

## FCC Certification - TEST REPORT

Report Number : **60/790.14.004.02** Date of Issue: 15<sup>th</sup> May 2014

Model : **RAR213HG**

Product type : **BLE connected IN/out thermo-hygrometer with clock**

FCC ID: : **NMTRAR213HG-01**

Applicant : **IDT Technology Limited**

Address : **Block C,9/F., Kaiser Estate,Phase1,41 Man Yue Street, Hunghom, Kowloon , Hong Kong**

Production Facility : **IDT Technology Limited**

Address : **Block C,9/F., Kaiser Estate,Phase1,41 Man Yue Street, Hunghom, Kowloon , Hong Kong**

Test Result : ☒ **Positive** ☐ **Negative** Total Pages: 11

Prepared by:



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Reviewed by:



Edmond FUNG

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# 1 General Information

## 1.1 Summary of Test Result

| FCC Rules  | IC Rules     | Description of Test         | Result | Remark                |
|------------|--------------|-----------------------------|--------|-----------------------|
| FCC§15.107 | ICES-003§6.1 | AC Line Conducted Emissions | NIL    | Battery operated only |
| FCC§15.109 | ICES-003§6.2 | Radiated Emission           | PASS   | Meet Class B limit    |

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

## 1.2 Measurement Uncertainty

### Conducted Emission

The measurement uncertainty is evaluated as  $\pm 2.26$  dB.

### Radiated Emission

The measurement uncertainty is evaluated as  $\pm 3.19$  dB.

## 1.3 Measurement Uncertainty

### Details about the Test Laboratory

#### Test site 1

Company name: TÜV SÜD HONG KONG LTD.  
3/F, West Wing, Lakeside 2,  
10 Science Park West Avenue,  
Science Park, Shatin  
HK.

Telephone: 852 2776 1323

Fax: 852 2776 1372

#### Test site 2

Company name: TMC-Telecommunication Metrology Center of M.I.I.T  
No 52 Hua Yuanbei Road, Haidian District, Beijing, P.R.China

## 2 EUT Description

|              |                                                                                                              |
|--------------|--------------------------------------------------------------------------------------------------------------|
| Product      | BLE connected IN/out thermo-hygrometer with clock                                                            |
| Model Number | RAR213HG                                                                                                     |
| Applicant    | IDT Technology Limited<br>Block C,9/F., Kaiser Estate,Phase1,41 Man Yue Street, Hunghom, Kowloon , Hong Kong |
| Manufacturer | IDT Technology Limited<br>Block C,9/F., Kaiser Estate,Phase1,41 Man Yue Street, Hunghom, Kowloon , Hong Kong |

### I/O Port Description:

| I/O Port Types | Q'TY | Test Description |
|----------------|------|------------------|
| 1). NIL        | /    | /                |

### 3 Test Methodology

#### 3.1 Decision of Test Mode

| Pre-Test Mode |                             |
|---------------|-----------------------------|
| EMC           | Mode 1: 433MHz RF receiving |

#### 3.2 Configuration of Test System Details

| Mode 1                                                                                                                                                                                                                                     |                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <div style="border: 1px dashed black; padding: 20px; text-align: center;"> <div style="border: 1px solid black; width: 100px; height: 50px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">EUT</div> </div> |                          |
| Signal Cable Type                                                                                                                                                                                                                          | Signal Cable Description |
| A /                                                                                                                                                                                                                                        | /                        |

#### 3.3 Test Site Environment

| Items                      | Test Item          | Actual |
|----------------------------|--------------------|--------|
| Temperature (°C)           | Conducted Emission | 25     |
| Humidity (%RH)             |                    | 66     |
| Barometric pressure (mbar) |                    | 1004   |
| Temperature (°C)           | Radiated Emission  | 25     |
| Humidity (%RH)             |                    | 62     |
| Barometric pressure (mbar) |                    | 1004   |

## 4 Emission Test

### 4.1 Conducted Emission Measurement

#### 4.1.1 Limit

A.C. Mains Conducted Interference Limit

| Frequency (MHz) | Class A (dBuV) |         | Class B (dBuV) |         |
|-----------------|----------------|---------|----------------|---------|
|                 | Quasi-peak     | Average | Quasi-peak     | Average |
| 0.15 - 0.5      | 79             | 66      | 66 - 56        | 56 - 46 |
| 0.50 - 5.0      | 73             | 60      | 56             | 46      |
| 5.0 - 30.0      | 73             | 60      | 60             | 50      |

Note: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases in line with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

#### 4.1.2 Test Instruments

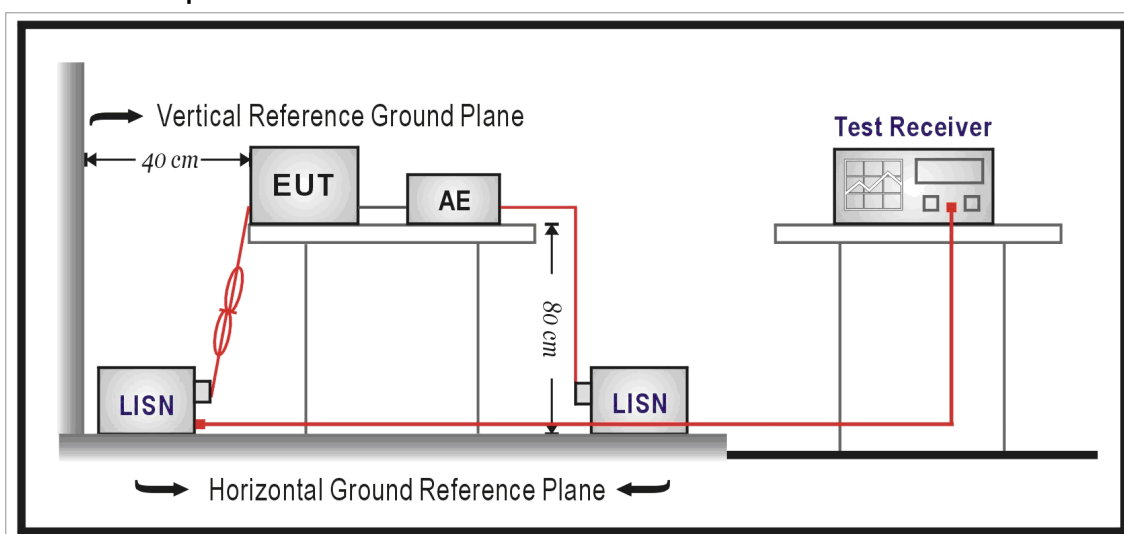
| Equipment     | Manufacturer | Model Number | Serial Number | Cal. Date  | Remark |
|---------------|--------------|--------------|---------------|------------|--------|
| Test Receiver | R&S          | ESCI         | 100367        | 06/18/2013 | (1)    |
| LISN          | R&S          | ENV216       | 101040        | 03/07/2014 | (1)    |
| LISN          | R&S          | ENV216       | 101041        | 03/07/2014 | (1)    |
| Test Site     | ATL          | TE02         | TE02          | N.C.R.     | -----  |

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

#### 4.1.3 Test Setup

A.C. mains setup



#### 4.1.4 Test Result

N/A (Battery operated only)

## 4.2 Radiated Interference Measurement

### 4.2.1 Limit

Under 1GHz test shall not exceed following value

| FCC 47 CFR PART 15 SUBPART B |              |        |              |        |
|------------------------------|--------------|--------|--------------|--------|
| Frequency range (MHz)        | Class A      |        | Class B      |        |
|                              | Distance (m) | dBuV/m | Distance (m) | dBuV/m |
| 30 to 88                     | 10           | 39     | 3            | 40     |
| 88 to 216                    | 10           | 43.5   | 3            | 43.5   |
| 216 to 960                   | 10           | 46.4   | 3            | 46     |
| Above 960                    | 10           | 49.5   | 3            | 54     |

- Remark: 1. The tighter limit shall apply at the edge between two frequency bands.  
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.  
3. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)  
4. Peak detector limit is corresponding to 20 dB above the maximum permitted average limit.

According to FCC Part 15.33 (b), for an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

| Highest frequency generated or used in the device or in which the device operated or tunes (MHz) | Upper frequency of measurement range (MHz)                         |
|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| Below 1.75                                                                                       | 30                                                                 |
| 1.75-108                                                                                         | 1000                                                               |
| 108-500                                                                                          | 2000                                                               |
| 500-1000                                                                                         | 5000                                                               |
| Above 1000                                                                                       | 5th harmonic of the highest frequency or 40GHz, whichever is lower |

#### 4.2.2 Test Instruments

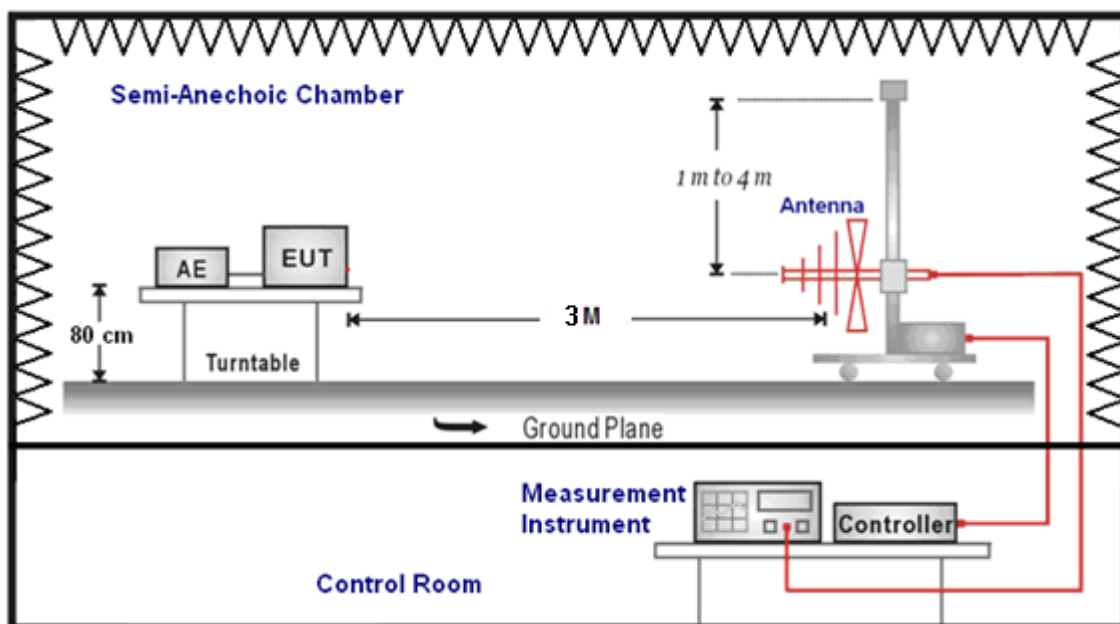
| 3 Meter Chamber            |                                |              |               |            |        |
|----------------------------|--------------------------------|--------------|---------------|------------|--------|
| Equipment                  | Manufacturer                   | Model Number | Serial Number | Cal. Date  | Remark |
| Pre Amplifier              | Agilent                        | 8447D        | 2944A11120    | 01/10/2014 | (1)    |
| Pre Amplifier              | Agilent                        | 8447D        | 2944A11119    | 01/10/2014 | (1)    |
| Test Receiver              | R&S                            | ESCI         | 100722        | 10/18/2013 | (1)    |
| Spectrum Analyzer          | R&S                            | FSV40        | 100903        | 01/27/2014 | (1)    |
| Broadband Antenna          | SCHWARZBECK<br>MESS-ELEKTRONIK | VULB 9160    | 9160-3268     | 06/06/2013 | (1)    |
| Broadband Antenna          | SCHWARZBECK<br>MESS-ELEKTRONIK | VULB 9160    | 9160-3273     | 12/13/2013 | (1)    |
| Horn Antenna<br>(1~18GHz)  | ETS-Lindgren                   | 3117         | 00128055      | 08/09/2013 | (1)    |
| Horn Antenna<br>(18~40GHz) | SCHWARZBECK<br>MESS-ELEKTRONIK | BBHA9170     | 9170-320      | 06/21/2013 | (1)    |

Remark: <sup>(1)</sup> Calibration period 1 year. <sup>(2)</sup> Calibration period 2 years.

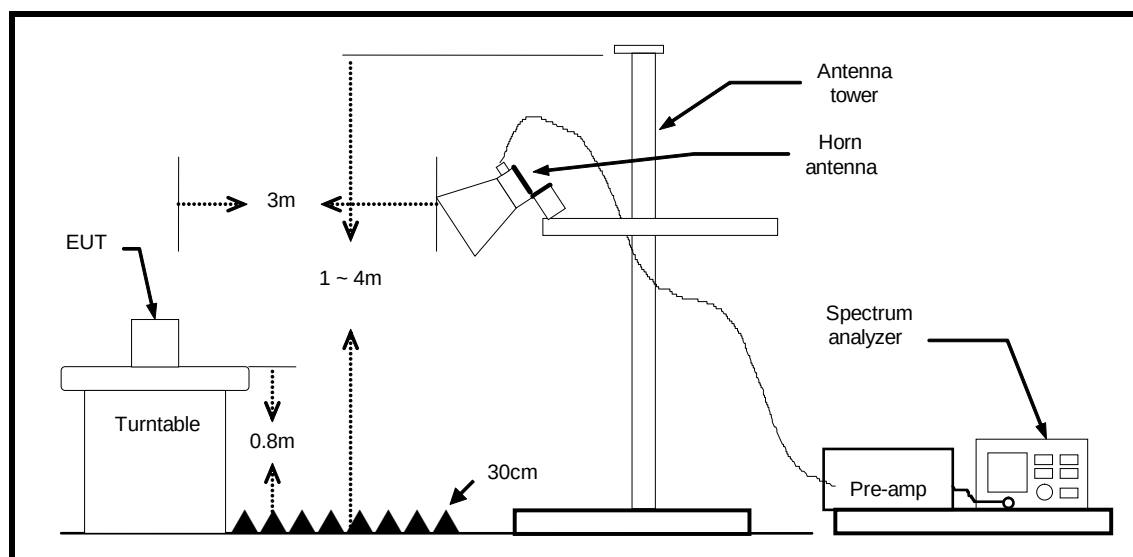
Note: N.C.R. = No Calibration Request.

### 4.2.3 Setup

Below 1GHz



Above 1GHz



#### 4.2.4 Test Result

|               |                   |                      |              |
|---------------|-------------------|----------------------|--------------|
| Standard:     | FCC 15.109        | Test Distance:       | 3m           |
| Test item:    | Radiated Emission | Power:               | DC 3.0V      |
| Model Number: | RAR213HG          | Temp.(°C)/Hum.(%RH): | 22(°C)/54%RH |
| Mode:         | 1                 | Date:                | 2014/04/06   |
| Range:        | 30MHz-5GHz        |                      |              |

| Frequency<br>(MHz) | Reading<br>(dBuV) | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark | Ant.Polar.<br>H / V |
|--------------------|-------------------|--------------------------|--------------------|-------------------|----------------|--------|---------------------|
| 49.26              | 45.55             | -33.4                    | 12.15              | 40.0              | -27.85         | QP     | H                   |
| 93.60              | 44.15             | -35.7                    | 8.45               | 43.5              | -35.05         | QP     | H                   |
| 135.00             | 49.58             | -38.9                    | 10.68              | 43.5              | -32.82         | QP     | H                   |
| 319.08             | 49.96             | -33.0                    | 16.96              | 46.0              | -29.04         | QP     | H                   |
| 490.92             | 55.63             | -28.9                    | 26.73              | 46.0              | -19.27         | QP     | H                   |
| 750.12             | 49.68             | -24.2                    | 25.48              | 46.0              | -20.52         | QP     | H                   |
| 1142.50            | 45.25             | -5.2                     | 40.05              | 74.0              | -33.95         | PK     | H                   |
| 1142.50            | 36.49             | -5.2                     | 31.29              | 54.0              | -22.71         | Ave.   | H                   |
| 1856.12            | 44.08             | -0.3                     | 43.78              | 74.0              | -30.22         | PK     | H                   |
| 1856.12            | 31.40             | -0.3                     | 31.10              | 54.0              | -22.90         | Ave.   | H                   |
| 37.56              | 47.47             | -33.4                    | 14.07              | 40.0              | -25.93         | QP     | V                   |
| 115.98             | 56.07             | -35.7                    | 20.37              | 43.5              | -23.13         | QP     | V                   |
| 220.92             | 56.80             | -38.9                    | 17.90              | 46.0              | -29.10         | QP     | V                   |
| 417.24             | 51.83             | -33.0                    | 18.83              | 46.0              | -27.17         | QP     | V                   |
| 490.92             | 55.47             | -28.9                    | 26.57              | 46.0              | -19.43         | QP     | V                   |
| 662.76             | 54.77             | -24.2                    | 30.57              | 46.0              | -15.43         | QP     | V                   |
| 1142.50            | 41.93             | -5.2                     | 36.73              | 74.0              | -37.27         | PK     | V                   |
| 1142.50            | 37.74             | -5.2                     | 32.54              | 54.0              | -21.46         | Ave.   | V                   |
| 1856.12            | 42.95             | -0.3                     | 42.65              | 74.0              | -31.35         | PK     | V                   |
| 1856.12            | 31.51             | -0.3                     | 31.21              | 54.0              | -22.79         | Ave.   | V                   |

#### 4.2.5 Test Photograph

Test Mode: Mode 1

Description: View of Radiated Emission Test (Below 1 GHz)



Test Mode: Mode 1

Description: View of Radiated Emission Test (Above 1 GHz)

