

# TEST REPORT

**This laboratory is accredited by Radio Research Laboratory and National Voluntary Laboratory Accreditation Program.**  
The tests reported herein have been performed in accordance with its terms of accreditation.

**Test Report No.** : LR500110908C  
**Issue Date** : Aug 19, 2009  
**Applied Standard** : FCC Part 15, Subpart B:(July 10, 2008)

**Trade Name** : QUFIELD CO.,LTD.  
**Category** : RECEIVER  
(Other Class B digital devices)

**Brand** : -  
**Model Name** : LM-R100US  
**FCC ID** : -  
**Serial Number** : Identification

**This test result only responds to the tested sample. It is not allowed to copy this report even partly without the allowance of the test laboratory.**  
**This report must not be used by the applicant to claim product endorsement by NVLAP or any agency of the U.S.Government.**



NVLAP LAB Code.: 200723-0

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## LTA Certification

### **Applicant**

Company name : QUFIELD CO.,LTD.  
Address : 208 mega valley, 799 Gwanyang 2-dong, Dongan-gu, Anyang-si,  
Gyeonggi-do, Korea  
TEL / FAX : 82-31-420-4782 / -

### **Factory**

Company name : QUFIELD CO.,LTD.  
Address : 208 mega valley, 799 Gwanyang 2-dong, Dongan-gu, Anyang-si,  
Gyeonggi-do, Korea  
TEL / FAX : 82-31-420-4782 / -

### **Equipment Under Test (EUT)**

Trade name : QUFIELD CO.,LTD.  
Category : RECEIVER  
(Other Class B digital devices)  
Model name : LM-R100US  
FCC ID : V6OLMR100US  
Date of receipt : July 22, 2009  
EUT condition : Pre-production, not damaged  
Interface port : -  
Power Source : -  
Test Memory Size : -  
Operating Mode : RX mode  
Crystal/Oscillator(s) : 4MHz, 20.945MHz, 21MHz, 47.384722MHz

### **Model Description**

- NONE

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**Model Specification**

Items	Specification
Frequency	447.8625Mhz
Modulation	F.S.K.(FM)
Sensitivity	-107dBm Below
Power Supply	BATTERY 3.7V
Antenna Type	LOOP Antenna
ARLAM DEVICE	VIBRATOR, BUZZER
Operating Temperature	-10℃~40℃

**Test Performed**

Test started & completed : August 14, 2009  
Location : LTA Co., Ltd.

**Test Specification**

Purpose of the test : Compliance test to the following standard  
Applied standard : FCC Part 15, Subpart B : (July 10, 2008)  
Classification : Class B  
Deviations from Standard : N/A  
Test Method

\*\*\* To be continued next page \*\*\*

## LTA Certification –cont.-

### Test Results

Measurement	Results*	Test method
Radiated disturbance	Complies	ANSI C 63.4: (July 10, 2008)
Conducted disturbance	Complies	ANSI C 63.4: (July 10, 2008)

\* : The compliance statement is based on nominal value only.

### Modification performed by the lab.:

- N.A

-We were performed the test according to LTA procedure QP-014.

### Laboratory's Certificate

Report number : LR500110908C

Issue date : Aug 19 , 2009

This test report is issued under the authority of:



Kyung-Taek LEE, Technical Manager

The test was supervised by:



Bok – Soo KIM, Test Engineer

The results in this report apply only to the sample(s) tested.

It is not allowed to copy this report even partly without the allowance of the test laboratory.

## General information's

### Purpose

This document is based on the Electromagnetic Interference (EMI) tests performed on the “**LM-R100US**”.

The measurements were performed according to the measurement procedure described in ANSI C 63.4:2003. The tests were carried out in order to confirm whether the electromagnetic emissions from the EUT( Equipment Under Test), are within the class B limits defined in FCC Part 15, Subpart B- “Section 15.107- Conducted limits” and “Section 15.109-Radiated emission limits”.

### Test Performed

Company name : LTA Co., Ltd.  
Address : 243, Jubug-ri, Yangji-Myeon, Youngin-Si, Kyunggi-Do, Korea. 449-822  
Telephone : +82-31-323-6008  
Facsimile : +82-31-323-6010

### Measurement uncertainty

Radiated disturbance (30 – 1000MHz) : +4.52 [dB] , -4.43 [dB] (k=2)  
Conducted disturbance (0.15 – 30MHz) : +1.45 [dB] , -1.45 [dB] (k=2)  
ANT. Conducted Emission (30 – 2150MHz) : ±0.4 [dB] (k=2)

The coverage factor k=2 yields approx. a 95% level of confidence for near-normal distribution typical of most measurement results.

### Accredited agencies

LTA Co., Ltd. Is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2009-09-30	ECT accredited Lab.
RRL	KOREA	KR0049	2010-06-20	EMC accredited Lab.
FCC	U.S.A	610755	2011-04-22	FCC filing
VCCI	JAPAN	R2133, C2307	2011-06-22	VCCI registration
IC	CANADA	IC5799A-1	2010-05-23	IC filing

## Brief Information

### 1-1 Test Summary

Parameter	Applied Standard	Status (note 1)
<b>I. Emission</b>		
Radiated disturbance	FCC Part §15.109:(July 10, 2008)	C <sup>note2</sup>
Conducted disturbance	FCC Part §15.107:(July 10, 2008)	NA
Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable Note 2 : No emissions were detected at a level greater than 20dB below limit. * The data in this test report are traceable to the national or international standards.		

Frequency range to be scanned:

0.15 MHz - 30 MHz as conducted measurement

5<sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower

Bandwidth:

Measured by the CISPR quasi-peak function Bandwidth is 10kHz in the frequency 0.15MHz to 30MHz and 120kHz in the frequency 30MHz to 1,000MHz.

Measured by the CISPR Peak function Bandwidth is 1MHz in the frequency 1GHz to 40GHz.

A sample calculation:

COR. F (correction factor)= Antenna factor + Cable loss- Amp.gain- Distance correction

Emission Level= meter reading + COR.F

### 1-2 Variant Model

- NONE

### 1-3 Operating Mode of the EUT

The tests have been conducted with the following operational mode(s) of the EUT.

Name of mode in the report

Description

RX mode : -

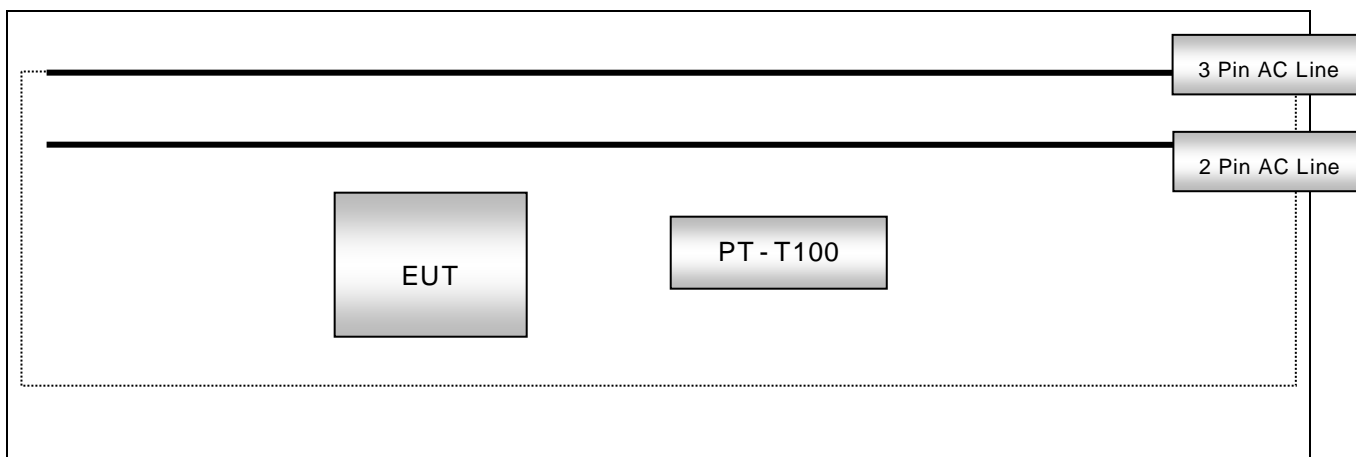
### 1-4 List of EUT and accessory

EUT				
Category	Model Name	Serial No.	Manufacturer	Remarks
RECEIVER	LM-R100US	N/A	QUFIELD CO.,LTD.	-
ACCESSORY				
Category	Model Name	Serial No.	Manufacturer	FCC ID
Non-specific Short Range Devices	PT-T100	N/A	QUFIELD CO.,LTD.	-
-	-	-	-	-

### 1-5 Cable List

Cable List				
Type	Length	Shielding (Cable/backshell)	Remarks	
			From	to
-	-	-	-	-
-	-	-	-	-

### 1-6 Block diagram of the EUT test



Note) refer to the Test setup photograph.



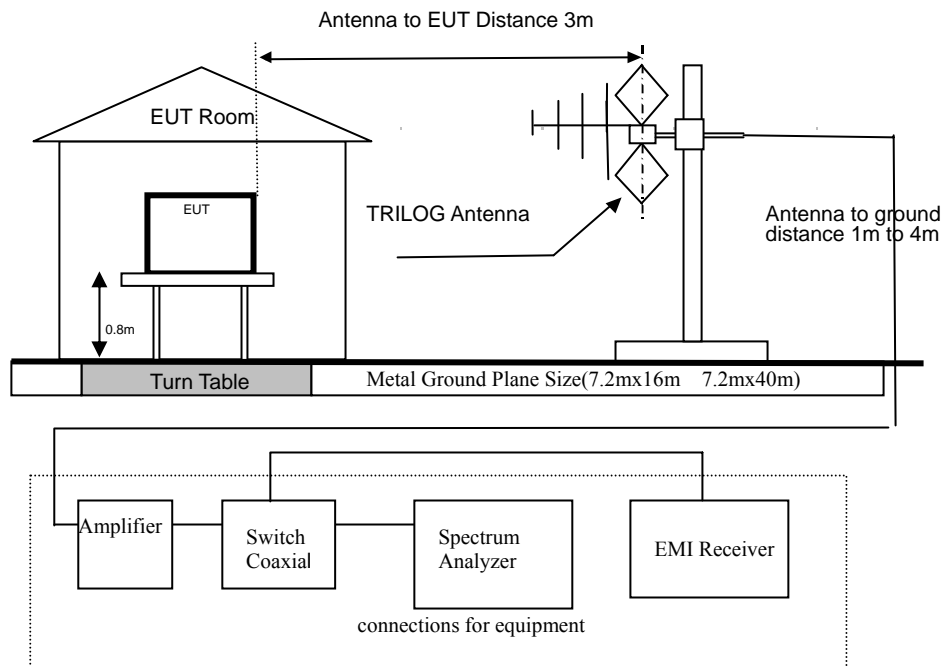
## **2- Test Site Description**

### **1-Facility**

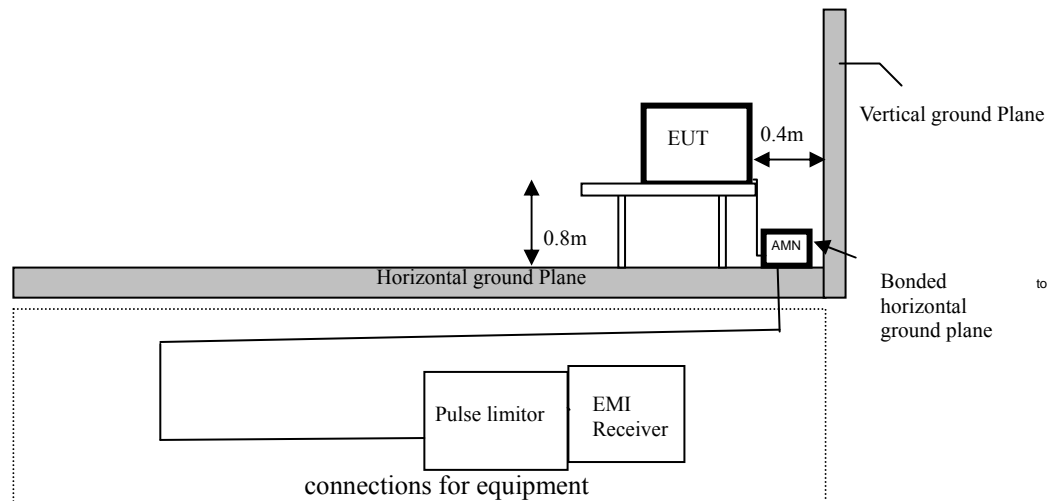
All the testing facilities are periodically serviced as a daily check for equipment and cables systems, an every 6 months facility check for the facilities and a monthly check and annual calibration for testing equipment according to ISO/IEC 17025. All the testing facilities are used as the same specifications shown below. There are descriptions both for radiated disturbance measurement and conducted disturbance measurement conformed by ANSI C 63.4:2003.

The NSA measurement of the OATS was performed on 29 Feb 2008 according to ANSI C63.4 : 2003.

### **2-1 Radiated Disturbance Measurement**



### **2-2 Conducted Disturbance Measurement**



### **3- Test Procedure**

#### **3-1 Radiated Disturbance Measurements**

- Test site is met the requirements of ANSI C 63.4:2003 and the distance between the EUT and the antenna is adjusted 3m.
- The turntable can be rotated 360 degrees.
- The antenna can be adjusted between 1m and 4m in height above the ground.
- The EUT is placed on the non-conducting table with 0.8m height on the turntable.
- Measurements are carried out using a spectrum analyzer with peak detectors (100kHz bandwidth) and an EMI receiver with quasi-peak detectors(120kHz bandwidth).
- Refer to the list of test equipment used for the test.
- TRILOG antenna are used as wideband antenna.
- The TRILOG antenna is used in the frequency range of 30MHz to 1000MHz, the Horn antenna is used in the frequency range of 1GHz to 18GHz.
- A variable attenuator is used for verifying amplifier's linearity.
- Rotating the turntable and adjusting the height of the antenna are carried out by control buttons on the console.
- Refer to "Brief Information"(page 5-8) about details of the EUT and configuration of the cables.
  
- Measurement is carried out by a LTA operator as manual operation.
- searching for some of High disturbance frequency points than the other points with the following settings;  
bandwidth 100kHz, frequency range 10MHz between 30MHz and 300MHz and frequency range 50MHz between 300MHz and 1GHz.
- searching the worst direction with the maximum level of the disturbance wave in rotating the turntable 360 degrees at each searched frequency point.
- setting the height of the antenna with the maximum level of the disturbance wave from 1m to 4m.
- reading the disturbance level by the EMI receiver with quasi-peak detectors (120kHz bandwidth) according to ANSI C 63.4:2003.
- measuring to vertical and horizontal polarization.
- calculating the measurement result with the following formula or equation:  
(Measurement result= measured value + antenna factor + antenna cable loss)

### 3-2 Conducted Disturbance Measurements

- The measurement is carried out on an open site with horizontal and metallic ground plane.
- An AMN(Artificial Mains Network) with a nominal impedance ( $50\Omega/50\mu\text{H}$ ) as defined in ANSI C 63.4:2003, shall be utilized.
- The AMN is grounded on a horizontal metal ground plane.
- Measurement is carried out using an EMI receiver with quasi-peak detectors and average detector.  
(Refer to the List of test equipment used for the test.)
- The shortest distance between the EUT and the AMN is 0.8m.
- The EUT is placed on the non-conducting table with 0.8m height.
- A remote switch is used for changing phases between Line (L) and Neutral (N).
- Refer to "Brief Information"(page 5-8 ) about details of the EUT and configuration of the cables.
  
- Measurement is carried out as manual operation.
- detecting the maximized emission level using the maxhold function after setting the spectrum analyzer bandwidth 1MHz and the frequency range from 150kHz to 1MHz , 1MHz to 5MHz and 5MHz to 30MHz.
- searching the maximum frequency point of the disturbance wave in each frequency range.
- reading the disturbance level of quasi-peak, average and Line (L) and Neutral (N) in 9kHz bandwidth by the EMI receiver.
- calculating the measurement result with the following formula or equation.  
(Result = Reading + Cor.F.)  
(Margin = Limit- Result)

#### **4- List of Equipment Used For the Tests**

	Item	Model Name	Serial No.	Manufacturer	Interval	Last Cal.
1	Spectrum Analyzer	8594E	3624A03313	HP	1 year	Apr-04-09
2	Test Receiver	ESHS10	828404/009	R&S	1 year	Apr-01-09
3	Two-Line V-Network	ENV216	100408	R&S	1 year	Oct-12-08
4	Two-Line V-Network	ESH3-Z5	893045/017	R&S	1 year	Oct-12-08
5	EMI Test Receiver	ESVD	843748/001	R&S	1 year	Apr-01-09
6	Spectrum Analyzer	8591E	3649A05888	HP	1 year	Oct-12-08
7	RF Amplifier	8447D	2944A07882	HP	1 year	Apr-03-09
8	RF Amplifier	8447D	2439A09058	HP	1 year	Oct-13-08
9	TRILOG Antenna	VULB9160	9160-3198	SCHWARZBECK	2 year	Nov-25-08
10	RF Switch	MP59B	6200414971	ANRITSU	1 year	May-28-09
11	Splitter	ZFM-150	15542	Mini-Circuits	1 year	Apr-02-09
12	RF Amplifier	8447D OPT 010	2944A07684	HP	1 year	Oct-12-08
13	Horn Antenna	3115	00055005	ETS	2 year	Mar-16-09

TEST EQUIPMENT USED: 01, 05, 08, 09, 10, 13

## **Conclusions**

Product models "**LM-R100US** " meets all of the Class B requirements of the FCC Part 15, Subpart B: (Limits of radio disturbance characteristics of ITE).

( Refer to Test Specification and Test Results in the "LTA certification", page 3,4 and 5.)

## Photograph of the Radiated Disturbance Measurements





### Photograph of the Equipment Under Test



## Photograph of the Equipment Under Test

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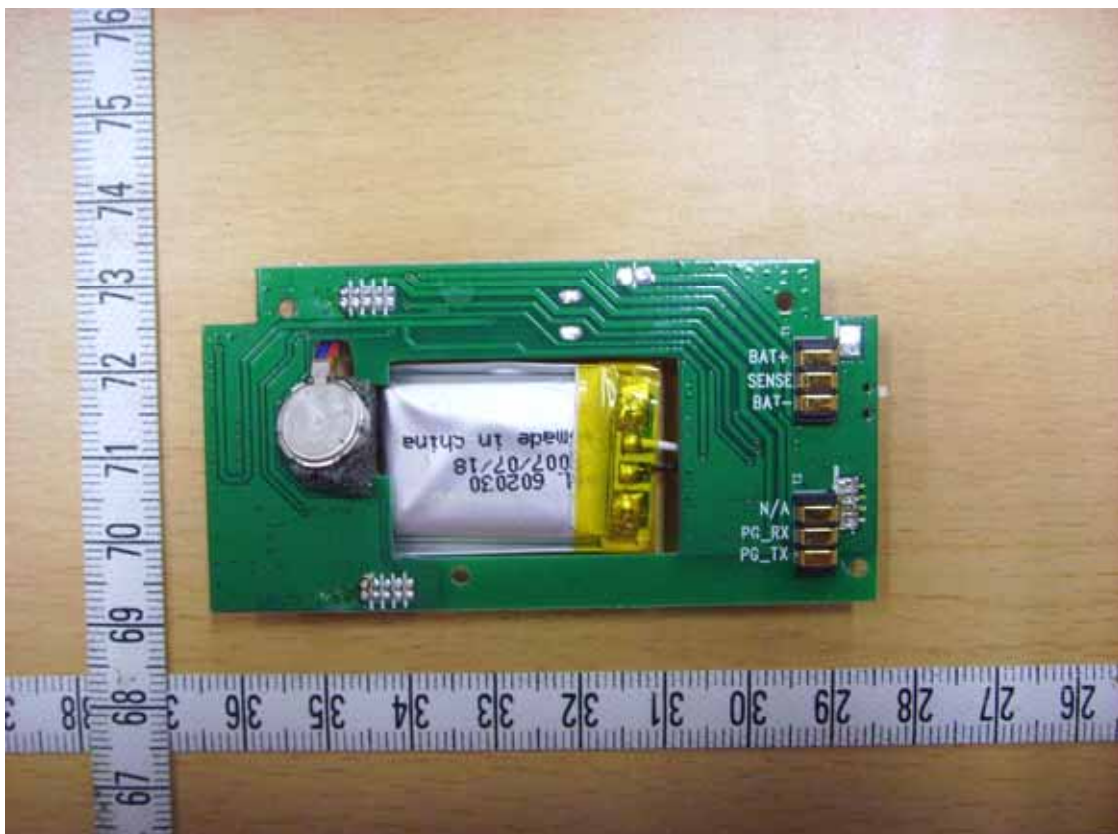


## Photograph of the Equipment Under Test

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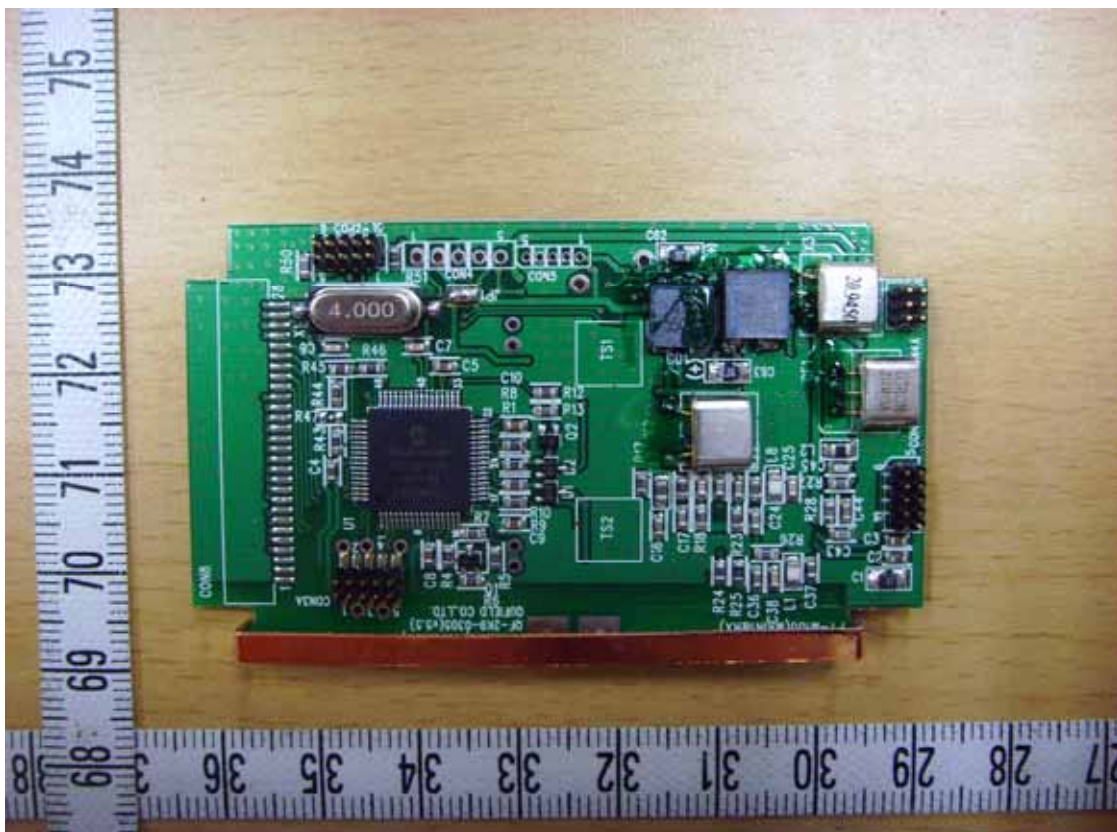
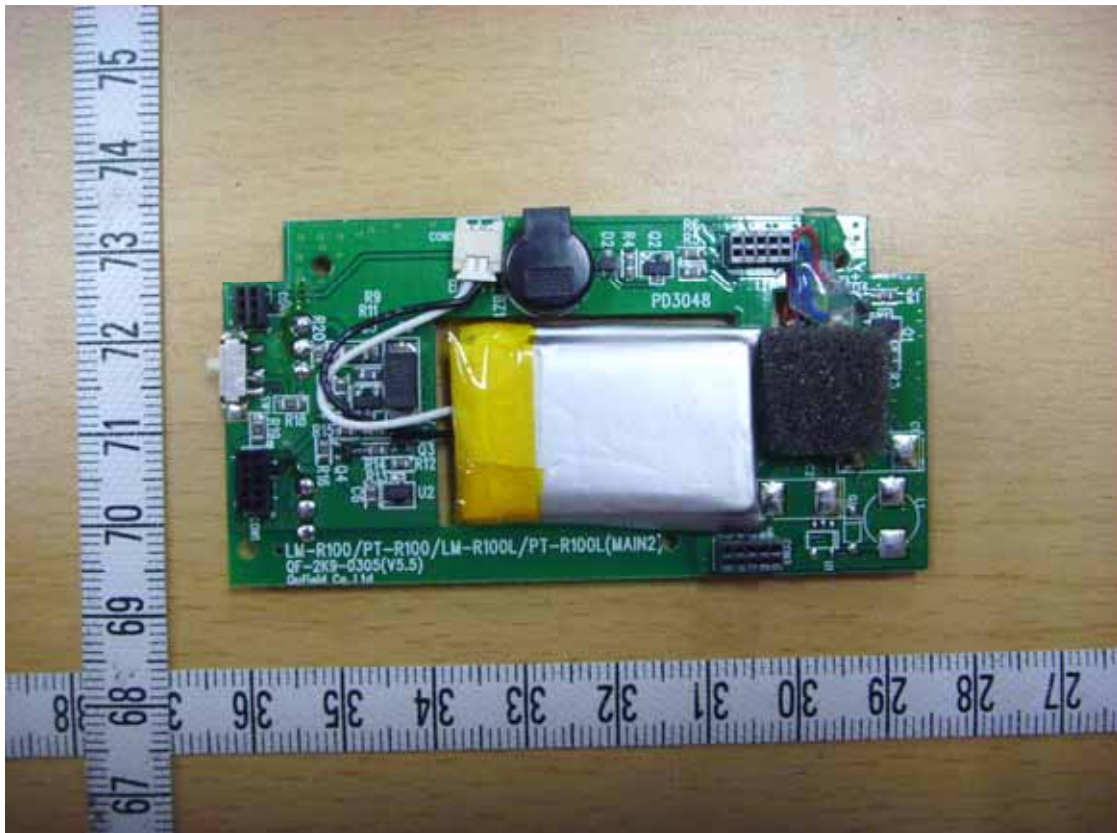


## Photograph of the Equipment Under Test





## Photograph of the Equipment Under Test



## Photograph of the Equipment Under Test

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