



# CMA Testing and Certification Laboratories

廠商會檢定中心

## TEST REPORT

Report No. : AR0040286(9)

Date : 29 Jul 2013

Application No. : LR006869(7)

Applicant : E Measuring Device Limited  
3/F, Fook Cheong Building,  
63 Hoi Yuen Road, Kwun Tong  
Hong Kong

Sample Description : One(1) item of submitted sample stated to be Digital Measuring Tape with USB RF Receiver of Model No. DT-138  
Sample registration No. : RR023627-001  
Radio Frequency : 2440MHz Receiver  
Rating : USB 5V  
No. of submitted sample : Four (4) set (s)

Date Received : 23 Apr 2013.

Test Period : 23 Apr 2013 to 08 Jul 2013.

Test Requested : FCC Part 15 Certification.

Test Method : 47 CFR Part 15 (10-1-12 Edition)  
ANSI C63.4 – 2009

Test Result : See attached sheet(s) from page 2 to 19.

Conclusion : The submitted sample was found to comply with requirement of FCC Part 15 Subpart B.

*For and on behalf of*  
CMA Industrial Development Foundation Limited

Authorized Signature : 

Mr. WONG Lap-pong, Andrew  
Assistant Manager  
Electrical Division

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### 1 General Information

#### 1.1 General Description

The equipment under test (EUT) is a receiver for DT-138 Digital Measurement Tape. The EUT is powered by USB 5V. When the product received the RF signal, it demodulate the RF Signal and send the data to computer through USB.

The brief circuit description is listed as follows:

- U1 and its associated circuit act as demodulator.
- U3 and its associated circuit act as USB controller.

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### 1.2 Location of the test site

**FCC Registered Test Site Number: 552221**

**Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2009. A Semi-Anechoic Chamber Testing Site is set up for investigation and located at:**

Ground Floor, Yan Hing Centre,  
9 – 13 Wong Chuk Yeung Street,  
Fo Tan, Shatin,  
New Territories,  
Hong Kong.

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2009. A shielded room is located at :

Ground Floor, Yan Hing Centre,  
9 – 13 Wong Chuk Yeung Street,  
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### 1.3 List of measuring equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibration Due Date
EMI Test Receiver	R&S	ESCS 30	100001	15Aug 2013
Spectrum Analyzer	R&S	FSP30	100628	15 Aug 2013
Broadband Antenna	Schaffner	CBL6112B	2692	16 Jan 2014
Loop Antenna	EMCO	6502	00056620	15 Sep 2013
Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-531	09 Oct 2014
Broadband Pre-Amplifier	Schwarzbeck	BBV 9718	9718-119	09 Oct 2014
Coaxial Cable	Schaffner	RG 213/U	N/A	16 May 2015
Coaxial Cable	Schaffner	RG 214/U	N/A	16 May 2015
Coaxial Cable	Suhner	Sucoflex_102	N/A	09 Oct 2014

### 1.4 Measurement Uncertainty

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

#### Radiated emissions

Frequency	Uncertainty (U <sub>lab</sub> )
30MHz ~ 200MHz (Horizontal)	4.83dB
30MHz ~ 200MHz (Vertical)	4.84dB
200MHz ~1000MHz (Horizontal)	4.66dB
200MHz ~1000MHz (Vertical)	4.65dB

#### Conducted emissions

Frequency	Uncertainty (U <sub>lab</sub> )
150kHz~30MHz	3.02dB



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### 2 Description of the radiated emission test

#### 2.1 Test Procedure

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2009.

The equipment under test (EUT) was placed on a non-conductive turntable with dimensions of 1.5m x 1m and 0.8m high above the ground. 3m from the EUT, a broadband antenna mounting on the mast received the signal strength. The turntable was rotated to maximize the emission level. The antenna was then moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated.

For below 30MHz, a loop antenna with its vertical plane is placed 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1 m above the ground.

The device was rotated through three orthogonal axes to determine which attitude and configuration produce the highest emission during measurement for Radiated Emission measurement.

#### 2.2 Test Result

The frequencies from 30MHz to 1000MHz were investigated, and emissions more 20dB below limit were not reported. Thus, those highest emissions were presented in next page (section 2.3).

The emissions meeting the requirement of section 15.109 are based on measurements employing the CISPR quasi-peak detector below 1000MHz and average detector for frequencies above 1000MHz.

It was found that the EUT meet the FCC requirement.

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### 2.3 Radiated Emission Measurement Data

#### Radiated emission

pursuant to

the requirement of FCC Part 15 subpart B

Environmental conditions:

Parameter	Recorded value
Ambient temperature:	27 °C
Relative humidity:	70 %

Detector: Quasi-peak

RBW: 120kHz

VBW: 300kHz

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dB $\mu$ V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
48.034	V	9.8	12.5	22.3	40.0	- 17.7
151.985	H	7.9	14.5	22.4	43.5	- 21.1
192.173	H	12.0	11.2	23.2	43.5	- 20.3
200.136	H	17.7	11.9	29.6	43.5	- 13.9
200.148	V	9.9	11.9	21.8	43.5	- 21.7
225.159	V	12.1	11.9	24.0	46.0	- 22.0
234.365	H	11.7	11.9	23.6	46.0	- 22.4
287.683	H	10.2	15.0	25.2	46.0	- 20.8
300.197	H	12.6	15.9	28.5	46.0	- 17.5
300.211	V	11.8	15.9	27.7	46.0	- 18.3

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### 3 Description of the Line-conducted Test

#### 3.1 Test Procedure

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2009. The EUT was setup as described in the procedures, and both lines were measured.

#### 3.2 Test Result

It was found that the EUT met the FCC requirement.

#### 3.3 Graph and Table of Conducted Emission Measurement Data

For electronic filing, the documents are saved with filename TestRpt2.pdf.



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### 4 Photograph

#### 4.1 Photographs of the Test Setup for Radiated Emission and Conducted Emission

For electronic filing, the photos are saved with filename TSup1.jpg to TSup5.jpg.

#### 4.2 Photographs of the External and Internal Configurations of the EUT

For electronic filing, the photos are saved with filename ExPho1.jpg to ExPho2.jpg and InPho1.jpg to InPho2.jpg.



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### 5 Supplementary document

The following document were submitted by applicant, and for electronic filing, the document are saved with the following filenames:

Document	Filename
ID Label/Location	LabelSmp.jpg
Block Diagram	BlkDia.pdf
Schematic Diagram	Schem.pdf
Users Manual	UserMan.pdf
Operational Description	OpDes.pdf

#### 5.1 Bandwidth

Not Applicable

#### 5.2 Duty cycle

Not Applicable

#### 5.3 Transmission time

Not Applicable



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### 6 Appendices

A1.	Photos of the set-up of Radiated Emissions	1	page
A2	Photos of the set-up of Conducted Emissions	2	pages
A3.	Photos of External Configurations	1	page
A4.	Photos of Internal Configurations	1	page
A5.	ID Label/Location	1	page
A6.	Conducted Emissions Measurement Data	2	pages

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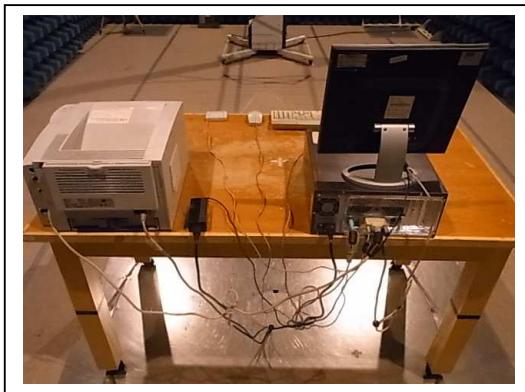
Report No. : AR0040286(9)

Date : 29 Jul 2013

### A1. Photos of the set-up of Radiated Emissions



(Front view)



(Back view)

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Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew

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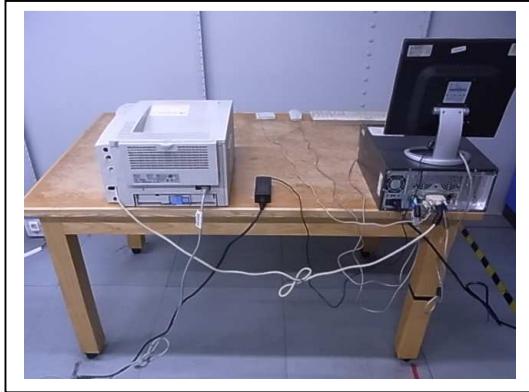
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Date : 29 Jul 2013

### A2. Photos of the set-up of Conducted Emissions



(Front view)



(Back view)

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Mr. LEUNG Shu-kan, Ken

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(Side View)

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### A3. Photos of External Configurations



External Configuration 1



External Configuration 2

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### A4. Photos of Internal Configurations



Internal Configuration 1



Internal Configuration 2

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### A5. ID Label / Location



ID Label 1

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Mr. LEUNG Shu-kan, Ken

Reviewed by:

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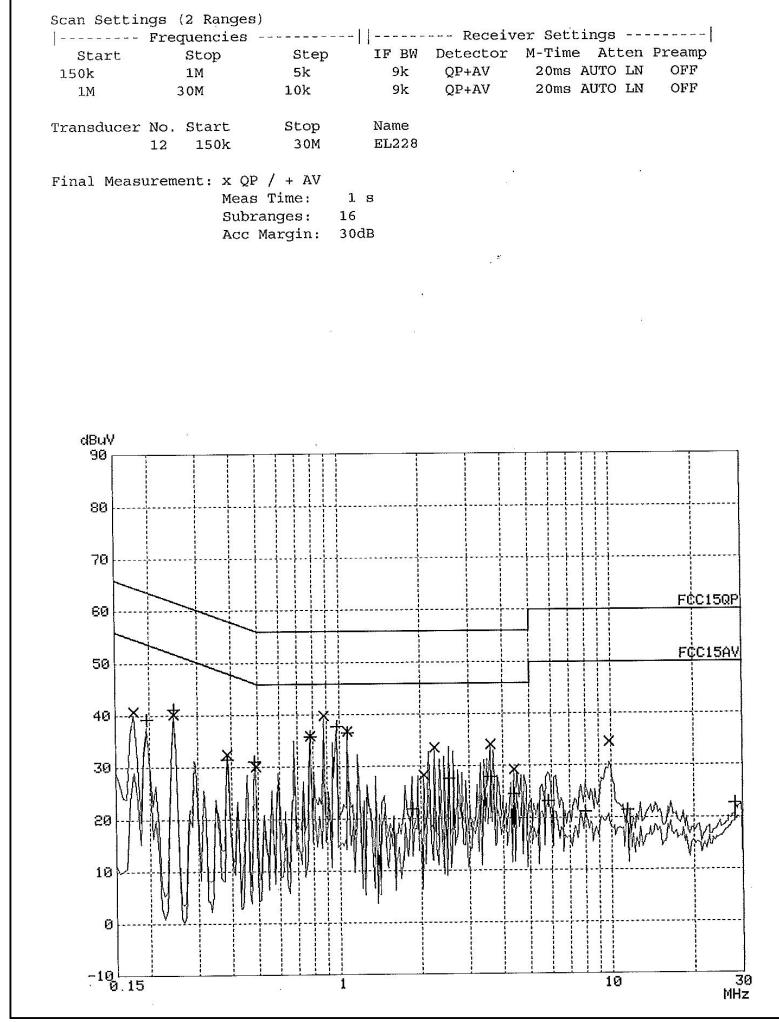
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### A6. Conducted Emissions Measurement Data



Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew

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### A6. Conducted Emissions Measurement Data

Final Measurement Results:				
Indicated Phase/PE shows Configuration of max. Emission				
Frequency MHz	QP Level dBuV	Delta Limit dB	Phase	PE
0.17500	40.8	-23.9	L1	gnd
0.24500	40.2	-21.6	N	gnd
0.38500	32.5	-25.6	N	gnd
0.49000	30.2	-25.9	L1	gnd
0.78000	35.9	-20.0	L1	gnd
0.87500	39.9	-16.1	N	gnd
1.07000	36.8	-19.1	N	gnd
2.04000	28.3	-27.6	L1	gnd
2.24000	33.6	-22.3	L1	gnd
3.60000	34.2	-21.7	N	gnd
4.38000	29.4	-26.6	L1	gnd
9.83000	34.6	-25.4	N	gnd
Frequency MHz	AV Level dBuV	Delta Limit dB	Phase	PE
0.19500	39.3	-14.5	N	gnd
0.24500	41.1	-10.7	N	gnd
0.38500	31.5	-16.6	L1	gnd
0.48500	31.1	-15.2	N	gnd
0.78000	35.9	-10.1	L1	gnd
0.97500	37.8	-8.2	L1	gnd
1.07000	36.4	-9.5	N	gnd
1.85000	21.8	-24.1	L1	gnd
2.53000	27.6	-18.3	N	gnd
3.60000	27.9	-18.0	N	gnd
4.38000	24.6	-21.3	L1	gnd
5.84000	23.3	-26.7	L1	gnd
7.98000	21.2	-28.7	L1	gnd
11.38000	21.4	-28.5	N	gnd
28.10000	22.7	-27.2	N	gnd

\* limit exceeded

\*\*\*\*\* End of Report \*\*\*\*\*

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew

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