



360 Herndon Parkway  
 Suite 1400  
 Herndon, VA 20170  
<http://www.rheintech.com>

Report Number: 2001334-Rev 5:  
 Quote Number: QRTL01-250  
 FCC Class II Permissive Change

**CLASS 2 PERMISSIVE CHANGE  
 FCC PART 90 CERTIFICATION  
 (PART 90.217(B))**


<b>Test Lab:</b>  Rhein Tech Laboratories, Inc. 360 Herndon Parkway Suite 1400 Herndon, VA 20170  Phone: 703-689-0368 Fax: 703-689-2056 Web Site: <a href="http://www.rheintech.com">www.rheintech.com</a>	<b>Applicant Information</b>  Dominion Wireless Inc. 22611 Markey Ct, Unit 110 Sterling, VA 20166 USA
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<b>FCC Classification:</b>	<input type="checkbox"/> TBC – Licensed Broadcast Station Transmitter <input type="checkbox"/> TBF – Licensed Broadcast Transmitter Held to Face <input checked="" type="checkbox"/> TBT – Licensed Broadcast Transmitter Worn on Body <input type="checkbox"/> TNB – Licensed Non-Broadcast Station Transmitter <input type="checkbox"/> TNE – Licensed Nono-Broadcast Transmitter Held to Ear <input type="checkbox"/> TNF – Licensed Non-Broadcast Transmitter Held to Face <input type="checkbox"/> TNT – Licensed Non-Broadcast Transmitter Worn on Body
<b>FCC Rule Part(s):</b>	Part 90: PRIVATE LAND MOBILE RADIO SERVICES <input checked="" type="checkbox"/> Subpart I – General Technical Standards <input checked="" type="checkbox"/> Subpart J – Non-Voice and Other Specialized Operations

<b>FCC ID:</b>	OQUB76060	<b>Max. ERP Output Power :</b>	0.051 W
<b>Equipment Type:</b>	Transmitter	<b>Frequency Tolerance:</b>	1010 Hz
<b>Tx Frequency Range:</b>	421 – 470 MHz	<b>Emission Designator:</b>	25K0F7D
<b>Rx Frequency Range:</b>	N/A	<b>Date of Test Report:</b>	March 12, 2002
<b>Model(s):</b>	Personal Protection Device		

We, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. No modifications were made to the equipment during testing in order to achieve compliance with these standards.


Furthermore, there was no deviation from, additions to or exclusions from the FCC Part 2, FCC Part 15, FCC Part 90, ANSI C63.4, ANSI/TIA/EIA603 and ANSI/TIA/EIA 603-1.

Signature: 

Date: March 12, 2002

Typed/Printed Name: Bruno Clavier

Position: Vice President of Operations

Signature: 

Date: March 12, 2002

Typed/Printed Name: Daniel W. Baltzell

Position: EMC Test Engineer

**Note: This report may not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.**



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## TABLE OF CONTENTS

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<b>1</b>	<b>GENERAL INFORMATION .....</b>	<b>3</b>
1.1	SCOPE .....	3
1.2	TEST FACILITY .....	3
1.3	RELATED SUBMITAL(S)/GRANT(S) .....	3
1.4	PERMISSIVE CHANGE .....	3
<b>2</b>	<b>EQUIPMENT INFORMATION .....</b>	<b>4</b>
2.1	APPLICANT AND EQUIPMENT INFORMATION .....	4
2.2	JUSTIFICATION .....	4
2.3	EXERCISING THE EUT .....	4
2.4	TEST SYSTEM DETAILS .....	5
<b>3</b>	<b>RF POWER OUTPUT - §2.1046 .....</b>	<b>6</b>
3.1	ANSI/TIA/EIA-603-1992, SECTION 2.2.1 TEST PROCEDURE .....	6
3.2	EFFECTIVE RADIATED POWER OUTPUT TEST DATA- §2.1046 .....	6
<b>4</b>	<b>RADIATED SPURIOUS AND HARMONIC EMISSIONS - §2.1053 .....</b>	<b>7</b>
4.1	RADIATED SPURIOUS AND HARMONIC EMISSIONS - §2.1053 .....	7
4.2	RADIATED SPURIOUS TEST EQUIPMENT .....	7
4.3	FIELD STRENGTH OF SPURIOUS RADIATION TEST DATA - §2.1053 .....	8
<b>5</b>	<b>CONCLUSION .....</b>	<b>11</b>

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## TABLE INDEX

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TABLE 2-1:	EQUIPMENT UNDER TEST (EUT) .....	5
TABLE 3-1:	POWER OUTPUT DATA - §2.1046 .....	6
TABLE 4-1:	RADIATED SPURIOUS TEST EQUIPMENT .....	7
TABLE 4-2:	FIELD STRENGTH DATA §2.1053 .....	8
TABLE 4-3:	FIELD STRENGTH DATA §2.1053 .....	9
TABLE 4-4:	FIELD STRENGTH DATA §2.1053 .....	10



## **1 GENERAL INFORMATION**

### **1.1 SCOPE**

FCC Rules Part 90.217(b): Private Land Mobile Radio Services - Exemption from technical standards  
Additionally, the digital interface of this device was tested and was found compliant with Part 15 subpart B. A test report is placed on file and available upon request.

All measurements contained in this application were conducted in accordance with the FCC Rules and Regulations CFR47 and ANSI/TIA/EIA603-1992/-1-1998 Land Mobile FM or PM Communications Equipment Measurement and Performance Standards. The instrumentation utilized for the measurements conforms to the ANSI C63.4 standard for EMI and Field Strength Instrumentation. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier and cables.

### **1.2 TEST FACILITY**

The open area test site and conducted measurement facility used to collect the radiated data is located at 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communication Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 1992).

### **1.3 RELATED SUBMITAL(S)/GRANT(S)**

Original application for Certification FCCID: OQUB76060  
Granted on 02/28/2000

### **1.4 PERMISSIVE CHANGE**

The changes to the unit are a new antenna (+2dBi), the housing (plastic), label marking which will now be embossed into the plastic housing, battery is changed from a 6 V Lithium to 9 V alkaline, shields which will now clip into surface mount clips, microprocessor crystal will be surface mount oscillator, and the printed circuit board dimensions and layout.



## 2 EQUIPMENT INFORMATION

### 2.1 APPLICANT AND EQUIPMENT INFORMATION

Dominion Wireless Inc.  
 22611 Markey Ct, Unit 110  
 Sterling, VA 20166  
 USA

<b>FCC Classification:</b>	<input type="checkbox"/> TBC – Licensed Broadcast Station Transmitter <input type="checkbox"/> TBF – Licensed Broadcast Transmitter Held to Face <input checked="" type="checkbox"/> TBT – Licensed Broadcast Transmitter Worn on Body <input type="checkbox"/> TNB – Licensed Non-Broadcast Station Transmitter <input type="checkbox"/> TNE – Licensed Nono-Broadcast Transmitter Held to Ear <input type="checkbox"/> TNF – Licensed Non-Broadcast Transmitter Held to Face <input type="checkbox"/> TNT – Licensed Non-Broadcast Transmitter Worn on Body
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<b>FCC ID:</b>	OQUB76060	<b>Max. Conducted Output Power:</b>	0.051 W
<b>Equipment Type:</b>	Transmitter	<b>Frequency Tolerance:</b>	1010 Hz
<b>Tx Frequency Range:</b>	421 – 470 MHz	<b>Emission Designator:</b>	25K0F7D
<b>Rx Frequency Range:</b>	N/A	<b>Date of Test Report:</b>	March 12, 2002
<b>Model(s):</b>	Personal Protection Device		

### 2.2 JUSTIFICATION

To complete the test configuration required by the FCC, the transmitter was wired by the manufacturer to operate in a continuous mode. A high middle and low channel were investigated. The final data was taken as a substitution measurement. Since the device is battery operated conducted line emission is not required.

### 2.3 EXERCISING THE EUT

The Personal Protection Device (PPD) is a transmitter designed to transmit at a predetermined frequency within the range (421 MHz – 470 MHz). The following frequencies were tested: 421.000 MHz, 458.9375 MHz and 470.000 MHz. Each frequency was measured independently.



## 2.4 TEST SYSTEM DETAILS

The FCC Identifiers for all equipment, plus descriptions of all cables used in the tested system are:

**TABLE 2-1: EQUIPMENT UNDER TEST (EUT)**

PART	MANUFACTURER	MODEL	SERIAL NUMBER	FCC ID	CABLE DESCRIPTION
PERSONAL PROTECTION DEVICE	DOMINION WIRELESS, INC.	N/A	N/A	OQUB76060	UNSHIELDED I/O
PATCH ANTENNA (-4dBi)* ORIGINAL ANTENNA	LINX TECHNOLOGY	ANTSP-458-TWC-A REV 1	N/A	N/A	N/A
FLEXIBLE ¼ WAVE WIRE (+2dBi)*	DOMINION WIRELESS, INC.	N/A	N/A	N/A	N/A

\* Antennas are integral to the transmitter.



### 3 RF POWER OUTPUT - §2.1046

#### 3.1 ANSI/TIA/EIA-603-1992, SECTION 2.2.1 TEST PROCEDURE

ERP Measurements by Substitution Method:

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A half-wave dipole was substituted in place of the EUT. The dipole was fed by a signal generator and adjusted until the previous field strength level was attained. The conducted power at the antenna feed point was recorded. It was further corrected by subtracting the cable loss from the signal generator to the dipole and correcting the dipole gain to a theoretical  $\frac{1}{2}$  wave dipole. For readings above 1GHz the above method is repeated using standard gain horn antennas.

#### 3.2 EFFECTIVE RADIATED POWER OUTPUT TEST DATA- §2.1046

This measurement was performed using the new antenna: Flexible  $\frac{1}{4}$  wave wire (+2dBi)

TABLE 3-1: POWER OUTPUT DATA - §2.1046

Frequency (MHz)	Spectrum Analyzer (dBuV)	Signal Generator Level (dBm)	Cable Loss (dB)	Corrected Antenna Gain (dB)	Corrected Signal Generator Level (dBm)	ERP (mW)
421.000	92.6	17.0	0.4	0.45	17.05	50.7
458.938	93.7	17.0	0.4	0.35	16.95	49.6
470.000	88.4	11.7	0.5	0.35	11.55	14.3



## 4 RADIATED SPURIOUS AND HARMONIC EMISSIONS - §2.1053

### 4.1 RADIATED SPURIOUS AND HARMONIC EMISSIONS - §2.1053

Radiated and harmonic emissions were measured on a 3-meter outdoor site. The EUT was placed on the turntable with the transmitter enabled. A receiving antenna located 3 meters from the turntable received any signal radiated from the transmitter and its operating accessories. The receiving antenna was varied from 1 to 4 meters and the polarization was varied through 3 orthogonal planes to determine the worst-case emission level.

### 4.2 RADIATED SPURIOUS TEST EQUIPMENT

**TABLE 4-1: RADIATED SPURIOUS TEST EQUIPMENT**

RTL Asset #	Manufacturer	Model	Part Type	Serial Number
901053	Schaffner Chase	CBL6112B	Bi-Log Antenna (20 MHz – 2 GHz)	2648
900932	Hewlett Packard	8449B OPT H02	Preamplifier 1-26.5 GHz	3008A00505
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771
900917	Hewlett Packard	8648C	Signal Generator (100kHz – 3200 MHz)	3537A01741
900928	Hewlett Packard	83752A	Synthesized Sweeper (0.01 GHz – 20 GHz)	3610A00866
900154	Compliance Design Inc,	Roberts Dipole	Adjustable Elements Dipole Antenna (30- 1000MHz)	N/A
900814	Electro-Metrics	EM-6961 (RGA-60)	Double Ridges Guide Antenna 1-18 GHz	2310



**4.3 FIELD STRENGTH OF SPURIOUS RADIATION TEST DATA - §2.1053**

Operating Frequency (MHz): 421.000  
 Channel: Low  
 Measured ERP (dBm): 17.05  
 Modulation: F7D  
 Distance: 3 m  
 Limit: -12.95 dBm

**TABLE 4-2: FIELD STRENGTH DATA §2.1053**

Frequency (MHz)	Signal Generator Level (dBm)	Cable Loss (dB)	Corrected Antenna Gain (dB)	Corrected Signal Generator Level (dBm)	Limit dBm (equivalent to -30 dBc)	Margin (dB)
842.0000	-35.1	0.6	-1.00	-36.70	-12.95	-23.75
1260.0000	-33.7	0.7	2.35	-32.05	-12.95	-19.10
1680.0000	-35.7	1.0	4.72	-31.98	-12.95	-19.03
2100.0000	-31.0	1.0	4.91	-27.09	-12.95	-14.14
2520.0000	-37.6	0.9	5.19	-33.31	-12.95	-20.36
2940.0000	-28.7	1.0	6.12	-23.58	-12.95	-10.63
3360.0000	-40.3	1.1	6.03	-35.37	-12.95	-22.42
3780.0000	-34.1	1.1	7.41	-27.79	-12.95	-14.84
4200.0000	-33.0	1.2	6.33	-27.87	-12.95	-14.92

Substitution method.

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A half-wave dipole was substituted in place of the EUT. The dipole was fed by a signal generator and adjusted until the previous field strength level was attained. The conducted power at the antenna feed point was recorded. It was further corrected by subtracting the cable loss from the signal generator to the dipole and correcting the dipole gain to a theoretical 1/2 wave dipole. For readings above 1GHz the above method is repeated using standard gain horn antennas.





Operating Frequency (MHz): 458.9375  
 Channel: Middle  
 Measured ERP (dBm): 16.95  
 Modulation: F7D  
 Distance: 3m  
 Limit: -13.05 dBm

**TABLE 4-3: FIELD STRENGTH DATA §2.1053**

Frequency (MHz)	Signal Generator Level (dBm)	Cable Loss (dB)	Corrected Antenna Gain (dB)	Corrected Signal Generator Level (dBm)	Limit dBm (equivalent to -30 dBc)	Margin (dB)
917.8750	-48.2	0.6	-0.90	-49.70	-13.05	-36.65
1376.8125	-32.1	0.8	3.47	-29.43	-13.05	-16.38
1835.7500	-53.6	1.0	4.78	-49.82	-13.05	-36.77
2294.6875	-50.0	0.9	5.03	-45.87	-13.05	-32.82
2753.6250	-51.7	1.0	5.71	-46.99	-13.05	-33.94
3212.5625	-44.9	1.2	6.12	-39.98	-13.05	-26.93
3671.5000	-52.9	1.1	7.38	-46.62	-13.05	-33.57
4130.4375	-35.8	1.2	6.16	-30.84	-13.05	-17.79
4589.3750	-55.5	1.3	7.03	-49.77	-13.05	-36.72

Substitution method.

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A half-wave dipole was substituted in place of the EUT. The dipole was fed by a signal generator and adjusted until the previous field strength level was attained. The conducted power at the antenna feed point was recorded. It was further corrected by subtracting the cable loss from the signal generator to the dipole and correcting the dipole gain to a theoretical 1/2 wave dipole. For readings above 1GHz the above method is repeated using standard gain horn antennas.



Operating Frequency (MHz): 470.0  
 Channel: High  
 Measured ERP (dBm): 11.55  
 Modulation: F7D  
 Distance (m): 3  
 Limit (dBm): -18.45

**TABLE 4-4: FIELD STRENGTH DATA §2.1053**

Frequency (MHz)	Signal Generator Level (dBm)	Cable Loss (dB)	Corrected Antenna Gain (dB)	Corrected Signal Generator Level (dBm)	Limit dBm (equivalent to -30 dBc)	Margin (dB)
940.0000	-35.0	0.6	-1.00	-36.60	-18.45	-18.15
1410.0000	-49.2	0.8	3.79	-46.21	-18.45	-27.76
1880.0000	-36.2	1.0	4.80	-32.40	-18.45	-13.95
2350.0000	-46.2	1.0	5.06	-42.14	-18.45	-23.69
2820.0000	-28.7	1.2	5.85	-24.05	-18.45	-5.60
3290.0000	-34.7	1.1	6.08	-29.72	-18.45	-11.27
3760.0000	-35.6	1.2	7.40	-29.40	-18.45	-10.95
4230.0000	-34.6	1.2	6.40	-29.40	-18.45	-10.95
4700.0000	-46.0	1.3	7.01	-40.29	-18.45	-21.84

Substitution method.

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A half-wave dipole was substituted in place of the EUT. The dipole was fed by a signal generator and adjusted until the previous field strength level was attained. The conducted power at the antenna feed point was recorded. It was further corrected by subtracting the cable loss from the signal generator to the dipole and correcting the dipole gain to a theoretical ½ wave dipole. For readings above 1GHz the above method is repeated using standard gain horn antennas.



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## 5 CONCLUSION

The data in this measurement report shows that the **Dominion Wireless Inc., Personal Protection Device with FCC ID: OQUB76060** complies with all the requirements of Parts 2 and 90.217 of the FCC Rules.