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RADIO COMPLIANCE REPORT
Certification Test Report
In accordance with:
CFR47 FCC Part 15, Subpart C, 15.247

Setec BMPRO Pty Ltd

SONIC

Bluetooth Module

FCC ID: 2ASJH-SONIC

REPORT: E2304-1648-1
DATE: May, 2023

Accreditation Number: 18553
Accredited for compliance with ISO/IEC 17025 - Testing

Certificate of Compliance
Certification Compliance Report
EMC Bayswater Test Report: E2304-1648-1
Issue Date: May, 2023

Test Sample(s):	Bluetooth Module
Model No:	SONIC
Serial No:	Engineering sample
FCC ID:	2ASJH-SONIC

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Test Specification: CFR47 FCC Part 15, Subpart C, 15.247

Results Summary:

15.203 - Antenna requirement	***Complied***
15.247 (a) (2) - 6dB Bandwidth	***Complied***
15.247 (b)(3) – Maximum Output Power	***Complied***
15.247 (d) - Out-of-Band Emissions - – 100kHz, -20dBc	***Complied***
15.247 (d) - Emissions on the Band edge	***Complied***
15.247 (d), 15.209 – Radiated emissions in Restricted bands	***Complied***
15.247 (e) - Power Spectral Density	***Complied***
15.247 (i) - Radio frequency hazard	***Complied***

Test Date(s): 2nd to 18th March, 2023

Test House (Issued By):

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FCC Accredited Test Firm Registration number: 527798
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This is to certify that the necessary measurements were made by EMC Bayswater Pty Ltd, and that the Setec BMPRO Pty Ltd, SONIC, Bluetooth Module, has been tested in accordance with requirements contained in the appropriate commission regulations.

Tested and prepared by:	Approved by:	
		30/05/2023 16:01
Adnan Zaman (EMC Test Engineer)	Neville Liyanapatabendige (Manager)	Date

Radio Compliance Report
for
Setec BMPRO Pty Ltd

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1. Introduction

Electromagnetic Compatibility (EMC) tests were performed on a Setec BMPRO Pty Ltd, SONIC, Bluetooth Module in accordance with the requirements of Title 47 of the standard CFR47 FCC Part 15, Subpart C, 15.247.

2. Test Report Revision History

None

3. Report Information

EMC Bayswater Pty Ltd reports apply only to the specific samples tested under the stated test conditions. All samples tested were in good operating condition throughout the entire test program unless otherwise stated. EMC Bayswater Pty Ltd does not in any way guarantee the later performance of the product/equipment. It is the manufacturer's responsibility to ensure that additional production units of the tested model are manufactured with identical electrical and mechanical components. EMC Bayswater Pty Ltd shall have no liability for any deductions, inference or generalisations drawn by the clients or others from EMC Bayswater Pty Ltd issued reports. This report shall not be used to claim, constitute or imply product endorsement by EMC Bayswater Pty Ltd. This report shall not be reproduced except in full (with the exception of the certificate on page 2) without the written approval of EMC Bayswater Pty Ltd. This document may be altered or revised by EMC Bayswater Pty Ltd personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by EMC Bayswater Pty Ltd will nullify the document.

4. Summary of Results

The EUT complied with applicable requirements of CFR47 FCC Part 15, Subpart C, 15.247. Worst-case results are tabled as follows:

FCC Part 15C sections	Test	Result
15.203	Antenna Requirement	Complied[#1]
15.247 (a) (2)	6dB Bandwidth	Complied by 225kHz
15.247 (b)(3)	Maximum Peak Output Power	Complied by 23.7dB
15.247 (d)	Out-of-Band Emissions – 100kHz, -20dBc	Complied by > 15dB
15.247 (d)	Emissions on the Band edge	Complied by 8.5dB
15.247 (d), 15.209	Radiated emissions in Restricted bands	Complied by 4.9dB
15.247 (e)	Power Spectral Density	Complied by 14.3dB
	Occupied Bandwidth (99% Emission Bandwidth)	2110kHz

[#1]The Antenna is attached to a dedicated connector, external to the device

Table 1: Summary of test results

5. Product Sample Details

5.1. EUT Description

The EUT (Equipment Under Test), as supplied by the client, is described as follows:

Product:	Bluetooth Module	
Model No:	SONIC	
Serial No:	Engineering sample	
Firmware:	Not supplied	
Software:	N/A	
Power Specifications:	1.7 - 3.3 Vdc, 15mA max.	
Dimensions:	20mm x 23mm x 3.8mm (Length x Width x Height)	
Weight:	< 1gram	
EUT Type:	Tested as table-top	
Transmitter details:	Description:	System-on-chip
	Type:	nRF52840
	Modulation:	GFSK
	Channels:	2.402 + k GHz, k= 0… 78
	Max power:	+8dBm
	Data Rates:	1Mbps and 2Mbps
	Antenna:	External whip antenna (Mag Layers EDA-8709-2G4C1-B27)
	Antenna Gain:	2dBi

(Customer supplied product information)

(Refer to photographs in Annex A for views of the EUT)

5.2. Product description

The EUT (Equipment Under Test) has been described by the customer as follows:

"SONIC is a single mode Bluetooth Low Energy (BLE) v.5.3 module that is designed for integration in Setec BMPRO's power conversion, and RV features control and monitoring products. It requires power and software to implement BLE functionality. This module enables the products to connect to a wide range of external devices/sensors via configurable GPIO interfaces and preconfigured NFC, QSPI, I2C, and UART interfaces."

(Customer supplied product description information)

The highest frequency generated or used in the device or on which the device operates or tunes as specified by the customer is 2480MHz (BLE).

5.3. Support Equipment

Support Equipment 1:	Description:	Carrier Board
	Manufacturer:	Setec BMPRO
	Model No:	Not stated
	Serial No:	Not stated

5.4. Product operating modes

"Transmit mode
Receive mode"

(Customer supplied product operating mode information)

5.5. Product operating mode for testing

"Transmit mode
Receive mode"

(Customer supplied product operating mode for testing information)

5.6. Configuration

The EUT was either configured by the customer or configured using the customer's instructions.

The module is mounted on a carrier board containing a 12V-3.3V DC/DC power converter. The Carrier Board was connected to an external DC Power source. For transmitter testing, the module is configured to transmit maximum power of +8dBm with data rates of 1Mbps and 2Mbps. The EUT transmitted at maximum TX power at the lowest, middle and highest TX frequencies.

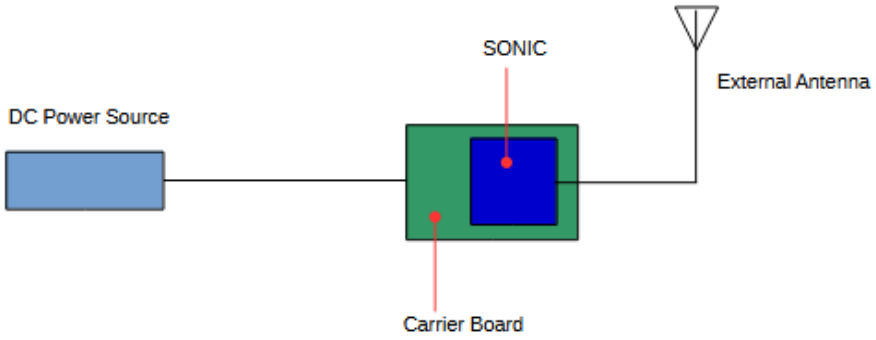


Figure 1: Block diagram of EUT test configuration – Radiated Method

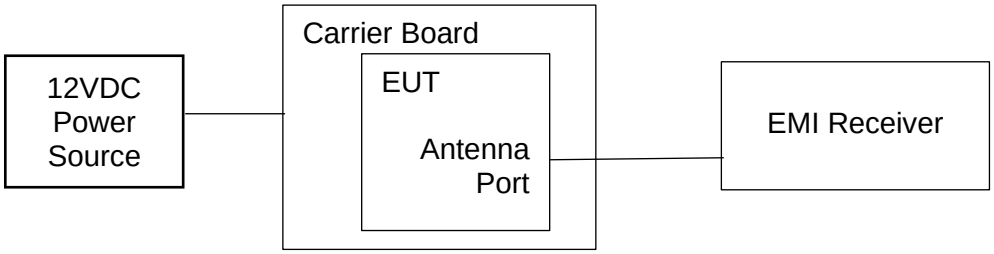


Figure 2: Block diagram of EUT test configuration – Conducted Method

5.7. Modifications

EMC Bayswater Pty Ltd did not modify the EUT.

6. Test Facility & Equipment

6.1. Test Facility

Tests were performed at the indoor Open Area Test Site (iOATS) at EMC Bayswater Pty Ltd, located at 18/88 Merrindale Drive, Croydon South, Victoria, 3136, Australia.

EMC Bayswater Pty Ltd FCC Test Firm registration number is 527798.

EMC Bayswater Pty Ltd FCC Test Firm Designation number is AU0004.

6.2. Test Equipment

Refer to Appendix A for the measurement instrument list.

7. Referenced Standards

CFR47 FCC Part 15, Subpart C, 15.247

CFR47 FCC Part 15, Subpart B

ANSI C63.10 - 2013
American National Standard of Procedures for Compliance Testing of Unlicensed Wireless 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.

FCC KDB - 558074 D01 15.247 Meas Guidance v05r02

8. Referenced Documents

Test Plan
Not supplied

9. Antenna Requirement – FCC Part 15.203

9.1. Requirements

As per section 15.203 of CFR47 FCC Part 15, Subpart C, 15.247:

- An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

9.2. Result

The EUT uses external antenna with dedicated connector. Therefore, the EUT complied with the antenna requirements of CFR47 FCC Part 15, Subpart C, Section 15.203.

10. Duty Cycle correction factor

Value	Declared by the manufacturer
Duty Cycle	Maximum 17%

Table 2: Duty Cycle

Duty Cycle = (17/100) = 0.17
Duty Cycle Correction Factor = 20*Log(0.17) = -15.4dB

The customer supplied sample for testing was configured to transmit at 100% duty cycle.

The measurement uncertainty was calculated as follows:

Measurement Parameter	Calculated measurement uncertainty
Time	±0.2%

The reported uncertainty is an expanded uncertainty calculated using a coverage factor of *k=2* which gives a level of confidence of approximately 95%.

Notes: The customer declared maximum duty cycle is 17%.

The duty cycle correction factor for 17% duty cycle is -15.4dB.

Assessment: All Peak measurements of the transmission fundamental and associated harmonics can be reduced by 15.4dB.

11. 6dB Bandwidth – FCC 15.247 (a) (2)

11.1. Test Procedure

The 6dB Bandwidth was performed in accordance with the section 11.8 of ANSI C63.10 - 2013.

6dB Bandwidth measurements were performed at the antenna port (Conducted method). The transmitter output was connected to a spectrum analyzer through a suitable attenuator. The spectrum analyser was tuned to the fundamental (transmit frequency) of the transmitter bottom, centre and top channels with 100kHz RBW and 300kHz VBW using the peak detector and a suitable span to allow accurate measurements whilst capturing the full intentional transmission including side lobes. The resultant bandwidth measurement was recorded.

(Refer to photographs in Annex B for views of the test configuration)

11.2. Limits

Applicable only to systems using digital modulation techniques:

Transmit operating frequency (MHz)	Minimum 6dB Bandwidth (kHz)
2400 – 2483.5	500

Table 3: 6dB Bandwidth

11.3. Test Results

6dB Bandwidth measurements are tabulated below:

(Refer to graphs in Appendix C.1)

Transmit operating frequency (MHz)	Measured 6dB Bandwidth (kHz)	Minimum 6dB Bandwidth (kHz)	Margin (kHz)	Comment
2402 (Bottom)	750	500	+250	Complied
2440 (Middle)	735	500	+235	Complied
2480 (Top)	725	500	+225	Complied

Table 4: Results for 6dB Bandwidth – 1 Mbps

Transmit operating frequency (MHz)	Measured 6dB Bandwidth (kHz)	Minimum 6dB Bandwidth (kHz)	Margin (kHz)	Comment
2402 (Bottom)	1197	500	+697	Complied
2440 (Middle)	1232	500	+732	Complied
2480 (Top)	1263.5	500	+763.5	Complied

Table 5: Results for 6dB Bandwidth – 2 Mbps

The measurement uncertainty was calculated as follows:

Measurement Parameter	Calculated measurement uncertainty
Operating Frequency	±10.5kHz
Bandwidth	±14.96kHz

The reported uncertainty is an expanded uncertainty calculated using a coverage factor of *k=2* which gives a level of confidence of approximately 95%.

Climatic Conditions	
Temperature:	18.5 to 20.1°C
Humidity:	51 to 53%
Atmospheric pressure:	1020.1 to 1020.7hPa

Table 6: Climatic conditions

Notes: The minimum required 500kHz 6dB Bandwidth requirements were satisfied by at least 225kHz.

The transmitter was continuously transmitting in modulated transmit mode.

Assessment: The EUT complied with the 6dB Bandwidth requirements of CFR47 FCC Part 15, Subpart C, 15.247 (a)(2).

12. Occupied Channel Bandwidth (99% Emission Bandwidth)

12.1. Test Procedure

The 99% emission Bandwidth was performed in accordance with the section 6.9.3 of ANSI C63.10 - 2013.

99% Emission Bandwidth measurements were performed at at the antenna port (Conducted method). The transmitter output was connected to a spectrum analyzer through a suitable attenuator. The spectrum analyzer centre frequency was tuned to the fundamental (transmit frequency) of the transmitter with the span of the analyzer was set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth (RBW) was set to 1% to 5% of the occupied bandwidth and video bandwidth (VBW) was set to three times the RBW.

A peak detector, maxhold function (worst case) was used to measure the occupied bandwidth, using the built-in 99% occupied bandwidth measurement function of the receiver. The resultant bandwidth measurement was recorded.

(Refer to photographs in Annex B for views of the test configuration)

12.2. Requirements

No limits are defined in CFR47 FCC Part 15, Subpart C, 15.247.

12.3. Test Results

Occupied Bandwidth measurements are tabulated below:

(Refer to graph in Appendix C.7)

Transmit Operating Frequency (MHz)	99%BW Lower Frequency (MHz)	99%BW Upper Frequency (MHz)	Occupied Channel Bandwidth (kHz)
2402 (Lowest Channel)	2401.453	2402.523	1070
2440 (Middle Channel)	2439.450	2440.528	1078
2480 (Highest Channel)	2479.453	2480.520	1067

Table 7: Occupied Bandwidth – 1 Mbps

Transmit Operating Frequency (MHz)	99%BW Lower Frequency (MHz)	99%BW Upper Frequency (MHz)	Occupied Channel Bandwidth (kHz)
2402 (Lowest Channel)	2400.936	2403.029	2093
2440 (Middle Channel)	2438.943	2441.050	2107
2480 (Highest Channel)	2478.919	2481.029	2110

Table 8: Occupied Bandwidth – 2 Mbps

The measurement uncertainty was calculated as follows:

Measurement Parameter	Calculated measurement uncertainty
Operating Frequency	±10.5kHz
Bandwidth	±14.96kHz

The reported uncertainty is an expanded uncertainty calculated using a coverage factor of *k=2* which gives a level of confidence of approximately 95%.

Climatic Conditions	
Temperature:	18.5 to 20.1°C
Humidity:	51 to 53%
Atmospheric pressure:	1020.1 to 1020.7hPa

Table 9: Climatic conditions

Notes: The transmitter was tested with modulation.

Assessment: The measured Occupied bandwidth (99% Emission Bandwidth) is 2110 kHz (informative only).

13. Maximum Peak Output Power – FCC 15.247 (b)(3)

13.1. Test Procedure

Conducted Method:
The conducted output power measurements were performed in accordance with the section 11.9.1 of ANSI C63.10 - 2013.

The transmitter output was connected to a spectrum analyzer through a suitable attenuator. The Maximum Peak Conducted Output Power of the fundamental transmit frequency was measured using a spectrum analyzer with 1MHz RBW and 3MHz VBW using the peak detector and a suitable span to allow accurate measurement whilst capturing the full intentional transmission including side lobes. An offset for the measurement path insertion loss (attenuators and cables) was used to get a true measurement.

The EUT was tested on the top, middle and bottom channels.

(Refer to photographs in Annex B for views of the test configuration)

13.2. Limits

For systems using digital modulation techniques:

Transmit operating frequency (MHz)	Peak Power (W)	Peak Power (dBm)	e.i.r.p (W)	e.i.r.p (dBm)
2400 – 2483.5	1	30	4	36

Table 10: Limits – Transmitter maximum peak output power

13.3. Test Results

The worst-case maximum output power measurements are tabulated below:

(Refer to plots Appendix C.2)

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	2402	+6.3	30.0	**-23.7***	Complied
Middle	2440	+6.2	30.0	-23.8	Complied
Top	2480	+6.1	30.0	-23.9	Complied

**Worst-case emission*

Table 11: Results for Maximum Peak Conducted Output Power – Conducted Method – 1 Mbps

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	2402	+6.2	30.0	**-23.8***	Complied
Middle	2440	+6.2	30.0	**-23.8***	Complied
Top	2480	+6.1	30.0	-23.9	Complied

**Worst-case emissions*

Table 12: Results for Maximum Peak Conducted Output Power – Conducted Method – 2 Mbps

The measurement uncertainty was calculated at ±1.4dB. The reported uncertainty is an expanded uncertainty calculated using a coverage factor of approximately *k=2* which gives a level of confidence of approximately 95%.

Climatic Conditions	
Temperature:	18.5 to 20.1°C
Humidity:	51 to 53%
Atmospheric pressure:	1020.1 to 1020.7hPa

Table 13: Climatic Conditions

Notes: The transmitter maximum output power was below the specified limit for the specified operating frequency.

The transmitter was continuously transmitting in modulated transmit mode.

Duty cycle correction factor was not applied to the measurements.

Assessment: The EUT complied with the Transmitter Maximum Peak output power requirements of CFR47 FCC Part 15, Subpart C, 15.247 (b)(3).

14. Radiated emissions in Restricted bands – 15.247 (d), 15.209

14.1. Requirements

As per section 15.247(d) of 47 CFR Part 15 Subpart C:

- Radiated emissions which fall in the restricted bands, as defined in section 15.205(a) of 47 CFR Part 15 Subpart C, must also comply with the radiated emission limits specified in section15.209(a) of 47 CFR Part 15 Subpart C (see §15.205(c) of 47 CFR Part 15 Subpart C).

As per section 47 CFR Part 15 Subpart C section 15.209 (Radiated emissions, general requirements) the EUT is required to meet the limits that permit the highest field strength of the following table for the radiated emissions which fall in the restricted bands, as defined in section 15.205(a) of 47 CFR Part 15 Subpart C:

Frequency Range (MHz)	Limits at 3m (dBμV/m)
0.009 to 0.490	128.5 to 93.8
0.490 to 1.705	73.8 to 62.9
1.705 to 30.0	69.5
30.0 to 88	40.0
88.0 to 216.0	43.5
216.0 to 960.0	46.0
Above 960	54.0
NOTE: The lower limit shall apply at the transition frequency.	

Note 1: as per CFR FCC Part 15 section15.209 (d) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector

Note 2: as per CFR FCC Part 15.35 (b) Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz. When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, e.g., see §§15.250, 15.252, 15.253(d), 15.255, 15.256, and 15.509 through 15.519 of this part, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device, e.g., the total peak power level. Note that the use of a pulse desensitization correction factor may be needed to determine the total peak emission level. The instruction manual or application note for the measurement instrument should be consulted for determining pulse desensitization factors, as necessary.

Table 14: Limits for Radiated Spurious Emissions at distance of 3m – Restricted Bands

14.2.Test Procedure

The Radiated Emissions were performed in accordance with the section 11.12 of ANSI C63.10 - 2013.

Radiated Emissions were measured 3 metres (from 9kHz to 25GHz) away from the EUT in the iOATS (indoor Open Area Test Site) facility, which is an ANSI C63.4 compliant semi-anechoic chamber with ground plane. The EUT was placed on a non-conductive support at a height of 0.8m (9kHz to 1GHz) and 1.5m (1GHz to 25GHz) above the ground plane.

In the frequency range of 9kHz to 30MHz, an Active loop antenna was used. For X (Parallel), Y (Perpendicular) and Z (Ground-Parallel) antenna polarizations, the peak detector was set to MAX-HOLD and the range selected continuously scanned. The measuring antenna was positioned at 1m fixed height, and the turntable slowly rotated. The peak preview measurements were performed with a resolution bandwidth of 200Hz (9kHz to 150kHz), 9kHz (150kHz to 30MHz) and a video bandwidth of 30kHz. Peak emissions that exceeded the limit or were close to the applicable limit were investigated further. The frequency of each emission was then accurately determined. Each emission of interest was then in-turn maximised by using the turntable to rotate the EUT through 360 degrees to find the worst-case emission arrangement. Quasi peak measurements were then performed using a measuring time of no less than 15 seconds. The final quasi-peak measurements were performed using a receiver bandwidth of 6dB and a resolution bandwidth of 200Hz (9kHz to 150kHz) and 9kHz (150kHz to 30MHz).

In the frequency range of 30MHz to 1GHz, a Biconilog antenna was used. For both horizontal and vertical antenna polarizations, the peak detector was set to MAX-HOLD and the range selected continuously scanned. The measuring antenna was positioned at 4 different fixed height positions and the turntable slowly rotated. The peak preview measurements were performed with a resolution bandwidth of 120kHz and a video bandwidth of 300kHz. Peak emissions that exceeded the limit or were close to the applicable limit were investigated further. The frequency of each emission was then accurately determined. Each emission of interest was then in-turn maximised by using the turntable to rotate the EUT through 360 degrees and varying the height of the antenna between 1 and 4 metres to find the worst-case emission arrangement. Quasi peak measurements were then performed using a measuring time of no less than 15 seconds. The final quasi-peak measurements were performed using a receiver bandwidth of 6dB and a resolution bandwidth of 120kHz.

In the frequency range 1.0GHz to 25GHz a Horn antenna was used and an area of 3m x 3m was covered between the antenna and the EUT using RF absorbing material with a rated attenuation more than 20dB over the frequency range. The height of the horn antenna was varied using the antenna bore-sighting technique and the turntable slowly rotated to maximise the emissions. For both horizontal and vertical antenna polarizations, the Peak and Average preview measurements were performed with a resolution bandwidth of 1 MHz and a video bandwidth of 3MHz. Peak and average emissions that exceeded the applicable limit or were close to the applicable limit were investigated further. Each emission of interest was then in-turn maximised by using the turntable to rotate the EUT through 360 degrees and the antenna height varied (if applicable, using the antenna bore-sighting technique) to find the worst-case emission arrangement. Peak and CISPR Average measurements were then performed using a

measuring time of no less than 15 seconds, the maximum emission level in the observed duration was recorded as the final result. The final peak and CISPR Average measurements were performed using a receiver bandwidth of 6dB and a resolution bandwidth of 1 MHz. Peak and Average measurements were performed at spot frequencies where the peak or average emission was close to, or exceeded the applicable limit line with the EUT rotation and antenna height varied (if applicable, using the antenna bore-sighting technique) to produce the highest emission.

Plots of the accumulated measurement data for both horizontal and vertical antenna polarizations, including all transducer and other measuring system correction factors were produced using commercially available compliant software (as listed in the test equipment list of this report).

(Refer to photographs in Annex B for views of the test configuration)

14.3.Test Results

Transmitter Spurious Emissions measurements are detailed as follows:

(Refer to graphs in Appendix C.4)

Operating Channel: Bottom				
Measurement Antenna Polarisation	**Frequency (MHz)**	**Result peak (dBµV/m)**	**Limit Quasi-peak/ Average (dBµV/m)**	**Delta limit (dB)**
X	Peak preview emissions >20dB below limit or no significant emissions above the noise floor observed			
Y	Peak preview emissions >20dB below limit or no significant emissions above the noise floor observed			
Z	Peak preview emissions >20dB below limit or no significant emissions above the noise floor observed			

Table 15: Transmitter Spurious Emissions – 9kHz to 30MHz – 2Mbps

Operating Channel: Bottom				
Measurement Antenna Polarisation	**Frequency (MHz)**	**Result Quasi-peak (dBµV/m)**	**Limit Quasi-peak (dBµV/m)**	**Delta limit (dB)**
Horizontal	37.615	17.4	40.0	-22.6
	401.656	19.5	46.0	-26.5
	609.236	25.3	46.0	**-20.7***
Vertical	38.197	17.0	40.0	-23.0
	406.021	19.6	46.0	-26.4
	608.993	25.3	46.0	**-20.7***

**Worst-case emissions*

Table 16: Transmitter Spurious Emissions – 30MHz to 1GHz – 2Mbps

Operating Channel: Bottom, (2402MHz)								
Measurement Antenna Polarisation	**Frequency (MHz)**	**Peak Result (dBµV/m)**	**Duty Cycle Factor (dB)**	**Average Result (dBµV/m)**	**Peak Limit (dBµV/m)**	**Average Limit (dBµV/m)**	**Peak Delta Limit (dB)**	**Average Delta Limit (dB)**
Horizontal	4802.880	63.9	-15.4	48.5	74.0	54.0	-10.1	-5.5
	4804.800	64.0	-15.4	48.6	74.0	54.0	-10.0	-5.4
	12007.840	56.8	-15.4	41.4	74.0	54.0	-17.2	-12.6
	12012.160	55.9	-15.4	40.5	74.0	54.0	-18.1	-13.5
Vertical	4802.880	63.2	-15.4	47.8	74.0	54.0	-10.8	-6.2
	4804.800	64.2	-15.4	48.8	74.0	54.0	**-9.8***	**-5.2***
	12007.840	60.8	-15.4	45.4	74.0	54.0	-13.2	-8.6
	12012.160	59.9	-15.4	44.5	74.0	54.0	-14.1	-9.5

**Worst-case emissions*

Table 17: Transmitter Spurious Emissions – 1GHz to 25GHz – 2Mbps

Operating Channel: Middle, (2440MHz)								
Measurement Antenna Polarisation	**Frequency (MHz)**	**Peak Result (dBµV/m)**	**Duty Cycle Factor (dB)**	**Average Result (dBµV/m)**	**Peak Limit (dBµV/m)**	**Average Limit (dBµV/m)**	**Peak Delta Limit (dB)**	**Average Delta Limit (dB)**
Horizontal	4878.960	62.8	-15.4	47.4	74.0	54.0	-11.2	-6.6
	4880.880	64.5	-15.4	49.1	74.0	54.0	**-9.5***	**-4.9***
	7318.480	53.1	-15.4	37.7	74.0	54.0	-20.9	-16.3
	7321.360	52.6	-15.4	37.2	74.0	54.0	-21.4	-16.8
	12197.440	58.5	-15.4	43.1	74.0	54.0	-15.5	-10.9
	12202.720	57.3	-15.4	41.9	74.0	54.0	-16.7	-12.1
Vertical	4878.960	63.0	-15.4	47.6	74.0	54.0	-11.0	-6.4
	4880.880	63.1	-15.4	47.7	74.0	54.0	-10.9	-6.3
	7318.480	53.5	-15.4	38.1	74.0	54.0	-20.5	-15.9
	7321.360	53.2	-15.4	37.8	74.0	54.0	-20.8	-16.2
	12197.920	57.9	-15.4	42.5	74.0	54.0	-16.1	-11.5
	12202.720	59.0	-15.4	43.6	74.0	54.0	-15.0	-10.4

**Worst-case emissions*

Table 18: Transmitter Spurious Emissions – 1GHz to 25GHz – 2Mbps

Operating Channel: Top, (2480MHz)								
Measurement Antenna Polarisation	**Frequency (MHz)**	**Peak Result (dBµV/m)**	**Duty Cycle Factor (dB)**	**Average Result (dBµV/m)**	**Peak Limit (dBµV/m)**	**Average Limit (dBµV/m)**	**Peak Delta Limit (dB)**	**Average Delta Limit (dB)**
Horizontal	4958.880	63.3	-15.4	47.9	74.0	54.0	-10.7	-6.1
	4961.040	63.5	-15.4	48.1	74.0	54.0	-10.5	-5.9
	7438.720	54.6	-15.4	39.2	74.0	54.0	-19.4	-14.8
	7441.360	56.2	-15.4	40.8	74.0	54.0	-17.8	-13.2
	12397.600	56.7	-15.4	41.3	74.0	54.0	-17.3	-12.7
	12402.600	54.0	-15.4	38.6	74.0	54.0	-20.0	-15.4
Vertical	4959.120	64.2	-15.4	48.8	74.0	54.0	-9.8	-5.2
	4961.040	64.5	-15.4	49.1	74.0	54.0	**-9.5***	**-4.9***
	7438.480	54.0	-15.4	38.6	74.0	54.0	-20.0	-15.4
	7441.600	53.6	-15.4	38.2	74.0	54.0	-20.4	-15.8
	12397.600	56.6	-15.4	41.2	74.0	54.0	-17.4	-12.8
	12402.080	52.6	-15.4	37.2	74.0	54.0	-21.4	-16.8

**Worst-case emissions*

Table 19: Transmitter Spurious Emissions – 1GHz to 25GHz – 2Mbps

The measurement uncertainty was calculated as follows:

Measurement frequency range	Calculated measurement uncertainty
30MHz to 1GHz	±4.65dB
1GHz to 6GHz	±4.83dB
6GHz to 18GHz	±4.49dB
18GHz to 26.5GHz	±4.46dB

The reported uncertainty is an expanded uncertainty calculated using a coverage factor of *k=2* which gives a level of confidence of approximately 95%.

Climatic Conditions	
Temperature:	17.1 to 18.8°C
Humidity:	49 to 52%
Atmospheric pressure:	1012.7 to 1030.4hPa

Table 20: Climatic conditions

Calculation: The above results are based upon the following calculation:

$$E = V_{QP/PK/AV} + AF - G_{Amp} + L_C$$

Where:

E = E-field in dBµV/m

$V_{QP/PK/AV}$ = Measured Voltage (Quasi Peak, Peak or Average) in dBµV

AF = Antenna Factor in dB(/m)

L_C = Cable and attenuator Loss in dB

G_{Amp} = Pre Amplifier Voltage Gain in dB

Example calculation:

E = V_{PK} + AF - G_{Amp} + L_C
E = 30dBμV + 12dB/m - 0dB + 2.3dB
E = 44.3 dBμV/m

Notes: All Transmitter Radiated spurious emissions in restricted bands measurements were below the specified limits.

Radiated Emissions measurements were made up to the 10th harmonic.

The transmitter was continuously transmitting in modulated transmit mode.

The average measurements were determined from Peak detector measurements by applying the duty cycle correction factor.

Assessment: The EUT complied with the Radiated emissions in Restricted bands requirements of CFR47 FCC Part 15, Subpart C, 15.247 (d).

15. Out of Band emissions (100kHz, -20dBc) - FCC 15.247 (d)

15.1. Test Procedure

The Out of band emissions in non-restricted bands were performed in accordance with the section 11.11 of ANSI C63.10 – 2013.

Measurements were performed at the antenna port.

The EUT was placed inside a shielded chamber. The transmitter output was connected to a spectrum analyzer through a suitable attenuator (Conducted method). The out of band emissions were measured by spectrum analyzer with 100kHz RBW and 300kHz VBW using the peak detector. All measuring system correction factors (attenuators and cables) were used to get a true measurement.

Reference and emission level measurements were performed as per section 11.11.2 and 11.11.3 of ANSI ANSI C63.10 - 2013.

(Refer to photographs in Annex B for views of the test configuration)

15.2. Limits

As per section 15.247(d) of 47 CFR Part 15 Subpart C:

- In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of section 15.247 of 47 CFR Part 15 Subpart C, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in section 15.209(a) of 47 CFR Part 15 Subpart C is not required. In addition, radiated emissions which fall in the restricted bands, as defined in section 15.205(a) of 47 CFR Part 15 Subpart C, must also comply with the radiated emission limits specified in section15.209(a) of 47 CFR Part 15 Subpart C (see §15.205(c) of 47 CFR Part 15 Subpart C).

The measured highest fundamental channel PSD in 100kHz was +6.1dBm

Frequency Range (MHz)	Limits (dBm)
30MHz and 25GHz	-13.9

Table 21: Limits for Unwanted Emissions - -20dBc (Non-restricted bands)

15.3.Test Results

Unwanted emissions measurements are detailed as follows:

(Refer to graphs in Appendix C.5)

Channel	Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Delta limit (dB)
Bottom	Peak preview emissions >15dB below limit or no significant emissions above the noise floor observed			
Middle	Peak preview emissions >15dB below limit or no significant emissions above the noise floor observed			
Top	Peak preview emissions >15dB below limit or no significant emissions above the noise floor observed			

Table 22: Transmitter Out of Band emissions - -20dBc/100kHz - 2 Mbps

The measurement uncertainty was calculated as follows:

Measurement frequency range	Calculated measurement uncertainty
30MHz to 25GHz	±1.4dB

The reported uncertainty is an expanded uncertainty calculated using a coverage factor of *k=2* which gives a level of confidence of approximately 95%.

Notes: All Transmitter Out of Band emissions measurements were below the specified limits (-20dBc).

Radiated measurements were made up to the 10th harmonic.

The transmitter was continuously transmitting in modulated transmit mode.

Duty cycle correction factor was not applied to the measurements.

Assessment: The EUT complied with the Out of Band emissions (100kHz, -20dBc) requirements of CFR47 FCC Part 15, Subpart C, 15.247 (d).

16. Emissions on the Band edge – FCC 15.247 (d)

16.1. Test Procedure

The Band edge Measurement (100kHz, -20dB from fc & Restricted bands) was performed in accordance with the section 11.11, 11.12 and 11.13 of ANSI C63.10 – 2013.

Conducted measurements were performed within 2 MHz of the authorised lower band-edge.

At the lowest channel, 99% Occupied Band Width of the fundamental channel emission was within 2 MHz of the authorised Lower band edge therefore Marker-delta method was used. Unwanted emission at the lower band-edge were performed as per section 6.10.4 of ANSI C63.10 - 2013. At authorised-band band edge where the requiring band-edge emission attenuation is -20dB in a 100kHz bandwidth relative to the highest fundamental channel PSD in 100kHz. Radiated peak measurements were performed as per as section 6.10.4 of ANSI C63.10 - 2013.

The higher end of the band-edge was in restricted-band therefore measurements were performed as per section 6.10.5 of ANSI C63.10 - 2013. The FCC 15.209 limits are applicable to emission in restricted-band band-edge.

(Refer to photographs in Annex B for views of the test configuration)

16.2. Limits

Band edge in Non-restricted Bands

As per CFR47 FCC Part 15, Subpart C, 15.247 (d) the EUT shall meet the requirements that in any given 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

The measured highest fundamental channel PSD in 100kHz was +6.1dBm

Band edge Frequencies	Limits (dBm)
Lower Edge (2402MHz)	-13.9

Table 23: Limits for Band edge - -20dBc (Non-restricted bands)

Band edge in Restricted Bands

As per CFR47 FCC Part 15, Subpart C, 15.247 (d) and 15.209 (Transmitter emission limits) the EUT is required to meet the limits that permit the highest field strength of the following table for the radiated emissions which fall in the restricted bands, as defined in section 15.205(a) of 47 CFR Part 15 Subpart C :

Band edge Frequencies	Limits at 3m (dBμV/m)
2483.5MHz to 2485.5	54.0

Note 1: as per CFR FCC Part 15.35 (b), The emission limits shown in the above table are based on measurements employing an average detector.

Table 24: Limits for Radiated Spurious Emissions at distance of 3m – Restricted Bands.

16.3.Test Results

Band edge measurements are detailed as follows:

(Refer to graphs in Appendix C.3)

Operating Channel: Bottom (2402MHz)			
Frequency (MHz)	**Result Radiated Peak Power Spectral Density (dBm/100kHz)**	**Limit Radiated Peak Power Spectral Density (dBm/100kHz)**	**Delta limit (dB)**
2398.526	-35.2	-13.9	-21.3
2398.898	-35.0	-13.9	**-21.1***

**Worst-case emissions*

Table 25: Transmitter Emissions on the Band edge - Low end – 1 Mbps

Operating Channel: Bottom (2402MHz)			
Frequency (MHz)	**Result Radiated Peak Power Spectral Density (dBm/100kHz)**	**Limit Radiated Peak Power Spectral Density (dBm/100kHz)**	**Delta limit (dB)**
2399.954	-26.5	-13.9	-12.6
2399.993	-24.4	-13.9	**-10.5***

**Worst-case emissions*

Table 26: Transmitter Emissions on the Band edge - Low end – 2 Mbps

Operating Channel: Top (2480MHz)								
Measurement Antenna Polarisation	**Peak Measurements**				**Average Measurements**			
	Frequency (MHz)	**Result (dBμV/m)**	**Limit (dBμV/m)**	**Delta Limit (dB)**	**Frequency (MHz)**	**Result (dBμV/m)**	**Limit (dBμV/m)**	**Delta Limit (dB)**
Horizontal	2483.560	58.6	74.0	-15.4	2483.560	45.5	54.0	**-8.5***
	2484.080	58.1	74.0	-15.9	2484.080	44.0	54.0	-10.0
Vertical	2483.560	59.3	74.0	**-14.7***	2483.560	45.5	54.0	**-8.5***
	2484.080	57.2	74.0	-16.8	2484.080	44.2	54.0	-9.8

**Worst-case emissions*

Table 27: Transmitter Emissions on the Band edge - High end – 2 Mbps

The measurement uncertainty was calculated as follows:

Measurement frequency range	Calculated measurement uncertainty
Radiated (1GHz to 6GHz)	±4.83dB
Conducted (1GHz to 6GHz)	±1.4dB

The reported uncertainty is an expanded uncertainty calculated using a coverage factor of *k=2* which gives a level of confidence of approximately 95%.

Climatic Conditions	
Temperature:	17.1 to 20.1°C
Humidity:	49 to 53%
Atmospheric pressure:	1012.7 to 1030.4hPa

Table 28: Climatic conditions

Calculation: The above results are based upon the following calculation:

$$E = V_{QP/PK/AV} + AF - G_{Amp} + L_C$$

Where:

E = E-field in dBμV/m
$V_{QP/PK/AV}$ = Measured Voltage (Quasi Peak, Peak or Average) in dBμV
AF = Antenna Factor in dB(/m)
L_C = Cable and attenuator Loss in dB
G_{Amp} = Pre Amplifier Voltage Gain in dB

Example calculation:

$E = V_{PK} + AF - G_{Amp} + L_C$
$E = 30dB\mu V + 12dB/m - 0dB + 2.3dB$
$E = 44.3\ dB\mu V/m$

Notes: All Band edge measurements were below the specified limits.

The transmitter was continuously transmitting in modulated transmit mode.

Duty cycle correction factor was not applied to the measurements.

Assessment: The EUT complied with the Transmitter Emissions on the Band edge requirements of CFR47 FCC Part 15, Subpart C, 15.247 (d).

17. Power Spectral Density – FCC 15.247 (e)

17.1. Test Procedure

The Power Spectral Density was performed in accordance with the section 11.10 of ANSI C63.10 - 2013.

The transmitter output was connected to a spectrum analyzer through a suitable attenuator (Conducted method). The Power Spectral density was measured in a 3kHz bandwidth of the fundamental frequency by spectrum analyzer with 3kHz RBW and 30kHz VBW using the peak detector and a suitable span to allow accurate measurements whilst capturing the full intentional transmission including side lobes.

(Refer to photographs in Annex B for views of the test configuration)

17.2. Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of CFR47 FCC Part 15, Subpart C, 15.247 (e). The same method of determining the conducted output power shall be used to determine the power spectral density.

Applicable only to systems using digital modulation techniques:

Transmit operating frequency (MHz)	Limit
2400 – 2483.5	8dBm/3kHz

Table 29: Power Spectral Density limits

17.3. Test Results

Power Spectral Density measurements are tabulated below:

(Refer to graphs in Appendix C.6)

Channel	Frequency (MHz)	Measured Power (dBm)	Limit (dBm/3kHz)	Margin (dB)	Result
Bottom	2401.975	-6.3	8.00	**-14.3***	Complied
Middle	2440.053	-6.8	8.00	-14.8	Complied
Top	2480.025	-6.3	8.00	**-14.3***	Complied

**Worst-case emissions*

Table 30: Results for Power Spectral Density – 1 Mbps

Channel	Frequency (MHz)	Measured Power (dBm)	Limit (dBm/3kHz)	Margin (dB)	Result
Bottom	2402.118	-9.0	8.00	**-17.0***	Complied
Middle	2439.900	-8.5	8.00	-16.5	Complied
Top	2480.060	-9.2	8.00	-17.2	Complied

**Worst-case emissions*

Table 31: Results for Power Spectral Density – 2 Mbps

The measurement uncertainty was calculated at ±1.4dB. The reported uncertainty is an expanded uncertainty calculated using a coverage factor of approximately *k=2* which gives a level of confidence of approximately 95%.

Climatic Conditions	
Temperature:	18.5 to 20.1°C
Humidity:	51 to 53%
Atmospheric pressure:	1020.1 to 1020.7hPa

Table 32: Climatic conditions

Notes: All Power Spectral Density measurements were below the specified limits.

The transmitter was supplied by the customer to be continuously transmitting in modulated transmit mode.

Duty cycle correction factor was not applied to the measurements.

Assessment: The EUT complied with the Power Spectral Density requirements of CFR47 FCC Part 15, Subpart C, 15.247 (e).

18. Conclusion

The Setec BMPRO Pty Ltd, SONIC, Bluetooth Module complied with the applicable requirements of CFR47 FCC Part 15, Subpart C, 15.247.

Appendix A – Test Equipment

Inv.	Equipment	Make	Model No.	Serial No.	Calibration		
					Interval	Due	Type
Transmitter Maximum EIRP, Power Spectral Density, 6dB Bandwidth and Band-edge – Conducted Method							
0954	ANALYSER, EMI Receiver	Rohde+Schwarz	ESCI 3	100196	1 year	Aug-23	E
1092	ATTENUATOR, 6dB, 2W	Fairview Microwave	SA26B-06	1092	2 years	Jan-24	E
1093	ATTENUATOR, 6dB, 2W	Fairview Microwave	SA26B-06	1093	2 years	Jan-24	E
1154	Hygrometer, Temp, Humidity	DigiTech	QM7312	-	2 years	Jul-23	I
0441	ENCLOSURE, Shielded, No 5	RFI Industries	TC800-20	933	N/A	N/A	V
Radiated Emissions							
1217	ANALYSER, EMI Receiver	Rohde & Schwarz	ESU40	100182	1 year	Jun-23	E
1294	ANTENNA, Biconilog	Sunol Sciences	JB6	A012312	2 years	Jul-24	E
1295	ATTENUATOR, 4dB	Pasternack	-	A-403	2 years	Jul-24	E
0633	ANTENNA, Double Ridge Horn	EMCO	3115	9712-5369	3 years	Aug-24	I
0559	PRE-AMP, Microwave, 18GHz	Miteq	AFS8	605305	1 year	Apr-24	I
1009	CABLE, Coax, Sucoflex 104B	Huber+Suhner	00065/4B	C405	2 years	Aug-24	V
1010	CABLE, Coax, Sucoflex 104B	Huber+Suhner	00078/4B	C406	2 years	Aug-24	V
1064	PRE-AMP, Microwave, 26GHz	Miteq	AFS33	1696371	1 year	Aug-23	I
1193	Standard Gain Horn Antenna - 5.85GHz to 8.2GHz	A.H. Systems, inc	SAS-584	186	1 year	May-24	E
1194	Standard Gain Horn Antenna - 8.2GHz to 12.4GHz	A.H. Systems, inc	SAS-585	224	1 year	May-24	E
1195	Standard Gain Horn Antenna - 12.4GHz to 18.0GHz	A.H. Systems, inc	SAS-586	195	1 year	May-24	E
1196	Standard Gain Horn Antenna - 18.0GHz to 26.5GHz	A.H. Systems, inc	SAS-587	181	1 year	May-24	E
0024	ANTENNA, Active Loop	EMCO	6502	2620	2 years	Aug-23	I
0932	CONTROLLER, Position	Sunol Sciences	SC104V-3	081006-1	N/A	N/A	V
0933	TURNTABLE	Sunol Sciences	SM46C	081006-2	N/A	N/A	V
0934	MAST, Antenna	Sunol Sciences	TLT2	081006-5	N/A	N/A	V
1145	CABLE, Coax, Sucoflex 104PA	Huber + Suhner	84279564	SN MY056/4PA	1 year	Jan-24	I
0989	CABLE, Coax, Sucoflex 104A	Huber+Suhner	44454/4A	C357	1 year	Jan-24	I
1238	CABLE, Coax, Sucoflex 126 E	Huber + Suhner	10422876	SN 8000495/126E	1 year	Jan-24	I
1155	Hygrometer, Temp, Humidity	DigiTech	QM7312	-	2 years	Jul-23	I
0843	ATTENUATOR, 10dB	JFW	50HF-010N	-	3 years	Dec-24	I
1259	High Pass filter	Micro-Tronics	HPM50111	G237	1 year	Oct-23	I
0666	Enclosure, Semi-Anechoic, No 1	RFI Industries	S800 iOATS	1229	3 years	Aug-25	I
SW007	EMC Measurement Software	Rohde & Schwarz	EMC 32	Version 8.53.0	N/A	N/A	N/A

V: Verification of operation against an internal reference
I: Internal calibration against a traceable standard
E: External calibration by a NATA endorsed facility
N/A: Not Applicable

Appendix B – Photographs

Annex	Number	Photograph Description
A	1	EUT on Carrier Board – Views
A	2	
A	3	
A	4	
A	5	
A	6	
A	7	
A	8	
A	9	
A	10	
A	11	
A	12	
A	13	
A	14	
A	15	
A	16	EUT with SMA connector
A	17	
B	1	Radiated measurements – EUT Antenna X Orientation
B	2	Radiated measurements – EUT Antenna Y Orientation
B	3	Radiated measurements – 9kHz to 30MHz – X Antenna orientation
B	4	Radiated measurements – 9kHz to 30MHz – Y Antenna orientation
B	5	Radiated measurements – 9kHz to 30MHz – Z Antenna orientation
B	6	Radiated measurements – below 1GHz
B	7	Radiated measurements – above 1GHz
B	8	Conducted measurements
B	9	

EUT Photographs	EMC Bayswater Test Report E2304-1648-1 Annex A
EUT Orientations & Test Configurations Photographs	EMC Bayswater Test Report E2304-1648-1 Annex B

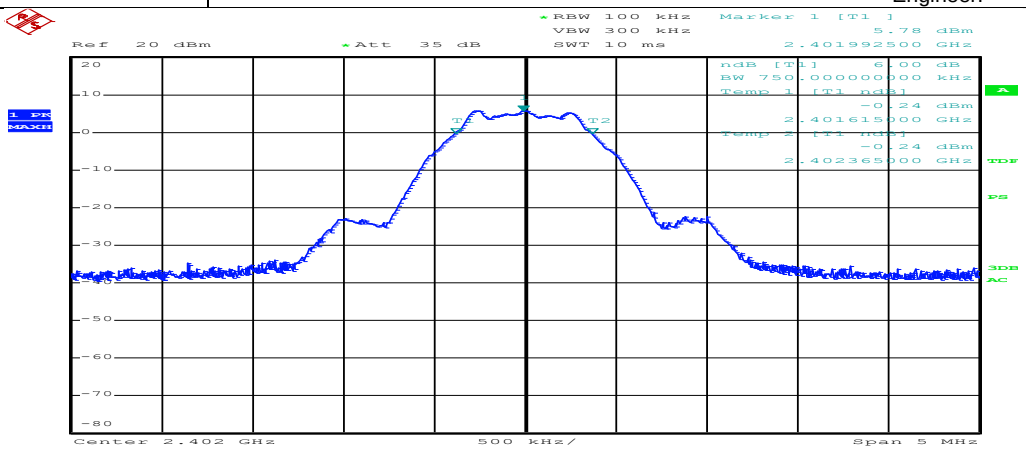
Appendix C.1 – Measurement Graphs –6dB Bandwidth - 15.247 (a) (2)

No.	Test	Graph Description
1	6dB Bandwidth – 1 Mbps	2402MHz Channel
2		2440MHz Channel
3		2480MHz Channel
4	6dB Bandwidth – 2 Mbps	2402MHz Channel
5		2440MHz Channel
6		2480MHz Channel

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - 6dB Bandwidth
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 1 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ

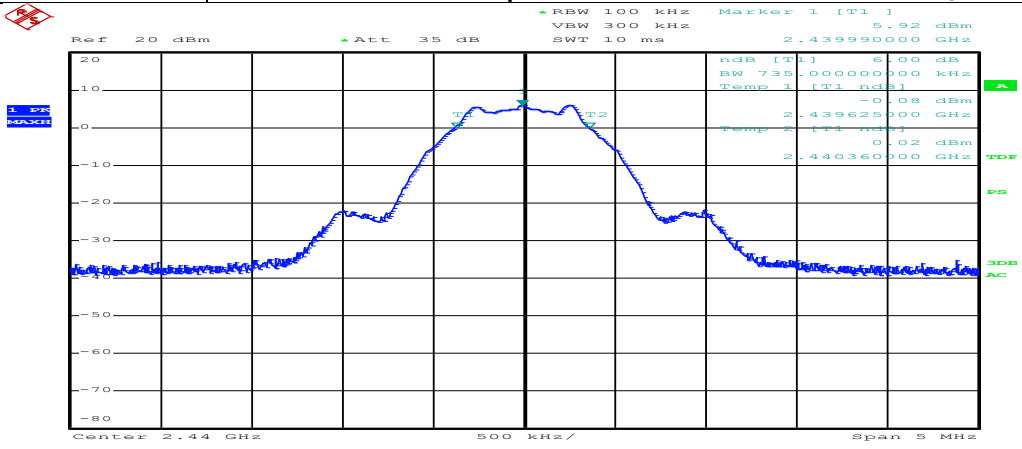


Graph 1

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - 6dB Bandwidth
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 1 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ

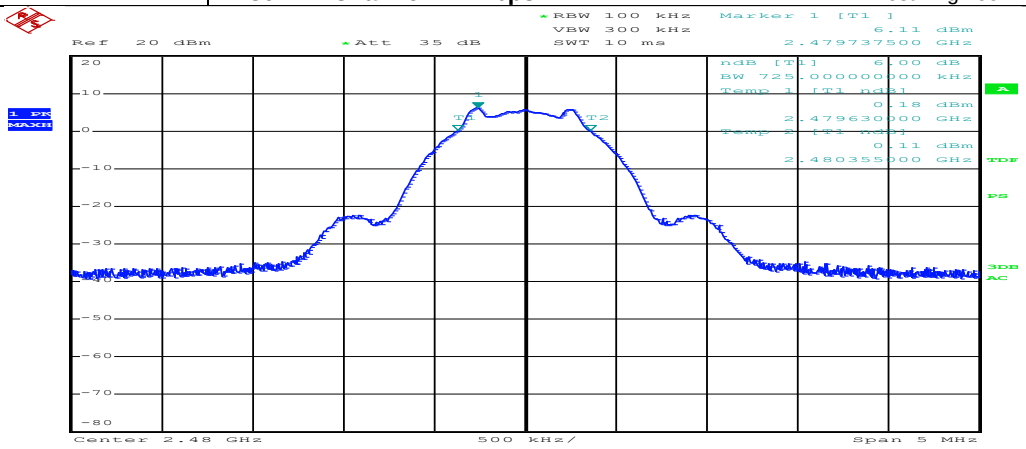


Graph 2

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - 6dB Bandwidth
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 1 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ

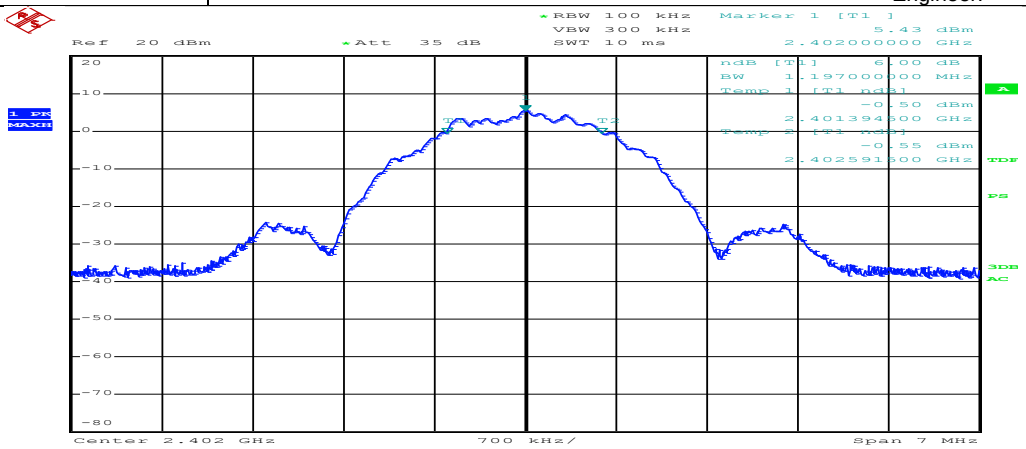


Graph 3

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - 6dB Bandwidth
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 2 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ

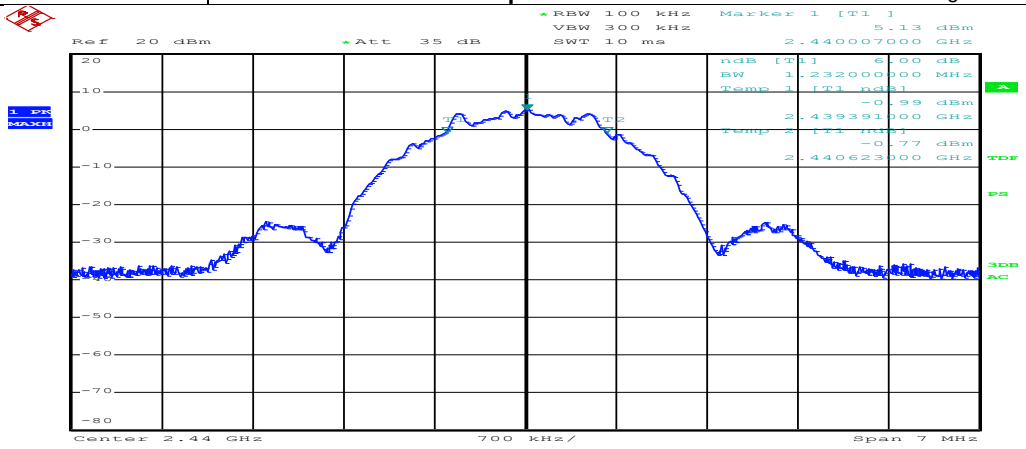


Graph 4

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - 6dB Bandwidth
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 2 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ

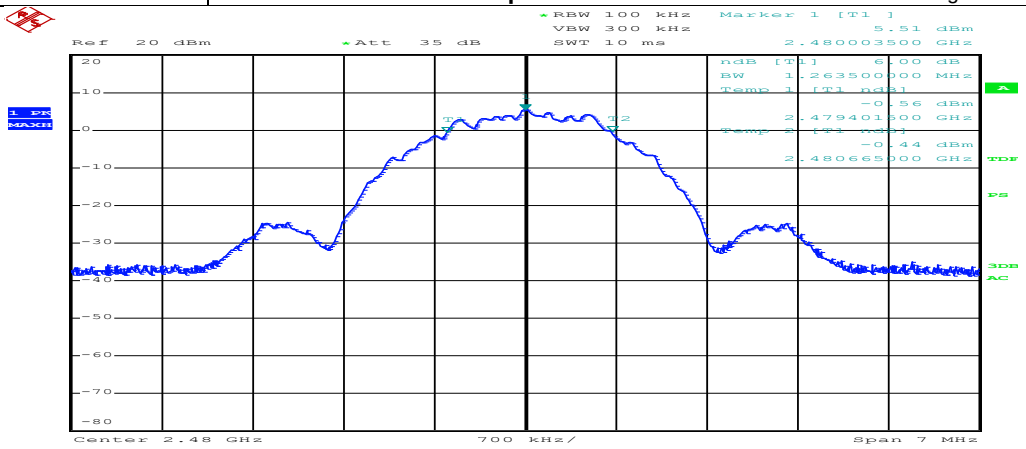


Graph 5

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - 6dB Bandwidth
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 2 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ



Graph 6

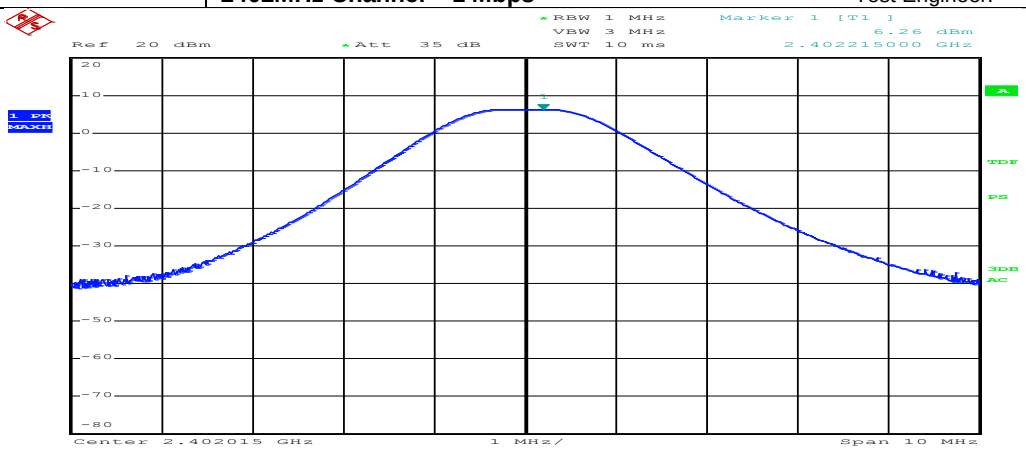
Appendix C.2 – Measurement Graphs – Maximum Peak Conducted Output Power - 15.247 (b)(3)

No.	Test	Graph Description
7	Maximum Peak Conducted Output Power – 1 Mbps	2402MHz Channel
8		2440MHz Channel
9		2480MHz Channel
10	Maximum Peak Conducted Output Power – 2 Mbps	2402MHz Channel
11		2440MHz Channel
12		2480MHz Channel

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Maximum Peak Conducted Output Power
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 1 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ

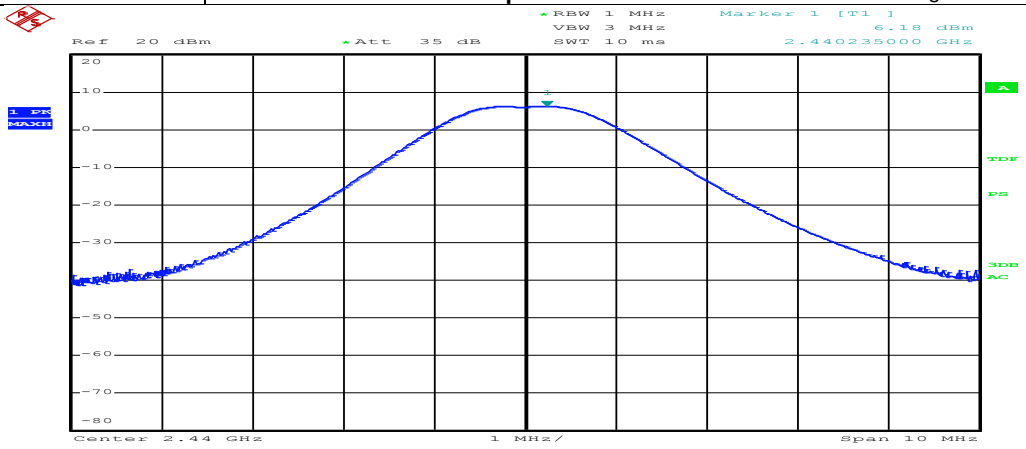


Graph 7

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Maximum Peak Conducted Output Power
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 1 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ

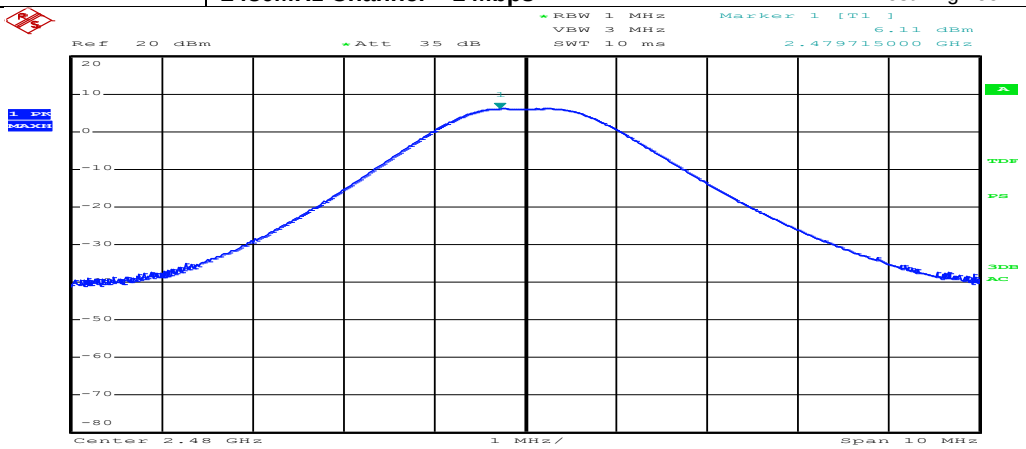


Graph 8

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Maximum Peak Conducted Output Power
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 1 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ

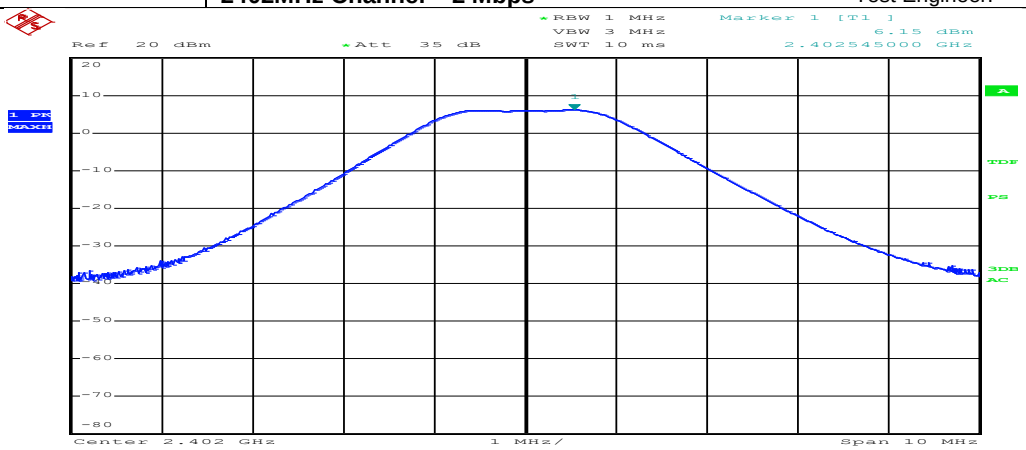


Graph 9

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Maximum Peak Conducted Output Power
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 2 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ

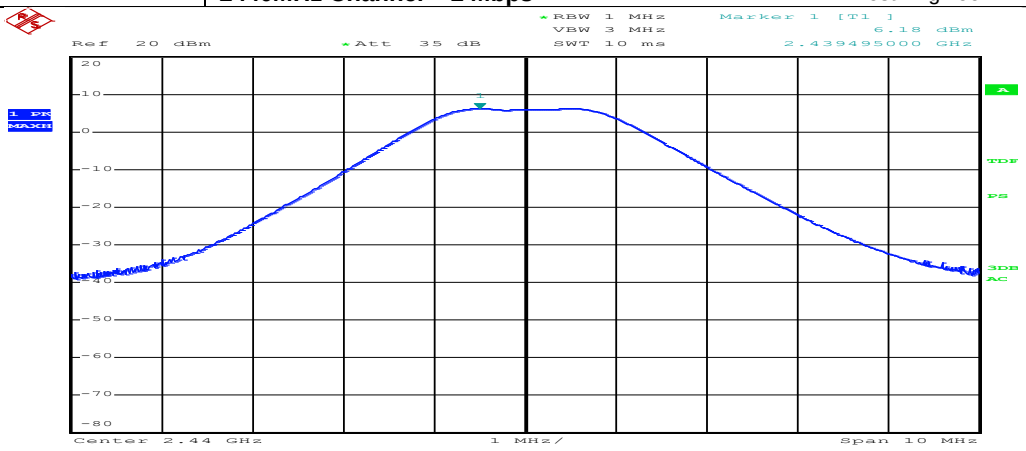


Graph 10

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Maximum Peak Conducted Output Power
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 2 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ

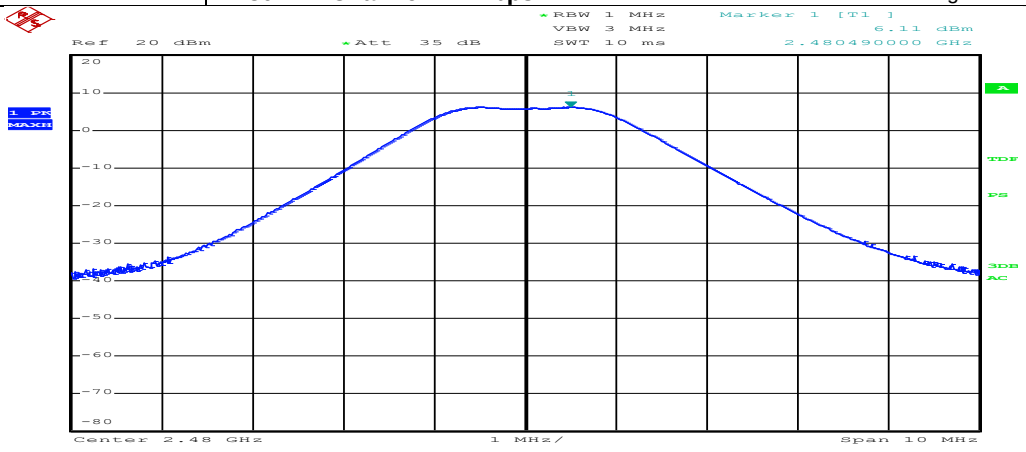


Graph 11

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Maximum Peak Conducted Output Power
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 2 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ



Graph 12

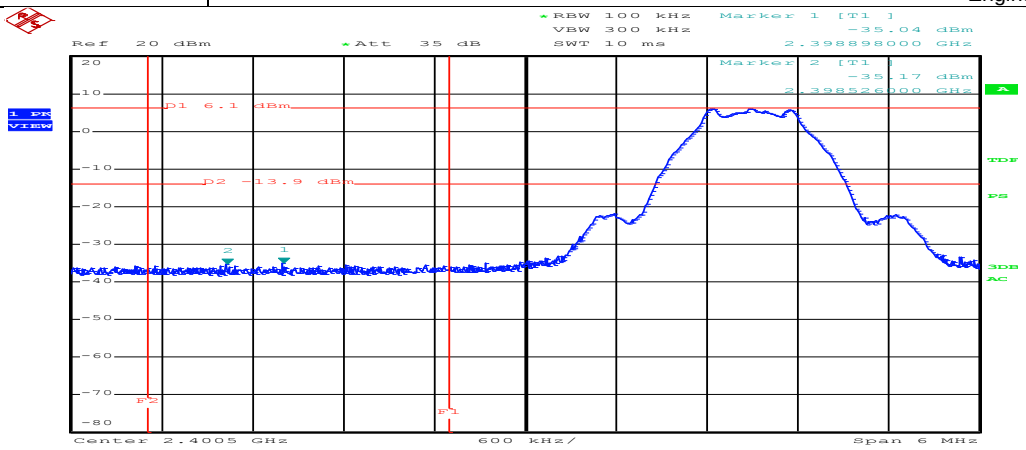
Appendix C.3 – Measurement Graphs – Band Edge - 15.247 (d)

No.	Test	Graph Description
13	Band edge Measurement – 1 Mbps	2402MHz Channel (Non-restricted Band – Bandedge)
14	Band edge Measurement – 2 Mbps	2402MHz Channel (Non-restricted Band – Bandedge)
15	Band edge Measurement – 2 Mbps	2480MHz Channel (Restricted Bands) – Horizontal measurement Antenna
16		2480MHz Channel (Restricted Bands) – Vertical measurement Antenna

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Band edge Measurement (100kHz, -20dB from fc)
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel (Non-restricted Band – Bandedge) – 1 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ

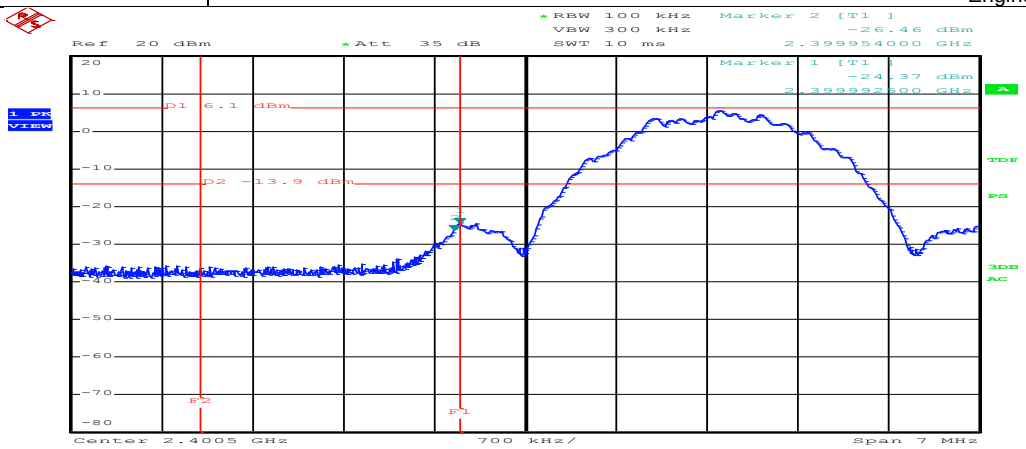


Graph 13

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Band edge Measurement (100kHz, -20dB from fc)
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel (Non-restricted Band – Bandedge) – 2 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ



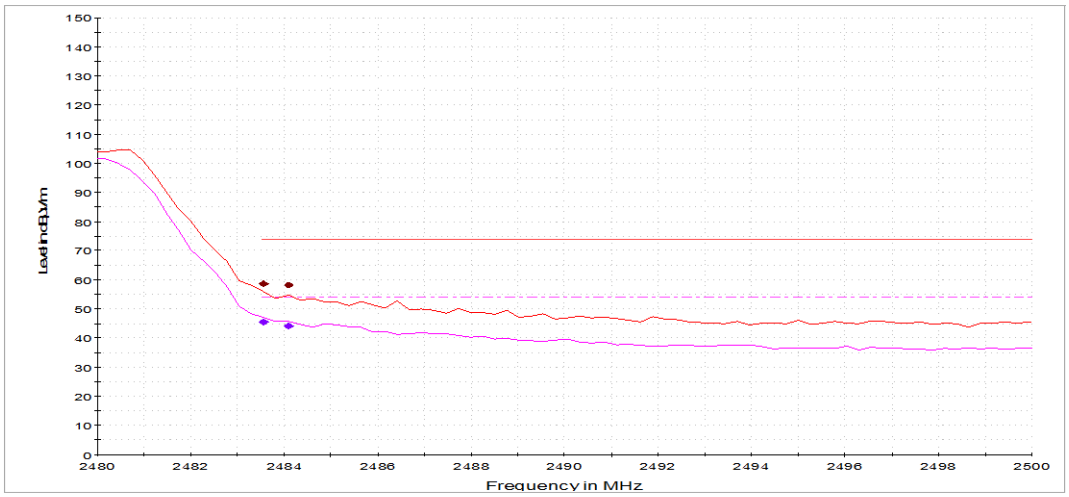
Graph 14

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Band edge Measurement
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel (Restricted Bands) – Horizontal measurement Antenna – 2 Mbps

Job Number: E2304-1648-1

Test Engineer: AZ



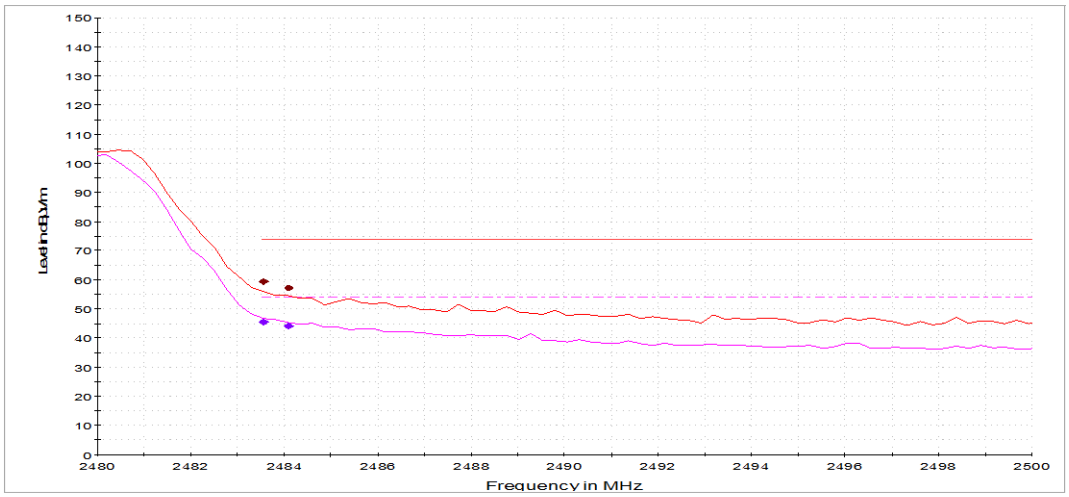
Graph 15

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Band edge Measurement
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel (Restricted Bands) – Vertical measurement Antenna – 2 Mbps

Job Number: E2304-1648-1

Test Engineer: AZ



Graph 16

Appendix C.4 – Measurement Graphs – Transmitter Spurious – FCC 15.247 (d), 15.209 – Restricted Bands

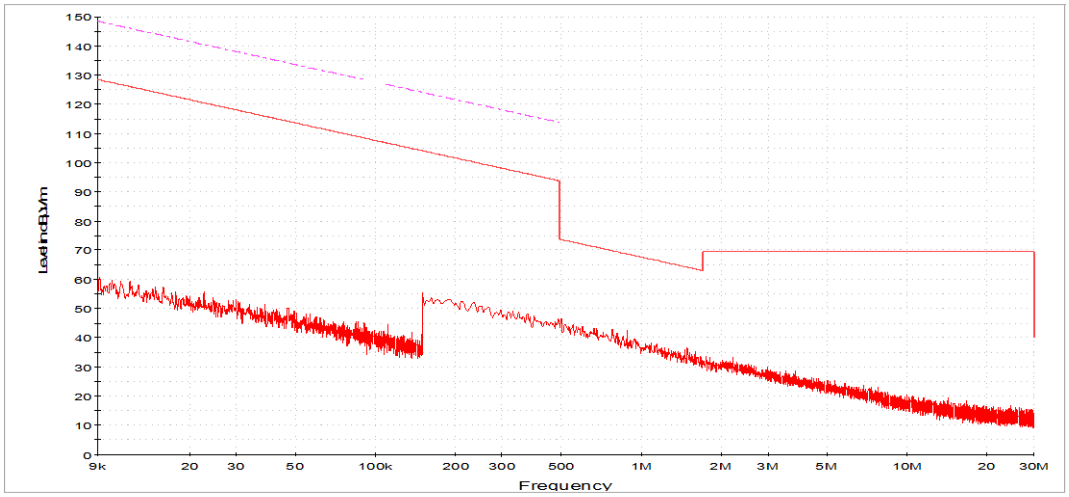
No.	Test	Graph Description
17	9kHz to 30MHz	2402MHz Channel, Antenna X
18		2402MHz Channel, Antenna Y
19		2402MHz Channel, Antenna Z
20	30MHz to 1GHz	2402MHz Channel, Antenna Horizontal
21		2402MHz Channel, Antenna Vertical
22	1GHz to 3.6GHz	2402MHz Channel, Antenna Horizontal
23		2402MHz Channel, Antenna Vertical
24		2440MHz Channel, Antenna Horizontal
25		2440MHz Channel, Antenna Vertical
26		2480MHz Channel, Antenna Horizontal
27		2480MHz Channel, Antenna Vertical
28	3.6GHz to 6GHz	2402MHz Channel, Antenna Horizontal
29		2402MHz Channel, Antenna Vertical
30		2440MHz Channel, Antenna Horizontal
31		2440MHz Channel, Antenna Vertical
32		2480MHz Channel, Antenna Horizontal
33		2480MHz Channel, Antenna Vertical
34	5.8GHz to 8.2GHz	2402MHz Channel, Antenna Horizontal
35		2402MHz Channel, Antenna Vertical
36		2440MHz Channel, Antenna Horizontal
37		2440MHz Channel, Antenna Vertical
38		2480MHz Channel, Antenna Horizontal
39		2480MHz Channel, Antenna Vertical
40	8.2GHz to 12.4GHz	2402MHz Channel, Antenna Horizontal
41		2402MHz Channel, Antenna Vertical
42		2440MHz Channel, Antenna Horizontal
43		2440MHz Channel, Antenna Vertical
44		2480MHz Channel, Antenna Horizontal
45		2480MHz Channel, Antenna Vertical
46	12.4GHz to 18GHz	2402MHz Channel, Antenna Horizontal
47		2402MHz Channel, Antenna Vertical
48		2440MHz Channel, Antenna Horizontal
49		2440MHz Channel, Antenna Vertical
50		2480MHz Channel, Antenna Horizontal
51		2480MHz Channel, Antenna Vertical
52	18GHz to 25GHz	2402MHz Channel, Antenna Horizontal
53		2402MHz Channel, Antenna Vertical
54		2440MHz Channel, Antenna Horizontal
55		2440MHz Channel, Antenna Vertical
56		2480MHz Channel, Antenna Horizontal
57		2480MHz Channel, Antenna Vertical

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel - 9KHz to 30MHz
X Antenna Orientation

Job Number: E2304-1648-1

Test Engineer: AZ



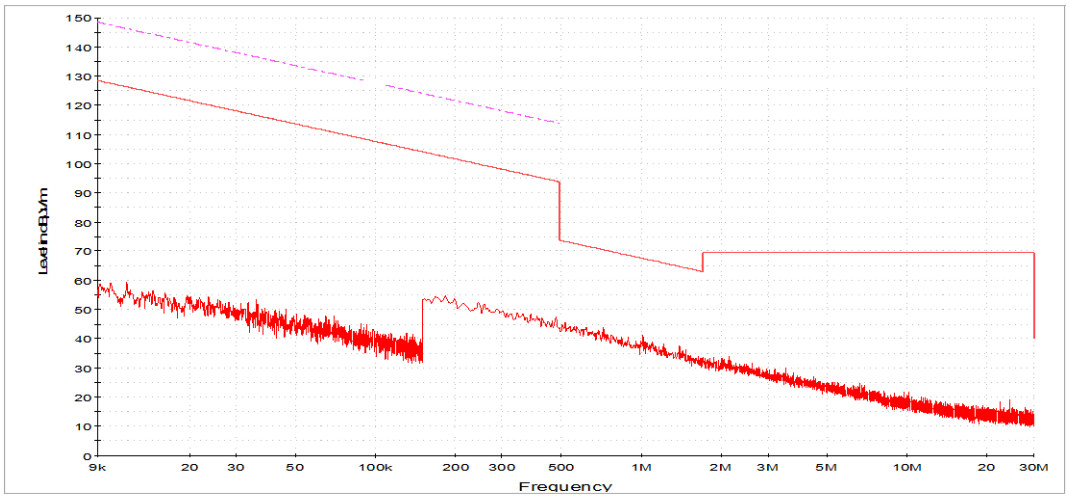
Graph 17

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel - 9KHz to 30MHz
Y Antenna Orientation

Job Number: E2304-1648-1

Test Engineer: AZ



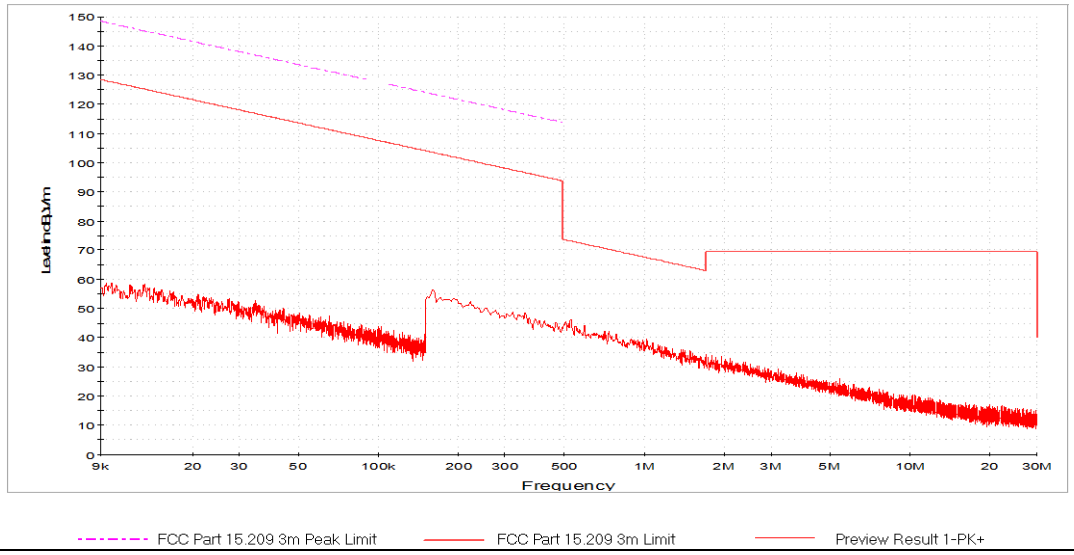
Graph 18

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel - 9KHz to 30MHz
Z Antenna Orientation

Job Number: E2304-1648-1

Test Engineer: AZ



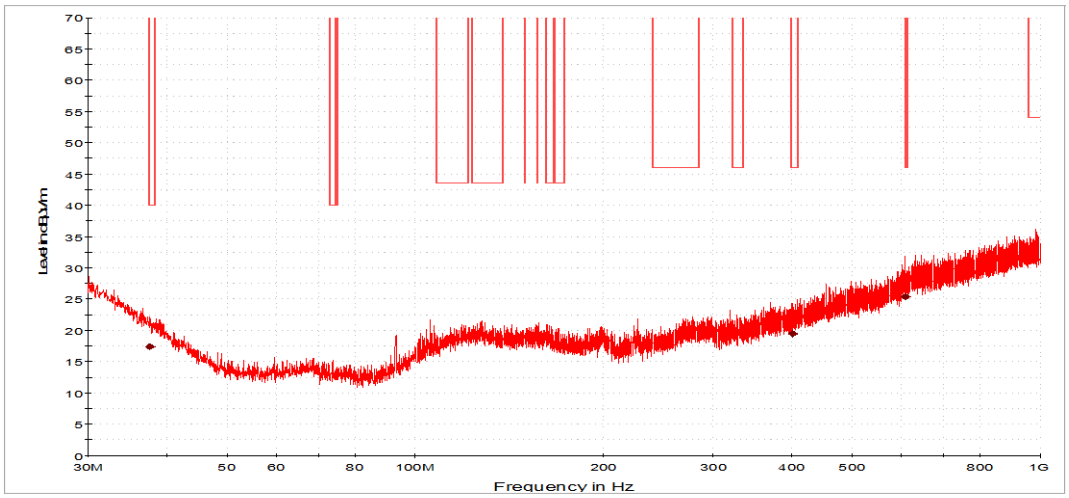
Graph 19

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 30MHz to 1GHz
Horizontal Antenna Orientation

Job Number: E2304-1648-1

Test Engineer: AZ



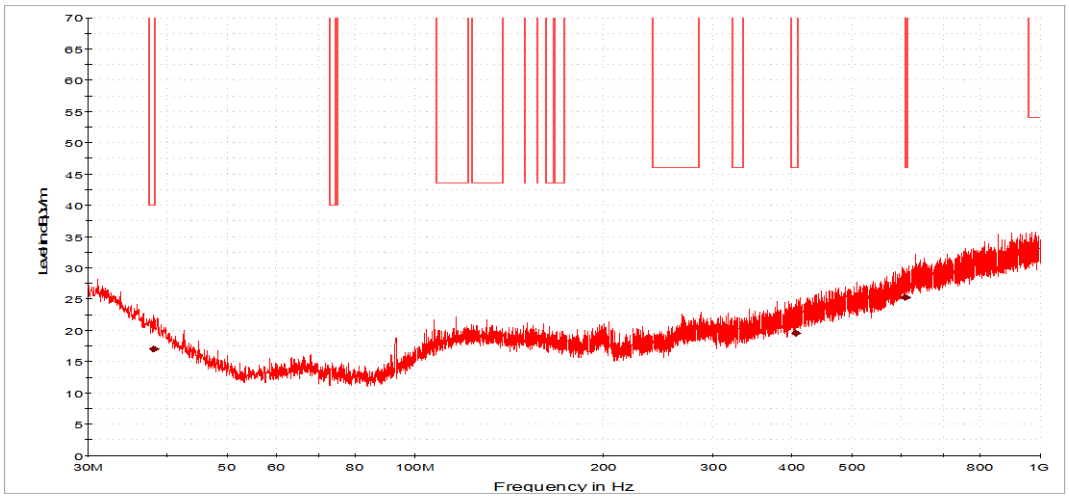
Graph 20

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 30MHz to 1GHz
Vertical Antenna Orientation

Job Number: E2304-1648-1

Test Engineer: AZ



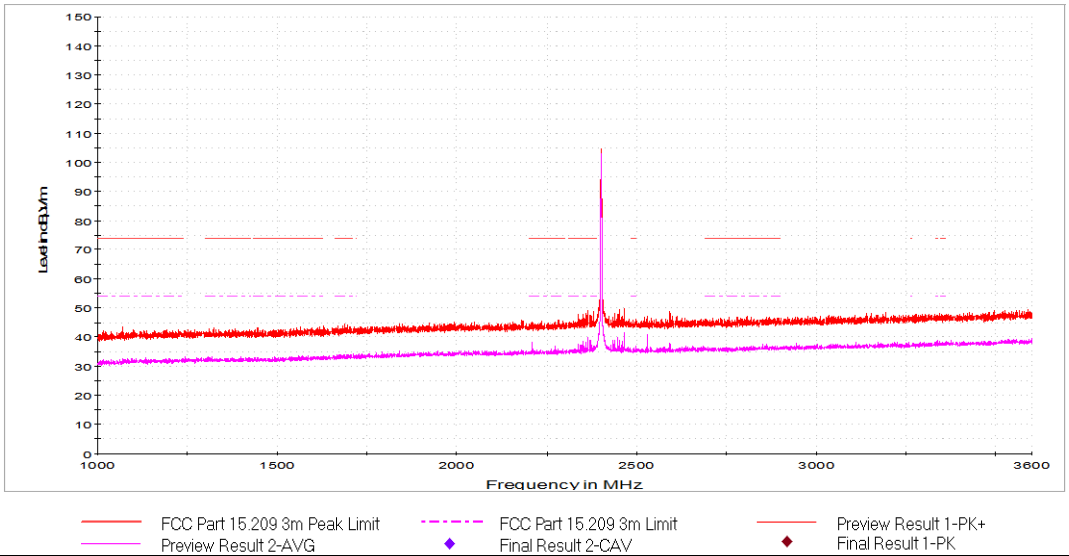
Graph 21

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 1GHz to 3.6GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1

Test Engineer: AZ

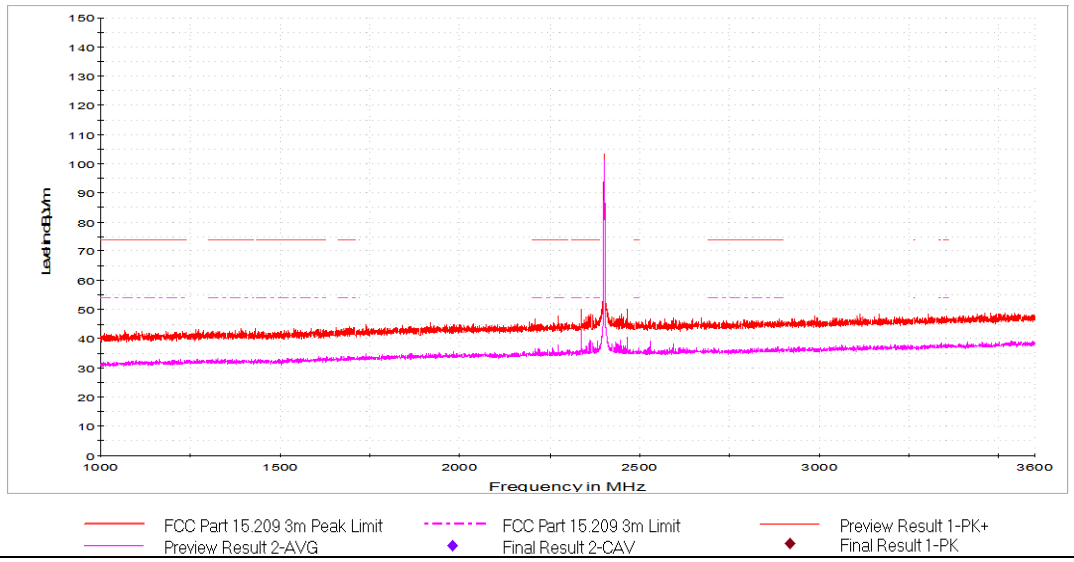


Graph 22

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 1GHz to 3.6GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

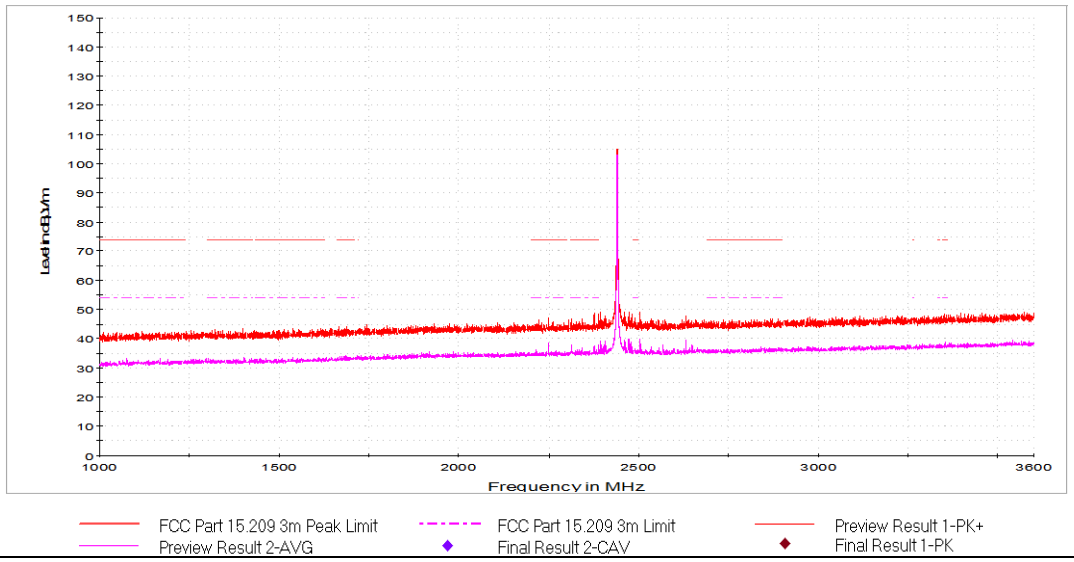


Graph 23

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 1GHz to 3.6GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

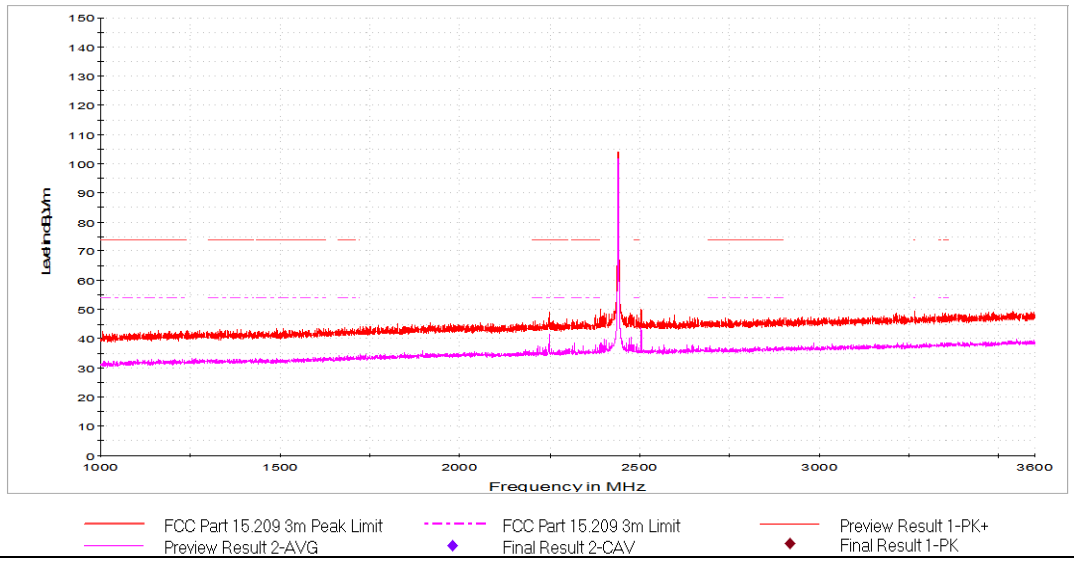


Graph 24

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 1GHz to 3.6GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

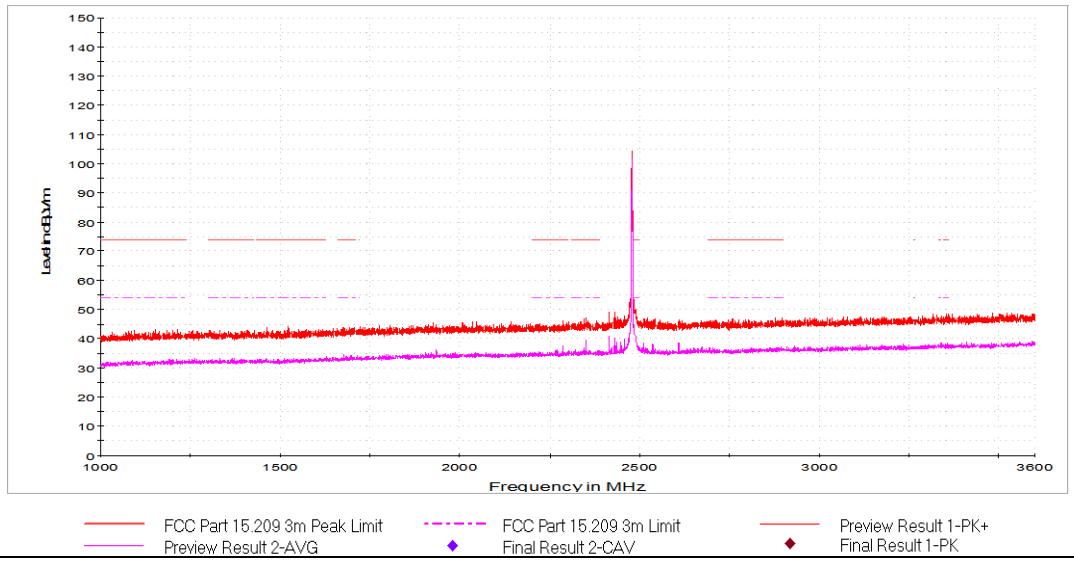


Graph 25

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 1GHz to 3.6GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

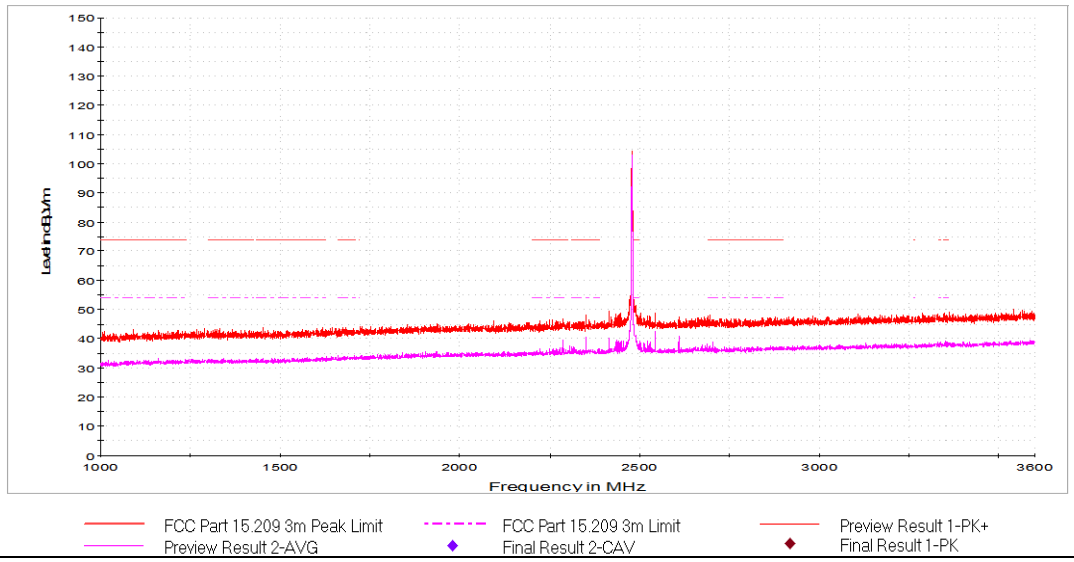


Graph 26

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 1GHz to 3.6GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

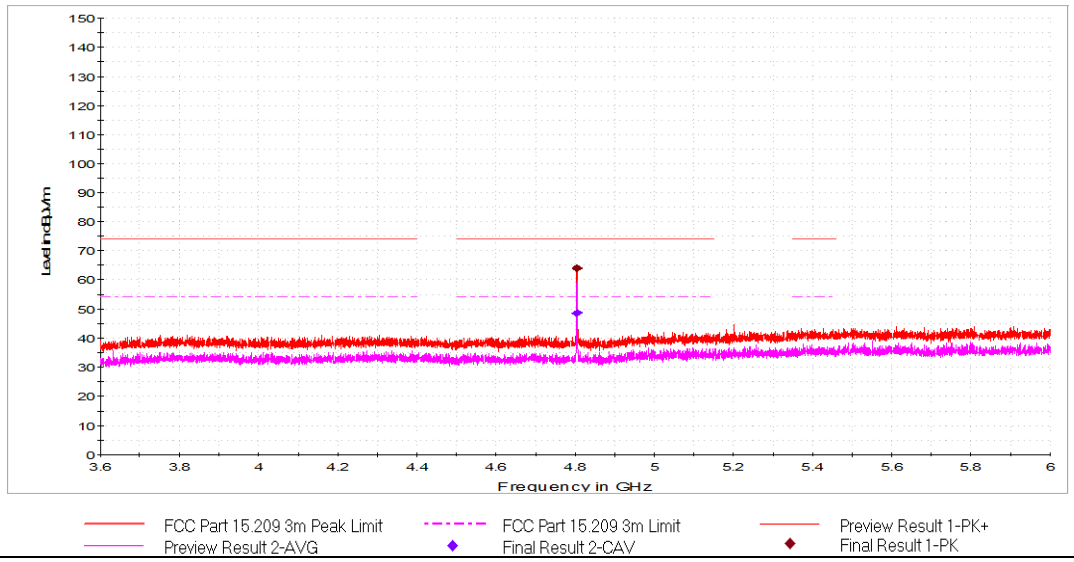


Graph 27

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 3.6GHz to 6GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

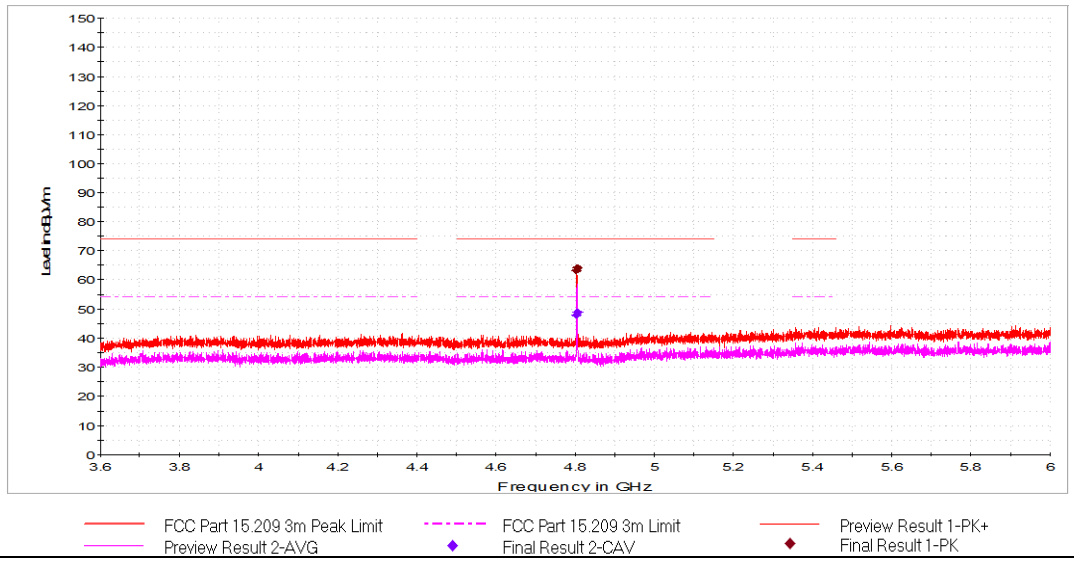


Graph 28

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 3.6GHz to 6GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

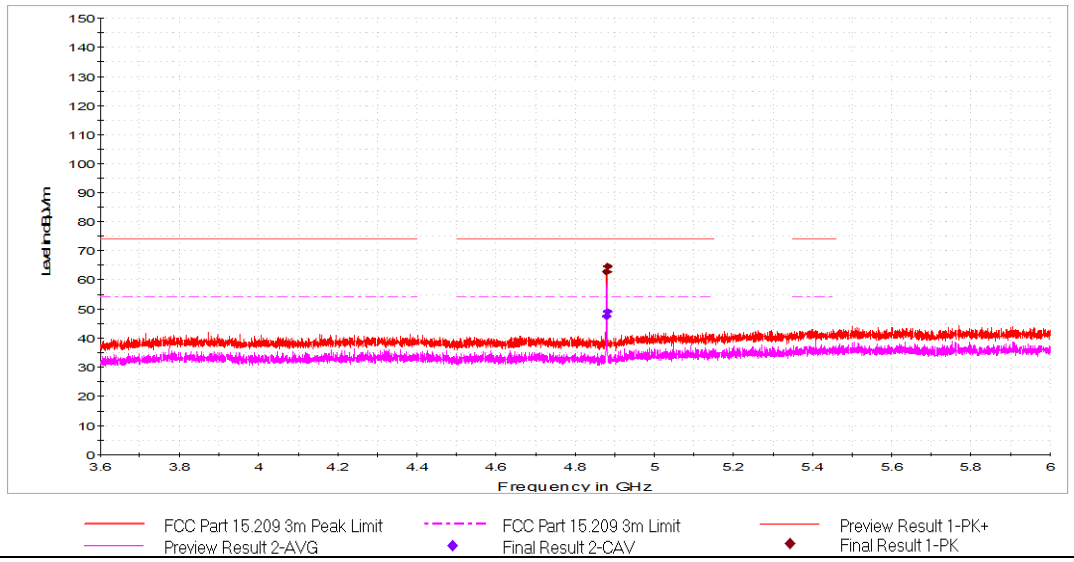


Graph 29

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 3.6GHz to 6GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

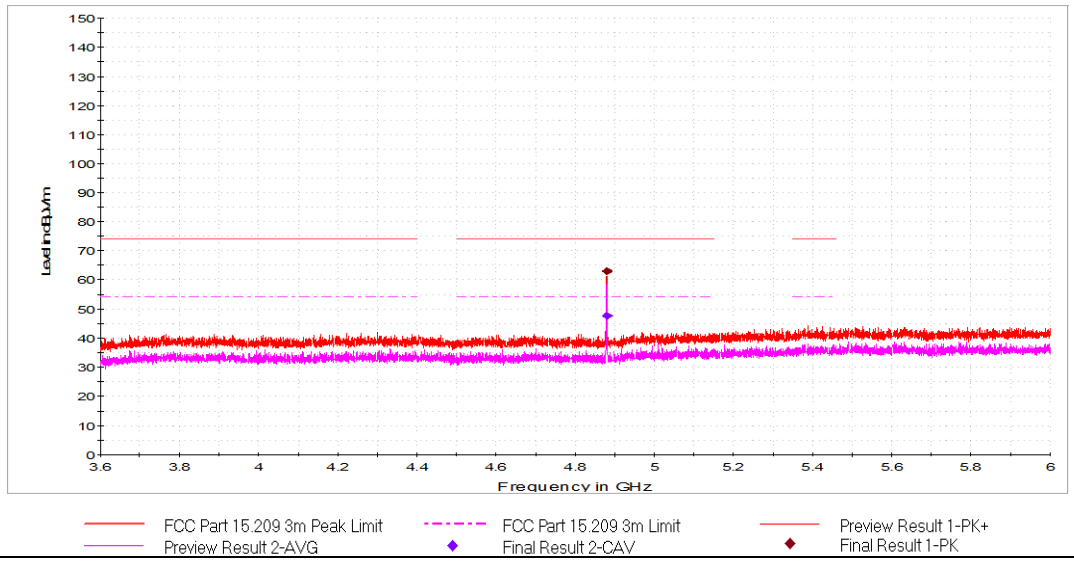


Graph 30

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 3.6GHz to 6GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

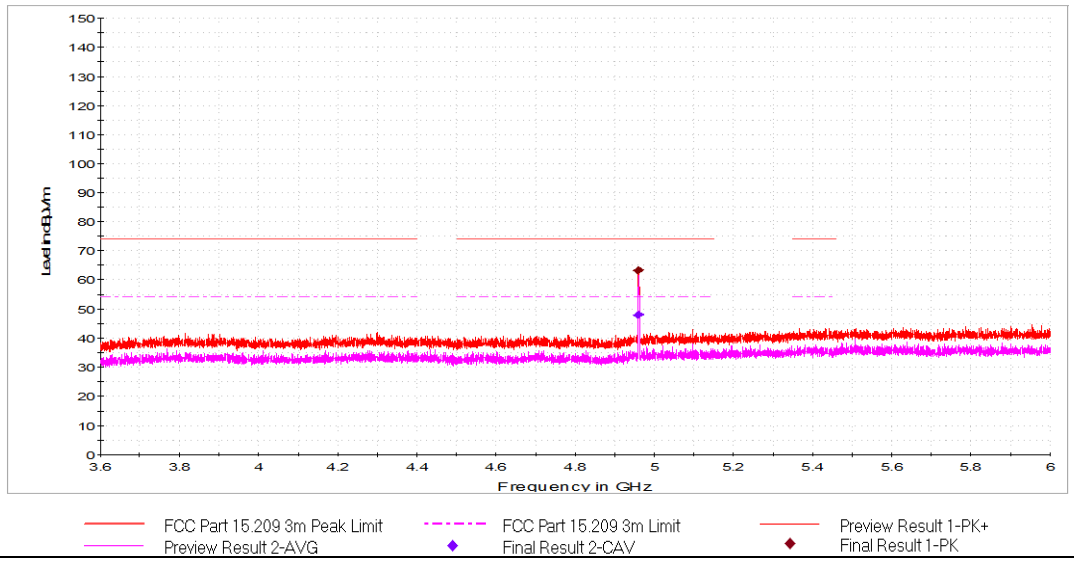


Graph 31

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 3.6GHz to 6GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

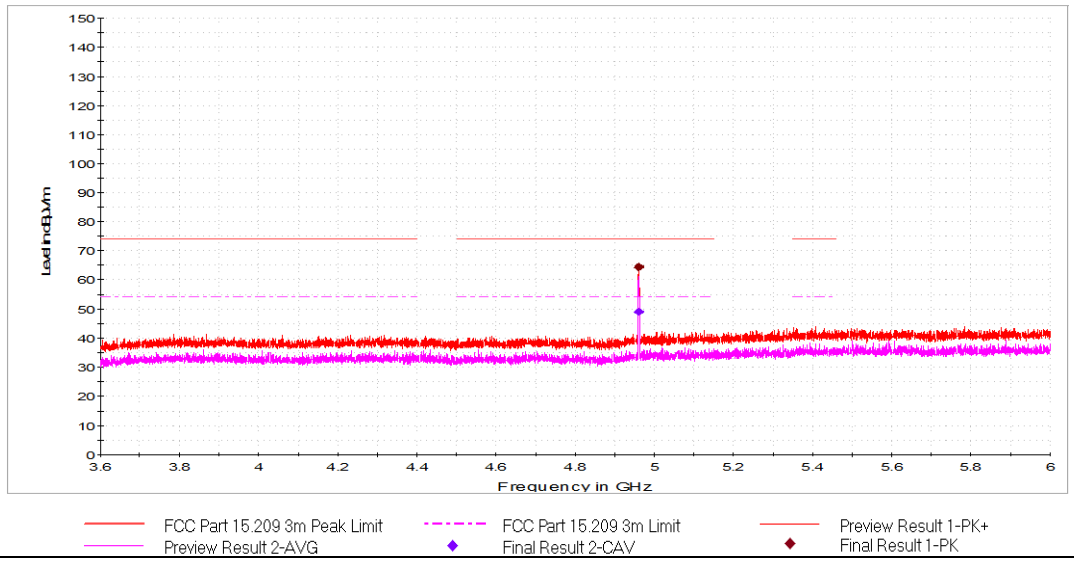


Graph 32

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 3.6GHz to 6GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

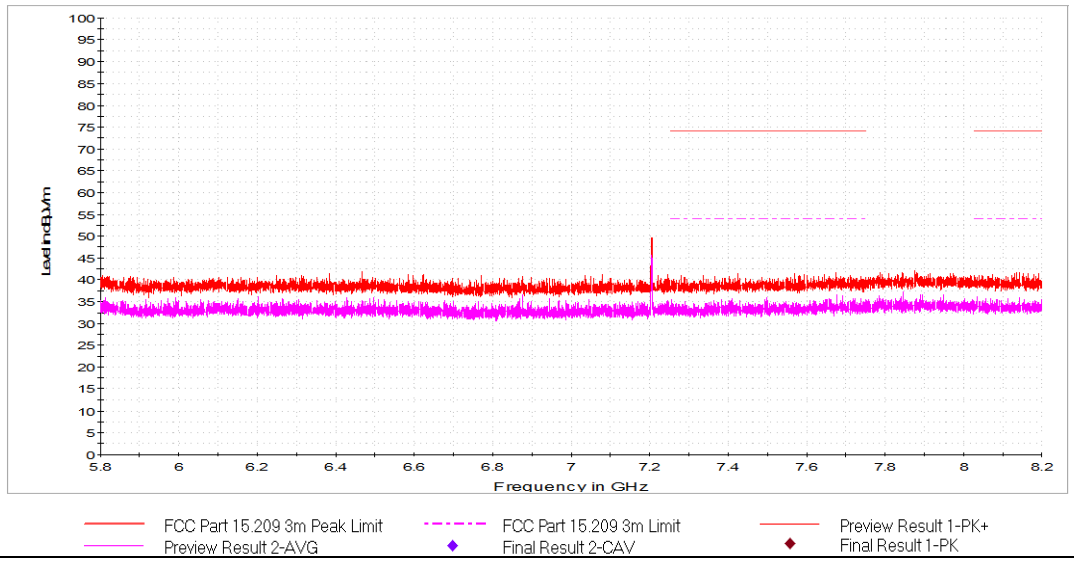


Graph 33

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 5.8GHz to 8.2GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

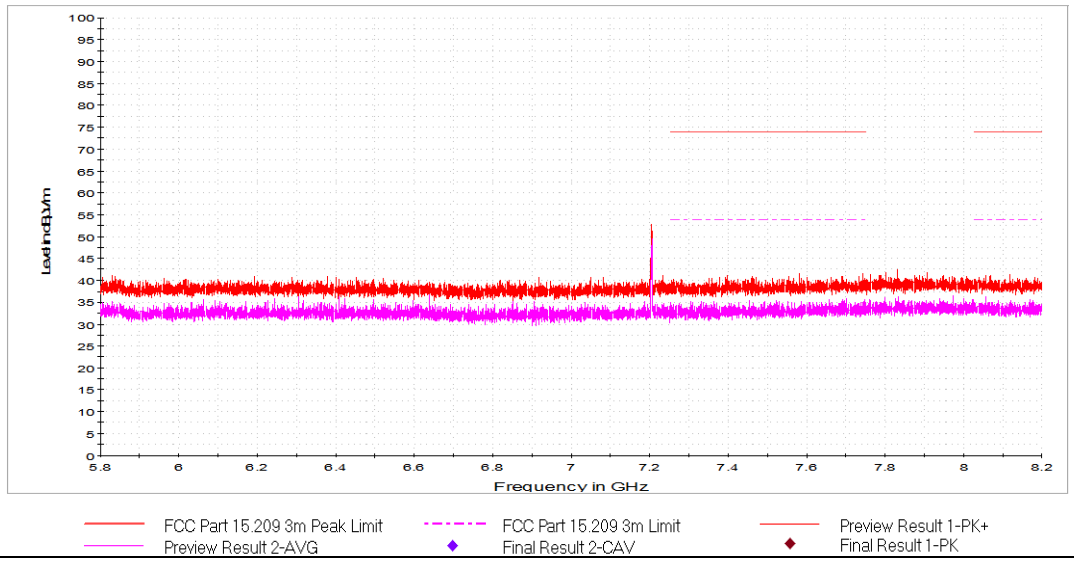


Graph 34

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 5.8GHz to 8.2GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

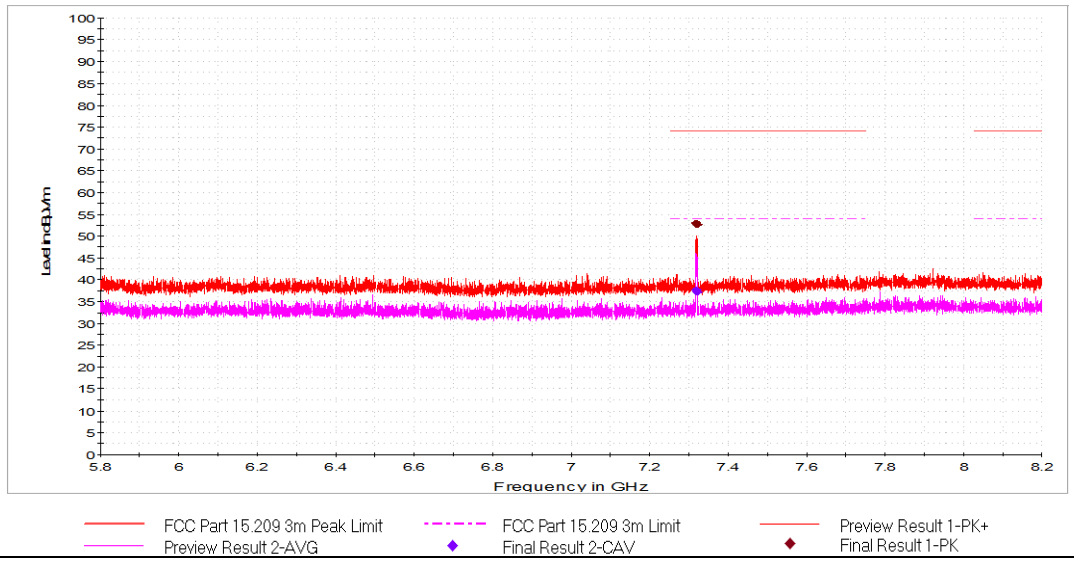


Graph 35

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 5.8GHz to 8.2GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

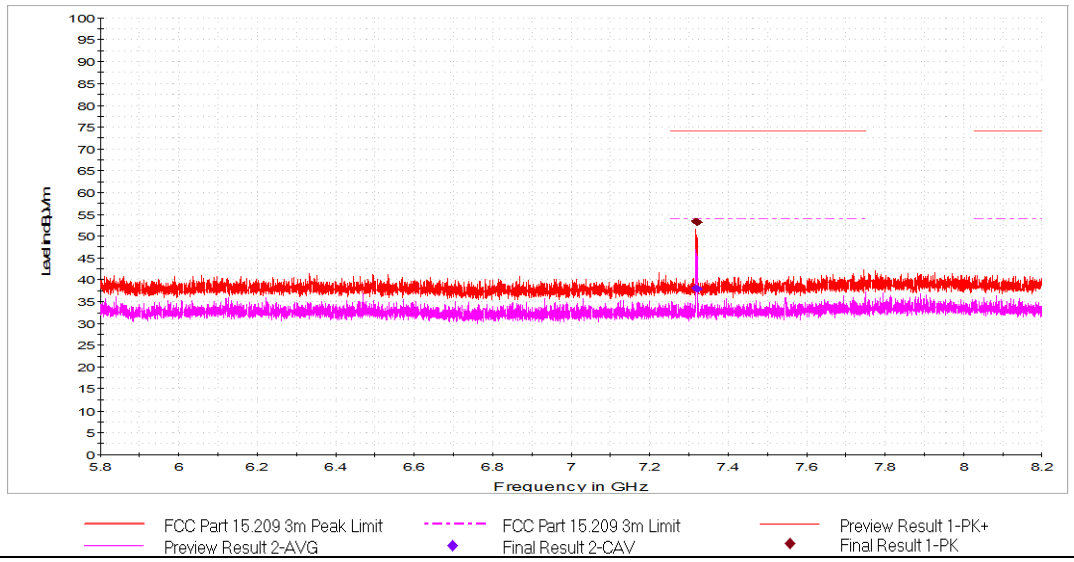


Graph 36

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 5.8GHz to 8.2GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

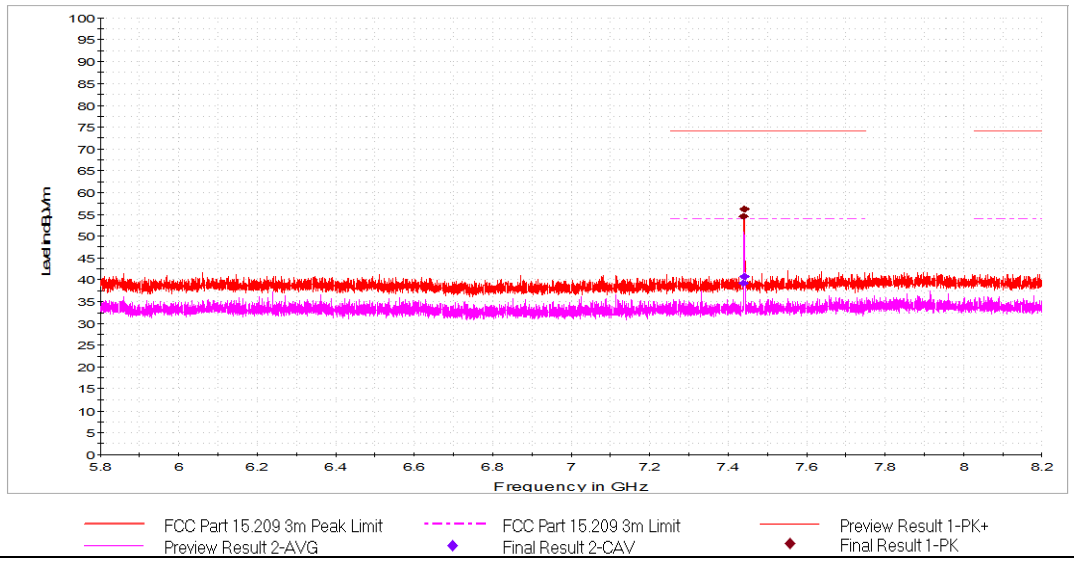


Graph 37

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 5.8GHz to 8.2GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

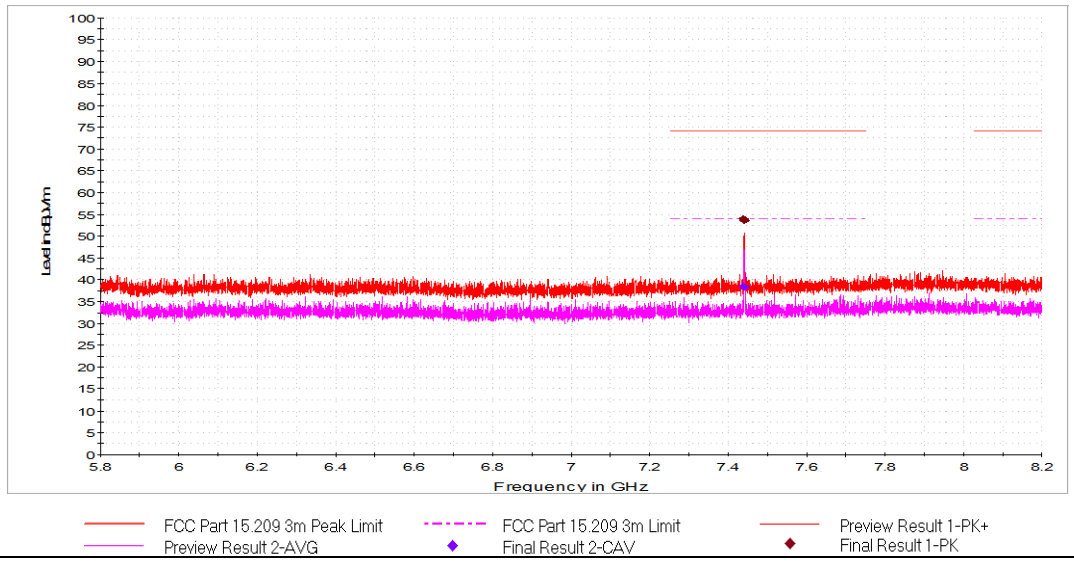


Graph 38

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 5.8GHz to 8.2GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

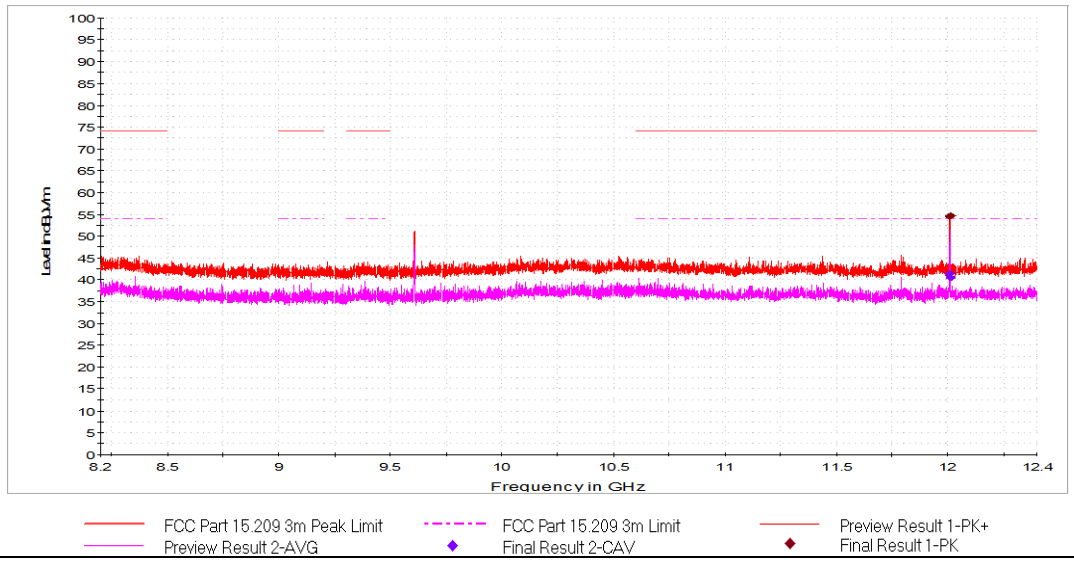


Graph 39

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 8.2GHz to 12.4GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

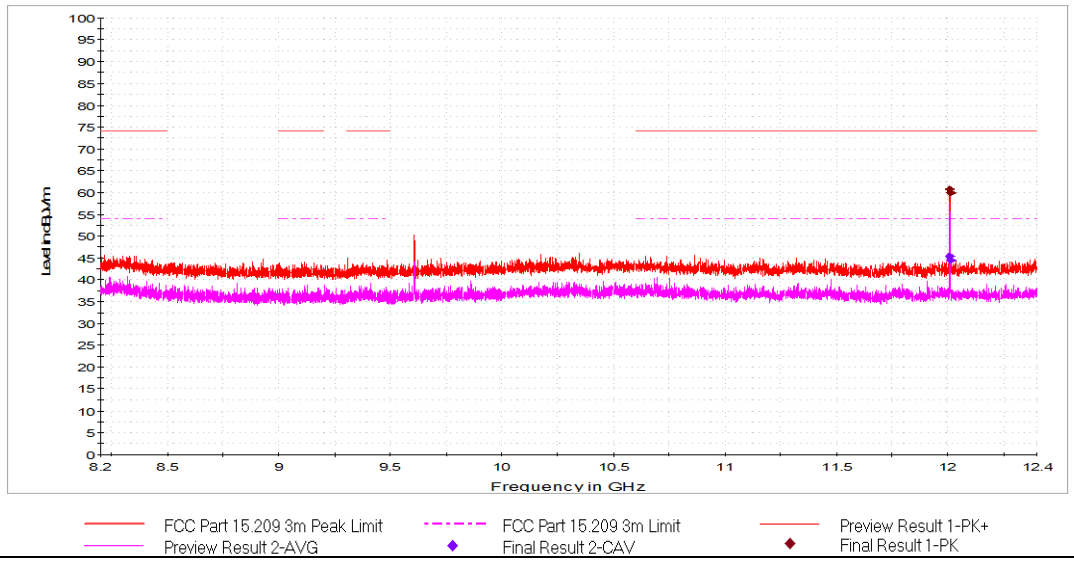


Graph 40

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 8.2GHz to 12.4GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

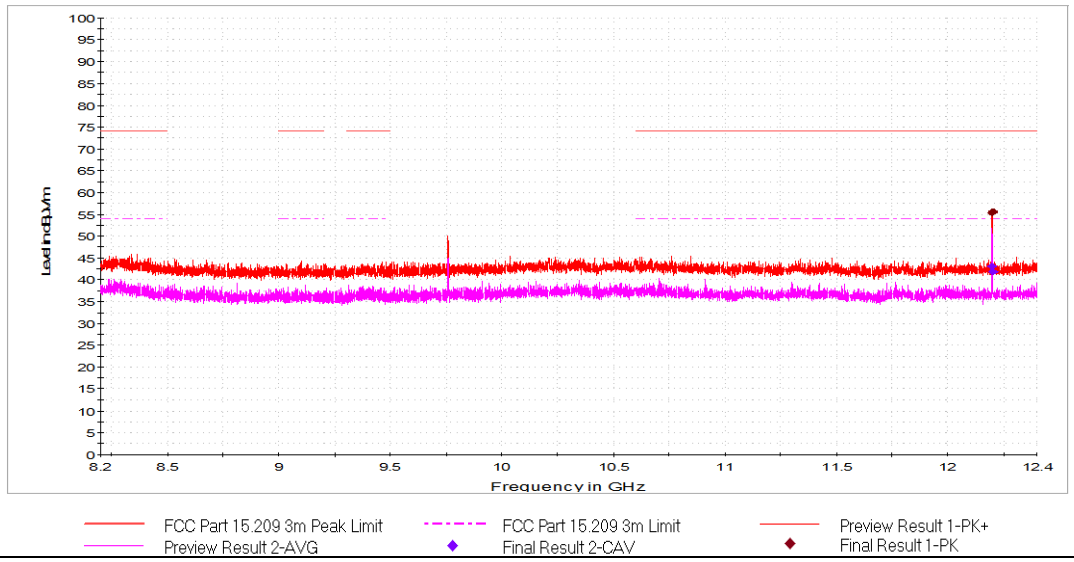


Graph 41

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 8.2GHz to 12.4GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

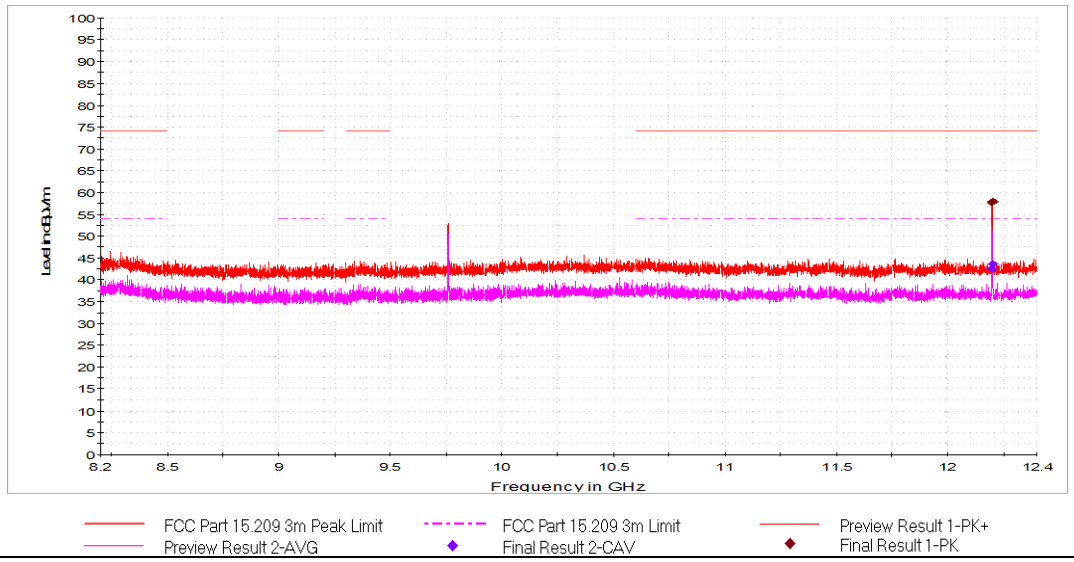


Graph 42

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 8.2GHz to 12.4GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

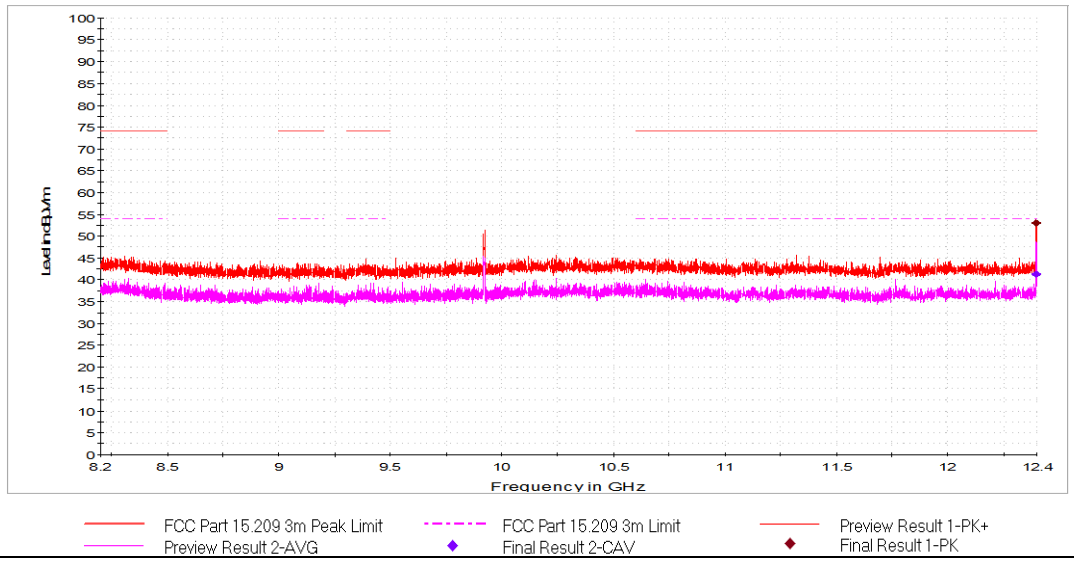


Graph 43

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 8.2GHz to 12.4GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

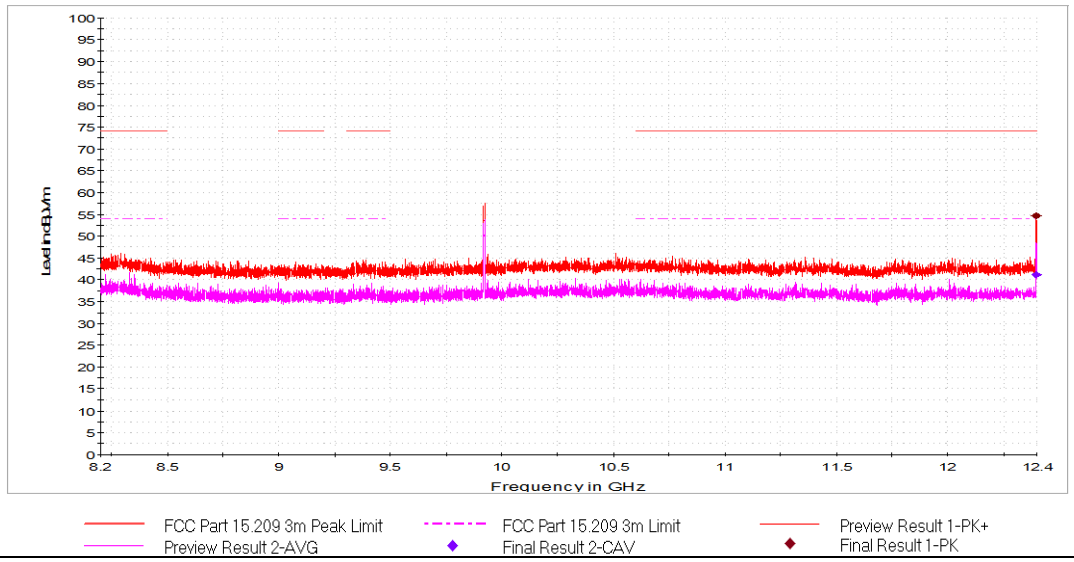


Graph 44

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 8.2GHz to 12.4GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

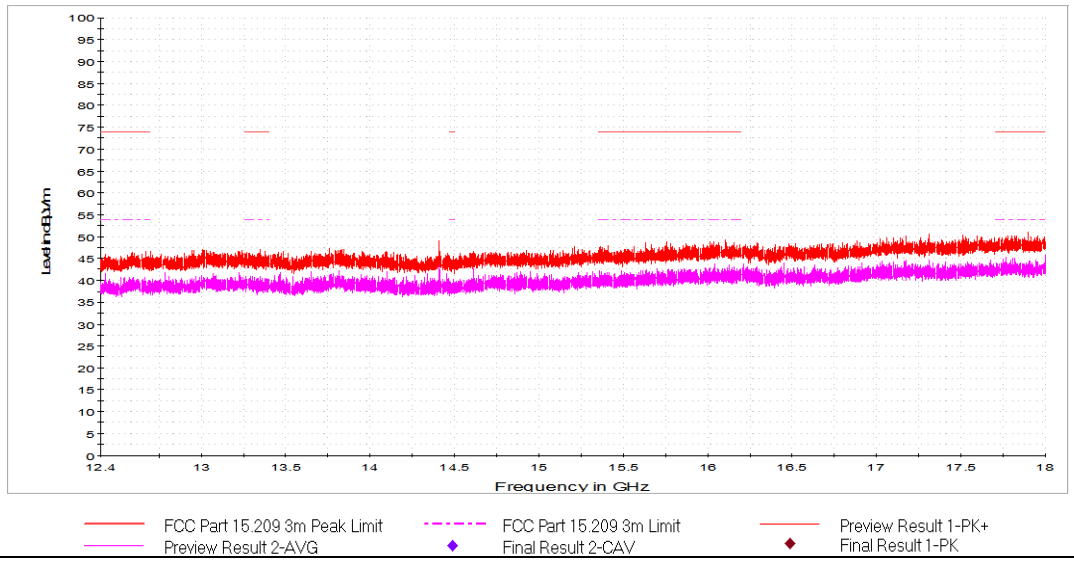


Graph 45

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 12.4GHz to 18GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

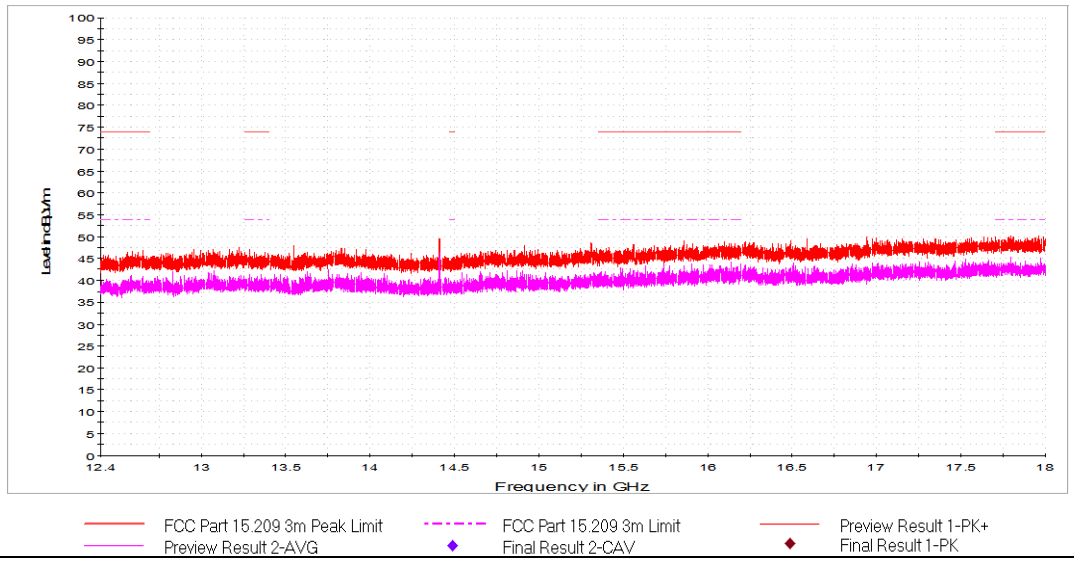


Graph 46

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 12.4GHz to 18GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

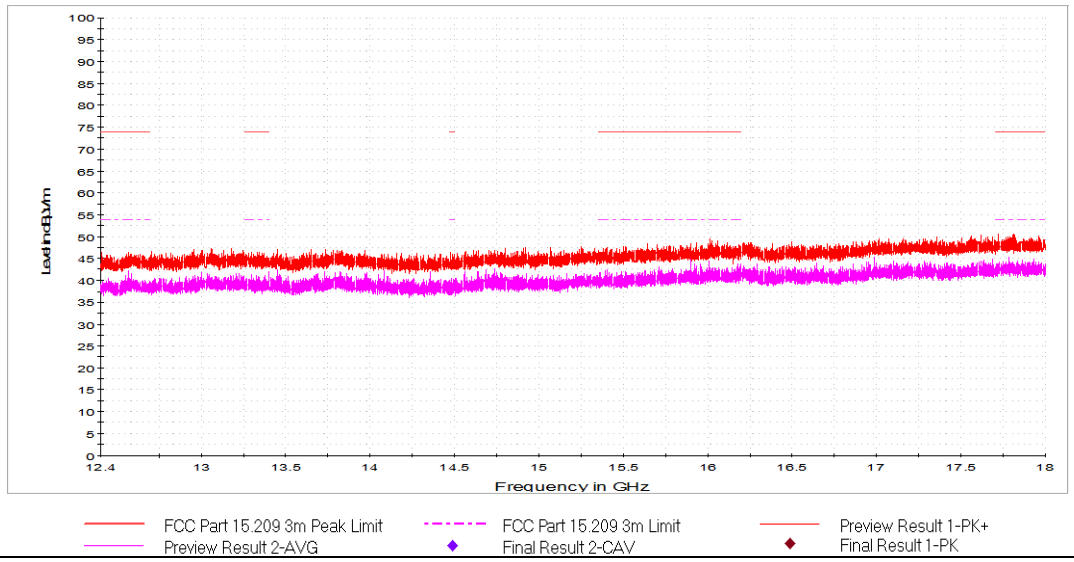


Graph 47

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 12.4GHz to 18GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

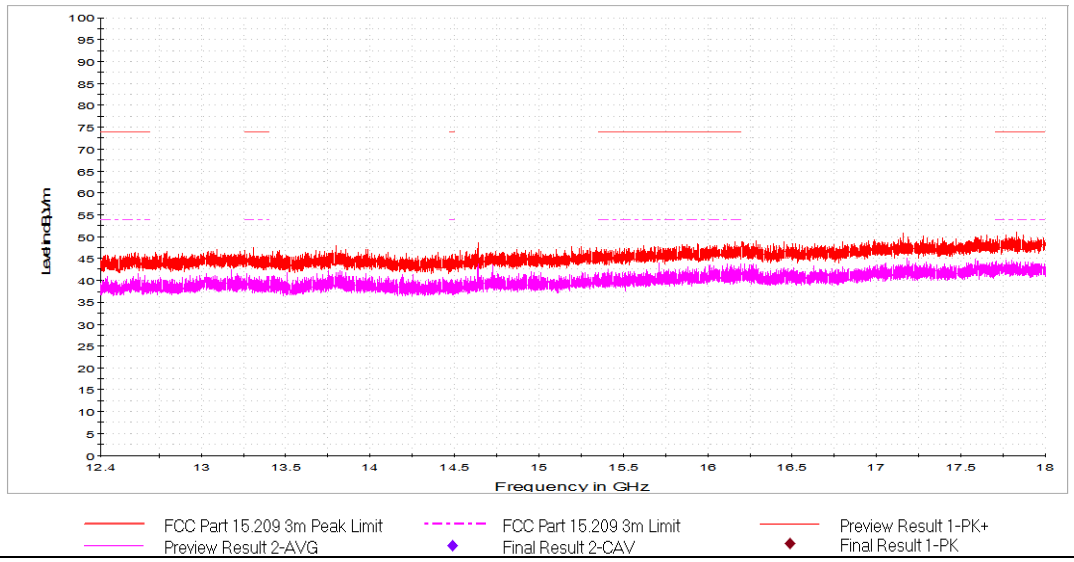


Graph 48

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 12.4GHz to 18GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

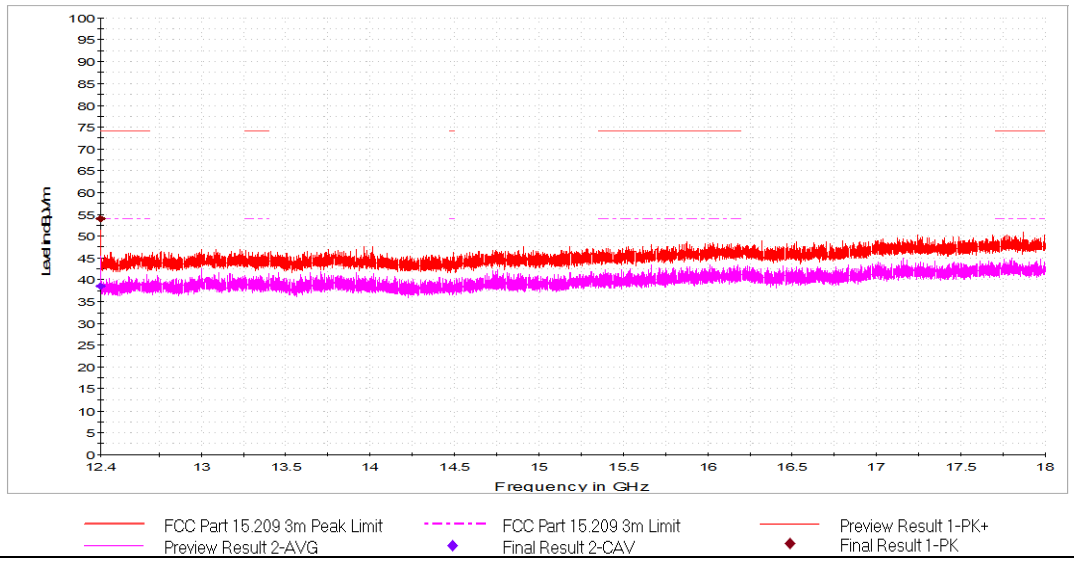


Graph 49

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 12.4GHz to 18GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

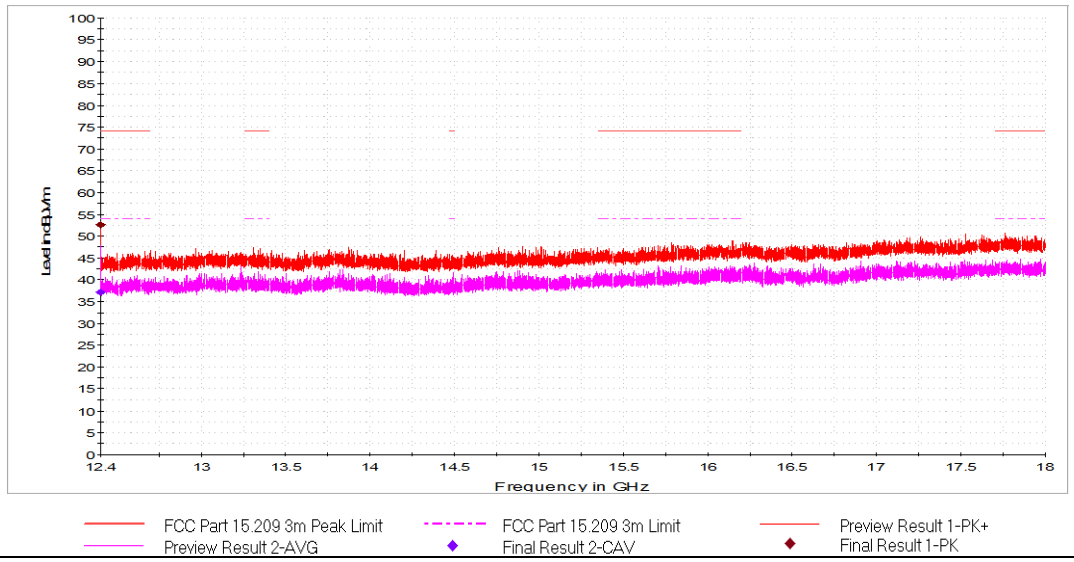


Graph 50

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 12.4GHz to 18GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

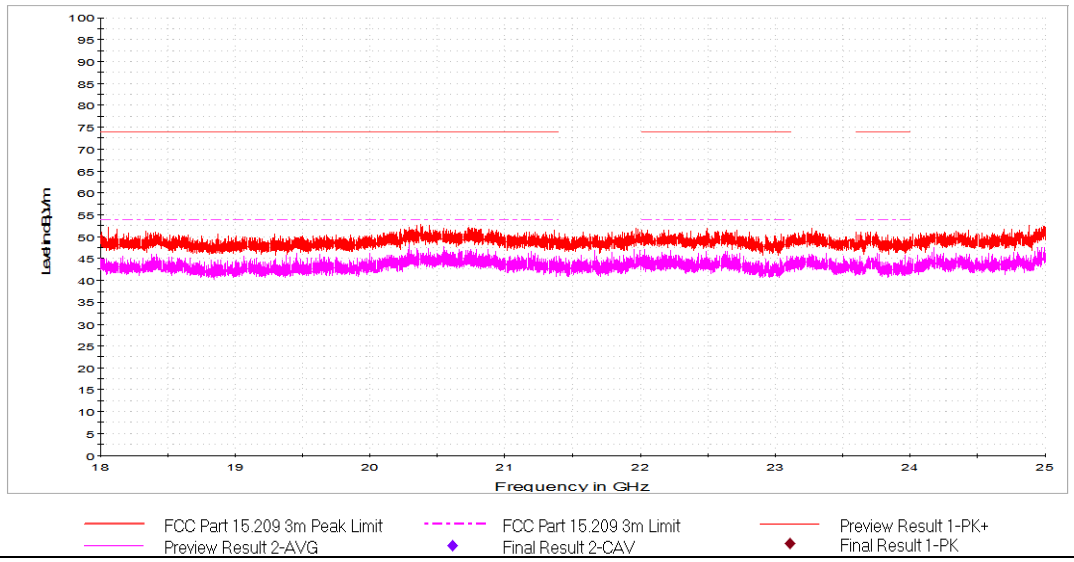


Graph 51

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 18GHz to 25GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

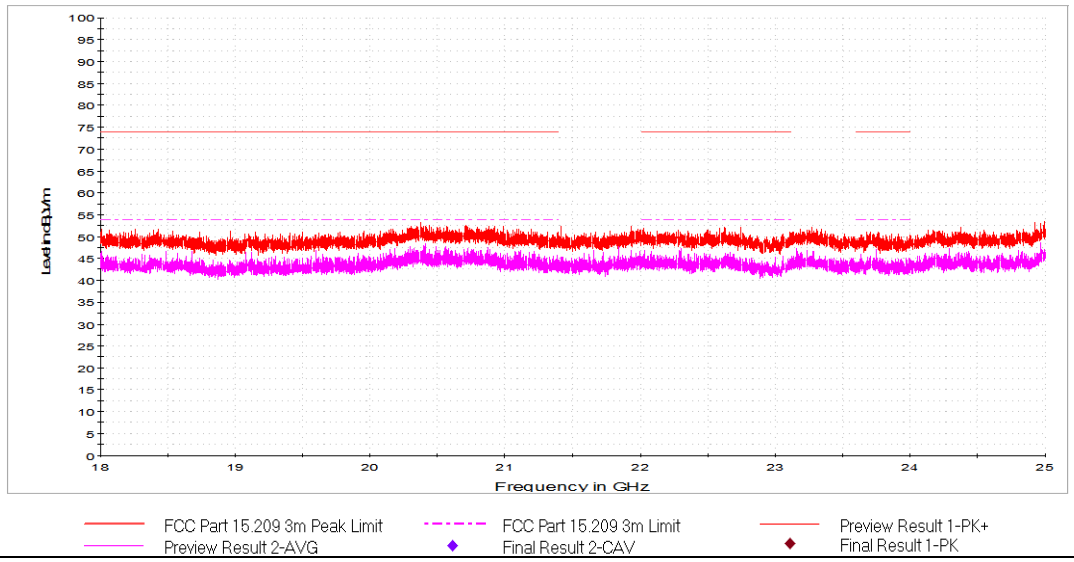


Graph 52

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 18GHz to 25GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

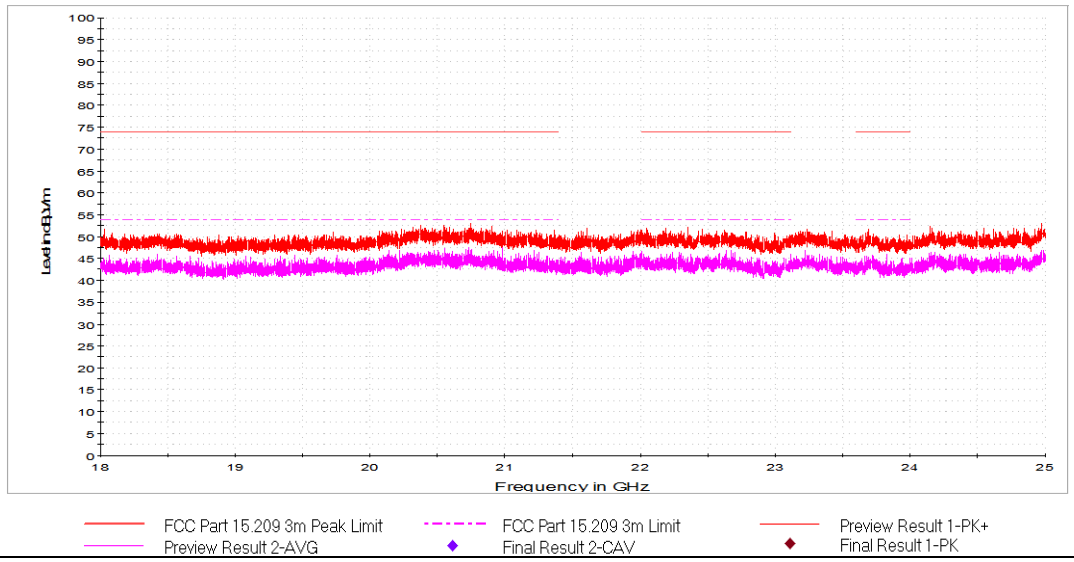


Graph 53

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 18GHz to 25GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

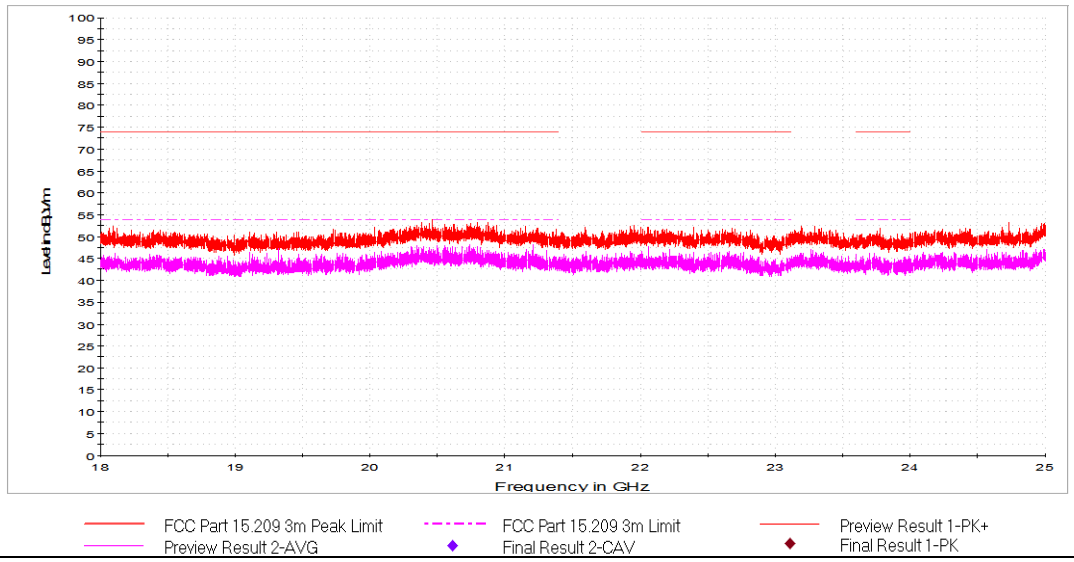


Graph 54

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 18GHz to 25GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ

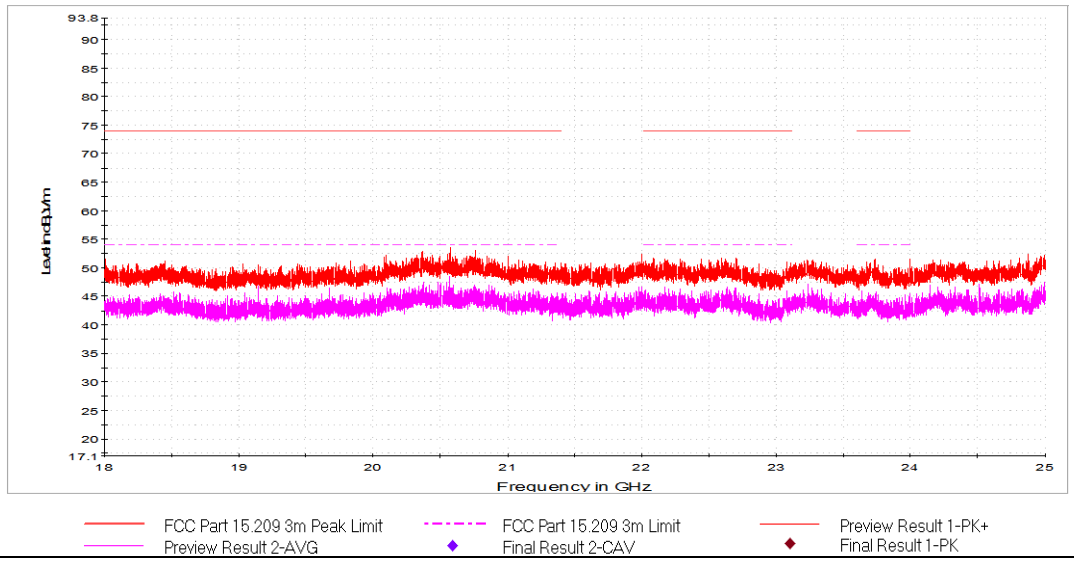


Graph 55

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 18GHz to 25GHz
Horizontal Antenna Polarisation

Job Number: E2304-1648-1
Test Engineer: AZ



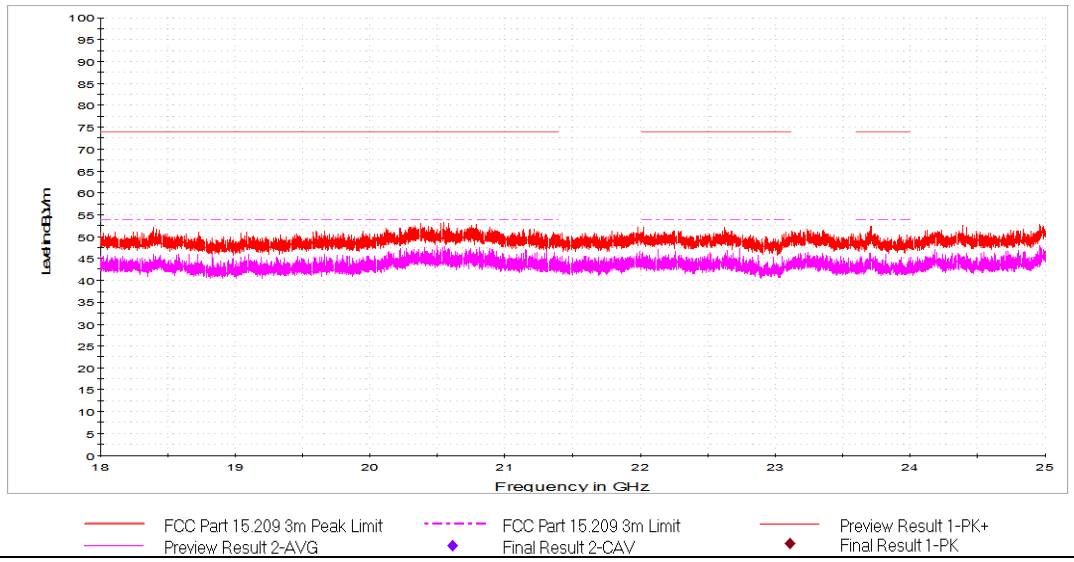
Graph 56

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Radiated emissions in Restricted bands
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 18GHz to 25GHz
Vertical Antenna Polarisation

Job Number: E2304-1648-1

Test Engineer: AZ



Graph 57

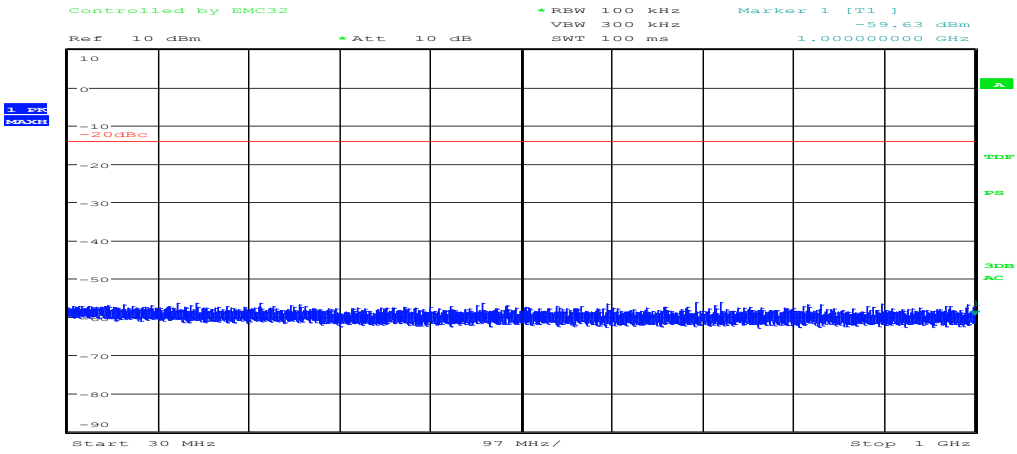
Appendix C.5 – Out-of-Band Emissions – 100kHz, -20dBc – FCC 15.247(d)

No.	Test	Graph Description
58	Out-of-Band Emissions – 100kHz, -20dBc 2402MHz Channel	30MHz to 1GHz
59		1GHz to 5GHz
60		5GHz to 10GHz
61		10GHz to 15GHz
62		15GHz to 25GHz
63	Out-of-Band Emissions – 100kHz, -20dBc 2440MHz Channel	30MHz to 1GHz
64		1GHz to 5GHz
65		5GHz to 10GHz
66		10GHz to 15GHz
67		15GHz to 20GHz
68		10GHz to 25GHz
69	Out-of-Band Emissions – 100kHz, -20dBc 2480MHz Channel	30MHz to 1GHz
70		1GHz to 5GHz
71		5GHz to 10GHz
72		10GHz to 15GHz
73		15GHz to 25GHz

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Out-of-Band Emissions - – 100kHz, -20dBc
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 30MHz to 1GHz

Job Number: E2304-1648-1
Test Engineer: AZ

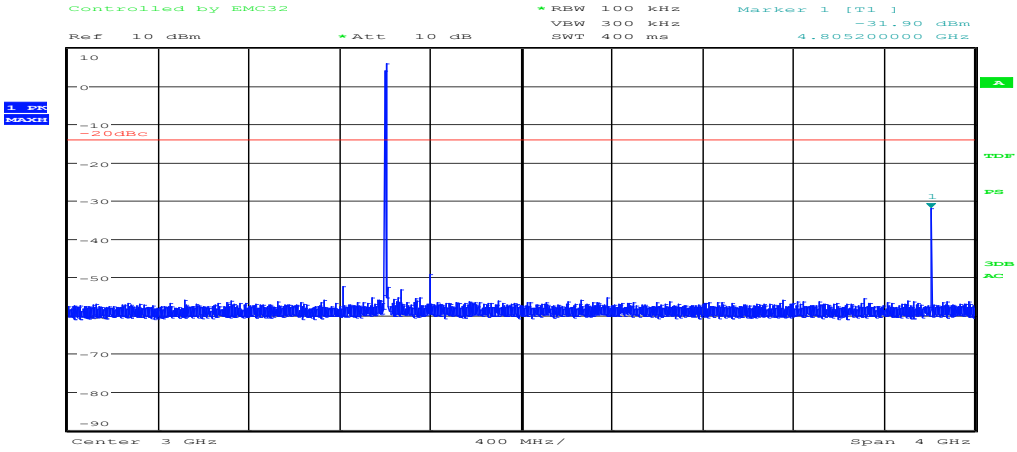


Graph 58

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Out-of-Band Emissions - – 100kHz, -20dBc
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 1GHz to 5GHz

Job Number: E2304-1648-1
Test Engineer: AZ

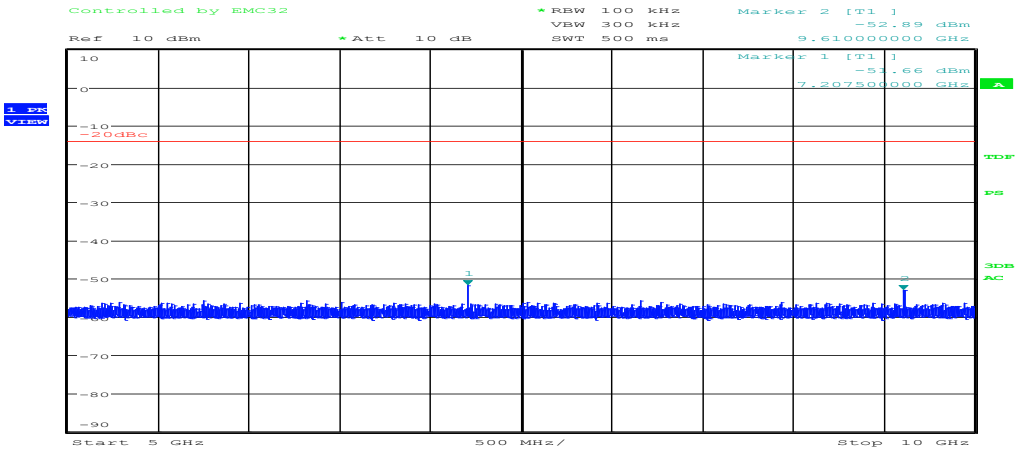


Graph 59

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Out-of-Band Emissions - – 100kHz, -20dBc
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 5GHz to 10GHz

Job Number: E2304-1648-1
Test Engineer: AZ

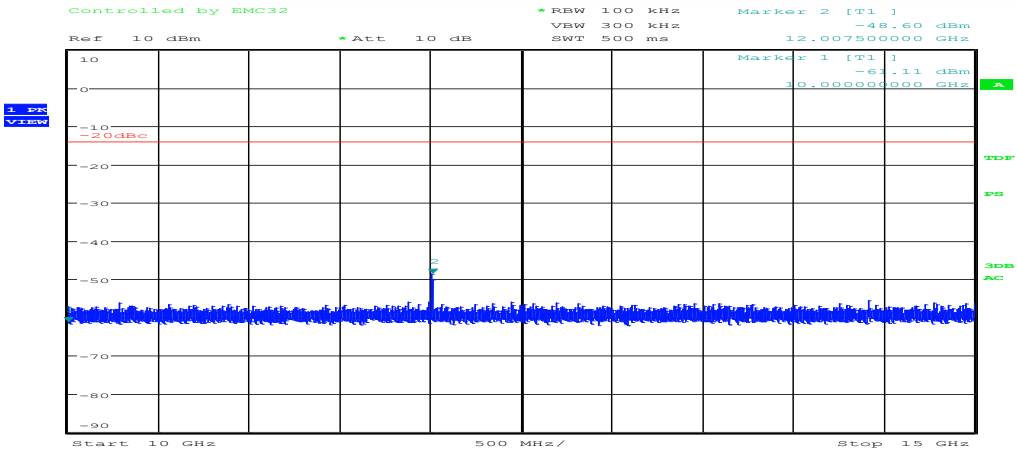


Graph 60

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Out-of-Band Emissions - – 100kHz, -20dBc
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 10GHz to 15GHz

Job Number: E2304-1648-1
Test Engineer: AZ

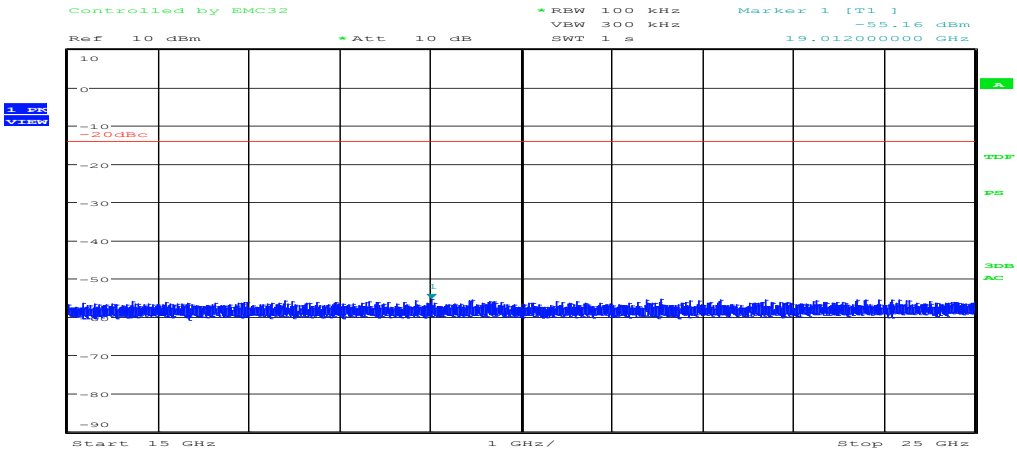


Graph 61

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Out-of-Band Emissions - – 100kHz, -20dBc
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 15GHz to 25GHz

Job Number: E2304-1648-1
Test Engineer: AZ

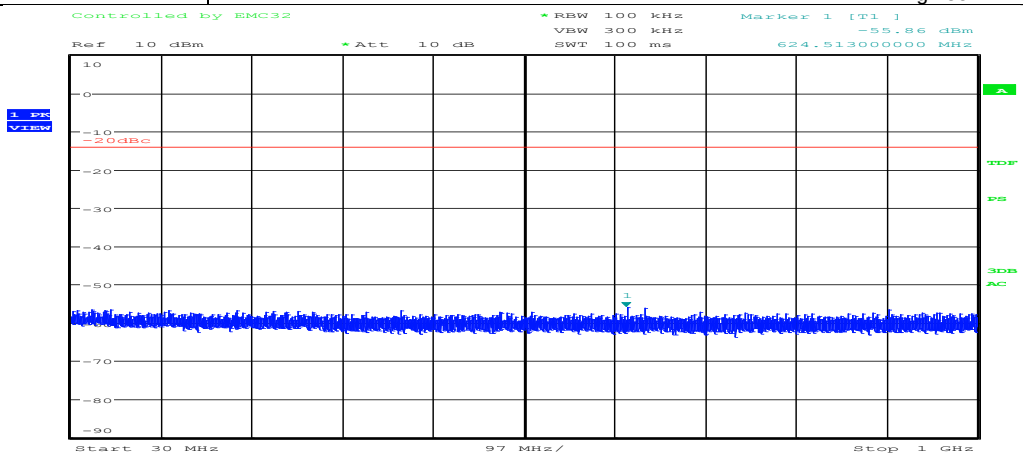


Graph 62

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Out-of-Band Emissions - – 100kHz, -20dBc
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 30MHz to 1GHz

Job Number: E2304-1648-1
Test Engineer: AZ

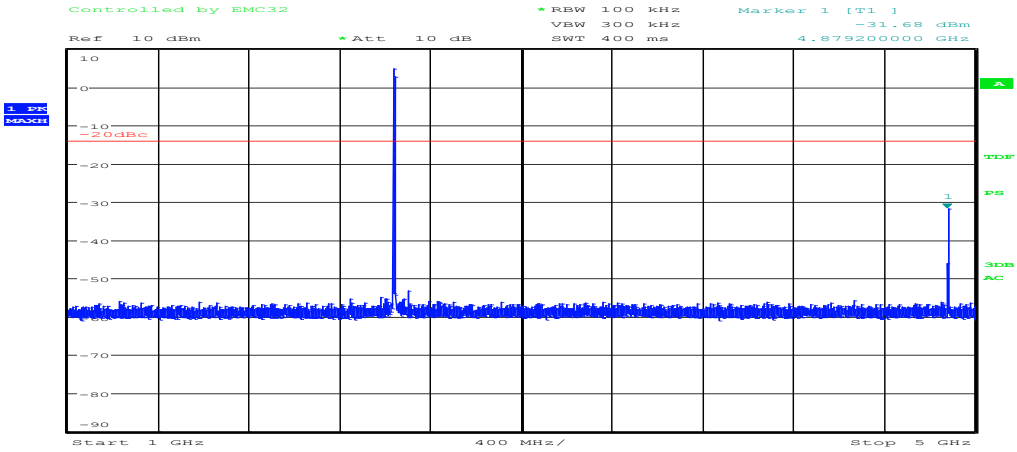


Graph 63

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Out-of-Band Emissions - – 100kHz, -20dBc
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 1GHz to 5GHz

Job Number: E2304-1648-1
Test Engineer: AZ

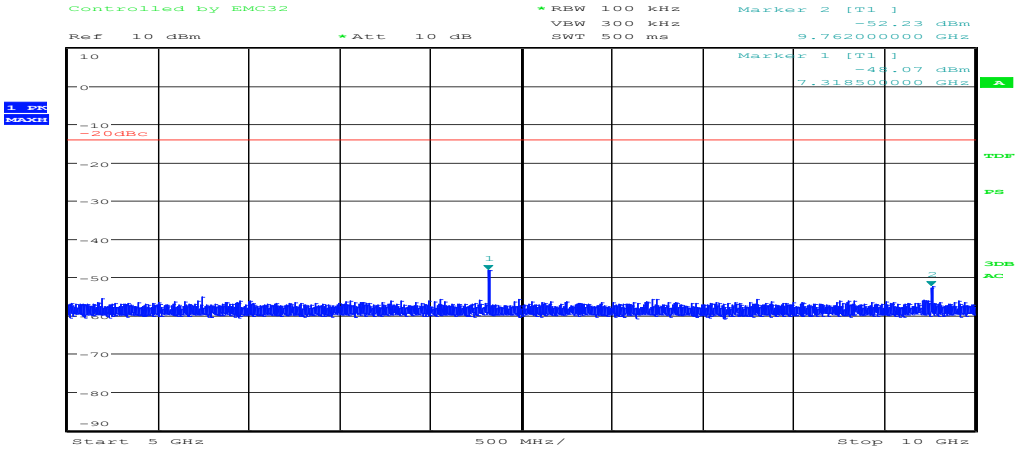


Graph 64

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Out-of-Band Emissions - – 100kHz, -20dBc
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 5GHz to 10GHz

Job Number: E2304-1648-1
Test Engineer: AZ

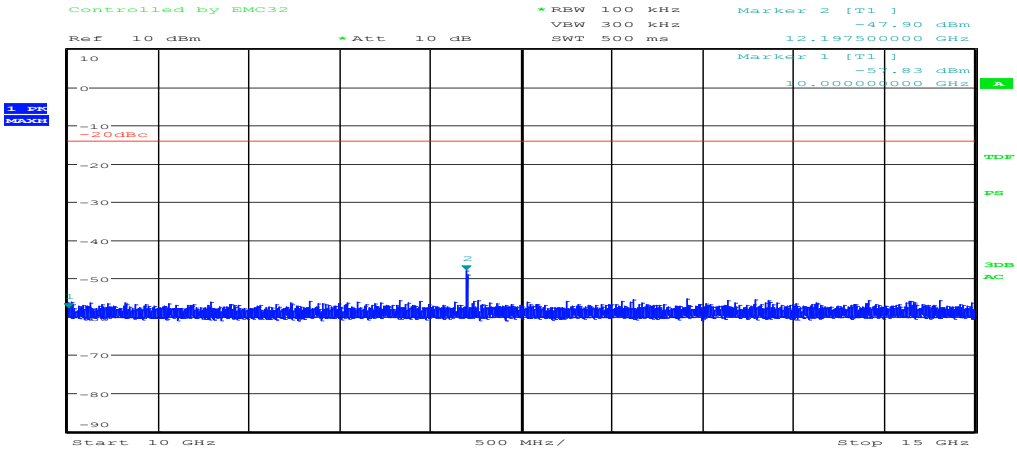


Graph 65

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Out-of-Band Emissions - – 100kHz, -20dBc
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 10GHz to 15GHz

Job Number: E2304-1648-1
Test Engineer: AZ

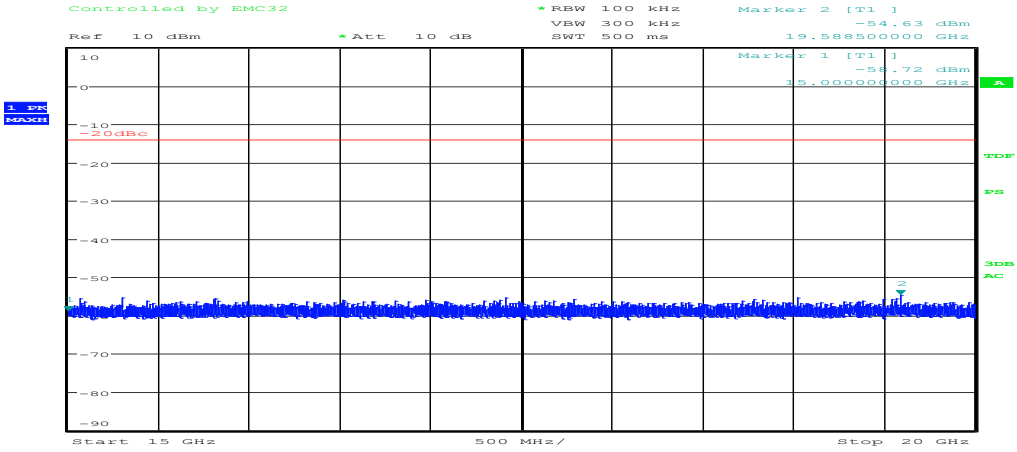


Graph 66

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Out-of-Band Emissions - – 100kHz, -20dBc
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 15GHz to 20GHz

Job Number: E2304-1648-1
Test Engineer: AZ

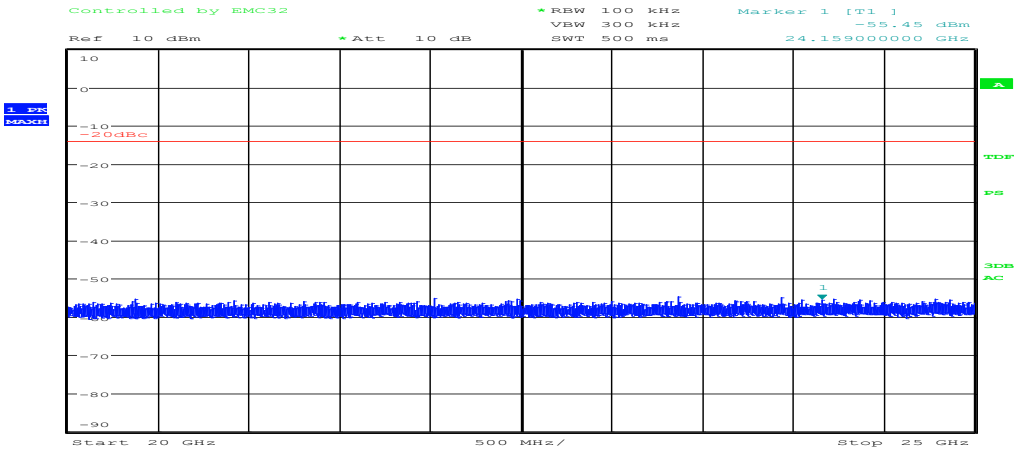


Graph 67

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Out-of-Band Emissions - – 100kHz, -20dBc
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 20GHz to 25GHz

Job Number: E2304-1648-1
Test Engineer: AZ

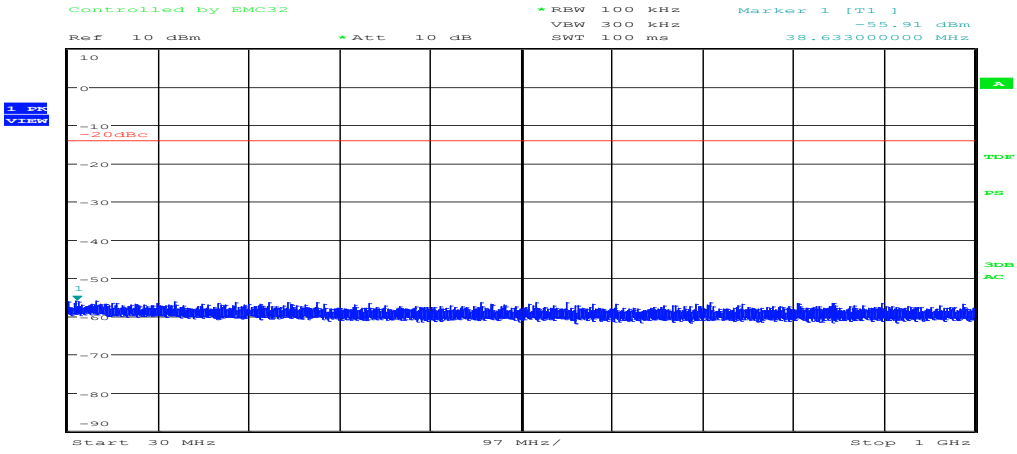


Graph 68

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Out-of-Band Emissions - – 100kHz, -20dBc
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel -– 30MHz to 1GHz

Job Number: E2304-1648-1
Test Engineer: AZ

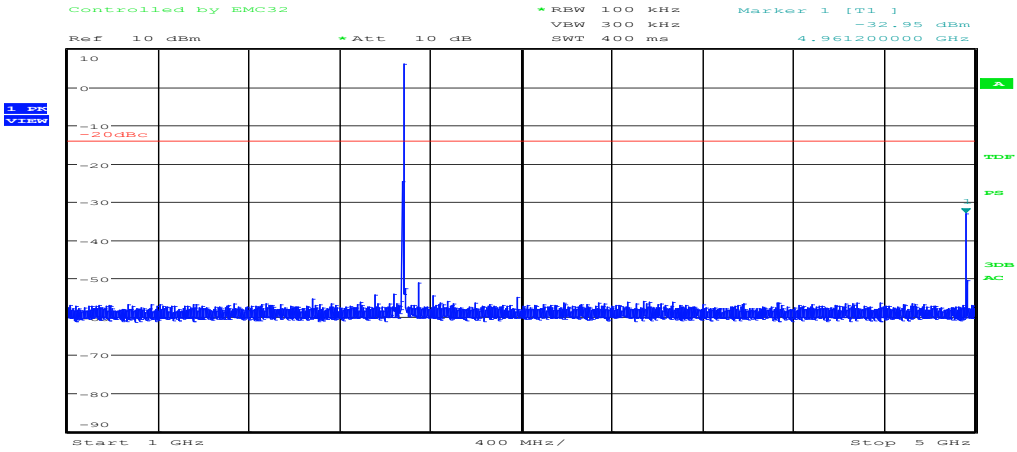


Graph 69

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Out-of-Band Emissions - – 100kHz, -20dBc
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 1GHz to 5GHz

Job Number: E2304-1648-1
Test Engineer: AZ

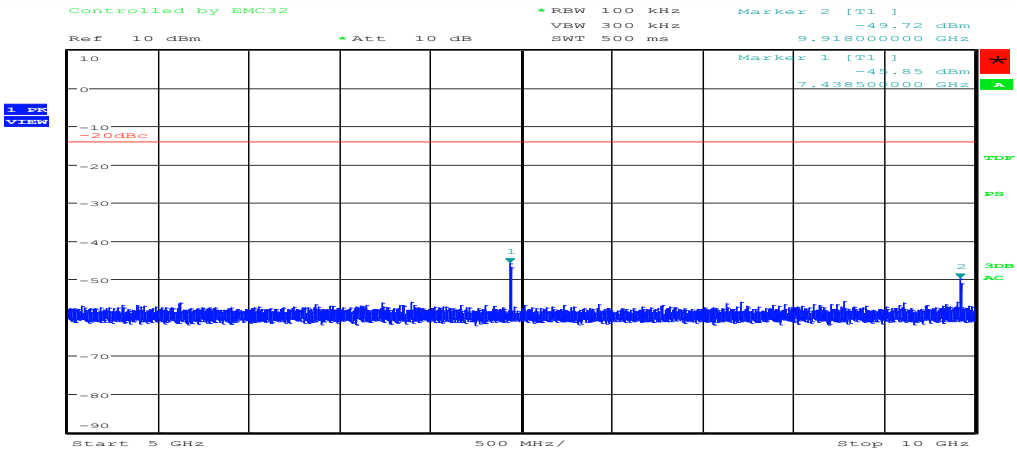


Graph 70

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Out-of-Band Emissions - – 100kHz, -20dBc
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 5GHz to 10GHz

Job Number: E2304-1648-1
Test Engineer: AZ

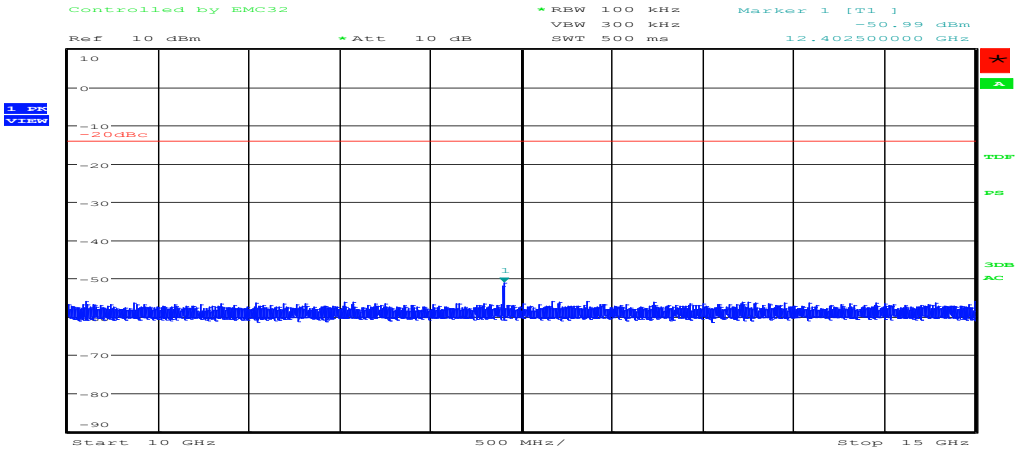


Graph 71

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Out-of-Band Emissions - – 100kHz, -20dBc
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 10GHz to 15GHz

Job Number: E2304-1648-1
Test Engineer: AZ

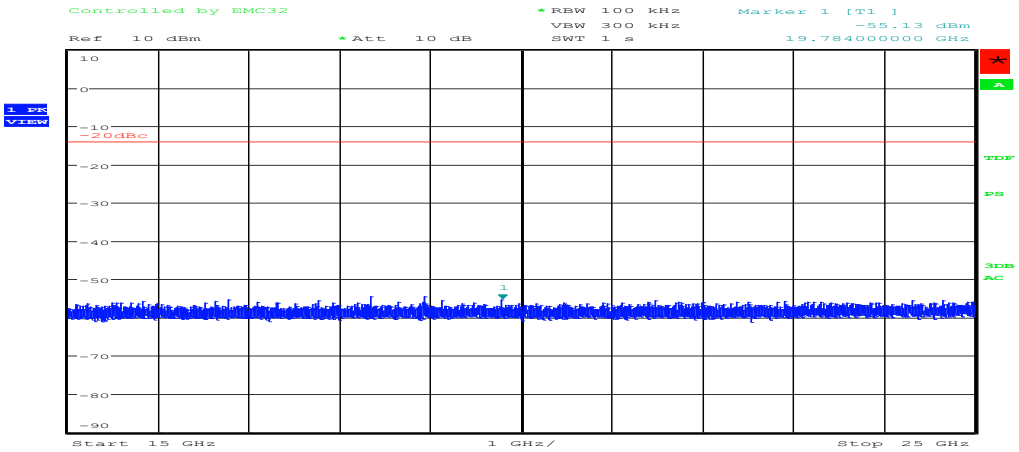


Graph 72

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Out-of-Band Emissions - – 100kHz, -20dBc
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 15GHz to 25GHz

Job Number: E2304-1648-1
Test Engineer: AZ



Graph 73

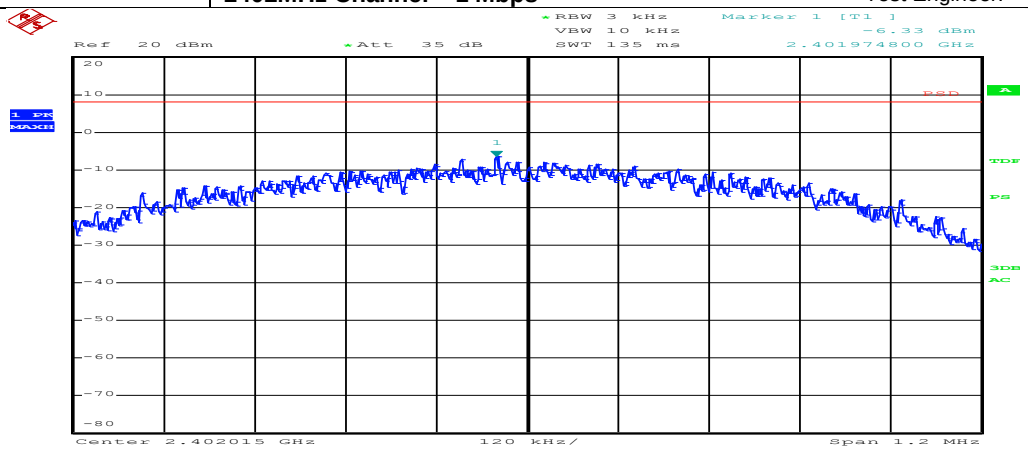
Appendix C.6 – Measurement Graphs – Power Spectral Density – FCC 15.247 (e)

No.	Test	Graph Description
74	Power Spectral Density – 1 Mbps	2402MHz Channel
75		2440MHz Channel
76		2480MHz Channel
77	Power Spectral Density – 2 Mbps	2402MHz Channel
78		2440MHz Channel
79		2480MHz Channel

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Peak Power Spectral Density
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 1 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ

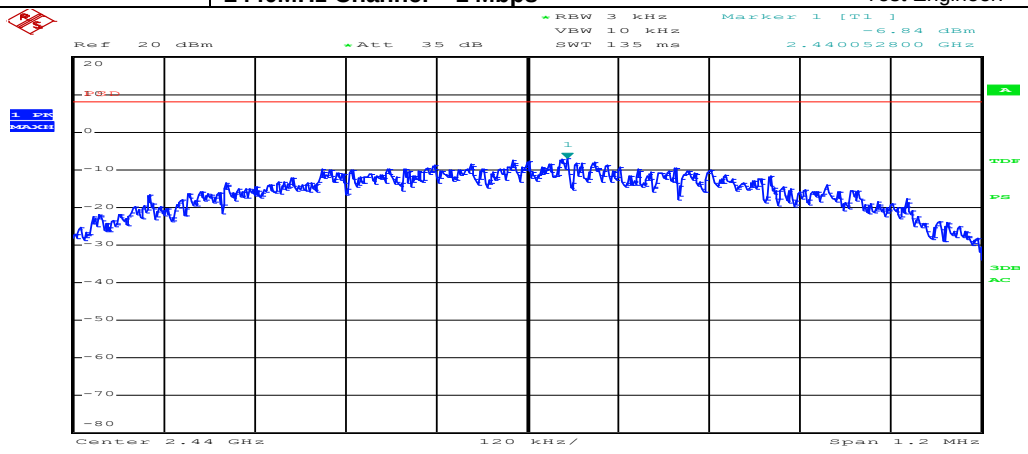


Graph 74

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Peak Power Spectral Density
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 1 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ

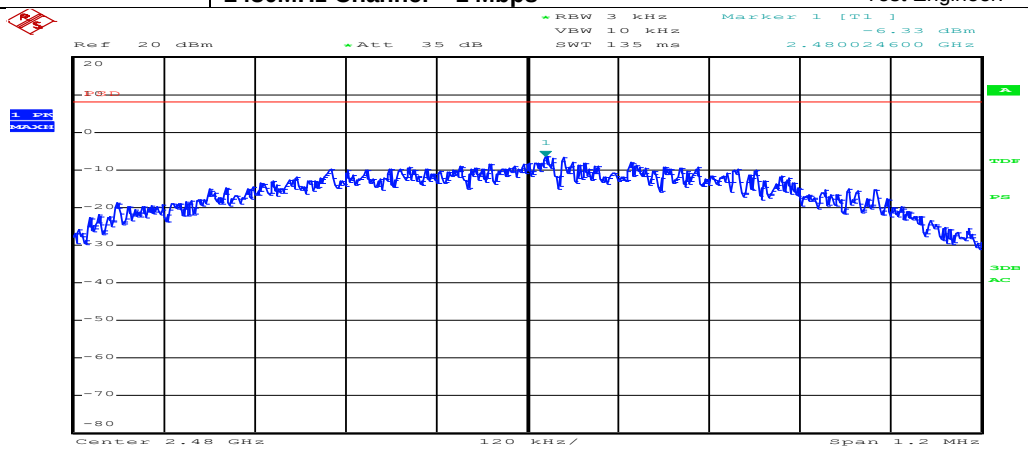


Graph 75

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Peak Power Spectral Density
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 1 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ

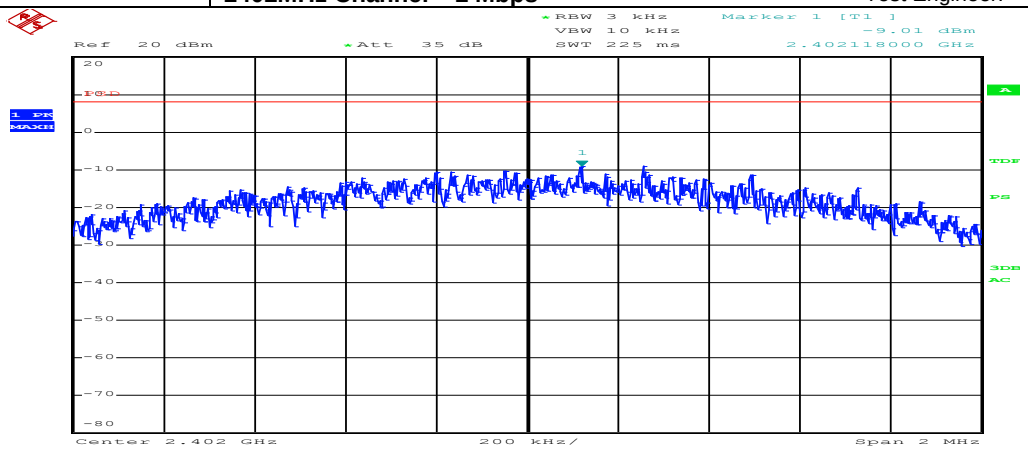


Graph 76

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Peak Power Spectral Density
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2402MHz Channel – 2 Mbps

Job Number: E2304-1648-1
Test Engineer: AZ



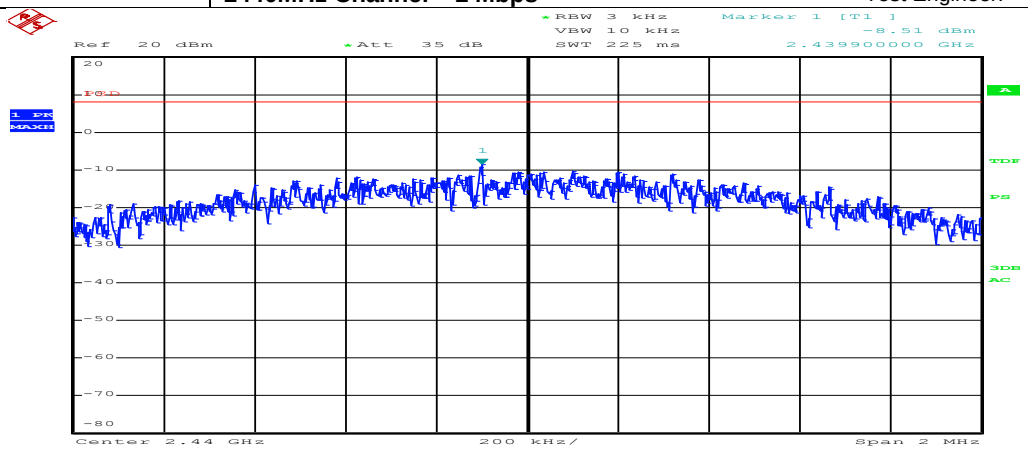
Graph 77

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Peak Power Spectral Density
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2440MHz Channel – 2 Mbps

Job Number: E2304-1648-1

Test Engineer: AZ



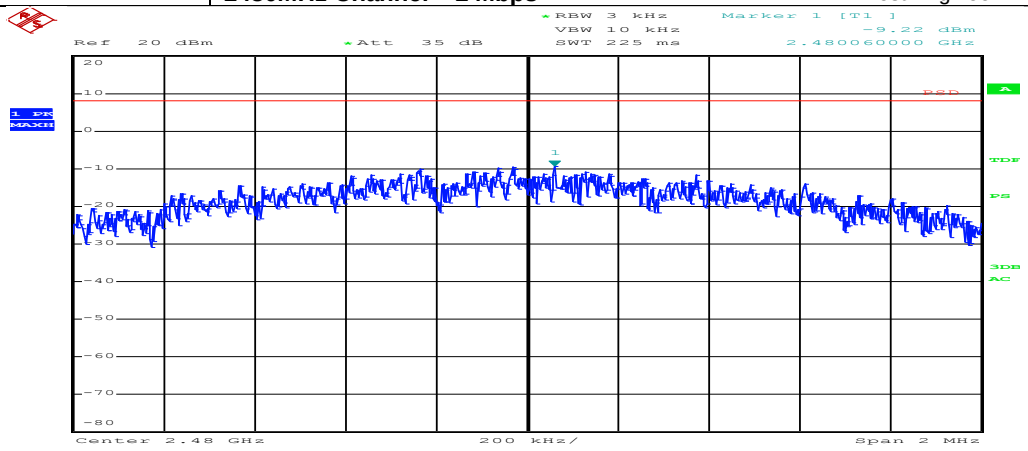
Graph 78

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C, 15.247 - Peak Power Spectral Density
Setec BMPRO Pty Ltd - SONIC - Bluetooth Module
2480MHz Channel – 2 Mbps

Job Number: E2304-1648-1

Test Engineer: AZ



Graph 79

Appendix C.7 – Occupied Bandwidth (99% Emission Bandwidth)

No.	Test	Graph Description
80	Occupied Bandwidth (99% Emission Bandwidth) – 1 Mbps	2402MHz Channel
81		2440MHz Channel
82		2480MHz Channel
83	Occupied Bandwidth (99% Emission Bandwidth) – 2 Mbps	2402MHz Channel
84		2440MHz Channel
85		2480MHz Channel

EMC Bayswater Pty. Ltd.

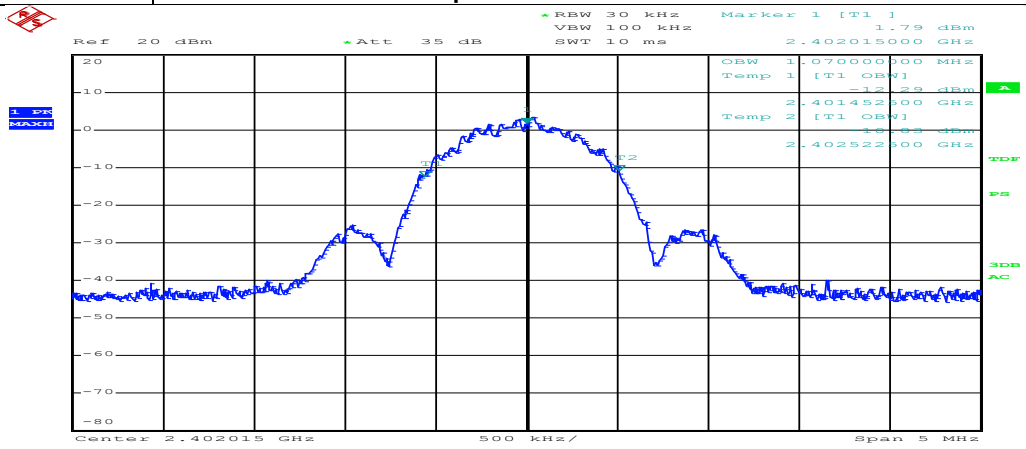
CFR47 FCC Part 15, Subpart C, 15.247 - Occupied Bandwidth (99% Emission Bandwidth)

Setec BMPRO Pty Ltd - SONIC - Bluetooth Module

2402MHz Channel – 1 Mbps

Job Number: E2304-1648-1

Test Engineer: AZ



Graph 80

EMC Bayswater Pty. Ltd.

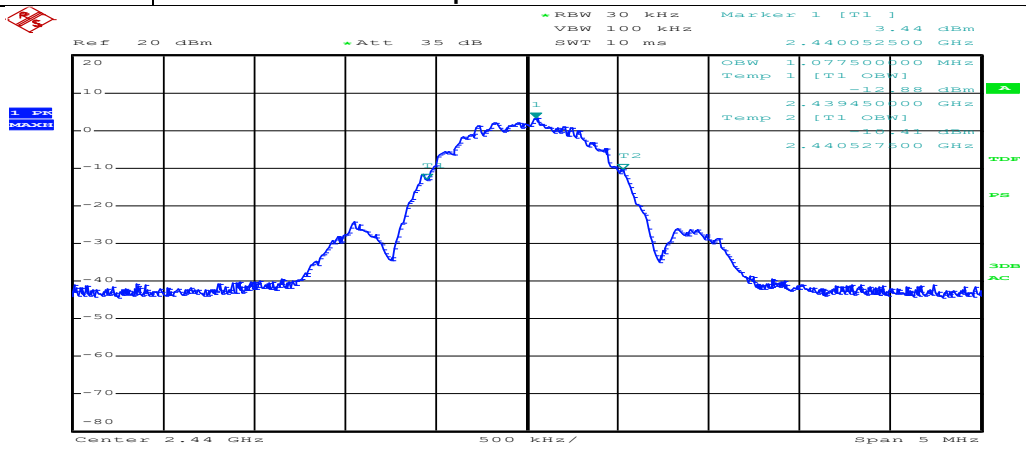
CFR47 FCC Part 15, Subpart C, 15.247 - Occupied Bandwidth (99% Emission Bandwidth)

Setec BMPRO Pty Ltd - SONIC - Bluetooth Module

2440MHz Channel – 1 Mbps

Job Number: E2304-1648-1

Test Engineer: AZ



Graph 81

EMC Bayswater Pty. Ltd.

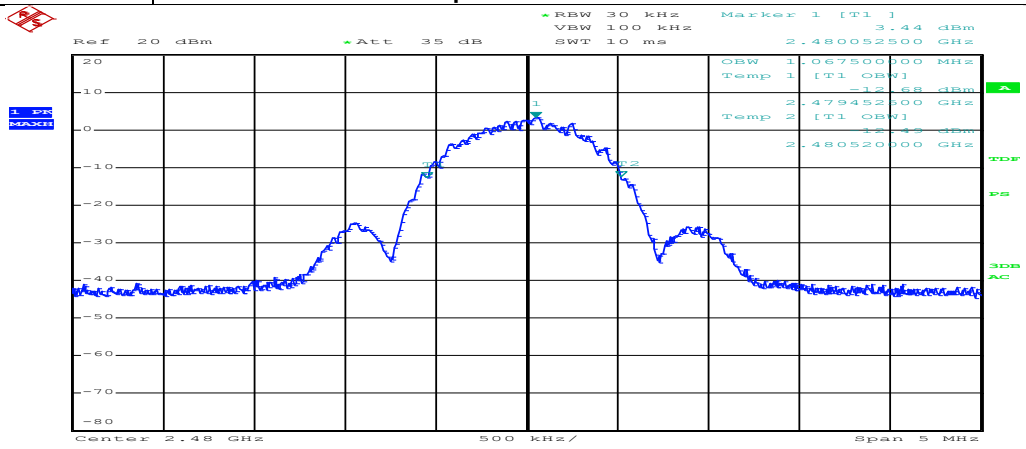
CFR47 FCC Part 15, Subpart C, 15.247 - Occupied Bandwidth (99% Emission Bandwidth)

Setec BMPRO Pty Ltd - SONIC - Bluetooth Module

2480MHz Channel – 1 Mbps

Job Number: E2304-1648-1

Test Engineer: AZ



Graph 82

EMC Bayswater Pty. Ltd.

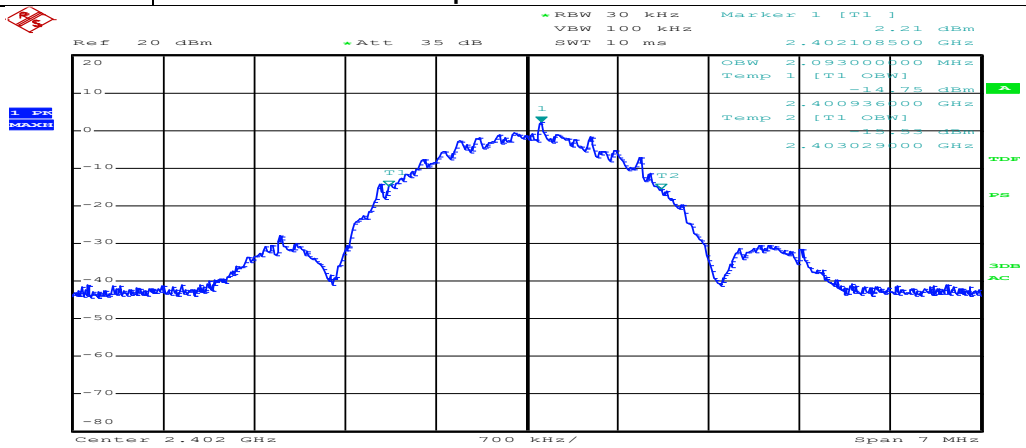
CFR47 FCC Part 15, Subpart C, 15.247 - Occupied Bandwidth (99% Emission Bandwidth)

Setec BMPRO Pty Ltd - SONIC - Bluetooth Module

2402MHz Channel – 2 Mbps

Job Number: E2304-1648-1

Test Engineer: AZ



Graph 83

EMC Bayswater Pty. Ltd.

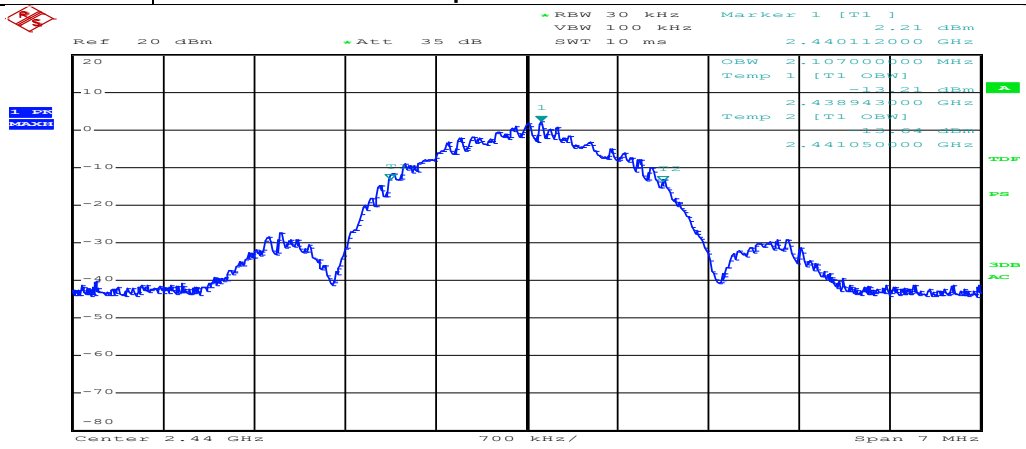
CFR47 FCC Part 15, Subpart C, 15.247 - Occupied Bandwidth (99% Emission Bandwidth)

Setec BMPRO Pty Ltd - SONIC - Bluetooth Module

2440MHz Channel – 2 Mbps

Job Number: E2304-1648-1

Test Engineer: AZ



Graph 84

EMC Bayswater Pty. Ltd.

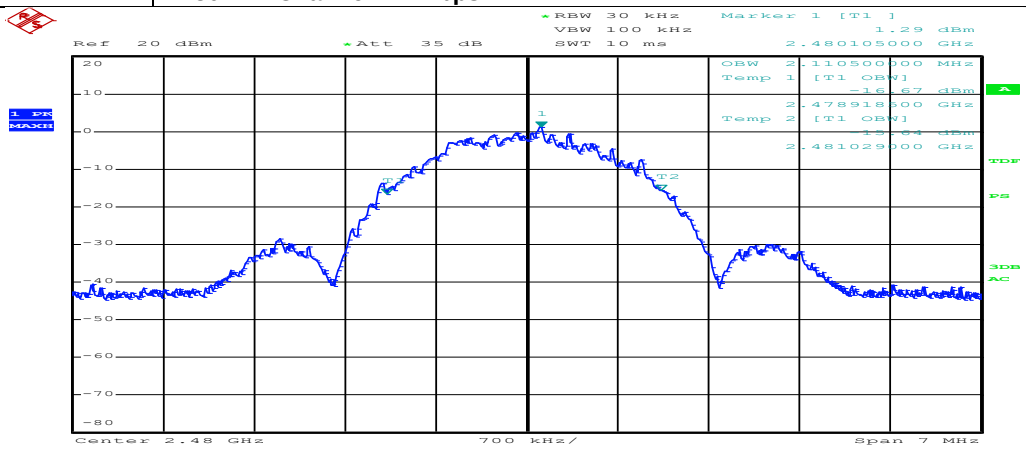
CFR47 FCC Part 15, Subpart C, 15.247 - Occupied Bandwidth (99% Emission Bandwidth)

Setec BMPRO Pty Ltd - SONIC - Bluetooth Module

2480MHz Channel – 2 Mbps

Job Number: E2304-1648-1

Test Engineer: AZ



Graph 85