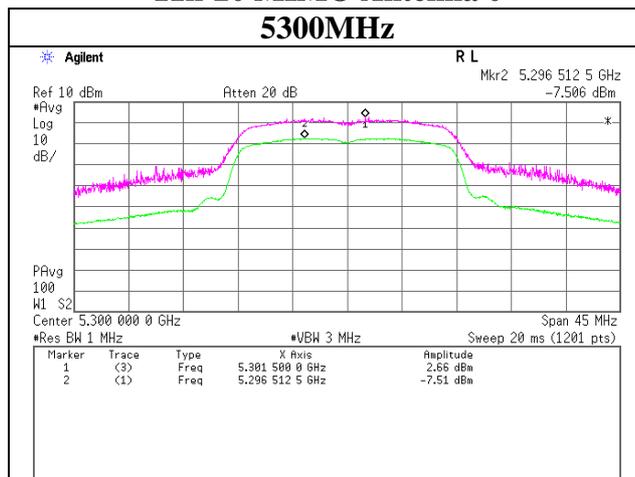
Facsimile : +81 596 24 8124

Peak Excursion Ratio

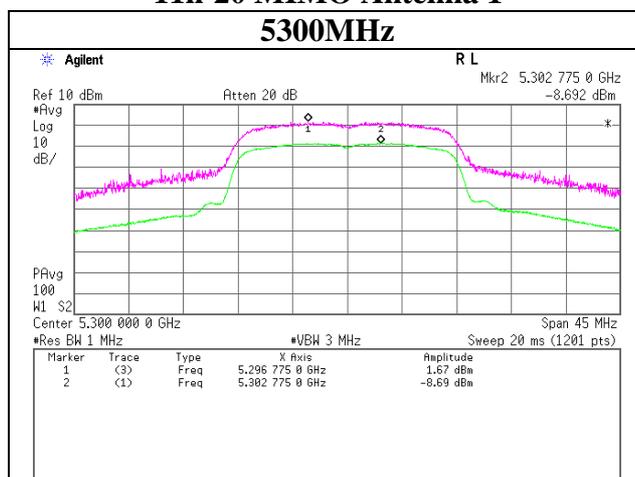
11n-20 MISO Antenna 0



11n-20 MIMO Antenna 0

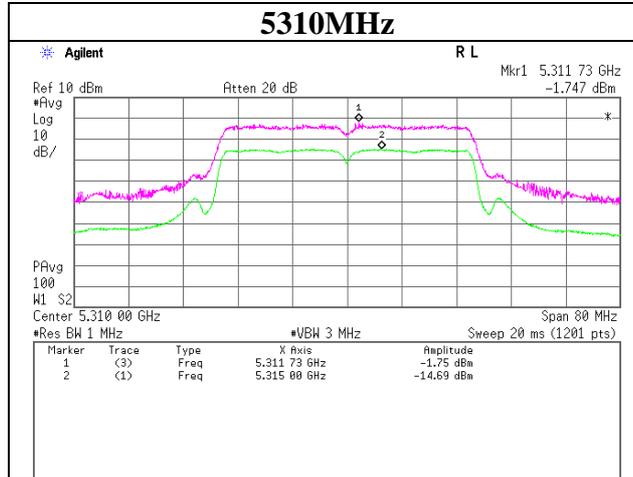


11n-20 MIMO Antenna 1

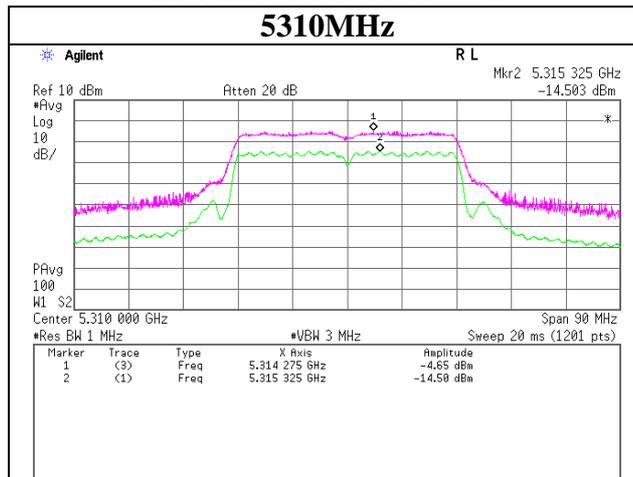


Peak Excursion Ratio

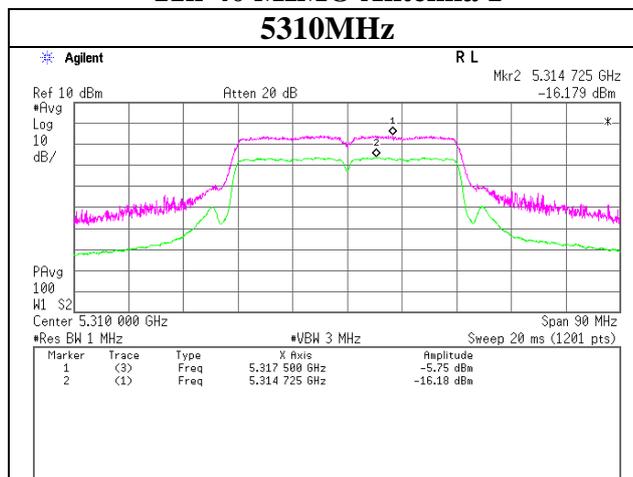
11n-40 MISO Antenna 0



11n-40 MIMO Antenna 0



11n-40 MIMO Antenna 1



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APPENDIX 2: Test instruments

EMI test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	AT	2012/10/08 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	011737	AT	2012/10/08 * 12
MPM-12	Power Meter	Anritsu	ML2495A	0825002	AT	2012/06/01 * 12
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	AT	2012/06/01 * 12
MAT-25	Attenuator(10dB) (above1GHz)	Agilent	8493C	71642	AT	2012/06/27 * 12
MAT-20	Attenuator(10dB) (above1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	AT	2013/01/09 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	AT	2013/02/22 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2013/02/26 * 12
MCC-66	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	28636/2	AT	2012/04/25 * 12
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2013/02/28 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	RE	2013/02/26 * 12
MJM-09	Measure	KDS	E19-55	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2012/11/20 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2012/08/17 * 12
MCC-141	Microwave Cable	Junkosha	MWX221	1203S212(1m)/ 1204S062(5m)	RE	2012/04/23 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	MY39500780	RE	2013/03/19 * 12
MHA-17	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170307	RE	2012/06/27 * 12
MCC-54	Microwave Cable	Suhner	SUCOFLEX101	2873(1m)/ 2876(5m)	RE	2013/03/19 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	3950M00205	RE	2012/06/22 * 12
MHF-23	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCC	603	RE	2013/01/10 * 12
MCC-79	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278923/4	RE	2012/12/24 * 12
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	100635	RE	2013/04/10 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2012/11/18 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2012/11/18 * 12
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2012/06/01 * 12
MAT-68	Attenuator	Anritsu	MP721B	6200961025	RE	2012/11/21 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2013/03/12 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE(EUT)	2013/01/07 * 12
MAT-67	Attenuator	JFW Industries, Inc.	50FP-013H2 N	-	CE	2013/01/09 * 12
MCC-113	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/ SFM141(5m)/ 421-010(1m)/ suciform141-PE(1m)/ RFM-E121(Switcher)	-/04178	CE	2012/07/12 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2012/06/29 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2013/02/26 * 12

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EMI test equipment (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2013/04/03 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2013/02/15 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2013/01/10 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2013/02/15 * 12
MCC-132	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336161/4(1m) / 340639(5m)	RE	2012/09/05 * 12
MHA-04	Horn Antenna 26.5-40GHz	EMCO	3160-10	1140	RE	2012/11/07 * 12
MHF-16	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCA	7001	RE	2012/09/06 * 12
MCC-77	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278942/4	RE	2012/12/14 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2013/04/10 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2012/10/08 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2012/10/08 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2013/02/06 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2012/11/06 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2012/09/11 * 12

**The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.**

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

**Test Item: CE: Conducted Emission
RE: Radiated Emission
AT: Antenna Terminal Conducted test**