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EMC Test Report

Application for FCC Grant of Equipment Authorization
Canada Certification

Innovation, Science and Economic Development Canada
RSS-Gen Issue 4 / RSS 247 Issue 2
FCC Part 15 Subpart C

Model: FB202 (Aria 2)

IC CERTIFICATION #:	8542A-FB202
FCC ID:	XRAFB202
APPLICANT:	Fitbit, Inc. 199 Fremont Street, 14th Floor San Francisco, CA 94105
TEST SITE(S):	National Technical Systems - Silicon Valley 41039 Boyce Road. Fremont, CA. 94538-2435
IC SITE REGISTRATION #:	2845B-7
REPORT DATE:	August 2, 2017
REISSUE DATE:	August 4, 2017
FINAL TEST DATES:	June 12, 15, 21, 22, 27 and July 5, 2017
TOTAL NUMBER OF PAGES:	105

ACCREDITED
Testing Cert #0214.26

VALIDATING SIGNATORIES

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REVISION HISTORY

Rev#	Date	Comments	Modified By
-	August 2, 2017	First release	
1.0	August 4, 2017	Clarified the BLE modulation	Mark Hill

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SCOPE

An electromagnetic emissions test has been performed on the Fitbit, Inc. model FB202 (Aria 2), pursuant to the following rules:

RSS-Gen Issue 4 " General Requirements for Compliance of Radio Apparatus"
RSS 247 Issue 2 "Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices"
FCC Part 15 Subpart C

Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in the following reference standards and as outlined in National Technical Systems - Silicon Valley test procedures:

ANSI C63.10-2013
FCC DTS Measurement Guidance KDB558074

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant Industry Canada performance and procedural standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

OBJECTIVE

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section.

Prior to marketing in the USA, all unlicensed transmitters and transceivers require certification. Receive-only devices operating between 30 MHz and 960 MHz are subject to either certification or a manufacturer's declaration of conformity, with all other receive-only devices exempt from the technical requirements.

Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification. Class II devices are required to meet the appropriate technical requirements but are exempt from certification requirements.

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

STATEMENT OF COMPLIANCE

The tested sample of Fitbit, Inc. model FB202 (Aria 2) complied with the requirements of the following regulations:

RSS-Gen Issue 4 " General Requirements for Compliance of Radio Apparatus"
RSS 247 Issue 2 "Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices"
FCC Part 15 Subpart C

Maintenance of compliance is the responsibility of the manufacturer. Any modifications to the product should be assessed to determine their potential impact on the compliance status of the device with respect to the standards detailed in this test report.

The test results recorded herein are based on a single type test of Fitbit, Inc. model FB202 (Aria 2) and therefore apply only to the tested sample. The sample was selected and prepared by Ricky Wang of Fitbit, Inc.

DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

TEST RESULTS SUMMARY

DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHz)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 247 5.2	Digital Modulation	BLE: GFSK 11b: DSSS (CCK) 11g/n20: OFDM	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	RSS 247 5.2 (a)	6dB Bandwidth	WIFI: 9.0 MHz BLE: 687 kHz	>500kHz	Complies
15.247 (b) (3)	RSS 247 5.4 (d)	Output Power (multipoint systems)	b: 19.1 dBm (81.3mW) g: 18.8 dBm (75.9mW) n20: 18.7 dBm (74.1mW) EIRP = 0.131 W Note 1 BLE: 6.9 dBm (4.9mW) EIRP = 0.008 W Note 1	1Watt, EIRP limited to 4 Watts.	Complies
15.247(e)	RSS 247 5.2 (b)	Power Spectral Density	b: 1.4 dBm/10kHz g: -0.8 dBm/10kHz n20: -0.3 dBm/10kHz BLE: -2.0 dBm/10kHz	8dBm/3kHz	Complies
15.247(d)	RSS 247 5.5	Antenna Port Spurious Emissions 30MHz – 25 GHz	All emissions below the -30dBc Limit	< -30dBc Note 2	Complies
15.247(d) / 15.209	RSS 247 5.5	Radiated Spurious Emissions 30MHz – 25 GHz	70.8 dBµV/m @ 2483.8 MHz (-3.2 dB)	Refer to the limits section (p20) for restricted bands, all others <-30dBc Note 2	Complies

Note 1: EIRP calculated using antenna gains of 2.4 dBi for the highest EIRP system.
Note 2: Limit of -30dBc used because the power was measured using the UNII test procedure (maximum power averaged over a transmission burst).

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Antennas are internal to the enclosure	Unique or integral antenna required	Complies
15.407 (b) (6)	RSS-Gen Table 3	AC Conducted Emissions	N/A – EUT is battery powered		
15.247 (i) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to the SAR reports provided.	Refer to OET 65, FCC Part 1 and RSS 102	Complies
-	RSS-Gen 8.3	User Manual	Antennas are not detachable	Statement for products with detachable antenna	N/A
-	RSS-Gen 8.4	User Manual	Refer to users manual	Statement for all products	Complies
-	RSP-100 RSS-Gen 6.6	Occupied Bandwidth	b: 14.0MHz g: 16.7MHz n20: 17.7 MHz BLE: 1.1 MHz	Information only	N/A

MEASUREMENT UNCERTAINTIES

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
RF power, conducted (power meter)	dBm	25 to 7000 MHz	± 0.52 dB
RF power, conducted (Spectrum analyzer)	dBm	25 to 7000 MHz	± 0.7 dB
Conducted emission of transmitter	dBm	25 to 26500 MHz	± 0.7 dB
Conducted emission of receiver	dBm	25 to 26500 MHz	± 0.7 dB
Radiated emission (substitution method)	dBm	25 to 26500 MHz	± 2.5 dB
Radiated emission (field strength)	dBµV/m	25 to 1000 MHz	± 3.6 dB
		1000 to 40000 MHz	± 6.0 dB
Conducted Emissions (AC Power)	dBµV	0.15 to 30 MHz	± 2.4 dB

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Fitbit, Inc. model FB202 (Aria 2) is a wireless smart scale that is designed to provide user fitness data. The EUT is powered via batteries. There is no battery charger option.

The sample was received on June 12, 2017 and tested on June 12, 15, 21, 22, 27 and July 5, 2017. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Fitbit	FB202	Wireless Smart Scale	Refer to test data	XRAFB202

OTHER EUT DETAILS

IEEE 802.11 radio has one output, but uses Tx/Rx diversity.
Bluetooth operation is limited to Low Energy.
No simultaneous transmission supported.

ANTENNA SYSTEM

Internal antennas, Antenna 1: 2.36dBi; Antenna 2: 2.21dBi (peak gain)

ENCLOSURE

The EUT enclosure measures approximately 31.5 by 31.5 by 3 centimeters. It is primarily constructed of glass and uncoated coated plastic.

MODIFICATIONS

No modifications were made to the EUT during the time the product was at NTS Silicon Valley.

SUPPORT EQUIPMENT

The following equipment was used as support equipment for testing:

Company	Model	Description	Serial Number	FCC ID
Lenovo	Thinkpad T450 20BV000DUS	Laptop PC for EUT	PC0B4RW0	-

Note: For radio testing (spurious and antenna port), the laptop was used to configure the device and then disconnected during testing.

EUT INTERFACE PORTS

The I/O cabling configuration during testing was as follows:

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
None	-	-	-	-

EUT OPERATION

During emissions testing the EUT was in either Tx or Rx mode. In Tx mode it was transmitting on the channel & at the power level called out in the specific test. In Rx mode it was set to receive on the channel called out in the specific test.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission and with industry Canada.

Site	Designation / Registration Numbers		Location
	FCC	Canada	
Chamber 7	US0027	2845B-7	41039 Boyce Road Fremont, CA 94538-2435

ANSI C63.4 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement. The test site(s) contain separate areas for radiated and conducted emissions testing. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4.

RADIATED EMISSIONS CONSIDERATIONS

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment or in a semi-anechoic chamber. The test sites are maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4 guidelines and meet the Normalized Site Attenuation (NSA) requirements of ANSI C63.4.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements. If the repetition frequency of the signal being measured is below 20Hz, peak measurements are made in lieu of Quasi-Peak measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz, unless the signal is pulsed in which case the average (or video) bandwidth of the measuring instrument is reduced to onset of pulse desensitization and then increased.

INSTRUMENT CONTROL COMPUTER

Software is used to view and convert receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers. The software used for radiated and conducted emissions measurements is NTS EMI Test Software (rev 2.10)

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

A loop antenna is used below 30 MHz. For the measurement range 30 MHz to 1000 MHz either a combination of a biconical antenna and a log periodic or a bi-log antenna is used. Above 1000 MHz, horn antennas are used. The antenna calibration factors to convert the received voltage to an electric field strength are included with appropriate cable loss and amplifier gain factors to determine an overall site factor, which is then programmed into the test receivers or incorporated into the test software.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height. Measurements below 30 MHz are made with the loop antenna at a fixed height of 1m above the ground plane.

ANSI C63.10 specifies that the test height above ground for table mounted devices shall be 80 centimeters for measurement below 1GHz, and 1.5m for measurements above 1GHz. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor as specified in ANSI C63.4. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

TEST PROCEDURES

EUT AND CABLE PLACEMENT

The regulations require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.10, and the worst-case orientation is used for final measurements.

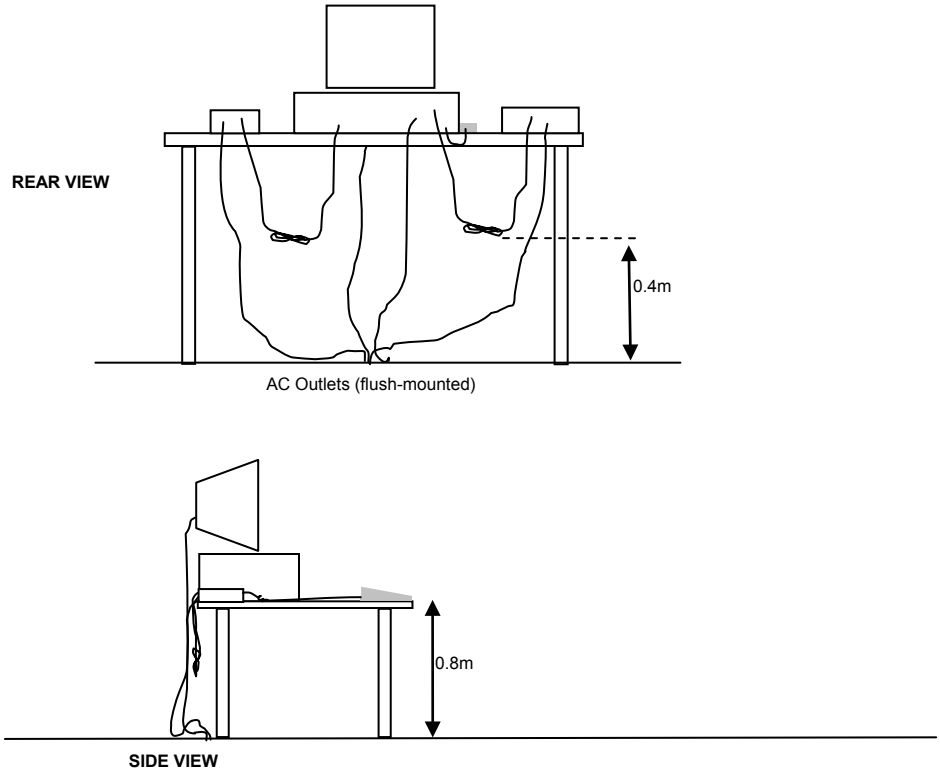
RADIATED EMISSIONS

A preliminary scan of the radiated emissions is performed in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed, one scan for each antenna polarization (horizontal and vertical; loop parallel and perpendicular to the EUT). During the preliminary scans, the EUT is rotated through 360˚, the antenna height is varied (for measurements above 30 MHz) and cable positions are varied to determine the highest emission relative to the limit. Preliminary scans may be performed in a fully anechoic chamber for the purposes of identifying the frequencies of the highest emissions from the EUT.

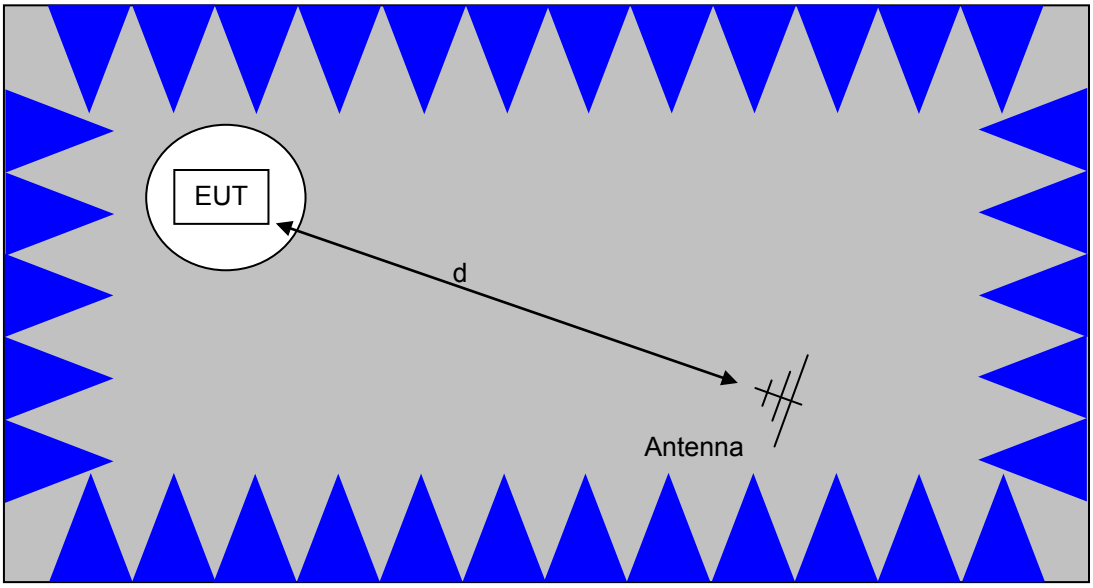
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth, which results in the highest emission is then maintained while varying the antenna height from one to four meters (for measurements above 30 MHz, measurements below 30 MHz are made with the loop antenna at a fixed height of 1m). The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain.

When testing above 18 GHz, the receive antenna is located at 1meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.

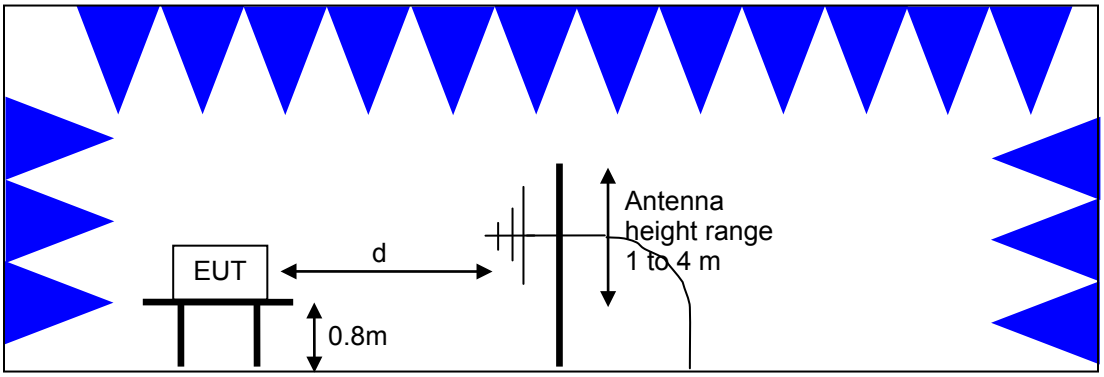


Typical Test Configuration for Radiated Field Strength Measurements



The anechoic materials on the walls and ceiling ensure compliance with the normalized site attenuation requirements of CISPR 16 / CISPR 22 / ANSI C63.4 for an alternate test site at the measurement distances used.

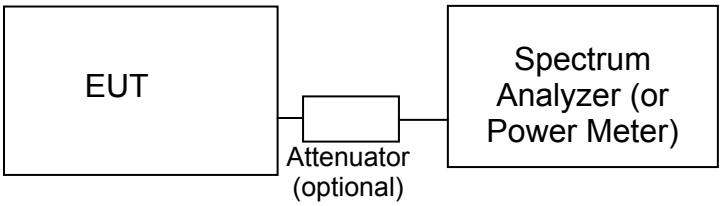
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



Test Configuration for Radiated Field Strength Measurements
Semi-Anechoic Chamber, Plan and Side Views

CONDUCTED EMISSIONS FROM ANTENNA PORT

Direct measurements of power, bandwidth and power spectral density are performed, where possible, with the antenna port of the EUT connected to either the power meter or spectrum analyzer via a suitable attenuator and/or filter. These are used to ensure that the front end of the measurement instrument is not overloaded by the fundamental transmission.



Test Configuration for Antenna Port Measurements

Measurement bandwidths (video and resolution) are set in accordance with the relevant standards and NTS Silicon Valley's test procedures for the type of radio being tested. When power measurements are made using a resolution bandwidth less than the signal bandwidth the power is calculated by summing the power across the signal bandwidth using either the analyzer channel power function or by capturing the trace data and calculating the power using software. In both cases the summed power is corrected to account for the equivalent noise bandwidth (ENBW) of the resolution bandwidth used.

If power averaging is used (typically for certain digital modulation techniques), the EUT is configured to transmit continuously. Power averaging is performed using either the built-in function of the analyzer or, if the analyzer does not feature power averaging, using external software. In both cases the average power is calculated over a number of sweeps (typically 100). When the EUT cannot be configured to continuously transmit then either the analyzer is configured to perform a gated sweep to ensure that the power is averaged over periods that the device is transmitting or power averaging is disabled and a max-hold feature is used.

If a power meter is used to make output power measurements the sensor head type (peak or average) is stated in the test data table.

BANDWIDTH MEASUREMENTS

The 6dB, 20dB, 26dB and/or 99% signal bandwidth are measured using the bandwidths recommended by ANSI C63.10 and RSS GEN.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands[1].

Frequency Range (MHz)	Limit (uV/m)	Limit (dBuV/m @ 3m)
0.009-0.490	$2400/F_{KHz}$ @ 300m	$67.6-20*\log_{10}(F_{KHz})$ @ 300m
0.490-1.705	$24000/F_{KHz}$ @ 30m	$87.6-20*\log_{10}(F_{KHz})$ @ 30m
1.705 to 30	30 @ 30m	29.5 @ 30m
30 to 88	100 @ 3m	40 @ 3m
88 to 216	150 @ 3m	43.5 @ 3m
216 to 960	200 @ 3m	46.0 @ 3m
Above 960	500 @ 3m	54.0 @ 3m

RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from receivers as detailed in FCC Part 15.109 and RSS GEN Table 2. Note that receivers operating outside of the frequency range 30 MHz – 960 MHz are exempt from the requirements of 15.109 and receivers that are not stand-alone are exempt from the ISED Canada requirements per RSS-GEN.

Frequency Range (MHz)	Limit (uV/m @ 3m)	Limit (dBuV/m @ 3m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

[1] The restricted bands are detailed in FCC 15.205 and RSS-Gen Table 6

OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS

The table below shows the limits for output power and output power density.

Operating Frequency (MHz)	Output Power	Power Spectral Density
2400 – 2483.5	1 Watt (30 dBm)	8 dBm/3kHz

The maximum permitted output power is reduced by 1dB for every dB the antenna gain exceeds 6dBi.

TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS

The limits for unwanted (spurious) emissions from the transmitter falling in the restricted bands are those specified in the general limits sections of FCC Part 15 and RSS GEN. All other unwanted (spurious) emissions shall be at least 20dB below the level of the highest in-band signal level (30dB if the power is measured using the sample detector/power averaging method).

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form) as follows:

$$R_r - S = M$$

where:
R_r = Receiver Reading in dBuV
S = Specification Limit in dBuV
M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

A distance factor, when used for electric field measurements above 30MHz, is calculated by using the following formula:

$$F_d = 20*LOG_{10}(D_m/D_s)$$

where:
F_d = Distance Factor in dB
D_m = Measurement Distance in meters
D_s = Specification Distance in meters

For electric field measurements below 30MHz the extrapolation factor is either determined by making measurements at multiple distances or a theoretical value is calculated using the formula:

$$F_d = 40*LOG_{10}(D_m/D_s)$$

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:
R_r = Receiver Reading in dBuV/m
F_d = Distance Factor in dB
R_c = Corrected Reading in dBuV/m
L_s = Specification Limit in dBuV/m
M = Margin in dB Relative to Spec

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

Where the radiated electric field strength is expressed in terms of the equivalent isotropic radiated power (eirp), or where a field strength measurement of output power is made in lieu of a direct measurement, the following formula is used to convert between eirp and field strength at a distance of d (meters) from the equipment under test:

$$E = \frac{1000000 \sqrt{30 P}}{d} \quad \text{microvolts per meter}$$

where P is the eirp (Watts)

For a measurement at 3m the conversion from a logarithmic value for field strength (dBuV/m) to an eirp power (dBm) is -95.3dB.

Appendix A Test Equipment Calibration Data

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Duty Cycle, 12-Apr-17					
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	1538	2/11/2017	2/11/2018
Radiated Emissions, 1000 - 6,000 MHz, 12-Jun-17					
EMCO	Antenna, Horn, 1-18 GHz	3115	786	12/21/2015	12/21/2017
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	1538	2/11/2017	2/11/2018
Radiated Spurious Emissions, 1000 - 6,500 MHz, 15-Jun-17					
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A
EMCO	Antenna, Horn, 1-18 GHz	3115	786	12/21/2015	12/21/2017
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	1538	2/11/2017	2/11/2018
Radiated Emissions, 1000 - 25,000 MHz, 21-Jun-17					
EMCO	Antenna, Horn, 1-18 GHz	3115	786	12/21/2015	12/21/2017
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	1/17/2017	1/17/2018
Hewlett Packard	High Pass filter, 8.2 GHz	P/N 84300-80039	1156	5/10/2017	5/10/2018
HP / Miteq	SA40 P Head HF preAmplifier, 18-40 GHz (w/2415)	TTA1840-45-5P-HG-S	1772	9/12/2016	N/A
A. H. Systems	Spare System Horn, 18-40GHz	SAS-574, p/n: 2581	2162	7/29/2015	7/29/2017
Micro-Tronics	Band Reject Filter, 2400-2500 MHz 18GHz	BRM50702-02	2238	5/17/2017	5/17/2018
Hewlett Packard	Spectrum Analyzer (SA40) Purple 9 kHz - 40 GHz,	8564E (84125C)	2415	3/1/2017	3/1/2018
Radiated Emissions, 1000 - 25,000 MHz, 22-Jun-17					
EMCO	Antenna, Horn, 1-18 GHz	3115	786	12/21/2015	12/21/2017
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	1/17/2017	1/17/2018
Hewlett Packard	High Pass filter, 8.2 GHz	P/N 84300-80039	1156	5/10/2017	5/10/2018
HP / Miteq	SA40 P Head HF preAmplifier, 18-40 GHz (w/2415)	TTA1840-45-5P-HG-S	1772	9/12/2016	N/A
A. H. Systems	Spare System Horn, 18-40GHz	SAS-574, p/n: 2581	2162	7/29/2015	7/29/2017
Micro-Tronics	Band Reject Filter, 2400-2500 MHz 18GHz	BRM50702-02	2238	5/17/2017	5/17/2018
Hewlett Packard	Spectrum Analyzer (SA40) Purple 9 kHz - 40 GHz,	8564E (84125C)	2415	3/1/2017	3/1/2018
Radiated Emissions, 30 - 1,000 MHz, 22-Jun-17					
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	1538	2/11/2017	2/11/2018
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1657	7/27/2016	7/27/2018
Hewlett Packard	9KHz-1300MHz pre-amp	8447F	2777	1/27/2017	1/27/2018

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Radiated Emissions, 30 - 1,000 MHz, 27-Jun-17					
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	1538	2/11/2017	2/11/2018
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1657	7/27/2016	7/27/2018
Hewlett Packard	9KHz-1300MHz pre-amp	8447F	2777	1/27/2017	1/27/2018
Radio Antenna Port (Power and Spurious Emissions), 27-Jun-17					
Agilent Technologies	USB Average Power Sensor	U2001A	2442	1/5/2017	1/5/2018
Agilent Technologies	3Hz -44GHz PSA Spectrum Analyzer	E4446A	2796	5/22/2017	5/22/2018
Radio Antenna Port (Power and Spurious Emissions), 05-Jul-17					
Rohde & Schwarz	Open Switch and Control Unit, p/s	OSP120 with B157	3000	4/7/2017	4/17/2018

Appendix B Test Data

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Client:	Fitbit, Inc.	Job Number:	JD99548
Product	FB202 (Aria 2)	T-Log Number:	T99619
System Configuration:	-	Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Emissions Standard(s):	FCC 15.247/RSS-247/LP0002	Class:	B
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Fitbit, Inc.

Product

FB202 (Aria 2)

Date of Last Test: 6/27/2017

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Duty Cycle

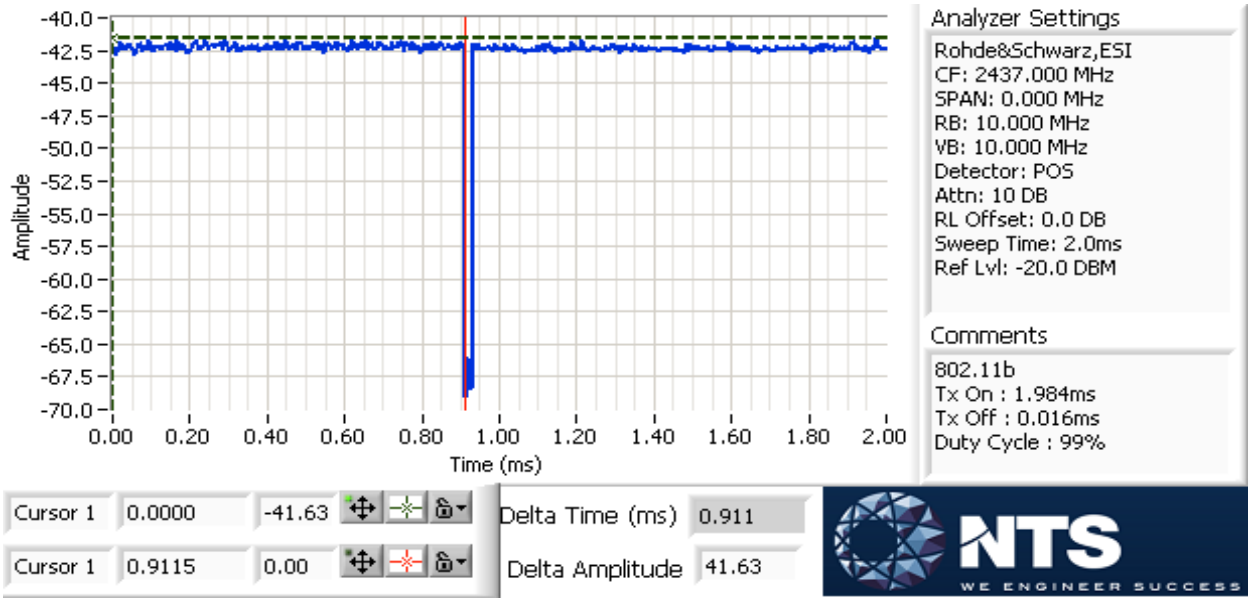
Date of Test: 4/12/2017
Test Engineer: Rafael Varelas
Test Location: FT Chamber #7

Duty cycle measurements performed on the worse case data rate for power.

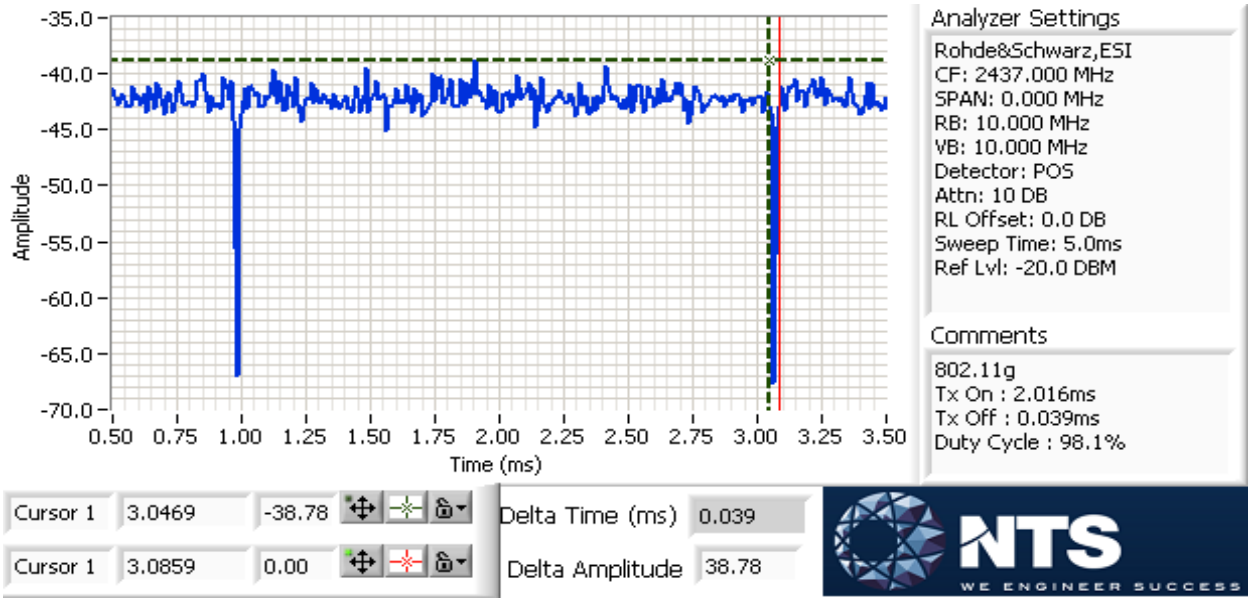
Notes: Measurements taken with maximum RBW/VBW settings allowed.

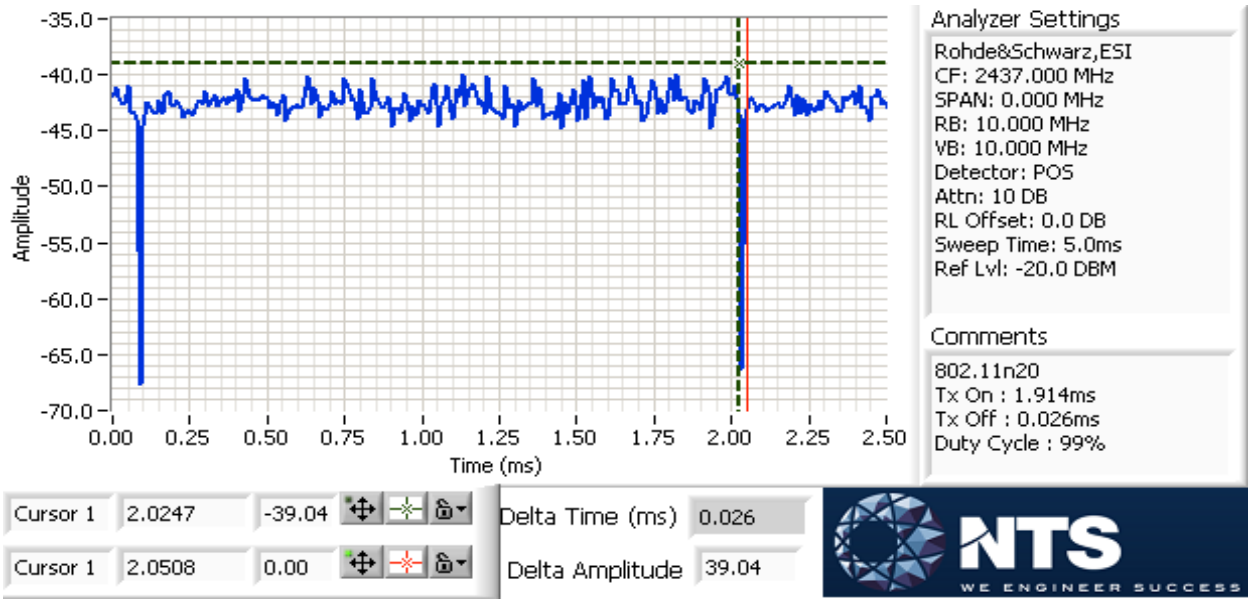
Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11b	1 Mb/s	0.99	Yes	1.984	0	0	10
11g	6 Mb/s	0.981	Yes	2.016	0	0	10
HT20	MCS0	0.99	Yes	1.914	0	0	10
BLE	1 Mb/s	0.63	Yes	0.404	2.0	4.1	2475

* Correction factor when using RMS/Power averaging - 10*log(1/x)
** Correction factor when using linear voltage average - 20*log(1/x)
T = Minimum transmission duration

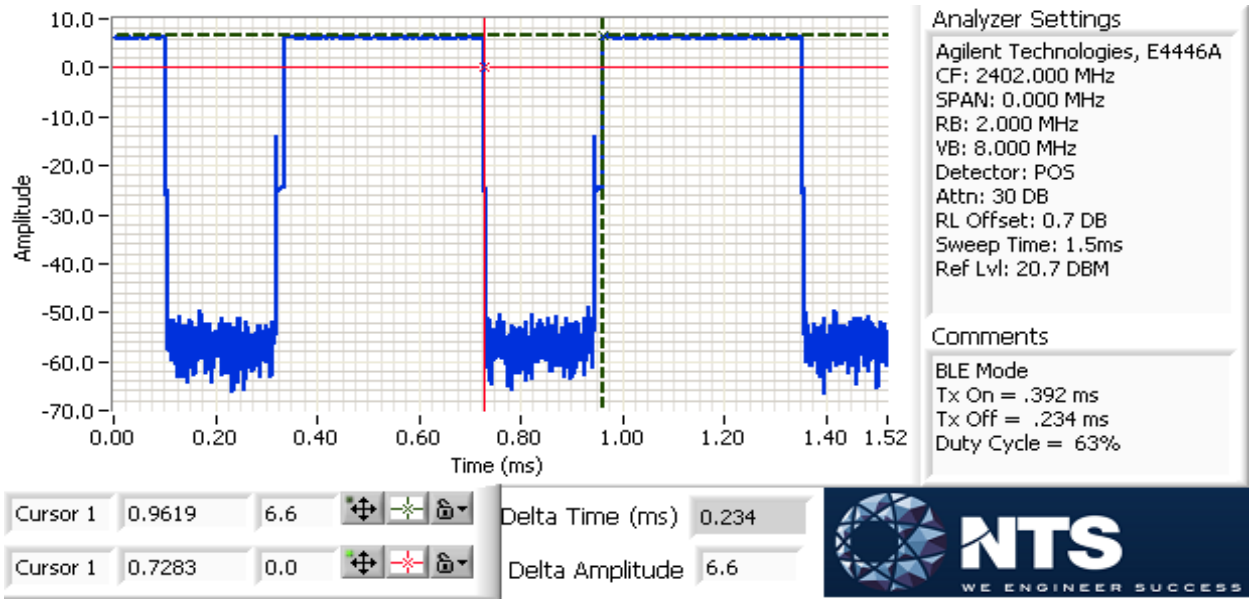


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A





Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

RSS-247 and FCC 15.247 (DTS) Radiated Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.
For radiated emissions testing the measurement antenna was located 3 meters from the EUT, unless otherwise noted.

Ambient Conditions:

Temperature: 22.4 °C
Rel. Humidity: 38 %

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel	Target Power	Power Setting	Test Performed	Limit	Result / Margin
1	b	1 - 2412MHz	21	21	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	47.8 dBµV/m @ 2381.9 MHz (-6.2 dB)
		11 - 2462MHz		21	Restricted Band Edge (2483.5 MHz)		49.1 dBµV/m @ 2484.1 MHz (-4.9 dB)
2	g	1 - 2412MHz		16	Restricted Band Edge (2390 MHz)		70.4 dBµV/m @ 2386.8 MHz (-3.6 dB)
		2 - 2417MHz		20			48.4 dBµV/m @ 2390.0 MHz (-5.6 dB)
		3 - 2422MHz		21			48.1 dBµV/m @ 2390.0 MHz (-5.9 dB)
		9 - 2452MHz		21	Restricted Band Edge (2483.5 MHz)		49.5 dBµV/m @ 2483.5 MHz (-4.5 dB)
		10 - 2457MHz		20			48.6 dBµV/m @ 2483.5 MHz (-5.4 dB)
		11 - 2462MHz		16			70.8 dBµV/m @ 2483.8 MHz (-3.2 dB)
3	n20	1 - 2412MHz		18	Restricted Band Edge (2390 MHz)		69.5 dBµV/m @ 2389.5 MHz (-4.5 dB)
		2 - 2417MHz		21			50.6 dBµV/m @ 2390.0 MHz (-3.4 dB)
		11 - 2462MHz		17	Restricted Band Edge (2483.5 MHz)		70.5 dBµV/m @ 2483.9 MHz (-3.5 dB)
		10 - 2457MHz		20			69.0 dBµV/m @ 2484.7 MHz (-5.0 dB)

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Sample Notes

Sample S/N: 1704272408B1373917
Driver: -
Antenna: Internal

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074
Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time
Unless otherwise stated/noted, emission has a duty cycle ≥ 98% and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear average mode, auto sweep time, max hold.

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11b	1 Mb/s	0.99	Yes	1.984	0	0	10
11g	6 Mb/s	0.981	Yes	2.016	0	0	10
HT20	MCS0	0.99	Yes	1.914	0	0	10

Measurement Specific Notes:

Note 1:	Emission in non-restricted band, but limit of 15.209 used.
Note 2:	Emission in non-restricted band, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Notes:

The EUT was rotated thru three orientations to determine worse case
The EUT was placed on a surface 1.5m above the ground plane in order to get accruate measurement results.
The EUT supports tx diversity, testing was performed using 11b to determine the worse case antenna. This was used for the other modes.

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

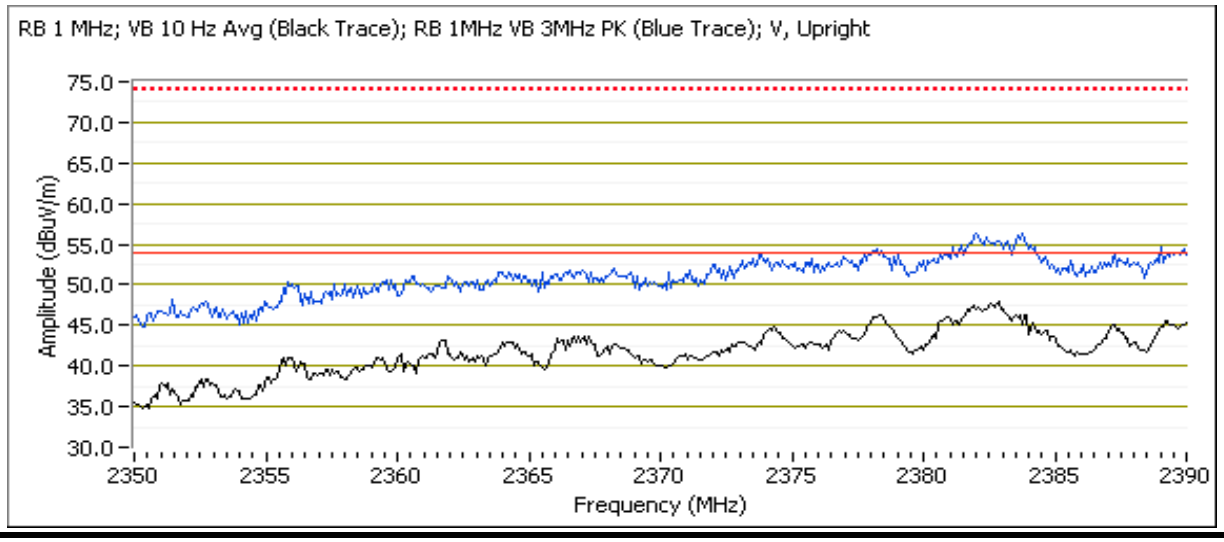
Run #1: Radiated Bandedge Measurements

Date of Test: 6/12/2017 0:00 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Chamber #7 EUT Voltage: Battery

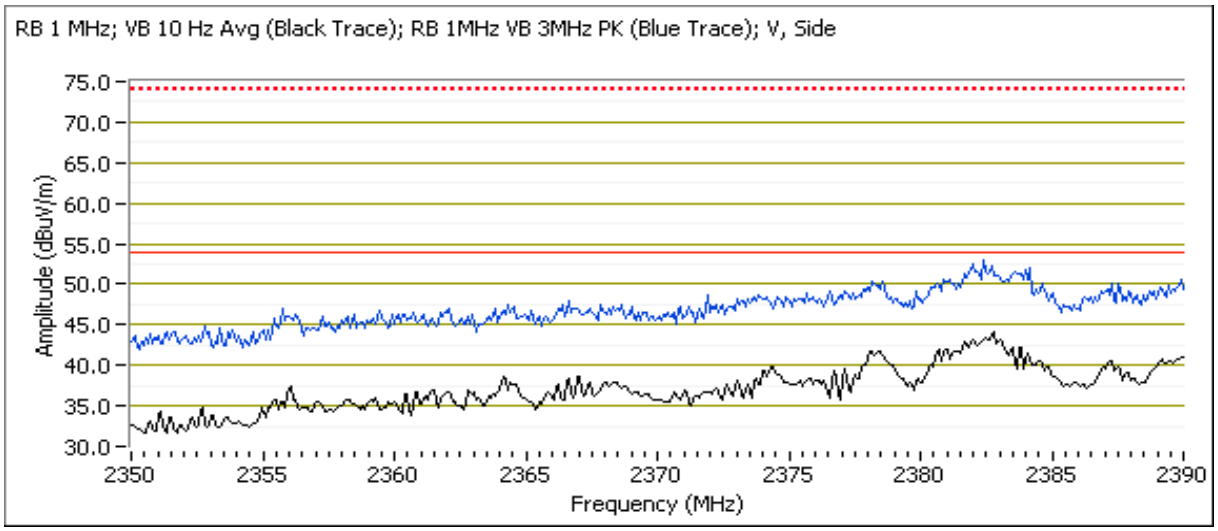
Channel: 1 Mode: b
Tx Chain: 0 - Main Data Rate: 1 Mb/s

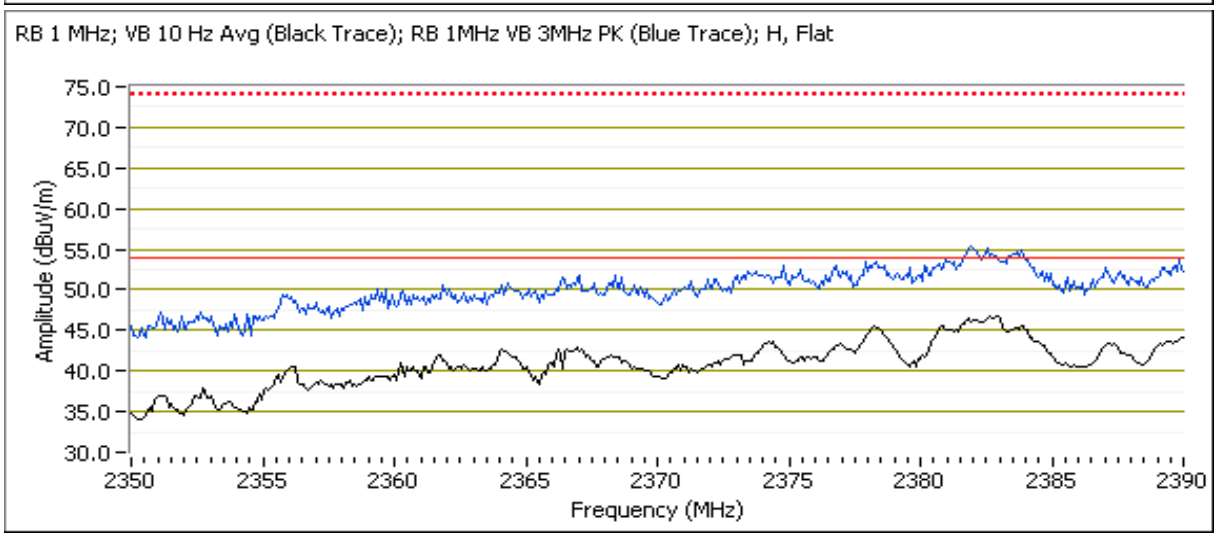
Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Upright								
2381.860	47.8	V	54.0	-6.2	AVG	68	1.6	POS; RB 1 MHz; VB: 10 Hz
2381.980	56.4	V	74.0	-17.6	PK	68	1.6	POS; RB 1 MHz; VB: 3 MHz
2382.760	38.8	H	54.0	-15.2	AVG	0	1.0	POS; RB 1 MHz; VB: 10 Hz
2382.330	48.0	H	74.0	-26.0	PK	0	1.0	POS; RB 1 MHz; VB: 3 MHz
Side								
2382.710	44.2	H	54.0	-9.8	AVG	0	2.4	POS; RB 1 MHz; VB: 10 Hz
2382.830	53.1	H	74.0	-20.9	PK	0	2.4	POS; RB 1 MHz; VB: 3 MHz
2382.830	44.5	V	54.0	-9.5	AVG	94	2.2	POS; RB 1 MHz; VB: 10 Hz
2382.550	52.8	V	74.0	-21.2	PK	94	2.2	POS; RB 1 MHz; VB: 3 MHz
Flat								
2382.870	46.7	H	54.0	-7.3	AVG	82	2.2	POS; RB 1 MHz; VB: 10 Hz
2378.380	55.1	H	74.0	-18.9	PK	82	2.2	POS; RB 1 MHz; VB: 3 MHz
2382.580	37.7	V	54.0	-16.3	AVG	196	2.1	POS; RB 1 MHz; VB: 10 Hz
2377.950	46.7	V	74.0	-27.3	PK	196	2.1	POS; RB 1 MHz; VB: 3 MHz



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A



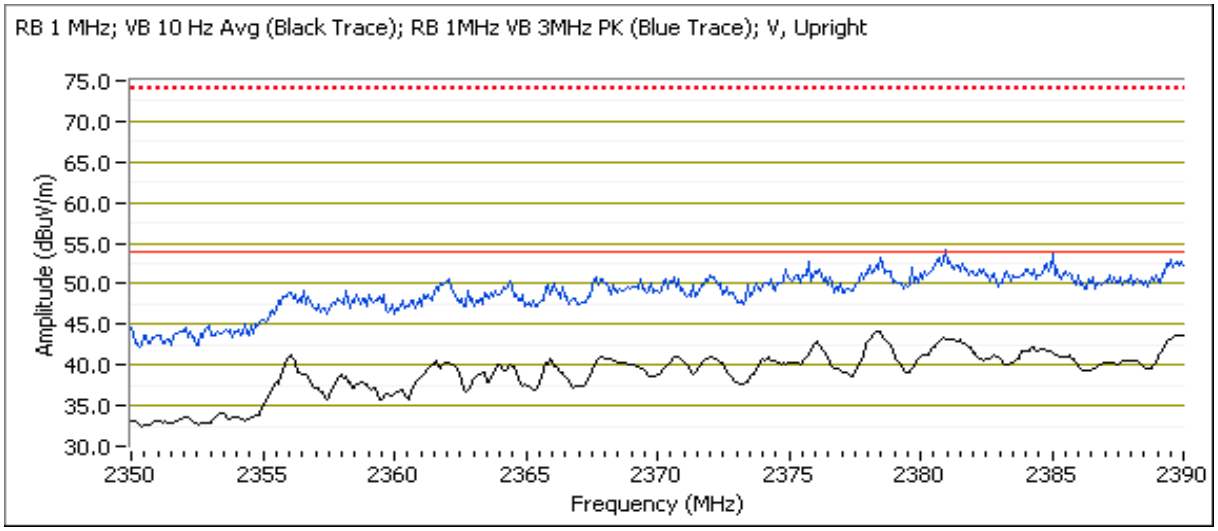


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

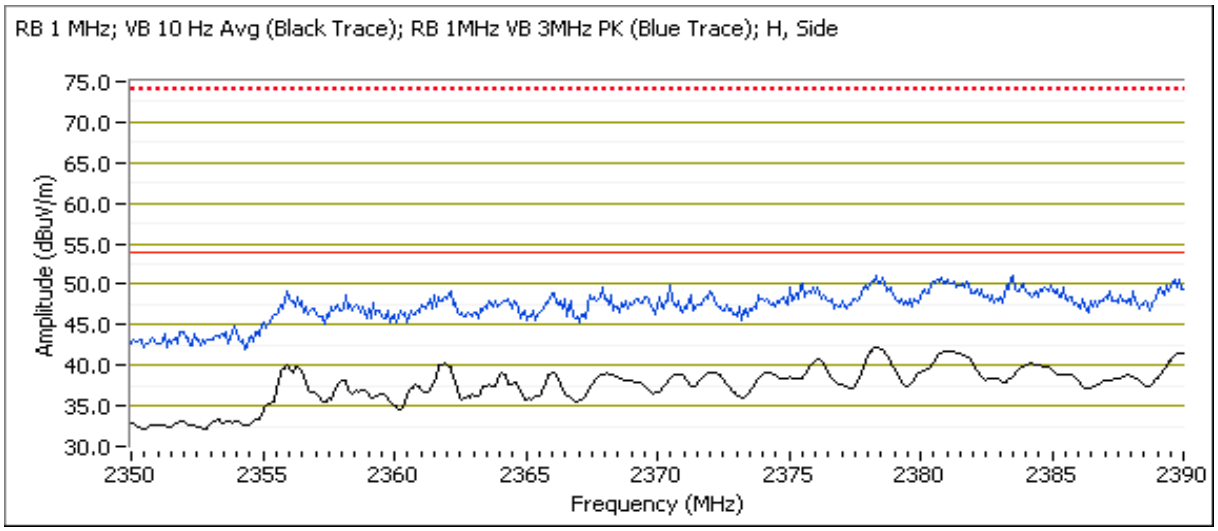
Channel: 1 Mode: b
Tx Chain: 1 - Aux Data Rate: 1 Mb/s

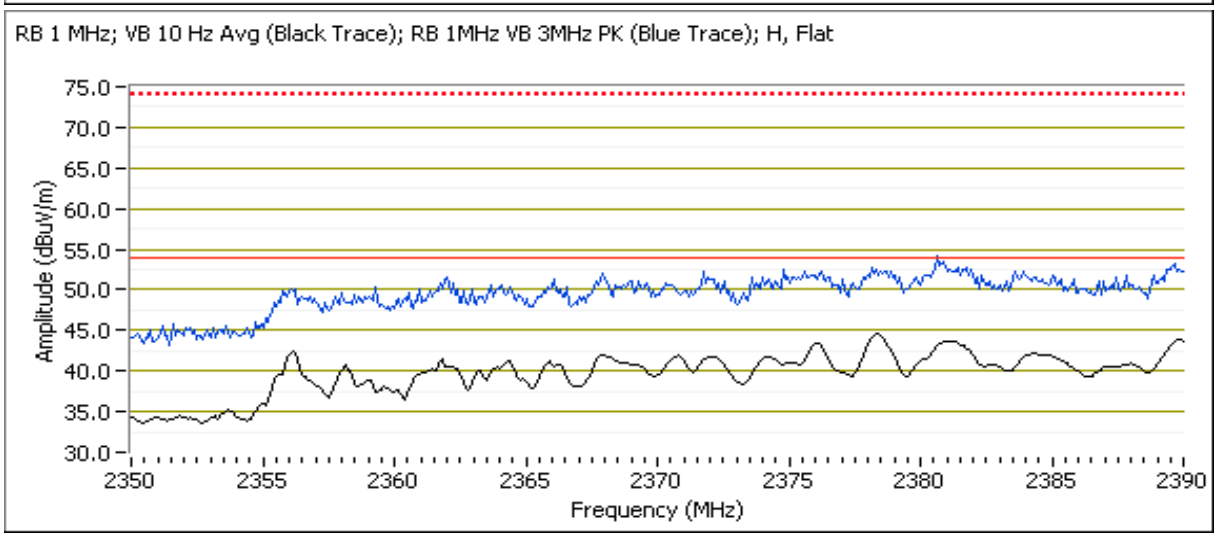
Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Upright								
2378.380	44.3	V	54.0	-9.7	AVG	285	2.2	POS; RB 1 MHz; VB: 10 Hz
2381.260	53.1	V	74.0	-20.9	PK	285	2.2	POS; RB 1 MHz; VB: 3 MHz
2389.760	36.5	H	54.0	-17.5	AVG	190	2.3	POS; RB 1 MHz; VB: 10 Hz
2389.840	47.3	H	74.0	-26.7	PK	190	2.3	POS; RB 1 MHz; VB: 3 MHz
Side								
2378.220	42.6	H	54.0	-11.4	AVG	358	1.0	POS; RB 1 MHz; VB: 10 Hz
2383.670	51.6	H	74.0	-22.4	PK	358	1.0	POS; RB 1 MHz; VB: 3 MHz
2378.380	41.8	V	54.0	-12.2	AVG	270	1.1	POS; RB 1 MHz; VB: 10 Hz
2381.100	50.6	V	74.0	-23.4	PK	270	1.1	POS; RB 1 MHz; VB: 3 MHz
Flat								
2378.380	44.0	H	54.0	-10.0	AVG	272	1.9	POS; RB 1 MHz; VB: 10 Hz
2389.920	53.0	H	74.0	-21.0	PK	272	1.9	POS; RB 1 MHz; VB: 3 MHz
2389.920	33.8	V	54.0	-20.2	AVG	224	2.5	POS; RB 1 MHz; VB: 10 Hz
2383.910	43.7	V	74.0	-30.3	PK	224	2.5	POS; RB 1 MHz; VB: 3 MHz



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A



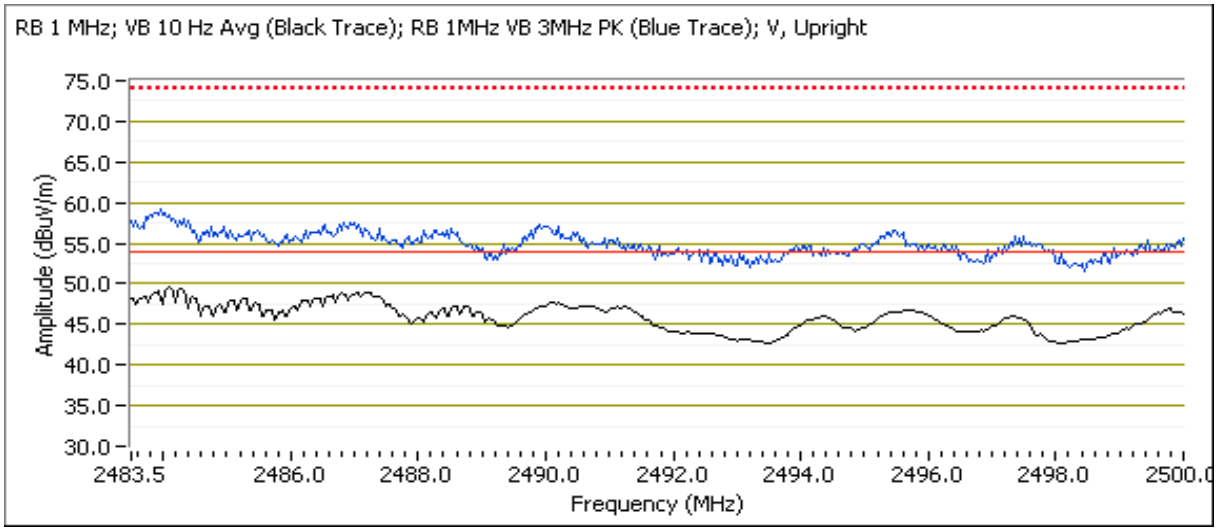


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Channel: 11 Mode: b EUT Orientation: Upright
Tx Chain: 0 - Main Data Rate: 1 Mb/s

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2484.100	49.1	V	54.0	-4.9	AVG	54	1.4	POS; RB 1 MHz; VB: 10 Hz
2490.180	58.2	V	74.0	-15.8	PK	54	1.4	POS; RB 1 MHz; VB: 3 MHz
2484.190	42.4	H	54.0	-11.6	AVG	181	1.0	POS; RB 1 MHz; VB: 10 Hz
2484.100	51.5	H	74.0	-22.5	PK	181	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Run #2: Radiated Bandedge Measurements

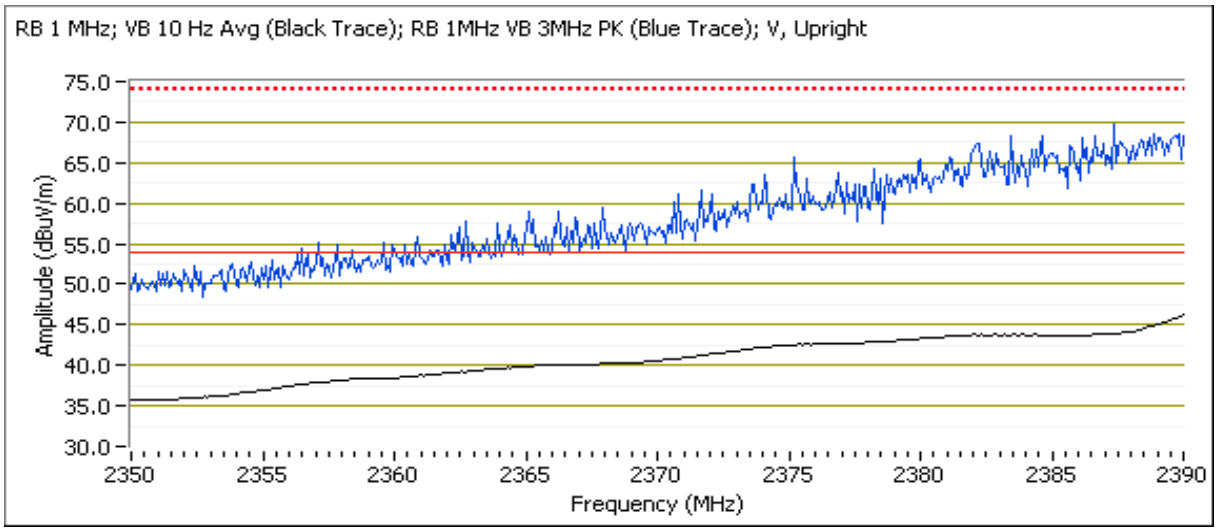
Date of Test: 6/12/2017 & 6/15/17 Config. Used: 1
Test Engineer: Rafael Varelas & John Caizzi Config Change: None
Test Location: FT Chamber #7 EUT Voltage: Battery

Channel: 1 Mode: g EUT Orientation: Upright
Tx Chain: 0 - Main Data Rate: 6 Mb/s

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power setting = 16								
2389.940	46.3	V	54.0	-7.7	AVG	68	1.8	POS; RB 1 MHz; VB: 10 Hz
2386.810	70.4	V	74.0	-3.6	PK	68	1.8	POS; RB 1 MHz; VB: 3 MHz
2390.000	37.9	H	54.0	-16.1	AVG	0	1.0	POS; RB 1 MHz; VB: 10 Hz
2386.950	59.1	H	74.0	-14.9	PK	0	1.0	POS; RB 1 MHz; VB: 3 MHz

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

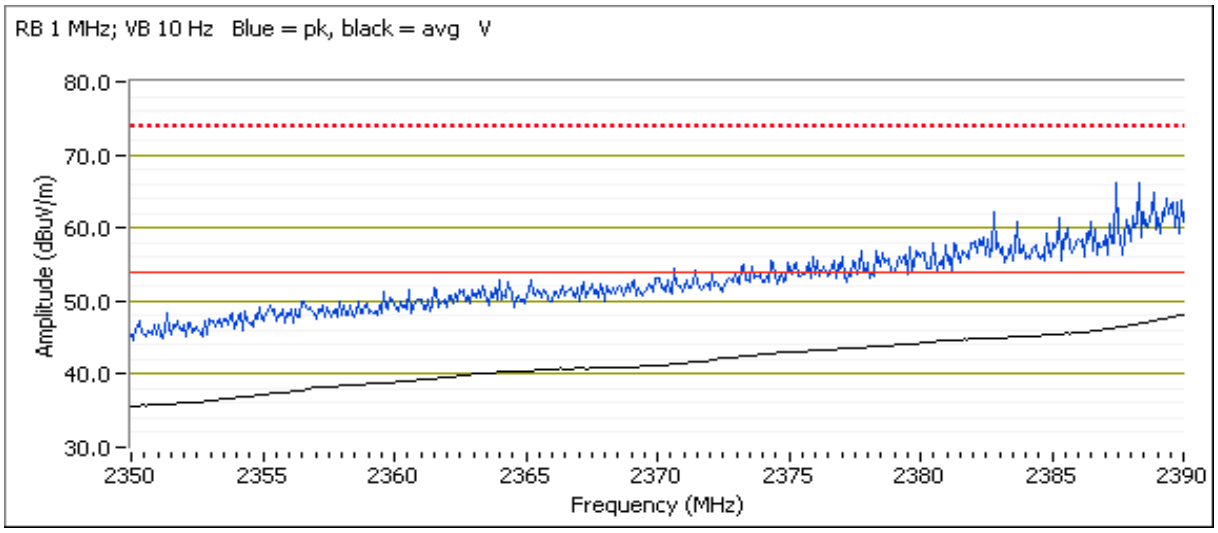


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Channel: 2 Mode: g EUT Orientation: Upright
Tx Chain: 0 - Main Data Rate: 6 Mb/s

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power setting = 20								
2389.960	48.4	V	54.0	-5.6	AVG	81	1.66	
2387.400	68.1	V	74.0	-5.9	PK	81	1.66	

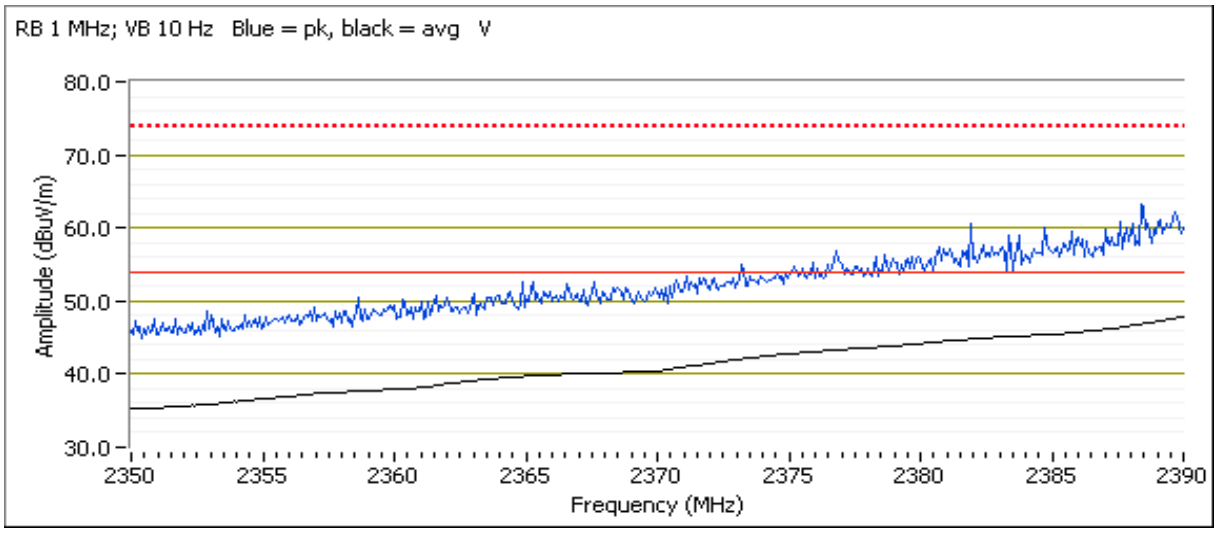


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Channel: 3 Mode: g EUT Orientation: Upright
Tx Chain: 0 - Main Data Rate: 6 Mb/s

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power setting = 21								
2389.970	48.1	V	54.0	-5.9	AVG	91	1.65	
2389.600	65.6	V	74.0	-8.4	PK	91	1.65	

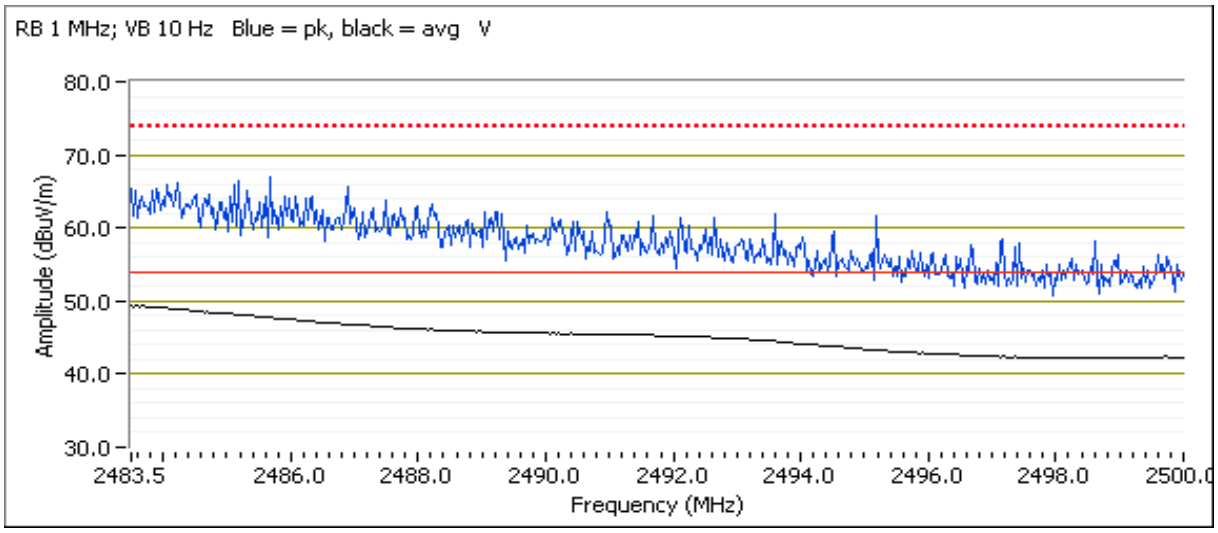


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Channel: 9 Mode: g EUT Orientation: Upright
Tx Chain: 0 - Main Data Rate: 6 Mb/s

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power setting = 21								
2483.500	49.5	V	54.0	-4.5	AVG	77	1.75	
2483.700	66.6	V	74.0	-7.4	PK	77	1.75	

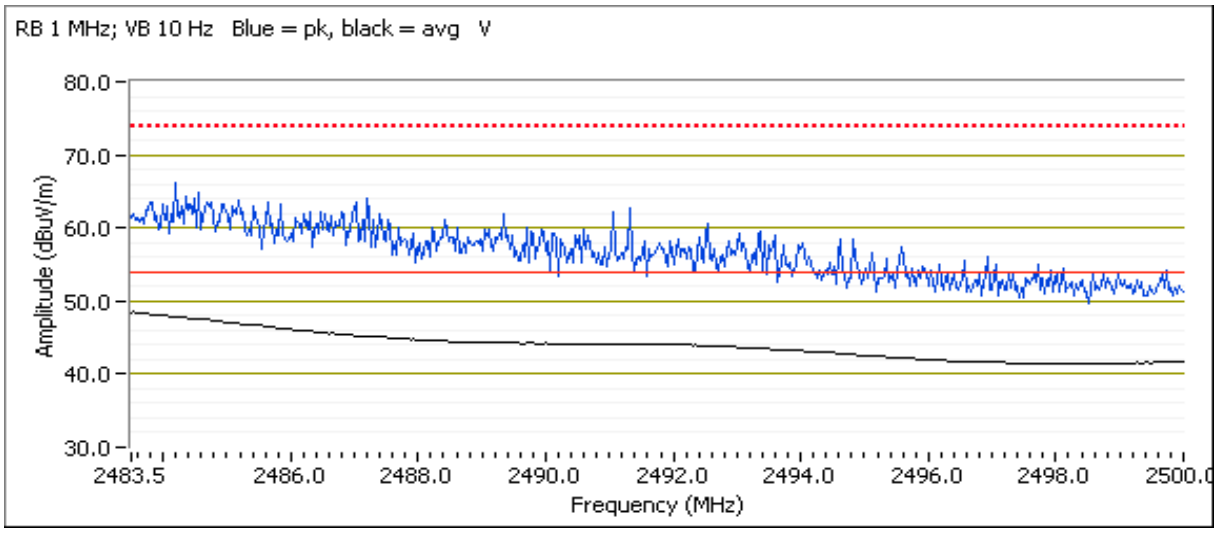


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Channel: 10 Mode: g EUT Orientation: Upright
Tx Chain: 0 - Main Data Rate: 6 Mb/s

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power setting = 20								
2483.500	48.6	V	54.0	-5.4	AVG	85	1.75	
2483.730	66.9	V	74.0	-7.1	PK	85	1.75	

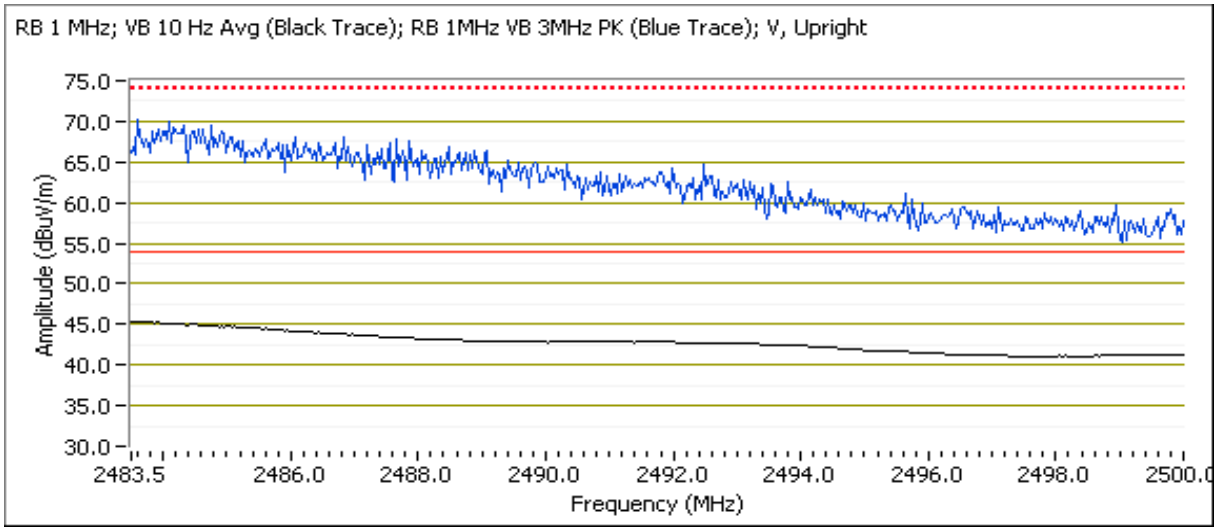


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Channel: 11 Mode: g EUT Orientation: Upright
Tx Chain: 0 - Main Data Rate: 6 Mb/s

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power setting = 16								
2483.600	45.3	V	54.0	-8.7	AVG	59	1.7	POS; RB 1 MHz; VB: 10 Hz
2483.770	70.8	V	74.0	-3.2	PK	59	1.7	POS; RB 1 MHz; VB: 3 MHz
2483.500	38.3	H	54.0	-15.7	AVG	184	1.0	POS; RB 1 MHz; VB: 10 Hz
2483.960	57.7	H	74.0	-16.3	PK	184	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

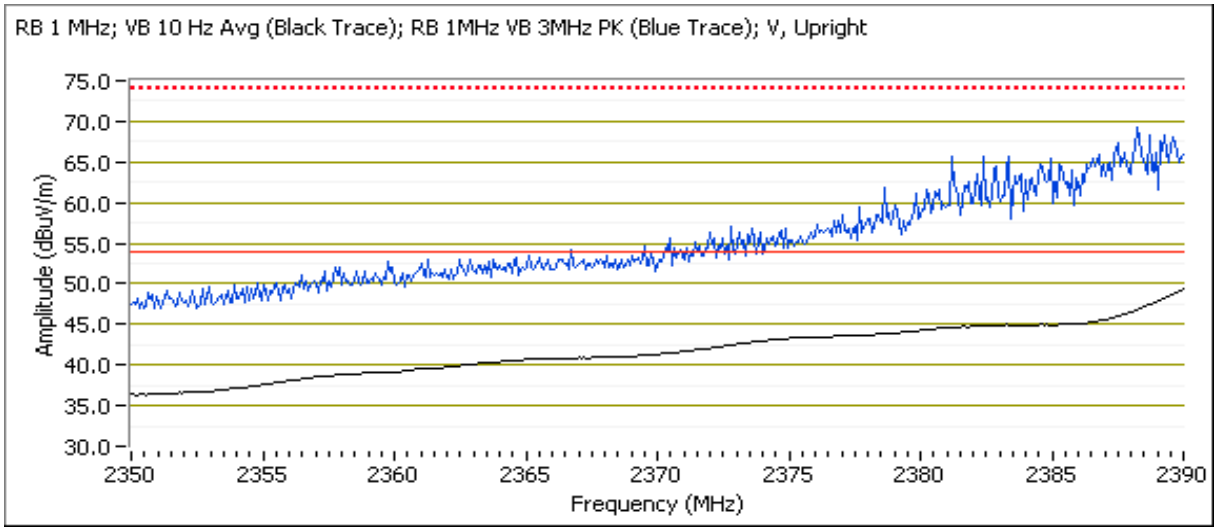
Run #3: Radiated Bandedge Measurements

Date of Test: 6/12/2017 0:00 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Chamber #7 EUT Voltage: Battery

Channel: 1 Mode: HT20 EUT Orientation: Upright
Tx Chain: 0 - 1Tx Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power setting = 18								
2390.000	48.4	V	54.0	-5.6	AVG	64	1.8	POS; RB 1 MHz; VB: 10 Hz
2389.480	69.5	V	74.0	-4.5	PK	64	1.8	POS; RB 1 MHz; VB: 3 MHz
2390.000	39.3	H	54.0	-14.7	AVG	6	1.0	POS; RB 1 MHz; VB: 10 Hz
2388.960	58.2	H	74.0	-15.8	PK	6	1.0	POS; RB 1 MHz; VB: 3 MHz

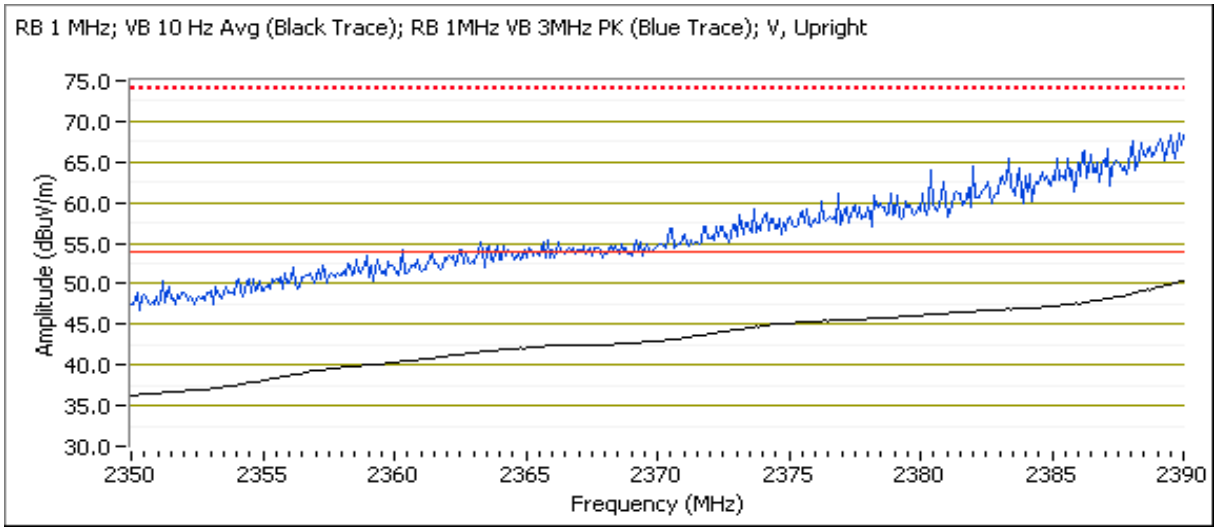


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Channel: 2 Mode: HT20 EUT Orientation: Upright
Tx Chain: 0 - 1Tx Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power setting = 21								
2390.000	50.6	V	54.0	-3.4	AVG	61	1.6	POS; RB 1 MHz; VB: 10 Hz
2389.970	70.2	V	74.0	-3.8	PK	61	1.6	POS; RB 1 MHz; VB: 3 MHz
2390.000	40.7	H	54.0	-13.3	AVG	360	1.0	POS; RB 1 MHz; VB: 10 Hz
2389.680	58.9	H	74.0	-15.1	PK	360	1.0	POS; RB 1 MHz; VB: 3 MHz

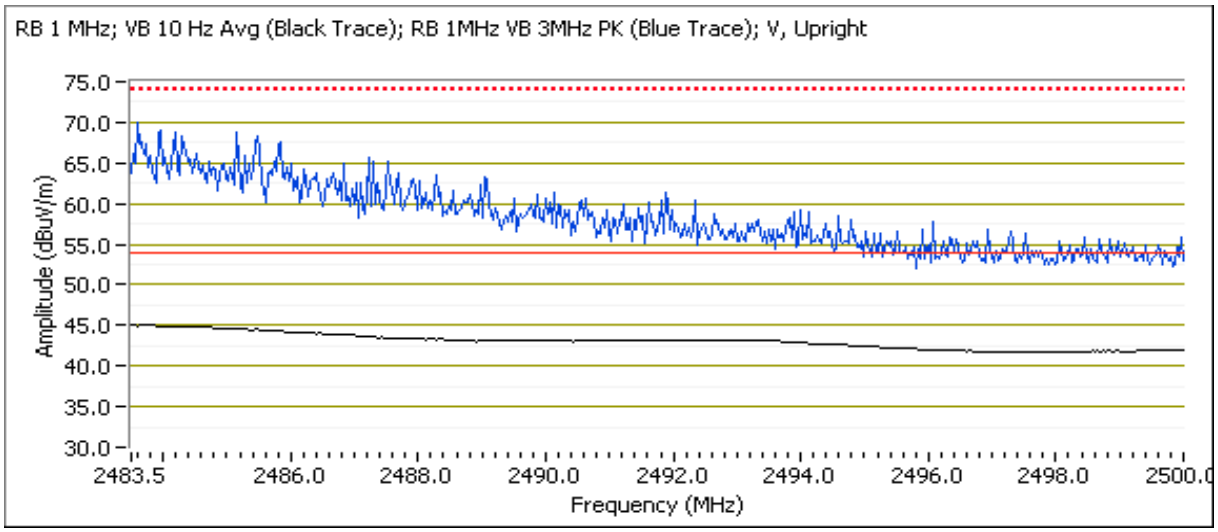


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Channel: 11 Mode: HT20 EUT Orientation: Upright
Tx Chain: 0 - 1Tx Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power setting = 17								
2483.550	45.1	V	54.0	-8.9	AVG	66	1.7	POS; RB 1 MHz; VB: 10 Hz
2483.940	70.5	V	74.0	-3.5	PK	66	1.7	POS; RB 1 MHz; VB: 3 MHz
2483.570	37.6	H	54.0	-16.4	AVG	168	1.2	POS; RB 1 MHz; VB: 10 Hz
2484.370	62.2	H	74.0	-11.8	PK	168	1.2	POS; RB 1 MHz; VB: 3 MHz

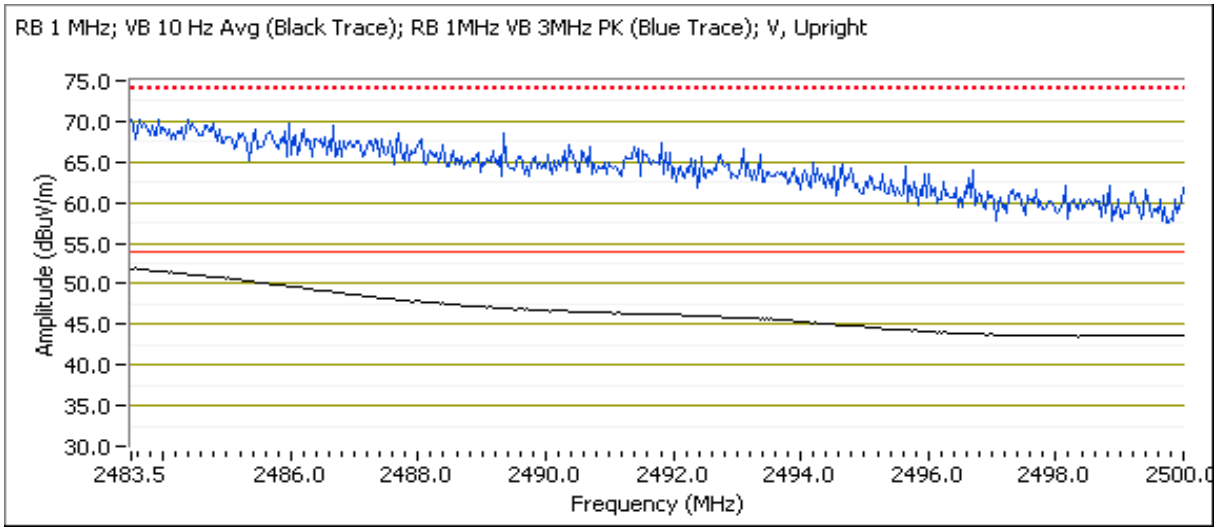


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Channel: 10 Mode: HT20 EUT Orientation: Upright
Tx Chain: 0 - 1Tx Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Power setting = 20								
2483.520	48.7	V	54.0	-5.3	AVG	53	1.7	POS; RB 1 MHz; VB: 10 Hz
2484.690	69.0	V	74.0	-5.0	PK	53	1.7	POS; RB 1 MHz; VB: 3 MHz
2483.600	41.1	H	54.0	-12.9	AVG	168	1.2	POS; RB 1 MHz; VB: 10 Hz
2490.010	60.0	H	74.0	-14.0	PK	168	1.2	POS; RB 1 MHz; VB: 3 MHz



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

RSS-247 and FCC 15.247 (DTS) Radiated Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT, unless otherwise noted.

Ambient Conditions:

Temperature: 22.1 °C
Rel. Humidity: 38 %

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel	Target Power	Power Setting	Test Performed	Limit	Result / Margin
1	b	1 - 2412MHz	21	21	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	50.4 dBµV/m @ 7235.1 MHz (-3.6 dB)
		6 - 2437MHz		21			47.8 dBµV/m @ 7310.2 MHz (-6.2 dB)
		11 - 2462MHz		21			49.1 dBµV/m @ 7385.2 MHz (-4.9 dB)
Scans on center channel in all OFDM modes to determine the worst case mode.							
2	g	6 - 2437MHz	21	21	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	45.0 dBµV/m @ 7311.1 MHz (-9.0 dB)
	n20			21			45.0 dBµV/m @ 7310.9 MHz (-9.0 dB)
Measurements on low and high channels in worst-case OFDM mode.							
3	g	1 - 2412MHz	21	21	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	43.1 dBµV/m @ 3618.0 MHz (-10.9 dB)
		11 - 2462MHz		21			41.9 dBµV/m @ 3693.0 MHz (-12.1 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Sample Notes

Sample S/N: 1704272408B1373917
Driver: -
Antenna: internal

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074
Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time
Unless otherwise stated/noted, emission has duty cycle ≥ 98% and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear average mode, auto sweep time, max hold.
2.4GHz band reject filter used

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11b	1 Mb/s	0.99	Yes	1.984	0	0	10
11g	6 Mb/s	0.981	Yes	2.016	0	0	10
HT20	MCS0	0.99	Yes	1.914	0	0	10

Measurement Specific Notes:

Note 1:	Emission in non-restricted band, but limit of 15.209 used.
Note 2:	Emission in non-restricted band, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Notes:

The EUT was rotated thru three orientations to determine worse case in preliminary testing
The EUT was placed on a surface 1.5m above the ground plane in order to get accruate measurement results.
The EUT supports tx diversity, testing was performed using 11b to determine the worse case antenna. This was used for the other modes.

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Run #1: Radiated Spurious Emissions, 1,000 - 25000 MHz. Operating Mode: 802.11b

Date of Test: 6/21/2017 0:00
Test Engineer: Rafael Varelas
Test Location: Chamber 7

Config. Used: 1
Config Change: none
EUT Voltage: Internal battery

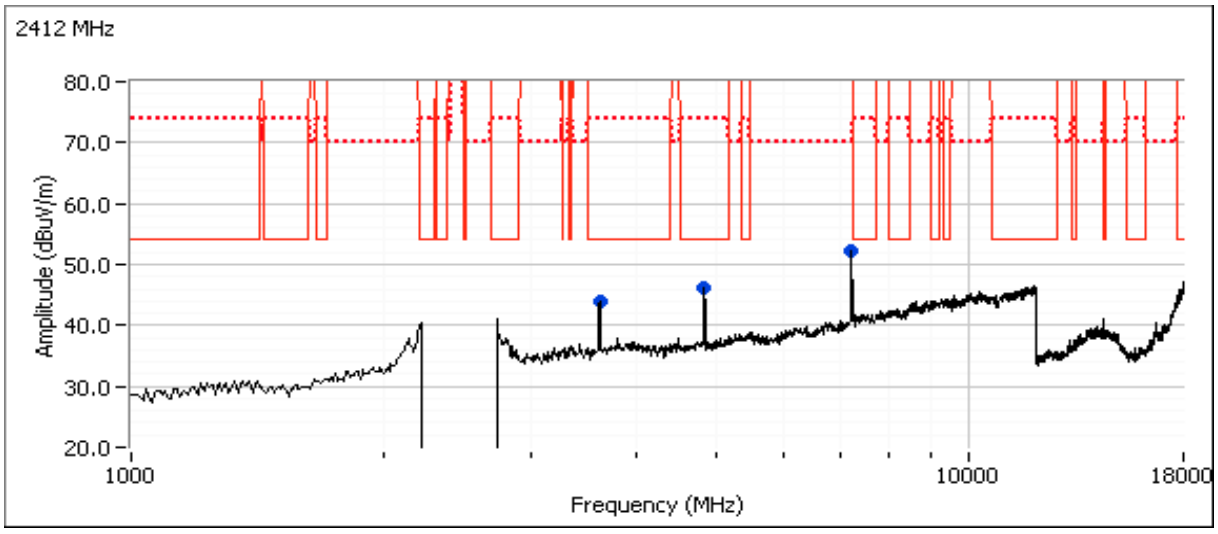
Run #1a: Low Channel

Channel: 1
Tx Chain: 0 - Main

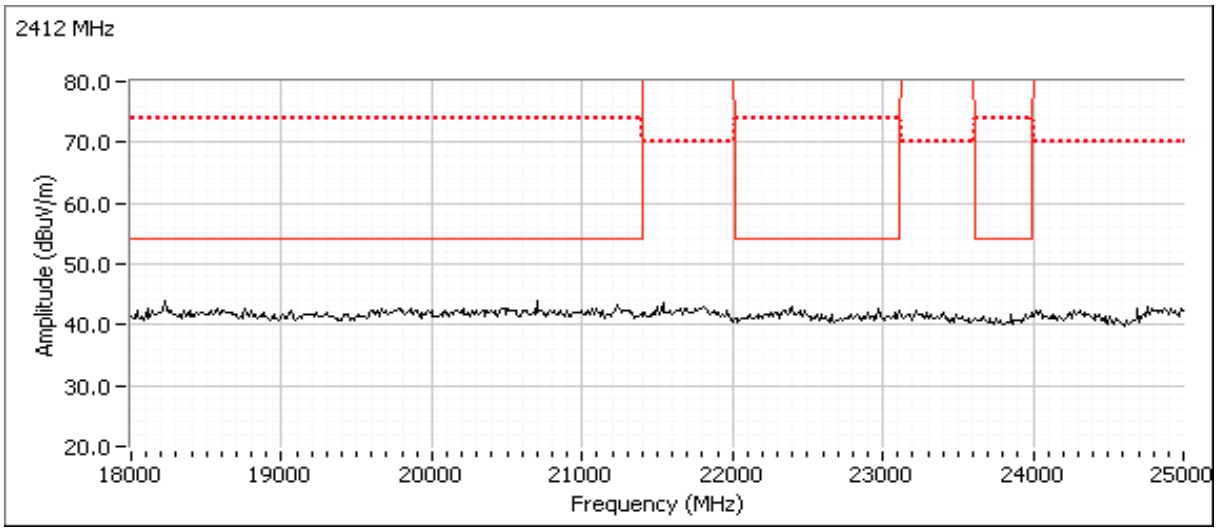
Mode: b
Data Rate: 1 Mb/s

EUT Orientation: Upright

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7235.140	50.4	V	54.0	-3.6	AVG	144	1.1	Note 1
7235.140	56.0	V	74.0	-18.0	PK	144	1.1	Note 1
4823.980	44.2	V	54.0	-9.8	AVG	170	1.1	RB 1 MHz;VB 10 Hz;Peak
4823.940	48.9	V	74.0	-25.1	PK	170	1.1	RB 1 MHz;VB 3 MHz;Peak
3618.000	42.5	H	54.0	-11.5	AVG	152	1.9	RB 1 MHz;VB 10 Hz;Peak
3618.070	47.2	H	74.0	-26.8	PK	152	1.9	RB 1 MHz;VB 3 MHz;Peak



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A



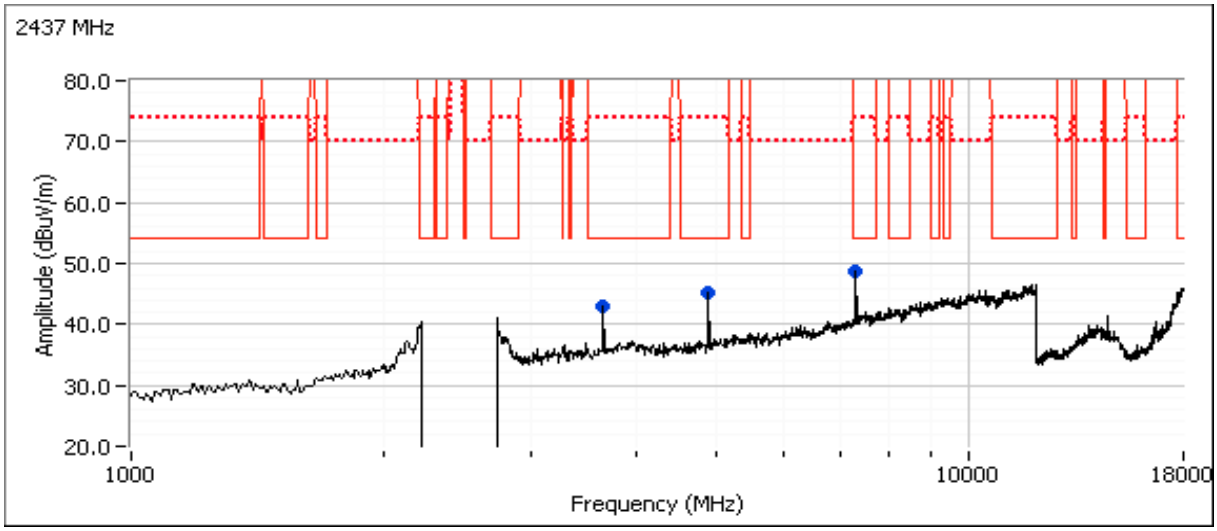
Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Run #1b: Center Channel

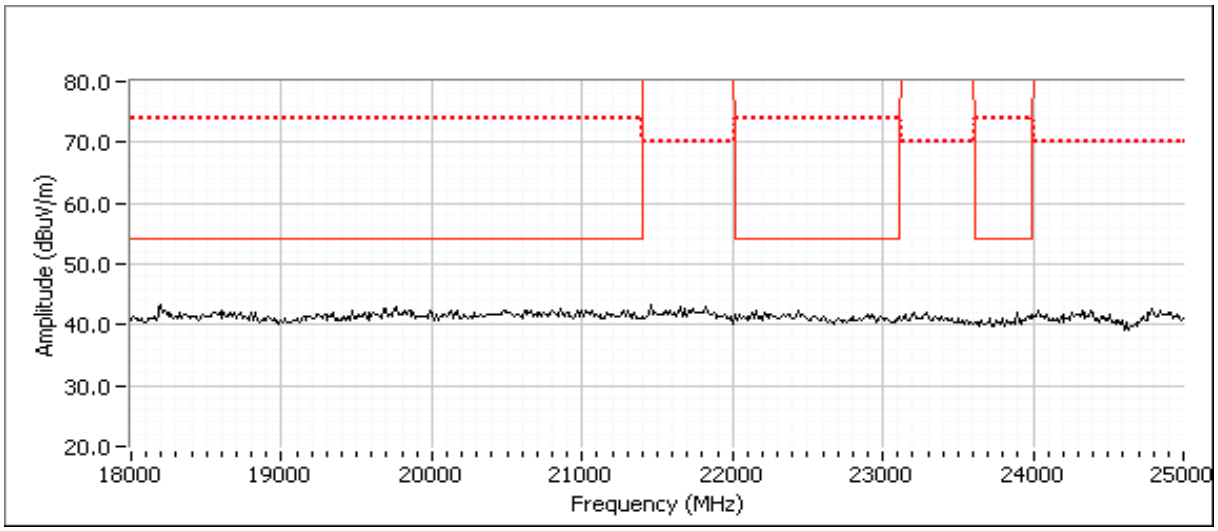
Channel: 6 Mode: b EUT Orientation: Upright
Tx Chain: 0 - Main Data Rate: 1 Mb/s

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7310.230	47.8	V	54.0	-6.2	AVG	146	1.0	RB 1 MHz;VB 10 Hz;Peak
7311.900	54.4	V	74.0	-19.6	PK	146	1.0	RB 1 MHz;VB 3 MHz;Peak
3655.450	41.8	H	54.0	-12.2	AVG	152	2.0	RB 1 MHz;VB 10 Hz;Peak
3655.410	47.0	H	74.0	-27.0	PK	152	2.0	RB 1 MHz;VB 3 MHz;Peak
4874.030	44.6	V	54.0	-9.4	AVG	180	1.6	RB 1 MHz;VB 10 Hz;Peak
4874.060	49.2	V	74.0	-24.8	PK	180	1.6	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 18 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

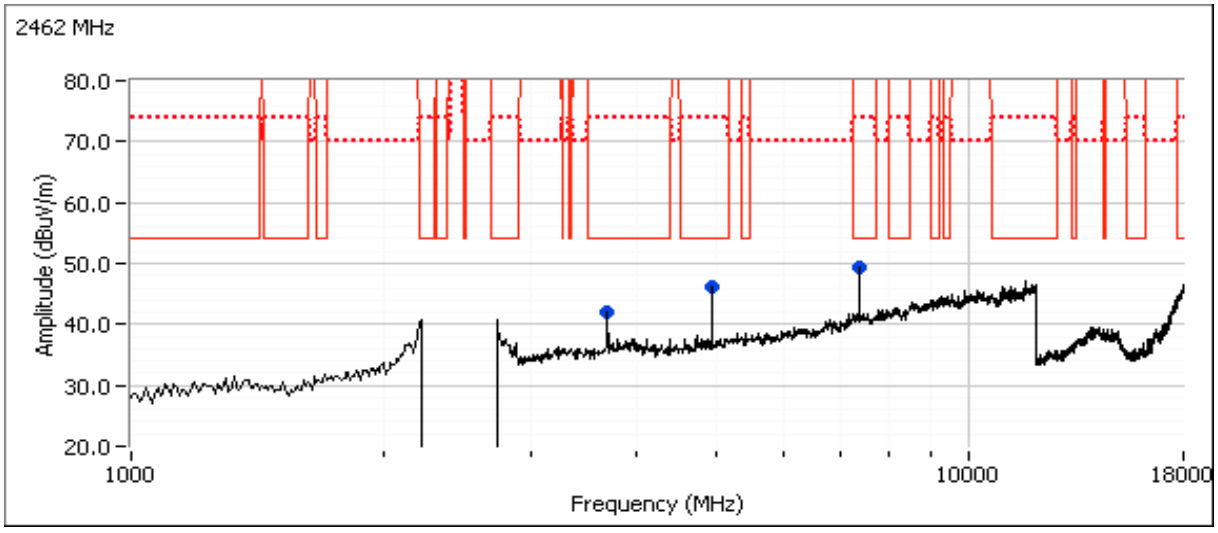


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

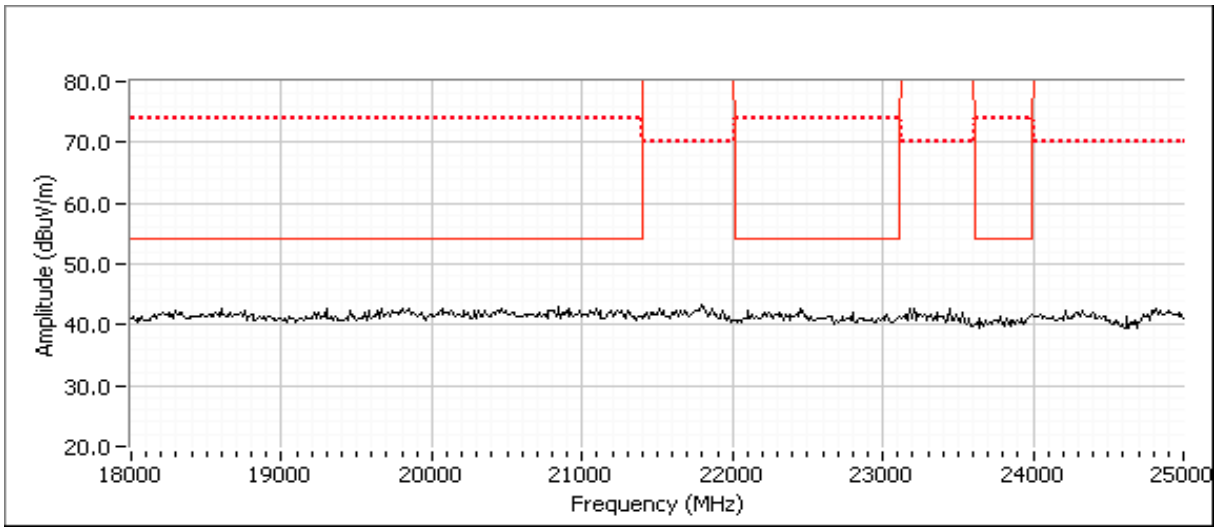
Run #1c: High Channel

Channel: 11 Mode: b EUT Orientation: Upright
Tx Chain: 0 - Main Data Rate: 1 Mb/s

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7385.200	49.1	V	54.0	-4.9	AVG	144	1.1	RB 1 MHz;VB 10 Hz;Peak
7387.140	55.0	V	74.0	-19.0	PK	144	1.1	RB 1 MHz;VB 3 MHz;Peak
3692.920	40.5	H	54.0	-13.5	AVG	148	1.8	RB 1 MHz;VB 10 Hz;Peak
3693.250	46.0	H	74.0	-28.0	PK	148	1.8	RB 1 MHz;VB 3 MHz;Peak
4923.980	45.0	V	54.0	-9.0	AVG	154	1.8	RB 1 MHz;VB 10 Hz;Peak
4923.940	49.4	V	74.0	-24.6	PK	154	1.8	RB 1 MHz;VB 3 MHz;Peak



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Run #2: Radiated Spurious Emissions, 1,000 - 25000 MHz. Operating Mode: OFDM.

Date of Test: 6/22/2017 0:00
Test Engineer: Rafael Varelas
Test Location: Chamber 7

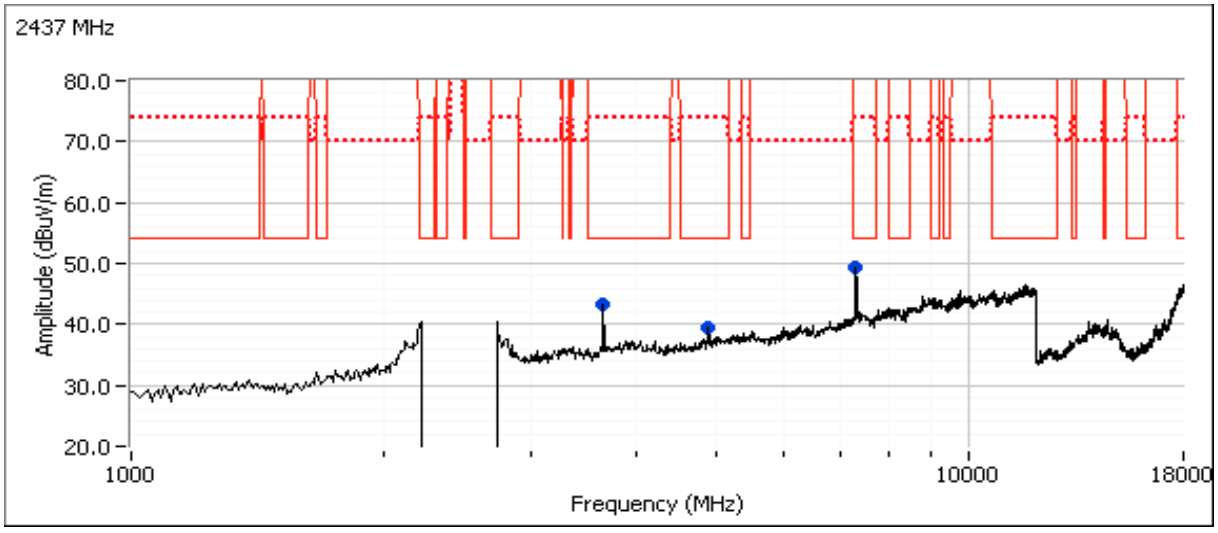
Config. Used: 1
Config Change: none
EUT Voltage: Internal battery

Run #2a: Center Channel

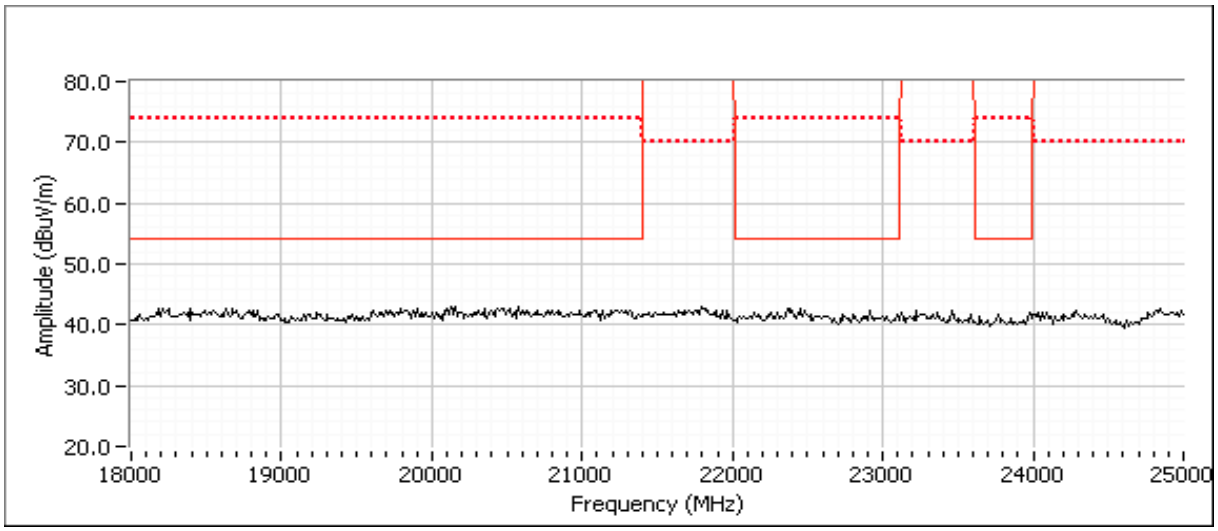
Channel: 6
Tx Chain: 0 - Main

Mode: g
Data Rate: 6 Mb/s

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7311.060	45.0	V	54.0	-9.0	AVG	163	1.2	RB 1 MHz;VB 10 Hz;Peak
7315.260	57.8	V	74.0	-16.2	PK	163	1.2	RB 1 MHz;VB 3 MHz;Peak
4873.970	33.4	V	54.0	-20.6	AVG	201	1.7	RB 1 MHz;VB 10 Hz;Peak
4867.450	45.5	V	74.0	-28.5	PK	201	1.7	RB 1 MHz;VB 3 MHz;Peak
3655.480	42.7	H	54.0	-11.3	AVG	152	1.8	RB 1 MHz;VB 10 Hz;Peak
3655.400	47.6	H	74.0	-26.4	PK	152	1.8	RB 1 MHz;VB 3 MHz;Peak



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A



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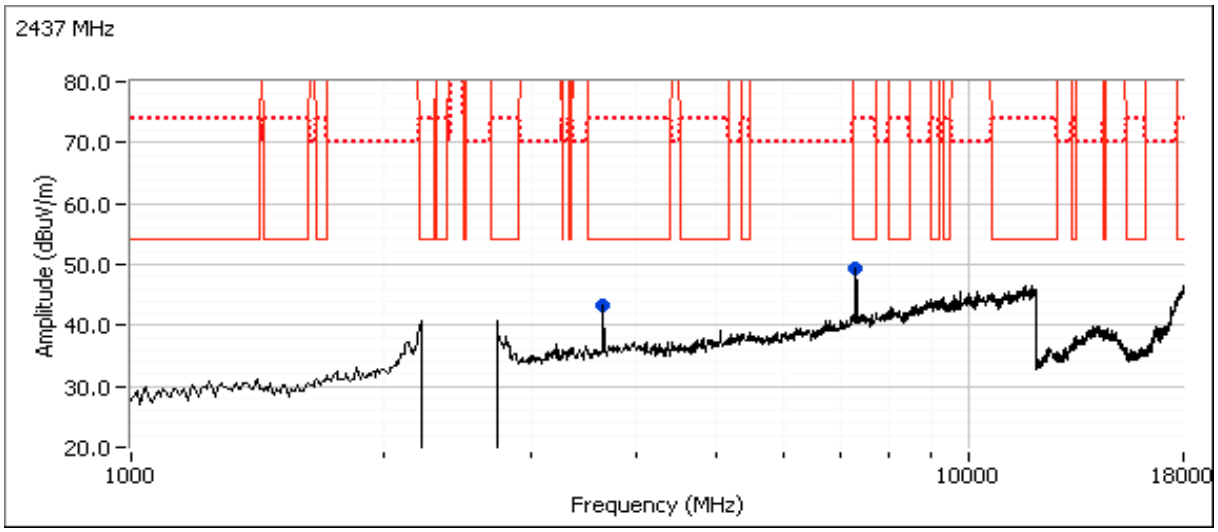
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Run #2b: Center Channel

Channel: 6 Mode: n20
Tx Chain: 0 - Main Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7310.890	45.0	V	54.0	-9.0	AVG	145	1.0	RB 1 MHz;VB 10 Hz;Peak
7309.640	58.7	V	74.0	-15.3	PK	145	1.0	RB 1 MHz;VB 3 MHz;Peak
3655.430	42.6	H	54.0	-11.4	AVG	153	1.8	RB 1 MHz;VB 10 Hz;Peak
3655.400	47.7	H	74.0	-26.3	PK	153	1.8	RB 1 MHz;VB 3 MHz;Peak



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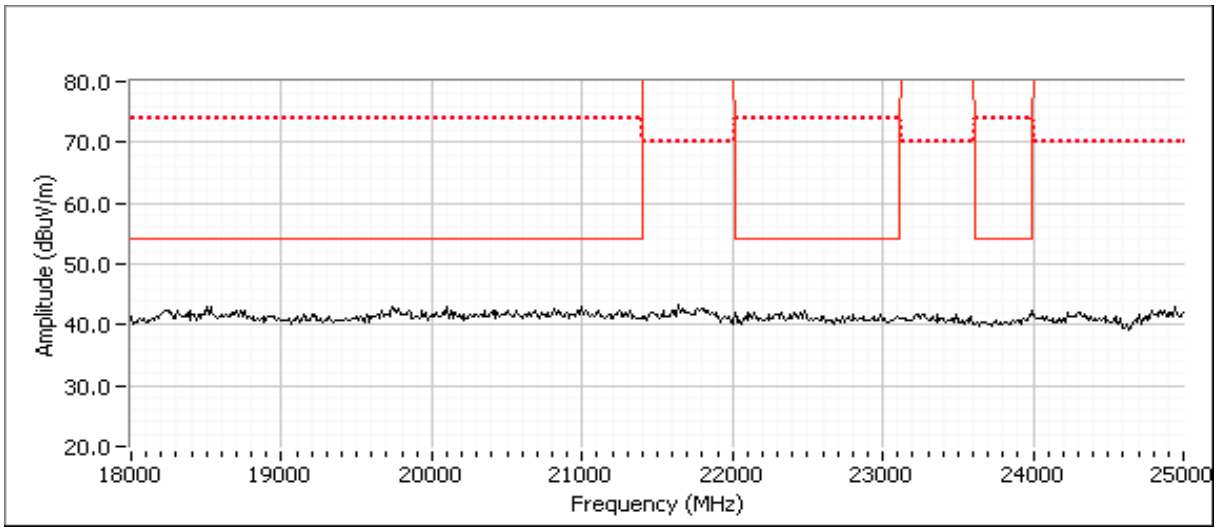
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Run #3: Radiated Spurious Emissions, 1,000 - 25000 MHz. Operating Mode: Worse case from Run #2

Date of Test: 6/22/2017 0:00
Test Engineer: Rafael Varelas
Test Location: Chamber 7

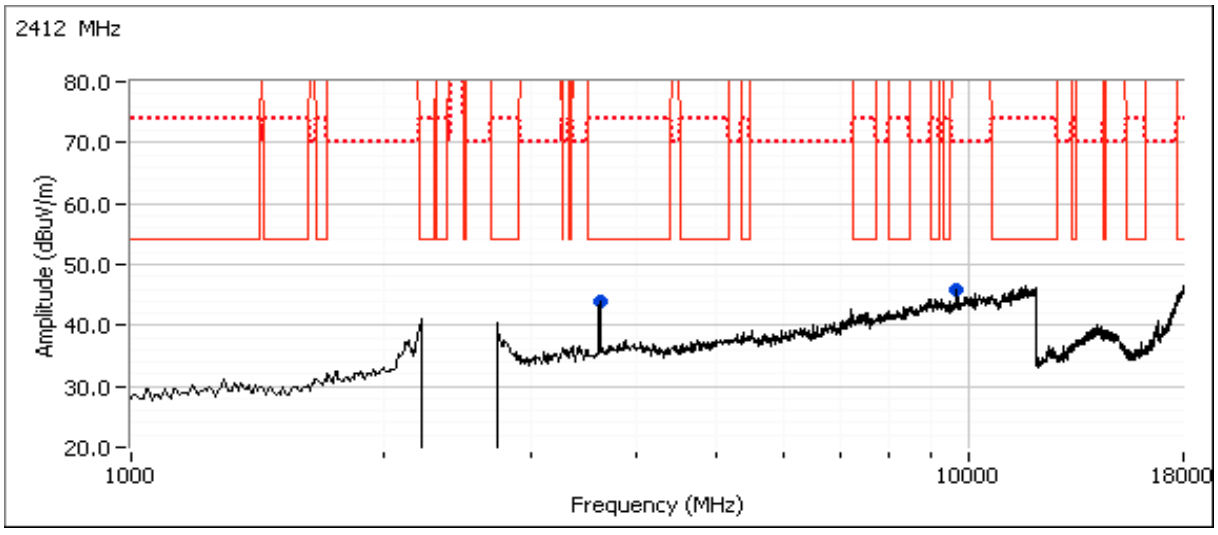
Config. Used: 1
Config Change: none
EUT Voltage: Internal battery

Run #3a: Low Channel

Channel: 1
Tx Chain: 0 - Main

Mode: g
Data Rate: 6 Mb/s

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3618.000	43.1	H	54.0	-10.9	AVG	154	1.6	RB 1 MHz;VB 10 Hz;Peak
3617.850	47.1	H	74.0	-26.9	PK	154	1.6	RB 1 MHz;VB 3 MHz;Peak
9669.830	38.1	V	54.0	-15.9	AVG	203	1.0	Note 1
9669.860	49.5	V	74.0	-24.5	PK	203	1.0	Note 1



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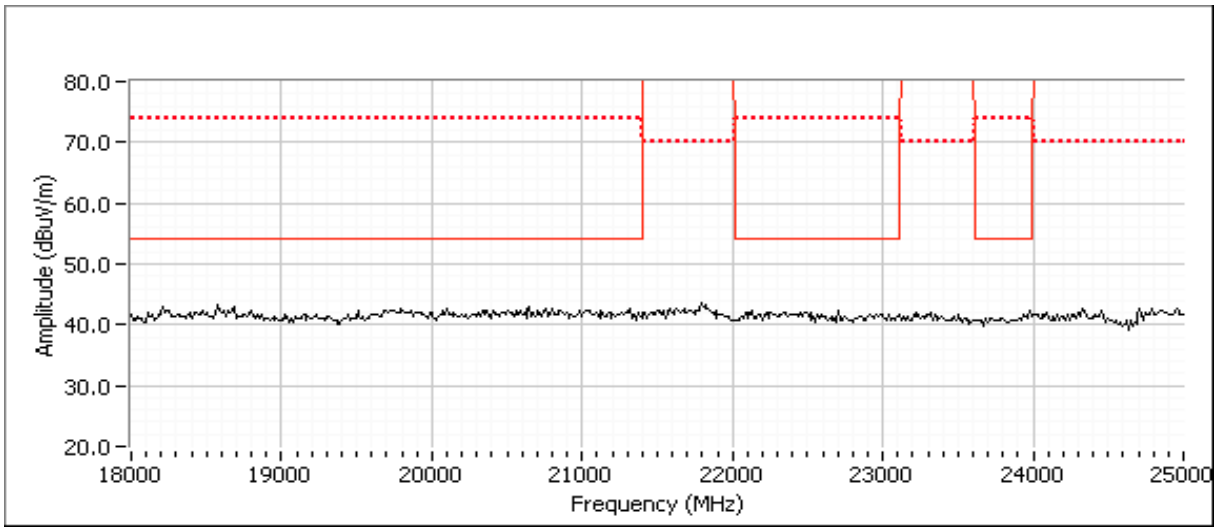
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A



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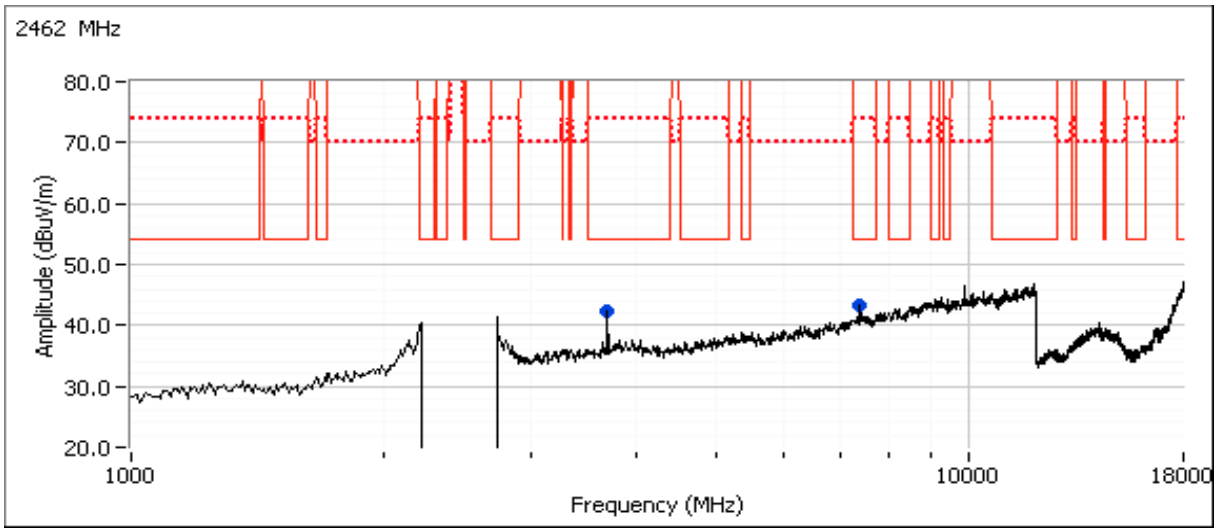
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

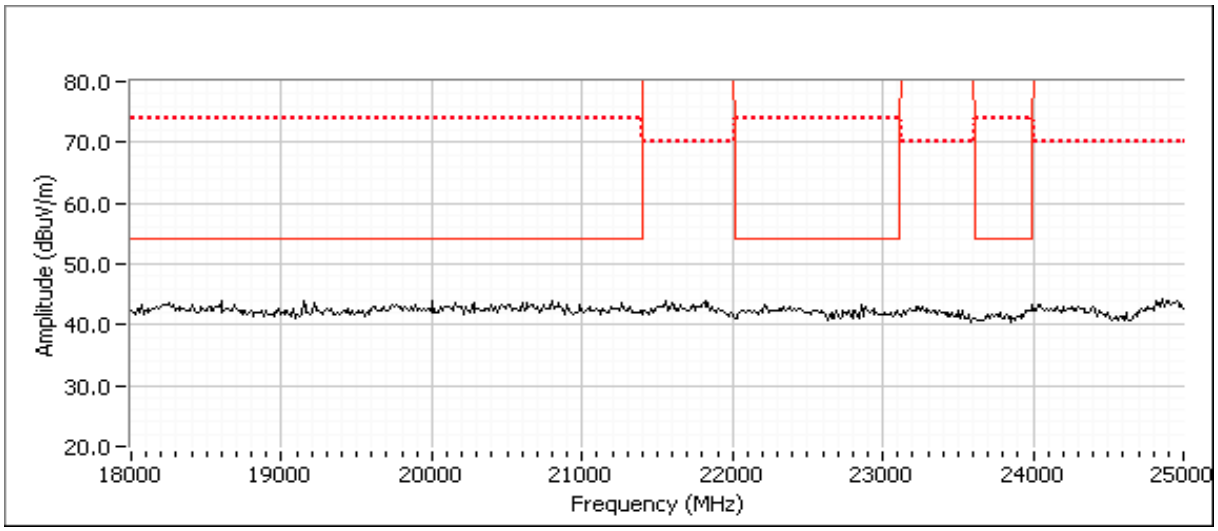
Run #3b: High Channel

Channel: 11 Mode: g
Tx Chain: 0 - Main Data Rate: 6 Mb/s

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3692.950	41.9	H	54.0	-12.1	AVG	152	2.5	RB 1 MHz;VB 10 Hz;Peak
3692.980	47.1	H	74.0	-26.9	PK	152	2.5	RB 1 MHz;VB 3 MHz;Peak
7386.040	40.5	V	54.0	-13.5	AVG	162	1.2	RB 1 MHz;VB 10 Hz;Peak
7386.280	52.4	V	74.0	-21.6	PK	162	1.2	RB 1 MHz;VB 3 MHz;Peak



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

RSS-247 and FCC 15.247 (DTS) Radiated Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.
For radiated emissions testing the measurement antenna was located 3 meters from the EUT, unless otherwise noted.

Ambient Conditions:

Temperature: 28 °C
Rel. Humidity: 40 %

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel	Target Power	Power Setting	Test Performed	Limit	Result / Margin
1	BLE	2402MHz	Default	Default	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	31.9 dBµV/m @ 2376.0 MHz (-22.1 dB)
		2480MHz			Restricted Band Edge (2483.5 MHz)		59.3 dBµV/m @ 2484.1 MHz (-14.7 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Sample Notes

Sample S/N: 1704272408B1373917
Driver: -
Antenna: internal

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074
Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time
Unless otherwise stated/noted, emission has a duty cycle ≥ 98% and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear average mode, auto sweep time, max hold.

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
BLE	1 Mb/s	0.63	Yes	0.404	2.0	4.1	2475

Measurement Specific Notes:

Note 6:	Emission has non constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW> 1/T, peak detector, linear average mode, sweep time auto, max hold. Max hold for 50*(1/DC) traces

Notes:

The EUT was rotated thru three orientations to determine worse case in preliminary testing
The EUT was placed on a surface 1.5m above the ground plane in order to get accruate measurement results.
The EUT supports tx diversity, testing was performed using 11b to determine the worse case antenna. This was used for the other modes.

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Run #1: Radiated Bandedge Measurements

Date of Test: 6/15/2017 0:00
Test Engineer: John Caizzi
Test Location: Chamber 7

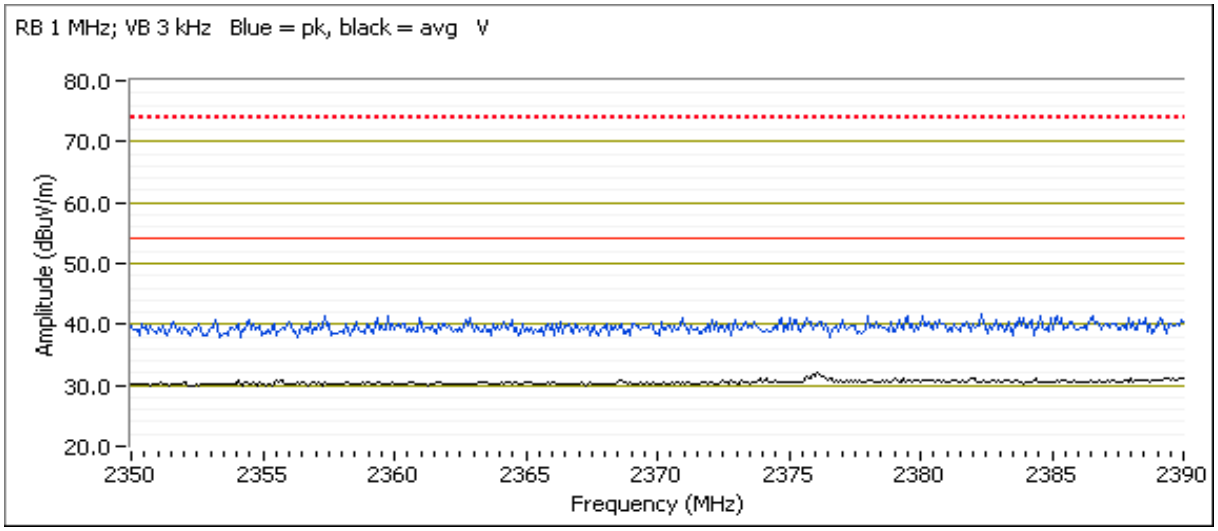
Config. Used: 1
Config Change: none
EUT Voltage: Internal battery

Channel: 2402 MHz
Tx Chain: 0 - Main

Mode: BLE
Data Rate: 1 Mb/s

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2376.040	31.9	V	54.0	-22.1	Avg	105	1.57	VB: 3 kHz, note 6
2376.390	42.8	V	74.0	-31.2	PK	105	1.57	
2374.530	31.5	H	54.0	-22.5	Avg	360	2.50	VB: 3 kHz, note 6
2371.000	42.2	H	74.0	-31.8	PK	360	2.50	



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Date of Test: 6/21/2017 0:00
Test Engineer: Rafael Varelas
Test Location: Chamber 7

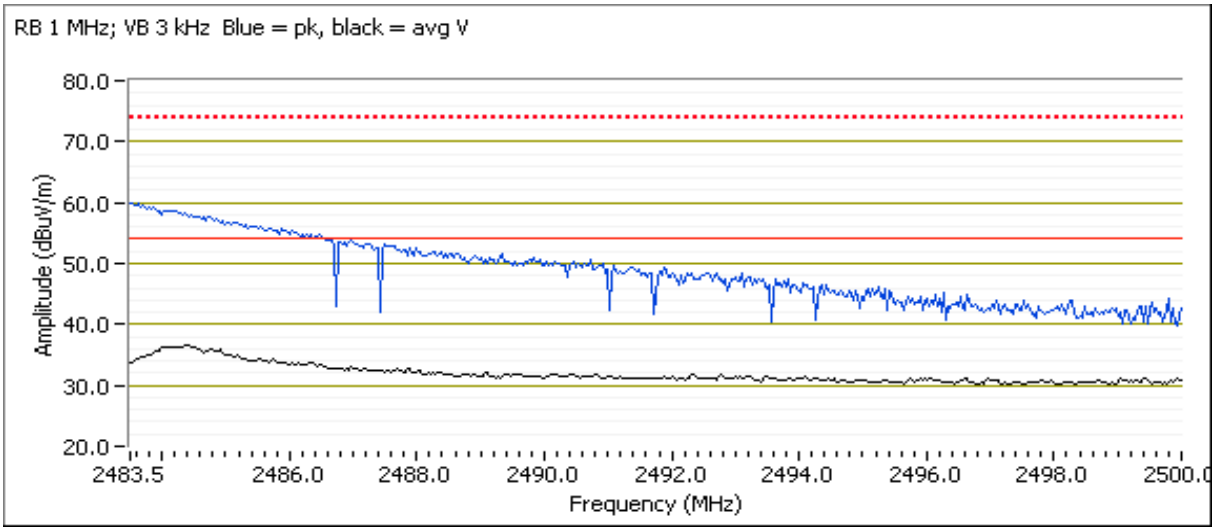
Config. Used: 1
Config Change: none
EUT Voltage: Internal battery

Channel: 2480MHz
Tx Chain: 0 - Main

Mode: BLE
Data Rate: 1 Mb/s

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2484.590	36.9	V	54.0	-17.1	Avg	55	1.9	VB: 3 kHz, note 6
2484.130	59.3	V	74.0	-14.7	PK	55	1.9	
2483.900	32.1	H	54.0	-21.9	Avg	348	1.0	VB: 3 kHz, note 6
2483.930	50.8	H	74.0	-23.2	PK	348	1.0	



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

RSS-247 and FCC 15.247 (DTS) Radiated Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT, unless otherwise noted.

Ambient Conditions:

Temperature: 22.1 °C
Rel. Humidity: 38 %

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel	Target Power	Power Setting	Test Performed	Limit	Result / Margin
1	BLE	2402MHz	Default	Default	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	44.3 dBµV/m @ 4803.7 MHz (-9.7 dB)
	BLE	2440MHz	Default	Default	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	42.5 dBµV/m @ 4879.8 MHz (-11.5 dB)
	BLE	2480MHz	Default	Default	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	42.7 dBµV/m @ 4959.5 MHz (-11.3 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Sample Notes

Sample S/N: 1704272408B1373917
Driver: -
Antenna: internal

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074
Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time
Unless otherwise stated/noted, emission has duty cycle ≥ 98% and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear average mode, auto sweep time, max hold.
2.4GHz band reject filter used

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
BLE	1 Mb/s	0.63	Yes	0.404	2.0	4.1	2475

Measurement Specific Notes:

Note 1:	Emission in non-restricted band, but limit of 15.209 used.
Note 2:	Emission in non-restricted band, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 4:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep, trace average 100 traces, measurement corrected by Linear Voltage correction factor
Note 6:	Emission has non constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW> 1/T, peak detector, linear average mode, sweep time auto, max hold. Max hold for 50*(1/DC) traces
Note 7:	Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements.

Notes:

The EUT was rotated thru three orientations to determine worse case in preliminary testing
The EUT was placed on a surface 1.5m above the ground plane in order to get accruate measurement results.
The EUT supports tx diversity, testing was performed using 11b to determine the worse case antenna. This was used for the other modes.

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

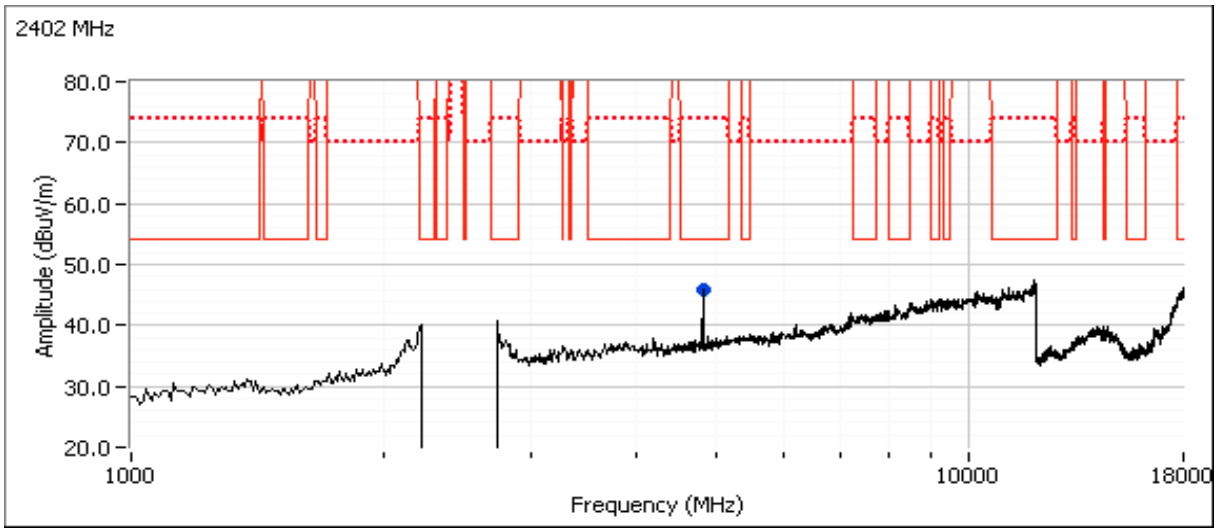
Run #1: Radiated Spurious Emissions, 1,000 - 25000 MHz. Operating Mode: BLE

Date of Test: 6/21/2017 0:00 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: none
Test Location: Chamber 7 EUT Voltage: Internal battery

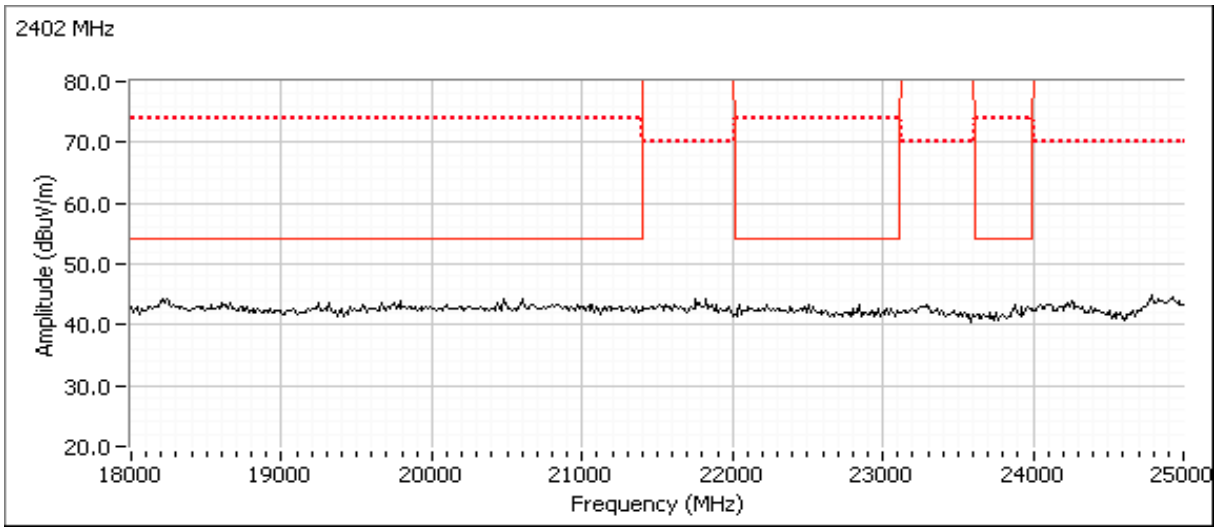
Run #1a: Low Channel

Channel: 2402MHz Mode: BLE EUT Orientation: Upright
Tx Chain: 0 - Main Data Rate: 1 Mb/s

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4803.650	44.3	V	54.0	-9.7	Avg	175	1.6	RB 1 MHz;VB 3 kHz;Peak
4804.600	50.1	V	74.0	-23.9	PK	175	1.6	RB 1 MHz;VB 3 MHz;Peak



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

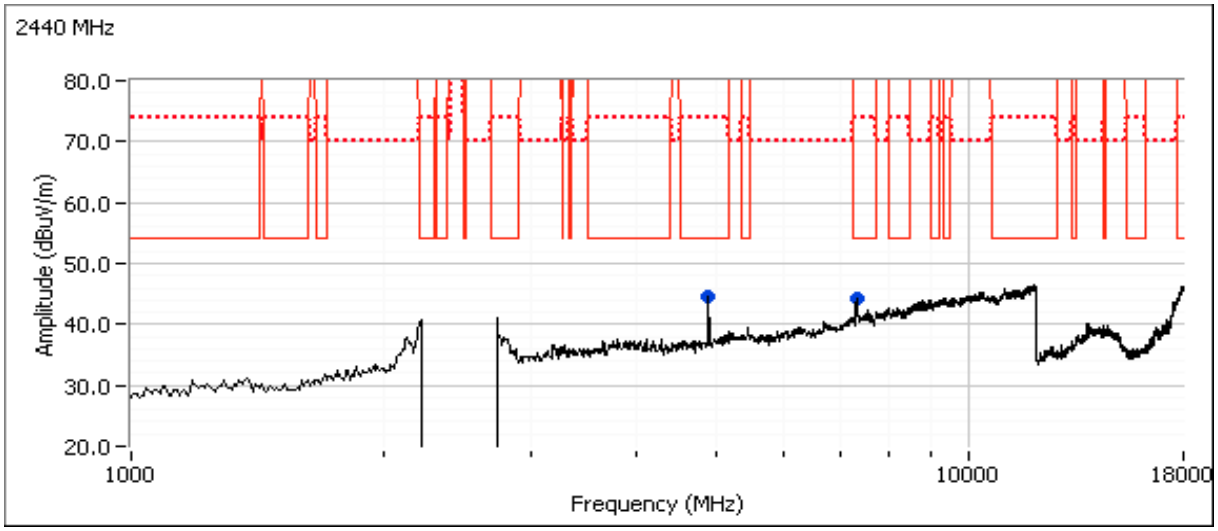


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

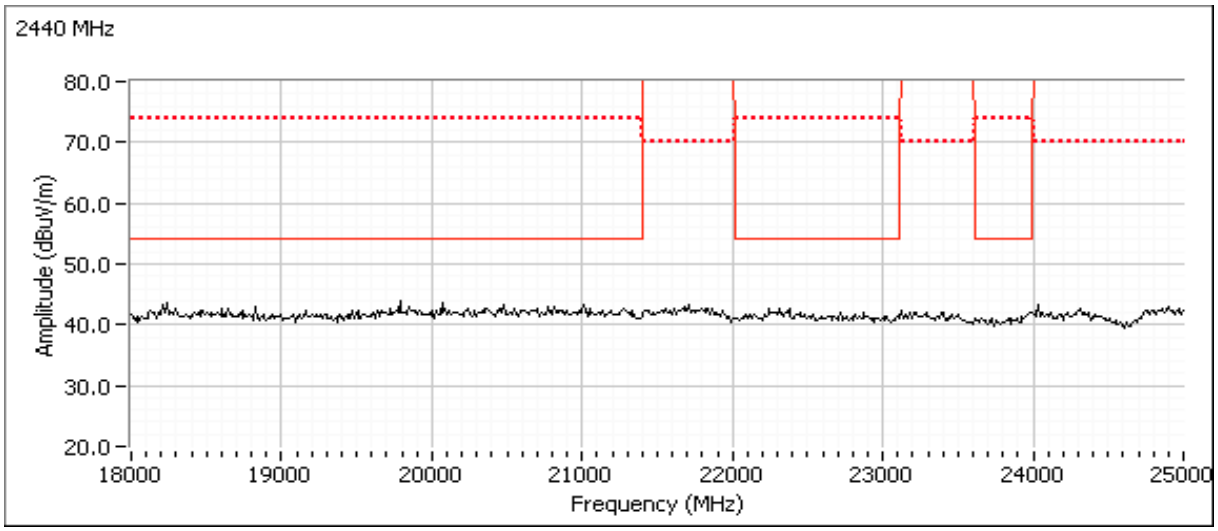
Run #1b: Center Channel

Channel: 2440MHz Mode: BLE EUT Orientation: Upright
Tx Chain: 0 - Main Data Rate: 1 Mb/s

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4879.830	42.5	V	54.0	-11.5	Avg	170	1.4	VB: 3 kHz, note 6
4879.590	49.3	V	74.0	-24.7	PK	170	1.4	
7319.350	40.8	V	54.0	-13.2	Avg	167	1.3	VB: 3 kHz, note 6
7318.890	50.6	V	74.0	-23.4	PK	167	1.3	



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

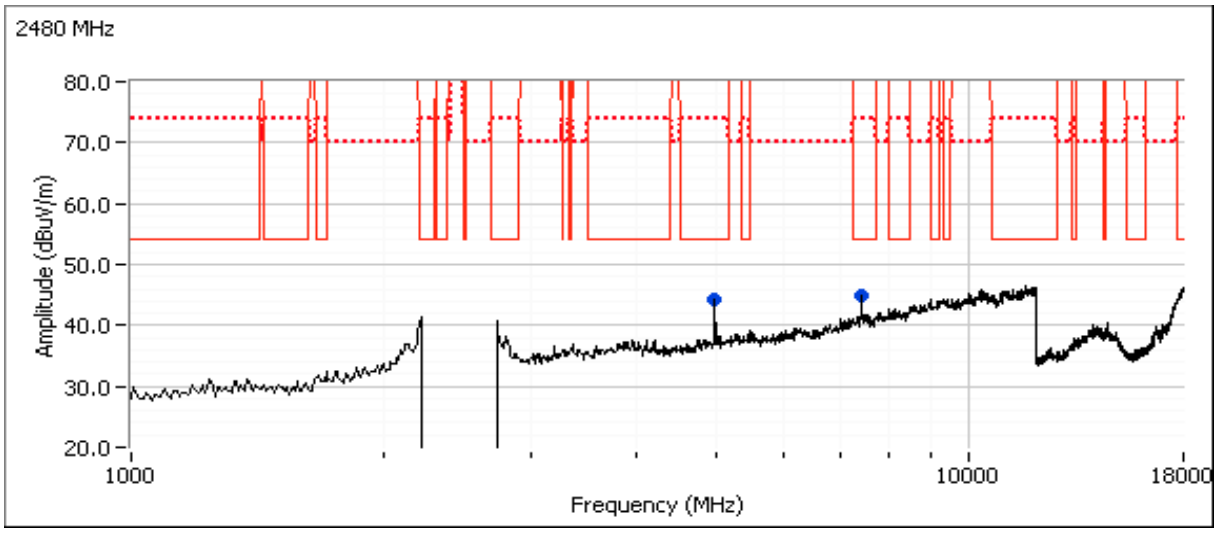


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

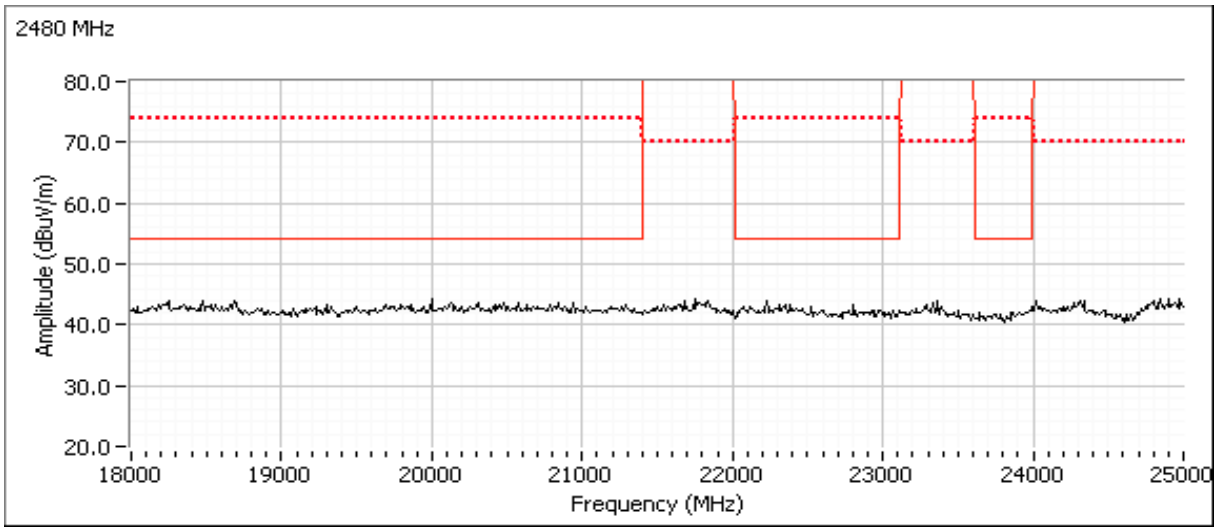
Run #1c: High Channel

Channel: 2480MHz Mode: BLE EUT Orientation: Upright
Tx Chain: 0 - Main Data Rate: 1 Mb/s

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4959.500	42.7	V	54.0	-11.3	Avg	202	1.5	VB: 3 kHz, note 6
4960.580	49.3	V	74.0	-24.7	PK	202	1.5	
7439.350	41.9	V	54.0	-12.1	Avg	164	1.4	VB: 3 kHz, note 6
7439.380	50.7	V	74.0	-23.3	PK	164	1.4	



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

RSS-247 and FCC 15.247 (DTS) Antenna Port Measurements

Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 6/27/17 and 7/5/17
Test Engineer: Rafael Varelas; M. Birgani
Test Location: Lab #4A

Config. Used: 1
Config Change: None
EUT Voltage: Internal Battery

General Test Configuration

The EUT was connected to the spectrum analyzer or power meter via a suitable attenuator. All measurements were made on a single chain.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions:

Temperature: 23.5 °C
Rel. Humidity: 38 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	-	-	Output Power	15.247(b)	Pass	b: 19.1 dBm (81.3mW) g: 18.8 dBm (75.9mW) n20: 18.7 dBm (74.1mW)
2	-	-	Power spectral Density (PSD)	15.247(d)	Pass	b: 1.4 dBm/10kHz g: -0.8 dBm/10kHz n20: -0.3 dBm/10kHz
3	-	-	Minimum 6dB Bandwidth	15.247(a)	Pass	9.0 MHz
3	-	-	99% Bandwidth	RSS GEN	-	b: 14.0MHz g: 16.7MHz n20: 17.7 MHz
4	-	-	Spurious emissions	15.247(b)	Pass	All emissions below the -30dBc Limit

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11b	1 Mb/s	0.99	Yes	1.984	0	0	10
11g	6 Mb/s	0.981	Yes	2.016	0	0	10
HT20	MCS0	0.99	Yes	1.914	0	0	10

Sample Notes

Sample S/N: 1704272408B1373917
Driver: -

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Run #1: Output Power

Mode: 11b

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP dBm	EIRP W	Output Power (dBm)[3]	Output Power mW
21	2412	18.7	74.1	2.4	Pass	21.1	0.128		
21	2437	18.4	69.2	2.4	Pass	20.8	0.119		
21	2462	19.1	81.3	2.4	Pass	21.5	0.140		

Mode: 11g

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP dBm	EIRP W	Output Power (dBm)[3]	Output Power mW
16	2412	14.1	25.7	2.4	Pass	16.5	0.044		
21	2437	18.8	75.9	2.4	Pass	21.2	0.131		
16	2462	14.3	26.9	2.4	Pass	16.7	0.046		

Mode: n20

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP dBm	EIRP W	Output Power (dBm)[3]	Output Power mW
18	2412	15.8	38.0	2.4	Pass	18.2	0.065		
21	2437	18.7	74.1	2.4	Pass	21.1	0.128		
17	2462	15.3	33.9	2.4	Pass	17.7	0.058		

Note 1:	Duty Cycle ≥ 98%. Output power measured using gated average power meter.
Note 2:	Power setting - the software power setting used during testing, included for reference only.
Note 3:	This measurments were made by M. Birgani on 7/5/17.

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Run #2: Power spectral Density

Mode: 11b

Power Setting	Frequency (MHz)	PSD (dBm/10kHz) Note 1	Limit dBm/3kHz	Result
21	2412	0.5	8.0	Pass
21	2437	1.4	8.0	Pass
21	2462	0.9	8.0	Pass

Mode: 11g

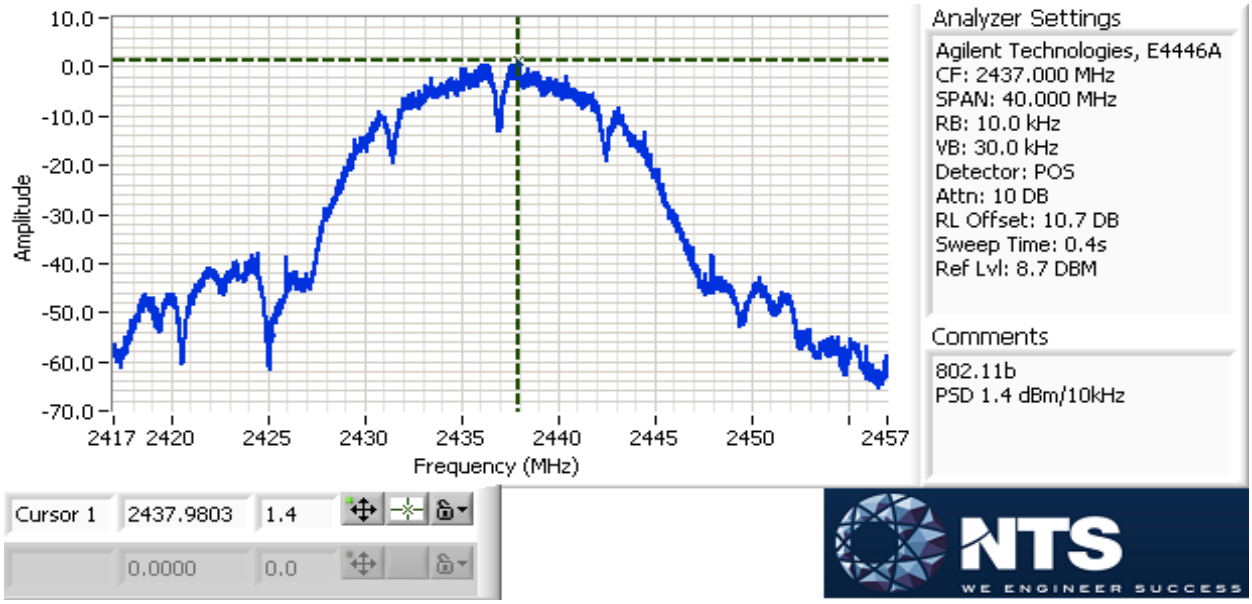
Power Setting	Frequency (MHz)	PSD (dBm/10kHz) Note 1	Limit dBm/3kHz	Result
16	2412	-5.1	8.0	Pass
21	2437	-0.8	8.0	Pass
16	2462	-5.1	8.0	Pass

Mode: n20

Power Setting	Frequency (MHz)	PSD (dBm/10kHz) Note 1	Limit dBm/3kHz	Result
18	2412	-3.8	8.0	Pass
21	2437	-0.3	8.0	Pass
17	2462	-4.0	8.0	Pass

Note 1:	Test performed per method PKSPD, in KDB 558074. Power spectral density measured using: 3kHz ≤ RBW ≤ 100kHz, VBW=3*RBW, peak detector, span = 1.5*DTS BW, auto sweep time, max hold.

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Run #3: Signal Bandwidth

Mode: 11b

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
		6dB	99%	6dB	99%
21	2412	9.0	14.03	100	300
21	2437	9.0	14.01	100	300
21	2462	9.0	14.01	100	300

Mode: 11g

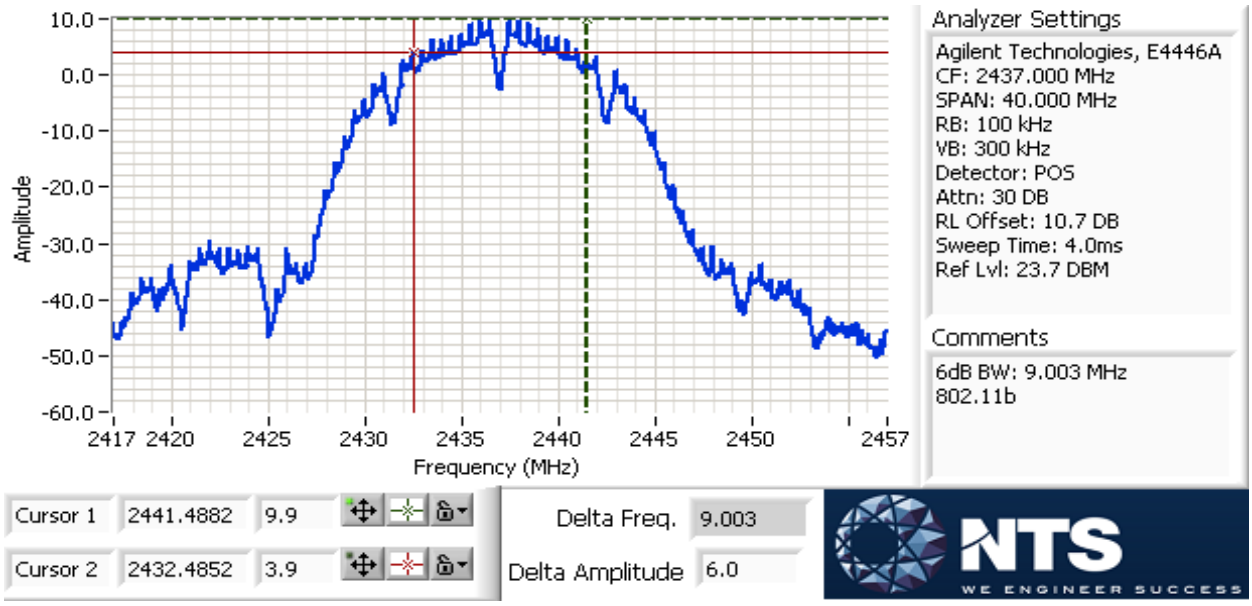
Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
		6dB	99%	6dB	99%
16	2412	15.1	16.5	100	300
21	2437	15.1	16.7	100	300
16	2462	15.1	16.5	100	300

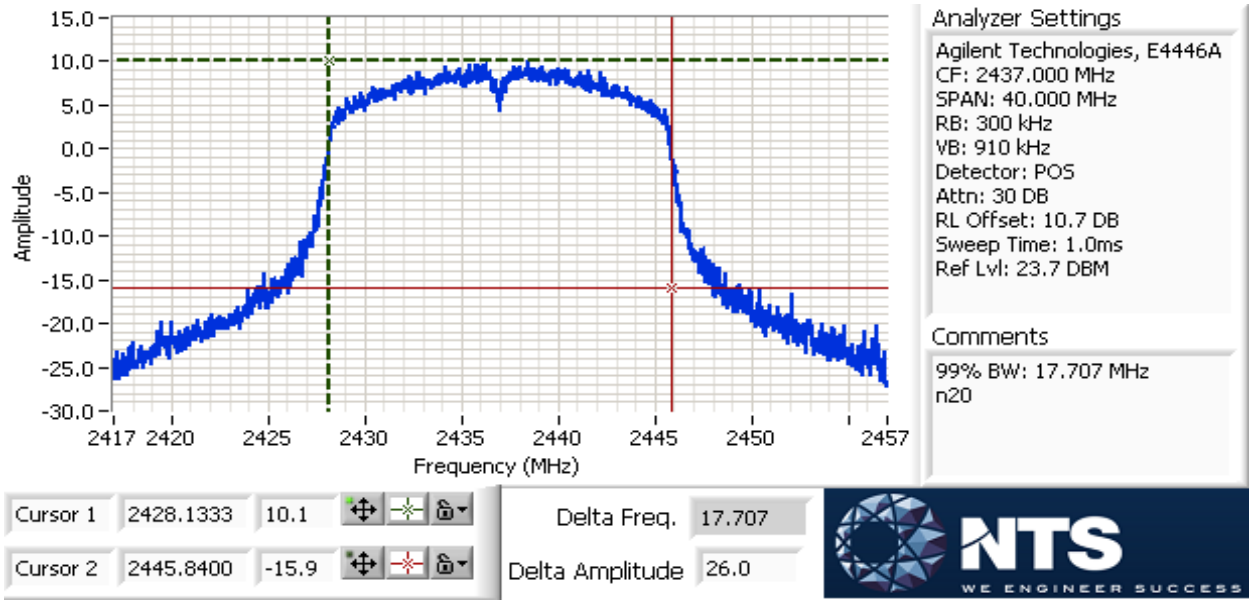
Mode: n20

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
		6dB	99%	6dB	99%
18	2412	15.1	17.6	100	300
21	2437	15.1	17.7	100	300
17	2462	15.1	17.6	100	300

Note 1:	DTS BW: RBW=100kHz, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time, Span 2-5 times measured BW. 99% BW: RBW=1-5% of 99%BW, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time. Span 1.5-5 times OBW.

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A





Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

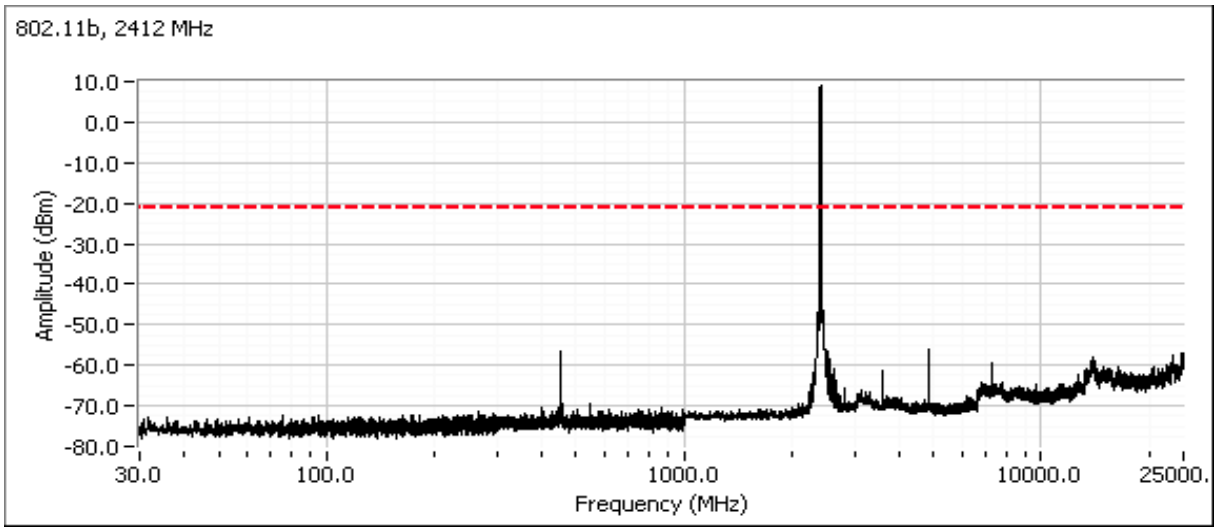
Run #4a: Out of Band Spurious Emissions

Frequency (MHz)	Power Setting	Mode	Limit	Result
2412	21	b	-30dBc	Pass
2437	21	b	-30dBc	Pass
2462	21	b	-30dBc	Pass
2412	16	g	-30dBc	Pass
2437	21	g	-30dBc	Pass
2462	16	g	-30dBc	Pass
2412	18	n20	-30dBc	Pass
2437	21	n20	-30dBc	Pass
2462	17	n20	-30dBc	Pass

RBW = 100 kHz and VBW = 300 kHz for all plots.

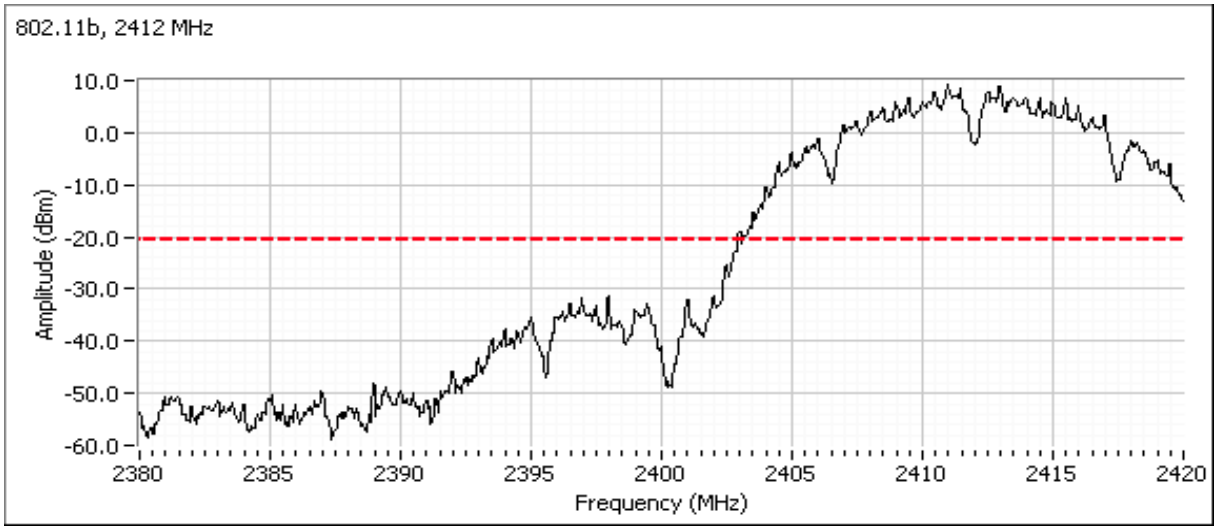
802.11b Mode

Plots for low channel

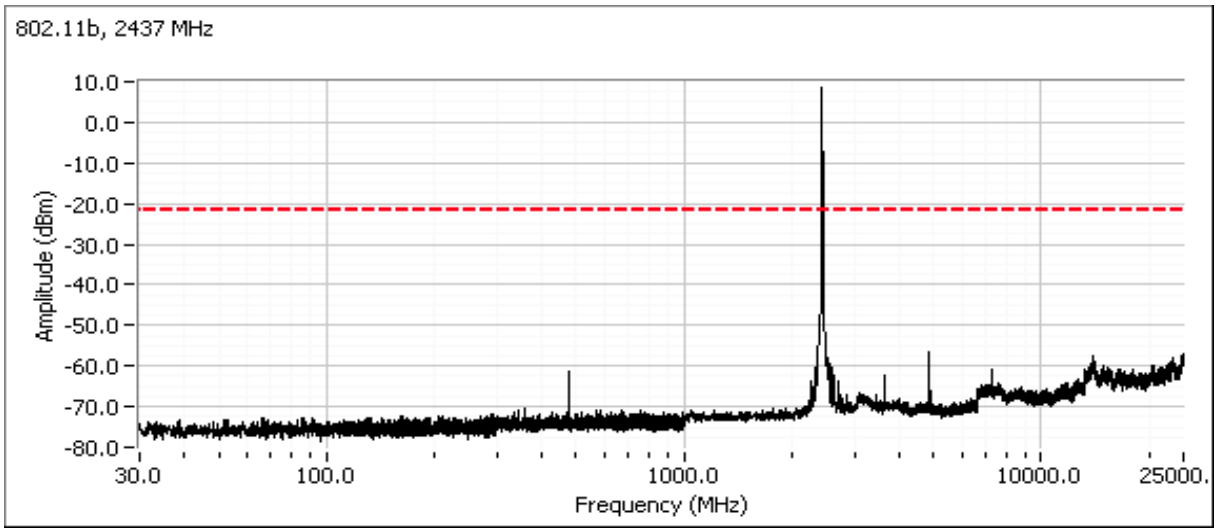


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

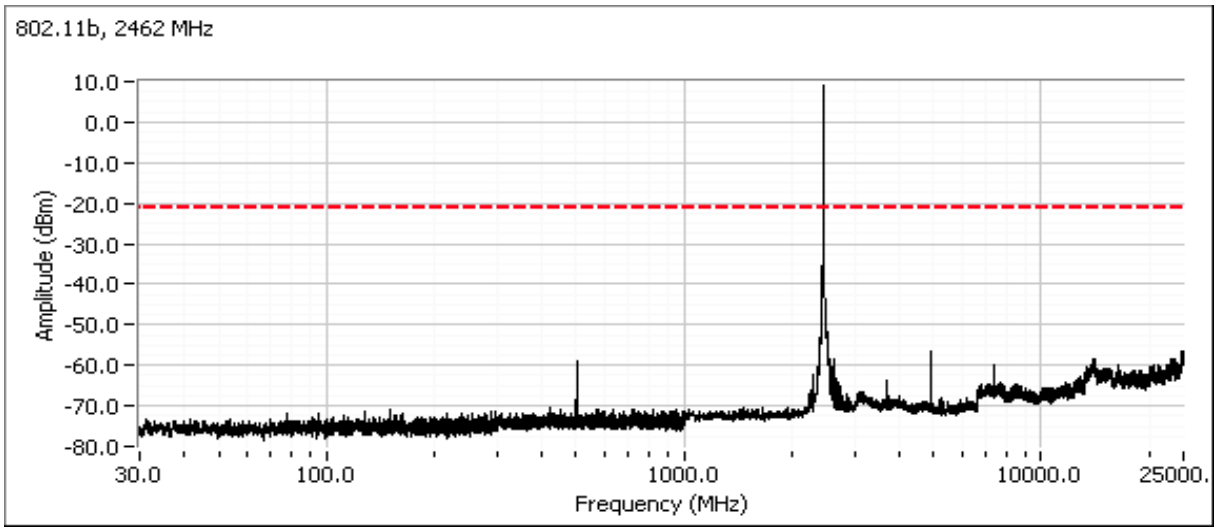


Plots for center channel



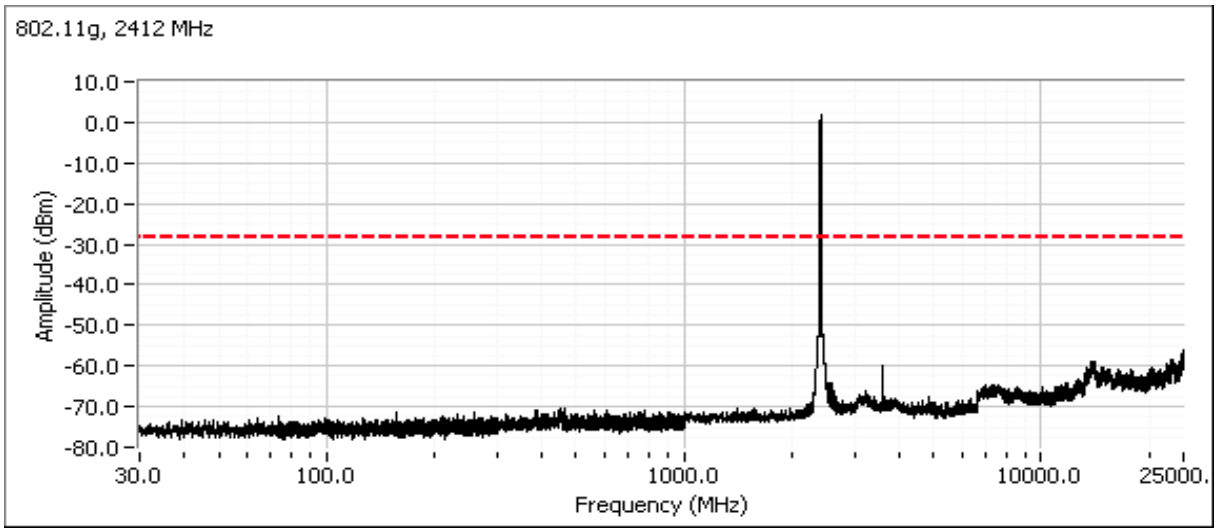
Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Plots for high channel



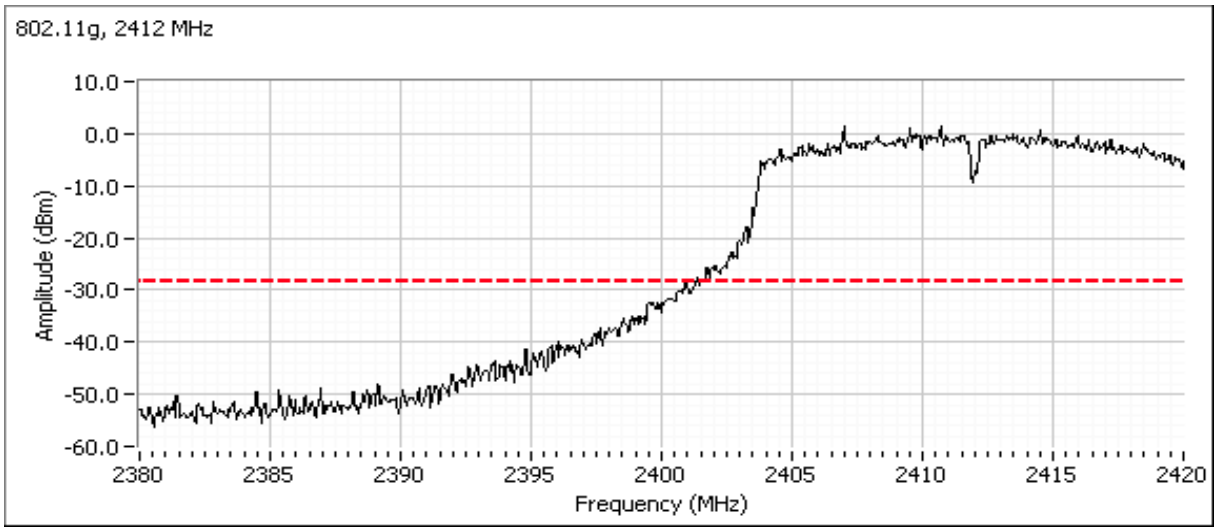
802.11g Mode

Plots for low channel

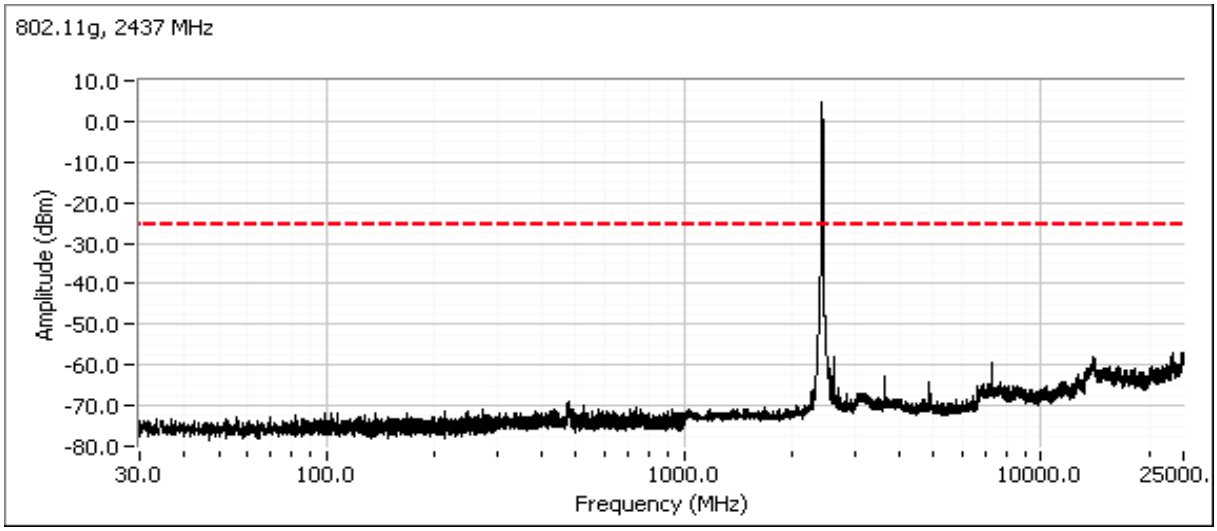


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

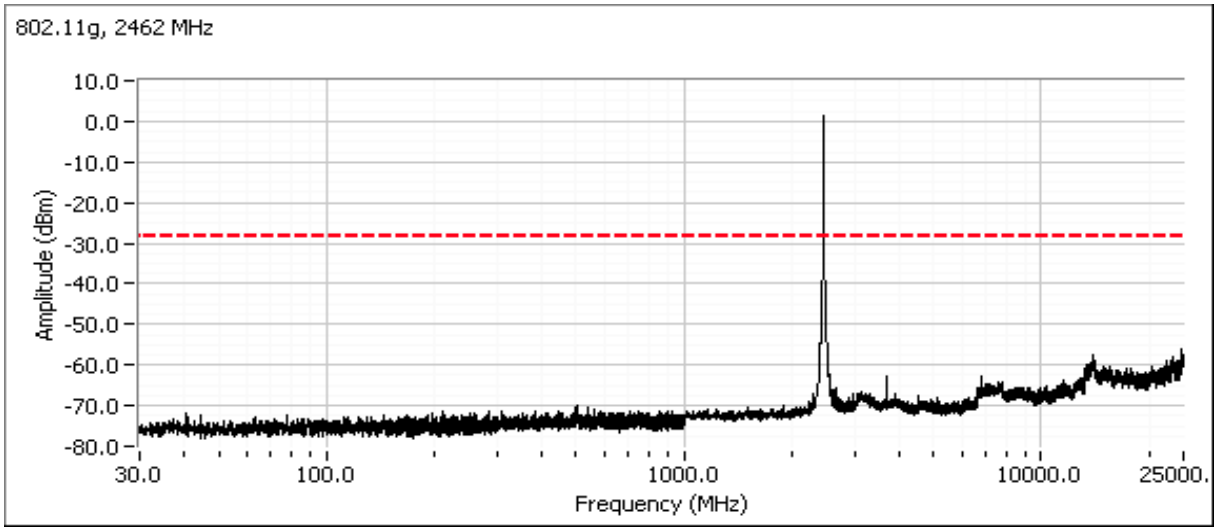


Plots for center channel



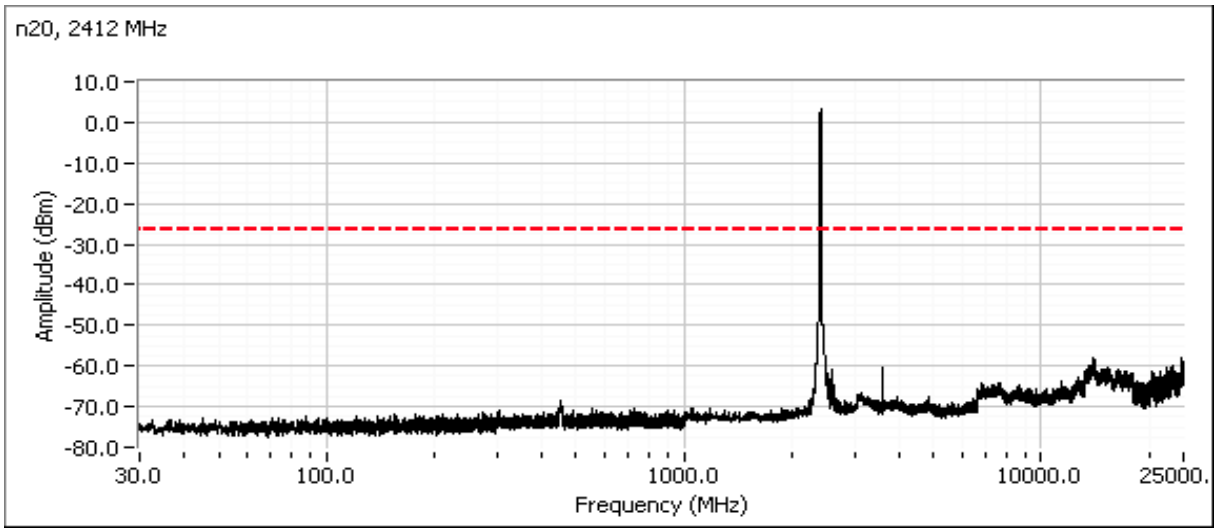
Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Plots for high channel



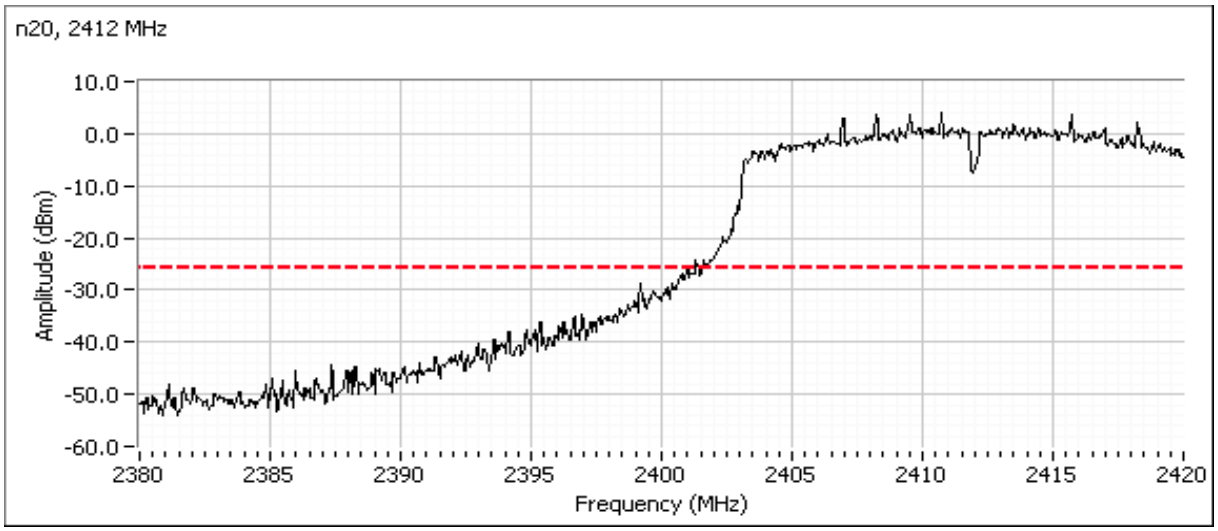
n20 Mode

Plots for low channel

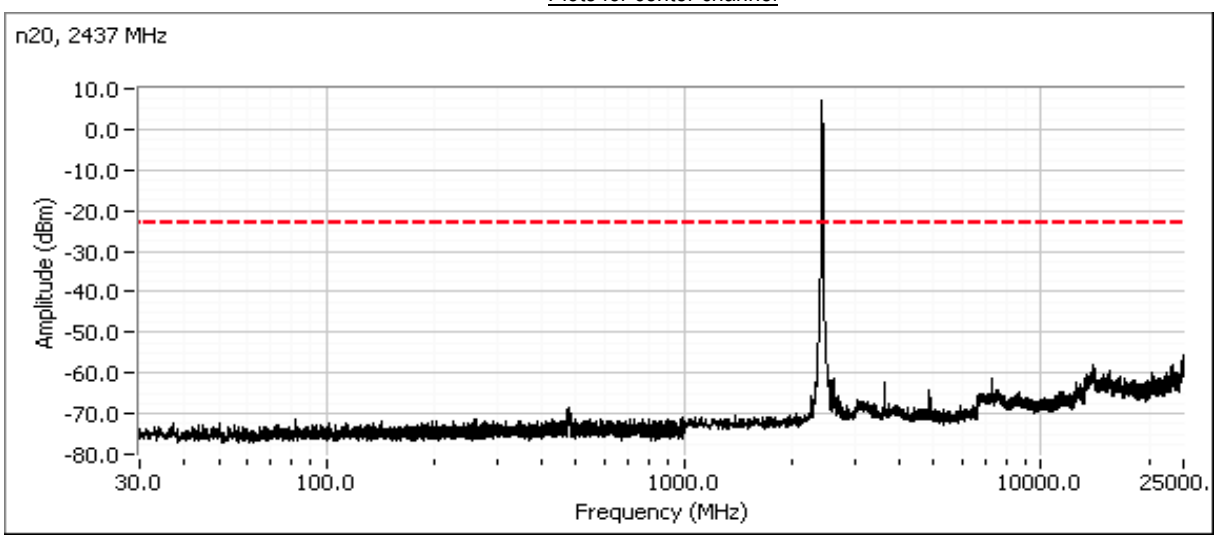


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

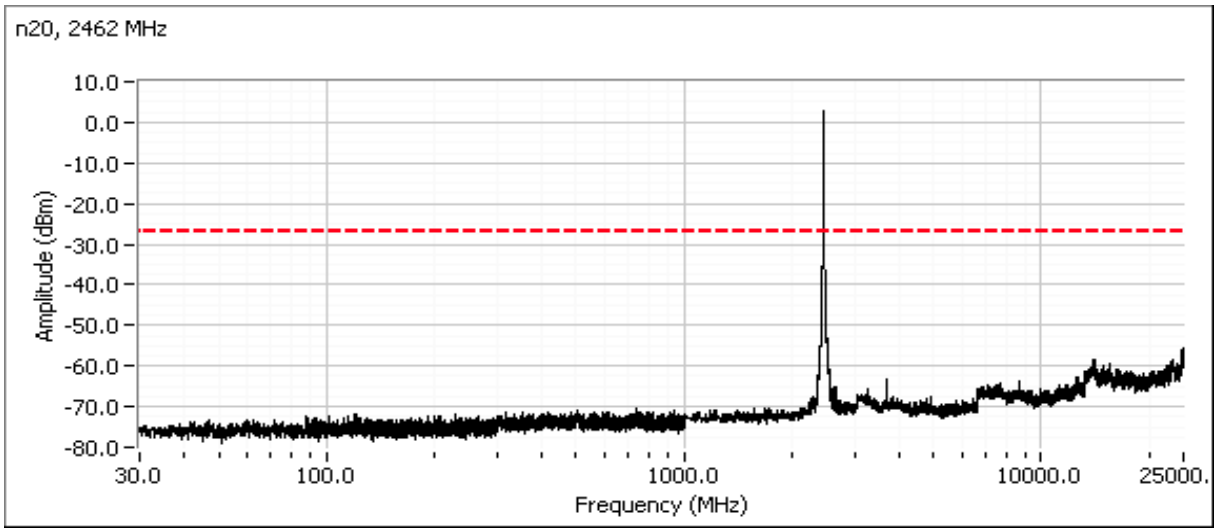


Plots for center channel



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Plots for high channel



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

RSS-247 and FCC 15.247 (DTS) Antenna Port Measurements

Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 6/27/2017
Test Engineer: Rafael Varelas
Test Location: Lab #4A

Config. Used: 1
Config Change: None
EUT Voltage: Internal Battery

General Test Configuration

The EUT was connected to the spectrum analyzer or power meter via a suitable attenuator. All measurements were made on a single chain.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions:

Temperature: 23.5 °C
Rel. Humidity: 38 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	-	-	Output Power	15.247(b)	Pass	6.9 dBm (4.9mW)
2	-	-	Power spectral Density (PSD)	15.247(d)	Pass	-2.0 dBm/10kHz
3	-	-	Minimum 6dB Bandwidth	15.247(a)	Pass	687 kHz
3	-	-	99% Bandwidth	RSS GEN	-	1.1 MHz
4	-	-	Spurious emissions	15.247(b)	Pass	All emissions below the -30dBc Limit

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
BLE	1 Mb/s	0.63	Yes	0.404	2.0	4.1	2475

Sample Notes

Sample S/N: 1704272408B1373917
Driver: -

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Run #1: Output Power

Mode: BLE

Power Setting[2]	Frequency (MHz)	Output Power (dBm) [1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP dBm	EIRP W	Output Power (dBm) [3]	Output Power mW
Default	2402	6.1	4.1	2.4	Pass	8.5	0.007		
Default	2440	6.5	4.5	2.4	Pass	8.9	0.008		
Default	2480	6.9	4.9	2.4	Pass	9.3	0.008		

Note 1:	Output power measured using gated average power meter. (option AVGPM-G in ANSI C63.10). Spurious limit becomes -30dBc.
Note 2:	Power setting - the software power setting used during testing, included for reference only.

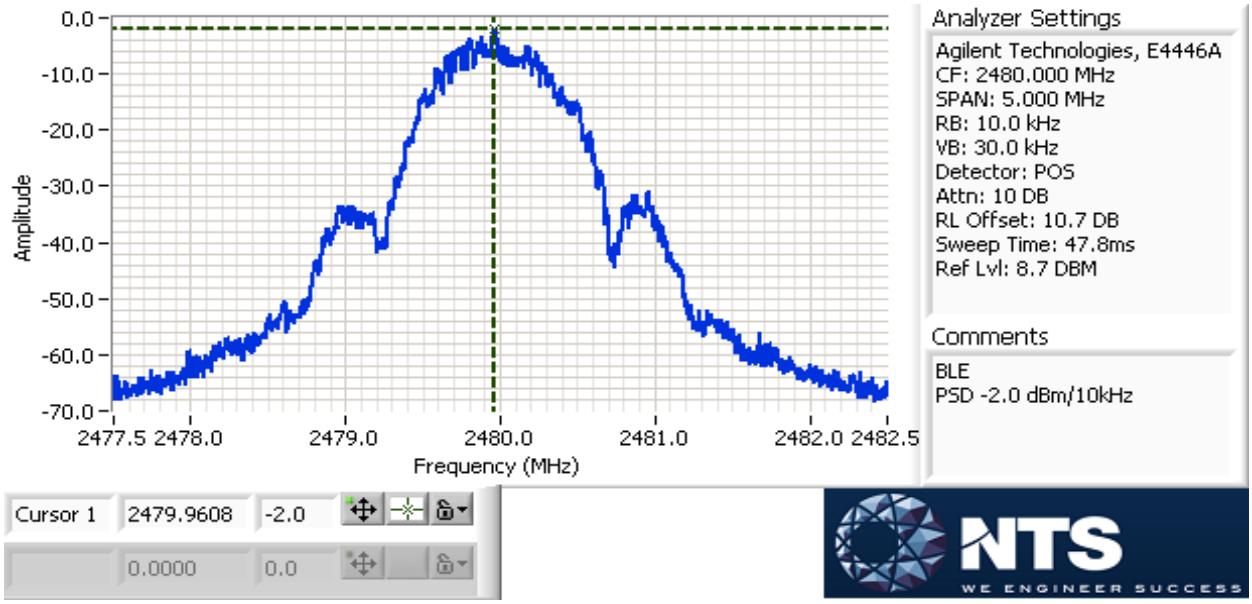
Run #2: Power spectral Density

Mode: BLE

Power Setting	Frequency (MHz)	PSD (dBm/10kHz) Note 1	Limit dBm/3kHz	Result
Default	2402	-2.9	8.0	Pass
Default	2440	-2.1	8.0	Pass
Default	2480	-2.0	8.0	Pass

Note 1:	Test performed per method PKSPD, in KDB 558074. Power spectral density measured using: 3kHz ≤ RBW ≤ 100kHz, VBW=3*RBW, peak detector, span = 1.5*DTS BW, auto sweep time, max hold.

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A



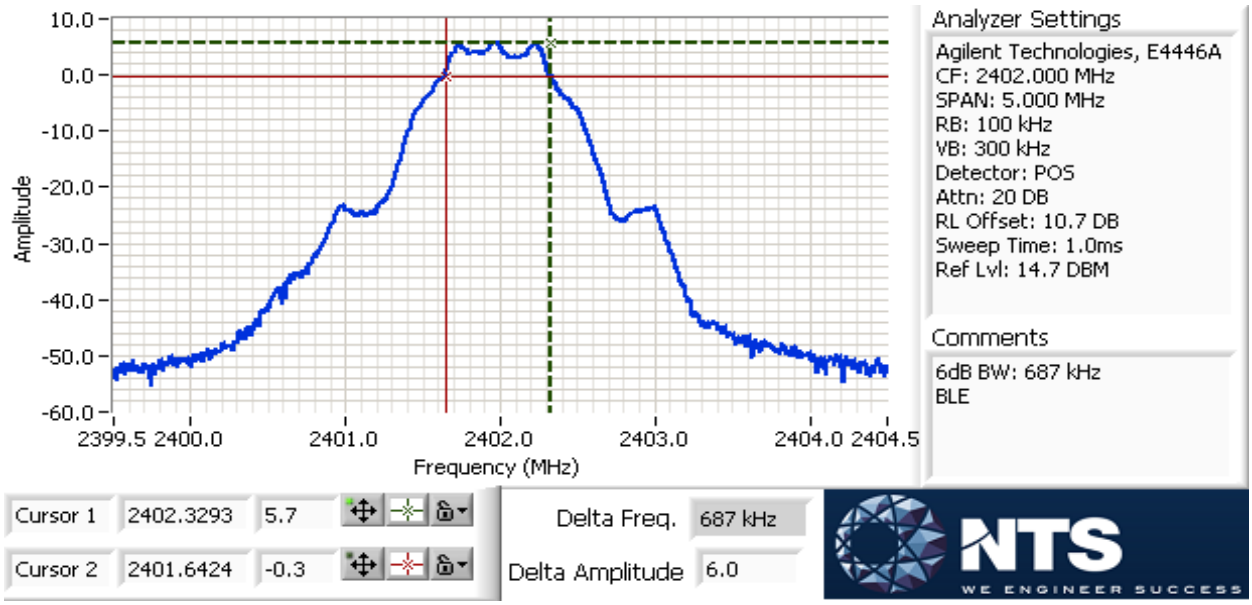
Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Run #3: Signal Bandwidth

Mode: BLE

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
		6dB	99%	6dB	99%
Default	2402	0.687	1.06	100	30
Default	2440	0.707	1.06	100	30
Default	2480	0.705	1.06	100	30

Note 1:	DTS BW: RBW=100kHz, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time, Span 2-5 times measured BW. 99% BW: RBW=1-5% of 99%BW, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time. Span 1.5-5 times OBW.



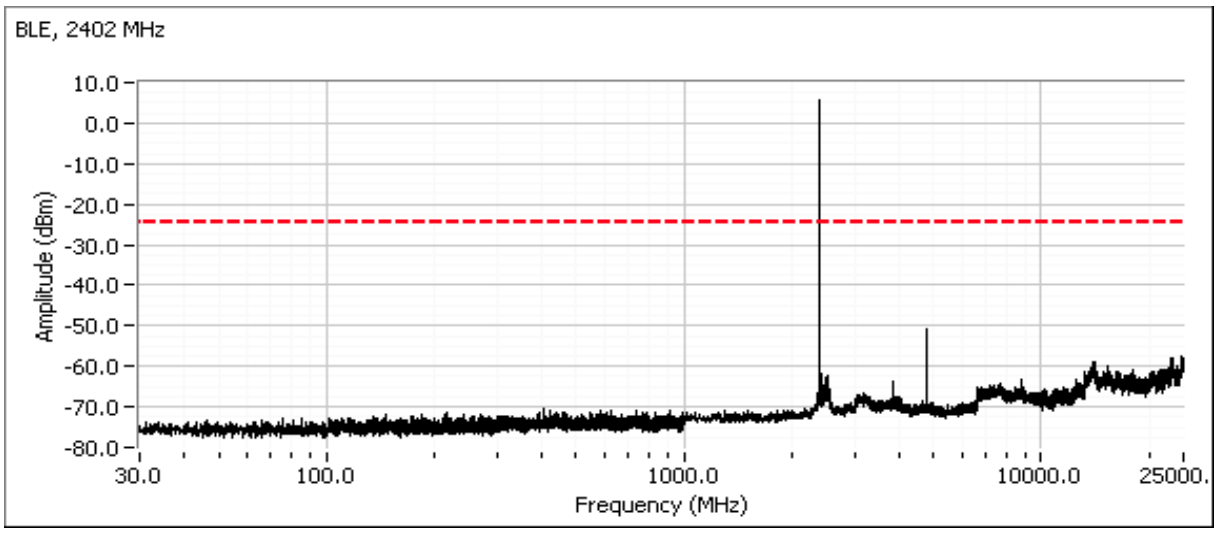
Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Run #4a: Out of Band Spurious Emissions

Frequency (MHz)	Power Setting	Mode	Limit	Result
2402	Default	BLE	-30dBc	Pass
2440	Default	BLE	-30dBc	Pass
2480	Default	BLE	-30dBc	Pass

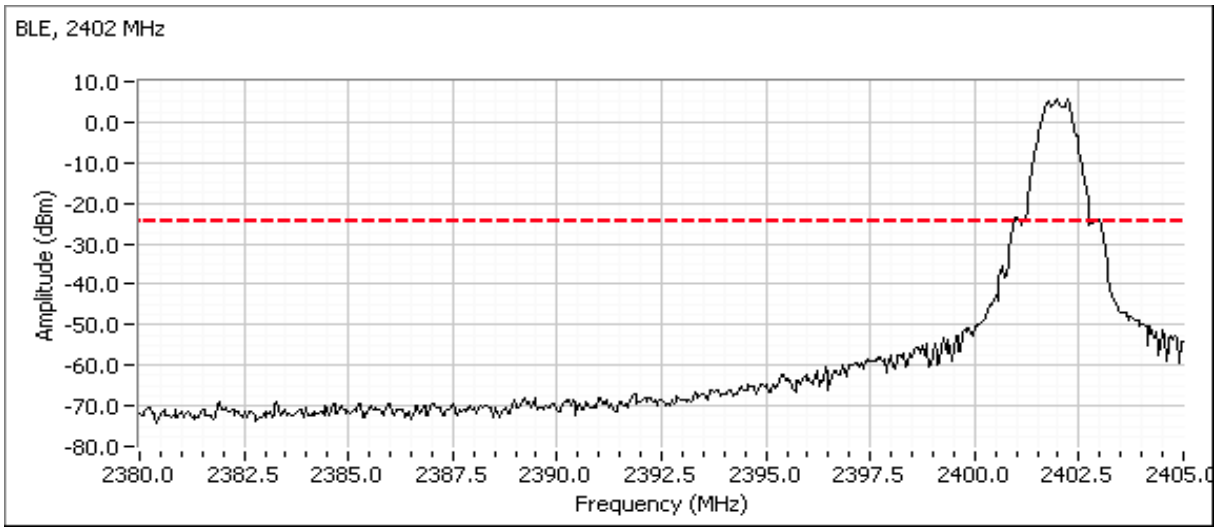
RBW = 100 kHz and VBW = 300 kHz for all plots.

Plots for low channel

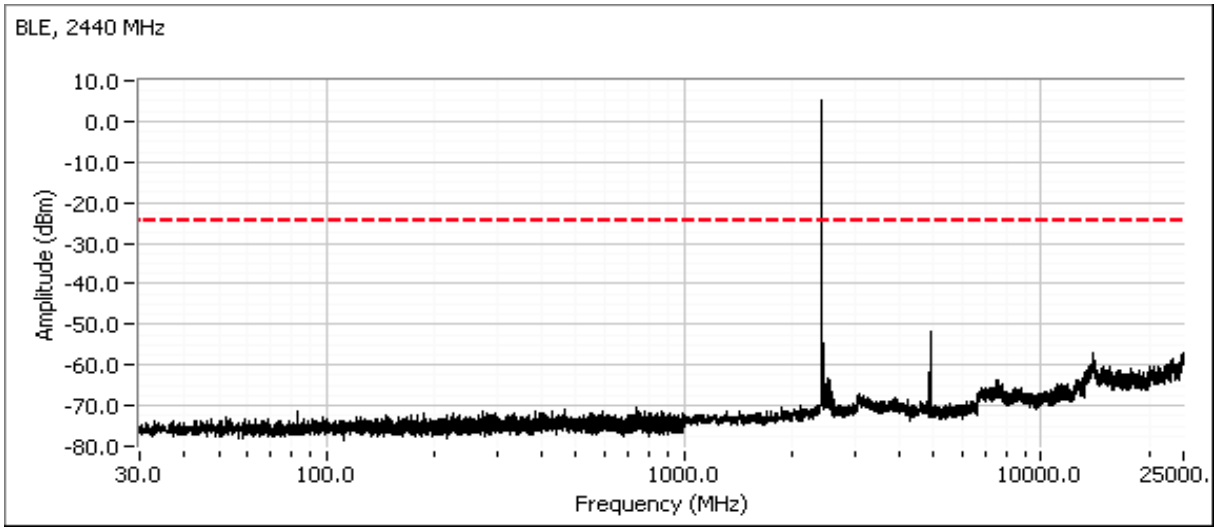


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

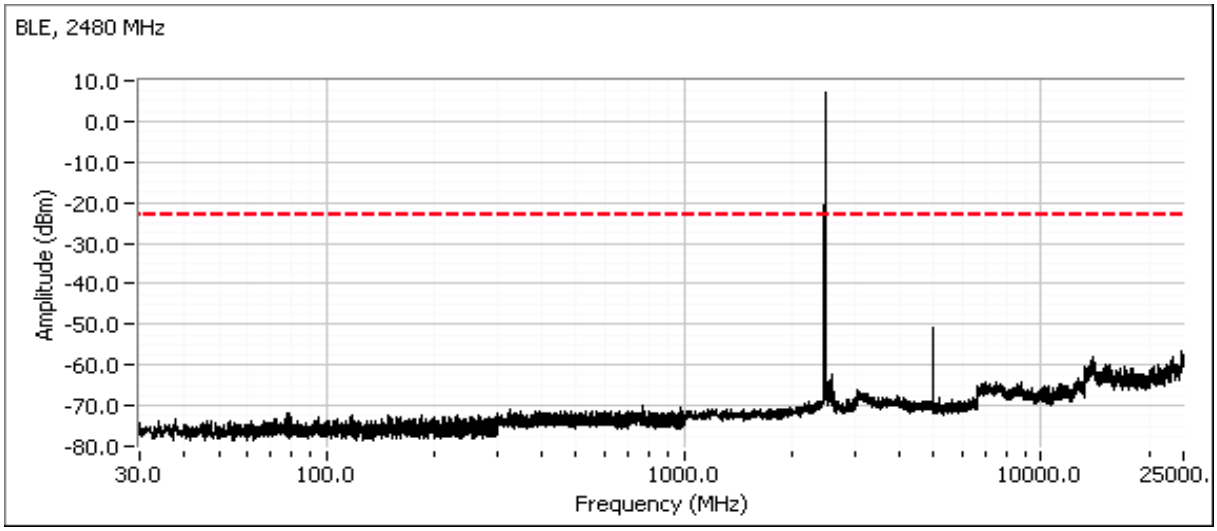


Plots for center channel



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Plots for high channel



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

RSS-247 and FCC 15.247 (DTS) Radiated Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT, unless otherwise noted.

Ambient Conditions:

Temperature: 23.6 °C
Rel. Humidity: 42 %

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel	Target Power	Power Setting	Test Performed	Limit	Result / Margin
1	11b	2437MHz	21	21	Radiated Emissions, 30 - 1000 MHz	FCC Part 15.209 / 15.247(c)	26.3 dBµV/m @ 171.22 MHz (-17.2 dB)
	BLE	2440MHz	Default	Default	Radiated Emissions, 30 - 1000 MHz	FCC Part 15.209 / 15.247(c)	26.2 dBµV/m @ 172.31 MHz (-17.3 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Sample Notes

Sample S/N: 1704272408B1373917
Driver: -
Antenna: internal

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074
Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time
Unless otherwise stated/noted, emission has duty cycle ≥ 98% and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear average mode, auto sweep time, max hold.
2.4GHz band reject filter used

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11b	1 Mb/s	0.99	Yes	1.984	0	0	10
BLE	1 Mb/s	0.63	Yes	0.404	2.0	4.1	2475

Measurement Specific Notes:

Note 1:	Emission in non-restricted band, but limit of 15.209 used.
Note 2:	Emission in non-restricted band, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 3:	Emission has a duty cycle ≥ 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces
Note 4:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep, trace average 100 traces, measurement corrected by Linear Voltage correction factor
Note 5:	Emission has constatnt duty cycle < 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces, measurement corrected by Pwr correction factor
Note 6:	Emission has non constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW> 1/T, peak detector, linear average mode, sweep time auto, max hold. Max hold for 50*(1/DC) traces
Note 7:	Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements.

Notes:

The EUT was rotated thru three orientations to determine worse case in preliminary testing
The EUT was placed on a surface 0.8m above the ground plane in order to get accruate measurement results.

Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

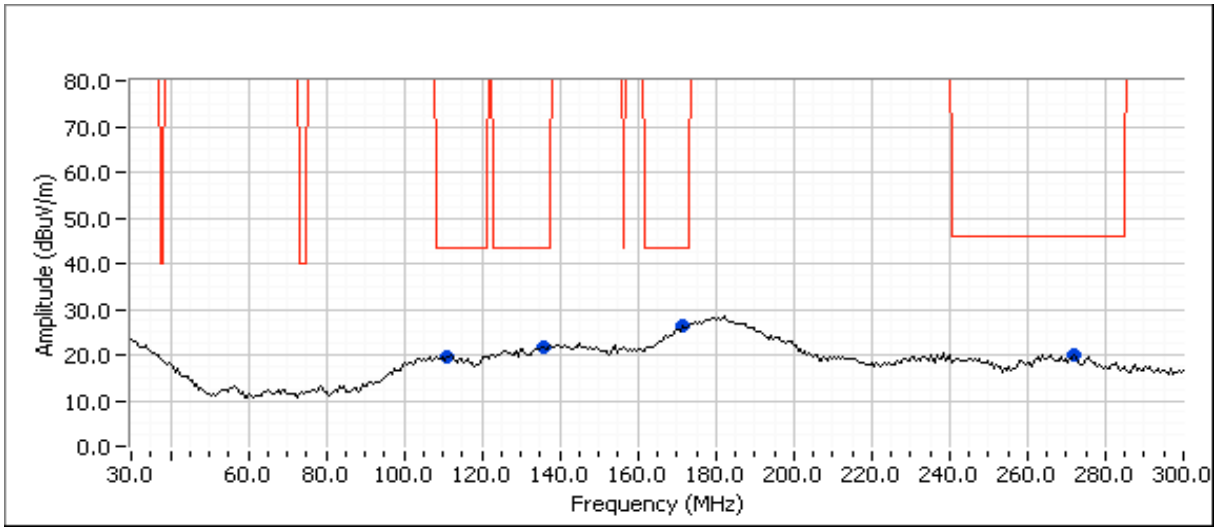
Run #1: Radiated Spurious Emissions, 30 - 1000 MHz.

Date of Test: 6/22/2007 0:00
Test Engineer: Rafael Varelas
Test Location: Chamber 7
Config. Used: 1
Config Change: none
EUT Voltage: Internal battery

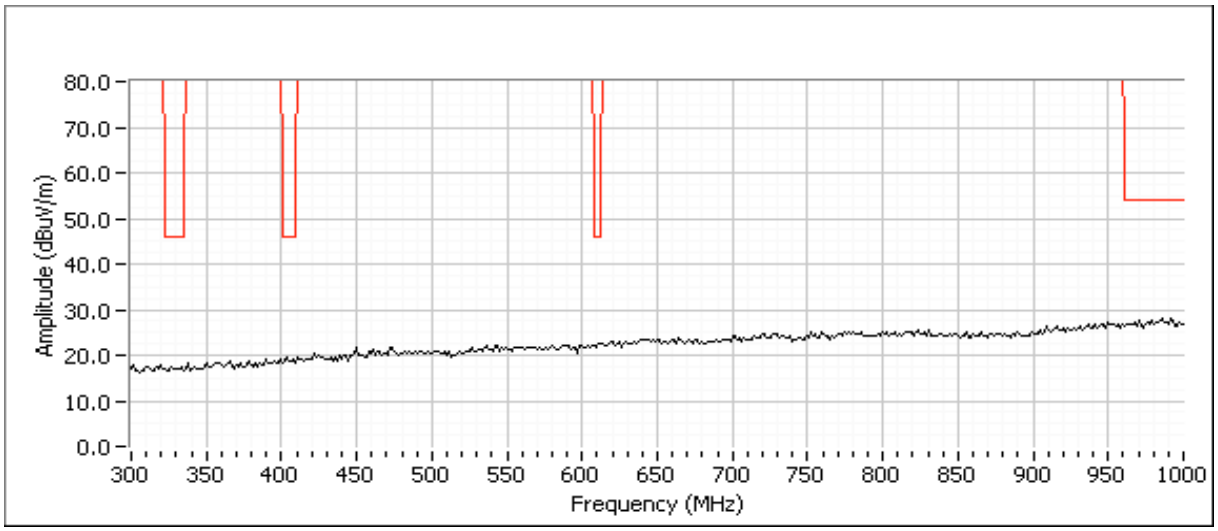
Run #1a:

Channel: 6
Tx Chain: Main
Mode: 11b
Data Rate: 1 Mb/s

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
171.222	26.3	H	43.5	-17.2	Peak	12	3.5	
111.162	19.5	H	43.5	-24.0	Peak	17	1.0	
136.052	21.8	H	43.5	-21.7	Peak	106	1.0	
271.864	19.9	H	46.0	-26.1	Peak	119	4.0	



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

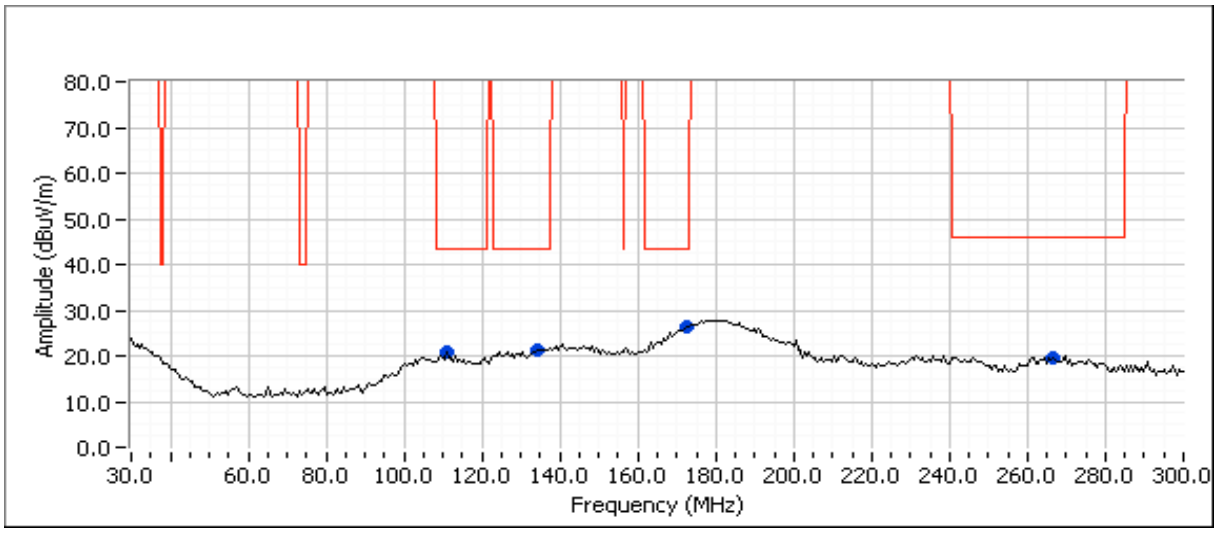


Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A

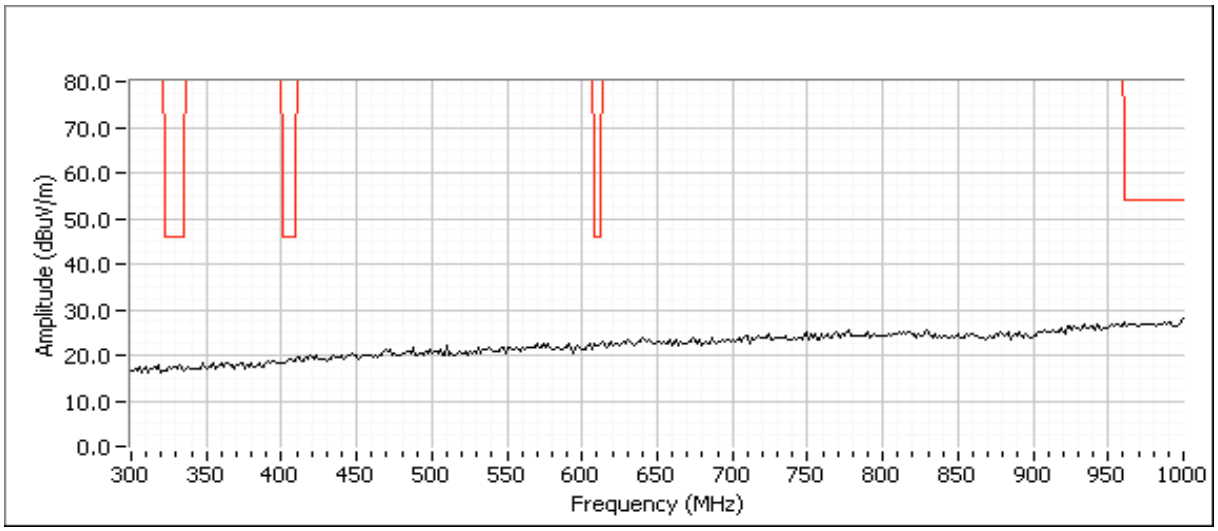
Run #1b:

Channel: 2440MHz Mode: BLE
Tx Chain: Main Data Rate: 1 Mb/s

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
172.305	26.2	H	43.5	-17.3	Peak	72	2.0	
111.162	20.7	H	43.5	-22.8	Peak	234	3.5	
134.429	21.2	H	43.5	-22.3	Peak	324	1.0	
266.453	19.7	H	46.0	-26.3	Peak	194	4.0	



Client:	Fitbit, Inc.	Job Number:	JD99548
Model:	FB202 (Aria 2)	T-Log Number:	T99619
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Standard:	FCC 15.247/RSS-247/LP0002	Class:	N/A



End of Report

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