Prüfbericht-Nr.: *Test Report No.*:	**50270953 001**	**Auftrags-Nr.:** *Order No.*:	238106588	Seite 1 von 31 *Page 1 of 31*
Kunden-Referenz-Nr.: *Client Reference No.*:	N/A	**Auftragsdatum:** *Order date*:	20-Jun-2019	
Auftraggeber: *Client*:	Anhui Huami Information Technology Co.,Ltd. Room 1201, Building A4, National Animation Industry Base, No. 800 Wangjiang West Road, Gaoxin District, Hefei, Anhui, China			
Prüfgegenstand: *Test item*:	Amazfit Strators 3			
Bezeichnung / Typ-Nr.: *Identification / Type No.*:	A1929			
Auftrags-Inhalt: *Order content*:	FCC Part 15C, IC RSS-247 Issue 2 (BLE)			
Prüfgrundlage: *Test specification*:	FCC 47CFR Part 15: Subpart C Section 15.247(DTS) FCC 47CFR Part 2: Subpart J Section 2.1093 RSS-247 Issue 2 Feb 2017 RSS-102 Issue 5 Mar 2015			

Wareneingangsdatum: *Date of receipt*:	21-Jun-2019
Prüfmuster-Nr.: *Test sample No.*:	A000944312-001, 002
Prüfzeitraum: *Testing period*:	27-Jun-2019 ~ 22-Jul-2019
Ort der Prüfung: *Place of testing*:	EMC/RF Laboratory Taipei
Prüflaboratorium: *Testing laboratory*:	TUV Rheinland Taiwan Ltd.
Prüfergebnis*: *Test result**:	Pass

geprüft von / *tested by*:

Datum *Date(Report Date)*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*
2019-08-06	Mars Y.J. Lin / Project Engineer	

kontrolliert von / *reviewed by*:

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*
2019-08-06	Brenda S. H. Chen / Senior Project Manager	

Sonstiges / *Other*:

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery*:	Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT
RESULT: Passed

5.1.2 PEAK OUTPUT POWER
RESULT: Passed

5.1.3 6DB & 99% BANDWIDTH
RESULT: Passed

5.1.4 POWER DENSITY
RESULT: Passed

5.1.5 CONDUCTED SPURIOUS EMISSIONS AND FREQUENCY BAND EDGE MEASURED IN 100KHZ BANDWIDTH
RESULT: Passed

5.1.6 SPURIOUS EMISSION
RESULT: Passed

5.2.1 MAINS CONDUCTED EMISSIONS
RESULT: Passed

6.1.1 ELECTROMAGNETIC FIELDS
RESULT: Passed

Contents

1. General Remarks

1.1 Complementary Materials

These attachments are integral parts of this test report:

Appendix P: Photo Documentation internal view
(File Name: 50270952 50270953 50270954 001 Appendix P)

Appendix D: Test Result of Radiated Emissions
(File Name: 50270953 001 Appendix D)

Appendix E: Photographs of the Test Set-Up
(File Name: 50270952 50270953 50270954 001 Appendix E)

Test Specifications

The following standards were applied.

Table 1: Applied Standard and Test Levels

Radio
FCC CFR47 Part 15: Subpart C Section 15.247
FCC 47CFR Part 2: Subpart J Section 2.1093
ANSI C63.10:2013
KDB558074 D01 DTS Meas Guidance v05
RSS-247 Issue 2 Feb 2017
RSS-102 Issue 5 Mar 2015
RSS-Gen Issue 5 Apr 2018

The decision rule of conformity of this test report is following the requirements of the requested standard in the quotation, and agreed among testing laboratory and manufacturer (applicant) to exclude the consideration of Measurement Uncertainty, unless it is required by the specific standard.

2. Test Sites

2.1 Test Laboratory

TUV Rheinland Taiwan Ltd.
Taipei Testing Laboratories

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

2.2 Test Facility

TUV Rheinland Taiwan Ltd.

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

FCC Registration No.: 180491
IC Canada Registration No.: 9465A
TAF Accredited NCC Test Lab. No.:3567
TAF ISO17025 Certification effective period: 6th-May-2019 to 05th-May-2022

Testing Laboratory
3567

2.3 List of Test and Measurement Instruments

Table 2: List of Test and Measurement Equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100797	2019/01/16	2020/01/16
Two-Line V-Network	Rohde & Schwarz	ENV216	101243	2019/06/23	2020/06/23
Telecom ISN 2 Line	Fischer Custom Communications	FCC-TLISN-T2-02-09	101169	2018/08/24	2019/08/24
Telecom ISN 4 Line	Fischer Custom Communications	FFCC-TLISN-T4-02-09	101168	2019/01/02	2020/01/02
Impedance Stabilization Network	TESEQ	ISN T800	51949	2019/02/20	2020/02/20
Test Software	Audix	e3	Ver. 9	N/A	N/A
EMI Test Receiver	Rohde & Schwarz	ESR 7	101062	2018/10/01	2019/10/01
Spectrum Analyzer	Rohde & Schwarz	FSV-40	101514	2019/02/07	2020/02/07
Pre-Amplifier	Hewlett Packard	8447F	2805A03335	2018/08/22	2019/08/22
Pre-Amplifier	EM Electronics	EM01G18G	060558	2018/11/30	2019/11/30
Pre-Amplifier	EMC Instruments	EMC184045SE	980652	2019/02/25	2020/02/25
Bilog Antenna	TESEQ	CBL 6111D	29802	2018/08/22	2019/08/22
Horn Antenna	ETS-Lindgren	3117	00218931	2018/12/27	2019/12/27
Horn Antenna	Com-Power	AH-840	101029	2018/12/22	2019/12/22
Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	2019/07/11	2020/07/11
Spectrum Analyzer	Agilent	N9010A	MY53470241	2019/06/17	2020/06/17
Power Meter	Anritu	ML2495A	1901008	2019/04/29	2020/04/29

2.4 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.5 Calibration

Equipment requiring calibration is calibrated periodically in a suitably accredited Calibration Lab. Additionally all equipment is verified for proper performance on a regular schedule using in house standards or comparisons.

2.6 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements .

Table 3: Emission Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 0.1 ppm
RF power, conducted	± 1.5 dB
RF power density, conducted	± 3 dB
spurious emissions, conducted	± 3 dB
all emissions, radiated	± 6 dB
Temperature	± 1 ºC
Humidity	± 5 %
DC and low frequency voltages	±3 %

3. General Product Information

3.1 Product Function and Intended Use

The EUT is a smart watch. It contains a Bluetooth compatible module enabling the user to communicate data through a Wireless interface.
For details refer to the User Guide, Data Sheet and Block Diagram.

3.2 System Details and Ratings

Table 4: Basic Information of EUT

Item	EUT information
Kind of Equipment/Test Item	Amazfit Strators 3
Type Identification	A1929
FCC ID	2AC8UA1929
IC ID	21806-A1929
HVIN	A1929

Table 5: Technical Specification of EUT

Technical Specification	Value
Operating Frequencies	2402MHz ~ 2480MHz
Channel Spacing	2 MHz
Channel number	40
Operation Voltage	5Vdc
Modulation	GFSK
Antenna gain	-4.7dBi

3.3 Independent Operation Modes

Basic operation modes are:

A. Transmitting
    1. Low channel
    2. Middle channel
    3. High channel
B. Receiving
    1. Low channel
    2. Middle channel
    3. High channel
C. Normal

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Block Diagram.

3.5 Submitted Documents

- Block Diagram
- Instruction Manual
- Rating Label
- Technical Description

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Setup for testing: Test samples are provided with a USB interface which makes it possible to control them through a test software installed on a notebook computer.

This software SmartSnippets.exe was running on the laptop computer connected to the EUT. It was used to enable the operation modes listed in section 3.3 as appropriate.

The samples were used as follows:
A000944312-001 for Conducted test
A000944312-002 for Radiated test

Full test was applied on all test modes, but only worst case was shown.

4.3 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

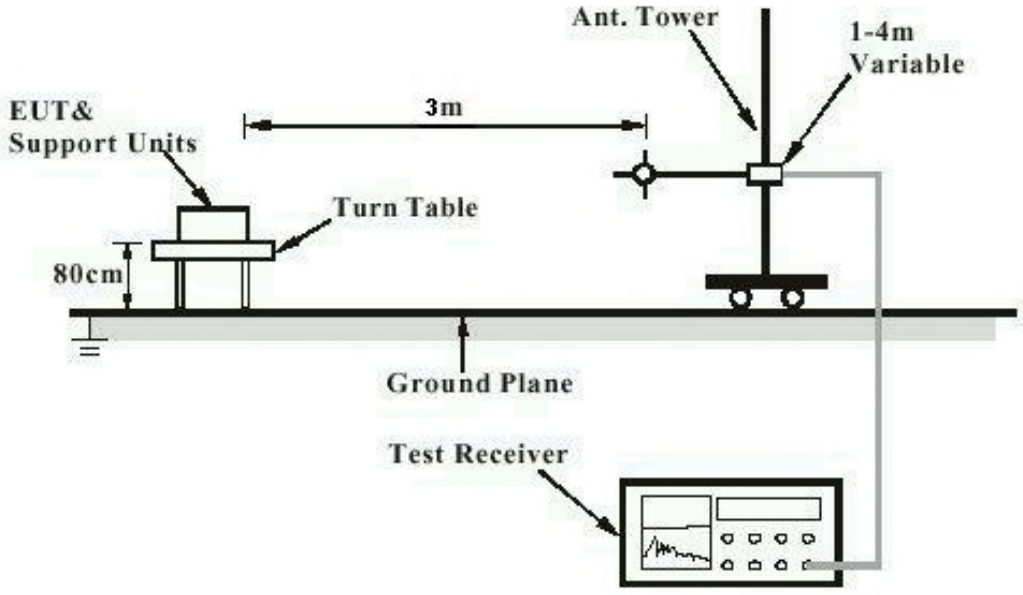
Kind of Equipment	Manufacturer	Model Name	S/N
Fixture	N/A	ARM V9	21557 10034
Notebook(EMC-05)	Lenovo	TP00048A	PB-0F8B2

4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



Note: Measurements above 1 GHz are done with a table height of 1.5m

Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)

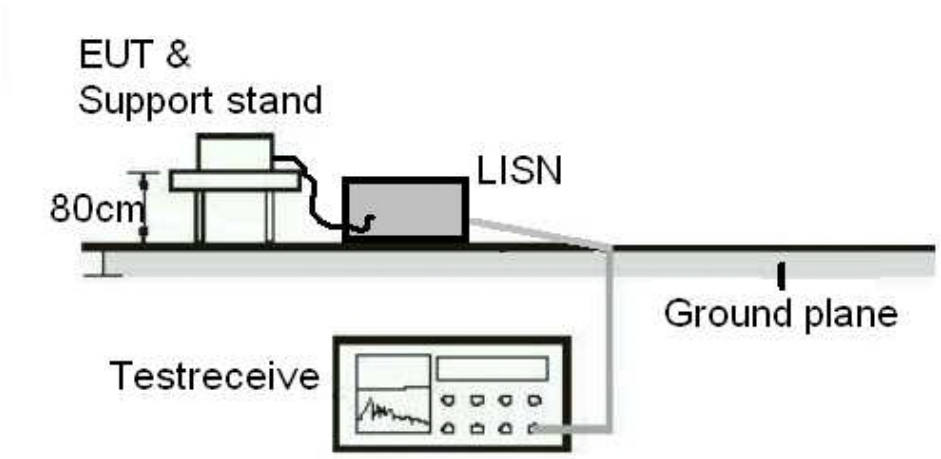
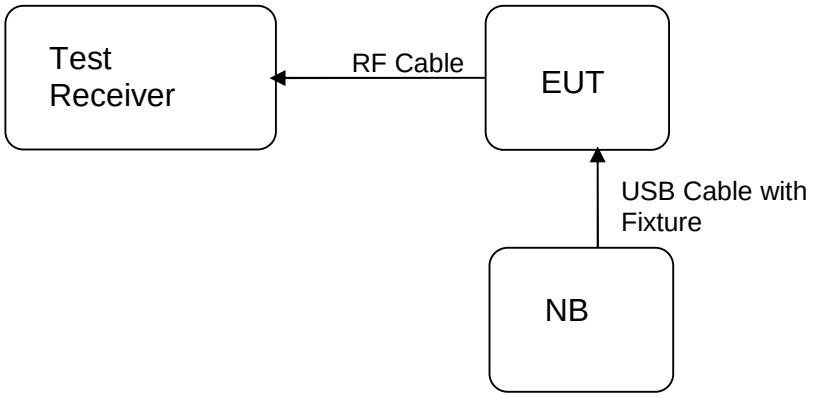


Diagram of Measurement Equipment Configuration for Conducted Transmitter Measurement



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Passed**

Test standard	:	FCC Part 15.247(b)(4), Part 15.203, RSS-Gen 6.8
Requirement	:	use of approved antennas only with directional gains that do not exceed 6 dBi

According to the manufacturer declaration, the EUT has an antenna with a directional gain of -4.7 dBi. The antenna is a metal frame antenna with no possibility of replacement with a non-approved antenna by the end-user. Therefore, the EUT is considered to comply with this provision.

Refer to EUT photo for details.

5.1.2 Peak Output Power

RESULT: **Passed**

Test standard	:	FCC Part 15.247(b)(3), RSS-247 5.4(d)
Basic standard	:	ANSI C63.10:2013, KDB558074
Limit	:	1 Watt
Kind of test site	:	Shielded room

Test setup

Test Channel	:	Low/ Middle/ High
Operation Mode	:	A

Ambient temperature	:	20-24 °C
Relative humidity	:	50-65 %
Atmospheric pressure	:	100-103 kPa

Table 6: Test result of Peak Output Power

Channel	Channel Frequency (MHz)	Output Power		Limit
		(dBm)	(W)	(W)
Low Channel	2402	-3.51	0.00045	1
Middle Channel	2440	-3.61	0.00044	1
High Channel	2480	-3.61	0.00044	1

Maximum Peak Power : 0.4457mW

Table 7: Test result of Maximum Average Output Power

Channel	Channel Frequency (MHz)	Output Power		Limit
		(dBm)	(W)	(W)
Low Channel	2402	-3.62	0.00043	1
Middle Channel	2440	-3.71	0.00043	1
High Channel	2480	-3.71	0.00043	1

5.1.3 6dB & 99% Bandwidth

RESULT: **Passed**

Test standard	:	FCC Part 15.247(a)(2) RSS-247 5.2(a) RSS-Gen
Basic standard	:	ANSI C63.10:2013, KDB558074
Kind of test site	:	Shielded room

Test setup

Test Channel	:	Low/ Middle/ High
Operation Mode	:	A

Ambient temperature	:	20-24°C
Relative humidity	:	50-65%
Atmospheric pressure	:	100-103 kPa

Table 8: Test result of 6dB Bandwidth

Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low Channel	2402	738.7	>500	Pass
Mid Channel	2440	750.7	>500	Pass
High Channel	2480	743.4	>500	Pass

Table 9: Test result of 99% Bandwidth

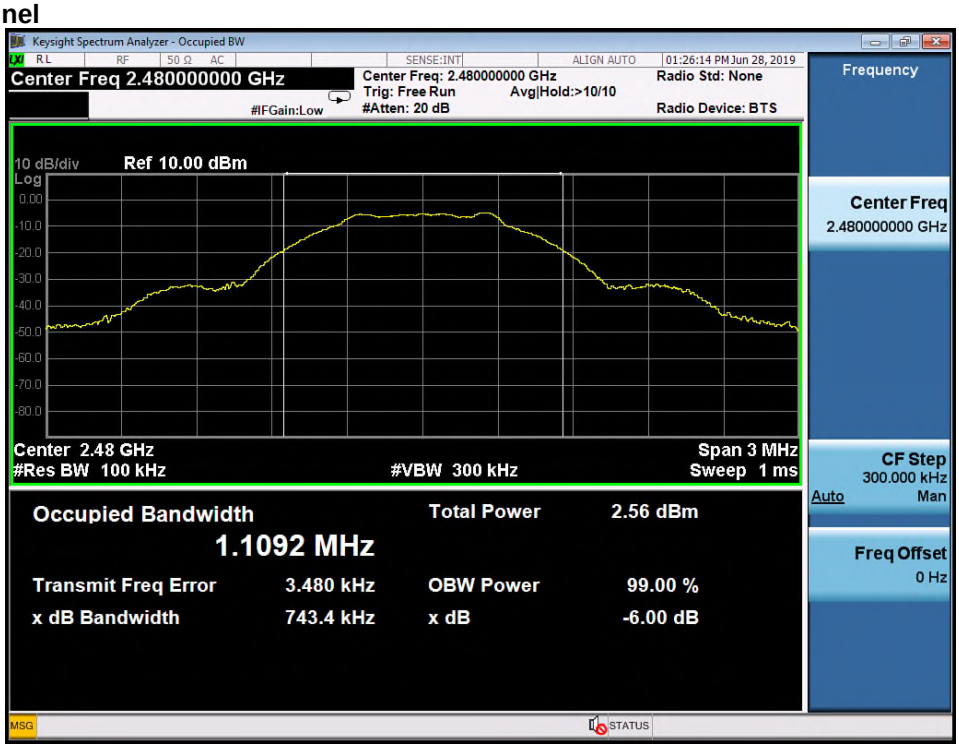
Channel	Channel Frequency (MHz)	99% Bandwidth (MHz)	Result
Mid Channel	2440	1.1041	Pass

Test Plot of 6dB Bandwidth

Low Channel

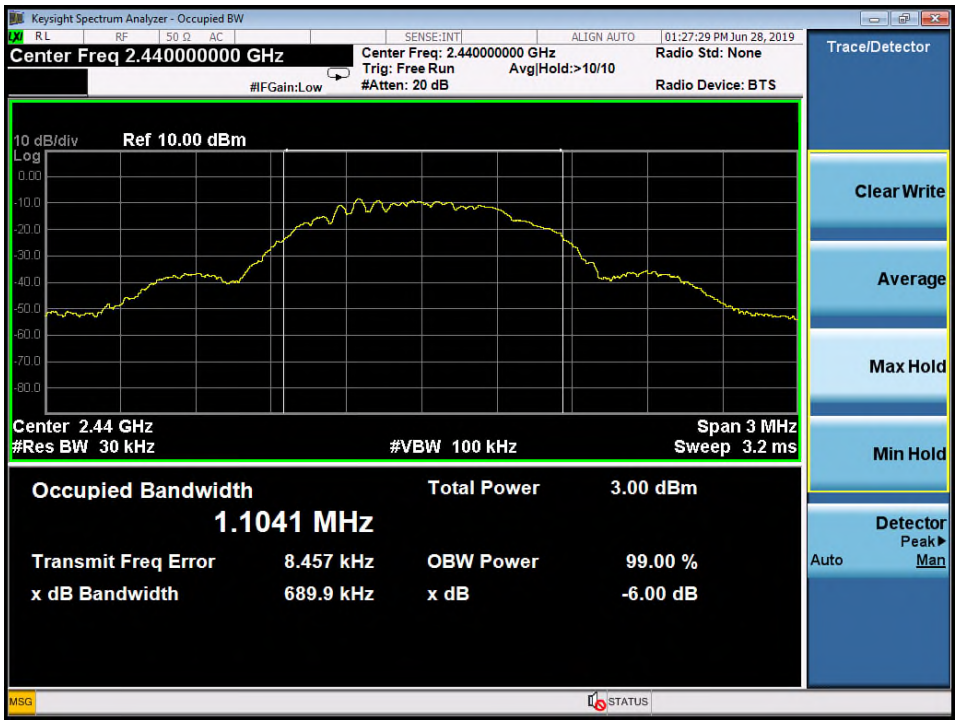
Middle Channel

High Channel



Test Plot of 99% Bandwidth

Middle Channel



5.1.4 Power Density

RESULT: **Passed**

Test standard : FCC Part 15.247(e), RSS-247 5.2(b)
Basic standard : ANSI C63.10:2013, KDB558074
Kind of test site : Shielded room

Test setup

Test Channel : Low/ Middle/ High
Operation Mode : A
Ambient temperature : 20-24°C
Relative humidity : 50-65%
Atmospheric pressure : 100-103 kPa

Table 10: Test result of Power Density

Channel	Channel Frequency (MHz)	Power Density	Limit
		(dBm)	(dBm)
Low Channel	2402	-20.38	8
Middle Channel	2440	-20.64	8
High Channel	2480	-20.85	8

Test Plot of Power Density

Low Channel

Middle Channel

High Channel

5.1.5 Conducted spurious emissions and Frequency Band Edge measured in 100kHz Bandwidth

RESULT: **Passed**

Test standard	:	FCC part 15.247(d), RSS-247 5.5
Basic standard	:	ANSI C63.10:2013, KDB558074
Limit	:	20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power)
Kind of test site	:	Shielded room

Test setup

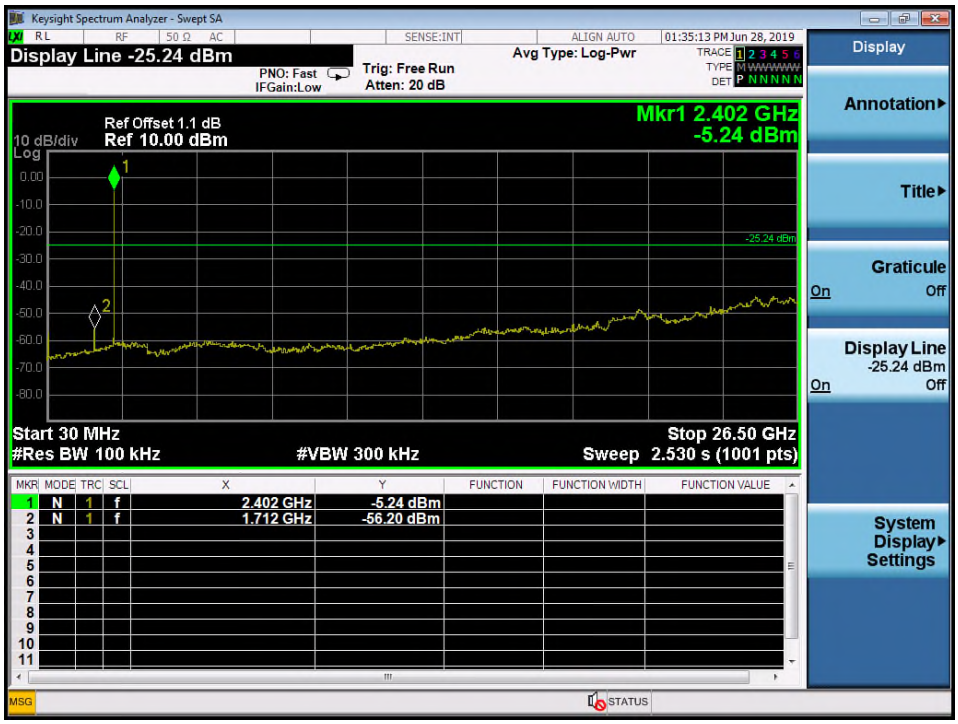
Test Channel	:	Low/ Middle/ High for Conducted Spurious Emissions Low/ High for Frequency Band Edge
Operation Mode	:	A

Ambient temperature	:	20-24°C
Relative humidity	:	50-65%

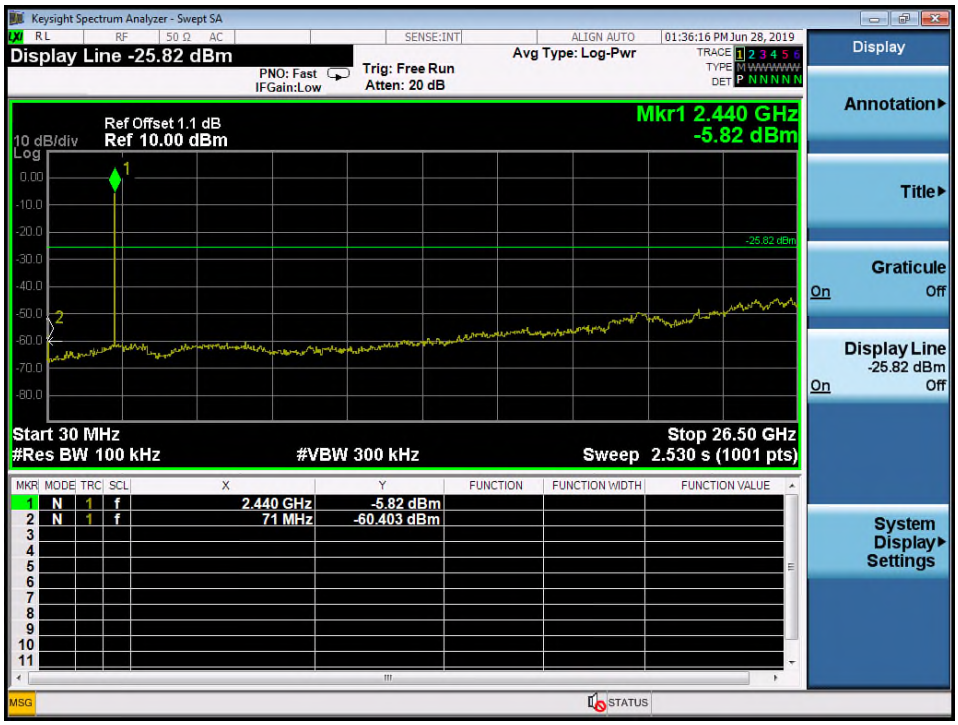
All emissions are more than 20dB below fundamental, details refer to following test plot, and compliance is achieved as well.
Due to the small size of the product and that there are no inductive components of significant size, 9kHz to 30MHz frequency range is not tested based on technical judgment.

Test Plot 100kHz Conducted Emissions

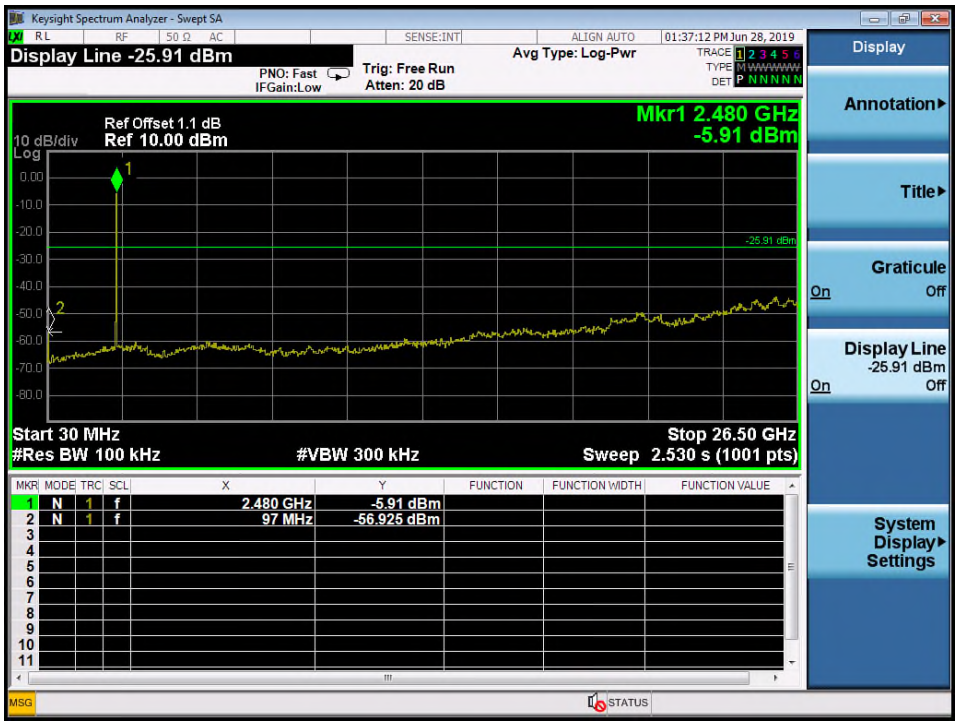
Low Channel



Middle Channel

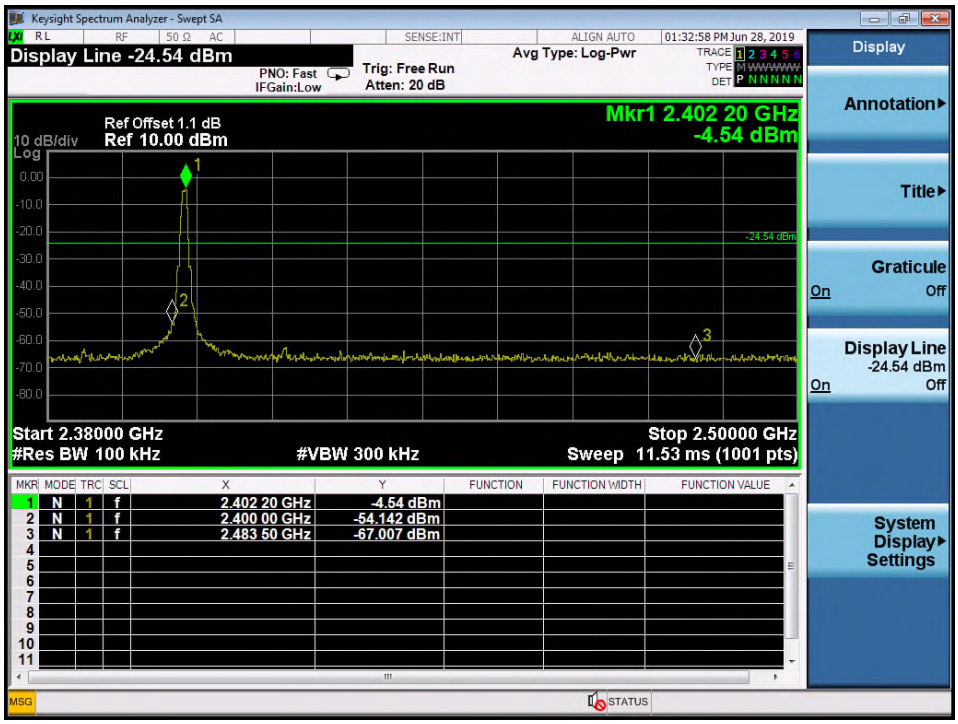


High Channel

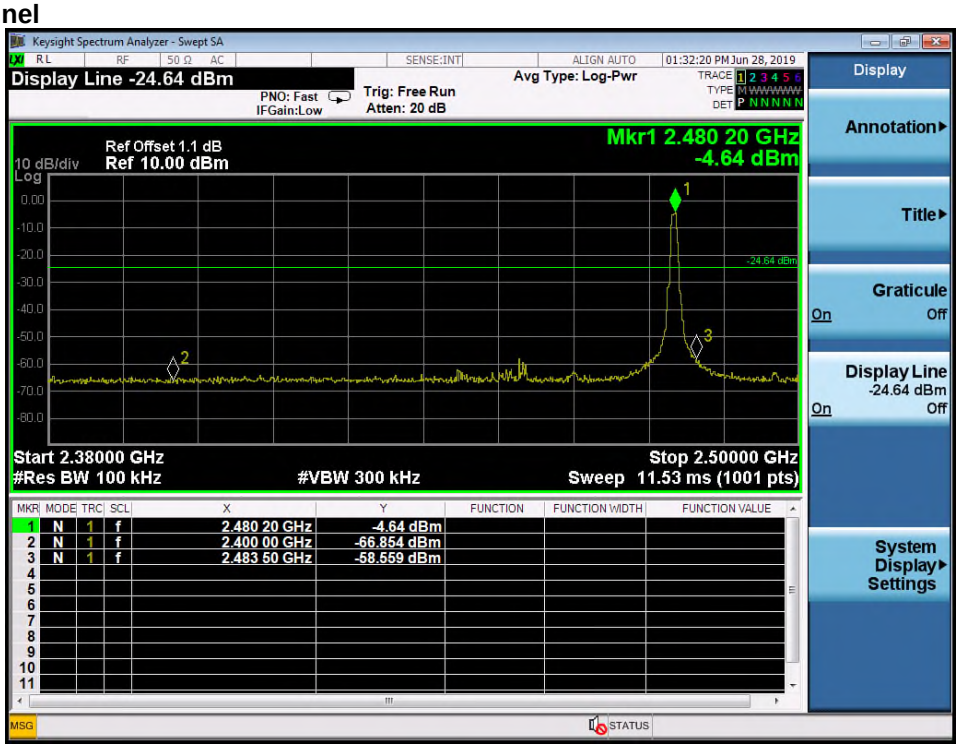


Test Plot 100kHz RBW of Band Edge

Low Channel



High Channel



5.1.6 Spurious Emission

RESULT: **Passed**

Test standard	:	FCC part 15.247(d), FCC 15.205, FCC 15.209 RSS-Gen 8.9
Basic standard	:	ANSI C63.10: 2013
Limits	:	Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a) and RSS-Gen i5, 8.10 (Table 7), must comply with the radiated emission limits specified in FCC 15.209(a) and RSS-Gen 5, 8.9 (Table 5 and 6). Emission radiated outside the restricted and authorized frequency bands must either comply with the radiated emission limits specified for the restricted bands or in FCC15.247(d) and RSS-247 i2, 5.5
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	Low/ Middle/ High
Operation mode	:	A

Factor (dB/m)=Antenna Factor(dB/m)+Cable loss (dB)

Level(dBuV/m)=Reading(dBuV)+ Factor(dB/m)

Testing was carried out within frequency range 9kHz to the tenth harmonic. For details refer to Appendix D. The Radiated Emissions testing was performed in the X, Y and Z axis orientation. The worst-case Axis orientation is recorded in this test report.

5.2 Mains Emissions

5.2.1 Mains Conducted Emissions

RESULT: **Passed**

Test standard	:	FCC Part 15.207 FCC Part 15.107 RSS-Gen 8.8
Limits	:	Mains Conducted emissions as defined in above test standards must comply with the mains conducted emission limits specified
Kind of test site	:	Shielded Room

Test setup

Operation mode	:	C
Ambient temperature	:	20-24°C
Relative humidity	:	50-65%
Atmospheric pressure	:	100-103 kPa

Factor (dB/m)=Antenna Factor(dB/m)+Cable loss (dB)

Level(dBuV/m)=Reading(dBuV)+ Factor(dB/m)

Remark: For details refer to Appendix D.

6. Safety Human exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

RESULT: **Passed**

Test standard : FCC CFR 47 Part 2 Subpart J Section 2.1093
KDB 447498 D01 v06
RSS-102 Issue 5, Table 4

The test product is a watch and belongs to the wearing device. Use distance less than 5mm.

FCC SAR Exposure:

Limit :

For 100 MHz to 6 GHz and *test separation distances* ≤ 50 mm, the 1-g and 10-g *SAR test exclusion thresholds* are determined by the following:
[(*max. power of channel, including tune-up tolerance, mW*) / (*min. test separation distance, mm*)] · [$\sqrt{f_{(GHz)}}$] ≤ 3.0 for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR, where

f(GHz) is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation31

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum *test separation distance* is ≤ 50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

Result:
WiFi 2.4G , F(GHz) is 2.462
Maximum Average Power is 6.84mW for Wifi 2.4GHz
(6.84 / 5) * $\sqrt{2.462}$ = 2.128
BLE , F(GHz) is 2.480
Maximum Average Power is 0.43mW for BLE
(0.43 / 5) * $\sqrt{2.480}$ = 0.135
Co-location SAR exposure is 2.128 + 0.135 = 2.263

2.258 < 7.5 for 10-g extremity SAR. Therefore, the test of SAR can be excluded.

IC SAR Exposure:

Limit Canada:

Exemption Limits for Routine Evaluation - SAR Evaluation
SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1.

Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance[4,5]

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 5. For Limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in Table 1, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.

Result:

For Limb-worn devices, the exemption SAR limit is 4mW * 2.5 = 10mW
The product WiFi 2.4GHz maximum average conducted output power is 6.84mW.
The product BLE maximum average conducted output power is 0.43mW.
Co-loaction SAR exposure is 6.84mW + 0.43mW = 7.27mW
Therefore, the test of SAR can be excluded.

7. List of Tables