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ELECTROMAGNETIC COMPATIBILITY TEST REPORT

Company : Compeye Corporation
Address : 11, Lane 596, Chien Hsing Road Sec. 2, Hsinfeng, Hsinchu, Taiwan, R.O.C.
Sample Name : SCANNER
Model : DP36VC
Data Applies To : Smartkey 636C,Smartkey 2000C,Sm@rtScan Studio,DP36VU Smartkey 636U,Smartkey 2000U,DP36VP,DP36KC,DP36KU, DP36HC,DP36HU,DP36MU,DP36MC,DP36BC,DP36BU
Date Received : JUN. 16, 1999
Date Tested : JUN. 17, 1999

MEASUREMENT PORCEDURE USED :
FCC RULES AND REGULATION PART 15 SUBPART A
CLASS B OCTOBER 1996 AND ANSI C63.4 MAY 1992

WE HEREBY CERTIFY THAT: The measurements shown in the attachment were made in accordance with the procedures indicated, and the energy emitted by the equipment was found to be within the limits applicable. We assume full responsibility for the accuracy and completeness of these measurements and vouch for the qualifications of all persons taking them.

	Name	Signature	Date
Testing Engineer	C.F.Wu/NVLAP	C. F. Wu	Jul.07, 1999
Approving Manager	Paul Y. Liau/NVLAP	Paul Y. Liau	Jul.07, 1999

Notes :
1. This report will be invalid if duplicated or photocopied in part.
2. This report refers only to the specimen(s) submitted to test, and is invalid as seperately used.
3. This report is invalid without examination stamp and signature of this institute.
4. The tested specimen(s) will be preserved for thirty days from the date issued.
5. This is a NIST/NVLAP accrediated report but not constituted and endorsed by US government.

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1. GENERAL INFORMATION

1.1 DESCRIPTION OF EUT

COMPANY : Compeye Corporation

SAMPLE NAME : SCANNER

MODEL NUMBER : DP36VC

SERIAL NO. : ----------

POWER SUPPLY : 15VDC (from power adapter by SINCHO with model No. SCP48-151000)

POWER CORD : Unshielded cable

SIGNAL CABLE : 1. Shielded cable (1.8m) for USB port
2. Shielded cable (1.8m) for parallel port

1.2 DESCRIPTION OF PERIPHERALS

(1) PC

MODEL NUMBER : 54V
SERIAL NUMBER : 96NB054
MANUFACTURER : IBM CORP.
FCC ID : ----------
POWER CORD : Unshielded , Detachable , 1.8m

(2) MONITOR

MODEL NUMBER : JC-1571VMA-2
SERIAL NUMBER : 6Z01162EA
MANUFACTURER : NEC CORP.
F.C.C. ID : A3DJC-1571VMA-2
POWER CORD : Unshielded , Detachable , 1.8m

(3) KEYBOARD

PRODUCT NUMBER : KB-7953
MANUFACTURER : IBM CORP.
SERIAL NUMBER : 0004093
POWER SOURCE : 5VDC (FROM PC)
FCC ID : ----------

(4) MOUSE

MODEL NUMBER : M-S34
MANUFACTURER : HP CORP.
SERIAL NUMBER : 23-037335
POWER SOURCE : 5VDC (FROM PC)
FCC ID : DZL211029

(5) MODEM

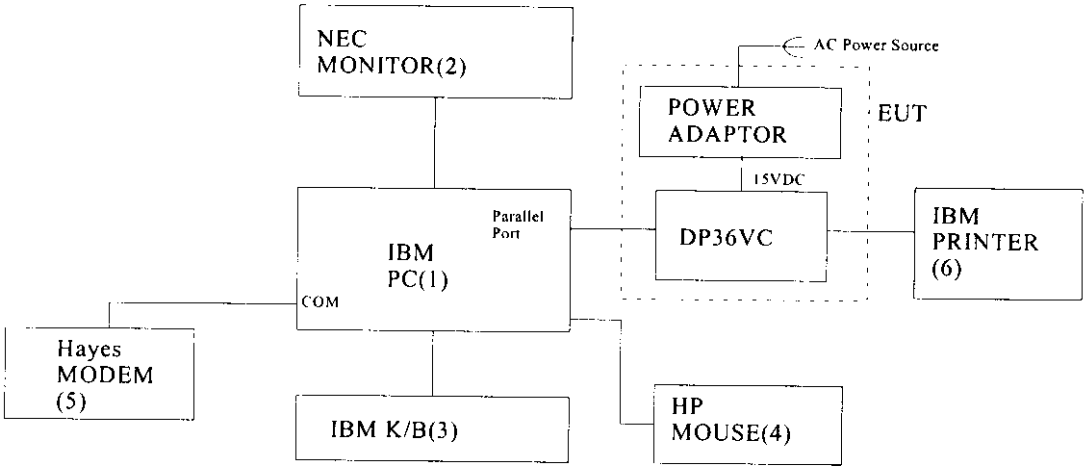
MODEL NUMBER : 5240AM
SERIAL NUMBER : A0095240K270
MANUFACTURER : Hayes CORP.
FCC ID : BFJ5201AM
POWER SUPPLY : 9 VAC (FROM AC ADAPTOR)

(6) PRINTER

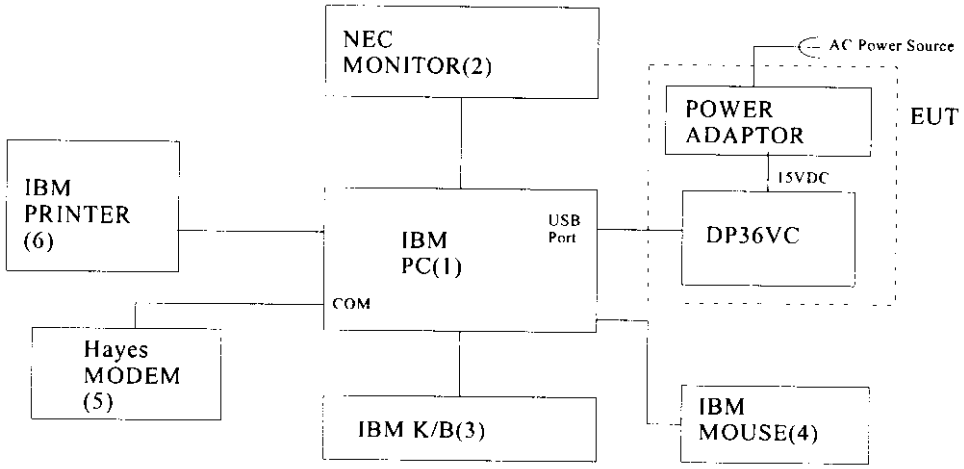
MODEL NUMBER : 5152-002
SERIAL NUMBER : 0754365
MANUFACTURER : IBM CORP.
FCC ID : BKM9A85152002
POWER CORD : Shielded , Detachable , 1.8m

1.3 EUT & PERIPHERALS SETUP DIAGRAM

(1) For Printer port mode



(2) For USB port mode



The indicated numbers(1)(2).....,please refer to 1.2

1.4 EUT OPERATING CONDITION

1. Powered on of all equipments.
2. Run "SCAN32.EXE" program.
3. Start testing.

1.5 DESCRIPTION OF OPEN SITE

SITE DESCRIPTION : FCC certificate NO. :31040/SIT
DNV certificate NO. : 510-96-1016
TUV R. certificate NO. :I9664582-9610
Lloyd's certificate NO. :LA003
BCIQ certificate NO. :SL2-IN-E-02
NVLAP Lab code :200118-0
CNLA certificate NO. : CNLA-ZL97018
VCCI certificate NO. :R-706, C-650

NAME OF SITE : Electronics Research & Service Organization
Industrial Technology Research Institute

SITE LOCATION : K500, 195-4 , sec. 4, Chung Hsing Rd.,
Chu-Tung Chen. Hsin-Chu, Taiwan 31015 R.O.C.

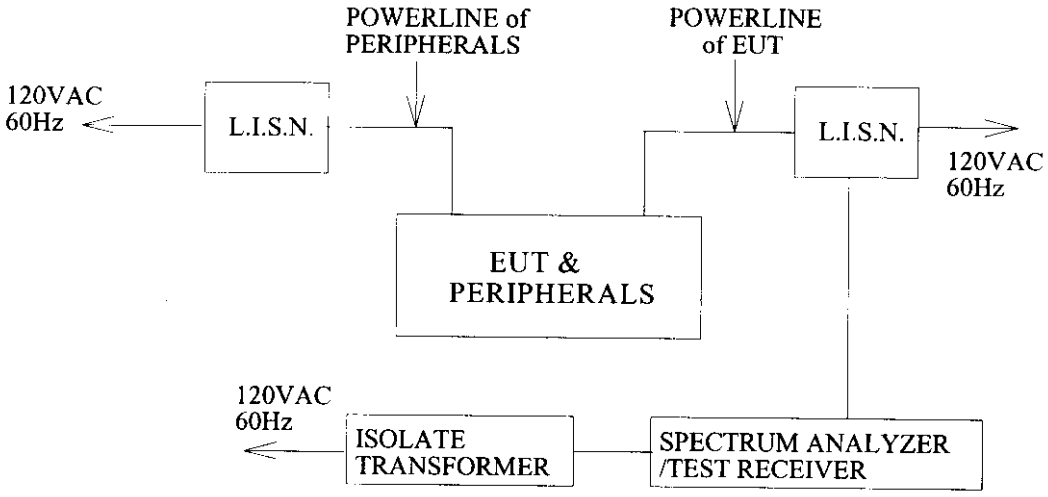
2. CONDUCTED POWERLINE TEST

2.1 TEST EQUIPMENTS

The following test equipments are used during the conducted powerline tests :

MANUFACTURER OR TYPE	MODEL No.	SERIAL No.	DATE OF CALIBRATION
SPECTRUM ANALYZER & DISPLAY	HP 8568A	2235A02320	MAR. 18, 1999
QUASI-PEAK ADAPTER	HP 85650 A	2341A00672	MAR. 18, 1999
ISOLATION TRANSFORMER	SOLAR 7032-1	N/A	N/A
L.I.S.N.	EMCO 3850/2	9311-1025 9401-1028	MAR. 25. 1999
TEST RECEIVER	R/S ESH3	8720791118	MAR. 18, 1999
SHIELDED ROOM	KEENE 5983	N/A	N/A

2.2 TEST SETUP



2.3 CONDUCTED POWER LINE EMISSION LIMIT

FREQUENCY (MHz)	MAXIMUM RF LINE VOLTAGE (dB μ V)	
	CLASS A	CLASS B
0.45 - 1.705	60	48
1.705 - 30.0	69.5	48

2.4 TEST PROCEDURE

The test procedure is performed in a 12ft × 12ft × 8ft(L × W × H) shielded room. the EUT along with its peripherals were placed on a 1.0m(W) × 1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chasis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chasis ground also bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

2.5 UNCERTAINTY OF CONDUCTED EMISSION

The uncertainty of conducted emission is ±1.36dB.

2.6 LINE CONDUCTED RF VOLTAGE MEASUREMENT

The frequency spectrum from 0.45 MHz to 30 MHz was investigated. All emissions not reported below are more than 20 dB below the prescribed limits.

All readings are Quasi-peak values.

Temperature : 22 ℃ Humidity : 49 % R.H.

FREQUENCY	READING(dB μ V)		LIMITS
	ONE END & GRD'D	THE OTHER END & GRD'D	(dB μ V)
(MHz)	Q.P.	Q.P.	Q.P.
0.450	*	*	48.00
0.513	*	27.30	48.00
0.526	30.60	28.60	48.00
0.541	31.00	27.50	48.00
8.264	18.04	*	48.00
10.722	17.65	*	48.00
10.812	*	17.85	48.00
14.386	24.06	25.66	48.00
24.834	29.69	31.99	48.00
30.000	*	*	48.00

REMARKS : 1. * Undetectable or the Q.P. value is lower than the limits of Ave.

2. For Printer port mode

3. SINCHO: SCP48-151000 power adapter

2.6 LINE CONDUCTED RF VOLTAGE MEASUREMENT

The frequency spectrum from 0.45 MHz to 30 MHz was investigated. All emissions not reported below are more than 20 dB below the prescribed limits.

All readings are Quasi-peak values.

Temperature : 22 ℃ Humidity : 49 % R.H.

FREQUENCY	READING(dB μ V)		LIMITS
	ONE END & GRD'D	THE OTHER END & GRD'D	(dB μ V)
(MHz)	Q.P.	Q.P.	Q.P.
0.450	*	*	48.00
0.510	30.10	27.70	48.00
0.523	30.90	*	48.00
0.528	*	28.10	48.00
0.555	*	27.01	48.00
8.058	17.14	*	48.00
10.722	*	18.05	48.00
11.323	18.75	*	48.00
14.386	24.06	25.96	48.00
24.834	29.79	30.89	48.00
30.000	*	*	48.00

REMARKS : 1. * Undetectable or the Q.P. value is lower than the limits of Ave.

2. For USB port mode

3. SINCHO: SCP48-151000 power adapter

3. RADIATED EMISSION TEST

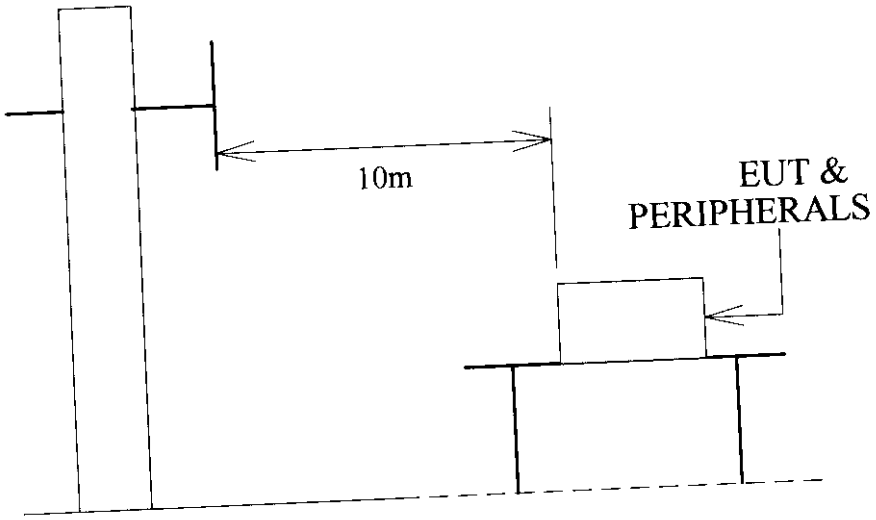
3.1 TEST EQUIPMENTS

The following test equipments are utilized in making the measurements contained in this report.

MANUFACTURER OR TYPE	MODEL No.	SERIAL No.	DATE OF CALIBRATION
CHASE BI-LOG ANTENNA	CBL6111A	1546	MAY. 23, 1999
R/S TEST RECEIVER	ESMI	842088/005 841978/008	MAY. 03, 1999
OPEN SITE	----------	No.2	AUG. 18, 1998

3.2 TEST SETUP

The diagram below shows the test setup which is utilized to make these measurements.



Antenna Elevation Variable

3.3 RADIATION LIMIT

All emanation from a class B computing device or system , including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below :

FREQUENCY (MHz)	FIELD STRENGTHS(dB μ V/M)	
	CLASS A(10m)	CLASS B(3m)
30－88	39.0	40.0
88－216	43.5	43.5
216－960	46.4	46.0
960－1000	49.5	54.0

Note : (1)The tighter limit shall apply at the edge between two frequency bands.
(2)Distance refers to the distance in meters between the measuring instrument antenna and the closest point of any part of the device or system.

3.4 TEST PROCEDURE

The devices under test were placed on a rotatable table top 0.8 meter above ground. The table was rotated 360 degrees to determine the position of the highest radiation. EUT is set 10 meters from the interference receiving antenna which is mounted on the top of a variable height mast. The antenna height is varied between one meter and four meters above ground to find the maximum value of the field strength Both horizontal polarization and vertical polarization of the antenna are set to make the measurement. The bandwidth setting on the E.M.I. meter (R/S TEST RECEIVER ESMI) is 120 KHz. The levels are quasi peak value readings. The frequency spectrum from 30MHz to 1000MHz was investigated.

3.5 UNCERTAINTY OF RADIATED EMISSION

The uncertainty of radiated emission is $\pm$2.72dB.

3.6 RADIATED RF NOISE MEASUREMENT

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported below are more than 20 dB below the prescribed limits.
All readings are quasi-peak values.

Temperature : 26 ℃ Humidity : 79 % RH

FREQ-UENCY (MHz)	ANTENNA FACTOR (dB)	CABLE LOSS (dB)	METER READING AT10m(dB μV/M)		LIMITS (dB μV/M)	EMISSION LEVEL AT3m(dB μV/M)	
			HORIZON-TAL	VERTICAL		HORIZON-TAL	VERTICAL
30.00	19.50	1.06	*	*	40.00	*	*
74.29	7.49	1.65	7.90	11.50	40.00	27.04	30.64
84.33	8.96	1.72	6.00	9.60	40.00	26.67	30.27
86.33	9.28	1.73	5.80	9.20	40.00	26.81	30.21
122.47	11.87	2.03	9.70	6.70	43.50	33.61	30.61
124.48	12.01	2.05	8.90	5.60	43.50	32.97	29.67
136.54	11.85	2.18	11.70	*	43.50	35.73	*
138.53	11.82	2.20	11.70	6.30	43.50	35.71	30.31
140.54	11.77	2.22	11.60	5.60	43.50	35.58	29.58
142.55	11.67	2.24	10.90	5.20	43.50	34.81	29.11
144.56	11.58	2.26	9.20	2.30	43.50	33.04	26.14
146.56	11.49	2.28	9.80	2.50	43.50	33.56	26.26
150.58	11.30	2.31	8.60	5.60	43.50	32.22	29.22
152.59	11.21	2.33	8.40	3.20	43.50	31.93	26.73
154.60	11.11	2.34	8.90	5.80	43.50	32.35	29.25
170.66	9.94	2.44	7.80	3.20	43.50	30.18	25.58
192.75	9.19	2.58	9.10	5.80	43.50	30.87	27.57
1000.00	24.86	6.80	*	*	54.00	*	*

REMARKS :
1. * Undetectable
2. Emission level (dB μV/M) =Antenna Factor (dB) + Cable loss (dB) + Meter Reading (dB μV/M).
3. 10m measured data are transferred to 3m by the formula
   L2=L1(d1/d2) μV/M from CISPR 22
   20LogL2=20LogL1+20Log(d1/d2) dB μ V/M
4. For Printer port mode
5. SINCHO: SCP48-151000 power adapter

3.6 RADIATED RF NOISE MEASUREMENT

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported below are more than 20 dB below the prescribed limits.
All readings are quasi-peak values.

Temperature : 26 ℃ Humidity : 79 % RH

FREQ-UENCY (MHz)	ANTENNA FACTOR (dB)	CABLE LOSS (dB)	METER READING AT10m(dB μV/M)		LIMITS (dB μV/M)	EMISSION LEVEL AT3m(dB μV/M)	
			HORIZON-TAL	VERTICAL		HORIZON-TAL	VERTICAL
30.00	19.50	1.06	*	*	40.00	*	*
36.08	16.55	1.19	4.30	7.30	40.00	32.04	35.04
38.09	14.97	1.24	4.10	9.30	40.00	30.31	35.51
108.25	11.21	1.89	15.70	10.30	43.50	38.80	33.40
110.26	11.30	1.91	13.50	7.20	43.50	36.71	30.41
112.26	11.38	1.93	12.20	5.60	43.50	35.51	28.91
114.26	11.46	1.95	13.10	4.50	43.50	36.51	27.91
118.27	11.63	1.99	12.40	3.40	43.50	36.02	27.02
122.28	11.86	2.03	12.50	3.60	43.50	36.39	27.49
124.29	12.00	2.05	12.50	3.50	43.50	36.55	27.55
126.30	12.03	2.07	12.30	3.50	43.50	36.40	27.60
136.32	11.85	2.17	11.20	4.70	43.50	35.23	28.73
138.32	11.82	2.19	10.50	6.10	43.50	34.51	30.11
140.33	11.77	2.21	10.70	8.90	43.50	34.69	32.89
142.33	11.68	2.23	11.70	4.20	43.50	35.62	28.12
380.88	15.14	3.79	10.30	9.40	46.00	39.23	38.33
382.88	15.19	3.80	12.30	10.20	46.00	41.28	39.18
384.89	15.23	3.81	11.30	10.20	46.00	40.34	39.24
388.90	15.32	3.83	10.00	9.90	46.00	39.15	39.05
705.64	23.69	5.43	2.30	*	46.00	41.42	*
1000.00	24.86	6.80	*	*	54.00	*	*

REMARKS :
1. * Undetectable
2. Emission level (dB μV/M) =Antenna Factor (dB) + Cable loss (dB) + Meter Reading (dB μV/M).
3. 10m measured data are transferred to 3m by the formula
   L2=L1(d1/d2) μV/M from CISPR 22
   20LogL2=20LogL1+20Log(d1/d2) dB μ V/M
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