

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

## INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C CLASS II PC REQUIREMENT

OF

**Product Name:** USB Receiver

**Brand Name:** N/A

**Model Name:** TD1J

**FCC ID:** V2L-TD1J

**Report No.:** ER/2008/10038-04

**Issue Date:** Aug. 24, 2009

**FCC Rule Part:** §15.249

**Prepared for:** YI-PHONE INC.  
7F-1, No. 286-1, Hsin-Ya Rd. Chien-Chen  
District Kaohsiung, Taiwan.

**Prepared by:** SGS Taiwan Ltd.  
Electronics & Communication Laboratory  
No. 134, Wu Kung Rd., Wuku Industrial  
Zone, Taipei County, Taiwan.



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## VERIFICATION OF COMPLIANCE

**Applicant:** YI-PHONE INC.  
7F-1, No. 286-1, Hsin-Ya Rd. Chien-Chen District Kaohsiung, Taiwan.

**Product Description:** USB Receiver

**Brand Name:** N/A

**FCC ID Number:** V2L-TD1J

**Model No.:** TD1J

**Model Difference:** N/A

**File Number:** ER/2008/10038-04

**Date of test:** Aug. 13, 2009 ~ Aug. 21, 2009

**Date of EUT Received:** Aug. 13, 2009

**We hereby certify that:**

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.249.

The test results of this report relate only to the tested sample identified in this report.

**Test By:****Date**

Aug. 24, 2009

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**Brian Chang / Engineer****Prepared By:****Date**

Aug. 24, 2009

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**Alex Hsieh / Sr. Engineer****Approved By:****Date**

Aug. 24, 2009

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**Vincent Su / Manager**

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## Version

Version No.	Date	Description
00	Aug. 24, 2009	Initial creation of document

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## 1. GENERAL INFORMATION

### 1.1 Product Description

Product Name:	USB Receiver
Brand Name:	N/A
Model Name:	TD1J
Model Difference:	N/A
Power Supply:	5V from USB port

### Wireless:

Operation Frequency:	2402~2438MHz, 37 channels, 1MHz step
Modulation type:	DSSS (GFSK)
Antenna Designation:	Chip Antenna, 3dBi gain
Original FCC ID	V2L-TD1J
Class II Permissive change	1. Replace capacitors C2/C4 for improving accuracy of clock frequency. 2. Replace capacitors C9/C12/C20 for stabilizing voltage.

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## 1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **V2L-TD1J** filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules.

## 1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

## 1.4 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-1

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

## 1.5 Special Accessories

Not available for this EUT intended for grant.

## 1.6 Equipment Modifications

Not available for this EUT intended for grant.

## 2. System Test Configuration

### EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### EUT Exercise

The Transmitter was operated in the engineering operating mode. The Tx frequency was fixed which was for the purpose of the measurements.

### Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

#### 2.3.2 Radiated Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna. according to the requirements in Section 8 and 13 and Subclause 8.3.1.2 of ANSI C63.4-2003.

## Limitation

### (1) Radiated Emission 15.249(a)

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following.

Frequency (MHz)	Field strength of Fundamental	Field strength of Harmonics	Distance (m)
902 - 928	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
2400 – 2483.5	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
5725 – 5875	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
24.0 – 24.25 GHz	250 mV/m (107.95dBuV/m)	2500 uV/m (67.95dBuV/m)	3

### (2) Radiated Emission 15.249 (d)

Emission Radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in Section 15.209 as below, whichever is the lesser attenuation.

Frequency (MHz)	Field strength $\mu\text{V/m}$	Distance (m)	Field strength at 3m dB $\mu\text{V/m}$
1.705-30	30	30	69.54
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

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**(3) Radiated Emission 15.249(e)**

For frequencies above 1000MHz, the above field strength limits are based on average limits. The peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20dB under any condition of modulation.

- Remark:
1. Emission level in dBuV/m=20 log (uV/m)
  2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
  3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of § 15.205
  4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of §15.205, then the general radiated emission limits in § 15.209 apply.

## Configuration of Tested System

Fig. 2-1 Configuration of TX

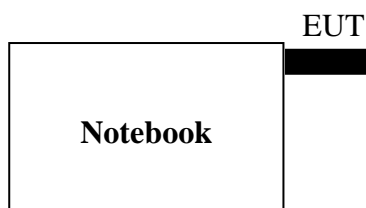


Table 2-2 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	FCC ID	Series No.	Data Cable	Power Cord
1.	Notebook	IBM	T40	N/A	99HCYF4	N/A	N/A

**Note:** All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

**Grounding:** Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.

### 3. Summary of Test Results

FCC Rules	Description Of Test	Result
§15.249(a)(e)	Radiated Emission	Compliant

#### Description of test modes

Frequency 2402MHz, 2420MHz and 2438MHz are chosen for full testing.

\*Noted: Other test data please refer to SGS Taiwan Ltd. Test report: ER/2008/10038 for test result.

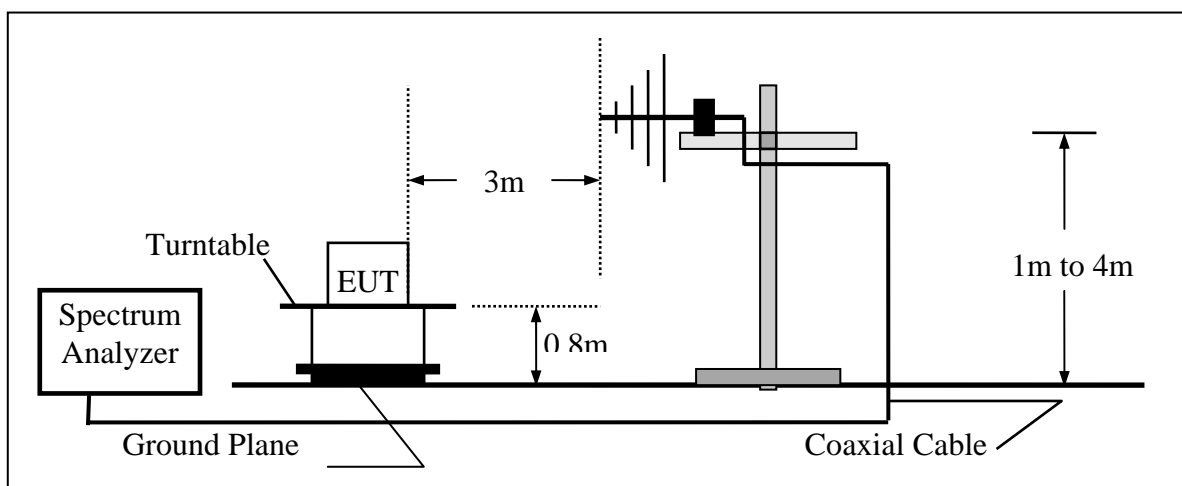
## 4. Radiated Emission Test

### Measurement Procedure

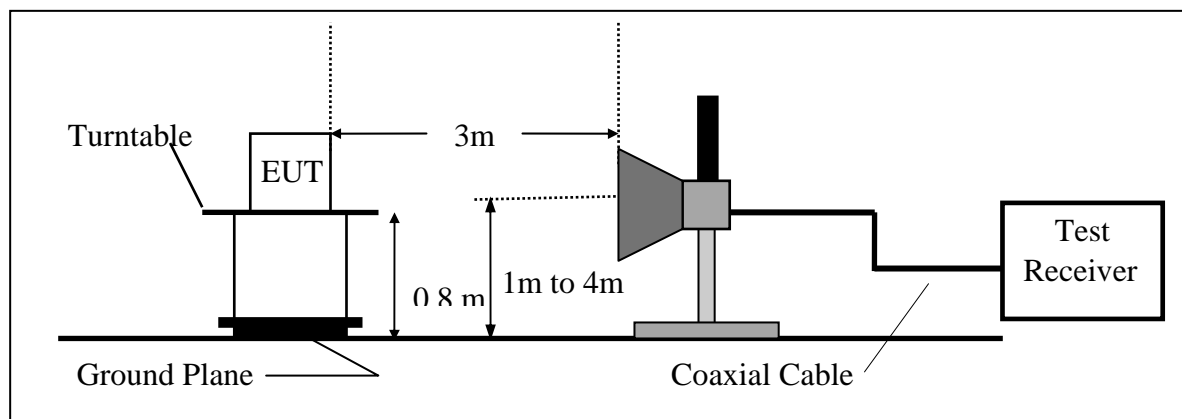
1. The EUT was placed on a turntable that is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

### Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-Up Frequency Over 1 GHz



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**Measurement Equipment Used:**

966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2009	02/11/2010
Loop antenna	MESSTEC	FLA30	03/10086	07/08/2009	07/07/2011
Bilog Antenna	SCHWAZBECK	VULB9160	9160-3136	11/15/2008	11/14/2009
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2008	05/08/2010
Pre-Amplifier	Agilent	8447D	1937A02834	11/30/2008	11/29/2009
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2009	01/04/2010
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2009	01/04/2010
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2009	01/04/2010
3m Site	SGS	966 chamber	N/A	11/08/2008	11/09/2009

**Field Strength Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

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## Measurement Result

## Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX Low	Test Date	Aug. 21, 2009
Fundamental Frequency	2402MHz	Test By	Brian
Temperature	25 °C	Pol	Ver./Hor
Humidity	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
58.13	V	Peak	53.23	-26.67	26.56	40.00	-13.44
101.78	V	Peak	53.77	-30.29	23.48	43.50	-20.02
133.79	V	Peak	60.24	-28.02	32.22	43.50	-11.28
130.88	H	Peak	50.02	-28.16	21.86	43.50	-21.64
281.23	H	Peak	53.30	-29.93	23.37	46.00	-22.63
320.03	H	Peak	54.09	-27.81	26.28	46.00	-19.72

## Remark :

- (1) Measuring frequencies from 30 MHz to the 1GHz °
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- (3) Datas of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

**Radiated Spurious Emission Measurement Result (below 1GHz)**

Operation Mode TX Mid  
 Fundamental Frequency 2420MHz  
 Temperature 25 °C  
 Humidity 65 %

Test Date Aug. 21, 2009  
 Test By Brian  
 Pol Ver./Hor

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
58.13	V	Peak	53.58	-26.67	26.91	40.00	-13.09
101.78	V	Peak	54.56	-30.29	24.27	43.50	-19.23
133.79	V	Peak	62.23	-28.02	34.21	43.50	-9.29
143.49	H	Peak	50.41	-27.31	23.10	43.50	-20.40
320.03	H	Peak	52.31	-27.81	24.50	46.00	-21.50
492.69	H	Peak	55.20	-24.86	30.34	46.00	-15.66

**Remark :**

- (1) Measuring frequencies from 30 MHz to the 1GHz .
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- (3) Datas of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

**Radiated Spurious Emission Measurement Result (below 1GHz)**

Operation Mode TX High  
 Fundamental Frequency 2438MHz  
 Temperature 25 °C  
 Humidity 65 %

Test Date Aug. 21, 2009  
 Test By Brian  
 Pol Ver./Hor

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
58.13	V	Peak	53.12	-26.67	26.45	40.00	-13.55
101.78	V	Peak	54.77	-30.29	24.48	43.50	-19.02
135.73	V	Peak	60.08	-27.87	32.21	43.50	-11.29
133.79	H	Peak	50.50	-28.02	22.48	43.50	-21.02
298.79	H	Peak	54.22	-28.54	25.68	46.00	-20.32
320.03	H	Peak	53.14	-27.81	25.33	46.00	-20.67

**Remark :**

- (1) Measuring frequencies from 30 MHz to the 1GHz .
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- (3) Datas of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.