

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

0F

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT AND INDUSTRY CANADA RSS 210

| Product Name: | PeopleNet Connected Tablet | |
|--------------------------|---|--|
| Brand Name: | PeopleNet | |
| Model No.: | MS5 | |
| Model Difference: | N/A | |
| FCC ID: | NKS-MS5 | |
| Report No.: | E2/2015/10033 | |
| Issue Date: | Mar. 11, 2015 | |
| FCC Rule Part: | §15.247, Cat: DSS | |
| Prepared for: | PEOPLENET 4400 Baker Road, Minnetonka, MN 55343, USA | |
| Prepared by: | SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333 | |
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VERIFICATION OF COMPLIANCE

| Applicant: | PEOPLENET 4400 Baker Road, Minnetonka, MN 55343, USA |
|--|---|
| Product Name: | PeopleNet Connected Tablet |
| Brand Name: | PeopleNet |
| Model No.: | MS5 |
| Model Difference: | N/A |
| FCC ID: | NKS-MS5 |
| File Number: | E2/2015/10033 |
| Date of test: Date of EUT Received: | Jan. 30, 2015 ~ Mar. 11, 2015 Jan. 30, 2015 |

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4:2014 the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247.

The test results of this report relate only to the tested sample identified in this report.

| Test By: | Marcus Tseng | Date: | Mar. 11, 2015 | |
|-------------------|---|-------|---------------|---|
| - Prepared By: | Marcus Tseng / Engineer Allon Tsai | Date: | Mar. 11, 2015 | _ |
| Approved By: | Allen Tsai /Engineer Jim Chang Jim Chang / Supervisor | Date: | Mar. 11, 2015 | _ |

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Version

| Version No. | Date | Description |
|-------------|---------------|------------------------------|
| 00 | Mar. 11, 2015 | Initial creation of document |
| | | |



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GENERAL INFORMATION 1.

1.1. Product description

General:

| Product Name: | PeopleNet Connected Tablet | | | |
|------------------------|---|-------------------------------------|--|--|
| Brand Name: | PeopleNet | PeopleNet | | |
| Model No.: | MS5 | | | |
| Model Difference: | N/A | | | |
| Hardware Version: | N/A | | | |
| Software Version: | N/A | | | |
| Tablet Docking Station | Model No.: MS-57602, Supplier: MSI | | | |
| Power Cable | P/N: L016-0576, Supplier: ELECTRI-CORD MFG.CO. | | | |
| Power Supply: | 7.4Vdc from LITHIUM-ION rechargeable battery or 12/24Vdc from DC Car battery | | | |
| | Battery: | Model No.: MS5760 , Supplier: Getac | | |

Bluetooth:

| Bluetooth Version: | Bluetooth V4.0 (dual mode) + HS |
|-----------------------------|---------------------------------|
| Channel number: 79 channels | |
| Modulation type: | GFSK +π/4DQPSK+8DPSK |
| Transmit Power: | 2 dBm (Peak) |
| Frequency Range: | 2.402GHz – 2.480GHz |
| Dwell Time: | <= 0.4s |
| Antenna Designation: | PIFA Antenna, Gain: 0.76dBi |

The report applied for Bluetooth BR+EDR.

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1.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: <u>NKS-MS5</u> filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules. The composite system (digital device) is compliance with FCC part 15; Subpart B is authorized under a Doc procedure.

1.3. Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4:2014 and ANSI C63.10:2013. Radiated testing was performed at an antenna to EUT distance 3 meters. Tested in accordance with FCC Public Notice DA 00-705 – Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems

1.4. Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan, which is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2014 & ANSI C63.10:2013. FCC Registration Numbers are: 628985, Canada Registration Number: 4620A-4.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Township, Taoyuan County, Taiwan, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 455997.

1.5. Special Accessories

There is no special accessory used while test was conducted.

1.6. Equipment Modifications

There was no modification incorporated into the EUT.

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SYSTEM TEST CONFIGURATION 2.

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3. Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the general criterion in Section 7.1 of ANSI C63.4:2014 & 6.2 ANSI C63.10:2013.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz, and the measurement procedure 7.3 in ANSI C63.4:2014 & 6.2.2, and 6.2.3 in ANSI C63.10:2013 is followed to carry out the test. The CISPR Quasi-Peak and Average detector mode is employed according to §15.107

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 8 and 13 and of ANSI C63.4:2014, & Section 6.3, 6.4, 6.5, and 6.6 of ANSI C63.10:2013.

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2.4. Configuration of Tested System

Fig. 2-1 Radiated & Conducted Emission

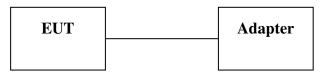


Fig. 2-2 Conducted (Antenna Port)

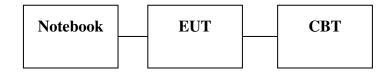


Table 2-1 Equipment Used in Tested System

| Item | Equipment Mfr/Brand | | Model/ | Series No. | Data Cable | |
|------|-------------------------|-------------|----------|------------|------------|------------|
| item | | Will/Druike | Type No. | Series 100 | Duta Cubic | Power Cord |
| 1 | Bluetooth Test Software | Tera Term | N/A | N/A | N/A | N/A |
| 2. | Bluetooth Test Set | R&S | CBT | 101140 | N/A | unshielded |
| 3. | Notebook | Lenovo | L430 | R9-YYG88 | N/A | Unshielded |

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3. SUMMARY OF TEST RESULTS

| FCC/IC Rules | Description Of Test | Result |
|--------------------------------|--|-----------|
| §15.207(a) | AC Power Line Conducted Emission | Compliant |
| §15.247(b)(1) | Peak Output Power | Compliant |
| §15.247(a)(1) | 20dB Bandwidth | Compliant |
| §15.247(d) | 100 kHz Bandwidth Of Frequency Band Edges | Compliant |
| \$15.247(d) \$15.209(a) (f) | Spurious Emission | Compliant |
| §15.247(a)(1) | Frequency Separation | Compliant |
| §15.247(a)(1)(iii) | Number of hopping frequency | Compliant |
| §15.247(a)(1)(iii) | Time of Occupancy | Compliant |
| §15.203 | Antenna Requirement | Compliant |



4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel Low, Mid and High with highest rated data rate were chosen as worst case for full testing. The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for Bluetooth Transmitter for channel Low, Mid and High the worst case E2 position was reported.

Channel Low: channel 0 at 2402MHz Channel Mid: channel 39 at 2441MHz Channel High: channel 78 at 2480MHz

In comparison with BR and EDR mode, emission carried out by EDR is chosen as the most representative measurement to perform measurement of radiated spurious emission pursuant to Part 15C.Modulation, EDR, is selected to be performed for 100 kHz Bandwidth Band Edge, Conducted Spurious Emission, Frequency Separation, Number of hopping frequency due to its characteristics of wider bandwidth.

Data type being used to conduct the measurement: DH1/DH3/DH5 (GFSK) with 1Mbps 2DH1/2DH3/2DH5 (∏/4 DQPSK) with 2Mbps 3DH1/3DH3/3DH5 (8DPSK) with 3Mbps

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5. MEASUREMENT UNCERTAINTY

| Test Items | Uncertainty |
|--|--------------------------|
| AC Power Line Conducted Emission | +/- 2.586 dB |
| Peak Output Power | +/- 1.55 dB |
| 20dB Bandwidth & 99% Power Bandwidth | +/- 123.36 Hz |
| 100 KHz Bandwidth Of Frequency Band Edges | +/- 1.55 dB |
| Frequency Separation | +/- 123.36 Hz |
| Number of hopping frequency | +/- 123.36 Hz |
| Time of Occupancy | +/- 123.36 Hz |
| Temperature | +/- 0.8 °C |
| Humidity | +/- 4.7 % |
| DC / AC Power Source | DC= +/- 1%, AC= +/- 0.2% |

Radiated Spurious Emission:

| Measurement uncertainty (Polarization : Vertical) | 30MHz - 180MHz: +/- 3.37dB |
|--|----------------------------|
| | 180MHz -417MHz: +/- 3.19dB |
| | 0.417GHz-1GHz: +/- 3.19dB |
| | 1GHz - 18GHz: +/- 4.04dB |
| | 18GHz - 40GHz: +/- 4.04dB |

| | 30MHz - 167MHz: +/- 4.22dB |
|-----------------------------|----------------------------|
| Measurement uncertainty | 167MHz -500MHz: +/- 3.44dB |
| (Polarization : Horizontal) | 0.5GHz-1GHz: +/- 3.39dB |
| | 1GHz - 18GHz: +/- 4.08dB |
| | 18GHz - 40GHz: +/- 4.08dB |

This uncertainty represents an expanded uncertainty expressed at approximately the

95% confidence level using a coverage factor of k=2.

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CONDUCTED EMISSION TEST 6.

6.1. Standard Applicable

According to §15.207, frequency within 150 kHz to 30MHz shall not exceed the limit table as below.

| Frequency range | Limits dB(uV) | | | | | | |
|--|------------------|----------|--|--|--|--|--|
| MHz | Quasi-peak | Average | | | | | |
| 0.15 to 0.50 | 66 to 56 | 56 to 46 | | | | | |
| 0.50 to 5 | 56 | 46 | | | | | |
| 5 to 30 | 60 | 50 | | | | | |
| Note | | | | | | | |
| 1. The lower limit shall apply at the transition frequencies | | | | | | | |
| 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz. | | | | | | | |

6.2. **Measurement Equipment Used:**

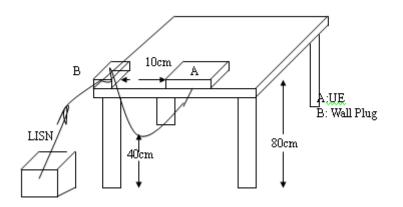
| | SGS Conducted Emission Test Site No.A | | | | | | | | |
|-------------------|---------------------------------------|-------------------|---------------|-------------|-------------|--|--|--|--|
| Name of Equipment | Manufacturer | Model | Serial Number | Calibration | Calibration | | | | |
| Name of Equipment | | WIUUCI | Serial Number | Date | Due | | | | |
| EMI Test Receiver | R&S | ESCI 3 | 101311 | 06/20/2014 | 06/19/2015 | | | | |
| Coaxial Cables | N/A | N30N30-1042-150cm | N/A | 01/06/2015 | 01/07/2016 | | | | |
| LISN | Schwarzbeck | NSLK 8127 | 8127-648 | 06/10/2014 | 06/09/2015 | | | | |
| LISN | Rolf-Heine | NNB-2/16Z | 99012 | 03/26/2014 | 03/25/2015 | | | | |
| Test Software | Farad | EZ-EMC | Ver. SGS-03A2 | N.C.R. | N.C.R. | | | | |



6.3. EUT Setup

- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4:2014.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- 3. The LISN was connected with 120Vac/60Hz power source.

6.4. Test SET-UP (Block Diagram of Configuration)



6.5. Measurement Procedure

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. Repeat above procedures until all frequency measured were complete.

Measurement Result 6.6.

Note: Refer to next page for measurement data and plots. Note2: The * reveals the worst-case results that closet to the limit

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AC POWER LINE CONDUCTED EMISSION TEST DATA

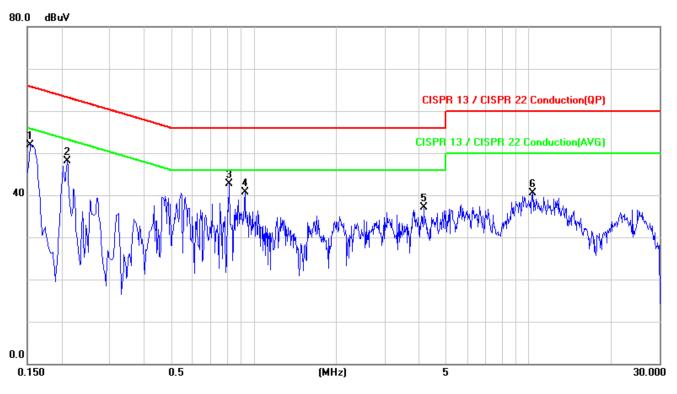
| (| Operation Mode: | Operation Mode | | | Test Date: | Feb. 26, 2015 |
|-----|-----------------|----------------------------------|-----------|---------|--------------------|-------------------------|
| ' | Temperature: | 23 °C | Humidity: | 58 % | Test By: | Vito |
|] | Probe: | L1 | | | | |
| 80. | 0 dBuV | | | | | |
| | | | | | | |
| | | | | CISPR | 13 / CISPR 22 Cond | luction(QP) |
| | X 2 | | | CISPR 1 | 3 / CISPR 22 Condu | ction(AVG) |
| 40 | | | h Min M. | \$ | MANNA MANA | MANY MAY AN AND MANY IN |
| | | 1911 Mar - An - E Frither, 1964. | WW YW IN | | | AABA P |

| 0.0 | | | | |
|-------|-----|-------|---|--------|
| 0.150 | 0.5 | (MHz) | 5 | 30.000 |
| | | | | |

| No. | Mk. | Freq. | Reading | Factor | Measurement | Limit | Over | Detector | Comment |
|-----|-----|--------|---------|--------|-------------|--------|--------|----------|---------|
| | | (MHz) | dBuV | (dB) | (dBuV) | (dBuV) | (dB) | | |
| 1 | | 0.1660 | 52.15 | 0.05 | 52.20 | 65.16 | -12.96 | peak | |
| 2 | | 0.2260 | 47.72 | 0.05 | 47.77 | 62.60 | -14.83 | peak | |
| - 3 | * | 0.5580 | 45.17 | 0.20 | 45.37 | 56.00 | -10.63 | peak | |
| 4 | | 1.6140 | 38.24 | 0.45 | 38.69 | 56.00 | -17.31 | peak | |
| - 5 | | 2.3180 | 36.43 | 0.51 | 36.94 | 56.00 | -19.06 | peak | |
| 6 | | 4.2860 | 41.89 | 0.50 | 42.39 | 56.00 | -13.61 | peak | |



| Operation Mode: | Operation Mode | | Test Date: | Feb. 26, 2015 | |
|--------------------------|----------------|-----------|------------|---------------|------|
| Temperature: 23 °C Humid | | Humidity: | 58 % | Test By: | Vito |
| Probe: | Ν | | | · | |



| No. | Mk. | Freq. | Reading | Factor | Measurement | Limit | Over | Detector | Comment |
|-----|-----|---------|---------|--------|-------------|--------|--------|----------|---------|
| | | (MHz) | dBuV | (dB) | (dBuV) | (dBuV) | (dB) | | |
| 1 | | 0.1540 | 51.84 | 0.05 | 51.89 | 65.78 | -13.89 | peak | |
| 2 | | 0.2100 | 48.04 | 0.04 | 48.08 | 63.21 | -15.13 | peak | |
| - 3 | * | 0.8140 | 42.47 | 0.30 | 42.77 | 56.00 | -13.23 | peak | |
| 4 | | 0.9300 | 40.35 | 0.34 | 40.69 | 56.00 | -15.31 | peak | |
| - 5 | | 4.1660 | 36.51 | 0.51 | 37.02 | 56.00 | -18.98 | peak | |
| 6 | | 10.3620 | 39.97 | 0.47 | 40.44 | 60.00 | -19.56 | peak | |

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PEAK OUTPUT POWER MEASUREMENT 7.

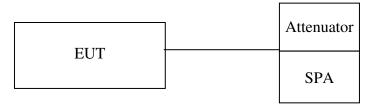
7.1. Standard Applicable

According to \$15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, The Limit: 1Watt. For all other frequency hopping systems in the 2400 - 2483.5MHz band: The Limit: 0.125 Watts.

7.2. Measurement Equipment Used

| SGS Conducted Room(ALL) | | | | | | | | |
|-------------------------|------------|----------------|--------------|------------|------------|--|--|--|
| EQUIPMENT | MFR | MODEL | MODEL SERIAL | | CAL DUE. | | | |
| ТҮРЕ | | NUMBER | NUMBER | CAL. | | | | |
| Spectrum Analyzer | Agilent | N9010A | MY53400256 | 10/15/2014 | 10/14/2015 | | | |
| Power Meter | Anritsu | ML2496A | 1326001 | 06/21/2014 | 06/20/2015 | | | |
| Power Sensor | Anritsu | MA2411B | 1315048 | 06/21/2014 | 06/20/2015 | | | |
| Power Sensor | Anritsu | MA2411B | 1315049 | 06/21/2014 | 06/20/2015 | | | |
| Coaxial Cable 30cm | WOKEN | 00100A1F1A195C | RF01 | 12/19/2014 | 12/18/2015 | | | |
| DC Block | PASTERNACK | PE8210 | RF29 | 12/19/2014 | 12/18/2015 | | | |
| Splitter | RF-LAMBAD | RFLT2W1G18G | RF35 | 12/19/2014 | 12/18/2015 | | | |
| Attenuator | WOKEN | 218FS-10 | RF23 | 12/19/2014 | 12/18/2015 | | | |
| DC Power Supply | Agilent | E3640A | MY53140006 | 05/31/2014 | 05/30/2015 | | | |

7.3. Test Set-up:



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7.4. Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter or spectrum. (Max Hold, Detector = Peak, RBW >=20dB bandwidth)
- 3. Record the max. reading.
- 4. Repeat above procedures until all default test channel is completed.

NOTE: cable loss as 4.43dB that offsets in the spectrum

7.5. Measurement Result

1M BR mode (GFSK):

| Frequency (MHz) | Reading Power (dBm) | Output Power (W) | Limit (W) |
|--------------------|---------------------------|---------------------|--------------|
| 2402.00 | -2.63 | 0.00055 | 1 |
| 2441.00 | -0.64 | 0.00086 | 1 |
| 2480.00 | -1.22 | 0.00075 | 1 |

2M EDR mode (π /4DQPSK):

| Frequency (MHz) | Reading Power (dBm) | Output Power (W) | Limit (W) |
|--------------------|---------------------------|---------------------|--------------|
| 2402.00 | -0.27 | 0.00094 | 0.125 |
| 2441.00 | 1.44 | 0.00139 | 0.125 |
| 2480.00 | 0.97 | 0.00125 | 0.125 |

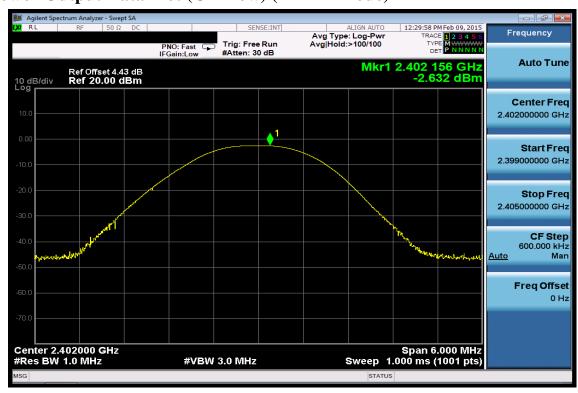
3M EDR mode (8DPSK):

| Frequency (MHz) | Reading Power (dBm) | Output Power (W) | Limit (W) |
|--------------------|---------------------------|---------------------|--------------|
| 2402.00 | 0.32 | 0.00108 | 0.125 |
| 2441.00 | 2.00 | 0.00159 | 0.125 |
| 2480.00 | 1.53 | 0.00142 | 0.125 |

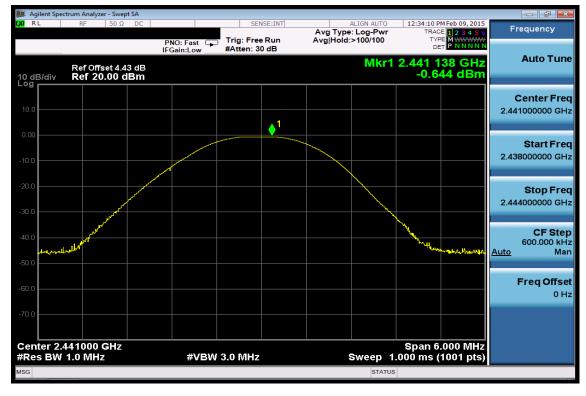
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Peak Power Output Data Plot (CH Low) (1M BR mode)



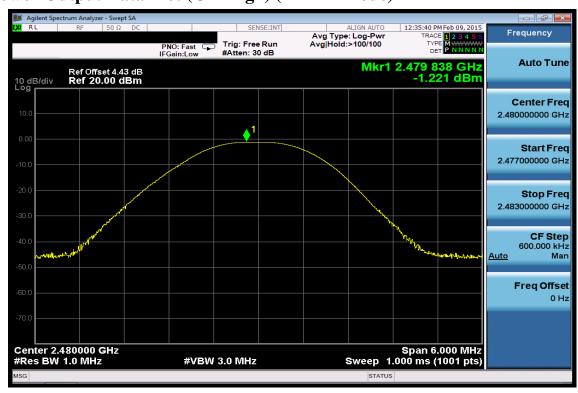
Peak Power Output Data Plot (CH Mid) (1M BR mode)



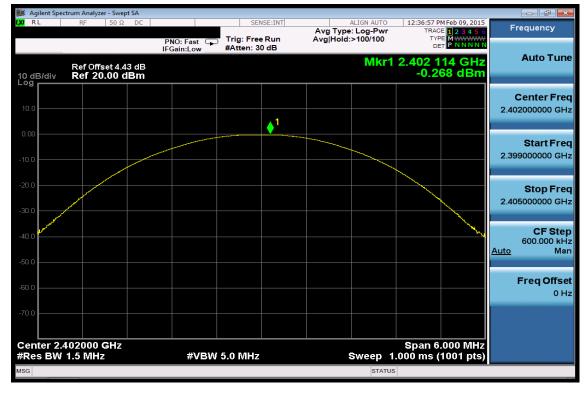
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Peak Power Output Data Plot (CH High) (1M BR mode)



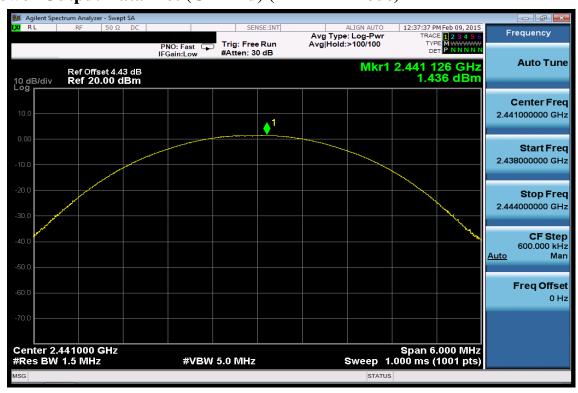
Peak Power Output Data Plot (CH Low) (2M EDR mode)



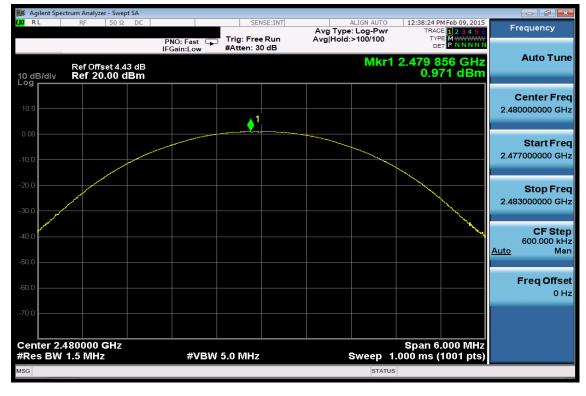
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Peak Power Output Data Plot (CH Mid) (2M EDR mode)



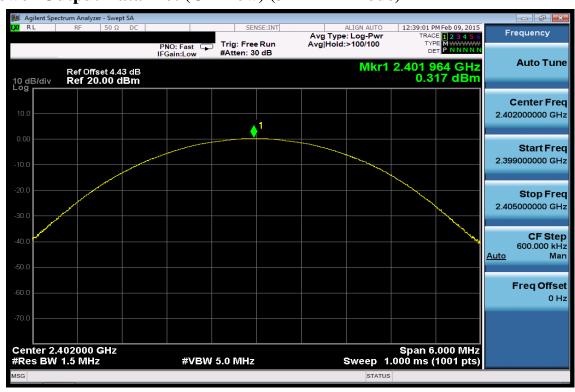
Peak Power Output Data Plot (CH High) (2M EDR mode)



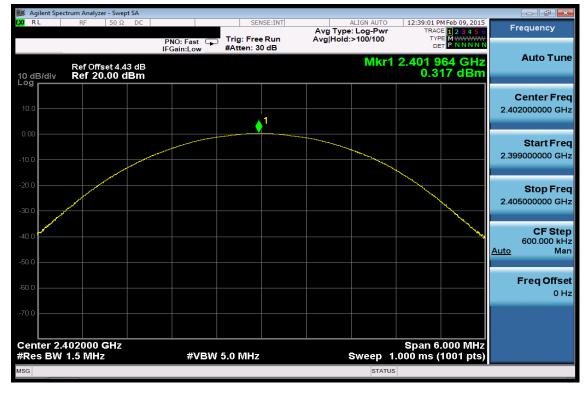
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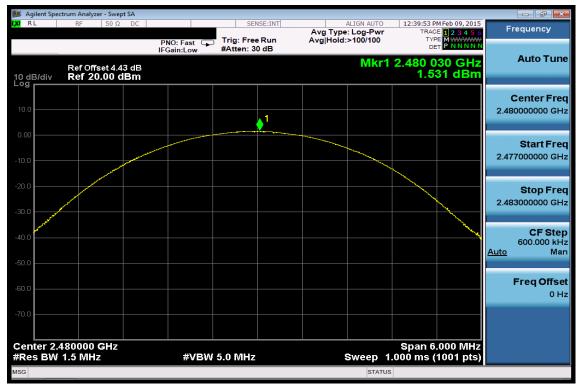
Peak Power Output Data Plot (CH Mid) (3M EDR mode)



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Peak Power Output Data Plot (CH High) (3M EDR mode)



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20dB BANDWIDTH 8.

8.1. Standard Applicable

For 20dB Bandwidth

According to §15.247(a)(1) for frequency hopping systems operating in the 2400MHz-2483.5 MHz no limit for 20dB bandwidth.

Measurement Equipment Used 8.2.

Refer to section 7.2 for details.

8.3. Test Set-up

Refer to section 7.3 for details.

8.4. Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set the spectrum analyzer as RBW=10 kHz (1 % of 20 dB Bandwidth.), VBW = 30 kHz, Span= 3MHz, Sweep=auto, Detector = Peak, and Max hold for 20dB Bandwidth test.
- 4. Mark the peak frequency and –20dB (upper and lower) frequency
- 5. Repeat above procedures until all test default channel is completed

NOTE: cable loss as 4.43dB that offsets in the spectrum

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8.5. Measurement Result:

1M BR mode:

| СН | Bandwidth |
|------|-----------|
| | (MHz) |
| Low | 0.92 |
| Mid | 0.92 |
| High | 0.92 |

2M EDR mode:

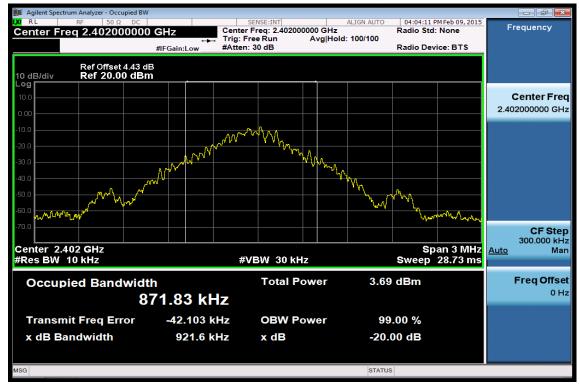
| СН | Bandwidth | 2/3 Bandwidth |
|------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 1.32 | 0.88 |
| Mid | 1.33 | 0.89 |
| High | 1.33 | 0.89 |

3M EDR mode:

| СН | Bandwidth | 2/3 Bandwidth | |
|-------|-----------|---------------|--|
| | (MHz) | (MHz) | |
| Lower | 1.34 | 0.89 | |
| Mid | 1.31 | 0.87 | |
| High | 1.31 | 0.87 | |



20dB Band Width Test Data CH-Low (1M BR mode)



20dB Band Width Test Data CH-Mid (1M BR mode)

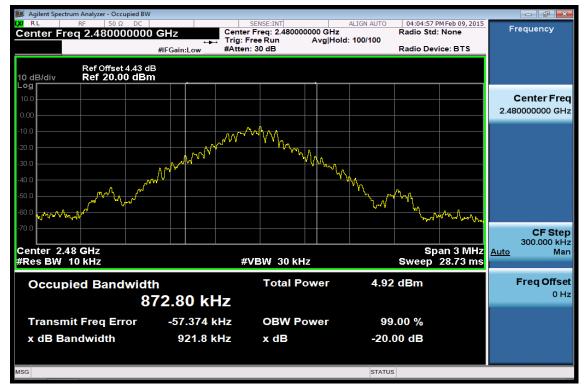


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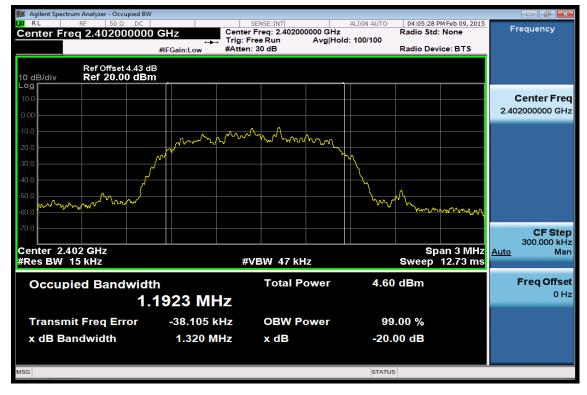
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20dB Width Test Data CH-High (1M BR mode)



20dB Band Width Test Data CH-Low (2M EDR mode)



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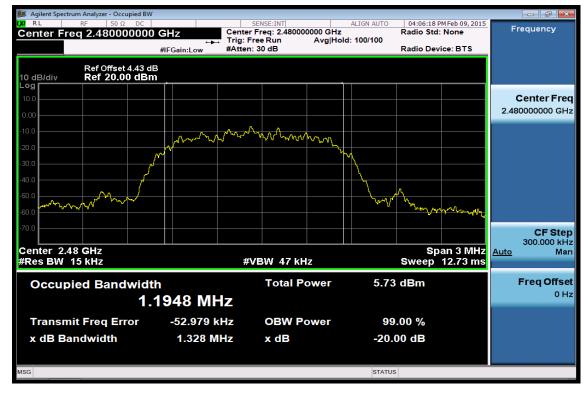
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20dB Band Width Test Data CH-Mid (2M EDR mode)



20dB Band Width Test Data CH-High (2M EDR mode)

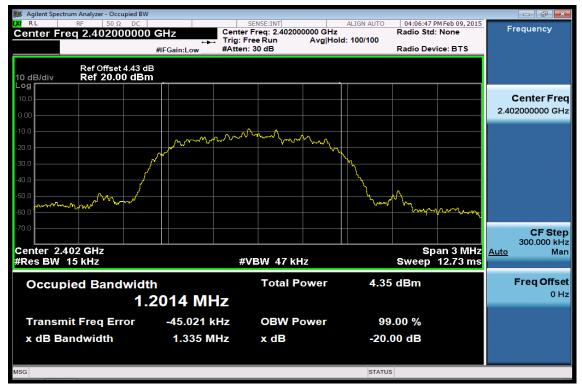


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20dB Band Width Test Data CH-Low (3M EDR mode)



20dB Band Width Test Data CH-Mid (3M EDR mode)

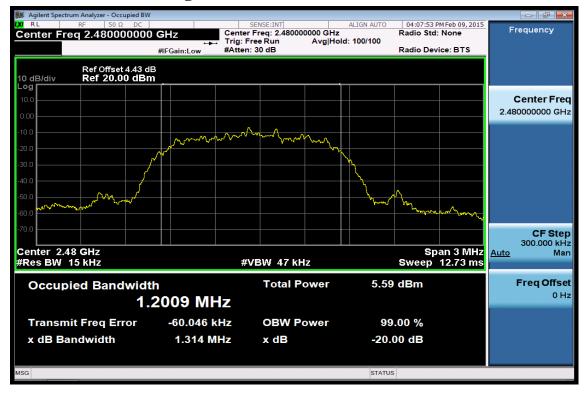


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20dB Width Test Data CH-High (3M EDR mode)



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9. BAND EDGES EMISSION MEASUREMENT

9.1. Standard Applicable

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in15.209(a).

9.2. Measurement Equipment Used

9.2.1. Conducted Emission at antenna port:

Refer to section 7.2 for details.

9.3. Test SET-UP:

9.3.1. Conducted Emission at antenna port:

Refer to section 7.3 for details.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



9.4. Measurement Procedure

100 kHz BANDWIDTH OF BAND EDGES:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set center frequency of spectrum analyzer = operating frequency.
- 4. Set the spectrum analyzer as RBW, VBW=300 kHz, Sweep = auto
- 5. Mark Peak, 2.390GHz and 2.4835GHz and record the max. level.
- 6. Repeat above procedures until all frequency measured were complete.

Out-Of-Band EMISSION

- 1. To connect Antenna Port of EUT to Spectrum.
- 2. Set RBW = 100K & VBW = 300K on Spectrum.
- 3. Sweep the frequency to determine spurious emission as seen on spectrum from span of 30MHz to 3G, 3G to 8G, 8G to 13G, 13G to 18G and 18G to 26.5GHz
- 4. Via Software, combine 5 spans of frequency range into two plots containing the range of 30MHz to 3GHz, and 3GHz to 26.5GHz.

9.5. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

| Where | FS = Field Strength | CL = Cable Attenuation Factor (Cable Loss) |
|-------|------------------------|--|
| | RA = Reading Amplitude | AG = Amplifier Gain |
| | AF = Antenna Factor | |

9.6. Measurement Result -1 Out-Of-Band EMISSION:

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

NOTE: cable loss as 4.43dB that offsets in the spectrum

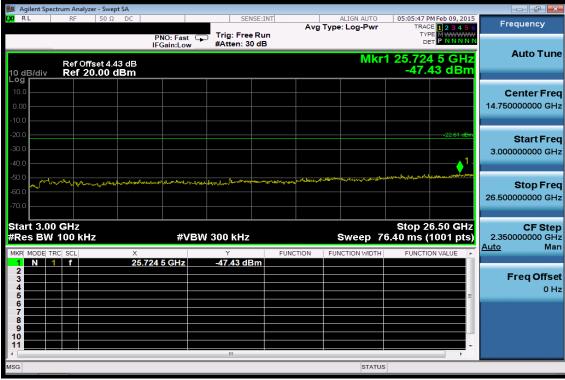
NOTE: the occurrence of the spike on the conducted emission is the signal of the fundamental emission.



9.7 Measurement Result -1 Conducted Spurious Emission Measurement Result (Worst: EDR mode) Ch Low 30MHz - 3GHz

Milent Spectrum Analyzer - Swept S 05:05:23 PM Feb 09, 2015 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N LIGN AUTO Frequency Avg Type: Log-Pwr Center Freq 1.515000000 GHz Trig: Free Run #Atten: 30 dB PNO: Fast IFGain:Low Auto Tune Mkr1 2.403 0 GHz Ref Offset 4.43 dB Ref 20.00 dBm 10 dB/div .og -2.61 dBm **Center Freq** 1.515000000 GHz Start Freq 30.000000 MHz Stop Freq 3.000000000 GHz Start 30 MHz #Res BW 100 kHz Stop 3.000 GHz Sweep 9.667 ms (1001 pts) **CF** Step #VBW 300 kHz 297.000000 M Auto Man FUNCTION 2.403 0 GHz -2.61 dBm N f Freq Offset 0 Hz 10

Ch Low 3GHz - 26.5GHz



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.





Ch Mid 30MHz – 3GHz

| | ctrum Analyzer - Sv | wept SA | | | | | | | |
|--|--------------------------------|---|-------------------------|------------------------------|----------|-------------------------------|-----------------------|---|--|
| Center F | ^{RF} 50 req 1.5150 | 000000 GHz | | SENSE | Avg | ALIGN AUTO g Type: Log-Pwr | TRA | PM Feb 09, 2015 DE 1 2 3 4 5 6 PE M WWWWW | Frequency |
| 10 dB/div Log | Ref Offset | IFGa 4.43 dB |):Fast ⊂⊾ in:Low | Trig: Free R #Atten: 30 c | | MI | □ (r1 2.44 | 1 6 GHz 07 dBm | Auto Tune |
| 10.0 0.00 -10.0 | | | | | | | ↓ ¹ | | Center Freq 1.515000000 GHz |
| -20.0 -30.0 -40.0 | | | | | | | | -21.07 dBm | Start Freq 30.000000 MHz |
| -50.0 -60.0 | Annan Landerstein besch | ىر يەر يەر يەر يەر يەر يەر يەر يەر يەر يە | yksynger och förstanden | مهيديات المربية مريدهم | | Al male and a set of the set | ter law when a | ามีคาราสีกระบ | Stop Freq 3.000000000 GHz |
| Start 30 F #Res BW | 100 kHz | X | | 300 kHz | FUNCTION | Sweep 9 | .667 ms (| .000 GHz 1001 pts) ^{ON VALUE} | CF Step 297.000000 MHz <u>Auto</u> Man |
| 1 N 2 3 3 4 5 6 6 7 8 9 10 | | 2.441 6 | GHZ | -1.07 dBn | | | | | Freq Offset 0 Hz |
| A MSG | | | | III | | STATU | 5 | * | |

Ch Mid 3GHz - 26.5GHz

| 🎉 Agilent Spec | ctrum Analyzer - Swept SA | | | | | | |
|-----------------------------------|---------------------------|---|--------------------------------|---|-----------------------------|---|--------------------------------------|
| LXI RL | RF 50 Ω DC | | SENSE:I | | ALIGN AUTO Type: Log-Pwr | 05:06:31 PM Feb 09, 201 TRACE 1 2 3 4 5 | |
| | Ref Offset 4.43 dB | PNO: Fast IFGain:Low | Trig: Free Ru #Atten: 30 dB | n | | 1 26.241 5 GHz -47.08 dBm | Auto Tune |
| 10 dB/div Log 10.0 -10.0 | Ref 20.00 dBm | | | | | -47.08 GBH | Center Freq 14.750000000 GHz |
| -20.0 -30.0 -40.0 -50.0 | | | | | | -21.07 dBr | Start Freq 3.000000000 GHz |
| -60.0 | | the algeon of the American Strength and the | - Porryshy and Marshamph | ingentel aller and a second | | | Stop Freq 26.500000000 GHz |
| Start 3.00 #Res BW | 100 kHz RC SCL X | #VBW | / 300 kHz Y -47.08 dBm | FUNCTION | Sweep 7 | Stop 26.50 GHz 6.40 ms (1001 pts FUNCTION VALUE | |
| 2 3 4 5 6 | | 241 J GH2 | -47.00 UDIII | | | = | Freq Offset 0 Hz |
| / 8 9 10 11 | | | m | | | | |
| MSG | | | | | STATUS | | |



Ch High 30MHz – 3GHz

| Agilent Spectrum Analyzer - Swept SA | | | | |
|--|--|---------------------------------------|---|---|
| IX RL RF 50 Ω DC Center Freq 1.515000000 DC <thdc< th=""> DC <thdc< th=""> DC<td></td><td>ALIGN AUTO 05 Avg Type: Log-Pwr</td><td>:08:00 PM Feb 09, 2015 TRACE 1 2 3 4 5 6 TYPE M WWWWW</td><td>Frequency</td></thdc<></thdc<> | | ALIGN AUTO 05 Avg Type: Log-Pwr | :08:00 PM Feb 09, 2015 TRACE 1 2 3 4 5 6 TYPE M WWWWW | Frequency |
| Ref Offset 4.43 dB 10 dB/div Ref 20.00 dBm | PNO: Fast Free Run IFGain:Low #Atten: 30 dB | Mkr1 2 | 2.480 3 GHz -1.60 dBm | Auto Tune |
| Log | | • • • • • • • • • • • • • • • • • • • | | Center Freq 1.515000000 GHz |
| -20.0 | | | -21.60.dBm | Start Freq 30.000000 MHz |
| -50.0 -60.0 | ynhann fry yn rhyfernau felige yn raenwyhdyn fref afwrgantau | | مىسىيەر يوروامىلى ^ب ىمەلچىرىم | Stop Freq 3.000000000 GHz |
| Start 30 MHz #Res BW 100 kHz | #VBW 300 kHz | Sweep 9.667 | | CF Step 297.000000 MHz <u>Auto</u> Man |
| | 480 3 GHz -1.60 dBm | | E F | Freq Offset 0 Hz |
| MSG | | STATUS | | |

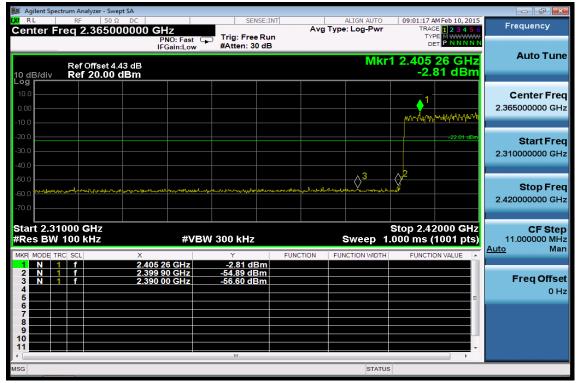
Ch High 3GHz - 26.5GHz

| | trum Analyzer - Swept S | A | | | | | |
|---|--|----------------------------|----------------------------------|--|---|--|--|
| LXI RL | RF 50 Ω | DC | SENSE | Avg | ALIGN AUTO Type: Log-Pwr | 05:08:22 PM Feb 09, 201 TRACE 1 2 3 4 5 TYPE M WWWWW | Frequency |
| 10 dB/div Log | Ref Offset 4.43 Ref 20.00 dB | | | | Mkr | 1 25.560 0 GHz -47.16 dBm | Auto Tune |
| 10.0 0.00 -10.0 | | | | | | | Center Freq 14.750000000 GHz |
| -20.0 -30.0 -40.0 | | | | | | | Start Freq 3.000000000 GHz |
| -50.0 -60.0 -70.0 | ghang again again an | nglessafternasterätternest | Managerine party reported and | and Shaphing and an and an | n ya an | an a | Stop Freq 26.500000000 GHz |
| Start 3.00 #Res BW | 100 kHz | #V | BW 300 kHz Y | FUNCTION | Sweep 7 | Stop 26.50 GHz 6.40 ms (1001 pts) | |
| 1 N 1 2 3 4 5 6 7 7 8 9 9 10 11 | | * 25.560 0 GHz | , 47.16 dBm -47.16 dBm | | | | Freq Offset 0 Hz |
| MSG | | | | | STATUS | 3 | |

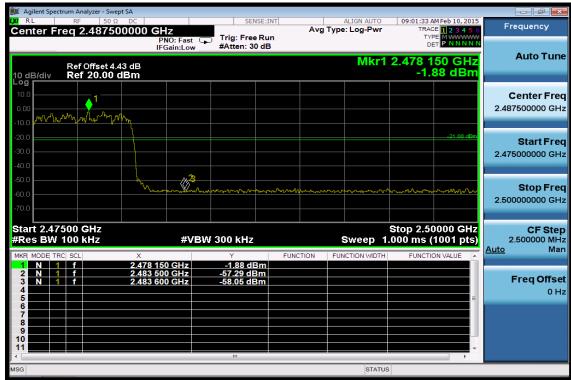
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9.7 Measurement Result -2 100 kHz BANDWIDTH OF BNAD EDGE: Band Edges Test Data CH-Low (Worst: EDR mode)(Hopping)



Band Edges Test Data CH-High



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Band Edges Test Data CH-Low (Worst: EDR mode)(Non-Hopping)

AM Feb 10, 2015 ALIGN AUTO Avg Type: Log-Pwr Frequency Center Freq 2.365000000 GHz 2345 Trig: Free Run #Atten: 30 dB TYP PNO: Fast IFGain:Low Auto Tune Mkr1 2.402 29 GHz -2.84 dBm Ref Offset 4.43 dB Ref 20.00 dBm I0 dB/div _og **Center Freq** 2 365000000 GHz Start Freq 2.310000000 GHz \Diamond^3 Stop Freq 2.420000000 GHz Stop 2.42000 GHz 1.000 ms (1001 pts) Start 2.31000 GHz **CF** Step #VBW 300 kHz 11.000000 MHz #Res BW 100 kHz Sweep Auto Man 56.83 dBm 56.90 dBm Freq Offset 0 Hz STATUS

Band Edges Test Data CH-High

IGN AUTC 08:47:17 AM Feb 10, 2015 Frequency Avg Type: Log-Pwr ACE 1 2 3 4 5 Center Freq 2.487500000 GHz Trig: Free Run #Atten: 30 dB PNO: Fast IFGain:Low Auto Tune Mkr1 2.480 125 GHz Ref Offset 4.43 dB Ref 20.00 dBm -1.52 dBm 0 dB/div Center Frea 2.487500000 GHz Start Freq 2.475000000 GHz \Diamond^2 Stop Freq 2.50000000 GHz Stop 2.50000 GHz 1.000 ms (1001 pts) Start 2.47500 GHz **CF** Step #VBW 300 kHz BW 100 kHz Sweep 2.500000 MHz #Res Auto Man -57.22 dBm -57.80 dBm Freq Offset N 0 Hz 10

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10. SPURIOUS RADIATED EMISSION TEST

10.1. Standard Applicable

According to §15.247(d),

Emission at antenna port:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Radiated Spurious Emission

Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

And according to \$15.33(a) (1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

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10.2. Measurement Equipment Used:

10.2.1. Radiated emission:

| SGS 966 Chamber No.C | | | | | | | | | | |
|----------------------|-----------------|-----------------------------|------------------|---------------------|--------------------|--|--|--|--|--|
| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Date | Calibration Due | | | | | |
| EMI Test Receiver | R&S | ESU 40 | 100363 | 04/12/2014 | 04/11/2015 | | | | | |
| Loop Antenna | ETS-Lindgren | 6502 | 00143303 | 12/09/2014 | 12/08/2015 | | | | | |
| Broadband Antenna | TESEQ | CBL 6112D | 35240 | 12/05/2014 | 12/04/2015 | | | | | |
| Horn Antenna | ETS-Lindgren | 3117 | 00143272 | 12/08/2014 | 12/07/2015 | | | | | |
| Horn Antenna | ETS-Lindgren | 3160-09 | 3160-09 00117911 | | 11/12/2015 | | | | | |
| Horn Antenna | ETS-Lindgren | 3160-10 | 00117783 | 11/13/2014 | 11/12/2015 | | | | | |
| Pre Amplifier | EMC Instruments | EMC330 | 980096 | 12/19/2014 | 12/18/2015 | | | | | |
| Pre Amplifier | EMC Instruments | EMC0011830 | 980199 | 12/19/2014 | 12/18/2015 | | | | | |
| Pre Amplifier | R&S | SCU-18 | 10204 | 12/19/2014 | 12/18/2015 | | | | | |
| Pre Amplifier | R&S | SCU-26 | 100780 | 12/19/2014 | 12/18/2015 | | | | | |
| Coaxial Cable | Huber+Suhner | RG 214/U | 966Rx 9K-30M | 12/19/2014 | 12/18/2015 | | | | | |
| Coaxial Cable | Huber+Suhner | RG 214/U SUCOFLEX 104 | 966Rx 30M-3G | 12/19/2014 | 12/18/2015 | | | | | |
| Coaxial Cable | Huber+Suhner | SUCOFLEX 104 | 966Rx 1G-18G | 12/19/2014 | 12/18/2015 | | | | | |
| Coaxial Cable | Huber+Suhner | mini 141-12 SUCOFLEX 104 | 966Rx 18G-40G | 12/19/2014 | 12/18/2015 | | | | | |
| Coaxial Cable | Huber+Suhner | SUCOFLEX 104 | 966Tx 30M-18G | 12/19/2014 | 12/18/2015 | | | | | |
| Coaxial Cable | Huber+Suhner | SUCOFLEX 102 | 966Tx 18G-40G | 12/19/2014 | 12/18/2015 | | | | | |
| Attenuator | WOKEN | 218FS-10 | RF27 | 12/19/2014 | 12/18/2015 | | | | | |
| Site NSA | SGS | 966 Chamber C | SAC-C | 03/05/2014 | 03/05/2015 | | | | | |
| Site VSWR | SGS | 966 Chamber C | SAC-C | 04/10/2014 | 04/09/2015 | | | | | |
| DC Power Supply | HOLA | DP-3003 | D7070035 | 05/31/2014 | 05/30/2015 | | | | | |
| Controller | MF | MF-7802 | N/A | N.C.R. | N.C.R. | | | | | |
| Antenna Master | MF | N/A | N/A | N.C.R. | N.C.R. | | | | | |
| Turn Table | MF | N/A | N/A | N.C.R. | N.C.R. | | | | | |
| Test Software | World-Pallas | Dr. E | V 3.0 Lite | N.C.R. | N.C.R. | | | | | |

NOTE: N.C.R refers to Not Calibrated Required.

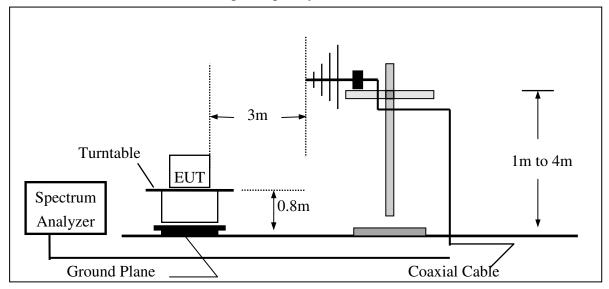
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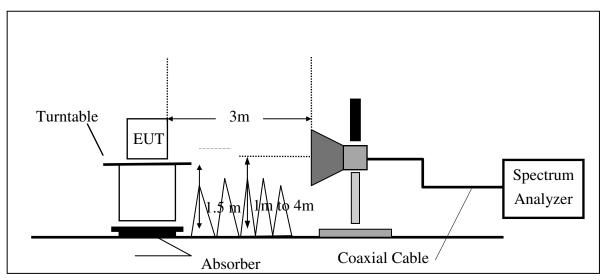
10.3. Test SET-UP:

10.3.1. Radiated emission:

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



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10.4. Measurement Procedure:

Radiated Emission:

- 1. The EUT was placed on a turn table which is 0.8m above ground plane.
- 2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 4. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.
- 5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 7. Repeat above procedures until all frequency of the interest measured were complete.

Auxiliary Procedure (Setting on Spectrum to capture the reading of emission level):

Span = wide enough to fully capture the emission being measured RBW = 1 MHz for $f \ge 1$ GHz, 100 kHz for f < 1 GHz VBW \ge RBW Sweep = auto Detector function = peak Trace = max hold

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10.5. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

| Where | FS = Field Strength | CL = Cable Attenuation Factor (Cable Loss) |
|-------|------------------------|--|
| | RA = Reading Amplitude | AG = Amplifier Gain |
| | AF = Antenna Factor | |

Remark:

- 1. The limit of the emission level is expressed in dBuV/m, which converts 20*log(uV/m)
- 2. Factor(dB) = Antenna Factor(dB μ V/m) + Cable Loss(dB) Pre Amplifier Gain(dB)

10.6. Measurement Result:

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

Note: For measurement plot of radiation revealing the compliance of 15.209, please refer to Appendix I.

Note: For the tabular table as presents below, "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor

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10.6.1 Radiated Emission Band Edge: (Worst: EDR mode)(Hopping)

| Operation Ban Fundamental I Operation Mo EUT Pol. | Frequency | :EDR :2402 MHz :BANDEDG :E2 Plane | Test Date Temp./Humi. GE LOW Engineer Measurement Antenna Pol. | | :2015-02-22 :18.5 deg_C/ 56 RH : Ashton :VERTICAL | | |
|---|-----------|--|---|--|--|---|--------|
| Freq. | Note | Detector | Spectrum | Factor | Actual | Limit | Margin |
| | | Mode | Reading Lev | vel | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBµV/m | dBµV/m | dB |
| 2390.00 | Е | Peak | 39.82 | 6.36 | 46.18 | 74 | -27.82 |
| 2390.00 | Е | Average | 26.99 | 6.36 | 33.35 | 54 | -20.65 |
| Operation Band Fundamental Frequency Operation Mode EUT Pol. | | :EDR :2402 MHz :BANDEDG :E2 Plane | E LOW | Test Date Temp./Humi. Engineer Measurement Ar | ntenna Pol. | :2015-02-22 :18.5 deg_C/ : : Ashton :HORIZONT. | |
| Freq. | Note | Detector | Spectrum | Factor | Actual | Limit | Margin |
| | | Mode | Reading Lev | vel | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBµV/m | dBµV/m | dB |
| 2390.00 | Е | Peak | 39.80 | 6.36 | 46.16 | 74 | -27.84 |
| 2390.00 | E | Average | 26.96 | 6.36 | 33.32 | 54 | -20.68 |



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| Operation Ban Fundamental I Operation Mo EUT Pol. | Frequency | :EDR :2480 MHz :BANDEDG :E2 Plane | EDGE HIGH Engineer | | :2015-02-22 :18.5 deg_C/ 56 RH : Ashton :VERTICAL | | |
|--|-----------|--|--------------------|--|--|---|--------|
| Freq. | Note | Detector | Spectrum | Factor | Actual | Limit | Margin |
| | | Mode | Reading Lev | vel | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBµV/m | dBµV/m | dB |
| 2483.50 | Е | Peak | 42.70 | 7.14 | 49.83 | 74 | -24.17 |
| 2483.50 | E | Average | 28.65 | 7.14 | 35.79 | 54 | -18.21 |
| Fundamental Frequency Operation Mode | | :EDR :2480 MHz :BANDEDG :E2 Plane | | Test Date Temp./Humi. Engineer Measurement Ar | itenna Pol. | :2015-02-22 :18.5 deg_C/ : Ashton :HORIZONT. | |
| Freq. | Note | Detector | Spectrum | Factor | Actual | Limit | Margin |
| | | Mode | Reading Lev | vel | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBµV/m | dBµV/m | dB |
| 2483.50 | E | Peak | 46.89 | 7.14 | 54.03 | 74 | -19.97 |
| 2483.50 | Е | Average | 30.51 | 7.14 | 37.65 | 54 | -16.35 |



Band Edge: (Worst: EDR mode)(Non-Hopping)

| Operation Ban Fundamental H Operation Mod EUT Pol. | mental Frequency:2402 MHzTemp./Humi.tion Mode:BANDEDGE LOWEngineer | | :2015-02-22 :18.5 deg_C/ 56 RH : Ashton : VERTICAL | | | | |
|---|--|--|---|--|--------------|---|--------|
| Freq. | Note | Detector Mode | Spectrum Reading Lev | | Actual FS | Limit @3m | Margin |
| MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBµV/m | dBµV/m | dB |
| 2390.00 | Е | Peak | 41.13 | 6.36 | 47.49 | 74 | -26.51 |
| 2390.00 | Е | Average | 26.76 | 6.36 | 33.12 | 54 | -20.88 |
| Operation Band Fundamental Frequency Operation Mode EUT Pol. | | :EDR :2402 MHz :BANDEDG :E2 Plane | E LOW | Test Date Temp./Humi. Engineer Measurement Ar | ntenna Pol. | :2015-02-22 :18.5 deg_C/ : Ashton :HORIZONT. | |
| Freq. | Note | Detector | Spectrum | Factor | Actual | Limit | Margin |
| | | Mode | Reading Lev | vel | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBµV/m | dBµV/m | dB |
| 2390.00 | Е | Peak | 40.69 | 6.36 | 47.05 | 74 | -26.95 |
| 2390.00 | E | Average | 29.06 | 6.36 | 35.42 | 54 | -18.58 |



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| Operation Ban Fundamental I Operation Mo EUT Pol. | Frequency | :EDR :2480 MHz :BANDEDG :E2 Plane | MHzTemp./Humi.DEDGE HIGHEngineer | | :2015-02-22 :18.5 deg_C/ 56 RH : Ashton :VERTICAL | | |
|---|-----------|--|----------------------------------|--|--|---|--------|
| Freq. | Note | Detector | Spectrum | Factor | Actual | Limit | Margin |
| | | Mode | Reading Lev | vel | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBµV/m | dBµV/m | dB |
| 2483.50 | Е | Peak | 42.33 | 7.14 | 49.46 | 74 | -24.54 |
| 2483.50 | Е | Average | 31.85 | 7.14 | 38.99 | 54 | -15.01 |
| Operation Band Fundamental Frequency Operation Mode EUT Pol. | | :EDR :2480 MHz :BANDEDG :E2 Plane | E HIGH | Test Date Temp./Humi. Engineer Measurement An | tenna Pol. | :2015-02-22 :18.5 deg_C/ : Ashton :HORIZONT. | |
| Freq. | Note | Detector | Spectrum | Factor | Actual | Limit | Margin |
| | | Mode | Reading Lev | vel | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBµV/m | dBµV/m | dB |
| 2483.50 | E | Peak | 47.84 | 7.14 | 54.98 | 74 | -19.02 |
| 2483.50 | Е | Average | 38.27 | 7.14 | 45.41 | 54 | -8.59 |



| 10.6.2 Radiated Spurious Emission Measurement Result (worst case EDR mode) | | | | | | | | | | |
|--|--|----------|---------------|---|--------|--------|--------|--|--|--|
| Operation Ban Fundamental F Operation Moo EUT Pol. | amental Frequency:2402 MHzTemp./Humi.ation Mode:TX LOWEngineer | | itenna Pol. | :2015-02-22 :18.5 deg_C/ 56 RH : Ashton | | | | | | |
| | | | | | | | | | | |
| Freq. | Note | Detector | Spectrum | Factor | Actual | Limit | Margin | | | |
| | | Mode | Reading Level | | FS | @3m | | | | |
| MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBµV/m | dBµV/m | dB | | | |
| | | | | | | | | | | |
| 33.88 | S | Peak | 48.15 | -15.22 | 32.93 | 40 | -7.07 | | | |
| 47.46 | S | Peak | 49.41 | -23.95 | 25.46 | 40 | -14.54 | | | |
| 100.81 | S | Peak | 52.76 | -23.69 | 29.08 | 43.5 | -14.42 | | | |
| 352.04 | S | Peak | 39.27 | -17.31 | 21.96 | 46 | -24.04 | | | |
| 452.92 | S | Peak | 39.10 | -14.83 | 24.27 | 46 | -21.73 | | | |
| 503.36 | S | Peak | 38.99 | -14.15 | 24.85 | 46 | -21.15 | | | |
| 4804.00 | Н | Peak | 37.47 | 10.98 | 48.45 | 74 | -25.55 | | | |
| 4804.00 | Н | Average | 25.72 | 10.98 | 36.70 | 54 | -17.30 | | | |
| 7206.00 | Н | Peak | - | - | - | - | - | | | |
| 9608.00 | Н | Peak | - | - | - | - | - | | | |
| 12010.00 | Н | Peak | - | - | - | - | - | | | |
| 14412.00 | Н | Peak | - | - | - | - | - | | | |
| 16814.00 | Н | Peak | - | - | - | - | - | | | |
| 19216.00 | Н | Peak | - | - | - | - | - | | | |
| 21618.00 | Н | Peak | - | - | - | - | - | | | |
| 24020.00 | Н | Peak | - | - | - | - | - | | | |



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| Operation Ban Fundamental F Operation Mod EUT Pol. | Frequency | :EDR :2402 MHz :TX LOW :E2 Plane | Test Date Temp./Humi. Engineer Measurement Antenna Pol. | | | :2015-02-22 :18.5 deg_C/ 56 RH : Ashton :HORIZONTAL | |
|---|-----------|---|--|--------|--------|--|--------|
| Freq. | Note | Detector | Spectrum | Factor | Actual | Limit | Margin |
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBµV/m | dBµV/m | dB |
| | | | | | | | |
| 101.78 | S | Peak | 54.26 | -23.54 | 30.72 | 43.5 | -12.78 |
| 172.59 | S | Peak | 52.55 | -23.96 | 28.59 | 43.5 | -14.91 |
| 503.36 | S | Peak | 43.61 | -14.15 | 29.46 | 46 | -16.54 |
| 576.11 | S | Peak | 41.93 | -12.45 | 29.48 | 46 | -16.52 |
| 672.14 | S | Peak | 40.40 | -11.68 | 28.71 | 46 | -17.29 |
| 720.64 | S | Peak | 38.80 | -10.77 | 28.03 | 46 | -17.97 |
| 4804.00 | Н | Peak | 36.52 | 10.98 | 47.50 | 74 | -26.50 |
| 4804.00 | Н | Average | 26.30 | 10.98 | 37.28 | 54 | -16.72 |
| 7206.00 | Н | Peak | - | - | - | - | - |
| 9608.00 | Н | Peak | - | - | - | - | - |
| 12010.00 | Н | Peak | - | - | - | - | - |
| 14412.00 | Н | Peak | - | - | - | - | - |
| 16814.00 | Н | Peak | - | - | - | - | - |
| 19216.00 | Н | Peak | - | - | - | - | - |
| 21618.00 | Н | Peak | - | - | - | - | - |
| 24020.00 | Н | Peak | - | - | - | - | - |



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| Operation Ban Fundamental F Operation Mod EUT Pol. | Frequency | :EDR :2441 MHz :TX MID :E2 Plane | Test Date Temp./Humi. Engineer Measurement Antenna Pol. | | :2015-02-22 :18.5 deg_C/ 56 RH : Ashton :VERTICAL | | |
|---|-----------|---|--|--------|--|--------|--------|
| Freq. | Note | Detector | Spectrum | Factor | Actual | Limit | Margin |
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBµV/m | dBµV/m | dB |
| | | | | | | | |
| 50.37 | S | Peak | 59.60 | -25.65 | 33.95 | 40 | -6.05 |
| 103.72 | S | Peak | 53.36 | -23.24 | 30.12 | 43.5 | -13.38 |
| 352.04 | S | Peak | 42.38 | -17.31 | 25.07 | 46 | -20.93 |
| 503.36 | S | Peak | 39.51 | -14.15 | 25.36 | 46 | -20.64 |
| 576.11 | S | Peak | 37.10 | -12.45 | 24.64 | 46 | -21.36 |
| 720.64 | S | Peak | 35.06 | -10.77 | 24.29 | 46 | -21.71 |
| 4882.00 | Н | Peak | 36.65 | 10.91 | 47.56 | 74 | -26.44 |
| 4882.00 | Н | Average | 26.31 | 10.91 | 37.22 | 54 | -16.78 |
| 7323.00 | S | Peak | - | - | - | - | - |
| 9764.00 | Н | Peak | - | - | - | - | - |
| 12205.00 | Н | Peak | - | - | - | - | - |
| 14646.00 | Н | Peak | - | - | - | - | - |
| 17087.00 | Н | Peak | - | - | - | - | - |
| 19528.00 | Н | Peak | - | - | - | - | - |
| 21969.00 | Н | Peak | - | - | - | - | - |
| 24410.00 | Н | Peak | - | - | - | - | - |



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| Operation Ban Fundamental F Operation Mod EUT Pol. | Frequency | :EDR :2441 MHz :TX MID :E2 Plane | Test Date Temp./Humi. Engineer Measurement Antenna Pol. | | | :2015-02-22 :18.5 deg_C/ 56 RH : Ashton :HORIZONTAL | |
|---|-----------|---|--|--------|--------|--|--------|
| Freq. | Note | Detector | Spectrum | Factor | Actual | Limit | Margin |
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dBμV | dB | dBµV/m | dBµV/m | dB |
| | | | | | | | |
| 33.88 | S | Peak | 39.64 | -15.22 | 24.42 | 40 | -15.58 |
| 100.81 | S | Peak | 55.71 | -23.69 | 32.02 | 43.5 | -11.48 |
| 172.59 | S | Peak | 52.29 | -23.96 | 28.33 | 43.5 | -15.17 |
| 503.36 | S | Peak | 42.71 | -14.15 | 28.56 | 46 | -17.44 |
| 576.11 | S | Peak | 41.71 | -12.45 | 29.25 | 46 | -16.75 |
| 720.64 | S | Peak | 39.16 | -10.77 | 28.38 | 46 | -17.62 |
| 4882.00 | Н | Peak | 37.45 | 10.91 | 48.36 | 74 | -25.64 |
| 4882.00 | Н | Average | 26.83 | 10.91 | 37.74 | 54 | -16.26 |
| 7323.00 | Н | Peak | - | - | - | - | - |
| 9764.00 | Н | Peak | - | - | - | - | - |
| 12205.00 | Н | Peak | - | - | - | - | - |
| 14646.00 | Н | Peak | - | - | - | - | - |
| 17087.00 | Н | Peak | - | - | - | - | - |
| 19528.00 | Н | Peak | - | - | - | - | - |
| 21969.00 | Н | Peak | - | - | - | - | - |
| 24410.00 | Н | Peak | - | - | - | - | - |



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| Operation Ban Fundamental F Operation Mod EUT Pol. | Frequency | :EDR :2480 MHz :TX HIGH :E2 Plane | Test Date Temp./Humi. Engineer Measurement Antenna Pol. | | | :2015-02-22 :18.5 deg_C/ 56 RH : Ashton :VERTICAL | |
|---|-----------|--|--|--------|--------|--|--------|
| Freq. | Note | Detector | Spectrum | Factor | Actual | Limit | Margin |
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBµV/m | dBµV/m | dB |
| | | | | | | | |
| 61.04 | S | Peak | 64.19 | -28.42 | 35.77 | 40 | -4.23 |
| 96.93 | S | Peak | 54.30 | -24.36 | 29.94 | 43.5 | -13.56 |
| 352.04 | S | Peak | 42.81 | -17.31 | 25.50 | 46 | -20.50 |
| 503.36 | S | Peak | 40.06 | -14.15 | 25.91 | 46 | -20.09 |
| 576.11 | S | Peak | 38.21 | -12.45 | 25.75 | 46 | -20.25 |
| 672.14 | S | Peak | 36.33 | -11.68 | 24.65 | 46 | -21.35 |
| 4960.00 | Н | Peak | 36.91 | 10.99 | 47.90 | 74 | -26.10 |
| 4960.00 | Н | Average | 26.62 | 10.99 | 37.61 | 54 | -16.39 |
| 7440.00 | S | Peak | - | - | - | - | - |
| 9920.00 | Н | Peak | - | - | - | - | - |
| 12400.00 | Н | Peak | - | - | - | - | - |
| 14880.00 | Н | Peak | - | - | - | - | - |
| 17360.00 | Н | Peak | - | - | - | - | - |
| 19840.00 | Н | Peak | - | - | - | - | - |
| 22320.00 | Н | Peak | - | - | - | - | - |
| 24800.00 | Н | Peak | - | - | - | - | - |



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| Operation Ban Fundamental F Operation Mod EUT Pol. | Frequency | :EDR :2480 MHz :TX HIGH :E2 Plane | Test Date Temp./Humi. Engineer Measurement Antenna Pol. | | | :2015-02-22 :18.5 deg_C/ 56 RH : Ashton :HORIZONTAL | |
|---|-----------|--|--|--------|--------|--|--------|
| Freq. | Note | Detector | Spectrum | Factor | Actual | Limit | Margin |
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBµV/m | dBµV/m | dB |
| | | | | | | | |
| 100.81 | S | Peak | 54.18 | -23.69 | 30.49 | 43.5 | -13.01 |
| 166.77 | S | Peak | 51.17 | -23.63 | 27.53 | 43.5 | -15.97 |
| 352.04 | S | Peak | 42.60 | -17.31 | 25.29 | 46 | -20.71 |
| 503.36 | S | Peak | 42.30 | -14.15 | 28.15 | 46 | -17.85 |
| 576.11 | S | Peak | 40.98 | -12.45 | 28.53 | 46 | -17.47 |
| 672.14 | S | Peak | 41.07 | -11.68 | 29.39 | 46 | -16.61 |
| 4960.00 | Н | Peak | 36.96 | 10.99 | 47.96 | 74 | -26.04 |
| 4960.00 | Н | Average | 26.06 | 10.99 | 37.05 | 54 | -16.95 |
| 7440.00 | Н | Peak | - | - | - | - | - |
| 9920.00 | Н | Peak | - | - | - | - | - |
| 12400.00 | Н | Peak | - | - | - | - | - |
| 14880.00 | Н | Peak | - | - | - | - | - |
| 17360.00 | Н | Peak | - | - | - | - | - |
| 19840.00 | Н | Peak | - | - | - | - | - |
| 22320.00 | Н | Peak | - | - | - | - | - |
| 24800.00 | Н | Peak | - | - | - | - | - |



11. FREQUENCY SEPARATION

11.1. Standard Applicable

According to §15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25 kHz or the 2/3*20dB bandwidth of the hopping channel, whichever is greater.

11.2. Measurement Equipment Used:

Refer to section 7.2 for details.

11.3. Test Set-up:

Refer to section 7.3 for details.

11.4. Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set center frequency of spectrum analyzer = middle of hopping channel.
- 4. Set the spectrum analyzer as RBW, VBW=100 kHz, Adjust Span to 5MHz, Sweep = auto.
- 5. Max hold. Mark 3 Peaks of hopping channel and record the 3 peaks frequency.

11.5. Measurement Result:

| Channel separation (MHz) | Limit | Result |
|-----------------------------|---|--------|
| 1 | >=25 kHz or 2/3 times 20dB bandwidth | PASS |

Note: Refer to next page for plots.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Frequency Separation Test Data



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12. NUMBER OF HOPPING FREQUENCY

12.1. Standard Applicable

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands shall use at least 15 hopping frequencies.

12.2. Measurement Equipment Used:

Refer to section 7.2 for details.

12.3. Test Set-up:

Refer to section 7.3 for details.

12.4. Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set spectrum analyzer Start=2400MHz, Stop = 2483.5MHz, Sweep = auto.
- 4. Set the spectrum analyzer as RBW=430 kHz, VBW=1.5MHz., Detector = Peak
- 5. Max hold, view and count how many channel in the band.

12.5. Measurement Result:

Note: Refer to next page for plots.

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Channel Number

nt Spectrum Analyzer - Swept SA ALIGN AUTO Avg Type: Log-Pwr Frequency Center Freq 2.420500000 GHz 234 Trig: Free Run #Atten: 30 dB PNO: Fast PNNN DE Mkr1 2.402 000 GHz -2.22 dBm Auto Tune Ref Offset 4.43 dB Ref 20.00 dBm 10 dB/div Log **Center Freq** 2.420500000 GHz Start Freq 2.40000000 GHz Stop Freq 2.441000000 GHz CF Step 4.100000 MHz Man Auto Freq Offset 0 Hz Start 2.40000 GHz #Res BW 430 kHz Stop 2.44100 GHz Sweep 1.000 ms (1001 pts) #VBW 1.5 MHz

2.4 GHz - 2.441GHz

2.441 GHz - 2.4835GHz



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13. TIME OF OCCUPANCY (DWELL TIME)

13.1. Standard Applicable

According to \$15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz. The average time of occupancy on any frequency shall not greater than 0.4 s within period of 0.4 seconds multiplied by the number of hopping channel employed.

13.2. Measurement Equipment Used:

Refer to section 7.2 for details.

13.3. Test Set-up:

Refer to section 7.3 for details.

13.4. Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set center frequency of spectrum analyzer = operating frequency.
- 4. Set the spectrum analyzer as RBW, VBW=1MHz, 3MHz, Span = 0Hz, Detector = Peak, Adjust Sweep = 2~7ms.
- 5. Repeat above procedures until all frequency of the interest measured were complete.

Formula Deduced: time occupancy of one time slot X Hopping rate / total slot in one channel / total channel that hops X period of working channels.

Where, standard hopping rate is 1600 hops/s, slot in one channel for DH1, DH3, and DH5 is 2, 4, and 6, respectively.

DH1 consists of single time slot of the uplink, and one slot of the downlink Total Slot: 2

DH3 consists of three time slot of the uplink, and one slot of the downlink. Total Slot: 4

DH5 consists of five time slot of the uplink, and one slot of the downlink. Total Slot: 6

Note: the result of the complete test default channel at 1Mbps is recorded on the test report, 2Mbps, and 3Mbps only records the measurement result at middle channel that reveals no much deviation.

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13.5. Tabular Result of the Measurement:

1Mbps (GFSK):

| Test Channel: | Mode: | Measurement Result (ms): | Limit (ms): |
|---------------|-------|--------------------------|-------------|
| Low: | DH1 | 0.382 | 400ms |
| | DH3 | 1.64 | 400ms |
| | DH5 | 2.885 | 400ms |
| Middle: | DH1 | 0.382 | 400ms |
| | DH3 | 1.64 | 400ms |
| | DH5 | 2.885 | 400ms |
| High: | DH1 | 0.382 | 400ms |
| | DH3 | 1.64 | 400ms |
| | DH5 | 2.885 | 400ms |

2Mbps (Π /4 DQPSK):

| Test Channel: | Mode: | Measurement Result (ms): | Limit (ms): |
|---------------|-------|--------------------------|-------------|
| Middle: | 2DH1 | 0.382 | 400ms |
| | 2DH3 | 1.64 | 400ms |
| | 2DH5 | 2.885 | 400ms |

3Mbps (8DPSK):

| Test Channel: | Mode: | Measurement Result (ms): | Limit (ms): |
|---------------|-------|--------------------------|-------------|
| Middle: | 3DH1 | 0.382 | 400 |
| | 3DH3 | 1.64 | 400 |
| | 3DH5 | 2.885 | 400 |

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A period time = 0.4 (s) * 79 = 31.6 (s)

1Mbps:

| CH Low | DH1 time slot | = 0.382 | (ms) * (1600/2/79) | * 31.6 = 122.24 | (ms) |
|--------|---------------|---------|--------------------|-----------------|------|
| | DH3 time slot | = 1.64 | (ms) * (1600/4/79) | * 31.6 = 262.40 | (ms) |
| | DH5 time slot | = 2.885 | (ms) * (1600/6/79) | * 31.6 = 307.73 | (ms) |

CH Mid DH1 time slot =
$$0.382$$
 (ms) * (1600/2/79) * 31.6 = 122.24 (ms)
DH3 time slot = 1.64 (ms) * (1600/4/79) * 31.6 = 262.40 (ms)
DH5 time slot = 2.885 (ms) * (1600/6/79) * 31.6 = 307.73 (ms)

CH High DH1 time slot =
$$0.382$$
 (ms) * (1600/2/79) * 31.6 = 122.24 (ms)
DH3 time slot = 1.64 (ms) * (1600/4/79) * 31.6 = 262.40 (ms)
DH5 time slot = 2.885 (ms) * (1600/6/79) * 31.6 = 307.73 (ms)

2Mbps:

| | CH Mid | 2DH1 time slot = 0.382 | (ms) * (1600/2/79) | * 31.6 = 122.24 | (ms) |
|--------|--------|--------------------------|--------------------|-----------------|------|
| | | 2DH3 time slot = 1.64 | (ms) * (1600/4/79) | * 31.6 = 262.40 | (ms) |
| | | 2DH5 time slot = 2.885 | (ms) * (1600/6/79) | * 31.6 = 307.73 | (ms) |
| 3Mbps: | | | | | |
| | CH Mid | 3DH1 time slot = 0.382 | (ms) * (1600/2/79) | * 31.6 = 122.24 | (ms) |
| | | 3DH3 time slot = 1.64 | (ms) * (1600/4/79) | * 31.6 = 262.40 | (ms) |
| | | 3DH5 time slot = 2.885 | (ms) * (1600/6/79) | * 31.6 = 307.73 | (ms) |

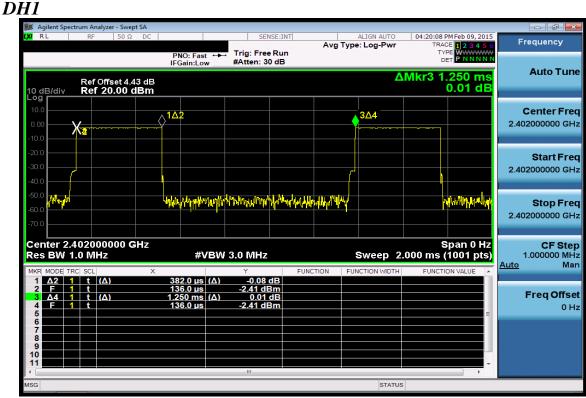
13.6. Measurement Result:

Note: Refer to next page for plots.

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CH-Low



DH3



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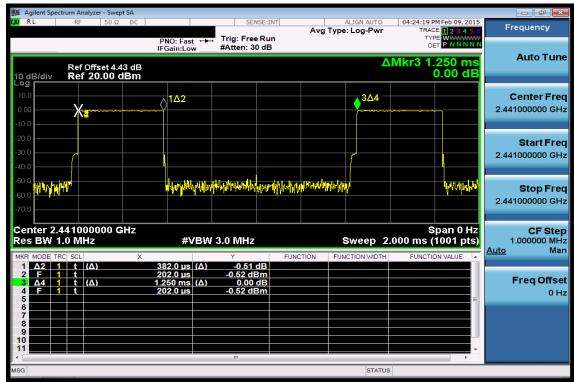


DH5

| Agilent Spectrum Analyzer - Swept SA | | | | | |
|---|--------------|--|---------------------------------|---|--|
| IX RL RF 50Ω DC | | SENSE:INT | ALIGN AUTO Avg Type: Log-Pwr | 04:36:41 PM Feb 09, 2015 TRACE 1 2 3 4 5 6 TYPE WWWWWWW | Frequency |
| Ref Offset 4.43 dB 10 dB/div Ref 20.00 dBm | | g: Free Run tten: 30 dB | Ľ | Mkr3 3.752 ms -0.01 dB | Auto Tune |
| 10.0 0.00 -10.0 | | 1Δ2 | .4 | | Center Freq 2.402000000 GHz |
| -20.0 | | | | | Start Freq 2.402000000 GHz |
| -60.0 (Marcal -60.0 | | ppArtent Appendix | | vik.tymetry | Stop Freq 2.402000000 GHz |
| Center 2.402000000 GHz Res BW 1.0 MHz | #VBW 3.0 | | Sweep 7 | Span 0 Hz 2.533 ms (1001 pts) | CF Step 1.000000 MHz <u>Auto</u> Mar |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 3.752 ms (A) | -0.06 dB 2.28 dBm -0.01 dB 2.28 dBm | | | Freq Offset 0 Hz |
| 6 7 8 9 10 | | | | | |
| .∢ [MSG | | m | STATU | S | |

CH-Mid

DH1

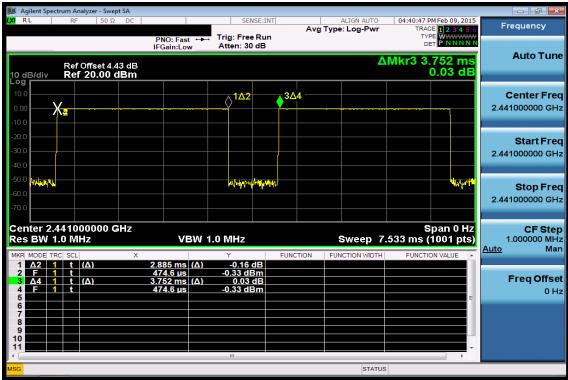




DH3

| 📁 Agilent Spectrum Analyzer - Swept SA | | | | |
|---|--|-------------------|---|--|
| LXI RE 50 Ω DC | SENSE: | Avg Type: Log-Pwr | 04:32:57 PM Feb 09, 2015 TRACE 1 2 3 4 5 6 TYPE WWWWW | Frequency |
| Ref Offset 4.43 dB 10 dB/div Ref 20.00 dBm | PNO: Fast + I rig: Free Rt IFGain:Low #Atten: 30 db | 3 | Mkr3 2.500 ms 0.00 dB | Auto Tune |
| 10.0 0.00 -10.0 | 1∆2 | 3Δ4 | | Center Freq 2.441000000 GHz |
| -20.0 | | | | Start Freq 2.441000000 GHz |
| -60.0 | south in the second sec | dWenderhald | ntwenter New Texa | Stop Freq 2.441000000 GHz |
| Center 2.441000000 GHz Res BW 1.0 MHz | #VBW 3.0 MHz | Sweep 5. | Span 0 Hz 000 ms (1001 pts) | CF Step 1.000000 MHz <u>Auto</u> Man |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 1.640 ms (Δ) 0.01 dB 670.0 μs -0.47 dBm 2.500 ms (Δ) 0.00 dB 670.0 μs -0.47 dBm | | | Freq Offset 0 Hz |
| 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | m | STATUS | | |

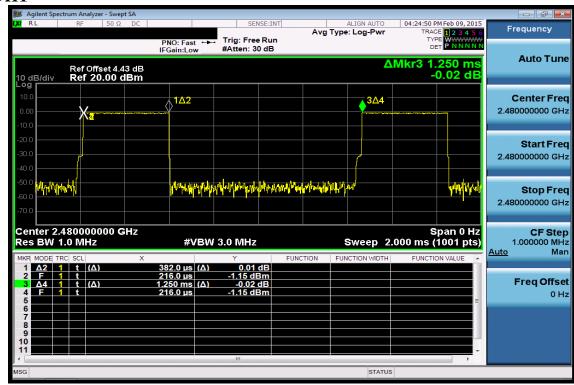
DH5



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CH-High DH1



DH3

| | trum Analyzer - Swept | SA | | | | |
|---|---------------------------------|---|---|---------------------------------|--|--|
| IXI RL | RF 50 Ω | DC | SENSE:INT | ALIGN AUTO Avg Type: Log-Pwr | 04:33:56 PM Feb 09, 2015 TRACE 1 2 3 4 5 6 TYPE WWWWWW | Frequency |
| 10 dB/div | Ref Offset 4.43 Ref 20.00 dl | | #Atten: 30 dB | Δ | Mkr3 2.500 ms -0.01 dB | Auto Tune |
| 10.0 0.00 | | | 2 ▲3△ | 4 | | Center Freq 2.480000000 GHz |
| -20.0 | | | | | | Start Freq 2.48000000 GHz |
| -50.0 +++++++++++++++++++++++++++++++++++ | | | onnt-annihandan | | with an all and | Stop Freq 2.480000000 GHz |
| Center 2.4 Res BW 1 | | #VBW | 3.0 MHz | | Span 0 Hz .000 ms (1001 pts) | CF Step 1.000000 MHz <u>Auto</u> Man |
| 1 <u>A2</u> 2 F 1 3 <u>A4</u> 1 4 F 1 5 | t (Δ) t (Δ) t (Δ) t | × 1.640 ms (Δ) 200.0 μs 2.500 ms (Δ) 200.0 μs | 0.00 dB -1.07 dBm -0.01 dB -1.07 dBm | INCTION FUNCTION WIDTH | | Freq Offset 0 Hz |
| 6 7 8 9 10 11 | | | | | | |
| MSG 🗼 File • | <1234.PNG> sav | red | m | STATUS | 5 | |

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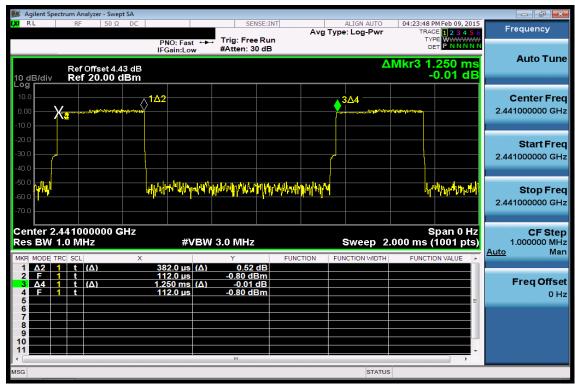


DH5

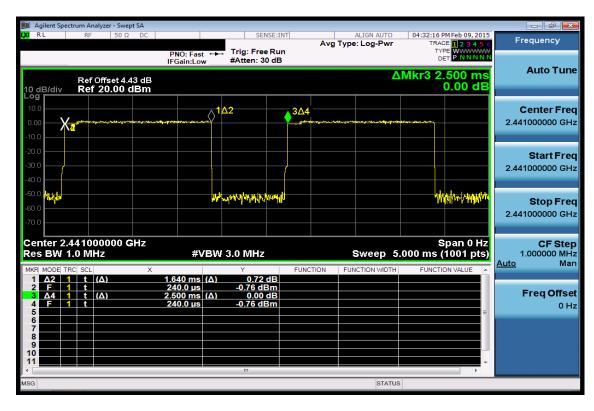
| | ilent Spect | | | | SA | | | | | | | | | | | | | | |
|---|--|------|------------|--------|----|----------------------------------|-----------------|-----|--|-----------|--------------------|------|---|-------------|---------|------------|-----------------|----------|---|
| l <mark>XI</mark> R | L | RF | 5 | 50 Ω | DC | | | | SEI | NSE:IN | Т | Ava | | LIGN AUTO | | | eb 09, 20 | | Frequency |
| | | Ref | Offse | t 4 43 | dB | PNO: IFGair | Fast ⊷ n:Low | | Frig: Free Atten: 30 | | | | .,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | 1 | DET | 52 m | | Auto Tune |
| 10 di | B/div | | f 20.0 | | | | | | | | | | | | | 0.0 | 02 dl | В | |
| Log 10.0 0.00 | -x | 22 | | | | | | | \ | | <mark>∮</mark> 3∆4 | | | | | |] | | Center Freq 2.480000000 GHz |
| -20.0 -30.0 -40.0 | | | | | | | | | | | | | | | | | | | Start Freq 2.480000000 GHz |
| -50.0 -60.0 -70.0 | milit | | | | | | | | MAN AT | letoph 18 | | | | | | | ¥ 4 ,/*\ | д | Stop Freq 2.480000000 GHz |
| Res | ter 2.4 BW 1 | .0 M | Hz | 0 GI | | | VBW | 1.0 | MHz | | FUNC | TION | | Sweep 7 | .533 ms | Spa (10 | | 5) | CF Step 1.000000 MHz <u>Auto</u> Man |
| MKR 1 2 3 4 5 6 7 8 9 10 11 < | MODE TR A2 1 F 1 A4 1 F 1 F 1 | t | (Δ) (Δ) | | X | 2.885 391.7 3.752 391.7 | ′us ms (∆ | | Y -0.11 -0.97 dl 0.02 -0.97 dl | Bm dB | FUNC | TION | FUN | CTION WIDTH | FUNC | | ALUE | 4 III + | Freq Offset 0 Hz |
| MSG | | | | | | | | | | | | | | STATUS | 3 | | | | |



CH-Mid 2DH1

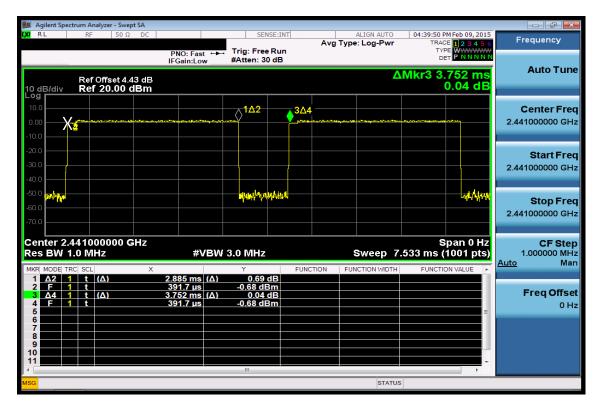


2DH3





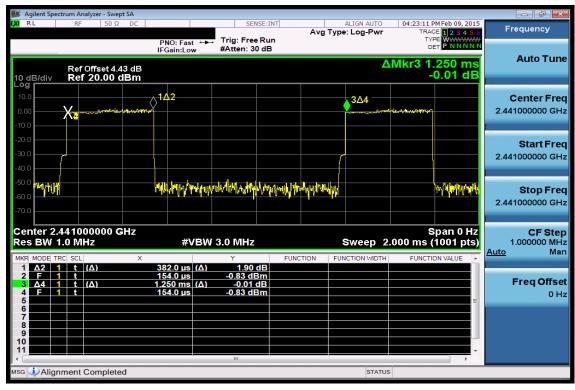
2DH5



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CH-Mid 3DH1



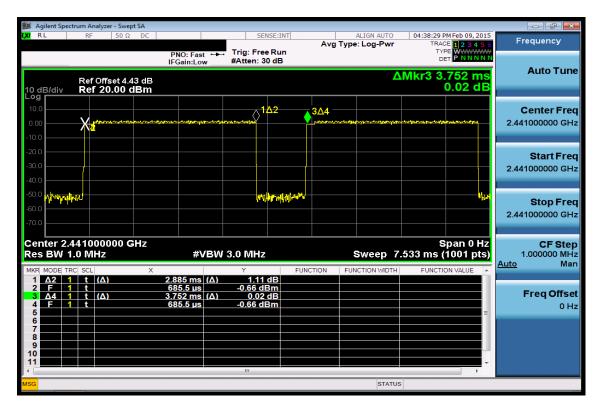
3DH3

| 🎉 Agilent Sp | pectrum A | nalyzer - Sv | vept SA | | | | | | | | | | |
|--------------------------------|-------------------|-----------------------|--|----------------------------------|--------------|-------------------------------|---------------------|------|-----------|---------------------------------|--------------------|---------------------------|--------------------------------------|
| LXI RL | RF | 50 | Ω DC | | _ | SE | NSE:INT | | Ave | ALIGN AUTO Type: Log-Pwr | 04:31:28 PM F | eb 09, 2015 | Frequency |
| | | | | PNO: Fast IFGain:Lov | | Trig: Fre #Atten: 3 | | | Avg | Type. Log-F wi | TYPE | 23450 WWWWWW PNNNNN | |
| 10 dB/div Log | | f Offset 4 f 20.00 | | | | | | | | Δ | Mkr3 2.5 -0. | 00 ms 02 dB | Auto Tune |
| 10.0 | X² | NedifyeedPress | the state of the s | Pouriesidulations | •••••••••••• | ∆2 | | 344 | Weitigset | marchandigtowthysparetimescaler | | | Center Freq 2.441000000 GHz |
| -20.0 -30.0 -40.0 | | | | | | | | | | | | | Start Freq 2.441000000 GHz |
| -50.0 -60.0 -70.0 | w | | | | - with | vinder ¹ 01/101 | 1 7 90/10/11 | | | | | der-titlerft | Stop Freq 2.441000000 GHz |
| Center 2 Res BW | | | GHz | #V | 'BW 3 | 3.0 MHz | | | | Sweep 5 | Spa 000 ms (10. | an 0 Hz 101 pts) | CF Step 1.000000 MHz Auto Man |
| MKR MODE | TRC SCL | (A) | Х | 1.640 ms | () | Y 0.99 | | FUNC | TION | FUNCTION WIDTH | FUNCTION | VALUE 🔺 | <u>Auto</u> Mari |
| 2 F 3 <u>Δ4</u> 4 F 5 | 1 t 1 t 1 t | (Δ) (Δ) | | 295.0 µs 2.500 ms 295.0 µs | | -0.69 dl -0.02 -0.69 dl | Bm dB | | | | | | Freq Offset 0 Hz |
| 6 7 8 9 10 11 | | | | | | | | | | | | | |
| | | | | | | III | | | | | | • | |
| мsg 🗼 Ali | gnment | Comple | ted | | | | | | | STATUS | 5 | | |

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3DH5





14. ANTENNA REQUIREMENT

14.1. Standard Applicable

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

14.2. Antenna Connected Construction

The directional gains of antenna used for transmitting is 0.76 dBi, and the antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

~ End of Report ~

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