RADIO TEST REPORT

Test Report No.: 32KE0042-SH-02-A

Applicant	:	**PIONEER CORPORATION**
Type of Equipment	:	**Bluetooth CD RDS RECEIVER**
Model No.	:	**DEH-X9500BHS**
FCC ID	:	**AJDK056**
Test regulation	:	**FCC Part15 Subpart C: 2012**
Test result	:	**Complied**

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3. This sample tested is in compliance with the limits of the above regulation.
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7. Some test items have been performed at UL Japan, Inc., Yamakita EMC Lab. as a subcontractor, in accordance with ISO/IEC 17025.

Date of test: August 30 to September 5, 2012

Tested by:
Kenichi Adachi
Engineer of WiSE Japan, UL
Verification Service

Approved by :
Toyokazu Imamura
Leader of WiSE Japan, UL
Verification Service

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JAB Testing RTL02610

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Contents

Page

SECTION 1: Customer information 3
SECTION 2: Equipment under test (E.U.T.) 3
SECTION 3: Test specification, procedures & results 4
SECTION 4: Operation of E.U.T. during testing 7
SECTION 5: Radiated emission 10
SECTION 6: Out of band emissions (Antenna port conducted) 11
SECTION 7: Carrier frequency separation 11
SECTION 8: 20dB bandwidth & Occupied bandwidth (99%) 11
SECTION 9: Number of hopping frequency 11
SECTION 10: Dwell time 11
SECTION 11: Maximum peak output power 11
Contents of APPENDIXES 12

APPENDIX 1: Test data 13
APPENDIX 2: Test instruments 51
APPENDIX 3: Photographs of test setup 52

SECTION 1: Customer information

Company Name	:	PIONEER CORPORATION
Brand Name	:	Pioneer
Address	:	25-1 Aza-Nishimachi, Yamada, Kawagoe-shi, Saitama, 350-8555, Japan
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Contact Person	:	Makoto Kaieda

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

2.1 Identification of E.U.T.

Type of Equipment	:	Bluetooth CD RDS RECEIVER
Model Number	:	DEH-X9500BHS
Serial Number	:	Refer to Section 4.2
Rating	:	DC 14.4V (DC 10.8V to 15.1V)
Country of Mass-production	:	Thailand
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample	:	August 6, 2012
Modification of EUT	:	The test lab did not make the modification to the EUT supplied from the customer to have it pass the tests.

2.2 Product description

Model: DEH-X9500BHS (referred to as the EUT in this report) is a Bluetooth CD RDS RECEIVER.

DEH-X9500BHS have similar model. Refer to follows table;

	DEH-X8500BH	DEH-X8500BS	DEH-X9500BHS
Sxi Bus	No	Yes	Yes
Grille Mechanical	POP-UP	POP-UP	MANUAL FLAP
Display size	28.6 mm x 67.19 mm	28.6 mm x 67.19 mm	32.5 mm x 74.9 mm
USB port	1 port	1 port	2 port

Clock Frequency:
MEDIA MICRO: 16.93MHz, 12MHz, SYSTEM MICRO: 20.00MHz, GRILL MICRO: 16.00MHz, CD Mecha: 16.93MHz, tuner: 36.48MHz (VCO: 2.5 - 3.3GHz), HD Unit :55.296MHz, 24.00MHz, Bluetooth module: 26MHz,
DC-DC CONVERTER: 370.4kHz / 416.7kHz

<Radio part>

Equipment type	:	Transceiver
Frequency of operation	:	2402MHz - 2480MHz
Bandwidth & channel spacing	:	79MHz & 1MHz
Type of modulation	:	GFSK, π/4DQPSK, 8DPSK
Antenna type	:	PWB pattern antenna
Antenna gain with cable loss	:	-2.2dBi (max)
Antenna connector type	:	None
Operation temperature range	:	-10 to +60 deg.C.

FCC 15.31 (e)
The RF Module has its own regulator.
The RF Module is constantly provided voltage (DC3.3V) through its own regulator regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203
It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2012, final revised on July 23, 2012 and effective August 22, 2012

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
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
Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	FCC Section 15.207	-	N/A	-	N/A *1)
Carrier frequency separation	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (a)(1)	Conducted	N/A	*See data.	Complied
20dB bandwidth	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (a)(1)	Conducted	N/A		Complied
Number of hopping frequency	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (a)(1)(iii)	Conducted	N/A		Complied
Dwell time	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (a)(1)(iii)	Conducted	N/A		Complied
Maximum peak output power	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (b)(1)	Conducted	N/A		Complied
Band edge compliance & Spurious emission	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (d) Section15.209	Conducted/ Radiated	N/A	7.4dB (2400.000MHz, AV, Vertial, Tx 2402MHz, 3-DH5)	Complied

Note: UL Japan's EMI Work Procedures No.13-EM-W0420 and 13-EM-W0422.
*1) The test is not applicable since the EUT does not have AC Mains.

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied Bandwidth (99%)	ANSI C63.4:2003 13. Measurement of intentional radiators, RSS-Gen 4.6.1	RSS-Gen 4.6.1	Conducted	-	N/A *1)
Note: UL Japan's EMI Work Procedures No.13-EM-W0420 and 13-EM-W0422.					

* Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

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

(Yamakita EMC Lab.)

Item	Frequency range	No.1 Site*1/SR*2 (±)	No.2 Site/SR (±)	No.1 SAC/SR (±)
Conducted emission (AC Mains) AMN/LISN	150kHz-30MHz	3.6 dB	3.6 dB	3.6 dB
Radiated emission (Measurement distance: 3m)	9kHz-30MHz	3.6 dB	3.7 dB	3.7 dB
	30MHz-300MHz	5.0 dB	5.1 dB	5.0 dB
	300MHz-1GHz	5.1 dB	5.1 dB	5.1 dB
	1GHz-15GHz	4.9 dB	4.9 dB	5.4 dB
Radiated emission (Measurement distance: 1m)	15GHz-18GHz	5.7 dB	5.7 dB	5.7 dB
	18GHz-40GHz	4.9 dB	4.4 dB	4.5 dB

*1: SAC=Semi-Anechoic Chamber
*2: SR= Shielded Room is applied besides radiated emission

(Shonan EMC Lab.)

Item	Frequency range	No.1 SAC*1/SR*2 (±)	No.2 SAC/SR (±)	No.3 SAC/SR (±)
Conducted emission (AC Mains) LISN	150kHz-30MHz	3.6 dB	3.6 dB	3.5 dB
Radiated emission (Measurement distance: 3m)	30MHz-300MHz	4.9 dB	5.1 dB	4.9 dB
	300MHz-1GHz	5.0 dB	5.2 dB	4.9 dB
	1GHz-15GHz	4.8 dB	4.8 dB	4.9 dB
Radiated emission (Measurement distance: 1m)	15GHz-18GHz	5.6 dB	5.6 dB	5.6 dB
	18GHz-40GHz	4.6 dB	4.3 dB	4.4 dB

*1: SAC=Semi-Anechoic Chamber
*2: SR= Shielded Room is applied besides radiated emission

Radiated emission test

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

Power Measurement uncertainty above 1GHz for this test was: (±) 1.5dB
Conducted emissions Measurement (below 1GHz) uncertainty for this test was: (±) 1.7dB
Conducted emissions, Power Density Measurement (1G-3GHz) uncertainty for this test was: (±) 2.3dB
Conducted emissions Measurement (3G-18GHz) uncertainty for this test was: (±) 3.0dB
Conducted emissions Measurement (18G-26.5GHz) uncertainty for this test was: (±) 2.9dB
Bandwidth Measurement uncertainty for this test was: (±) 5.4%

3.5 Test location

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JAB Accreditation No. : RTL02610

No.1/ No.2/ No.3 anechoic chamber has been fully described in a report submitted to FCC office, and accepted on April 17, 2009 (Registration No.: 697847).

	FCC Registration No.	IC Registration No.	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
☐ No.1 Semi-anechoic chamber	697847	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☐ No.2 Semi-anechoic chamber	697847	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☐ No.3 Semi-anechoic chamber	697847	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
☐ No.4 Semi-anechoic chamber	-	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
☐ No.1 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
☐ No.2 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
☐ No.3 shielded room	-	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
☐ No.4 shielded room	-	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
☒ No.5 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
☐ No.6 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-

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	Test room	Width × Depth × Height (m)
	No.1 shielded room	8.0 × 5.0 × 2.5
	No.2 shielded room	5.0 × 4.0 × 2.5
	No.3 shielded room	4.0 × 5.0 × 2.7
	No.4 shielded room	5.0 × 4.0 × 2.7
	No.5 shielded room	4.5 × 4.3 × 2.7

	Test room	Width × Depth × Height (m)
●	No.1 Semi-anechoic chamber	10.0 × 7.5 × 5.7
	No.2 Full-anechoic chamber	8.0 × 4.7 × 4.0
	No.2 Open test site (Turn table)	3m diameter, max. measurement distance:10m.
	No.1 Open test site (Turn table)	5m diameter, max. measurement distance:30m.

*. ●: EMI, O: EMS

3.6 Test setup, Data of EMI & Test instruments

Refer to APPENDIX 1 to 3.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating mode

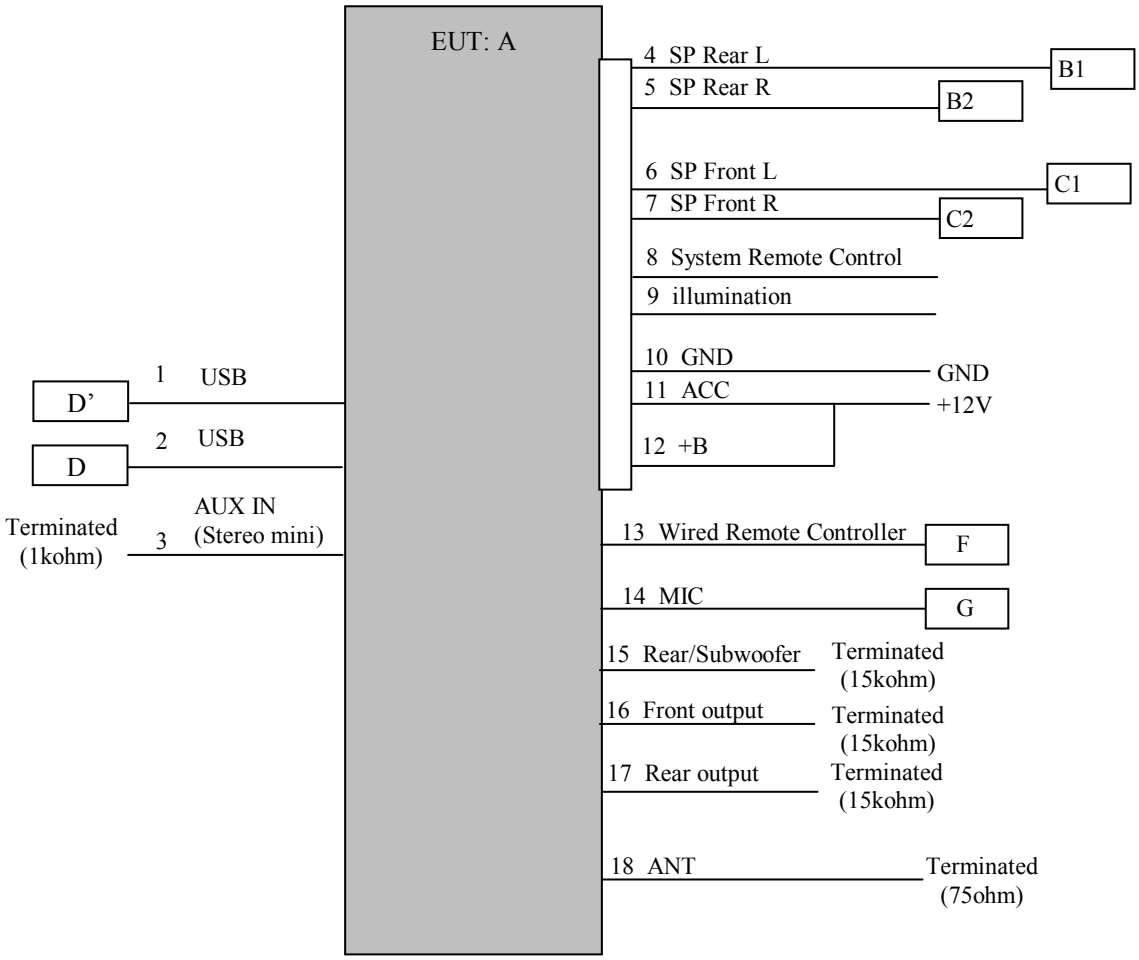
Test item	Operating mode	Tested frequency
Carrier frequency separation	Transmitting Hopping ON (DH5 / 3-DH5)/Inquiry, Payload: PRBS9	-
20dB bandwidth	Transmitting Hopping OFF (DH5 / 3-DH5) / Inquiry, Payload: PRBS9	2402MHz, 2441MHz, 2480MHz
Number of hopping frequency	Transmitting Hopping ON (DH5 / 3-DH5)/Inquiry, Payload: PRBS9	-
Dwell time	Transmitting (Hopping ON) - DH1, - DH3, - DH5 - 3-DH1, - 3-DH3, - 3-DH5	-
	-Inquiry	
Maximum peak output power	Transmitting Hopping OFF (DH5 / 2-DH5 / 3-DH5) / Inquiry, Payload: PRBS9 - DH5 - 2-DH5 - 3-DH5	2402MHz, 2441MHz, 2480MHz
Band edge compliance & Spurious emission (Conducted)	Transmitting (DH5 / 3-DH5), Payload: PRBS9 -Hopping ON / Inquiry -Hopping OFF	Band edge compliance: 2402MHz, 2480MHz Spurious emission:
(Radiated)	Transmitting (DH5 / 3-DH5), Payload: PRBS9	2402MHz, 2441MHz, 2480MHz
99% occupied bandwidth	Transmitting (DH5 / 3-DH5), Payload: PRBS9 -Hopping ON -Hopping OFF	2402MHz, 2441MHz, 2480MHz

*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum packet type / payload (except Dwell time test)
*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 125mWof AFH mode was used for the test.

*EUT has the power settings by the software as follows;
Software: BlueTest.exe Ver.1.24,
BtCli.exe Ver.1.24 (Inquiry mode only)
Power settings: BDR: Ext.=255, Int.=44
EDR: Ext.=255, Int.=48

*This setting of software is the worst case.
Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

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	Remarks
A	Bluetooth CD RDS RECEIVER	DEH-X9500BHS	LFTM000020UC *1) LFTM000019UC *2)	PIONEER	EUT
B1	4 ohm Dummy Load	-	-	CHIBA TECHNO Co.,Ltd.	-
B2	4 ohm Dummy Load	-	-	CHIBA TECHNO Co.,Ltd.	-
C1	Speaker	TS-X350	47	PIONEER	-
C2	Speaker	TS-X350	48	PIONEER	-
D	USB Memory	-	R7R1004783ZW	IO DATA	-
D'	USB Memory	-	CHA1109176UE	IO DATA	-
E	Remote Controller	QXE1044	-	PIONEER	-
F	Wired Remote Controller	RM-X2S	-	SONY	-
G	HF-MIC	-	-	-	-

*1) Used for Antenna terminal conducted tests.
*2) Used for Radiated emission tests.

List of cables used

No.	Cable name	Length (m)	Shield		Remark
			Cable	Connector	
1	USB	2.0	Shielded	Shielded	-
2	USB	2.0	Shielded	Shielded	-
3	AUX In (Stereo-mini)	1.4	Unshielded	Unshielded	-
4	SP Rear L	0.15+5.0	Unshielded	Unshielded	-
5	SP Rear R	0.15+6.2	Unshielded	Unshielded	-
6	SP Front L	0.15+6.4	Unshielded	Unshielded	-
7	SP Front R	0.15+6.4	Unshielded	Unshielded	-
8	System Remote Control	0.15+1.85	Unshielded	Unshielded	-
9	illumination	0.15+1.85	Unshielded	Unshielded	-
10	GND	0.15+1.85	Unshielded	Unshielded	-
11	ACC	0.15+1.85	Unshielded	Unshielded	-
12	+B	0.15+1.85	Unshielded	Unshielded	-
13	Wired Remote Controller	2.0	Unshielded	Unshielded	-
14	MIC	4.0	Unshielded	Unshielded	-
15	Rear/Subwoofer (RCA)	3.0	Unshielded	Unshielded	-
16	Front Audio (RCA)	1.5	Unshielded	Unshielded	-
17	Rear Audio (RCA)	1.5	Unshielded	Unshielded	-
18	ANT	0.3+1.5	Shielded	Shielded	-

*All cables used for the measurement are exclusive use or marketed.

SECTION 5: Radiated emission

5.1 Operating environment

Test place : See test data (APPENDIX 1)
Temperature : See test data (APPENDIX 1)
Humidity : See test data (APPENDIX 1)

5.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane.
The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity.
The configuration was set in accordance with ANSI C63.4: 2009.
The rear of EUT, including its peripherals was aligned and flushed with rear of tabletop. I/O cables that were connected to the peripherals were bundled in center. They were folded back and for the forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.
Photographs of the set up are shown in APPENDIX 3.

5.3 Test conditions

Frequency range : 30MHz to 26GHz
Test distance : 3m(below 15GHz) / 1m(above15GHz)
EUT position : Table top
EUT operation mode : Refer to SECTION 4.1

5.4 Test procedure

The Radiated Electric Field Strength intensity has been measured on a semi-anechoic chamber with a ground plane and at a distance of 3m(below 15GHz) / 1m(above 15GHz) (Refer to Figure 1). 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 detection of the test receiver.

Frequency	:	30M-1000MHz	1000M-26000MHz	
Detection Type	:	Quasi-Peak	Peak	* Average
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.
Although 00-705 accepts VBW=10Hz for AV measurements, confirmed that superfluous smoothing was not performed.

The carrier level and noise levels were confirmed at angle of 0 to 60 deg. based on the product specification to see the position of maximum noise, and the test was made at the position (0deg.) that has the maximum noise.

5.5 Band edge

Band edge level at 2400MHz is less than 20dB of peak point of the carrier. Refer to the data of Out of Band Emissions (Antenna Port Conducted). Band edge level at 2390MHz and 2483.5MHz is below the limits of FCC 15.209. Refer to the data of Radiated emission.

5.6 Results

Summary of the test results : Pass *No noise was detected above the 5th order harmonics.
Refer to APPENDIX 1

SECTION 6: Out of band emissions (Antenna port conducted)

Test procedure
The Out of Band Emissions was measured with a spectrum analyzer connected to the antenna port.
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.

Summary of the test results: Pass
Refer to APPENDIX 1

SECTION 7: Carrier frequency separation

Test procedure
The carrier frequency separation was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass
Refer to APPENDIX 1

SECTION 8: 20dB bandwidth & Occupied bandwidth (99%)

Test procedure
The bandwidth was measured with a spectrum analyzer connected to the antenna port.
The channel separation in Hopping mode and Inquiry mode was separated by 25kHz and 2/3 of the 20dB bandwidth.

Summary of the test results: Pass
Refer to APPENDIX 1

SECTION 9: Number of hopping frequency

Test procedure
The Number of Hopping Frequency was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass
Refer to APPENDIX 1

SECTION 10: Dwell time

Test procedure
The Dwell time was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass
Refer to APPENDIX 1

SECTION 11: Maximum peak output power

Test procedure
The Maximum Peak Output Power was measured with a power meter connected to the antenna port.

Summary of the test results: Pass
Refer to APPENDIX 1

Contents of APPENDIXES

APPENDIX 1: Data of EMI test

20dB bandwidth and Carrier frequency separation
Number of Hopping Frequency
Dwell time
Maximum peak output power
Radiated emission
Spurious emission (Antenna port conducted)
Occupied Bandwidth

APPENDIX 2: Test instruments

Test instruments

APPENDIX 3: Photographs of test setup

Radiated emission