



RADIO TEST REPORT

Test Report No. : 28BE0159-YK-A

Applicant : SOKKIA CO., LTD.
Type of Equipment : Bluetooth Module
Model No. : SM-BT1
FCC ID : S6MSMBT1
Test Standard : FCC Part 15 Subpart C: 2007
Section 15.209
Section 15.247 (d)
Test Result : Complied

1. This test report shall not be reproduced except in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.

Date of test: October 2, 2007

Tested by: T. Arai
Tatsuya Arai

Approved by: O. Watatani
Osamu Watatani
Manager of Yamakita EMC Lab.

UL Japan, Inc.

YAMAKITA EMC LAB.

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MF060b (18.06.07)

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1 Applicant Information

Company Name : SOKKIA CO., LTD.
Brand Name : SOKKIA
Address : 260-63, Hase, Atsugi-shi, Kanagawa-ken, 243-0036 JAPAN
Telephone Number : +81-46-248-0068
Facsimile Number : +81-46-247-6866
Contact Person : Keiji Tomita

2 Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : Bluetooth Module
Model No. : SM-BT1
Serial No. : SMBT10002
Rating : DC3.3V
Country of Manufacture : Japan
Receipt Date of Sample : September 28, 2007
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No modification by the test lab.

2.2 Product Description

Model: SM-BT1 (referred to as the EUT in this report) is a Bluetooth Module.

Clock frequency : 32.768kHz, 24MHz
Equipment type : Transceiver
Frequency of operation : 2402-2480MHz
Bandwidth & channel spacing : 79MHz & 1MHz
Type of modulation : FHSS
Antenna type : 1/2λ Sleeve (Dipole)
Antenna connector type : U.FL connector (hirose)
Antenna gain : 2.14dBi
ITU code : F1D
Operation temperature range : -20 to +70 deg.C.

FCC Part15.31 (e)

The modular transmitter does not have its own power supply, so that the regulated power of 3.3V is supplied from the end product. Therefore the use of this device is limited to the end product which has 3.3V stabilized power source.

FCC Part15.203 & 204 (c) Antenna requirement

This module can select two antennas, one is a chip mounted antenna that cannot be removed by user, and the other is a 1/2λ sleeve antenna. The 1/2λ sleeve antenna of this equipment is connected with U.FL that cannot be accessed by user (Please see Installation description). Therefore the equipment complies with the requirement.

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3 Test Specification, Procedures and Results

3.1 Test specification

Test specification : FCC Part15 Subpart C: 2007
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.209 Radiated emission limits, general requirements
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz,
and 5725-5850MHz

3.2 Procedures & Results

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC 15.247 (d) & 15.209	Radiated	N/A	1.8dB (9764.00MHz, AV, Vertical, Tx 2441MHz)	Complied

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

The measurements also referred to FCC Public Notice DA 00-705 "Guidance on Measurement for Frequency Hopping Spread Spectrum Systems".

3.3 Addition to standard

No addition, exclusion nor deviation has been made from the standard for item tested.

3.4 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

	No.1 open site	No.2 open site	No.1 anechoic chamber
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

Spurious emission test (Radiated)

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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3.5 Test Location

UL Japan, Inc. Yamakita EMC Lab.

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

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	10.0 x 7.5 x 5.7
No.2 shielded room	5.0 x 4.0 x 2.5	Semi-anechoic chamber	
No.3 shielded room	4.0 x 5.0 x 2.7		

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4 System Test Configuration

4.1 Justification

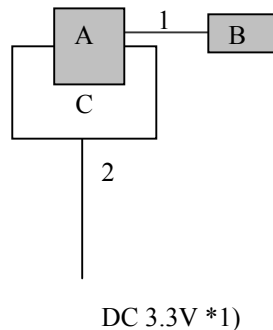
The system was configured in typical fashion (as a customer would normally use it) for testing.

Test mode: Transmitting
- Low channel : 2402MHz
- Middle channel : 2441MHz
- High channel : 2480MHz

*Remarks: Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not influence on the output power and bandwidth of the EUT.

However, the limit level 125mW of AFH mode was used for the test.

4.2 Configuration of Tested System



* 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	Bluetooth module	SM-BT1	SMBT10002	SOKKIA	S6MSMBT1 (EUT)
B	1/2λ sleeve antenna	1029-C17586	-	HOKO ELECTRONICS	(EUT)
C	EVA-board	-	-	-	(jig)

*1) DC power supply (Model No.: PAN35-10A) was used for DC 3.3V input.

List of cables used

No.	Name	Length (m)	Shield		Remark
			Connector	Cable	
1	Antenna cable	0.15	Shielded	Shielded	-
2	DC cable	0.9	Unshielded	Unshielded	-

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5 Out of Band Emissions (Radiated)

5.1 Operating environment

The test was carried out in No.1 anechoic chamber.

5.2 Test configuration

EUT was placed on a urethane 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 - 26GHz
 Test distance : 3m
 EUT operation mode : Transmitting

5.4 Test procedure

The Radiated Electric Field Strength intensity has been measured with a ground plane and at a distance of 3m. 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.

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement. Measurements were performed with QP, PK, and AV detector.

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

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

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer
Detector IF bandwidth	QP: BW 120kHz	PK: RBW: 1MHz/VBW: 1MHz, AV: RBW: 1MHz VBW: 200Hz (See data)
Measuring antenna	Biconical (30-300MHz) Logperiodic (300MHz-1GHz)	Horn

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.

Below 1GHz		Above 1GHz	
Module	Antenna	Module	Antenna
Horizontal: X, Vertical: X	Horizontal: X, Vertical: Y	Horizontal: Z, Vertical: Z	Horizontal: X, Vertical: Y

5.5 Band edge

Band edge level at 2390MHz and 2483.5MHz is below the limits of FCC 15.209. Refer to the data.

Band edge level at 2400MHz is below the 20dBc. Refer to the 26LE0147-YK-A (original) report.

5.6 Results

Summary of the test results : Pass
 No noise emission was detected above 13GHz.

Date: October 2, 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

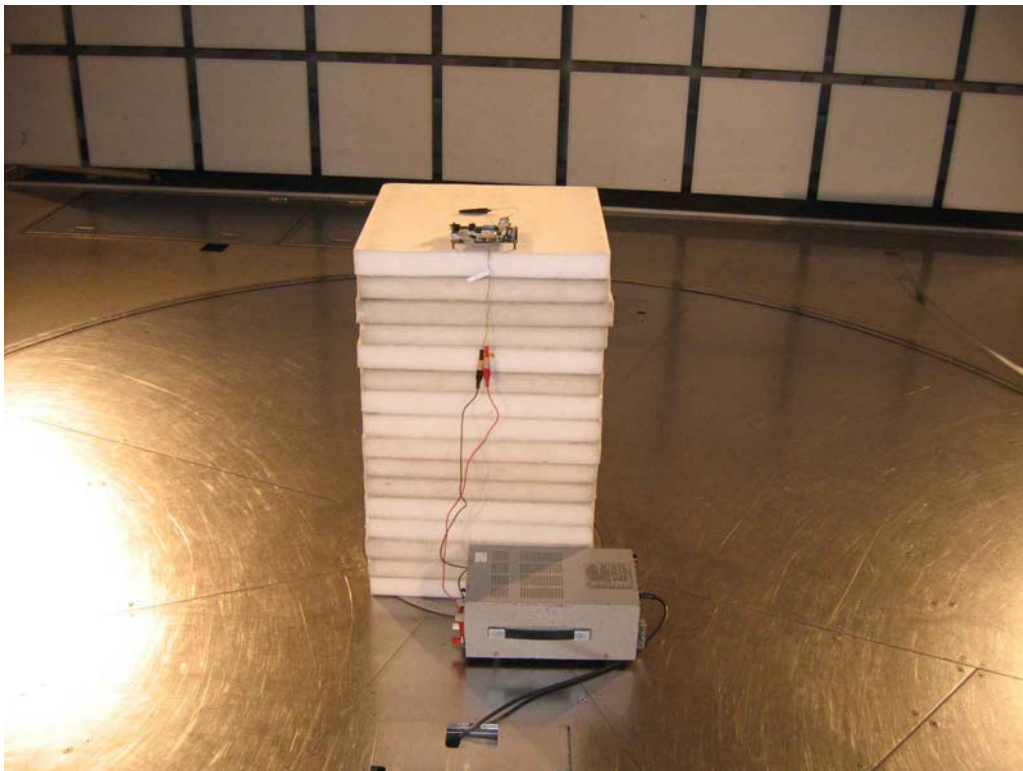
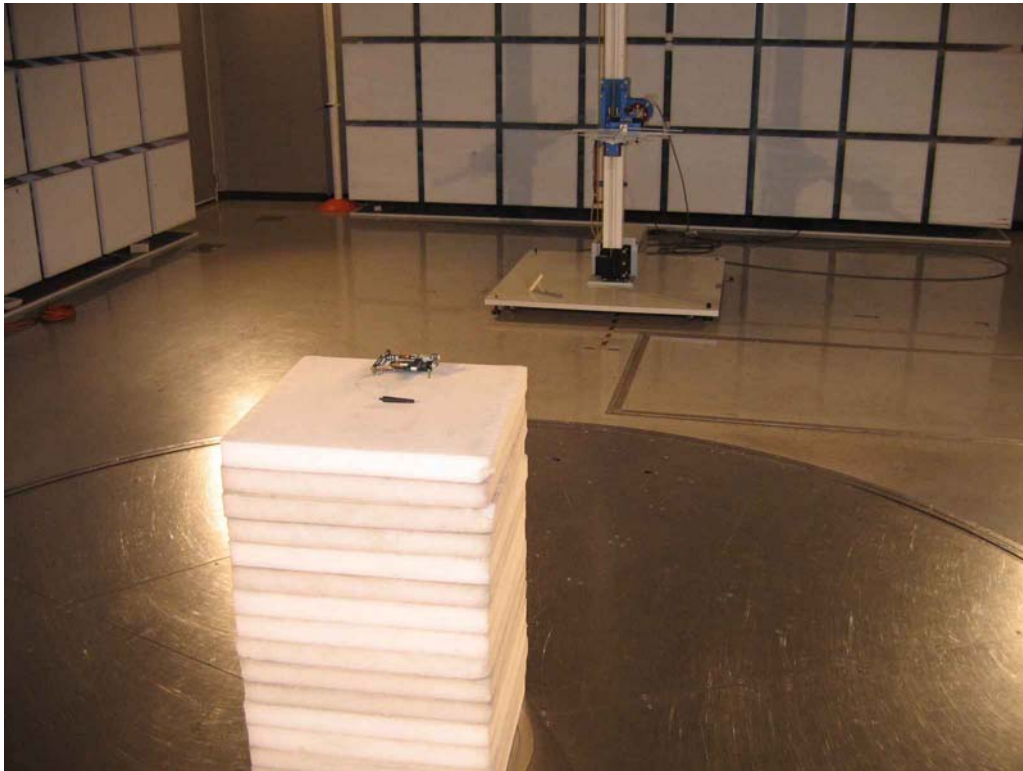
APPENDIX 2: Test Data

Page 11 - 22 : Out of Band Emissions (Radiated)
Page 23 : Duty cycle

APPENDIX 3: Test instruments

Page 24 : Test instruments

Radiated emission



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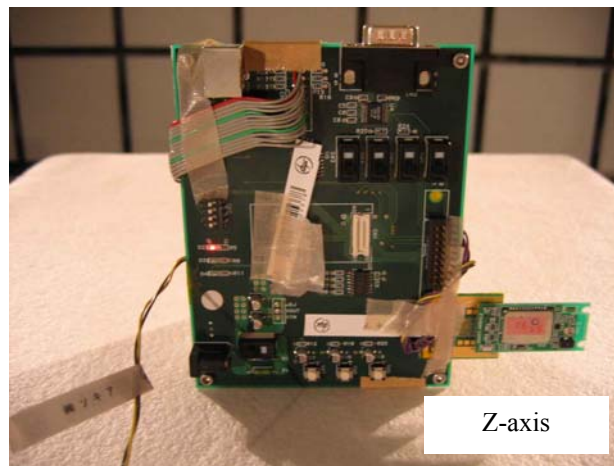
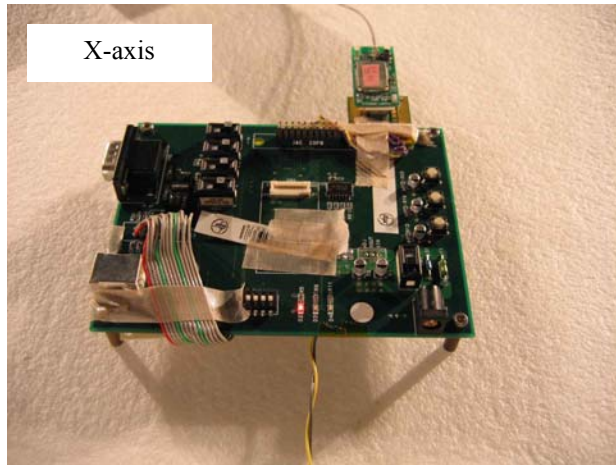
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Pre-check of the worst position

Module



Antenna



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DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 28BE0159-YK-A

Applicant : SOKKIA CO., LTD.
Kind of Equipment : BLUETOOTH MODULE
Model No. : SM-BT1
Serial No. : SMBT10002
Power : DC3.3V
Mode : Tx:2402MHz
Remarks : ANT:1029-C17586
Date : 10/2/2007
Test Distance : 3 m
Temperature : 24 °C
Humidity : 62 %
Regulation : FCC Part15C § 15.209

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.	360.03	BB	26.4	23.4	15.9	28.0	4.3	5.9	24.5	21.5	46.0	21.5	24.5
2.	408.03	BB	28.4	24.6	17.1	28.5	4.8	5.9	27.7	23.9	46.0	18.3	22.1
3.	720.06	BB	23.1	22.7	20.3	29.1	6.0	5.9	26.2	25.8	46.0	19.8	20.2
4.	816.06	BB	23.0	22.8	21.3	28.9	6.4	5.9	27.7	27.5	46.0	18.3	18.5

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

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz / KLA-03 (USLP9143) 300-1000MHz

■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-01 (ES140)

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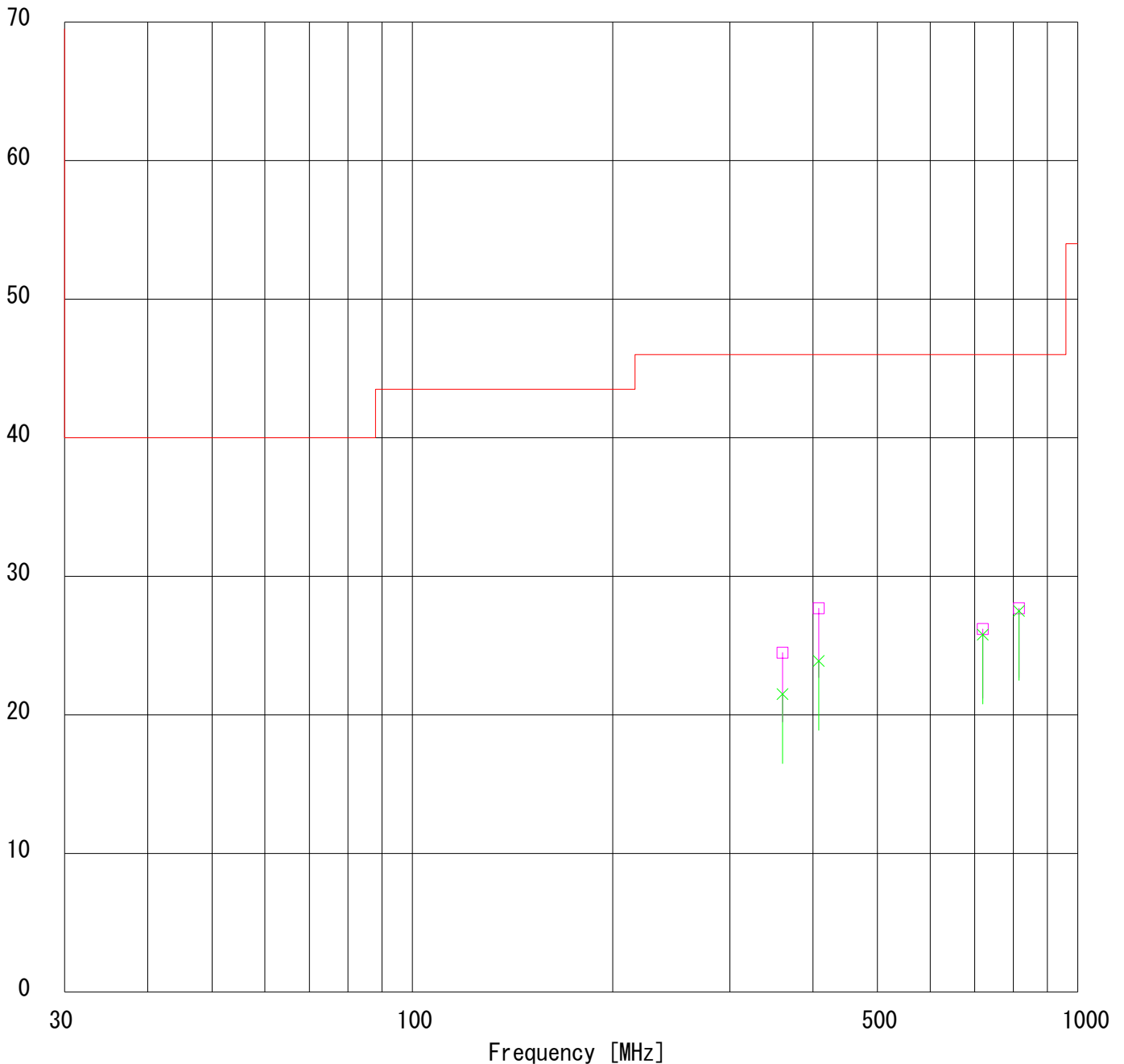
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Kind of Equipment : BLUETOOTH MODULE
Model No. : SM-BT1
Serial No. : SMBT10002
Power : DC3.3V
Mode : Tx:2402MHz
Remarks : ANT:1029-C17586
Date : 10/2/2007
Test Distance : 3 m
Temperature : 24 °C
Humidity : 62 %
Regulation : FCC Part15C § 15.209

Engineer : Tatsuya Arai

Emission Level [dB μ V/m]

□ Horizontal

× Vertical



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Applicant : SOKKIA CO., LTD.
Kind of Equipment : BLUETOOTH MODULE
Model No. : SM-BT1
Serial No. : SMBT10002
Power : DC3.3V
Mode : Tx:2402MHz
Remarks : ANT:1029-C17586 PK (RBW:1MHz, VBW:1Mz)
Date : 10/2/2007
Test Distance : 3 m
Temperature : 24 °C Engineer : Tatsuya Arai
Humidity : 62 %
Regulation : FCC Part15C § 15.209 (a) (PK) 1-18GHz:3m/18-40GHz:1m

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	2390.00	BB	45.9	46.2	28.5	35.5	5.0	10.1	54.0	54.3	74.0	20.0	19.7
2.	4804.00	BB	50.9	51.2	32.9	34.6	5.7	0.7	55.6	55.9	74.0	18.4	18.1
3.	7206.00	BB	47.7	49.9	36.5	35.3	7.6	0.1	56.6	58.8	74.0	17.4	15.2
4.	9608.00	BB	47.7	50.7	37.7	35.9	7.7	0.6	57.8	60.8	74.0	16.2	13.2
5.	12010.00	BB	45.2	45.9	40.0	35.5	8.9	0.5	59.1	59.8	74.0	14.9	14.2

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

■ ANTENNA:KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■ CABLE:KCC-D3/D7 ■ PREAMP:APPRA05 (8449B) ■ EMI RECEIVER:KTR-01 (ES140)

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Model No. : SM-BT1
Serial No. : SMBT10002
Power : DC3.3V
Mode : Tx:2402MHz
Remarks : ANT:1029-C17586 AV (RBW:1MHz, VBW:200Hz)
Date : 10/2/2007
Test Distance : 3 m
Temperature : 24 °C Engineer : Tatsuya Arai
Humidity : 62 %
Regulation : FCC Part15C § 15.209(a) 1-18GHz:3m/18-40GHz:1m

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	2390.00	BB	33.5	33.7	28.5	35.5	5.0	10.1	41.6	41.8	54.0	12.4	12.2
2.	4804.00	BB	46.4	46.2	32.9	34.6	5.7	0.7	51.1	50.9	54.0	2.9	3.1
3.	7206.00	BB	38.9	41.0	36.5	35.3	7.6	0.1	47.8	49.9	54.0	6.2	4.1
4.	9608.00	BB	38.2	41.9	37.7	35.9	7.7	0.6	48.3	52.0	54.0	5.7	2.0
5.	12010.00	BB	33.2	33.4	40.0	35.5	8.9	0.5	47.1	47.3	54.0	6.9	6.7

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

■ ANTENNA:KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

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Kind of Equipment : BLUETOOTH MODULE
Model No. : SM-BT1
Serial No. : SMBT10002
Power : DC3.3V
Mode : Tx:2441MHz
Remarks : ANT:1029-C17586
Date : 10/2/2007
Test Distance : 3 m
Temperature : 24 °C
Humidity : 62 %
Regulation : FCC Part15C § 15.209

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.	360.03	BB	26.3	23.9	15.9	28.0	4.3	5.9	24.4	22.0	46.0	21.6	24.0
2.	408.03	BB	27.5	23.5	17.1	28.5	4.8	5.9	26.8	22.8	46.0	19.2	23.2
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4.	816.06	BB	23.0	22.7	21.3	28.9	6.4	5.9	27.7	27.4	46.0	18.3	18.6

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

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz / KLA-03 (USLP9143) 300-1000MHz

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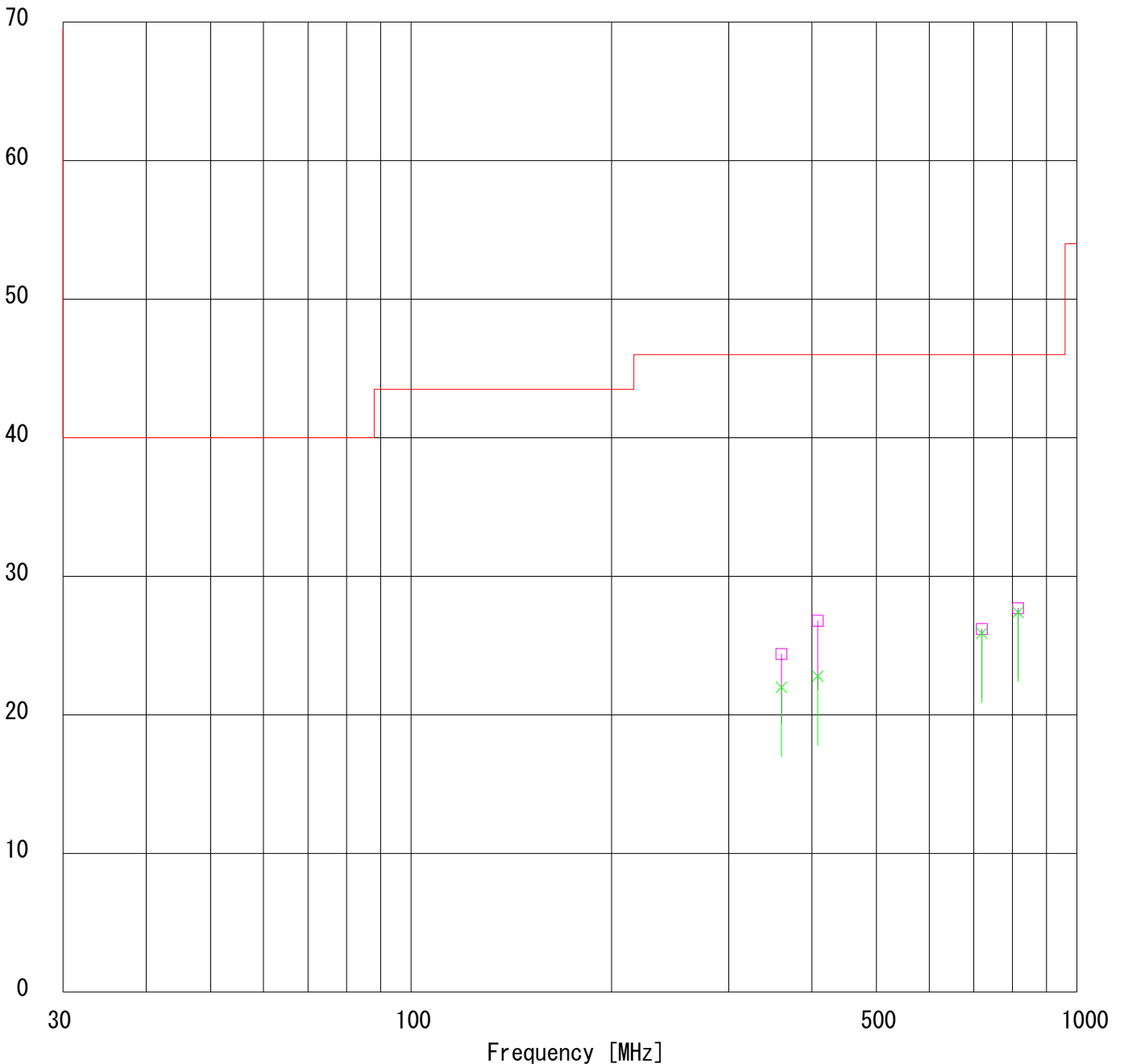
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Regulation : FCC Part15C § 15.209

Engineer : Tatsuya Arai

Emission Level [dB μ V/m]

□ Horizontal

× Vertical



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Date : 10/2/2007
Test Distance : 3 m
Temperature : 24 °C Engineer : Tatsuya Arai
Humidity : 62 %
Regulation : FCC Part15C § 15.209 (a) (PK) 1-18GHz:3m/18-40GHz:1m

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	4882.00	BB	50.0	50.8	33.1	34.6	5.8	0.7	55.0	55.8	74.0	19.0	18.2
2.	7323.00	BB	47.3	49.1	36.7	35.3	7.7	0.1	56.5	58.3	74.0	17.5	15.7
3.	9764.00	BB	49.2	51.3	37.7	35.9	7.7	0.6	59.3	61.4	74.0	14.7	12.6
4.	12205.00	BB	45.7	46.1	40.2	35.4	9.0	0.4	59.9	60.3	74.0	14.1	13.7

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

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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.	4882.00	BB	46.1	46.1	33.1	34.6	5.8	0.7	51.1	51.1	54.0	2.9	2.9
2.	7323.00	BB	38.6	40.2	36.7	35.3	7.7	0.1	47.8	49.4	54.0	6.2	4.6
3.	9764.00	BB	39.0	42.1	37.7	35.9	7.7	0.6	49.1	52.2	54.0	4.9	1.8
4.	12205.00	BB	33.3	33.4	40.2	35.4	9.0	0.4	47.5	47.6	54.0	6.5	6.4

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

■ ANTENNA:KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■ CABLE:KCC-D3/D7 ■ PREAMP:APPRA05 (8449B) ■ EMI RECEIVER:KTR-01 (ES140)

DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 28BE0159-YK-A

Applicant : SOKKIA CO., LTD.
Kind of Equipment : BLUETOOTH MODULE
Model No. : SM-BT1
Serial No. : SMBT10002
Power : DC3.3V
Mode : Tx:2480MHz
Remarks : ANT:1029-C17586
Date : 10/2/2007
Test Distance : 3 m
Temperature : 24 °C
Humidity : 62 %
Regulation : FCC Part15C § 15.209

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.	360.03	BB	25.8	24.2	15.9	28.0	4.3	5.9	23.9	22.3	46.0	22.1	23.7
2.	408.03	BB	27.5	23.7	17.1	28.5	4.8	5.9	26.8	23.0	46.0	19.2	23.0
3.	720.06	BB	23.0	22.7	20.3	29.1	6.0	5.9	26.1	25.8	46.0	19.9	20.2
4.	816.06	BB	22.9	22.9	21.3	28.9	6.4	5.9	27.6	27.6	46.0	18.4	18.4

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

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz / KLA-03 (USLP9143) 300-1000MHz
■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-01 (ES140)

DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 28BE0159-YK-A

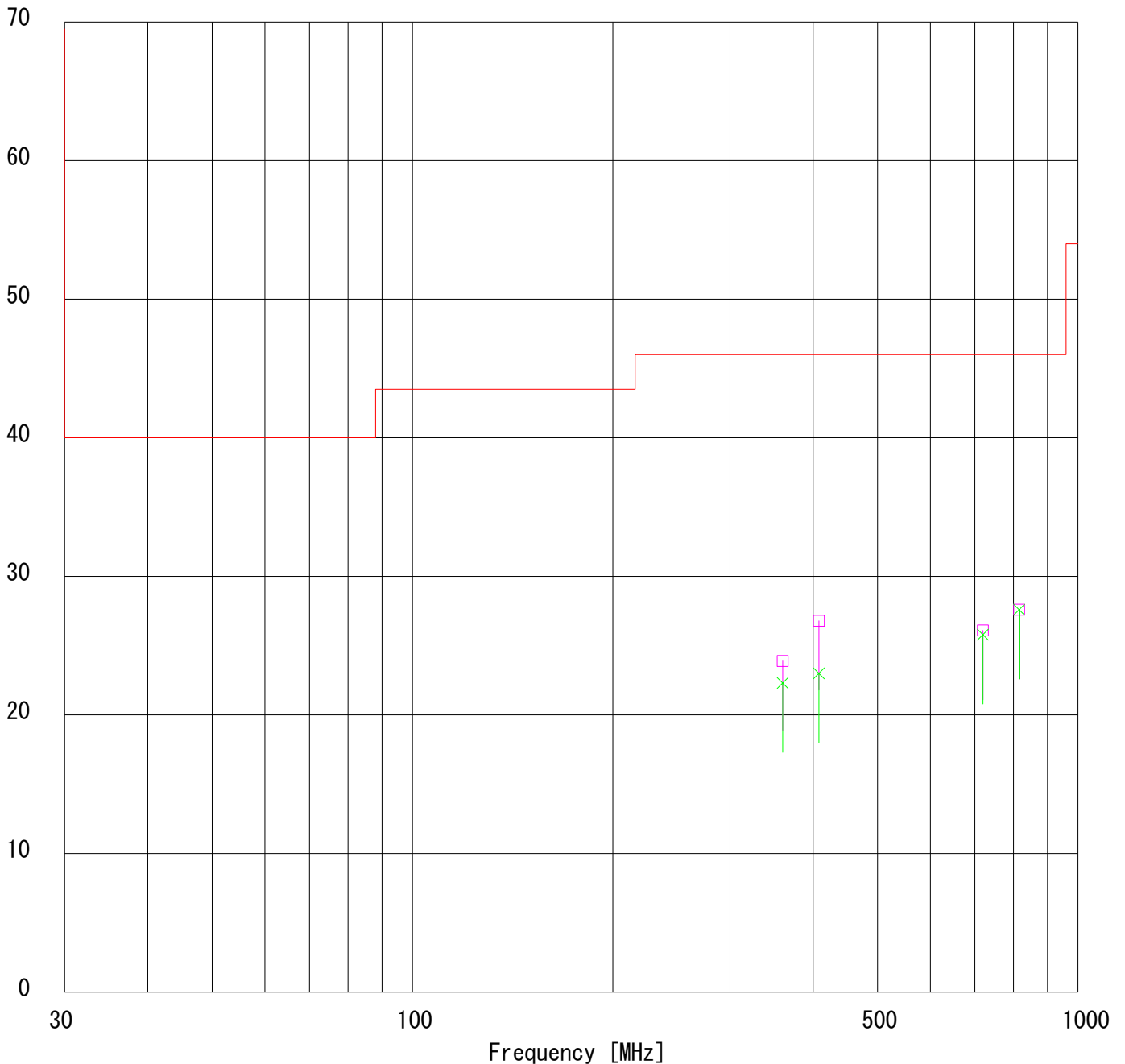
Applicant : SOKKIA CO., LTD.
Kind of Equipment : BLUETOOTH MODULE
Model No. : SM-BT1
Serial No. : SMBT10002
Power : DC3.3V
Mode : Tx:2480MHz
Remarks : ANT:1029-C17586
Date : 10/2/2007
Test Distance : 3 m
Temperature : 24 °C
Humidity : 62 %
Regulation : FCC Part15C § 15.209

Engineer : Tatsuya Arai

Emission Level [dB μ V/m]

□ Horizontal

× Vertical



DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 28BE0159-YK-A

Applicant : SOKKIA CO., LTD.
Kind of Equipment : BLUETOOTH MODULE
Model No. : SM-BT1
Serial No. : SMBT10002
Power : DC3.3V
Mode : Tx:2480MHz
Remarks : ANT:1029-C17586 PK (RBW:1MHz, VBW:1MHz)
Date : 10/2/2007
Test Distance : 3 m
Temperature : 24 °C Engineer : Tatsuya Arai
Humidity : 62 %
Regulation : FCC Part15C § 15.209 (a) (PK) 1-18GHz:3m/18-40GHz:1m

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	2483.50	BB	49.3	48.6	28.3	35.5	5.1	10.2	57.4	56.7	74.0	16.6	17.3
2.	4960.00	BB	49.3	48.6	33.4	34.6	5.8	0.7	54.6	53.9	74.0	19.4	20.1
3.	7440.00	BB	46.6	46.0	36.8	35.4	7.9	0.2	56.1	55.5	74.0	17.9	18.5
4.	9920.00	BB	47.9	46.4	37.7	35.9	7.7	0.6	58.0	56.5	74.0	16.0	17.5
5.	12400.00	BB	46.2	46.1	40.3	35.2	9.1	0.4	60.8	60.7	74.0	13.2	13.3

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

■ ANTENNA:KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■ CABLE:KCC-D3/D7 ■ PREAMP:APPRA05 (8449B) ■ EMI RECEIVER:KTR-01 (ES140)

DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 28BE0159-YK-A

Applicant : SOKKIA CO., LTD.
Kind of Equipment : BLUETOOTH MODULE
Model No. : SM-BT1
Serial No. : SMBT10002
Power : DC3.3V
Mode : Tx:2480MHz
Remarks : ANT:1029-C17586 AV (RBW:1MHz, VBW:200Hz)
Date : 10/2/2007
Test Distance : 3 m
Temperature : 24 °C Engineer : Tatsuya Arai
Humidity : 62 %
Regulation : FCC Part15C § 15.209(a) 1-18GHz:3m/18-40GHz:1m

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	2483.50	BB	40.0	41.1	28.3	35.5	5.1	10.2	48.1	49.2	54.0	5.9	4.8
2.	4960.00	BB	44.9	44.5	33.4	34.6	5.8	0.7	50.2	49.8	54.0	3.8	4.2
3.	7440.00	BB	38.3	38.2	36.8	35.4	7.9	0.2	47.8	47.7	54.0	6.2	6.3
4.	9920.00	BB	37.6	37.4	37.7	35.9	7.7	0.6	47.7	47.5	54.0	6.3	6.5
5.	12400.00	BB	33.7	34.1	40.3	35.2	9.1	0.4	48.3	48.7	54.0	5.7	5.3

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

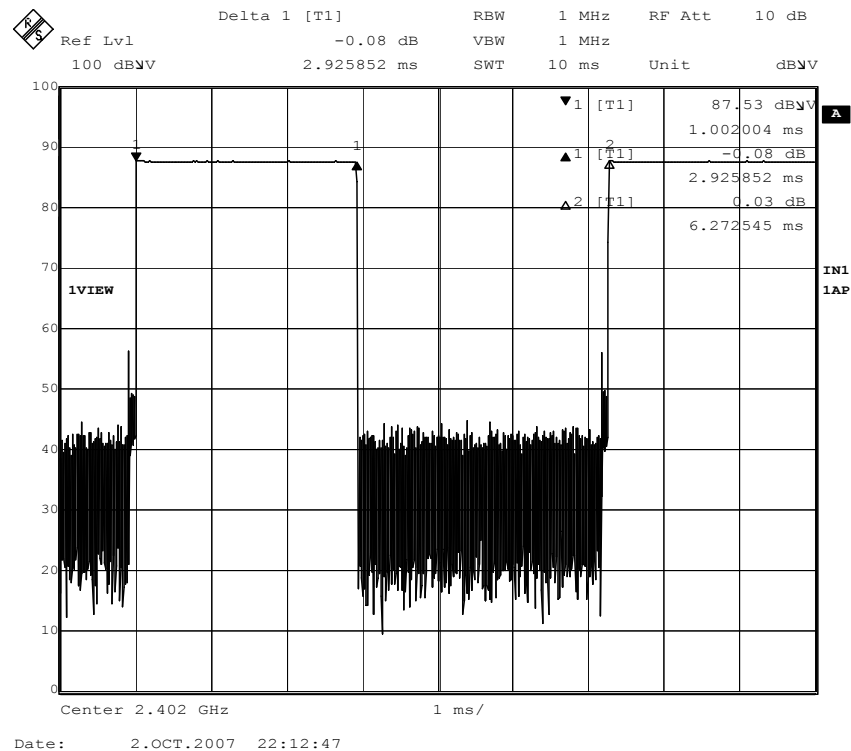
■ ANTENNA:KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■ CABLE:KCC-D3/D7 ■ PREAMP:APPRA05 (8449B) ■ EMI RECEIVER:KTR-01 (ES140)

Duty Cycle

COMPANY : SOKKIA
EQUIPMENT : BLUETOOTH MODULE
MODEL NUMBER: SM-BT1
SERIAL NUMBER: SMT10002
POWER : DC3.3V

REPORT NO : 28BE0159-YK-A
DATE : 2007/10/02
TEMP./HUMI : 24deg.C./62%
TEST MODE : Tx2402MHz
ENGINEER : Tatsuya Arai



Duty Cycle: 6.27ms

AV Detector VBW: $1 / 6.27\text{ms} = 159.49\text{Hz} \rightarrow 200\text{Hz}$

- * All the measured noise was pulse emission.
- * Duty cycle was within 100msec.

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 Japan	RE(Ver.1.5)	RE	-
KAEC-01	Anechoic Chamber	JSE	Semi 3m	RE	2007/08/26 * 12
KAF-05	Pre Amplifier	Agilent	8447D	RE	2007/04/13 * 12
KAT6-01	Attenuator	INMET	18N-6dB	RE	2007/03/28 * 12
KBA-03	Biconical Antenna	Schwarzbeck	BBA9106	RE	2007/01/06 * 12
KCC-30/31/32 /34/KRM-03	Coaxial Cable/RF Relay Matrix	Fujikura/Suhner/TSJ	5D-2W/S04272B/RFM-E421	RE	2006/11/27 * 12
KLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2007/01/06 * 12
KSA-04	Spectrum Analyzer	Advantest	R3271A	RE	2007/09/25 * 12
KTR-01	Test Receiver	Rohde & Schwarz	ESI40	RE	2007/04/12 * 12
KOS-02	Humidity Indicator	Custom	CTH-190	RE	2006/07/10 * 24
KJM-01	Measure	TAJIMA	GL19-55	RE	-
KAT10-S2	Attenuator	Agilent	8490D 010	RE	2006/12/13 * 12
KCC-D3/D7	Coaxial Cable	Rosenberger/Advantest	2201/JUN-08-01-061	RE	2007/04/11 * 12
KFL-01	Highpass Filter	Hewlett Packard	84300 80038	RE	2007/04/11 * 12
KHA-01	Horn Antenna	A.H.Systems	SAS-200/571	RE	2007/08/14 * 12
KHA-03	Horn Antenna	EMCO	3160-09	RE	2007/04/14 * 12
APPRA05	Pre Amplifier	Hewlett Packard	8449B	RE	2006/12/21 * 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: Out of Band Emission (Radiated)