STC Test Report

Date : 2008-11-12
No. : MH182673

Applicant (STD003): AG.COM.CHEONG UN
AV DA CONCORDIA, EDF VANG HOI, BL3, 16/F, MACAO

Manufacturer: SIRDAR METAL & PLASTIC WORKS
Bai Shi, San Xiang Town, Zhong Shan City, Guang Dong, China

Description of Samples:

Product:	Radio Control System
Brand Name:	SD MODEL
Model Number:	T2DP-A
FCC ID:	RTW8123

Date Samples Received: 2008-10-24, 2008-11-03

Date Tested: 2008-10-27 to 2008-11-05

Investigation Requested: Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2008 and ANSI C63.4:2003 for FCC Certification.

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: ----

Dr. LEE Kam Chuen,
ElectroMagnetic Compatibility Department
For and on behalf of
The Hong Kong Standards and Testing Centre Ltd.

The Hong Kong Standards and Testing Centre Ltd.
10 Dai Wang Street, Taipo Industrial Estate, N.T., Hong Kong
Tel: (852) 2666 1888 Fax: (852) 2664 4353 Homepage: www.hkstc.org E-mail: hkstc@hkstc.org

CONTENT:

1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.
EMC Laboratory
10 Dai Wang Street, Taipo Industrial Estate
New Territories, Hong Kong

Telephone: 852 2666 1888
Fax: 852 2664 4353

1.2 Applicant Details

Applicant

AG.COM.CHEONG UN
AV DA CONCORDIA, EDF VANG HOI, BL3, 16/F, MACAO

Manufacturer

SIRDAR METAL & PLASTIC WORKS
Bai Shi, San Xiang Town, Zhong Shan City, Guang Dong, China

1.3 Equipment Under Test [EUT]
Description of Sample

Product:	Radio Control System
Manufacturer:	SIRDAR METAL & PLASTIC WORKS
Brand Name:	SD MODEL
Model Number:	T2DP-A
Rating:	12Vd.c. ("AA" size battery x 8)

1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is an AG.COM.CHEONG UN, Radio Control System. The transmitter is a 2 buttons transmitter. The EUT continues to transmit while button is being pressed, Modulation by IC, and type is pulse modulation.

1.4 Date of Order

2008-10-24, 2008-11-03

1.5 Submitted Sample(s):

1 Sample

1.6 Test Duration

2008-10-27 to 2008-11-05

1.7 Country of Origin

China

2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2008 and ANSI C63.4:2003 for FCC Certification.

2.2 Test Standards and Results Summary Tables

EMISSION
Results Summary

Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Field Strength of Fundamental Emissions & Spurious Emissions	FCC 47CFR 15.227	ANSI C63.4:2003	N/A	☒	☐	☐
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.4:2003	N/A	☒	☐	☐

Note: N/A - Not Applicable

3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions (30 – 1000MHz)

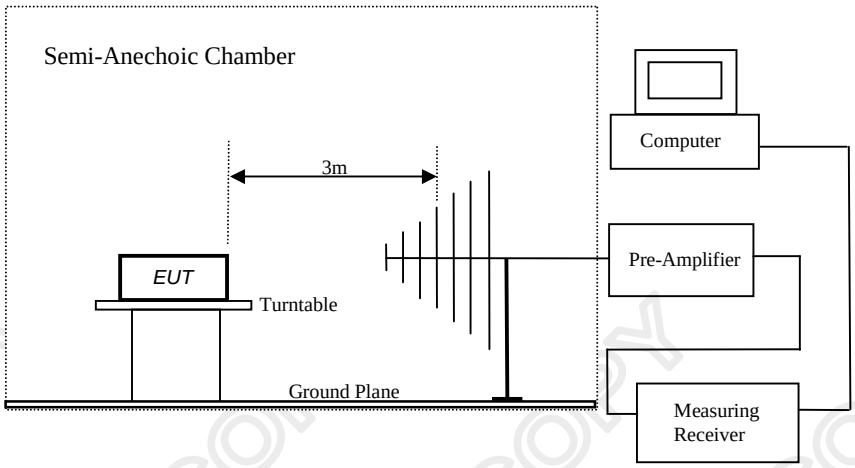
Test Requirement:	FCC 47CFR 15.227
Test Method:	ANSI C63.4:2003
Test Date:	2008-11-05
Mode of Operation:	Tx mode

Test Method:

The sample was placed 0.8m above the ground plane on a standard radiated 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. In the frequency range of 9kHz to 30MHz, The center of the loop antenna shall be 1 meter above the ground and rotated loop axis for maximum reading. The emissions worst-case are shown in Test Results of the following pages.

*: Semi-anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

Test Setup:



Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.227]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Peak] [μV/m]	Field Strength of Fundamental Emission [Average] [μV/m]
26.96-27.28	100,000	10,000

Results of Tx Mode: PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
27.145	38.40	18.6	57.0	707.9	100,000	Vertical

According to FCC 47CFR15.35, the limit on the radio frequency emissions as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.
Calculated measurement uncertainty: 30MHz to 1GHz 5.2dB

Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [μV/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.

Results of Tx Mode: PASS

Radiated Emissions Quasi-Peak						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
54.29	< 1.0	8.7	< 9.7	< 3.1	100	Horizontal
81.44	< 1.0	8.1	< 9.1	< 2.9	100	Vertical
108.58	< 1.0	10.7	< 11.7	< 3.8	150	Vertical
135.73	< 1.0	7.8	< 8.8	< 2.8	150	Vertical
162.87	< 1.0	9.9	< 10.9	< 3.5	150	Vertical
190.02	< 1.0	12.4	< 13.4	< 4.7	150	Vertical
214.30	< 1.0	12.3	< 13.3	< 4.6	150	Vertical
217.16	< 1.0	12.8	< 13.8	< 4.9	200	Vertical
244.31	< 1.0	15.0	< 16.0	< 6.3	200	Vertical
271.00	< 1.0	14.2	< 15.2	< 5.8	200	Horizontal
271.45	< 1.0	16.1	< 17.1	< 7.2	200	Vertical

Remarks:

No further spurious emissions found between lowest internal frequency and 30MHz
Correction Factor includes Antenna Factor and Cable Attenuation.
Calculated measurement uncertainty: 30MHz to 1GHz 5.2dB

3.2 20dB Bandwidth of Fundamental Emission

Test Requirement:	FCC 47 CFR 15.227
Test Method:	ANSI C63.4:2003 (Section 13.1.7)
Test Date:	2008-10-27
Mode of Operation:	On mode

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

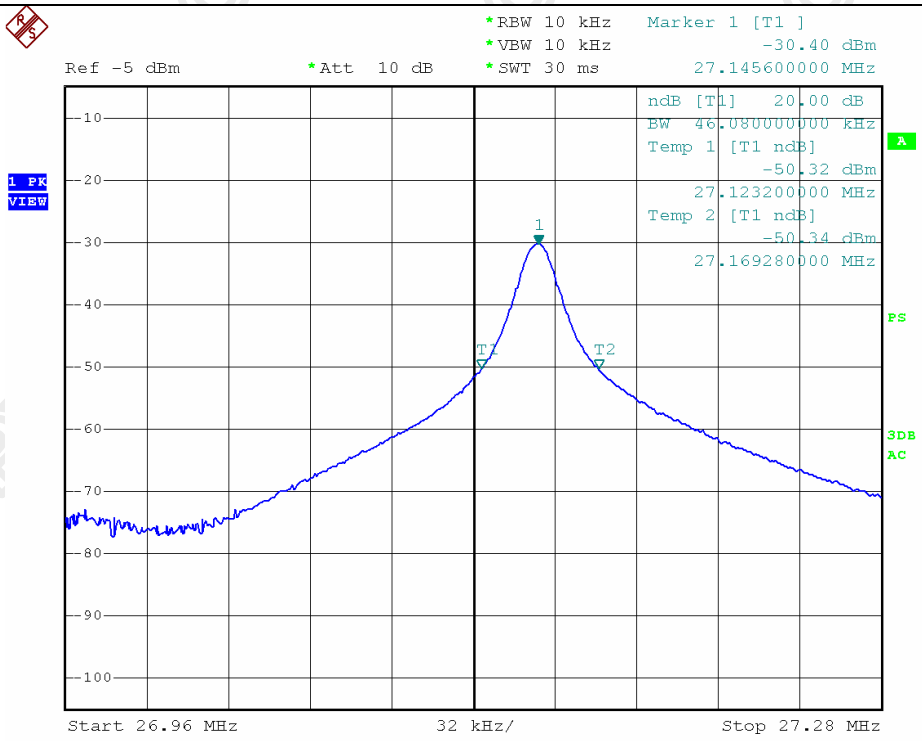
Test Setup:

As Test Setup of clause 3.1.1 in this test report.

Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [KHz]	FCC Limits [MHz]
27.145	46.080	within 26.96-27.28

20dB Bandwidth of Fundamental Emission



Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM215	MULTIDEVICE CONTROLER	EMCO	2090	00024676	N/A	N/A
EM216	MINI MAST SYSTEM	EMCO	2075	00026842	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-Lindgren	FACT-3	--	2006/05/02	2009/05/02
EM174	BICONILOG ANTENNA	EMCO	3142C	00029071	2008/01/24	2010/01/24
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2008/06/16	2009/06/16
EM022	LOOP ANTENNA	EMCO	6502	1189-2424	2006/07/26	2009/07/26

Remarks:-

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

Appendix B

Duty Cycle Correction During 100msec

Each function key sends a different series of characters, but each packet period (28.1msec) never exceeds a series of 4 long (1.2msec) and 26 short (0.4msec) pulses. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered (4x1.2msec)+(26x0.4msec) per 28.1msec duty cycle. Figure A through C show the characteristics of the pulse train for one of these functions.

Remark:

Duty Cycle Correction = 20Log[(4x1.2ms+26x0.4ms)/28.1] =-5.3dB
(-20dB used as field strength of fundamental emissions calculation)

The following figures [Figure A to Figure C] show the characteristics of the pulse train for one of these functions.

Figure A [Pulse Train]

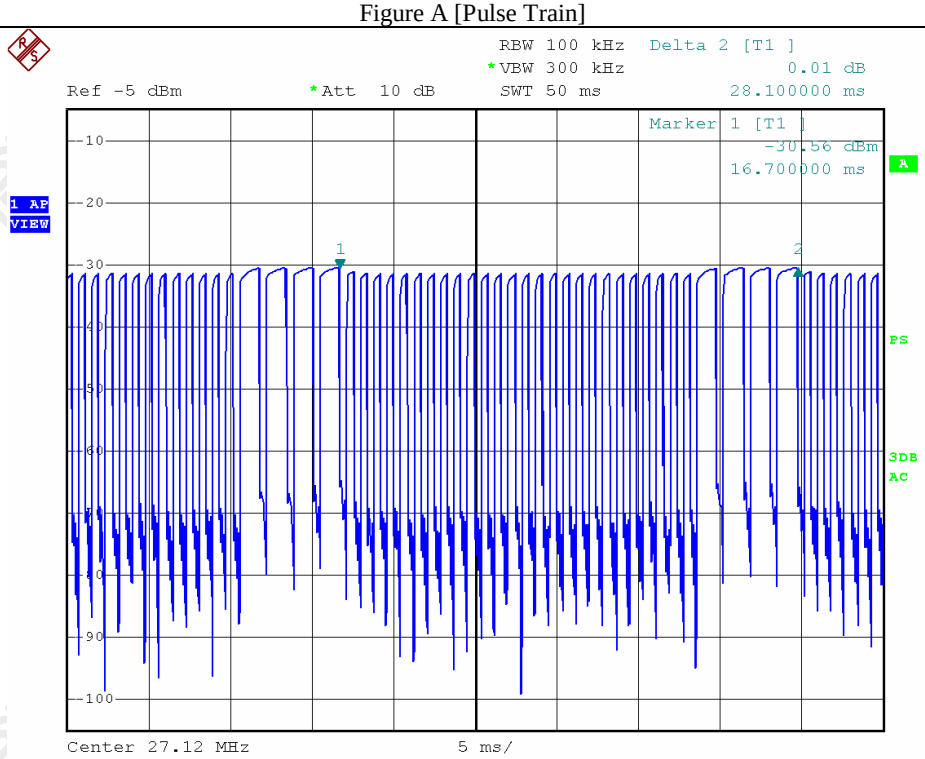


Figure B [Long Pulse]

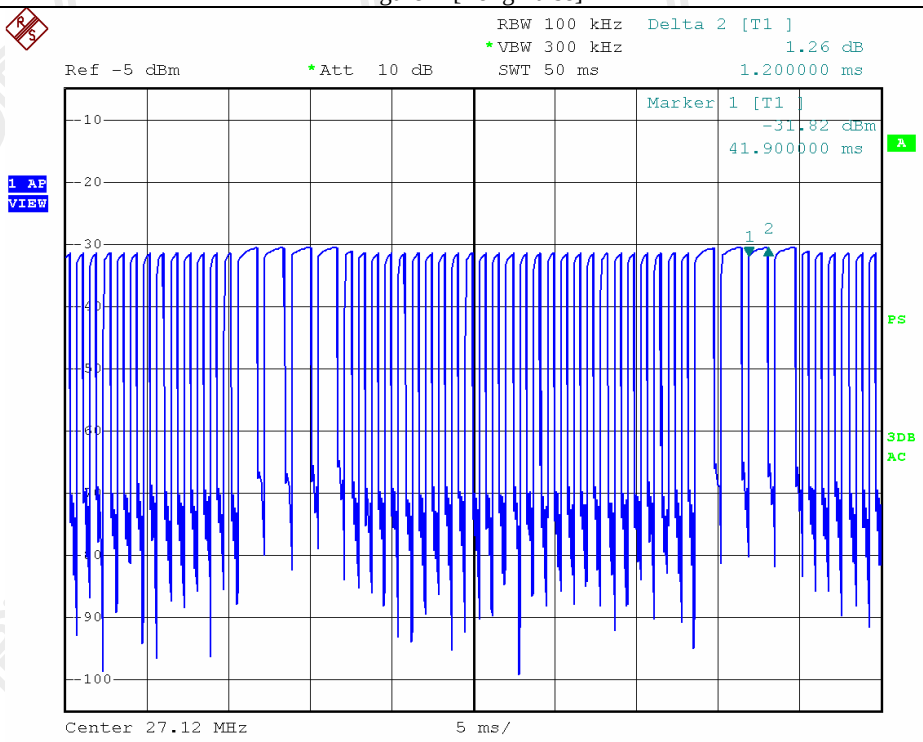
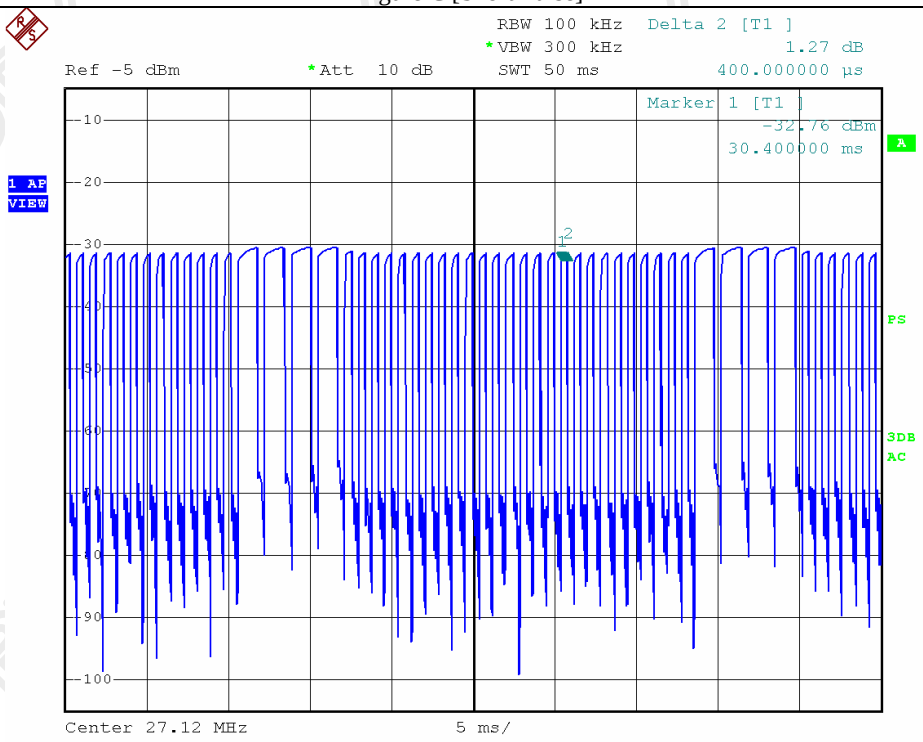


Figure C [Short Pulse]



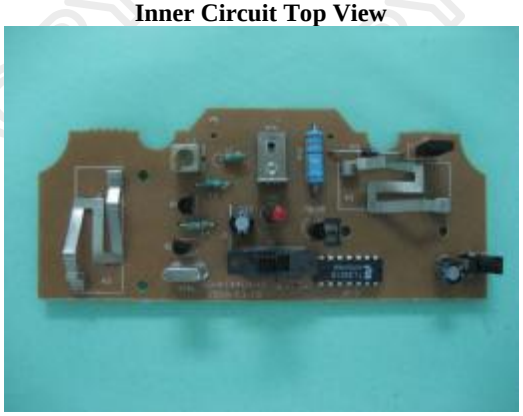
Appendix C

Photographs of EUT

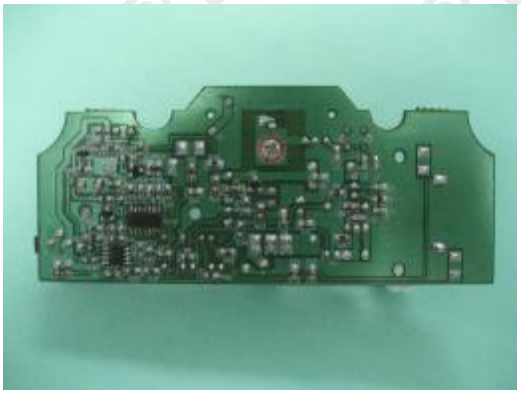
Front View of the product

Rear View of the product

Inner Circuit Top View

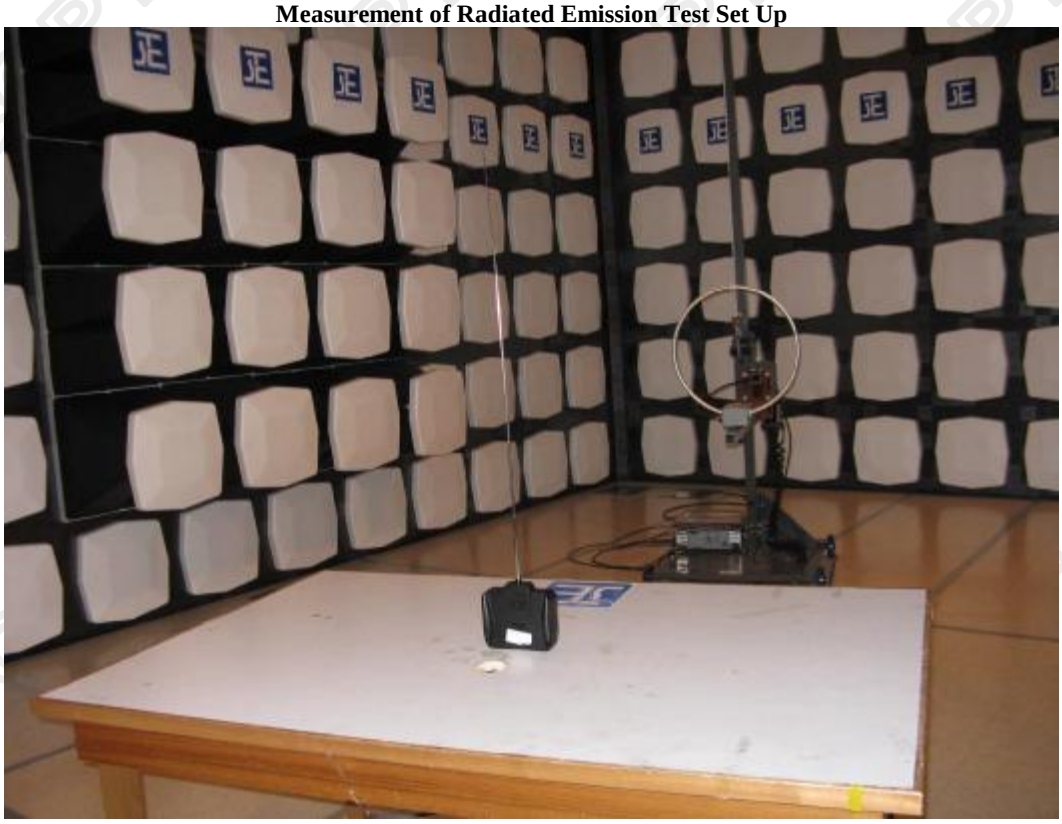


Inner Circuit Bottom View



Photographs of EUT

Measurement of Radiated Emission Test Set Up



******* End of Test Report *******