



## TEST REPORT

Date: 2011-04-20

Report No.: 60.870.11.007.02F

**Applicant:** Electronics Tomorrow Ltd.  
Unit 903-7, 9/F, Tower 1, Harbour Center,  
1 Hok Cheung Street, Hung Hom, Kowloon, HK.

**Description of Samples:** Model name: 433MHz RF Cooking Thermometer (Receiver)  
Brand name: Nil  
Model no.: WT2  
FCCID: PEQA240900411

**Date Samples Received:** 2011-03-24

**Date Tested:** 2011-03-24 to 2011-04-19

**Investigation Requested:** FCC Part 15 Subpart B

**Conclusions:** The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

**Remarks:**

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Checked by:

A handwritten signature in blue ink, appearing to read "Prudence Poon".

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Prudence Poon  
Technical Manager  
Wireless & Telecom Department

Approved by:-

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Jeff Pong  
Project Manager  
Wireless & Telecom Department

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**1.0    General Details**

**1.1    Test Laboratory**

Neutron Engineering Inc.  
No 3, Jinshagang 1<sup>st</sup> Road, ShiXia, Dalang Town, Dong  
Guan, China.  
Registration Number: 319330

Tested by:



Ares Liu  
Ares Liu

**1.2    Applicant Details**  
**Applicant**

**Electronics Tomorrow Ltd.**  
Unit 903-7, 9/F, Tower 1, Harbour Center,  
1 Hok Cheung Street, Hung Hom, Kowloon, HK.

**Manufacturer**

**Electronics Tomorrow Ltd.**  
Unit 903-7, 9/F, Tower 1, Harbour Center,  
1 Hok Cheung Street, Hung Hom, Kowloon, HK.

**1.3 Equipment Under Test [EUT]**  
**Description of Sample**

Model Name: 433MHz RF Cooking Thermometer (Receiver)  
Manufacturer: Electronics Tomorrow Ltd.  
Brand Name: Nil  
Model Number: WT2  
FCCID: PEQA240900411  
Rating: DC 3.0V ( 2 x " AAA" size batteries )  
No. of Channel: 1  
Accessories and Auxiliary Equipment: None  
EUT Exercising Software: None

**Description of EUT**

The Equipment Under Test (EUT) is the wireless receiver operated at 433.970MHz to receive the temperature signal from the associated transmitter.

**1.4 Related Submittal(s) Grants**

This is a single application for certification of the receiver.

**2.0      Technical Details**

**2.1      Investigations Requested**

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2009 and ANSI C63.4: 2003 for FCC Verification.

**2.2      Test Standards and Results Summary Tables**

<b>EMISSION Results Summary</b>						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Radiated Emissions, 30MHz to 4.5GHz	FCC 47CFR 15.109	ANSI C63.4:2003	Class B	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emissions on AC, 0.15MHz to 30MHz	FCC 47CFR 15.107	ANSI C63.4:2003	Class B	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Note: N/A - Not Applicable

### **3.0 Test Methodology**

#### **3.1 Radiated Emission**

The sample was placed 0.8m above the ground plane on a standard emission test site \*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

\*On a standard emission test site with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 319330.

#### **3.2 Field Strength Calculation**

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

$$FS = R + \text{System Factor}$$

$$\text{System Factor} = AF + CF + FA - PA$$

Where FS = Net Field Strength in dBuV/m at 3 meters.

R = Reading of Spectrum Analyzer / Test Receiver in dBuV.

AF = Antenna Factor in dB.

CF = Cable Attenuation Factor in dB.

FA = Filter Attenuation Factor in dB.

PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

#### **3.3 Conducted Emissions**

The EUT was placed on a non-metallic table 0.8m above the horizontal metal reference place and 0.4m from a vertical ground plane which is connected to the horizontal metal ground plane. Meanwhile, the AC main of EUT was connected to the distance of 0.8m line impedance stabilization network (LISN) during measurement.

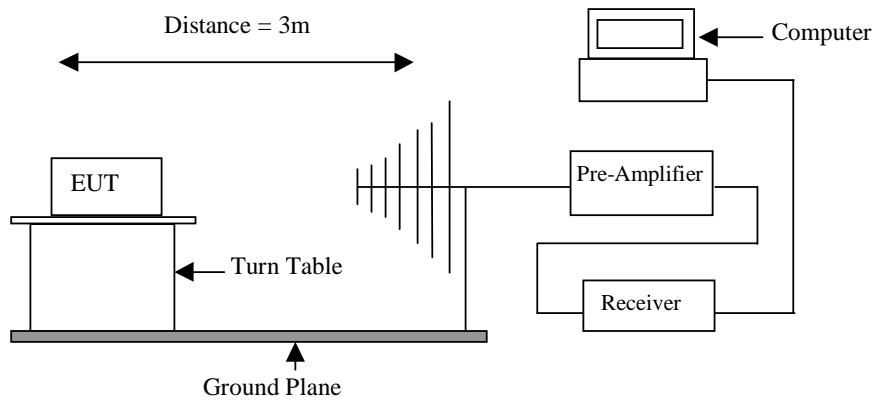
Initial measurements were performed in quasi-peak and average detection modes by the test receiver, any emissions recorded within 30dB of the relevant limit lines were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

## 4.0 Test Results

### 4.1 Radiated Emissions ( 30MHz to 4.5GHz )

Test Requirement: FCC part 15 section 15.109 Class B  
Test Method: ANSI C63.4:2003  
Test Date: 2011-04-18  
Mode of Operation: Receiving signal from the transmitter.

#### Test Setup:



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Results: PASS

Radiated Emissions							
Detector	Emissions	E-Field	Reading	System	Field Strength at 3m	Limit	Delta to Limit
	Frequency MHz	Polarity	dBuV/m	Factor dB	dBuV/m	dBuV/m	dBuV/m
PK	56.32	V	41.11	-17.60	23.51	40.00	-16.49
PK	88.65	V	43.13	-19.08	24.05	43.50	-19.45
PK	212.84	V	38.27	-16.18	22.09	43.50	-21.41
PK	325.94	V	39.84	-11.43	28.41	46.00	-17.59
PK	385.64	V	35.95	-9.54	26.41	46.00	-19.59
PK	748.29	V	36.53	-2.59	33.94	46.00	-12.06
AV	1301.06	V	41.82	-5.65	36.17	54.00	-17.83
PK	35.06	H	42.07	-16.91	25.16	40.00	-14.84
PK	84.22	H	43.48	-19.10	24.38	40.00	-15.62
PK	159.06	H	44.84	-17.65	27.19	43.50	-16.31
PK	258.41	H	36.00	-13.97	22.03	46.00	-23.97
PK	565.47	H	35.28	-5.11	30.17	46.00	-15.83
PK	688.32	H	34.97	-3.28	31.69	46.00	-14.31
AV	1301.06	H	40.94	-5.65	35.29	54.00	-18.71

Note: No further spurious emissions found between 30 MHz and lowest internal used/generated frequency.

Remark:

- Calculated measurement uncertainty:  $\pm 5.0\text{dB}$

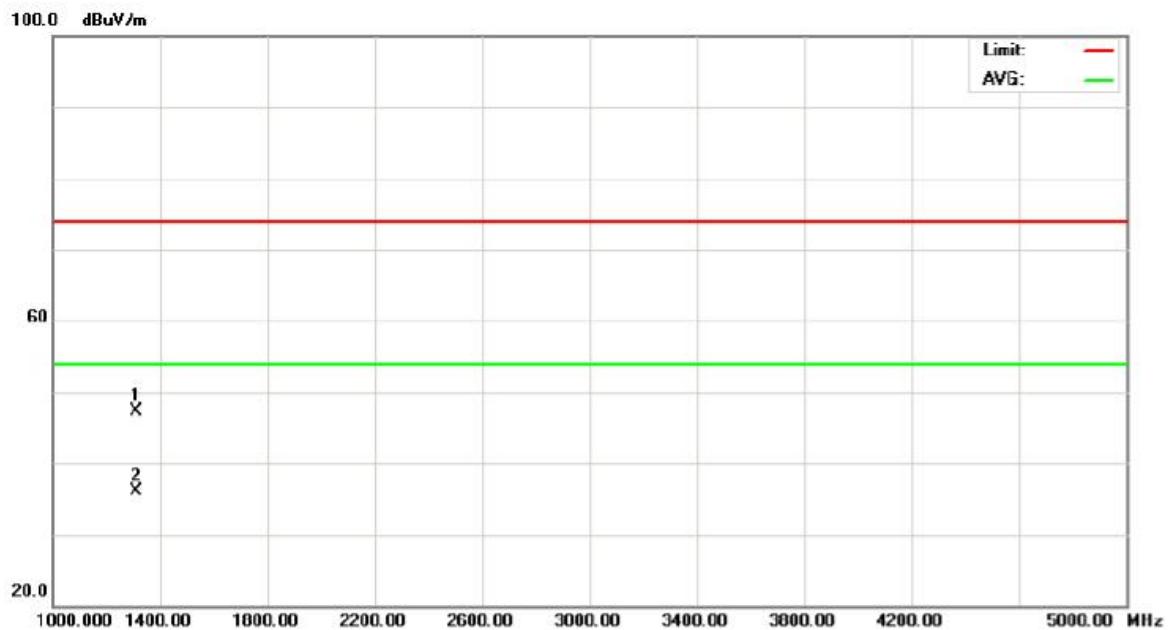
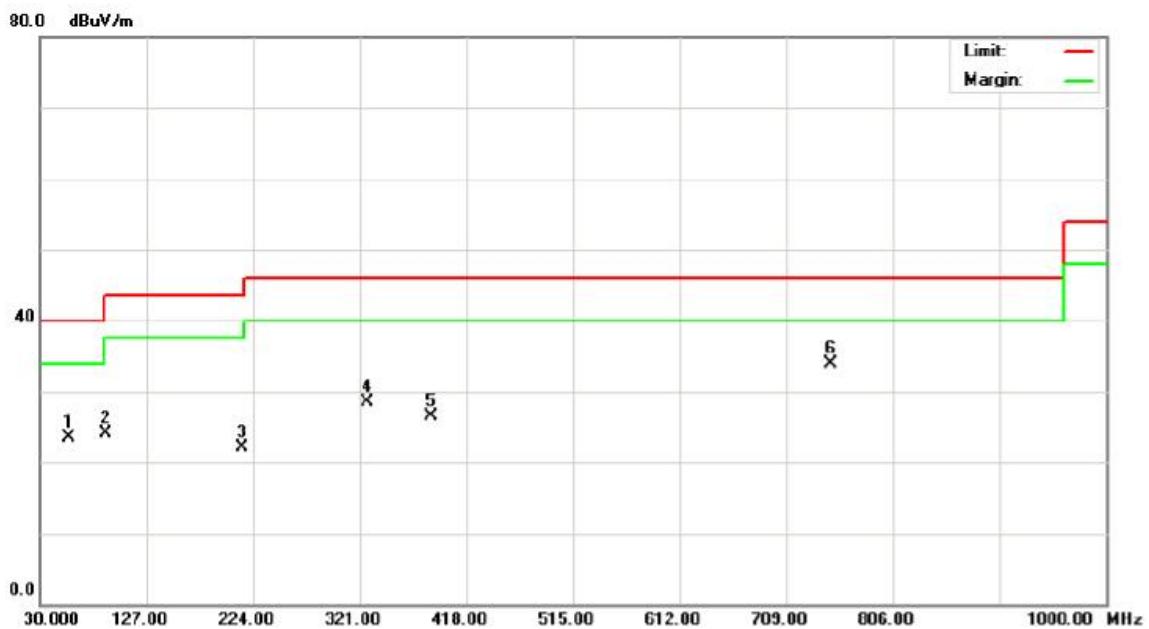
- Result data graph is attached at the next pages for reference.

## Limits for Radiated Emissions [ Section 15.109 Class B]:

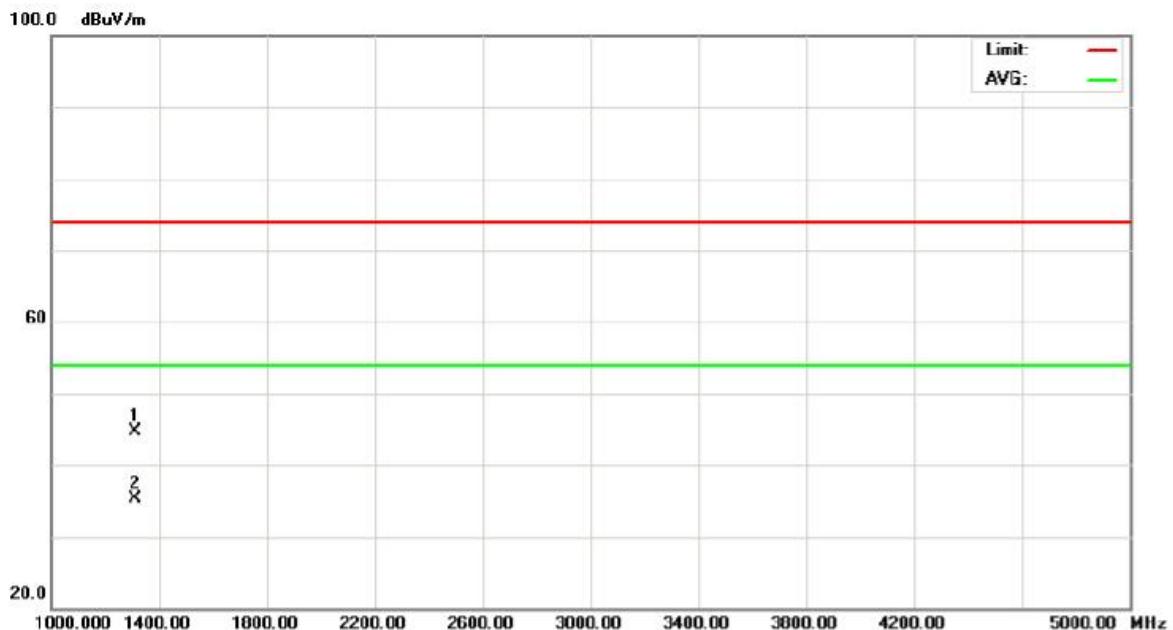
Frequency Range [MHz]	Quasi-Peak Limits [ $\mu\text{V/m}$ ]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Vertical



Horizontal



**4.2 Conducted Emissions (0.15MHz to 30MHz)**

Test Requirement: FCC part 15 Section 15.107 Class B  
Test Method: ANSI C63.4:2003  
Test Date: ---  
Mode of Operation: ---

**Results: N/A**

**Note : This testing is not applicable for the battery operated EUT.**

**Limits for Conducted Emissions ( Section 15.107):**

Frequency Range [MHz]	Quasi-Peak Limits [dB $\mu$ V]	Average [dB $\mu$ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

\* Decreases with the logarithm of the frequency.

Remarks:

Calculated measurement uncertainty:  $\pm 2.8$ dB

**5.0 List of Measurement Equipment**

**Radiated Emission**

<b>Description</b>	<b>Manufacturer</b>	<b>Model no.</b>	<b>Serial no.</b>	<b>CAL due</b>
Test Receiver	R & S	ESCI	100382	26 May 2011
Spectrum Analyzer	Agilent	E4408B	US39240143	26 Nov 2011
Spectrum Analyzer	R & S	FS300	101335	21 Jul 2011
Antenna	Schwarbeck	VULB9106	9160-3232	08 Jun 2011
Antenna	ETS	3115	00075789	27 May 2011
Amplifier	Agilent	8449B	3008A02274	26 May 2011
Test Cable	Huber+Suhner	SUCOFLEX_8	313794/4	12 Apr 2012
Controller	CT	SC100	N/A	N/A

Remarks:

CM      Corrective Maintenance  
N/A     Not Applicable or Not Available  
TBD    To Be Determined