

Measurement and Test Report

According to

MIC Public Notice 88:2004 Annex 43

For

Acer Incorporated

8F, 88, Sec.1 Xintai 5th Rd. Xizhi, New Taipei City 221, Taiwan, R.O.C

Test Standards: Item 19 of Article 2 Paragraph 1

Product Description: Heart Rate Monitor Set

Tested Model: HS5

Report No.: STR18028070E-2

Tested Date: 2018-02-07 to 2018-02-27

Issued Date: 2018-02-27

Tested By: Long Tang / Engineer

Reviewed By: Silin Chen / EMC Manager

Approved & Authorized By: Jandy so / PSQ Manager

Prepared By:

Shenzhen SEM.Test Technology Co., Ltd.

1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road,
Bao'an District, Shenzhen, P.R.C. (518101)

Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM.Test Technology Co., Ltd.

TABLE OF CONTENTS

| | |
|--|-----------|
| 1. GENERAL INFORMATION | 3 |
| 1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) | 3 |
| 1.2 TEST STANDARDS | 4 |
| 1.3 TEST METHODOLOGY | 4 |
| 1.4 TEST FACILITY | 4 |
| 1.5 EUT SETUP AND TEST MODE | 5 |
| 1.6 TEST CONDITIONS | 6 |
| 1.7 MEASUREMENT UNCERTAINTY | 6 |
| 1.8 TEST EQUIPMENT LIST AND DETAILS | 6 |
| 1.9 CALIBRATION INFORMATION | 6 |
| 2. SUMMARY OF TEST RESULTS | 7 |
| 3. RF OUTPUT POWER | 8 |
| 3.1 STANDARD APPLICABLE | 8 |
| 3.2 TEST SETUP BLOCK DIAGRAM | 8 |
| 3.3 TEST PROCEDURE | 8 |
| 3.4 ENVIRONMENTAL CONDITIONS | 8 |
| 3.5 SUMMARY OF TEST RESULTS/PLOTS | 9 |
| 4. FREQUENCY TOLERANCE | 11 |
| 4.1 STANDARD APPLICABLE | 11 |
| 4.2 TEST SETUP BLOCK DIAGRAM | 11 |
| 4.3 TEST PROCEDURE | 11 |
| 4.4 ENVIRONMENTAL CONDITIONS | 11 |
| 4.5 SUMMARY OF TEST RESULTS/PLOTS | 12 |
| 5. OCCUPIED BANDWIDTH | 13 |
| 5.1 STANDARD APPLICABLE | 13 |
| 5.2 TEST SETUP BLOCK DIAGRAM | 13 |
| 5.3 TEST PROCEDURE | 13 |
| 5.4 ENVIRONMENTAL CONDITIONS | 14 |
| 5.5 SUMMARY OF TEST RESULTS/PLOTS | 14 |
| 6. TRANSMITTER SPURIOUS EMISSIONS | 16 |
| 6.1 STANDARD APPLICABLE | 16 |
| 6.2 TEST SETUP BLOCK DIAGRAM | 16 |
| 6.3 TEST PROCEDURE | 16 |
| 6.4 ENVIRONMENTAL CONDITIONS | 16 |
| 6.5 SUMMARY OF TEST RESULTS/PLOTS | 17 |
| 7. INTERFERENCE PREVENTION FUNCTION | 21 |
| 7.1 STANDARD APPLICABLE | 21 |
| 7.2 TEST SETUP BLOCK DIAGRAM | 21 |
| 7.3 TEST PROCEDURE | 21 |
| 7.4 SUMMARY OF TEST RESULTS/PLOTS | 21 |

| Version: | Issue date | Revisions Content |
|----------|------------|-------------------|
| initial | 2018-02-27 | initial Issue |
| | | |
| | | |

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Acer Incorporated
Address of applicant: 8F, 88, Sec.1 Xintai 5th Rd. Xizhi, New Taipei City 221,
Taiwan, R.O.C

Manufacturer: Acer Incorporated
Address of manufacturer: 8F, 88, Sec.1 Xintai 5th Rd. Xizhi, New Taipei City 221,
Taiwan, R.O.C

| General Description of EUT | |
|--|------------------------|
| Product Name: | Heart Rate Monitor Set |
| Brand Name: | Xplova |
| Model No.: | HS5 |
| Hardware version: | HRM812 V7.0 |
| Software version: | V2.4 |
| Rated Voltage: | Battery DC 3.0V |
| Device Category: | Portable Device |
| Note: The test data is gathered from a production sample provided by the manufacturer. | |

Technical Characteristics of EUT

| | |
|----------------------|-------------|
| ANT+ | |
| Frequency Range: | 2457MHz |
| Rated Output Power: | 1mW |
| Type of Modulation: | GFSK |
| Quantity of Channels | 1 |
| Type of Antenna: | PCB Antenna |
| Antenna Gain: | 4.79 dBi |

Center Frequency of Each of Channel:

| Channel | Frequency |
|-------------|-----------|
| Channel 01: | 2457MHz |

1.2 Test Standards

The following report is prepared on behalf of the Acer Incorporated in accordance with "Certification Ordinance, Art. 49.20" and MIC public notice 88:2004, annex 43 or relevant Arib STD or relevant Telec STD.

The objective is to determine compliance with Item 19 of Article 2 Paragraph 1 of the TELEC rules for 2.4GHz band wide-band low-power data communication system.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with test method for radio equipment specified in MIC public notice 88:2004, annex 43 for certification. And measuring method for electric field intensity of radio station with remarkably weak radiowave transmitted.

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted with Low Channel, Middle Channel and High Channel, accordingly in reference to the Operating Instructions.

1.4 Test Facility

FCC – Registration No.: 125990

Shenzhen SEM Test Technology Co., Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM. Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

| Test Mode List | | |
|----------------|--------------|----------|
| Test Mode | Description | Remark |
| TM1 | Transmitting | 2457 MHz |

| Special Cable List and Details | | | |
|--------------------------------|------------|---------------------|------------------------|
| Cable Description | Length (m) | Shielded/Unshielded | With / Without Ferrite |
| / | / | / | / |

| Auxiliary Equipment List and Details | | | |
|--------------------------------------|--------------|-------|---------------|
| Description | Manufacturer | Model | Serial Number |
| / | / | / | / |

1.6 Test Conditions

| Supply Voltage | | | |
|----------------|-----------------------|-----------------|---------|
| | AC Input Voltage V | DC Voltage V | Percent |
| Normal | 3.0 | 3.3 | |
| +10% | 3.3 | 3.3 | 0% |
| -10% | 2.7 | 3.3 | 0% |

Note 1: When the input voltage is reduced or increased by 10%, the regulator voltage changes of less than 1%. So the following test items are conducted in the normal voltage.

Note 2: The regulator voltage is U3

1.7 Measurement Uncertainty

| Measurement uncertainty | | |
|--------------------------------|------------|------------------------|
| Parameter | Conditions | Uncertainty |
| RF Output Power | 9kHz-6GHz | $\pm 0.42\text{dB}$ |
| Frequency Tolerance | 9kHz-6GHz | $\pm 1 \times 10^{-7}$ |
| Spreading Bandwidth | 9kHz-6GHz | $\pm 3\%$ |
| Transmitter Spurious Emissions | 9kHz-25GHz | $\pm 2.76\text{dB}$ |
| Receiver Spurious Emissions | 9kHz-25GHz | $\pm 2.76\text{dB}$ |

1.8 Test Equipment List and Details

| Description | Manufacturer | Model | Serial Number | Cal Date | Due Date |
|-------------------|--------------|-------------|---------------|------------|------------|
| Attenuator | ATTEN | ATS100-4-20 | / | 2017-06-12 | 2018-06-11 |
| Spectrum Analyzer | Agilent | N9020A | US47140102 | 2017-06-12 | 2018-06-11 |

1.9 Calibration Information

Calibration lab: CHINA CEPREI LABORATORY

Calibrated by: Liu Peng

2. SUMMARY OF TEST RESULTS

| TELEC RULES | DESCRIPTION OF TEST | RESULT |
|-------------|---|-----------|
| Item 19 | RF Output Power | Compliant |
| Item 19 | Frequency Tolerance | Compliant |
| Item 19 | Occupied Bandwidth /Spreading Bandwidth/Spread Factor | Compliant |
| Item 19 | Transmitter Spurious Emissions | Compliant |
| Item 19 | Receiver Spurious Emissions | N/A |
| Item 19 | Interference Prevention Function | Compliant |

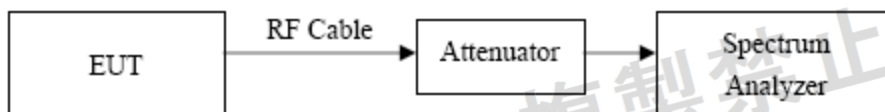
N/A means' not application.

3. RF OUTPUT POWER

3.1 Standard Applicable

According to Equipment Regulations, art. 49.20, the max. permitted antenna power density shall not exceed 3mW/MHz and deviation of power density shall be within a range of -80% to +20% of declared power density.
Eirp: not exceed 6.91dBm/ MHz(OFDM.DS form 2400-2483.5 MHz)

3.2 Test Setup Block Diagram



3.3 Test Procedure

A spectrum analyzer or similar device shall be used to observe a sample of the modulated transmitter's radio frequency power output.

- A sample detector function must be used.
- A measurement instrument with an integrated 1MHz power bandwidth function may be used to automate the test process.
- Connect the EUT to the RF input of the spectrum analyzer via a 50ohm attenuator.
- Centre Frequency: the centre frequency of the channel under test. Set the RBW = 1MHz, VBW = 1MHz, Span: wide enough to cover the complete power envelope of the signal of the EUT. Detector: Peak, Trace Mode :Max Hold.
- When the trace is complete, find the peak value of the power envelope and record the frequency.
- Make the following changes to the settings of the spectrum analyzer
Centre Frequency: Equal to the frequency recorded in step (e)
RBW :1MHz, VBW : 1MHz,Span: 3MHz
Detector: Average, Trace Mode :Max Hold.
Sweep mode : 60 S
- Repeat above procedures until all frequency measured was complete.

3.4 Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 24 °C |
| Relative Humidity: | 54% |
| ATM Pressure: | 1011 mbar |

3.5 Summary of Test Results/Plots

RF Output Power:

| Frequency (MHz) | Measure Value (dBm) | Measure Value (mW) | Antenna Gain (dBi) | EIRP (dBm) |
|--------------------|------------------------|-----------------------|-----------------------|---------------|
| 2457 | -3.954 | 0.91 | 4.79 | 0.83 |

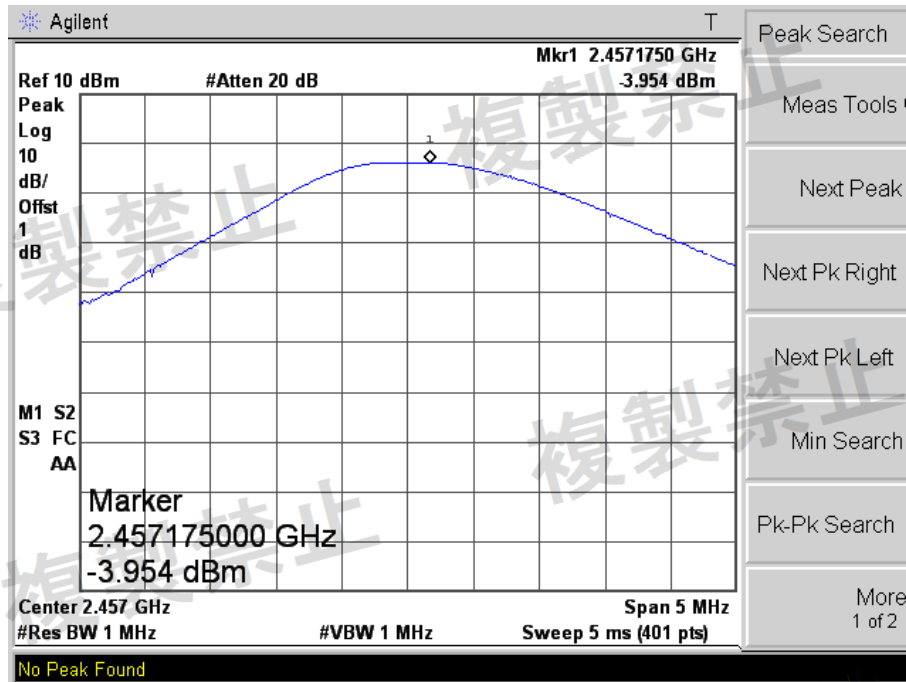
All the EIRP is less than 6.91dBm, the half-power beam width is not necessary

RF Output Power Tolerance

| Frequency (MHz) | Output Power (mW) | Rated Output Power (mW) | Tolerance (%) | Limit (%) |
|--------------------|----------------------|----------------------------|------------------|--------------|
| 2457 | 0.91 | 1 | -9.00 | +20% to -80% |

Note: Tolerance = (Output Power – Rated Output Power) / Rated Output Power * 100%

Channel:

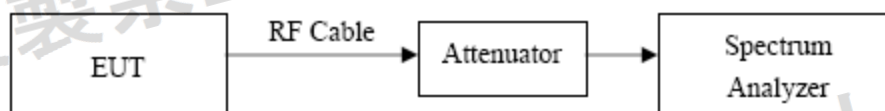


4. FREQUENCY TOLERANCE

4.1 Standard Applicable

According to Item 19 of Article 2 Paragraph 1, the maximum permit tolerance of frequency is 50ppm.

4.2 Test Setup Block Diagram



4.3 Test Procedure

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set center frequency of spectrum analyzer = operating frequency.
3. Set the spectrum analyzer as RBW, VBW=10KHz, Span = 1MHz.
- 4 'Maximum Hold' mode may be used to accumulate the measurement result over several scans provided emission is repetitive in nature.
5. Repeat above procedures until all frequency measured was complete.

4.4 Environmental Conditions

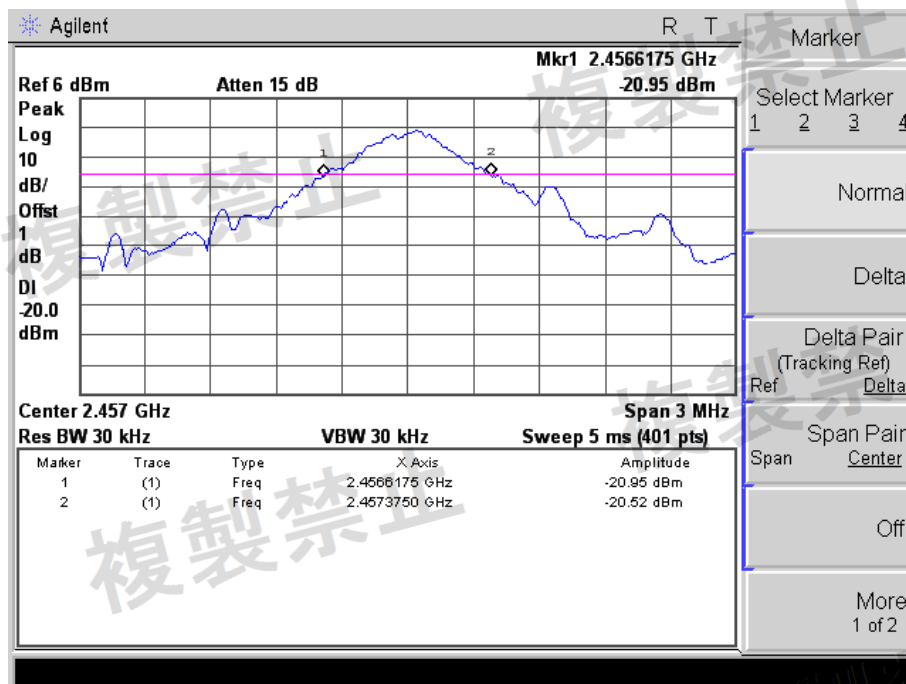
| | |
|--------------------|-----------|
| Temperature: | 24 °C |
| Relative Humidity: | 54% |
| ATM Pressure: | 1011 mbar |

4.5 Summary of Test Results/Plots

| Tx Frequency (MHz) | Reading Value (MHz) | Tolerance (ppm) | Limit (ppm) |
|--------------------|---------------------|-----------------|-------------|
| 2457 | 2456.9962 | -1.55 | ± 50 |

Reading Value(MHz) =(Marker1+Marker2)/2

Low

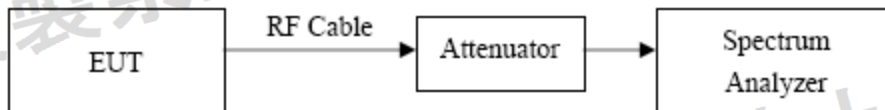


5. OCCUPIED BANDWIDTH

5.1 Standard Applicable

According to Item 19 of Article 2 Paragraph 1.

5.2 Test Setup Block Diagram



5.3 Test Procedure

(1) Set up the spectrum analyzer as the follows:

Center frequency: Test frequency

Sweep bandwidth: 2 to 3.5 times of allowance

Resoluble bandwidth: less than 3% of allowance

Video bandwidth: Equivalent to resolvable bandwidth

Sweep time: Minimum time by which measuring accuracy is assured (In case of burst wave, 1 burst shall be contained per 1 sample)

Sampling points: More than 400 points

Sweep mode : Continuous sweeping

Detection mode: Positive peak

Display mode: Maximum holding

(2) Repeat the sweeping till no change was observed on the display and enter all values of data point to the computer as array variable.

(3) About all data, convert dB value to antilogarithm of electric power dimension.

(4) Add up the electric power of all data and record it as “Sum total of electric power”.

(5) Adding up data in order from the lowest frequency to upper frequencies, look for a limit point where the value reaches to 0.5% (5% in case of diffusion bandwidth) of “Sum total of electric power”. Convert the limit point to frequency and record as “Lowest limit frequency”.

(6) Adding up data in order from the highest frequency to lower frequencies, look for a limit point where the value reaches to 0.5% (5% in case of diffusion bandwidth) of “Sum total of electric power”. Convert the limit point to frequency and record as “Highest limit frequency”.

(7) Repeat above procedures until all frequency measured was complete.

5.4 Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 25 °C |
| Relative Humidity: | 53% |
| ATM Pressure: | 1018 mbar |

5.5 Summary of Test Results/Plots

Occupied Bandwidth (99% Emission bandwidth)

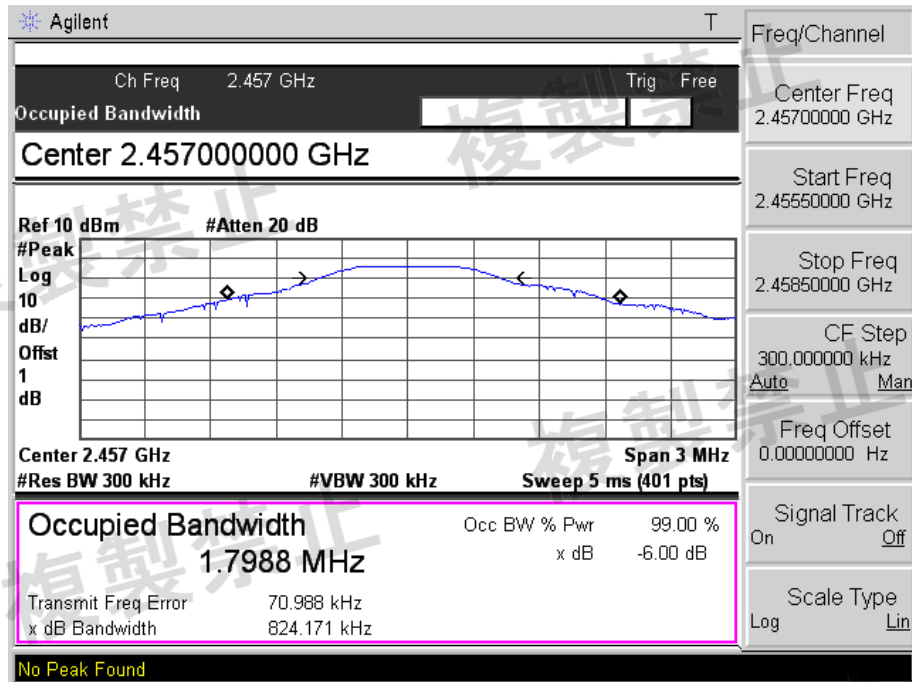
| Tx Frequency (MHz) | Reading Value (MHz) | Limit (MHz) |
|-----------------------|------------------------|----------------|
| 2457 | 1.7988 | <26 |

Diffusion Bandwidth (90% Emission bandwidth)

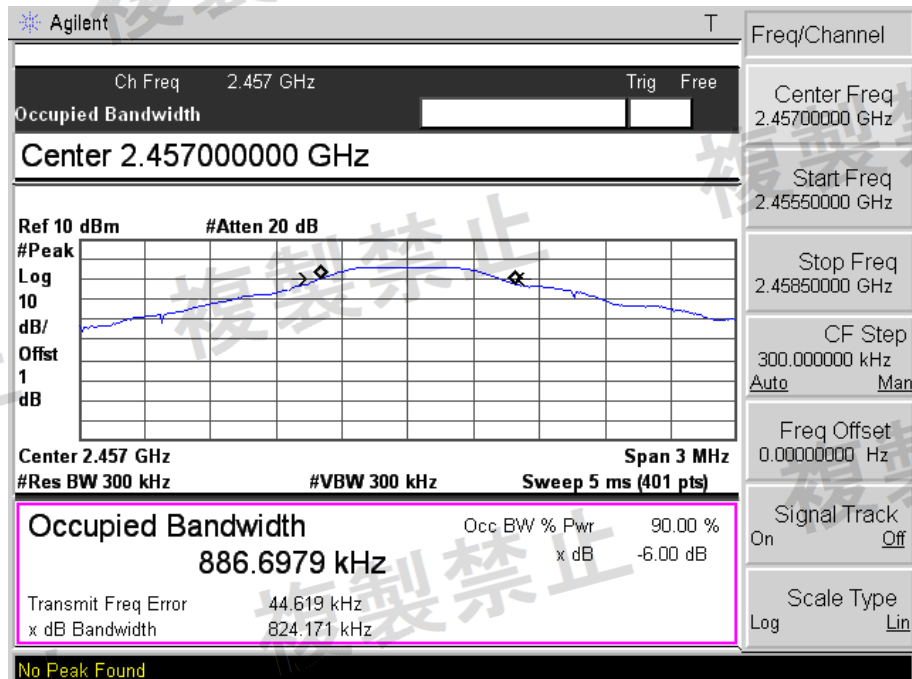
| Tx Frequency (MHz) | Reading Value (KHz) | Limit (kHz) |
|-----------------------|------------------------|----------------|
| 2457 | 886.6979 | ≥ 500 |

Please refer to the following test plots

99% Occupied Bandwidth



90% Diffusion Bandwidth



6. TRANSMITTER SPURIOUS EMISSIONS

6.1 Standard Applicable

According to Item 19 of Article 2 Paragraph 1. The transmitter spurious emissions shall not exceed the following limit:

- (1) Below 2387MHz : $2.5\mu\text{W/MHz}$
- (2) 2387 to 2400MHz : $25\mu\text{W/MHz}$
- (3) 2483.5 through 2496.5MHz : $25\mu\text{W/MHz}$
- (4) Over 2496.5MHz : $2.5\mu\text{W/MHz}$

6.2 Test Setup Block Diagram



6.3 Test Procedure

- (1) A spectrumIn case of conducted measurements, the radio device shall be connected to the measuring equipment via a suitable attenuator.
- (2) The measurement equipment shall be set for peak hold mode of operation.
- (3) the transmitter shall be operated at the highest output power, or, in the case of equipment able to operate at more than one power level, at the lowest and highest output powers;
- (4) The resolution bandwidth shall be set to 100kHz from 10MHz to 1GHz, the resolution bandwidth shall be set to 1MHz above 1GHz , and the sweep time shall be set to auto mode, to ensure all major modulation products are captured.
- (5) When the searched result is less than the specified limit, the maximum one shall be recorded, when the result is more than the specified limit, all measured values shall be recorded.
- (5) This measurement shall be repeated with the transmitter in standby mode where applicable.
- (6) Repeat above procedures until all frequency measured was complete.

6.4 Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 24 °C |
| Relative Humidity: | 55% |
| ATM Pressure: | 1011 mbar |

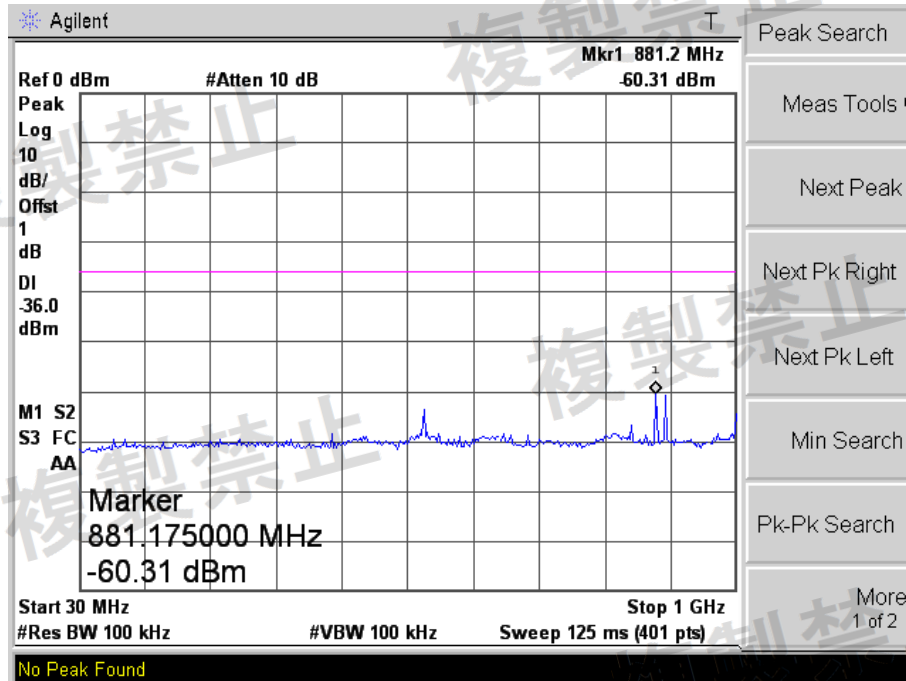
6.5 Summary of Test Results/Plots

Transmitter Spurious Emissions

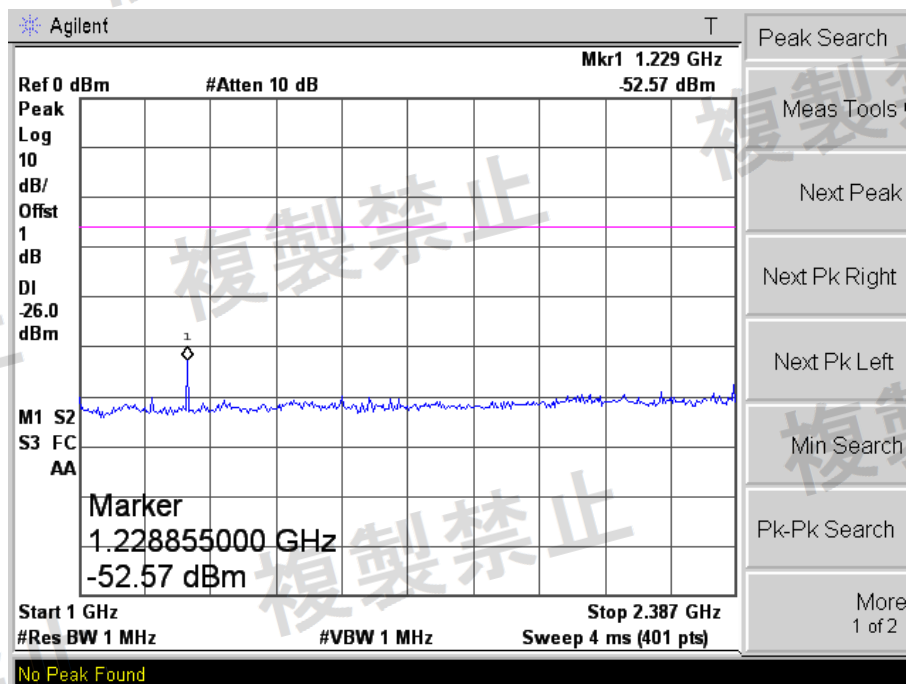
| Frequency Range (MHz) | Maximum Spurious Emission Value (dBm) | Limit (dBm) |
|------------------------------|--|----------------|
| Test Mode: Channel (2457MHz) | | |
| 30-1000 | -60.31 | -36 |
| 1000-2387 | -52.57 | -26 (2.5uW) |
| 2387-2400 | -60.66 | -16 (25uW) |
| 2483.5-2496.5 | -58.42 | -16 (25uW) |
| 2496.5-127500 | -38.69 | -26 (2.5uW) |

Please refer to the following test plots

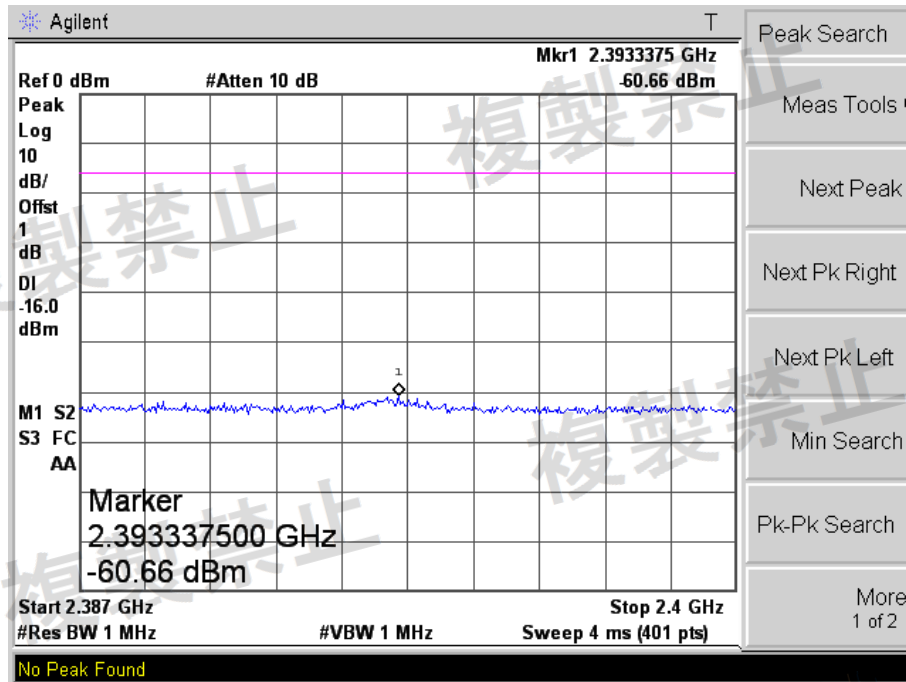
30-1000MHz



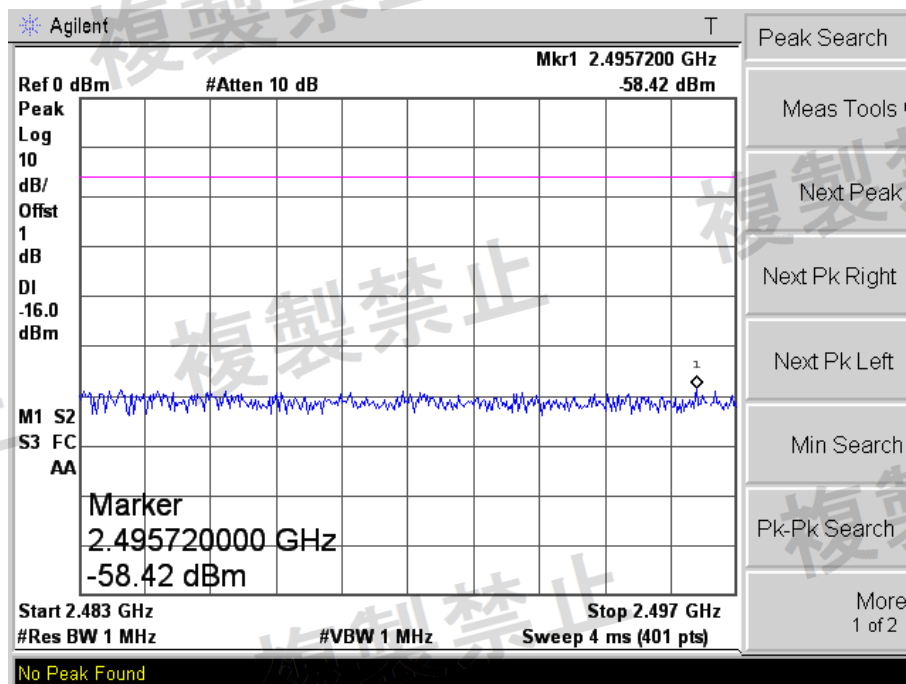
1000-2387MHz



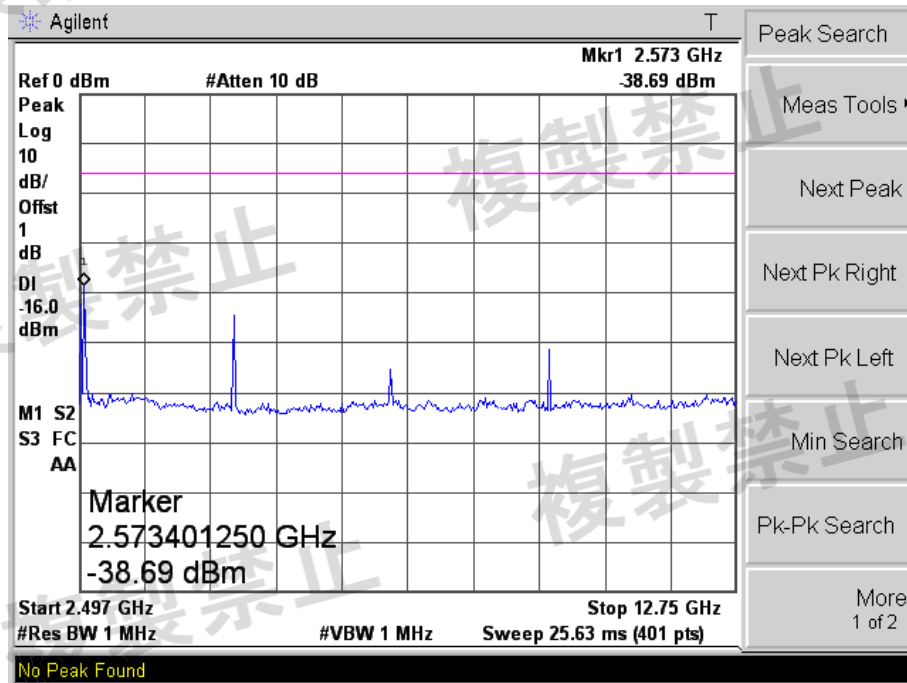
2387-2400MHz



2483.5-2496.5MHz



2496.5-12750MHz

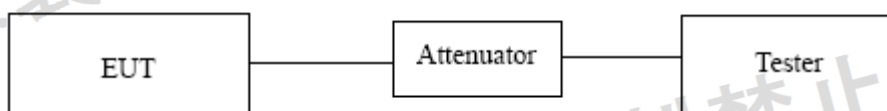


7. INTERFERENCE PREVENTION FUNCTION

7.1 Standard Applicable

According to Item 19 of Article 2 Paragraph 1. The device shall have the function of automatic transmission or reception of identification code.

7.2 Test Setup Block Diagram



7.3 Test Procedure

1. Set the EUT in the usual operation condition
2. The radio equipment with automatic transmitting function of identification code
 - A. Transmit the assigned identification code from the radio equipment.
 - B. Confirm the identification code received by the demodulator.
3. The radio equipment with automatic receiving function of identification code
 - A. Transmit the assigned identification code from the opposite equipment.
 - B. Confirm that the usual communication is available.
 - C. Transmit the identification code distinct from the assigned one from the opposite equipment.
 - D. Confirm that the radio equipment is stopped or an indication is displayed as the identification code is different.
4. The identification function shall be recorded with “Good” or “No”.

7.4 Summary of Test Results/Plots

| Test Item | Test Result |
|--|--|
| Transmitting Function of Identification Code | The device have the function of automatic transmission or reception of identification code |
| Receiving Function of Identification Code | The device have the function of automatic transmission or reception of identification code |

***** END OF REPORT *****