

# Certification of Compliance

CFR 47 Part 15 Subpart B

Test Result  Positive

## Negative

Reviewed By

Approved By

J. H. Lee / EMC Group Manager

G. Chung / Chief

- The test report with appendix consists of 12 pages.
- The test result only responds to the tested sample.
- This device is classified by PC peripherals.
- It is not allowed to copy this report even partly without the allowance of IST EMC Laboratory.
- This equipment as for has been shown to be capable of continued compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4 1992.



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## INFORMATIONS OF TEST LABORATORY

EMC LABORATORY of IST Co., Ltd. (*FCC Filing Lab*)

San 21-8, Goan-Ri, Baekam-Myun, Yongin-City

Kyonggi-Do, 449-860, Korea

TEL : +82 31 333 4093

FAX : +82 31 333 4094

## ENVIRONMENTAL CONDITIONS

Temperature 28

Humidity 34 %

Atmospheric pressure 999 mbar

## POWER SUPPLY SYSTEM USED

Power supply system DC 1.5V (AAA Battery x1)

- EMC suppression device is not used during the test.

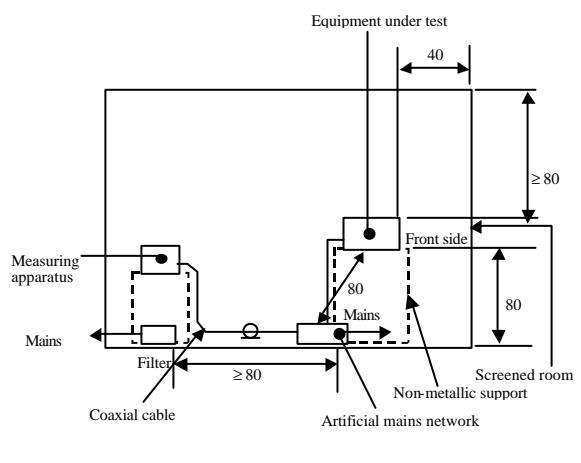
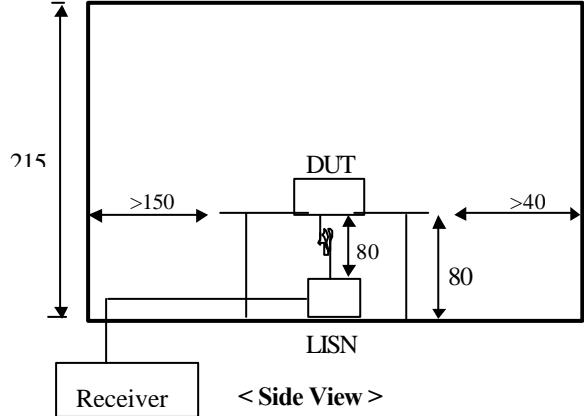
## DESCRIPTIONS OF TEST

### Conducted Emissions:

The measurement were performed over the frequency range of 0.45MHz to 30MHz using a 50 /50uH LISN as the input transducer to a Spectrum Analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within an bandwidth of 10KHz or for "quasi-peak" within a bandwidth of 9KHz.

### - Procedure of Test

The line-conducted facility is located inside a shielded room No.1. A 1m X 1.5m wooden table 80cm height is placed 40cm away from the vertical wall and 1.5m away from the other wall of the shielded room. The R/S ESH3-Z5 and EMCO 3825/2 LISN are bonded to bottom of the shielded room. The DUT is located on the wooden table with distance more than 80cm from the LISN and powered from the EMCO LISN .The peripheral equipment is powered from the other LISN. Power to the LISNs are filtered by a noise cut power line filters. All electrical cables are shielded by braided tinned steel tubing with inner  $\phi$  1.2cm. If the DUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the EMCO LISN. All interconnecting cables more than 1m were shortened by non-inductive bundling to a 1m length. Sufficient time for the DUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating conditions. The RF output of the LISN was connected to the R/S receiver to determine the frequency producing the maximum emission from the DUT. The frequency producing the maximum level was reexamined using Quasi-Peak mode by manual measurement, after scanned by automatic Peak mode for frequency range from 0.45 to 30MHz. The bandwidth of the receiver was set to 10kHz. The DUT, peripheral equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission.



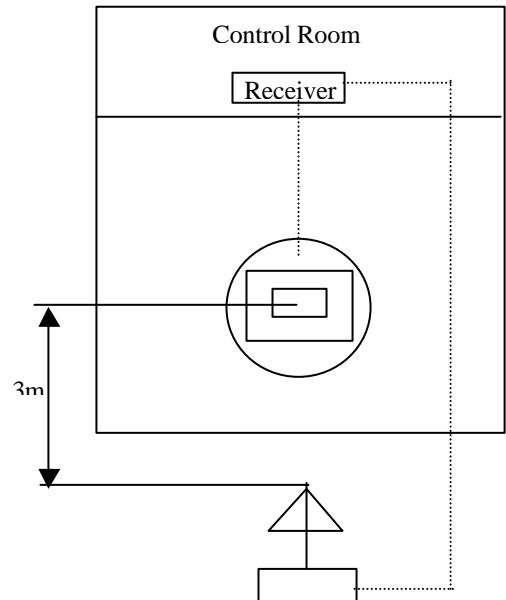
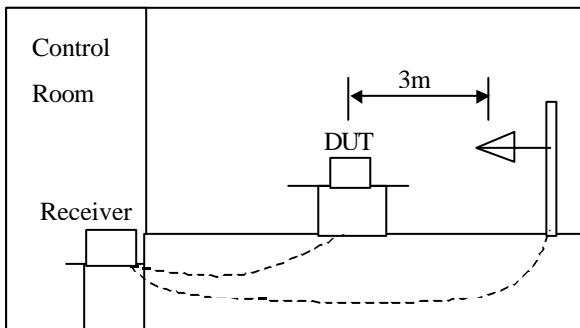
## DESCRIPTION OF TEST

### **Radiated Emissions:**

The measurement was performed over the frequency range of 30MHz to 1GHz using antenna as the input transducer to a Spectrum analyzer or a Field Intensity Meter. The measurement was made with the detector set for "quasi-peak" within a bandwidth of 120KHz.

#### **- Procedure of Test**

Preliminary measurements were made at 3 meter using bi-conical and log-periodic antennas, and spectrum analyzer to determine the frequency producing the max. emission in anechoic chamber. Appropriate precaution was taken to ensure that all emission from the DUT were maximized and investigated. The system configuration, mode of operation, turn-table azimuth and height with respect to the antenna were noted for each frequency found. The spectrum was scanned from 40MHz to 300MHz using S/B bi-conical antenna and 300 to 1000MHz using S/B log-periodic antenna. Above 1GHz, linearly polarized double ridge horn antennas were used. Final measurements were made at open site with 3-meters test distance using S/B bi-log antenna or horn antenna. The OATS have been verified in regular for its normalized site attenuations. The test equipment was placed on a wooden table. Sufficient time for the DUT, peripheral equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined by manual. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120kHz or 1MHz depending on the frequency of type of signal. The DUT, peripheral equipment and interconnecting cables were re-configured to the set-up producing the max. emission for the frequency and were placed on top of a 0.8-meter high nonmetallic 1 x 1.5 meter table. The DUT, peripheral equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation to the DUT and/or peripheral equipment and changing the polarity of the antenna, whichever determined the worst-case emission.



## SUMMARY

Conducted Emission

The requirements are	MET	Not MET
Minimum limit margin	7.8dB	at 28.682 MHz
Maximum limit exceeding	dB	at Hz

**Remarks :** For normal operating mode at Live phase

Radiated Emission

The requirements are	MET	Not MET
Minimum limit margin	3.8 dB	at 48.2 MHz
Maximum limit exceeding	dB	at Hz

**Remarks :**

Reported By



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H.C. Kim / EMC Engineer

*Note :*

means the test is applicable,  is not applicable.

## TEST CONDITIONS AND DATA

### Conducted Emissions

#### Test Equipment Used

Model Name	Manufacturer	Description	Next Cal. Date
ESH3	Rohde Schwarz	Receiver	Jun. 10, 2003
ESH3-Z2	Rohde Schwarz	Pulse Limiter	Jul. 13, 2002
EZM	Rohde Schwarz	Spectrum monitor	-
3825/2	EMCO	LISN	Jul. 13, 2002
-	-	-	-
-	-	-	-

#### External Peripherals

Device Description	Model Name	Manufacture	FCC Compliance Information
Host Computer	Brio BA 600/550	Hewlett Packard	DoC
Monitor	529B	Daewoo Electronics.	FCC ID : C5F7NFCMC529B
Mouse	M-S48a	Hewlett Packard	FCC ID : JNZ201213
Keyboard	SK-2502C	Hewlett Packard	DoC
Printer	A0302380	Northern telecom	FCC ID : C5F7NFCMC1509B
Serial Mouse	M-M28	LOGITECH	FCC ID : DZL210365

Test Program Up/Download

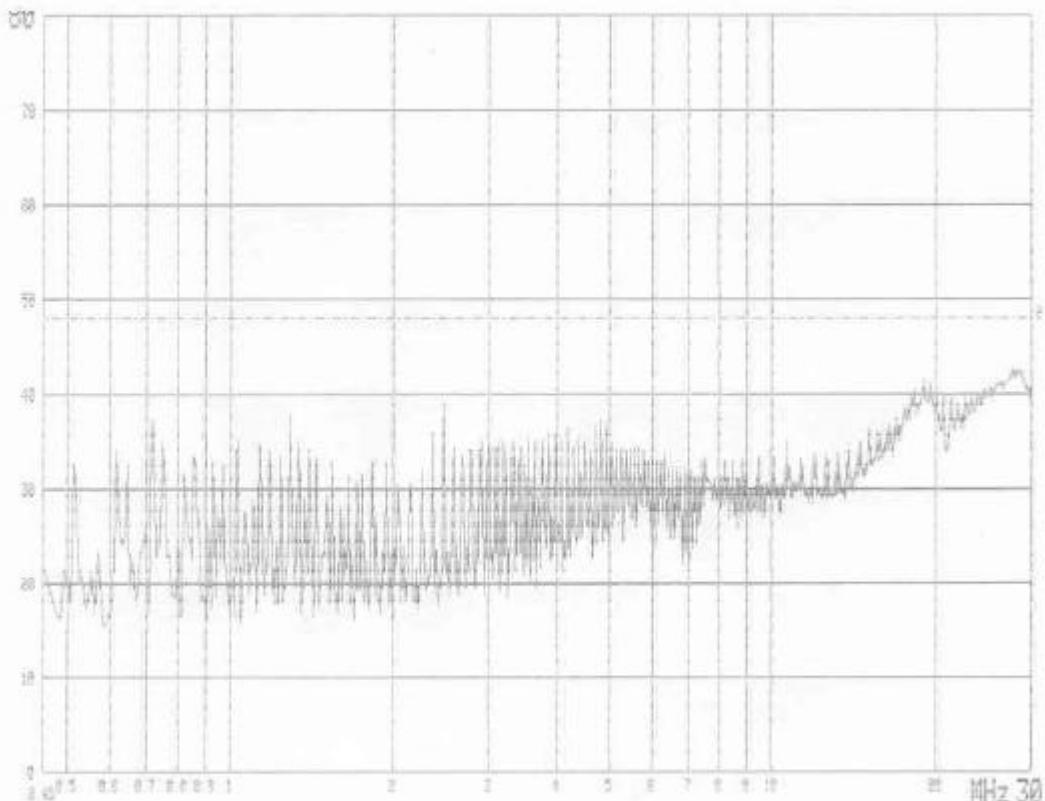
Test Area Shielded Room #3

Note : .

- Find the test data in following page(s) 8 to 9.

**Conducted Emissions**

(Mains Terminal Disturbance Voltages)



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MODEL : IHP3-064  
120Vac 60Hz Phase : L1

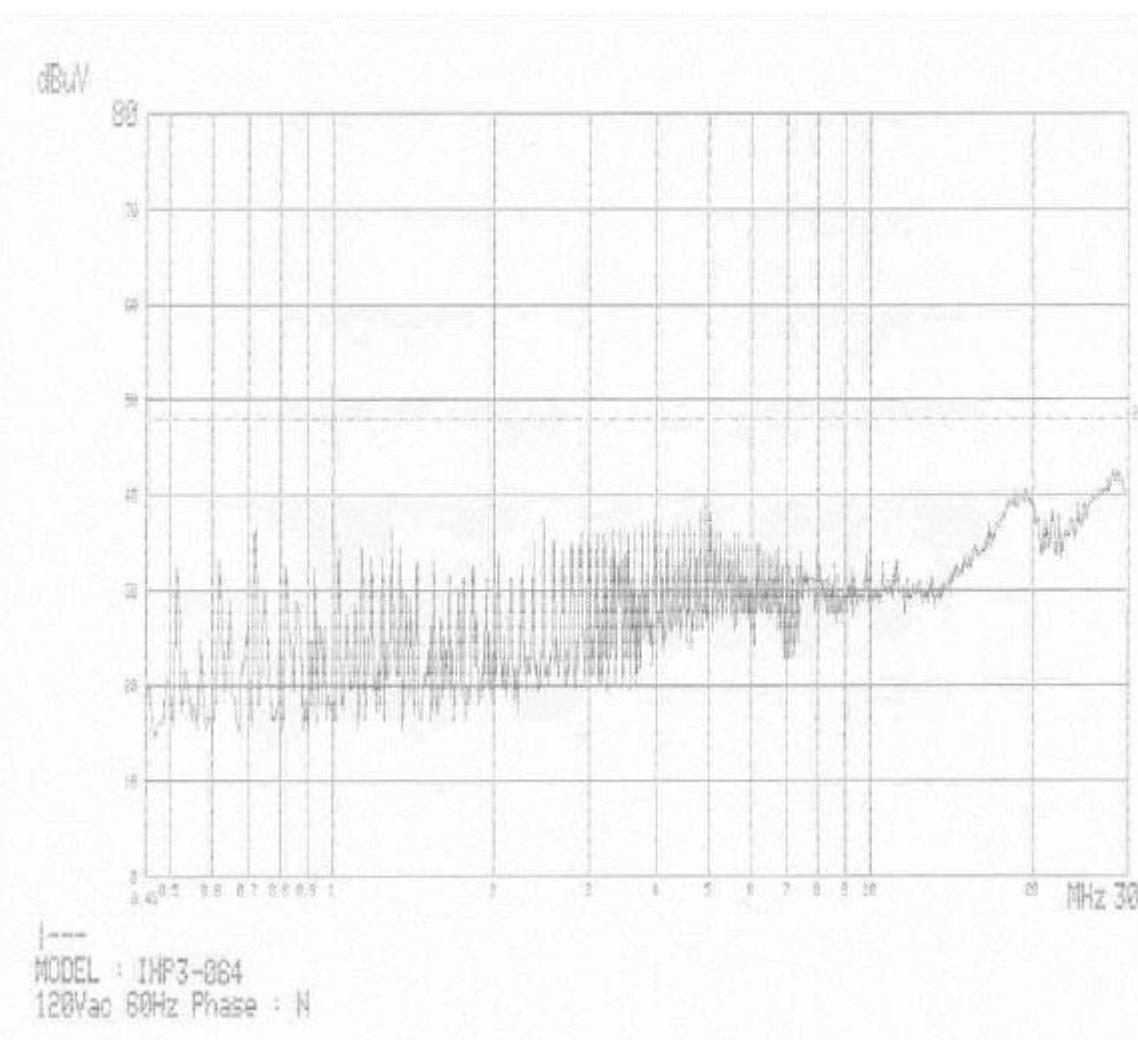
Live

Frequency [MHz]	Measurement [dBuV]	Limit [dBuV]	Margin [dBuV]
	Q-Peak	Q-Peak	Q-Peak
0.720	36.7	48.0	11.3
1.289	36.8	48.0	11.2
2.470	35.5	48.0	12.5
4.836	35.4	48.0	12.6
18.986	37.3	48.0	10.7
27.932	39.4	48.0	8.6

Note : The insertion loss and cable loss are negligible as less than 0.8dB.

**Conducted Emissions**

(Mains Terminal Disturbance Voltages)



Neutral

Frequency [MHz]	Measurement [dBuV]	Limit [dBuV]	Margin [dBuV]
	Q-Peak	Q-Peak	Q-Peak
0.720	36.4	48.0	11.6
1.289	35.5	48.0	12.5
2.469	36.3	48.0	11.7
4.940	36.8	48.0	11.2
19.364	38.1	48.0	9.9
28.682	40.2	48.0	7.8

Note : The insertion loss and cable loss are negligible as less than 0.8dB.

## TEST CONDITIONS AND DATA

### Radiated Emission

#### Test Equipment Used

Model Name	Manufacturer	Description	Next Cal. Date
ESVP	Rohde Schwarz	Receiver	Jun 10, 2003
VULB9160	Schwarzbeck	Antenna	Jun 03, 2003
EZM	Rohde Schwarz	Spectrum monitor	
-	-	-	-
-	-	-	-
-	-	-	-

#### External Peripherals

Device Description	Model Name	Manufacture	FCC Compliance Information
Host Computer	Brio BA 600/550	Hewlett Packard	DoC
Monitor	529B	Daewoo Electronics.	FCC ID : C5F7NFCMC529B
Mouse	M-S48a	Hewlett Packard	FCC ID : JNZ201213
Keyboard	SK-2502C	Hewlett Packard	DoC
Printer	A0302380	Northern telecom	FCC ID : C5F7NFCMC1509B
Serial Mouse	M-M28	LOGITECH	FCC ID : DZL210365

Test Program      Playback, Up/Download

Test Area      Open Area Test Site #2

*Note : It was investigated the radiated interferences for every operating mode and the final measurement was performed for Up/download (USB connected) .*

- Find the test data in following page 11.

**Radiated Emissions**

(Disturbance Radiation)

	Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Polar. [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
	48.2	23.2	11.5	1.5	209	V	36.2	40.0	3.8
	120.4	20.9	11.5	2.6	266	V	35.0	43.5	8.5
	168.6	14.9	12.4	3.1	257	V	30.4	43.5	13.1
	263.9	21.5	11.3	3.9	302	H	36.7	46.0	9.3
	360.1	21.0	13.8	4.9	216	H	39.7	46.0	6.3

End of data

Note :

Appendix A. The EUT Photos



Front View



Rear View