CONFORMANCE TEST REPORT
FOR
FCC 47 CFR, Part 15 Subpart C

Report No.: 18-11-MAS-098-05

Client:	Acare Technology Co., Ltd.
Product:	Handheld Pulse Oximeter
Model:	AH-TB
FCC ID:	2ATBR-AHTB
Manufacturer/supplier:	Acare Technology Co., Ltd.
Date test item received:	2018/11/20
Date test campaign completed:	2019/05/03
Date of issue:	2019/11/08

Total number of pages of this test report: 63 pages
Total number of pages of photos: External photos 6 pages
Internal photos 6 pages
Setup photos 5 pages

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0371

Client	: Acare Technology Co., Ltd.
Address	: 5F.-4, No.24, Wuquan 2nd Rd., Xinzhuang Dist., New Taipei City 242, Taiwan (R.O.C.)
Manufacturer	: Acare Technology Co., Ltd.
Address	: 5F.-4, No.24, Wuquan 2nd Rd., Xinzhuang Dist., New Taipei City 242, Taiwan (R.O.C.)
EUT	: Handheld Pulse Oximeter
Trade name	: Acare Technology Co., Ltd.
Model No.	: AH-TB
Power Source	: Adapter: HPU15-102 Input 100-240VAC, 47-86Hz, 0.4-0.2A Output DC 5V⎓ 2.4A max
Regulations applied	: FCC 47 CFR, Part 15 Subpart C

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1 GENERAL INFORMATION

1.1 Product Description

a) Type of EUT : Handheld Pulse Oximeter
b) Trade Name : Acare Technology Co., Ltd.
c) Model No. : AH-TB
d) FCC ID : 2ATBR-AHTB

1.2 Characteristics of Device

The AH-TB handheld pulse oximeter is intended for continuously monitoring or spot checking peripheral oxygen saturation (SpO2) and pulse rate (PR) for adult, pediatric or neonatal patients.
This device can be used in professional institutions or units with health care capability. This includes outpatient departments, emergency rooms and departments of internal medicine in hospitals, ordinary departments in clinics, nursing hospitals and community medical institutions. It conforms to the BLE protocal and operates in the unlicensed ISM Band at 2.4 GHz.

1.3 Test Methodology

All testing were performed according to the procedures in ANSI C63.10(2013) and FCC CFR 47 Part 2 and Part 15 and KDB 558074 D01 15.247 Meas Guidance v05r02.

1.4 Test Facility

The semi-anechoic chamber and conducted measurement facility used to collect the radiated and conducted data are located inside the Building at No.8, Lane 29, Wenming Rd. Guishan Dist. Taoyuan City 33383, Taiwan, R.O.C.
This site has been accreditation as a FCC filing site.

1.5 Test Summary

Requirement	FCC Paragraph #	Test Pass
Antenna Requirement	15.203,15.247 (c)	☒
Conducted Emission	15.207	☒
Emission Bandwidth	15.247 (a)(2)	☒
Output Power Requirement	15.247 (b)(3)	☒
Power Density Requirement	15.247 (e)	☒
Spurious Emissions	15.247 (d)	☒
Radiated Emission	15.247 (d)	☒

Note: The test setup and measurement method for conductive output power measurements shown in this test report is different to the "Peak Output Power" test. Certain measurement uncertainty of peak power may be expected with the use of different power detection method or measuring equipment. Therefore, the conductive output power measurement results provided in this test report may be different to the specification of the device under test.

2 PROVISIONS APPLICABLE

2.1 Definition

Unintentional radiator:
A device that intentionally generates and radio frequency energy for use within the device, or that sends radio frequency signals by conduction to associated equipment via connecting wiring, but which is not intended to emit RF energy by radiation or induction.

Class A Digital Device:
A digital device which is marketed for use in commercial or business environment; exclusive of a device which is market for use by the general public, or which is intended to be used in the home.

Class B Digital Device :
A digital device which is marketed for use in a residential environment notwithstanding use in a commercial, business of industrial environment. Example of such devices that are marketed for the general public.

Note : A manufacturer may also qualify a device intended to be marketed in a commercial, business, or industrial environment as a Class B digital device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B Digital Device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B Digital Device, Regardless of its intended use.

Intentional radiator:
A device that intentionally generates and emits radio frequency energy by radiation or induction.

2.2 Requirement for Compliance

(1) Conducted Emission Requirement

According to 15.207, for an intentional radiator, which is designed to be connected to the public utility (AC) power line, the conducted limit is the following:

Frequency MHz	Quasi Peak dB μV	Average dB μV
0.15 - 0.5	66-56*	56-46*
0.5 - 5.0	56	46
5.0 - 30.0	60	50

*Decreases with the logarithm of the frequency.

(2) Radiated Emission Requirement

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

According to §15.209(a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

(3) Antenna Requirement

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

According to §15.247 (c), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(4) Bandwidth Requirement

According to 15.247 (a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

(5) Output Power Requirement

For systems using digital modulation , according to 15.247(b)(3), the maximum peak output power of the intentional radiator shall not exceed 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(6) Spurious Emissions Measurement

According to 15.247 (d) , in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

(7) Power Density Requirement

According to 15.247 (e) , for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

2.3 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below :

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.15
0.495 - 0.505 **	16.69475 - 16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425 - 16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475 - 156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

2.4 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device :

This device complies with part 15 of the 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.

2.5 User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual.

The Federal Communications Commission Radio Frequency Interference Statement includes the following paragraph.

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 instruction may cause harmful interference to radio communication. 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 to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

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

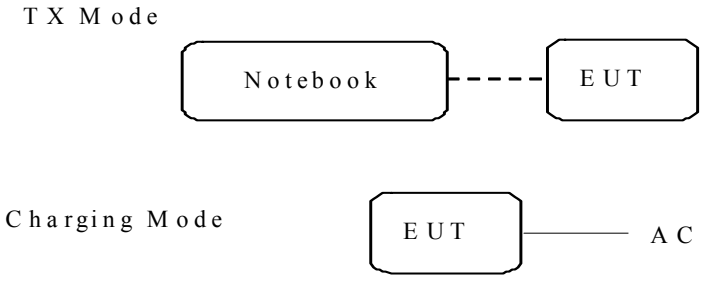
-- Consult the dealer or an experienced radio / TV technician for help.

3. SYSTEM TEST CONFIGURATION

3.1 Devices for Tested System

Device	Manufacture	Model No.	Cable Description
* Handheld Pulse Oximeter	Acare Technology Co., Ltd.	AH-TB	1.8m*1, Unshielded Power Line
Notebook	HP	nx6320	2.5m*1, Unshielded Power Line/Adapter 1.0m*1 Unshielded Signal Line(USB Cable)

Remark: 1. "*" means equipment under test.



A HP notebook performs the control test mode. The notebook removes away after the control command is ready.

2.

Test Software:	Simplicity studio4.exe
Power Setting:	80 for Ch Low, Mid, High

3.2 Dscription of Test modes

There are three channels have been tested as following:

Channel	Frequency (MHz)
Low	2402
Middle	2440
High	2480

3.2.2 Test Mode Description

3.2.2.1 Modulation Type

Test Mode	Modulation	Note
A	GFSK	-

3.2.2.2 Test Mode and Worse Case Determination

Item	Test Item	Test Mode	Test Frequency (MHz)
1	Conducted Emission	A+ Charging Mode	-
2	Emission Bandwidth	A	L，M，H
3	Output Power Requirement	A	L，M，H
4	Power Density Requirement	A	L，M，H
5	Spurious Emissions	A	L，M，H
6	Radiated Emission	A	L，M，H
6.1	Radiated Emission (below 1GHz)	A , Charging Mode	M (Worse Case)
6.2	Radiated Emission (above 1GHz)	A	L，M，H

Note :The worse case is chosen by channel middle which emission has no difference with others'.

4 CONDUCTED EMISSION MEASUREMENT

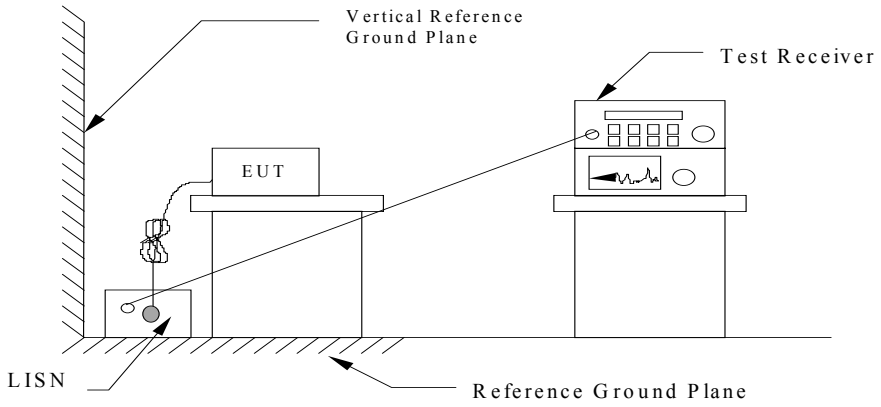
4.1 Standard Applicable

Line Conducted Emission Limits are in accordance to §§15.207(a).

4.2 Measurement Procedure

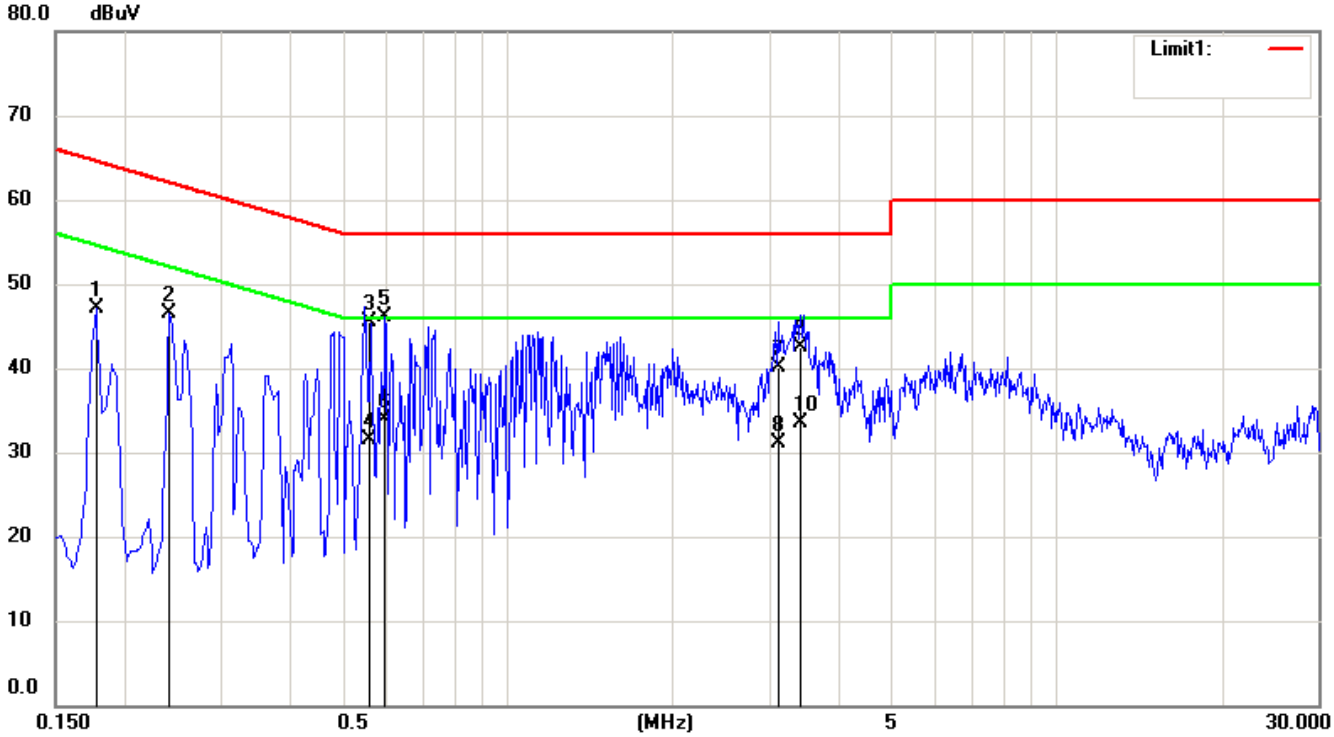
1. The testing follows ANSI C63.10(2013).
2. Setup the configuration per figure 1.
3. A preliminary scan with a spectrum monitor is performed to identify the frequency of emission that has the highest amplitude relative to the limit by operating the EUT in selected modes of operation, typical cable positions, and with a typical system configuration.
4. Record the 6 highest emissions relative to the limit.
5. Measure each frequency obtained from step 3 by a test receiver set on quasi peak detector function, and then record the accuracy frequency and emission level. If all emissions measured in the specified band are attenuated more than 20 dB from the limit, this step would be ignored, and the peak detector function would be used.
6. Confirm the highest three emissions with variation of the EUT cable configuration and record the final data.
7. Repeat all above procedures on measuring each operation mode of EUT.

Figure 1: Conducted emissions measurement configuration



4.3 Conducted Emission Data

File: 18-11-MAS-098 **#1** **Date:** 2019/4/15 **Temperature:** 24 ℃
Time: PM 07:06:18 **Humidity:** 58 %

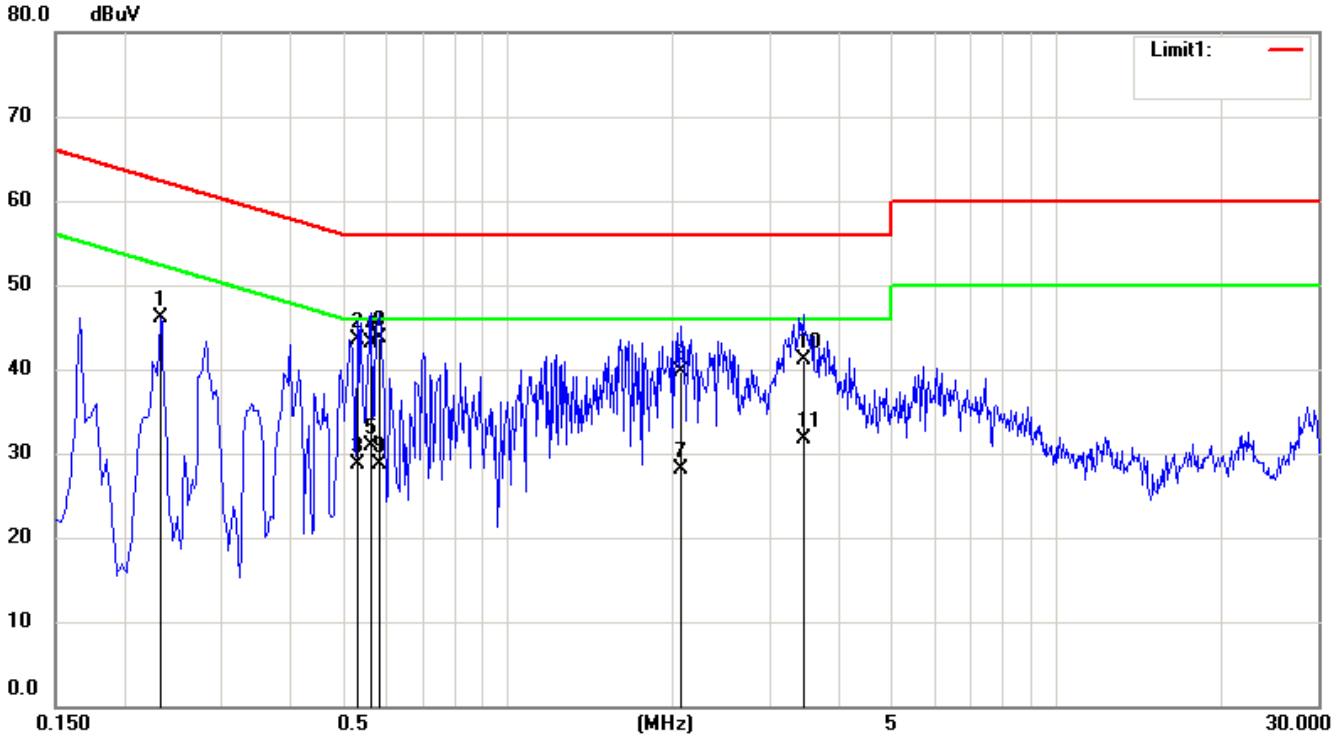


Site: CE04-10M 2F
Condition: FCC PART15B Conduction(QP) **Phase:** L1
EUT: Handheld Pulse Oximeter
Model: AH-TB
Test Mode: BLE **Operator:** Phillip

No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBuV)		dB	(dBuV)	(dBuV)	(dB)
1	0.1780	37.41	QP	9.68	47.09	64.58	-17.49
2	0.2420	36.79	QP	9.68	46.47	62.03	-15.56
3	0.5593	35.82	QP	9.68	45.50	56.00	-10.50
4	0.5593	21.82	AVG	9.68	31.50	46.00	-14.50
5	0.5980	36.49	QP	9.68	46.17	56.00	-9.83
6	0.5980	24.13	AVG	9.68	33.81	46.00	-12.19
7	3.1100	30.30	QP	9.73	40.03	56.00	-15.97
8	3.1100	21.31	AVG	9.73	31.04	46.00	-14.96
9	3.4221	32.84	QP	9.74	42.58	56.00	-13.42
10	3.4221	23.71	AVG	9.74	33.45	46.00	-12.55

Note: 1. Place of measurement: EMC LAB. of the ETC.
2. "***" means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. "#" means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

File: 18-11-MAS-098 **#2** **2019/4/15** **Temperature:** 24 ℃
Time: PM 07:12:43 **Humidity:** 58 %



Site: CE04-10M 2F
Condition: FCC PART15B Conduction(QP) **Phase:** N
EUT: Handheld Pulse Oximeter
Model: AH-TB
Test Mode: BLE **Operator:** Phillip

No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBuV)		dB	(dBuV)	(dBuV)	(dB)
1	0.2340	36.40	QP	9.66	46.06	62.31	-16.25
2	0.5340	33.88	QP	9.66	43.54	56.00	-12.46
3	0.5340	19.12	AVG	9.66	28.78	46.00	-17.22
4	0.5660	33.51	QP	9.66	43.17	56.00	-12.83
5	0.5660	21.28	AVG	9.66	30.94	46.00	-15.06
6	2.0700	30.08	QP	9.70	39.78	56.00	-16.22
7	2.0700	18.50	AVG	9.70	28.20	46.00	-17.80
8	0.5860	34.05	QP	9.66	43.71	56.00	-12.29
9	0.5860	18.96	AVG	9.66	28.62	46.00	-17.38
10	3.4660	31.37	QP	9.73	41.10	56.00	-14.90
11	3.4660	21.91	AVG	9.73	31.64	46.00	-14.36

Note: 1. Place of measurement: EMC LAB. of the ETC.
2. "***" means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. "#" means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

4.4 Result Data Calculation

The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

RESULT = READING + LISN FACTOR (Included Cable Loss)

4.5 Conducted Measurement Equipment

The following test equiPMent are used during the conducted test.

Equipment	Manufacturer	Model No.
EMI Test Receiver	R&S	ESCI
V-LISN	R&S	ENV216

Software: EZ-EMC (Ver. ETC-03A1)

5 ANTENNA REQUIREMENT

5.1 Standard Applicable

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to §15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2 Antenna Construction and Directional Gain

The antenna is a PCB antenna.

Antenna Type	PCB antenna
Peak Antenna Gain	1 dBi

The directional gain of antenna doesn't greater than 6 dBi, the power won't be reduced.

6 EMISSION BANDWIDTH MEASUREMENT

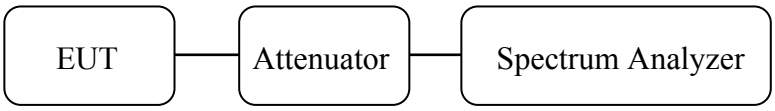
6.1 Standard Applicable

According to 15.247(a)(2), system using digital modulation techniques, the minimum 6dB bandwidth shall be at least 500 kHz.

6.2 Measurement Procedure

1. The testing follows FCC KDB 558074 D01 15.247 Meas Guidance v05r02.
2. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
3. Position the EUT as shown in figure 2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
4. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
5. Repeat above procedures until all frequencies measured were complete.

Figure 2: Emission bandwidth measurement configuration.



6.3 Measurement Equipment

Equipment	Manufacturer	Model No.
Spectrum Analyzer	R&S	FSV
Attenuator	WEINSCHEL	56-10

Software: LZ-RF (Ver. ETC-3A2)

6.4 Measurement Data

Test Apr. 09, 2019 Temperature: 25℃ Humidity: 60%

Channel	6dB Bandwidth (MHz)	FCC Limit (kHz)	Chart
L	0.79	500	Page 22
M	0.79	500	Page 23
H	0.78	500	Page 24

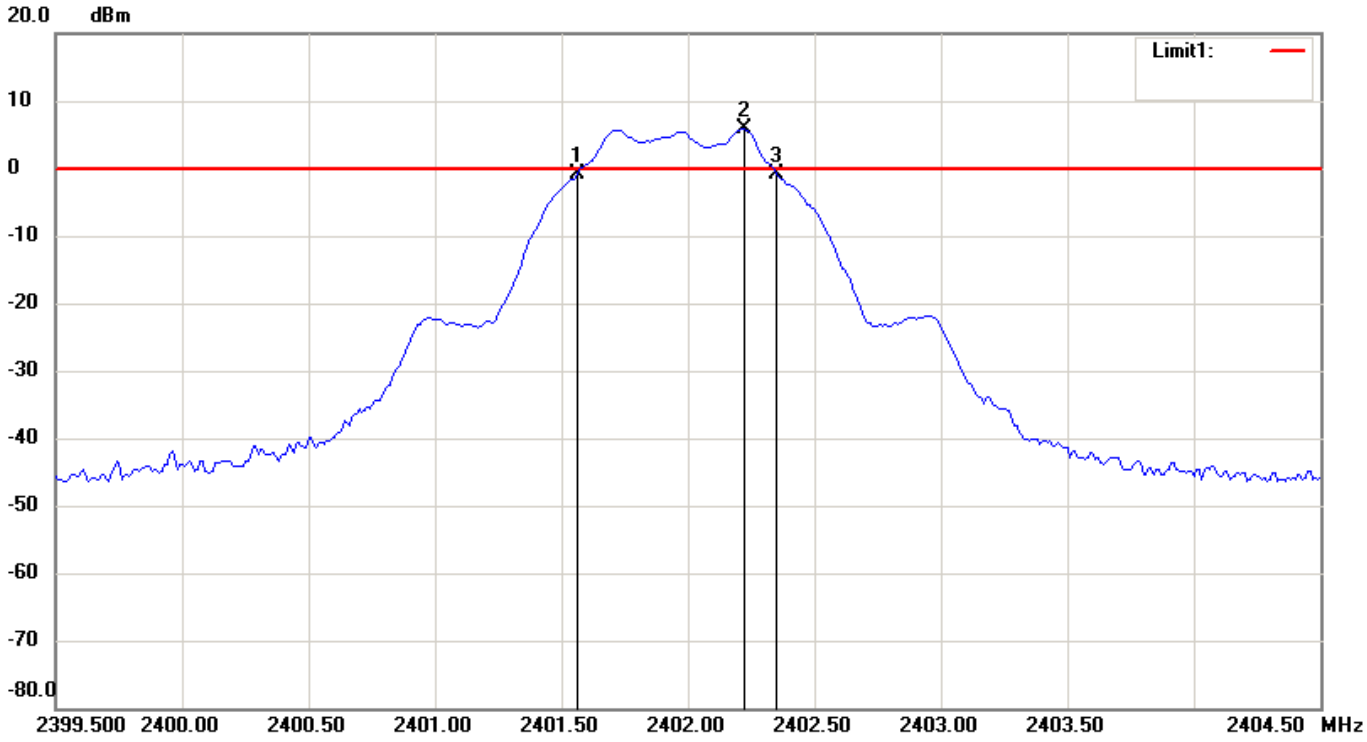
Note:

1. Please refer to page 22 to page 24 for chart

2. The estimated measurement uncertainty of the result measurement is 8.25×10^{-7} (1GHz≦f ≦18GHz)

File: **18-11-MAS-098** **2019/4/9** **Temperature:** 25 ℃

Site **RF-Cond01** **Humidity:** **60 %**



Condition: **-0.24dBm** **RF Conducted**

EUT: **Handheld Pulse Oximeter** **Sweep Time: 1ms** **Att.: 25dB**

Model: **AH-TB** **RBW: 100 KHz** **VBW: 300 KHz**

Test Mode: **BLE**

Note: **FCC_Channel -6dB EBW**

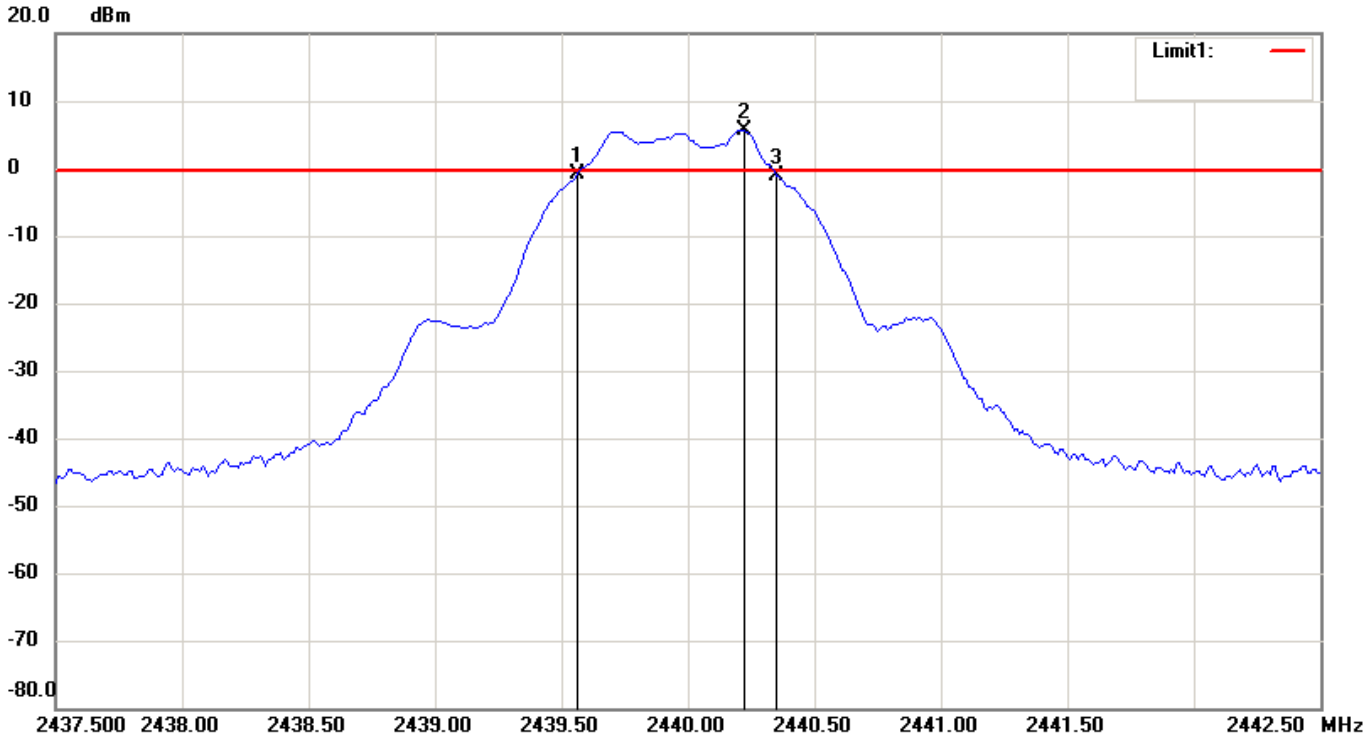
Operator: **Phillip**

No.	Frequency(MHz)	Level(dBm)
1	2401.56000	-0.78
2	2402.22000	5.76
3	2402.35000	-0.87

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	0.79	-0.09

File: **18-11-MAS-098** **2019/4/9** **Temperature:** **25 ℃**

Site **RF-Cond01** **Humidity:** **60 %**



Condition: **-0.41dBm** **RF Conducted**

EUT: **Handheld Pulse Oximeter** **Sweep Time: 1ms** **Att.: 25dB**

Model: **AH-TB** **RBW: 100 KHz** **VBW: 300 KHz**

Test Mode: **BLE**

Note: **FCC_Channel -6dB EBW**

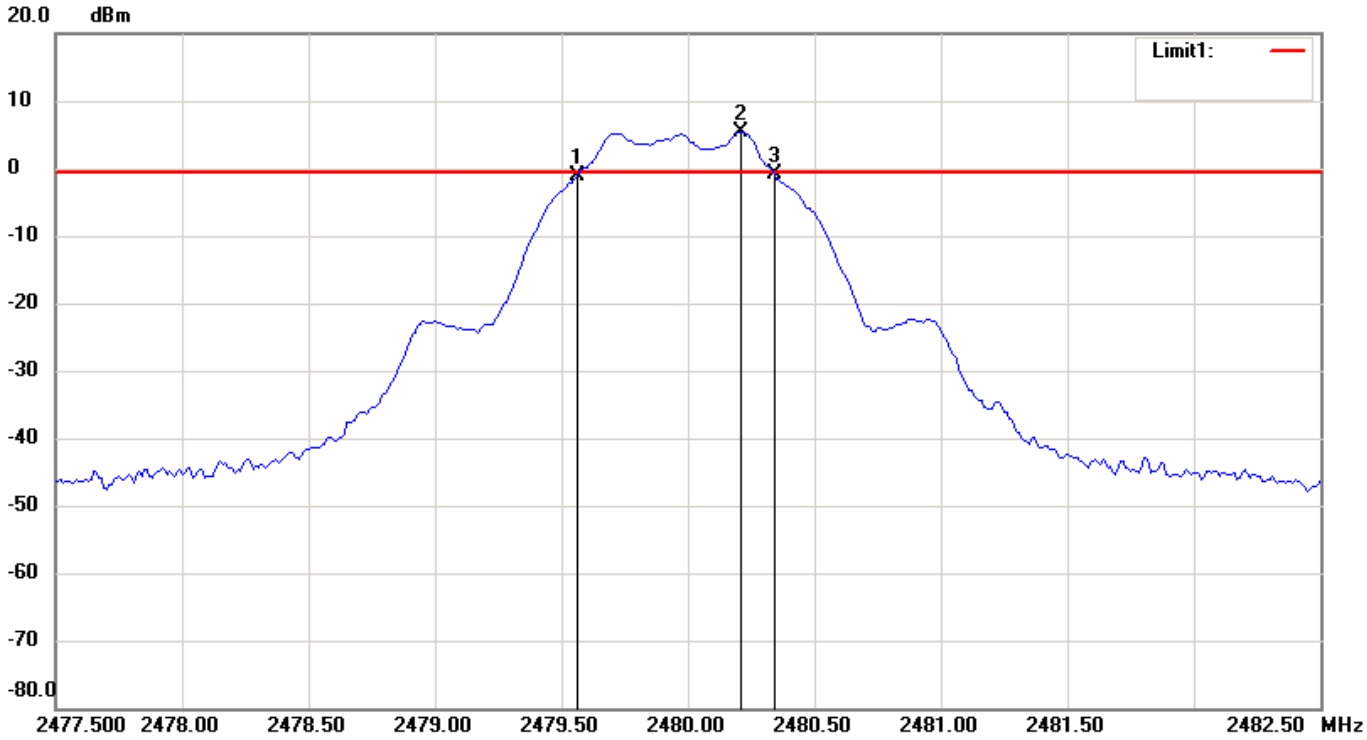
Operator: **Phillip**

No.	Frequency(MHz)	Level(dBm)
1	2439.56000	-0.88
2	2440.22000	5.59
3	2440.35000	-1.17

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	0.79	-0.29

File: **18-11-MAS-098** **2019/4/9** **Temperature:** **25 ℃**

Site **RF-Cond01** **Humidity:** **60 %**



Condition: **-0.65dBm** **RF Conducted**

EUT: **Handheld Pulse Oximeter** **Sweep Time: 1ms** **Att.: 25dB**

Model: **AH-TB** **RBW: 100 KHz** **VBW: 300 KHz**

Test Mode: **BLE**

Note: **FCC_Channel -6dB EBW**

Operator: **Phillip**

No.	Frequency(MHz)	Level(dBm)
1	2479.56000	-1.02
2	2480.21000	5.35
3	2480.34000	-0.84

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	0.78	0.18

7 OUTPUT POWER MEASUREMENT

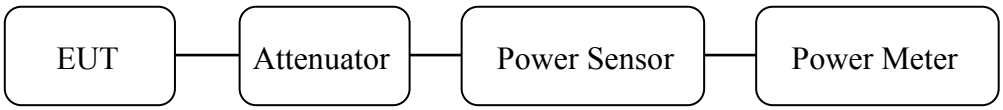
7.1 Standard Applicable

According to 15.247(b), the maximum peak output power of the transmitter shall not exceed 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

7.2 Measurement Procedure

1. The testing follows FCC 558074 D01 15.247 Meas Guidance v05r02.
2. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
3. Position the EUT as shown in figure 3. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range.
4. Measure the highest value appearing on power meter and record the level to calculate result data.
5. Repeat above procedures until all frequencies measured were complete.

Figure 3: Output power measurement configuration.



7.3 Measurement Equipment

Equipment	Manufacturer	Model No.
Power Meter	Agilent	N1912A
Power Sensor	Agilent	N1922A
Attenuator	WEINSCHEL	56-10

Software: LZ-RF (Ver. ETC-3A2)

7.4 Measurement Data

Test Apr. 09, 2019 Temperature: 25℃ Humidity: 60%

Channel	Maximum Peak Output Power (dBm)	FCC Limit (dBm)	Chart
L	6.67	30.0	-
M	6.47	30.0	-
H	6.21	30.0	-

Note:

The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)

8 POWER DENSITY MEASUREMENT

8.1 Standard Applicable

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

8.2 Measurement Procedure

1. The testing follows FCC FCC 558074 D01 15.247 Meas Guidance v05r02.
2. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
3. Position the EUT as shown in figure 2. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set EUT to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
4. Adjust the center frequency of spectrum analyzer on highest level appearing on spectral display within a 300 kHz frequency span.
5. Set the spectrum analyzer on a 3 kHz resolution bandwidth and 10 kHz video bandwidth as well as max. hold function, then record the measurement result.
6. Repeat above procedures until all measured frequencies were complete.

8.3 Measurement Equipment

Equipment	Manufacturer	Model No.
Spectrum Analyzer	R&S	FSV
Attenuator	WEINSCHEL	56-10

Software: LZ-RF (Ver. ETC-3A2)

8.4 Measurement Data

Test Apr. 09, 2019 Temperature: 25℃ Humidity: 60%

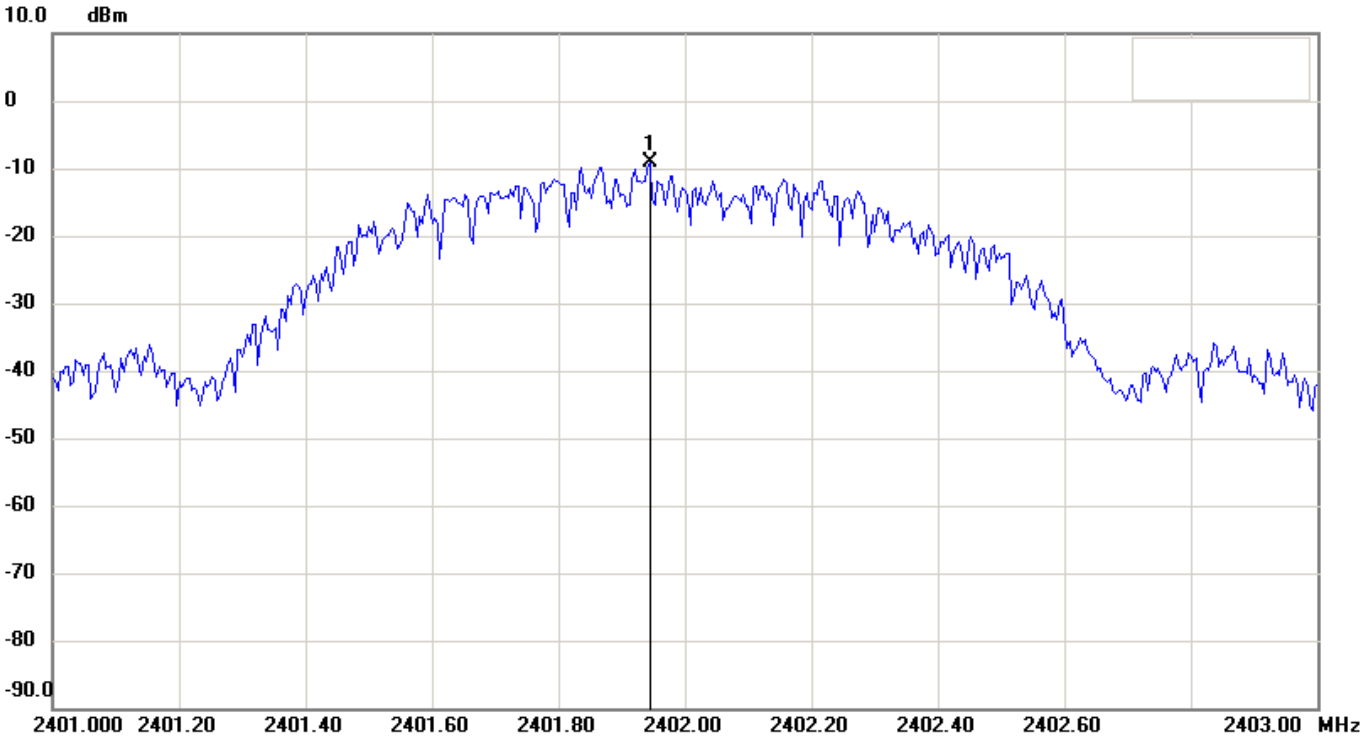
Channel	Peak Power Spectral Density (dBm)	FCC Limit (dBm)	Chart
L	-9.04	8	Page 29
M	-9.25	8	Page 30
H	-9.39	8	Page 31

Note:

1. *Please refer to page 29 to page 31 for chart*
2. *The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦ 18GHz)*

File: **18-11-MAS-098** **2019/4/9** **Temperature:** **25 ℃**

Site **RF-Cond01** **Humidity:** **60 %**



Condition: **RF Conducted**

EUT: **Handheld Pulse Oximeter** **Sweep Time: 22.3ms** **Att.: 15dB**

Model: **AH-TB** **RBW: 3 KHz** **VBW: 10 KHz**

Test Mode: **BLE**

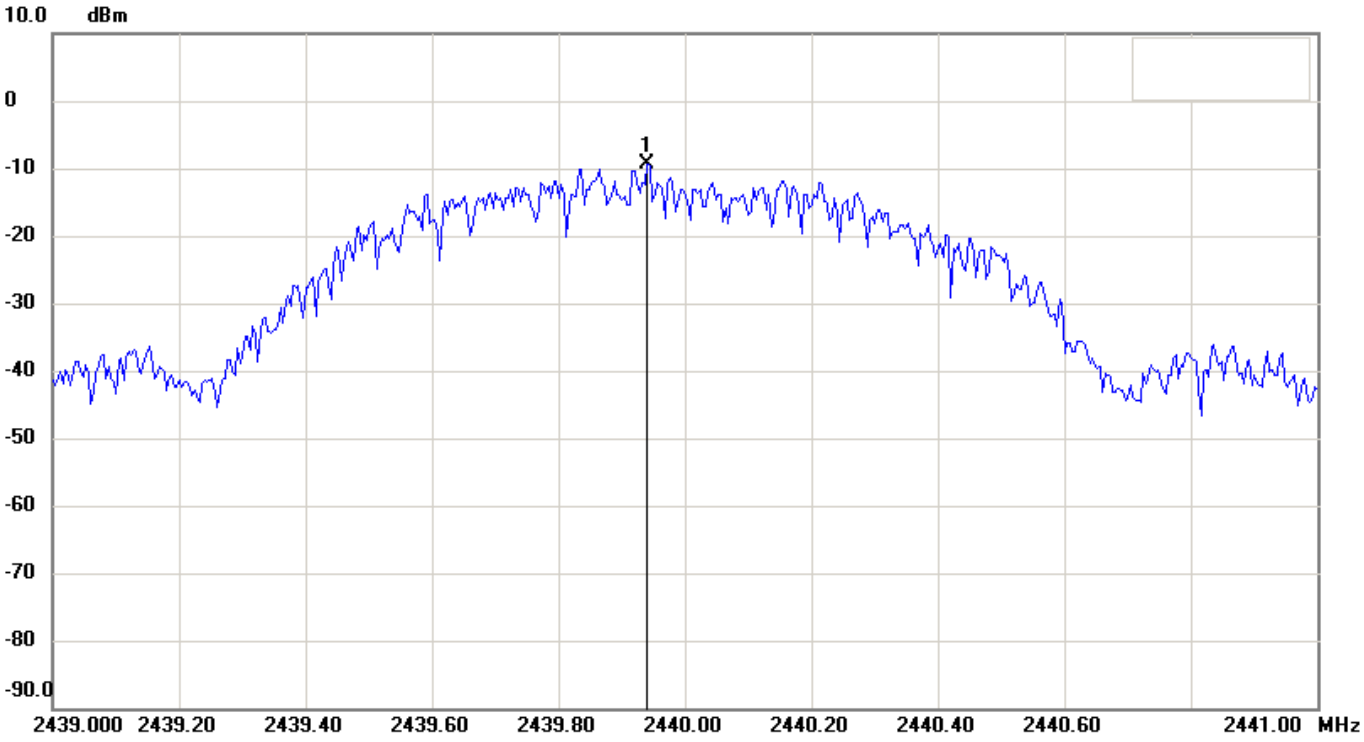
Note: **FCC_Channel LOW-Power Density (PK)**

Operator: **Phillip**

No.	Frequency(MHz)	Level(dBm)
1	2401.94400	-9.04

File: **18-11-MAS-098** **2019/4/9** **Temperature:** **25 ℃**

Site **RF-Cond01** **Humidity:** **60 %**



Condition: **RF Conducted**

EUT: **Handheld Pulse Oximeter** **Sweep Time: 22.3ms** **Att.: 15dB**

Model: **AH-TB** **RBW: 3 KHz** **VBW: 10 KHz**

Test Mode: **BLE**

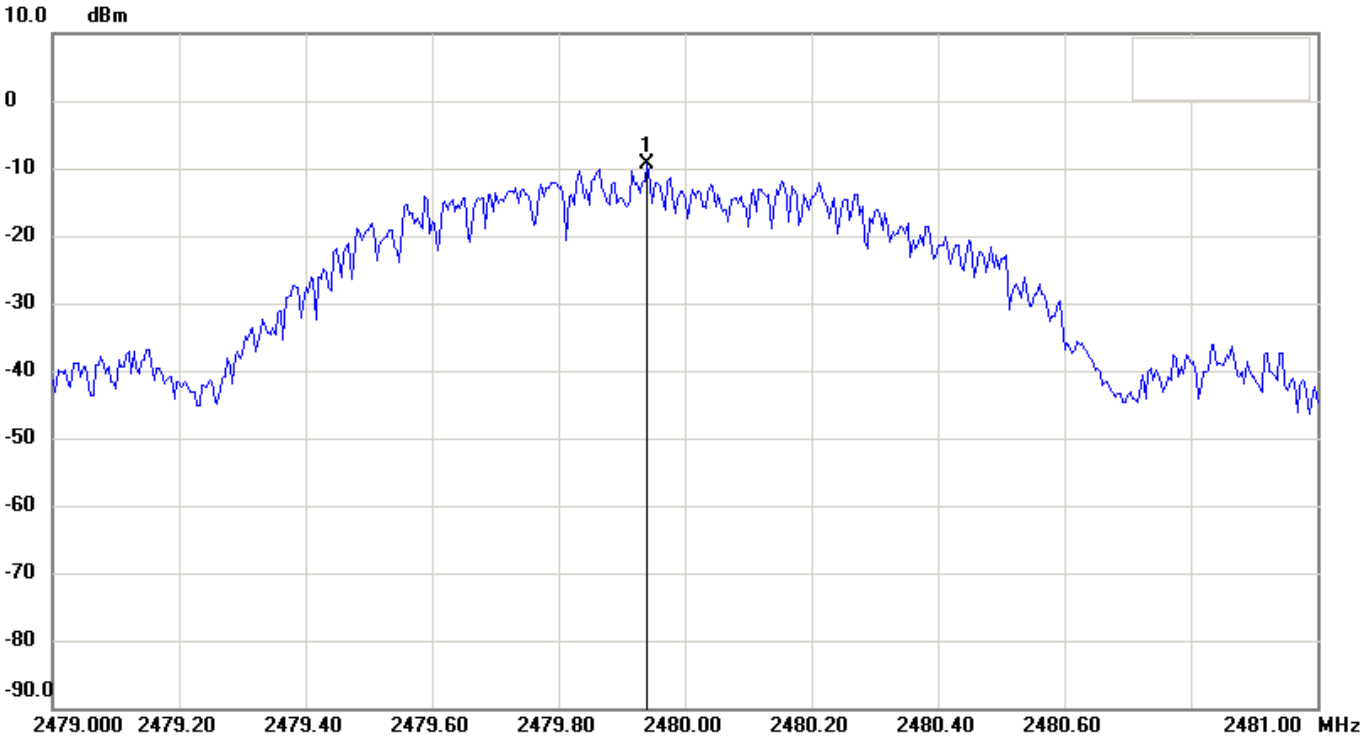
Note: **FCC_Channel LOW-Power Density (PK)**

Operator: **Phillip**

No.	Frequency(MHz)	Level(dBm)
1	2439.94000	-9.25

File: **18-11-MAS-098** **2019/4/9** **Temperature:** **25 ℃**

Site **RF-Cond01** **Humidity:** **60 %**



Condition: **RF Conducted**

EUT: **Handheld Pulse Oximeter** **Sweep Time: 22.3ms** **Att.: 15dB**

Model: **AH-TB** **RBW: 3 KHz** **VBW: 10 KHz**

Test Mode: **BLE**

Note: **FCC_Channel LOW-Power Density (PK)**

Operator: **Phillip**

No.	Frequency(MHz)	Level(dBm)
1	2479.94000	-9.39

9 SPURIOUS EMISSION - RF CONDUCTED MEASUREMENT

9.1 Standard Applicable

According to 12.247 (d) , in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

9.2 Measurement Procedure

1. The testing follows FCC 558074 D01 15.247 Meas Guidance v05r02.
2. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
3. Position the EUT as shown in figure 2. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
4. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge.
5. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
6. Repeat above procedures until all measured frequencies were complete.

9.3 Measurement Equipment

Equipment	Manufacturer	Model No.
Spectrum Analyzer	R&S	FSV
Attenuator	WEINSCHEL	56-10

Software: LZ-RF (Ver. ETC-3A2)

9.4 Measurement Data

Test Apr. 09, 2019 Temperature: 25℃ Humidity: 60%

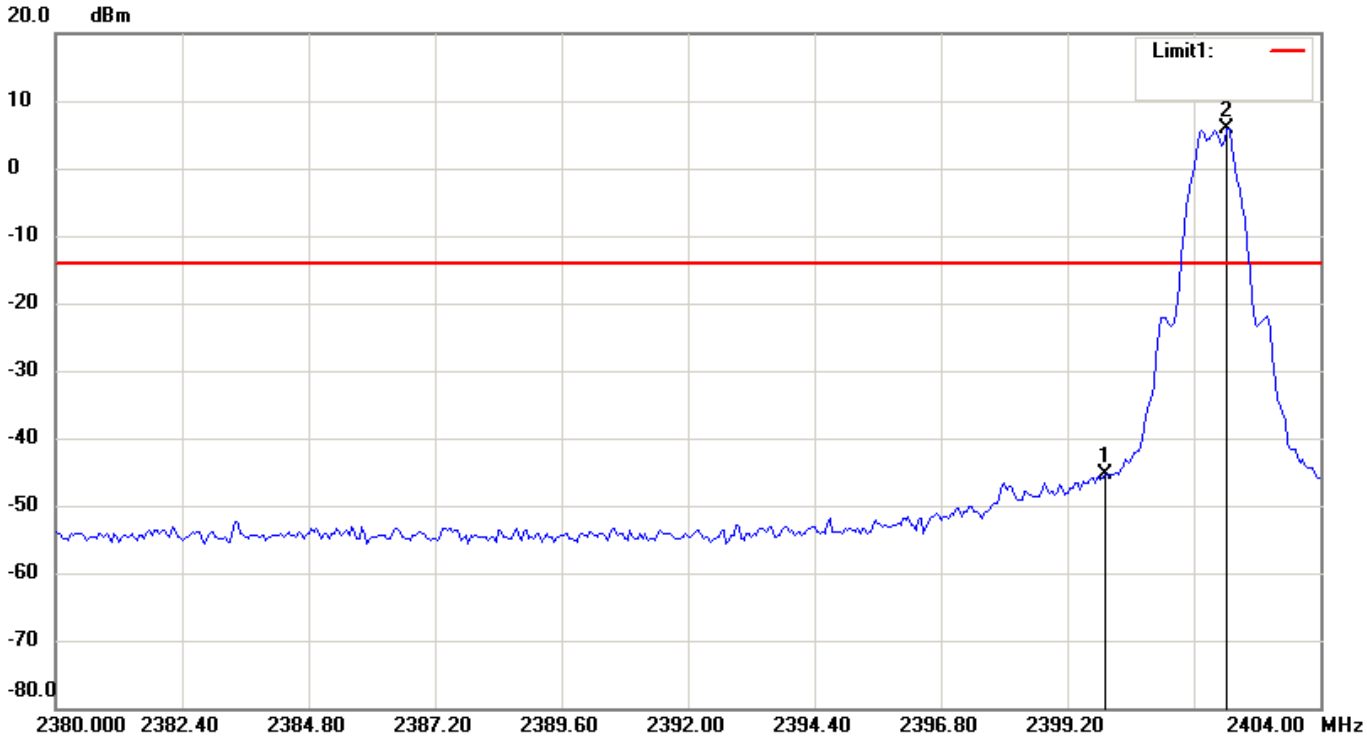
Channel	Frequency(MHz)	Chart
0	2402	Page 34, Page 36, 37
19	2440	Page 38,39
39	2480	Page 35, Page 40, 41

Frequency Band: 2400 MHz ~ 2483.5 MHz
All out-of –band conducted emissions were more than 20dB below the carrier.

Note: 1. Please refer to page 34 to page 41 for chart
2. An external attenuator is used as part of the test system for these measurements, the attenuation introduced by the external attenuator has not been explicitly compensated in the measured power level as it is irrelevant to these specific measurement results.

File: **18-11-MAS-098** **2019/4/9** **Temperature:** **25 ℃**

Site **RF-Cond01** **Humidity:** **60 %**



Condition: **-14.1dBm** **RF Conducted**

EUT: **Handheld Pulse Oximeter** **Sweep Time: 1.01ms** **Att.: 25dB**

Model: **AH-TB** **RBW: 100 KHz** **VBW: 300 KHz**

Test Mode: **BLE**

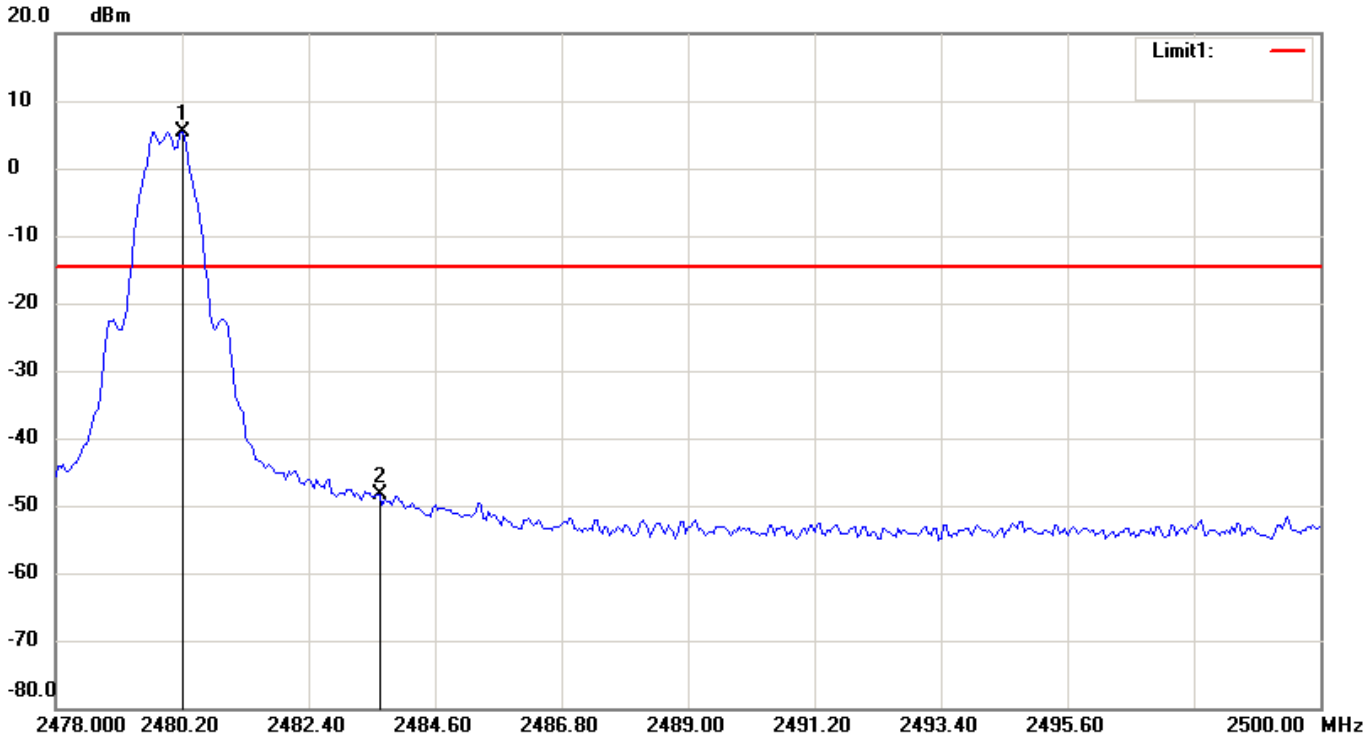
Note: **FCC_Channel LOW-Bandedge**

Operator: **Phillip**

No.	Frequency(MHz)	Level(dBm)
1	2399.92000	-45.39
2	2402.22400	5.90

File: **18-11-MAS-098** **2019/4/9** **Temperature:** **25 ℃**

Site **RF-Cond01** **Humidity:** **60 %**



Condition: **-14.52dBm** **RF Conducted**

EUT: **Handheld Pulse Oximeter** **Sweep Time: 1.02ms** **Att.: 25dB**

Model: **AH-TB** **RBW: 100 KHz** **VBW: 300 KHz**

Test Mode: **BLE**

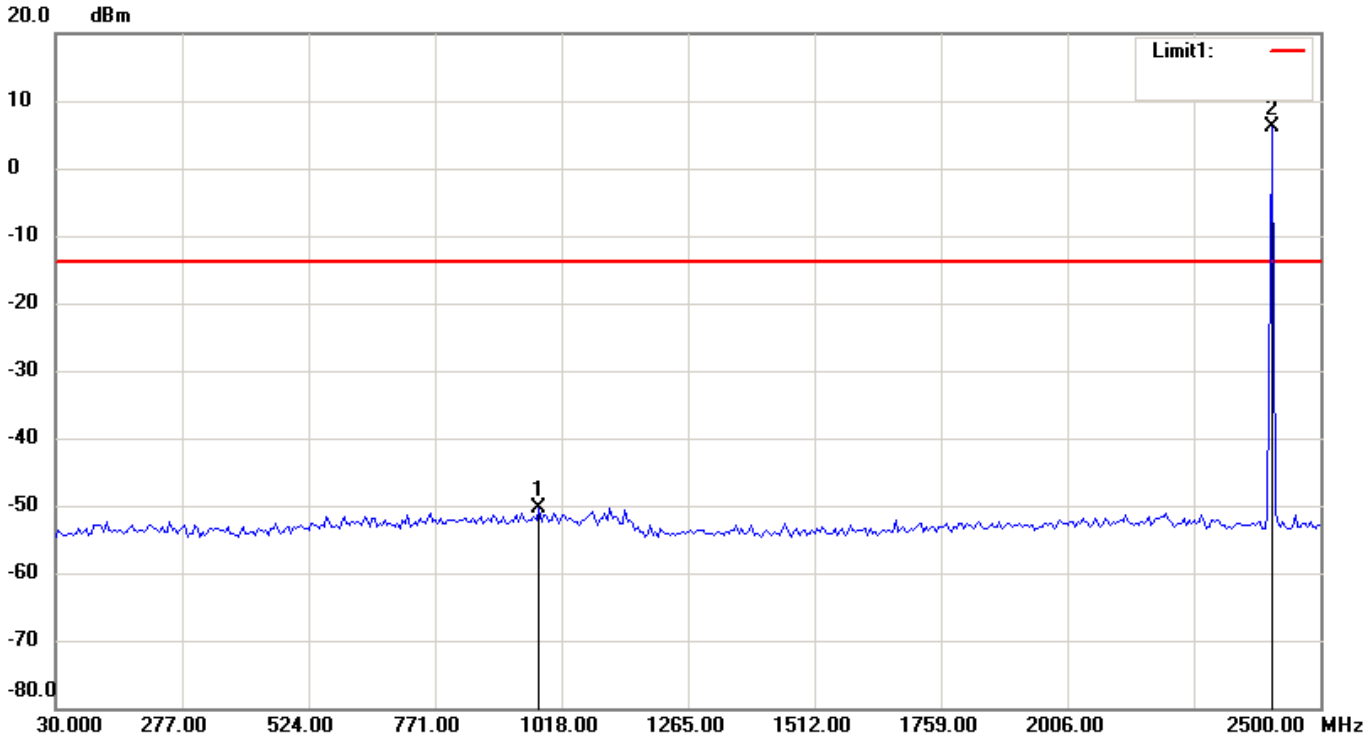
Note: **FCC_Channel High-Bandedge**

Operator: **Phillip**

No.	Frequency(MHz)	Level(dBm)
1	2480.20000	5.48
2	2483.63200	-48.40

File: **18-11-MAS-098** **2019/4/9** **Temperature:** **25 ℃**

Site **RF-Cond01** **Humidity:** **60 %**



Condition: **-13.92dBm** **RF Conducted**

EUT: **Handheld Pulse Oximeter** **Sweep Time: 24.7ms** **Att.: 25dB**

Model: **AH-TB** **RBW: 100 KHz** **VBW: 300 KHz**

Test Mode: **BLE**

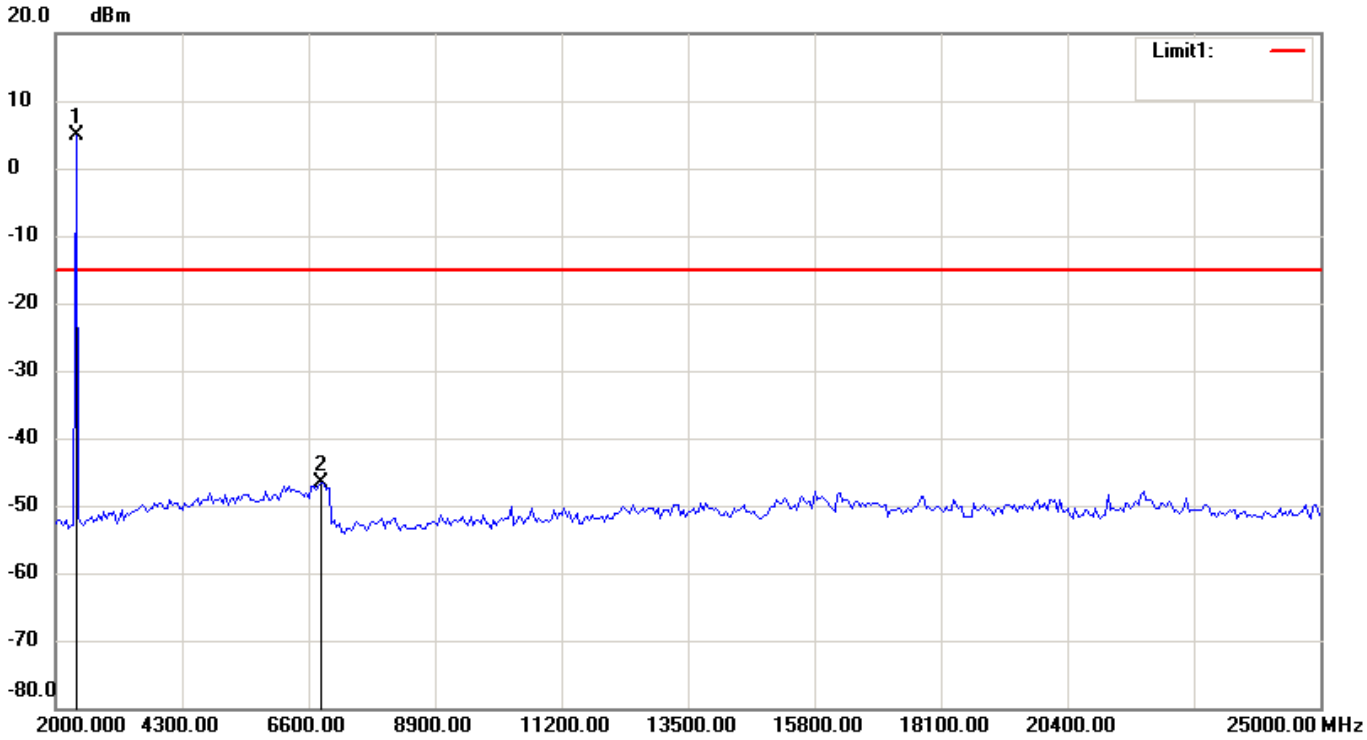
Note: **FCC_Channel LOW-Conducted Spurious**

Operator: **Phillip**

No.	Frequency(MHz)	Level(dBm)
1	973.5400	-50.28
2	2406.14000	6.08

File: **18-11-MAS-098** **2019/4/9** **Temperature:** **25 ℃**

Site **RF-Cond01** **Humidity:** **60 %**



Condition: **-15.2dBm** **RF Conducted**

EUT: **Handheld Pulse Oximeter** **Sweep Time: 230ms** **Att.: 25dB**

Model: **AH-TB** **RBW: 100 KHz** **VBW: 300 KHz**

Test Mode: **BLE**

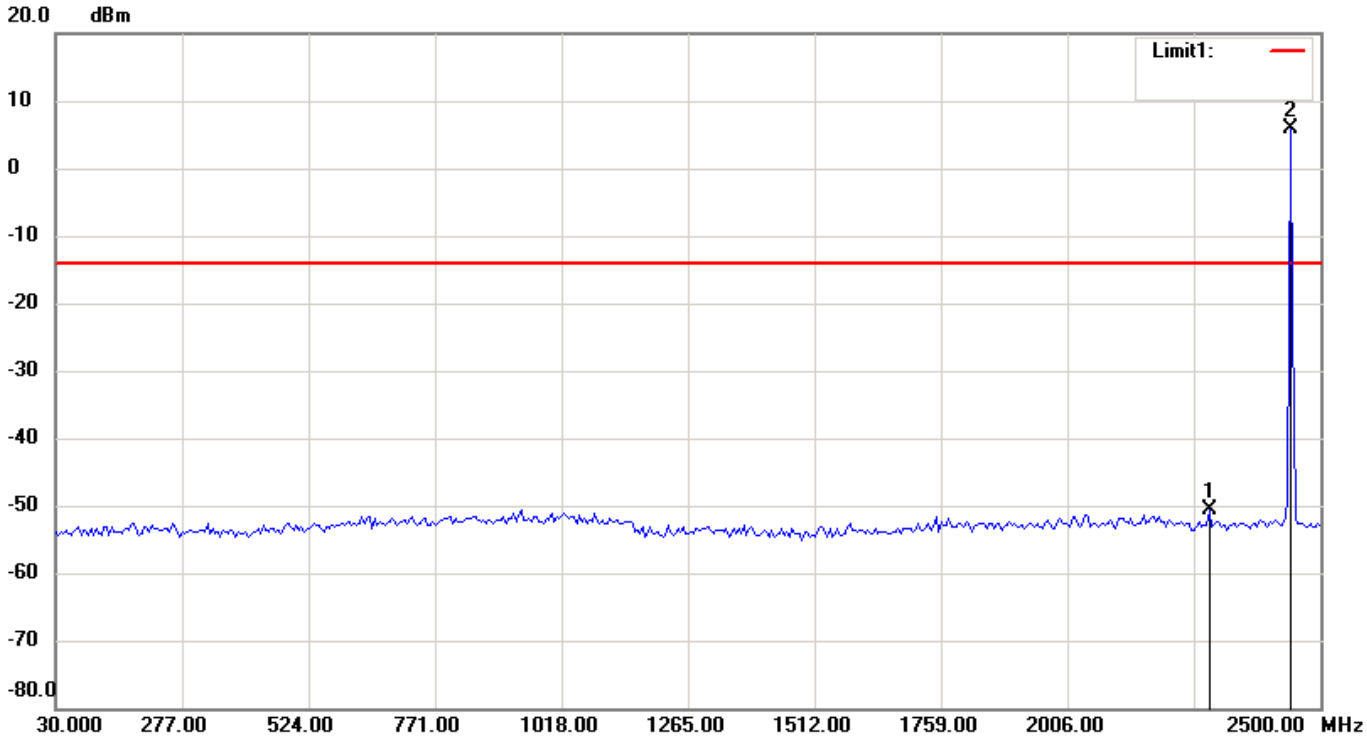
Note: **FCC_Channel LOW-Conducted Spurious**

Operator: **Phillip**

No.	Frequency(MHz)	Level(dBm)
1	2368.00000	4.80
2	6830.00000	-46.61

File: **18-11-MAS-098** **2019/4/9** **Temperature:** **25 ℃**

Site **RF-Cond01** **Humidity:** **60 %**



Condition: **-14.23dBm** **RF Conducted**

EUT: **Handheld Pulse Oximeter** **Sweep Time: 24.7ms** **Att.: 25dB**

Model: **AH-TB** **RBW: 100 KHz** **VBW: 300 KHz**

Test Mode: **BLE**

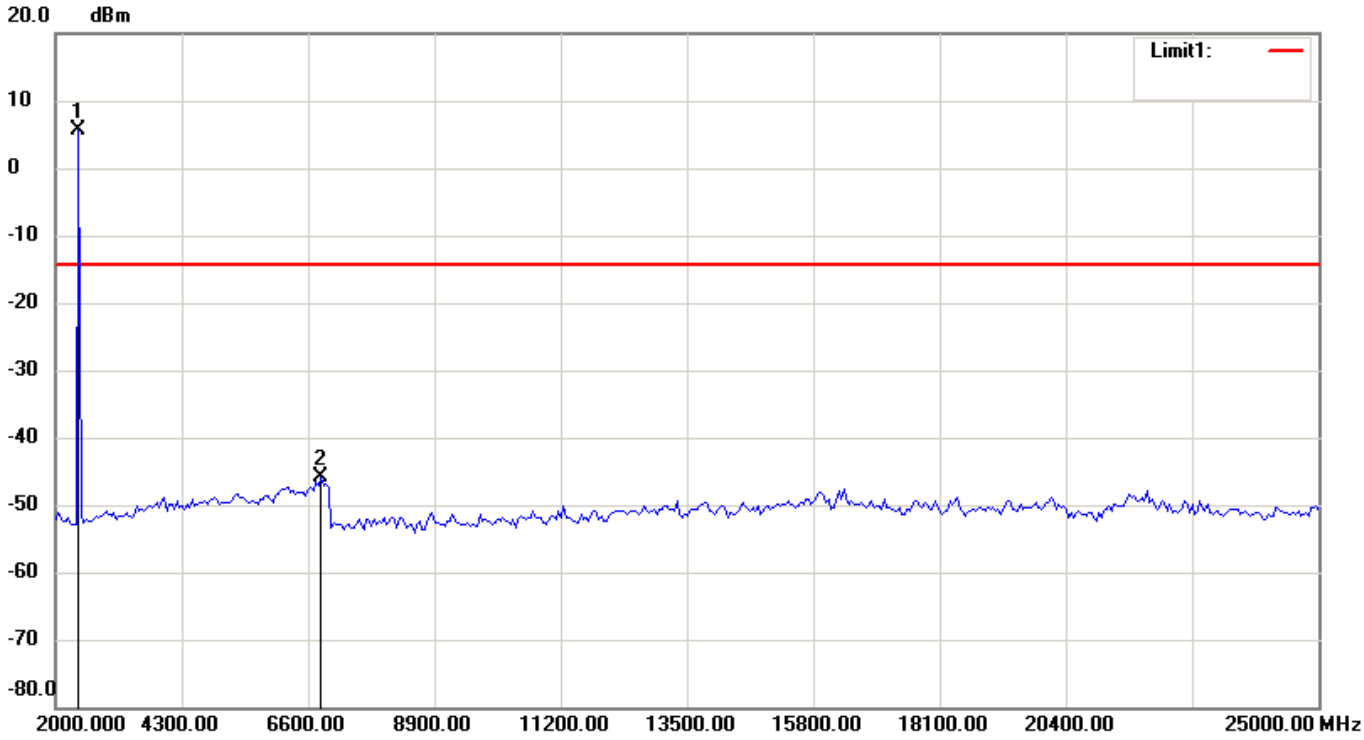
Note: **FCC_Channel MID-Conducted Spurious**

Operator: **Phillip**

No.	Frequency(MHz)	Level(dBm)
1	2282.64000	-50.56
2	2440.72000	5.77

File: **18-11-MAS-098** **2019/4/9** **Temperature:** **25 ℃**

Site **RF-Cond01** **Humidity:** **60 %**



Condition: **-14.34dBm** **RF Conducted**

EUT: **Handheld Pulse Oximeter** **Sweep Time: 230ms** **Att.: 25dB**

Model: **AH-TB** **RBW: 100 KHz** **VBW: 300 KHz**

Test Mode: **BLE**

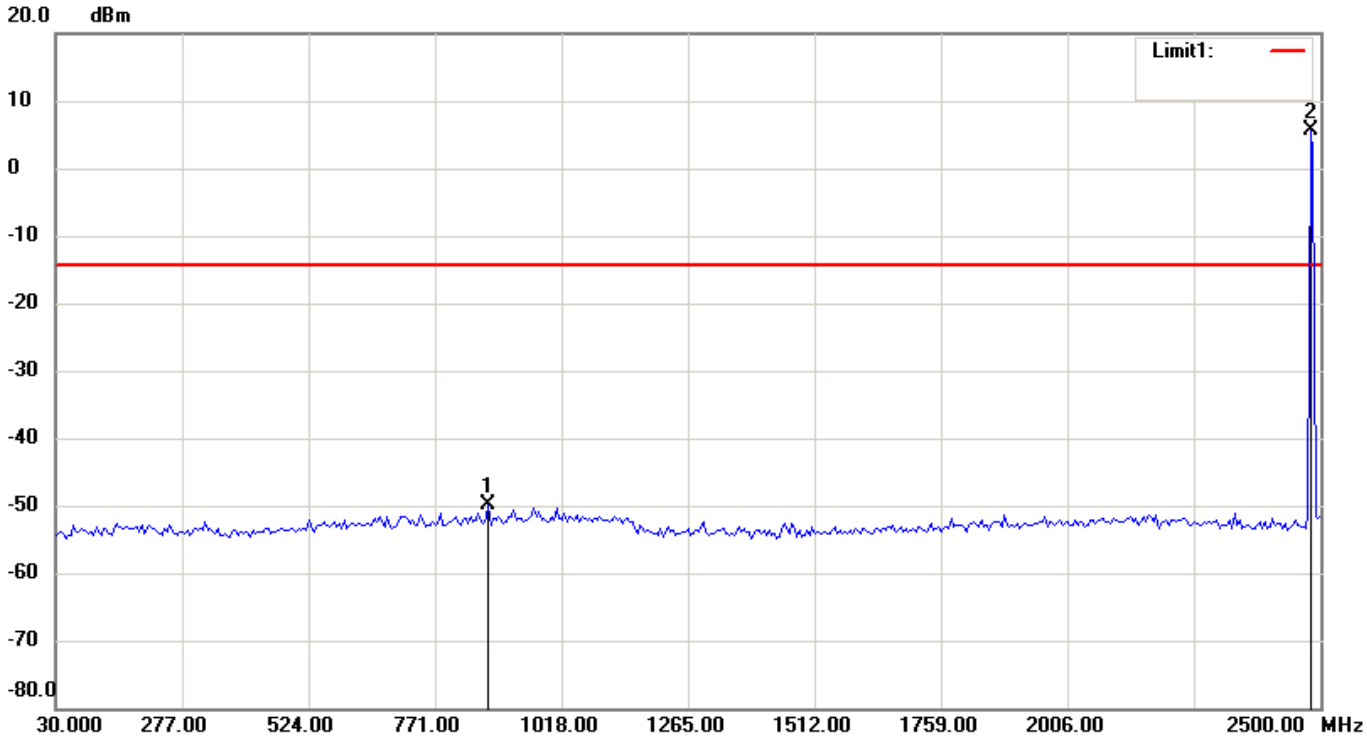
Note: **FCC_Channel MID-Conducted Spurious**

Operator: **Phillip**

No.	Frequency(MHz)	Level(dBm)
1	2414.0000	5.66
2	6830.0000	-45.93

File: **18-11-MAS-098** **2019/4/9** **Temperature:** **25 ℃**

Site **RF-Cond01** **Humidity:** **60 %**



Condition: **-14.29dBm** **RF Conducted**

EUT: **Handheld Pulse Oximeter** **Sweep Time: 24.7ms** **Att.: 25dB**

Model: **AH-TB** **RBW: 100 KHz** **VBW: 300 KHz**

Test Mode: **BLE**

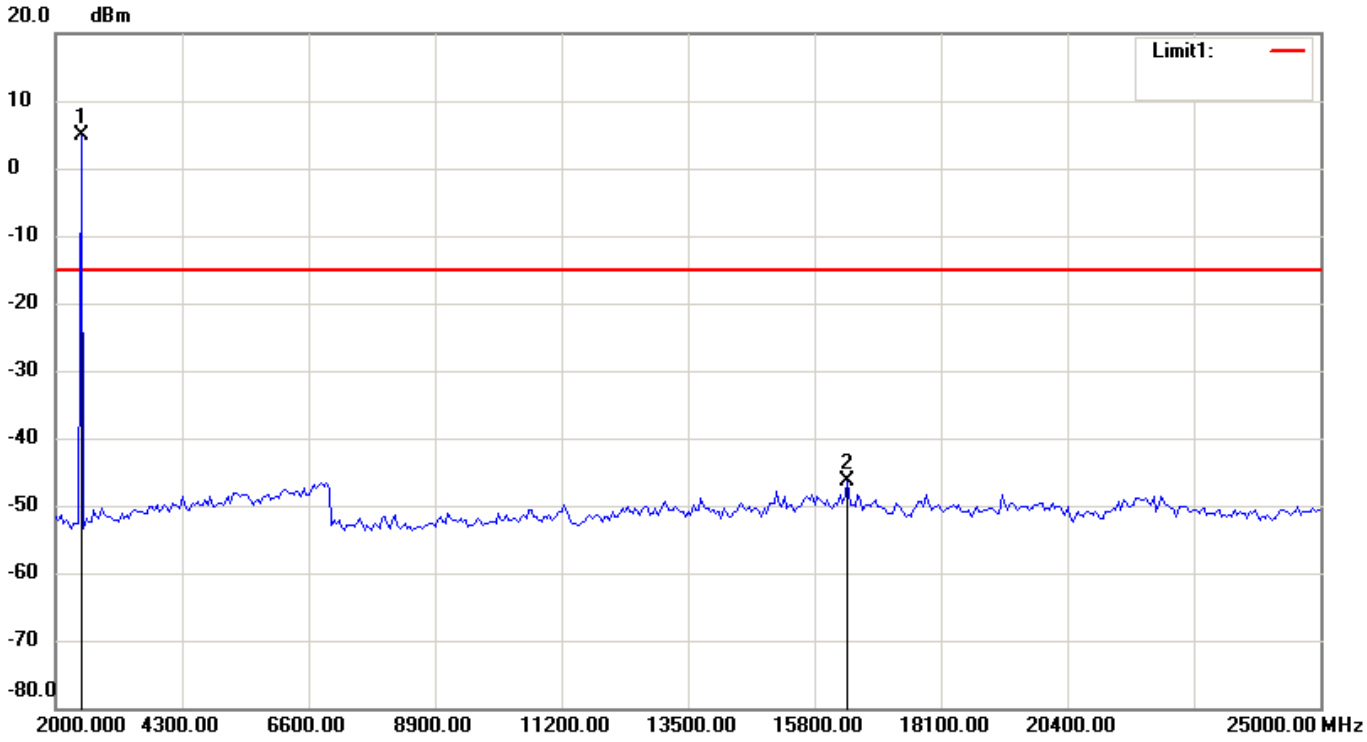
Note: **FCC_Channel HIGH-Conducted Spurious**

Operator: **Phillip**

No.	Frequency(MHz)	Level(dBm)
1	874.7400	-49.99
2	2480.24000	5.71

File: **18-11-MAS-098** **2019/4/9** **Temperature:** **25 ℃**

Site **RF-Cond01** **Humidity:** **60 %**



Condition: **-15.05dBm** **RF Conducted**

EUT: **Handheld Pulse Oximeter** **Sweep Time: 230ms** **Att.: 25dB**

Model: **AH-TB** **RBW: 100 KHz** **VBW: 300 KHz**

Test Mode: **BLE**

Note: **FCC_Channel HIGH-Conducted Spurious**

Operator: **Phillip**

No.	Frequency(MHz)	Level(dBm)
1	2460.00000	4.95
2	16398.00000	-46.28

10 RADIATED EMISSION MEASUREMENT

10.1 Standard Applicable

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

10.2 Measurement Procedure

The testing follows FCC KDB 558074 D01 15.247 Meas Guidance v05r02.

A.Preliminary Measurement For Portable Devices.

For portable devices, the following procedure was performed to determine the maximum emission axis of EUT (X, Y and Z axis):

1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antennna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. The axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.
4. The position in which the maximum noise occurred was “X axis”. (Please see the test setup photos)

B. Final Measurement

1. Setup the configuration per figure 4 and 5 for frequencies measured below and above 1 GHz respectively.
2. For emission frequencies measured below 1 GHz, it is performed in a semi-anechoic chamber to determine the accurate frequencies of higher emissions. For emission frequencies measured above 1 GHz, a pre-scan be performed with a 1 meter measuring distance before final test.
3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 120 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.
4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ° to 360 ° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.
   Note : A filter was used to avoid pre-amplifier saturated when measure TX operation mode.
5. Repeat step 4 until all frequencies need to be measured were complete.
6. Repeat step 5 with search antenna in vertical polarized orientations.
7. Check the three frequencies of highest emission with varying the datarate, placement of ANT. cables associated with EUT to obtain the worse case and record the result.
8. Investigate from the lowest frequency signal generated in the device up to the 10th harmonic.

Figure 4: Frequencies measured below 1 GHz configuration

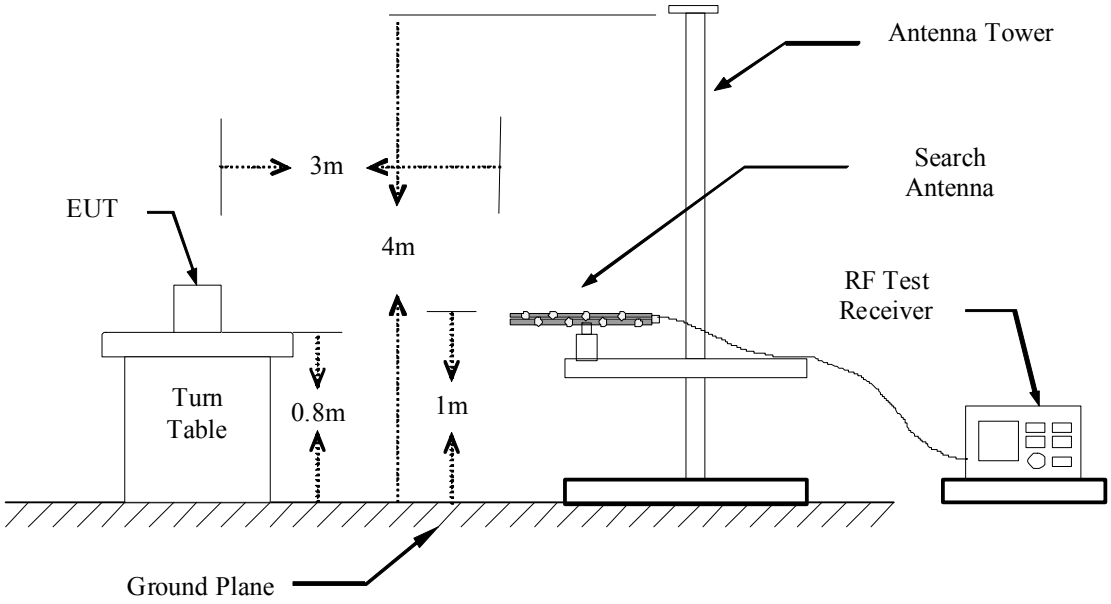
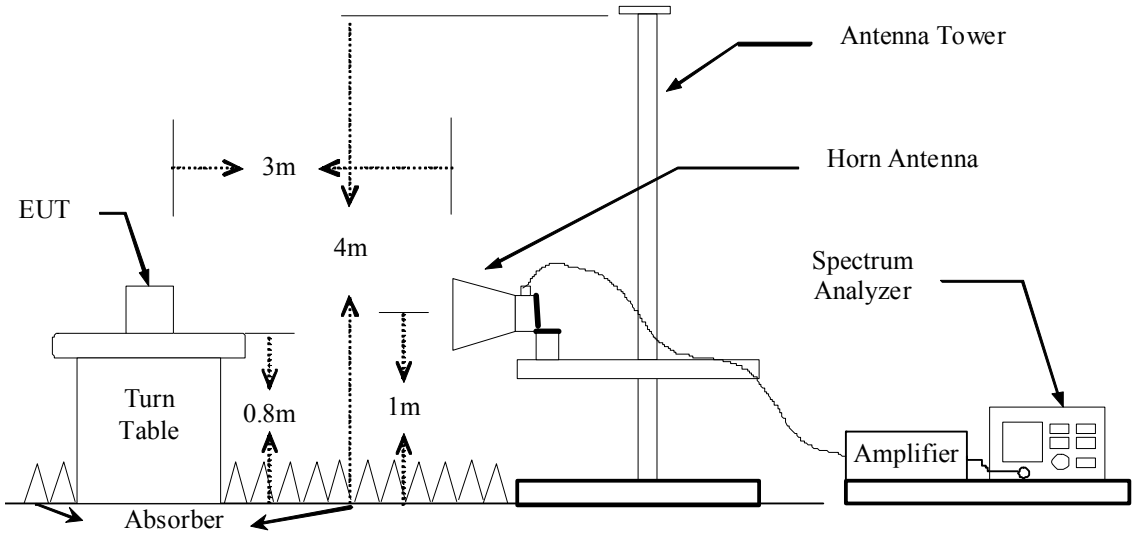


Figure 5: Frequencies measured above 1 GHz configuration



10.3 Measuring Instrument

The following instrument are used for radiated emissions measurement :

Equipment	Manufacturer	Model No.
EMI Receiver	R&S	ESCI
Spectrum Analyzer	R&S	FSU46
Horn Antenna	EMCO	3117
Horn Antenna	EMCO	3116
PRE-Amplifier	Agilent	8449B
PRE-Amplifier	Agilent	8447D
BiLog Antenna	ETC	MCTD 2786
Loop Antenna	EMCO	6512
PRE-Amplifier	EMCI	PA303N

Software: LZ-RF (Ver. ETC-3A2)

Measuring instrument setup in measured frequency band when specified detector function is used:

Frequency Band (MHz)	Instrument	Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	RF Test Receiver	Quasi-Peak	120 kHz	300 kHz
	Spectrum Analyzer	Peak	120 kHz	300 kHz
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz
	Spectrum Analyzer	Average	1 MHz	VBW_avg (Note)

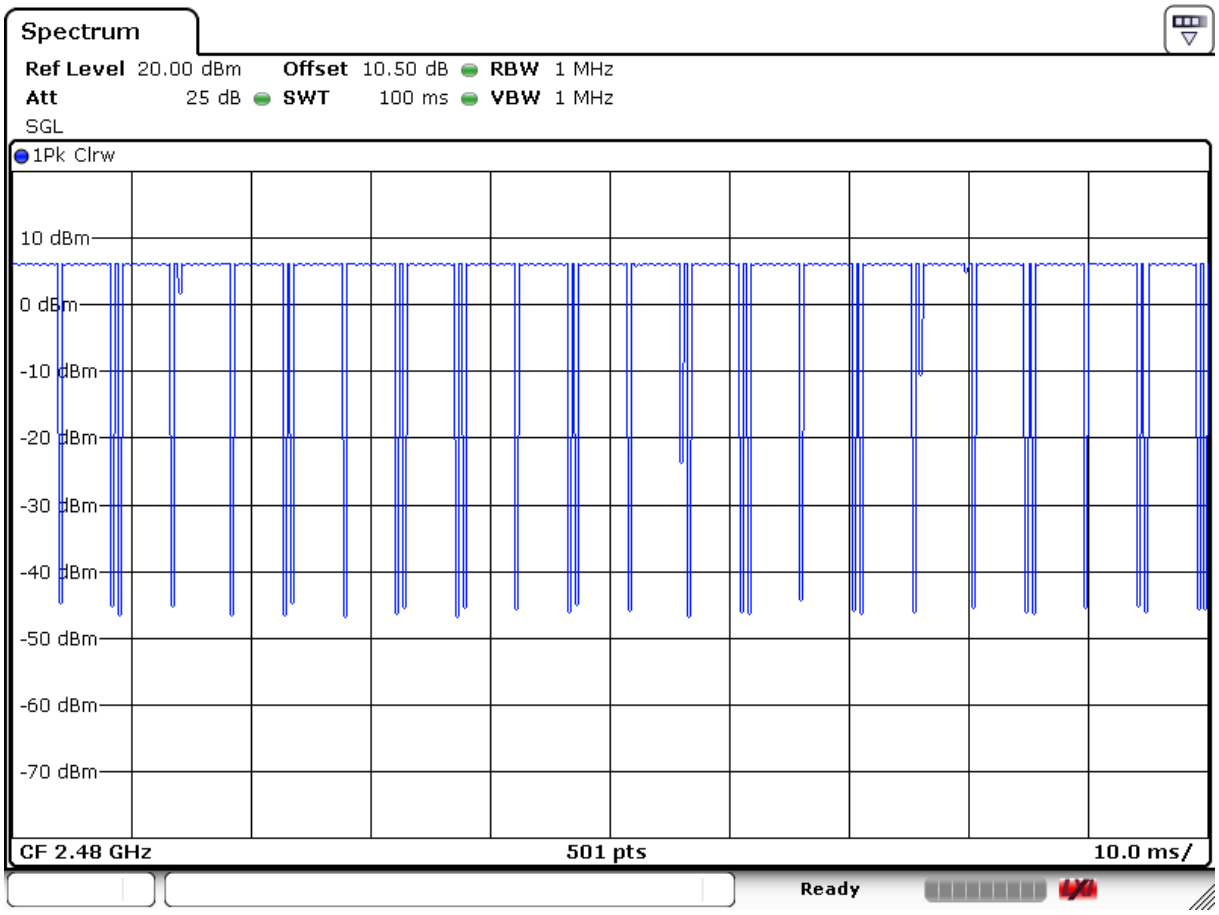
Note:For average measurement

Condition	VBW_avg
Duty cycle is no less than 98 percent	10 Hz
Duty cycle is less than 98 percent, T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation	$\geq \frac{1}{T}$
Current use	10Hz

Duty cycle

File: **18-11-MAS-098** **2019/4/9** **Temperature:** **25 ℃**

Site **RF-Cond01** **Humidity:** **60 %**



Date: 9 APR 2019 15:36:42

Condition: **RF Conducted**

EUT: **Handheld Pulse Oximeter**

Model: **AH-TB**

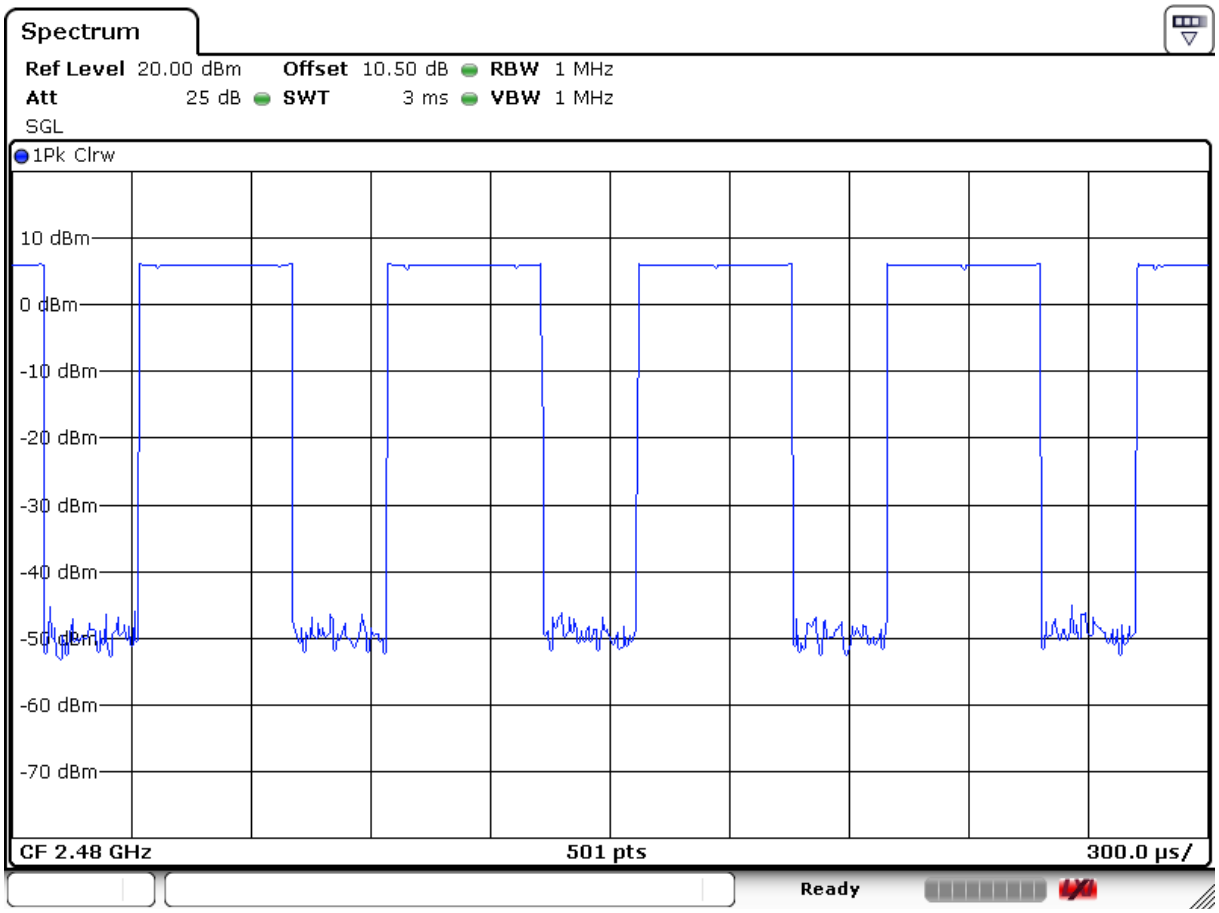
Test Mode: **BLE**

Note: **FCC_Duty1**

Operator: **Phillip**

File: **18-11-MAS-098** **2019/4/9** **Temperature:** **25 ℃**

Site **RF-Cond01** **Humidity:** **60 %**



Date: 9.APR.2019 15:38:11

Condition: **RF Conducted**

EUT: **Handheld Pulse Oximeter**

Model: **AH-TB**

Test Mode: **BLE**

Note: **FCC_Duty-2**

Operator: **Phillip**

10.4 Radiated Emission Data

10.4.1 Harmonic

10.4.1.1 Operation Mode: Tx

Test Apr. 02, 2019 Temperature: 22℃ Humidity: 62%

a) Channel Low

Fundamental Frequency: 2402 MHz

Frequency	Ant Pol	Reading (dBuV/m)@3m		Correct Factor	Result (dBuV/m)@3m		Limit (dBuV/m)@3m		Margin (worse)
(MHz)	H/V	Peak	AVG	(dB)	Peak	AVG	Peak	AVG	(dB)
4804.0000	H	52.92	40.68	1.02	53.94	41.70	74.0	54.0	-12.30
4804.0000	V	53.21	41.19	1.02	54.23	42.21	74.0	54.0	-11.79
7206.0000	H	---	---	3.08	---	---	74.0	54.0	---
7206.0000	V	---	---	3.08	---	---	74.0	54.0	---
9608.0000	H	---	---	4.18	---	---	74.0	54.0	---
9608.0000	V	---	---	4.18	---	---	74.0	54.0	---
12010.0000	H	---	---	7.48	---	---	74.0	54.0	---
12010.0000	V	---	---	7.48	---	---	74.0	54.0	---
14412.0000	H	---	---	9.89	---	---	74.0	54.0	---
14412.0000	V	---	---	9.89	---	---	74.0	54.0	---

Note :

1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. If there is only peak result, item "Margin" referred to "peak result – average limit".
5. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

b) Channel Mid

Fundamental Frequency: 2440 MHz

Frequency	Ant Pol	Reading (dBuV/m)@3m		Correct Factor	Result (dBuV/m)@3m		Limit (dBuV/m)@3m		Margin (worse)
(MHz)	H/V	Peak	AVG	(dB)	Peak	AVG	Peak	AVG	(dB)
4880.0000	H	50.67	38.62	1.18	51.85	39.80	74.0	54.0	-14.20
4880.0000	V	51.40	39.12	1.18	52.58	40.30	74.0	54.0	-13.70
7320.0000	H	---	---	3.08	---	---	74.0	54.0	---
7320.0000	V	---	---	3.08	---	---	74.0	54.0	---
9760.0000	H	---	---	4.43	---	---	74.0	54.0	---
9760.0000	V	---	---	4.43	---	---	74.0	54.0	---
12200.0000	H	---	---	7.80	---	---	74.0	54.0	---
12200.0000	V	---	---	7.80	---	---	74.0	54.0	---
14640.0000	H	---	---	9.86	---	---	74.0	54.0	---
14640.0000	V	---	---	9.86	---	---	74.0	54.0	---

Note :

1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. If there is only peak result, item "Margin" referred to "peak result – average limit".
5. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

c) Channel High

Fundamental Frequency: 2480 MHz

Frequency	Ant Pol	Reading (dBuV/m)@3m		Correct Factor	Result (dBuV/m)@3m		Limit (dBuV/m)@3m		Margin (worse)
(MHz)	H/V	Peak	AVG	(dB)	Peak	AVG	Peak	AVG	(dB)
4960.0000	H	50.75	38.91	1.36	52.11	40.27	74.0	54.0	-13.73
4960.0000	V	51.89	39.75	1.36	53.25	41.11	74.0	54.0	-12.89
7440.0000	H	---	---	3.08	---	---	74.0	54.0	---
7440.0000	V	---	---	3.08	---	---	74.0	54.0	---
9920.0000	H	---	---	4.70	---	---	74.0	54.0	---
9920.0000	V	---	---	4.70	---	---	74.0	54.0	---
12400.0000	H	---	---	8.12	---	---	74.0	54.0	---
12400.0000	V	---	---	8.12	---	---	74.0	54.0	---
14880.0000	H	---	---	9.89	---	---	74.0	54.0	---
14880.0000	V	---	---	9.89	---	---	74.0	54.0	---

Note :

1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. If there is only peak result, item "Margin" referred to "peak result – average limit".
5. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

10.4.3 Spurious Emission

10.4.3.1 Above 1GHz test charts for Harmonic and spurious emission

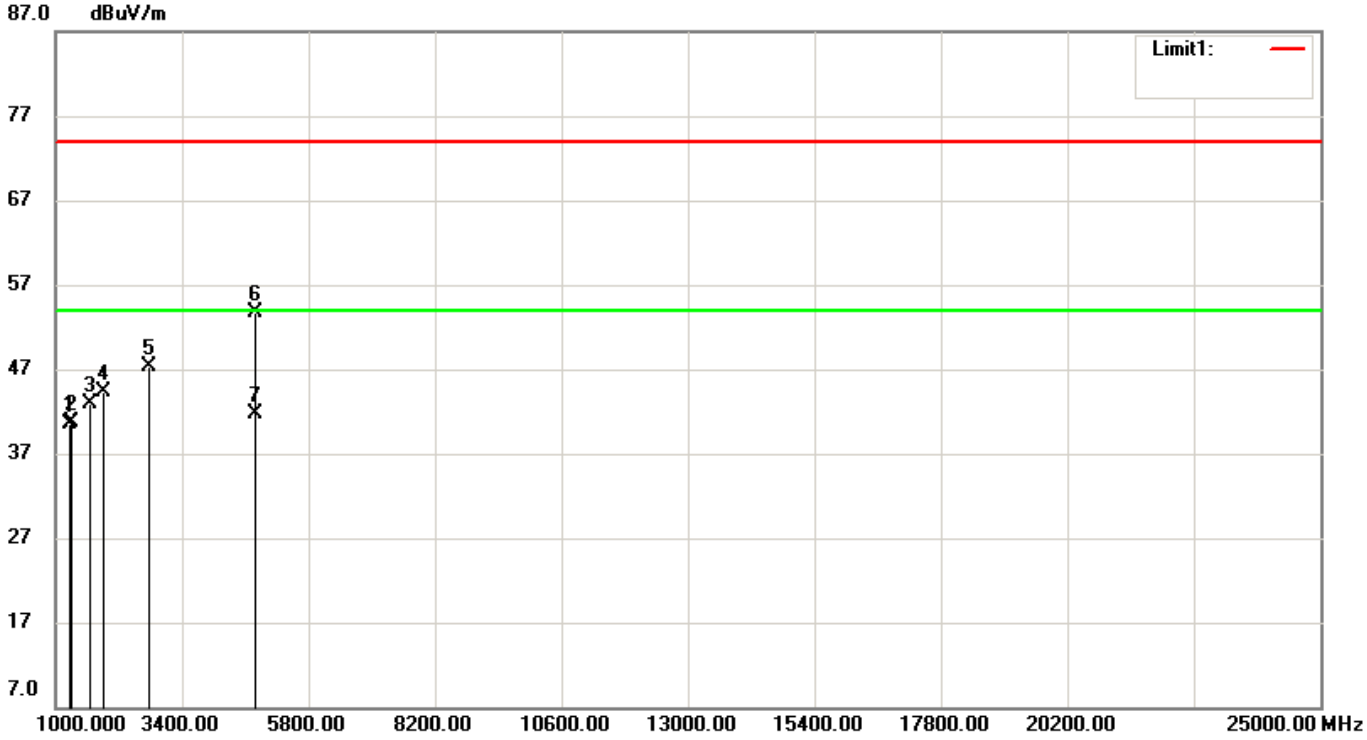
A. Channel Low

Operation Mode : TX/RX

Fundamental Frequency : 2402 MHz

File: **18-11-MAS-098** **#52** **2019/4/2** **Temperature:** **22 ℃**

Site **RE02-EMC B1-N2** **Humidity:** **62 %**



Condition: **FCC_Above1G_Pk** **Polarization:** **Horizontal**

EUT: **Handheld Pulse Oximeter** **Distance:** **3m**

Model: **AH-TB**

Test Mode: **BLE** **Operator:** **Phillip**

Note: **CHL**

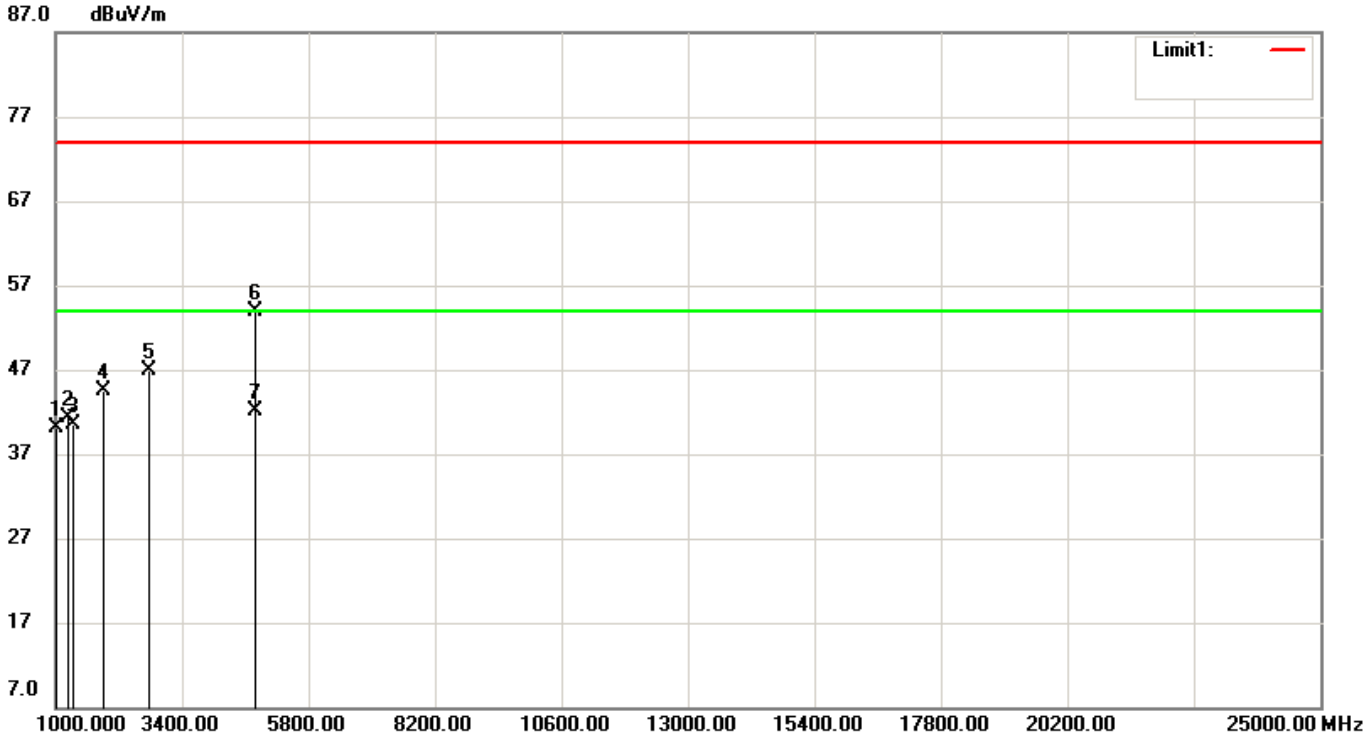
No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBuV/m)		dB/m	(dBuV/m)	(dBuV/m)	(dB)
1	1244.56130	49.70	peak	-9.17	40.53	74.00	-33.47
2	1298.34340	49.61	peak	-8.99	40.62	74.00	-33.38
3	1639.41200	49.86	peak	-7.02	42.84	74.00	-31.16
4	1906.51030	48.91	peak	-4.61	44.30	74.00	-29.70
5	2732.16200	49.70	peak	-2.24	47.46	74.00	-26.54
6	4804.00000	52.92	peak	1.02	53.94	74.00	-20.06
7*	4804.00000	40.68	AVG	1.02	41.70	54.00	-12.30

Note: 1. Remark "---" means that the emissions level is too low to be measured.
2. The test range is up to the tenth harmonic or 40GHz, whichever is lower.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. The estimated measurement uncertainty of the result measurement is:
+4.10dB/ -4.10 dB (1GHz≦f<18GHz)
+4.40dB/ -4.42 dB (18GHz≦f≦40GHz)

Operation Mode : TX/RX
Fundamental Frequency : 2402 MHz

File: **18-11-MAS-098** **#53** **2019/4/2** **Temperature:** **22 ℃**

Site **RE02-EMC B1-N2** **Humidity:** **62 %**



Condition: **FCC_Above1G_Pk** **Polarization:** **Vertical**

EUT: **Handheld Pulse Oximeter** **Distance:** **3m**

Model: **AH-TB**

Test Mode: **BLE** **Operator:** **Phillip**

Note: **CHL**

No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBuV/m)		dB/m	(dBuV/m)	(dBuV/m)	(dB)
1	1033.64780	50.00	peak	-9.92	40.08	74.00	-33.92
2	1219.89120	50.51	peak	-9.27	41.24	74.00	-32.76
3	1323.10700	49.40	peak	-8.91	40.49	74.00	-33.51
4	1913.14210	49.06	peak	-4.54	44.52	74.00	-29.48
5	2732.16200	49.23	peak	-2.24	46.99	74.00	-27.01
6	4804.00000	53.21	peak	1.02	54.23	74.00	-19.77
7*	4804.00000	41.19	AVG	1.02	42.21	54.00	-11.79

Note: 1. Remark "---" means that the emissions level is too low to be measured.
2. The test range is up to the tenth harmonic or 40GHz, whichever is lower.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. The estimated measurement uncertainty of the result measurement is:
+4.10dB/ -4.10 dB (1GHz≦f<18GHz)
+4.40dB/ -4.42 dB (18GHz≦f≦40GHz)

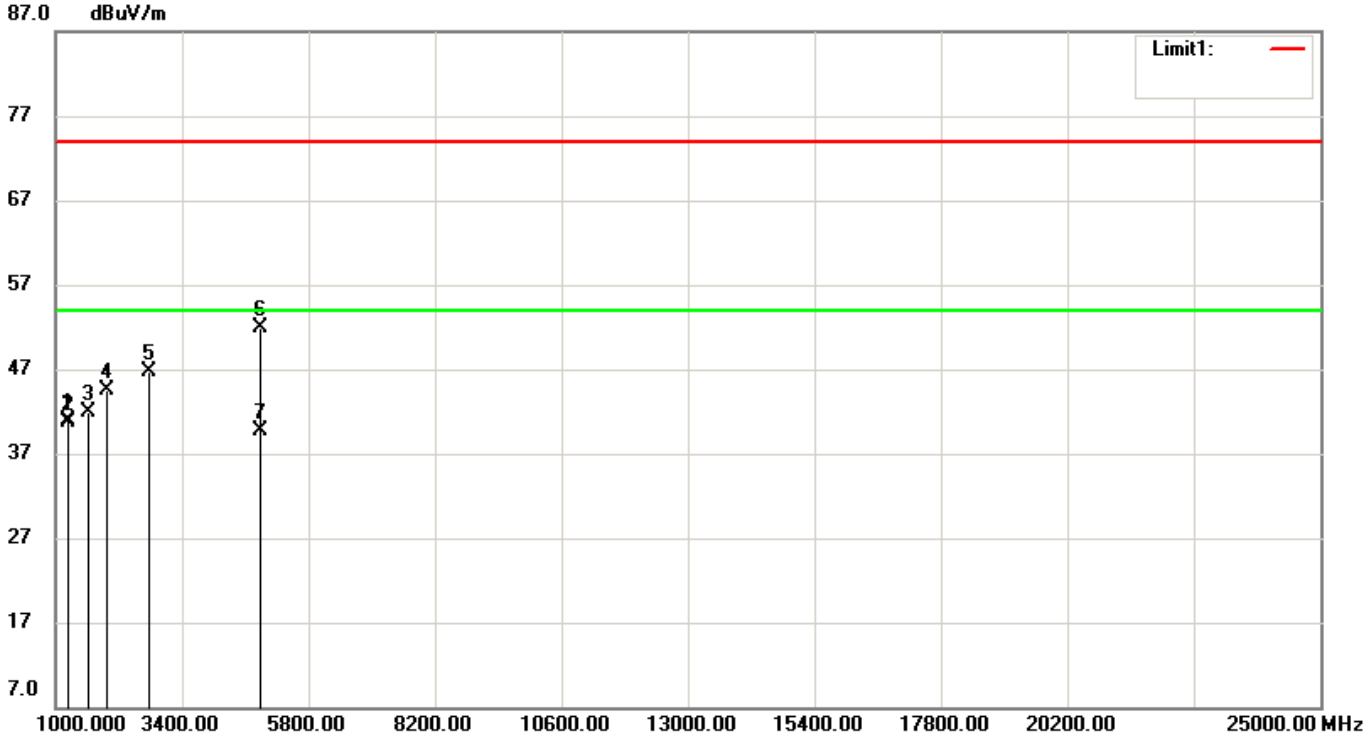
B. Channel Mid

Operation Mode : TX/RX

Fundamental Frequency : 2440 MHz

File: **18-11-MAS-098** **#54** **2019/4/2** **Temperature:** **22 ℃**

Site **RE02-EMC B1-N2** **Humidity:** **62 %**



Condition: **FCC_Above1G_Pk** **Polarization:** **Horizontal**

EUT: **Handheld Pulse Oximeter** **Distance:** **3m**

Model: **AH-TB**

Test Mode: **BLE** **Operator:** **Phillip**

Note: **CHM**

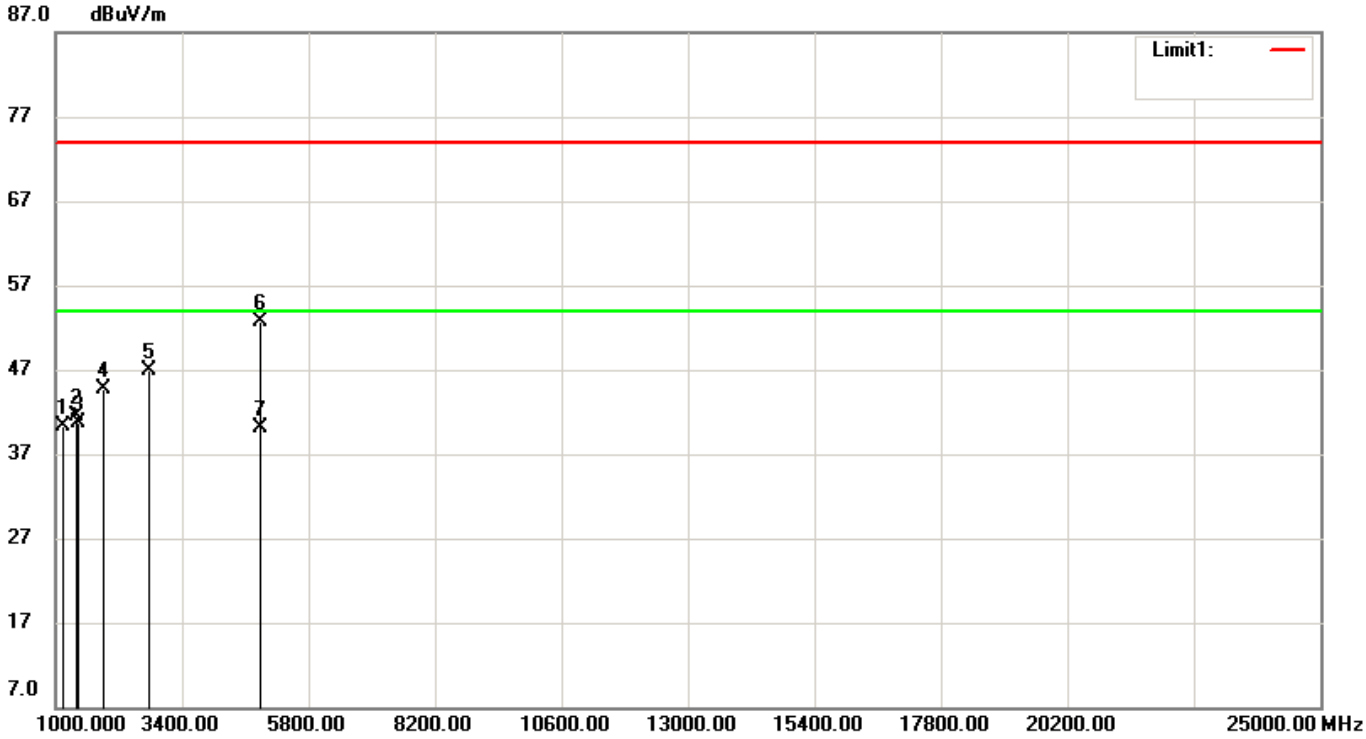
No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBuV/m)		dB/m	(dBuV/m)	(dBuV/m)	(dB)
1	1199.67940	50.12	peak	-9.33	40.79	74.00	-33.21
2	1224.35900	50.00	peak	-9.25	40.75	74.00	-33.25
3	1596.79420	49.30	peak	-7.40	41.90	74.00	-32.10
4	1928.83110	48.88	peak	-4.41	44.47	74.00	-29.53
5	2757.02780	48.91	peak	-2.23	46.68	74.00	-27.32
6	4880.00000	50.67	peak	1.18	51.85	74.00	-22.15
7*	4880.00000	38.62	AVG	1.18	39.80	54.00	-14.20

Note: 1. Remark "---" means that the emissions level is too low to be measured.
2. The test range is up to the tenth harmonic or 40GHz, whichever is lower.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. The estimated measurement uncertainty of the result measurement is:
+4.10dB/ -4.10 dB (1GHz≦f<18GHz)
+4.40dB/ -4.42 dB (18GHz≦f≦40GHz)

Operation Mode : TX/RX
Fundamental Frequency : 2440 MHz

File: **18-11-MAS-098** **#55** **2019/4/2** **Temperature:** **22 ℃**

Site **RE02-EMC B1-N2** **Humidity:** **62 %**



Condition: **FCC_Above1G_Pk** **Polarization:** **Vertical**

EUT: **Handheld Pulse Oximeter** **Distance:** **3m**

Model: **AH-TB**

Test Mode: **BLE** **Operator:** **Phillip**

Note: **CHM**

No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBuV/m)		dB/m	(dBuV/m)	(dBuV/m)	(dB)
1	1123.39840	49.92	peak	-9.61	40.31	74.00	-33.69
2	1350.01000	50.27	peak	-8.81	41.46	74.00	-32.54
3	1406.09110	49.26	peak	-8.62	40.64	74.00	-33.36
4	1892.94760	49.37	peak	-4.72	44.65	74.00	-29.35
5	2732.16200	49.16	peak	-2.24	46.92	74.00	-27.08
6	4880.00000	51.40	peak	1.18	52.58	74.00	-21.42
7*	4880.00000	39.12	AVG	1.18	40.30	54.00	-13.70

Note: 1. Remark "---" means that the emissions level is too low to be measured.
2. The test range is up to the tenth harmonic or 40GHz, whichever is lower.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. The estimated measurement uncertainty of the result measurement is:
+4.10dB/ -4.10 dB (1GHz≦f<18GHz)
+4.40dB/ -4.42 dB (18GHz≦f≦40GHz)

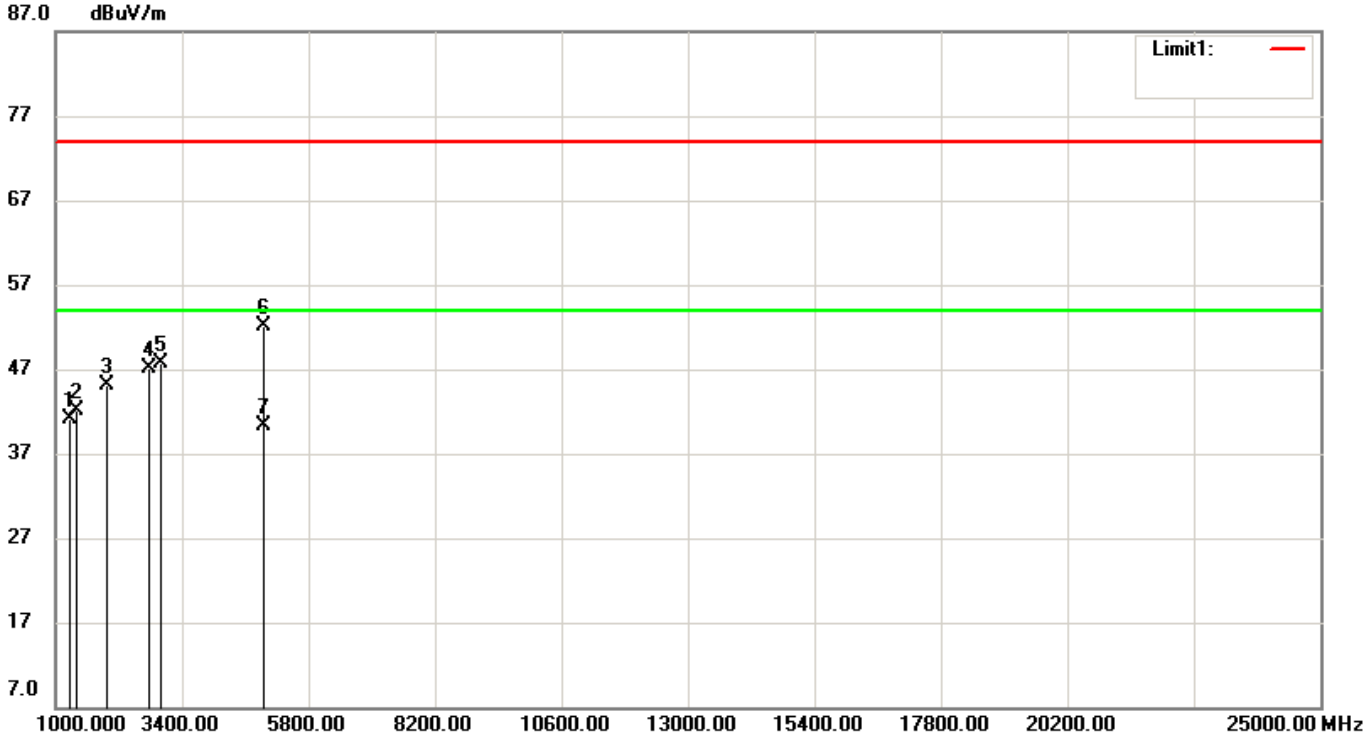
C. Channel High

Operation Mode : TX/RX

Fundamental Frequency : 2480 MHz

File: **18-11-MAS-098** **#56** **2019/4/2** **Temperature:** **22 ℃**

Site **RE02-EMC B1-N2** **Humidity:** **62 %**



Condition: **FCC_Above1G_Pk** **Polarization:** **Horizontal**

EUT: **Handheld Pulse Oximeter** **Distance:** **3m**

Model: **AH-TB**

Test Mode: **BLE** **Operator:** **Phillip**

Note: **CHH**

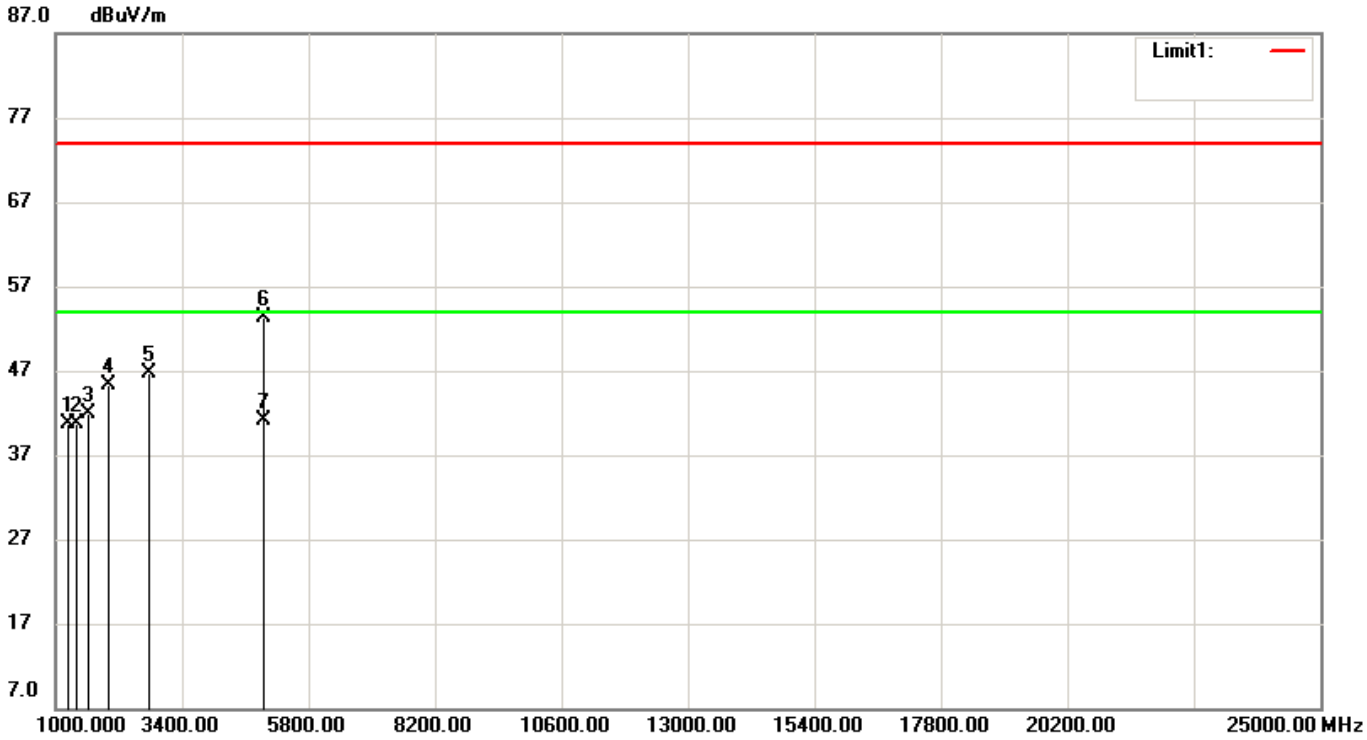
No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBuV/m)		dB/m	(dBuV/m)	(dBuV/m)	(dB)
1	1253.52650	50.23	peak	-9.15	41.08	74.00	-32.92
2	1354.48620	50.91	peak	-8.79	42.12	74.00	-31.88
3	1955.76900	49.25	peak	-4.16	45.09	74.00	-28.91
4	2732.16200	49.30	peak	-2.24	47.06	74.00	-26.94
5	2980.82420	49.78	peak	-2.05	47.73	74.00	-26.27
6	4960.00000	50.75	peak	1.36	52.11	74.00	-21.89
7*	4960.00000	38.91	AVG	1.36	40.27	54.00	-13.73

Note: 1. Remark "---" means that the emissions level is too low to be measured.
2. The test range is up to the tenth harmonic or 40GHz, whichever is lower.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. The estimated measurement uncertainty of the result measurement is:
+4.10dB/ -4.10 dB (1GHz≦f<18GHz)
+4.40dB/ -4.42 dB (18GHz≦f≦40GHz)

Operation Mode : TX/RX
Fundamental Frequency : 2480 MHz

File: 18-11-MAS-098 **#57** **2019/4/2** **Temperature: 22 ℃**

Site RE02-EMC B1-N2 **Humidity: 62 %**



Condition: **FCC_Above1G_Pk** **Polarization:** **Vertical**

EUT: **Handheld Pulse Oximeter** **Distance:** **3m**

Model: **AH-TB**

Test Mode: **BLE** **Operator:** **Phillip**

Note: **CHH**

No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBuV/m)		dB/m	(dBuV/m)	(dBuV/m)	(dB)
1	1222.11330	49.97	peak	-9.26	40.71	74.00	-33.29
2	1350.00000	49.51	peak	-8.81	40.70	74.00	-33.30
3	1601.28300	49.24	peak	-7.36	41.88	74.00	-32.12
4	1978.21500	49.28	peak	-3.96	45.32	74.00	-28.68
5	2732.16200	48.91	peak	-2.24	46.67	74.00	-27.33
6	4960.00000	51.89	peak	1.36	53.25	74.00	-20.75
7*	4960.00000	39.75	AVG	1.36	41.11	54.00	-12.89

Note: 1. Remark "---" means that the emissions level is too low to be measured.
2. The test range is up to the tenth harmonic or 40GHz, whichever is lower.
3. If the peak result is under the average limit, that is deemed to meet the average limit.
4. The estimated measurement uncertainty of the result measurement is:
+4.10dB/ -4.10 dB (1GHz≦f<18GHz)
+4.40dB/ -4.42 dB (18GHz≦f≦40GHz)

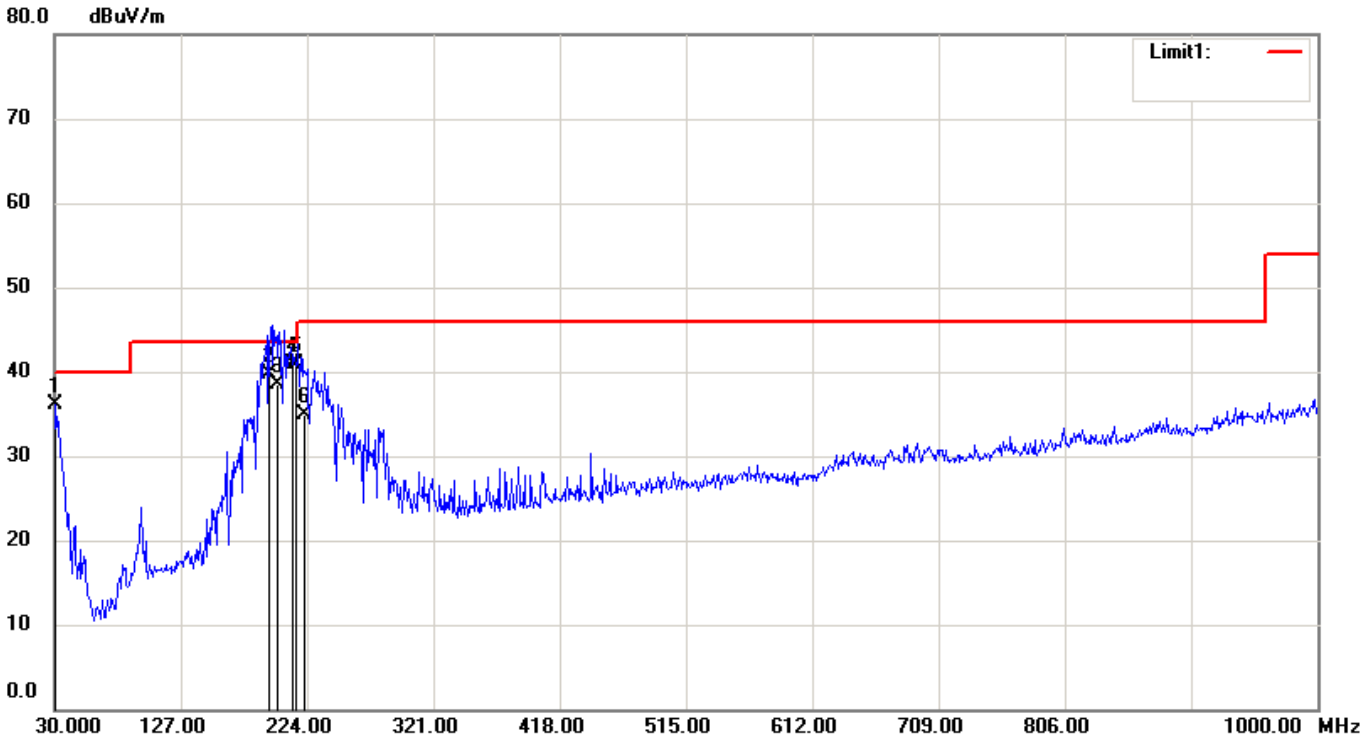
10.4.3.2 Spurious emission test charts below 1GHz

10.4.3.2.1 Operation Mode: Tx

10.4.3.2.1.1 30 MHz to 1 GHz

File: 18-11-MAS-098 **#48** **2019/4/1** **Temperature:** 21 ℃

Site RE02-EMC B1-N2 **Humidity:** 63 %



Condition: FCC Part15 RE-Class B_30-1000MHz **Polarization:** Horizontal

EUT: Handheld Pulse Oximeter **Distance:** 3m

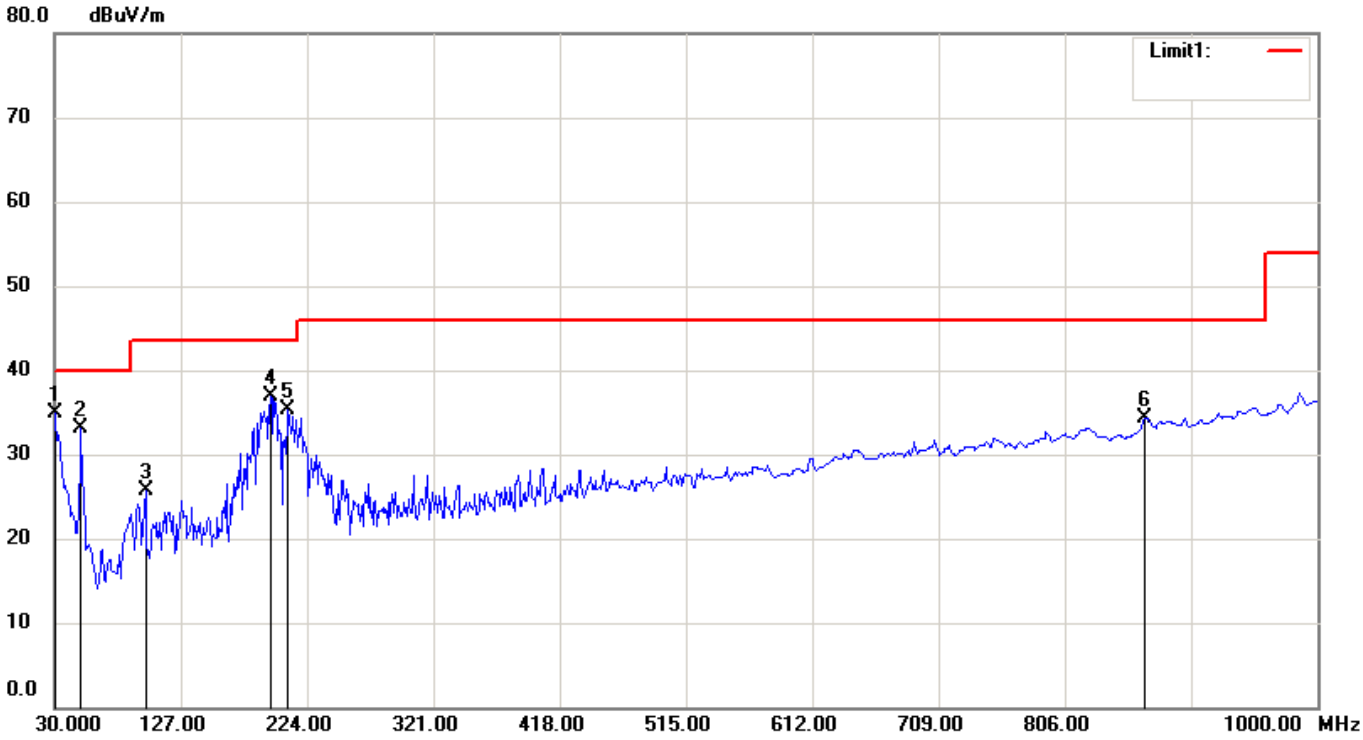
Model: AH-TB

Test Mode: BLE **Operator:** Phillip

Note:

No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
	(MHz)	(dBuV/m)		dB/m	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	30.9700	38.14	QP	-2.11	36.03	40.00	-3.97	100	200
2	194.8000	48.78	QP	-8.98	39.80	43.50	-3.70	115	151
3	201.2000	46.49	QP	-7.89	38.60	43.50	-4.90	115	145
4	211.4000	47.48	QP	-6.53	40.95	43.50	-2.55	170	158
5	215.2570	47.88	QP	-6.88	41.00	43.50	-2.50	160	164
6	221.6000	42.33	QP	-7.33	35.00	46.00	-11.00	100	171

File:	**18-11-MAS-098**	**#49**	**2019/4/1**	**Temperature:**	**21 ℃**
Site	**RE02-EMC B1-N2**			**Humidity:**	**63 %**



Condition:	**FCC Part15 RE-Class B_30-1000MHz**	**Polarization:**	**Vertical**
EUT:	**Handheld Pulse Oximeter**	**Distance:**	**3m**
Model:	**AH-TB**		
Test Mode:	**BLE**	**Operator:**	**Phillip**
Note:			

No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
	(MHz)	(dBuV/m)		dB/m	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	30.1054	36.49	QP	-1.67	34.82	40.00	-5.18	100	230
2	50.3700	45.06	QP	-12.00	33.06	40.00	-6.94	100	148
3	99.8400	36.38	QP	-10.64	25.74	43.50	-17.76	100	218
4	195.8700	45.67	QP	-8.80	36.87	43.50	-6.63	135	247
5	209.4500	41.73	QP	-6.50	35.23	43.50	-8.27	135	200
6	867.1100	27.83	QP	6.47	34.30	46.00	-11.70	100	88

Note: 1. Remark "---" means that the emissions level is too low to be measured.
2. The test range is up to the tenth harmonic or 40GHz, whichever is lower.
3. If the peak result is under the Quasi-peak limit, that is deemed to meet the Quasi-peak limit.
4. The estimated measurement uncertainty of the result measurement is:
±4.6dB (30MHz≦f<300MHz).
±4.4dB (300MHz≦f<1000MHz).

10.4.3.2.1.2 below 30MHz

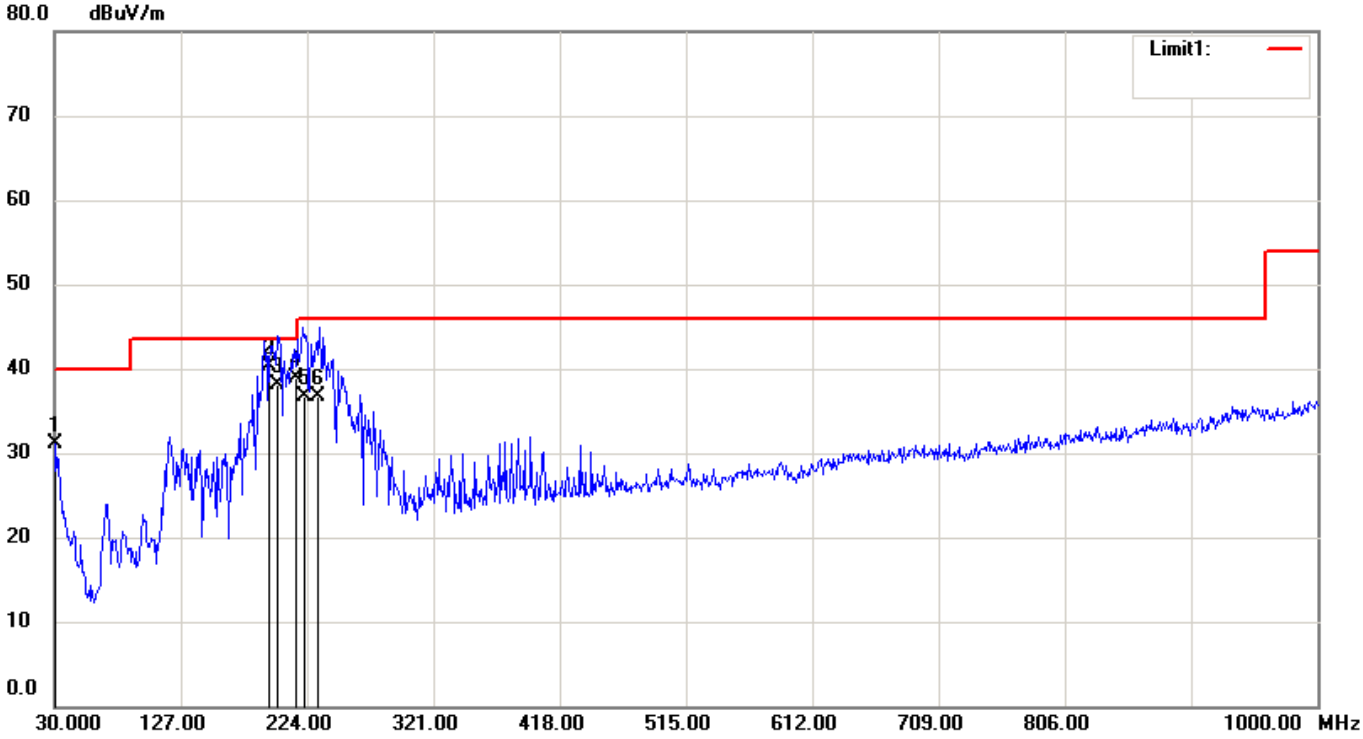
Frequency (MHz)	Reading (dBuV/m) Peak	Duty (dB)	Factor (dB)	Result @3m (dBuV/m) Peak	QP	AVG	Limit @3m (dBuV/m) Peak	AVG
Radiated emission frequencies from 9 kHz to 30 MHz were too low to be measured.								

Note: 1. Place of Measurement: Measuring site of the RE02-EMC B1-N2.
2. Item of margin shown in above table refer to average limit.
3. Remark "---" means that the emissions level is too low to be measured.
4. If the peak result is under the average limit, that is deemed to meet the average limit.
5. If there is only peak result, item "Margin" referred to "peak result – average limit".

10.4.3.2.2 Operation Mode: Charging Mode

File: 18-11-MAS-098 **#50** **2019/4/1** **Temperature:** 21 ℃

Site RE02-EMC B1-N2 **Humidity:** 63 %



Condition: FCC Part15 RE-Class B_30-1000MHz **Polarization:** Horizontal

EUT: Handheld Pulse Oximeter **Distance:** 3m

Model: AH-TB

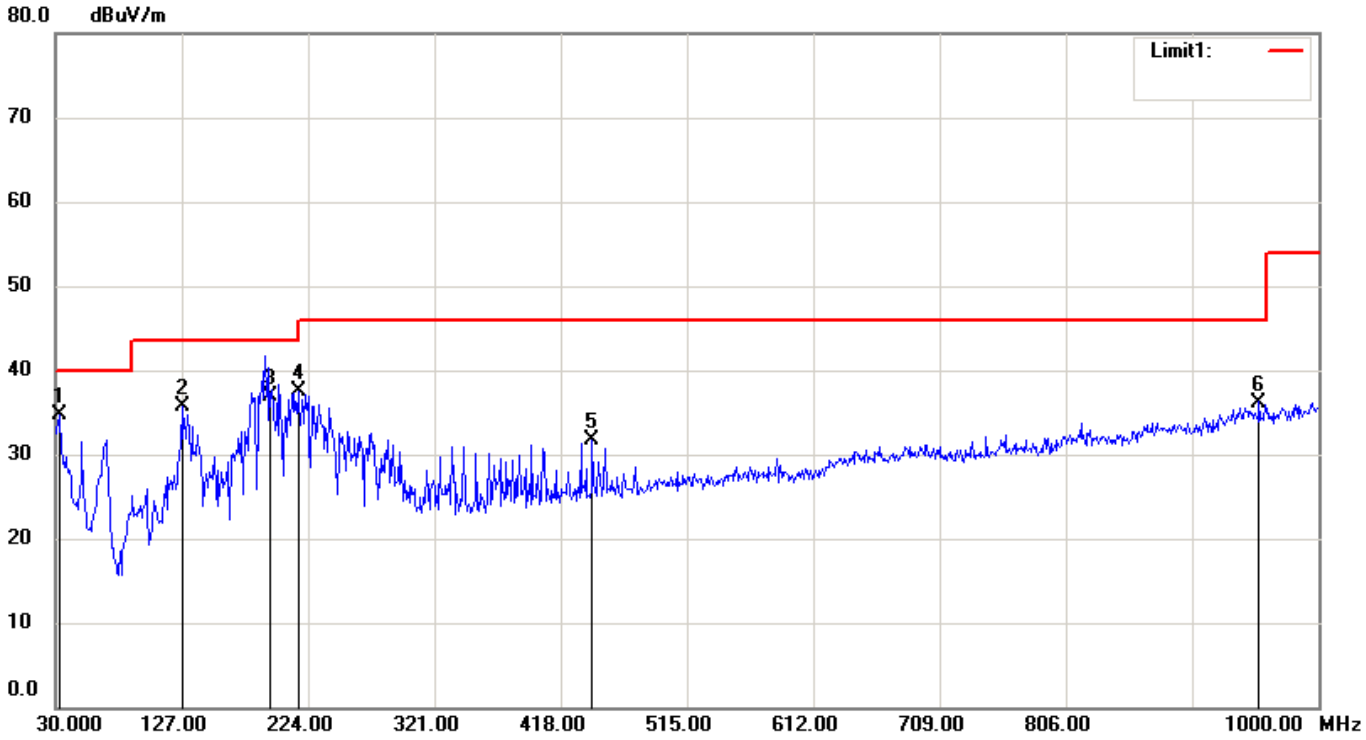
Test Mode: BLE **Operator:** Phillip

Note: charging mode

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	30.9700	33.17	QP	-2.11	31.06	40.00	-8.94	100	35
2	194.7610	49.39	QP	-8.99	40.40	43.50	-3.10	200	325
3	201.0500	46.11	QP	-7.91	38.20	43.50	-5.30	185	333
4	215.2580	45.83	QP	-6.88	38.95	43.50	-4.55	150	180
5	221.7500	44.13	QP	-7.33	36.80	46.00	-9.20	155	166
6	231.8500	44.09	QP	-7.29	36.80	46.00	-9.20	150	145

File: 18-11-MAS-098 **#51** **2019/4/1** **Temperature:** 21 ℃

Site RE02-EMC B1-N2 **Humidity:** 63 %



Condition: FCC Part15 RE-Class B_30-1000MHz **Polarization:** Vertical

EUT: Handheld Pulse Oximeter **Distance:** 3m

Model: AH-TB

Test Mode: BLE **Operator:** Phillip

Note: Charging mode

No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
	(MHz)	(dBuV/m)		dB/m	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	32.9100	37.80	QP	-3.13	34.67	40.00	-5.33	100	242
2	127.0000	44.54	QP	-8.74	35.80	43.50	-7.70	100	31
3	194.7550	45.99	QP	-8.99	37.00	43.50	-6.50	100	210
4	216.2400	44.48	QP	-6.96	37.52	46.00	-8.48	200	109
5	442.2500	32.72	QP	-1.05	31.67	46.00	-14.33	100	110
6	954.4100	27.56	QP	8.64	36.20	46.00	-9.80	171	135

Note: 1. Remark "---" means that the emissions level is too low to be measured.
2. The test range is up to the tenth harmonic or 40GHz, whichever is lower.
3. If the peak result is under the Quasi-peak limit, that is deemed to meet the Quasi-peak limit.
4. The estimated measurement uncertainty of the result measurement is:
±4.6dB (30MHz≦f<300MHz).
±4.4dB (300MHz≦f<1000MHz).

10.4.4 Radiated Measurement at Bandedge with Fundamental Frequencies and co-location

Test Mar. 28, 2019 Temperature: 21℃ Humidity: 63%

Operation Mode: Tx

Operation Channel	Test Frequency	Reading @3m (dBuV/m)				Factor	Result		Limit @3m		Margin (worse)	
		H		V			(dBuV/m)		(dBuV/m)		(dB)	
	(MHz)	Peak	Ave	Peak	Ave	(dB)	Peak	Ave	Peak	Ave	Peak	Ave
CHLow	2390.000	27.1	13.8	27.1	13.8	34.4	61.5	48.2	74.0	54.0	-12.5	-5.9
CH High	2483.500	26.2	16.5	25.8	15.3	34.5	60.7	51.0	74.0	54.0	-13.3	-3.0

Note :
1. Remark "---" means that the emissions level is too low to be measured.
2. The result is the highest value of radiated emission from restrict band of 2310 ~ 2390 MHz and 2483.5 ~ 2900 MHz.

10.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor, High Pass Filter Loss(if used) and Cable Loss, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

where
Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Amplifier Gain

11. EQUIPMENTS LIST FOR TESTING

Equipment	Manufacturer	Model No.	S/N	Calibration Date	Next Cal. Due
EMI Test Receiver	R&S	ESCI	13054418-001	01/24/2019	01/23/2020
V-LISN	R&S	ENV216	13057719-002	09/21/2018	09/20/2019
Spectrum Analyzer	R&S	FSV	13052017-001	06/13/2018	06/12/2019
Attenuator	WEINSCHEL	56-10	58772	04/27/2018	04/26/2019
Power Meter	Agilent	N1912A	13050625-001	10/11/2018	10/10/2019
Power Sensor	Agilent	N1922A	13053523-001	10/11/2018	10/10/2019
EMI Receiver	R&S	ESCI	13054423-001	01/04/2019	01/03/2020
Spectrum Analyzer	R&S	FSU46	13040904-001	06/04/2018	06/03/2019
Horn Antenna	EMCO	3117	13059211-004	01/05/2019	01/04/2020
Horn Antenna	EMCO	3116	13059202-001	11/23/2018	11/22/2019
PRE-Amplifier	Agilent	8449B	13040709-001	01/03/2019	01/02/2020
PRE-Amplifier	Agilent	8447D	13040715-002	04/23/2018	04/22/2019
BiLog Antenna	ETC	MCTD 2786	BL19J04024	01/15/2019	01/14/2020
Loop Antenna	EMCO	6512	13054104-001	01/10/2019	01/09/2020