

Radio Test Report

FCC Part 27 and RSS-130/RSS-139
(663.6 MHz to 697.4 MHz)
(699.6 MHz to 715.4 MHz)
(777.6 MHz to 786.4 MHz)
(1710.6 MHz to 1779.4 MHz)

Model: V4 Base 3

IC CERTIFICATION #: 5266A-V4B3
FCC ID: SEJ-V4B3

COMPANY: Zonar Systems
18200 Cascade Ave South Suite 200
Seattle, WA 98188

TEST SITE(S): Element Materials Technology Fremont Newark
AKA: NTS Labs LLC
41039 Boyce Road.
Fremont, CA. 94538-2435

IC SITE REGISTRATION #: 2845B

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VALIDATING SIGNATORIES

PROGRAM MGR

A handwritten signature in black ink, reading 'David W. Bare', written over a horizontal line.

David W. Bare

Chief Engineer

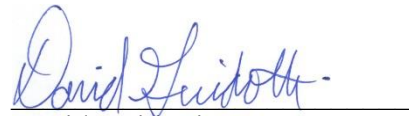
TECHNICAL REVIEWER:

A handwritten signature in black ink, reading 'David W. Bare', written over a horizontal line.

David W. Bare

Chief Engineer

FINAL REPORT PREPARER:

A handwritten signature in blue ink, reading 'David Guidotti', written over a horizontal line.

David Guidotti

Senior Technical Writer

QUALITY ASSURANCE DELEGATE

A handwritten signature in black ink, reading 'Gary Izard', written over a horizontal line.

Gary Izard

Senior Technical Writer

REVISION HISTORY

Rev#	Date	Comments	Modified By
1	September 18, 2026	First release	

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SCOPE

Tests have been performed on the Zonar Systems model V4 Base 3, pursuant to the relevant requirements of the following standard(s) in order to obtain device certification against the regulatory requirements of the Federal Communications Commission and Innovation Science and Economic Development Canada.

- CFR 47 Part 27 Subpart C (Operation in 1710–1755 MHz, 2110–2155 MHz, and 2160–2180 MHz Bands)
- RSS-139 Issue 4, September 2022 (Advanced Wireless Services Equipment Operating in the Bands 1710-1755 MHz and 2110-2155 MHz)

Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in the following reference standards and as outlined in Element Materials Technology Fremont Newark test procedures:

ANSI C63.26:2015

ANSI TIA-603-D June 2010

FCC KDB 971168 Licensed Digital Transmitters

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant Innovation Science and Economic Development Canada performance and procedural standards.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

Element Materials Technology Fremont Newark is accredited by the A2LA, certificate number 0214.26, to perform the test(s) listed in this report, except where noted otherwise.

The test results recorded herein are based on a single type test of the Zonar Systems model V4 Base 3 and therefore apply only to the tested sample. The sample was selected and prepared by David Pascoe of Zonar Systems.

OBJECTIVE

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section.

Prior to marketing in the USA, the device requires certification. Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification.

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

STATEMENT OF COMPLIANCE

The tested sample of Zonar Systems model V4 Base 3 complied with the requirements of the standards and frequency bands declared in the scope of this test report.

Maintenance of compliance is the responsibility of the manufacturer. Any modifications to the product should be assessed to determine their potential impact on the compliance status of the device with respect to the standards detailed in this test report.

DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

TEST RESULTS

FCC Part 27 (User Equipment) and RSS-139

FCC	Canada	Description	Measured	Limit	Result
Transmitter Modulation, output power and other characteristics					
§2.1033 (c) (5) §27.5	RSS-139 6.1	Frequency range(s)	663.6 – 697.4 MHz 699.6 – 715.4 MHz 777.6 – 786.4 MHz 1710.6 – 1779.4 MHz	663 – 698 MHz 698 – 716 MHz 775 – 788 MHz 1710-1780 MHz	Pass
§2.1033 (c) (4) §2.1047	RSS-139 6.2	Modulation Type	Same as original	Any allowed	Pass
§2.1033 (c) (6) §2.1033 (c) (7) §2.1046 §27.50(d)	RSS-139 6.4 SRSP-513	EIRP	26.2 dBm to 28.2 dBm	1 Watt 30 dBm or 30 Watts 44.8 dBm	Pass
§27.50(d) (6)	RSS-139	Peak to Average Ratio	Same as original	<= 13 dBm	
§2.1049 §27.53	RSS-GEN 6.7	Occupied Bandwidth	Same as original	Remain in Block	
Transmitter spurious emissions ³					
§2.1051 §2.1053 §2.1057 §27.53(h)	RSS-139 6.5	Field strength Band 4 + Wi-Fi	-23.4 dBm @ 795.18 MHz (-10.4 dB)	-13 dBm	Pass
		Field strength Band 12 + Wi-Fi	-30.4 dBm @ 1430.8 MHz (-17.4 dB)		Pass
		Field strength Band 13 + Wi-Fi	-23.4 dBm @ 795.18 MHz (-10.4 dB)		Pass
		Field strength Band 66 + Wi-Fi	-26.0 dBm @ 3421.2 MHz (-13.0 dB)		Pass
		Field strength Band 71 + Wi-Fi	-17.8 dBm @ 699.49 MHz (-4.8 dB)		Pass
Receiver spurious emissions ²					
Other details					
§2.1055 §27.54	RSS-139 6.3	Frequency stability	Same as original	2.5 ppm	Pass
§2.1093	RSS-102	RF Exposure	Refer to RF exposure report		Pass
§2.1033 (c) (8)		Final radio frequency amplifying circuit's dc voltages and currents for normal operation over the power range	Same as original	-	N/A
-	-	Antenna Gain	Same as original	-	N/A
Note 1	As the frequency of operation is above 960 MHz there are no technical requirements for spurious emissions from the receiver.				
Note 2	The measurement at the channel edge is made in a reference bandwidth of at least 1% the emission bandwidth is used. For measurements more than 1MHz from the edge of the channel the measurement bandwidth is 1MHz.				
Note 3	Pass/Fail criteria defined by standards listed above.				

MEASUREMENT UNCERTAINTIES

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2) and were calculated in accordance with NAMAS document NIS 81 and M3003.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
RF frequency	Hz	25 to 7,000 MHz	1.7×10^{-7}
RF power, conducted	dBm	25 to 7,000 MHz	± 0.52 dB
Conducted emission of transmitter	dBm	25 to 40,000 MHz	± 0.7 dB
Conducted emission of receiver	dBm	25 to 40,000 MHz	± 0.7 dB
Radiated emission (substitution method)	dBm	25 to 40,000 MHz	± 2.5 dB
Radiated emission (field strength)	dB μ V/m	25 to 1,000 MHz 1 to 40 GHz	± 3.6 dB ± 6.0 dB

EQUIPMENT UNDER TEST (EUT) DETAILS**GENERAL**

The Zonar Systems model V4 Base 3 is a vehicle mounted telematics device that is designed to track vehicles. Since the EUT would be placed in heavy vehicles during operation, the EUT was treated as tabletop equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 8-32VDC, 0.5 Amps maximum.

The sample was received on August 17, 2026 and tested on August 17 thru September 16, 2026. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Zonar Systems	V4 Base 3	Aftermarket Telematics Device	0001, 0002, 0003, 0004	SEJ-V4B3

OTHER EUT DETAILS

The following EUT details should be noted: The EUT incorporates three radio modules (Wi-Fi, Bluetooth and Cellular/GNSS)

ENCLOSURE

The EUT enclosure is primarily constructed of polycarbonate. It measures approximately 9.8 cm wide, 15.2 cm deep and 3.2 cm high. Weight is approximately .23 KG

MODIFICATIONS

No modifications were made to the EUT during the time the product was at Element Materials Technology Fremont Newark.

SUPPORT EQUIPMENT

The following equipment was used as support equipment for testing:

Company	Model	Description	Serial Number	FCC ID
EverStart	WDC31M	Battery	HSW0000005462	-

The following equipment was used as remote support equipment for emissions testing:

Company	Model	Description	Serial Number	FCC ID
hp	Z2 Tower G4 Workstation	Computer	MXL03735X1	-

EUT INTERFACE PORTS

The I/O cabling configuration during testing was as follows:

Port	Connected To	Description	Cable(s)	
			Shielded or Unshielded	Length(m)
GNSS	Termination	Coax	Shielded	4.0
Power	Battery	4 wire	Unshielded	3.0
Cellular communication	Unterminated	Multiwire	Shielded	3.0
Wi-Fi/BLE communication	Unterminated	Multiwire	Shielded	3.0
Input	Unterminated	Multiwire	Unshielded	0.5
CAN Bus	Unterminated	Multiwire	Unshielded	3.0
Programming	Remote computer	USB	Shielded	7.6

EUT OPERATION

During testing, the EUT was configured to continuously transmit a modulated signal at the specified power and channels for Wi-Fi and Cellular or BLE and Cellular at the specified bands/channels. All measurements were performed using radiated test methods as the device has an integral antenna.

TESTING**GENERAL INFORMATION**

Final test measurements were taken at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 6.2 of RSS-GEN, Element Materials Technology Fremont Newark has been recognized as an accredited test laboratory by the Commission and Innovation, Science and Economic Development Canada. A description of the facilities employed for testing is maintained by Element Materials Technology Fremont Newark.

Site	Company / Registration Numbers		Location
	FCC	Canada	
Chamber 3	US1031	2845B (Wireless test lab #US0027)	41039 Boyce Road Fremont, CA 94538-2435
Chamber 4			
Chamber 5			
Chamber 7			

ANSI C63.4 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement. The test site(s) contain separate areas for radiated and conducted emissions testing. Results from testing performed in this chamber have been correlated with results from an open area test site. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4.

RADIATED EMISSIONS MEASUREMENTS

Receiver radiated spurious emissions measurements are made in accordance with ANSI C63.4:2003 by measuring the field strength of the emissions from the device at a specific test distance and comparing them to a field strength limit. Where the field strength limit is specified at a longer distance than the measurement distance the measurement is extrapolated to the limit distance.

Transmitter radiated spurious emissions are initially measured as a field strength. The eirp or erp limit as specified in the relevant rule part(s) is converted to a field strength at the test distance and the emissions from the EUT are then compared to that limit. Emissions within 20dB of this limit are the subjected to a substitution measurement.

All radiated emissions measurements are performed in two phases. A preliminary scan of emissions is conducted in either an anechoic chamber or on an OATS during which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed across the complete frequency range of interest and at each operating frequency identified in the reference standard. One or more of these is with the antenna polarized vertically while the one or more of these is with the antenna polarized horizontally. Initial scans are made using a peak detector (RBW=VBW) and using scan rates to ensure that the EUT transmits before the sweep moves out of each resolution bandwidth (for transmit mode).

During the preliminary scans, the EUT is rotated through 360°, the antenna height is varied and cable positions are varied to determine the highest emission relative to the limit. For transmitter spurious emissions, where the limit is expressed as an effective radiated power, the eirp or erp is converted to a field strength limit.

Final measurements are made on an OATS or in a semi-anechoic chamber at the significant frequencies observed during the preliminary scan(s) using the same process of rotating the EUT and raising/lowering the measurement antenna to find the highest level of the emission. The field strength is recorded and, for receiver spurious emissions, compared to the field strength limit. For the final measurement the appropriate detectors (average, peak, normal, sample, quasi-peak) are used. For receiver measurements below 1GHz the detector is a Quasi-Peak detector, above 1GHz a peak detector is used and the peak value (RB=VB=1MHz) and average value (RB=1MHz, VB=10Hz) are recorded.

For transmitter spurious emissions, the radiated power of all emissions within 20dB of the calculated field strength limit are determined using a substitution measurement. The substitution measurement is made by replacing the EUT with an antenna of known gain (typically a dipole antenna or a double-ridged horn antenna), connected to a signal source. The output power of the signal generator is adjusted until the maximum field strength from the substitution antenna is similar to the field strength recorded from the EUT. The erp of the EUT is then calculated.

INSTRUMENTATION

An EMI receiver as specified in CISPR 16-1-1 is used for radiated emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 7000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary.

For measurements above the frequency range of the receivers and for all conducted measurements a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis.

Measurement bandwidths for the test instruments are set in accordance with the requirements of the standards referenced in this document.

Software control is used to correct the measurements for transducer factors (e.g. antenna) and the insertion loss of cables, attenuators and other series elements to obtain the final measurement value. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are exported in a graphic and/or tabular format, as appropriate.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the EUT antenna port or receiving antenna and the test receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

A combination of biconical, log periodic or bi-log antennas are used to cover the range from 30 MHz to 1000 MHz. Broadband antennas or tuned dipole antennas are used over the entire 30 to 1000 MHz frequency range as the reference antenna for substitution measurements.

Above 1000 MHz, a dual-ridge guide horn antenna or octave horn antenna are used as reference and measurement antennas.

The antenna calibration factors are included in site factors that are programmed into the test receivers and instrument control software when measuring the radiated field strength.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height.

Table mounted devices are placed on a non-conductive table at a height of 80 centimeters above the floor. Floor mounted equipment is placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. The EUT is positioned on a motorized turntable to allow it to be rotated during testing to determine the angle with the highest level of emissions.

SAMPLE CALCULATIONS**SAMPLE CALCULATIONS - CONDUCTED SPURIOUS EMISSIONS**

Measurements are compared directly to the conducted emissions specification limit (decibel form). The calculation is as follows:

$$R_r - S = M$$

where:

R_r = Measured value in dBm

S = Specification Limit in dBm

M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED FIELD STRENGTH

Measurements of radiated field strength are compared directly to the specification limit (decibel form). The receiver and/or control software corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

A distance factor is used when measurements are made at a test distance that is different to the specified limit distance by using the following formula:

$$F_d = 20 \cdot \log_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

For electric field measurements below 30MHz the extrapolation factor is either determined by making measurements at multiple distances or a theoretical value is calculated using the formula or using the values specified in ANSI C63.10:

$$F_d = 40 * \text{LOG}_{10} (D_m/D_s)$$

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dBuV/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dBuV/m

L_s = Specification Limit in dBuV/m

M = Margin in dB Relative to Spec

SAMPLE CALCULATIONS –RADIATED POWER

The erp/eirp limits for transmitter spurious measurements are converted to a field strength in free space using the following formula:

$$E = \frac{\sqrt{30 P G}}{d}$$

where:

- E = Field Strength in V/m
- P = Power in Watts
- G = Gain of isotropic antenna (numeric gain) = 1
- D = measurement distance in meters

The field strength limit is then converted to decibel form (dBuV/m) and the margin of a given emission peak relative to the limit is calculated (refer to *SAMPLE CALCULATIONS –RADIATED FIELD STRENGTH*).

When substitution measurements are required (all signals with less than 20dB of margin relative to the calculated field strength limit) the eirp of the spurious emission is calculated using:

$$P_{EUT} = P_S - (E_S - E_{EUT})$$

and

$$P_S = G + P_{in}$$

where:

- P_S = effective isotropic radiated power of the substitution antenna (dBm)
- P_{in} = power input to the substitution antenna (dBm)
- G = gain of the substitution antenna (dBi)
- E_S = field strength the substitution antenna (dBm) at eirp P_S
- E_{EUT} = field strength measured from the EUT

Where necessary the effective isotropic radiated power is converted to effective radiated power by subtracting the gain of a dipole (2.2dBi) from the eirp value.

RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from receivers as detailed in FCC Part 15.109 and RSS-GEN Table 3. Note that receivers operating outside of the frequency range 30 MHz – 960 MHz are exempt from the requirements of 15.109.

Frequency Range (MHz)	Limit (uV/m @ 3m)	Limit (dBuV/m @ 3m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

Appendix A Test Equipment Calibration Data

<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	<u>Asset #</u>	<u>Calibrated</u>	<u>Cal Due</u>
Radiated Bandedge, Power, PSD, Bandwidth, 17-Aug-26					
NTS	NTS EMI Software (rev 2.10)		US58-A022452	N/A	
NTS	NTS UNII Power Software (rev 4.0)		US58-A022700	N/A	
NTS	NTS Capture Analyzer Software (rev 4.0)		US58-A022706	N/A	
ETS-Lindgren	EMC Chamber #5, Inner Dimensions (LxWxH): 24' x 38' x 20'	CH 5 (FACT-5)	US58-A055567	5/24/2024	5/24/2027
EMCO	Antenna, Horn, 1-18 GHz	3115	US58-A064725	2/20/2024	12/8/2026
Rohde & Schwarz	EMI Test Receiver, 20Hz-7GHz	ESIB 7	US58-A064989	1/13/2026	1/12/2027
Radiated Emissions, 1 - 12.75 GHz, 19-Aug-26					
NTS	NTS EMI Software (rev 2.10)		US58-A022452	N/A	
ETS-Lindgren	EMC Chamber #5, Inner Dimensions (LxWxH): 24' x 38' x 20'	CH 5 (FACT-5)	US58-A055567	5/24/2024	5/24/2027
Hewlett Packard	Spectrum Analyzer (Blue)	8564E	US58-A055592	1/9/2026	1/9/2027
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	US58-A064416	10/10/2025	10/10/2026
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	US58-A064481	12/26/2025	12/26/2026
EMCO	Antenna, Horn, 1-18 GHz	3115	US58-A064725	2/20/2024	12/8/2026
Radiated Emissions, 1 - 25 GHz, 26-Aug-26					
NTS	NTS EMI Software (rev 2.10)		US58-A022452	N/A	
ETS-Lindgren	EMC Chamber #5, Inner Dimensions (LxWxH): 24' x 38' x 20'	CH 5 (FACT-5)	US58-A055567	5/24/2024	5/24/2027
Hewlett Packard	Spectrum Analyzer (Blue)	8564E	US58-A055592	1/9/2026	1/9/2027
Hewlett Packard	Microwave Preamplifier Head, 18-40 GHz (Blue)	84125C	US58-A055663	12/22/2025	12/22/2026
Narda	High Pass Filter 4.0 GHz	HXF-370	US58-A064405	12/26/2025	12/26/2026
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	US58-A064416	10/10/2025	10/10/2026
A. H. Systems	Antenna, Horn, 18-40GHz	SAS-574	US58-A064553	12/30/2024	12/29/2026
EMCO	Antenna, Horn, 1-18 GHz	3115	US58-A064725	2/20/2024	12/8/2026
MITEQ	Microwave Preamplifier, 18-40 GHz	TTA1840-45-5P-HG-S	US58-A068003	12/22/2025	12/22/2026
EMCO	Standard Gain Horn	3160-08	US58-A072273	N/A	

<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	<u>Asset #</u>	<u>Calibrated</u>	<u>Cal Due</u>
Radiated Emissions, 30 - 1,000 MHz, 31-Aug-26					
ETS-Lindgren	EMC Chamber #5, Inner Dimensions (LxWxH): 24' x 38' x 20'	CH 5 (FACT-5)	US58-A055567	5/24/2024	5/24/2027
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	US58-A064481	12/26/2025	12/26/2026
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	US58-A064536	5/16/2025	1/27/2028
Rohde & Schwarz	EMI Test Receiver, 20Hz-7GHz	ESIB 7	US58-A064989	1/13/2026	1/12/2027
Com-Power	Preamplifier, 1-1000MHz	PAM-103	US58-A080961	1/6/2026	1/6/2027
Radiated Emissions, 30 - 1,000 MHz, 02-Sep-26					
NTS	NTS EMI Software (rev 2.10)		US58-A022452	N/A	
ETS-Lindgren	EMC Chamber #7, Inner Dimensions (LxWxH): 24' x 38' x 20'	CH 7 (FACT-5)	US58-A055569		2/2/2027
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	US58-A064573	8/13/2024	3/19/2027
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	US58-A064593	12/26/2026	12/26/2026
Com-Power	Preamplifier, 1-1000 MHz	PAM-103	US58-A064733	10/7/2025	10/6/2026
Rohde & Schwarz	EMI Test Receiver, 20Hz-26.5GHz	ESI	US58-A071498	7/29/2026	7/29/2027
Radiated Emissions, 30 kHz - 30 MHz, 02-Sep-26					
NTS	NTS EMI Software (rev 2.10)		US58-A022452	N/A	
ETS-Lindgren	EMC Chamber #7, Inner Dimensions (LxWxH): 24' x 38' x 20'	CH 7 (FACT-5)	US58-A055569		2/2/2027
Rohde & Schwarz	Loop Antenna	HFH2-Z2	US58-A062457	2/9/2026	2/9/2028
Rohde & Schwarz	EMI Test Receiver, 20Hz-26.5GHz	ESI	US58-A071498	7/29/2026	7/29/2027
Radiated Emissions, 1 - 25 GHz, 16-Sep-26					
NTS	NTS EMI Software (rev 2.10)		US58-A022452	N/A	
Hewlett Packard	Spectrum Analyzer (Blue)	8564E	US58-A055592	1/9/2026	1/9/2027
Micro-Tronics	Filter (High Pass)	HPM50111-01	US58-A062506	6/22/2026	6/22/2027
EMCO	Horn Antenna, 1-18 GHz (SA40-Purple)	3115	US58-A062583	10/2/2024	10/1/2026
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	US58-A064416	10/10/2025	10/10/2026
A. H. Systems	Antenna, Horn, 18-40GHz	SAS-574	US58-A064553	12/30/2024	12/29/2026
Hewlett Packard	Microwave Preamplifier Head, 18-40 GHz (Blue)	84125C	US58-A055663	12/22/2025	12/22/2026

<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	<u>Asset #</u>	<u>Calibrated</u>	<u>Cal Due</u>
SM Electronics	Attenuator	SA18B-10	US58- A072173	N/A	
EMCO	Standard Gain Horn	3160-08	US58- A072273	N/A	
Fairview Microwave	Attenuator, 10 dB, 18 GHz, 2Watt	SA18N-10	US58- A072307	N/A	
Signal Substitutions, 16-Sep-26					
NTS	NTS EMI Software (rev 2.10)	-	US58- A022452	N/A	
Hewlett Packard	Spectrum Analyzer (Blue)	8564E	US58- A055592	1/9/2026	1/9/2027
Hewlett Packard	Microwave Preamplifier Head, 18-40 GHz (Blue)	84125C	US58- A055663	12/22/2025	12/22/2026
Agilent Technologies	Signal Generator (Vector) (PSG)	E8267D	US58- A055673	6/25/2026	6/25/2027
Micro-Tronics	Filter (High Pass)	HPM50111-01	US58- A062506	6/22/2026	6/22/2027
EMCO	Horn Antenna, 1-18 GHz (SA40-Purple)	3115	US58- A062583	10/2/2024	10/1/2026
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	US58- A064416	10/10/2025	10/10/2026
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blue)	3115	US58- A064442	4/16/2026	4/16/2028
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	US58- A064456	6/26/2026	6/26/2027
Compliance Design	Tuned Dipole Antenna	Roberts (400-1000)	US58- A064523	10/27/2024	10/27/2026
Rohde & Schwarz	Power Sensor, 200 pW-10W, 10 MHz-18 GHz, 50ohms	NRV-Z1	US58- A064543	1/6/2026	1/6/2027
Agilent Technologies	Signal Generator 100kHz - 6GHz (MXG)	N5181A	US58- A064545	7/22/2026	7/22/2027
A. H. Systems	Antenna, Horn, 18-40GHz	SAS-574	US58- A064553	12/30/2024	12/29/2026
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	US58- A064573	8/13/2024	3/19/2027
Com-Power	Preamplifier, 1-1000 MHz	PAM-103	US58- A064733	10/7/2025	10/6/2026
Rohde & Schwarz	EMI Test Receiver, 20Hz-26.5GHz	ESI	US58- A071498	7/29/2026	7/29/2027
SM Electronics	Attenuator	SA18B-10	US58- A072173	N/A	
EMCO	Standard Gain Horn	3160-08	US58- A072273	N/A	
Fairview Microwave	Attenuator, 10 dB, 18 GHz, 2Watt	SA18N-10	US58- A072307	N/A	

Appendix B Test Data

TL004583-RA Pages 22 – 64

Client:	Zonar Systems	PR Number:	PUS58004583
Product	V4 Base 3	T-Log Number:	TL6004583-RA
System Configuration:		Project Manager:	Christine Krebill
Contact:	David Pascoe	Project Engineer:	Art Thammanavarat
Emissions Standard(s):	FCC Part 15.247, ANSI C63.10	Class:	-
Immunity Standard(s):	-	Environment:	Radio

EMC Test Data

For The

Zonar Systems

Product

V4 Base 3

Date of Last Test: 9/16/2026

Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

RSS-139 and FCC Part 27 Power and Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

With the exception of the radiated spurious emissions tests, all measurements are made with the EUT's rf port connected to the measurement instrument via an attenuator or dc-block if necessary. All amplitude measurements are adjusted to account for the attenuation between EUT and measuring instrument. For frequency stability measurements the EUT was place inside an environmental chamber.

Radiated measurements are made with the EUT located on a non-conductive table, 3m from the measurement antenna.

Ambient Conditions:

Temperature: 20-27 °C

Rel. Humidity: 41-50 %

Summary of Results

Run #		Test Performed	Limit	Pass / Fail	Result / Margin
4	Band 4 + Wi-Fi	Spurious emissions (radiated)	FCC Part 27	Pass	-26.5 dBm @ 3421.3 MHz (-13.5 dB)
8	Band 12 + Wi-Fi	Spurious emissions (radiated)	FCC Part 27	Pass	-30.4 dBm @ 1430.8 MHz (-17.4 dB)
10	Band 13 + Wi-Fi	Spurious emissions (radiated)	FCC Part 27	Pass	-23.4 dBm @ 795.18 MHz (-10.4 dB)
14	Band 66 + Wi-Fi	Spurious emissions (radiated)	FCC part 27	Pass	-26.0 dBm @ 3421.2 MHz (-13.0 dB)
16	Band 71 + Wi-Fi	Spurious emissions (radiated)	FCC part 27	Pass	-17.8 dBm @ 699.49 MHz (-4.8 dB)



EMC Test Data

Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Sample Notes

Sample S/N: 39000007

Operating Software: Wifi Test Tool 1.6.5 dated 3/11/2025

Run #3: Output Power - Band 4

Date of Test: 9/9/2026

Test Engineer: Art Tham

Test Location: Fremont Chamber #7

Config. Used: 1+Simultaneous with 802.11b ch8 power 25

Config Change: None

EUT Voltage: 12VDC

Power Setting ²	Frequency (MHz)	EIRP			Result
		(dBm) ¹	mW		
Max	1710.6	26.7	467.7		Pass
Max	1732.5	25.9	389.0		Pass
Max	1754.4	26.7	467.7		Pass

Note 1: Output power (EIRP) calculated from measured field strength



EMC Test Data

Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

Run #4: Out of Band Spurious Emissions, Radiated, Band 4, 30-18,000 MHz

Conducted limit (dBm): -13
Approximate field strength limit @ 3m: 82.2

The limit is taken from FCC Part 27

Run #4a - Preliminary measurements - chamber scans

Date of Test: 9/8/2026
Test Engineer: Rafael Varelas
Test Location: FT Chamber #7

Config. Used: 1+Simultaneous with 802.11b ch8 power 25
Config Change: None
EUT Voltage: 12Vdc

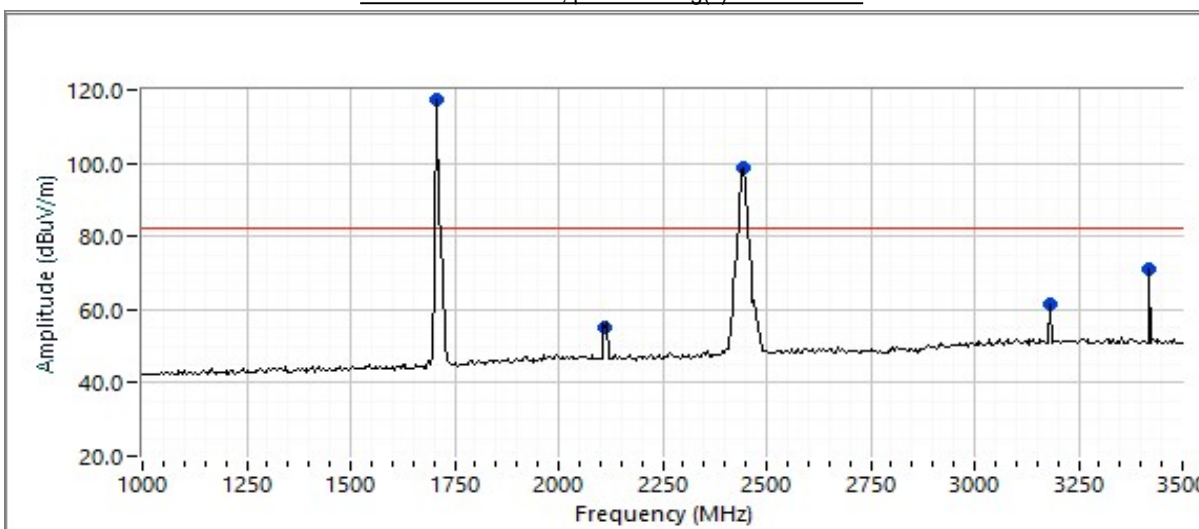
Frequency	Level	Pol	FCC Part 27		Detector	Azimuth	Height	Comments	Channel
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
Low CH									
1708.330	122.2	H	-	-	Peak	58	1.6	Fundamental	
2108.330	60.3	H	82.2	-21.9	Peak	298	1.3	Downlink	
2441.670	99.9	H	-	-	Peak	104	1.3	Wi-Fi	
3420.830	65.4	H	82.2	-16.8	Peak	58	1.6		
9780.540	59.1	H	82.2	-23.1	Peak	300	1.9		
17853.330	60.6	H	82.2	-21.6	Peak	194	1.3	Noise Floor	
Mid CH									
1016.670	55.6	H	82.2	-26.6	Peak	65	1.0		
1733.330	118.7	H	-	-	Peak	68	1.0	Fundamental	
2133.330	58.8	H	82.2	-23.4	Peak	13	1.0	Downlink	
2445.830	99.2	H	-	-	Peak	99	1.3	Wi-Fi	
3462.500	62.7	H	82.2	-19.5	Peak	97	1.6		
9791.580	58.9	H	82.2	-23.3	Peak	308	2.2		
11623.660	60.7	H	82.2	-21.5	Peak	117	1.6	Noise Floor	
17025.700	60.4	H	82.2	-21.8	Peak	124	1.9		

Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

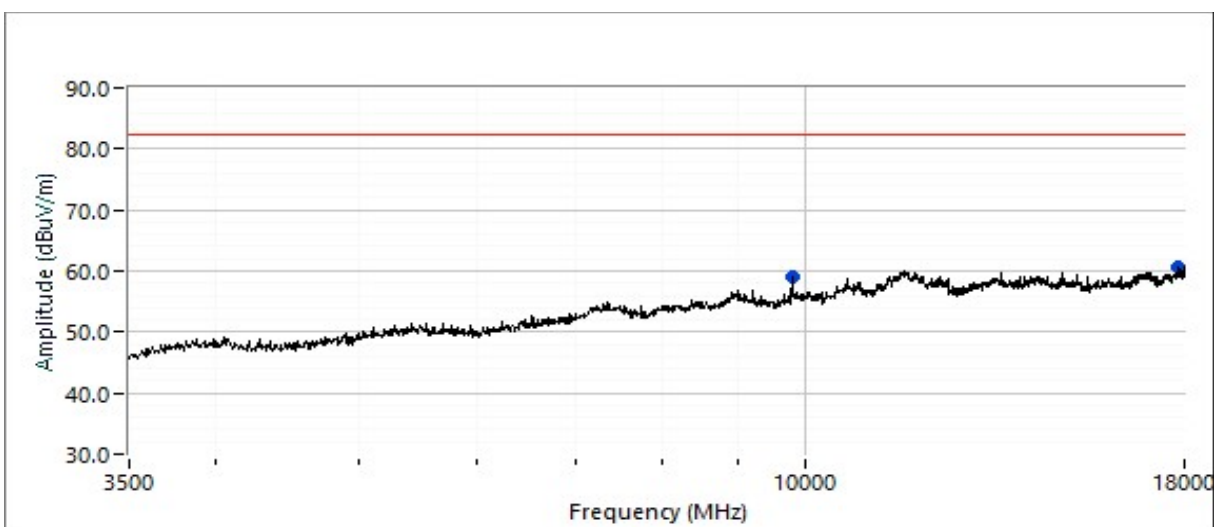
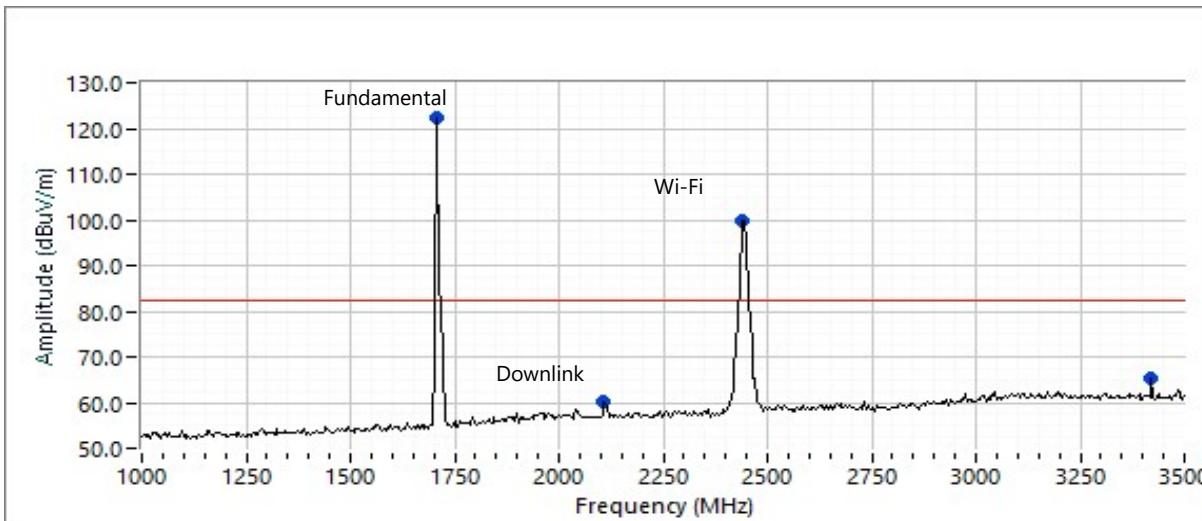
Frequency	Level	Pol	FCC Part 27		Detector	Azimuth	Height	Comments	Channel
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
High CH									
1058.330	57.1	H	82.2	-25.1	Peak	53	1.3		
1750.000	119.6	H	-	-	Peak	40	1.0	Fundamental	
2141.670	58.6	H	82.2	-23.6	Peak	12	1.0	Downlink	
2441.670	98.6	H	-	-	Peak	158	1.9	Wi-Fi	
3275.000	61.5	H	82.2	-20.7	Peak	286	1.9		
9786.670	59.4	H	82.2	-22.8	Peak	305	2.2		
11665.830	60.9	H	82.2	-21.3	Peak	302	2.5	Noise Floor	
17838.560	60.7	H	82.2	-21.5	Peak	322	1.6	Noise Floor	

Note 1: The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than **20dB** of margin relative to this field strength limit is determined using substitution measurements.

Plots for low channel, power setting(s) = Max Power

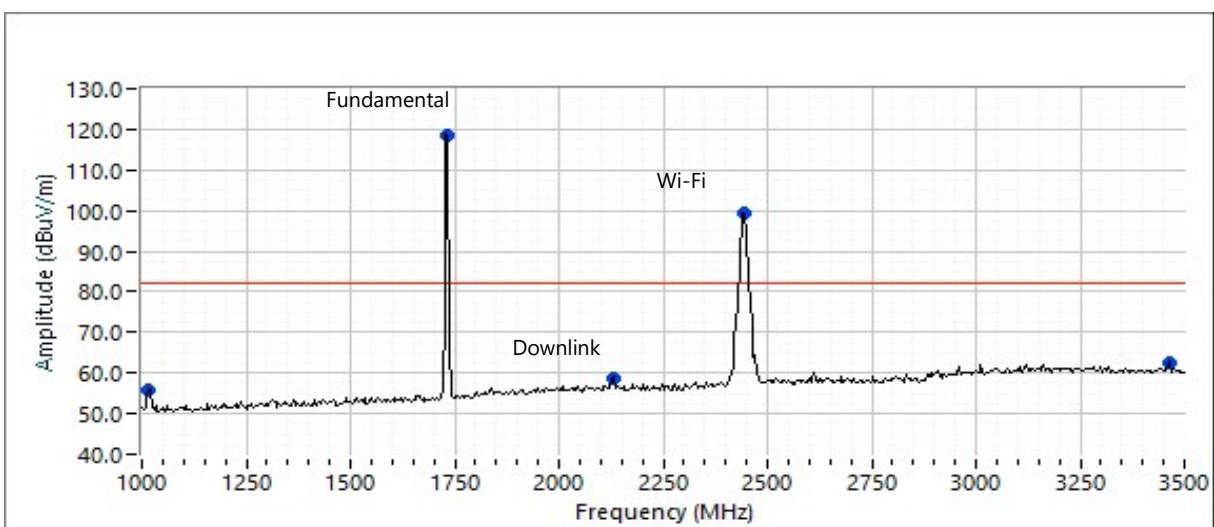
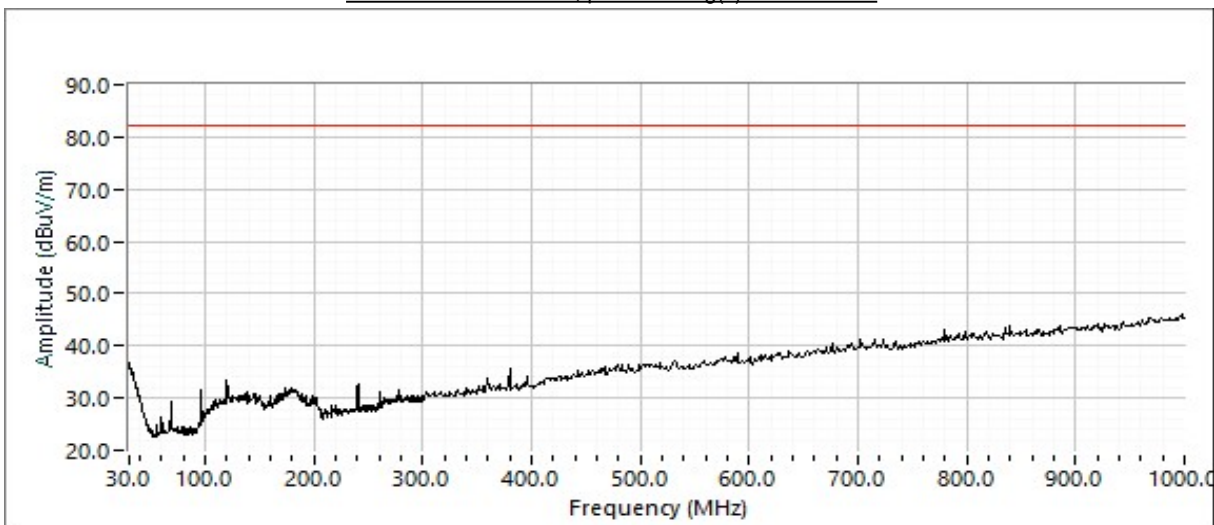


Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

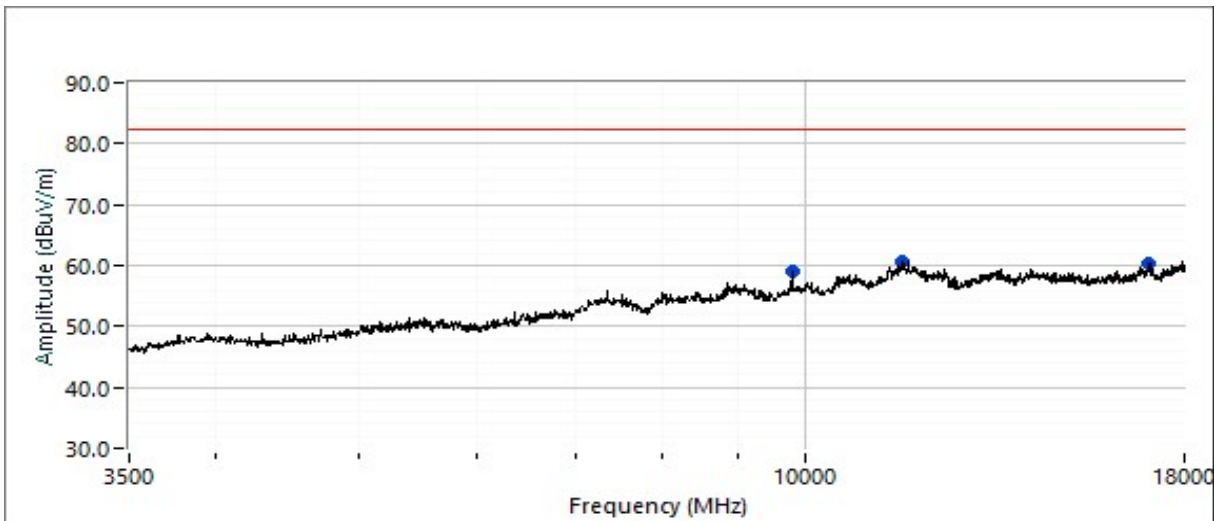


Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

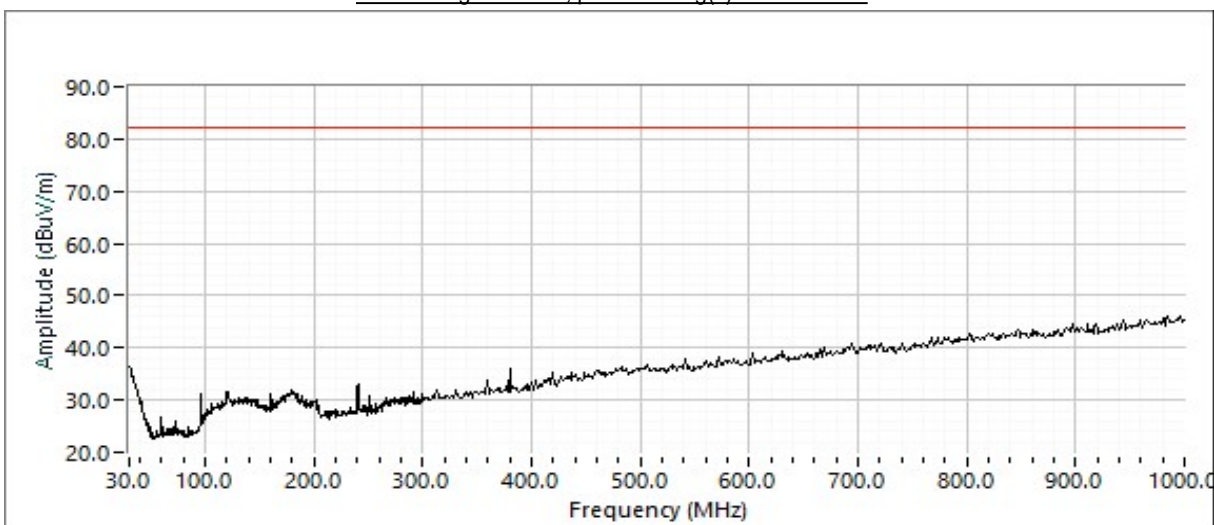
Plots for center channel, power setting(s) = Max Power



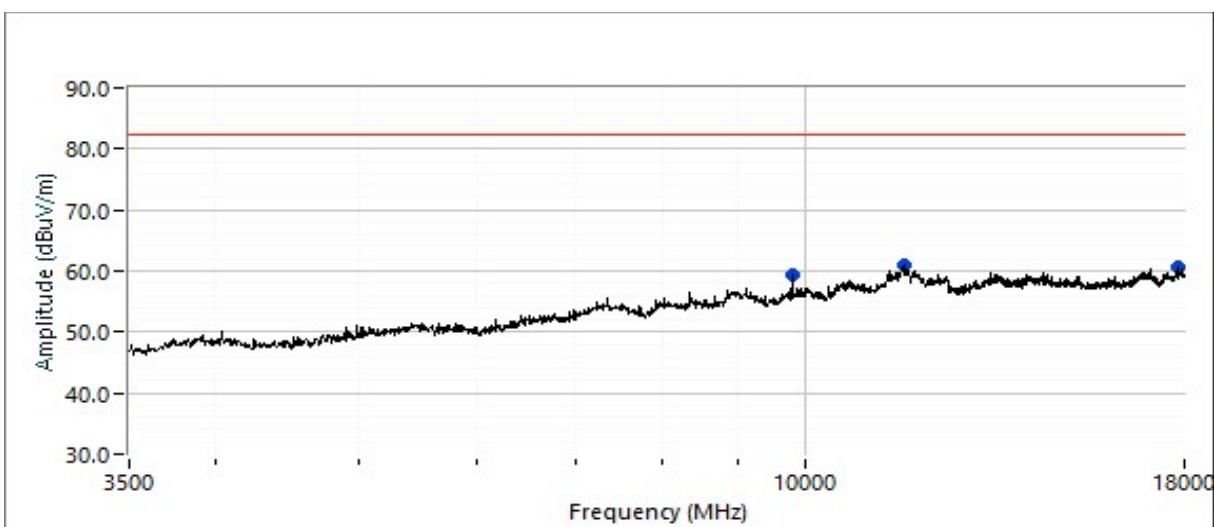
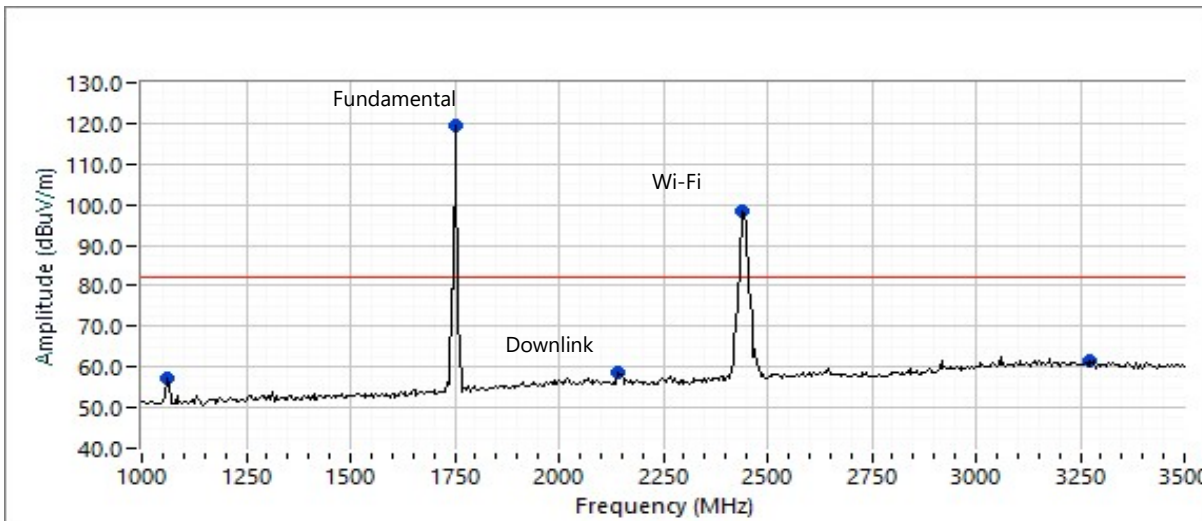
Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A



Plots for high channel, power setting(s) = Max Power



Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A





EMC Test Data

Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

Run #4b: - Final Field Strength Measurements and Substitution Measurements

Date of Test: 9/3-9/16/2026

Config. Used: 1+Simultaneous with 802.11b ch8 power 25

Test Engineer: Rafael Varelas, Art Tham

Config Change: None

Test Location: FT Chamber #7

EUT Voltage: 12VDC

EUT Field Strength

Frequency	Level	Pol	FCC Part 27		Detector	Azimuth	Height	Comments	Channel
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
Low CH									
3421.340	67.9	H	82.2	-14.3	PK	54	1.6	RB 1 MHz;VB 3 MHz;Peak	
9780.110	60.8	H	82.2	-21.4	PK	270	2.1	RB 1 MHz;VB 3 MHz;Peak	
17852.420	65.1	H	82.2	-17.1	PK	208	1.3	RB 1 MHz;VB 3 MHz;Peak	
MID CH									
1018.730	65.1	H	82.2	-17.1	PK	61	1.0	RB 1 MHz;VB 3 MHz;Peak	
3464.760	61.0	H	82.2	-21.2	PK	124	1.6	RB 1 MHz;VB 3 MHz;Peak	
9791.140	62.4	H	82.2	-19.8	PK	297	2.2	RB 1 MHz;VB 3 MHz;Peak	
11624.080	64.8	H	82.2	-17.4	PK	108	1.6	RB 1 MHz;VB 3 MHz;Peak	
17026.460	64.8	H	82.2	-17.4	PK	127	1.9	RB 1 MHz;VB 3 MHz;Peak	
HIGH CH									
1057.210	62.1	H	82.2	-20.1	PK	47	1.2	RB 1 MHz;VB 3 MHz;Peak	
3274.060	49.9	H	82.2	-32.3	PK	291	1.9	RB 1 MHz;VB 3 MHz;Peak	
9783.900	61.3	H	82.2	-20.9	PK	306	2.1	RB 1 MHz;VB 3 MHz;Peak	
11659.430	65.7	H	82.2	-16.5	PK	311	2.4	RB 1 MHz;VB 3 MHz;Peak	
17838.620	66.4	H	82.2	-15.8	PK	322	1.6	RB 1 MHz;VB 3 MHz;Peak	

Note 1:	The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 20dB of margin relative to this field strength limit is determined using substitution measurements.
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Client:	Zonar Systems	PR Number:	PUS58004583
Model:	V4 Base 3	T-Log Number:	TL6004583-RA
Contact:	David Pascoe	Project Manager:	Christine Krebill
Standard:	FCC Part 15.247, ANSI C63.10	Project Engineer:	Art Thammanavarat
		Class:	N/A

Substitution measurements

Horizontal

Frequency MHz	Substitution measurements			Site Factor ⁴	EUT measurements			eirp Limit dBm	erp Limit dBm	Margin dB
	Pin ¹	Gain ²	FS ³		FS ⁵	eirp (dBm)	erp (dBm)			
1018.730	-23.1	6.1	78.8	95.8	65.1	-30.7	-32.9	-13.0		-17.7
3421.340	-26.5	9.8	77.6	94.4	67.9	-26.5	-28.7	-13.0		-13.5
9791.140	-22.9	12.1	83.4	94.2	62.4	-31.8	-34.0	-13.0		-18.8
11624.080	-26.1	11.8	82.6	96.9	64.8	-32.1	-34.3	-13.0		-19.1
11659.430	-26.1	11.8	82.5	96.8	65.7	-31.1	-33.3	-13.0		-18.1

Note 1: Pin is the input power (dBm) to the substitution antenna

Note 2: Gain is the gain (dBi) for the substitution antenna.

Note 3: FS is the field strength (dBuV/m) measured from the substitution antenna.

Note 4: Site Factor - this is the site factor to convert from a field strength in dBuV/m to an eirp in dBm.

Note 5: EUT field strength as measured during initial run.

Run #7: Output Power - Band 12

Date of Test: 9/4/2026

Test Engineer: Art Tham

Test Location: FT Chamber #7

Config. Used: 1+Simultaneous with 802.11b ch8 power 25

Config Change: None

EUT Voltage: 12VDC

Power Setting ²	Frequency (MHz)	EIRP		Result
		(dBm) ¹	mW	
Max	699.6	26.8	478.6	Pass
Max	707.5	27.4	549.5	Pass
Max	715.4	28.2	660.7	Pass

Note 1: Output power (EIRP) calculated from measured field strength



EMC Test Data

Client:	Zonar Systems	PR Number:	PUS58004583
Model:	V4 Base 3	T-Log Number:	TL6004583-RA
Contact:	David Pascoe	Project Manager:	Christine Krebill
Standard:	FCC Part 15.247, ANSI C63.10	Project Engineer:	Art Thammanavarat
		Class:	N/A

Run #8: Out of Band Spurious Emissions, Radiated, Band 12

Conducted limit (dBm): -13
Approximate field strength limit @ 3m: 82.2

The limit is taken from FCC Part 27

Run #8a - Preliminary measurements - chamber scans

Date of Test: 9/3-10/2026
Test Engineer: Rafael Varelas, Art Tham
Test Location: FT Chamber #7

Config. Used: 1+Simultaneous with 802.11b ch8 power 25
Config Change: None
EUT Voltage: 12Vdc

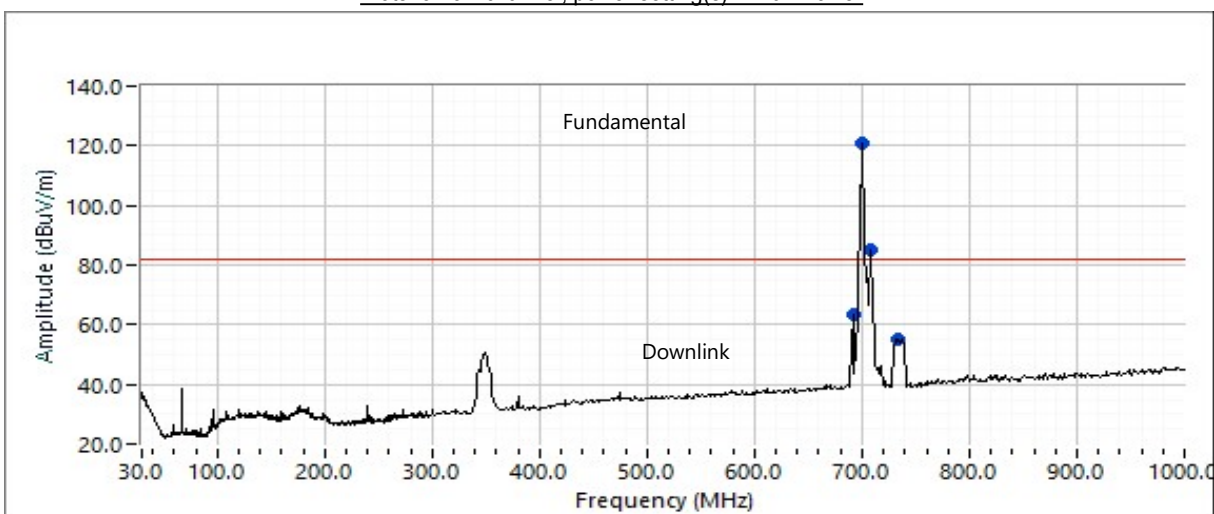
Frequency	Level	Pol	FCC Part 27		Detector	Azimuth	Height	Comments	Channel
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
Low CH									
691.383	63.4	H	-	-	Peak	332	1.0	In Band	
699.800	121.0	H	-	-	Peak	334	1.0	Fundamental	
708.216	85.1	H	-	-	Peak	321	1.0	In Band	
733.467	54.8	H	82.2	-27.4	Peak	158	1.5	Downlink only	
1400.000	61.5	H	82.2	-20.7	Peak	155	1.0		
2441.670	99.9	H	-	-	Peak	153	1.3	Wi-Fi	
3220.830	62.7	H	82.2	-19.5	Peak	148	2.2	Noise Floor	
4894.210	46.6	H	82.2	-35.6	Peak	61	1.0		
7343.330	50.9	H	82.2	-31.3	Peak	224	1.0		
MID CH									
708.216	121.1	H	-	-	Peak	168	1.0	Fundamental	
737.675	54.5	H	82.2	-27.7	Peak	188	1.5	Downlink only	
1412.500	58.0	H	82.2	-24.2	Peak	158	1.9		
2441.670	99.2	H	-	-	Peak	100	1.3	Wi-Fi	
4894.230	50.4	H	82.2	-31.8	Peak	59	1.0		
7342.840	56.4	H	82.2	-25.8	Peak	310	1.0		

Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

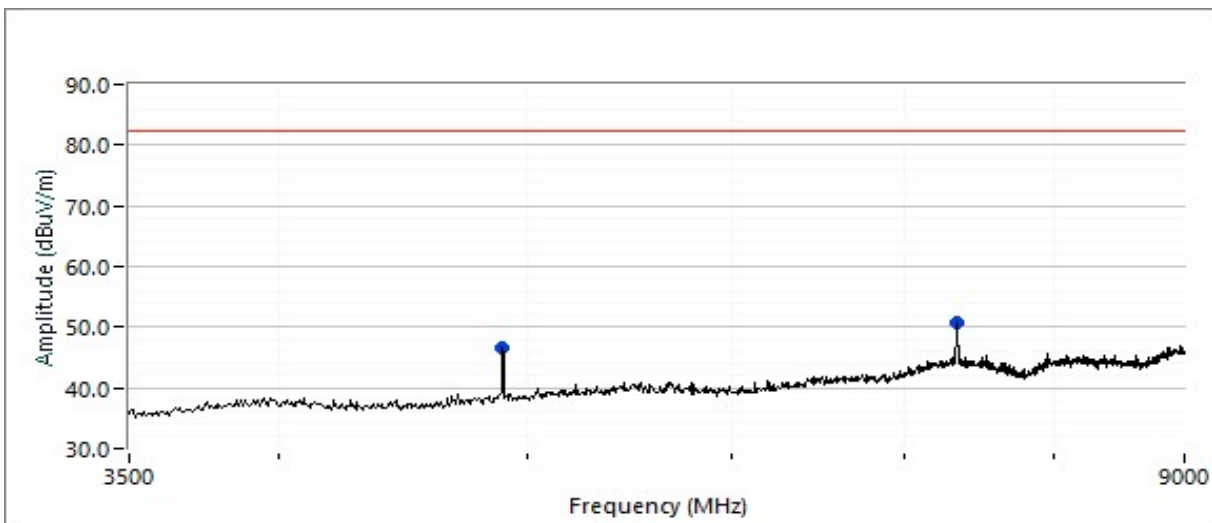
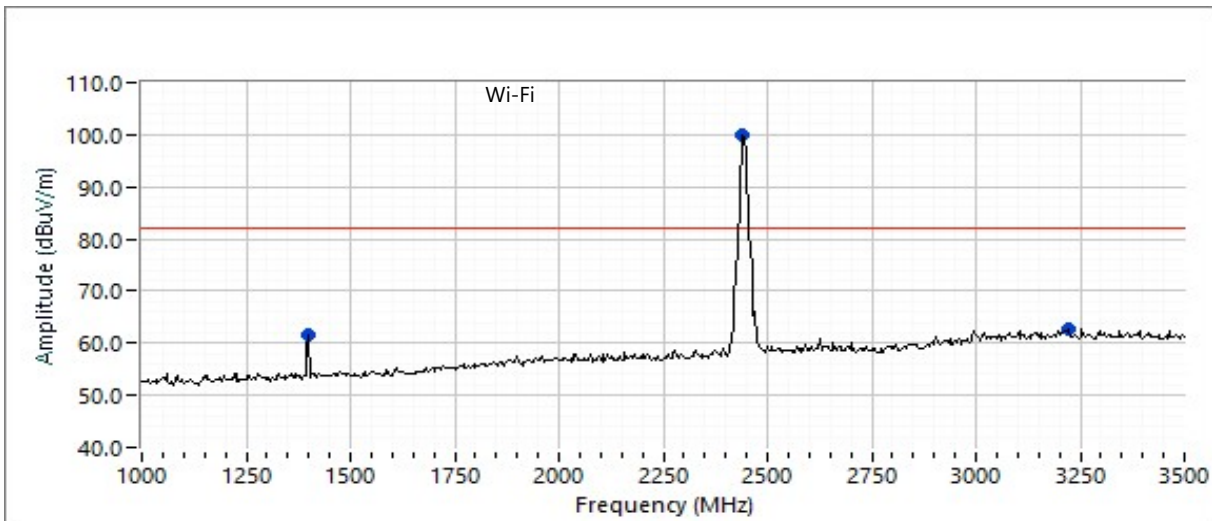
Frequency	Level	Pol	FCC Part 27		Detector	Azimuth	Height	Comments	Channel
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
HIGH CH									
706.814	83.8	H	-	-	Peak	327	1.0	In Band	
715.230	121.5	H	-	-	Peak	318	1.0	Fundamental	
719.832	66.9	H	82.2	-15.3	Peak	320	1.0	In Band	
737.675	54.9	H	82.2	-27.3	Peak	163	1.5	Downlink only	
1429.170	59.0	H	82.2	-23.2	Peak	152	1.0		
2441.670	99.4	H	-	-	Peak	155	1.3	Wi-Fi	
3212.500	62.2	H	82.2	-20.0	Peak	206	1.3		
4894.170	46.6	H	82.2	-35.6	Peak	58	1.6		
7343.330	50.9	H	82.2	-31.3	Peak	212	1.9		

Note 1: The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than **20dB** of margin relative to this field strength limit is determined using substitution measurements.

Plots for low channel, power setting(s) = Max Power

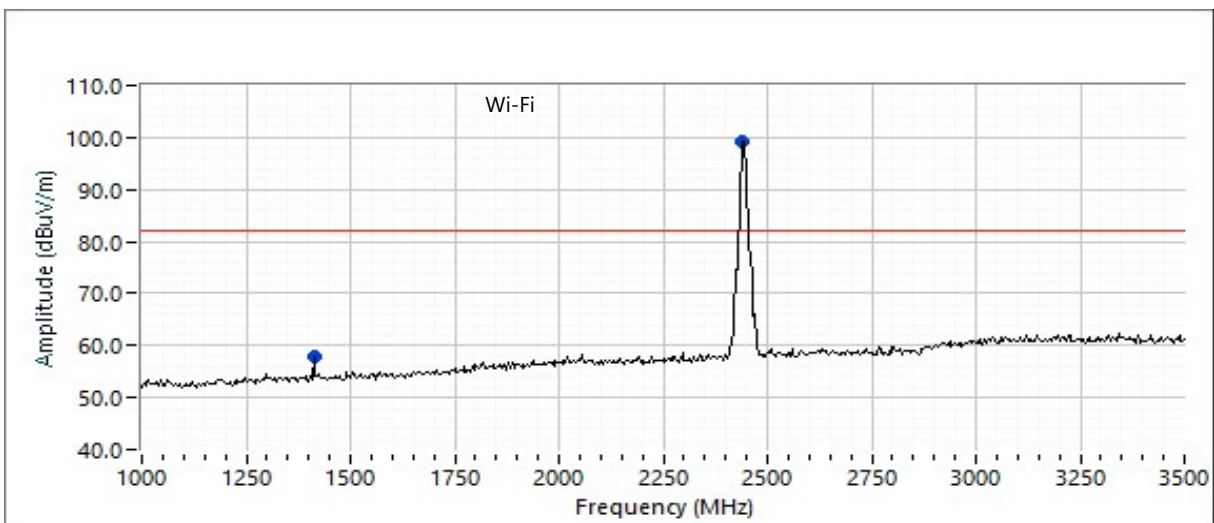
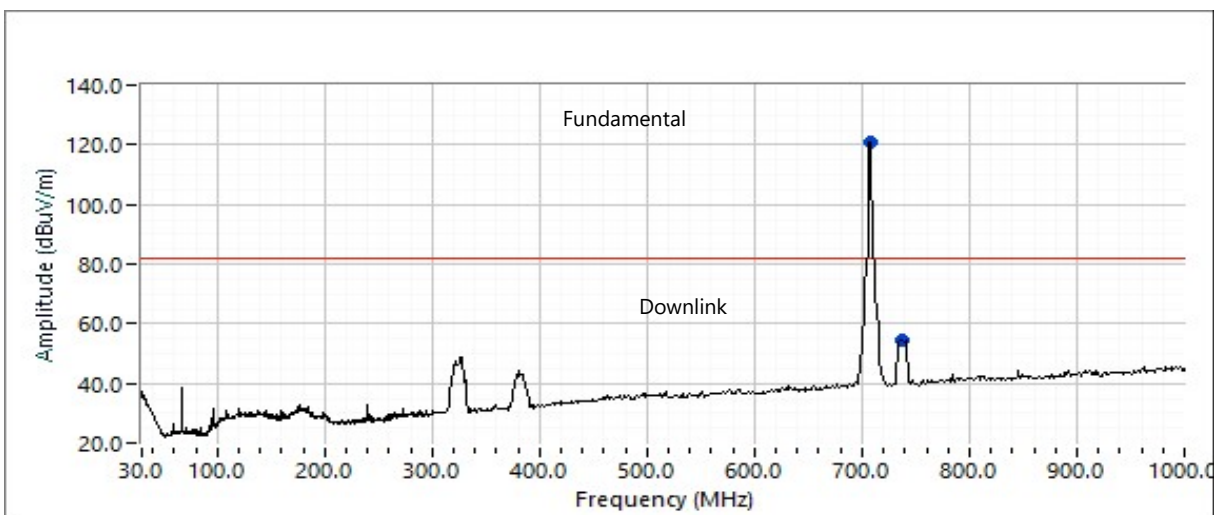


Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

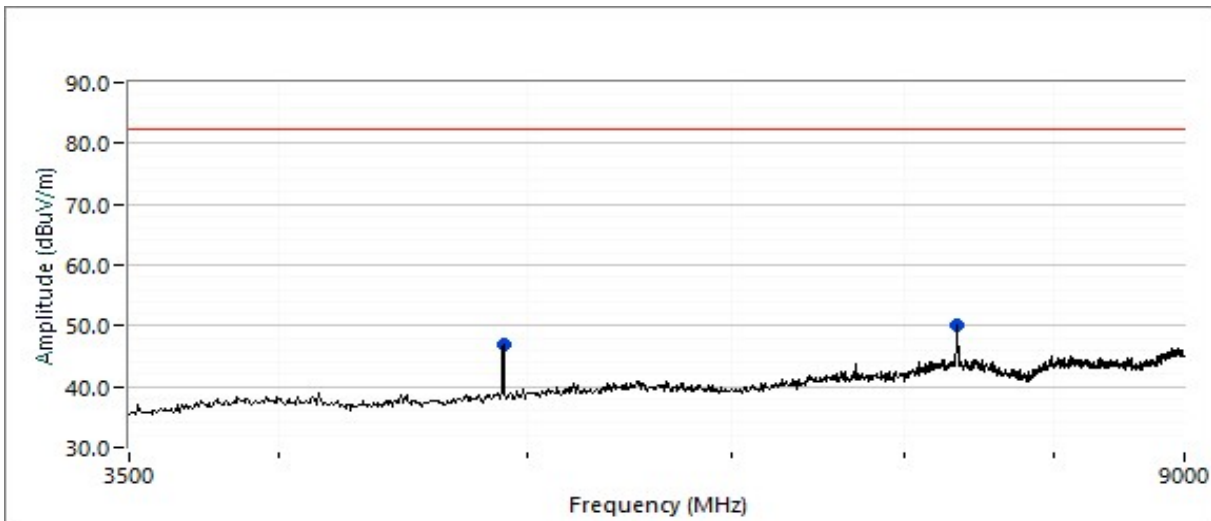


Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

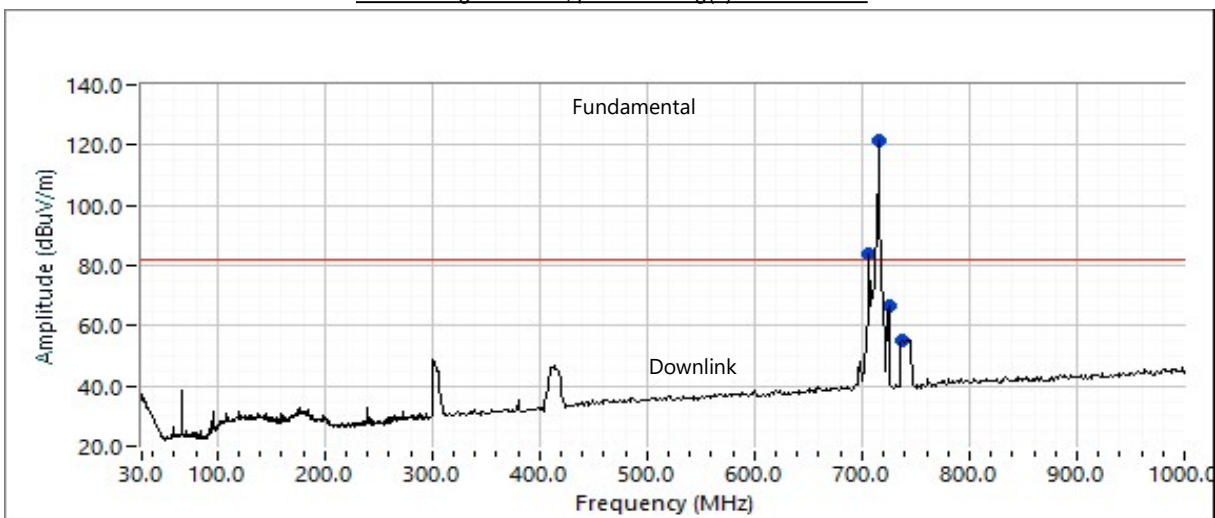
Plots for center channel, power setting(s) = Max Power



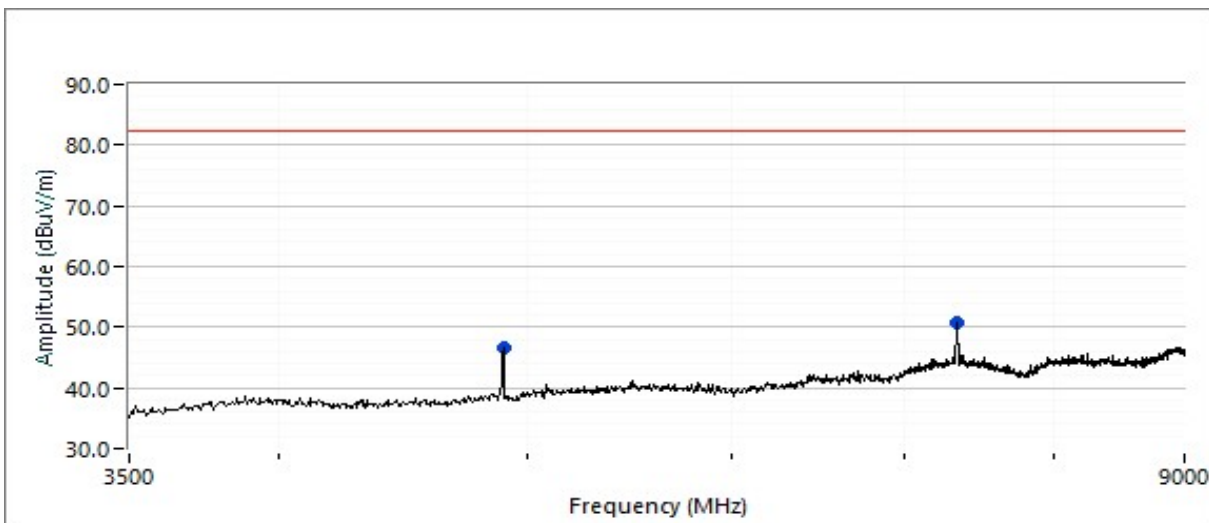
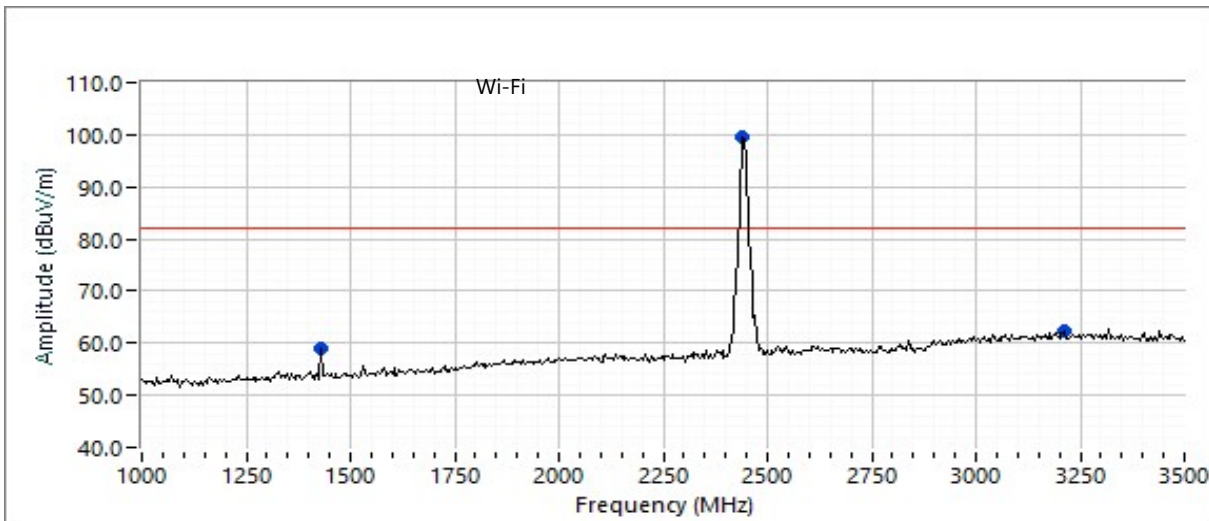
Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A



Plots for high channel, power setting(s) = Max Power



Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A





EMC Test Data

Client:	Zonar Systems	PR Number:	PUS58004583
Model:	V4 Base 3	T-Log Number:	TL6004583-RA
Contact:	David Pascoe	Project Manager:	Christine Krebill
Standard:	FCC Part 15.247, ANSI C63.10	Project Engineer:	Art Thammanavarat
		Class:	N/A

Run #8b: - Final Field Strength Measurements and Substitution Measurements

Date of Test: 9/3-10/2026

Config. Used: 1+Simultaneous with 802.11b ch8 power 25

Test Engineer: Rafael Varelas, Art Tham

Config Change: None

Test Location: FT Chamber #7

EUT Voltage: 12Vdc

EUT Field Strength

Frequency	Level	Pol	FCC Part 27		Detector	Azimuth	Height	Comments	Channel
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
LOW CH									
1399.170	62.6	H	82.2	-19.6	PK	155	1.1	RB 1 MHz;VB 3 MHz;Peak	
3226.210	62.7	H	82.2	-19.5	PK	154	2.2	RB 1 MHz;VB 3 MHz;Peak	
4894.130	50.3	H	82.2	-31.9	PK	60	1.0	RB 1 MHz;VB 3 MHz;Peak	
7342.870	55.2	H	82.2	-27.0	PK	222	1.0	RB 1 MHz;VB 3 MHz;Peak	
MID CH									
719.809	56.8	H	82.2	-25.4	PK	326	1.2	POS; RB 100 kHz; VB: 300 kHz	
1414.920	58.3	H	82.2	-23.9	PK	153	1.9	RB 1 MHz;VB 3 MHz;Peak	
4894.230	50.4	H	82.2	-31.8	PK	59	1.0	RB 1 MHz;VB 3 MHz;Peak	
7342.840	56.4	H	82.2	-25.8	PK	310	1.0	RB 1 MHz;VB 3 MHz;Peak	
HIGH CH									
1430.790	63.3	H	82.2	-18.9	PK	160	1.0	RB 1 MHz;VB 3 MHz;Peak	
3206.130	60.1	H	82.2	-22.1	PK	213	1.3	RB 1 MHz;VB 3 MHz;Peak	
4894.150	50.1	H	82.2	-32.1	PK	55	1.6	RB 1 MHz;VB 3 MHz;Peak	
7344.880	55.4	H	82.2	-26.8	PK	213	1.7	RB 1 MHz;VB 3 MHz;Peak	

Note 1: The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 20dB of margin relative to this field strength limit is determined using substitution measurements.



EMC Test Data

Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

Substitution measurements

Horizontal

Frequency MHz	Substitution measurements			Site Factor ⁴	EUT measurements			eirp Limit dBm	erp Limit dBm	Margin dB
	Pin ¹	Gain ²	FS ³		FS ⁵	eirp (dBm)	erp (dBm)			
1399.170	-23.75	7.98	78.3	94.1	62.6	-31.5	-33.7	-13.0		-18.5
1430.790	-23.75	7.98	77.9	93.7	63.3	-30.4	-32.6	-13.0		-17.4
3226.210	-26.21	9.38	77.1	93.9	62.7	-31.2	-33.4	-13.0		-18.2

Note 1: Pin is the input power (dBm) to the substitution antenna

Note 2: Gain is the gain (dBi) for the substitution antenna.

Note 3: FS is the field strength (dBuV/m) measured from the substitution antenna.

Note 4: Site Factor - this is the site factor to convert from a field strength in dBuV/m to an eirp in dBm.

Note 5: EUT field strength as measured during initial run.

Run #9: Output Power - Band 13

Date of Test: 9/4/2026

Test Engineer: Art Tham

Test Location: FT Chamber #7

Config. Used: 1+Simultaneous with 802.11b ch8 power 25

Config Change: None

EUT Voltage: 12VDC

Power Setting ²	Frequency (MHz)	EIRP			Result
		(dBm) ¹	mW		
Max	777.6	28.1	645.7		Pass
Max	782	27.9	616.6		Pass
Max	786.4	27.2	524.8		Pass

Note 1: Output power (EIRP) calculated from measured field strength



EMC Test Data

Client:	Zonar Systems	PR Number:	PUS58004583
Model:	V4 Base 3	T-Log Number:	TL6004583-RA
Contact:	David Pascoe	Project Manager:	Christine Krebill
Standard:	FCC Part 15.247, ANSI C63.10	Project Engineer:	Art Thammanavarat
		Class:	N/A

Run #10: Out of Band Spurious Emissions, Radiated, Band 13

Conducted limit (dBm): -13
Approximate field strength limit @ 3m: 82.2

The limit is taken from FCC Part 27

Run #6a - Preliminary measurements - chamber scans

Date of Test: 9/8-11/2026

Test Engineer: Art Tham

Test Location: FT Chamber #7

Config. Used: 1+Simultaneous with 802.11b ch8 power 25

Config Change: None

EUT Voltage: 12Vdc

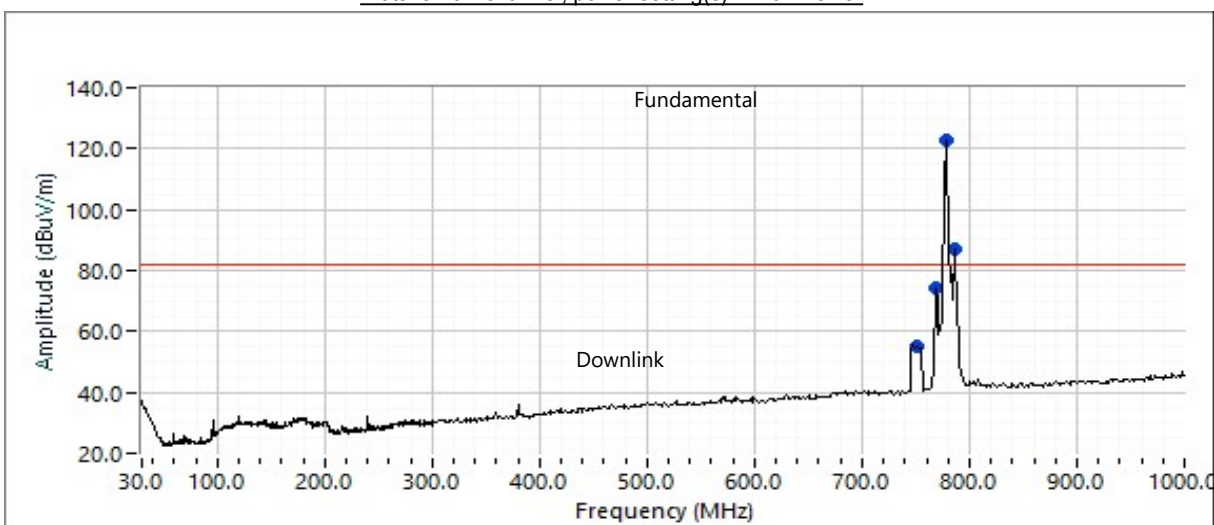
Frequency	Level	Pol	FCC Part 27		Detector	Azimuth	Height	Comments	Channel
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
751.703	55.3	H	82.2	-26.9	Peak	42	1.5	Downlink	Low CH
778.357	122.5	H	-	-	Peak	169	1.0	Fundamental	Low CH
786.774	86.8	H	-	-	Peak	174	1.0	In Band	Low CH
768.537	74.5	H	-	-	Peak	166	1.0	In Band	Low CH
2446.660	100.6	H	82.2	18.4	Peak	153	1.9	Wi-Fi	Low CH
1555.250	61.5	H	82.2	-20.7	Peak	170	1.0		Low CH
4894.230	46.9	H	82.2	-35.3	Peak	57	1.0		Low CH
7340.900	52.4	H	82.2	-29.8	Peak	308	1.0		Low CH
751.703	55.0	H	82.2	-27.2	Peak	110	1.5	Downlink	Mid CH
782.565	122.4	H	-	-	Peak	185	1.0	Fundamental	Mid CH
2446.660	100.1	H	82.2	17.9	Peak	156	1.9	Wi-Fi	Mid CH
1563.830	61.8	H	82.2	-20.4	Peak	144	1.0		Mid CH
4894.250	46.1	H	82.2	-36.1	Peak	54	1.0		Mid CH
7342.490	51.7	H	82.2	-30.5	Peak	310	1.0		Mid CH

Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

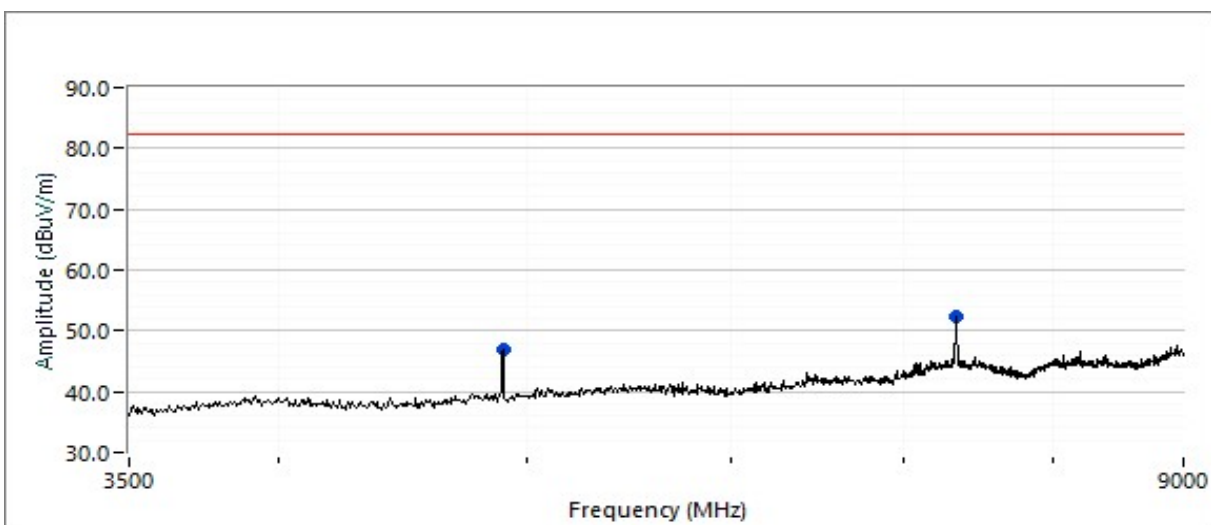
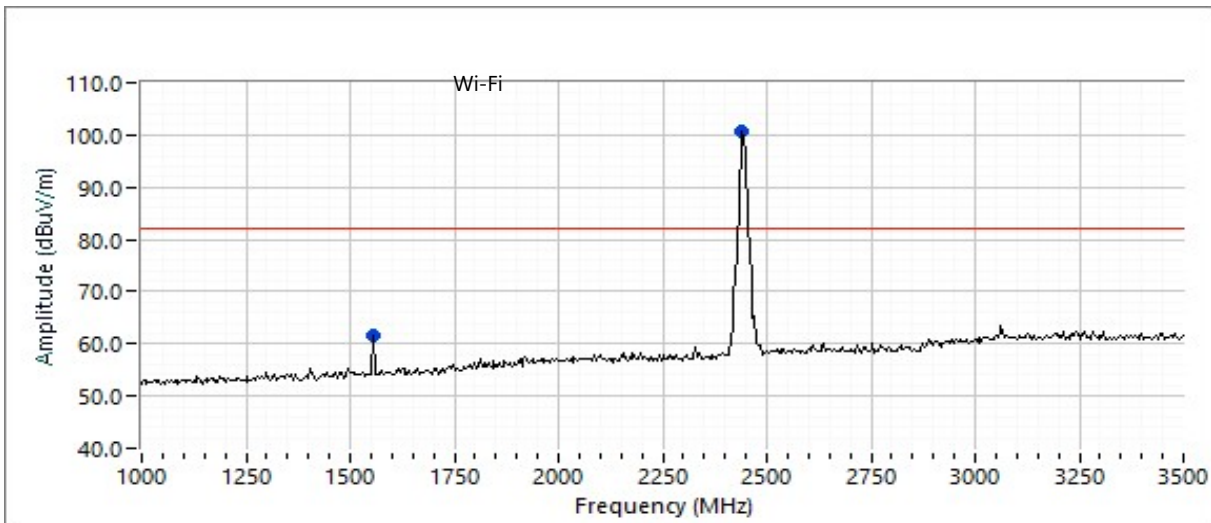
Frequency	Level	Pol	FCC Part 27		Detector	Azimuth	Height	Comments	Channel
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
754.509	55.4	H	82.2	-26.8	Peak	190	1.5	Downlink	High CH
786.774	122.3	H	-	-	Peak	162	1.0	Fundamental	High CH
778.357	84.5	H	-	-	Peak	167	1.0	In Band	High CH
795.190	73.7	H	82.2	-8.5	Peak	172	1.0		High CH
1572.500	62.1	H	82.2	-20.1	Peak	144	1.0		High CH
4894.230	45.6	H	82.2	-36.6	Peak	58	1.6		High CH
7341.950	50.7	H	82.2	-31.5	Peak	0	1.6		High CH

Note 1: The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than **20dB** of margin relative to this field strength limit is determined using substitution measurements.

Plots for low channel, power setting(s) = Max Power

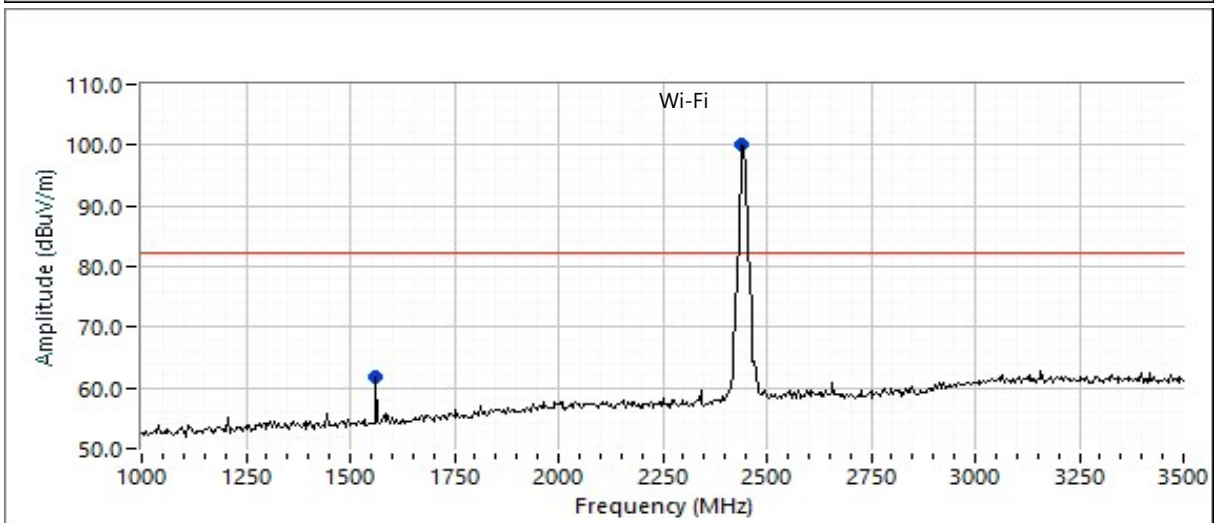
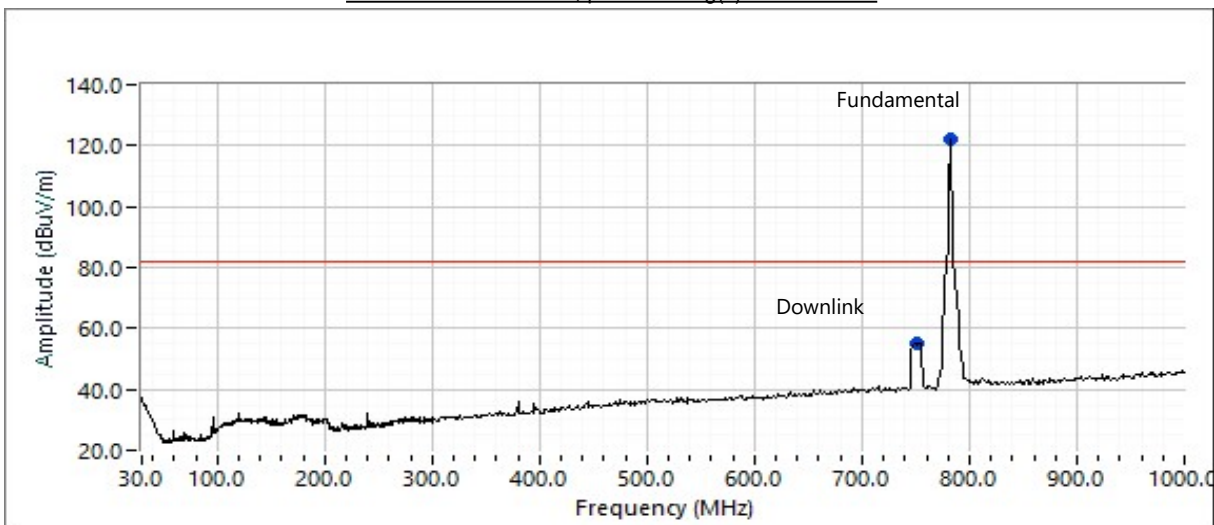


Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

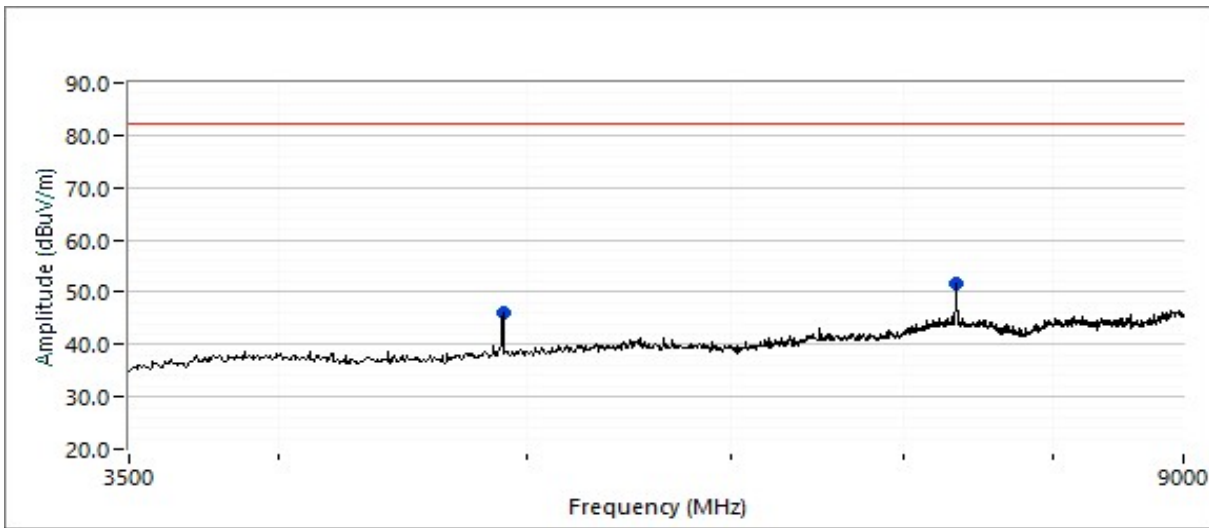


Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

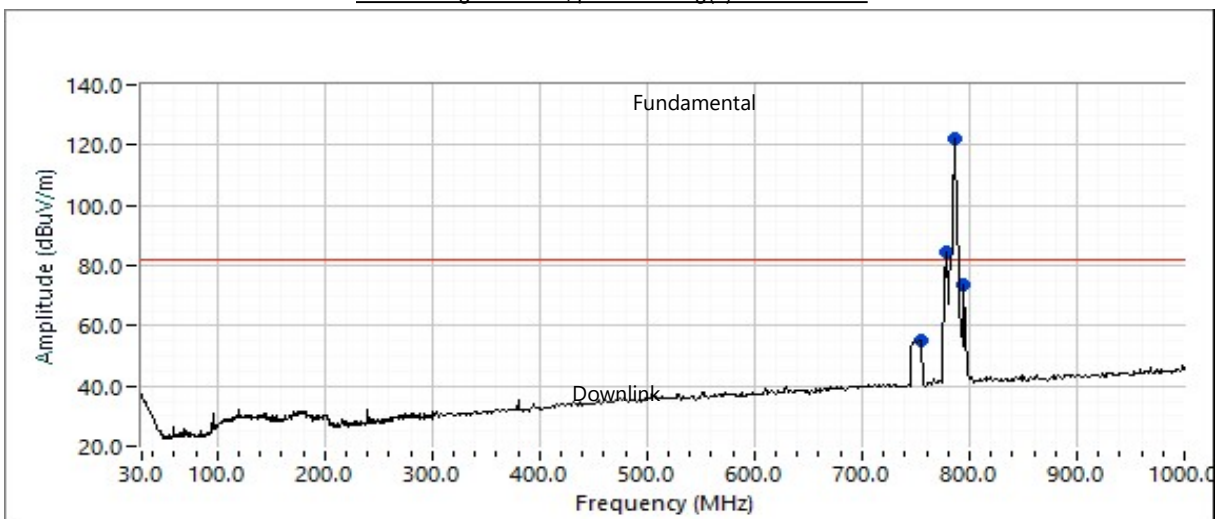
Plots for center channel, power setting(s) = Max Power



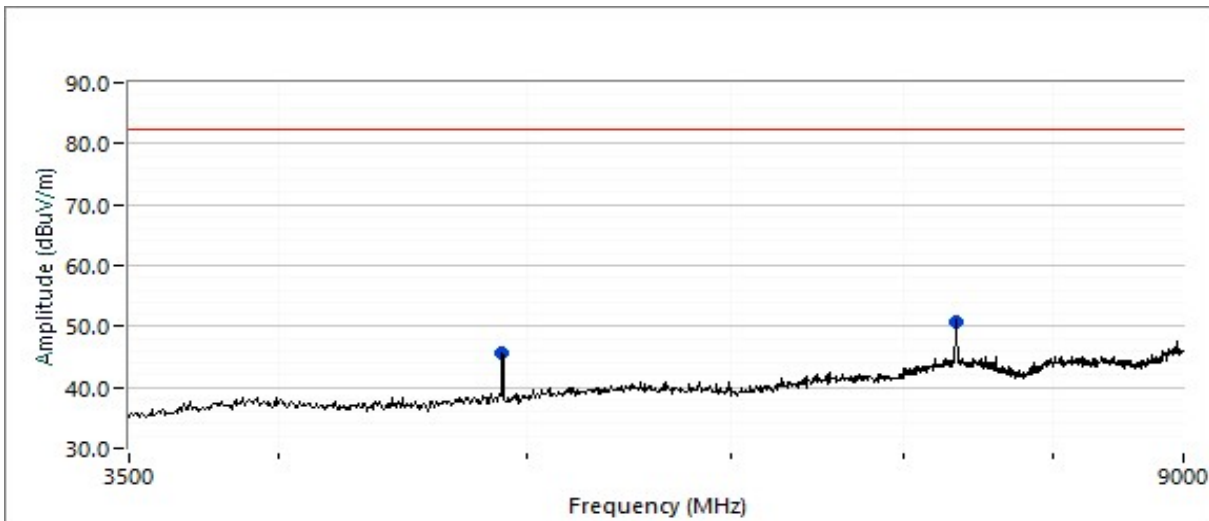
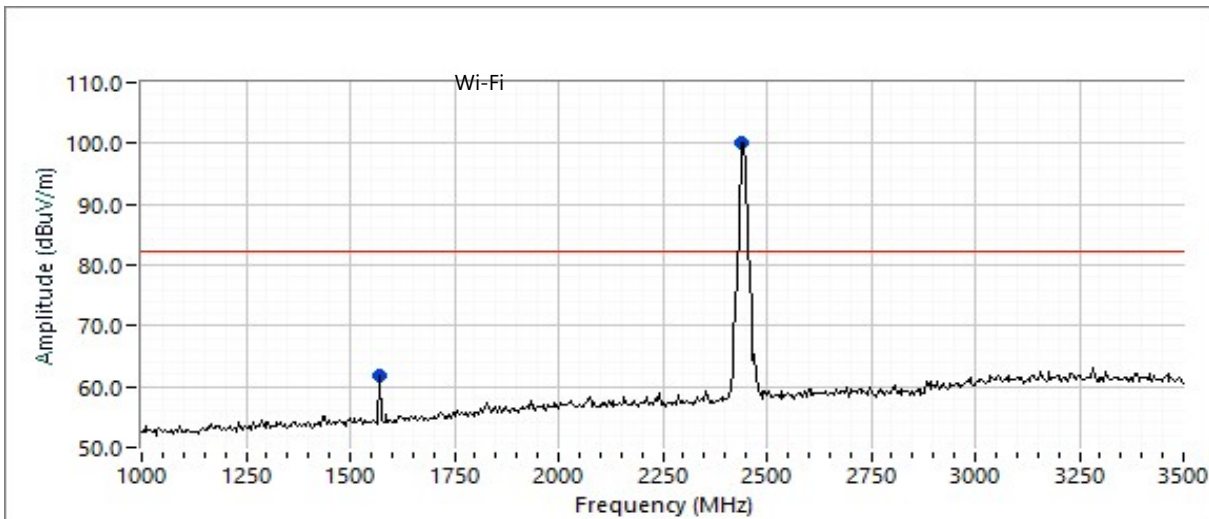
Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A



Plots for high channel, power setting(s) = Max Power



Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A





EMC Test Data

Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

Run #10b: - Final Field Strength Measurements and Substitution Measurements

Date of Test: 9/11 - 9/16/26

Config. Used: 1+Simultaneous with 802.11b ch8 power 25

Test Engineer: Art Tham, David Bare

Config Change: None

Test Location: Fremont Chamber #7

EUT Voltage: 12Vdc

EUT Field Strength

Frequency	Level	Pol	FCC Part 27		Detector	Azimuth	Height	Comments	Channel
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
LOW CH									
1555.270	64.3	H	82.2	-17.9	PK	169	1.1	RB 1 MHz;VB 3 MHz;Peak	
7342.090	57.7	H	82.2	-24.5	PK	309	1.0	RB 1 MHz;VB 3 MHz;Peak	
4894.090	50.9	H	82.2	-31.3	PK	60	1.0	RB 1 MHz;VB 3 MHz;Peak	
MID CH									
1563.800	65.1	H	82.2	-17.1	PK	146	1.0	RB 1 MHz;VB 3 MHz;Peak	
4894.130	49.8	H	82.2	-32.4	PK	62	1.0	RB 1 MHz;VB 3 MHz;Peak	
7341.960	56.9	H	82.2	-25.3	PK	311	1.0	RB 1 MHz;VB 3 MHz;Peak	
				0.0					
High CH									
795.182	75.4	H	82.2	-6.8	PK	170	1.0	PK (0.10s)	
1572.500	66.9	H	82.2	-15.3	PK	163	1.0	RB 1 MHz;VB 3 MHz;Peak	
4894.210	49.8	H	82.2	-32.4	PK	58	1.0	RB 1 MHz;VB 3 MHz;Peak	
7342.180	55.7	H	82.2	-26.5	PK	0	1.0	RB 1 MHz;VB 3 MHz;Peak	

Note 1: The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than **20dB** of margin relative to this field strength limit is determined using substitution measurements.



EMC Test Data

Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

Substitution measurements

Horizontal

Frequency MHz	Substitution measurements			Site Factor ⁴	EUT measurements			eirp Limit dBm	erp Limit dBm	Margin dB
	Pin ¹	Gain ²	FS ³		FS ⁵	eirp (dBm)	erp (dBm)			
795.182	-22.7	1.19	75.1	96.6	75.4	-21.2	-23.4		-13.0	-10.4
1555.270	-23.75	7.98	78.2	94.0	64.3	-29.7	-31.9	-13.0		-16.7
1563.800	-23.98	8.52	77.9	93.4	65.1	-28.3	-30.5	-13.0		-15.3
1572.500	-23.98	8.52	77.4	92.9	66.9	-26.0	-28.2	-13.0		-13.0

Note 1: Pin is the input power (dBm) to the substitution antenna

Note 2: Gain is the gain (dBi) for the substitution antenna.

Note 3: FS is the field strength (dBuV/m) measured from the substitution antenna.

Note 4: Site Factor - this is the site factor to convert from a field strength in dBuV/m to an eirp in dBm.

Note 5: EUT field strength as measured during initial run.

Run #11: Output Power - Band 14

Date of Test: 9/4/2026

Test Engineer: Art Tham

Test Location: FT Chamber #7

Config. Used: 1+Simultaneous with 802.11b ch8 power 25

Config Change: None

EUT Voltage: 12VDC

Power Setting ²	Frequency (MHz)	EIRP			Result
		(dBm) ¹	mW		
Max	788.6	27.1	512.9		Pass
Max	793.0	26.9	489.8		Pass
Max	797.4	26.0	398.1		Pass

Note 1: Output power (EIRP) calculated from measured field strength



EMC Test Data

Client:	Zonar Systems	PR Number:	PUS58004583
Model:	V4 Base 3	T-Log Number:	TL6004583-RA
Contact:	David Pascoe	Project Manager:	Christine Krebill
Standard:	FCC Part 15.247, ANSI C63.10	Project Engineer:	Art Thammanavarat
		Class:	N/A

Run #13: Output Power - Band 66

Date of Test: 9/9/2026

Test Engineer: Art Tham

Test Location: FT Chamber #7

Config. Used: 1+Simultaneous with 802.11b ch8 power 25

Config Change: None

EUT Voltage: 12VDC

Power Setting ²	Frequency (MHz)	EIRP			Result
		(dBm) ¹	mW		
Max	1710.6	26.0	398.1		Pass
Max	1744.9	26.2	416.9		Pass
Max	1779.4	25.1	323.6		Pass

Note 1: Output power (EIRP) calculated from measured field strength



EMC Test Data

Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

Run #14: Out of Band Spurious Emissions, Radiated, Band 66, 30-18,000 MHz

Conducted limit (dBm): -13
Approximate field strength limit @ 3m: 82.2

The limit is taken from FCC Part 27

Run #14a - Preliminary measurements - chamber scans

Date of Test: 9/4,10/2026

Test Engineer: Art Tham & David Bare

Test Location: FT Chamber #7

Config. Used: 1+Simultaneous with 802.11b ch8 power 25

Config Change: None

EUT Voltage: 12Vdc

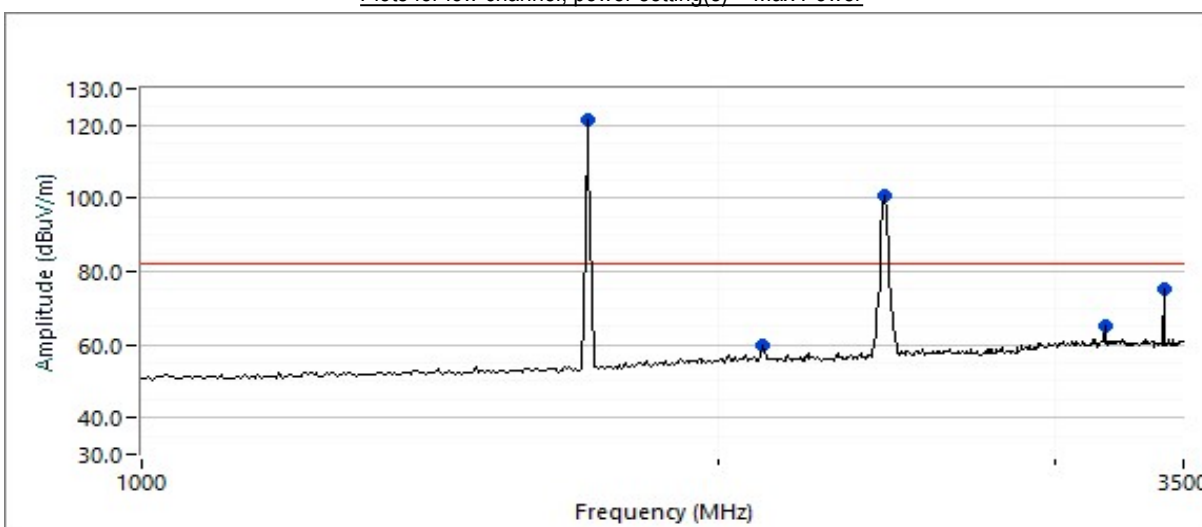
Frequency	Level	Pol	FCC Part 27		Detector	Azimuth	Height	Comments	Channel
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
LOW CH									
1710.660	121.6	H	-	-	Peak	54	1.6	Fundamental	
2115.450	59.7	H	82.2	-22.5	Peak	158	1.3	Downlink	
2447.000	100.0	H	-	-	Peak	106	1.3	Wi-Fi	
3421.220	64.1	H	82.2	-18.1	Peak	70	1.6		
4894.230	46.3	H	82.2	-35.9	Peak	60	1.0		
7339.170	50.6	H	82.2	-31.6	Peak	328	2.2		
9786.670	57.3	H	82.2	-24.9	Peak	257	1.3		
14681.670	49.6	H	82.2	-32.6	Peak	17	1.0		
17129.000	48.9	H	82.2	-33.3	Peak	348	1.0		
MID CH									
1745.000	119.6	H	-	-	Peak	46	1.0	Fundamental	
2145.000	58.6	H	82.2	-23.6	Peak	1	1.3	Downlink	
2446.500	99.1	H	-	-	Peak	159	1.9	Wi-Fi	
3489.800	62.4	H	82.2	-19.8	Peak	46	1.0		
4894.230	46.9	H	82.2	-35.3	Peak	37	1.0		
7340.790	51.6	H	82.2	-30.6	Peak	360	1.0		
9788.560	56.8	H	82.2	-25.4	Peak	262	1.3		
17129.110	49.9	H	82.2	-32.3	Peak	37	1.3		

Client:	Zonar Systems	PR Number:	PUS58004583
Model:	V4 Base 3	T-Log Number:	TL6004583-RA
Contact:	David Pascoe	Project Manager:	Christine Krebill
Standard:	FCC Part 15.247, ANSI C63.10	Project Engineer:	Art Thammanavarat
		Class:	N/A

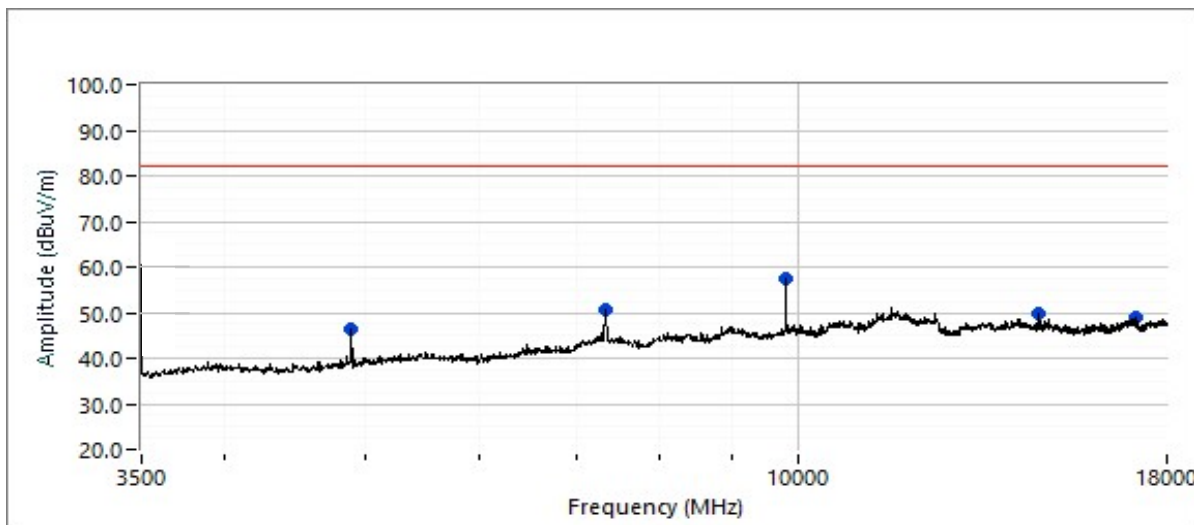
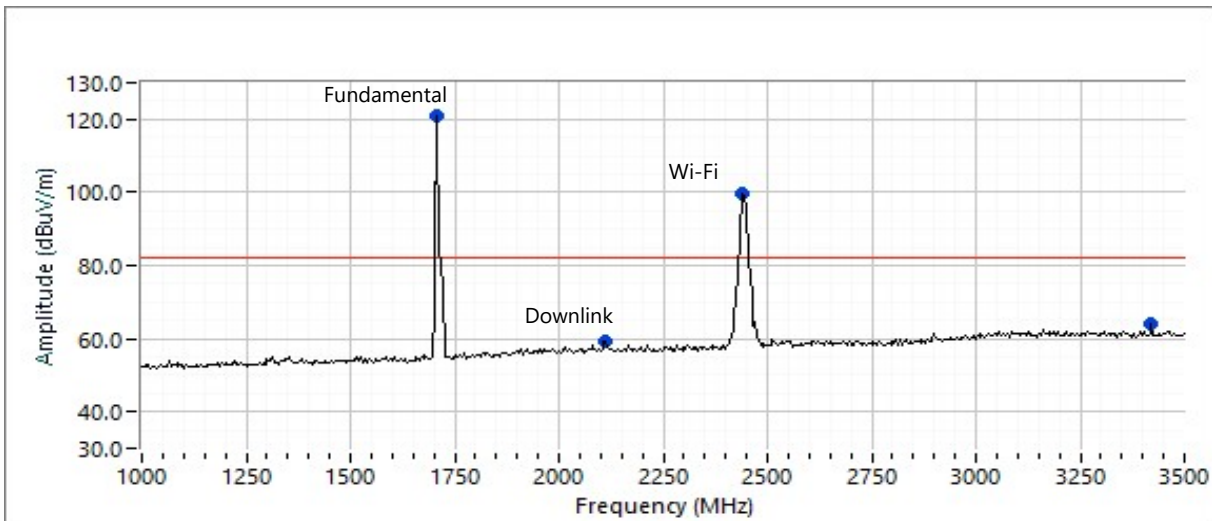
Frequency	Level	Pol	FCC Part 27		Detector	Azimuth	Height	Comments	Channel
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
HIGH CH									
1779.390	118.0	H	-	-	Peak	60	1.0	Fundamental	
2174.890	60.0	H	82.2	-22.2	Peak	223	2.2	Downlink	
2446.330	99.7	H	-	-	Peak	100	1.3	Wi-Fi	
4894.170	46.8	H	82.2	-35.4	Peak	62	1.0		
7341.000	50.4	H	82.2	-31.8	Peak	333	2.2		
9788.500	56.9	H	82.2	-25.3	Peak	307	2.2		
14682.650	53.5	H	82.2	-28.7	Peak	24	1.0		
				0.0					

Note 1: The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than **20dB** of margin relative to this field strength limit is determined using substitution measurements.

Plots for low channel, power setting(s) = Max Power

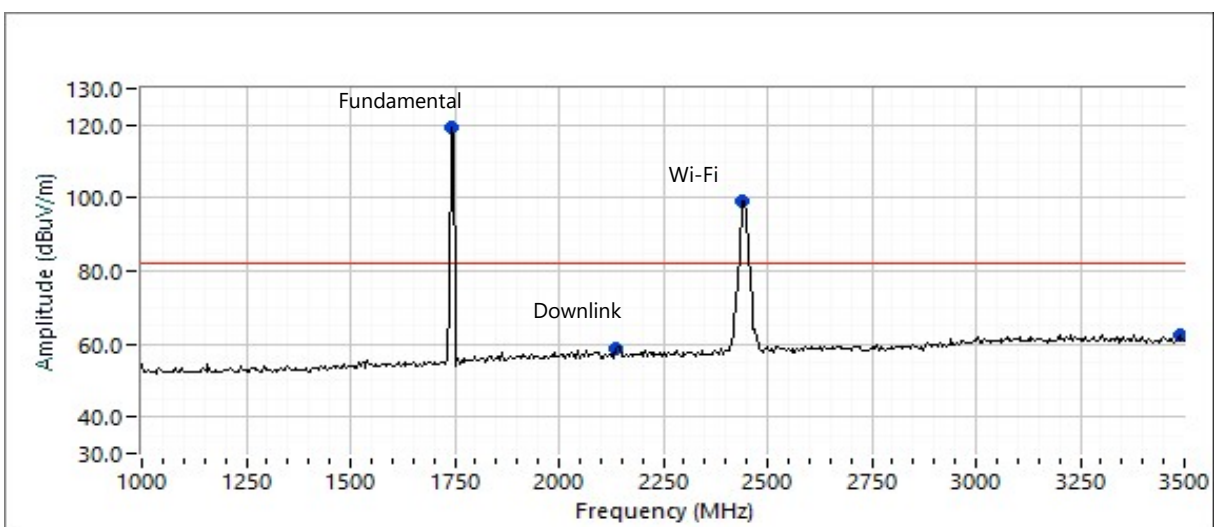
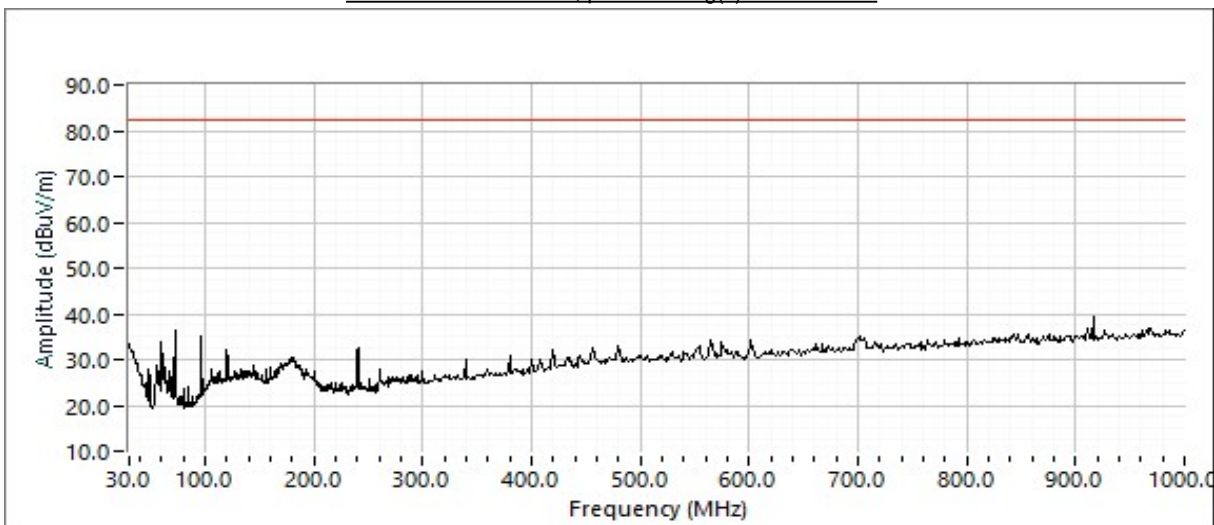


Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

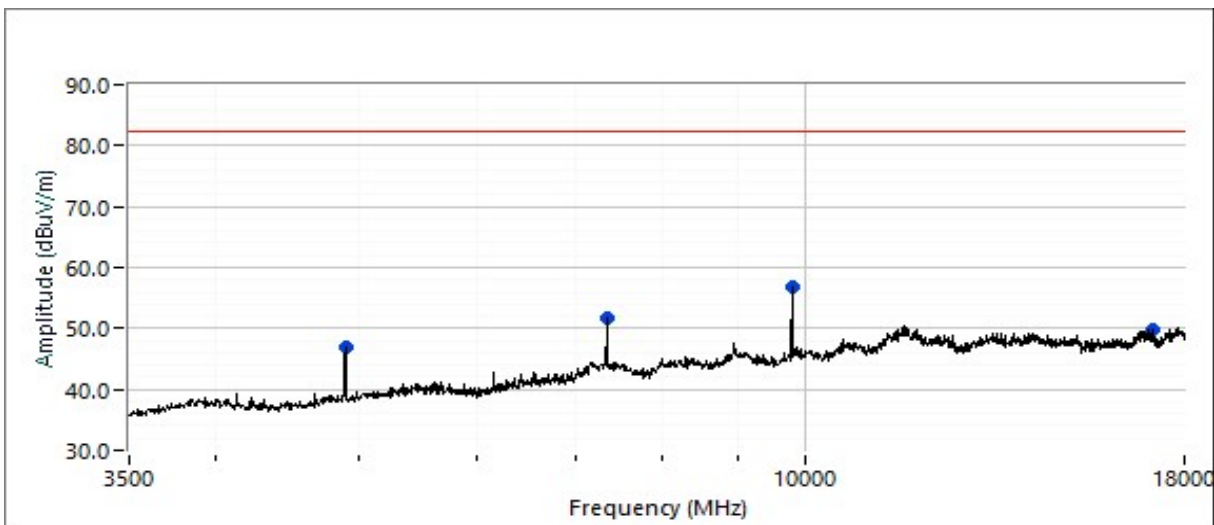


Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

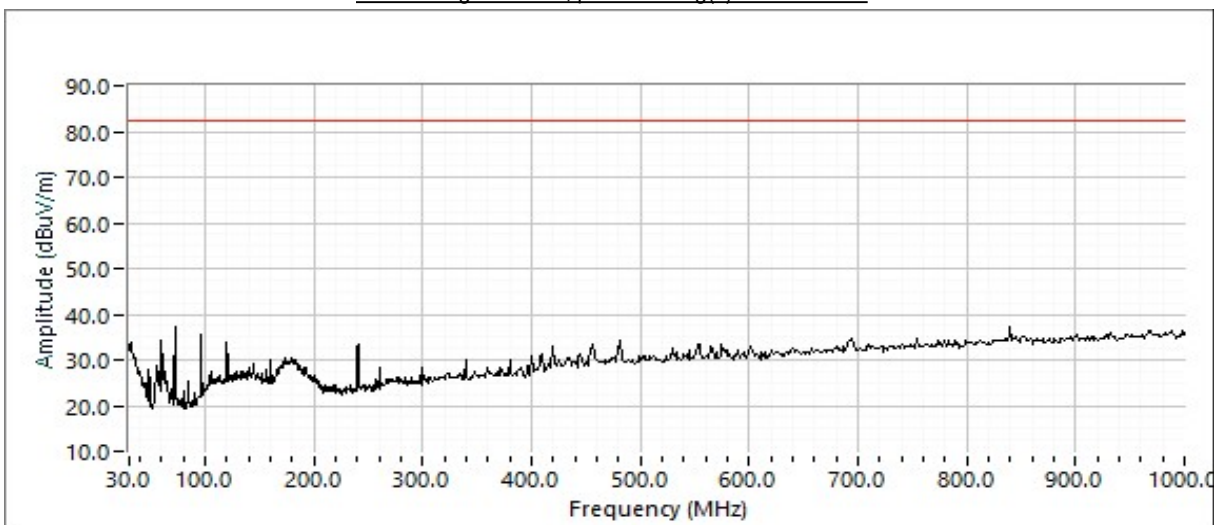
Plots for center channel, power setting(s) = Max Power



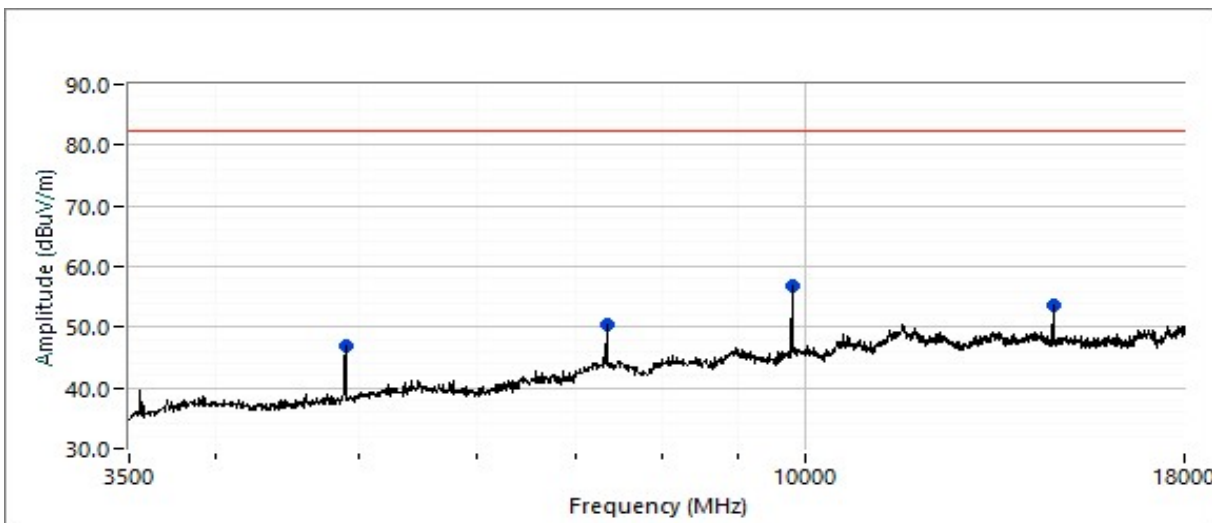
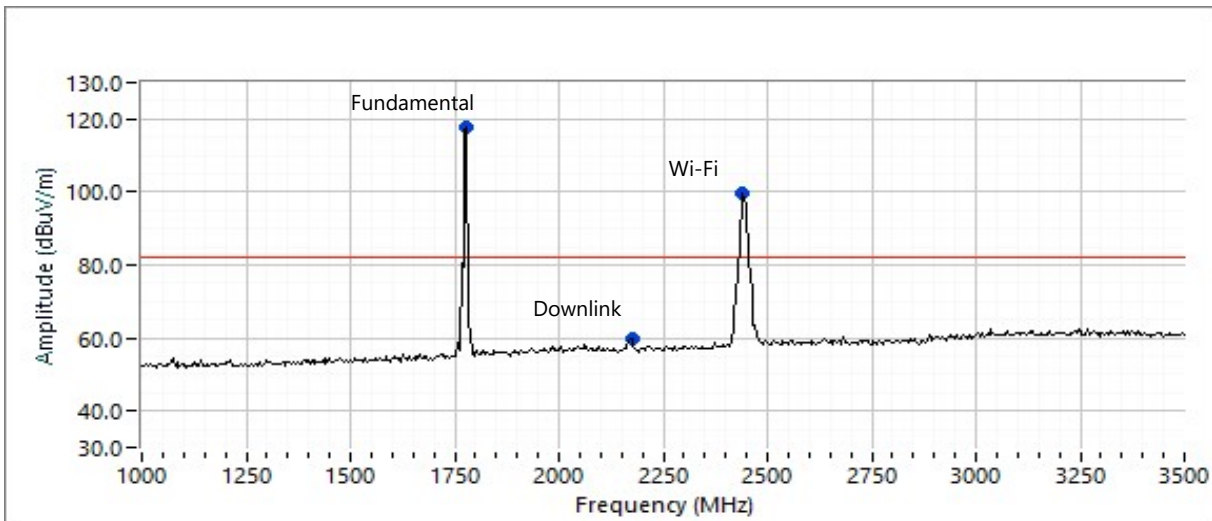
Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A



Plots for high channel, power setting(s) = Max Power



Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A



Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

Run #14b: - Final Field Strength Measurements and Substitution Measurements

Date of Test: 9/10/2026

Config. Used: 1+Simultaneous with 802.11b ch8 power 25

Test Engineer: Art Tham & David Bare

Config Change: None

Test Location: FT Chamber #7

EUT Voltage: 12Vdc

EUT Field Strength

Frequency	Level	Pol	FCC Part 27		Detector	Azimuth	Height	Comments	Channel
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
LOW CH									
3421.170	68.4	H	82.2	-13.8	PK	56	1.6	RB 1 MHz;VB 3 MHz;Peak	
9788.550	59.4	H	82.2	-22.8	PK	258	1.4	RB 1 MHz;VB 3 MHz;Peak	
MID CH									
3489.780	67.0	H	82.2	-15.2	PK	46	1.0	RB 1 MHz;VB 3 MHz;Peak	
9788.490	59.9	H	82.2	-22.3	PK	259	1.2	RB 1 MHz;VB 3 MHz;Peak	
HIGH CH									
9788.280	59.5	H	82.2	-22.7	PK	305	2.2	RB 1 MHz;VB 3 MHz;Peak	
14682.540	57.5	H	82.2	-24.7	PK	24	1.0	RB 1 MHz;VB 3 MHz;Peak	

Note 1:	The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 20dB of margin relative to this field strength limit is determined using substitution measurements.
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Substitution measurements

Horizontal

Frequency	Substitution measurements			Site	EUT measurements			eirp Limit	erp Limit	Margin
MHz	Pin ¹	Gain ²	FS ³	Factor ⁴	FS ⁵	eirp (dBm)	erp (dBm)	dBm	dBm	dB
3421.170	-26.53	9.8	77.6	94.4	68.4	-26.0	-28.2	-13.0		-13.0
3489.780	-26.53	9.8	77.4	94.2	67.0	-27.2	-29.4	-13.0		-14.2

Note 1: Pin is the input power (dBm) to the substitution antenna

Note 2: Gain is the gain (dBi) for the substitution antenna.

Note 3: FS is the field strength (dB μ V/m) measured from the substitution antenna.

Note 4: Site Factor - this is the site factor to convert from a field strength in dB μ V/m to an erp in dBm.

Note 5: EUT field strength as measured during initial run.



EMC Test Data

Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

Run #15: Output Power - Band 71

Date of Test: 9/4/2026

Test Engineer: Art Tham

Test Location: FT Chamber #7

Config. Used: 1+Simultaneous with 802.11b ch8 power 25

Config Change: None

EUT Voltage: 12Vdc

Power Setting ²	Frequency (MHz)	EIRP			Result
		(dBm) ¹	mW		
Max	663.6	25.2	331.1		Pass
Max	680.4	26.4	436.5		Pass
Max	697.4	27.2	524.8		Pass

Note 1: Output power (EIRP) calculated from measured field strength

Run #16: Out of Band Spurious Emissions, Radiated, Band 71, 30-9,000 MHz

Conducted limit (dBm): -13

Approximate field strength limit @ 3m: 82.2

The limit is taken from FCC Part 27

Run #16a - Preliminary measurements - chamber scans

Date of Test: 9/4/2026

Test Engineer: Art Tham

Test Location: FT Chamber #7

Config. Used: 1+Simultaneous with 802.11b ch8 power 25

Config Change: None

EUT Voltage: 12Vdc

Frequency	Level	Pol	FCC Part 27		Detector	Azimuth	Height	Comments	Channel
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
LOW CH									
619.840	50.5	H	82.2	-31.7	Peak	142	1.5	Downlink	
663.327	120.2	H	-	-	Peak	167	1.5	Fundamental	
673.146	83.0	H	-	-	Peak	156	1.0	In band	
2441.670	100.2	H	82.2	18.0	Peak	150	1.9	Wi-Fi	
3216.670	62.4	H	82.2	-19.8	Peak	85	2.5		
4894.170	47.3	H	82.2	-34.9	Peak	60	1.3		
7340.000	51.6	H	82.2	-30.6	Peak	327	2.2		
8903.330	47.4	H	82.2	-34.8	Peak	309	1.9		



EMC Test Data

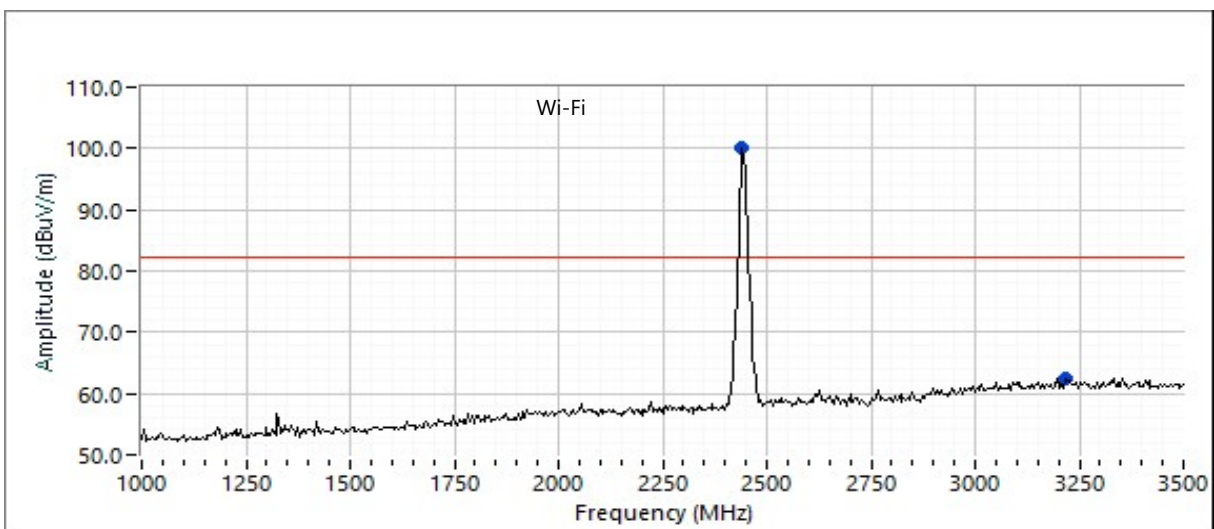
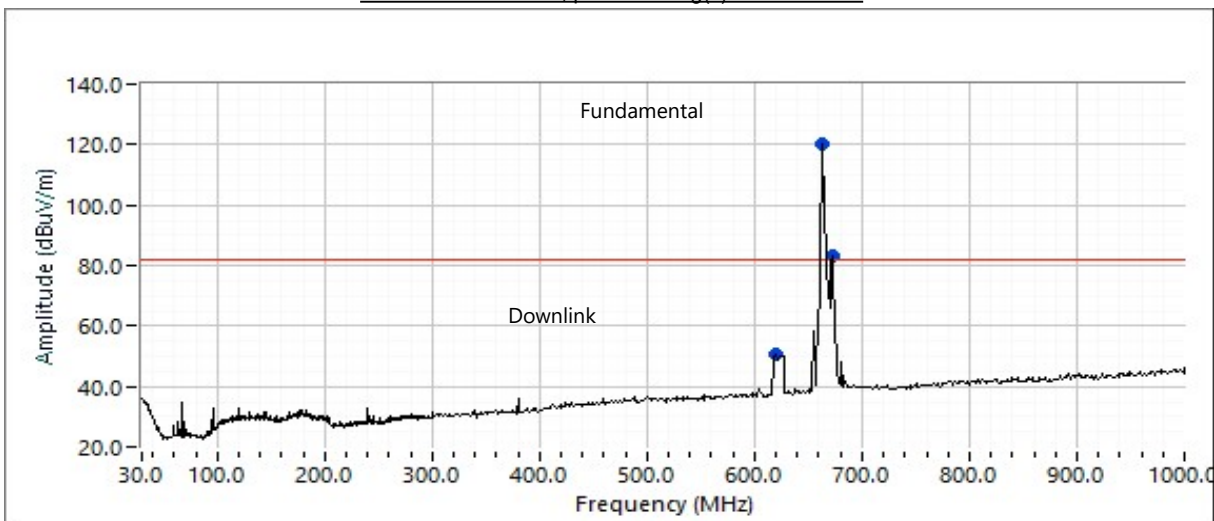
Client:	Zonar Systems	PR Number:	PUS58004583
Model:	V4 Base 3	T-Log Number:	TL6004583-RA
Contact:	David Pascoe	Project Manager:	Christine Krebill
Standard:	FCC Part 15.247, ANSI C63.10	Project Engineer:	Art Thammanavarat
		Class:	N/A

Frequency	Level	Pol	FCC Part 27		Detector	Azimuth	Height	Comments	Channel
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
MID CH									
633.868	50.0	H	82.2	-32.2	Peak	36	1.5	Downlink	
680.160	120.6	H	-	-	Peak	344	1.0	Fundamental	
1360.830	62.3	H	82.2	-19.9	Peak	152	1.3		
2441.670	99.6	H	82.2	17.4	Peak	152	1.9	Wi-Fi	
4894.330	45.6	H	82.2	-36.6	Peak	55	1.6		
7343.330	51.9	H	82.2	-30.3	Peak	308	1.0		
8946.670	47.3	H	82.2	-34.9	Peak	223	2.2		
HIGH CH									
647.178	51.5	H	82.2	-30.7	Peak	194	1.5	Downlink	
688.611	84.8	H	-	-	Peak	341	1.0	In band	
697.432	121.2	H	-	-	Peak	343	1.0	Fundamental	
699.493	74.4	H	82.2	-7.8	Peak	332	1.0		
1391.670	59.6	H	82.2	-22.6	Peak	160	1.3		
2441.670	99.9	H	82.2	17.7	Peak	106	1.3		
4894.170	47.1	H	82.2	-35.1	Peak	60	1.0		
7343.330	51.7	H	82.2	-30.5	Peak	310	1.0		
8940.000	45.6	H	82.2	-36.6	Peak	93	2.5	Noise Floor	

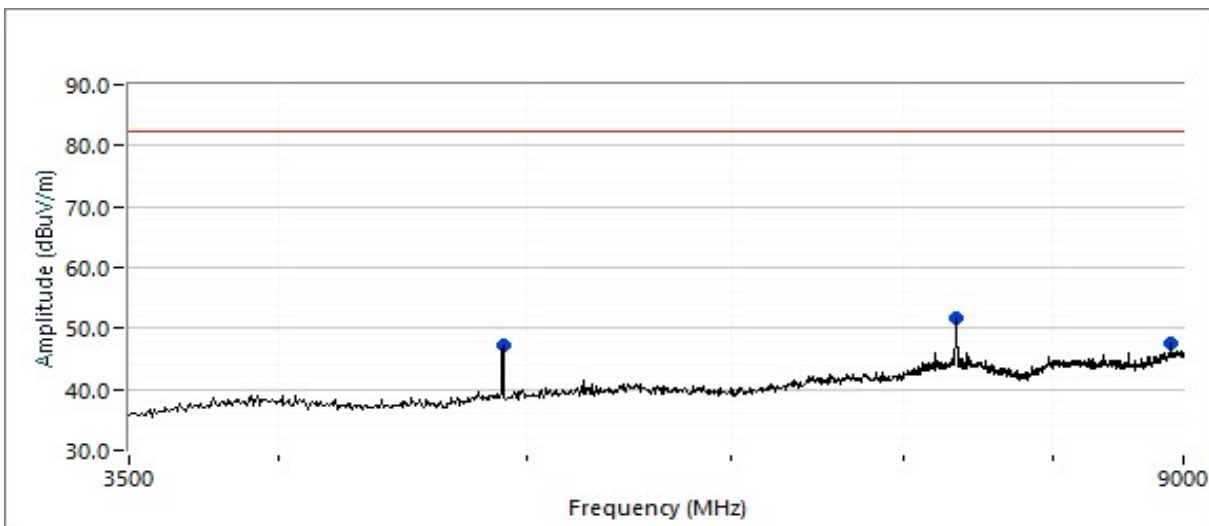
Note 1:	The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 20dB of margin relative to this field strength limit is determined using substitution measurements.
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Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

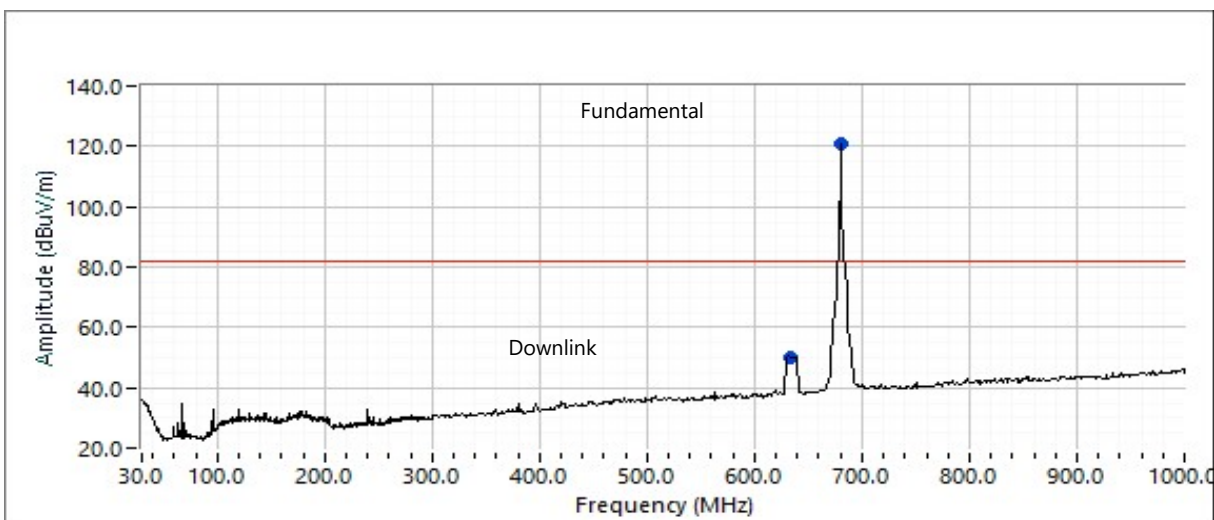
Plots for low channel, power setting(s) = Max Power



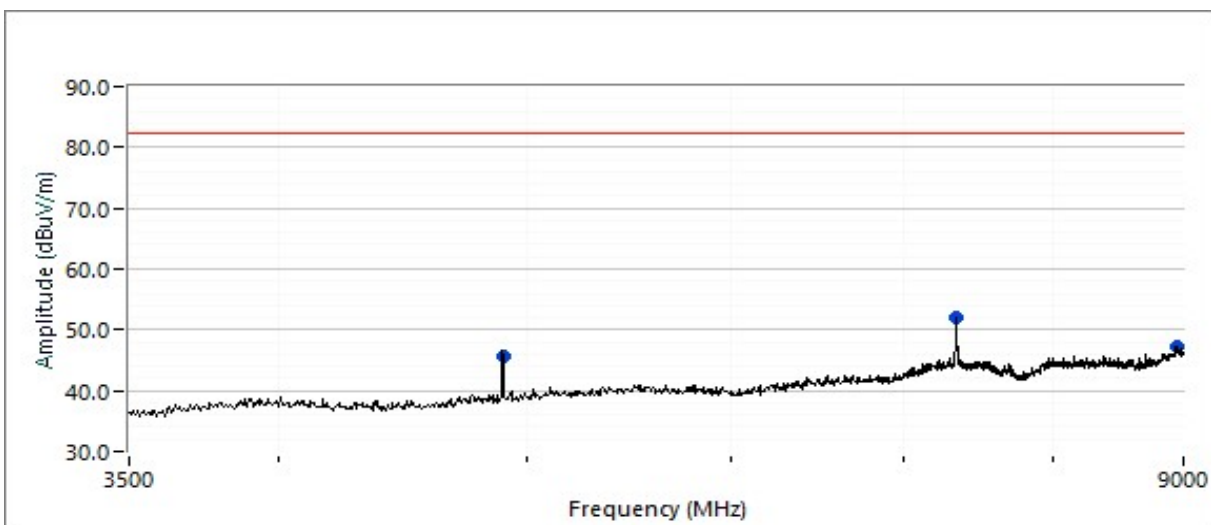
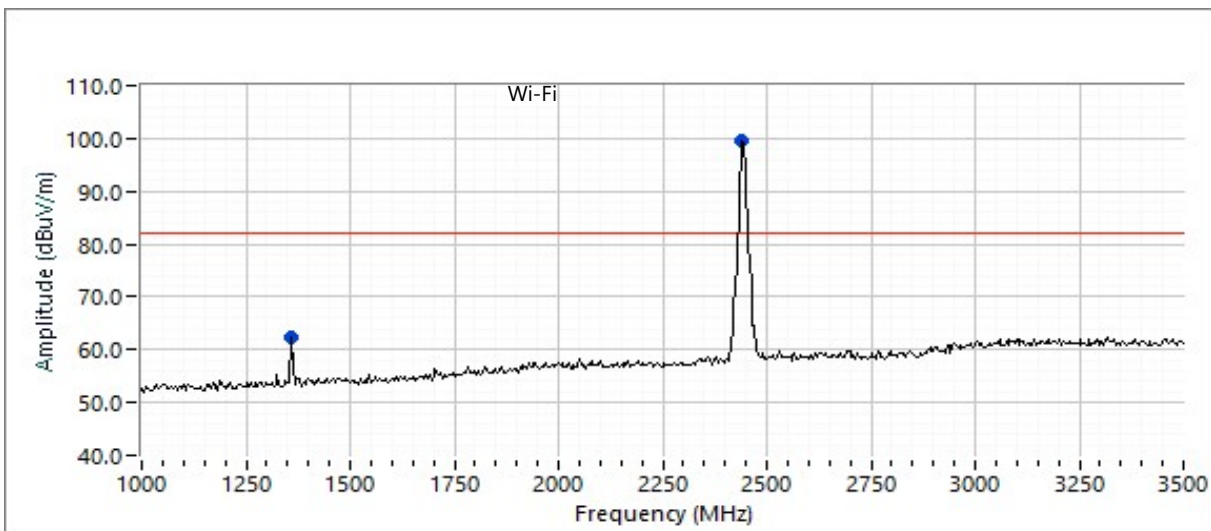
Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A



Plots for center channel, power setting(s) = Max Power

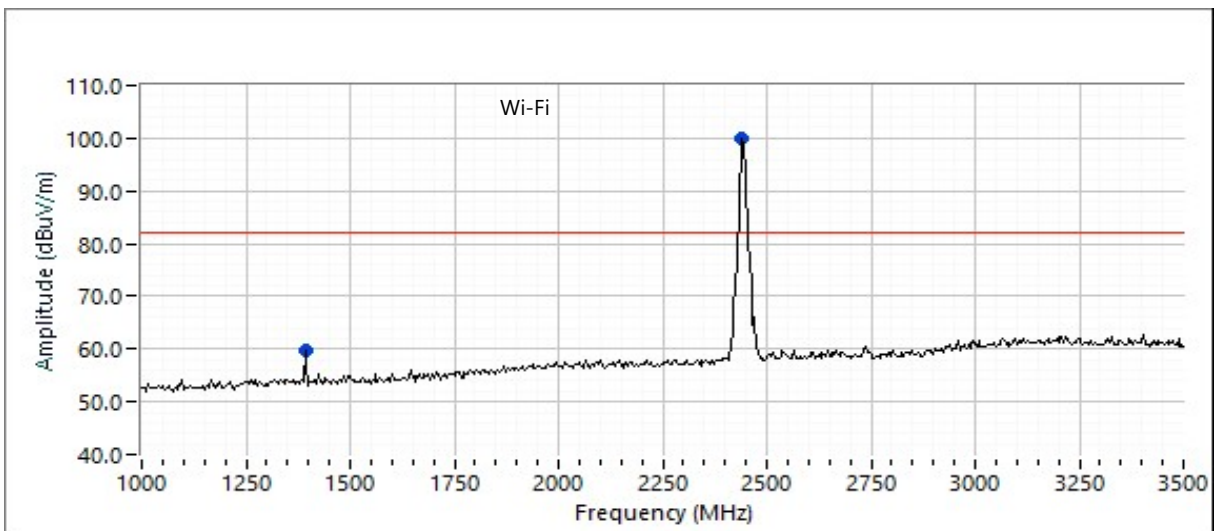
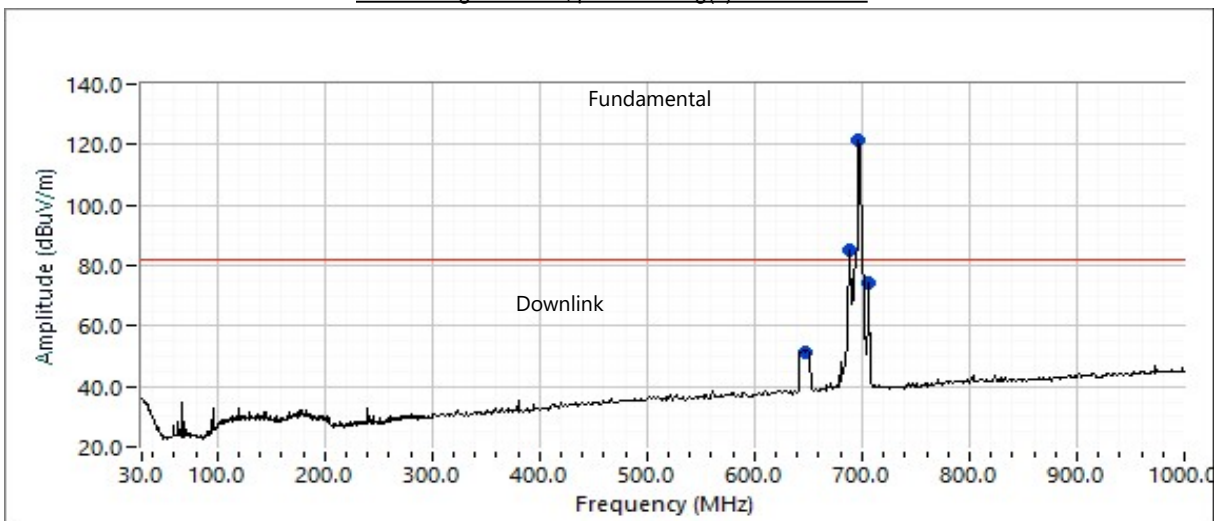


Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

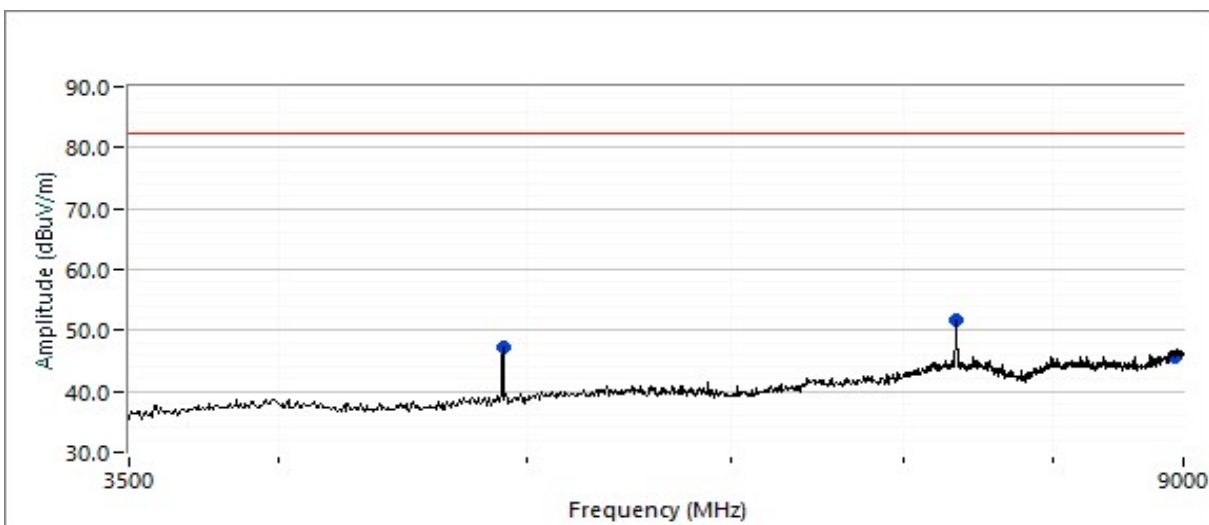


Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A

Plots for high channel, power setting(s) = Max Power



Client: Zonar Systems	PR Number: PUS58004583
Model: V4 Base 3	T-Log Number: TL6004583-RA
Contact: David Pascoe	Project Manager: Christine Krebill
Standard: FCC Part 15.247, ANSI C63.10	Project Engineer: Art Thammanavarat
	Class: N/A



Run #16b: - Final Field Strength Measurements and Substitution Measurements

Date of Test: 9/11/2026

Config. Used: 1+Simultaneous with 802.11b ch8 power 25

Test Engineer: Art Tham

Config Change: None

Test Location: Freont Chamber #7

EUT Voltage: 12Vdc

EUT Field Strength

Frequency	Level	Pol	FCC Part 27		Detector	Azimuth	Height	Comments	Channel
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
LOW CH									
3216.910	61.8	H	82.2	-20.4	PK	85	1.0	RB 1 MHz;VB 3 MHz;Peak	
4894.270	49.8	H	82.2	-32.4	PK	56	1.3	RB 1 MHz;VB 3 MHz;Peak	
7342.290	56.1	H	82.2	-26.1	PK	327	2.2	RB 1 MHz;VB 3 MHz;Peak	
8906.370	51.7	H	82.2	-30.5	PK	309	1.9	RB 1 MHz;VB 3 MHz;Peak	
MID CH									
1360.910	65.8	H	82.2	-16.4	PK	161	1.3	RB 1 MHz;VB 3 MHz;Peak	
4894.220	49.2	H	82.2	-33.0	PK	62	1.4	RB 1 MHz;VB 3 MHz;Peak	
7340.960	55.7	H	82.2	-26.5	PK	308	1.1	RB 1 MHz;VB 3 MHz;Peak	
8939.240	52.1	H	82.2	-30.1	PK	223	2.2	RB 1 MHz;VB 3 MHz;Peak	

Client:	Zonar Systems	PR Number:	PUS58004583
Model:	V4 Base 3	T-Log Number:	TL6004583-RA
Contact:	David Pascoe	Project Manager:	Christine Krebill
Standard:	FCC Part 15.247, ANSI C63.10	Project Engineer:	Art Thammanavarat
		Class:	N/A

Frequency	Level	Pol	FCC Part 27		Detector	Azimuth	Height	Comments	Channel
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
HIGH CH									
699.493	81.2	H	82.2	-1.0	PK	330	1.0	PK (0.10s)	
1395.010	62.7	H	82.2	-19.5	PK	164	1.2	RB 1 MHz;VB 3 MHz;Peak	
4894.260	50.7	H	82.2	-31.5	PK	60	1.0	RB 1 MHz;VB 3 MHz;Peak	
7342.630	56.8	H	82.2	-25.4	PK	309	1.0	RB 1 MHz;VB 3 MHz;Peak	
8939.290	52.2	H	82.2	-30.0	PK	96	2.5	RB 1 MHz;VB 3 MHz;Peak	

Note 1: The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than **20dB** of margin relative to this field strength limit is determined using substitution measurements.

Substitution measurements

Horizontal

Frequency	Substitution measurements			Site	EUT measurements			eirp Limit	erp Limit	Margin
MHz	Pin ¹	Gain ²	FS ³	Factor ⁴	FS ⁵	eirp (dBm)	erp (dBm)	dBm	dBm	dB
699.493	-22.45	1.27	75.6	96.8	81.2	-15.6	-17.8		-13.0	-4.8
1360.910	-23.68	7.7	77.7	93.7	65.8	-27.9	-30.1	-13.0		-14.9
1395.010	-23.68	7.7	78.7	94.7	62.7	-32.0	-34.2	-13.0		-19.0

Note 1: Pin is the input power (dBm) to the substitution antenna

Note 2: Gain is the gain (dBi) for the substitution antenna.

Note 3: FS is the field strength (dB μ V/m) measured from the substitution antenna.

Note 4: Site Factor - this is the site factor to convert from a field strength in dB μ V/m to an eirp in dBm.

Note 5: EUT field strength as measured during initial run.

End of Report

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