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EMC Test Report

Application for Grant of Equipment Authorization

Industry Canada RSS-Gen Issue 3 / RSS 210 Issue 8
FCC Part 15 Subpart C

Model: FB402

IC CERTIFICATION #:	8542A-FB402
FCC ID:	XRAFB402
APPLICANT:	Fitbit, Inc. 150 Spear Street, Suite 200 San Francisco, CA 94105
TEST SITE(S):	National Technical Systems - Silicon Valley 41039 Boyce Road. Fremont, CA. 94538-2435
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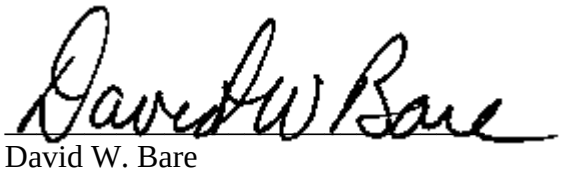

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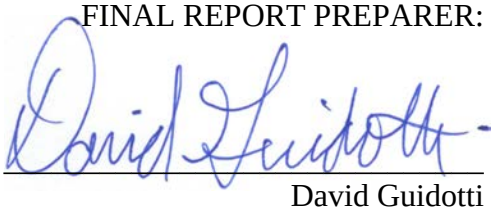

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REVISION HISTORY

Rev#	Date	Comments	Modified By
-	07-12-2013	First release	
1	08-20-2013	Reissued to correct model name and description	Dave Guidotti

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SCOPE

An electromagnetic emissions test has been performed on the Fitbit, Inc. model FB402, pursuant to the following rules:

Industry Canada RSS-Gen Issue 3
RSS 210 Issue 8 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
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 C63.10-2009
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 FB402 complied with the requirements of the following regulations:

Industry Canada RSS-Gen Issue 3
RSS 210 Issue 8 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
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 FB402 and therefore apply only to the tested sample. The sample was selected and prepared by Arndt Hufenbach 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 210 A8.2	Digital Modulation	Systems uses GFSK modulation	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	RSS 210 A8.2 (1)	6dB Bandwidth	0.65 MHz	>500kHz	Complies
15.247 (b) (3)	RSS 210 A8.2 (4)	Output Power (multipoint systems)	1.5 dBm (0.0014 Watts) EIRP = 0.002 W Note 1	1Watt, EIRP limited to 4 Watts.	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	-11.5 dBm / 3kHz	8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions 30MHz – 25 GHz	All emissions < -20 dBc	< -20dBc	Complies
15.247(c) / 15.209	RSS 210 A8.5	Radiated Spurious Emissions 30MHz – 25 GHz	67.3 dBµV/m @ 2483.8 MHz (-6.7 dB)	15.207 in restricted bands, all others < -20dBc	Complies
Note 1: EIRP calculated using antenna gain of 1.9 dBi for the highest EIRP system.					

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Integral antenna	Unique or integral antenna required	Complies
15.207	RSS GEN Table 2	AC Conducted Emissions	45.7 dBµV @ 0.156 MHz (-20.0 dB)	Refer to standard	Complies
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Meets standalone SAR exclusion for 5mm separation Calculation yields 0.44 which is less than 3.0 per KDB 447498 Refer to RSS 102 declaration and User Manual statements.	Refer to OET 65, FCC Part 1 and RSS 102	Complies
-	RSP 100 RSS GEN 7.1.5	User Manual		Statement required regarding non-interference	Complies
-	RSP 100 RSS GEN 7.1.5	User Manual		Statement for products with detachable antenna	Complies
-	RSP 100 RSS GEN 4.4.1	99% Bandwidth	2.22 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
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 FB402 is a Bluetooth LE Fitness Tracker with passive NFC tag. Since the EUT would be worn during operation, the EUT was treated as table-top equipment during testing to simulate typical operational height and position. The electrical rating of the EUT is rechargeable battery powered, 5V DC (USB charger).

The sample was received on May 24, 2013 and tested on June 10, 12 and 13, 2013. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Fitbit Inc.	FB402	Wireless Activity Tracker	None	XRAFB402

ANTENNA SYSTEM

The antenna is integral to the device.

ENCLOSURE

The EUT enclosure is constructed of metal (bottom) and plastic (top) parts. It measures approximately 20mm wide, 50mm deep and 10mm high.

MODIFICATIONS

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

SUPPORT EQUIPMENT

No support equipment was used during testing.

EUT INTERFACE PORTS

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

Port		Cable(s)		
From	To	Description	Shielded/Unshielded	Length(m)
USB Charge	Un-terminated	Multiwire	Unshielded	10

Note: The EUT does not transmit when connected to a USB Charger. The cable was connected only to program the device.

EUT OPERATION

During emissions testing the EUT was configured to transmit continuously on the selected channel.

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	Registration Numbers		Location
	FCC	Canada	
Chamber 3	769238	2845B-3	41039 Boyce Road Fremont, CA 94538-2435
Chamber 4	211948	2845B-4	
Chamber 5	211948	2845B-5	
Chamber 7	A2LA accreditation	2845B-7	

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.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.10. Measurements are made with the EUT connected to the public power network through a nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord.

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

The receivers utilize either a Rohde & Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the 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 Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer run automated data collection programs which control the receivers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted measurements utilize a fifty microhenry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 uH CISPR adapter. This network provides for calibrated radio frequency noise measurements by the design of the internal low pass and high pass filters on the EUT and measurement ports, respectively.

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. 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.

CONDUCTED EMISSIONS

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord.

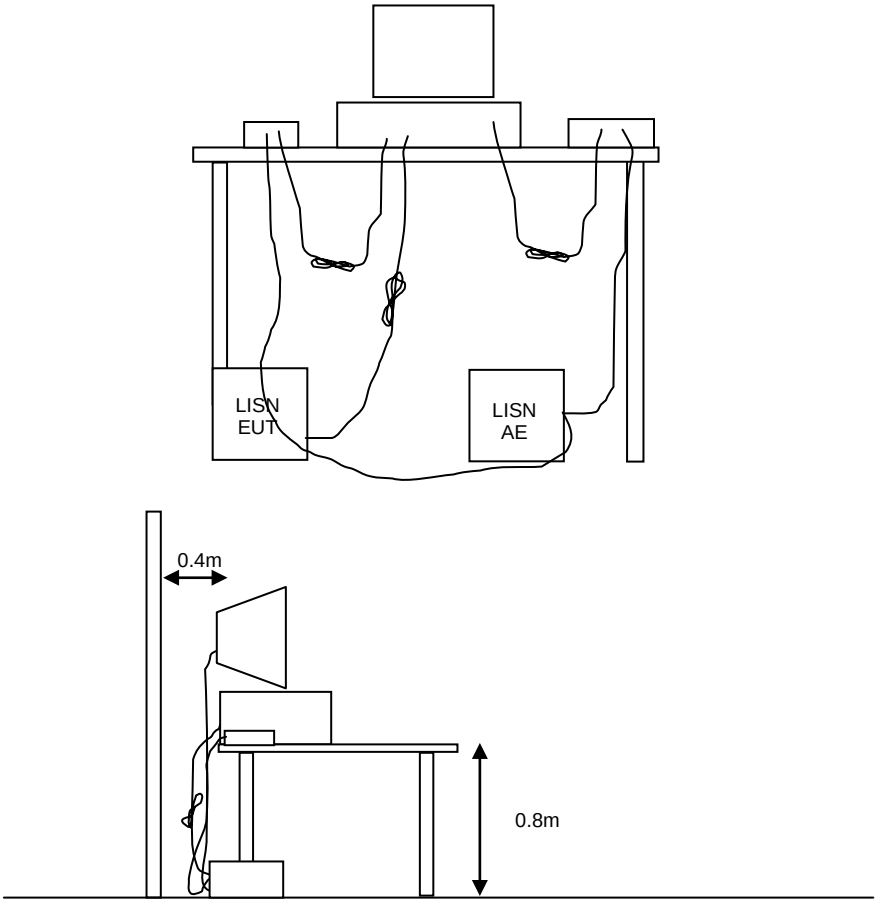


Figure 1 Typical Conducted Emissions Test Configuration

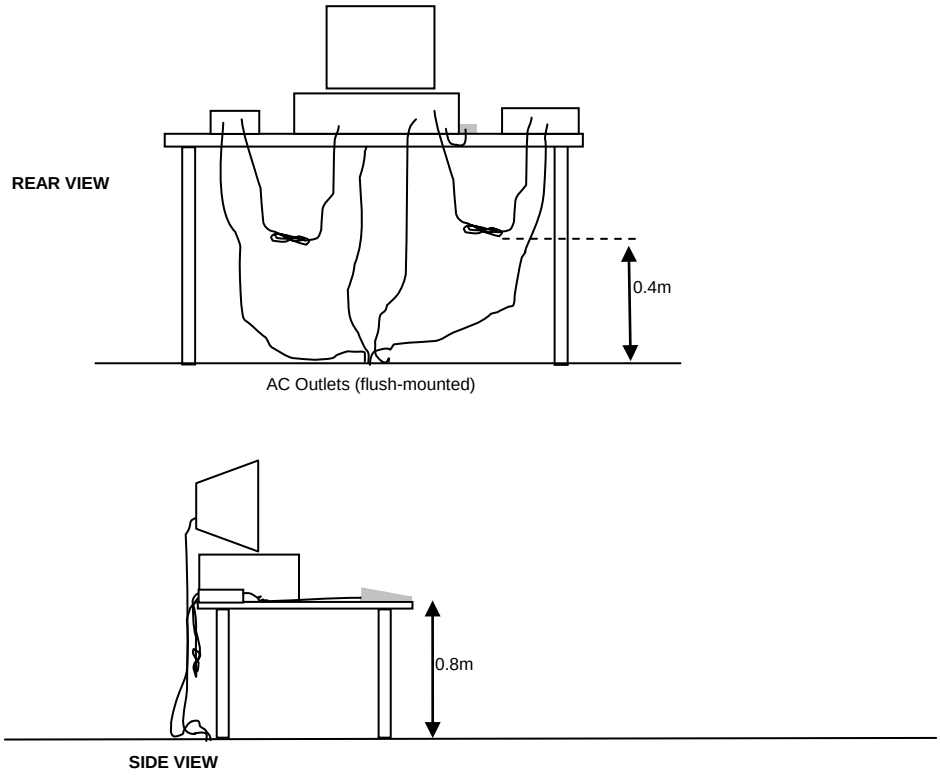
RADIATED EMISSIONS

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.

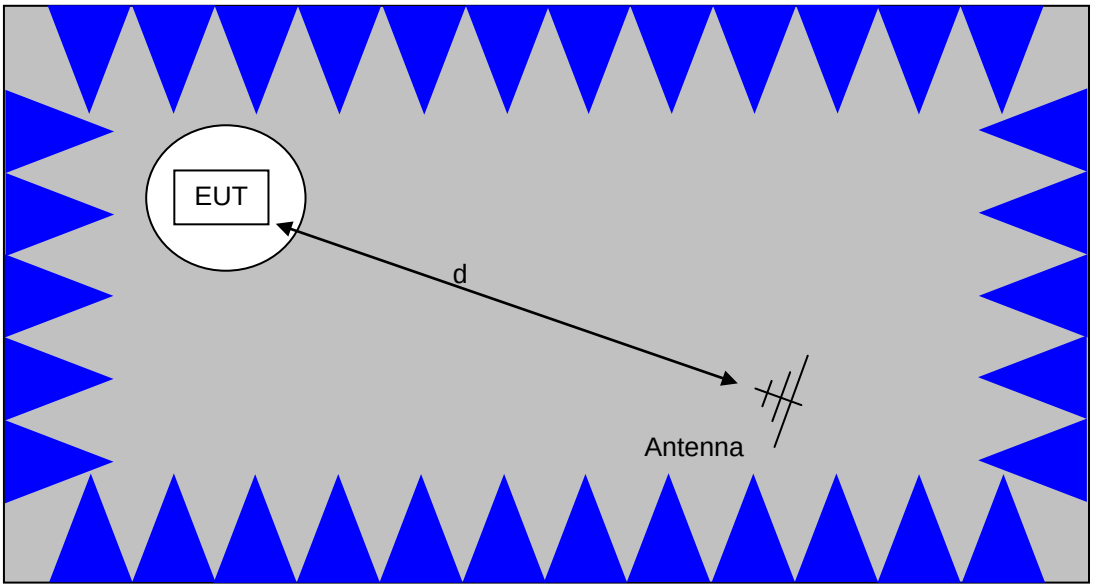
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

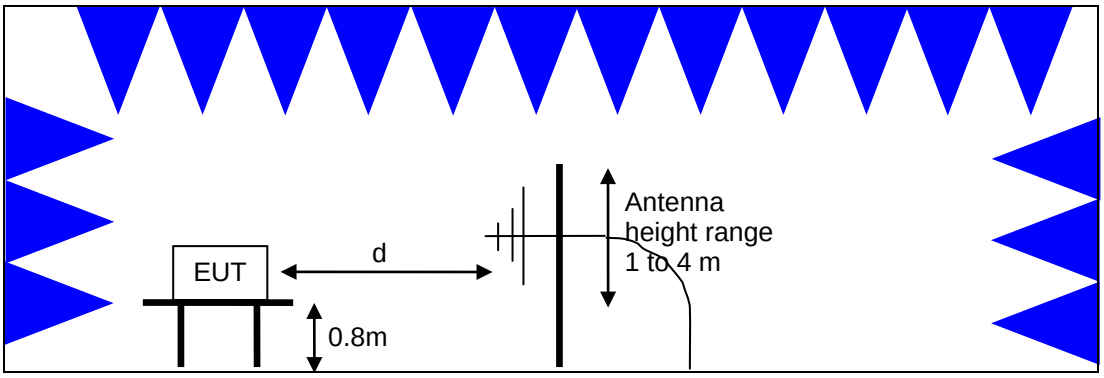


Typical Test Configuration for Radiated Field Strength Measurements



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.

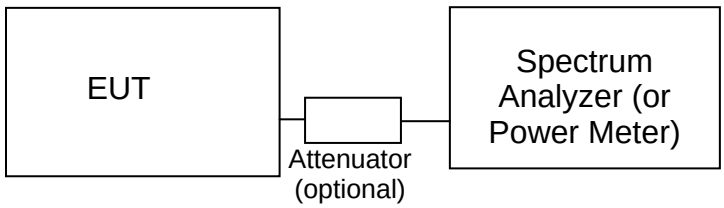
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



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] (with the exception of transmitters operating under FCC Part 15 Subpart D and RSS 210 Annex 9), the limits for all emissions from a low power device operating under the general rules of RSS 310 (tables 3 and 4), RSS 210 (table 2) and FCC Part 15 Subpart C section 15.209.

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, RSS 210 Table 2, RSS GEN Table 1 and RSS 310 Table 3. Note that receivers operating outside of the frequency range 30 MHz – 960 MHz are exempt from the requirements of 15.109.

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 15.203, RSS 210 Table 1 and RSS 310 Table 2

OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS

The table below shows the limits for output power and output power density. Where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

Operating Frequency (MHz)	Output Power	Power Spectral Density
902 – 928	1 Watt (30 dBm)	8 dBm/3kHz
2400 – 2483.5	1 Watt (30 dBm)	8 dBm/3kHz
5725 – 5850	1 Watt (30 dBm)	8 dBm/3kHz

The maximum permitted output power is reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5850 MHz band are not subject to this restriction.

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 210. 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

Radiated Emissions, 1,000 - 26,000 MHz, 12-Jun-13

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	7/19/2014
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	5/9/2014
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	6/21/2013
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	12/5/2013
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	2238	10/4/2013

Radiated Emissions, 30 - 1,000 MHz, 13-Jun-13

Manufacturer	Description	Model	Asset #	Cal Due
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1657	6/4/2014
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	6/21/2013
Com-Power	Preamplifier, 30-1000 MHz	PAM-103	2380	11/9/2013

Radio Antenna Port (Power and Spurious Emissions), 13-Jun-13

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1422	1/3/2014
Rohde & Schwarz	Power Sensor 100 uW - 2 Watts (w/ 20 dB pad, SN BJ5155)	NRV-Z32	1536	12/12/2013
Agilent Technologies	USB Average Power Sensor	U2001A	2442	12/17/2013
Agilent Technologies	3Hz -44GHz PSA Spectrum Analyzer	E4446A	2796	1/28/2014

Conducted Emissions - AC Power Ports, 10-Jun-13

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	LISN, 10 kHz-100 MHz	3825/2	1293	2/14/2014
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1594	5/15/2014
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	6/22/2014

Appendix B Test Data

T92658 Pages 23 – 39
T92442 Pages 40 - 49

Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92658
		Account Manager:	-
Contact:	Arndt Hufenbach		-
Emissions Standard(s):	FCC 15.247, EN 300 328(V1.7.1)	Class:	B
Immunity Standard(s):	EN 301 489-17	Environment:	-

EMC Test Data

For The

Fitbit, Inc.

Model

FB402

Date of Last Test: 7/3/2013

Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92658
		Project Manager:	-
Contact:	Arndt Hufenbach	Project Coordinator:	-
Standard:	FCC 15.247, EN 300 328(V1.7.1)	Class:	N/A

RSS 210 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: 6/13/2013
Test Engineer: Mehran Birgani
Test Location: Lab #4A

Config. Used: -
Config Change: -
Host Unit Voltage 120V/60Hz

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: 20 °C
Rel. Humidity: 36 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1			Output Power	15.247(b)	PASS	1.5 dBm
2			Power spectral Density (PSD)	15.247(d)	PASS	-11.5 dBm/3kHz
3			Minimum 6dB Bandwidth	15.247(a)	PASS	0.65 MHz
3			99% Bandwidth	RSS GEN	-	2.22 MHz
4			Spurious emissions	15.247(b)	PASS	Below 30dBc

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:	J91795
Model:	FB402	T-Log Number:	T92658
		Project Manager:	-
Contact:	Arndt Hufenbach	Project Coordinator:	-
Standard:	FCC 15.247, EN 300 328(V1.7.1)	Class:	N/A

Run #1: Output Power

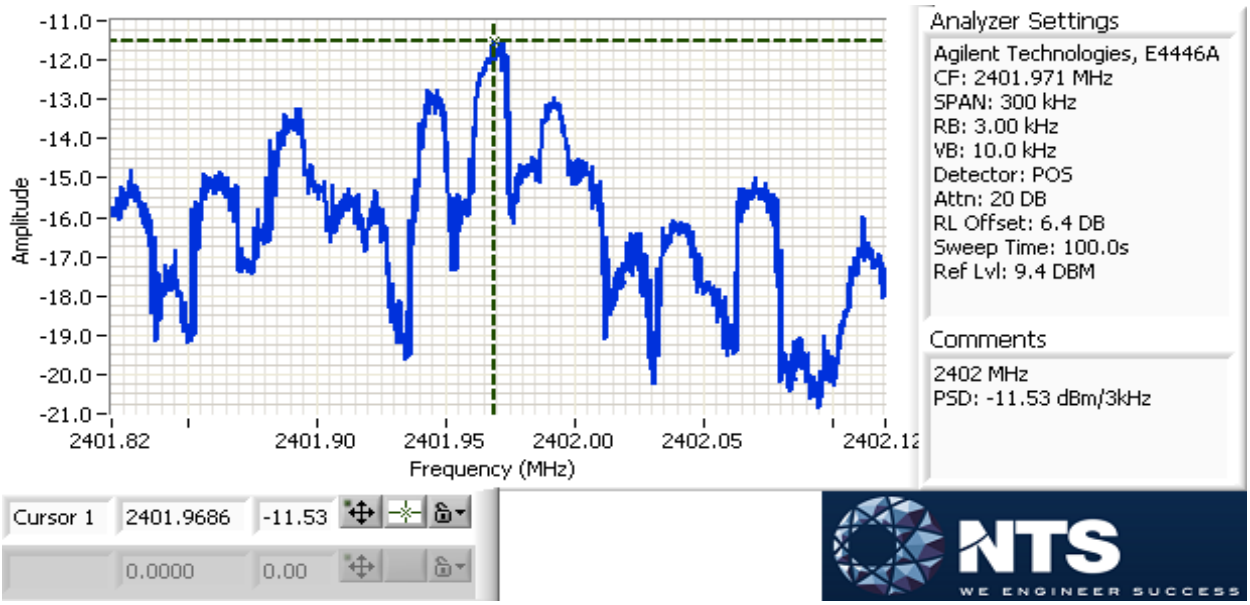
Power Setting[2]	Frequency (MHz)	Output Power (dBm) [1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP dBm	EIRP W	Output Power (dBm) [3]	Output Power mW
	2402	1.1	1.28	1.9	Pass	3.0	0.002	-0.8	0.8
	2440	1.4	1.37	1.9	Pass	3.3	0.002	-0.6	0.9
	2480	1.5	1.43	1.9	Pass	3.4	0.002	-0.5	0.9

Note 1:	Output power measured using a peak power meter, spurious limit is -20dBc.
Note 3:	Power measured using average power meter and is included for reference only.

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
	2402	-11.5	8.0	Pass
	2440	-12.0	8.0	Pass
	2480	-12.1	8.0	Pass

Note 1:	Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using RB=3kHz using multiple sweeps at a faster rate over the 6dB bandwidth of the signal.

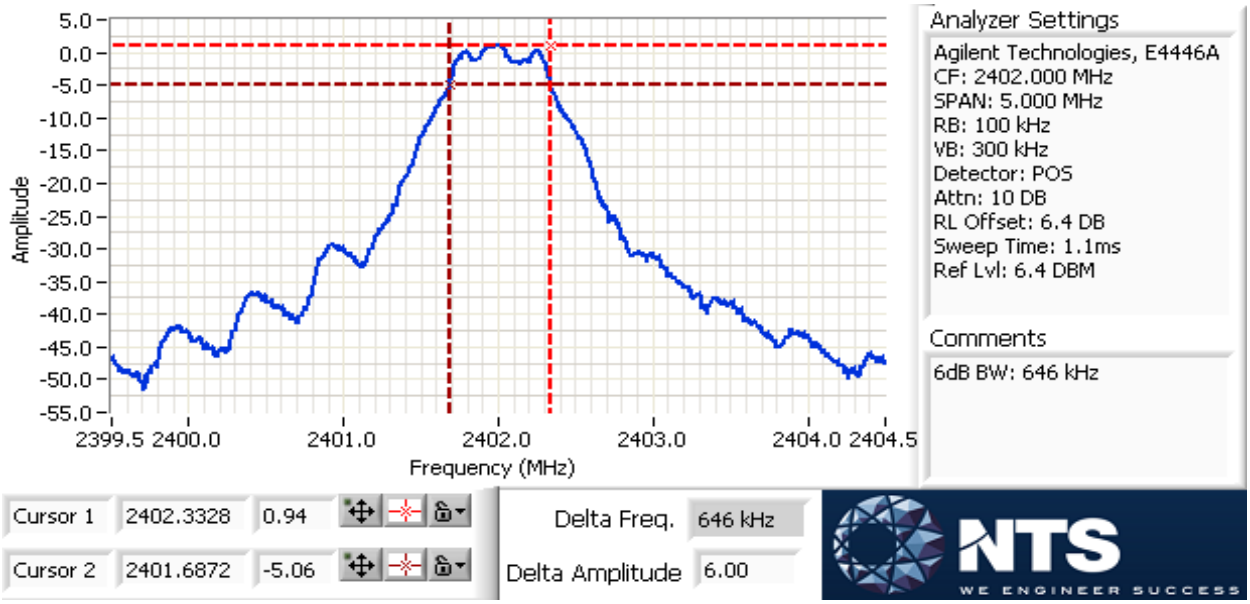


Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92658
		Project Manager:	-
Contact:	Arndt Hufenbach	Project Coordinator:	-
Standard:	FCC 15.247, EN 300 328(V1.7.1)	Class:	N/A

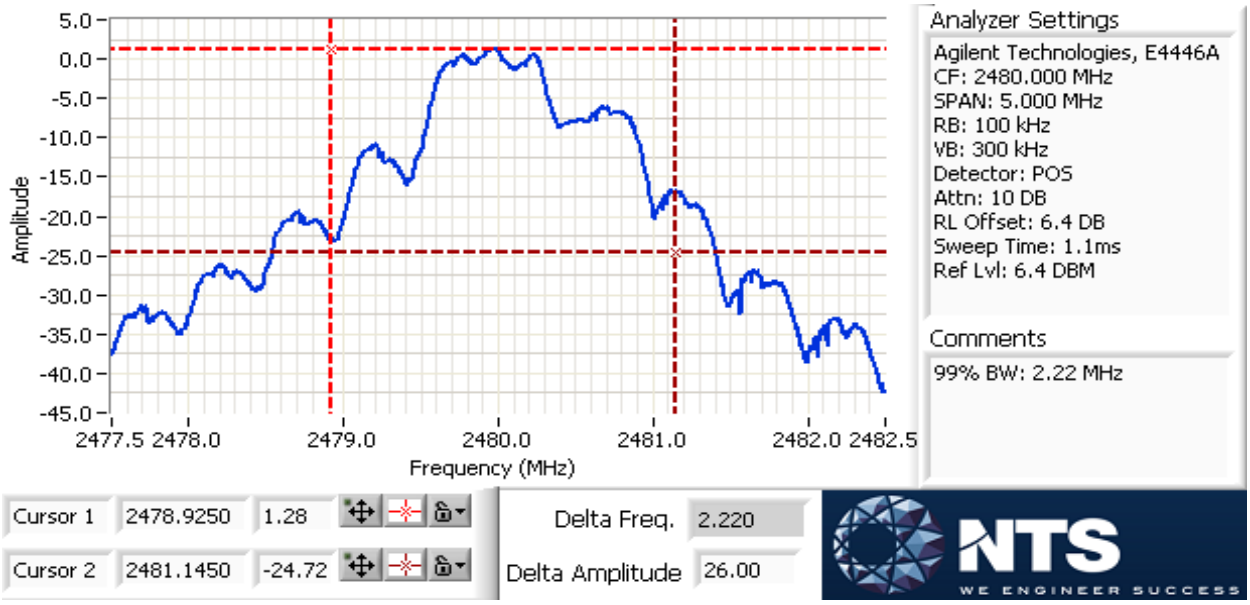
Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
	2402	100kHz	0.65	1.06
	2440	100kHz	0.68	1.54
	2480	100kHz	0.73	2.22

Note 1:	99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB



Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92658
		Project Manager:	-
Contact:	Arndt Hufenbach	Project Coordinator:	-
Standard:	FCC 15.247, EN 300 328(V1.7.1)	Class:	N/A



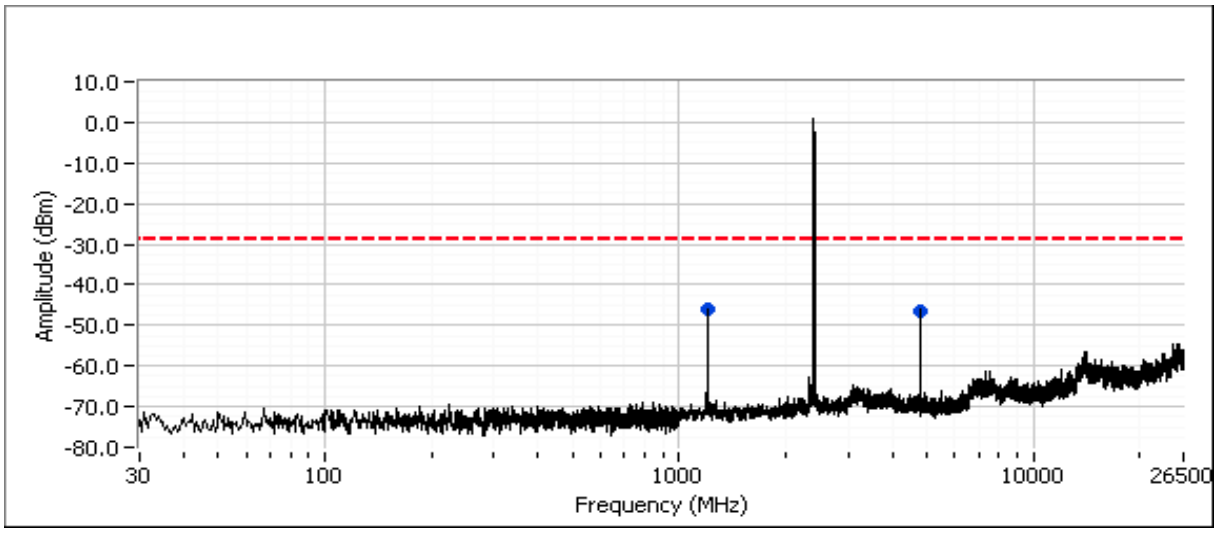
Run #4: Out of Band Spurious Emissions

Frequency (MHz)	Limit	Result
2402	-30dBc	PASS
2440	-30dBc	PASS
2480	-30dBc	PASS

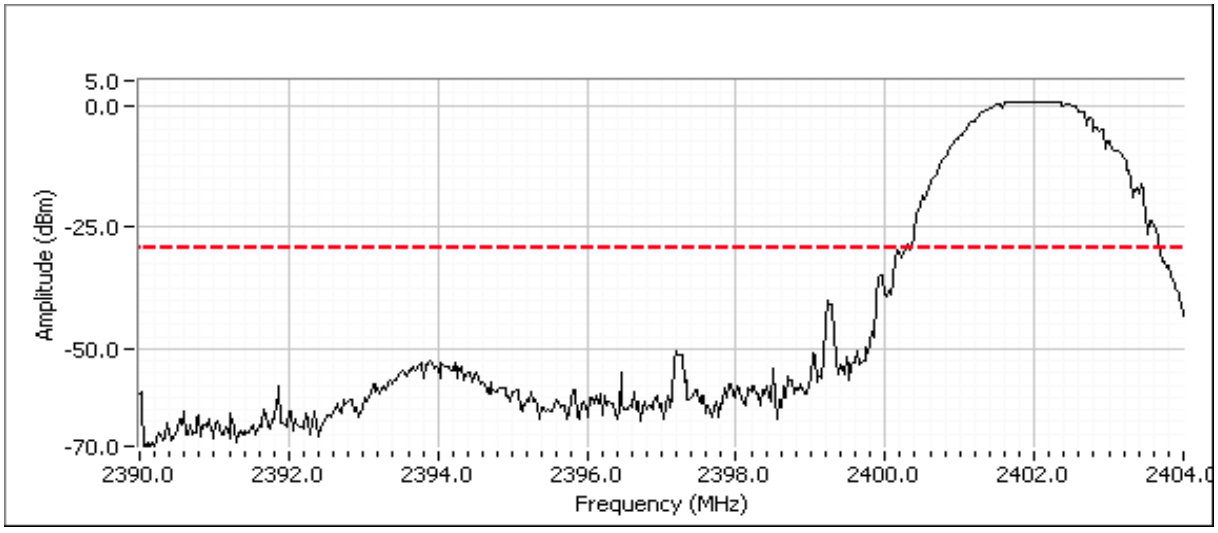
Note 1:	Output power measured using a peak power meter, spurious limit is -20dBc but more restrigent limit of -30dBc limit was used during testing.

Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92658
		Project Manager:	-
Contact:	Arndt Hufenbach	Project Coordinator:	-
Standard:	FCC 15.247, EN 300 328(V1.7.1)	Class:	N/A

Plots for low channel

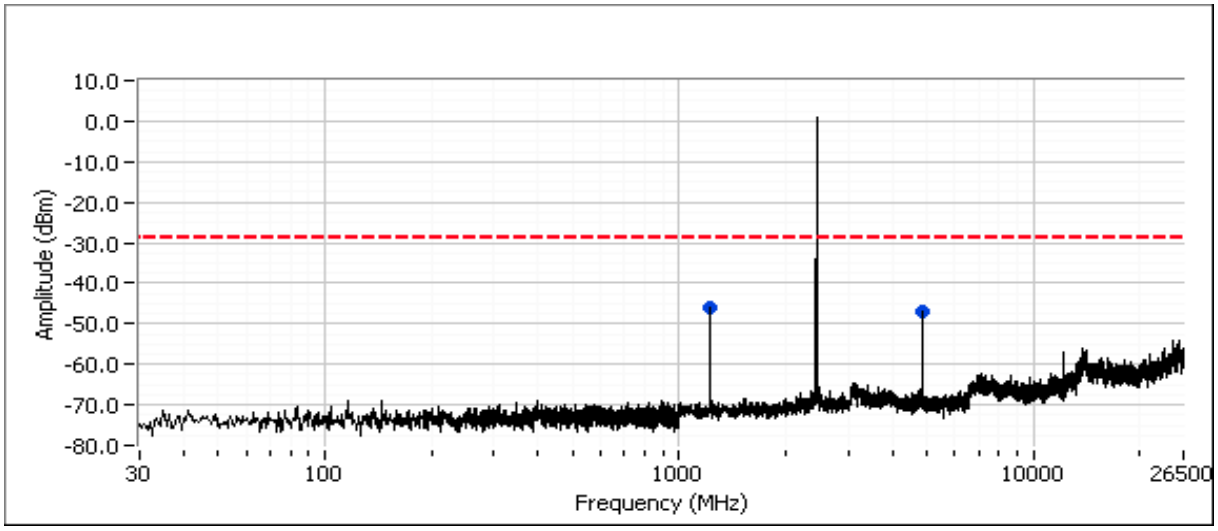


Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

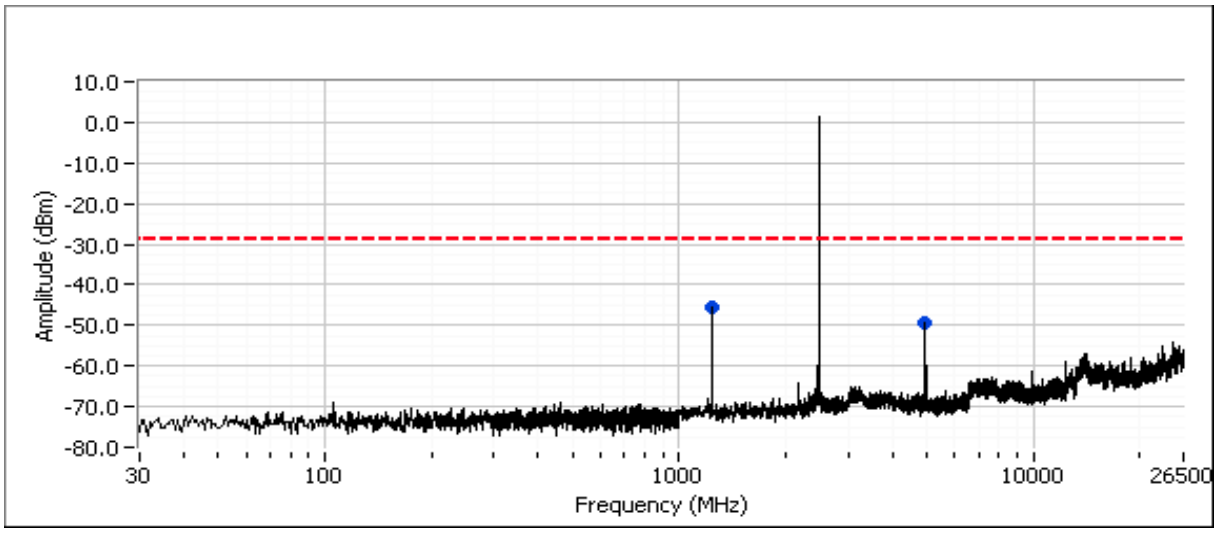


Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92658
		Project Manager:	-
Contact:	Arndt Hufenbach	Project Coordinator:	-
Standard:	FCC 15.247, EN 300 328(V1.7.1)	Class:	N/A

Plots for center channel



Plots for high channel



Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92658
		Project Manager:	-
Contact:	Arndt Hufenbach	Project Coordinator:	-
Standard:	FCC 15.247, EN 300 328(V1.7.1)	Class:	N/A

RSS 210 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.

Ambient Conditions:

Temperature: 25 °C

Rel. Humidity: 32 %

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

Run #	Frequency	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	2402	Low			Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	33.7 dBµV/m @ 2386.2 MHz (-20.3 dB)
					Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	40.4 dBµV/m @ 1201.0 MHz (-13.6 dB)
1b	2440	Center			Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	42.7 dBµV/m @ 7320.9 MHz (-11.3 dB)
1c	2480	High			Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	67.3 dBµV/m @ 2483.8 MHz (-6.7 dB)
					Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	44.7 dBµV/m @ 7439.5 MHz (-9.3 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.

On time	Cycle time	Duty cycle	Correction Factor
0.44ms	0.62ms	71%	2.97

Note: All measurment were made by correction factor added to the instrument setup and deducted from peak measurment.

Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92658
		Project Manager:	-
Contact:	Arndt Hufenbach	Project Coordinator:	-
Standard:	FCC 15.247, EN 300 328(V1.7.1)	Class:	N/A

Run #1: Radiated Spurious Emissions, 30 - 26000 MHz. Operating Mode: BLE

Date of Test: 6/12/2013 Test Location: chamber #4

Test Engineer: M. Birgani

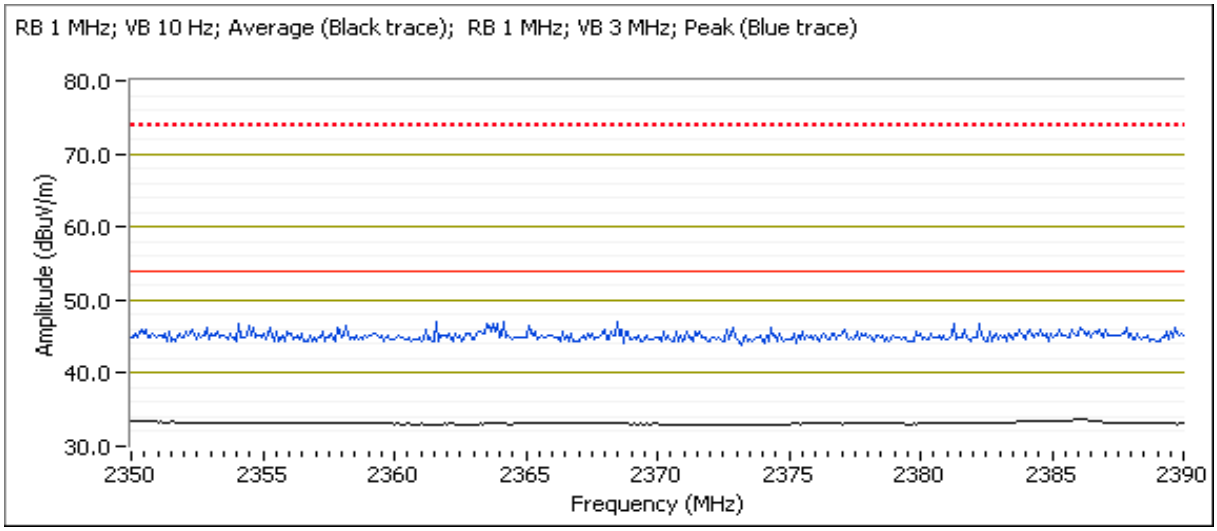
Run #1a: Low Channel @ 2402 MHz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2401.950	87.1	V	-	-	-	110	1.0	Side, POS; RB 100 kHz; VB: 100 kHz
2402.030	85.6	V	-	-	AVG	110	1.0	Side, POS; RB 1 MHz; VB: 10 Hz
2402.210	86.9	V	-	-	PK	110	1.0	Side, POS; RB 1 MHz; VB: 3 MHz
2401.950	94.9	H	-	-	-	161	1.1	Side, POS; RB 100 kHz; VB: 100 kHz
2402.020	93.5	H	-	-	AVG	161	1.1	Side, POS; RB 1 MHz; VB: 10 Hz
2402.230	94.9	H	-	-	PK	161	1.1	Side, POS; RB 1 MHz; VB: 3 MHz
2402.000	84.2	V	-	-	-	296	1.0	Flat, POS; RB 100 kHz; VB: 100 kHz
2402.020	83.0	V	-	-	AVG	296	1.0	Flat, POS; RB 1 MHz; VB: 10 Hz
2401.740	84.3	V	-	-	PK	296	1.0	Flat, POS; RB 1 MHz; VB: 3 MHz
2402.000	91.4	H	-	-	-	153	1.2	Flat, POS; RB 100 kHz; VB: 100 kHz
2402.020	89.9	H	-	-	AVG	153	1.2	Flat, POS; RB 1 MHz; VB: 10 Hz
2402.240	91.3	H	-	-	PK	153	1.2	Flat, POS; RB 1 MHz; VB: 3 MHz
2401.950	89.3	V	-	-	-	110	1.0	Upright, POS; RB 100 kHz; VB: 100 kHz
2402.020	88.0	V	-	-	AVG	110	1.0	Upright, POS; RB 1 MHz; VB: 10 Hz
2402.230	89.3	V	-	-	PK	110	1.0	Upright, POS; RB 1 MHz; VB: 3 MHz
2401.940	92.3	H	-	-	-	168	1.1	Upright, POS; RB 100 kHz; VB: 100 kHz
2402.030	90.9	H	-	-	AVG	168	1.1	Upright, POS; RB 1 MHz; VB: 10 Hz
2402.240	92.2	H	-	-	PK	168	1.1	Upright, POS; RB 1 MHz; VB: 3 MHz

Fundamental emission level @ 3m in 100kHz RBW:	94.9 dBµV/m	
Limit for emissions outside of restricted bands:	64.9 dBµV/m	Limit is -30dBc (UNII power measurement)

Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92658
		Project Manager:	-
Contact:	Arndt Hufenbach	Project Coordinator:	-
Standard:	FCC 15.247, EN 300 328(V1.7.1)	Class:	N/A



Band Edge Signal Field Strength - Direct measurement of field strength

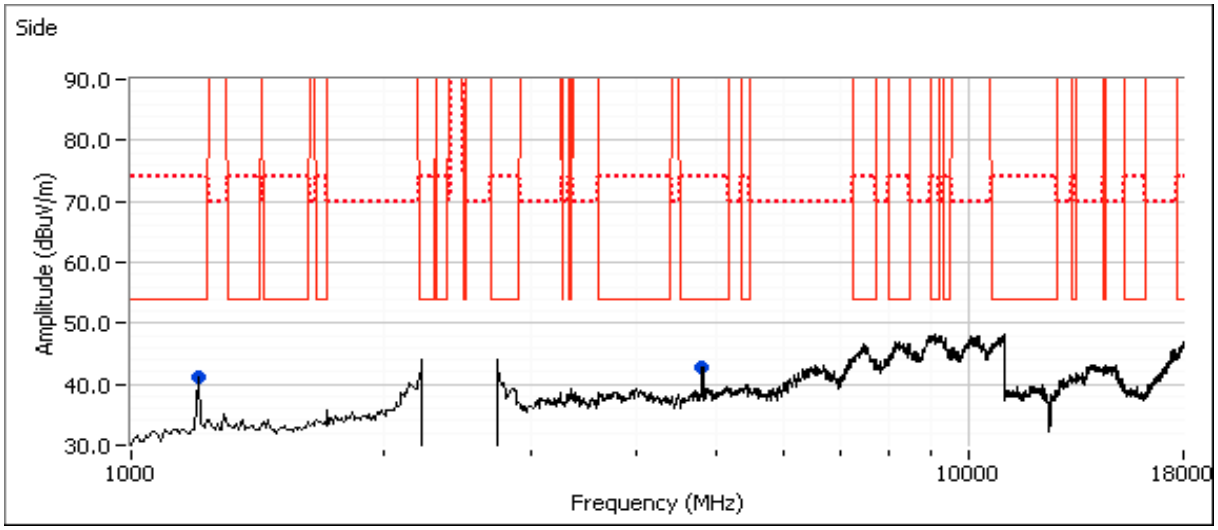
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2386.150	33.7	H	54.0	-20.3	AVG	320	1.3	Side, POS; RB 1 MHz; VB: 10 Hz
2387.920	42.8	H	74.0	-31.2	PK	320	1.3	Side, POS; RB 1 MHz; VB: 3 MHz

Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92658
		Project Manager:	-
Contact:	Arndt Hufenbach	Project Coordinator:	-
Standard:	FCC 15.247, EN 300 328(V1.7.1)	Class:	N/A

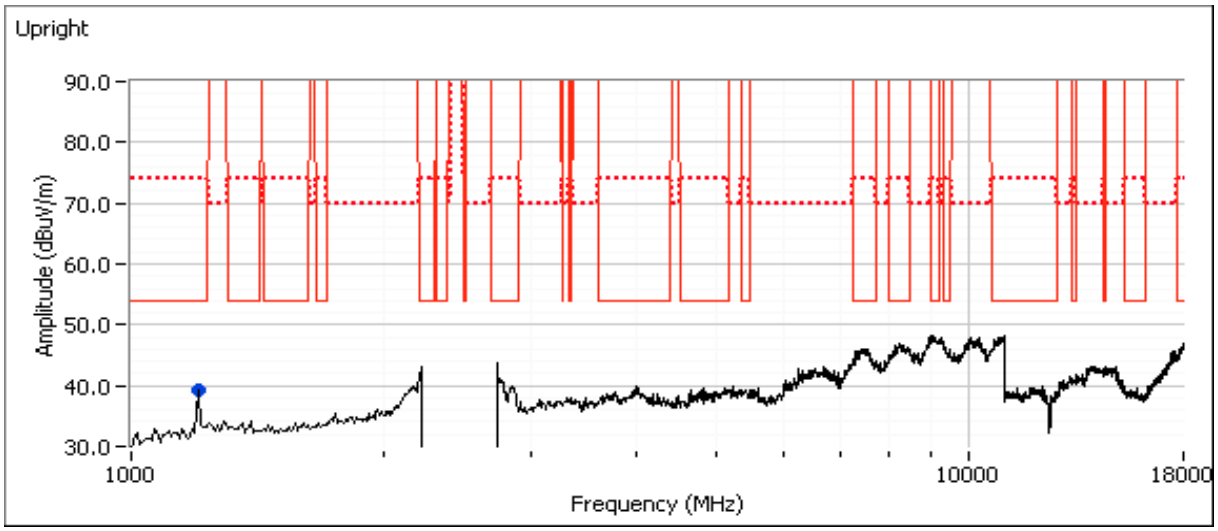
Other Spurious Emissions

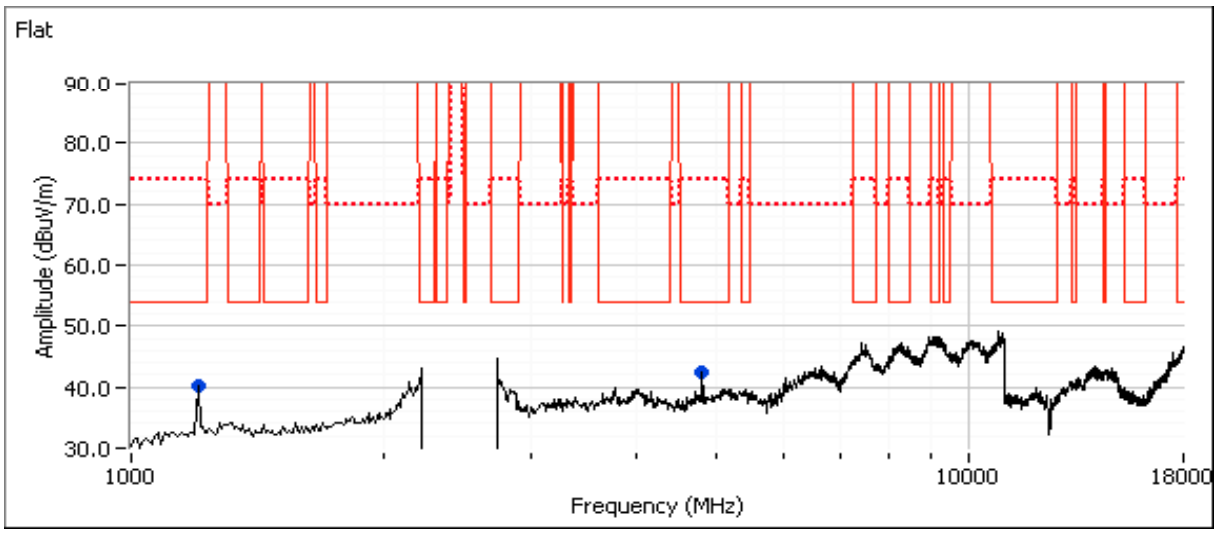
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1201.020	40.4	H	54.0	-13.6	AVG	148	1.2	Upright, RB 1 MHz;VB 10 Hz;Peak
4803.950	37.2	V	54.0	-16.8	AVG	252	1.3	Side, RB 1 MHz;VB 10 Hz;Peak
4803.920	35.6	V	54.0	-18.4	AVG	3	1.2	Flat, RB 1 MHz;VB 10 Hz;Peak
1201.020	35.5	H	54.0	-18.5	AVG	59	1.2	Side, RB 1 MHz;VB 10 Hz;Peak
1201.030	35.2	V	54.0	-18.8	AVG	161	1.1	Flat, RB 1 MHz;VB 10 Hz;Peak
4803.800	44.0	V	74.0	-30.0	PK	252	1.3	Side, RB 1 MHz;VB 3 MHz;Peak
1200.830	42.6	H	74.0	-31.4	PK	148	1.2	Upright, RB 1 MHz;VB 3 MHz;Peak
4804.350	41.9	V	74.0	-32.1	PK	3	1.2	Flat, RB 1 MHz;VB 3 MHz;Peak
1200.980	39.4	V	74.0	-34.6	PK	161	1.1	Flat, RB 1 MHz;VB 3 MHz;Peak
1200.930	38.9	H	74.0	-35.1	PK	59	1.2	Side, RB 1 MHz;VB 3 MHz;Peak

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is not in a restricted band but the more stringent restricted band limit was used.



Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92658
		Project Manager:	-
Contact:	Arndt Hufenbach	Project Coordinator:	-
Standard:	FCC 15.247, EN 300 328(V1.7.1)	Class:	N/A





Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92658
		Project Manager:	-
Contact:	Arndt Hufenbach	Project Coordinator:	-
Standard:	FCC 15.247, EN 300 328(V1.7.1)	Class:	N/A

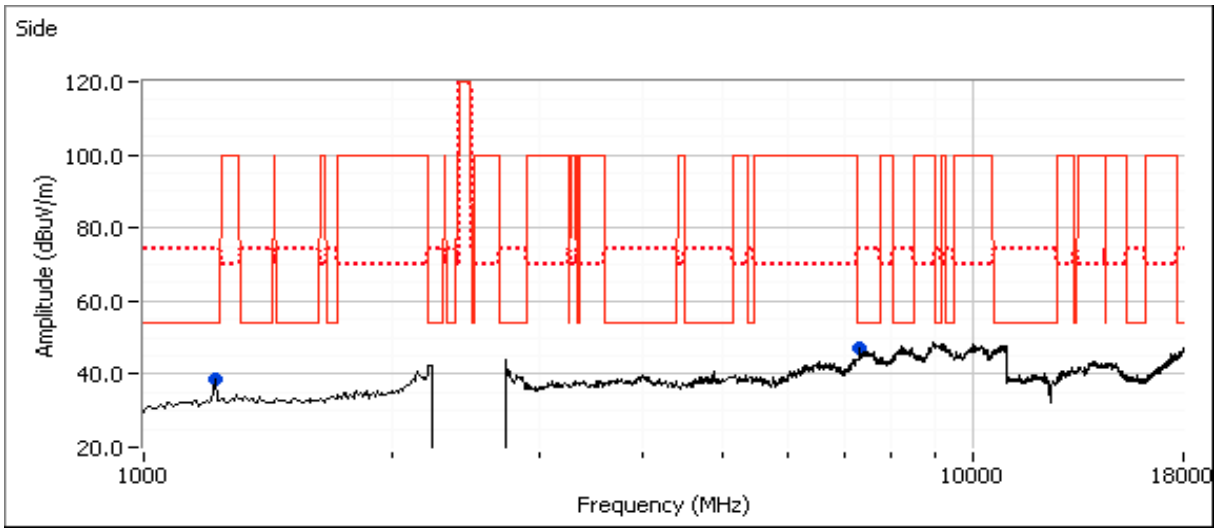
Run #1b: Center Channel @ 2440 MHz

Other Spurious Emissions

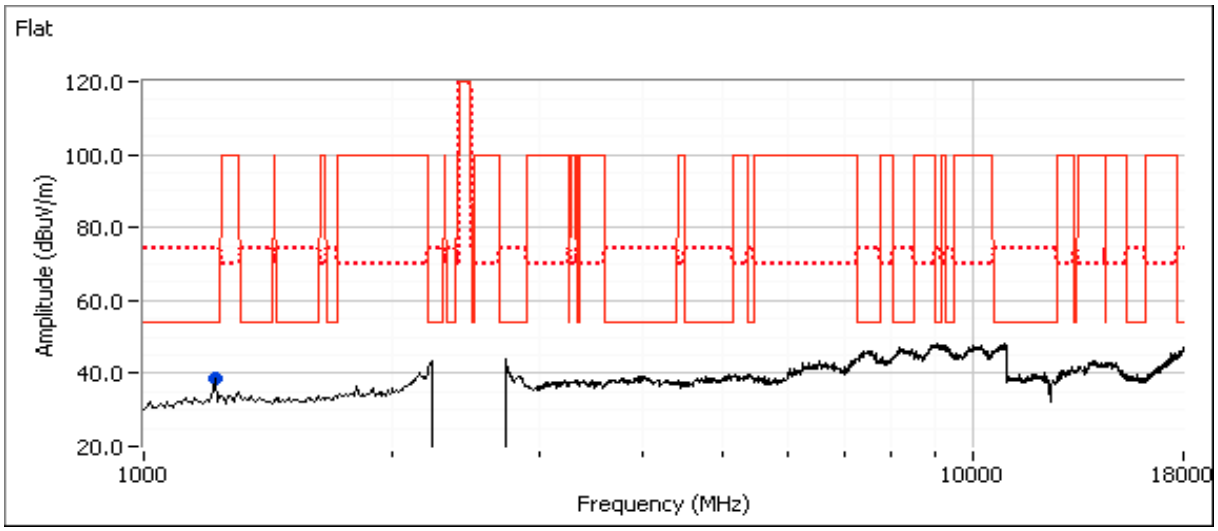
Fundamental emission level @ 3m in 100kHz RBW:	dBµV/m	
Limit for emissions outside of restricted bands:	-30 dBµV/m	Limit is -30dBc (UNII power measurement)

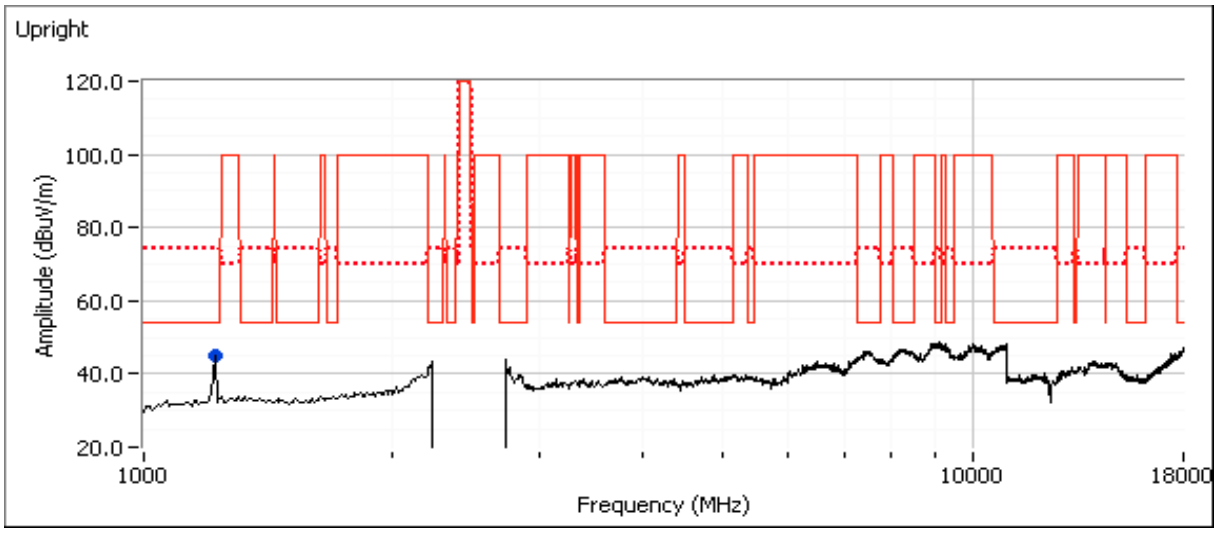
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7320.880	42.7	V	54.0	-11.3	AVG	332	1.6	side,RB 1 MHz;VB 10 Hz;Peak
1220.010	38.7	V	54.0	-15.3	AVG	118	1.0	upright,RB 1 MHz;VB 10 Hz;Peak
1220.000	35.9	H	54.0	-18.1	AVG	167	1.3	flat,RB 1 MHz;VB 10 Hz;Peak
7323.870	53.9	V	74.0	-20.1	PK	332	1.6	side,RB 1 MHz;VB 3 MHz;Peak
1199.990	27.2	H	54.0	-26.8	AVG	0	1.0	side,RB 1 MHz;VB 10 Hz;Peak
1220.040	44.2	V	74.0	-29.8	PK	118	1.0	upright,RB 1 MHz;VB 3 MHz;Peak
1220.150	42.7	H	74.0	-31.3	PK	167	1.3	flat,RB 1 MHz;VB 3 MHz;Peak
1201.610	39.0	H	74.0	-35.0	PK	0	1.0	side,RB 1 MHz;VB 3 MHz;Peak

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is not in a restricted band but the more stringent restricted band limit was used.



Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92658
		Project Manager:	-
Contact:	Arndt Hufenbach	Project Coordinator:	-
Standard:	FCC 15.247, EN 300 328(V1.7.1)	Class:	N/A





Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92658
		Project Manager:	-
Contact:	Arndt Hufenbach	Project Coordinator:	-
Standard:	FCC 15.247, EN 300 328(V1.7.1)	Class:	N/A

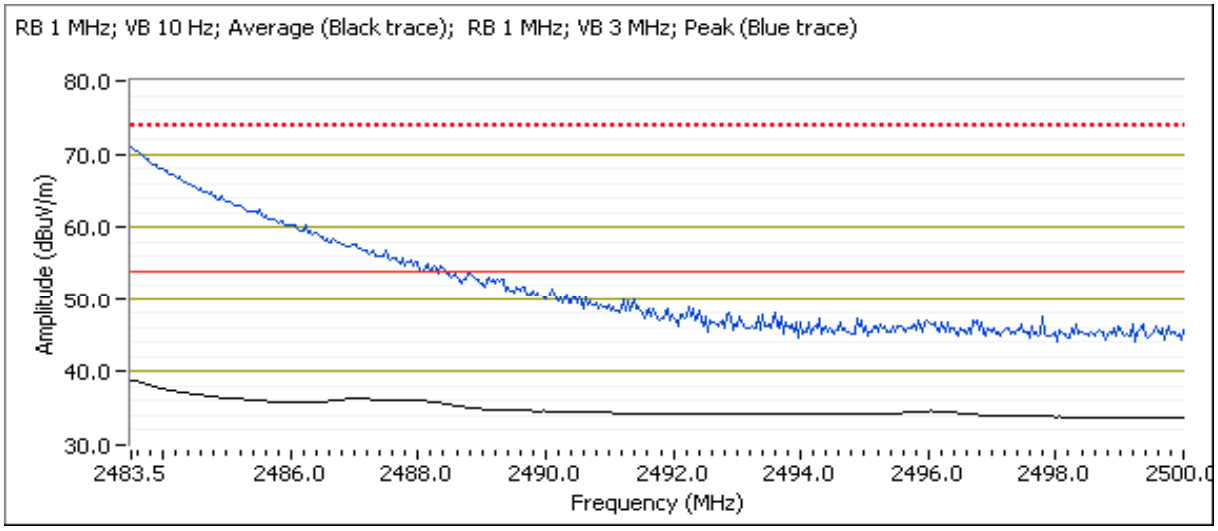
Run #1c: High Channel @ 2480 MHz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2479.960	96.3	H	-	-	-	164	1.0	Side, POS; RB 100 kHz; VB: 100 kHz
2480.040	95.1	H	-	-	AVG	164	1.0	Side, POS; RB 1 MHz; VB: 10 Hz
2479.740	96.3	H	-	-	PK	164	1.0	Side, POS; RB 1 MHz; VB: 3 MHz

Fundamental emission level @ 3m in 100kHz RBW:	99.3 dBµV/m
Limit for emissions outside of restricted bands:	69.3 dBµV/m

Limit is -30dBc (UNII power measurement)



Band Edge Signal Field Strength - Direct measurement of field strength

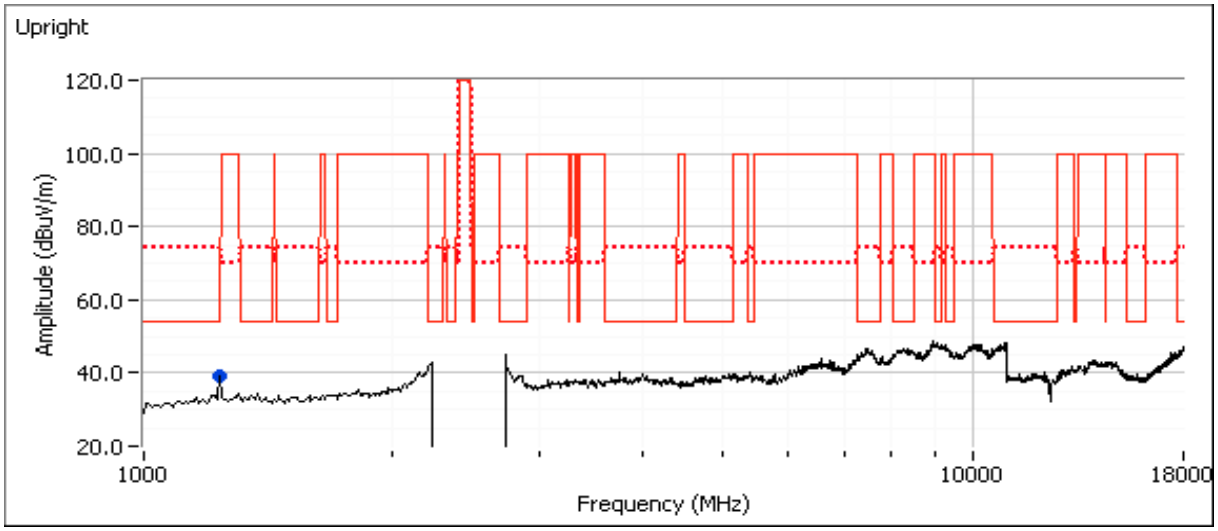
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.760	67.3	H	74.0	-6.7	PK	164	1.0	Side, POS; RB 1 MHz; VB: 3 MHz
2483.500	39.0	H	54.0	-15.0	AVG	164	1.0	Side, POS; RB 1 MHz; VB: 10 Hz

Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92658
		Project Manager:	-
Contact:	Arndt Hufenbach	Project Coordinator:	-
Standard:	FCC 15.247, EN 300 328(V1.7.1)	Class:	N/A

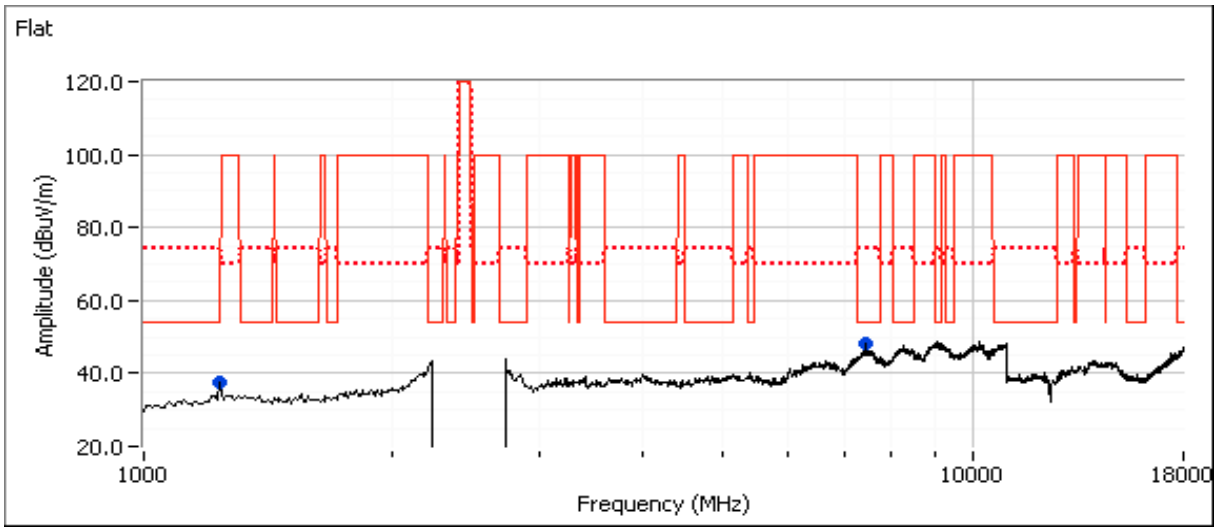
Other Spurious Emissions

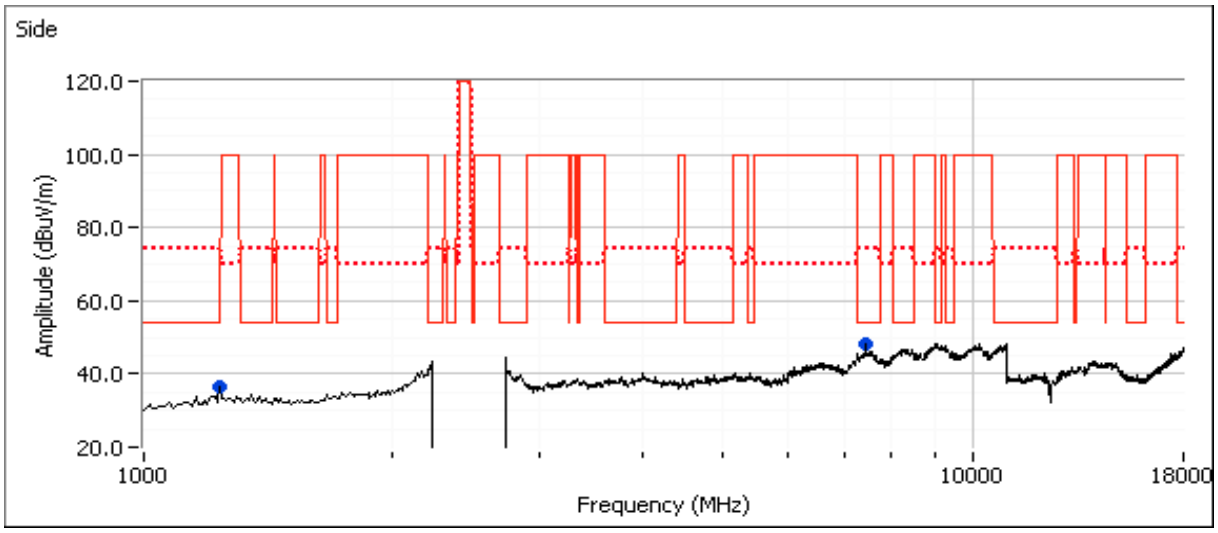
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7439.480	44.7	V	54.0	-9.3	AVG	331	1.3	side,RB 1 MHz;VB 10 Hz;Peak
7439.330	43.8	V	54.0	-10.2	AVG	14	1.0	flat,RB 1 MHz;VB 10 Hz;Peak
1239.990	38.2	V	54.0	-15.8	AVG	110	1.0	upright,RB 1 MHz;VB 10 Hz;Peak
7439.320	55.8	V	74.0	-18.2	PK	331	1.3	side,RB 1 MHz;VB 3 MHz;Peak
7440.650	55.7	V	74.0	-18.3	PK	14	1.0	flat,RB 1 MHz;VB 3 MHz;Peak
1240.070	44.4	V	70.0	-25.6	PK	110	1.0	upright,RB 1 MHz;VB 3 MHz;Peak
1234.420	27.5	H	54.0	-26.5	AVG	261	1.6	side,RB 1 MHz;VB 10 Hz;Peak
1240.090	42.1	V	70.0	-27.9	PK	102	1.9	flat,RB 1 MHz;VB 3 MHz;Peak
1240.010	34.9	V	69.3	-34.4	AVG	102	1.9	flat,RB 1 MHz;VB 10 Hz;Peak
1232.580	38.8	H	74.0	-35.2	PK	261	1.6	side,RB 1 MHz;VB 3 MHz;Peak

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is not in a restricted band but the more stringent restricted band limit was used.



Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92658
		Project Manager:	-
Contact:	Arndt Hufenbach	Project Coordinator:	-
Standard:	FCC 15.247, EN 300 328(V1.7.1)	Class:	N/A





Client:	Fitbit, Inc.	Job Number:	J91795
Product	FB402	T-Log Number:	T92442
		Project Manager:	Deepa Shetty
Contact:	Arndt Hufenbach	Project Coordinator:	Irene Rademacher
Emissions Standard(s):	FCC 15B, EN 55022, CISPR 22, AS/NZ CISPR 22, VCCI	Class:	B
Immunity Standard(s):	EN 301 489-17, EN 55024	Environment:	Radio

EMC Test Data

For The

Fitbit, Inc.

Product

FB402

Date of Last Test: 7/3/2013

Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92442
		Project Manager:	Deepa Shetty
Contact:	Arndt Hufenbach	Project Coordinator:	Irene Rademacher
Standard:	FCC 15B, EN 55022, CISPR 22, AS/NZ CISPR 22, VCCI	Class:	B

Conducted Emissions

(Elliott Laboratories Fremont Facility, Semi-Anechoic Chamber)

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: 6/10/2013
Test Engineer: Riaz Momand
Test Location: Fremont Chamber # 3
Config. Used: 2
Config Change: None
EUT Voltage: Refer to individual run

General Test Configuration

For tabletop equipment, the EUT was located on a wooden table inside the semi-anechoic chamber, 40 cm from a vertical coupling plane and 80cm from the LISN.

Ambient Conditions:

Temperature: 22 °C
Rel. Humidity: 44 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power,120V/60Hz	Class B	Pass	45.7 dBµV @ 0.156 MHz (-20.0 dB)
2	CE, AC Power, 230V/50Hz	Class B	Pass	24.7 dBµV @ 0.658 MHz (-21.3 dB)
3	CE, AC Power,220V/60Hz	Class B	Pass	54.2 dBµV @ 0.156 MHz (-11.5 dB)

Modifications Made During Testing

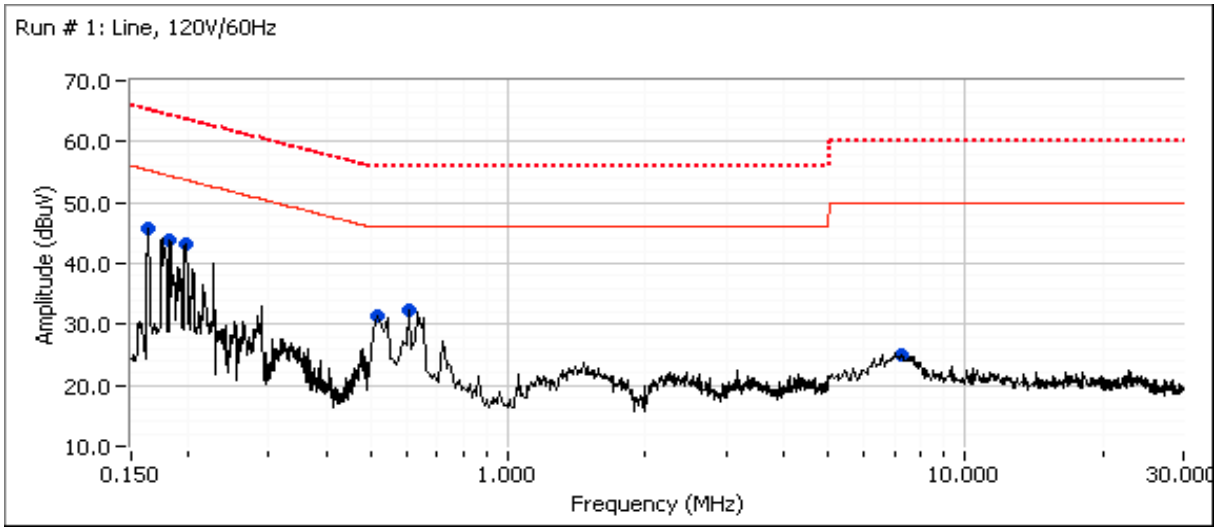
No modifications were made to the EUT during testing

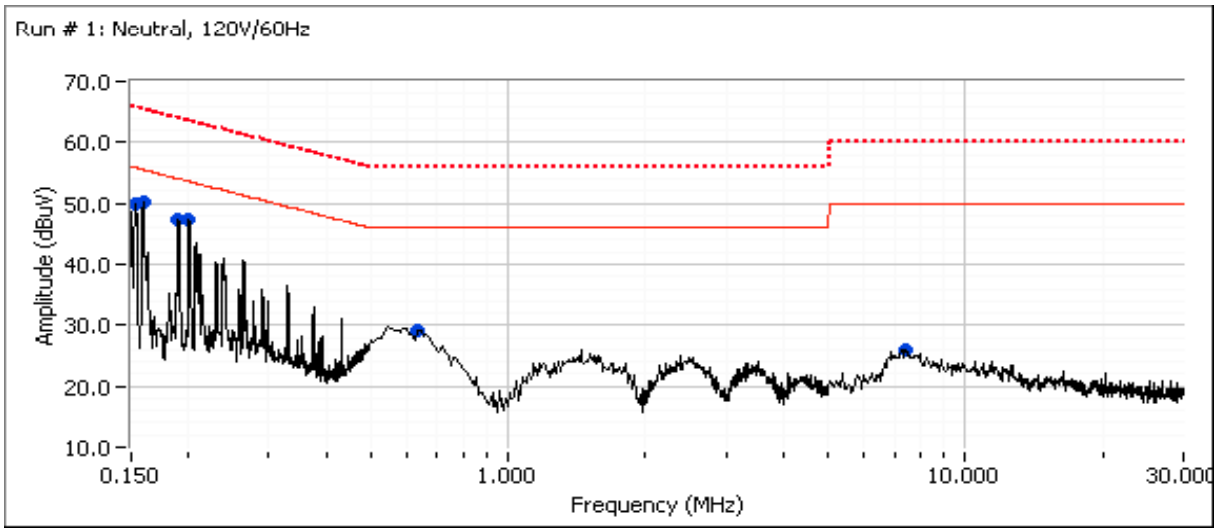
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92442
		Project Manager:	Deepa Shetty
Contact:	Arndt Hufenbach	Project Coordinator:	Irene Rademacher
Standard:	FCC 15B, EN 55022, CISPR 22, AS/NZ CISPR 22, VCCI	Class:	B

Run # 1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz





Run # 1 Continued on Next Page .....

Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92442
		Project Manager:	Deepa Shetty
Contact:	Arndt Hufenbach	Project Coordinator:	Irene Rademacher
Standard:	FCC 15B, EN 55022, CISPR 22, AS/NZ CISPR 22, VCCI	Class:	B

…….. Continuation of Run # 1

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

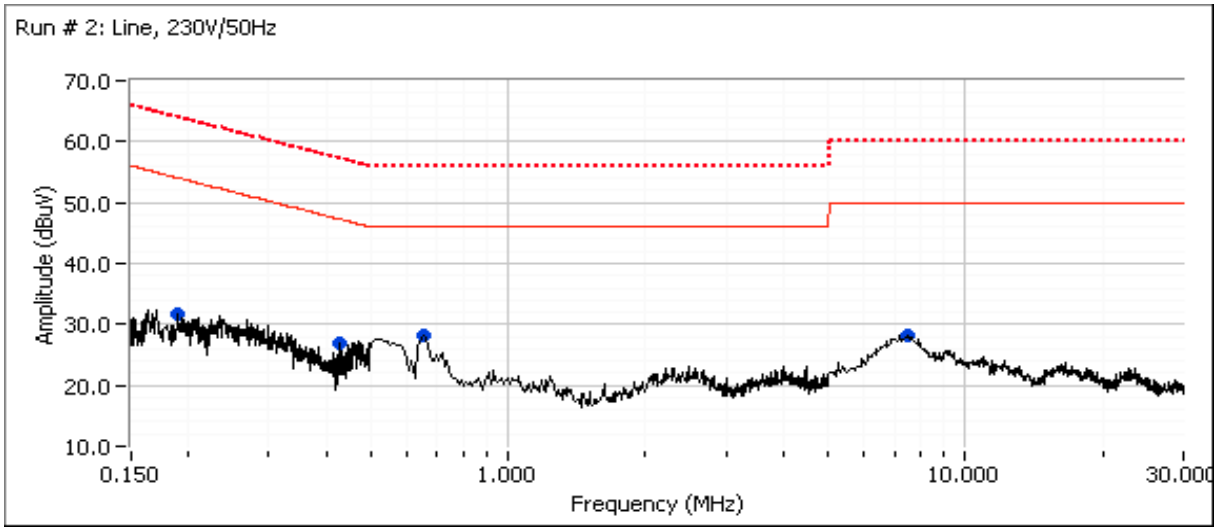
Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.165	45.7	Line	55.3	-9.6	Peak	
0.178	43.7	Line	54.4	-10.7	Peak	
0.198	43.2	Line	53.7	-10.5	Peak	
0.596	32.4	Line	46.0	-13.6	Peak	
0.555	31.5	Line	46.0	-14.5	Peak	
7.450	24.9	Line	50.0	-25.1	Peak	
0.156	49.8	Neutral	55.8	-6.0	Peak	
0.156	50.2	Neutral	55.5	-5.3	Peak	
0.186	47.5	Neutral	54.0	-6.5	Peak	
0.204	47.4	Neutral	53.6	-6.2	Peak	
0.587	29.3	Neutral	46.0	-16.7	Peak	
7.560	25.8	Neutral	50.0	-24.2	Peak	

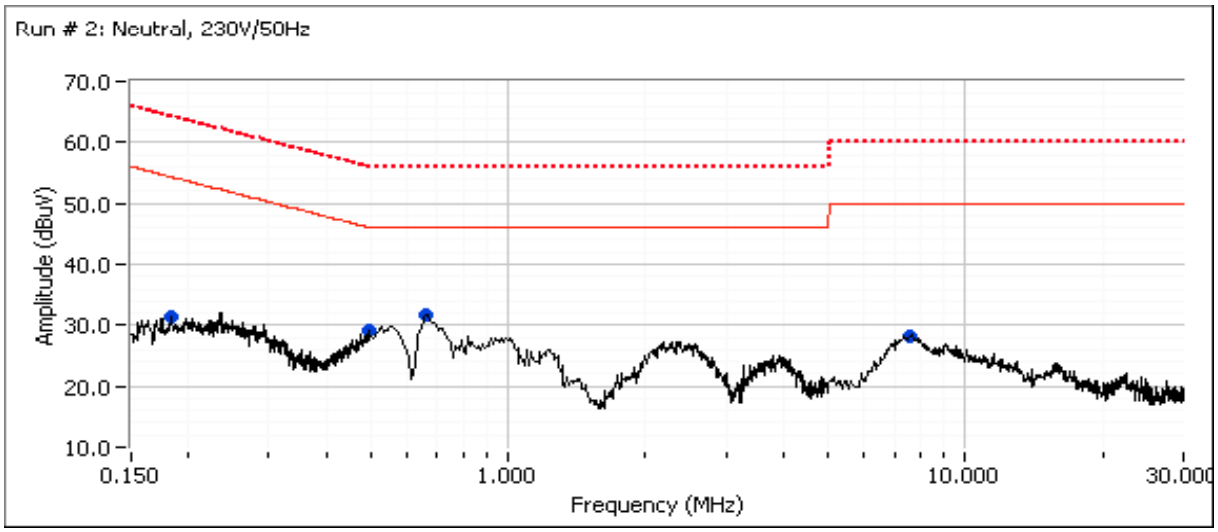
Final quasi-peak and average readings

Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.156	45.7	Neutral	65.7	-20.0	QP	QP (1.00s)
0.156	44.7	Neutral	65.7	-21.0	QP	QP (1.00s)
0.165	44.1	Line	65.2	-21.1	QP	QP (1.00s)
0.186	42.9	Neutral	64.2	-21.3	QP	QP (1.00s)
0.204	41.5	Neutral	63.4	-21.9	QP	QP (1.00s)
0.198	41.5	Line	63.7	-22.2	QP	QP (1.00s)
0.178	42.2	Line	64.6	-22.4	QP	QP (1.00s)
0.587	23.1	Neutral	46.0	-22.9	AVG	AVG (0.10s)
0.555	28.7	Line	56.0	-27.3	QP	QP (1.00s)
0.587	26.8	Neutral	56.0	-29.2	QP	QP (1.00s)
0.555	15.8	Line	46.0	-30.2	AVG	AVG (0.10s)
0.596	15.5	Line	46.0	-30.5	AVG	AVG (0.10s)
0.204	21.5	Neutral	53.4	-31.9	AVG	AVG (0.10s)
0.596	24.0	Line	56.0	-32.0	QP	QP (1.00s)
7.560	17.6	Neutral	50.0	-32.4	AVG	AVG (0.10s)
0.186	21.6	Neutral	54.2	-32.6	AVG	AVG (0.10s)
0.178	20.4	Line	54.6	-34.2	AVG	AVG (0.10s)
0.156	21.5	Neutral	55.7	-34.2	AVG	AVG (0.10s)
0.165	20.6	Line	55.2	-34.6	AVG	AVG (0.10s)
0.156	21.1	Neutral	55.7	-34.6	AVG	AVG (0.10s)
0.198	19.0	Line	53.7	-34.7	AVG	AVG (0.10s)
7.450	14.9	Line	50.0	-35.1	AVG	AVG (0.10s)
7.560	20.4	Neutral	60.0	-39.6	QP	QP (1.00s)
7.450	18.2	Line	60.0	-41.8	QP	QP (1.00s)

Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92442
		Project Manager:	Deepa Shetty
Contact:	Arndt Hufenbach	Project Coordinator:	Irene Rademacher
Standard:	FCC 15B, EN 55022, CISPR 22, AS/NZ CISPR 22, VCCI	Class:	B

Run # 2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz





Run # 2 Continued on Next Page .....

Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92442
		Project Manager:	Deepa Shetty
Contact:	Arndt Hufenbach	Project Coordinator:	Irene Rademacher
Standard:	FCC 15B, EN 55022, CISPR 22, AS/NZ CISPR 22, VCCI	Class:	B

…….. Continuation of Run # 2

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.185	31.6	Line	54.1	-22.5	Peak	
0.427	26.9	Line	47.3	-20.4	Peak	
0.660	28.3	Line	46.0	-17.7	Peak	
7.219	28.2	Line	50.0	-21.8	Peak	
0.184	31.4	Neutral	54.3	-22.9	Peak	
0.496	29.1	Neutral	46.1	-17.0	Peak	
0.658	31.7	Neutral	46.0	-14.3	Peak	
7.622	28.2	Neutral	50.0	-21.8	Peak	

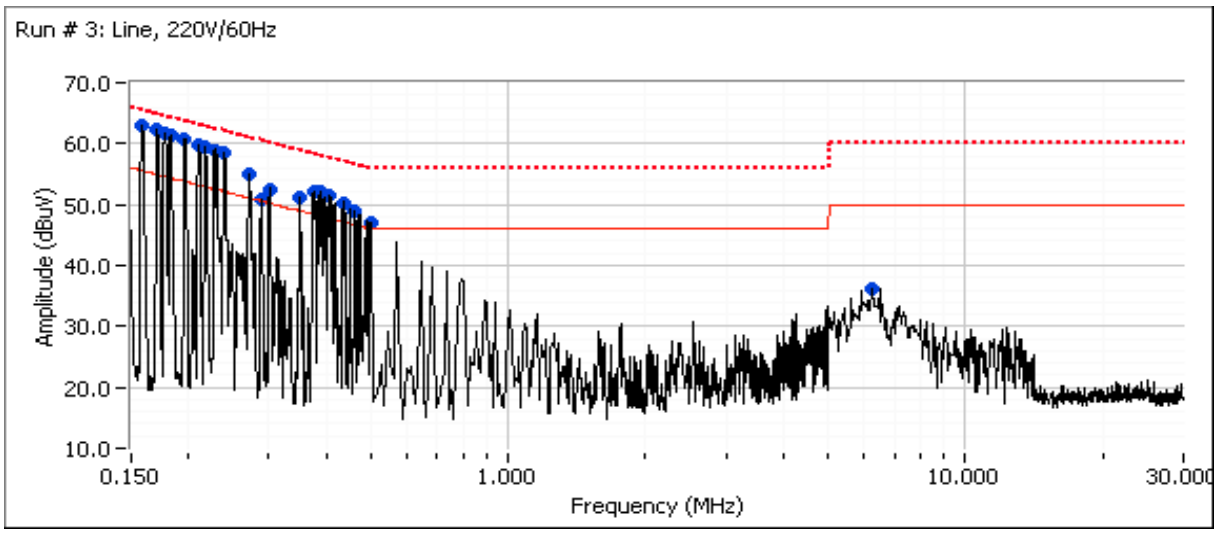
Final quasi-peak and average readings

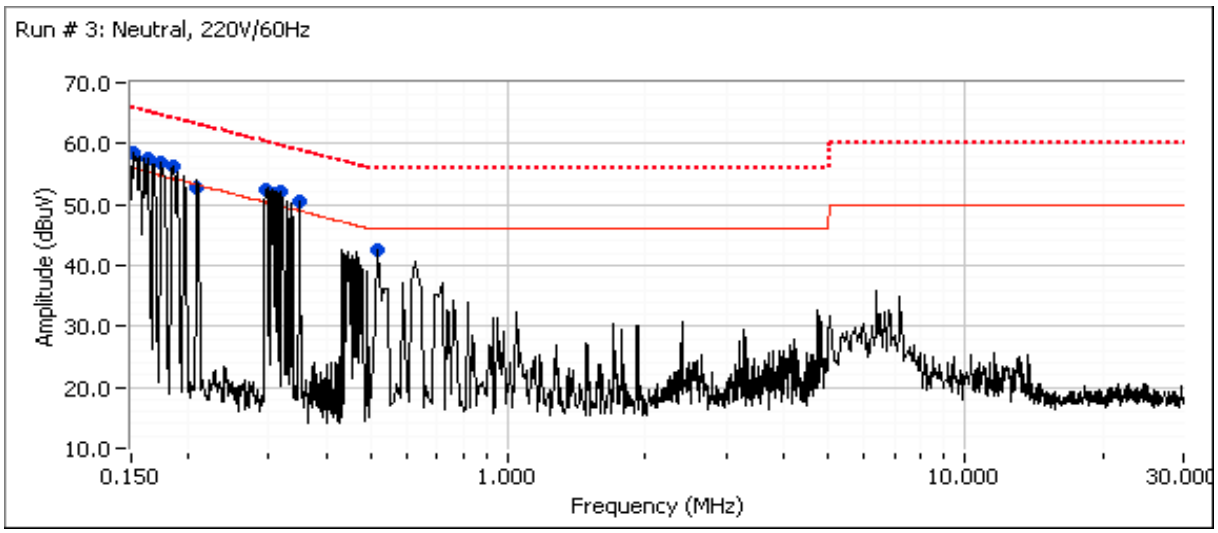
Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.658	24.7	Neutral	46.0	-21.3	AVG	AVG (0.10s)
0.496	20.5	Neutral	46.1	-25.6	AVG	AVG (0.10s)
0.658	27.8	Neutral	56.0	-28.2	QP	QP (1.00s)
7.622	20.6	Neutral	50.0	-29.4	AVG	AVG (0.10s)
0.660	16.0	Line	46.0	-30.0	AVG	AVG (0.10s)
7.219	19.9	Line	50.0	-30.1	AVG	AVG (0.10s)
0.496	23.9	Neutral	56.1	-32.2	QP	QP (1.00s)
0.660	21.7	Line	56.0	-34.3	QP	QP (1.00s)
0.184	19.6	Neutral	54.3	-34.7	AVG	AVG (0.10s)
0.427	12.0	Line	47.3	-35.3	AVG	AVG (0.10s)
0.185	17.8	Line	54.3	-36.5	AVG	AVG (0.10s)
7.622	22.7	Neutral	60.0	-37.3	QP	QP (1.00s)
0.427	19.4	Line	57.3	-37.9	QP	QP (1.00s)
7.219	22.1	Line	60.0	-37.9	QP	QP (1.00s)
0.184	25.7	Neutral	64.3	-38.6	QP	QP (1.00s)
0.185	25.4	Line	64.3	-38.9	QP	QP (1.00s)

Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92442
		Project Manager:	Deepa Shetty
Contact:	Arndt Hufenbach	Project Coordinator:	Irene Rademacher
Standard:	FCC 15B, EN 55022, CISPR 22, AS/NZ CISPR 22, VCCI	Class:	B

Run # 3: AC Power Port Conducted Emissions, 0.15 - 30MHz, 220V/60Hz

Testing with KN qualified AC to DC Adapter (Model # 329679, Bose AC to DC Adaptor)





Run # 3 Continued on Next Page .....

Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92442
		Project Manager:	Deepa Shetty
Contact:	Arndt Hufenbach	Project Coordinator:	Irene Rademacher
Standard:	FCC 15B, EN 55022, CISPR 22, AS/NZ CISPR 22, VCCI	Class:	B

…….. Continuation of Run # 3

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.156	63.0	Line	55.5	7.5	Peak	
0.171	62.4	Line	54.9	7.5	Peak	
0.177	61.8	Line	54.6	7.2	Peak	
0.185	61.3	Line	54.3	7.0	Peak	
0.195	60.8	Line	53.8	7.0	Peak	
0.208	59.9	Line	53.2	6.7	Peak	
0.216	59.4	Line	52.9	6.5	Peak	
0.229	58.8	Line	52.5	6.3	Peak	
0.238	58.4	Line	52.1	6.3	Peak	
0.270	54.9	Line	51.1	3.8	Peak	
0.300	52.6	Line	50.2	2.4	Peak	
0.287	50.7	Line	50.6	0.1	Peak	
0.349	51.3	Line	48.9	2.4	Peak	
0.377	52.0	Line	48.4	3.6	Peak	
0.394	52.0	Line	48.0	4.0	Peak	
0.410	51.4	Line	47.7	3.7	Peak	
0.439	50.2	Line	47.1	3.1	Peak	
0.462	48.8	Line	46.6	2.2	Peak	
0.498	46.9	Line	46.0	0.9	Peak	
6.200	36.1	Line	50.0	-13.9	Peak	
0.151	58.4	Neutral	55.9	2.5	Peak	
0.161	57.6	Neutral	55.3	2.3	Peak	
0.172	57.0	Neutral	54.7	2.3	Peak	
0.182	56.3	Neutral	54.3	2.0	Peak	
0.206	52.7	Neutral	53.3	-0.6	Peak	
0.299	52.5	Neutral	50.3	2.2	Peak	
0.307	51.9	Neutral	50.0	1.9	Peak	
0.321	52.1	Neutral	49.7	2.4	Peak	
0.351	50.6	Neutral	49.0	1.6	Peak	
0.514	42.4	Neutral	46.0	-3.6	Peak	

Run # 3 Continued on Next Page ……..

Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92442
		Project Manager:	Deepa Shetty
Contact:	Arndt Hufenbach	Project Coordinator:	Irene Rademacher
Standard:	FCC 15B, EN 55022, CISPR 22, AS/NZ CISPR 22, VCCI	Class:	B

…….. Continuation of Run # 3

Final quasi-peak and average readings

Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.156	54.2	Line	65.7	-11.5	QP	QP (1.00s)
0.171	53.3	Line	64.9	-11.6	QP	QP (1.00s)
0.176	52.9	Line	64.7	-11.8	QP	QP (1.00s)
0.185	52.2	Line	64.3	-12.1	QP	QP (1.00s)
0.215	50.8	Line	63.0	-12.2	QP	QP (1.00s)
0.229	50.3	Line	62.5	-12.2	QP	QP (1.00s)
0.151	53.7	Neutral	65.9	-12.2	QP	QP (1.00s)
0.208	51.0	Line	63.3	-12.3	QP	QP (1.00s)
0.161	53.1	Neutral	65.4	-12.3	QP	QP (1.00s)
0.172	52.4	Neutral	64.9	-12.5	QP	QP (1.00s)
0.195	51.1	Line	63.8	-12.7	QP	QP (1.00s)
0.182	51.7	Neutral	64.4	-12.7	QP	QP (1.00s)
0.238	49.4	Line	62.2	-12.8	QP	QP (1.00s)
0.300	46.6	Line	60.2	-13.6	QP	QP (1.00s)
0.206	49.7	Neutral	63.4	-13.7	QP	QP (1.00s)
0.270	46.9	Line	61.1	-14.2	QP	QP (1.00s)
0.287	45.9	Line	60.6	-14.7	QP	QP (1.00s)
0.351	43.7	Neutral	58.9	-15.2	QP	QP (1.00s)
0.299	44.6	Neutral	60.3	-15.7	QP	QP (1.00s)
0.307	44.4	Neutral	60.1	-15.7	QP	QP (1.00s)
0.410	41.5	Line	57.6	-16.1	QP	QP (1.00s)
0.321	43.6	Neutral	59.7	-16.1	QP	QP (1.00s)
0.349	42.6	Line	59.0	-16.4	QP	QP (1.00s)
0.394	41.1	Line	58.0	-16.9	QP	QP (1.00s)
0.377	41.2	Line	58.3	-17.1	QP	QP (1.00s)
0.462	39.2	Line	56.7	-17.5	QP	QP (1.00s)
0.498	37.8	Line	56.0	-18.2	QP	QP (1.00s)
0.439	38.4	Line	57.1	-18.7	QP	QP (1.00s)
0.514	37.2	Neutral	56.0	-18.8	QP	QP (1.00s)
0.156	24.0	Line	55.7	-31.7	AVG	AVG (0.10s)
0.171	23.2	Line	54.9	-31.7	AVG	AVG (0.10s)
0.195	22.1	Line	53.8	-31.7	AVG	AVG (0.10s)
0.176	22.9	Line	54.7	-31.8	AVG	AVG (0.10s)
0.185	22.4	Line	54.3	-31.9	AVG	AVG (0.10s)
0.215	21.0	Line	53.0	-32.0	AVG	AVG (0.10s)
0.229	20.3	Line	52.5	-32.2	AVG	AVG (0.10s)

Run # 3 Continued on Next Page ……..

Client:	Fitbit, Inc.	Job Number:	J91795
Model:	FB402	T-Log Number:	T92442
		Project Manager:	Deepa Shetty
Contact:	Arndt Hufenbach	Project Coordinator:	Irene Rademacher
Standard:	FCC 15B, EN 55022, CISPR 22, AS/NZ CISPR 22, VCCI	Class:	B

…….. Continuation of Run # 3

Final quasi-peak and average readings

Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.182	22.2	Neutral	54.4	-32.2	AVG	AVG (0.10s)
0.206	21.0	Neutral	53.4	-32.4	AVG	AVG (0.10s)
0.208	20.8	Line	53.3	-32.5	AVG	AVG (0.10s)
0.238	19.7	Line	52.2	-32.5	AVG	AVG (0.10s)
0.287	17.8	Line	50.6	-32.8	AVG	AVG (0.10s)
0.462	13.4	Line	46.7	-33.3	AVG	AVG (0.10s)
0.321	16.4	Neutral	49.7	-33.3	AVG	AVG (0.10s)
0.349	15.6	Line	49.0	-33.4	AVG	AVG (0.10s)
0.307	16.7	Neutral	50.1	-33.4	AVG	AVG (0.10s)
0.270	17.6	Line	51.1	-33.5	AVG	AVG (0.10s)
0.300	16.7	Line	50.2	-33.5	AVG	AVG (0.10s)
0.377	14.7	Line	48.3	-33.6	AVG	AVG (0.10s)
0.299	16.7	Neutral	50.3	-33.6	AVG	AVG (0.10s)
0.161	21.7	Neutral	55.4	-33.7	AVG	AVG (0.10s)
0.172	21.2	Neutral	54.9	-33.7	AVG	AVG (0.10s)
0.351	15.2	Neutral	48.9	-33.7	AVG	AVG (0.10s)
0.394	14.2	Line	48.0	-33.8	AVG	AVG (0.10s)
0.151	22.1	Neutral	55.9	-33.8	AVG	AVG (0.10s)
0.410	13.3	Line	47.6	-34.3	AVG	AVG (0.10s)
0.439	12.7	Line	47.1	-34.4	AVG	AVG (0.10s)
0.498	11.5	Line	46.0	-34.5	AVG	AVG (0.10s)
6.200	24.8	Line	60.0	-35.2	QP	QP (1.00s)
0.514	10.2	Neutral	46.0	-35.8	AVG	AVG (0.10s)
6.200	8.9	Line	50.0	-41.1	AVG	AVG (0.10s)

End of Report

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