RADIO TEST REPORT

Test Report No. : 13665469H-C

Applicant	:	**DENSO TEN Limited**
Type of EUT	:	**Car Navigation**
Model Number of EUT	:	**FT0091A**
FCC ID	:	**BABFT0091A**
Test regulation	:	**FCC Part 15 Subpart E: 2021** **(26 dB Emission Bandwidth and 99 % Occupied Bandwidth, 6 dB Bandwidth and Radiated Spurious Emission tests only)** ***For permissive change**
Test Result	:	**Complied (Refer to SECTION 3)**

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 limits of the above regulation.
4. The test results in this test 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 the A2LA accreditation body.
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. The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in Section 1.

Date of test: February 4 to 22, 2021

Representative test engineer:
Ken Fujita
Engineer
Consumer Technology Division

Approved by:
Tsubasa Takayama
Leader
Consumer Technology Division

CERTIFICATE 5107.02

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☒ There is no testing item of "Non-accreditation".

REVISION HISTORY

Original Test Report No.: 13665469H-C

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13665469H-C	March 22, 2021	-	-

Reference: Abbreviations (Including words undescribed in this report)

A2LA	The American Association for Laboratory Accreditation
AC	Alternating Current
AFH	Adaptive Frequency Hopping
AM	Amplitude Modulation
Amp, AMP	Amplifier
ANSI	American National Standards Institute
Ant, ANT	Antenna
AP	Access Point
ASK	Amplitude Shift Keying
Atten., ATT	Attenuator
AV	Average
BPSK	Binary Phase-Shift Keying
BR	Bluetooth Basic Rate
BT	Bluetooth
BT LE	Bluetooth Low Energy
BW	BandWidth
Cal Int	Calibration Interval
CCK	Complementary Code Keying
Ch., CH	Channel
CISPR	Comite International Special des Perturbations Radioelectriques
CW	Continuous Wave
DBPSK	Differential BPSK
DC	Direct Current
D-factor	Distance factor
DFS	Dynamic Frequency Selection
DQPSK	Differential QPSK
DSSS	Direct Sequence Spread Spectrum
EDR	Enhanced Data Rate
EIRP, e.i.r.p.	Equivalent Isotropically Radiated Power
EMC	ElectroMagnetic Compatibility
EMI	ElectroMagnetic Interference
EN	European Norm
ERP, e.r.p.	Effective Radiated Power
EU	European Union
EUT	Equipment Under Test
Fac.	Factor
FCC	Federal Communications Commission
FHSS	Frequency Hopping Spread Spectrum
FM	Frequency Modulation
Freq.	Frequency
FSK	Frequency Shift Keying
GFSK	Gaussian Frequency-Shift Keying
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
Hori.	Horizontal
ICES	Interference-Causing Equipment Standard
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IF	Intermediate Frequency
ILAC	International Laboratory Accreditation Conference
ISED	Innovation, Science and Economic Development Canada
ISO	International Organization for Standardization
JAB	Japan Accreditation Board
LAN	Local Area Network
LIMS	Laboratory Information Management System
MCS	Modulation and Coding Scheme
MRA	Mutual Recognition Arrangement
N/A	Not Applicable
NIST	National Institute of Standards and Technology
NS	No signal detect.
NSA	Normalized Site Attenuation
NVLAP	National Voluntary Laboratory Accreditation Program
OBW	Occupied Band Width
OFDM	Orthogonal Frequency Division Multiplexing
P/M	Power meter
PCB	Printed Circuit Board
PER	Packet Error Rate
PHY	Physical Layer
PK	Peak
PN	Pseudo random Noise
PRBS	Pseudo-Random Bit Sequence
PSD	Power Spectral Density
QAM	Quadrature Amplitude Modulation
QP	Quasi-Peak
QPSK	Quadri-Phase Shift Keying
RBW	Resolution Band Width
RDS	Radio Data System
RE	Radio Equipment
RF	Radio Frequency
RMS	Root Mean Square
RSS	Radio Standards Specifications
Rx	Receiving
SA, S/A	Spectrum Analyzer
SG	Signal Generator
SVSWR	Site-Voltage Standing Wave Ratio
TR	Test Receiver
Tx	Transmitting
VBW	Video BandWidth
Vert.	Vertical
WLAN	Wireless LAN

CONTENTS PAGE

SECTION 1: Customer information.....5
SECTION 2: Equipment under test (EUT).....5
SECTION 3: Test specification, procedures & results.....7
SECTION 4: Operation of EUT during testing.....10
SECTION 5: Radiated Spurious Emission and Band Edge Compliance.....13
SECTION 6: Antenna Terminal Conducted Tests.....16
APPENDIX 1: Test data.....17
26 dB Emission Bandwidth and 99 % Occupied Bandwidth.....17
6 dB Bandwidth.....28
Burst rate confirmation.....31
Radiated Spurious Emission.....33
APPENDIX 2: Test instruments.....75
APPENDIX 3: Photographs of test setup.....76
Radiated Spurious Emission.....76
Antenna Terminal Conducted Tests.....77

SECTION 1: Customer information

Company Name	:	DENSO 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	:	Daisuke Fukii

The information provided from the customer is as follows;
- Applicant, Type of EUT, Model Number of EUT, FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer information
- SECTION 2: Equipment under test (EUT) other than the Receipt Date
- SECTION 4: Operation of EUT during testing

* The laboratory is exempted from liability of any test results affected from the above information in SECTION 2 and 4.

SECTION 2: Equipment under test (EUT)

2.1 Identification of EUT

Type	:	Car Navigation
Model Number	:	FT0091A
Serial Number	:	Refer to SECTION 4.2
Rating	:	DC 12 V
Receipt Date	:	January 15, 2021
Country of Mass-production	:	Mexico
Condition	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	:	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
Clock frequency(ies) : 26 MHz

	IEEE802.11b	IEEE802.11g/n	IEEE802.11a/n (20 M band) *1)	IEEE802.11n (40M 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	5 MHz		20 MHz	40 MHz
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	FHSS (GFSK, π/4-DQPSK, 8-DPSK)
Channel spacing	1 MHz
Antenna type	Surface Mountable Dielectric Chip Antenna
Antenna Connector type	-
Antenna Gain	1.6 dBi

	Broadband Receiver
Frequency of operation	AM / HD_AM: 530 kHz - 1710 kHz FM / HD_FM: 87.75 MHz - 107.9 MHz XM:2332.5 MHz - 2345.0 MHz
Local oscillation frequency	AM: 472.5 kHz - 1777.5 kHz FM: 88.05 MHz - 108.2 MHz
Channel spacing	AM / HD_AM: 10 kHz FM / HD_FM: 0.2 MHz
IF Frequency	AM: 57.5 kHz FM: 300 kHz
Antenna Connector type	HFC

*1) This test report applies to WLAN (5 GHz Band only).
*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 January 12, 2021 and effective February 11, 2021
* The revision does not affect the test result conducted before its effective date.

Title : FCC 47 CFR Part 15 Radio Frequency Device Subpart E
Unlicensed National Information Infrastructure Devices
Section 15.407 General technical requirements

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	**FCC:** ANSI C63.10-2013	**FCC:** 15.407 (b) (6) / 15.207	N/A	N/A	*1)
	ISED: RSS-Gen 8.8	**ISED:** RSS-Gen 8.8			
26 dB Emission Bandwidth	**FCC:** KDB Publication Number 789033	**FCC:** 15.407 (a) (1) (2) (3)	See data	Complied a)	Conducted
	ISED: -	**ISED:** -			
Maximum Conducted Output Power	**FCC:** KDB Publication Number 789033	**FCC:** 15.407 (a) (1) (2) (3)		N/A	*2)
	ISED: -	**ISED:** 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)		N/A	*2)
	ISED: -	**ISED:** 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	4.6 dB 11000.000 MHz, AV, Vert.	Complied# b)	Conducted (< 30 MHz) *2) / Radiated (> 30 MHz) *3)
	ISED: -	**ISED:** 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 c)	Conducted
	ISED: -	**ISED:** RSS-247 6.2.4.1			

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.
*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) The purpose of this test is to verify that the degradation and performance meets the minimum adaptable requirements, therefore, only items related to the x'tal were tested. This test items is controlled by software there is no "degradation".
*3) Radiated test was selected over 30 MHz based on FCC 15.407 (b) and KDB 789033 D02 G.3.b).

a) Refer to APPENDIX 1 (data of 26 dB Emission Bandwidth and 99 % Occupied Bandwidth)
b) Refer to APPENDIX 1 (data of Radiated Spurious Emission)
c) Refer to APPENDIX 1 (data of 6 dB Bandwidth)

Symbols:
Complied The data of this test item has enough margin, more than the measurement uncertainty.
Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.

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

FCC Part 15.31 (e)
This EUT provides the stable voltage constantly to RF Part 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	**ISED:** RSS-Gen 6.7	**ISED:** -	N/A	- a)	Conducted
a) Refer to APPENDIX 1 (data of 26 dB Emission Bandwidth and 99 % Occupied Bandwidth)					

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

3.4 Uncertainty

There is no applicable rule of uncertainty in this applied standard. Therefore, the following results are derived depending on whether or not laboratory uncertainty is applied.

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

Conducted emission

using Item	Frequency range	Uncertainty (+/-)
AMN (LISN)	0.009 MHz to 0.15 MHz	3.4 dB
	0.15 MHz to 30 MHz	2.9 dB

Radiated emission

Measurement distance	Frequency range		Uncertainty (+/-)
3 m	9 kHz to 30 MHz		3.3 dB
10 m			3.2 dB
3 m	30 MHz to 200 MHz	(Horizontal)	4.8 dB
		(Vertical)	5.0 dB
	200 MHz to 1000 MHz	(Horizontal)	5.2 dB
		(Vertical)	6.3 dB
10 m	30 MHz to 200 MHz	(Horizontal)	4.8 dB
		(Vertical)	4.8 dB
	200 MHz to 1000 MHz	(Horizontal)	5.0 dB
		(Vertical)	5.0 dB
3 m	1 GHz to 6 GHz		4.9 dB
	6 GHz to 18 GHz		5.2 dB
1 m	10 GHz to 26.5 GHz		5.5 dB
	26.5 GHz to 40 GHz		5.5 dB
0.5 m	26.5 GHz to 40 GHz		5.5 dB
10 m	1 GHz to 18 GHz		5.2 dB

Antenna Terminal test

Test Item	Uncertainty (+/-)
26 dB Emission Bandwidth / 6 dB Emission Bandwidth /	0.96 %
Maximum Conducted Output Power / Average Output Power	1.4 dB
Burst Rate	0.10 %
Maximum Power Spectral Density	2.6 dB
Spurious Emission (Conducted)	2.6 dB

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.
*A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 199967
ISED Lab Company Number: 2973C / CAB identifier: JP0002
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124

Test site	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	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	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	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	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.5 measurement room	6.4 x 6.4 x 3.0	6.4 x 6.4	-	-
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	3.1 x 5.0	-	-
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 EUT 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

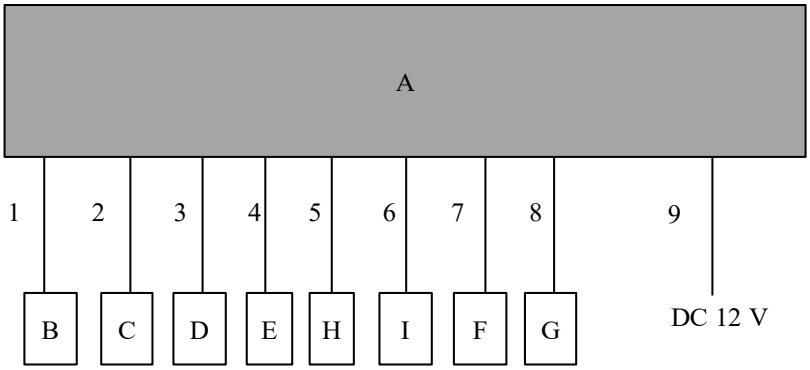
Mode	Remarks*
IEEE 802.11a (11a)	54 Mbps, PN9
IEEE 802.11n 20 MHz BW (11n-20)	MCS 7 PN9 (Short) Short GI
IEEE 802.11n 40 MHz BW (11n-40)	MCS 7 PN9 (Short) Short GI
*The worst condition was determined based on the test result of Maximum Conducted Output Power.	
*Power of the EUT was set by the software as follows; Power settings: 11a/n-20: +11 dBm n-40: +10 dBm Software: Ver.00.01F (Date: January 6, 2021, Storage location: EUT memory) *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	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 5240 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)	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 5600 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

Radiated Spurious Emission test



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

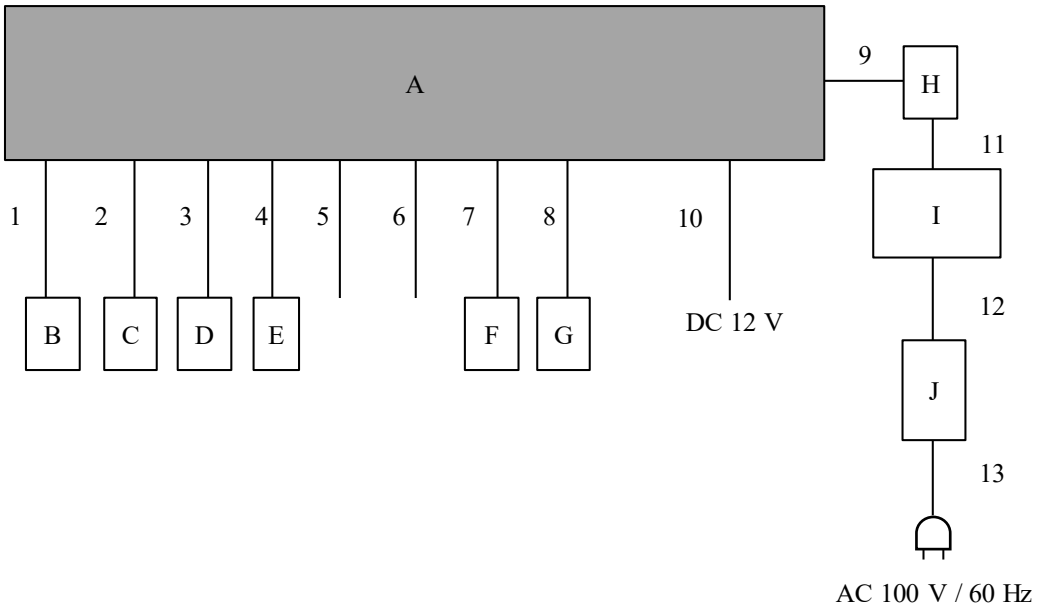
Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Navigation	FT0091A	MSC00011	DENSO TEN Limited	EUT
B	Antenna	16ADA	No.1	HONDA Genuine product	-
C	Radio dummy	39835-T5A-E010-M1	24D50094	-	-
D	Camera	8983980530	0000015	HONDA Genuine product	-
E	MIC ASSY	W01B-5012-D240	03U1520000026	TRANSTRON INC.	-
F	Dummy load	-	-	DENSO TEN Limited	-
G	Switch	-	-	DENSO TEN Limited	-
H	USB memory	USM4GR B	-	Sony	-
I	USB memory	USM4GR B	-	Sony	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Antenna Cable	0.6	Shielded	Shielded	-
2	Antenna Cable	0.5	Shielded	Shielded	-
3	Signal Cable	0.6	Unshielded	Unshielded	-
4	Signal Cable	0.5	Unshielded	Unshielded	-
5	USB Cable	1.0	Shielded	Shielded	-
6	USB Cable	1.0	Shielded	Shielded	-
7	Signal Cable	0.5	Unshielded	Unshielded	-
8	Signal Cable	1.0	Unshielded	Unshielded	-
9	DC Cable	1.5	Unshielded	Unshielded	-

Antenna Terminal Conducted tests



* 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	MSC00011	DENSO TEN Limited	EUT
B	Antenna	16ADA	No.1	HONDA Genuine product	-
C	Antenna	39835-T5A-E010-M1	24D50094	-	-
D	Camera	8983980530	0000015	HONDA Genuine product	-
E	MIC ASSY	W01B-5012-D240	03U1520000026	TRANSTRON INC.	-
F	Dummy load	-	-	DENSO TEN Limited	-
G	Switch	-	-	DENSO TEN Limited	-
H	Jig board	-	-	DENSO TEN Limited	-
I	Laptop PC	PR63PBAA337AD7X	6F053983H	TOSHIBA	-
J	AC Adapter	PA51770-1ACA	FX1200E91PCC	TOSHIBA	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Antenna Cable	0.6	Shielded	Shielded	-
2	Antenna Cable	0.5	Shielded	Shielded	-
3	Signal Cable	0.6	Unshielded	Unshielded	-
4	Signal Cable	0.5	Unshielded	Unshielded	-
5	USB Cable	1.0	Shielded	Shielded	-
6	USB Cable	1.0	Shielded	Shielded	-
7	Signal Cable	0.5	Unshielded	Unshielded	-
8	Signal Cable	1.0	Unshielded	Unshielded	-
9	Signal Cable	0.1	Unshielded	Unshielded	-
10	DC Cable	0.5	Unshielded	Unshielded	-
11	USB Cable	0.7	Shielded	Shielded	-
12	DC Cable	1.7	Unshielded	Unshielded	-
13	AC Cable	0.8	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 m and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
Test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beamwidth of the antenna.
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 68.2 dBuV/m, 3 m (-27 dBm e.i.r.p.*) in the Section 15.407 (b) (1) (2) (3).

For W58 Bandedge
-27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge in the section 15.407(b)(4)(i).

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;

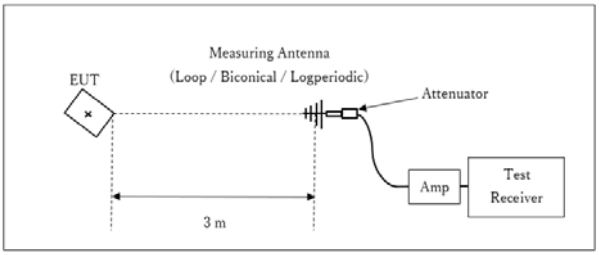
Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

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: 3 MHz	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.

*1) The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".

Figure 2: Test Setup

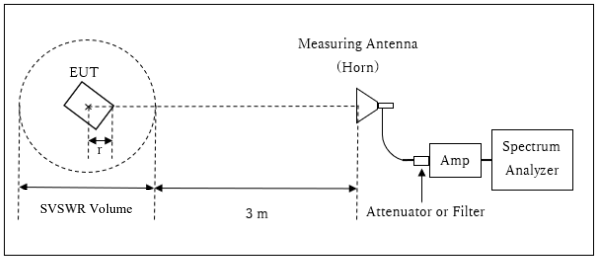
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 10 GHz

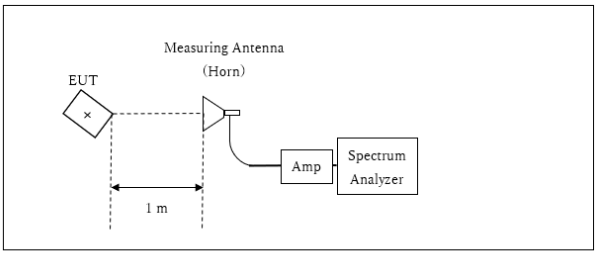


r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: 20 x log (3.9 m / 3.0 m) = 2.28 dB
* Test Distance: (3 + SVSWR Volume /2) - r = 3.9 m

SVSWR Volume : 2.0 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
r = 0.1 m

10 GHz - 40 GHz



× : Center of turn table

Distance Factor: 20 x log (1.0 m / 3.0 m) = -9.5 dB
*Test Distance: 1 m

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

* The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".

*1) Peak hold was applied as Worst-case measurement.

The test results and limit are rounded off to two decimals place, so some differences might be observed.
The equipment and cables were not used for factor 0 dB of the data sheets.

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No.	13665469H		
Test place	Ise EMC Lab.		
	No.3 Measurement Room	No.2 Measurement Room	No.2 Measurement Room
Date	February 4, 2021	February 22, 2021	February 22, 2021
Temperature / Humidity	23 deg. C / 38 % RH	20 deg. C / 30 % RH	20 deg. C / 33 % RH
Engineer	Junya Okuno	Yuichiro Yamazaki	Junya Okuno
Mode	Tx		

11a

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5180	-	16738.2
5220	-	16788.7
5240	-	16810.8
5260	21.608	16767.6
5300	21.539	16735.7
5320	21.257	16761.5
5500	20.492	16759.2
5580	20.284	16797.6
5700	20.938	16766.9
5745	-	16780.4
5785	-	16754.9
5825	-	16752.9

11n-20

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5180	-	17827.8
5220	-	17940.6
5240	-	18140.5
5260	21.981	17853.3
5300	24.935	18953.1
5320	24.464	18449.2
5500	22.496	17857.1
5580	21.844	17847.8
5700	21.671	17864.4
5745	-	17823.3
5785	-	17860.9
5825	-	17902.1

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No.	13665469H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	February 4, 2021
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Junya Okuno
Mode	Tx

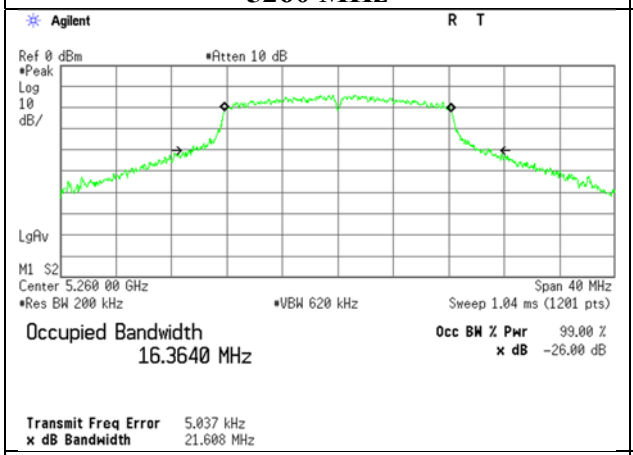
11n-40

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5190	-	36032.2
5230	-	36246.7
5270	42.105	36072.7
5310	42.280	36207.3
5510	41.730	36044.7
5550	41.448	36112.1
5670	41.351	36102.8
5755	-	36121.9
5795	-	36069.8

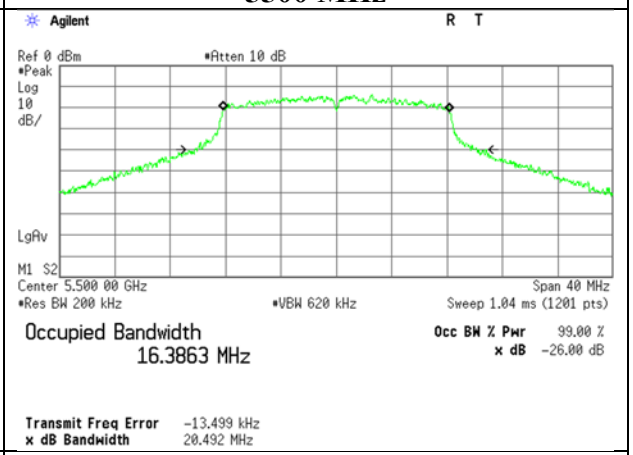
26 dB Emission Bandwidth

11a

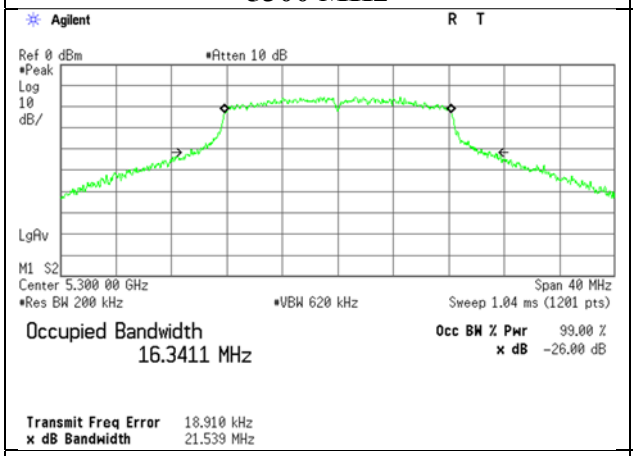
5260 MHz



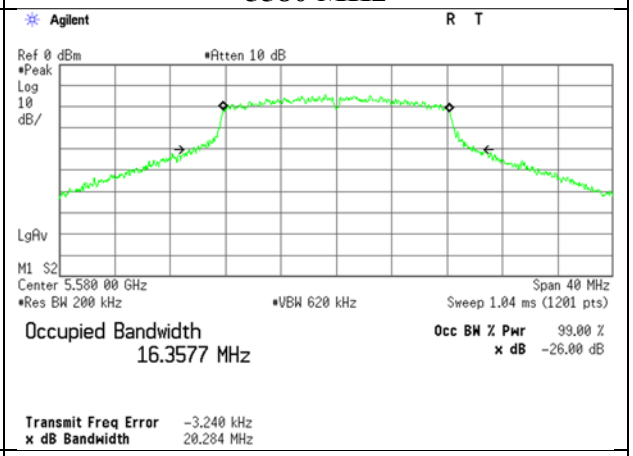
5500 MHz



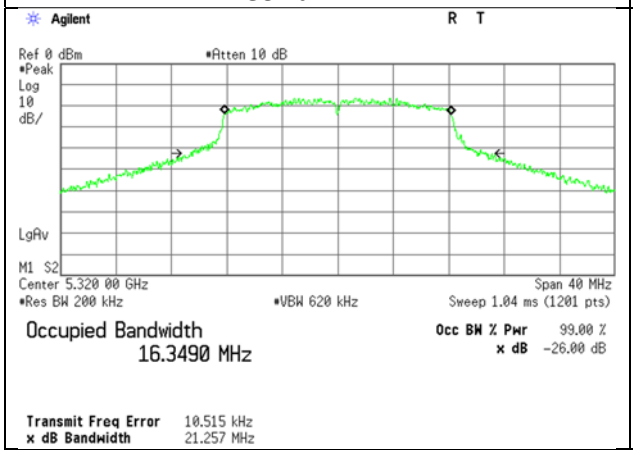
5300 MHz



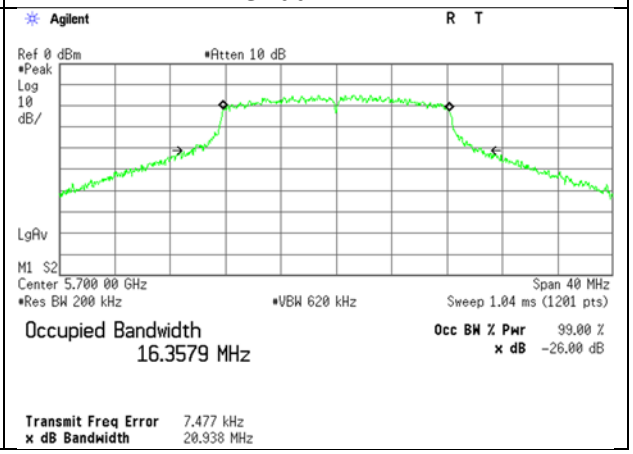
5580 MHz



5320 MHz



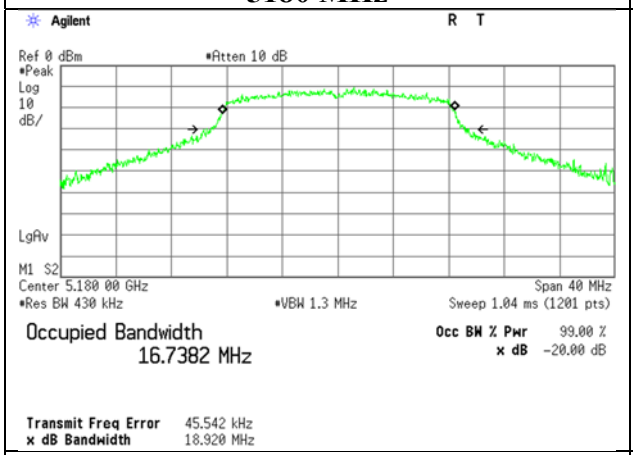
5700 MHz



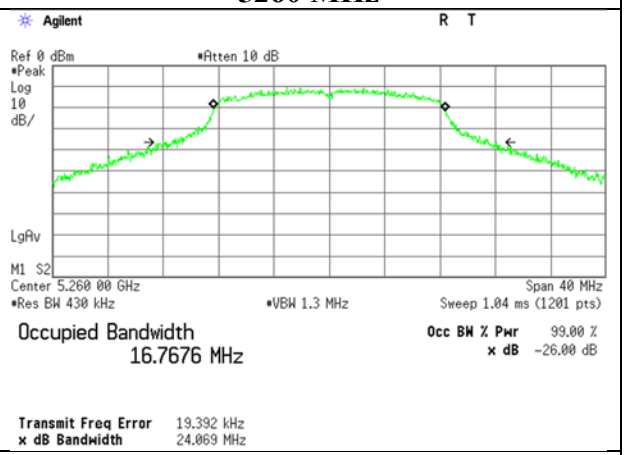
99 % Occupied Bandwidth

11a

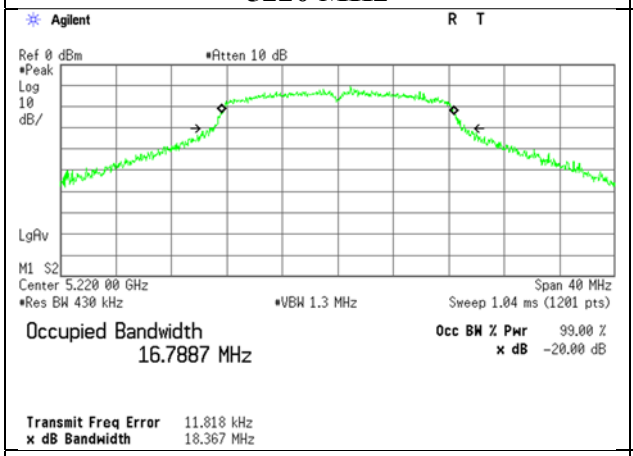
5180 MHz



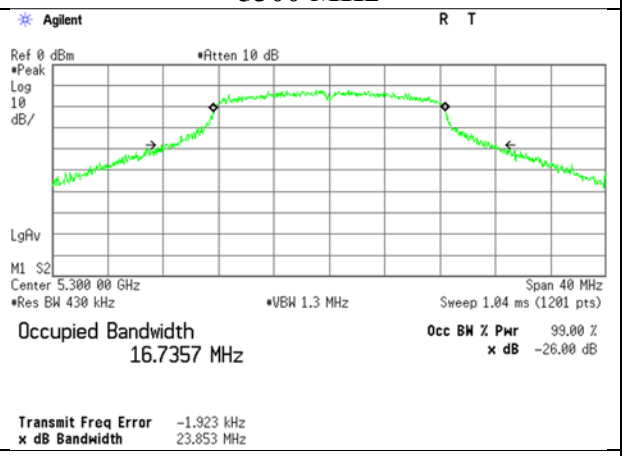
5260 MHz



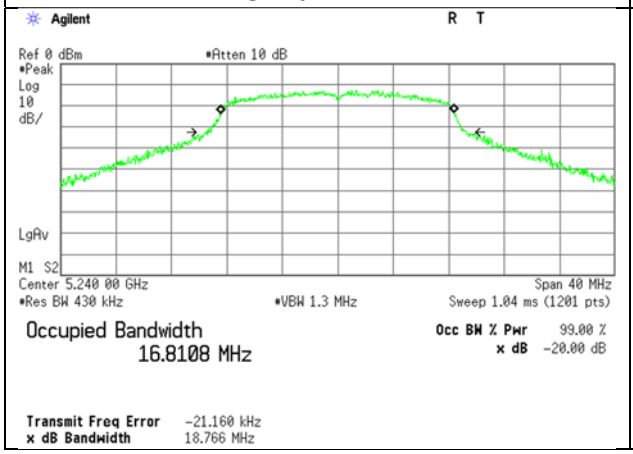
5220 MHz



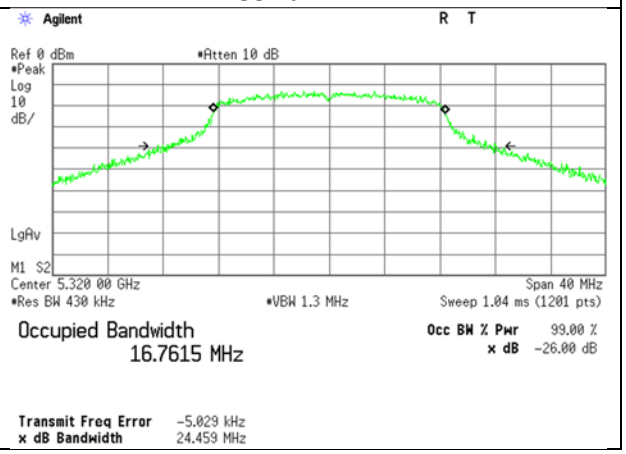
5300 MHz



5240 MHz



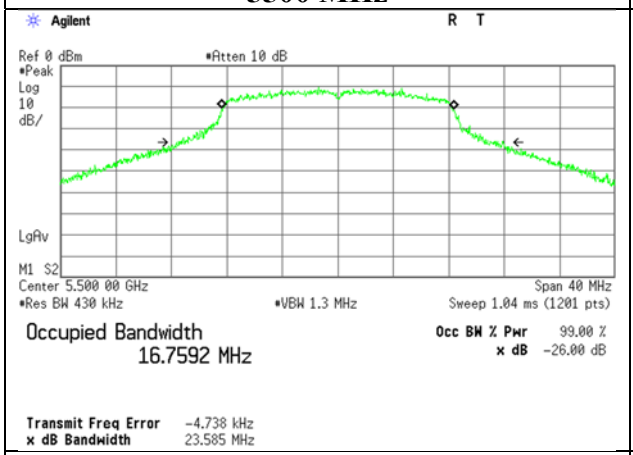
5320 MHz



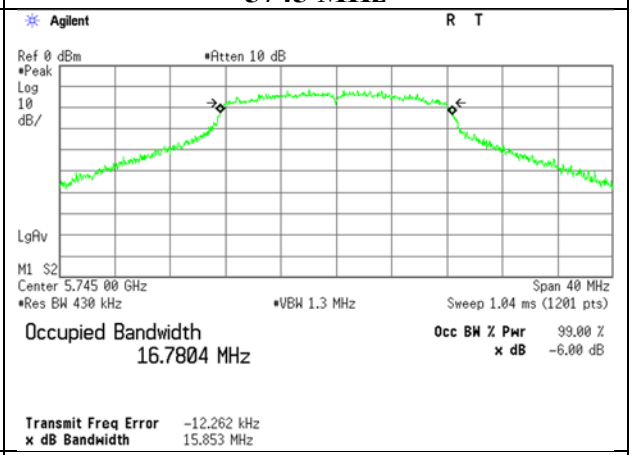
99 % Occupied Bandwidth

11a

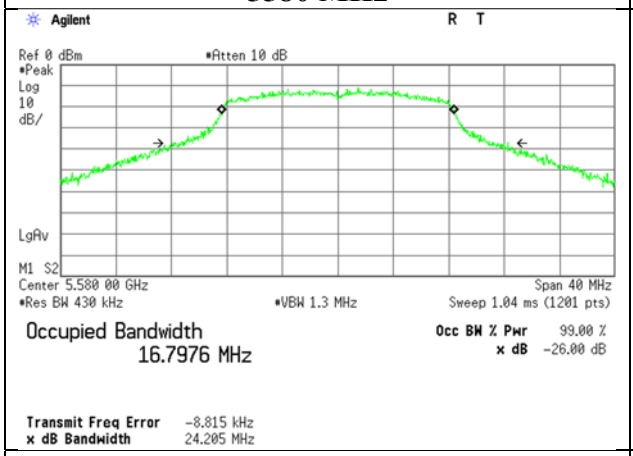
5500 MHz



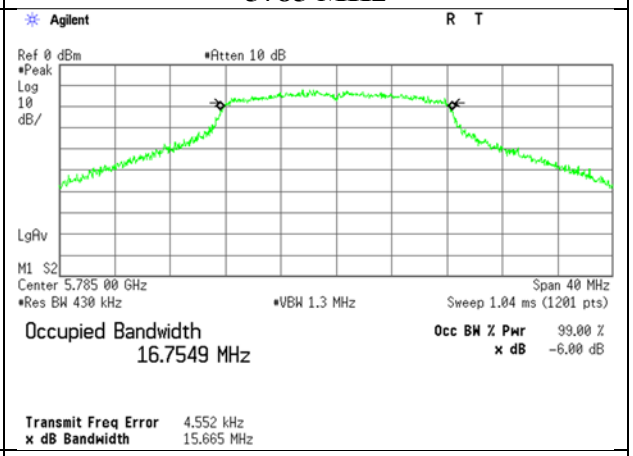
5745 MHz



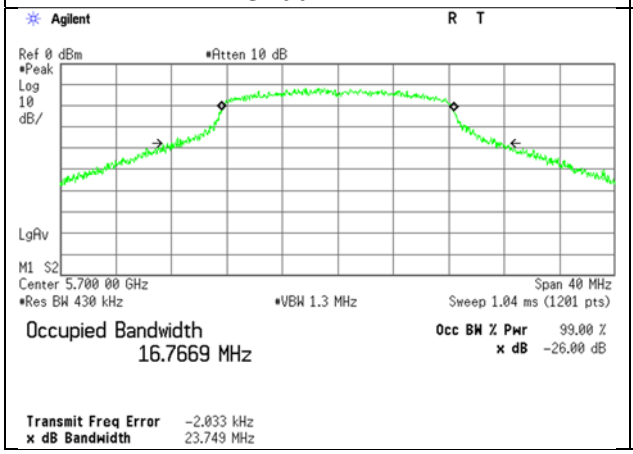
5580 MHz



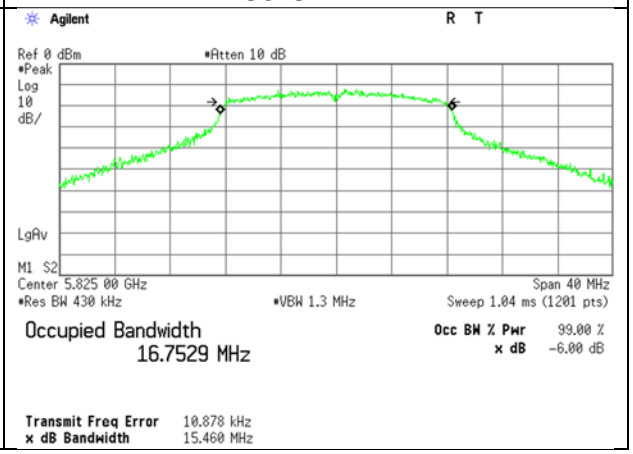
5785 MHz



5700 MHz



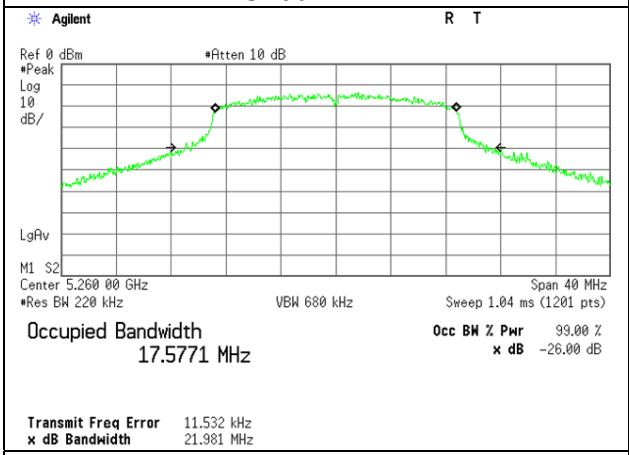
5825 MHz



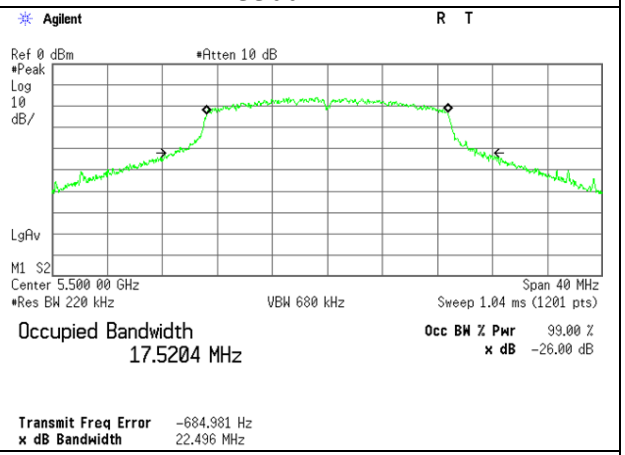
26 dB Emission Bandwidth

11n-20

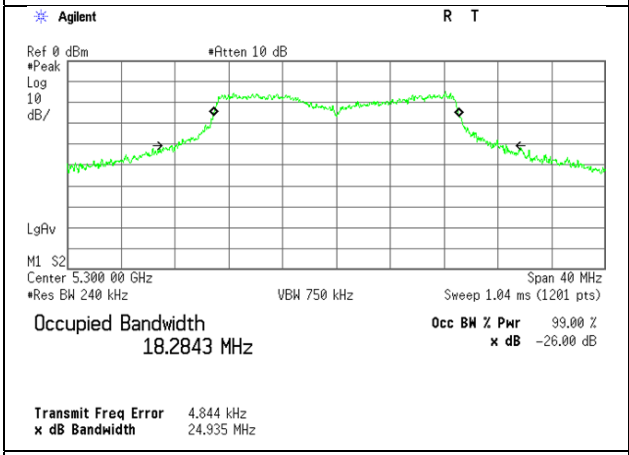
5260 MHz



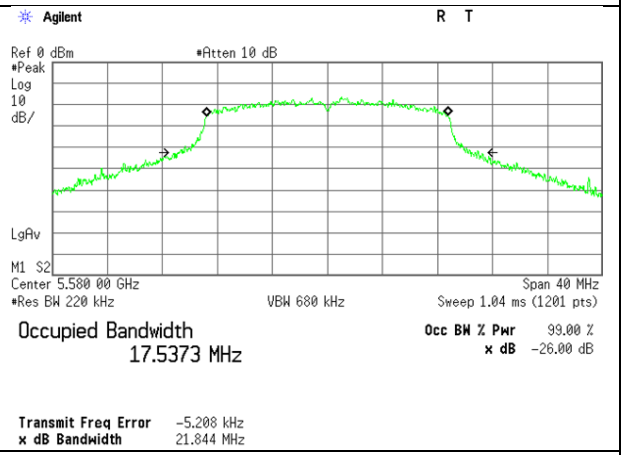
5500 MHz



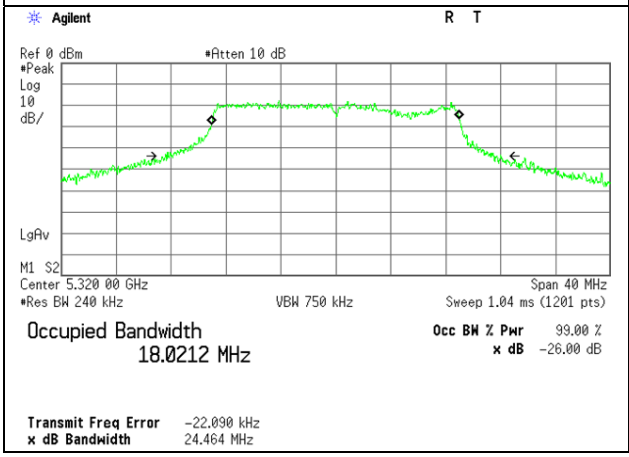
5300 MHz



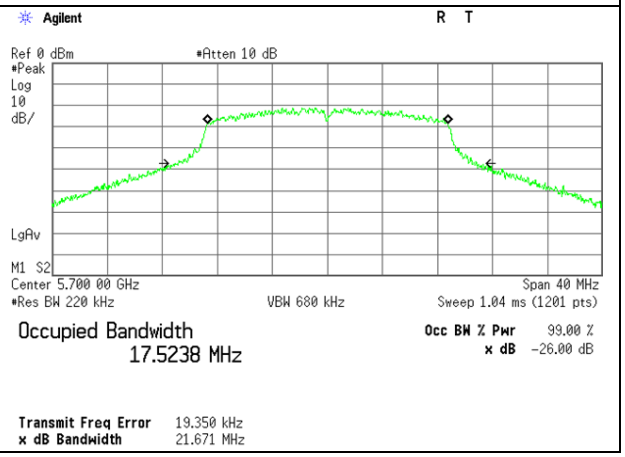
5580 MHz



5320 MHz



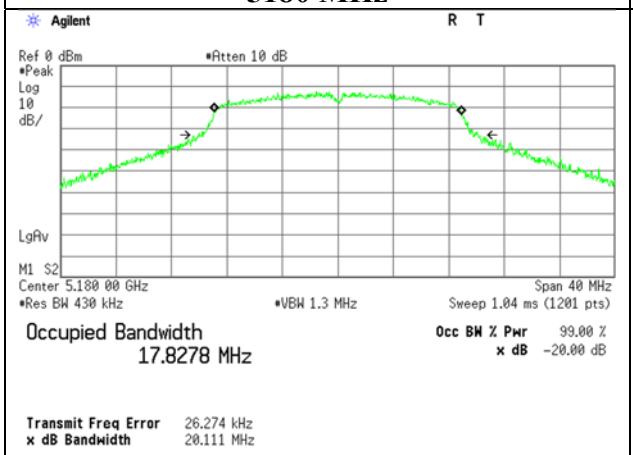
5700 MHz



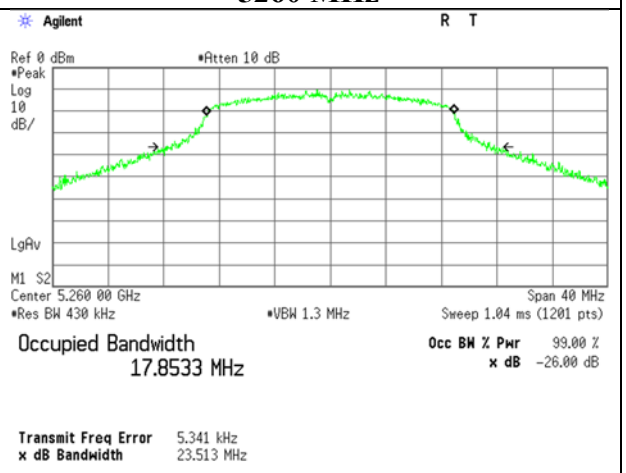
99 % Occupied Bandwidth

11n-20

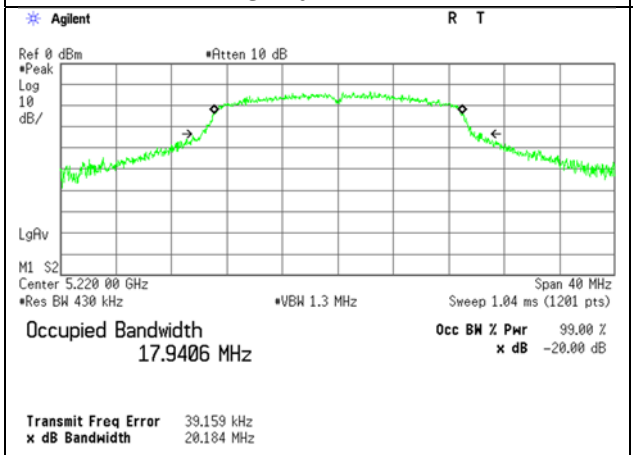
5180 MHz



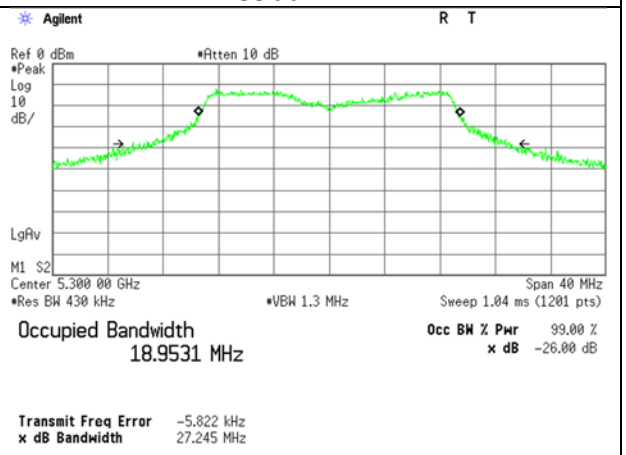
5260 MHz



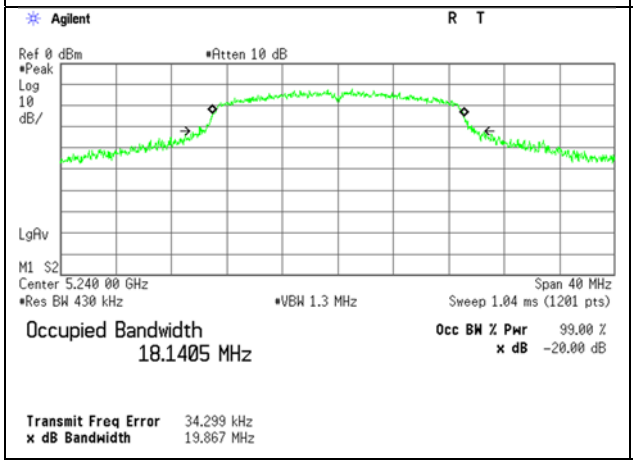
5220 MHz



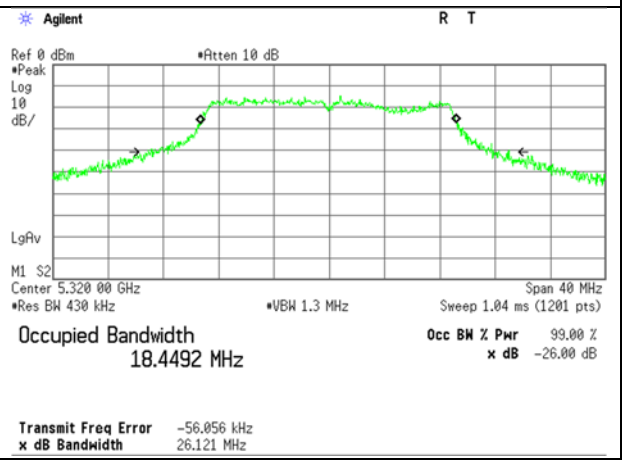
5300 MHz



5240 MHz



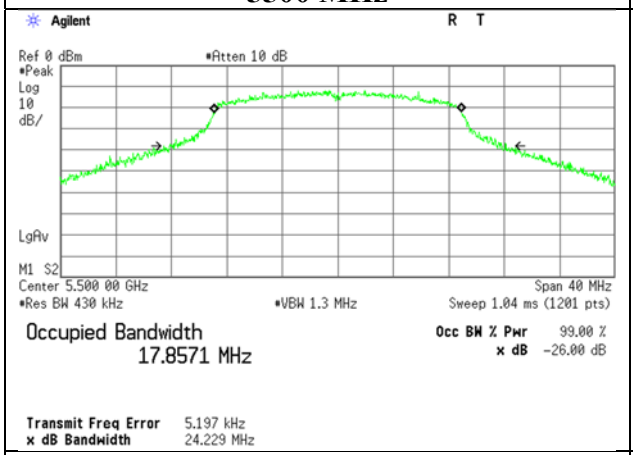
5320 MHz



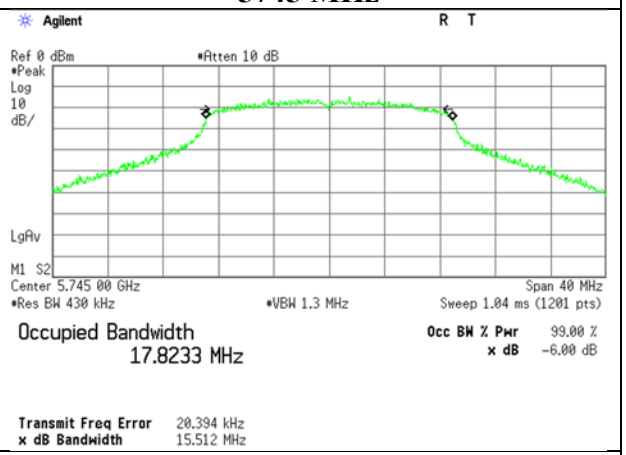
99 % Occupied Bandwidth

11n-20

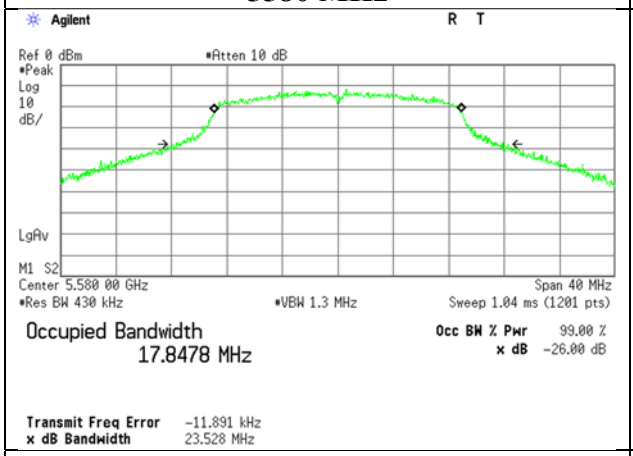
5500 MHz



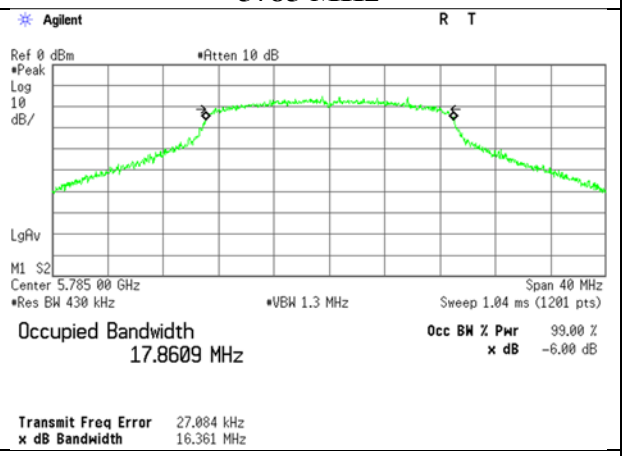
5745 MHz



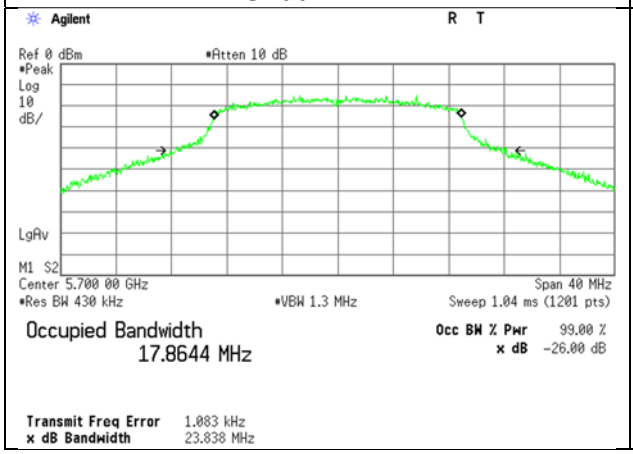
5580 MHz



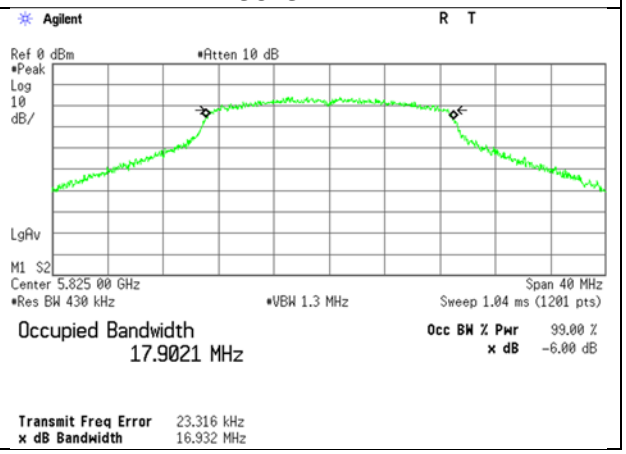
5785 MHz



5700 MHz



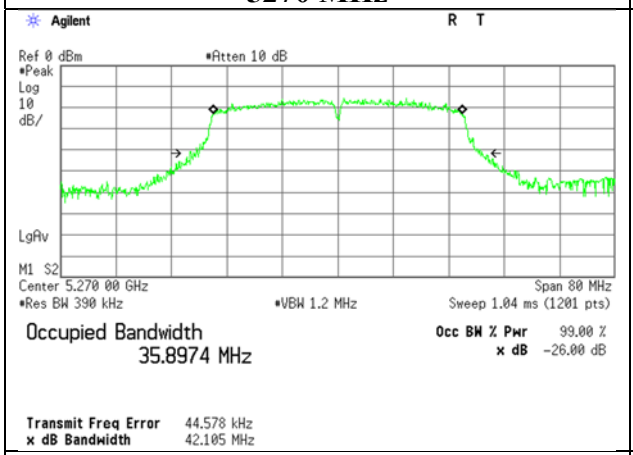
5825 MHz



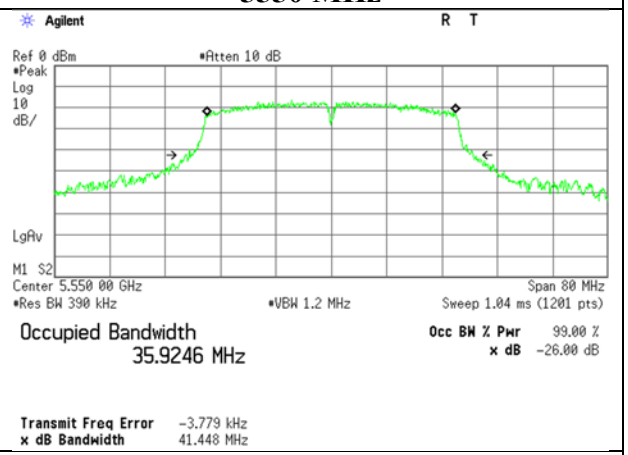
26 dB Emission Bandwidth

11n-40

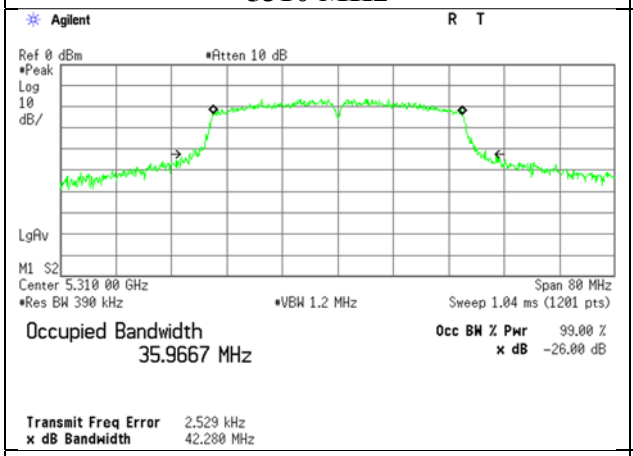
5270 MHz



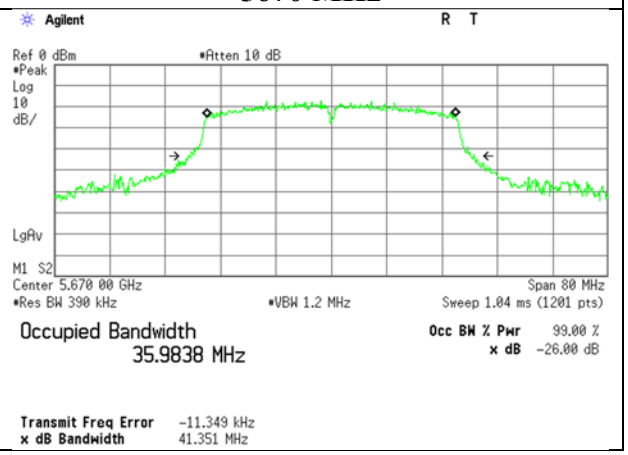
5550 MHz



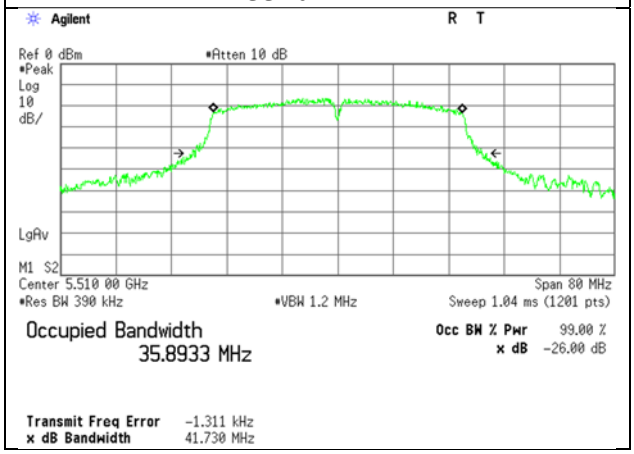
5310 MHz



5670 MHz



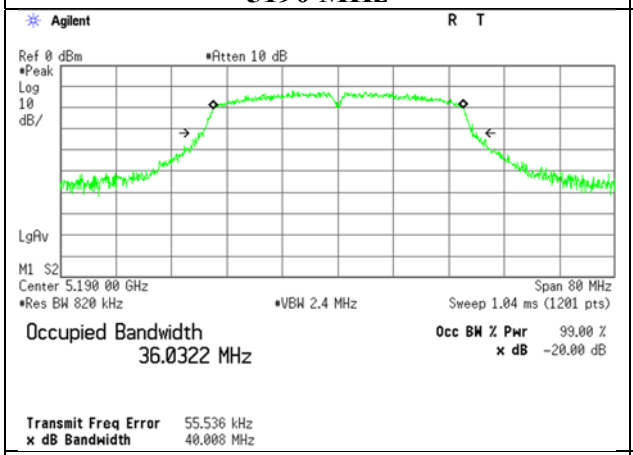
5510 MHz



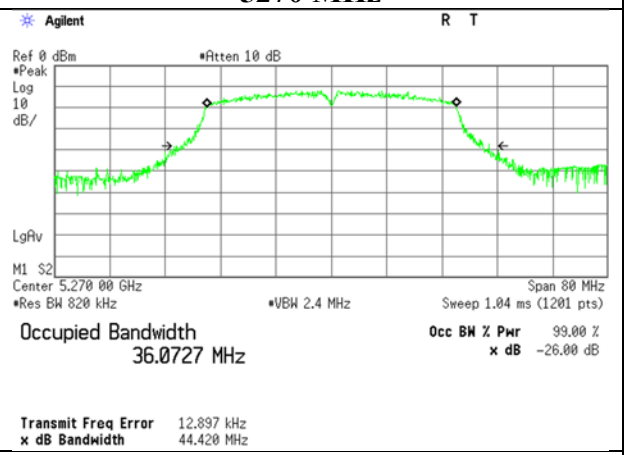
99 % Occupied Bandwidth

11n-40

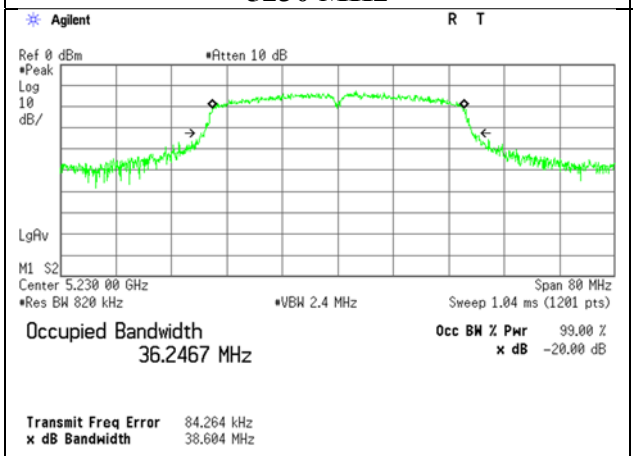
5190 MHz



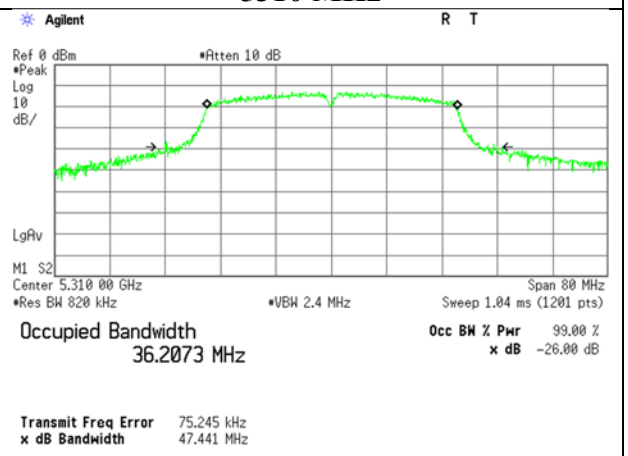
5270 MHz



5230 MHz



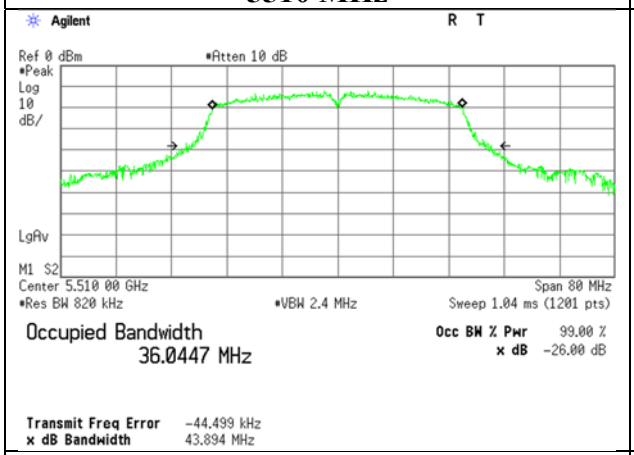
5310 MHz



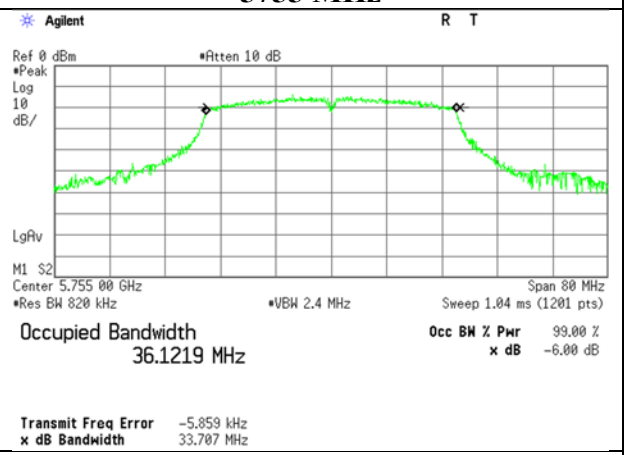
99 % Occupied Bandwidth

11n-40

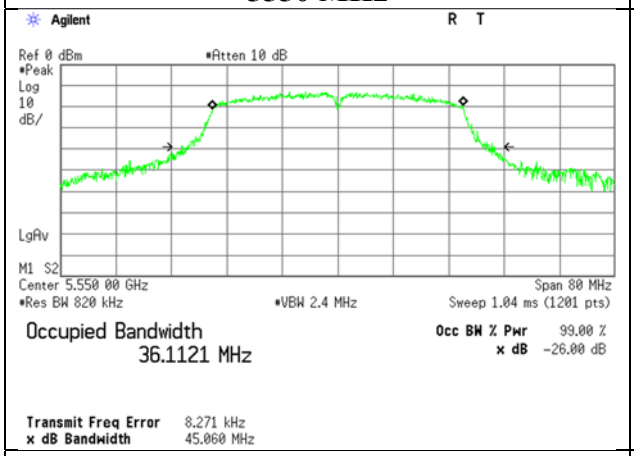
5510 MHz



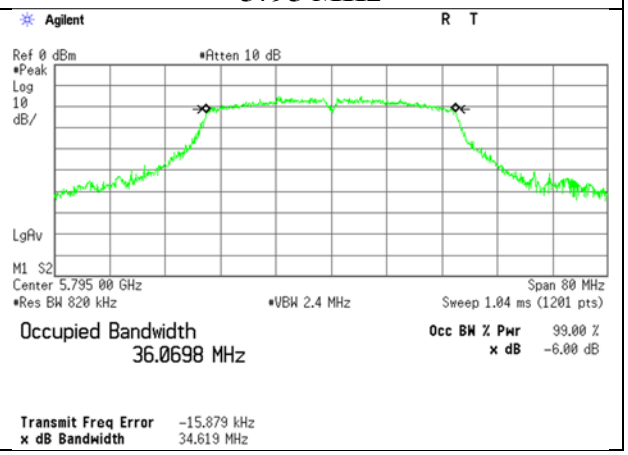
5755 MHz



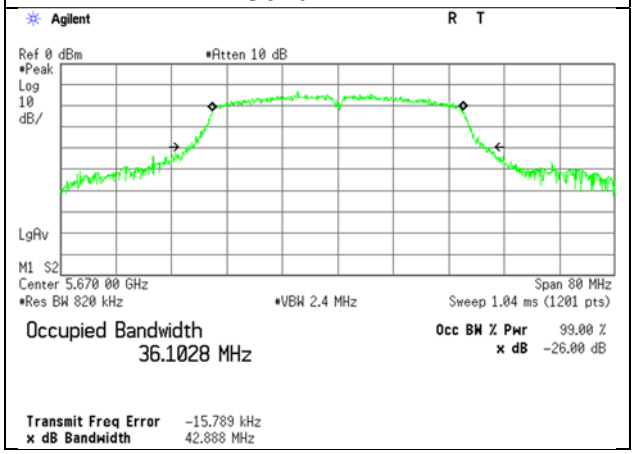
5550 MHz



5795 MHz



5670 MHz



6 dB Bandwidth

Report No.	13665469H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	February 4, 2021
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Junya Okuno
Mode	Tx

11a

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
5745	15.894	> 0.500
5785	15.424	> 0.500
5825	15.132	> 0.500

11n-20

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
5745	15.139	> 0.500
5785	15.146	> 0.500
5825	15.137	> 0.500

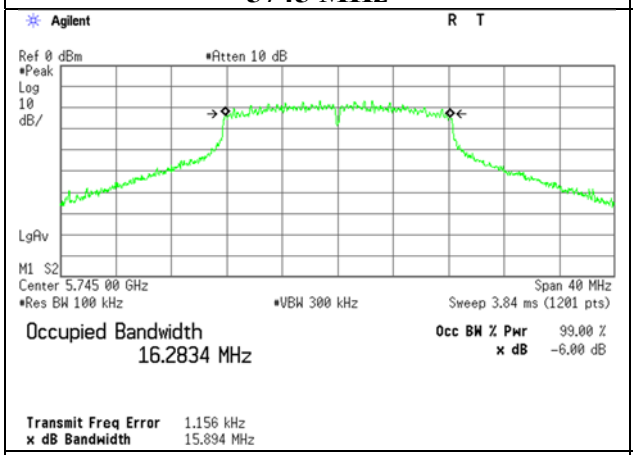
11n-40

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
5755	35.124	> 0.500
5795	35.114	> 0.500

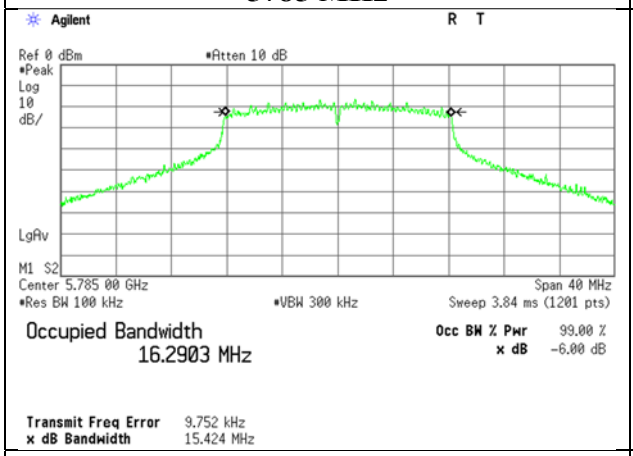
6 dB Bandwidth

11a

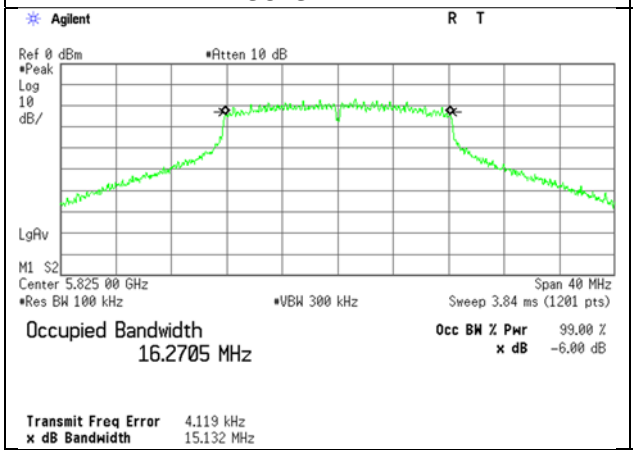
5745 MHz



5785 MHz

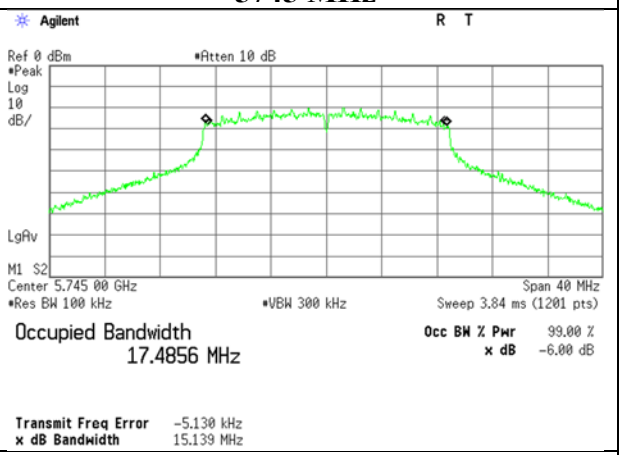


5825 MHz

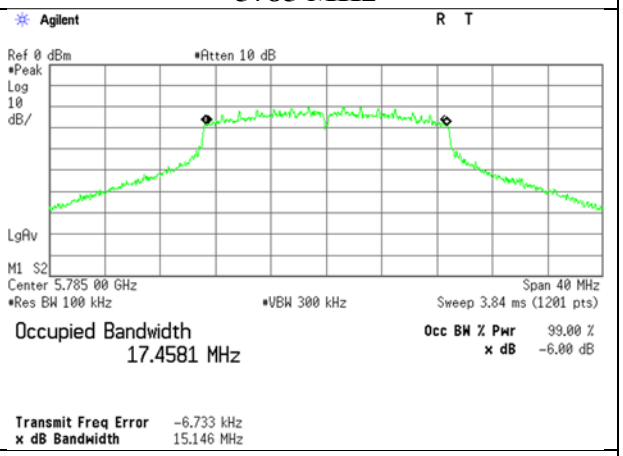


11n-20

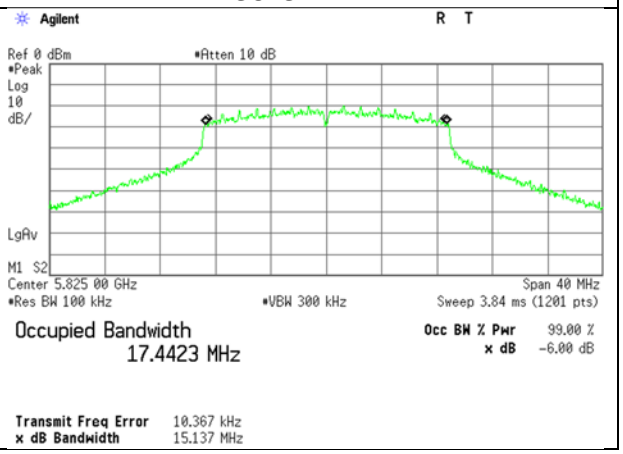
5745 MHz



5785 MHz



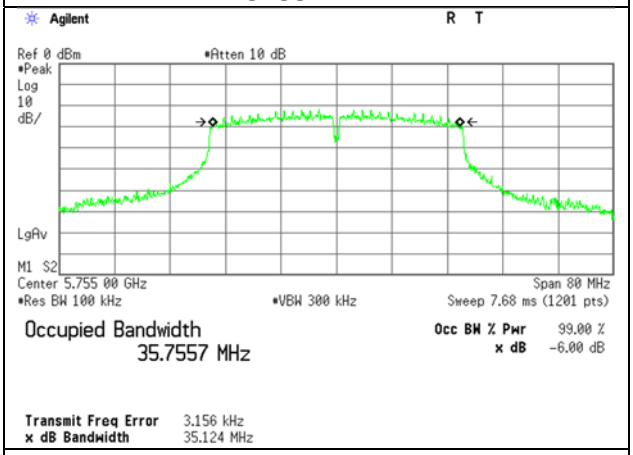
5825 MHz



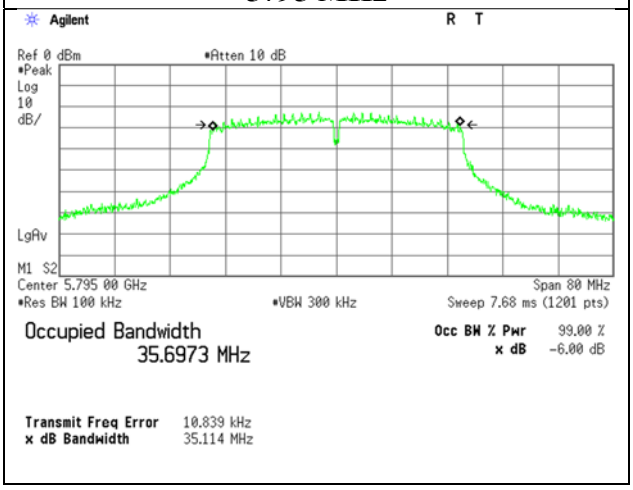
6 dB Bandwidth

11n-40

5755 MHz



5795 MHz

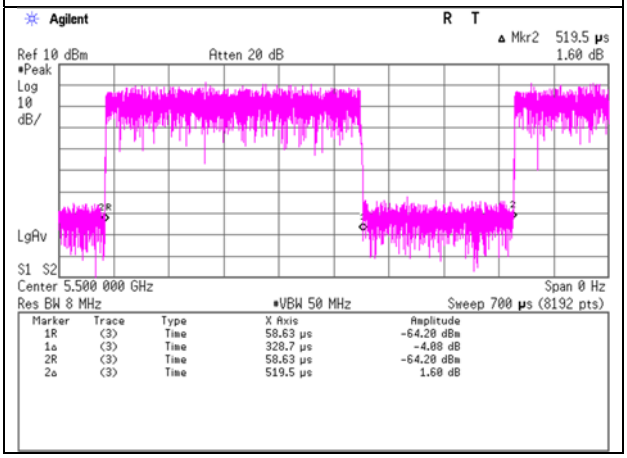


Burst rate confirmation

Report No.	13665469H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	April 1, 2015
Temperature / Humidity	22 deg. C / 38 % RH
Engineer	Junya Okuno
Mode	Tx

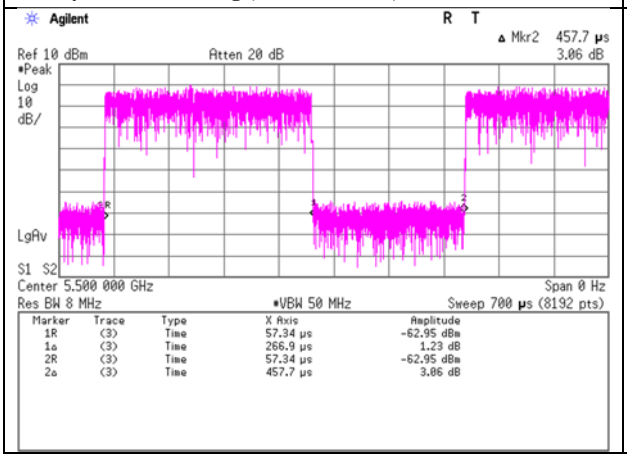
11a 54 Mbps

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



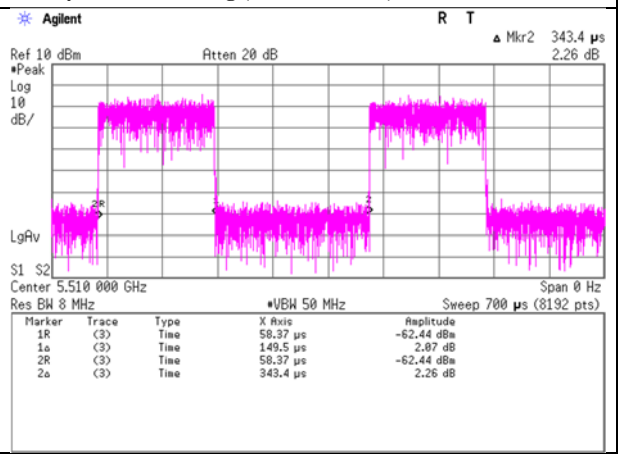
11n-20 MCS 7 (Short GI)

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 MCS 7 (Short GI)

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

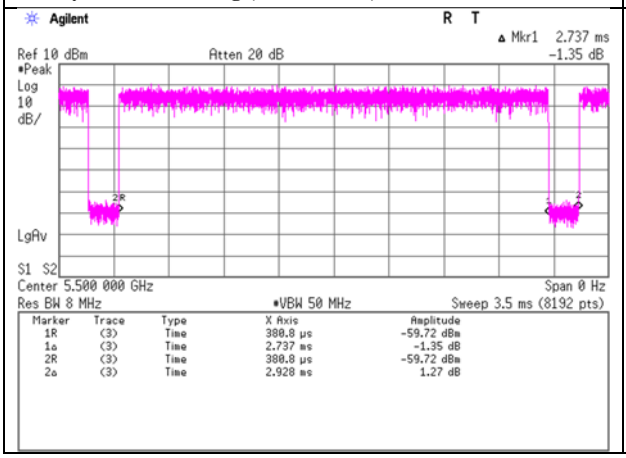


Burst rate confirmation

Report No.	13665469H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	April 1, 2015
Temperature / Humidity	22 deg. C / 38 % RH
Engineer	Junya Okuno
Mode	Tx

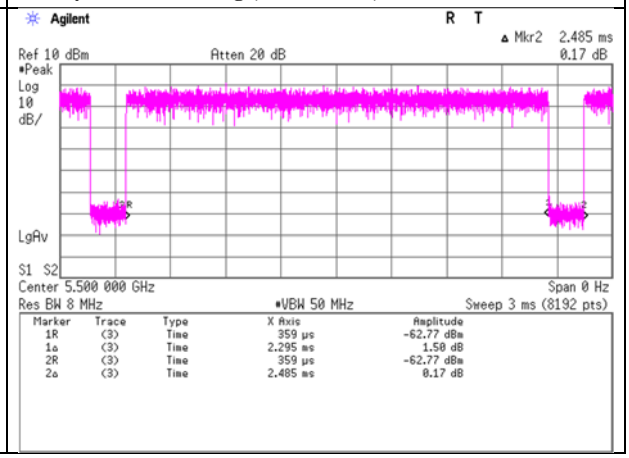
11a 6 Mbps

Tx on / (Tx on + Tx off) =	0.935
Tx on / (Tx on + Tx off) * 100 =	93.5 %
Duty factor = 10 * log (2.928 / 2.737) =	0.29 dB



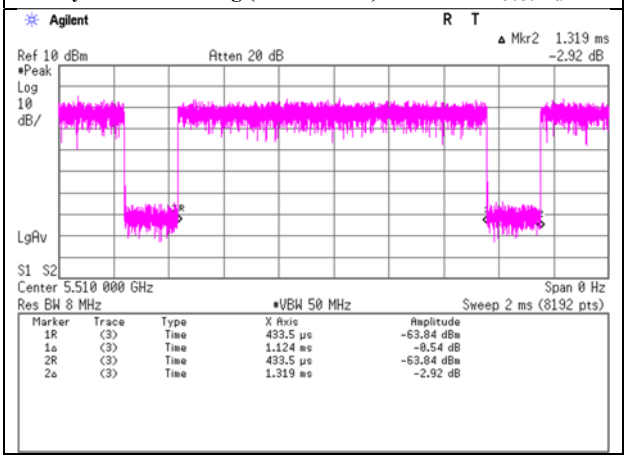
11n-20 MCS 0 (Short GI)

Tx on / (Tx on + Tx off) =	0.924
Tx on / (Tx on + Tx off) * 100 =	92.4 %
Duty factor = 10 * log (2.485 / 2.295) =	0.35 dB



11n-40 MCS 0 (Short GI)

Tx on / (Tx on + Tx off) =	0.852
Tx on / (Tx on + Tx off) * 100 =	85.2 %
Duty factor = 10 * log (1.319 / 1.124) =	0.69 dB



Radiated Spurious Emission

Report No.	13665469H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 18 GHz)	Ken Fujita (18 GHz - 40 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	47.4	32.0	6.0	31.6	-	53.7	73.9	20.2	
Hori.	10360.000	PK	49.2	40.1	-2.5	33.5	-	53.2	73.9	20.7	
Hori.	15540.000	PK	42.9	37.4	0.0	32.5	-	47.9	73.9	26.0	Floor noise
Hori.	5150.000	AV	32.3	32.0	6.0	31.6	2.0	40.6	53.9	13.3	*1)
Hori.	15540.000	AV	36.4	37.4	0.0	32.5	-	41.4	53.9	12.5	Floor noise
Vert.	5150.000	PK	46.3	32.0	6.0	31.6	-	52.6	73.9	21.3	
Vert.	10360.000	PK	51.5	40.1	-2.5	33.5	-	55.5	73.9	18.4	
Vert.	15540.000	PK	42.9	37.4	0.0	32.5	-	47.9	73.9	26.0	Floor noise
Vert.	5150.000	AV	32.1	32.0	6.0	31.6	2.0	40.4	53.9	13.5	*1)
Vert.	15540.000	AV	36.4	37.4	0.0	32.5	-	41.4	53.9	12.5	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 (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

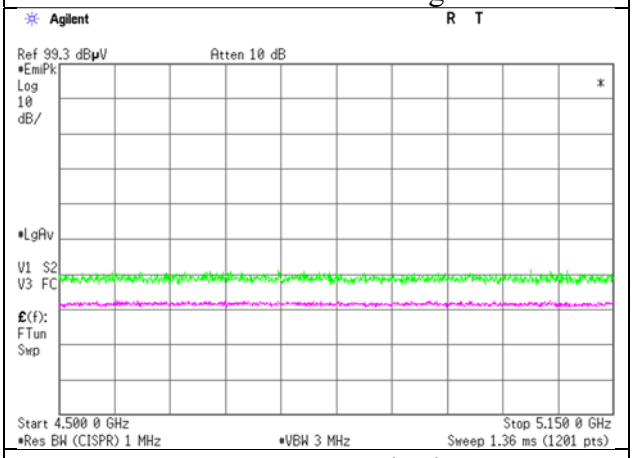
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11a 5180 MHz

Horizontal

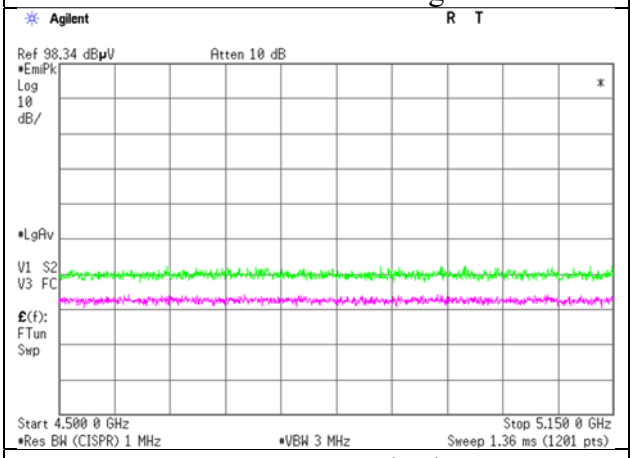
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 18 GHz)	Ken Fujita (18 GHz - 40 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	48.5	39.9	-2.5	33.6	-	52.4	68.2	15.8	
Hori.	15780.000	PK	43.1	37.0	0.2	32.6	-	47.6	73.9	26.3	Floor noise
Hori.	15780.000	AV	35.5	37.0	0.2	32.6	-	40.0	53.9	13.9	Floor noise
Vert.	10520.000	PK	50.5	39.9	-2.5	33.6	-	54.4	68.2	13.9	
Vert.	15780.000	PK	43.1	37.0	0.2	32.6	-	47.6	73.9	26.3	Floor noise
Vert.	15780.000	AV	35.5	37.0	0.2	32.6	-	40.0	53.9	13.9	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 (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No.	13665469H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita	Yuta Moriya	Ken Fujita	Ken Fujita
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)	(Below 1 GHz)
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.	46.992	QP	22.0	12.3	7.5	32.2	-	9.6	40.0	30.4	
Hori.	87.689	QP	22.4	8.3	8.1	32.2	-	6.6	40.0	33.4	
Hori.	156.146	QP	21.7	15.5	8.9	32.1	-	13.9	43.5	29.6	
Hori.	246.530	QP	22.3	11.7	9.7	32.1	-	11.7	46.0	34.3	
Hori.	396.957	QP	22.3	15.6	10.9	32.0	-	16.7	46.0	29.3	
Hori.	578.739	QP	22.4	18.6	12.0	32.0	-	20.9	46.0	25.1	
Hori.	5350.000	PK	46.3	31.5	6.1	31.7	-	52.2	73.9	21.7	
Hori.	10640.000	PK	46.6	39.9	-2.4	33.6	-	50.5	73.9	23.4	
Hori.	15960.000	PK	43.3	37.6	0.3	32.8	-	48.4	73.9	25.5	Floor noise
Hori.	5350.000	AV	32.4	31.5	6.1	31.7	2.0	40.3	53.9	13.6	*1)
Hori.	10640.000	AV	39.6	39.9	-2.4	33.6	2.0	45.4	53.9	8.5	
Hori.	15960.000	AV	35.0	37.6	0.3	32.8	-	40.2	53.9	13.7	Floor noise
Vert.	46.992	QP	24.6	12.3	7.5	32.2	-	12.2	40.0	27.8	
Vert.	87.689	QP	22.2	8.3	8.1	32.2	-	6.4	40.0	33.6	
Vert.	156.146	QP	22.6	15.5	8.9	32.1	-	14.8	43.5	28.7	
Vert.	246.530	QP	22.1	11.7	9.7	32.1	-	11.5	46.0	34.5	
Vert.	396.957	QP	22.2	15.6	10.9	32.0	-	16.6	46.0	29.4	
Vert.	578.739	QP	22.4	18.6	12.0	32.0	-	20.9	46.0	25.1	
Vert.	5350.000	PK	44.1	31.5	6.1	31.7	-	50.0	73.9	23.9	
Vert.	10640.000	PK	48.6	39.9	-2.4	33.6	-	52.5	73.9	21.4	
Vert.	15960.000	PK	43.3	37.6	0.3	32.8	-	48.5	73.9	25.5	Floor noise
Vert.	5350.000	AV	30.9	31.5	6.1	31.7	2.0	38.8	53.9	15.1	*1)
Vert.	10640.000	AV	42.6	39.9	-2.4	33.6	2.0	48.5	53.9	5.4	
Vert.	15960.000	AV	35.0	37.6	0.3	32.8	-	40.2	53.9	13.8	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 (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

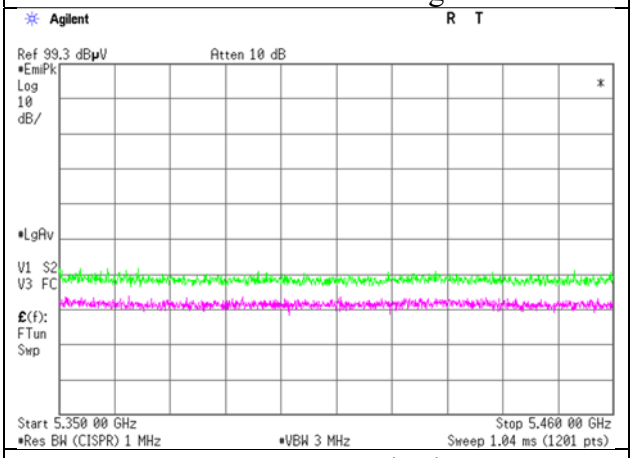
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11a 5320 MHz

Horizontal

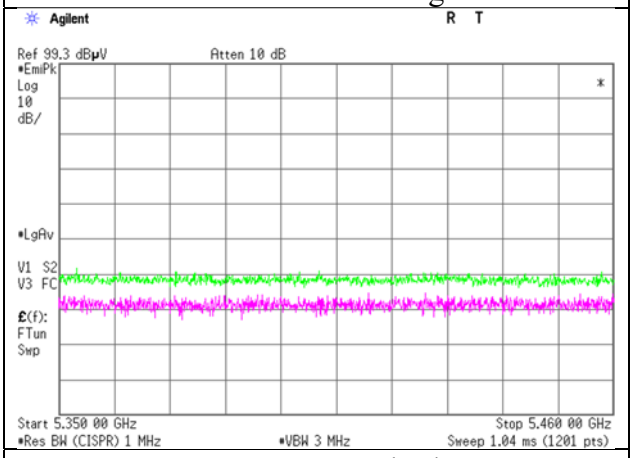
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 18 GHz)	Ken Fujita (18 GHz - 40 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	46.3	31.7	6.1	31.7	-	52.4	73.9	21.5	
Hori.	5470.000	PK	45.9	31.7	6.1	31.7	-	52.0	73.9	21.9	
Hori.	11000.000	PK	47.3	40.0	-2.3	33.6	-	51.4	73.9	22.5	
Hori.	16500.000	PK	43.2	39.5	0.0	32.7	-	50.1	68.2	18.1	Floor noise
Hori.	5460.000	AV	32.1	31.7	6.1	31.7	2.0	40.2	53.9	13.8	*1)
Hori.	5470.000	AV	32.2	31.7	6.1	31.7	2.0	40.3	53.9	13.6	*1)
Hori.	11000.000	AV	40.1	40.0	-2.3	33.6	2.0	46.2	53.9	7.7	
Vert.	5460.000	PK	44.8	31.7	6.1	31.7	-	50.9	73.9	23.0	
Vert.	5470.000	PK	43.9	31.7	6.1	31.7	-	50.0	73.9	23.9	
Vert.	11000.000	PK	49.8	40.0	-2.3	33.6	-	53.9	73.9	20.0	
Vert.	16500.000	PK	43.3	39.5	0.0	32.7	-	50.1	68.2	18.1	Floor noise
Vert.	5460.000	AV	32.7	31.7	6.1	31.7	2.0	40.8	53.9	13.2	*1)
Vert.	5470.000	AV	31.7	31.7	6.1	31.7	2.0	39.8	53.9	14.1	*1)
Vert.	11000.000	AV	43.2	40.0	-2.3	33.6	2.0	49.3	53.9	4.6	

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 (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

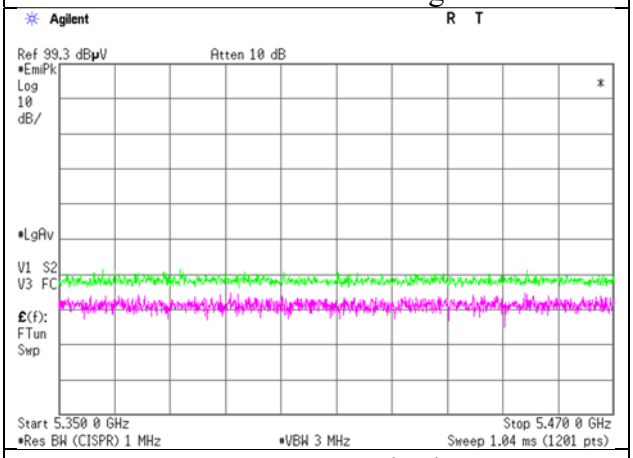
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11a 5500 MHz

Horizontal

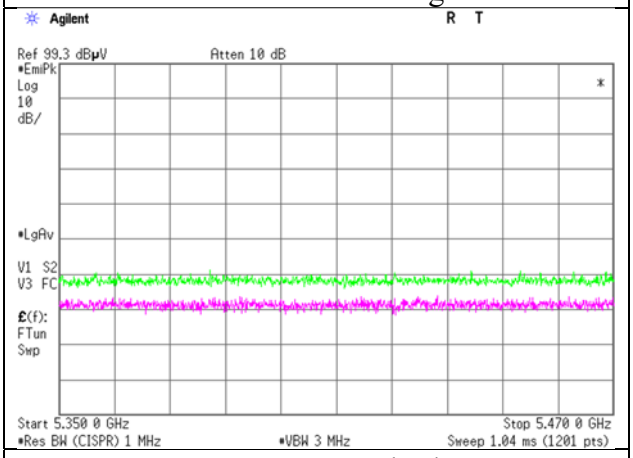
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 18 GHz)	Ken Fujita (18 GHz - 40 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	48.7	39.6	-2.2	33.6	-	52.5	73.9	21.4	
Hori.	16740.000	PK	42.1	40.9	-0.2	32.7	-	50.1	68.2	18.1	Floor noise
Hori.	11160.000	AV	40.6	39.6	-2.2	33.6	2.0	46.5	53.9	7.4	
Vert.	11160.000	PK	44.5	39.6	-2.2	33.6	-	48.4	73.9	25.5	
Vert.	16740.000	PK	42.1	40.9	-0.2	32.7	-	50.1	68.2	18.1	Floor noise
Vert.	11160.000	AV	37.0	39.6	-2.2	33.6	2.0	42.8	53.9	11.1	

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 (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No.	13665469H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 18 GHz)	Ken Fujita (18 GHz - 40 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	46.0	32.0	6.2	31.8	-	52.4	122.2	69.9	
Hori.	11400.000	PK	44.0	39.9	-2.0	33.5	-	48.3	73.9	25.6	
Hori.	17100.000	PK	43.4	42.0	-0.3	32.6	-	52.5	68.2	15.7	Floor noise
Hori.	5725.000	AV	34.3	32.0	6.2	31.8	2.0	42.6	53.9	11.3	*1)
Hori.	11400.000	AV	36.2	39.9	-2.0	33.5	2.0	42.5	53.9	11.4	
Vert.	5725.000	PK	48.9	32.0	6.2	31.8	-	55.3	122.2	67.0	
Vert.	11400.000	PK	46.0	39.9	-2.0	33.5	-	50.4	73.9	23.5	
Vert.	17100.000	PK	43.3	42.0	-0.3	32.6	-	52.4	68.2	15.8	Floor noise
Vert.	5725.000	AV	34.7	32.0	6.2	31.8	2.0	43.0	53.9	10.9	*1)
Vert.	11400.000	AV	37.7	39.9	-2.0	33.5	2.0	44.0	53.9	9.9	

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 (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

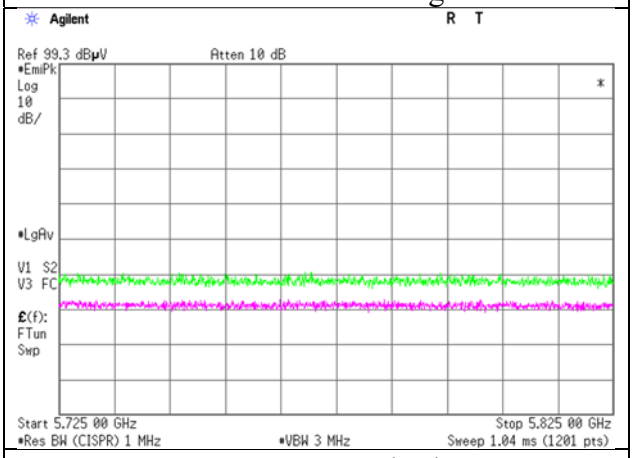
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11a 5700 MHz

Horizontal

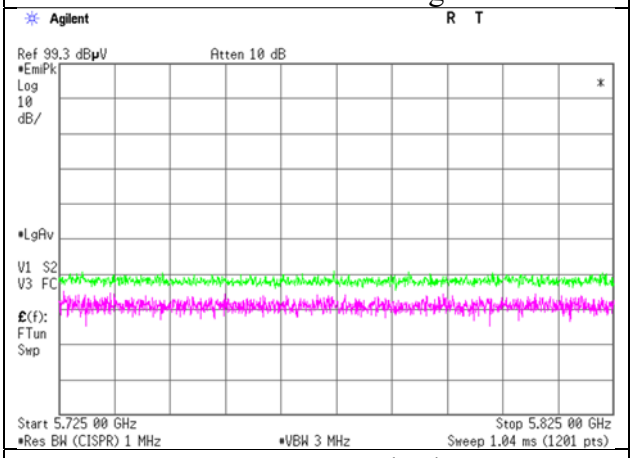
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita	Yuta Moriya	Ken Fujita
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 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.	5650.000	PK	44.7	31.7	6.2	31.8	-	50.7	68.2	17.5	
Hori.	5700.000	PK	43.1	31.8	6.2	31.8	-	49.3	105.2	55.9	
Hori.	5720.000	PK	43.8	31.9	6.2	31.8	-	50.1	110.8	60.7	
Hori.	5725.000	PK	44.4	32.0	6.2	31.8	-	50.8	122.2	71.5	
Hori.	11490.000	PK	44.5	39.7	-1.9	33.5	-	48.8	73.9	25.1	
Hori.	17235.000	PK	43.5	42.6	-0.2	32.7	-	53.2	68.2	15.0	Floor noise
Hori.	5650.000	AV	33.2	31.7	6.2	31.8	2.0	41.2	53.9	12.7	
Hori.	5700.000	AV	33.1	31.8	6.2	31.8	2.0	41.3	53.9	12.6	
Hori.	5720.000	AV	33.0	31.9	6.2	31.8	2.0	41.3	53.9	12.6	
Hori.	5725.000	AV	33.2	32.0	6.2	31.8	2.0	41.5	53.9	12.4	*1)
Hori.	11490.000	AV	37.2	39.7	-1.9	33.5	2.0	43.5	53.9	10.4	
Vert.	5650.000	PK	44.5	31.7	6.2	31.8	-	50.5	68.2	17.7	
Vert.	5700.000	PK	43.3	31.8	6.2	31.8	-	49.5	105.2	55.7	
Vert.	5720.000	PK	43.7	31.9	6.2	31.8	-	50.0	110.8	60.8	
Vert.	5725.000	PK	44.3	32.0	6.2	31.8	-	50.7	122.2	71.6	
Vert.	11490.000	PK	45.7	39.7	-1.9	33.5	-	50.0	73.9	23.9	
Vert.	17235.000	PK	43.3	42.6	-0.2	32.7	-	52.9	68.2	15.3	Floor noise
Vert.	5650.000	AV	32.8	31.7	6.2	31.8	2.0	40.8	53.9	13.1	
Vert.	5700.000	AV	32.9	31.8	6.2	31.8	2.0	41.1	53.9	12.8	
Vert.	5720.000	AV	33.0	31.9	6.2	31.8	2.0	41.3	53.9	12.6	
Vert.	5725.000	AV	33.1	32.0	6.2	31.8	2.0	41.4	53.9	12.5	*1)
Vert.	11490.000	AV	40.5	39.7	-1.9	33.5	2.0	46.7	53.9	7.2	

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 (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

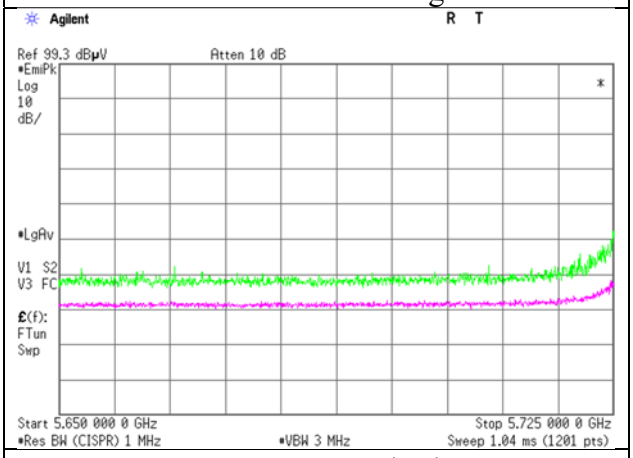
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11a 5745 MHz

Horizontal

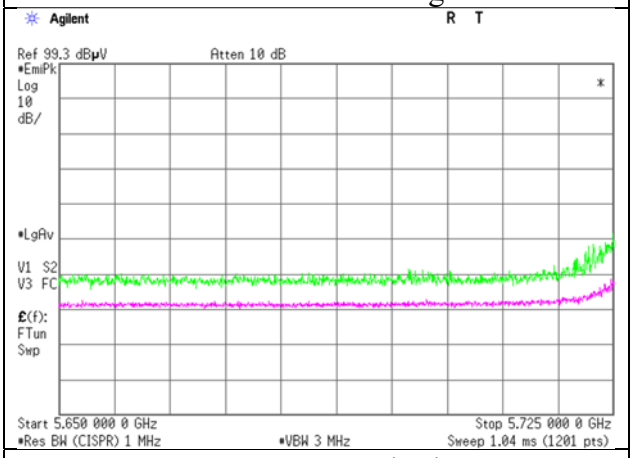
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 18 GHz)	Ken Fujita (18 GHz - 40 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.	11650.000	PK	45.3	39.2	-1.8	33.4	-	49.3	73.9	24.6	
Hori.	17475.000	PK	42.2	44.6	-0.1	32.7	-	54.0	68.2	14.2	Floor noise
Hori.	11650.000	AV	38.7	39.2	-1.8	33.4	2.0	44.6	53.9	9.3	
Vert.	11650.000	PK	46.6	39.2	-1.8	33.4	-	50.6	73.9	23.3	
Vert.	17475.000	PK	42.5	44.6	-0.1	32.7	-	54.3	68.2	13.9	Floor noise
Vert.	11650.000	AV	39.9	39.2	-1.8	33.4	2.0	45.8	53.9	8.1	

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 (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No.	13665469H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 18 GHz)	Ken Fujita (18 GHz - 40 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	42.2	32.3	6.2	31.8	-	48.9	122.2	73.3	
Hori.	5855.000	PK	41.8	32.3	6.2	31.8	-	48.5	110.8	62.3	
Hori.	5875.000	PK	42.4	32.3	6.3	31.8	-	49.2	105.2	56.1	
Hori.	5925.000	PK	42.8	32.4	6.3	31.9	-	49.6	68.2	18.6	
Hori.	11650.000	PK	45.3	39.2	-1.8	33.4	-	49.3	73.9	24.6	
Hori.	17475.000	PK	42.2	44.6	-0.1	32.7	-	54.0	68.2	14.2	Floor noise
Hori.	5850.000	AV	34.6	32.3	6.2	31.8	2.0	43.3	53.9	10.6	
Hori.	5855.000	AV	33.2	32.3	6.2	31.8	2.0	41.9	53.9	12.0	
Hori.	5875.000	AV	32.2	32.3	6.3	31.8	2.0	40.9	53.9	13.0	
Hori.	5925.000	AV	32.7	32.4	6.3	31.9	2.0	41.5	53.9	12.4	
Hori.	11650.000	AV	38.7	39.2	-1.8	33.4	2.0	44.6	53.9	9.3	
Vert.	5850.000	PK	42.6	32.3	6.2	31.8	-	49.3	122.2	72.9	
Vert.	5855.000	PK	42.3	32.3	6.2	31.8	-	49.0	110.8	61.8	
Vert.	5875.000	PK	42.2	32.3	6.3	31.8	-	49.0	105.2	56.3	
Vert.	5925.000	PK	42.1	32.4	6.3	31.9	-	48.9	68.2	19.3	
Vert.	11650.000	PK	46.6	39.2	-1.8	33.4	-	50.6	73.9	23.3	
Vert.	17475.000	PK	42.5	44.6	-0.1	32.7	-	54.3	68.2	13.9	Floor noise
Vert.	5850.000	AV	33.4	32.3	6.2	31.8	2.0	42.1	53.9	11.8	
Vert.	5855.000	AV	33.4	32.3	6.2	31.8	2.0	42.1	53.9	11.8	
Vert.	5875.000	AV	34.1	32.3	6.3	31.8	2.0	42.8	53.9	11.1	
Vert.	5925.000	AV	32.4	32.4	6.3	31.9	2.0	41.2	53.9	12.7	
Vert.	11650.000	AV	39.9	39.2	-1.8	33.4	2.0	45.8	53.9	8.1	

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).

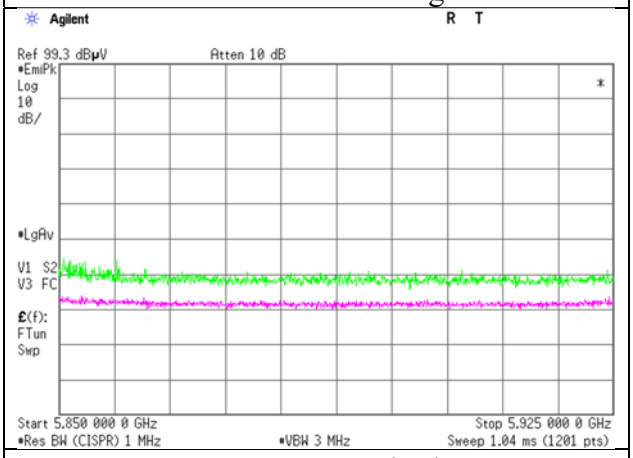
Distance factor: 1 GHz - 10 GHz 20log (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11a 5825 MHz

Horizontal

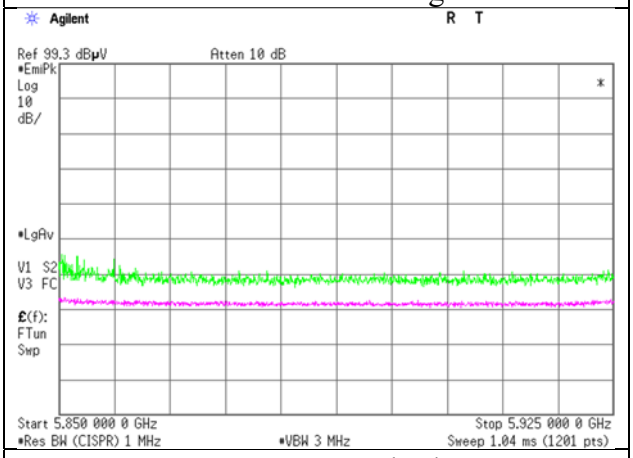
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita (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	46.9	32.0	6.0	31.6	-	53.2	73.9	20.7	
Hori.	5150.000	AV	32.2	32.0	6.0	31.6	2.3	40.8	53.9	13.1	*1)
Vert.	5150.000	PK	46.6	32.0	6.0	31.6	-	52.9	73.9	21.0	
Vert.	5150.000	AV	32.4	32.0	6.0	31.6	2.3	41.0	53.9	12.9	*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).

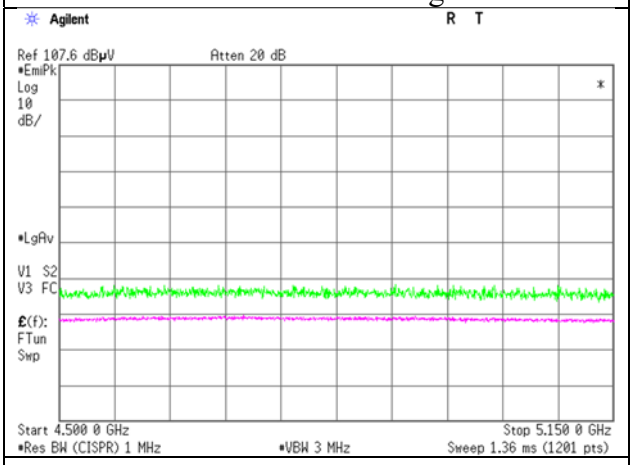
Distance factor: 1 GHz - 10 GHz 20log (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11n-20 5180 MHz

Horizontal

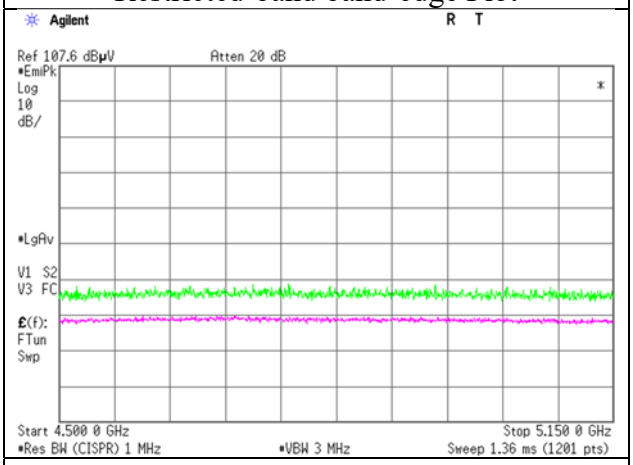
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
	(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	46.9	31.5	6.1	31.7	-	52.8	73.9	21.1	
Hori.	5350.000	AV	33.1	31.5	6.1	31.7	2.3	41.3	53.9	12.6	*1)
Vert.	5350.000	PK	44.3	31.5	6.1	31.7	-	50.2	73.9	23.7	
Vert.	5350.000	AV	31.1	31.5	6.1	31.7	2.3	39.3	53.9	14.6	*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).

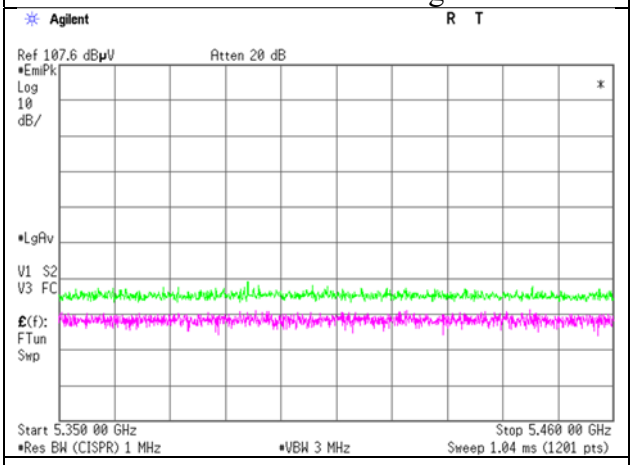
Distance factor: 1 GHz - 10 GHz 20log (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11n-20 5320 MHz

Horizontal

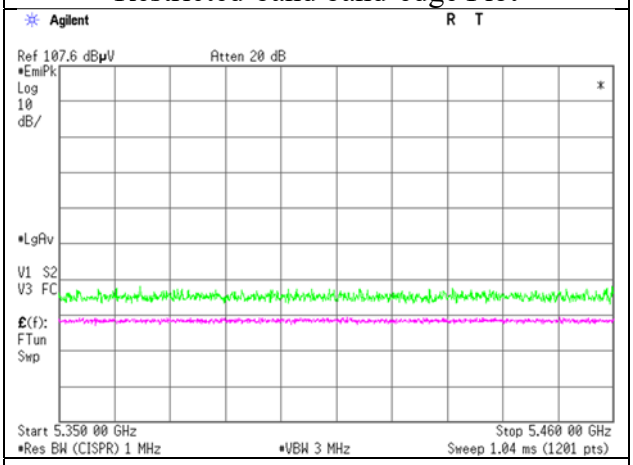
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
	(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	46.9	31.7	6.1	31.7	-	53.0	73.9	20.9	
Hori.	5470.000	PK	46.3	31.7	6.1	31.7	-	52.4	73.9	21.5	
Hori.	5460.000	AV	33.1	31.7	6.1	31.7	2.3	41.5	53.9	12.4	*1)
Hori.	5470.000	AV	32.7	31.7	6.1	31.7	2.3	41.1	53.9	12.8	*1)
Vert.	5460.000	PK	44.9	31.7	6.1	31.7	-	51.0	73.9	22.9	
Vert.	5470.000	PK	44.1	31.7	6.1	31.7	-	50.2	73.9	23.7	
Vert.	5460.000	AV	32.7	31.7	6.1	31.7	2.3	41.1	53.9	12.8	*1)
Vert.	5470.000	AV	32.0	31.7	6.1	31.7	2.3	40.4	53.9	13.5	*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).

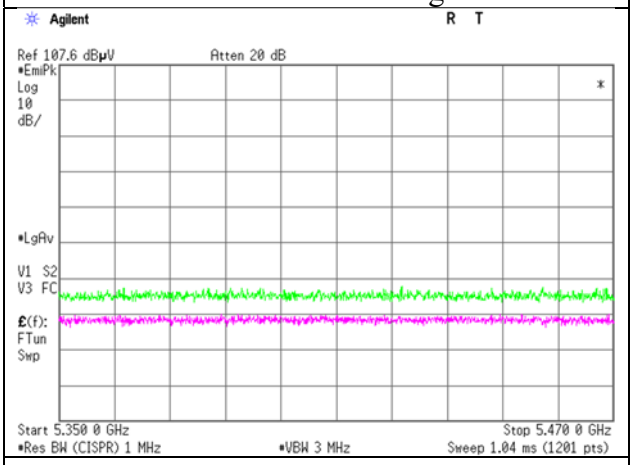
Distance factor: 1 GHz - 10 GHz 20log (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11n-20 5500 MHz

Horizontal

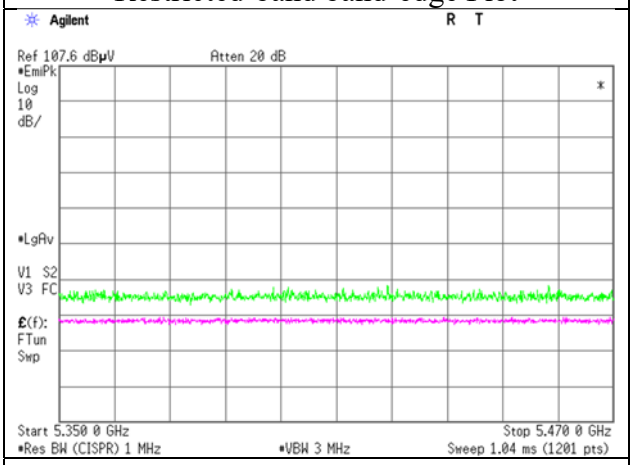
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
	(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	46.3	32.0	6.2	31.8	-	52.7	122.2	69.6	
Hori.	5725.000	AV	34.2	32.0	6.2	31.8	2.3	42.9	53.9	11.0	*1)
Vert.	5725.000	PK	48.4	32.0	6.2	31.8	-	54.8	122.2	67.5	
Vert.	5725.000	AV	34.6	32.0	6.2	31.8	2.3	43.3	53.9	10.6	*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 (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

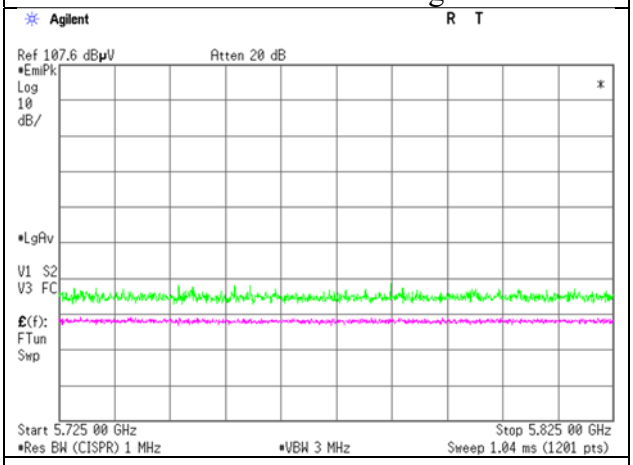
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11n-20 5700 MHz

Horizontal

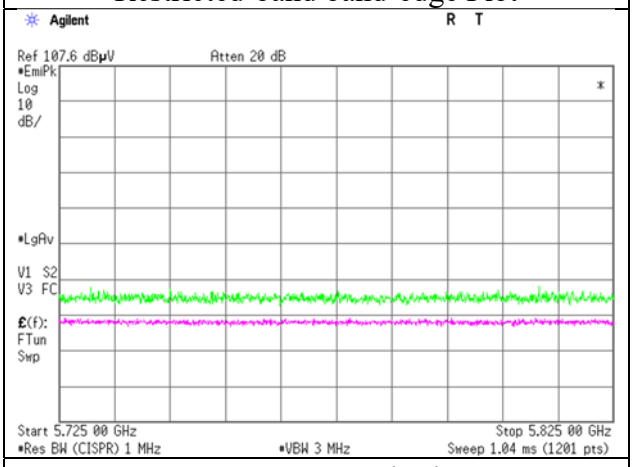
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
	(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.	5650.000	PK	44.8	31.7	6.2	31.8	-	50.8	68.2	17.4	
Hori.	5700.000	PK	44.1	31.8	6.2	31.8	-	50.3	105.2	54.9	
Hori.	5720.000	PK	44.4	31.9	6.2	31.8	-	50.7	110.8	60.1	
Hori.	5725.000	PK	44.4	32.0	6.2	31.8	-	50.8	122.2	71.5	
Hori.	5650.000	AV	33.1	31.7	6.2	31.8	2.3	41.5	53.9	12.4	
Hori.	5700.000	AV	33.4	31.8	6.2	31.8	2.3	41.9	53.9	12.0	
Hori.	5720.000	AV	32.7	31.9	6.2	31.8	2.3	41.4	53.9	12.5	
Hori.	5725.000	AV	33.0	32.0	6.2	31.8	2.3	41.7	53.9	12.2	*1)
Vert.	5650.000	PK	43.8	31.7	6.2	31.8	-	49.8	68.2	18.4	
Vert.	5700.000	PK	43.6	31.8	6.2	31.8	-	49.8	105.2	55.4	
Vert.	5720.000	PK	43.7	31.9	6.2	31.8	-	50.0	110.8	60.8	
Vert.	5725.000	PK	44.2	32.0	6.2	31.8	-	50.6	122.2	71.7	
Vert.	5650.000	AV	32.8	31.7	6.2	31.8	2.3	41.2	53.9	12.7	
Vert.	5700.000	AV	32.9	31.8	6.2	31.8	2.3	41.4	53.9	12.5	
Vert.	5720.000	AV	32.7	31.9	6.2	31.8	2.3	41.4	53.9	12.5	
Vert.	5725.000	AV	33.3	32.0	6.2	31.8	2.3	42.0	53.9	11.9	*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 (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

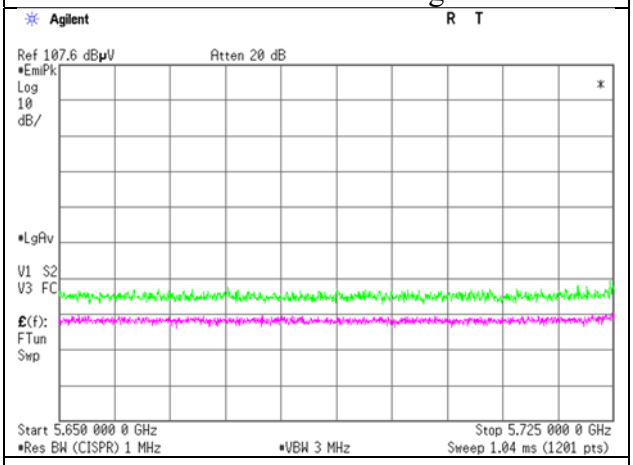
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11n-20 5745 MHz

Horizontal

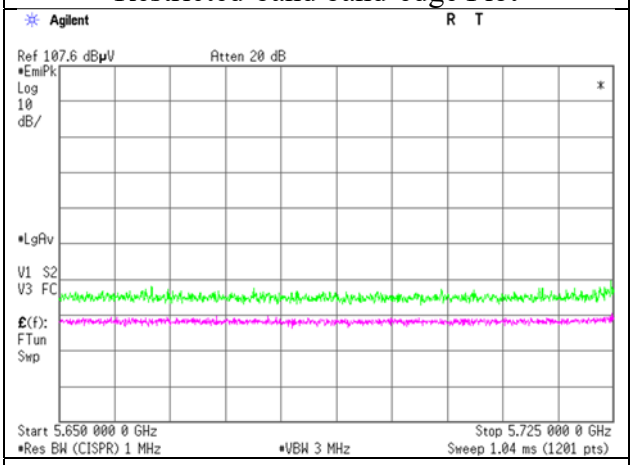
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
	(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	43.1	32.3	6.2	31.8	-	49.8	122.2	72.4	
Hori.	5855.000	PK	42.2	32.3	6.2	31.8	-	48.9	110.8	61.9	
Hori.	5875.000	PK	42.6	32.3	6.3	31.8	-	49.4	105.2	55.9	
Hori.	5925.000	PK	42.8	32.4	6.3	31.9	-	49.6	68.2	18.6	
Hori.	5850.000	AV	33.9	32.3	6.2	31.8	2.3	42.9	53.9	11.0	
Hori.	5855.000	AV	34.1	32.3	6.2	31.8	2.3	43.2	53.9	10.8	
Hori.	5875.000	AV	33.6	32.3	6.3	31.8	2.3	42.7	53.9	11.2	
Hori.	5925.000	AV	33.0	32.4	6.3	31.9	2.3	42.1	53.9	11.8	
Vert.	5850.000	PK	43.1	32.3	6.2	31.8	-	49.8	122.2	72.4	
Vert.	5855.000	PK	43.0	32.3	6.2	31.8	-	49.7	110.8	61.1	
Vert.	5875.000	PK	42.7	32.3	6.3	31.8	-	49.5	105.2	55.8	
Vert.	5925.000	PK	42.3	32.4	6.3	31.9	-	49.1	68.2	19.1	
Vert.	5850.000	AV	33.2	32.3	6.2	31.8	2.3	42.2	53.9	11.7	
Vert.	5855.000	AV	33.6	32.3	6.2	31.8	2.3	42.7	53.9	11.3	
Vert.	5875.000	AV	34.1	32.3	6.3	31.8	2.3	43.2	53.9	10.7	
Vert.	5925.000	AV	33.3	32.4	6.3	31.9	2.3	42.4	53.9	11.5	

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).

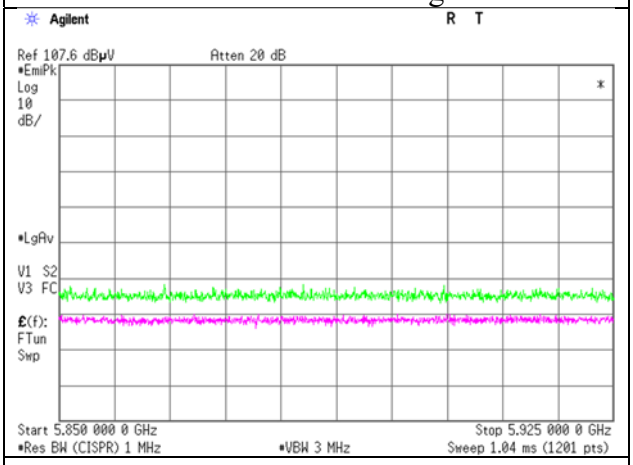
Distance factor:	1 GHz - 10 GHz	20log (3.9 m / 3.0 m) = 2.28 dB
	10 GHz - 40 GHz	20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11n-20 5825 MHz

Horizontal

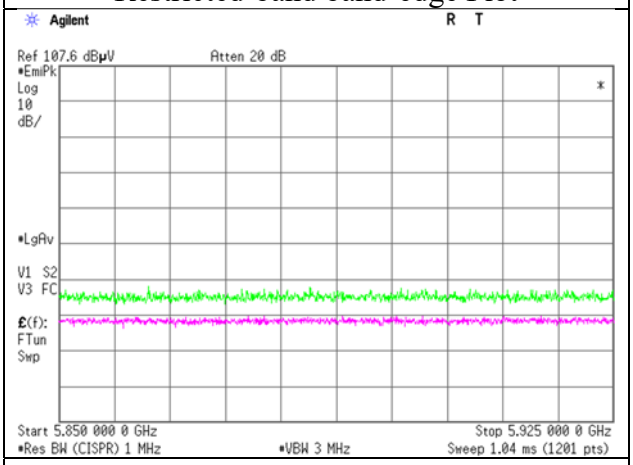
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 18 GHz)	Ken Fujita (18 GHz - 40 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	46.7	32.0	6.0	31.6	-	53.0	73.9	20.9	
Hori.	10380.000	PK	45.4	40.0	-2.5	33.5	-	49.4	68.2	18.8	
Hori.	15570.000	PK	43.2	37.2	0.0	32.5	-	48.0	73.9	25.9	Floor noise
Hori.	20760.000	PK	46.0	37.9	-1.5	33.2	-	49.2	73.9	24.7	Floor noise
Hori.	5150.000	AV	33.5	32.0	6.0	31.6	3.6	43.4	53.9	10.5	*1)
Hori.	15570.000	AV	36.0	37.2	0.0	32.5	-	40.8	53.9	13.1	Floor noise
Hori.	20760.000	AV	36.7	37.9	-1.5	33.2	-	39.8	53.9	14.1	Floor noise
Vert.	5150.000	PK	45.8	32.0	6.0	31.6	-	52.1	73.9	21.8	
Vert.	10380.000	PK	49.3	40.0	-2.5	33.5	-	53.2	68.2	15.0	
Vert.	15570.000	PK	43.9	37.2	0.0	32.5	-	48.7	73.9	25.2	Floor noise
Vert.	20760.000	PK	47.0	37.9	-1.5	33.2	-	50.2	73.9	23.7	Floor noise
Vert.	5150.000	AV	33.1	32.0	6.0	31.6	3.6	43.0	53.9	10.9	*1)
Vert.	15570.000	AV	36.0	37.2	0.0	32.5	-	40.8	53.9	13.1	Floor noise
Vert.	20760.000	AV	36.0	37.9	-1.5	33.2	-	39.2	53.9	14.7	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 (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

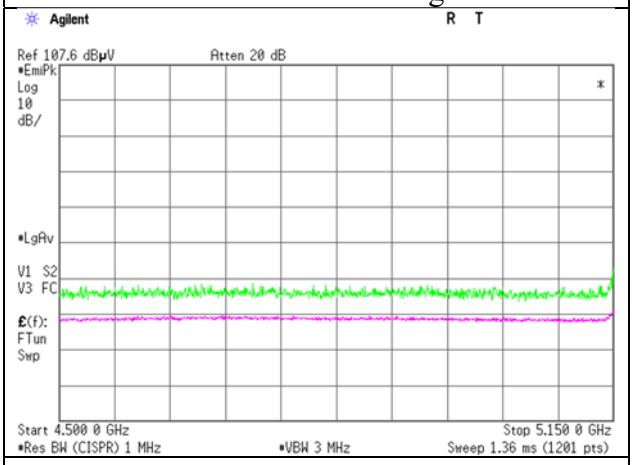
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11n-40 5190 MHz

Horizontal

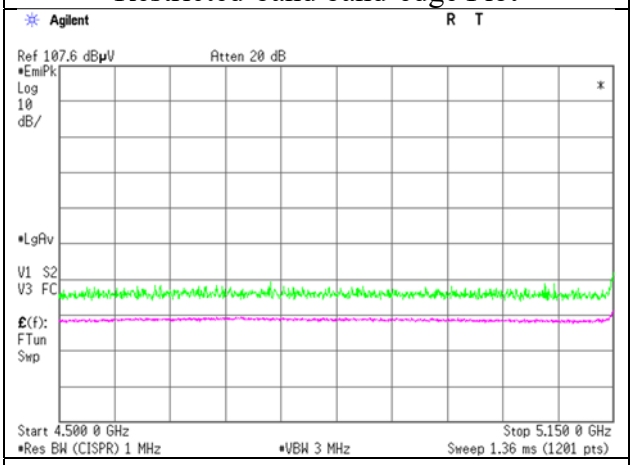
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 18 GHz)	Ken Fujita (18 GHz - 40 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	45.6	39.9	-2.5	33.6	-	49.5	68.2	18.7	
Hori.	15810.000	PK	42.6	36.8	0.2	32.7	-	46.9	73.9	27.0	Floor noise
Hori.	21080.000	PK	46.2	38.0	-1.4	33.2	-	49.6	73.9	24.3	Floor noise
Hori.	15810.000	AV	35.4	36.8	0.2	32.7	-	39.7	53.9	14.2	Floor noise
Hori.	21080.000	AV	36.7	38.0	-1.4	33.2	-	40.1	53.9	13.8	Floor noise
Vert.	10540.000	PK	46.0	39.9	-2.5	33.6	-	49.9	68.2	18.3	
Vert.	15810.000	PK	42.7	36.8	0.2	32.7	-	47.0	73.9	26.9	Floor noise
Vert.	21080.000	PK	47.3	38.0	-1.4	33.2	-	50.7	73.9	23.2	Floor noise
Vert.	15810.000	AV	35.4	36.8	0.2	32.7	-	39.7	53.9	14.2	Floor noise
Vert.	21080.000	AV	36.3	38.0	-1.4	33.2	-	39.7	53.9	14.2	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 (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No.	13665469H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 18 GHz)	Ken Fujita (18 GHz - 40 GHz)
Mode	Tx 11n-40 5310 MHz		

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
5350.000	PK	45.6	31.5	6.0	31.7	-	51.4	73.9	22.5	
10620.000	PK	45.1	39.9	-2.4	33.6	-	49.0	73.9	25.0	
15930.000	PK	42.1	37.3	0.3	32.7	-	47.0	73.9	26.9	Floor noise
21240.000	PK	47.1	38.1	-1.4	33.1	-	50.7	73.9	23.3	Floor noise
5350.000	AV	32.2	31.5	6.0	31.7	3.6	41.6	53.9	12.3	*1)
10620.000	AV	37.3	39.9	-2.4	33.6	3.6	44.8	53.9	9.1	
15930.000	AV	35.2	37.3	0.3	32.7	-	40.1	53.9	13.8	Floor noise
21240.000	AV	35.9	38.1	-1.4	33.1	-	39.5	53.9	14.5	Floor noise
5350.000	PK	45.2	31.5	6.0	31.7	-	51.0	73.9	22.9	
10620.000	PK	44.9	39.9	-2.4	33.6	-	48.8	73.9	25.1	
15930.000	PK	42.1	37.3	0.3	32.7	-	47.0	73.9	26.9	Floor noise
21240.000	PK	47.3	38.1	-1.4	33.1	-	50.9	73.9	23.1	Floor noise
5350.000	AV	32.4	31.5	6.0	31.7	3.6	41.8	53.9	12.1	*1)
10620.000	AV	38.7	39.9	-2.4	33.6	3.6	46.2	53.9	7.7	
15930.000	AV	35.3	37.3	0.3	32.7	-	40.2	53.9	13.7	Floor noise
21240.000	AV	36.1	38.1	-1.4	33.1	-	39.7	53.9	14.3	Floor noise

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

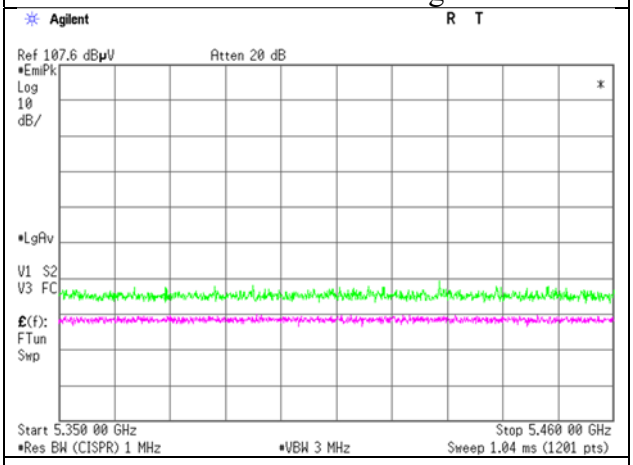
factor: 1 GHz - 10 GHz 20log (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
ut of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11n-40 5310 MHz

Horizontal

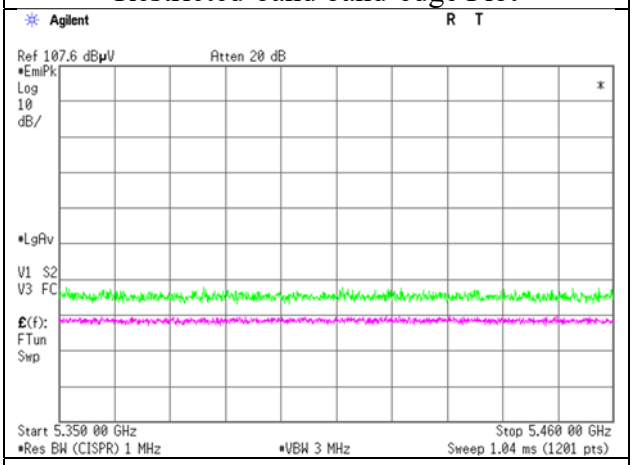
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 18 GHz)	Ken Fujita (18 GHz - 40 GHz)
Mode	Tx 11n40 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	43.0	31.7	6.1	31.7	-	49.1	73.9	24.8	
Hori.	5470.000	PK	42.8	31.7	6.1	31.7	-	48.9	73.9	25.0	
Hori.	11020.000	PK	45.8	40.0	-2.3	33.6	-	49.9	73.9	24.0	
Hori.	16530.000	PK	43.3	39.6	0.0	32.7	-	50.2	68.2	18.1	Floor noise
Hori.	22040.000	PK	48.0	38.1	-1.4	32.4	-	52.2	73.9	21.7	Floor noise
Hori.	5460.000	AV	33.1	31.7	6.1	31.7	3.6	42.8	53.9	11.1	*1)
Hori.	5470.000	AV	33.2	31.7	6.1	31.7	3.6	42.9	53.9	11.0	*1)
Hori.	11020.000	AV	38.8	40.0	-2.3	33.6	3.6	46.5	53.9	7.4	
Hori.	22040.000	AV	37.7	38.1	-1.4	32.4	-	41.9	53.9	12.0	Floor noise
Vert.	5460.000	PK	43.2	31.7	6.1	31.7	-	49.3	73.9	24.6	
Vert.	5470.000	PK	42.6	31.7	6.1	31.7	-	48.7	73.9	25.2	
Vert.	11020.000	PK	45.9	40.0	-2.3	33.6	-	50.0	73.9	23.9	
Vert.	16530.000	PK	43.3	39.6	0.0	32.7	-	50.2	68.2	18.1	Floor noise
Vert.	22040.000	PK	47.2	38.1	-1.4	32.4	-	51.4	73.9	22.5	Floor noise
Vert.	5460.000	AV	33.3	31.7	6.1	31.7	3.6	43.0	53.9	10.9	*1)
Vert.	5470.000	AV	33.1	31.7	6.1	31.7	3.6	42.8	53.9	11.1	*1)
Vert.	11020.000	AV	40.2	40.0	-2.3	33.6	3.6	47.8	53.9	6.1	
Vert.	22040.000	AV	38.1	38.1	-1.4	32.4	-	42.3	53.9	11.6	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 (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

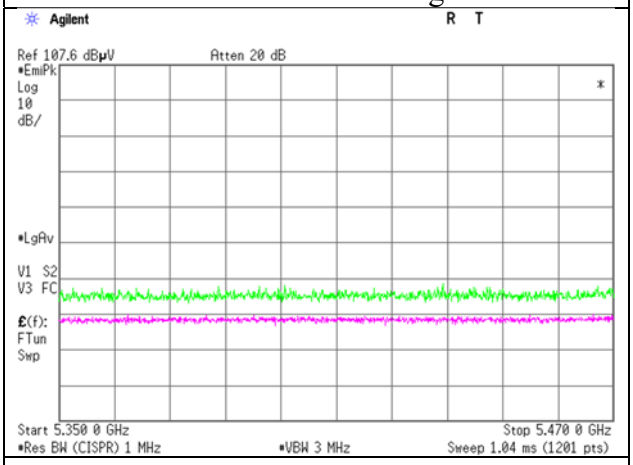
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11n-40 5510 MHz

Horizontal

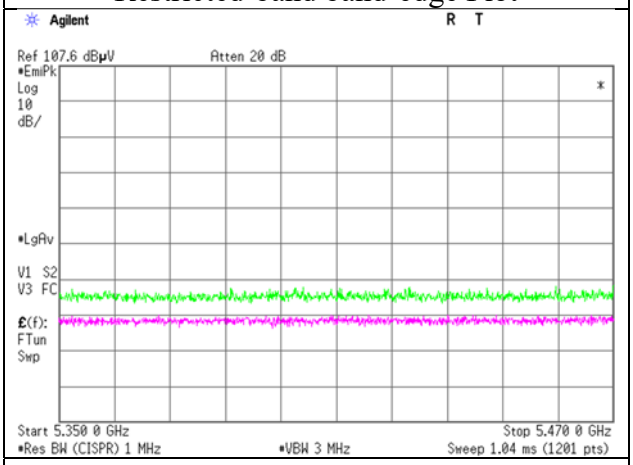
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 18 GHz)	Ken Fujita (18 GHz - 40 GHz)
Mode	Tx 11n40 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	44.2	39.6	-2.2	33.6	-	48.0	73.9	26.0	
Hori.	16650.000	PK	42.4	40.2	-0.1	32.7	-	49.8	68.2	18.4	Floor noise
Hori.	22200.000	PK	45.1	38.1	-1.4	32.4	-	49.4	73.9	24.5	Floor noise
Hori.	11100.000	AV	37.3	39.6	-2.2	33.6	3.6	44.7	53.9	9.2	
Hori.	22200.000	AV	35.9	38.1	-1.4	32.4	-	40.2	53.9	13.7	Floor noise
Vert.	11100.000	PK	45.7	39.6	-2.2	33.6	-	49.5	73.9	24.4	
Vert.	16650.000	PK	42.4	40.2	-0.1	32.7	-	49.8	68.2	18.4	Floor noise
Vert.	22200.000	PK	44.7	38.1	-1.4	32.4	-	49.0	73.9	24.9	Floor noise
Vert.	11100.000	AV	38.6	39.6	-2.2	33.6	3.6	46.0	53.9	7.9	
Vert.	22200.000	AV	36.1	38.1	-1.4	32.4	-	40.4	53.9	13.5	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 (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No.	13665469H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 18 GHz)	Ken Fujita (18 GHz - 40 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	44.6	32.0	6.2	31.8	-	51.0	122.2	71.3	
Hori.	11340.000	PK	45.0	39.8	-2.1	33.5	-	49.3	73.9	24.6	
Hori.	17010.000	PK	42.2	41.7	-0.3	32.6	-	51.0	68.2	17.3	Floor noise
Hori.	22680.000	PK	45.6	38.3	-1.3	32.3	-	50.3	73.9	23.6	Floor noise
Hori.	5725.000	AV	32.2	32.0	6.2	31.8	3.6	42.2	53.9	11.7	*1)
Hori.	11340.000	AV	36.8	39.8	-2.1	33.5	3.6	44.6	53.9	9.3	
Hori.	22680.000	AV	36.4	38.3	-1.3	32.3	-	41.1	53.9	12.8	Floor noise
Vert.	5725.000	PK	41.4	32.0	6.2	31.8	-	47.7	122.2	74.5	
Vert.	11340.000	PK	44.3	39.8	-2.1	33.5	-	48.5	73.9	25.4	
Vert.	17010.000	PK	42.2	41.7	-0.3	32.6	-	50.9	68.2	17.3	Floor noise
Vert.	22680.000	PK	45.7	38.3	-1.3	32.3	-	50.4	73.9	23.5	Floor noise
Vert.	5725.000	AV	32.3	32.0	6.2	31.8	3.6	42.3	53.9	11.6	*1)
Vert.	11340.000	AV	37.0	39.8	-2.1	33.5	3.6	44.9	53.9	9.1	
Vert.	22680.000	AV	36.7	38.3	-1.3	32.3	-	41.4	53.9	12.5	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 (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

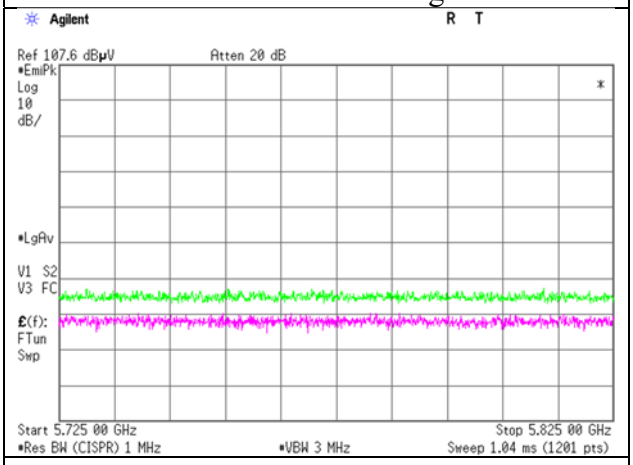
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11n-40 5670 MHz

Horizontal

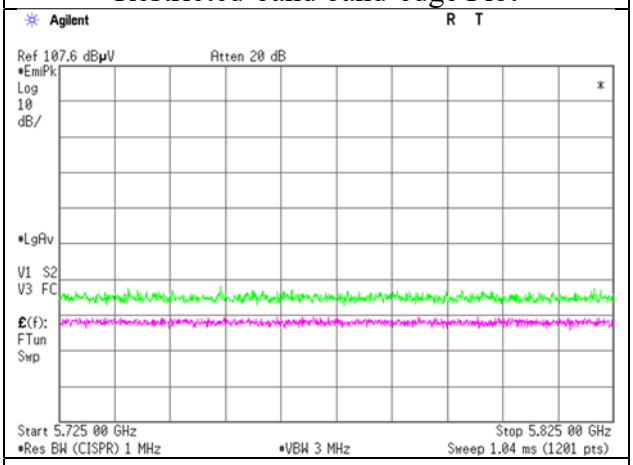
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 18 GHz)	Ken Fujita (18 GHz - 40 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.	5650.000	PK	42.2	31.7	6.2	31.8	-	48.2	68.2	20.0	
Hori.	5700.000	PK	41.8	31.8	6.2	31.8	-	48.0	105.2	57.2	
Hori.	5720.000	PK	42.0	31.9	6.2	31.8	-	48.3	110.8	62.5	
Hori.	5725.000	PK	41.1	32.0	6.2	31.8	-	47.5	122.2	74.8	
Hori.	11510.000	PK	43.8	39.6	-1.9	33.5	-	48.1	73.9	25.8	
Hori.	17265.000	PK	42.5	42.8	-0.2	32.7	-	52.5	68.2	15.7	Floor noise
Hori.	23020.000	PK	45.9	38.5	-1.2	32.3	-	50.9	73.9	23.0	Floor noise
Hori.	5650.000	AV	32.2	31.7	6.2	31.8	3.6	41.9	53.9	12.1	
Hori.	5700.000	AV	33.1	31.8	6.2	31.8	3.6	42.9	53.9	11.0	
Hori.	5720.000	AV	31.9	31.9	6.2	31.8	3.6	41.8	53.9	12.1	
Hori.	5725.000	AV	32.2	32.0	6.2	31.8	3.6	42.2	53.9	11.7	*1)
Hori.	11510.000	AV	36.4	39.6	-1.9	33.5	3.6	44.3	53.9	9.6	
Hori.	23020.000	AV	37.2	38.5	-1.2	32.3	-	42.2	53.9	11.7	Floor noise
Vert.	5650.000	PK	42.3	31.7	6.2	31.8	-	48.3	68.2	19.9	
Vert.	5700.000	PK	42.1	31.8	6.2	31.8	-	48.3	105.2	56.9	
Vert.	5720.000	PK	42.0	31.9	6.2	31.8	-	48.3	110.8	62.5	
Vert.	5725.000	PK	41.8	32.0	6.2	31.8	-	48.2	122.2	74.1	
Vert.	11510.000	PK	45.9	39.6	-1.9	33.5	-	50.1	73.9	23.8	
Vert.	17265.000	PK	42.5	42.8	-0.2	32.7	-	52.5	68.2	15.7	Floor noise
Vert.	23020.000	PK	45.4	38.5	-1.2	32.3	-	50.4	73.9	23.5	Floor noise
Vert.	5650.000	AV	32.3	31.7	6.2	31.8	3.6	42.0	53.9	12.0	
Vert.	5700.000	AV	33.0	31.8	6.2	31.8	3.6	42.8	53.9	11.1	
Vert.	5720.000	AV	32.0	31.9	6.2	31.8	3.6	41.9	53.9	12.0	
Vert.	5725.000	AV	32.1	32.0	6.2	31.8	3.6	42.1	53.9	11.8	*1)
Vert.	11510.000	AV	40.0	39.6	-1.9	33.5	3.6	47.9	53.9	6.0	
Vert.	23020.000	AV	37.1	38.5	-1.2	32.3	-	42.1	53.9	11.8	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 (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

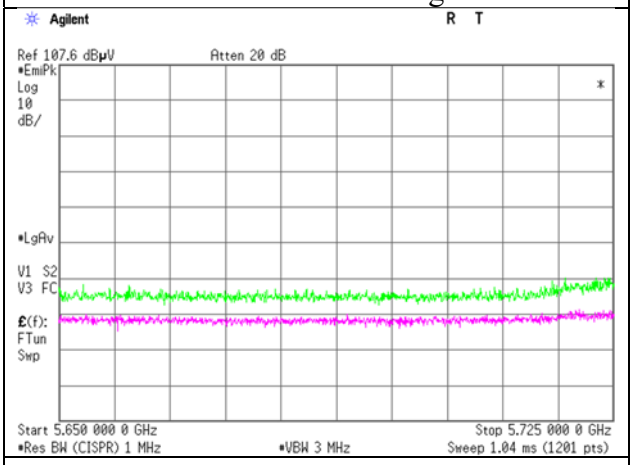
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11n-40 5755 MHz

Horizontal

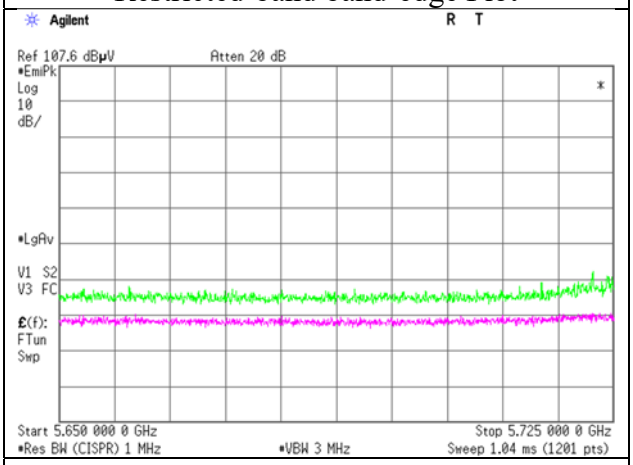
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13665469H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 18 GHz)	Ken Fujita (18 GHz - 40 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.	5650.000	PK	41.5	31.7	6.2	31.8	-	47.5	68.2	20.7	
Hori.	5700.000	PK	41.4	31.8	6.2	31.8	-	47.6	105.2	57.6	
Hori.	5720.000	PK	41.1	31.9	6.2	31.8	-	47.4	110.8	63.4	
Hori.	5725.000	PK	41.2	32.0	6.2	31.8	-	47.6	122.2	74.7	
Hori.	11590.000	PK	45.5	39.2	-1.9	33.4	-	49.4	73.9	24.5	
Hori.	17385.000	PK	42.3	44.2	-0.1	32.7	-	53.7	68.2	14.5	Floor noise
Hori.	23180.000	PK	47.0	38.6	-1.2	32.2	-	52.2	73.9	21.7	Floor noise
Hori.	5650.000	AV	31.1	31.7	6.2	31.8	3.6	40.8	53.9	13.2	
Hori.	5700.000	AV	31.5	31.8	6.2	31.8	3.6	41.3	53.9	12.6	
Hori.	5720.000	AV	31.9	31.9	6.2	31.8	3.6	41.8	53.9	12.1	
Hori.	5725.000	AV	32.0	32.0	6.2	31.8	3.6	42.0	53.9	11.9	*1)
Hori.	11590.000	AV	37.9	39.2	-1.9	33.4	3.6	45.4	53.9	8.5	
Hori.	23180.000	AV	36.9	38.6	-1.2	32.2	-	42.1	53.9	11.8	Floor noise
Vert.	5650.000	PK	41.4	31.7	6.2	31.8	-	47.4	68.2	20.8	
Vert.	5700.000	PK	41.3	31.8	6.2	31.8	-	47.5	105.2	57.7	
Vert.	5720.000	PK	41.7	31.9	6.2	31.8	-	48.0	110.8	62.8	
Vert.	5725.000	PK	42.1	32.0	6.2	31.8	-	48.5	122.2	73.8	
Vert.	11590.000	PK	45.2	39.2	-1.9	33.4	-	49.1	73.9	24.8	
Vert.	17385.000	PK	42.3	44.2	-0.1	32.7	-	53.7	68.2	14.5	Floor noise
Vert.	23180.000	PK	46.3	38.6	-1.2	32.2	-	51.5	73.9	22.4	Floor noise
Vert.	5650.000	AV	32.3	31.7	6.2	31.8	3.6	42.0	53.9	12.0	
Vert.	5700.000	AV	32.2	31.8	6.2	31.8	3.6	42.0	53.9	11.9	
Vert.	5720.000	AV	32.1	31.9	6.2	31.8	3.6	42.0	53.9	11.9	
Vert.	5725.000	AV	31.7	32.0	6.2	31.8	3.6	41.7	53.9	12.2	*1)
Vert.	11590.000	AV	38.9	39.2	-1.9	33.4	3.6	46.4	53.9	7.5	
Vert.	23180.000	AV	37.2	38.6	-1.2	32.2	-	42.4	53.9	11.5	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).

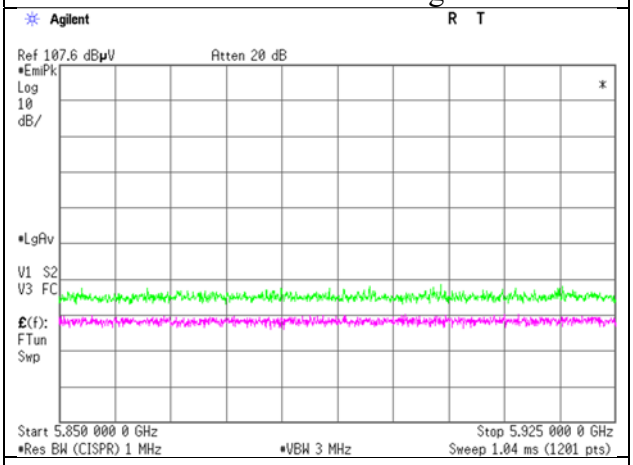
Distance factor: 1 GHz - 10 GHz 20log (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	13665469H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 18, 2021
Temperature / Humidity	21 deg. C / 32 % RH
Engineer	Ken Fujita
Mode	Tx 11n40 5795 MHz

Horizontal

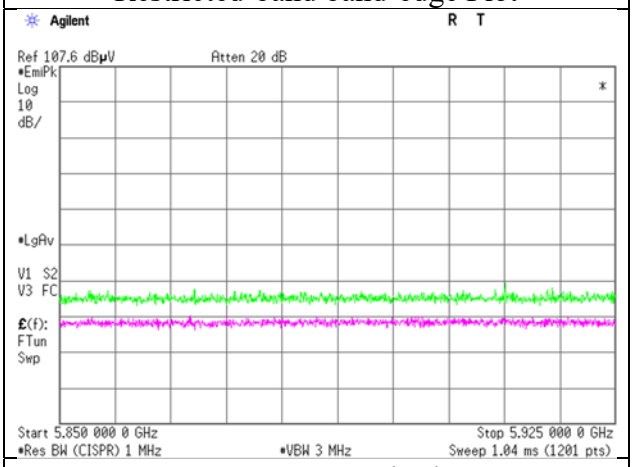
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot

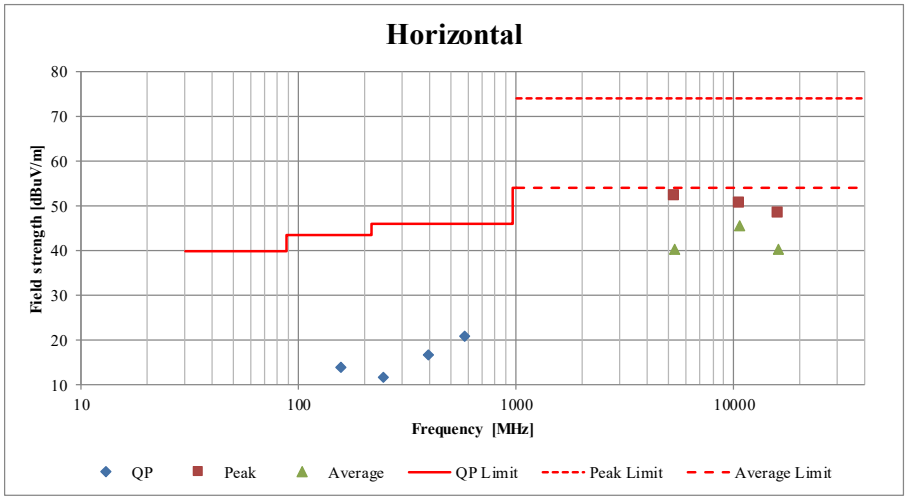


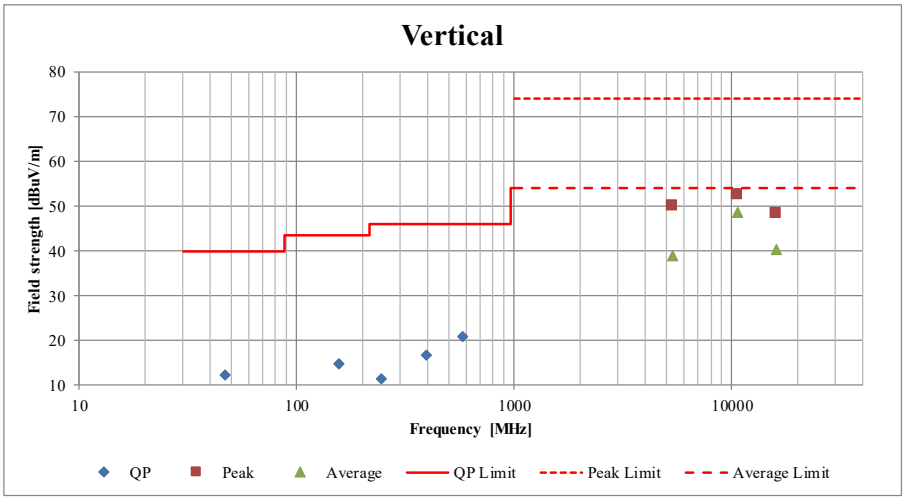
Trace Green: Peak Plot
Trace Purple: Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Plot data, Worst case)

Report No.	13665469H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	February 18, 2021	February 19, 2021	February 19, 2021	February 19, 2021
Temperature / Humidity	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH	21 deg. C / 32 % RH
Engineer	Ken Fujita (1 GHz - 10 GHz)	Yuta Moriya (10 GHz - 18 GHz)	Ken Fujita (18 GHz - 40 GHz)	Ken Fujita (Below 1 GHz)
Mode	Tx 11a 5320 MHz			





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

APPENDIX 2: Test instruments

Test equipment

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
AT	MCC-224	160324	Coaxial Cable	Huber+Suhner	SUCOFLEX 102A	MY009/2A	11/17/2020	12
AT	MAT-57	141333	Attenuator(10dB)	Suhner	6810.19.A	-	12/07/2020	12
AT	MSA-10	141899	Spectrum Analyzer	AGILENT	E4448A	MY46180655	08/04/2020	12
AT	MPM-16	141812	Power Meter	AGILENT	8990B	MY51000271	08/20/2020	12
AT	MPSE-22	141842	Power sensor	AGILENT	N1923A	MY54070003	08/20/2020	12
AT	MMM-16	141360	DIGIITAL HiTESTER	HIOKI	3805	70900532	01/07/2021	12
AT	MOS-29	141568	Thermo-Hygrometer	CUSTOM	CTH-201	2901	01/15/2021	12
AT	MAT-21	141174	Attenuator(20dB)(above1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-120	901247	01/13/2021	12
AT	MOS-41	192300	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	0013	12/06/2020	12
RE	MAEC-03	142008	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	05/22/2020	24
RE	MOS-13	141554	Thermo-Hygrometer	CUSTOM	CTH-180	1301	01/15/2021	12
RE	MMM-08	141532	DIGITAL HiTESTER	HIOKI	3805	51201197	01/07/2021	12
RE	MJM-16	142183	Measure	KOMELON	KMC-36	-	-	-
RE	COTS-MEMI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	MAT-95	142314	Attenuator	Pasternack	PE7390-6	D/C 1504	06/17/2020	12
RE	MBA-03	141424	Biconical Antenna	Schwarzbeck	BBA9106	1915	08/13/2020	12
RE	MCC-51	141323	Coaxial cable	UL Japan	-	-	07/06/2020	12
RE	MLA-22	141266	Logperiodic Antenna (200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-191	08/13/2020	12
RE	MPA-13	141582	Pre Amplifier	SONOMA INSTRUMENT	11/5/1900	260834	02/03/2021	12
RE	MTR-10	141951	EMI Test Receiver	Rohde & Schwarz	ESR26	101408	03/10/2020	12
RE	MHA-20	141507	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	10/31/2020	12
RE	MPA-11	141580	MicroWave System Amplifier	AGILENT	83017A	MY39500779	03/24/2020	12
RE	MCC-231	177964	Microwave Cable	Junkosha INC.	MMX221	1901S329(1m)/ 1902S579(5m)	03/04/2021	12
RE	MHA-16	141513	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	05/21/2020	12
RE	MCC-54	141325	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	03/02/2021	12

***Hyphens for Last Calibration Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.**

The expiration date of the calibration is the end of the expired month.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

Test item:
RE: Radiated Emission
AT: Antenna Terminal Conducted test