



Test report No. : 11234699H-R1
Page : 1 of 54
Issued date : May 11, 2016
Revised date : May 19, 2016
FCC ID : N6C-SXPCEAN2

RADIO TEST REPORT

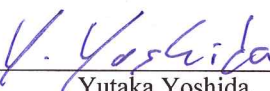
Test Report No. : 11234699H-R1

Applicant : silex technology, Inc.
Type of Equipment : PCI Express Half mini card WLAN module
Model No. : SX-PCEAN2
FCC ID : N6C-SXPCEAN2
Test regulation : FCC Part 15 Subpart E: 2015
(Class II permissive change)
Test Result : Complied

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3. This sample tested is in compliance with above regulation.
4. The test results in this report are traceable to the national or international standards.
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6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 11234699H. 11234699H is replaced with this report.

Date of test: April 4 to 19, 2016

Representative test engineer:


Yutaka Yoshida
Engineer
Consumer Technology Division

Approved by:


Tsubasa Takayama
Engineer
Consumer Technology Division



NVLAP LAB CODE: 200572-0

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SECTION 1: Customer information

Company Name	:	silex technology, Inc.
Address	:	2-3-1 Hikaridai, Seika-cho, Kyoto 619-0237, Japan
Telephone Number	:	+81-774-98-3878
Facsimile Number	:	+81-774-98-3758
Contact Person	:	Toshiro Kometani

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

2.1 Identification of E.U.T.

Type of Equipment	:	PCI Express Half mini card WLAN module
Model No.	:	SX-PCEAN2
Serial No.	:	Refer to Clause 4.2
Rating	:	DC3.3V
Receipt Date of Sample	:	March 15, 2016
Country of Mass-production	:	Japan
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model No: SX-PCEAN2 (referred to as the EUT in this report) is the PCI Express Half mini card WLAN module.

General Specification

Clock frequency(ies) in the system	:	40MHz
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Radio Specification

Radio Type : Transceiver
Method of Frequency Generation : Synthesizer
Power Supply (inner) : DC1.2V

	IEEE802.11b	IEEE802.11g/n (20 M band)	IEEE802.11a/n (20 M band)	IEEE802.11n (40 M band)
Frequency of operation	2412-2462MHz	2412-2462MHz	5180-5240MHz 5260-5320MHz 5500-5700MHz 5745-5825MHz *1)	2422-2452MHz 5190-5230MHz 5270-5310MHz 5510-5670MHz 5755-5795MHz *1)
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)	
Channel spacing	5MHz		20MHz	2.4GHz: 5MHz 5GHz: 40MHz
Antenna type	WiFi Dual Band PCB antenna			
Antenna Gain	2.4GHz: 1.8dBi 5GHz: 3.9dBi			
Antenna Connector type	U.FL Alternative connector			

*1) W58 band is applied for this test report.

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart E: 2015, final revised on November 23, 2015
*Some parts are effective on and after December 17, 2015 or December 23, 2015. The revision does not affect the test specification applied to the EUT.

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

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
26 dB Emission Bandwidth	FCC: KDB Publication Number 789033 IC: -	FCC: 15.407 (a) (1) (2) (3) IC: -	See data	N/A	Conducted
Maximum Conducted Output Power	FCC: KDB Publication Number 789033 IC: -	FCC: 15.407 (a) (1) (2) (3) IC: RSS-247 6.2.1 (1) 6.2.2 (1) 6.2.3 (1) 6.2.4 (1)		Complied	Conducted
Maximum Power Spectral Density	FCC: KDB Publication Number 789033 IC: -	FCC : 15.407 (a) (1) (2) (3) IC: RSS-247 6.2.1 (1) 6.2.2 (1) 6.2.3 (1) 6.2.4 (1)		Complied	Conducted
Spurious Emission Restricted Band Edge	FCC: ANSI C63.10-2013 KDB Publication Number 789033 IC: -	FCC: 15.407 (b), 15.205 and 15.209 IC: RSS-247 6.2.1 (2) 6.2.2 (2) 6.2.3 (2) 6.2.4 (2)	0.1dB 11650.000 MHz, AV, Vertical	Complied	Conducted (< 30 MHz) / Radiated (> 30 MHz) *1)
6 dB Emission Bandwidth	FCC: ANSI C63.10-2013 IC: -	FCC: 15.407 (e) IC: RSS-247 6.2.4 (1)	See data	Complied	Conducted

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.
*Test Items are according to KDB 926956 v01r06.
*1) Radiated test was selected over 30 MHz based on section FCC 15.407 (b) and KDB 789033 D02 G.3.b).

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

FCC 15.31 (e)

The RF Module has own regulator.

The RF Module is constantly provided voltage through own regulator regardless of input voltage (DC3.3V).
Therefore, this EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

The EUT has a unique antenna connector (U.FL on the Module).

Therefore the equipment complies with the requirement of 15.203/212.

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3.3 Addition to standard

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

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

3.4 Uncertainty

EMI

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

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

Test distance	Radiated emission ($\pm$ dB) 9 kHz - 30 MHz
3m	3.8 dB
10m	3.7 dB

Polarity	Radiated emission (Below 1GHz)			
	(3 m*)($\pm$ dB)		(10 m*)($\pm$ dB)	
	30 - 300 MHz	300 - 1000MHz	30 - 300 MHz	300 - 1000MHz
Horizontal	4.8 dB	5.2 dB	4.8 dB	5.0 dB
Vertical	4.5 dB	5.9 dB	4.8 dB	5.1 dB

Radiated emission				
(3 m*)($\pm$ dB)		(1 m*)($\pm$ dB)	(0.5 m*)($\pm$ dB)	(10 m*)($\pm$ dB)
1 - 6GHz	6 - 18GHz	10 - 26.5 GHz	26.5 - 40GHz	1 - 18 GHz
5.1 dB	5.3 dB	5.1 dB	5.1 dB	5.3 dB

*Measurement distance

Radiated emission test

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

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3.5 Test Location

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

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Modes

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

Mode	Remarks*
IEEE 802.11a (11a)	18Mbps, PN9
IEEE 802.11n MIMO 20MHz BW (11n-20)	MCS 8 (Short GI), PN9
IEEE 802.11n MIMO 40MHz BW (11n-40)	MCS 8 (Short GI), PN9
*The worst antenna and condition was determined based on the test result of Maximum Conducted Output Power.	
*The power value of the EUT was set for testing as follows (setting value might be different from product specification value); Power settings: Refer to the following table Software: Atheros Radio Test 2 (ART2-GUI) Version 2.3 *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.	

[Power setting]

Operation	Rate	Frequency	Power Setting [dBm]
11a	18Mbps	5745MHz	13.5
		5785MHz	13.5
		5825MHz	13.5
11n MIMO 20Mband	MCS 8 (Short GI)	5745MHz	14.0
		5785MHz	14.0
		5825MHz	14.0
11n MIMO 40Mband	MCS 8 (Short GI)	5755MHz	12.0
		5795MHz	12.0

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*The details of Operating mode(s)

Test Item	Operating Mode *3)	Tested Antenna Port	Tested Frequency
			Upper Band
99% Occupied Bandwidth, 6dB Bandwidth	11a Tx 11n-20 Tx	0, 1	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx	0, 1	5755 MHz 5795 MHz
Maximum Conducted Output Power, Maximum Power Spectral Density	11a Tx	0, 1	5745 MHz 5785 MHz 5825 MHz
	11n-20 Tx	0+1	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx	0+1	5755 MHz 5795 MHz
Radiated Spurious Emission (Below 1GHz)	11n-20 Tx *1)	0+1	5785 MHz
Radiated Spurious Emission (Above 1GHz) *4)	11n-20 Tx	0+1	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx	0+1	5755 MHz 5795 MHz
Conducted Spurious Emission	11n-20 Tx *1)	0 *2)	5825 MHz

*1) The operating mode and tested frequency were tested as a representative, because it had the highest power at antenna terminal test.

*2) After the comparison between Antenna Port 0 and Antenna Port 1, test was performed with the antenna that had higher power as a representative.

*3) Since 11a and 11n-20 have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest conducted output power.

*4) After the comparison MIMO and SISO in pre-check, test was performed with MIMO as a representative as it had worst case.

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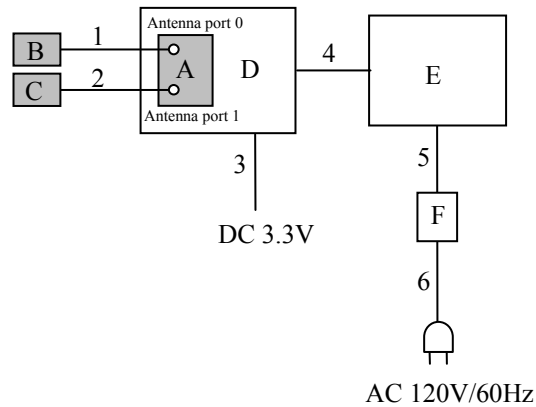
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4.2 Configuration and peripherals



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

* The test was performed using a typical evaluation board (Jig board).

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	PCI Express Half Mini Card WLAN Module	SX-PCEAN2	001	Silex	EUT
B	Antenna	H2B1PC1A1C	001	Unictron Technologies Corporation	EUT
C	Antenna	H2B1PC1A1C	002	Unictron Technologies Corporation	EUT
D	Jig board	-	-	-	-
E	Laptop PC	HP ProBook 6550 b	CNU1242 MQ0	HP	-
F	AC Adapter	Series PPP009L-E	CT: WBGST0A1R0PJ9u	HP	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Antenna Cable	0.15	Shielded	Shielded	-
2	Antenna Cable	0.15	Shielded	Shielded	-
3	DC Cable	2.7	Unshielded	Unshielded	-
4	Mini PCI Cable	0.3	Shielded	Shielded	-
5	DC Cable	1.8	Unshielded	Unshielded	-
6	AC Cable	1.8	Unshielded	Unshielded	-

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SECTION 5: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

< Below 1GHz >

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

< Above 1GHz >

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane.

The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

The height of the measuring antenna varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

< Below 1GHz >

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

< Above 1GHz >

Inside of restricted bands (Section 15.205):

Apply to limit in the Section 15.209 (a).

Outside of the restricted bands:

Apply to limit in FCC 16-24.

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:

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

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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.
Test Distance	3 m	4.45 m*2) (1 GHz – 10GHz), 1 m*3) (10 GHz – 26.5 GHz), 0.5 m*4) (26.5 GHz – 40 GHz)	

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

*2) Distance Factor: $20 \times \log (4.45 \text{ m}/3.0 \text{ m}) = 3.4 \text{ dB}$

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

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

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

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

Measurement range : 30 MHz-40 GHz

Test data : APPENDIX

Test result : Pass

*Refer to FCC16.24.

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SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

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

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

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

*2) FCC standard says that RBW is set to be 500 kHz for 5.725 GHz-5.850 GHz, but it is not possible with spectrum analyzer, so $10\log(500\text{ kHz}/470\text{ kHz})$ was added to the test result.

*3) In the frequency range below 30 MHz, RBW was narrowed to separate the noise contents.

Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart. (9 kHz-150 kHz: RBW = 200 Hz, 150 kHz-30 MHz: RBW = 9.1 kHz)

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

Test data : APPENDIX

Test result : Pass

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APPENDIX 1: Test data

99% Occupied Bandwidth

Test place Ise EMC Lab. No.3 Measurement Room
Report No. 11234699H
Date 04/19/2016
Temperature/ Humidity 23deg. C / 32% RH
Engineer Yutaka Yoshida
Mode Tx 11a / 11n-20 / 11n-40

11a

Frequency [MHz]	99% Occupied Bandwidth		Limit [MHz]
	Antenna Port 0 [MHz]	Antenna Port 1 [MHz]	
5745	16.9328	16.9520	-
5785	16.9878	16.9796	-
5825	16.9142	16.9350	-

11n-20

Frequency [MHz]	99% Occupied Bandwidth		Limit [MHz]
	Antenna Port 0 [MHz]	Antenna Port 1 [MHz]	
5745	18.1449	18.0324	-
5785	18.1661	18.0888	-
5825	18.1628	18.0546	-

11n-40

Frequency [MHz]	99% Occupied Bandwidth		Limit [MHz]
	Antenna Port 0 [MHz]	Antenna Port 1 [MHz]	
5755	36.8799	36.7268	-
5795	36.7844	36.5756	-

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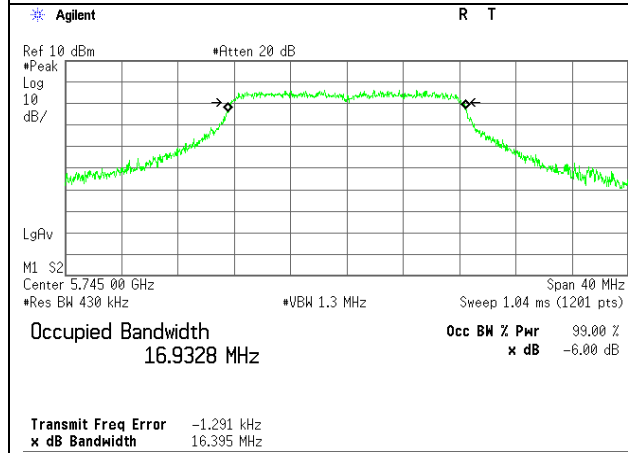
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99% Occupied Bandwidth

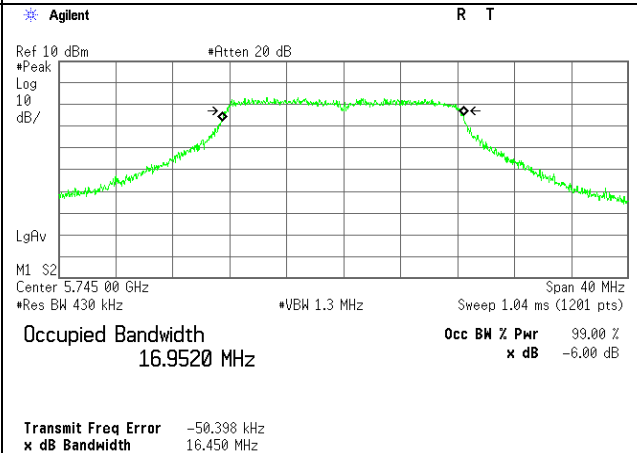
11a Antenna Port 0

5745 MHz

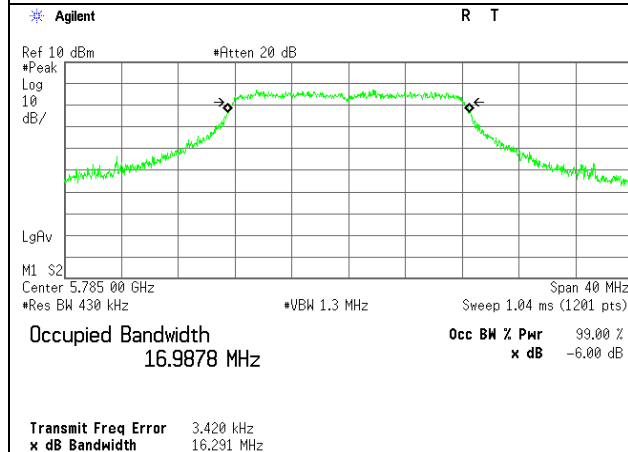


11a Antenna Port 1

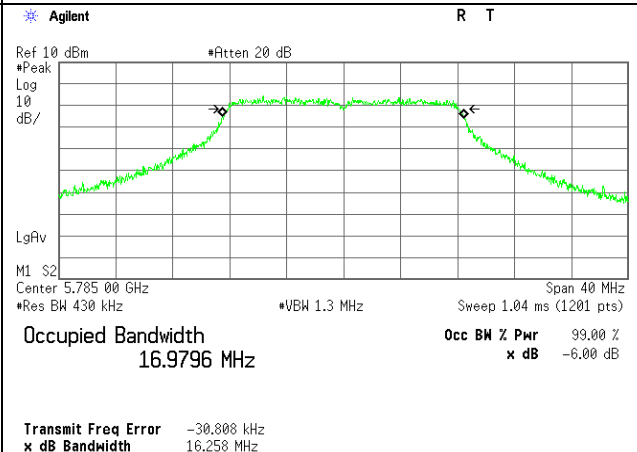
5745 MHz



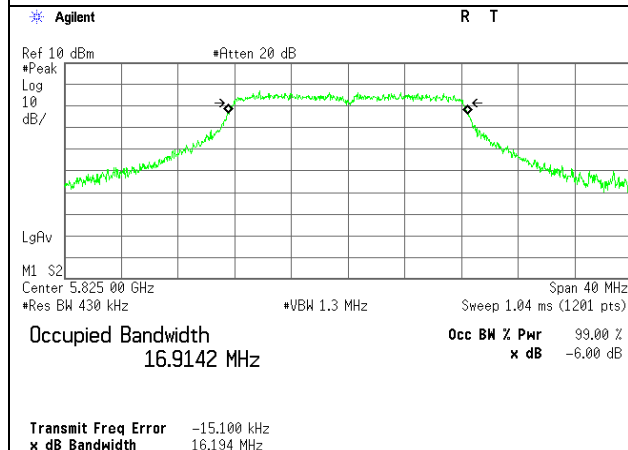
5785 MHz



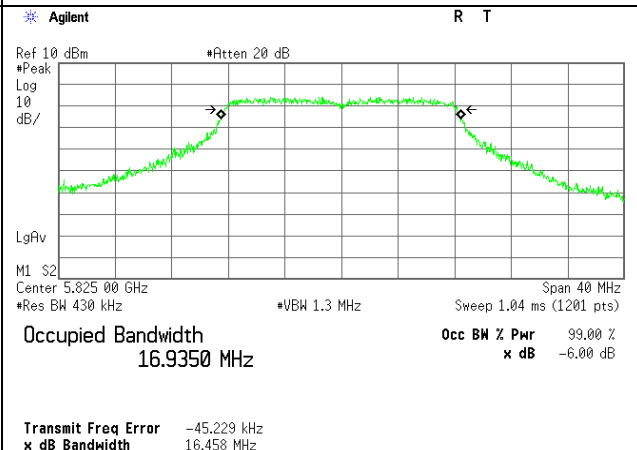
5785 MHz



5825 MHz



5825 MHz



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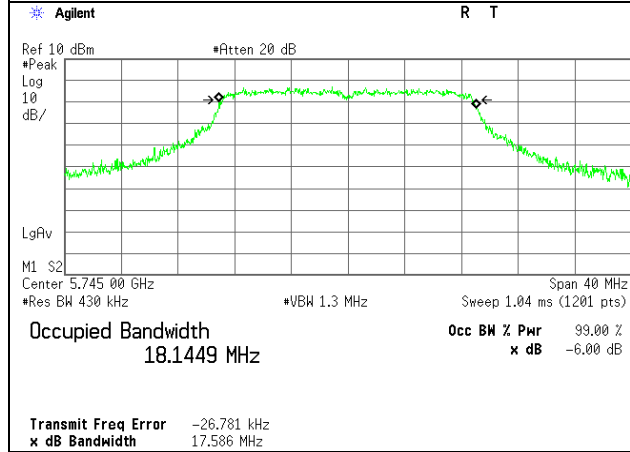
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99% Occupied Bandwidth

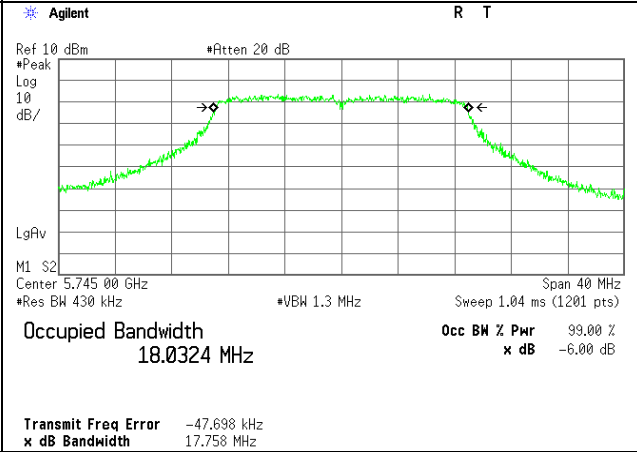
11n-20 Antenna Port 0

5745 MHz

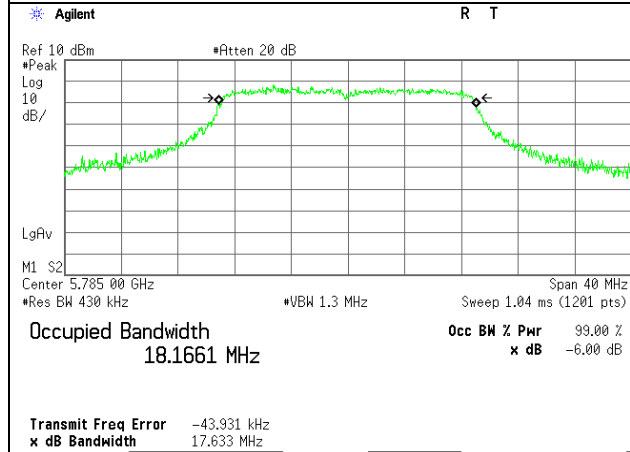


11n-20 Antenna Port 1

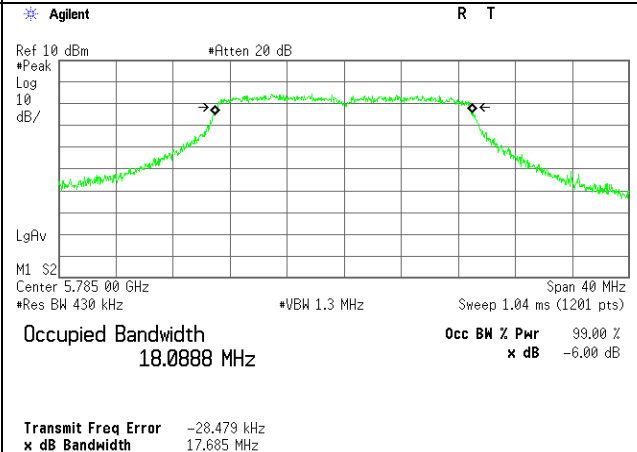
5745 MHz



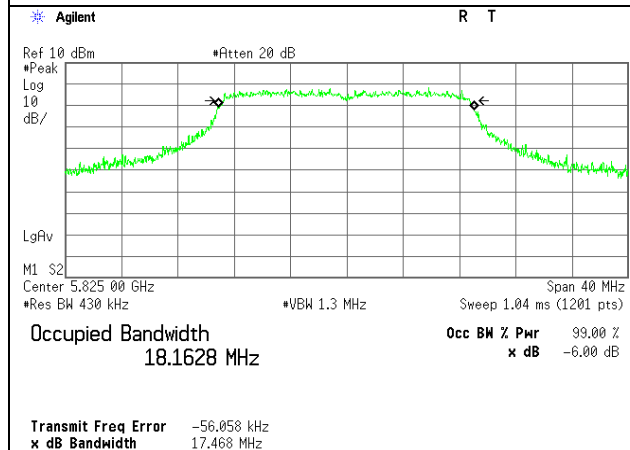
5785 MHz



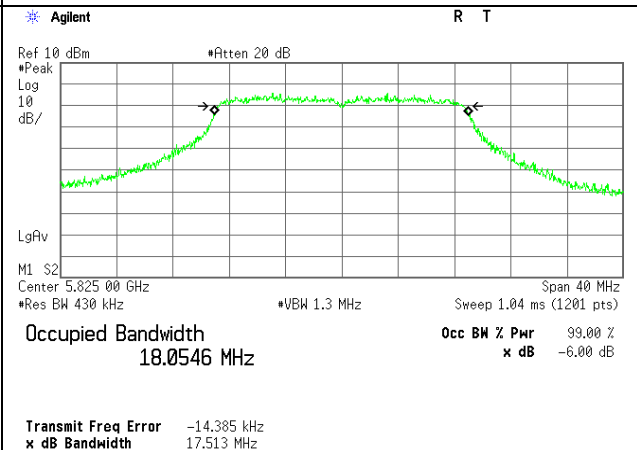
5785 MHz



5825 MHz



5825 MHz



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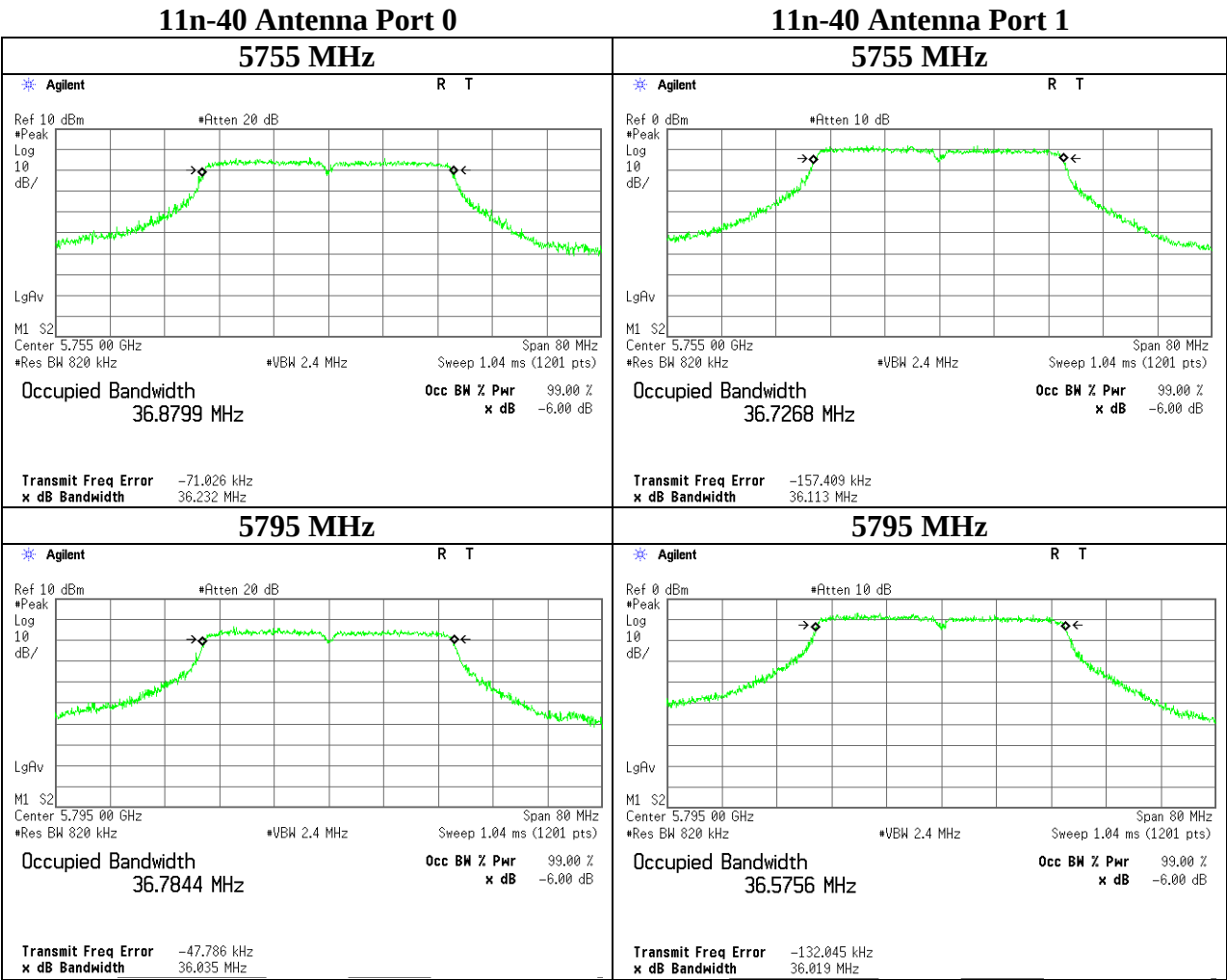
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99% Occupied Bandwidth



6 dB Bandwidth

Test place : Ise EMC Lab. No.3 Measurement Room
Report No. : 11234699H
Date : 04/19/2016
Temperature / Humidity : 23deg. C / 32% RH
Engineer : Yutaka Yoshida
Mode : Tx 11a / 11n-20 / 11n-40

11a

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
Antenna Port 0	5745	16.417	> 500
	5785	16.372	> 500
	5825	16.400	> 500
Antenna Port 1	5745	16.370	> 500
	5785	15.942	> 500
	5825	16.386	> 500

11n-20

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
Antenna Port 0	5745	17.631	> 500
	5785	17.581	> 500
	5825	17.617	> 500
Antenna Port 1	5745	17.510	> 500
	5785	17.454	> 500
	5825	17.580	> 500

11n-40

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
Antenna Port 0	5755	35.955	> 500
	5795	36.152	> 500
Antenna Port 1	5755	36.148	> 500
	5795	36.051	> 500

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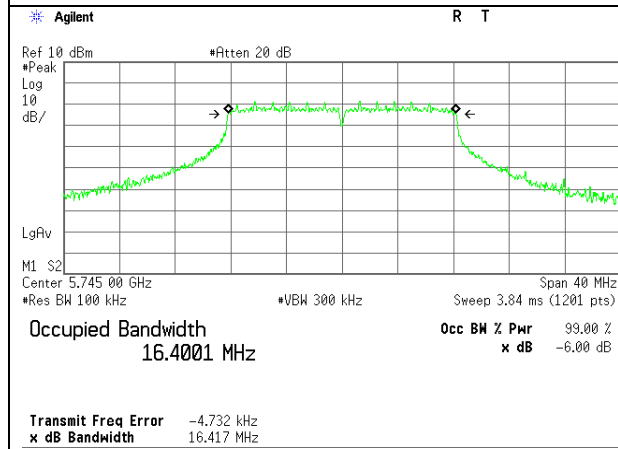
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

6 dB Bandwidth

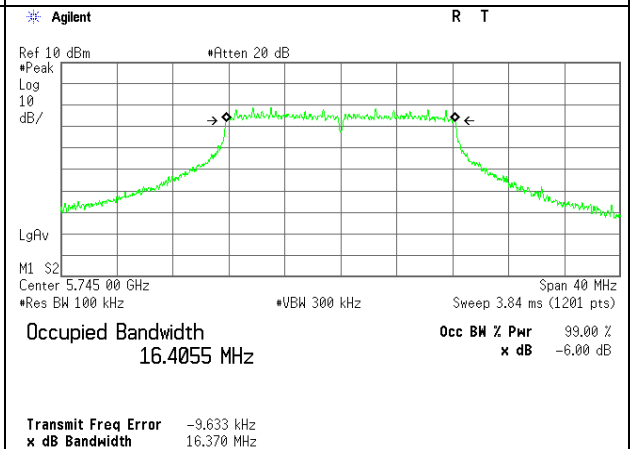
11a, Antenna Port 0

5745 MHz

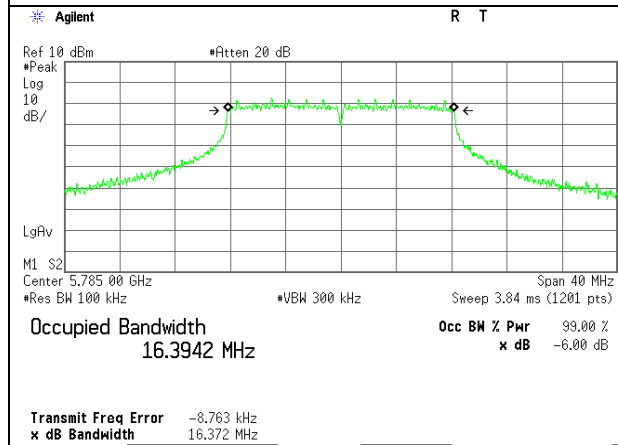


11a, Antenna Port 0

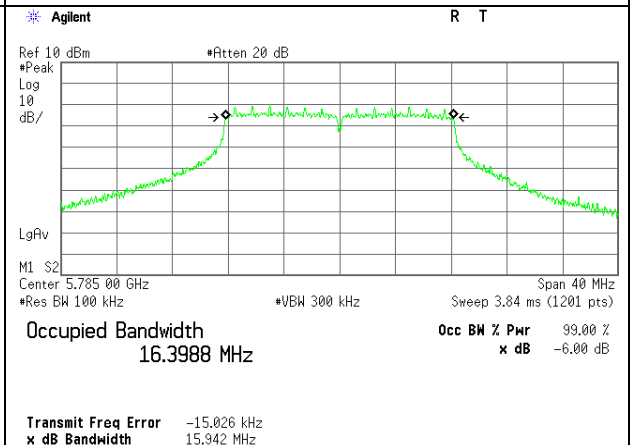
5745 MHz



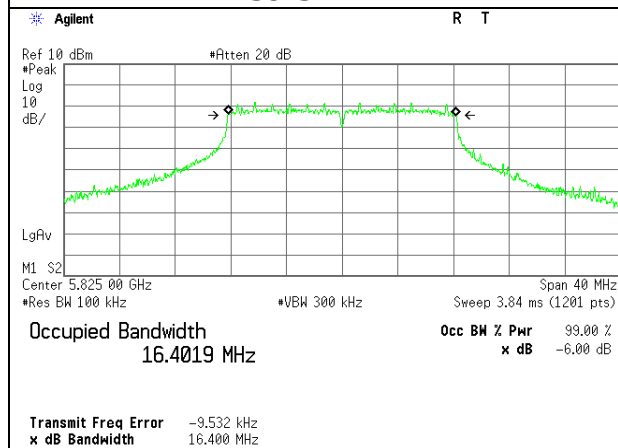
5785 MHz



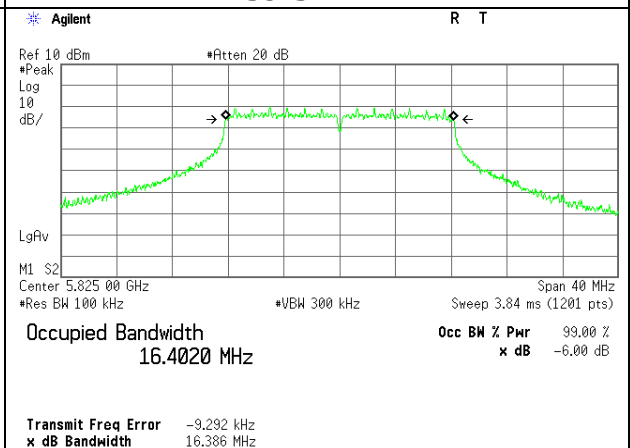
5785 MHz



5825 MHz



5825 MHz



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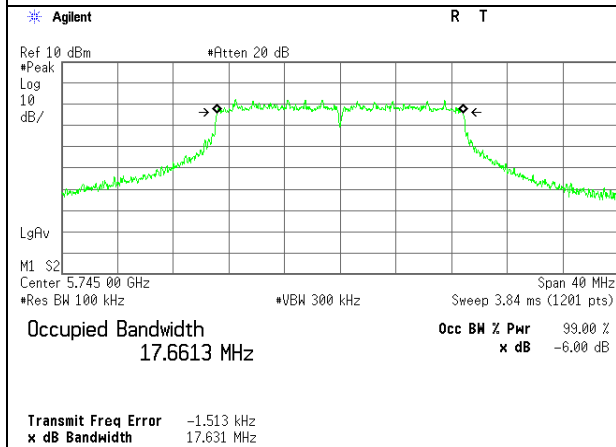
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Facsimile : +81 596 24 8124

6 dB Bandwidth

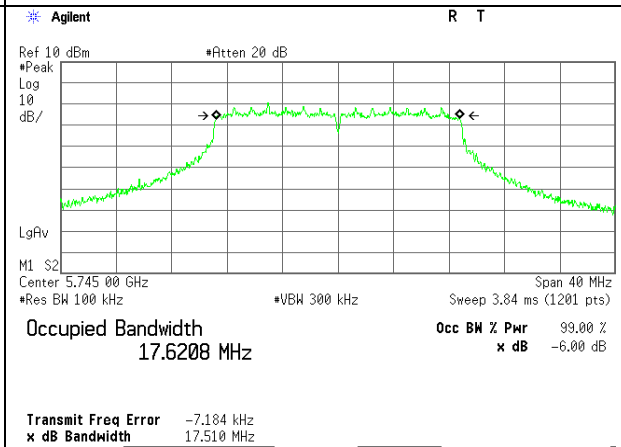
11n-20, Antenna Port 0

5745 MHz

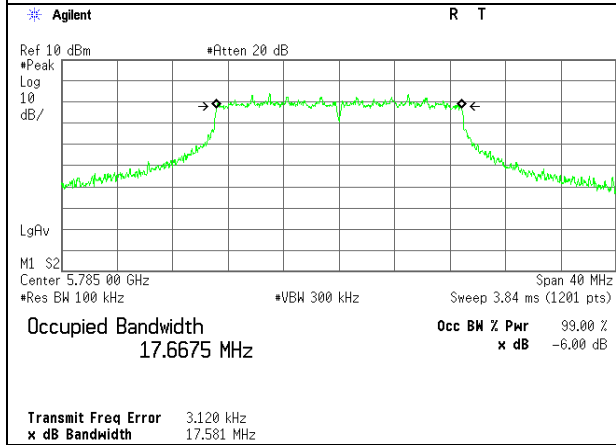


11n-20, Antenna Port 0

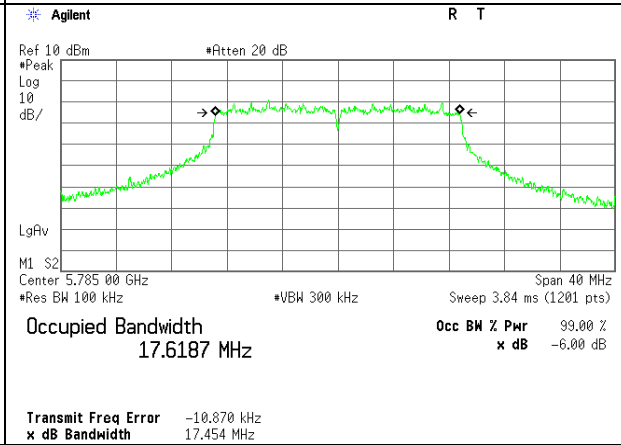
5745 MHz



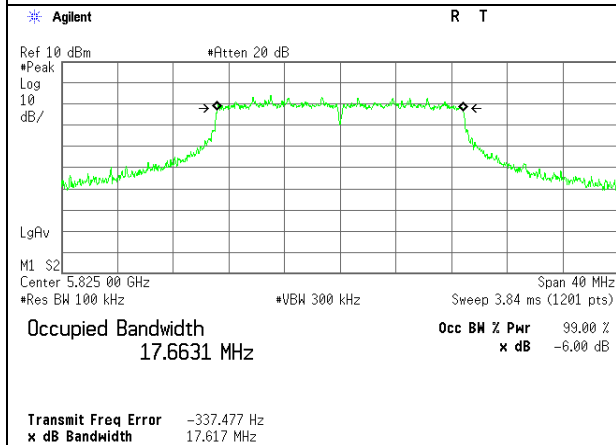
5785 MHz



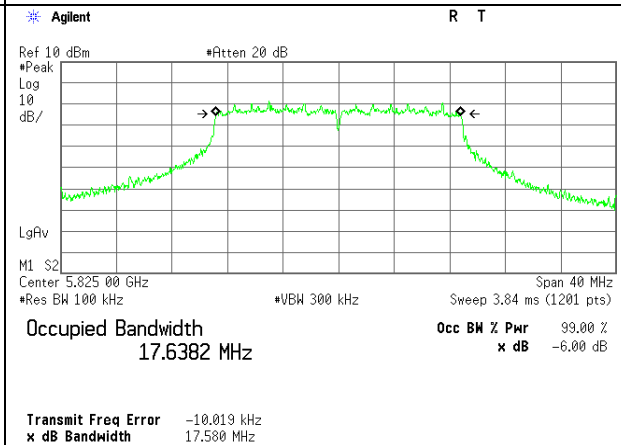
5785 MHz



5825 MHz



5825 MHz



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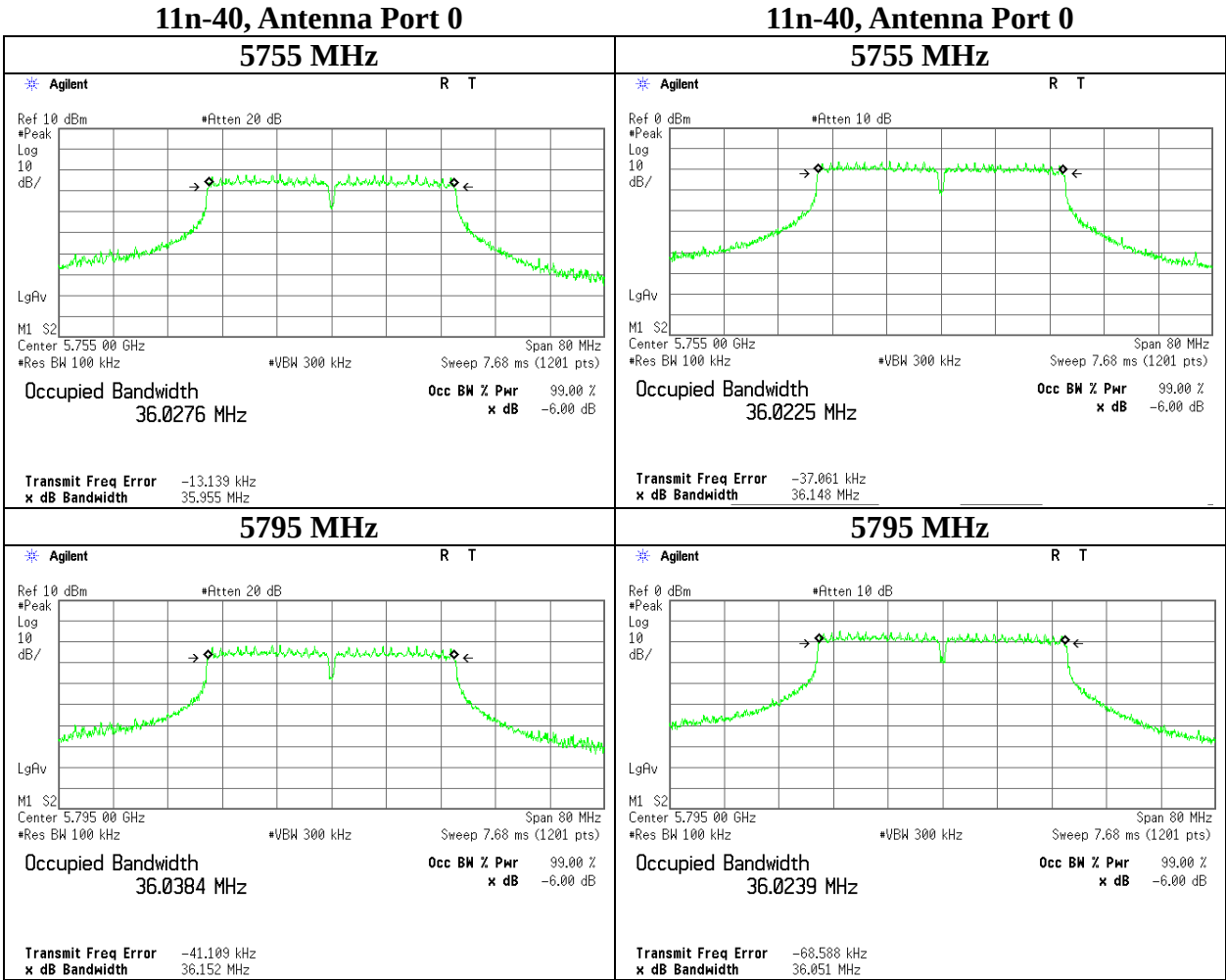
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6 dB Bandwidth



Maximum Conducted Output Power

Test place : Ise EMC Lab. No.3 Measurement Room
Report No. : 11234699H
Date : 04/19/2016
Temperature/ Humidity : 23deg. C / 32% RH
Engineer : Yutaka Yoshida
Mode : Tx 11a

Antenna Port 0

Applied limit: 15.407, (a), (3)

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
								Result	Limit	Margin		Result	Limit	Margin	
5745	2.27	0.89	10.07	0.38	3.9	-	-	13.62	22.99	30.00	16.38	17.52	56.44	36.00	18.48
5785	2.85	0.90	10.07	0.38	3.9	-	-	14.20	26.28	30.00	15.80	18.10	64.52	36.00	17.90
5825	2.70	0.90	10.06	0.38	3.9	-	-	14.05	25.40	30.00	15.95	17.95	62.34	36.00	18.05

Sample Calculation:

Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Conducted Power Limit (5725 - 5850 MHz) = 1W (30dBm)

e.i.r.p. Limit (5725 - 5850 MHz) = 2W (36dBm)

Antenna Port 1

Applied limit: 15.407, (a), (3)

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
								Result	Limit	Margin		Result	Limit	Margin	
5745	-0.67	0.89	10.07	0.38	3.9	-	-	10.68	11.68	30.00	19.32	14.58	28.68	36.00	21.42
5785	0.07	0.90	10.07	0.38	3.9	-	-	11.42	13.86	30.00	18.58	15.32	34.02	36.00	20.68
5825	0.49	0.90	10.06	0.38	3.9	-	-	11.84	15.27	30.00	18.16	15.74	37.48	36.00	20.26

Sample Calculation:

Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Conducted Power Limit (5725 - 5850 MHz) = 1W (30dBm)

e.i.r.p. Limit (5725 - 5850 MHz) = 2W (36dBm)

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Ise EMC Lab.

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Maximum Conducted Output Power

Test place : Ise EMC Lab. No.3 Measurement Room
Report No. : 11234699H
Date : 04/19/2016
Temperature/ Humidity : 23deg. C / 32% RH
Engineer : Yutaka Yoshida
Mode : Tx 11n-20

Antenna Port 0+1

Applied limit: 15.407, (a), (3)

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna Port			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna Port			Result [dBm]	Limit [dBm]	Margin [dB]
			0 [mW]	1 [mW]	Sum [mW]				0 [mW]	1 [mW]	Sum [mW]			
5745	-	-	26.83	12.07	38.90	15.90	30.00	14.10	65.86	29.62	95.48	19.80	36.00	16.20
5785	-	-	29.83	14.95	44.78	16.51	30.00	13.49	73.23	36.70	109.93	20.41	36.00	15.59
5825	-	-	30.46	15.30	45.76	16.61	30.00	13.39	74.77	37.56	112.34	20.51	36.00	15.49

Antenna Port 0								Antenna Port 1					
Tested Frequency [MHz]	Duty Factor [dB]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Cond. Power [dBm]	Result e.i.r.p. [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Cond. Power [dBm]	Result e.i.r.p. [dBm]
5745	0.30	3.02	0.89	10.07	3.90	14.29	18.19	-0.45	0.89	10.07	3.90	10.82	14.72
5785	0.30	3.48	0.90	10.07	3.90	14.75	18.65	0.48	0.90	10.07	3.90	11.75	15.65
5825	0.30	3.57	0.90	10.06	3.90	14.84	18.74	0.58	0.90	10.06	3.90	11.85	15.75

Sample Calculation:

Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Conducted Power Limit (5725 - 5850 MHz) = 1W (30dBm)

e.i.r.p. Limit (5725 - 5850 MHz) = 2W (36dBm)

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Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Maximum Conducted Output Power

Test place : Ise EMC Lab. No.3 Measurement Room
Report No. : 11234699H
Date : 04/19/2016
Temperature/ Humidity : 23deg. C / 32% RH
Engineer : Yutaka Yoshida
Mode : Tx 11n-40

Antenna Port 0+1

Applied limit: 15.407, (a), (3)

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna Port			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna Port			Result [dBm]	Limit [dBm]	Margin [dB]
			0 [mW]	1 [mW]	Sum [mW]				0 [mW]	1 [mW]	Sum [mW]			
5755	-	-	16.89	7.51	24.40	13.87	30.00	16.13	41.46	18.43	59.89	17.77	36.00	18.23
5795	-	-	18.35	9.24	27.59	14.41	30.00	15.59	45.05	22.68	67.73	18.31	36.00	17.69

Antenna Port 0								Antenna Port 1					
Tested Frequency [MHz]	Duty Factor [dB]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Cond. Power [dBm]	Result e.i.r.p. [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Cond. Power [dBm]	Result e.i.r.p. [dBm]
5755	0.40	0.91	0.89	10.07	3.90	12.28	16.18	-2.61	0.89	10.07	3.90	8.76	12.66
5795	0.40	1.27	0.90	10.07	3.90	12.64	16.54	-1.71	0.90	10.07	3.90	9.66	13.56

Sample Calculation:

Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Conducted Power Limit (5725 - 5850 MHz) = 1W (30dBm)

e.i.r.p. Limit (5725 - 5850 MHz) = 2W (36dBm)

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Maximum Conducted Output Power

Rate check

Test place : Ise EMC Lab. No.6 Shielded Room
Report No. : 11234699H
Date : April 7, 2016
Temperature / Humidity : 23deg. C / 40 % RH
Engineer : Tomohisa Nakagawa
Mode : Tx 11a

11a 5785MHz Method PM-G(Measurement using a Gated RF average power meter)

Mode	Rate Mbps	Reading Ant0 [dBm]	Reading Ant1 [dBm]	Remarks
11a	6	4.40	2.51	
	9	4.42	2.49	
	12	4.47	2.18	
	18	4.57	2.59	*
	24	4.27	2.28	
	36	4.25	2.38	
	48	4.00	2.36	
	54	2.80	1.60	

Timed average

Mode	Rate Mbps	Reading Ant0 [dBm]	Reading Ant1 [dBm]	Remarks
11a	6	3.89	1.95	
	9	3.77	2.09	
	12	3.99	1.95	
	18	4.00	2.22	*
	24	3.85	1.78	
	36	3.65	2.20	
	48	3.32	1.48	
	54	0.40	-0.90	

* Worst rate

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

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Maximum Conducted Output Power

Test place : Ise EMC Lab. No.6 Shielded Room
Report No. : 11234699H
Date : April 7, 2016
Temperature / Humidity : 23deg. C / 40 % RH
Engineer : Tomohisa Nakagawa
Mode : Tx 11n-20

11n20 5785MHz Method PM-G(Measurement using a Gated RF average power meter)

Mode	MCS Number	Reading Antenna						Remarks
		0 [dBm]	1 [dBm]	0 [mW]	1 [mW]	0+1 [mW]	0+1 [dBm]	
11n	0	-6.30	-7.90	-	-	-	-	
	1	-6.10	-8.00	-	-	-	-	
	2	-5.70	-7.90	-	-	-	-	
	3	-5.80	-7.50	-	-	-	-	
	4	-5.60	-7.30	-	-	-	-	* 1 TX
	5	-6.50	-8.60	-	-	-	-	
	6	-7.60	-9.70	-	-	-	-	
	7	-11.10	-12.10	-	-	-	-	
	8	-5.30	-7.70	0.30	0.17	0.46	-3.33	
	8	-5.20	-7.60	0.30	0.17	0.48	-3.23	short GI * 2 TX
	9	-5.30	-7.80	0.30	0.17	0.46	-3.36	
	10	-5.30	-8.00	0.30	0.16	0.45	-3.43	
	11	-5.30	-7.80	0.30	0.17	0.46	-3.36	
	12	-5.40	-7.70	0.29	0.17	0.46	-3.39	
	13	-6.50	-8.70	0.22	0.13	0.36	-4.45	
	14	-7.60	-9.90	0.17	0.10	0.28	-5.59	
	15	-10.50	-13.00	0.09	0.05	0.14	-8.56	

Timed average

Mode	MCS Number	Reading Antenna						Remarks
		0 [dBm]	1 [dBm]	0 [mW]	1 [mW]	0+1 [mW]	0+1 [dBm]	
11n	0	-6.5	-8.2	-	-	-	-	
	1	-6.8	-8.3	-	-	-	-	
	2	-6.2	-8.5	-	-	-	-	
	3	-6.4	-8.5	-	-	-	-	
	4	-6.1	-8.1	-	-	-	-	* 1 TX
	5	-7.7	-10.1	-	-	-	-	
	6	-8.8	-10.8	-	-	-	-	
	7	-12.3	-13.7	-	-	-	-	
	8	-5.7	-8.3	0.27	0.15	0.42	-3.80	
	8	-5.6	-8.3	0.28	0.15	0.42	-3.73	short GI * 2 TX
	9	-6.0	-8.6	0.25	0.14	0.39	-4.10	
	10	-6.2	-8.8	0.24	0.13	0.37	-4.30	
	11	-6.8	-8.8	0.21	0.13	0.34	-4.68	
	12	-7.0	-9.1	0.20	0.12	0.32	-4.91	
	13	-8.2	-10.3	0.15	0.09	0.24	-6.11	
	14	-9.2	-11.6	0.12	0.07	0.19	-7.23	
	15	-12.5	-14.8	0.06	0.03	0.09	-10.49	

* Worst rate

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

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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Maximum Conducted Output Power

Test place : Ise EMC Lab. No.6 Shielded Room
Report No. : 11234699H
Date : April 7, 2016
Temperature / Humidity : 23deg. C / 40 % RH
Engineer : Tomohisa Nakagawa
Mode : Tx 11n-40

11n40 5755MH: Method PM-G(Measurement using a Gated RF average power meter)

Mode	MCS Number	Reading Antenna						Remarks
		0	1	0	1	0+1	0+1	
		[dBm]	[dBm]	[mW]	[mW]	[mW]	[dBm]	
11n	0	-7.10	-9.70	-	-	-	-	
	1	-7.10	-9.50	-	-	-	-	
	2	-7.10	-9.50	-	-	-	-	
	3	-7.20	-9.50	-	-	-	-	
	4	-7.30	-9.50	-	-	-	-	* 1 TX
	5	-7.30	-9.60	-	-	-	-	
	6	-7.80	-9.50	-	-	-	-	
	7	-11.00	-12.00	-	-	-	-	
	8	-7.30	-10.10	0.19	0.10	0.28	-5.47	
	8	-7.30	-10.00	0.19	0.10	0.29	-5.43	short GI * 2 TX
	9	-7.30	-10.10	0.19	0.10	0.28	-5.47	
	10	-7.40	-10.00	0.18	0.10	0.28	-5.50	
	11	-7.40	-10.00	0.18	0.10	0.28	-5.50	
	12	-7.40	-9.90	0.18	0.10	0.28	-5.46	
	13	-7.40	-9.90	0.18	0.10	0.28	-5.46	
	14	-8.10	-10.70	0.15	0.09	0.24	-6.20	
	15	-10.60	-12.60	0.09	0.05	0.14	-8.48	

Timed average

Mode	MCS Number	Reading Antenna						Remarks
		0	1	0	1	0+1	0+1	
		[dBm]	[dBm]	[mW]	[mW]	[mW]	[dBm]	
11n	0	-7.7	-10.0	-	-	-	-	
	1	-7.7	-10.1	-	-	-	-	
	2	-8.2	-10.3	-	-	-	-	
	3	-8.3	-10.3	-	-	-	-	
	4	-8.8	-10.6	-	-	-	-	* 1 TX
	5	-8.7	-11.0	-	-	-	-	
	6	-9.7	-11.2	-	-	-	-	
	7	-12.5	-13.9	-	-	-	-	
	8	-7.9	-10.6	0.16	0.09	0.25	-6.03	
	8	-7.9	-10.4	0.16	0.09	0.25	-5.96	Short GI * 2 TX
	9	-8.1	-11.0	0.15	0.08	0.23	-6.30	
	10	-8.6	-11.1	0.14	0.08	0.22	-6.66	
	11	-8.5	-11.3	0.14	0.07	0.22	-6.67	
	12	-8.8	-11.6	0.13	0.07	0.20	-6.97	
	13	-8.9	-11.8	0.13	0.07	0.19	-7.10	
	14	-10.0	-12.3	0.10	0.06	0.16	-7.99	
	15	-12.6	-14.4	0.05	0.04	0.09	-10.40	

* Worst rate

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

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

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Maximum Average Output Power (Reference data for SAR testing)

Test place : Ise EMC Lab. No.3 Measurement Room
Report No. : 11234699H
Date : 04/19/2016
Temperature/ Humidity : 23deg. C / 32% RH
Engineer : Yutaka Yoshida
Mode : 11a Tx

Antenna Port 0

Applied limit: 15.407, (a), (3)

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power				e.i.r.p.			
								Result		Limit	Margin	Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5745	2.27	0.89	10.07	0.00	3.9	-	-	13.24	21.07	30.00	16.76	17.14	51.71	36.00	18.86
5785	2.85	0.90	10.07	0.00	3.9	-	-	13.82	24.08	30.00	16.18	17.72	59.11	36.00	18.28
5825	2.70	0.90	10.06	0.00	3.9	-	-	13.67	23.27	30.00	16.33	17.57	57.12	36.00	18.43

Sample Calculation:

Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Conducted Power Limit (5725 - 5850 MHz) = 1W (30dBm)

e.i.r.p. Limit (5725 - 5850 MHz) = 2W (36dBm)

Antenna Port 1

Applied limit: 15.407, (a), (3)

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power				e.i.r.p.			
								Result		Limit	Margin	Result		Limit	Margin
								[MHz]	[dBm]	[dB]	[dB]	[dBi]	[MHz]	[dBm]	[mW]
5745	-0.67	0.89	10.07	0.00	3.9	-	-	10.30	10.71	30.00	19.70	14.20	26.28	36.00	21.80
5785	0.07	0.90	10.07	0.00	3.9	-	-	11.04	12.70	30.00	18.96	14.94	31.17	36.00	21.06
5825	0.49	0.90	10.06	0.00	3.9	-	-	11.46	13.99	30.00	18.54	15.36	34.34	36.00	20.64

Sample Calculation:

Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Conducted Power Limit (5725 - 5850 MHz) = 1W (30dBm)

e.i.r.p. Limit (5725 - 5850 MHz) = 2W (36dBm)

UL Japan, Inc.

Ise EMC Lab.

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Facsimile : +81 596 24 8124

Maximum Average Output Power (Reference data for SAR testing)

Test place : Ise EMC Lab. No.3 Measurement Room
Report No. : 11234699H
Date : 04/19/2016
Temperature/ Humidity : 23deg. C / 32% RH
Engineer : Yutaka Yoshida
Mode : Tx 11n-20

Antenna Port 0+1

Applied limit: 15.407, (a), (3)

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna Port			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna Port			Result [dBm]	Limit [dBm]	Margin [dB]
			0 [mW]	1 [mW]	Sum [mW]				0 [mW]	1 [mW]	Sum [mW]			
5745	-	-	25.04	11.26	36.30	15.60	30.00	14.40	61.46	27.64	89.10	19.50	36.00	16.50
5785	-	-	27.84	13.95	41.79	16.21	30.00	13.79	68.34	34.25	102.59	20.11	36.00	15.89
5825	-	-	28.43	14.28	42.71	16.31	30.00	13.69	69.78	35.06	104.84	20.21	36.00	15.79

Antenna Port 0								Antenna Port 1					
Tested Frequency [MHz]	Duty Factor [dB]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Cond. Power [dBm]	Result e.i.r.p. [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Cond. Power [dBm]	Result e.i.r.p. [dBm]
5745	0.00	3.02	0.89	10.07	3.90	13.99	17.89	-0.45	0.89	10.07	3.90	10.52	14.42
5785	0.00	3.48	0.90	10.07	3.90	14.45	18.35	0.48	0.90	10.07	3.90	11.45	15.35
5825	0.00	3.57	0.90	10.06	3.90	14.54	18.44	0.58	0.90	10.06	3.90	11.55	15.45

Sample Calculation:

Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Conducted Power Limit (5725 - 5850 MHz) = 1W (30dBm)

e.i.r.p. Limit (5725 - 5850 MHz) = 2W (36dBm)

UL Japan, Inc.

Ise EMC Lab.

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Facsimile : +81 596 24 8124

Maximum Average Output Power (Reference data for SAR testing)

Test place : Ise EMC Lab. No.3 Measurement Room
Report No. : 11234699H
Date : 04/19/2016
Temperature/ Humidity : 23deg. C / 32% RH
Engineer : Yutaka Yoshida
Mode : Tx 11n-40

Antenna Port 0+1

Applied limit: 15.407, (a), (3)

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna Port			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna Port			Result [dBm]	Limit [dBm]	Margin [dB]
			0 [mW]	1 [mW]	Sum [mW]				0 [mW]	1 [mW]	Sum [mW]			
5755	-	-	15.40	6.85	22.25	13.47	30.00	16.53	37.81	16.81	54.62	17.37	36.00	18.63
5795	-	-	16.74	8.43	25.17	14.01	30.00	15.99	41.09	20.69	61.77	17.91	36.00	18.09

Antenna Port 0								Antenna Port 1					
Tested Frequency [MHz]	Duty Factor [dB]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result Cond. Power [dBm]	Result e.i.r.p. [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result Cond. Power [dBm]	Result e.i.r.p. [dBm]
5755	0.00	0.91	0.89	10.07	3.90	11.88	15.78	-2.61	0.89	10.07	3.90	8.36	12.26
5795	0.00	1.27	0.90	10.07	3.90	12.24	16.14	-1.71	0.90	10.07	3.90	9.26	13.16

Sample Calculation:

Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Conducted Power Limit (5725 - 5850 MHz) = 1W (30dBm)

e.i.r.p. Limit (5725 - 5850 MHz) = 2W (36dBm)

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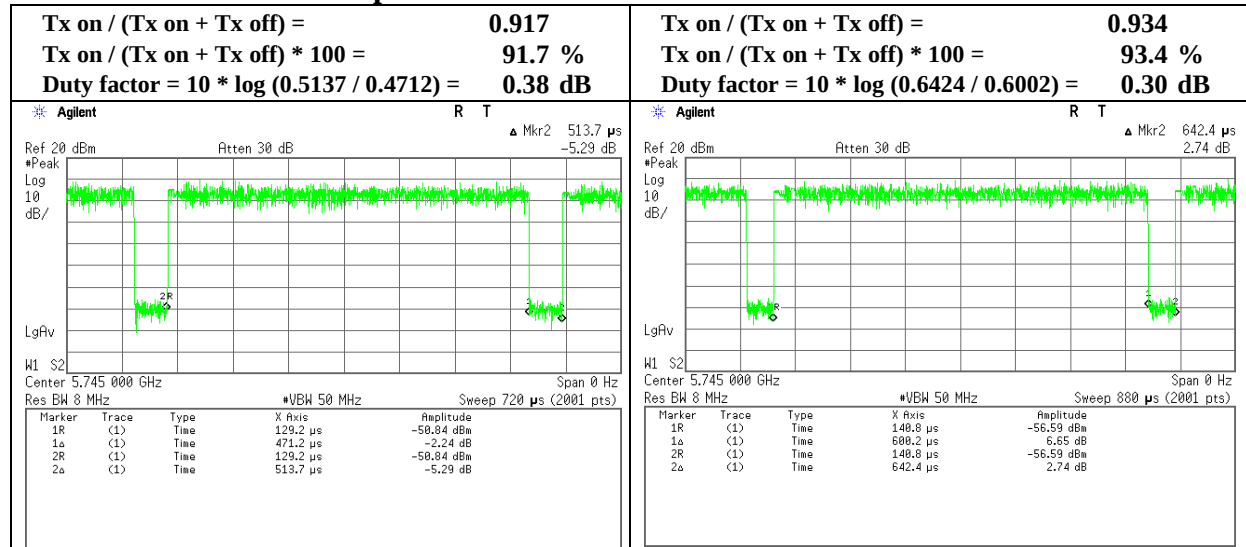
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

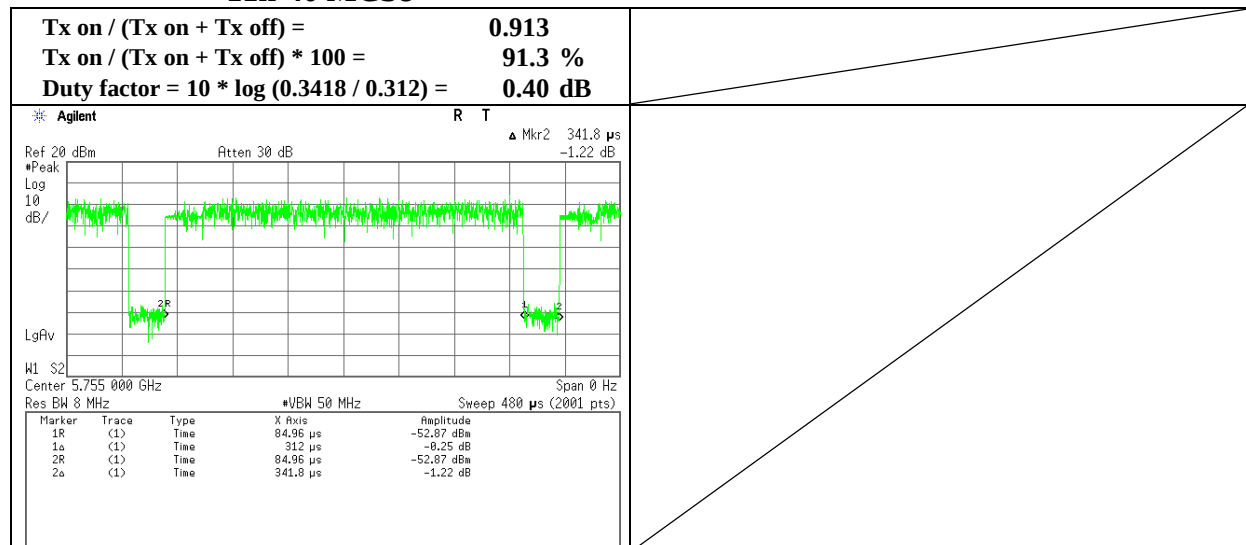
Burst rate confirmation

Test place : Ise EMC Lab. No.3 Measurement Room
Report No. : 11234699H
Date : 04/19/2016
Temperature / Humidity : 23deg. C / 32% RH
Engineer : Yutaka Yoshida
Mode : Tx 11a / 11n-20 / 11n-40

11a 18Mbps



11n-40 MCS8



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Maximum Power Spectral Density

Test place : Ise EMC Lab. No.3 Measurement Room
Report No. : 11234699H
Date : 04/19/2016
Temperature/ Humidity : 23deg. C / 32% RH
Engineer : Yutaka Yoshida
Mode : 11a Tx

Antenna Port 0

Applied limit: 15.407, (a), (3)

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted)			PSD (e.i.r.p.)		
							Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]	Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]
5745	-11.56	0.89	10.07	0.38	3.9	0.27	0.05	30.00	29.95	3.95	36.00	32.05
5785	-10.96	0.90	10.07	0.38	3.9	0.27	0.65	30.00	29.35	4.55	36.00	31.45
5825	-11.39	0.90	10.06	0.38	3.9	0.27	0.23	30.00	29.77	4.13	36.00	31.87

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = $10 * \log (\text{Specified bandwidth} / \text{Measured bandwidth})$

PSD Result (Conducted) = Reading + Cable Loss + Atten. Loss + Duty Factor + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

The conducted PSD limit was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. (All frequencies for FCC, 5725 MHz-5850 MHz for IC)

UL Japan, Inc.

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Maximum Power Spectral Density

Test place : Ise EMC Lab. No.3 Measurement Room
Report No. : 11234699H
Date : 04/19/2016
Temperature/ Humidity : 23deg. C / 32% RH
Engineer : Yutaka Yoshida
Mode : 11a Tx

Antenna Port 1

Applied limit: 15.407, (a), (3)

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted)			PSD (e.i.r.p.)		
							Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]	Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]
5745	-14.37	0.89	10.07	0.38	3.9	0.27	-2.75	30.00	32.75	1.15	36.00	34.85
5785	-13.71	0.90	10.07	0.38	3.9	0.27	-2.10	30.00	32.10	1.80	36.00	34.20
5825	-13.27	0.90	10.06	0.38	3.9	0.27	-1.65	30.00	31.65	2.25	36.00	33.75

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = $10 \cdot \log (\text{Specified bandwidth} / \text{Measured bandwidth})$

PSD Result (Conducted) = Reading + Cable Loss + Atten. Loss + Duty Factor + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

The conducted PSD limit was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. (All frequencies for FCC, 5725 MHz-5850 MHz for IC)

UL Japan, Inc.

Ise EMC Lab.

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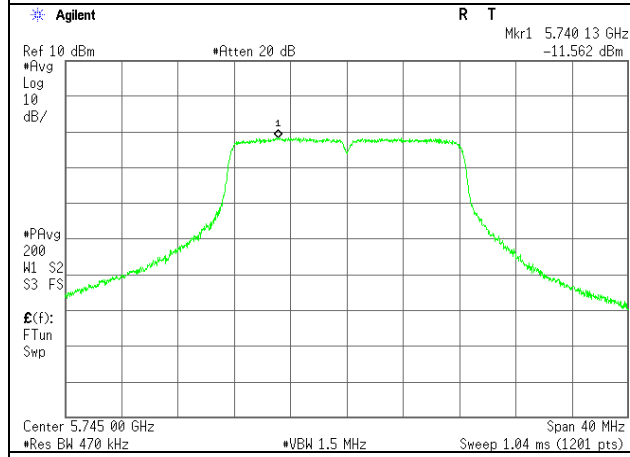
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Facsimile : +81 596 24 8124

Maximum Power Spectral Density

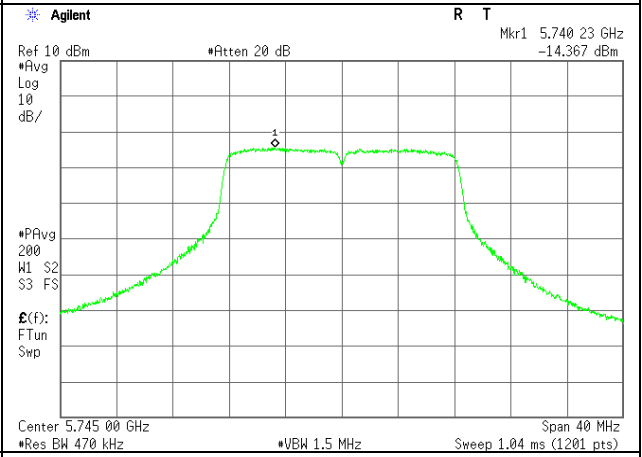
11a Antenna Port 0

5745 MHz

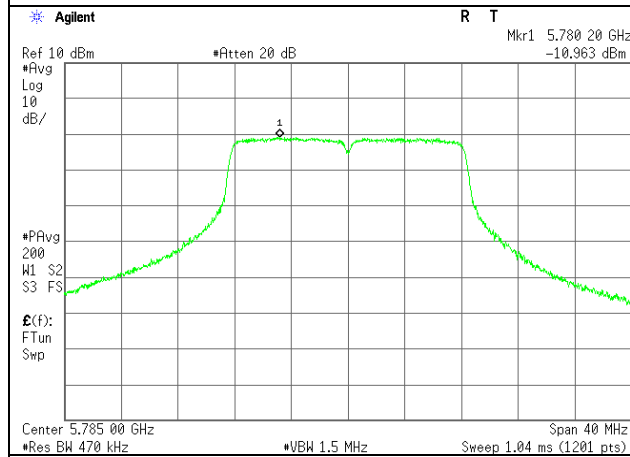


11a Antenna Port 1

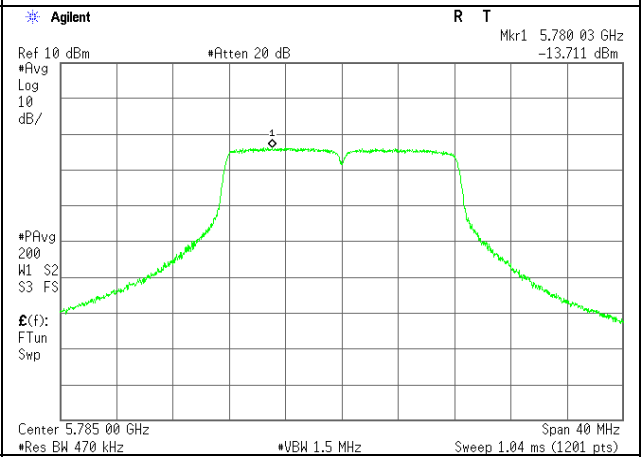
5745 MHz



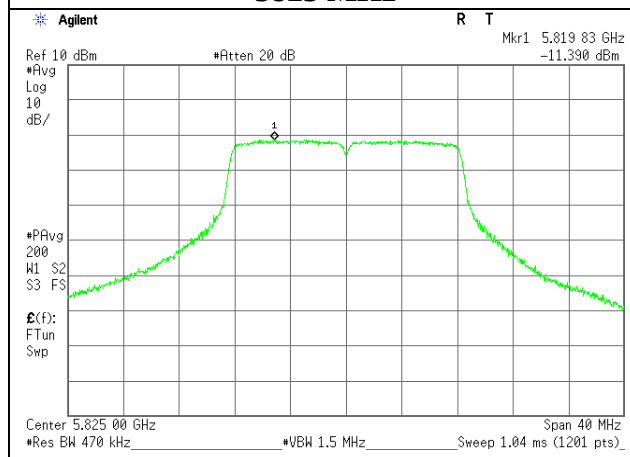
5785 MHz



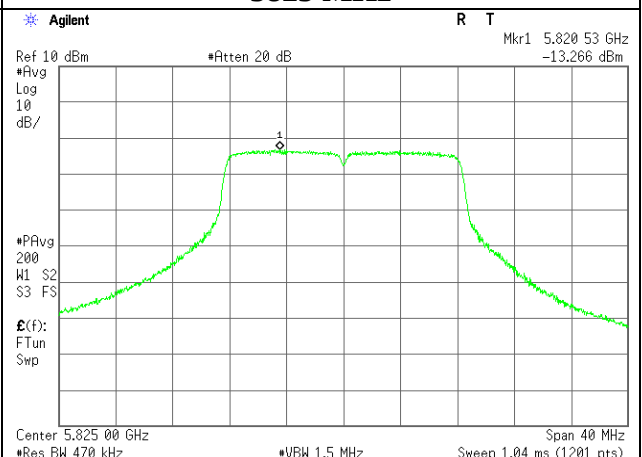
5785 MHz



5825 MHz



5825 MHz



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Maximum Power Spectral Density

Test place : Ise EMC Lab. No.3 Measurement Room
Report No. : 11234699H
Date : 04/19/2016
Temperature/ Humidity : 23deg. C / 32% RH
Engineer : Yutaka Yoshida
Mode : 11n-20 Tx

Antenna Port 0+1							Applied limit: 15.407, (a), (3)					
Tested Frequency [MHz]	PSD (Conducted)						PSD (e.i.r.p.)					
	Antenna Port			Result	Limit	Margin	Antenna Port			Result	Limit	Margin
	0	1	Sum				0	1	Sum			
	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]
5745	1.11	0.54	1.66	2.19	30.00	27.81	2.73	1.33	4.07	6.09	36.00	29.91
5785	1.26	0.61	1.87	2.71	30.00	27.29	3.08	1.50	4.58	6.61	36.00	29.39
5825	1.28	0.67	1.96	2.92	30.00	27.08	3.15	1.65	4.81	6.82	36.00	29.18

Antenna Port 0										Antenna Port 1					
Tested Frequency	Duty Factor	RBW Correction Factor	PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result Cond.	PSD Result e.i.r.p.		PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result Cond.	PSD Result e.i.r.p.
[MHz]	[dB]	[dB]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]		[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]
5745	0.30	0.27	-11.07	0.89	10.07	3.90	0.47	4.37	-14.19	0.89	10.07	3.90	-2.65	-2.65	1.25
5785	0.30	0.27	-10.54	0.90	10.07	3.90	0.99	4.89	-13.69	0.90	10.07	3.90	-2.15	-2.15	1.75
5825	0.30	0.27	-10.45	0.90	10.06	3.90	1.09	4.99	-13.25	0.90	10.06	3.90	-1.71	-1.71	2.19

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = $10 * \log (\text{Specified bandwidth} / \text{Measured bandwidth})$

PSD Result (Conducted) = Reading + Cable Loss + Atten. Loss + Duty Factor + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

The conducted PSD limit was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. (All frequencies for FCC, 5725 MHz-5850 MHz for IC)

UL Japan, Inc.

Ise EMC Lab.

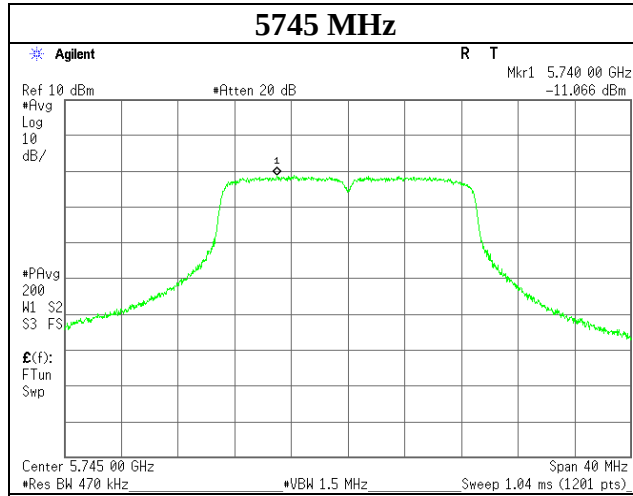
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

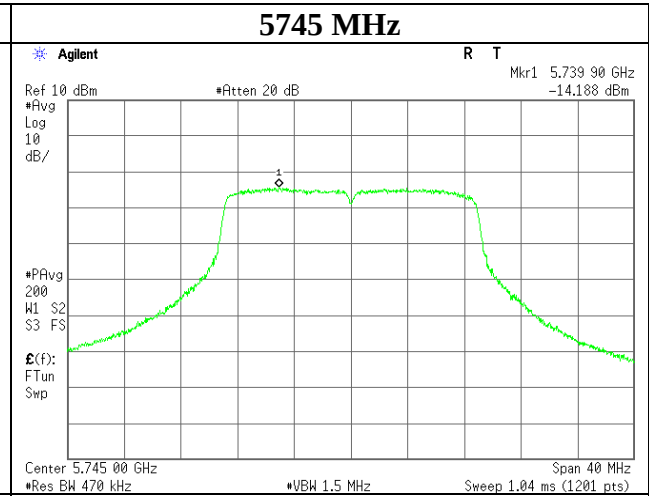
Facsimile : +81 596 24 8124

Maximum Power Spectral Density

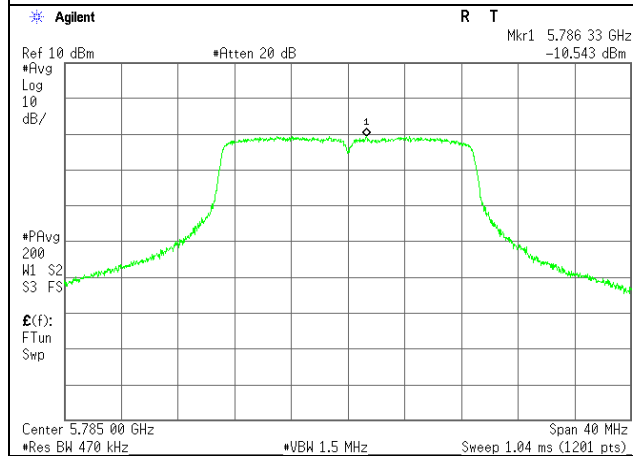
11n-20 Antenna Port 0



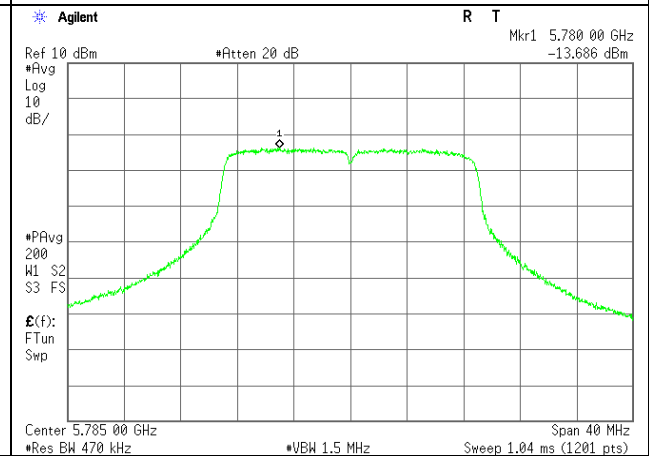
11n-20 Antenna Port 1



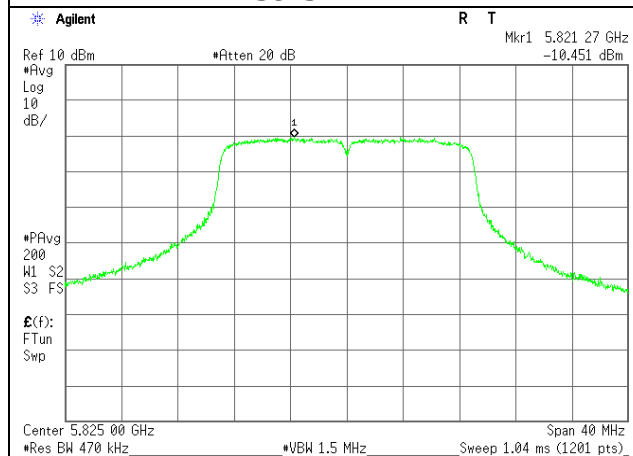
5785 MHz



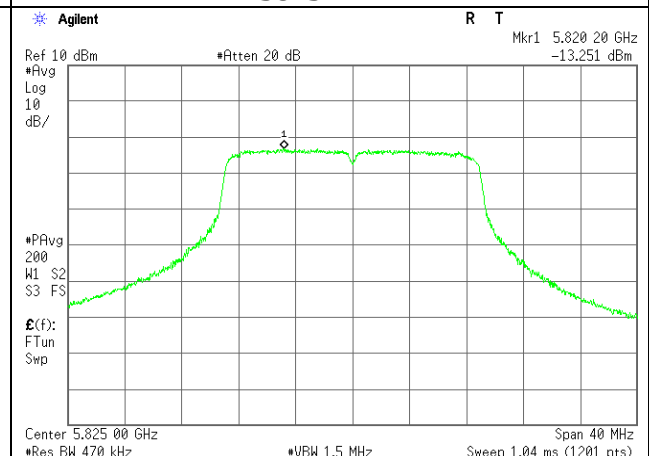
5785 MHz



5825 MHz



5825 MHz



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Maximum Power Spectral Density

Test place : Ise EMC Lab. No.3 Measurement Room
Report No. : 11234699H
Date : 04/19/2016
Temperature/ Humidity : 23deg. C / 32% RH
Engineer : Yutaka Yoshida
Mode : 11n-40 Tx

Antenna Port 0+1							Applied limit: 15.407, (a), (3)						
Tested Frequency [MHz]	PSD (Conducted)						PSD (e.i.r.p.)						
	Antenna Port			Result	Limit	Margin	Antenna Port			Result	Limit	Margin	
	0	1	Sum				0	1	Sum				
	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	
5755	0.39	0.15	0.54	-2.67	30.00	32.67	0.96	0.36	1.33	1.23	36.00	34.77	
5795	0.40	0.21	0.60	-2.18	30.00	32.18	0.97	0.51	1.48	1.72	36.00	34.28	

Antenna Port 0									Antenna Port 1					
Tested Frequency	Duty Factor	RBW Correction Factor	PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result Cond.	e.i.r.p.	PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result Cond.	e.i.r.p.
[MHz]	[dB]	[dB]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]
5755	0.40	0.27	-15.70	0.89	10.07	3.90	-4.06	-0.16	-19.94	0.89	10.07	3.90	-8.30	-4.40
5795	0.40	0.27	-15.65	0.90	10.07	3.90	-4.01	-0.11	-18.47	0.90	10.07	3.90	-6.83	-2.93

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)

PSD Result (Conducted) = Reading + Cable Loss + Atten. Loss + Duty Factor + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

The conducted PSD limit was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. (All frequencies for FCC, 5725 MHz-5850 MHz for IC)

UL Japan, Inc.

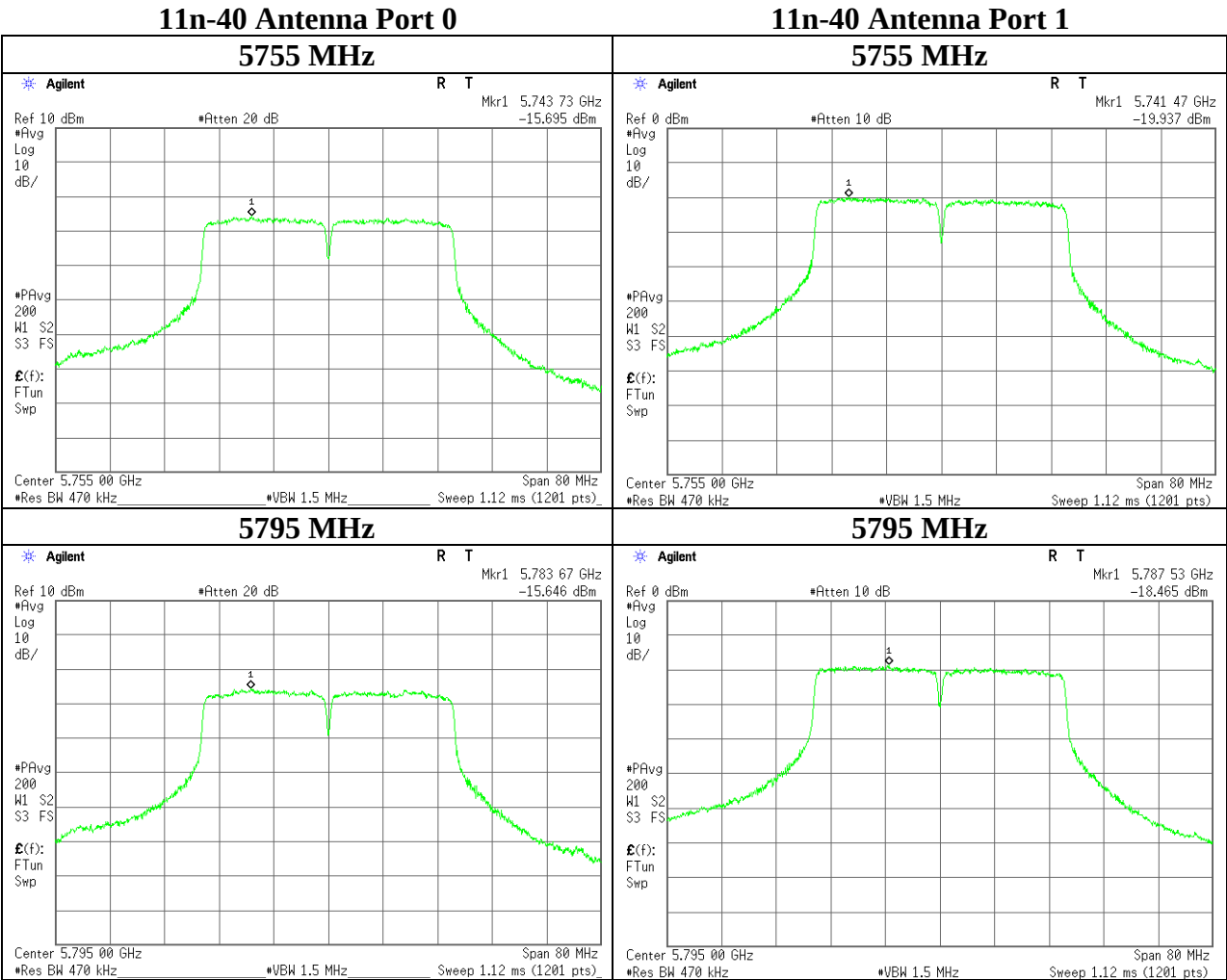
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Maximum Power Spectral Density



Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber		
Report No.	11234699H		
Date	April 4, 2016	April 8, 2016	April 8, 2016
Temperature / Humidity	22deg. C / 61 % RH	21 deg. C / 51 % RH	21 deg. C / 51 % RH
Engineer	Keisuke Kawamura (1 GHz-10 GHz)	Takafumi Noguchi (10 GHz-26.5 GHz)	Masafumi Niwa (26.5 GHz-40 GHz)
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	4987.831	PK	52.0	33.5	7.4	31.2	-	61.7	73.9	12.2	
Hori	5715.000	PK	55.9	33.1	7.7	31.4	-	65.3	109.4	44.1	
Hori	5725.000	PK	67.6	33.1	7.7	31.4	-	77.0	122.2	45.2	
Hori	11490.000	PK	55.9	40.2	-1.7	33.1	-	61.3	73.9	12.6	
Hori	17235.000	PK	42.3	42.2	0.1	32.6	-	52.0	73.9	21.9	
Hori	4987.831	AV	40.7	33.5	7.4	31.2	0.3	50.7	53.9	3.2	
Hori	11490.000	AV	44.2	40.2	-1.7	33.1	0.3	49.9	53.9	4.0	
Hori	17235.000	AV	33.7	42.2	0.1	32.6	0.3	43.7	53.9	10.2	
Vert	4987.831	PK	53.6	33.5	7.4	31.2	-	63.3	73.9	10.6	
Vert	5715.000	PK	54.1	33.1	7.7	31.4	-	63.5	109.4	45.9	
Vert	5725.000	PK	66.2	33.1	7.7	31.4	-	75.6	122.2	46.6	
Vert	11490.000	PK	51.9	40.2	-1.7	33.1	-	57.3	73.9	16.6	
Vert	17235.000	PK	44.1	42.2	0.1	32.6	-	53.8	73.9	20.1	
Vert	4987.831	AV	43.0	33.5	7.4	31.2	0.3	53.0	53.9	0.9	
Vert	11490.000	AV	42.2	40.2	-1.7	33.1	0.3	47.9	53.9	6.0	
Vert	17235.000	AV	34.8	42.2	0.1	32.6	0.3	44.8	53.9	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 20dB).

Distance factor:	1GHz-10GHz	20log(4.45m/3.0m)= 3.4dB
	10GHz-26.5GHz	20log(1.0m/3.0m)= -9.5dB
	26.5GHz-40GHz	20log(0.5m/3.0m)= -15.6dB

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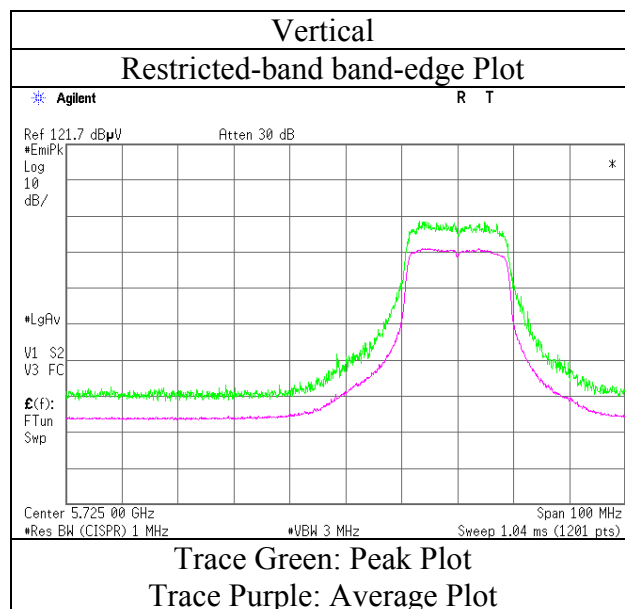
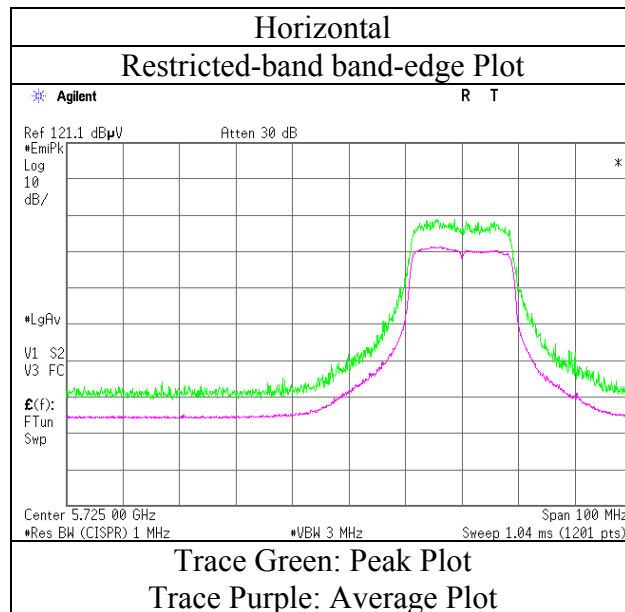
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 11234699H
Date : April 4, 2016
Temperature / Humidity : 22deg. C / 61 % RH
Engineer : Keisuke Kawamura
Mode : Tx 11n-20 5745 MHz



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

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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 11234699H
Date : April 4, 2016 April 8, 2016 April 8, 2016
Temperature / Humidity : 22deg. C / 61 % RH 21 deg. C / 51 % RH 21 deg. C / 51 % RH
Engineer : Keisuke Kawamura Takafumi Noguchi Masafumi Niwa
(1 GHz-10 GHz) (10 GHz-26.5 GHz) (26.5 GHz-40 GHz)
(30MHz-1000MHz)
Mode : Tx 11n-20 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	99.717	QP	44.9	9.7	8.1	32.1	-	30.6	43.5	12.9	
Hori	120.000	QP	43.3	12.4	8.3	32.0	-	32.0	43.5	11.5	
Hori	165.990	QP	34.6	15.6	8.8	32.0	-	27.0	43.5	16.5	
Hori	497.824	QP	36.3	17.5	11.2	32.2	-	32.8	46.0	13.2	
Hori	699.577	QP	37.4	19.8	12.3	32.2	-	37.3	46.0	8.7	
Hori	832.745	QP	35.6	21.1	13.0	31.5	-	38.2	46.0	7.8	
Hori	4987.831	PK	50.0	33.5	7.4	31.2	-	59.7	73.9	14.2	
Hori	5360.000	PK	52.5	33.1	7.6	31.3	-	61.9	73.9	12.0	
Hori	11570.000	PK	56.9	40.1	-1.7	33.1	-	62.2	73.9	11.7	
Hori	17355.000	PK	44.4	42.4	0.0	32.6	-	54.2	73.9	19.7	
Hori	4987.831	AV	38.0	33.5	7.4	31.2	0.3	48.0	53.9	5.9	
Hori	5360.000	AV	44.0	33.1	7.6	31.3	0.3	53.7	53.9	0.2	
Hori	11570.000	AV	46.2	40.1	-1.7	33.1	0.3	51.8	53.9	2.1	
Hori	17355.000	AV	35.8	42.4	0.0	32.6	0.3	45.9	53.9	8.0	
Vert	52.480	QP	33.1	9.4	7.5	32.1	-	17.9	40.0	22.1	
Vert	99.652	QP	45.2	9.7	8.1	32.1	-	30.9	43.5	12.6	
Vert	119.996	QP	39.6	12.4	8.3	32.0	-	28.3	43.5	15.2	
Vert	498.244	QP	38.1	17.5	11.2	32.2	-	34.6	46.0	11.4	
Vert	696.945	QP	36.1	19.8	12.3	32.2	-	36.0	46.0	10.0	
Vert	949.990	QP	29.7	22.1	13.5	30.9	-	34.4	46.0	11.6	
Vert	4987.831	PK	56.3	33.5	7.4	31.2	-	66.0	73.9	7.9	
Vert	5360.000	PK	50.3	33.1	7.6	31.3	-	59.7	73.9	14.2	
Vert	11570.000	PK	57.6	40.1	-1.7	33.1	-	62.9	73.9	11.0	
Vert	17355.000	PK	46.6	42.4	0.0	32.6	-	56.4	73.9	17.5	
Vert	4987.831	AV	43.5	33.5	7.4	31.2	0.3	53.5	53.9	0.4	
Vert	5360.000	AV	42.6	33.1	7.6	31.3	0.3	52.3	53.9	1.6	
Vert	11570.000	AV	47.2	40.1	-1.7	33.1	0.3	52.8	53.9	1.1	
Vert	17355.000	AV	37.4	42.4	0.0	32.6	0.3	47.5	53.9	6.4	

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 20dB).

Distance factor: 1GHz-10GHz 20log(4.45m/3.0m)= 3.4dB
 10GHz-26.5GHz 20log(1.0m/3.0m)= -9.5dB
 26.5GHz-40GHz 20log(0.5m/3.0m)= -15.6dB

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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 11234699H
Date : April 4, 2016 April 8, 2016 April 8, 2016
Temperature / Humidity : 22deg. C / 61 % RH 21 deg. C / 51 % RH 21 deg. C / 51 % RH
Engineer : Keisuke Kawamura Takafumi Noguchi Masafumi Niwa
(1 GHz-10 GHz) (10 GHz-26.5 GHz) (26.5 GHz-40 GHz)
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	4987.831	PK	51.4	33.5	7.4	31.2	-	61.1	73.9	12.8	
Hori	5360.000	PK	51.5	33.1	7.6	31.3	-	60.9	73.9	13.0	
Hori	5850.000	PK	56.4	33.2	7.8	31.5	-	65.9	122.2	56.3	
Hori	5860.000	PK	54.1	33.2	7.8	31.5	-	63.6	109.4	45.8	
Hori	11650.000	PK	58.4	40.1	-1.6	33.1	-	63.8	73.9	10.1	
Hori	17475.000	PK	45.4	42.6	0.0	32.6	-	55.4	73.9	18.5	
Hori	4987.831	AV	41.0	33.5	7.4	31.2	0.3	51.0	53.9	2.9	
Hori	5360.000	AV	44.0	33.1	7.6	31.3	0.3	53.7	53.9	0.2	
Hori	11650.000	AV	47.7	40.1	-1.6	33.1	0.3	53.4	53.9	0.5	
Hori	17475.000	AV	36.6	42.6	0.0	32.6	0.3	46.9	53.9	7.0	
Vert	4987.831	PK	52.4	33.5	7.4	31.2	-	62.1	73.9	11.8	
Vert	5360.000	PK	49.2	33.1	7.6	31.3	-	58.6	73.9	15.3	
Vert	5850.000	PK	58.1	33.2	7.8	31.5	-	67.6	122.2	54.6	
Vert	5860.000	PK	51.8	33.2	7.8	31.5	-	61.3	109.4	48.1	
Vert	11650.000	PK	61.6	40.1	-1.6	33.1	-	67.0	73.9	6.9	
Vert	17475.000	PK	45.1	42.6	0.0	32.6	-	55.1	73.9	18.8	
Vert	4987.831	AV	42.7	33.5	7.4	31.2	0.3	52.7	53.9	1.2	
Vert	5360.000	AV	42.0	33.1	7.6	31.3	0.3	51.7	53.9	2.2	
Vert	11650.000	AV	48.1	40.1	-1.6	33.1	0.3	53.8	53.9	0.1	
Vert	17475.000	AV	36.6	42.6	0.0	32.6	0.3	46.9	53.9	7.0	

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 20dB).

Distance factor: 1GHz-10GHz 20log(4.45m/3.0m)= 3.4dB
 10GHz-26.5GHz 20log(1.0m/3.0m)= -9.5dB
 26.5GHz-40GHz 20log(0.5m/3.0m)= -15.6dB

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Ise EMC Lab.

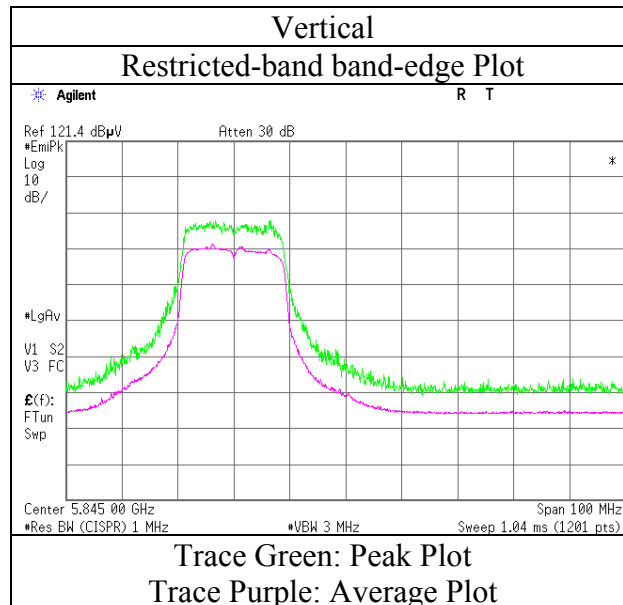
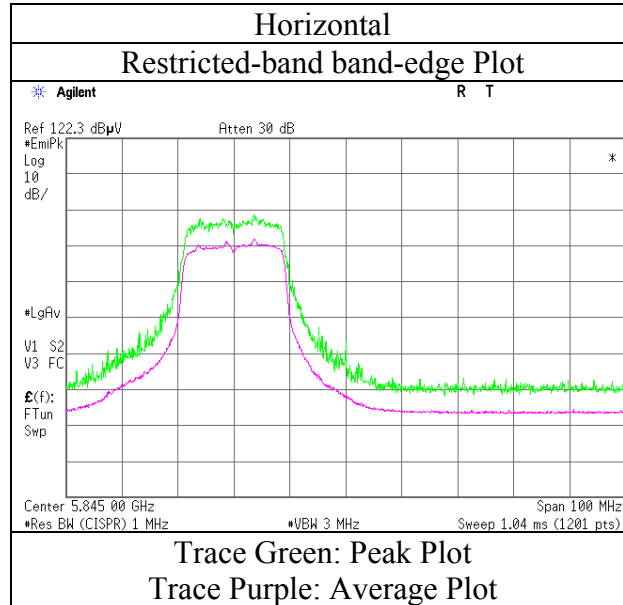
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11234699H
Date	April 4, 2016
Temperature / Humidity	22deg. C / 61 % RH
Engineer	Keisuke Kawamura
Mode	Tx 11n-20 5825 MHz



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

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Ise EMC Lab.

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

Telephone : +81 596 24 8999

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 11234699H
Date : April 4, 2016 April 8, 2016 April 8, 2016
Temperature / Humidity : 22deg. C / 61 % RH 21 deg. C / 51 % RH 21 deg. C / 51 % RH
Engineer : Keisuke Kawamura Takafumi Noguchi Masafumi Niwa
Mode : (1 GHz-10 GHz) (10 GHz-26.5 GHz) (26.5 GHz-40 GHz)
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	4987.831	PK	52.4	33.5	7.4	31.2	-	62.1	73.9	11.8	
Hori	5360.000	PK	49.5	33.1	7.6	31.3	-	58.9	73.9	15.0	
Hori	5715.000	PK	60.0	33.1	7.7	31.4	-	69.4	109.4	40.0	
Hori	5725.000	PK	59.5	33.1	7.7	31.4	-	68.9	122.2	53.3	
Hori	11510.000	PK	50.2	40.2	-1.7	33.1	-	55.6	73.9	18.3	
Hori	17265.000	PK	42.1	42.3	0.0	32.6	-	51.8	73.9	22.1	Floor Noise
Hori	4987.831	AV	41.0	33.5	7.4	31.2	0.4	51.1	53.9	2.8	
Hori	5360.000	AV	41.6	33.1	7.6	31.3	0.4	51.4	53.9	2.5	
Hori	11510.000	AV	38.3	40.2	-1.7	33.1	0.4	44.1	53.9	9.8	
Hori	17265.000	AV	33.3	42.3	0.0	32.6	-	43.0	53.9	10.9	Floor Noise
Vert	4987.831	PK	50.2	33.5	7.4	31.2	-	59.9	73.9	14.0	
Vert	5360.000	PK	49.5	33.1	7.6	31.3	-	58.9	73.9	15.0	
Vert	5715.000	PK	56.5	33.1	7.7	31.4	-	65.9	109.4	43.5	
Vert	5725.000	PK	64.2	33.1	7.7	31.4	-	73.6	122.2	48.6	
Vert	11510.000	PK	53.8	40.2	-1.7	33.1	-	59.2	73.9	14.7	
Vert	17265.000	PK	41.5	42.3	0.0	32.6	-	51.2	73.9	22.7	Floor Noise
Vert	4987.831	AV	41.1	33.5	7.4	31.2	0.4	51.2	53.9	2.7	
Vert	5360.000	AV	41.9	33.1	7.6	31.3	0.4	51.7	53.9	2.2	
Vert	11510.000	AV	41.2	40.2	-1.7	33.1	0.4	47.0	53.9	6.9	
Vert	17265.000	AV	33.3	42.3	0.0	32.6	-	43.0	53.9	10.9	Floor Noise

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

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

Distance factor: 1GHz-10GHz 20log(4.45m/3.0m)= 3.4dB
 10GHz-26.5GHz 20log(1.0m/3.0m)= -9.5dB
 26.5GHz-40GHz 20log(0.5m/3.0m)= -15.6dB

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Ise EMC Lab.

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Radiated Spurious Emission

Test place

Report No.

Date

Temperature / Humidity

Engineer

Mode

Ise EMC Lab. No.4 Semi Anechoic Chamber

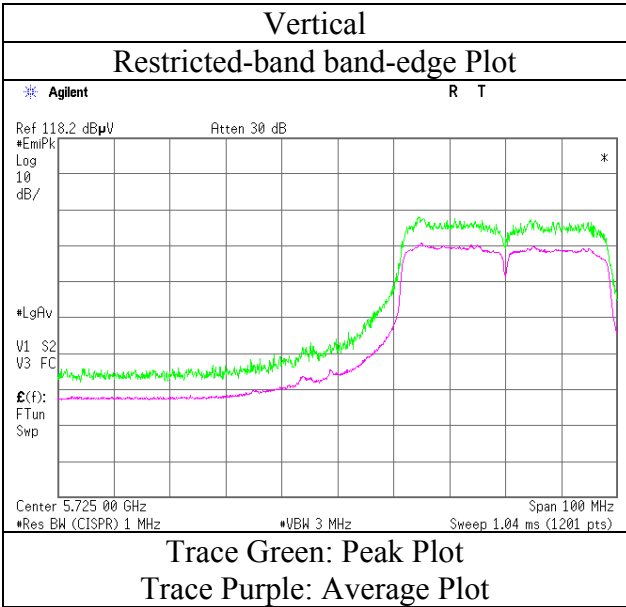
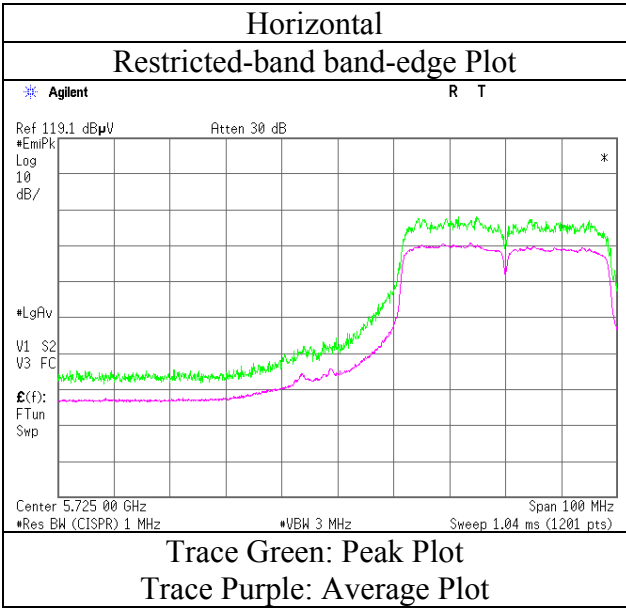
11234699H

April 4, 2016

22deg. C / 61 % RH

Keisuke Kawamura

Tx 11n-40 5755 MHz



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

Radiated Spurious Emission

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 11234699H
Date : April 4, 2016 April 8, 2016 April 8, 2016
Temperature / Humidity : 22deg. C / 61 % RH 21 deg. C / 51 % RH 21 deg. C / 51 % RH
Engineer : Keisuke Kawamura Takafumi Noguchi Masafumi Niwa
(1 GHz-10 GHz) (10 GHz-26.5 GHz) (26.5 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	4987.831	PK	53.2	33.5	7.4	31.2	-	62.9	73.9	11.0	
Hori	5360.000	PK	48.3	33.1	7.6	31.3	-	57.7	73.9	16.2	
Hori	5850.000	PK	49.4	33.2	7.8	31.5	-	58.9	122.2	63.3	
Hori	5860.000	PK	47.5	33.2	7.8	31.5	-	57.0	109.4	52.4	
Hori	11590.000	PK	53.8	40.1	-1.6	33.1	-	59.2	73.9	14.7	
Hori	17385.000	PK	42.5	42.5	0.0	32.6	-	52.4	73.9	21.5	Floor Noise
Hori	4987.831	AV	40.8	33.5	7.4	31.2	0.4	50.9	53.9	3.0	
Hori	5360.000	AV	39.5	33.1	7.6	31.3	0.4	49.3	53.9	4.6	
Hori	11590.000	AV	42.2	40.1	-1.6	33.1	0.4	48.0	53.9	5.9	
Hori	17385.000	AV	33.7	42.5	0.0	32.6	-	43.6	53.9	10.3	Floor Noise
Vert	4987.831	PK	55.2	33.5	7.4	31.2	-	64.9	73.9	9.0	
Vert	5360.000	PK	50.5	33.1	7.6	31.3	-	59.9	73.9	14.0	
Vert	5850.000	PK	48.6	33.2	7.8	31.5	-	58.1	122.2	64.1	
Vert	5860.000	PK	46.0	33.2	7.8	31.5	-	55.5	109.4	53.9	
Vert	11590.000	PK	53.3	40.1	-1.6	33.1	-	58.7	73.9	15.2	
Vert	17385.000	PK	42.6	42.5	0.0	32.6	-	52.5	73.9	21.4	Floor Noise
Vert	4987.831	AV	37.9	33.5	7.4	31.2	0.4	48.0	53.9	5.9	
Vert	5360.000	AV	41.2	33.1	7.6	31.3	0.4	51.0	53.9	2.9	
Vert	11590.000	AV	42.3	40.1	-1.6	33.1	0.4	48.1	53.9	5.8	
Vert	17385.000	AV	33.7	42.5	0.0	32.6	-	43.6	53.9	10.3	Floor Noise

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

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

Distance factor: 1GHz-10GHz 20log(4.45m/3.0m)= 3.4dB
 10GHz-26.5GHz 20log(1.0m/3.0m)= -9.5dB
 26.5GHz-40GHz 20log(0.5m/3.0m)= -15.6dB

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Ise EMC Lab.

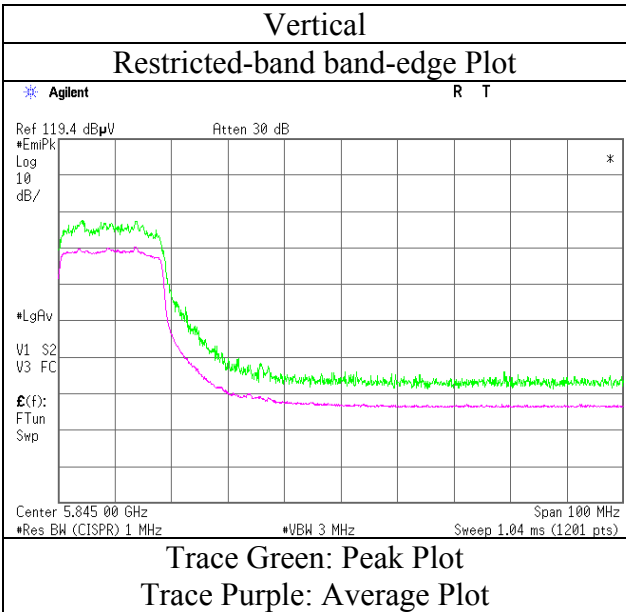
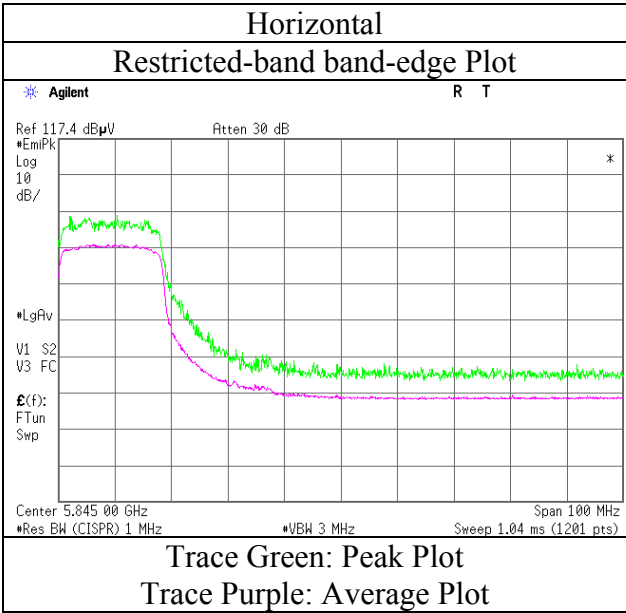
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Radiated Spurious Emission

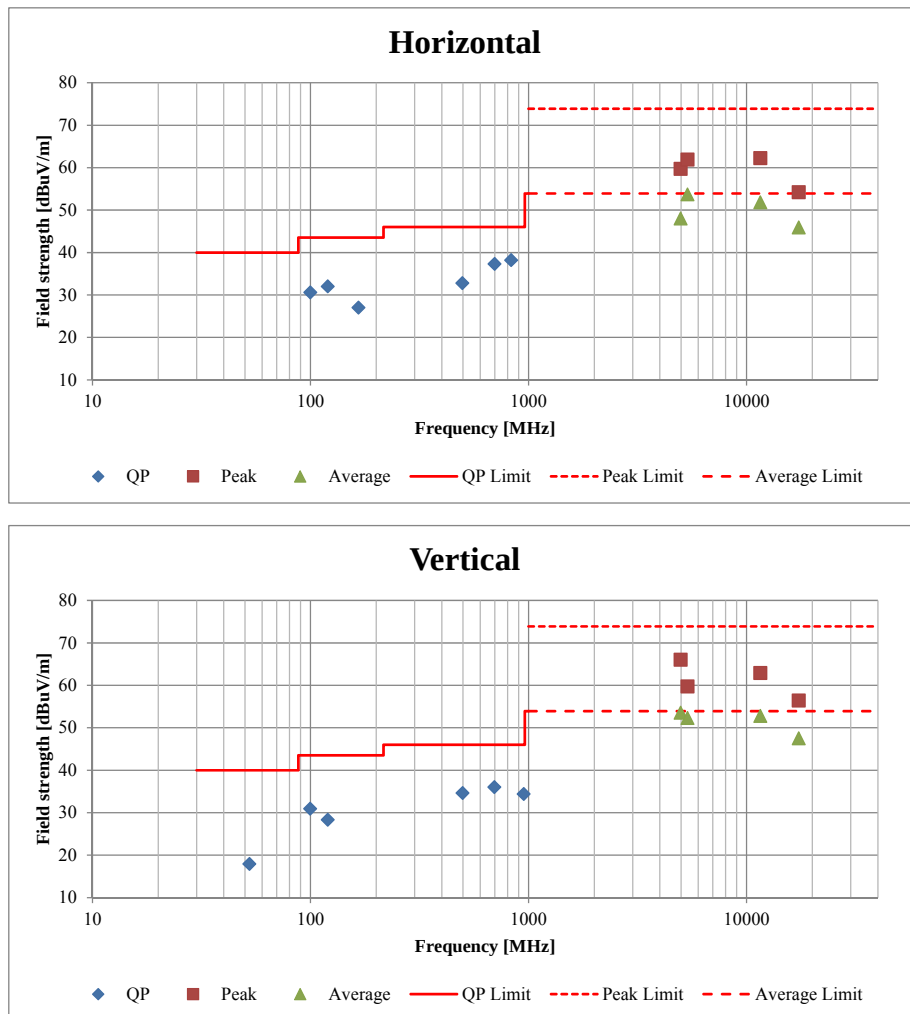
Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11234699H
Date	April 4, 2016
Temperature / Humidity	22deg. C / 61 % RH
Engineer	Keisuke Kawamura
Mode	Tx 11n-40 5795 MHz



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

Radiated Spurious Emission (Plot data, Worst case)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber		
Report No.	11234699H		
Date	April 4, 2016	April 8, 2016	April 8, 2016
Temperature / Humidity	22deg. C / 61 % RH	21 deg. C / 51 % RH	21 deg. C / 51 % RH
Engineer	Keisuke Kawamura (1 GHz-10 GHz)	Takafumi Noguchi (10 GHz-26.5 GHz)	Masafumi Niwa (26.5 GHz-40 GHz) (30MHz-1000MHz)
Mode	Tx 11n-20 5785 MHz		



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

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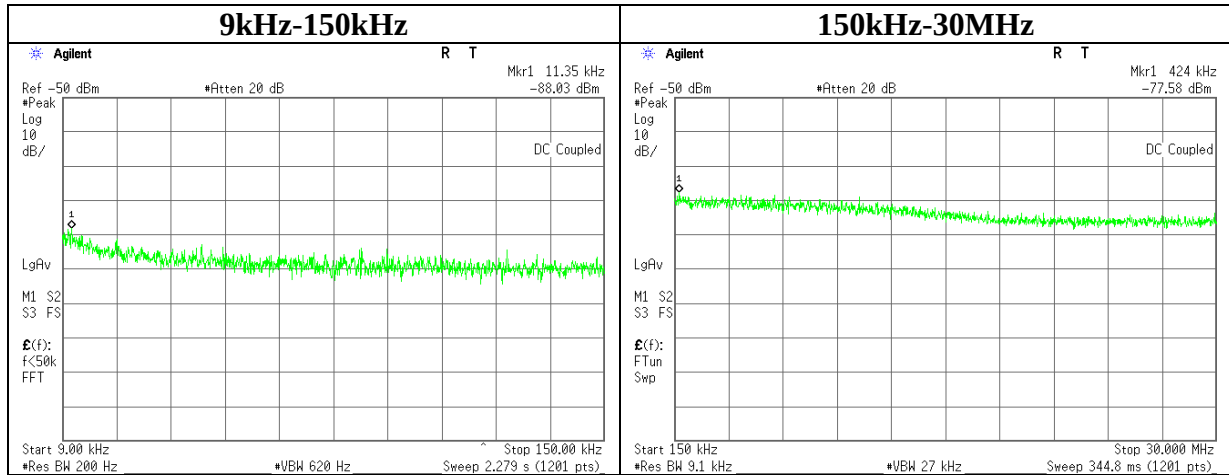
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place	Ise EMC Lab. No.3 Measurement Room
Report No.	11234699H
Date	04/19/2016
Temperature/ Humidity	23deg. C / 32% RH
Engineer	Yutaka Yoshida
Mode	Tx 11n-20

11n-20 Tx 5825MHz Antenna Port 0



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
11.35	-88.0	0.13	10.01	3.9	2	-71.0	300	6.0	-9.7	46.5	56.2	
424.00	-77.6	0.13	10.01	3.9	2	-60.5	300	6.0	0.7	15.0	14.3	

$E = \text{EIRP} - 20\log(D) + \text{Ground bounce} + 104.8 [\text{dBuV/m}]$

$\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain} + 10 * \log(N)$

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APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2015/10/02 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	1501	RE	2016/01/21 * 12
MJM-26	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE	2016/02/24 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2015/11/06 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2015/08/10 * 12
MCC-141	Microwave Cable	Junkosha	MWX221	1305S002R(1m) / 1405S146(5m)	RE	2015/06/22 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	00650	RE	2015/10/01 * 12
MMM-10	DIGITAL HiTESTER	Hioki	3805	051201148	RE	2016/01/18 * 12
MPM-20	Power Meter	DARE!! Instruments	RPR3006W	14I00048SNO0 84	AT	2015/11/09 * 12
MPM-19	Power Meter	DARE!! Instruments	RPR3006W	14I00048SNO0 83	AT	2015/11/09 * 12
MAT-82	Attenuator	Weinschel Associates	WA1-20-33	100132	AT	2015/05/04 * 12
MAT-80	Attenuator	Weinschel Associates	WA1-20-33	100130	AT	2015/05/04 * 12
MPSE-12	Power sensor	Anritsu	MA2411B	011598	AT	2015/10/19 * 12
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	AT	2015/10/08 * 12
MAT-89	Attenuator	Weinschel Associates	WA56-10	56100305	AT	2015/06/01 * 12
MOS-23	Thermo-Hygrometer	Custom	CTH-201	0004	AT	2015/12/08 * 12
MRENT-126	Spectrum Analyzer	KEYSIGHT	E4440A	MY46185516	AT	2015/07/31 * 12
MPM-12	Power Meter	Anritsu	ML2495A	0825002	AT	2015/06/09 * 12
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	AT	2015/06/09 * 12
MCC-207	Microwave Cable	RS components	R-132G7210200CD	-	AT	2016/02/08 * 12
MAT-25	Attenuator(10dB)(above 1GHz)	Agilent	8493C	71642	AT	2015/06/18 * 12
MOS-29	Thermo-Hygrometer	Custom	CTH-201	2901	AT	2016/01/21 * 12
MHA-17	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170307	RE	2015/06/06 * 12
MHF-23	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCC	603	RE	2016/01/19 * 12
MCC-178	Microwave Cable	Junkosha	MMX221-00500DMSDMS	1502S305	RE	2016/03/10 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	100084	RE	2015/11/28 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2015/10/11 * 12
MLA-23	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-192	RE	2016/01/30 * 12
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2015/06/19 * 12
MAT-68	Attenuator	Anritsu	MP721B	6200961025	RE	2015/11/12 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2016/03/18 * 12
MHA-29	Horn Antenna 26.5-40GHz	ETS LINDGREN	3160-10	00152399	RE	2015/09/04 * 12
MCC-54	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	RE	2016/03/18 * 12
MPA-22	Pre Amplifier	MITEQ, Inc	AMF-6F-2600400-33-8P / AMF-4F-2600400-33-8P	1871355 /1871328	RE	2015/09/03 * 12

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The expiration date of the calibration is the end of the expired month.

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

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

Test Item: RE: Radiated Emission

AT: Antenna Terminal Conducted test

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