Measurement of RF Interference from an 802AWE Advanced Wireless Test Set Transceiver

For	Trilithic 9710 Park Davis Drive Indianapolis, IN 46235
P.O. Number	88027
Date Tested	January 18, 2016 through April 1, 2016
Test Personnel	Mark Longinotti
Specification	FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Section 15.247 for Frequency Hopping Spread Spectrum Intentional Radiators Operating within the band 2400-2483.5MHz FCC “Code of Federal Regulations” Title 47, Part15, Subpart 15B, Section 15.107 and 15.109 for Receivers Industry Canada RSS-247 Industry Canada RSS-GEN

Test Report By: MARK E. LONGINOTTI

Mark Longinotti
EMC Engineer

Requested By: Tom Haller
Trilithic

Approved By: Raymond J Klouda

Raymond J. Klouda
Registered Professional
Engineer of Illinois - 44894

Elite Electronic Engineering Inc.
1516 CENTRE CIRCLE
DOWNERS GROVE, IL 60515
TEL: 630 - 495 - 9770
FAX: 630 - 495 - 9785
www.elitetest.com

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THIS REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF ELITE ELECTRONIC ENGINEERING INCORPORATED.

REVISION HISTORY

Revision	Date	Description
—	05/03/2016	Initial release

Measurement of RF Emissions from an 802AWE Advanced Wireless Test Set

1. INTRODUCTION

1.1 Scope of Tests

This document represents the results of the series of radio interference measurements performed on a Trilithic Advanced Wireless Test Set, Part No. 802AWE transceiver (hereinafter referred to as the EUT). The EUT contains a frequency hopping spread spectrum Bluetooth transceiver, FCC ID: XF6-RS9113DB. The transceiver was designed to transmit and receive in the 2400-2483.5 MHz using an Access Point Router 802.11n Antenna, Pulse Part Number: W3513. The gain of the W3513 antenna was 2.0dB in the 2400-2483.5MHz band. EUT was manufactured and submitted for testing by Trilithic located in Indianapolis, IN.

1.2 Purpose

This limited test series was performed to determine if the transceiver, FCC ID: XF6-RS9113DB when installed in the EUT, continues to comply with the following requirements:

- FCC "Code of Federal Regulations" Title 47, Part 15,Subpart C, Section 15.247 for Digitally Modulated Intentional Radiators Operating within the band 2400-2483.5MHz
- FCC “Code of Federal Regulations” Title 47, Part15,Subpart 15B, Section 15.107 and 15.109 for Receivers
- Industry Canada RSS-247
- Industry Canada RSS-GEN

Testing was performed in accordance with ANSI C63.10-2013.

1.3 Deviations, Additions and Exclusions

There were no deviations, additions to, or exclusions from the test specification during this test series

1.4 EMC Laboratory Identification

This series of tests was performed by Elite Electronic Engineering Incorporated of Downers Grove, Illinois. The laboratory is accredited by the American Association for Laboratory Accreditation (A2LA), A2LA Lab Code: 1786-01.

1.5 Laboratory Conditions

The temperature at the time of the test was 21C and the relative humidity was 19%.

2. APPLICABLE DOCUMENTS

The following documents of the exact issue designated form part of this document to the extent specified herein:

- Federal Communications Commission "Code of Federal Regulations", Title 47, Part 15, Subparts B and C
- ANSI C63.10-2013, "American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices"
- FCC Public Notice, DA 00-705, "Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems", Released March 30, 2000
- Industry Canada RSS-247, Issue 1,May 2015, “Spectrum Management and Telecommunications Radio Standards Specification, Digital Transmission Systems (DTSs), Frequency

Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices"

- Industry Canada RSS-GEN, Issue 4, November 2014, "Spectrum Management and Telecommunications Radio Standards Specification, General Requirements for Compliance of Radio Apparatus"

3. EUT SET-UP AND OPERATION

3.1 General Description

The EUT is a Trilithic Advanced Wireless Test Set, Part No. 802AWE. A block diagram of the EUT setup is shown as Figure 1 and Figure 2.

3.1.1 Power Input

The EUT is normally powered with 3.7VDC from 2 internal, rechargeable lithium ion batteries.

The EUT was submitted for testing with a battery charger, M/N: USB-TC-CE. The battery charger provided 5VDC to the EUT via a 1.95m long 2 wire power cable. The battery charger was powered with 115V, 60Hz AC power.

The EUT can transmit and receive while connected to the battery charger. However, per Trilithic personnel, the EUT would not be charging while in use. That would be considered an abnormal condition. Normally the EUT is used as a standalone unit running only on the internal batteries. For testing purposes, the EUT was connected to the charger.

3.1.2 Peripheral Equipment

The EUT was submitted for testing with no peripheral equipment.

3.1.3 Interconnect Cables

The following interconnect cables were submitted with the EUT:

Item	Description
Ethernet Cable	1.6m long Ethernet cable (unterminated)

Per Trilithic personnel, the EUT would not be connected to Ethernet while in use. That would be considered an abnormal condition. Normally the EUT is used as a standalone unit. For testing purposes, the Ethernet port of the EUT was loaded with an unterminated 1.6 m long Ethernet cable.

3.1.4 Grounding

The EUT was not grounded.

3.2 Software

For all tests the EUT had Firmware Version V16.02.01.107 loaded onto the device to provide correct load characteristics.

3.3 Operational Mode

The EUT was programmed to operate separately in each of the following modes:

- Transmit at 2402MHz (Bluetooth Channel 0), power setting = 15
- Transmit at 2440MHz (Bluetooth Channel 38), power setting = 15
- Transmit at 2480MHz (Bluetooth Channel 78), power setting = 15

3.4 EUT Modifications

In order to meet the case spurious radiated emissions below 1GHz with the EUT transmitting while connected to

the battery charger, M/N: USB-TC-CE, and with an Ethernet cable in the Ethernet port of the EUT, the following modifications were made:

1. Copper sprayed the inside of both the front and back of the plastic case.
2. Added a tubular ferrite bead (Laird part no. 28B0375-300) to WiFi antenna cable. Cable makes two loops thru bead.
3. Attached a thin metal film coated EMI lens (surface resistivity 14+\-4 ohms /square) w/conductive adhesive to LCD frame window.
4. Attached an 8-finger length piece of finger stock (Tech-Etch part no. 187W35 w/adhesive) to the inside front half of the case. Locate over the molded-in part number “2131587002” with the adhesive side nearest the LCD opening in the plastic.
5. Added a solder lug (Keystone Electronics part no. 4003) to the back side of the LCD assembly. Screwed down with one of the LCD Assy. mounting screws and soldered to the LCD PCB ground around one of the LCD frame tabs passing through the PCB.
6. A Fair Rite ferrite bead, part no. 04311642819 was placed on the power cable between the EUT and the battery charger, at the EUT end of the cable.
7. A Fair Rite ferrite bead, part no. 0475164281, was placed on the power cable between the EUT and the battery charger, at the charger end of the cable.

4. TEST FACILITY AND TEST INSTRUMENTATION

4.1 Shielded Enclosure

All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. With the exception of the floor, the reflective surfaces of the shielded chamber are lined with ferrite tiles on the walls and ceiling. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4-2014 for site attenuation.

4.2 Test Instrumentation

The test instrumentation and auxiliary equipment used during the tests are listed in Table 9-1. All equipment was calibrated per the instruction manuals supplied by the manufacturer.

Conducted and radiated emission tests were performed with an EMI receiver utilizes the bandwidths and detectors specified by the FCC.

4.3 Calibration Traceability

Test equipment is maintained and calibrated on a regular basis with a calibration interval no greater than two years. All calibrations are traceable to the National Institute of Standards and Technology (NIST).

4.4 Measurement Uncertainty

All measurements are an estimate of their true value. The measurement uncertainty characterizes, with a specified confidence level, the spread of values which may be possible for a given measurement system.

The measurement uncertainty for these tests is presented below:

Conducted Emissions Measurements		
Combined Standard Uncertainty	1.06	-1.06
Expanded Uncertainty (95% confidence)	2.12	-2.12
Radiated Emissions Measurements		
Combined Standard Uncertainty	2.09	-2.09
Expanded Uncertainty (95% confidence)	4.19	-4.19

5. TEST PROCEDURES

5.1 Receiver

5.1.1 Requirements

Per the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Section 15.101(b), receivers operating above 960MHz are exempt from complying with the technical provisions of part 15.

Per the Industry Canada RSS-Gen, only radiocommunication receivers operating in stand-alone mode within the band 30-960 MHz, as well as scanner receivers, are subject to Industry Canada requirements. All other receivers are exempted from any Industry Canada certification, testing, labeling and reporting requirements.

5.2 Transmitter

5.2.1 Maximum Average Output Power

5.2.1.1 Requirements

Per section 15.247(b)(3), for systems using digital modulation the maximum peak output conducted power shall not be greater than 1.0W (30dBm). Per section 15.247(b)(4), this limit is based on the use of antennas with directional gains that do not exceed 6dBi. Since the limit allows for a 6dBi antenna gain, the maximum EIRP can be increased by 6dB to 4 Watt (36dBm).

5.2.1.2 Procedures

RBW ≥ DTS Bandwidth

The output of the EUT was connected to the spectrum analyzer through 30 dB of attenuation.

a) Set the RBW ≥ DTS Bandwidth
b) Set VBW ≥ 3 X RBW
c) Set span ≥ 3 x RBW
d) Sweep Time = auto couple
e) Detector = peak
f) Trace mode = max hold
g) Allow trace to fully stabilize
h) Use peak marker function to determine the peak amplitude level.

5.2.1.3 Results

The tabular results are presented on pages 18 and 19. Plots of the individual power measurements are shown on pages 20 through 22. The maximum peak conducted output power from the transmitter was 0.0329W (15.17dBm) which is below the 1 Watt limit. The maximum EIRP from the transmitter was 0.0521W (17.17 dBm) which is below the 4 Watt limit.

5.2.2 Duty Cycle Factor Measurements

5.2.2.1 Requirements

Unless otherwise specified, when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the

pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

5.2.2.2 Procedures

a. The EUT was placed on the non-conductive stand and set to transmit continuously.
b. A double ridged waveguide antenna was positioned at a 3 meter distance from the EUT. The output of the antenna was connected to the input of a spectrum analyzer.
c. The center frequency of the spectrum analyzer was set to the transmit frequency of the EUT.
d. The frequency span of the spectrum analyzer was set to 0Hz so that the time domain trace of the transmitted pulse of the EUT was displayed on the spectrum analyzer.
e. The sweep time of the spectrum analyzer was adjusted so that the beginning and end of a single pulse could be seen on the display of the spectrum analyzer.
f. The single sweep function of the spectrum analyzer was used multiple times to determine the maximum pulse width of the EUT.
g. The maximum pulse width display of the spectrum analyzer was recorded and then plotted using a 'screen dump' utility.
h. The sweep time of the spectrum analyzer was then adjusted to 100msec.
i. The single sweep function of the spectrum analyzer was used multiple times to determine the maximum number of transmitted pulses that occurred in a 100msec time period.
j. The maximum number of pulses transmitted in a 100msec time period was recorded and then plotted using a ‘screen dump’ utility.
k. The duty cycle correction was calculated using the following equation:

Duty Cycle Correction Factor (dB) = D.C. (dB)
D.C. (dB) = 20 x log [((pulse width (msec)) x (#pulses in a 100msecperiod)) / 100msec]

5.2.2.3 Results

Duty cycle plots are shown on pages 23 and 24. The EUT transmits a 369.74usec pulse 2 times in a 100msec period. This results in a duty cycle correction factor of -42.6dB.

5.2.3 Radiated Spurious Emissions Measurements

5.2.3.1 Requirements

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a).

Paragraph 15.209(a) has the following radiated emission 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	3
30.0-88.0	100	3
88.0-216.0	150	3
216.0-960.0	200	3
Above 960	500	3

5.2.3.2 Procedures

Radiated measurements were performed in a 32ft. x 20ft. x 14ft. high shielded enclosure. The shielded enclosure prevents emissions from other sources, such as radio and TV stations from interfering with the measurements. All powerlines and signal lines entering the enclosure pass through filters on the enclosure wall. The powerline filters prevent extraneous signals from entering the enclosure on these leads.

Preliminary radiated emissions tests were performed to determine the emission characteristics of the EUT. For the preliminary test, a broadband measuring antenna was positioned at a 3 meter distance from the EUT. The entire frequency range from 30MHz to 25GHz was investigated using a peak detector function.

The final open field emission tests were then manually performed over the frequency range of 30MHz to 25GHz.

1) For all emissions in the restricted bands, the following procedure was used:

   a) The field strengths of all emissions below 1 GHz were measured using a bi-log antenna. The EUT was placed on an 80cm high non-conductive stand. The bi-log antenna was positioned at a 3 meter distance from the EUT. A peak detector with a resolution bandwidth of 100 kHz was used on the spectrum analyzer.

   b) The field strengths of all emissions above 1 GHz were measured using a double-ridged waveguide antenna. The EUT was placed on a 1.5m high non-conductive stand. The waveguide antenna was positioned at a 3 meter distance from the EUT. A peak detector with a resolution bandwidth of 1 MHz was used on the spectrum analyzer.

   c) To ensure that maximum or worst case emission levels were measured, the following steps were taken when taking all measurements:

      i) The EUT was rotated so that all of its sides were exposed to the receiving antenna.

      ii) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.

      iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.

      iv) In instances where it was necessary to use a shortened cable between the measuring antenna and the spectrum analyzer. The measuring antenna was not raised or lowered to ensure maximized readings, instead the EUT was rotated through all axis to ensure the maximum readings were recorded for the EUT.

   d) For all radiated emissions measurements below 1 GHz, if the peak reading is below the limits listed in 15.209(a), no further measurements are required. If however, the peak readings exceed the limits listed in 15.209(a), then the emissions are re-measured using a quasi-peak detector.

   e) For all radiated emissions measurements above 1 GHz, the peak readings must comply with the 15.35(b) limits. 15.35(b) states that when average radiated emissions measurements are specified, there also is a limit on the peak level of the radiated emissions. The limit on the peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. Therefore, all peak readings above 1 GHz must be no greater than 20 dB above the limits specified in 15.209(a).

   f) Next, for all radiated emissions measurements above 1GHz, the resolution bandwidth was set to 1MHz. The analyzer was set to linear mode with a 10Hz video bandwidth in order to simulate an average detector. An average reading was taken. These readings must be no greater than the limits specified in 15.209(a).

   g) If the dwell time per channel of the hopping signal is less than 100msec, then the reading obtained with the 10 Hz video bandwidth may be further adjusted by a “duty cycle correction factor”, derived from 20*log(dwell time/100msec). These readings must be no greater than the limits specified in 15.209(a).

5.2.3.3 Results

Transmit at 2402MHz (Bluetooth Channel 0)

Preliminary radiated emissions plots are shown on pages 25 through 32. Final radiated emissions data are presented on data pages 33 and 34. As can be seen from the data, all emissions measured from the EUT were within the specification limits.

Transmit at 2440MHz (Bluetooth Channel 38)

Preliminary radiated emissions plots are shown on pages 35 through 42. Final radiated emissions data are presented on data pages 43 and 44. As can be seen from the data, all emissions measured from the EUT were within the specification limits.

Transmit at 2480MHz (Bluetooth Channel 78)

Preliminary radiated emissions plots are shown on pages 45 through 52. Final radiated emissions data are presented on data pages 53 and 54. As can be seen from the data, all emissions measured from the EUT were within the specification limits.

Photographs of the test configuration which yielded the highest, or worst case, radiated emission levels are shown on Figures 3 through 5.

5.2.4 High Band Edge Compliance

5.2.4.1 Requirements

Per section 15.247(d), the radiated emissions which fall in the restricted band beginning at 2483.5 MHz must meet the general limits of 15.209(a).

5.2.4.2 Procedures

1) The EUT was set to transmit continuously at the channel closest to the high band-edge.
2) A double ridged waveguide was placed 3 meters away from the EUT. The antenna was connected to the input of a spectrum analyzer.
3) The center frequency of the analyzer was set to the high band edge (2483.5MHz)
4) The resolution bandwidth was set to 1MHz.
5) To ensure that the maximum or worst case emission level was measured, the following steps were taken:

    a. The EUT was rotated so that all of its sides were exposed to the receiving antenna.
    b. Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
    c. The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.

6) The highest measured peak reading was recorded.
7) The highest measured average reading was recorded.
8) Steps 1 through 7 were repeated with hopping enabled.

5.2.4.3 Results

Pages 55 through 58 show the band-edge compliance results. As can be seen from the data, the radiated emissions at the high end band edge are within the general limits.

6. CONCLUSIONS

It was determined, with a limited series of emissions tests, that the frequency hopping spread spectrum

transceiver, FCC ID: XF6-RS9113DB when installed in the Trilithic Advanced Wireless Test Set, Part No. 802AWE, continues to fully meet the conducted and radiated emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Sections 15.107 and 15.109 for receivers, the conducted and radiated emissions of the FCC “Code of Federal Regulations” Title 47, Part 15, Subpart C, Sections 15.207 and 15.247 for Intentional Radiators Operating within the 2400-2483.5 MHz, when tested per ANSI C63.4-2014 when the modification listed in section 3.4 were installed.

It was also determined, with a limited series of emissions tests, that the frequency hopping spread spectrum transceiver, FCC ID: XF6-RS9113DB when installed in the Trilithic Advanced Wireless Test Set, Part No. 802AWE, continues to fully meet the conducted and radiated RF emission requirements of the Industry Canada Radio Standards Specification, RSS-Gen, Section 8.8 and Section 7.1.2 for receivers and the Industry Canada Radio Standards Specification RSS-Gen Section 8.8 and RSS-247 for transmitters operating in the 2400MHz-2483.5MHz band, when tested per ANSI C63.4-2014 when the modification listed in section 3.4 were installed.

7. CERTIFICATION

Elite Electronic Engineering Incorporated certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the test specifications.

The data presented in this test report pertains to the EUT at the test date. Any electrical or mechanical modification made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification.

8. ENDORSEMENT DISCLAIMER

This report must not be used to claim product certification, approval, or endorsement by A2LA, NIST or any agency of the Federal Government.

9. EQUIPMENT LIST

Table 9-1 Equipment List

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
APW0	PREAMPLIFIER	PLANAR ELECTRONICS	PE2-30-20G20R6G	PL2926/0646	20GHZ-26.5GHZ	3/2/2016	3/2/2017
APW9	PREAMPLIFIER	PLANAR	PE2-35-120-5R0-10-120-SFF	PL8527	1-20GHz	3/2/2016	3/2/2017
CDY0	WORKSTATION	ELITE	WORKSTATION		WINDOWS 7	N/A	
GRE0	SIGNAL GENERATOR	AGILENT TECHNOLOGIES	E4438C	MY42083127	250KHZ-6GHZ	2/25/2016	2/25/2017
NHG0	STANDARD GAIN HORN ANTENNA	NARDA	638	---	18-26.5GHZ	NOTE 1	
NTA2	BILOG ANTENNA	TESEQ	6112D	28040	25-1000MHz	10/27/2015	10/27/2016
NWQ2	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS LINDGREN	3117	66659	1GHZ-18GHZ	3/2/2016	3/2/2018
RAKG	RF SECTION	HEWLETT PACKARD	85462A	3549A00284	0.009-6500MHZ	2/22/2016	2/22/2017
RAKH	RF FILTER SECTION	HEWLETT PACKARD	85460A	3448A00324	---	2/22/2016	2/22/2017
RBB0	EMI TEST RECEIVER 20HZ TO 40 GHZ.	ROHDE & SCHWARZ	ESIB40	100250	20 HZ TO 40GHZ	2/16/2016	2/16/2017
RBD1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESU40	100009	20Hz-40GHz	2/10/2016	2/10/2017
RBE1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESU26	100096	20Hz-26GHz	2/25/2016	2/25/2017
SES0	24VDC POWER SUPPLY	P-TRANS	FS-32024-1M	001	18-27VDC	NOTE 1	
T1EJ	10DB 25W ATTENUATOR	WEINSCHEL	46-10-34	CD6790	DC-18GHZ	6/10/2015	6/10/2016
T2DG	20DB, 25W ATTENUATOR	WEINSCHEL	46-20-34	BN1038	DC-18GHZ	1/5/2016	1/5/2018
XOB2	ADAPTER	HEWLETT PACKARD	K281C,012	09407	18-26.5GHZ	NOTE 1	
XPQ4	HIGH PASS FILTER	K&L MICROWAVE	11SH10-4800/X20000-O/O	1	4.8-20GHZ	9/22/2015	9/22/2016

I/O: Initial Only
N/A: Not Applicable
Note 1: For the purpose of this test, the equipment was calibrated over the specified frequency range, pulse rate, or modulation prior to the test or monitored by a calibrated instrument.

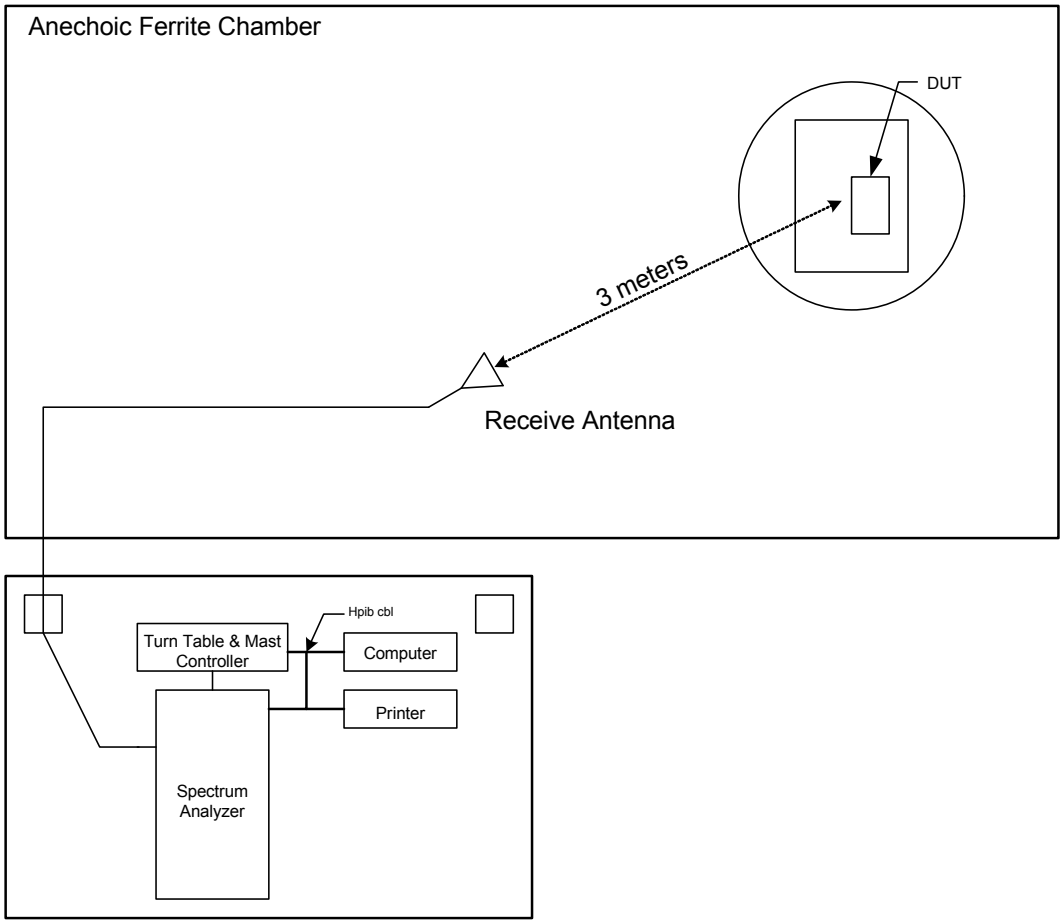


FIGURE 1 BLOCKDIAGRAM OF TEST SETUP

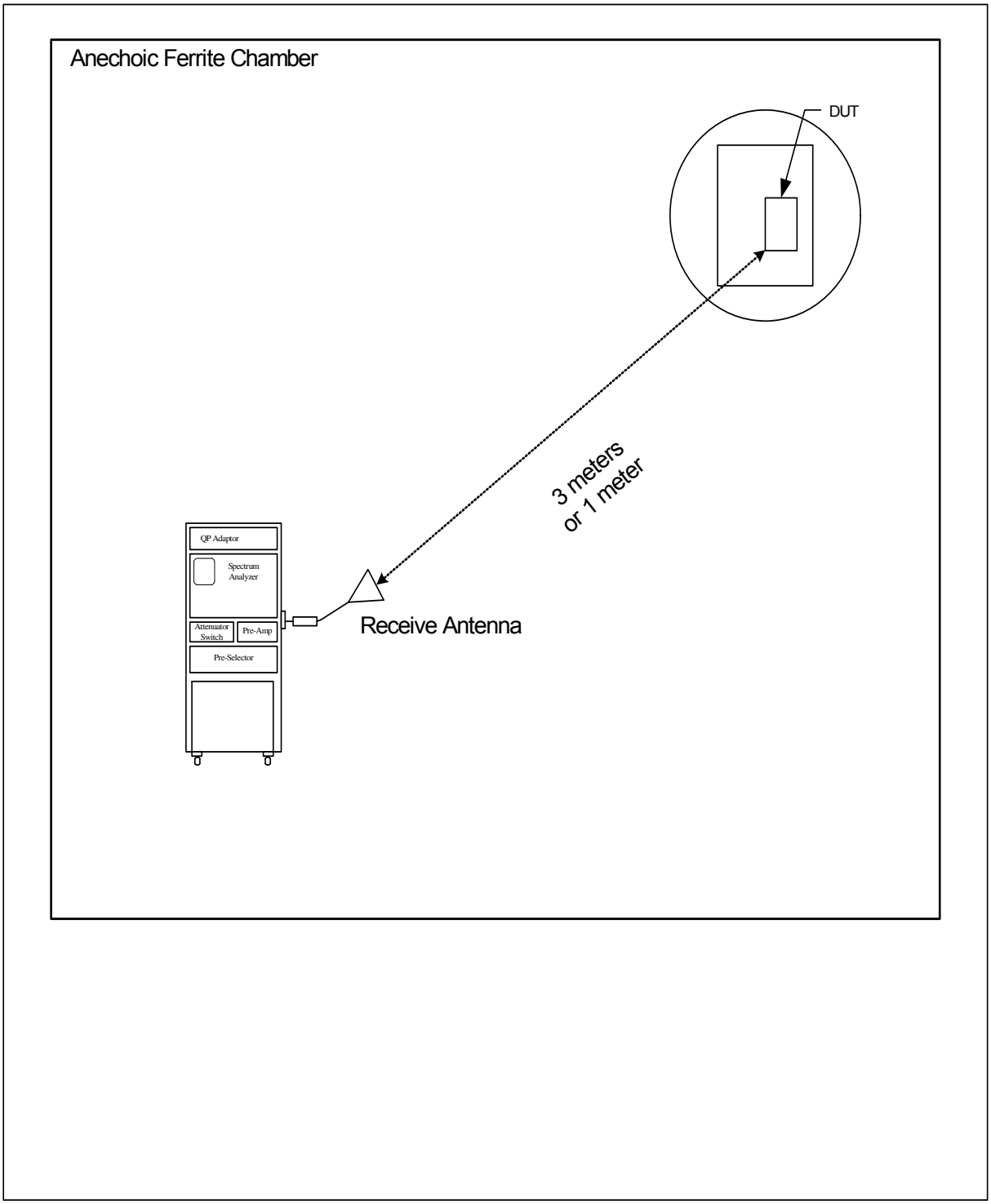


Figure 2: BLOCK DIAGRAM OF TEST SETUP FOR RADIATED EMISSIONS ABOVE 18GHZ

Figure 3

Test Setup for Radiated Emissions – 30MHz to 1GHz, Horizontal Polarization

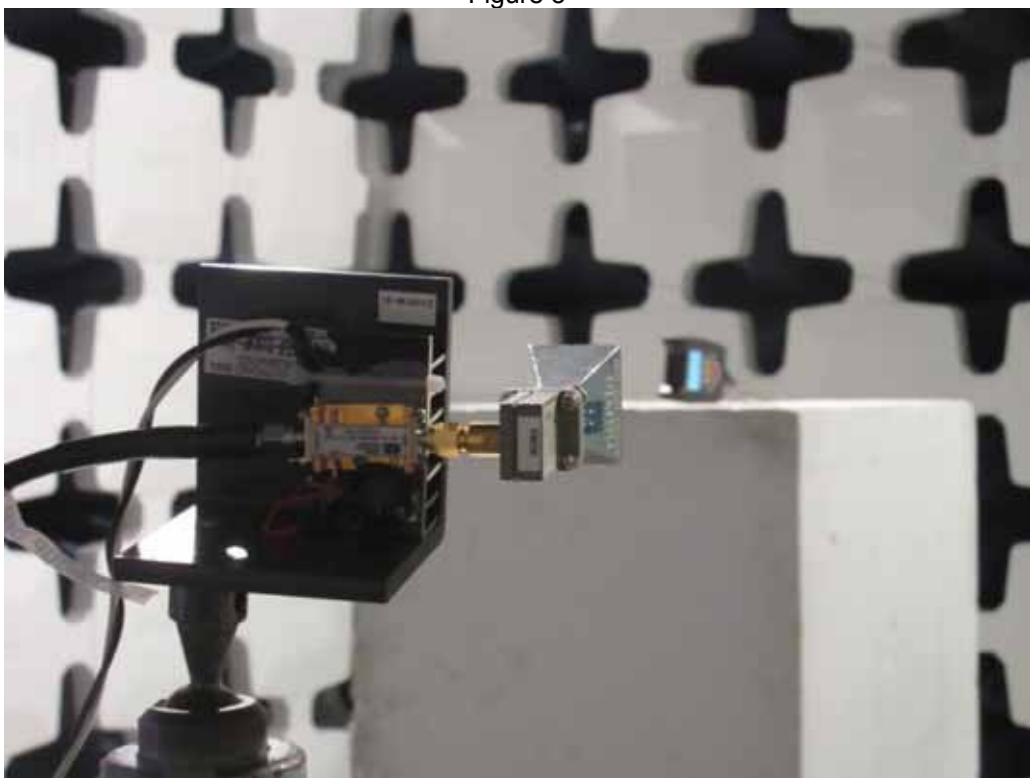
Test Setup for Radiated Emissions – 30MHz to 1GHz, Vertical Polarization

Figure 4

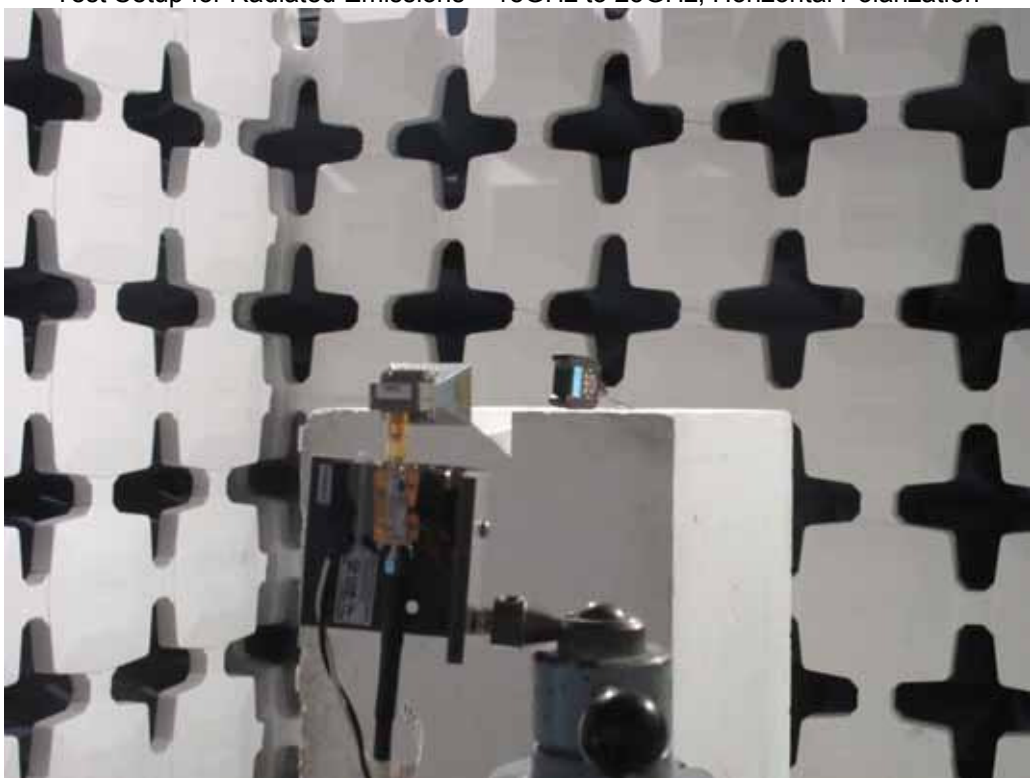
Test Setup for Radiated Emissions – 1GHz to 18GHz, Horizontal Polarization

Test Setup for Radiated Emissions – 1GHz to 18GHz, Vertical Polarization

Figure 5



Test Setup for Radiated Emissions – 18GHz to 25GHz, Horizontal Polarization



Test Setup for Radiated Emissions – 18GHz to 25GHz, Vertical Polarization

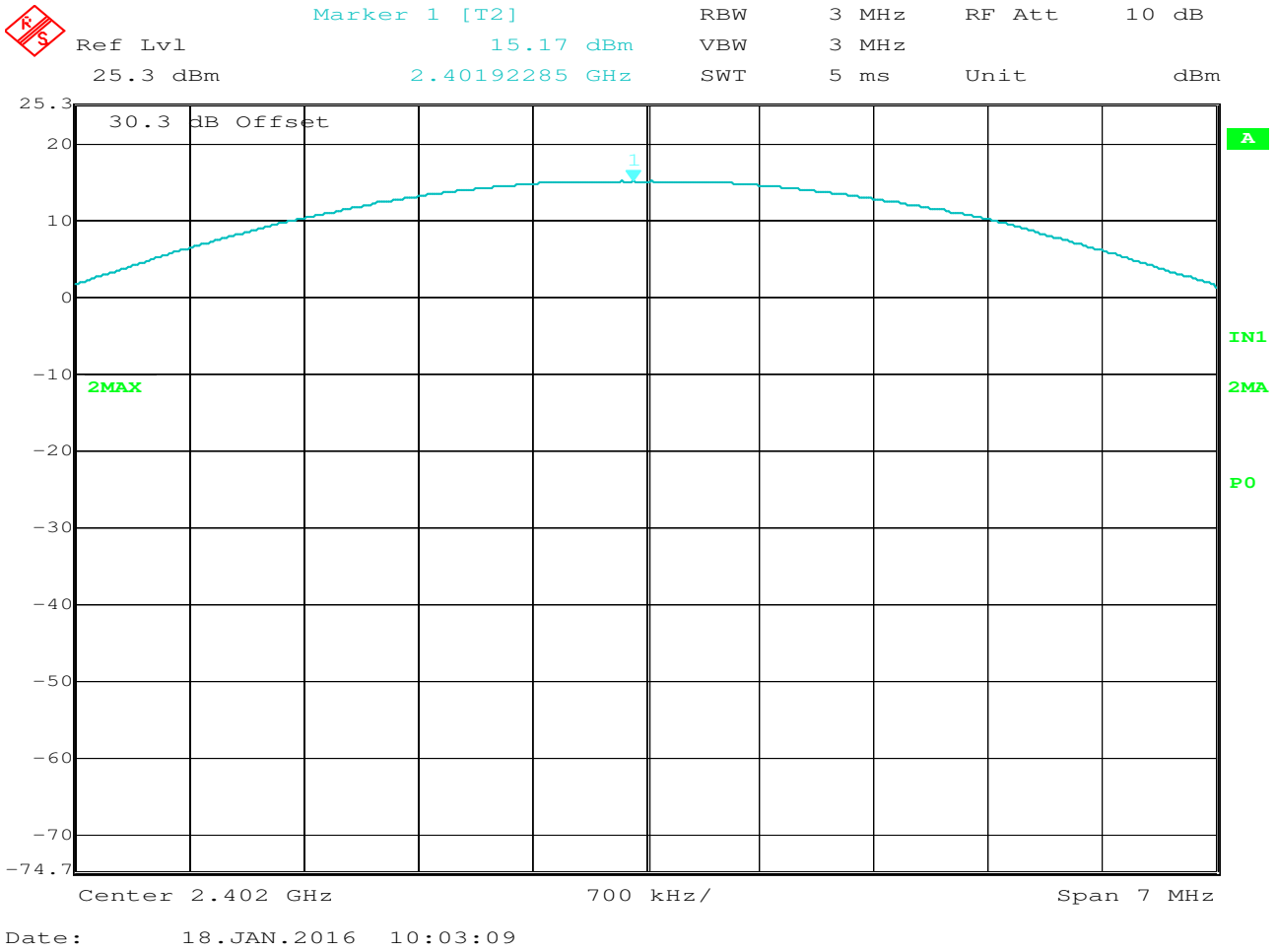
Manufacturer : Trilithic
Model No. : 802AWE
Serial No. :
Date Tested : January 18, 2016 through April 1, 2016
Test Performed : Maximum Conducted Peak Output Power
Mode : See Below
Notes : Antenna Port Conducted Emissions Test

Frequency MHz	Bluetooth Channel No.	Power Setting	Maximum Conducted Peak Output Power Reading dBm	Maximum Conducted Peak Output Power Limit dBm
2402	0	15	15.17	30
2442	38	15	14.51	30
2480	78	15	14.51	30

Manufacturer : Trilithic
Model No. : 802AWE
Serial No. :
Date Tested : January 18, 2016 through April 1, 2016
Test Performed : EIRP
Mode : See Below
Notes :

Frequency MHz	Bluetooth Channel No.	Power Setting	Peak Power Reading dBm	Antenna Gain dB	Peak EIRP dBm	Peak EIRP Limit dBm
2402	0	15	15.17	2.0	17.17	36.0
2440	38	15	14.51	2.0	16.51	36.0
2480	78	15	14.51	2.0	16.51	36.0

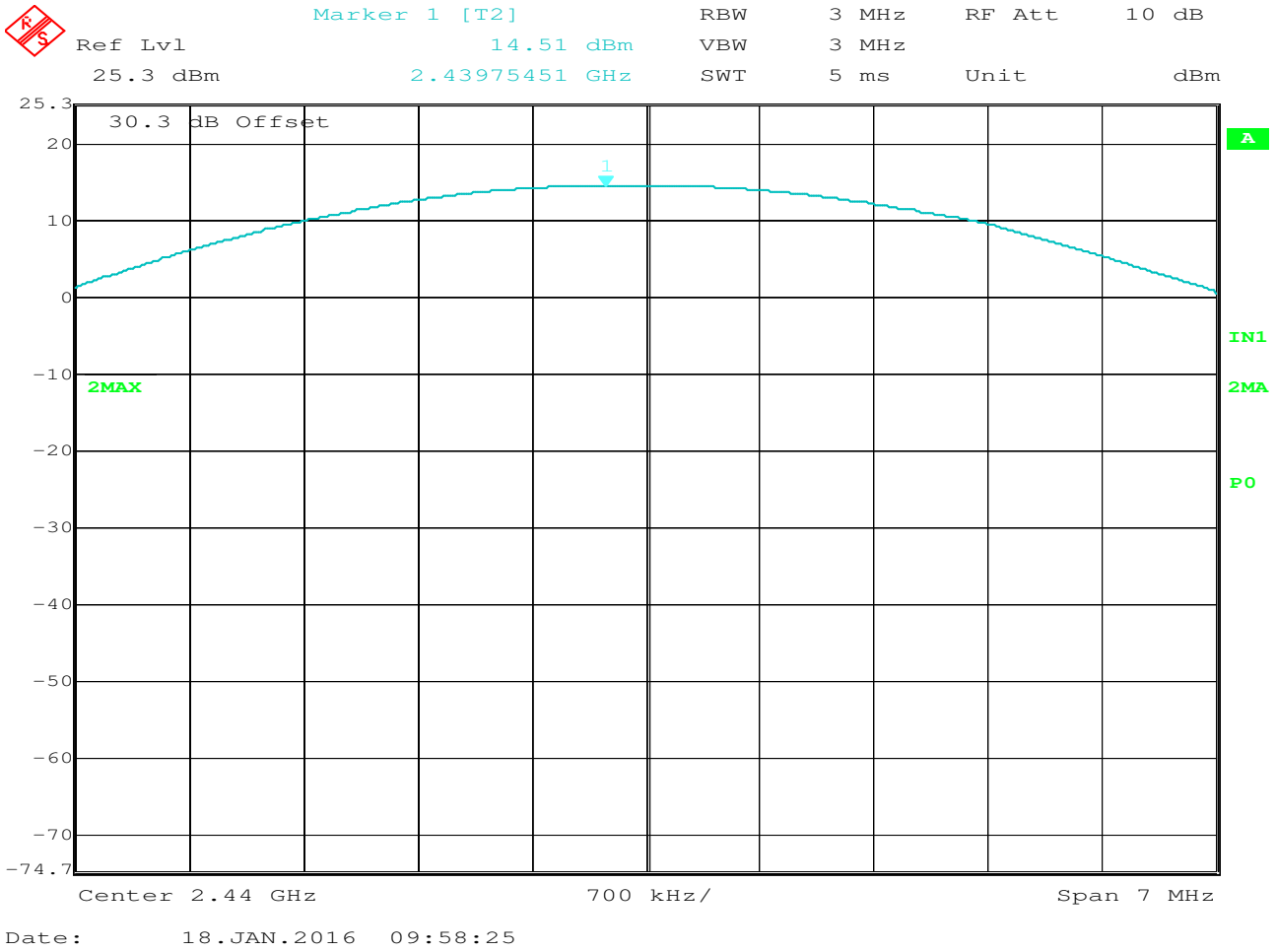
Average EIRP (dBm) = Average Power Reading (dBm) + Antenna Gain (dB)



FCC 15.247 Conducted Peak Output Power

MANUFACTURER	:	Trilithic
MODEL NUMBER	:	802AWE
SERIAL NUMBER	:	315486
TEST MODE	:	Bluetooth Transmit at 2402MHz (Ch. 0)
TEST PARAMETERS	:	Peak Output Power
NOTES	:	Power Level Setting = 15
EQUIPMENT USED	:	RBB0, T2DG, T1EJ

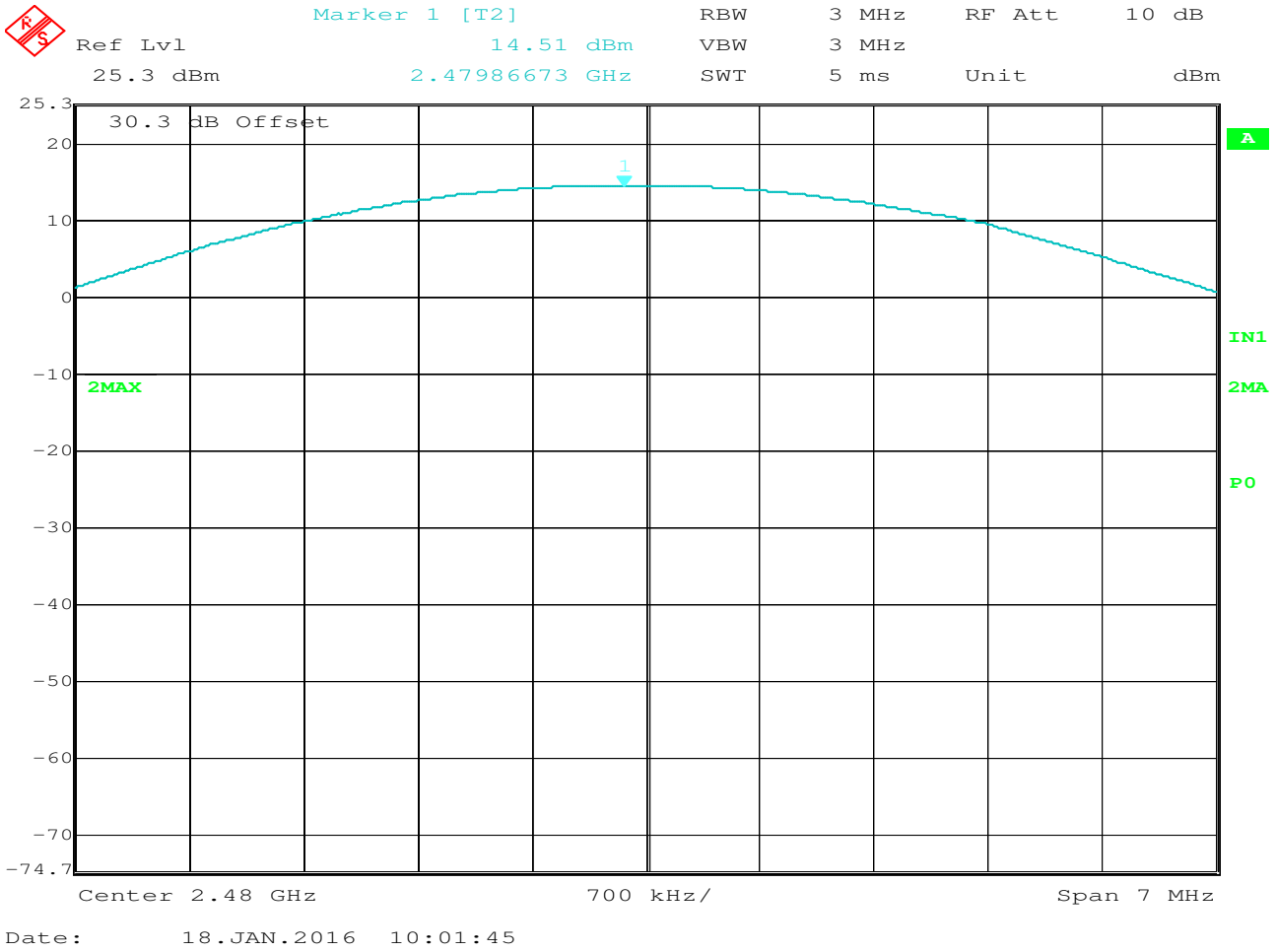
NOTES



FCC 15.247 Conducted Peak Output Power

MANUFACTURER	:	Trilithic
MODEL NUMBER	:	802AWE
SERIAL NUMBER	:	315486
TEST MODE	:	Bluetooth Transmit at 2440MHz (Ch. 38)
TEST PARAMETERS	:	Peak Output Power
NOTES	:	Power Level Setting = 15
EQUIPMENT USED	:	RBB0, T2DG, T1EJ

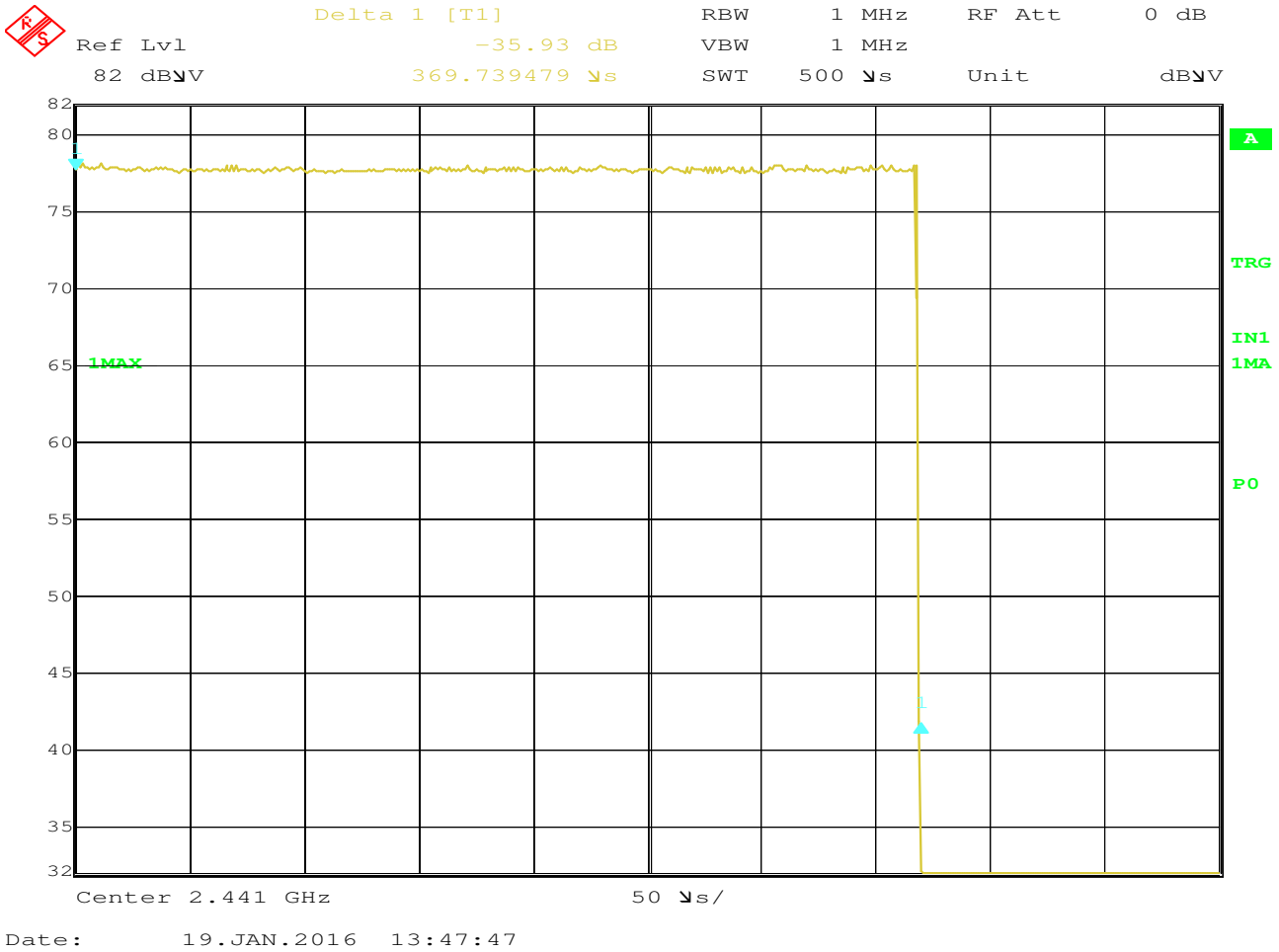
NOTES



FCC 15.247 Conducted Peak Output Power

MANUFACTURER	:	Trilithic
MODEL NUMBER	:	802AWE
SERIAL NUMBER	:	315486
TEST MODE	:	Bluetooth Transmit at 2480MHz (Ch. 78)
TEST PARAMETERS	:	Peak Output Power
NOTES	:	Power Level Setting = 15
EQUIPMENT USED	:	RBB0, T2DG, T1EJ

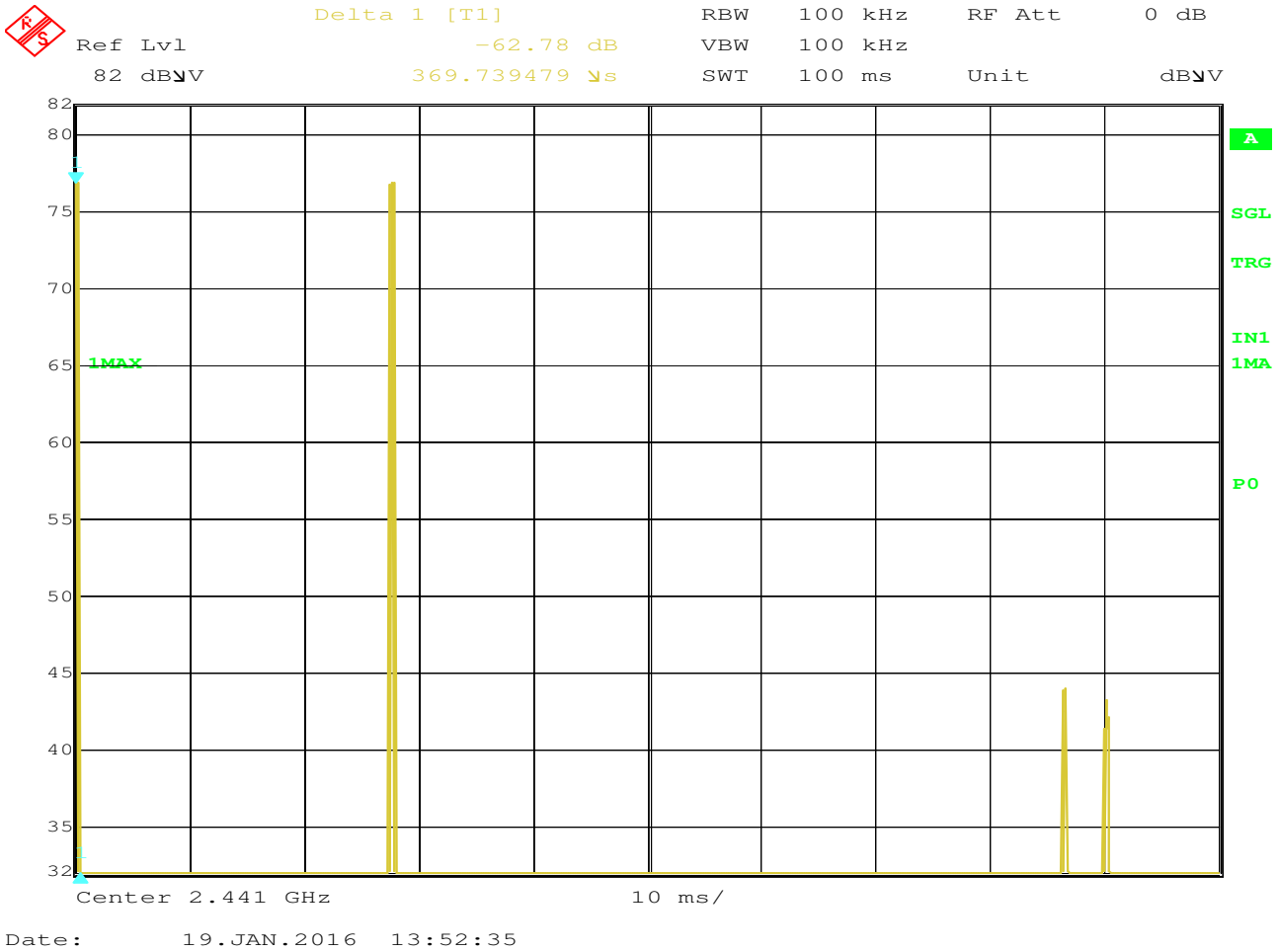
NOTES



FCC 15.247 Duty Cycle Correction Factor

MANUFACTURER	:	Trilithic
MODEL NUMBER	:	802AWE
SERIAL NUMBER	:	315486
TEST MODE	:	Bluetooth mode, hopping enabled
TEST PARAMETERS	:	Duty Cycle Correction Factor
NOTES	:	Pulse duration = 369.74usec
EQUIPMENT USED	:	RBB0, NWQ2

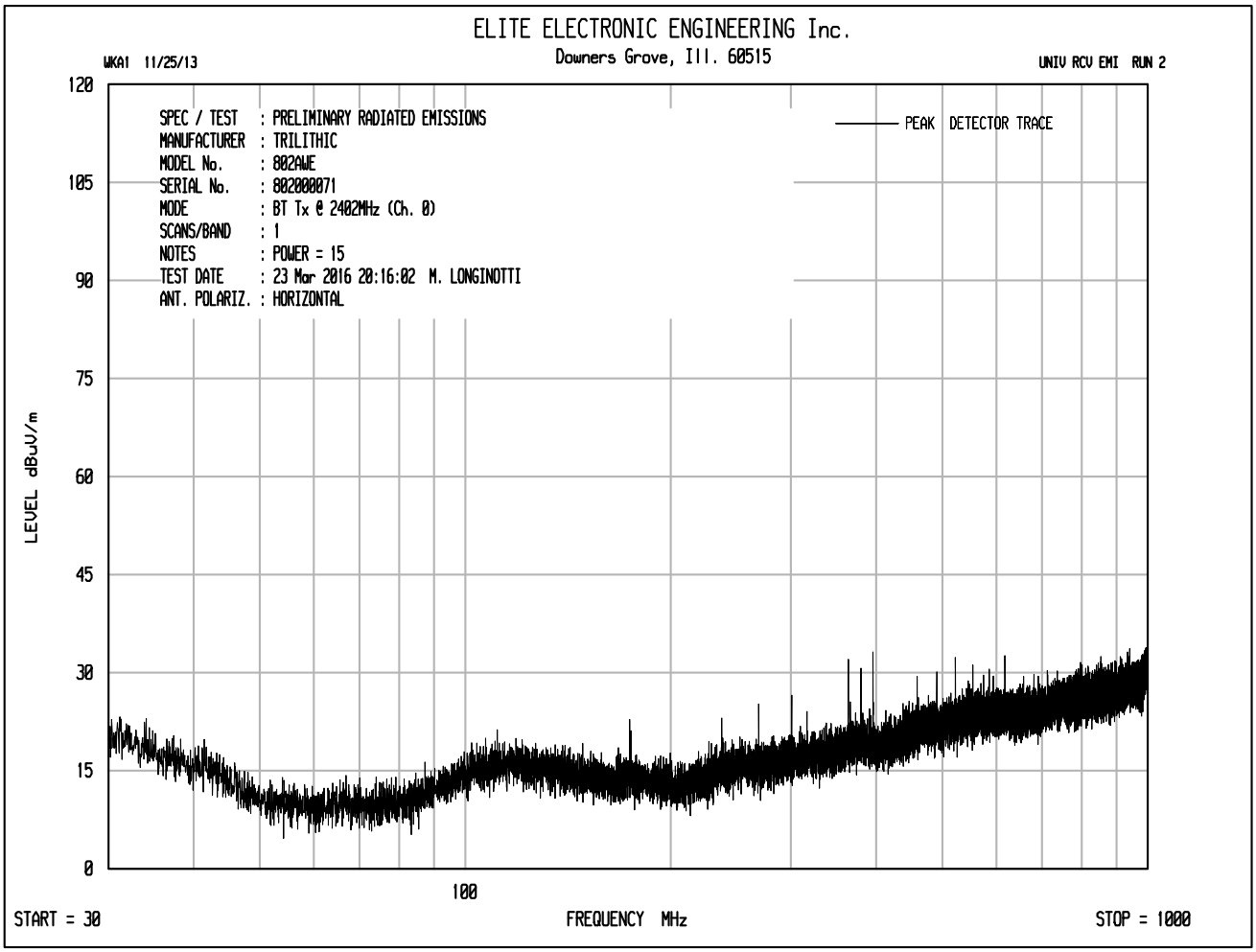
NOTES

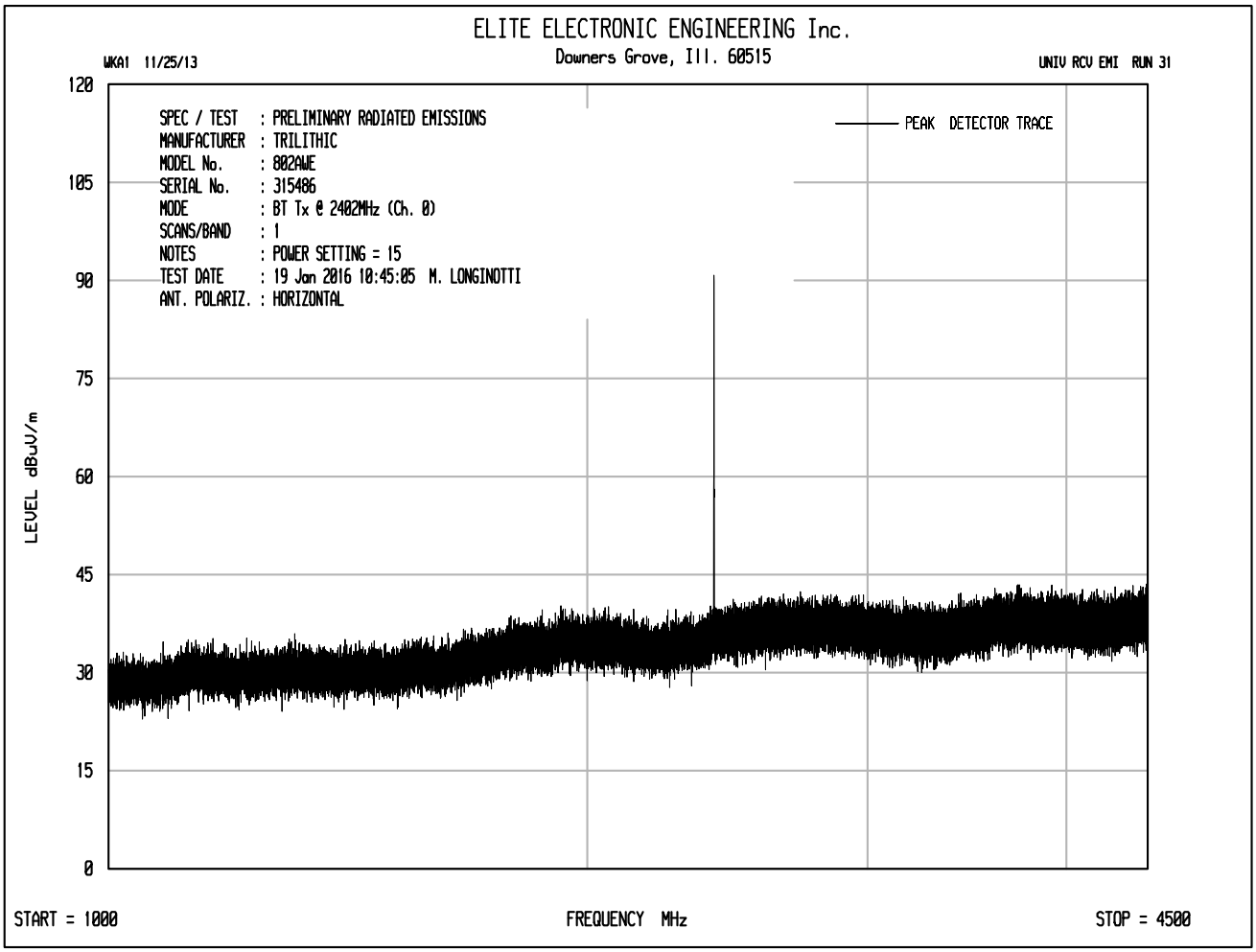


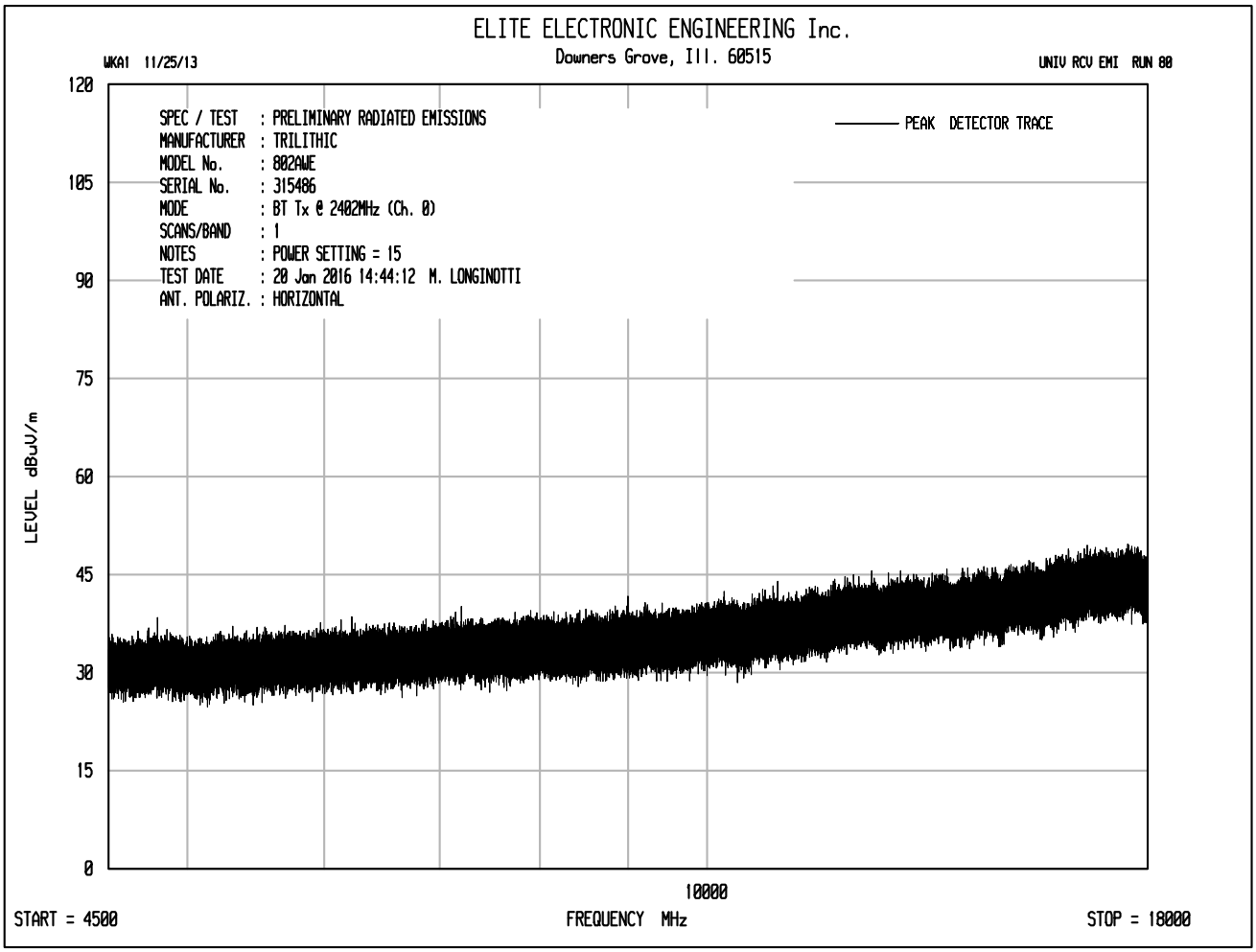
FCC 15.247 Duty Cycle Correction Factor

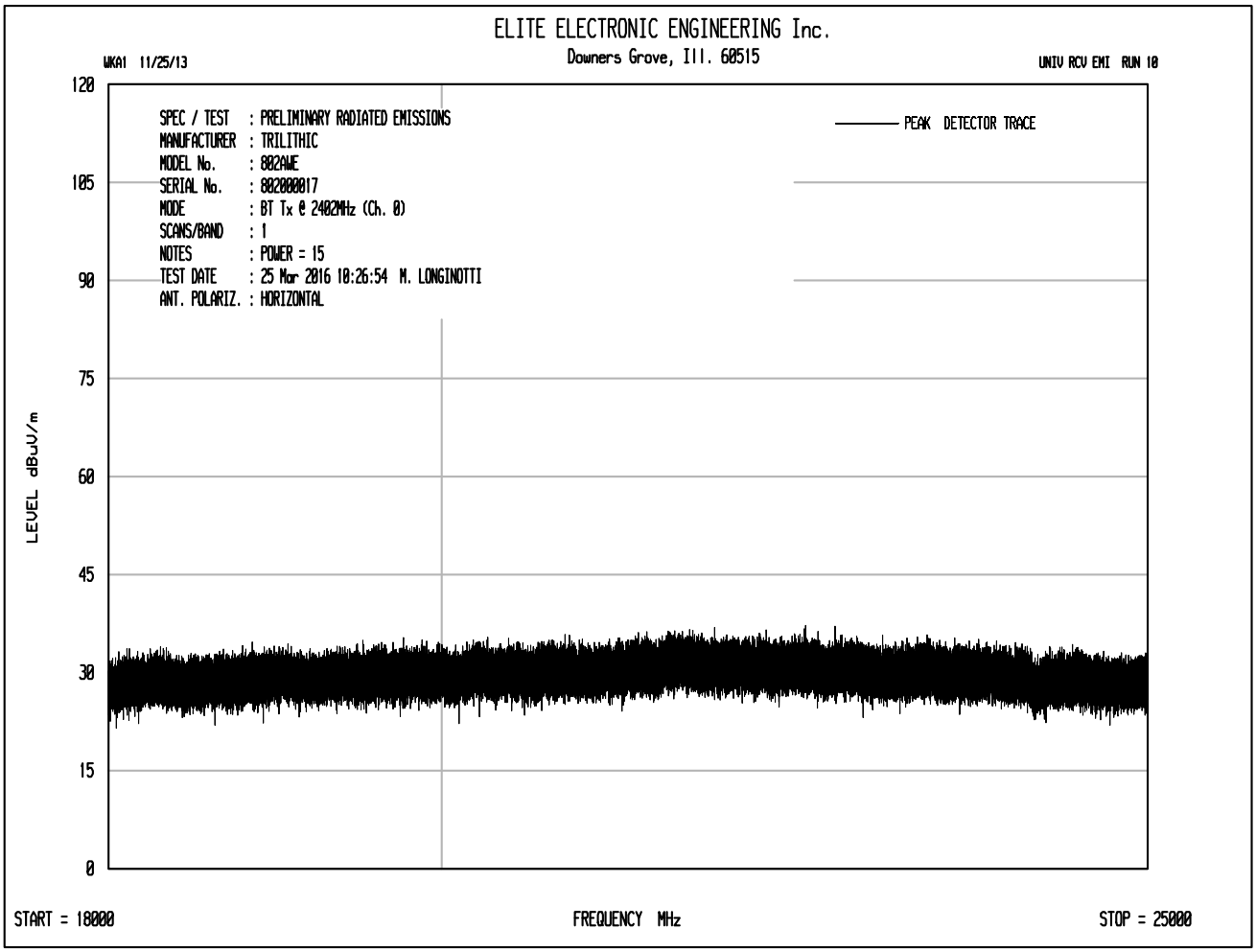
MANUFACTURER	:	Trilithic
MODEL NUMBER	:	802AWE
SERIAL NUMBER	:	315486
TEST MODE	:	Bluetooth mode, hopping enabled
TEST PARAMETERS	:	Duty Cycle Correction Factor
NOTES	:	Number of pulses in 100msec period = 2
	:	Duty Cycle Correction Factor (dB) = D.C. (dB)
	:	D.C. (dB) = 20 x log [((pulse width (msec)) x (#pulses in a 100msecperiod)) / 100msec]
	:	D.C. (dB) = 20x log ((0.3697msec)x2/100msec)
	:	D.C. (dB) = -42.6dB
EQUIPMENT USED	:	RBB0, NWQ2

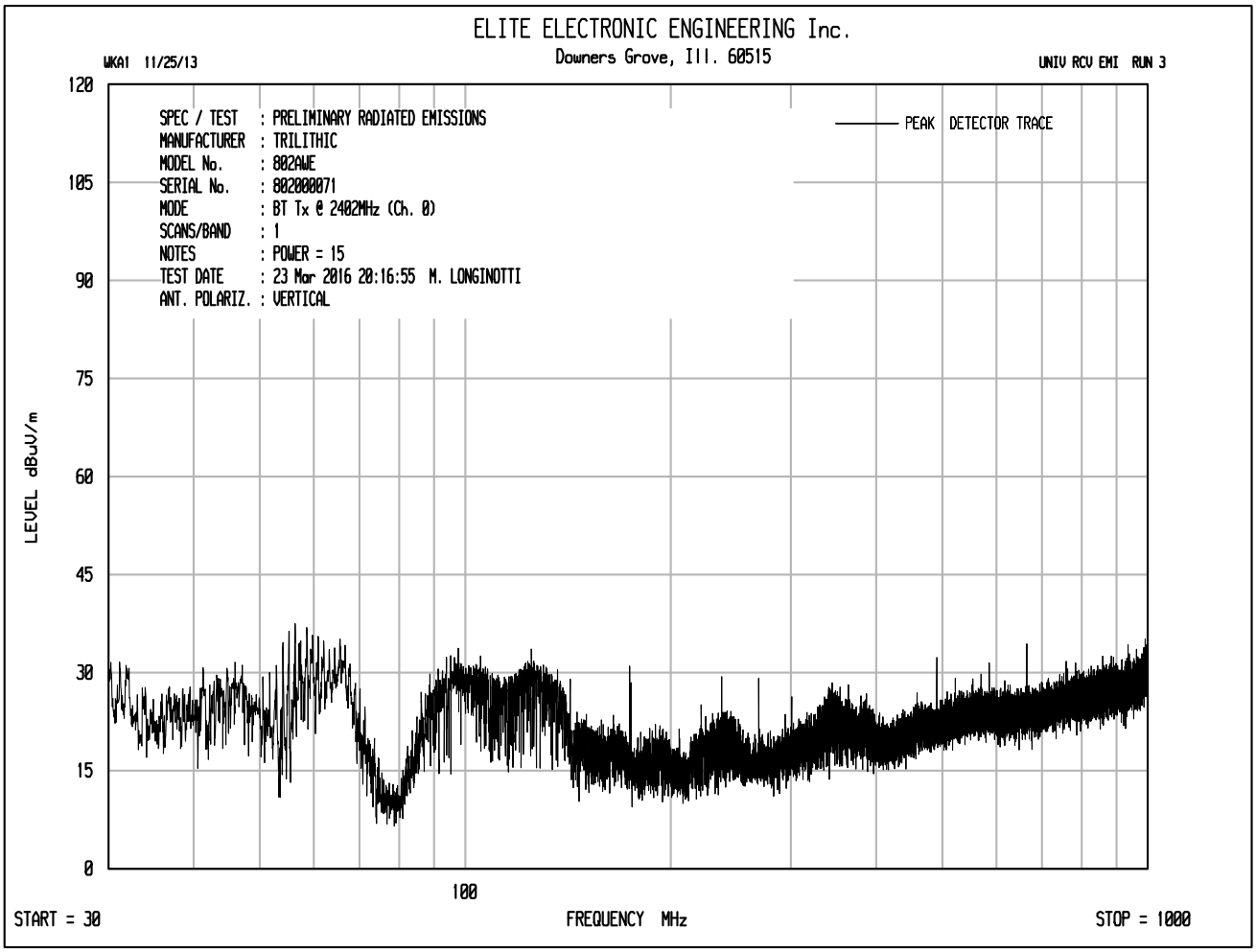
NOTES

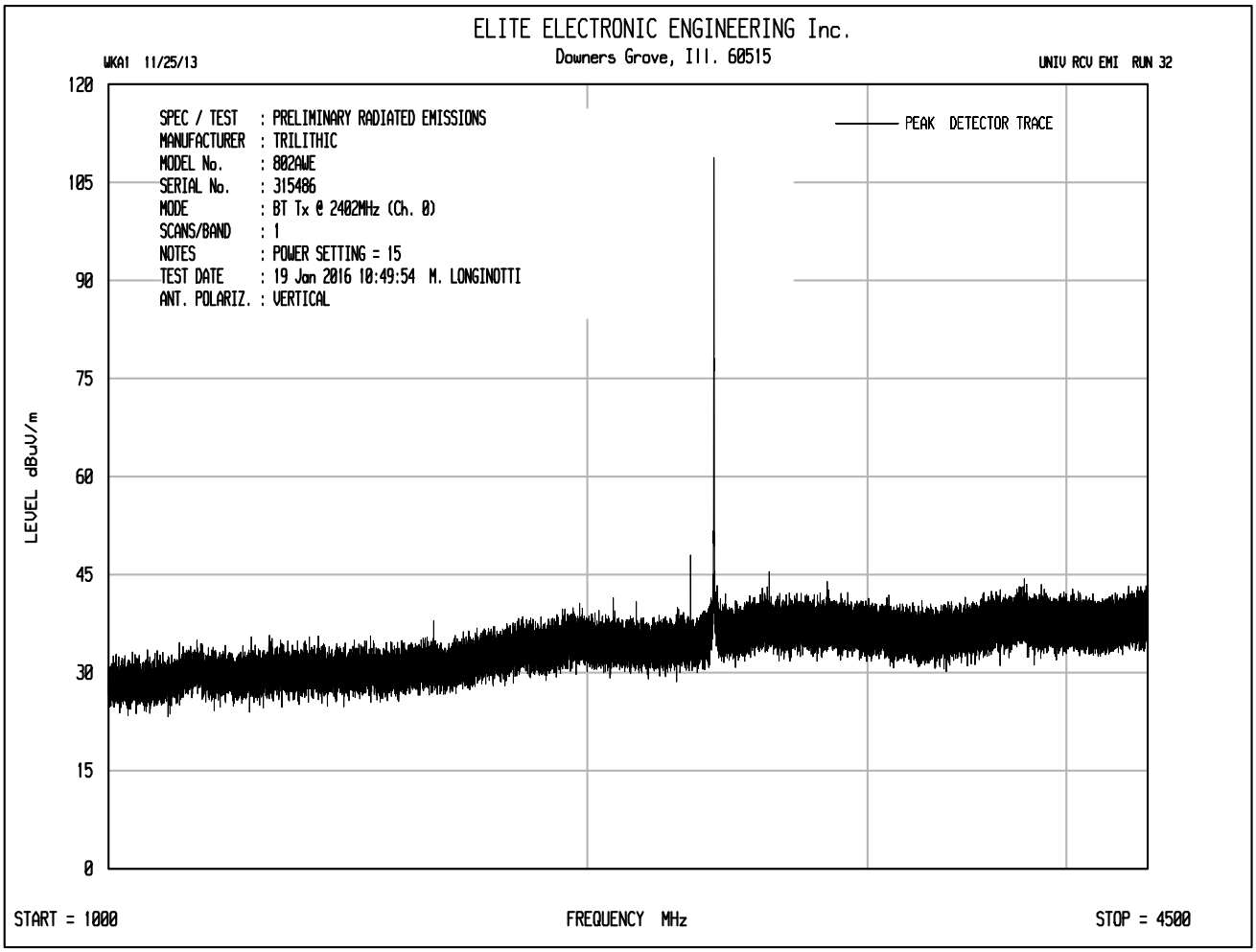

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 802000071
MODE : BT Tx @ 2402MHz (Ch. 0)
SCANS/BAND : 1
NOTES : POWER = 15
TEST DATE : 23 Mar 2016 20:16:02 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

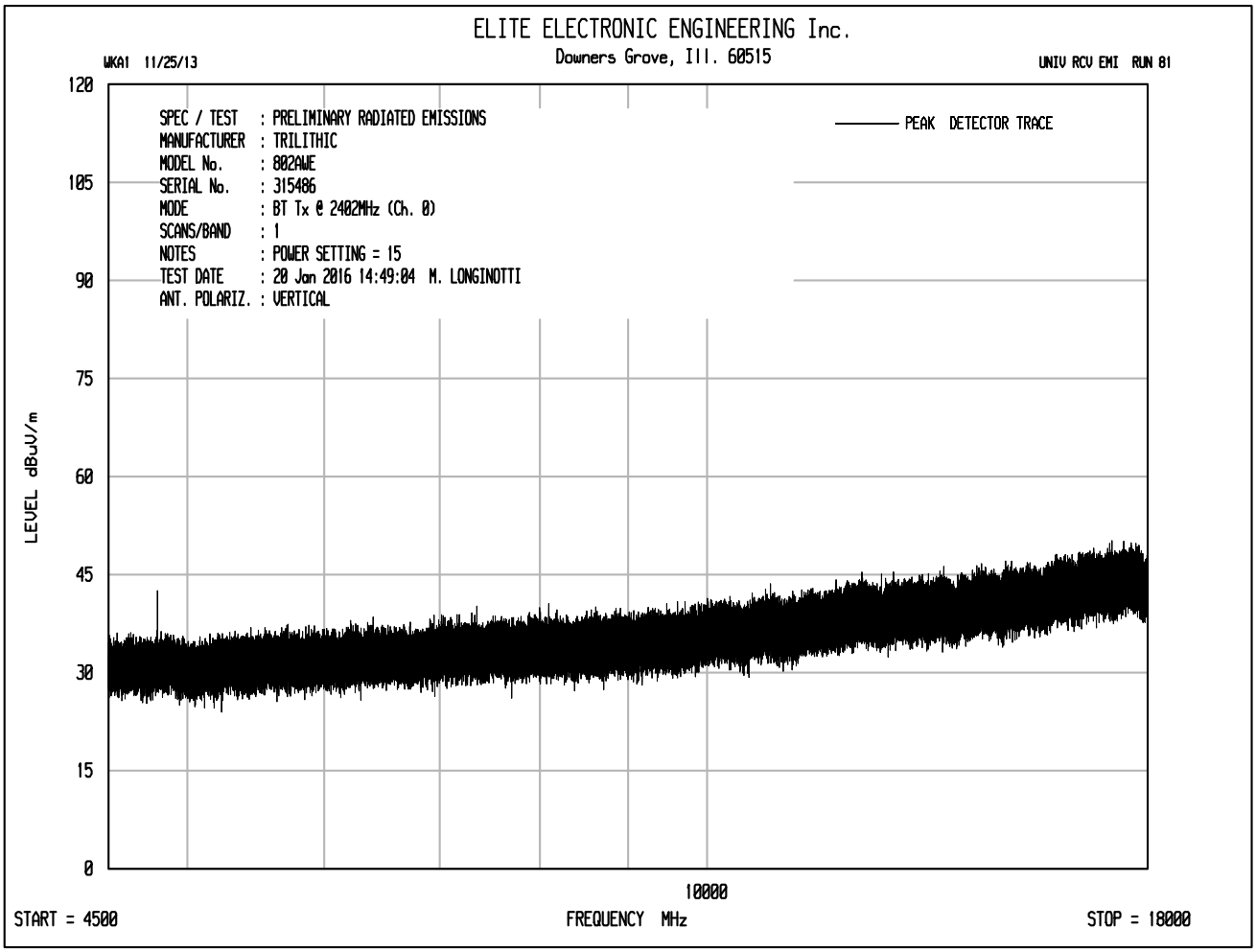

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 31
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 315486
MODE : BT Tx @ 2402MHz (Ch. 0)
SCANS/BAND : 1
NOTES : POWER SETTING = 15
TEST DATE : 19 Jan 2016 10:45:05 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500

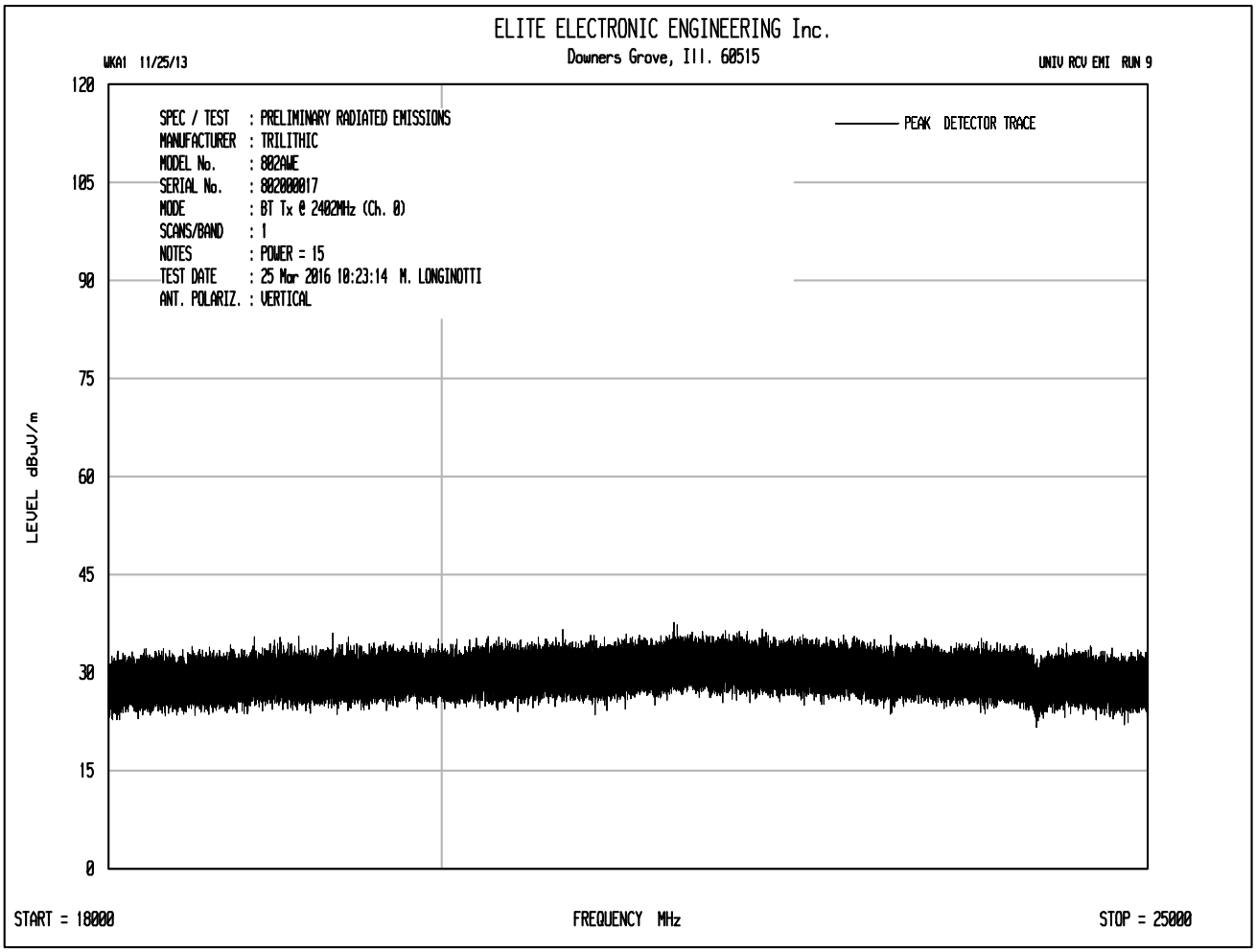

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 00
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 002AWE
SERIAL No. : 315486
MODE : BT Tx @ 2402MHz (Ch. 0)
SCANS/BAND : 1
NOTES : POWER SETTING = 15
TEST DATE : 20 Jan 2016 14:44:12 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 802000017
MODE : BT Tx @ 2402MHz (Ch. 0)
SCANS/BAND : 1
NOTES : POWER = 15
TEST DATE : 25 Mar 2016 10:26:54 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 802000071
MODE : BT Tx @ 2402MHz (Ch. 0)
SCANS/BAND : 1
NOTES : POWER = 15
TEST DATE : 23 Mar 2016 20:16:55 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 32
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 315486
MODE : BT Tx @ 2402MHz (Ch. 0)
SCANS/BAND : 1
NOTES : POWER SETTING = 15
TEST DATE : 19 Jan 2016 10:49:54 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 81
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 315486
MODE : BT Tx @ 2402MHz (Ch. 0)
SCANS/BAND : 1
NOTES : POWER SETTING = 15
TEST DATE : 20 Jan 2016 14:49:04 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 9
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 802000017
MODE : BT Tx @ 2402MHz (Ch. 0)
SCANS/BAND : 1
NOTES : POWER = 15
TEST DATE : 25 Mar 2016 10:23:14 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

Manufacturer : Trilithic
Model No. : 802AWE
Serial No. :
Date Tested : January 18, 2016 through April 1, 2016
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Bluetooth Transmit at 2402MHz (Ch. 0), power setting = 15
Test Distance : 3 meters
Notes : Peak Readings with a 1MHz RBW

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4804.00	H	51.7		4.8	34.2	-39.3	51.4	373.0	5000.0	-22.5
4804.00	V	55.7		4.8	34.2	-39.3	55.4	591.1	5000.0	-18.5
12010.00	H	48.6	Ambient	8.0	39.1	-39.2	56.6	672.3	5000.0	-17.4
12010.00	V	48.4	Ambient	8.0	39.1	-39.2	56.4	657.0	5000.0	-17.6
19216.00	H	30.7	Ambient	2.2	40.4	-28.6	44.7	172.5	5000.0	-29.2
19216.00	V	31.6	Ambient	2.2	40.4	-28.6	45.6	191.3	5000.0	-28.3
2321.93	H	15.8	Ambient	3.4	32.2	0.0	51.4	372.2	5000.0	-22.6
2321.93	V	18.2		3.4	32.2	0.0	53.8	490.7	5000.0	-20.2

Peak Total (dBuV/m) = Meter Reading (dBuV) + CBL Fac (dB) + Ant Fac (dB) + Pre Amp (dB)

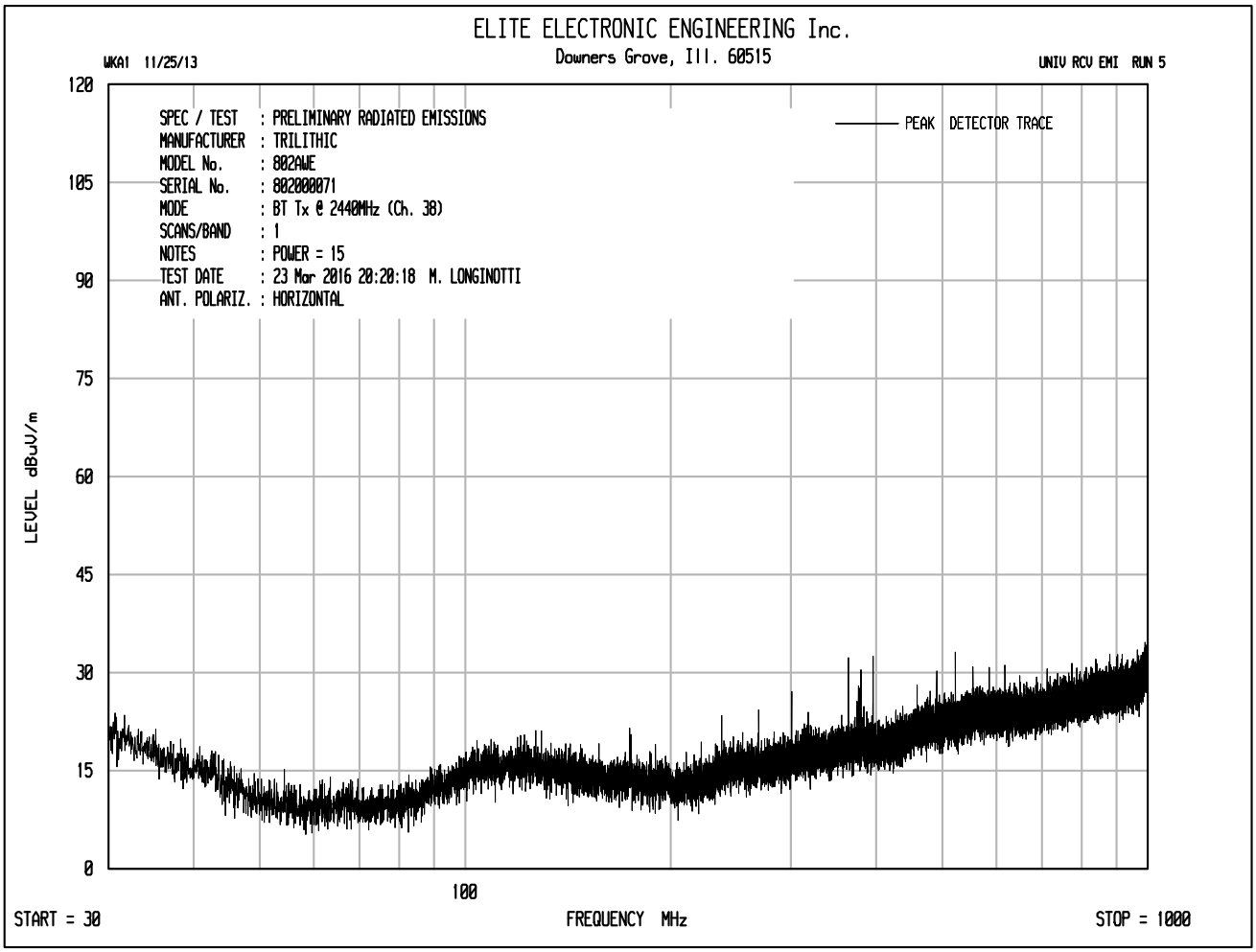
Peak Total (uV/m) = 10^(Peak Total (dBuV/m)/20)

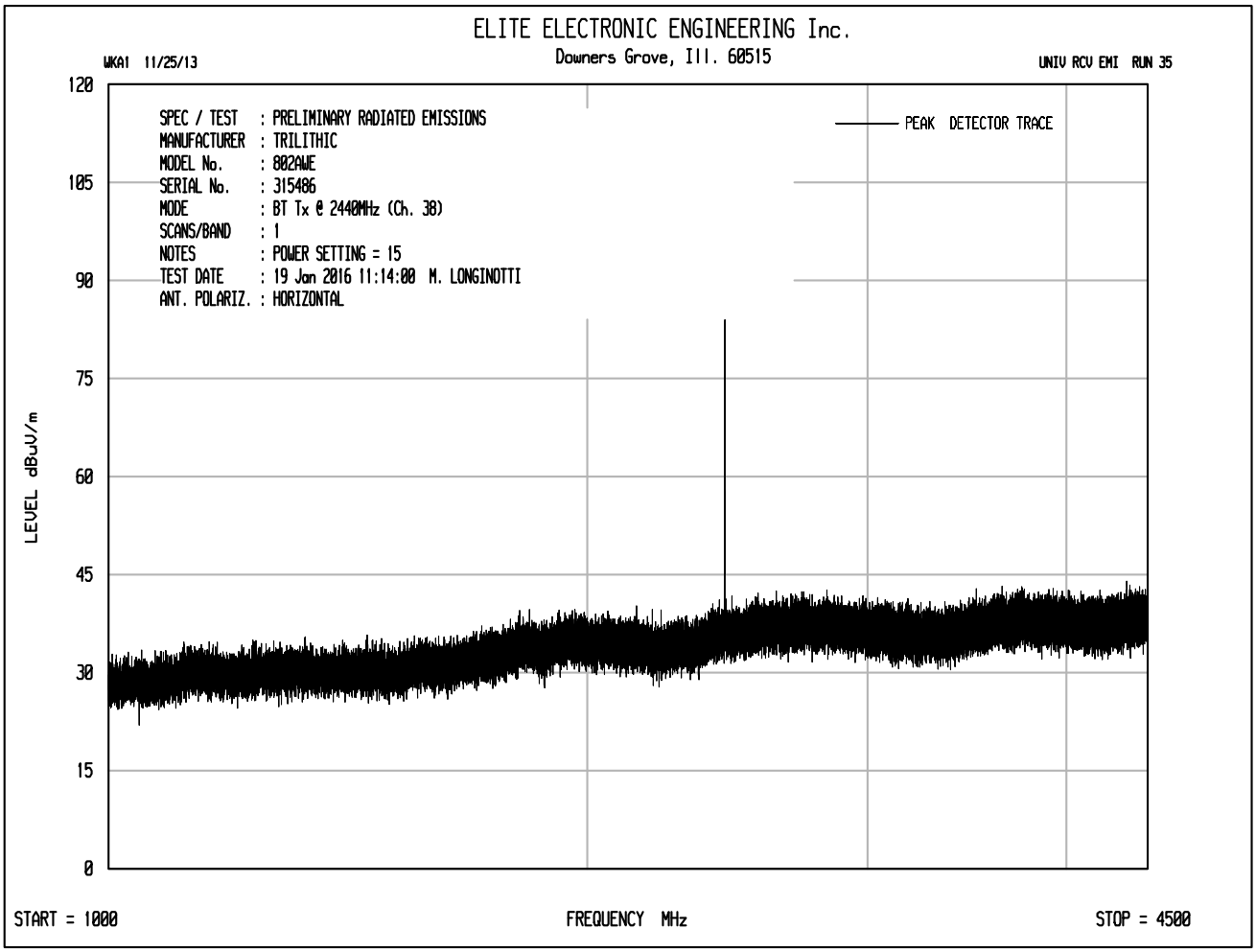
Manufacturer : Trilithic
Model No. : 802AWE
Serial No. :
Date Tested : January 18, 2016 through April 1, 2016
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Bluetooth Transmit at 2402MHz (Ch. 0), power setting = 15
Test Distance : 3 meters
Notes : Average Readings with a 1MHz RBW

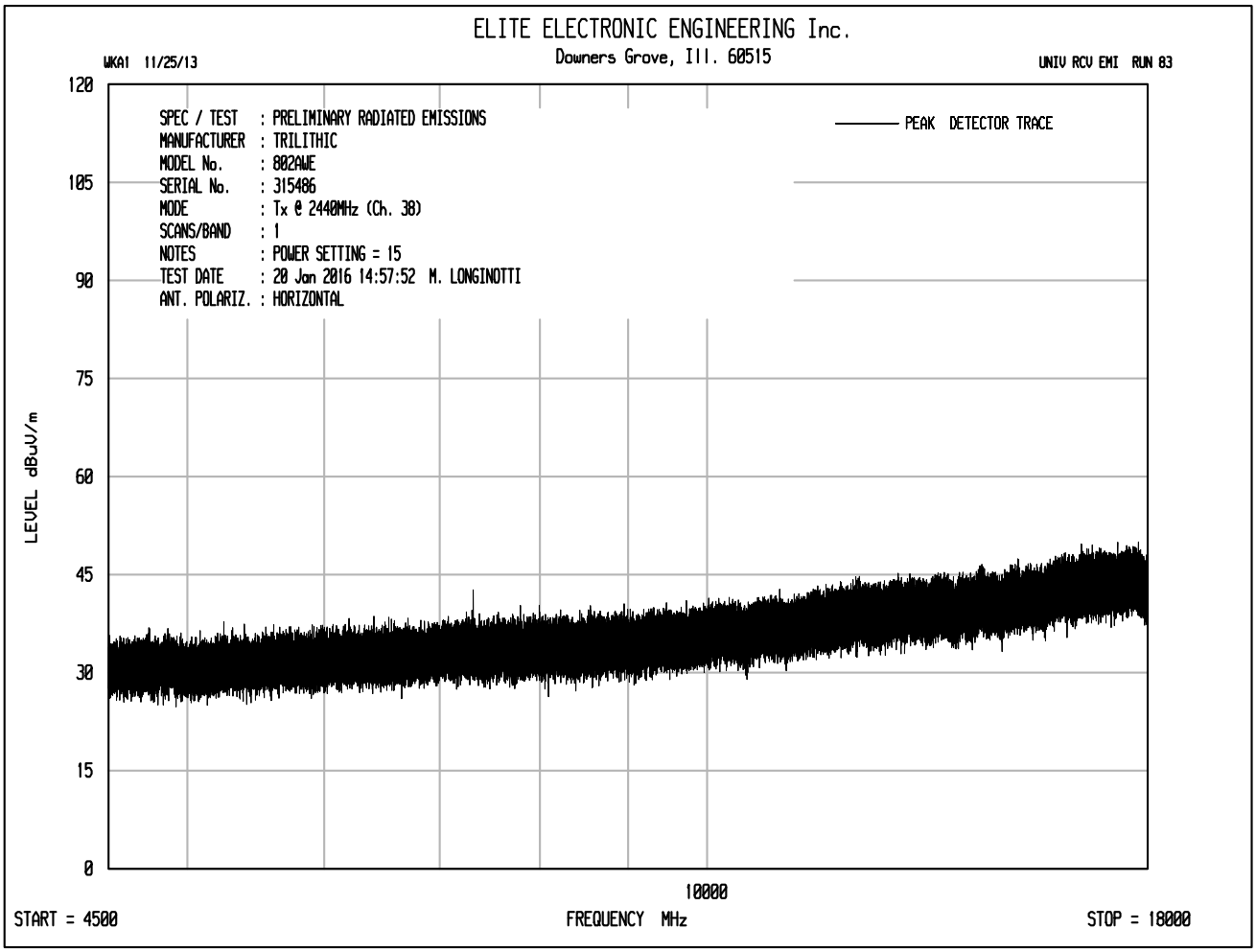
Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4804.00	H	45.4		4.8	34.2	-39.3	-42.6	2.5	1.3	500.0	-51.4
4804.00	V	51.7		4.8	34.2	-39.3	-42.6	8.8	2.8	500.0	-45.1
12010.00	H	35.6	Ambient	8.0	39.1	-39.2	-42.6	1.0	1.1	500.0	-53.0
12010.00	V	35.6	Ambient	8.0	39.1	-39.2	-42.6	1.0	1.1	500.0	-53.0
19216.00	H	18.9	Ambient	2.2	40.4	-28.6	-42.6	-9.7	0.3	500.0	-63.6
19216.00	V	19.0	Ambient	2.2	40.4	-28.6	-42.6	-9.6	0.3	500.0	-63.5
2321.93	H	4.0	Ambient	3.4	32.2	0.0	-42.6	-3.0	0.7	500.0	-57.0
2321.93	V	11.3		3.4	32.2	0.0	-42.6	4.3	1.6	500.0	-49.7

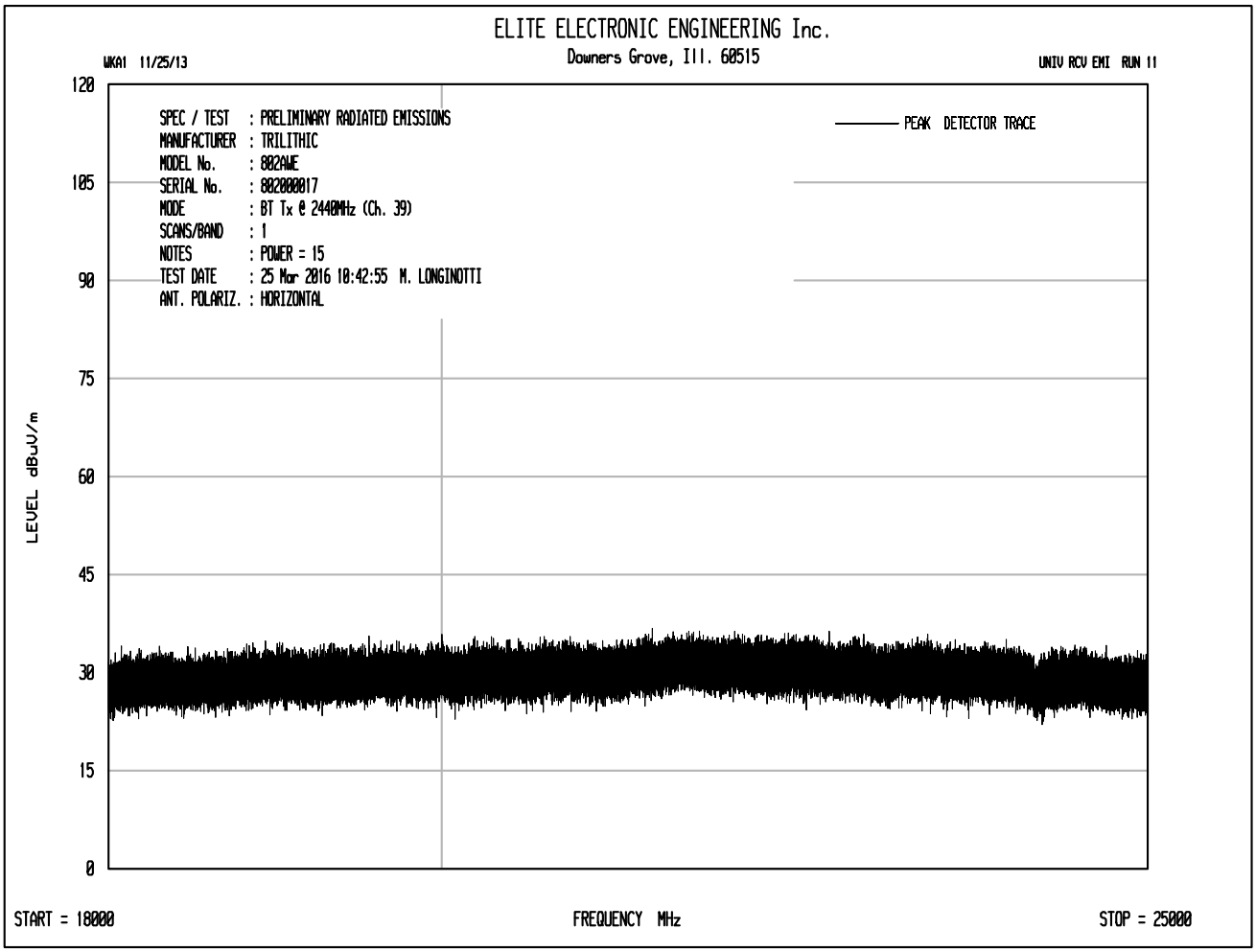
Average Total (dBuV/m) = Meter Reading (dBuV) + CBL Fac (dB) + Ant Fac (dB) + Pre Amp (dB)

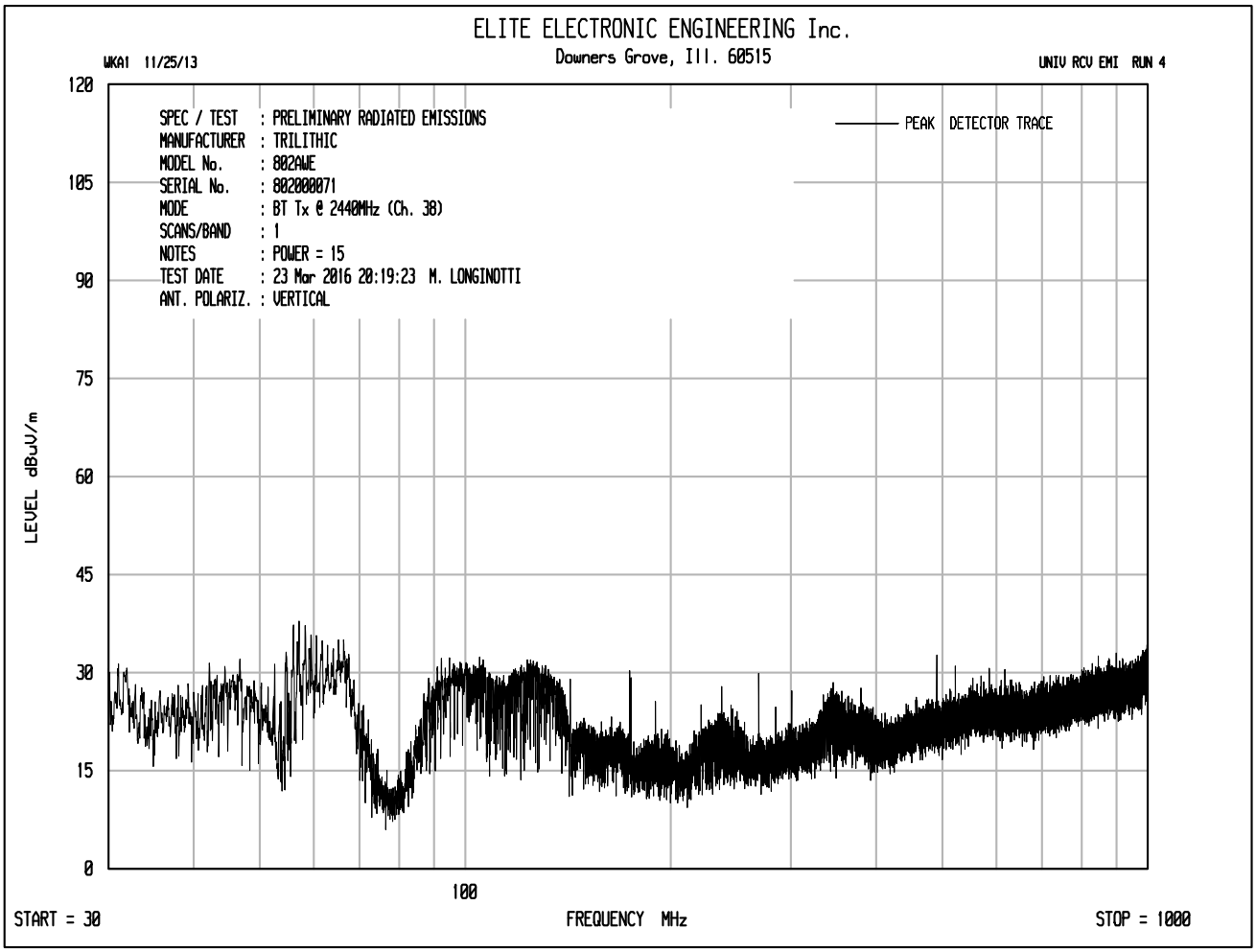
Average Total (uV/m) = 10^(Peak Total (dBuV/m)/20)

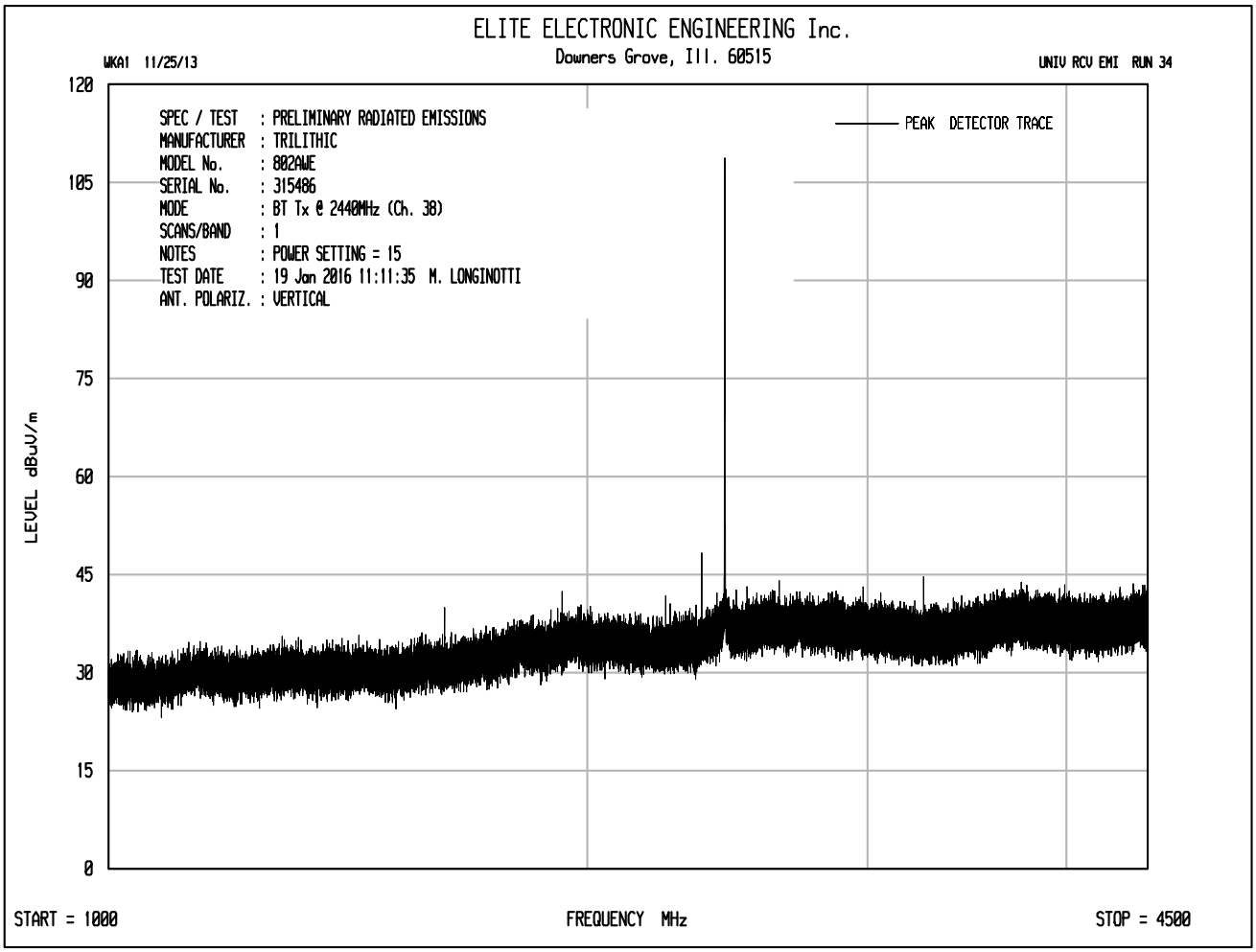

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 802000071
MODE : BT Tx @ 2440MHz (Ch. 38)
SCANS/BAND : 1
NOTES : POWER = 15
TEST DATE : 23 Mar 2016 20:20:18 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

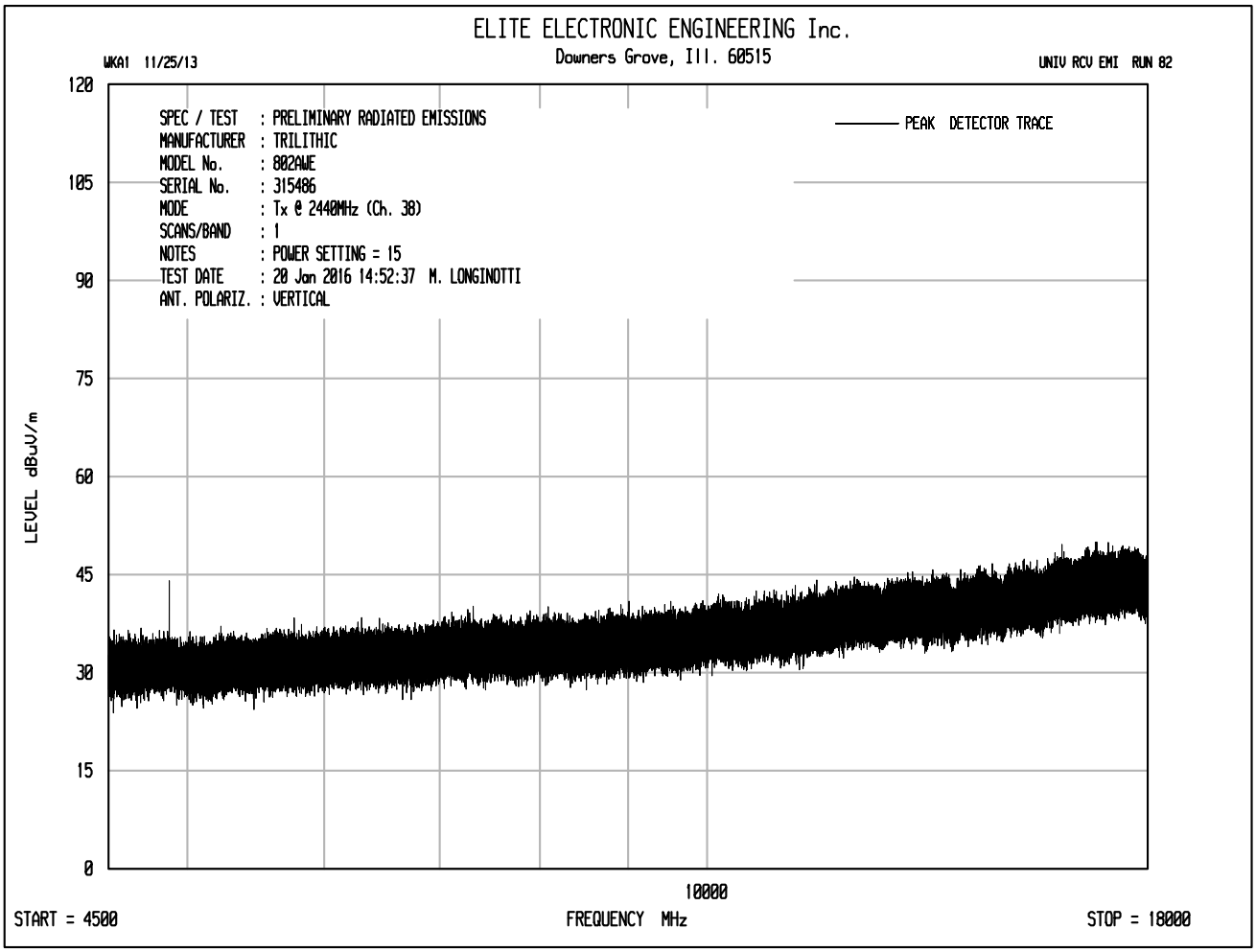

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 35
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 315486
MODE : BT Tx @ 2440MHz (Ch. 38)
SCANS/BAND : 1
NOTES : POWER SETTING = 15
TEST DATE : 19 Jan 2016 11:14:00 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500

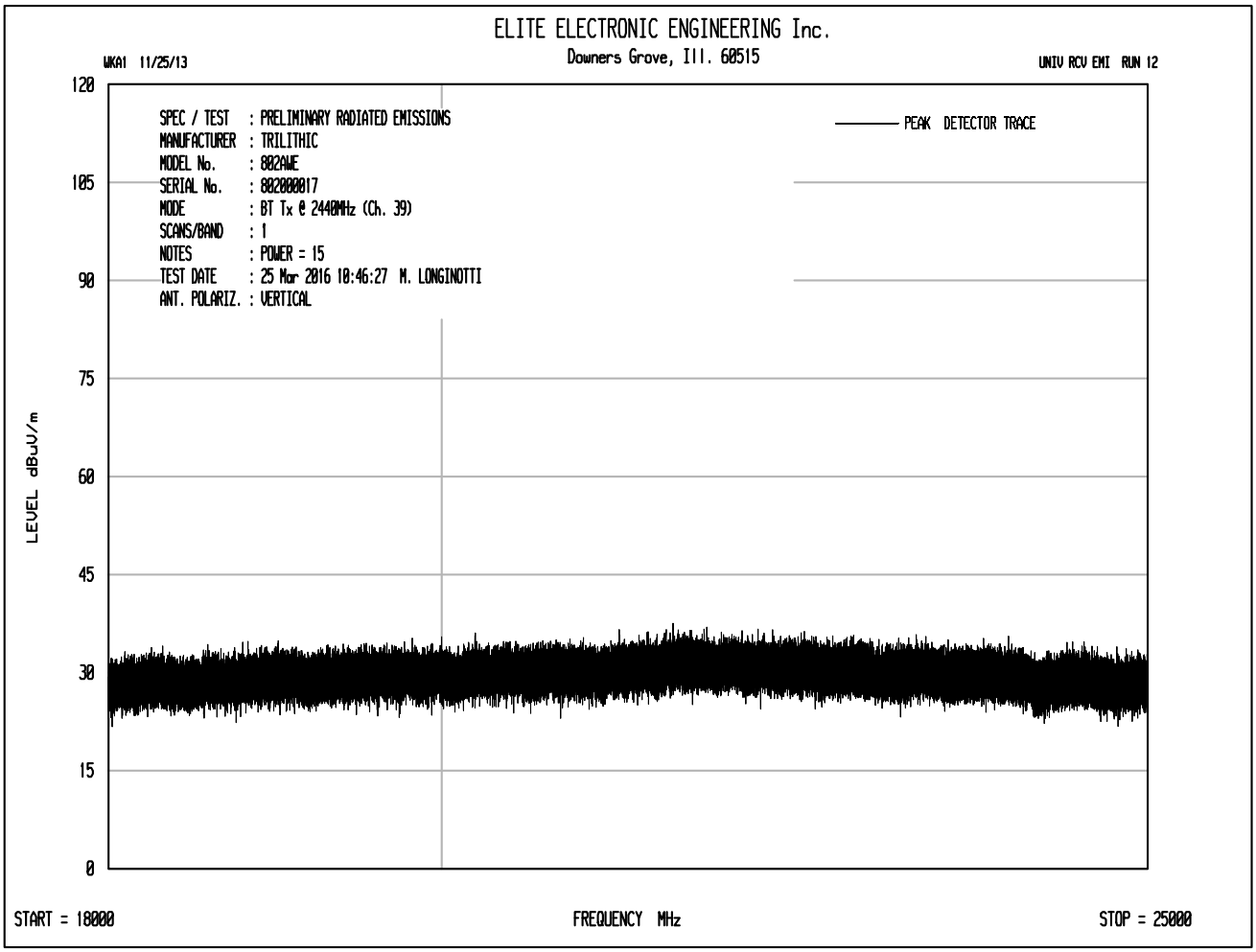

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 83
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 315486
MODE : Tx @ 2440MHz (Ch. 38)
SCANS/BAND : 1
NOTES : POWER SETTING = 15
TEST DATE : 20 Jan 2016 14:57:52 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 802000017
MODE : BT Tx @ 2440MHz (Ch. 39)
SCANS/BAND : 1
NOTES : POWER = 15
TEST DATE : 25 Mar 2016 10:42:55 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 4
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 802000071
MODE : BT Tx @ 2440MHz (Ch. 38)
SCANS/BAND : 1
NOTES : POWER = 15
TEST DATE : 23 Mar 2016 20:19:23 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 34
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 315486
MODE : BT Tx @ 2440MHz (Ch. 38)
SCANS/BAND : 1
NOTES : POWER SETTING = 15
TEST DATE : 19 Jan 2016 11:11:35 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 82
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 315486
MODE : Tx @ 2440MHz (Ch. 38)
SCANS/BAND : 1
NOTES : POWER SETTING = 15
TEST DATE : 20 Jan 2016 14:52:37 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 12
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 802000017
MODE : BT Tx @ 2440MHz (Ch. 39)
SCANS/BAND : 1
NOTES : POWER = 15
TEST DATE : 25 Mar 2016 10:46:27 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

Manufacturer : Trilithic
Model No. : 802AWE
Serial No. :
Date Tested : January 18, 2016 through April 1, 2016
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Bluetooth Transmit at 2440MHz, (Ch. 38), power setting = 15
Test Distance : 3 meters
Notes : Peak Readings with a 1MHz RBW

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4880.00	H	51.2		4.9	34.2	-39.3	50.9	352.5	5000.0	-23.0
4880.00	V	55.4		4.9	34.2	-39.3	55.1	571.7	5000.0	-18.8
7320.00	H	53.4		6.2	36.2	-39.4	56.3	653.1	5000.0	-17.7
7320.00	V	52.4		6.2	36.2	-39.4	55.3	582.0	5000.0	-18.7
12200.00	H	49.1	Ambient	8.0	39.3	-39.1	57.3	730.7	5000.0	-16.7
12200.00	V	48.7	Ambient	8.0	39.3	-39.1	56.9	697.8	5000.0	-17.1
19520.00	H	30.6	Ambient	2.2	40.4	-28.5	44.7	171.8	5000.0	-29.3
19520.00	V	31.0	Ambient	2.2	40.4	-28.5	45.1	179.9	5000.0	-28.9
2360.00	H	16.1	Ambient	3.4	32.3	0.0	51.8	390.2	5000.0	-22.2
2360.00	V	19.1		3.4	32.3	0.0	54.8	551.2	5000.0	-19.2

Peak Total (dBuV/m) = Meter Reading (dBuV) + CBL Fac (dB) + Ant Fac (dB) + Pre Amp (dB)

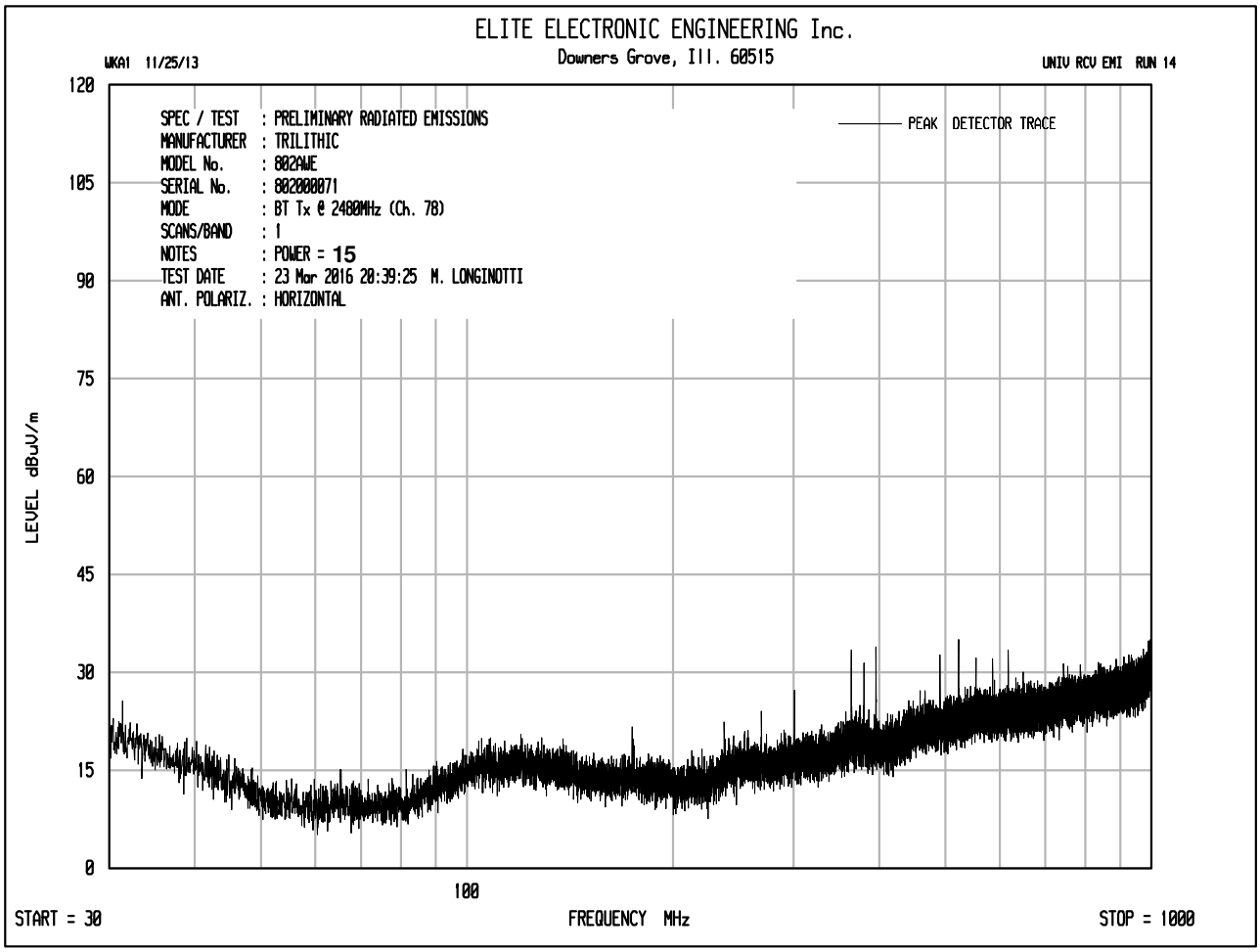
Peak Total (uV/m) = 10^(Peak Total (dBuV/m)/20)

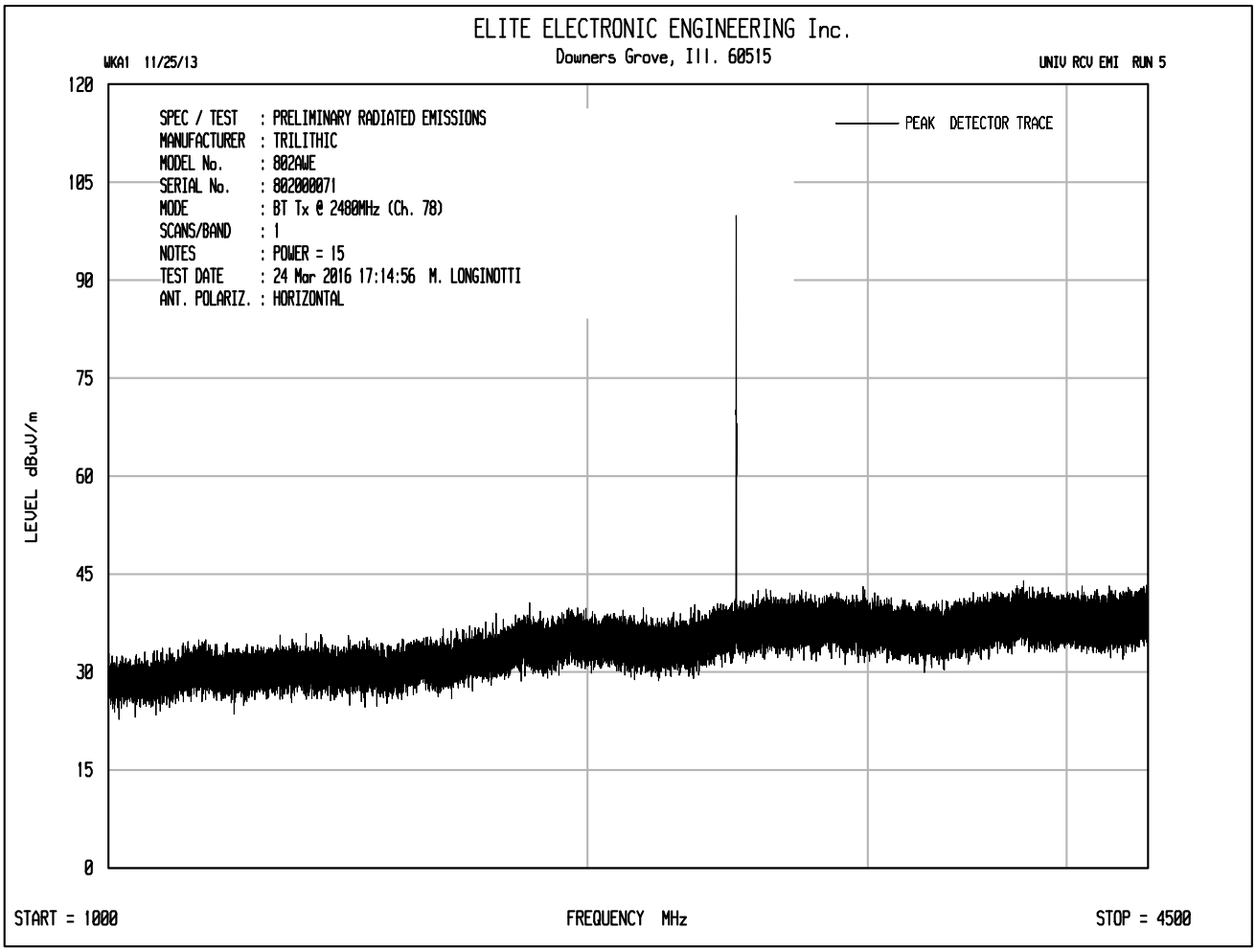
Manufacturer : Trilithic
Model No. : 802AWE
Serial No. :
Date Tested : January 18, 2016 through April 1, 2016
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Bluetooth Transmit at 2440MHz, (Ch. 38), power setting = 15
Test Distance : 3 meters
Notes : Average Readings with a 1MHz RBW

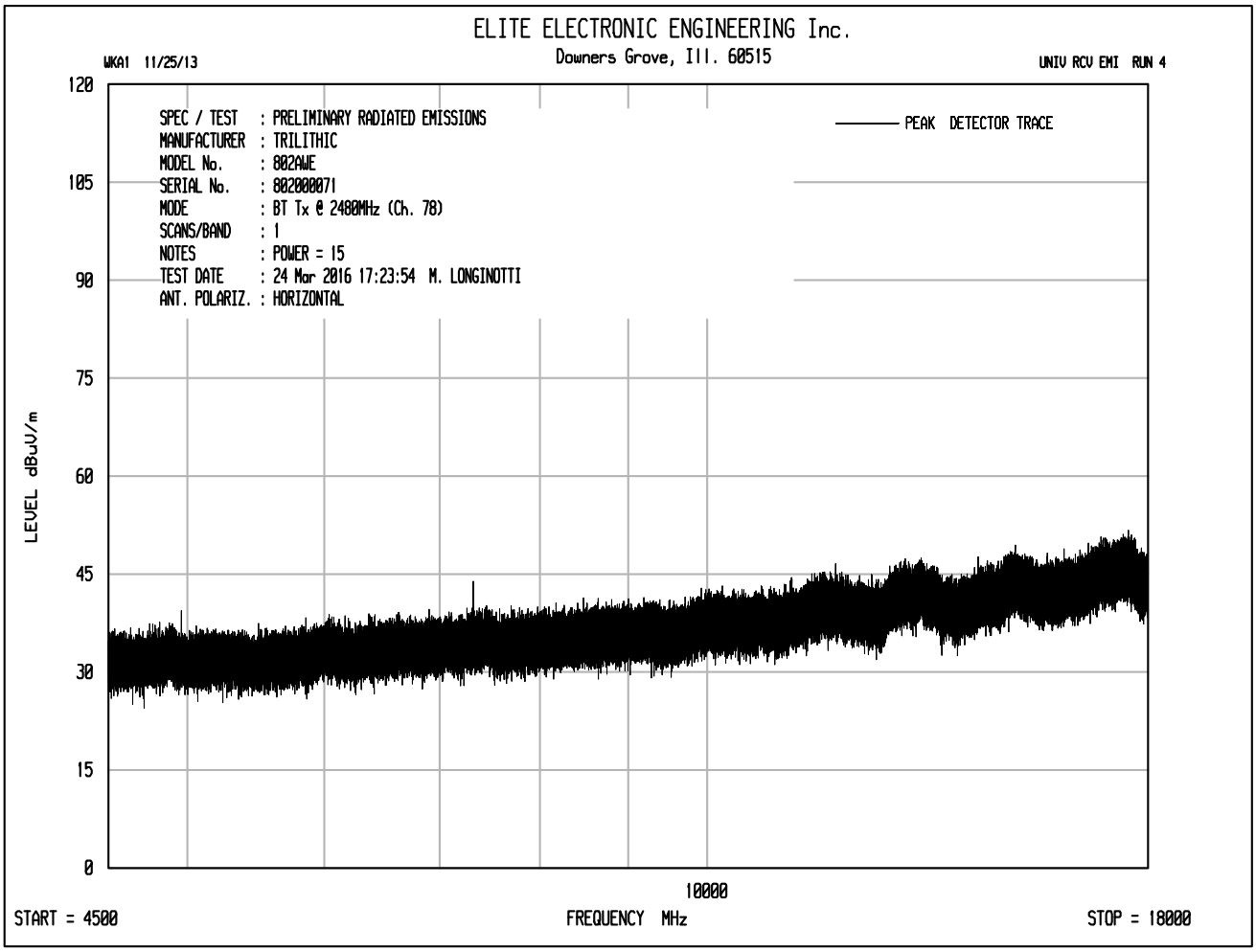
Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
H	42.4		4.9	34.2	-39.3	-42.6	-0.5	0.9	500.0	-54.4
V	50.7		4.9	34.2	-39.3	-42.6	7.8	2.5	500.0	-46.1
H	46.70		6.2	36.2	-39.4	-42.6	7.0	2.2	500.0	-47.0
V	45.6		6.2	36.2	-39.4	-42.6	5.9	2.0	500.0	-48.1
H	36.0	Ambient	8.0	39.3	-39.1	-42.6	1.6	1.2	500.0	-52.4
V	36.0	Ambient	8.0	39.3	-39.1	-42.6	1.6	1.2	500.0	-52.4
H	19.1	Ambient	2.2	40.4	-28.5	-42.6	-9.4	0.3	500.0	-63.4
V	19.2	Ambient	2.2	40.4	-28.5	-42.6	-9.3	0.3	500.0	-63.3
H	6.5	Ambient	3.4	32.3	0.0	-42.6	-0.4	1.0	500.0	-54.4
V	12.0		3.4	32.3	0.0	-42.6	5.1	1.8	500.0	-48.9

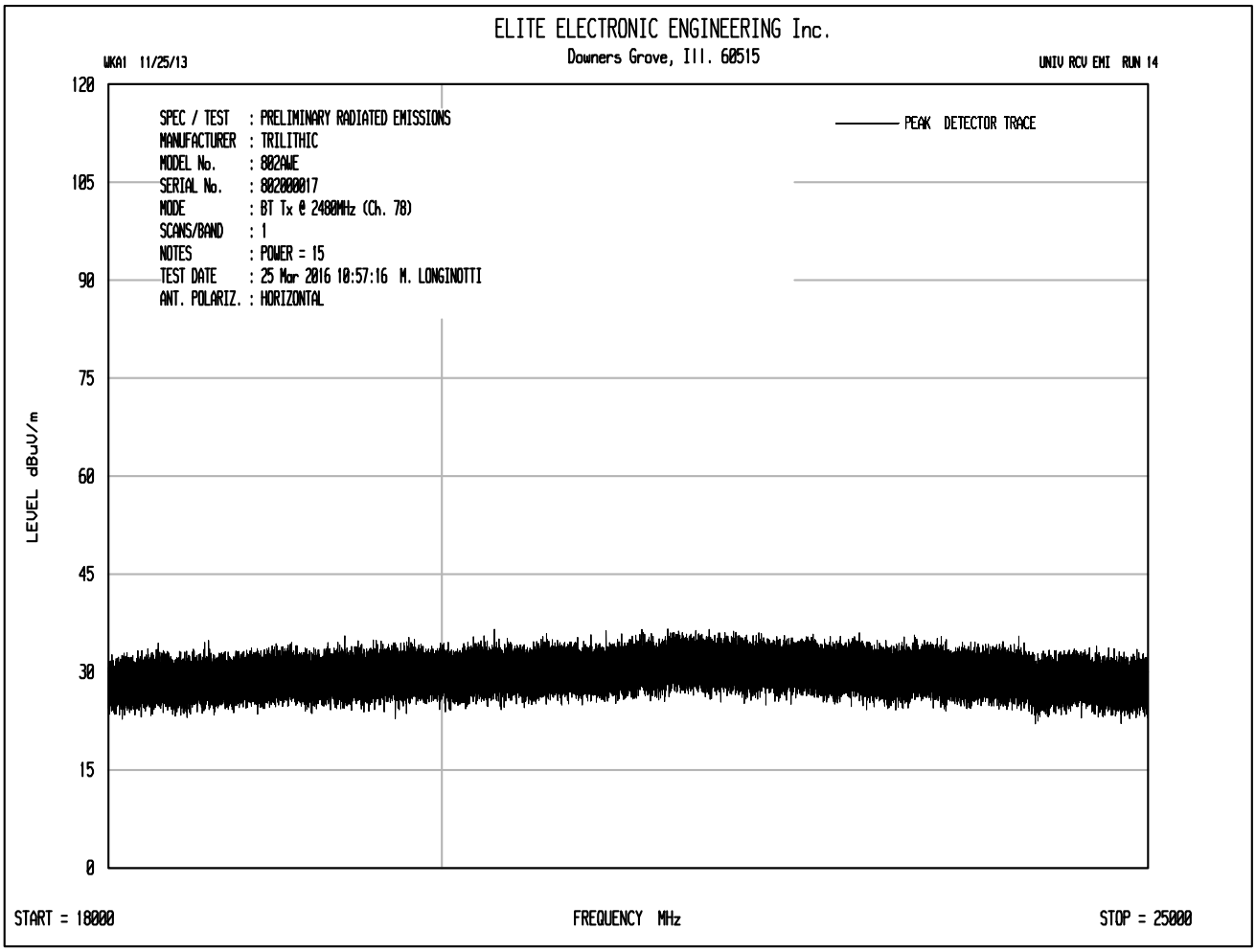
Average Total (dBuV/m) = Meter Reading (dBuV) + CBL Fac (dB) + Ant Fac (dB) + Pre Amp (dB)

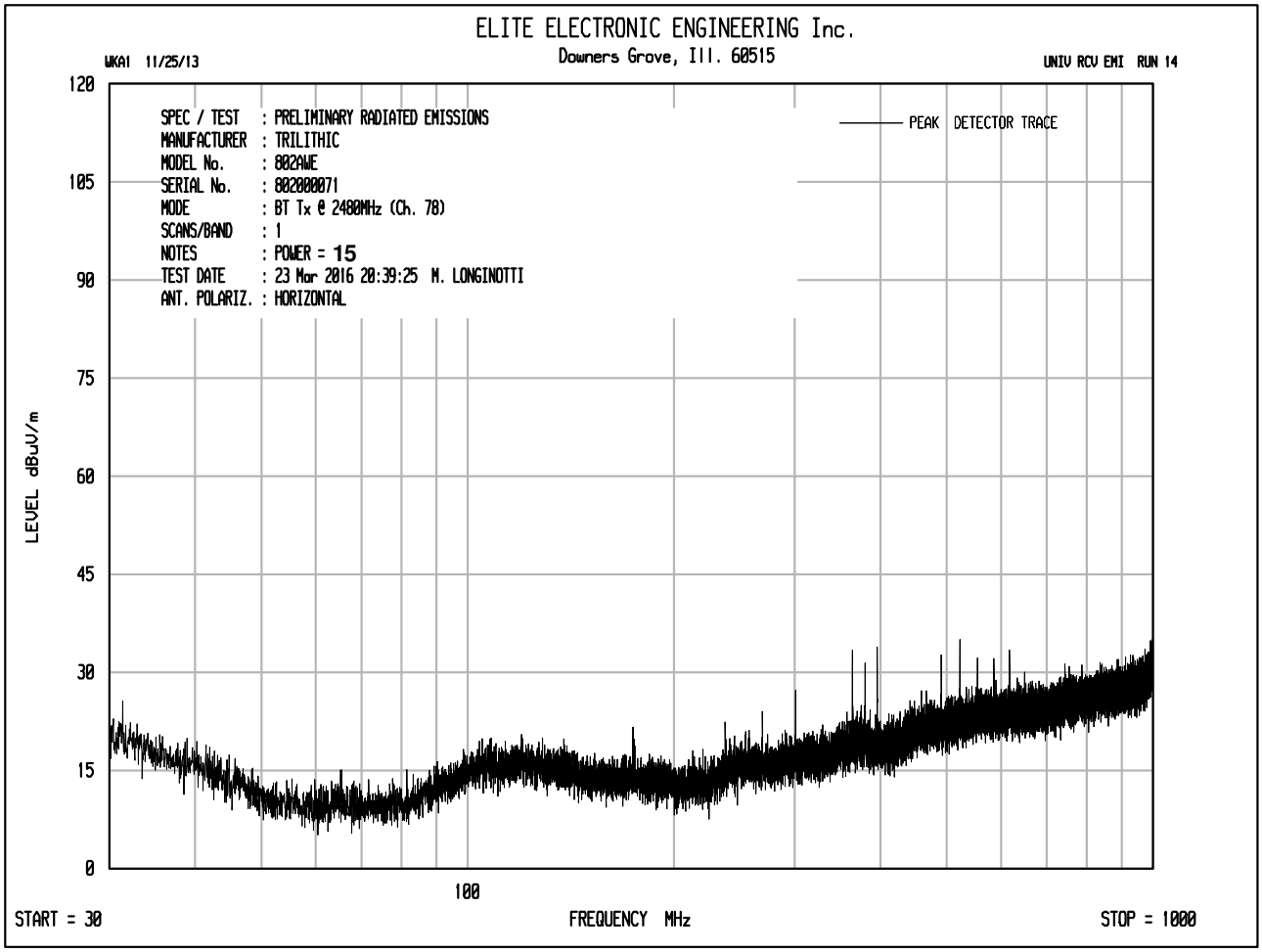
Average Total (uV/m) = 10^(Peak Total (dBuV/m)/20)

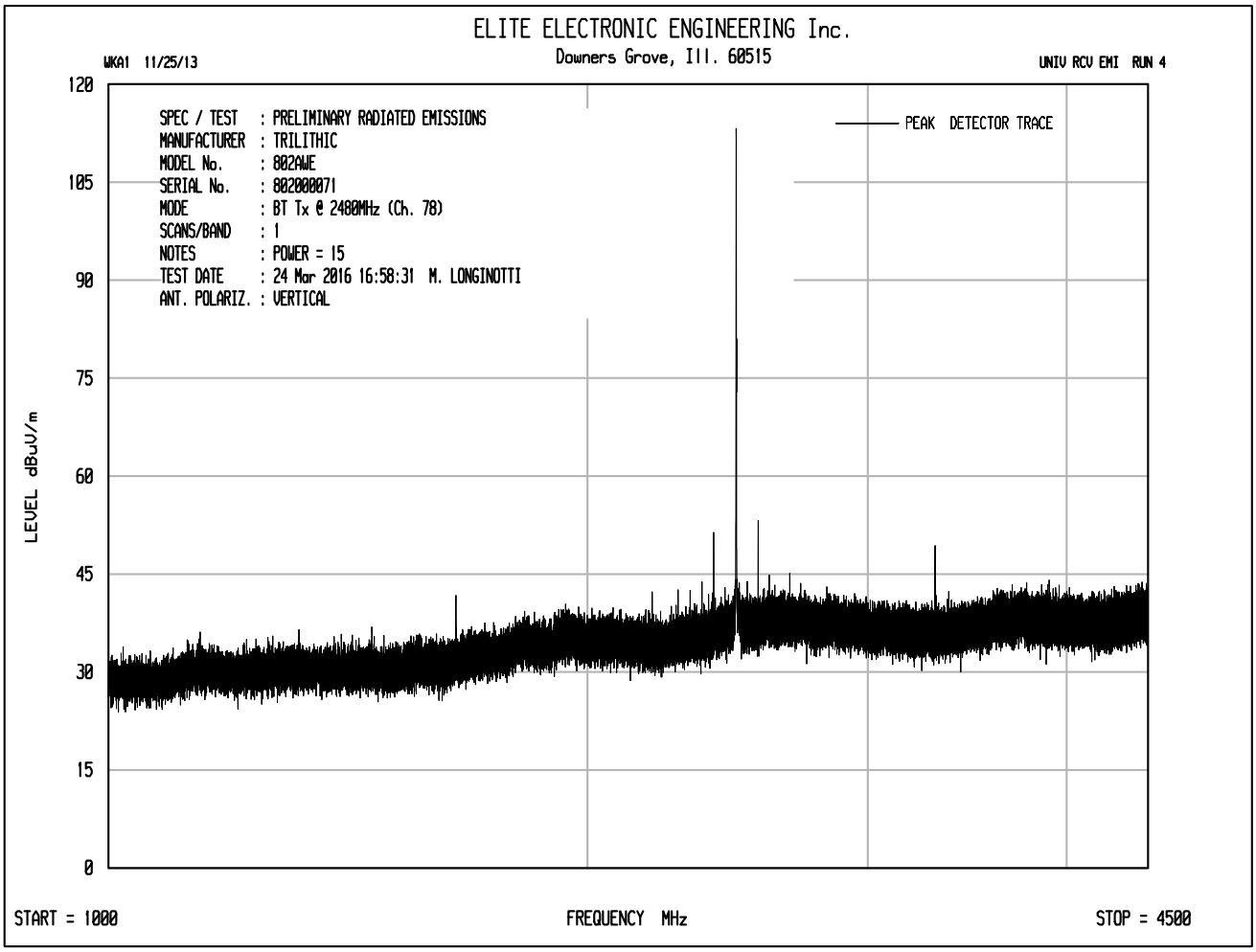

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 14
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 802000071
MODE : BT Tx @ 2480MHz (Ch. 78)
SCANS/BAND : 1
NOTES : POWER = 15
TEST DATE : 23 Mar 2016 20:39:25 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

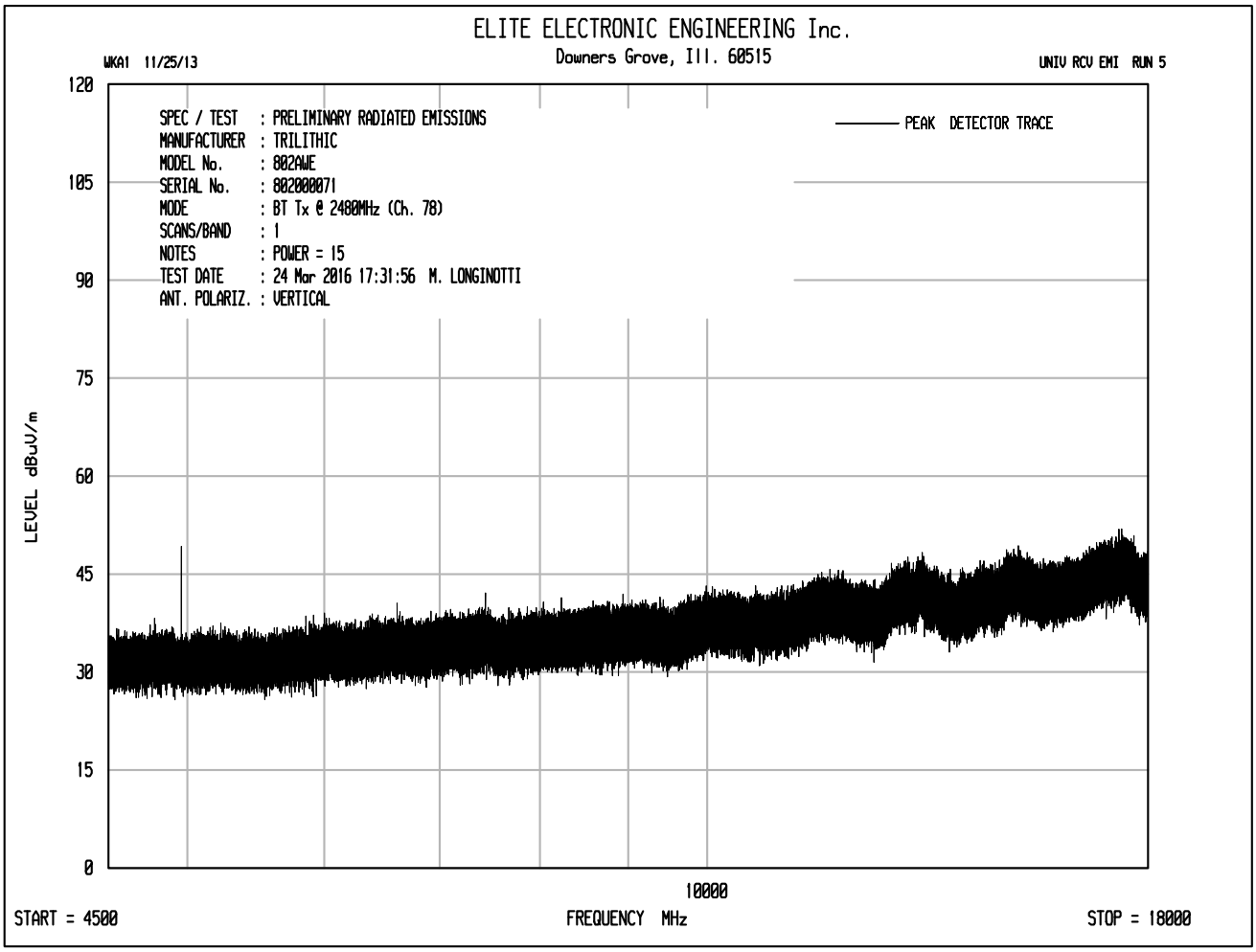

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 802000071
MODE : BT Tx @ 2480MHz (Ch. 78)
SCANS/BAND : 1
NOTES : POWER = 15
TEST DATE : 24 Mar 2016 17:14:56 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500

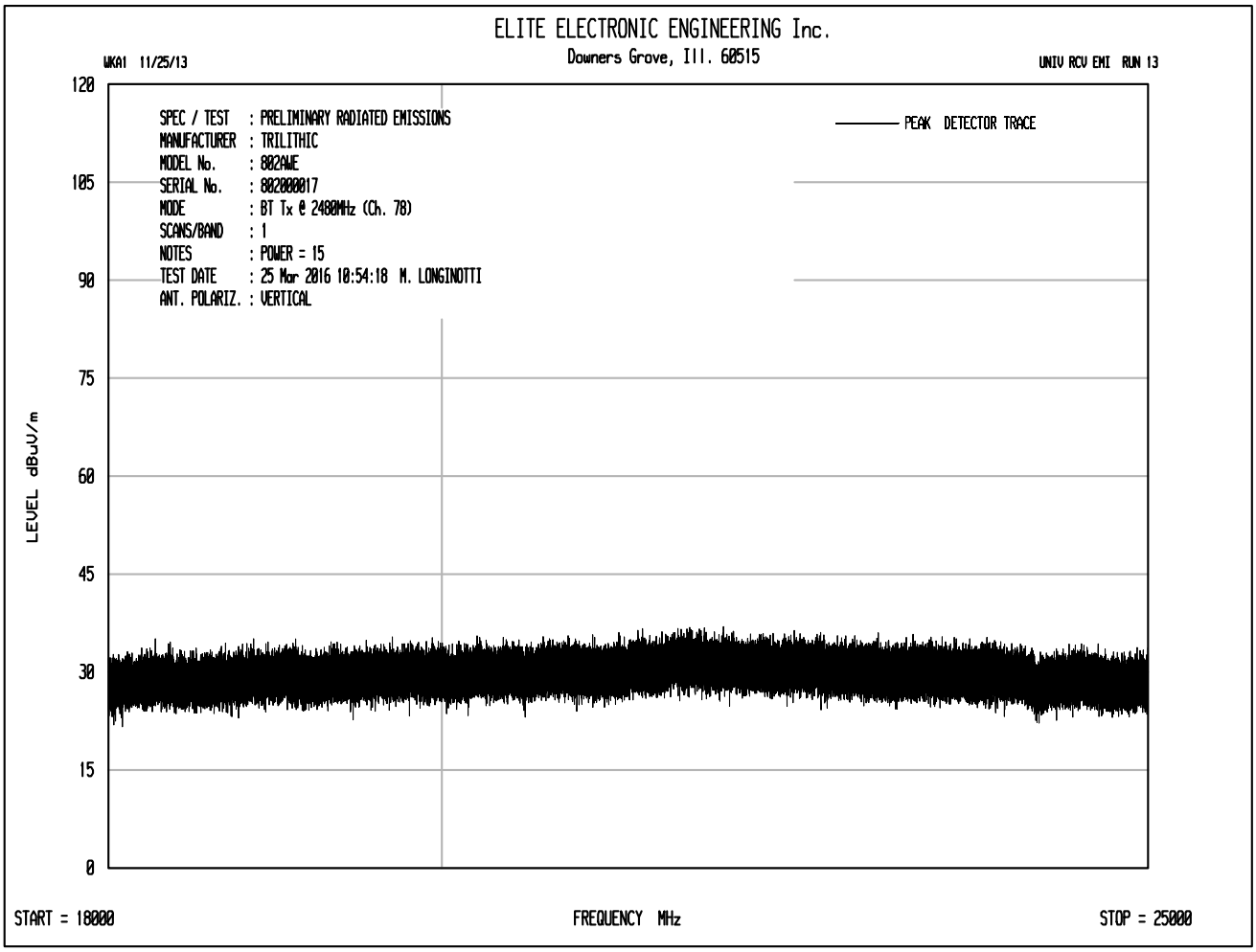

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 4
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 802000071
MODE : BT Tx @ 2480MHz (Ch. 78)
SCANS/BAND : 1
NOTES : POWER = 15
TEST DATE : 24 Mar 2016 17:23:54 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 14
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 802000017
MODE : BT Tx @ 2480MHz (Ch. 78)
SCANS/BAND : 1
NOTES : POWER = 15
TEST DATE : 25 Mar 2016 10:57:16 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 14
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 802000071
MODE : BT Tx @ 2480MHz (Ch. 78)
SCANS/BAND : 1
NOTES : POWER = 15
TEST DATE : 23 Mar 2016 20:39:25 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 4
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 802000071
MODE : BT Tx @ 2480MHz (Ch. 78)
SCANS/BAND : 1
NOTES : POWER = 15
TEST DATE : 24 Mar 2016 16:58:31 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 802000071
MODE : BT Tx @ 2480MHz (Ch. 78)
SCANS/BAND : 1
NOTES : POWER = 15
TEST DATE : 24 Mar 2016 17:31:56 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 13
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : TRILITHIC
MODEL No. : 802AWE
SERIAL No. : 802000017
MODE : BT Tx @ 2480MHz (Ch. 78)
SCANS/BAND : 1
NOTES : POWER = 15
TEST DATE : 25 Mar 2016 10:54:18 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

Manufacturer : Trilithic
Model No. : 802AWE
Serial No. :
Date Tested : January 18, 2016 through April 1, 2016
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Bluetooth Transmit at 2480MHz (Ch. 78), power setting = 15
Test Distance : 3 meters
Notes : Peak Readings with a 1MHz RBW

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4960.00	H	49.4	Ambient	4.9	34.2	-38.4	50.1	321.7	5000.0	-23.8
4960.00	V	54.2	Ambient	4.9	34.2	-38.4	54.9	559.0	5000.0	-19.0
7440.00	H	52.3	Ambient	6.2	36.3	-38.8	56.0	629.0	5000.0	-18.0
7440.00	V	51.6	Ambient	6.2	36.3	-38.8	55.3	580.3	5000.0	-18.7
12400.00	H	47.7	Ambient	8.0	39.4	-38.6	56.5	668.5	5000.0	-17.5
12400.00	V	47.2	Ambient	8.0	39.4	-38.6	56.0	631.1	5000.0	-18.0
19840.00	H	31.6	Ambient	2.2	40.4	-28.2	46.1	201.2	5000.0	-27.9
19840.00	V	31.1	Ambient	2.2	40.4	-28.2	45.6	190.0	5000.0	-28.4
22320.00	H	32.0	Ambient	2.2	40.6	-29.1	45.7	193.8	5000.0	-28.2
22320.00	V	32.1	Ambient	2.2	40.6	-29.1	45.8	196.1	5000.0	-28.1

Peak Total (dBuV/m) = Meter Reading (dBuV) + CBL Fac (dB) + Ant Fac (dB) + Pre Amp (dB)

Peak Total (uV/m) = 10^(Peak Total (dBuV/m)/20)

Manufacturer : Trilithic
Model No. : 802AWE
Serial No. :
Date Tested : January 18, 2016 through April 1, 2016
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Bluetooth Transmit at 2480MHz (Ch. 78), power setting = 15
Test Distance : 3 meters
Notes : Average Readings with a 1MHz RBW

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4960.00	H	40.0	Ambient	4.9	34.2	-38.4	-42.6	-1.9	0.8	500.0	-55.8
4960.00	V	50.0	Ambient	4.9	34.2	-38.4	-42.6	8.1	2.6	500.0	-45.8
7440.00	H	43.00	Ambient	6.2	36.3	-38.8	-42.6	4.1	1.6	500.0	-49.9
7440.00	V	40.6	Ambient	6.2	36.3	-38.8	-42.6	1.7	1.2	500.0	-52.3
12400.00	H	34.7	Ambient	8.0	39.4	-38.6	-42.6	0.9	1.1	500.0	-53.1
12400.00	V	34.7	Ambient	8.0	39.4	-38.6	-42.6	0.9	1.1	500.0	-53.1
19840.00	H	19.2	Ambient	2.2	40.4	-28.2	-42.6	-8.9	0.4	500.0	-62.9
19840.00	V	19.3	Ambient	2.2	40.4	-28.2	-42.6	-8.8	0.4	500.0	-62.8
22320.00	H	20.2	Ambient	2.2	40.6	-29.1	-42.6	-8.7	0.4	500.0	-62.6
22320.00	V	20.3	Ambient	2.2	40.6	-29.1	-42.6	-8.6	0.4	500.0	-62.5

Average Total (dBuV/m) = Meter Reading (dBuV) + CBL Fac (dB) + Ant Fac (dB) + Pre Amp (dB)

Average Total (uV/m) = 10^(Peak Total (dBuV/m)/20)

Manufacturer : Trilithic
Model No. : 802AWE
Serial No. :
Date Tested : January 18, 2016 through April 1, 2016
Test Performed : Radiated Spurious Emissions at the High Band Edge
Mode : Bluetooth Transmit at 2480MHz (Ch. 78), power setting = 15
Test Distance : 3 meters
Notes : Peak Readings with a 1MHz RBW

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2486.94	H	24.3		3.5	32.6	0.0	60.4	1044.9	5000.0	-13.6
2483.50	V	24.7		3.5	32.6	0.0	60.8	1092.9	5000.0	-13.2

Manufacturer : Trilithic
Model No. : 802AWE
Serial No. :
Date Tested : January 18, 2016 through April 1, 2016
Test Performed : Radiated Spurious Emissions at the High Band Edge
Mode : Bluetooth Transmit at 2480MHz (Ch. 78), power setting = 15
Test Distance : 3 meters
Notes : Average Readings with a 1MHz RBW

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
2486.94	H	11.4		3.5	32.6	0.0	-42.6	4.9	1.8	500.0	-49.1
2483.50	V	13.4		3.5	32.6	0.0	-42.6	6.9	2.2	500.0	-47.1

Manufacturer : Trilithic
Model No. : 802AWE
Serial No. :
Date Tested : January 18, 2016 through April 1, 2016
Test Performed : Radiated Spurious Emissions at the High Band Edge
Mode : Hopping Enabled
Test Distance : 3 meters
Notes : Peak Readings with a 1MHz RBW

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2483.59	H	25.3		3.5	32.6	0.0	61.4	1171.1	5000.0	-12.6
2843.70	V	32.1		3.8	33.0	0.0	68.9	2791.3	5000.0	-5.1

Manufacturer : Trilithic
Model No. : 802AWE
Serial No. :
Date Tested : January 18, 2016 through April 1, 2016
Test Performed : Radiated Spurious Emissions at the High Band Edge
Mode : Hopping Enabled
Test Distance : 3 meters
Notes : Average Readings with a 1MHz RBW

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
2483.59	H	11.4	Ambient	3.5	32.6	0.0	-42.6	4.9	1.8	500.0	-49.1
2843.70	V	11.5	Ambient	3.8	33.0	0.0	-42.6	5.7	1.9	500.0	-48.3