



Hong Kong

FCC – Test report

Report Number : **60/720.9.228.01** Date of Issue: 15 June 2009

Model : **DUOTRAP**

Product Type : Bike Combo Transmitter

Applicant : Dayton Industrial Co., Ltd.

Address : 2-12 Kwai Fat Road, 11-A Kwai Chung,
: New Territories, Hong Kong

Production Facility : Kendy Enterprise Ltd.

Address : 2-12 Kwai Fat Road, 11-A Kwai Chung,
: New Territories, Hong Kong

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including Appendices : 20

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2 Details about the Test Laboratory

Details about the Test Laboratory

Company name: TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2,
10 Science Park West Avenue,
Science Park, Shatin
HK.

Telephone: 852 2776 1323
Fax: 852 2776 1372

Company name: The Hong Kong Standards and Testing Centre Ltd.
10 Dai Wang Street,
Taipo Industrial Estate,
N.T.,
Hong Kong

3 Description of the Equipment Under Test

Description of the Equipment Under Test

Product: Bike Combo Transmitter

Model no.: DUOTRAP

Serial number: NIL

Options and accessories: NIL

Rated Voltage: 3 V DC

Rated Current: NIL

Rated Power: NIL

Frequency: NIL

Description of the EUT: NIL

4 Summary of Test Standards and Results

Emission Tests						
Test Condition	Test Requirement	Test Method	Pages	Test Result		
				Pass	Fail	N/A
Radiated Emission (Fundamental & Spurious Emission)	FCC Part 15 Section 15.249	ANSI C63.4:2003	7-9	☒	☐	☐
Radiated Emission 30MHz – 1000MHz	FCC Part 15 Section 15.209	ANSI C63.4:2003	10-11	☒	☐	☐
Conducted Emission on AC 150kHz to 30MHz	FCC Part 15 Section 15.207	ANSI C63.4:2003	NIL	☐	☐	☒



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5 General Remarks

Remarks

NIL

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

□ - Not Performed

The Equipment Under Test

■ - Fulfills the general approval requirements.

□ - Does not fulfill the general approval requirements.

Sample Received Date: 18 May 2009

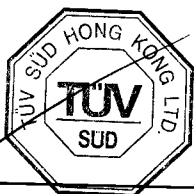
Testing Start Date: 4 June 2009

Testing End Date: 5 June 2009

- TÜV SÜD HONG KONG LTD. -

Reviewed by:

Ivan Toa
Deputy Manager



Prepared by:

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Report Number: 60/720.9.228.01

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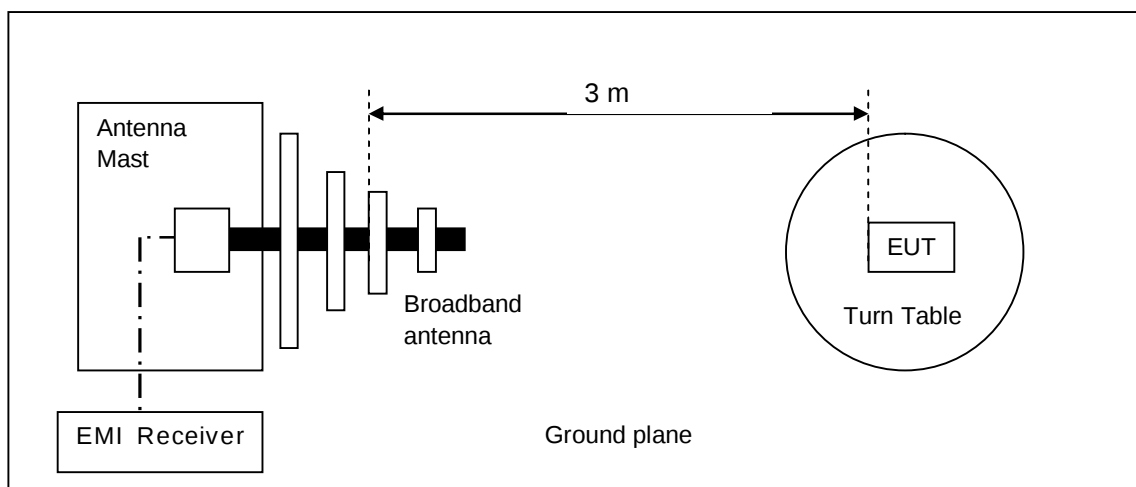
6 Emission Test Results

6.1 Radiated Emission Test (Fundamental)

Test Procedure :

The equipment under test (EUT) was placed on a test table with 0.8m high above the ground plane and the distance between the EUT and the broadband antenna is 3m. 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. The turntable was rotated to maximize the emission level and the antenna was moving along the mast from 1m up to 4m in both horizontal and vertical polarizations.

Test Setup :



Radiated Emission Test (Fundamental)

Date of test : 4 June 2009

Test requirement : FCC Part 15 Section 15.249

Test method : ANSI C63.4:2003

Operating mode : On mode

Antenna polarity : Horizontal (Worse case, Horizontal > Vertical)

Remarks : Duty Cycle Correction = $20 \log(0.00181) = -54.8\text{dB}$

Test Result

☒ Passed

☐ Not Passed

Field Strength of Fundamental Emissions in Peak Value

Frequency MHz	Test result dB μ V/m	Limit dB μ V/m	Margin dB
2456.9	82.3	114.0	-31.7

Field Strength of Fundamental Emissions in Average Value

Frequency MHz	Test result dB μ V/m	Limit dB μ V/m	Margin dB
2456.9	27.5	94.0	-66.5

Radiated Emission Test (Spurious Emission)

Date of test : 4 June 2009

Test requirement : FCC Part 15 Section 15.249

Test method : ANSI C63.4:2003

Operating mode : On mode

Antenna polarity : Horizontal (Worse case, Horizontal > Vertical)

Remarks : Duty Cycle Correction = $20 \log(0.00181) = -54.8 \text{ dB}$

Test Result

☒ Passed

☐ Not Passed

Field Strength of Emissions in Peak Value

Frequency MHz	Test result dBμV/m	Limit dBμV/m	Margin dB
4913.60	52.8	74.0	-21.2
7370.40	<30.0	74.0	<-44.0
9827.20	<30.0	74.0	<-44.0
12284.00	<30.0	74.0	<-44.0
14740.80	<30.0	74.0	<-44.0
17197.60	<30.0	74.0	<-44.0
19654.40	<30.0	74.0	<-44.0
22111.20	<30.0	74.0	<-44.0
24568.00	<30.0	74.0	<-44.0

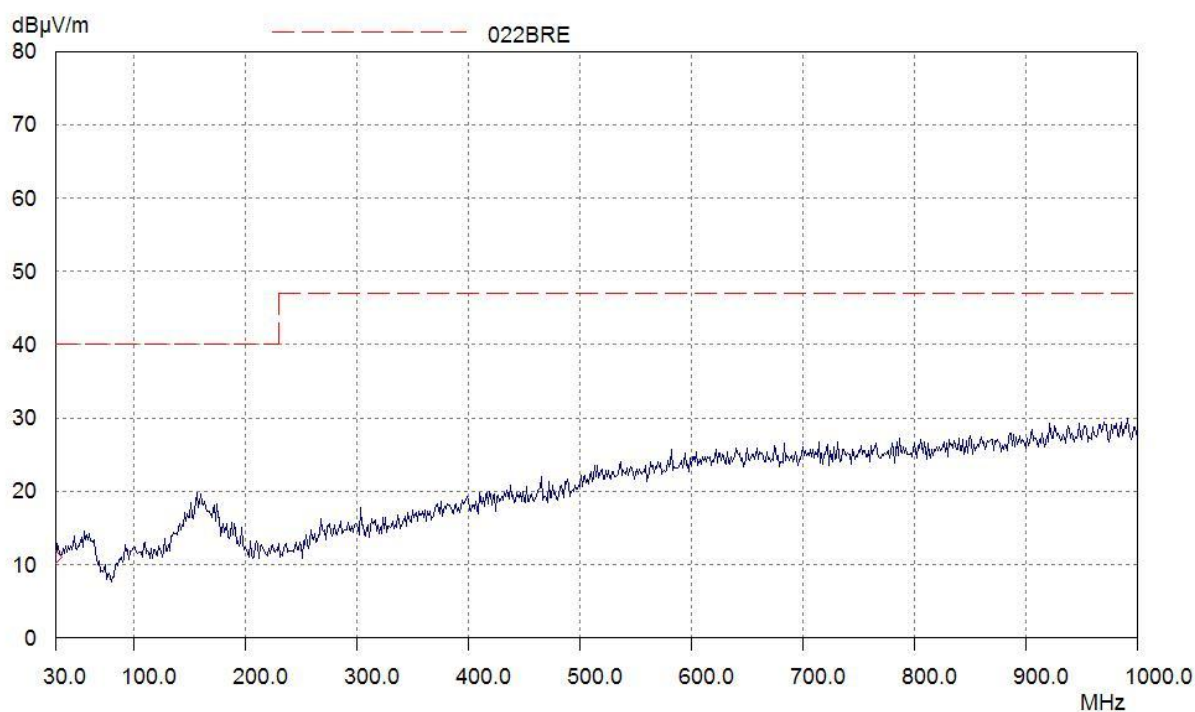
Field Strength of Fundamental Emissions in Average Value

Frequency MHz	Test result dBμV/m	Limit dBμV/m	Margin dB
4913.60	0	54.0	-54.0
7370.40	<30.0	54.0	<-24.0
9827.20	<30.0	54.0	<-24.0
12284.00	<30.0	54.0	<-24.0
14740.80	<30.0	54.0	<-24.0
17197.60	<30.0	54.0	<-24.0
19654.60	<30.0	54.0	<-24.0
22111.20	<30.0	54.0	<-24.0
24568.00	<30.0	54.0	<-24.0

Radiated Emission Test 30MHz - 1000MHz

Date of test : 4 June 2009
 Test requirement : FCC Part 15 Section 15.209
 Test method : ANSI C63.4:2003
 Operating mode : On mode
 Antenna polarity : Horizontal
 Remarks : NIL

Test Result	
☒	Passed
☐	Not Passed



Radiated Emission Test 30MHz - 1000MHz

Date of test : 4 June 2009

Test requirement : FCC Part 15 Section 15.209

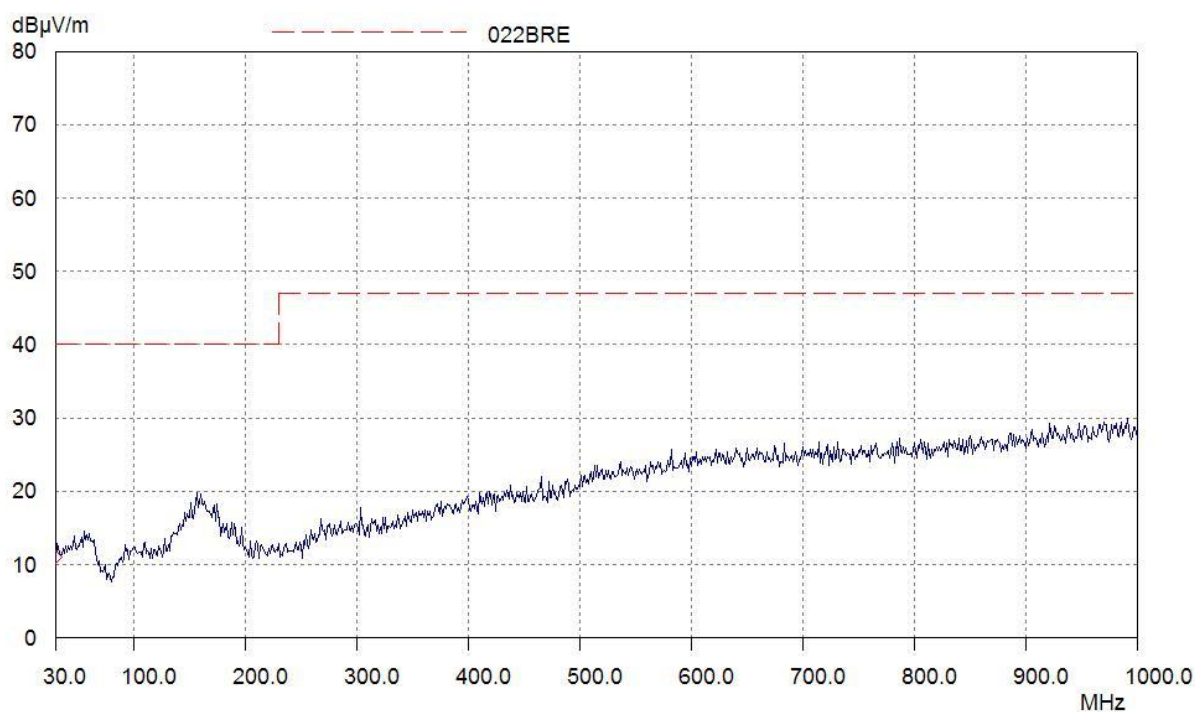
Test method : ANSI C63.4:2003

Operating mode : On mode

Antenna polarity : Vertical

Remarks : NIL

Test Result	
☒	Passed
☐	Not Passed



Frequency Range of Fundamental Emission

Date of test : 4 June 2009
Test requirement : FCC Part 15 Section 15.249
Test method : ANSI C63.4:2003
Operating mode : On mode
Remarks : NIL

Test Result	
☒	Passed
☐	Not Passed

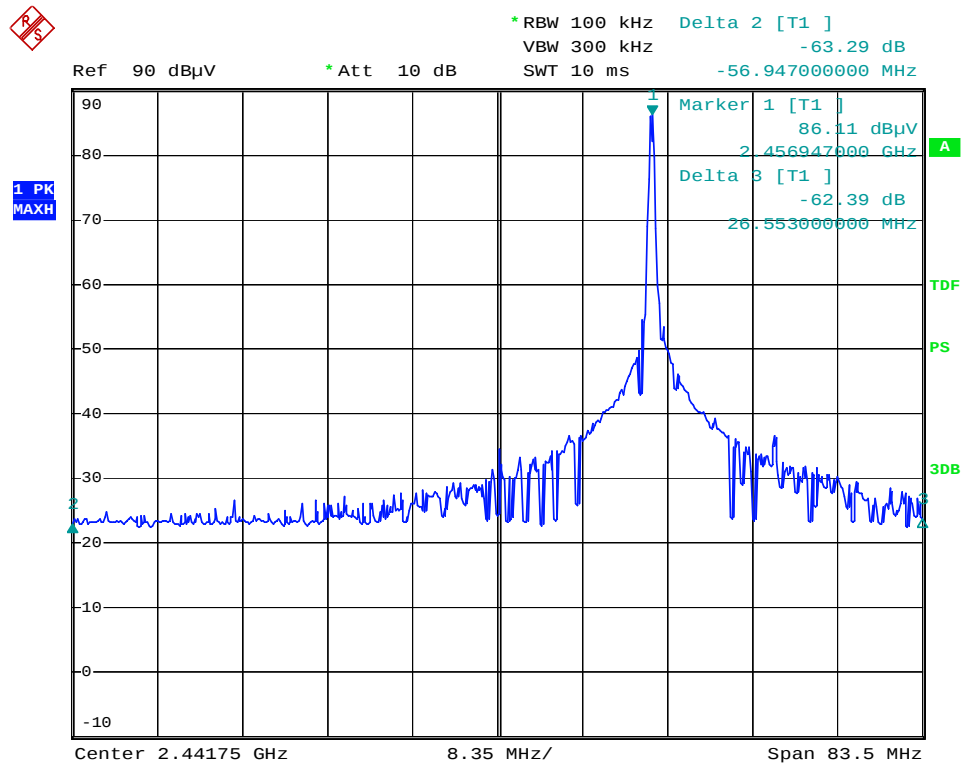
Limits for Frequency Range of Fundamental Emission

Frequency MHz	Limits MHz
2456.9	2400-2483.5

Band Edge

Start: 2400.0 MHz

Stop: 2483.5 MHz



Band Edge (MHz)	dBc (dB)
2400.0	-63.29
2483.5	-62.39

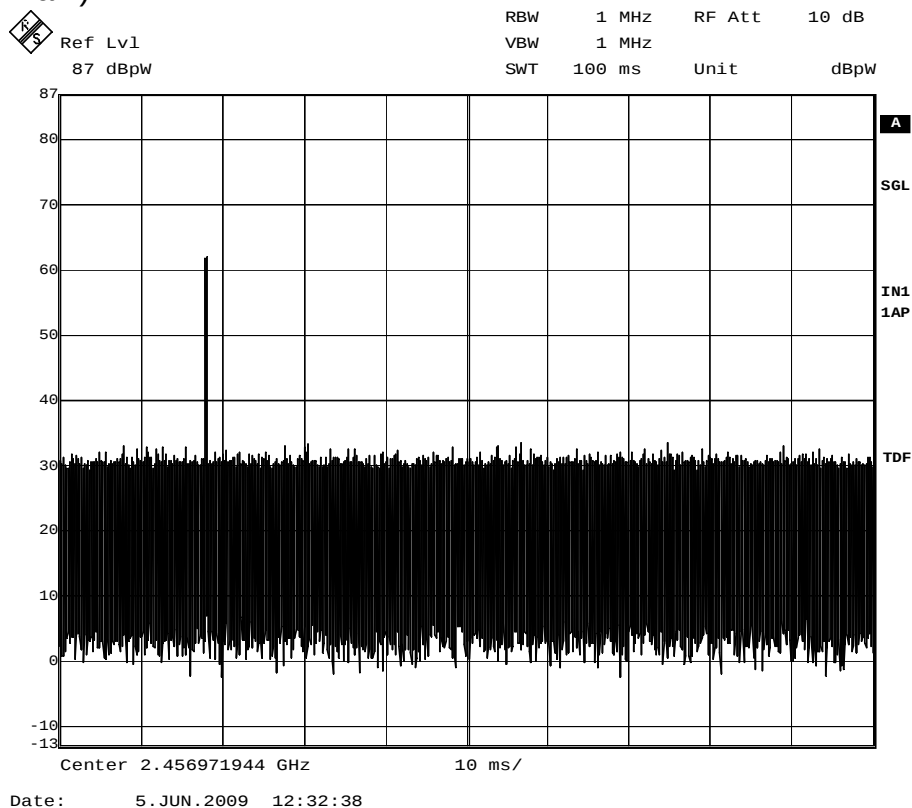
Band Edge

Band Edge (MHz)	Highest emission of Fundamental dBuV/m at 2456.9 MHz		dBc	Field strength dBuV/m	
	P	AV		P	AV
2400	82.3	27.5	-63.29	19.01	0
2483.5	82.3	27.5	-62.39	19.91	0

NOTE: Band edge peak value is less than average limit of 54dBuV/m.

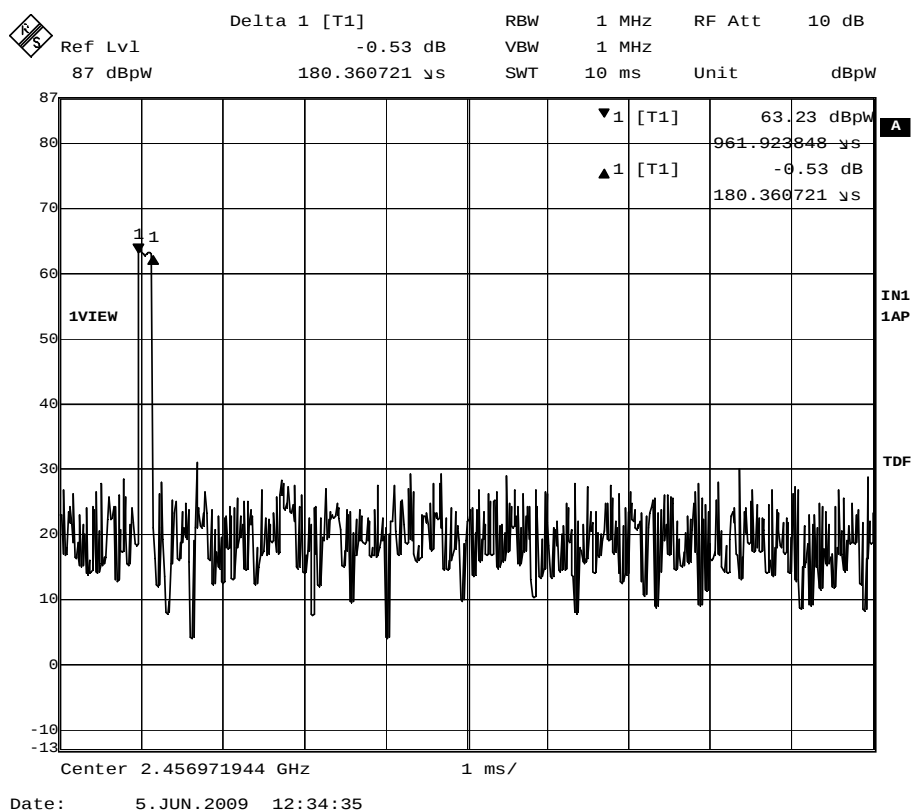
Assuming any combination of short or long pulses may be obtained due to encoding the worst Case transmit duty cycle would be considered $0.181\text{msec per }100\text{msec} = 0.181\%$ duty cycle. Figure A and B show the characteristics of the pulse train.

Figure A (Pulse Train)

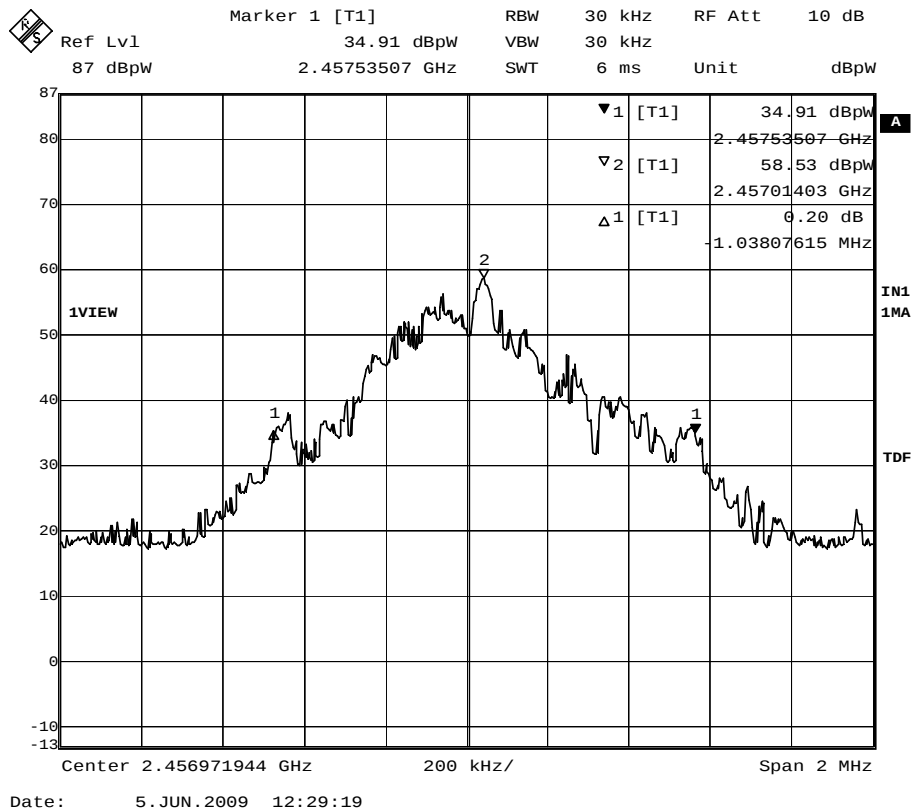


Duty Cycle Correction

Figure B (Pulse)



20 dB Bandwidth



Test Equipment List**Radiated Emission Test**

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE	DUE CAL. DATE
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-Linggren	FACT-3	--	2008/12/01	2011/12/01
EM174	BICONILOG ANTENNA	EMCO	3142B	1671	2008/01/24	2010/01/24
EM229	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB40	100248	2007/07/20	2009/08/20
EM020	HORN ANTENNA	EMCO	3115	4032	2006/07/11	2009/07/11
EM223	DOUBLE-RIDGED WAVEGUIDE HORN	EMCO	3116	00060088	2008/05/27	2010/05/27

7 Appendix A



8 Appendix B

Radiated Emission Test Set Up

