



STC Test Report

Date : 2006-08-14

Page 1 of 24

No. : HM157171

Applicant:

CHENGHAI HENGLONG PLASTIC TOYS CO., LTD.
NINGCHUAN ROAD, CHENGHAI DISTRICT,
SHANTOU CITY

Description of Samples:

Model name: R/C OIL CAR, ELECTRICAL CAR
(TRANSMITTER, RECEIVER,
ELECTRONIC ACTIYATOR, DRIVE)
Model no.: 3851-1
Brand name: N/A
FCC ID: UI8HENGLONGEOC

Date Samples Received: 2006-08-03

Date Tested: 2006-08-08

Investigation Requested: FCC Part 15 Subpart C

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: For additional models details, see page 5.

TSANG Chi Ho, Steven, EMD

For and on behalf of

The Hong Kong Standards and Testing Centre Ltd.

The Hong Kong Standards and Testing Centre Ltd.

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STC Test Report

Date : 2006-08-14

Page 2 of 24

No. : HM157171

CONTENT:

Cover	Page 1 of 24
Content	Page 2-3 of 24
1.0 General Details	
1.1 Test Laboratory	Page 4 of 24
1.2 Applicant Details	Page 4 of 24
Applicant	
HKSTC Code Number for Applicant	
Manufacturer	
1.3 Equipment Under Test [EUT]	Page 5 of 24
Description of EUT operation	
1.4 Date of Order	Page 5 of 24
1.5 Submitted Samples	Page 5 of 24
1.6 Test Duration	Page 5 of 24
1.7 Country of Origin	Page 5 of 24
2.0 Technical Details	
2.1 Investigations Requested	Page 6 of 24
2.2 Test Standards and Results Summary	Page 6 of 24
3.0 Test Results	
3.1 Emission	Page 7-16 of 24
3.2 Bandwidth Measurement	Page 17-19 of 24

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STC Test Report

Date : 2006-08-14

Page 3 of 24

No. : HM157171

Appendix A

List of Measurement Equipment

Page 20 of 24

Appendix B

Duty Cycle Correction During 100 msec

Page 21-22 of 24

Appendix C

Photographs

Page 23-24 of 24

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STC Test Report

Date : 2006-08-14

Page 4 of 24

No. : HM157171

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

CHENGHAI HENGLONG PLASTIC TOYS CO., LTD.
NINGCHUAN ROAD, CHENGHAI DISTRICT,
SHANTOU CITY

Manufacturer

CHENGHAI HENGLONG PLASTIC TOYS CO., LTD.
NINGCHUAN ROAD, CHENGHAI DISTRICT,
SHANTOU CITY

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STC Test Report

Date : 2006-08-14

Page 5 of 24

No. : HM157171

1.3 Equipment Under Test [EUT]

Description of Sample

Model Name: R/C OIL CAR, ELECTRICAL CAR (TRANSMITTER, RECEIVER, ELECTRONIC ACTIVATOR, DRIVE)
Manufacturer: CHENGHAI HENGLONG PLASTIC TOYS CO., LTD.
Brand Name: N/A
Model Number: 3851-1
Additional Model Number: 3851-2, 3851-3, 3851-4, 3850-1, 3850-2, 3850-3, 3850-4
Rating: 12Vdc ("AA" size battery x 8)

1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is a CHENGHAI HENGLONG PLASTIC TOYS CO., LTD., R/C OIL CAR, ELECTRICAL CAR (TRANSMITTER, RECEIVER, ELECTRONIC ACTIVATOR, DRIVE). The transmitter is a 2 joystick transmitter. The EUT continues to transmit while joystick is being pressed. It is pulse transmitter, Modulation by IC, and type is pulse modulation.

1.4 Date of Order

2006-08-03

1.5 Submitted Sample(s):

1 Samples per model

1.6 Test Duration

2006-08-08

1.7 Country of Origin

China

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STC Test Report

Date : 2006-08-14

Page 6 of 24

No. : HM157171

2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.4:2003	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emissions on AC, 0.15MHz to 30MHz	FCC 47CFR 15.207	ANSI C63.4:2003	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Note: N/A - Not Applicable

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STC Test Report

Date : 2006-08-14

Page 7 of 24

No. : HM157171

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:

2006-08-08

Mode of Operation:

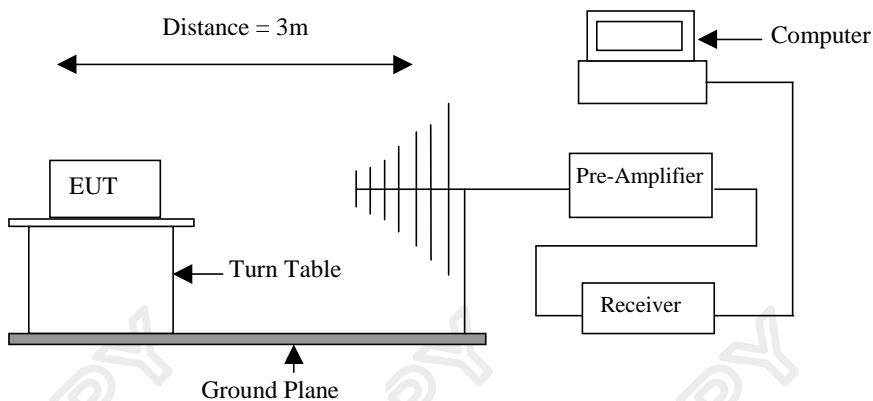
Tx mode

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.

*: On a standard radiated emission test site located at HKSTC with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

Test Setup:



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STC Test Report

Date : 2006-08-14

Page 8 of 24

No. : HM157171

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

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

Results of (27.095MHz) Tx Mode: PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
27.095	43.20	9.9	53.1	451.9	100,000	Vertical

Field Strength of Fundamental Emissions Average							
Frequency MHz	Measured Level @3m dB μ V	Adjusted by Duty Cycle dB	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
27.095	42.8	-0.4	9.9	52.7	431.5	10,000	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 ± 4.1 dB

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STC Test Report

Date : 2006-08-14

Page 9 of 24

No. : HM157171

Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [μ V/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 (27.095MHz) Tx Mode: PASS

Radiated Emissions Quasi-Peak						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
54.19	< 1.0	8.9	< 9.9	< 3.1	100	Vertical
81.29	< 1.0	9.5	< 10.5	< 3.3	100	Vertical
108.38	< 1.0	10.7	< 11.7	< 3.8	150	Vertical
135.48	< 1.0	10.2	< 11.2	< 3.6	200	Vertical
162.57	< 1.0	11.9	< 12.9	< 4.4	200	Vertical
189.67	< 1.0	12.4	< 13.4	< 4.7	200	Vertical
216.76	< 1.0	13.2	< 14.2	< 5.1	200	Vertical
243.86	< 1.0	15.0	< 16.0	< 6.3	200	Vertical
270.95	< 1.0	16.1	< 17.1	< 7.2	200	Vertical

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty: 30MHz to 1GHz ± 4.1 dB

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STC Test Report

Date : 2006-08-14

Page 10 of 24

No. : HM157171

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

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

Results of (27.145MHz) Tx Mode : PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
27.145	43.40	9.9	53.3	462.4	100,000	Vertical

Field Strength of Fundamental Emissions Average							
Frequency MHz	Measured Level @3m dB μ V	Adjusted by Duty Cycle dB	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
27.145	43.0	-0.4	9.9	52.9	441.6	10,000	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 ± 4.1 dB

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STC Test Report

Date : 2006-08-14

Page 11 of 24

No. : HM157171

Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [μ V/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 (27.145MHz) Tx Mode: PASS

Radiated Emissions Quasi-Peak						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
54.29	< 1.0	8.9	< 9.9	< 3.1	100	Vertical
81.44	< 1.0	9.5	< 10.5	< 3.3	100	Vertical
108.58	< 1.0	10.7	< 11.7	< 3.8	150	Vertical
135.73	< 1.0	10.2	< 11.2	< 3.6	200	Vertical
162.87	< 1.0	11.9	< 12.9	< 4.4	200	Vertical
190.02	< 1.0	12.4	< 13.4	< 4.7	200	Vertical
217.16	< 1.0	13.2	< 14.2	< 5.1	200	Vertical
244.31	< 1.0	15.0	< 16.0	< 6.3	200	Vertical
271.45	< 1.0	16.1	< 17.1	< 7.2	200	Vertical

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty: 30MHz to 1GHz ± 4.1 dB

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STC Test Report

Date : 2006-08-14

Page 12 of 24

No. : HM157171

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

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

Results of (27.195MHz) Tx Mode: PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
27.195	42.80	9.9	52.7	431.5	100,000	Vertical

Field Strength of Fundamental Emissions Average							
Frequency MHz	Measured Level @3m dB μ V	Adjusted by Duty Cycle dB	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
27.195	42.4	-0.4	9.9	52.3	412.1	10,000	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 ± 4.1 dB

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STC Test Report

Date : 2006-08-14

Page 13 of 24

No. : HM157171

Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [μ V/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 (27.195MHz) Tx Mode: PASS

Radiated Emissions Quasi-Peak						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
54.39	< 1.0	8.9	< 9.9	< 3.1	100	Vertical
81.59	< 1.0	9.5	< 10.5	< 3.3	100	Vertical
108.78	< 1.0	10.7	< 11.7	< 3.8	150	Vertical
135.98	< 1.0	10.2	< 11.2	< 3.6	200	Vertical
163.17	< 1.0	11.9	< 12.9	< 4.4	200	Vertical
190.37	< 1.0	12.4	< 13.4	< 4.7	200	Vertical
217.56	< 1.0	13.2	< 14.2	< 5.1	200	Vertical
244.76	< 1.0	15.0	< 16.0	< 6.3	200	Vertical
271.95	< 1.0	16.1	< 17.1	< 7.2	200	Vertical

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty: 30MHz to 1GHz ± 4.1 dB

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STC Test Report

Date : 2006-08-14

Page 14 of 24

No. : HM157171

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

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

Results of (27.225MHz) Tx Mode : PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
27.225	43.20	9.9	53.1	451.9	100,000	Vertical

Field Strength of Fundamental Emissions Average							
Frequency MHz	Measured Level @3m dB μ V	Adjusted by Duty Cycle dB	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
27.225	42.8	-0.4	9.9	52.7	431.5	10,000	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 ± 4.1 dB

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STC Test Report

Date : 2006-08-14

Page 15 of 24

No. : HM157171

Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [μ V/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 (27.225MHz) Tx Mode: PASS

Radiated Emissions Quasi-Peak						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
54.45	< 1.0	8.9	< 9.9	< 3.1	100	Vertical
81.68	< 1.0	9.5	< 10.5	< 3.3	100	Vertical
108.90	< 1.0	10.7	< 11.7	< 3.8	150	Vertical
136.13	< 1.0	10.2	< 11.2	< 3.6	200	Vertical
163.35	< 1.0	11.9	< 12.9	< 4.4	200	Vertical
190.58	< 1.0	12.4	< 13.4	< 4.7	200	Vertical
217.80	< 1.0	13.2	< 14.2	< 5.1	200	Vertical
245.03	< 1.0	15.0	< 16.0	< 6.3	200	Vertical
272.25	< 1.0	16.1	< 17.1	< 7.2	200	Vertical

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty: 30MHz to 1GHz ± 4.1 dB

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STC Test Report

Date : 2006-08-14

Page 16 of 24

No. : HM157171

3.1.1 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207
Test Method:	ANSI C63.4:2003
Test Date:	N/A
Mode of Operation:	N/A

Results: N/A

The EUT is operated by a single source of internal battery power [located in the battery compartment], therefore power line conducted emission was deemed unnecessary.

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STC Test Report

Date : 2006-08-14

Page 17 of 24

No. : HM157171

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:

2006-08-08

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.



STC Test Report

Date : 2006-08-14

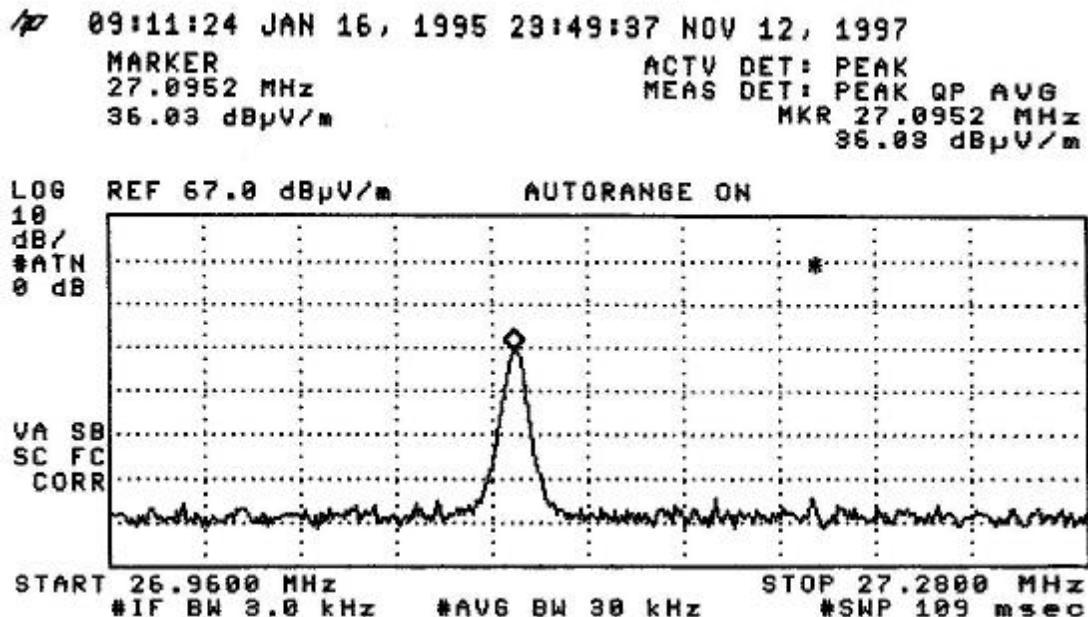
Page 18 of 24

No. : HM157171

Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [KHz]	FCC Limits [MHz]
27.095	14.6	within 26.96-27.28

20dB Bandwidth of Fundamental Emission



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STC Test Report

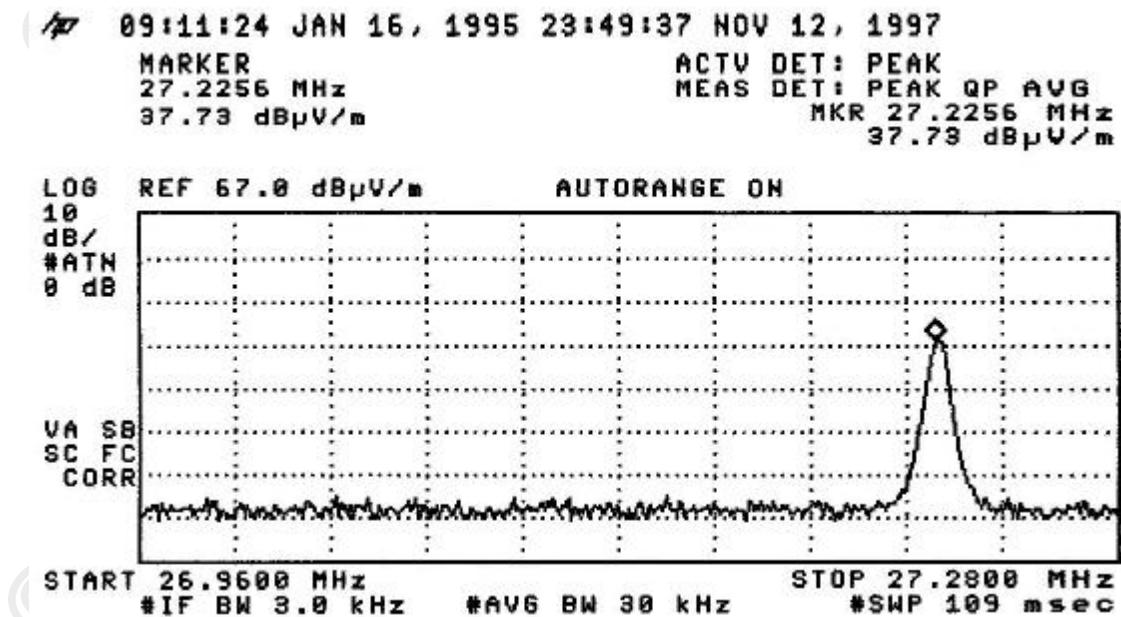
Date : 2006-08-14

Page 19 of 24

No. : HM157171

Frequency Range [MHz]	20dB Bandwidth [KHz]	FCC Limits [MHz]
27.225	14.3	within 26.96-27.28

20dB Bandwidth of Fundamental Emission



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STC Test Report

Date : 2006-08-14

No. : HM157171

Page 20 of 24

Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EM007	SPECTRUM ANALYZER	HEWLETT PACKARD	HP85660B	3144A21192	2005/06/27
EM008	SPECTRUM ANALYZER DISPLAY	HEWLETT PACKARD	HP85662A	3144A20514	2005/06/27
EM009	QUASI PEAK ADAPTOR	HEWLETT PACKARD	HP85650A	3303A01702	2005/06/27
EM010	RF PRESELECTOR	HEWLETT PACKARD	HP85685A	3221A01410	2005/06/27
EM011	ATTENUATOR/SWITCH	HEWLETT PACKARD	HP11713A	2508A10595	2005/06/27
EM012	PRE-AMPLIFIER	HEWLETT PACKARD	HP8449B	3008A00262	2005/06/27
EM020	HORN ANTENNA	ETS-Linggren	3115	4032	2003/07/30
EM022	LOOP ANTENNA	ETS-Linggren	6502	1189-2424	2003/09/19
EM072	SIGNAL GENERATOR	HEWLETT PACKARD	8640B	1948A11892	N/A
EM083	OPEN AREA TEST SITE	HKSTC	N/A	N/A	2005/12/08
EM131	EMC ANALYZER	HEWLETT PACKARD	8595EM	3710A00155	2006/03/29
EM145	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCS 30	830245/021	2004/10/04
EM195	ANTENNA POSITIONING MAST	ETS-Linggren	2075	2368	N/A
EM196	MULTI-DEVICE CONTROLLER	ETS-Linggren	2090	1662	N/A
EM215	MULTIDEVICE CONTROLLER	ETS-Linggren	2090	00024676	N/A
EM216	MINI MAST SYSTEM	ETS-Linggren	2075	00026842	N/A
EM217	ELECTRIC POWERED TURNTABLE	ETS-Linggren	2088	00029144	N/A
EM218	ANECHOIC CHAMBER	ETS-Linggren	FACT-3	--	2006/05/02
EM219	BICONILOG ANTENNA	ETS-Linggren	3142C	00029071	2006/02/01
EM229	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB40	100248	2005/02/04

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EM078	VARIAC	SHANGHAI VOLTAGE	TDGC-3/0.5	N/A	CM
EM081	SMALL SCREENED ROOM	MIKO INST HK	N/A	N/A	2006/01/12
EM119	LISN	ROHDE & SCHWARZ	ESH3-Z5	0831.5518.52	2004/10/14
EM127	ISOLATION TRANSFORMER 220 TO 300V	WING SUN	N/A	N/A	CM
EM233	PULSE LIMITER	ROHDE & SCHWARZ	ESH3-Z2	100314	2006/01/09
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2006/03/17
EM154	SHIELDING ROOM	SIEMENA MATSUSHITA COMPONENTS	N/A	803-740-057-99A	2006/01/12
EM197	LISN	ETS-Linggren	4825/2	1193	2005/06/27
EM213	DIGITAL POWER METER	VICNOBL	VIP120	00277	2004/09/14

Remarks:-

CM Corrective Maintenance

N/A Not Applicable or Not Available

TBD To Be Determined

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STC Test Report

Date : 2006-08-14

Page 21 of 24

No. : HM157171

Appendix B

Duty Cycle Correction During 100msec

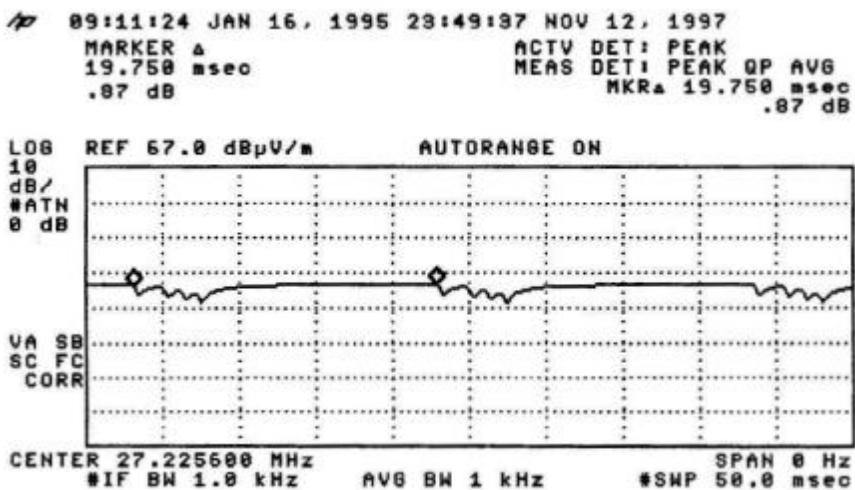
Each function key sends a different series of characters, but each packet period (19.75msec) never exceeds a series of 1 long (14.75msec) and 3 short (1.375msec) pulses. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered $14.75\text{msec} + (3 \times 1.375\text{msec})$ per $19.75\text{msec} = 95.6\%$ duty cycle. Figure A through C show the characteristics of the pulse train for one of these functions.

Remarks:

Duty Cycle Correction = $20\log(0.956) = -0.4\text{dB}$

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

Figure A [Pulse Train]



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STC Test Report

Date : 2006-08-14

Page 22 of 24

No. : HM157171

Figure B [Long Pulse]

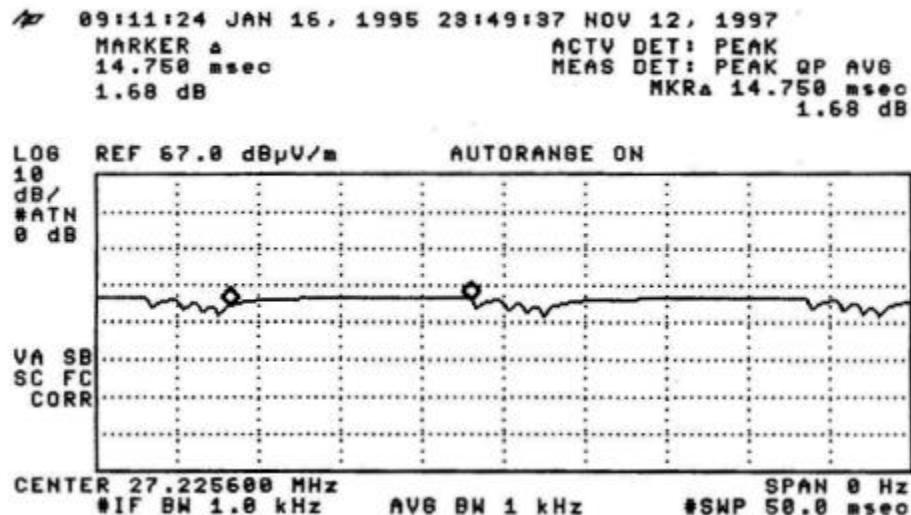
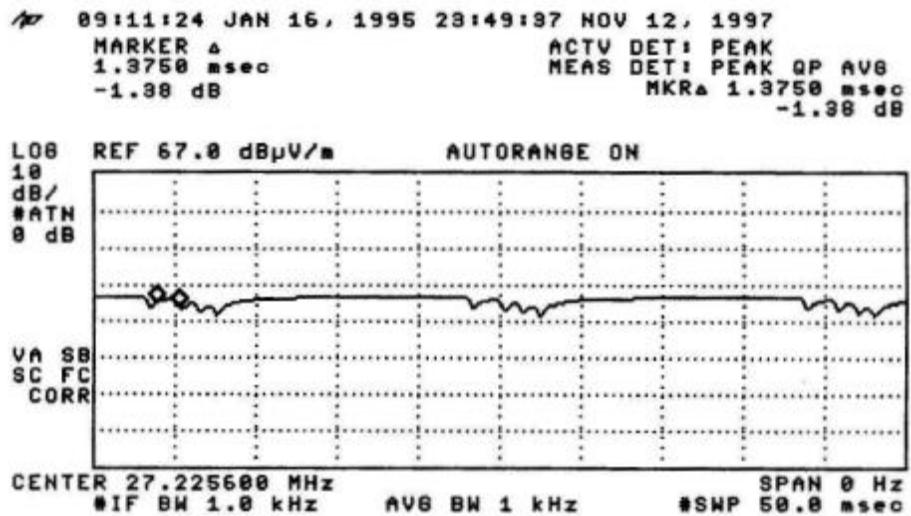


Figure C [Short Pulse]



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STC Test Report

Date : 2006-08-14

Page 23 of 24

No. : HM157171

Appendix C

Photographs of EUT

Front View of the product



Rear View of the product



Inner Circuit Top View



Inner Circuit Bottom View



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STC Test Report

Date : 2006-08-14

Page 24 of 24

No. : HM157171

Photographs of EUT

Measurement of Radiated Emission Test Set Up



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

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