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FCC PART 74
WIRELESS MICROPHONE
TEST REPORT

APPLICANT	AZDEN CORPORATION
	1-12-17 KAMI-RENJAKU
	MITAKA, TOKYO JAPAN 181
FCC ID	BZB2000BT
PRODUCT DESCRIPTION	UHF WIRELESS MICROPHONE
DATE SAMPLE RECEIVED	7/6/2011
DATE TESTED	1/31/2011
TESTED BY	Nam Nguyen
APPROVED BY	Mario de Aranzeta
TIMCO REPORT NO.	1492AT11TestReport.doc
TEST RESULTS	☒ PASS ☐ FAIL

ACCREDITED
Certificate # 0955-01

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STATEMENT OF COMPLIANCE

This equipment has been tested in accordance with the standards identified in the referenced test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report and demonstrate that the equipment complies with the appropriate standards. No modifications were made to the equipment during testing in order to demonstrate compliance with these standards.

I attest that the necessary measurements were made by me or under my supervision, at Timco Engineering, Inc. located at 849 N.W. State Road 45, Newberry, Florida 32669 USA.

Authorized by: Mario de Aranzeta C.E.T.

Signature:

Function: Compliance Engineer/ Lab. Supervisor

Date: **7/25/11**

GENERAL INFORMATION
RULES PART 2.1033

DUT TECHNICAL DESCRIPTION

The test results relate only to the items tested.	
DUT Description	UHF WIRELESS MICROPHONE
FCC ID	BZB2000BT
Modulation	FM
Type of Emission	110KOF3E Bn = 2M+2DK M = 15000 D = 40 kHz (Peak Deviation) K = 1 Bn = 2(15k) + 2(40k)(1) = 110k
Frequency Range	(638.125 – 661.875) MHz
Test Frequencies	(638.125, 650.125, and 661.875) MHz
Power range and controls	DUT has no controls
Maximum Output Power	0.032 Watts
DUT Power Source	☐ 110–120Vac/50– 60Hz
	☐ DC Power
	☒ Battery Operated Exclusively
Test Item	☐ Prototype
	☒ Pre-Production
	☐ Production
Type of Equipment	☐ Fixed
	☐ Mobile
	☒ Portable

GENERAL INFORMATION

Test Facility	Timco Engineering, Inc. 849 NW State Road 45, Newberry, FL 32669
Test Condition	The temperature was 26ºC with a relative humidity of 50%.
Modifications	None
Test Exercise (e.g software description, test signal, etc.)	The DUT was placed in continuous transmit mode of operation.
Applicable Standards	TIA 603, FCC CFR 47 Parts 2 and 74

TEST PROCEDURES

Power Line Conducted Interference: The procedure used was TIA 603 using a 50uH LISN. Both lines were observed with the UUT transmitting. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

Bandwidth 20 dB: The measurements were made with the spectrum analyzer's resolution bandwidth (RBW) = 1 MHz and the video bandwidth (VBW) = 3 MHz and the span set as shown on plot.

Power Output: For a device with a fixed antenna, RF power is measured as ERP as the antenna is permanently attached. The substitution method was used as described in TIA-603-C.

Antenna Conducted Emissions: The RBW = 100 kHz, VBW = 300 kHz and the span set to 10.0 MHz and the spectrum was scanned from 30 MHz to the 10th Harmonic of the fundamental. Above 1 GHz the resolution bandwidth was 1 MHz and the VBW = 3 MHz and the span to 50 MHz.

Radiation Interference: The test procedure used was TIA 603 using an Agilent spectrum receiver with pre-selector. The bandwidth (RBW) of the spectrum TIA 603 receiver was 100 kHz up to 1 GHz and 1 MHz above 1 GHz with an appropriate sweep speed. The VBW above 1 GHz was 3 MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

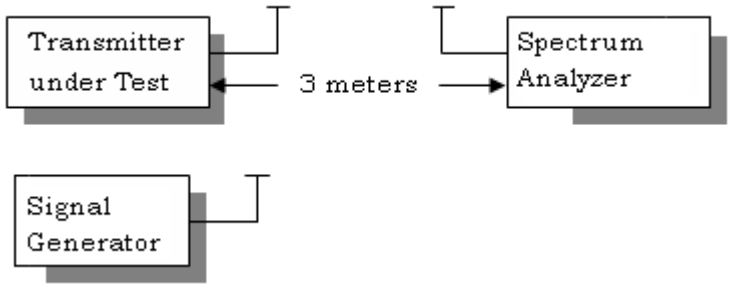
RF POWER OUTPUT

Rule Part No.: Part 2.1046(a), Part 74

Test Requirements:

Method of Measurement: For a device that has a permanently attached antenna, RF power is measured as ERP. The substitution method was used. With a nominal battery voltage, and the transmitter properly adjusted, the RF output measures:

Test Setup Diagram:



Test Data:

OUTPUT POWER: 0.032 W

Part 2.1033 (C)(8) DC Input into the final amplifier

(3.0V)(0. 3A) = 0.9 Watts

MODULATION CHARACTERISTICS

Rule Part No.: Part 2.1047(a)(b)

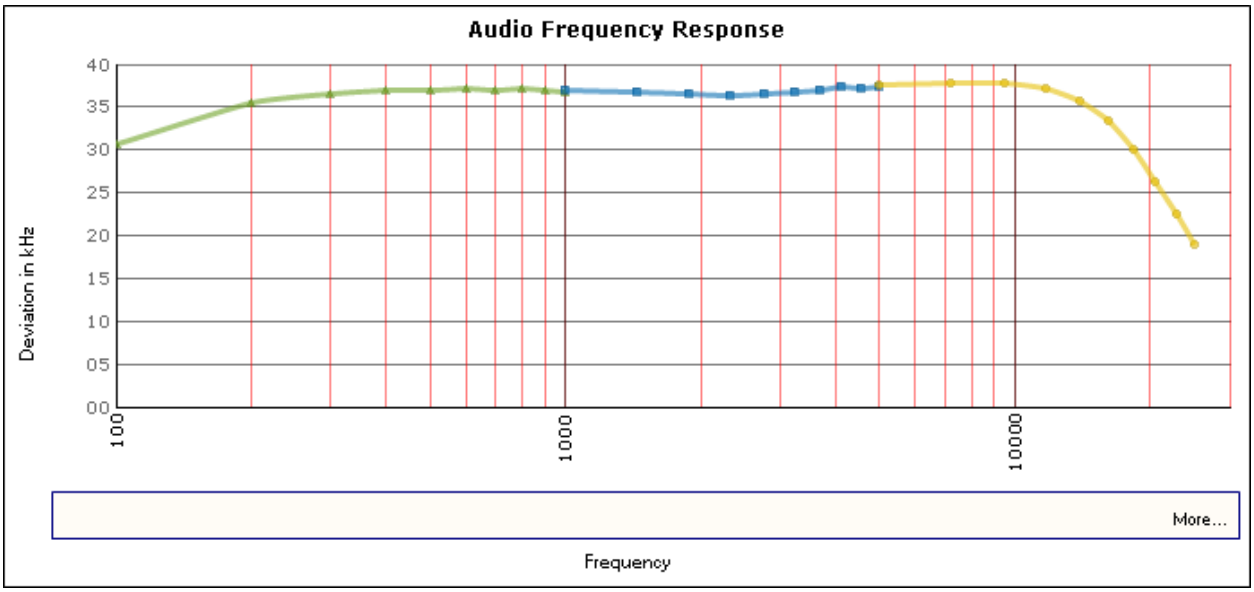
Test Requirements:

Method of Measurement:

Audio frequency response

The audio frequency response was measured in accordance with TIA/EIA Specification 603 with no exception. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 – 5000Hz shall be submitted. The audio frequency response curve is shown below.

AUDIO FREQUENCY RESPONSE PLOT



VOICE MODULATED COMMUNICATION EQUIPMENT

Part 2.1047(a) Voice modulated communication equipment: For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all the circuitry installed between the modulation limiter and the modulated stage shall be submitted.

The audio low pass filter is not required in this unit.

AUDIO INPUT VERSUS MODULATION

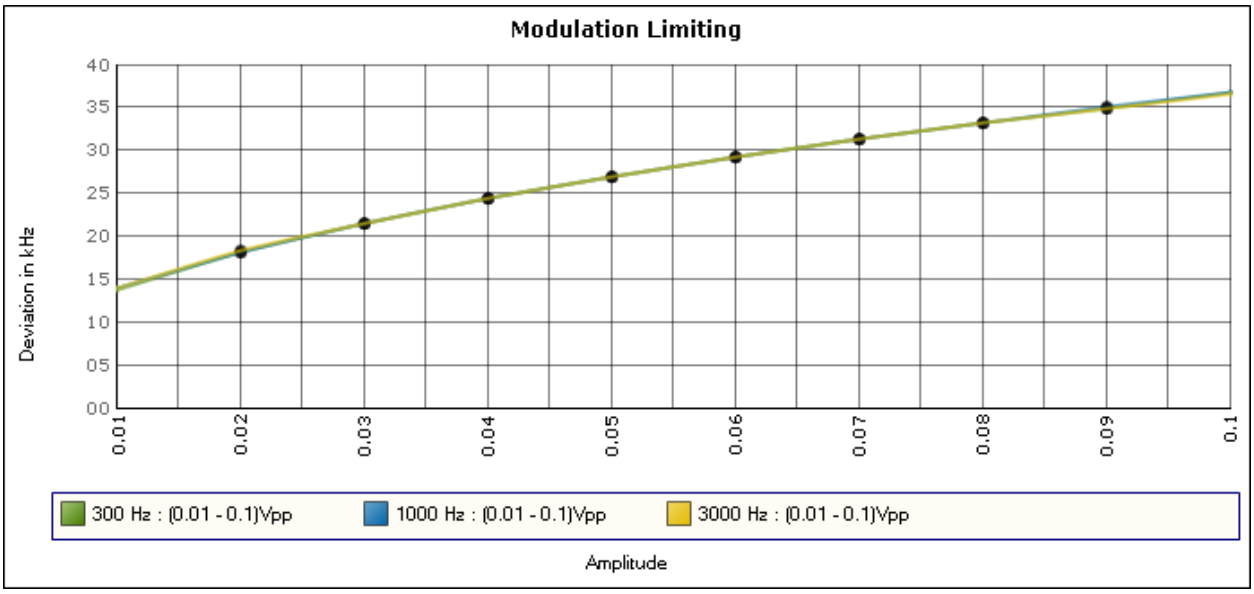
Rule Part No.: Part 2.1047(b) & 74

Test Requirements:

Method of Measurement: **Modulation cannot exceed 100%,** The audio input level needed for a particular percentage of modulation was measured in accordance with ANSI/TIA 603-C: 2004. The audio input curves versus modulation are shown below. Curves are provided for audio input frequencies of 300, 1000, and 3000 Hz.

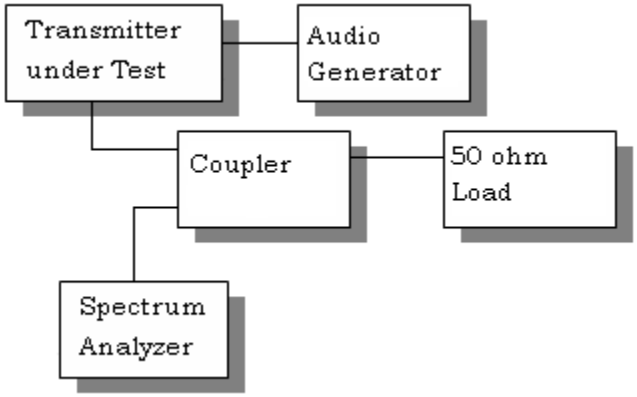
Test data:

Modulation Limiting Plot



OCCUPIED BANDWIDTH

Data in the plots show that all sidebands between 50 & 100% for the authorized bandwidth are attenuated by at least 25dB. From 100 to 250% of the authorize3d bandwidth they are attenuated by at least 35dB and beyond 250% 43 log(Po) dB. The plot shows the transmitter modulated with 15000 Hz(the highest modulation frequency), adjusted for 50% modulation plus 16 dB. The spectrum analyzer was set with the unmodulated carrier at the top of the screen. The test procedure diagram and occupied bandwidth plot follows.

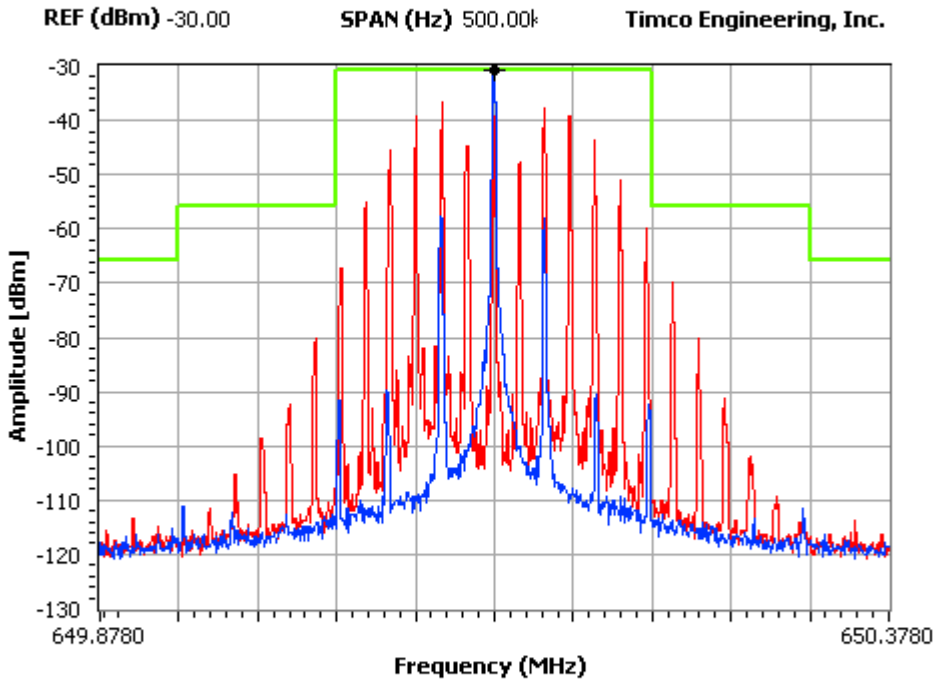


OCCUPIED BANDWIDTH MEASUREMENT

OCCUPIED BANDWIDTH PLOT

NOTES:

AZDEN CORPORATION - UHF WIRELESS MICROPHONE
OCCUPIED BANDWIDTH PLOT



SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)

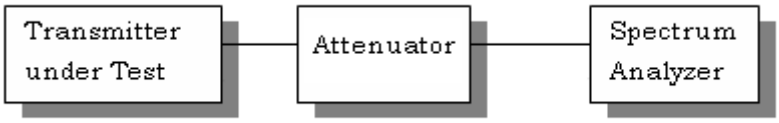
Rule Part No.: Part 2.1051(a)

Requirements: Emissions must be 43 +10log(Po) dB below the mean power output of the transmitter.

43 + 10 log(0.032) = 28.05 dBc

Method of Measurement: The carrier was modulated 100% using a 2500 Hz tone. The spectrum was scanned from 0.4 to at least the 10th harmonic of the fundamental. The measurements were made in accordance with standard ANSI/TIA 603-C: 2004.

Method of Measuring Conducted Spurious Emissions



Test Data:

TF	EF	dB below carrier		TF	EF	dB below carrier		TF	EF	dB below carrier
638.13	1276.25	53.3		650.13	1300.25	54.6		661.88	1323.75	55.7
	1914.38	57.4			1950.38	56.4			1985.63	57.2
	2552.50	59.2			2600.50	59.4			2647.50	61.7
	3190.63	56.2			3250.63	55.9			3309.38	58.5
	3828.75	59.5			3900.75	56.6			3971.25	52.4
	4466.88	56.7			4550.88	55.3			4633.13	57.2
	5105.00	63.8			5201.00	64			5295.00	61.9
	5743.13	62			5851.13	62.9			5956.88	64.8
	6381.25	62.7			6501.25	60.7			6618.75	62.5

FIELD STRENGTH OF SPURIOUS EMISSIONS

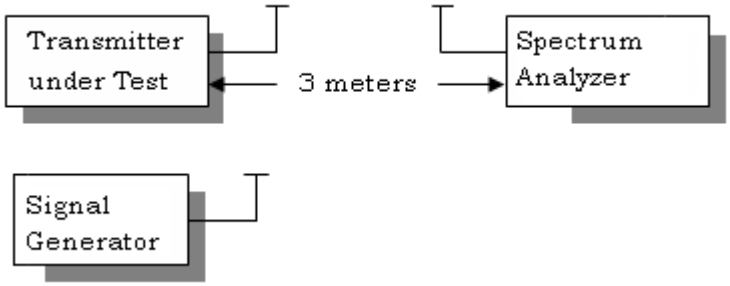
Rule Parts. No.: Part 2.1053

Requirements: Emissions must be 43 +10log(Po) dB below the mean power output of the transmitter.

43 + 10 log(0.032) = 28.05 dBc

METHOD OF MEASUREMENTS: The tabulated data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 MHz to at least the tenth harmonic of the fundamental. This test was conducted per ANSI/TIA 603-C: 2004 using the substitution method. Measurements were made at the test site of Timco Engineering, Inc. located at 849 NW State Road 45, Newberry, FL 32669.

Test Setup Diagram:



Test Data:

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
638.13	0	0
1276.25	V	54.66
1914.38	V	62.44
2552.50	V	59.33
3190.63	V	55.43
3828.75	V	57.93
4466.88	V	61.04
5105.00	V	68.86
5743.13	V	55.87
6381.25	V	63.67

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
650.13	0	0
1300.25	V	61.57
1950.38	V	65.41
2600.50	V	64.11
3250.63	V	55.70
3900.75	V	62.39
4550.88	V	60.38
5201.00	V	67.16
5851.13	V	57.03
6501.25	V	60.57

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
661.88	0	0
1323.75	V	54.47
1985.63	V	65.39
2647.50	V	63.07
3309.38	V	55.96
3971.25	V	59.42
4633.13	V	56.99
5295.00	V	68.23
5956.88	V	61.11
6618.75	V	60.59

FREQUENCY STABILITY

Rule Parts. No.: Part 2.1055, Part 74.861

Requirements: Temperature and voltage tests were performed to verify that the frequency remains within the .0050%,(50 ppm)

Method of Measurements: ANSI/TIA 603-C: 2004.

The test was conducted as follows: The transmitter was placed in the temperature chamber at 25 °C and allowed to stabilize for one hour. The transmitter was keyed ON for one minute during which four frequency readings were recorded at 15-second intervals. The worse case number used in the table below. The assigned channel frequency was considered to be the reference frequency. The temperature was then reduced to -30 °C after which the transmitter was again allowed to stabilize for one hour. The transmitter was keyed ON for one minute, and again frequency readings were noted at 15-second intervals. The worst-case number was again used in the table below. This procedure was repeated in 10-degree increments up to + 50 °C.

Test Data:

Assigned Frequency (Ref. Frequency) (MHz)		**650.125356**
Temperature (ºC)	**Frequency (MHz)**	**Frequency Stability (PPM)**
-30	650.118602	-10.39
-20	650.123002	-3.62
-10	650.125626	0.42
0	650.126712	2.09
+10	650.126631	1.96
+20	650.125906	0.85
+30	650.124931	-0.65
+40	650.124085	-1.96
+50	650.123858	-2.30

Assigned Frequency (Ref. Frequency) (MHz)		
Battery %	**Frequency (MHz)**	**Frequency Stability (PPM)**
-15%	650.125395	0.06
0	650.125356	0.00
+15%	650.125322	-0.05

EMC EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	Listed 3/10/10	3/10/12
AC Voltmeter	HP	400FL	2213A14499	CAL 3/23/09	3/23/12
Antenna: Dipole Kit	Electro-Metrics	TDA-30/1-4	153	CHAR 6/10/09	6/10/12
Frequency Counter	HP	5385A	3242A07460	CAL 5/26/09	5/26/12
Hygro-Thermometer	Extech	445703	0602	CAL 1/30/09	1/30/12
Modulation Analyzer	HP	8901A	3435A06868	CAL 5/26/09	5/26/12
Digital Multimeter	Fluke	FLUKE-77-3	79510405	CAL 5/18/09	5/18/12
Analyzer Tan Tower Preamplifier	HP	8449B-H02	3008A00372	CAL 11/21/09	11/21/11
Analyzer Tan Tower Quasi-Peak Adapter	HP	85650A	3303A01690	CAL 11/22/09	11/22/11
Analyzer Tan Tower RF Preselector	HP	85685A	3221A01400	CAL 11/21/09	11/21/11
Analyzer Tan Tower Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 11/24/09	11/24/11
Temperature Chamber	Tenney Engineering	TTRC	11717-7	CHAR 4/25/10	4/25/12