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The Power Leader of Global Regulatory Compliance

CTK Co., Ltd.

(Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea
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TEST REPORT For FCC

FCC Standards : FCC 47CFR part 15 subpart E
Industry Canada Standards :RSS-247 Issue 1 & RSS-GEN Issue 4

Test Report No. : CTK-2015-01158

Date of Issue : 2015-08-31

FCC ID : GU6-QUATECH1

Certification Number IC : 1502A-QUATECH1

Model/Type No. : 9485NP

Kind of Product : Mobile Printer

Applicant : Avery Dennison Retail Information Services, LLC

Applicant Address : 170 Monarch Lane, Miamisburg, Ohio, USA 45342

Manufacturer : SEWOO TECH Co., Ltd.

Manufacturer Address : 28-6,Gajangsaneopdong-ro Osan-si, Gyeonggi-do Korea

Contact Person : James Bacher / Senior Engineer

Telephone : 937.865.2020

Received Date : 2014-11-26

Test period : Start : 2015-08-06 End : 2015-08-29

The test results presented in this report relate only to the object tested.

Tested by

Y. T. Lee

Young-taek, Lee
Test Engineer
Date: 2015-08-31

Reviewed by

Y. J. Park

Young-Joon, Park
Technical Manager
Date: 2015-08-31



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REPORT REVISION HISTORY

| Date | Revision | Page No |
|------------|-------------------------|---------|
| 2015-08-31 | Issued (CTK-2015-01158) | All |
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1.0 General Product Description

| | | | | | |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------|-----------------------|-----------------------|
| Equipment model name | 9485NP | | | | |
| Device type | Client device | | | | |
| Serial number | Prototype | | | | |
| EUT condition | Pre-production, not damaged | | | | |
| Frequency Range | UNII 1 : 5180 MHz - 5240 MHz (20 MHz_BW) UNII 2A : 5260 MHz - 5320 MHz (20 MHz_BW) UNII 2C : 5500 MHz - 5720 MHz (20 MHz_BW) UNII 3 : 5745 MHz - 5825 MHz (20 MHz_BW) | | | | |
| RF output power : | | | | | |
| | Band | Mode | Channel Bandwidth (MHz) | Frequency Range (MHz) | RF output power (dBm) |
| | UNII 1 | 802.11a | 20 | 5180 - 5240 | 5.60 |
| | UNII 2A | 802.11a | 20 | 5260 - 5320 | 2.73 |
| | UNII 2C | 802.11a | 20 | 5500 - 5720 | 9.82 |
| | UNII 3 | 802.11a | 20 | 5745 - 5825 | 4.89 |
| Transfer Rate | 802.11a : 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6 Mbps | | | | |
| Type of Modulation | OFDM | | | | |
| Power Source | DC 7.4 V (Battery) | | | | |
| Duty Cycle | 802.11a : 89.8 % | | | | |
| Antenna Type | PCB antenna | | | | |
| Antenna Gain* | 5.1 dBi | | | | |

* Test mode

The worst-case data rates are determined to be as follows for each mode.

802.11a mode, 54 Mb/s, OFDM Modulation.



1.1 Tune-up limits

| Band | Mode | Bandwidth (MHz) | Channel | Frequency (MHz) | Tune-up limits (dBm) |
|---------|---------|-----------------|---------|-----------------|----------------------|
| 2.4 GHz | 802.11b | 20 | 1 | 2 412 | 15.50 |
| | | | 6 | 2 437 | 15.80 |
| | | | 11 | 2 462 | 15.10 |
| | 802.11g | 20 | 1 | 2 412 | 9.33 |
| | | | 6 | 2 437 | 9.10 |
| | | | 11 | 2 462 | 9.30 |
| 5.2 GHz | 802.11a | 20 | 36 | 5 180 | 7.90 |
| | | | 40 | 5 200 | 7.90 |
| | | | 44 | 5 220 | 7.90 |
| | | | 48 | 5 240 | 7.90 |
| 5.3 GHz | 802.11a | 20 | 52 | 5 260 | 7.20 |
| | | | 56 | 5 280 | 7.20 |
| | | | 60 | 5 300 | 6.90 |
| | | | 64 | 5 320 | 7.60 |
| 5.6 GHz | 802.11a | 20 | 100 | 5 500 | 11.80 |
| | | | 104 | 5 520 | 12.60 |
| | | | 108 | 5 540 | 13.50 |
| | | | 112 | 5 560 | 13.70 |
| | | | 116 | 5 580 | 14.60 |
| | | | 120 | 5 600 | 15.40 |
| | | | 124 | 5 620 | 15.20 |
| | | | 128 | 5 640 | 15.40 |
| | | | 132 | 5 660 | 14.90 |
| | | | 136 | 5 680 | 14.80 |
| 5.8 GHz | 802.11a | 20 | 149 | 5 745 | 11.00 |
| | | | 153 | 5 765 | 11.00 |
| | | | 157 | 5 785 | 11.40 |
| | | | 161 | 5 805 | 11.30 |
| | | | 165 | 5 825 | 10.80 |

* Tune up tolerance is + 1.0 dB.



1.2 Tested Frequency

802.11a

| Frequency (MHz) | LOW | MID | HIGH |
|-----------------|------|------|------|
| UNII 1 | 5180 | 5200 | 5240 |
| UNII 2A | 5260 | 5300 | 5320 |
| UNII 2C | 5500 | 5580 | 5700 |
| UNII 3 | 5745 | 5785 | 5825 |

1.3 Device Modifications

The following modifications were necessary for compliance:

Not applicable

1.4 Model Differences

Not applicable

1.5 Peripheral Devices

| Device | Manufacturer | Model No. | Serial No. |
|---------------|--------------|---------------|------------|
| Note Computer | TOSHIBA | PSL48K-00L00K | - |
| | | | |

1.6 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.7 Test Facility

The measurement facility is located at (Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.







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1.8 Laboratory Accreditations and Listings

| Country | Agency | Scope of Accreditation | Logo |
|---------------|--------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| USA | FCC | 3 m & 10 m SAC and Conducted Test Site to perform FCC Part 15/18 measurements |  805871 |
| JAPAN | VCCI | 3 m & 10 m SAC and Conducted Test Site |  R-948, C-986, T-1843 |
| KOREA | MSIP | EMI (Electromagnetic Interference / Emission) EMS (Electromagnetic Susceptibility / Immunity) |  No. 51, KR0025 |
| International | KOLAS | EMC |  |



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2.0 Summary of tests

| FCC Part Section(s) | Parameter | Limit | Test Condition | Status (note 1) |
|-------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|
| 15.407(e) | 6 dB Bandwidth | > 500 kHz | Conducted | C |
| 15.407(a) | 26 dB Bandwidth and 99% Bandwidth | NA | | C |
| 15.407(a)(1) | Conducted Output Power | < 250 mW (5150 – 5250 MHz) < 250 mW (5250 – 5350 MHz) < 250 mW (5470 – 5725 MHz) < 1 W (5725 – 5850 MHz) | | C |
| 15.407(a)(1) | Power Spectral Density | < 11 dBm/MHz (5150 – 5250 MHz) < 11 dBm/MHz (5250 – 5350 MHz) < 11 dBm/MHz (5470 – 5725 MHz) < 30 dBm/500kHz (5725 – 5850 MHz) | | C |
| 15.407(g) | Frequency Stability | NA | | C |
| 15.407 (b) | Undesirable emission | < -27 dBm/MHz EIRP (5150 – 5250 MHz, 5250 – 5350 MHz, 5470 – 5725 MHz) < -17 dBm/MHz EIRP (5715 – 5725 MHz, 5850 – 5860 MHz) < -27 dBm/MHz EIRP outside (5715 - 5850 MHz) | Radiated | C |
| 15.205, 15.407 (b)(1),(5),(6) | Radiated Spurious Emission | 15.209(a) | | C |
| 15.207 | AC Conducted Emissions | 15.207(a) | Line Conducted | C |

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

The sample was tested according to the following specification:
- FCC Part 15.407, ANSI C63.10-2013

The tests were performed according to the method of measurements prescribed in
KDB No.789033



[DFS_Operation in the 5.25 - 5.35 GHz Band]

| FCC Rule Part | RSS Rule Part | Test Description | Test Result |
|-------------------|------------------|---------------------------------|-------------|
| 15.407(h)(1) | 247 6.2.2 (1) | Transmit Power Control(TPC) | N/A** |
| 15.407(h)(2) | 247 6.3 (1) | DFS Radar detection threshold | N/A* |
| 15.407(h)(2)(ii) | 247 6.3 (2)(ii) | Channel Availability Check Time | N/A* |
| 15.407(h)(2)(iii) | 247 6.3 (2)(iii) | Channel Move Time | Pass |
| 15.407(h)(2)(iv) | 247 6.3 (2)(v) | Non-Occupancy Period | Pass |

* : The EUT is a client device with no in-service monitoring

** : The EUT has an EIRP of less than 500 mW.

[DFS_Operation in the 5.47 - 5.725 GHz Band]

| FCC Rule Part | RSS Rule Part | Test Description | Test Result |
|-------------------|------------------|---------------------------------|-------------|
| 15.407(h)(1) | 247 6.2.3 (1) | Transmit Power Control(TPC) | N/A** |
| 15.407(h)(2) | 247 6.3 (1) | DFS Radar detection threshold | N/A* |
| 15.407(h)(2)(ii) | 247 6.3 (2)(ii) | Channel Availability Check Time | N/A* |
| 15.407(h)(2)(iii) | 247 6.3 (2)(iii) | Channel Move Time | Pass |
| 15.407(h)(2)(iv) | 247 6.3 (2)(v) | Non-Occupancy Period | Pass |

* : The EUT is a client device with no in-service monitoring

** : The EUT has an EIRP of less than 500 mW.



2.1 Technical Characteristic Test

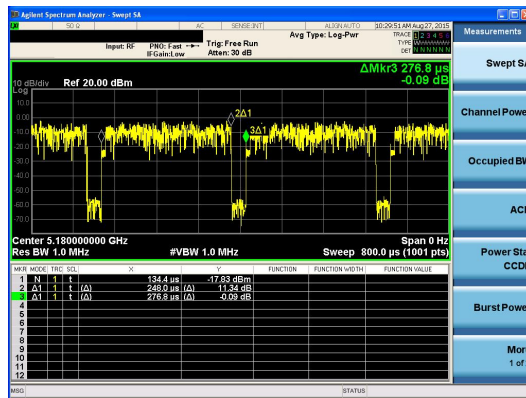
2.1.1 ON Time, Duty Cycle

Procedure:

KDB 789033 Zero-Span Spectrum Analyzer Method.

Measurement Data:

| Test mode | Period (ms) | ON Time (ms) | TX OFF (ms) | Duty Cycle (linear) | Duty Cycle (%) |
|-----------|-------------|--------------|-------------|---------------------|----------------|
| 802.11a | 0.276 | 0.248 | 0.028 | 0.898 | 89.8 |



802.11a



2.1.2 6 dB Bandwidth

Procedure:

The bandwidth at 6 dB below the highest in-band spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 6 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

Span = 1.5 time > RBW

VBW = 300 kHz

Sweep = auto

Trace = max hold

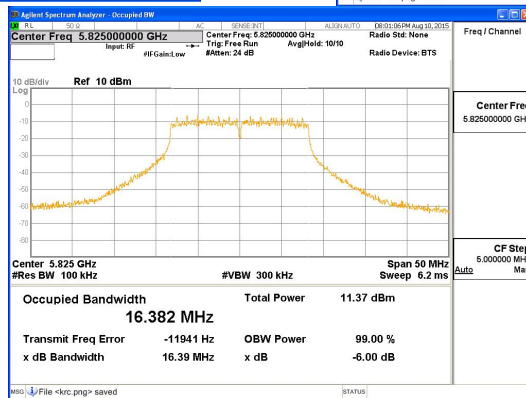
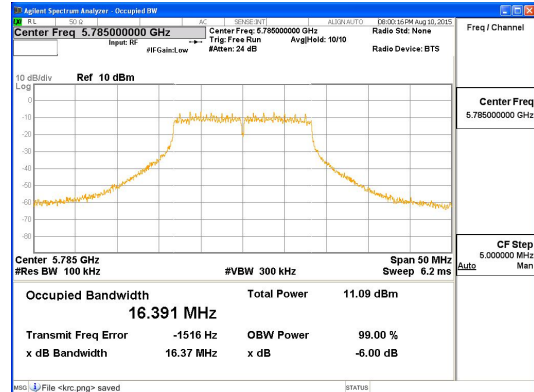
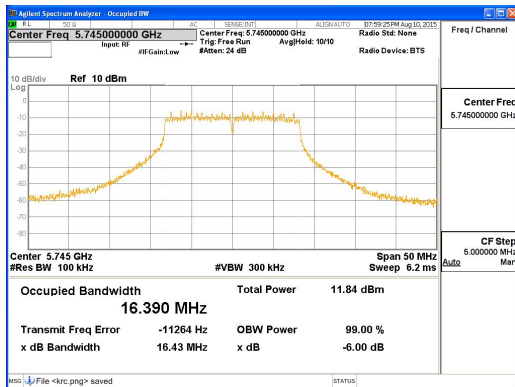
Detector function = peak



Measurement Data:

802.11a

| 6 dB Bandwidth (MHz) | |
|-------------------------|---------|
| Mode | 802.11a |
| Frequency | |
| 5745 MHz | 16.43 |
| 5785 MHz | 16.37 |
| 5825 MHz | 16.39 |
| Measurement uncertainty | ± 3 dB |



802.11a



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2.1.3 26 dB Bandwidth and 99% Bandwidth

Procedure:

The bandwidth at 26 dB below the highest in-band spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 26 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 26 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = approximately 1 % of the emission bandwidth Span = 1.5 time > RBW

VBW = VBW > RBW

Sweep = auto

Trace = max hold

Detector function = peak

Measurement Data:

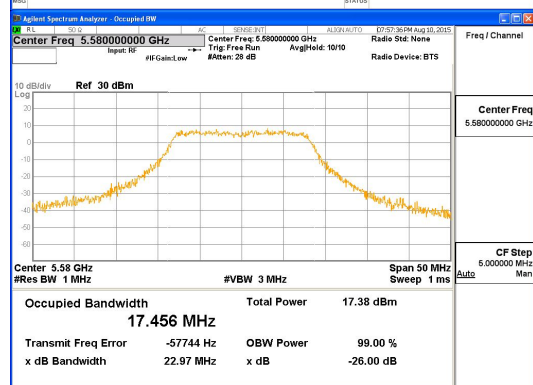
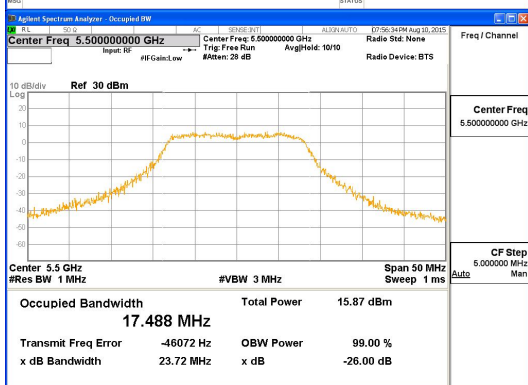
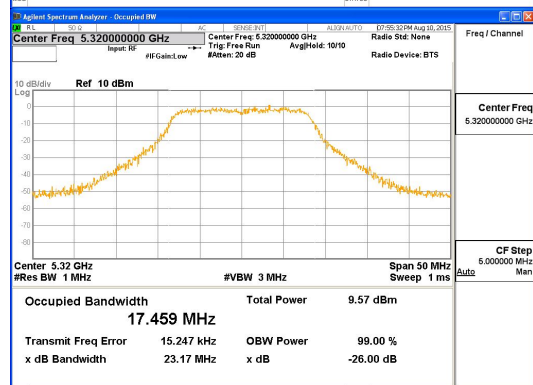
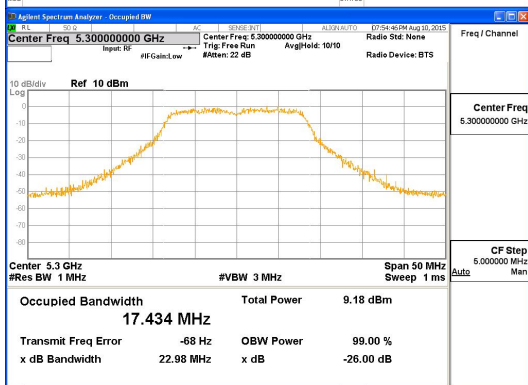
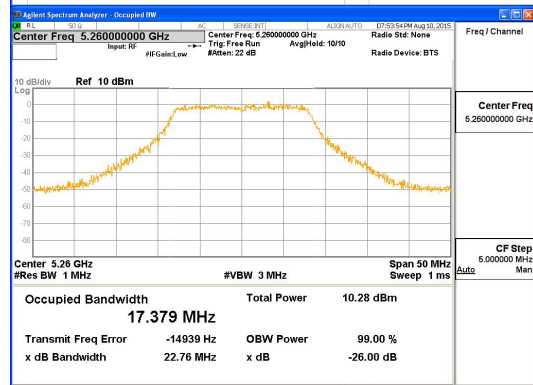
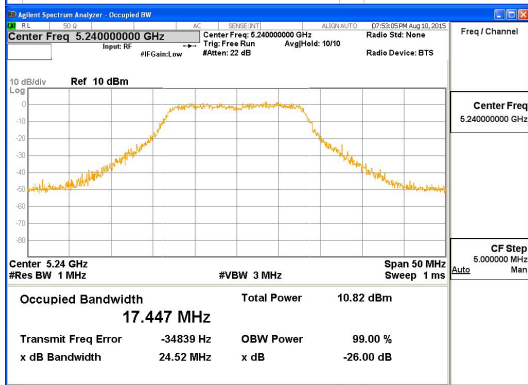
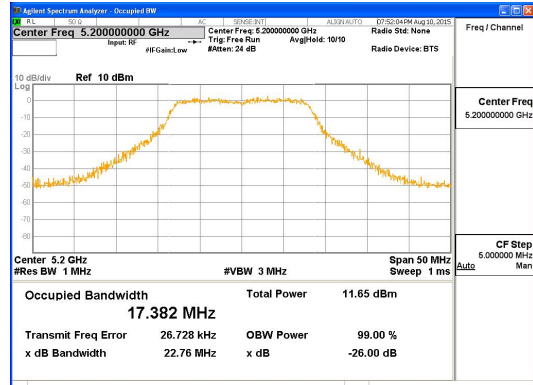
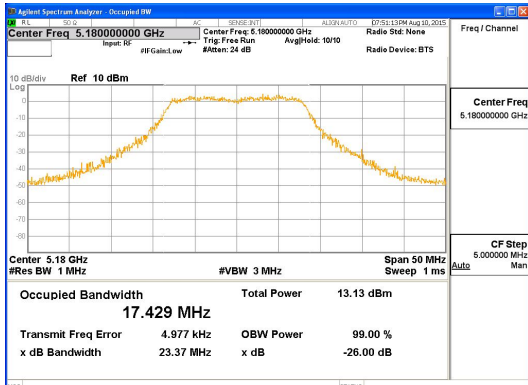
802.11a

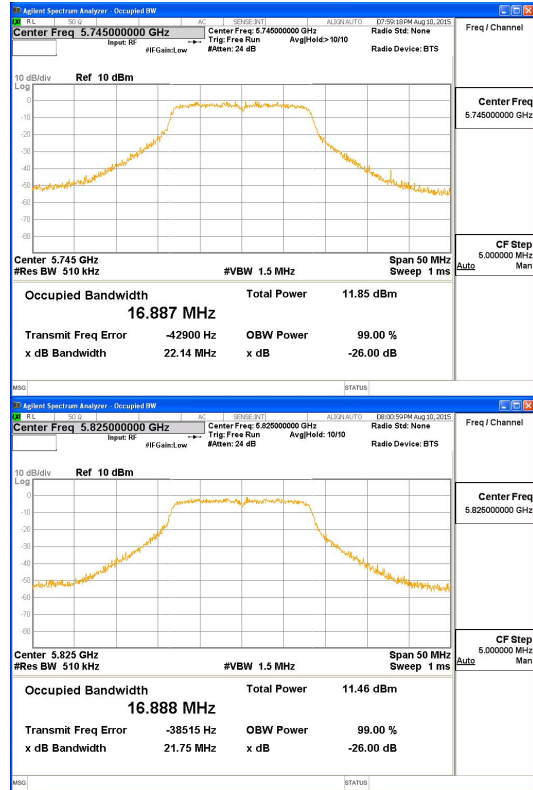
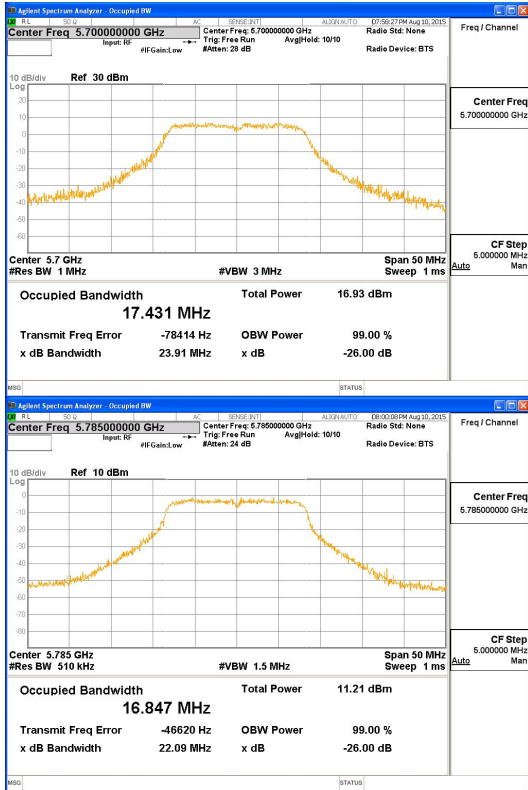
| | 26 dB Bandwidth and 99% Bandwidth (MHz) | |
|-------------------------|-----------------------------------------|-------|
| Mode | 802.11a | |
| Frequency | 26 dB | 99% |
| 5180 MHz | 23.37 | 17.43 |
| 5200 MHz | 22.76 | 17.38 |
| 5240 MHz | 24.52 | 17.44 |
| 5260 MHz | 22.76 | 17.38 |
| 5300 MHz | 22.98 | 17.43 |
| 5320 MHz | 23.17 | 17.46 |
| 5500 MHz | 23.72 | 17.49 |
| 5600 MHz | 22.97 | 17.46 |
| 5720 MHz | 23.91 | 17.43 |
| 5745 MHz | 22.14 | 16.89 |
| 5785 MHz | 22.09 | 16.85 |
| 5825 MHz | 21.75 | 16.89 |
| Measurement uncertainty | ± 3 dB | |

Minimum Standard:

6 dB Bandwidth > 500kHz

See next pages for actual measured spectrum plots.





802.11a

2.1.4 Conducted Output Power

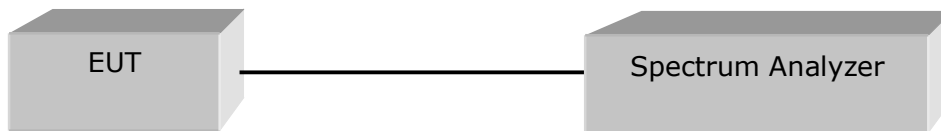
Test Location

RF Test Room

Test Procedures

Maximum Conducted Output Power(KDB 789033, Method SA-1)

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.



The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 1 MHz

VBW = 3 MHz (3 x RBW)

Trace = average at least 100

Sweep = auto

Detector function = RMS

Limit

[Dipole ANT]

| Band | Mode | Limit (dBm) | |
|---------|---------|-------------|----|
| | | FCC | IC |
| UNII 1 | 802.11a | 24 | 23 |
| UNII 2A | 802.11a | 24 | 24 |
| UNII 2C | 802.11a | 24 | 24 |
| UNII 3 | 802.11a | 30 | 30 |



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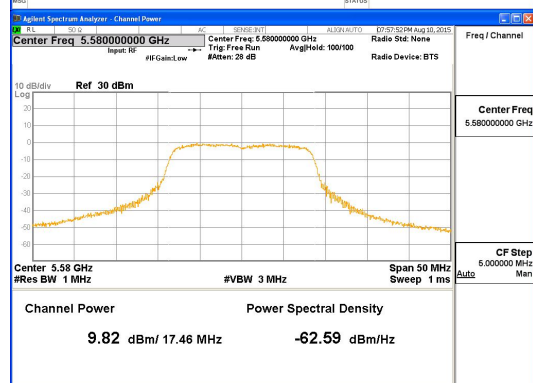
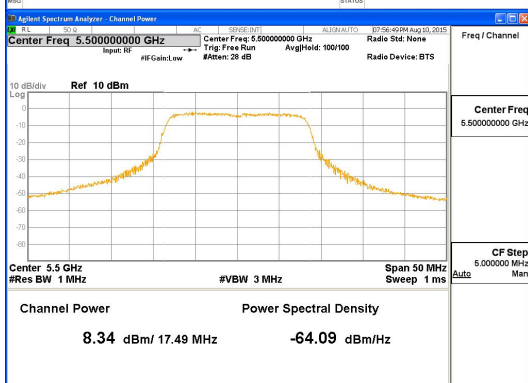
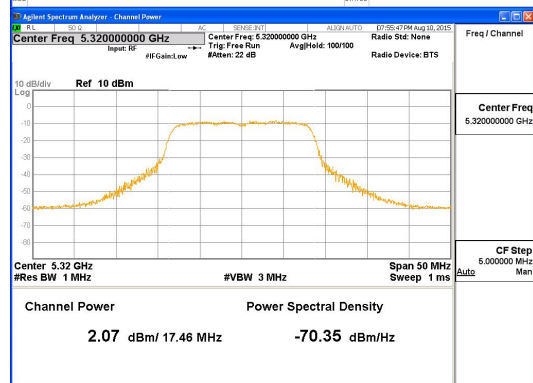
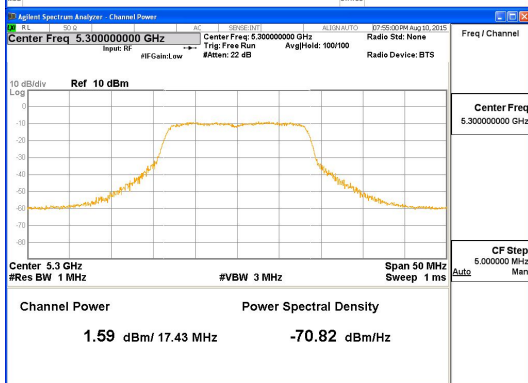
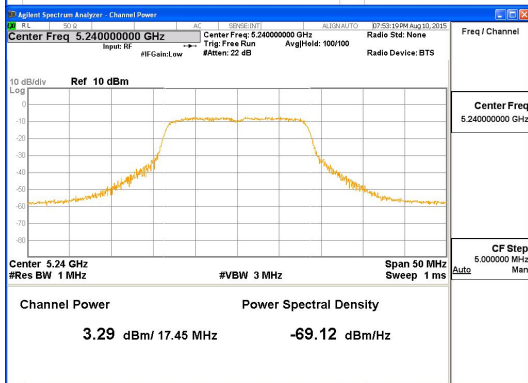
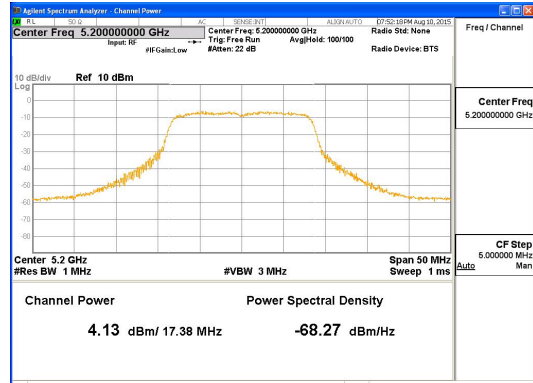
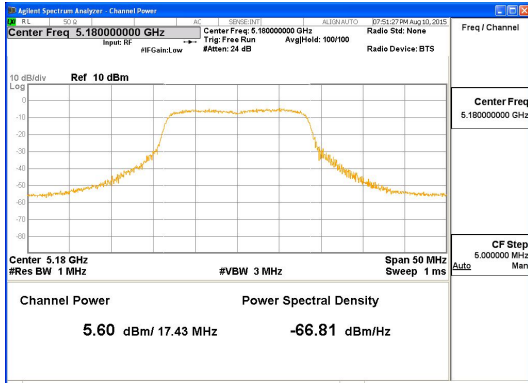
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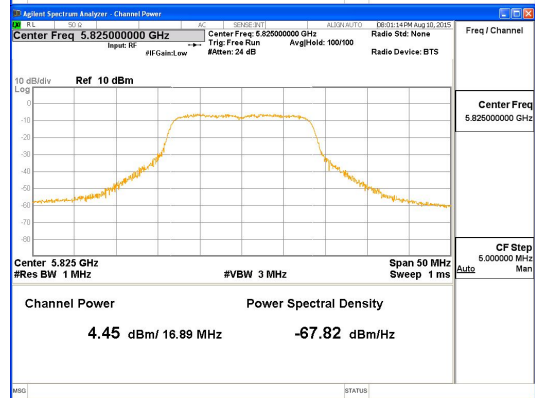
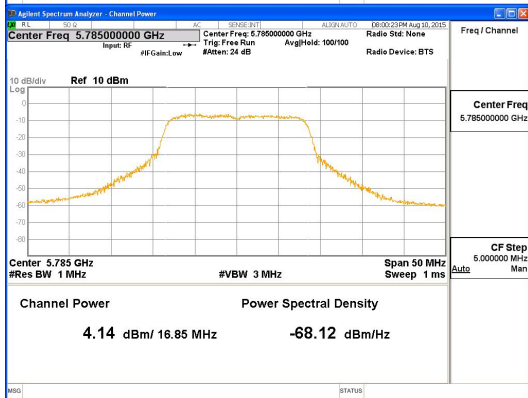
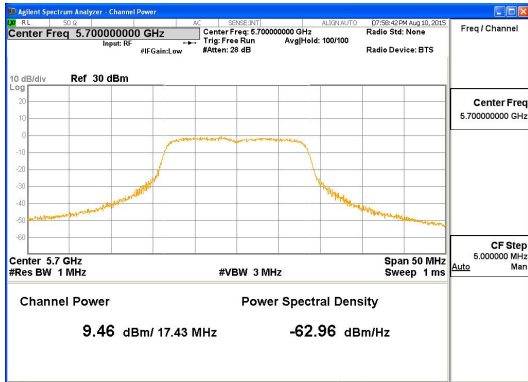
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Test Results

| | Measured Output Power (dBm) |
|-------------------------|-----------------------------|
| Mode | 802.11a |
| Frequency | |
| 5180 MHz | 5.60 |
| 5200 MHz | 4.13 |
| 5240 MHz | 3.29 |
| 5260 MHz | 2.73 |
| 5300 MHz | 1.59 |
| 5320 MHz | 2.07 |
| 5500 MHz | 8.34 |
| 5580 MHz | 9.82 |
| 5700 MHz | 9.46 |
| 5745 MHz | 4.89 |
| 5785 MHz | 4.14 |
| 5825 MHz | 4.45 |
| Measurement uncertainty | ± 3 dB |







2.1.5 Power Spectral Density

Procedure:

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

The spectrum analyzer is set to:

RBW = 1 MHz, 500 KHz (UNII 3)

VBW = 3 MHz, 1.5 MHz (UNII 3)

Trace = average at least 100

Sweep = auto

Detector function = RMS

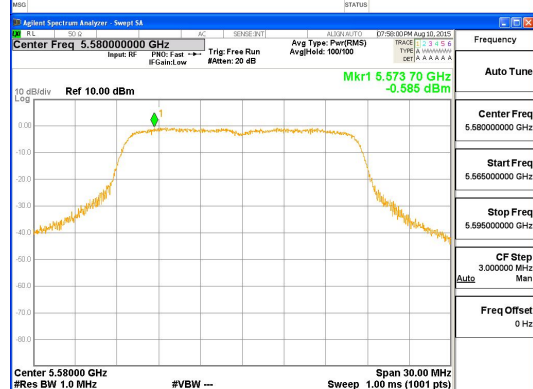
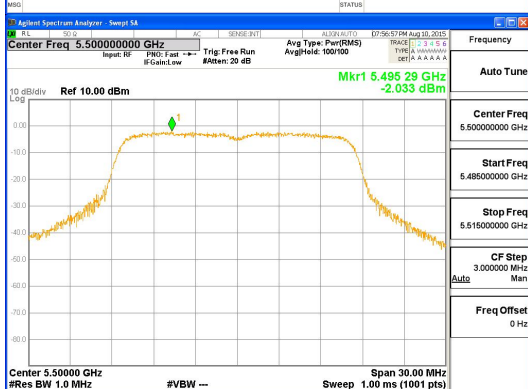
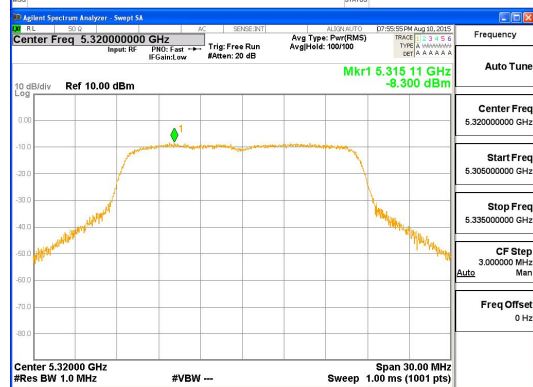
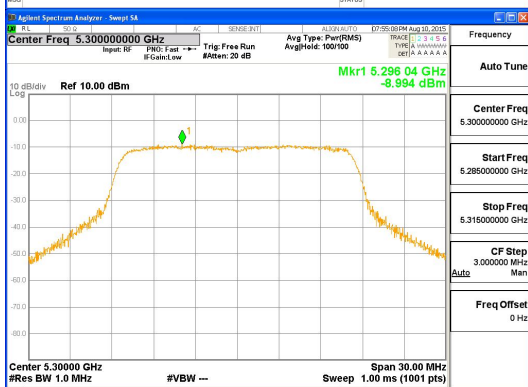
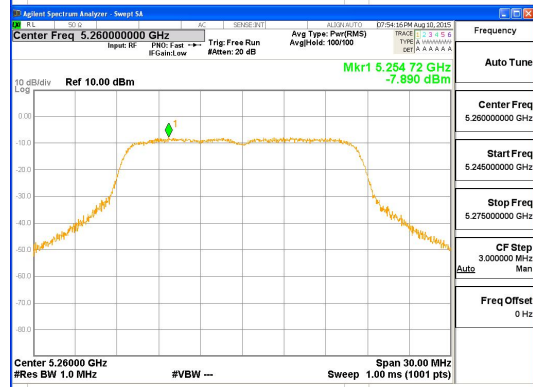
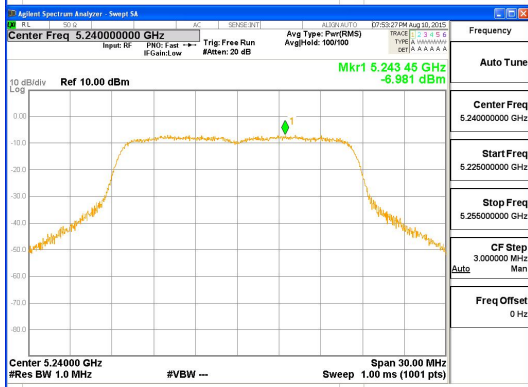
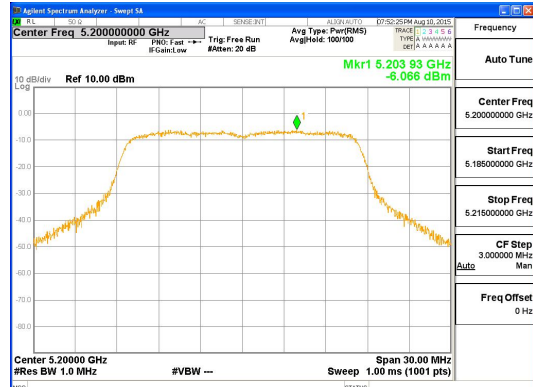
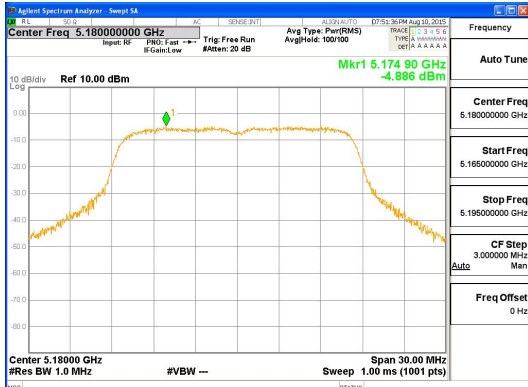
Limit

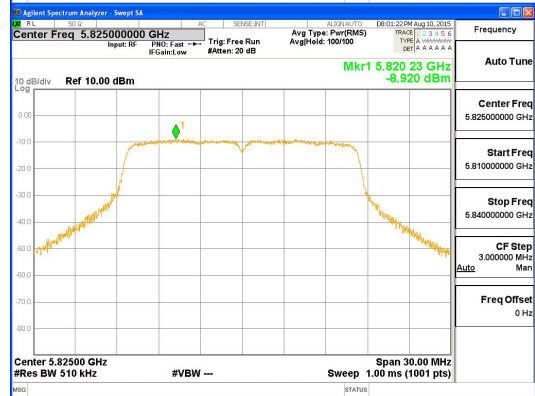
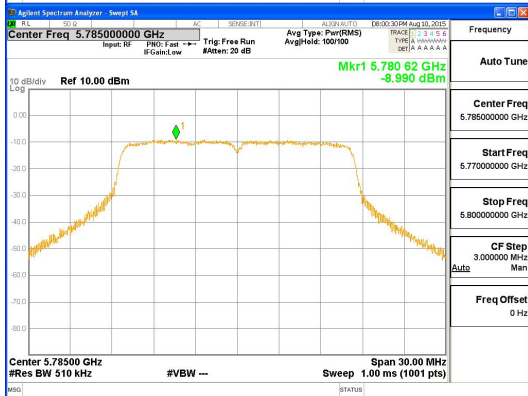
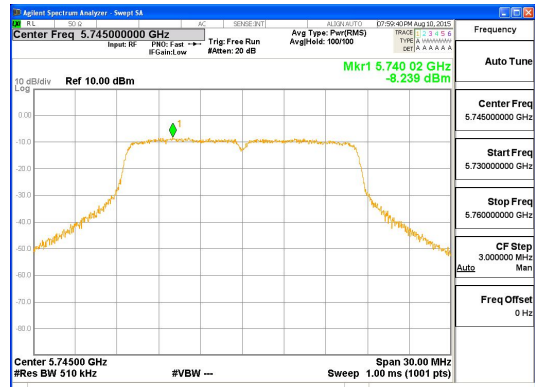
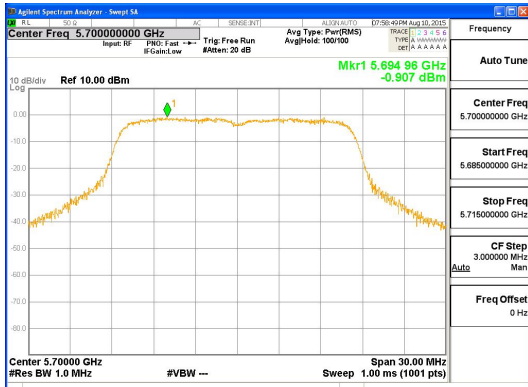
| Band | Mode | Limit (dBm) |
|---------|---------|-------------|
| | | FCC, IC |
| UNII 1 | 802.11a | 11 |
| UNII 2A | | 11 |
| UNII 2C | | 11 |
| UNII 3 | | 30 /500KHz |

Test Results

| Mode | Measured Power Density (dBm) |
|-------------------------|------------------------------|
| | 802.11a |
| Frequency | |
| 5180 MHz | -4.88 |
| 5200 MHz | -6.06 |
| 5240 MHz | -6.98 |
| 5260 MHz | -7.89 |
| 5300 MHz | -8.99 |
| 5320 MHz | -8.30 |
| 5500 MHz | -2.03 |
| 5600 MHz | -0.58 |
| 5720 MHz | -0.90 |
| 5745 MHz | -8.23 |
| 5785 MHz | -8.99 |
| 5825 MHz | -8.92 |
| Measurement uncertainty | ± 3 dB |

See next pages for actual measured spectrum plots.







2.1.6 Frequency Stability

Procedure:

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between 0°C and +45°C. The temperature was incremented by 10°C (15°C) intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.

Data for the worst case channel is shown below.

| Temperature (°C) | 0 | 10 | 20 | 30 | 45 |
|-------------------------|--------------------------------|---------|---------|---------|---------|
| Frequency | Measured Frequency Error (kHz) | | | | |
| 5180 MHz | 35.108 | 11.010 | 8.508 | 30.212 | -2.393 |
| 5200 MHz | 9.935 | 30.065 | 24.250 | 37.808 | 35.014 |
| 5240 MHz | -50.643 | -11.325 | -27.726 | 36.382 | 39.697 |
| 5260 MHz | -48.575 | -23.876 | -55.512 | -52.768 | 25.870 |
| 5300 MHz | -68.216 | -74.024 | -7.896 | -51.722 | -15.986 |
| 5320 MHz | -59.324 | -94.730 | -68.880 | -54.670 | -52.231 |
| 5500 MHz | -52.789 | -34.698 | -17.553 | -20.676 | -23.976 |
| 5580 MHz | -44.887 | -45.055 | -80.714 | -12.251 | -69.529 |
| 5700 MHz | -54.576 | -88.668 | -98.075 | -83.520 | -71.938 |
| 5745 MHz | -90.247 | -67.901 | -69.662 | -43.996 | -28.697 |
| 5785 MHz | -70.456 | -59.958 | -67.186 | -32.401 | -34.557 |
| 5825 MHz | -69.309 | -17.874 | -45.823 | -37.280 | -17.337 |
| Measurement uncertainty | ± 3 kHz | | | | |

Note :

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.