



Page 1 of 102

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT **AND INDUSTRY CANADA RSS 247**

OF

Product Name: HUAWEI MateBook

Brand Name: HUAWEI

Model No.: WT-W09, WT-W19

Model Difference: N/A

FCC ID: **QISWT-WX9**

IC: 6369A-WTWX9

Report No.: E2/2017/20016

Issue Date: Mar. 08, 2017

FCC Rule Part: §15.247, Cat: DTS

IC Rule Part: RSS-247 issue 2 Feb. 2017

Prepared for: HUAWEI TECHNOLOGIES CO., LTD.

> Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

Prepared by: SGS Taiwan Ltd.

Electronics & Communication Laboratory

No.2, Keji 1st Rd., Guishan District, Taoyuan

City, Taiwan 333



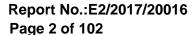


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VERIFICATION OF COMPLIANCE

Applicant: HUAWEI TECHNOLOGIES CO., LTD.

Administration Building, Headquarters of Huawei Technologies

Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C.

Product Name: HUAWEI MateBook

Brand Name: HUAWEI

Model No.: WT-W09, WT-W19

Model Difference: N/A

FCC ID: QISWT-WX9

IC: 6369A-WTWX9

File Number: E2/2017/20016

Date of Test: Feb. 17, 2017 ~ Feb. 18, 2017

Date of EUT Received: Feb. 02, 2017

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 C63.10:2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

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

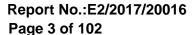
| Test By: | Iony Chen | Date: | Mar. 08, 2017 | |
|--------------|--|-------|---------------|---|
| Prepared By: | Pony Chen / Engineer | Date: | Mar. 08, 2017 | • |
| Approved By: | Allen Tsai / Sr. Engineer Lang Jim Chang / Asst. Manager | Date: | Mar. 08, 2017 | |

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Revision History

| Report Number | Revision | Description | Issue Date |
|---------------|----------|------------------------------|---------------|
| E2/2017/20016 | Rev.00 | Initial creation of document | Mar. 08, 2017 |
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GENERAL INFORMATION

1.1 Product description

General:

| Jeneral. | | |
|------------------------------|---|--|
| Product Name: | HUAWEI MateBook | |
| Brand Name: | HUAWEI | |
| Model No.: | WT-W09, WT-W19 | |
| Model Difference: | N/A | |
| Product SW/HW version: | 19.45/ V1.1 | |
| Radio SW/HW version: | 19.0 / 19.0 | |
| Test SW Version: | N/A | |
| RF power setting in TEST SW: | DRTU 1.9.1-04155 | |
| | 7.6Vdc from Rechargeable Li-ion Battery | |
| Power Supply: | Battery: 1. Model No.: HB54A9Q3ECW Supplier: Sunwoda Electronic Co., Ltd. 2. Model No.: HB54A9Q3ECW Supplier: Huizhou Desay Battery Co., Ltd | |
| | Adapter: Model No.: HW-200200UP0 Supplier: HUAWEI | |

WLAN 2.4GHz:

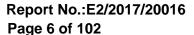
| Wi-Fi | Frequency Range | Channels | Rated Power in dBm (Peak) | Rated Power in dBm (EIRP) | Type of Emission | Modulation Technology | |
|--|--------------------|-----------|--|---------------------------|---------------------|--------------------------|--|
| 802.11b | | | 20.33 | 14.16 | 14M1G1D | DSSS, | |
| 802.11g | 2412-2462 | 11 | 22.25 | 13.16 | 16M6D1D | | |
| 802.11n HT20 | | | 21.88 | 12.69 | 17M8D1D | OFDM | |
| 802.11n HT40 | 2422-2452 | 9 | 21.61 | 12.68 | 36M4D1D | | |
| Antenna Designation: | | Main Ante | PIFA Antenna, Main Antenna Gain: -3.30 dBi Aux Antenna Gain: -3.50 dBi | | | | |
| Modulation type: CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM | | | | | | | |
| 802.11 b: 1/2/5.5/11 Mbps 802.11 g: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 144.4Mbps 802.11 n_40MHz: 13.5 – 300.0Mbps | | | | | | | |

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1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247

FCC KDB 558074 D01 DTS Meas. Guidance

FCC KDB 662911 D01 Multiple Transmitter Output

Canada RSS-247 issue 2 Feb. 2017

Canada RSS-Gen issue 4 Nov. 2014

ANSI C63.10:2013

Note: All test items have been performed and record as per the above standards.

1.3 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333

(TAF code 0513)

FCC Registration Numbers are: 735305

Canada Registration Number: 4620A-5 .

1.4 Special Accessories

There are no special accessories used while test was conducted.

1.5 Equipment Modifications

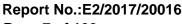
There was no modification incorporated into the EUT.

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SYSTEM TEST CONFIGURATION

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. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz,. The CISPR Quasi-Peak and Average detector mode is employed according to §15.207. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 **Radiated Emissions**

The EUT is a placed on as turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. 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 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.

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2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

Following shows an offset computation example with cable loss and attenuator.

Note: The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset:

= RF cable loss (dB)+ attenuation factor(dB) dB =11.20 (dB)

2.5 Configuration of Tested System

Fig. 2-1 Radiated Emission Configuration



Fig. 2-2 Conducted Emission (AC Power Line) Configuration

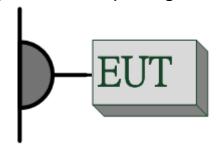


Fig.2-3 Conducted Emission (Antenna Port) Configuration

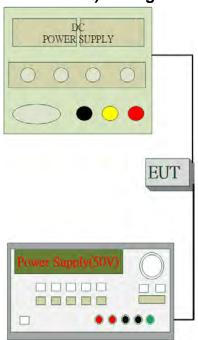


Table 2-1 Equipment Used in Tested System

| Item | Equipment | Mfr/Brand | Model/Type No. | Series No. | Data Cable | Power Cord |
|------|----------------------------|-----------|-------------------|------------|------------|-------------|
| 1 | Bluetooth Test Software | N/A | N/A | N/A | N/A | N/A |
| 2 | DC Power Supply | Agilent | E3640A | MY53140006 | N/A | Un-Shielded |
| 3. | DC Power Supply | Agilent | E3634A | MY53180030 | N/A | Un-Shielded |

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SUMMARY OF TEST RESULTS

| FCC Rules | IC Rules | Description Of Test | Result |
|-----------------------|----------------------------------|---|-----------|
| §15.207(a) | RSS-Gen §8.8 | AC Power Line Conducted Emission | Compliant |
| §15.247(b) (3) | RSS-247 §5.4(4) | Peak Output Power | Compliant |
| §15.247(a)(2) | RSS-247 §5.2 (1) RSS-Gen §6.6 | 6dB & 99% Emission Bandwidth | Compliant |
| §15.247(d) | RSS-247 §5.5 | Conducted Band Edge and Spurious Emission | Compliant |
| §15.247(d) | RSS-247 §5.5 | Radiated Band Edge and Spurious Emission | Compliant |
| §15.247(e) | RSS-247 §5.2(2) | Power Spectral Density | Compliant |
| §15.203 §15.247(b) | RSS- Gen §6.7 RSS- Gen §8.3 | Antenna Requirement | Compliant |

DESCRIPTION OF TEST MODES

4.1 Operated in 2400 ~ 2483.5MHz Band

11 channels are provided for 802.11b, 802.11g and 802.11n_HT20

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 1 | 2412 MHz | 7 | 2442 MHz |
| 2 | 2417 MHz | 8 | 2447 MHz |
| 3 | 2422 MHz | 9 | 2452 MHz |
| 4 | 2427 MHz | 10 | 2457 MHz |
| 5 | 2432 MHz | 11 | 2462 MHz |
| 6 | 2437 MHz | | |

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4.2 The Worst Test Modes and Channel Details

- 1. The EUT has been tested under operating condition.
- 2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
- 3. Investigation has been done on all the possible configurations for searching the worst case.

RADIATED EMISSION TEST:

| RADIATED EMISSION TEST (BELOW 1 GHz) | | | | | |
|--------------------------------------|----------------------|-------------------|------------|---------------------|-----------------|
| MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION | DATA RATE (Mbps) | ANTENNA PORT |
| 802.11g | 1 to 11 | 1,6,11 | OFDM | 6 | MIMO |

| | RADIATED EMISSION TEST (ABOVE 1 GHz) | | | | | |
|----------------|--------------------------------------|-------------------|------------|---------------------|-----------------|--|
| MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION | DATA RATE (Mbps) | ANTENNA PORT | |
| 802.11b | 1 to 11 | 1, 6, 11 | DSSS | 1 | MIMO | |
| 802.11g | 1 to 11 | 1, 6, 11 | OFDM | 6 | MIMO | |
| 802.11n (HT20) | 1 to 11 | 1, 6, 11 | OFDM | MCS 0 | MIMO | |
| 802.11n (HT40) | 3 to 9 | 3, 6, 9 | OFDM | MCS 8 | MIMO | |

Note:

The field strength of radiation emission was measured as EUT lie down position (E2 mode).

ANTENNA PORT CONDUCTED MEASUREMENT:

| | CONDUCTED TEST | | | | | |
|----------------|----------------------|-------------------|------------|---------------------|-----------------|--|
| MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION | DATA RATE (Mbps) | ANTENNA PORT | |
| 802.11b | 1 to 11 | 1, 6, 11 | DSSS | 11 | MIMO | |
| 802.11g | 1 to 11 | 1, 6, 11 | OFDM | 54 | MIMO | |
| 802.11n (HT20) | 1 to 11 | 1, 6, 11 | OFDM | MCS 8 | MIMO | |
| 802.11n (HT40) | 3 to 9 | 3, 6, 9 | OFDM | MCS 8 | MIMO | |

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Directional gain (MIMO)

The Tx transmission to construct MIMO operation is cyclic delay diversity, and the following deduction to obtain the array gain of MIMO operation is based on the approach given by KDB 662911 D01.

Array gain = 3.01 dBi (peak spectral density, conducted spurious emission) Gain that is combined with different magnitude of two antennas:

- (ii) If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream:
 - Directional gain may be calculated by using the formulas applicable to equal gain antennas
 with G_{ANT} set equal to the gain of the antenna having the highest gain; or,

$$Directional Gain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^{2}}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

 N_{SS} = the number of independent spatial streams of data;

 N_{ANT} = the total number of antennas

 $g_{j,k} = 10^{G_k/20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not; G_k is the gain in dBi of the kth antenna.

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MEASUREMENT UNCERTAINTY

| Test Items | Uncertainty |
|---|-----------------------------|
| AC Power Line Conducted Emission | +/- 2.586 dB |
| Peak Output Power | +/- 0.84 dB |
| 6dB Bandwidth | +/- 51.33 Hz |
| 100 KHz Bandwidth Of Frequency Band Edge | +/- 0.84 dB |
| Peak Power Density | +/- 1.3 dB |
| Temperature | +/- 0.65 °C |
| Humidity | +/- 4.6 % |
| DC / AC Power Source | DC= +/- 0.13%, AC= +/- 0.2% |

Radiated Spurious Emission:

| | 9kHz-30MHz: +/-2.87dB |
|-----------------------------------|----------------------------|
| | 30MHz - 180MHz: +/- 3.37dB |
| Measurement uncertainty | 180MHz -417MHz: +/- 3.19dB |
| (Polarization : Vertical) | 0.417GHz-1GHz: +/- 3.19dB |
| | 1GHz - 18GHz: +/- 4.04dB |
| | 18GHz - 40GHz: +/- 4.04dB |

| | 9kHz-30MHz: +/-2.87dB |
|-------------------------------------|----------------------------|
| | 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

6.1 Standard Applicable

Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

| Frequency range | Lin dB(| nits 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 |

6.2 Measurement Equipment Used

| Conducted Emission Test Site | | | | | | | | | |
|------------------------------|-------------|-------------------|------------------|--------------|------------|--|--|--|--|
| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | CAL DUE. | | | | |
| EMI Test Receiver | R&S | ESCI 7 | 100950 | 12/08/2016 | 12/07/2017 | | | | |
| Coaxial Cables | N/A | N30N30-1042-150cm | N/A | 08/30/2016 | 08/29/2017 | | | | |
| LISN | Schwarzbeck | NSLK 8127 | 8127-648 | 03/11/2016 | 03/10/2017 | | | | |
| 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 63.10:2013.
- 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.

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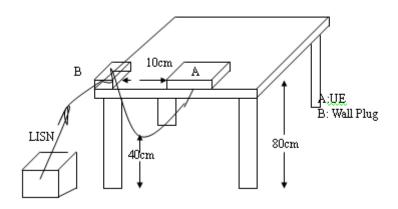
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^{1.} The lower limit shall apply at the transition frequencies

^{2.} The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.



6.4 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 phases of power being supplied by given UE are completed

6.6 Measurement Result

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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Operation Mode: operation mode Test By: Pony

Site: Conduction Room Phase: Temperature: 22.4 °C L1

AC 120V/60Hz Humidity: 56 % Limit: FCC Class B Conduction(QP) Power:

Mode: Kollur Note: ADP-100PB

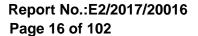
Conducted Emission Data :#557 Date: 2017/2/18 File: Condution Time: 上午 09:48:20 80.0 dBuV FCC Class B Conduction(QP) FCC Class B Conduction(AVG) 0.0 (MHz) 30,000 0 150

| No. Mk. | Freq. | Reading Level | Correct Factor | Measure- ment | Limit | Over | | |
|---------|--------|------------------|-------------------|------------------|-------|--------|----------|---------|
| | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | 0.1860 | 54.80 | 0.35 | 55.15 | 64.21 | -9.06 | QP | |
| 2 * | 0.1860 | 44.90 | 0.35 | 45.25 | 54.21 | -8.96 | AVG | |
| 3 | 0.2380 | 49.78 | 0.36 | 50.14 | 62.17 | -12.03 | peak | |
| 4 | 0.2860 | 45.44 | 0.36 | 45.80 | 60.64 | -14.84 | peak | |
| 5 | 0.4740 | 43.82 | 0.37 | 44.19 | 56.44 | -12.25 | peak | |
| 6 | 0.5660 | 40.43 | 0.36 | 40.79 | 56.00 | -15.21 | peak | |
| 7 | 9.3580 | 31.09 | 0.60 | 31.69 | 60.00 | -28.31 | peak | |

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Site: Conduction Room

Limit: FCC Class B Conduction(QP)

Phase:

N

I emperature: 22.4 °C

Power:

AC 120V/60Hz

Humidity: 56 %

30,000

Mode: Kollur

0.150

Note: ADP-100PB

Conducted Emission Date: 2017/2/18 File: Condution Data:#558 Time: 上午 09:50:21 80.0 dBuV FCC Class B Conduction(QP) FCC Class B Conduction(AVG) 0.0

| No. Mk | د. Fre | q. | Reading Level | Correct Factor | Measure- ment | Limit | Over | | |
|--------|--------|-----|------------------|-------------------|------------------|-------|--------|----------|---------|
| | МН | Z | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 * | 0.18 | 360 | 55.80 | 0.39 | 56.19 | 64.21 | -8.02 | QP | |
| 2 | 0.18 | 360 | 40.30 | 0.39 | 40.69 | 54.21 | -13.52 | AVG | |
| 3 | 0.23 | 300 | 47.84 | 0.39 | 48.23 | 62.45 | -14.22 | peak | |
| 4 | 0.42 | 260 | 41.50 | 0.39 | 41.89 | 57.33 | -15.44 | peak | |
| 5 | 0.52 | 220 | 40.85 | 0.40 | 41.25 | 56.00 | -14.75 | peak | |
| 6 | 4.06 | 60 | 33.60 | 0.44 | 34.04 | 56.00 | -21.96 | peak | |
| 7 | 9.4 | 100 | 30.52 | 0.63 | 31.15 | 60.00 | -28.85 | peak | |

(MHz)

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DUTY CYCLE OF TEST SIGNAL

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

Formula:

Duty Cycle = Ton / (Ton+Toff)

Measurement Procedure:

- 1. Set span = Zero
- 2. RBW = 8MHz
- 3. VBW = 8MHz,
- 4. Detector = Peak

Duty Cycle:

| | Duty Cycle (%) | Duty Factor (dB) |
|------------|-------------------|------------------|
| 802.11b | 98.75 | 0.05 |
| 802.11g | 94.51 | 0.25 |
| 802.11n_20 | 95.50 | 0.20 |
| 802.11n_40 | 84.38 | 0.74 |

b = 98.75%, g = 94.51%, $n_ht_20 = 95.5\%$, $n_ht_40 = 84.38\%$

Duty Cycle Factor: $10 * \log(1/0.9875) = 0.05$ Duty Cycle Factor: $10 * \log(1/0.9451) = 0.25$ Duty Cycle Factor: $10 * \log(1/0.955) = 0.2$ Duty Cycle Factor: $10 * \log(1/0.8438) = 0.74$

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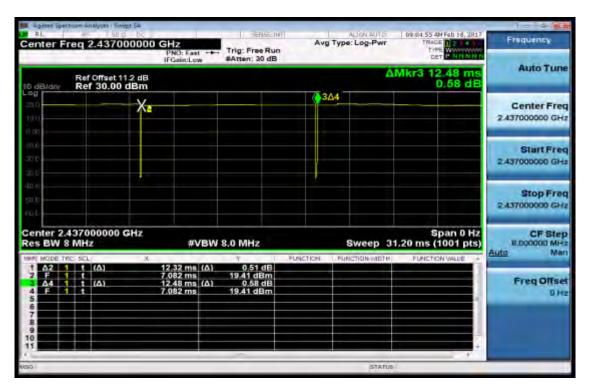
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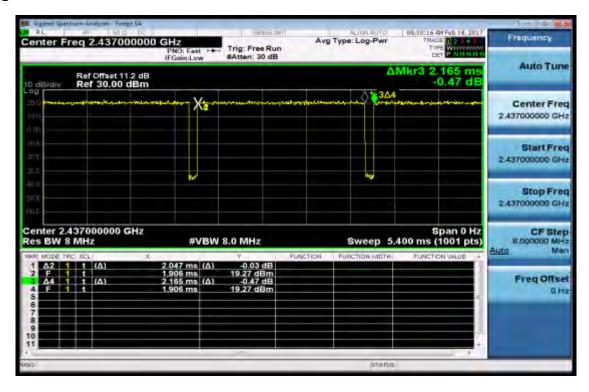
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7.1 DUTY CYCLE TEST SIGNAL Measurement Result 802.11 b



802.11 g



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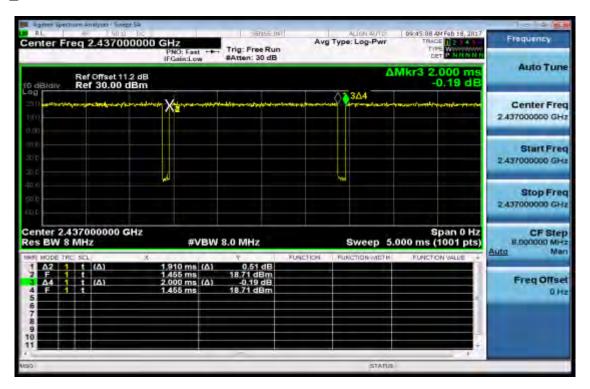
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802.11 n_20 MHz



802.11 n_40 MHz

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PEAK OUTPUT POWER MEASUREMENT

8.1 Standard Applicable

For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt.

Per RSS-247 §5.4(4)

For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. Except as provided in Section 5.4(5), the e.i.r.p. shall not exceed 4 W.

If the transmitting antenna of directional gain greater than 6dBi are used the peak output power form the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6dBi.

In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of Antenna exceeds 6dBi.

-3.30 dBi Main Antenna Gain: Aux 1 Antenna Gain: *-3.50* dBi Number Antenna: 2 pcs Limit: *30* dBm

The antenna gain is not grater than 6dBi in MIMO mode and the limit is not reduced:

Directional gain = gain of antenna element + 10 log (# of TX antenna elements) Effective Legacy Gain (dBi) = -3.3+3.01=-0.29dBi Limit: 30dBm - (-0.29- 6dBi)=30

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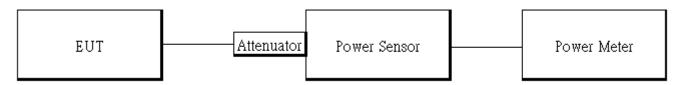


8.2 Measurement Equipment Used

| Conducted Emission Test Site | | | | | | | | |
|------------------------------|------------|--------------------|------------|------------|------------|--|--|--|
| EQUIPMENT | MFR | MODEL | SERIAL | LAST | CAL DUE. | | | |
| TYPE | | NUMBER | NUMBER | CAL. | | | | |
| Power Meter | Anritsu | ML2496A | 1326001 | 06/23/2016 | 06/22/2017 | | | |
| Power Sensor | Anritsu | MA2411B | 1315048 | 06/23/2016 | 06/22/2017 | | | |
| Power Sensor | Anritsu | MA2411B | 1315049 | 06/23/2016 | 06/22/2017 | | | |
| Coaxial Cable 30cm | WOKEN | 00100A1F1A1 95C | RF01 | 12/12/2016 | 12/11/2017 | | | |
| DC Block | PASTERNACK | PE8210 | RF29 | 12/12/2016 | 12/11/2017 | | | |
| Attenuator | WOKEN | 218FS-10 | RF23 | 12/12/2016 | 12/11/2017 | | | |
| DC Power Supply | Agilent | E3640A | MY53140006 | 05/04/2016 | 05/03/2017 | | | |
| DC Power Supply | Agilent | E3634A | MY53180030 | 05/17/2016 | 05/16/2017 | | | |

8.3 Test Set-up

Power Meter:



8.4 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.

Power Meter:

It is used as the auxiliary test equipment to conduct the output power measurement.

4. Record the max. Reading as observed from Spectrum or Power Meter.

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8.5 Measurement Result

| 802.1 | 1b Main | | | | | |
|-------|----------------|--------------|--|---|--------------------|---------|
| СН | Freq. (MHz) | Data Rate | Peak Output Power (dBm) | Peak Output Power (mW) | Limit | RESULT |
| 1 | 2412 | 1 | 19.42 | 87.50 | 1 Watt = 30.00 dBm | PASS |
| 6 | 2437 | 1 | 20.33 | 107.89 | 1 Watt = 30.00 dBm | PASS |
| 11 | 2462 | 1 | 20.28 | 106.66 | 1 Watt = 30.00 dBm | PASS |
| 802.1 | 1b Main | | | | | |
| СН | Freq. (MHz) | Data Rate | Max. Output include tune up tolerance Power (dBm) | Max. Output include tune up tolerance Power (mW) | Limit | RESULT |
| 1 | 2412 | 1 | 16.48 | 44.46 | 1 Watt = 30.00 dBm | PASS |
| 6 | 2437 | 1 | 17.45 | 55.59 | 1 Watt = 30.00 dBm | PASS |
| 11 | 2462 | 1 | 17.46 | 55.72 | 1 Watt = 30.00 dBm | PASS |
| 802.1 | 1b Aux1 | | | | | |
| СН | Freq. (MHz) | Data Rate | Peak Output Power (dBm) | Peak Output Power (mW) | Limit | RESULT |
| 1 | 2412 | 1 | 19.17 | 82.60 | 1 Watt = 30.00 dBm | PASS |
| 6 | 2437 | 1 | 20.26 | 106.17 | 1 Watt = 30.00 dBm | PASS |
| 11 | 2462 | 1 | 20.16 | 103.75 | 1 Watt = 30.00 dBm | PASS |
| 802.1 | 1b Aux1 | | | | | |
| СН | Freq. (MHz) | Data Rate | Max. Output include tune up tolerance Power (dBm) | Max. Output include tune up tolerance Power (mW) | Limit | RESULT |
| 1 | 2412 | 1 | 16.43 | 43.95 | 1 Watt = 30.00 dBm | PASS |
| 6 | 2437 | 1 | 17.43 | 55.34 | 1 Watt = 30.00 dBm | PASS |
| 44 | 0.470 | 4 | 47.44 | EE 47 | 4 14/ 11 00 00 10 | D.4.0.0 |

17.44

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f (886-2) 2298-0488

1 Watt =

30.00

dBm

2462

PASS



| 802.1 | 1g Main | | | | | |
|-------|----------------|--------------|--|---|--------------------|--------|
| СН | Freq. (MHz) | Data Rate | Peak Output Power (dBm) | Peak Output Power (mW) | Limit | RESULT |
| 1 | 2412 | 6 | 21.38 | 137.40 | 1 Watt = 30.00 dBm | PASS |
| 6 | 2437 | 6 | 22.25 | 167.88 | 1 Watt = 30.00 dBm | PASS |
| 11 | 2462 | 6 | 22.23 | 167.11 | 1 Watt = 30.00 dBm | PASS |
| 802.1 | 1g Main | | | | | |
| СН | Freq. (MHz) | Data Rate | Max. Output include tune up tolerance Power (dBm) | Max. Output include tune up tolerance Power (mW) | Limit | RESULT |
| 1 | 2412 | 6 | 15.46 | 35.16 | 1 Watt = 30.00 dBm | PASS |
| 6 | 2437 | 6 | 16.45 | 44.16 | 1 Watt = 30.00 dBm | PASS |
| 11 | 2462 | 6 | 16.46 | 44.26 | 1 Watt = 30.00 dBm | PASS |
| 802.1 | 1g Aux1 | | | | | |
| СН | Freq. (MHz) | Data Rate | Peak Output Power (dBm) | Peak Output Power (mW) | Limit | RESULT |
| 1 | 2412 | 6 | 21.13 | 129.72 | 1 Watt = 30.00 dBm | PASS |
| 6 | 2437 | 6 | 22.19 | 165.58 | 1 Watt = 30.00 dBm | PASS |
| 11 | 2462 | 6 | 22.14 | 163.68 | 1 Watt = 30.00 dBm | PASS |
| 802.1 | 1g Aux1 | | | | | |
| СН | Freq. (MHz) | Data Rate | Max. Output include tune up tolerance Power (dBm) | Max. Output include tune up tolerance Power (mW) | Limit | RESULT |
| 1 | 2412 | 6 | 15.45 | 35.08 | 1 Watt = 30.00 dBm | PASS |
| 6 | 2437 | 6 | 16.42 | 43.85 | 1 Watt = 30.00 dBm | PASS |
| 11 | 2462 | 6 | 16.45 | 44.16 | 1 Watt = 30.00 dBm | PASS |

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| 802.1 | 1n_HT20 | M Main | | | | |
|-------|----------------|--------------|--|---|--------------------|--------|
| СН | Freq. (MHz) | Data Rate | Peak Output Power (dBm) | Peak Output Power (mW) | Limit | RESULT |
| 1 | 2412 | MCS0 | 21.86 | 153.46 | 1 Watt = 30.00 dBm | PASS |
| 6 | 2437 | MCS0 | 21.81 | 151.71 | 1 Watt = 30.00 dBm | PASS |
| 11 | 2462 | MCS0 | 21.88 | 154.17 | 1 Watt = 30.00 dBm | PASS |
| 802.1 | 1n_HT20 | M Main | | | | |
| СН | Freq. (MHz) | Data Rate | Max. Output include tune up tolerance Power (dBm) | Max. Output include tune up tolerance Power (mW) | Limit | RESULT |
| 1 | 2412 | MCS0 | 15.98 | 39.63 | 1 Watt = 30.00 dBm | PASS |
| 6 | 2437 | MCS0 | 15.99 | 39.72 | 1 Watt = 30.00 dBm | PASS |
| 11 | 2462 | MCS0 | 15.97 | 39.54 | 1 Watt = 30.00 dBm | PASS |

| 802.1 | 1n_HT20 | M Aux1 | | | | |
|-------|----------------|--------------|--|---|--------------------|--------|
| СН | Freq. (MHz) | Data Rate | Peak Output Power (dBm) | Peak Output Power (mW) | Limit | RESULT |
| 1 | 2412 | MCS0 | 21.74 | 149.28 | 1 Watt = 30.00 dBm | PASS |
| 6 | 2437 | MCS0 | 21.59 | 144.21 | 1 Watt = 30.00 dBm | PASS |
| 11 | 2462 | MCS0 | 21.83 | 152.41 | 1 Watt = 30.00 dBm | PASS |
| 802.1 | 1n_HT20 | M Aux1 | | | | |
| СН | Freq. (MHz) | Data Rate | Max. Output include tune up tolerance Power (dBm) | Max. Output include tune up tolerance Power (mW) | Limit | RESULT |
| 1 | 2412 | MCS0 | 15.95 | 39.36 | 1 Watt = 30.00 dBm | PASS |
| 6 | 2437 | MCS0 | 15.92 | 39.08 | 1 Watt = 30.00 dBm | PASS |
| 11 | 2462 | MCS0 | 15.96 | 39.45 | 1 Watt = 30.00 dBm | PASS |

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| 802.1 | 1n_HT20 | м мімо |) | | | | | | | |
|-------|----------------|--------------|-------|----------------------|---|---|--------------------|-------|------|--------|
| СН | Freq. (MHz) | Data Rate | Po | Output wer Bm) | Total Peak Output Power (dBm) | Total Peak Output Power (mW) | | Limit | | RESULT |
| | | | CH 0 | CH1 | , , | ` , | | | | |
| 1 | 2412 | MCS8 | 18.82 | 18.74 | 21.79 | 151.02 | 1 Watt = | 30.00 | dBm | PASS |
| 6 | 2437 | MCS8 | 18.72 | 18.34 | 21.54 | 142.71 | 1 Watt = | 30.00 | dBm | PASS |
| 11 | 2462 | MCS8 | 18.83 | 18.35 | 21.61 | 144.77 | 1 Watt = 30.00 dBm | | | PASS |
| 802.1 | 1n_HT20 | M MIMO |) | | | | | | | |
| СН | Freq. (MHz) | Data Rate | Po | Output wer 3m) | Max. Output include tune up tolerance Power | Max. Output include tune up tolerance Power | Limit | | | RESULT |
| | | | CH 0 | CH1 | (dBm) | (mW) | | | | |
| 1 | 2412 | MCS8 | 12.77 | 12.72 | 15.76 | 37.63 | 1 Watt = | 30.00 | dBm | PASS |
| 6 | 2437 | MCS8 | 13.11 | 12.48 | 15.82 | 38.17 | 1 Watt = 30.00 dBm | | PASS | |
| 11 | 2462 | MCS8 | 13.03 | 12.51 | 15.79 | 37.91 | 1 Watt = 30.00 dBm | | | PASS |

| 802.1 | 302.11n_HT40M Main | | | | | | | | | | | | |
|-------|--------------------|--------------|--|---|--------------------|--------|--|--|--|--|--|--|--|
| СН | Freq. (MHz) | Data Rate | Peak Output Power (dBm) | Peak Output Power (mW) | Limit | RESULT | | | | | | | |
| 3 | 2422 | MCS0 | 21.61 | 144.88 | 1 Watt = 30.00 dBm | PASS | | | | | | | |
| 6 | 2437 | MCS0 | 21.53 | 142.23 | 1 Watt = 30.00 dBm | PASS | | | | | | | |
| 9 | 2452 | MCS0 | 21.37 | 137.09 | 1 Watt = 30.00 dBm | PASS | | | | | | | |
| 802.1 | 1n_HT40 | M Main | | | | | | | | | | | |
| СН | Freq. (MHz) | Data Rate | Max. Output include tune up tolerance Power (dBm) | Max. Output include tune up tolerance Power (mW) | Limit | RESULT | | | | | | | |
| 3 | 2422 | MCS0 | 15.98 | 39.63 | 1 Watt = 30.00 dBm | PASS | | | | | | | |
| 6 | 2437 | MCS0 | 15.97 | 39.54 | 1 Watt = 30.00 dBm | PASS | | | | | | | |
| 9 | 2452 | MCS0 | 15.97 | 39.54 | 1 Watt = 30.00 dBm | PASS | | | | | | | |

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| 802.1 | 802.11n_HT40M Aux1 | | | | | | | | | | | | |
|-------|--------------------|--------------|--|---|--------------------|--------|--|--|--|--|--|--|--|
| СН | Freq. (MHz) | Data Rate | Peak Output Power (dBm) | Peak Output Power (mW) | Limit | RESULT | | | | | | | |
| 3 | 2422 | MCS0 | 21.25 | 133.35 | 1 Watt = 30.00 dBm | PASS | | | | | | | |
| 6 | 2437 | MCS0 | 21.44 | 139.32 | 1 Watt = 30.00 dBm | PASS | | | | | | | |
| 9 | 2452 | MCS0 | 21.36 | 136.77 | 1 Watt = 30.00 dBm | PASS | | | | | | | |
| 802.1 | 1n_HT40 | M Aux1 | | | | | | | | | | | |
| СН | Freq. (MHz) | Data Rate | Max. Output include tune up tolerance Power (dBm) | Max. Output include tune up tolerance Power (mW) | Limit | RESULT | | | | | | | |
| 3 | 2422 | MCS0 | 15.93 | 39.17 | 1 Watt = 30.00 dBm | PASS | | | | | | | |
| 6 | 2437 | MCS0 | 15.96 | 39.45 | 1 Watt = 30.00 dBm | PASS | | | | | | | |
| 9 | 2452 | MCS0 | 15.92 | 39.08 | 1 Watt = 30.00 dBm | PASS | | | | | | | |

| 802.1 | 302.11n_HT40M MIMO | | | | | | | | | | | | |
|-------|--------------------|--------------|-------|----------------------|---|---|--------------------|-------|-----|--------|--|--|--|
| СН | Freq. (MHz) | Data Rate | Po | Output wer 3m) | Total Peak Output Power (dBm) | Total Peak Output Power (mW) | | Limit | | RESULT | | | |
| | | | CH 0 | CH1 | | | | | | | | | |
| 3 | 2422 | MCS8 | 18.08 | 17.97 | 21.04 | 126.93 | 1 Watt = | 30.00 | dBm | PASS | | | |
| 6 | 2437 | MCS8 | 18.25 | 17.78 | 21.03 | 126.81 | 1 Watt = | 30.00 | dBm | PASS | | | |
| 9 | 2452 | MCS8 | 18.51 | 17.73 | 21.15 | 130.25 | 1 Watt = 30.00 dBn | | | PASS | | | |
| 802.1 | 1n_HT40 | M MIMO | | | | | | | | | | | |
| СН | Freq. (MHz) | Data Rate | Po | Output wer 3m) | Max. Output include tune up tolerance Power | Max. Output include tune up tolerance Power | Limit | | | RESULT | | | |
| | | | CH 0 | CH1 | (dBm) | (mW) | | | | | | | |
| 3 | 2422 | MCS8 | 12.98 | 12.86 | 15.93 | 39.18 | 1 Watt = | 30.00 | dBm | PASS | | | |
| 6 | 2437 | MCS8 | 13.01 | 12.74 | 15.89 | 38.79 | 1 Watt = | 30.00 | dBm | PASS | | | |
| 9 | 2452 | MCS8 | 13.32 | 12.49 | 15.94 | 39.22 | 1 Watt = | 30.00 | dBm | PASS | | | |

^{*} Note: The duty cycle factor is compensated to obtain the maximum value of measurement in average.

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EIRP

| 802.1 | 1b Main | | | | | | | |
|-------|----------------|--------------|----------------------------------|--------------------------|---------------|-------|-------|--------|
| СН | Freq. (MHz) | Data Rate | Avg. Output Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | Limit | | RESULT |
| 1 | 2412 | 1 | 16.48 | -3.30 | 13.18 | 4W= 3 | 6 dBm | PASS |
| 6 | 2437 | 1 | 17.45 | -3.30 | 14.15 | 4W= 3 | PASS | |
| 11 | 2462 | 1 | 17.46 | -3.30 | 14.16 | 4W= 3 | 6 dBm | PASS |

| 802.1 | 802.11b Aux1 | | | | | | | | | | | | | |
|-------|----------------|--------------|----------------------------------|--------------------------|---------------|-------|----|-----|--------|--|--|--|--|--|
| СН | Freq. (MHz) | Data Rate | Avg. Output Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | Limit | | | RESULT | | | | | |
| 1 | 2412 | 1 | 16.43 | -3.50 | 12.93 | 4W= | 36 | dBm | PASS | | | | | |
| 6 | 2437 | 1 | 17.43 | -3.50 | 13.93 | 4W= | 36 | dBm | PASS | | | | | |
| 11 | 2462 | 1 | 17.44 | -3.50 | 13.94 | 4W= | 36 | dBm | PASS | | | | | |

| 802.1 | 802.11g Main | | | | | | | | | | | | | |
|-------|----------------|--------------|----------------------------------|--------------------------|---------------|-----|-------|-----|--------|--|--|--|--|--|
| СН | Freq. (MHz) | Data Rate | Avg. Output Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | | Limit | | RESULT | | | | | |
| 1 | 2412 | 6 | 15.46 | -3.30 | 12.16 | 4W= | 36 | dBm | PASS | | | | | |
| 6 | 2437 | 6 | 16.45 | -3.30 | 13.15 | 4W= | 36 | dBm | PASS | | | | | |
| 11 | 2462 | 6 | 16.46 | -3.30 | 13.16 | 4W= | 36 | dBm | PASS | | | | | |

| 802.1 | 1g Aux1 | | | | | | | | |
|-------|----------------|--------------|----------------------------------|--------------------------|---------------|------------|-------|-----|--------|
| СН | Freq. (MHz) | Data Rate | Avg. Output Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | | Limit | | RESULT |
| 1 | 2412 | 6 | 15.45 | -3.50 | 11.95 | 4W= | 36 | dBm | PASS |
| 6 | 2437 | 6 | 16.42 | -3.50 | 12.92 | 4W= 36 dBm | | | PASS |
| 11 | 2462 | 6 | 16.45 | -3.50 | 12.95 | 4W= | 36 | dBm | PASS |

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| 802.1 | 802.11n_HT20M Main | | | | | | | | | | | | | |
|-------|--------------------|--------------|----------------------------------|--------------------------|---------------|-----|-------|-----|--------|--|--|--|--|--|
| СН | Freq. (MHz) | Data Rate | Avg. Output Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | | Limit | | RESULT | | | | | |
| 1 | 2412 | MCS0 | 15.98 | -3.30 | 12.68 | 4W= | 36 | dBm | PASS | | | | | |
| 6 | 2437 | MCS0 | 15.99 | -3.30 | 12.69 | 4W= | 36 | dBm | PASS | | | | | |
| 11 | 2462 | MCS0 | 15.97 | -3.30 | 12.67 | 4W= | 36 | dBm | PASS | | | | | |

| 802.1 | 802.11n_HT20M Aux1 | | | | | | | | | | | | | |
|-------|--------------------|--------------|----------------------------------|--------------------------|---------------|-----|-------|-----|--------|--|--|--|--|--|
| СН | Freq. (MHz) | Data Rate | Avg. Output Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | | Limit | | RESULT | | | | | |
| 1 | 2412 | MCS0 | 15.95 | -3.50 | 12.45 | 4W= | 36 | dBm | PASS | | | | | |
| 6 | 2437 | MCS0 | 15.92 | -3.50 | 12.42 | 4W= | 36 | dBm | PASS | | | | | |
| 11 | 2462 | MCS0 | 15.96 | -3.50 | 12.46 | 4W= | 36 | dBm | PASS | | | | | |

| 802.11 | 302.11n_HT20M MIMO | | | | | | | | | | | | | | |
|--------|--------------------|--------------|-------|----------------------|-------------------------|-------------------------------|--------------------------|---------------|-----|-------|-----|--------|--|--|--|
| СН | Freq. (MHz) | Data Rate | Po۱ | Output wer Bm) | Avg. Output Power | Total Peak Output Power | Antenna Gain (dBi) | EIRP (dBm) | | Limit | | RESULT | | | |
| | | | CH 0 | CH1 | (dBm) | (mW) | , , | | | | | | | | |
| 1 | 2412 | MCS8 | 12.77 | 12.72 | 15.76 | 37.63 | -0.29 | 15.47 | 4W= | 36 | dBm | PASS | | | |
| 6 | 2437 | MCS8 | 13.11 | 12.48 | 15.82 | 38.17 | -0.29 | 15.53 | 4W= | 36 | dBm | PASS | | | |
| 11 | 2462 | MCS8 | 13.03 | 12.51 | 15.79 | 37.91 | -0.29 | 15.50 | 4W= | 36 | dBm | PASS | | | |

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| 802.1 | 1n_HT40N | 1 Main | | | | | | | |
|-------|----------------|--------------|----------------------------------|--------------------------|---------------|------------|----|-----|--------|
| СН | Freq. (MHz) | Data Rate | Avg. Output Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | Limit | | | RESULT |
| 3 | 2422 | MCS0 | 15.98 | -3.30 | 12.68 | 4W= | 36 | dBm | PASS |
| 6 | 2437 | MCS0 | 15.97 | -3.30 | 12.67 | 4W= 36 dBm | | | PASS |
| 9 | 2452 | MCS0 | 15.97 | -3.30 | 12.67 | 4W= | 36 | dBm | PASS |

| 802.1 | 802.11n_HT40M Aux1 | | | | | | | | |
|-------|--------------------|--------------|----------------------------------|--------------------------|---------------|-------|----|--------|------|
| СН | Freq. (MHz) | Data Rate | Avg. Output Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | Limit | | RESULT | |
| 3 | 2422 | MCS0 | 15.93 | -3.50 | 12.43 | 4W= | 36 | dBm | PASS |
| 6 | 2437 | MCS0 | 15.96 | -3.50 | 12.46 | 4W= | 36 | dBm | PASS |
| 9 | 2452 | MCS0 | 15.92 | -3.50 | 12.42 | 4W= | 36 | dBm | PASS |

| 802.11 | 802.11n_HT40M MIMO | | | | | | | | | | | |
|--------|--------------------|--------------|------------|-------|----------------------------------|---------------------------------------|--------------------------|---------------|-----|-------|-----|--------|
| СН | Freq. (MHz) | Data Rate | Po\ (dE | Bm) | Avg. Output Power (dBm) | Total Peak Output Power (mW) | Antenna Gain (dBi) | EIRP (dBm) | | Limit | | RESULT |
| | | | CH 0 | CH1 | (aB111) | (11111) | | | | | | |
| 3 | 2422 | MCS8 | 12.98 | 12.86 | 15.93 | 39.18 | -0.29 | 15.64 | 4W= | 36 | dBm | PASS |
| 6 | 2437 | MCS8 | 13.01 | 12.74 | 15.89 | 38.79 | -0.29 | 15.60 | 4W= | 36 | dBm | PASS |
| 9 | 2452 | MCS8 | 13.32 | 12.49 | 15.94 | 39.22 | -0.29 | 15.65 | 4W= | 36 | dBm | PASS |

^{*} Note: EIRP = Average Power + Gain

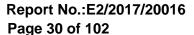
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6DB & 99% BANDWIDTH MEASUREMENT

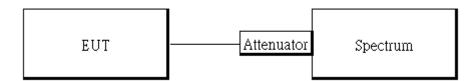
9.1 Standard Applicable

The minimum 6 dB bandwidth shall be at least 500 kHz.

9.2 Measurement Equipment Used

| Conducted Emission Test Site | | | | | | | |
|------------------------------|------------|--------------------|------------------|--------------|------------|--|--|
| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | CAL DUE. | | |
| Spectrum Analyzer | KEYSIGHT | N9010A | MY54510568 | 04/14/2016 | 04/13/2017 | | |
| Coaxial Cable 30cm | WOKEN | 00100A1F1 A195C | RF01 | 12/12/2016 | 12/11/2017 | | |
| DC Block | PASTERNACK | PE8210 | RF29 | 12/12/2016 | 12/11/2017 | | |
| Attenuator | WOKEN | 218FS-10 | RF23 | 12/12/2016 | 12/11/2017 | | |
| DC Power Supply | Agilent | E3640A | MY53140006 | 05/04/2016 | 05/03/2017 | | |
| DC Power Supply | Agilent | E3634A | MY53180030 | 05/17/2016 | 05/16/2017 | | |

9.3 Test Set-up



9.4 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. For 6dB Bandwidth:
 - Set the spectrum analyzer as RBW = 100 kHz, VBW = 3*RBW, Span = 30M/50MHz, Detector=peak, Sweep=auto.
- 5. Mark the peak frequency and –6dB (upper and lower) frequency.
- 6. For 99% Bandwidth:
 - Set the spectrum analyzer as RBW=1%, VBW = 3*RBW, Span = 30M/50MHz, Detector=Sample, Sweep=auto.
- 7. Turn on the 99% bandwidth function, max reading.
- 8. Repeat above procedures until all frequency of interest measured was complete.

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9.5 Measurement Result

6dB Bandwidth

802 11b Main

802.11g Main

| OOZ. I ID IVIGITI | | | | | | |
|-------------------|--------|-------|--------|--|--|--|
| Freq. | 6dB BW | Limit | Result | | | |
| (MHz) | (kHz) | (kHz) | Result | | | |
| 2412 | 10132 | > 500 | PASS | | | |
| 2437 | 10124 | > 500 | PASS | | | |
| 2462 | 10131 | > 500 | PASS | | | |

| | - 002111g man | | | | | | |
|----|---------------|--------|-------|--------|--|--|--|
| F | req. | 6dB BW | Limit | Result | | | |
| (1 | ИHz) | (kHz) | (kHz) | | | | |
| 2 | 412 | 15150 | > 500 | PASS | | | |
| 2 | 437 | 15150 | > 500 | PASS | | | |
| 2 | 462 | 15150 | > 500 | PASS | | | |

802.11 n HT20 Main

| 00211121121120111 | | | | | | |
|-------------------|--------|-------|--------|--|--|--|
| Freq. | 6dB BW | Limit | Result | | | |
| (MHz) | (kHz) | (kHz) | | | | |
| 2412 | 15140 | > 500 | PASS | | | |
| 2437 | 15140 | > 500 | PASS | | | |
| 2462 | 15140 | > 500 | PASS | | | |

802.11 n HT40 Main

| Freq. | 6dB BW | Limit | Docult | | | |
|-------|--------|-------|--------|--|--|--|
| (MHz) | (kHz) | (kHz) | Result | | | |
| 2422 | 35120 | > 500 | PASS | | | |
| 2437 | 35120 | > 500 | PASS | | | |
| 2452 | 35120 | > 500 | PASS | | | |

99% Bandwidth

| 802.11b Main | | | | |
|--------------|--------|--|--|--|
| Freq. | 99% BW | | | |
| (MHz) | (MHz) | | | |
| 2412 | 13.607 | | | |
| 2437 | 13.608 | | | |
| 2462 | 13.417 | | | |

| 802.11g Main | | | | |
|--------------|--------|--|--|--|
| Freq. | 99% BW | | | |
| (MHz) | (MHz) | | | |
| 2412 | 16.512 | | | |
| 2437 | 16.449 | | | |
| 2462 | 16.340 | | | |

| 802.11n_HT20M Main | | | |
|--------------------|--------|--|--|
| Freq. | 99% BW | | |
| (MHz) | (MHz) | | |
| 2412 | 17.725 | | |
| 2437 | 17.692 | | |
| 2462 | 17.702 | | |

| 802.11n_HT40M Main | | | |
|--------------------|--------|--|--|
| Freq. | 99% BW | | |
| (MHz) | (MHz) | | |
| 2422 | 36.257 | | |
| 2437 | 36.326 | | |
| 2452 | 36.182 | | |

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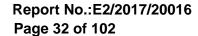
SCS Talwan Lie*

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**INC 3.13

^{*}Refer to next page for plots



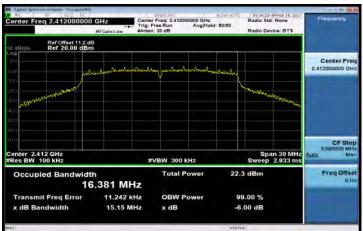


802.11b (Main)

6dB Band Width Test Data CH-Low



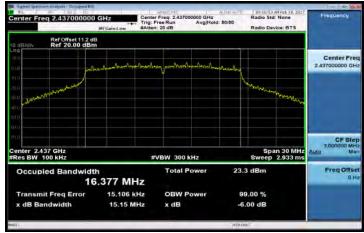
802.11g (Main) 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid



6dB Band Width Test Data CH-Mid



6dB Band Width Test Data CH-High



6dB Band Width Test Data CH-High

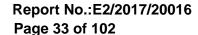


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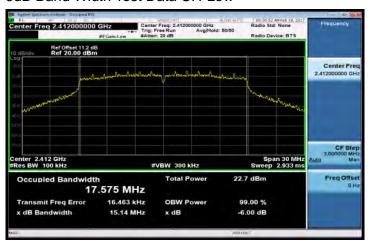
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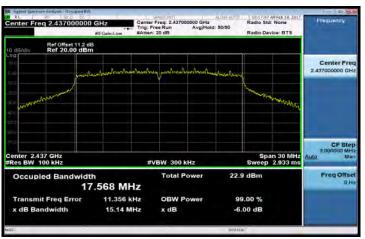
802.11n_20M (Main) 6dB Band Width Test Data CH-Low



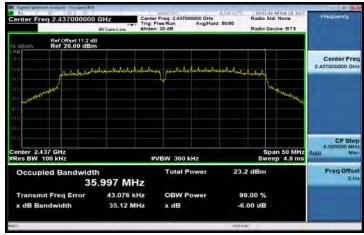
802.11n_40M (Main) 6dB Band Width Test Data CH-Low



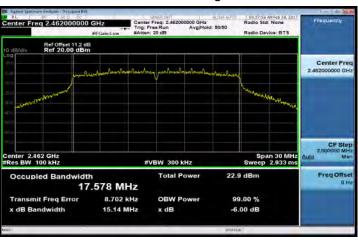
6dB Band Width Test Data CH-Mid



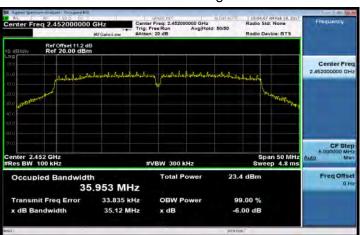
6dB Band Width Test Data CH-Mid



6dB Band Width Test Data CH-High



6dB Band Width Test Data CH-High

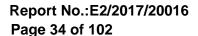


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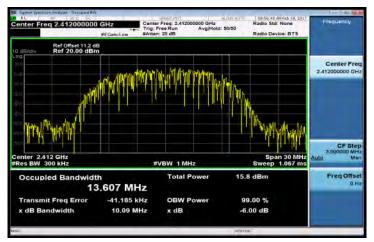
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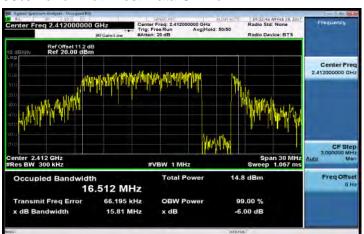


802.11b (Main)

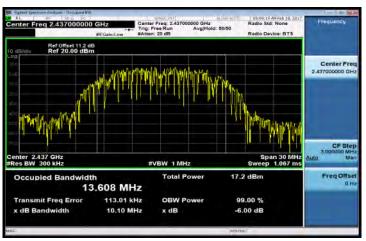
99% Band Width Test Data CH-Low



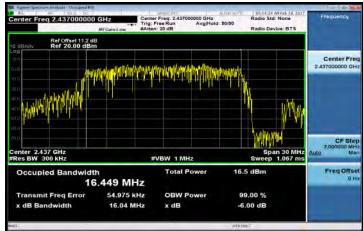
802.11g (Main) 99% Band Width Test Data CH-Low



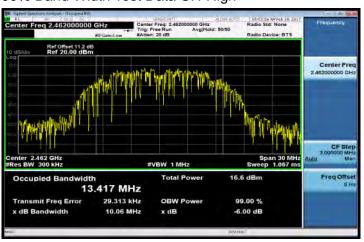
99% Band Width Test Data CH-Mid



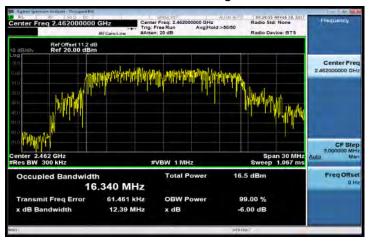
99% Band Width Test Data CH-Mid



99% Band Width Test Data CH-High



99% Band Width Test Data CH-High

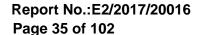


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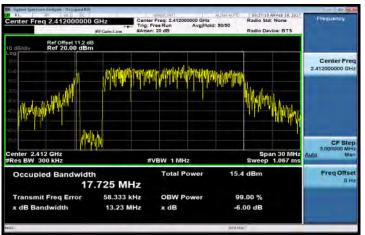
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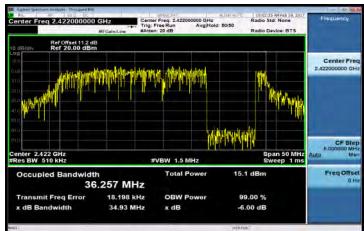




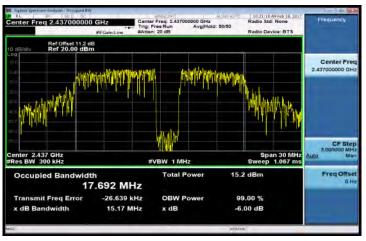
802.11n_20M (Main) 99% Band Width Test Data CH-Low



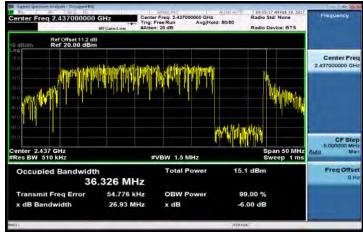
802.11n_40M (Main) 99% Band Width Test Data CH-Low



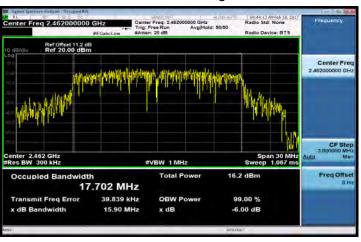
99% Band Width Test Data CH-Mid



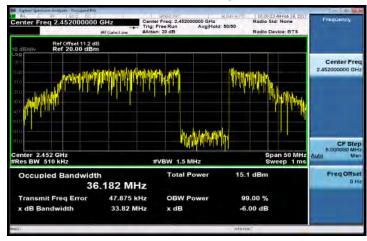
99% Band Width Test Data CH-Mid



99% Band Width Test Data CH-High



99% Band Width Test Data CH-High



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10 CONDUCTED BAND EDGE AND SPURIOUS EMISSION MEASUREMENT

10.1 Standard Applicable

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.

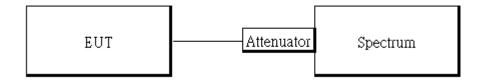
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a) & RSS-Gen §8.10, must also comply with the radiated emission limits specified in §15.209(a) & RSS-Gen §8.8.

If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

10.2 Measurement Equipment Used

| Conducted Emission Test Site | | | | | | | |
|------------------------------|------------|--------------------|------------------|--------------|------------|--|--|
| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | CAL DUE. | | |
| Spectrum Analyzer | KEYSIGHT | N9010A | MY54510568 | 04/14/2016 | 04/13/2017 | | |
| Coaxial Cable 30cm | WOKEN | 00100A1F1A 195C | RF01 | 12/12/2016 | 12/11/2017 | | |
| DC Block | PASTERNACK | PE8210 | RF29 | 12/12/2016 | 12/11/2017 | | |
| Attenuator | WOKEN | 218FS-10 | RF23 | 12/12/2016 | 12/11/2017 | | |
| DC Power Supply | Agilent | E3640A | MY53140006 | 05/04/2016 | 05/03/2017 | | |
| DC Power Supply | Agilent | E3634A | MY53180030 | 05/17/2016 | 05/16/2017 | | |

10.3 Test SET-UP



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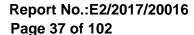
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f (886-2) 2298-0488





10.4 Measurement Procedure

Conducted Band Edge Limt

- Set analyzer center frequency to DTS channel center frequency.
- The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- Set the span to 1.5 times the DTS channel bandwidth.
- Set the RBW = 100kHz & VBW = 300 kHz.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9.Use the peak marker function to determine the maximum amplitude level.

Conducted Band Edge:

- To connect Antenna Port of EUT to Spectrum.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. Set start to edge frequency, and stop frequency of spectrum analyzer so as to encompass the spectrum to be examined.
- 5. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Detector = Peak, Sweep = auto
- 6. Mark the highest reading of the emission as the reference level measurement.
- 7. Set DL as the limit = reading on marker 1 20dBm
- 8. Marker on frequency, 2.3999GHz and 2.4836GHz, and examine shall 100 kHz immediately outside the authorized (2400~2483.5) be attenuated by 20dB at least relative to the maximum emission of power.
- 9. Repeat above procedures until all default test channel (low, middle, and high) was complete.

Conducted Spurious Emission:

- To connect Antenna Port of EUT to Spectrum
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Set RBW = 100 kHz & VBW= 300 kHz, Detector = Peak, Sweep = Auto.
- 4. Allow trace to fully stabilize.
- 5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
- 6. Repeat above procedures until all default test channel measured were complete.

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10.5 **Measurement Result**

| Bande | edge Limi | t 802.11b MODE | Bandedge Limit 802.11g MODE | | | |
|-------|------------------------|----------------|-----------------------------|-------|----------------|--|
| Freq. | eq. PSD Bandedge Limit | | Freq. | PSD | Bandedge Limit | |
| (MHz) | Ü | | (MHz) | (dBm) | (dBm) | |
| 2412 | 6.75 | -13.25 | 2412 | 4.92 | -15.08 | |
| 2462 | 7.74 | -12.26 | 2462 | 5.79 | -14.21 | |

| Banded | dge Limit | 802.11n20 MODE | Banded | dge Limit | 802.11n40 MODE |
|--------|-----------|----------------|--------|-----------|----------------|
| Freq. | · · | | Freq. | PSD | Bandedge Limit |
| (MHz) | (dBm) | (dBm) | (MHz) | (dBm) | (dBm) |
| 2412 | 5.23 | | | 3.37 | -16.63 |
| 2462 | 5.49 | -14.51 | 2452 | 3.25 | -16.75 |

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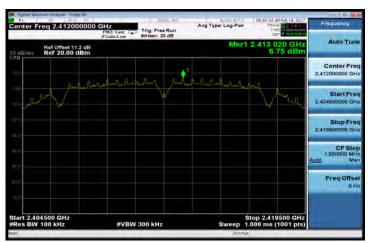
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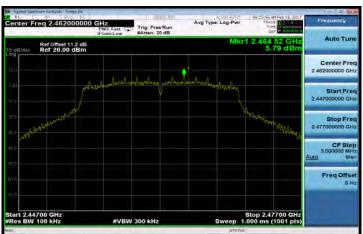
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802.11b Band Edge Limit Test Data CH-Low



802.11g Band Edge Limit Test Data CH-High



802.11b Band Edge Limit Test Data CH-High



802.11n_HT20 Band Edge Limit Test Data CH-Low



802.11g Band Edge Limit Test Data CH-Low



802.11n_HT20 Band Edge Limit Test Data CH-High



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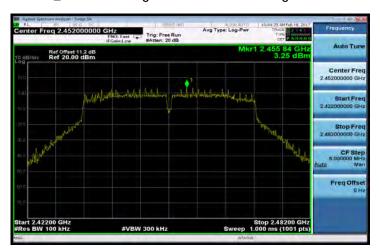
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802.11n_HT40 Band Edge Limit Test Data CH-Low

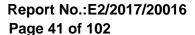


802.11n_HT40 Band Edge Limit Test Data CH-High



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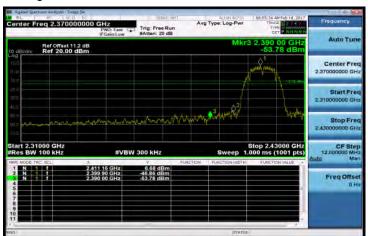
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802.11b

Band Edge Test Data CH-Low



802.11g

Band Edge Test Data CH-Low



Band Edge Test Data CH-High



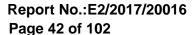
Band Edge Test Data CH-High



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802.11n_HT20

Band Edge Test Data CH-Low



802.11n_HT40

Band Edge Test Data CH-Low



Band Edge Test Data CH-High



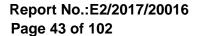
Band Edge Test Data CH-High



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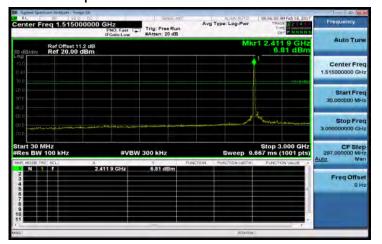
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802.11b

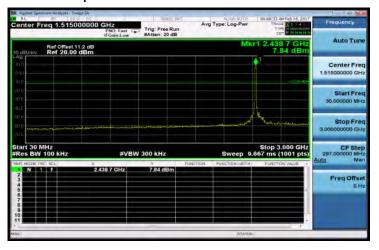
30M-3GHz Spurious Emission Test Data CH-Low



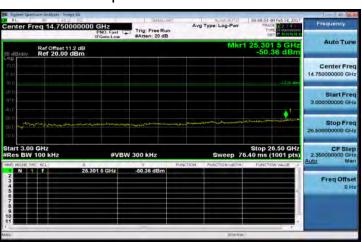
3G-26.5GHz Spurious Emission Test Data CH-Low



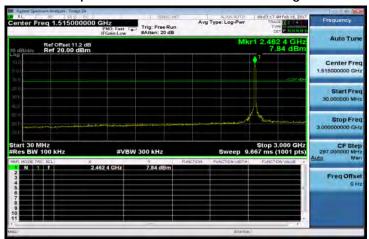
30M-3GHz Spurious Emission Test Data CH-Mid



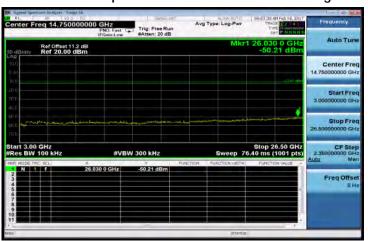
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30M-3GHz Spurious Emission Test Data CH-High



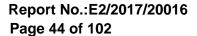
3G-26.5GHz Spurious Emission Test Data CH-High



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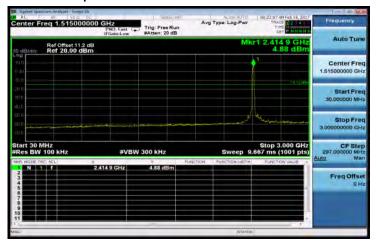
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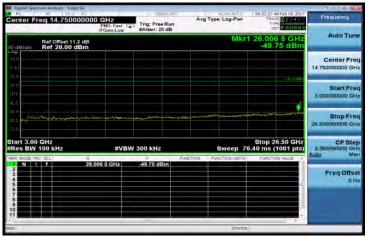


802.11g

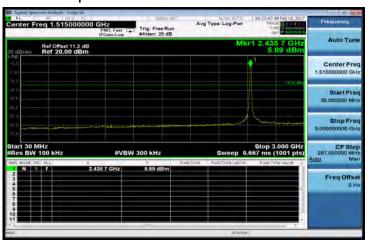
30M-3GHz Spurious Emission Test Data CH-Low



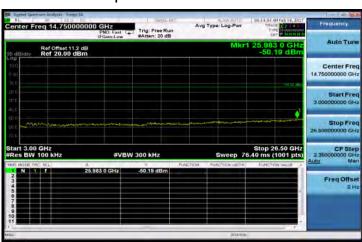
3G-26.5GHz Spurious Emission Test Data CH-Low



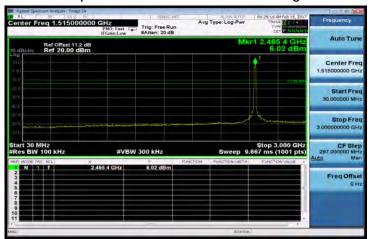
30M-3GHz Spurious Emission Test Data CH-Mid



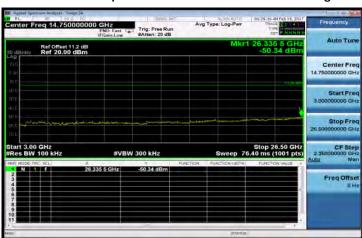
3G-26.5GHz Spurious Emission Test Data CH-Mid



30M-3GHz Spurious Emission Test Data CH-High



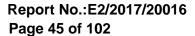
3G-26.5GHz Spurious Emission Test Data CH-High



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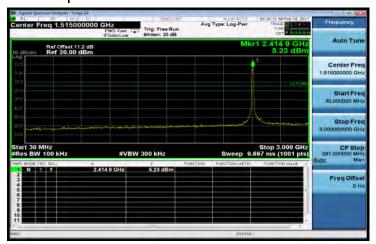
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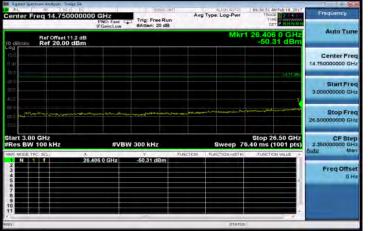


802.11n_HT20

30M-3GHz Spurious Emission Test Data CH-Low

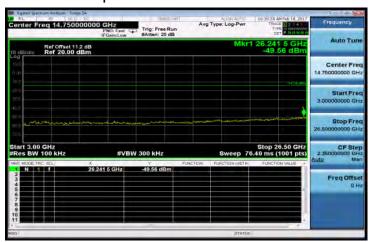


3G-26.5GHz Spurious Emission Test Data CH-Low

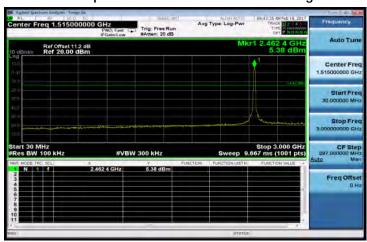


30M-3GHz Spurious Emission Test Data CH-Mid

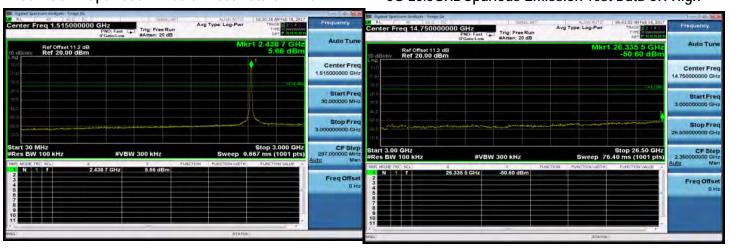
3G-26.5GHz Spurious Emission Test Data CH-Mid



30M-3GHz Spurious Emission Test Data CH-High



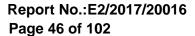
3G-26.5GHz Spurious Emission Test Data CH-High



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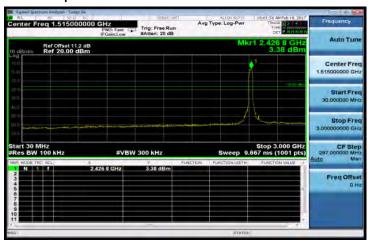
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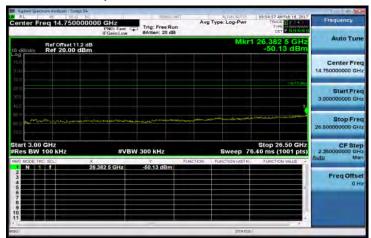


802.11n_HT40

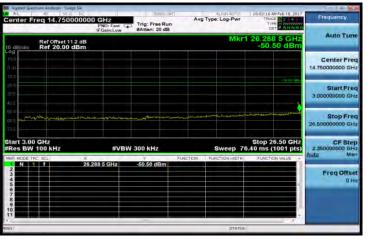
30M-3GHz Spurious Emission Test Data CH-Low



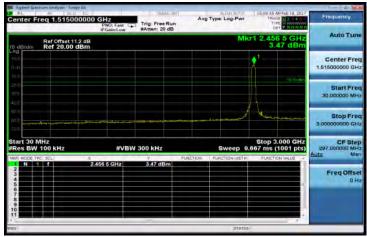
3G-26.5GHz Spurious Emission Test Data CH-Mid



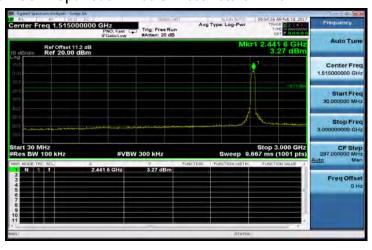
3G-26.5GHz Spurious Emission Test Data CH-Low



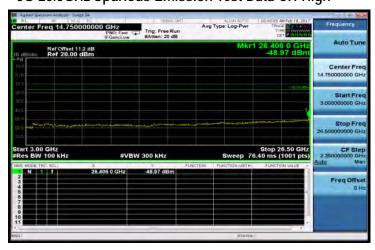
30M-3GHz Spurious Emission Test Data CH-High



30M-3GHz Spurious Emission Test Data CH-Mid



3G-26.5GHz Spurious Emission Test Data CH-High



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11 RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT

Standard Applicable 11.1

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. In addition, radiated emissions which fall in the restricted bands must also comply with the §15.209 & RSS-Gen §8.8, 8.9 limit as below.

And according to §15.33(a) (1) & RSS-Gen §6.13(a), 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.

| Frequency (MHz) | Field strength (microvolts/meter) | Distance (meters) |
|--------------------|-----------------------------------|----------------------|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

Note:

- 1. The lower limit shall apply at the transition frequencies.
- Emission level (dBµV/m) = 20 log Emission level (dBµV/m)

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11.2 Measurement Equipment Used:

| 966 Chamber | | | | | | | | | |
|-------------------|-----------------|--------------------------------|---------------|------------|------------|--|--|--|--|
| EQUIPMENT | MFR | MODEL | SERIAL | LAST | CAL DUE. | | | | |
| TYPE | | NUMBER | NUMBER | CAL. | | | | | |
| EMI Test Receiver | R&S | ESU 40 | 100363 | 04/12/2016 | 04/11/2017 | | | | |
| Loop Antenna | ETS-Lindgren | 6502 | 00143303 | 12/23/2016 | 12/22/2017 | | | | |
| Broadband Antenna | TESEQ | CBL 6112D | 35240 | 11/03/2016 | 11/02/2017 | | | | |
| Horn Antenna | ETS-Lindgren | 3117 | 00143272 | 12/15/2016 | 12/16/2017 | | | | |
| Horn Antenna | Schwarzbeck | BBHA9170 | 185 | 07/24/2016 | 07/23/2017 | | | | |
| Pre Amplifier | EMC Instruments | EMC330 | 980096 | 12/12/2016 | 12/11/2017 | | | | |
| Pre Amplifier | EMC Instruments | EMC0011830 | 980199 | 12/12/2016 | 12/11/2017 | | | | |
| Pre Amplifier | R&S | SCU-18 | 10204 | 12/12/2016 | 12/11/2017 | | | | |
| Pre Amplifier | R&S | SCU-26 | 100780 | 12/12/2016 | 12/11/2017 | | | | |
| Coaxial Cable | Huber+Suhner | RG 214/U | 966Rx 9K-30M | 12/12/2016 | 12/11/2017 | | | | |
| Coaxial Cable | Huber+Suhner | RG 214/U SUCOFLEX 104 | 966Rx 30M-3G | 12/12/2016 | 12/11/2017 | | | | |
| Coaxial Cable | Huber+Suhner | SUCOFLEX 104 | 966Rx 1G-18G | 12/12/2016 | 12/11/2017 | | | | |
| Coaxial Cable | Huber+Suhner | mini 141-12 SUCOFLEX 104 | 966Rx 18G-40G | 12/12/2016 | 12/11/2017 | | | | |
| Coaxial Cable | Huber+Suhner | SUCOFLEX 104 | 966Tx 30M-18G | 12/12/2016 | 12/11/2017 | | | | |
| Coaxial Cable | Huber+Suhner | SUCOFLEX 102 | 966Tx 18G-40G | 12/12/2016 | 12/11/2017 | | | | |
| Attenuator | WOKEN | 218FS-10 | RF27 | 12/12/2016 | 12/11/2017 | | | | |
| Site NSA | SGS | 966 Chamber C | SAC-C | 03/04/2016 | 03/03/2017 | | | | |
| Site VSWR | SGS | 966 Chamber C | SAC-C | 03/04/2016 | 03/03/2017 | | | | |
| DC Power Supply | HOLA | DP-3003 | D7070035 | 05/04/2016 | 05/03/2017 | | | | |
| Controller | MF | MF MF-7802 N/A | | N.C.R. | N.C.R. | | | | |
| Antenna Mast | 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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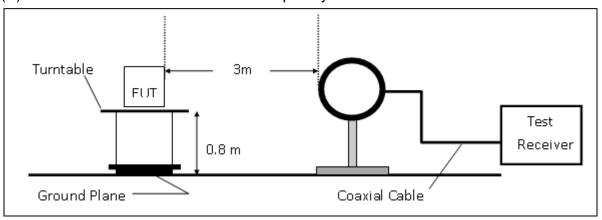
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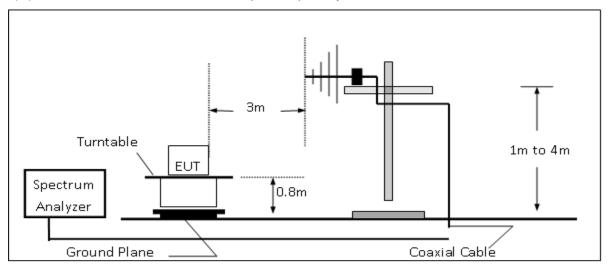


11.3 Test SET-UP

(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(B) Radiated Emission Test Set-Up, Frequency form 30MHz to 1000MHz



(C) Radiated Emission Test Set-UP Frequency Over 1 GHz Turntable Зт 1m to 4m EUT Spectrum 1.5m Analyzer Ground Plane Absorber Coaxial Cable

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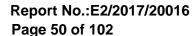
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11.4 Measurement Procedure

- The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 2. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 1GHz above ground plane.
- 3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 5. 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.
- 6. Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector (PK) and Quasi-peak (QP) at frequency below 1 GHz.
- 7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency above 1 GHz.
- 8. Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW ≥ 1/T (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
- 9. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 11. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. On spectrum, change spectrum mode in linear display mode, and reduce VBW = 10Hz if average reading is measured.
- 12. Repeat above procedures until all default test channel measured were complete.

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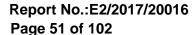
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11.5 Field Strength Calculation

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 | • | CL = Cable Attenuation Factor (Cable Loss) |
|-------|------------------------|--|
| | RA = Reading Amplitude | AG = Amplifier Gain |
| | AF = Antenna Factor | |

Actual FS(dB μ V/m) = SPA. Reading level(dB μ V) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)

Note:

"F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency. "E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

11.6 Test Results of Radiated Spurious Emissions form 9 kHz to 30 MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) was not reported.

11.7 **Measurement Result**

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

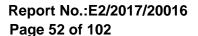
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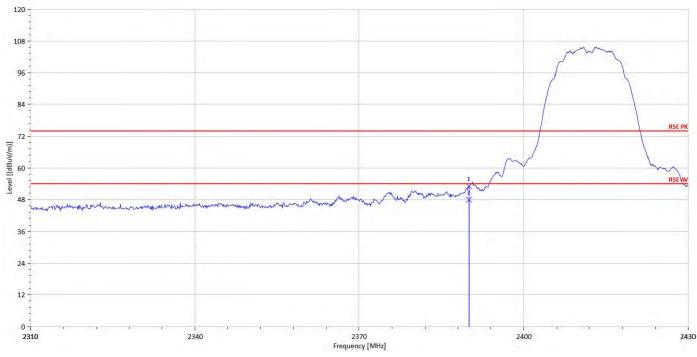


Radiated Band Edge Measurement Result (802.11b)

Operation Mode: 802.11b Test Date: 2017/2/17

Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Vertical E2

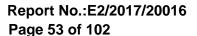


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 2390.00 | Е | Peak | 52.14 | 0.92 | 53.06 | 74 | -20.94 |
| 2390.00 | Е | Average | 47.01 | 0.92 | 47.93 | 54 | -6.07 |

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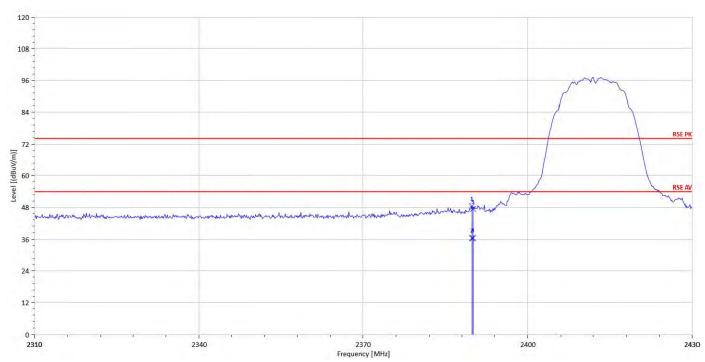




Operation Mode: Test Date: 2017/2/17 802.11b

Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

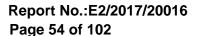
Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol. : Horizontal E2



| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 2389.80 | S | Peak | 47.59 | 0.92 | 48.51 | 74 | -25.49 |
| 2389.80 | S | Average | 35.50 | 0.92 | 36.42 | 54 | -17.58 |
| 2390.00 | E | Peak | 46.53 | 0.92 | 47.45 | 74 | -26.55 |
| 2390.00 | Е | Average | 35.58 | 0.92 | 36.50 | 54 | -17.50 |

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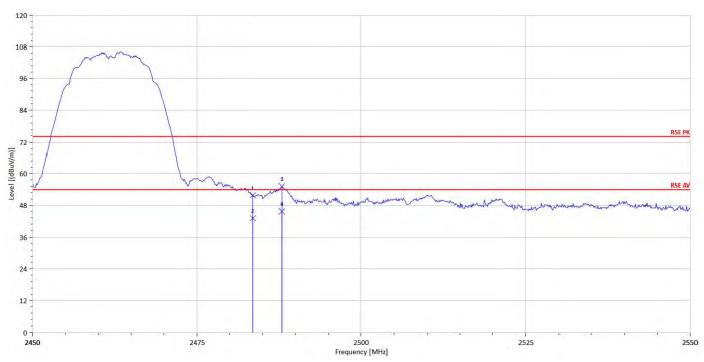




Operation Mode: Test Date: 802.11b 2017/2/17

Fundamental Frequency: 2462 MHz Temp. / Humi.: 22.7deg_C/57RH

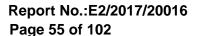
Operation Band: Test Engineer: BE CH High Ashton EUT Pol.: Measurement Antenna Pol.: Vertical



| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 2483.50 | Е | Peak | 50.72 | 1.16 | 51.88 | 74 | -22.12 |
| 2483.50 | E | Average | 41.94 | 1.16 | 43.10 | 54 | -10.90 |
| 2487.90 | S | Peak | 54.00 | 1.15 | 55.15 | 74 | -18.85 |
| 2487.90 | S | Average | 44.58 | 1.15 | 45.73 | 54 | -8.27 |

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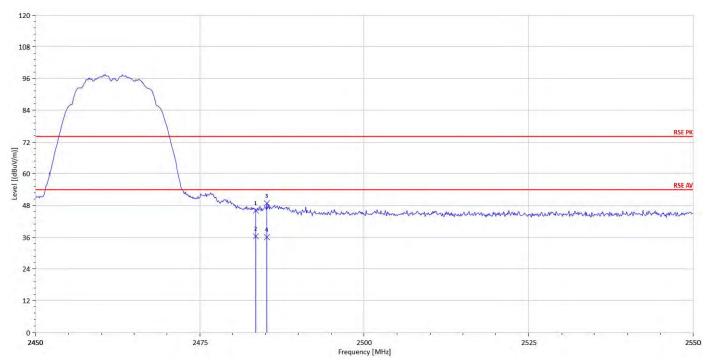




Operation Mode: Test Date: 802.11b 2017/2/17

Fundamental Frequency: 2462 MHz Temp. / Humi.: 22.7deg_C/57RH

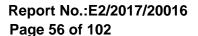
Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: E2 Horizontal



| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dΒμV/m | dBµV/m | dB |
| 2483.50 | Е | Peak | 44.91 | 1.16 | 46.07 | 74 | -27.93 |
| 2483.50 | Е | Average | 35.27 | 1.16 | 36.43 | 54 | -17.57 |
| 2485.20 | S | Peak | 47.68 | 1.16 | 48.84 | 74 | -25.16 |
| 2485.20 | S | Average | 34.92 | 1.16 | 36.08 | 54 | -17.92 |

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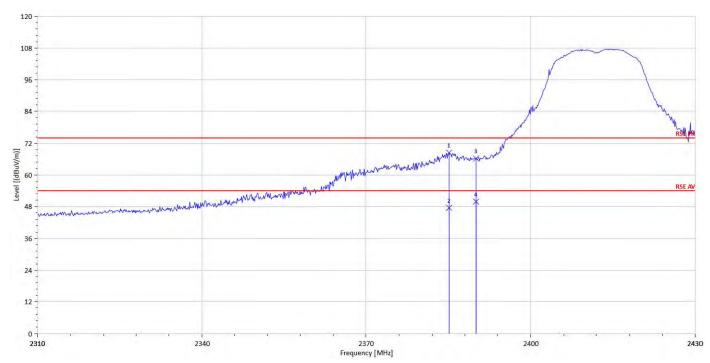


Radiated Band Edge Measurement Result (802.11g)

Operation Mode: Test Date: 2017/2/17 802.11g

Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

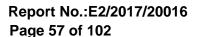
Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: E2 Measurement Antenna Pol. : Vertical



| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 2385.12 | S | Peak | 67.53 | 0.85 | 68.38 | 74 | -5.62 |
| 2385.12 | S | Average | 46.63 | 0.85 | 47.48 | 54 | -6.52 |
| 2390.00 | S | Peak | 65.22 | 0.92 | 66.14 | 74 | -7.86 |
| 2390.00 | S | Average | 48.96 | 0.92 | 49.88 | 54 | -4.12 |

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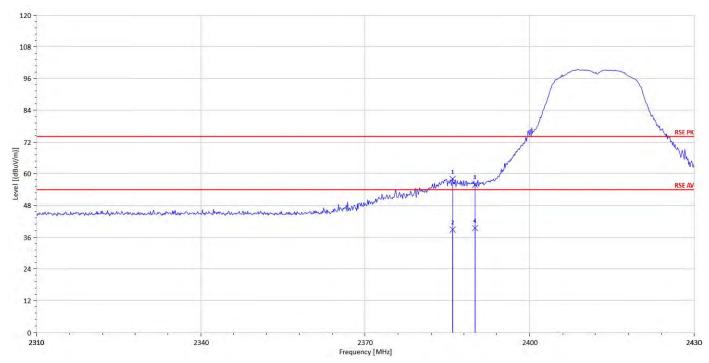




Operation Mode: Test Date: 802.11g 2017/2/17

Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: BE CH Low Ashton EUT Pol.: Measurement Antenna Pol. : Horizontal

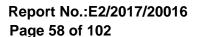


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 2385.96 | S | Peak | 57.11 | 0.86 | 57.98 | 74 | -16.02 |
| 2385.96 | S | Average | 37.99 | 0.86 | 38.85 | 54 | -15.15 |
| 2390.00 | E | Peak | 54.94 | 0.92 | 55.86 | 74 | -18.14 |
| 2390.00 | Е | Average | 38.45 | 0.92 | 39.37 | 54 | -14.63 |

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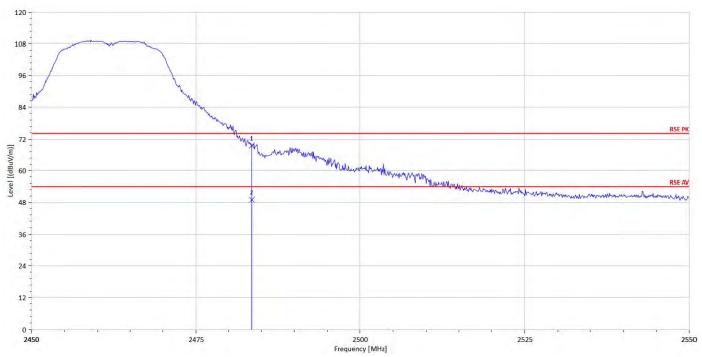




Operation Mode: Test Date: 802.11g 2017/2/17

Fundamental Frequency: 2462 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: E2 Vertical



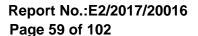
| Freq. | Note | Detector Mode | Spectum Reading Level | Factor | Actual FS | Limit @3m | Margin |
|---------|---------|------------------|--------------------------|--------|--------------|--------------|--------|
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 2483.50 | Е | Peak | 68.39 | 1.16 | 69.55 | 74 | -4.45 |
| 2483.50 | Е | Average | 47.88 | 1.16 | 49.04 | 54 | -4.96 |

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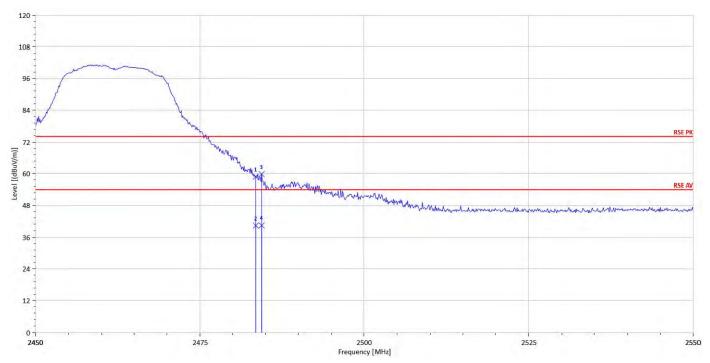




Operation Mode: Test Date: 802.11g 2017/2/17

Fundamental Frequency: 2462 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: BE CH High Ashton EUT Pol.: Measurement Antenna Pol.: E2 Horizontal

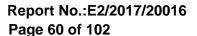


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 2483.50 | Е | Peak | 57.69 | 1.16 | 58.85 | 74 | -15.15 |
| 2483.50 | E | Average | 39.16 | 1.16 | 40.32 | 54 | -13.68 |
| 2484.40 | S | Peak | 58.66 | 1.16 | 59.81 | 74 | -14.19 |
| 2484.40 | S | Average | 39.24 | 1.16 | 40.40 | 54 | -13.60 |

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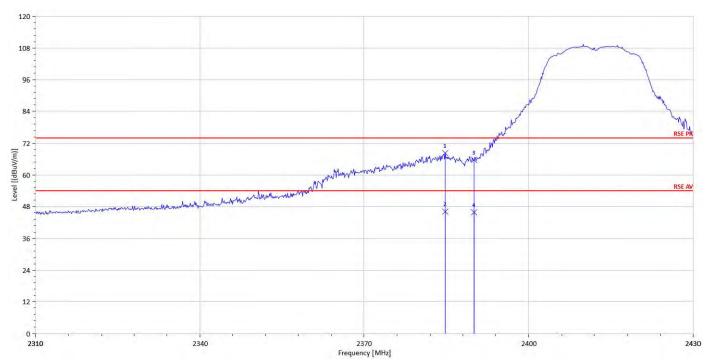


Radiated Band Edge Measurement Result (802.11_HT20)

Operation Mode: 802.11n20 Test Date: 2017/2/17

22.7deg_C/57RH Fundamental Frequency: 2412 MHz Temp. / Humi.:

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: E2 Measurement Antenna Pol. : Vertical

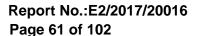


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dΒμV/m | dB |
| 2384.76 | S | Peak | 67.35 | 0.85 | 68.20 | 74 | -5.80 |
| 2384.76 | S | Average | 45.19 | 0.85 | 46.04 | 54 | -7.96 |
| 2390.00 | E | Peak | 64.72 | 0.92 | 65.64 | 74 | -8.36 |
| 2390.00 | E | Average | 44.86 | 0.92 | 45.78 | 54 | -8.22 |

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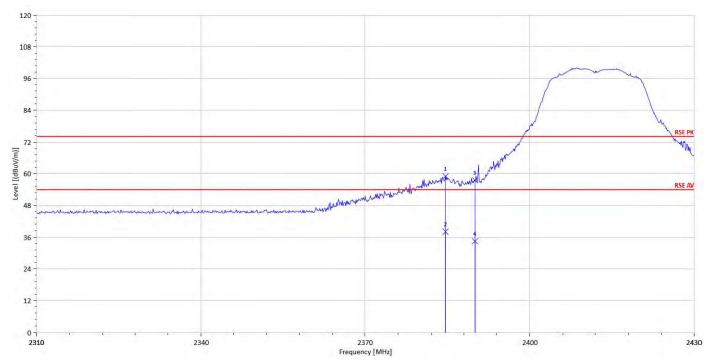




Operation Mode: Test Date: 2017/2/17 802.11n20

Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: BE CH Low Ashton EUT Pol.: Measurement Antenna Pol. : E2 Horizontal

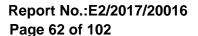


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dΒμV/m | dBµV/m | dB |
| 2384.64 | S | Peak | 58.14 | 0.85 | 58.99 | 74 | -15.01 |
| 2384.64 | S | Average | 37.24 | 0.85 | 38.09 | 54 | -15.91 |
| 2390.00 | E | Peak | 56.54 | 0.92 | 57.46 | 74 | -16.54 |
| 2390.00 | Е | Average | 33.59 | 0.92 | 34.51 | 54 | -19.49 |

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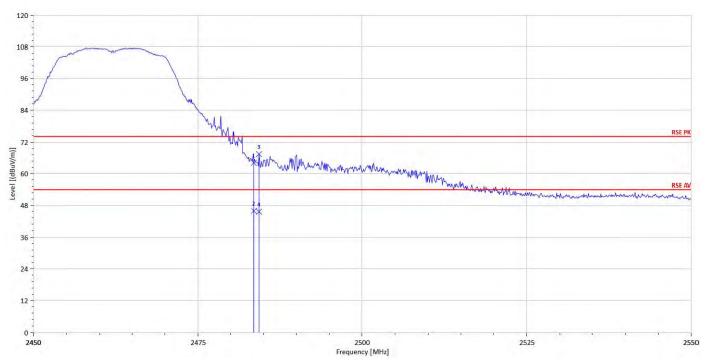




Operation Mode: Test Date: 802.11n20 2017/2/17

Fundamental Frequency: 2462 MHz Temp. / Humi.: 22.7deg_C/57RH

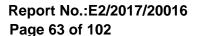
Operation Band: BE CH High Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: E2 Vertical



| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 2483.50 | Е | Peak | 62.97 | 1.16 | 64.13 | 74 | -9.87 |
| 2483.50 | Е | Average | 44.80 | 1.16 | 45.96 | 54 | -8.04 |
| 2484.30 | S | Peak | 66.28 | 1.16 | 67.44 | 74 | -6.56 |
| 2484.30 | S | Average | 44.46 | 1.16 | 45.62 | 54 | -8.38 |

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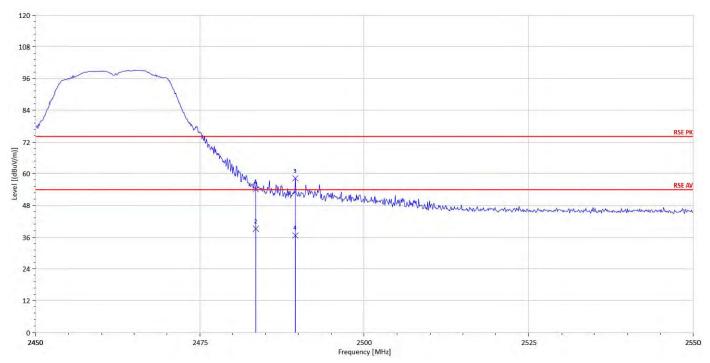




Operation Mode: Test Date: 802.11n20 2017/2/17

Fundamental Frequency: 2462 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: BE CH High Ashton EUT Pol.: Measurement Antenna Pol.: E2 Horizontal

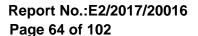


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dΒμV/m | dBµV/m | dB |
| 2483.50 | Е | Peak | 53.02 | 1.16 | 54.18 | 74 | -19.82 |
| 2483.50 | E | Average | 37.97 | 1.16 | 39.13 | 54 | -14.87 |
| 2489.50 | S | Peak | 57.05 | 1.14 | 58.19 | 74 | -15.81 |
| 2489.50 | S | Average | 35.58 | 1.14 | 36.72 | 54 | -17.28 |

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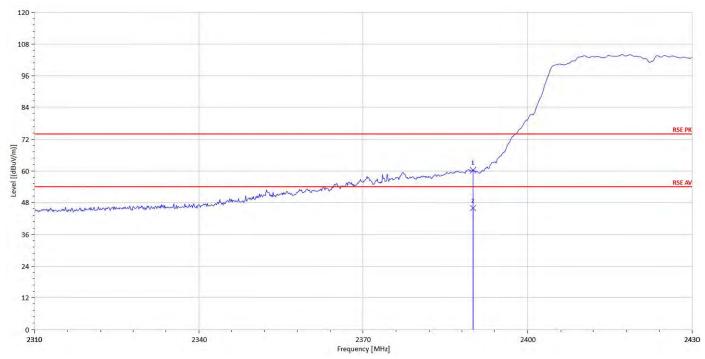


Radiated Band Edge Measurement Result (802.11_HT40)

Operation Mode: 802.11n40 Test Date: 2017/2/17

Fundamental Frequency: 2422 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: BE CH Low Test Engineer: Ashton EUT Pol.: E2 Measurement Antenna Pol. : Vertical

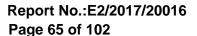


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 2390.00 | Е | Peak | 59.40 | 0.92 | 60.33 | 74 | -13.67 |
| 2390.00 | Е | Average | 44.96 | 0.92 | 45.88 | 54 | -8.12 |

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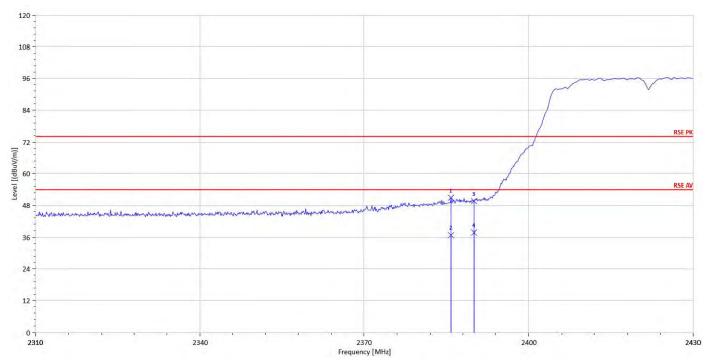




Operation Mode: Test Date: 2017/2/17 802.11n40

Fundamental Frequency: 2422 MHz Temp. / Humi.: 22.7deg_C/57RH

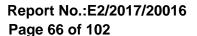
Operation Band: Test Engineer: BE CH Low Ashton EUT Pol.: Measurement Antenna Pol. : E2 Horizontal



| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dΒμV/m | dBµV/m | dB |
| 2385.84 | S | Peak | 50.11 | 0.86 | 50.97 | 74 | -23.03 |
| 2385.84 | S | Average | 35.97 | 0.86 | 36.83 | 54 | -17.17 |
| 2390.00 | E | Peak | 48.73 | 0.92 | 49.66 | 74 | -24.34 |
| 2390.00 | Е | Average | 36.84 | 0.92 | 37.76 | 54 | -16.24 |

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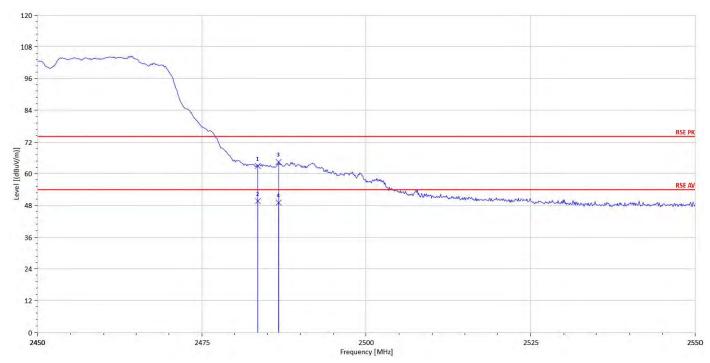




Operation Mode: Test Date: 802.11n40 2017/2/17

Fundamental Frequency: 2452 MHz Temp. / Humi.: 22.7deg_C/57RH

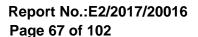
Operation Band: Test Engineer: BE CH High Ashton EUT Pol.: Measurement Antenna Pol.: E2 Vertical



| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dΒμV/m | dΒμV/m | dB |
| 2483.50 | Е | Peak | 61.77 | 1.16 | 62.93 | 74 | -11.07 |
| 2483.50 | E | Average | 48.52 | 1.16 | 49.68 | 54 | -4.32 |
| 2486.70 | S | Peak | 63.29 | 1.15 | 64.44 | 74 | -9.56 |
| 2486.70 | S | Average | 47.92 | 1.15 | 49.07 | 54 | -4.93 |

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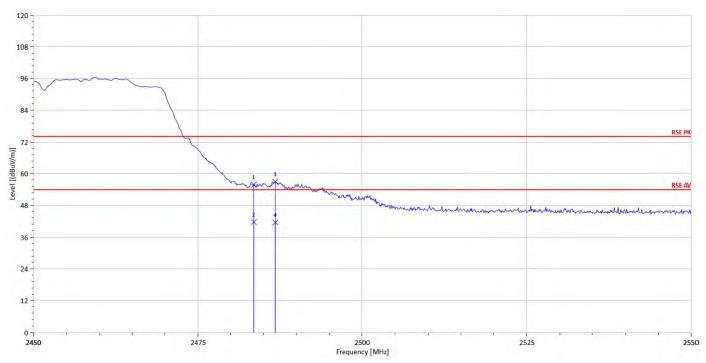




Operation Mode: Test Date: 802.11n40 2017/2/17

Fundamental Frequency: 2452 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: BE CH High Ashton EUT Pol.: Measurement Antenna Pol.: E2 Horizontal



| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 2483.50 | Е | Peak | 54.65 | 1.16 | 55.81 | 74 | -18.19 |
| 2483.50 | E | Average | 40.52 | 1.16 | 41.68 | 54 | -12.32 |
| 2486.80 | S | Peak | 55.74 | 1.15 | 56.89 | 74 | -17.11 |
| 2486.80 | S | Average | 40.36 | 1.15 | 41.51 | 54 | -12.49 |

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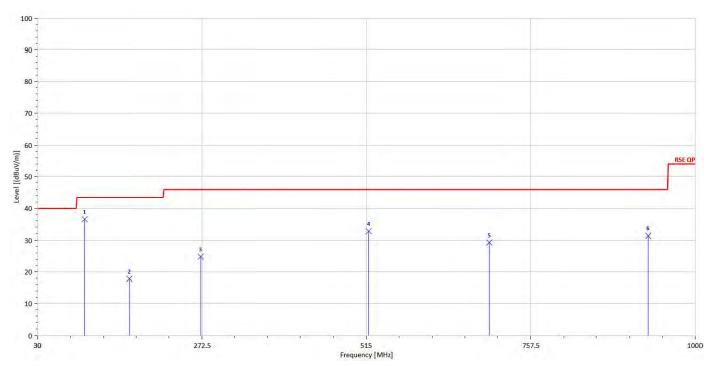
Below 1GHz Worst-Case Data:

Radiated Spurious Emission Measurement Result (802.11 g)

Operation Mode: Test Date: 2017/2/17 802.11g

Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Vertical E2



| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|--------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 99.84 | S | Peak | 54.35 | -17.77 | 36.58 | 43.5 | -6.92 |
| 165.80 | S | Peak | 35.74 | -17.92 | 17.82 | 43.5 | -25.68 |
| 270.56 | S | Peak | 38.76 | -13.91 | 24.85 | 46 | -21.15 |
| 518.88 | S | Peak | 40.18 | -7.40 | 32.78 | 46 | -13.22 |
| 696.39 | S | Peak | 34.41 | -5.10 | 29.31 | 46 | -16.69 |
| 931.13 | S | Peak | 33.08 | -1.70 | 31.38 | 46 | -14.62 |

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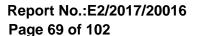
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SGS Taiwan Ltd.

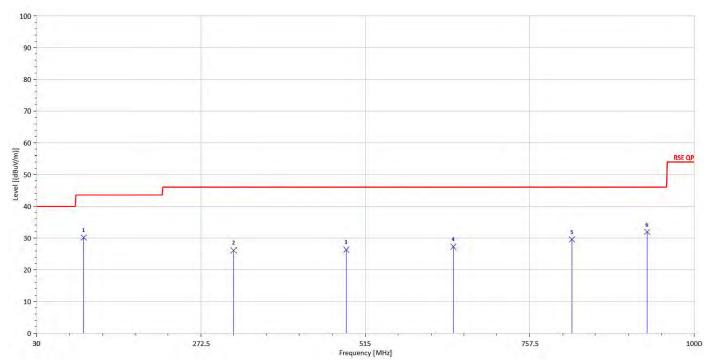
f (886-2) 2298-0488





Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

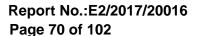
Operation Band: Test Engineer: Tx CH Low Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal E2



| Freq. | Note | Detector Mode | Spectum Reading Level | Factor | Actual FS | Limit @3m | Margin |
|--------|---------|------------------|--------------------------|--------|--------------|--------------|--------|
| MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBμV/m | dBµV/m | dB |
| 99.84 | S | Peak | 47.88 | -17.77 | 30.11 | 43.5 | -13.39 |
| 321.00 | S | Peak | 38.41 | -12.27 | 26.13 | 46 | -19.87 |
| 486.87 | S | Peak | 34.31 | -7.97 | 26.34 | 46 | -19.66 |
| 644.98 | S | Peak | 32.14 | -4.88 | 27.25 | 46 | -18.75 |
| 819.58 | S | Peak | 32.51 | -2.98 | 29.53 | 46 | -16.47 |
| 931.13 | S | Peak | 33.63 | -1.70 | 31.93 | 46 | -14.07 |

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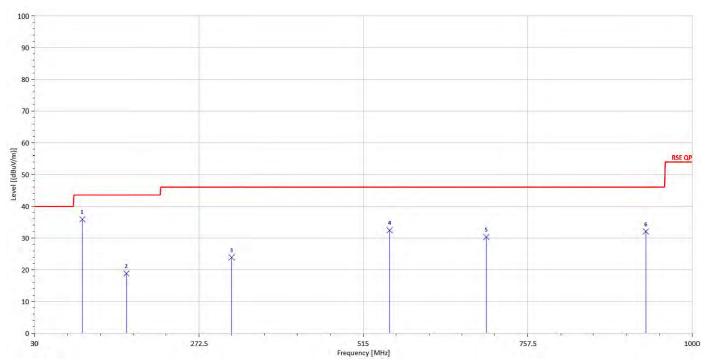
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Fundamental Frequency: 2437 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Vertical E2

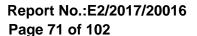


| Freq. | Note | Detector Mode | Spectum Reading Level | Factor | Actual FS | Limit @3m | Margin |
|--------|---------|------------------|--------------------------|--------|--------------|--------------|--------|
| MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBµV/m | dBµV/m | dB |
| 100.81 | S | Peak | 53.56 | -17.64 | 35.92 | 43.5 | -7.58 |
| 165.80 | S | Peak | 36.73 | -17.92 | 18.81 | 43.5 | -24.69 |
| 321.00 | S | Peak | 36.23 | -12.27 | 23.96 | 46 | -22.04 |
| 553.80 | S | Peak | 39.26 | -6.84 | 32.42 | 46 | -13.58 |
| 696.39 | S | Peak | 35.37 | -5.10 | 30.27 | 46 | -15.73 |
| 932.10 | S | Peak | 33.79 | -1.72 | 32.06 | 46 | -13.94 |

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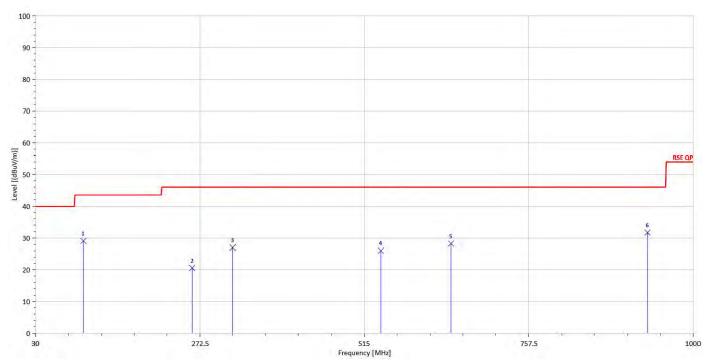
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Fundamental Frequency: 2437 MHz Temp. / Humi.: 22.7deg_C/57RH

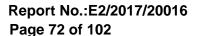
Operation Band: Tx CH Mid Test Engineer: Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal E2



| Freq. | Note | Detector Mode | Spectum Reading Level | Factor | Actual FS | Limit @3m | Margin |
|--------|---------|------------------|--------------------------|--------|--------------|--------------|--------|
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 100.81 | S | Peak | 46.69 | -17.64 | 29.05 | 43.5 | -14.45 |
| 260.86 | S | Peak | 34.19 | -13.62 | 20.57 | 46 | -25.43 |
| 321.00 | S | Peak | 39.27 | -12.27 | 26.99 | 46 | -19.01 |
| 539.25 | S | Peak | 33.41 | -7.38 | 26.03 | 46 | -19.97 |
| 643.04 | S | Peak | 33.30 | -5.09 | 28.21 | 46 | -17.79 |
| 933.07 | S | Peak | 33.36 | -1.66 | 31.70 | 46 | -14.30 |

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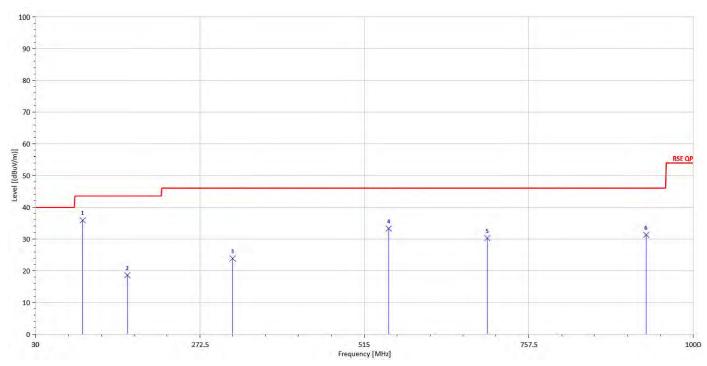
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Fundamental Frequency: 2462 MHz Temp. / Humi. : 22.7deg_C/57RH

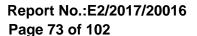
Operation Band: Test Engineer: Tx CH High Ashton EUT Pol.: E2 Measurement Antenna Pol.: Vertical



| Freq. | Note | Detector Mode | Spectum Reading Level | Factor | Actual FS | Limit @3m | Margin |
|--------|---------|------------------|--------------------------|--------|--------------|--------------|--------|
| MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBµV/m | dBµV/m | dB |
| 99.84 | S | Peak | 53.68 | -17.77 | 35.92 | 43.5 | -7.58 |
| 165.80 | S | Peak | 36.52 | -17.92 | 18.60 | 43.5 | -24.90 |
| 321.00 | S | Peak | 36.19 | -12.27 | 23.91 | 46 | -22.09 |
| 550.89 | S | Peak | 40.07 | -6.77 | 33.31 | 46 | -12.69 |
| 696.39 | S | Peak | 35.33 | -5.10 | 30.23 | 46 | -15.77 |
| 931.13 | S | Peak | 32.99 | -1.70 | 31.29 | 46 | -14.71 |

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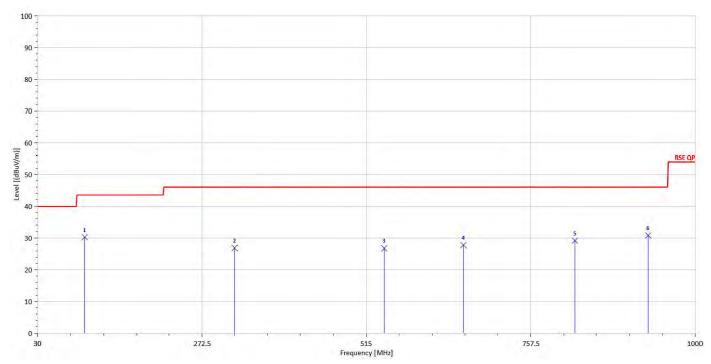
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Fundamental Frequency: 2462 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH High Ashton EUT Pol.: E2 Measurement Antenna Pol.: Horizontal

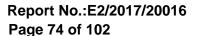


| Freq. | Note | Detector Mode | Spectum Reading Level | Factor | Actual FS | Limit @3m | Margin |
|--------|---------|------------------|--------------------------|--------|--------------|--------------|--------|
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 99.84 | S | Peak | 48.00 | -17.77 | 30.23 | 43.5 | -13.27 |
| 321.00 | S | Peak | 39.14 | -12.27 | 26.86 | 46 | -19.14 |
| 541.19 | S | Peak | 33.81 | -7.06 | 26.75 | 46 | -19.25 |
| 658.56 | S | Peak | 33.01 | -5.27 | 27.74 | 46 | -18.26 |
| 822.49 | S | Peak | 31.71 | -2.59 | 29.12 | 46 | -16.88 |
| 931.13 | S | Peak | 32.48 | -1.70 | 30.78 | 46 | -15.22 |

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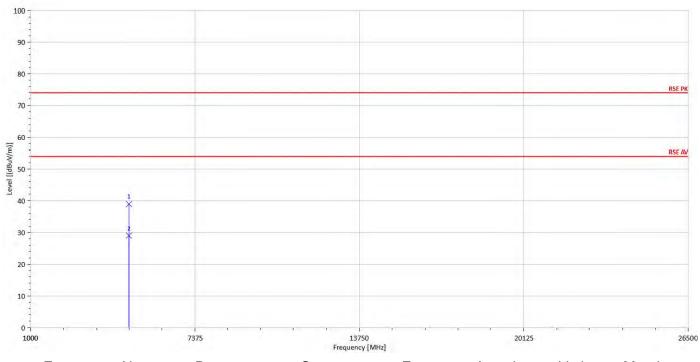
Above 1GHz Data:

Radiated Spurious Emission Measurement Result (802.11 b)

Operation Mode: 802.11b Test Date: 2017/2/17

2412 MHz Temp. / Humi.: Fundamental Frequency: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Low Ashton EUT Pol.: Measurement Antenna Pol.: E2 Vertical

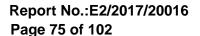


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 4824.00 | Н | Peak | 31.44 | 7.58 | 39.01 | 74 | -34.99 |
| 4824.00 | Н | Average | 21.41 | 7.58 | 28.99 | 54 | -25.01 |

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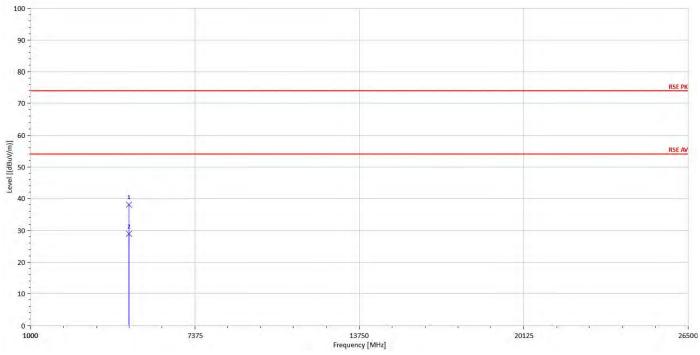
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Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Tx CH Low Test Engineer: Ashton EUT Pol.: E2 Measurement Antenna Pol.: Horizontal

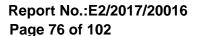


| | Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin | |
|---|---------|---------|----------|---------------|--------|--------|--------|--------|---|
| | | | Mode | Reading Level | | FS | @3m | | |
| _ | MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB | |
| - | 4824.00 | Н | Peak | 30.48 | 7.58 | 38.06 | 74 | -35.94 | • |
| | 4824.00 | Н | Average | 21.35 | 7.58 | 28.93 | 54 | -25.07 | |

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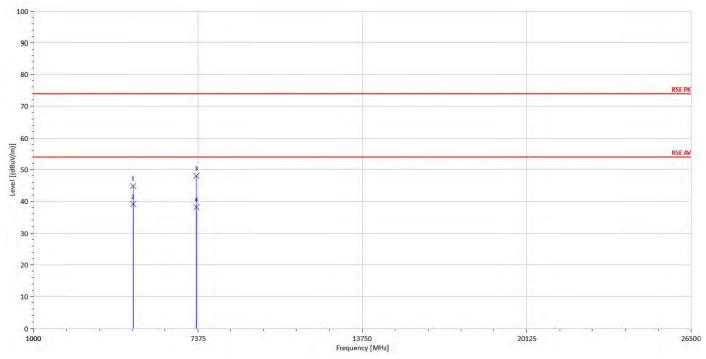
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Fundamental Frequency: Temp. / Humi.: 2437 MHz 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Mid Ashton EUT Pol.: Measurement Antenna Pol.: E2 Vertical

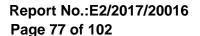


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 4874.00 | Н | Peak | 37.01 | 7.91 | 44.92 | 74 | -29.08 |
| 4874.00 | Н | Average | 31.30 | 7.91 | 39.21 | 54 | -14.79 |
| 7311.00 | Н | Peak | 33.57 | 14.47 | 48.04 | 74 | -25.96 |
| 7311.00 | Н | Average | 23.77 | 14.47 | 38.24 | 54 | -15.76 |

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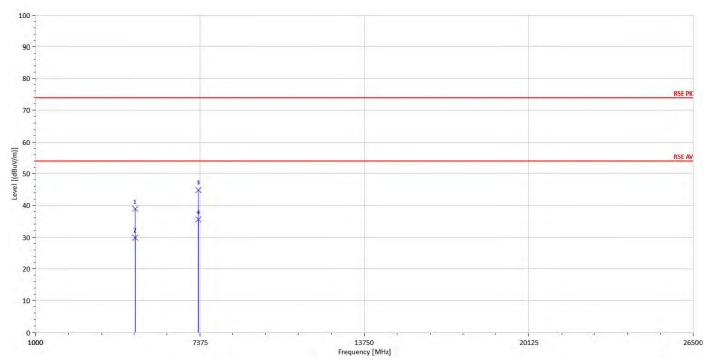
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Fundamental Frequency: Temp. / Humi.: 2437 MHz 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Mid Ashton EUT Pol.: Measurement Antenna Pol.: E2 Horizontal

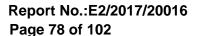


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 4874.00 | Н | Peak | 31.06 | 7.91 | 38.97 | 74 | -35.03 |
| 4874.00 | Н | Average | 21.99 | 7.91 | 29.90 | 54 | -24.10 |
| 7311.00 | Н | Peak | 30.42 | 14.47 | 44.89 | 74 | -29.11 |
| 7311.00 | Н | Average | 21.09 | 14.47 | 35.56 | 54 | -18.44 |

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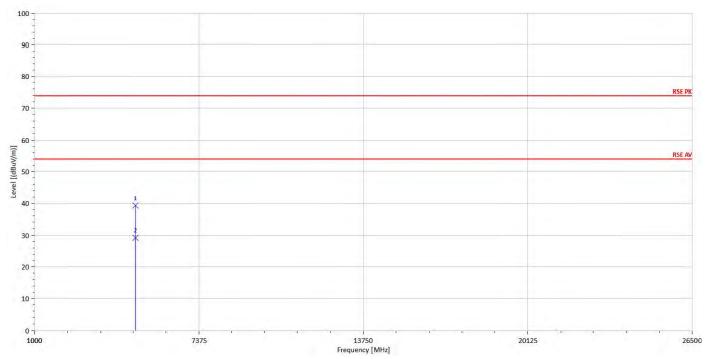
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Fundamental Frequency: 2462 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH High Ashton EUT Pol.: Measurement Antenna Pol.: E2 Vertical

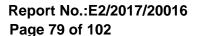


| | Freq. | Note | Detector Mode | Spectum Reading Level | Factor | Actual FS | Limit @3m | Margin |
|---|---------|---------|------------------|--------------------------|--------|--------------|--------------|--------|
| _ | MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dBµV/m | dBµV/m | dB |
| | 4924.00 | Н | Peak | 31.44 | 7.92 | 39.36 | 74 | -34.64 |
| | 4924.00 | Н | Average | 21.29 | 7.92 | 29.21 | 54 | -24.79 |

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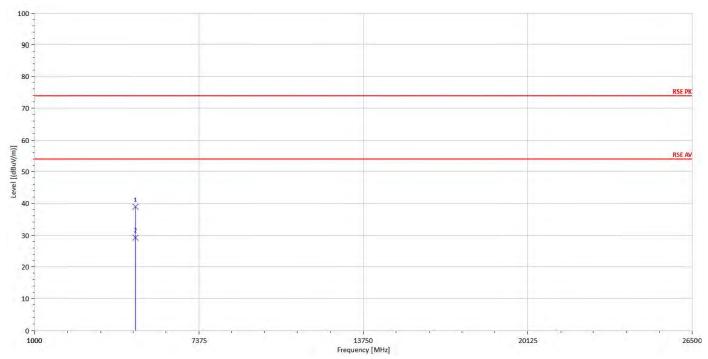
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Fundamental Frequency: 2462 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH High Ashton EUT Pol.: Measurement Antenna Pol.: E2 Horizontal

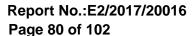


| | Freq. | Note | Detector Mode | Spectum Reading Level | Factor | Actual FS | Limit @3m | Margin |
|---|---------|---------|------------------|--------------------------|--------|--------------|--------------|--------|
| _ | MHz | F/H/E/S | PK/QP/AV | dBµV | dB | dΒμV/m | dBµV/m | dB |
| - | 4924.00 | Н | Peak | 31.04 | 7.92 | 38.96 | 74 | -35.04 |
| | 4924.00 | Н | Average | 21.34 | 7.92 | 29.26 | 54 | -24.74 |

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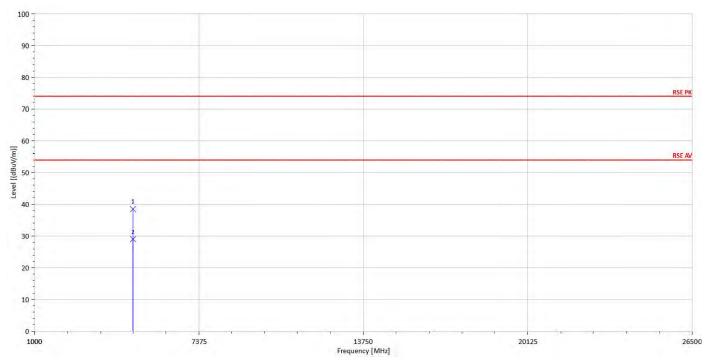


Radiated Spurious Emission Measurement Result (802.11 g)

Test Date: Operation Mode: 802.11g 2017/2/17

Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Low Ashton EUT Pol.: E2 Measurement Antenna Pol.: Vertical

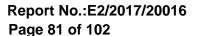


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 4824.00 | Н | Peak | 30.96 | 7.58 | 38.54 | 74 | -35.46 |
| 4824.00 | Н | Average | 21.38 | 7.58 | 28.96 | 54 | -25.04 |

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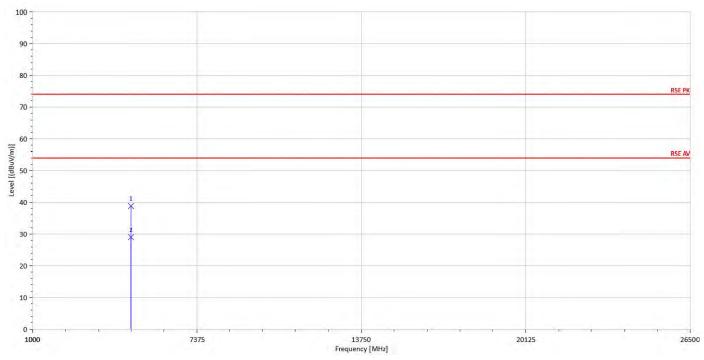
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Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Low Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal E2

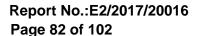


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 4824.00 | Н | Peak | 31.31 | 7.58 | 38.89 | 74 | -35.11 |
| 4824.00 | Н | Average | 21.39 | 7.58 | 28.97 | 54 | -25.03 |

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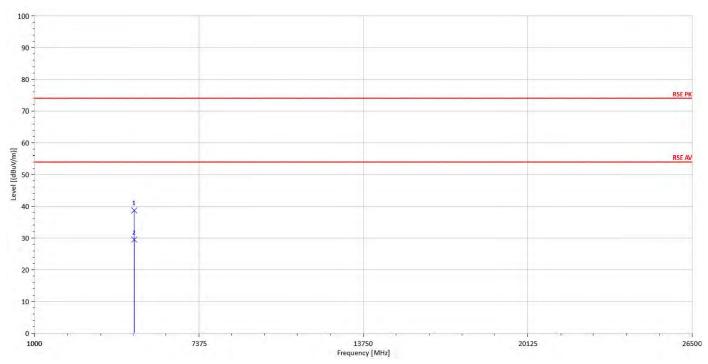
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Fundamental Frequency: 2437 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Mid Ashton EUT Pol.: Measurement Antenna Pol.: Vertical E2

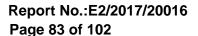


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 4874.00 | Н | Peak | 30.84 | 7.91 | 38.75 | 74 | -35.25 |
| 4874.00 | Н | Average | 21.56 | 7.91 | 29.47 | 54 | -24.53 |

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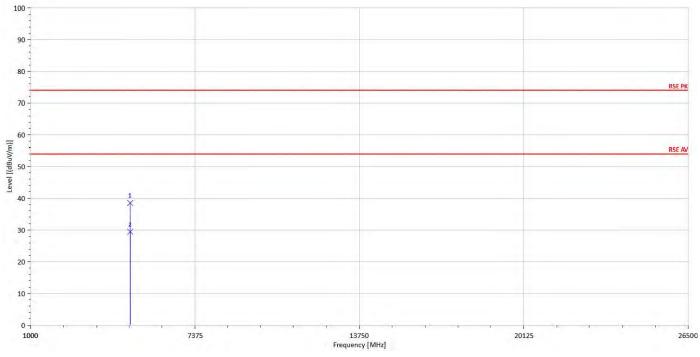
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Fundamental Frequency: 2437 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Mid Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal E2

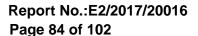


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 4874.00 | Н | Peak | 30.67 | 7.91 | 38.58 | 74 | -35.42 |
| 4874.00 | Н | Average | 21.50 | 7.91 | 29.41 | 54 | -24.59 |

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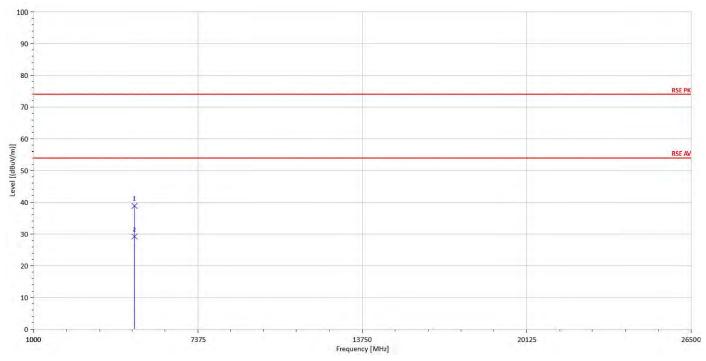
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Fundamental Frequency: 2462 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH High Ashton EUT Pol.: Measurement Antenna Pol.: Vertical E2

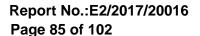


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 4924.00 | Н | Peak | 30.99 | 7.92 | 38.92 | 74 | -35.08 |
| 4924.00 | Н | Average | 21.24 | 7.92 | 29.16 | 54 | -24.84 |

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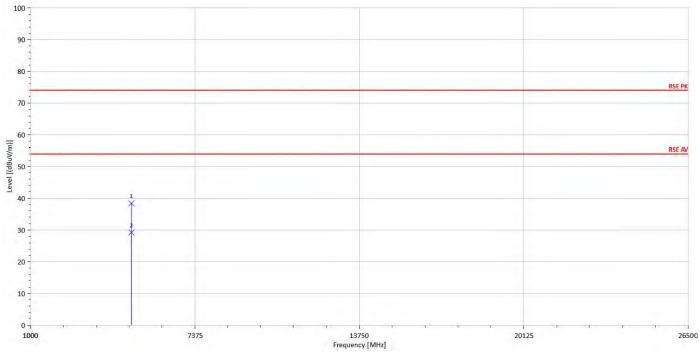
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Fundamental Frequency: 2462 MHz Temp. / Humi. : 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH High Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal E2

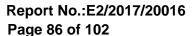


| | Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | | Mode | Reading Level | | FS | @3m | |
| _ | MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| | 4924.00 | Н | Peak | 30.52 | 7.92 | 38.44 | 74 | -35.56 |
| | 4924.00 | Н | Average | 21.24 | 7.92 | 29.16 | 54 | -24.84 |

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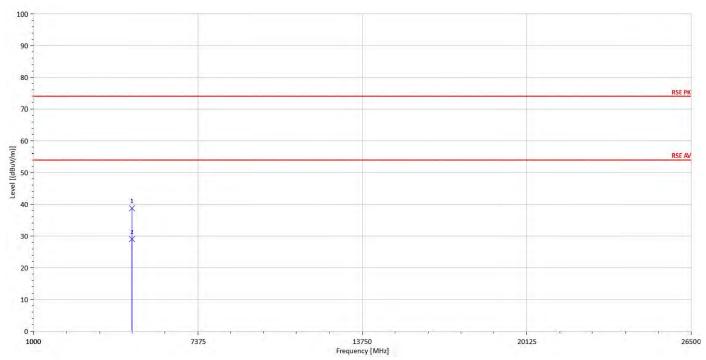


Radiated Spurious Emission Measurement Result (802.11n_HT20)

Operation Mode: 802.11n20 Test Date: 2017/2/17

Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Low Ashton EUT Pol.: E2 Measurement Antenna Pol.: Vertical

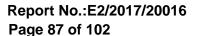


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 4824.00 | Н | Peak | 31.22 | 7.58 | 38.80 | 74 | -35.20 |
| 4824.00 | Н | Average | 21.40 | 7.58 | 28.98 | 54 | -25.02 |

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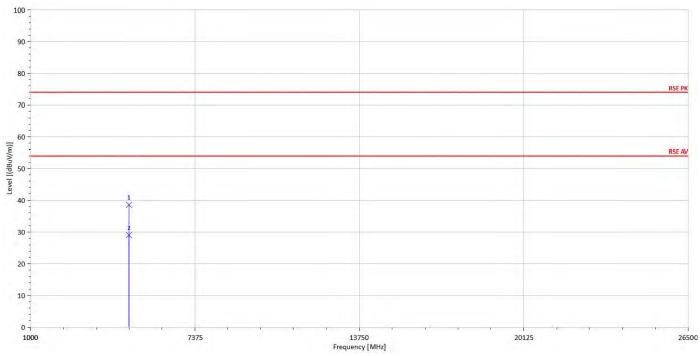
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Fundamental Frequency: 2412 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Low **Ashton** EUT Pol.: Measurement Antenna Pol.: Horizontal E2

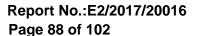


| | Freq. | Note | Detector Mode | Spectum Reading Level | Factor | Actual FS | Limit @3m | Margin | |
|---|---------|---------|------------------|--------------------------|--------|--------------|--------------|--------|--|
| | MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB | |
| • | 4824.00 | Н | Peak | 31.03 | 7.58 | 38.60 | 74 | -35.40 | |
| | 4824.00 | Н | Average | 21.41 | 7.58 | 28.99 | 54 | -25.01 | |

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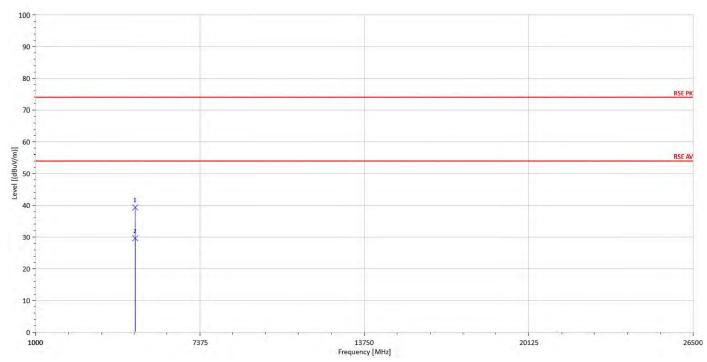
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Fundamental Frequency: 2437 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Mid Ashton EUT Pol.: Measurement Antenna Pol.: Vertical E2

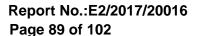


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 4874.00 | Н | Peak | 31.48 | 7.91 | 39.39 | 74 | -34.61 |
| 4874.00 | Н | Average | 21.67 | 7.91 | 29.58 | 54 | -24.42 |

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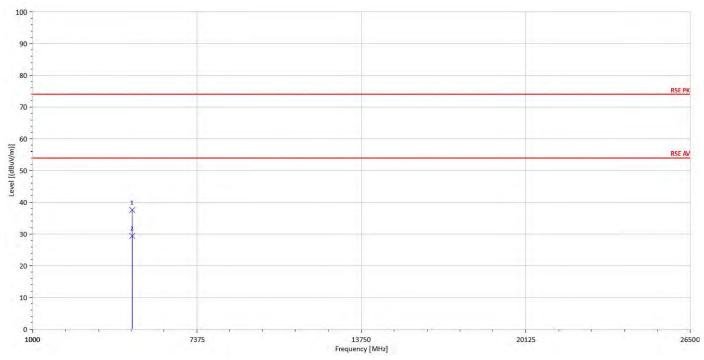
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Fundamental Frequency: 2437 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Mid Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal E2

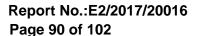


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 4874.00 | Н | Peak | 29.70 | 7.91 | 37.61 | 74 | -36.39 |
| 4874.00 | Н | Average | 21.45 | 7.91 | 29.36 | 54 | -24.64 |

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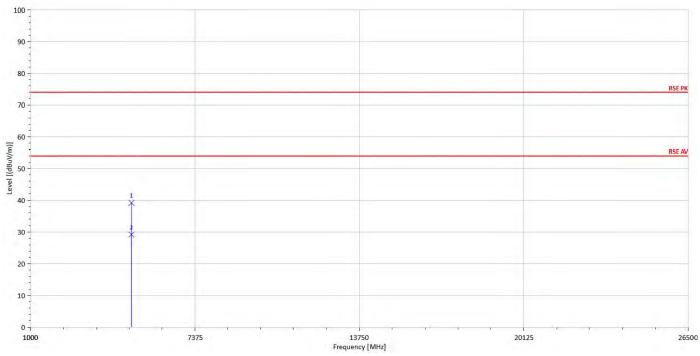
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Fundamental Frequency: 2462 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH High Ashton EUT Pol.: Measurement Antenna Pol.: Vertical E2

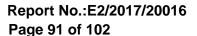


| | Freq. | Note | Detector Mode | Spectum Reading Level | Factor | Actual FS | Limit @3m | Margin |
|---|---------|---------|------------------|--------------------------|--------|--------------|--------------|--------|
| | MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| - | 4924.00 | Н | Peak | 31.33 | 7.92 | 39.25 | 74 | -34.75 |
| | 4924.00 | Н | Average | 21.24 | 7.92 | 29.16 | 54 | -24.84 |

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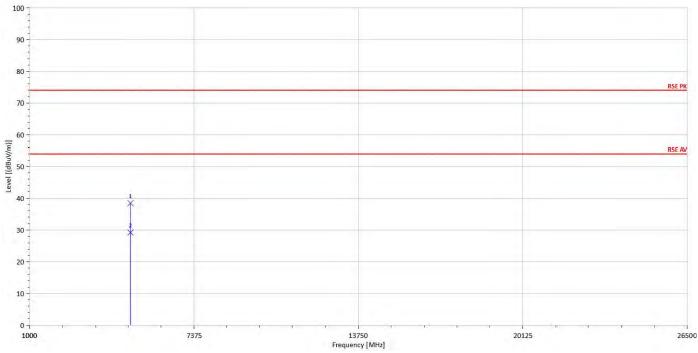
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Fundamental Frequency: 2462 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH High **Ashton** EUT Pol.: Measurement Antenna Pol.: Horizontal E2

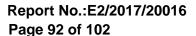


| | Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin | |
|---|---------|---------|----------|---------------|--------|--------|--------|--------|---|
| | | | Mode | Reading Level | | FS | @3m | | |
| _ | MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dΒμV/m | dBµV/m | dB | |
| | 4924.00 | Н | Peak | 30.59 | 7.92 | 38.51 | 74 | -35.49 | • |
| | 4924.00 | Н | Average | 21.25 | 7.92 | 29.17 | 54 | -24.83 | |

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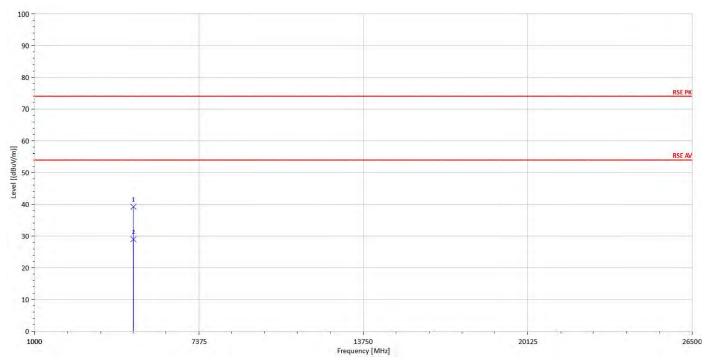


Radiated Spurious Emission Measurement Result (802.11n_HT40)

Operation Mode: 802.11n40 Test Date: 2017/2/17

Fundamental Frequency: 2422 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Low Ashton EUT Pol.: E2 Measurement Antenna Pol.: Vertical



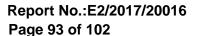
| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 4844.00 | Н | Peak | 31.72 | 7.55 | 39.27 | 74 | -34.73 |
| 4844.00 | Н | Average | 21.39 | 7.55 | 28.94 | 54 | -25.06 |

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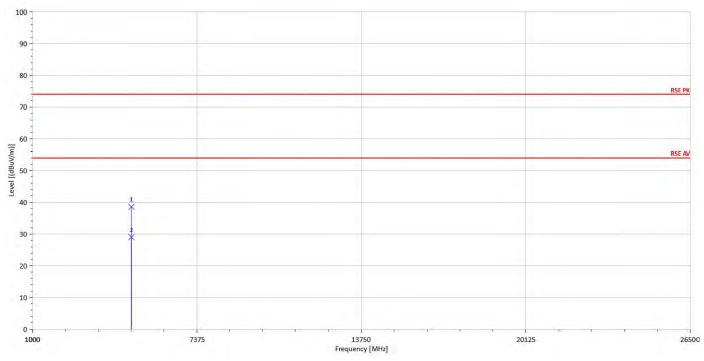
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Fundamental Frequency: 2422 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Low Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal E2

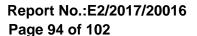


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 4844.00 | Н | Peak | 31.07 | 7.55 | 38.63 | 74 | -35.37 |
| 4844.00 | Н | Average | 21.40 | 7.55 | 28.95 | 54 | -25.05 |

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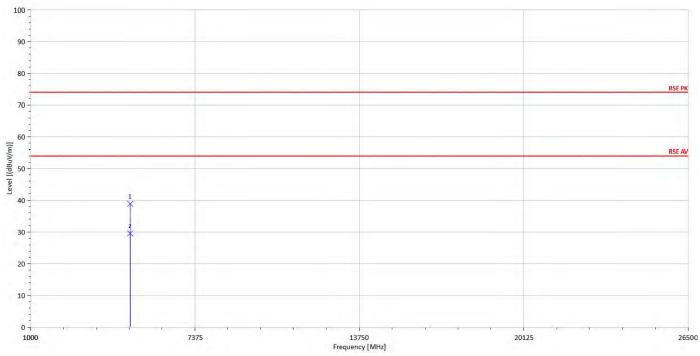
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Fundamental Frequency: 2437 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Mid Ashton EUT Pol.: Measurement Antenna Pol.: Vertical E2

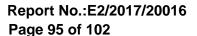


| | Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | | Mode | Reading Level | | FS | @3m | |
| _ | MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| | 4874.00 | Н | Peak | 31.02 | 7.91 | 38.93 | 74 | -35.07 |
| | 4874.00 | Н | Average | 21.62 | 7.91 | 29.53 | 54 | -24.47 |

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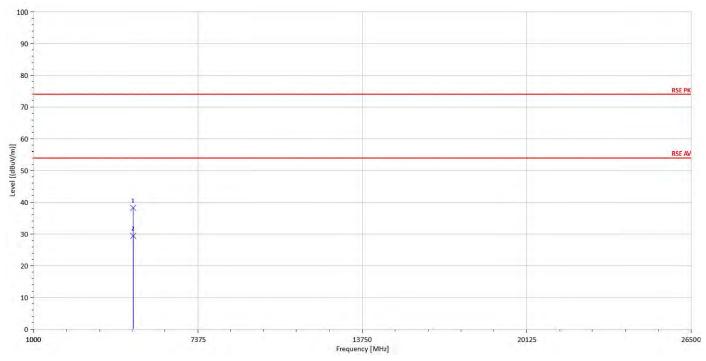
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Fundamental Frequency: 2437 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH Mid Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal E2

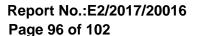


| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 4874.00 | Н | Peak | 30.37 | 7.91 | 38.28 | 74 | -35.72 |
| 4874.00 | Н | Average | 21.47 | 7.91 | 29.38 | 54 | -24.62 |

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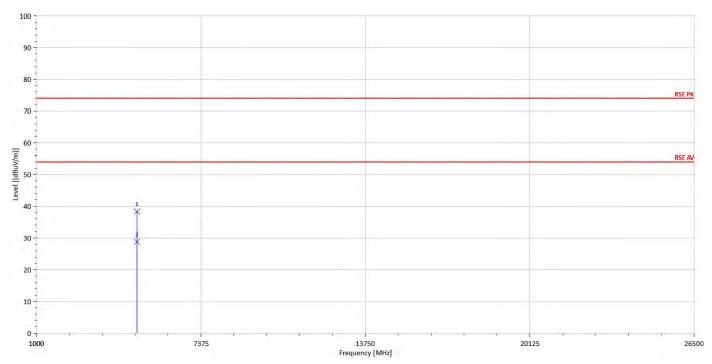
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Fundamental Frequency: 2452 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH High Ashton EUT Pol.: Measurement Antenna Pol.: Vertical E2



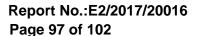
| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 4904.00 | Н | Peak | 30.97 | 7.44 | 38.42 | 74 | -35.58 |
| 4904.00 | Н | Average | 21.31 | 7.44 | 28.75 | 54 | -25.25 |

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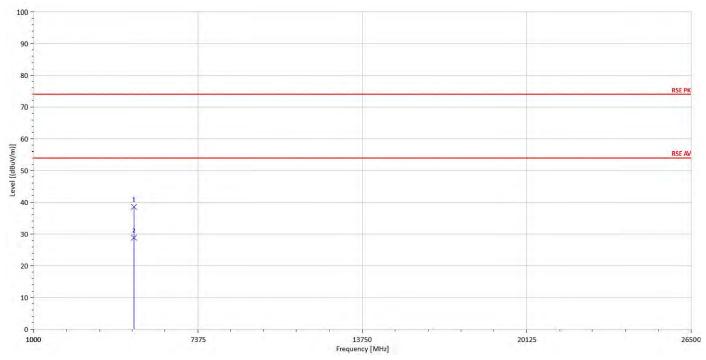
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Fundamental Frequency: 2452 MHz Temp. / Humi.: 22.7deg_C/57RH

Operation Band: Test Engineer: Tx CH High Ashton EUT Pol.: Measurement Antenna Pol.: Horizontal E2



| Freq. | Note | Detector | Spectum | Factor | Actual | Limit | Margin |
|---------|---------|----------|---------------|--------|--------|--------|--------|
| | | Mode | Reading Level | | FS | @3m | |
| MHz | F/H/E/S | PK/QP/AV | dΒμV | dB | dBµV/m | dBµV/m | dB |
| 4904.00 | Н | Peak | 31.15 | 7.44 | 38.59 | 74 | -35.41 |
| 4904.00 | Н | Average | 21.34 | 7.44 | 28.78 | 54 | -25.22 |

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12 PEAK POWER SPECTRAL DENSITY

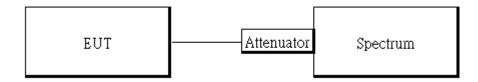
12.1 Standard Applicable

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

12.2 Measurement Equipment Used

| Conducted Emission Test Site | | | | | | | | |
|------------------------------|------------|----------------|------------|------------|------------|--|--|--|
| EQUIPMENT MFR | | MODEL | SERIAL | LAST | CAL DUE. | | | |
| TYPE | | NUMBER | NUMBER | CAL. | | | | |
| Spectrum Analyzer | KEYSIGHT | N9010A | MY54510568 | 04/14/2016 | 04/13/2017 | | | |
| Coaxial Cable 30cm | WOKEN | 00100A1F1A195C | RF01 | 12/12/2016 | 12/11/2017 | | | |
| DC Block | PASTERNACK | PE8210 | RF29 | 12/12/2016 | 12/11/2017 | | | |
| Attenuator | WOKEN | 218FS-10 | RF23 | 12/12/2016 | 12/11/2017 | | | |
| DC Power Supply | Agilent | E3640A | MY53140006 | 05/04/2016 | 05/03/2017 | | | |
| DC Power Supply | Agilent | E3634A | MY53180030 | 05/17/2016 | 05/16/2017 | | | |

12.3 Test Set-up



12.4 Measurement Procedure

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
- 3. Set the span to 1.5 times the DTS channel bandwidth.
- 4. Set the RBW = 3 kHz. & the VBW = 10 kHz
- For defining Restricted Band Edge Limit:Set the RBW = 100kHz & VBW = 300 kHz.
- 6. Detector = peak.
- 7. Sweep time = auto couple.
- 8. Trace mode = max hold.
- 9. Allow trace to fully stabilize.
- 10. Use the peak marker function to determine the maximum amplitude level.
- 11.802.11n MIMO mode: offset is set following "measure and add 10 Log (N)" on spectrum to measure the PSD for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna. N=2 for this given application.

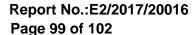
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Note:

Antenna Gain: -3.30 dBi -3.50 dBi Aux1 Antenna Gain: Number Antenna: 2 pcs 8 dBm Limit:

The antenna gain is not grater than 6dBi in MIMO mode and the limit is not reduced: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain (dBi) = -3.3+3.01=-0.29dBi

Limit: 8dBm - (-0.29- 6dBi)=8

12.5 Measurement Result

| POWE | R DENSIT | Y 802.11b | MODE | POWE | R DENSIT | Y 802.11g | g MODE | | |
|----------------|--------------|----------------|--------|----------------|--------------|----------------|--------|--|--|
| Freq. (MHz) | PSD (dBm) | Limit (dBm) | Result | Freq. (MHz) | PSD (dBm) | Limit (dBm) | Result | | |
| 2412 | -5.72 | 8.00 | PASS | 2412 | -8.96 | 8.00 | PASS | | |
| 2437 | -5.45 | 8.00 | PASS | 2437 | -8.52 | 8.00 | PASS | | |
| 2462 | -5.08 | 8.00 | PASS | 2462 | -8.56 | 8.00 | PASS | | |

| POWER DENSITY 802.11n HT20 MODE | | | | POWER | DENSITY 8 | 302.11n HT | 40 MODE |
|---------------------------------|--------------|----------------|--------|----------------|--------------|----------------|---------|
| Freq. (MHz) | PSD (dBm) | Limit (dBm) | Result | Freq. (MHz) | PSD (dBm) | Limit (dBm) | Result |
| 2412 | -7.24 | 8.00 | PASS | 2422 | -11.63 | 8.00 | PASS |
| 2437 | -8.25 | 8.00 | PASS | 2437 | -10.86 | 8.00 | PASS |
| 2462 | -8.17 | 8.00 | PASS | 2452 | -10.25 | 8.00 | PASS |

Note:

offset 11.20 dΒ

*Refer to next page for plots

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802.11b **Power Spectral Density Test Plot (CH-Low)**



802.11g **Power Spectral Density Test Plot (CH-Low)**



Power Spectral Density Test Plot (CH-Mid)



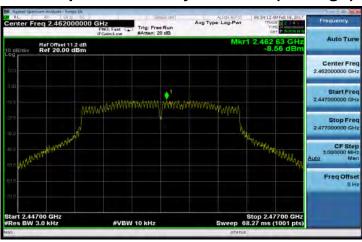
Power Spectral Density Test Plot (CH-Mid)



Power Spectral Density Test Plot (CH-High)



Power Spectral Density Test Plot (CH-High)



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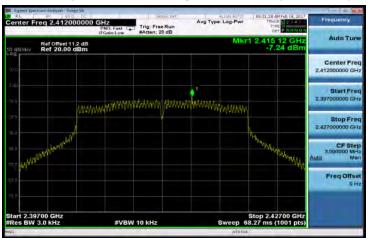
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802.11n HT20

Power Spectral Density Test Plot (CH-Low)



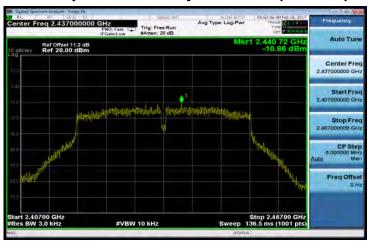
802.11n HT40 **Power Spectral Density Test Plot (CH-Low)**



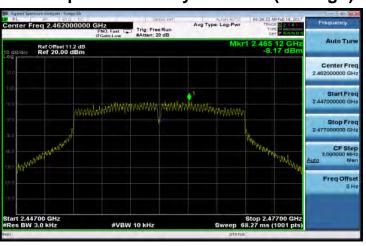
Power Spectral Density Test Plot (CH-Mid)



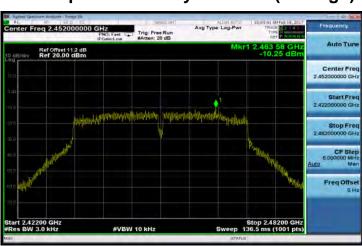
Power Spectral Density Test Plot (CH-Mid)



Power Spectral Density Test Plot (CH-High)



Power Spectral Density Test Plot (CH-High)



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13 ANTENNA REQUIREMENT

13.1 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.

If the transmitting antenna is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

13.2 Antenna Connected Construction

An embedded-in antenna design is used.

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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