EMI TEST REPORT

Test report No.: **EMC- FCC- 0325**

Type of equipment: **IRIS SCANNER**

Model Name: **JEC-2000**

FCC ID : **TNIJEC3000**

Applicant: **JIRIS Co.,Ltd.**

Test standards: **FCC part 15 subpart B Class B**

Test Procedure and Items :
AC Power Line Conducted Emissions Measurement: ANSI C63.4:2001
Radiated Emissions Measurement : ANSI C63.4:2001

Test result : Complied

The above equipment was tested by EMC compliance Testing Laboratory for compliance with the requirements of FCC Rules and Regulations.
The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Date of test: 2005. 09. 12~14 **Issued date: 2005 . 09. 16**

Tested by: PARK, SEUNG-SOO

Approved by: YOO, CHAN-SOO

EMC Compliance Ltd.
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[Contents]

1. Client information

Applicant :	JIRIS Co.,Ltd.
Address :	1F Atrium Bldg, 30 Samsung-Dong, Gangnam-Gu, Seoul, Korea 135-090
Telephone number :	+82-2-541-0173
Facsimile number :	+82-2-541-0174
Contact Person:	Jeff Lim / Director of Marketing Group

Manufacturer :	JIRIS Co.,Ltd.
Address :	1F Atrium Bldg, 30 Samsung-Dong, Gangnam-Gu, Seoul, Korea 135-090
Telephone number :	+82-2-541-0173
Facsimile number :	+82-2-541-0174
Contact Person:	Jeff Lim / Director of Marketing Group

2. Laboratory information

Address

EMC compliance Ltd.

82-1, JEIL-RI, YANGJI-MYUN, YOUNGIN-CITY, KYUNGGI-DO, KOREA

Telephone Number : 82 31 336 9919

Facsimile Number : 82 31 336 4767

FCC Filing No. : 793334

VCCI Registration No. : C-1713, R-1606

KOLAS NO.: 231

SITE MAP

3. Test system configuration

3.1 Operation Environment

		Temperature	Humidity	Pressure
OATS	:	26 °C	38 %	1002 hPa
Shielded room	:	24 °C	37 %	1001 hPa

Test site

These testing were performed following locations;

OATS : Radiated emission

Shielded room: Conducted emission

3.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMI. The factors contributing to uncertainties are test receiver, Cable Loss, antenna factor calibration, Antenna directivity, antenna factor Variation with height, antenna phase center variation, antenna Frequency interpolation, measurement distance variation, Site imperfection, mismatching, and system repeatability.

Based on NIS 80, 81, the measurement uncertainty level with a 95% confidence level was applied.

3.3 Sample calculation

Radiated emission

The field strength is calculated adding the antenna Factor, cable loss and, Antenna pad adding, subtracting the amplifier gain from the measured reading.

The sample calculation is as follows :

FS = MR + AF + CL + AT -AG

MR = Meter Reading / AF = Antenna Factor / CL = Cable Loss

AP = Antenna Pad / AG=Amplifier Gain /

If MR is 30dB, AF 12dB, CL 5dB, AP 10dB, AG 35dB

The result (MR) is

30 + 12 + 5 + 10 –35 = 22dBuV/m

Conducted emission

The field strength is calculated by adding the LISN factor, cable loss to the measured reading.

The sample calculation is as follows :

FS = MR + LF + CL

MR = Meter Reading

LF = LISN Factor

CL = Cable Loss

If MR is 30dB, LISN Factor 1dB, CL 1dB

The result (FS) is

30 + 1 + 1 = 32dBuV

4. Description of EUT

4.1 Product description

Applicant:	JIRIS Co.,Ltd.
Address of Applicant:	1F Atrium Bldg, 30 Samsung-Dong, Gangnam-Gu, Seoul, Korea 135-090
Manufacturer:	JIRIS Co.,Ltd.
Address of Manufacturer:	1F Atrium Bldg, 30 Samsung-Dong, Gangnam-Gu, Seoul, Korea 135-090
Type of equipment :	IRIS SCANNER
Basic Model :	JEC-2000
Serial No.:	N/A

4.2 Peripherals

Description	Model / Part #	Serial number	Manufacture
PC	DIMESION3000	B2ZRD1S	DELL
PRINTER	EPSON STYLUS C60	DR5K025464	EPSON
KEYBOARD	SEM-DT35	3V001966	SAMSUNG
MOUSE	P801	1127202	samsung
MOUSE	SWW-23	N/A	A4TECH
HEADSET	RP-HM211	N/A	PANASONIC
MONITOR	E173FPB	CN-OC5385-46633-539-OTYL	DELL

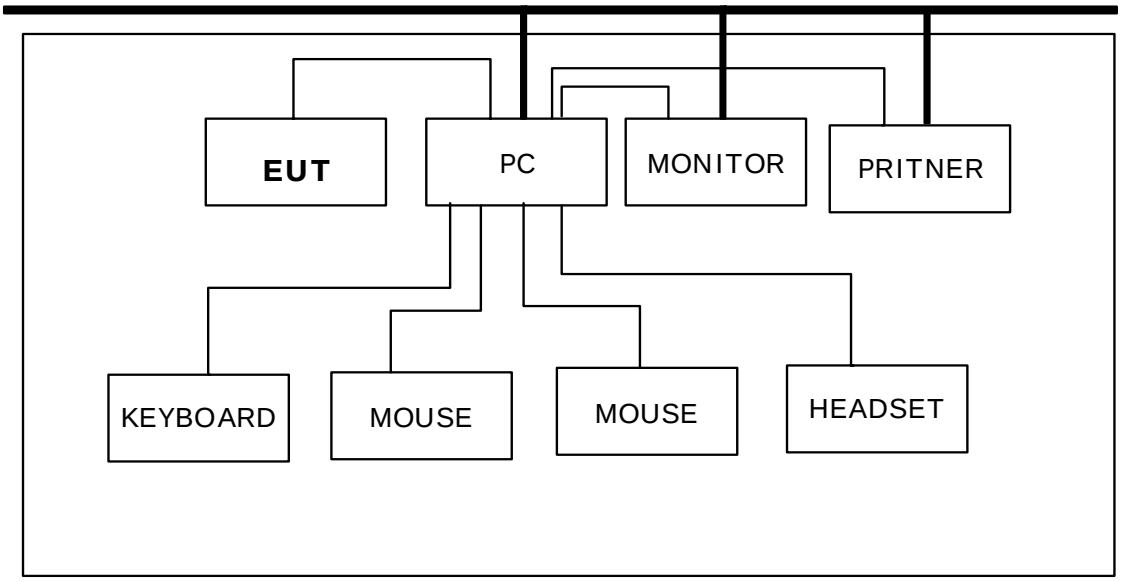
4.3 Operating conditions

Operating : Monitoring mode.

4.4 Used cables

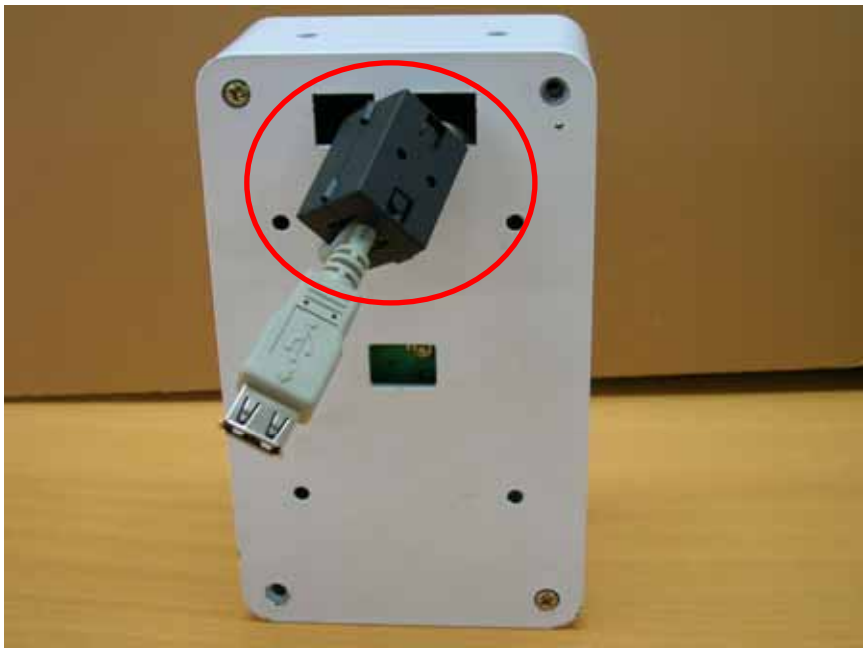
Start		END		Cable Spec.	
Name	I/O Port	Name	I/O Port	Length	Shield
EUT	USB	PC	USB	1.0	Shield

4.5 E.U.T. test configuration

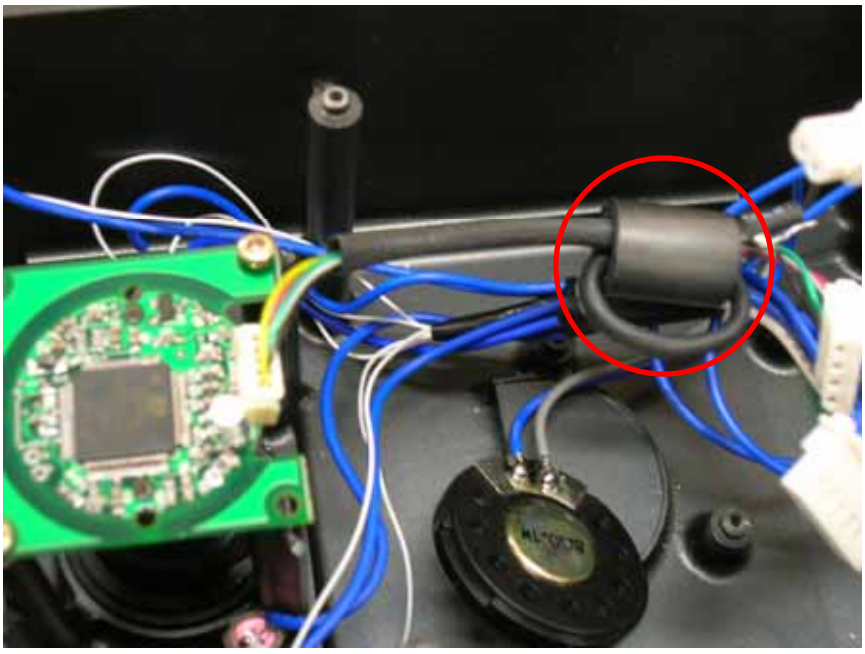


5. Summary of test results

5.1 Modification to the E.U.T.



-Add the core. (Steward/RM100)



-Add the core. (Coretecom/T-314)

5.2 Standards & results

FCC part 15 subpart B (Class B)

ANSI C63.4 – 2003

Test items	Test methods	Result
Conducted emission	ANSI C63.4-2003	Pass
Radiated emission	ANSI C63.4-2003	Pass

6. Test results

6.1 Conducted emission

6.1.1 Measurement procedure

Mains

Measurements were performed at the AC Power Inlet of the host PC with the EUT plugged in the frequency band of 150kHz ~30MHz. EUT was placed on a non-metallic table height of 0.1m above the reference ground plane.
The rear of tabletop was located 0.4m to the vertical conducted plane.
All other surfaces of tabletop were at least 0.8m away from any other grounded conducting surface.
Cables were folded back and forth forming a bundle 0.3m to 0.4m long and were hanged at a 0.4m height to the ground plane.
Each EUT power lead, except ground (safety) lead, was individually connected through a LISN to input power source.
Both lines of power cord, hot and neutral were measured.

6.1.2 Used equipments

Equipment	Model	Serial no.	Makers	Next Cal. date	Used
Test receiver	ESHS10	843276/003	R&S	06.05.13	☒
L.I.S.N.	ESH3-Z5	100267	R&S	06.06.14	☒
	L3-32A	0120J20305	PMM	06.04.03	☒
Test site	Shield room	-	-	-	☒

6.1.3 Measurement uncertainty

Conducted emission measurement : (k=2, 95%)
9kHz-150 kHz : ±3.47 [dB]
150kHz-30 MHz : ±3.01 [dB]

6.1.4 Test data

Frequency	Correction Factor		Line	Quasi-peak			Average		
				Limit	Reading	Result	Limit	Reading	Result
[MHz]	LISN	Cable		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]
0.192	0.11	0.1	H	63.95	42.80	43.01	53.95	36.03	36.24
0.285	0.12	0.1	H	60.67	33.44	33.66	50.67	30.02	30.24
0.339	0.12	0.1	H	59.23	37.65	37.87	49.23	36.19	36.41
0.480	0.16	0.1	N	56.34	38.95	39.21	46.34	34.22	34.48
0.681	0.15	0.1	H	56.00	47.99	48.24	46.00	45.12	45.37
1.020	0.15	0.1	H	56.00	43.10	43.35	46.00	41.41	41.66
1.359	0.15	0.1	H	56.00	49.47	49.72	46.00	43.32	43.57
2.040	0.20	0.2	H	56.00	40.78	41.18	46.00	36.93	37.33
16.260	0.62	0.2	N	60.00	27.20	28.02	50.00	21.34	22.16
20.310	0.88	0.3	N	60.00	28.54	29.72	50.00	22.67	23.85
20.330	0.83	0.3	H	60.00	38.17	39.30	50.00	30.59	31.72
24.440	1.10	0.4	N	60.00	20.30	21.80	50.00	7.62	9.12

- Note. QP = Quasi-Peak, AV= Average
- LINE(N) : Neutral, LINE(H) : Hot
- Loss = LISN Loss + Cable Loss
- Measurement time : 1 s

6.1.5. Result

The EUT tested complied with the limits detailed in FCC Rules Part 15 Section 15.107(a).

6.2 Radiated emission

6.2.1 Measurement procedure

A pretest was performed at 3m distance in a semi-anechoic chamber for searching correct frequency. The final test was done at a 10m open area test site with a quasi-peak detector. EUT was placed on a non-metallic table height of 0.1m above the reference ground plane. Cables were folded back and forth forming a bundle 0.3m to 0.4m long and were hanged at a 0.8m height to the ground plane. Cables connected to EUT were fixed to cause maximum emission. 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. The radiated emission measurement has been performed in the frequency band of above 1GHz. All other emissions not reported were more than 25dB below the permitted limit.

6.2.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next cal. date	Used
Test receiver	ESVD	841729/010	R&S	06.05.23	☒
TRILOG Broadband Ant.	VULB 9160	3138	SCHWARZBECK	06.04.10	☒
Antenna Mast	A109	N/A	DEAIL	-	☒
Turn Table	TS14	N/A	DEAIL	-	☒
10m OATS	-	-	EMC Compliance	-	☒

6.2.3 Measurement uncertainty

Radiated Emission measurement : (K=2, 95%)
30-300 MHz ; 3 m: ±3.69 [dB], 10 m: ±3.67 [dB]
300-1000 MHz ; 3 m: ±4.07 [dB], 10 m: ±3.41 [dB]

6.2.4 Test data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	angle	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
					Antenna	Cable			
95.50	17.8	V	1.0	271	9.01	1.40	30.0	28.21	1.79
335.60	18.5	V	1.0	299	13.96	3.30	37.0	35.76	1.24
384.10	15.4	H	3.5	96	15.07	3.70	37.0	34.17	2.83
480.00	11.1	V	1.0	360	17.15	4.20	37.0	32.45	4.55
493.20	9.7	H	2.4	164	17.27	4.30	37.0	31.27	5.73
624.00	6.5	H	2.7	271	19.64	5.40	37.0	31.54	5.46
798.70	4.8	H	1.3	173	22.26	6.60	37.0	33.66	3.34
815.70	2.4	V	1.8	118	22.40	6.90	37.0	31.70	5.30
864.00	1.9	V	1.3	260	22.62	7.00	37.0	31.52	5.48
898.20	2.2	H	2.5	93	23.12	7.10	37.0	32.42	4.58

*10 m OATS

** Note : Reading = Test Receiver meter,*

P= Polarization → POL H = Horizontal, POL V = Vertical

** Result = Field Strength (Antenna factor + Cable factor + Reading)*

6.2.5. Result

The EUT tested complied with the limits detailed in FCC Rules Part 15 Section 15.109(g).

7. Test graphs

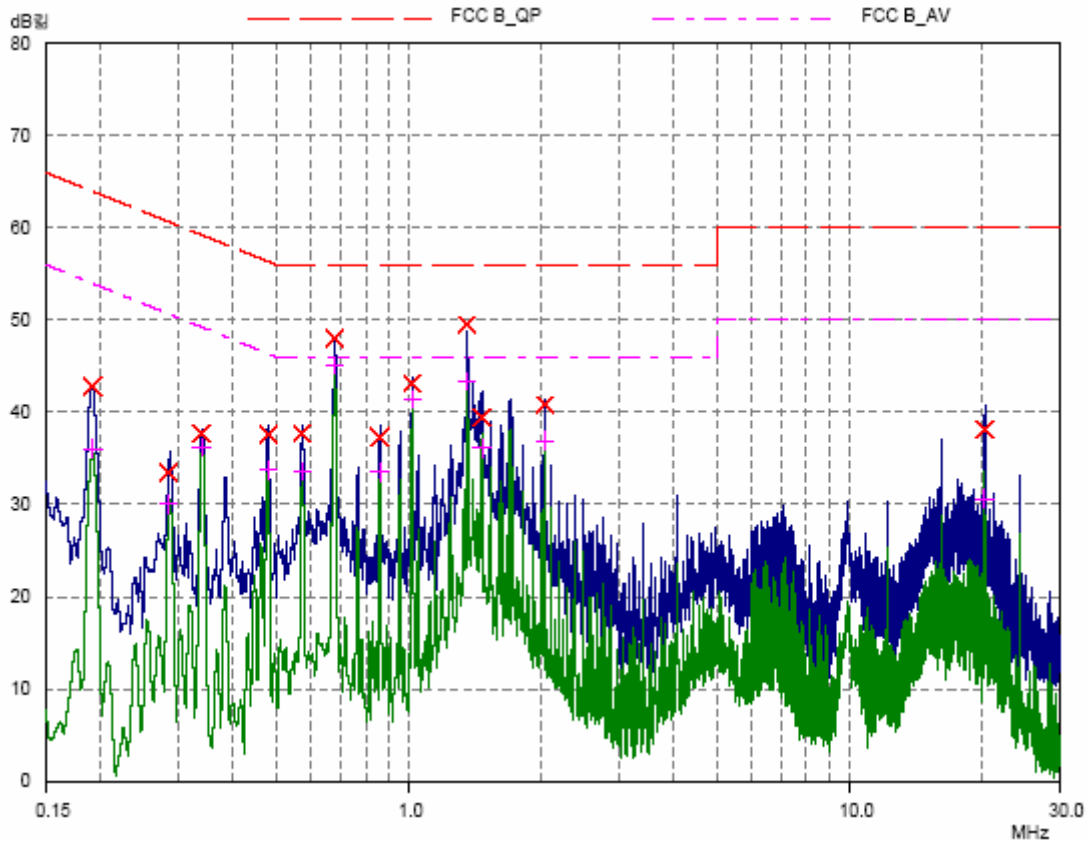
EUT: EIAP-3000
Manuf:
Op Cond: H
Operator:
Test Spec: FCC Class B Conducted Emission
Comment:

Result File: 509151h.dat : JEC-2000

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	60dB
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 25 dB



EUT: EIAP-3000
Manuf:
Op Cond: N
Operator:
Test Spec: FCC Class B Conducted Emission
Comment:

Result File: 509151n.dat : JEC-2000

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	60dB
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 25 dB