



RADIO TEST REPORT

Test Report No.: 30CE0256-HO-01-A

Applicant : Rimage Corporation
Type of Equipment : Professional 3400 / Professional 5400N
Model No. : RAS26 / RAS26E
FCC ID : QT5-RAS26E
Test regulation : FCC Part15 Subpart C: 2009
Test result : Complied

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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.
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6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.

Date of test:

November 24 to December 29, 2009

Tested by:

K. Adachi

Kenichi Adachi
Engineer of EMC Service

T. Arai

Tatsuya Arai
Engineer of EMC Service

M. Hosaka

Makoto Hosaka
Engineer of EMC Service

Approved by:

I. Isozaki

Ichiro Isozaki
Group Leader of Shonan EMC Lab.

- The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
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MF060d (06.08.09)

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SECTION 1: Customer information

Company Name : Rimage Corporation
Address : 7725 Washington Avenue South Minneapolis, MN 55439, U.S.A
Telephone Number : (+1) 952 944 8144
Facsimile Number : (+1) 952 944 7808
Contact Person : Zahid Taufiq

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

2.1 Identification of E.U.T.

Type of Equipment : Professional 3400,
Professional 5400N
Model No. : RAS26,
RAS26E
Serial No. : EP2-13 (RAS26),
EP2-43 (RAS26E)
Rating : AC 100V to 240V, 50Hz or 60Hz
Country of Manufacture : Japan
Country of Mass-production : Japan
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No modification by the test lab.
Receipt Date of Sample : November 20, 2009

2.2 Product description

Model: RAS26 (referred to as the EUT in this report) is a Professional 3400 (Kind of equipment is Label Printer).
Model: RAS26E (referred to as the EUT in this report) is a Professional 5400N (Kind of equipment is Label Printer).
Model No. RAS26 is without personal computer, Model No. RAS26E is with personal computer.
Radio part is same unit in RAS26 and RAS26E.

Equipment type : Transceiver
Frequency of operation : 2427MHz to 2469MHz
Clock frequency : 13MHz
Channel spacing : 2MHz
Type of modulation : ASK
Antenna model & type : 2.4GHz Band Inverted-F Antenna
Antenna gain with cable loss : -3dBi max
Antenna connector type : U. FL (Hirose)
ITU code : A1D
Operation temperature range : +15 to +35 deg.C.
Power supply (Radio part) : +5V, +3.3V(Digital), +3.3V(Analog)

FCC Part15.31 (e)

Host devise (Professional 3400 / Professional 5400N) provides the radio module with stable power supply (DC3.3V (Digital and Analog), DC5V), and the power is not changed when voltage of the device is varied. Therefore, the equipment complies power supply regulation.

FCC Part15.203 Antenna requirement

The radio module complies with the requirement. When it is put up for sale, one of the antennas is attached and the antenna is with a unique coupling to the intentional radiator.

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SECTION 3: Test specification, procedures and results

3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2009, final revised on December 2, 2009
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

The EUT complies with FCC Part 15 Subpart B: 2009, final revised on February 27, 2009. Refer to the test report 30CE0256-HO-01-C.

3.2 Procedures & Results

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.4:2003 Section 7, ANSI C63.10:2009 Section 6.2	FCC Section 15.207	-	N/A	0.2dB , 0.38466MHz, L, QP 0.3dB , 0.38466MHz, L, AV, [RAS26, Standby]	Complied
Carrier frequency separation	FCC Public Notice DA 00-705 & ANSI C63.4:2003 Section 13., ANSI C63.10:2009 Section 6.7	FCC Section15.247 (a)(1)	Conducted	N/A		Complied
20dB bandwidth	FCC Public Notice DA 00-705 & ANSI C63.4:2003 Section 13, ANSI C63.10:2009 Section 6.9	FCC Section15.247 (a)(1)	Conducted	N/A		Complied
Number of hopping frequency	FCC Public Notice DA 00-705 & ANSI C63.4:2003 Section 13, ANSI C63.10:2009 Section 6.7	FCC Section15.247 (a)(1)(iii)	Conducted	N/A	*See data.	Complied
Dwell time	FCC Public Notice DA 00-705 & ANSI C63.4:2003 Section 13, ANSI C63.10:2009 Section 6.7	FCC Section15.247 (a)(1)(iii)	Conducted	N/A		Complied
Maximum peak output power	FCC Public Notice DA 00-705 & ANSI C63.4:2003 Section 13, ANSI C63.10:2009 Section 6.10	FCC Section15.247 (b)(1)	Conducted	N/A		Complied
Band edge compliance & Spurious emission	FCC Public Notice DA 00-705 & ANSI C63.4:2003 Section 13, ANSI C63.10:2009 Section 6.3, 6.5, 6.6, 6.9	FCC Section15.247 (d) Section15.209	Conducted/ Radiated	N/A	2.2dB , 864.189MHz, QP, Horizontal, [RAS26E, Tx 2427MHz]	Complied

Note: EMI Procedures of UL Japan: QPM05 and QPM15.

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3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied bandwidth (99%)	ANSI C63.4:2003 Section 13, ANSI C63.10:2009 Section 6.9, RSS-Gen 4.6.1	RSS-Gen 4.6.1	Conducted	-	Complied

* 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.

	No.1 anechoic chamber (±)	No.2 anechoic chamber (±)	No.3 anechoic chamber (±)
Conducted emission			
150kHz-30MHz	3.0 dB	2.7 dB	2.8 dB
Radiated emission (3m)			
9k-30MHz	3.1 dB	2.9dB	3.0 dB
30-300MHz	4.4 dB	4.3 dB	4.5 dB
300-1000MHz	4.3 dB	4.2 dB	4.5 dB
1GHz<	5.7 dB	5.6 dB	5.6 dB
Radiated emission (10m)			
9k-30MHz	3.1dB	2.9dB	-
30-300MHz	4.4 dB	4.3 dB	-
300-1000MHz	4.2 dB	4.1 dB	-

Conducted emission test

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

Radiated emission test

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

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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).

IC Registration No. : 2973D-1 (No1 Semi-anechoic chamber)

2973D-2 (No2 Semi-anechoic chamber)

2973D-3 (No3 Semi-anechoic chamber)

Test room	Width x Depth x Height (m)	Test room	Width x Depth x Height (m)
No.1 Semi-anechoic chamber	20.6 x 11.3 x 7.65 Maximum measurement distance: 10m	No.1 Shielded room	6.8 x 4.1 x 2.7
No.2 Semi-anechoic chamber	20.6 x 11.3 x 7.65 Maximum measurement distance: 10m	No.2 Shielded room	6.8 x 4.1 x 2.7
No.3 Semi-anechoic chamber	12.7 x 7.7 x 5.35 Maximum measurement distance: 5m	No.3 Shielded room	6.3 x 4.7 x 2.7
No.4 Semi-anechoic chamber	8.1 x 5.1 x 3.55	No.4 Shielded room	4.4 x 4.7 x 2.7
		No.5 Shielded room	7.8 x 6.4 x 2.7
		No.6 Shielded room	7.8 x 6.4 x 2.7

3.6 Test setup, Data of EMI & Test instruments

Refer to the Appendix 1 to 3.

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

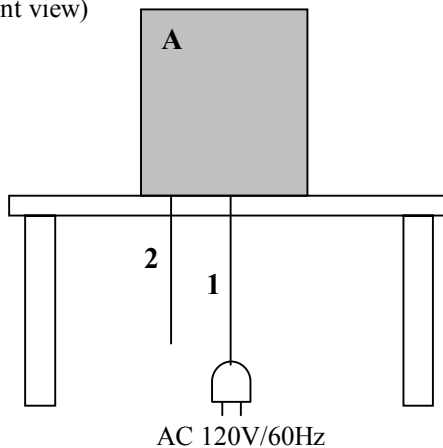
4.1 Operating mode

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

Test item	Operating mode	Tested frequency
Carrier frequency separation	Tx (Transmitting, Hopping on, normal modulation)	(Hopping on)
20dB bandwidth	Tx (Transmitting, Hopping off, normal modulation)	2427MHz, 2449MHz, 2469MHz
Number of hopping frequency	Tx (Transmitting, Hopping on, normal modulation)	(Hopping on)
Dwell time	Tx (Transmitting, Hopping on, normal modulation)	(Hopping on)
Maximum peak output power	Tx (Transmitting, Hopping off, normal modulation)	2427MHz, 2449MHz, 2469MHz
Band edge compliance & Spurious emission (Conducted)	Tx (Transmitting, Hopping on/off, normal modulation), Standby	(Band edge compliance): 2427MHz, 2469MHz
(Radiated)	Tx (Transmitting, Hopping off, normal modulation), Stsndby	(Spurious emission): 2427MHz, 2449MHz, 2469MHz
99% occupied bandwidth	Tx (Transmitting, Hopping on/off, normal modulation)	2427MHz, 2449MHz, 2469MHz, Hopping on

4.2 Configuration and peripherals

< RAS26 >
(front view)

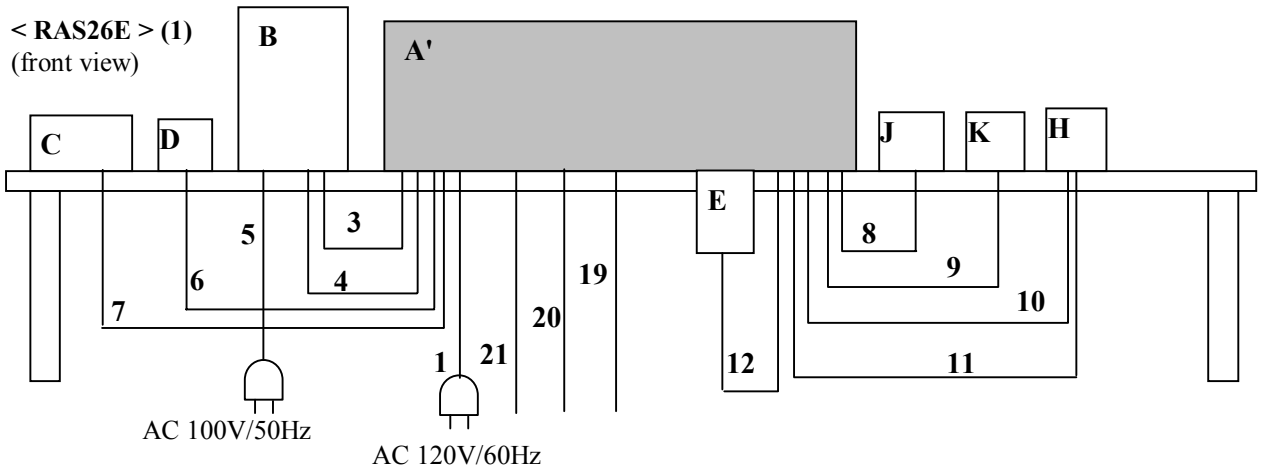


* Test data was taken under worse case conditions.

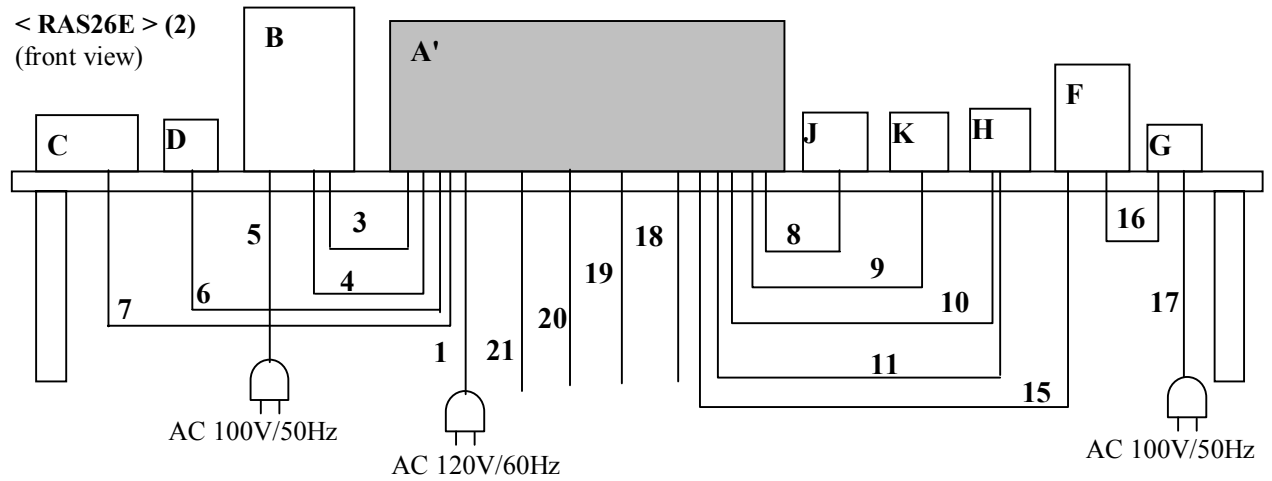
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* Test data was taken under worst case conditions.



* Test data was taken under worst case conditions.

*<RAS26E> (2): for Radiated emission's frequency range above 1GHz .

*<RAS26E> (1): for other tests.

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Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Professional 3400	RAS26	EP2-13	Rimage Corporation	EUT, FCC ID: QT5-RAS26E
A'	Professional 5400N	RAS26E	EP2-43	Rimage Corporation	EUT, FCC ID: QT5-RAS26E
B	Display	E2200HD	ETH2901780026	BenQ	-
C	Keyboard	KUH0010	F08050002088	PFU	-
D	Mouse	M-FG2UP2RBUD	123040C	ELECOM	-
E	eSATA & USB combo drive	600-UZ16G	-	Sanwa Supply	direct connect
F	eSATA HDD	d2 quadra	1221909290389E	LaCie	cable connect
G	AC adapter	DA-36J12	-	Asian Power Devices	-
H	USB HDD	TS250GSJ25P	238677-0449	Transcend	-
J	Microphone	F-V320	-	Sony	-
K	Headphone	HP-H500N	-	Audio Comm	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	AC cable	2.0	Unshield	Unshield	-
2	USB cable	1.8	Shield	Shield	-
3	RGB cable	1.8	Shield	Shield	-
4	HDMI cable	1.5	Shield	Shield	-
5	AC cable	2.0	Unshield	Unshield	-
6	Mouse cable	1.6	Shield	Shield	-
7	Keyboard cable	1.8	Shield	Shield	-
8	Microphone cable	3.0	Shield	Shield	-
9	Headphone cable	1.1	Shield	Shield	-
10	USB cable	0.6	Shield	Shield	-
11	USB cable	0.3	Shield	Shield	-
12	USB cable	1.8	Shield	Shield	-
13	USB cable	1.8	Shield	Shield	-
14	USB cable	1.8	Shield	Shield	-
15	eSATA cable	1.5	Shield	Shield	-
16	DC cable	1.2	Unshield	Unshield	-
17	AC cable	1.0	Unshield	Unshield	-
18	USB cable	3.0	Shield	Shield	-
19	USB cable	3.0	Shield	Shield	-
20	LAN cable	1.5	Unshield	Unshield	-
21	Audio cable	3.0	Shield	Shield	-

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SECTION 5: Conducted emissions

5.1 Operating environment

The test was carried out in No.3 Semi-anechoic chamber.

5.2 Test configuration

EUT was placed on a table of nominal size, 1.0m by 2.0m, raised 80cm above the conducting ground plane. The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity. EUT was located 0.8m from Line Impedance Stabilization Network (LISN) and excess AC Cable was bundled in center. I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 0.3m to 0.4m long. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through an LISN to the input power source. All unused 50ohm connectors of the LISN were resistively terminated in 50ohm when not connected to the measuring equipment. Photographs of the set up are shown in APPENDIX.

5.3 Test conditions

Frequency range : 0.15 - 30MHz

5.4 Test procedure

The AC Mains Terminal continuous disturbance Voltage had been measured with the EUT. The EUT was connected to a Line Impedance Stabilization Network (LISN). An overview sweep with peak detection had been performed. The measurements had been performed with a quasi-peak detector and if required, an average detector. The conducted emission measurements were made with the following detector of the test receiver.

Detector type : Quasi-Peak/ Average
IF Bandwidth: 9kHz

5.5 Results

Summary of the test results : Pass

Date : December 29, 2009 Tested by : Kenichi Adachi

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SECTION 6: 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
Date : December 30, 2009 Tested by : Tatsuya Arai

SECTION 7: 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.

Date : December 30, 2009 Tested by : Tatsuya Arai

SECTION 8: 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
Date : December 30, 2009 Tested by : Tatsuya Arai

SECTION 9: Dwell time

Test procedure

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

Summary of the test results: Pass
Date : December 30, 2009 Tested by : Tatsuya Arai

SECTION 10: 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
Date : December 30, 2009 Tested by : Tatsuya Arai

SECTION 11: 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 conducted measurement.

Summary of the test results: Pass
Date : December 30, 2009 Tested by : Tatsuya Arai

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SECTION 12: Out of band emissions (Radiated)

12.1 Operating environment

The test was carried out in No.3 Semi-anechoic chamber.

12.2 Test configuration

EUT was placed on a table of nominal size, 1m by 1.5m or 2m, 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. Photographs of the set up are shown in Appendix.

12.3 Test conditions

Frequency range : 30MHz - 26.5GHz
Test distance : 3m

12.4 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. Measurements were performed with QP, PK, and AV detector. The radiated emission measurements were made with the following detector function of the Spectrum Analyzer and test receiver.

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: 10Hz or 30Hz (See data) *1),*2) (AV value was calculated by the dwell time factor.)
Measuring antenna	Biconical (30-300MHz) Logperiodic (300MHz-1GHz)	Horn

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

*2) Used for the band edge of the carrier and the harmonics that can be measured. The VBW is based on the inverse of the duty cycle (see Appendix).

The EUT was tested in the direction normally used.

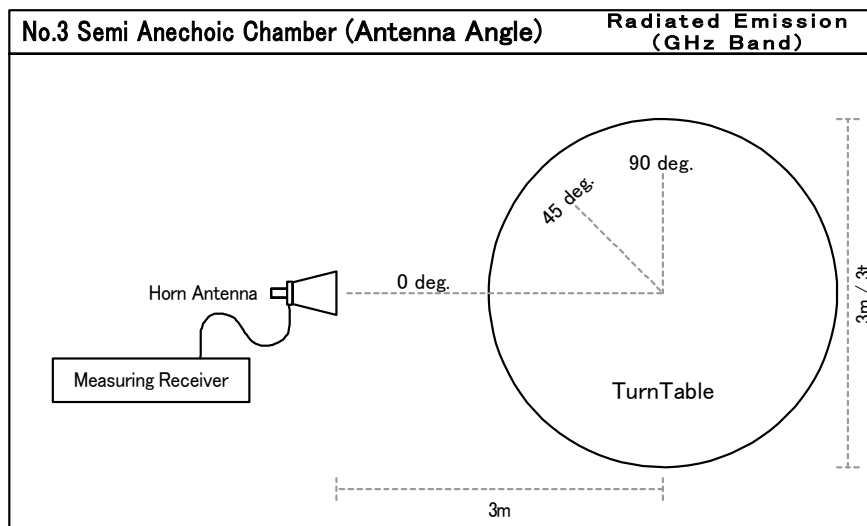
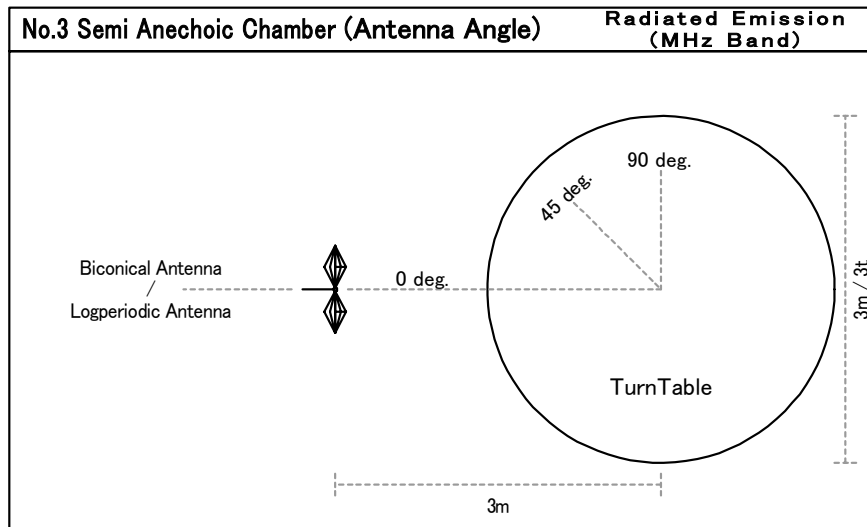
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Figure 1. Antenna angle



12.5 Results

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

EUT	Test Date	Tested by
RAS26	November 24, 2009	Makoto Hosaka
RAS26R	November 25, 2009	Makoto Hosaka

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Contents of Appendixes

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APPENDIX 2: Test Data

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Page 25 - 26	:	20dB bandwidth and Carrier frequency separation
Page 27 - 28	:	Number of hopping frequency
Page 29 - 30	:	Dwell time
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Page 40	:	Duty cycle
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Page 47	:	Occupied bandwidth

APPENDIX 3: Test instruments

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