

# **Test Certificate**

A sample of the following product received on April 9, 2018 and tested on April 12, 20, 26, 27 and May 4, 2018 complied with the applicable requirements of,

- Subpart B of Part 15 of FCC Rules for Class B digital devices
- Innovation, Science and Economic Development Canada Interference Causing Equipment Standard ICES-003, "Information Technology Equipment (ITE) – Limits and methods of measurement", Issue 6, dated January 2016 (Class B)
- VCCI-CISPR 32:2016 "Technical Requirements" for multimedia equipment (Class B)
- EN 55022:2010, "Information technology equipment Radio disturbance characteristics Limits and methods of measurement" (Class B)
- CISPR 22:2008 "Information technology equipment Radio disturbance characteristics Limits and methods of measurement" (Class B)
- AS/NZS CISPR 32:2015 "Electromagnetic compatibility of multimedia equipment Emission requirements" (Class B)
- EN 55032:2015/AC:2016, "Electromagnetic compatibility of multimedia equipment Emissions requirements"
- CISPR 32:2012, "Electromagnetic compatibility of multimedia equipment Emissions requirements"
- EN 55024:2010 "Information technology equipment Immunity characteristics, Limits and method of measurement."
- CISPR 24:2010 +A1:2015 "Information technology equipment Immunity characteristics, Limits and method of measurement."
- TCVN 7189:2009 "Information technology equipment Radio disturbance characteristics Limits and methods of measurement" (Class B)

given the measurement uncertainties detailed in National Technical Systems report FR-069580.01-GL Rev 3.

## Fitbit, Inc. Models FB409 and FB410

David W. Bare Chief Engineer

Page 1 of 1

Gary Izafd Quality Assurance Delegate

David Guidotti Report Preparer

This report and the information contained herein represent the results of testing test articles identified and selected by the client performed to specifications and/or procedures selected by the client. National Technical Systems (NTS) makes no representations, expressed or implied, that such testing is adequate (or inadequate) to demonstrate efficiency, performance, reliability, or any other characteristic of the articles being tested, or similar products. This report should not be relied upon as an endorsement or certification by NTS of the equipment tested, nor does it represent any statement whatsoever as to its merchantability or fitness of the test article, or similar products, for a particular purpose. This report shall not be reproduced except in full

National Technical Systems www.nts.com 41039 Boyce Road Fremont, CA. 94538 510-578-3500 Phone 510-440-9525 Fax



41039 Boyce Road Fremont, CA. 94538

## EMC Test Report

## Class B Information Technology Equipment Class B Digital Device

FCC Part 15 Innovation, Science and Economic Development Canada ICES-003, Issue 6 VCCI–CISPR 32:2016 EN 55022:2010 CISPR 22:2008 AS/NZS CISPR 32:2015 TCVN 7189:2009 EN 55032:2015/AC:2016 CISPR 32:2012 EN 55024:2010 CISPR 24:2010 +A1:2015

## Models: FB409 and FB410

COMPANY:	Fitbit, Inc. 199 Fremont Street, 14th Floor San Francisco, CA 94105
TEST SITE(S):	National Technical Systems 41039 Boyce Road Fremont, CA. 94538-2435
PROJECT NUMBER:	PR069580
REPORT DATE:	May 25, 2018
<b>REISSUE DATE:</b>	July 27, 2018
FINAL TEST DATES:	April 12, 20, 26, 27 and May 4, 2018
TOTAL NUMBER OF PAGES:	104



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Report Date: May 25, 2018

## VALIDATING SIGNATORIES

PROGRAM MGR

Sare

David W. Bare Chief Engineer

TECHNICAL REVIEWER:

David W. Bare Chief Engineer

FINAL REPORT PREPARER:

David Guidotti Senior Technical Writer

QUALITY ASSURANCE DELEGATE

nu

Gary Izard Technical Writer



## **REVISION HISTORY**

Rev#	Date	Comments	Modified By
-	May 25, 2018	First release	
1	June 4, 2018	Revised report to update EN 55032:2012 to EN 55032:2015/AC:2016	David Guidotti
2	July 11, 2018	Revised report to remove detailed photographs	David Guidotti
3	July 27, 2018	Added serial numbers of additional samples that were used during testing on page 14 and added additional test data	David Guidotti



## TABLE OF CONTENTS

VALIDATING SIGNATORIES	2
REVISION HISTORY	3
TABLE OF CONTENTS	4
SCOPE	6
OBJECTIVE	6
STATEMENT OF COMPLIANCE	7
DEVIATIONS FROM THE STANDARDS	7
INFORMATION TECHNOLOGY EOUIPMENT EMISSIONS TEST RESULTS	8
CONDUCTED EMISSIONS (MAINS PORT)	8
CONDUCTED EMISSIONS (TELECOMMUNICATIONS PORTS)	8
RADIATED EMISSIONS	9
MULTIMEDIA EQUIPMENT EMISSIONS TEST RESULTS	10
ASYMMETRIC MODE CONDUCTED EMISSIONS (FROM CLASS B FOUIPMENT)	10
CONDUCTED DIFFERENTIAL VOLTAGE EMISSIONS (FROM CLASS B EQUIPMENT)	10
RADIATED EMISSIONS	11
INFORMATION TECHNOLOGY EQUIPMENT IMMUNITY TEST RESULTS	12
IMMUNITY (ENCLOSURE PORT)	12
IMMUNITY (SIGNAL PORTS AND TELECOMMUNICATIONS PORTS)	12
IMMUNITY (INPUT AC POWER PORTS)	.13
MEASUDEMENT INCEDTAINTIES	15
NIEASUKENIENI UNCERIAINIIES	14
GENER AI	.15
HIGHEST EUT INTERNAL FREQUENCY SOURCE	15
ENCLOSURE	16
MODIFICATIONS	16
SUPPORT EQUIPMENT	16
EUT INTERFACE PORTS	1/ 18
ENTERNING FRANK	10
RADIATED AND CONDUCTED EMISSIONS	19
RADIATED EMISSIONS CONSIDERATIONS	19
EMISSIONS MEASUREMENT INSTRUMENTATION	20
RECEIVER SYSTEM	20
INSTRUMENT CONTROL COMPUTER	20
LINE IMPEDANCE STABILIZATION NETWORK (LISN)	20
FILTERS/ATTENUATORS	20
ANTENNAS	21
ANTENNA MAST AND EQUIPMENT TURNTABLE	21
INSTRUMENT CALIBRATION	21
EMISSIONS TEST PROCEDURES	22
EUTAND CABLE PLACEMENT	22
General	22
Preliminary Scan.	22
Final Maximization	23
SAMPLE CALCULATIONS	24
SAMPLE CALCULATIONS - RADIATED EMISSIONS	24



Report Date: May 25, 2018

IMMUNITY TESTING	25
GENERAL INFORMATION	25
IMMUNITY MEASUREMENT INSTRUMENTATION	25
ELECTROSTATIC DISCHARGE TEST SYSTEM	25
ELECTROMAGNETIC FIELD TEST SYSTEM	25
INSTRUMENT CALIBRATION	25
IMMUNITY TEST PROCEDURES	26
EQUIPMENT PLACEMENT	26
APPLICATION OF ELECTROSTATIC DISCHARGES	27
APPLICATION OF ELECTROMAGNETIC FIELD	27
APPENDIX A TEST EQUIPMENT CALIBRATION DATA	28
APPENDIX B TEST DATA	30
APPENDIX C PRODUCT LABELING REQUIREMENTS	92
APPENDIX D USER MANUAL REGULATORY STATEMENTS	94
APPENDIX E ADDITIONAL INFORMATION FOR VCCI	95
APPENDIX F ADDITIONAL INFORMATION FOR AUSTRALIA AND NEW ZEALAND	96
APPENDIX G BASIC AND REFERENCE STANDARDS	97
SUBPART B OF PART 15 OF FCC RULES FOR DIGITAL DEVICES.	97
INDUSTRY CANADA INTERFERENCE CAUSING EQUIPMENT STANDARD ICES-003 ISSUE 6, JANUARY	201697
VCCI REGULATIONS FOR INFORMATION TECHNOLOGY EQUIPMENT, DATED NOVEMBER 2016	97
EN 55022:2010	98
CISPR 22:2008	99
EN 55032:2012 (CISPR 32:2012)	100
TCVN 7189:2009	101
EN 55024:2010	102
CISPR 24:2010	103
END OF REPORT	104



## SCOPE

Governments and standards organizations around the world have published requirements regarding the electromagnetic compatibility (EMC) of electronic equipment. Testing has been performed on the Fitbit, Inc. model FB409 and FB410, pursuant to the following standards.

Standard	Title	Standard Date
FCC Part 15, Subpart B	Radio Frequency Devices	October 2017 as Amended
ICES-003, Issue 6	Information Technology Equipment (Including Digital Apparatus) - Limits and Methods of Measurement	January 2016
VCCI-CISPR 32	Technical Requirements	2016
CISPR 22	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement	2008
AS/NZS CISPR 32	Electromagnetic compatibility of multimedia equipment – Emission requirements	2015
EN 55022	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement	2010
EN 55032	Electromagnetic compatibility of multimedia equipment – Emission requirements	2015/AC 2016
CISPR 32	Electromagnetic compatibility of multimedia equipment – Emission requirements	2012
TCVN 7189	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement	2009

All measurements and evaluations have been in accordance with these specifications, test procedures, and measurement guidelines as outlined in National Technical Systems test procedures, and in accordance with the standards referenced therein (refer to Appendix G). National Technical Systems is accredited by the A2LA, certificate number 0214.26, to perform the test(s) listed in this report, except where noted otherwise.

## OBJECTIVE

The objective of Fitbit, Inc. is to:

- declare conformity with the essential requirements of the EMC directive 2014/30/EU using the harmonized standard(s) referenced in this report;
- declare conformity with the electromagnetic compatibility (EMC) regulatory arrangement of the Australian Communications and Media Authority (ACMA);
- verify compliance with FCC and Canada's requirements for digital devices;
- verify compliance to the Japanese VCCI requirements for Multimedia Equipment;
- verify compliance to the Vietnamese requirements for Information Technology Equipment



## STATEMENT OF COMPLIANCE

The tested samples of Fitbit, Inc. models FB409 and FB410 complied with the applicable requirements of:

Standard/Regulation	Equipment Type/Class	Standard Date
Subpart B of Part 15 of the FCC Rules (CFR title 47)	В	2017 as amended
ICES-003, Issue 6	В	2016
VCCI-CISPR 32	В	2016
EN 55022	Class B	2010
CISPR 22 Edition 6	Class B	2008
AS/NZS CISPR 32	Class B	2015
TCVN 7189	Class B	2009
EN 55032	Class B	2015/AC:2016
CISPR 32	Class B	2012
EN55024	-	2010
CISPR 24	-	2010 +A1:2015

This report is suitable for demonstrating compliance with the EMC requirements in Australia and New Zealand. Refer to Appendix F for more details.

As specified in Section 15.101 of FCC Part 15, unintentional radiators shall be authorized prior to the initiation of marketing. Based on the description of the EUT, the following criteria per Section 15.101 of FCC Part 15 were applied to the EUT:

Type of device	Equipment authorization required
Other Class B digital devices & peripherals	SDoC or Certification

Prior to November 2, 2018, Verification and Declaration of Conformity (DoC) authorizations may still be used as applicable. Supplier's Declaration of Conformity (SDoC) authorization procedures must be used after November 2, 2018 instead of Verification and Declaration of Conformity.

The test results recorded herein are based on a single type test of the Fitbit, Inc. models FB409 and FB410 and therefore apply only to the tested sample(s). The samples were selected and prepared by Ricky Wang of Fitbit, Inc.

Maintenance of compliance is the responsibility of the company. Any modification of the product that could result in increased emissions or susceptibility should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different enclosure, different line filter or power supply, harnessing and/or interface cable changes, etc.).

#### **DEVIATIONS FROM THE STANDARDS**

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

## INFORMATION TECHNOLOGY EQUIPMENT EMISSIONS TEST RESULTS

The following emissions tests were performed on the Fitbit, Inc. models FB409 and FB410. The measurements were extracted from the data recorded during testing and represent the highest-amplitude emissions relative to the specification limits. The complete test data is provided in the appendices of this report.

#### CONDUCTED EMISSIONS (MAINS PORT)

Frequency Range Operating Voltage	Standard/Section	Requirement	Measurement Margin	Status	
0.15-30 MHz, 110V, 60Hz FB409		0.15-0.5 MHz:	41.6 dBµV @ 0.48 MHz (-14.6 dB)	Complied	
0.15-30 MHz, 220V, 60Hz FB409	CISPR 22 Table 2 EN 55022 Table 2 AS/NZS CISPR 32 TCVN 7189 Table 2 (Class B)	66-56 dBµV QP 56-46 dBµV Av 0.5-5.0 MHz:	56-56 dBµV QP 56-46 dBµV Av 0.5-5.0 MHz:	37.3 dBµV @ 0.49 MHz (-18.8 dB)	Complied
0.15-30 MHz, 110V, 60Hz FB410		46 dBμV QP 46 dBμV Av 5.0-30.0 MHz:	33.1 dBµV @ 0.40 MHz (-24.6 dB)	Complied	
0.15-30 MHz, 220 V, 60 Hz FB410	(Class D)	50 dBµV QP	35.5 dBµV @ 0.48 MHz (-20.7 dB)	Complied	

#### CONDUCTED EMISSIONS (TELECOMMUNICATIONS PORTS)

Testing was not performed as the EUT does not have any telecommunication ports.



#### RADIATED EMISSIONS

Frequency Range	Standard/Section	Requirement	Measurement Margin	Status
30-1000 MHz 220V, 60Hz FB410			18.0 dBµV/m @ 30.53 MHz (-12.0 dB)	Complied
30-1000 MHz 110V, 60Hz FB410	CISPR 22 Table 6 FCC §15.109(g)	N 55022 Table 6 ISPR 22 Table 6 FCC §15.109(g) 30 dBµV/m S/NZS CISPR 22 220,1000 MU-		Complied
30-1000 MHz 220V, 60Hz FB409	TCVN 7189 Table 6	37 dBµV/m (10 m limit)	17.5 dBµV/m @ 31.29 MHz (-12.5 dB)	Complied
30-1000 MHz 110V, 60Hz FB409			17.6 dBµV/m @ 30.68 MHz (-12.4 dB)	Complied
1000-6000 MHz NFC (EN)			28.3 dBµV/m @ 3152.0 MHz (Margin: -21.7 dB)	Complied
1000-6000 MHz NFC (FCC)	1000-6000 MHz NFC (FCC) EN 55022 Table 8 CISPR 22 Table 8 TCVN 7189 Table8 3-6 GHz		32.0 dBµV/m @ 5432.6 MHz (Margin: -22.0 dB)	Complied
1000-6000 MHz 220V Non NFC	(Free-Space Measurement) Class B	5-0 GH2 54 dBμV/m Av 74 dBμV/m Pk (3 m limit)	35.6 dBµV/m @ 2448.1 MHz (-18.4 dB)	Complied
1000-6000 MHz 110V Non NFC			35.9 dBµV/m @ 2448.1 MHz (-14.1 dB)	Complied
6000-25000 MHz	FCC §15.109(a) Class B	54.0 dBµV/m Av 74.0 dBµV/m Pk (3 m limit)	No emissions above measurement noise floor.	Complied

#### MULTIMEDIA EQUIPMENT EMISSIONS TEST RESULTS

The following emissions tests were performed on the Fitbit, Inc. models FB409 and FB410. The measurements were extracted from the data recorded during testing and represent the highest-amplitude emissions relative to the specification limits. The complete test data is provided in the appendices of this report.

#### CONDUCTED EMISSIONS (AC MAINS POWER PORTS)

Frequency Range Operating Voltage	Standard/Section	Requirement	Measurement Margin	Status
0.15-30 MHz, 110V, 60Hz FB409		0.15-0.5 MHz:	41.6 dBµV @ 0.48 MHz (-14.6 dB)	Complied
0.15-30 MHz, 220V, 60Hz FB409	EN 55032 CISPR 32 VCCI-CISPR 32	56-46 dBµV QP 56-46 dBµV Av 0.5-5.0 MHz:	37.3 dBµV @ 0.49 MHz (-18.8 dB)	Complied
0.15-30 MHz, 110V, 60Hz FB410	Table A.10 TEC India (Class B)	46 dBμV QP 46 dBμV Av 5.0-30.0 MHz:	33.1 dBµV @ 0.40 MHz (-24.6 dB)	Complied
0.15-30 MHz, 220 V, 60 Hz FB410		50 dBμV QP 50 dBμV Av	35.5 dBµV @ 0.48 MHz (-20.7 dB)	Complied

#### ASYMMETRIC MODE CONDUCTED EMISSIONS (FROM CLASS B EQUIPMENT)

Testing was not performed as the EUT does not have any telecommunication ports..

#### CONDUCTED DIFFERENTIAL VOLTAGE EMISSIONS (FROM CLASS B EQUIPMENT)

Applicable to:

- 1. TV broadcast receiver tuner ports with an accessible connector
- 2. RF modulator output ports
- 3. FM broadcast receiver tuner ports with an accessible connector

Testing was not performed as the EUT does not have any of the above ports.



#### RADIATED EMISSIONS

Frequency Range	Standard/Section	Standard/Section Requirement Measurement Margin		Status
30-1000 MHz 220V FB410			18.0 dBµV/m @ 30.53 MHz (-12.0 dB)	Complied
30-1000 MHz 110V FB410	EN 55032 CISPR 32	30-230 MHz, 40 dBµV/m 230-1000 MHz	18.2 dBµV/m @ 30.56 MHz (-11.8 dB)	Complied
30-1000 MHz 220V FB409	Table A.4 (Class B)	47 dBµV/m (10 m limit)	17.5 dBµV/m @ 31.29 MHz (-12.5 dB)	Complied
30-1000 MHz 110V FB409			17.6 dBµV/m @ 30.68 MHz (-12.4 dB)	Complied
1000-6000 MHz NFC	EN 55032 CISPR 32	1-3 GHz 50 dBµV/m Av 70 dBµV/m Pk	28.3 dBµV/m @ 3152.0 MHz (Margin: -21.7 dB)	Complied
1000-6000 MHz Non-NFC	Table A.5 54 dB (Class B) 74 dB (3 n	54 dBµV/m Av 74 dBµV/m Pk (3 m limit)	35.6 dBµV/m @ 2448.1 MHz (-14.4 dB)	Complied

## INFORMATION TECHNOLOGY EQUIPMENT IMMUNITY TEST RESULTS

The following tests were performed on the Fitbit, Inc. models FB409 and FB410. The results are based upon performance criteria defined by the company and as detailed in this test report.

#### IMMUNITY (ENCLOSURE PORT)

Taat	Decis Standard	Le	vel	Criterion		Statua
Test	Basic Standard	Required	Tested	Req.	Met	Status
Power Frequency Magnetic Field	EN 61000-4-8 IEC 61000-4-8	3A/m 60 Hz	N/A – the manufac does not contair magnetic fields (su elements, electro magnetic f	cturer sta device: uch as C odynami ield sen:	ated this susce RT mo c micro	at the EUT eptible to initors, Hall ophones, tc.)
Radio-Frequency Electromagnetic Field, Amplitude Modulated	EN 61000-4-3 IEC 61000-4-3	80-1000 MHz 3 V/m 80% AM (1 kHz)	80-1000 MHz 3 V/m	A	A	Complied
Electrostatic Discharge	EN 61000-4-2 IEC 61000-4-2	4 kV CD 8 kV AD	4 kV CD 8 kV AD	В	А	Complied

#### IMMUNITY (SIGNAL PORTS AND TELECOMMUNICATIONS PORTS)

Taat	Decis Standard	Level		Criterion		Ctatura
Test	Basic Standard	Required	Tested	Req.	Met	Status
Radio-Frequency Continuous Conducted	EN 61000-4-6 IEC 61000-4-6	0.15-80 MHz, 3 Vrms 80% AM (1 kHz)	N/A – there are no cables which accordi to the manufacturer's specification supp communication on cable lengths greate than 3 m			according on support s greater
Surges	EN 61000-4-5	1.5 kV 10/700 μs	N/A – there are no ports which according to the manufacturer's specification may connect directly to outdoor cables			ccording to on may
	120 01000-4-3	4.0 κν 10/700 μs				ables
Electrical Fast Transients	EN 61000-4-4 IEC 61000-4-4	0.5 kV	N/A – there are no cables which accord to the manufacturer's specification supp communication on cable lengths great than 3 m		according on support s greater	



#### IMMUNITY (INPUT DC POWER PORTS)

Test	Decis Standard	Level		Criterion		Statua
Test	Basic Standard	Required	Tested	Req.	Met	Status
Radio-Frequency Continuous Conducted	EN 61000-4-6 IEC 61000-4-6	0.15-80 MHz, 3 Vrms 80% AM (1 kHz)	N/A – the EUT cannot be used with the charger connected.			
Surges	EN 61000-4-5 IEC 61000-4-5	0.5 kV 1.2/50 μs				with the
Electrical Fast Transients	EN 61000-4-4 IEC 61000-4-4	0.5 kV 5/50 ns 5 kHz				

## IMMUNITY (INPUT AC POWER PORTS)

Test Desis Standard		Le	vel	Criterion		Ctatua	
Test	Basic Standard	Required	Tested	Req.	Met	et	
EFT, AC Power Port	EN 61000-4-4 IEC 61000-4-4	1.0 kV					
Surge, AC Power Port	EN 61000-4-5 IEC 61000-4-5	1 kV DM, 2 kV CM 1.2/50 µs	CM				
RF, conducted continuous, AC Power Port	conducted continuous,EN 61000-4-6Power PortIEC 61000-4-6		N/A – the EUT cannot be used with the charger connected.				
Voltage Dips and Interrupts (50 Hz)	EN 61000-4-11 IEC 61000-4-11	>95%, 0.5 cycles 30%, 25 cycles >95%, 250 cycles					
Voltage Dips and Interrupts (60 Hz)	EN 61000-4-11 IEC 61000-4-11	>95%, 0.5 cycles 30%, 30 cycles >95%, 300 cycles					



## 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 were calculated using the approach described in CISPR 16-4-2 using a coverage factor of k=2, which gives a level of confidence of approximately 95%. The levels were found to be below levels of CISPR and therefore no adjustment of the data for measurement uncertainty is required.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
Conducted Emissions	dBuV or dBuA	150 kHz – 30 MHz	± 2.2 dB
Padiated Electric Field	dRu\//m	30-1000 MHz	± 3.6 dB
Radiated Electric Field	ubuv/III	1000-40,000 MHz	± 6.0 dB
Radiated Immunity	V/m	80-10,000 MHz	- 26.3%, + 29.97%
ESD	KV	N/A	± 8.6%

## EQUIPMENT UNDER TEST (EUT) DETAILS

#### GENERAL

The Fitbit, Inc. models FB409 and FB410 are wrist-worn activity trackers, which send data about activity to the user via a Bluetooth Low Energy (BLE) link. Model FB410 also has an NFC transceiver. They are powered by an internal, rechargeable battery. The EUT was treated as tabletop equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 3.85 VDC.

The samples were received on April 9, 2018 and tested on April 12, 20, 26, 27 and May 4, 2018. The following samples of the EUT were tested:

Company	Model	Description	Serial Number
Fitbit, Inc.	FB409		B2-E-271
	FB410	Winalaaa Aativity Traakar	B2-D-102
	FB409	wireless Activity Tracker	B2-B-289
	FB410		B2-SAT2-279A-C43

#### HIGHEST EUT INTERNAL FREQUENCY SOURCE

The highest internal frequency source  $(F_x)$  of an EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes. The highest internal frequency source determines the frequency range of test for radiated emissions.

The highest internal frequency source of the EUT was declared to be 32 MHz.

Based on the declared highest internal frequency source, the upper frequency range of measurement for the current project were:

#### FCC Part 15, Subpart B

Highest Internal Frequency	Upper Frequency Range of	Applicability
Source (MHz)	Measurement (MHz)	
Below 1.705	30	
1.705 – 108	1000	Х
108 – 500	2000	
500 – 1000	5000	
Above 1000	5th harmonic of the highest internal	
	source or 40 GHz, whichever is	
	lower	

#### CISPR 22 (and related standards)

Highest Internal Source (MHz)	Upper Frequency Range of Measurement (MHz)	Applicability
1.705 – 108	1000	Х
108 – 500	2000	
500 – 1000	5000	
Above 1000	5th harmonic of the highest internal source or 6 GHz, whichever is lower	

#### CISPR 32 (and related standards)

Highest Internal Source (MHz)	Upper Frequency Range of	Applicability
	Measurement (MHz)	
1.705 – 108	1000	Х
108 – 500	2000	
500 – 1000	5000	
Above 1000	5th harmonic of the highest internal	
	source or 6 GHz, whichever is lower	

#### ENCLOSURE

The EUT enclosure measures approximately 24 by 2.5 by 1.3 centimeters. It is primarily constructed of metal and plastic.

#### **MODIFICATIONS**

No modifications were made to the EUT during the time the product was at National Technical Systems.

#### SUPPORT EQUIPMENT

No local support equipment was used during testing.

The following equipment was used as remote support equipment for testing:

#### Configuration #1 (Emissions)

Company	Model	Description	Serial Number
Choetech	Qualcomm Quickcharge 30	USB charger	NA
Lenovo	ThinkPad	Laptop	-

#### Configuration #2 (Immunity)

Company	Model	Description	Serial Number	FCC ID
Appe Inc.	MacBook Pro	Laptop	-	-
Lenovo	ThinkPad	Laptop	-	-
Vivo	VivoPay 4800	Tag reader	CA1352A546	Q55VIVOPAY4800



#### EUT INTERFACE PORTS

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

## Configuration #1 (Emissions)

Port		Cable(s)			
From	То	Description	Shielded/Unshielded	Length(m)	
AC\DC adapter In	Mains	Power Adapter	-	-	
AC\DC adapter Out	EUT	USB cable	Shielded	0.4	

## Configuration #1 (Additional on Support Equipment)

Port		Cable(s)			
From	То	Description	Shielded/Unshielded	Length(m)	
USB/ Lenovo Laptop	EUT Programmer	USB	Shielded	0.7	
Power/ Lenovo Laptop	AC/DC adapter/ACMains	2Wire	Unshielded	1	

## Configuration #2 (Immunity)

Port		Cable(s)			
From	То	Description	Shielded/Unshielded	Length(m)	
AC\DC adapter In	Mains	Power Adapter	-	-	
AC\DC adapter Out	EUT	USB cable	Shielded	0.4	

## Configuration #2 (Additional on Support Equipment)

Por	t		Cable(s)			
From	То	Description	Shielded/Unshielded	Length(m)		
USB/ Apple Laptop	BLE Dongle	USB	Shielded	0.7		
USB/ Lenovo Laptop	EUT Programmer	USB	Shielded	0.7		
Power/ Apple Laptop	AC/DC adapter/ACMains	Power cable	Unshielded	1.5		
Power/ Lenovo Laptop	AC/DC adapter/ACMains	2Wire	Unshielded	1		



#### EUT OPERATION

During emissions testing, the BLE radio was continuously transmitting on channel 17 (2440 MHz) at maximum power (setting 4); the NFC radio was continuously transmitting (13.56 MHz) at maximum power.

During immunity testing the EUT was in either transmit or receive mode.

BLE - In transmit mode, the EUT was configured to receive/transmit data from a dongle which was connected to a remote laptop.

NFC - the EUT NFC mode was verified to be operational before and after testing. In standby mode, the EUT was configured in a receive only mode on channel 17. For standby mode, a spectrum analyzer with field probe was used to monitor the 2400-2483.5MHz band.

The performance criteria applied during immunity testing were:

#### Performance criteria for continuous phenomena:

Transmit mode:

For BLE - During and after testing the EUT shall continue to transmit and receive data from the local dongle. There shall be no errors reported by the monitoring software.

For NFC - The NFC was verified to be operational before and after each test by placing the watch close to the VIVOpay reader which plays a quick audio tone. Receive mode:

During and after testing there shall be no transmissions from the EUT.

#### Performance criteria for transient phenomena:

Transmit mode:

For BLE - After testing the EUT shall continue to transmit and receive data from the local dongle.

For NFC - The NFC was verified to be operational before and after each test by placing the watch close to the VIVOpay reader which plays a quick audio tone. Receive mode:

During and after testing, there should be no transmissions from the EUT.



## EMISSIONS TESTING

#### RADIATED AND CONDUCTED EMISSIONS

Final test measurements were taken at the National Technical Systems Anechoic Chambers listed below. The test sites contain separate areas for radiated and conducted emissions testing. The sites conform to the requirements of ANSI C63.4-2014 American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz and CISPR 16-1-4:2017 - Specification for radio disturbance and immunity measuring apparatus and methods Part 1-4: Radio disturbance and immunity measuring apparatus Ancillary equipment Radiated disturbances. They are registered with the VCCI and are on file with the FCC and Industry Canada.

Sito	Re	gistration Numb	Location	
Sile	VCCI	FCC	Canada	LOCATION
Chamber 3	Member 1211 Facility Registration A-0169	A2LA accredited	IC 2845B-3	41039 Boyce Road Fremont, CA 94538-2435

#### **RADIATED EMISSIONS CONSIDERATIONS**

Radiated emissions measurements were made with the EUT powered from a supply voltage within the expected tolerances of each nominal operating voltage/frequency for each geographical regions covered by the scope of the standards referenced in this report.



## **EMISSIONS MEASUREMENT INSTRUMENTATION**

#### **RECEIVER SYSTEM**

An EMI receiver as specified in CISPR 16-1-1:2015 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 7 GHz. 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.

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 1000 MHz 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.

#### INSTRUMENT CONTROL COMPUTER

Measurements for radiated and conducted emissions are converted to the field strength at an antenna or voltage developed at the LISN (or ISN) measurement port, which is then compared directly with the appropriate specification limit under software control of the test receivers and spectrum analyzers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically. The software used for measurements is NTS EMI Test Software (rev 2.10).

#### LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted emission measurements utilize a 50  $\mu$ H Line Impedance Stabilization Network (LISN) as the measurement point. The LISN used may also contain an additional 250  $\mu$ H inductor. 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.

#### IMPEDANCE STABILIZATION NETWORK (ISN)

Telecommunication port conducted emission measurements utilize an Impedance Stabilization Network with a 150-ohm termination impedance and specific longitudinal conversion loss as the voltage monitoring point. This network provides for calibrated radio-frequency noise measurements by the design of the internal circuitry on the EUT and measurement ports, respectively. For current measurements, a current probe with a uniform frequency response and less than 1-ohm insertion impedance is used.

#### 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 bilog antenna or combination of biconical and log periodic antennas are used to cover the range from 30 MHz to 1000 MHz. Narrowband tuned dipole antennas may be used over the entire 30 to 1000 MHz frequency range for precision measurements of field strength. Above 1000 MHz, horn antennas are used. The antenna calibration factors are included in site factors that are programmed into the test receivers or data collection software.

#### ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a nonconductive antenna mast equipped with a motor drive to vary the antenna height.

ANSI C63.4, CISPR 22, and CISPR 32 specify 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 up to 12-mm thick if the device is normally used on a non-conductive floor. 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 company's specifications. An appendix of this report contains the list of test equipment used and calibration information.



## EMISSIONS TEST PROCEDURES

#### EUT AND CABLE PLACEMENT

The standards 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 C63.4, CISPR 22, and CISPR 32, and the worst-case orientation is used for final measurements.

#### RADIATED EMISSIONS

#### General

FCC Part 15 references the test methods of ANSI C63.4-2014 (American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz) for emissions measurements. Radiated emissions measurements are performed in two phases, preliminary scan and final maximization.

#### Preliminary Scan

A preliminary scan of emissions is conducted in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed, one or more of these with the antenna polarized vertically and one or more of these are performed with the antenna polarized horizontally. During the preliminary scans, the EUT is rotated through 360°, the antenna height is varied and cable positions are varied as necessary to determine the highest emission relative to the limit.

Note that for the frequency range of 1-6 GHz in the "free space" test environment, CISPR 22 and CISPR 32 allows the antenna to be set at a fixed height equal to the center height of the EUT, except for cases where additional scans are necessary with the antenna height adjusted up and down to ensure the measurement antenna illuminates the entire height of the EUT. However, in cases where a single "free space" test is performed in the 1-6 GHz frequency to simultaneously meet the requirements of FCC Part 15 (ANSI C63.4-2014 test methods) and CISPR 22, the antenna height is by default varied since required by ANSI C63.4.

In the frequency range of 30-1000 MHz, a speaker (with demodulation) is provided in the receiver to aid in discriminating between EUT and ambient emissions if required. Other possible methods for discriminating between EUT and ambient emissions involve scanning with near-field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.



#### **Final Maximization**

During final maximization, 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 that results in the highest emission is then maintained while varying the antenna height from one to four meters. 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. Emissions that have values close to the specification limit may also be measured with a tuned dipole antenna to determine compliance.

Final measurements in the frequency range of 30-1000 MHz are made using a quasi-peak detector and compared to the quasi-peak limit. Final measurements above 1 GHz are made using average and peak detectors and compared to the average and peak limits respectively.

When testing above 1 GHz, the receive antenna is restricted to a maximum height of 2.5 m. Maximum emissions are found within this restricted range because emission levels decrease over distance and as the antenna is raised above 2.5 m, the distance from the EUT increases. As a result of the increased measurement distance, at antenna heights above 2.5 m, lower emission levels are measured as compared to emissions levels measured at antenna heights at 2.5 m and below. Final measurements are captured at 3 meters test distance except in cases where a closer test distance is required due to noise-floor considerations of the test-and-measurement equipment.

For measurements above 1 GHz every effort is made to ensure the EUT remains within the cone of radiation of the measurement antenna (i.e. 3 dB beam-width of the antenna). This may include rotating the product and/or angling the measurement antenna.



## SAMPLE CALCULATIONS

#### 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, 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

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:

$$\begin{array}{rcl} R_c &=& R_r \,+\, F_d \\ and \\ M &=& R_c \,-\, L_S \\ where: \\ R_r &=& Receiver \ Reading \ in \ dBuV/m \\ F_d &=& Distance \ Factor \ in \ dB \\ R_c &=& Corrected \ Reading \ in \ dBuV/m \end{array}$$

 $L_{S}$  = Specification Limit in dBuV/m

M = Margin in dB Relative to Spec



### **IMMUNITY TESTING**

#### GENERAL INFORMATION

Final tests were performed at the National Technical Systems Test Sites located at41039 Boyce Road, Fremont, CA 94538-2435. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent CENELEC and IEC standards.

All immunity tests were performed with the host system operating from an AC source voltage within the operating ranges specified for the product, meeting the requirement detailed in EN 55024 / CISPR 24 section 6.1.

#### IMMUNITY MEASUREMENT INSTRUMENTATION

#### ELECTROSTATIC DISCHARGE TEST SYSTEM

An ESD generator is used for all testing. It is capable of applying electrostatic discharges in both contact discharge mode to 8 kV and air discharge mode to 16.5 kV in both positive and negative polarities in accordance with the IEC/EN 61000-4-2 basic EMC publication.

#### ELECTROMAGNETIC FIELD TEST SYSTEM

A signal generator and power amplifiers are used to provide a signal at the appropriate power and frequency to an antenna to obtain the required electromagnetic field at the position of the EUT in accordance with the IEC/EN 61000-4-3 basic EMC publication.

#### INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the company's specifications. An appendix of this report contains the list of test equipment used and calibration information.



### IMMUNITY TEST PROCEDURES

#### EQUIPMENT PLACEMENT

IEC 61000-4-2 specifies that a floor-standing EUT shall be placed on an insulating support 5 - 15 centimeters above a ground plane and that all cables be isolated from the ground plane by  $0.5 \pm 0.05$  millimeter thick insulating material.

For tabletop equipment, the EUT shall be placed a table  $0.8 \pm 0.08$  meters high with a 1.6  $\pm 0.02$  by  $0.8 \pm 0.02$  meter metal sheet placed on the table and connected to the ground plane via a metal strap with two 470-k $\Omega$  resistors in series. The EUT and attached cables shall be isolated from this metal sheet by  $0.5 \pm 0.05$  millimeter thick insulating material. During the tests, the EUT and cables were positioned over a ground reference plane in conformance with this requirement.

IEC 61000-4-3 specifies that a tabletop EUT shall be placed on a non-conducting table 80 centimeters high and that floor-mounted equipment should be mounted on nonconductive supports 0.05 to 0.15 m high or may be placed on an 80 centimeter high platform, if practicable. During the IEC 61000-4-3 tests, the EUT was positioned in a shielded anechoic test chamber on an insulating support in conformance with this requirement. The anechoic materials are used to reduce reflections from the internal surfaces of the chamber.

#### APPLICATION OF ELECTROSTATIC DISCHARGES

The points of application of the test discharges directly to the EUT are determined after consideration of the parts of the EUT that are accessible to the operator during normal operation. Contact and air discharges are applied to the EUT, contact discharges to conducting surfaces and air-gap discharges to insulating surfaces. Contact discharges are also applied to the coupling planes to simulate nearby ESD events.

#### APPLICATION OF ELECTROMAGNETIC FIELD

The electromagnetic field is established at the front edge of the EUT.

The frequency range is swept through the frequency range of the test using a power level necessary to obtain the required field strength at the EUT. The field is amplitude modulated using a 1 kHz sine wave to a depth of 80% for the swept frequency test in accordance with the applicable basic standard(s).

The test is repeated with each of the four sides of the EUT facing the field-generating antenna. For small, portable products the test is also performed with the top and bottom sides of the EUT facing the antenna.



## Appendix A Test Equipment Calibration Data

Manufacturer Radiated Emissions	Description	<u>Model</u>	<u>Asset #</u>	<u>Calibrated</u>	<u>Cal Due</u>
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	1538	2/10/2018	2/10/2019
Sunol Sciences Com-Power	Biconilog, 30-3000 MHz Preamplifier, 30-1000 MHz	JB3 PA-103	2237 2465	6/27/2016 9/6/2017	6/27/2018 9/6/2018
ESD, 20-Apr-18 National Technical	ESD, Vertical Plane, 19-3/4 x	ESD, VP, 19-3/4	610		N/A
Teseq Schaffner	ESD Gun (Red), 100pF-1500 ohm & 150pF-330 ohm tips	x 19-3/4 NSG-438	3010	10/30/2017	10/30/2018
Radiated Immunity, 8	80 - 1,000 MHz, 26&27-Apr-18				
Hewlett Packard	Signal Generator (sweep) 0.01 - 26.5 GHz	8340A	1244	1/10/2018	1/10/2019
Werlatone	Directional Coupler, 0.1-1000 MHz 40dB 500w	C6021	1533		N/A
Rohde & Schwarz ETS Lindgren	Power Meter, Dual Channel Biconilog Antenna 26 MHz - 3	NRVD 3140B	1539 1775	10/30/2017	10/30/2018 N/A
Amplifier Research	Amplifier, 250W, 80-1000	250A1000	1809		N/A
Rohde & Schwarz	Power Sensor, 1 uW-100	NRV-Z51	2152	6/27/2017	6/27/2018
ETS Lindgren	Field Probe, RF, 10 MHz - 40	HI-6053	2202	1/8/2018	1/8/2019
HP Agilent Keysight	Function / Arbitrary waveform generator 80 MHz	33250A	3257	6/22/2017	6/22/2018
Radiated Immunity, 8	80 - 1,000 MHz, 4-May-18				
Hewlett Packard	Signal Generator (sweep) 0.01 - 26.5 GHz	8340A	1244	1/10/2018	1/10/2019
Werlatone	Directional Coupler, 0.1-1000 MHz, 40dB, 500w	C6021	1533		N/A
Rohde & Schwarz ETS Lindgren	Power Meter, Dual Channel Biconilog Antenna 26 MHz - 3 GHz, Badiated Immunity Only	NRVD 3140B	1539 1775	10/30/2017	10/30/2018 N/A
Amplifier Research	Amplifier, 250W, 80-1000	250A1000	1809		N/A
Rohde & Schwarz	Power Sensor, 1 uW-100	NRV-Z51	2152	6/27/2017	6/27/2018
ETS Lindgren	Field Probe, RF, 10 MHz - 40	HI-6053	2202	1/8/2018	1/8/2019
HP Agilent Keysight	GHZ Function / Arbitrary waveform generator 80 MHz	33250A	3257	6/22/2017	6/22/2018
Radiated Immunity, 1	,000 - 6,000 MHz, 04-May-18		_		
National Technical Systems	Radiated Immunity Playback (rev 7.21)	N/A	0		N/A
Hewlett Packard	Signal Génerator (sweep)	8340A	1244	1/10/2018	1/10/2019
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1539	10/30/2017	10/30/2018



Project number PR069580 Reissue Date: July 27, 2018

<u>Manufacturer</u> EMCO	Description Antenna, Horn, 1-18 GHz (SA40-Purple). Used for Chamber 6	<u>Model</u> 3115	<u>Asset #</u> 1779	<u>Calibrated</u>	<u>Cal Due</u> N/A
Amplifier Research Rohde & Schwarz	Amplifier, 25w, 0.8-4.2GHz Power Sensor, 1 uW-100 mW_DC-18 GHz_50ohms	25S1G4AM3 NRV-Z51	1805 2152	6/27/2017	N/A 6/27/2018
Advanced Technical Materials	Directional Coupler, 1.0- 11.0GHz, 35dB, 50w	CHP223G- 35FNF	2320		N/A
HP Agilent Keysight	Function / Arbitrary waveform generator 80 MHz	33250A	3257	6/22/2017	6/22/2018
Amplifier Research	Amplifier, 15W, 4.2 to 18 GHz	15T4G18M1	2065		N/A
Conducted Emission	s - AC Power Ports, 12-Apr-18				
EMCO	LISN, 10 kHz-100 MHz	3825/2	1292	8/8/2017	8/8/2018
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1401	1/8/2018	1/8/2019
Rohde & Schwarz	EMI Test Receiver, 20 Hz-40 GHz	ESI 40	2493	3/22/2018	3/22/2019
<b>Radiated Emissions</b> ,	1000 - 25,000 MHz, 23-Jul-18				
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A
EMCO	Antenna Horn 1-18GHz	3115	868	7/9/2018	7/9/2020
HP / Mitea	SA40 P Head HE	TTA1840_45_5P_	1772	0/1//2017	
rn / witteq	preAmplifier, 18-40 GHz (w/2415)	HG-S	1112	3/14/2017	N/A
A. H. Systems	System Horn, 18-40GHz	SAS-574, p/n: 2581	2161	7/21/2017	7/21/2019
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	2199	8/30/2017	8/30/2018
Hewlett Packard	Spectrum Analyzer (SA40) Purple 9 kHz - 40 GHz,	8564E (84125C)	2415	2/16/2018	2/16/2019
Radiated Emissions	1 000 - 25 000 MHz 24-Jul-18				
Hewlett Packard	Microwave Preamplifier, 1- 26 5GHz	8449B	785	9/8/2017	9/8/2018
Hewlett Packard	Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz	8564E (84125C)	1393	12/8/2017	12/8/2018
A. H. Systems	Purple System Horn, 18- 40GHz	SAS-574, p/n: 2581	2160	8/18/2017	8/18/2018
Micro-Tronics	Band Reject Filter, 2400-2500 MHz 18GHz	BRM50702-02	2238	5/1/2018	5/1/2019
EMCO	Antenna, Horn, 1-18 GHz	3115	2870	8/24/2017	8/24/2019

Report Date: May 25, 2018



## Appendix B Test Data

## T106007 CE FB409 Pages 31 – 36 T106007 CE FB410 Pages 37 – 42 T106007 RE, ESD & RI Pages 43 – 91



# EMC Test Data

WE ENGINEER S	UCCESS	LI	
Client:	Fitbit, Inc.	Job Number:	JD105947
Product	FB409	T-Log Number:	T106007
System Configuration:	-	Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Emissions Standard(s):	FCC 15.247, 15.209 / RSS-247, RSS-210 / LP0002	Class:	-
Immunity Standard(s):	-	Environment:	-
1			

## **EMC** Test Data

For The

## Fitbit, Inc.

Product

FB409

Date of Last Test: 4/20/2018

🎲 NTS				EMO	C Test Data
Client: Fitbit, Inc.				PR Number:	JD105947
Model: EB400			T·	Log Number:	T106007
			Proj	ect Manager:	Deepa Shetty
Contact: Ricky War	ng		Proj	ject Engineer:	-
Standard: FCC 15.2	47, 15.209 / RSS-247, RSS-210 / LP0002	2		Class:	-
	Conduc (NTS Silicon Valley, Fremo	cted Emissions nt Facility, Semi-Ane	echoic Chaml	ber)	
Test Specific Deta Objectiv	ails e: The objective of this test session is to specification listed above.	perform final qualificat	ion testing of t	the EUT with r	espect to the
Date of Tes Test Enginee Test Locatio	st: 4/12/2018 rr: Rafael Varelas n: FT Chamber #7	Config. Use Config Chang EUT Voltag	ed: 1 je: None je: See Individ	lual Runs	
General Test Con For tabletop equipm plane and 80cm fror	<b>figuration</b> ent, the EUT was located on a wooden ta n the LISN.	ble inside the semi-ar	nechoic chamb	oer, 40 cm fron	n a vertical coupling
Ambient Conditio	ns: Temperature: Rel. Humidity:	22.4 °C 38 %			
	Test Performed	Limit	Result	Margin	
1	CE, AC Power, 110V/60Hz	Class B	Pass	41.6 dBµV @	@ 0.48 MHz(-14.6 dB)
2	CE, AC Power,220V/60Hz	Class B	Pass	37.3 dBµV @	@ 0.49 MHz(-18.8 dB)
Modifications Mad No modifications we Deviations From No deviations were r	de During Testing re made to the EUT during testing The Standard made from the requirements of the standa	ard.			
Sample Notes Sample S/N: B2-B-289 Driver: 1.5.9615 Antenna: Internal Notes: EUT configured to tran	smit on channel 19 at power setting Max				





# EMC Test Data

Client:	Fitbit, Inc.						PR Number:	JD105947
	50.000						T-Log Number:	T106007
Model:	FB409						Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Ricky Wang					Project Engineer:	-
Standard:	FCC 15.247	FCC 15.247, 15.209 / RSS-247, RSS-210 / LP0002					Class:	-
otandara								
Preliminary	peak readi	nas capture	d durina pre	e-scan (peak	k readings v	s. average lim	it)	
Frequency	Level	AC	Cla	ss B	Detector	Comments	/	
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.308	37.2	Line 1	50.1	-12.9	Peak			
0.487	46.6	Line 1	46.2	0.4	Peak			
0.571	40.2	Line 1	46.0	-5.8	Peak			
1.541	37.5	Line 1	46.0	-8.5	Peak			
0.418	34.5	Neutral	47.5	-13.0	Peak			
0.479	36.9	Neutral	46.4	-9.5	Peak			
0.620	35.8	Neutral	46.0	-10.2	Peak			
0.921	34.6	Neutral	46.0	-11.4	Peak			
Final quasi	-peak and a	verage read	ings		•	1		
Frequency	Level	AC	Cla	ss B	Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.487	41.6	Line 1	56.2	-14.6	QP	QP (1.00s)		
0.479	38.1	Neutral	56.4	-18.3	QP	QP (1.00s)		
0.487	26.3	Line 1	46.2	-19.9	AVG	AVG (0.10s)		
0.479	25.0	Neutral	46.4	-21.4	AVG	AVG (0.10s)		
0.571	30.4	Line 1	56.0	-25.6	QP	QP (1.00s)		
1.541	30.3	Line 1	56.0	-25.7	QP	QP (1.00s)		
0.619	29.3	Neutral	56.0	-26.7	QP	QP (1.00s)		
0.418	30.6	Neutral	57.5	-26.9	QP	QP (1.00s)		
0.921	27.8	Neutral	56.0	-28.2	QP	QP (1.00s)		
0.308	30.8	Line 1	60.0	-29.2	QP	QP (1.00s)		
0.418	18.0	Neutral	47.5	-29.5	AVG	AVG (0.10s)		
1.541	15.9	Line 1	46.0	-30.1	AVG	AVG (0.10s)		
0.921	15.7	Neutral	46.0	-30.3	AVG	AVG (0.10s)		
0.619	14.2	Neutral	46.0	-31.8	AVG	AVG (0.10s)		
0.308	18.0	Line 1	50.0	-32.0	AVG	AVG (0.10s)		
0.571	14.0	Line 1	46.0	-32.0	AVG	AVG (0.10s)		
1								




42								
Client:	Fitbit, Inc.						PR Number:	JD105947
	ED 400						T-Log Number:	T106007
Modei:	FB409						Project Manager:	Deepa Shetty
Contact:	Ricky Wang	I					Project Engineer:	-
Standard:	FCC 15.247	/ /. 15.209 / RS	SS-247, RSS	5-210 / LP000	02		Class:	-
Clanda L		1.6.20.				1		
Preliminary	v peak readiv	nas capture	d durina pre	e-scan (peal	k readinas v	s. average limi	t)	
Frequency	Level	AC	Cla	ss B	Detector	Comments	7	
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.183	44.1	Neutral	54.5	-10.4	Peak			
0.471	36.3	Neutral	46.5	-10.2	Peak			
0.540	39.4	Neutral	46.0	-6.6	Peak			
1.922	32.4	Neutral	46.0	-13.6	Peak			
0.177	41.1	Line 1	54.6	-13.5	Peak			
0.495	39.1	Line 1	46.1	-7.0	Peak			
0.709	38.5	Line 1	46.0	-7.5	Peak			
1.949	34.5	Line 1	46.0	-11.5	Peak			
Final quasi	-peak and a	verage read	ings		_	-		
Frequency	Level	AC	Cla	ss B	Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.495	37.3	Line 1	56.1	-18.8	QP	QP (1.00s)		
0.495	25.0	Line 1	46.1	-21.1	AVG	AVG (0.10s)		
0.709	32.8	Line 1	56.0	-23.2	QP	QP (1.00s)		
0.540	20.8	Neutral	46.0	-25.2	AVG	AVG (0.10s)		
0.709	20.6	Line 1	46.0	-25.4	AVG	AVG (0.10s)		
0.471	20.7	Neutral	46.5	-25.8	AVG	AVG (0.10s)		
1.949	30.1	Line 1	56.0	-25.9	QP	QP (1.00s)		
0.540	29.8	Neutral	56.0	-26.2	QP	QP (1.00s)		
0.471	30.0	Neutral	56.5	-26.5	QP	QP (1.00s)		
1.949	17.9	Line 1	46.0	-28.1	AVG	AVG (0.10s)		
0.183	36.0	Neutral	64.3	-28.3	QP	QP (1.00s)		
0.177	36.0	Line 1	64.6	-28.6	QP	QP (1.00s)		
1.922	15.0	Neutral	46.0	-31.0	AVG	AVG (0.10s)		
1.922	24.1	Neutral	56.0	-31.9	QP	QP (1.00s)		
0.183	13.5	Neutral	54.3	-40.8	AVG	AVG (0.10s)		
0.177	13.6	Line 1	54.6	-41.0	AVG	AVG (0.10s)		



WE ENGINEER S	UCCESS	LI	
Client:	Fitbit, Inc.	Job Number:	JD105947
Product	FB410	T-Log Number:	T106007
System Configuration:	-	Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Emissions Standard(s):	FCC 15.247, 15.209 / RSS-247, RSS-210 / LP0002	Class:	-
Immunity Standard(s):	-	Environment:	-
1			

### **EMC** Test Data

For The

### Fitbit, Inc.

Product

FB410

Date of Last Test: 4/17/2018

() 	ITS				EM	C Test Data			
Client: Fi	itbit, Inc.				PR Number:	JD105947			
Model: El	D/10			T-	Log Number:	T106007			
would re	D410			Proj	ect Manager:	Deepa Shetty			
Contact: Ri	licky Wang			Proj	ect Engineer:	-			
Standard: F	CC 15.247	15.209 / RSS-247, RSS-210 / LP0002			Class:	-			
Conducted Emissions (NTS Silicon Valley, Fremont Facility, Semi-Anechoic Chamber)									
Test Specif	fic Detail Objective:	<b>S</b> The objective of this test session is to p specification listed above.	perform final qualification	n testing of t	he EUT with r	respect to the			
Dat Test Test	Date of Test:4/12/2018Config. Used:1Test Engineer:Rafael VarelasConfig Change:NoneTest Location:FT Chamber #7EUT Voltage:See Individual Runs								
General Test For tabletop plane and 80	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 Co	onditions	Rel. Humidity:	22.4 °C 38 %						
Summary o	of Result	S			1				
Run i	#	CE AC Dowor 110//60Hz	Limit Class R	Result		@ 0 40 MUz( 24 6 dD)			
2		CE, AC Power, 220V/60Hz	Class B Class B	Pass	35.5 dBuV	@ 0.48 MHz(-24.0 dB) @ 0.48 MHz(-20.7 dB)			
Z       CE, AC POWEL, ZZUV/OUTZ       Class B       Pass       J35.5 dBµV @ 0.48 MHZ(-20.7 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 Nation									
Sample S/N: E Driver: 1.5.96 Antenna: inter	Sample Notes Sample S/N: B2-SAT2-279A-C43 Driver: 1.5.9615 Antenna: internal Notes:								
EUT configure	ed to transn	it on channel 19 at power setting Max							





Client:	Fitbit, Inc.						PR Number:	JD105947
Madal	ED 410						T-Log Number:	T106007
Wodel:	FB410						Project Manager:	Deepa Shetty
Contact:	Ricky Wang						Project Engineer:	-
Standard:	FCC 15.247	/, 15.209 / RS	SS-247, RSS	-210 / LP000		Class:	-	
						<u></u>		
Preliminary	peak readi	ngs capture	d during pre	e-scan (peak	k readings v	s. average lir	mit)	
Frequency	Level	AC	Clas	ss B	Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.388	30.8	Neutral	48.0	-17.2	Peak			
0.487	25.4	Neutral	46.2	-20.8	Peak			
0.522	31.6	Neutral	46.0	-14.4	Peak			
1.416	24.9	Neutral	46.0	-21.1	Peak			
0.389	35.3	Line 1	48.1	-12.8	Peak			
0.406	35.6	Line 1	47.7	-12.1	Peak			
0.602	31.5	Line 1	46.0	-14.5	Peak			
1.305	28.5	Line 1	46.0	-17.5	Peak			
Final quasi	-peak and a	verage read	ings					
Frequency	Level	AC	Clas	ss B	Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.406	33.1	Line 1	57.7	-24.6	QP	QP (1.00s)		
0.406	21.6	Line 1	47.7	-26.1	AVG	AVG (0.10s)		
0.389	21.9	Line 1	48.1	-26.2	AVG	AVG (0.10s)		
0.389	31.8	Line 1	58.1	-26.3	QP	QP (1.00s)		
0.602	28.3	Line 1	56.0	-27.7	QP	QP (1.00s)		
0.388	19.8	Neutral	48.1	-28.3	AVG	AVG (0.10s)		
0.602	17.7	Line 1	46.0	-28.3	AVG	AVG (0.10s)		
0.522	16.6	Neutral	46.0	-29.4	AVG	AVG (0.10s)		
0.522	25.7	Neutral	56.0	-30.3	QP	QP (1.00s)		
0.487	15.6	Neutral	46.2	-30.6	AVG	AVG (0.10s)		
0.388	26.5	Neutral	58.1	-31.6	QP	QP (1.00s)		
0.487	24.2	Neutral	56.2	-32.0	QP	QP (1.00s)		
1.305	21.6	Line 1	56.0	-34.4	QP	QP (1.00s)		
1.416	10.5	Neutral	46.0	-35.5	AVG	AVG (0.10s)		
1.416	19.2	Neutral	56.0	-36.8	QP	QP (1.00s)		
1.305	8.9	Line 1	46.0	-37.1	AVG	AVG (0.10s)		





Client:	Fitbit, Inc.						PR Number:	JD105947
	ED 110						T-Log Number:	T106007
Model:	FB410					_	Project Manager:	Deepa Shetty
Contact:	Ricky Wang						Project Engineer:	-
Standard:	FCC 15.247	, 15.209 / RS	SS-247, RSS	-210 / LP000	)2		Class:	-
					-			
Preliminary	v peak readi	nas capture	d durina pre	e-scan (peak	k readings v	s. average lin	nit)	
Frequency	Level	AC	Cla	ss B	Detector	Comments	/	
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.352	35.6	Line 1	48.9	-13.3	Peak			
0.486	36.5	Line 1	46.2	-9.7	Peak			
0.698	36.1	Line 1	46.0	-9.9	Peak			
1.885	33.5	Line 1	46.0	-12.5	Peak			
0.392	27.9	Neutral	48.1	-20.2	Peak			
0.487	29.4	Neutral	46.2	-16.8	Peak			
0.700	34.0	Neutral	46.0	-12.0	Peak			
2.043	30.2	Neutral	46.0	-15.8	Peak			
Final quasi	-peak and a	verage read	ings					
Frequency	Level	AC	Cla	ss B	Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.486	35.5	Line 1	56.2	-20.7	QP	QP (1.00s)		
0.697	30.4	Line 1	56.0	-25.6	QP	QP (1.00s)		
0.487	29.6	Neutral	56.2	-26.6	QP	QP (1.00s)		
1.885	28.9	Line 1	56.0	-27.1	QP	QP (1.00s)		
0.486	18.2	Line 1	46.2	-28.0	AVG	AVG (0.10s)		
0.352	30.8	Line 1	58.9	-28.1	QP	QP (1.00s)		
0.700	26.8	Neutral	56.0	-29.2	QP	QP (1.00s)		
0.487	15.1	Neutral	46.2	-31.1	AVG	AVG (0.10s)		
0.697	14.0	Line 1	46.0	-32.0	AVG	AVG (0.10s)		
2.043	23.4	Neutral	56.0	-32.6	QP	QP (1.00s)		
0.700	13.3	Neutral	46.0	-32.7	AVG	AVG (0.10s)		
1.885	12.9	Line 1	46.0	-33.1	AVG	AVG (0.10s)		
0.352	15.0	Line 1	48.9	-33.9	AVG	AVG (0.10s)		
0.392	13.1	Neutral	48.0	-34.9	AVG	AVG (0.10s)		
2.043	11.0	Neutral	46.0	-35.0	AVG	AVG (0.10s)		
0.392	22.4	Neutral	58.0	-35.6	QP	QP (1.00s)		



Client:	Fitbit, Inc.	Job Number:	JD105947
Product	FB409 and FB410	T-Log Number:	T106007
System Configuration:	-	Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Coordinator:	-
Emissions Standard(s):	EN 55032, AS/NZ CISPR 22, VCCI-CISPR 32,	Class:	В
	KN32, CNS 13438		
Immunity Standard(s):	EN 55024, KN35, EN/KN 301 489-1, -17	Environment:	Radio and ITE

### **EMC Test Data**

For The

#### Fitbit, Inc.

Product

FB409 and FB410

Date of Last Test: 7/24/2018

🎲 NTS				EMC Test Data
Client: Fitbit, Inc.				PR Number: JD105947
Madal, ED400 and E			T-	Log Number: T106007
	·B410		Proj	ect Manager: Deepa Shetty
Contact: Ricky Wang			Proj	ect Engineer: -
Standard: EN 55032, A	S/NZ CISPR 22, VCCI-CISPR 32,	KN32, CNS 13438		Class: B
	Radia (NTS Silicon Valley, Fren	ated Emissions nont Facility, Semi-Ane	choic Cham	ber)
Test Specific Details Objective:	<b>S</b> The objective of this test session is specification listed above.	to perform final qualifica	tion testing o	f the EUT with respect to the
Date of Test: Test Engineer: Test Location:	4/12/2018 Rafael Varelas FT Chamber #3	Config. Used Config Change EUT Voltage	: 1 : None : 220V/60Hz	
General Test Config The EUT and any local equipment was located metal conduit and wher Radiated emissions tes methods of ANSI C63.4 The test distance and e Note, preliminary testin antenna. Maximized te antenna, and manipula	<b>juration</b> support equipment were located or outside the semi-anechoic chambe n possible passed through a ferrite of sts above 1 GHz to FCC Part 15 were 4 and CISPR 16-1-4. extrapolation factor (if applicable) and ig indicates that the emissions were esting indicated that the emissions were tion of the EUT's interface cables.	n the turntable for radiate er. Any cables running to clamp upon exiting the cl re performed <u>with</u> floor a e detailed under each ru maximized by orientatio vere maximized by orient	ed emissions o remote supp hamber. bsorbers in p n description n of the EUT tation of the F	testing. Any remote support port equipment were routed through place in accordance with the test and elevation of the measurement EUT, elevation of the measurement
Ambient Conditions	Contraction Temperature: Rel. Humidity:	22.4 °C 38 %		
Summary of Results	S			
Run #	Test Performed	Limit	Result	Margin
1	Radiated Emissions 30 - 1000 MHz, Preliminary	Class B	Eval	Refer to individual runs
2	Radiated Emissions 30 - 1000 MHz, Maximized	Class B	Pass	18.0 dBµV/m @ 30.53 MHz (-12.0 dB)



Client:	Fitbit, Inc.	PR Number:	JD105947
Model	EP400 and EP410	T-Log Number:	T106007
wouer.		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Engineer:	-
Standard:	EN 55032, AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438	Class:	В

#### 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: B2-SAT2-279A-C43 (BLE+NFC) Driver: 1.5.9615 Antenna: internal





Client:       Fitbit,         Model:       FB40         Contact:       Ricky         Standard:       EN 5         Preliminary       peak         Frequency       Lee         MHz       dBµ         30.528       2         48.994       11         126.564       11         265.652       2         255.921       11         910.030       2         Preliminary       quas         Frequency       Lee         MHz       dBµ         48.994       1.         126.564       1.         30.528       1.         48.994       1.         126.564       1.         30.528       1.         910.030       2         265.652       1.         255.921       1.         255.921       1.	bit, Inc. 409 and F ky Wang 55032, A <u>ak readin</u> Level	t, Inc. 09 and FB410 y Wang 55032, AS/NZ CI					T-I	PR Number: Log Number:	JD105947 T106007	
Model:         FB40           Contact:         Ricky           Standard:         EN 5           Preliminary         peak           Frequency         Lee           MHz         dBµ           30.528         2           48.994         11           126.564         11           265.652         2           255.921         11           910.030         2           Preliminary         quass           Frequency         Lee           MHz         dBµ           48.994         1           126.564         11           30.528         2           48.994         1           126.564         11           30.528         11           30.528         11           30.528         11           30.528         11           30.528         11           910.030         2           265.652         1           255.921         1	409 and F ky Wang 55032, A <u>ak readin</u> Level	09 and FB410 y Wang 55032, AS/NZ CI				-	T-I	Log Number:	T106007	
Model:         FB40           Contact:         Ricky           Standard:         EN 5           Preliminary peak           Frequency         Le           MHz         dBj           30.528         2           48.994         1           126.564         1           265.652         2           255.921         1           910.030         2           Preliminary quase         Frequency           Frequency         Le           MHz         dBj           48.994         1           126.564         1           30.528         1           910.030         2           265.652         1           910.030         2           265.652         1           255.921         1	409 and F ky Wang 55032, A <u>ak readin</u> Level	09 and FB410 y Wang 55032, AS/NZ CI				-	T-Log Number			
Contact:         Ricky           Standard:         EN 5           Preliminary peak           Frequency         Lee           MHz         dBµ           30.528         2           48.994         11           126.564         11           265.652         2           255.921         11           910.030         22           Preliminary quase         Frequency           Frequency         Lee           MHz         dBµ           48.994         1.           126.564         1.           30.528         1.           910.030         2           265.652         1.           30.528         1.           910.030         2           265.652         1.           255.921         1.	cky Wang 55032, A ak readin Level	y Wang 55032, AS/NZ CI				Proje	ect Manager:	Deepa Shetty		
Standard:       EN 5/3         Preliminary peak         Frequency       Lee         MHz       dBµ         30.528       2         48.994       11         126.564       11         265.652       2         255.921       11         910.030       2         Preliminary quase         Frequency       Lee         MHz       dBµ         48.994       1         126.564       11         30.528       11         910.030       2         265.652       11         30.528       11         910.030       2         265.652       11         255.921       11	<u>ak readin</u>	5032, AS/NZ CI					Proie	ect Engineer:	-	
Preliminary peak           Frequency         Lee           MHz         dBj           30.528         2           48.994         14           126.564         11           265.652         2           255.921         11           910.030         2           Preliminary quase         Frequency           Frequency         Lee           MHz         dBj           48.994         1.           126.564         11           30.528         11           910.030         2           265.652         11           30.528         11           910.030         2           265.652         11           255.921         11	ak readin	10002, NOME OF	SPR 22 VCC	I-CISPR 32	KN32 CNS 1	3438		Class <sup>,</sup>	B	
Preliminary peak           Frequency         Let           MHz         dBj           30.528         2           48.994         11           126.564         11           265.652         2           255.921         11           910.030         2           Preliminary quast           Frequency         Let           MHz         dBj           48.994         1.           126.564         1.           30.528         1.           910.030         2           265.652         1.           30.528         1.           910.030         2           265.652         1.           255.921         1.	ak readin Level									
Preliminary peak           Frequency         Let           MHz         dBj           30.528         2           48.994         1           126.564         1           265.652         2           255.921         1           910.030         2           Preliminary quase           Frequency         Let           MHz         dBj           48.994         1           126.564         1           30.528         1           910.030         2           265.652         1           30.528         1           910.030         2           265.652         1           255.921         1	<mark>ak readin</mark> Level									
Frequency       Let         MHz       dBµ         30.528       2         48.994       11         126.564       11         265.652       2         255.921       11         910.030       2         Preliminary quass         Frequency       Let         MHz       dBµ         48.994       1         126.564       11         30.528       11         910.030       2         265.652       1         30.528       11         30.528       11         910.030       2         265.652       1         255.921       11	Level	k readings can	ured durina r	re-scan						
MHz         dBj           30.528         2           48.994         11           126.564         11           265.652         2           255.921         11           910.030         2           Preliminary quase           Frequency         Lee           MHz         dBj           48.994         1.           126.564         11           30.528         11           910.030         2           265.652         11           30.528         11           30.528         11           30.528         11           255.921         11	2010.	evel Pol	Cla	ss B	Detector	Azimuth	Heiaht	Comments		
30.528         2           48.994         1           126.564         1           265.652         2           255.921         1           910.030         2           Preliminary quas           Frequency         Lee           MHz         dBµ           48.994         1           126.564         1           30.528         1           910.030         2           265.652         1           255.921         1	BuV/m	uV/m v/h	Limit	Margin	Pk/OP/Ava	dearees	meters			
48.994       1         126.564       1         265.652       2         255.921       1         910.030       2         Preliminary quase         Frequency       Lee         MHz       dBp         48.994       1         126.564       1         30.528       1         910.030       2         265.652       1         255.921       1	23.5	23.5 H	30.0	-6.5	Peak	255	4.0			
126.564       1         265.652       2         255.921       1         910.030       2         Preliminary quas         Frequency       Le         MHz       dBj         48.994       1         126.564       1         30.528       1         910.030       2         265.652       1         255.921       1	18.0	18.0 V	30.0	-12.0	Peak	22	1.0			
265.652         2           255.921         1           910.030         2           Preliminary quas           Frequency         Lee           MHz         dBj           48.994         1.           126.564         1.           30.528         1.           910.030         2           265.652         1.           255.921         1.	19.3	19.3 H	30.0	-10.7	Peak	190	1.5			
255.921         1           910.030         2           Preliminary quas           Frequency         Le           MHz         dBµ           48.994         1.           126.564         1.           30.528         1.           910.030         2           265.652         1.           255.921         1.	21.6	21.6 H	37.0	-15.4	Peak	352	3.0			
910.030         2           Preliminary quas           Frequency         Le           MHz         dBµ           48.994         1.           126.564         1.           30.528         1.           910.030         2           265.652         1.           255.921         1.	19.1	19.1 H	37.0	-17.9	Peak	360	3.0			
Preliminary         quase           Frequency         Lee           MHz         dBj           48.994         1.           126.564         1.           30.528         1.           910.030         2           265.652         1.           255.921         1.	29.9	29.9 H	37.0	-7.1	Peak	302	2.5			
Preliminary         quase           Frequency         Lee           MHz         dBµ           48.994         1.           126.564         1.           30.528         1.           910.030         2           265.652         1.           255.921         1.		•								
Frequency         Let           MHz         dBj           48.994         1.           126.564         1.           30.528         1.           910.030         2           265.652         1.           255.921         1.	asi-peak	si-peak reading	s (no manipu	lation of EU	T interface c	ables)				
MHz         dBj           48.994         1           126.564         1           30.528         1           910.030         2           265.652         1           255.921         1	Level	evel Pol	Cla	ss B	Detector	Azimuth	Height	Comments		
48.994       1         126.564       1         30.528       1         910.030       2         265.652       1         255.921       1	BμV/m	μV/m v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
126.564       1         30.528       1         910.030       2         265.652       1         255.921       1	12.8	2.8 V	30.0	-17.2	QP	24	1.0	QP (1.00s)		
30.528     1:       910.030     2       265.652     1:       255.921     1:	14.3	I4.3 H	30.0	-15.7	QP	191	1.5	QP (1.00s)		
910.030     2       265.652     1       255.921     1	18.0	18.0 H	30.0	-12.0	QP	256	4.0	QP (1.00s)		
265.652 1. 255.921 1	23.1	23.1 H	37.0	-13.9	QP	304	2.5	QP (1.00s)		
255.921 1	12.2	12.2 H	37.0	-24.8	QP	353	3.0	QP (1.00s)		
	10.9	10.9 H	37.0	-26.1	QP	360	3.0	QP (1.00s)		



Client:	Fitbit, Inc.		PR Number:	JD105947				
Madalı		T-l	og Number:	T106007				
Model:	FB409 and FB410	Proje	ect Manager:	Deepa Shett	/			
Contact:	Ricky Wang	Proje	ect Engineer:	-				
	RICKY Wally Project Eligiteet							
Standard: Run #2: Ma	EN 55032, AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438 Iximized Readings From Run #1		Class:	В				
Standard: Run #2: Ma	EN 55032, AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438 Iximized Readings From Run #1	na(s)	Class:	B				
Standard: Run #2: Ma	EN 55032, AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438 Aximized Readings From Run #1           Test Parameters for Maximized Reading           Frequency Range         Test Distance         Limit D	ng(s) Vistance	Class:	B ion Factor				
Standard: Run #2: Ma	EN 55032, AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438 aximized Readings From Run #1           Test Parameters for Maximized Reading           Test Parameters for Maximized Reading           Frequency Range         Test Distance         Limit D           (MHz)         (meters)         (meters)         (meters)         (meters)         (meters)	ng(s) Distance ters)	Class: Extrapolat (dB, applie	B ion Factor id to data)				

Frequency	Level	Pol	Clas	ss B	Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
30.528	18.0	Н	30.0	-12.0	QP	256	4.0	QP (1.00s)
910.030	23.1	Н	37.0	-13.9	QP	304	2.5	QP (1.00s)
126.564	14.3	Н	30.0	-15.7	QP	191	1.5	QP (1.00s)
48.994	12.8	V	30.0	-17.2	QP	24	1.0	QP (1.00s)
265.652	12.2	Н	37.0	-24.8	QP	353	3.0	QP (1.00s)
255.921	10.9	Н	37.0	-26.1	QP	360	3.0	QP (1.00s)

🎲 NTS				EMC Test Data		
Client: Fitbit, Inc.				PR Number: JD105947		
	D 440		T-	Log Number: T106007		
MODEI: FRADA SUR E	B410		Proj	ect Manager: Deepa Shetty		
Contact: Ricky Wang			Proje	ect Engineer: -		
Standard: EN 55032, A	S/NZ CISPR 22, VCCI-CISPR 32,	KN32, CNS 13438		Class: B		
	Radia (NTS Silicon Valley, Frem	ated Emissions nont Facility, Semi-Ane	choic Cham	ber)		
Test Specific Details Objective:	<b>S</b> The objective of this test session is specification listed above.	to perform final qualifica	tion testing of	f the EUT with respect to the		
Date of Test: Test Engineer:	4/12/2018 Rafael Varelas	Config. Used Config Change	: 1 : None			
Test Location:	FT Chamber #3	EUT Voltage: 110V/60Hz				
General Test Config The EUT and any local equipment was located metal conduit and when Radiated emissions tes methods of ANSI C63.4 The test distance and e Note, preliminary testin antenna. Maximized te antenna, and manipula	Juration support equipment were located or outside the semi-anechoic chambe n possible passed through a ferrite of ts above 1 GHz to FCC Part 15 were and CISPR 16-1-4. Extrapolation factor (if applicable) and g indicates that the emissions were esting indicated that the emissions were tion of the EUT's interface cables.	n the turntable for radiate er. Any cables running to clamp upon exiting the cl re performed <u>with</u> floor a e detailed under each ru maximized by orientatio vere maximized by orient	ed emissions o remote supp hamber. bsorbers in p n description n of the EUT tation of the E	testing. Any remote support port equipment were routed through place in accordance with the test and elevation of the measurement EUT, elevation of the measurement		
Ambient Conditions	Temperature: Rel. Humidity:	22.4 °C 38 %				
Summary of Results	3					
Run #	Test Performed	Limit	Result	Margin		
1	Radiated Emissions 30 - 1000 MHz, Preliminary	Class B	Eval	Refer to individual runs		
2	Radiated Emissions 30 - 1000 MHz, Maximized	Class B	Pass	18.2 dBµV/m @ 30.56 MHz (-11.8 dB)		



Client:	Fitbit, Inc.	PR Number:	JD105947
Model:	EP400 and EP410	T-Log Number:	T106007
		Project Manager:	JD105947 T106007 Deepa Shetty - B
Contact:	Ricky Wang	Project Engineer:	-
Standard:	EN 55032, AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438	Class:	В

#### 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: B2-SAT2-279A-C43 (BLE+NFC) Driver: 1.5.9615 Antenna: internal





Client:	Fitbit, Inc.							PR Number:	JD105947
							T-	Log Number:	T106007
Model:	FB409 and FB410						Proje	ect Manager:	Deepa Shetty
Contact	Ricky Wang						Proi	oct Engineer	-
Chanderd, EN EE022 AC/NZ CISED 22, VCCL CISED 22, KN22, CNS 12420					TOJ		P		
Stanualu, EN 35032, ASINZ CISER 22, VCCI-CISER 52, KN52, CNS 15450							Uldss.	D	
D									
Preliminary	peak readir	ngs captur		re-scan	Dotootor	Azimuth	Lloight	Commonto	
Frequency	dD\//m	P01	Limit	13438 Margin		AZIIIIUIII	meters	Comments	
	αβμν/m	V/I1	20.0	waryin 4 2	PK/QP/Avy Dook	aegrees			
30.000	23.7 14 E	V	30.0	-0.3 12 F	Peak	320	2.0 1 E		
47.427	10.0	V	30.0	-13.5	Peak	<u> </u>	1.0		
102.834	17.2	V	30.0	-12.0 10.1	Peak	01	1.0		
190.420	17.9	V	30.0	- I Z. I	Peak	33 170	1.5		
197.745	17.0	V	30.0	-12.4	Peak	1/8	1.5		
831.820	27.6	Н	37.0	-9.4	Реак	342	1.0		
Droliminory		roodingo	(no moninul	ation of FU	T interface a	ablac)			
Frequency	quasi-peak	Del		12420	Detector	ables)	Lloight	Commonto	
		P01	Limit	13438 Margin		AZIIIIUIII	meterc	Comments	
IVIFIZ	OBUA/W	V/f1		147	PK/QP/AVy	aegrees	1.0	OD(1.00c)	
031.02U 20.550	22.3 10.0	H V	37.0	-14./		340	1.0	QP(1.005)	
30.000	18.2	V	30.0	-11.0		323	2.0 1 E	QP(1.005)	
47.4Z7	0.9	V	30.0	-21.1		220	1.0	QP(1.005)	
197.745	14.0	V	30.0	-10.0		1/0	1.0	QP(1.005)	
102.034	12.4	V	20.0	-17.0		00	1.0	QP(1.005)	
190.420	10.7	V	30.0	-13.3	QP	31	1.5	QP (1.005)	



Client:	Fitbit, Inc.							PR Number:	JD105947
Madal	ED400 and I	-0410					T-	Log Number:	T106007
wodel:	FB409 and I	-B410					Proj	ect Manager:	Deepa Shetty
Contact:	Ricky Wang						Proj	ect Engineer:	-
Standard:	EN 55032, AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438							Class:	В
Run #2: Ma	aximized Rea	adings Fro	om Run #1	st Paramete	ers for Maxim	nized Readir	nn(s)		
	Fre	quency Ra	nae	Test D	Distance	Limit D	istance	Extrapolat	ion Factor
	(MHz) (meters)					(met	ters)	(dB, applie	ed to data)
		30 - 1000		1	10	10 (			.0
Maximized	quasi-peak	readings (	includes ma	anipulation	of EUT interf	ace cables)			
Frequency	Level	Pol	CNS	13438	Detector	Azimuth	Height	Comments	
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
30.558	18.2	V	30.0	-11.8	QP	323	2.5	QP (1.00s)	
190.420	16.7	V	30.0	-13.3	QP	31	1.5	QP (1.00s)	
001 000	22.3	Н	37.0	-14.7	QP	340	1.0	QP (1.00s)	
831.820	110	V	30.0	-16.0	QP	176	1.5	QP (1.00s)	
831.820 197.745	14.0	-				(0	1.0	OD(1.00c)	
831.820 197.745 102.834	14.0	V	30.0	-17.6	QP	60	1.0	QP(1.005)	

🎲 NTS				EMC Test	Data
Client: Fitbit, Inc.				PR Number: JD105947	
			T-L	Log Number: T106007	
Model: FB409 and i	-B410		Proje	ect Manager: Deepa Shetty	!
Contact: Ricky Wang			Proje	ect Engineer: -	
Standard: EN 55032, A	AS/NZ CISPR 22, VCCI-CISPR 32,	KN32, CNS 13438		Class: B	
	Radia (NTS Silicon Valley, Fren	ated Emissions nont Facility, Semi-Anec	choic Chamt	ber)	
Test Specific Detail Objective:	S The objective of this test session is specification listed above.	to perform final qualificati	ion testing of	the EUT with respect to the	е
Date of Test: Test Engineer: Test Location:	4/12/2018 Rafael Varelas FT Chamber #3	Config. Used: Config Change: EUT Voltage:	1 None 220V/60Hz		
General Test Config The EUT and any loca equipment was located metal conduit and whe Radiated emissions test methods of ANSI C63. The test distance and of Note, preliminary testir antenna. Maximized to antenna, and manipula	<b>guration</b> I support equipment were located of d outside the semi-anechoic chamber in possible passed through a ferrite sts above 1 GHz to FCC Part 15 were 4 and CISPR 16-1-4. extrapolation factor (if applicable) and ing indicates that the emissions were esting indicated that the emissions were ation of the EUT's interface cables.	n the turntable for radiated er. Any cables running to clamp upon exiting the ch ere performed <u>with</u> floor ab re detailed under each rur e maximized by orientatior were maximized by orientat	d emissions t remote supp namber. osorbers in pl n description. n of the EUT ation of the E	testing. Any remote suppor port equipment were routed lace in accordance with the and elevation of the measu	t through test irement irement
Ambient Conditions	S: Temperature: Rel. Humidity:	22.4 °C 38 %			
Summary of Result	S				
Run #	Test Performed	Limit	Result	Margin	
1	Radiated Emissions 30 - 1000 MHz, Preliminary	Class B	Eval	Refer to individual r	uns
2	Radiated Emissions	Class B	Pass	17.5 dBµV/m @ 31.29 (-12.5 dB)	9 MHz



Client:	Fitbit, Inc.	PR Number:	JD105947
Model:	EP400 and EP410	T-Log Number:	T106007
		Project Manager:	JD105947 T106007 Deepa Shetty - B
Contact:	Ricky Wang	Project Engineer:	-
Standard:	EN 55032, AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438	Class:	В

#### 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: B2-B-289 Driver: 1.5.9615 Antenna: Internal



	NTS					
Client:	Fitbit, Inc.					
Model:	FB409 and I	-B410				
Contact:	Ricky Wang					
Standard:	EN 55032. A	S/NZ CISF	PR 22. VCC	-CISPR 32.	KN32, CNS 1	3438
Preliminary	peak readir	ngs captur	ed during p	re-scan		
Frequency	Level	Pol	Clas	ss B	Detector	Azimuth
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees
31.286	24.1	V	30.0	-5.9	Peak	133
49.397	18.9	V	30.0	-11.1	Peak	17
76.126	14.8	V	30.0	-15.2	Peak	349
126.560	19.3	Н	30.0	-10.7	Peak	0
176.490	17.6	V	30.0	-12.4	Peak	153
198.554	19.3	V	30.0	-10.7	Peak	347
744.745	28.8	Н	37.0	-8.2	Peak	53
684.492	27.3	Н	37.0	-9.7	Peak	53
Preliminary	v quasi-peak	readings	(no manipul	ation of EU	T interface c	ables)
Frequency	Level	Pol	Clas	ss B	Detector	Azimuth
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees
126.560	15.0	Н	30.0	-15.0	QP	0
49.397	8.3	V	30.0	-21.7	QP	18
744.745	20.8	Н	37.0	-16.2	QP	55
684.492	20.0	Н	37.0	-17.0	QP	52
31.286	17.5	V	30.0	-12.5	QP	135
176.490	14.1	V	30.0	-15.9	QP	154
198.554	13.1	V	30.0	-16.9	QP	348
76.126	8.7	V	30.0	-21.3	QP	348

PR Number: JD105947 T-Log Number: T106007 Project Manager: Deepa Shetty

Class: B

Project Engineer:

Comments

Comments

QP (1.00s)

QP (1.00s) QP (1.00s)

QP (1.00s)

QP (1.00s) QP (1.00s)

QP (1.00s)

QP (1.00s)

Height

meters

1.0

4.0

3.5 1.0

1.5

1.5

3.0

3.0

Height

meters

1.2

1.0

3.0

3.0

1.0

1.5

1.5

3.5



Client:	Fitbit, Inc.	PR Number:	JD105947
Madal		T-Log Number:	T106007
wodel:	FB409 and FB410	Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Engineer:	-
Standard:	EN 55032, AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438	Class:	В
Run #2: Ma	aximized Readings From Run #1 Test Parameters for Maximized Readir	na(s)	

Test Parameters for Maximized Reading(s)								
Frequency Range	Test Distance	Limit Distance	Extrapolation Factor					
(MHz)	(meters)	(meters)	(dB, applied to data)					
30 - 1000	10	10	0.0					

#### Maximized quasi-peak readings (includes manipulation of EUT interface cables)

Frequency	Level	Pol	Clas	ss B	Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
31.286	17.5	V	30.0	-12.5	QP	135	1.0	QP (1.00s)
126.560	15.0	Н	30.0	-15.0	QP	0	1.2	QP (1.00s)
176.490	14.1	V	30.0	-15.9	QP	154	1.5	QP (1.00s)
744.745	20.8	Н	37.0	-16.2	QP	55	3.0	QP (1.00s)
198.554	13.1	V	30.0	-16.9	QP	348	1.5	QP (1.00s)
684.492	20.0	Н	37.0	-17.0	QP	52	3.0	QP (1.00s)

🎲 NTS				EMC Test Data
Client: Fitbit, Inc.				PR Number: JD105947
Madal ED400 and E			T-l	_og Number: T106007
	B410		Proje	ect Manager: Deepa Shetty
Contact: Ricky Wang			Proje	ect Engineer: -
Standard: EN 55032, A	S/NZ CISPR 22, VCCI-CISPR 32, I	KN32, CNS 13438		Class: B
	Radia (NTS Silicon Valley, Frem	ated Emissions nont Facility, Semi-Ane	choic Chaml	ber)
Test Specific Details Objective:	<b>S</b> The objective of this test session is specification listed above.	to perform final qualificat	tion testing of	the EUT with respect to the
Date of Test: 4 Test Engineer: F Test Location: F	4/12/2018 Rafael Varelas FT Chamber #3	Config. Used: Config Change: EUT Voltage	: 1 : None : 110V/60Hz	
General Test Config The EUT and any local equipment was located metal conduit and wher Radiated emissions tes methods of ANSI C63.4 The test distance and e Note, preliminary testing antenna. Maximized te antenna, and manipulat	uration support equipment were located on outside the semi-anechoic chambe possible passed through a ferrite of ts above 1 GHz to FCC Part 15 were and CISPR 16-1-4. extrapolation factor (if applicable) ar- g indicates that the emissions were esting indicated that the emissions v tion of the EUT's interface cables.	<ul> <li>the turntable for radiate</li> <li>r. Any cables running to clamp upon exiting the ch re performed with floor al</li> <li>e detailed under each run maximized by orientatio</li> <li>vere maximized by orient</li> </ul>	d emissions t ) remote supp namber. bsorbers in pl n description. n of the EUT tation of the E	esting. Any remote support bort equipment were routed through lace in accordance with the test and elevation of the measurement CUT, elevation of the measurement
Ambient Conditions	: Temperature: Rel. Humidity:	22.4 °C 38 %		
Summary of Results	š			
Run #	Test Performed	Limit	Result	Margin
1	Radiated Emissions 30 - 1000 MHz, Preliminary	Class B	Eval	Refer to individual runs
2	Radiated Emissions	Class B	Pass	1/.6 dBµV/m @ 30.68 MHz (-12 4 dB)



Client:	Fitbit, Inc.	PR Number:	JD105947
Model:	EP400 and EP410	T-Log Number:	T106007
		Project Manager:	JD105947 T106007 Deepa Shetty - B
Contact:	Ricky Wang	Project Engineer:	-
Standard:	EN 55032, AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438	Class:	В

#### 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: B2-B-289 Driver: 1.5.9615 Antenna: Internal





Client:	Fitbit, Inc.							PR Number:	JD105947
									T106007
Model:	FB409 and FB410							ect Manager:	Deepa Shetty
Contact	Ricky Wang	icky Mang							-
Standard:									R
Statiuaru.	EN 33032, P		rzz, vcc	I-CIJER JZ,	KNJZ, GNJ I	3430		01855.	D
Droliminary	nook roodir	ac contur	od during n	ro coop					
Frequency		Dol		12/28	Detector	Λzimuth	Hoight	Comments	
MHz	dBuV/m	v/h	Limit	Margin	Pk/OP/Avg	dearees	meters	Comments	
30.675	22.9	V	30.0	-7.1	Peak	286	4 0		
46 934	15.1	V	30.0	-14.9	Peak	313	2.5		
131.062	19.1	V	30.0	-10.9	Peak	276	4.0		
190.632	18.3	V	30.0	-11.7	Peak	272	1.5		
200.246	17.5	H	30.0	-12.5	Peak	290	2.0		
416.702	23.4	Н	37.0	-13.6	Peak	263	3.5		
Preliminary	quasi-peak	readings	(no manipul	lation of EU	T interface c	ables)			
Frequency	Level	Pol	CNS	13438	Detector	Azimuth	Height	Comments	
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
46.934	7.5	V	30.0	-22.5	QP	311	2.5	QP (1.00s)	
200.246	11.5	Н	30.0	-18.5	QP	288	2.0	QP (1.00s)	
30.675	17.6	V	30.0	-12.4	QP	285	4.0	QP (1.00s)	
131.062	12.4	V	30.0	-17.6	QP	275	4.0	QP (1.00s)	
190.632	11.2	V	30.0	-18.8	QP	271	1.5	QP (1.00s)	
416.702	15.6	Н	37.0	-21.4	QP	262	3.5	QP (1.00s)	



Cliont									
Client.	Fitbit, Inc.				PR Number:		JD105947		
Model		-0410			T-	Log Number:	T106007		
Model:	FB409 and F	-B410			Proj	ect Manager:	Deepa Shetty		
Contact:	Ricky Wang	ect Engineer:	-						
Standard <sup>.</sup>	EN 55032 A	S/NZ CISI	PR 22 VCC	I-CISPR 32	KN32 CNS 1	3438		Class <sup>.</sup>	B
			·						
Run #2: Ma	aximized Rea	adings Fro	om Run #1						
			Te	st Paramete	ers for Maxim	nized Readir	ng(s)		
	Free	quency Ra	nge	Test D	istance	Limit D	istance	Extrapolat	ion Factor
		(MHz)		(me	ters)	(met	ters)	(dB, appli€	ed to data)
	30 - 1000			10		10		0	0
		30 - 1000		1	0	I	0	0	.0
<b>Maximized</b>	quasi-peak i	<u>30 - 1000</u> readings ( Pol	includes ma	nipulation	of EUT interf	ace cables)	Height	Comments	.0
Maximized Frequency MHz	quasi-peak Level dBuV/m	30 - 1000 readings ( Pol v/h	includes ma CNS	nipulation of 13438 Margin	of EUT interf	ace cables) Azimuth degrees	Height	Comments	.0
Maximized Frequency MHz 30.675	quasi-peak Level dBµV/m 17.6	30 - 1000 readings ( Pol v/h V	includes ma CNS Limit 30.0	nipulation of 13438 Margin -12.4	of EUT interf Detector Pk/QP/Avg OP	ace cables) Azimuth degrees 285	Height meters 4.0	Comments OP (1.00s)	
Maximized Frequency MHz 30.675 131.062	quasi-peak Level dBμV/m 17.6 12.4	30 - 1000 readings ( Pol v/h V V	includes ma CNS Limit 30.0 30.0	nipulation ( 13438 Margin - <b>12.4</b> -17.6	of EUT interf Detector Pk/QP/Avg QP QP	ace cables) Azimuth degrees 285 275	Height meters 4.0 4.0	Comments QP (1.00s) QP (1.00s)	
Maximized Frequency MHz 30.675 131.062 200.246	quasi-peak Level dBμV/m 17.6 12.4 11.5	30 - 1000 readings ( Pol v/h V V V H	includes ma CNS Limit 30.0 30.0 30.0	nipulation ( 13438 Margin - <b>12.4</b> -17.6 -18.5	of EUT interf Detector Pk/QP/Avg QP QP QP	ace cables) Azimuth degrees 285 275 288	Height meters 4.0 4.0 2.0	Comments QP (1.00s) QP (1.00s) QP (1.00s)	
<b>Aaximized</b> Frequency MHz <b>30.675</b> 131.062 200.246 190.632	<b>quasi-peak</b> Level dBμV/m <b>17.6</b> 12.4 11.5 11.2	30 - 1000 readings ( Pol v/h V V V H V	includes ma CNS <sup>-</sup> Limit 30.0 30.0 30.0 30.0 30.0	nipulation ( 13438 Margin -12.4 -17.6 -18.5 -18.8	of EUT interf Detector Pk/QP/Avg QP QP QP QP	ace cables) Azimuth degrees 285 275 288 271	Height meters 4.0 4.0 2.0 1.5	Comments QP (1.00s) QP (1.00s) QP (1.00s) QP (1.00s)	
Maximized Frequency MHz 30.675 131.062 200.246 190.632 416.702	<b>quasi-peak</b> Level dBμV/m <b>17.6</b> 12.4 11.5 11.2 15.6	30 - 1000 readings ( Pol V/h V V V H V H	includes ma CNS Limit 30.0 30.0 30.0 30.0 37.0	nipulation ( 13438 Margin -12.4 -17.6 -18.5 -18.8 -21.4	of EUT interf Detector Pk/QP/Avg QP QP QP QP QP QP	ace cables) Azimuth degrees 285 275 288 271 262	Height meters 4.0 4.0 2.0 1.5 3.5	Comments QP (1.00s) QP (1.00s) QP (1.00s) QP (1.00s) QP (1.00s)	

4.6				EMC Test Data
Client: Fitbit, Inc.				PR Number: JD105947
Model: FB409 and F	R410		T-	Log Number: T106007
			Proje	ect Manager: Deepa Shetty
Contact: Ricky Wang			Proje	ect Engineer: -
Standard: EN 55032, AS	S/NZ CISPR 22, VCCI-CISPR 3	2, KN32, CNS 13438		Class: B
	Rac (NTS Silicon Valley, Fr	liated Emissions emont Facility, Semi-Anec	hoic Cham	ber)
Test Specific Details	6			
Objective: 1	The objective of this test session specification listed above.	is to perform final qualificati	on testing of	f the EUT with respect to the
Date of Test: 7	//24/2018	Config. Used:	1	
Test Engineer: N	A. Birgani	Config Change:	NFC Mode	
Test Location: H	-remont Chamber #7	EUT Voltage:	220V/60Hz	
The test distance and e	xtrapolation factor (if applicable)	are detailed under each run	decorintion	
Note, preliminary testing antenna. Maximized tes antenna, and manipulat	g indicates that the emissions we sting indicated that the emissions ion of the EUT's interface cables	s were maximized by orientation	of the EUT ation of the E	and elevation of the measurement EUT, elevation of the measurement
Note, preliminary testing antenna. Maximized tes antenna, and manipulat Ambient Conditions	g indicates that the emissions we sting indicated that the emissions ion of the EUT's interface cables : Temperatur	e: 23-25 °C	a of the EUT ation of the E	and elevation of the measurement EUT, elevation of the measurement
Note, preliminary testing antenna. Maximized tes antenna, and manipulat Ambient Conditions	g indicates that the emissions we sting indicated that the emissions ion of the EUT's interface cables : Temperatur Rel. Humidit	e: 23-25 °C y: 35-38 %	ation of the EUT	and elevation of the measurement EUT, elevation of the measurement
Note, preliminary testing antenna. Maximized tes antenna, and manipulat Ambient Conditions Summary of Results	g indicates that the emissions we sting indicated that the emissions ion of the EUT's interface cables : Temperatur Rel. Humidit	e: 23-25 °C y: 35-38 %	ation of the EUT	and elevation of the measurement EUT, elevation of the measurement
Note, preliminary testing antenna. Maximized tes antenna, and manipulat Ambient Conditions Summary of Results Run #	g indicates that the emissions we sting indicated that the emissions ion of the EUT's interface cables : Temperatur Rel. Humidit Test Performed	e: 23-25 °C y: 35-38 %	Result	Margin
Note, preliminary testing antenna. Maximized test antenna, and manipulat Ambient Conditions Summary of Results Run #	g indicates that the emissions we sting indicated that the emissions ion of the EUT's interface cables : Temperatur Rel. Humidit Test Performed Radiated Emissions	e: 23-25 °C y: 35-38 % Limit EN 55022/32 Class B	Result Pass	and elevation of the measurement EUT, elevation of the measurement Margin 28.3 dBμV/m @ 3152.0 MHz (Margin: -21.7 dB)
Note, preliminary testing antenna. Maximized test antenna, and manipulat Ambient Conditions Summary of Results Run #	g indicates that the emissions we sting indicated that the emissions ion of the EUT's interface cables Temperatur Rel. Humidit Test Performed Radiated Emissions 1 - 6 GHz Maximized	re maximized by orientation s were maximized by orientation e: 23-25 °C y: 35-38 % Limit EN 55022/32 Class B FCC Class B	Result Pass Pass	Margin 28.3 dBµV/m @ 3152.0 MHz (Margin: -21.7 dB) 32.0 dBµV/m @ 5432.6 MHz (Margin: -22.0 dB)
Note, preliminary testing antenna. Maximized test antenna, and manipulat Ambient Conditions Summary of Results Run # 1 1	g indicates that the emissions we sting indicated that the emissions ion of the EUT's interface cables : Temperatur Rel. Humidit Test Performed Radiated Emissions 1 - 6 GHz Maximized Radiated Emissions 6 - 25 GHz Maximized	e: 23-25 °C y: 35-38 % Limit EN 55022/32 Class B FCC Class B FCC Class B	Result Pass Pass Pass	Margin 28.3 dBµV/m @ 3152.0 MHz (Margin: -21.7 dB) 32.0 dBµV/m @ 5432.6 MHz (Margin: -22.0 dB) All emissions were within the noise floor.
Note, preliminary testing antenna. Maximized test antenna, and manipulat Ambient Conditions Summary of Results Run # 1 2 Modifications Made No modifications were r	g indicates that the emissions we sting indicated that the emissions ion of the EUT's interface cables : Temperatur Rel. Humidit Composition Radiated Emissions 1 - 6 GHz Maximized Radiated Emissions 6 - 25 GHz Maximized During Testing nade to the EUT during testing	re maximized by orientation s were maximized by orientation e: 23-25 °C y: 35-38 % Limit EN 55022/32 Class B FCC Class B FCC Class B	Result Pass Pass Pass	And elevation of the measurement EUT, elevation of the measurement EUT, elevation of the measurement 28.3 dBµV/m @ 3152.0 MHz (Margin: -21.7 dB) 32.0 dBµV/m @ 5432.6 MHz (Margin: -22.0 dB) All emissions were within the noise floor.
Note, preliminary testing antenna. Maximized test antenna, and manipulat Ambient Conditions Summary of Results Run # 1 2 Modifications Made No modifications were r	g indicates that the emissions we sting indicated that the emissions ion of the EUT's interface cables : Temperatur Rel. Humidit Composition Radiated Emissions 1 - 6 GHz Maximized Radiated Emissions 6 - 25 GHz Maximized During Testing nade to the EUT during testing e Standard	re maximized by orientation s were maximized by orientation e: 23-25 °C y: 35-38 % Limit EN 55022/32 Class B FCC Class B FCC Class B	Result Pass Pass Pass	And elevation of the measurement EUT, elevation of the measurement Margin 28.3 dBµV/m @ 3152.0 MHz (Margin: -21.7 dB) 32.0 dBµV/m @ 5432.6 MHz (Margin: -22.0 dB) All emissions were within the noise floor.
Note, preliminary testing antenna. Maximized test antenna, and manipulat Ambient Conditions Summary of Results Run # 1 2 Modifications Made No modifications were r Deviations From The No deviations were made	g indicates that the emissions we sting indicated that the emissions ion of the EUT's interface cables : Temperatur Rel. Humidit : Test Performed Radiated Emissions 1 - 6 GHz Maximized Radiated Emissions 6 - 25 GHz Maximized During Testing nade to the EUT during testing e Standard de from the requirements of the s	re maximized by orientation s were maximized by orientation e: 23-25 °C y: 35-38 % Limit EN 55022/32 Class B FCC Class B FCC Class B	Result Pass Pass Pass	And elevation of the measurement EUT, elevation of the measurement EUT, elevation of the measurement 28.3 dBµV/m @ 3152.0 MHz (Margin: -21.7 dB) 32.0 dBµV/m @ 5432.6 MHz (Margin: -22.0 dB) All emissions were within the noise floor.



	NTS							EMC Test Data
Client:	Fitbit, Inc.							PR Number: JD105947
	ED 400 11					T-	Log Number: T106007	
Model:	FB409 and I	-B410				Proj	ect Manager: Deepa Shetty	
Contact:	Ricky Wang					Proi	ect Engineer: -	
Standard <sup>.</sup>	EN 55032.	AS/NZ CIS	PR 22. VCC	I-CISPR 32	3438		Class: B	
Run #1: Ma Prelimina EN 550	aximized Rea ary peak read 022/32 limit u:	adings, 10 dings cap <i>sed for pre</i>	000 - 6000 M tured during 2- <i>scan (i.e. w</i>	Hz. NFC sa y pre-scan (j orst case of l	mple, Tx mo beak reading EN 55022/32	de, set to hi is vs. averac <i>and FCC)</i>	gh channel ge limit)	Commonts
		P01	EN 33022/	32 Class B		AZIIIIUUI	meterc	Comments
IVIHZ	αβμν/m 20.0		LIIIIII 54.0	15.1	PK/QP/Avy Dook	aegrees	2 5	
5226 160	30.9 30.6	⊓ V	54.0	-13.1 15.4	Peak	323	2.0	
3620.100	36.0	V	54.0	-10.4 17.0	Peak	500	1.0	
2876 760	30.Z 25.1	V	54.0	-17.0	Peak	251	1.0	
2070.700	30.1	V	54.0	-10.9	Peak	00	1.9	
101/ 170	22 /	 Ц	54.0	-17.0	Poak	90 17/	1.0	Doak roading with avorage limit
Final pea All final	k and avera	ge reading <i>llected at 3</i>	gs (vs. EN 5 <i>meters test</i>	5022/32 limi <i>distance, uni</i> 132 Class B	ts) <i>less otherwise</i>	e <i>noted</i> Azimuth	Height	Comments
MHz	dBu\//m	v/h	LIN JJUZZ	Margin	$Pk/OP/\Delta_{V/R}$	dearees	meters	Comments
3151 980	28 3	H	50.0	-21 7	AVG	90 90	10	RB 1 MHz·VB 10 Hz·Peak
5432 600	32.0	Н	54.0	-21.7	AVG	323	2.5	RB 1 MHz:VB 10 Hz:Peak
5227 330	31.9	V	54.0	-22.0	AVG	350	1.6	RB 1 MHz·VB 10 Hz·Peak
3629,820	29.5	V	54.0	-24.5	AVG	66	1.0	RB 1 MHz:VB 10 Hz:Peak
2876.872	25.4	H	50.0	-24.6	AVG	174	1.6	RB 1 MHz;VB 10 Hz;Peak
3151.570	40.3	H	70.0	-29.7	PK	90	1.0	RB 1 MHz;VB 3 MHz;Peak
5432.630	44.2	Н	74.0	-29.8	PK	323	2.5	RB 1 MHz;VB 3 MHz;Peak
5226.650	43.2	V	74.0	-30.8	PK	350	1.6	RB 1 MHz;VB 3 MHz;Peak
2876.211	38.0	Н	70.0	-32.0	PK	174	1.6	RB 1 MHz;VB 3 MHz;Peak
3629.470	41.9	V	74.0	-32.1	PK	66	1.0	RB 1 MHz;VB 3 MHz;Peak
Final pea	k and avera	ge reading	gs (vs. FCC	limits)				
Frequency	Level	Pol	FCC (	Class B	Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5432.600	32.0	H	54.0	-22.0	AVG	323	2.5	RB 1 MHz;VB 10 Hz;Peak
5227.330	31.9	V	54.0	-22.1	AVG	350	1.6	RB 1 MHz;VB 10 Hz;Peak
3629.820	29.5	V	54.0	-24.5	AVG	66	1.0	RB 1 MHz;VB 10 Hz;Peak
3151.980	28.3	Н	54.0	-25.7	AVG	90	1.0	RB 1 MHz;VB 10 Hz;Peak
1814.550	25.4	H	54.0	-28.6	AVG	174	1.6	RB 1 MHz;VB 10 Hz;Peak
5432.630	44.2	H	74.0	-29.8	PK	323	2.5	RB 1 MHz;VB 3 MHz;Peak
5226.650	43.2	V	/4.0	-30.8	PK	350	1.6	RB 1 MHz;VB 3 MHz;Peak
3629.470	41.9	V	/4.0	-32.1	PK	66	1.0	RB 1 MHz;VB 3 MHz;Peak
	40.3	Н	/4.0	-33.7	PK	90	1.0	IRB 1 MHz:VB 3 MHz:Peak
3151.570	00.0		- 4 -	o / -	517	~ <b>-</b> ·		



	NTS							EMC Test Data
Client:	Fitbit, Inc.							PR Number: JD105947
Model.	FB/09 and	FB/10				T-Log Number: T106007		
wouer.	1 0407 and	1 0410				Proje	ect Manager: Deepa Shetty	
Contact:	act: Ricky Wang							ect Engineer: -
Standard:	EN 55032, <i>I</i>	AS/NZ CISI	PR 22, VCC	I-CISPR 32,	KN32, CNS 1	3438		Class: B
	75.0							
	/0.0-							
E C	50.0-							
Ang	50.0-							
de (d								
) iti	40.0-							
Amp	30.0-							
					يەرب×ۇر.			when in mu
Drolimina	15.0 -', , , , , , , , , , , , , , , , , , ,	1900	turod during	0000	21000 Frequence	22000 cy (MHz)	2300	0 24000 25000
Frequency	Level	Pol	FCC C	Class B	Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
All emissi	on were with	ing the nois	se floor.					
Final pea	k and avera	ide reading	as (vs. FCC	limits)				
Frequency	Level	Pol	FCC C	Class B	Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
All emissi	on were with	ing the nois	se floor.					
Note 1:	For FCC tes emission ab	sting above bove 1 GHz	e 1 GHz, the l	imit is based eed the aver	l on an avera age limit by n	ge measurer hore than 20	nent. In add dB.	lition, the peak reading of any

	NTS				EMC Test Data				
Client:	Fitbit, Inc.		PR Number: JD105947						
Madalı	ED400 and [	D/10	T-I	Log Number: T106007					
wouer.	FD409 dilu r	·D4 IU		Proj€	ect Manager: Deepa Shetty				
Contact:	Ricky Wang			Proje	ect Engineer: -				
Standard:	EN 55032, A	S/NZ CISPR 22, VCCI-CISPR 32,	KN32, CNS 13438		Class: B				
<b>T</b> 10		Radi (NTS Silicon Valley, Fren	ated Emissions nont Facility, Semi-Anec	hoic Chami	ber)				
Test Spec	Objective:	<b>S</b> The objective of this test session is specification listed above.	to perform final qualificati	ion testing of	f the EUT with respect to the				
⊑ Te T€	Date of Test: st Engineer: est Location:	7/23/2018 John Caizzi Fremont Chamber #7	Config. Used: Config Change: EUT Voltage:	1 none 220V/60Hz	& 110V / 60Hz				
The EUT Radiated methods of The test d Note, prel antenna, a	The EUT and any local support equipment were located on the turntable for radiated emissions testing. Radiated emissions tests above 1 GHz to FCC Part 15 were performed with floor absorbers in place in accordance with the test methods of ANSI C63.4 and CISPR 16-1-4. The test distance and extrapolation factor (if applicable) are detailed under each run description. Note, preliminary testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. Maximized testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.								
Ambient	Conditions	C: Temperature: Rel. Humidity:	26 °C 36 %						
Summary	of Result	S							
Ru	n #	Test Performed	Limit	Result	Margin				
3a (2	20V)		EN 55022/32 Class B	Pass	35.6 dBµV/m @ 2448.1 MHz (-14.4 dB)				
3b (2	20V)	Radiated Emissions 1 - 6 GHz Maximized	FCC Class B	Pass	35.6 dBµV/m @ 2448.1 MHz (-18.4 dB)				
4 (1	(110V)		CNS 13438	Pass	35.9 dBµV/m @ 2448.1 MHz (-14.1 dB)				
Ę	5	Radiated Emissions 6 - 25 GHz Maximized	FCC Class B	Pass	No emissions above measurement noise floor.				
Modificat No modifi Deviation No deviati	ions Made cations were s From Th ons were ma	During Testing made to the EUT during testing the Standard de from the requirements of the sta	andard.						



Client:         PR Number:         D105947           Model:         FB409 and FB410         T-Log Number:         T106007           Project Manager:         Deepa Shelty         Project Ingineer;         Standard:           Standard:         EN 55032, AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438         Class: B         Im #3: Maximized Readings, 1000 - 6000 MHz.         Non-NFC sample, Tx mode, set to high channel, 220V / 60Hz.           ngle pre-scan covering both EN 5502/32 and FCC Part 15 requirements         Imman height scan performed during pre-scan to satisfy FCC requirements           Test Parameters for Preliminary Scan(S)         Extrapolation Factor         Imit Distance         Extrapolation Factor           1000 - 6000         3         3         0.0         0.0           90.0         -         -         -         6000           90.0         -         -         -         6000           90.0         -         -         -         -         6000           90.0         -         -         -         -         6000         -           90.0         -         -         -         -         -         6000         -         6000         -         -         -         6000         -         -         6000         -	Client:										
Model:         FB409 and FB410         T-Log Number:         T106007           Project Manager:         Depa Shetty         Project Manager:         Depa Shetty           Standard:         EN 55032, AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438         Class:         B           an #3: Maximized Readings, 1000 - 6000 MHz. Non-NFC sample, Tx mode, set to high channel, 220V / 60Hz.         ngle pre-scan covering both EN 55022/32 and FCC Part 15 requirements           Itenna height scan performed during pre-scan to satisfy FCC requirements         Extrapolation Factor         Extrapolation Factor           (MHz)         (meters)         (meters)         (dB, applied to data)         0.0           1000 - 6000         3         3         0.0         0.0           90.0 - 000         3         3         0.0         0.0           100.0 - 000         3         3         0.0         0.0           90.0 - 000         3         3         0.0         0.0           90.0 - 000         -         -         -         -         -           90.0 - 000         -         -         -         -         -         -           90.0 - 000         -         -         -         -         -         -         -         -         -         -		: Fitbit, In	С.						PR Number:	JD105947	
Project Manager: Deepa Shelty           Contact:         Ricky Wang         Project Engineer: -           Standard:         EN 55032. AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438         Class: B           In #3:         Maximized Readings, 1000 - 6000 MHz.         Non-NFC sample, Tx mode, set to high channel, 220V / 60Hz.           ngle pre-scan covering both EN 55022/32 and FCC Part 15 requirements         tenna height scan performed during pre-scan to satisfy FCC requirements           Test Parameters for Preliminary Scan(s)         Extrapolation Factor           (MHz)         (Metry)         (dB, applied to data)           1000 - 6000         3         3         0.0           90.0         -         -         -         -           90.0         -         -         -         -         -           90.0         -         -         -         -         -         -           90.0         -         -         -         -         -         -         -           90.0         -	Madal	. ED400 ~	nd ED410					T-Log Number: T106007			
Contact:         Ricky Wang         Project Engineer:           Standard:         EN 55032, AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438         Class: B           In #3: Maximized Readings, 1000 - 6000 MHz. Non-NFC sample, Tx mode, set to high channel, 220V / 60Hz.         Ingle pre-scan covering both EN 55022/32 and FCC Part 15 requirements           Iteman height scan performed during pre-scan to satisfy FCC requirements         Itemation to satisfy FCC requirements           Iteman height scan performed during pre-scan to satisfy FCC requirements         Extrapolation Factor           (MHz)         Prescan Distance         Limit Distance           (MHz)         1000 - 6000         3         3           0.0         3         3         0.0           90.0	wodel:	. г б409 а	пи г 64 10					Proj	ect Manager:	Deepa Shet	ty
Standard:         EN 55032. AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438         Class:         B           un #3:         Maximized Readings, 1000 - 6000 MHz.         Non-NFC sample, Tx mode, set to high channel, 220V / 60Hz.           ngle pre-scan covering both EN 55022/32 and FCC Part 15 requirements         Test Parameters for Preliminary Scan(5)         Extrapolation Factor           Image:         Frequency Range         Prescan Distance         Limit Distance         Extrapolation Factor           (MHz)         (meters)         (meters)         (dB, applied to data)         0.0           1000 - 6000         3         3         0.0           90.0	Contact:	: Ricky W	ang			Proj	ect Engineer:	-			
un #3: Maximized Readings, 1000 - 6000 MHz. Non-NFC sample, Tx mode, set to high channel, 220V / 60Hz. ngle pre-scan covering both EN 55022/32 and FCC Part 15 requirements tenna height scan performed during pre-scan to satisfy FCC requirements $ 1000 - 6000 3 3 3 0.0 $ $ \frac{1000 - 6000 3 3 0.0 $ $ \frac{1000 - 6000 - 50.0 $ $ \frac{1000 - 6000 - 50.0 $ $ \frac{1000 - 60.0 $ $ \frac{10$	Standard:	: EN 5503	32, AS/NZ CI	SPR 22, VCC	3438		Class:	В			
Test Parameters for Preliminary Scan(s)           Frequency Range (MHz)         Prescan Distance (meters)         Limit Distance (dB, applied to data)           1000 - 6000         3         3         0.0           90.0         3         3         0.0           90.0         60.0         3         3         0.0           90.0         60.0         50.0         50.0         50.0         50.0           90.0         60.0         50.0         50.0         50.0         50.0           90.0         60.0         50.0         50.0         50.0         50.0           90.0         60.0         50.0         50.0         50.0         50.0           90.0         1000         Frequency (MHz)         50.0         50.0         50.0           90.0         1000         Frequency (MHz)         50.0         50.0         50.00           90.0         1000         Frequency (MHz)         50.00         50.00         50.00           90.0         80.0         1000         EN 55022/32 and FCC)         Frequency (MHz)         50.00           90.0         80.0         1000         A/4.4         Peak         242         1.5           80.000	ın #3: Ma ngle pre- ntenna he	laximized -scan cov eight sca	Readings, 1 vering both I n performed	1000 - 6000 M EN 55022/32 a I during pre-s	Hz. Non-NF and FCC Par scan to satis	C sample, T t 15 requirer fy FCC requ	x mode, set nents irements	to high cha	annel, 220V /	60Hz.	
Image: Presumption of the initial statuce (MHz)         Extrapolation Factor (dB, applied to data)           1000 - 6000         3         3         0.0           1000 - 6000         3         3         0.0           1000 - 6000         3         3         0.0           1000 - 6000         3         3         0.0           90.0 - (dB, applied to data)         0.0         0.0           80.0 - (dB, applied to data)         0.0         0.0           90.0 - (dB, applied to data)         0.0         0.0           60.0 - (dB, applied to data)         0.0         0.0           60.0 - (dB, applied to data)         0.0         0.0           90.0 - (dB, applied to data)         0.0			_	т	oct Darama	toro for Droli			_	_	T
Image of the scale of the			Fraguanay	lango	Droccon	Distance	Ininary Scar	lictanco	Extrapolat	ion Eactor	
Image: system         (indexts)				kange	Prescari (mo	DISIGNCE	LIMIL D	isiance	EXITAPOIAL	1011 Factor	
IOUD * 0000         J <thj< th="">         J         <thj< th="">         J         <thj< th=""> <thj< <="" td=""><td></td><td></td><td>1000 60</td><td>00</td><td>(IIIE</td><td>2</td><td>(iiie</td><td>2</td><td></td><td></td><td>ł</td></thj<></thj<></thj<></thj<>			1000 60	00	(IIIE	2	(iiie	2			ł
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			1000 - 00	00		5		5	0.	.0	1
eliminary peak readings captured during pre-scan (peak readings vs. average limit)         V 55022/32 limit used for pre-scan (i.e. worst case of EN 55022/32 and FCC)         requency       Level       Pol       EN 55022/32 Class B       Detector       Azimuth       Height       Comments         MHz       dBµV/m       v/h       Limit       Margin       Pk/QP/Avg       degrees       meters         483.330       94.4       H       50.0       44.4       Peak       242       1.5       BLE, measured in radio tests.         956.670       34.0       V       50.0       -16.0       Peak       208       2.0         483.330       94.4       H       50.0       -13.6       Peak       208       2.0         483.000       36.4       H       50.0       -13.6       Peak       238       1.5       1.5         590.000       36.4       V       50.0       -13.6       Peak       247       1.5       1.5         790.000       38.5       V       54.0       -15.5       Peak       311       1.5       1.5         795.000       39.9       H       54.0       -14.1       Peak       311       1.5       1.5	(m//m)	80.0 - 70.0 -									
requency         Level         Pol         EN 55022/32 Class B         Detector         Azimuth         Height         Comments           MHz         dBμV/m         v/h         Limit         Margin         Pk/QP/Avg         degrees         meters         meters           483.330         94.4         H         50.0         44.4         Peak         242         1.5         BLE, measured in radio tests.           956.670         34.0         V         50.0         -16.0         Peak         208         2.0         450.00           450.000         36.4         H         50.0         -13.6         Peak         238         1.5         590.00           590.000         36.4         V         50.0         -13.6         Peak         247         1.5           190.000         38.5         V         54.0         -15.5         Peak         110         1.5           795.000         39.9         H         54.0         -14.1         Peak         311         1.5           935.000         40.7         V         54.0         -13.3         Peak         212         2.0	Amplitude (	50.0 - 50.0 - 40.0 - 30.0, 20.0 - 1000	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	n, man da kana ya da	www.www.	Frequen	cy (MHz)	the to the second			6000
VIFIZ         QBµV/m         V/n         Limit         Margin         PK/QP/AVg         degrees         meters           483.330         94.4         H         50.0         44.4         Peak         242         1.5         BLE, measured in radio tests.           956.670         34.0         V         50.0         -16.0         Peak         208         2.0           450.000         36.4         H         50.0         -13.6         Peak         238         1.5           590.000         36.4         V         50.0         -13.6         Peak         247         1.5           190.000         38.5         V         54.0         -15.5         Peak         110         1.5           795.000         39.9         H         54.0         -14.1         Peak         311         1.5           935.000         40.7         V         54.0         -13.3         Peak         212         2.0	eliminary	50.0 - 50.0 - 40.0 - 30.0 - 20.0 - 1000 y peak re 32 limit us	adings captu	ured during p	pre-scan (pe	Frequen ak readings	cy (MHz) vs. average FCC)	اimit)	,~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		6000
440.5.330       74.4       Fit       50.0       44.4       Peak       242       1.5       BLE, measured in radio tests.         956.670       34.0       V       50.0       -16.0       Peak       208       2.0         450.000       36.4       H       50.0       -13.6       Peak       238       1.5         590.000       36.4       V       50.0       -13.6       Peak       247       1.5         190.000       38.5       V       54.0       -15.5       Peak       110       1.5         795.000       39.9       H       54.0       -14.1       Peak       311       1.5         935.000       40.7       V       54.0       -13.3       Peak       212       2.0	eliminary / 55022/3 equency	50.0 - 40.0 - 30.0 - 20.0 - 1000 y peak re 32 limit us Leve	adings captu	ured during p an (i.e. worst of EN 55022)	pre-scan (pe case of EN 5 (32 Class B	Frequen ak readings 5022/32 and Detector	cy (MHz) vs. average FCC) Azimuth	limit)	Comments		<b>6000</b>
33.070       34.0       V       30.0       -10.0       Peak       200       2.0         450.000       36.4       H       50.0       -13.6       Peak       238       1.5         590.000       36.4       V       50.0       -13.6       Peak       247       1.5         190.000       38.5       V       54.0       -15.5       Peak       110       1.5         795.000       39.9       H       54.0       -14.1       Peak       311       1.5         935.000       40.7       V       54.0       -13.3       Peak       212       2.0	eliminary <i>I 55022/3</i> equency MHz	50.0 - 50.0 - 40.0 - 30.0 - , 20.0 - , 1000 y peak re 32 limit us Leve dBµV/	adings capte ed for pre-sc Pol m v/h	ured during p an (i.e. worst of EN 55022/ Limit	pre-scan (pe case of EN 5 /32 Class B Margin	Frequen ak readings 5022/32 and Detector Pk/QP/Avg	cy (MHz) vs. average FCC) Azimuth degrees	limit) Height meters	Comments		6000
50.000       36.4       V       50.0       -13.6       Peak       247       1.5         190.000       38.5       V       54.0       -15.5       Peak       110       1.5         795.000       39.9       H       54.0       -14.1       Peak       311       1.5         935.000       40.7       V       54.0       -13.3       Peak       212       2.0	eliminary / 55022/3 equency MHz 483.330	50.0 - 40.0 - 30.0 - γ, 20.0 - γ, 1000 y peak re 32 limit us Leve dBμV/ 94.4 24.0	adings capte ed for pre-sc Pol m v/h	ured during p an (i.e. worst of EN 55022) Limit 50.0	pre-scan (pe case of EN 5 32 Class B Margin 44.4	Frequen ak readings 5022/32 and Detector Pk/QP/Avg Peak Poak	cy (MHz) vs. average FCC) Azimuth degrees 242 200	limit) Height meters 1.5	Comments	red in radio	6000
190.000         38.5         V         54.0         -15.5         Peak         110         1.5           795.000         39.9         H         54.0         -14.1         Peak         311         1.5           935.000         40.7         V         54.0         -13.3         Peak         212         2.0	eliminary / 55022/3 equency MHz 483.330 956.670 450.000	50.0 - 40.0 - 30.0 - γ, 20.0 - γ, 1000 y peak re 32 limit us Leve dBμV/ 94.4 34.0 26.4	adings captu ed for pre-sc Pol m v/h H	ured during p an (i.e. worst of EN 55022) Limit 50.0 50.0	ore-scan (pe case of EN 5 (32 Class B Margin 44.4 -16.0	Frequen ak readings 5022/32 and Detector Pk/QP/Avg Peak Peak Peak	cy (MHz) vs. average FCC) Azimuth degrees 242 208 239	limit) Height meters 1.5 2.0 1.5	Comments BLE, measu	red in radio	6000
775.000         39.9         H         54.0         -14.1         Peak         311         1.5           935.000         40.7         V         54.0         -13.3         Peak         212         2.0	eliminary / 55022/3 equency MHz 483.330 956.670 450.000 590.000	50.0 - 50.0 - 40.0 - 30.0 - 30.0 - 1000 y peak re 32 limit us Leve dBμV/ 94.4 34.0 36.4 26.4	adings captu ed for pre-sc Pol m v/h H V H	ured during p an (i.e. worst of EN 55022) Limit 50.0 50.0 50.0	ore-scan (pe case of EN 5 '32 Class B Margin 44.4 -16.0 -13.6 -13.6	Frequen ak readings 5022/32 and Detector Pk/QP/Avg Peak Peak Peak Peak	cy (MHz) vs. average FCC) Azimuth degrees 242 208 238 247	limit) Height meters 1.5 2.0 1.5 1.5	Comments BLE, measu	red in radio	6000
935.000 40.7 V 54.0 -13.3 Peak 212 2.0	eliminary / 55022/3 equency MHz 483.330 956.670 450.000 590.000	50.0 - 40.0 - 30.0 - 30.0 - 1000 y peak re 32 limit us Leve dBμV/ 94.4 34.0 36.4 36.4 28 5	adings capte ed for pre-sc Pol m v/h H V H	ured during p can (i.e. worst of EN 55022) Limit 50.0 50.0 50.0 50.0 50.0	pre-scan (pe case of EN 5 32 Class B Margin 44.4 -16.0 -13.6 -13.6 -15.5	Frequen ak readings 5022/32 and Detector Pk/QP/Avg Peak Peak Peak Peak Peak Peak	cy (MHz) vs. average FCC) Azimuth degrees 242 208 238 247 110	limit) Height meters 1.5 2.0 1.5 1.5 1.5 1.5	Comments BLE, measu	red in radio	6000
700.000 TO.7 V OT.0 TO.J I CAN 212 2.0	eliminary / 55022/3 equency MHz 483.330 956.670 450.000 590.000 190.000 795.000	50.0 - 40.0 - 30.0 - 30.0 - 20.0 - 1000 y peak re 32 limit us Leve dBμV/ 94.4 34.0 36.4 36.4 38.5 30.0 - 30.0 - 30.	adings capte ed for pre-sc Pol m v/h H V H V V	ured during p an (i.e. worst of EN 55022/ Limit 50.0 50.0 50.0 50.0 50.0 50.0 50.0 50.	pre-scan (pe case of EN 5 (32 Class B Margin 44.4 -16.0 -13.6 -13.6 -15.5 -14.1	Frequen ak readings 5022/32 and Detector Pk/QP/Avg Peak Peak Peak Peak Peak Peak Peak Peak	cy (MHz) vs. average FCC) Azimuth degrees 242 208 238 247 110 311	limit) Height meters 1.5 2.0 1.5 1.5 1.5 1.5 1.5 1.5	Comments BLE, measu	red in radio	6000
	eliminary <i>V 55022/3</i> equency MHz 483.330 956.670 450.000 590.000 190.000 795.000 935.000	50.0 - 40.0 - 30.0 - γ, 20.0 - γ, 1000 y peak re 32 limit us Leve dBμV/ 94.4 34.0 36.4 36.4 38.5 39.9 40.7	adings captured for pre-sc Pol M V/h H V V V V H	ured during p an (i.e. worst of EN 55022) Limit 50.0 50.0 50.0 50.0 50.0 50.0 50.0 50.	pre-scan (pe case of EN 5 (32 Class B Margin 44.4 -16.0 -13.6 -13.6 -15.5 -14.1 -13.3	Frequen ak readings 5022/32 and Detector Pk/QP/Avg Peak Peak Peak Peak Peak Peak Peak Peak	cy (MHz) vs. average FCC) Azimuth degrees 242 208 238 247 110 311 212	limit) Height meters 1.5 2.0 1.5 1.5 1.5 1.5 1.5 2.0	Comments BLE, measu	red in radio	6000
	eliminary / 55022/3 equency MHz 483.330 956.670 450.000 795.000 935.000	50.0 - 40.0 - 30.0	adings captu ed for pre-sc Pol M V/h H V V V V H V	ured during p ean (i.e. worst of EN 55022) Limit 50.0 50.0 50.0 50.0 54.0 54.0 54.0	ore-scan (pe case of EN 5 32 Class B Margin 44.4 -16.0 -13.6 -13.6 -15.5 -14.1 -13.3	Frequen ak readings 5022/32 and Detector Pk/QP/Avg Peak Peak Peak Peak Peak Peak Peak Peak	cy (MHz) vs. average FCC) Azimuth degrees 242 208 238 247 110 311 212	limit) Height meters 1.5 2.0 1.5 1.5 1.5 1.5 1.5 2.0	Comments BLE, measu	red in radio	tests.
	eliminary / 55022/3 equency MHz 483.330 956.670 450.000 790.000 795.000 935.000	50.0 - 40.0 - 30.0 - 30.0 - 30.0 - 1000 y peak re 32 limit us Leve dBμV/ 94.4 34.0 36.4 36.4 38.5 39.9 40.7	adings captured for pre-sc Pol M V/h H V H V V H V	ured during p can (i.e. worst of EN 55022) Limit 50.0 50.0 50.0 50.0 54.0 54.0 54.0 54.0	ore-scan (pe case of EN 5 32 Class B Margin 44.4 -16.0 -13.6 -15.5 -14.1 -13.3	Frequen ak readings 5022/32 and Detector Pk/QP/Avg Peak Peak Peak Peak Peak Peak Peak Peak	cy (MHz) vs. average FCC) Azimuth degrees 242 208 238 247 110 311 212	limit) Height meters 1.5 2.0 1.5 1.5 1.5 1.5 2.0	Comments BLE, measu	red in radio	tests.

								EMC Test Data			
Client:	Fitbit, Inc.							PR Number: JD105947			
	ED 400	-D 44 C					T-	Log Number: T106007			
Model:	FB409 and I	-B410				Proi	ect Manager: Deepa Shetty				
Contact.	Ricky Wang					Proi	ect Engineer: -				
Standard	EN 55032 A				KN32 CNS 1	2/128	110	Class: B			
Stanuaru.			N 22, VCC			3430		61833.			
Final peak a All final reac	and average lings collecte	readings d at 3 met	(vs. EN 550) ers test dista	22/32 limits) nce, unless d	) otherwise not	ed					
Frequency	Level	Pol	EN 55022/	32 Class B	Detector	Azimuth	Height	Comments			
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters				
1945.740	28.1	V	50.0	-21.9	AVG	208	2.0				
1990.670	40.1	V	70.0	-29.9	PK	208	2.0				
2448.100	35.6	Н	50.0	-14.4	AVG	240	1.17				
2447.930	44.4	Н	70.0	-25.6	PK	240	1.17				
2581.670	29.9	V	50.0	-20.1	AVG	216	1.71				
2583.670	41.5	V	70.0	-28.5	PK	216	1.71				
3192.470	32.4	V	54.0	-21.6	AVG	110	1.51				
3192.670	44.4	V	74.0	-29.6	PK	110	1.51				
4793.200	33.7	Н	54.0	-20.3	AVG	311	1.49				
4791.000	45.9	Н	74.0	-28.1	PK	311	1.49				
5949.730	33.6	V	54.0	-20.4	AVG	212	2.01				
5927.270	46.4	V	74.0	-27.6	РК	212	2.01				
MAXIMIZED All final read	) final peak a	and averag	ge readings ers test dista	(vs. EN 550 nce. unless (	22/32 limits, otherwise not	including c	able manip	ulation)			
Frequency	Level	Pol	EN 55022/	32 Class B	Detector	Azimuth	Height	Comments			
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters				
1945.740	28.1	V	50.0	-21.9	AVG	208	2.0				
1990.670	40.1	V	70.0	-29.9	РК	208	2.0				
2448.100	35.6	Н	50.0	-14.4	AVG	240	1.17				
2447.930	44.4	Н	70.0	-25.6	PK	240	1.17				
2581.670	29.9	V	50.0	-20.1	AVG	216	1.71				
2583.670	41.5	V	70.0	-28.5	PK	216	1.71				
3192 470	32.4	V	54.0	-21.6	AVG	110	1 51				
3192.670	44.4	V	74.0	-29.6	PK	110	1.51				
4793 200	33.7	Н	54.0	-20.3	AVG	311	1.01				
4791 000	45.9	H	74.0	-28.3	PK	311	1 49	1			
5949 730	33.6	V	54.0	-20.1	A\/G	212	2 01	1			
5927 270	Δ6 Δ	v \/	7 <u>4</u> 0	_20.7	PK	212	2.01	1			
5727.210	10.1		,	21.0	<u> </u>	- 12	2.01				
	NTS							EMC Test Data			
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Client:	Fitbit, Inc.							PR Number: JD105947			
							T-	Log Number: T106007			
Model:	FB409 and F	B410				-	Project Manager: Deepa Shetty				
Contact:	Ricky Wang						Project Engineer: -				
Standard:	EN 55032, A	S/NZ CISF	PR 22, VCC	J-CISPR 32,	KN32, CNS 1	3438	,	Class: B			
inal neak :	and average	readings	(vs. FCC lir	nits)							
requency	Level	Pol	FCC (	Class B	Detector	Azimuth	Height	Comments			
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters				
1945.740	28.1	V	54.0	-25.9	AVG	208	2.0				
1990.670	40.1	V	74.0	-33.9	PK	208	2.0				
2448.100	35.6	Н	54.0	-18.4	AVG	240	1.17				
2447.930	44.4	Н	74.0	-29.6	PK	240	1.17				
2581.670	29.9	V	54.0	-24.1	AVG	216	1.71				
2583.670	41.5	V	74.0	-32.5	PK	216	1.71				
3192.470	32.4	V	54.0	-21.6	AVG	110	1.51				
3192.670	44.4	V	74.0	-29.6	PK	110	1.51				
793.200	33.7	<u>H</u>	54.0	-20.3	AVG	311	1.49				
1/91.000	45.9	H	/4.0	-28.1	PK	311	1.49				
0949.730	33.0	V	54.0	-20.4	AVG	212	2.01				



Client:	Fitbit, Inc.							PR Number:	JD105947				
Madal	EP400 and [						T-	Log Number:	T106007				
Niudei.	FB409 anu i	- B4 IU					Proj	ect Manager:	Deepa Shetty				
Contact:	Ricky Wang						Proje	ect Engineer:	-				
Standard:	EN 55032, A	<b>\S/NZ CIS</b>	PR 22, VCC	I-CISPR 32,	KN32, CNS 1	3438		Class:	В				
Run #4: Ma Single pre-s Antenna he	aximized Rea scan coverir sight scan p	adings, 10 ng both EN erformed (	100 - 6000 M N 55022/32 a during pre-s	Hz. Non-NF Ind FCC Par	C sample, T t 15 requirer fy FCC requ	x mode, set nents irements	to high cha	ınnel, 110V /	60Hz				
Final peak and average readings (vs. EN 55022/32 limits)													
Final peak a	and average	readings	(vs. EN 550	22/32 limits)		. ,							
All final read	lings collecte	d at 3 meie	Ers lest alsia	nce, uniess c	Detector	<i>ea</i> A <del>-</del> imuth	Usiaht	Commonte					
		PUI v/h	EIV 550227	32 Class D Margin		AZIMUUN	Height	Comments					
10/5 7/0	0Βμν/III 28.1	V/11 V/	LIIIII 50 0	1012111 21.0	AVG	2008 Uegrees	2.0	┨─────					
1940.740	20.1 //0.1	V V	70.0	-21.7	AVG DK	200	2.0	╂────					
21/18 100	25.0	v Ц	50.0	-27.7		200	2.0						
2440.100	30.7 AA 1	Ц	70.0	-14.1	DK	241	1.17						
2402.020	20 0	V	50.0	-20.7		241	1.17						
2501.070	<u> </u>	v V	70.0	-20.1 28 5	DK	210	1.71						
2003.070	41.0 22.4	V V	510	-20.0		210 110	1.71	┨─────					
3192.470	32.4 11.1	V	24.0 74.0	-21.0		110	1.01	┨─────					
3192.070	44.4	V	/4.U	-29.0		11U 211	1.01						
4793.200	33.7 45.0		54.0	-20.3		<u> </u>	1.49						
4/91.000	45.Y	H	/4.0	-2ö.1	PK	<u>র্</u> যা। ১1১	1.49						
5949.730	33.0	V	54.0	-20.4	AVG	212	2.01						
5921.270	46.4	V	/4.0	-27.0	Ρĸ	212	2.01						
MAXIMIZED All final read	) final peak a lings collecte	and averaged at 3 meter	ge readings ers test dista	(vs. EN 550) <i>nce, unless c</i>	22/32 limits, <i>otherwise not</i>	including c	able manip	ulation)					
MH7	dRu\//m	v/h		Margin		dearees	meters	Commenta					
19/15 7/10	28.1	V	50.0	_21.0	AVG	208	2.0						
1990.670	20.1 /0.1	V	70.0	_20.0	PK	200	2.0						
2//8 100	25.0	H	50.0	-14.1	Δ\/G	200	1 10	+					
2440.100	14.1	Н	70.0	-25.9	DK VIC	241	1.17	+					
2581 670	20.0	V	50.0	-20.7	Δ\/G	216	1 71	╂────					
2583 670	/15	V	70.0	-28.5	DK	210	1 71	╂────					
2102 470	27 <u>Λ</u>	V	54.0	-20.0	Δ\/G	110	1.71	╂────					
2102 670	11 1	V	74.0	_20.6		110	1.51						
1703 200	22.7	Ч	510	_27.0		211	1.01	╂────					
4793.200	/5.0	Ц	74.0	-20.3		211	1 /0						
50/0 730	22.6	V	54.0	20.1		211 212	2 01						
5747.730	33.0	V V	74.0	-20.4		212	2.01	+					
5721.210	40.4	V	/4.0	-27.0	۲N	Z1Z	2.01	<u> </u>					

# 🎲 NTS

# EMC Test Data

Client:	Fitbit, Inc.	PR Number:	JD105947
Model:	EP400 and EP410	T-Log Number:	T106007
MUUEI.	r D409 anu r D410	Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Engineer:	-
Standard:	EN 55032, AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438	Class:	В

### Run #5: Maximized Readings, 6000 - 25,000 MHz Additional tests against FCC limits, above 6 GHz

Test Parameters for Preliminary Scan(s)											
(Class B Device)											
Frequency RangePrescan DistanceLimit DistanceExtrapolation Factor											
(MHz)	(meters)	(meters)	(dB, applied to data)								
6000 - 12000	3	3	0.0								
12000 - 18000	1	3	-9.5								
18000 - 25000	0.3	3	-20.0								



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

Frequency	Level	Pol	FCC C	Class B	Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	

### Final peak and average readings (vs. FCC limits)

	<u> </u>			,				
Frequency	Level	Pol	FCC C	Class B	Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	

	NTS	EM	C Test Data									
Client:	Fitbit, Inc.	PR Number:	JD105947									
Model	EB/09 and EB/10	T-Log Number:	T106007									
wouer.		Project Manager:	Deepa Shetty									
Contact:	Ricky Wang	Project Engineer:	-									
Standard:	EN 55032, AS/NZ CISPR 22, VCCI-CISPR 32, KN32, CNS 13438	Class:	В									
Note 1:	For FCC testing above 1 GHz, the limit is based on an average measuren emission above 1 GHz can not exceed the average limit by more than 20	nent. In addition, the pea dB.	k reading of any									
Note 2	Scans made between 18 - 25 GHz with the measurement antenna moved there were no significant emissions in this frequency range.	around the EUT 30cm fr	om the device indicated									
Note 3	Note 3 As there were no emissions observed above 14 GHz during the preliminary scan, or the size of the EUT did not exceed											
	1.6m above the ground plane, additional measures were <b>not</b> required to emaintained within the beam-width of the antenna during antenna height m	ensure that the emissions	from the EUT were									

🎲 NTS	6				EMC Test Data				
C	ont Fithit Inc			PR	Number ID105947				
Pro	duct FR409 and FR41	0		T-L og	Number: T106007				
		0		Project M	lanager: Deena Shetty				
Con	act: Ricky Wang			Project Engineer: -					
Immunity Standard	1(s): EN 55024 KN35	EN/KN 301 489-1	-17	Envir	onment: Radio and ITF				
		, LIWIKI OOT 107 .	, - 17						
	Ele	ctrostatic Di	scharge (EN	61000-4-2)					
Test Specific Deta	ails								
Objective: The liste	objective of this test s d above.	ession is to perforn	n final qualification	testing of the EUI	with respect to the specification				
Date of Test: 4/20	/2018	Config. Used:	2						
Test Engineer: Rafa	nel Varelas	Config Change:	None						
Test Location: FT L	ab #3	EUT Voltage:	220V/60Hz						
Ormanal Teat Can	C								
General Test Con	figuration	· · · ·							
For tabletop equipm	ent, the EUT and all lo	ocal support equipm	nent were located of	on a 0.5-mm thick i	nsulating layer above a horizontal				
coupling plane, 80 c	m above a ground rete	erence plane.							
Unless otherwise sta	ated, ten discharges a	t each voltage, and	polarity, were app	lied to each test po	int listed. Contact discharges (CD)				
were applied to cour	bling planes and condu	uctive surfaces of th	he EUT. Air discha	arges (AD) were ap	plied to any non-conductive surfaces				
of the EUT. The VCI	P was located on the t	abletop for tabletop	devices and 80cm	n above the ground	plane for floor-standing equipment.				
		-		-	•				
The determination a	s to the test point bein	a a part of a condu	ictive or non-condu	ictive surface was b	pased on the manufacturer's				
declaration.	5 to the toot point 2								
<b>~</b>									
Ambient Conditio	ns:	Temperature <sup>.</sup>	22.4 °C						
	115.		22.7 0						
			1020 mh						
		FICSSUIC.							
Summary of Resu	ilts - Electrostatio	Discharges							
	Test		Performar	nce Criteria					
Run # Port	Required	Applied	Required	Met / Result	Comments				
	4 kV CD	4 kV CD	rioquirou	Motritoout					
1 Enclosure	8 kV AD	8 kV AD	В	A / Pass	Tx Mode Mode(BLE+NFC)				
	4 kV CD	4 kV CD							
2 Enclosure	8 kV AD	8 kV AD	В	A / Pass	Standby Mode (BLE+NFC)				
Modifications Ma	de During Testing	a							
No modifications we	re made to the EUT d	uring testing							
Deviations From	The Standard								
No deviations were	made from the require	ments of the stand	ard.						
Sample S/N: B2-I	D-102 (BLE+NFC)								



Client: Fitbit, Inc.					PR	Number:	JD10594	17		
Product FB409 and FB410				L	T-Log	Number:	T106007	1		
					Project N	/lanager:	Deepa S	hetty		
Contact: Ricky Wang					Project E	ingineer:	-			
Immunity Standard(s): EN 55024, KN35, EN/KN 3	01 489-1	, -17			Envir	ronment:	Radio ar	nd ITE		
Run #1: Electrostatic Discharge, Normal Mode										
Indirect Discharges		Positive	Polarity			Negative	Polarity			
(To Coupling Planes)		(k'	V)			(k	V)			
		``````````````````````````````````````				<u> </u>			1	
Contact	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4		
Mode	2	4	6	8	2	4	6	8	l	
Vertical Coupling Plane (VCP) located 10cm from the		Х				Х			l	
front, rear, left and right sides of the EUT		ļ								
Horizontal Coupling Plane (HCP) located 10cm trom		Х				Х			l	
the front, rear, left and right sides of the EUT									I	
	<del></del>								1	
Direct Discharges		Positive	Polarity		Negative Polarity					
(To the EUT)		(k)	V)		<u> </u>	(kV)				
Contact	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4		
Mode	2	4	6	8	2	4	6	8	l	
Shell left side - left and right corners		х				Х				
Shell right side - left and right corners		X				Х				
shell bottom - left and right side		X				Х				
Reset button		X				Х				
Wristband lock		ND				ND			l	
Pin #1		ND				ND			l	
Pin #2		ND				ND				
Pin #3		ND				ND				
			Laval 2		Laval 1				I	
Air Discharge	Level I	Level 2	Level 3	Level 4	Level I	Level 2	Level 3	Level 4		
Mode	2	4	8	15	2	4	8	15		
Display center	ND	ND	ND		ND	ND	ND		l	
Display right side and left side	ND	X	X		ND	X	X			
Left side band	ND	ND	ND		ND	ND	ND			
Rifgt side band	ND	ND	ND		ND	ND	ND		l	
Charge connector - left, right, top, and bottom sides	ND	ND	ND		ND	ND	ND			
USB connector	ND	ND	ND		ND	ND	ND		l	
Sensor	ND	ND	ND		ND	ND	ND		I	
Note: An "X" indicates that the unit continued to ope remote dongle and the NFC was verified for operative errors reported by the monitoring software for	erate as ir operation r BLE mor	ntended. at the ren de.	The BLE note tag r	was cont eader du	figured to ring and a	receive of after testi	continuou ng. There	is data fro e were no	ım a data	
HCP: Horizontal Coupling Plane. VCP: Vertic	cal Coupli	ng Plane								



Client: Fitbit, Inc.					PR	Number:	JD10594	17	
Product FB409 and FB410				[	T-Log	Number:	T106007	1	
			1		Project N	Nanager:	Deepa S	hetty	
Contact: Ricky Wang					Project E	ingineer:	-	-	
Immunity Standard(s): EN 55024, KN35, EN/KN 3	01 489-1	, -17			Envi	ronment:	Radio ar	nd ITE	
									ł
Dun #2: Flectrostatic Discharge Standby Mode									l
Indirect Discharges	<u> </u>	Positive	Polarity		<b></b>	Negative	- Polarity		<b>i</b> 1
(To Counting Planes)		<u>(k</u>	1 0101113 \/)			(k	1/)		1
	L	(\	<u>v</u> j		L	(iv	<u>v</u> ;		· •
Contact	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4	1
Mode	2	4	6	8	2	4	6	8	1
Vertical Coupling Plane (VCP) located 10cm from the		х				х			1
front, rear, left and right sides of the EUT		_!				ı'			1
Horizontal Coupling Plane (HCP) located 10cm from		Х				Х			1
the front, rear, left and right sides of the EUT		_!				ı'			1
									ļ
Direct Discharges		Positive	Polarity			Negative	e Polarity		1
(To the EUT)		(k'	V)			(k	.V)		i '
Contact									i I
Contact	2	LEVELZ	LEVELJ	Q	2	LEVEIZ	6	Q LEVEL4	1
	<u>∠</u>	4	Ŭ	0		4 	U	°	i i
Shell left side - left and right corners		X				<u> </u>			i i
Shell right side - left and right corners		X				<u> </u>			i i
Shell bottom - left and right side		X				<u> </u>			i i
Reset button		X							i i
		ND							i i
Pin #1		ND				ND			i
Pin #2		ND				ND			i
Pin #3		ND				ND			I
Air Discharge	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4	i
Mode	2	4	8	15	2	4	8	15	i
Display	ND	ND	ND		ND	ND	ND		I
Display right side and left side	ND	х	х		ND	Х	х		i i
Left side band	ND	ND	ND		ND	ND	ND		l
Rifot side band	ND	ND	ND		ND	ND	ND		I
Charge connector - left, right, top, and bottom sides	ND	ND	ND		ND	ND	ND		I
USB connector	ND	ND	ND		ND	ND	ND		I
Sensor	ND	ND	ND		ND	ND	ND		I
Note: An "X" indicates that the unit continued to operative remote analyzer.	erate as ir	ntended.	The EUT	was mor	nitored for	r any unir	ntentional	transmis:	sions by a
Note: ND: No discharge was possible due to the lac	ck of a dis	scharge p	ath to orc	und from	the test	noint.			
HCP: Horizontal Counting Plane VCP: Vertic	cal Counli	ing Plane	Jui to gio	unu nom	110 1001 r	Joint.			
	ai coupii	TIY FIANC							

🎲 NTS					EMC Test Data
Client	Fithit Inc			PR	Number: ID105947
Product	FR409 and FR41	0		I no I-T	Number: T106007
TTOUGE		0		Project M	lanager: Deena Shetty
Contact	Picky Wang			Project R	nginger:
Immunity Standard(s):	EN 55024, KN35	EN/KN 301 489-1,	-17	Envir	onment: Radio and ITE
	Ele	ctrostatic Dis	scharge (EN	61000-4-2)	
Test Specific Details Objective: The objective about the objective	ective of this test s bove.	ession is to perform	final qualification	testing of the EUT	with respect to the specification
Date of Test. 4/20/20	18	Config Used	2		
Test Engineer: Rafael V Test Location: FT Lab	/arelas #3	Config Change: EUT Voltage:	None 220V/60Hz		
		5			
General Test Configue For tabletop equipment, coupling plane, 80 cm a	uration the EUT and all lo bove a ground refe	cal support equipm erence plane.	ent were located o	on a 0.5-mm thick ir	nsulating layer above a horizontal
were applied to coupling of the EUT. The VCP wa The determination as to declaration.	the test point bein	abletop for tabletop g a part of a conduc	e EUT. Air discha devices and 80cm	arges (AD) were ap n above the ground	plied to any non-conductive surfaces plane for floor-standing equipment. based on the manufacturer's
Ambient Conditione		т	22.4.80		
	•	Temperature:	22.4 °C		
		Relative Humidity:	38 %		
		Pressure:	1020 mb		
Summary of Results	- Floctrostatio	Discharges			
			Performan	re Criteria	
Run # Port	Required		Required	Met / Result	Comments
			Required	Met / Result	
1 Enclosure			В	A / Pass	Tx Mode (BLE Mode)
2 Enclosure	8 kV AD	8 kV AD	В	A / Pass	Standby Mode
Modifications Made No modifications were n Deviations From The No deviations were mad	During Testing hade to the EUT du e Standard le from the require	J uring testing ments of the standa	ırd.		
Sample S/N: B2-E-2	/ I (BLE)				



301 489-1	17			PR T-Log Project N Project E	Number: Number: Manager: Ingineer:	JD10594 T106007 Deepa S	17 hetty	
301 489-1	17			T-Log Project N Project E	Number: /anager: Ingineer	T106007 Deepa S	hetty	
301 489-1	17			Project N Project E	lanager:	Deepa S	hetty	
301 489-1	17			Project E	naineer	_		
301 489-1	17				inginoon			
	, -17			Envi	ronment:	Radio ar	nd ITE	
	Positive	Polarity			Negative	Polarity		
-	(k	V)			(k	V)		
- -	, ,	,			, ,	,		1
Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4	
2	4	6	8	2	4	6	8	
e	Х				Х			
	Х				Х			
	Positive	Polarity			Negative	e Polarity		
	(k	V)			(k			
Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4	
2	4	6	8	2	4	6	8	
	Х				Х			
	Х				Х			
	х				Х			
	х				Х			
	ND				ND			
	ND				ND			
	ND				ND			
	ND				ND			
Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4	
2	4	8	15	2	4	8	15	
ND	ND	ND		ND	ND	ND		
ND	Х	Х		ND	Х	Х		
ND	ND	ND		ND	ND	ND		
ND	ND	ND		ND	ND	ND		
ND	ND	ND		ND	ND	ND		
ND	ND	ND		ND	ND	ND		
ND	ND	ND		ND	ND	ND		I
perate as in re were no	ntended. data erro	The BLE	was con ed by the	figured to monitorir	receive on receive of twa	continuou re for BLE	is data fro E mode.	im a
	Level 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Positive (k Level 1 Level 2 2 4 2 X X X V V V V V V V V V V V V V V V V V	Positive Polarity (kV)         Level 1       Level 2       Level 3         2       4       6         2       4       6         2       4       6         2       4       6         2       4       6         2       4       6         2       4       6         2       4       6         2       4       6         2       4       6         2       4       6         2       4       6         X       X       X         2       4       6         X       X       X         X       X       X         X       X       X         X       X       X         X       X       X         X       X       X         ND       ND       ND         ND       ND	Positive Polarity         Level 1       Level 2       Level 3       Level 4         2       4       6       8         2       4       6       8         2       X       5       5         X       X       5       5         X       X       5       5         X       X       5       5         Level 1       Level 2       Level 3       Level 4         2       4       6       8         X       X       5       5         Level 1       Level 2       Level 3       Level 4         X       X       5       5         ND       ND       5       5         ND       ND       10       5         ND       ND       ND       10         ND       N	Positive Polarity         Level 1       Level 2       Level 3       Level 4       Level 1         2       4       6       8       2         3       X       S       S       S         2       4       6       8       2         3       X       S       S       S         2       4       6       8       2         3       X       S       S       S         3       X       S       S       S         3       X       S       S       S         3       X       S       S       S         4       6       8       2       S         5       X       S       S       S         4       6       8       2       S       S         5       X       S       S       S       S         6       8       2       S       S       S       S         7       X       S       S       S       S       S       S         8       ND       ND       ND       ND       ND       ND       ND	Positive Polarity       Negative (kV)         Level 1       Level 2       Level 3       Level 4       Level 1       Level 2         2       4       6       8       2       4         3       X       X       X       X         4       5       X       X       X         2       4       6       8       2       4         3       X       X       X       X         4       X       X       X       X         2       X       X       X       X         4       X       X       X       X         9       X       X       X       X         1       X       X       X       X         1       Level 1       Level 2       Level 3       Level 4       Level 1         2       4       6       8       2       4         X       X       X       X       X         X       X       X       X       X         X       X       X       X       X         X       X       X       X       X         X <t< td=""><td>Positive PolarityNegative PolarityLevel 1Level 2Level 3Level 4Level 1Level 2Level 324682463XXXXXXXXXXPositive PolarityNegative Polarity(kV)(kV)(kV)Level 1Level 2Level 3Level 4Level 1Level 2Level 32468246246824624682462468246246824624682463XXXXX2468243XXXX4XXXX4NDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDND<td< td=""><td>Positive Polarity         Negative Polarity           (kV)         (kV)           Level 1         Level 2         Level 3         Level 4         Level 2         Level 4         Level 4         Level 2         Level 4         Level 4         Level 3         Level 4         Level 4         6         8         2         4         6         8         2         4         6         8         3         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X</td></td<></td></t<>	Positive PolarityNegative PolarityLevel 1Level 2Level 3Level 4Level 1Level 2Level 324682463XXXXXXXXXXPositive PolarityNegative Polarity(kV)(kV)(kV)Level 1Level 2Level 3Level 4Level 1Level 2Level 32468246246824624682462468246246824624682463XXXXX2468243XXXX4XXXX4NDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDNDND <td< td=""><td>Positive Polarity         Negative Polarity           (kV)         (kV)           Level 1         Level 2         Level 3         Level 4         Level 2         Level 4         Level 4         Level 2         Level 4         Level 4         Level 3         Level 4         Level 4         6         8         2         4         6         8         2         4         6         8         3         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X</td></td<>	Positive Polarity         Negative Polarity           (kV)         (kV)           Level 1         Level 2         Level 3         Level 4         Level 2         Level 4         Level 4         Level 2         Level 4         Level 4         Level 3         Level 4         Level 4         6         8         2         4         6         8         2         4         6         8         3         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X



Client: Fitbit, Inc.					PR	Number:	JD10594	47				
Product FB409 and FB410	Client: Fitbit, Inc. Product FB409 and FB410							T-Log Number: T106007				
	Product FB409 and FB410							hetty				
Contact: Ricky Wang	Contact: Ricky Wang							Project Engineer: -				
Immunity Standard(s): EN 55024, KN35, EN/KN 3	Contact: Ricky Wang nmunity Standard(s): EN 55024, KN35, EN/KN 301 489-1, -17							nd ITE				
									l			
Run #2. Electrostatic Discharge, Standby Mode									I			
Indirect Discharges		Positive	Polarity			Negative	- Polarity		1			
(To Coupling Planes)	<b> </b>	(k	10iainy 1/)		<u> </u>	(k	·//		1			
			<u>v</u> ,				v,		·   -			
Contact	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4	1 '			
Mode	2	4	6	8	2	4	6	8	1			
Vertical Coupling Plane (VCP) located 10cm from the		х				Х			1			
front, rear, left and right sides of the EUT						<u> </u>			1			
Horizontal Coupling Plane (HCP) located 10cm from		х				х			1 '			
the front, rear, left and right sides of the EUT						<u> </u>			1 '			
									-			
Direct Discharges		Positive	Polarity			Negative	e Polarity		1 '			
(To the EUT)		(k'	.V)			(k	.V)		1 '			
Contact	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4	1			
Mode	2	4	6	8	2	4	6	8	1			
Shell left side - left and right corners		×				X			1 '			
Shell right side - left and right corners		x x				x			1 '			
shell bottom - left and right side		x x				x			1			
Reset hutton		X				x			l			
Wristhand lock		ND				ND			l			
Din #1		ND				ND			l			
Din #2		ND				ND			l			
F 111 #2 Din #3		ND							l			
									1 I			
Air Discharge	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4	ł			
Mode	2	4	8	15	2	4	8	15	l			
Display center	ND	ND	ND		ND	ND	ND		l			
Display right side and left side	ND	Х	Х		ND	Х	Х		1			
Left side band	ND	ND	ND		ND	ND	ND		1			
Rifgt side band	ND	ND	ND		ND	ND	ND		l			
Charge connector - left, right, top, and bottom sides	ND	ND	ND		ND	ND	ND		1			
USB connector	ND	ND	ND		ND	ND	ND					
Sensor	ND	ND	ND		ND	ND	ND		l			
Note: An "X" indicates that the unit continued to $ope$	erate as ir	ntended.	The EUT	was mor	nitored for	r any unir	ntentional	i transmis	sions by a			
remote analyzer.												
Note: ND: No discharge was possible due to the lac	ck of a dis	charge p	ath to grc	ound from	the test r	point.						
HCP: Horizontal Coupling Plane. VCP: Vertic	cal Coupli	ing Plane	Ť									
	. <u> </u>											

	NTS					EMC Test Data
	Client:	Fitbit, Inc.			PR	Number: JD105947
	Product	FB409 and FB410	)		T-Log	Number: T106007
					Project N	Nanager: Deepa Shetty
	Contact:	Ricky Wang			Project E	Ingineer: -
Imm	unity Standard(s):	EN 55024, KN35,	EN/KN 301 489-1	, -17	Envir	ronment: Radio and ITE
		R	adiated Imm	unity (EN 61	1000-4-3)	
Test S <sub>I</sub> C	pecific Details bjective: The obje listed ab	ctive of this test se ove.	ession is to perform	n final qualificatior	n testing of the EUT	with respect to the specification
Date Test E Test I	e of Test: 4/26, 4/2 Engineer: Rafael V Location: FT Chan	7 & 5/4/2018 arelas nber #6	Config. Used: Config Change: EUT Voltage:	2 None 220V/60Hz		
Genera The El located passed Unless side" o	al Test Configu UT and all local su d outside the cham d through ferrite cla s otherwise noted, of the EUT is consi	uration pport equipment w ober. Interface cab amps at the exit po the "right side" of t dered the side on	vere located on a tu ling to the remote s pint from the chaml the EUT is conside the left when stand	urntable in an ane support equipmen ber. red the side on th ling behind the EU	choic chamber. All It was routed along e right when standi JT.	remote support equipment was the floor and, where possible, ng behind the EUT and the "left
Ambie	nt Conditions:	Tem Rel. I	perature: 22.5 Humidity: 38	°C %		
Summ	ary of Results-		unity	2.4	<b>a</b> ii i	
Run #	Port	Test	Level	Performa	nce Criteria	Comments
	4.2010 Doguinom	Required	Applied	Required	Met / Result	
EN 5502	4.2010 Requirem		<u>80 1000 MIU→</u>			
1	Enclosure	1kHz 80% AM	1kHz 80% AM	А	A / Pass	
KN35 Re	equirements	3 1/11	3 1/11			
1	Enclosure	80-1000 MHz 1kHz 80% AM 3 V/m	80-1000 MHz 1kHz 80% AM 3 V/m	А	A / Pass	
1	Enclosure	Spot Frequencies 1kHz 80% AM 3 V/m	1800, 2600, 3500, 5000 MHz 1kHz 80% AM 3 V/m	A	A / Pass	



Client:	Fitbit, Inc.	PR Number:	JD105947
Product	FB409 and FB410	T-Log Number:	T106007
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Engineer:	-
Immunity Standard(s):	EN 55024, KN35, EN/KN 301 489-1, -17	Environment:	Radio and ITE

# EN 301 489-1 V2.1.1 Requirements

		80-1000 MHz	80-1000 MHz					
1	1 Enclosure	1.0-6.0GHz	1.0-6.0GHz	٨	A / Dass	Normal Mada (BLE NEC)		
I	Eficiosure	1kHz 80% AM	1kHz 80% AM	A	A/Pass	NOTTIAL MODE (BLE+NFC)		
		3 V/m	3 V/m					
		80-1000 MHz	80-1000 MHz					
2	Englacura	1.0-6.0GHz	1.0-6.0GHz	٨		Ctandby Mada		
2	Eliciosule	1kHz 80% AM	1kHz 80% AM	А	A/Pass	Startuby Mode		
		3 V/m	3 V/m					

### 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 S/N: B2-D-102 (BLE+NFC)



	Client:	Fitbit, In	С.						PR	Number:	JD10594	17	
	Product	FB409 a	ind FB410	)					T-Log Number: T106007			1	I
							I	Project Manager: De			Deepa S	Deepa Shetty	
	Contact:	Ricky W	ang			-		Project Engineer: -					
Immunity Sta	ndard(s):	EN 5502	24, KN35,	EN/KN 3	01 489-1	, -17			Envi	ironment:	Radio ar	nd ITE	
· · · · · ·					_								
Run #1∙ Radiate	d Immur	nitv 80-6	.000 MHz	(FN6100	.∩-4-3). T	v Mode							I
	u minu.	Fr	equency:	80-100	10 MHz	1-4.2	) GH7	4.2-(	6 GHz	1			
	ļ	с С	ten Size	1	%	1	%	1	%	1			I
	ļ		well time.	2874	ms	2874	 	2874	ms	1			
	ļ	Field II	niformity	1.5m	v 1 5m	1 0m	v 1 0m	1 0m	v 1 0m	1			
	ļ	Test	Distance	2	m	1.011	25m	1	2m	1			
	ļ	1630	Jistance.			1.2	.011	i	0111	」 			
		<b></b>	Mod	ulation D	otalle		1				Fro	ont	
	ļ	Mod	IVIUu		319112 1 1/17		1			Lef	+ El	IT (	Right
	ļ	IVIUU	Jalling Fie	dulation			1						ugin
	ļ	┝───	IVIU				1				R(	oar	
	ļ	L	Deptn / D	eviation:	80%		1					:di	
Fraguaney			ant	Loft	<u>Cido</u>		oor		aht	<del>т т</del>	an	Po.	ttom
		Vort	Offi	Lun Mort	Sille	Nort Nort		Vort		Vort		Vort	
	 ک	Ven.	HUHZ.		HUHZ.								
<u>δU-1000</u>	3 2	X	X		X	X	X	X	X	X	X	X	X
1000-4200	<u>3</u>	X	X	X	<u>X</u>	X	<u>X</u>	X	<u>X</u>	X	X	X	X
4200-6000	3	Х	X	Х	Х	X	X	X	Х	Х	Х	X	Х
KN35 Spot	3	х	х	Х	Х	х	Х	Х	Х	Х	Х	Х	Х
Frequencies	'			1 '	'	1	1 '						
(Note 2)	L'	l		I'	L'	L	<u>                                     </u>						
Test files used for The following calil Antenna Antenna The following calil used: Antenna The following calil used: 1.8m fro 1.8m fro Note: An "X" ir local dor reported Note 2: Radiatec	this run: bration file tip 2m fro bration file 1.25 m fro bration file m UFA, 1 m UFA, 1 m UFA, 1 ndicates the ngle and to by the m	es from L om UFA, om UFA, es from L om UFA, om UFA, es from L .25m hig .25m hig hat the ui he NFC i ionitoring ty Spot L	J:\EMC St 1.55m he 1.55m he J:\EMC St J:\EMC St 1.25 m hi 1.25 m hi J:\EMC St h 4200 M h 4200 M nit continu was verifie software ests at 18	uff\Radia ight 80 M ight 80 M uff\Radia igh 1000 igh 1000 uff\Radia Hz - 600( Hz - 600( Hz - 600( Jed to ope ed for ope for BLE r 00, 2600	ted Immu /Hz - 100 /Hz - 100 ted Immu MHz - 42 MHz - 42 ited Immu 0 MHz H : 0 MHz H : 0 MHz V : erate as in eration at mode. 	inity Play 0 MHz H 0 MHz V inity Play 200 MHz 00 MHz H inity Play 3Vm.crf 3Vm.crf ntended. the local d 5000M	back Files 3Vm.crf back Files V 3Vm.cr I 3Vm.crf back Files The BLE tag read	s\CH6\Cu s\CH6\Cu f f s\CH6\Cu E was cor er during %)	urrent\80- urrent\1-4 urrent\4.2	1000 MH .2 GHz (C - 6.0 GH	z 12Vm (/ )ctober 2 Z (Sept 2 continuou There wei	April 2016 017)\3 Vr 016)\3 Vr us data fro re no data	5)\ were u m\ were m\ were om a a errors
Note 3: The follo	wing excl	usion ba	nds were	used per	EN 301 4	489-1:							



Client:	Fitbit, Inc.	PR Number:	JD105947
Product	FB409 and FB410	T-Log Number:	T106007
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Engineer:	-
Immunity Standard(s):	EN 55024, KN35, EN/KN 301 489-1, -17	Environment:	Radio and ITE

### EN 301 489-1 Exclusion Bands:

	Ba	ind	Bandwidth	Exclusio	on Band
	Start (MHz)	Stop (MHz)	(MHz)	Start (MHz)	Stop (MHz)
Bluetooth	2400	2483.5	-	2280	2603.5



		-											
	Client:	Fitbit, In	С.						PR	Number:	JD10594	17	
	Product	FB409 a	nd FB410	T-Log Number: T106007									
		1						Project Manager: Deepa S			hettv		
	Contact:	Rickv W	ang						Project I	Engineer	-	J	
Immunity Sta	ndard(s)	EN 5502	24, KN35	EN/KN 3	01 489-1	17		Environment: Radio and ITF					
			,			,		1	<u>_</u> v				
Dun #2∙ Dadiate	d Immur	nity 80-6	000 MHz	(FN6100	0_1_2) 51	andhy M	lodo						
	ummu	III ( ), 00-0			0-4-3), 31	1 / 1		126		T			
			ton Sizor	00-100		1-4.2		4.2-0	0/				
			Nep Size.	1	70 mc	1	70 mc	1	70 mc				
		D'	well time:	20/4	1115 1 1 5 m	2874	1115	2874	1115	-			
		Field U	niiormity:	1.500.2		1.00		1.00					
		Test	Distance:	2	m	1.2	25M	1.	8m	」			
							1				Fre	ont	
			Mod	ulation D	etails								
		Mod	ulating Fre	equency:	1 kHz					Lef	EL	JI F	Right
			Мо	dulation:	AM								
			Depth / D	eviation:	80%						Re	ear	
	-	-						-				-	
Frequency	Level	Fr	ront	Left	Side	R	ear	Ri	ght	Т	ор	Bo	ttom
Range (MHz)	V/m	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.
80-1000	3	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
1000-4200	3	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
4200-6000	3	х	Х	Х	Х	х	Х	х	Х	х	х	х	Х
Antenna Antenna The following cali used: Antenna Antenna The following cali used: 1.8m fro 1.8m fro Note: An "X" ir a remote	tip 2m fro tip 2m fro bration fil- 1.25 m fro bration fil- bration fil- m UFA, 1 m UFA, 1 ndicates the analyzed	om UFA, om UFA, es from UFA, om UFA, es from UFA, es from L .25m hig .25m hig hat the ur r.	1.55m he 1.55m he 1.55m he J:\EMC St 1.25 m hi 1.25 m hi J:\EMC St h 4200 M h 4200 M h 4200 M	ight 80 N ight 80 N uff\Radia igh 1000 uff\Radia Hz - 6000 Hz - 6000	MHz - 100 MHz - 100 ted Immu MHz - 42 MHz - 42 ted Immu O MHz H 3 O MHz V 3 erate as ir	0 MHz H 0 MHz V 10 MHz V 200 MHz H 00 MHz H 10 MHz V 10 MHz H 10 MHz V 10 MHz V 10 MHz H 10 MHz V 10 MHz V 10 MHz H 10 MHz H 10 MHz V 10 MHz H 10 MHZ H 10 MHZ H 10 MHZ H 10 MHZ H 10 MHZ H 10 M	3Vm.crf 3Vm.crf back File: V 3Vm.cr H 3Vm.crf back File:	s\CH6\Cu f s\CH6\Cu	urrent\1-4 urrent\4.2	2 GHz (( - 6.0 GH	Dctober 2 Z (Sept 2	017)\3 Vr 016)\3 Vr	m\ were m\ were

	NTS					ЕМС	Test Data
	Client:	Fitbit, Inc.			PR Nur	nber: JD10	5947
	Product	FB409 and FB410	D		T-Log Nur	nber: T106	007
					Project Man	ager: Deep	a Shetty
	Contact:	Ricky Wang	EN1///NL 004 400 4		Project Engi	neer: -	
Imm	nunity Standard(s):	EN 55024, KN35,	EN/KN 301 489-1,	, -1/	Environi	nent: Radi	o and II E
		R	adiated Imm	unity (EN 61	000-4-3)		
Test S	<b>pecific Details</b> Dbjective: The objective: The objective	ective of this test se pove.	ession is to perform	n final qualification	testing of the EUT wit	h respect to	o the specification
Date Test E Test I	e of Test: 4/27/201 Engineer: Rafael V Location: FT Char	18, 5/4/18 /arelas, J.Caizzi nber #6	Config. Used: Config Change: EUT Voltage:	2 None 220V/60Hz			
Genera The El locate passe Unless side" o Ambie	al Test Configu UT and all local su d outside the char d through ferrite cl s otherwise noted, of the EUT is cons ant Conditions:	uration upport equipment wonber. Interface cab lamps at the exit por the "right side" of idered the side on the side on the Rel. I	vere located on a tu ling to the remote s point from the chamb the EUT is conside the left when stand perature: 22.6 Humidity: 41	urntable in an anecesupport equipment per. red the side on the ling behind the EU °C %	choic chamber. All rer t was routed along the e right when standing I IT.	note suppo floor and, v	rt equipment was where possible, EUT and the "left
Run #	Port	Test	Level	Performar	nce Criteria	C	omments
		Required	Applied	Required	Met / Result	0	omments
<u>EN 5502</u> 1	Enclosure	80-1000 MHz 1kHz 80% AM 3 V/m	80-1000 MHz 1kHz 80% AM 3 V/m	A	A / Pass		
KN35 Re	equirements						
1	Enclosure	80-1000 MHz 1kHz 80% AM 3 V/m	80-1000 MHz 1kHz 80% AM 3 V/m	А	A / Pass		
1	Enclosure	Spot Frequencies 1kHz 80% AM 3 V/m	1800, 2600, 3500, 5000 MHz 1kHz 80% AM 3 V/m	А	A / Pass		



	Client:	Fitbit, Inc.			PR	Number: JD105947	
	Product	FB409 and FB410	)		T-Log Number: T106007		
					Project Manager: Deepa Shetty		
	Contact:	Ricky Wang			Project I	Engineer: -	
Imm	unity Standard(s):	EN 55024, KN35,	EN/KN 301 489-1	, -17	Envi	ronment: Radio and ITE	
EN 301	489-1 V2.1.1 Requ	uirements					
		80-1000 MHz	80-1000 MHz				
1	Enclosuro	1.0-6.0GHz	1.0-6.0GHz	۸	A / Dass	Normal Mode (PLE)	
1	Eliciosule	1kHz 80% AM	1kHz 80% AM	A	A / Fass		
		3 V/m	3 V/m				
		80-1000 MHz	80-1000 MHz				
C	Enclosuro	1.0-6.0GHz	1.0-6.0GHz	۸	A / Dass	Standhy Modo	
Z	Eliciosule	1kHz 80% AM	1kHz 80% AM	A	A/PdSS	Stational mode	
		3 V/m	3 V/m				

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 S/N: B2-E-271 (BLE)



											-		
	Client:	Fitbit, In	C.						PR	Number:	JD10594	17	
	Product FB409 and FB410									Number:	T106007	1	
						Project Manager: Deepa Shetty							
	Contact.	Ricky W	ana					-	Project [	Engineer	-	nong	
Immunity Sta	ndard(s)	EN 5502	24 KN35	FN/KN ?	101 489-1	-17			Envi	ironment <sup>.</sup>	Radio ar	nd ITF	
	nuaru(3).		. <del>,</del> KNJJ,		01 407-1	, - 17				ionnent.	Radio ai		
Run #1: Radiate	d Immun	ity, 80-6	000 MHz	(EN6100	10-4-3), Ta	x Mode				-			
		Fr	equency:	80-100	)0 MHz	1-4.2	? GHz	4.2-6	5 GHz				
		S	tep Size:	1	%	1	%	1	%				
		Dı	well time:	2874	ms	2874	ms	2874	ms				
		Field U	niformity:	1.5m <sup>-</sup>	x 1.5m	1.0m :	x 1.0m	1.0m	x 1.0m				
		Test	Distance:	2	.m	1.2	25m	1.	8m				
										-	Fro	ont	
		ſ <u></u>	Mod	ulation D	etails		]						
		Modu	ulating Fre	equency:	1 kHz		1			Left	t El	JT F	light
			Mc	dulation:	AM		1						
			Depth / C	Deviation:	80%		1				Re	ear	
			t										
Frequency	Level	Fr	ont	Left	Side	R	ear	Ri	ght	Т	ор	Bot	itom
Range (MHz)	V/m	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.
80-1000	3	Х	X	X	X	X	X	X	Х	X	Х	X	Х
1000-4200	3	x	X	X	X	X	X	X	х	X	X	X	X
4200-6000	3	x	χ	χ	x	χ	χ	χ	χ	χ	χ	x	x
KN35 Spot	.3	X	X	X	X	X	X	X	X	X	X	X	X
Frequencies	<u> </u>							•			**		
(Note 2)		l											
		l		L		<u> </u>							
The following cali used: Antenna Antenna The following cali used: Antenna Antenna The following cali	bration file tip 2m fro tip 2m fro bration file 1.25 m fro 1.25m fro bration file	es from L om UFA, om UFA, es from L rom UFA, om UFA, es from L	J:\EMC St 1.55m he 1.55m he J:\EMC St , 1.25 m h 1.25 m h J:\EMC S <sup>-</sup>	uff\Radia ight 80 N ight 80 N tuff\Radia nigh 1000 tuff\Radia	ited Immu VIHz - 100 VIHz - 100 ated Immu ) MHz - 42 MHz - 42 ated Immu	inity Playl )0 MHz H )0 MHz V jnity Play 200 MHz 00 MHz H unity Play	back File: 3Vm.crf 3Vm.crf back File: V 3Vm.cr 3Vm.crl back File	s\CH6\Cı s\CH6\Cı f s\CH6\Cı	urrent\80- urrent\1-4 urrent\4.2	1000 MH 2 GHz (( 2 - 6.0 GH	z 12Vm (/ October 2 IZ (Sept 2	April 2016 017)\3 Vr 016)\3 Vr	5)\ were n\ were n\ were
used:											= v- i	/	
1.8m fro 1.8m fro	m UFA, 1 m UFA, 1	.25m hig .25m hig	h 4200 M h 4200 M	Hz - 600( Hz - 600(	) MHz H ( ) MHz V (	3Vm.crf 3Vm.crf							
Note: An "X" in	ndicates tl	nat the ur	nit continu	Jed to op	erate as ir	ntended.	The BLE	was con	ifigured to	o receive	continuou	is data fro	om a
remote c	longle an	d the NF	C was ver	rified for a	operation	at the rer	mote tag	reader du	uring and	after test	ing. There	e were no	o data
errors re	ported by	, the mon	nitori <u>ng so</u>	oftwa <u>re fo</u>	r BL <u>E mo</u> r	de.			č		ŭ		_
Note 2: Radiated	d Immunit	y Spot Te	ests at 18	00, 2600	, 3500 an	d 5000M	Hz (+/- 19	%)					
Note 3: The follo	wing exc	lusion ba	nds were	used per	EN 301	489-1:	· · ·						
-													



Client:	Fitbit, Inc.	PR Number:	JD105947
Product	FB409 and FB410	T-Log Number:	T106007
		Project Manager:	Deepa Shetty
Contact:	Ricky Wang	Project Engineer:	-
Immunity Standard(s):	EN 55024, KN35, EN/KN 301 489-1, -17	Environment:	Radio and ITE

# EN 301 489-1 Exclusion Bands:

	Ba	ind	Bandwidth	Exclusion Band		
	Start (MHz)	Stop (MHz)	(MHz)	Start (MHz)	Stop (MHz)	
Bluetooth	2400	2483.5	-	2280	2603.5	



	Client:	it: Fitbit, Inc.					PR	Number:	JD10594	47			
	Product	FB409 and FB410				T-Log	Number:	T106007	/				
						Project N	Manager:	Deepa S	shetty				
	Contact:	: Ricky Wang				Project E	Engineer	-					
Immunity Star	ndard(s):	EN 5502	24, KN35,	EN/KN 3	01 489-1	, -17			Envi	ronment:	Radio ar	nd ITE	
Run #2: Radiated Immunity, 80-6000 MHz (EN61000-4-3), Standby Mode													
		Fr	equency:	80-100	0 MHz	1-4.2	GHz	4.2-6	GHz				
		S	tep Size:	1	%	1	%	1	%				
		D	well time:	2874	ms	2874	ms	2874	ms				
		Field U	niformity:	1.5m x	x 1.5m	1.0m :	x <u>1.0</u> m	1.0m :	x 1.0m				
		Test	Distance:	2	m	1.2	25m	1.8	8m				
		·					•			•	Fro	ont	
			Mod	ulation De	etails								
		Modu	ulating Fre	equency:	1 kHz					Lef	t El	JT F	Right
			Mc	dulation:	AM								
			Depth / D	eviation:	80%						Re	ear	
										1			
Frequency	Level	Fr	ont	Left	Side	Re	ear	Ri	ght	T	ор	Bot	ttom
Range (MHz)	V/m	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.
80-1000	3	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
1000-4200	3	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
4200-6000	3	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
The following calibration files from U:\EMC Stuff\Radiated Immunity Playback Files\CH6\Current\80-1000 MHz 12Vm (April 2016)\ were used: Antenna tip 2m from UFA, 1.55m height 80 MHz - 1000 MHz H 3Vm.crf Antenna tip 2m from UFA, 1.55m height 80 MHz - 1000 MHz V 3Vm.crf The following calibration files from U:\EMC Stuff\Radiated Immunity Playback Files\CH6\Current\1-4.2 GHz (October 2017)\3 Vm\ were used: Antenna 1.25 m from UFA, 1.25 m high 1000 MHz - 4200 MHz V 3Vm.crf Antenna 1.25m from UFA, 1.25 m high 1000 MHz - 4200 MHz V 3Vm.crf The following calibration files from U:\EMC Stuff\Radiated Immunity Playback Files\CH6\Current\4.2 - 6.0 GHZ (Sept 2016)\3 Vm\ were used: 1.8m from UFA, 1.25m high 4200 MHz - 6000 MHz H 3Vm.crf 1.8m from UFA, 1.25m high 4200 MHz - 6000 MHz V 3Vm.crf													
Note 1 An "X" in a remote	idicates ti	nat the ur <u>r.</u>		ied to ope	erate as II	ntended.	The EUT	was moi	nitored fo	r any uni	ntentiona	I transmis	SSIONS by



# Appendix C Product Labeling Requirements

The following information has been provided to clarify notification, equipment labeling requirements and information that must be included in the operator's manual. These requirements may be found in the standards/regulations listed in the scope of this report.

### Label Location

The required label(s) must be in a *conspicuous location* on the product, which is defined as any location readily visible to the user of the device without the use of tools.

### Label Attachment

The label(s) must be *permanently attached* to the product, which is defined as attached such that it can normally be expected to remain fastened to the equipment during the equipment's expected useful life. A paper gum label will generally <u>not</u> meet this condition.

### United States Class B Label

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

If the device is too small or for such use that it is not practicable to place the US label statement on it, the statement shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed

For FCC, a unique identifier shall appear on the product label. The importer or manufacturer shall maintain adequate identification records to facilitate positive identification of each product sold.

### United States Class B Label

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

If the device is too small or for such use that it is not practicable to place the US label statement on it, the statement shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed



Japanese Class B Label



#### Industry Canada

For ICES-003 Issue 6, the product must be labeled with the following Innovation, Science and Economic Development Canada ICES-003 Compliance Label:

```
CAN ICES-3 (*)/NMB-3(*)
```

\*Insert either "A" or "B" but not both to identify the applicable Class of ITE.

If the product is too small then the text may be placed in the manual with the approval of ISED Canada.

#### Vietnam

For TCVN 7189:2009, the product must be labeled with the following label which can be printed by the manufacturer. The label should also include the approval holder's name (brand of manufacturer can be accepted) and CODE (certificate number or code listed on the approval). The color of the label is not officially specified, but black is recommended. The minimum size of the label is not specified, but it must be clearly visible.



# Appendix D User Manual Regulatory Statements

Where special accessories, such as shielded cables, are required in order to meet the emission limits, appropriate instructions regarding the need to use such accessories must be contained on the first page of text concerned with the installation of the device in the operator's manual.

A requirement by FCC regulations, and recommended for all regulatory markets, is a cautionary statement to the end user that changes or modifications to the device not expressly approved by you, the manufacturer, could void their right to operate the equipment.

### United States Class B Manual Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures: -Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and the receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/TV technician for help.

Note: Additional information about corrective measures may also be provided to the user at the company's option.

The FCC has indicated that the radio interference statement be bound in the same manner as the operator's manual. Thus, a loose-leaf insert page in a bound or center-spine and stapled manual would <u>not</u> meet this condition.

### Japanese Class B Manual Statement

この装置は、クラスB機器です。この装置は、住宅環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。取扱説明書に従って正しい取り扱いをして下さい。 VCCI-B

The English translation for the text is: *This is Class B equipment. Although this equipment is intended for use in residential environment, it could cause poor reception if used near a radio or television receiver. Please follow instructions in the instruction manual.* 



# Appendix E Additional Information for VCCI

The VCCI requires a notification for each product sold with the VCCI label. The "Report of Compliance" is submitted electronically on the VCCI web site <a href="https://www.vcci.jp/senyo/tekigou\_kakunin/">https://www.vcci.jp/senyo/tekigou\_kakunin/</a>. Enter your registered email and password and click "OK". Then click "New report" to open the submission form. Fill all required information and click "CONFIRM" after making sure everything is filled properly. Click "Report" on the confirmation page. Further information may be found at: <a href="https://www.vcci.jp/english/member/tekigou\_kakunin/manual.pdf">https://www.vcci.jp/english/member/tekigou\_kakunin/</a>.



# Appendix F Additional Information for Australia and New Zealand

In Australia, an application to use the RCM mark must be made by the importer of the product. The importer must hold a Declaration of Conformity and compliance folder, of which this report forms a part, for each product sold with a RCM mark. Information about the mark can be found at <a href="http://www.acma.gov.au/Industry/Suppliers/Supplier-resources/Supplier-overview/new-single-compliance-mark">http://www.acma.gov.au/Industry/Suppliers/Supplier-resources/Supplier-overview/new-single-compliance-mark</a>.

The European harmonized standards (EN) and international (CISPR/IEC) standards are acceptable for demonstrating compliance with the Australian/New Zealand compliance framework. This is explained in the document "Electromagnetic compatibility requirements for suppliers of electrical and electronic devices, vehicles and devices with internal combustion engines in Australia", dated March 2014. Follow the link for the booklet on the page <a href="http://acma.gov.au/Industry/Suppliers/Equipment-regulation/EMC-Electromagnetic-compatibility/emc-booklet-and-standard">http://acma.gov.au/Industry/Suppliers/Equipment-regulation/EMC-Electromagnetic-compatibility/emc-booklet-and-standard</a>.

Follow the link below to the ACMA EMC information site and click on the link "list of EMC standards" which lists Australia, EN and international standards that are acceptable: <u>http://www.acma.gov.au/theACMA/how-to-use-the-emc-standards-list</u>

# Appendix G Basic and Reference Standards

### Subpart B of Part 15 of FCC Rules for digital devices.

FCC Part 15 Subpart B references the use of ANSI C63.4–2014: "*Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz*" for the purposes of evaluating the radiated and conducted emissions from digital devices.

### Industry Canada Interference Causing Equipment Standard ICES-003 Issue 6, January 2016

ICES 003 refers to ANSI C63.4-2014 and Canadian Standards Association Standard CAN/CSA-CEI/IEC CISPR 22: 10, "Information technology equipment - Radio disturbance characteristics - Limits and Methods of Measurement." This standard is an adoption of IEC CISPR 22:2008-09, sixth edition, with Canadian deviations.

### VCCI Regulations For Information Technology Equipment, dated November 2016

The VCCI Rules for voluntary control measures of radio interference generated by Information Technology Equipment make reference to the following national and international standards for the purposes of making measurements. NTS's test procedures associated with measurements against VCCI rules use these standards in addition to the procedures laid out in the VCCI regulations.

Standard	Description / Title
VCCI-CISPR 32: 2016	"Technical Requirements" for multimedia equipment
CISPR 16-1-1:2010	Specification for radio disturbance and immunity measuring apparatus and method –
	Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring
	apparatus.
CISPR 16-1-2:2003	Specification for radio disturbance and immunity measuring apparatus and methods –
	Part 1-2: Radio disturbance and immunity measuring apparatus – Measuring
	apparatus – Ancillary equipment – Conducted disturbances
CISPR 16-1-4:2010	Specification for radio disturbance and immunity measuring apparatus and methods
	-Part 1-4: Radio disturbance and immunity measuring apparatus - Ancillary
	equipment – Radio disturbances
CISPR 16-2-3:2010	Specification for radio disturbance and immunity measuring apparatus and methods –
	Part 2-3: Methods of measurement of disturbance and immunity – Radiated
	disturbance measurements
CISPR 16-4-2:2011	Specification for radio disturbance and immunity measuring apparatus and methods –
	Part 4-2: Uncertainties, statistics and limit modeling – Uncertainty in EMC
	measurements
IEC 61000-4-6:2008	Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement
	techniques – Immunity to conducted disturbances, induced by radio-frequency fields
ANSI C63.5-2006	American National Standard for Electromagnetic Compatibility – Radiated Emission
	Measurements in Electromagnetic Interference (EMI) Control - Calibration of
	Antennas (9kHz to 40 GHz)



### EN 55022:2010

EN 55022 references various international and European standards to be used when making the required measurements. The references all cite dated versions of the standards, therefore the editions cited are used.

International and	Description	Standard Used		
EN equivalent				
standard				
CISPR 16-1-1:2006	Specification for radio disturbance and immunity measuring	CISPR 16-1-1 2006		
+A1:2006	apparatus and methods – Part 1-1: Radio disturbance and	+A1:2006		
EN 55016-1-1:2007	immunity measuring apparatus - Measuring apparatus	+A2:2007		
+A1:2007				
CISPR 16-1-2:2003	Specification for radio disturbance and immunity measuring	CISPR 16-1-2:2003		
+A1:2004	apparatus and methods – Part 1-2: Radio disturbance and	+A1:2004		
+A2:2006	immunity measuring apparatus - Ancillary equipment - Conducted	+A2:2006		
EN 55016-1-2:2004	disturbances			
+A1:2005				
+A2:2006				
CISPR 16-1-4:2007	Specification for radio disturbance and immunity measuring	CISPR 16-1-4:2007		
EN 55016-1-4: 2007	apparatus and methods – Part 1-4: Radio disturbance and			
	immunity measuring apparatus - Ancillary equipment - Radiated			
	disturbances			
CISPR 16-2-3:2003	Specification for radio disturbance and immunity measuring	CISPR 16-2-3:2006		
+A1:2005	apparatus and methods – Part 2-3: Methods of measurement of			
EN 55016-2-3:2004	disturbances and immunity – Radiated disturbance measurements			
+A1:2005				
CISPR 16-4-2:2003	Specification for radio disturbance and immunity measuring	CISPR 16-4-2:2003		
EN 55016-4-2 2004	apparatus and methods – Part 4-2: Uncertainties, statistics and			
	limit modelling - Uncertainty in EMC measurements			
Unless the international publication has been modified by common modifications, indicated by (mod), either the				
international or the EN standard may be used. Where the EN standard differs from the international standard then				
the EN version is used. For all of the standards listed above there are no common modifications therefore National				
Technical Systems makes use of the international version of all standards listed.				



### CISPR 22:2008

CISPR 22 references various IEC basic standards to be used when making the required measurements. When the referenced standard is cited by version (date or revision) then that version is used except where noted. In instances where the standards are referenced without citing the version to be used, the current versions are used.

International and	Description	Standard Used		
EN equivalent	-			
standard				
CISPR 16-1-1:2006	Specification for radio disturbance and immunity measuring	CISPR 16-1-1:2006		
+A1:2006	apparatus and methods – Part 1-1: Radio disturbance and	+A1:2006		
+A2:2007	immunity measuring apparatus - Measuring apparatus	+A2:2007		
EN 55016-1-1:2007				
+A1:2007				
+A2:2008				
CISPR 16-1-2:2003	Specification for radio disturbance and immunity measuring	CISPR 16-1-2:2003		
+A1:2004	apparatus and methodsPart 1-2: Radio disturbance and immunity	+A1:2004		
+A2:2006	measuring apparatus - Ancillary equipment - Conducted	+A2:2006		
EN 55016-1-2 2004	disturbances			
+ A1 2005				
CISPR 16-1-4:2007	Specification for radio disturbance and immunity measuring	CISPR 16-1-4:2007		
EN 55016-1-4: 2007	apparatus and methodsPart 1-4: Radio disturbance and immunity			
	measuring apparatus - Ancillary equipment - Radiated			
	disturbances			
CISPR 16-2-3:2006	Specification for radio disturbance and immunity measuring	CISPR 16-2-3:2006		
EN 55016-2-3:2006	apparatus and methods –Part 2-3: Methods of measurement of			
	disturbances and immunity - Radiated disturbance measurements			
CISPR 16-4-2 2003	Specification for radio disturbance and immunity measuring	CISPR 16-4-2 2003		
EN 55016-4-2 2004	apparatus and methods - Part 4-2: Uncertainties, statistics and limit			
	modeling - Uncertainty in EMC measurements			
Unless the international publication has been modified by common modifications, indicated by (mod), either the				
international or the EN standard may be used. Where the EN standard differs from the international standard then				
the EN version is used. For all of the standards listed above there are no common modifications therefore National				
Technical Systems ma	Technical Systems makes use of the international version of all standards listed.			



### EN 55032:2012 (CISPR 32:2012)

EN 55032 (CISPR 32) references various IEC basic standards to be used when making the required measurements. When the referenced standard is cited by version (date or revision) then that version is used except where noted. In instances where the standards are referenced without citing the version to be used, the current versions are used.

International and	Description	Standard Used		
EN equivalent				
standard				
CISPR 16-1-1:2010	Specification for radio disturbance and immunity measuring	CISPR 16-1-1:2010		
+A1:2010	apparatus and methods – Part 1-1: Radio disturbance and immunity	+A1:2010		
	measuring apparatus - Measuring apparatus	+A2:2014		
CISPR 16-1-2:2003	Specification for radio disturbance and immunity measuring	CISPR 16-1-2:2003		
+A1:2004	apparatus and methods –Part 1-2: Radio disturbance and immunity	+A1:2004		
+A2:2006	measuring apparatus - Ancillary equipment - Conducted disturbances	+A2:2006		
CISPR 16-1-4:2010	Specification for radio disturbance and immunity measuring	CISPR 16-1-4:2010		
	apparatus and methods –Part 1-4: Radio disturbance and immunity	+A1:2012		
	measuring apparatus – Antennas and test sites for radiated			
	disturbance measurements			
CISPR 16-2-1:2008	Specification for radio disturbance and immunity measuring	CISPR 16-2-1:2008		
+A1:2010	apparatus and methods – Part 2-1: Methods of measurement of	+A1:2010		
	disturbances and immunity – Conducted disturbance measurements			
CISPR 16-2-3:2010	Specification for radio disturbance and immunity measuring	CISPR 16-2-3:2010		
	apparatus and methods –Part 2-3: Methods of measurement of	+A1:2010		
	disturbances and immunity – Radiated disturbance measurements			
CISPR 16-4-2:2011	Specification for radio disturbance and immunity measuring	CISPR 16-4-2:2011		
	apparatus and methods – Part 4-2: Uncertainties, statistics and limit	+A1:2014		
	modeling – Measurement instrumentation uncertainty			
CISPR/TR 16-4-	Specification for radio disturbance and immunity measuring	CISPR/TR 16-4-		
3:2004	apparatus and methods – Part 4-3: Uncertainties, statistics and limit	3:2004		
+A1:2006	modeling – Statistical considerations in the determination of EMC	+A1:2006		
	compliance of mass-produced products			
IEC 60050-	International Electrotechnical Vocabulary – Chapter 161:	IEC 60050-		
161:1990	Electromagnetic compatibility	161:1990		
IEC 61000-4-6:2008	Electromagnetic compatibility (EMC) – Part 4-6: Testing and	IEC 61000-4-6:2008		
	measurement techniques – Immunity to conducted disturbances,			
	induced by radio-frequency fields			
ISO/IEC	General requirements for the competence of testing and calibration	ISO/IEC		
17025:2005	laboratories	17025:2005		
IEEE Std 802.3	IEEE Standard for Information technology – Specific requirements –	IEEE Std 802.3		
	Part 3: Carrier Sense Multiple Access with Collision Detection			
	(CMSA/CD) Access Method and PHysical Layer Specifications			
ANSI C63.5-2006	American National Standard (for) Electromagnetic Compatibility –	ANSI C63.5-2006		
	Radiated Emission Measurements in Electromagnetic Interference			
	(EMI) Control – Calibration of Antennas (9 kHz to 40 GHz)			
Unless the internation	al publication has been modified by common modifications, indicated by	(mod), either the		
international or the EN standard may be used. Where the EN standard differs from the international standard then				
the EN version is used. For all of the standards listed above there are no common modifications therefore National				
Technical Systems makes use of the international version of all standards listed.				



### TCVN 7189:2009

TCVN 7189 references various IEC basic standards and TCVN standards to be used when making the required measurements. When the referenced standard is cited by version (date or revision) then that version is used except where noted. In instances where the standards are referenced without citing the version to be used, the current versions are used.

TCVN and	Description	Standard Used		
international				
equivalent standard				
IEC 60083:1997	Plugs and socket-outlets for domestic and similar general use	IEC 60083:2009		
	standardized in member countries of IEC			
TCVN 8241-4-	Section 6: Immunity to conducted disturbances, induced by radio-	IEC 61000-4-6:2008		
6:2009	frequency fields			
IEC 61000-4-6:2005				
TCVN 6988:2006	Industrial, scientific and medical equipment – Radio-frequency	CISPR 11:2010		
CISPR 11:2004	disturbance characteristics - Limits and methods of measurement	+A1:2010		
TCVN 7600:2006	Sound and television broadcast receivers and associated	CISPR 13:2001		
IEC/CISPR 13:2003	equipment – Radio disturbance characteristics – Limits and	+A1:2003		
	methods of measurement	+A2:2006		
TCVN 6989-1-	Specification for radio disturbance and immunity measuring	CISPR 16-1-1:2006		
1:2008	apparatus and methods – Part 1-1: Radio disturbance and	+A1:2006		
CISPR 16-1-1:2006	immunity measuring apparatus - Measuring apparatus	+A2:2007		
CISPR 16-1-2:2003	Specification for radio disturbance and immunity measuring	CISPR 16-1-2:2003		
+A1:2004	apparatus and methods –Part 1-2: Radio disturbance and immunity	+A1:2004		
	measuring apparatus - Ancillary equipment - Conducted	+A2:2006		
	disturbances			
CISPR 16-1-4:2007	Specification for radio disturbance and immunity measuring	CISPR 16-1-4:2007		
	apparatus and methods –Part 1-4: Radio disturbance and immunity			
	measuring apparatus - Ancillary equipment - Radiated			
	disturbances			
CISPR 16-2-3:2006	Specification for radio disturbance and immunity measuring	CISPR 16-2-3:2006		
	apparatus and methods –Part 2-3: Methods of measurement of			
	disturbances and immunity – Radiated disturbance measurements			
CISPR 16-4-2 2003	Specification for radio disturbance and immunity measuring	CISPR 16-4-2 2003		
	apparatus and methods –Part 4-2: Uncertainties, statistics and limit			
	modeling - Uncertainty in EMC measurements			
Unless the international publication has been modified by common modifications, indicated by (mod), either the				
international or the TCVN standard may be used. Where the TCVN standard differs from the international				
standard then the TCVN version is used. For all of the standards listed above there are no common modifications				
therefore National Technical Systems makes use of the international version of all standards listed.				



### EN 55024:2010

EN 55024 references various European standards to be used when making the required measurements. When the referenced standard is cited by version (date or revision) then that version is used except where noted. In instances where the standards are referenced without citing the version to be used, the current versions (or its international equivalent) are used.

Referenced standard	Description	Standard Used
IEC 60050-161:1990	International Electrotechnical Vocabulary (IEV) -	IEC 60050-161:1990
	Chapter 161: Electromagnetic compatibility	
IEC 60318-1:2009	Electroacoustics - Simulators of human head and ear -	N/A
EN 60318-1:2009	Part 1: Ear simulator for the measurement of supra-aural and	(The EUT tested did
	circumaural earphones	not require the use of
		an ear simulator)
IEC 61000-4-2:2008	Electromagnetic compatibility (EMC) Part 4: Testing and	IEC 61000-4-2:2008
EN 61000-4-2:2009	measurement techniques -" Section 2: Electrostatic discharge	EN 61000-4-2:2009
	immunity test	
IEC 61000-4-3:2006	Section 3: Radiated, radio-frequency, electromagnetic field	IEC 61000-4-3:2006
+A1:2007	immunity test	A1:2007
+A2:2010		A2:2010
EN 61000-4-3:2006		EN 61000-4-3:2006
+A1:2008		A1:2008
+A2:2010		A2:2010
IEC 61000-4-4:2004	Section 4: Electrical fast transient/burst immunity test	IEC 61000-4-4:2012
EN 61000-4-4:2004		EN 61000-4-4:2102
IEC 61000-4-5: 2005	Section 5: Surge immunity test	IEC 61000-4-5:2005
EN 61000-4-5 :2006		EN 61000-4-5:2006
IEC 61000-4-6 :2008	Section 6: Immunity to conducted disturbances, induced by	IEC 61000-4-6:2008
EN 61000-4-6:2009	radio-frequency fields	EN 61000-4-6:2009
IEC 61000-4-8 :2009	Section 8: Power frequency magnetic field immunity test	IEC 61000-4-8 2009
EN 61000-4-8:2010		EN 61000-4-8:2010
IEC 61000-4-11:2004	Section 11: Voltage dips, short interruptions and voltage	IEC 61000-4-11:2004
EN 61000-4-11:2004	variations immunity tests	EN 61000-4-11:2004
CISPR 16-1-2:2003	Specification for radio disturbance and immunity measuring	CISPR 16-1-2:2003
A+1:2004	apparatus and methods - Part 1-2: Radio disturbance and	A+1:2004
+A2:2006	immunity measuring apparatus - Ancillary equipment -	+A2:2006
EN 55016-1-2:2004	Conducted disturbances	EN 55016-1-2:2004
+A1:2005		+A1:2005
+A2:2006		+A2:2006
CISPR 20:2006	Sound and television broadcast receivers and associated	CISPR 20:2006
EN 55020:2007	equipment – Immunity characteristics - Limits and methods of	EN 55020:2007
	measurement	
CISPR 22:2008 (mod)	Information technology equipment – Radio disturbance	CISPR 22:2008 (mod)
EN 55022 2010	characteristics - Limits and methods of measurement	EN 55022 2010



### CISPR 24:2010

CISPR 24 references various IEC basic standards to be used when making the required measurements. When the referenced standard is cited by version (date or revision) then that version is used except where noted. In instances where the standards are referenced without citing the version to be used, the current versions are used.

Referenced standard	Description	Standard Used
IEC 60050-161:1990	International Electrotechnical Vocabulary (IEV) -	IEC 60050-161:1990
	Chapter 161: Electromagnetic compatibility	
IEC 60318-1:2009	Electroacoustics - Simulators of human head and ear -	N/A
	Part 1: Ear simulator for the measurement of supra-aural and	(The EUT tested did
	circumaural earphones	not require the use of
	1	an ear simulator)
IEC 61000-4-2:2008	Electromagnetic compatibility (EMC) Part 4: Testing and	IEC 61000-4-2:2008
	measurement techniques -" Section 2: Electrostatic discharge	EN 61000-4-2:2009
	immunity test	
IEC 61000-4-3:2006	Section 3: Radiated, radio-frequency, electromagnetic field	IEC 61000-4-3:2006
+A1:2007	immunity test	+A1:2007
+A2:2010		+A2:2010
		EN 61000-4-3:2006
		+A1:2008
		+A2:2010
IEC 61000-4-4:2004	Section 4: Electrical fast transient/burst immunity test	IEC 61000-4-4:2012
		EN 61000-4-4:2012
IEC 61000-4-5: 2005	Section 5: Surge immunity test	IEC 61000-4-5:2005
		EN 61000-4-5:2006
IEC 61000-4-6 :2008	Section 6: Immunity to conducted disturbances, induced by	IEC 61000-4-6:2008
	radio-frequency fields	EN 61000-4-6:2009
IEC 61000-4-8 :2009	Section 8: Power frequency magnetic field immunity test	IEC 61000-4-8:2009
		EN 61000-4-8:2010
IEC 61000-4-11:2004	Section 11: Voltage dips, short interruptions and voltage	IEC 61000-4-11:2004
	variations immunity tests	EN 61000-4-11:2004
CISPR 16-1-2:2003	Specification for radio disturbance and immunity measuring	CISPR 16-1-2:2003
+A1:2004	apparatus and methods - Part 1-2: Radio disturbance and	+A1:2004
+A2:2006	immunity measuring apparatus - Ancillary equipment -	+A2:2006
	Conducted disturbances	EN 55016-1-2:2004
		+A1:2005
		+A2:2006
CISPR 20:2006	Sound and television broadcast receivers and associated	CISPR 20:2006
	equipment – Immunity characteristics - Limits and methods of	EN 55020:2007
	measurement	
CISPR 22:2008	Information technology equipment – Radio disturbance	CISPR 22:2008 (mod)
	characteristics - Limits and methods of measurement	EN 55022:2010



# End of Report

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