SAR TEST REPORT

Test Report No.: 26KE0022-HO-B

Applicant	:	**BROTHER INDUSTRIES,LTD.**
Type of Equipment	:	**Digital Cordless Handset**
Model No.	:	**BCL-D10**
FCC ID	:	**B3QBCLD10**
Test standard	:	**FCC47CFR 2.1093** **FCC OET Bulletin 65, Supplement C**
Test Result	:	**Complied**
Max. SAR Measured	:	**Head 0.048W/kg (5725.809328MHz)** **Body 0.230W/kg (5725.809328MHz)**

1. This test report shall not be reproduced except full or partial, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with the above standard. We hereby certify that the data contain a true representation of the SAR profile.
4. The test results in this test report are traceable to the national or international standards.

Date of test:
July 3,4, 2006

Tested by:
H. Sato
Hisayoshi Sato
EMC Services

Approved by :
T. Maeno
Tetsuo Maeno
Site Manager of EMC Services

NVLAP®
NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, 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://ulapex.jp/emc/nvlap.htm

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CONTENTS **PAGE**

SECTION 1 : Client information

Company Name	BROTHER INDUSTRIES,LTD.
Brand name	brother
Address	1-1-1, Kawagishi, Mizuho-ku, Nagoya 467-8562, Japan
Telephone Number	+81-52-824-2348
Facsimile Number	+81-52-824-2734
Contact Person	Katsuhiro Sato

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

2.1 Identification of E.U.T.

Type of Equipment		Digital Cordless Handset
Model No.		BCL-D10
Serial No.		0001
Country of Manufacture		China
Battery	Model Name	BCL-BT10
	Rating	DC+3.6V
	Manufacture	brother
Condition of EUT		Engineering prototype (Not for sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample		May 29 and 30 , 2006
Category Identified		Portable device
Modification of EUT		No modification by the test lab.

2.2 Product description

2.2.1 General Information

Feature of EUT	It can be used as a cordless phone unit of facsimile. EUT has a function of connecting to inside and outside line.
Size	W49.6*D31.6*H154mm
Range of operation temperature	+5 deg. C. to +35 deg. C.
Operation Clock	13.824MHz

2.2.2 Radio Specification

Equipment Type	Transceiver
Frequency band	Low Channel = 5725.809328 MHz High Channel = 5848.889420 MHz
Bandwidth & Channel spacing	Bandwidth: 1MHz Channel spacing: 891.871kHz
Type of Modulation	FHSS
Antenna Type	Patch antenna
Antenna Connector Type	N/A
Antenna Gain	5.5dBi(Max)
Antenna location	Refer to Appendix 1
Max.Transmit Power tested	18.94dBm (78.26mW)
Power Supply	DC +3.3V
Method of Frequency Generation	Synthesizer

SECTION 3 : Test standard information

3.1 Requirements for compliance testing defined by the FCC

The US Federal Communications Commission has released the report and order “Guidelines for Evaluating the Environmental Effects of RF Radiation", ET Docket No. 93-62 in August 1996. The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g for an uncontrolled environment and 8.0 mW/g for an occupational/controlled environment as recommended by the ANSI/IEEE standard C95.1-1992. According to the Supplement C of OET Bulletin 65 “Evaluating Compliance with FCC Guide-lines for Human Exposure to Radio frequency Electromagnetic Fields", released on Jun 29, 2001 by the FCC, the device should be evaluated at maximum output power (radiated from the antenna) under “worst-case” conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

1 Specific Absorption Rate (SAR) is a measure of the rate of energy absorption due to exposure to an RF transmitting source (wireless portable device).
2 IEEE/ANSI Std. C95.1-1992 limits are used to determine compliance with FCC ET Docket 93-62.

3.2 Exposure limit

(A) Limits for Occupational/Controlled Exposure (W/kg)

Spatial Average (averaged over the whole body)	Spatial Peak (averaged over any 1g of tissue)	Spatial Peak (hands/wrists/feet/ankles averaged over 10g)
0.4	8.0	20.0

(B) Limits for General population/Uncontrolled Exposure (W/kg)

Spatial Average (averaged over the whole body	Spatial Peak (averaged over any 1g of tissue)	Spatial Peak (hands/wrists/feet/ankles averaged over 10g)
0.08	1.6	4.0

Occupational/Controlled Environments: are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

General Population/Uncontrolled Environments: are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

NOTE:GENERAL POPULATION/UNCONTROLLED EXPOSURE
SPATIAL PEAK(averaged over any 1g of tissue) LIMIT
1.6 W/kg

SECTION 4 : Test result

4.1 Result of Max. SAR value

Max. SAR Measured : **Head 0.048W/kg (5725.809328MHz)**
Body 0.230W/ kg (5725.809328MHz)

4.2 Test Location

UL Apex Co., Ltd. Head Office EMC Lab.
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Telephone : +81 596 24 8116
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SECTION 5 : Operation of E.U.T. during testing

5.1 Operating modes

	The frequency band and the modulation used in this test are shown as a following. Frequency band : 5725.809328 – 5848.88942 MHz Channel : 1ch(5725.809328 MHz) 71ch(5788.240269MHz) 139ch(5848.889420MHz) Modulation : FHSS Duty Cycle[%] : 10% Crest factor : 10

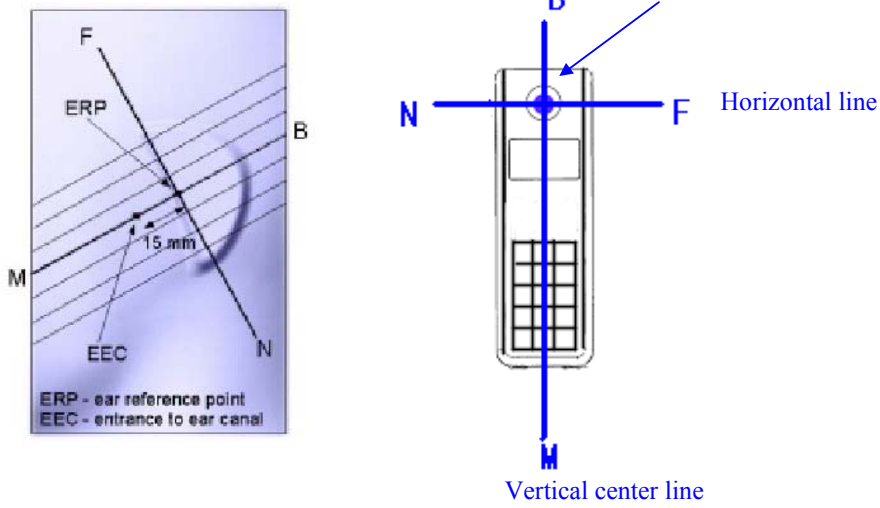
5.2 Description of the Head test setup

According to the OET 65 and IEEE1528, this EUT was tested on the "Cheek/Touch" and "Ear/Tilt" positions at the left head and right head section of the SAM Twin Phantom.

5.2.1 Initial ear position

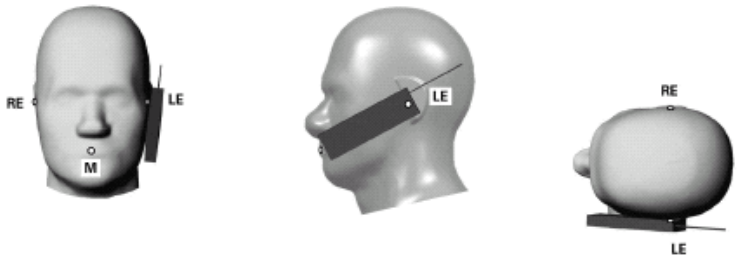
A handset should be initially positioned with the earpiece region pressed against the ear spacer of a head phantom.

The device should be positioned parallel to the "N-F" line defined along the base of the ear spacer that contains the "ear reference point". The "test device reference point" is aligned to the "ear reference point" on the head phantom and the "vertical centerline" is aligned to the "phantom reference plane".



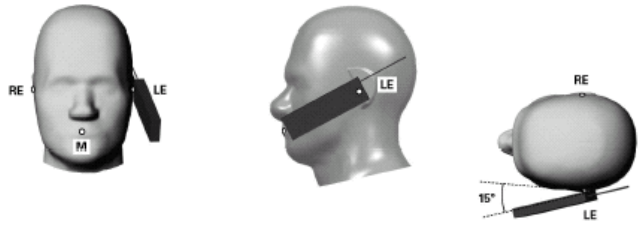
5.2.2 Cheek position

The device is brought toward the mouth of the head phantom by pivoting against the "ear reference point" or along the "N-F" line.
This test position is established:
i) When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.
ii) (or) When any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.



5.2.3 Tilt position

If the earpiece of the handset is not in full contact with the phantom's ear spacer and the peak SAR location for the "Cheek/Touch" position is located at the ear spacer region or corresponds to the earpiece region of the handset, the device should be returned to the "initial ear position" by rotating it away from the mouth until the earpiece is in full contact with the ear spacer.Otherwise the handset should be moved away from the cheek perpendicular to the line passes through both "ear reference points" for approximate 2-3 cm. While it is in this position, the handset is tilted away from the mouth with respect to the "test device reference point" by 15°. After the tilt, it is then moved back toward the head perpendicular to the line passes through both "ear reference points" until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process should be repeated with a tilt angle less than 15° so that the device and its antenna would touch the phantom simultaneously.



5.3 Description of the Body test setup

When users operate or carry the EUT, it could be considered to touch or get close to their bodies. In order to assume this situation, we performed the test at the following positions. Please refer to "APPENDIX 1".

Front position:
The test was performed in touch with Front surface of EUT to the flat section of SAM Twin Phantom.

Back position:
The test was performed in touch with Back surface of EUT to the flat section of SAM Twin Phantom.

Left Side position:
The test was performed in touch with Left Side surface of EUT to the flat section of SAM Twin Phantom.

Right Side position:
The test was performed in touch with Right Side surface of EUT to the flat section of SAM Twin Phantom.

Top position:
The test was performed in touch with Top surface of EUT to the flat section of SAM Twin Phantom.

Bottom position:
The test was performed in touch with Bottom surface of EUT to the flat section of SAM Twin Phantom.

Back position(Separation 5mm, 10mm, 15mm):
The test was performed in the separation of 5mm, 10mm, 15mm between EUT and flat sections of the SAM Twin Phantom

5.4 Measurement procedure

1. Confirmation before testing

The data of EMC test is used as a substitute for SAR test because there is no possibility in power change obviously as follows:
- EMC and SAR tests are performed with the same test sample under the same condition.
- EMC and SAR tests are performed at the same laboratory.
- The test mode setting is simple, and there is no possibility that the power (value) is changed by the wrong setting.

2. SAR Measurement (Radiated power is always monitored by Spectrum Analyzer.)

Head SAR

Step1. Worst position search
The frequency was set to Mid channel, and the position that has the maximum SAR value was detected.

Step2. Change channels
Test was performed using Low/High channels at the position of the maximum value.

Body SAR

Step1. Worst position search
The frequency was set to Mid channel, and the position that has the maximum SAR value was detected.

Step2. Change channels
Test was performed using Low/High channels at the position of the maximum value.

Step3. Change separations
The measurement was performed with the distance, 5mm, 10mm and 15mm to check if the shortest distance (0mm) may not have the worst value at the conditions of the highest SAR value. As a result, the shortest distance (0mm) had the worst value

*It is checked that the power drift value at each measurement is within ±5% as to the power change before and after the SAR test. When the power drift value is over +/-5%, the power changes against time is measured to confirm the changes are within tolerance.
Moreover, the change rate is reflected on the uncertainty.

SECTION 6 : Test surrounding

6.1 Measurement uncertainty

The uncertainty budget has been determined for the DASY4 measurement system according to the SPEAG documents[6][7] and is given in the following Table.

Error Description	Uncertainty value ± %	Probability distribution	divisor	(ci) 1g	Standard Uncertainty (1g)	vi or veff
Measurement System						
Probe calibration	±6.8	Normal	1	1	±6.8	∞
Axial isotropy of the probe	±4.7	Rectangular	√3	0.7	±1.9	∞
Spherical isotropy of the probe	±9.6	Rectangular	√3	0.7	±3.9	∞
Boundary effects	±2.0	Rectangular	√3	1	±1.2	∞
Probe linearity	±4.7	Rectangular	√3	1	±2.7	∞
Detection limit	±1.0	Rectangular	√3	1	±0.6	∞
Readout electronics	±1.0	Normal	1	1	±1.0	∞
Response time	±0.8	Rectangular	√3	1	±0.5	∞
Integration time	±2.6	Rectangular	√3	1	±1.5	∞
RF ambient Noize	±3.0	Rectangular	√3	1	±1.7	∞
RF ambient Reflections	±3.0	Rectangular	√3	1	±1.7	∞
Mech. constraints of robot	±0.8	Rectangular	√3	1	±0.5	∞
Probe positioning	±9.9	Rectangular	√3	1	±5.7	∞
Extrap. and integration	±4.0	Rectangular	√3	1	±2.3	∞
Test Sample Related						
Device positioning	±2.9	Normal	1	1	±2.9	17
Device holder uncertainty	±3.6	Normal	1	1	±3.6	13
Power drift	±5.0	Rectangular	√3	1	±2.9	∞
Phantom and Setup						
Phantom uncertainty	±4.0	Rectangular	√3	1	±2.3	∞
Liquid conductivity (target)	±5.0	Rectangular	√3	0.64	±1.8	∞
Liquid conductivity (meas.)	±5.0	Normal	1	0.64	±3.2	∞
Liquid permittivity (target)	±5.0	Rectangular	√3	0.6	±1.7	∞
Liquid permittivity (meas.)	±5.0	Normal	1	0.6	±3.0	∞
Combined Standard Uncertainty					**±13.515**	
Expanded Uncertainty (k=2)					**±27.0**	

SECTION 7 : Confirmation before testing

7.1 Conducted power

Date : June 30, 2006

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Result [mW]
Low	5725.809328	-3.36	1.71	20.24	18.59	72.21
Mid	5788.240269	-3.16	1.84	20.26	18.94	78.26
High	5848.889420	-3.26	1.81	20.28	18.83	76.35

Sample Calculation:
Result = Reading + Cable Loss (supplied by customer)+ Attenuator

* This data is the measured Maximum Peak OutPut Power of EMC Test. (Reference Report No. 26KE0022-HO-A)

SECTION 8 : Measurement results

8.1 Head 5800MHz SAR

Liquid Depth (cm)	**:**	**15.0**	**Model**	**:**	**BCL-D10**
Parameters	**:**	**εr =34.5, σ =5.48**	**Serial No.**	**:**	**0001**
Ambient temperature (deg.c.)	**:**	**24.2**	**Modulation**	**:**	**FHSS**
Relative Humidity (%)	**:**	**56**	**Crest factor**	**:**	**10**
Date	**:**	**July 4,2006**	**Measured By**	**:**	**Hisayoshi Sato**

HEAD SAR MEASUREMENT RESULTS								
Frequency		Modulation	Phantom Section	EUT Set-up Conditions		Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Before	After	Maximum value of multi-peak
Step1. Worst position search								
Mid	5788.240269	FHSS	Left head	Fixed	Cheek	24.0	24.0	**0.042**
Mid	5788.240269	FHSS	Left head	Fixed	Tilt	23.9	23.9	**0.046**
Mid	5788.240269	FHSS	Right head	Fixed	Cheek	23.9	23.9	**0.033**
Mid	5788.240269	FHSS	Right head	Fixed	Tilt	24.0	24.0	**0.036**
Step2. Chamge channel								
Low	5725.809328	FHSS	Left head	Fixed	Tilt	24.0	24.0	**0.048**
High	5848.889420	FHSS	Left head	Fixed	Tilt	24.0	24.0	**0.039**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population						**Head SAR: 1.6 W/kg (averaged over 1 gram)**		

*See Appendix 3 for measurement data plots.

8.2 Body-worn 5800MHz SAR

Liquid Depth (cm)	:	**15.1**	Model	:	**BCL-D10**
Parameters	:	εr =**46.2**, σ =**6.29**	Serial No.	:	**0001**
Ambient temperature (deg.c.)	:	**25.0**	Modulation	:	**FHSS**
Relative Humidity (%)	:	**55**	Crest factor	:	**10**
Date	:	**July 3, 2006**	Measured By	:	**Hisayoshi Sato**

BODY SAR MEASUREMENT RESULTS									
Frequency		Modulation	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Before	After	Maximum value of multi-peak
Step1. Worst position search									
Mid	5788.240269	FHSS	Flat	Fixed	Front	0	24.3	24.3	**0.040**
Mid	5788.240269	FHSS	Flat	Fixed	Back	0	24.3	24.3	**0.119**
Mid	5788.240269	FHSS	Flat	Fixed	Left side	0	24.2	24.2	**0.028**
Mid	5788.240269	FHSS	Flat	Fixed	Right side	0	24.2	24.2	**0.033**
Mid	5788.240269	FHSS	Flat	Fixed	Top	0	24.2	24.3	**0.042**
Mid	5788.240269	FHSS	Flat	Fixed	Bottom	0	24.3	24.3	**0.00581**
Step2. Chamge channel									
Low	5725.809328	FHSS	Flat	Fixed	Back	0	24.3	24.3	**0.230**
High	5848.889420	FHSS	Flat	Fixed	Back	0	24.2	24.2	**0.127**
Step3. Change space									
Low	5725.809328	FHSS	Flat	Fixed	Back	5	24.3	24.3	**0.099**
Low	5725.809328	FHSS	Flat	Fixed	Back	10	24.3	24.3	**0.097**
Low	5725.809328	FHSS	Flat	Fixed	Back	15	24.2	24.2	**0.091**
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population							**Body SAR: 1.6 W/kg (averaged over 1 gram)**		

* See Appendix 3 for measurement data plots.