



EMI TEST REPORT

Test Report No. : 27IE0351-YK-B

Applicant : SMART COMMUNICATIONS LIMITED.
Type of Equipment : UHF FM Handheld Transceiver
Model No. : SC-580 A, SC-581 A
FCC ID : O78SC580
Test Standard : FCC Part15 Subpart B
Test Result : Complied

1. This test report shall not be reproduced except in full, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Date of test: May 11, 2007

Tested by:

T. Arai
Tatsuya Arai

Approved by:

O. Watatani
Osamu Watatani
Manager of Yamakita EMC Lab.



This laboratory is accredited by the NVLAP LAB CODE 200441-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address,
<http://uljapan.co.jp/emc/nvlap.html>

UL Japan, Inc.

YAMAKITA EMC LAB.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

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MF060b(26.04.07)

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1 Applicant Information

Company Name : SMART COMMUNICATIONS LIMITED.
Address : Unit B,21/F.,Nathan Commercial Bldg.,430-436 Nathan Road,
Yaumatei Kowloon, Hong Kong
Telephone Number : (852)2735 3008
Facsimile Number : (852)2735 3001
Contact Person : George.Kishikawa

2 Product Description

Type of Equipment : UHF FM Handheld Transceiver
Model No. : SC-580 A, SC-581 A
Serial No. : Sample2
Rating : DC7.2V
Country of Manufacture : CHINA
Receipt Date of Sample : May 10, 2007
Condition of EUT : Production prototype
(Not for sale: This sample is equivalent to mass-produced items.)

SMART COMMUNICATIONS LIMITED, Model: SC-580 A (referred to as the EUT in this report) is a UHF FM Handheld Transceiver.

Model SC-580 A: Full key Type

Model SC-581 A: Simple key Type

Frequency of operation : 400.0250MHz – 429.9750MHz
Intermediate frequency : 1st IF : -44.95MHz, 2nd IF: 455kHz
Other clock frequency : CPU : 4.032MHz, 2nd Local : 44.495MHz, DTMF IC : 4.19MHz,
TCXO : 12.8MHz
Type of receiver : Double-conversion super heterodyne
Antenna type : 1/4 wave whip
Antenna connector type : STUD
Operation temperature range : -30 ~ +60 deg. C.

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3 Test Specification, Procedures and Results

3.1 Test specification

Test Specification : FCC Part 15 Subpart B: 2006
Title : FCC 47CFR Part 15 Radio Frequency Device
Subpart B Unintentional Radiators

3.2 Procedures & Results

Item	Test Procedure	Limits	Deviation	Worst margin	Result
Conducted emission	ANSI C63.4: 2003 7. AC powerline conducted emission measurements	CISPR 22	N/A *1	N/A	N/A
Radiated emission	ANSI C63.4: 2003 8. Radiated emission measurements	FCC §15.109(a)	N/A	5.6dB (770.06MHz, Horizontal, Rx 429.9750MHz)	Complied
Antenna power conduction for receivers	ANSI C63.4: 2003 12.1.5 Antenna-conducted power measurements	FCC §15.111(a)	Excluded *2	N/A	N/A

*1) The test is not applicable since the EUT has no AC mains.

*2) The test was not performed according to the client's request.

Note: UL Japan's EMI Work Procedures No.QPM05.

3.3 Addition to standard

Other than above, no addition, deviation or exclusion has been made from the standard.

3.4 Confirmation

UL Japan, Inc. hereby confirms the E.U.T., in the configuration tested, complies with the specifications FCC Part 15 Subpart B: 2006, Class B.

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3.5 Uncertainty

The measurement uncertainty (with a 95% confidence level) is as follows:

	No.1 open site	No.2 open site	No.1 anechoic chamber
Conducted emission			
150kHz-30MHz	2.8 dB	2.8 dB	2.8 dB
Radiated emission (3m)			
30-300MHz	4.5 dB	4.4 dB	4.5 dB
300-1000MHz	4.3 dB	4.3 dB	4.3 dB
1GHz<	5.7 dB	5.7 dB	5.7 dB
Radiated emission (10m)			
30-300MHz	4.5 dB	4.4 dB	-
300-1000MHz	4.1 dB	4.1 dB	-

Radiated Emission Test

The data listed in this test report has enough margin, more than site margin.

3.6 Test Location

UL Japan, Inc. Yamakita EMC Lab.

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Telephone number : +81 465 77 1011

Facsimile number : +81 465 77 2112

NVLAP Lab. code : 200441-0

No. 1 test site has been fully described in a report submitted to FCC office, and accepted on August 26, 2005 (Registration No.: 95486).

IC Registration No. : 2973B-1

No. 2 test site has been fully described in a report submitted to FCC office, and accepted on April 4, 2005 (Registration No.: 466226).

IC Registration No. : 2973B-3

No. 1 anechoic chamber has been fully described in a report submitted to FCC office, and accepted on November 2, 2005 (Registration No.: 95967).

IC Registration No. : 2973B-2

Test room	Width x Depth x Height (m)	Test room	Width x Depth x Height (m)
No.1 shielded room	8.0 x 5.0 x 2.5	No.1 EMS lab. (Semi-anechoic chamber)	10.0 x 7.5 x 5.7
No.2 shielded room	5.0 x 4.0 x 2.5		
No.3 shielded room	4.0 x 5.0 x 2.7		

3.7 Test Setup, Data of EMI & Test instruments

Refer to Appendix 1 to 3.

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4 System Test Configuration

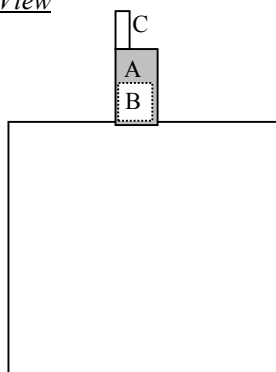
4.1 Justification

The system was configured in typical fashion (as a customer would normally use it) for testing.

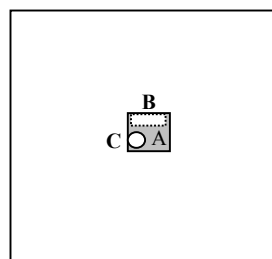
Test mode: Receiving mode
- Low channel : 400.0250MHz
- Middle channel : 415.0250MHz
- High channel : 429.9750MHz

4.2 Configuration of Tested System

Front View



Top View



* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID (Remarks)
A	Transceiver	SC-580 A	Sample2	SMART COMMUNICATIONS LTD	O78SC580 (EUT)
B	Battery	SCB-2200	Sample1	SMART COMMUNICATIONS LTD	-
C	ANTENNA	SAN-45A	Sample1	SMART COMMUNICATIONS LTD	-

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5 Radiated Emissions

5.1 Operating environment

The test was carried out in No.2 open site.

5.2 Test configuration

EUT was placed on a platform of nominal size, 0.5m by 0.5m, raised 80cm above the conducting ground plane. A drawing of the set up is shown in the photos of Appendix 1.

5.3 Test conditions

Frequency range : 30MHz – 2000MHz
Test distance : 3m
EUT operation mode : Receiving

5.4 Test procedure

The Radiated Electric Field Strength intensity has been measured on an anechoic chamber with a ground plane and at a distance of 3m. Pre check measurements were performed in a screened room with a search coil at 30-1000MHz to distinguish disturbances of EUT from the ambient noise. Measurements were performed with quasi-peak, peak and average detector.

The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for both vertical and horizontal antenna polarization.

The radiated emission measurements were made with the following detector function of the test receiver.

	30-1000MHz	1000-2000MHz
Detector Type	: Quasi-Peak	PK / AV
IF Bandwidth	: 120kHz	RBW:1MHz, VBW:1MHz / RBW:1MHz, VBW:10Hz

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

The equipment was previously checked at each position of three axes X, Y and Z. The position in which the maximum noise occurred was chosen to put into measurement. See the table below and photographs in page 10.

With the position, the noise levels of all the frequencies were measured.

Frequency	Below 1GHz	Above 1GHz
Antenna: Horizontal	Y	X
Antenna: Vertical	Z	Z

5.5 Results

Summary of the test results : Pass

Date : May 11, 2007 Test engineer : Tatsuya Arai

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APPENDIX 1: Photographs of test setup

Page 9 : Radiated emission
Page 10 : Pre-check of the worst position

APPENDIX 2: Test Data

Page 11 - 22 : Radiated emission

APPENDIX 3: Test instruments

Page 23 : Test instruments

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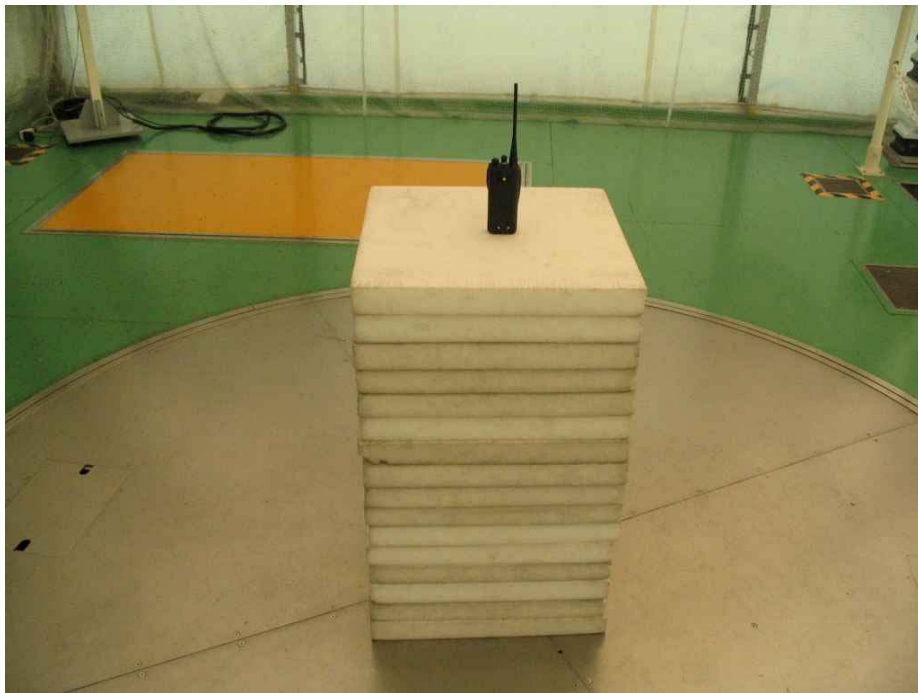
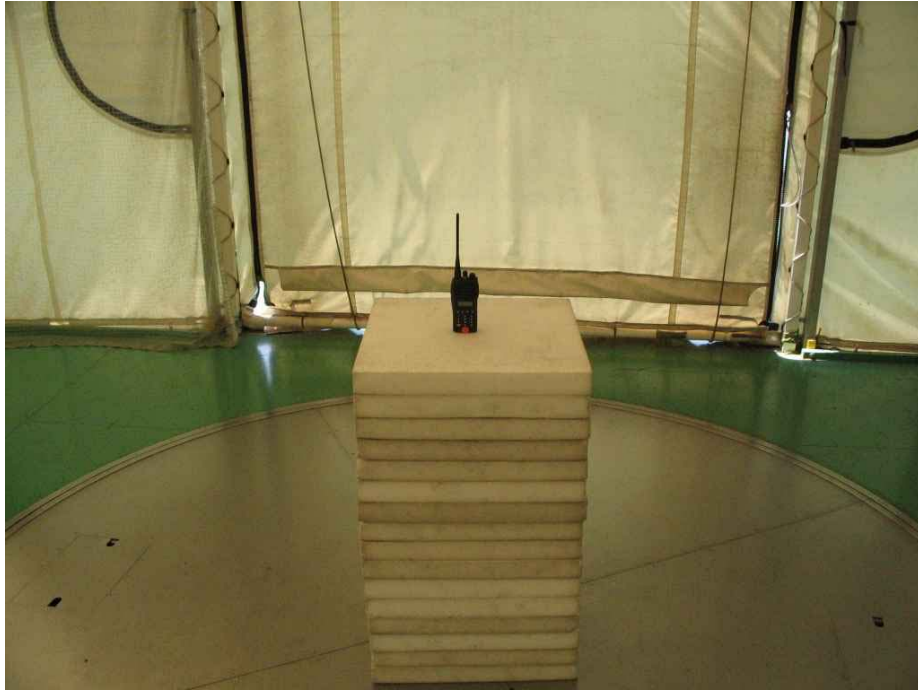
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Radiated emission



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Pre-check of worst position



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DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.2 OPEN TEST SITE

Report No. : 271E0351-YK -B

Applicant : SMART COMMUNICATIONS LIMITED.
Kind of Equipment : UHF Handheld Transceiver
Model No. : SC-580 A
Serial No. : Sample2
Power : DC7.2V
Mode : Receiving(400.0250MHz)
Remarks : -
Date : 5/11/2007
Test Distance : 3 m
Temperature : 22 °C
Humidity : 49 %
Regulation : FCC Part15B § 15.109(a)

Engineer : Tatsuya Arai

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	355.08	BB	33.4	32.3	15.9	27.7	4.1	6.0	31.7	30.6	46.0	14.3	15.4
2.	400.03	BB	21.2	22.1	17.6	28.3	4.4	6.0	20.9	21.8	46.0	25.1	24.2
3.	710.16	BB	32.8	28.7	21.1	29.0	6.0	6.0	36.9	32.8	46.0	9.1	13.2
4.	800.05	BB	21.0	21.1	21.2	28.8	6.4	6.0	25.8	25.9	46.0	20.2	20.1

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA: KBA-02 (BBA9106) 30-299MHz / KLA-02 (USLP9143) 300-1000MHz

■ AMP: KAF-03 (8447D) ■ RECEIVER: KTR-04 (ESVS10) ■ CABLE: KCC-20/21/22/23/29

DATA OF RADIATION TEST

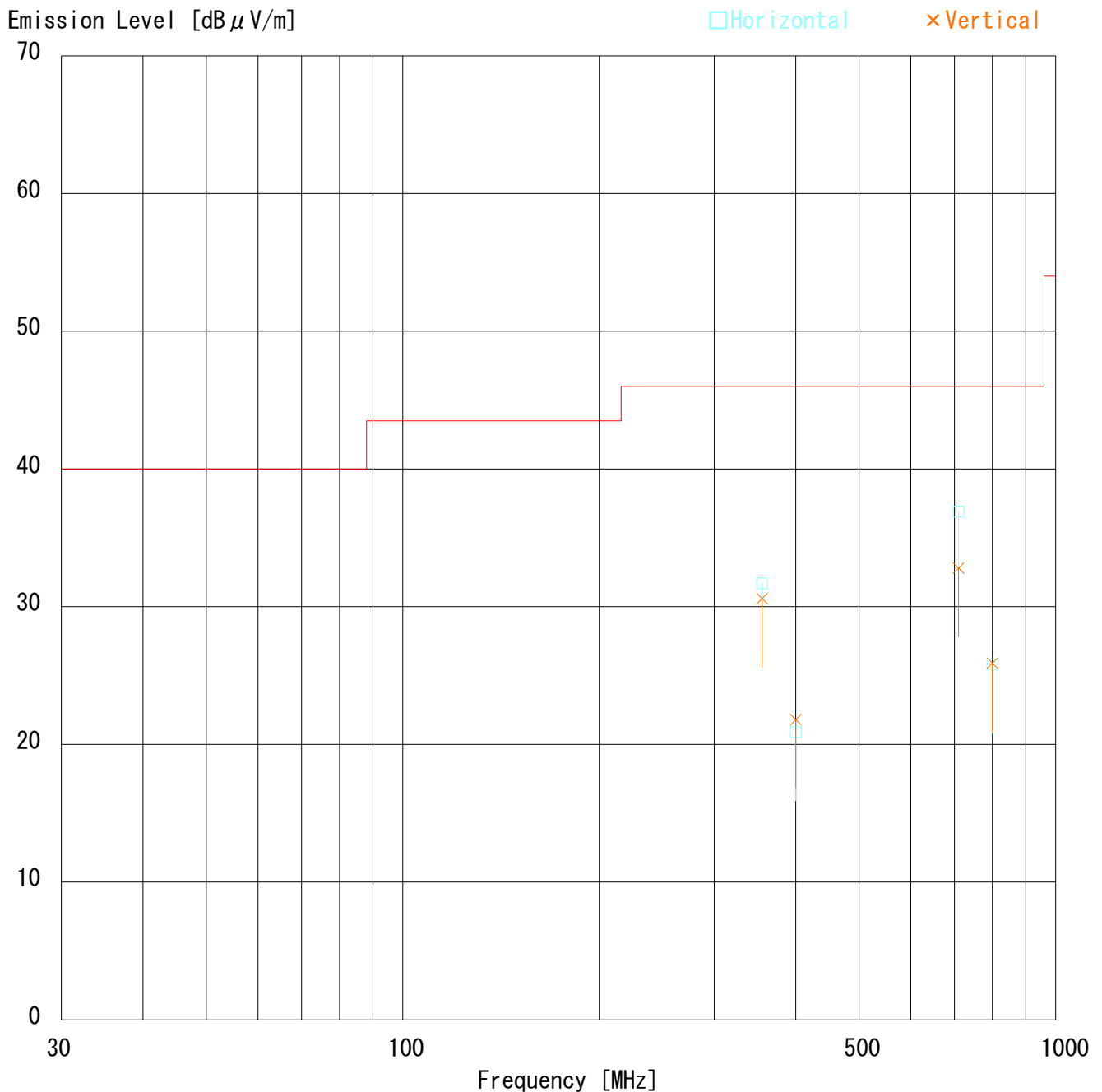
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Serial No. : Sample2
Power : DC7.2V
Mode : Receiving(400.0250MHz)
Remarks : AV (RBW: 1MHz, VBW: 10Hz)
Date : 5/11/2007
Test Distance : 3 m
Temperature : 22 °C
Humidity : 49 %
Regulation : FCC Part15B § 15.109(a)

Engineer : Tatsuya Arai

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	1065.23	BB	43.1	44.0	24.9	36.5	3.1	0.0	34.6	35.5	54.0	19.4	18.5
2.	1420.30	BB	36.7	33.3	25.6	36.0	3.6	0.0	29.9	26.5	54.0	24.1	27.5
3.	1775.38	BB	31.1	33.3	26.3	35.5	3.9	0.0	25.8	28.0	54.0	28.2	26.0

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA: KHA-02 (1-18GHz)

■ AMP: KAF-04 (8449B) ■ SPECTRUM ANALYZER: KSA-02 ■ CABLE: KCC-D14/D15

DATA OF RADIATION TEST

UL Japan, Inc.

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Kind of Equipment : UHF Handheld Transceiver
Model No. : SC-580 A
Serial No. : Sample2
Power : DC7.2V
Mode : Receiving(400.0250MHz)
Remarks : PK (RBW: 1MHz, VBW: 1MHz)
Date : 5/11/2007
Test Distance : 3 m
Temperature : 22 °C
Humidity : 49 %
Regulation : FCC Part15B CLASS B (PK)

Engineer : Tatsuya Arai

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	1065.23	BB	48.9	48.9	24.9	36.5	3.1	0.0	40.4	40.4	74.0	33.6	33.6
2.	1420.30	BB	45.5	44.8	25.6	36.0	3.6	0.0	38.7	38.0	74.0	35.3	36.0
3.	1775.38	BB	42.8	44.1	26.3	35.5	3.9	0.0	37.5	38.8	74.0	36.5	35.2

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■ ANTENNA: KHA-02 (1-18GHz)

■ AMP: KAF-04 (8449B) ■ SPECTRUM ANALYZER: KSA-02 ■ CABLE: KCC-D14/D15

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Model No. : SC-580 A
Serial No. : Sample2
Power : DC7.2V
Mode : Receiving(415.0250MHz)
Remarks : -
Date : 5/11/2007
Test Distance : 3 m
Temperature : 22 °C
Humidity : 49 %
Regulation : FCC Part15B § 15.109(a)

Engineer : Tatsuya Arai

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	370.08	BB	34.0	31.7	16.5	27.9	4.2	6.0	32.8	30.5	46.0	13.2	15.5
2.	415.03	BB	21.1	21.5	17.6	28.3	4.5	6.0	20.9	21.3	46.0	25.1	24.7
3.	740.15	BB	34.5	29.8	21.2	28.9	6.2	6.0	39.0	34.3	46.0	7.0	11.7
4.	830.05	BB	21.3	22.2	21.4	28.7	6.6	6.0	26.6	27.5	46.0	19.4	18.5

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA: KBA-02 (BBA9106) 30-299MHz / KLA-02 (USLP9143) 300-1000MHz

■ AMP: KAF-03 (8447D) ■ RECEIVER: KTR-04 (ESVS10) ■ CABLE: KCC-20/21/22/23/29

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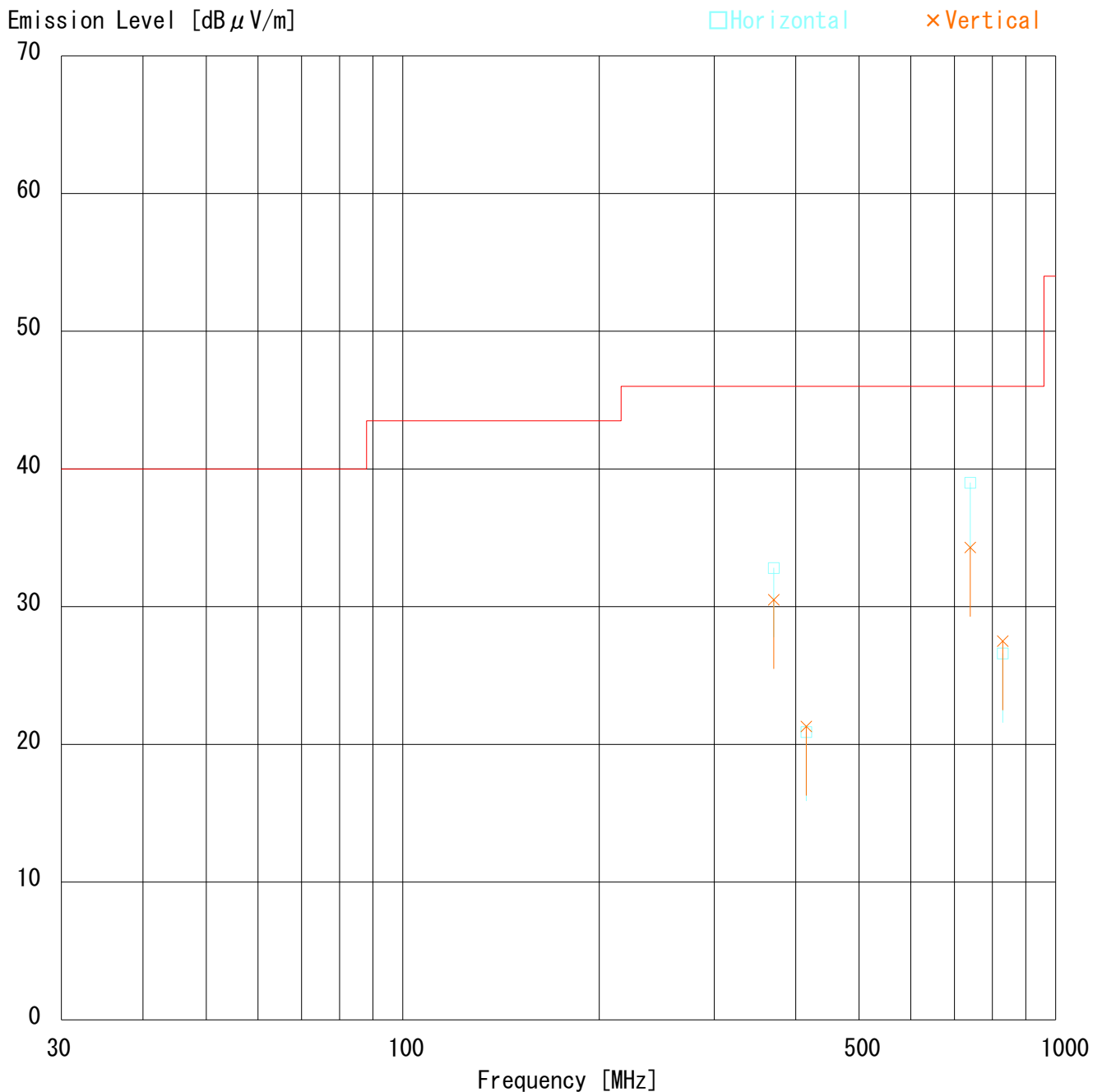
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Date : 5/11/2007
Test Distance : 3 m
Temperature : 22 °C
Humidity : 49 %
Regulation : FCC Part15B § 15.109(a)

Engineer : Tatsuya Arai

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	1110.23	BB	37.7	41.4	25.0	36.4	3.2	0.0	29.5	33.2	54.0	24.5	20.8
2.	1850.38	BB	30.8	31.7	26.4	35.4	3.9	0.0	25.7	26.6	54.0	28.3	27.4

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA:KHA-02 (1-18GHz)

■ AMP:KAF-04 (8449B) ■ SPECTRUM ANALYZER:KSA-02 ■ CABLE:KCC-D14/D15

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Regulation : FCC Part15B CLASS B (PK)

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No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	1110.23	BB	46.8	48.2	25.0	36.4	3.2	0.0	38.6	40.0	74.0	35.4	34.0
2.	1850.38	BB	42.2	43.1	26.4	35.4	3.9	0.0	37.1	38.0	74.0	36.9	36.0

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA:KHA-02 (1-18GHz)

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			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	385.04	BB	37.9	35.9	17.0	28.1	4.3	6.0	37.1	35.1	46.0	8.9	10.9
2.	429.98	BB	21.4	21.5	17.6	28.4	4.6	6.0	21.2	21.3	46.0	24.8	24.7
3.	770.06	BB	35.7	30.3	21.2	28.8	6.3	6.0	40.4	35.0	46.0	5.6	11.0
4.	860.00	BB	21.3	21.2	21.7	28.7	6.7	6.0	27.0	26.9	46.0	19.0	19.1

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA: KBA-02 (BBA9106) 30-299MHz / KLA-02 (USLP9143) 300-1000MHz

■ AMP: KAF-03 (8447D) ■ RECEIVER: KTR-04 (ESVS10) ■ CABLE: KCC-20/21/22/23/29

DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.2 OPEN TEST SITE

Report No. : 271E0351-YK -B

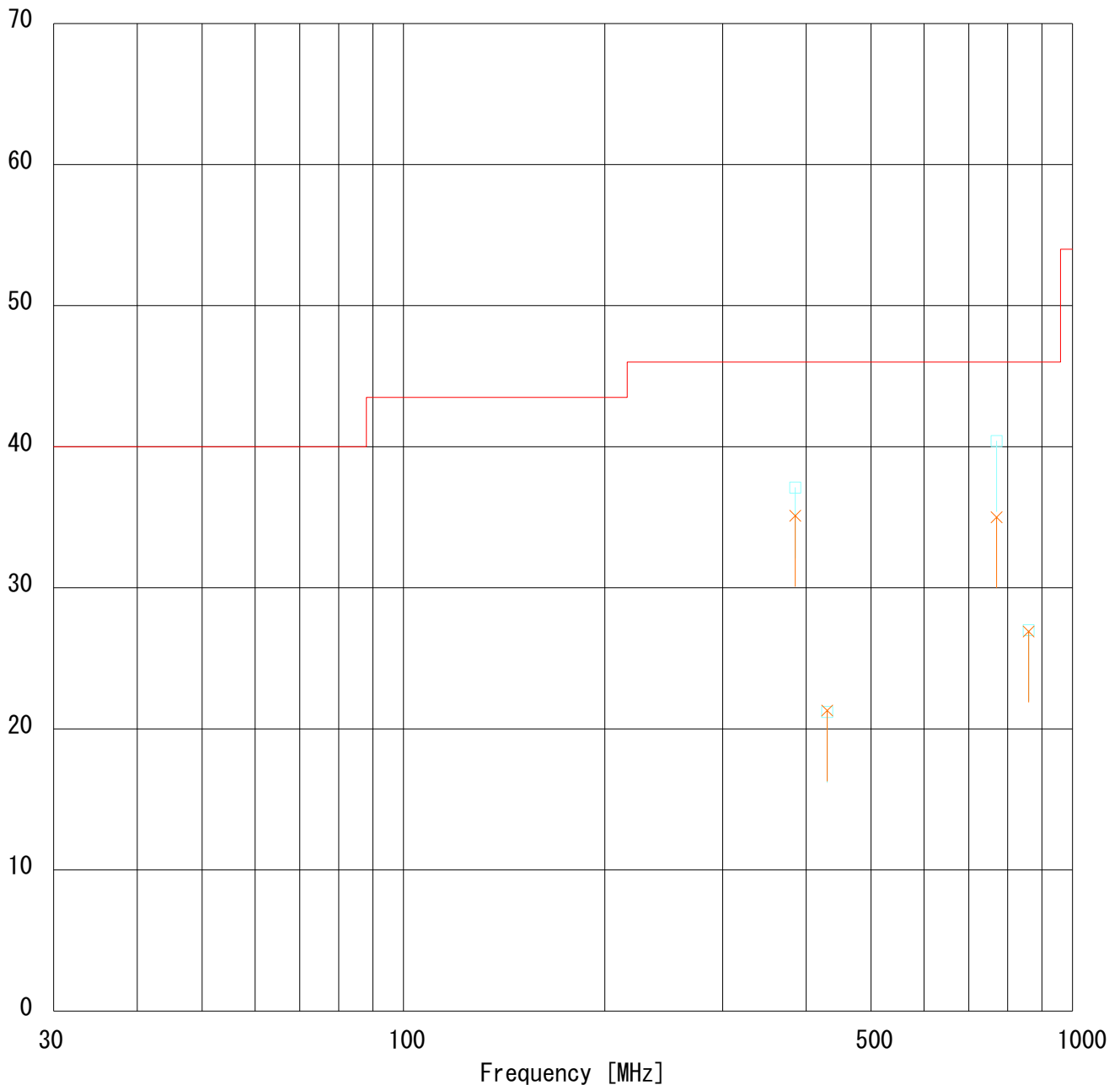
Applicant : SMART COMMUNICATIONS LIMITED.
Kind of Equipment : UHF Handheld Transceiver
Model No. : SC-580 A
Serial No. : Sample2
Power : DC7.2V
Mode : Receiving(429.9750MHz)
Remarks : -
Date : 5/11/2007
Test Distance : 3 m
Temperature : 22 °C
Humidity : 49 %
Regulation : FCC Part15B § 15.109(a)

Engineer : Tatsuya Arai

Emission Level [dB μ V/m]

□ Horizontal

× Vertical



DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.2 OPEN TEST SITE

Report No. : 271E0351-YK -B

Applicant : SMART COMMUNICATIONS LIMITED.
Kind of Equipment : UHF Handheld Transceiver
Model No. : SC-580 A
Serial No. : Sample2
Power : DC7.2V
Mode : Receiving(429.9750MHz)
Remarks : AV (RBW: 1MHz, VBW: 10Hz)
Date : 5/11/2007
Test Distance : 3 m
Temperature : 22 °C
Humidity : 49 %
Regulation : FCC Part15B § 15.109(a)

Engineer : Tatsuya Arai

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	1155.08	BB	36.2	41.2	25.1	36.4	3.2	0.0	28.1	33.1	54.0	25.9	20.9
2.	1540.10	BB	33.8	33.6	25.9	35.8	3.7	0.0	27.6	27.4	54.0	26.4	26.6
3.	1925.13	BB	30.8	31.0	26.6	35.2	4.0	0.0	26.2	26.4	54.0	27.8	27.6

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA: KHA-02 (1-18GHz)

■ AMP: KAF-04 (8449B) ■ SPECTRUM ANALYZER: KSA-02 ■ CABLE: KCC-D14/D15

DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.2 OPEN TEST SITE

Report No. : 271E0351-YK -B

Applicant : SMART COMMUNICATIONS LIMITED.
Kind of Equipment : UHF Handheld Transceiver
Model No. : SC-580 A
Serial No. : Sample2
Power : DC7.2V
Mode : Receiving(429.9750MHz)
Remarks : PK (RBW: 1MHz, VBW: 1MHz)
Date : 5/11/2007
Test Distance : 3 m
Temperature : 22 °C
Humidity : 49 %
Regulation : FCC Part15B CLASS B (PK)

Engineer : Tatsuya Arai

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	1155.08	BB	46.1	47.9	25.1	36.4	3.2	0.0	38.0	39.8	74.0	36.0	34.2
2.	1540.10	BB	44.0	44.8	25.9	35.8	3.7	0.0	37.8	38.6	74.0	36.2	35.4
3.	1925.13	BB	42.9	42.5	26.6	35.2	4.0	0.0	38.3	37.9	74.0	35.7	36.1

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA: KHA-02 (1-18GHz)

■ AMP: KAF-04 (8449B) ■ SPECTRUM ANALYZER: KSA-02 ■ CABLE: KCC-D14/D15

APPENDIX 3
Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
YA-RE	Radiated emission(software)	UL-Apex	RE(Ver.1.5)	RE	-
KAF-03	Pre Amplifier	Hewlett Packard	8447D	RE	2006/09/26 * 12
KAT6-04	Attenuator	INMET	18N-6dB	RE	2007/03/28 * 12
KBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2006/07/22 * 12
KCC-20/21/22 /23/29/KRM-0 2	Coaxial Cable/RF Relay Matrix	Fujikura/Suhner/TSJ	8D-2W/12D-SFA/S042 72B/S04272B/RFM-E3 21	RE	2006/09/22 * 12
KLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2006/07/22 * 12
KOTS-02	Open Test Site	JSE	10m	RE	2006/08/05 * 12
KOS-06	Humidity Indicator	Custom	CTH-190	RE	2006/07/14 * 24
KSA-02	Spectrum Analyzer	Advantest	R3265A	RE	2006/12/02 * 12
KTR-04	Test Receiver	Rohde & Schwarz	ESVS10	RE	2006/10/26 * 12
KJM-04	Measure	TAJIMA	GL19-55	RE	-
KAF-04	Pre Amplifier	Agilent	8449B	RE	2007/04/24 * 12
KCC-D14/D15	Coaxial cable	Suhner	SUCOFLEX 104	RE	2006/12/13 * 12
KHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2007/04/14 * 12

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Test Item:

RE: Radiated emission,