



ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

*FCC PART 15.407 SUBPART C
TEST REPORT*

for

the

WIFI MODULE

MODEL: BLUEFIN 5G

Prepared for

Tropos Networks, Inc.
555 Del Rey Avenue
Sunnyvale, CA, 94085

Prepared by: George Hsu
GEORGE HSU

Approved by: Kevin Bothmann
KEVIN BOTHMANN

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(650) 965-4000

DATE: October 18, 2015

| | REPORT BODY | APPENDICES | | | | TOTAL |
|-------|----------------|------------|---|---|---|-------|
| | | A | B | C | D | |
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GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Electro Magnetic Test, Inc., which is an independent testing and consulting firm. The test report is based on testing performed Electro Magnetic Test, Inc. personnel according to the measurement procedure described in the test specification given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form unless done so in full.

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Federal Government.

The measurement data and conclusions contained in this test report are deemed satisfactory evidence of compliance with Industry Canada Interference-Causing Equipment Standard ICES-003, Issue 5, August 2012.

Electro Magnetic Test, Inc. is recognized by the following agencies for performing EMI/EMC testing:

| COUNTRY | AGENCY | IDENTIFYING # |
|--|--|------------------------------------|
| USA | Federal Communications Commission (FCC) (EMT's test site is recognized by the FCC) | Registration Number: 90576 |
| USA, Canada, Taiwan, Australia/New Zealand, European Community | National Voluntary Lab Accreditation Program (NVLAP) (EMT is accredited by NVLAP. A copy of the NVLAP Scope Of Accreditation is available upon request.) | Lab Code: 200147-0 |
| Canada | Industry Canada | File No.: IC 2804 |
| Japan | Voluntary Control Council For Interference (VCCI) | A-0118 |
| | Open Field Test Site "A" | - |
| | Mains Conducted Emissions Test Site "A" | - |
| | Telecom Conducted Emissions Test Site "A" | - |
| | 3 Meter Semi-Anechoic Chamber Site "E" | - |
| | 3 Meter Semi-Anechoic Chamber Site "E" (1GHz – 6GHz) | - |
| | Mains Conducted Emissions Test Site "E" | - |
| | Telecom Conducted Emissions Test Site "E" | - |
| Korea | Ministry of Information and Communication's Radio Research Laboratory (RRL) under the Asia Pacific Economic Cooperation (APEC) Mutual Recognition Arrangement (A copy of the Scope Of Accreditation is available upon request) | US0036 |
| Taiwan | Bureau Of Standards, Metrology and Inspection (BSMI) | Reference Number: SL2-IN-E-1024 |
| Australia / New Zealand | Australian Communications Authority (AUSTEL) | * |

*These agencies do not issue an identifying number to test labs.



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GENERAL REPORT SUMMARY (CONTINUED)

Device Tested: WIFI Module
 Model: Bluefin 5G
 S/N: N/A

Product Description: The EUT is a 802.11 b/g/n RF module that operates in the 5 GHz band.

Modifications: The EUT was not modified during the testing.

Manufacturer: Tropos Networks, Inc.
 555 Del Rey Avenue
 Sunnyvale, CA 94085

Test Date(s): Septemeber 15, October 7, and 8, 2015

Test Specifications: EMI requirements
 Limits: FCC Title 47, Part 15 Subpart C
 Test Procedure: ANSI C63.4: 2009

Test Deviations: The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

| TEST | DESCRIPTION | FCC STANDARD | REMARKS | RESULTS |
|-------------|--|------------------------------------|----------------|----------------|
| 7.1 | Radiated Emissions (General Requirements and Emissions in Restricted Frequency Bands) | 15.209 | Radiated** | PASS** |
| 7.2 | Conducted Emissions | 15.207(a) | N/A* | N/A* |
| 7.3 | Occupied Bandwidth | 15.407(e) | Conducted | PASS |
| 7.4 | Maximum Average Output Power | 15.407 (a)(1)(i), 15.407 (a)(3) | Conducted | PASS |
| 7.5 | Maximum Average Power Spectral Density | 15.407(a)(1)(i), 15.407(a)(3) | Conducted | PASS |
| 7.6 | Emissions in Non-Restricted Frequency Bands | 15.407(b)(1, 4) | Conducted | PASS |
| 7.7 | Bandedge | 15.407(b)(1, 4) | Conducted | PASS |
| 7.8 | Antenna Requirement | 15.203 | N/A | PASS |

*No hardware changes were made in this permissive change, that would effect conducted emissions

**The worst case modes where chosen for radiated emissions

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TECHNICAL DESCRIPTION OF THE EUT

| | |
|-------------------------------|--|
| Manufacturer: | Tropos Networks, Inc. |
| Manufacturer Address: | 298 S. Sunnyvale Ave, Ste 205, Sunnyvale, CA 94086 |
| EUT Name: | WIFI Module |
| Model No: | Bluefin 5G |
| Operation frequency: | 5180 to 5240 MHz and 5745 to 5825 |
| Channel Number: | 30 |
| Modulation Technology: | DSSS |
| Antenna Type: | Patch Antenna |
| Antenna Gain: | 8.0 dBi @ 5 GHz |
| Maximum Output Power: | 25.334 dBm |


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| Description of Channel | | | | | |
|------------------------|-----------------|---------|-----------------|---------|-----------------|
| 802.11a, 5 MHz | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 36 | 5180 | 46 | 5230 | 156 | 5780 |
| 37 | 5185 | 47 | 5235 | 157 | 5785 |
| 38 | 5190 | 48 | 5240 | 158 | 5790 |
| 39 | 5195 | 149 | 5745 | 159 | 5795 |
| 40 | 5200 | 150 | 5750 | 160 | 5800 |
| 41 | 5205 | 151 | 5755 | 161 | 5805 |
| 42 | 5210 | 152 | 5760 | 162 | 5810 |
| 43 | 5215 | 153 | 5765 | 163 | 5815 |
| 44 | 5220 | 154 | 5770 | 164 | 5820 |
| 45 | 5225 | 155 | 5775 | 165 | 5825 |
| 802.11a, 10 MHz | | | | | |
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 36 | 5180 | 48 | 5240 | 159 | 5795 |
| 38 | 5190 | 149 | 5745 | 161 | 5805 |
| 40 | 5200 | 151 | 5755 | 163 | 5815 |
| 42 | 5210 | 153 | 5765 | 165 | 5825 |
| 44 | 5220 | 155 | 5775 | | |
| 46 | 5230 | 157 | 5785 | | |

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1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the WIFI MODULE Model: BLUEFIN 5G. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2009. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the specification limits defined in FCC Title 47, Part 15, Subpart C.

2. ADMINISTRATIVE DATA**2.1 Location of Testing**

The EMI tests described herein were performed at the test facility of Electro Magnetic Test, Inc., 1547 Plymouth Street, Mountain View, California, 94043.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The measurement results in this report and the calibration of the test equipment are traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant PersonnelTropos Networks, Inc.

Maxim Bakaleynik Senior Director , Hardware Engineering

Electro Magnetic Test, Inc.

David Vivanco Test Technician
George Hsu Test Technician
Kevin Bothmann Lab Manager

2.4 Date Test Sample was Received

The test sample was received on September 9, 2015.

2.5 Disposition of the Test Sample

The test sample has not yet been returned Tropos Networks, Inc.



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2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

| | |
|-------|---|
| RF | Radio Frequency |
| EMI | Electromagnetic Interference |
| EUT | Equipment Under Test |
| P/N | Part Number |
| S/N | Serial Number |
| HP | Hewlett Packard |
| ITE | Information Technology Equipment |
| CML | Corrected Meter Limit |
| LISN | Line Impedance Stabilization Network |
| CISPR | International Special Committee On Radio Interference |
| FCC | Federal Communications Commission |

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3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

| SPEC | TITLE |
|-------------------------------------|---|
| FCC Title 47, Part 15, Subpart C | FCC Rules - Radio frequency devices (including digital devices). |
| FCC Publication KDB789033 | Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E, June 6 2014 |
| ANSI C63.4 2009 | Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz. |



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4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration – EMI

The EUT was connected to the remote Ethernet switch and remote laptop computer via its Ethernet port and Ethernet POE port, respectively. The remote Ethernet switch and remote laptop computer were located outside the test site. During the testing process, traffic was running at its maximum workload at the network interfaces and the intentional radiator was transmitting constantly.

It was determined that the emissions were at their highest level when the EUT was operating in the above configuration. The cables were moved to maximize the emissions. The final conducted as well as radiated data was taken in this mode of operation. All initial investigations were performed with the EMI receiver in manual mode scanning the frequency range continuously. The cables were bundled and routed as shown in the photographs in Appendix B.



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4.1.1 Cable Construction and Termination

Cable #1

This is a 10 foot shielded CAT 5 Ethernet cable connecting the EUT to the POE adapter. They have metallic RJ45 plastic connectors at both ends of the cables. The shields of the connectors were grounded to the chassis via the connectors. The cable was bundled to a length of 4 feet.

Cable #2

This is a 50 foot shielded CAT 5 Ethernet cable connecting the EUT to the ethernet switch. They have metallic RJ45 plastic connectors at both ends of the cables. The shields of the connectors were grounded to the chassis via the connectors.

Cable #3

This is a 50 foot shielded CAT 5 Ethernet cable connecting the EUT to the remote laptop computer. They have metallic RJ45 plastic connectors at both ends of the cables. The shields of the connectors were grounded to the chassis via the connectors.

Cables #4

This is a 6 foot unshielded power cables connecting the POE to the AC outlet.


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5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT
5.1 EUT and Accessory List

| EQUIPMENT TYPE | MANUFACTURER | MODEL | SERIAL NUMBER | FCC ID |
|----------------------------|-----------------------|-----------------|------------------------------|---------------|
| Bluefin 5G (EUT) | Tropos Networks, Inc. | Bluefin 5G | 301304 | P9J-642401 |
| POE Adapter | Cincon Electronics | TR60A-POE-L | 006516 | DoC |
| Laptop Computer | Dell | Lattitude E5430 | 100PYW1 | DoC |
| Laptop Powersupply | Dell | LA90PE1-01 | CN-0J62H3-71615-09K-7D70-A01 | DoC |
| Ethernet Switch | Linksys | EZXS55W | R9160KS13148 | DoC |
| Ethernet Switch AC Adapter | N/A | SJ-0510-U | N/A | DoC |


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5.2 EMI Test Equipment

| EQUIPMENT TYPE | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | CAL. DATE | CAL. CYCLE |
|------------------------|---------------------|-----------------------|----------------------|-------------------|-------------------|
| Spectrum Analyzer | Hewlett Packard | 8566B | 3024A20115 | September 2, 2015 | 1 Year |
| RF Preselector | Hewlett Packard | 85685A | 3010A01157 | September 2, 2015 | 1 Year |
| Quasi-Peak Adapter | Hewlett Packard | 85650A | 2430A00451 | September 2, 2015 | 1 Year |
| RF Attenuator | Mini-Circuits | CAT-10 | Asset #1000 | December 11, 2014 | 1 Year |
| Radiated EMI Software | Sector Design | N/A | Ver.1.4.6 | N/A | N/A |
| Conducted EMI Software | ETS-Lindgren | Tile! | Rev. 7.0.12.697 | N/A | N/A |
| Preamplifier | Com Power | PA-102 | 1482 | March 4, 2015 | 1 Year |
| RF Attenuator | Mini-Circuits | CAT-10 | Asset #1000 | December 11, 2014 | 1 Year |
| LISN | Solar Electronics | Type 21107-50-TS-50-N | 21107150701 | July 16, 2015 | 1 Year |
| LISN | Solar Electronics | Type 21107-50-TS-50-N | 21107150702 | July 16, 2015 | 1 Year |
| LISN | Solar Electronics | Type 21107-50-TS-50-N | 21107150703 | July 16, 2015 | 1 Year |
| LISN | Solar Electronics | Type 21107-50-TS-50-N | 21107150704 | July 16, 2015 | 1 Year |
| Biconical Antenna | Com Power | AB-900 | 15026 | June 17, 2015 | 1 Year |
| Log Periodic Antenna | Com Power | AL-100 | 16037 | June 17, 2015 | 1 Year |
| Horn Antenna | Com Power | AHA-118 | 711054 | December 11, 2014 | 1 Year |
| Antenna Mast | Com Power | AM-400 | N/A | N/A | N/A |
| Turntable | Com Power | TT-100 | N/A | N/A | N/A |
| Computer | Dell, Inc. | DHS | DNSV641 | N/A | N/A |
| Printer | Hewlett Packard | C8124A | CN39A220ZD | N/A | N/A |


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5.2 EMI Test Equipment (Continued)

| EQUIPMENT TYPE | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | CAL. DATE | CAL. CYCLE |
|--|---------------------|---------------------|----------------------|-------------------|-------------------|
| EMI Receiver | Rohde & Schwarz | ESU40 | 100127 | January 16, 2015 | 1 Year |
| EMI Test Software | Rohde & Schwarz | EMC32 | V8.40.0 | N/A | N/A |
| MXA Signal Analyzer | Agilent | N9020A | MY53420778 | September 4, 2015 | 1 Year |
| Passive Loop Antenna (9kHz – 30MHz) | ETS-Lindgren | 6512 | 00128210 | April 23, 2015 | 2 Years |
| BiConiLog Antenna (30 MHz – 1 GHz) | ETS-Lindgren | 3142D | 00109337 | July 8, 2015 | 1 Year |
| Horn Antenna (1 GHz – 18 GHz) | ETS-Lindgren | 3117 | 00109294 | July 8, 2015 | 1 Year |
| Preamplifier (1 GHz – 18 GHz) | Rohde & Schwarz | TS-PR18 | 100056 | December 12, 2014 | 1 Year |
| Horn Antenna (18-26.5GHz) | ETS-Lindgren | 3160-09 | 102646 | June 19, 2015 | 1 Year |
| Preamplifier (18-26.5GHz) | Rohde & Schwarz | TS-PR26 | 100034 | June 18, 2015 | 1 Year |
| Horn Antenna (26.5-40GHz) | ETS-Lindgren | 3160-10 | 109153 | June 19, 2015 | 1 Year |
| Preamplifier (26.5-40GHz) | Rohde & Schwarz | TS-PR40 | 100030 | June 18, 2015 | 1 Year |
| Antenna Mast | ETS-Lindgren | 2175 | 00095727 | N/A | N/A |
| Turntable | ETS-Lindgren | 2187-3.0 | 00118231 | N/A | N/A |
| Computer | Dell, Inc. | OPTIPLEX 745 | 4T50WC1 | N/A | N/A |
| Multi-Function Controller | ETS-Lindgren | 2090 | 00102270 | N/A | N/A |



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6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to the table below and section 7 of this report for the details of which sites were used for testing. All sites are located at 1547 Plymouth Street, Mountain View, California 94043.

| Site Used For Test | Site Description |
|---------------------------|---|
| | Open Field Test Site "A" |
| X | Mains Conducted Emissions Test Site "A" |
| | Telecom Conducted Emissions Test Site "A" |
| X | 3 Meter Semi-Anechoic Chamber Site "E" |
| | Mains Conducted Emissions Test Site "E" |
| | Telecom Conducted Emissions Test Site "E" |

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 1.5 meters above the ground plane.

The EUT was grounded only through the safety ground in its power cable(s).

6.3 Facility Environmental Characteristics

All tests were performed in a climate controlled building. The temperature was 22° C, humidity 45%, and barometric pressure 102.6 kPa.



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7. TEST PROCEDURES

7.1 Radiated Emissions Test – Semi-Anechoic Chamber

7.1.1 General Requirements Limit (FCC PART 15 Section 15.209(a)(1))

| Frequency of Emission (MHz) | Field Strength | | Measurement Distance (Meters) |
|-----------------------------|----------------|--------|-------------------------------|
| | μV/m | dBμV/m | |
| 0.009-0.49 | 2400/F(kHz) | | 300 |
| 0.49-1.705 | 24000/F(kHz) | | 30 |
| 1.705-30 | 30 | | 30 |
| 30-88 | 100 | 40 | 3 |
| 88-216 | 150 | 43.5 | 3 |
| 216-960 | 200 | 46 | 3 |
| Above 960 | 500 | 54 | 3 |

7.1.2 Emissions in Restricted Bands Limit (FCC PART 15 Section 15.407(a)(6,7))

15.407(a)(6,7)

(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(7) The provisions of §15.205 apply to intentional radiators operating under this section.

| Limit |
|---|
| See General Limits Requirement In Above Chart |

7.1.3 Test Procedure

The Rohde & Schwarz ESU40 EMI receiver was used as a measuring meter while under software control by the Rohde & Schwarz EMC32 software. To increase the sensitivity of the instrument, the built in preamplifier was used from 9 KHz to 1 GHz and an external preamplifier was used from 1 GHz to 40 GHz. The EMI receiver was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the EMI receiver records the highest measured reading over all the sweeps. The built in quasi-peak or average detector was used only for those readings which are marked accordingly on the data sheets. The



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7.1.3 Test Procedure (Continued)

effective measurement bandwidth used for the radiated emissions test was 100 kHz from 9 kHz to to 40 GHz.

The Loop Antenna, Broadband BiConiLog and horn antennas were used as transducers during the measurement. The Loop antenna was used from 9 KHz to 30 MHz, the BiConiLog antenna was used from 30 MHz to 1000 MHz and horn antennas were used from 1GHz – 26.5 GHz. The frequency spans were wide (9 kHz to 150 kHz, 150 kHz to 30 MHz, 30 MHz to 88 MHz, 88 MHz to 216 MHz, 216 to 300 MHz, 300 MHz to 1 GHz, 1 GHz to 18 GHz 18 GHz to 26.5 GHz, and 26.5 GHz to 40 GHz) during preliminary investigations. The final data was taken with a frequency span of 1 MHz. Furthermore, the frequency span was reduced during the preliminary investigations as deemed necessary.

The 5 meter semi-anechoic chamber of Electro Magnetic Test, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 2009. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. The EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength).

The presence of non EUT signals was verified by turning the EUT off. In case a non EUT signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the other signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance from 9 kHz to 26.5 GHz. to obtain final test data.

Calculation Of Radiated Emission Test Data:

Amplitude - Gain + Antenna Factor + Cable Loss = Corrected Amplitude

Corrected Amplitude - Limit = Margin



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7.2 Conducted Emissions Test – Mains Ports

7.2.1 Limit (FCC PART 15 Section 15.207(a))

| Frequency of Emission (MHz) | Conducted Limit (dB μ V) | |
|-----------------------------|------------------------------|------------|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 * | 56 to 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

*Note: Decreases with the logarithm of the frequency

7.2.2 Test Procedure

The HP 8566B spectrum analyzer was used as a measuring meter along with the HP 85650A quasi-peak adapter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak detector was used only where indicated in the data sheets. A 10 dB attenuation pad was used for the protection of the spectrum analyzer input stage, and the spectrum analyzer offset was adjusted accordingly to read the actual data measured. The LISN output was read by the HP 8566B spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for the conducted emissions test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 2009. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The initial test data was taken in manual mode while scanning the frequency ranges of 0.15 MHz to 1.6 MHz, 1.6 MHz to 5 MHz and 5 MHz to 30 MHz. The conducted emissions from the EUT were maximized for operating mode as well as cable and peripheral placement. Once a predominant frequency (within 12 dB of the limit) was found, it was more closely examined with the spectrum analyzer span adjusted to 1 MHz.

The final data was collected under program control by the HP 85869PC software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave.



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7.3 Occupied Bandwidth

7.3.1 Limit (FCC PART 15 Section 15.407(e))

15.407(e)

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz

| Limit |
|-------------------------------|
| 6 dB Bandwidth \geq 500 kHz |

7.3.2 Test Procedure

Connect the antenna port of the EUT to the spectrum analyzer via an Attenuator, set the Spectrum Analyzer as below:

RBW: 1% of Emission Bandwidth
 VBW: \geq RBW
 Detector: Peak
 Trace Mode: Max Hold

- (1) Measure the 26db bandwidth using Xdb down function, If this does not encompass the full bandwidth, then “Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission”
- (2) Remeasure to ensure the RBW is around 1% of the emission bandwidth

For band 5.725-5.85 GHz :

RBW: 100 KHz
 VBW: \geq 3 x RBW
 Detector: Peak
 Trace Mode: Max Hold

- (1) Measure the 6db bandwidth using Xdb down function, If this does not encompass the full bandwidth, then “Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission”



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7.3.3

Test Result

The EUT meets the requirements. Please see the datasheets in Appendix A for the measurement results.



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7.4 Maximum Average Output Power

7.4.1 Limit (FCC PART 15 Section 15.407 (a)(1)(i), 15.407 (a)(3))

15.407 (a)(1)(i)

For outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm)

| Limit |
|---|
| Maximum Average Output Power (Digital Modulation) \leq 1Watt or 30 dBm and Maximum e.i.r.p. above 30 degrees measured from the horizon \leq 125 mW (21 dBm) |

15.407 (a)(3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

| Limit |
|--|
| Maximum Average Output Power (Digital Modulation) \leq 1Watt or 30 dBm |

7.4.2 Test Procedure

Connect the antenna port of the EUT to the spectrum analyzer via an Attenuator and set the Spectrum Analyzer as below:

- RBW = 1 MHz
- VBW \geq 3 MHz
- Number of points in Sweep \geq 2 Span/ RBW
- Detector: RMS
- Span: Encompass entire emission bandwidth

- (1) Switch analyzer to channel power mode



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7.4.3

Test Result

The EUT meets the requirements. Please see the datasheets in Appendix A for the measurement results.



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7.5 Maximum Average Power Spectral Density

7.5.1 Limit (FCC PART 15 Section 15.407(a)(1)(i), 15.407(a)(3))

15.407(a)(1)(i):

For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

| |
|--------------|
| Limit |
| 17 dBm/1 MHz |

15.407(a)(3):

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

| |
|----------------|
| Limit |
| 30 dBm/500 kHz |

7.5.2 Test Procedure

Connect the antenna port of the EUT to the spectrum analyzer via an Attenuator and set the Spectrum Analyzer as below:

- (1) Follow procedure for measuring output power
- (2) Do not switch to channel power mode, instead keep in regular spectrum analyzer mode
- (3) Use marker to find peak
- (4) Add correction of $10\log(\text{Specified Bandwidth}/\text{Actual Used Bandwidth})$, if the actual used bandwidth is lower than the specified bandwidth.



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7.5.3

Test Result

The EUT meets the requirements. Please see the datasheets in Appendix A for the measurement results.



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7.6 Emissions in Non-Restricted Frequency Bands

7.6.1 Limit (FCC PART 15 Section 15.407(b)(1,4))

15.407(b)(1):

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

15.407(b)(4):

For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

| Limit |
|--|
| -27 dBm/MHz outside 5.15-5.35 GHz for 5.15-5.25 GHz transmitter AND -27 dBm/MHz outside 5.725-5.85 GHz for 5.725-5.85 GHz transmitter With limit of -17 dBm/MHz, 10 MHz below or above the bandedge |

7.6.2 Test Procedure

Connect the antenna port of the EUT to the spectrum analyzer via an Attenuator, set the Spectrum Analyzer as below:

- RBW: 1 MHz
- VBW: ≥ 3 MHz
- Detector: Peak
- Trace Mode: Max Hold

- (1) Mark highest emissions

7.6.3 Test Result

The EUT meets the requirements. Please see the datasheets in Appendix A for the measurement results.



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7.7 Bandedge

7.7.1 Limit (FCC PART 15 Section 15.407(b)(1,4))

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

| Limit |
|---|
| -27 dBm/MHz outside 5.15-5.35 GHz for 5.15-5.25 GHz transmitter |
| AND |
| -27 dBm/MHz outside 5.725-5.85 GHz for 5.725-5.85 GHz transmitter |
| With limit of -17 dBm/MHz, 10 MHz below or above the bandedge |

7.7.2 Test Procedure

Connect the antenna port of the EUT to the spectrum analyzer via an Attenuator, set the Spectrum Analyzer as below:

RBW: 1 MHz
 VBW: ≥ 3 MHz
 Detector: Peak
 Trace Mode: Max Hold

- (1) Mark highest emissions

7.7.3 Test Result

The EUT meets the requirements. Please see the datasheets in Appendix A for the measurement results.



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7.8 Antenna Requirement

7.8.1 Requirement (FCC PART 15 SECTION 15.203)

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section.

7.8.2 Test Result

The antennas are secured using special connectors and furthermore, the unit is secured together using torx screws.



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8. CONCLUSIONS / COMPLIANCE STATEMENT

Based upon the results contained in this report, Electro Magnetic Test, Inc. has determined that the WIFI MODULE, Model: BLUEFIN 5G meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C.



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APPENDIX A

RADIATED AND CONDUCTED DATA SHEETS

**ELECTRO MAGNETIC TEST, INC.**1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Radiated Emissions

| | | | |
|----------------|-------------|--------------|-----------------|
| EUT: | WIFI MODULE | Model Name: | BLUEFIN 5G |
| Test Mode: | - | Test Date: | 10/5/15 |
| Test Engineer: | George Hsu | Measurement: | 9 KHz to 30 MHz |

The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators were attenuated more than 20 dB below the permissible value



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Radiated Emissions

| | | | |
|----------------|--------------------------------|--------------|-----------------|
| EUT: | WIFI MODULE | Model Name: | BLUEFIN 5G |
| Test Mode: | Channel 149, 802.11a, 5 MHz | Test Date: | 10/7/15 |
| Test Engineer: | George Hsu | Measurement: | 30 MHz to 1 GHz |

Peak Measurement:

| Frequency (MHz) | MaxPeak (dB μ V/m) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dB μ V/m) |
|-----------------|------------------------|-------------|--------------|---------------|------------|-------------|----------------------|
| 47.100000 | 39.8 | 100.0 | V | 257.0 | 9.8 | 0.20 | 40.00 |
| 47.580000 | 35.5 | 100.0 | V | 270.0 | 9.7 | 4.50 | 40.00 |
| 54.150000 | 38.0 | 114.0 | V | 9.0 | 8.4 | 2.00 | 40.00 |
| 66.300000 | 30.3 | 113.0 | V | 331.0 | 8.0 | 9.70 | 40.00 |
| 146.250000 | 42.7 | 197.0 | H | 193.0 | 9.1 | 0.80 | 43.50 |
| 375.000000 | 43.4 | 100.0 | H | 172.0 | 17.8 | 2.60 | 46.00 |
| 375.000000 | 47.4 | 119.0 | V | 190.0 | 17.8 | -1.40 | 46.00 |
| 630.030000 | 43.5 | 250.0 | V | 60.0 | 23.8 | 2.50 | 46.00 |

Quasipeak Measurement:

| Frequency (MHz) | QuasiPeak (dB μ V/m) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dB μ V/m) |
|-----------------|--------------------------|-------------|--------------|---------------|------------|-------------|----------------------|
| 47.100000 | 34.6 | 100.0 | V | 257.0 | 9.8 | 5.40 | 40.00 |
| 47.580000 | 30.4 | 100.0 | V | 270.0 | 9.7 | 9.60 | 40.00 |
| 54.150000 | 33.8 | 114.0 | V | 9.0 | 8.4 | 6.20 | 40.00 |
| 66.300000 | 25.9 | 113.0 | V | 331.0 | 8.0 | 14.10 | 40.00 |
| 146.250000 | 37.6 | 197.0 | H | 193.0 | 9.1 | 5.90 | 43.50 |
| 375.000000 | 41.9 | 100.0 | H | 172.0 | 17.8 | 4.10 | 46.00 |
| 375.000000 | 45.8 | 106.7 | V | 180.6 | 17.8 | 0.20 | 46.00 |
| 630.030000 | 31.6 | 250.0 | V | 60.0 | 23.8 | 14.40 | 46.00 |


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Radiated Emissions

| | | | |
|----------------|--------------------------------|--------------|-----------------|
| EUT: | WIFI MODULE | Model Name: | BLUEFIN 5G |
| Test Mode: | Channel 149, 802.11a, 5 MHz | Test Date: | 10/5/15 |
| Test Engineer: | George Hsu | Measurement: | 1 GHz to 18 GHz |

Peak Measurement:

| Frequency (MHz) | MaxPeak (dB μ V/m) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dB μ V/m) |
|-----------------|------------------------|-------------|--------------|---------------|------------|-------------|----------------------|
| 9053.370000 | 54.6 | 381.0 | V | 2.0 | 15.1 | 19.40 | 74.00 |
| 11492.345000 | 67.1 | 221.0 | V | 289.0 | 19.3 | 6.90 | 74.00 |
| 11493.885000 | 59.0 | 182.0 | H | 304.0 | 19.3 | 15.00 | 74.00 |
| 16807.270000 | 59.2 | 362.0 | V | 276.0 | 27.7 | 14.80 | 74.00 |
| 17236.930000 | 72.5 | 178.0 | V | 144.0 | 28.7 | 1.50 | 74.00 |
| 17237.700000 | 67.2 | 265.0 | H | 54.0 | 28.7 | 6.80 | 74.00 |

Average Measurement:

| Frequency (MHz) | Average (dB μ V/m) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dB μ V/m) |
|-----------------|------------------------|-------------|--------------|---------------|------------|-------------|----------------------|
| 9053.370000 | 34.3 | 381.0 | V | 2.0 | 15.1 | 19.70 | 54.00 |
| 11492.345000 | 51.8 | 221.0 | V | 289.0 | 19.3 | 2.20 | 54.00 |
| 11493.885000 | 42.3 | 182.0 | H | 304.0 | 19.3 | 11.70 | 54.00 |
| 16807.270000 | 45.9 | 362.0 | V | 276.0 | 27.7 | 8.10 | 54.00 |
| 17236.930000 | 50.1 | 178.0 | V | 144.0 | 28.7 | 3.90 | 54.00 |
| 17237.700000 | 47.8 | 265.0 | H | 54.0 | 28.7 | 6.20 | 54.00 |


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Radiated Emissions

| | | | |
|----------------|---------------------------------|--------------|-----------------|
| EUT: | WIFI MODULE | Model Name: | BLUEFIN 5G |
| Test Mode: | Channel 149, 802.11a, 10 MHz | Test Date: | 10/5/15 |
| Test Engineer: | George Hsu | Measurement: | 1 GHz to 18 GHz |

Peak Measurement:

| Frequency (MHz) | MaxPeak (dB μ V/m) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dB μ V/m) |
|-----------------|------------------------|-------------|--------------|---------------|------------|-------------|----------------------|
| 11489.650000 | 64.8 | 223.0 | V | 158.0 | 19.3 | 9.20 | 74.00 |
| 11490.420000 | 56.8 | 158.0 | H | 304.0 | 19.3 | 17.20 | 74.00 |
| 12298.535000 | 54.6 | 235.0 | V | 7.0 | 21.8 | 19.40 | 74.00 |
| 16374.915000 | 59.4 | 300.0 | V | 4.0 | 27.8 | 14.60 | 74.00 |
| 17234.235000 | 62.8 | 200.0 | H | 146.0 | 28.7 | 11.20 | 74.00 |
| 17236.545000 | 67.8 | 164.0 | V | 278.0 | 28.7 | 6.20 | 74.00 |

Average Measurement:

| Frequency (MHz) | Average (dB μ V/m) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dB μ V/m) |
|-----------------|------------------------|-------------|--------------|---------------|------------|-------------|----------------------|
| 11489.650000 | 50.7 | 223.0 | V | 158.0 | 19.3 | 3.30 | 54.00 |
| 11490.420000 | 42.8 | 158.0 | H | 304.0 | 19.3 | 11.20 | 54.00 |
| 12298.535000 | 40.9 | 235.0 | V | 7.0 | 21.8 | 13.10 | 54.00 |
| 16374.915000 | 46.0 | 300.0 | V | 4.0 | 27.8 | 8.00 | 54.00 |
| 17234.235000 | 47.1 | 200.0 | H | 146.0 | 28.7 | 6.90 | 54.00 |
| 17236.545000 | 48.1 | 164.0 | V | 278.0 | 28.7 | 5.90 | 54.00 |



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Radiated Emissions

| | | | |
|----------------|----------------------------|--------------|-----------------|
| EUT: | WIFI MODULE | Model Name: | BLUEFIN 5G |
| Test Mode: | Channel 48, 802.11a, 5 MHz | Test Date: | 10/5/15 |
| Test Engineer: | George Hsu | Measurement: | 1 GHz to 18 GHz |

Peak Measurement:

| Frequency (MHz) | MaxPeak (dB μ V/m) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dB μ V/m) |
|-----------------|------------------------|-------------|--------------|---------------|------------|-------------|----------------------|
| 10479.025000 | 55.6 | 100.0 | H | 130.0 | 17.3 | 18.40 | 54.00 |
| 10482.875000 | 68.2 | 209.0 | V | 172.0 | 17.3 | 5.80 | 54.00 |
| 15720.800000 | 63.0 | 182.0 | H | 255.0 | 26.1 | 11.00 | 54.00 |
| 15721.955000 | 68.4 | 154.0 | V | 256.0 | 26.1 | 5.60 | 54.00 |
| 17611.535000 | 61.1 | 370.0 | H | 189.0 | 29.4 | 12.90 | 54.00 |
| 17642.335000 | 61.2 | 324.0 | H | 114.0 | 29.5 | 12.80 | 54.00 |

Average Measurement:

| Frequency (MHz) | Average (dB μ V/m) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dB μ V/m) |
|-----------------|------------------------|-------------|--------------|---------------|------------|-------------|----------------------|
| 10479.025000 | 39.5 | 100.0 | H | 130.0 | 17.3 | 14.50 | 54.00 |
| 10482.875000 | 49.8 | 209.0 | V | 172.0 | 17.3 | 4.20 | 54.00 |
| 15720.800000 | 46.1 | 182.0 | H | 255.0 | 26.1 | 7.90 | 54.00 |
| 15721.955000 | 48.9 | 154.0 | V | 256.0 | 26.1 | 5.10 | 54.00 |
| 17611.535000 | 47.8 | 370.0 | H | 189.0 | 29.4 | 6.20 | 54.00 |
| 17642.335000 | 48.0 | 324.0 | H | 114.0 | 29.5 | 6.00 | 54.00 |


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Radiated Emissions

| | | | |
|----------------|--------------------------------|--------------|-----------------|
| EUT: | WIFI MODULE | Model Name: | BLUEFIN 5G |
| Test Mode: | Channel 36, 802.11a, 10 MHz | Test Date: | 10/5/15 |
| Test Engineer: | George Hsu | Measurement: | 1 GHz to 18 GHz |

Peak Measurement:

| Frequency (MHz) | MaxPeak (dB μ V/m) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dB μ V/m) |
|-----------------|------------------------|-------------|--------------|---------------|------------|-------------|----------------------|
| 10357.365000 | 51.2 | 155.0 | H | 78.0 | 17.5 | 22.80 | 74.00 |
| 10362.370000 | 64.0 | 200.0 | V | 172.0 | 17.5 | 10.00 | 74.00 |
| 14856.860000 | 56.0 | 294.0 | V | 90.0 | 24.4 | 18.00 | 74.00 |
| 15534.075000 | 66.9 | 178.0 | V | 143.0 | 26.4 | 7.10 | 74.00 |
| 15543.700000 | 60.8 | 248.0 | H | 20.0 | 26.5 | 13.20 | 74.00 |
| 17256.565000 | 60.8 | 318.0 | H | 317.0 | 28.5 | 13.20 | 74.00 |

Average Measurement:

| Frequency (MHz) | Average (dB μ V/m) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dB μ V/m) |
|-----------------|------------------------|-------------|--------------|---------------|------------|-------------|----------------------|
| 10357.365000 | 37.5 | 155.0 | H | 78.0 | 17.5 | 16.50 | 54.00 |
| 10362.370000 | 48.3 | 200.0 | V | 172.0 | 17.5 | 5.70 | 54.00 |
| 14856.860000 | 43.0 | 294.0 | V | 90.0 | 24.4 | 11.00 | 54.00 |
| 15534.075000 | 48.1 | 178.0 | V | 143.0 | 26.4 | 5.90 | 54.00 |
| 15543.700000 | 45.5 | 248.0 | H | 20.0 | 26.5 | 8.50 | 54.00 |
| 17256.565000 | 46.8 | 318.0 | H | 317.0 | 28.5 | 7.20 | 54.00 |

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Radiated Emissions

| | | | |
|----------------|-------------|--------------|------------------|
| EUT: | WIFI MODULE | Model Name: | BLUEFIN 5G |
| Test Mode: | - | Test Date: | 10/5/15 |
| Test Engineer: | George Hsu | Measurement: | 18 GHz to 40 GHz |

The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators were attenuated more than 20 dB below the permissible value


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6dB Bandwidth Test Data (Conducted)

| Company: | Tropos Networks, Inc. | | Test Date: | 9/17/15 | |
|--|-----------------------|-----------------|-----------------------|-------------|------------|
| EUT Name: | WIFI Module | | Test Engineer: | George Hsu | |
| Model: | BLUEFIN 5G | | Test Result: | PASS | |
| Operating Mode: | TX Mode | | | | |
| Mode | Test CH | Frequency (MHz) | 6 dB Bandwidth (KHz) | Limit (KHz) | Conclusion |
| 802.11a, 5 MHz | 149 | 5745 | 4.134 | ≥ 500 | PASS |
| | 157 | 5785 | 4.149 | ≥ 500 | PASS |
| | 165 | 5825 | 4.154 | ≥ 500 | PASS |
| 802.11a, 10 MHz | 149 | 5745 | 8.225 | ≥ 500 | PASS |
| | 157 | 5785 | 8.229 | ≥ 500 | PASS |
| | 165 | 5825 | 8.213 | ≥ 500 | PASS |
| Test Equipment: Please refer to section 5.2 | | | | | |



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6dB Bandwidth Test (Conducted)



5 Mhz, 802.11a, Channel 149



5 Mhz, 802.11a, Channel 157



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6dB Bandwidth Test (Conducted)



5 Mhz, 802.11a, Channel 165



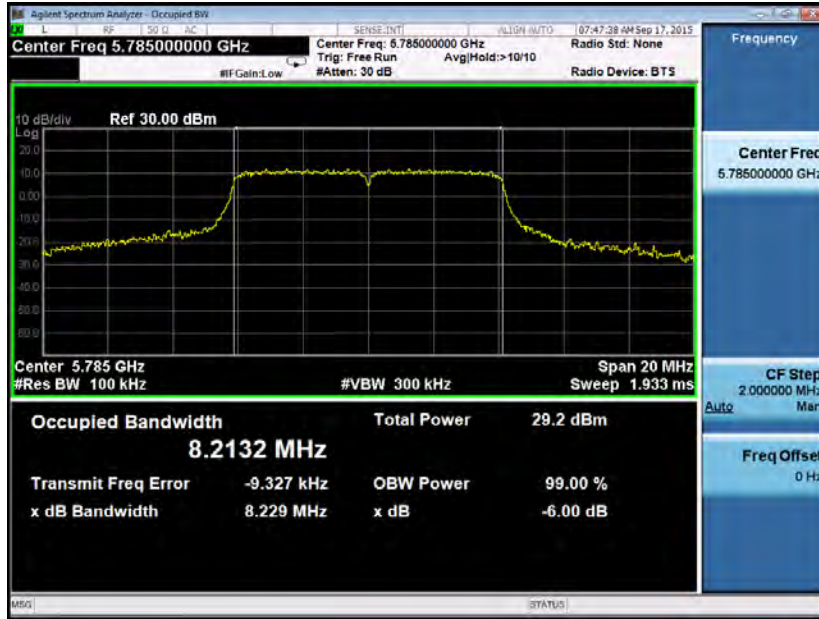
10 Mhz, 802.11a, Channel 149



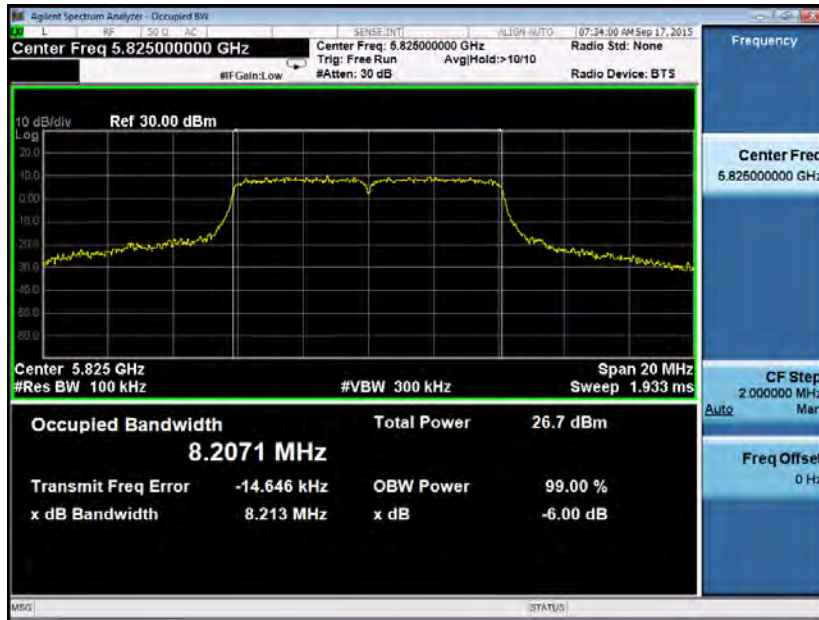
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6dB Bandwidth Test (Conducted)



10 Mhz, 802.11a, Channel 157



10 Mhz, 802.11a, Channel 165


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26dB Bandwidth Test Data (Conducted)

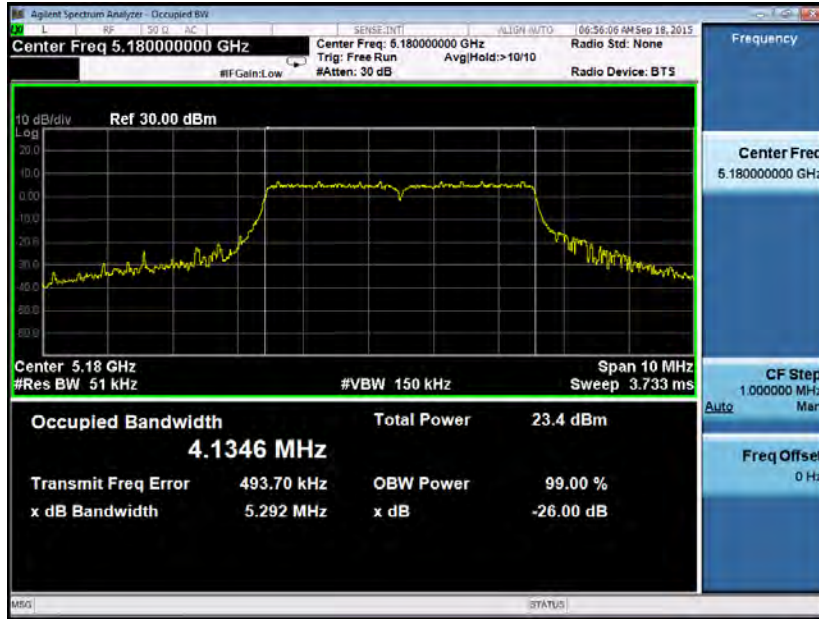
| | | | | |
|--|-----------------------|------------------------|------------------------------|------------|
| Company: | Tropos Networks, Inc. | | Test Date: | 9/17/15 |
| EUT Name: | WIFI Module | | Test Engineer: | George Hsu |
| Model: | BLUEFIN 5G | | Test Result: | PASS |
| Operating Mode: | TX Mode | | | |
| Mode | Test CH | Frequency (MHz) | 26 dB Bandwidth (KHz) | |
| 802.11a, 5 MHz | 36 | 5180 | 5.292 | |
| | 42 | 5210 | 5.324 | |
| | 48 | 5240 | 6.245 | |
| 802.11a, 10 MHz | 36 | 5180 | 9.618 | |
| | 42 | 5210 | 9.647 | |
| | 48 | 5240 | 9.588 | |
| Test Equipment: Please refer to section 5.2 | | | | |



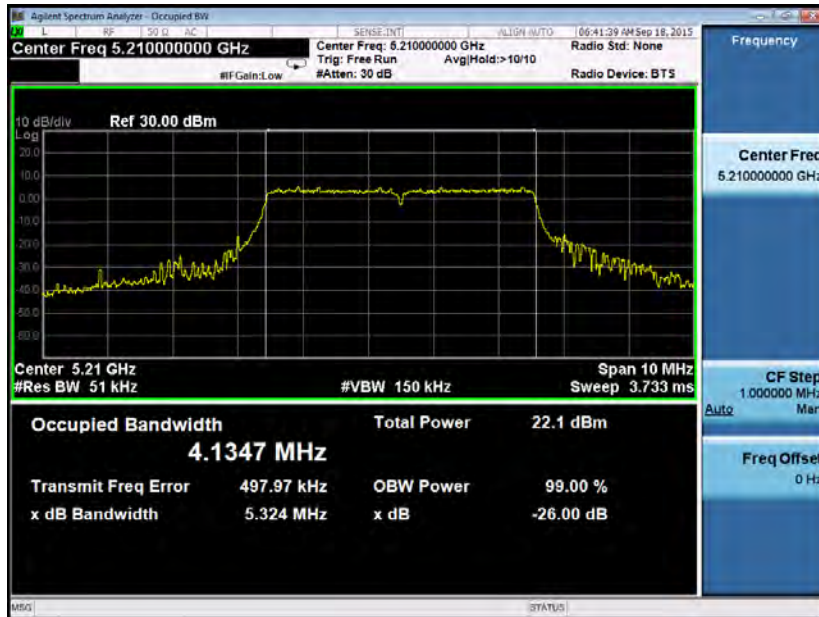
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

26dB Bandwidth Test (Conducted)



5 Mhz, 802.11a, Channel 36



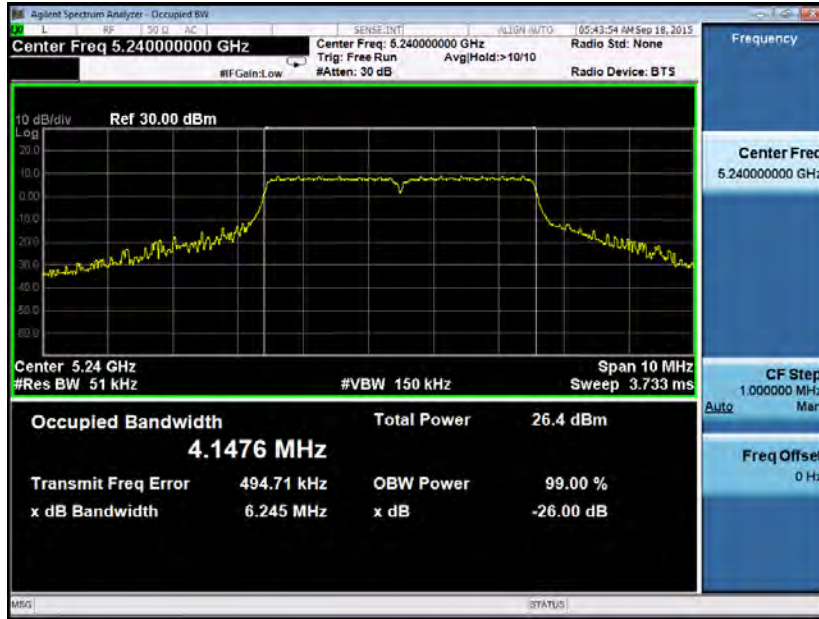
5 Mhz, 802.11a, Channel 42



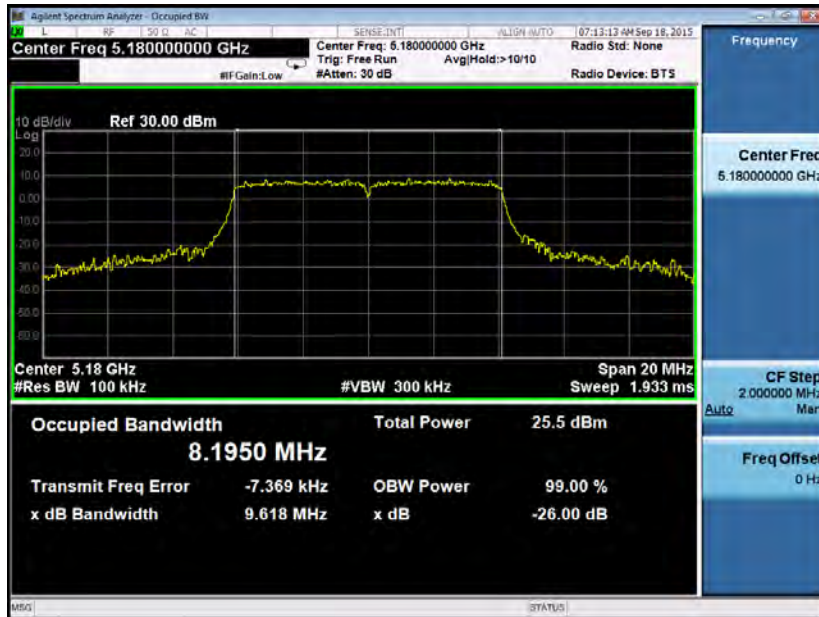
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

26dB Bandwidth Test (Conducted)



5 Mhz, 802.11b, Channel 48



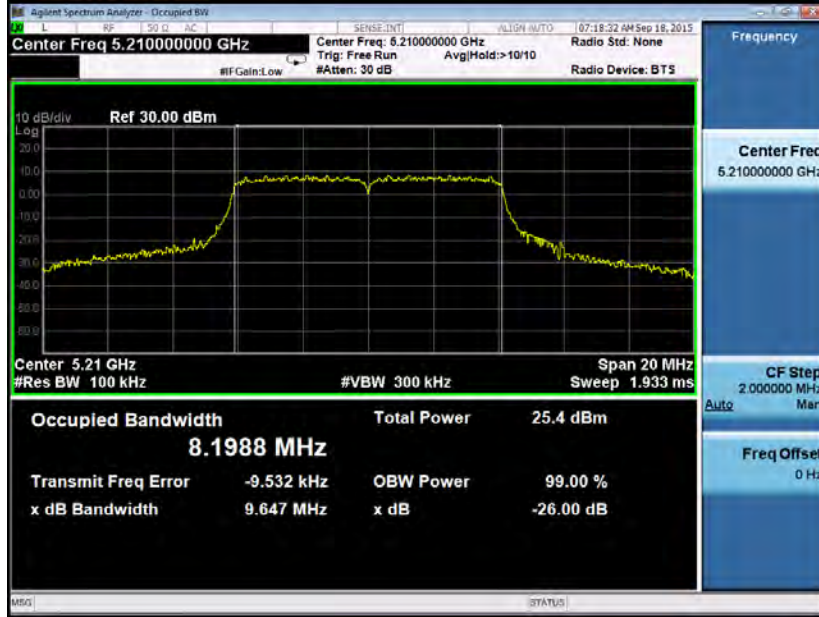
10 Mhz, 802.11b, Channel 36



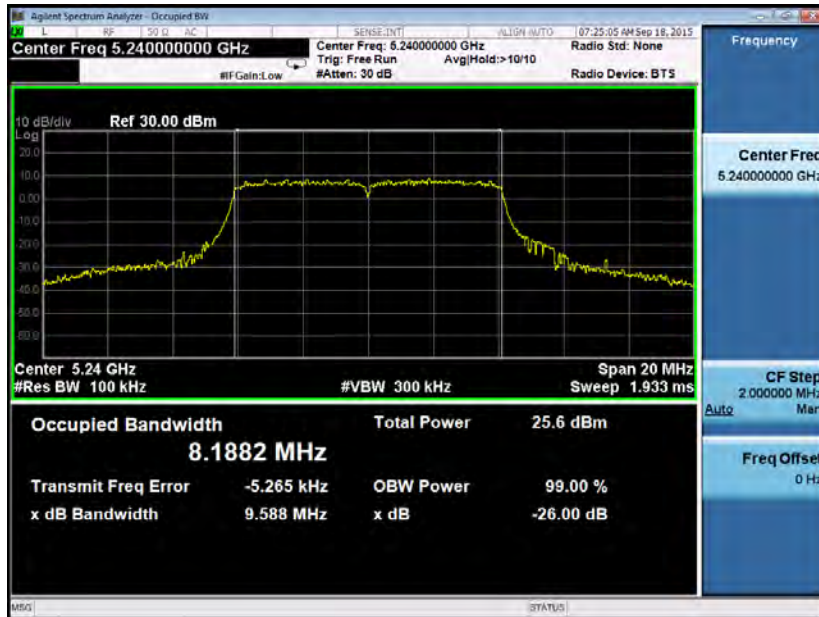
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

26dB Bandwidth Test (Conducted)



10 Mhz, 802.11b, Channel 42



10 Mhz, 802.11b, Channel 48


ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Output Power Test Data (Conducted)

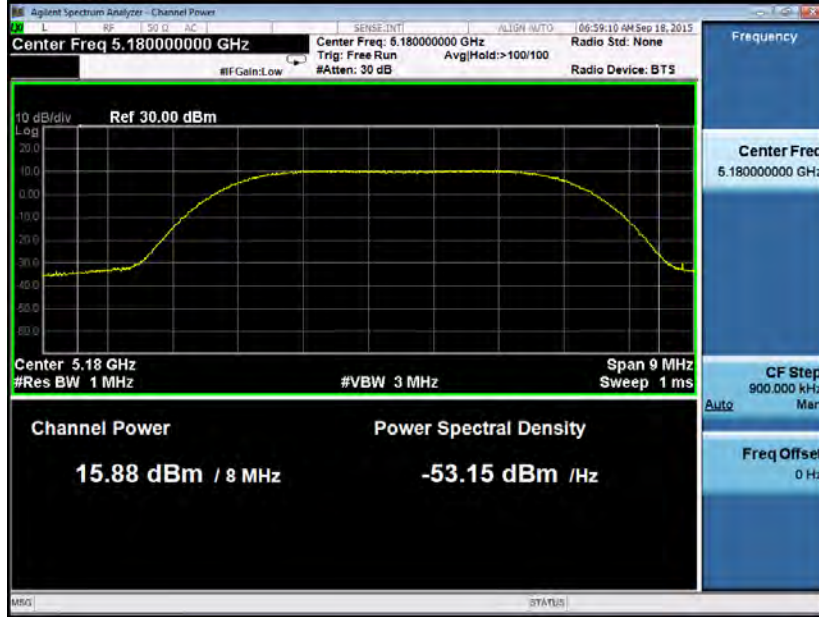
| Company: | Tropos Networks, Inc. | | Test Date: | | | 9/18/15 | |
|--|-----------------------|-----------------|------------------------------------|------------------------------------|----------------------------------|-------------|------------|
| EUT Name: | WIFI Module | | Test Engineer: | | | George Hsu | |
| Model: | Bluefin 5G | | Test Result: | | | PASS | |
| Operating Mode: | TX Mode | | | | | | |
| Mode | Test CH | Frequency (MHz) | Chain 0 Average Output Power (dBm) | Chain 1 Average Output Power (dBm) | Total Average Output Power (dBm) | Limit (dBm) | Conclusion |
| 802.11a, 5 MHz | 36 | 5180 | 15.880 | 16.910 | 19.436 | ≤ 28 | Pass |
| | 42 | 5210 | 15.780 | 16.090 | 18.948 | ≤ 28 | Pass |
| | 48 | 5240 | 16.010 | 16.340 | 19.188 | ≤ 28 | Pass |
| 802.11a, 10 MHz | 36 | 5180 | 19.040 | 19.560 | 22.318 | ≤ 28 | Pass |
| | 42 | 5210 | 18.780 | 19.050 | 21.927 | ≤ 28 | Pass |
| | 48 | 5240 | 19.200 | 19.090 | 22.156 | ≤ 28 | Pass |
| 802.11a, 5 MHz | 149 | 5745 | 21.550 | 22.980 | 25.334 | ≤ 28 | Pass |
| | 157 | 5785 | 21.130 | 23.220 | 25.310 | ≤ 28 | Pass |
| | 165 | 5825 | 20.470 | 23.320 | 25.135 | ≤ 28 | Pass |
| 802.11a, 10 MHz | 149 | 5745 | 20.740 | 22.660 | 24.816 | ≤ 28 | Pass |
| | 157 | 5785 | 21.060 | 22.750 | 24.997 | ≤ 28 | Pass |
| | 165 | 5825 | 20.260 | 22.930 | 24.807 | ≤ 28 | Pass |
| Test Equipment: Please refer to section 5.2 | | | | | | | |



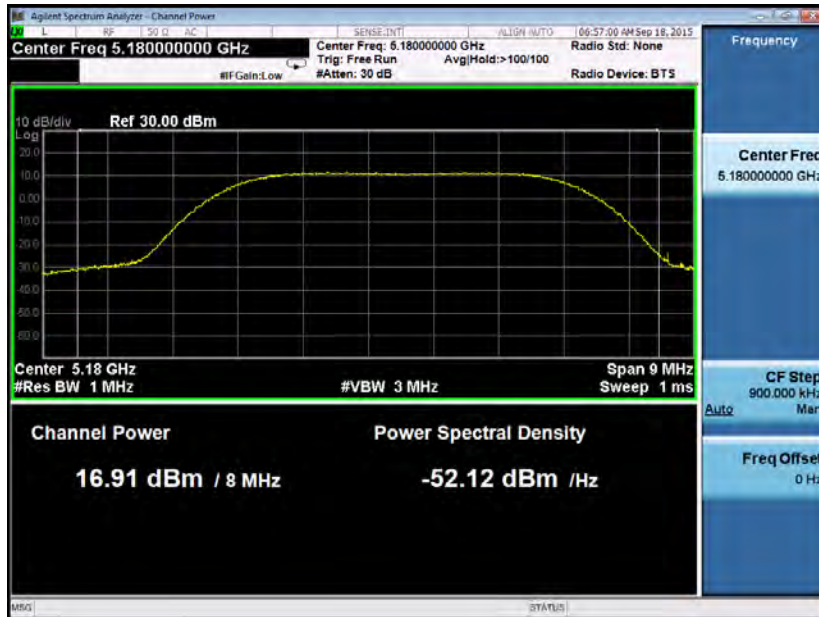
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Output Power Test Data (Conducted)



5 MHz, 802.11a, Channel 36, Chain 0



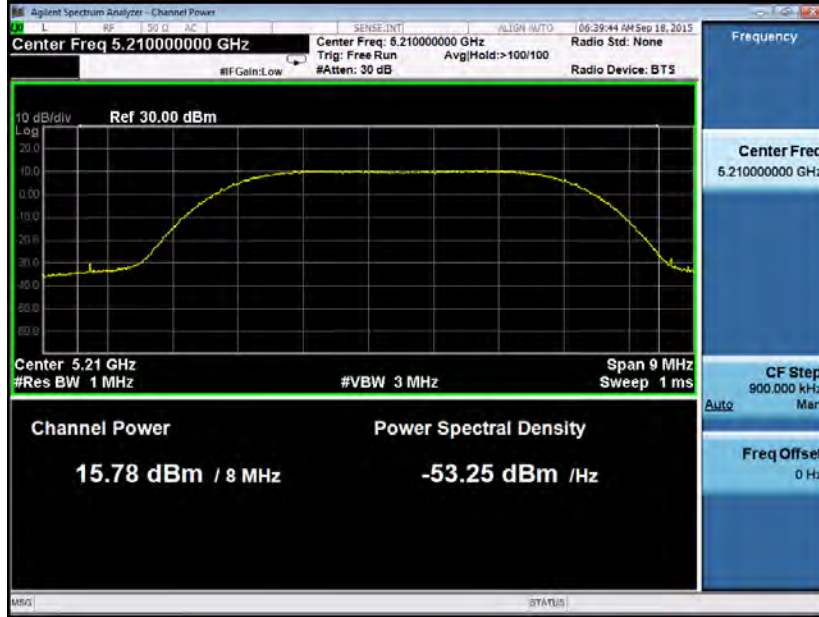
5 MHz, 802.11a, Channel 36, Chain 1



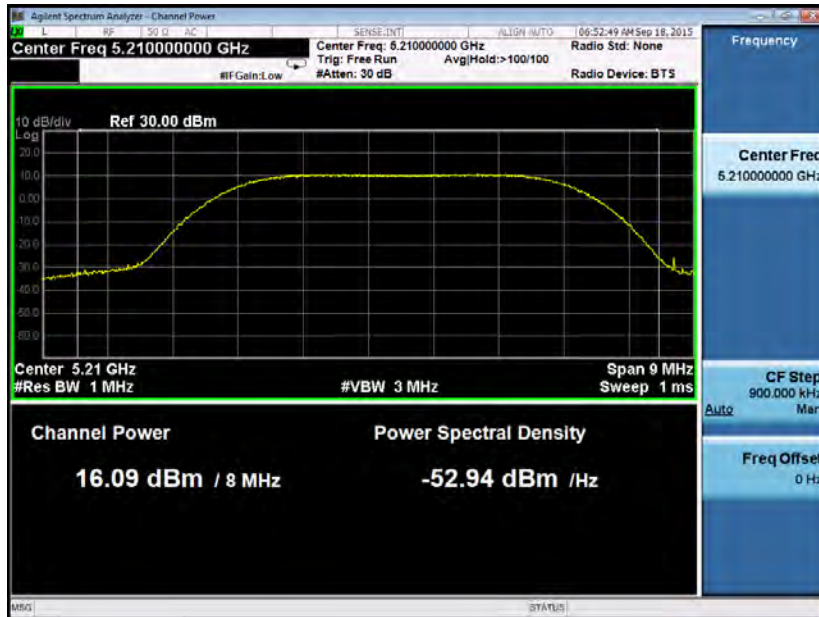
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Output Power Test Data (Conducted)



5 MHz, 802.11a, Channel 42, Chain 0



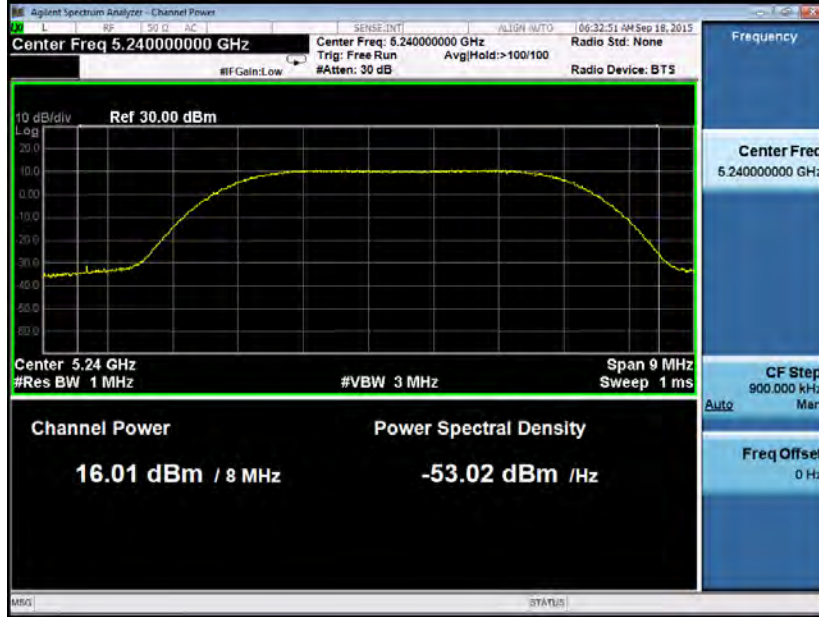
5 MHz, 802.11a, Channel 42, Chain 1



ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Output Power Test Data (Conducted)



5 MHz, 802.11a, Channel 48, Chain 0



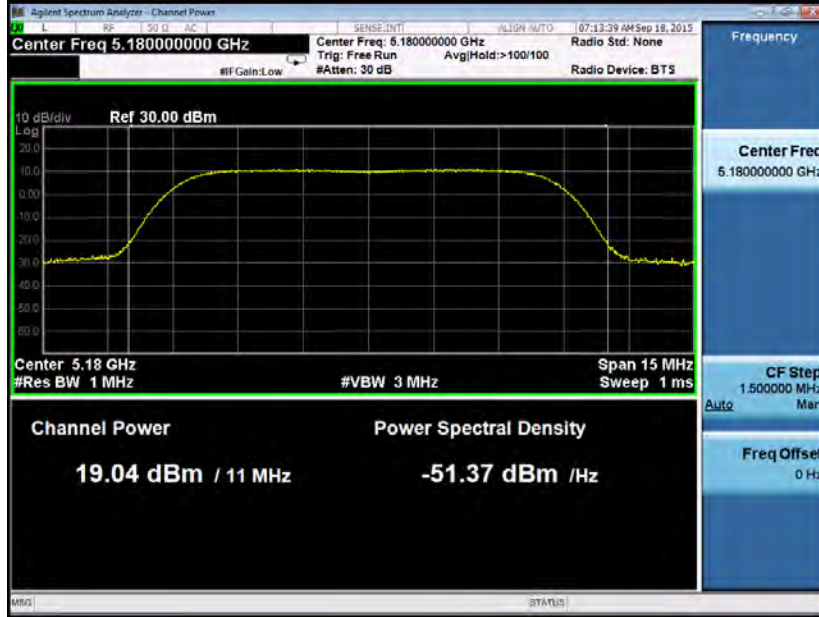
5 MHz, 802.11a, Channel 48, Chain 1



ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Output Power Test Data (Conducted)



10 MHz, 802.11a, Channel 36, Chain 0



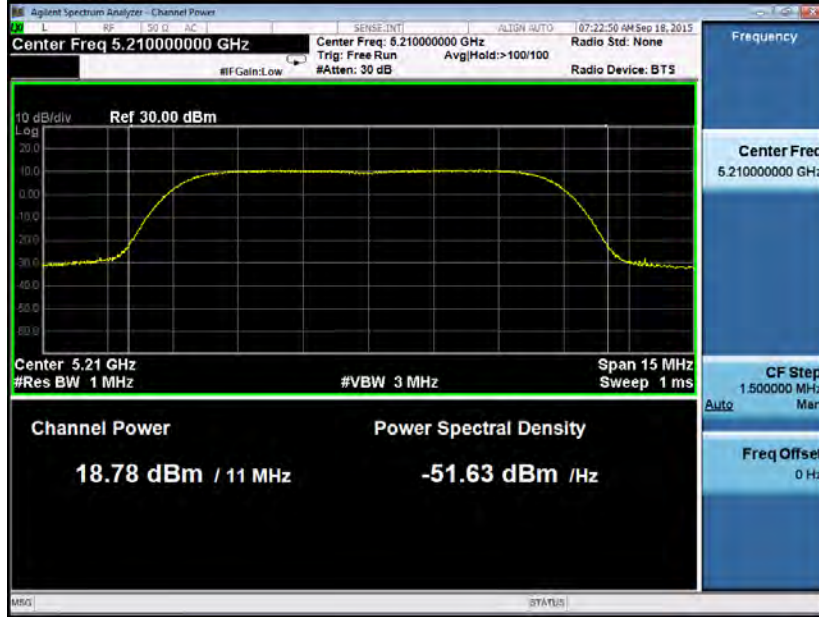
10 MHz, 802.11a, Channel 36, Chain 1



ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Output Power Test Data (Conducted)



10 MHz, 802.11a, Channel 42, Chain 0



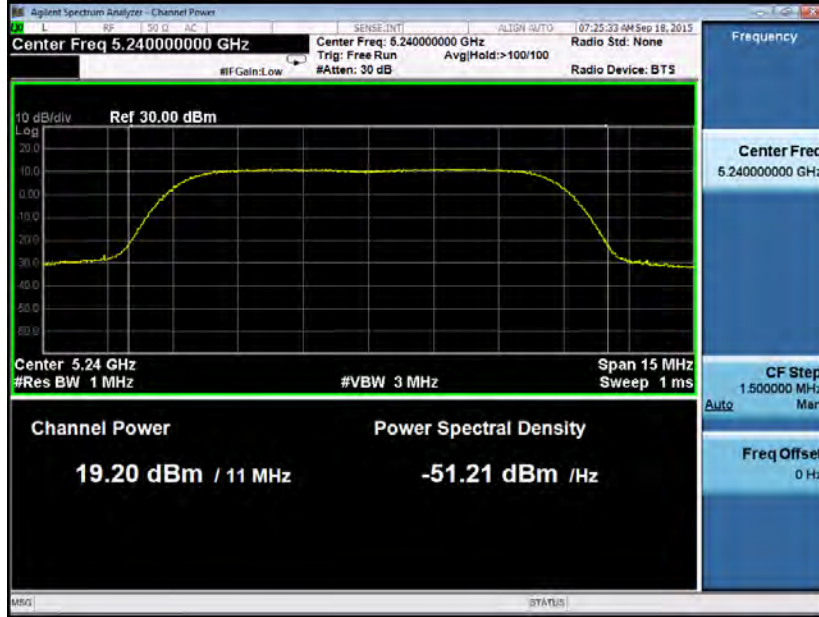
10 MHz, 802.11a, Channel 42, Chain 1



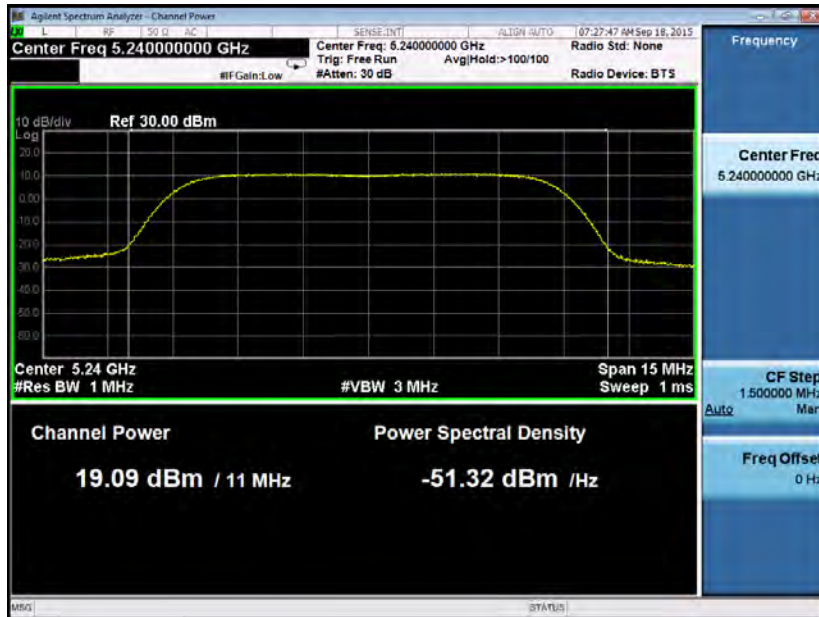
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Output Power Test Data (Conducted)



10 MHz, 802.11a, Channel 48, Chain 0



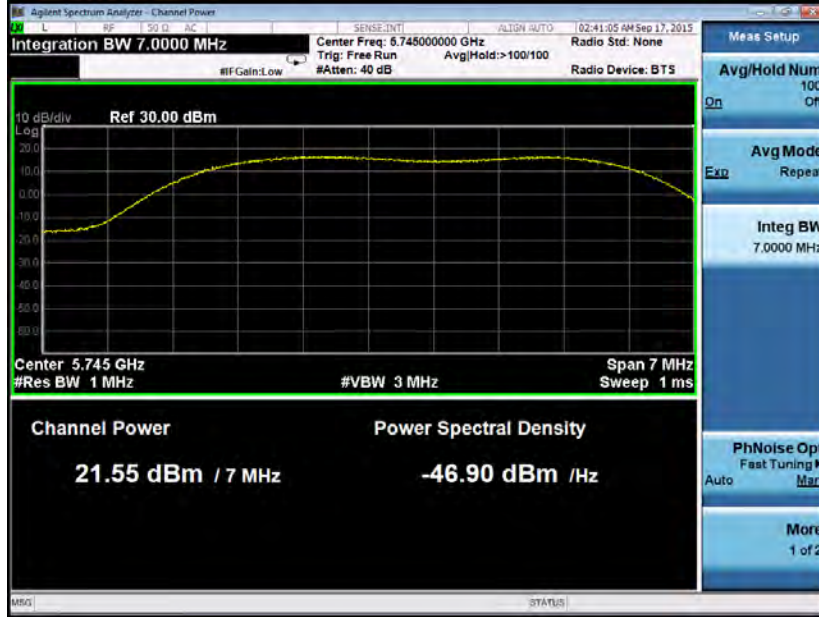
10 MHz, 802.11a, Channel 48, Chain 1



ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Output Power Test Data (Conducted)



5 MHz, 802.11a, Channel 149, Chain 0



5 MHz, 802.11a, Channel 149, Chain 1



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1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Output Power Test Data (Conducted)



5 MHz, 802.11a, Channel 157, Chain 0



5 MHz, 802.11a, Channel 157, Chain 1



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1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Output Power Test Data (Conducted)



5 MHz, 802.11a, Channel 165, Chain 0



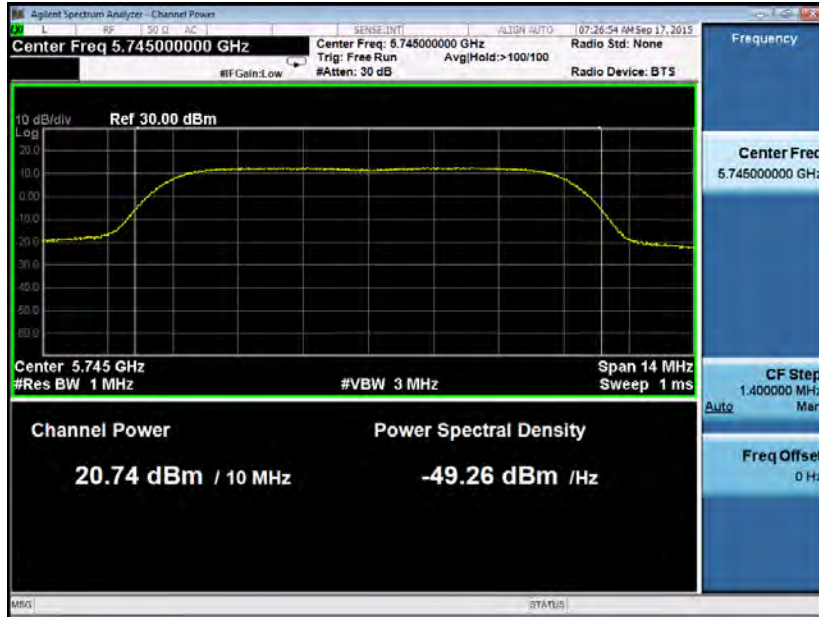
5 MHz, 802.11a, Channel 165, Chain 1



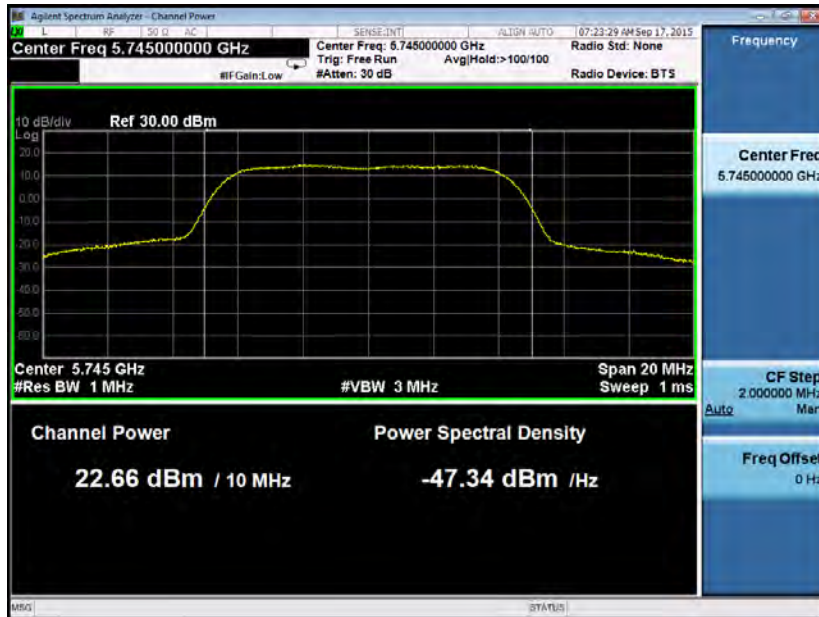
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Output Power Test Data (Conducted)



10 MHz, 802.11a, Channel 149, Chain 0



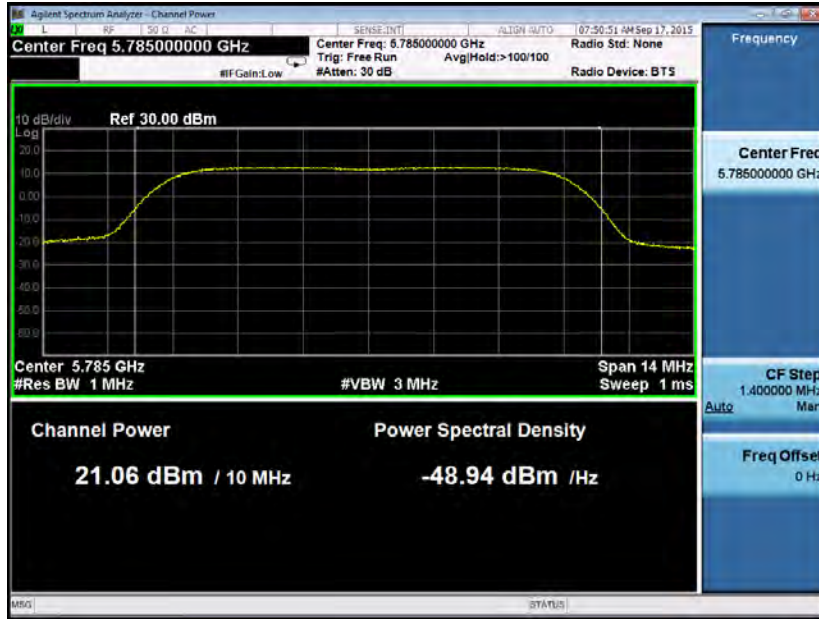
10 MHz, 802.11a, Channel 149, Chain 1



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1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Output Power Test Data (Conducted)



10 MHz, 802.11a, Channel 157, Chain 0



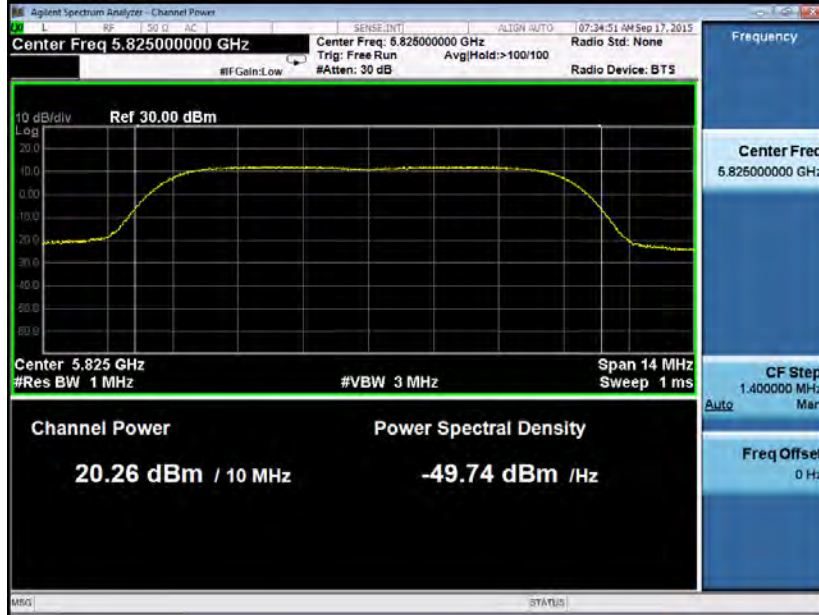
10 MHz, 802.11a, Channel 157, Chain 1



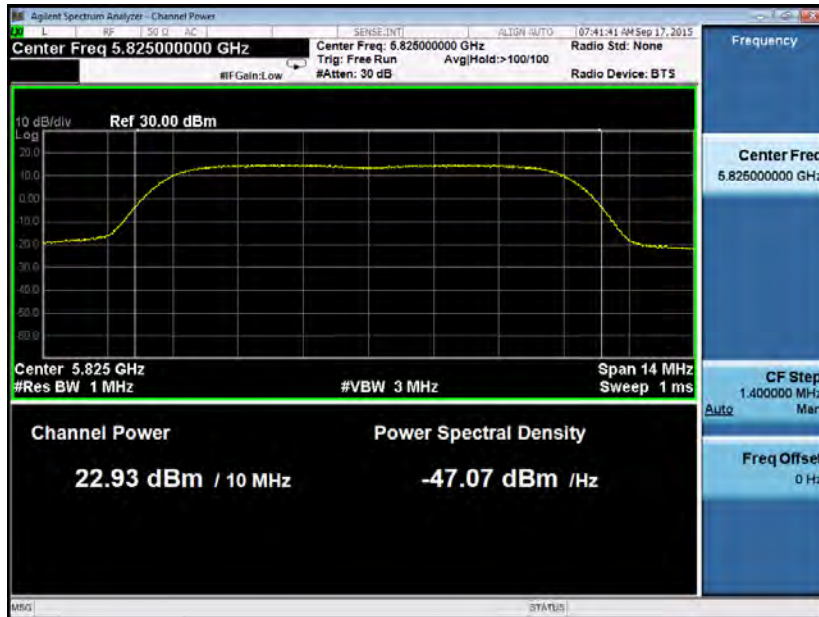
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Output Power Test Data (Conducted)



10 MHz, 802.11a, Channel 165, Chain 0



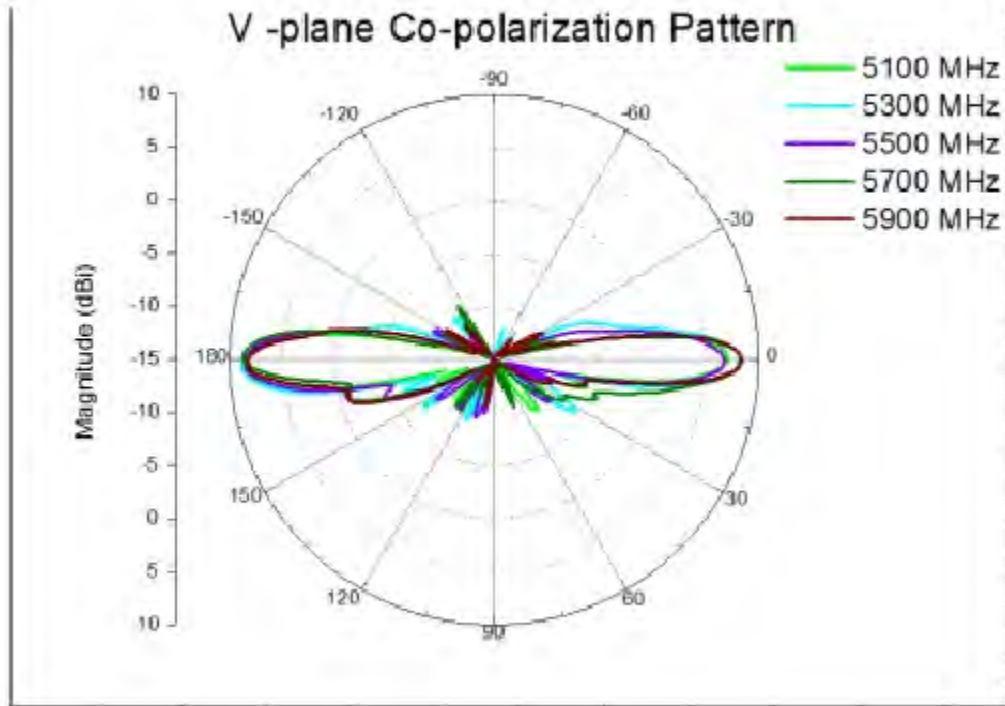
10 MHz, 802.11a, Channel 165, Chain 1



ELECTRO MAGNETIC TEST, INC.

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Maximum Average Output Power (Maximum EIRP 30 Degrees Above Horizon)



The maximum antenna gain 30 degrees above the horizon is -11.9101 dBi and the maximum allowable conducted power is 28 dBm (after correction for antenna gain), therefore the maximum possible EIRP is 16.0899 dBm which is lower than the 21 dBm (125mW) limit.

| Degree | Antenna Gain (dBi) | | |
|--------|--------------------|----------|----------|
| | 5.1 GHz | 5.2 GHz | 5.3 GHz |
| 30 | -18.2971 | -16.0941 | -13.9251 |
| 31 | -18.4371 | -18.4851 | -15.4131 |
| 32 | -19.3301 | -21.6401 | -17.3601 |
| 33 | -20.2591 | -23.5421 | -16.0441 |
| 34 | -23.0391 | -20.5931 | -15.4001 |
| 35 | -24.6161 | -18.8031 | -15.0431 |
| 36 | -26.2591 | -17.2441 | -14.3471 |
| 37 | -24.0751 | -15.9561 | -13.7371 |
| 38 | -22.4261 | -15.1011 | -13.5081 |
| 39 | -20.4331 | -15.3101 | -13.3701 |
| 40 | -20.7841 | -16.1821 | -13.5991 |


ELECTRO MAGNETIC TEST, INC.

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Maximum Average Output Power (Maximum EIRP 30 Degrees Above Horizon)

| Degree | Antenna Gain (dBi) | | |
|--------|--------------------|----------|----------|
| | 5.1 GHz | 5.2 GHz | 5.3 GHz |
| 41 | -19.9801 | -15.8231 | -14.4721 |
| 42 | -19.5151 | -16.3321 | -15.5831 |
| 43 | -19.3891 | -16.0991 | -17.0931 |
| 44 | -19.3441 | -16.1951 | -17.3691 |
| 45 | -19.0081 | -15.3741 | -16.3671 |
| 46 | -17.7281 | -14.8281 | -15.5221 |
| 47 | -17.6011 | -13.7391 | -14.6761 |
| 48 | -18.0251 | -13.1761 | -14.6501 |
| 49 | -17.5281 | -13.2141 | -13.5831 |
| 50 | -17.6321 | -13.8391 | -13.5601 |
| 51 | -18.1281 | -13.7911 | -12.2601 |
| 52 | -20.6211 | -13.8741 | -11.9101 |
| 53 | -22.6731 | -13.3991 | -12.6831 |
| 54 | -26.9161 | -15.6411 | -13.2091 |
| 55 | -26.2471 | -17.4301 | -13.6491 |
| 56 | -27.5531 | -18.4511 | -14.6621 |
| 57 | -27.1191 | -20.4781 | -17.3571 |
| 58 | -24.9991 | -22.5301 | -20.3941 |
| 59 | -22.7911 | -21.6681 | -23.6461 |
| 60 | -22.1481 | -22.8951 | -27.3031 |
| 61 | -20.5451 | -20.6751 | -29.2291 |
| 62 | -19.9621 | -19.7051 | -27.0681 |
| 63 | -19.6581 | -19.7711 | -22.4921 |
| 64 | -18.9291 | -18.4191 | -21.1841 |
| 65 | -18.8251 | -17.0791 | -21.8081 |


ELECTRO MAGNETIC TEST, INC.

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Maximum Average Output Power (Maximum EIRP 30 Degrees Above Horizon)

| Degree | Antenna Gain (dBi) | | |
|--------|--------------------|----------|----------|
| | 5.1 GHz | 5.2 GHz | 5.3 GHz |
| 66 | -17.4101 | -17.3141 | -19.7971 |
| 67 | -16.9331 | -16.2791 | -16.6011 |
| 68 | -16.2611 | -14.9721 | -14.9581 |
| 69 | -15.1851 | -13.7071 | -14.0161 |
| 70 | -14.8501 | -13.4251 | -13.4101 |
| 71 | -14.8841 | -13.8001 | -12.9801 |
| 72 | -15.1181 | -13.8591 | -12.3511 |
| 73 | -15.3391 | -13.8801 | -12.1091 |
| 74 | -13.3901 | -15.3661 | -13.3731 |
| 75 | -16.5591 | -17.8771 | -14.5241 |
| 76 | -17.7091 | -18.7701 | -15.7241 |
| 77 | -19.1021 | -19.0081 | -17.7261 |
| 78 | -19.9631 | -20.9621 | -19.0631 |
| 79 | -19.3551 | -23.3071 | -19.9871 |
| 80 | -19.4311 | -22.9511 | -18.0421 |
| 81 | -19.2491 | -22.0051 | -17.7181 |
| 82 | -19.1221 | -21.7111 | -19.3911 |
| 83 | -19.0451 | -22.1701 | -17.9991 |
| 84 | -20.5051 | -23.2201 | -18.0251 |
| 85 | -22.7871 | -25.3551 | -18.1231 |
| 86 | -25.3291 | -29.6001 | -20.9331 |
| 87 | -28.5161 | -37.7351 | -22.4861 |
| 88 | -29.3401 | -35.9181 | -23.9841 |
| 89 | -27.2891 | -36.5101 | -24.9901 |
| 90 | -30.2901 | -35.4251 | -26.3951 |


ELECTRO MAGNETIC TEST, INC.

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Maximum Average Power Spectral Density

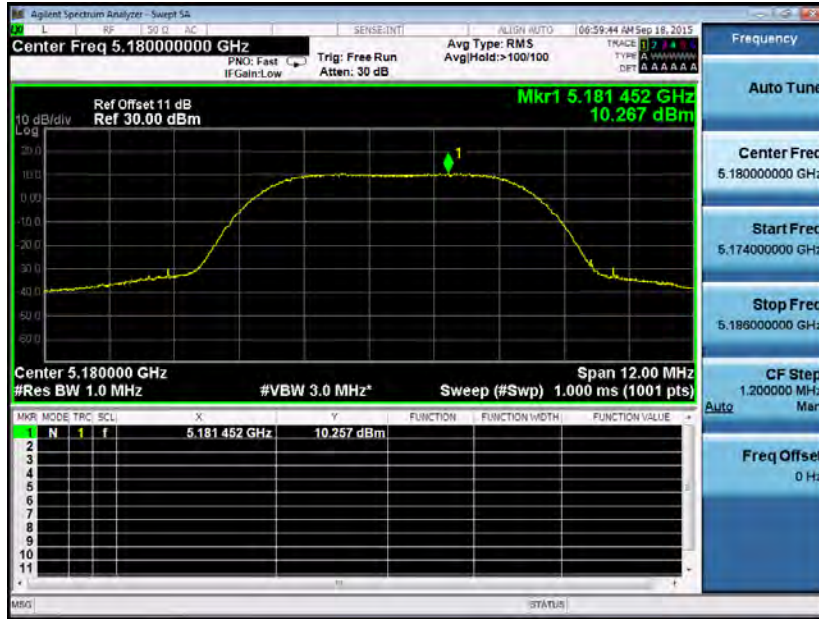
| Company: | Tropos Networks, Inc. | | Test Date: | | 9/18/15 | | |
|--|-----------------------|-----------------|---------------------------|---------------------------|-------------------------|---------------|------------|
| EUT Name: | WIFI Module | | Test Engineer: | | George Hsu | | |
| Model: | Bluefin 5G | | Test Result: | | PASS | | |
| Operating Mode: | TX Mode | | | | | | |
| Mode | Test CH | Frequency (MHz) | Chain 0 Average PSD (dBm) | Chain 1 Average PSD (dBm) | Total Average PSD (dBm) | Limit (dBm) | Conclusion |
| 802.11a, 5 MHz | 36 | 5180 | 9.926 | 10.700 | 13.341 | ≤ 15 /MHz | Pass |
| | 42 | 5210 | 10.057 | 10.366 | 13.225 | ≤ 15 /MHz | Pass |
| | 48 | 5240 | 10.570 | 11.054 | 13.829 | ≤ 15 /MHz | Pass |
| 802.11a, 10 MHz | 36 | 5180 | 10.814 | 11.273 | 14.060 | ≤ 15 /MHz | Pass |
| | 42 | 5210 | 10.736 | 10.728 | 13.742 | ≤ 15 /MHz | Pass |
| | 48 | 5240 | 10.707 | 10.278 | 13.508 | ≤ 15 /MHz | Pass |
| 802.11a, 5 MHz | 149 | 5745 | 12.455 | 14.458 | 16.581 | ≤ 28 /500 KHz | Pass |
| | 157 | 5785 | 12.719 | 14.177 | 16.519 | ≤ 28 /500 KHz | Pass |
| | 165 | 5825 | 12.065 | 14.391 | 16.392 | ≤ 28 /500 KHz | Pass |
| 802.11a, 10 MHz | 149 | 5745 | 9.590 | 11.495 | 13.656 | ≤ 28 /500 KHz | Pass |
| | 157 | 5785 | 9.093 | 11.284 | 13.440 | ≤ 28 /500 KHz | Pass |
| | 165 | 5825 | 9.245 | 11.508 | 14.151 | ≤ 28 /500 KHz | Pass |
| Test Equipment: Please refer to section 5.2 | | | | | | | |



ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Power Spectral Density Test Data (Conducted)



5 MHz, 802.11a, Channel 36, Chain 0



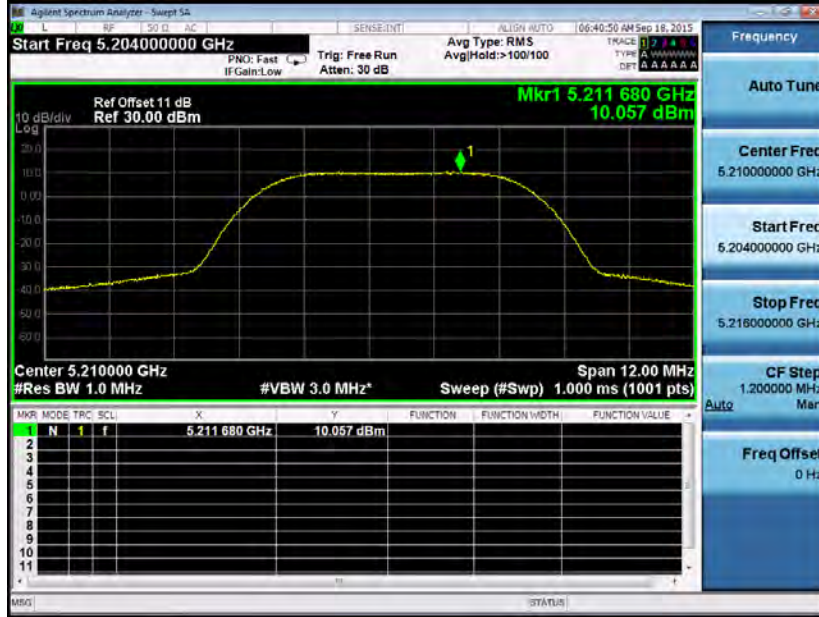
5 MHz, 802.11a, Channel 36, Chain 1



ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Power Spectral Density Test Data (Conducted)



5 MHz, 802.11a, Channel 42, Chain 0



5 MHz, 802.11a, Channel 42, Chain 1



ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Power Spectral Density Test Data (Conducted)



5 MHz, 802.11a, Channel 48, Chain 0



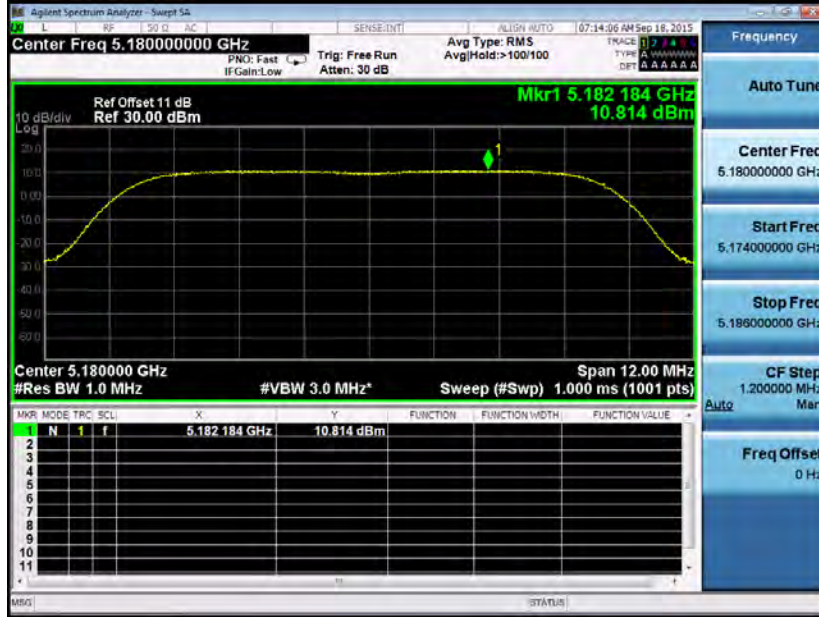
5 MHz, 802.11a, Channel 48, Chain 1



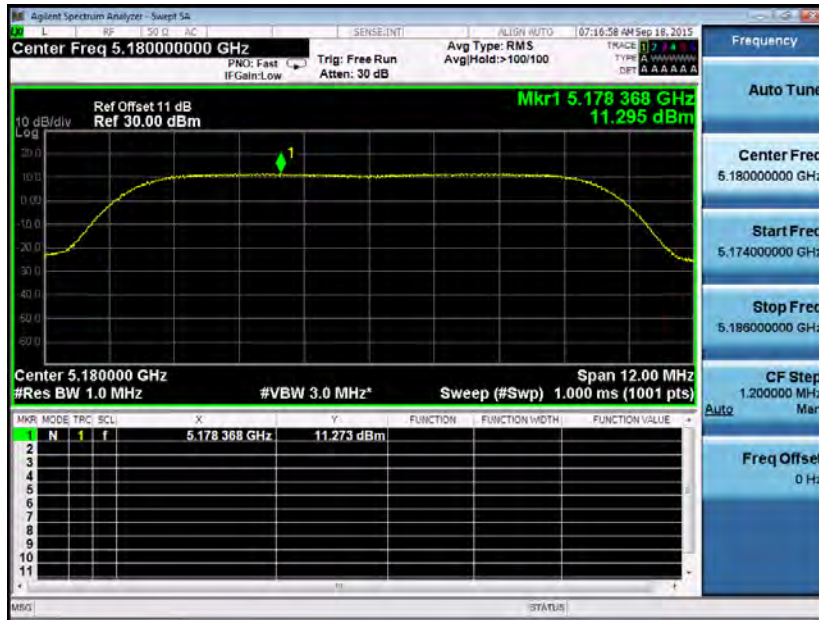
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Power Spectral Density Test Data (Conducted)



10 MHz, 802.11a, Channel 36, Chain 0



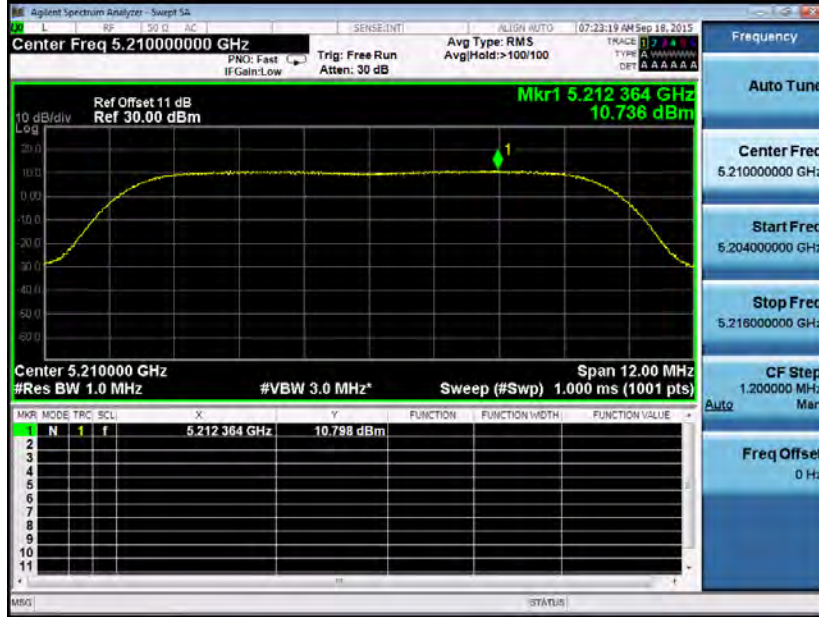
10 MHz, 802.11a, Channel 36, Chain 1



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1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Power Spectral Density Test Data (Conducted)



10 MHz, 802.11a, Channel 42, Chain 0



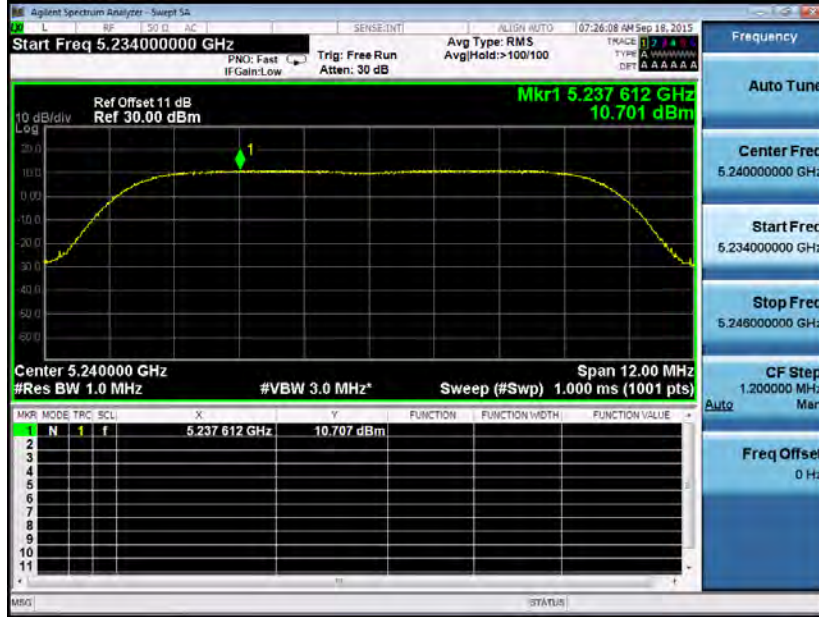
10 MHz, 802.11a, Channel 42, Chain 1



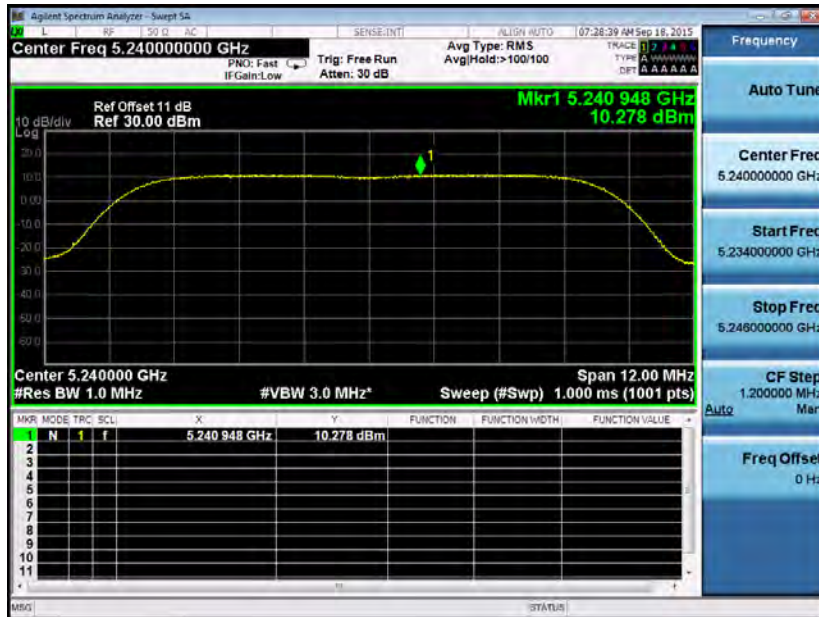
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Power Spectral Density Test Data (Conducted)



10 MHz, 802.11a, Channel 48, Chain 0



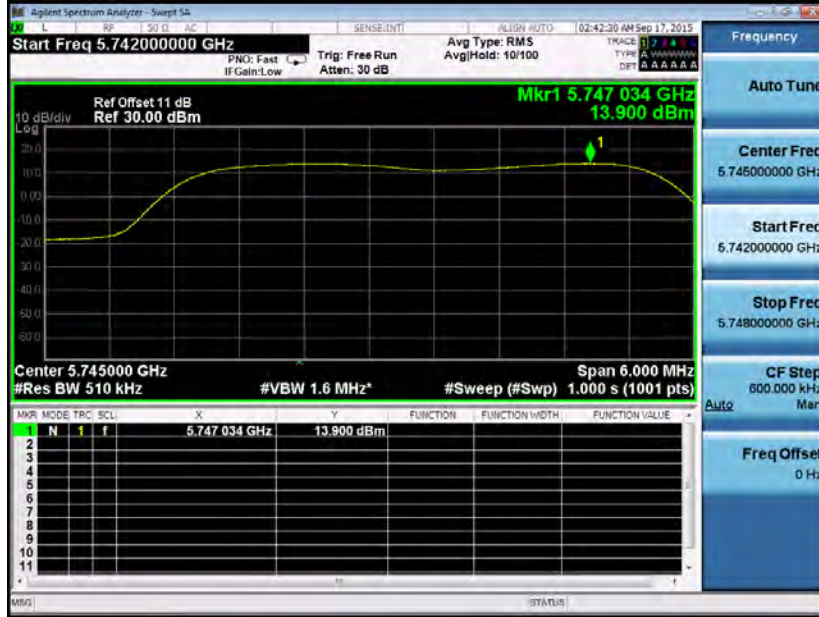
10 MHz, 802.11a, Channel 48, Chain 1



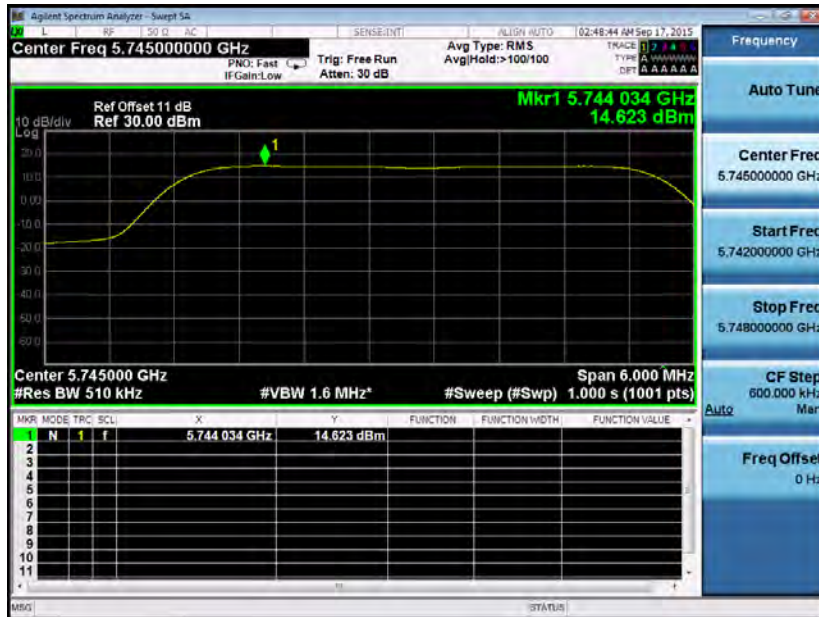
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Power Spectral Density Test Data (Conducted)



5 MHz, 802.11a, Channel 149, Chain 0



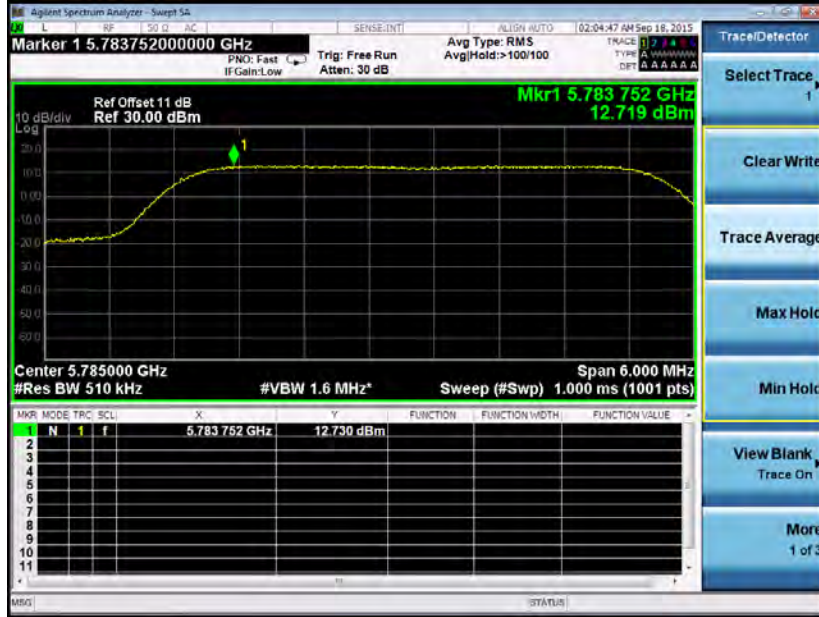
5 MHz, 802.11a, Channel 149, Chain 1



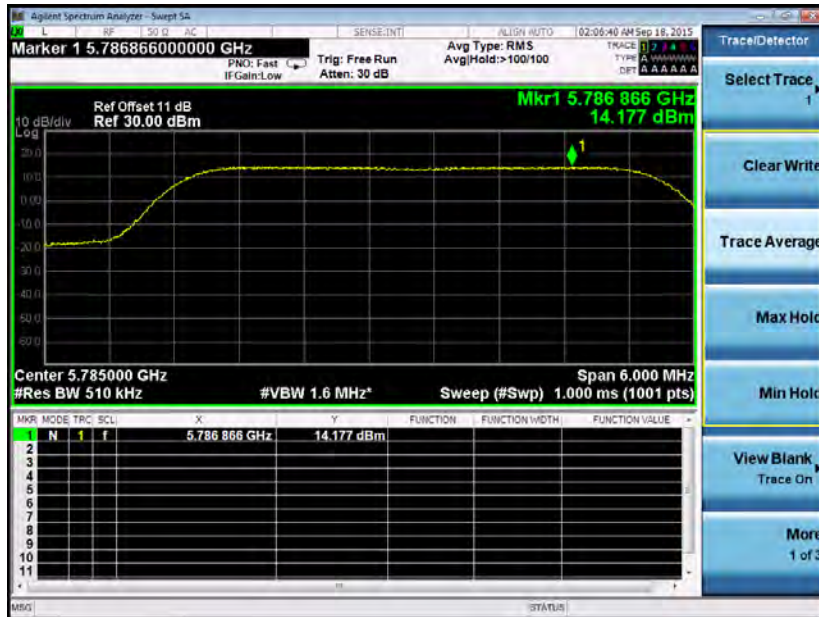
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Power Spectral Density Test Data (Conducted)



5 MHz, 802.11a, Channel 157, Chain 0



5 MHz, 802.11a, Channel 157, Chain 1



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1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Power Spectral Density Test Data (Conducted)



5 MHz, 802.11a, Channel 165, Chain 0



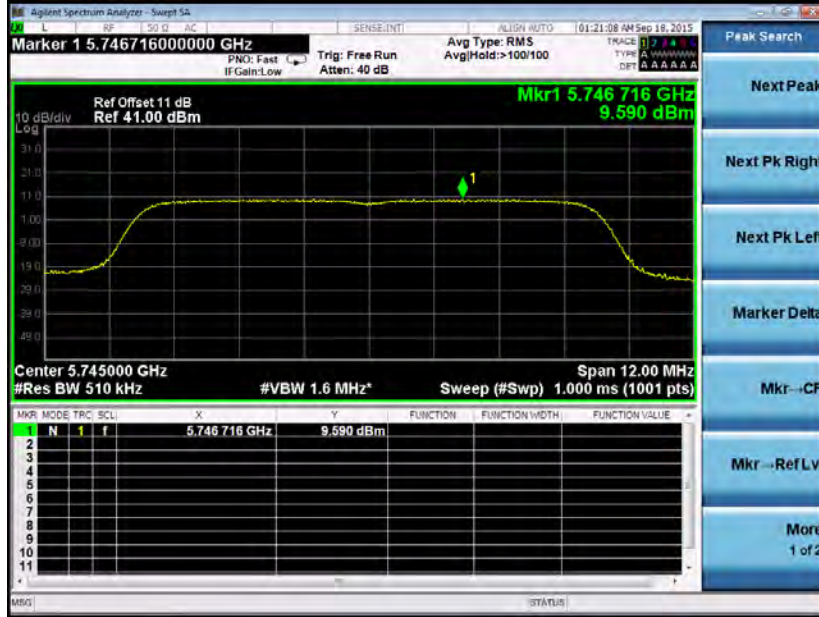
5 MHz, 802.11a, Channel 165, Chain 1



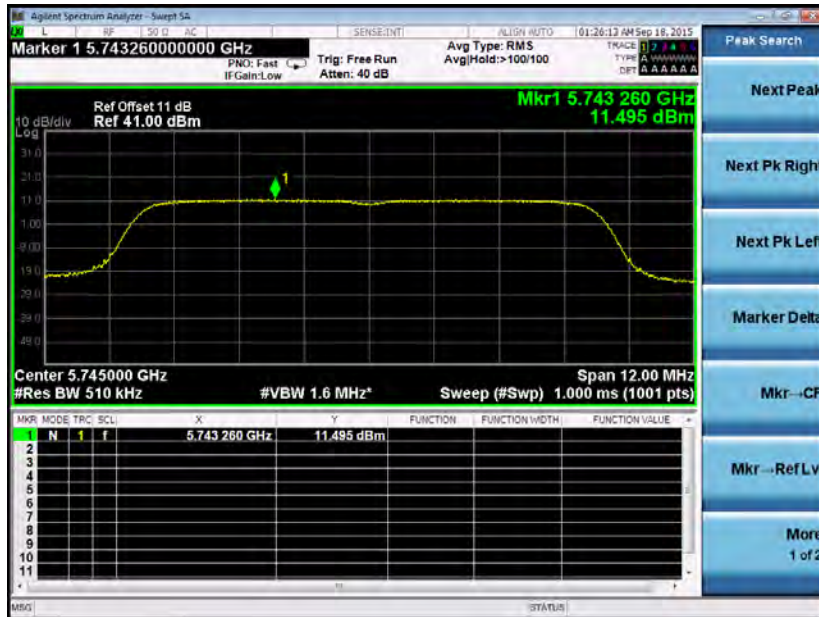
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Power Spectral Density Test Data (Conducted)



10 MHz, 802.11a, Channel 149, Chain 0



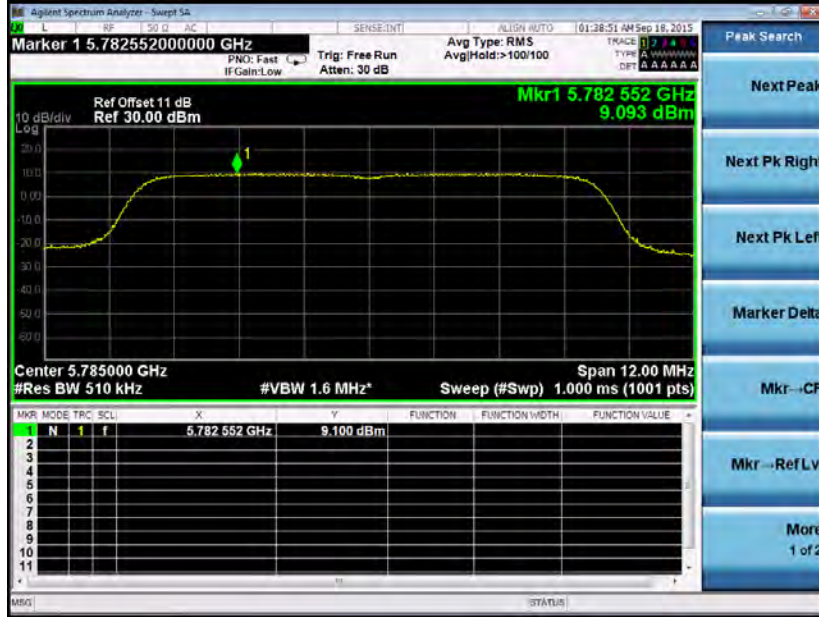
10 MHz, 802.11a, Channel 149, Chain 1



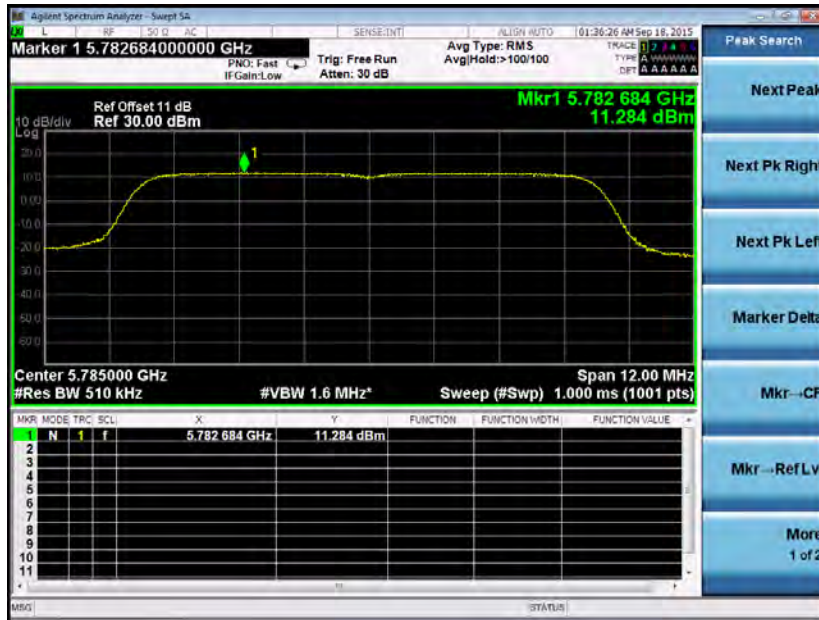
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Power Spectral Density Test Data (Conducted)



10 MHz, 802.11a, Channel 157, Chain 0



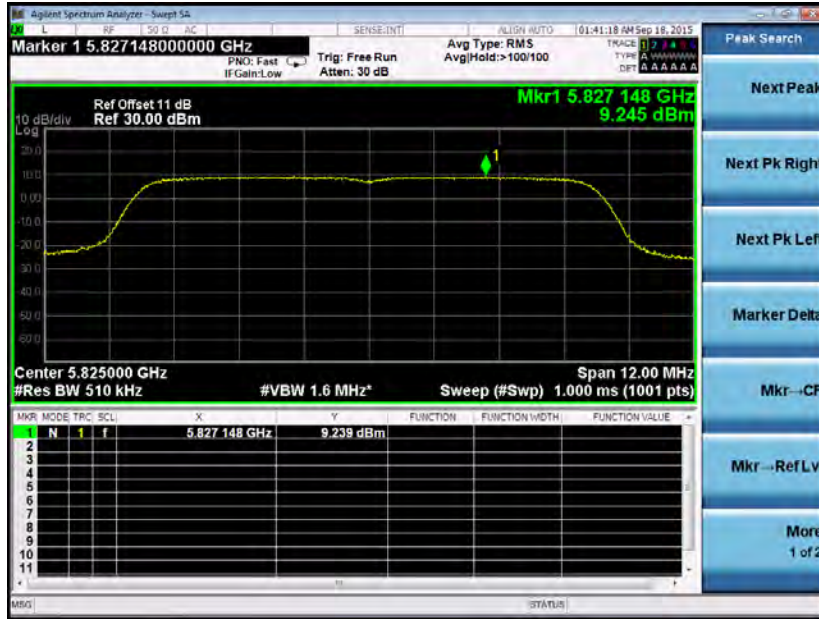
10 MHz, 802.11a, Channel 157, Chain 1



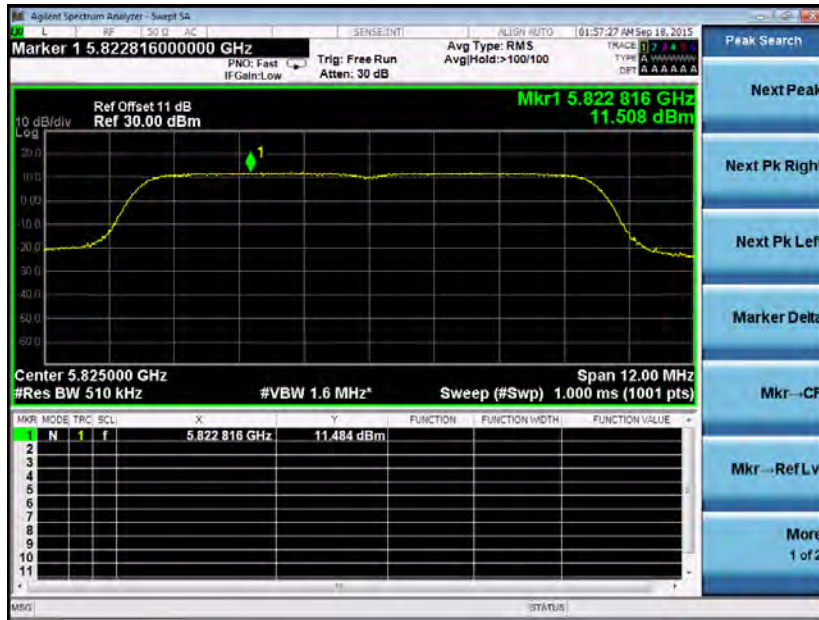
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Maximum Average Power Spectral Density Test Data (Conducted)



10 MHz, 802.11a, Channel 165, Chain 0



10 MHz, 802.11a, Channel 165, Chain 1



ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)

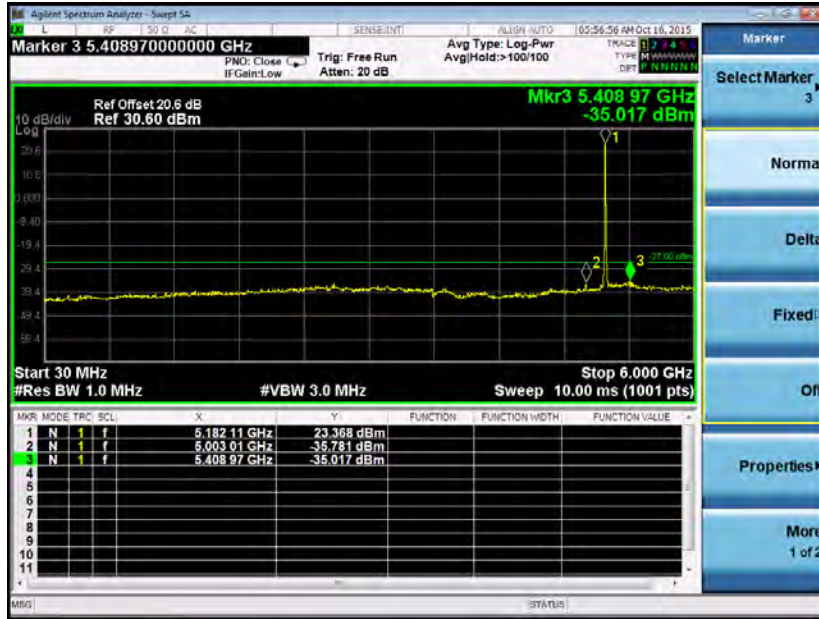
| Company: | Tropos Networks, Inc. | | Test Date: | | 9/15/15 | | |
|--|-----------------------|-----------------|--------------------------------|--------------------------------|----------------------|-------------|------------|
| EUT Name: | WIFI Module | | Test Engineer: | | George Hsu | | |
| Model: | Bluefin 5G | | Test Result: | | PASS | | |
| Operating Mode: | TX Mode | | | | | | |
| Mode | Test CH | Frequency (MHz) | Chain 0 Highest Emission (dBm) | Chain 1 Highest Emission (dBm) | Total Emission (dBm) | Limit (dBm) | Conclusion |
| 802.11b, 5 MHz | 36 | See Below | | | | ≤ -27.00 | Pass |
| | 42 | | | | | ≤ -27.00 | Pass |
| | 48 | | | | | ≤ -27.00 | Pass |
| 802.11b, 10 MHz | 36 | | | | | ≤ -27.00 | Pass |
| | 42 | | | | | ≤ -27.00 | Pass |
| | 48 | | | | | ≤ -27.00 | Pass |
| 802.11g, 5 MHz | 149 | | | | | ≤ -27.00 | Pass |
| | 157 | | | | | ≤ -27.00 | Pass |
| | 165 | | | | | ≤ -27.00 | Pass |
| 802.11g, 10 MHz | 149 | | | | | ≤ -27.00 | Pass |
| | 157 | | | | | ≤ -27.00 | Pass |
| | 165 | | | | | ≤ -27.00 | Pass |
| Test Equipment: Please refer to section 5.2 | | | | | | | |



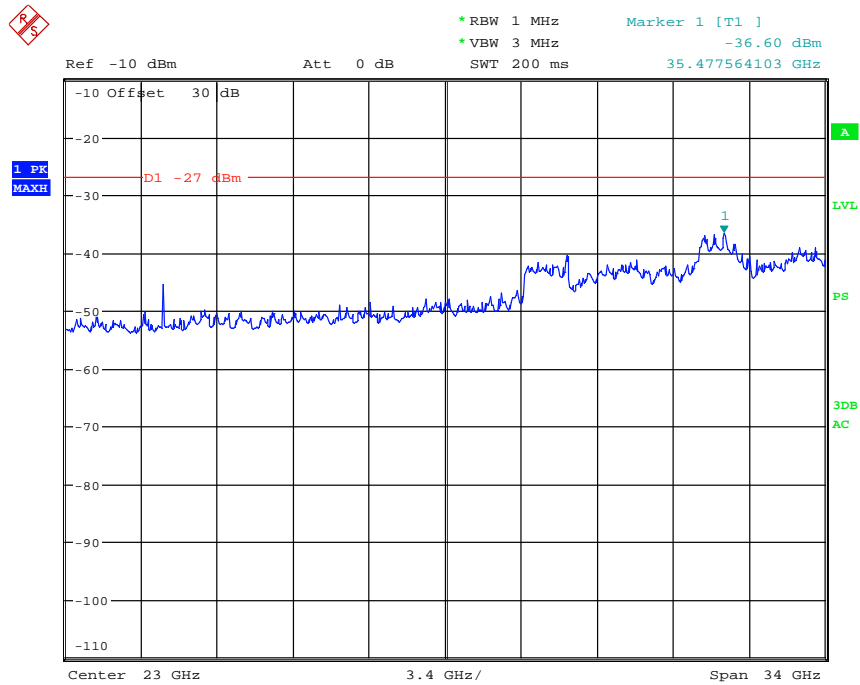
ELECTRO MAGNETIC TEST, INC.

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Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 5 MHz, 802.11a, Channel 36, Chain 0



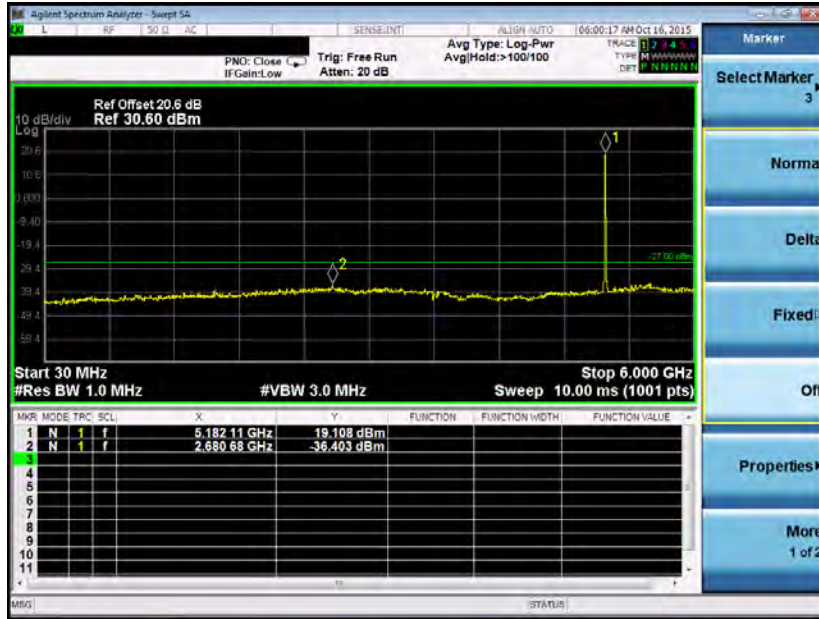
6 GHz to 40 GHz, 5 MHz, 802.11a, Channel 36, Chain 0



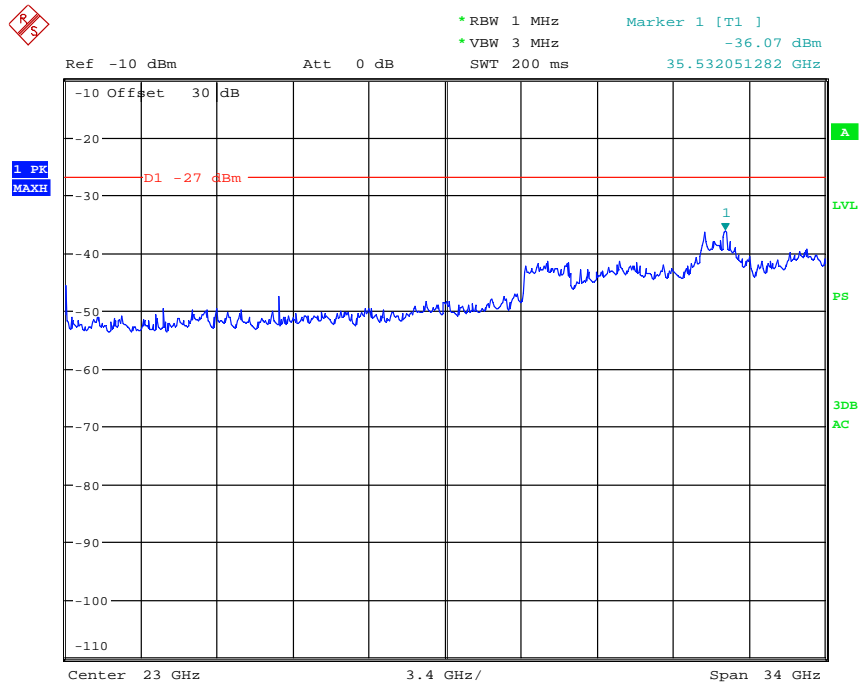
ELECTRO MAGNETIC TEST, INC.

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Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 5 MHz, 802.11a, Channel 36, Chain 1



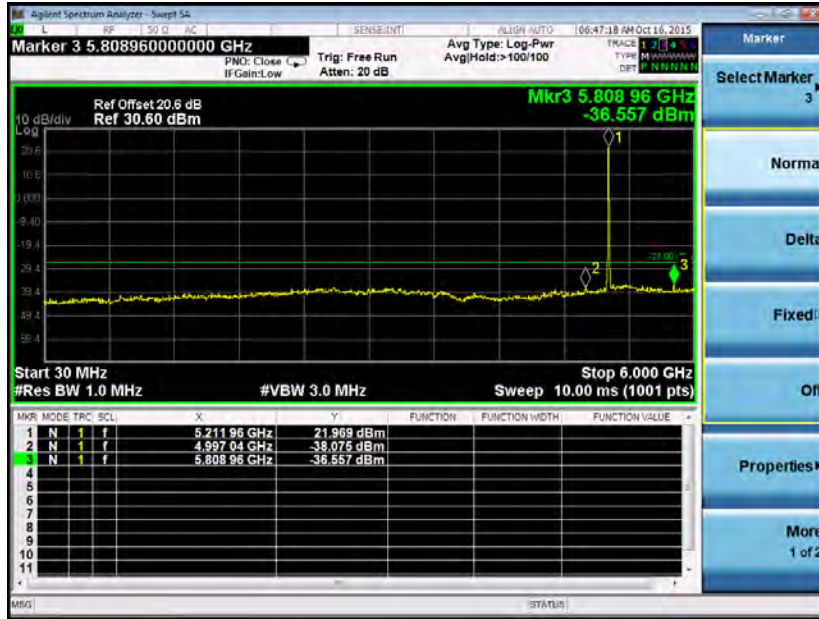
6 GHz to 40 GHz, 5 MHz, 802.11a, Channel 36, Chain 1



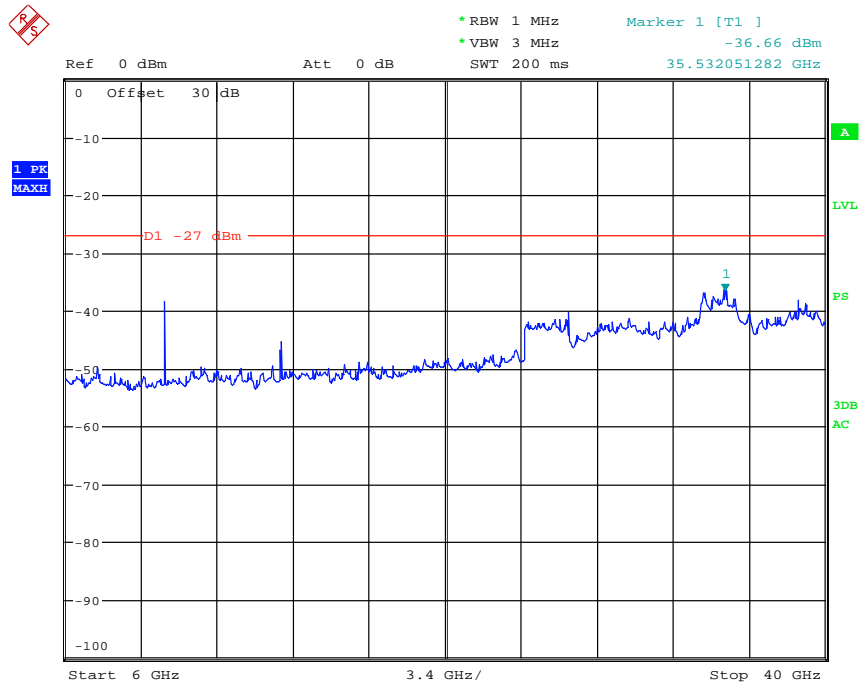
ELECTRO MAGNETIC TEST, INC.

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Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 5 MHz, 802.11a, Channel 42, Chain 0



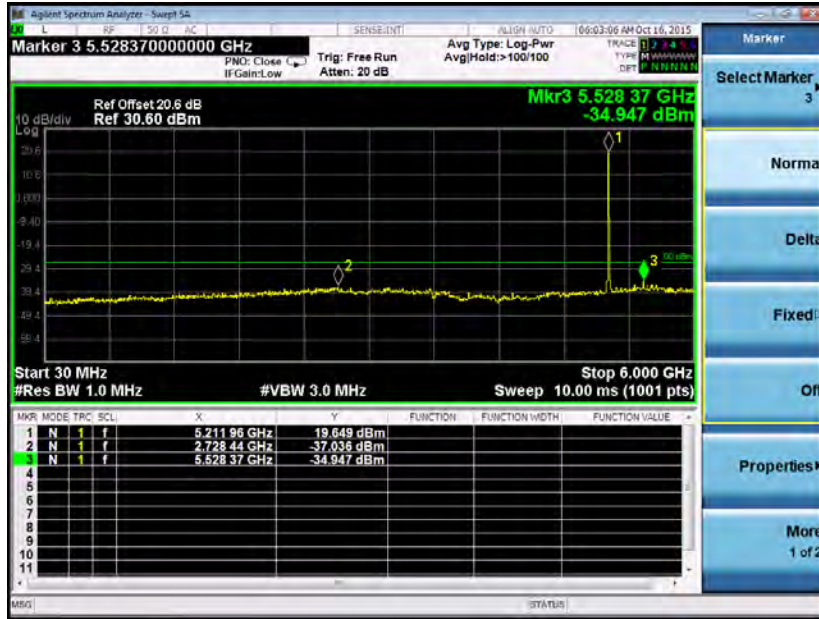
6 GHz to 40 GHz, 5 MHz, 802.11a, Channel 42, Chain 0



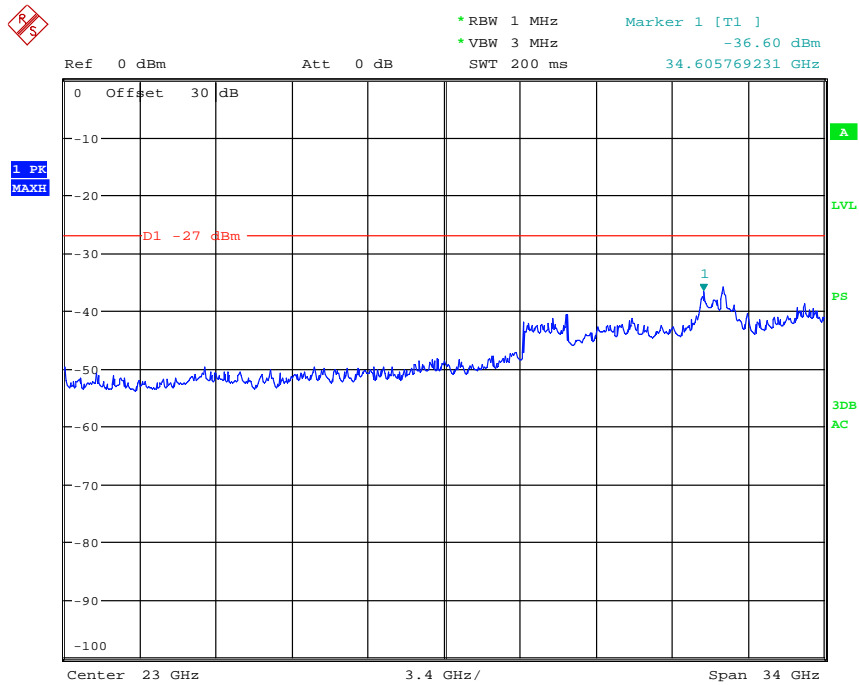
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 5 MHz, 802.11a, Channel 42, Chain 1



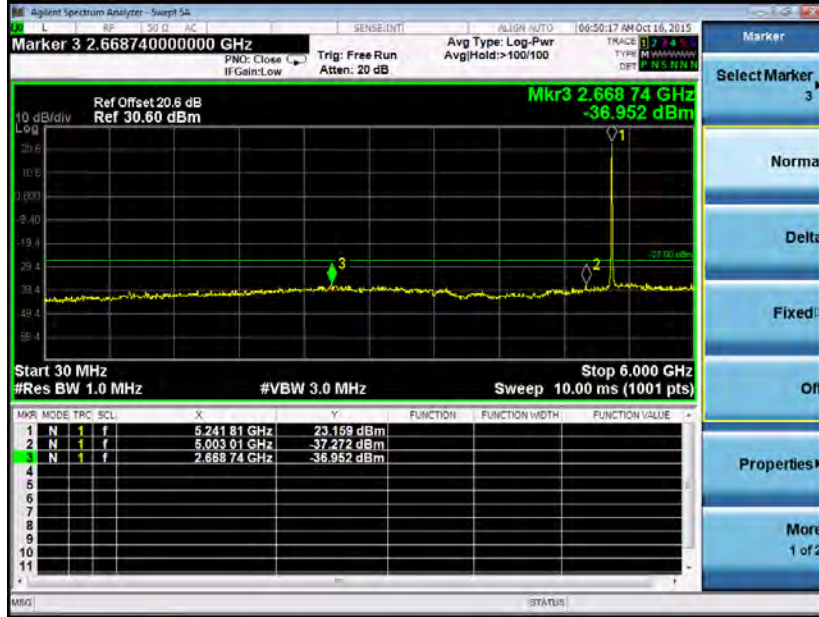
6 GHz to 40 GHz, 5 MHz, 802.11a, Channel 42, Chain 1



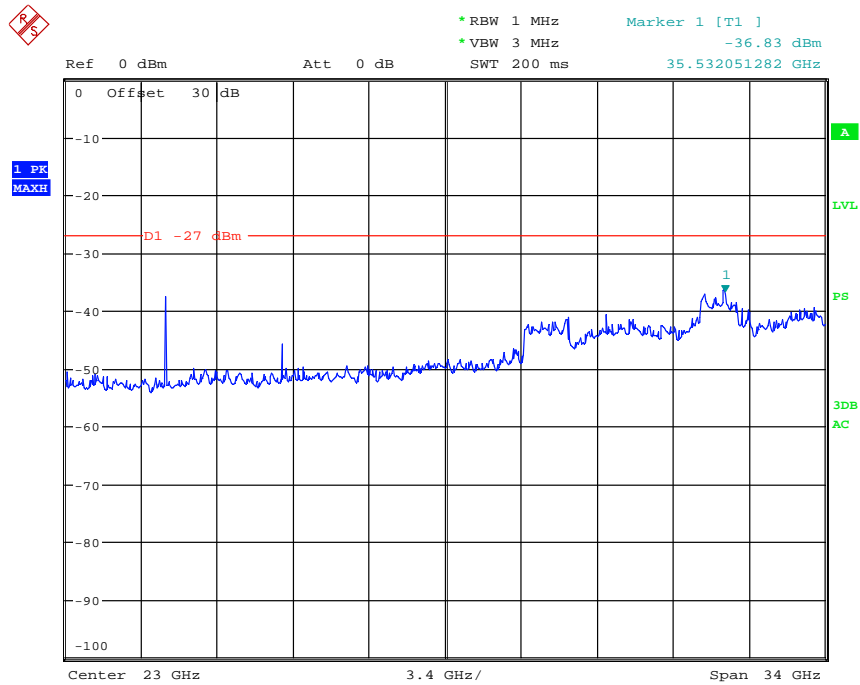
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 5 MHz, 802.11a, Channel 48, Chain 0



6 GHz to 40 GHz, 5 MHz, 802.11a, Channel 48, Chain 0



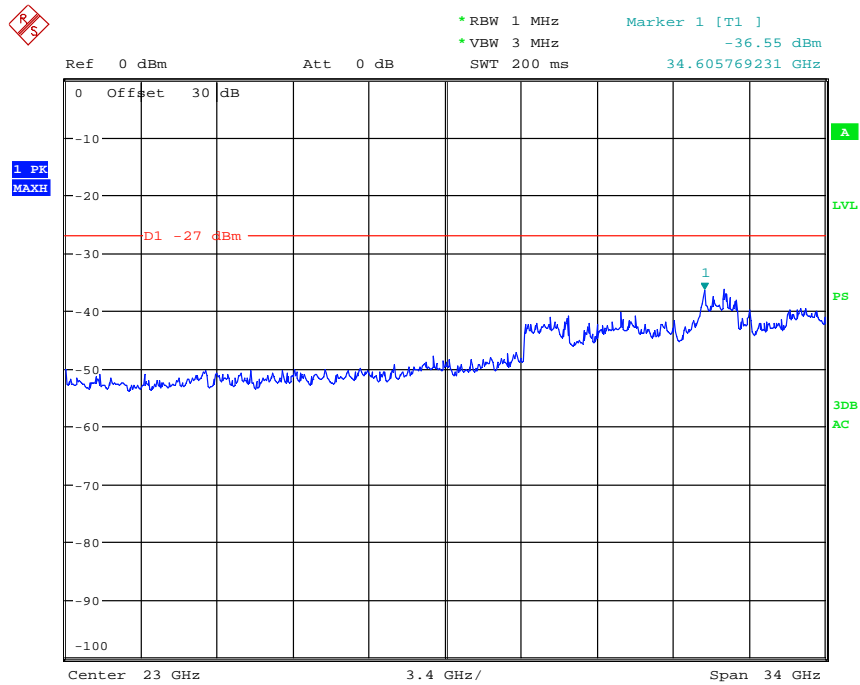
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 5 MHz, 802.11a, Channel 48, Chain 1



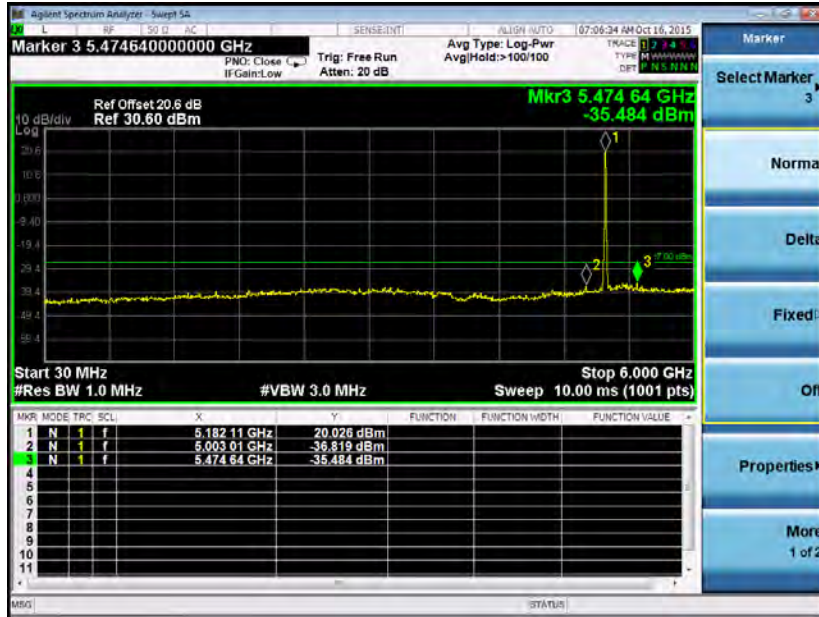
6 GHz to 40 GHz, 5 MHz, 802.11a, Channel 48, Chain 1



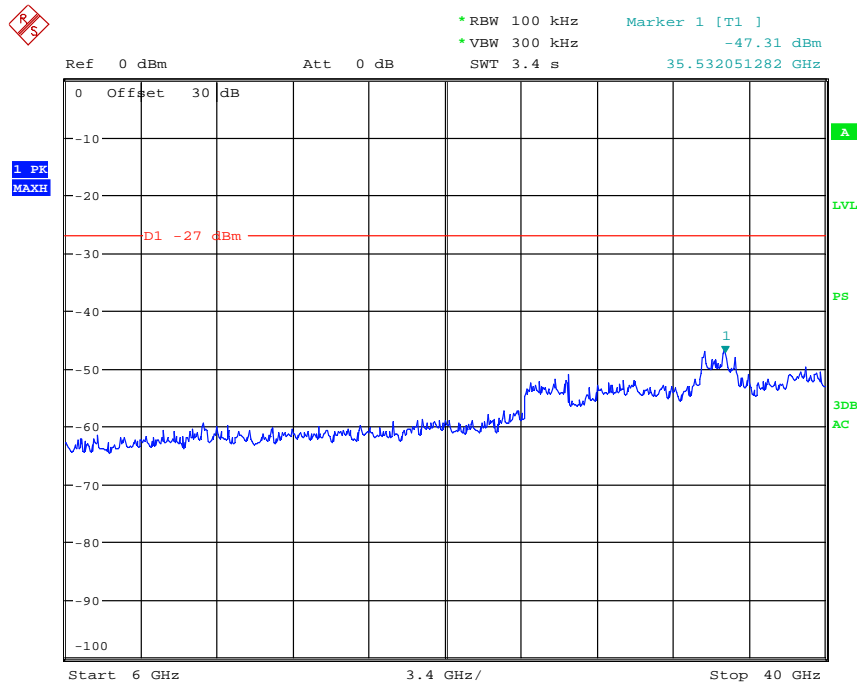
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 10 MHz, 802.11a, Channel 36, Chain 0



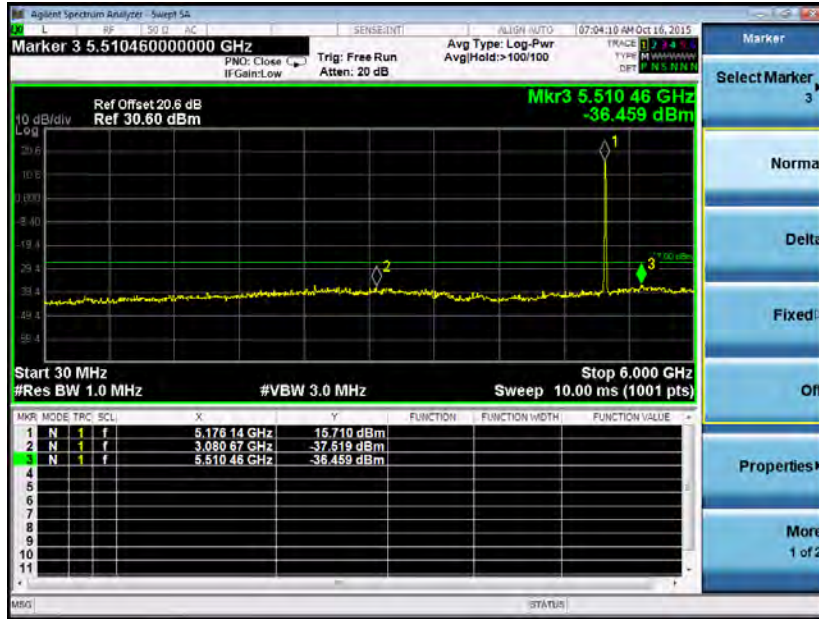
6 GHz to 40 GHz, 10 MHz, 802.11a, Channel 36, Chain 0



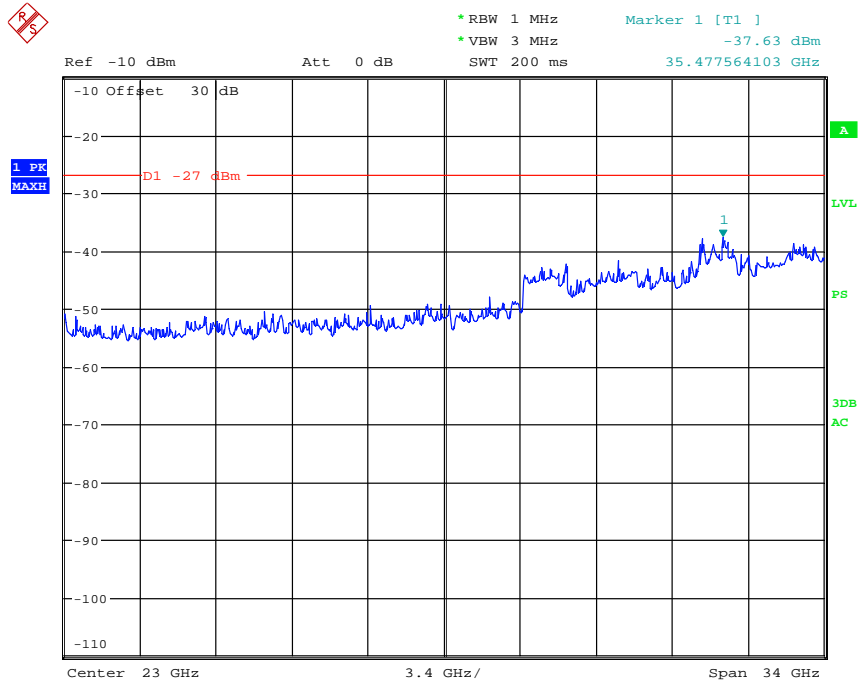
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 10 MHz, 802.11a, Channel 36, Chain 1



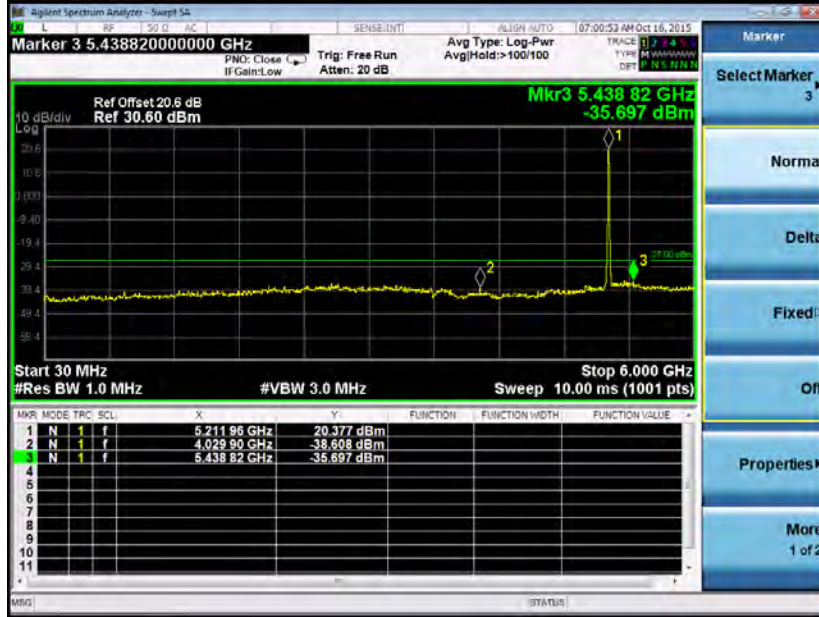
6 GHz to 40 GHz, 10 MHz, 802.11a, Channel 36, Chain 1



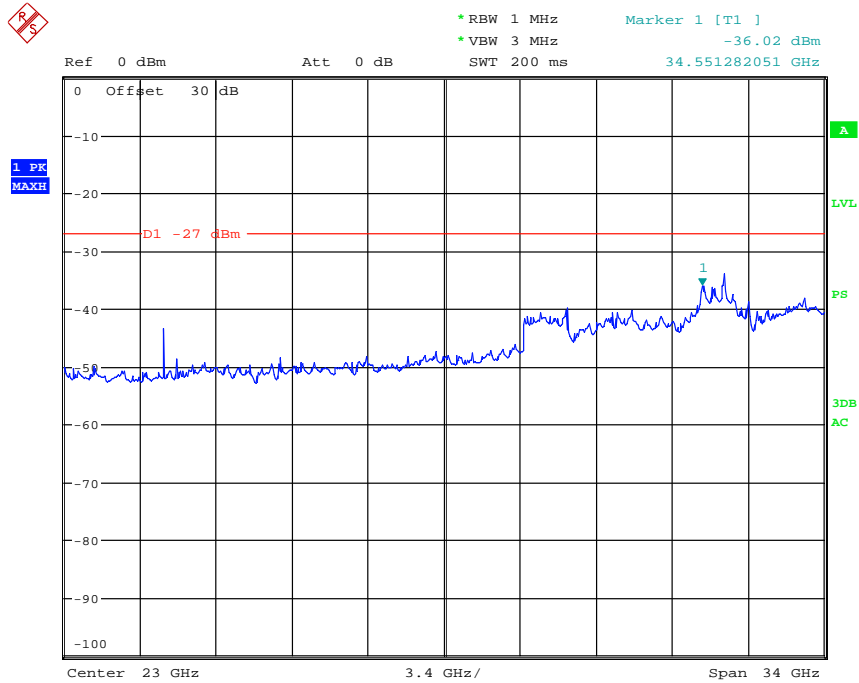
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 10 MHz, 802.11a, Channel 42, Chain 0



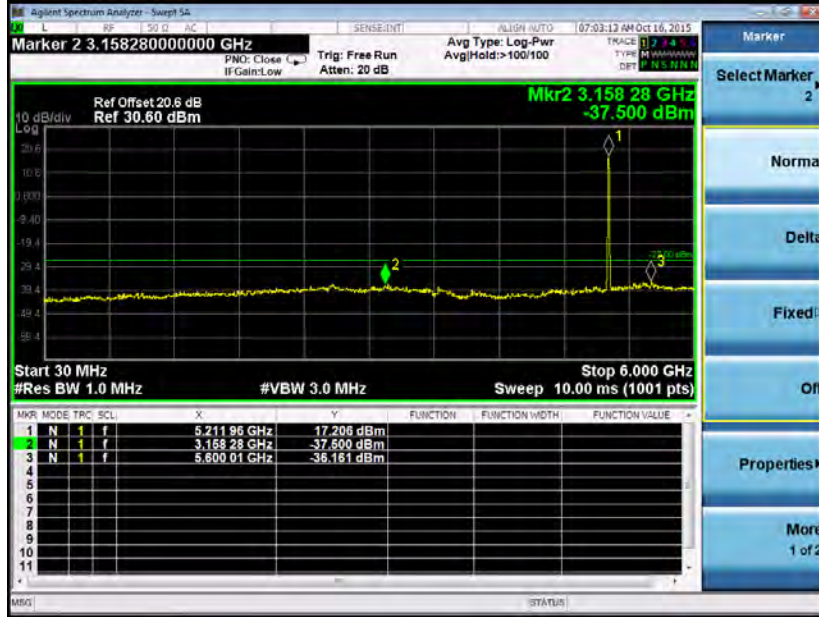
6 GHz to 40 GHz, 10 MHz, 802.11a, Channel 42, Chain 0



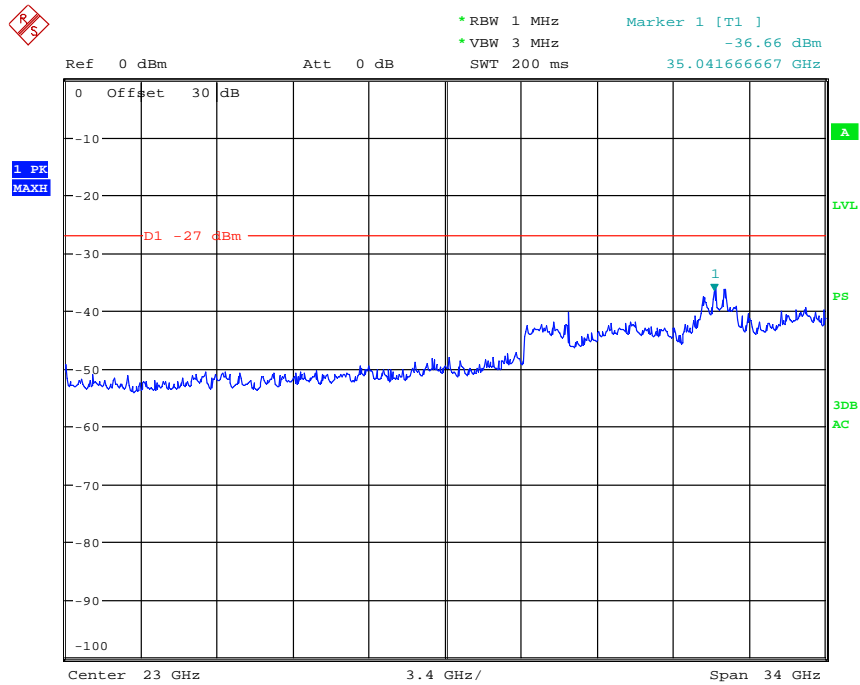
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 10 MHz, 802.11a, Channel 42, Chain 1



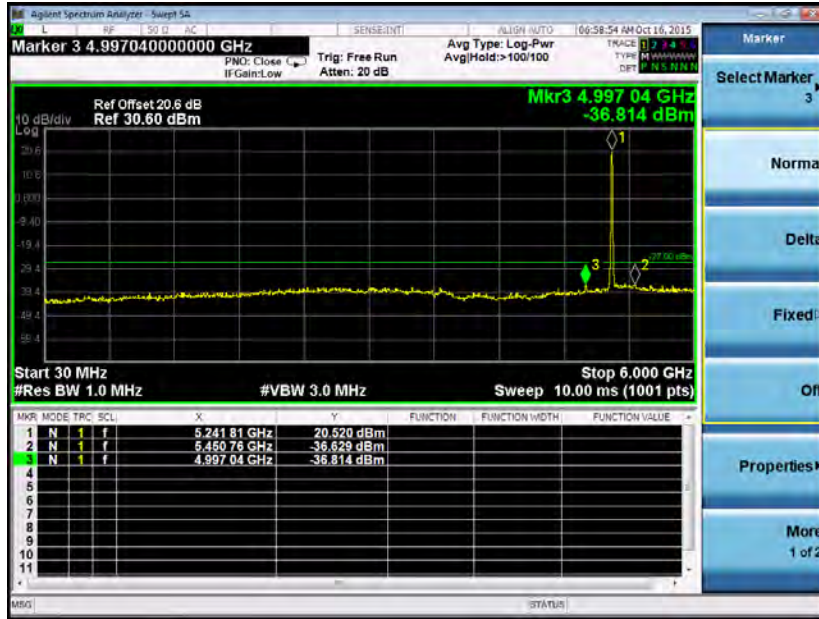
6 GHz to 40 GHz, 10 MHz, 802.11a, Channel 42, Chain 1



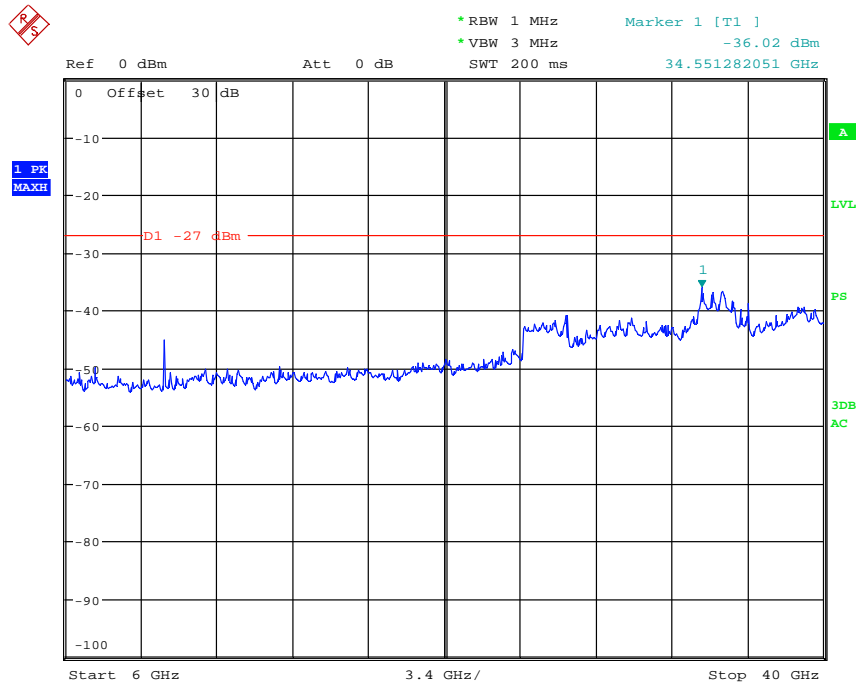
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 10 MHz, 802.11a, Channel 48, Chain 0



6 GHz to 40 GHz, 10 MHz, 802.11a, Channel 48, Chain 0



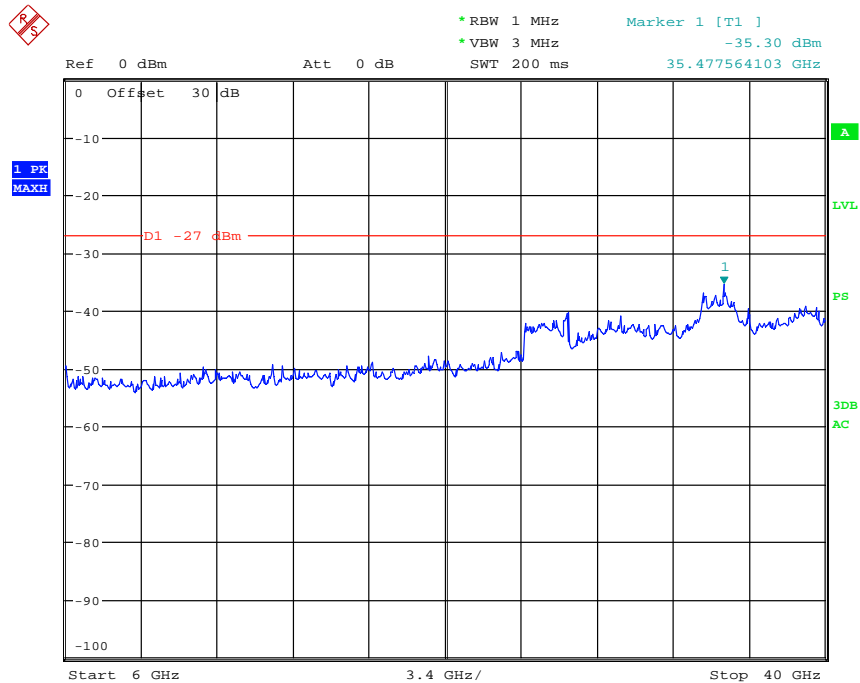
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 10 MHz, 802.11a, Channel 48, Chain 1



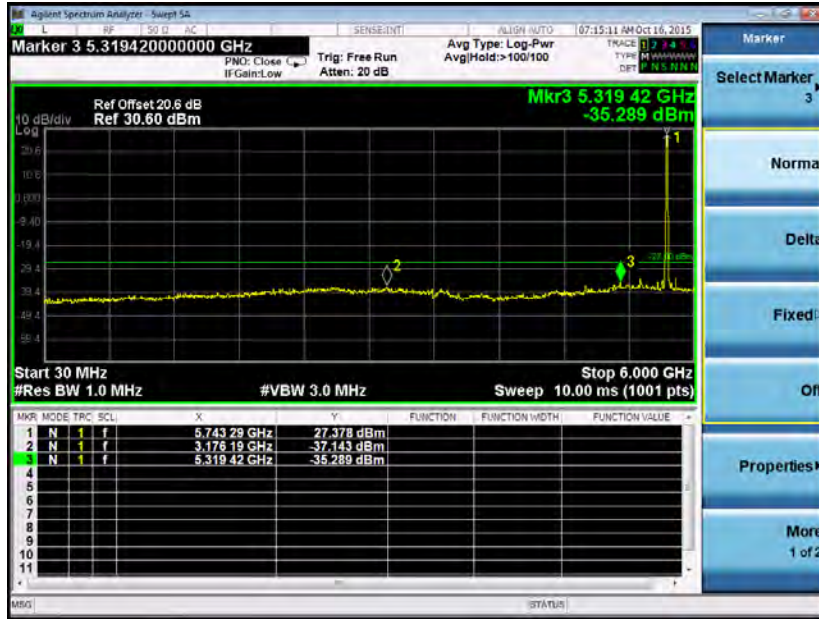
6 GHz to 40 GHz, 10 MHz, 802.11a, Channel 48, Chain 1



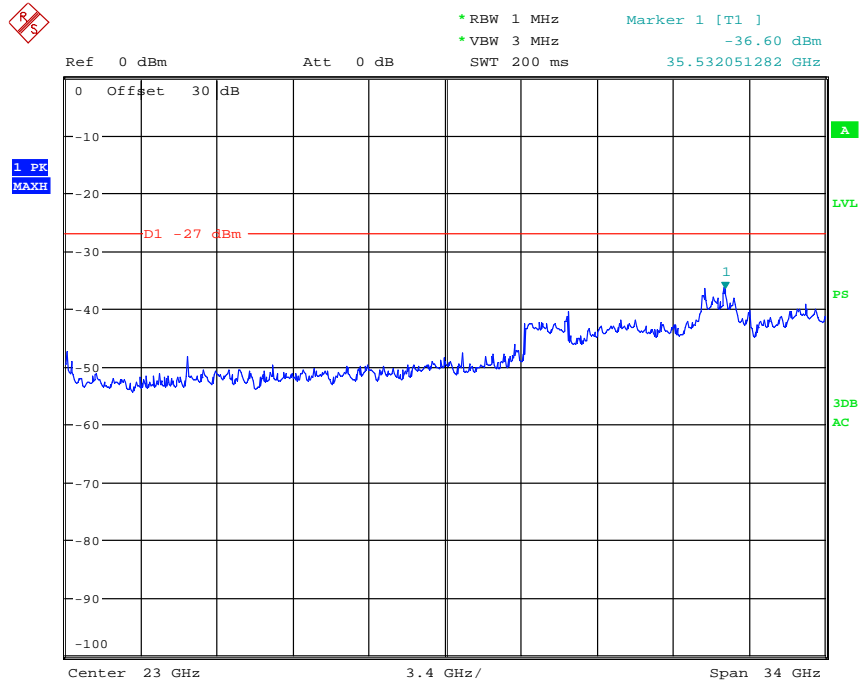
ELECTRO MAGNETIC TEST, INC.

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Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 5 MHz, 802.11a, Channel 149, Chain 0



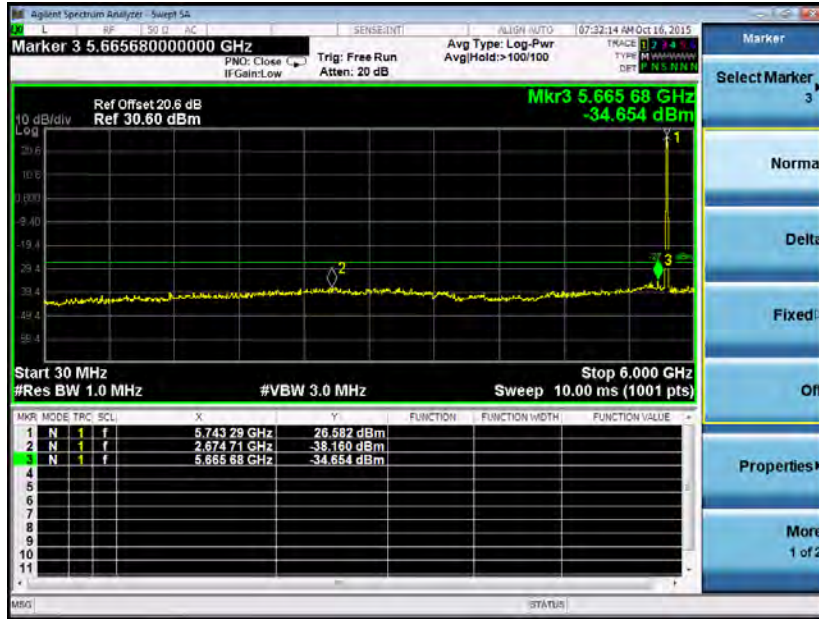
6 GHz to 40 GHz, 5 MHz, 802.11a, Channel 149, Chain 0



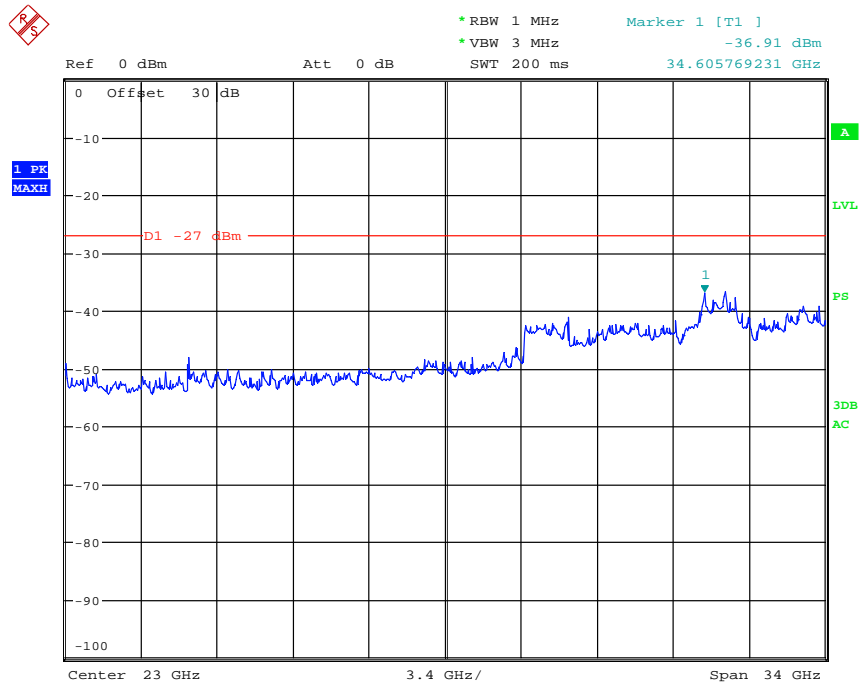
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 5 MHz, 802.11a, Channel 149, Chain 1



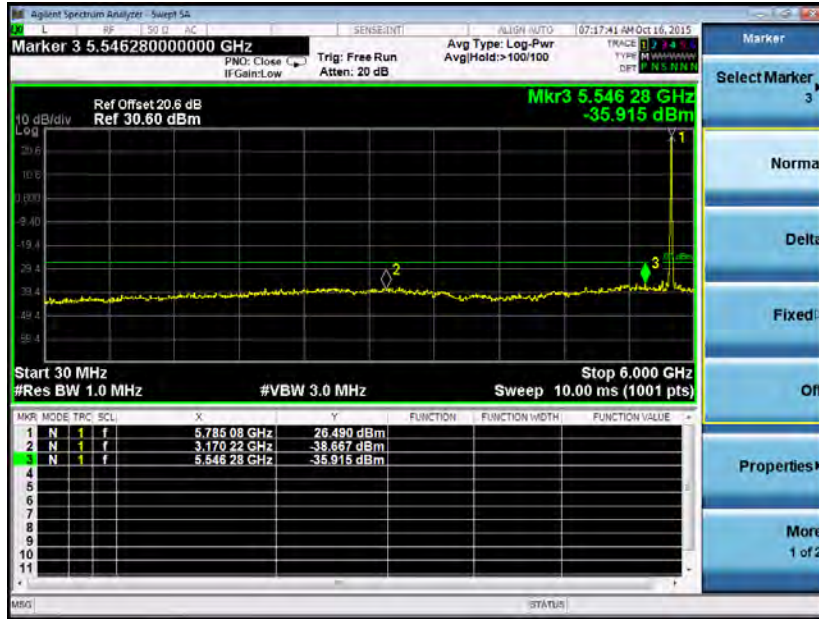
6 GHz to 40 GHz, 5 MHz, 802.11a, Channel 149, Chain 1



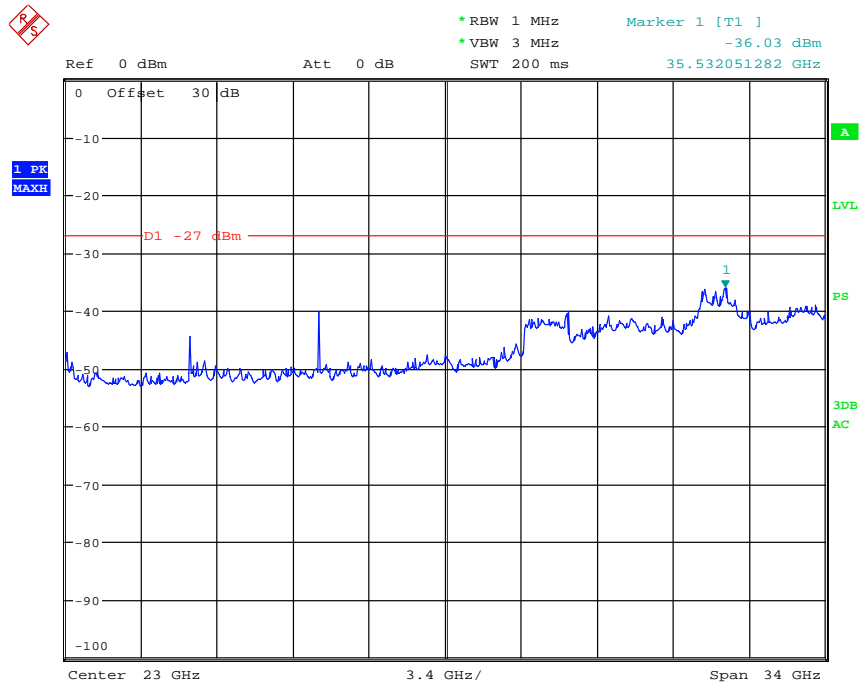
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 5 MHz, 802.11a, Channel 157, Chain 0



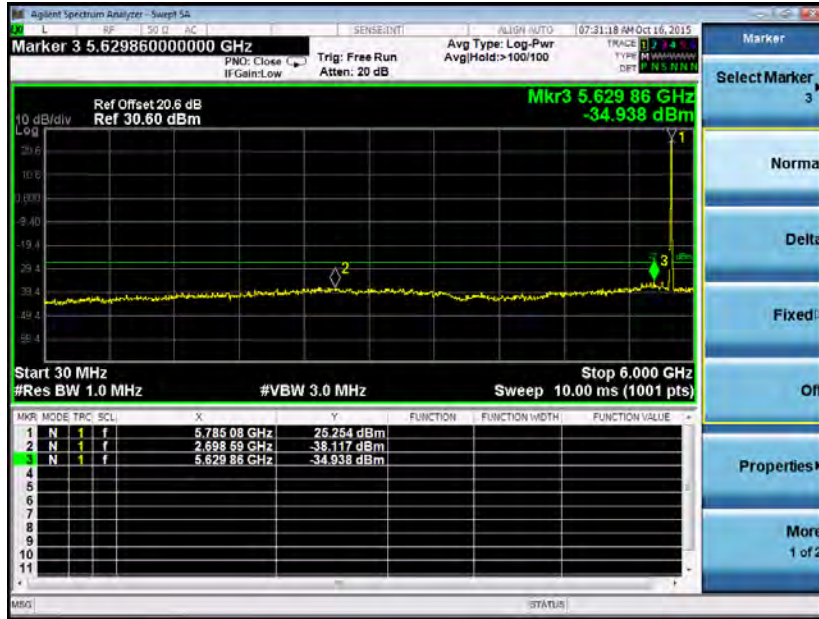
6 GHz to 40 GHz, 5 MHz, 802.11a, Channel 157, Chain 0



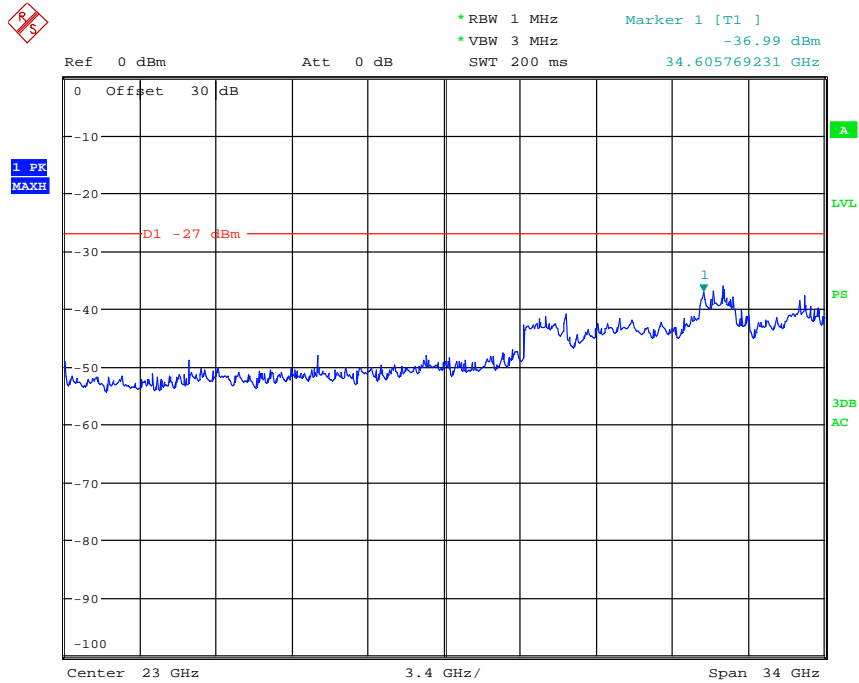
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 5 MHz, 802.11a, Channel 157, Chain 1



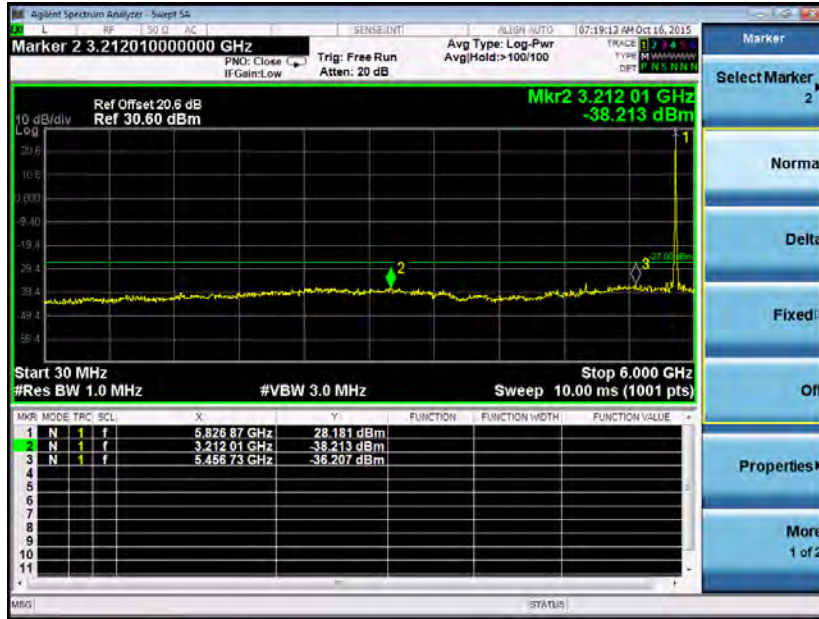
6 GHz to 40 GHz, 5 MHz, 802.11a, Channel 157, Chain 1



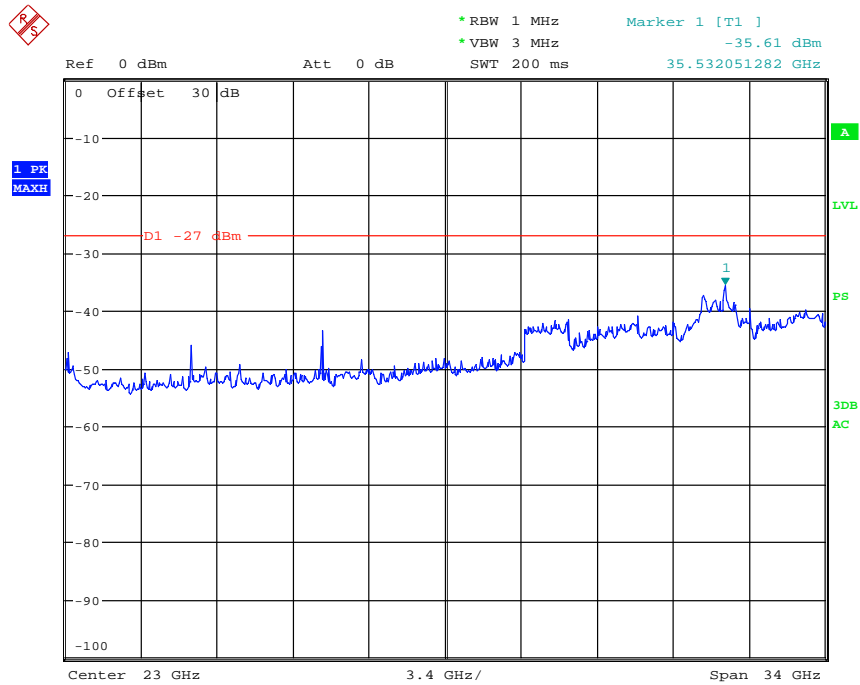
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 5 MHz, 802.11a, Channel 165, Chain 0



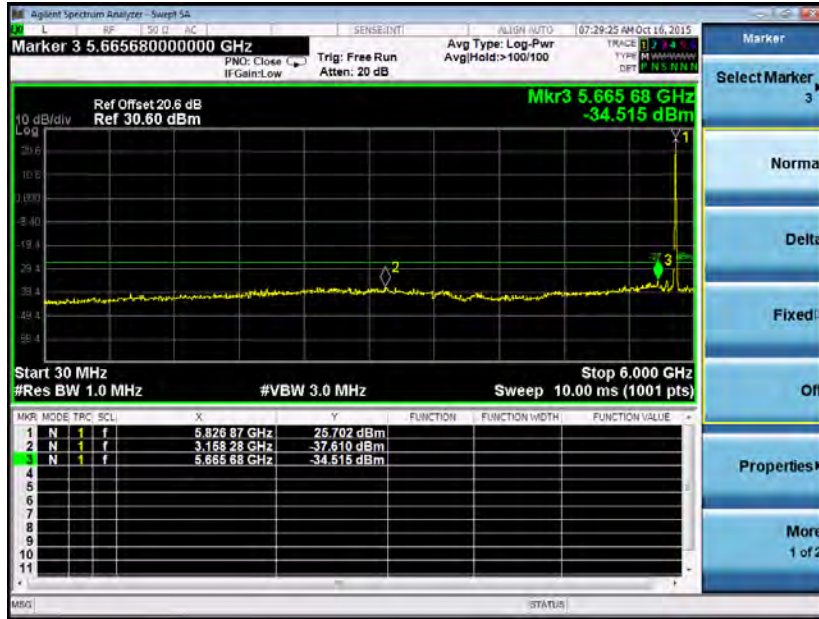
6 GHz to 40 GHz, 5 MHz, 802.11a, Channel 165, Chain 0



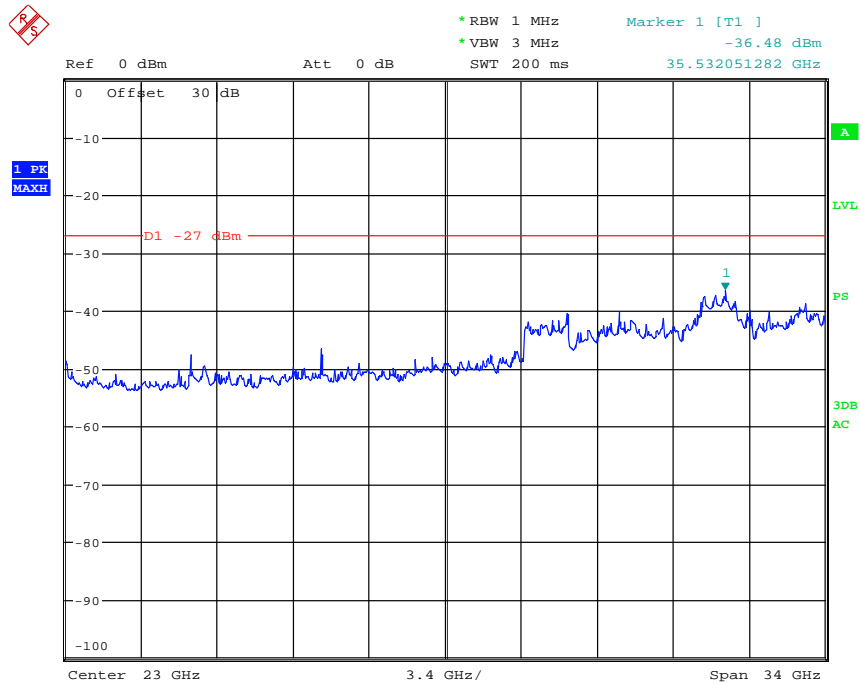
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 5 MHz, 802.11a, Channel 165, Chain 1



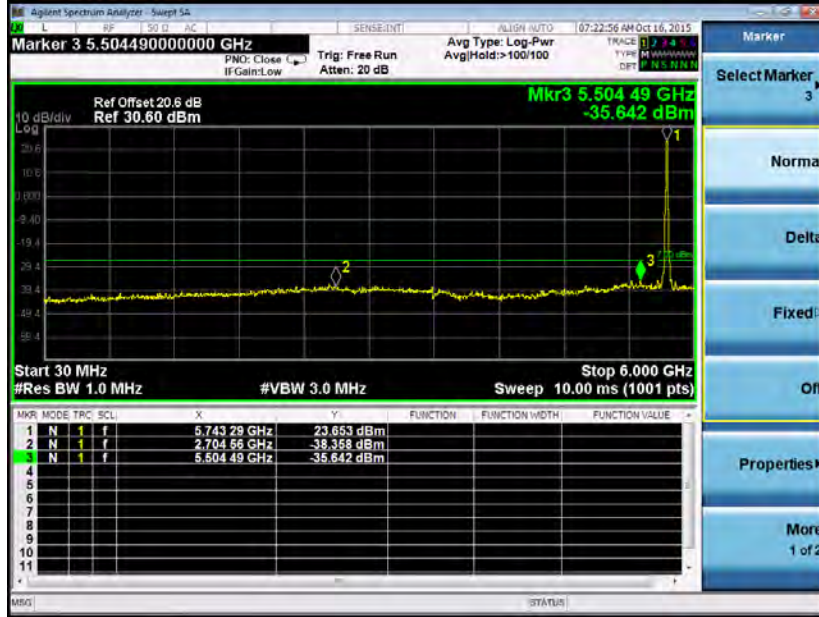
6 GHz to 40 GHz, 5 MHz, 802.11a, Channel 165, Chain 1



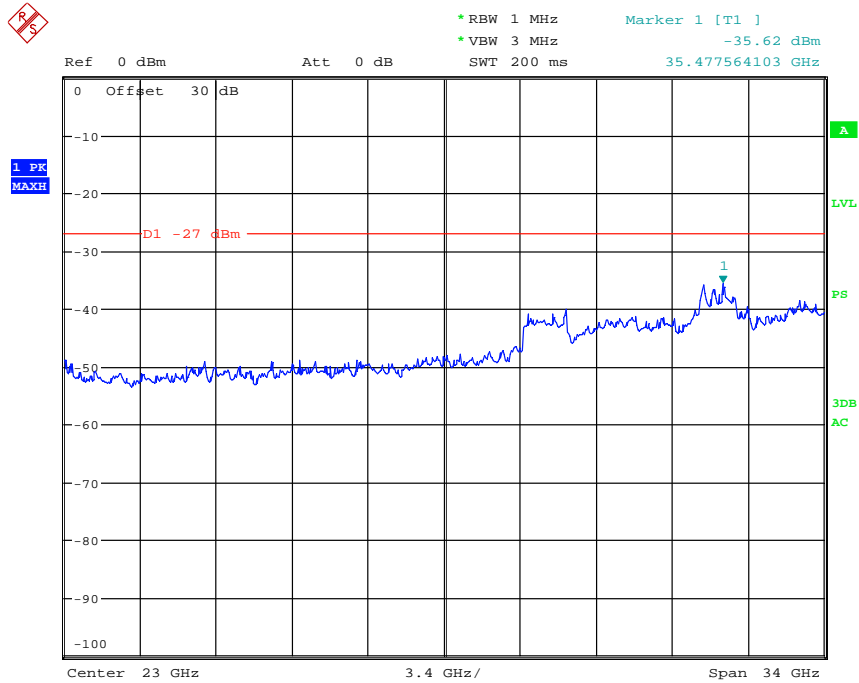
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 10 MHz, 802.11a, Channel 149, Chain 0



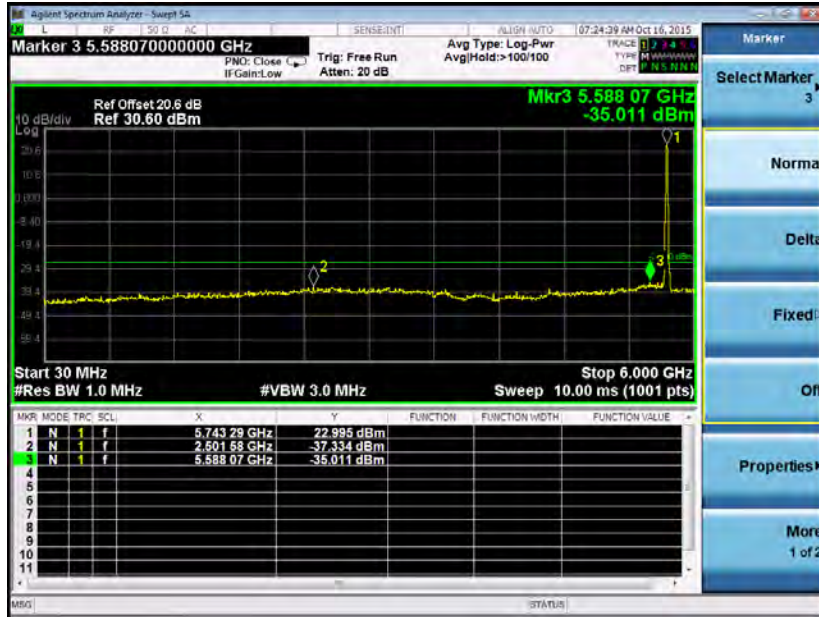
6 GHz to 40 GHz, 10 MHz, 802.11a, Channel 149, Chain 0



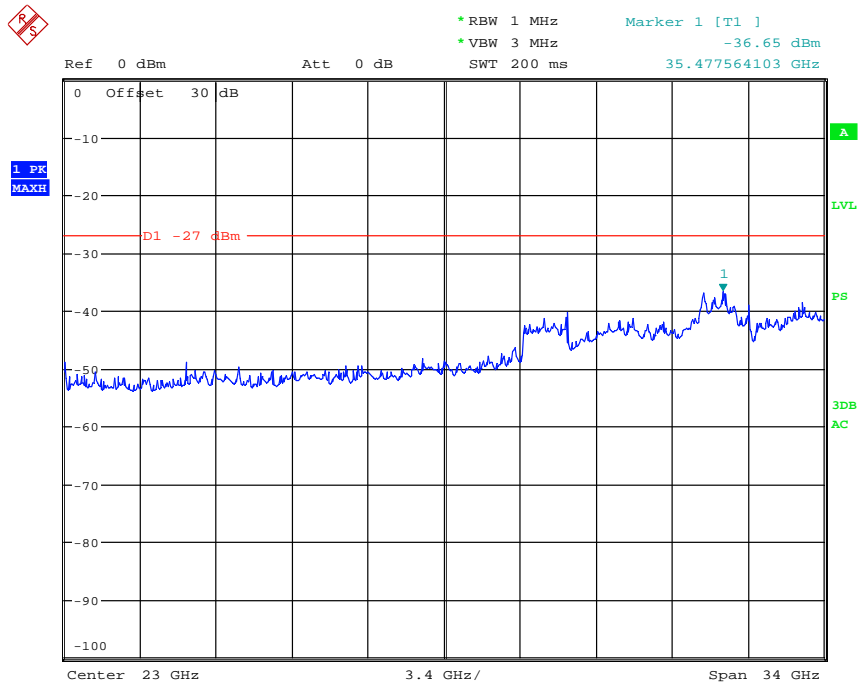
ELECTRO MAGNETIC TEST, INC.

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Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 10 MHz, 802.11a, Channel 149, Chain 1



6 GHz to 40 GHz, 10 MHz, 802.11a, Channel 149, Chain 1



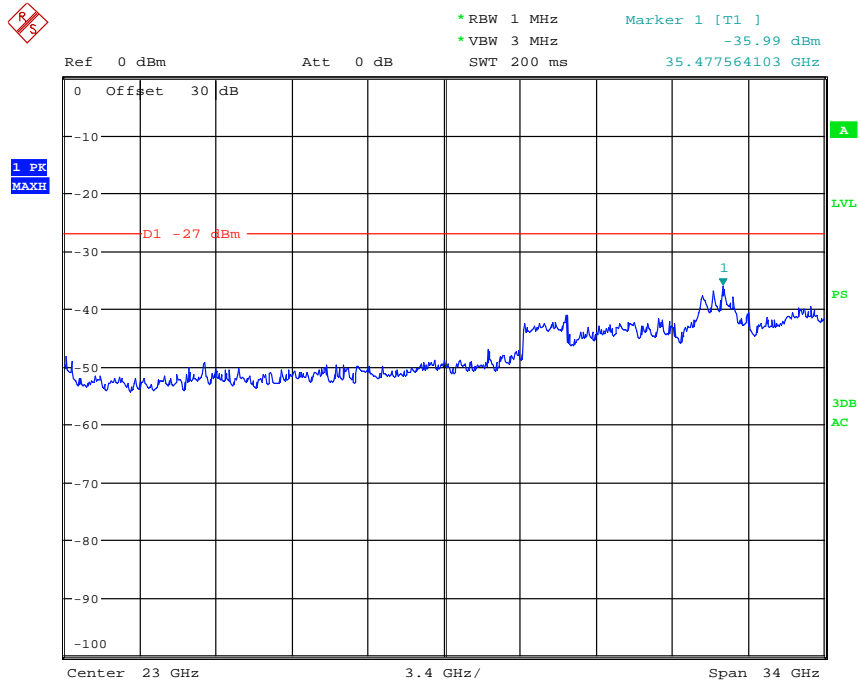
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 10 MHz, 802.11a, Channel 157, Chain 0



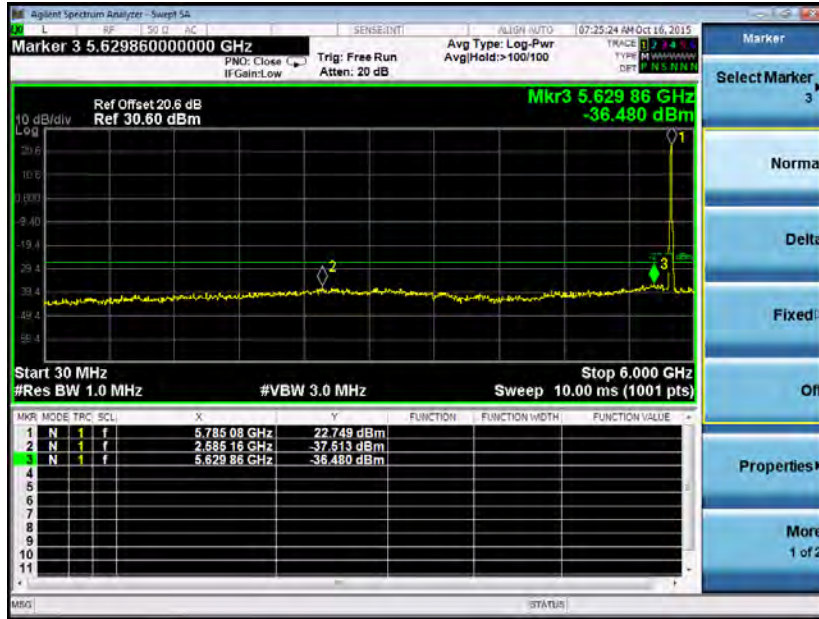
6 GHz to 40 GHz, 10 MHz, 802.11a, Channel 157, Chain 0



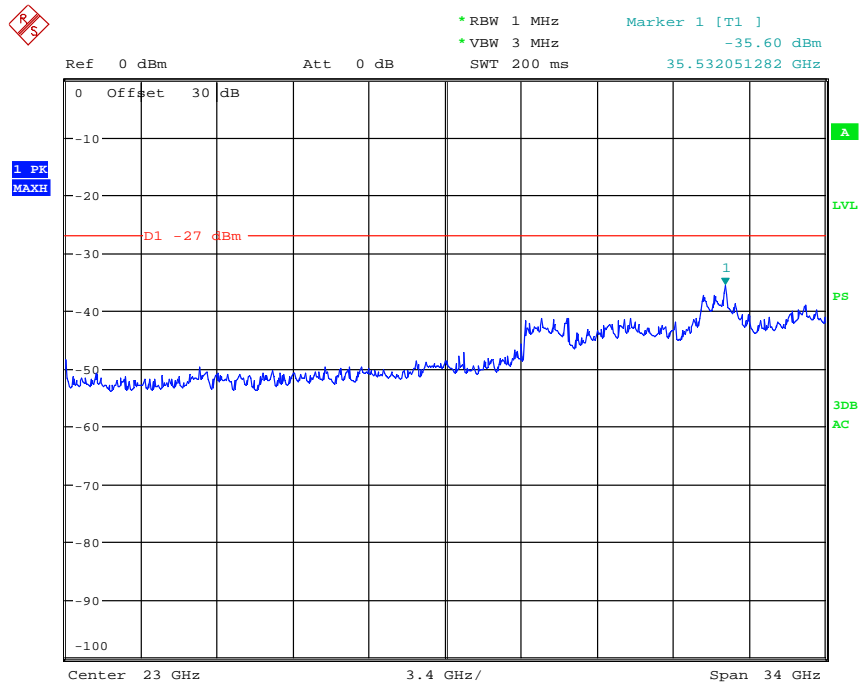
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 10 MHz, 802.11a, Channel 157, Chain 1



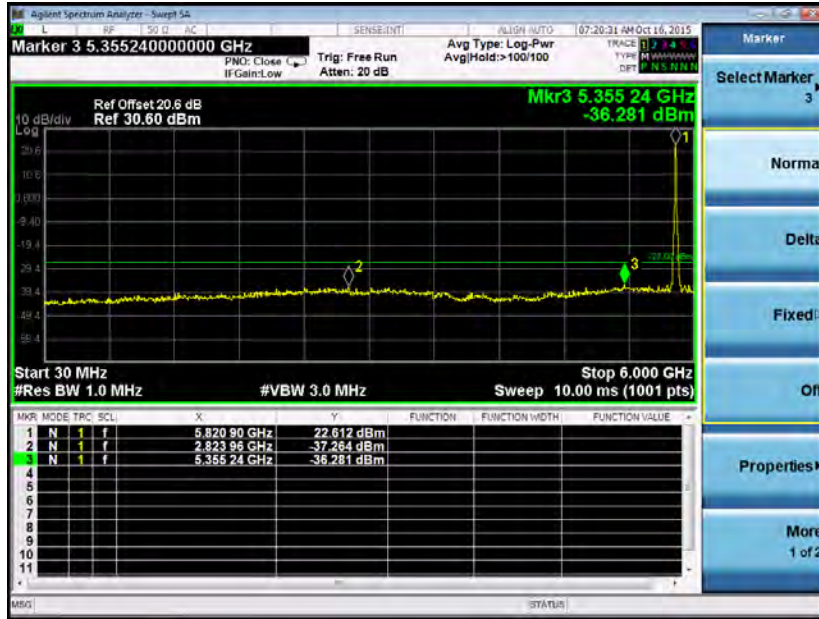
6 GHz to 40 GHz, 10 MHz, 802.11a, Channel 157, Chain 1



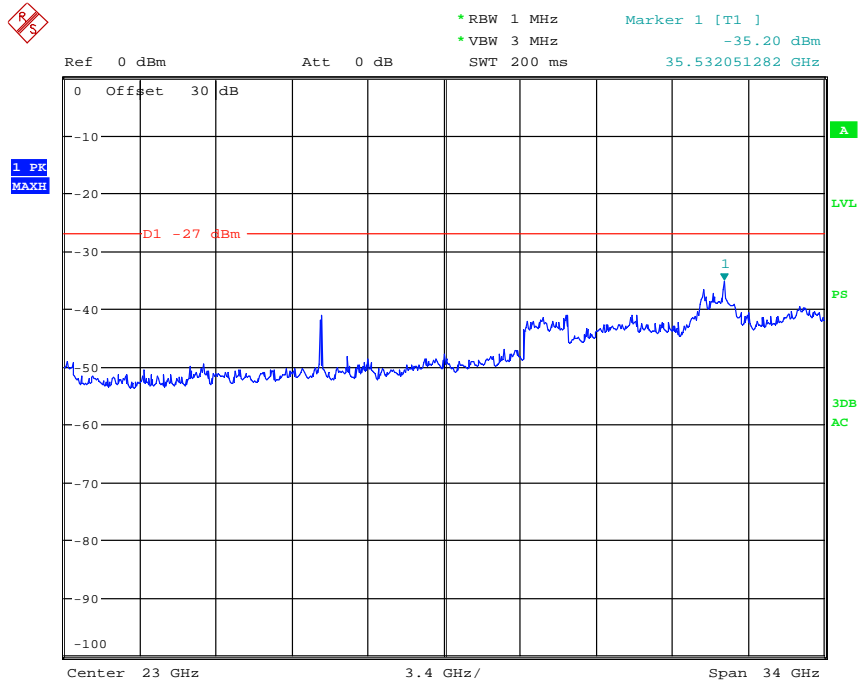
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 10 MHz, 802.11a, Channel 165, Chain 0



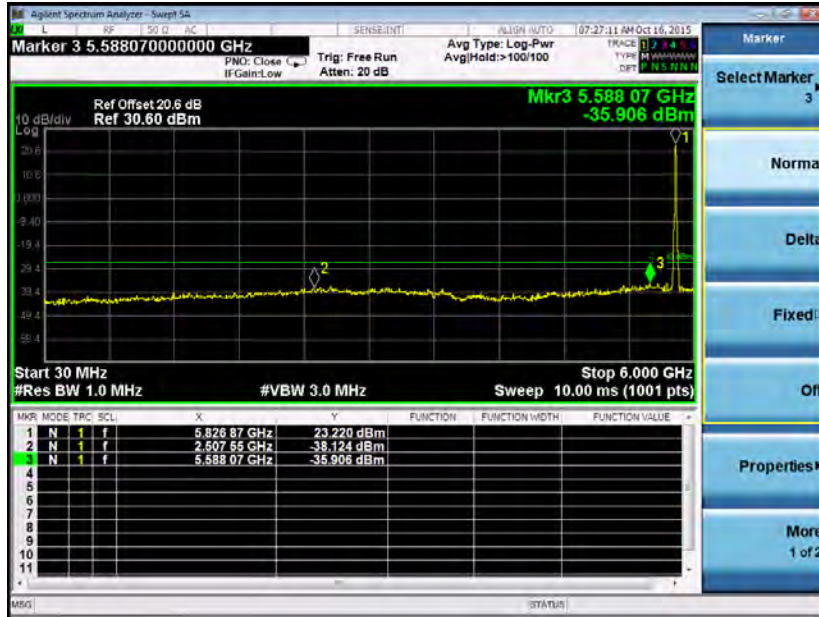
6 GHz to 40 GHz, 10 MHz, 802.11a, Channel 165, Chain 0



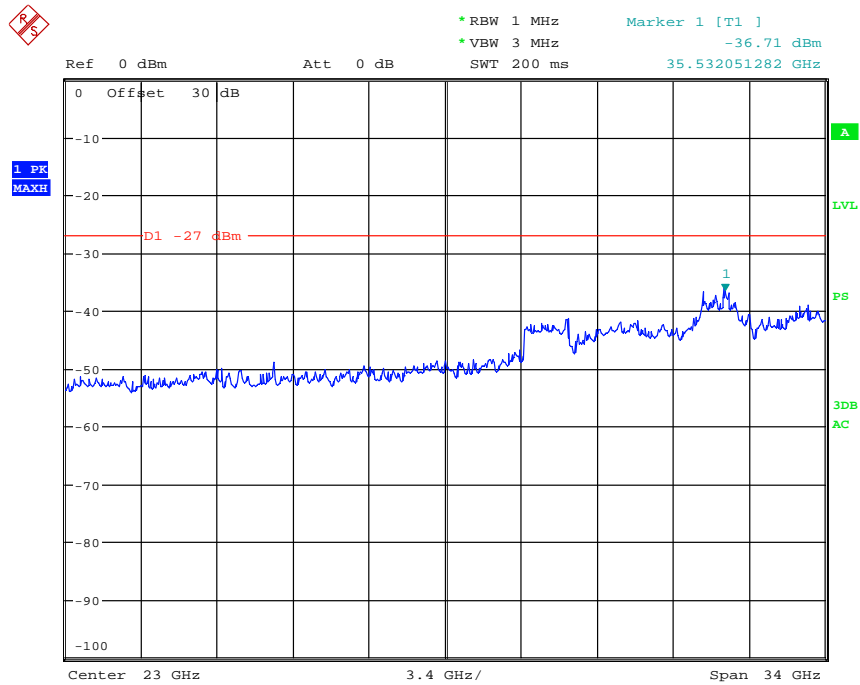
ELECTRO MAGNETIC TEST, INC.

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Emissions in Non-Restricted Frequency Bands (Conducted)



30 MHz to 6 GHz, 10 MHz, 802.11a, Channel 165, Chain 1



6 GHz to 40 GHz, 10 MHz, 802.11a, Channel 165, Chain 1


ELECTRO MAGNETIC TEST, INC.

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Bandedge Test Data (Conducted)

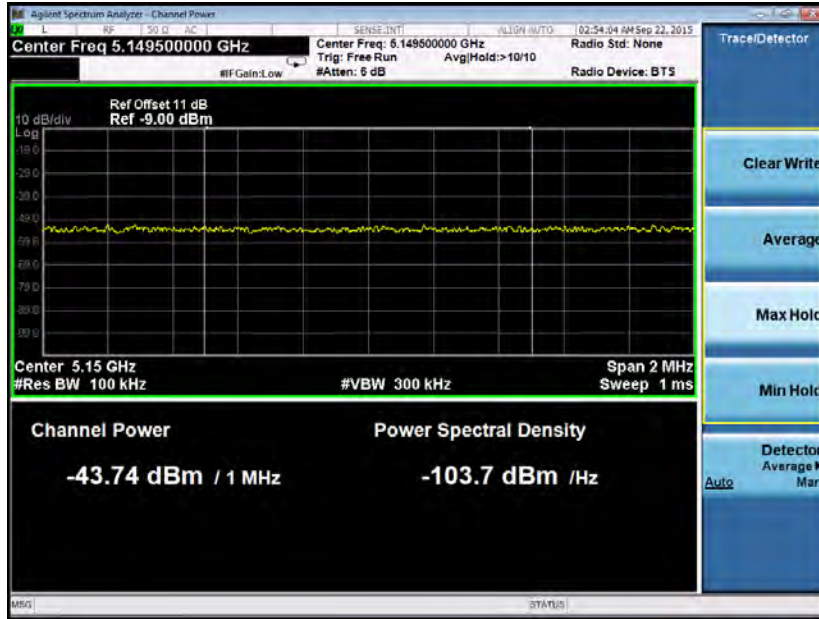
| | | | | | | | |
|--|-----------------------|------------------------|------------------------------|------------------------------|----------------------------|--------------------|-------------------|
| Company: | Tropos Networks, Inc. | | Test Date: | | 9/15/15 | | |
| EUT Name: | WIFI Module | | Test Engineer: | | George Hsu | | |
| Model: | Bluefin 5g | | Test Result: | | PASS | | |
| Operating Mode: | TX Mode | | | | | | |
| Mode | Test CH | Frequency (MHz) | Chain 0 Channel Power | Chain 1 Channel Power | Total Channel Power | Limit (dBm) | Conclusion |
| 802.11a, 5 MHz | 36 | 5180 | -43.74 | -45.29 | -41.436 | ≤ -17 | Pass |
| | 48 | 5240 | -41.39 | -43.03 | -39.123 | ≤ -17 | Pass |
| 802.11a, 10 MHz | 36 | 5180 | -43.39 | -44.38 | -40.847 | ≤ -17 | Pass |
| | 48 | 5240 | -41.03 | -43.49 | -39.078 | ≤ -17 | Pass |
| 802.11a, 5 MHz | 149 | 5745 | -44.22 | -41.17 | -39.422 | ≤ -27 | Pass |
| | 165 | 5825 | -45.64 | -43.21 | -41.247 | ≤ -27 | Pass |
| 802.11a, 10 MHz | 149 | 5745 | -38.92 | -33.82 | -32.651 | ≤ -27 | Pass |
| | 165 | 5825 | -45.29 | -43.72 | -41.424 | ≤ -27 | Pass |
| Test Equipment: Please refer to section 5.2 | | | | | | | |



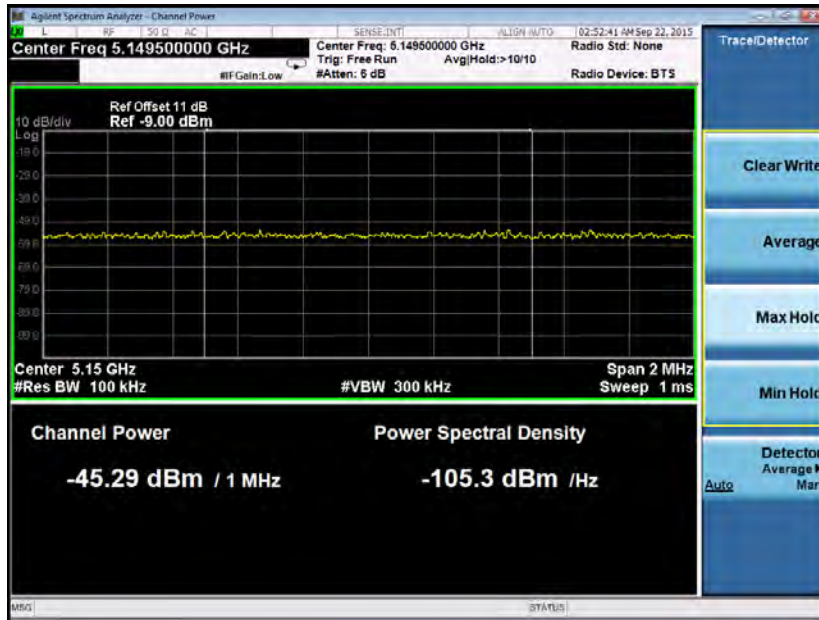
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Bandedge Test Data (Conducted)



5 MHz, 802.11a, Channel 36, Chain 0



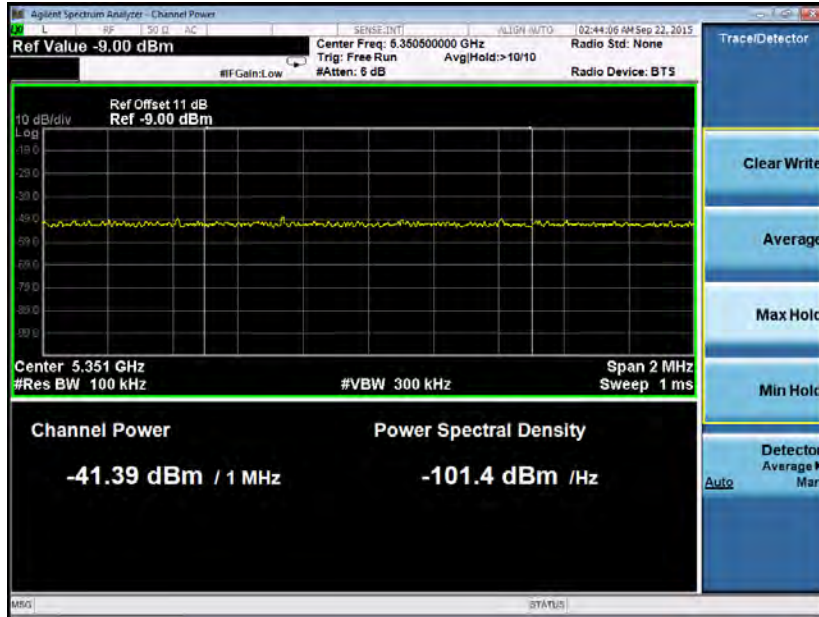
5 MHz, 802.11a, Channel 36, Chain 1



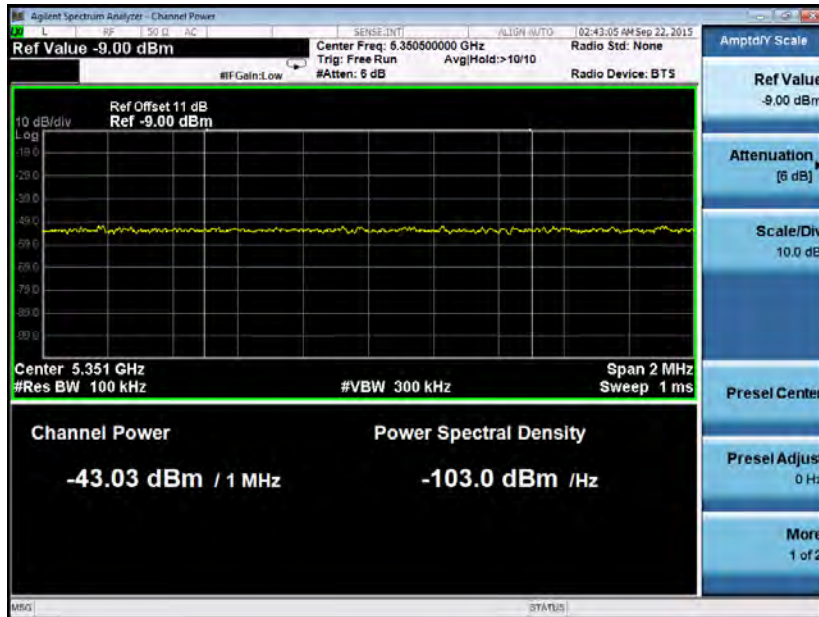
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Bandedge Test Data (Conducted)



5 MHz, 802.11a, Channel 48, Chain 0



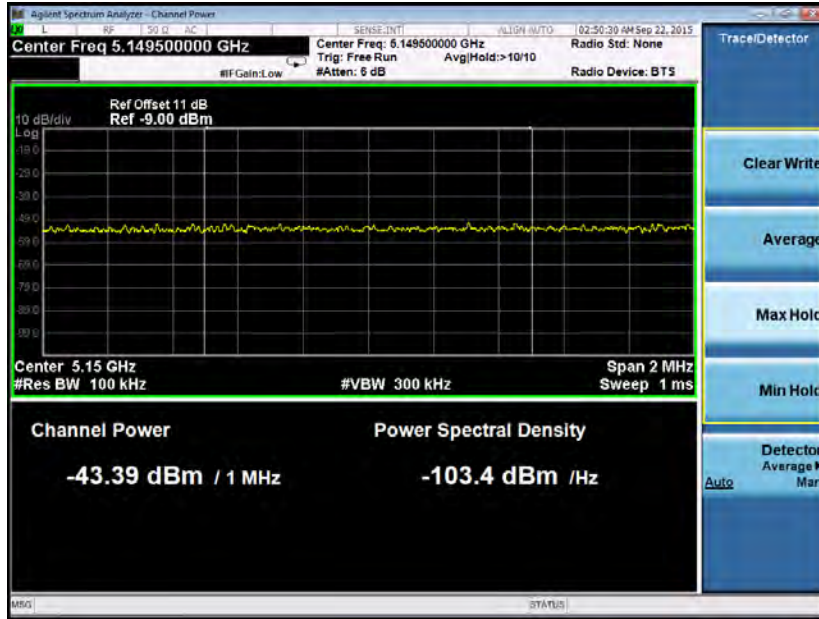
5 MHz, 802.11a, Channel 48, Chain 1



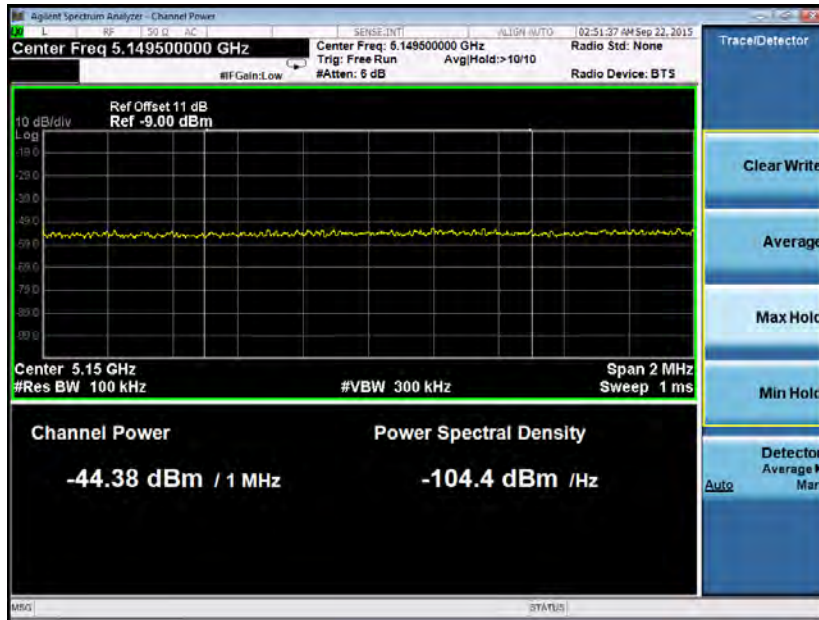
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

Bandedge Test Data (Conducted)



10 MHz, 802.11a, Channel 36, Chain 0



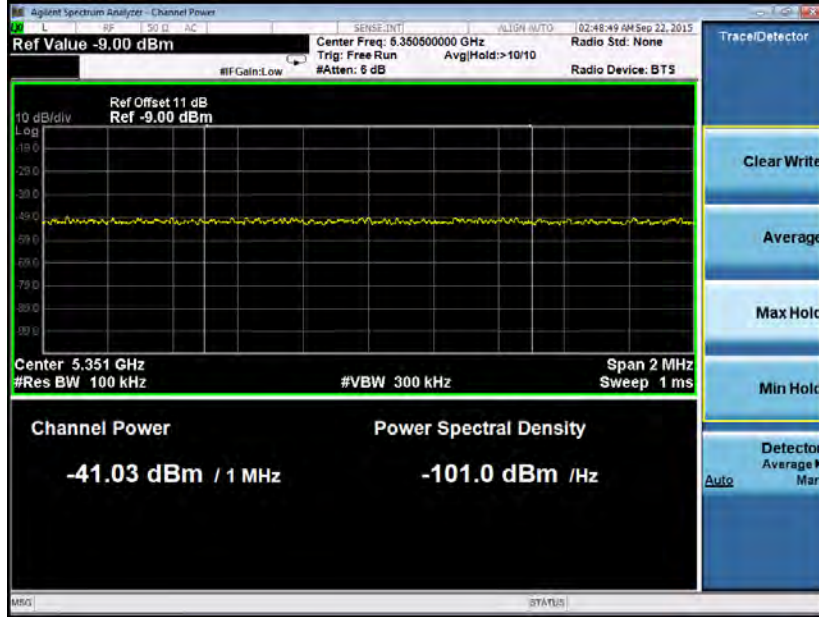
10 MHz, 802.11a, Channel 36, Chain 1



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Bandedge Test Data (Conducted)



10 MHz, 802.11a, Channel 48, Chain 0



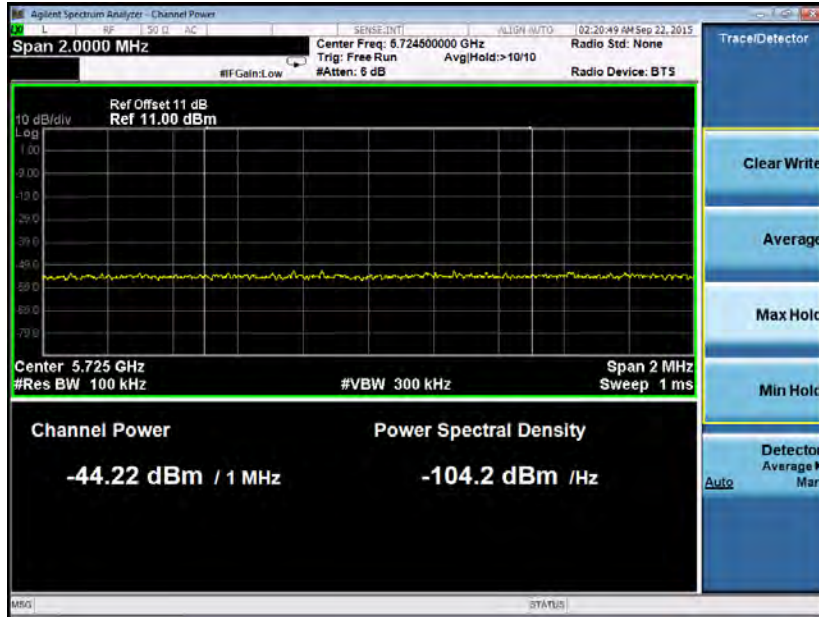
10 MHz, 802.11a, Channel 48, Chain 1



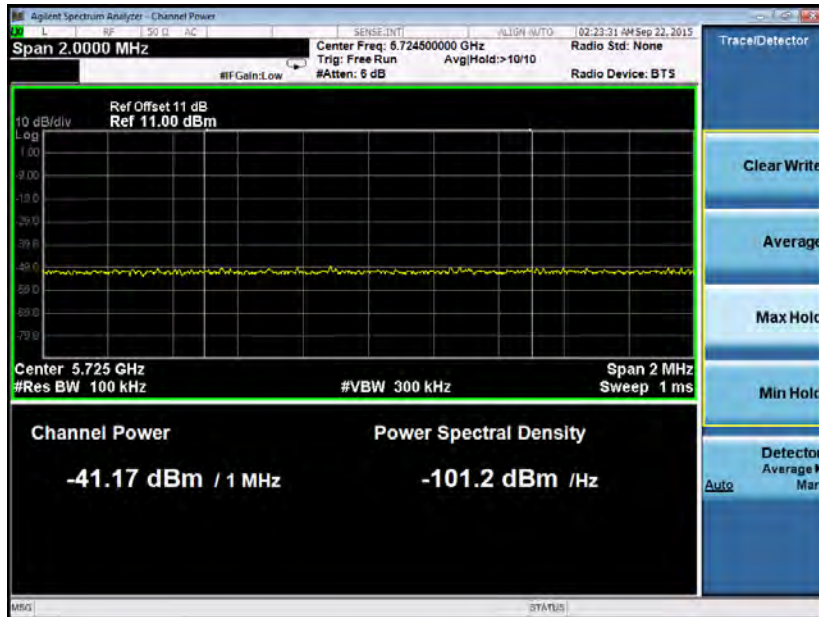
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Bandedge Test Data (Conducted)



5 MHz, 802.11a, Channel 149, Chain 0



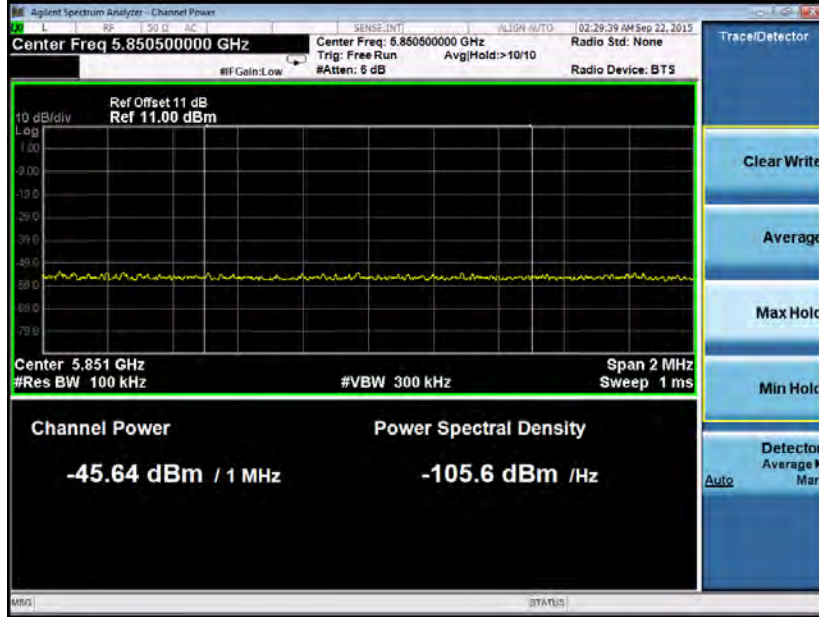
5 MHz, 802.11a, Channel 149, Chain 1



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Bandedge Test Data (Conducted)



5 MHz, 802.11a, Channel 165, Chain 0



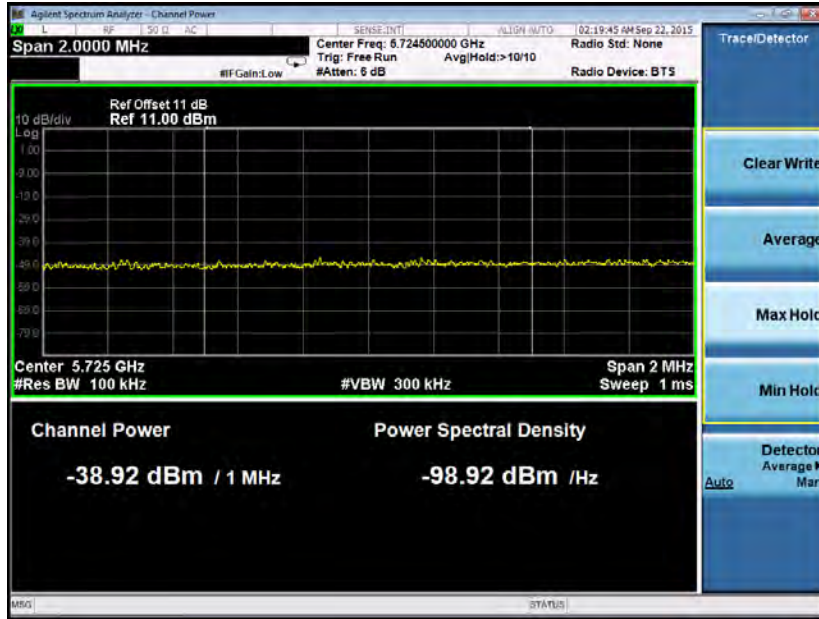
5 MHz, 802.11a, Channel 165, Chain 1



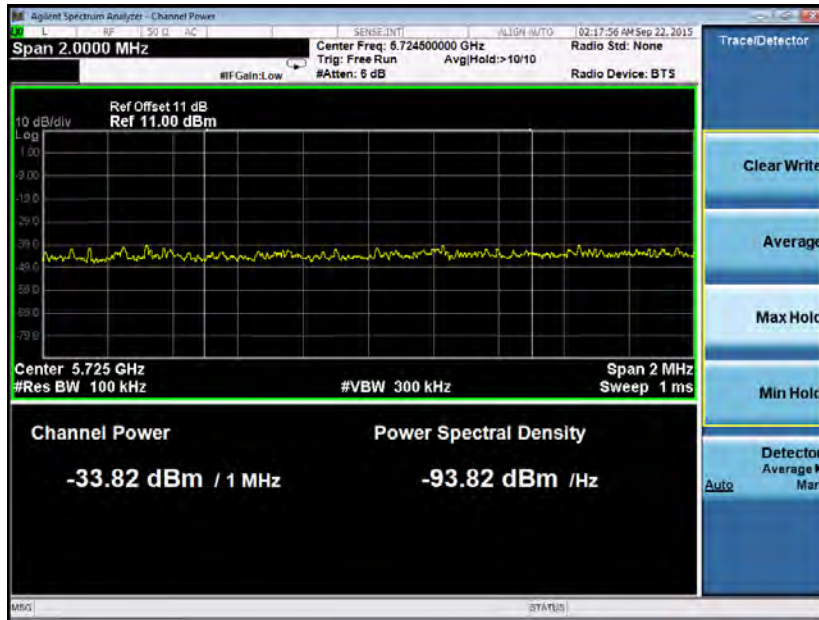
ELECTRO MAGNETIC TEST, INC.

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Bandedge Test Data (Conducted)



10 MHz, 802.11a, Channel 149, Chain 0



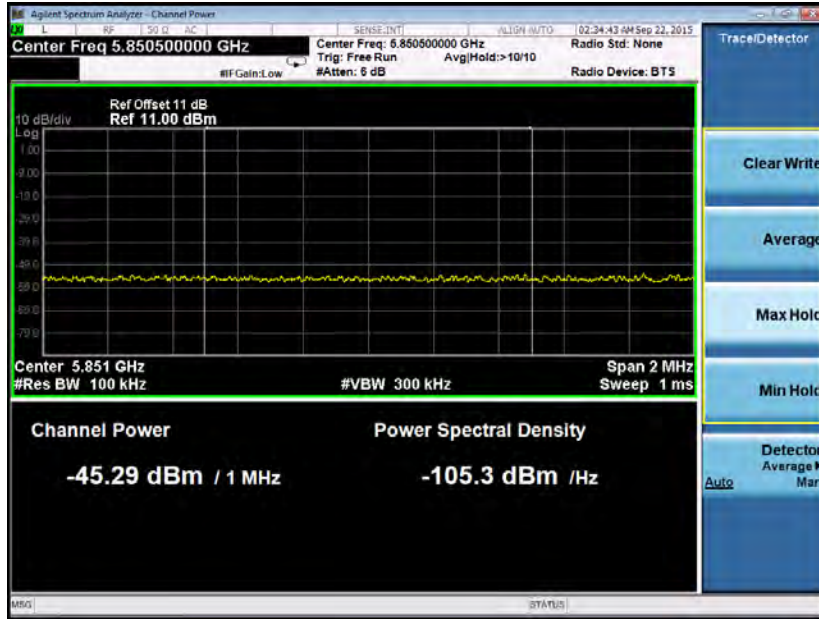
10 MHz, 802.11a, Channel 149, Chain 1



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10 MHz, 802.11a, Channel 165, Chain 0



10 MHz, 802.11a, Channel 165, Chain 1



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APPENDIX B

TEST SETUP DIAGRAMS



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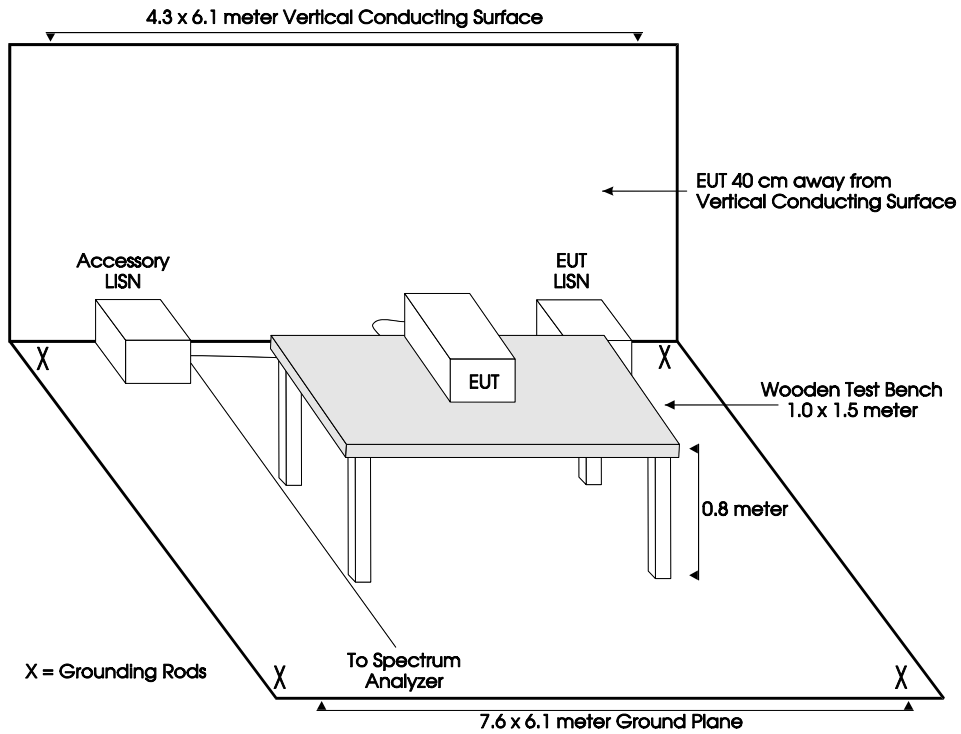


FIGURE 1 – TABLETOP CONDUCTED EMISSIONS TEST SETUP – SITE “A”

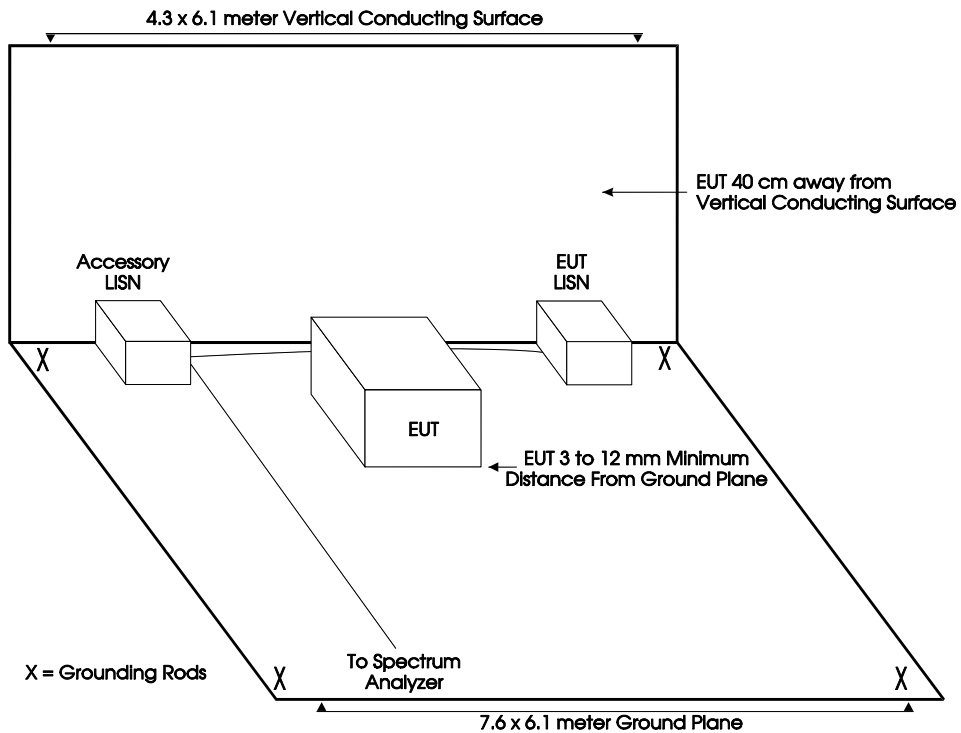


FIGURE 1a – FLOORSTANDING CONDUCTED EMISSIONS TEST SETUP – SITE “A”



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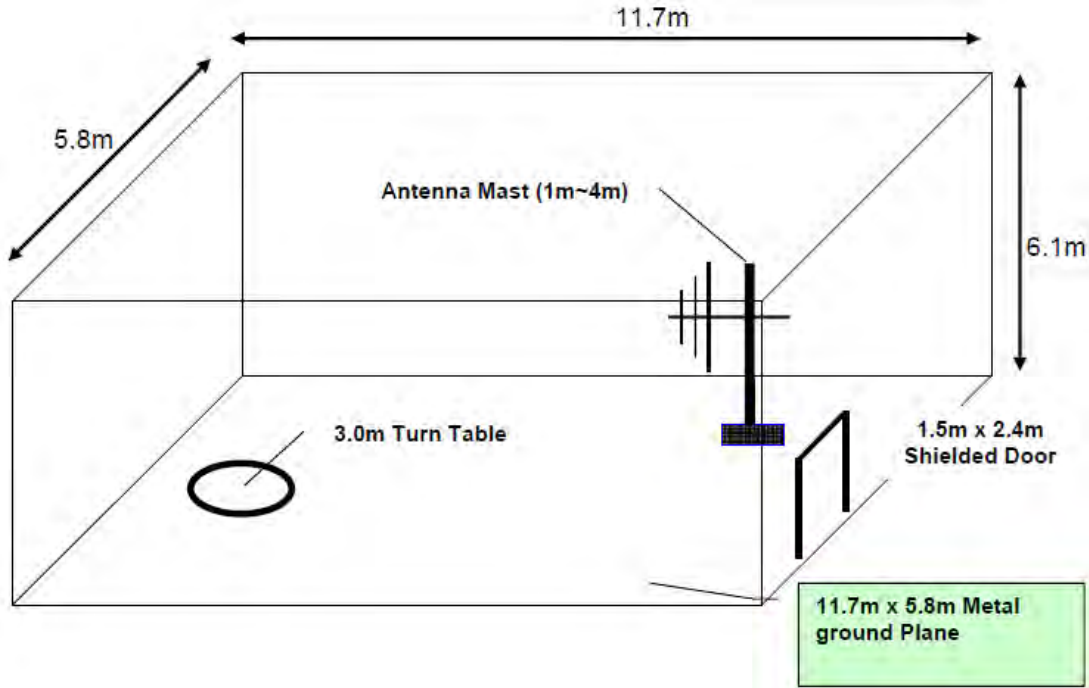


FIGURE 3 - LAYOUT OF 5 METER SEMI-ANECHOIC CHAMBER



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APPENDIX C

MODIFICATIONS TO THE EUT



ELECTRO MAGNETIC TEST, INC.

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MODIFICATIONS TO THE EUT

No modifications were made to the EUT by Electro Magnetic Test, Inc. personnel during the testing.



ELECTRO MAGNETIC TEST, INC.

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APPENDIX D

***ADDITIONAL MODELS COVERED
UNDER THIS REPORT***



ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

ADDITIONAL MODELS COVERED UNDER THIS REPORT

There are no additional models covered under this report.