



**KES Co., Ltd.**

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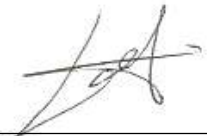
Test report No.:  
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# EMI Test Report for FCC

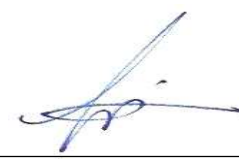
**Test Report No.** : KES-E1-120356  
**Date of Issue** : 05. 03. 2012  
**Description of Product** : Busylight UC  
**Model No.** : Busylight UC  
**Variant Model** : -  
**Applicant** : DASANELECTRON Co.,Ltd  
**Applicant's Address** : #307, Godowhadong, Gyunggi Techno Park, 1271-11, Sa-dong Ansan-Si,  
Gyunggido, Korea  
**Manufacturer** : DASANELECTRON Co.,Ltd  
**Manufacturer's Address** : #307, Godowhadong, Gyunggi Techno Park, 1271-11, Sa-dong Ansan-Si,  
Gyunggido, Korea  
**Standards** : Part 15.107(a): Conducted Emission  
Part 15.109(a): Radiated Emission  
**Test Date** : 04. 30. 2012 ~ 04. 30. 2012  
**Test Results** :  Pass  Fail

The test results relate only to the items tested.

**Tested by:**

  
JaeJu, Lee  
Test Engineer

**Reviewed by:**

  
Won-Wook, Kim  
Technical Manager



Testing Laboratories for EMS and Safety and RF Compliance  
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Testing Laboratories for EMI Compliance 477-6, Hageo-ri, Yeosu-eup, Yeosu-gun, Gyeonggi-do,  
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## Revision history

Revision	Date of issue	Test report No.	Description
-	05. 03. 2012	KES-E1-120356	Initial
1	05. 25. 2012	KES-E1-120356	modify a FCC ID

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# 1. General Information

## 1.1 Introduction

The EMI Test Report of Information Technology Equipment is prepared on behalf of named applicant in accordance with the ANSI C63.4-2003. The test results reported in this document relate only to the item that was tested.

The detailed description of the measurement facility was found to be in compliance with the requirement of Section 2.948 of the FCC Rules. The Federal Communications Commission has the reports on file and is listed under Registration Number. The scope of the accreditation covers the FCC Method - 47 CFR Part 15 or 18 of the Commission's Rules.

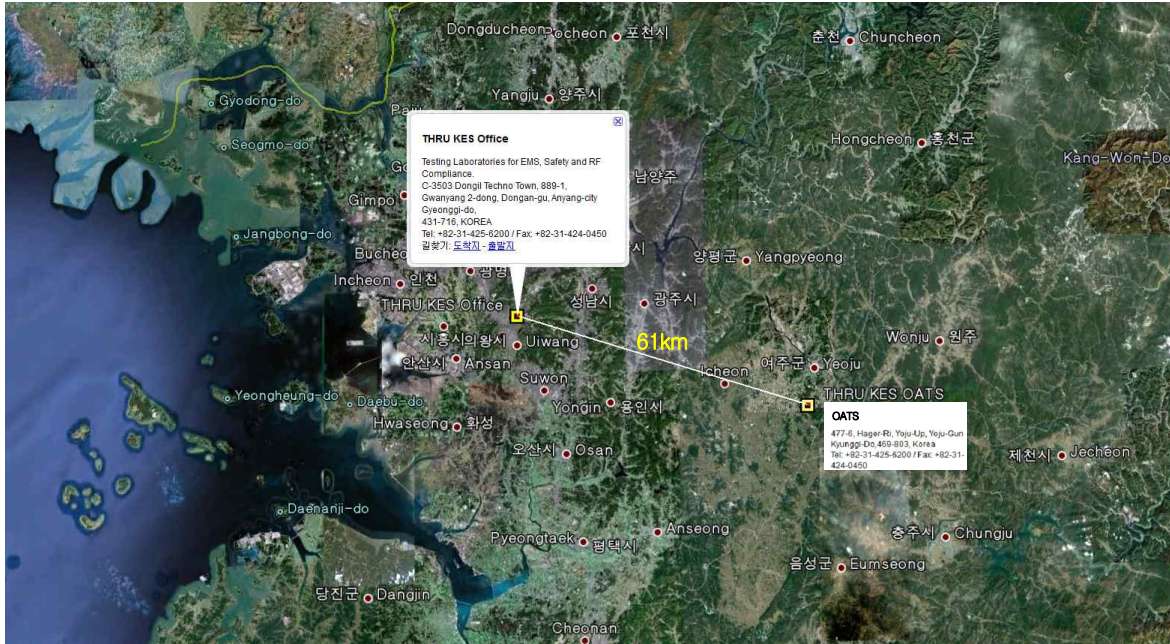
All measurements contained in this report were conducted in accordance with ANSI C63.4-2003. The instrumentation utilized for the measurements conforms with CISPR16 Specification for Radio Disturbance and Immunity Measuring Apparatus and Methods. Some accessories are used to increase sensitivity and prevent overloading of the measuring instrument. Calibration checks are performed yearly on the instruments by a local calibration laboratories.

All radiated and conducted emission measurements are performed manually at KES Co., Ltd. (hereinafter referred to as "KES"), 477-6, Hageo-ri, Yeosu-eup, Yeosu-gun, Gyeonggi-do, 469-803, Korea

The radiated emission measurements required by the FCC Rules were performed on 3 meter or 10 meter, Open Area Test Site, test range maintained by KES. Complete ANSI 63.4-2003 description and site attenuation measurement data records are maintained at the test facility and have been placed on file with the Federal Communications Commission. The power line conducted emission measurements were performed in a shielded enclosure also located at the same facility.

The KES EMC test facilities in Anyang-City and Yeosu-eup are designated testing laboratory according to ISO/IEC 17025 by Radio Research Agency(RRA), Korea  
Communications Commission.

## 1.2 Geographic location







KES Office Latitude : 37°23'54.59"N, Longitude : 126°58'14.66"E



KES OATS Latitude : 37°13'58.03"N, Longitude : 127°37'21.95"E

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### 1.3 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	
KOREA	KCC	EMC (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site)	 KR0100
Canada	IC	3 & 10 meter Open Area Test Sites and one conducted site	 4769B-1
Europe	TUV_SUD	EMC EN 55011, EN 55022, EN 61000-3-2, EN 61000-3-3, EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 55014-1, EN 61326 EN 50130-4, EN 55024, EN 55014-2 EN 61204-3, EN 60601-1-2, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11	

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**1.4 Product Description**

DASANELECTRON Co., Ltd, Busylight UC, Model No: Busylight UC

Main Specifications of EUT are:

Name	Specification
System requirements	<ul style="list-style-type: none"><li>• Microsoft Lync Server 2010 or Microsoft Lync Online 2010</li><li>• Windows XP SP3, Windows Vista or Windows 7</li></ul>
Driver software	<p>1. Mass deployment: The driver software can be mass deployed using the .msi-file.</p> <p>2. Single user: A single user can also install the driver on his/her PC. Download driver on <a href="http://www.busylight.com/support/lync">www.busylight.com/support/lync</a>.</p>
Lamp colours	<p>Busylight UC™ supports the colours of Microsoft Lync</p> <ul style="list-style-type: none"><li>•Red: Busy/Do Not Disturb</li><li>•Yellow: Off Work/Be Right Back</li><li>•Green: Available</li></ul>
Ringtones	<p>Busylight UC™ has 8 different ringtones. These include traditional telephone ringing as well as melodies tailored for the office. Speaker and ringtones are built into the device to avoid conflicts with the PC's audio settings.</p>
Power	<p>Powered via the USB data cable. No need for external power supply.</p>

※ Test Operating Mode

- Normal Operating mode .



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**1.5 Equipment Under Test**

Description	Model Number	Serial Number	Manufacturer	Remarks
Busylight UC	Busylight UC	-	DASANELECTRON Co.,Ltd	EUT

**1.6 Support Equipments**

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	NT-R519	ZKPA93AS90 0077D	Samsung Electronics Co., Ltd.	-
AC/DC Adapter	ADP-6019R	090909-11	DELTA ELECTRONICS, INC.	-

**1.7 External I/O Cabling**

Description	Length (m)	Port / From	Port/To	Remarks
Busylight UC	2.45	USB / Notebook	USB / Notebook	Unshielded

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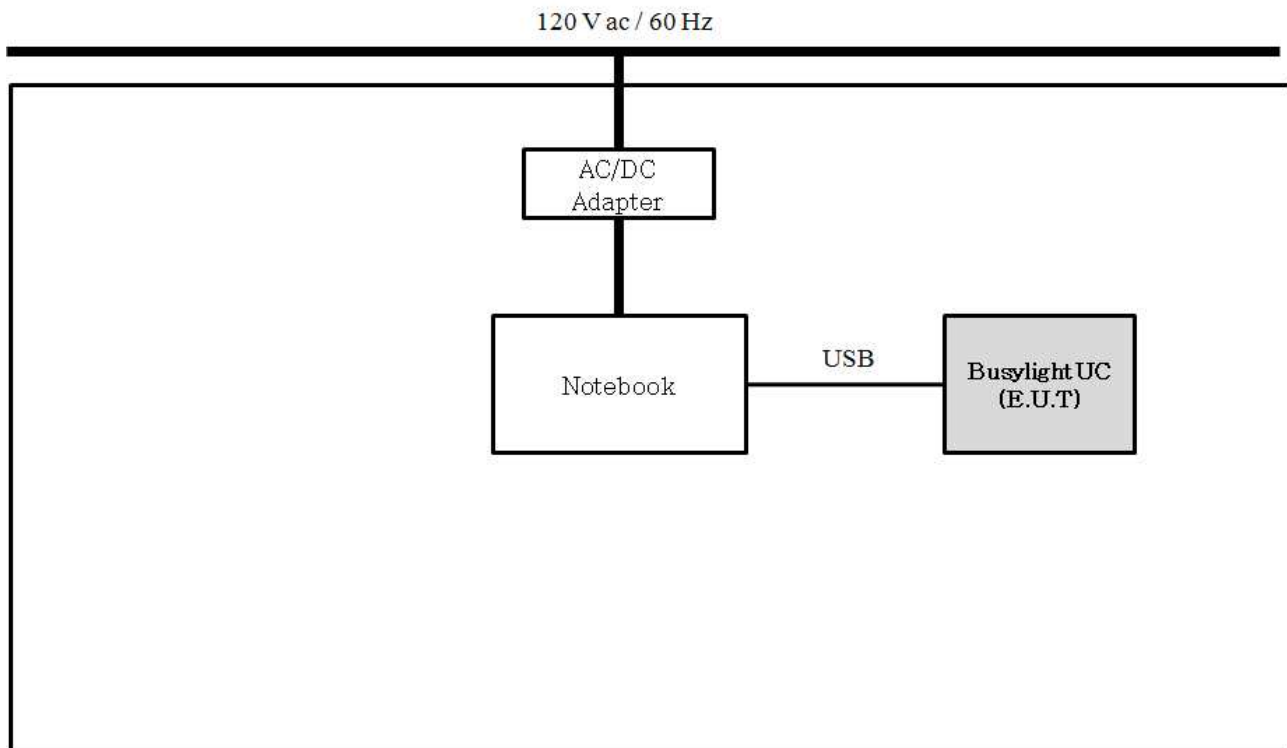
### 1.8 Special Accessories

As shown in section 1.10, all interface cables used for compliance testing are shielded as normally supplied or by use respective component manufacturers.

### 1.9 E.U.T Modifications

No modifications were made to the E.U.T in order to achieve and maintain compliance to the standards described in this report.

### 1.10 Configuration of Test System





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## 2. Summary of Tests

<b>FCC Part Section(s)</b>	<b>Parameter</b>	<b>Test Condition</b>	<b>Status (note 1)</b>
15.109(a)	Emission limits	Radiated	C
15.107(a)	Emission limits	Conducted	C

Note 1 : C=Complies N/C=Not Complies N/T=Not Tested N/A=Not Applicable

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## 2.1 Conducted Emission Measurements

### 2.1.1 Test Methods

The power line conducted emission measurements were performed in a shielded enclosure, using the setup in accordance with ANSI C63.4-2003 conducted emission measurement procedure.

### 2.1.2 Test Equipments

Description	Manufacturer	Model Number	Serial Number	Cal. Due
EMI TEST Receiver	Rohde & Schwarz	ESHS10	862970/018	05.09.2012
LISN	R&S	ENV216	101137	02.27.2013
Electro wave Shieldroom	Korea Shield	-	-	-

### 2.1.3 Test Environments

Ambient Temperatures	Relative Humidity
15.0 °C ~ 35.0 °C	30 % R.H.~ 60 % R.H.

### 2.1.4 Test Limits

Frequency (MHz)	15.107 Conducted limits			
	Class B (dB $\mu$ V)		Class A (dB $\mu$ V)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 to 0.50	66.0 to 56.0	56.0 to 46.0	79.0	66.0
0.50 to 5.00	56.0	46.0	73.0	60.0
5.00 to 30.00	60.0	50.0	73.0	60.0

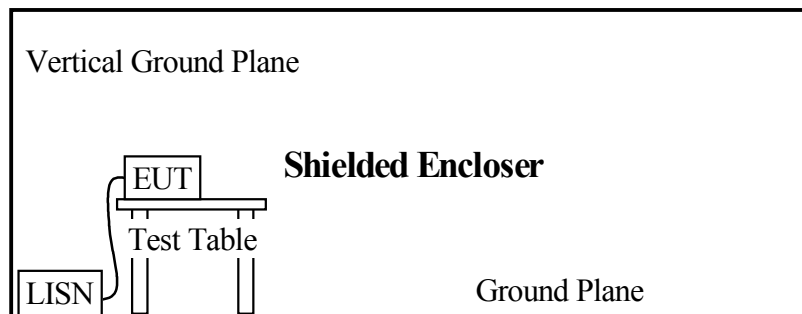
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### 2.1.5 Test Procedure

Conducted emission levels were measured on each current-carrying line with the EMI TEST Receiver operating in the CISPR quasi-peak mode (or peak mode if applicable). The Receiver's 6 dB bandwidth was set to 9 kHz. The initial step in collecting conducted data is a EMI TEST Receiver peak scan of the measurement range. If the conducted emission exceed the average limit with the instrument set to the quasi-peak mode, the measurements are made in the average mode. The emission spectrum was scanned from 150 kHz to 30 MHz. The highest emission amplitudes relative to the appropriate limits were measured and have been recorded. Quasi-peak readings are distinguished with a "QP".

The conducted emission test was performed with the E.U.T exercise program loaded, and the emissions were scanned between 150 kHz to 30 MHz on the HOT side and NEUTRAL side, herein referred to as H and N, respectively.

### 2.1.6 Test Configuration



### 2.1.7 Test Results

According to the data in section 2.1.8, the E.U.T complied with the FCC 15.107 limits.



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**2.1.8 Test Data**

Frequency [MHz]	Correction		Phase Hot/ Neutral	Quasi peak			Average		
	LISN (dB)	Cable (dB)		Limit (dB $\mu$ V/m)	Measure (dB $\mu$ V/m)	Result (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Measure (dB $\mu$ V/m)	Result (dB $\mu$ V/m)
0.150	9.510	0.035	H	66.000	46.760	46.760	56.000	30.600	30.600
0.183	9.540	0.035	N	64.348	44.840	44.840	54.348	28.860	28.860
0.186	9.524	0.035	H	64.213	43.150	43.150	54.213	27.620	27.620
0.219	9.532	0.035	H	62.857	40.580	40.580	52.857	25.220	25.220
0.303	9.550	0.034	N	60.160	27.010	27.010	50.160	14.650	14.650
0.405	9.560	0.037	N	57.750	29.900	29.900	47.750	21.410	21.410
0.627	9.540	0.047	H	56.000	34.480	34.480	46.000	30.010	30.010
0.690	9.560	0.042	N	56.000	32.540	32.540	46.000	21.580	21.580
1.550	9.556	0.073	H	56.000	36.570	36.570	46.000	26.050	26.050
2.241	9.572	0.085	N	56.000	36.080	36.080	46.000	26.270	26.270
2.928	9.569	0.096	H	56.000	37.260	37.260	46.000	26.090	26.090
2.964	9.580	0.097	N	56.000	35.880	35.880	46.000	23.850	23.850
13.350	9.674	0.200	H	60.000	35.910	35.910	50.000	28.620	28.620
13.458	9.849	0.199	N	60.000	34.530	34.530	50.000	27.390	27.390
20.307	10.164	0.268	N	60.000	32.640	32.640	50.000	23.540	23.540
20.388	9.742	0.271	H	60.000	29.510	29.510	50.000	22.250	22.250
22.395	9.750	0.282	H	60.000	30.150	30.150	50.000	21.610	21.610
22.467	10.126	0.280	N	60.000	28.420	28.420	50.000	22.630	22.630

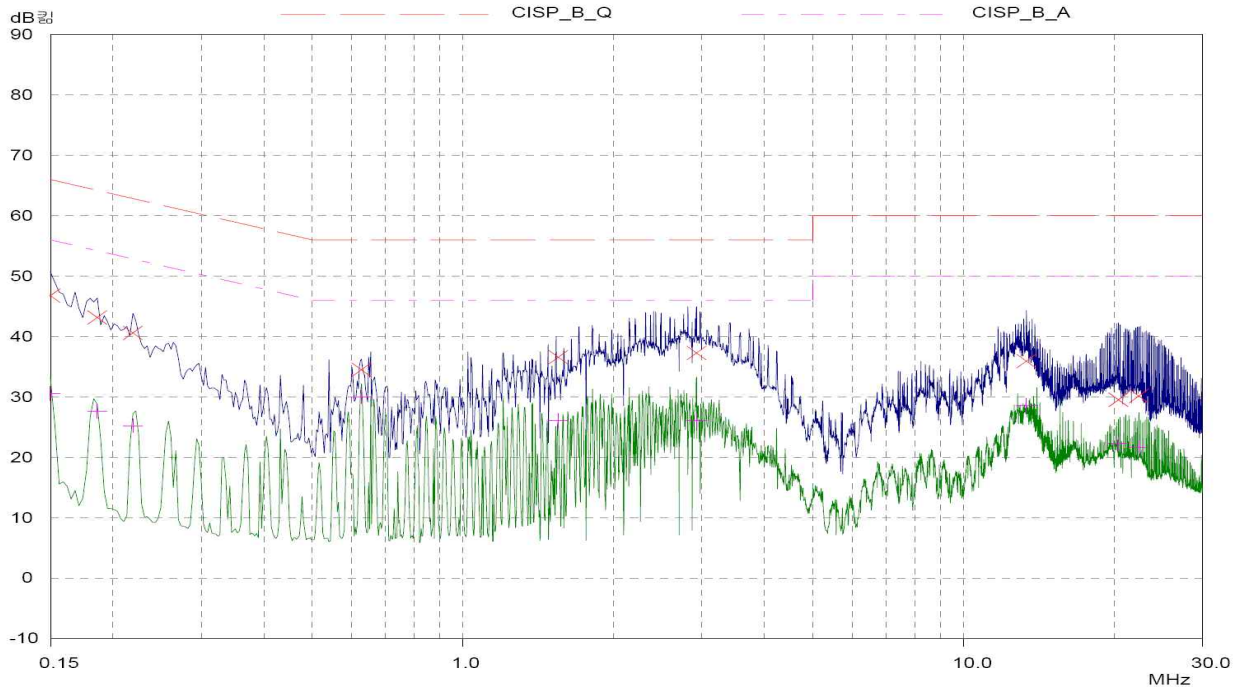
\* The LISN factor and Cable loss is included in the measurement Value

Temperature: 19.8 °C Humidity: 41 % R.H. Test Date: 04. 30. 2012 Tested by: JaeJu, Lee

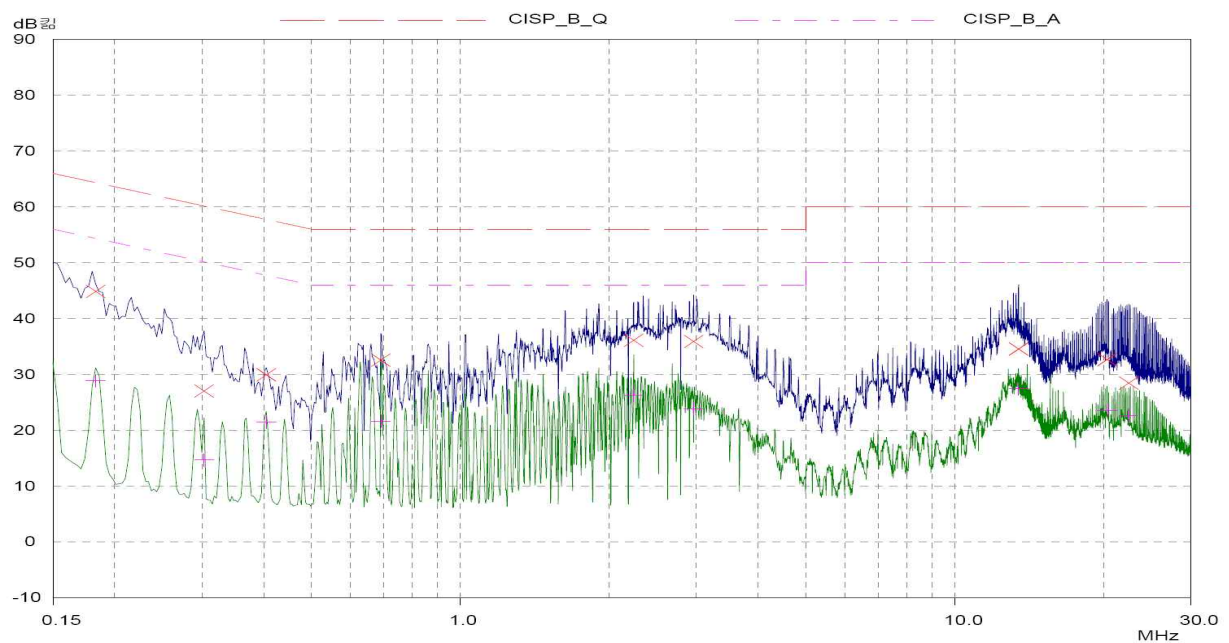
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### 2.1.9 Plots of Test Data

Polarization: HOT



Polarization: NEUTRAL



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## 2.2 Radiated Emission Measurements

### 2.2.1 Test Methods

The radiated emission measurements were performed in a Open Area Test Site (OATS), using the setup in accordance with ANSI C63.4-2003 radiated emission measurement procedure.

### 2.2.2 Test Equipments

Description	Manufacturer	Model Number	Serial Number	Cal. Due
EMI TEST Receiver	R & S	ESVS10	826008/014	05. 20. 2012
EMC Analyzer	Agilent	E7405A	US41160306	08. 22. 2012
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-350	03. 17. 2013
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-385	04. 28. 2013

### 2.2.3 Test Environments

Ambient Temperatures	Relative Humidity
15.0 °C ~ 35.0 °C	30 % R.H.~ 60 % R.H.

### 2.2.4 Test Limits

Frequency (MHz)	15.109 Radiated emission limits			
	Class B @ 3 m		Class A @ 10 m	
	(dB $\mu$ V/m)	( $\mu$ V/m)	(dB $\mu$ V/m)	( $\mu$ V/m)
30 to 88	40.0	100	39.0	90
88 to 216	43.5	150	43.5	150
216 to 960	46.0	200	46.5	210
above 960	54.0	500	49.5	300

### 2.2.5 Test Procedure

Before final measurements of radiated emission were made at the OATS, the E.U.T was scanned in semi-anechoic chamber in order to determine its emission spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the E.U.T's emission in amplitude, direction and frequency. This process was repeated during final radiated emission measurements at the OATS range, at each frequency, in order to ensure that maximum emissions amplitudes were attained.

The radiated emission test was performed with E.U.T exercise program loaded, and the emissions were scanned between 30 MHz to 1 000 MHz using a R&S ESVS10 EMI TEST Receiver. The EMI TEST Receiver's 6 dB bandwidth was set to 120 kHz, and EMI TEST Receiver was operated in the CISPR quasi-peak detection mode.

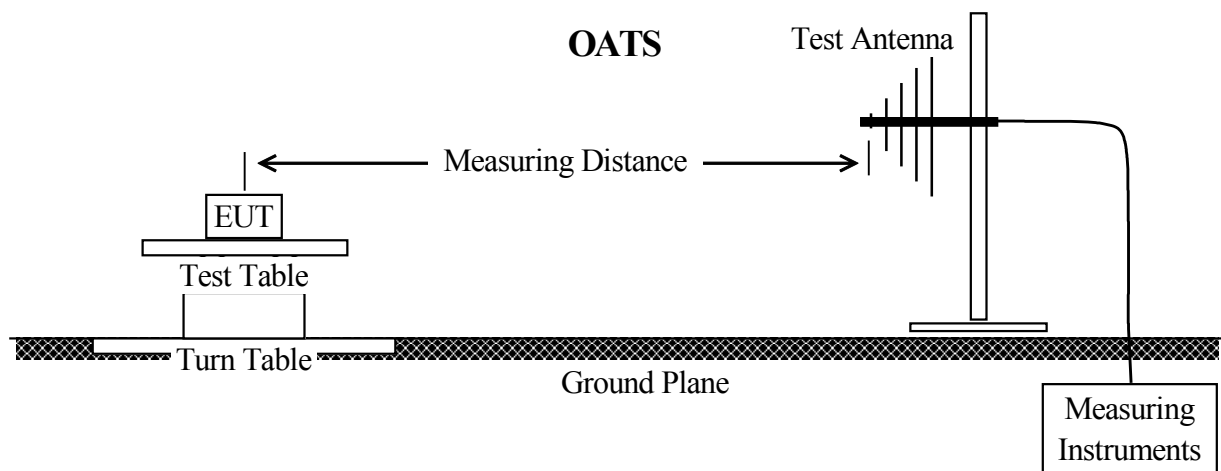
At each frequency, the E.U.T was rotated 360 degrees, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum emission levels. Measurements were taken using both HORIZONTAL and VERTICAL antenna polarization, herein referred to as H and V, respectively.

### 2.2.6 Field Strength Calculation

The Field Strength (FS) is calculated by adding the Antenna Factor (AF) and Cable Factor (CF) from the Measured Reading (MR). The basic equation with a sample calculation is as follows:

$$FS(dB\mu V/m) = MR(dB\mu V) + [AF(dB/m) + CF(dB)]$$

### 2.2.7 Test Configuration







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### 2.2.8 Test Results

A search was made of the spectrum from 30 to above 960 and the measurements indicate that the unit DOES meet the FCC requirements.

### 2.2.9 Test Data

Indicated		Antenna		Correction Factor		Corrected Amplitude	Class B	
Frequency (MHz)	Amplitude (dB $\mu$ V/m)	Polar. (H/V)	Height (m)	Ant. (dB)	Cable (dB)	(dB $\mu$ V/m)	Applicable Limit	Margin (dB)
							(dB $\mu$ V/m)	
43.500	9.240	V	1.410	13.470	0.880	23.590	40.000	16.410
115.500	9.900	H	1.790	10.650	1.280	21.830	43.500	21.670
157.000	8.960	H	2.980	13.220	1.590	23.770	43.500	19.730
289.700	7.060	H	3.760	13.010	1.960	22.030	46.000	23.970
799.800	4.640	V	2.320	22.380	3.230	30.250	46.000	15.750
874.900	4.840	H	1.990	23.030	3.420	31.290	46.000	14.710

- The highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz.

Temperature: 26.0 °C Humidity: 36 % R.H. Test Date: 04. 30. 2012 Tested by: JaeJu, Lee

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### 3. Product Labelling Requirements

#### 3.1 FCC Statement

Product shall be labelled the following statement on the user's manual:

This device complies with part 15 of the FCC Rules. Operation in subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC ID : WF2-BUSYLIGHTUC

Note : When the device is so small or for such use that it is not practicable to place the statement on it, the information shall be placed in prominent location in the instruction manual or pamphlet supplied to the user. However, the FCC identifier or unique identifier, as appropriate, must be displayed on the device.

## 4. Test Setup Photographs

### 4.1 Conducted Emission



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## 4.2 Radiated Emission



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## 5. External Photographs

### 5.1 E.U.T: Front View



### 5.2 E.U.T: Rear View



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### 5.3 E.U.T: Label View(Location & Label Sample)



DASANELECTRON Co.,Ltd  
Model Name : Busylight UC  
Product Name : Busylight UC  
FCC ID : WF2-BUSYLIGHTUC

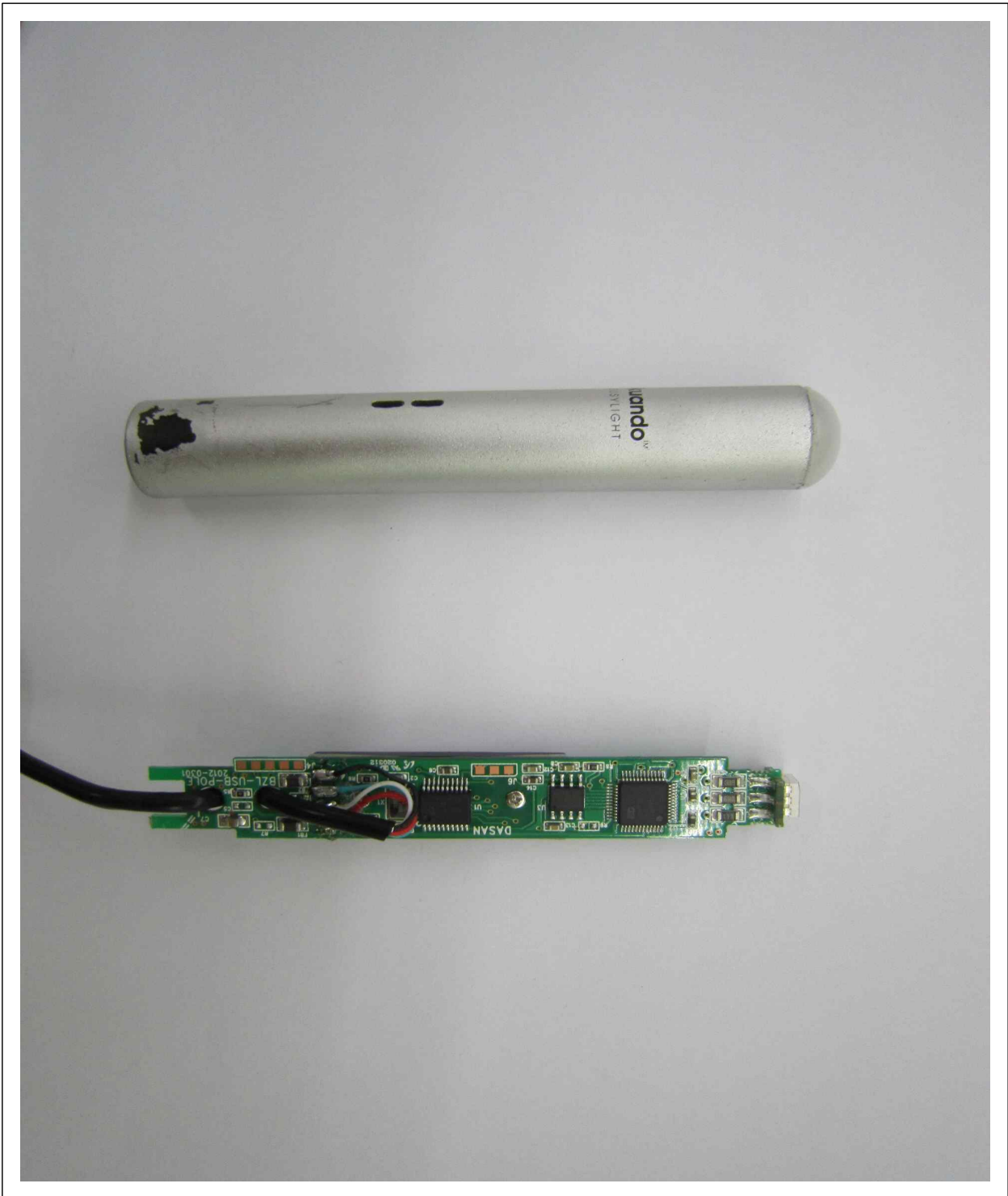
Made In KOREA

This device complies with part 15 of the FCC Rules. Operation in subject to the fol-lowing two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference re-ceived, including interference that may cause undesired operation.

Note : When the device is so small or for such use that it is not practicable to place the statement on it, the information shall be placed in prominent location in the instruction manual or pamphlet supplied to the user. However, the FCC identifier or unique identifier, as appropriate, must be displayed on the device.

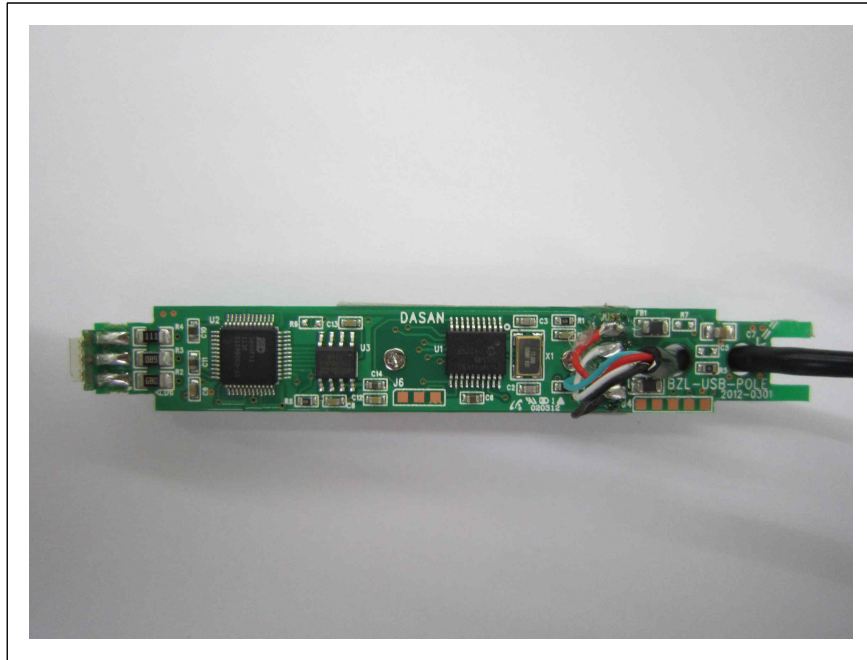
## 6. Internal Photographs

### 6.1 E.U.T: Internal View

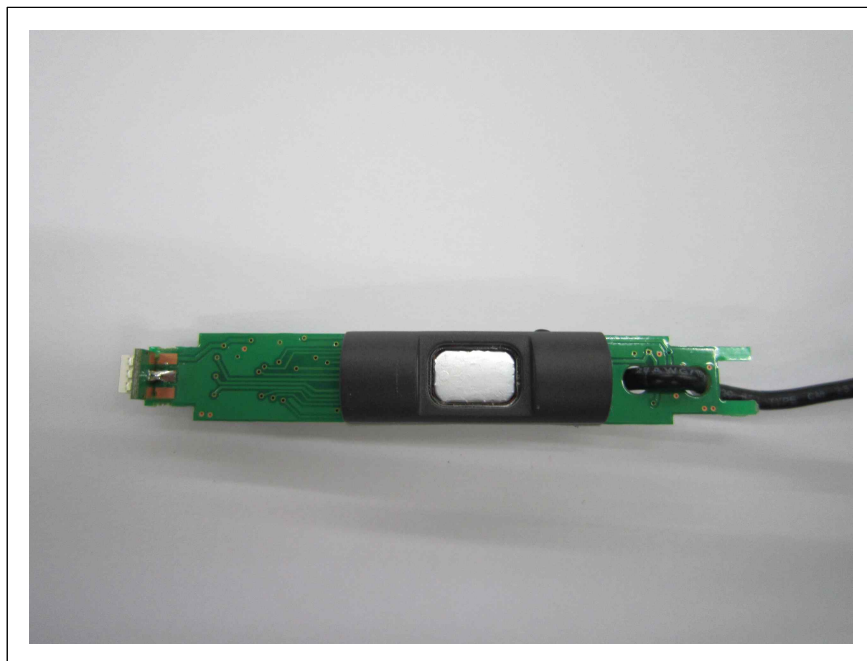


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## 6.2 E.U.T: Internal View(Top) - Main Board



## E.U.T: Internal View(Bottom) - Main Board



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**Appendix A - Schematics/Block Diagram**

Please see attached document(s).

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**Appendix B - User's Manual**

Please see attached document(s).

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