RADIO TEST REPORT

Test Report No. : 11328915H-C-R1

Applicant	:	**FUJITSU TEN LIMITED**
Type of Equipment	:	**Car Navigation**
Model No.	:	**FT0091A**
FCC ID	:	**BABFT0091A**
Test regulation	:	**FCC Part 15 Subpart E: 2016**
Test Result	:	**Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 11328915H-C. 11328915H-C is replaced with this report.

Date of test: July 29 to August 7, 2016

Representative test engineer:

T. Nakagawa

Tomohisa Nakagawa
Engineer
Consumer Technology Division

Approved by:

Tsubasa Takayama
Engineer
Consumer Technology Division

NVLAP TESTING

NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address,
http://japan.ul.com/resources/emc_accredited/

REVISION HISTORY

Original Test Report No.: 11328915H-C

Revision	Test report No.	Date	Page revised	Contents
- (Original)	11328915H-C	October 3, 2016	-	-
1	11328915H-C-R1	November 9, 2016	P9	Correction of Operating mode
1	11328915H-C-R1	November 9, 2016	P11	Correction of Item F and Cable No.7 [Item F] GPS → Camera [Cable No.7] GPS Cable → Camera Cable
1	11328915H-C-R1	November 9, 2016	P12	Correction of sentence for limit (Above 1 GHz)
1	11328915H-C-R1	November 9, 2016	P51, 54, 64, 66, 78, 80	Correction of data

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SECTION 1: Customer information

Company Name	:	FUJITSU TEN LIMITED
Address	:	2-28, Gosho-dori 1-Chome, Hyogo-ku, Kobe, 652-8510 JAPAN
Telephone Number	:	+81-78-682-2159
Facsimile Number	:	+81-78-671-7160
Contact Person	:	FUKII DAISUKE

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

2.1 Identification of E.U.T.

Type of Equipment	:	Car Navigation
Model No.	:	FT0091A
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 12 V
Receipt Date of Sample	:	July 12, 2016
Country of Mass-production	:	Mexico
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model: FT0091A (referred to as the EUT in this report) is a Car Navigation.

Radio Specification

Radio Type : Transceiver
Power Supply (inner) : DC 3.3 V, DC 1.8 V
Clock frequency(ies) : 26 MHz

	IEEE802.11b	IEEE802.11g/n (20 M band)	IEEE802.11a/n (20 M band) *1)	IEEE802.11n (40 M band) *1)
Frequency of operation	2412 MHz - 2462 MHz	2412 MHz - 2462 MHz	5180 MHz - 5240 MHz 5260 MHz - 5320 MHz 5500 MHz - 5700 MHz 5745 MHz - 5825 MHz	5190 MHz - 5230 MHz 5270 MHz - 5310 MHz 5510 MHz - 5670 MHz 5755 MHz - 5795 MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK, 256QAM)	
Channel spacing	5MHz		20MHz	40MHz
Antenna type	Surface Mountable Dielectric Chip Antenna			
Antenna Connector type	-			
Antenna Gain	1.6 dBi (2.4 GHz Band), 0 dBi (5 GHz Band)			

	Bluetooth Ver.3.0 with EDR function
Frequency of operation	2402 MHz - 2480 MHz
Type of modulation	BT: FHSS (GFSK, π/4-DQPSK, 8-DPSK)
Channel spacing	BT: 1 MHz
Antenna type	Surface Mountable Dielectric Chip Antenna
Antenna Connector type	-
Antenna Gain	1.6 dBi

*1) This test report applies to WLAN (5GHz band).
*Wireless LAN and Bluetooth do not transmit simultaneously.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart E FCC part 15 final revised on April 6, 2016.
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart E Unlicensed National Information Infrastructure Devices Section 15.407 General technical requirements

* Also the EUT complies with FCC Part 15 Subpart B.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	**FCC:** ANSI C63.10-2013	**FCC:** 15.407 (b) (6) / 15.207	-	N/A *1)	-
	IC: RSS-Gen 8.8	**IC:** RSS-Gen 8.8			
26 dB Emission Bandwidth	**FCC:** KDB Publication Number 789033	**FCC:** 15.407 (a) (1) (2) (3)	See data	N/A	Conducted
	IC: -	**IC:** -			
Maximum Conducted Output Power	**FCC:** KDB Publication Number 789033	**FCC:** 15.407 (a) (1) (2) (3)		Complied	Conducted
	IC: -	**IC:** RSS-247 6.2.1 (1) 6.2.2 (1) 6.2.3 (1) 6.2.4 (1)			
Maximum Power Spectral Density	**FCC:** KDB Publication Number 789033	**FCC :** 15.407 (a) (1) (2) (3)		Complied	Conducted
	IC: -	**IC:** RSS-247 6.2.1 (1) 6.2.2 (1) 6.2.3 (1) 6.2.4 (1)			
Spurious Emission Restricted Band Edge	**FCC:** ANSI C63.10-2013 KDB Publication Number 789033	**FCC:** 15.407 (b), 15.205 and 15.209	2.2 dB 7660.042 MHz, AV, Vertical	Complied	Conducted (< 30 MHz) / Radiated (> 30 MHz) *2)
	IC: -	**IC:** RSS-247 6.2.1 (2) 6.2.2 (2) 6.2.3 (2) 6.2.4 (2)			
6 dB Emission Bandwidth	**FCC:** ANSI C63.10-2013	**FCC:** 15.407 (e)	See data	Complied	Conducted
	IC: -	**IC:** RSS-247 6.2.4 (1)			

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.
* For DFS tests, please see the test report number 11328915H-D issued by UL Japan, Inc.
*1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.
*2) Radiated test was selected over 30 MHz based on section FCC 15.407 (b) and KDB 789033 D02 G.3.b).

* In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred.

FCC Part 15.31 (e)

This EUT provides stable voltage (DC 3.3 V, DC 1.8 V) 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.

3.3 Addition to standard

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

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

3.4 Uncertainty

EMI

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

Ise EMC Lab.

Antenna terminal test Uncertainty (+/-)							
Power meter		Conducted emission and Power density			Conducted emission		Channel power
Below 1 GHz	Above 1 GHz	Below 1 GHz	1 GHz -3 GHz	3 GHz -18 GHz	18 GHz -26.5 GHz	26.5 GHz -40 GHz	
0.9 dB	1.0 dB	1.4 dB	1.7 dB	2.8 dB	2.8 dB	2.9 dB	2.6 dB

Test distance	Radiated emission (+/-) 9 kHz - 30 MHz
3m	3.8 dB
10m	3.7 dB

Polarity	Radiated emission (Below 1GHz)			
	(3 m*) (+/-)		(10 m*) (+/-)	
	30 – 200 MHz	200 – 1000MHz	30 – 200 MHz	200 – 1000MHz
Horizontal	5.0 dB	5.3 dB	5.0 dB	5.0 dB
Vertical	4.7 dB	5.9 dB	5.0 dB	5.1 dB

Radiated emission (Above 1GHz)				
(3 m*) (+/-)		(1 m*) (+/-)		(10 m*) (+/-)
1 – 6GHz	6 – 18GHz	10 – 26.5 GHz	26.5 – 40GHz	1 -18 GHz
5.2 dB	5.4 dB	5.5 dB	5.5 dB	5.4 dB

*Measurement distance

Radiated emission test

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

3.5 Test Location

UL Japan, Inc. Ise EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	2973C-1	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	2973C-2	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	2973C-3	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	2973C-4	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	-	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.6 shielded room	-	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	-	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	-	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	-	3.1 x 5.0 x 2.7	N/A	-	-
No.9 measurement room	-	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.11 measurement room	-	6.2 x 4.7 x 3.0	4.8 x 4.6	-	-

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Mode(s)

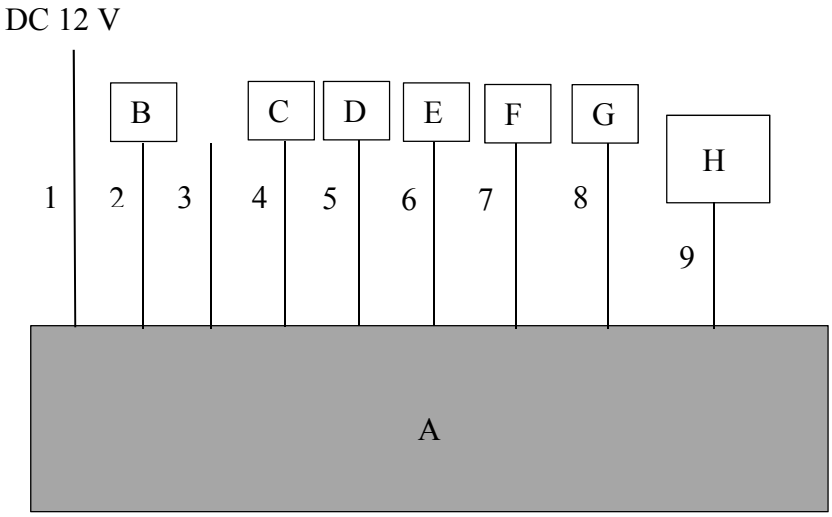
Test operating mode was determined as follows according to "Section 1 of 6 802.11 a/b/g/n testing - Managing Complex Regulatory Approvals -" of TCB Council Workshop October 2009.

Mode	Remarks*
IEEE 802.11a (11a)	54 Mbps, PN9
IEEE 802.11n 20 MHz BW (11n-20)	MCS 7 PN9 (Short) Short GI
IEEE 802.11n 40 MHz BW (11n-40)	MCS 7 PN9 (Short) Short GI
*The worst condition was determined based on the test result of Maximum Conducted Output Power.	
*Power of the EUT was set by the software as follows; Power settings: 11a/n-20: +11dBm 11n-40: +10dBm Software: Ver.00.005 *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.	

*The details of Operation mode(s)

Test Item	Operating Mode	Tested Frequency			
		Lower Band	Middle Band	Additional Band	Upper Band
26 dB Emission Bandwidth	11a Tx 11n-20 Tx	-	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	-
	11n-40 Tx	-	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz	-
99 % Occupied Bandwidth, Maximum Conducted Output Power, Maximum Power Spectral Density	11a Tx 11n-20 Tx	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx	5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz	5755 MHz 5795 MHz
6 dB Bandwidth	11a Tx 11n-20 Tx	-	-	-	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx	-	-	-	5755 MHz 5795 MHz
Radiated Spurious Emission (Below 1 GHz), Conducted Spurious Emission	11a Tx *1)	-	5320 MHz	-	-
Radiated Spurious Emission (Above 1 GHz)	11a Tx	5180 MHz	5260 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-20 Tx	5180 MHz	5320 MHz	5500 MHz 5700 MHz	5745 MHz 5825 MHz
	11n-40 Tx	5190 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz	5755 MHz 5795 MHz
*1) The mode was tested as a representative, because it had the highest power at antenna terminal test.					

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	Car Navigation	FT0091A	No, 19 *1) No, 23 *2)	FUJITSU TEN LIMITED	EUT
B	Load resistance	-	-	-	-
C	USB	RUF2-JV4GSWH	121101	BUFFALO	-
D	USB	RUF2-JV4GSWH	121201	BUFFALO	-
E	MIC ASSY	W01B-5012-D210	0700700000853	TRANSTRON Inc.	-
F	Camera	39530-T5A-003	15	-	-
G	GPS	3985-TSA-E010-M1	25260094	yokowo	-
H	Jig board	-	-	-	-

*1) Used for Radiated Emission test
*2) Used for Antenna Terminal conducted test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	3.9	Unshielded	Unshielded	-
2	Signal Cable	0.7	Unshielded	Unshielded	-
3	Signal Cable	0.2	Unshielded	Unshielded	-
4	USB Cable	1.0	Shielded	Shielded	-
5	USB Cable	1.0	Shielded	Shielded	-
6	Signal Cable	0.5	Unshielded	Unshielded	-
7	Camera Cable	5.0	Shielded	Shielded	-
8	GPS Cable	0.5	Shielded	Shielded	-
9	FFC Cable	0.1	Unshielded	Unshielded	-

SECTION 5: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

< Below 1GHz >
EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

< Above 1GHz >
EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

The height of the measuring antenna varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).
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 in the Section 15.407 (b) (1) (2) (3) (4).

Restricted band edge:
Apply to limit in the Section 15.209 (a).
Since this limit is severer than the limit of the inside of restricted bands.

*Electric field strength to e.i.r.p. conversion:

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

Test Antennas are used as below;

Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

Frequency	Below 1 GHz	Above 1 GHz	
Instrument used	Test Receiver	Spectrum Analyzer	
Detector	QP	Peak	Average
IF Bandwidth	BW: 120 kHz	RBW: 1 MHz VBW: 3MHz	Method AD *1) RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: ≥ 100 traces If duty cycle was less than 98%, a duty factor was added to the results.
Test Distance	3 m	4.4 m*2) (1 GHz – 10GHz), 1 m*3) (10 GHz – 40 GHz)	

*1) The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v01r03 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E (Issued on August 22, 2016)".
*2) Distance Factor: 20 x log (4.4 m/3.0 m) = 3.33 dB
*3) Distance Factor: 20 x log (1.0 m/3.0 m) = -9.5 dB

The test was made on EUT at the normal use position.

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

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

SECTION 6: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
26 dB Bandwidth	Enough to capture the emission	Close to 1 % of EBW	> RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 % to 5 % of OBW	≥ 3 RBW	Auto	Peak	Max Hold	Spectrum Analyzer
6 dB Bandwidth	Enough to capture the emission	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Conducted Output Power	-	-	-	Auto	Average	-	Power Meter (Sensor: 80 MHz BW) (Method PM)
Maximum Power Spectral Density	Encompass the entire EBW	1 MHz or 470 kHz *2)	≥ 3 RBW	Auto	RMS Power Averaging (100 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*3)	9 kHz – 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz – 30 MHz	9.1 kHz	27 kHz				

* The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v01r02 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E (Issued on April 8, 2016)".

*1) Peak hold was applied as Worst-case measurement.
*2) KDB 789033 D02 says that RBW is set to be 500 kHz for 5.725 GHz-5.850 GHz, but it is not possible with spectrum analyzer, so RBW Correction Factor (10 log(500 kHz / 470 kHz)) was added to the test result.
*3) In the frequency range below 30 MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately, however the noise was low enough as shown in the chart.
(9 kHz-150 kHz: RBW = 200 Hz, 150 kHz-30 MHz: RBW = 9.1 kHz)

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

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	24deg. C / 56 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

11a

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5180	-	16.619	-
5220	-	16.692	-
5240	-	16.580	-
5260	20.263	16.635	-
5300	20.360	16.650	-
5320	20.390	16.743	-
5500	20.769	16.658	-
5580	20.599	16.595	-
5700	20.498	16.702	-
5745	-	16.548	-
5785	-	16.671	-
5825	-	16.624	-

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	24deg. C / 56 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

11n-20

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5180	-	17.696	-
5220	-	17.773	-
5240	-	17.741	-
5260	21.653	17.700	-
5300	24.915	18.552	-
5320	23.017	18.320	-
5500	22.397	16.585	-
5580	22.088	16.612	-
5700	20.944	16.589	-
5745	-	17.688	-
5785	-	17.681	-
5825	-	17.720	-

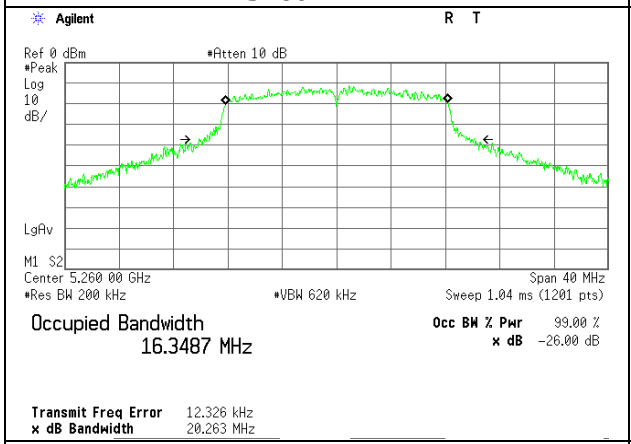
11n-40

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5190	-	35.914	-
5230	-	35.926	-
5270	42.598	35.981	-
5310	40.185	35.993	-
5510	41.264	35.958	-
5550	41.546	36.022	-
5670	40.506	35.923	-
5755	-	35.781	-
5795	-	35.663	-

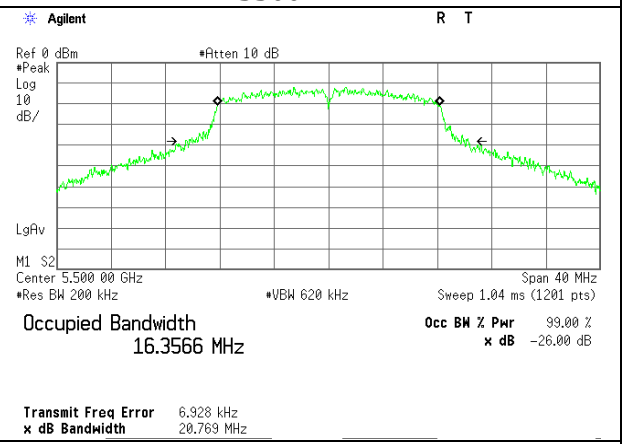
26 dB Emission Bandwidth

11a

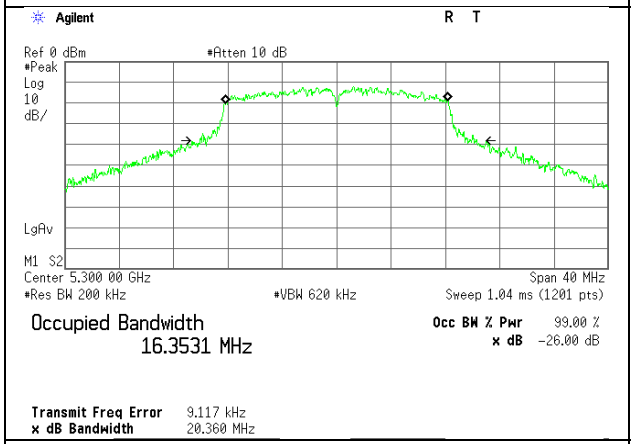
5260 MHz



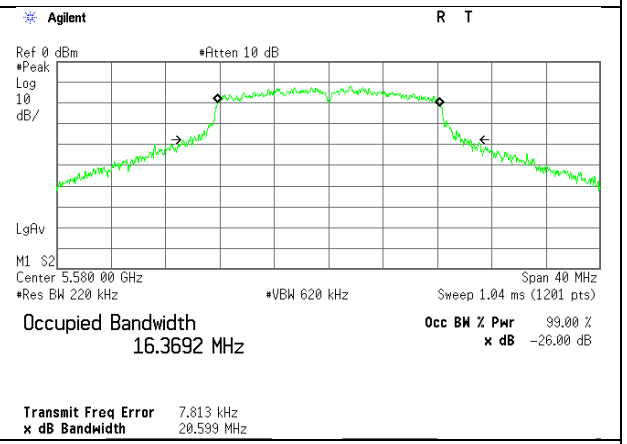
5500 MHz



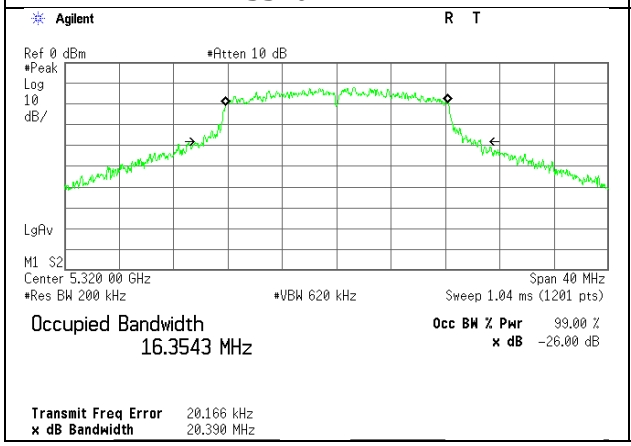
5300 MHz



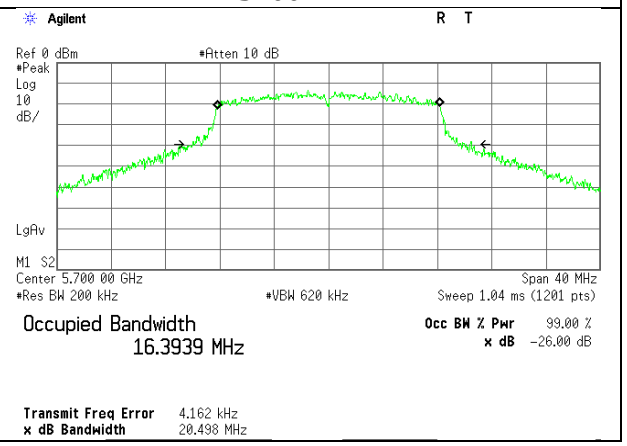
5580 MHz



5320 MHz



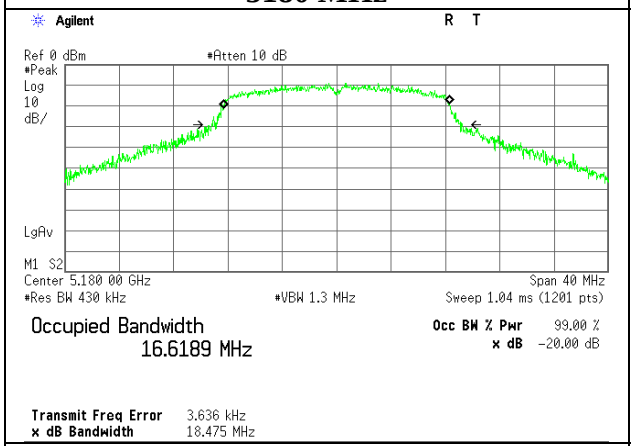
5700 MHz



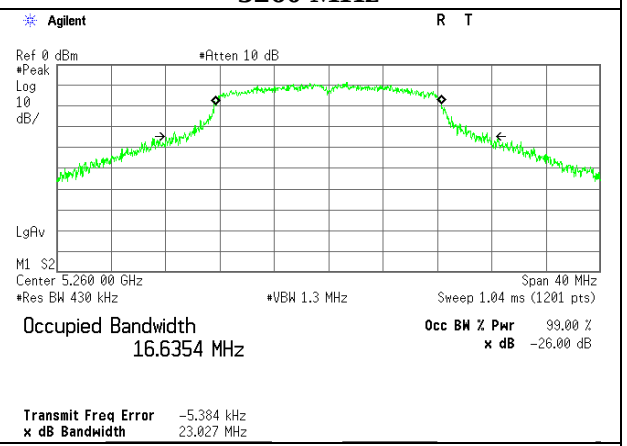
99 % Emission Bandwidth

11a

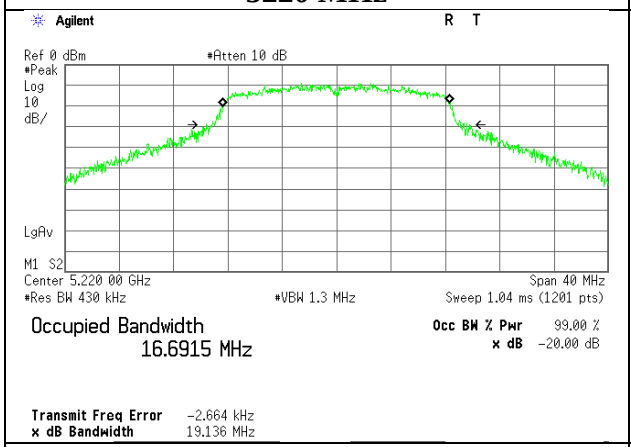
5180 MHz



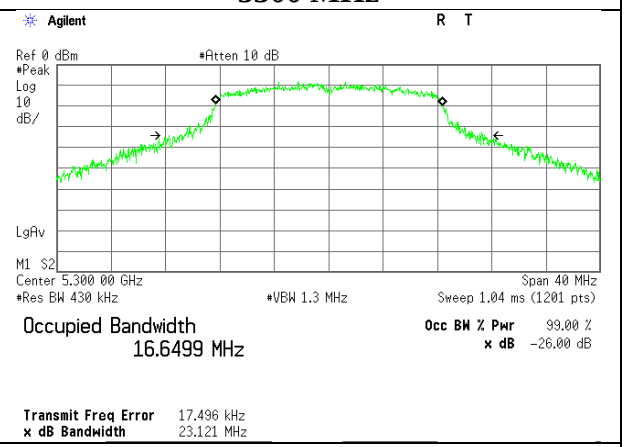
5260 MHz



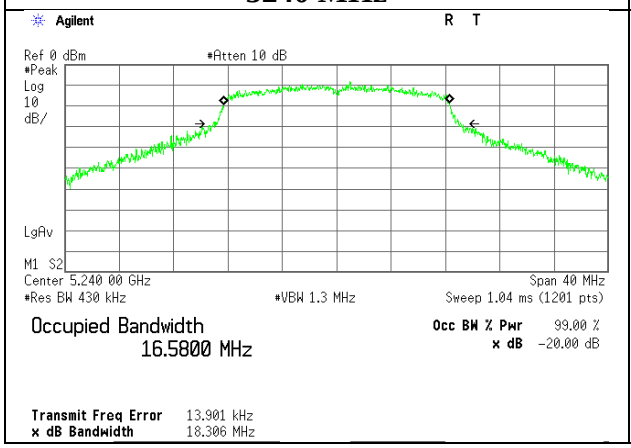
5220 MHz



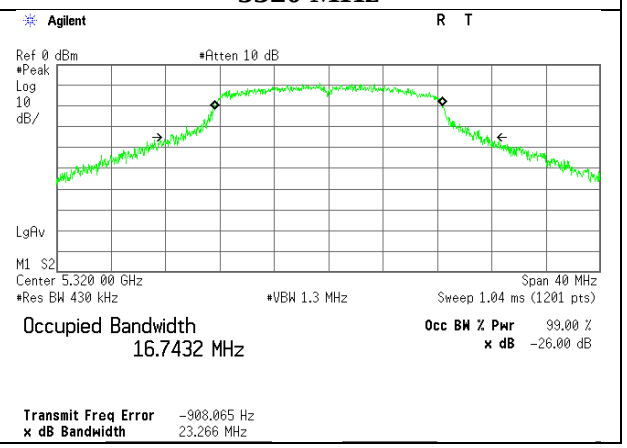
5300 MHz



5240 MHz



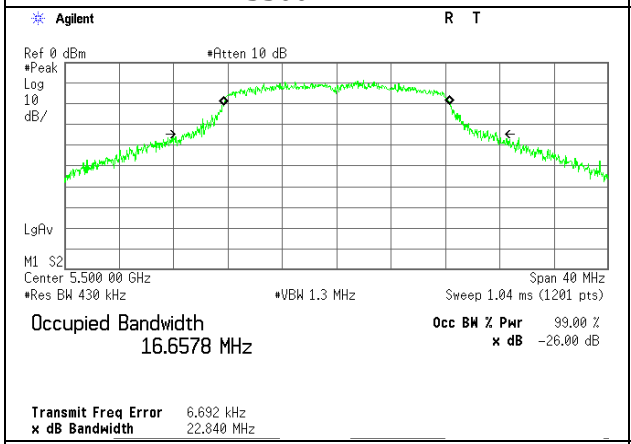
5320 MHz



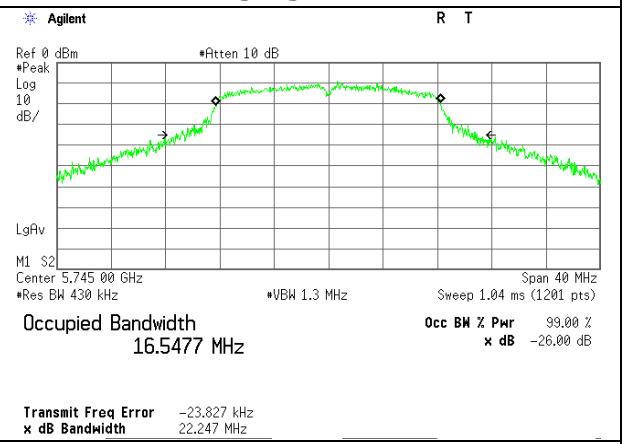
99% Emission Bandwidth

11a

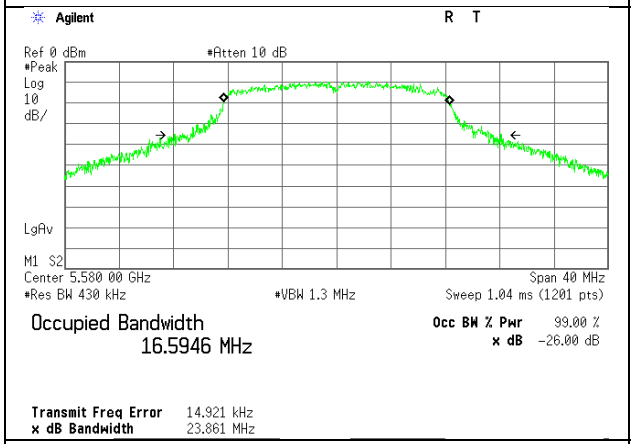
5500 MHz



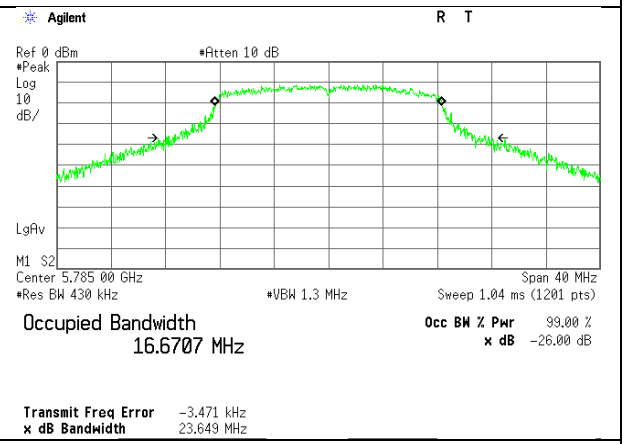
5745 MHz



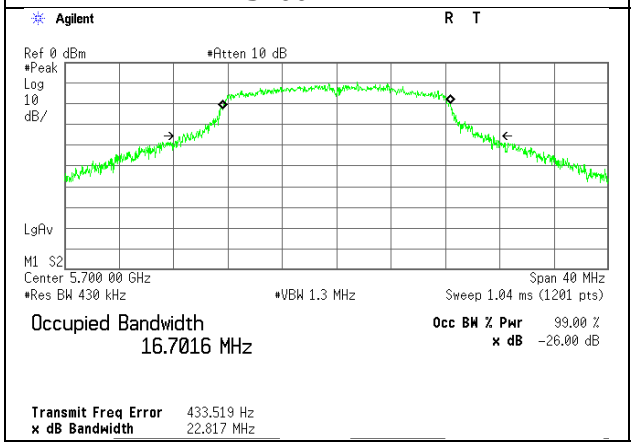
5580 MHz



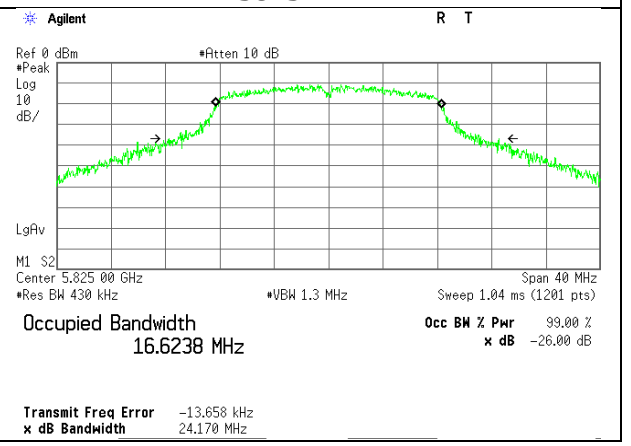
5785 MHz



5700 MHz



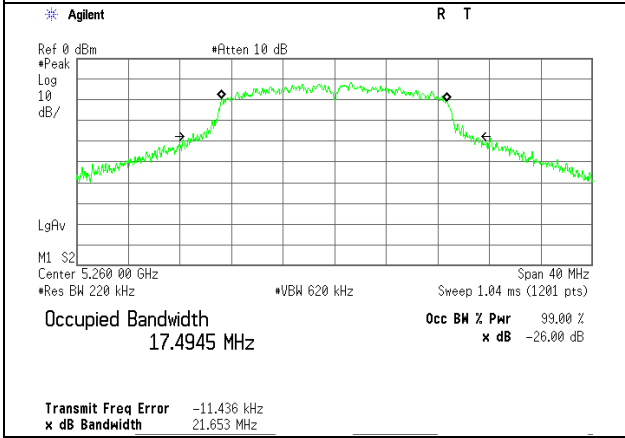
5825 MHz



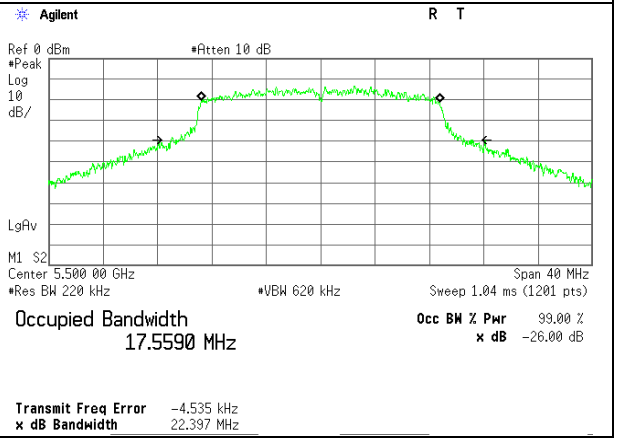
26 dB Emission Bandwidth

11n-20

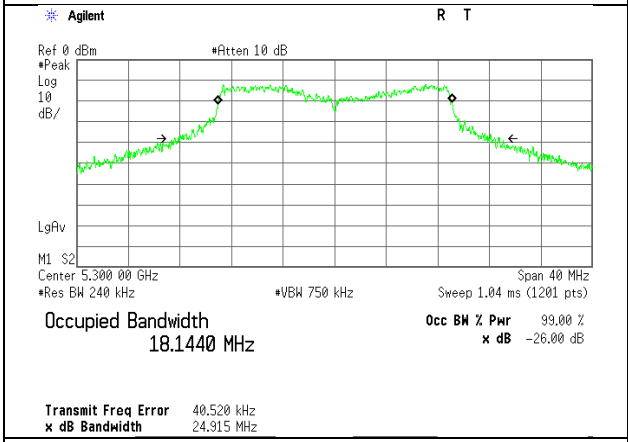
5260 MHz



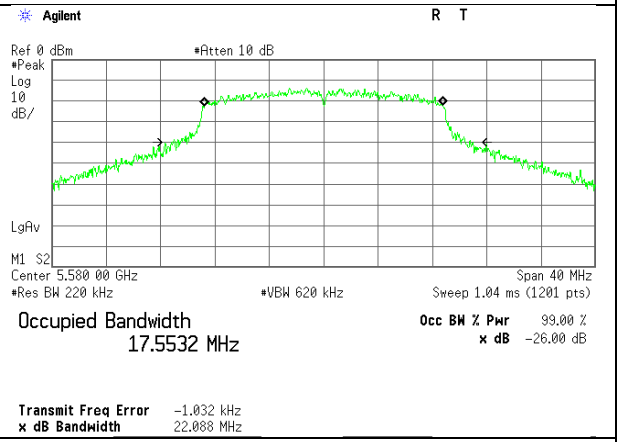
5500 MHz



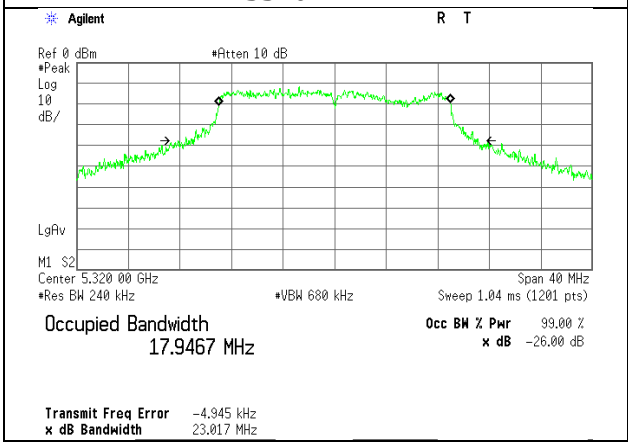
5300 MHz



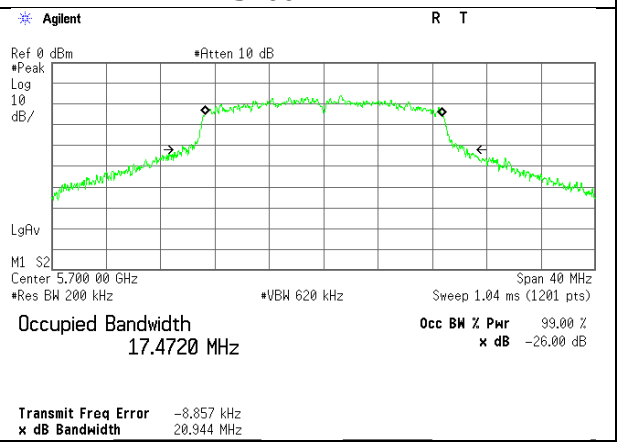
5580 MHz



5320 MHz



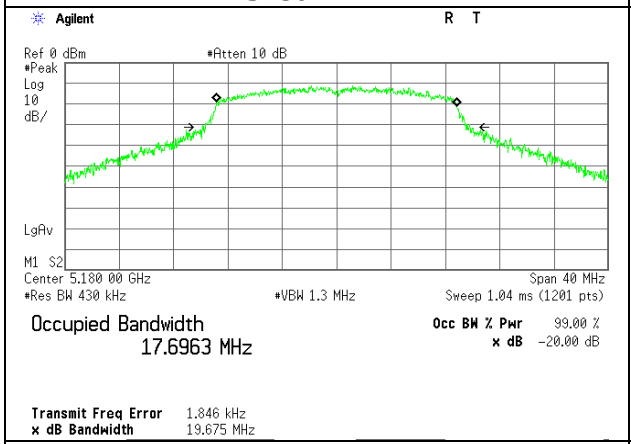
5700 MHz



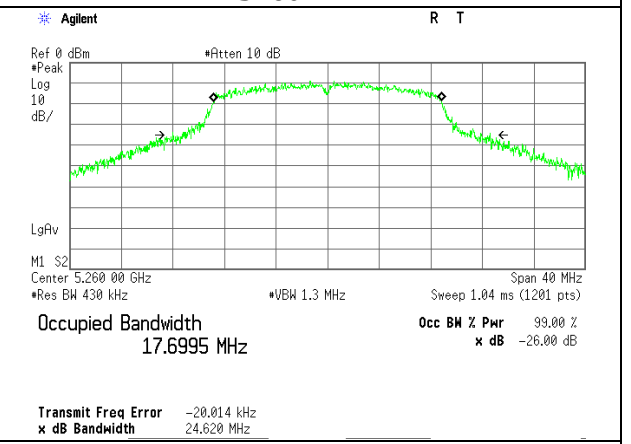
99 % Emission Bandwidth

11n-20

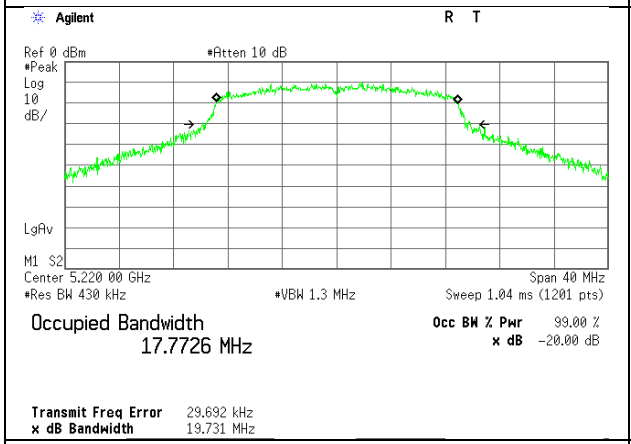
5180 MHz



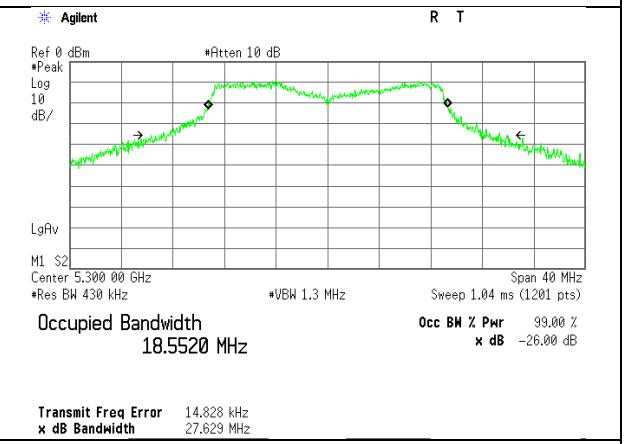
5260 MHz



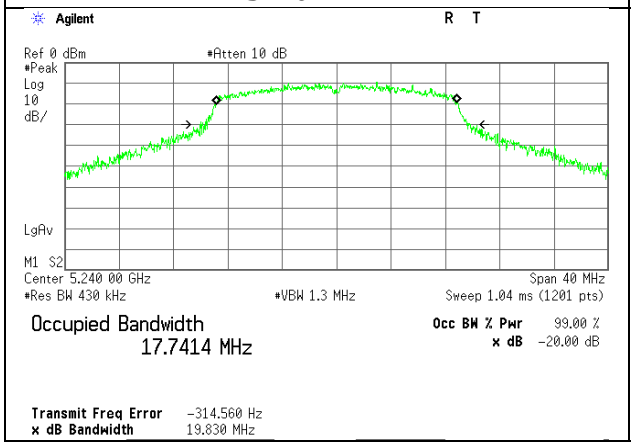
5220 MHz



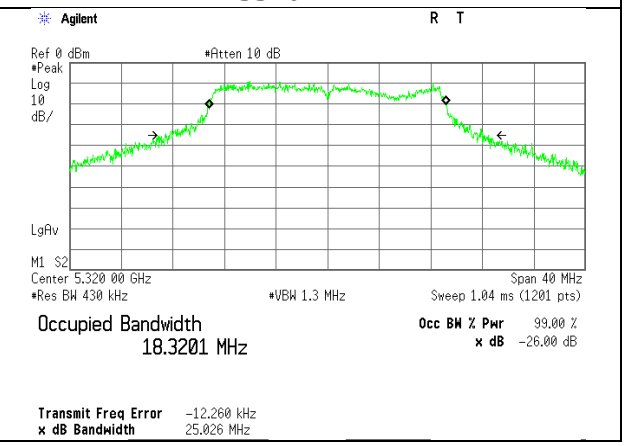
5300 MHz



5240 MHz



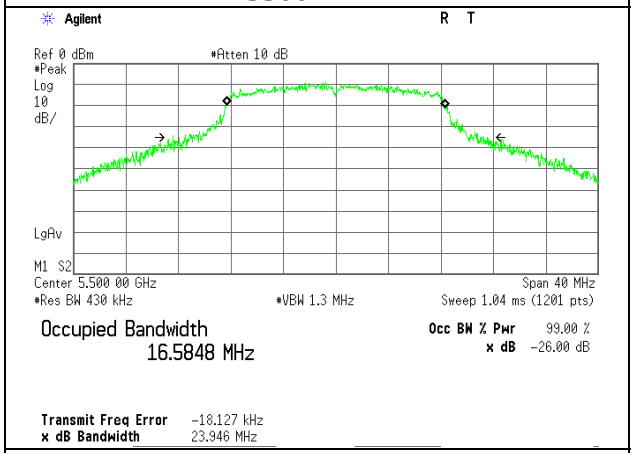
5320 MHz



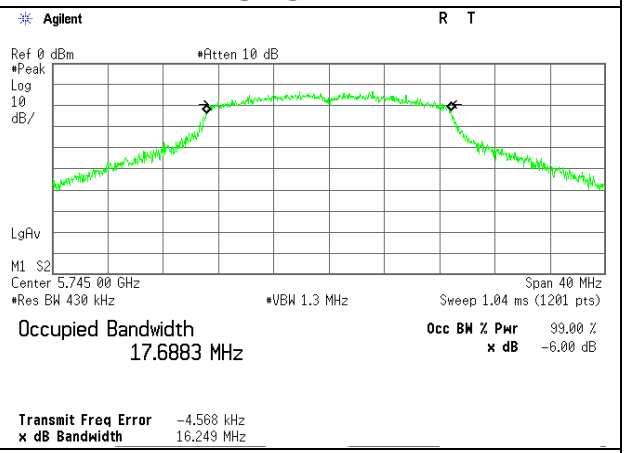
99 % Emission Bandwidth

11n-20

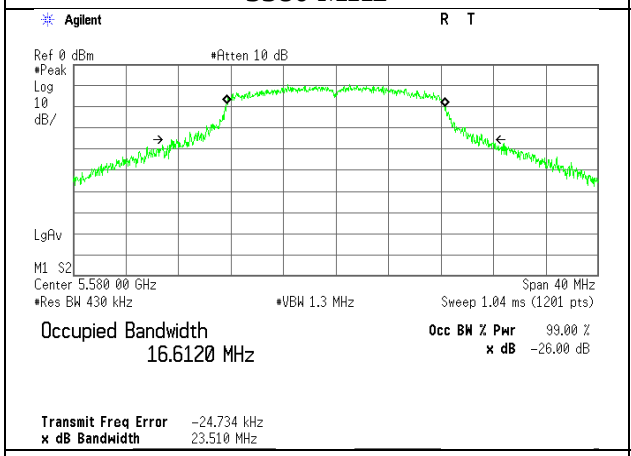
5500 MHz



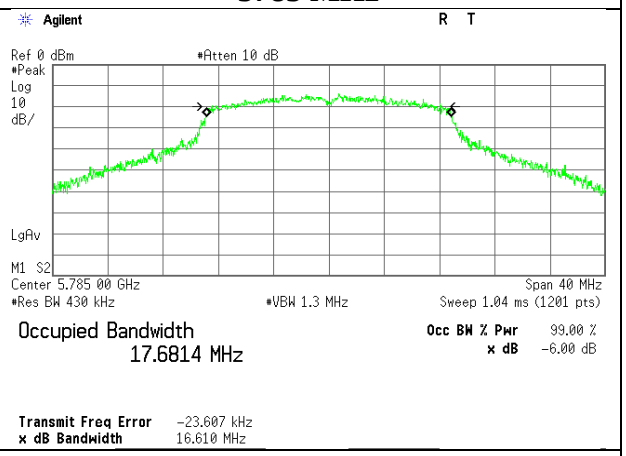
5745 MHz



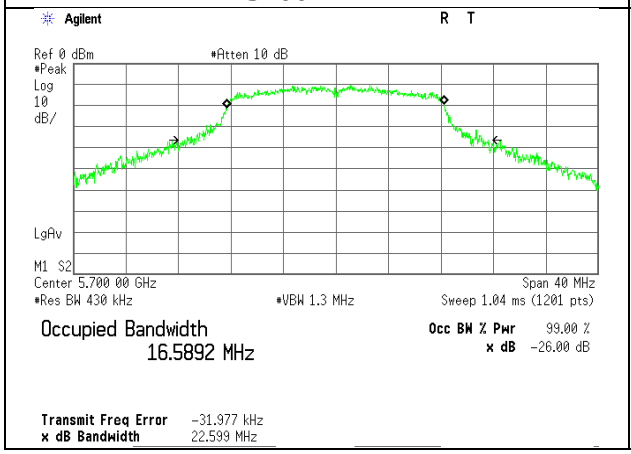
5580 MHz



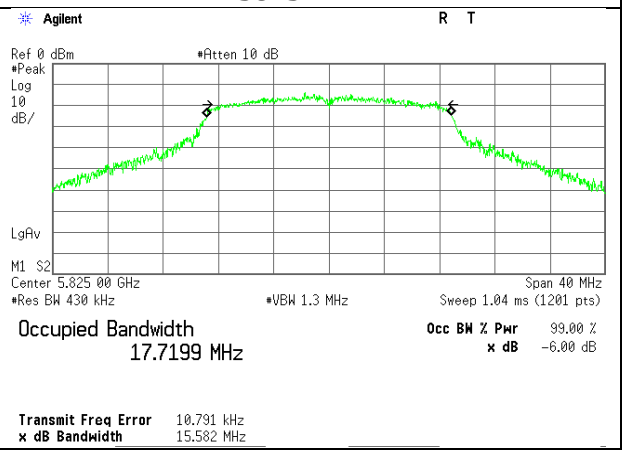
5785 MHz



5700 MHz



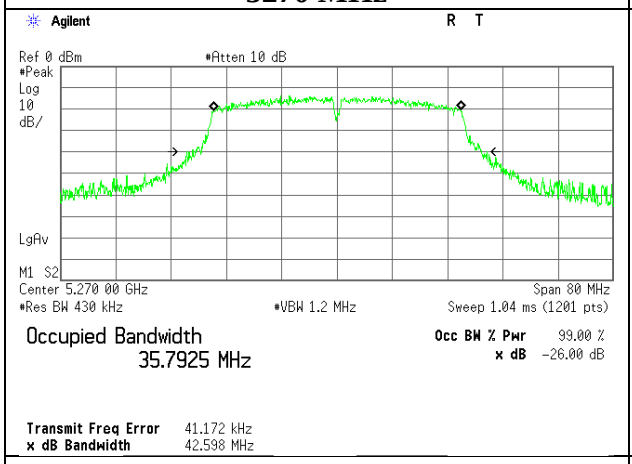
5825 MHz



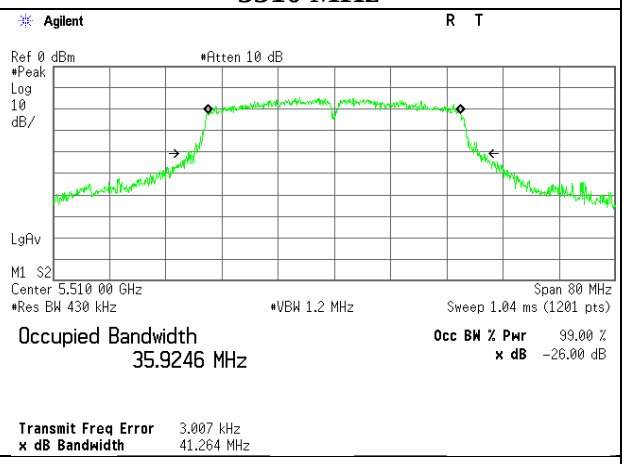
26dB Emission Bandwidth

11n-40

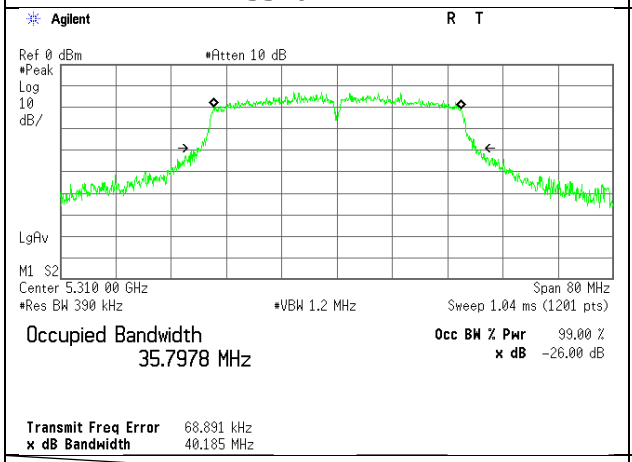
5270 MHz



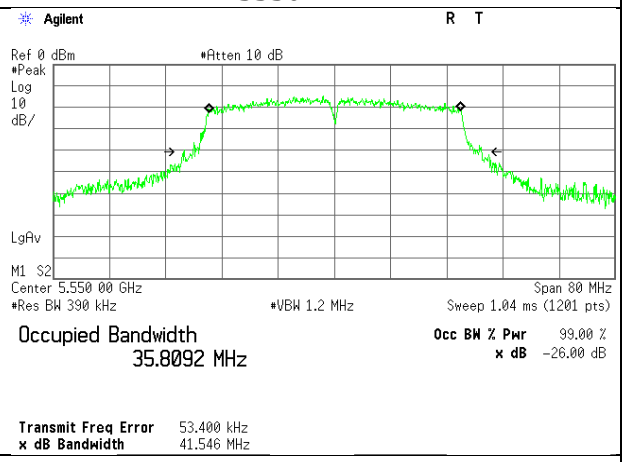
5510 MHz



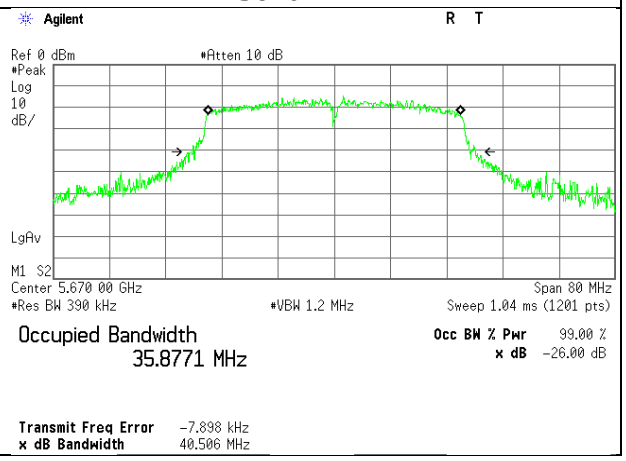
5310 MHz



5550 MHz



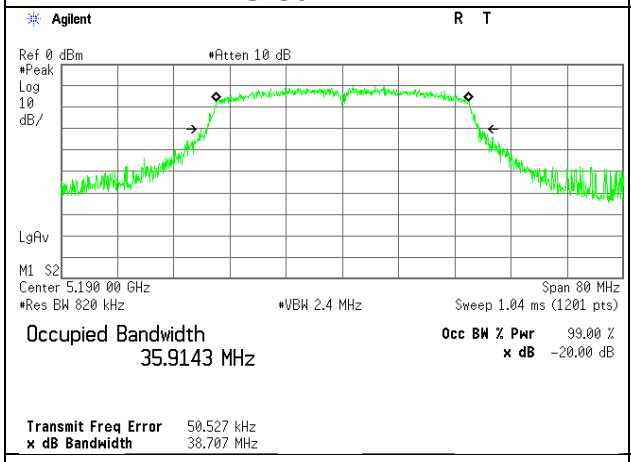
5670 MHz



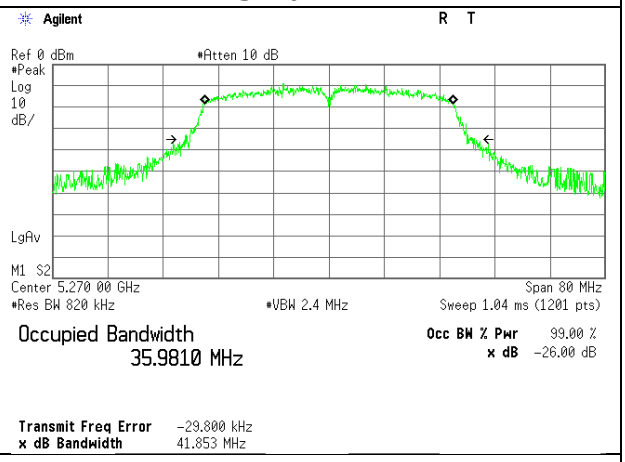
99% Emission Bandwidth

11n-40

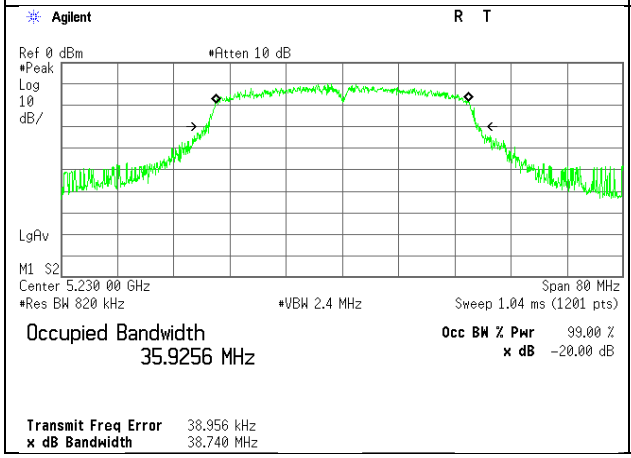
5190 MHz



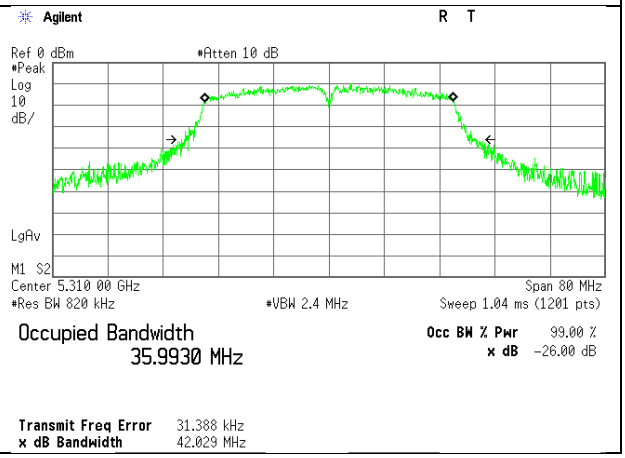
5270 MHz



5230 MHz



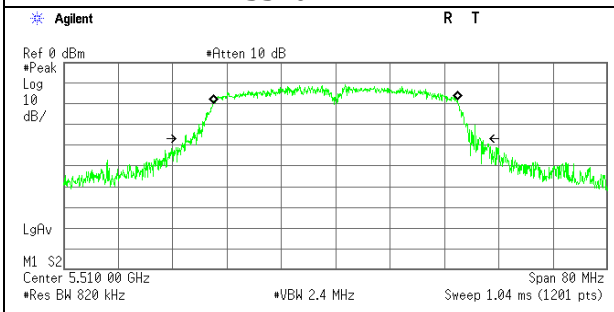
5310 MHz



99% Emission Bandwidth

11n-40

5510 MHz

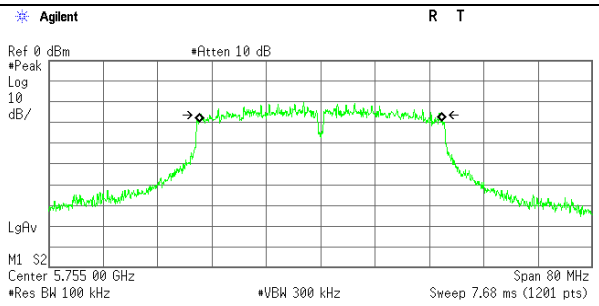


Occupied Bandwidth
35.9578 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -54.403 kHz
x dB Bandwidth 43.309 MHz

5755 MHz

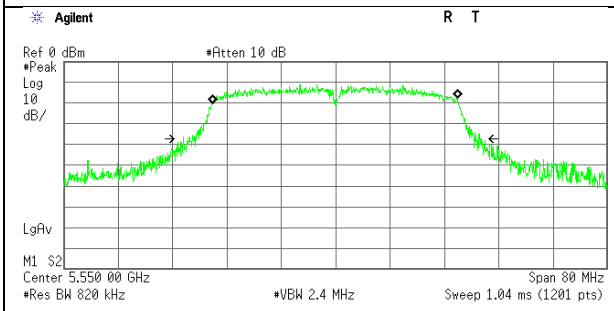


Occupied Bandwidth
35.7808 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -18.479 kHz
x dB Bandwidth 35.113 MHz

5550 MHz

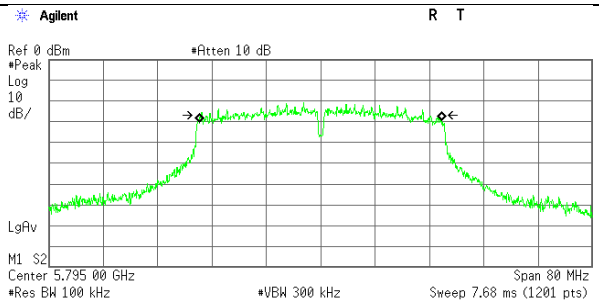


Occupied Bandwidth
36.0218 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -85.114 kHz
x dB Bandwidth 43.658 MHz

5795 MHz

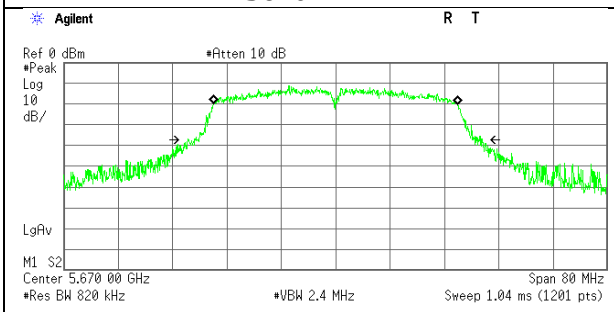


Occupied Bandwidth
35.6634 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -27.748 kHz
x dB Bandwidth 34.891 MHz

5670 MHz



Occupied Bandwidth
35.9225 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 4.975 kHz
x dB Bandwidth 43.153 MHz

6 dB Bandwidth

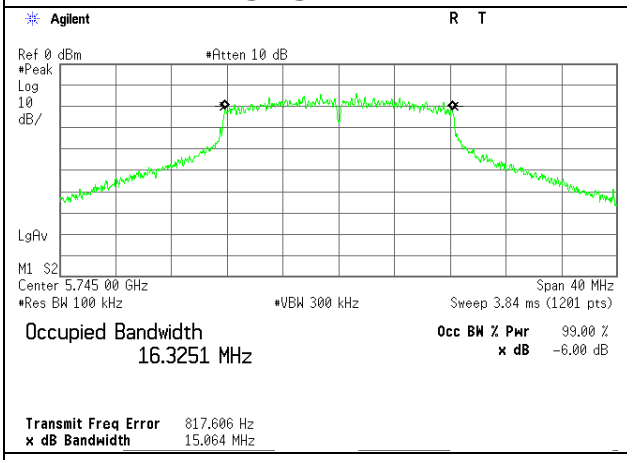
Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	24deg. C / 56 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

Mode	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
11a	5745	15.064	> 500
	5785	15.317	> 500
	5825	15.319	> 500
11n-20	5745	15.008	> 500
	5785	15.908	> 500
	5825	14.567	> 500
11n-40	5755	35.113	> 500
	5795	34.891	> 500

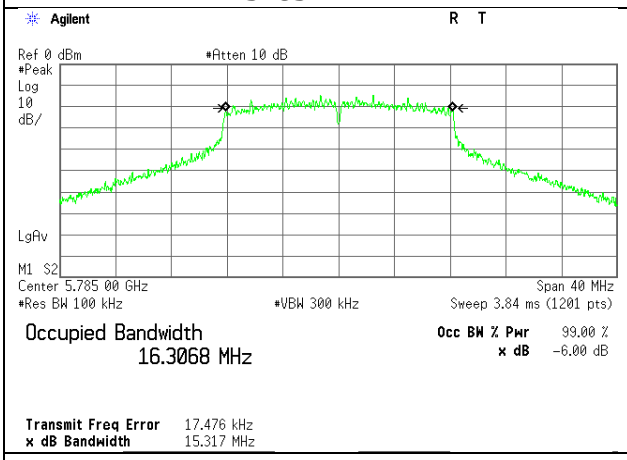
6 dB Bandwidth

11a

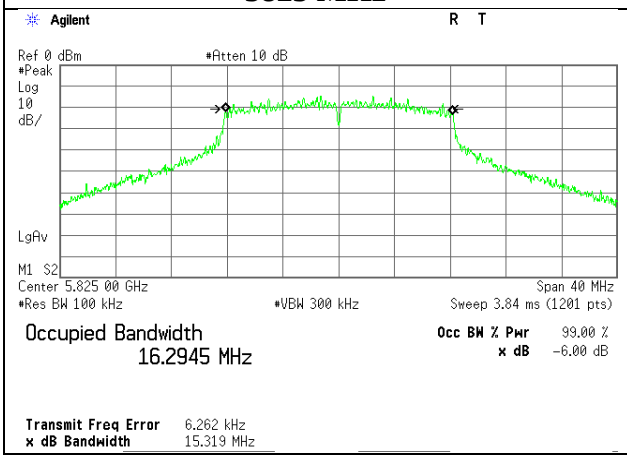
5745 MHz



5785 MHz

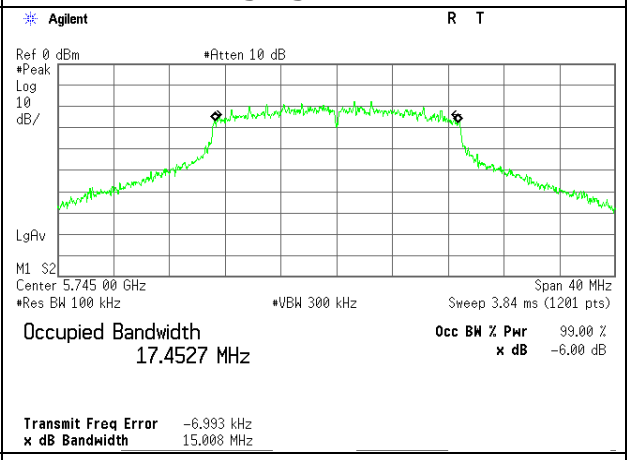


5825 MHz

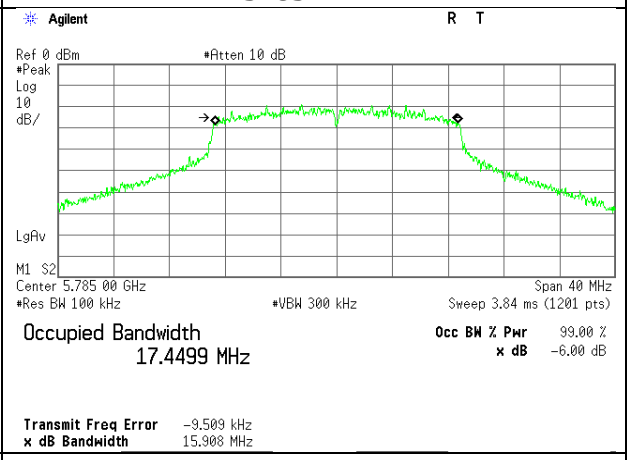


11n-20

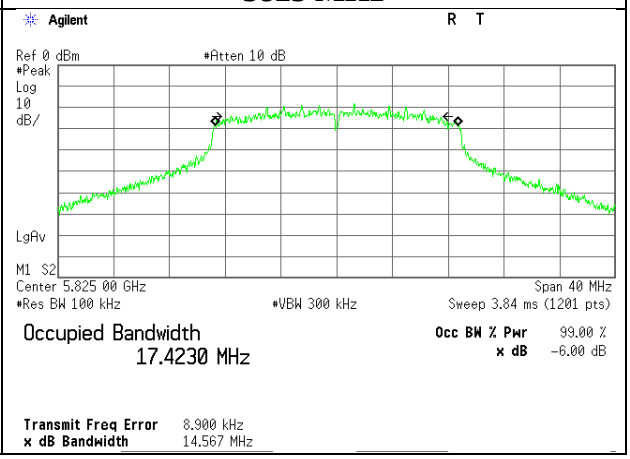
5745 MHz



5785 MHz



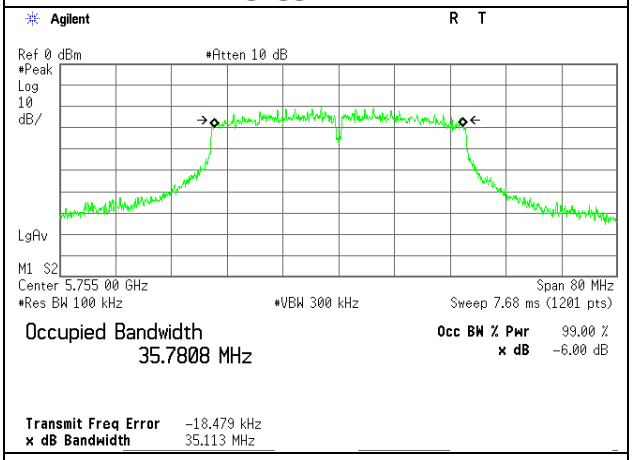
5825 MHz



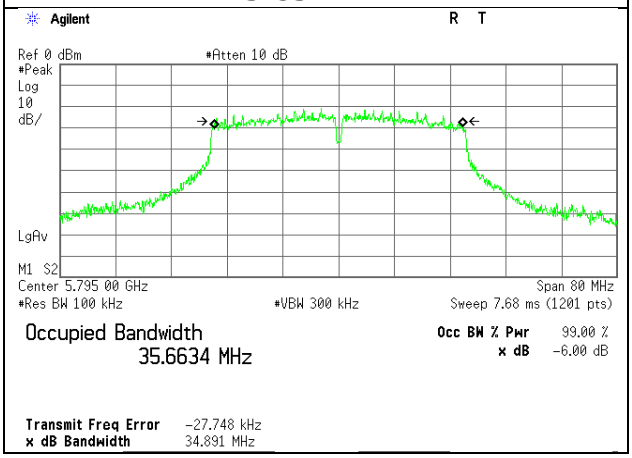
6 dB Bandwidth

11n-40

5755 MHz



5795 MHz



Maximum Conducted Output Power

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11328915H
Date	July 28, 2016
Temperature / Humidity	23deg. C / 68 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

11a

Applied limit: 15.407, mobile and portable client device

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Conducted Power Limit	Conducted Power Margin	e.i.r.p. Result		e.i.r.p. Limit	e.i.r.p. Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	-14.22	2.11	19.68	1.99	0.0	-	16.619	9.56	9.04	23.97	14.41	9.56	9.04	29.97	20.41
5220	-13.98	2.11	19.68	1.99	0.0	-	16.692	9.80	9.55	23.97	14.17	9.80	9.55	29.97	20.17
5240	-14.89	2.11	19.68	1.99	0.0	-	16.580	8.89	7.74	23.97	15.08	8.89	7.74	29.97	21.08
5260	-14.08	2.11	19.68	1.99	0.0	20.263	16.635	9.70	9.33	23.97	14.27	9.70	9.33	29.97	20.27
5300	-14.21	2.11	19.68	1.99	0.0	20.360	16.650	9.57	9.06	23.97	14.40	9.57	9.06	29.97	20.40
5320	-13.88	2.11	19.68	1.99	0.0	20.390	16.743	9.90	9.77	23.97	14.07	9.90	9.77	29.97	20.07
5500	-14.78	2.12	19.67	1.99	0.0	20.769	16.658	9.00	7.94	23.97	14.97	9.00	7.94	29.97	20.97
5580	-15.70	2.13	19.71	1.99	0.0	20.599	16.595	8.13	6.50	23.97	15.84	8.13	6.50	29.97	21.84
5700	-16.39	2.14	19.70	1.99	0.0	20.498	16.702	7.44	5.55	23.97	16.53	7.44	5.55	29.97	22.53
5745	-15.96	2.14	19.69	1.99	0.0	-	-	7.86	6.11	30.00	22.14	7.86	6.11	36.00	28.14
5785	-16.50	2.15	19.68	1.99	0.0	-	-	7.32	5.40	30.00	22.68	7.32	5.40	36.00	28.68
5825	-15.99	2.15	19.68	1.99	0.0	-	-	7.83	6.07	30.00	22.17	7.83	6.07	36.00	28.17

11n-20

Applied limit: 15.407, mobile and portable client device

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Conducted Power Limit	Conducted Power Margin	e.i.r.p. Result		e.i.r.p. Limit	e.i.r.p. Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	-15.16	2.11	19.68	2.34	0.0	-	17.696	8.97	7.89	23.97	15.00	8.97	7.89	29.97	21.00
5220	-15.06	2.11	19.68	2.34	0.0	-	17.773	9.07	8.07	23.97	14.90	9.07	8.07	29.97	20.90
5240	-14.98	2.11	19.68	2.34	0.0	-	17.741	9.15	8.22	23.97	14.82	9.15	8.22	29.97	20.82
5260	-14.32	2.11	19.68	2.34	0.0	21.653	17.700	9.81	9.57	23.97	14.16	9.81	9.57	29.97	20.16
5300	-14.30	2.11	19.68	2.34	0.0	24.915	18.552	9.83	9.61	23.97	14.14	9.83	9.61	29.97	20.14
5320	-14.64	2.11	19.68	2.34	0.0	23.017	18.320	9.49	8.90	23.97	14.48	9.49	8.90	29.97	20.48
5500	-15.87	2.12	19.67	2.34	0.0	22.397	16.585	8.26	6.70	23.97	15.71	8.26	6.70	29.97	21.71
5580	-16.52	2.13	19.71	2.34	0.0	22.088	16.612	7.66	5.83	23.97	16.31	7.66	5.83	29.97	22.31
5700	-17.87	2.14	19.70	2.34	0.0	20.944	16.589	6.31	4.28	23.97	17.66	6.31	4.28	29.97	23.66
5745	-19.77	2.14	19.69	2.34	0.0	-	-	4.40	2.75	30.00	25.60	4.40	2.75	36.00	31.60
5785	-20.37	2.15	19.68	2.34	0.0	-	-	3.80	2.40	30.00	26.20	3.80	2.40	36.00	32.20
5825	-19.35	2.15	19.68	2.34	0.0	-	-	4.82	3.03	30.00	25.18	4.82	3.03	36.00	31.18

Sample Calculation:
Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor
e.i.r.p. Result = Conducted Power Result + Antenna Gain
Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11328915H
Date	July 28, 2016
Temperature / Humidity	23deg. C / 68 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

11n-40

Applied limit: 15.407, mobile and portable client device

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Conducted Power Limit	Conducted Power Margin	e.i.r.p. Result		e.i.r.p. Limit	e.i.r.p. Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5190	-16.25	2.11	19.68	3.61	0.0	-	35.914	9.15	8.22	23.97	14.82	9.15	8.22	29.97	20.82
5230	-16.66	2.11	19.68	3.61	0.0	-	35.926	8.74	7.48	23.97	15.23	8.74	7.48	29.97	21.23
5270	-16.49	2.11	19.68	3.61	0.0	42.598	35.981	8.91	7.78	23.97	15.06	8.91	7.78	29.97	21.06
5310	-16.29	2.11	19.68	3.61	0.0	40.185	35.993	9.11	8.14	23.97	14.86	9.11	8.14	29.97	20.86
5510	-18.36	2.12	19.67	3.61	0.0	41.264	35.958	7.04	5.05	23.97	16.93	7.04	5.05	29.97	22.93
5550	-18.85	2.12	19.70	3.61	0.0	41.546	36.022	6.59	4.56	23.97	17.39	6.59	4.56	29.97	23.39
5670	-20.00	2.14	19.71	3.61	0.0	40.506	35.923	5.46	3.52	23.97	18.51	5.46	3.52	29.97	24.51
5755	-23.77	2.14	19.69	3.61	0.0	-	-	1.67	1.47	30.00	28.33	1.67	1.47	36.00	34.33
5795	-24.35	2.15	19.68	3.61	0.0	-	-	1.10	1.29	30.00	28.91	1.10	1.29	36.00	34.91

Sample Calculation:
Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor
e.i.r.p. Result = Conducted Power Result + Antenna Gain
Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11328915H
Date	July 28, 2016
Temperature / Humidity	23deg. C / 68 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

5500 MHz

Mode	Rate Mbps	Burst power [dBm]		Remarks
11a	6	8.48		
	9	8.85		
	12	8.51		
	18	8.69		
	24	8.29		
	36	8.78		
	48	8.95		
	54	9.00		*
Mode	MCS Number	Burst power SGI [dBm]	Burst power LGI [dBm]	Remarks
11n-20	0	7.30		
	1	7.39		
	2	7.28		
	3	7.45		
	4	7.28		
	5	7.58		
	6	7.50		
	7	7.65	7.63	* SGI

5510 MHz

Mode	MCS Number	Burst power SGI [dBm]	Burst power LGI [dBm]	Remarks
11n-40	0	6.25		
	1	6.36		
	2	6.41		
	3	6.60		
	4	6.55		
	5	6.78		
	6	6.81		
	7	6.88	6.63	* SGI

Sample Calculation:

Burst power = Reading (on-time average)

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

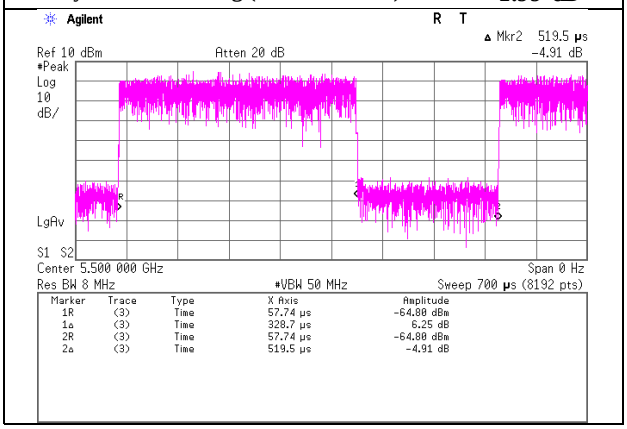
* Worst rate

Burst rate confirmation

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11328915H
Date	July 28, 2016
Temperature / Humidity	23deg. C / 68 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

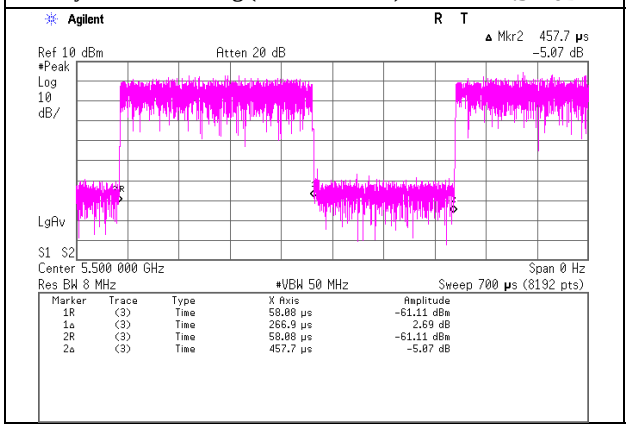
11a 54Mbps

Tx on / (Tx on + Tx off) =	**0.633**
Tx on / (Tx on + Tx off) * 100 =	**63.3 %**
Duty factor = 10 * log (0.5195 / 0.3287) =	**1.99 dB**



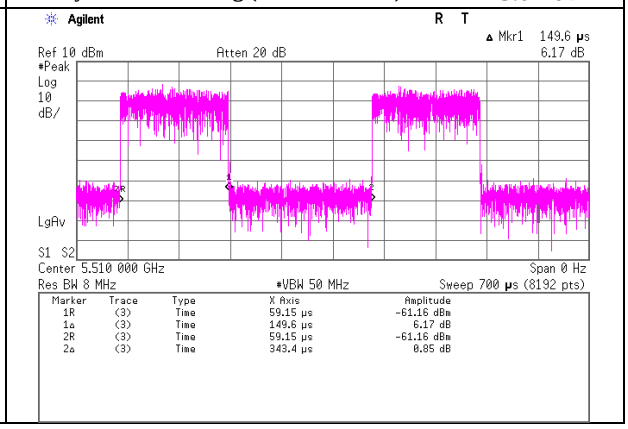
11n-20 MCS7

Tx on / (Tx on + Tx off) =	**0.583**
Tx on / (Tx on + Tx off) * 100 =	**58.3 %**
Duty factor = 10 * log (0.4577 / 0.2669) =	**2.34 dB**



11n-40 MCS7

Tx on / (Tx on + Tx off) =	**0.436**
Tx on / (Tx on + Tx off) * 100 =	**43.6 %**
Duty factor = 10 * log (0.3434 / 0.1496) =	**3.61 dB**



Maximum Power Spectral Density

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	24deg. C / 56 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

11a

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /MHz]	PSD (Conducted) Limit [dBm /MHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	PSD (e.i.r.p.) Limit [dBm /MHz]	PSD (e.i.r.p.) Margin [dB]
5180	-14.79	2.11	9.75	1.99	0.0	0.00	-0.94	11.00	11.94	-0.94	17.00	17.94
5220	-15.30	2.11	9.75	1.99	0.0	0.00	-1.45	11.00	12.45	-1.45	17.00	18.45
5240	-15.42	2.11	9.75	1.99	0.0	0.00	-1.57	11.00	12.57	-1.57	17.00	18.57
5260	-14.17	2.11	9.75	1.99	0.0	0.00	-0.32	11.00	11.32	-0.32	17.00	17.32
5300	-14.60	2.11	9.75	1.99	0.0	0.00	-0.75	11.00	11.75	-0.75	17.00	17.75
5320	-14.74	2.11	9.75	1.99	0.0	0.00	-0.89	11.00	11.89	-0.89	17.00	17.89
5500	-15.00	2.12	9.75	1.99	0.0	0.00	-1.14	11.00	12.14	-1.14	17.00	18.14
5580	-14.83	2.13	9.76	1.99	0.0	0.00	-0.95	11.00	11.95	-0.95	17.00	17.95
5700	-16.45	2.14	9.77	1.99	0.0	0.00	-2.55	11.00	13.55	-2.55	17.00	19.55
5745	-18.88	2.14	9.78	1.99	0.0	0.27	-4.70	30.00	34.70	-4.70	36.00	40.70
5785	-19.12	2.15	9.78	1.99	0.0	0.27	-4.93	30.00	34.93	-4.93	36.00	40.93
5825	-19.52	2.15	9.79	1.99	0.0	0.27	-5.32	30.00	35.32	-5.32	36.00	41.32

Sample Calculation:
PSD: Power Spectral Density
The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

11n-20

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /MHz]	PSD (Conducted) Limit [dBm /MHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	PSD (e.i.r.p.) Limit [dBm /MHz]	PSD (e.i.r.p.) Margin [dB]
5180	-16.94	2.11	9.75	2.34	0.0	0.00	-2.74	11.00	13.74	-2.74	17.00	19.74
5220	-16.48	2.11	9.75	2.34	0.0	0.00	-2.28	11.00	13.28	-2.28	17.00	19.28
5240	-15.54	2.11	9.75	2.34	0.0	0.00	-1.34	11.00	12.34	-1.34	17.00	18.34
5260	-15.36	2.11	9.75	2.34	0.0	0.00	-1.16	11.00	12.16	-1.16	17.00	18.16
5300	-15.23	2.11	9.75	2.34	0.0	0.00	-1.03	11.00	12.03	-1.03	17.00	18.03
5320	-16.03	2.11	9.75	2.34	0.0	0.00	-1.83	11.00	12.83	-1.83	17.00	18.83
5500	-16.70	2.12	9.75	2.34	0.0	0.00	-2.49	11.00	13.49	-2.49	17.00	19.49
5580	-17.00	2.13	9.76	2.34	0.0	0.00	-2.77	11.00	13.77	-2.77	17.00	19.77
5700	-19.29	2.14	9.77	2.34	0.0	0.00	-5.04	11.00	16.04	-5.04	17.00	22.04
5745	-22.42	2.14	9.78	2.34	0.0	0.27	-7.89	30.00	37.89	-7.89	36.00	43.89
5785	-23.17	2.15	9.78	2.34	0.0	0.27	-8.63	30.00	38.63	-8.63	36.00	44.63
5825	-23.74	2.15	9.79	2.34	0.0	0.27	-9.19	30.00	39.19	-9.19	36.00	45.19

Sample Calculation:
PSD: Power Spectral Density
The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	24deg. C / 56 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

11n-40

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /MHz]	PSD (Conducted) Limit [dBm /MHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	PSD (e.i.r.p.) Limit [dBm /MHz]	PSD (e.i.r.p.) Margin [dB]
5190	-20.42	2.11	9.75	3.61	0.0	0.00	-4.95	11.00	15.95	-4.95	17.00	21.95
5230	-20.83	2.11	9.75	3.61	0.0	0.00	-5.36	11.00	16.36	-5.36	17.00	22.36
5270	-20.30	2.11	9.75	3.61	0.0	0.00	-4.83	11.00	15.83	-4.83	17.00	21.83
5310	-20.26	2.11	9.75	3.61	0.0	0.00	-4.79	11.00	15.79	-4.79	17.00	21.79
5510	-21.37	2.12	9.75	3.61	0.0	0.00	-5.89	11.00	16.89	-5.89	17.00	22.89
5550	-21.50	2.12	9.76	3.61	0.0	0.00	-6.01	11.00	17.01	-6.01	17.00	23.01
5670	-22.12	2.14	9.77	3.61	0.0	0.00	-6.60	11.00	17.60	-6.60	17.00	23.60
5755	-26.81	2.14	9.78	3.61	0.0	0.27	-11.01	30.00	41.01	-11.01	36.00	47.01
5795	-27.43	2.15	9.78	3.61	0.0	0.27	-11.62	30.00	41.62	-11.62	36.00	47.62

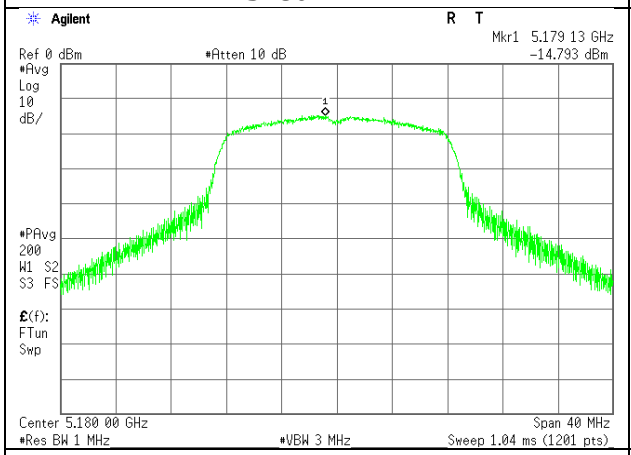
Sample Calculation:
PSD: Power Spectral Density
The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

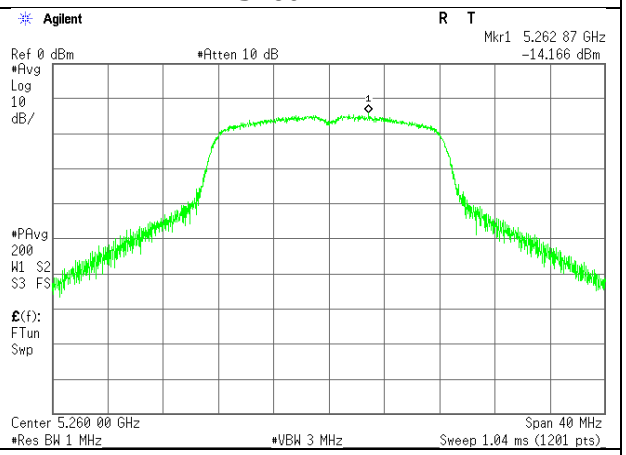
Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	24deg. C / 56 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

11a

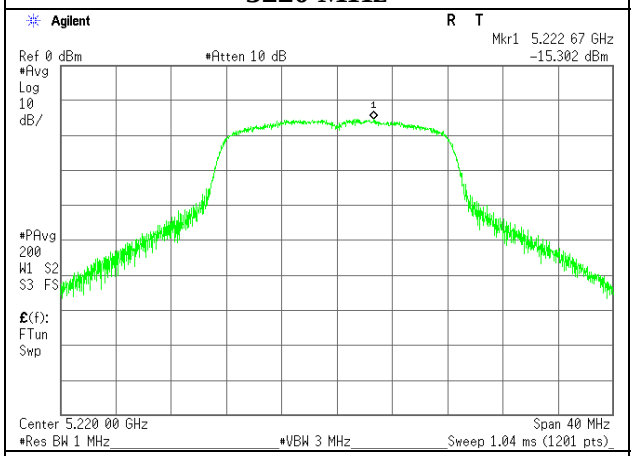
5180 MHz



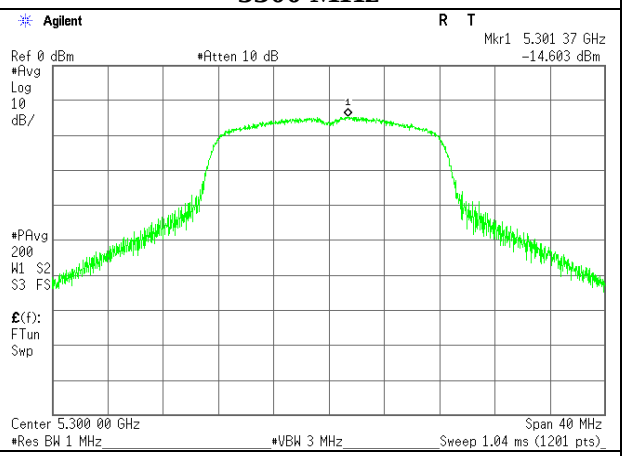
5260 MHz



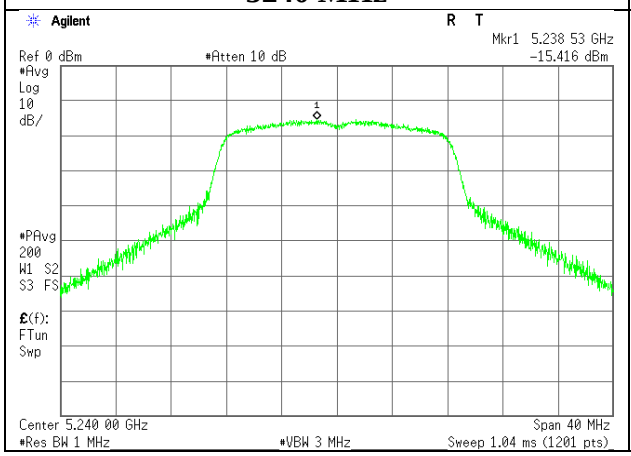
5220 MHz



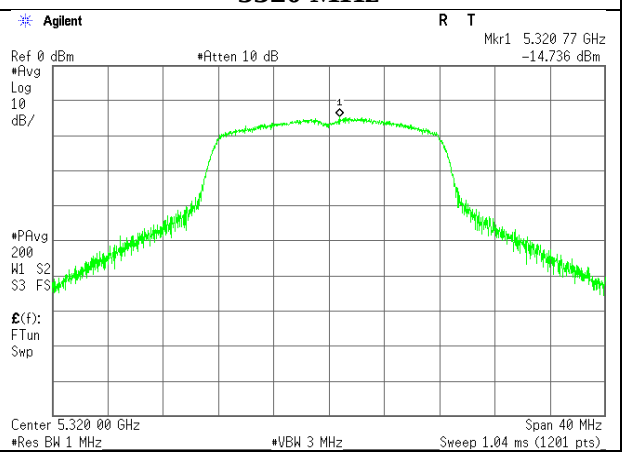
5300 MHz



5240 MHz



5320 MHz

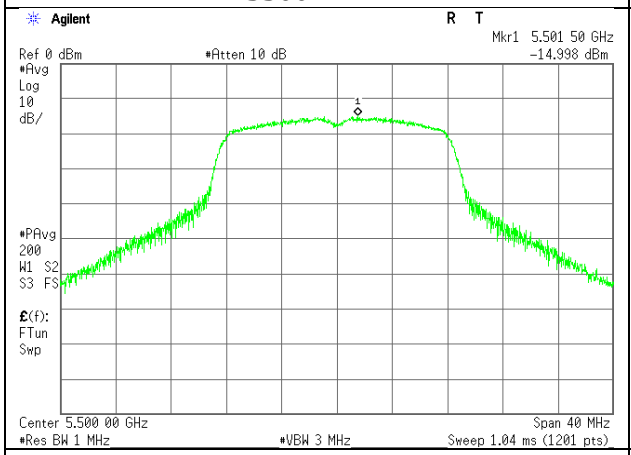


Maximum Power Spectral Density

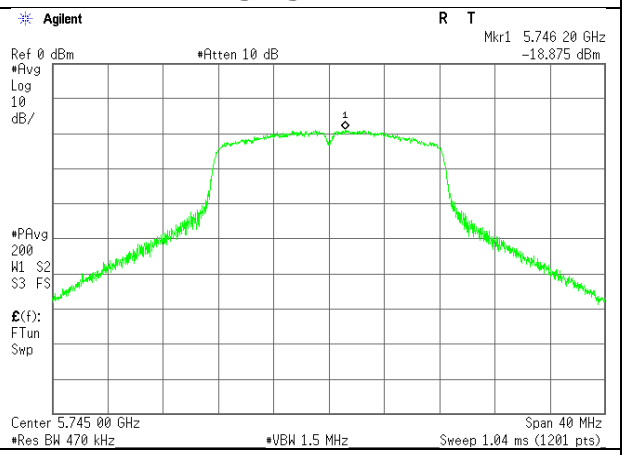
Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	24deg. C / 56 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

11a

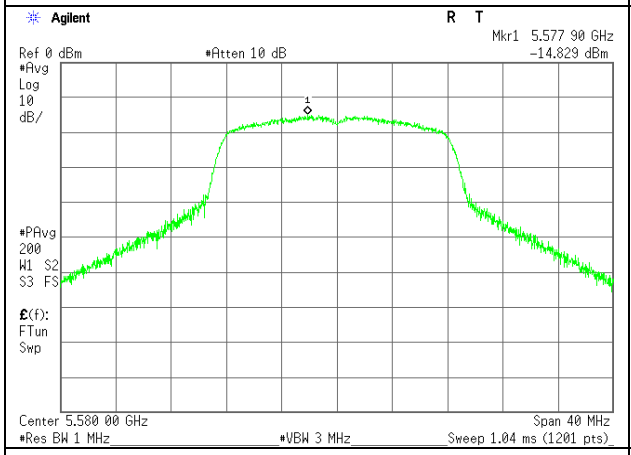
5500 MHz



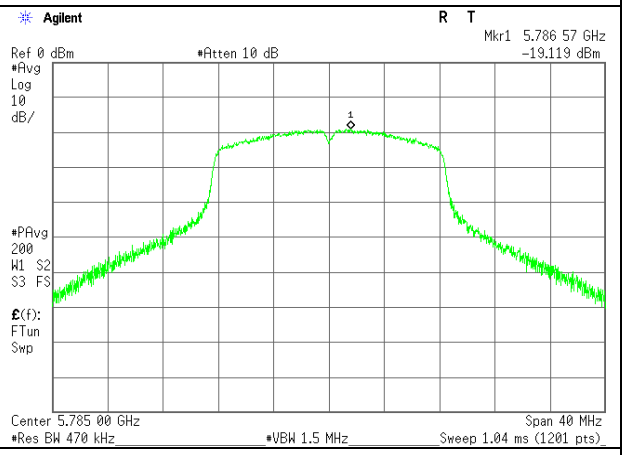
5745 MHz



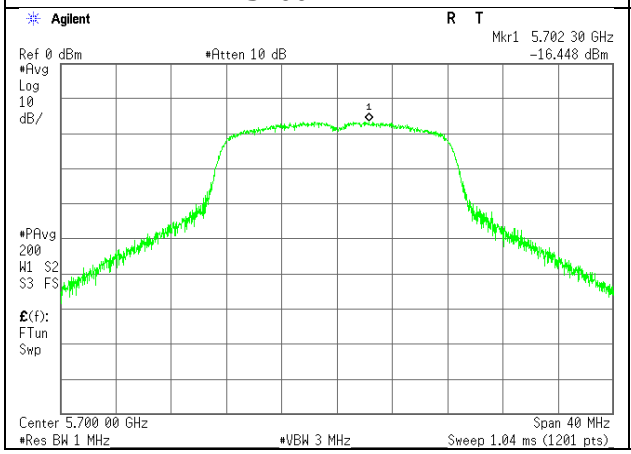
5580 MHz



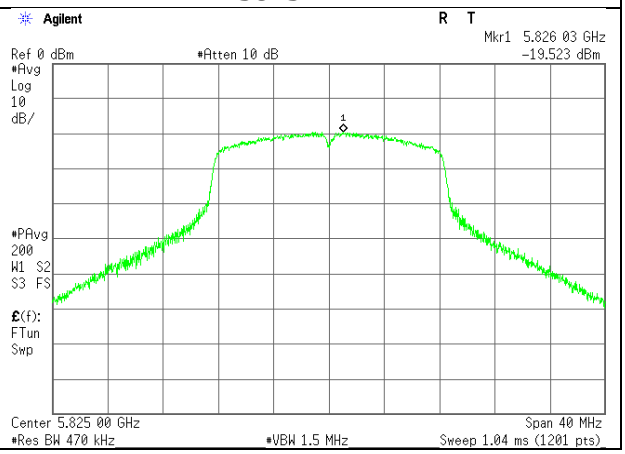
5785 MHz



5700 MHz



5825 MHz

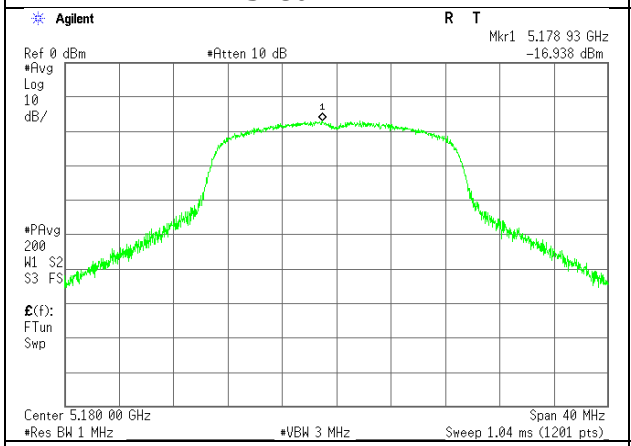


Maximum Power Spectral Density

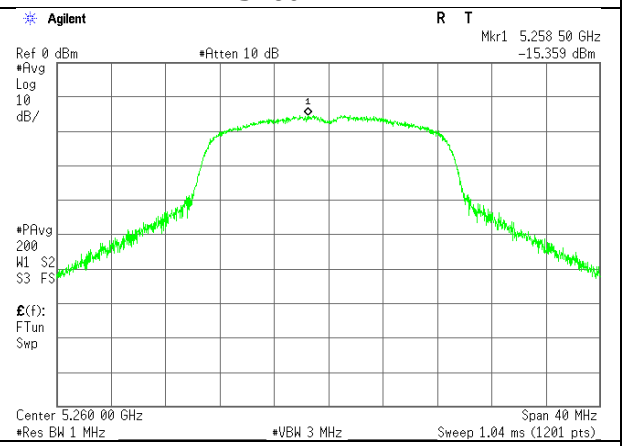
Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	24deg. C / 56 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

11n-20

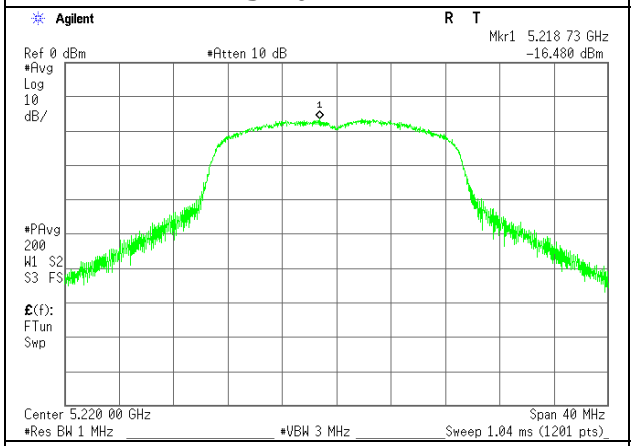
5180 MHz



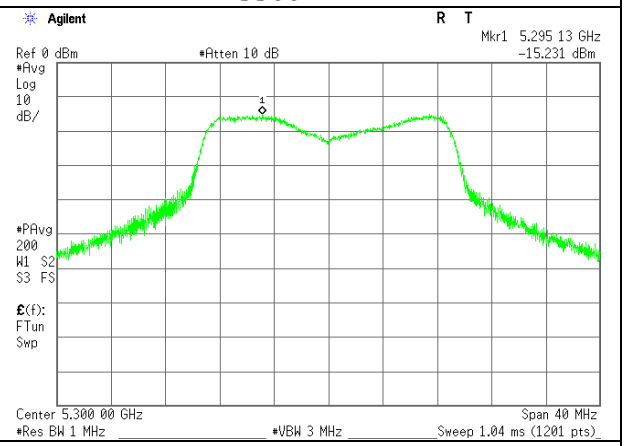
5260 MHz



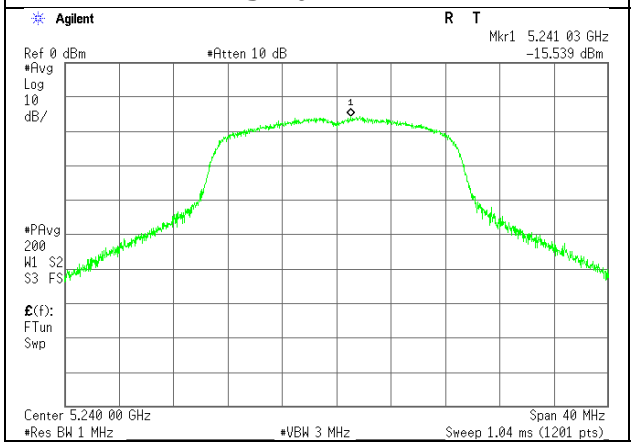
5220 MHz



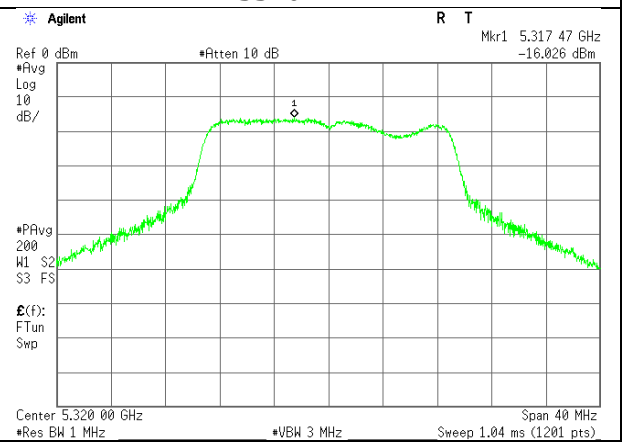
5300 MHz



5240 MHz



5320 MHz

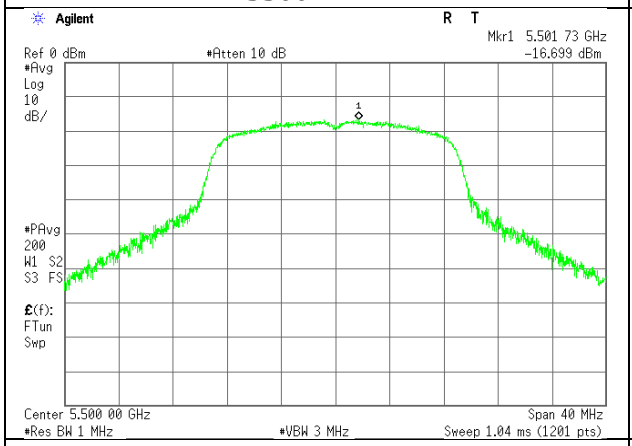


Maximum Power Spectral Density

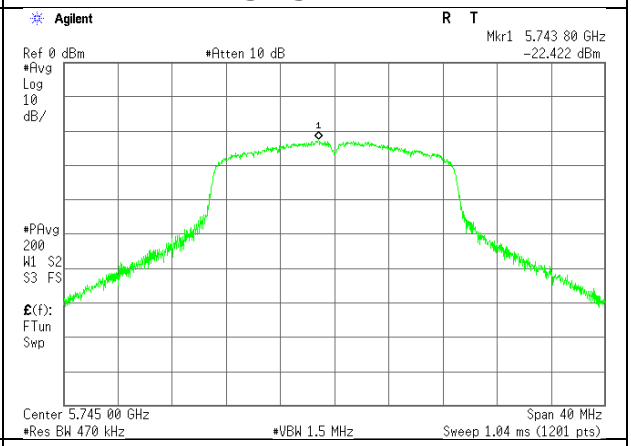
Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	24deg. C / 56 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

11n-20

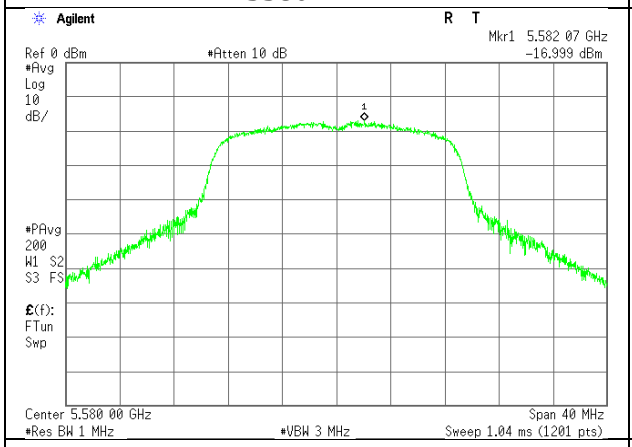
5500 MHz



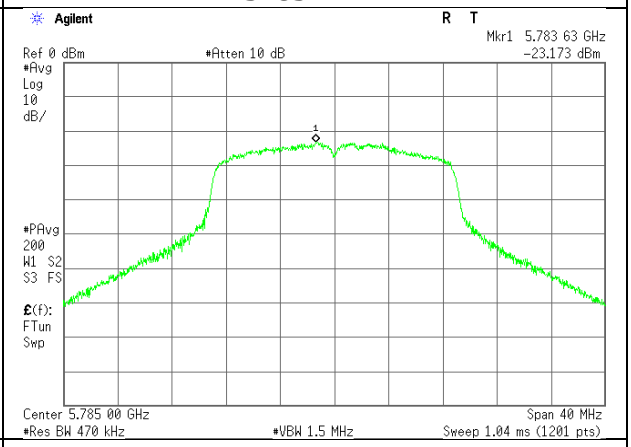
5745 MHz



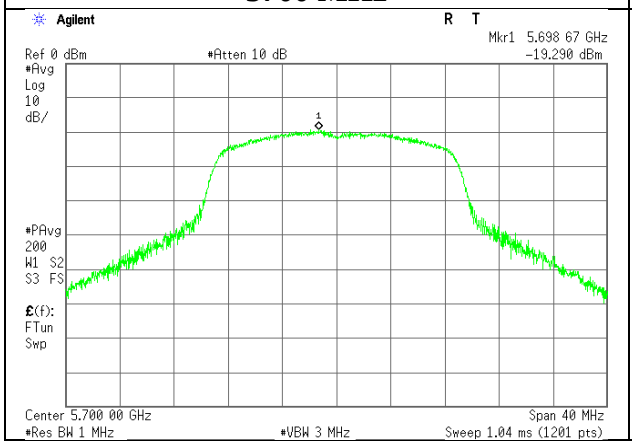
5580 MHz



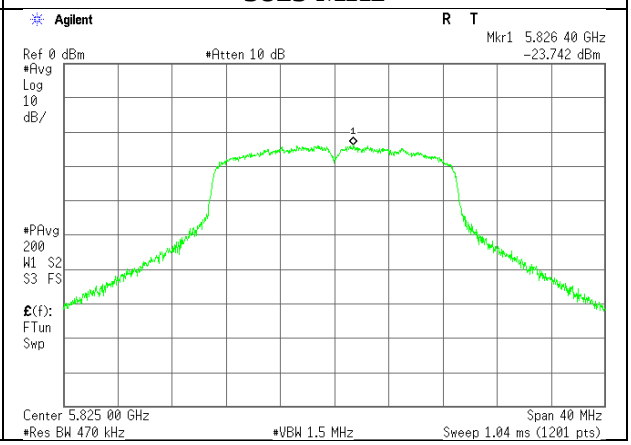
5785 MHz



5700 MHz



5825 MHz

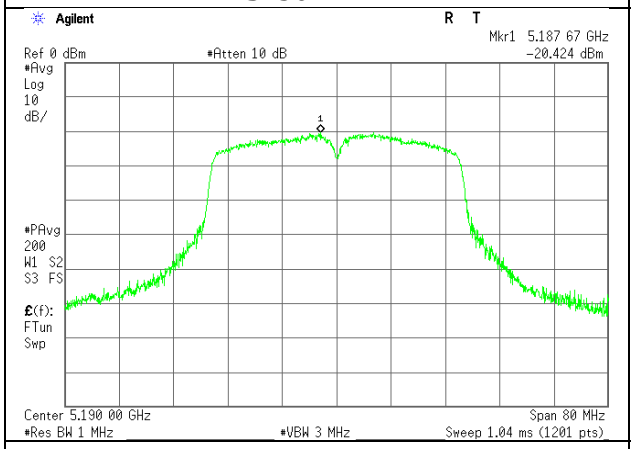


Maximum Power Spectral Density

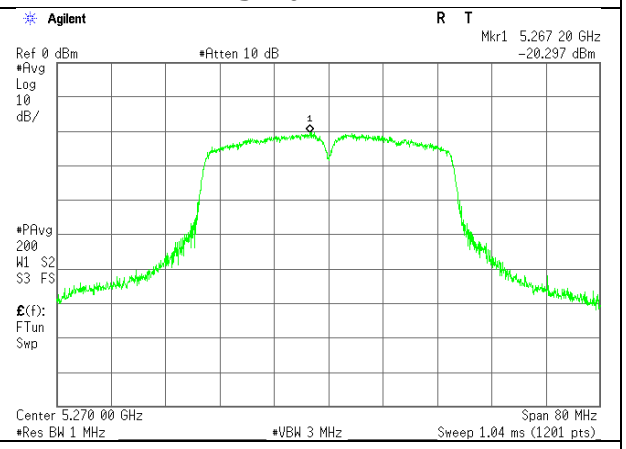
Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	24deg. C / 56 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

11n-40

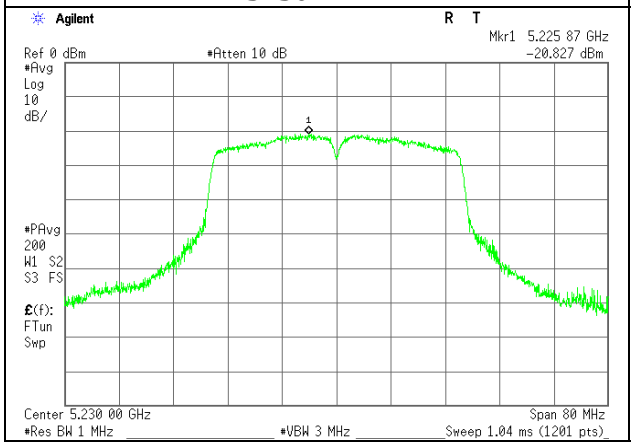
5190 MHz



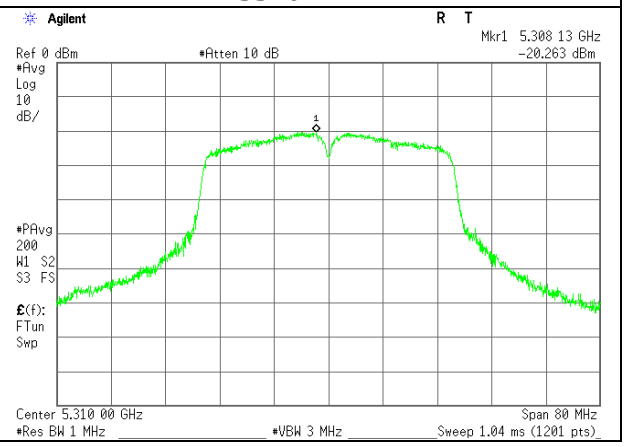
5270 MHz



5230 MHz



5310 MHz

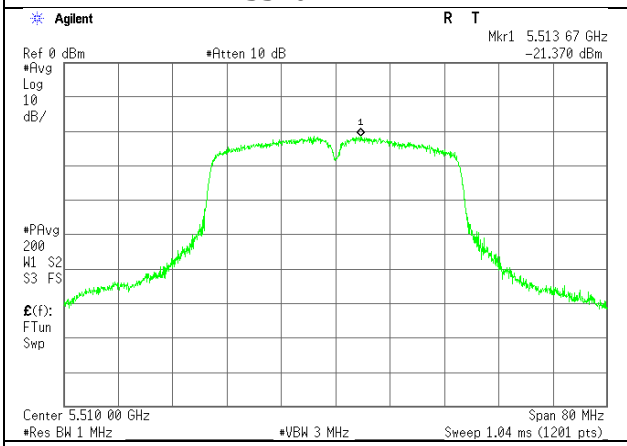


Maximum Power Spectral Density

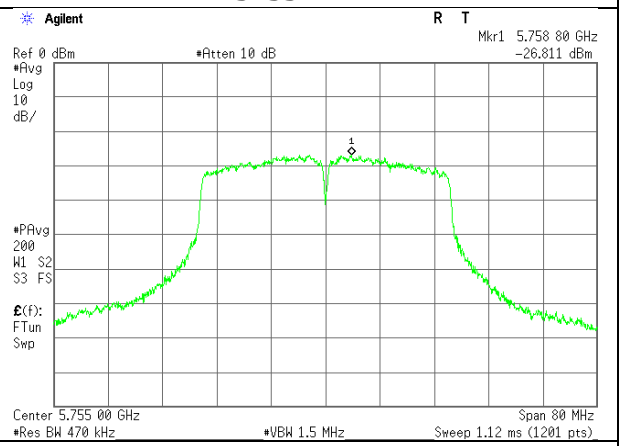
Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	24deg. C / 56 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

11n-40

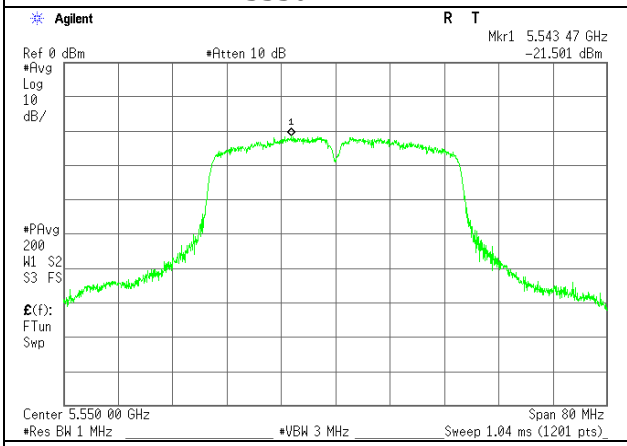
5510 MHz



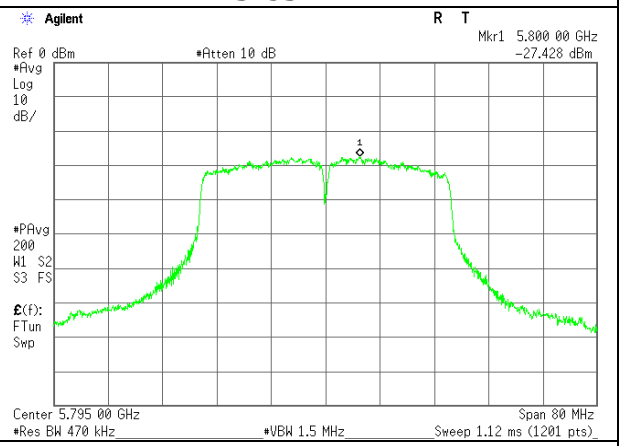
5755 MHz



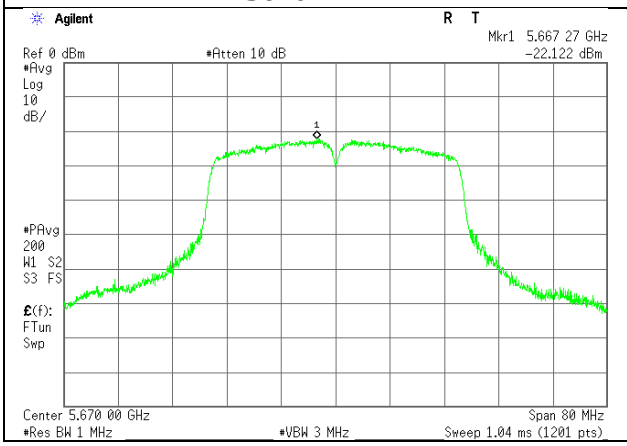
5550 MHz



5795 MHz



5670 MHz



Radiated Spurious Emission

Test place	Ise EMC Lab.		
Report No.	11328915H		
Semi Anechoic Chamber	No.4	No.2	No.2
Date	July 29, 2016	August 4, 2016	August 5, 2016
Temperature / Humidity	22deg. C / 54 % RH	20deg. C / 62 % RH	20deg. C / 65 % RH
Engineer	Keisuke Kawamura (1 GHz-10 GHz)	Takafumi Noguchi (18 GHz-40 GHz)	Keisuke Kawamura (10 GHz-18 GHz)
Mode	Tx 11a 5180 MHz		

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]	Remark
Hori	5150.000	PK	45.8	33.3	7.2	31.3	-	55.0	73.9	18.9	
Hori	10360.000	PK	48.0	39.4	-1.9	34.5	-	51.0	68.2	17.2	
Hori	15540.000	PK	45.4	39.3	-0.4	33.6	-	50.7	73.9	23.2	Floor noise
Hori	20720.000	PK	47.6	40.2	-1.1	33.5	-	53.2	73.9	20.7	
Hori	5150.000	AV	30.6	33.3	7.2	31.3	2.0	41.8	53.9	12.1	*1)
Hori	15540.000	AV	36.7	39.3	-0.4	33.6	-	42.0	53.9	11.9	Floor noise
Hori	20720.000	AV	40.2	40.2	-1.1	33.5	2.0	47.8	53.9	6.1	
Vert	5150.000	PK	46.3	33.3	7.2	31.3	-	55.5	73.9	18.4	
Vert	10360.000	PK	49.3	39.4	-1.9	34.5	-	52.3	68.2	15.9	
Vert	15540.000	PK	44.8	39.3	-0.4	33.6	-	50.1	73.9	23.8	Floor noise
Vert	20720.000	PK	48.4	40.2	-1.1	33.5	-	54.0	73.9	19.9	
Vert	5150.000	AV	32.1	33.3	7.2	31.3	2.0	43.3	53.9	10.6	*1)
Vert	15540.000	AV	36.4	39.3	-0.4	33.6	-	41.7	53.9	12.2	Floor noise
Vert	20720.000	AV	40.7	40.2	-1.1	33.5	2.0	48.3	53.9	5.6	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

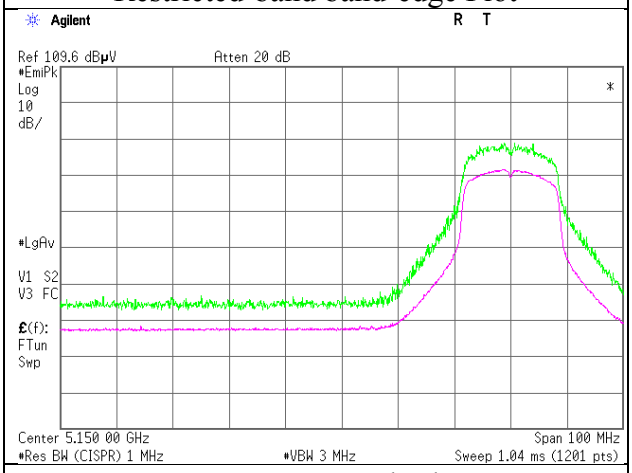
Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura
Mode	Tx 11a 5180 MHz

Horizontal

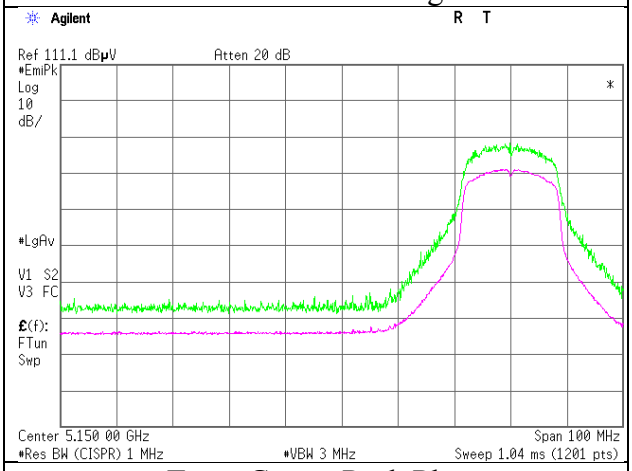
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Report No.	11328915H		
Semi Anechoic Chamber	No.4	No.2	No.2
Date	July 29, 2016	August 4, 2016	August 5, 2016
Temperature / Humidity	22deg. C / 54 % RH	20deg. C / 62 % RH	20deg. C / 65 % RH
Engineer	Keisuke Kawamura (1 GHz-10 GHz)	Takafumi Noguchi (18 GHz-40 GHz)	Keisuke Kawamura (10 GHz-18 GHz)
Mode	Tx 11a 5260 MHz		

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]	Remark
Hori	10520.000	PK	46.3	39.8	-1.7	34.4	-	50.0	68.2	18.2	
Hori	15780.000	PK	45.4	38.9	-0.3	33.8	-	50.2	73.9	23.7	Floor noise
Hori	21040.000	PK	46.6	40.2	-1.0	33.4	-	52.4	73.9	21.5	
Hori	15780.000	AV	36.7	38.9	-0.3	33.8	-	41.5	53.9	12.4	Floor noise
Hori	21040.000	AV	38.6	40.2	-1.0	33.4	2.0	46.4	53.9	7.5	
Vert	10520.000	PK	48.6	39.8	-1.7	34.4	-	52.3	68.2	15.9	
Vert	15780.000	PK	44.8	38.9	-0.3	33.8	-	49.6	73.9	24.3	Floor noise
Vert	21040.000	PK	47.6	40.2	-1.0	33.4	-	53.4	73.9	20.5	
Vert	15780.000	AV	36.4	38.9	-0.3	33.8	-	41.2	53.9	12.7	Floor noise
Vert	21040.000	AV	39.2	40.2	-1.0	33.4	2.0	47.0	53.9	6.9	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab.			
Report No.	11328915H			
Semi Anechoic Chamber	No.4	No.2	No.2	No.2
Date	July 29, 2016	August 4, 2016	August 5, 2016	August 7, 2016
Temperature / Humidity	22deg. C / 54 % RH	20deg. C / 62 % RH	20deg. C / 65 % RH	20deg. C / 61 % RH
Engineer	Keisuke Kawamura (1 GHz-10 GHz)	Takafumi Noguchi (18 GHz-40 GHz)	Keisuke Kawamura (10 GHz-18 GHz)	Keisuke Kawamura (Below 1GHz)
Mode	Tx 11a 5320 MHz			

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]	Remark
Hori	35.111	QP	23.5	15.6	6.8	28.5	-	17.4	40.0	22.6	
Hori	147.983	QP	38.5	14.7	7.8	28.0	-	33.0	43.5	10.5	
Hori	156.002	QP	37.5	15.2	7.8	27.9	-	32.6	43.5	10.9	
Hori	164.017	QP	33.8	15.5	7.9	27.9	-	29.3	43.5	14.2	
Hori	288.997	QP	25.4	13.3	8.7	27.4	-	20.0	46.0	26.0	
Hori	325.121	QP	33.7	14.1	9.0	27.6	-	29.2	46.0	16.8	
Hori	5350.000	PK	47.6	33.1	7.2	31.3	-	56.6	73.9	17.3	
Hori	10640.000	PK	44.6	40.0	-1.7	34.2	-	48.7	73.9	25.2	
Hori	15960.000	PK	45.4	38.5	-0.2	33.9	-	49.8	73.9	24.1	Floor noise
Hori	21280.000	PK	46.1	40.3	-0.9	33.3	-	52.2	73.9	21.7	Floor noise
Hori	5350.000	AV	30.9	33.1	7.2	31.3	2.0	41.9	53.9	12.0	*1)
Hori	10640.000	AV	37.5	40.0	-1.7	34.2	2.0	43.6	53.9	10.3	
Hori	15960.000	AV	36.7	38.5	-0.2	33.9	-	41.1	53.9	12.8	Floor noise
Hori	21280.000	AV	37.3	40.3	-0.9	33.3	-	43.4	53.9	10.5	Floor noise
Vert	577.995	QP	31.0	18.6	10.0	28.5	-	31.1	46.0	14.9	
Vert	650.246	QP	31.2	19.3	10.2	28.2	-	32.5	46.0	13.5	
Vert	722.491	QP	30.1	20.0	10.5	28.0	-	32.6	46.0	13.4	
Vert	794.748	QP	28.5	20.7	10.8	27.9	-	32.1	46.0	13.9	
Vert	866.997	QP	27.6	21.5	11.0	27.5	-	32.6	46.0	13.4	
Vert	939.247	QP	27.3	22.1	11.2	27.2	-	33.4	46.0	12.6	
Vert	5350.000	PK	45.6	33.1	7.2	31.3	-	54.6	73.9	19.3	
Vert	10640.000	PK	45.5	40.0	-1.7	34.2	-	49.6	73.9	24.3	
Vert	15960.000	PK	44.8	38.5	-0.2	33.9	-	49.2	73.9	24.7	Floor noise
Vert	21280.000	PK	46.2	40.3	-0.9	33.3	-	52.3	73.9	21.6	Floor noise
Vert	5350.000	AV	32.5	33.1	7.2	31.3	2.0	43.5	53.9	10.4	*1)
Vert	10640.000	AV	37.6	40.0	-1.7	34.2	2.0	43.7	53.9	10.2	
Vert	15960.000	AV	36.4	38.5	-0.2	33.9	-	40.8	53.9	13.1	Floor noise
Vert	21280.000	AV	37.5	40.3	-0.9	33.3	-	43.6	53.9	10.3	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

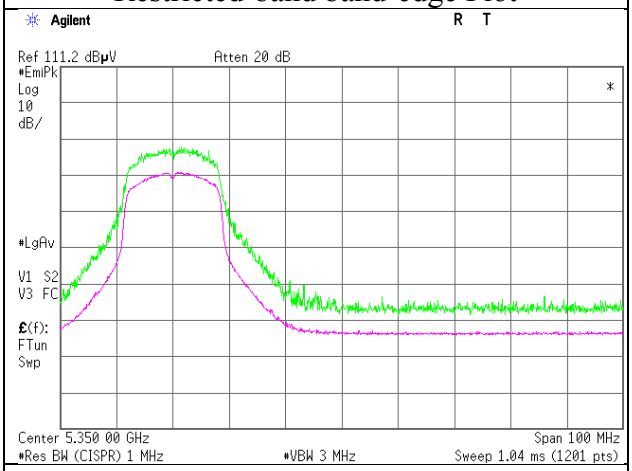
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura
Mode	Tx 11a 5320 MHz

Horizontal

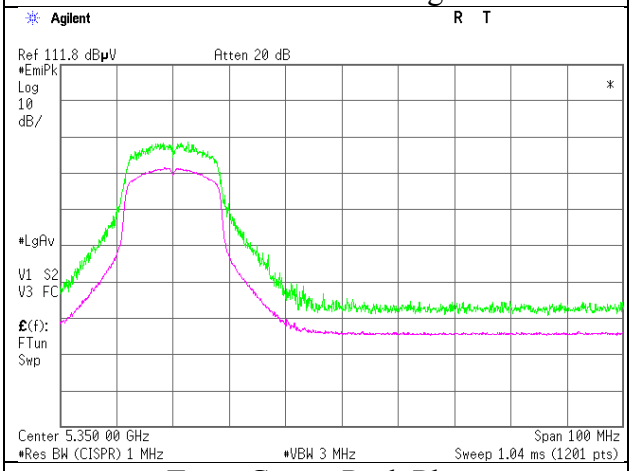
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Report No.	11328915H		
Semi Anechoic Chamber	No.4	No.2	No.2
Date	July 29, 2016	August 4, 2016	August 5, 2016
Temperature / Humidity	22deg. C / 54 % RH	20deg. C / 62 % RH	20deg. C / 65 % RH
Engineer	Keisuke Kawamura (1 GHz-10 GHz)	Takafumi Noguchi (18 GHz-40 GHz)	Keisuke Kawamura (10 GHz-18 GHz)
Mode	Tx 11a 5500 MHz		

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]	Remark
Hori	5460.000	PK	42.8	33.0	7.3	31.4	-	51.7	73.9	22.2	
Hori	5470.000	PK	44.9	33.0	7.3	31.4	-	53.8	68.2	14.4	
Hori	11000.000	PK	45.2	40.7	-1.5	33.9	-	50.5	73.9	23.4	
Hori	16500.000	PK	45.4	40.0	-0.1	33.4	-	51.9	68.2	16.3	Floor noise
Hori	22000.000	PK	47.0	40.6	-0.8	33.0	-	53.8	73.9	20.1	
Hori	5460.000	AV	30.9	33.0	7.3	31.4	2.0	41.8	53.9	12.1	*1)
Hori	11000.000	AV	37.7	40.7	-1.5	33.9	2.0	45.0	53.9	8.9	
Hori	22000.000	AV	38.8	40.6	-0.8	33.0	2.0	47.6	53.9	6.3	
Vert	5460.000	PK	42.5	33.0	7.3	31.4	-	51.4	73.9	22.5	
Vert	5470.000	PK	44.8	33.0	7.3	31.4	-	53.7	68.2	14.5	
Vert	11000.000	PK	46.8	40.7	-1.5	33.9	-	52.1	73.9	21.8	
Vert	16500.000	PK	44.8	40.0	-0.1	33.4	-	51.3	68.2	16.9	Floor noise
Vert	22000.000	PK	46.4	40.6	-0.8	33.0	-	53.2	73.9	20.7	Floor noise
Vert	5460.000	AV	32.2	33.0	7.3	31.4	2.0	43.1	53.9	10.8	*1)
Vert	11000.000	AV	38.6	40.7	-1.5	33.9	2.0	45.9	53.9	8.0	
Vert	22000.000	AV	37.3	40.6	-0.8	33.0	-	44.1	53.9	9.8	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

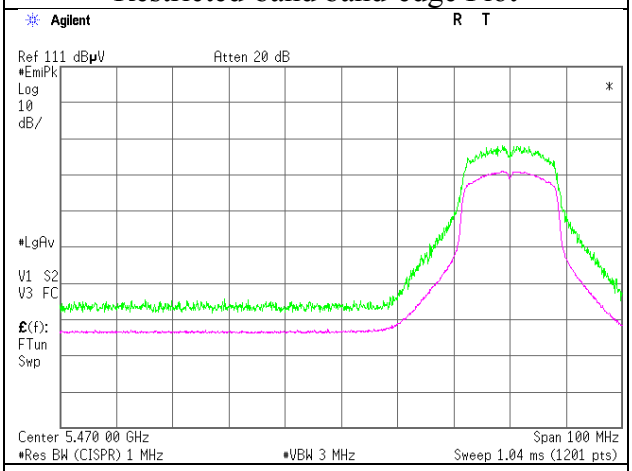
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura
Mode	Tx 11a 5500 MHz

Horizontal

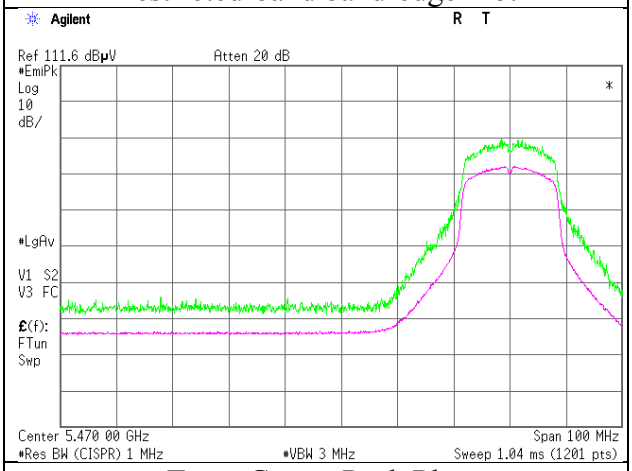
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Report No.	11328915H		
Semi Anechoic Chamber	No.4	No.2	No.2
Date	July 29, 2016	August 4, 2016	August 5, 2016
Temperature / Humidity	22deg. C / 54 % RH	20deg. C / 62 % RH	20deg. C / 65 % RH
Engineer	Keisuke Kawamura (1 GHz-10 GHz)	Takafumi Noguchi (18 GHz-40 GHz)	Keisuke Kawamura (10 GHz-18 GHz)
Mode	Tx 11a 5580 MHz		

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]	Remark
Hori	11160.000	PK	45.4	40.6	-1.5	33.9	-	50.6	73.9	23.3	
Hori	16740.000	PK	45.4	40.7	-0.1	33.2	-	52.8	68.2	15.4	Floor noise
Hori	22320.000	PK	47.1	40.8	-0.7	32.7	-	54.5	73.9	19.4	
Hori	11160.000	AV	36.7	40.6	-1.5	33.9	2.0	43.9	53.9	10.0	
Hori	22320.000	AV	39.0	40.8	-0.7	32.7	2.0	48.4	53.9	5.5	
Vert	11160.000	PK	45.7	40.6	-1.5	33.9	-	50.9	73.9	23.0	
Vert	16740.000	PK	44.8	40.7	-0.1	33.2	-	52.2	68.2	16.0	Floor noise
Vert	22320.000	PK	47.0	40.8	-0.7	32.7	-	54.4	73.9	19.5	
Vert	11160.000	AV	38.2	40.6	-1.5	33.9	2.0	45.4	53.9	8.5	
Vert	22320.000	AV	38.8	40.8	-0.7	32.7	2.0	48.2	53.9	5.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Report No.	11328915H		
Semi Anechoic Chamber	No.4	No.2	No.2
Date	July 29, 2016	August 4, 2016	August 5, 2016
Temperature / Humidity	22deg. C / 54 % RH	20deg. C / 62 % RH	20deg. C / 65 % RH
Engineer	Keisuke Kawamura (1 GHz-10 GHz)	Takafumi Noguchi (18 GHz-40 GHz)	Keisuke Kawamura (10 GHz-18 GHz)
Mode	Tx 11a 5700 MHz		

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]	Remark
Hori	5725.000	PK	45.7	33.1	7.4	31.4	-	54.8	68.2	13.4	
Hori	11400.000	PK	44.4	40.4	-1.4	33.9	-	49.5	73.9	24.4	
Hori	17100.000	PK	45.4	41.8	0.0	33.0	-	54.2	68.2	14.0	Floor noise
Hori	22800.000	PK	47.1	41.0	-0.7	32.4	-	55.0	73.9	18.9	Floor noise
Hori	11400.000	AV	36.1	40.4	-1.4	33.9	2.0	43.2	53.9	10.7	
Hori	22800.000	AV	38.4	41.0	-0.7	32.4	-	46.3	53.9	7.6	Floor noise
Vert	5725.000	PK	50.7	33.1	7.4	31.4	-	59.8	68.2	8.4	
Vert	11400.000	PK	44.3	40.4	-1.4	33.9	-	49.4	73.9	24.5	
Vert	17100.000	PK	44.8	41.8	0.0	33.0	-	53.6	68.2	14.6	Floor noise
Vert	22800.000	PK	47.2	41.0	-0.7	32.4	-	55.1	73.9	18.8	Floor noise
Vert	11400.000	AV	36.1	40.4	-1.4	33.9	2.0	43.2	53.9	10.7	
Vert	22800.000	AV	38.4	41.0	-0.7	32.4	-	46.3	53.9	7.6	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

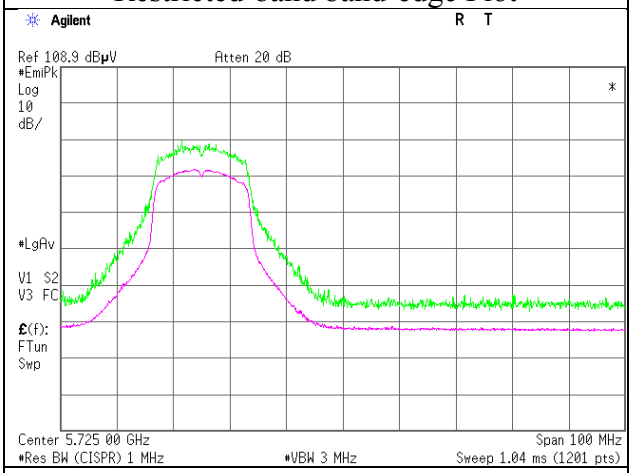
Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura
Mode	Tx 11a 5700 MHz

Horizontal

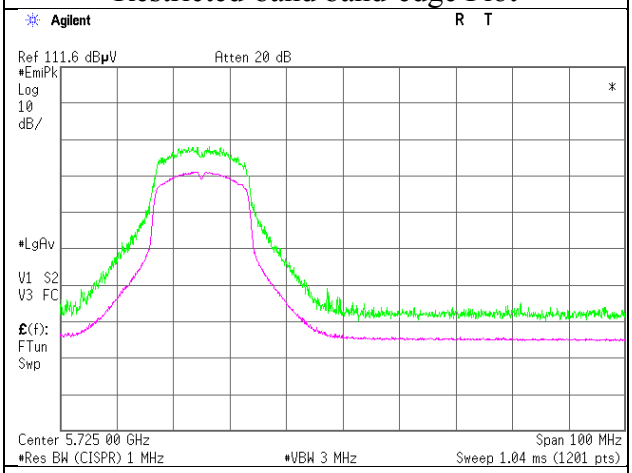
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Report No.	11328915H		
Semi Anechoic Chamber	No.4	No.2	No.2
Date	July 29, 2016	August 4, 2016	August 5, 2016
Temperature / Humidity	22deg. C / 54 % RH	20deg. C / 62 % RH	20deg. C / 65 % RH
Engineer	Keisuke Kawamura (1 GHz-10 GHz)	Takafumi Noguchi (18 GHz-40 GHz)	Keisuke Kawamura (10 GHz-18 GHz)
Mode	Tx 11a 5745 MHz		

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]	Remark
Hori	5715.000	PK	44.6	33.1	7.4	31.4	-	53.7	109.4	55.7	
Hori	5725.000	PK	50.8	33.1	7.4	31.4	-	59.9	122.2	62.3	
Hori	7660.042	PK	44.9	37.2	8.1	32.7	-	57.5	73.9	16.4	
Hori	11490.000	PK	43.9	40.3	-1.2	33.9	-	49.1	73.9	24.8	Floor noise
Hori	17235.000	PK	45.4	42.4	0.0	33.0	-	54.8	68.2	13.4	Floor noise
Hori	22980.000	PK	46.6	41.1	-0.6	32.2	-	54.9	73.9	19.0	Floor noise
Hori	7660.042	AV	34.4	37.2	8.1	32.7	2.0	49.0	53.9	4.9	
Hori	11490.000	AV	34.8	40.3	-1.2	33.9	-	40.0	53.9	13.9	Floor noise
Hori	22980.000	AV	37.9	41.1	-0.6	32.2	-	46.2	53.9	7.7	Floor noise
Vert	5715.000	PK	43.7	33.1	7.4	31.4	-	52.8	109.4	56.6	
Vert	5725.000	PK	51.2	33.1	7.4	31.4	-	60.3	122.2	61.9	
Vert	7660.042	PK	44.4	37.2	8.1	32.7	-	57.0	73.9	16.9	
Vert	11490.000	PK	43.8	40.3	-1.2	33.9	-	49.0	73.9	24.9	Floor noise
Vert	17235.000	PK	44.8	42.4	0.0	33.0	-	54.2	68.2	14.0	Floor noise
Vert	22980.000	PK	46.5	41.1	-0.6	32.2	-	54.8	73.9	19.1	Floor noise
Vert	7660.042	AV	37.1	37.2	8.1	32.7	2.0	51.7	53.9	2.2	
Vert	11490.000	AV	35.3	40.3	-1.2	33.9	-	40.5	53.9	13.4	Floor noise
Vert	22980.000	AV	37.9	41.1	-0.6	32.2	-	46.2	53.9	7.7	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

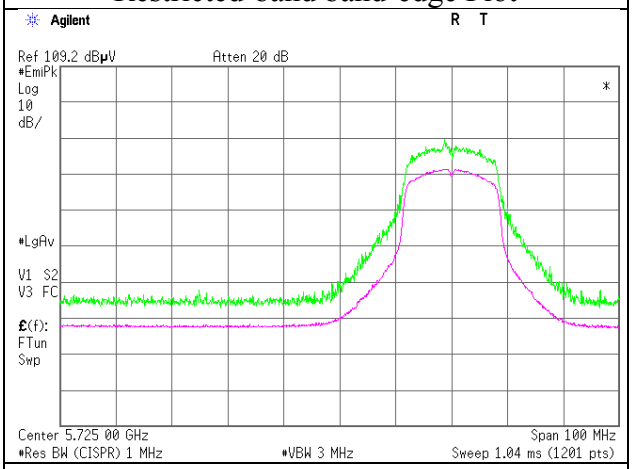
Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura
Mode	Tx 11a 5745 MHz

Horizontal

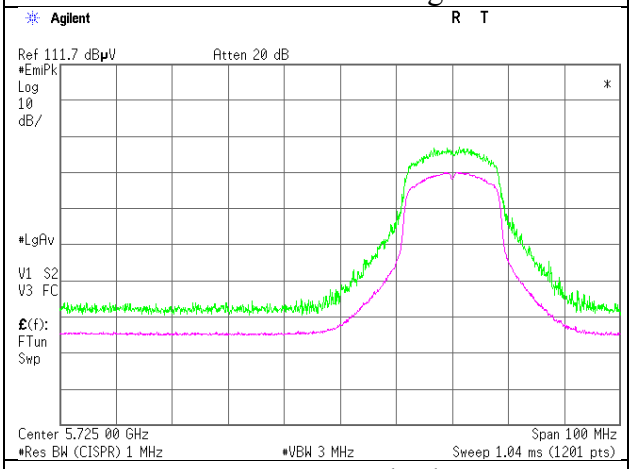
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Report No.	11328915H		
Semi Anechoic Chamber	No.4	No.2	No.2
Date	July 29, 2016	August 4, 2016	August 5, 2016
Temperature / Humidity	22deg. C / 54 % RH	20deg. C / 62 % RH	20deg. C / 65 % RH
Engineer	Keisuke Kawamura (1 GHz-10 GHz)	Takafumi Noguchi (18 GHz-40 GHz)	Keisuke Kawamura (10 GHz-18 GHz)
Mode	Tx 11a 5785 MHz		

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]	Remark
Hori	7713.339	PK	45.3	37.3	8.1	32.8	-	57.9	73.9	16.0	
Hori	11570.000	PK	44.3	40.1	-1.2	33.9	-	49.3	73.9	24.6	
Hori	17355.000	PK	45.4	42.9	0.1	33.0	-	55.4	68.2	12.8	Floor noise
Hori	23140.000	PK	46.0	41.1	-0.6	32.2	-	54.3	73.9	19.6	Floor noise
Hori	7713.339	AV	36.2	37.3	8.1	32.8	2.0	50.8	53.9	3.1	
Hori	11570.000	AV	37.1	40.1	-1.2	33.9	2.0	44.1	53.9	9.8	
Hori	23140.000	AV	37.5	41.1	-0.6	32.2	-	45.8	53.9	8.1	Floor noise
Vert	7713.339	PK	45.6	37.3	8.1	32.8	-	58.2	73.9	15.7	
Vert	11570.000	PK	44.2	40.1	-1.2	33.9	-	49.2	73.9	24.7	
Vert	17355.000	PK	44.8	42.9	0.1	33.0	-	54.8	68.2	13.4	Floor noise
Vert	23140.000	PK	46.0	41.1	-0.6	32.2	-	54.3	73.9	19.6	Floor noise
Vert	7713.339	AV	36.4	37.3	8.1	32.8	2.0	51.0	53.9	2.9	
Vert	11570.000	AV	36.4	40.1	-1.2	33.9	2.0	43.4	53.9	10.5	
Vert	23140.000	AV	37.5	41.1	-0.6	32.2	-	45.8	53.9	8.1	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab.		
Report No.	11328915H		
Semi Anechoic Chamber	No.4	No.2	No.2
Date	July 29, 2016	August 4, 2016	August 5, 2016
Temperature / Humidity	22deg. C / 54 % RH	20deg. C / 62 % RH	20deg. C / 65 % RH
Engineer	Keisuke Kawamura (1 GHz-10 GHz)	Takafumi Noguchi (18 GHz-40 GHz)	Keisuke Kawamura (10 GHz-18 GHz)
Mode	Tx 11a 5825 MHz		

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]	Remark
Hori	5850.000	PK	47.3	33.2	7.4	31.5	-	56.4	122.2	65.8	
Hori	5860.000	PK	44.7	33.2	7.4	31.5	-	53.8	109.4	55.6	
Hori	7766.691	PK	45.4	37.4	8.1	32.8	-	58.1	68.2	10.1	
Hori	11650.000	PK	45.7	40.0	-1.2	33.9	-	50.6	73.9	23.3	
Hori	17475.000	PK	45.4	43.4	0.1	33.1	-	55.8	68.2	12.4	Floor noise
Hori	23300.000	PK	46.1	41.0	-0.5	32.2	-	54.4	73.9	19.5	Floor noise
Hori	11650.000	AV	38.8	40.0	-1.2	33.9	2.0	45.7	53.9	8.2	
Hori	23300.000	AV	37.6	41.0	-0.5	32.2	-	45.9	53.9	8.0	Floor noise
Vert	5850.000	PK	47.9	33.2	7.4	31.5	-	57.0	122.2	65.2	
Vert	5860.000	PK	44.3	33.2	7.4	31.5	-	53.4	109.4	56.0	
Vert	7766.691	PK	45.5	37.4	8.1	32.8	-	58.2	68.2	10.0	
Vert	11650.000	PK	46.0	40.0	-1.2	33.9	-	50.9	73.9	23.0	
Vert	17475.000	PK	44.8	43.4	0.1	33.1	-	55.2	68.2	13.0	Floor noise
Vert	23300.000	PK	46.1	41.0	-0.5	32.2	-	54.4	73.9	19.5	Floor noise
Vert	11650.000	AV	39.0	40.0	-1.2	33.9	2.0	45.9	53.9	8.0	
Vert	23300.000	AV	37.6	41.0	-0.5	32.2	-	45.9	53.9	8.0	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

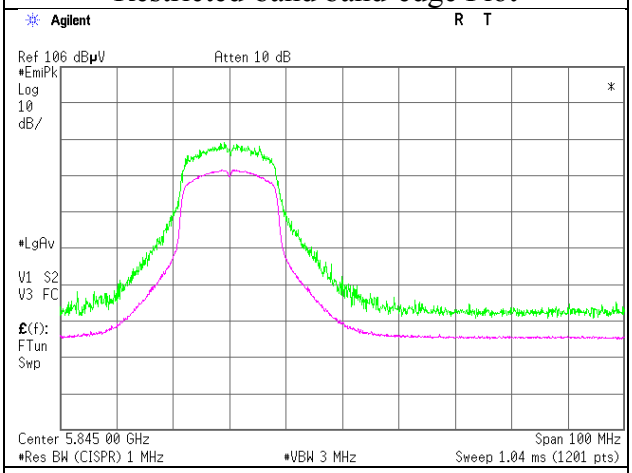
Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura
Mode	Tx 11a 5825 MHz

Horizontal

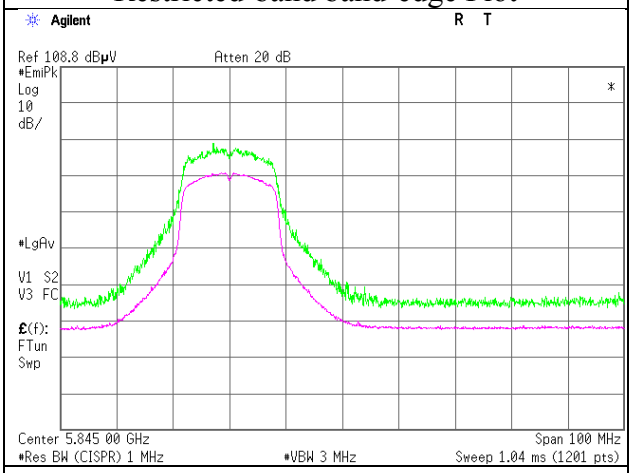
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura (Band Edge)
Mode	Tx 11n-20 5180 MHz

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]	Remark
Hori	5150.000	PK	43.6	33.3	7.2	31.3	-	52.8	73.9	21.1	
Hori	5150.000	AV	30.4	33.3	7.2	31.3	2.3	41.9	53.9	12.0	*1)
Vert	5150.000	PK	45.7	33.3	7.2	31.3	-	54.9	73.9	19.0	
Vert	5150.000	AV	33.3	33.3	7.2	31.3	2.3	44.8	53.9	9.1	*1)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

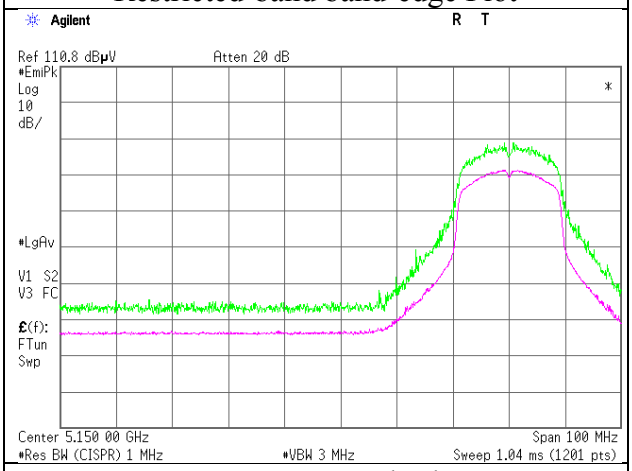
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura
Mode	Tx 11n-20 5180 MHz

Horizontal

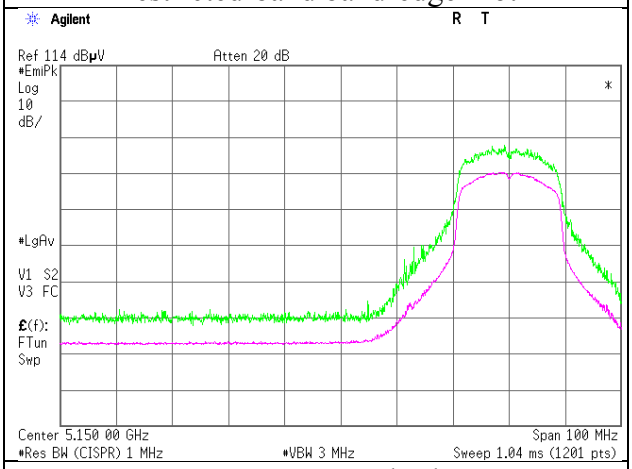
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura (Band Edge)
Mode	Tx 11n-20 5320 MHz

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]	Remark
Hori	5350.000	PK	43.9	33.1	7.2	31.3	-	52.9	73.9	21.0	
Hori	5350.000	AV	30.8	33.1	7.2	31.3	2.3	42.1	53.9	11.8	*1)
Vert	5350.000	PK	44.5	33.1	7.2	31.3	-	53.5	73.9	20.4	
Vert	5350.000	AV	31.1	33.1	7.2	31.3	2.3	42.4	53.9	11.5	*1)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

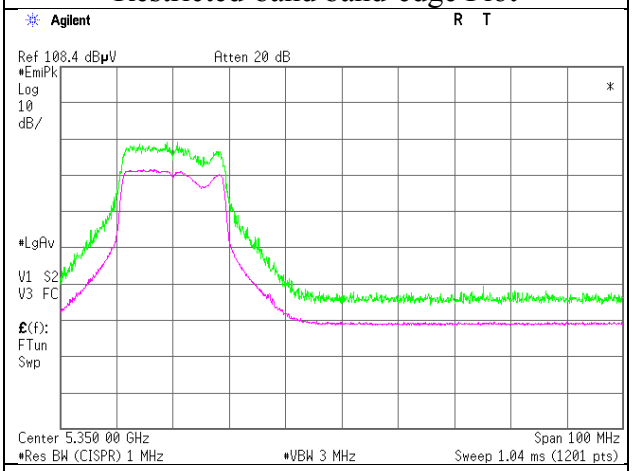
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura
Mode	Tx 11n-20 5320 MHz

Horizontal

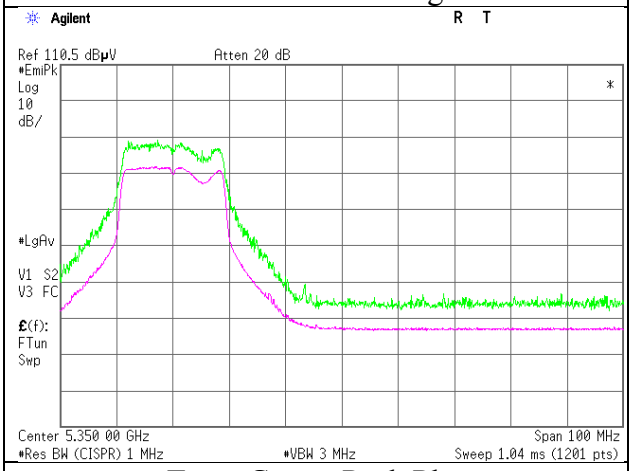
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura (Band Edge)
Mode	Tx 11n-20 5500 MHz

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]	Remark
Hori	5460.000	PK	41.2	33.0	7.3	31.4	-	50.1	73.9	23.8	
Hori	5470.000	PK	42.2	33.0	7.3	31.4	-	51.1	68.2	17.1	
Hori	5460.000	AV	31.0	33.0	7.3	31.4	2.3	42.2	53.9	11.7	*1)
Vert	5460.000	PK	42.0	33.0	7.3	31.4	-	50.9	73.9	23.0	
Vert	5470.000	PK	41.4	33.0	7.3	31.4	-	50.3	68.2	17.9	
Vert	5460.000	AV	31.0	33.0	7.3	31.4	2.3	42.2	53.9	11.7	*1)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

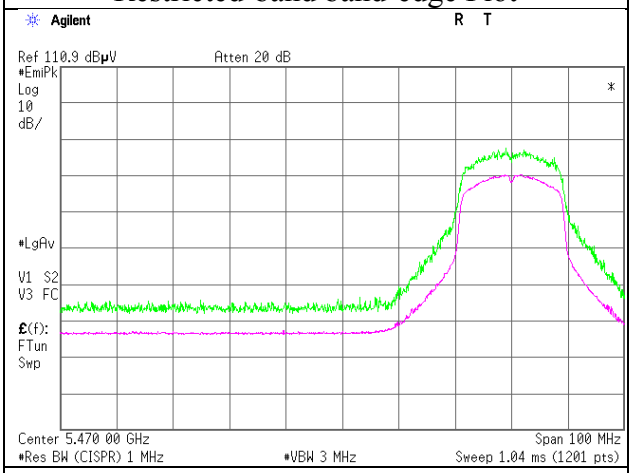
Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura
Mode	Tx 11n-20 5500 MHz

Horizontal

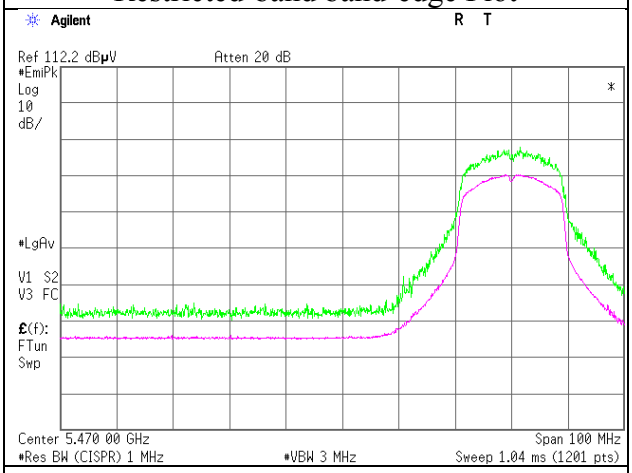
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura (Band Edge)
Mode	Tx 11n-20 5700 MHz

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]	Remark
Hori	5725.000	PK	47.1	33.1	7.4	31.4	-	56.2	68.2	12.0	
Vert	5725.000	PK	48.5	33.1	7.4	31.4	-	57.6	68.2	10.6	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

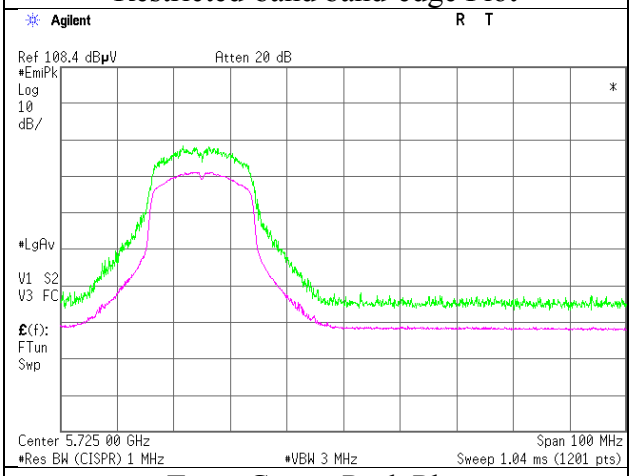
Distance factor:	1 GHz - 10 GHz	20log (4.4 m / 3.0 m) = 3.33 dB
	10 GHz - 40 GHz	20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura
Mode	Tx 11n-20 5700 MHz

Horizontal

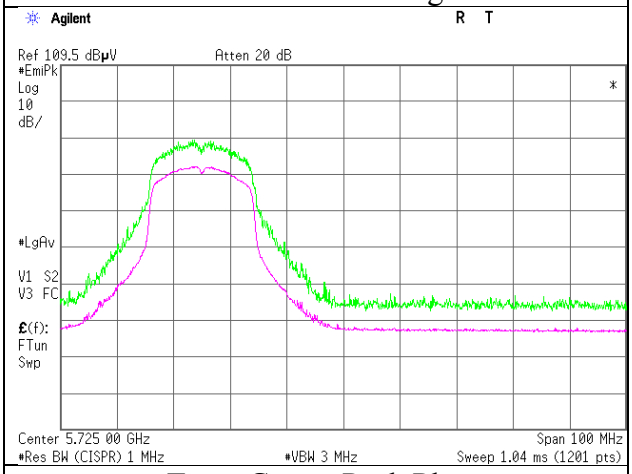
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura (Band Edge)
Mode	Tx 11n-20 5745 MHz

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]	Remark
Hori	5715.000	PK	42.1	33.1	7.4	31.4	-	51.2	109.4	58.2	
Hori	5725.000	PK	52.2	33.1	7.4	31.4	-	61.3	122.2	60.9	
Vert	5715.000	PK	42.2	33.1	7.4	31.4	-	51.3	109.4	58.1	
Vert	5725.000	PK	52.9	33.1	7.4	31.4	-	62.0	122.2	60.2	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

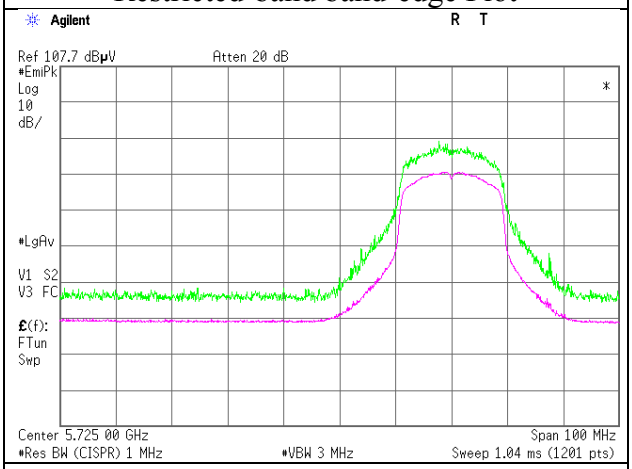
Distance factor:	1 GHz - 10 GHz	20log (4.4 m / 3.0 m) = 3.33 dB
	10 GHz - 40 GHz	20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura
Mode	Tx 11n-20 5745 MHz

Horizontal

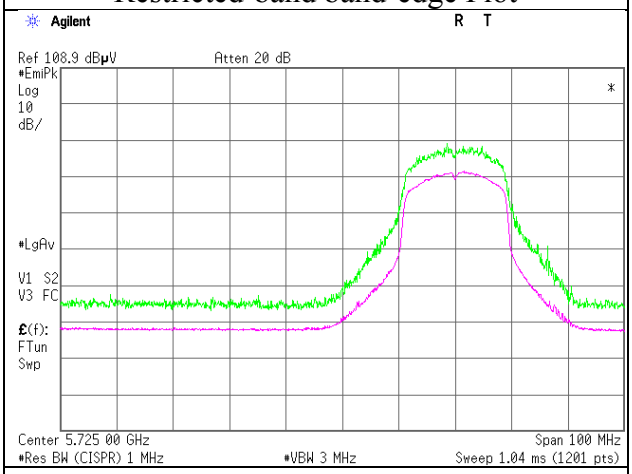
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura (Band Edge)
Mode	Tx 11n-20 5825 MHz

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]	Remark
Hori	5850.000	PK	44.8	33.2	7.4	31.5	-	53.9	122.2	68.3	
Hori	5860.000	PK	41.5	33.2	7.4	31.5	-	50.6	109.4	58.8	
Vert	5850.000	PK	43.5	33.2	7.4	31.5	-	52.6	122.2	69.6	
Vert	5860.000	PK	40.7	33.2	7.4	31.5	-	49.8	109.4	59.6	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

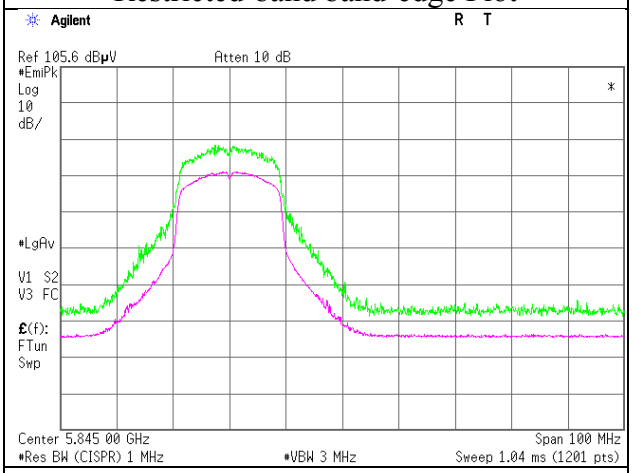
Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	22deg. C / 54 % RH
Engineer	Keisuke Kawamura
Mode	Tx 11n-20 5825 MHz

Horizontal

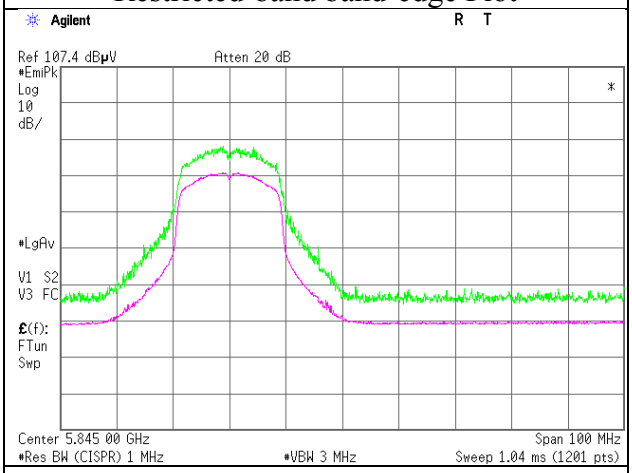
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	11328915H		
Date	August 3, 2016	August 4, 2016	August 4, 2016
Temperature / Humidity	22deg. C / 43 % RH	20 deg. C / 62 % RH	25 deg. C / 61 % RH
Engineer	Ken Fujita (1 GHz-10 GHz)	Takafumi Noguchi (26.5 GHz-40 GHz)	Keisuke Kawamura (10 GHz-26.5 GHz)
Mode	Tx 11n-40 5190 MHz		

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]	Remark
Hori	5150.000	PK	48.5	32.0	5.7	34.1	-	52.1	73.9	21.8	
Hori	10380.000	PK	47.6	39.5	-1.9	34.5	-	50.7	68.2	17.5	
Hori	15570.000	PK	45.8	39.2	-0.4	33.7	-	50.9	73.9	23.0	Floor noise
Hori	20760.000	PK	44.2	40.2	-1.1	33.5	-	49.8	73.9	24.1	Floor noise
Hori	5150.000	AV	31.7	32.0	5.7	34.1	3.6	38.9	53.9	15.0	*1)
Hori	15570.000	AV	36.6	39.2	-0.4	33.7	-	41.7	53.9	12.2	Floor noise
Hori	20760.000	AV	36.6	40.2	-1.1	33.5	-	42.2	53.9	11.7	Floor noise
Vert	5150.000	PK	51.1	32.0	5.7	34.1	-	54.7	73.9	19.2	
Vert	10380.000	PK	49.1	39.5	-1.9	34.5	-	52.2	68.2	16.0	
Vert	15570.000	PK	45.3	39.2	-0.4	33.7	-	50.4	73.9	23.5	Floor noise
Vert	20760.000	PK	45.7	40.2	-1.1	33.5	-	51.3	73.9	22.6	Floor noise
Vert	5150.000	AV	32.9	32.0	5.7	34.1	3.6	40.1	53.9	13.8	*1)
Vert	15570.000	AV	36.5	39.2	-0.4	33.7	-	41.6	53.9	12.3	Floor noise
Vert	20760.000	AV	37.2	40.2	-1.1	33.5	-	42.8	53.9	11.1	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

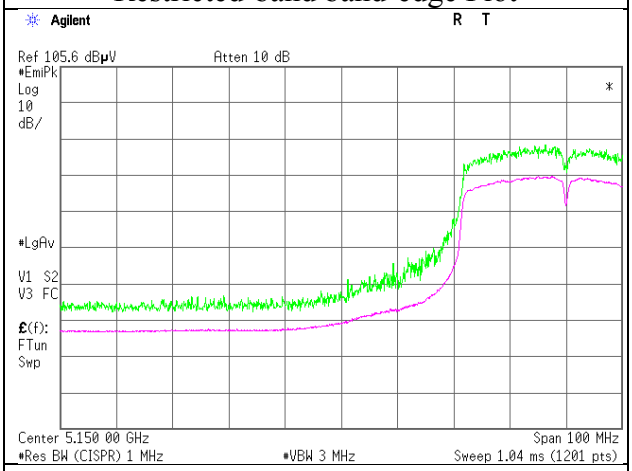
Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11328915H
Date	August 3, 2016
Temperature / Humidity	22deg. C / 43 % RH
Engineer	Ken Fujita
Mode	Tx 11n-40 5190 MHz

Horizontal

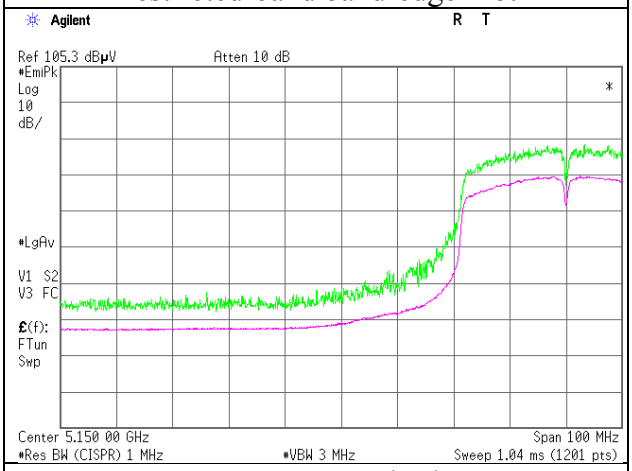
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	11328915H		
Date	August 3, 2016	August 4, 2016	August 4, 2016
Temperature / Humidity	22deg. C / 43 % RH	20 deg. C / 62 % RH	25 deg. C / 61 % RH
Engineer	Ken Fujita (1 GHz-10 GHz)	Takafumi Noguchi (26.5 GHz-40 GHz)	Keisuke Kawamura (10 GHz-26.5 GHz)
Mode	Tx 11n-40 5270 MHz		

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]	Remark
Hori	10540.000	PK	47.0	39.8	-1.7	34.3	-	50.8	68.2	17.4	
Hori	15810.000	PK	45.8	38.8	-0.2	33.8	-	50.6	73.9	23.3	Floor noise
Hori	21080.000	PK	44.2	40.3	-0.9	33.4	-	50.2	73.9	23.7	Floor noise
Hori	15810.000	AV	36.6	38.8	-0.2	33.8	-	41.4	53.9	12.5	Floor noise
Hori	21080.000	AV	36.6	40.3	-0.9	33.4	-	42.6	53.9	11.3	Floor noise
Vert	10540.000	PK	47.0	39.8	-1.7	34.3	-	50.8	68.2	17.4	
Vert	15810.000	PK	45.3	38.8	-0.2	33.8	-	50.1	73.9	23.8	Floor noise
Vert	21080.000	PK	45.7	40.3	-0.9	33.4	-	51.7	73.9	22.2	Floor noise
Vert	15810.000	AV	36.5	38.8	-0.2	33.8	-	41.3	53.9	12.6	Floor noise
Vert	21080.000	AV	37.2	40.3	-0.9	33.4	-	43.2	53.9	10.7	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	11328915H		
Date	August 3, 2016	August 4, 2016	August 4, 2016
Temperature / Humidity	22deg. C / 43 % RH	20 deg. C / 62 % RH	25 deg. C / 61 % RH
Engineer	Ken Fujita (1 GHz-10 GHz)	Takafumi Noguchi (26.5 GHz-40 GHz)	Keisuke Kawamura (10 GHz-26.5 GHz)
Mode	Tx 11n-40 5310 MHz		

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]	Remark
Hori	5250.000	PK	43.9	32.0	5.7	34.0	-	47.6	68.2	20.6	
Hori	5350.000	PK	49.7	32.0	5.8	34.0	-	53.5	73.9	20.4	
Hori	10620.000	PK	46.5	40.0	-1.7	34.3	-	50.5	73.9	23.4	
Hori	15930.000	PK	45.8	38.6	-0.1	33.9	-	50.4	73.9	23.5	Floor noise
Hori	21240.000	PK	44.2	40.3	-0.9	33.3	-	50.3	73.9	23.6	Floor noise
Hori	5350.000	AV	33.7	32.0	5.8	34.0	3.6	41.1	53.9	12.8	*1)
Hori	10620.000	AV	38.2	40.0	-1.7	34.3	3.6	45.8	53.9	8.1	
Hori	15930.000	AV	36.6	38.6	-0.1	33.9	-	41.2	53.9	12.7	Floor noise
Hori	21240.000	AV	36.6	40.3	-0.9	33.3	-	42.7	53.9	11.2	Floor noise
Vert	5250.000	PK	43.9	32.0	5.7	34.0	-	47.6	68.2	20.6	
Vert	5350.000	PK	47.3	32.0	5.8	34.0	-	51.1	73.9	22.8	
Vert	10620.000	PK	46.0	40.0	-1.7	34.3	-	50.0	73.9	23.9	
Vert	15930.000	PK	45.3	38.6	-0.1	33.9	-	49.9	73.9	24.0	Floor noise
Vert	21240.000	PK	45.7	40.3	-0.9	33.3	-	51.8	73.9	22.1	Floor noise
Vert	5350.000	AV	31.6	32.0	5.8	34.0	3.6	39.0	53.9	14.9	*1)
Vert	10620.000	AV	38.3	40.0	-1.7	34.3	3.6	45.9	53.9	8.0	
Vert	15930.000	AV	36.5	38.6	-0.1	33.9	-	41.1	53.9	12.8	Floor noise
Vert	21240.000	AV	37.2	40.3	-0.9	33.3	-	43.3	53.9	10.6	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

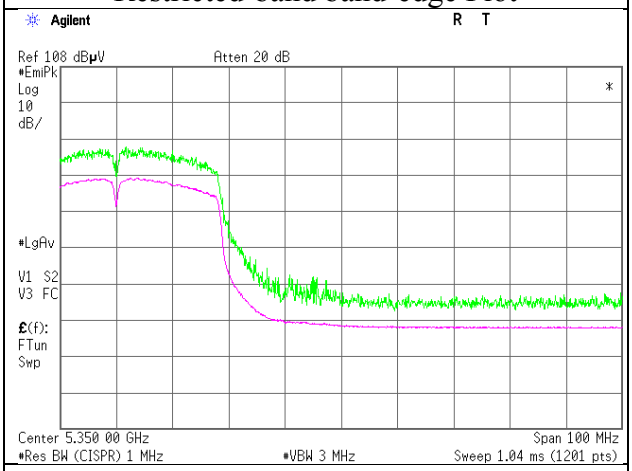
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11328915H
Date	August 3, 2016
Temperature / Humidity	22deg. C / 43 % RH
Engineer	Ken Fujita
Mode	Tx 11n-40 5310 MHz

Horizontal

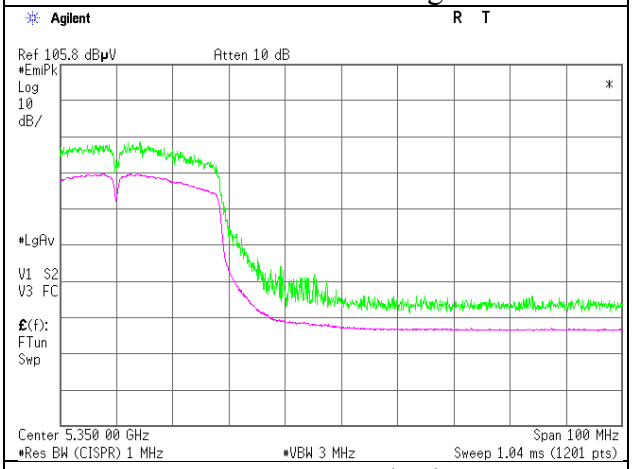
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	11328915H		
Date	August 3, 2016	August 4, 2016	August 4, 2016
Temperature / Humidity	22deg. C / 43 % RH	20 deg. C / 62 % RH	25 deg. C / 61 % RH
Engineer	Ken Fujita (1 GHz-10 GHz)	Takafumi Noguchi (26.5 GHz-40 GHz)	Keisuke Kawamura (10 GHz-26.5 GHz)
Mode	Tx 11n-40 5510 MHz		

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]	Remark
Hori	5460.000	PK	42.7	32.0	5.8	33.9	-	46.6	73.9	27.3	
Hori	5470.000	PK	48.7	32.0	5.8	33.9	-	52.6	68.2	15.6	
Hori	11020.000	PK	46.2	40.7	-1.5	33.9	-	51.5	73.9	22.4	
Hori	16530.000	PK	45.1	40.0	-0.1	33.4	-	51.6	68.2	16.6	Floor noise
Hori	22040.000	PK	44.2	40.6	-0.8	33.0	-	51.0	73.9	22.9	Floor noise
Hori	5460.000	AV	33.4	32.0	5.8	33.9	3.6	40.9	53.9	13.0	*1)
Hori	11020.000	AV	38.5	40.7	-1.5	33.9	3.6	47.4	53.9	6.5	
Hori	22040.000	AV	36.6	40.6	-0.8	33.0	-	43.4	53.9	10.5	Floor noise
Vert	5460.000	PK	43.9	32.0	5.8	33.9	-	47.8	73.9	26.1	
Vert	5470.000	PK	47.5	32.0	5.8	33.9	-	51.4	68.2	16.8	
Vert	11020.000	PK	44.7	40.7	-1.5	33.9	-	50.0	73.9	23.9	
Vert	16530.000	PK	44.9	40.0	-0.1	33.4	-	51.4	68.2	16.8	Floor noise
Vert	22040.000	PK	45.7	40.6	-0.8	33.0	-	52.5	73.9	21.4	Floor noise
Vert	5460.000	AV	33.6	32.0	5.8	33.9	3.6	41.1	53.9	12.8	*1)
Vert	11020.000	AV	36.5	40.7	-1.5	33.9	3.6	45.4	53.9	8.5	
Vert	22040.000	AV	37.2	40.6	-0.8	33.0	-	44.0	53.9	9.9	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

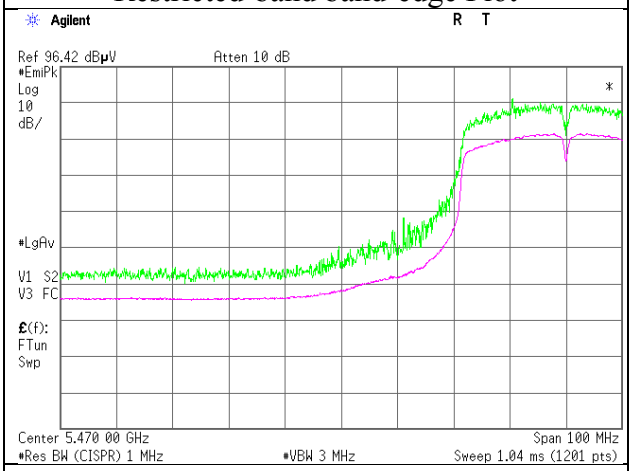
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11328915H
Date	August 3, 2016
Temperature / Humidity	22deg. C / 43 % RH
Engineer	Ken Fujita
Mode	Tx 11n-40 5510 MHz

Horizontal

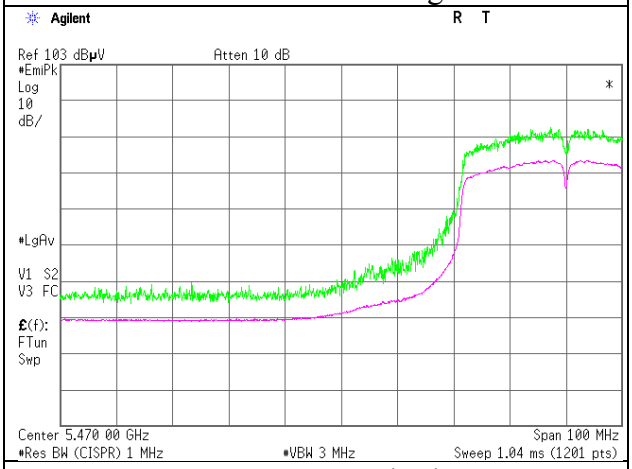
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	11328915H		
Date	August 3, 2016	August 4, 2016	August 4, 2016
Temperature / Humidity	22deg. C / 43 % RH	20 deg. C / 62 % RH	25 deg. C / 61 % RH
Engineer	Ken Fujita (1 GHz-10 GHz)	Takafumi Noguchi (26.5 GHz-40 GHz)	Keisuke Kawamura (10 GHz-26.5 GHz)
Mode	Tx 11n-40 5550 MHz		

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]	Remark
Hori	11100.000	PK	45.0	40.6	-1.5	33.9	-	50.2	73.9	23.7	
Hori	16650.000	PK	45.1	40.4	-0.1	33.3	-	52.1	68.2	16.1	Floor noise
Hori	22200.000	PK	44.2	40.7	-0.8	32.8	-	51.3	73.9	22.6	Floor noise
Hori	11100.000	AV	37.0	40.6	-1.5	33.9	3.6	45.8	53.9	8.1	
Hori	22200.000	AV	36.6	40.7	-0.8	32.8	-	43.7	53.9	10.2	Floor noise
Vert	11100.000	PK	45.3	40.6	-1.5	33.9	-	50.5	73.9	23.4	
Vert	16650.000	PK	44.9	40.4	-0.1	33.3	-	51.9	68.2	16.3	Floor noise
Vert	22200.000	PK	45.7	40.7	-0.8	32.8	-	52.8	73.9	21.1	Floor noise
Vert	11100.000	AV	37.0	40.6	-1.5	33.9	3.6	45.8	53.9	8.1	
Vert	22200.000	AV	37.2	40.7	-0.8	32.8	-	44.3	53.9	9.6	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor:	1 GHz - 10 GHz	20log (4.4 m / 3.0 m) = 3.33 dB
	10 GHz - 40 GHz	20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	11328915H		
Date	August 3, 2016	August 4, 2016	August 4, 2016
Temperature / Humidity	22deg. C / 43 % RH	20 deg. C / 62 % RH	25 deg. C / 61 % RH
Engineer	Ken Fujita (1 GHz-10 GHz)	Takafumi Noguchi (26.5 GHz-40 GHz)	Keisuke Kawamura (10 GHz-26.5 GHz)
Mode	Tx 11n-40 5670 MHz		

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]	Remark
Hori	5725.000	PK	43.5	32.3	5.9	34.0	-	47.7	73.9	26.2	
Hori	11340.000	PK	45.4	40.4	-1.4	33.9	-	50.5	73.9	23.4	
Hori	17010.000	PK	45.1	41.4	0.0	33.0	-	53.5	68.2	14.7	Floor noise
Hori	22680.000	PK	44.2	41.0	-0.7	32.5	-	52.0	73.9	21.9	Floor noise
Hori	5725.000	AV	31.7	32.3	5.9	34.0	3.6	39.5	53.9	14.4	*1)
Hori	11340.000	AV	37.0	40.4	-1.4	33.9	3.6	45.7	53.9	8.2	
Hori	22680.000	AV	36.6	41.0	-0.7	32.5	-	44.4	53.9	9.5	Floor noise
Vert	5725.000	PK	43.3	32.3	5.9	34.0	-	47.5	73.9	26.4	
Vert	11340.000	PK	45.3	40.4	-1.4	33.9	-	50.4	73.9	23.5	
Vert	17010.000	PK	44.9	41.4	0.0	33.0	-	53.3	68.2	14.9	Floor noise
Vert	22680.000	PK	45.7	41.0	-0.7	32.5	-	53.5	73.9	20.4	Floor noise
Vert	5725.000	AV	33.8	32.3	5.9	34.0	3.6	41.6	53.9	12.3	*1)
Vert	11340.000	AV	37.0	40.4	-1.4	33.9	3.6	45.7	53.9	8.2	
Vert	22680.000	AV	37.2	41.0	-0.7	32.5	-	45.0	53.9	8.9	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

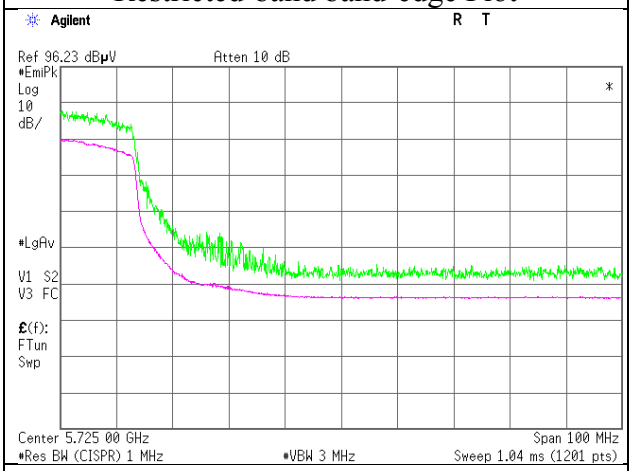
Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11328915H
Date	August 3, 2016
Temperature / Humidity	22deg. C / 43 % RH
Engineer	Ken Fujita
Mode	Tx 11n-40 5670 MHz

Horizontal

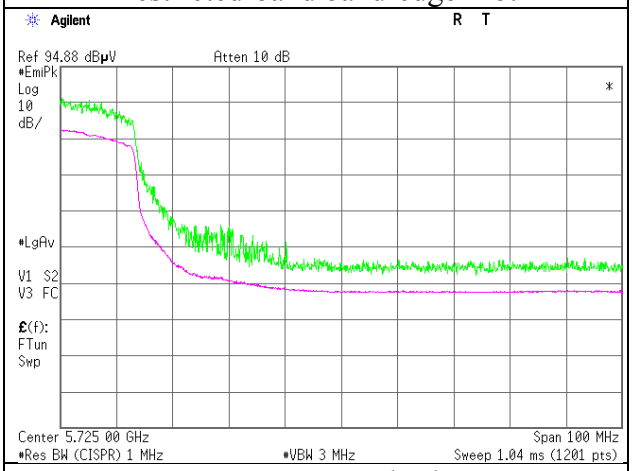
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	11328915H		
Date	August 3, 2016	August 4, 2016	August 4, 2016
Temperature / Humidity	22deg. C / 43 % RH	20 deg. C / 62 % RH	25 deg. C / 61 % RH
Engineer	Ken Fujita (1 GHz-10 GHz)	Takafumi Noguchi (26.5 GHz-40 GHz)	Keisuke Kawamura (10 GHz-26.5 GHz)
Mode	Tx 11n-40 5755 MHz		

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]	Remark
Hori	5715.000	PK	48.7	32.3	5.9	34.0	-	52.9	109.4	56.5	
Hori	5725.000	PK	51.9	32.3	5.9	34.0	-	56.1	122.2	66.1	
Hori	11510.000	PK	45.4	40.3	-1.2	33.9	-	50.6	73.9	23.3	
Hori	17265.000	PK	45.1	42.5	0.0	33.0	-	54.6	68.2	13.6	Floor noise
Hori	23020.000	PK	44.2	41.1	-0.6	32.2	-	52.5	73.9	21.4	Floor noise
Hori	11510.000	AV	37.3	40.3	-1.2	33.9	3.6	46.1	53.9	7.8	
Hori	23020.000	AV	36.6	41.1	-0.6	32.2	-	44.9	53.9	9.0	Floor noise
Vert	5715.000	PK	41.9	32.3	5.9	34.0	-	46.1	109.4	63.3	
Vert	5725.000	PK	43.3	32.3	5.9	34.0	-	47.5	122.2	74.7	
Vert	11510.000	PK	44.2	40.3	-1.2	33.9	-	49.4	73.9	24.5	
Vert	17265.000	PK	44.9	42.5	0.0	33.0	-	54.4	68.2	13.8	Floor noise
Vert	23020.000	PK	45.7	41.1	-0.6	32.2	-	54.0	73.9	19.9	Floor noise
Vert	11510.000	AV	36.2	40.3	-1.2	33.9	3.6	45.0	53.9	8.9	
Vert	23020.000	AV	37.2	41.1	-0.6	32.2	-	45.5	53.9	8.4	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

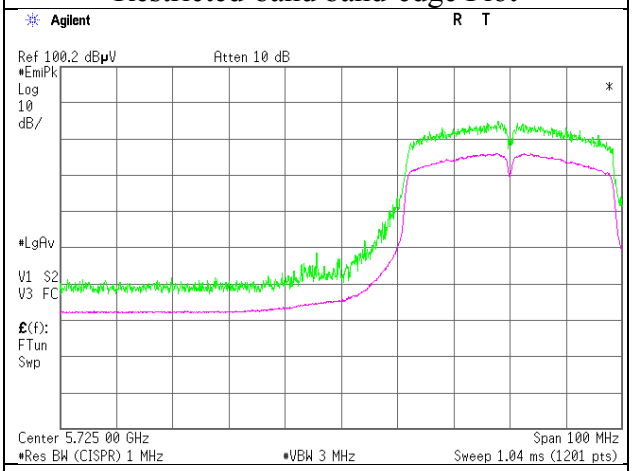
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11328915H
Date	August 3, 2016
Temperature / Humidity	22deg. C / 43 % RH
Engineer	Ken Fujita
Mode	Tx 11n-40 5755 MHz

Horizontal

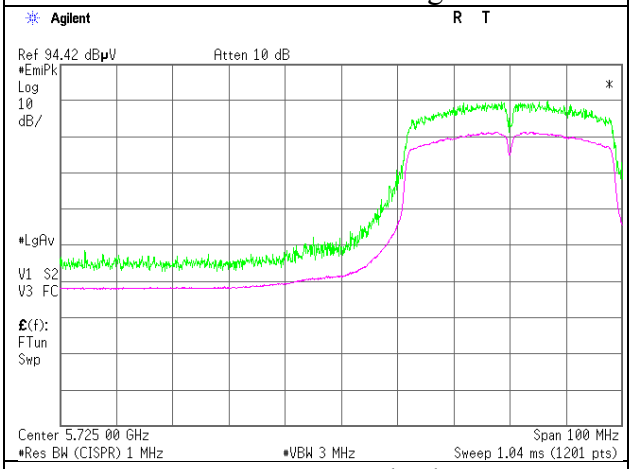
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	11328915H		
Date	August 3, 2016	August 4, 2016	August 4, 2016
Temperature / Humidity	22deg. C / 43 % RH	20 deg. C / 62 % RH	25 deg. C / 61 % RH
Engineer	Ken Fujita (1 GHz-10 GHz)	Takafumi Noguchi (26.5 GHz-40 GHz)	Keisuke Kawamura (10 GHz-26.5 GHz)
Mode	Tx 11n-40 5795 MHz		

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]	Remark
Hori	5850.000	PK	42.8	32.6	6.0	34.0	-	47.4	122.2	74.8	
Hori	5860.000	PK	42.1	32.6	6.0	34.0	-	46.7	109.4	62.7	
Hori	11590.000	PK	45.8	40.1	-1.2	33.9	-	50.8	73.9	23.1	
Hori	17385.000	PK	45.1	43.0	0.1	33.0	-	55.2	68.2	13.0	Floor noise
Hori	23180.000	PK	44.2	41.1	-0.6	32.2	-	52.5	68.2	15.7	Floor noise
Hori	11590.000	AV	39.0	40.1	-1.2	33.9	3.6	47.6	53.9	6.3	
Vert	5850.000	PK	42.7	32.6	6.0	34.0	-	47.3	122.2	74.9	
Vert	5860.000	PK	41.9	32.6	6.0	34.0	-	46.5	109.4	62.9	
Vert	11590.000	PK	45.1	40.1	-1.2	33.9	-	50.1	73.9	23.8	
Vert	17385.000	PK	44.9	43.0	0.1	33.0	-	55.0	68.2	13.2	Floor noise
Vert	23180.000	PK	45.7	41.1	-0.6	32.2	-	54.0	68.2	14.2	Floor noise
Vert	11590.000	AV	37.7	40.1	-1.2	33.9	3.6	46.3	53.9	7.6	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

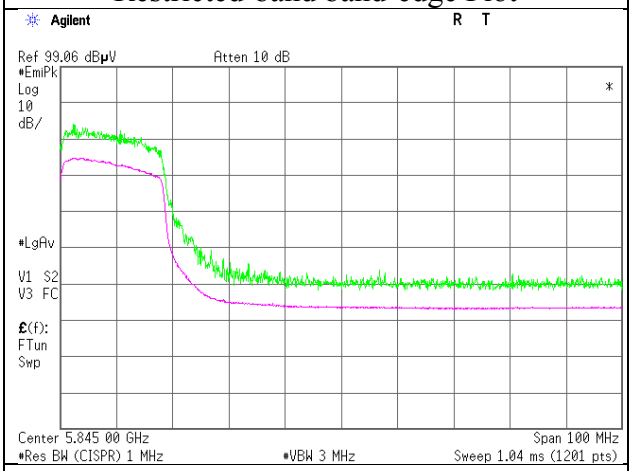
Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.33 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11328915H
Date	August 3, 2016
Temperature / Humidity	22deg. C / 43 % RH
Engineer	Ken Fujita
Mode	Tx 11n-40 5795 MHz

Horizontal

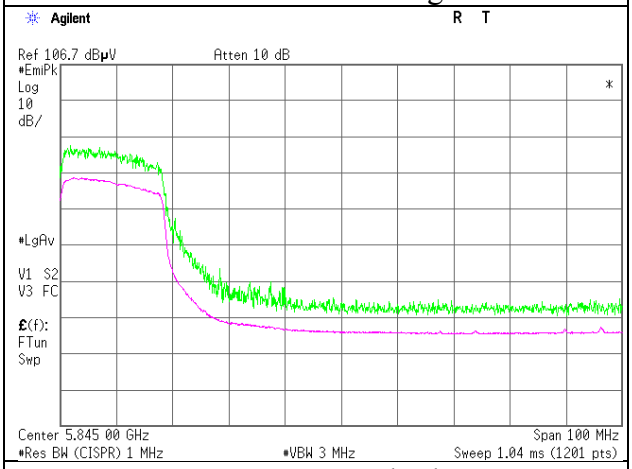
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot

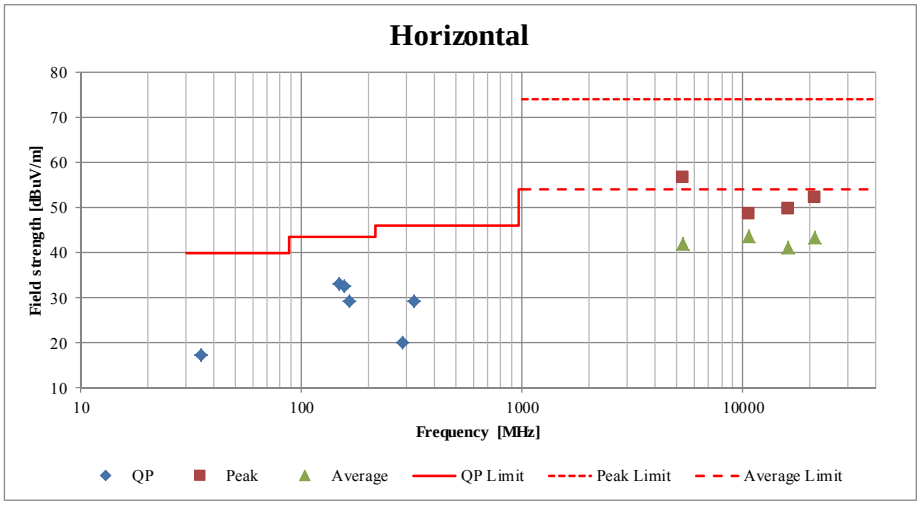


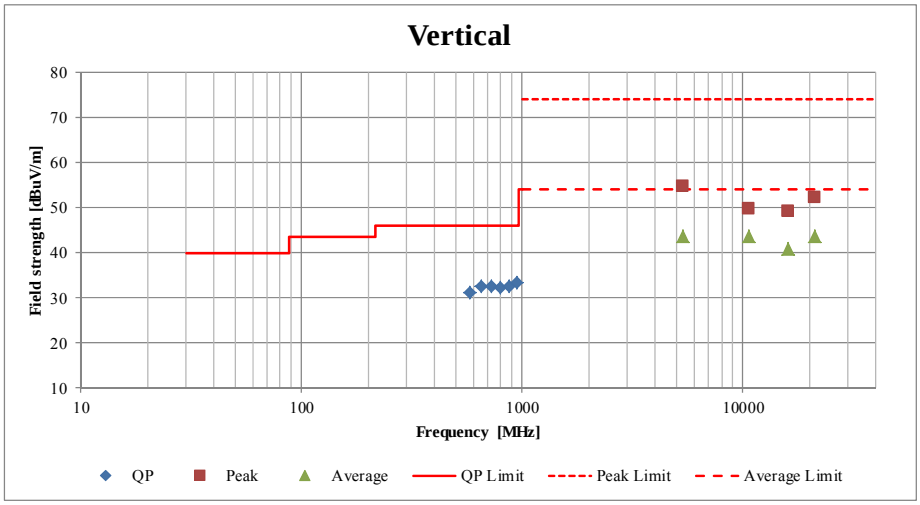
Trace Green: Peak Plot
Trace Purple: Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Plot data, Worst case)

Test place	Ise EMC Lab.			
Report No.	11328915H			
Semi Anechoic Chamber	No.4	No.2	No.2	No.2
Date	July 29, 2016	August 4, 2016	August 5, 2016	August 7, 2016
Temperature / Humidity	22deg. C / 54 % RH	20deg. C / 62 % RH	20deg. C / 65 % RH	20deg. C / 61 % RH
Engineer	Keisuke Kawamura (1 GHz-10 GHz)	Takafumi Noguchi (18 GHz-40 GHz)	Keisuke Kawamura (10 GHz-18 GHz)	Keisuke Kawamura (Below 1GHz)
Mode	Tx 11a 5320 MHz			



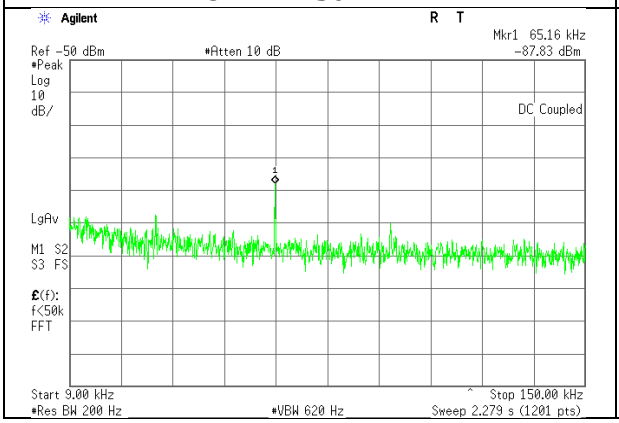


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

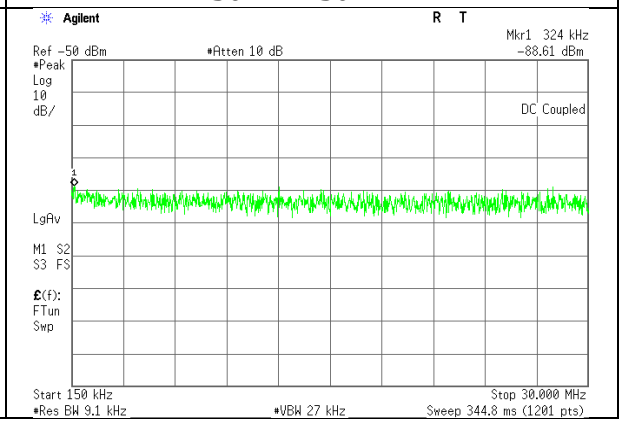
Conducted Spurious Emission

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11328915H
Date	July 29, 2016
Temperature / Humidity	24deg. C / 56 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx 11a 5320MHz

9 kHz-150 kHz



150 kHz-30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenator [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
65.16	-87.8	2.11	9.8	2.0	1	-74.0	300	6.0	-12.7	31.3	44.0	
324.00	-88.6	2.11	9.8	2.0	1	-74.8	300	6.0	-13.5	17.3	30.8	

E = EIRP - 20*log(D) + Ground bounce + 104.8 [dBuV/m]
EIRP = Reading + Cable Loss + Attenator + Antenna Gain + 10*log(N)

APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MOS-23	Thermo-Hygrometer	Custom	CTH-201	0004	AT	2015/12/08 * 12
MMM-16	DIGIITAL HiTESTER	Hioki	3805	070900532	AT	2016/01/13 * 12
MSA-15	Spectrum Analyzer	Agilent	E4440A	MY46187105	AT	2015/11/11 * 12
MPM-17	Power Meter	DARE!! Instruments	RPR3006W	14I00048SNO081	AT	2015/11/09 * 12
MAT-80	Attenuator	Weinschel Associates	WA1-20-33	100130	AT	2016/05/13 * 12
MAT-88	Attenuator	Weinschel Associates	WA56-10	56100304	AT	2016/06/15 * 12
MCC-96	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	30817/2	AT	2016/05/09 * 12
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2015/10/02 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	1501	RE	2016/01/21 * 12
MJM-26	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2015/11/06 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2015/08/10 * 12
MCC-141	Microwave Cable	Junkosha	MWX221	1305S002R(1m) / 1405S146(5m)	RE	2016/06/21 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	00650	RE	2015/10/01 * 12
MMM-10	DIGITAL HiTESTER	Hioki	3805	051201148	RE	2016/01/18 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2016/08/02 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2016/01/21 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
MSA-14	Spectrum Analyzer	Agilent	E4440A	MY48250080	RE	2015/10/07 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2016/02/29 * 12
MCC-165	Microwave Cable	Junkosha	MWX221	1203S213(1m) / 1311S166(5m)	RE	2015/11/10 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2016/01/19 * 12
MMM-01	Digital Tester	Fluke	FLUKE 26-3	78030611	RE	2015/08/19 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2016/02/29 * 12
MCC-54	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	RE	2016/03/18 * 12
MHA-29	Horn Antenna 26.5-40GHz	ETS LINDGREN	3160-10	00152399	RE	2015/09/04 * 12
MPA-22	Pre Amplifier	MITEQ, Inc	AMF-6F-2600400-33-8P / AMF-4F-2600400-33-8P	1871355 /1871328	RE	2015/09/03 * 12
MHF-16	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCA	7001	RE	2015/09/15 * 12
MCC-176	Microwave Cable	Junkosha	MMX221-00500D MSDMS	1502S303	RE	2016/03/10 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2015/10/11 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2015/10/11 * 12
MLA-21	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-190	RE	2016/01/30 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2016/02/08 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2015/11/10 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2015/09/04 * 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: **RE: Radiated Emission**
AT: Antenna Terminal Conducted test