BW TECHNOLOGIES TEST REPORT

FOR THE

PERSONNEL ALERT BASE, PA-BASE-900

FCC PART 15 SUBPART C SECTION 15.247,
SUBPART B SECTION 15.109, CLASS A AND RSS-210

COMPLIANCE

DATE OF ISSUE: AUGUST 23, 2005

PREPARED FOR:

BW Technologies
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PREPARED BY:

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P.O. No.: 35361
W.O. No.: 83628

Date of test: August 1-4, 2005

Report No.: FC05-035

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	August 1-4, 2005
DATE OF RECEIPT:	August 1, 2005
MANUFACTURER:	BW Technologies 2840 - 2nd Avenue S.E. Calgary, Alberta T2A-7X9 Canada
REPRESENTATIVE:	Jim Turner
TEST LOCATION:	CKC Laboratories, Inc. 5046 Sierra Pines Drive Mariposa, CA 95338
TEST METHOD:	ANSI C63.4 (2003), DA 02-2138 August 30, 2002, DA 00-705 March 30, 2000, KDB Publication No. 558074 and RSS-212
PURPOSE OF TEST:	To demonstrate the compliance of the Personnel Alert Base, PA-BASE-900, with the requirements for FCC Part 15 Subpart C Section 15.247 devices.

FCC TO CANADA STANDARD CORRELATION MATRIX

Canadian Standard	Canadian Section	FCC Standard	FCC Section	Test Description
RSS 210	5.5	47CFR	15.203	Antenna Connector Requirements
RSS 210	6.2.1	47CFR	15.209	General Radiated Emissions Requirement
RSS 210	6.3	47CFR	15.205	Restricted Bands of Operation
RSS 210	6.4	47CFR	15.215(c)	Frequency Stability Recommendation
RSS 210	6.5	47CFR	15.35(c)	Pulsed Operation
RSS 210	6.6	47CFR	15.207	AC Mains Conducted Emissions Requirement
RSS 210	6.2.2(o)(a1)	47CFR	15.247(a)(1)	Minimum Channel Bandwidth
RSS 210	6.2.2(o)(a1)	47CFR	15.247(g)	Hopping Sequence
RSS 210	6.2.2(o)(a1)	47CFR	15.247(h)	Incorporation of Intelligence
RSS 210	6.2.2(o)(a2)	47CFR	15.247(a)(1)(i)	Average Time of Occupancy
RSS 210	6.2.2(o)(a2)	47CFR	15.247(b)(2)	RF Power Output
RSS 210	6.2.2(o)(e1)	47CFR	15.247(d)	Spurious Emissions
	IC 3082-D		784962	Site File No.

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply. Conducted emissions not required for this device because this device is powered by a dedicated, isolated industrial whole-building power supply.

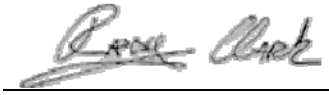
APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:

Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:



Randy Clark, EMC Engineer

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The customer declares the EUT tested by CKC Laboratories was representative of a production unit.

FCC 15.31(e) Voltage Variations

No detectable change was observed for power output with variations of input power ±15% of nominal DC input.

FCC 15.31(m) Number Of Channels

This device was tested on three channels.

FCC 15.33(a) Frequency Ranges Tested

15.109 Radiated Emissions: 30 MHz – 10 GHz
15.111 Antenna Conducted Emissions: 1 MHz – 10 GHz
15.247 Radiated Emissions: 1 MHz – 10 GHz

FCC SECTION 15.35: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	10 GHz	1 MHz

FCC 15.203 Antenna Requirements

See customer declaration for compliance to FCC 15.203 antenna requirements.

FCC 15.205 Restricted Bands

The fundamental operating frequency lies outside the restricted bands and therefore complies with the requirements of Section 15.205 of the FCC rules. Any spurious emission coming from the EUT was investigated to determine if any portion lies inside the restricted band. If any portion of a spurious emissions signal was found to be within a restricted band, investigation was performed to ensure compliance with Section 15.209.

Eut Operating Frequency

The EUT was operating at 902-928 MHz.

EQUIPMENT UNDER TEST

Personnel Alert Base

Manuf: BW Technologies
Model: PA-BASE-900
Serial: 05182196
FCC ID: R9O-PAHE-10 (pending)

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

DC Power Supply

Manuf: Topward Electric Instruments Co., Ltd.
Model: TPS-2000
Serial: 920035
FCC ID: NA

REPORT OF MEASUREMENTS

The following tables report the six highest worst case levels recorded during the tests performed on the EUT. All readings taken are peak readings unless otherwise noted. The data sheets from which these tables were compiled are contained in Appendix C.

Table 1: FCC 15.109 Six Highest Radiated Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
79.600	39.3	6.7	-27.0	2.0		21.0	40.0	-19.0	V
79.640	38.1	6.7	-27.0	2.0		19.8	40.0	-20.2	V
80.900	40.3	6.8	-27.0	2.0		22.1	40.0	-17.9	V
80.900	37.2	6.8	-27.0	2.0		19.0	40.0	-21.0	V
83.800	39.4	7.3	-26.9	2.1		21.9	40.0	-18.1	V
109.220	36.3	10.2	-26.8	2.4		22.1	43.5	-21.4	V

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart B Section 15.109 Class A
Test Distance: 3 Meters

NOTES: V = Vertical Polarization

COMMENTS: EUT is a gas detection system operating in the 902-928MHz frequency band. Equipment is a frequency hopping spread spectrum radio operating in continuous receive mode. Personnel Alert Base is mounted on test wall as per configuration typically seen in field installations. DC/Signal cable is routed through a conduit, which is grounded to the ground plane in accordance with the NEC and CEC requirements for explosion proof equipment. DC power to EUT is routed from support power supply. EUT drain wire is tied to ground plane. The operation of the RF deck is verified by confirming duplex traffic with the badge prior to the emissions test commencing. Operating Frequency: Receive Mode. Frequency Range Investigated: 30MHz - 10GHz. Temperature: 29ºC, Relative Humidity: 38%. **No EUT emissions detected within 20dB of the limit in the frequency range above 1GHz.**

Table 2: FCC 15.111 Six Highest Radiated Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB		Cable dB		CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
6992.800	30.8	0.0		1.9		32.7	50.0	-17.3	R
7055.800	30.7	0.0		1.9		32.6	50.0	-17.4	R
7064.200	30.6	0.0		1.9		32.5	50.0	-17.5	R
7148.200	31.7	0.0		1.9		33.6	50.0	-16.4	R
7345.600	29.2	0.0		1.9		31.1	50.0	-18.9	R
7828.600	29.0	0.0		2.0		31.0	50.0	-19.0	R

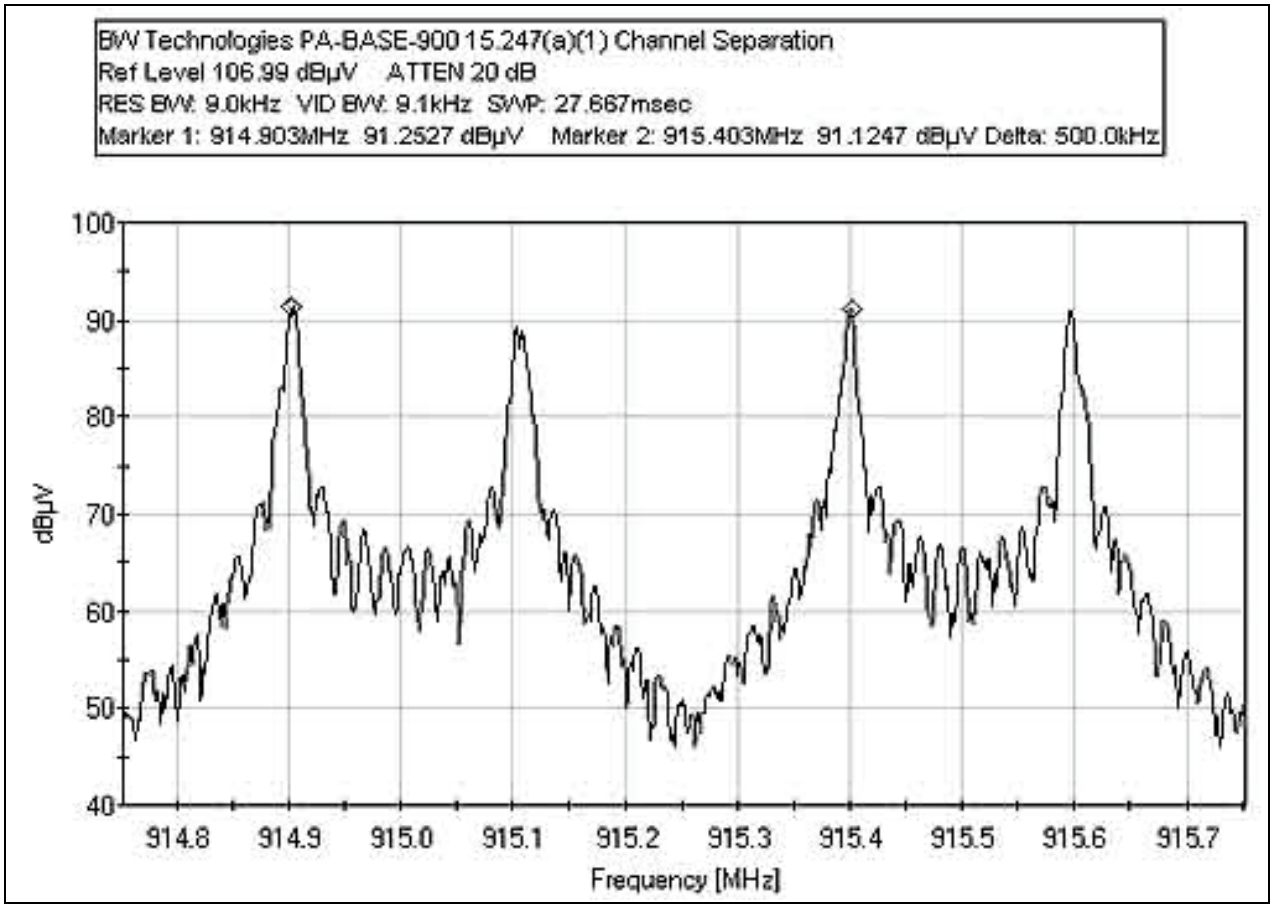
Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart B Section 15.111

NOTES: R = RF Output

COMMENTS: EUT is a gas detection system operating in the 902-928MHz frequency band. Equipment is a frequency hopping spread spectrum radio operating in continuous receive mode. Equipment is connected directly to the spectrum analyzer. Operating Frequency: Receive Mode. Frequency Range Investigated: 1MHz to 10GHz. Temperature: 23ºC, Relative Humidity: 38%.

FCC 15.247(a)(1) CHANNEL SEPARATION

Test Conditions: EUT is a gas detection system operating in the 902-928MHz frequency band. Equipment is a frequency hopping spread spectrum radio operating continuously with modulation enabled. Equipment is connected directly to the spectrum analyzer through suitable attenuation. Frequency Range Investigated: Carrier. Temperature: 23ºC, Relative Humidity: 38%.



FCC 15.247(a)(1)(i) AVERAGE TIME OF OCCUPANCY

In a single pulse, the equipment transmits for 5.06ms. Pulse repetition on a single channel appears at 924ms. Within a ten second window, a single pulse appears eight times. Therefore, 8 * 5.06ms = 40.48ms or 0.04 seconds within a 10 second period.

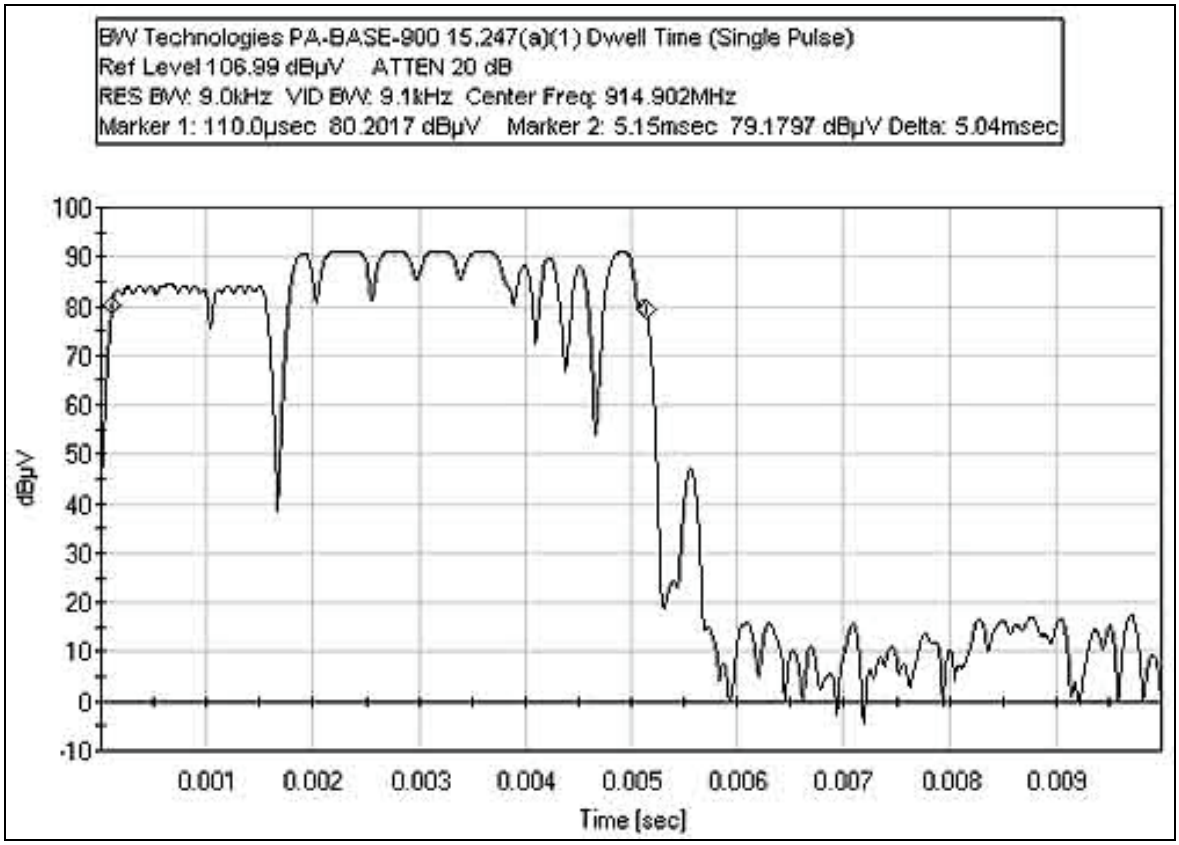
Single Pulse Duration	# pulses in 10 seconds	Total on time	Limit	Pass/Fail
5.06ms	8	0.04 seconds	0.4 seconds	Pass

DA 00-705 Dwell Time Correction Factor

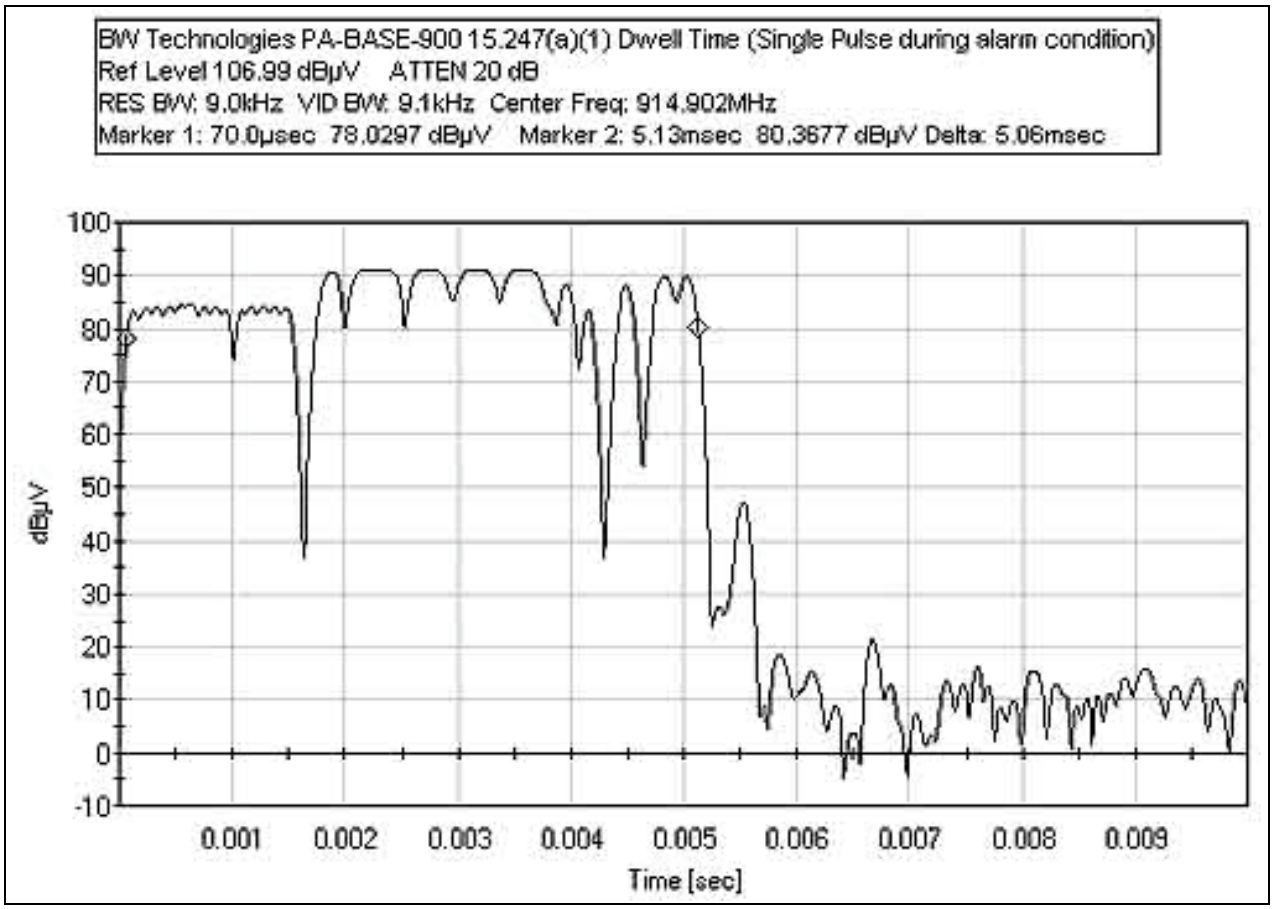
In a single pulse, the equipment transmits for 5.06ms. Pulse repetition on a single channel appears at 924ms. Therefore, the maximum pulse duration within a 100ms is 5.06ms.

$$DTCF = 20LOG\left(\frac{5.06ms}{100ms}\right) = -25.92dB$$

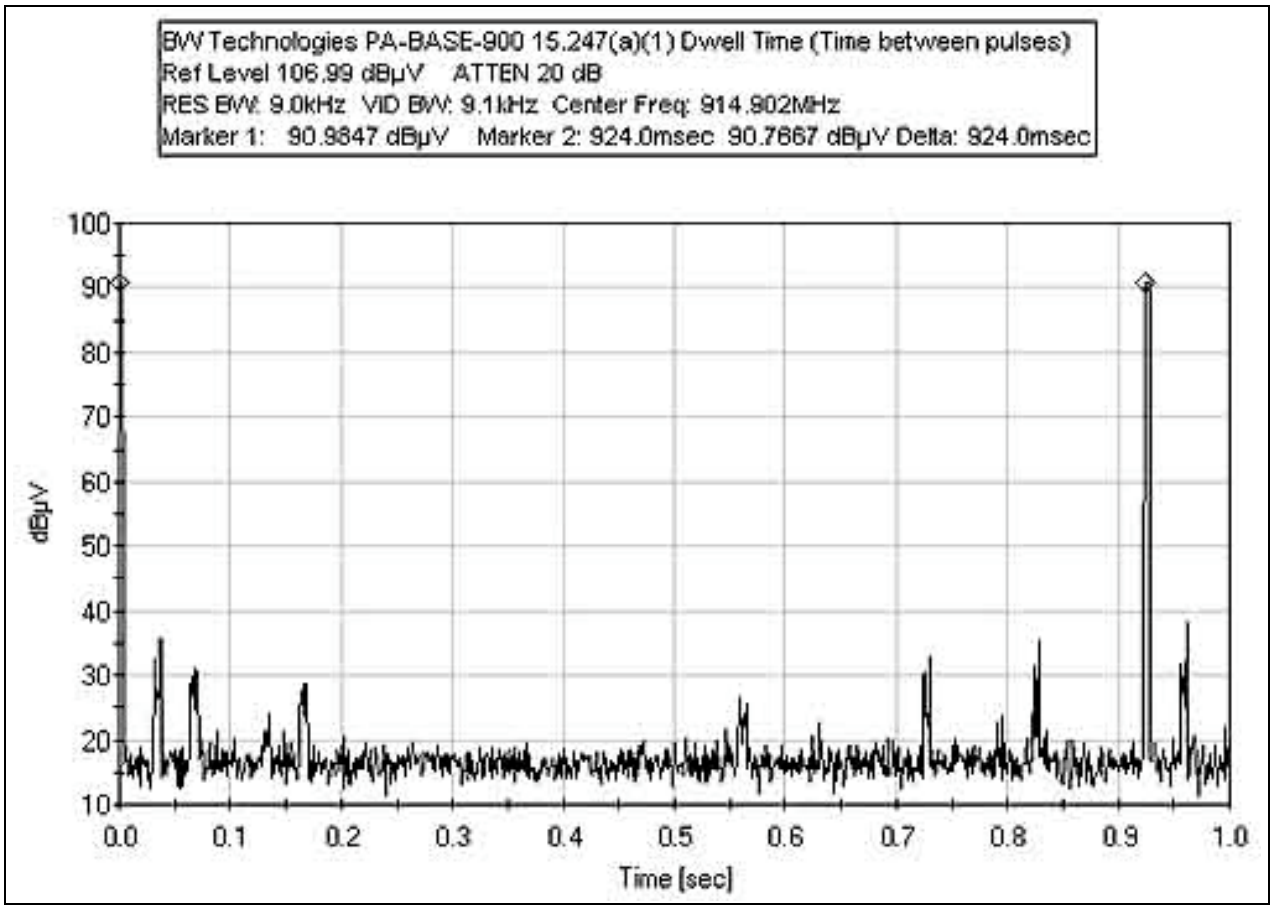
FCC 15.247(a)(1) DWELL TIME 1 (SINGLE)



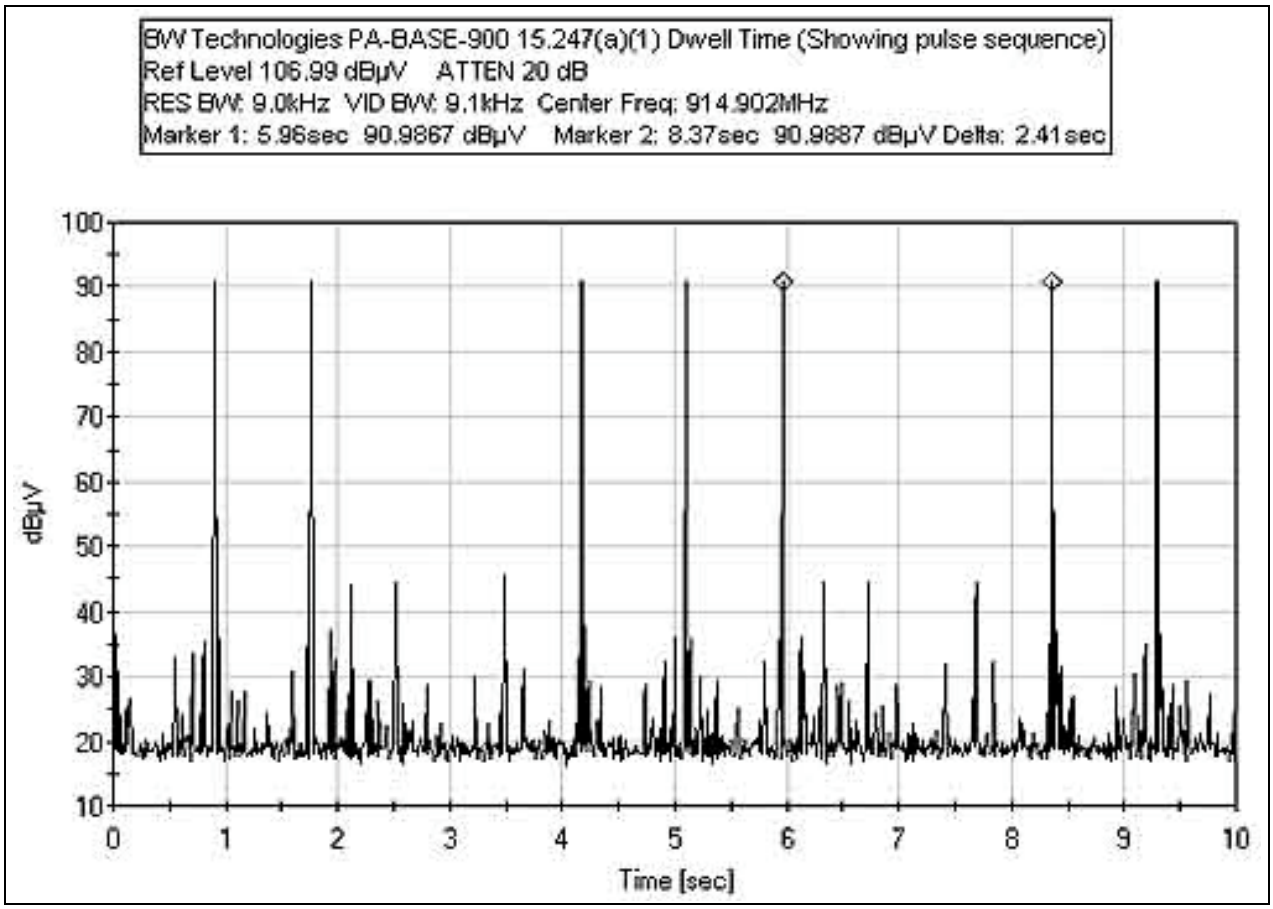
FCC 15.247(a)(1) DWELL TIME 1 (SINGLE) WITH ALARM



FCC 15.247(a)(1) DWELL TIME 2 (DUAL)



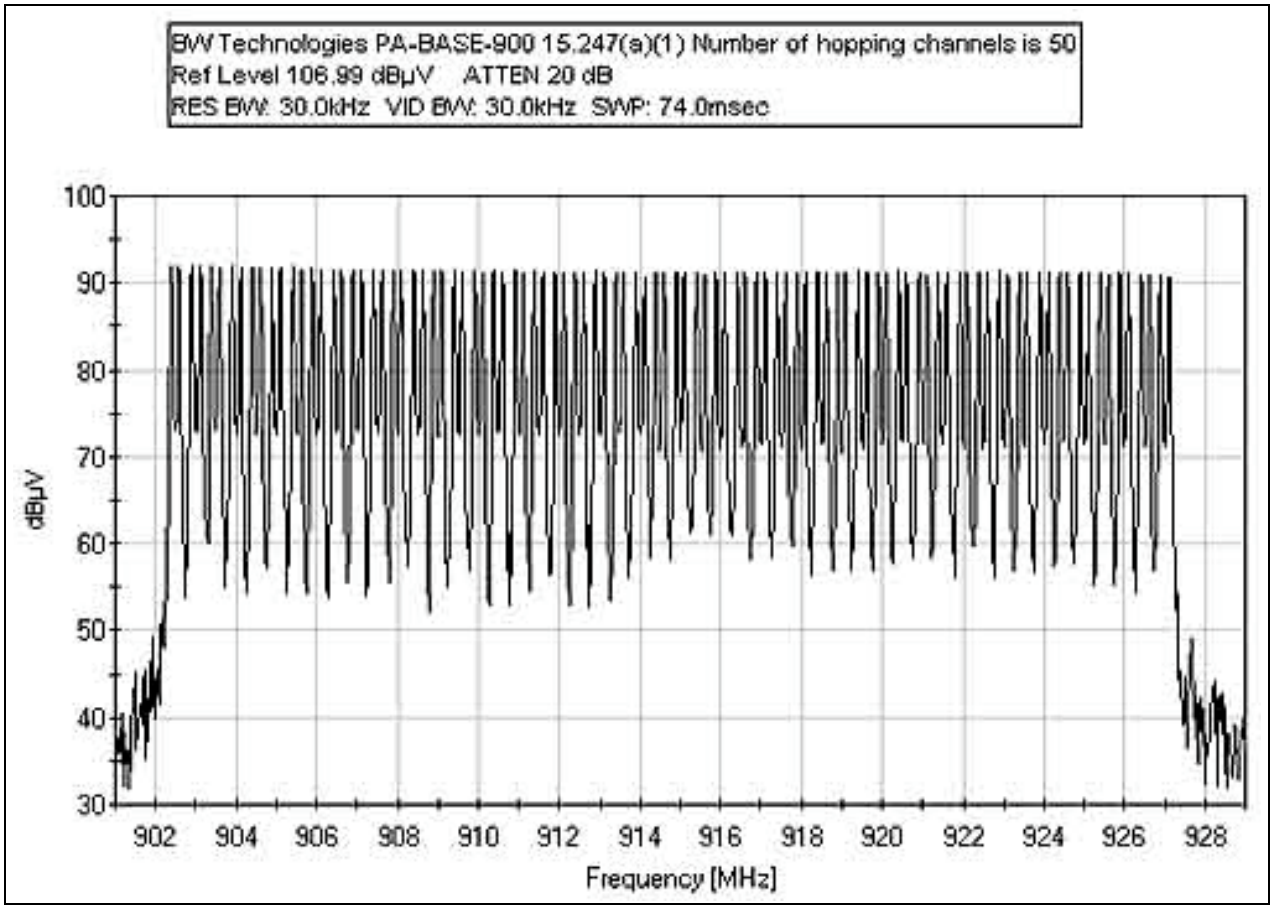
FCC 15.247(a)(1) DWELL TIME 3 (PULSE SEQUENCE)



FCC 15.247(a)(1) NUMBER OF HOPPING CHANNELS

The equipment incorporates 50 hopping channels. Due to the low resolution bandwidth of the provided plot, the 2-level FSK modulation appears as a double peak. Each set of peaks is a single carrier channel (see occupied bandwidth plot).

OBW	# Channels	Limit Min	Pass/Fail
246.1kHz	50	50	Pass



FCC 15.247(a)(1) OCCUPIED BANDWIDTH

The 20dB bandwidth of the equipment is 246.1kHz.

OBW	Limit Max	Pass / Fail
246.1kHz	500kHz	Pass

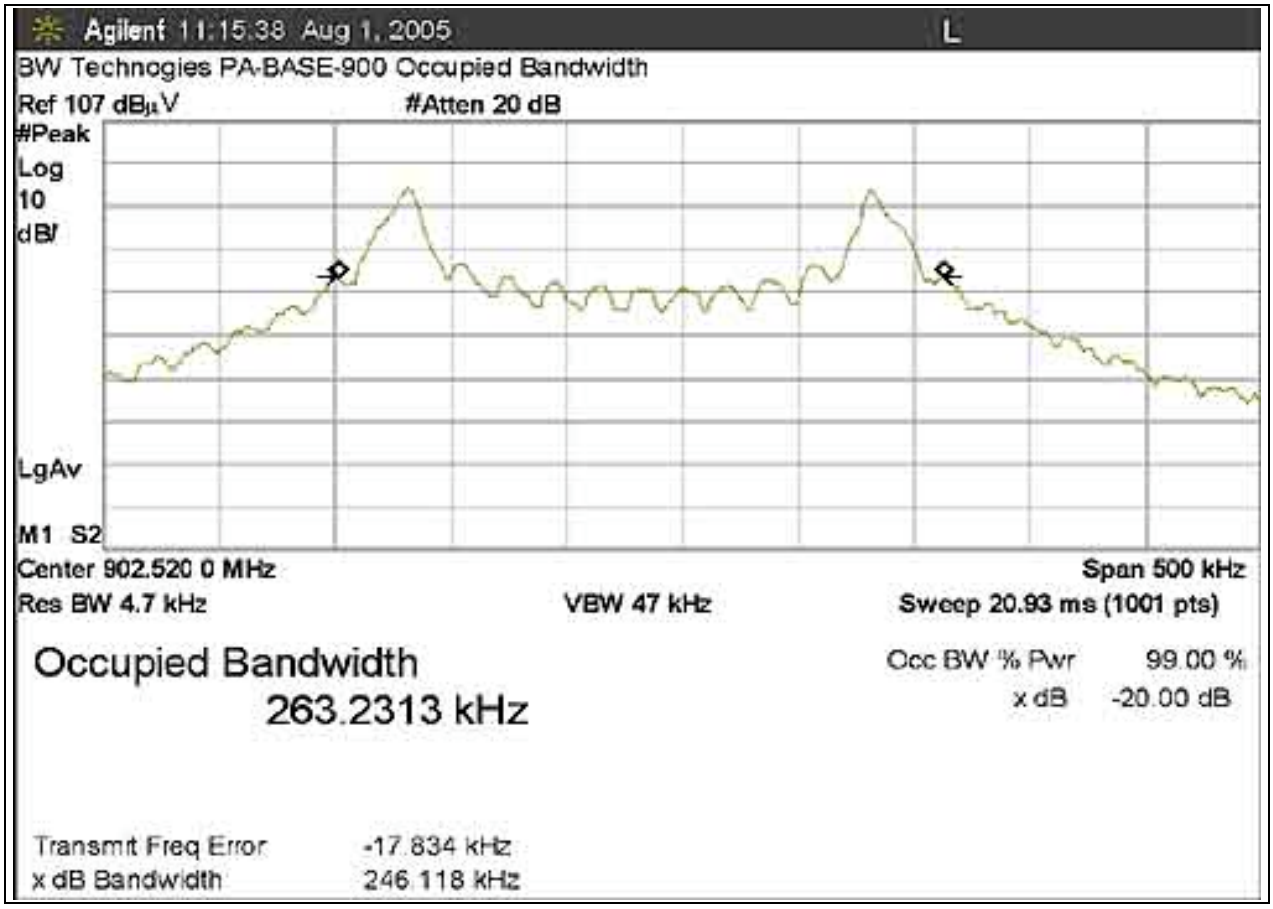


Table 3: FCC 15.247(b)(2) RF Power Output Levels									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Att dB	Amp dB	Cable dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
902.394	112.3	19.8		0.6		132.7	137.0	-4.3	R
915.098	111.6	19.8		0.6		132.0	137.0	-5.0	R
926.886	111.1	19.8		0.6		131.5	137.0	-5.5	R

Test Method: ANSI C63.4 (2003), DA 02-2138 August 30, 2002, DA 00-705 March 30, 2000, KDB Publication No. 558074
Spec Limit: FCC Part 15 Subpart C Sections15.247(b)(2)

NOTES: R = RF Output

COMMENTS: EUT is a gas detection system operating in the 902-928MHz frequency band. Equipment is a frequency hopping spread spectrum radio operating continuously with modulation enabled. Equipment is connected directly to the spectrum analyzer through suitable attenuation. Frequency Range Investigated: Carrier. Temperature: 23ºC, Relative Humidity: 38%. RBW=VBW=1MHz. RF output port of the EUT is routed to a spectrum analyzer through suitable attenuation. Peak measurements are reported in accordance with DA 00-705.

Frequency (MHz)	***Power Output (dBm)***	***Power Output (Watts)***	***Limit (Watts)***	***Pass/Fail***
902.40	25.7	0.371	1.0	Pass
915.10	25.0	0.316	1.0	Pass
926.89	24.5	0.281	1.0	Pass

Table 4: FCC 15.247(d) Antenna Conducted Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Att dB		Cable dB		CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
897.191700	55.3	19.8		0.6		75.7	113.0	-37.3	R-L
902.437000	111.8	19.8		0.6		132.2	133.0	-0.8	R-L
915.026000	111.0	19.8		0.6		131.4	133.0	-1.6	R-M
927.090000	110.9	19.8		0.6		131.3	133.0	-1.7	R-H
928.663600	60.0	19.8		0.6		80.4	113.0	-32.6	R-H
7018.13500	52.5	20.2		1.9		74.6	113.0	-38.4	R-H

Test Method: ANSI C63.4 (2003), DA 02-2138 August 30, 2002, DA 00-705 March 30, 2000, KDB Publication No. 558074

Spec Limit: FCC Part 15 Subpart C Section15.247(d)

NOTES: R = RF Output
L = Low Channel
M = Mid Channel
H = High Channel

COMMENTS: EUT is a gas detection system operating in the 902-928MHz frequency band. Equipment is a frequency hopping spread spectrum radio operating continuously on the specified channel with modulation enabled. Equipment is connected directly to the spectrum analyzer through suitable attenuation. Operating Frequency: Low Channel. Frequency Range Investigated: 1MHz to 10GHz. Temperature: 23°C, Relative Humidity: 38%.

Table 5: FCC 15.247(d) Six Highest OATS Spurious Emission Levels - 1-1000 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	Amp dB	Cable dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
960.913	45.6	23.7	-26.9	7.9		50.3	54.0	-3.7	VQ
961.111	44.9	23.7	-26.9	7.9		49.6	54.0	-4.4	VQ
965.909	47.9	23.7	-26.9	7.9		52.6	54.0	-1.4	VQ
966.108	47.8	23.7	-26.9	7.9		52.5	54.0	-1.5	VQ
976.600	43.2	23.9	-26.8	7.9		48.2	54.0	-5.8	V
976.818	42.6	23.9	-26.8	7.9		47.6	54.0	-6.4	V

Test Method: ANSI C63.4 (2003), DA 02-2138 August 30, 2002, DA 00-705 March 30, 2000, KDB Publication No. 558074
Spec Limit: FCC Part 15 Subpart C Section15.247(d)
Test Distance: 3 Meters

NOTES: Q = Quasi Peak Reading
V = Vertical Polarization

COMMENTS: EUT is a gas detection system operating in the 902-928MHz frequency band. Equipment is a frequency hopping spread spectrum radio operating in continuous transmit mode. Personnel Alert Base is mounted on test wall as per configuration typically seen in field installations. DC/Signal cable is routed through a conduit, which is grounded to the ground plane in accordance with the NEC and CEC requirements for explosion proof equipment. DC power to EUT is routed from support power supply. EUT drain wire is tied to ground plane. The operation of the RF deck is verified by confirming duplex traffic with the badge prior to the emissions test commencing. Operating Frequency: Low, Mid and High channels. Frequency Range Investigated: 1-1000MHz. Temperature: 29ºC, Relative Humidity: 38%. Limit applied is 15.209 except for frequencies outside of 15.205 restricted bands where limit applied is -20dBc. **No EUT emissions detected within 20dB of the limit in the frequency range below 30 MHz.**

Table 6: FCC 15.247(d) Six Highest OATS Spurious Emission Levels - 1-10 GHz

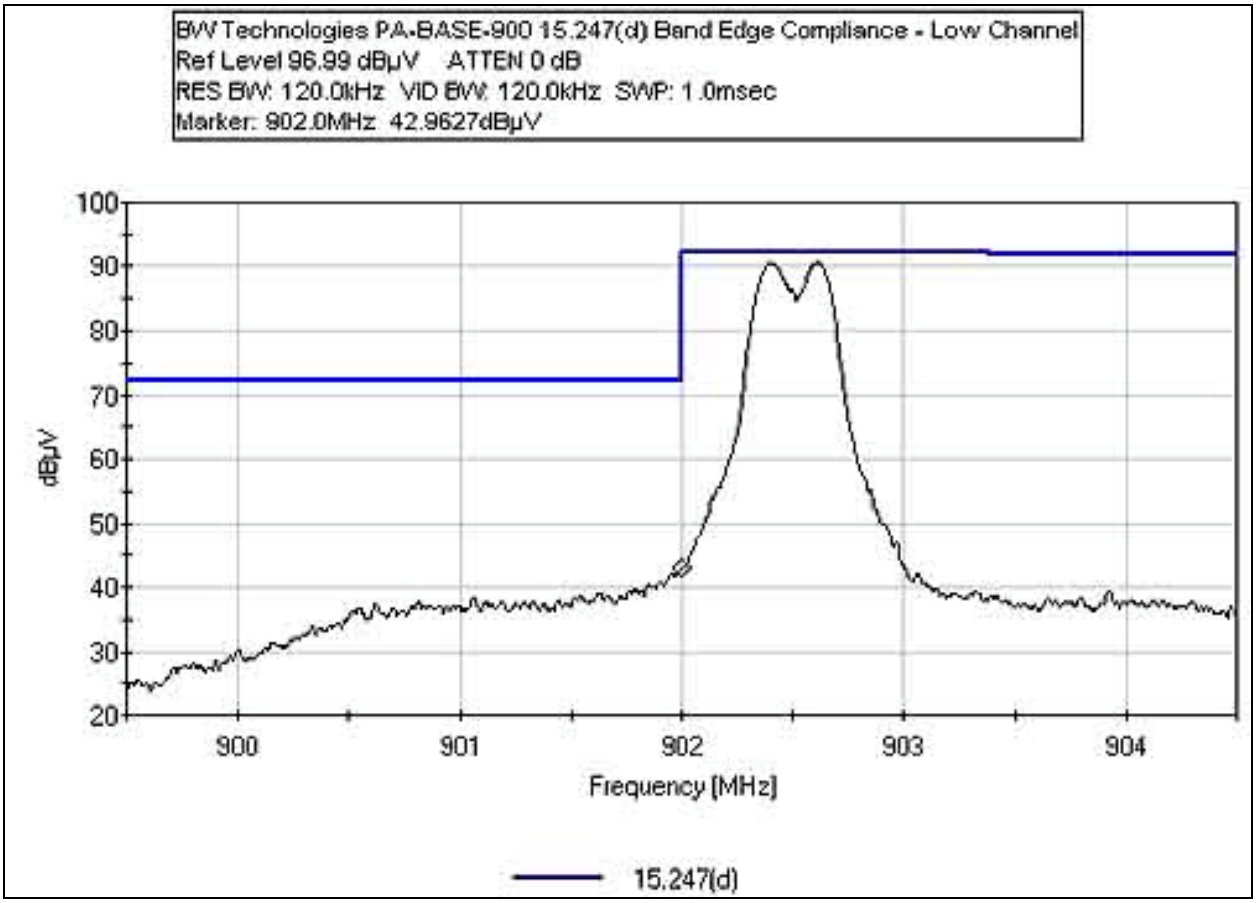
FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Dwell dB	Cable dB	dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
2707.221	20.0	30.1	-25.9	8.8		33.0	54.0	-21.0	V
2707.823	19.2	30.1	-25.9	8.8		32.2	54.0	-21.8	V
2744.716	18.5	30.3	-25.9	8.9		31.8	54.0	-22.2	V
2745.327	16.6	30.3	-25.9	8.9		29.9	54.0	-24.1	H
2745.328	18.5	30.3	-25.9	8.9		31.8	54.0	-22.2	V
2781.342	20.2	30.4	-25.9	9.0		33.7	54.0	-20.3	V

Test Method: ANSI C63.4 (2003), DA 02-2138 August 30, 2002, DA 00-705 March 30, 2000, KDB Publication No. 558074
Spec Limit: FCC Part 15 Subpart C Section15.247(d)
Test Distance: 3 Meters

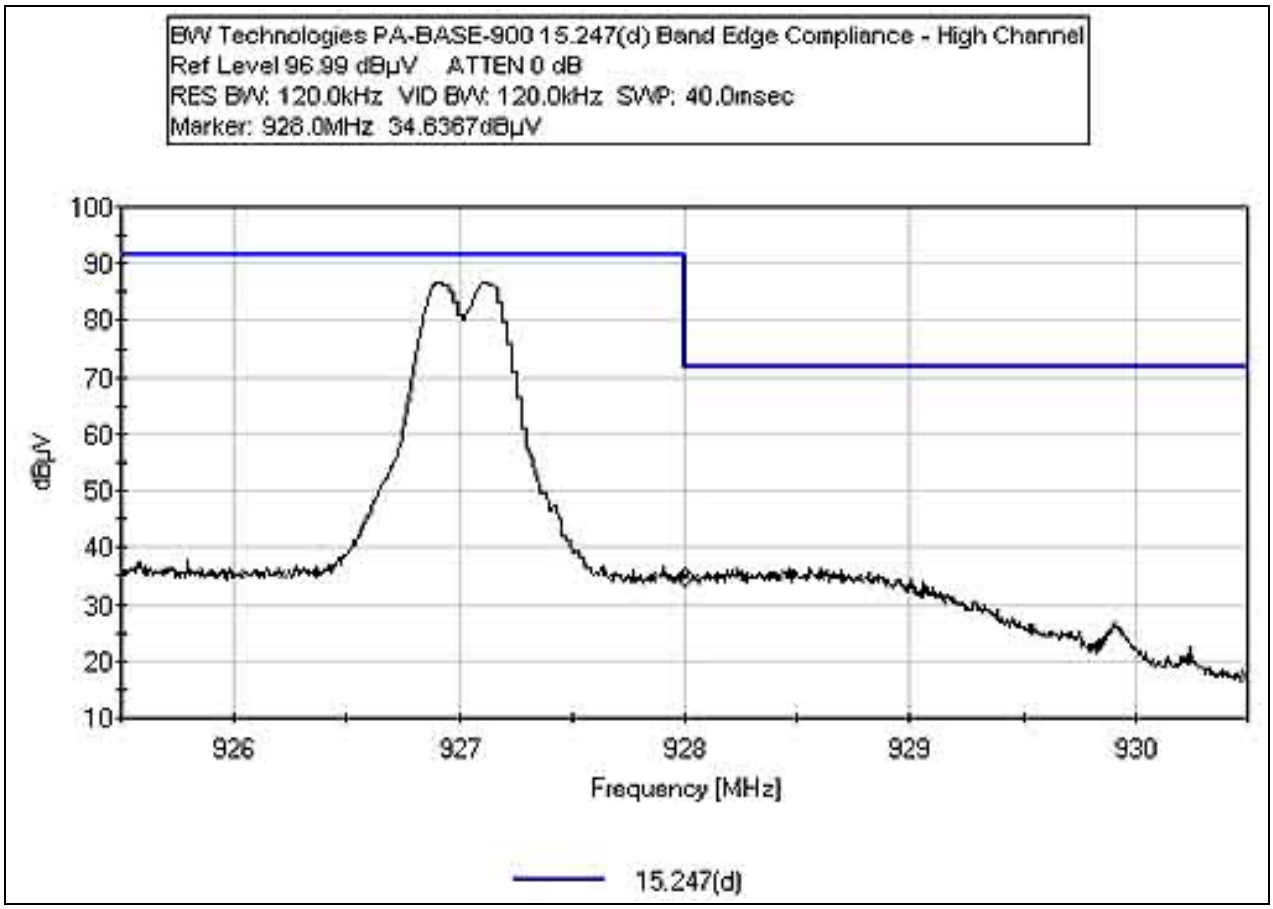
NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: EUT is a gas detection system operating in the 902-928MHz frequency band. Equipment is a frequency hopping spread spectrum radio operating in continuous transmit mode. Personnel Alert Base is mounted on test wall as per configuration typically seen in field installations. DC/Signal cable is routed through a conduit, which is grounded to the ground plane in accordance with the NEC and CEC requirements for explosion proof equipment. DC power to EUT is routed from support power supply. EUT drain wire is tied to ground plane. The operation of the RF deck is verified by confirming duplex traffic with the badge prior to the emissions test commencing. Operating Frequency: Low, Mid and High channels. Frequency Range Investigated: 1-10GHz. Temperature: 29ºC, Relative Humidity: 38%. Limit applied is 15.209 except for frequencies outside of 15.205 restricted bands where limit applied is -20dBc. Dwell time correction factor applied in accordance with DA 00-705. Maximum dwell time per 100ms is 5.06ms therefore DTCF = 20*LOG(5.06/100) = -25.91dB.

FCC 15.247(d) BANDEDGE - LOW CHANNEL



FCC 15.247(d) BANDEDGE - HIGH CHANNEL



TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

EUT SETUP

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the photographs in Appendix A. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables. The corrected data was then compared to the applicable emission limits to determine compliance.

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available I/O ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. I/O cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The radiated and conducted emissions data of the EUT was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in Table A.

Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula in Table A. This reading was then compared to the applicable specification limit to determine compliance.

TABLE A: SAMPLE CALCULATIONS

	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed in Table A were used to collect both the radiated and conducted emissions data for the EUT. For radiated measurements from 1 MHz to 30 MHz, the magnetic loop antenna was used. For radiated measurements from 30 to 1000 MHz, the biconilog antenna was used. The horn antenna was used for frequencies above 1000 MHz. Conducted emissions tests required the use of the FCC type LISNs.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. For conducted emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. A 10 dB external attenuator was also used during conducted tests, with internal offset correction in the analyzer. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 97 dBµV, and a vertical scale of 10 dB per division.

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the Tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the six highest readings, this is indicated as a "Q" or an "A" in the appropriate table. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the Spectrum Analyzer or test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the HP Quasi-Peak Adapter for the HP Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual were followed.

Average

For certain frequencies, average measurements may be made using the spectrum analyzer. To make these measurements, the test engineer reduces the video bandwidth on the analyzer until the modulation of the signal is filtered out. At this point the analyzer is set into the linear mode and the scan time is reduced.

EUT TESTING

Antenna Conducted Emissions

For measuring the signal strength on the RF output port of the EUT, the spectrum analyzer was connected directly to the EUT. The sweep time of the analyzer was adjusted so that the spectrum analyzer readings were always in a calibrated range. All readings within 20 dB of the limit were recorded.

Radiated Emissions

The EUT was mounted on a nonconductive, rotating table 80 cm above the conductive grid. The nonconductive table dimensions were 1 meter by 1.5 meters.

During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode. For radiated measurements from 1 MHz to 30 MHz, the magnetic loop antenna was used. The frequency range of 30 MHz to 1000 MHz was scanned with the biconilog antenna located about 1.5 meter above the ground plane in the vertical polarity. During this scan, the turntable was rotated and all peaks at or near the limit were recorded. A scan of the FM band from 88 to 110 MHz was then made using a reduced resolution bandwidth and frequency span. The biconilog antenna was changed to the horizontal polarity and the above steps were repeated. For frequencies exceeding 1000 MHz, the horn antenna was used. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

A thorough scan of all frequencies was made manually using a small frequency span, rotating the turntable and raising and lowering the antenna from one to four meters as needed. The test engineer maximized the readings with respect to the table rotation, antenna height and configuration of EUT. Maximizing of the EUT was achieved by monitoring the spectrum analyzer on a closed circuit television monitor.

APPENDIX A

INFORMATION ABOUT THE EQUIPMENT UNDER TEST

INFORMATION ABOUT THE EQUIPMENT UNDER TEST	
Test Software/Firmware:	PA_000.013
CRT was displaying:	N/A
Power Supply Manufacturer:	N/A
Power Supply Part Number:	N/A
AC Line Filter Manufacturer:	N/A
AC Line Filter Part Number:	N/A
Line voltage used during testing:	Battery Operated Equipment (Badge) DC Power 24 V (Base)

I/O PORTS	
Type	#
DC and Signal Port	1

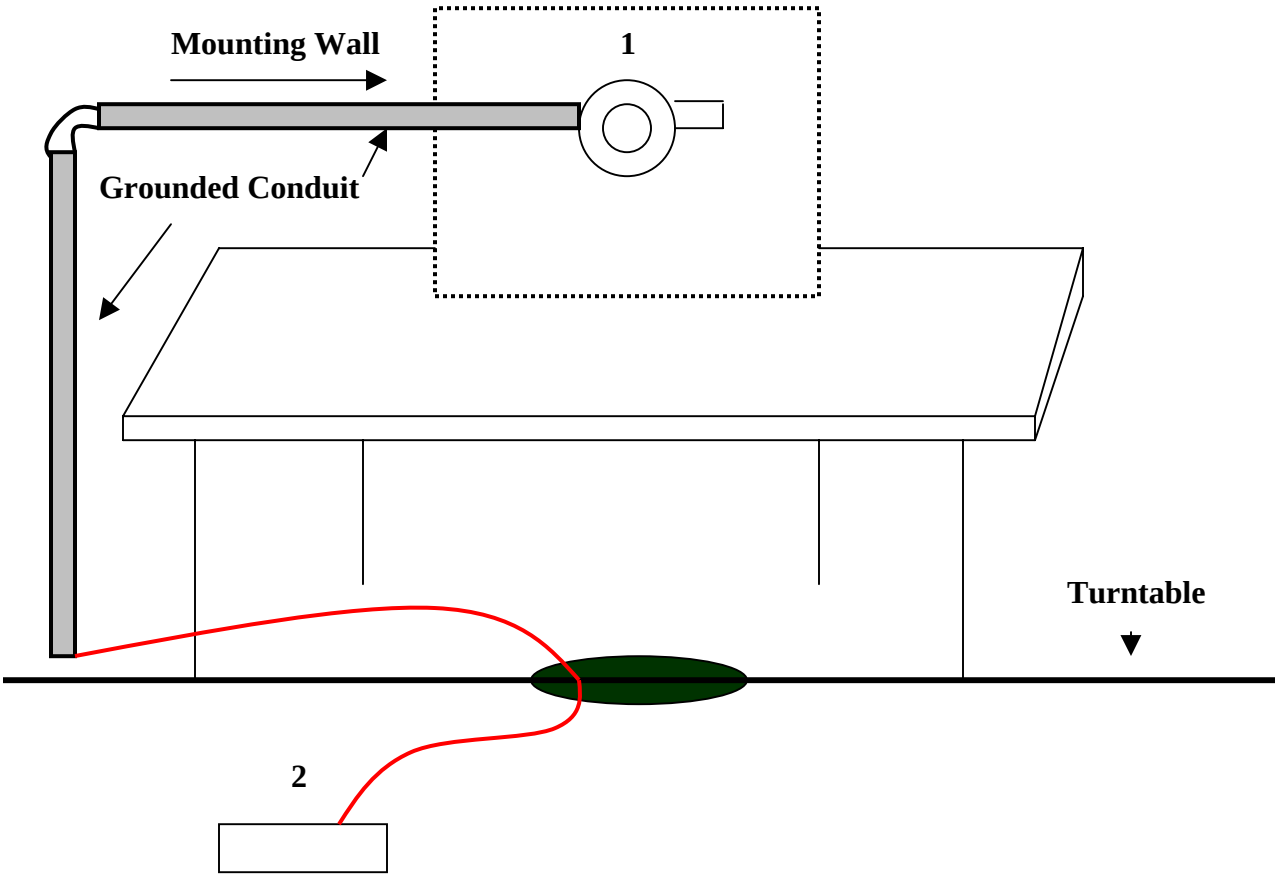
CRYSTAL OSCILLATORS	
Type	Freq In MHz
SMT (Badge)	10
SMT (Base)	4 and 5
SMT	0.040
SMT	39.0

PRINTED CIRCUIT BOARDS				
Function	Model & Rev	Clocks, MHz	Layers	Location
Base-Main PCB	PAHE-20 Rev C	4.0	4	Interface PCB, Base Unit CPU clock , component designation is Y1
Base-RF PCB	PAHE-10 Rev E	5.0	4	RF PCB, Base Unit, CPU Clock, component designation is Y1
Badge-RF PCB	PAHE-10 Rev E	39.0	4	RF PCB, Base Unit, RF Controller Clock, component designation is Y2
Badge-Main PCB	PASE-10, Rev B	10.0	4	Main PCB, Badge Unit, CPU Clock, component designation is Y1
Badge-Main PCB	PASE-10, Rev B	39.0	4	Main PCB, Badge Unit, RF Controller Clock, component designation is Y2
Badge- Main PCB	PASE-10, Rev B	0.040	4	Main PCB, Badge Unit, Data Clock, component designation is Y3

CABLE INFORMATION

Cable #:	1	Cable(s) of this type:	1
Cable Type:	AWG 22	Shield Type:	Braid over foil.
Construction:	6 connector bundle	Length In Meters:	5
Connected To End (1):	DC Power Source	Connected To End (2):	DC Power in on PA Base
Connector At End (1):	None, wire only	Connector At End (2):	None, wire only
Shield Grounded At (1):	Reliable earth ground (turntable)	Shield Grounded At (2):	Grounding screw, PA Base chassis
Part Number:	N/A	Number of Conductors:	6, (3 terminated)
Notes and/or description:	DC and Signal bundle from remote PLC or Power Source to Personnel Alert Base Station. Note that the DC/Signal cable is routed through grounded conduit as per the National Electrical Code (NEC-USA) and Canadian Electrical Code (CEC) requirements for explosion proof equipment.		

EMC/RF Configuration – Personnel Alert (Base)



Equipment Legend

1. Personnel Alert Base (EUT)
2. DC Power Supply

Cable Legend

AWG 22 Signal/24Vdc

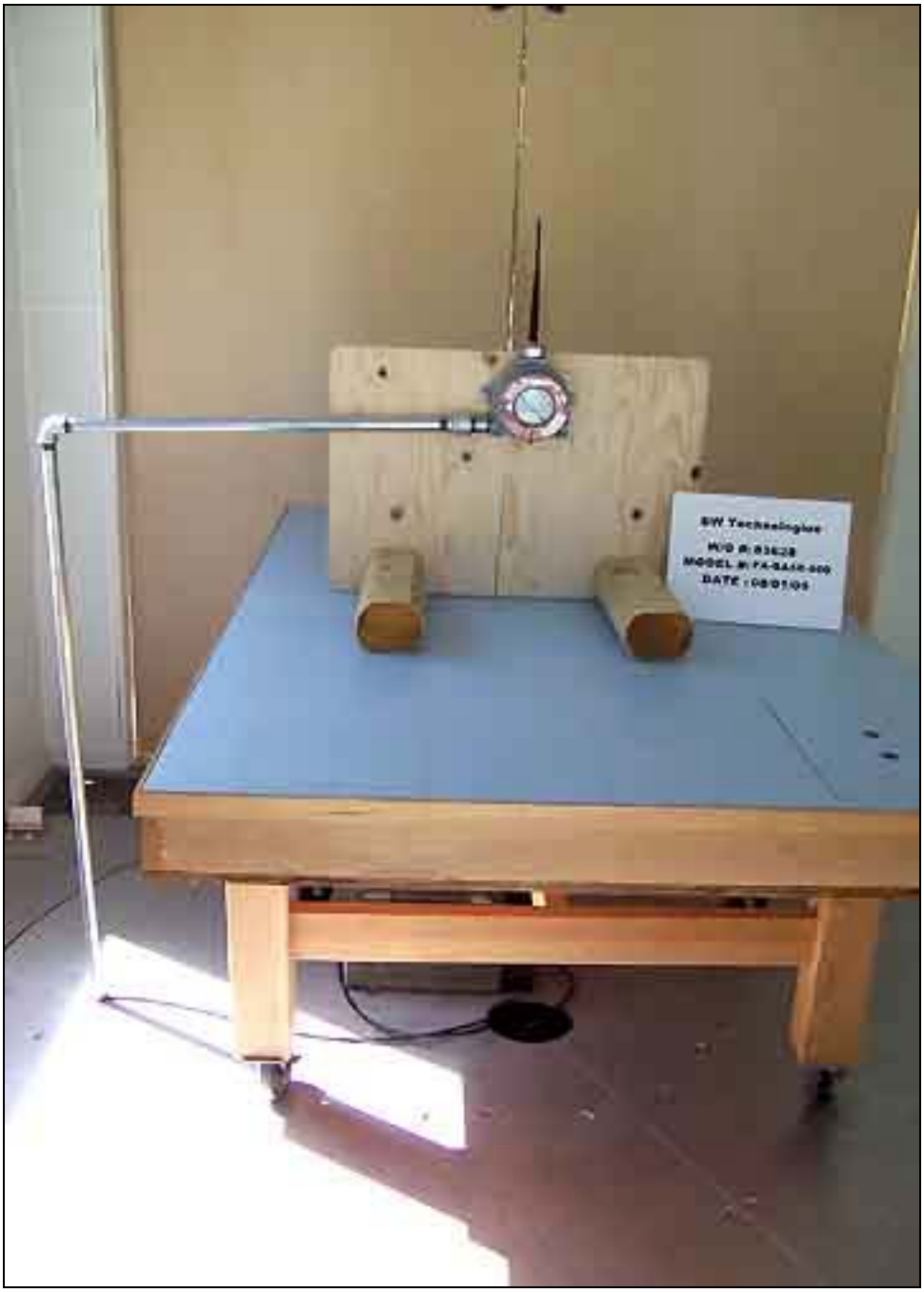
PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP

TX

PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP

RX

PHOTOGRAPH SHOWING RADIATED EMISSIONS

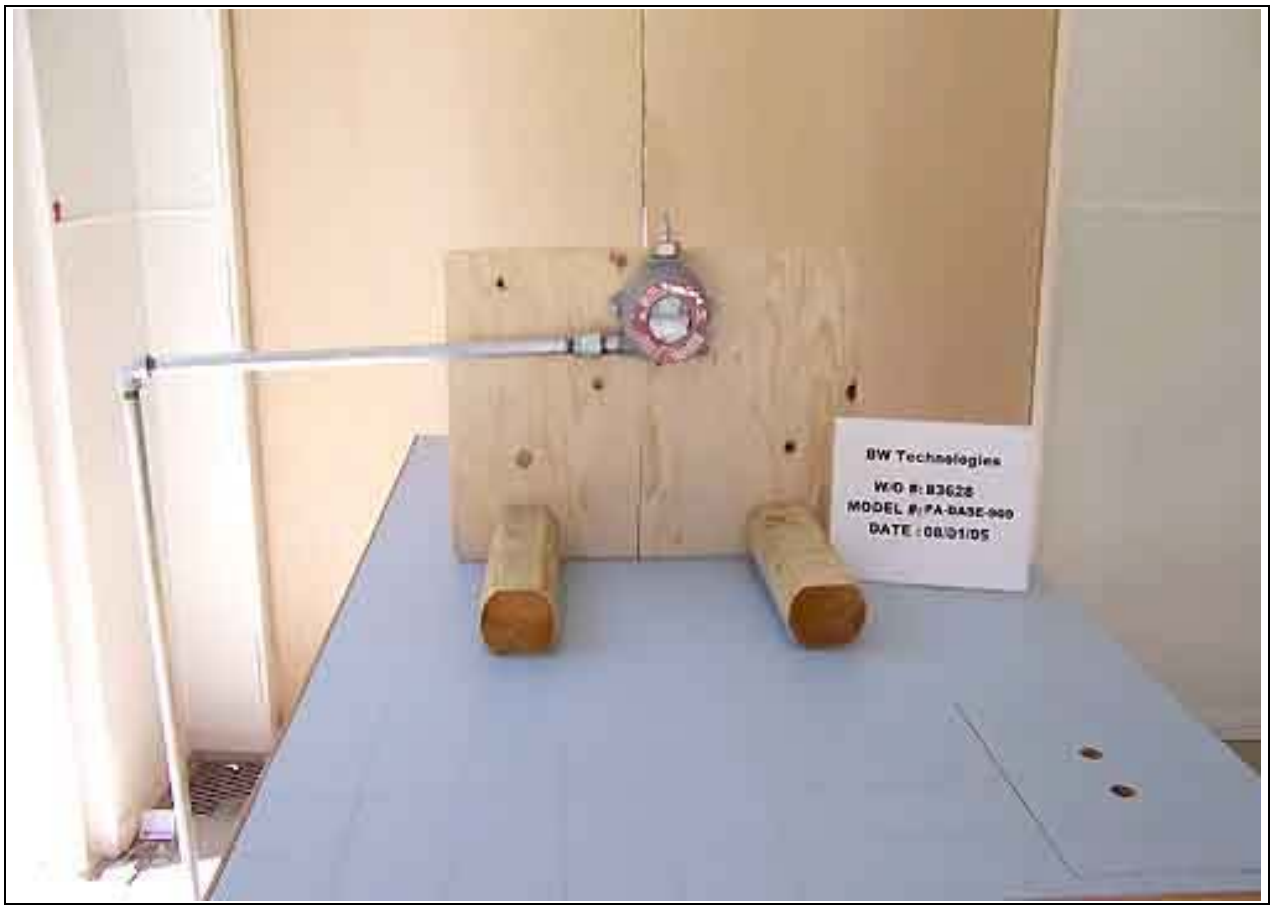


Radiated Emissions - Front View

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Back View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Front View - RX

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Side View

BASE OATS GROUND POINTS

APPENDIX B

TEST EQUIPMENT LIST

15.109

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/12/2005	01/12/2007	02660
HP 8447D Preamp	1937A02604	03/11/2005	03/11/2007	00099
HP 8449B Preamp	3008A00301	12/14/2004	12/14/2006	2010
Chase CBL6111C Bilog	2456	06/07/2005	06/07/2007	01991
EMCO 3115 Horn Antenna	9307-4085	04/29/2005	04/29/2007	00656
Cable, Pasternack 36"	NA	02/08/2005	02/08/2007	P05202
Cable, Andrews Hardline	NA	05/27/2005	05/27/2007	P01012

15.111

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/12/2005	01/12/2007	02660
Cable, Pasternack 36"	NA	02/08/2005	02/08/2007	P05202

15.247 (a)(1), 15.247(b)(2) & 15.247(d) Antenna Conducted

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/12/2005	01/12/2007	02660
Cable, Pasternack 36"	NA	02/08/2005	02/08/2007	P05202
Weinchel 10dB attenuator	C8596	10/01/2004	10/01/2006	P02138
Weinchel 10dB attenuator	C8597	10/01/2004	10/01/2006	P02139

15.247(d) Oats <1 GHz

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/12/2005	01/12/2007	02660
Chase CBL6111C Bilog	2456	06/07/2005	06/07/2007	01991
HP 8447D Preamp	1937A02604	03/11/2005	03/11/2007	00099
EMCO Loop Antenna	1074	05/13/2005	05/13/2007	00226

15.247(d) Oats >1 GHz

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/12/2005	01/12/2007	02660
EMCO 3115 Horn Antenna	9307-4085	04/29/2005	04/29/2007	00656
Cable, Pasternack 36"	NA	02/08/2005	02/08/2007	P05202
Cable, Andrews Hardline	NA	05/27/2005	05/27/2007	P01012

APPENDIX C

MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **BW Technologies**
Specification: **15.109 CLASS B**
Work Order #: **83628** Date: 8/2/2005
Test Type: **Maximized Emissions** Time: 13:50:45
Equipment: **Personnel Alert Base** Sequence#: 8
Manufacturer: BW Technologies Tested By: Randal Clark
Model: PA-BASE-900
S/N: 05182196

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Personnel Alert Base*	BW Technologies	PA-BASE-900	05182196

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a gas detection system operating in the 902-928MHz frequency band. Equipment is a frequency hopping spread spectrum radio operating in continuous receive mode. Personnel Alert Base is mounted on test wall as per configuration typically seen in field installations. DC/Signal cable is routed through a conduit, which is grounded to the ground plane in accordance with the NEC and CEC requirements for explosion proof equipment. DC power to EUT is routed from support power supply. EUT drain wire is tied to ground plane. The operation of the RF deck is verified by confirming duplex traffic with the badge prior to the emissions test commencing. Operating Frequency: Receive Mode. Frequency Range Investigated: 30MHz - 10GHz. Temperature: 29ºC, Relative Humidity: 38%. **No EUT emissions detected within 20dB of the limit in the frequency range above 1GHz.**

Transducer Legend:

T1=Amp - S/N 604	T2=Bilog Site D
T3=Cable - 10 Meter	

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	80.900M	40.3	-27.0	+6.8	+2.0		+0.0	22.1	40.0	-17.9	Verti 100
2	83.800M	39.4	-26.9	+7.3	+2.1		+0.0	21.9	40.0	-18.1	Verti 100
3	79.600M	39.3	-27.0	+6.7	+2.0		+0.0	21.0	40.0	-19.0	Verti 100
4	79.640M	38.1	-27.0	+6.7	+2.0		+0.0	19.8	40.0	-20.2	Verti 100
5	80.900M	37.2	-27.0	+6.8	+2.0		+0.0	19.0	40.0	-21.0	Verti 132
6	109.220M	36.3	-26.8	+10.2	+2.4		+0.0	22.1	43.5	-21.4	Verti 100

7	109.920M	36.0	-26.8	+10.2	+2.4	+0.0	21.8	43.5	-21.7	Horiz 154
8	77.780M	36.0	-27.0	+6.5	+2.0	+0.0	17.5	40.0	-22.5	Verti 100
9	109.140M	35.0	-26.8	+10.2	+2.4	+0.0	20.8	43.5	-22.7	Horiz 154
10	111.240M	33.0	-26.8	+10.3	+2.4	+0.0	18.9	43.5	-24.6	Verti 100

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **BW Technologies**
Specification: **FCC 15.111**
Work Order #: **83628** Date: 8/1/2005
Test Type: **Antenna Conducted Emissions** Time: 2:25:14 PM
Equipment: **Personnel Alert Base** Sequence#: 5
Manufacturer: BW Technologies Tested By: Randal Clark
Model: PA-BASE-900 12VDC
S/N: 05182196

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Personnel Alert Base*	BW Technologies	PA-BASE-900	05182196

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a gas detection system operating in the 902-928MHz frequency band. Equipment is a frequency hopping spread spectrum radio operating in continuous receive mode. Equipment is connected directly to the spectrum analyzer. Operating Frequency: Receive Mode. Frequency Range Investigated: 1MHz to 10GHz. Temperature: 23ºC, Relative Humidity: 38%.

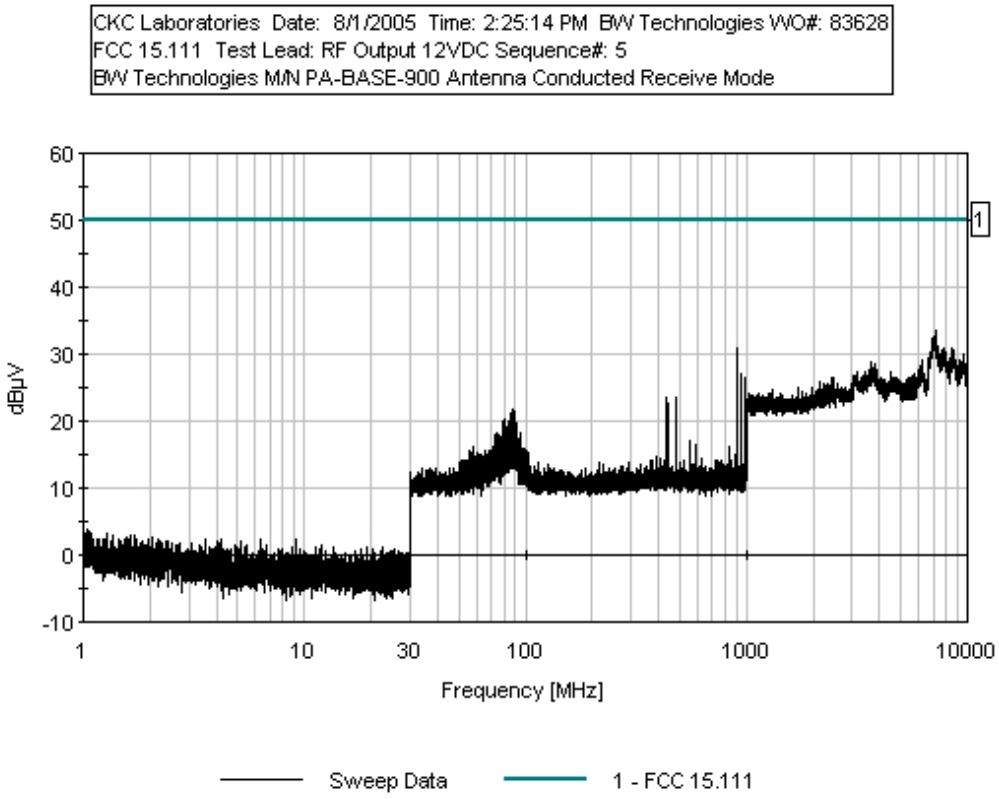
Transducer Legend:

T1=Cable 40 GHz 36"

Measurement Data: Reading listed by margin. Test Lead: RF Output

#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	7148.200M	31.7	+1.9				+0.0	33.6	50.0	-16.4	RF Ou
2	6992.800M	30.8	+1.9				+0.0	32.7	50.0	-17.3	RF Ou
3	7055.800M	30.7	+1.9				+0.0	32.6	50.0	-17.4	RF Ou
4	7064.200M	30.6	+1.9				+0.0	32.5	50.0	-17.5	RF Ou
5	7345.600M	29.2	+1.9				+0.0	31.1	50.0	-18.9	RF Ou
6	7828.600M	29.0	+2.0				+0.0	31.0	50.0	-19.0	RF Ou
7	915.119M	30.3	+0.6				+0.0	30.9	50.0	-19.1	RF Ou
8	7421.200M	29.0	+1.9				+0.0	30.9	50.0	-19.1	RF Ou
9	8504.800M	28.9	+2.0				+0.0	30.9	50.0	-19.1	RF Ou
10	8488.000M	28.8	+2.0				+0.0	30.8	50.0	-19.2	RF Ou
11	7358.200M	28.7	+1.9				+0.0	30.6	50.0	-19.4	RF Ou

12	7715.200M	28.6	+2.0	+0.0	30.6	50.0	-19.4	RF Ou
13	8639.200M	28.6	+2.0	+0.0	30.6	50.0	-19.4	RF Ou
14	7967.200M	28.4	+2.0	+0.0	30.4	50.0	-19.6	RF Ou
15	7950.400M	28.0	+2.0	+0.0	30.0	50.0	-20.0	RF Ou
16	7564.000M	28.0	+1.9	+0.0	29.9	50.0	-20.1	RF Ou
17	9517.000M	27.7	+2.2	+0.0	29.9	50.0	-20.1	RF Ou
18	7618.600M	27.7	+1.9	+0.0	29.6	50.0	-20.4	RF Ou
19	7488.400M	27.6	+1.9	+0.0	29.5	50.0	-20.5	RF Ou
20	8353.600M	27.3	+2.0	+0.0	29.3	50.0	-20.7	RF Ou
21	6295.600M	27.5	+1.7	+0.0	29.2	50.0	-20.8	RF Ou
22	6673.600M	27.4	+1.7	+0.0	29.1	50.0	-20.9	RF Ou
23	9277.600M	27.0	+2.1	+0.0	29.1	50.0	-20.9	RF Ou
24	8803.000M	27.0	+2.0	+0.0	29.0	50.0	-21.0	RF Ou
25	8189.800M	27.0	+1.9	+0.0	28.9	50.0	-21.1	RF Ou
26	3674.637M	27.4	+1.3	+0.0	28.7	50.0	-21.3	RF Ou
27	8122.600M	26.8	+1.9	+0.0	28.7	50.0	-21.3	RF Ou
28	9391.000M	26.5	+2.2	+0.0	28.7	50.0	-21.3	RF Ou
29	9437.200M	26.5	+2.2	+0.0	28.7	50.0	-21.3	RF Ou


CKC Laboratories Date: 8/1/2005 Time: 2:25:14 PM BW Technologies WO#: 83628
FCC 15.111 Test Lead: RF Output 12VDC Sequence#: 5
BW Technologies M/N PA-BASE-900 Antenna Conducted Receive Mode
60
50
40
30
20
10
0
-10
dBµV
1
1
10
30
100
1000
10000
Frequency [MHz]
Sweep Data
1 - FCC 15.111

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **BW Technologies**
Specification: **15.247(b)(2)**
Work Order #: **83628** Date: 8/1/2005
Test Type: **Antenna Conducted Emissions** Time: 13:58:27
Equipment: **Personnel Alert Base** Sequence#: 1
Manufacturer: BW Technologies Tested By: Randal Clark
Model: PA-BASE-900 12VDC
S/N: 05182196

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Personnel Alert Base*	BW Technologies	PA-BASE-900	05182196

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a gas detection system operating in the 902-928MHz frequency band. Equipment is a frequency hopping spread spectrum radio operating continuously with modulation enabled. Equipment is connected directly to the spectrum analyzer through suitable attenuation. Frequency Range Investigated: Carrier. Temperature: 23ºC, Relative Humidity: 38%. RBW=VBW=1MHz.

Transducer Legend:

T1=Att 10dB AN02138 T2=Att 10dB AN02139
T3=Cable 40 GHz 36"

Measurement Data: Reading listed by margin. Test Lead: RF Output

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	902.394M	112.3	+9.9	+9.9	+0.6		+0.0	132.7	137.0	-4.3	RF Ou
2	915.098M	111.6	+9.9	+9.9	+0.6		+0.0	132.0	137.0	-5.0	RF Ou
3	926.886M	111.1	+9.9	+9.9	+0.6		+0.0	131.5	137.0	-5.5	RF Ou

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **BW Technologies**
Specification: **15.247(d)**
Work Order #: **83628** Date: 8/1/2005
Test Type: **Antenna Conducted Emissions** Time: 14:09:12
Equipment: **Personnel Alert Base** Sequence#: 2
Manufacturer: BW Technologies Tested By: Randal Clark
Model: PA-BASE-900 12VDC
S/N: 05182196

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Personnel Alert Base*	BW Technologies	PA-BASE-900	05182196

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a gas detection system operating in the 902-928MHz frequency band. Equipment is a frequency hopping spread spectrum radio operating continuously on the specified channel with modulation enabled. Equipment is connected directly to the spectrum analyzer through suitable attenuation. Operating Frequency: Low Channel. Frequency Range Investigated: 1MHz to 10GHz. Temperature: 23ºC, Relative Humidity: 38%.

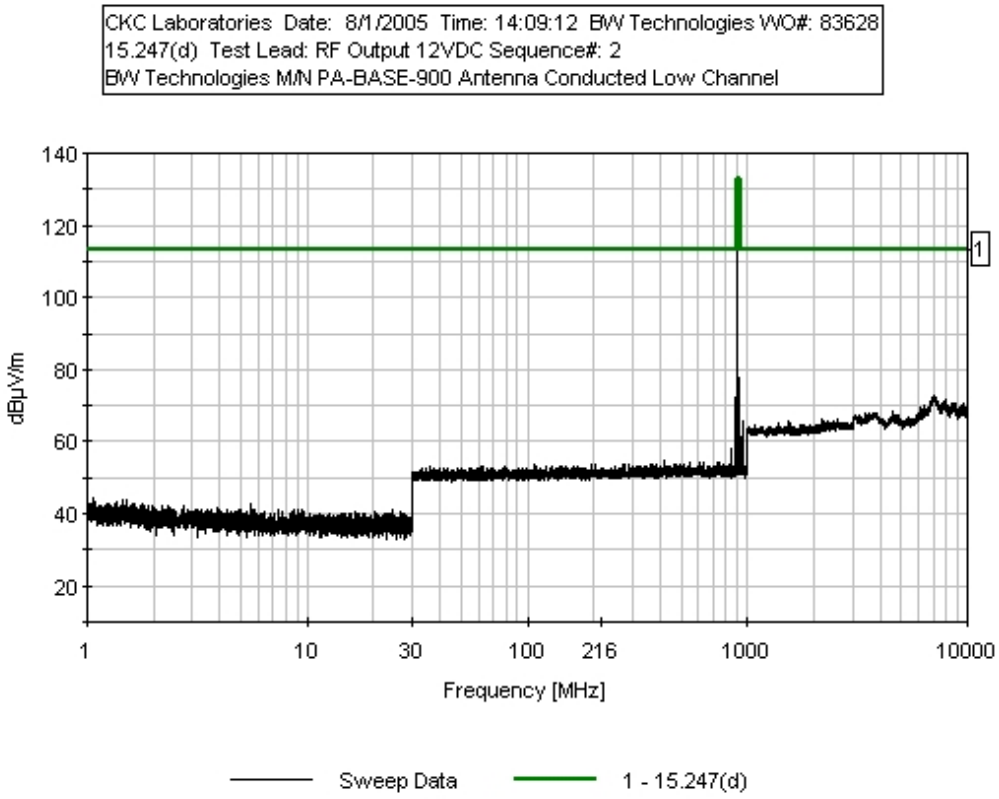
Transducer Legend:

T1=Att 10dB AN02138 T2=Att 10dB AN02139
T3=Cable 40 GHz 36"

Measurement Data: Reading listed by margin. Test Lead: RF Output

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	902.437M	111.8	+9.9	+9.9	+0.6		+0.0	132.2	133.0 Carrier	-0.8	RF Ou
2	897.192M	55.3	+9.9	+9.9	+0.6		+0.0	75.7	113.0	-37.3	RF Ou
3	6992.302M	50.7	+10.1	+10.1	+1.9		+0.0	72.8	113.0	-40.2	RF Ou
4	883.029M	52.1	+9.9	+9.9	+0.6		+0.0	72.5	113.0	-40.5	RF Ou
5	7940.742M	49.5	+10.1	+10.1	+2.0		+0.0	71.7	113.0	-41.3	RF Ou
6	7973.956M	49.2	+10.1	+10.1	+2.0		+0.0	71.4	113.0	-41.6	RF Ou
7	8704.660M	48.7	+10.1	+10.1	+2.0		+0.0	70.9	113.0	-42.1	RF Ou
8	9594.053M	48.4	+10.1	+10.2	+2.2		+0.0	70.9	113.0	-42.1	RF Ou
9	6331.716M	48.5	+10.0	+10.0	+1.7		+0.0	70.2	113.0	-42.8	RF Ou
10	8771.088M	48.0	+10.1	+10.1	+2.0		+0.0	70.2	113.0	-42.8	RF Ou

11	8398.354M	47.8	+10.1	+10.1	+2.0	+0.0	70.0	113.0	-43.0	RF Ou
12	8169.548M	47.7	+10.1	+10.1	+1.9	+0.0	69.8	113.0	-43.2	RF Ou
13	8346.688M	47.5	+10.1	+10.1	+2.0	+0.0	69.7	113.0	-43.3	RF Ou
14	9258.225M	47.3	+10.1	+10.2	+2.1	+0.0	69.7	113.0	-43.3	RF Ou
15	9660.480M	47.2	+10.1	+10.2	+2.2	+0.0	69.7	113.0	-43.3	RF Ou
16	6100.701M	47.8	+10.0	+10.1	+1.7	+0.0	69.6	113.0	-43.4	RF Ou
17	9686.313M	47.1	+10.1	+10.2	+2.2	+0.0	69.6	113.0	-43.4	RF Ou
18	9749.051M	47.1	+10.1	+10.1	+2.2	+0.0	69.5	113.0	-43.5	RF Ou
19	8217.524M	47.3	+10.1	+10.1	+1.9	+0.0	69.4	113.0	-43.6	RF Ou
20	8996.204M	46.6	+10.1	+10.2	+2.0	+0.0	68.9	113.0	-44.1	RF Ou
21	6051.331M	47.0	+10.0	+10.0	+1.6	+0.0	68.6	113.0	-44.4	RF Ou
22	6241.215M	46.7	+10.0	+10.0	+1.7	+0.0	68.4	113.0	-44.6	RF Ou
23	4608.209M	46.8	+10.0	+10.0	+1.4	+0.0	68.2	113.0	-44.8	RF Ou
24	3738.539M	46.9	+9.9	+10.0	+1.3	+0.0	68.1	113.0	-44.9	RF Ou
25	4577.828M	46.6	+10.0	+10.0	+1.4	+0.0	68.0	113.0	-45.0	RF Ou
26	6013.354M	46.4	+10.0	+10.0	+1.6	+0.0	68.0	113.0	-45.0	RF Ou
27	3905.637M	46.6	+10.0	+10.0	+1.3	+0.0	67.9	113.0	-45.1	RF Ou
28	3563.846M	46.5	+10.0	+10.0	+1.3	+0.0	67.8	113.0	-45.2	RF Ou
29	3430.927M	46.5	+10.0	+10.0	+1.2	+0.0	67.7	113.0	-45.3	RF Ou
30	3073.944M	46.6	+9.9	+9.9	+1.2	+0.0	67.6	113.0	-45.4	RF Ou
31	2707.820M	40.7	+9.9	+10.0	+1.1	+0.0	61.7	113.0	-51.3	RF Ou
32	2707.196M	40.2	+9.9	+10.0	+1.1	+0.0	61.2	113.0	-51.8	RF Ou
33	1804.817M	38.8	+9.9	+10.0	+0.9	+0.0	59.6	113.0	-53.4	RF Ou
34	4512.024M	37.6	+10.0	+10.0	+1.4	+0.0	59.0	113.0	-54.0	RF Ou


CKC Laboratories Date: 8/1/2005 Time: 14:09:12 BW Technologies WO#: 83628
15.247(d) Test Lead: RF Output 12VDC Sequence#: 2
BW Technologies M/N PA-BASE-900 Antenna Conducted Low Channel
140
120
100
80
60
40
20
dBµV/m
1
10
30
100
216
1000
10000
Frequency [MHz]
1
Sweep Data
1 - 15.247(d)

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **BW Technologies**
Specification: **15.247(d)**
Work Order #: **83628** Date: 8/1/2005
Test Type: **Antenna Conducted Emissions** Time: 14:05:44
Equipment: **Personnel Alert Base** Sequence#: 3
Manufacturer: BW Technologies Tested By: Randal Clark
Model: PA-BASE-900 12VDC
S/N: 05182196

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Personnel Alert Base*	BW Technologies	PA-BASE-900	05182196

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a gas detection system operating in the 902-928MHz frequency band. Equipment is a frequency hopping spread spectrum radio operating continuously on the specified channel with modulation enabled. Equipment is connected directly to the spectrum analyzer through suitable attenuation. Operating Frequency: Mid Channel. Frequency Range Investigated: 1MHz to 10GHz. Temperature: 23ºC, Relative Humidity: 38%.

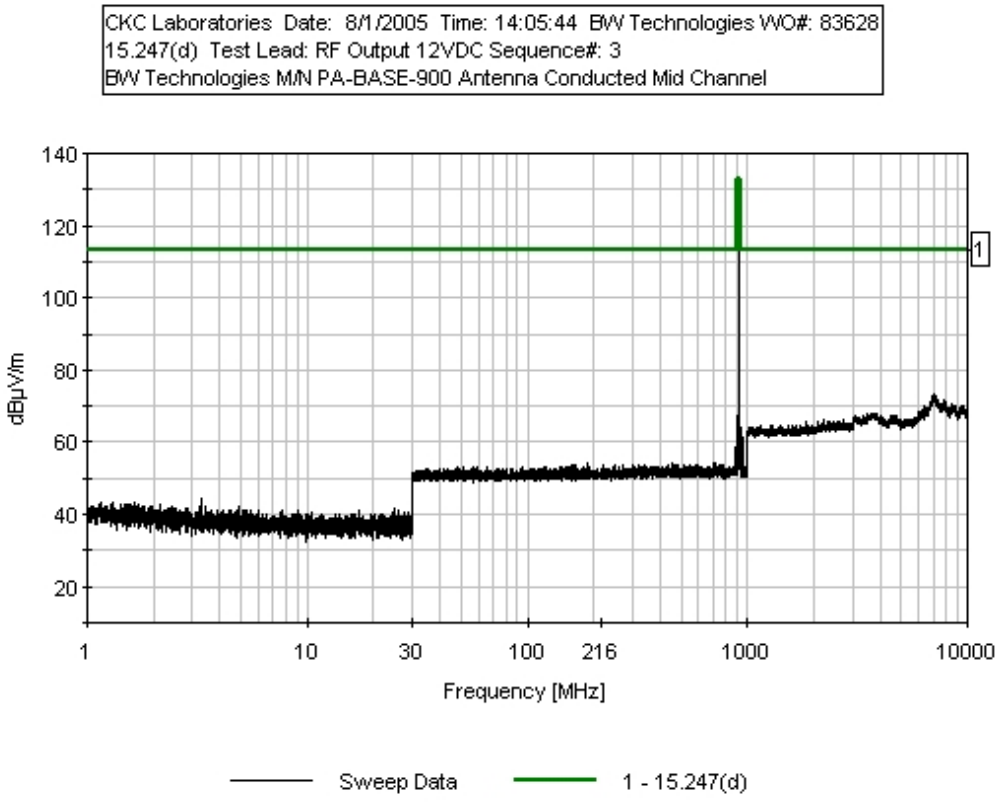
Transducer Legend:

T1=Att 10dB AN02138 T2=Att 10dB AN02139
T3=Cable 40 GHz 36"

Measurement Data: Reading listed by margin. Test Lead: RF Output

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	915.026M	111.0	+9.9	+9.9	+0.6		+0.0	131.4	133.0 Carrier	-1.6	RF Ou
2	7114.086M	51.2	+10.1	+10.1	+1.9		+0.0	73.3	113.0	-39.7	RF Ou
3	6911.113M	50.9	+10.1	+10.1	+1.9		+0.0	73.0	113.0	-40.0	RF Ou
4	6936.946M	50.9	+10.1	+10.1	+1.9		+0.0	73.0	113.0	-40.0	RF Ou
5	6984.921M	50.9	+10.1	+10.1	+1.9		+0.0	73.0	113.0	-40.0	RF Ou
6	7195.276M	50.7	+10.1	+10.1	+1.9		+0.0	72.8	113.0	-40.2	RF Ou
7	7165.752M	50.4	+10.1	+10.1	+1.9		+0.0	72.5	113.0	-40.5	RF Ou
8	7745.149M	49.4	+10.1	+10.1	+2.0		+0.0	71.6	113.0	-41.4	RF Ou
9	6759.806M	49.3	+10.1	+10.1	+1.8		+0.0	71.3	113.0	-41.7	RF Ou
10	6715.521M	48.9	+10.1	+10.1	+1.8		+0.0	70.9	113.0	-42.1	RF Ou

11	8516.448M	48.6	+10.1	+10.1	+2.0	+0.0	70.8	113.0	-42.2	RF Ou
12	7442.534M	48.5	+10.1	+10.1	+1.9	+0.0	70.6	113.0	-42.4	RF Ou
13	6328.025M	48.4	+10.0	+10.0	+1.7	+0.0	70.1	113.0	-42.9	RF Ou
14	9601.434M	47.5	+10.1	+10.2	+2.2	+0.0	70.0	113.0	-43.0	RF Ou
15	9247.153M	47.4	+10.1	+10.2	+2.1	+0.0	69.8	113.0	-43.2	RF Ou
16	9335.724M	47.3	+10.1	+10.2	+2.2	+0.0	69.8	113.0	-43.2	RF Ou
17	8243.357M	47.5	+10.1	+10.1	+1.9	+0.0	69.6	113.0	-43.4	RF Ou
18	8258.119M	47.4	+10.1	+10.1	+1.9	+0.0	69.5	113.0	-43.5	RF Ou
19	6169.059M	47.3	+10.0	+10.1	+1.7	+0.0	69.1	113.0	-43.9	RF Ou
20	5926.007M	46.6	+10.0	+10.0	+1.6	+0.0	68.2	113.0	-44.8	RF Ou
21	3654.990M	46.8	+10.0	+10.0	+1.3	+0.0	68.1	113.0	-44.9	RF Ou
22	3529.667M	46.8	+9.9	+10.0	+1.2	+0.0	67.9	113.0	-45.1	RF Ou
23	5933.603M	46.3	+10.0	+10.0	+1.6	+0.0	67.9	113.0	-45.1	RF Ou
24	3894.244M	46.4	+10.0	+10.0	+1.3	+0.0	67.7	113.0	-45.3	RF Ou
25	3089.135M	46.4	+9.9	+9.9	+1.2	+0.0	67.4	113.0	-45.6	RF Ou
26	4668.973M	45.9	+10.0	+10.0	+1.5	+0.0	67.4	113.0	-45.6	RF Ou
27	4027.164M	46.1	+10.0	+10.0	+1.3	+0.0	67.4	113.0	-45.6	RF Ou
28	897.192M	46.9	+9.9	+9.9	+0.6	+0.0	67.3	113.0	-45.7	RF Ou
29	3339.782M	45.9	+10.0	+10.0	+1.2	+0.0	67.1	113.0	-45.9	RF Ou
30	3392.950M	45.8	+10.0	+10.0	+1.2	+0.0	67.0	113.0	-46.0	RF Ou
31	2744.696M	42.5	+9.9	+10.0	+1.1	+0.0	63.5	113.0	-49.5	RF Ou
32	2745.310M	41.8	+9.9	+10.0	+1.1	+0.0	62.8	113.0	-50.2	RF Ou
33	1830.214M	40.3	+9.9	+10.0	+0.9	+0.0	61.1	113.0	-51.9	RF Ou
34	1829.806M	40.2	+9.9	+10.0	+0.9	+0.0	61.0	113.0	-52.0	RF Ou
35	3659.591M	37.5	+10.0	+10.0	+1.3	+0.0	58.8	113.0	-54.2	RF Ou


CKC Laboratories Date: 8/1/2005 Time: 14:05:44 BW Technologies WO#: 83628
15.247(d) Test Lead: RF Output 12VDC Sequence#: 3
BW Technologies M/N PA-BASE-900 Antenna Conducted Mid Channel
140
120
100
80
60
40
20
dBµV/m
1
10
30
100
216
1000
10000
Frequency [MHz]
1
Sweep Data
1 - 15.247(d)

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **BW Technologies**
Specification: **15.247(d)**
Work Order #: **83628** Date: 8/1/2005
Test Type: **Antenna Conducted Emissions** Time: 14:16:08
Equipment: **Personnel Alert Base** Sequence#: 4
Manufacturer: BW Technologies Tested By: Randal Clark
Model: PA-BASE-900 12VDC
S/N: 05182196

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Personnel Alert Base*	BW Technologies	PA-BASE-900	05182196

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a gas detection system operating in the 902-928MHz frequency band. Equipment is a frequency hopping spread spectrum radio operating continuously on the specified channel with modulation enabled. Equipment is connected directly to the spectrum analyzer through suitable attenuation. Operating Frequency: High Channel. Frequency Range Investigated: 1MHz to 10GHz. Temperature: 23ºC, Relative Humidity: 38%.

Transducer Legend:

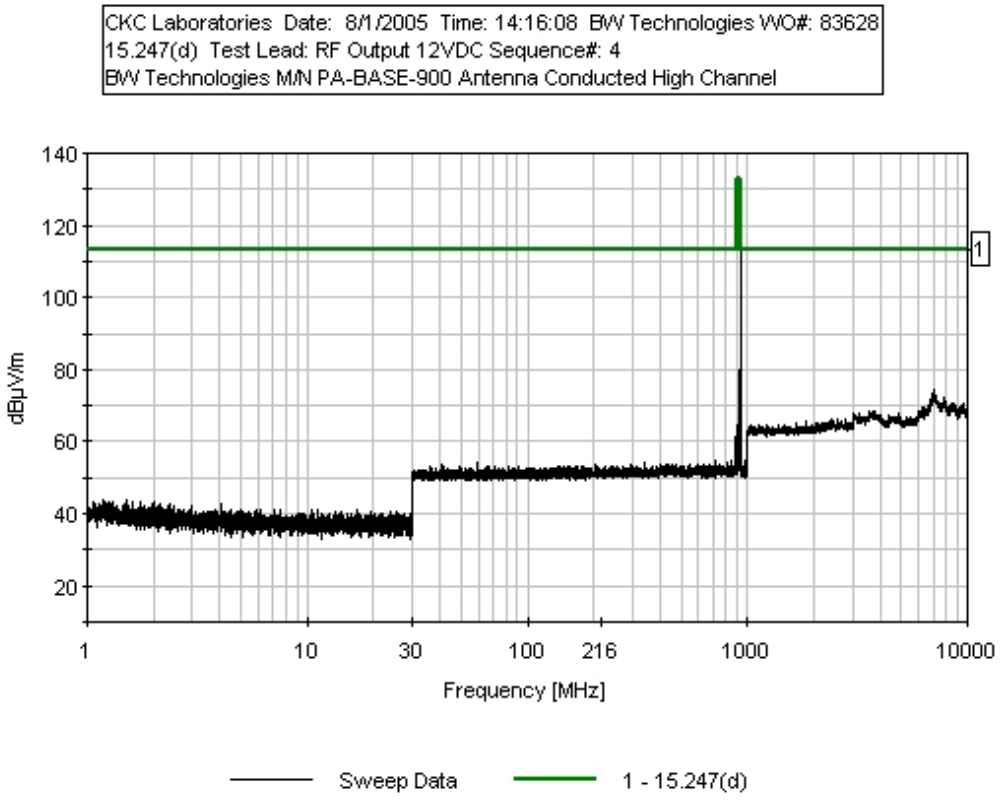
T1=Att 10dB AN02138 T2=Att 10dB AN02139
T3=Cable 40 GHz 36"

Measurement Data: Reading listed by margin. Test Lead: RF Output

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	927.090M	110.9	+9.9	+9.9	+0.6		+0.0	131.3	133.0 Carrier	-1.7	RF Ou
2	928.664M	60.0	+9.9	+9.9	+0.6		+0.0	80.4	113.0	-32.6	RF Ou
3	7018.135M	52.5	+10.1	+10.1	+1.9		+0.0	74.6	113.0	-38.4	RF Ou
4	7833.720M	49.8	+10.1	+10.1	+2.0		+0.0	72.0	113.0	-41.0	RF Ou
5	7376.107M	49.2	+10.1	+10.1	+1.9		+0.0	71.3	113.0	-41.7	RF Ou
6	7416.701M	49.0	+10.1	+10.1	+1.9		+0.0	71.1	113.0	-41.9	RF Ou
7	8534.900M	48.5	+10.1	+10.1	+2.0		+0.0	70.7	113.0	-42.3	RF Ou
8	9527.625M	47.9	+10.1	+10.2	+2.2		+0.0	70.4	113.0	-42.6	RF Ou
9	6671.235M	48.2	+10.0	+10.1	+1.7		+0.0	70.0	113.0	-43.0	RF Ou
10	6372.311M	48.1	+10.0	+10.0	+1.7		+0.0	69.8	113.0	-43.2	RF Ou

11	9693.694M	47.4	+10.1	+10.1	+2.2	+0.0	69.8	113.0	-43.2	RF Ou
12	6214.631M	47.8	+10.0	+10.0	+1.7	+0.0	69.5	113.0	-43.5	RF Ou
13	6578.975M	47.7	+10.0	+10.1	+1.7	+0.0	69.5	113.0	-43.5	RF Ou
14	8213.834M	47.3	+10.1	+10.1	+1.9	+0.0	69.4	113.0	-43.6	RF Ou
15	8926.086M	47.2	+10.1	+10.1	+2.0	+0.0	69.4	113.0	-43.6	RF Ou
16	9213.939M	46.9	+10.1	+10.2	+2.1	+0.0	69.3	113.0	-43.7	RF Ou
17	9996.310M	46.7	+10.1	+10.2	+2.3	+0.0	69.3	113.0	-43.7	RF Ou
18	9749.051M	46.5	+10.1	+10.1	+2.2	+0.0	68.9	113.0	-44.1	RF Ou
19	5982.972M	47.0	+10.0	+10.0	+1.6	+0.0	68.6	113.0	-44.4	RF Ou
20	6115.892M	46.7	+10.0	+10.1	+1.7	+0.0	68.5	113.0	-44.5	RF Ou
21	3579.036M	47.1	+10.0	+10.0	+1.3	+0.0	68.4	113.0	-44.6	RF Ou
22	3765.123M	47.1	+9.9	+10.0	+1.3	+0.0	68.3	113.0	-44.7	RF Ou
23	6165.261M	46.5	+10.0	+10.1	+1.7	+0.0	68.3	113.0	-44.7	RF Ou
24	3719.551M	47.0	+9.9	+10.0	+1.3	+0.0	68.2	113.0	-44.8	RF Ou
25	4828.476M	46.5	+10.0	+10.0	+1.5	+0.0	68.0	113.0	-45.0	RF Ou
26	3054.956M	46.7	+9.9	+9.9	+1.2	+0.0	67.7	113.0	-45.3	RF Ou
27	3248.638M	46.6	+9.9	+10.0	+1.2	+0.0	67.7	113.0	-45.3	RF Ou
28	4380.349M	45.8	+10.0	+10.0	+1.4	+0.0	67.2	113.0	-45.8	RF Ou
29	4589.221M	45.6	+10.0	+10.0	+1.4	+0.0	67.0	113.0	-46.0	RF Ou
30	4938.608M	45.4	+10.0	+10.0	+1.5	+0.0	66.9	113.0	-46.1	RF Ou
31	2781.313M	41.6	+9.9	+10.0	+1.1	+0.0	62.6	113.0	-50.4	RF Ou
32	2780.699M	40.9	+9.9	+10.0	+1.1	+0.0	61.9	113.0	-51.1	RF Ou
33	4635.545M	39.4	+10.0	+10.0	+1.4	+0.0	60.8	113.0	-52.2	RF Ou
34	3708.436M	39.2	+9.9	+10.0	+1.3	+0.0	60.4	113.0	-52.6	RF Ou

35	4634.503M	38.3	+10.0	+10.0	+1.4	+0.0	59.7	113.0	-53.3	RF Ou
36	1853.801M	38.9	+9.9	+10.0	+0.9	+0.0	59.7	113.0	-53.3	RF Ou
37	1854.205M	38.8	+9.9	+10.0	+0.9	+0.0	59.6	113.0	-53.4	RF Ou
38	3707.604M	38.4	+9.9	+10.0	+1.3	+0.0	59.6	113.0	-53.4	RF Ou



Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **BW Technologies**
Specification: **15.247(d)**
Work Order #: **83628** Date: 8/2/2005
Test Type: **Maximized Emissions** Time: 11:05:06
Equipment: **Personnel Alert Base** Sequence#: 6
Manufacturer: BW Technologies Tested By: Randal Clark
Model: PA-BASE-900
S/N: 05182196

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Personnel Alert Base*	BW Technologies	PA-BASE-900	05182196

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a gas detection system operating in the 902-928MHz frequency band. Equipment is a frequency hopping spread spectrum radio operating in continuous transmit mode. Personnel Alert Base is mounted on test wall as per configuration typically seen in field installations. DC/Signal cable is routed through a conduit, which is grounded to the ground plane in accordance with the NEC and CEC requirements for explosion proof equipment. DC power to EUT is routed from support power supply. EUT drain wire is tied to ground plane. The operation of the RF deck is verified by confirming duplex traffic with the badge prior to the emissions test commencing. Operating Frequency: Low, Mid and High channels Frequency Range Investigated: 1-1000MHz. Temperature: 29ºC, Relative Humidity: 38%. Limit applied is 15.209 except for frequencies outside of 15.205 restricted bands where limit applied is -20dBc. **No EUT emissions detected within 20dB of the limit in the frequency range below 30 MHz.**

Transducer Legend:

T1=Amp - S/N 604 T2=Bilog Site D
T3=Cable - 10 Meter

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	965.909M QP	47.9	-26.9	+23.7	+7.9		+0.0	52.6	54.0	-1.4	Verti 116
^	965.902M	48.9	-26.9	+23.7	+7.9		+0.0	53.6	54.0	-0.4	Verti 116
3	966.108M QP	47.8	-26.9	+23.7	+7.9		+0.0	52.5	54.0	-1.5	Verti 116

4	960.913M QP	45.6	-26.9	+23.7	+7.9	+0.0	50.3	54.0	-3.7	Verti 115
^	960.894M	48.6	-26.9	+23.7	+7.9	+0.0	53.3	54.0	-0.7	Verti 115
6	961.111M QP	44.9	-26.9	+23.7	+7.9	+0.0	49.6	54.0	-4.4	Verti 115
^	961.111M	48.6	-26.9	+23.7	+7.9	+0.0	53.3	54.0	-0.7	Verti 115
8	976.600M	43.2	-26.8	+23.9	+7.9	+0.0	48.2	54.0	-5.8	Verti 116
9	976.818M	42.6	-26.8	+23.9	+7.9	+0.0	47.6	54.0	-6.4	Verti 116
10	81.140M	48.1	-27.0	+6.9	+2.0	+0.0	30.0	40.0	-10.0	Verti 122
11	80.400M	48.1	-27.0	+6.8	+2.0	+0.0	29.9	40.0	-10.1	Verti 122
12	82.440M	46.5	-26.9	+7.1	+2.1	+0.0	28.8	40.0	-11.2	Verti 122
13	76.480M	45.8	-26.9	+6.4	+2.0	+0.0	27.3	40.0	-12.7	Verti 122
14	749.560M	70.2	-27.5	+20.9	+6.9	+0.0	70.5	103.0	-32.5	Verti 122
15	823.766M	68.1	-27.3	+21.7	+7.3	+0.0	69.8	103.0	-33.2	Verti 122
16	823.958M	67.6	-27.3	+21.8	+7.3	+0.0	69.4	103.0	-33.6	Verti 122
17	835.755M	65.2	-27.3	+21.9	+7.5	+0.0	67.3	103.0	-35.7	Verti 116
18	897.012M	62.3	-27.0	+22.8	+8.1	+0.0	66.2	103.0	-36.8	Verti 116
19	797.129M	64.3	-27.3	+21.4	+7.0	+0.0	65.4	103.0	-37.6	Verti 116
20	796.914M	63.8	-27.3	+21.4	+7.0	+0.0	64.9	103.0	-38.1	Verti 116
21	887.905M	59.5	-27.1	+22.6	+8.0	+0.0	63.0	103.0	-40.0	Verti 116
22	888.109M	59.4	-27.1	+22.6	+8.0	+0.0	62.9	103.0	-40.1	Verti 116
23	774.300M	60.0	-27.4	+21.1	+6.9	+0.0	60.6	103.0	-42.4	Verti 116
24	890.745M	55.5	-27.1	+22.7	+8.0	+0.0	59.1	103.0	-43.9	Verti 116
25	890.950M	54.4	-27.1	+22.7	+8.0	+0.0	58.0	103.0	-45.0	Verti 116
26	897.004M	53.6	-27.0	+22.8	+8.1	+0.0	57.5	103.0	-45.5	Verti 122
27	932.804M	52.2	-27.0	+23.3	+8.1	+0.0	56.6	103.0	-46.4	Verti 122
28	933.206M	51.6	-27.0	+23.3	+8.1	+0.0	56.0	103.0	-47.0	Verti 122

29	805.106M	54.6	-27.3	+21.5	+7.1	+0.0	55.9	103.0	-47.1	Verti 116
30	804.892M	54.5	-27.3	+21.5	+7.1	+0.0	55.8	103.0	-47.2	Verti 116
31	882.897M	51.7	-27.1	+22.6	+8.0	+0.0	55.2	103.0	-47.8	Verti 115
32	883.108M	51.5	-27.1	+22.6	+8.0	+0.0	55.0	103.0	-48.0	Verti 115
33	897.010M	50.8	-27.0	+22.8	+8.1	+0.0	54.7	103.0	-48.3	Verti 116
34	936.019M	48.9	-27.0	+23.3	+8.1	+0.0	53.3	103.0	-49.7	Verti 116
35	875.896M	48.5	-27.1	+22.5	+7.9	+0.0	51.8	103.0	-51.2	Verti 122
36	876.109M	48.0	-27.1	+22.5	+7.9	+0.0	51.3	103.0	-51.7	Verti 122
37	894.205M	45.9	-27.0	+22.7	+8.1	+0.0	49.7	103.0	-53.3	Verti 122
38	956.810M	45.2	-27.0	+23.6	+7.8	+0.0	49.6	103.0	-53.4	Verti 116
39	893.797M	45.1	-27.0	+22.7	+8.1	+0.0	48.9	103.0	-54.1	Verti 122
40	957.195M	43.7	-27.0	+23.6	+7.8	+0.0	48.1	103.0	-54.9	Verti 116
41	567.270M	49.9	-27.6	+18.6	+6.0	+0.0	46.9	103.0	-56.1	Verti 116
42	954.110M	41.9	-27.0	+23.6	+7.8	+0.0	46.3	103.0	-56.7	Verti 122
43	513.258M	50.3	-27.4	+17.6	+5.6	+0.0	46.1	103.0	-56.9	Verti 116
44	953.908M	41.4	-27.0	+23.6	+7.8	+0.0	45.8	103.0	-57.2	Verti 122
45	936.012M	40.5	-27.0	+23.3	+8.1	+0.0	44.9	103.0	-58.1	Verti 116
46	844.112M	42.5	-27.3	+22.0	+7.6	+0.0	44.8	103.0	-58.2	Verti 115
47	843.905M	41.4	-27.3	+22.0	+7.6	+0.0	43.7	103.0	-59.3	Verti 115
48	903.242M	55.6	-27.0	+22.8	+8.1	+0.0	59.5	123.0	-63.5	Verti 122
49	903.435M	53.9	-27.0	+22.9	+8.1	+0.0	57.9	123.0	-65.1	Verti 122
50	917.800M	50.8	-27.0	+23.1	+8.2	+0.0	55.1	123.0	-67.9	Verti 116
51	918.210M	50.5	-27.0	+23.1	+8.2	+0.0	54.8	123.0	-68.2	Verti 116
52	916.915M	45.9	-27.0	+23.0	+8.2	+0.0	50.1	123.0	-72.9	Verti 116

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **BW Technologies**
Specification: **FCC 15.247 (d) / 15.209 / 15.205**
Work Order #: **83628** Date: 8/2/2005
Test Type: **Maximized Emissions** Time: 13:18:55
Equipment: **Personnel Alert Base** Sequence#: 7
Manufacturer: BW Technologies Tested By: Randal Clark
Model: PA-BASE-900
S/N: 05182196

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Personnel Alert Base*	BW Technologies	PA-BASE-900	05182196

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a gas detection system operating in the 902-928MHz frequency band. Equipment is a frequency hopping spread spectrum radio operating in continuous transmit mode. Personnel Alert Base is mounted on test wall as per configuration typically seen in field installations. DC/Signal cable is routed through a conduit, which is grounded to the ground plane in accordance with the NEC and CEC requirements for explosion proof equipment. DC power to EUT is routed from support power supply. EUT drain wire is tied to ground plane. The operation of the RF deck is verified by confirming duplex traffic with the badge prior to the emissions test commencing. Operating Frequency: Low, Mid and High channels. Frequency Range Investigated: 1-10GHz. Temperature: 29ºC, Relative Humidity: 38%. Limit applied is 15.209 except for frequencies outside of 15.205 restricted bands where limit applied is -20dBc. Dwell time correction factor applied in accordance with DA 00-705. Maximum dwell time per 100ms is 5.06ms therefore DTCF = 20*LOG(5.06/100) = -25.91dB.

Transducer Legend:

T1=Horn AN 00656 1-18 GHz (Mariposa)	T2=Cable 40 GHz 36"
T3=Cable - 3 Meter to bulkhead	T4=Cable P01012
T5=DTCF - 5.06ms Dwell Time	

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	2781.342M	20.2	+30.4 -25.9	+1.1	+5.3	+2.6	+0.0	33.7	54.0	-20.3	Verti 125
2	2707.221M	20.0	+30.1 -25.9	+1.1	+5.2	+2.5	+0.0	33.0	54.0	-21.0	Verti 133
3	2707.823M	19.2	+30.1 -25.9	+1.1	+5.2	+2.5	+0.0	32.2	54.0	-21.8	Verti 133
4	2745.328M	18.5	+30.3 -25.9	+1.1	+5.3	+2.5	+0.0	31.8	54.0	-22.2	Verti 125
5	2744.716M	18.5	+30.3 -25.9	+1.1	+5.3	+2.5	+0.0	31.8	54.0	-22.2	Verti 125
6	2745.327M	16.6	+30.3 -25.9	+1.1	+5.3	+2.5	+0.0	29.9	54.0	-24.1	Horiz 119

7	2744.711M	15.2	+30.3 -25.9	+1.1	+5.3	+2.5	+0.0	28.5	54.0	-25.5	Horiz 119
8	2780.706M	14.0	+30.4 -25.9	+1.1	+5.3	+2.6	+0.0	27.5	54.0	-26.5	Verti 125
9	1830.211M	29.6	+27.5 -25.9	+0.9	+4.2	+2.0	+0.0	38.3	103.0	-64.7	Verti 125
10	1853.814M	29.2	+27.6 -25.9	+0.9	+4.2	+2.0	+0.0	38.0	103.0	-65.0	Verti 125
11	1830.209M	29.3	+27.5 -25.9	+0.9	+4.2	+2.0	+0.0	38.0	103.0	-65.0	Verti 125
12	1829.811M	29.3	+27.5 -25.9	+0.9	+4.2	+2.0	+0.0	38.0	103.0	-65.0	Verti 125
13	1829.807M	29.1	+27.5 -25.9	+0.9	+4.2	+2.0	+0.0	37.8	103.0	-65.2	Verti 125
14	1853.822M	28.6	+27.6 -25.9	+0.9	+4.2	+2.0	+0.0	37.4	103.0	-65.6	Verti 125
15	1804.805M	28.7	+27.4 -25.9	+0.9	+4.2	+2.0	+0.0	37.3	103.0	-65.7	Verti 136
16	1805.207M	28.2	+27.4 -25.9	+0.9	+4.2	+2.0	+0.0	36.8	103.0	-66.2	Verti 136
17	1829.807M	27.9	+27.5 -25.9	+0.9	+4.2	+2.0	+0.0	36.6	103.0	-66.4	Horiz 119
18	1830.217M	27.3	+27.5 -25.9	+0.9	+4.2	+2.0	+0.0	36.0	103.0	-67.0	Horiz 119
19	1804.805M	24.0	+27.4 -25.9	+0.9	+4.2	+2.0	+0.0	32.6	103.0	-70.4	Horiz 115
20	1805.211M	24.0	+27.4 -25.9	+0.9	+4.2	+2.0	+0.0	32.6	103.0	-70.4	Horiz 115