Test Report

Product Name ： Maker Pen
Model No. ： SBP-KL10
FCC ID. ： UBBSBPKL10

Applicant ： WALTOP International Corp.
Address ： 6F,No.19-1 Industry E.Rd.IV,Hsinchu Science Park,Hsin-Chu 30077,Taiwan,R.O.C.

Date of Receipt ： 2009/11/25
Issued Date ： 2009/12/11
Report No. ： 09B469R-RFUSP38V01
Version ： V1.0

Test Report Certification

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Report No. : 09B469R-RFUSP38V01

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Applicant	: WALTOP International Corp.
Address	: 6F,No.19-1 Industry E.Rd.IV,Hsinchu Science Park,Hsin-Chu 30077,Taiwan,R.O.C.
Manufacturer	: WALTOP International Corp.
Model No.	: SBP-KL10
FCC ID.	: UBBSBPKL10
Rated Voltage	: DC 3.0V (Power by Battery)
Trade Name	: WALTOP
Applicable Standard	: FCC CFR Title 47 Part 15 Subpart C 15.209: 2008
Test Result	: Complied

The test results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

Documented By : Demi Chang
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Approved By : Roy Wang
(Roy Wang / Manager)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Maker Pen
Trade Name	WALTOP
Model No.	SBP-KL10
FCC ID	UBBSBPKL10
EUT Voltage	DC 3.0V
Frequency Range	160KHz~200KHz
Channel Number	8
Antenna Type	Integrated Loop Antenna

Frequency of Each Channel:

Color	Channel	Frequency
Black	Channel 1:	165KHz
	Channel 2:	168KHz
Red	Channel 3:	173KHz
	Channel 4:	177KHz
Green	Channel 5:	183KHz
	Channel 6:	187KHz
Blue	Channel 7:	193KHz
	Channel 8:	197KHz

Note:

1. This device is a 160~200kHz device included transmitting function.
2. The major measurement is middle channel 183kHz. It's pen point is pressed retentively, and bring the operating mode of the continue transmit signal.
3. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.209.

1.3. Test Mode

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Pre-Test Mode	
TX	Mode1: Transmit
Final Test Mode	
TX	Mode1: Transmit

Emission	
Performed Item	Test
Conducted Emission	No
Radiated Emission	Yes

1.4. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

N/A

1.5. Configuration of tested System

Connection Diagram

1.6. EUT Exercise Software

1	Setup the EUT and simulators as shown on 1.5.
2	Enable RF signal and confirm EUT active.
3	Modulate output capacity of EUT up to specification.

1.7. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	ANSI.C63.4 CE	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	ANSI.C63.4 RE	15 -35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000

Site Description:

August 30, 2007 File on
Federal Communications Commission
Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 365520

Accredited by TAF
Accreditation Number: 1313
Effective through: December 27, 2010

Testing Laboratory
0914

Accredited by NVLAP
NVLAP Lab Code: 200347-0
Effective through: September 30, 2009

NVLAP Lab Code : 200347-0

Site Name: Quietek Corporation

Site Address: No.75-1, Wang-Yeh Valley, Yung-Hsing,
Chiung-Lin, Hsin-Chu County,
Taiwan, R.O.C.
TEL : 886-3-592-8858 / FAX : 886-3-592-8859
E-Mail : service@quietek.com

2. Conducted Emission

2.1. Test Equipment

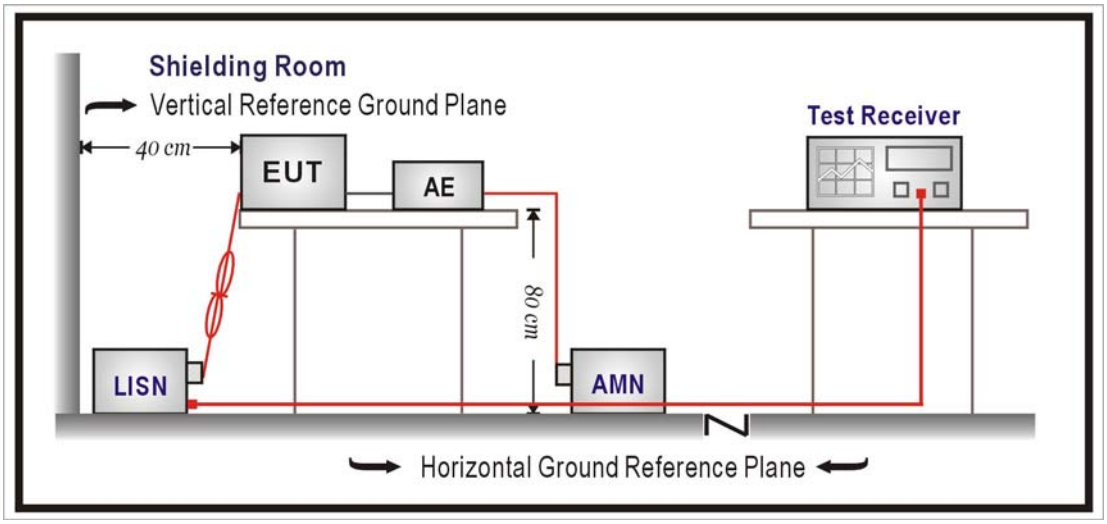
The following test equipments are used during the test:

Conducted Emission / SR2

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
4-Wire ISN	R & S	ENY 41	837032/001	2009/04/15
Artificial Mains Network	R & S	ENV4200	848411/010	2009/03/13
Double 2-Wire ISN	R & S	ENY 22	835354/008	2009/04/15
LISN	R & S	ESH3-Z5	825562/002	2009/03/31
Pulse Limiter	R & S	ZSH3Z2	357.8810.54	2009/07/19
Test Receiver	R & S	ESCS 30	100122	2009/02/21

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 Limits (dBuV)		
Frequency MHz	QP	AV
0.15 - 0.50	66-56	56-46
0.50 - 5.0	56	46
5.0 - 30	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)
Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.
Conducted emissions were invested over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz.

2.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.207: 2008

2.6. Test Result

Owing to the DC operation of EUT, this test item is not performed.

3. Radiated Emission

3.1. Test Equipment

The following test equipments are used during the test:

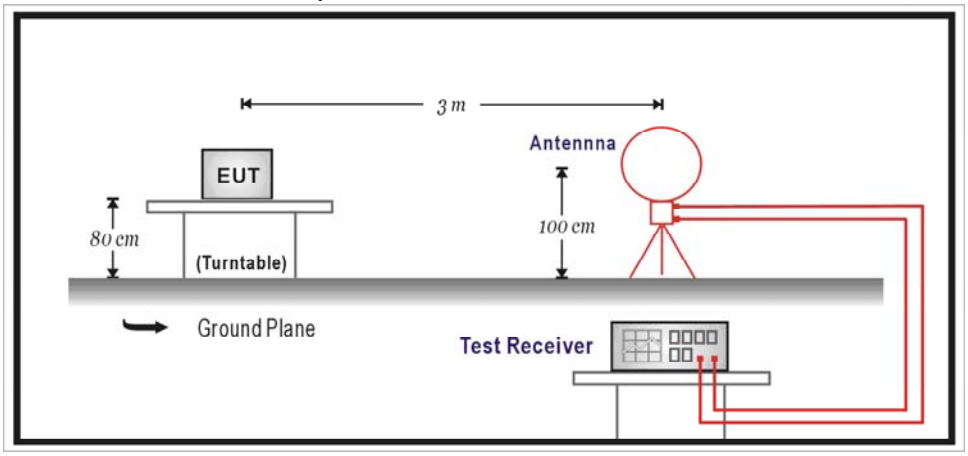
Radiated Emission / CB1

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Bilog Antenna	Schaffner Chase	CBL6112B	2895	2009/09/03
Loop Antenna	R & S	HFH2-Z2	833799/004	2009/09/13
Pre-Amplifier	Quietek	AP-025C	CHM0608021	2009/11/13
Spectrum Analyzer	R & S	FSP40	100005	2009/08/25
Test Receiver	R & S	ESCS 30	825442/017	2009/02/03

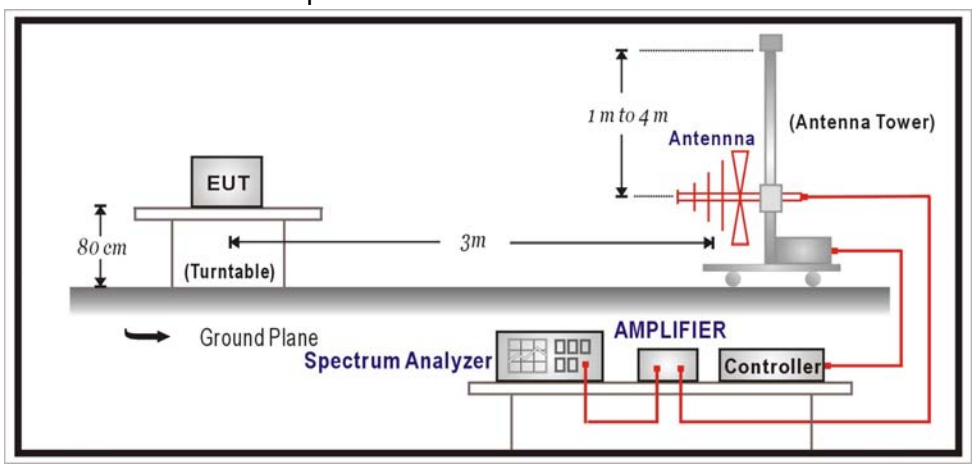
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.
2. Mark “X” test instruments are used to measure the final test results.

3.2. Test Setup

Under 30MHz Test Setup:



Under 1GHz Test Setup:



3.3. Limits

FCC Part 15 Subpart C Paragraph 15.209 Limits			
Frequency MHz	uV/m	dBuV/m	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	See Remark[1]	300
0.490-1.705	24000/F(kHz)	See Remark[1]	30
1.705-30	30	29.54	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Remarks : 1. RF Voltage (dBuV) = 20 log RF Voltage (uV).
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
4. When the very low emission of EUT, the 3m measurement distance was performed. Regards to an inverse linear extrapolation 40dB/dec is adopted.

3.4. Test Procedure

Under 30MHz Test:
The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum electric field strength. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna which is 1.0 meter above ground. All X-axis, Y-axis and Z-axis polarization of the antenna are set on measurement.
The emission limit shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limit in these three bands are based on measurements employing an average detector.

Under 1GHz Test:

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2003 on radiated measurement.

On any frequency the radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. When average radiated emission measurement are included emission measurement below 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

The bandwidth below 30MHz setting on the field strength meter is 9kHz and above 30MHz is 120kHz.

3.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.209: 2008

3.6. Test Result

Product	Maker Pen		
Test Item	Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2009/12/08	Test Site	CB1

(183kHz)

Horizontal				
Frequency (MHz)	**Cable Loss (dB)**	**Reading Level (dBuV)**	**Emission Level (dBuV/m)**	**Average Limit (dBuV/m)**
X-axis				
0.183	0.29	47.13	47.42	105.00
Y-axis				
0.183	0.29	46.43	46.72	105.00
Z-axis				
0.183	0.29	45.09	45.38	105.00
Horizontal (X-axis)				
Frequency (MHz)	**Cable Loss (dB)**	**Reading Level (dBuV)**	**Emission Level (dBuV/m)**	**Quasi-Peak Limit (dBuV/m)**
0.366	0.29	31.83	31.54	97.13
3.660	0.29	33.09	32.80	69.54
7.320	0.29	31.61	31.32	69.54
10.980	0.29	30.36	30.07	69.54
14.640	0.29	29.94	29.65	69.54
18.300	0.29	29.20	28.91	69.54
21.960	0.29	29.18	28.89	69.54

Note:

1. The Reading Levels are Average detector for the frequency bands 9–90kHz, 110–490 kHz and above 1000 MHz,and the others are QuasiPeak detector.
2. Measurement Level = Reading Level + Correct Factor.
3. 0.009 - 0.490 MHz , Limit(dBuV/m) = 20 log (2400 / F(kHz)) + 40 log (300m / 3m)
4. 0.490 - 1.705 MHz , Limit(dBuV/m) = 20 log (24000 / F(kHz)) + 40 log (30m / 3m)
5. 1.705 - 30.0 MHz , Limit(dBuV/m) = 20 log (30 uV/m) + 40 log (30m / 3m)

Product	Maker Pen		
Test Item	Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2009/12/08	Test Site	CB1

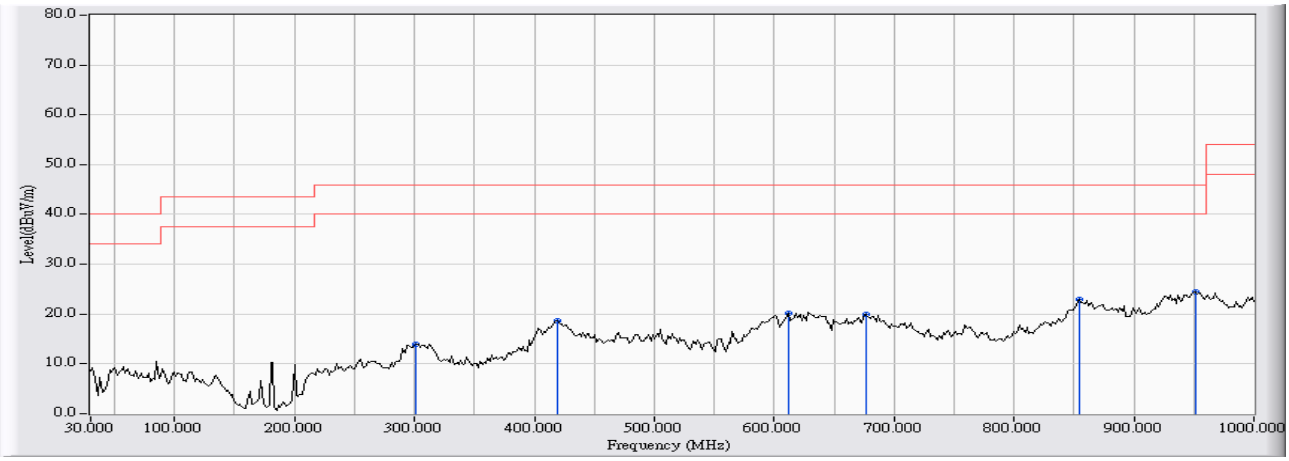
(183kHz)

Vertical				
Frequency (MHz)	**Cable Loss (dB)**	**Reading Level (dBuV)**	**Emission Level (dBuV/m)**	**Average Limit (dBuV/m)**
X-axis				
0.183	0.29	41.04	41.33	105.00
Y-axis				
0.183	0.29	40.36	40.65	105.00
Z-axis				
0.183	0.29	38.91	39.20	105.00
Vertical (X-axis)				
Frequency (MHz)	**Cable Loss (dB)**	**Reading Level (dBuV)**	**Emission Level (dBuV/m)**	**Quasi-Peak Limit (dBuV/m)**
0.366	0.29	32.61	32.32	97.13
3.660	0.29	32.84	32.55	69.54
7.320	0.29	31.38	31.09	69.54
10.980	0.29	28.41	28.12	69.54
14.640	0.29	28.89	28.60	69.54
18.300	0.29	28.40	28.11	69.54
21.960	0.29	28.69	28.40	69.54

Note:

1. The Reading Levels are Average detector for the frequency bands 9–90kHz, 110–490 kHz and above 1000 MHz,and the others are QuasiPeak detector.
2. Measurement Level = Reading Level + Correct Factor.
3. 0.009 - 0.490 MHz , Limit(dBuV/m) = 20 log (2400 / F(kHz)) + 40 log (300m / 3m)
4. 0.490 - 1.705 MHz , Limit(dBuV/m) = 20 log (24000 / F(kHz)) + 40 log (30m / 3m)
5. 1.705 - 30.0 MHz , Limit(dBuV/m) = 20 log (30 uV/m) + 40 log (30m / 3m)

Site : CB1	**Time : 2009/12/08 - 11:32**
Limit : NCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_NCC_30-1G(2009) - HORIZONTAL	**Power : DC 3V**
EUT : Maker Pen	**Note : TX**

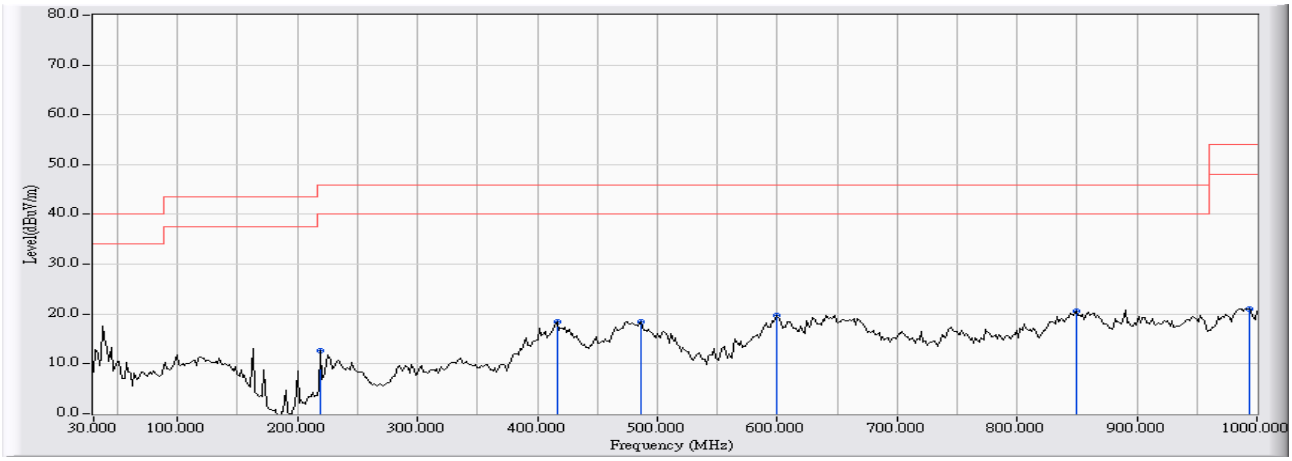


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		301.600	-8.623	22.645	14.021	-31.979	46.000	QUASIPEAK
2		419.617	-4.460	23.171	18.711	-27.289	46.000	QUASIPEAK
3		612.000	-2.703	22.953	20.251	-25.749	46.000	QUASIPEAK
4		676.667	-3.045	22.912	19.867	-26.133	46.000	QUASIPEAK
5		854.500	-0.180	23.070	22.891	-23.109	46.000	QUASIPEAK
6	*	951.500	2.314	22.171	24.485	-21.515	46.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : CB1	**Time : 2009/12/08 - 11:36**
Limit : NCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_NCC_30-1G(2009) - VERTICAL	**Power : DC 3V**
EUT : Maker Pen	**Note : TX**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		219.150	-16.103	28.714	12.611	-33.389	46.000	QUASIPEAK
2		416.383	-4.797	23.156	18.359	-27.641	46.000	QUASIPEAK
3		485.900	-4.470	22.849	18.379	-27.621	46.000	QUASIPEAK
4		599.067	-2.926	22.568	19.643	-26.357	46.000	QUASIPEAK
5	*	849.650	-2.240	22.848	20.608	-25.392	46.000	QUASIPEAK
6		993.533	-0.609	21.724	21.114	-32.886	54.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.