# RADIO TEST REPORT

## Test Report No. : 32BE0278-HO-A-R1

| | | |
|---|---|---|
| **Applicant** | : | **SAMSUNG ELECTRONICS CO., LTD.** |
| **Type of Equipment** | : | **Cellular/PCS GSM/GPRS/EDGE Tablet with 802.11abgn, BT3.0** |
| **Model No.** | : | **SC-02D** |
| **FCC ID** | : | **A3LSWDSC02D** |
| **Test regulation** | : | **FCC Part 15 Subpart C: 2011** |
| **Test Result** | : | **Complied** |

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This report is a revised version of 32BE0278-HO-A. 32BE0278-HO-A is replaced with this report.

**Date of test:** September 27 to November 4, 2011

**Representative test engineer:**

Katsunori Okai
Engineer of WiSE Japan,
UL Verification Service

**Approved by:**

Takahiro Hatakeda
Leader of WiSE Japan,
UL Verification Service

NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address,
http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap

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# SECTION 1: Customer information

| | | |
|---|---|---|
| Company Name | : | SAMSUNG ELECTRONICS CO., LTD. |
| Address | : | 416, MAETAN 3-DONG, YEONGTONG-GU SUWON-CITY, GYEONGGI-DO 443-742, SOUTH KOREA |

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

## 2.1 Identification of E.U.T.

| | | |
|---|---|---|
| Type of Equipment | : | Cellular/PCS GSM/GPRS/EDGE Tablet with 802.11abgn, BT3.0 |
| Model No. | : | SC-02D |
| Serial No. | : | Refer to Section 4, Clause 4.2 |
| Rating | : | DC4.0V |
| Receipt Date of Sample | : | September 27, 2011 |
| Modification of EUT | : | No Modification by the test lab |

## 2.2 Product Description

**Radio Specification**

**Bluetooth**

| | |
|---|---|
| Equipment Type | Transceiver |
| Frequency of Operation | 2402-2480MHz |
| Type of Modulation | FHSS |
| Bandwidth & Channel spacing | 1MHz & 1MHz |
| Antenna Type | PIFA |
| Antenna Gain | -0.63 dBi |

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

| | | |
|---|---|---|
| Equipment Type | Transceiver | |
| Frequency of Operation | 2412-2462MHz | 5180-5240MHz<br>5260-5320MHz<br>5500-5700MHz<br>5745-5825MHz |
| Type of Modulation | DSSS, OFDM | OFDM |
| Bandwidth & Channel spacing | 20MHz & 5MHz | 20MHz & 20MHz |
| Antenna Type | SEMI-PIFA | |
| Antenna Gain | 2.4G: -0.4dBi | 5G: -3.8dBi |

**WLAN (IEEE802.11n-40)**

| | |
|---|---|
| Equipment Type | Transceiver |
| Frequency of Operation | 5190-5230MHz<br>5270-5310MHz<br>5510-5670MHz<br>5755-5795MHz |
| Type of Modulation | OFDM |
| Bandwidth & Channel spacing | 40MHz & 40MHz |
| Antenna Type | SEMI-PIFA |
| Antenna Gain | -3.8dBi |

**GSM**

| | |
|---|---|
| Equipment Type | Transceiver |
| Frequency of Operation | [Up Link]<br>GSM850: 824 – 849MHz<br>PCS: 1850 – 1910MHz<br>[Down Link]<br>GSM850: 869 – 894MHz<br>PCS: 1930 – 1990MHz |
| Type of Modulation | GMSK , 8PSK |
| Antenna Type | PIFA |
| Antenna Gain | GSM850: -5.0dBi<br>PCS: -1.5dBi |

# SECTION 3: Test specification, procedures & results

## 3.1 Test Specification

| | | |
|---|---|---|
| Test Specification | : | FCC Part 15 Subpart C: 2011, final revised on July 8, 2011 and effective August 8, 2011 |
| Title | : | FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators<br>Section 15.207 Conducted limits<br>Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz |

* The EUT complies with FCC Part 15 Subpart B: 2011, final revised on July 8, 2011 and effective August 8, 2011.

## 3.2 Procedures and results

| Item | Test Procedure | Specification | Worst margin | Results | Remarks |
|---|---|---|---|---|---|
| Conducted Emission | **FCC:** ANSI C63.4:2003<br>7. AC powerline Conducted Emission measurements | **FCC:** Section 15.207 | **QP**<br>14.0dB, 0.44410MHz, N<br>**AV**<br>20.4dB, 0.44410MHz, N | Complied | - |
| | **IC:** RSS-Gen 7.2.4 | **IC:** RSS-Gen 7.2.4 | | | |
| 6dB Bandwidth | **FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" | **FCC:** Section 15.247(a)(2) | See data. | Complied | Conducted |
| | **IC:** RSS-Gen 4.6.2 | **IC:** RSS-210 A8.2(a) | | | |
| Maximum Peak Output Power | **FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" | **FCC:** Section 15.247(b)(3) | | Complied | Conducted |
| | **IC:** RSS-Gen 4.8 | **IC:** RSS-210 A8.4(4) | | | |
| Power Density | **FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" | **FCC:** Section 15.247 (e) | | Complied | Conducted |
| | **IC:** - | **IC:** RSS-210 A8.2(b) | | | |
| Spurious Emission Restricted Band Edges | **FCC:** "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247" | **FCC:** Section15.247(d) | 8.5dB<br>5725.000MHz, AV, Hori. | Complied | Conducted/ Radiated |
| | **IC:** RSS-Gen 4.9 | **IC:** RSS-210 A8.5<br>RSS-Gen 7.2.3 | | | |
| Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422. | | | | | |

* In case any questions arise about test procedure, ANSI C63.4: 2003 is also referred.

## 3.3 Addition to standard

| Item | Test Procedure | Specification | Worst margin | Results | Remarks |
|---|---|---|---|---|---|
| 99% Occupied Bandwidth | **IC:** RSS-Gen 4.6.1 | **IC:** RSS-Gen 4.6.1 | N/A | - | Conducted |

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

## 3.4 Uncertainty

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

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

| **Test room** (semi-anechoic chamber) | **Radiated emission** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **(3m*)(±dB)** | | | | **(1m*)(±dB)** | | **(0.5m*)(±dB)** |
| | 9kHz -30MHz | 30MHz -300MHz | 300MHz -1GHz | 1GHz -10GHz | 10GHz -18GHz | 18GHz -26.5GHz | 26.5GHz -40GHz |
| No.1 | 4.2dB | 5.0dB | 5.1dB | 5.6dB | 5.9dB | 4.4dB | 4.3dB |
| No.2 | 4.1dB | 5.2dB | 5.1dB | 5.7dB | 5.8dB | 4.3dB | 4.2dB |
| No.3 | 4.5dB | 5.0dB | 5.2dB | 5.7dB | 5.8dB | 4.5dB | 4.2dB |
| No.4 | 4.7dB | 5.2dB | 5.2dB | 5.7dB | 5.8dB | 5.1dB | 4.2dB |

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

| **Power meter (±dB)** | |
|---|---|
| Below 1GHz | Above 1GHz |
| 1.0dB | 1.0dB |

| **Antenna terminal conducted emission and Power density (±dB)** | | | **Antenna terminal conducted emission (±dB)** | | **Channel power (±dB)** |
|---|---|---|---|---|---|
| Below 1GHz | 1GHz-3GHz | 3GHz-18GHz | 18GHz-26.5GHz | 26.5GHz-40GHz | |
| 1.0dB | 1.1dB | 2.7dB | 3.2dB | 3.3dB | 1.5dB |

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

Radiated emission test(3m)
The data listed in this test report has enough margin, more than the site margin.

### 3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116 Facsimile : +81 596 24 8124

| | FCC Registration Number | IC Registration Number | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Other rooms |
|---|---|---|---|---|---|
| No.1 semi-anechoic chamber | 313583 | 2973C-1 | 19.2 x 11.2 x 7.7m | 7.0 x 6.0m | No.1 Power source room |
| No.2 semi-anechoic chamber | 655103 | 2973C-2 | 7.5 x 5.8 x 5.2m | 4.0 x 4.0m | - |
| No.3 semi-anechoic chamber | 148738 | 2973C-3 | 12.0 x 8.5 x 5.9m | 6.8 x 5.75m | No.3 Preparation room |
| No.3 shielded room | - | - | 4.0 x 6.0 x 2.7m | N/A | - |
| No.4 semi-anechoic chamber | 134570 | 2973C-4 | 12.0 x 8.5 x 5.9m | 6.8 x 5.75m | No.4 Preparation room |
| No.4 shielded room | - | - | 4.0 x 6.0 x 2.7m | N/A | - |
| No.5 semi-anechoic chamber | - | - | 6.0 x 6.0 x 3.9m | 6.0 x 6.0m | - |
| No.6 shielded room | - | - | 4.0 x 4.5 x 2.7m | 4.75 x 5.4 m | - |
| No.6 measurement room | - | - | 4.75 x 5.4 x 3.0m | 4.75 x 4.15 m | - |
| No.7 shielded room | - | - | 4.7 x 7.5 x 2.7m | 4.7 x 7.5m | - |
| No.8 measurement room | - | - | 3.1 x 5.0 x 2.7m | N/A | - |
| No.9 measurement room | - | - | 8.0 x 4.5 x 2.8m | 2.0 x 2.0m | - |
| No.10 measurement room | - | - | 2.6 x 2.8 x 2.5m | 2.4 x 2.4m | - |
| No.11 measurement room | - | - | 3.1 x 3.4 x 3.0m | 2.4 x 3.4m | - |

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

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

Refer to APPENDIX.

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

## 4.1 Operating 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 802.11b (11b) | 1Mbps, PN9 |
| IEEE 802.11g (11g)<br>IEEE 802.11n SISO 20MHz BW (11n-20): 2.4G Band | 24Mbps, PN9<br>MCS 6, PN9 |
| IEEE 802.11a (11a): 5G Band<br>IEEE 802.11n SISO 20MHz BW (11n-20): 5G Band | 24Mbps, PN9<br>MCS 6, PN9 |
| IEEE 802.11n SISO 40MHz BW (11n-40): 5G Band | MCS 0, PN9 |
| *The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel) | |

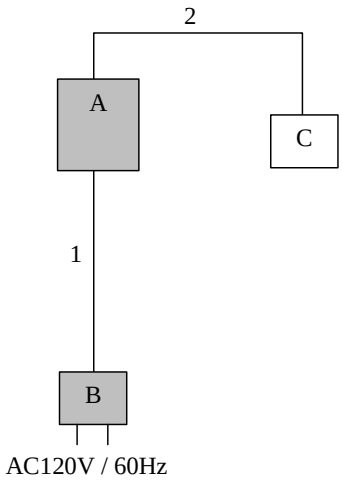
**Power of the EUT was set by the software as follows:**

Software name & version: HW: REV0.0, SW: N024.001
[Power Setting]
11b: 12dBm
11g: 12dBm
11n-20(2.4GHz): 12dBm
11a: 8dBm
11n-20(5GHz): 8dBm
11n-40(5GHz): 8dBm
*The above setting of the 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.

*Details of Operating mode(s)

| Test Item | Operating Mode | Tested frequency |
|---|---|---|
| Conducted Emission | 11g Tx*1) | 2412MHz |
| 6dB Bandwidth<br>99% Occupied Bandwidth<br>Spurious Emission (Conducted Emission Band Edge Compliance) | 11b Tx<br>11g Tx<br>11n-20(2.4GHz) Tx | 2412MHz<br>2437MHz<br>2462MHz |
| | 11a Tx<br>11n-20(5GHz) Tx | 5745MHz<br>5785MHz<br>5825MHz |
| | 11n-40(5GHz) Tx | 5755MHz<br>5795MHz |
| Maximum Peak Output Power<br>Power Density<br>Spurious Emission (Radiated/ Conducted) | 11b Tx<br>11g Tx *2) | 2412MHz<br>2437MHz<br>2462MHz |
| | 11a Tx *2) | 5745MHz<br>5785MHz<br>5825MHz |
| | 11n-40(5GHz) Tx | 5755MHz<br>5795MHz |
| *1) The mode was tested as a representative, because it had the highest power at antenna terminal test and the noise levels at the mode/tested frequencies were equivalent to those of other modes/tested frequencies.<br>*2) Since 11g/11a and 11n-20 have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest peak output power. | | |

## 4.2 Configuration and peripherals




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

**Description of EUT and Support equipment**

| No. | Item | Model number | Serial number | Manufacturer | Remarks |
|---|---|---|---|---|---|
| A | Cellular/PCS GSM/GPRS/EDGE Tablet with 802.11abgn, BT3.0 | SC-02D | R24B976664D *1)<br>R24B976670T *2)<br>R24B976808Y *3) | SAMSUNG | EUT |
| B | AC Adapter | SC02 | - | SAMSUNG | EUT |
| C | Ear phone | - | - | SAMSUNG | - |

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

**List of cables used**

| No. | Name | Length (m) | Shield | | Remarks |
|---|---|---|---|---|---|
| | | | Cable | Connector | |
| 1 | USB Cable | 1.0 | Shielded | Shielded | - |
| 2 | Ear phone Cable | 1.2 | Unshielded | Unshielded | - |

## SECTION 5: Conducted Emission

**Test Procedure and conditions**

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane.
The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

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

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

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

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

## SECTION 6: Radiated Spurious Emission

**Test Procedure**
It was measured based on "2. Radiated emission test" of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 ".
EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.
The height of the measuring antenna varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
The measurements were 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.

**Test Antennas are used as below;**

| Frequency | Below 30MHz | 30MHz to 300MHz | 300MHz to 1GHz | Above 1GHz |
|---|---|---|---|---|
| Antenna Type | Loop | Biconical | Logperiodic | Horn |

In any 100kHz bandwidth outside the restricted band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

**20dBc was applied to the frequency over the limit of FCC 15.209 / Table 5 of RSS-Gen 7.2.5(IC) and outside the restricted band of FCC15.205 / Table 3 of RSS-Gen 7.2.2 (IC).**

| Frequency | Below 1GHz | Above 1GHz | | 20dBc |
|---|---|---|---|---|
| Instrument used | Test Receiver | Spectrum Analyzer | | Spectrum Analyzer |
| Detector | QP | PK | AV | PK |
| IF Bandwidth | BW 120kHz(T/R) | RBW: 1MHz<br>VBW: 3MHz | RBW: 1MHz<br>VBW: 10Hz *1) | RBW: 100kHz<br>VBW: 300kHz (S/A) |
| Test Distance | 3m | 3m (below 10GHz),<br>1m*2) (above 10GHz), | | 3m (below 10GHz),<br>1m*2) (above 10GHz) |

*1) As both cycle and Off duration were short enough, 10Hz video bandwidth was used. (See Appendix)
*2) Distance Factor: 20 x log (3.0m/1.0m) = 9.5dB

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

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

**Measurement range : 30M-25GHz**
**Test data : APPENDIX**
**Test result : Pass**

# SECTION 7: Antenna Terminal Conducted Tests

**Test Procedure**

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

| Test | Span | RBW | VBW | Sweep time | Detector | Trace | Instrument used |
|---|---|---|---|---|---|---|---|
| 6dB Bandwidth | 20MHz, 40MHz | 100kHz | 300kHz | Auto | Peak | Max Hold | Spectrum Analyzer |
| 99% Occupied Bandwidth | Enough width to display 20dB Bandwidth | 1 to 3% of Span | Three times of RBW | Auto | Peak | Max Hold *1) | Spectrum Analyzer |
| Maximum Peak Output Power | - | - | - | Auto | Peak | - | Power Meter (Sensor: 50MHz BW) |
| Peak Power Density | 18, 20, 40MHz | 30kHz | 100kHz | 600, 667, 1334 sec | Peak | Max Hold | Spectrum Analyzer *2) *3) |
| Conducted Spurious Emission *4) | 9kHz to 150kHz | 200Hz | 620Hz | Auto | Peak | Max Hold | Spectrum Analyzer |
| | 150kHz to 30MHz | 9.1kHz | 27kHz | | | | |
| | 30MHz to 25GHz (Less or equal to 5GHz) | 100kHz | 300kHz | | | | |

*1) The measurement was performed with Max Hold since the duty cycle was not 100%.
*2) PSD Option 1 of "Guidance on Measurement of Digital Transmission Systems Operating under Section15.247 ".
*3) The test was not performed at RBW:3kHz however the measurement is to be performed with RBW:3kHz in the regulation, because the measurement value with RBW:3kHz is less than the value of RBW:30kHz and the test data met the limit with RBW:30kHz.
*4) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.(9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=9.1kHz)

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

**Test data : APPENDIX**
**Test result : Pass**

# APPENDIX 1: Data of EMI test

## Conducted Emission

### DATA OF CONDUCTED EMISSION TEST

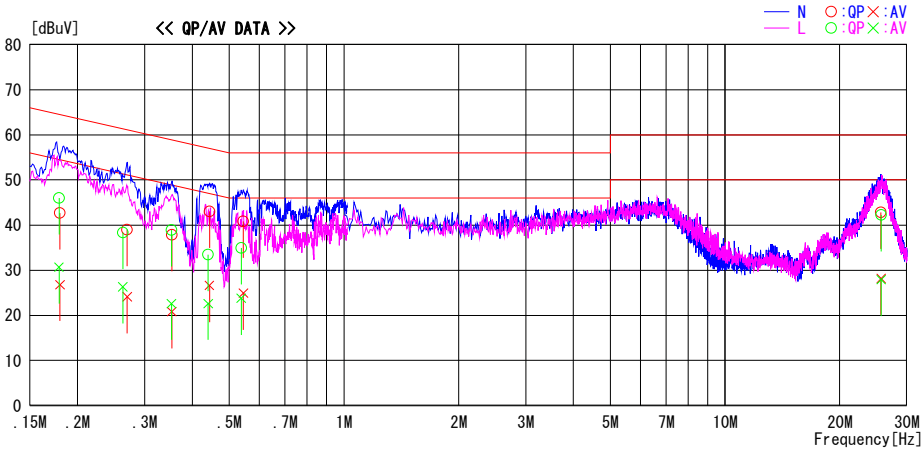
UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2011/10/06

Report No. : 32BE0278-HO

Temp./Humi. : 23deg.C / 57%RH
Engineer : Takumi Shimada

Mode / Remarks : Tx WLAN 11g 2412MHz 24Mbps

LIMIT : FCC15.207 QP
FCC15.207 AV




| Frequency | Reading Level | | Corr. | Results | | Limit | | Margin | | Phase | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | QP | AV | Factor | QP | AV | QP | AV | QP | AV | | |
| [MHz] | [dBuV] | [dBuV] | [dB] | [dBuV] | [dBuV] | [dBuV] | [dBuV] | [dB] | [dB] | | |
| 0.17983 | 29.4 | 13.5 | 13.3 | 42.7 | 26.8 | 64.5 | 54.5 | 21.8 | 27.7 | N | |
| 0.26973 | 25.7 | 10.8 | 13.3 | 39.0 | 24.1 | 61.1 | 51.1 | 22.1 | 27.0 | N | |
| 0.35366 | 24.5 | 7.5 | 13.3 | 37.8 | 20.8 | 58.9 | 48.9 | 21.1 | 28.1 | N | |
| 0.44410 | 29.7 | 13.3 | 13.3 | 43.0 | 26.6 | 57.0 | 47.0 | 14.0 | 20.4 | N | |
| 0.54428 | 27.5 | 11.6 | 13.3 | 40.8 | 24.9 | 56.0 | 46.0 | 15.2 | 21.1 | N | |
| 25.64762 | 24.5 | 9.9 | 18.3 | 42.8 | 28.2 | 60.0 | 50.0 | 17.2 | 21.8 | N | |
| 0.17890 | 32.7 | 17.4 | 13.3 | 46.0 | 30.7 | 64.5 | 54.5 | 18.5 | 23.8 | L | |
| 0.26304 | 25.0 | 13.0 | 13.3 | 38.3 | 26.3 | 61.3 | 51.3 | 23.0 | 25.0 | L | |
| 0.35269 | 25.6 | 9.3 | 13.3 | 38.9 | 22.6 | 58.9 | 48.9 | 20.0 | 26.3 | L | |
| 0.44025 | 20.2 | 9.3 | 13.3 | 33.5 | 22.6 | 57.1 | 47.1 | 23.6 | 24.5 | L | |
| 0.53758 | 21.6 | 10.5 | 13.3 | 34.9 | 23.8 | 56.0 | 46.0 | 21.1 | 22.2 | L | |
| 25.68540 | 24.0 | 9.6 | 18.3 | 42.3 | 27.9 | 60.0 | 50.0 | 17.7 | 22.1 | L | |

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

# 6dB Bandwidth

| | | | |
|---|---|---|---|
| Test place | Head Office EMC Lab. No.7 shielded room and 11 Measurement Room | | |
| Report No. | 32BE0278-HO | | |
| Date | 09/30/2011 | 10/03/2011 | 11/04/2011 |
| Temperature/ Humidity | 24 deg.C / 56% RH | 23 deg.C / 45% RH | 25 deg.C / 52% RH |
| Engineer | Satofumi Matsuyama | Katsunori Okai | Katsunori Okai |
| Mode | Tx | | |

11b

| Frequency [MHz] | 6dB Bandwidth [MHz] | Limit [kHz] |
|---|---|---|
| 2412 | 10.111 | >500 |
| 2437 | 10.072 | >500 |
| 2462 | 10.095 | >500 |

11g

| Frequency [MHz] | 6dB Bandwidth [MHz] | Limit [kHz] |
|---|---|---|
| 2412 | 16.474 | >500 |
| 2437 | 16.480 | >500 |
| 2462 | 16.442 | >500 |

11n-20(2.4GHz)

| Frequency [MHz] | 6dB Bandwidth [MHz] | Limit [kHz] |
|---|---|---|
| 2412 | 17.676 | >500 |
| 2437 | 17.680 | >500 |
| 2462 | 17.650 | >500 |

11a

| Frequency [MHz] | 6dB Bandwidth [MHz] | Limit [kHz] |
|---|---|---|
| 5745 | 16.446 | >500 |
| 5785 | 16.445 | >500 |
| 5825 | 16.425 | >500 |

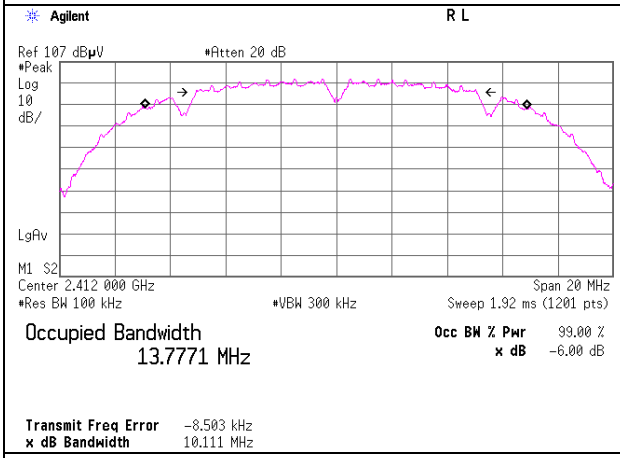
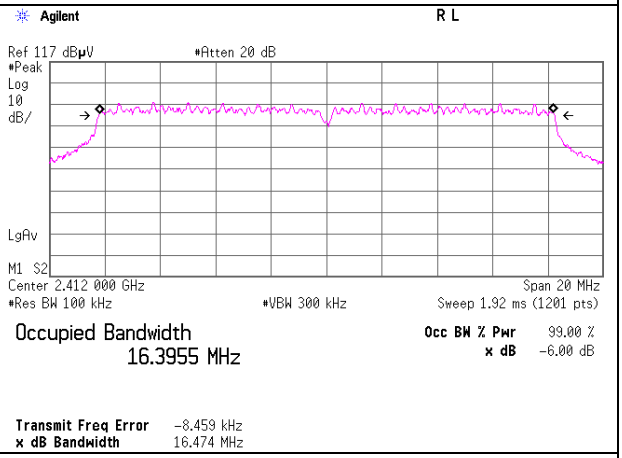
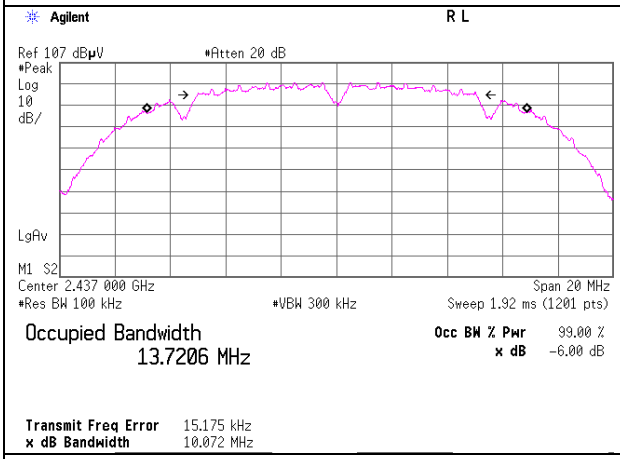
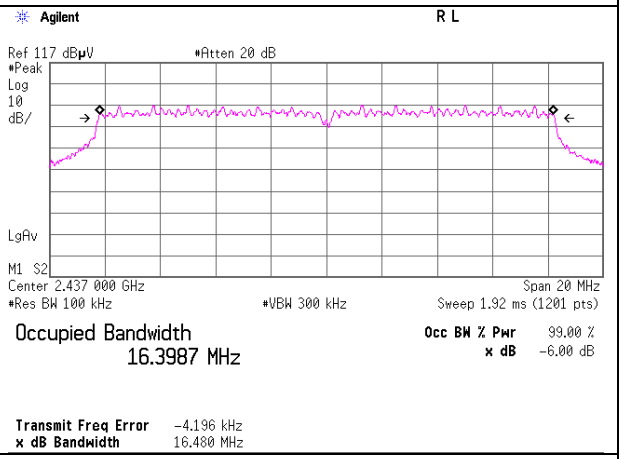
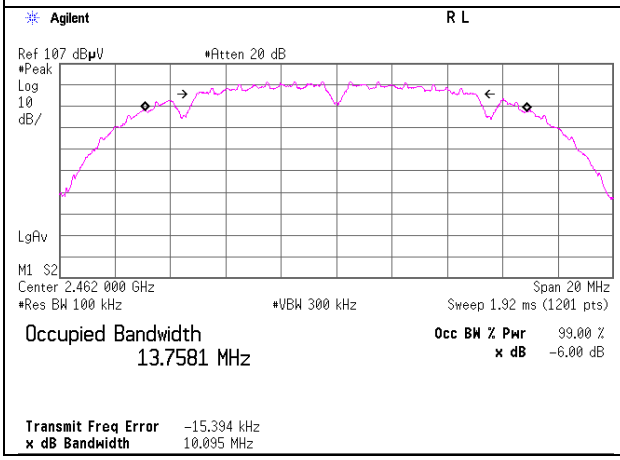
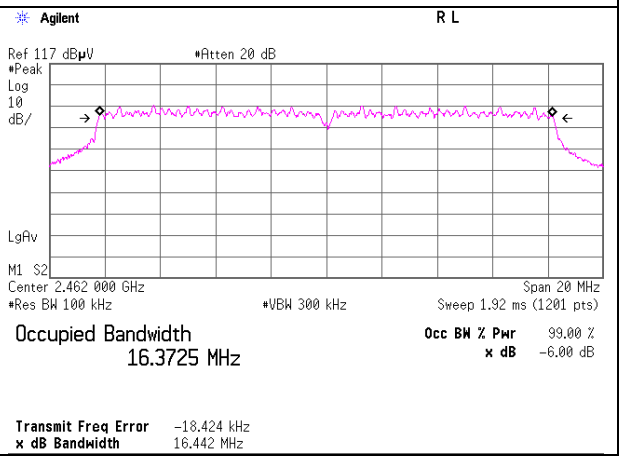
11n-20(5GHz)

| Frequency [MHz] | 6dB Bandwidth [MHz] | Limit [kHz] |
|---|---|---|
| 5745 | 17.606 | >500 |
| 5785 | 17.017 | >500 |
| 5825 | 17.313 | >500 |

11n-40(5GHz)

| Frequency [MHz] | 6dB Bandwidth [MHz] | Limit [kHz] |
|---|---|---|
| 5755 | 35.095 | >500 |
| 5795 | 35.507 | >500 |

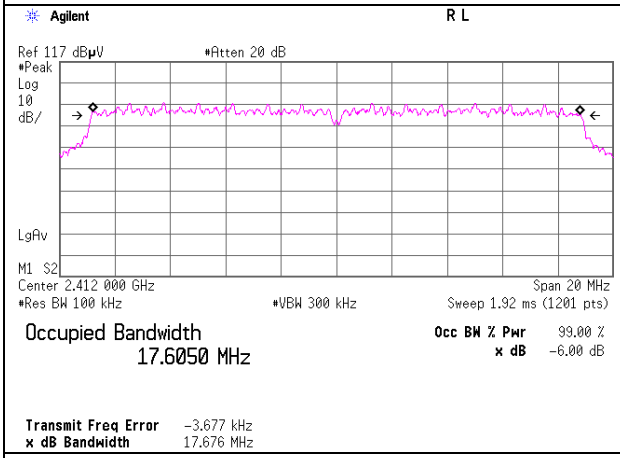
# 6dB Bandwidth

| 11b | 11g |
|---|---|
| **2412MHz** | **2412MHz** |
|  |  |
| **2437MHz** | **2437MHz** |
|  |  |
| **2462MHz** | **2462MHz** |
|  |  |

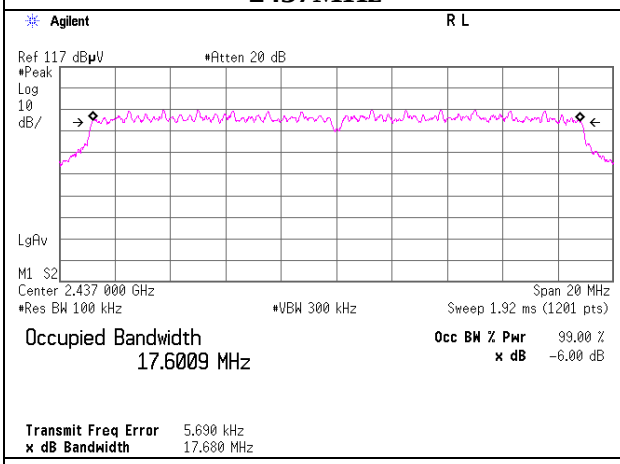
# 6dB Bandwidth

## 11n-20(2.4GHz)

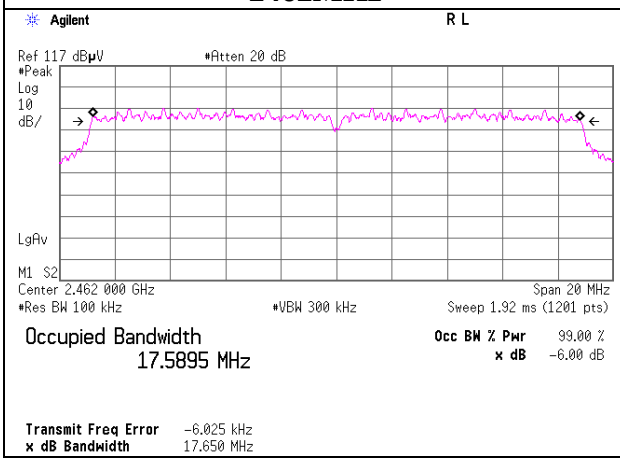
### 2412MHz




### 2437MHz

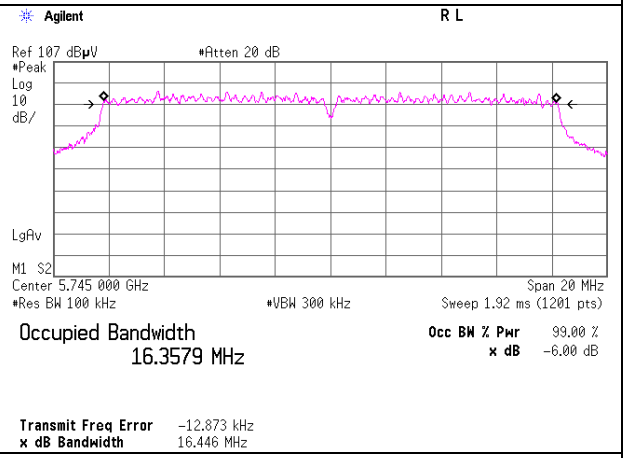



### 2462MHz

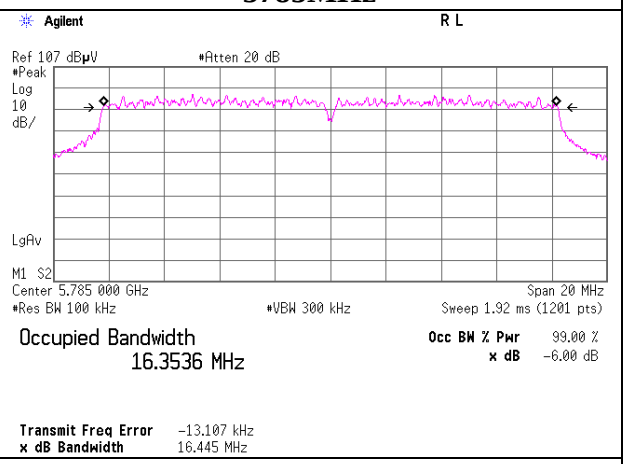



## 11a

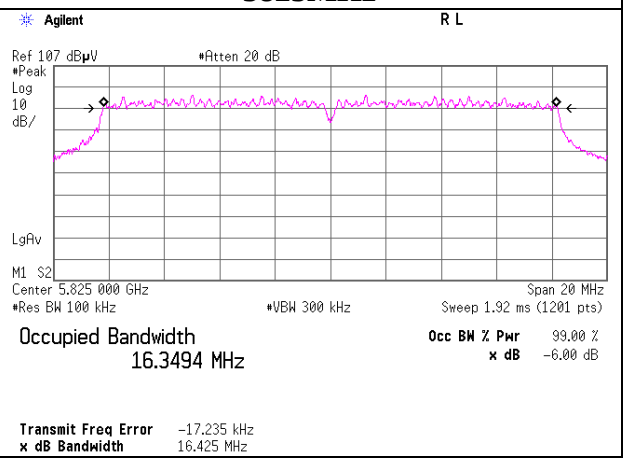
### 5745MHz




### 5785MHz



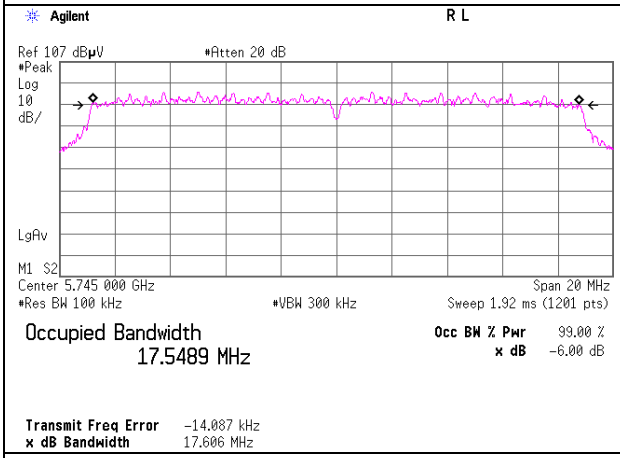

### 5825MHz



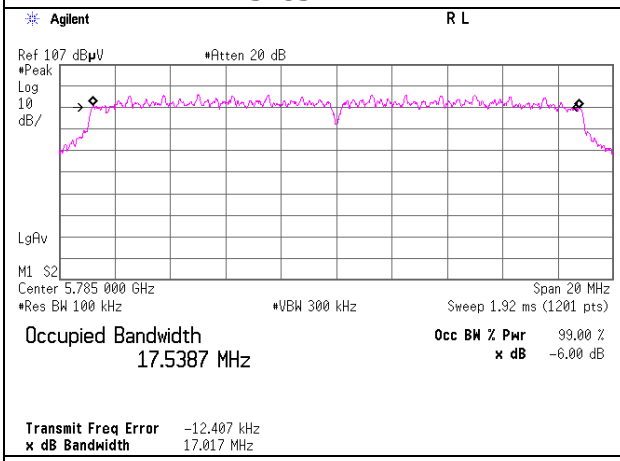
# 6dB Bandwidth

## 11n-20(5GHz)

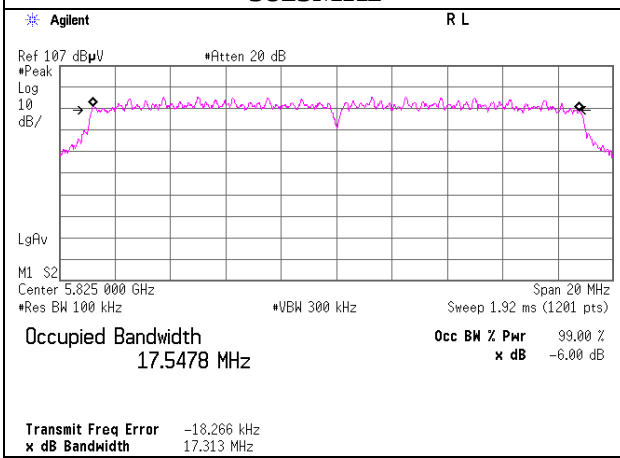
### 5745MHz




### 5785MHz

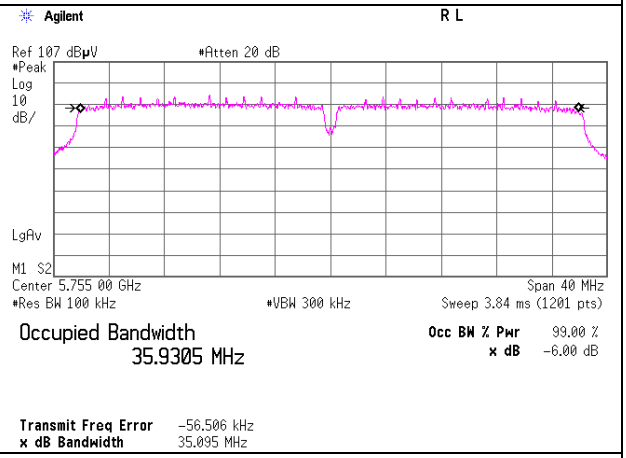



### 5825MHz

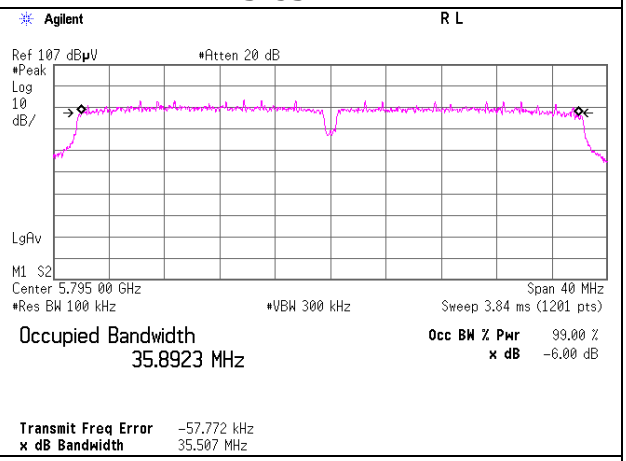



## 11n-40(5GHz)

### 5755MHz




### 5795MHz





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# Maximum Peak Output Power

| | |
|---|---|
| Test place | Head Office EMC Lab. No.11 Measurement Room |
| Report No. | 32BE0278-HO |
| Date | 09/27/2011 |
| Temperature/ Humidity | 22 deg.C / 63% RH |
| Engineer | Katsunori Okai |
| Mode | 11b Tx |

| Freq. | Reading | Cable Loss | Atten. | Result | | Limit | | Margin |
|---|---|---|---|---|---|---|---|---|
| [MHz] | [dBm] | [dB] | [dB] | [dBm] | [mW] | [dBm] | [mW] | [dB] |
| 2412 | 5.27 | 0.50 | 10.01 | 15.78 | 37.84 | 30.00 | 1000 | 14.22 |
| 2437 | 4.21 | 0.50 | 10.01 | 14.72 | 29.65 | 30.00 | 1000 | 15.28 |
| 2462 | 4.83 | 0.50 | 10.01 | 15.34 | 34.20 | 30.00 | 1000 | 14.66 |

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

2437MHz

| Rate | Reading | Remark |
|---|---|---|
| [Mbps] | [dBm] | |
| 1 | 4.21 | * |
| 2 | 4.16 | |
| 5.5 | 4.17 | |
| 11 | 4.05 | |

*: Worst Rate
All comparizon were carried out on same frequency and measurement factors.

# Maximum Peak Output Power

| | |
|---|---|
| Test place | Head Office EMC Lab. No.11 Measurement Room |
| Report No. | 32BE0278-HO |
| Date | 09/27/2011 |
| Temperature/ Humidity | 22 deg.C / 63% RH |
| Engineer | Katsunori Okai |
| Mode | 11g and 11n-20 Tx |

11g

| Freq. | Reading | Cable Loss | Atten. | Result | | Limit | | Margin |
|---|---|---|---|---|---|---|---|---|
| [MHz] | [dBm] | [dB] | [dB] | [dBm] | [mW] | [dBm] | [mW] | [dB] |
| 2412 | 12.91 | 0.50 | 10.01 | 23.42 | 219.79 | 30.00 | 1000 | 6.58 |
| 2437 | 12.58 | 0.50 | 10.01 | 23.09 | 203.70 | 30.00 | 1000 | 6.91 |
| 2462 | 12.67 | 0.50 | 10.01 | 23.18 | 207.97 | 30.00 | 1000 | 6.82 |

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

11g
2437MHz

| Rate | Reading | Remark |
|---|---|---|
| [Mbps] | [dBm] | |
| 6 | 12.21 | |
| 9 | 12.14 | |
| 12 | 12.17 | |
| 18 | 12.20 | |
| 24 | 12.37 | * |
| 36 | 12.03 | |
| 48 | 11.98 | |
| 54 | 12.07 | |

11n-20(2.4GHz)
2437MHz

| Rate | Reading | Remark |
|---|---|---|
| [Mbps] | [dBm] | |
| MCS0 | 11.41 | |
| MCS1 | 11.23 | |
| MCS2 | 11.82 | |
| MCS3 | 11.39 | |
| MCS4 | 11.34 | |
| MCS5 | 11.55 | |
| MCS6 | 12.19 | * |
| MCS7 | 11.45 | |

*: Worst Rate
All comparison were carried out on same frequency and measurement factors.

# Maximum Peak Output Power

| | |
|---|---|
| Test place | Head Office EMC Lab. No.11 Measurement Room |
| Report No. | 32BE0278-HO |
| Date | 09/30/2011 |
| Temperature/ Humidity | 24 deg.C / 56% RH |
| Engineer | Satofumi Matsuyama |
| Mode | 11a and 11n-20 (5GHz) Tx |

11a

| Freq. | Reading | Cable Loss | Atten. | Result | | Limit | | Margin |
|---|---|---|---|---|---|---|---|---|
| [MHz] | [dBm] | [dB] | [dB] | [dBm] | [mW] | [dBm] | [mW] | [dB] |
| 5745 | 9.30 | 1.00 | 10.07 | 20.37 | 108.89 | 30.00 | 1000 | 9.63 |
| 5785 | 9.54 | 1.00 | 10.07 | 20.61 | 115.08 | 30.00 | 1000 | 9.39 |
| 5825 | 9.33 | 1.00 | 10.07 | 20.40 | 109.65 | 30.00 | 1000 | 9.60 |

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

11a
5785MHz

| Rate | Reading | Remark |
|---|---|---|
| [Mbps] | [dBm] | |
| 6 | 8.82 | |
| 9 | 8.80 | |
| 12 | 8.74 | |
| 18 | 8.60 | |
| 24 | 9.54 | * |
| 36 | 9.03 | |
| 48 | 8.65 | |
| 54 | 8.62 | |

11n-20(5GHz)
5785MHz

| Rate | Reading | Remark |
|---|---|---|
| [Mbps] | [dBm] | |
| MCS0 | 8.70 | |
| MCS1 | 8.35 | |
| MCS2 | 8.44 | |
| MCS3 | 8.73 | |
| MCS4 | 8.64 | |
| MCS5 | 8.61 | |
| MCS6 | 9.44 | * |
| MCS7 | 8.60 | |

*: Worst Rate
All comparison were carried out on same frequency and measurement factors.

# Maximum Peak Output Power

| | |
|---|---|
| Test place | Head Office EMC Lab. No.11 Measurement Room |
| Report No. | 32BE0278-HO |
| Date | 09/30/2011 |
| Temperature/ Humidity | 24 deg.C / 56% RH |
| Engineer | Satofumi Matsuyama |
| Mode | 11n-40(5GHz) Tx |

| Freq. | Reading | Cable Loss | Atten. | Result | | Limit | | Margin |
|---|---|---|---|---|---|---|---|---|
| [MHz] | [dBm] | [dB] | [dB] | [dBm] | [mW] | [dBm] | [mW] | [dB] |
| 5755 | 9.43 | 1.00 | 10.07 | 20.50 | 112.20 | 30.00 | 1000 | 9.50 |
| 5795 | 8.77 | 1.00 | 10.07 | 19.84 | 96.38 | 30.00 | 1000 | 10.16 |

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

5755MHz

| Rate | Reading | Remark |
|---|---|---|
| [Mbps] | [dBm] | |
| MCS0 | 9.43 | * |
| MCS1 | 8.45 | |
| MCS2 | 8.58 | |
| MCS3 | 9.31 | |
| MCS4 | 8.73 | |
| MCS5 | 8.96 | |
| MCS6 | 8.46 | |
| MCS7 | 8.52 | |

*: Worst Rate
All comparison were carried out on same frequency and measurement factors.

## Maximum Average Output Power (Reference data for SAR testing)

**IEEE802.11b 1Mbps**

| Ch | Frequency | Power meter Reading | Cable Loss | Atten. | Result | |
|---|---|---|---|---|---|---|
| | | | | | [dBm] | [mW] |
| | [MHz] | AVG | [dB] | [dB] | AVG | AVG |
| 1 | 2412 | 2.62 | 0.50 | 10.01 | 13.13 | 20.56 |
| 6 | 2437 | 1.61 | 0.50 | 10.01 | 12.12 | 16.29 |
| 11 | 2462 | 2.22 | 0.50 | 10.01 | 12.73 | 18.75 |

**IEEE802.11g 6Mbps**

| Ch | Frequency | Power meter Reading | Cable Loss | Atten. | Result | |
|---|---|---|---|---|---|---|
| | | | | | [dBm] | [mW] |
| | [MHz] | AVG | [dB] | [dB] | AVG | AVG |
| 1 | 2412 | 2.39 | 0.50 | 10.01 | 12.90 | 19.50 |
| 6 | 2437 | 1.83 | 0.50 | 10.01 | 12.34 | 17.14 |
| 11 | 2462 | 1.78 | 0.50 | 10.01 | 12.29 | 16.94 |

**IEEE802.11n-20 MCS0**

| Ch | Frequency | Power meter Reading | Cable Loss | Atten. | Result | |
|---|---|---|---|---|---|---|
| | | | | | [dBm] | [mW] |
| | [MHz] | AVG | [dB] | [dB] | AVG | AVG |
| 1 | 2412 | 2.06 | 0.50 | 10.01 | 12.57 | 18.07 |
| 6 | 2437 | 1.26 | 0.50 | 10.01 | 11.77 | 15.03 |
| 11 | 2462 | 1.49 | 0.50 | 10.01 | 12.00 | 15.85 |

Sample Calculation:
Result = Reading + Cable Loss + Attenuator

## Maximum Average Output Power (Reference data for SAR testing)

**IEEE802.11a 5745-5825MHz band 6Mbps**

| Ch | Freq. [MHz] | Power meter Reading AVG | Cable Loss [dB] | Atten. [dB] | Result [dBm] AVG | Result [mW] AVG |
|---|---|---|---|---|---|---|
| 149 | 5745.0 | -1.22 | 1.00 | 10.07 | 9.85 | 9.66 |
| 153 | 5765.0 | -1.27 | 1.00 | 10.07 | 9.80 | 9.55 |
| 157 | 5785.0 | -1.12 | 1.00 | 10.07 | 9.95 | 9.89 |
| 161 | 5805.0 | -1.37 | 1.00 | 10.07 | 9.70 | 9.33 |
| 165 | 5825.0 | -1.30 | 1.00 | 10.07 | 9.77 | 9.48 |

**IEEE802.11n-20 5745-5825MHz band MCS3**

| Ch | Freq. [MHz] | Power meter Reading AVG | Cable Loss [dB] | Atten. [dB] | Result [dBm] AVG | Result [mW] AVG |
|---|---|---|---|---|---|---|
| 149 | 5745.0 | -1.24 | 1.00 | 10.07 | 9.83 | 9.62 |
| 153 | 5765.0 | -1.28 | 1.00 | 10.07 | 9.79 | 9.53 |
| 157 | 5785.0 | -1.15 | 1.00 | 10.07 | 9.92 | 9.82 |
| 161 | 5805.0 | -1.27 | 1.00 | 10.07 | 9.80 | 9.55 |
| 165 | 5825.0 | -1.34 | 1.00 | 10.07 | 9.73 | 9.40 |

**IEEE802.11n-40 5755-5795MHz band MCS0**

| Ch | Freq. [MHz] | Power meter Reading AVG | Cable Loss [dB] | Atten. [dB] | Result [dBm] AVG | Result [mW] AVG |
|---|---|---|---|---|---|---|
| 149 | 5755.0 | -1.16 | 1.00 | 10.07 | 9.91 | 9.79 |
| 165 | 5795.0 | -1.18 | 1.00 | 10.07 | 9.89 | 9.75 |

Sample Calculation: Result = Reading + Cable Loss + Attenuator

# Radiated Spurious Emission

| | | | |
|---|---|---|---|
| Report No. | 32BE0278-HO | | |
| Semi Anechoic Chamber | No.1 | No.1 | No.2 |
| Date | 10/20/2011 | 10/21/2011 | 10/22/2011 |
| Temperature/ Humidity | 22 deg.C / 48% RH | 23 deg.C / 52% RH | 24 deg.C / 55% RH |
| Engineer | Takayuki Shimada (1-10GHz) | Takayuki Shimada (10-18GHz) | Takayuki Shimada (18-26.5GHz) |
| Mode | 11b Tx 2412MHz | | |

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| Hori | 2390.000 | PK | 52.3 | 26.5 | 2.2 | 36.3 | 44.7 | 73.9 | 29.2 | |
| Hori | 2397.283 | PK | 58.8 | 26.5 | 2.2 | 36.3 | 51.2 | 73.9 | 22.7 | |
| Hori | 2400.000 | PK | 59.8 | 26.5 | 2.2 | 36.3 | 52.2 | 73.9 | 21.7 | |
| Hori | 4824.000 | PK | 44.7 | 30.6 | 4.6 | 35.8 | 44.1 | 73.9 | 29.8 | |
| Hori | 7236.000 | PK | 44.1 | 35.3 | 5.5 | 35.9 | 49.0 | 73.9 | 24.9 | NS |
| Hori | 9648.000 | PK | 43.9 | 38.0 | 6.0 | 36.5 | 51.4 | 73.9 | 22.5 | NS |
| Hori | 24120.000 | PK | 48.1 | 38.6 | -1.8 | 35.4 | 49.5 | 73.9 | 24.4 | NS |
| Hori | 2390.000 | AV | 38.9 | 26.5 | 2.2 | 36.3 | 31.3 | 53.9 | 22.6 | |
| Hori | 2397.283 | AV | 46.5 | 26.5 | 2.2 | 36.3 | 38.9 | 53.9 | 15.0 | |
| Hori | 2400.000 | AV | 41.5 | 26.5 | 2.2 | 36.3 | 33.9 | 53.9 | 20.0 | |
| Hori | 4824.000 | AV | 34.2 | 30.6 | 4.6 | 35.8 | 33.6 | 53.9 | 20.3 | |
| Hori | 7236.000 | AV | 31.9 | 35.3 | 5.5 | 35.9 | 36.8 | 53.9 | 17.1 | NS |
| Hori | 9648.000 | AV | 32.0 | 38.0 | 6.0 | 36.5 | 39.5 | 53.9 | 14.4 | NS |
| Hori | 24120.000 | AV | 36.3 | 38.6 | -1.8 | 35.4 | 37.7 | 53.9 | 16.2 | NS |
| Vert | 2390.000 | PK | 48.8 | 26.5 | 2.2 | 36.3 | 41.2 | 73.9 | 32.7 | |
| Vert | 2397.283 | PK | 54.6 | 26.5 | 2.2 | 36.3 | 47.0 | 73.9 | 26.9 | |
| Vert | 2400.000 | PK | 55.2 | 26.5 | 2.2 | 36.3 | 47.6 | 73.9 | 26.3 | |
| Vert | 4824.000 | PK | 46.4 | 30.6 | 4.6 | 35.8 | 45.8 | 73.9 | 28.1 | |
| Vert | 7236.000 | PK | 44.2 | 35.3 | 5.5 | 35.9 | 49.1 | 73.9 | 24.8 | NS |
| Vert | 9648.000 | PK | 44.0 | 38.0 | 6.0 | 36.5 | 51.5 | 73.9 | 22.4 | NS |
| Vert | 24120.000 | PK | 48.3 | 38.6 | -1.8 | 35.4 | 49.7 | 73.9 | 24.2 | NS |
| Vert | 2390.000 | AV | 36.3 | 26.5 | 2.2 | 36.3 | 28.7 | 53.9 | 25.2 | |
| Vert | 2397.283 | AV | 42.5 | 26.5 | 2.2 | 36.3 | 34.9 | 53.9 | 19.0 | |
| Vert | 2400.000 | AV | 38.1 | 26.5 | 2.2 | 36.3 | 30.5 | 53.9 | 23.4 | |
| Vert | 4824.000 | AV | 36.1 | 30.6 | 4.6 | 35.8 | 35.5 | 53.9 | 18.4 | |
| Vert | 7236.000 | AV | 31.9 | 35.3 | 5.5 | 35.9 | 36.8 | 53.9 | 17.1 | NS |
| Vert | 9648.000 | AV | 32.0 | 38.0 | 6.0 | 36.5 | 39.5 | 53.9 | 14.4 | NS |
| Vert | 24120.000 | AV | 36.3 | 38.6 | -1.8 | 35.4 | 37.7 | 53.9 | 16.2 | NS |

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

NS: No signal detected

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# Radiated Spurious Emission

| | | | |
|---|---|---|---|
| Report No. | 32BE0278-HO | | |
| Semi Anechoic Chamber | No.1 | No.1 | No.2 |
| Date | 10/20/2011 | 10/21/2011 | 10/22/2011 |
| Temperature/ Humidity | 22 deg.C / 48% RH | 23 deg.C / 52% RH | 24 deg.C / 55% RH |
| Engineer | Takayuki Shimada (1-10GHz) | Takayuki Shimada (10-18GHz) | Takayuki Shimada (18-26.5GHz) |
| Mode | 11b Tx 2437MHz | | |

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| Hori | 4874.000 | PK | 45.0 | 30.7 | 4.6 | 35.8 | 44.5 | 73.9 | 29.4 | |
| Hori | 7311.000 | PK | 44.4 | 35.3 | 5.5 | 35.9 | 49.3 | 73.9 | 24.6 | NS |
| Hori | 9748.000 | PK | 43.7 | 38.1 | 6.0 | 36.5 | 51.3 | 73.9 | 22.6 | NS |
| Hori | 24370.000 | PK | 48.3 | 38.8 | -1.8 | 35.4 | 49.9 | 73.9 | 24.0 | NS |
| Hori | 4874.000 | AV | 34.7 | 30.7 | 4.6 | 35.8 | 34.2 | 53.9 | 19.7 | |
| Hori | 7311.000 | AV | 31.9 | 35.3 | 5.5 | 35.9 | 36.8 | 53.9 | 17.1 | NS |
| Hori | 9748.000 | AV | 32.0 | 38.1 | 6.0 | 36.5 | 39.6 | 53.9 | 14.3 | NS |
| Hori | 24370.000 | AV | 35.7 | 38.8 | -1.8 | 35.4 | 37.3 | 53.9 | 16.6 | NS |
| Vert | 4874.000 | PK | 46.2 | 30.7 | 4.6 | 35.8 | 45.7 | 73.9 | 28.2 | |
| Vert | 7311.000 | PK | 44.2 | 35.3 | 5.5 | 35.9 | 49.1 | 73.9 | 24.8 | NS |
| Vert | 9748.000 | PK | 44.0 | 38.1 | 6.0 | 36.5 | 51.6 | 73.9 | 22.3 | NS |
| Vert | 24370.000 | PK | 48.1 | 38.8 | -1.8 | 35.4 | 49.7 | 73.9 | 24.2 | NS |
| Vert | 4874.000 | AV | 36.9 | 30.7 | 4.6 | 35.8 | 36.4 | 53.9 | 17.5 | |
| Vert | 7311.000 | AV | 31.9 | 35.3 | 5.5 | 35.9 | 36.8 | 53.9 | 17.1 | NS |
| Vert | 9748.000 | AV | 32.0 | 38.1 | 6.0 | 36.5 | 39.6 | 53.9 | 14.3 | NS |
| Vert | 24370.000 | AV | 35.7 | 38.8 | -1.8 | 35.4 | 37.3 | 53.9 | 16.6 | NS |

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

NS: No signal detected

# Radiated Spurious Emission

| | | | |
|---|---|---|---|
| Report No. | 32BE0278-HO | | |
| Semi Anechoic Chamber | No.1 | No.1 | No.2 |
| Date | 10/20/2011 | 10/21/2011 | 10/22/2011 |
| Temperature/ Humidity | 22 deg.C / 48% RH | 23 deg.C / 52% RH | 24 deg.C / 55% RH |
| Engineer | Takayuki Shimada (1-10GHz) | Takayuki Shimada (10-18GHz) | Takayuki Shimada (18-26.5GHz) |
| Mode | 11b Tx 2462MHz | | |

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| Hori | 2483.500 | PK | 55.9 | 26.5 | 2.2 | 36.3 | 48.3 | 73.9 | 25.6 | |
| Hori | 4924.000 | PK | 46.4 | 30.8 | 4.6 | 35.8 | 46.0 | 73.9 | 27.9 | |
| Hori | 7386.000 | PK | 44.8 | 35.4 | 5.5 | 35.9 | 49.8 | 73.9 | 24.1 | NS |
| Hori | 9848.000 | PK | 44.0 | 38.3 | 6.2 | 36.5 | 52.0 | 73.9 | 21.9 | NS |
| Hori | 24620.000 | PK | 47.7 | 38.9 | -1.7 | 35.5 | 49.4 | 73.9 | 24.5 | NS |
| Hori | 2483.500 | AV | 38.8 | 26.5 | 2.2 | 36.3 | 31.2 | 53.9 | 22.7 | |
| Hori | 4924.000 | AV | 38.0 | 30.8 | 4.6 | 35.8 | 37.6 | 53.9 | 16.3 | |
| Hori | 7386.000 | AV | 32.2 | 35.4 | 5.5 | 35.9 | 37.2 | 53.9 | 16.7 | NS |
| Hori | 9848.000 | AV | 32.2 | 38.3 | 6.2 | 36.5 | 40.2 | 53.9 | 13.7 | NS |
| Hori | 24620.000 | AV | 35.6 | 38.9 | -1.7 | 35.5 | 37.3 | 53.9 | 16.6 | NS |
| Vert | 2483.500 | PK | 50.5 | 26.5 | 2.2 | 36.3 | 42.9 | 73.9 | 31.0 | |
| Vert | 4924.000 | PK | 48.2 | 30.8 | 4.6 | 35.8 | 47.8 | 73.9 | 26.1 | |
| Vert | 7386.000 | PK | 44.6 | 35.4 | 5.5 | 35.9 | 49.6 | 73.9 | 24.3 | NS |
| Vert | 9848.000 | PK | 44.1 | 38.3 | 6.2 | 36.5 | 52.1 | 73.9 | 21.8 | NS |
| Vert | 24620.000 | PK | 47.7 | 38.9 | -1.7 | 35.5 | 49.4 | 73.9 | 24.5 | NS |
| Vert | 2483.500 | AV | 35.7 | 26.5 | 2.2 | 36.3 | 28.1 | 53.9 | 25.8 | |
| Vert | 4924.000 | AV | 42.3 | 30.8 | 4.6 | 35.8 | 41.9 | 53.9 | 12.0 | |
| Vert | 7386.000 | AV | 32.2 | 35.4 | 5.5 | 35.9 | 37.2 | 53.9 | 16.7 | NS |
| Vert | 9848.000 | AV | 32.2 | 38.3 | 6.2 | 36.5 | 40.2 | 53.9 | 13.7 | NS |
| Vert | 24620.000 | AV | 35.6 | 38.9 | -1.7 | 35.5 | 37.3 | 53.9 | 16.6 | NS |

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

NS: No signal detected

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# Radiated Spurious Emission

| | | | |
|---|---|---|---|
| Report No. | 32BE0278-HO | | |
| Semi Anechoic Chamber | No.1 | No.1 | No.2 |
| Date | 10/20/2011 | 10/21/2011 | 10/22/2011 |
| Temperature/ Humidity | 22 deg.C / 48% RH | 23 deg.C / 52% RH | 24 deg.C / 55% RH |
| Engineer | Takayuki Shimada (1-10GHz) | Takayuki Shimada (10-18GHz) | Takayuki Shimada (18-26.5GHz, 30-1000MHz) |
| Mode | 11g Tx 2412MHz | | |

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| Hori | 42.184 | QP | 26.8 | 14.1 | 6.9 | 28.6 | 19.2 | 40.0 | 20.8 | |
| Hori | 106.666 | QP | 29.3 | 11.3 | 7.5 | 28.4 | 19.7 | 43.5 | 23.8 | |
| Hori | 160.000 | QP | 32.9 | 15.1 | 7.9 | 28.1 | 27.8 | 43.5 | 15.7 | |
| Hori | 320.000 | QP | 27.7 | 16.5 | 8.9 | 27.8 | 25.3 | 46.0 | 20.7 | |
| Hori | 373.332 | QP | 33.5 | 17.3 | 9.2 | 28.1 | 31.9 | 46.0 | 14.1 | |
| Hori | 480.000 | QP | 27.0 | 18.9 | 9.7 | 28.7 | 26.9 | 46.0 | 19.1 | |
| Hori | 2390.000 | PK | 61.8 | 26.5 | 2.2 | 36.3 | 54.2 | 73.9 | 19.7 | |
| Hori | 2400.000 | PK | 82.3 | 26.5 | 2.2 | 36.3 | 74.7 | - | - | See 20dBc Data Sheet |
| Hori | 4824.000 | PK | 44.1 | 30.6 | 4.6 | 35.8 | 43.5 | 73.9 | 30.4 | NS |
| Hori | 7236.000 | PK | 44.2 | 35.3 | 5.5 | 35.9 | 49.1 | 73.9 | 24.8 | NS |
| Hori | 9648.000 | PK | 44.3 | 38.0 | 6.0 | 36.5 | 51.8 | 73.9 | 22.1 | NS |
| Hori | 24120.000 | PK | 48.2 | 38.6 | -1.8 | 35.4 | 49.6 | 73.9 | 24.3 | NS |
| Hori | 2390.000 | AV | 43.5 | 26.5 | 2.2 | 36.3 | 35.9 | 53.9 | 18.0 | |
| Hori | 2400.000 | AV | 61.9 | 26.5 | 2.2 | 36.3 | 54.3 | - | - | See 20dBc Data Sheet |
| Hori | 4824.000 | AV | 31.5 | 30.6 | 4.6 | 35.8 | 30.9 | 53.9 | 23.0 | NS |
| Hori | 7236.000 | AV | 31.9 | 35.3 | 5.5 | 35.9 | 36.8 | 53.9 | 17.1 | NS |
| Hori | 9648.000 | AV | 32.0 | 38.0 | 6.0 | 36.5 | 39.5 | 53.9 | 14.4 | NS |
| Hori | 24120.000 | AV | 36.3 | 38.6 | -1.8 | 35.4 | 37.7 | 53.9 | 16.2 | NS |
| Vert | 42.184 | QP | 33.5 | 14.1 | 6.9 | 28.6 | 25.9 | 40.0 | 14.1 | |
| Vert | 106.666 | QP | 27.1 | 11.3 | 7.5 | 28.4 | 17.5 | 43.5 | 26.0 | |
| Vert | 160.000 | QP | 26.1 | 15.1 | 7.9 | 28.1 | 21.0 | 43.5 | 22.5 | |
| Vert | 320.000 | QP | 24.1 | 16.5 | 8.9 | 27.8 | 21.7 | 46.0 | 24.3 | |
| Vert | 373.332 | QP | 31.5 | 17.3 | 9.2 | 28.1 | 29.9 | 46.0 | 16.1 | |
| Vert | 480.000 | QP | 25.2 | 18.9 | 9.7 | 28.7 | 25.1 | 46.0 | 20.9 | |
| Vert | 2390.000 | PK | 57.7 | 26.5 | 2.2 | 36.3 | 50.1 | 73.9 | 23.8 | |
| Vert | 2400.000 | PK | 78.1 | 26.5 | 2.2 | 36.3 | 70.5 | - | - | See 20dBc Data Sheet |
| Vert | 4824.000 | PK | 43.9 | 30.6 | 4.6 | 35.8 | 43.3 | 73.9 | 30.6 | NS |
| Vert | 7236.000 | PK | 44.2 | 35.3 | 5.5 | 35.9 | 49.1 | 73.9 | 24.8 | NS |
| Vert | 9648.000 | PK | 44.2 | 38.0 | 6.0 | 36.5 | 51.7 | 73.9 | 22.2 | NS |
| Vert | 24120.000 | PK | 48.2 | 38.6 | -1.8 | 35.4 | 49.6 | 73.9 | 24.3 | NS |
| Vert | 2390.000 | AV | 40.0 | 26.5 | 2.2 | 36.3 | 32.4 | 53.9 | 21.5 | |
| Vert | 2400.000 | AV | 57.3 | 26.5 | 2.2 | 36.3 | 49.7 | - | - | See 20dBc Data Sheet |
| Vert | 4824.000 | AV | 31.5 | 30.6 | 4.6 | 35.8 | 30.9 | 53.9 | 23.0 | NS |
| Vert | 7236.000 | AV | 31.9 | 35.3 | 5.5 | 35.9 | 36.8 | 53.9 | 17.1 | NS |
| Vert | 9648.000 | AV | 32.0 | 38.0 | 6.0 | 36.5 | 39.5 | 53.9 | 14.4 | NS |
| Vert | 24120.000 | AV | 36.3 | 38.6 | -1.8 | 35.4 | 37.7 | 53.9 | 16.2 | NS |

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

NS: No signal detected

**20dBc Data Sheet**

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant Factor [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| Hori | 2412.000 | PK | 100.1 | 26.5 | 2.2 | 36.3 | 92.5 | - | - | Carrier |
| Hori | 2400.000 | PK | 66.6 | 26.5 | 2.2 | 36.3 | 59.0 | 72.5 | 13.5 | |
| Vert | 2412.000 | PK | 96.5 | 26.5 | 2.2 | 36.3 | 88.9 | - | - | Carrier |
| Vert | 2400.000 | PK | 62.9 | 26.5 | 2.2 | 36.3 | 55.3 | 68.9 | 13.6 | |

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

# Radiated Spurious Emission

| | | | |
|---|---|---|---|
| Report No. | 32BE0278-HO | | |
| Semi Anechoic Chamber | No.1 | No.1 | No.2 |
| Date | 10/20/2011 | 10/21/2011 | 10/22/2011 |
| Temperature/ Humidity | 22 deg.C / 48% RH | 23 deg.C / 52% RH | 24 deg.C / 55% RH |
| Engineer | Takayuki Shimada (1-10GHz) | Takayuki Shimada (10-18GHz) | Takayuki Shimada (18-26.5GHz) |
| Mode | 11g Tx 2437MHz | | |

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| Hori | 4874.000 | PK | 43.2 | 30.7 | 4.6 | 35.8 | 42.7 | 73.9 | 31.2 | NS |
| Hori | 7311.000 | PK | 44.3 | 35.3 | 5.5 | 35.9 | 49.2 | 73.9 | 24.7 | NS |
| Hori | 9748.000 | PK | 44.2 | 38.1 | 6.0 | 36.5 | 51.8 | 73.9 | 22.1 | NS |
| Hori | 24370.000 | PK | 48.0 | 38.8 | -1.8 | 35.4 | 49.6 | 73.9 | 24.3 | NS |
| Hori | 4874.000 | AV | 31.5 | 30.7 | 4.6 | 35.8 | 31.0 | 53.9 | 22.9 | NS |
| Hori | 7311.000 | AV | 31.9 | 35.3 | 5.5 | 35.9 | 36.8 | 53.9 | 17.1 | NS |
| Hori | 9748.000 | AV | 32.0 | 38.1 | 6.0 | 36.5 | 39.6 | 53.9 | 14.3 | NS |
| Hori | 24370.000 | AV | 35.7 | 38.8 | -1.8 | 35.4 | 37.3 | 53.9 | 16.6 | NS |
| Vert | 4874.000 | PK | 43.3 | 30.7 | 4.6 | 35.8 | 42.8 | 73.9 | 31.1 | NS |
| Vert | 7311.000 | PK | 44.2 | 35.3 | 5.5 | 35.9 | 49.1 | 73.9 | 24.8 | NS |
| Vert | 9748.000 | PK | 44.1 | 38.1 | 6.0 | 36.5 | 51.7 | 73.9 | 22.2 | NS |
| Vert | 24370.000 | PK | 48.1 | 38.8 | -1.8 | 35.4 | 49.7 | 73.9 | 24.2 | NS |
| Vert | 4874.000 | AV | 31.5 | 30.7 | 4.6 | 35.8 | 31.0 | 53.9 | 22.9 | NS |
| Vert | 7311.000 | AV | 31.9 | 35.3 | 5.5 | 35.9 | 36.8 | 53.9 | 17.1 | NS |
| Vert | 9748.000 | AV | 32.0 | 38.1 | 6.0 | 36.5 | 39.6 | 53.9 | 14.3 | NS |
| Vert | 24370.000 | AV | 35.7 | 38.8 | -1.8 | 35.4 | 37.3 | 53.9 | 16.6 | NS |

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

NS: No signal detected

# Radiated Spurious Emission

| | | | |
|---|---|---|---|
| Report No. | 32BE0278-HO | | |
| Semi Anechoic Chamber | No.1 | No.1 | No.2 |
| Date | 10/20/2011 | 10/21/2011 | 10/22/2011 |
| Temperature/ Humidity | 22 deg.C / 48% RH | 23 deg.C / 52% RH | 24 deg.C / 55% RH |
| Engineer | Takayuki Shimada (1-10GHz) | Takayuki Shimada (10-18GHz) | Takayuki Shimada (18-26.5GHz) |
| Mode | 11g Tx 2462MHz | | |

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| Hori | 2483.500 | PK | 62.4 | 26.5 | 2.2 | 36.3 | 54.8 | 73.9 | 19.1 | |
| Hori | 4924.000 | PK | 43.5 | 30.8 | 4.6 | 35.8 | 43.1 | 73.9 | 30.8 | NS |
| Hori | 7386.000 | PK | 44.7 | 35.4 | 5.5 | 35.9 | 49.7 | 73.9 | 24.2 | NS |
| Hori | 9848.000 | PK | 44.1 | 38.3 | 6.2 | 36.5 | 52.1 | 73.9 | 21.8 | NS |
| Hori | 24620.000 | PK | 47.6 | 38.9 | -1.7 | 35.5 | 49.3 | 73.9 | 24.6 | NS |
| Hori | 2483.500 | AV | 42.9 | 26.5 | 2.2 | 36.3 | 35.3 | 53.9 | 18.6 | |
| Hori | 4924.000 | AV | 31.3 | 30.8 | 4.6 | 35.8 | 30.9 | 53.9 | 23.0 | NS |
| Hori | 7386.000 | AV | 32.2 | 35.4 | 5.5 | 35.9 | 37.2 | 53.9 | 16.7 | NS |
| Hori | 9848.000 | AV | 32.2 | 38.3 | 6.2 | 36.5 | 40.2 | 53.9 | 13.7 | NS |
| Hori | 24620.000 | AV | 35.6 | 38.9 | -1.7 | 35.5 | 37.3 | 53.9 | 16.6 | NS |
| Vert | 2483.500 | PK | 57.3 | 26.5 | 2.2 | 36.3 | 49.7 | 73.9 | 24.2 | |
| Vert | 4924.000 | PK | 43.6 | 30.8 | 4.6 | 35.8 | 43.2 | 73.9 | 30.7 | NS |
| Vert | 7386.000 | PK | 44.8 | 35.4 | 5.5 | 35.9 | 49.8 | 73.9 | 24.1 | NS |
| Vert | 9848.000 | PK | 44.1 | 38.3 | 6.2 | 36.5 | 52.1 | 73.9 | 21.8 | NS |
| Vert | 24620.000 | PK | 47.7 | 38.9 | -1.7 | 35.5 | 49.4 | 73.9 | 24.5 | NS |
| Vert | 2483.500 | AV | 37.6 | 26.5 | 2.2 | 36.3 | 30.0 | 53.9 | 23.9 | |
| Vert | 4924.000 | AV | 31.3 | 30.8 | 4.6 | 35.8 | 30.9 | 53.9 | 23.0 | NS |
| Vert | 7386.000 | AV | 32.2 | 35.4 | 5.5 | 35.9 | 37.2 | 53.9 | 16.7 | NS |
| Vert | 9848.000 | AV | 32.2 | 38.3 | 6.2 | 36.5 | 40.2 | 53.9 | 13.7 | NS |
| Vert | 24620.000 | AV | 35.6 | 38.9 | -1.7 | 35.5 | 37.3 | 53.9 | 16.6 | NS |

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

NS: No signal detected

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# Radiated Spurious Emission

| | | | |
|---|---|---|---|
| Report No. | 32BE0278-HO | | |
| Semi Anechoic Chamber | No.1 | No.1 | No.2 |
| Date | 10/20/2011 | 10/21/2011 | 10/22/2011 |
| Temperature/ Humidity | 22 deg.C / 48% RH | 23 deg.C / 52% RH | 24 deg.C / 55% RH |
| Engineer | Takayuki Shimada (1-10GHz) | Takayuki Shimada (10-18GHz) | Takayuki Shimada (18-40GHz) |
| Mode | 11a Tx 5745MHz | | |

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| Hori | 5368.500 | PK | 51.1 | 31.3 | 3.4 | 35.7 | 50.1 | 73.9 | 23.8 | |
| Hori | 5725.000 | PK | 60.3 | 31.7 | 3.5 | 35.6 | 59.9 | 73.9 | 14.0 | |
| Hori | 11490.000 | PK | 44.4 | 39.6 | -2.3 | 35.9 | 45.8 | 73.9 | 28.1 | NS |
| Hori | 17235.000 | PK | 44.3 | 42.3 | -0.9 | 35.6 | 50.1 | 73.9 | 23.8 | NS |
| Hori | 5368.500 | AV | 38.2 | 31.3 | 3.4 | 35.7 | 37.2 | 53.9 | 16.7 | |
| Hori | 5725.000 | AV | 41.2 | 31.7 | 3.5 | 35.6 | 40.8 | 53.9 | 13.1 | |
| Hori | 11490.000 | AV | 32.0 | 39.6 | -2.3 | 35.9 | 33.4 | 53.9 | 20.5 | NS |
| Hori | 17235.000 | AV | 32.5 | 42.3 | -0.9 | 35.6 | 38.3 | 53.9 | 15.6 | NS |
| Vert | 5326.133 | PK | 47.8 | 31.3 | 3.3 | 35.7 | 46.7 | 73.9 | 27.2 | |
| Vert | 5725.000 | PK | 58.5 | 31.7 | 3.5 | 35.6 | 58.1 | 73.9 | 15.8 | |
| Vert | 11490.000 | PK | 44.7 | 39.6 | -2.3 | 35.9 | 46.1 | 73.9 | 27.8 | NS |
| Vert | 17235.000 | PK | 44.5 | 42.3 | -0.9 | 35.6 | 50.3 | 73.9 | 23.6 | NS |
| Vert | 5326.133 | AV | 34.3 | 31.3 | 3.3 | 35.7 | 33.2 | 53.9 | 20.7 | |
| Vert | 5725.000 | AV | 40.4 | 31.7 | 3.5 | 35.6 | 40.0 | 53.9 | 13.9 | |
| Vert | 11490.000 | AV | 32.0 | 39.6 | -2.3 | 35.9 | 33.4 | 53.9 | 20.5 | NS |
| Vert | 17235.000 | AV | 32.5 | 42.3 | -0.9 | 35.6 | 38.3 | 53.9 | 15.6 | NS |

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

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

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

NS: No signal detected

# Radiated Spurious Emission

| | | | |
|---|---|---|---|
| Report No. | 32BE0278-HO | | |
| Semi Anechoic Chamber | No.1 | No.1 | No.2 |
| Date | 10/20/2011 | 10/21/2011 | 10/22/2011 |
| Temperature/ Humidity | 22 deg.C / 48% RH | 23 deg.C / 52% RH | 24 deg.C / 55% RH |
| Engineer | Takayuki Shimada (1-10GHz) | Takayuki Shimada (10-18GHz) | Takayuki Shimada (18-40GHz) |
| Mode | 11a Tx 5785MHz | | |

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| Hori | 5354.210 | PK | 51.1 | 31.3 | 3.3 | 35.7 | 50.0 | 73.9 | 23.9 | |
| Hori | 11570.000 | PK | 44.3 | 39.4 | -2.2 | 35.9 | 45.6 | 73.9 | 28.3 | NS |
| Hori | 17355.000 | PK | 45.5 | 43.4 | -0.7 | 35.6 | 52.6 | 73.9 | 21.3 | NS |
| Hori | 5354.210 | AV | 38.0 | 31.3 | 3.3 | 35.7 | 36.9 | 53.9 | 17.0 | |
| Hori | 11570.000 | AV | 32.0 | 39.4 | -2.2 | 35.9 | 33.3 | 53.9 | 20.6 | NS |
| Hori | 17355.000 | AV | 33.0 | 43.4 | -0.7 | 35.6 | 40.1 | 53.9 | 13.8 | NS |
| Vert | 5263.119 | PK | 45.8 | 31.2 | 3.3 | 35.7 | 44.6 | 73.9 | 29.3 | |
| Vert | 11570.000 | PK | 44.3 | 39.4 | -2.2 | 35.9 | 45.6 | 73.9 | 28.3 | NS |
| Vert | 17355.000 | PK | 45.6 | 43.4 | -0.7 | 35.6 | 52.7 | 73.9 | 21.2 | NS |
| Vert | 5263.119 | AV | 33.6 | 31.2 | 3.3 | 35.7 | 32.4 | 53.9 | 21.5 | |
| Vert | 11570.000 | AV | 32.0 | 39.4 | -2.2 | 35.9 | 33.3 | 53.9 | 20.6 | NS |
| Vert | 17355.000 | AV | 33.0 | 43.4 | -0.7 | 35.6 | 40.1 | 53.9 | 13.8 | NS |

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

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

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

NS: No signal detected

# Radiated Spurious Emission

| | | | |
|---|---|---|---|
| Report No. | 32BE0278-HO | | |
| Semi Anechoic Chamber | No.1 | No.1 | No.2 |
| Date | 10/20/2011 | 10/21/2011 | 10/22/2011 |
| Temperature/ Humidity | 22 deg.C / 48% RH | 23 deg.C / 52% RH | 24 deg.C / 55% RH |
| Engineer | Takayuki Shimada (1-10GHz) | Takayuki Shimada (10-18GHz) | Takayuki Shimada (18-40GHz) |
| Mode | 11a Tx 5825MHz | | |

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| Hori | 5340.833 | PK | 53.6 | 31.3 | 3.3 | 35.7 | 52.5 | 73.9 | 21.4 | |
| Hori | 5850.000 | PK | 60.7 | 31.9 | 3.5 | 35.6 | 60.5 | 73.9 | 13.4 | |
| Hori | 11650.000 | PK | 44.4 | 39.3 | -2.2 | 36.0 | 45.5 | 73.9 | 28.4 | NS |
| Hori | 17475.000 | PK | 45.2 | 44.5 | -0.7 | 35.5 | 53.5 | 73.9 | 20.4 | NS |
| Hori | 5340.833 | AV | 40.8 | 31.3 | 3.3 | 35.7 | 39.7 | 53.9 | 14.2 | |
| Hori | 5850.000 | AV | 38.0 | 31.9 | 3.5 | 35.6 | 37.8 | 53.9 | 16.1 | |
| Hori | 11650.000 | AV | 32.4 | 39.3 | -2.2 | 36.0 | 33.5 | 53.9 | 20.4 | NS |
| Hori | 17475.000 | AV | 33.0 | 44.5 | -0.7 | 35.5 | 41.3 | 53.9 | 12.6 | NS |
| Vert | 5308.521 | PK | 50.8 | 31.2 | 3.3 | 35.7 | 49.6 | 73.9 | 24.3 | |
| Vert | 5850.000 | PK | 57.2 | 31.9 | 3.5 | 35.6 | 57.0 | 73.9 | 16.9 | |
| Vert | 11650.000 | PK | 44.6 | 39.3 | -2.2 | 36.0 | 45.7 | 73.9 | 28.2 | NS |
| Vert | 17475.000 | PK | 45.2 | 44.5 | -0.7 | 35.5 | 53.5 | 73.9 | 20.4 | NS |
| Vert | 5308.521 | AV | 37.7 | 31.2 | 3.3 | 35.7 | 36.5 | 53.9 | 17.4 | |
| Vert | 5850.000 | AV | 35.4 | 31.9 | 3.5 | 35.6 | 35.2 | 53.9 | 18.7 | |
| Vert | 11650.000 | AV | 32.4 | 39.3 | -2.2 | 36.0 | 33.5 | 53.9 | 20.4 | NS |
| Vert | 17475.000 | AV | 33.0 | 44.5 | -0.7 | 35.5 | 41.3 | 53.9 | 12.6 | NS |

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

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

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

NS: No signal detected

# Radiated Spurious Emission

| | | | |
|---|---|---|---|
| Report No. | 32BE0278-HO | | |
| Semi Anechoic Chamber | No.1 | No.1 | No.2 |
| Date | 10/20/2011 | 10/21/2011 | 10/22/2011 |
| Temperature/ Humidity | 22 deg.C / 48% RH | 23 deg.C / 52% RH | 24 deg.C / 55% RH |
| Engineer | Takayuki Shimada (1-10GHz) | Takayuki Shimada (10-18GHz) | Takayuki Shimada (18-40GHz) |
| Mode | 11n-40 Tx 5755MHz | | |

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| Hori | 5337.675 | PK | 51.4 | 31.3 | 3.3 | 35.7 | 50.3 | 73.9 | 23.6 | |
| Hori | 5725.000 | PK | 65.7 | 31.7 | 3.5 | 35.6 | 65.3 | 73.9 | 8.6 | |
| Hori | 11510.000 | PK | 44.0 | 39.6 | -2.3 | 35.9 | 45.4 | 73.9 | 28.5 | NS |
| Hori | 17265.000 | PK | 44.7 | 42.6 | -0.8 | 35.6 | 50.9 | 73.9 | 23.0 | NS |
| Hori | 5337.675 | AV | 38.0 | 31.3 | 3.3 | 35.7 | 36.9 | 53.9 | 17.0 | |
| Hori | 5725.000 | AV | 45.8 | 31.7 | 3.5 | 35.6 | 45.4 | 53.9 | 8.5 | |
| Hori | 11510.000 | AV | 31.9 | 39.6 | -2.3 | 35.9 | 33.3 | 53.9 | 20.6 | NS |
| Hori | 17265.000 | AV | 32.4 | 42.6 | -0.8 | 35.6 | 38.6 | 53.9 | 15.3 | NS |
| Vert | 5317.233 | PK | 47.8 | 31.3 | 3.3 | 35.7 | 46.7 | 73.9 | 27.2 | |
| Vert | 5725.000 | PK | 64.0 | 31.7 | 3.5 | 35.6 | 63.6 | 73.9 | 10.3 | |
| Vert | 11510.000 | PK | 44.0 | 39.6 | -2.3 | 35.9 | 45.4 | 73.9 | 28.5 | NS |
| Vert | 17265.000 | PK | 44.8 | 42.6 | -0.8 | 35.6 | 51.0 | 73.9 | 22.9 | NS |
| Vert | 5317.233 | AV | 35.4 | 31.3 | 3.3 | 35.7 | 34.3 | 53.9 | 19.6 | |
| Vert | 5725.000 | AV | 44.2 | 31.7 | 3.5 | 35.6 | 43.8 | 53.9 | 10.1 | |
| Vert | 11510.000 | AV | 31.9 | 39.6 | -2.3 | 35.9 | 33.3 | 53.9 | 20.6 | NS |
| Vert | 17265.000 | AV | 32.4 | 42.6 | -0.8 | 35.6 | 38.6 | 53.9 | 15.3 | NS |

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

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

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

NS: No signal detected

# Radiated Spurious Emission

| | | | |
|---|---|---|---|
| Report No. | 32BE0278-HO | | |
| Semi Anechoic Chamber | No.1 | No.1 | No.2 |
| Date | 10/20/2011 | 10/21/2011 | 10/22/2011 |
| Temperature/ Humidity | 22 deg.C / 48% RH | 23 deg.C / 52% RH | 24 deg.C / 55% RH |
| Engineer | Takayuki Shimada (1-10GHz) | Takayuki Shimada (10-18GHz) | Takayuki Shimada (18-40GHz) |
| Mode | 11n-40 Tx 5795MHz | | |

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| Hori | 5324.333 | PK | 51.0 | 31.3 | 3.3 | 35.7 | 49.9 | 73.9 | 24.0 | |
| Hori | 5850.000 | PK | 59.4 | 31.9 | 3.5 | 35.6 | 59.2 | 73.9 | 14.7 | |
| Hori | 11590.000 | PK | 44.4 | 39.4 | -2.2 | 35.9 | 45.7 | 73.9 | 28.2 | NS |
| Hori | 17385.000 | PK | 44.7 | 43.6 | -0.7 | 35.6 | 52.0 | 73.9 | 21.9 | NS |
| Hori | 5324.333 | AV | 38.7 | 31.3 | 3.3 | 35.7 | 37.6 | 53.9 | 16.3 | |
| Hori | 5850.000 | AV | 33.6 | 31.9 | 3.5 | 35.6 | 33.4 | 53.9 | 20.5 | |
| Hori | 11590.000 | AV | 32.2 | 39.4 | -2.2 | 35.9 | 33.5 | 53.9 | 20.4 | NS |
| Hori | 17385.000 | AV | 32.9 | 43.6 | -0.7 | 35.6 | 40.2 | 53.9 | 13.7 | NS |
| Vert | 5303.434 | PK | 49.1 | 31.2 | 3.3 | 35.7 | 47.9 | 73.9 | 26.0 | |
| Vert | 5850.000 | PK | 57.1 | 31.9 | 3.5 | 35.6 | 56.9 | 73.9 | 17.0 | |
| Vert | 11590.000 | PK | 44.6 | 39.4 | -2.2 | 35.9 | 45.9 | 73.9 | 28.0 | NS |
| Vert | 17385.000 | PK | 44.6 | 43.6 | -0.7 | 35.6 | 51.9 | 73.9 | 22.0 | NS |
| Vert | 5303.434 | AV | 36.2 | 31.2 | 3.3 | 35.7 | 35.0 | 53.9 | 18.9 | |
| Vert | 5850.000 | AV | 32.9 | 31.9 | 3.5 | 35.6 | 32.7 | 53.9 | 21.2 | |
| Vert | 11590.000 | AV | 32.2 | 39.4 | -2.2 | 35.9 | 33.5 | 53.9 | 20.4 | NS |
| Vert | 17385.000 | AV | 32.9 | 43.6 | -0.7 | 35.6 | 40.2 | 53.9 | 13.7 | NS |

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

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

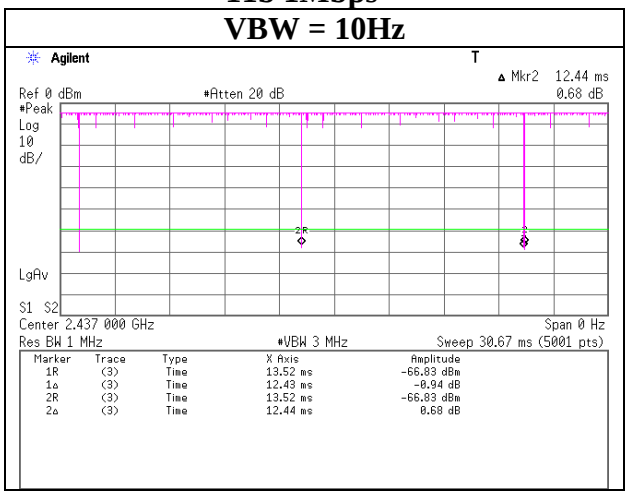
Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

NS: No signal detected

# VBW (AV) Calculation

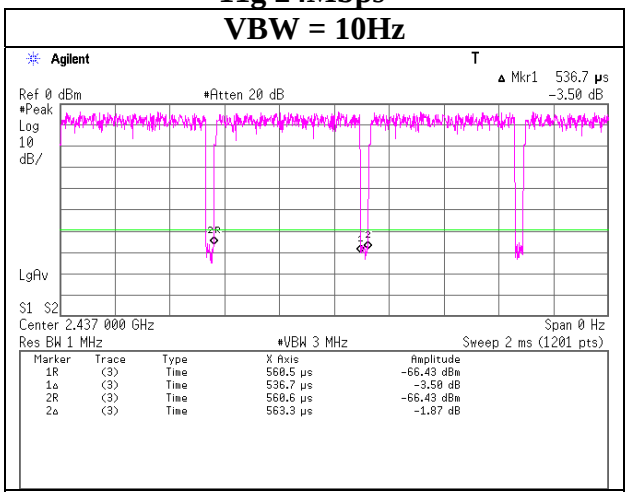
## 11b 1Mbps

### VBW = 10Hz




## 11g 24Mbps

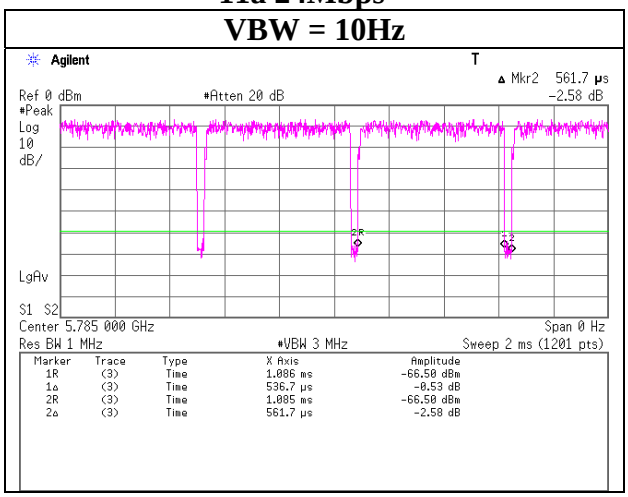
### VBW = 10Hz



# VBW (AV) Calculation

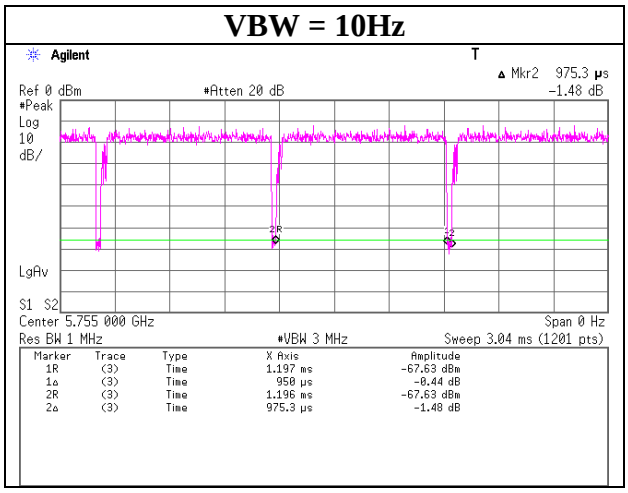
## 11a 24Mbps

### VBW = 10Hz




## 11n40 MCS0

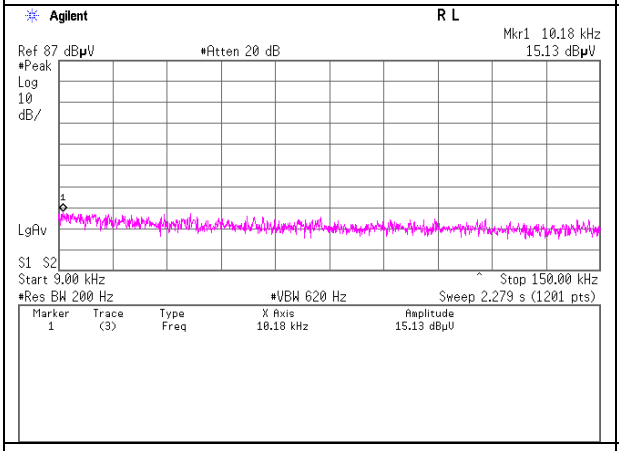
### VBW = 10Hz



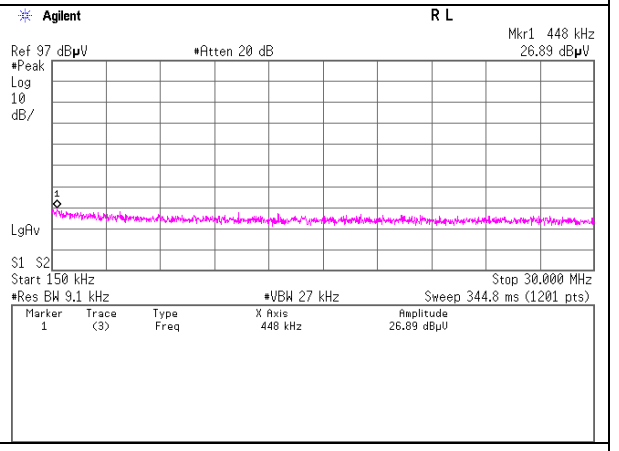
# Conducted Spurious Emission

## 11b Tx 2412MHz

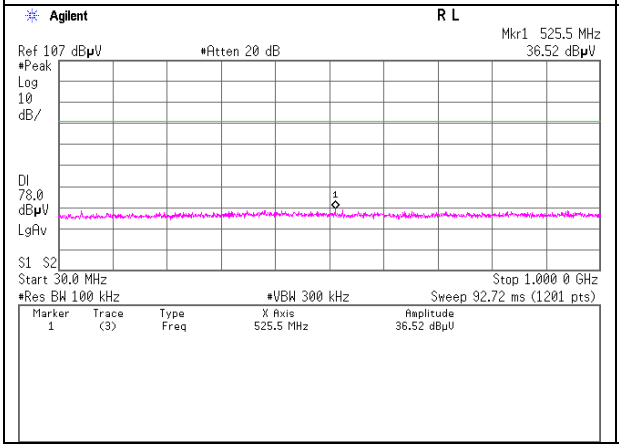
### 9kHz-150kHz



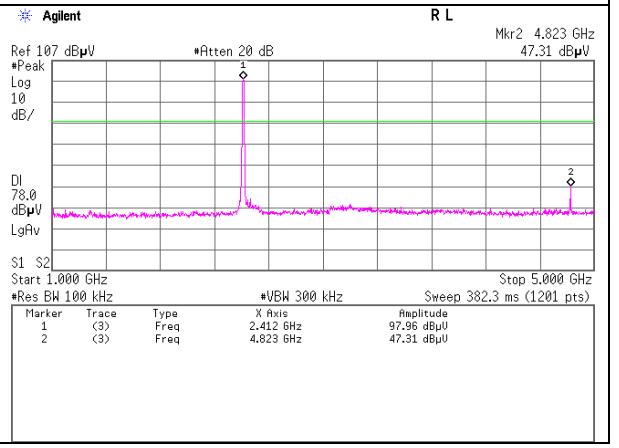

### 150kHz-30MHz




### 30MHz-1GHz



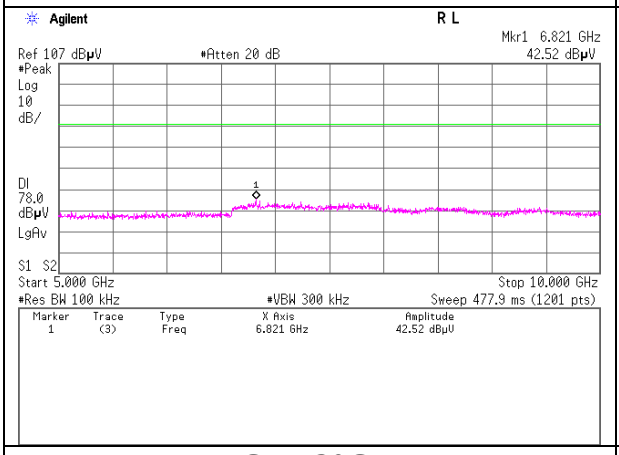

### 1GHz-5GHz



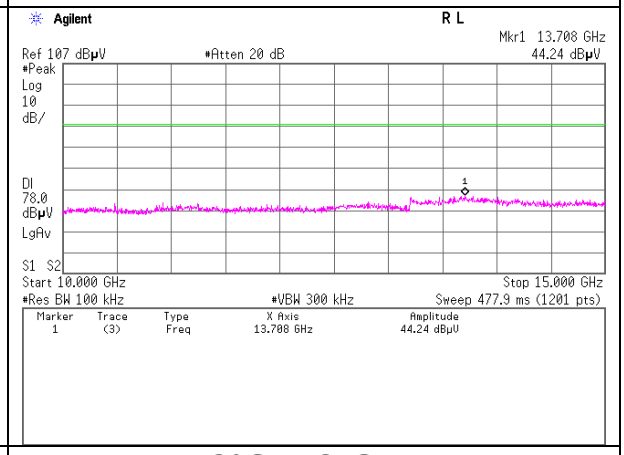
# Conducted Spurious Emission

## 11b Tx 2412MHz

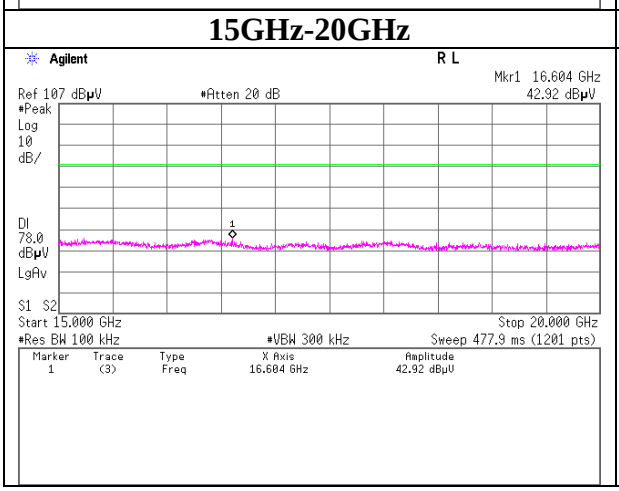
### 5GHz-10GHz



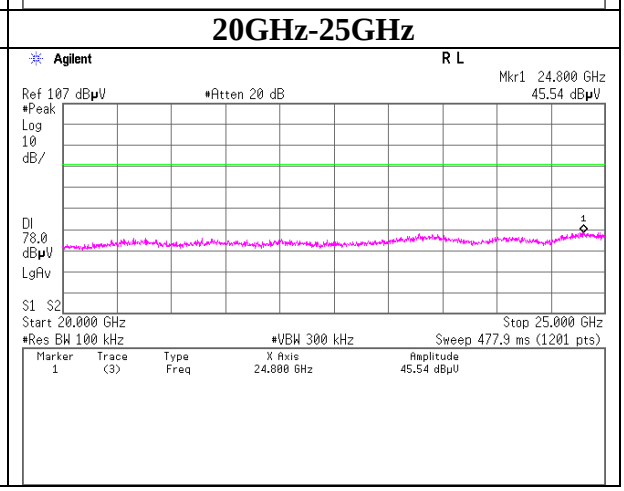

### 10GHz-15GHz




### 15GHz-20GHz



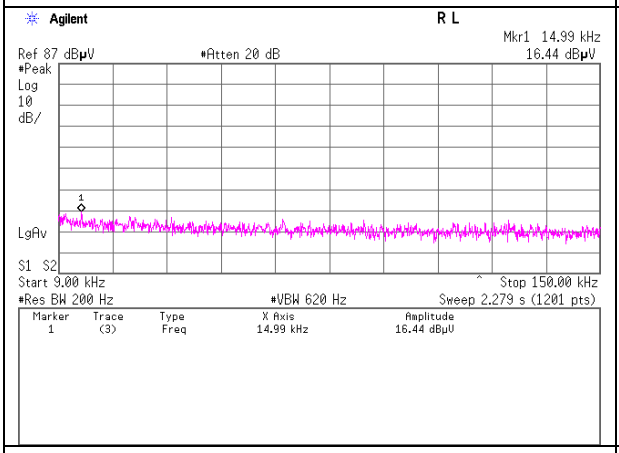

### 20GHz-25GHz



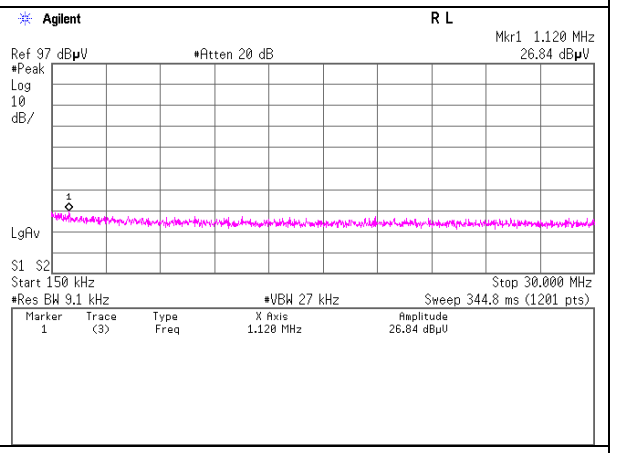
# Conducted Spurious Emission

## 11b Tx 2437MHz

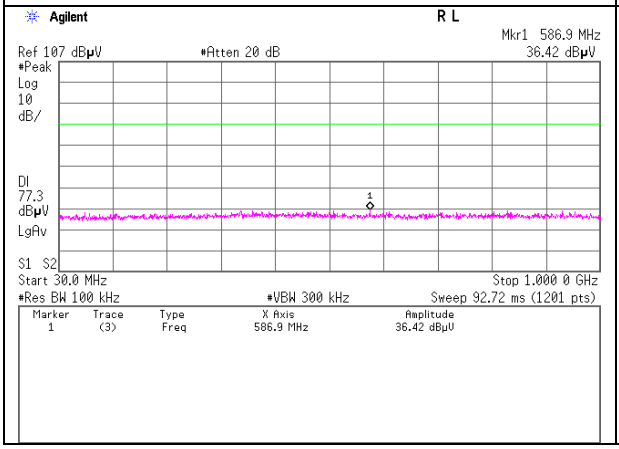
### 9kHz-150kHz



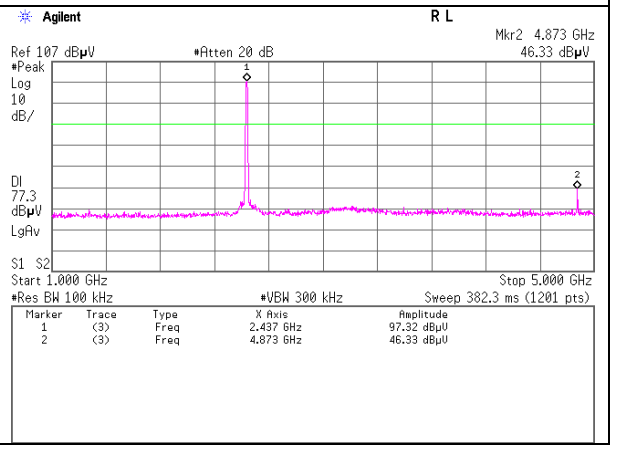

### 150kHz-30MHz




### 30MHz-1GHz



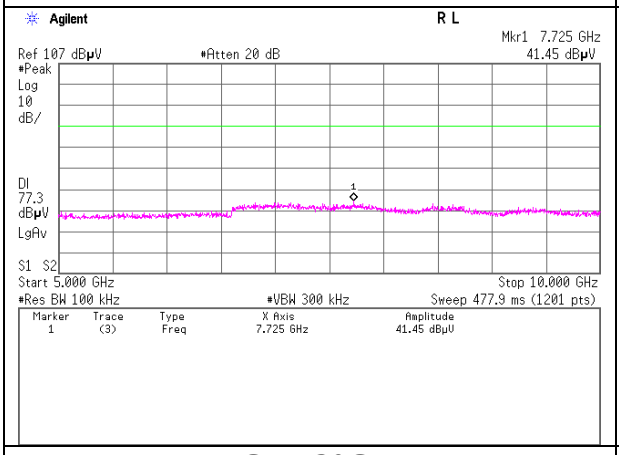

### 1GHz-5GHz



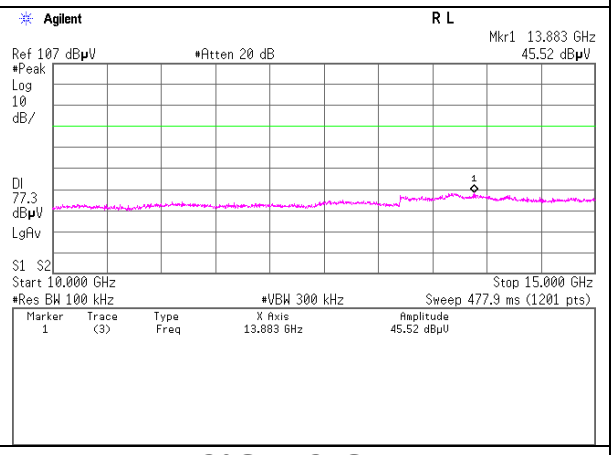
# Conducted Spurious Emission

## 11b Tx 2437MHz

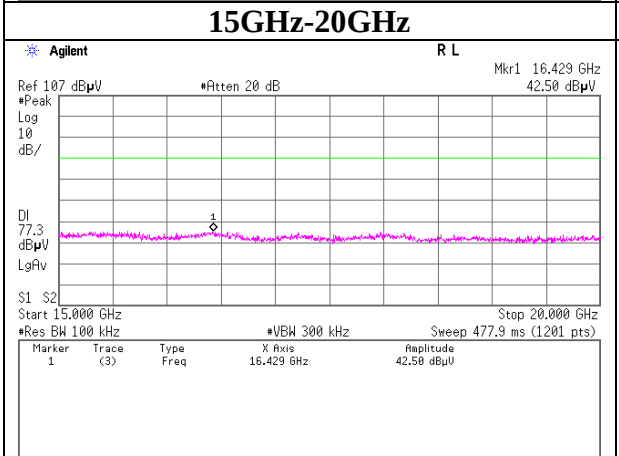
### 5GHz-10GHz



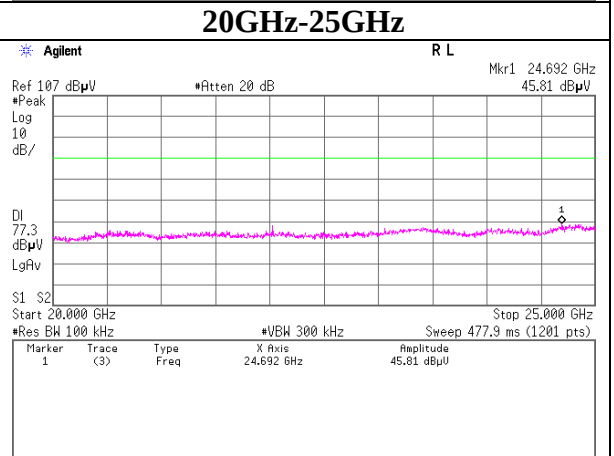

### 10GHz-15GHz




### 15GHz-20GHz



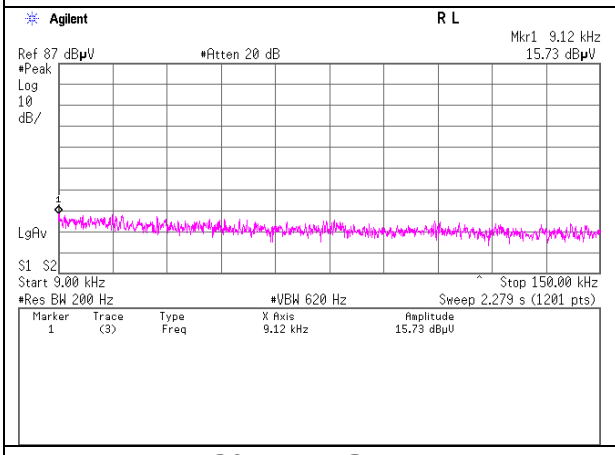

### 20GHz-25GHz



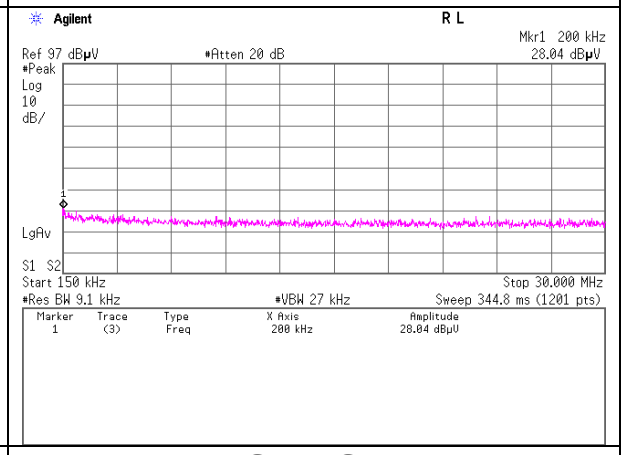
# Conducted Spurious Emission

## 11b Tx 2462MHz

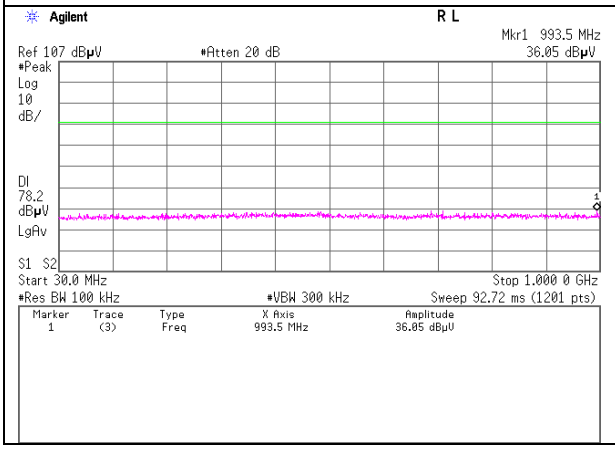
### 9kHz-150kHz



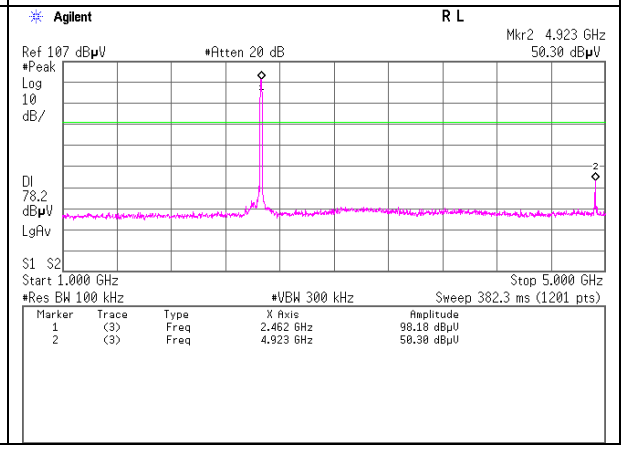

### 150kHz-30MHz




### 30MHz-1GHz



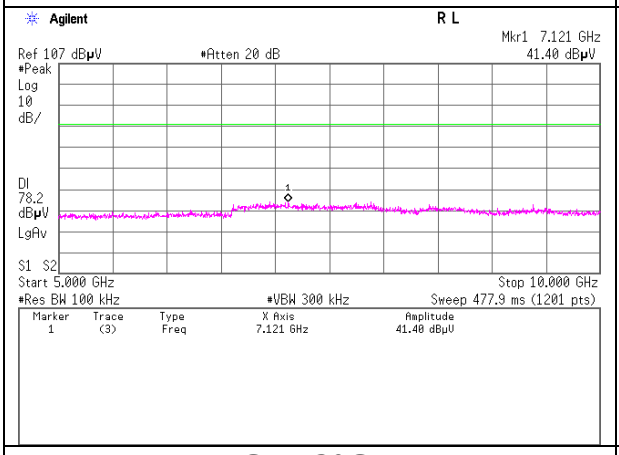

### 1GHz-5GHz



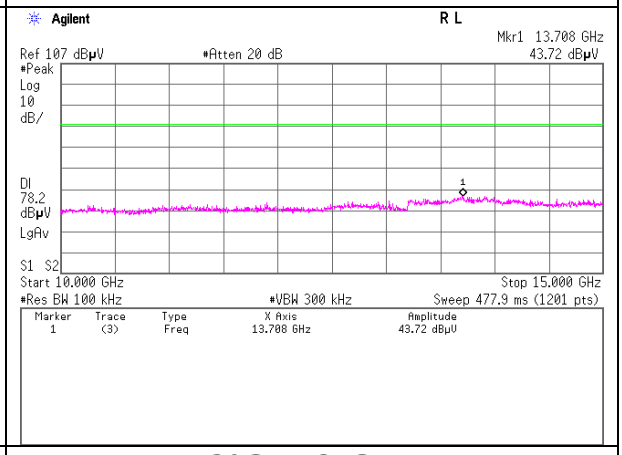
# Conducted Spurious Emission

## 11b Tx 2462MHz

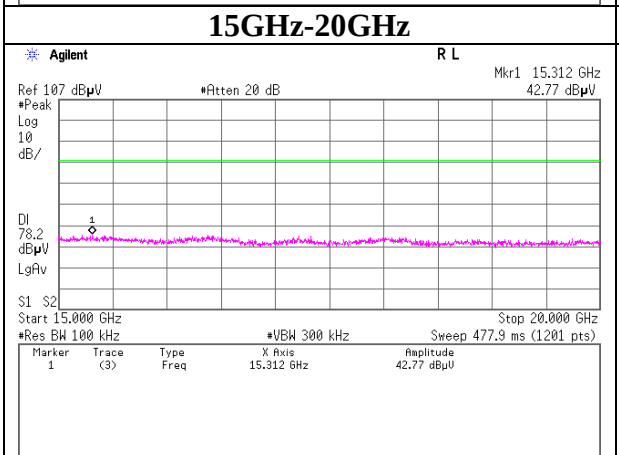
### 5GHz-10GHz



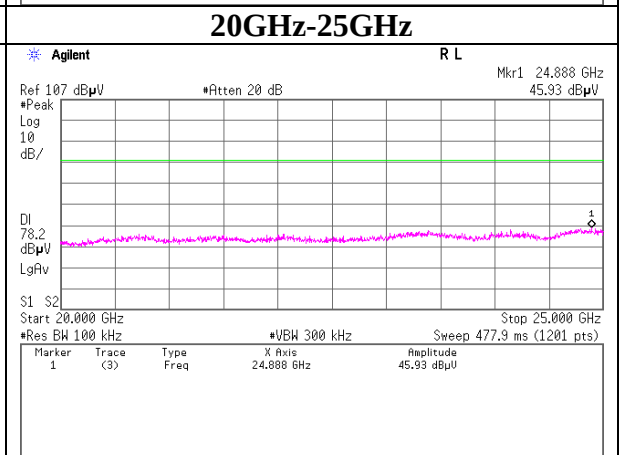

### 10GHz-15GHz




### 15GHz-20GHz



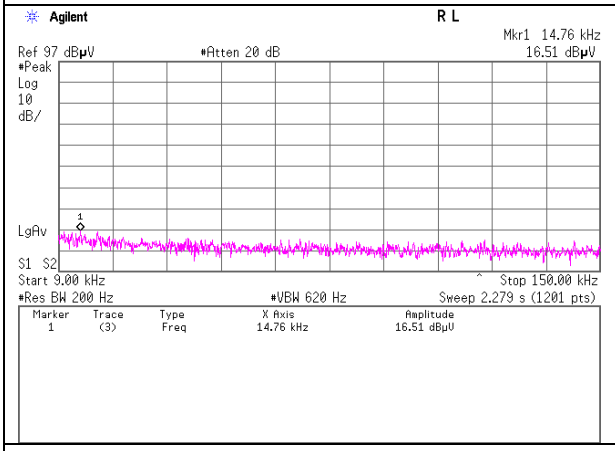

### 20GHz-25GHz



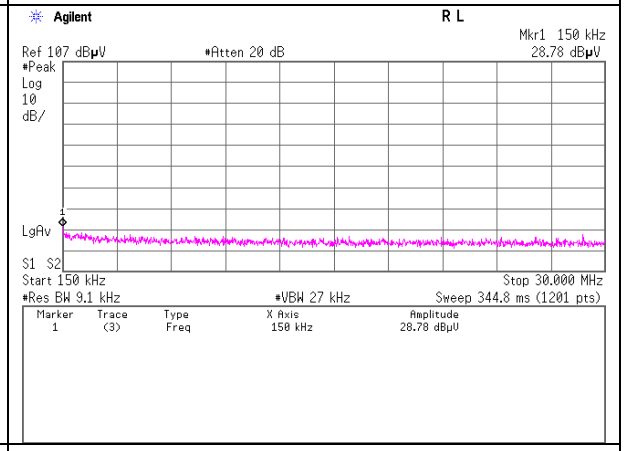
# Conducted Spurious Emission

## 11g Tx 2412MHz

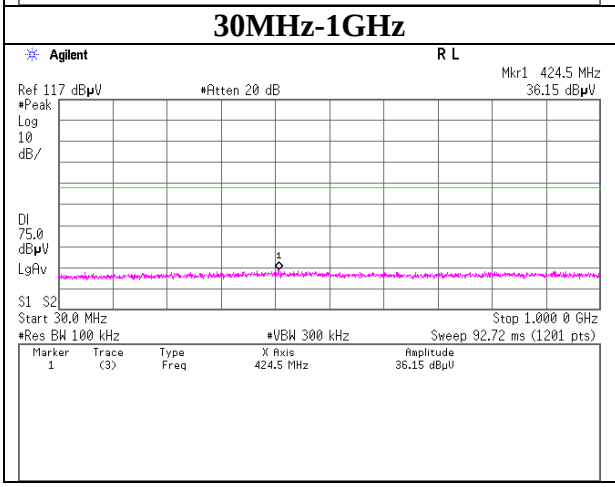
### 9kHz-150kHz



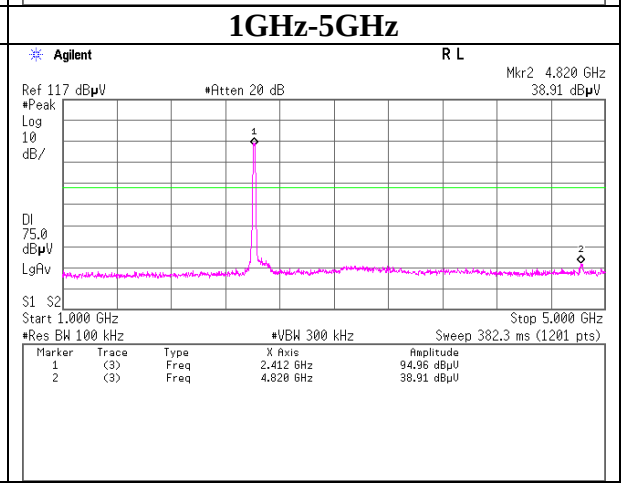

### 150kHz-30MHz




### 30MHz-1GHz



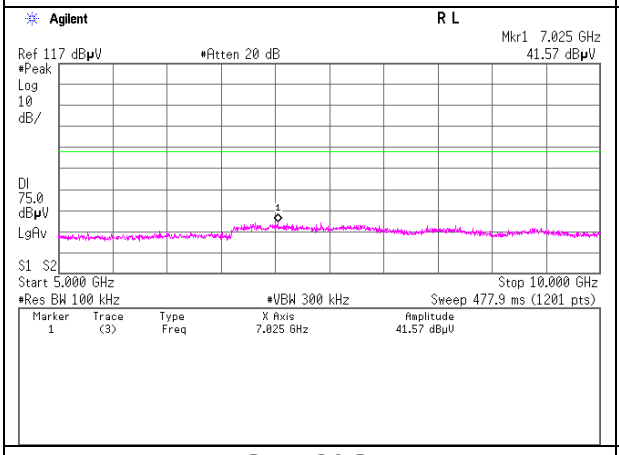

### 1GHz-5GHz



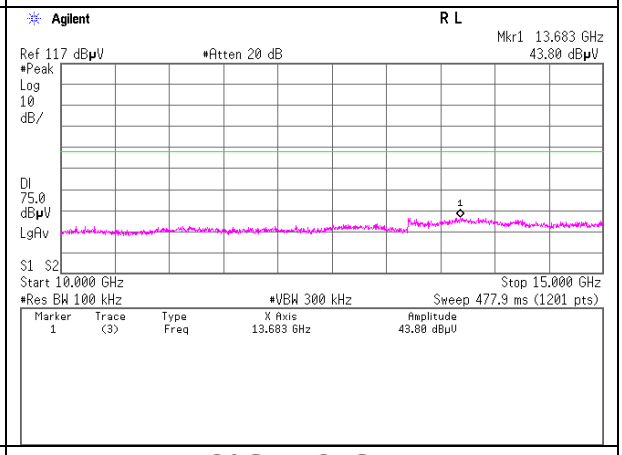
# Conducted Spurious Emission

## 11g Tx 2412MHz

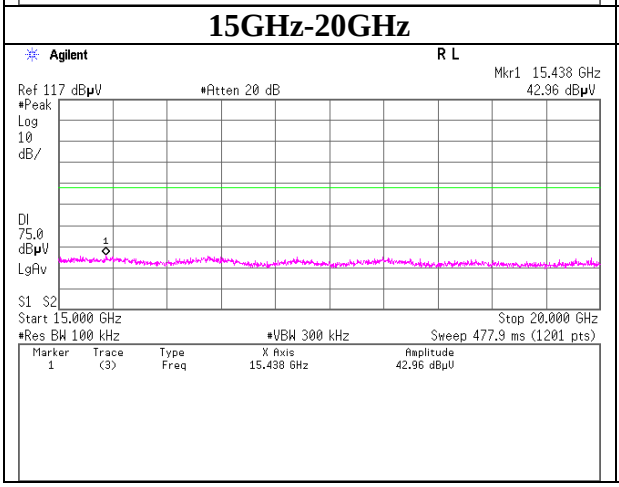
### 5GHz-10GHz



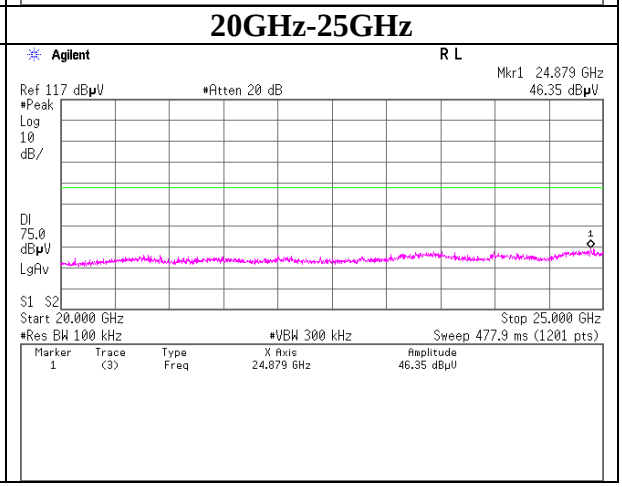

### 10GHz-15GHz




### 15GHz-20GHz



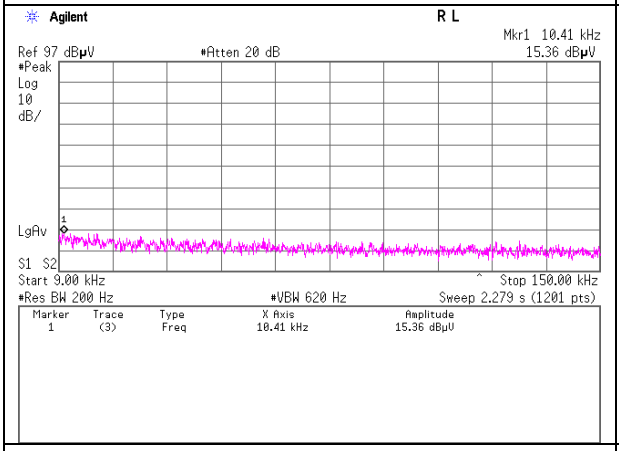

### 20GHz-25GHz



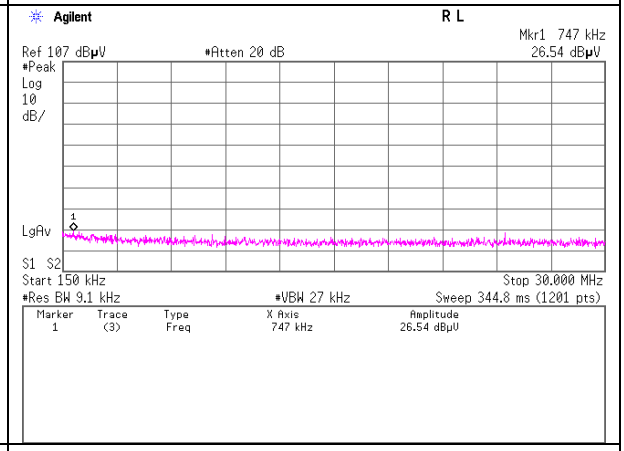
# Conducted Spurious Emission

## 11g Tx 2437MHz

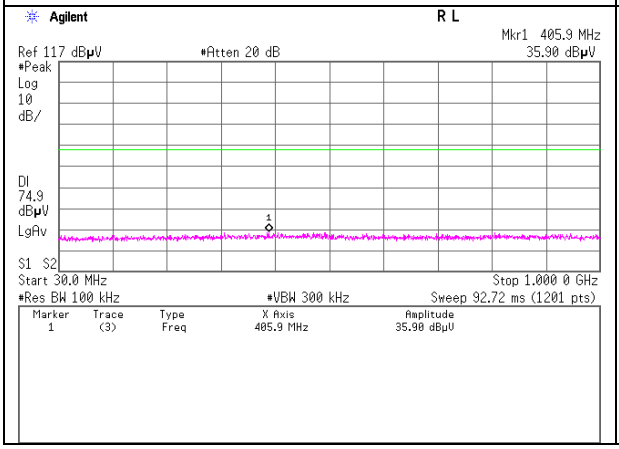
### 9kHz-150kHz



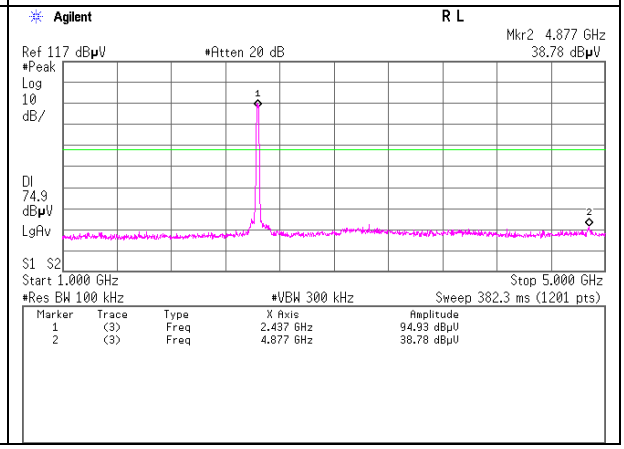

### 150kHz-30MHz




### 30MHz-1GHz



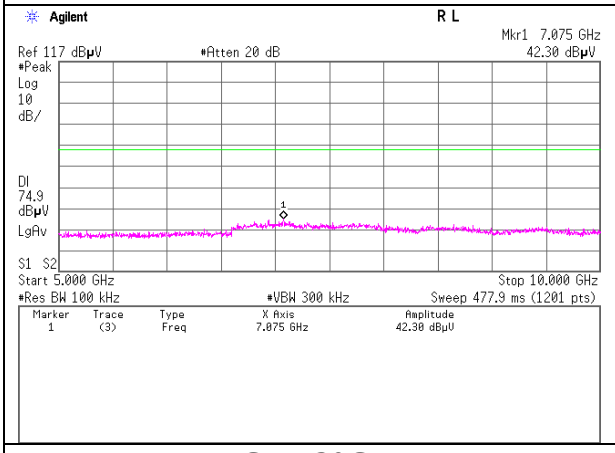

### 1GHz-5GHz



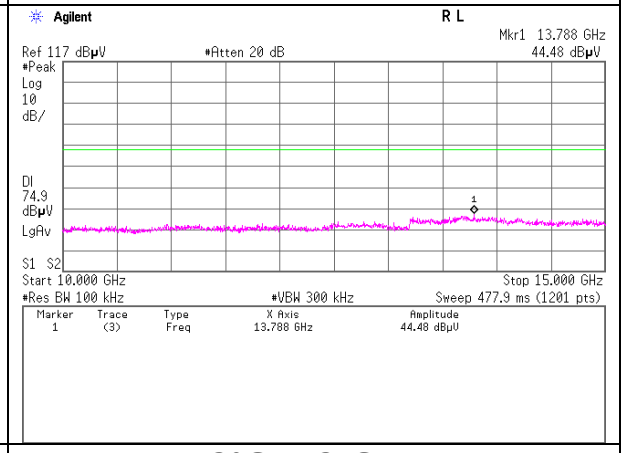
# Conducted Spurious Emission

## 11g Tx 2437MHz

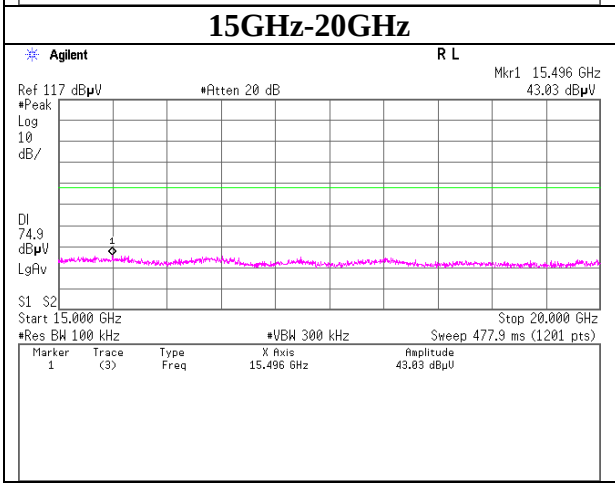
### 5GHz-10GHz



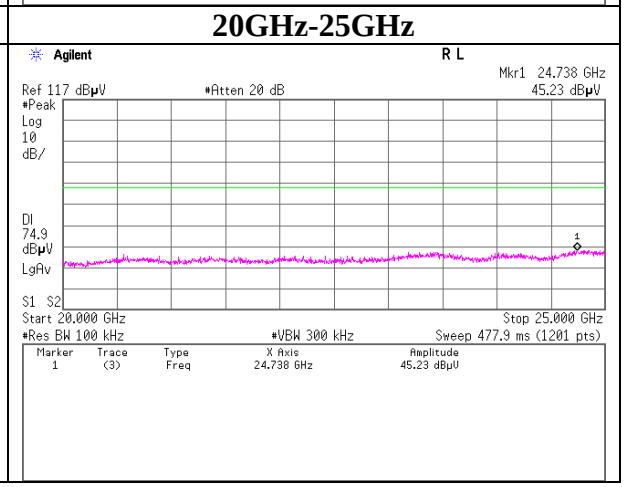

### 10GHz-15GHz




### 15GHz-20GHz



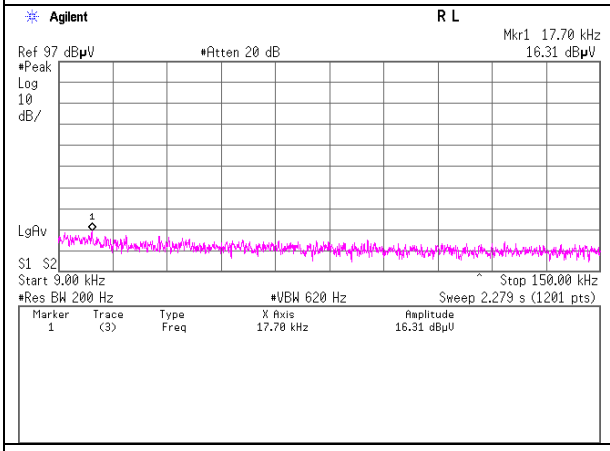

### 20GHz-25GHz



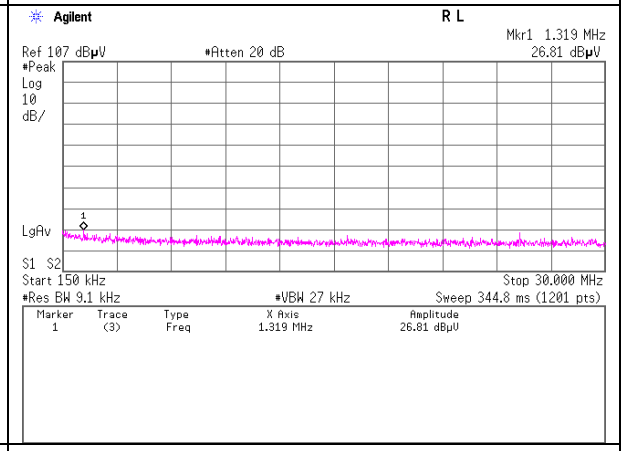
# Conducted Spurious Emission

## 11g Tx 2462MHz

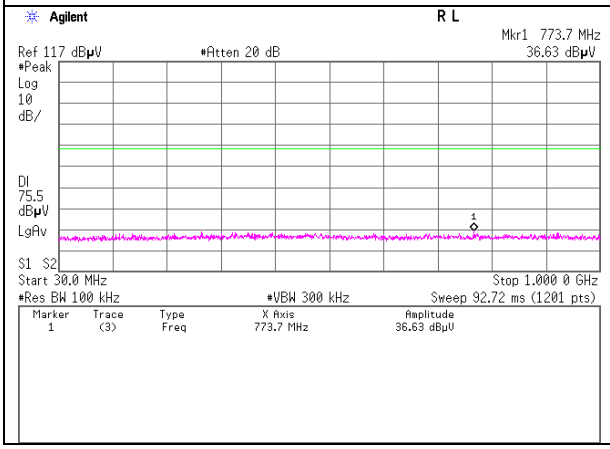
### 9kHz-150kHz



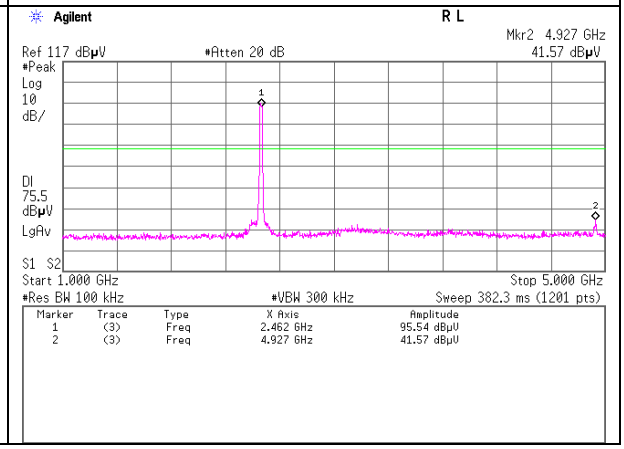

### 150kHz-30MHz




### 30MHz-1GHz



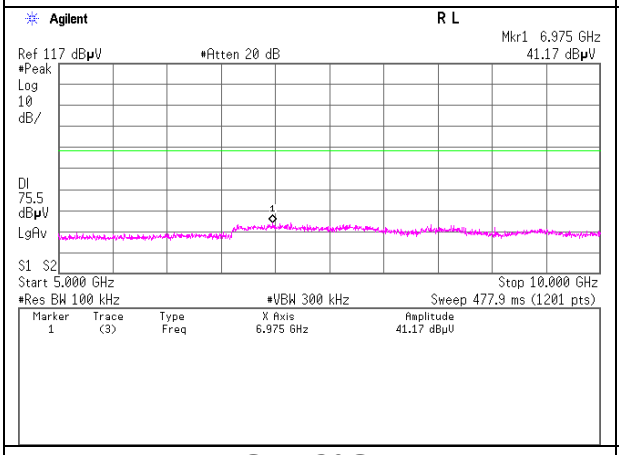

### 1GHz-5GHz



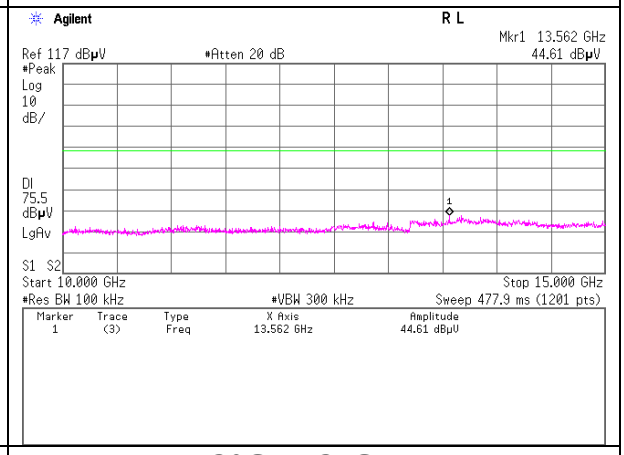
# Conducted Spurious Emission

## 11g Tx 2462MHz

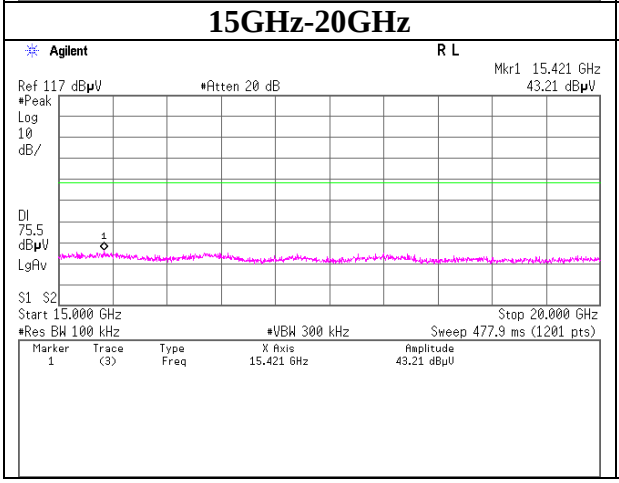
### 5GHz-10GHz



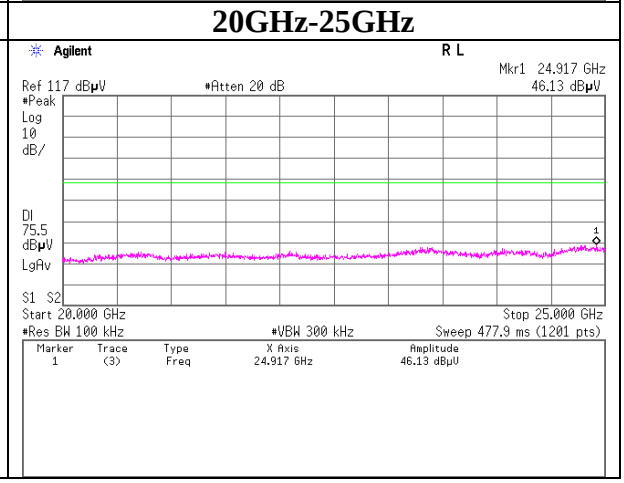

### 10GHz-15GHz




### 15GHz-20GHz




### 20GHz-25GHz

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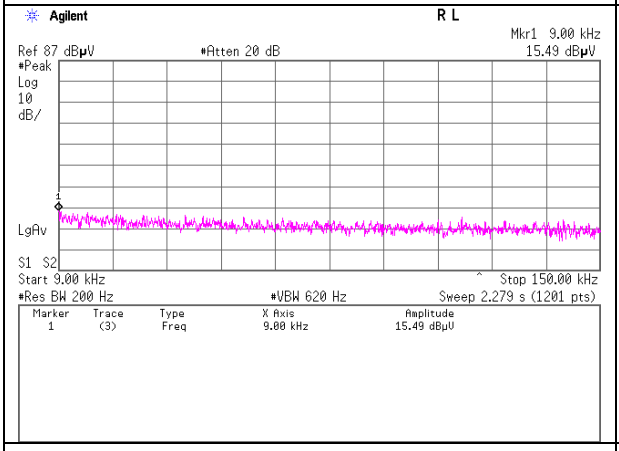
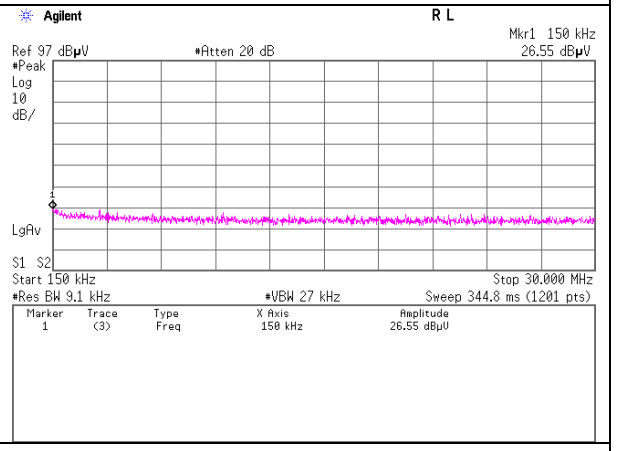
# Conducted Spurious Emission

## 11a Tx 5745MHz

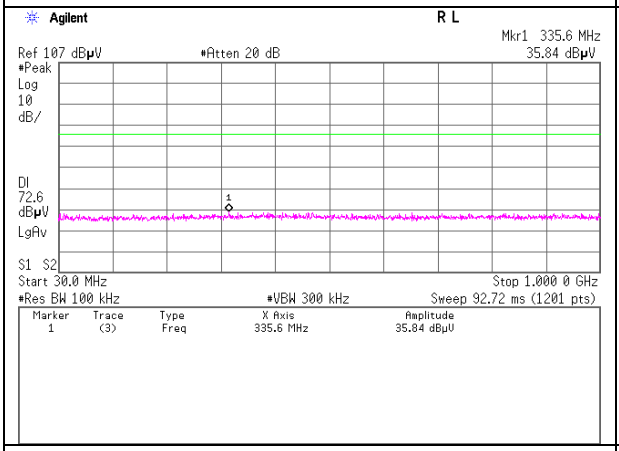
### 9kHz-150kHz



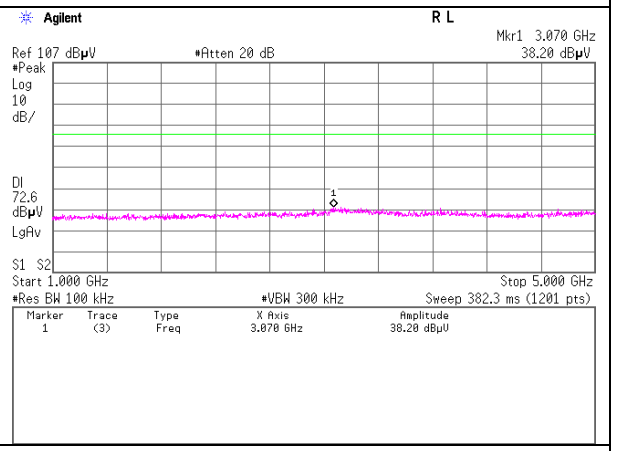

### 150kHz-30MHz



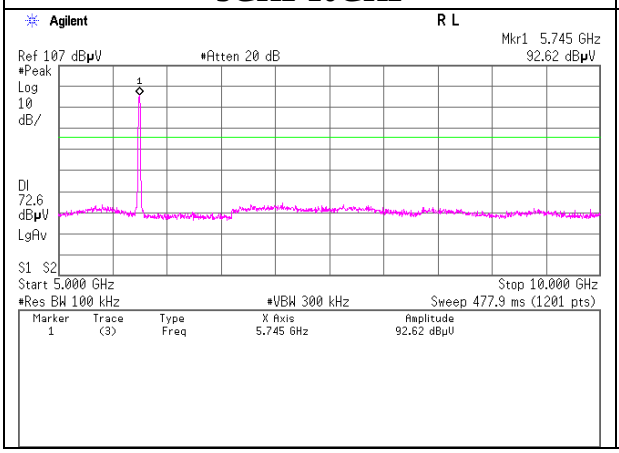

### 30MHz-1GHz



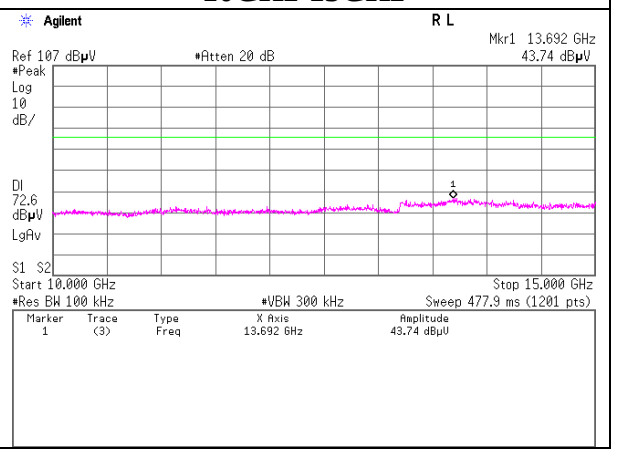

### 1GHz-5GHz




### 5GHz-10GHz




### 10GHz-15GHz





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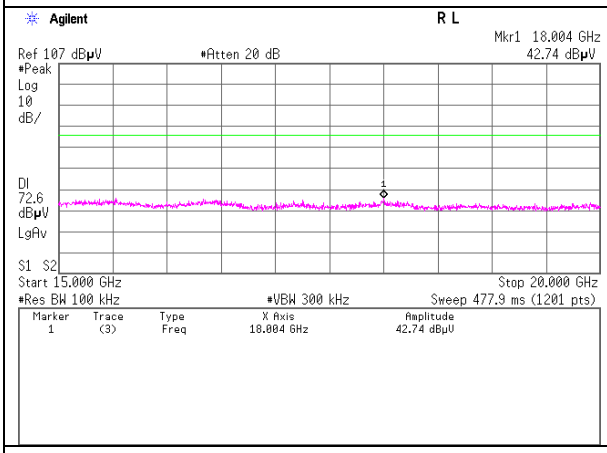
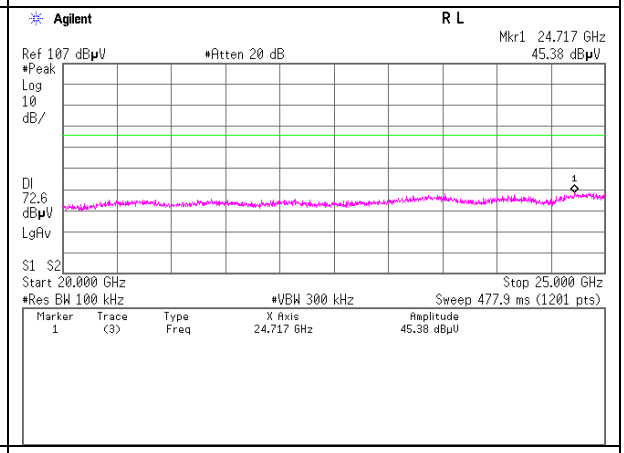
# Conducted Spurious Emission

## 11a Tx 5745MHz

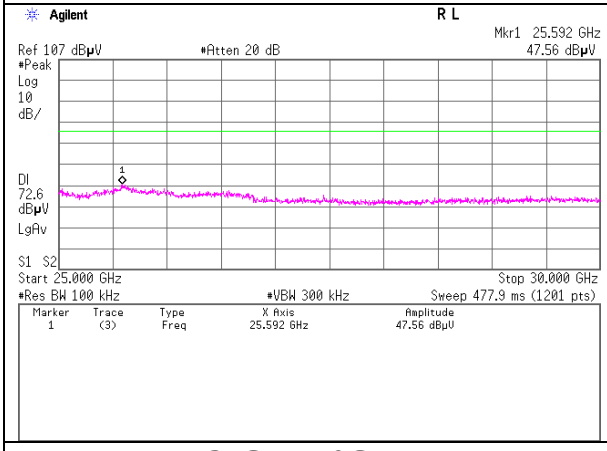
### 15GHz-20GHz



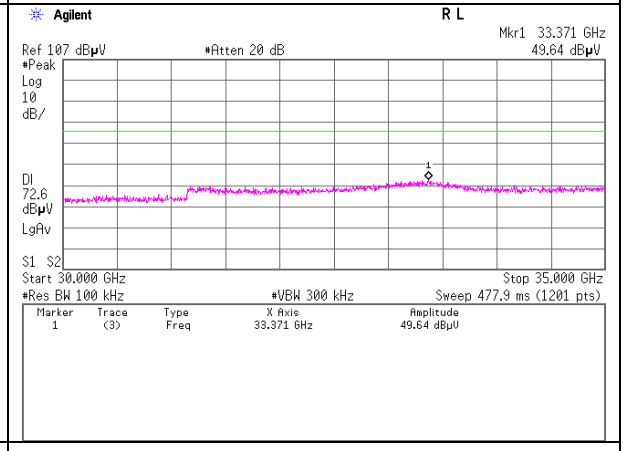

### 20GHz-25GHz



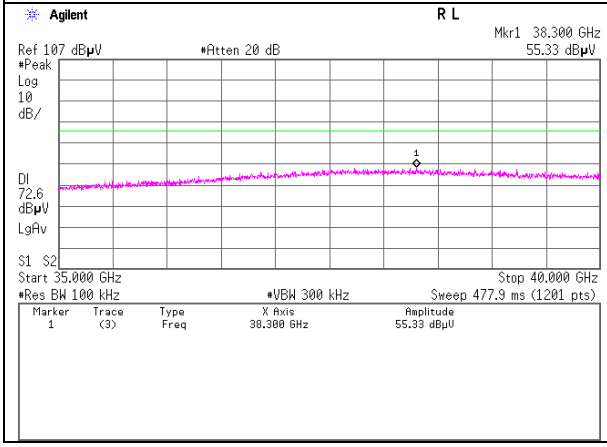

### 25GHz-30GHz




### 30GHz-35GHz



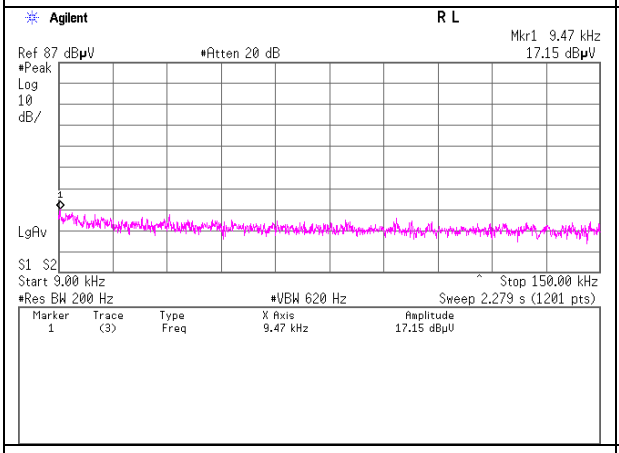

### 35GHz-40GHz



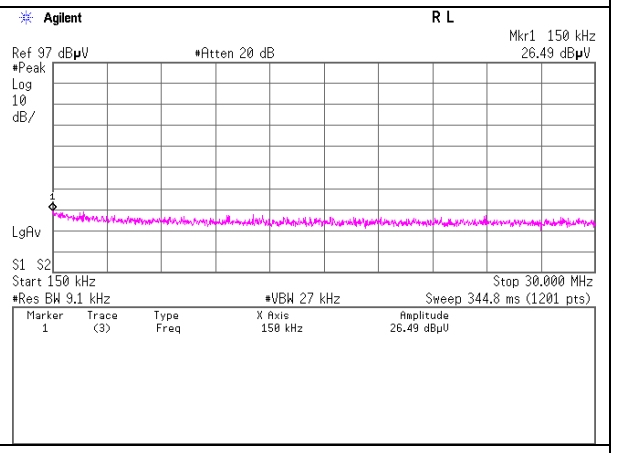
# Conducted Spurious Emission

## 11a Tx 5785MHz

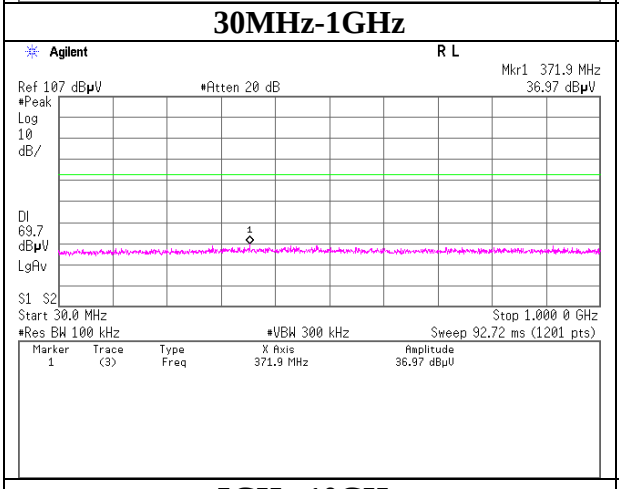
### 9kHz-150kHz



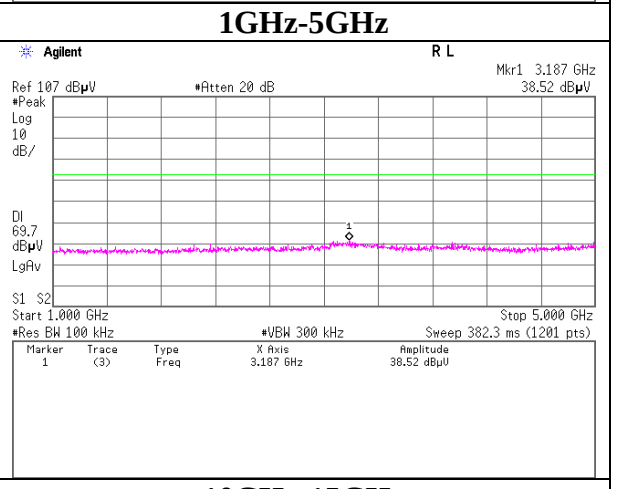

### 150kHz-30MHz



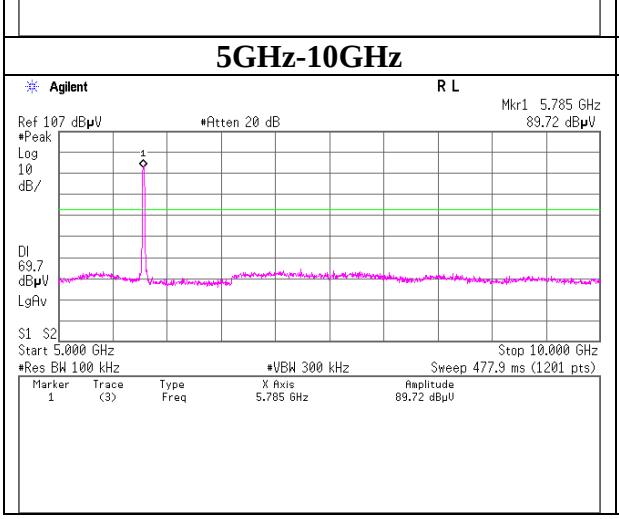

### 30MHz-1GHz



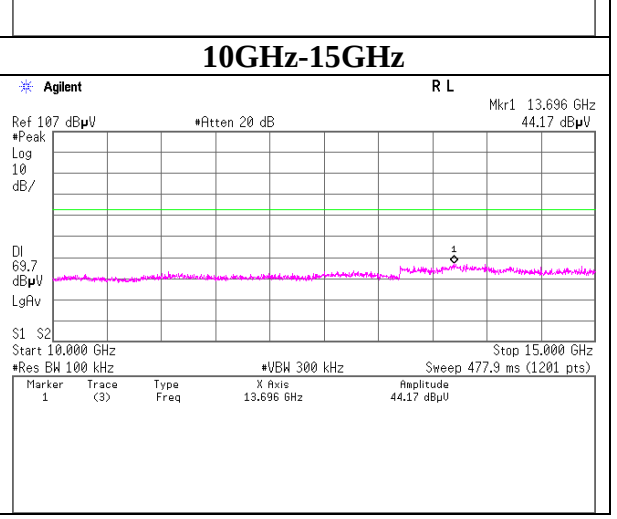

### 1GHz-5GHz




### 5GHz-10GHz




### 10GHz-15GHz

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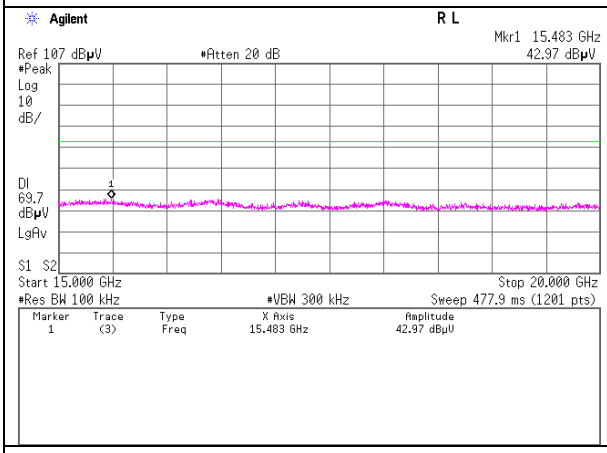
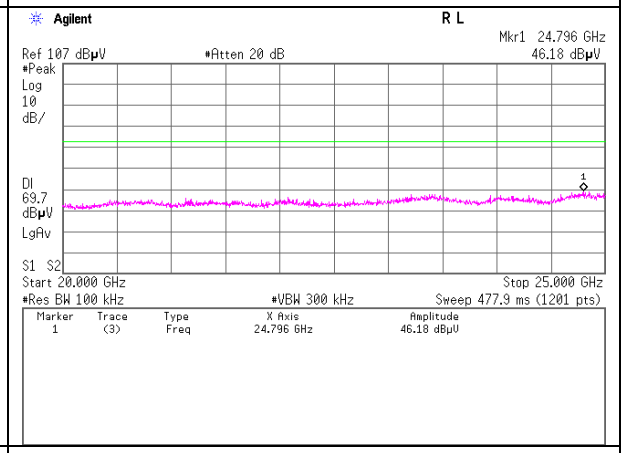
# Conducted Spurious Emission

## 11a Tx 5785MHz

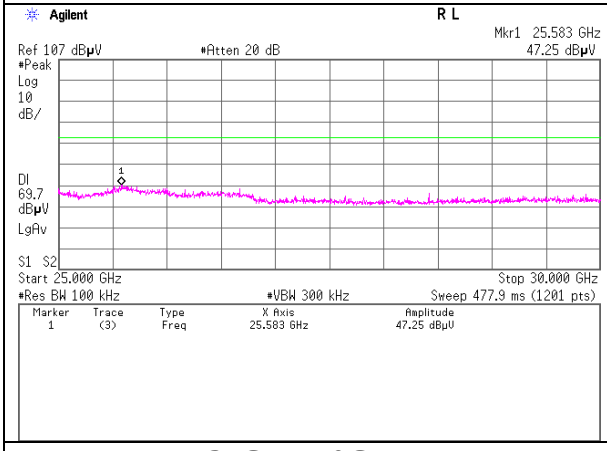
### 15GHz-20GHz



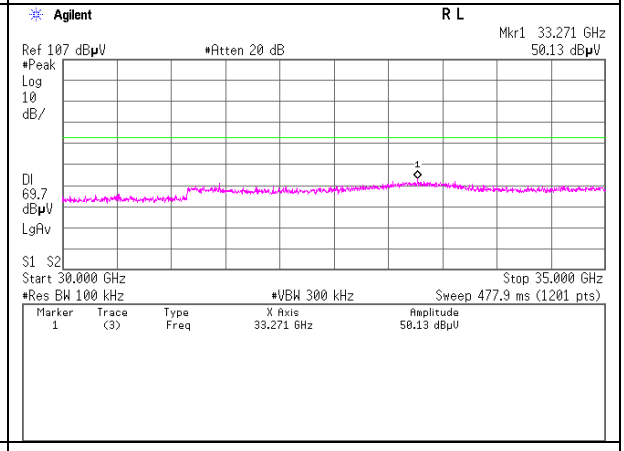

### 20GHz-25GHz



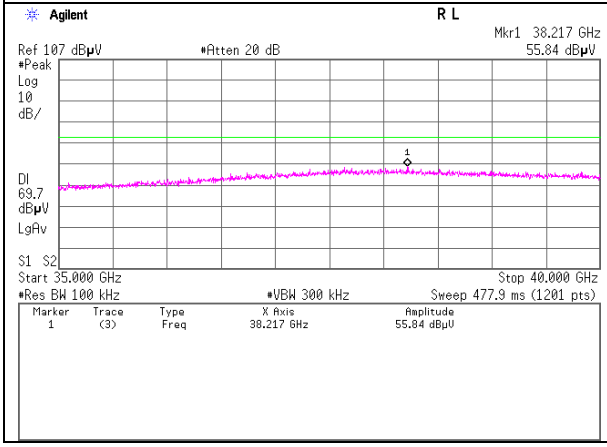

### 25GHz-30GHz




### 30GHz-35GHz



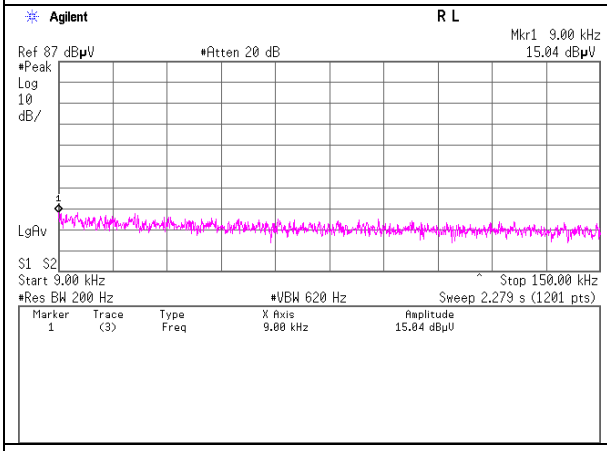

### 35GHz-40GHz



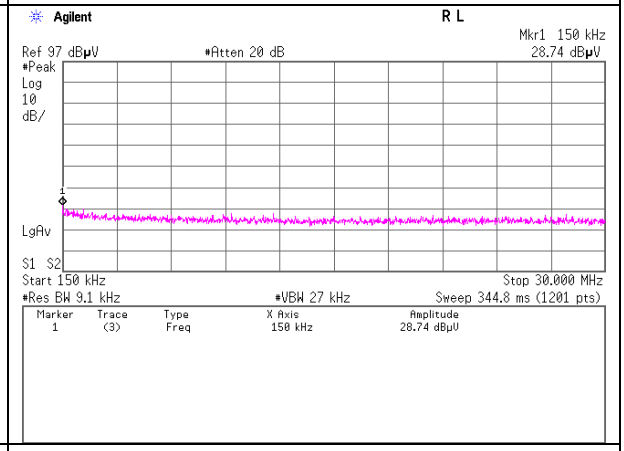
# Conducted Spurious Emission

## 11a Tx 5825MHz

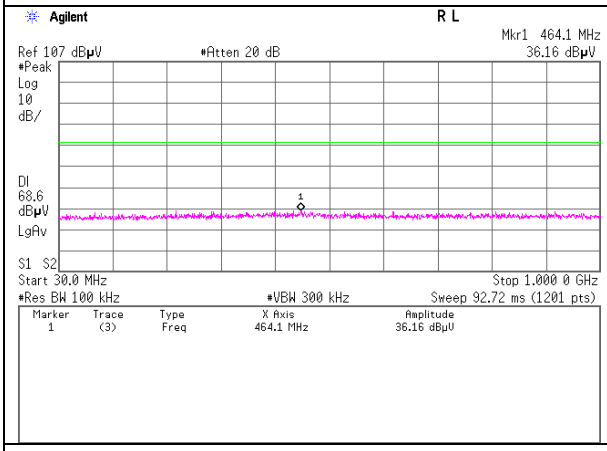
### 9kHz-150kHz



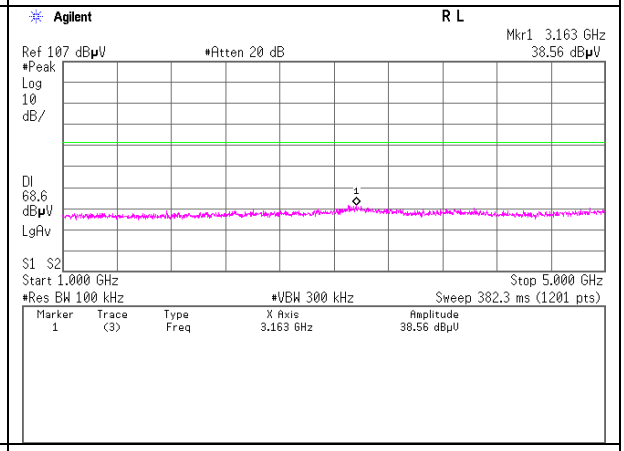

### 150kHz-30MHz



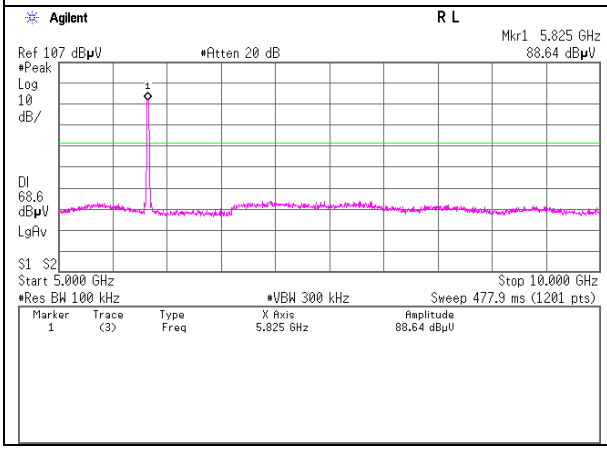

### 30MHz-1GHz



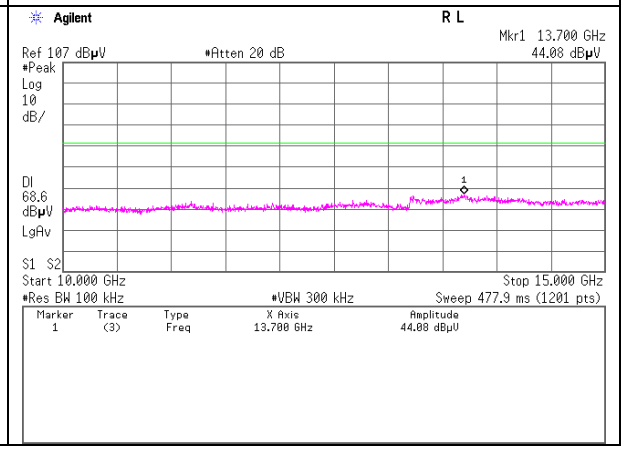

### 1GHz-5GHz




### 5GHz-10GHz



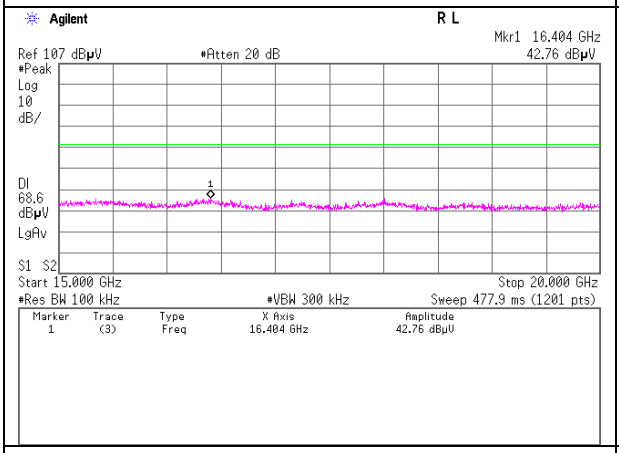

### 10GHz-15GHz



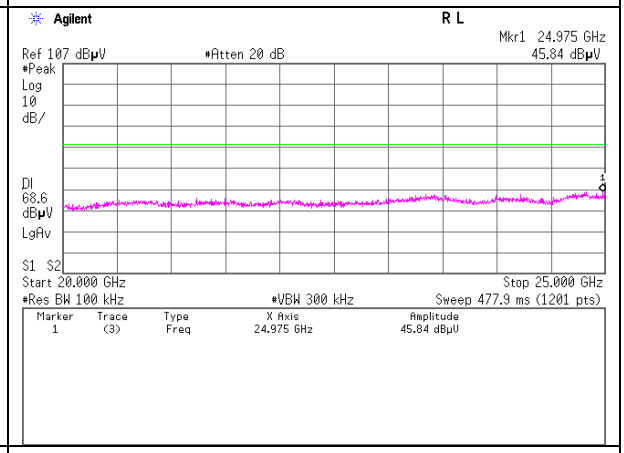
# Conducted Spurious Emission

## 11a Tx 5825MHz

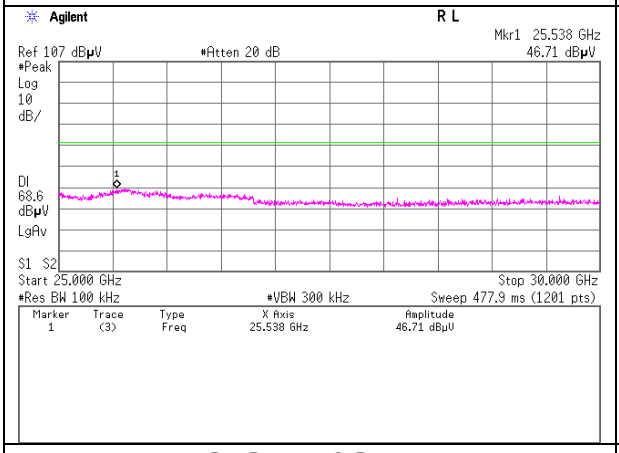
### 15GHz-20GHz



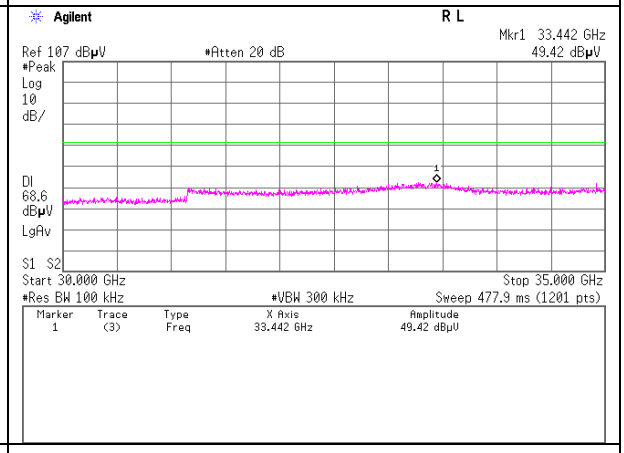

### 20GHz-25GHz



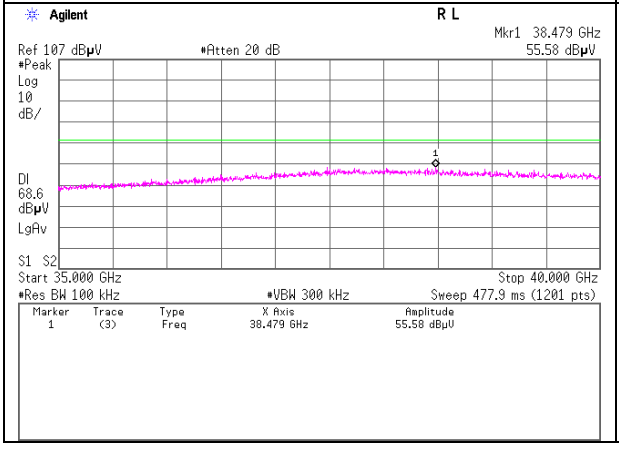

### 25GHz-30GHz




### 30GHz-35GHz



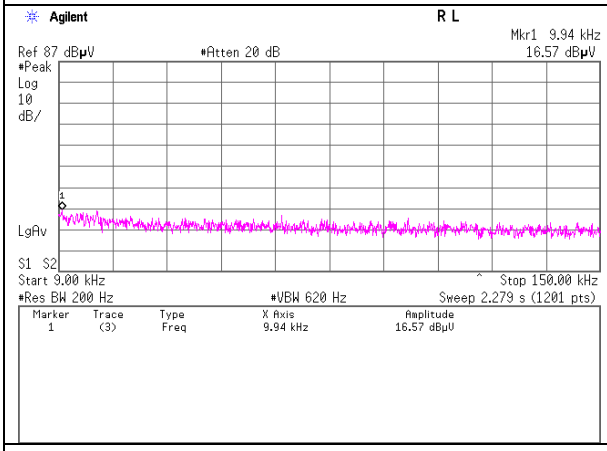

### 35GHz-40GHz



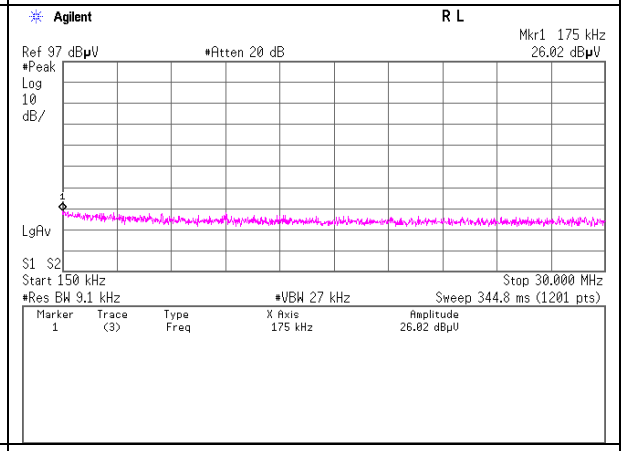
# Conducted Spurious Emission

## 11n-40(5GHz) Tx 5755MHz

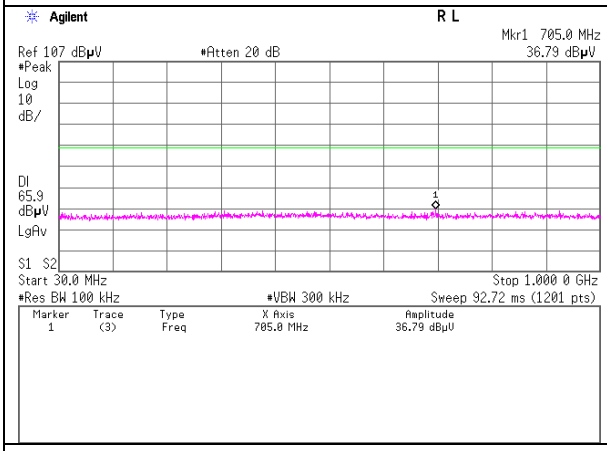
### 9kHz-150kHz



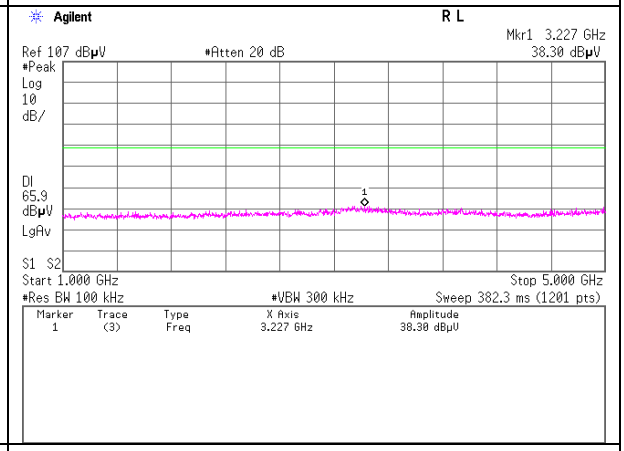

### 150kHz-30MHz



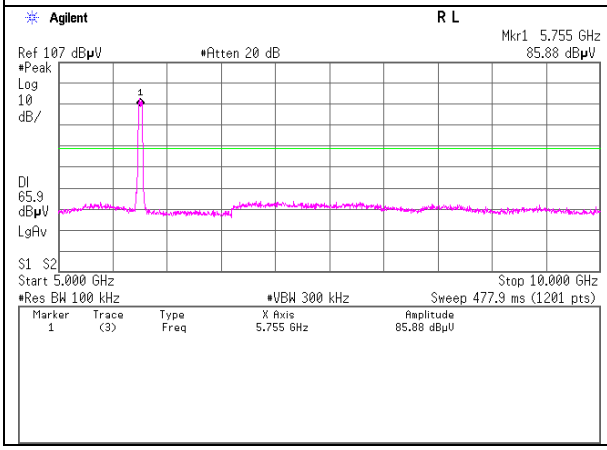

### 30MHz-1GHz



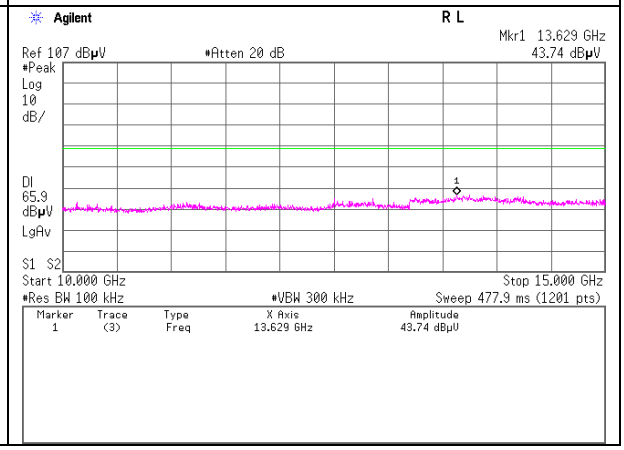

### 1GHz-5GHz




### 5GHz-10GHz



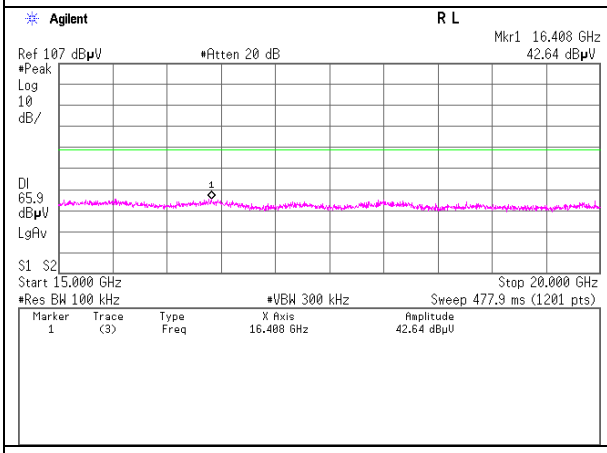

### 10GHz-15GHz



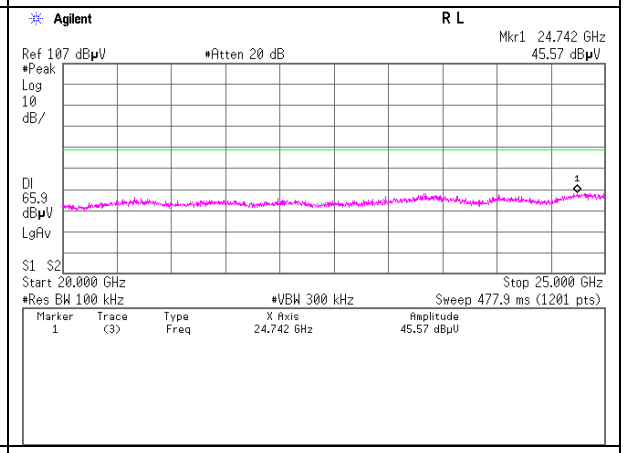
# Conducted Spurious Emission

## 11n-40(5GHz) Tx 5755MHz

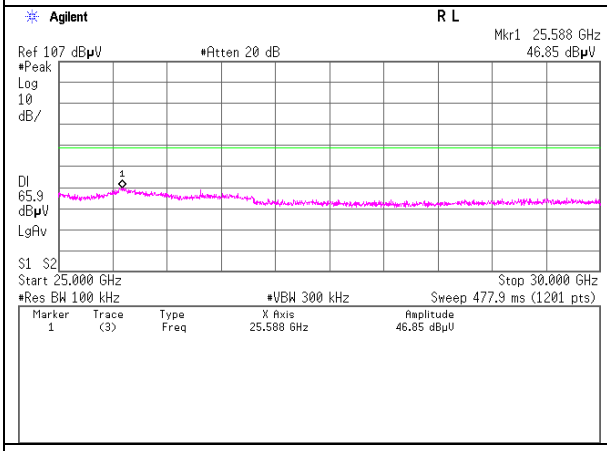
### 15GHz-20GHz



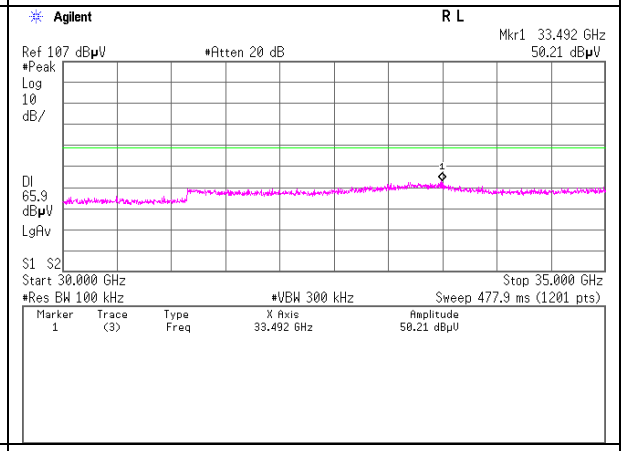

### 20GHz-25GHz



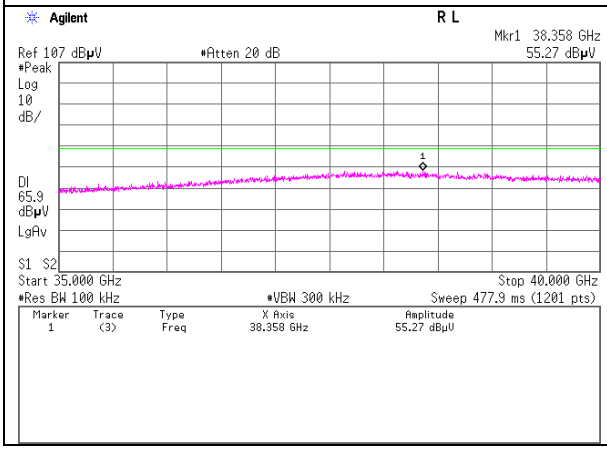

### 25GHz-30GHz




### 30GHz-35GHz




### 35GHz-40GHz





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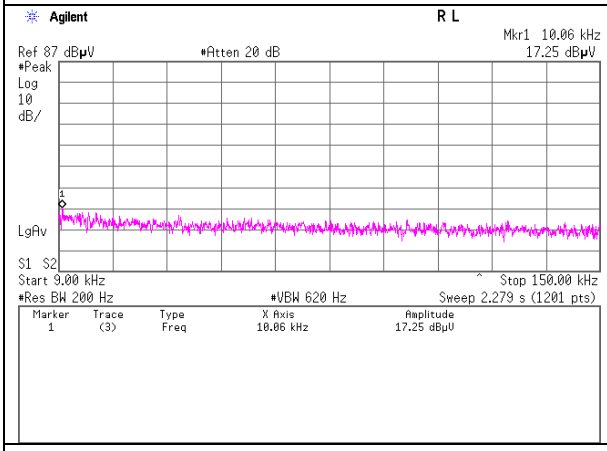
**Facsimile : +81 596 24 8124**

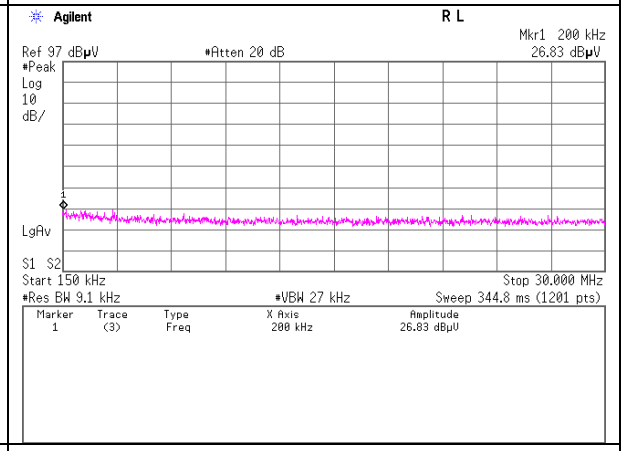
# Conducted Spurious Emission

## 11n-40(5GHz) Tx 5795MHz

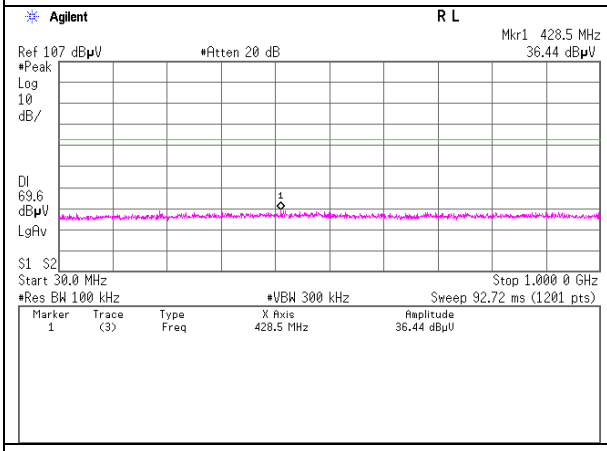
### 9kHz-150kHz



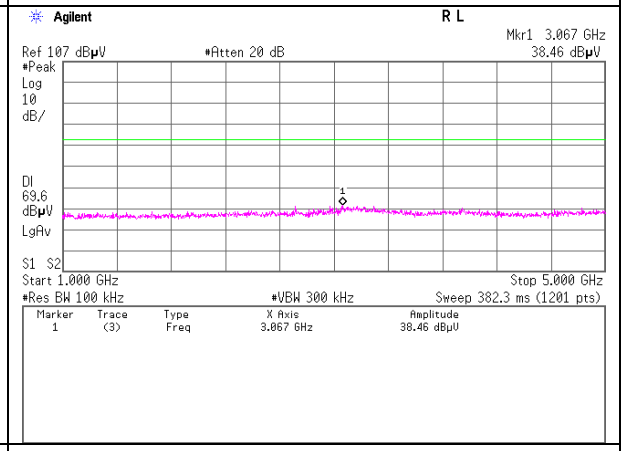

### 150kHz-30MHz



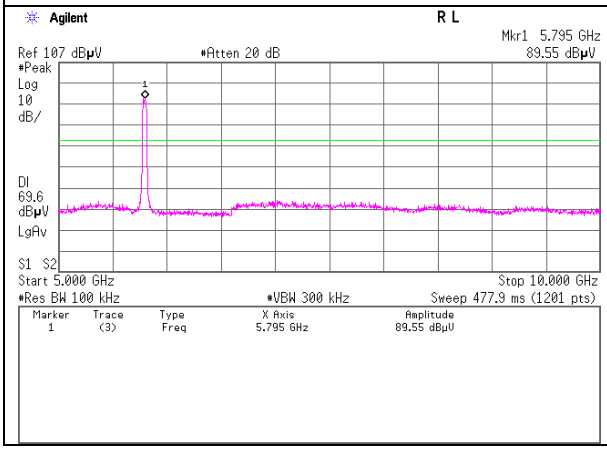

### 30MHz-1GHz



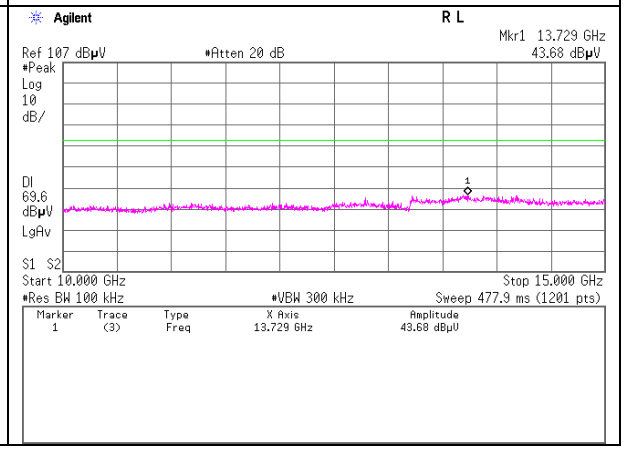

### 1GHz-5GHz




### 5GHz-10GHz



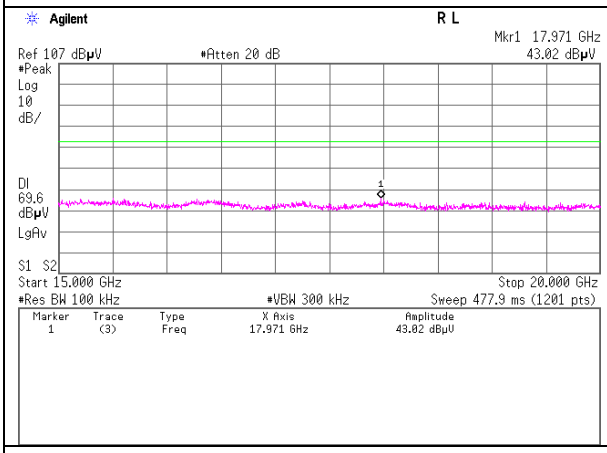

### 10GHz-15GHz



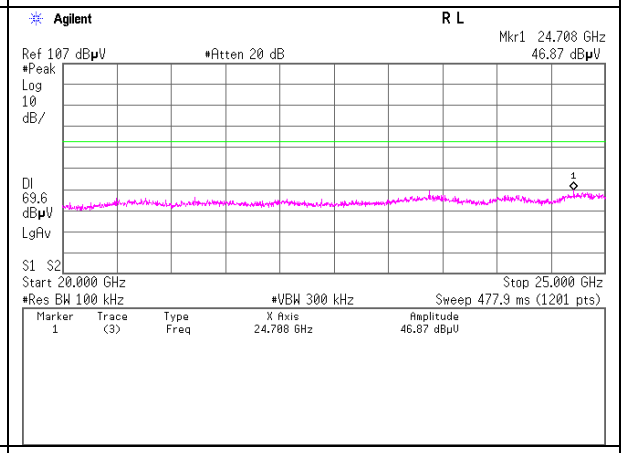
# Conducted Spurious Emission

## 11n-40(5GHz) Tx 5795MHz

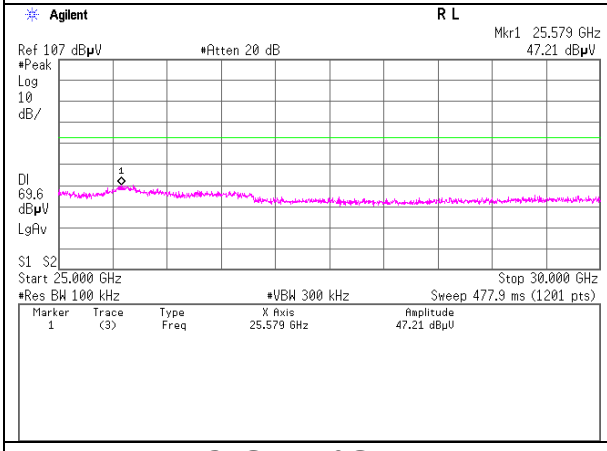
### 15GHz-20GHz



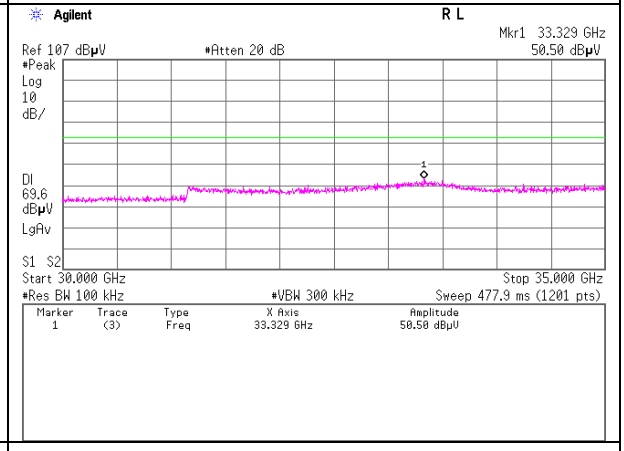

### 20GHz-25GHz



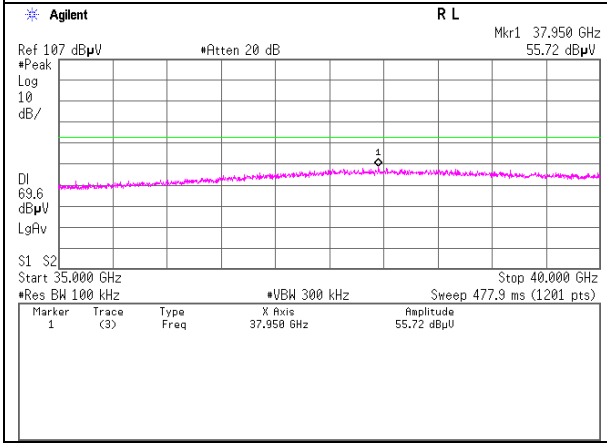

### 25GHz-30GHz




### 30GHz-35GHz



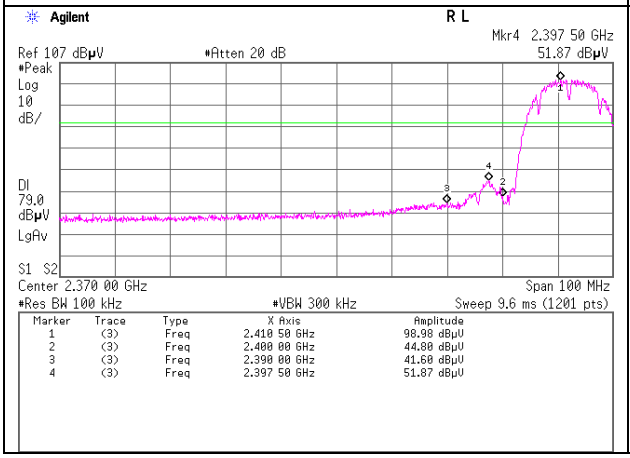

### 35GHz-40GHz



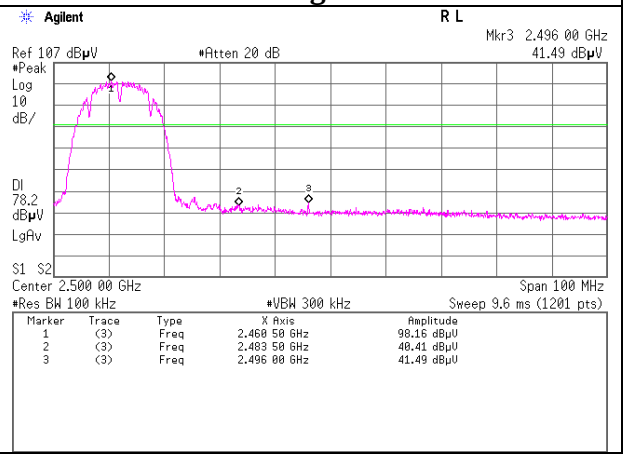
# Conducted Emission Band Edge compliance

## 11b Tx

### Low

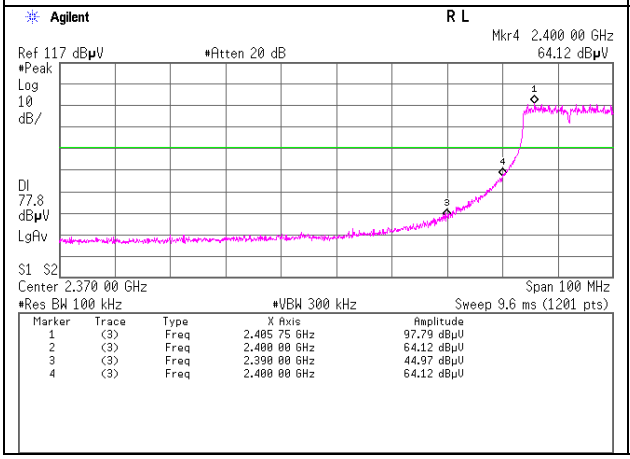



### High

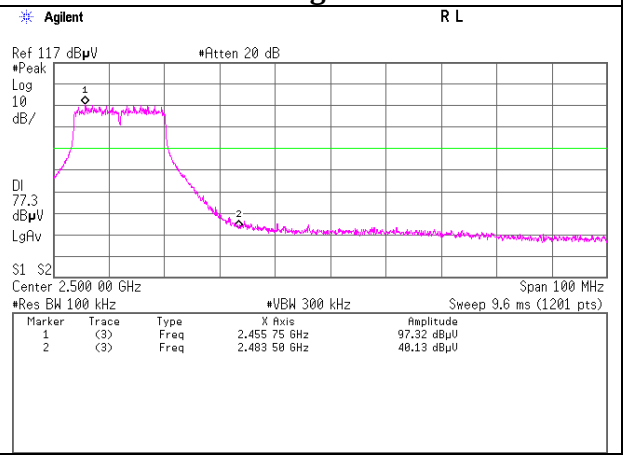



## 11g Tx

### Low

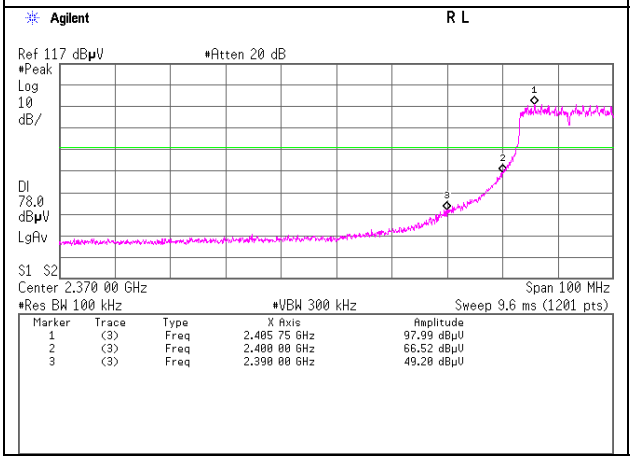



### High

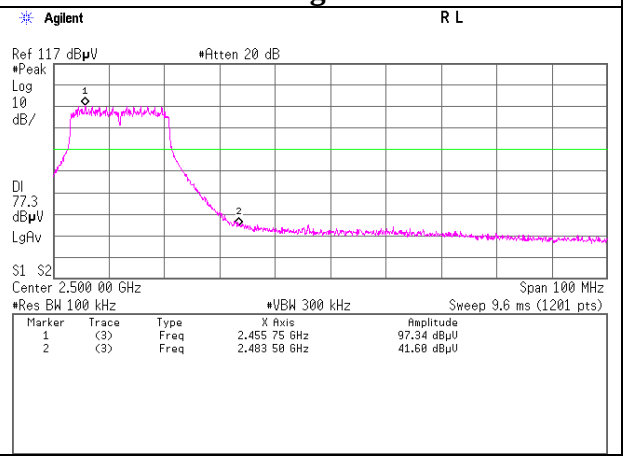



## 11n-20(2.4GHz) Tx

### Low



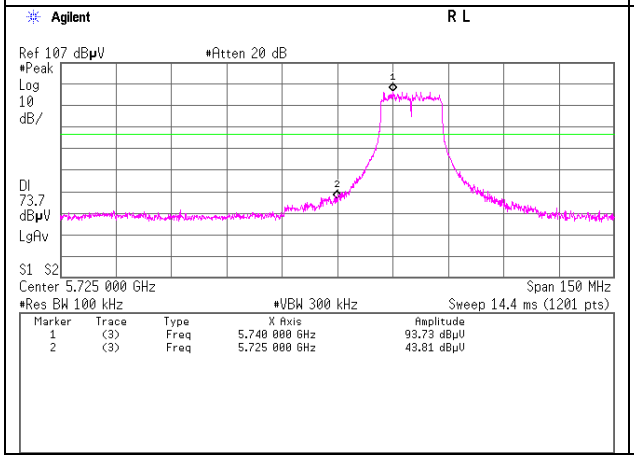

### High



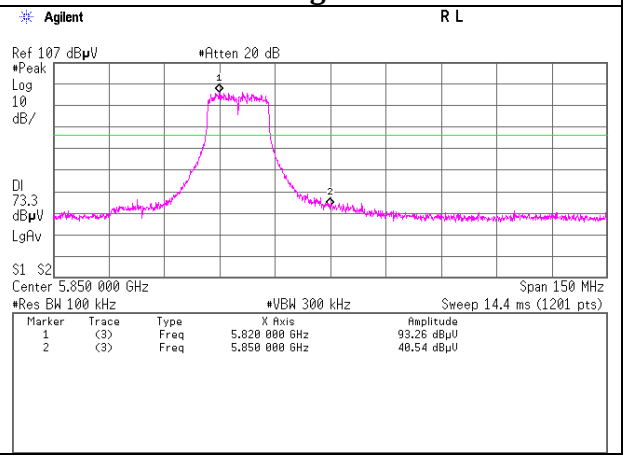
# Conducted Emission Band Edge compliance

## 11a Tx

### Low

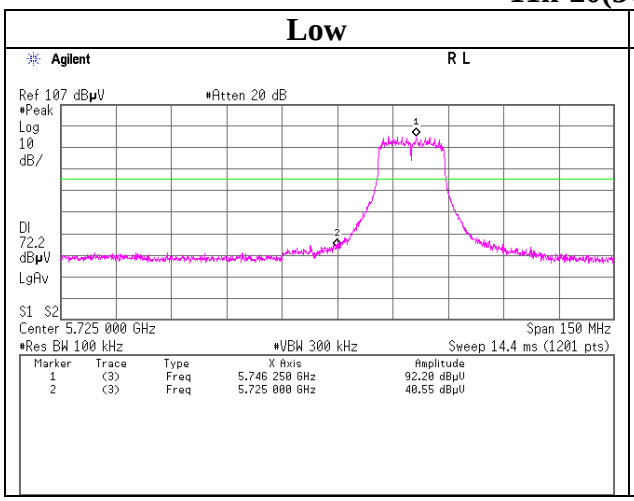



### High

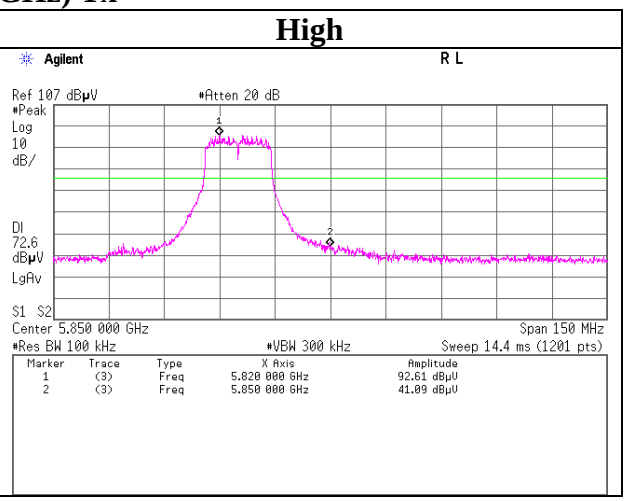



## 11n-20(5GHz) Tx

### Low

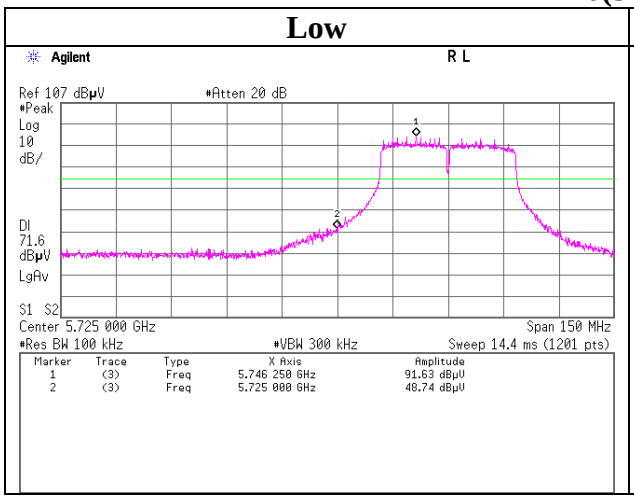



### High

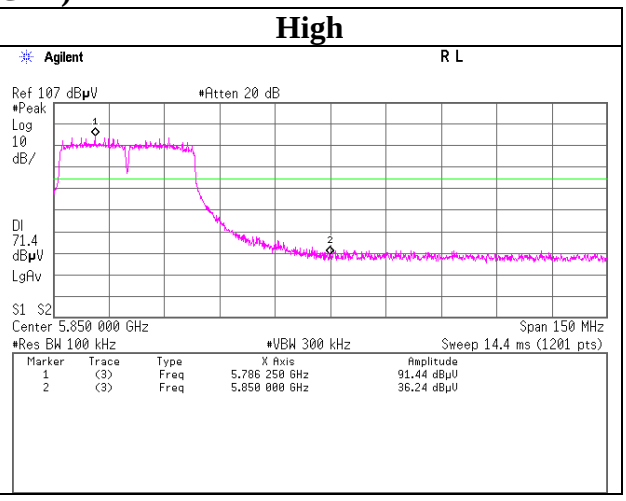



## 11n-40(5GHz) Tx

### Low




### High



# Power Density

| | |
|---|---|
| Test place | Head Office EMC Lab. No.11 Measurement Room |
| Report No. | 32BE0278-HO |
| Date | 09/30/2011 |
| Temperature/ Humidity | 24 deg.C/ 56% RH |
| Engineer | Satofumi Matsuyama |
| Mode | 11b Tx, 11g Tx |

11b

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result [dBm] | Limit [dBm] | Margin [dB] |
|---|---|---|---|---|---|---|
| 2412.00 | -13.28 | 0.50 | 10.01 | -2.77 | 8.00 | 10.77 |
| 2437.00 | -14.69 | 0.50 | 10.01 | -4.18 | 8.00 | 12.18 |
| 2462.00 | -14.09 | 0.50 | 10.01 | -3.58 | 8.00 | 11.58 |

11g

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result [dBm] | Limit [dBm] | Margin [dB] |
|---|---|---|---|---|---|---|
| 2412.00 | -13.00 | 0.50 | 10.01 | -2.49 | 8.00 | 10.49 |
| 2437.00 | -14.34 | 0.50 | 10.01 | -3.83 | 8.00 | 11.83 |
| 2462.00 | -13.48 | 0.50 | 10.01 | -2.97 | 8.00 | 10.97 |

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

# Power Density

| | |
|---|---|
| Test place | Head Office EMC Lab. No.7 shielded room |
| Report No. | 32BE0278-HO |
| Date | 10/03/2011 |
| Temperature/ Humidity | 23 deg.C / 45% RH |
| Engineer | Katsunori Okai |
| Mode | 11a Tx, 11n-40(5GHz) Tx |

11a

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result [dBm] | Limit [dBm] | Margin [dB] |
|---|---|---|---|---|---|---|
| 5745.00 | -17.33 | 1.55 | 10.07 | -5.71 | 8.00 | 13.71 |
| 5785.00 | -16.78 | 1.56 | 10.07 | -5.15 | 8.00 | 13.15 |
| 5825.00 | -17.38 | 1.56 | 10.07 | -5.75 | 8.00 | 13.75 |

11n-40(5GHz)

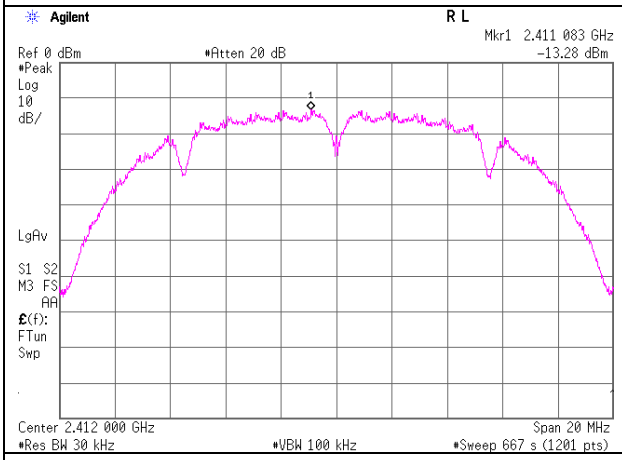
| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result [dBm] | Limit [dBm] | Margin [dB] |
|---|---|---|---|---|---|---|
| 5755.00 | -20.25 | 1.56 | 10.07 | -8.62 | 8.00 | 16.62 |
| 5795.00 | -20.18 | 1.56 | 10.07 | -8.55 | 8.00 | 16.55 |

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

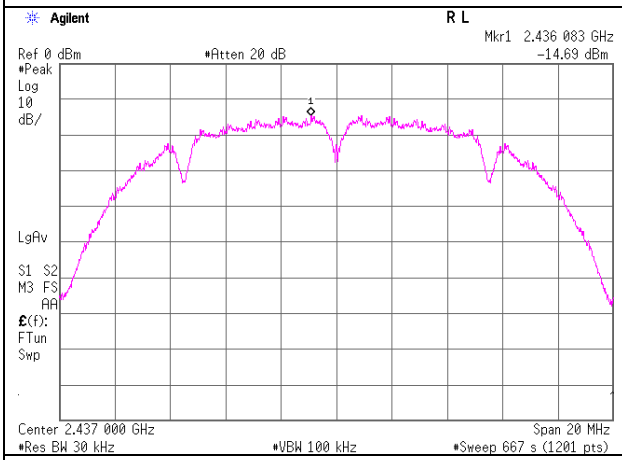
# Power Density

## 11b

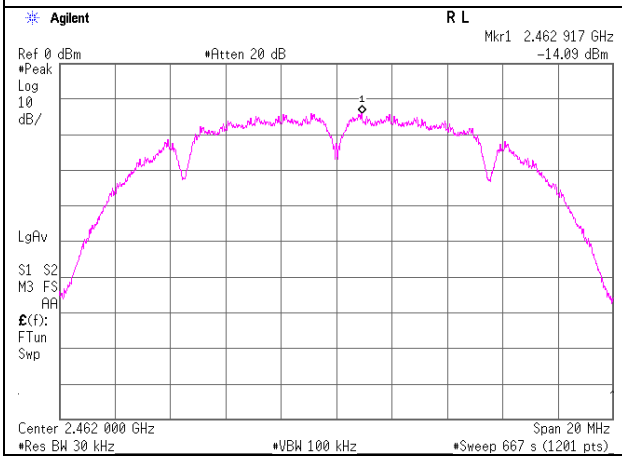
### 2412MHz




### 2437MHz

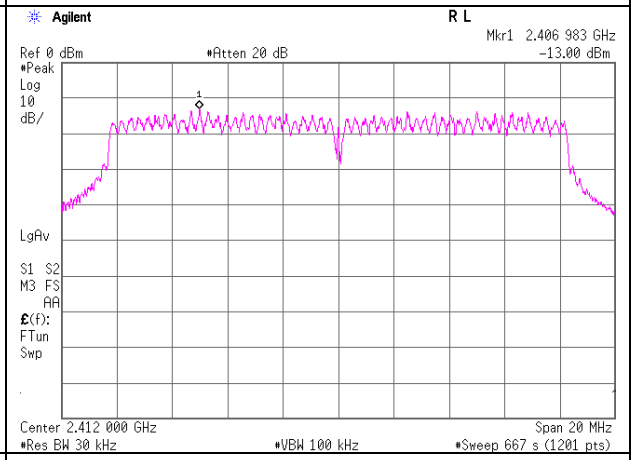



### 2462MHz

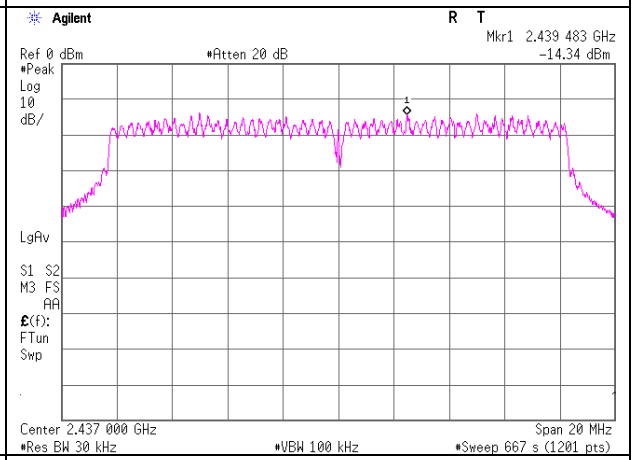



## 11g

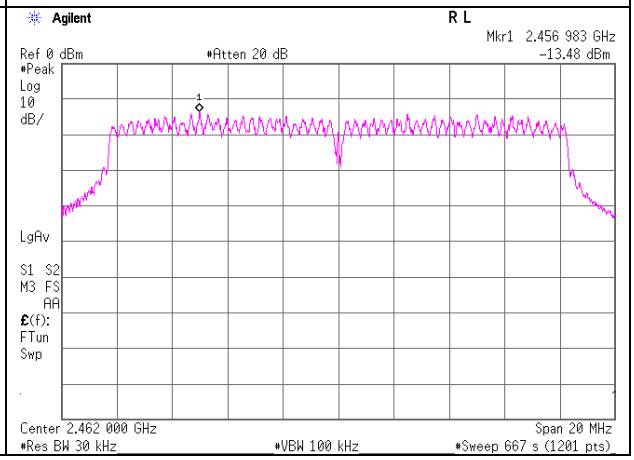
### 2412MHz




### 2437MHz



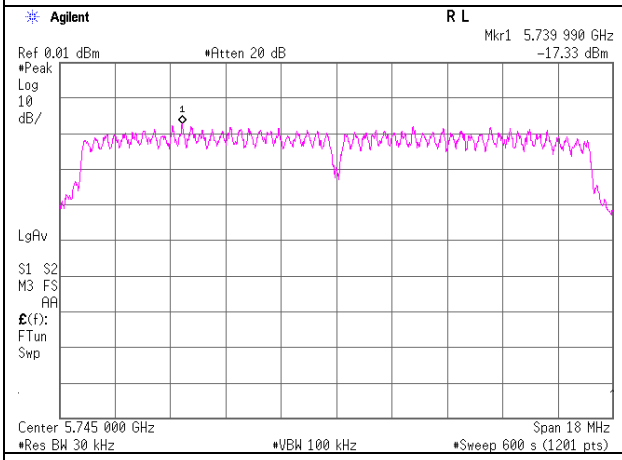

### 2462MHz



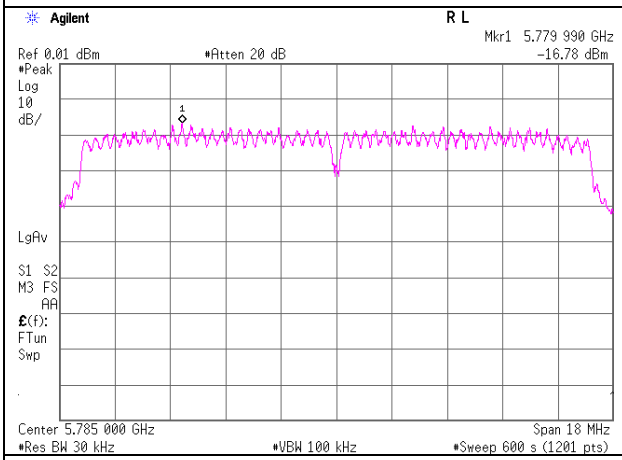
# Power Density

## 11a

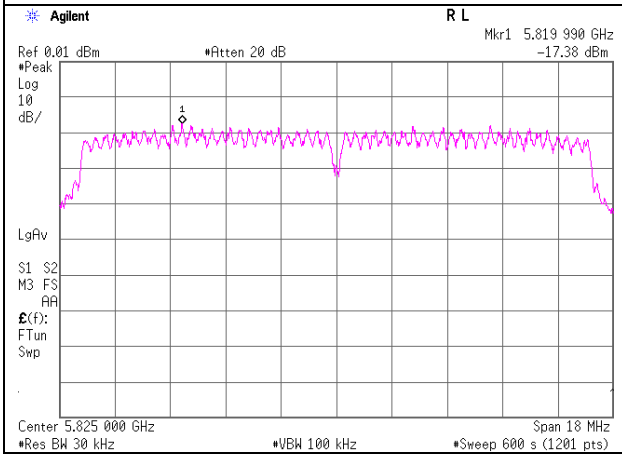
### 5745MHz




### 5785MHz

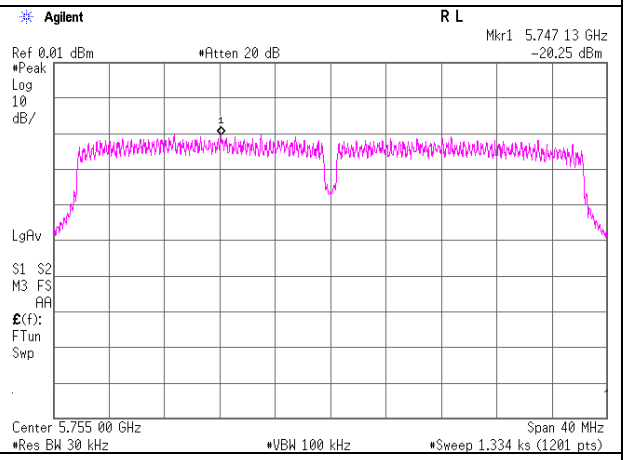



### 5825MHz

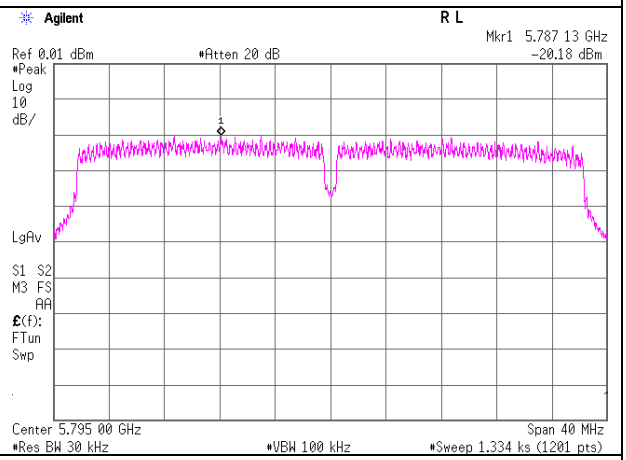



## 11n-40(5GHz)

### 5755MHz




### 5795MHz





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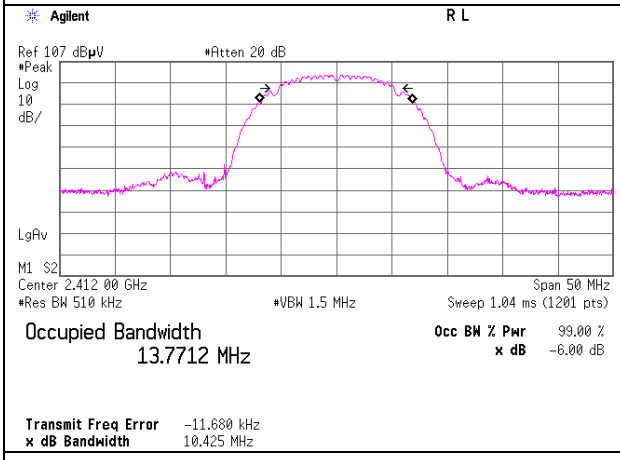
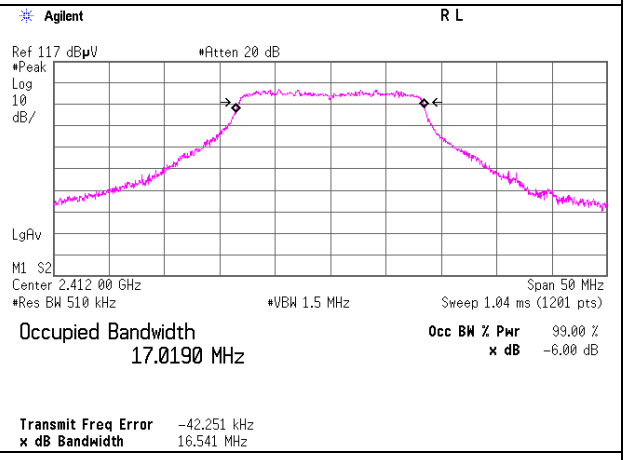
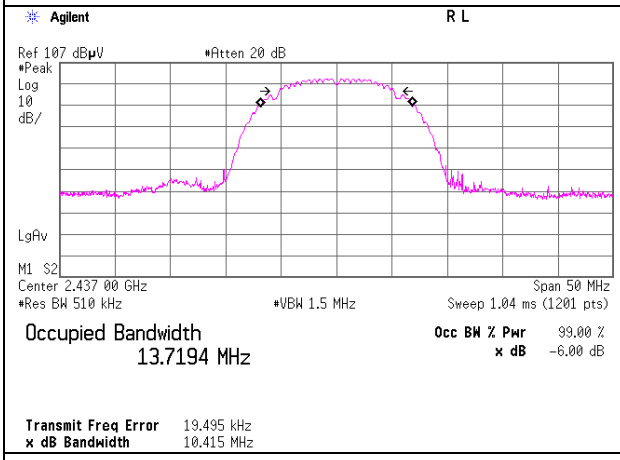
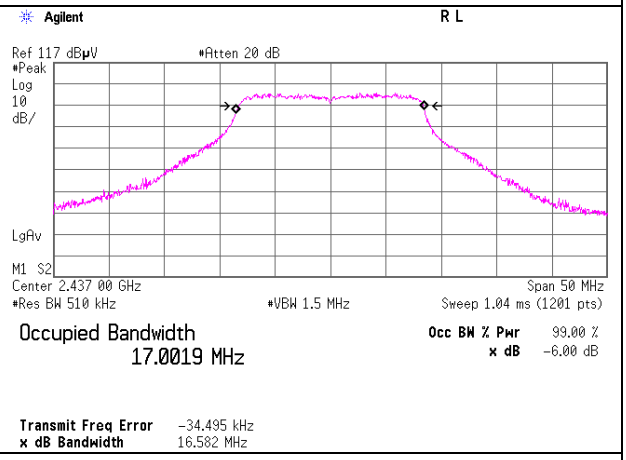
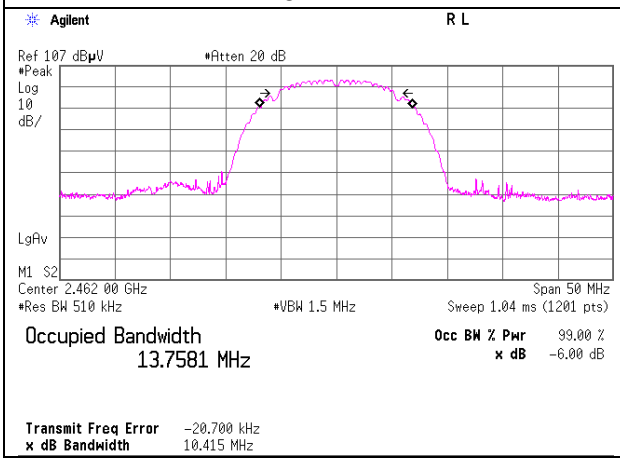
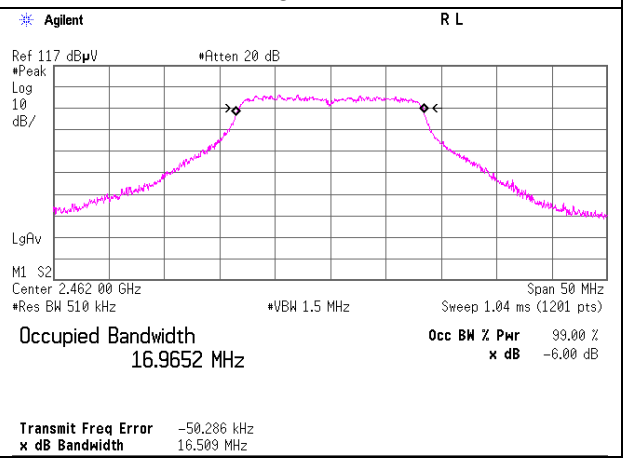
**Telephone : +81 596 24 8116**
**Facsimile : +81 596 24 8124**

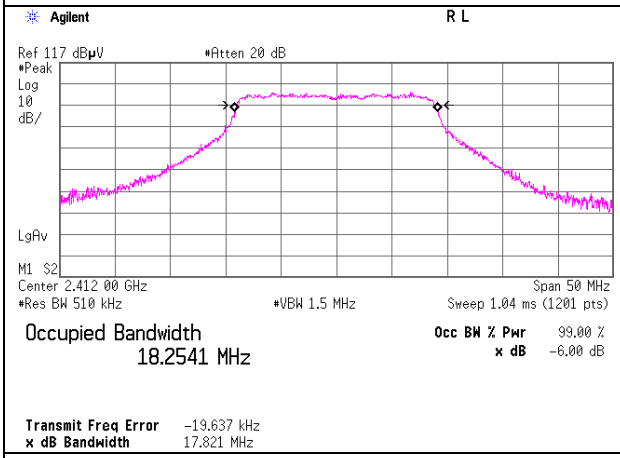
# 99%Occupied Bandwidth

| 11b | 11g |
|---|---|
| **2412MHz** | **2412MHz** |
|  |  |
| **2437MHz** | **2437MHz** |
|  |  |
| **2462MHz** | **2462MHz** |
|  |  |

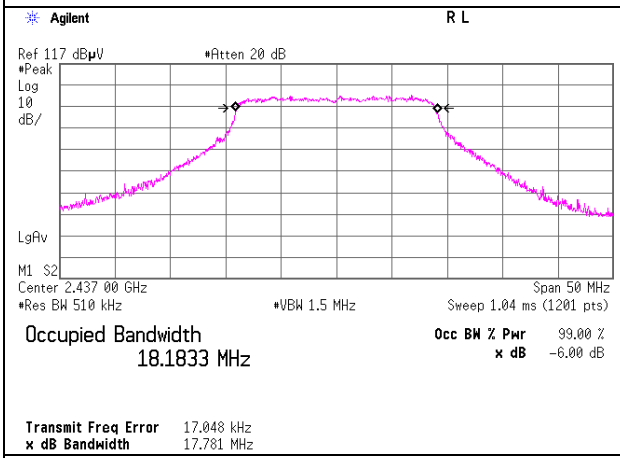
# 99% Occupied Bandwidth

## 11n-20(2.4GHz)

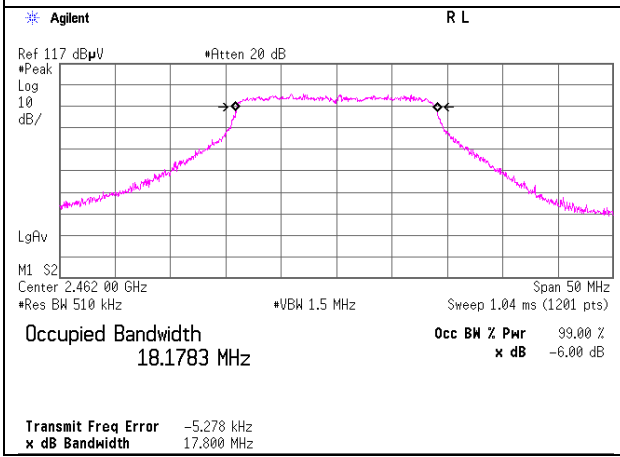
### 2412MHz




### 2437MHz

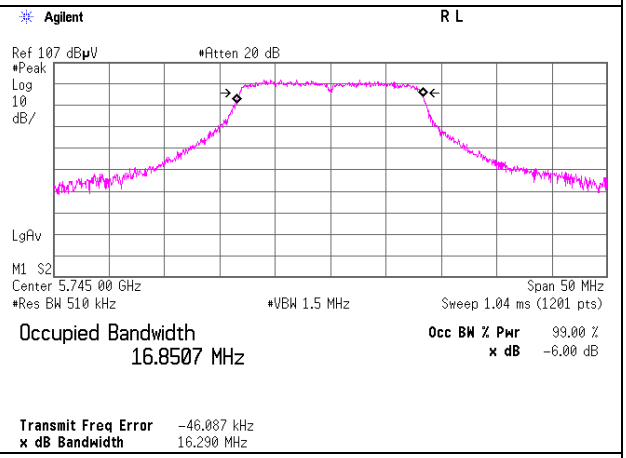



### 2462MHz

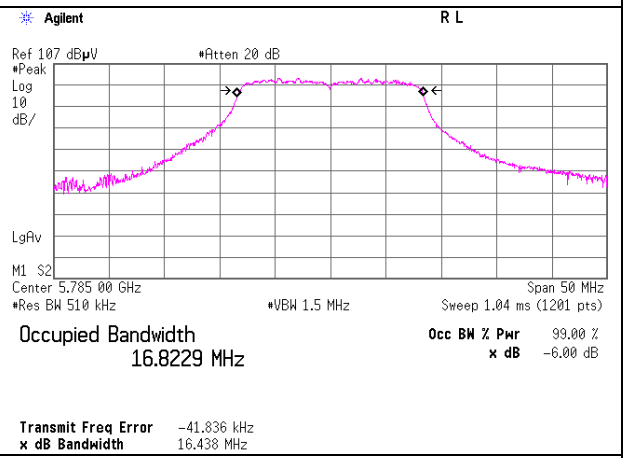



## 11a

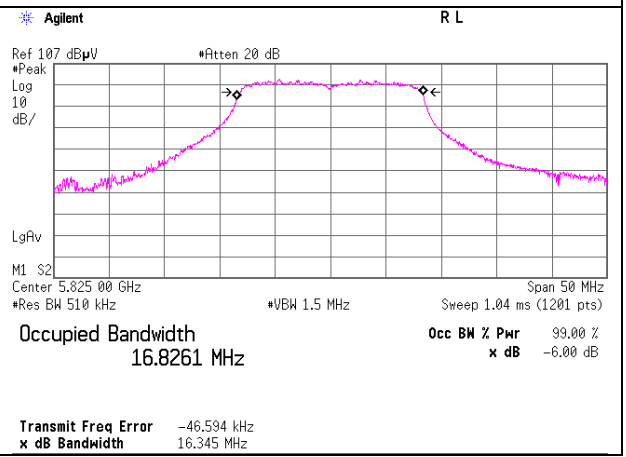
### 5745MHz




### 5785MHz



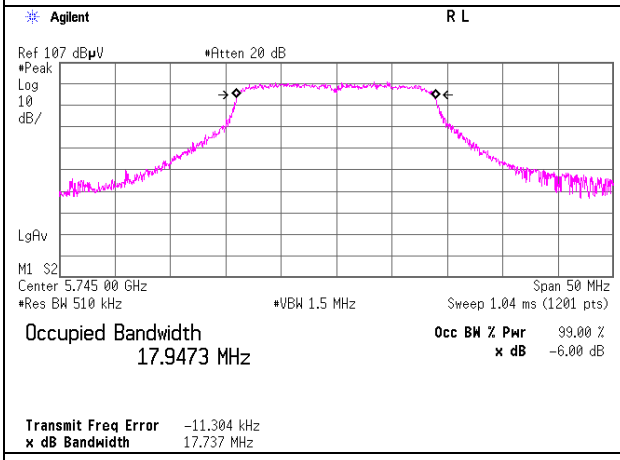

### 5825MHz



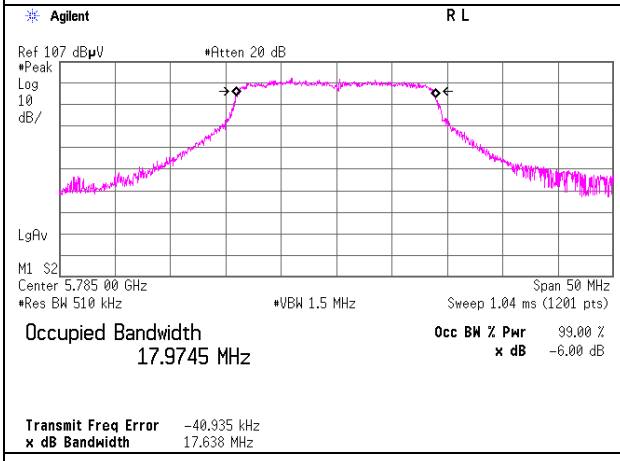
# 99% Occupied Bandwidth

## 11n-20(5GHz)

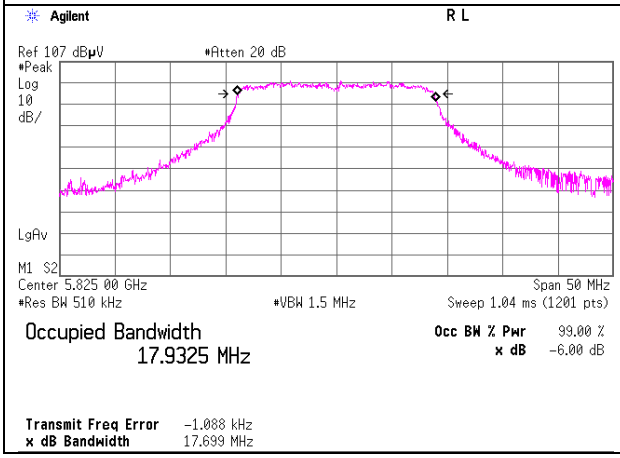
### 5745MHz




### 5785MHz

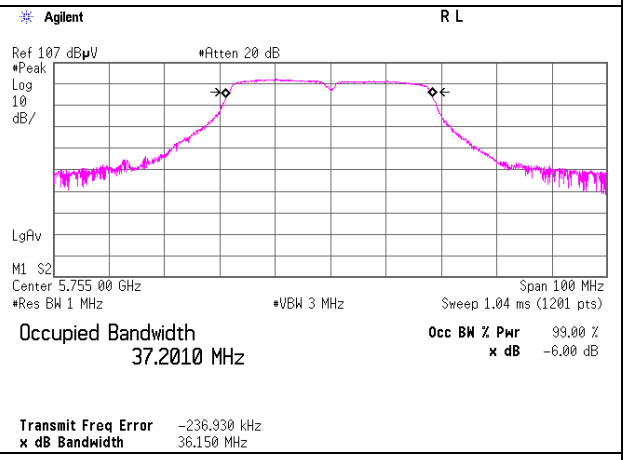



### 5825MHz

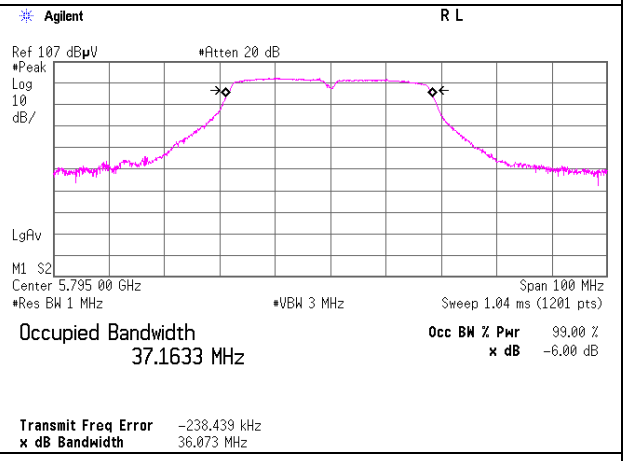



## 11n-40(5GHz)

### 5755MHz




### 5795MHz





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# APPENDIX 2: Test instruments

**EMI test equipment (1/2)**

| Control No. | Instrument | Manufacturer | Model No | Serial No | Test Item | Calibration Date * Interval(month) |
|---|---|---|---|---|---|---|
| MOS-19 | Thermo-Hygrometer | Custom | CTH-201 | 0001 | AT | 2010/12/13 * 12 |
| MPSE-11 | Power sensor | Anritsu | MA2411B | 011737 | AT | 2011/09/13 * 12 |
| MPM-08 | Power Meter | Anritsu | ML2495A | 6K00003338 | AT | 2011/09/13 * 12 |
| MAT-25 | Attenuator(10dB)(above 1GHz) | Agilent | 8493C | 71642 | AT | 2011/06/23 * 12 |
| MAEC-01 | Semi Anechoic Chamber(NSA) | TDK | Semi Anechoic Chamber 10m | DA-06881 | RE | 2011/07/10 * 12 |
| MOS-01 | Digital Humidity Indicator | N.T | NT-1800 | MOS01 | RE | 2011/02/23 * 12 |
| MJM-01 | Measure | KDS | ES19-55 | - | RE | - |
| COTS-MEMI | EMI measurement program | TSJ | TEPTO-DV | - | RE/CE | - |
| MSA-10 | Spectrum Analyzer | Agilent | E4448A | MY46180655 | RE/AT | 2011/02/15 * 12 |
| MHA-05 | Horn Antenna 1-18GHz | Schwarzbeck | BBHA9120D | 253 | RE | 2011/06/19 * 12 |
| MCC-134 | Microwave Cable | HUBER+SUHNER | SUCOFLEX104 | 336167/4(1m) / 340641(5m) | RE | 2011/09/07 * 12 |
| MPA-01 | Pre Amplifier | Agilent | 8449B | 3008A01671 | RE | 2011/02/24 * 12 |
| MCC-77 | Microwave Cable 1G-26.5GHz | Suhner | SUCOFLEX104 | 278942/4 | RE | 2010/12/02 * 12 |
| MHF-17 | High Pass Filter 3.5-18.0GHz | TOKIMEC | TF323DCA | 7001 | RE | 2011/09/08 * 12 |
| MHF-21 | High Pass Filter 7-20GHz | TOKIMEC | TF37NCCA | 601 | RE | 2011/01/06 * 12 |
| MAEC-02 | Semi Anechoic Chamber(NSA) | TDK | Semi Anechoic Chamber 3m | DA-06902 | RE/CE | 2011/06/21 * 12 |
| MOS-22 | Thermo-Hygrometer | Custom | CTH-201 | 0003 | RE/CE | 2011/02/23 * 12 |
| MJM-14 | Measure | KOMELON | KMC-36 | - | RE/CE | - |
| MHA-16 | Horn Antenna 15-40GHz | Schwarzbeck | BBHA9170 | BBHA9170306 | RE | 2011/05/23 * 12 |
| MCC-54 | Microwave Cable | Suhner | SUCOFLEX101 | 2873(1m) / 2876(5m) | RE | 2011/03/02 * 12 |
| MPA-03 | Microwave System Power Amplifier | Agilent | 83050A | 3950M00205 | RE | 2011/06/15 * 12 |
| MTR-03 | Test Receiver | Rohde & Schwarz | ESCI | 100300 | RE | 2011/04/15 * 12 |
| MBA-05 | Biconical Antenna | Schwarzbeck | BBA9106 | 1302 | RE | 2011/08/17 * 12 |
| MLA-08 | Logperiodic Antenna | Schwarzbeck | UKLP9140-A | N/A | RE | 2011/08/17 * 12 |
| MCC-12 | Coaxial Cable | Fujikura/Agilent | - | - | RE | 2011/02/18 * 12 |
| MAT-07 | Attenuator(6dB) | Weinschel Corp | 2 | BK7970 | RE | 2010/11/05 * 12 |
| MPA-09 | Pre Amplifier | Agilent | 8447D | 2944A10845 | RE | 2011/09/26 * 12 |

**EMI test equipment (2/2)**

| Control No. | Instrument | Manufacturer | Model No | Serial No | Test Item | Calibration Date * Interval(month) |
|---|---|---|---|---|---|---|
| MSA-05 | Spectrum Analyzer | Advantest | R3273 | 160400285 | CE | 2010/11/18 * 12 |
| MTR-03 | Test Receiver | Rohde & Schwarz | ESCI | 100300 | CE | 2011/04/15 * 12 |
| MLS-06 | LISN(AMN) | Schwarzbeck | NSLK8127 | 8127363 | CE(EUT) | 2011/02/20 * 12 |
| MTA-31 | Terminator | TME | CT-01 | - | CE | 2011/01/05 * 12 |
| MCC-13 | Coaxial Cable | Fujikura | 3D-2W(12m)/5D-2W(5m)/5D-2W(0.8m)/5D-2W(1m) | - | CE | 2011/02/18 * 12 |
| MAT-65 | Attenuator(13dB) | JFW Industries, Inc. | 50FP-013H2 N | - | CE | 2011/02/21 * 12 |

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

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

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