

TEST NUMBER - 156-04

TEST REPORT TO

INDUSTRY CANADA RSS 210 SECTION 6.2.2 (m)
FEDERAL COMMUNICATIONS COMMISSION CFR47 PART15.249

Low Power License-Exempt Radio communication Device
Intentional Radiator

for

Q Wireless, LLC.
5007 Lincoln Avenue, Suite 207
Lisle, IL 60532
630-663-9880

of

900 MHz Wireless Audio Transmitter

1038C1

FCC ID: RTB-1038

on

8/4/2004

Tested by

Andrew Mertinooke

Reviewed by

Clifton P. Brick

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TEST DESCRIPTION

1. TEST OBJECTIVE

To test the 900 MHz Wireless Audio Transmitter 1038C1 to
RSS 210 / Part 15 Subpart C Rules and write a report.

2. E.U.T. DESCRIPTION

GENERAL

The 900 MHz Wireless Audio Transmitter 1038C1 is a wireless
device with a single RCA input, used to remotely locate a
speaker, such as a subwoofer.

SERIAL NUMBERS:

Production Prototype

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TEST RESULTS AND CONCLUSIONS

PRODUCT TESTED - 900 MHz Wireless Audio Transmitter

MODEL NUMBER - 1038C1

RADIATED TEST RESULTS

The test results show that the emissions radiated from this equipment are in compliance with IC Rules RSS 210 / FCC Rules Part 15 Subpart C.

OCCUPIED BANDWIDTH & OUTPUT POWER

The test results show that the occupied bandwidth and output power of this equipment are in compliance with IC Rules RSS 210 / FCC Rules Part 15 Subpart C .

CONDUCTED TEST RESULTS

The test results show that the emissions conducted through the power line from this equipment are in compliance with IC Rules RSS 210 / FCC Rules Part 15 Subpart C.

ANALYSIS AND CONCLUSIONS

Based upon the radiated and conducted measurements we find that this equipment is within the limits of the IC Rules RSS 210 / FCC Rules Part 15 Subpart C. All results are based on a test of one sample, and represent other production units, only in as much as a sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required.

NOTES (Special conditions unique to this test)

None.

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TEST PROCEDURES

1. TEST EQUIPMENT

- A. HP 8546A (9 kHz - 6.5 GHz) EMI Receiver w/ RF Filter Section, S/N 3704A00323 / 3650A00360. Calibration Date 1-16-2004, calibrated annually.
- B. HP 8593E (9 kHz - 26.5 GHz) Spectrum Analyzer, S/N 3829A03887. Calibration Date 11-21-2003, calibrated annually.
- B. Com-Power Biconilog Antenna, Model AC220, S/N 25509. Calibration Date 7-16-2004, calibrated annually.
- C. Electro-Metrics Double Ridged Guide Antenna, Model EM-6961, S/N 6337. Calibration Date: 7-30-2004, calibrated annually.
- D. HP 1 - 26.5 GHz Preamplifier, Model 08449B, S/N 3008A01323. Calibration Date: 6-30-2004, calibrated annually.
- E. EMCO LISN, Model EM 3825/2, S/N 9109-1860. Calibration Date: 3-10-2004, calibrated annually.

2. FREQUENCY RANGE TO BE SCANNED.

- A. Radiated Test from 30 MHz to 40 GHz (or the 10th harmonic of the highest frequency whichever is lower).
- B. Conducted Test from 450 kHz to 30 MHz.

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3. TEST PROCEDURES.

Radiated test procedure:

The EUT, associated cables and peripheral devices are placed on the supporting table and any support equipment is placed off the site. The EUT is turned on and any necessary operating or test software installed and allowed to warm up. The EUT is pre-scanned in our ferrite tile lined chamber where it is rotated 360 degrees and examined in both horizontal and vertical polarization, all emission frequencies are identified and recorded. The EUT is then moved to the OATS and the frequency band from 30 MHz to 40 GHz is scanned, all frequencies identified in the chamber are investigated, as well as harmonic frequencies of the EUT. When an emission is found the emission is maximized by varying the bundle position of the connecting cables, the antenna height, the antenna polarization (vertical and horizontal) and the table orientation (360 degrees). The maximum reading is recorded and the next signal is searched for.

Conducted test procedure:

The power line of the EUT is connected to the LISN (Line Impedance Stabilization Network). A measurement of the emissions are made from the power line for both phase and neutral on the analyzer in the frequency range from 450 kHz to 30 MHz. The maximum readings are recorded for each phase.

All measurements are made according to the procedures defined in: "ANSI C63.4-1992 Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz, American National Standard for (ISBN 1-55937-215-5).

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RSS 210 TEST LIMITS

1. RSS 210 Section 6.2.2, Table 3 Radiation Limits (Quasi-Peak):
FCC Part 15.209, 15.235, 15.249 Radiation Limits (Quasi-Peak):

Frequency MHz	Distance meters	Limit dB μ V/m	Limit μ V/m
1.705 - 30	30	29.5*	30*
30 - 88	3	40.0	100
49.82 - 49.90	3	80.0*	10,000*
88 - 216	3	43.5	150
216 - 960	3	46.0	200
902 - 928	3	94.0*	50,000*
960 - 1000	3	54.0	500
1000 - 40000	3	54.0*	500*

*NOTE: Average Limits

2. RSS 210 Section 6.6a Conduction Limits (Quasi-Peak):
FCC Part 15.207 Conduction Limits (Quasi-Peak)

Frequency MHz	Limit dB μ V/m	Limit μ V/m
0.450 - 30.0	48.0	250

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TEST FACILITY DESCRIPTION

Compliance Worldwide is located on 357 Main Street in Sandown, New Hampshire. The conducted and radiated test sites, located at C.W. are used for Federal Communications Commission (FCC) testing and Industry Canada Testing. A site description is on file with the FCC in Columbia, MD USA. Site information is also on file with Industry Canada, anyone wishing to review this Test Facility Description is referred to file number **IC 3023**. This is currently on file at Industry Canada, 1241 Clyde Avenue, Ottawa, ON K2C 1Y3.

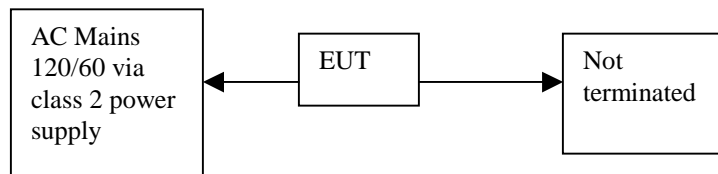
The radiated site is a 3/10 meter indoor site with an enclosure for the product and a basement for the personnel, support equipment and test equipment.

The conducted site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical metal wall required by EN 55022.

Both sites are designed to test products or systems 1.5 meter x 1.0 meter, floor standing or table top.

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**TEST SET UP
AND
PERIPHERAL CONNECTION INFORMATION**



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PLEASE NOTE - EUT (equipment under test) is 900 MHz Wireless Audio Transmitter.

The cables directly connected to this equipment are listed below.
Connection Descriptions

1. Power Cable connected to 9VDC 300mA Class 2 supply
(description)
EUT
(from device)
AC Mains 120V 60 Hz
(to device)
CABLE LENGTH 2m (S) SHIELDED or (U) UNSHIELDED U

2. RCA Cable
(description)
EUT audio input
(from device)
Not terminated
(to device)
CABLE LENGTH 1m (S) SHIELDED or (U) UNSHIELDED S

3. N/A
(description)

(from device)

(to device)
CABLE LENGTH _____ (S) SHIELDED or (U) UNSHIELDED _____

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RADIATED TEST RESULTS

Frequency Range: 30 - 9280 MHz.
Measurement Distance: 3.0 Meters.
Bandwidth: 120 kHz, Per ANSI C63.4-1992.*
Detector Functions: Peak, Quasi Peak, Average
Video Filter: 300 kHz
Table Height: 0.8 meters
Antenna Height Variation: 1 - 4 Meters.
Horizontal and Vertical Polarization investigated, worst case shown.

*Measurement Bandwidth is 1 MHz above 1 GHz

PLEASE SEE NEXT PAGE FOR RADIATED TEST DATA

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Radiated Tabular Data

Channel	Frequency (MHz)	Polarization (H/V)	Avg Amp (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)
1	1816.0	v	27.5	54.0	-26.5
1	2724.1	v	32.2	54.0	-21.8
1	3632.1	v	32.6	54.0	-21.4
1	4540.1	v	33.2	54.0	-20.8
1	5448.0	v	35.6	54.0	-18.4
3	1823.0	v	27.9	54.0	-26.1
3	2735.9	v	31.5	54.0	-22.5
3	3647.8	v	33.5	54.0	-20.5
3	4559.8	v	33.2	54.0	-20.8
3	5471.7	v	36.5	54.0	-17.5
6	1836.0	v	37.2	54.0	-16.8
6	2753.9	v	32.7	54.0	-21.3
6	3671.9	v	33.7	54.0	-20.3
6	4589.8	v	35.8	54.0	-18.2
6	5507.8	v	36.0	54.0	-18.0

All additional harmonics up to the 10th are greater than 20 dB below the limit.

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RADIATED OUTPUT POWER & OCCUPIED BANDWIDTH TEST RESULTS

Frequency Range: 902 - 928 MHz.
Measurement Distance: 3.0 Meters.
Bandwidth: As Noted, Per ANSI C63.4-1992.
Detector Functions: Peak, Quasi Peak, Average.
Video Filter: 300 kHz
Table Height: 0.8 meters
Antenna Height Variation: 1 - 4 Meters.
Horizontal and Vertical Polarization Measurements Taken, Worst Case Reported.

PLEASE SEE NEXT PAGE(S) FOR OCCUPIED BANDWIDTH RADIATED TEST DATA

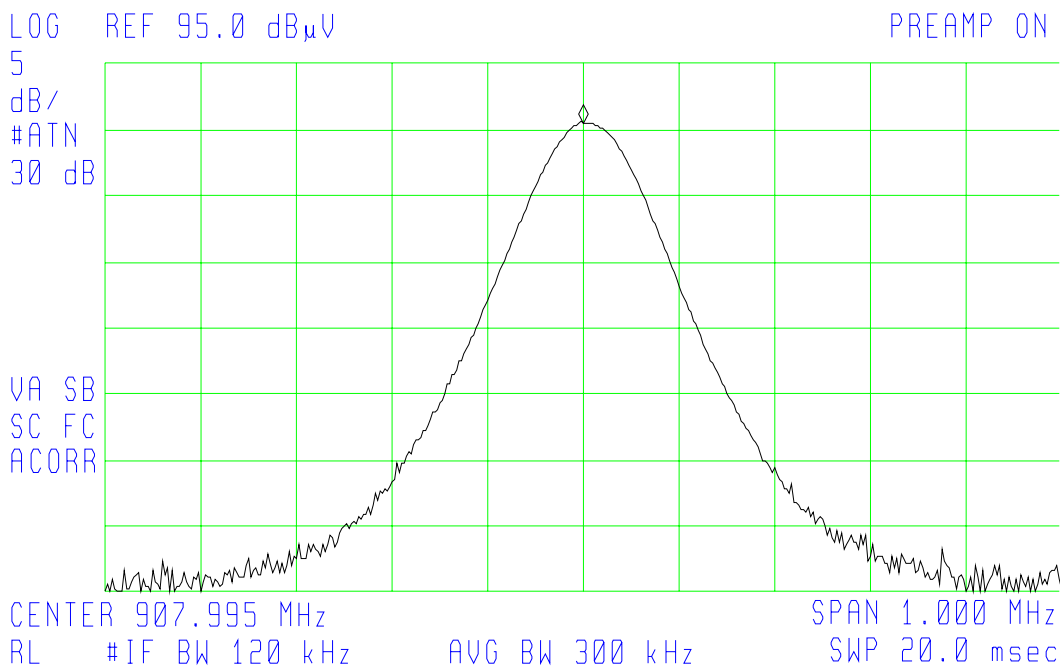
Bandwidth was taken using a 1 kHz tone at 4V P-P at the audio input. The range of 10 Hz to 3kHz was examined at 4V to find the maximum response, 1kHz was found to be the maximum.

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Channel 1 Output Power Plot

(h) 09:48:54 04 AUG 2004 LOW CHANNEL FIELD STRENGTH
156-04 QWIRELESS WIRELESS AUDIO TRANSMITTER

FREQ 908.0 MHz
PEAK 90.7 dB μ V
QP NOT SELECTED
AVG NOT SELECTED



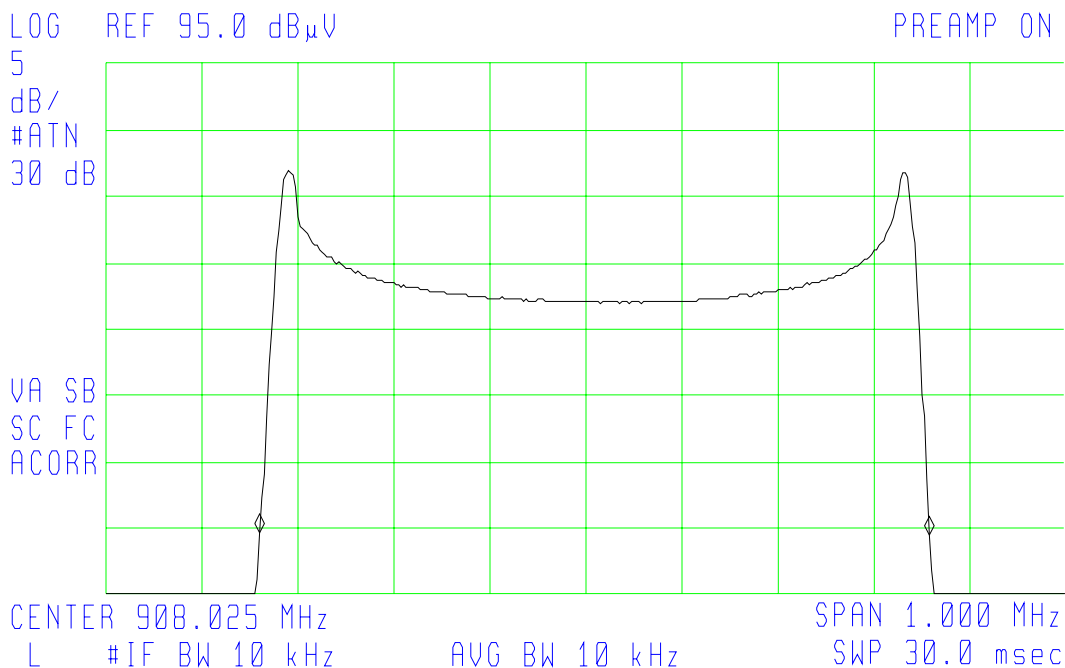
Freq (MHz)	Polarization (H/V)	Peak Amp (dB μ V/m)	Avg Limit (dB μ V/m)	Margin (dB)
907.995	V	90.7	94.0	-3.3

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Channel 1 Occupied Bandwidth Plot

(hp) 11:17:58 04 AUG 2004 LOW CHANNEL 26dB BANDWIDTH
156-04 QWIRELESS WIRELESS AUDIO TRANSMITTER

ACTV DET: PEAK
MEAS DET: PEAK
MKR Δ 698 kHz
-.16 dB



Channel	26dB BW (kHz)
1	698

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Channel 3 Output Power Plot

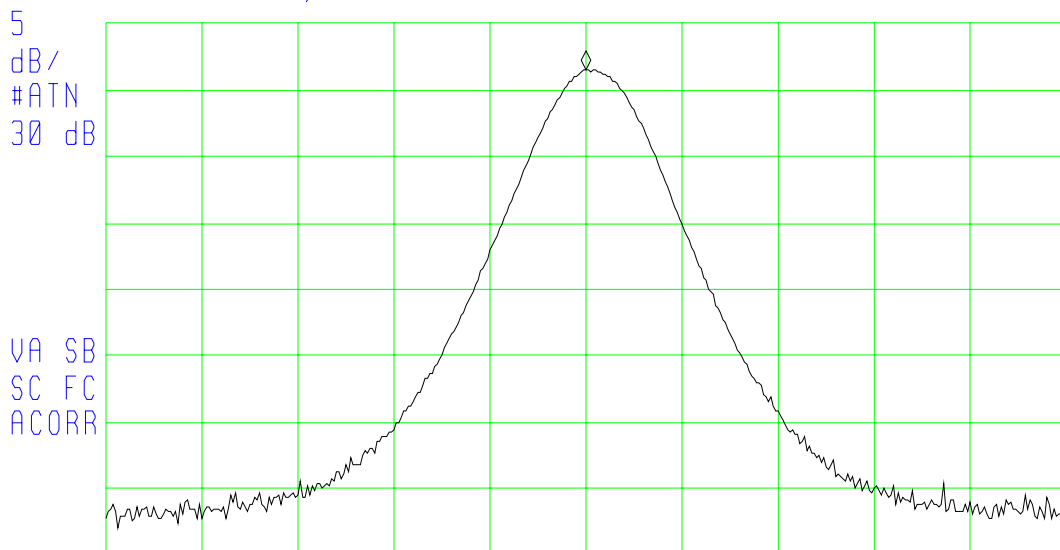
(h) 11:45:06 04 AUG 2004 MID CHANNEL FEILD STRENGTH
156-04 QWIRELESS WIRELESS AUDIO TRANSMITTER

ACTV DET: PEAK
MEAS DET: PEAK

MKR 911.962 MHz
90.45 dB μ V

LOG REF 94.0 dB μ V

PREAMP ON



CENTER 911.962 MHz

SPAN 1.000 MHz

L #IF BW 120 kHz

AVG BW 300 kHz

SWP 20.0 msec

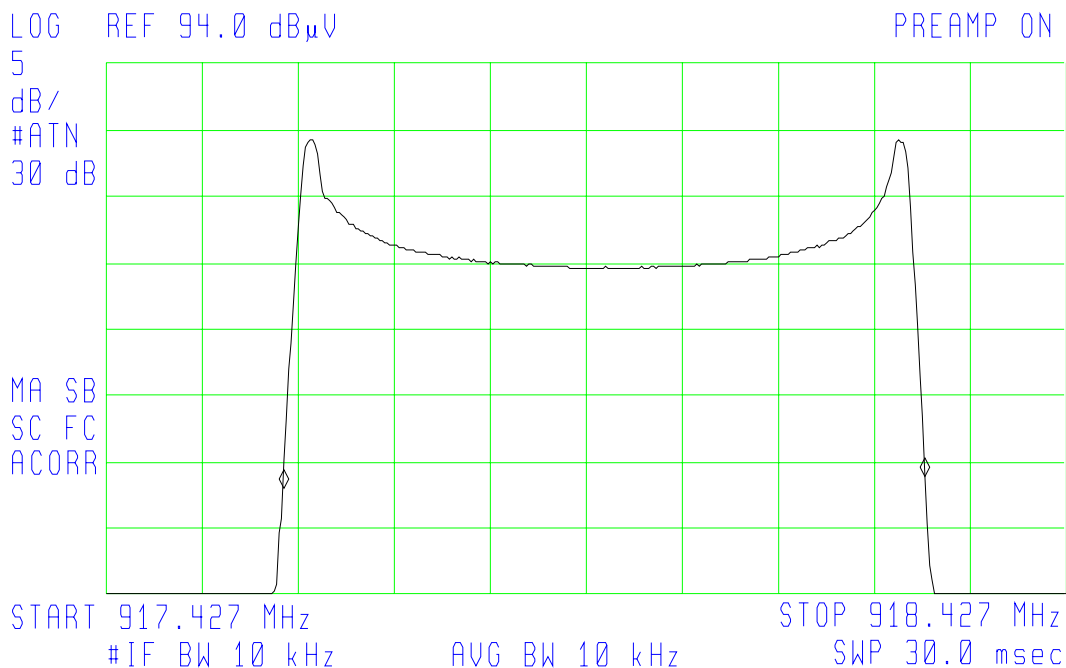
Freq (MHz)	Polarization (H/V)	Peak Amp (dB μ V/m)	Avg Limit (dB μ V/m)	Margin (dB)
911.962	V	90.45	94.0	-3.55

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Channel 3 Occupied Bandwidth Plot

(hp) 11:06:29 04 AUG 2004 HIGH CHANNEL 26dB BANDWIDTH
156-04 QWIRELESS WIRELESS AUDIO TRANSMITTER

ACTV DET: PEAK
MEAS DET: PEAK
MKR Δ 668 kHz
.88 dB



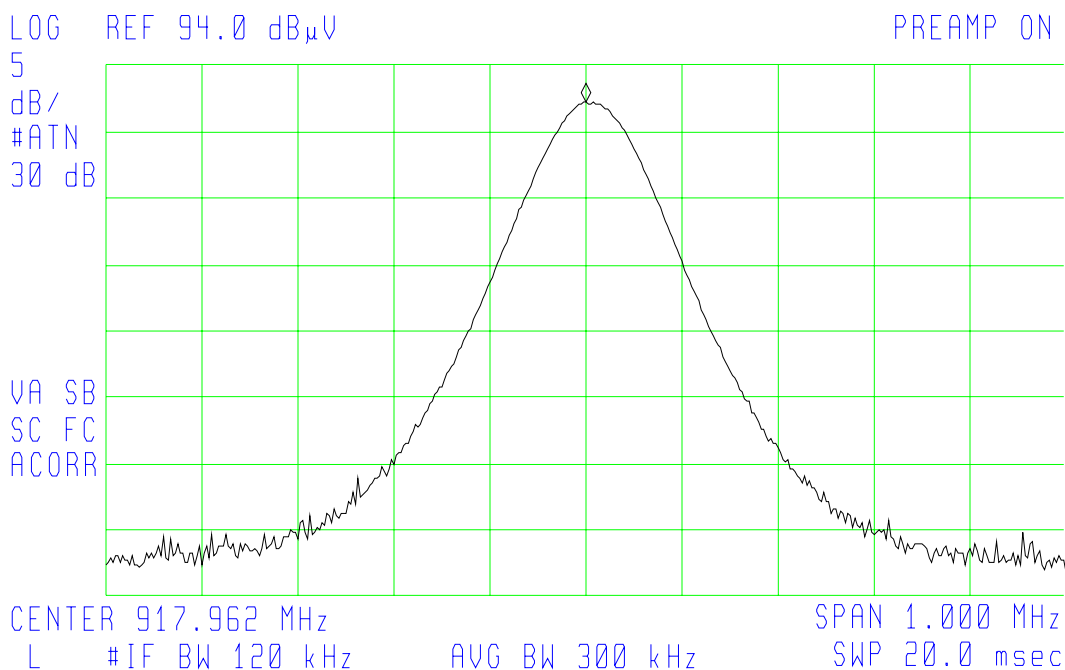
Channel	26dB BW (kHz)
3	668

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Channel 6 Output Power Plot

(h) 11:53:50 04 AUG 2004 HIGH CHANNEL FEILD STRENGTH
156-04 QWIRELESS WIRELESS AUDIO TRANSMITTER

ACTV DET: PEAK
MEAS DET: PEAK
MKR 917.962 MHz
91.14 dB μ V



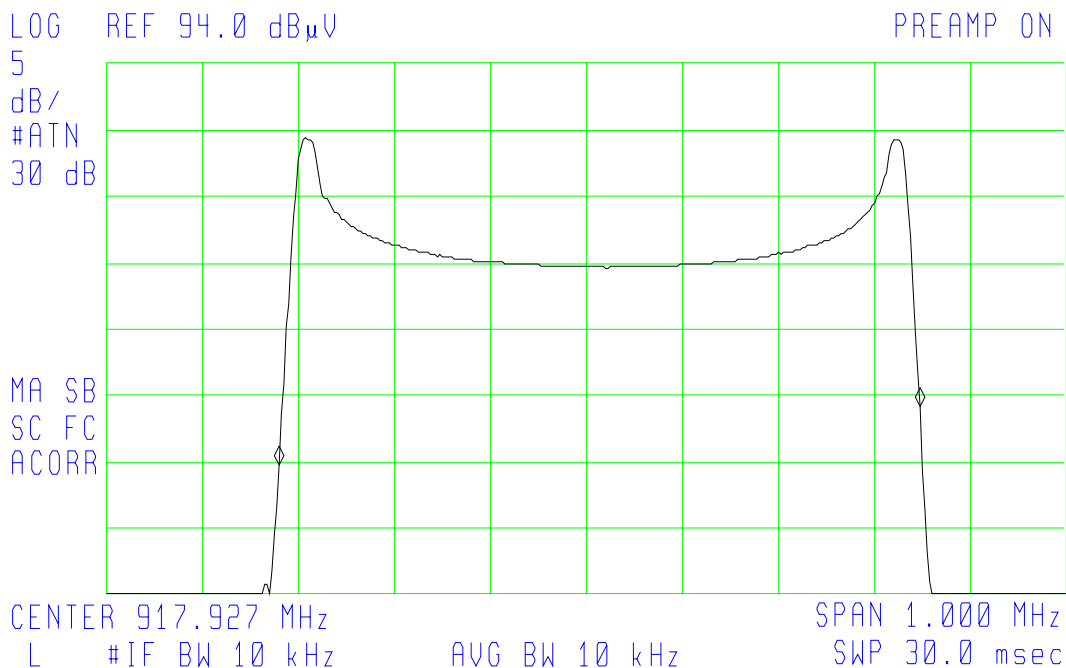
Freq (MHz)	Polarization (H/V)	Peak Amp (dB μ V/m)	Avg Limit (dB μ V/m)	Margin (dB)
917.962	V	91.14	94.0	-2.86

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Channel 6 Occupied Bandwidth Plot

(hp) 11:02:54 04 AUG 2004 HIGH CHANNEL 26dB BANDWIDTH
156-04 QWIRELESS WIRELESS AUDIO TRANSMITTER

ACTV DET: PEAK
MEAS DET: PEAK
MKR Δ 668 kHz
4.33 dB



Channel	26dB BW (kHz)
6	668

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CONDUCTED TEST RESULTS

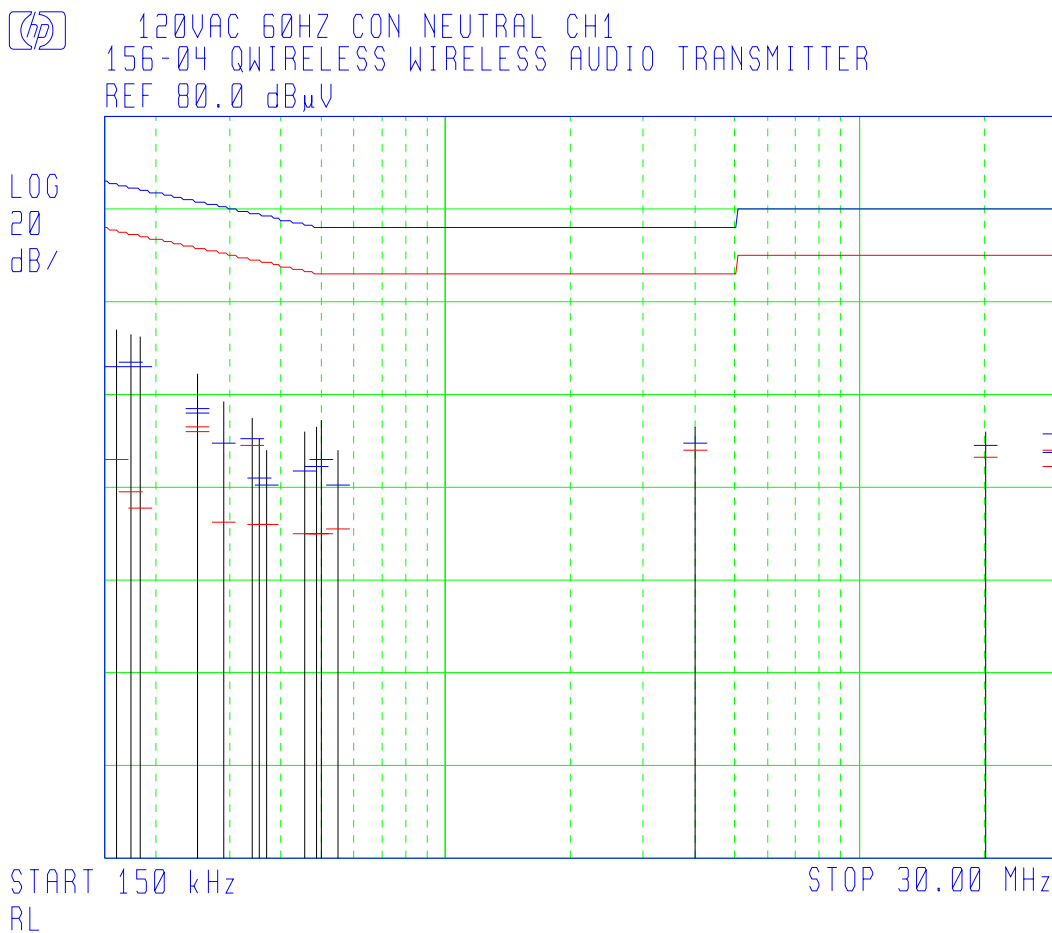
Frequency Range: 450 kHz to 30.0 MHz.
Bandwidth: 9 kHz per ANSI C63.4-1992.
Detector Functions: Peak, Quasi-Peak, Average
Table Height: 0.8 meters
Video Bandwidth: 30 kHz.

Phase and Neutral Measurements Taken.

PLEASE SEE NEXT PAGE FOR CONDUCTED TEST DATA. LOW MID AND HIGH CHANNELS EVALUATED, ALL ARE SIMILLAR.

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Conducted 120V 60Hz Neutral Data Log Plot



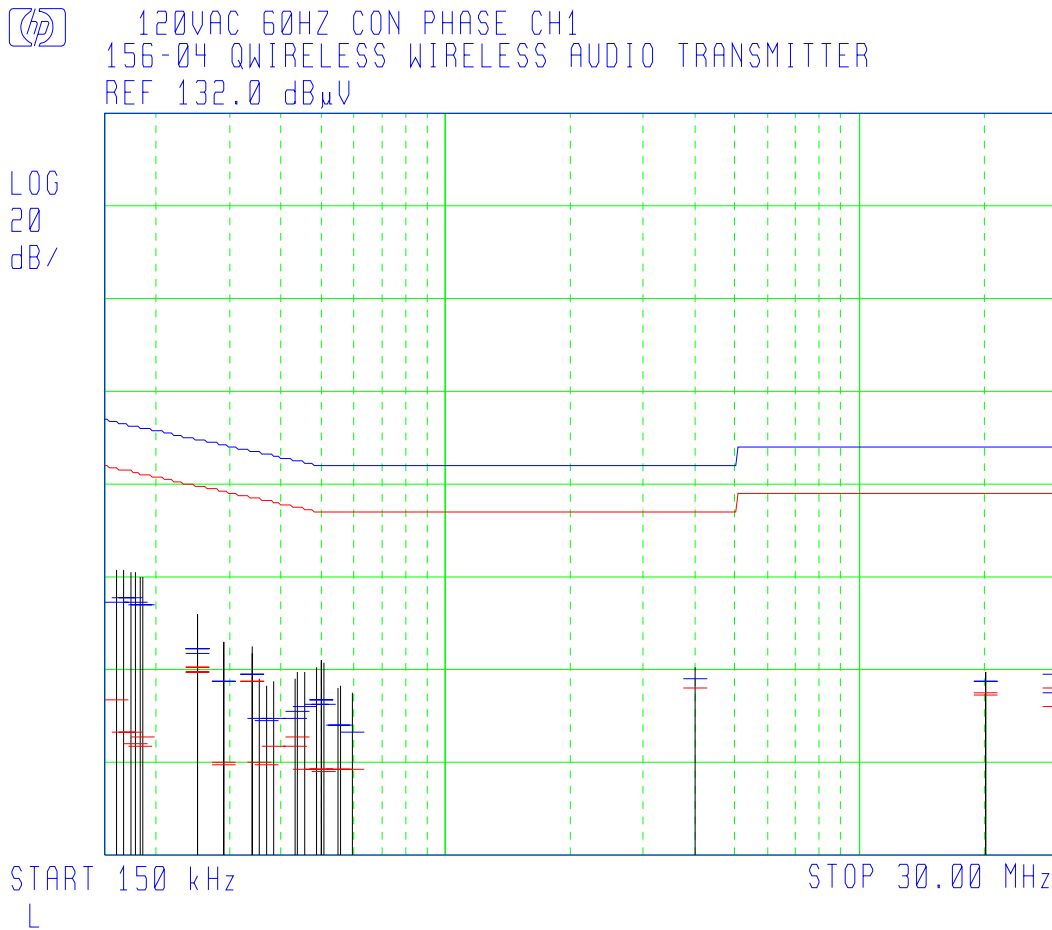
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Conducted 120V 60Hz Neutral Tabular Data

Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	Avg Amp (dBuV)	QP Limit (dBuV)	Avg Limit (dBuV)	QP Margin (dB)	Avg Margin (dB)
0.162220	34.19	26.88	5.95	65.40	55.40	-38.52	-49.45
0.175410	33.55	27.52	-0.86	64.76	54.76	-37.24	-55.62
0.183725	32.65	26.49	-4.06	64.35	54.35	-37.86	-58.41
0.252799	24.94	16.94	13.03	61.70	51.70	-44.76	-38.67
0.253871	24.38	16.52	12.71	61.67	51.67	-45.15	-38.96
0.293130	18.80	10.05	-7.22	60.48	50.48	-50.43	-57.70
0.344188	15.84	11.27	9.56	59.16	49.16	-47.89	-39.60
0.357939	10.53	1.96	-7.67	58.83	48.83	-56.87	-56.50
0.370115	8.82	0.97	-8.10	58.54	48.54	-57.57	-56.64
0.457976	12.54	4.14	-9.16	56.79	46.79	-52.65	-55.95
0.490454	13.28	4.94	-9.21	56.18	46.18	-51.24	-55.39
0.502656	14.77	5.98	-9.18	56.00	46.00	-50.02	-55.18
0.548515	8.61	0.40	-8.91	56.00	46.00	-55.60	-54.91
4.002044	13.31	10.37	8.48	56.00	46.00	-45.63	-37.52
20.001830	12.27	9.50	6.78	60.00	50.00	-50.50	-43.22
29.378891	11.66	7.90	4.65	60.00	50.00	-52.10	-45.35
29.385266	14.23	11.32	8.37	60.00	50.00	-48.68	-41.63

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Conducted 120V 60Hz Phase Data Log Plot



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Conducted 120V 60Hz Phase Tabular Data

Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	Avg Amp (dBuV)	QP Limit (dBuV)	Avg Limit (dBuV)	QP Margin (dB)	Avg Margin (dB)
0.162220	34.19	26.88	5.95	65.40	55.40	-38.52	-49.45
0.167175	34.05	27.75	-1.33	65.16	55.16	-37.41	-56.49
0.175410	33.55	27.52	-0.86	64.76	54.76	-37.24	-55.62
0.178396	33.46	27.33	-3.39	64.61	54.61	-37.28	-58.00
0.183725	32.65	26.49	-4.06	64.35	54.35	-37.86	-58.41
0.187346	32.42	26.11	-1.64	64.18	54.18	-38.07	-55.82
0.251970	24.51	16.16	11.92	61.73	51.73	-45.57	-39.81
0.252799	24.94	16.94	13.03	61.70	51.70	-44.76	-38.67
0.252890	24.45	16.56	12.02	61.70	51.70	-45.14	-39.68
0.253871	24.38	16.52	12.71	61.67	51.67	-45.15	-38.96
0.293043	18.67	9.79	-7.95	60.48	50.48	-50.69	-58.43
0.293130	18.80	10.05	-7.22	60.48	50.48	-50.43	-57.70
0.343901	17.39	11.30	9.66	59.17	49.17	-47.87	-39.51
0.344188	15.84	11.27	9.56	59.16	49.16	-47.89	-39.60
0.357939	10.53	1.96	-7.67	58.83	48.83	-56.87	-56.50
0.370115	8.82	0.97	-8.10	58.54	48.54	-57.57	-56.64
0.386539	10.06	2.03	-4.56	58.15	48.15	-56.12	-52.71
0.434124	10.88	2.41	-3.87	57.23	47.23	-54.82	-51.10
0.438635	12.35	3.37	-2.11	57.15	47.15	-53.78	-49.26
0.457976	12.54	4.14	-9.16	56.79	46.79	-52.65	-55.95
0.490454	13.28	4.94	-9.21	56.18	46.18	-51.24	-55.39
0.502295	14.75	6.07	-8.84	56.00	46.00	-49.93	-54.84
0.502656	14.77	5.98	-9.18	56.00	46.00	-50.02	-55.18
0.512325	13.38	4.80	-9.31	56.00	46.00	-51.20	-55.31
0.548515	8.61	0.40	-8.91	56.00	46.00	-55.60	-54.91
0.556446	9.38	0.31	-8.74	56.00	46.00	-55.69	-54.74
0.593385	7.45	-0.82	-8.86	56.00	46.00	-56.82	-54.86
4.002044	13.31	10.37	8.48	56.00	46.00	-45.63	-37.52
20.000524	12.58	9.82	7.20	60.00	50.00	-50.18	-42.80
20.001830	12.27	9.50	6.78	60.00	50.00	-50.50	-43.22
29.378891	11.66	7.90	4.65	60.00	50.00	-52.10	-45.35
29.385266	14.23	11.32	8.37	60.00	50.00	-48.68	-41.63

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NOTES AND COMMENTS

(Special conditions unique to this test)

None.