

# JAPAN MIC

## Radio Test Report

FOR

**Applicant:** WWZN Information Technology Company Limited  
Room 901, 9th Floor, No.19, Zhong Guancun Street, Haidian District,  
Beijing, 100080 China

**Product Name:** Smart Watch

**Brand Name:** TicWatch

**Model No.:** WG12016

**Model Difference:** N/A

**Report Number:** ER/2018/60030

**Issue Date:** Jul. 06, 2018

**Date of Test:** Jun. 14, 2018

**Date of EUT Received:** Jun. 07, 2018

**Place of Testing** No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District,  
New Taipei City, Taiwan 24803

**Test Result** PASS

**Classification of Specified Radio Equipment** Article 2 Clause 1 Item 19

**We hereby declare that:**

The data presented with this application to be true and correct; and That our testing equipment is regularly serviced and properly calibrated; and We agree to maintain records of data for a minimum of ten (10) years in our laboratory for immediate presentation upon request by Telefication B.V..

**Measurement was conducted by the following test method:**

the test method of Ordinance Concerning Technical Regulations  
Conformity Certification etc. of Specified Radio Equipment in Annex 1, the Ministry of Internal Affairs and Communication notification in Annex 43 of Article 88, Paragraph 1 or the test method more than equivalent.

Tested By:



Louis Chen / Engineer

Approved By:



Jim Chang / Manager

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## Revision History

| Report Number | Revision | Description                  | Effected Page | Issue Date    | Revised By |
|---------------|----------|------------------------------|---------------|---------------|------------|
| ER/2018/60030 | Rev.00   | Initial creation of document | All           | Jul. 06, 2018 | Elle Chang |

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## 1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

### 1.1 General information

#### General:

|                     |                                                                       |                                                                                    |
|---------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Product Name:       | Smart Watch                                                           |                                                                                    |
| Brand Name:         | TicWatch                                                              |                                                                                    |
| Model No.:          | WG12016                                                               |                                                                                    |
| Model Difference:   | N/A                                                                   |                                                                                    |
| Product HW version: | 1000                                                                  |                                                                                    |
| Product SW version: | OWDT.180612.001                                                       |                                                                                    |
| Charging Dock:      | Model No.: WG12016, Supplier: N/A                                     |                                                                                    |
| Power Supply:       | 3.8Vdc from Rechargeable Li-ion Battery<br>or 5Vdc from charging dock |                                                                                    |
|                     | Battery:                                                              | Model No.: SP452929SF,<br>Supplier: TIANJIN LISHEN BATTERY JOINT-STOCK<br>CO., LTD |

Type, frequency of  
transmittable radio wave  
and rated output

F1D 2402MHz-2480MHz(Interval of 2MHz 40ch)  
1.5885 mW

### Antenna Designation

| Antenna Type | Part Number | Supplier | Polarization<br>(H or V) | Peak Gain<br>(dBi) |
|--------------|-------------|----------|--------------------------|--------------------|
| PIFA         | N/A         | N/A      | H+V                      | -1.78              |

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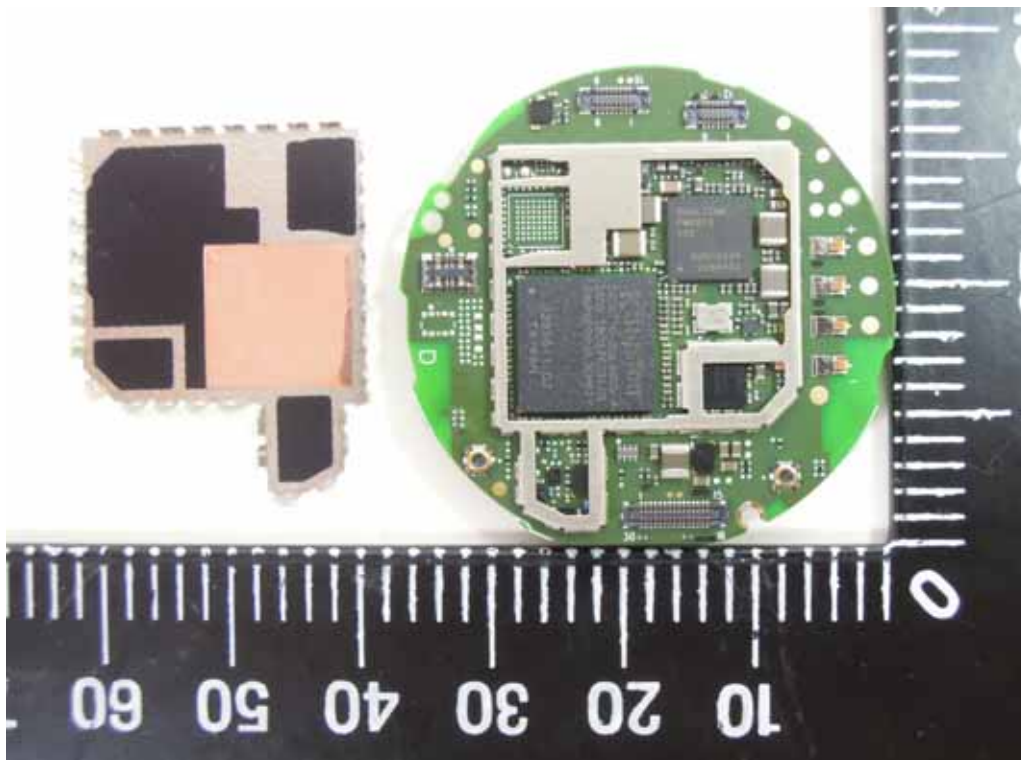
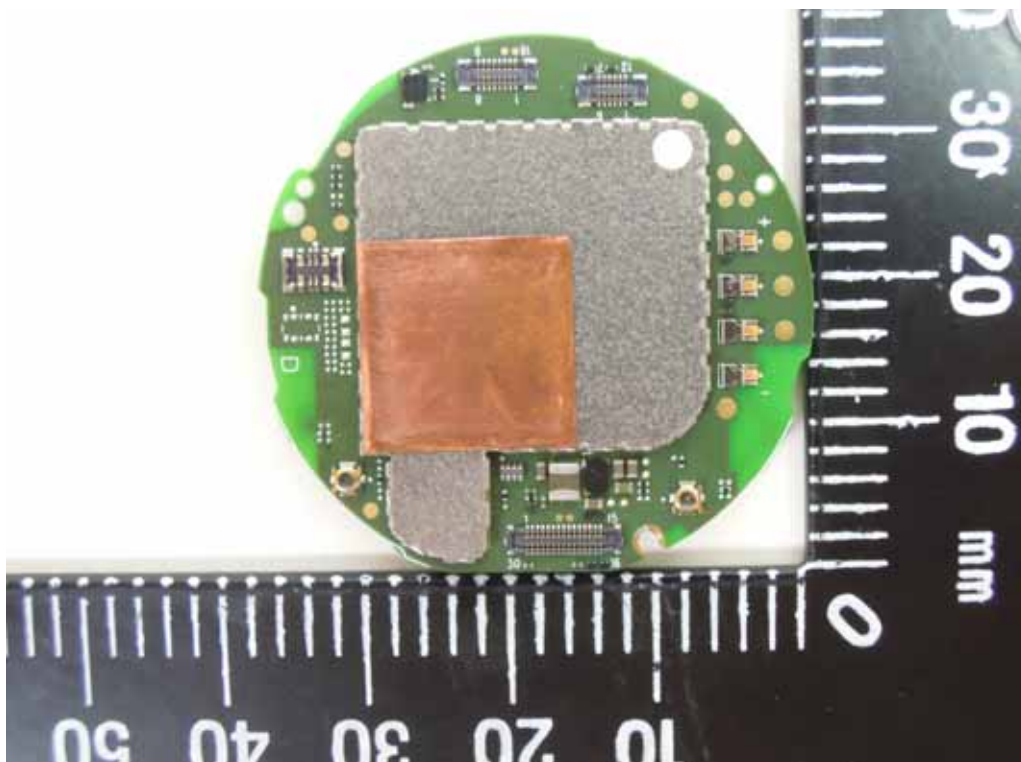
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## 1.2 Assemble

The shielding is directly soldered to the PCB board. The inner shielding is shown in the illustration below.



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## 2 DESCRIPTION OF TEST

|                          |             |    |    |
|--------------------------|-------------|----|----|
| Environment of Test Room | Temperature | 24 | °C |
|                          | Humidity    | 63 | %  |

|                   |               |            |
|-------------------|---------------|------------|
| Peak Antenna Gain | -1.78         | dBi        |
| Rated output      | 1.589         | mW         |
| Rated output      | 2.0100        | dBm        |
| <b>E.I.R.P.</b>   | <b>0.2300</b> | <b>dBm</b> |
| Input Voltage     | 3.85          | VDC        |

|                               |          |           |      |
|-------------------------------|----------|-----------|------|
| Tested Circuit Insertion Loss |          | 1         | dB   |
| Burst                         | ON TIME  | 0.000392  | sec  |
|                               | OFF TIME | 0.0002336 | sec  |
|                               | Ratio    | 62.66     | %    |
| Packet Type (Mode)            |          | BT LE     | mode |

|                                                                          |
|--------------------------------------------------------------------------|
| Test Category ; 2.4GHz Band Wideband Low-Power Data Communication System |
|--------------------------------------------------------------------------|

|                                                      |
|------------------------------------------------------|
| The reason why test are performed only rated voltage |
|------------------------------------------------------|

|                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| When the input voltage to receiver RF circuit varies below $\pm 1\%$ as the input voltage from the external power supply to the receiver varies $\pm 10\%$ (excluding power supply). |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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### 3 ABOUT UNCERTAINTY OF MEASURED VALUE

\*In this test, the influence of an error or uncertainty may be done according to the following factors.

- Bias of a measurement equipment, Change by aging, Attrition, Noise
- Skill and capability of an inspector
- Environment (Temperature, Humidity)
- Dispersion in a EUT (Equipment Under Test)
- Uncertainty of calibration of a measurement equipment

Therefore, Synthetic uncertainty is calculated using "k=2" of coverage factor, and about 95% of confidence level shall be obtained.

In consideration of the above, it judged as follows.

| JUDGE | Measured value and Standard limit value                                                                                                              |                                                                                                                                      |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| PASS  | <div> <div>Case1</div> <div>Standard limit value</div> <div> <div>+uncertainty</div> <div>-uncertainty</div> <div>Measured value</div> </div> </div> | *Even if it takes uncertainty into consideration, a standard limit value is fulfilled.                                               |
|       | <div> <div>Case2</div> <div> <div></div> <div></div> </div> </div>                                                                                   | *Although measured value is in a standard limit value, a limit value won't be fulfilled if uncertainty is taken into consideration.  |
| FAIL  | <div> <div>Case3</div> <div> <div></div> <div></div> </div> </div>                                                                                   | *Although measured value exceeds a standard limit value, a limit value will be fulfilled if uncertainty is taken into consideration. |
|       | <div> <div>Case4</div> <div> <div></div> <div></div> </div> </div>                                                                                   | *Even if it takes uncertainty into consideration, a standard limit value isn't fulfilled.                                            |

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## 4 MEASUREMENT EQUIPMENT LIST

### Output power

| EQUIPMENT TYPE  | MFR          | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
|-----------------|--------------|--------------|---------------|------------|------------|
| Power Meter     | Anritsu      | ML2496A      | 1804001       | 02/01/2018 | 01/31/2019 |
| Attenuator      | Mini-Circuit | BW-S10W2+    | 2             | 01/02/2018 | 01/01/2019 |
| Power Sensor    | Anritsu      | MA2411B      | 1726104       | 02/01/2018 | 01/31/2019 |
| DC Power Supply | Anritsu      | E3640A       | MY40000811    | 12/18/2017 | 12/17/2018 |

### Conducted

| EQUIPMENT TYPE        | MFR          | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
|-----------------------|--------------|--------------|---------------|------------|------------|
| EXA Spectrum Analyzer | Agilent      | N9010A       | MY57120290    | 02/14/2018 | 02/13/2019 |
| Attenuator            | Mini-Circuit | BW-S10W2+    | 2             | 01/02/2018 | 01/01/2019 |
| DC Power Supply       | Anritsu      | E3640A       | MY40000811    | 12/18/2017 | 12/17/2018 |

**Note 1:** The validity of measurement equipment is one year from the first day of the following month of the calibration date.

(e.g. If the calibration date is December 15th, 2014, measurement equipment can be used from December 15th, 2014 to December 31st, 2015.)

### Note 2: Calibration Method

- a): Calibration conducted by the National Institute of Information and Communications Technology(NICT)(hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1)
- b): Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992)
- c) : Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1)
- d) : Calibration conducted by using measuring instruments and other equipment listed in the right column of Table No. 3 attached hereto, which shall have been given any of calibration, etc. listed above from a) to c)

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## 5 TEST RESULTS:

|                                                             |                  |             |          |            |          |       |
|-------------------------------------------------------------|------------------|-------------|----------|------------|----------|-------|
| Measurement Frequency                                       | MHz              | 2402        | 2442     | 2480       | Result   | NOTES |
| Channel Number                                              | Ch.              | 0           | 20       | 39         | -----    |       |
| Reading Frequency                                           | MHz              | 2401.99189  | 2441.992 | 2479.99152 | -----    |       |
| Frequency Tolerance                                         | ppm              | -3.37635    | -3.27600 | -3.41935   | PASS     |       |
| Occupied Bandwidth                                          | MHz              | 1.2827      | 1.2827   | 1.2824     | PASS     |       |
| Spread Bandwidth                                            | MHz              | -           | -        | -          | -        | -     |
| RF Output Power                                             | mW               | 1.589       | 1.489    | 1.486      | PASS     |       |
|                                                             | dBm              | 2.010       | 1.730    | 1.720      |          |       |
| RF Output Power Tolerance                                   | %                | 0.00        | -6.24    | -6.46      | PASS     |       |
| Unwanted Emission Strength (TX1)                            | Under 2387MHz    | $\mu$ W/MHz | 0.057810 | 0.044566   | 0.051880 | PASS  |
|                                                             |                  | dBm/MHz     | -42.38   | -43.51     | -42.85   |       |
|                                                             |                  | MHz         | 2189.35  | 2104.75    | 2143.23  |       |
|                                                             | 2387-2400MHz     | $\mu$ W/MHz | 0.805378 | 0.035318   | 0.038994 | PASS  |
|                                                             |                  | dBm/MHz     | -30.94   | -44.52     | -44.09   |       |
|                                                             |                  | MHz         | 2399.98  | 2398.60    | 2395.97  |       |
|                                                             | 2483.5-2496.5MHz | $\mu$ W/MHz | 0.039628 | 0.038019   | 0.040179 | PASS  |
|                                                             |                  | dBm/MHz     | -44.02   | -44.20     | -43.96   |       |
|                                                             |                  | MHz         | 2495.26  | 2488.77    | 2483.56  |       |
|                                                             | 2496.5 - 26.5GHz | $\mu$ W/MHz | 0.185780 | 0.171002   | 0.133352 | PASS  |
|                                                             |                  | dBm/MHz     | -37.31   | -37.67     | -38.75   |       |
|                                                             |                  | MHz         | 9607.74  | 9767.79    | 9920.35  |       |
| Secondarily Emitted Radio Wave Strength (RX Spurious) (RX1) | Under 1GHz       | nW/MHz      | 0.0023   | 0.0021     | 0.0020   | PASS  |
|                                                             |                  | dBm/MHz     | -86.38   | -86.73     | -86.96   |       |
|                                                             |                  | MHz         | 787.93   | 941.68     | 818.13   |       |
|                                                             | 1 - 12.5GHz      | nW/MHz      | 0.0596   | 0.0646     | 0.0512   | PASS  |
|                                                             |                  | dBm/MHz     | -72.25   | -71.90     | -72.91   |       |
|                                                             |                  | MHz         | 6199.44  | 5717.88    | 6152.00  |       |
| Interference Prevention Function                            | -----            | Good        |          |            | PASS     |       |

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台灣檢驗科技股份有限公司

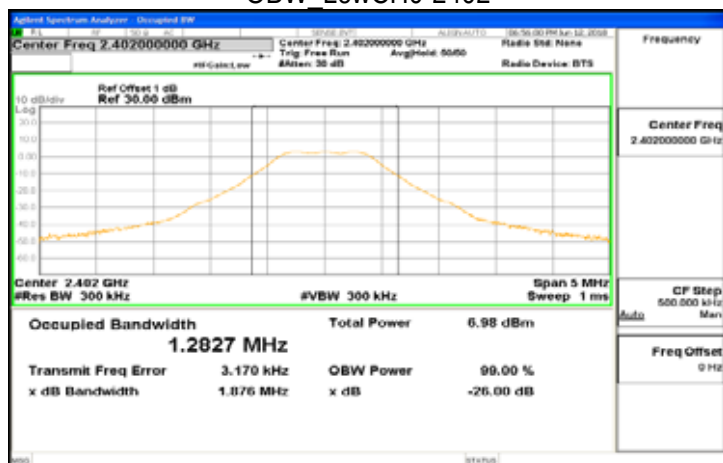
t (886-2) 2299-3279

f (886-2) 2298-0488

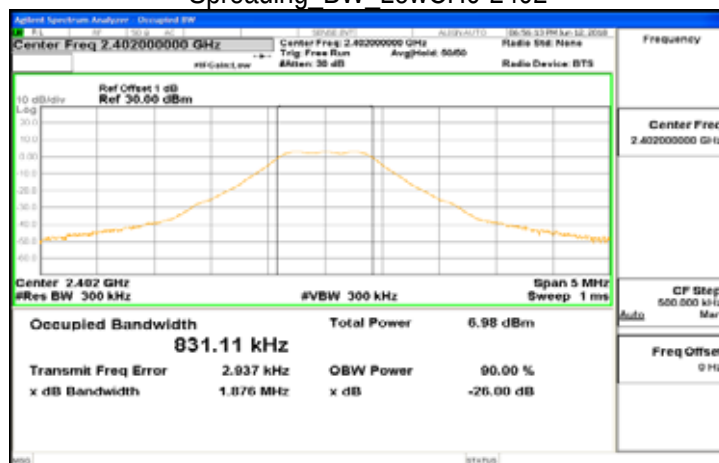
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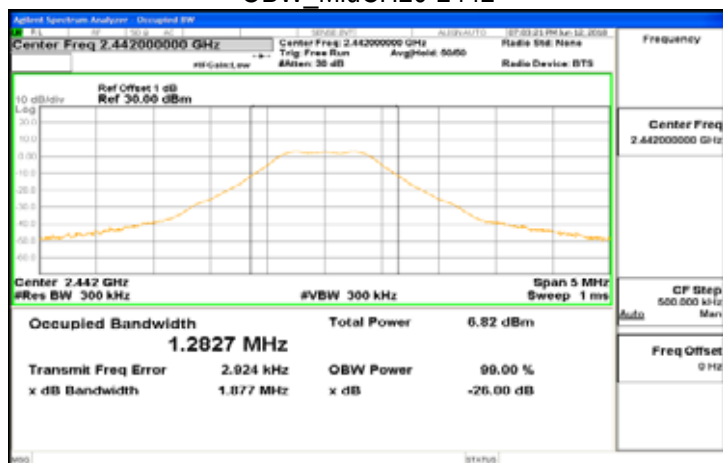
OBW LowCH0-2402



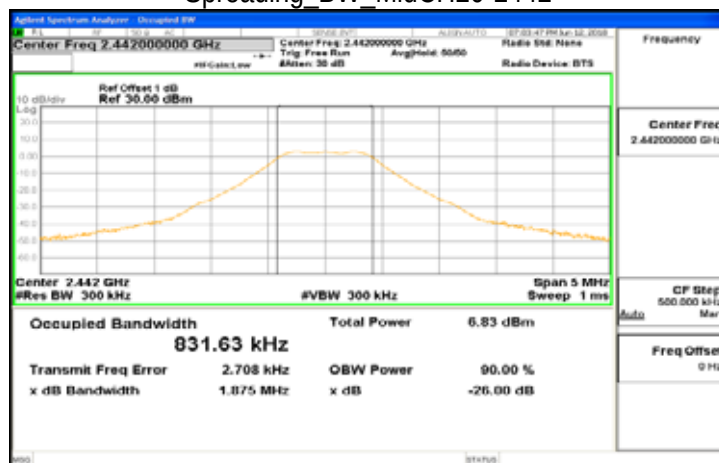
Spreading BW LowCH0-2402



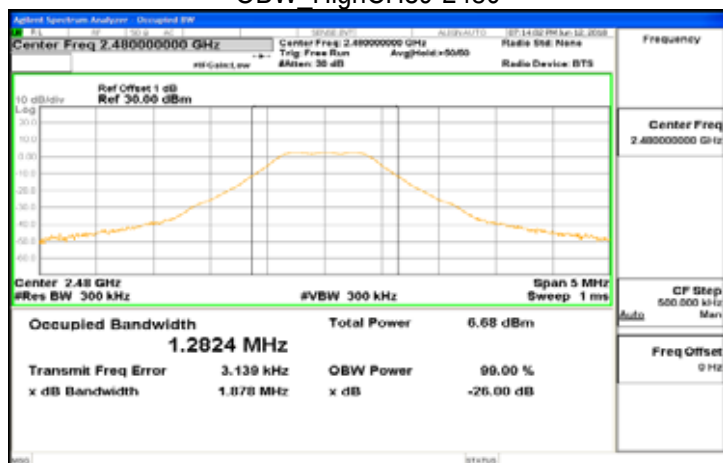
OBW MidCH20-2442



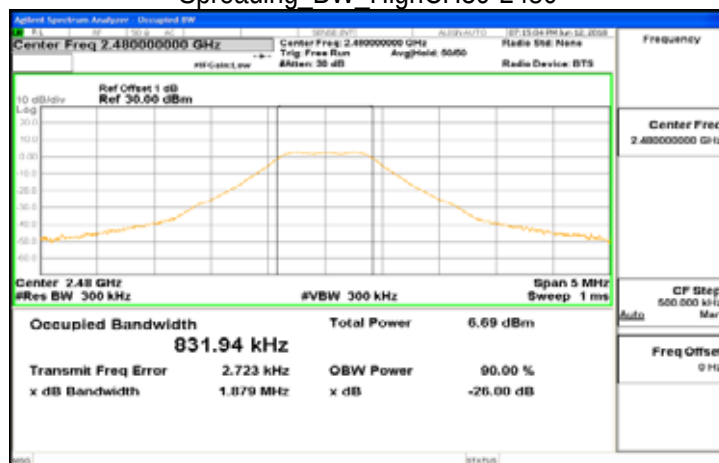
Spreading BW MidCH20-2442



OBW HighCH39-2480



Spreading BW HighCH39-2480

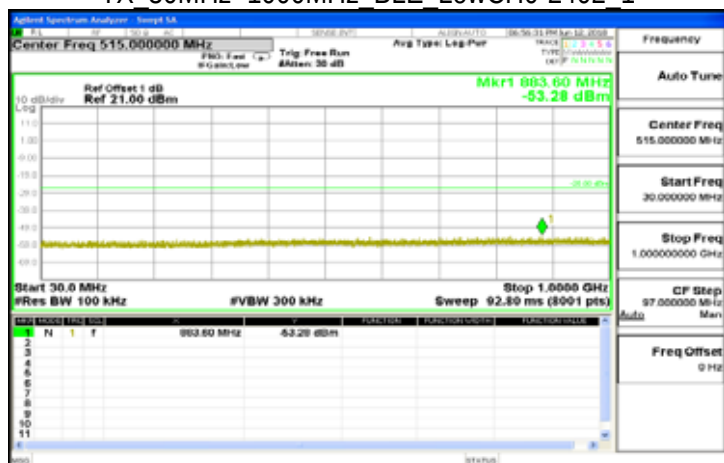


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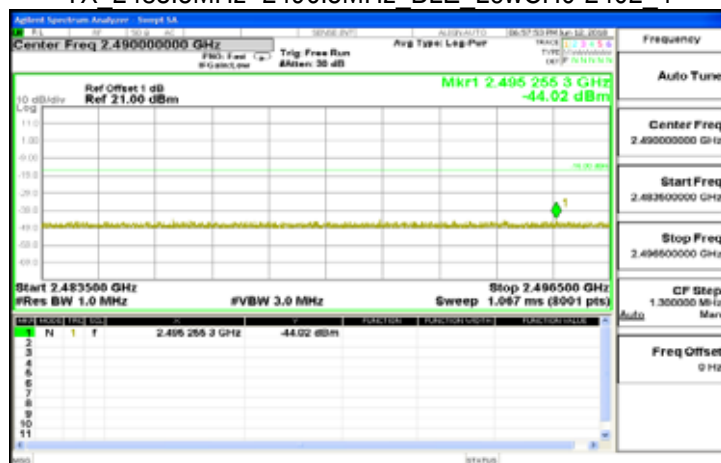
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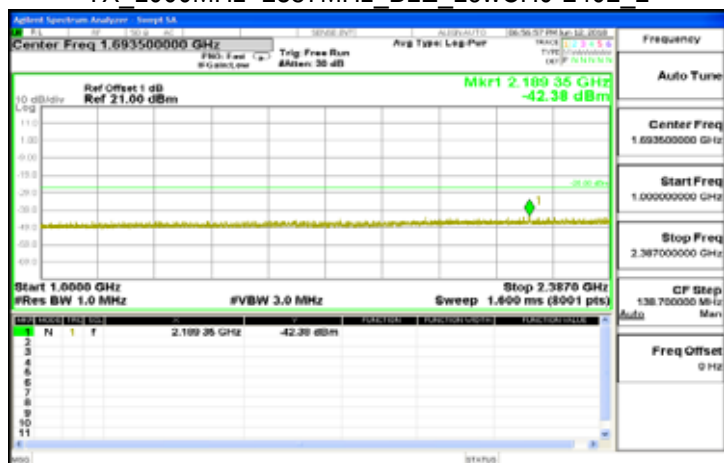
TX 30MHz~1000MHz\_BLE\_LowCH0-2402\_1



TX 2483.5MHz~2496.5MHz\_BLE\_LowCH0-2402\_4



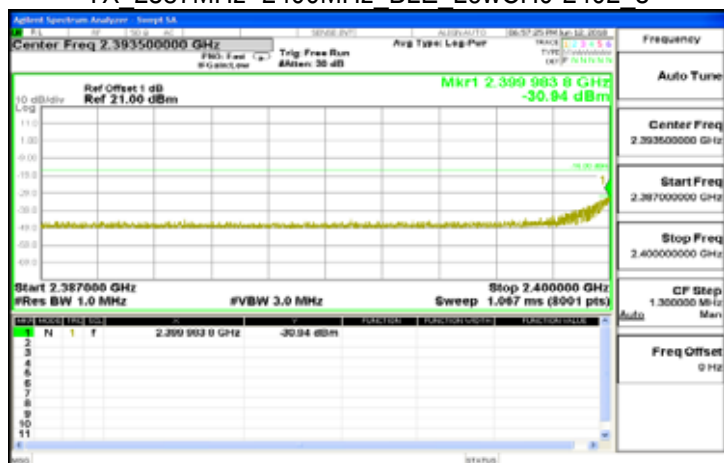
TX 1000MHz~2387MHz\_BLE\_LowCH0-2402\_2



TX 2496.5MHz~26.5GHz\_BLE\_LowCH0-2402\_5



TX 2387MHz~2400MHz\_BLE\_LowCH0-2402\_3



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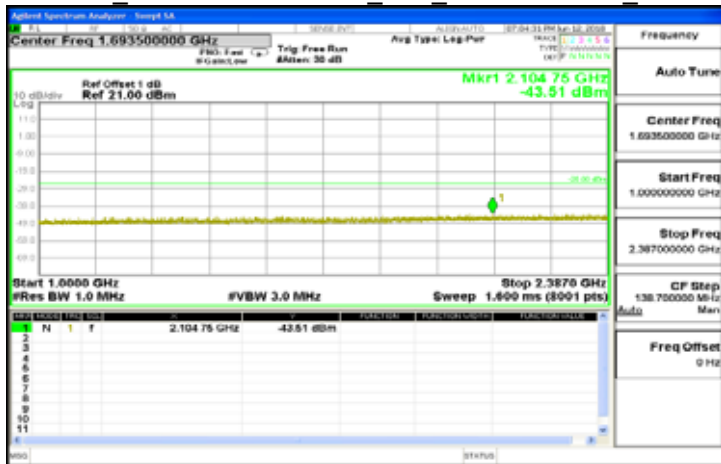
TX 30MHz~1000MHz BLE MidCH20-2442 1



TX 2483.5MHz~2496.5MHz BLE MidCH20-2442 4



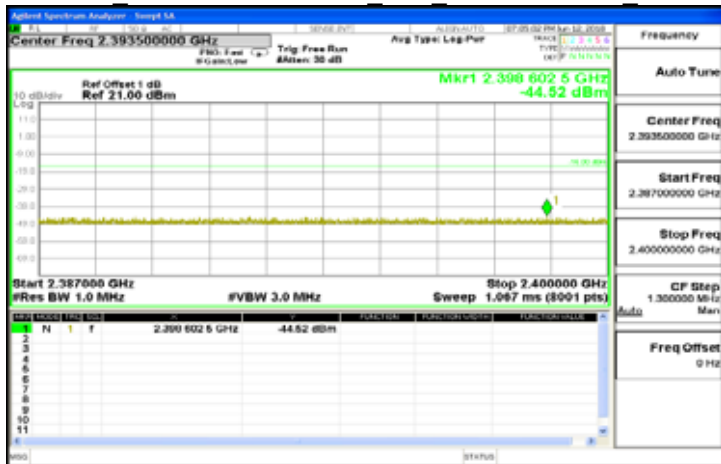
TX 1000MHz~2387MHz BLE MidCH20-2442 2



TX 2496.5MHz~26.5GHz BLE MidCH20-2442 5



TX 2387MHz~2400MHz BLE MidCH20-2442 3



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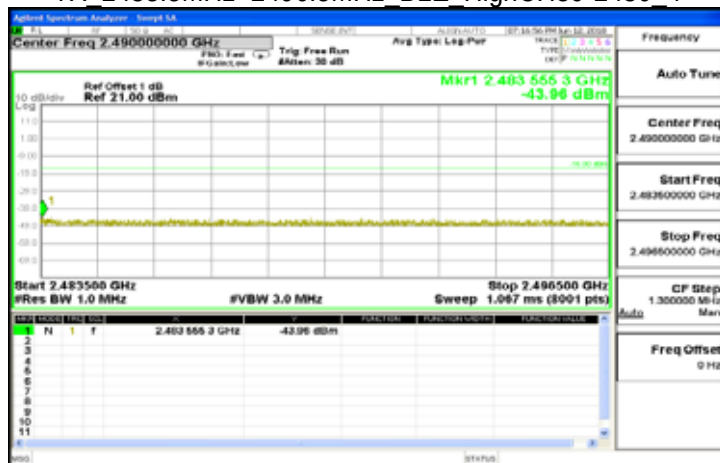
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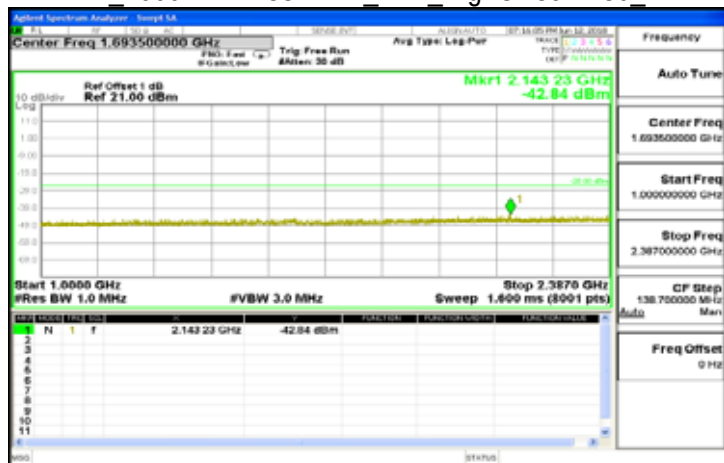
TX 30MHz~1000MHz BLE HighCH39-2480 1



TX 2483.5MHz~2496.5MHz BLE HighCH39-2480 4



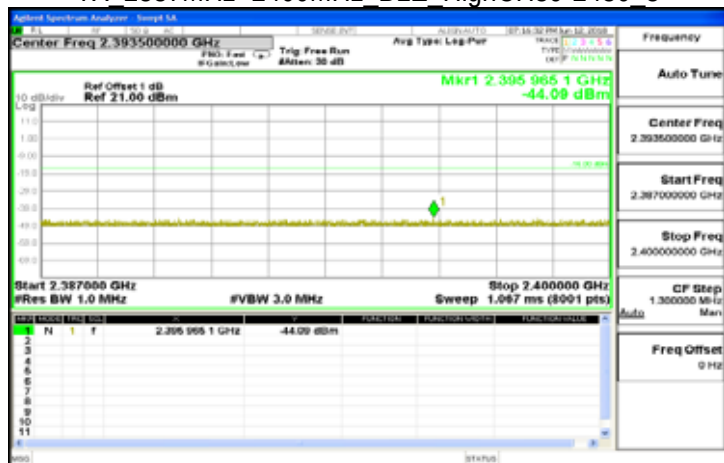
TX 1000MHz~2387MHz BLE HighCH39-2480 2



TX 2496.5MHz~26.5GHz BLE HighCH39-2480 5



TX 2387MHz~2400MHz BLE HighCH39-2480 3

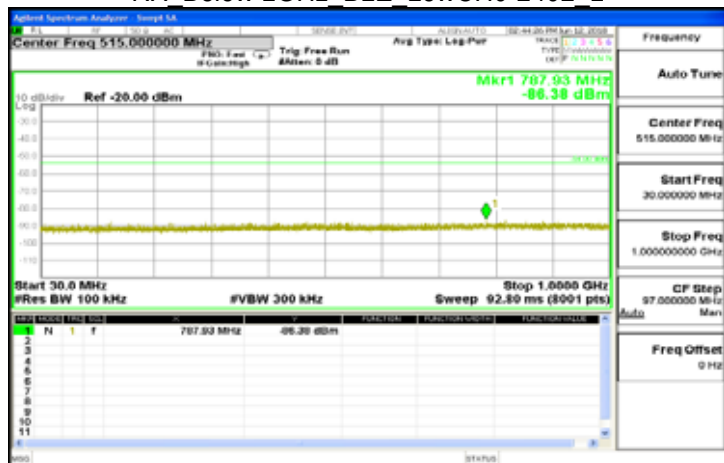


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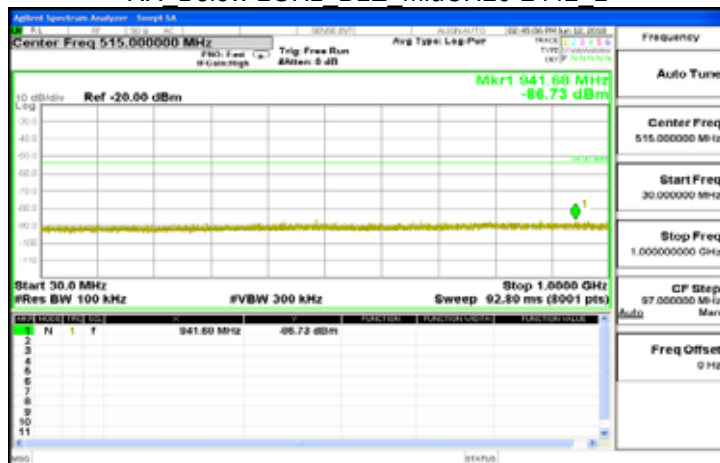
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RX Below 1GHz BLE LowCH0-2402 1



RX Below 1GHz BLE MidCH20-2442 1



RX Above 1GHz BLE LowCH0-2402 2



RX Above 1GHz BLE MidCH20-2442 2

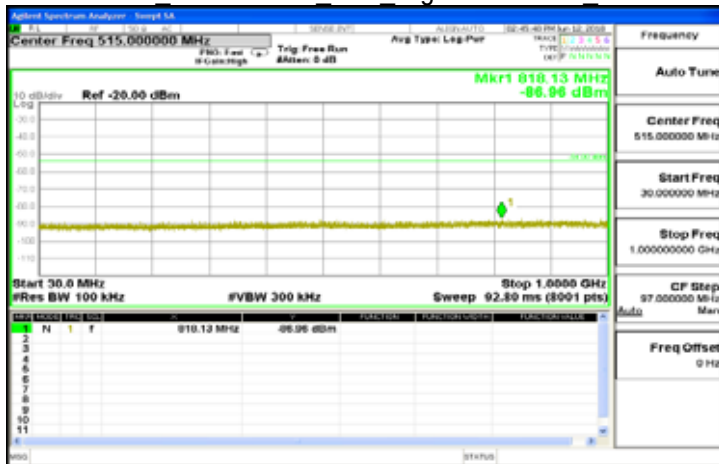


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## RX\_Below 1GHz\_BLE\_HighCH39-2480\_1



## RX\_Above 1GHz\_BLE\_HighCH39-2480\_2

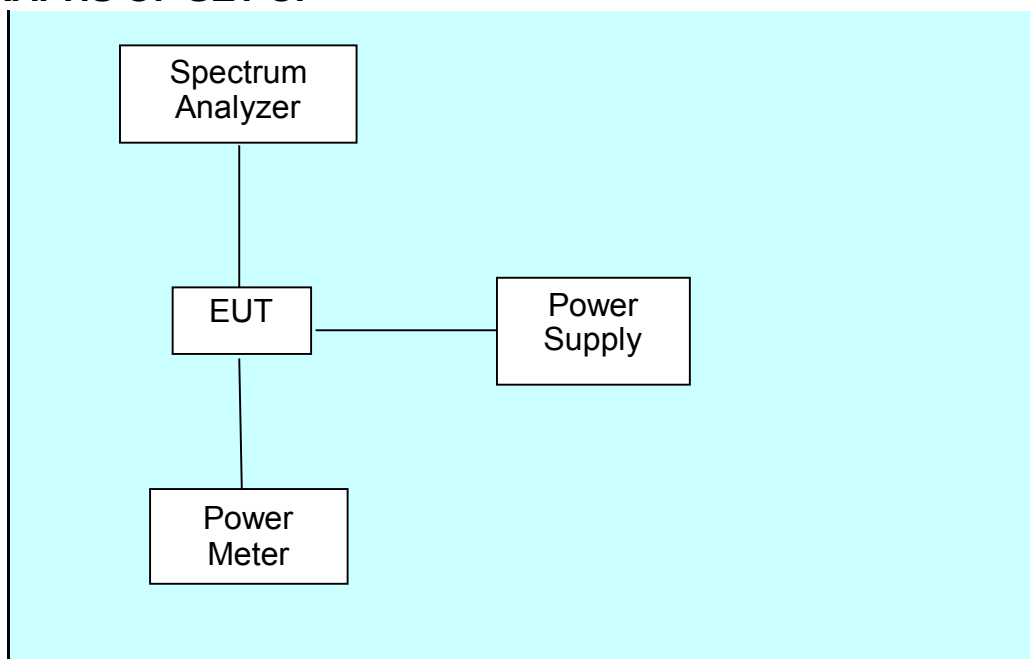


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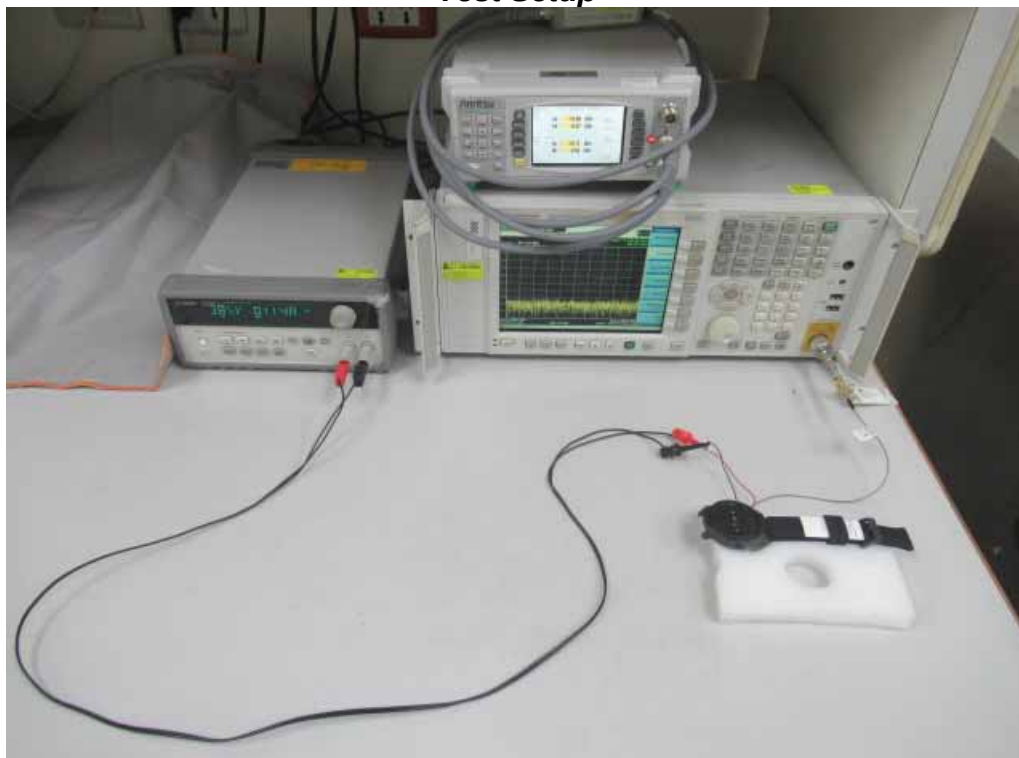
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## PHOTOGRAPHS OF SET UP



**Test Setup**



## PHOTOGRAPHS OF EUT

Please refer to the attached file(EUT Photo)

**~ End of Report ~**

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