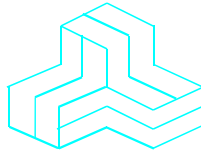


# ENGINEERING TEST REPORT



**PATSCAN CMR**  
**Model: CMR-v5**  
**FCC ID: 2ALZTCMR**

*Applicant:*

**Patriot One Technologies Inc.**  
3380 South Service Rd, Unit 302  
Burlington ON L7N 3J5  
Canada

**In Accordance With  
Federal Communications Commission (FCC)  
Part 15, Subpart F, Ultra-Wideband Operation**

**UltraTech's File No.: 17PEGM001\_FCC15F510**

This Test report is Issued under the Authority of  
Tri M. Luu  
Vice President of Engineering  
UltraTech Group of Labs

Date: August 23, 2017

Report Prepared by: Dan Huynh

Tested by: Hien Luu, Hung Trinh and Ketav Jani

Issued Date: August 23, 2017

Test Dates: July 20 - August 19, 2017

- *The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*
- *This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.*
- *This test report shall not be reproduced, except in full, without a written approval from UltraTech*

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91038



1309



46390-2049



AT-1945



SL2-IN-E-1119R



Korea  
KCC-RRR  
CA2049

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## EXHIBIT 1. INTRODUCTION

### 1.1. SCOPE

<b>Reference:</b>	FCC Part 15, Subpart F - Ultra-Wideband Operation
<b>Title:</b>	Code of Federal Regulations (CFR), Title 47, Telecommunication, Part 15 Subpart F - Ultra-Wideband Operation
<b>Purpose of Test:</b>	Equipment certification for through-wall imaging system
<b>Test Procedures:</b>	<ul style="list-style-type: none"><li>▪ ANSI C63.4</li><li>▪ ANSI C63.10</li></ul>
<b>Environmental Classification:</b>	Commercial, industrial or business environment

### 1.2. REVISION HISTORY

Document	Issue Date	Description
17PEGM001_FCC15F510	August 23, 2017	Original

### 1.3. RELATED SUBMITTAL(S)/GRANT(S)

None.

### 1.4. NORMATIVE REFERENCES

Publication	Year	Title
FCC 47 CFR 15	2017	Code of Federal Regulations, Title 47 – Telecommunication, Part 15 - Radio Frequency Devices
ANSI C63.4	2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40 GHz
ANSI C63.10	2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

## EXHIBIT 2. PERFORMANCE ASSESSMENT

### 2.1. CLIENT INFORMATION

<b>Applicant</b>	
<b>Name:</b>	Patriot One Technologies Inc.
<b>Address:</b>	3380 South Service Rd, Unit 302 Burlington ON L7N 3J5 Canada
<b>Contact Person:</b>	Crispian Sinnott Phone #: (819) 598 5759 Fax #: N/A Email Address: criss@patriot1tech.com

<b>Manufacturer</b>	
<b>Name:</b>	Patriot One Technologies Inc.
<b>Address:</b>	3380 South Service Rd, Unit 302 Burlington ON L7N 3J5 Canada
<b>Contact Person:</b>	Crispian Sinnott Phone #: (819) 598 5759 Fax #: N/A Email Address: criss@patriot1tech.com

### 2.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

<b>Brand Name:</b>	Patriot One Technologies Inc.
<b>Product Name:</b>	PATSCAN CMR
<b>Model Name or Number:</b>	CMR-v5
<b>Serial Number:</b>	Test sample
<b>Type of Equipment:</b>	Ultra Wideband Transmitter
<b>Input Power Supply Type:</b>	120VAC, 60Hz
<b>Primary User Functions of EUT:</b>	UWB radar – Through Wall Radar Imaging

**2.3. EUT'S TECHNICAL SPECIFICATIONS**

<b>Transmitter</b>	
<b>Equipment Type:</b>	Fixed
<b>Intended Operating Environment:</b>	Commercial, light industry & heavy industry
<b>Power Supply Requirement:</b>	120VAC, 60Hz converted to 12VDC
<b>RF Output Power Rating:</b>	57.91 dBµV/m Peak Power at 3m distance
<b>Operating Frequency Range:</b>	370.433 – 4807.692 MHz
<b>10 dB Bandwidth:</b>	4229.567 MHz
<b>Modulation Type:</b>	5MHz swept stepped pulsed carrier
<b>Oscillator Frequencies:</b>	2,400 – 4,800 MHz (VCO); 10 MHz Reference Oscillator
<b>Antenna Connector Type:</b>	SMA inside metal enclosure
<b>Antenna Description:</b>	Manufacturer: Patriot One Technologies Inc. Type: Cavity-backed Monopole Model: PAT-10005 Frequency Range: 300 - 4800 MHz In/Out Impedance: 50 Ohms Gain: 5dBi average, 8dBi peak

**2.4. LIST OF EUT'S PORTS**

<b>Port Number</b>	<b>EUT's Port Description</b>	<b>Number of Identical Ports</b>	<b>Connector Type</b>	<b>Cable Type (Shielded/Non-shielded)</b>
1	TX Antenna	1	SMA	Coax 4' shielded
2	RX Antenna	1	SMA	Coax 4' shielded
3	Ethernet	1	RJ45	Cat5, Cat5e, Cat6, Cat6a twisted pairs, 1'min, unshielded

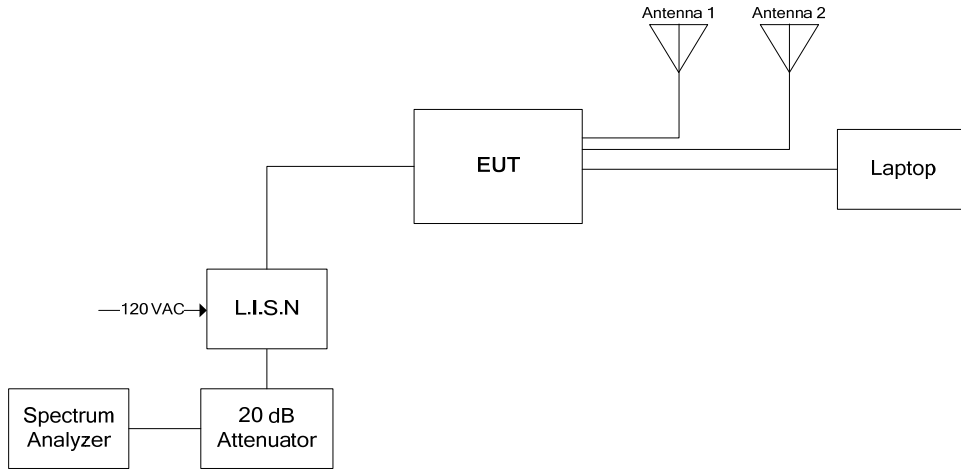
**2.5. ANCILLARY EQUIPMENT**

The EUT was tested while connected to the following representative configuration of ancillary equipment necessary to exercise the ports during tests:

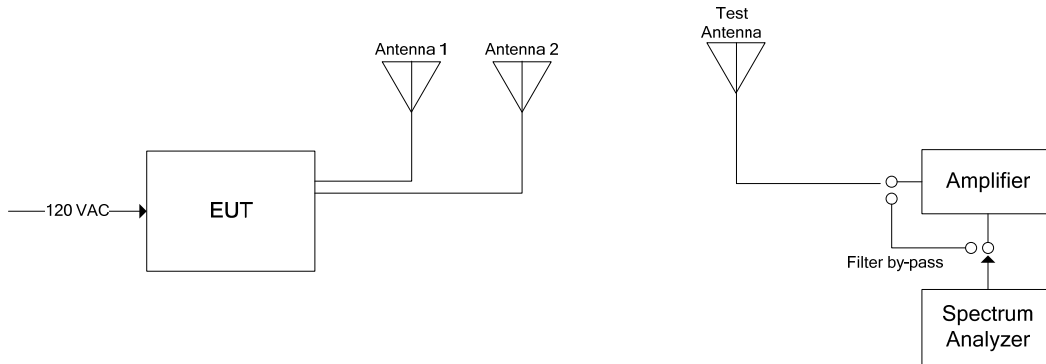
<b>Ancillary Equipment # 1</b>	
Equipment Make and Name:	Dell laptop
Model Name or Number:	Dell Precision 5510
Serial Number:	9PCBCG2
Cable Type:	Cat5
Connected to EUT's Port:	Ethernet

2.6. TEST SETUP BLOCK DIAGRAM

Power Line Conducted Emission



Radiated Emission Test Setup



### EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

#### 3.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

Temperature:	21°C
Humidity:	51%
Pressure:	102 kPa
Power input source:	120 VAC

#### 3.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TESTS

<b>Operating Modes:</b>	The EUT was configured for continuous transmission for the duration of testing.
<b>Special Test Software:</b>	N/A
<b>Special Hardware Used:</b>	N/A
<b>Transmitter Test Antenna:</b>	The EUT was tested with the antenna fitted in a manner typical of normal intended use as integral antenna equipment.

<b>Transmitter Test Signals</b>	
<b>Frequency Band(s):</b>	370.433 – 4807.692 MHz
<b>Test Frequency(ies):</b>	2110.577 MHz and 2427.885 MHz
<b>RF Power Output:</b>	57.91 dBµV/m Peak Power at 3m distance
<b>Normal Test Modulation:</b>	5MHz swept stepped pulsed carrier
<b>Modulating Signal Source:</b>	Internal

## EXHIBIT 4. SUMMARY OF TEST RESULTS

### 4.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- AC Power Line Conducted Emissions were performed in UltraTech's shielded room, 24'(L) by 16'(W) by 8'(H).
- Radiated Emissions were performed at the Ultratech's 3-10 TDK Semi-Anechoic Chamber situated in the Town of Oakville, province of Ontario. This test site been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville 3-10 TDK Semi-Anechoic Chamber has been filed with ANAB File No.: AT-1945.

### 4.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

FCC Section(s)	Test Requirements	Compliance (Yes/No)
15.203	Antenna Requirement	Yes*
15.207(a)	AC Powerline Conducted Emissions	Yes
15.510(a)	UWB bandwidth (10 dB Bandwidth)	Yes
15.510(a)(3) 15.209	Transmitter Radiated Emissions – Peak Power and Spurious Emissions	Yes

\*This device required professionally installation.

### 4.3. DEVIATIONS FROM THE STANDARD TEST PROCEDURES

Radiated emissions was conducted in the worst case configuration with no microwave absorbers employed and the receiver antenna directly facing the transmit antenna and beamwidth.

### 4.4. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None.



**EXHIBIT 5. TEST DATA**

**5.1. POWER LINE CONDUCTED EMISSIONS [§15.207(a)]**

**5.1.1. Limit(s)**

The equipment shall meet the limits of the following table:

Frequency of emission (MHz)	Conducted Limits (dBµV)	
	Quasi-peak	Average
0.15–0.5 .....	66 to 56* .....	56 to 46*
0.5–5 .....	56 .....	46
5–30 .....	60 .....	50

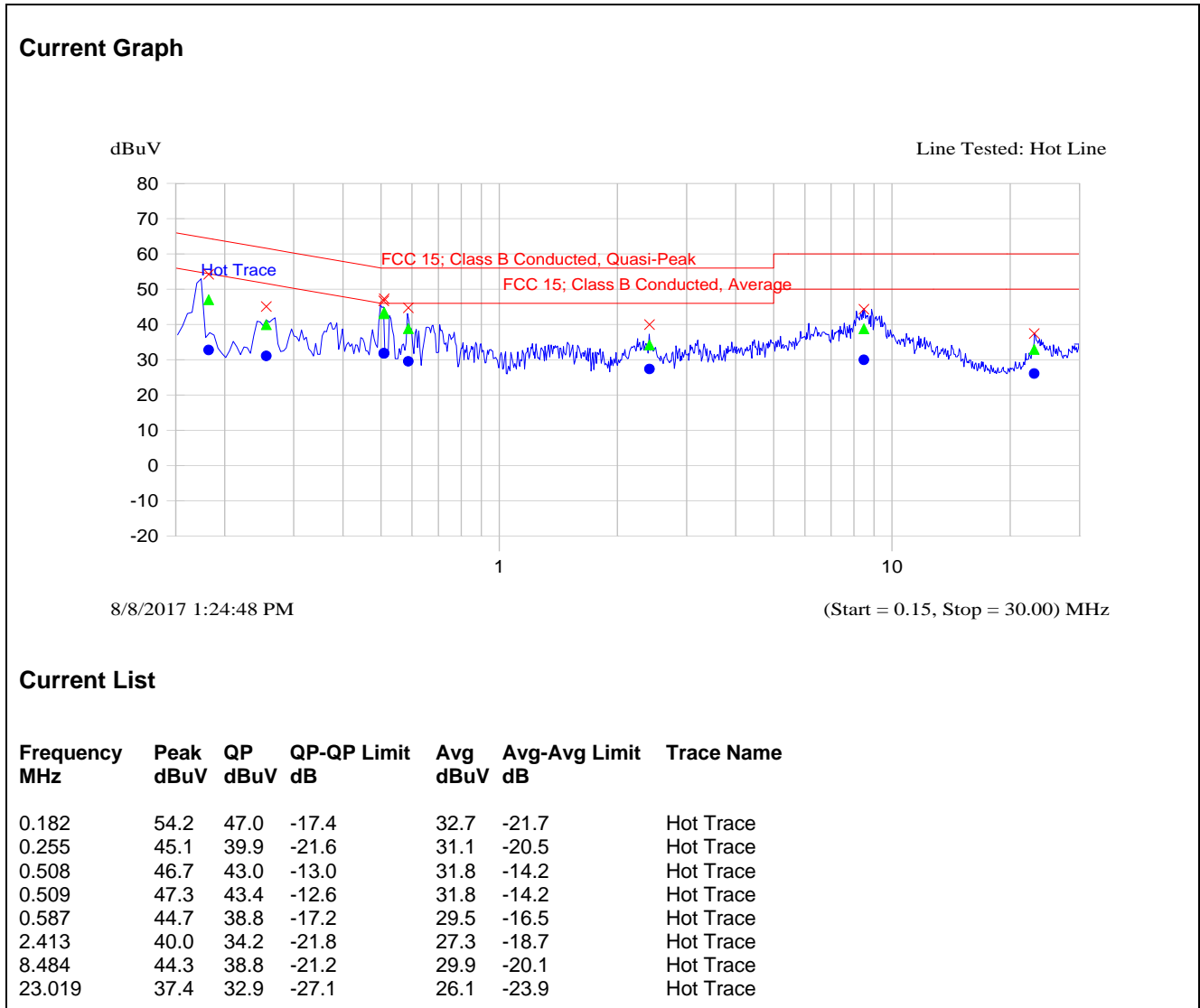
\*Decreases linearly with the logarithm of the frequency

**5.1.2. Method of Measurements**

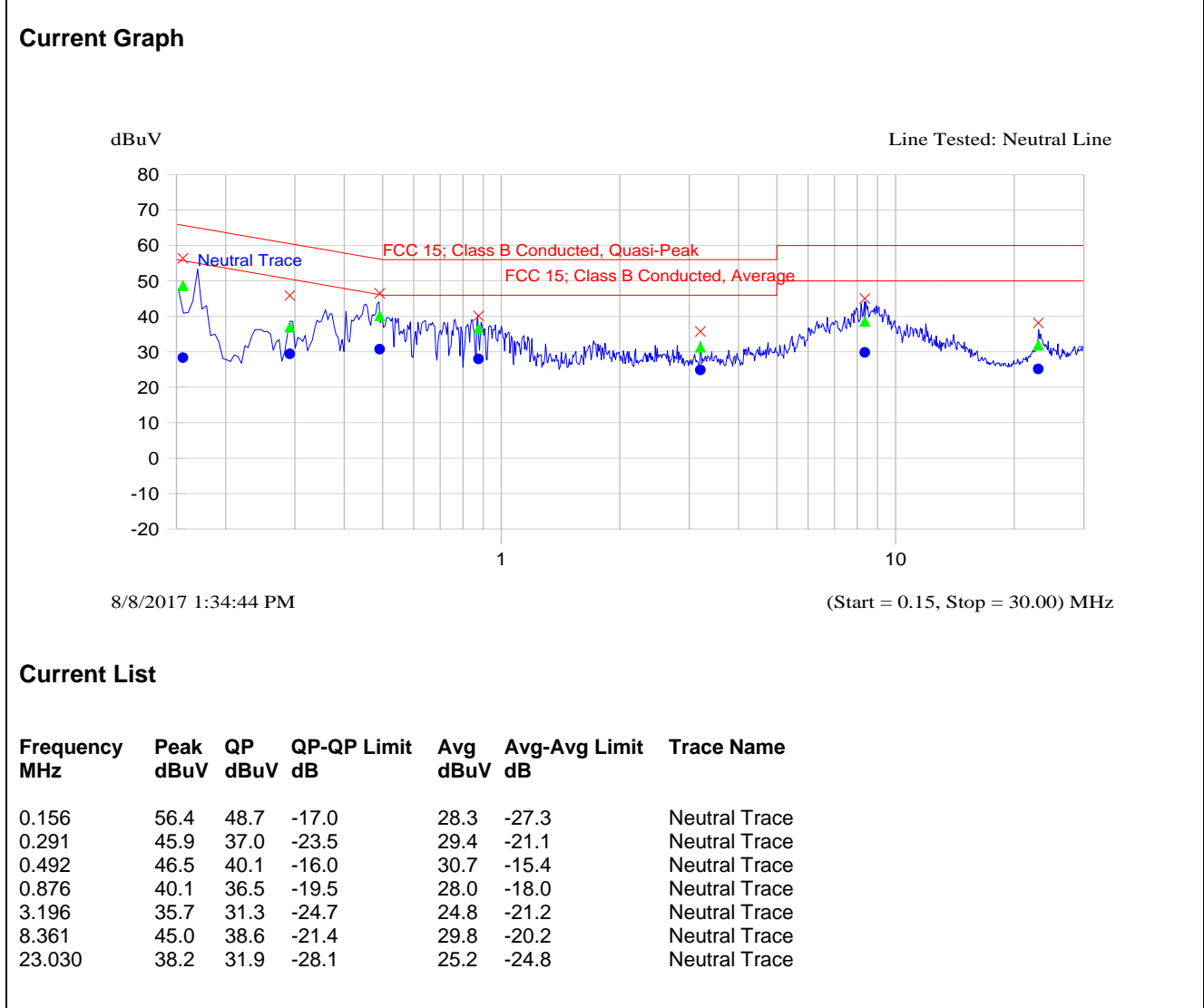
ANSI C63.4-2014

5.1.3. Test Data

Plot 5.1.3.1. Power Line Conducted Emissions  
 Line Tested: Hot



**Plot 5.1.3.2. Power Line Conducted Emissions**  
 Line Tested: Neutral



**5.2. UWB BANDWIDTH (10 dB BANDWIDTH) [47 CFR 15.510(a)]**

**5.2.1. Limit(s)**

§15.510(a) The UWB bandwidth of an imaging system operating under the provisions of this section must be below 960 MHz or the center frequency,  $f_C$ , and the frequency at which the highest radiated emission occurs,  $f_M$ , must be contained between 1990 MHz and 10600 MHz.

**5.2.2. Method of Measurements**

ANSI C63.10 Section 10.1.

**5.2.3. Test Data**

Receive Antenna Plane (H/V)	Highest Radiated Emission, $f_M$ (MHz)	10 dB Upper Boundary, $f_H$ (MHz)	10 dB Lower Boundary, $f_L$ (MHz)	Center Frequency, $f_C = (f_H + f_L)/2$ (MHz)	10 dB Bandwidth, $f_H - f_L$ (MHz)
V	2427.885	4807.692	654.904	2731.298	4152.788
H	2110.577	4600.000	370.433	2485.217	4229.567

See the following plots for detailed.

Plot 5.2.3.1. 10 dB Bandwidth, Vertical Polarization,  $f_m$  (Marker 1) and  $f_H$  (Marker 2)



**ROHDE & SCHWARZ**

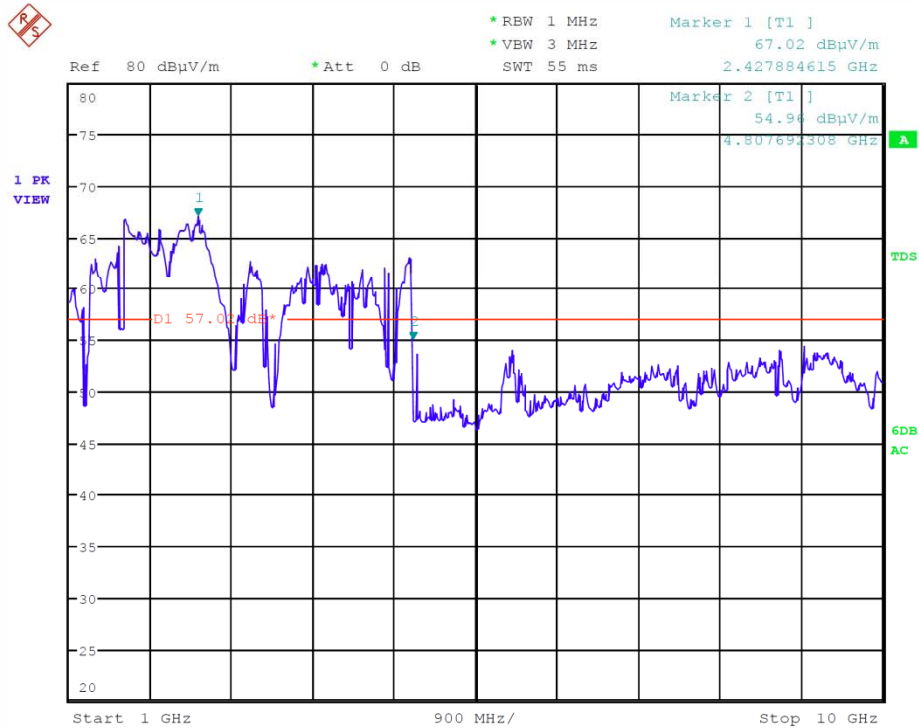
**ULTRATECH LABS**

19.Aug 17 05:46

**Meas Type** TDK 1m [V] Polarization  
**Equipment under Test** PEGM-001Q  
**Manufacturer** Pegmatics Inc  
**OP Condition** 10dBc High side Vertical at 1m  
**Operator** Hung  
**Test Spec**  
 Radiated Emissions

**Sweep Settings Screen A**

Center Frequency	5.500000 GHz	Ref Level	80.000 dBμV/m
Frequency Offset	0.000000 Hz	Ref Level Offset	0.000 dB
Span	9.000000 GHz	Ref Position	100.000 %
Start Frequency	1.000000 GHz	Level Range	60.000 dB
Stop Frequency	10.000000 GHz	RF Att	0.000 dB
RBW	1.000000 MHz	X-Axis	LIN
VBW	3.000000 MHz	Y-Axis	LOG
Sweep Time	55.00 ms		



**ULTRATECH GROUP OF LABS**

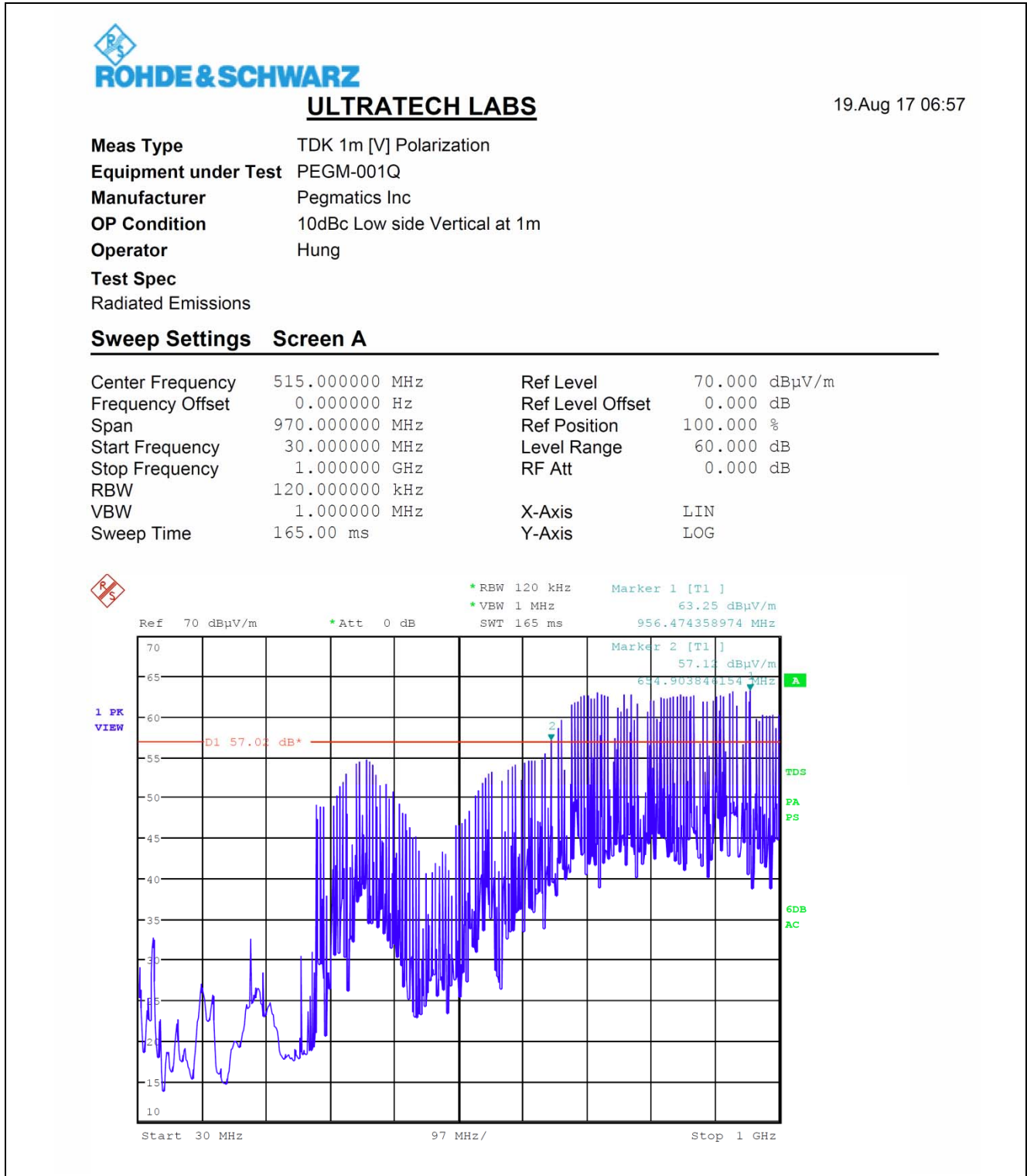
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4  
 Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: http://www.ultratech-labs.com

File #: 17PEGM001\_FCC15F510

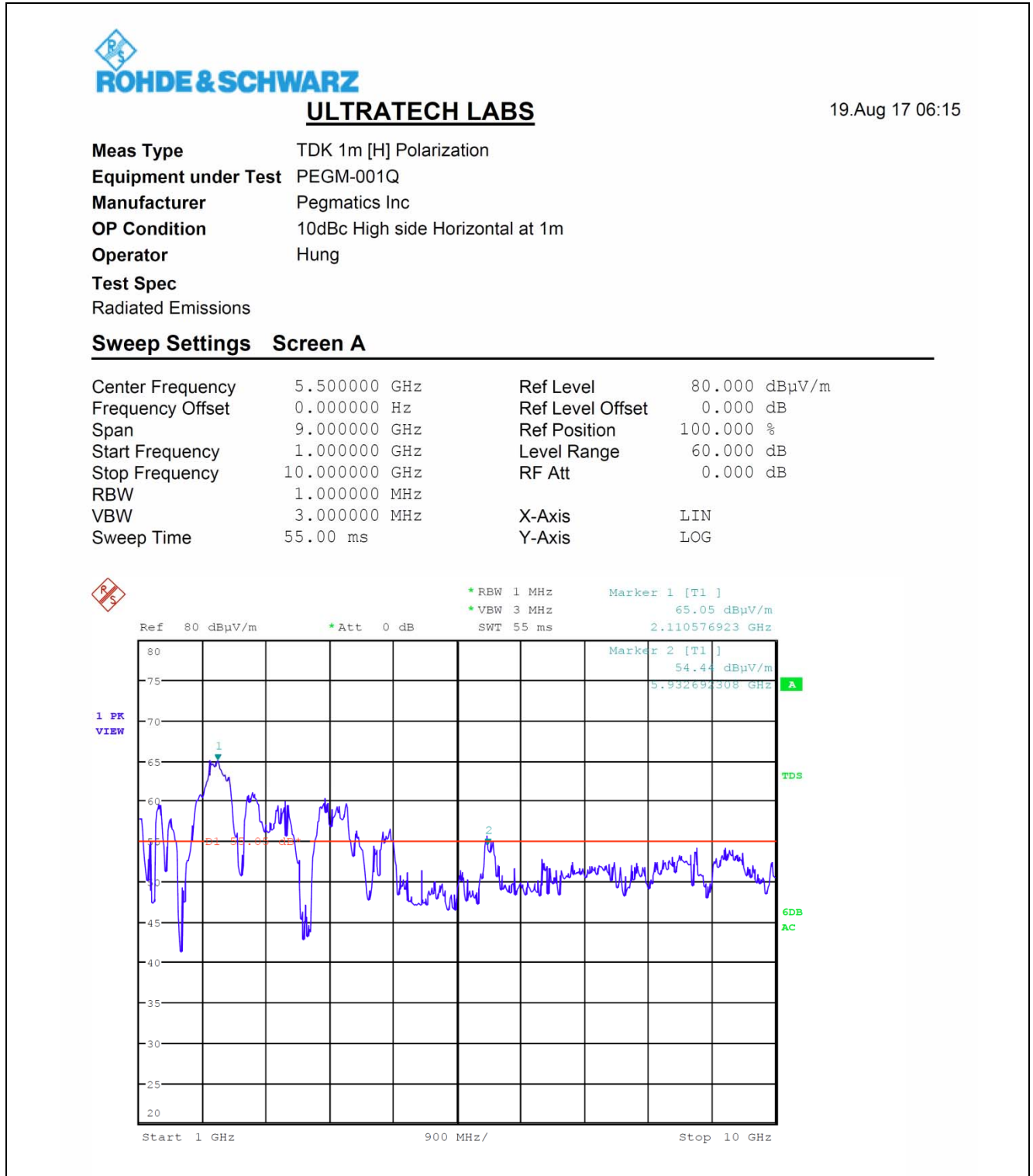
August 23, 2017

All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

Plot 5.2.3.2. 10 dB Bandwidth, Vertical Polarization, f<sub>L</sub> (Marker 2)



**Plot 5.2.3.3.** 10 dB Bandwidth, Horizontal Polarization,  $f_M$  (Marker 1) and  $f_H$  (Marker 2 is ambient, the 10 dB Upper Boundary is  $\leq 4600$  MHz )



Plot 5.2.3.4. 10 dB Bandwidth, Horizontal Polarization,  $f_L$  (Marker 2)



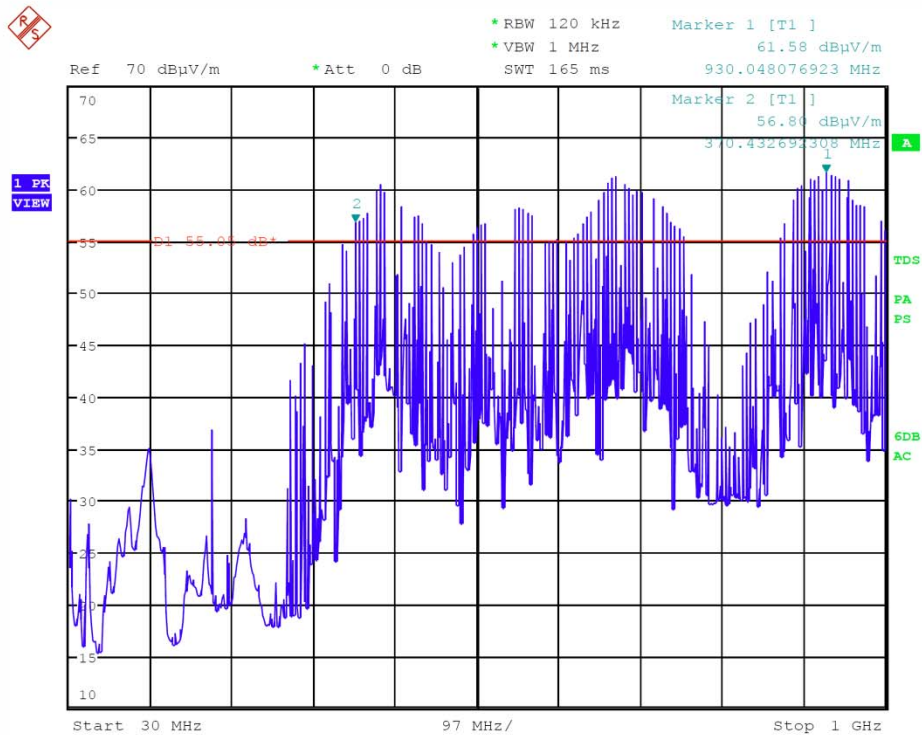
**ULTRATECH LABS**

19.Aug 17 07:13

**Meas Type** TDK 1m [H] Polarization  
**Equipment under Test** PEGM-001Q  
**Manufacturer** Pegmatics Inc  
**OP Condition** 10dBc Low side Horizontal at 1m  
**Operator** Hung  
**Test Spec**  
 Radiated Emissions

**Sweep Settings Screen A**

Center Frequency	515.000000 MHz	Ref Level	70.000 dB $\mu$ V/m
Frequency Offset	0.000000 Hz	Ref Level Offset	0.000 dB
Span	970.000000 MHz	Ref Position	100.000 %
Start Frequency	30.000000 MHz	Level Range	60.000 dB
Stop Frequency	1.000000 GHz	RF Att	0.000 dB
RBW	120.000000 kHz	X-Axis	LIN
VBW	1.000000 MHz	Y-Axis	LOG
Sweep Time	165.00 ms		





**5.3. TRANSMITTER RADIATED EMISSIONS [47 CFR §§ 15.510(d) & 15.209]**

**5.3.1. Limit(s)**

For equipment operating with  $f_C$  and  $f_M$  between 1990 MHz and 10600 MHz:

§15.510(d)(3) The radiated emissions at or below 960 MHz shall not exceed the emission levels in §15.209 of this chapter. The radiated emissions above 960 MHz shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

Frequency in MHz	EIRP in dBm
960 - 1610	-46.3
1610 - 10600	-41.3
Above 10600	-51.3

§15.510(d)(4) In addition to the radiated emission limits specified in the paragraph (d)(3) of this section, emissions from these imaging systems shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz:

Frequency in MHz	EIRP in dBm
1164 - 1240	-56.3
1559 - 1610	-56.3

§15.510(d)(5) There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs,  $f_M$ . That limit is 0 dBm EIRP. It is acceptable to employ a different resolution bandwidth, and a correspondingly different peak emission limit, following the procedures described in §15.521.

**47 CFR 15.209(a) General Field Strength Limits**

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30
30–88	100 **	3
88–216	150 **	3
216–960	200 **	3
Above 960	500	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54–72 MHz, 76– 88 MHz, 174–216 MHz or 470–806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.

**5.3.2. Method of Measurements**

ANSI C63.4 and/or ANSI C63.10

5.3.3. Test Data

5.3.3.1. Radiated Emissions at or Below 960 MHz

10 kHz – 30 MHz at 10m					
Remarks:					
<ul style="list-style-type: none"> <li>For frequency band 0.010- 0.490 MHz, the measured E-Field at 10m (column 2) will be extrapolated to 300m E-Field Level (column 3) using the extrapolation factor of <math>40 \cdot \log(10/300) = -59.1</math> dB</li> <li>For frequency bands 0.490-1.705 MHz and 1.705-30.0 MHz, the measured E-Field at 10m (column 2) will be extrapolated to 30m E-Field Level (column 3) using the extrapolation factor of <math>40 \cdot \log(10/30) = -19.1</math> dB</li> </ul>					
Frequency (MHz)	Peak E-Field @ 10m (dB $\mu$ V/m)	Extrapolated E-Field Level (dB $\mu$ V/m)	Antenna Plane (H/V)	§ 15.209 (a) Limits (dB $\mu$ V/m)	Margin (dB)
0.010 - 0.490	*	*	H / V	*	*
0.490 - 1.705	*	*	H / V	*	*
1.705 - 30.0	*	*	H / V	*	*

\* No emissions detected.

30 – 960 MHz at 3m					
Frequency (MHz)	RF Level (dB $\mu$ V/m)	Detector Used (Peak/QP)	Antenna Plane (H/V)	Limit (dB $\mu$ V/m)	Margin (dB)
35.7	27.0	Peak	V	40.0	-13.0
43.3	28.2	Peak	V	40.0	-11.8
48.5	29.5	Peak	V	40.0	-10.5
48.5	23.8	Peak	H	40.0	-16.2
126.7	30.3	Peak	V	43.5	-13.2
126.7	32.1	Peak	H	43.5	-11.4
300.1	36.2	Peak	V	46.0	-9.8
300.1	34.3	Peak	H	46.0	-11.7
305.1	42.0	Peak	V	46.0	-4.0
305.1	28.7	Peak	H	46.0	-17.3
314.9	41.5	Peak	V	46.0	-4.5
314.9	29.2	Peak	H	46.0	-16.8
325.1	26.1	QP	V	46.0	-19.9
325.1	31.5	Peak	H	46.0	-14.5
354.9	30.4	QP	V	46.0	-15.6
354.9	35.9	QP	H	46.0	-10.1
370.1	41.2	Peak	V	46.0	-4.8
370.1	39.4	QP	H	46.0	-6.6
375.0	42.0	Peak	V	46.0	-4.0
375.0	33.8	Peak	H	46.0	-12.2

30 – 960 MHz at 3m					
Frequency (MHz)	RF Level (dBµV/m)	Detector Used (Peak/QP)	Antenna Plane (H/V)	Limit (dBµV/m)	Margin (dB)
390.1	32.4	QP	V	46.0	-13.6
390.1	40.8	QP	H	46.0	-5.2
400.0	41.2	Peak	V	46.0	-4.8
400.0	40.0	Peak	H	46.0	-6.0
404.9	41.2	Peak	V	46.0	-4.8
404.9	41.6	QP	H	46.0	-4.4
409.8	40.9	QP	H	46.0	-5.1
415.0	40.7	Peak	V	46.0	-5.3
415.0	42.6	Peak	H	46.0	-3.4
420.0	42.8	QP	H	46.0	-3.2
428.8	40.5	Peak	V	46.0	-5.5
428.8	35.2	QP	H	46.0	-10.8
435.1	38.7	QP	H	46.0	-7.3
440.0	40.4	Peak	V	46.0	-5.6
440.0	33.0	QP	H	46.0	-13.0
530.0	42.1	Peak	V	46.0	-3.9
530.0	43.7	Peak	H	46.0	-2.3
540.2	30.3	QP	V	46.0	-15.7
540.2	34.4	QP	H	46.0	-11.6
550.1	41.7	Peak	V	46.0	-4.3
550.1	34.5	QP	H	46.0	-11.5
560.2	41.7	Peak	V	46.0	-4.3
560.2	44.9	Peak	H	46.0	-1.1
570.1	31.2	QP	V	46.0	-14.8
570.1	37.5	QP	H	46.0	-8.5
590.1	41.1	Peak	V	46.0	-4.9
590.1	37.2	QP	H	46.0	-8.8
659.9	33.3	QP	V	46.0	-12.7
659.9	33.2	QP	H	46.0	-12.8
700.0	35.5	QP	H	46.0	-10.5
704.7	35.6	QP	V	46.0	-10.4
715.1	35.0	QP	V	46.0	-11.0
715.1	42.1	Peak	H	46.0	-3.9
724.8	34.5	QP	V	46.0	-11.5
724.8	39.5	Peak	H	46.0	-6.5
735.2	34.4	QP	V	46.0	-11.6
735.2	43.2	Peak	H	46.0	-2.8
759.9	32.8	QP	V	46.0	-13.2
759.9	32.0	QP	H	46.0	-14.0

**ULTRATECH GROUP OF LABS**

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 Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: http://www.ultratech-labs.com

File #: 17PEGM001\_FCC15F510

August 23, 2017

All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

30 – 960 MHz at 3m					
Frequency (MHz)	RF Level (dBµV/m)	Detector Used (Peak/QP)	Antenna Plane (H/V)	Limit (dBµV/m)	Margin (dB)
779.9	33.0	QP	V	46.0	-13.0
779.9	41.8	Peak	H	46.0	-4.2
820.2	36.1	QP	V	46.0	-9.9
820.2	44.7	Peak	H	46.0	-1.3
855.3	38.3	QP	V	46.0	-7.7
865.0	37.3	QP	V	46.0	-8.7
865.0	37.9	QP	H	46.0	-8.1
879.9	38.7	QP	V	46.0	-7.3
879.9	42.5	Peak	H	46.0	-3.5
900.0	39.1	QP	V	46.0	-6.9
900.0	44.6	Peak	H	46.0	-1.4
915.0	38.4	QP	V	46.0	-7.6
950.0	40.1	QP	V	46.0	-5.9
955.2	40.1	QP	V	46.0	-5.9

5.3.3.2. Radiated Emissions Above 960 MHz

960 MHz – 10.6 GHz at 3m, Excluding 1164 – 1240 MHz and 1559 – 1610 MHz Bands					
Frequency (MHz)	RF Level (dBµV/m)	Detector Used (Peak/Avg)	Antenna Plane (H/V)	Limit (dBµV/m)	Margin (dB)
960.25	39.95	Avg	V	48.9	-9.0
960.25	33.00	Avg	H	48.9	-15.9
964.81	40.25	Avg	V	48.9	-8.7
964.81	40.23	Avg	H	48.9	-8.7
970.06	40.30	Avg	V	48.9	-8.6
970.06	40.81	Avg	H	48.9	-8.1
975.00	39.68	Avg	V	48.9	-9.2
975.00	38.00	Avg	H	48.9	-10.9
979.93	39.15	Avg	V	48.9	-9.8
979.93	39.99	Avg	H	48.9	-8.9
990.12	37.17	Avg	V	48.9	-11.7
990.12	40.62	Avg	H	48.9	-8.3
1635.00	46.46	Avg	V	53.9	-7.4
1635.00	35.34	Avg	H	53.9	-18.6
1695.00	47.67	Avg	V	53.9	-6.2
1740.00	47.25	Avg	V	53.9	-6.7
1746.00	51.45	Avg	V	53.9	-2.5
1746.00	46.14	Avg	H	53.9	-7.8
1754.00	50.25	Avg	V	53.9	-3.7
1754.00	45.18	Avg	H	53.9	-8.7
2029.00	47.28	Avg	V	53.9	-6.6
2029.00	39.35	Avg	H	53.9	-14.6
2175.00	48.61	Avg	V	53.9	-5.3
2175.00	39.72	Avg	H	53.9	-14.2
2375.00	47.67	Avg	V	53.9	-6.2
2375.00	44.59	Avg	H	53.9	-9.3
2485.00	48.82	Avg	V	53.9	-5.1
2485.00	44.14	Avg	H	53.9	-9.8
2515.00	48.34	Avg	V	53.9	-5.6
2515.00	43.31	Avg	H	53.9	-10.6
2620.00	47.64	Avg	V	53.9	-6.3
2620.00	42.46	Avg	H	53.9	-11.4
3170.00	46.95	Avg	V	53.9	-7.0
3170.00	39.48	Avg	H	53.9	-14.4
3350.00	46.85	Avg	V	53.9	-7.1
3350.00	40.49	Avg	H	53.9	-13.4
3740.00	39.96	Avg	V	53.9	-13.9
3740.00	48.12	Avg	H	53.9	-5.8

960 MHz – 10.6 GHz at 3m, Excluding 1164 – 1240 MHz and 1559 – 1610 MHz Bands					
Frequency (MHz)	RF Level (dBµV/m)	Detector Used (Peak/Avg)	Antenna Plane (H/V)	Limit (dBµV/m)	Margin (dB)
4320.00	44.86	Avg	V	53.9	-9.0
4320.00	46.18	Avg	H	53.9	-7.7
4340.00	45.63	Avg	V	53.9	-8.3
4340.00	45.91	Avg	H	53.9	-8.0
4480.00	38.76	Avg	V	53.9	-15.1
4480.00	48.85	Avg	H	53.9	-5.1

10.6 GHz – 40 GHz at 1m						
<b>Remarks:</b>						
<ul style="list-style-type: none"> <li>The value measured at 1m shall be extrapolated as applicable to compare with field strength level limit at 3m (-51.3 dBm EIRP + 95.2 = 43.9 dBµV/m).</li> <li>The measured E-Field at 1m (column 2) will be extrapolated to 3m E-Field Level (column 3) using the extrapolation factor of <math>20 \cdot \log(1/3) = -9.5</math> dB</li> </ul>						
Frequency (MHz)	RF Level at 1m (dBµV/m)	Extrapolated RF Level at 3m (dBµV/m)	Detector Used (Peak/Avg)	Antenna Plane (H/V)	Limit at 3m (dBµV/m)	Margin (dB)
10600 - 40000	*	*	Avg	H/V	43.9	*

\*No emissions detected.

**5.3.3.3. Radiated Emissions in 1164 – 1240 MHz and 1559 – 1610 MHz Bands at 3m**

Radiated Emissions in 1164 – 1240 MHz and 1559 – 1610 MHz Bands, Measured at 1MHz RBW					
Frequency (MHz)	RF Level (dBµV/m)	Detector Used (Peak/Avg)	Antenna Plane (H/V)	Limit (dBµV/m)	Margin (dB)
1169.00	33.29	Avg	V	38.9	-5.6
1169.00	25.00	Avg	H	38.9	-13.9
1200.00	33.68	Avg	V	38.9	-5.2
1200.00	28.16	Avg	H	38.9	-10.7
1575.00	36.49	Avg	V	38.9	-2.4
1575.00	28.50	Avg	H	38.9	-10.4
1599.00	34.68	Avg	V	38.9	-4.2
1599.00	30.91	Avg	H	38.9	-8.0

**5.3.3.4. Peak Power Radiated Emissions**

**Remarks:**

- Peak EIRP Limit for 3 MHz RBW =  $20 \log(\text{RBW}/50)$  dBm EIRP  
 =  $20 \log(3/50)$  dBm EIRP  
 = -24.44
- Peak Field Strength Limit at 3 m,  $E(\text{dB}\mu\text{V}/\text{m}) = P(\text{dBm EIRP}) + 95.2$   
 = -24.44 dBm EIRP + 95.2  
 = 70.76 dB $\mu\text{V}/\text{m}$
- The measured E-Field at 1m (column 3) will be extrapolated to 3m E-Field Level (column 4) using the extrapolation factor of  $20 \cdot \log(1/3) = -9.5$  dB, to compare with the peak field strength limit at 3m.

Frequency (MHz)	Antenna Plane (H/V)	Peak E-Field at 1m (dB $\mu\text{V}/\text{m}$ )	Extrapolated Peak E-Field at 3m (dB $\mu\text{V}/\text{m}$ )	Limit (dB $\mu\text{V}/\text{m}$ )	Margin (dB)
2400.000	V	67.41	57.91	70.8	-12.9
2125.000	H	65.93	56.43	70.8	-14.4

**EXHIBIT 6. TEST EQUIPMENT LIST**

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range	Cal. Due Date
EMI Receiver	Rohde & Schwarz	ESU40	100037	20Hz - 40GHz	09 May 2018
BiConiLog Antenna	EMCO	3142	9601-1005	26 - 2000MHz	12 May 2018
Pre-Amplifier	Com-Power	Pam-0118A	551052	0.5 - 18 GHz	17 Jul 2018
Horn Antenna	EMCO	3115	9701-5061	1-18 GHz	24 Apr 2018
Active Loop Antenna	EMCO	6502	9104-2611	10kHz – 30MHz	05 Nov 2017
Amplifier	Spacek Labs	SLKka-30-6	6D26	18–40 GHz	See Note 1
Horn Antenna	ETS-Lindgren	3160-09	00118385	18 – 26.5 GHz	Oct 11, 2018
Horn Antenna	ETS-Lindgren	3160-10	00102686	26.5 – 40 GHz	Oct 11, 2018
Analyzer	Hewlett Parkard	HP 8593EM	3710A00223	9kHz – 22 GHz	04 Oct 2017
Attenuator	Pasternack	PE7010-20	07	DC – 2GHz	13 Mar 2018
L.I.S.N.	EMCO	3825/2R	1165	10kHz – 30MHz	07 Nov 2017
Note 1: Internal Verification/Calibration check					



**EXHIBIT 7. MEASUREMENT UNCERTAINTY**

The measurement uncertainties stated were calculated in accordance with the requirements of CISPR 16-4-2 @ IEC:2003 and JCGM 100:2008 (GUM 1995) – Guide to the Expression of Uncertainty in Measurement.

**7.1. LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY**

	Line Conducted Emission Measurement Uncertainty (9 kHz – 30 MHz):	Measured	Limit
<b>u<sub>c</sub></b>	<b>Combined standard uncertainty:</b> $u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$	<b>± 1.31</b>	<b>± 1.8</b>
<b>U</b>	<b>Expanded uncertainty U:</b> $U = 2u_c(y)$	<b>± 2.62</b>	<b>± 3.6</b>

**7.2. RADIATED EMISSION MEASUREMENT UNCERTAINTY**

	Radiated Emission Measurement Uncertainty (10 KHz – 30 MHz):	Measured	Limit
<b>u<sub>c</sub></b>	<b>Combined standard uncertainty:</b> $u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$	<b>± 1.30</b>	<b>± 2.6</b>
<b>U</b>	<b>Expanded uncertainty U:</b> $U = 2u_c(y)$	<b>± 2.60</b>	<b>± 5.2</b>

	Radiated Emission Measurement Uncertainty @ 3m, Horizontal (30-1000 MHz):	Measured (dB)	Limit (dB)
<b>u<sub>c</sub></b>	<b>Combined standard uncertainty:</b> $u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$	<b>± 2.15</b>	<b>± 2.6</b>
<b>U</b>	<b>Expanded uncertainty U:</b> $U = 2u_c(y)$	<b>± 4.30</b>	<b>± 5.2</b>

	Radiated Emission Measurement Uncertainty @ 3m, Vertical (30-1000 MHz):	Measured (dB)	Limit (dB)
<b>u<sub>c</sub></b>	<b>Combined standard uncertainty:</b> $u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$	<b>± 2.14</b>	<b>± 2.6</b>
<b>U</b>	<b>Expanded uncertainty U:</b> $U = 2u_c(y)$	<b>± 4.29</b>	<b>± 5.2</b>

	Radiated Emission Measurement Uncertainty @ 3 m, Horizontal & Vertical (1 – 18 GHz):	Measured (dB)	Limit (dB)
<b>u<sub>c</sub></b>	<b>Combined standard uncertainty:</b> $u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$	<b>± 1.52</b>	<b>Under consideration</b>
<b>U</b>	<b>Expanded uncertainty U:</b> $U = 2u_c(y)$	<b>± 3.04</b>	<b>Under consideration</b>