

EXHIBIT 4
RFI/EMI TEST REPORT



EMC

TEST REPORT

REPORT NO. : F87080361A
MODEL NO. : 3C16750
DATE OF TEST : Oct. 9, 1998

PREPARED FOR : ACCTON TECHNOLOGY CORPORATION

ADDRESS : NO. 1, CREATION RD. III, S.B.I.P.
HSINCHU, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

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1.

CERTIFICATION

Issue Date: Nov. 13, 1998

Product : SwitchHUB
Trade Name : 3COM
Model No. : 3C16750
Applicant : ACCTON TECHNOLOGY CORPORATION
Standard : FCC Part 15, Subpart B, Class B
ANSI C63.4-1992
CISPR 22: 1993 +A1+A2

We hereby certify that one sample of the designation has been tested in our facility on Oct. 9, 1998. The test record, data evaluation and Equipment Under Test (EUT) configurations represent herein are true and accurate representation of the measurements of the sample's EMC characteristics under the conditions herein specified.

The test results show that the EUT as described in this report is in compliance with the Class B limits of conducted and radiated emission of applicable standards

PREPARED BY: Rita Yi, DATE: 11/13/98
(Rita Yi)

TESTED BY: James Chen, DATE: 11/13/98
(James Chen)

APPROVED BY: Stephen W.F. Chen, DATE: 11/13/98
(Stephen W.F. Chen)

ADVANCE DATA TECHNOLOGY CORPORATION

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	SwitchHUB
Model No.	:	3C16750
Power Supply	:	Switching
Power Cord	:	Nonshielded (1.8m)
Data Cable	:	Shielded cable (STP)

Note: The EUT is a dual-speed (10/100Mbps) hub with eight 10/100BASE-TX ports. It allows you to set up a network with both Ethernet (10Mbps) and Fast Ethernet (100Mbps) workstations and other devices. The port senses the speed of the connected equipment and operates at the appropriate speed.

The EUT is supplied with a BTC power adapter, model: ADP-305, the rating is Input: 100V~240Vac, 47~63 Hz, 1A, Output: 5V, 6A. There is a manufacturer-implemented ferrite core on the DC nonshielded power cord (1.2m) connected to the EUT.

This report was prepared for class II permissive change. The main change is following:

1. Amount of built-in Ethernet port is decreased to eight ports.
2. Enclosure and PCB size are smaller than the original because of this change but electrical circuit is the same.

For more detailed features, please refer to ATTACHMENT 1 - TECHNICAL DESCRIPTION OF EUT and User's Manual.



2.2 DESCRIPTION OF SUPPORT UNITS

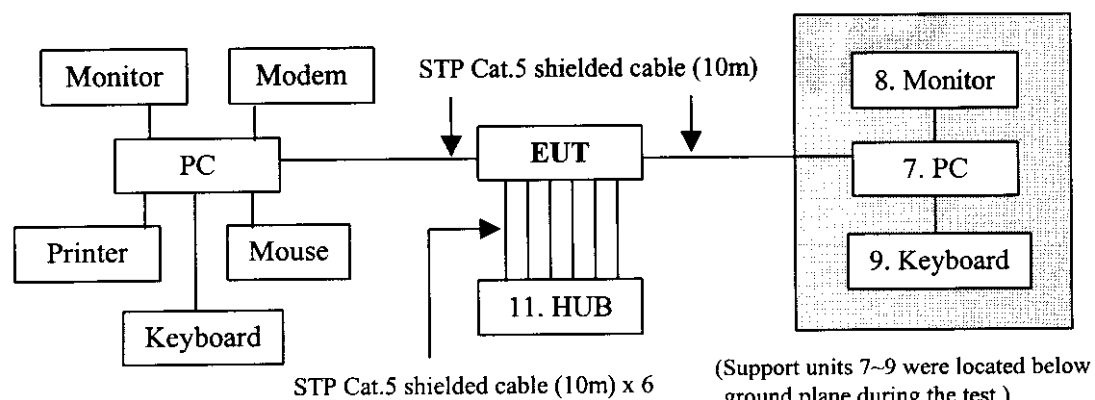
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories are used to form representative test configuration during the tests.

No	Product	Brand	Model No.	FCC ID	I/O Cable
1.	PERSONAL COMPUTER	HP	Net Server 5/133LC	B94HPLX105	Nonshielded Power (1.8m)
2.	COLOR MONITOR	ADI	PD-695	BR8PD-695	Shielded Signal (1.5m) Nonshielded Power (1.8m)
3.	KEYBOARD	BTC	5140	BTC5140	Shielded Signal (1.4m)
4.	MOUSE	LOGITECH	M-S35	DZL211029	Shielded Signal (1.5m)
5.	MODEM	ACEEX	1414	IFAXDM1414	Shielded Signal (1.2m) Nonshielded Power (2.4m)
6.	PRINTER	HP	C2642A	B94C2642X	Shielded Signal (1.1m) Nonshielded Power (2.4m)
7.	PERSONAL COMPUTER	HP	Net Server 5/133LC	B94HPLX121	Nonshielded Power (1.8m)
8.	COLOR MONITOR	ADI	937G	BR8937G	Shielded Signal (1.5m) Nonshielded Power (1.8m)
9.	KEYBOARD	BTC	5121	E5XKBM104M10VC	Shielded Signal (1.4m)
10.	HUB	ACCTON	ES3016A	N/A	N/A

Note: 1. Support unit 1 acted as SERVER PC and communicated with support unit 7-9 which acted as HOST PC and systems of communication partner. They communicated with each other via EUT at 100Mbps speed with two STP (Shielded Twisted Pair) cables (10m). The HOST PC was kept in the control room during the test..

2. Other ports of the EUT were connected to support unit 10 via a STP cable (10M) individually and support unit 10 was located under the test table.

2.3 TEST METHODOLOGY AND CONFIGURATION



Both conducted and radiated testing were performed according to the procedures in ANSI C63.4:1992. Radiated testing was performed at an antenna to EUT distance of 10m on an open area test site. Please refer to the photos of test configuration in Item 5.



3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8594E	3710A04861	Sept. 14, 1999
CHASE RF Pre Amplifier	CPA92320	1001	June 01, 1999
ROHDE & SCHWARZ Test Receiver	ESVS 10	846285/012	Dec. 12, 1998
CHASE Broadband Antenna	CBL6112A	2343	June 24, 1999
ROHDE & SCHWARZ Precision Dipole	HZ-12 (30~300MHz)	846932/0003	June 06, 2000
ROHDE & SCHWARZ Precision Dipole	HZ-13 (300~1000MHz)	846556/0007	June 17, 2000
HP Signal Generator	8657A	3225A05037	Sep. 17, 1999
EMCO Antenna Tower	2075-2	9712-2124	N/A
EMCO Turn Table	2081-1.53	9712-2030	N/A
EMCO Controller	2090	9712-1283	N/A
CORCOM AC Filter	MRI2030	107/108	N/A
ANRITSU RF Switch	MP59B	M50867	N/A
BELDEN RF Signal Cable	9913 RG-8/U	N/A	N/A
Open Field Test Site	Site A	ADT-RA	July 08, 1999

Note: 1. The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months.

And the calibrations are traceable to NML/ROC and NIST/USA.

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESCS 30	847124/029	Dec. 18, 1998
ROHDE & SCHWARZ LISN	ESHS-Z5	848773/004	Nov. 25, 1998
KYORITSU LISN	KNW-407	8/1395/12	July 15, 1999
Shielded Room	Con A	ADT-CA	N/A

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months.

And the calibrations are traceable to NML/ROC and NIST/USA.



3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION

LIMIT OF RADIATED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30 - 230	40	30
230 - 1000	47	37

LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
Above 1000	300	49.5	500	54.0

Note: (1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

LIMIT OF CONDUCTED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

Note: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Frequency Range : 0.15 - 30 MHz (Conducted Emission)
30 - 1000 MHz (Radiated Emission)

Input Voltage : 120 Vac, 60 Hz

Temperature : 26 °C

Humidity : 54 %

Atmospheric Pressure : 987 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -12.00 dB at 0.878 MHz Minimum passing margin of radiated emission: -4.8 dB at 800.02 MHz

4.1.1 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. SERVER PC and HOST PC run a test program to enable all functions of EUT.
3. SERVER PC transmitted messages to and received messages from the HOST PC via EUT.
4. Repeat steps 3-4.



4.2 TEST DATA OF CONDUCTED EMISSION

EUT: SwitchHUBMODEL: 3C167506 dB Bandwidth: 10 kHzTEST PERSONNEL: James Chen

Freq. [MHz]	L Level		N Level		Limit		Margin [dB (μV)]			
	[dB (μV)]		[dB (μV)]		[dB (μV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.150	48.70	-	49.50	-	66.00	56.00	-17.30	-	-16.50	-
0.457	43.10	-	41.80	-	56.75	46.75	-13.65	-	-14.95	-
0.878	44.00	-	43.60	-	56.00	46.00	-12.00	-	-12.40	-
1.712	42.90	-	42.70	-	56.00	46.00	-13.10	-	-13.30	-
3.831	37.00	-	36.80	-	56.00	46.00	-19.00	-	-19.20	-
10.242	41.30	-	42.30	-	60.00	50.00	-18.70	-	-17.70	-

- Remarks:
1. "*": Undetectable
 2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 4. The emission level of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value

ADT CORP. SHIELDED ROOM A

CISPR 22 CLASS B

EUT: 3C16750
 Operator: JAMES CHEN
 Test Spec: LISN :L
 Comment: 120V AC / 60Hz
 File name: EN_22CB.SPC
 Date: 09. Oct 98 10:36

Report No.: F87080361A

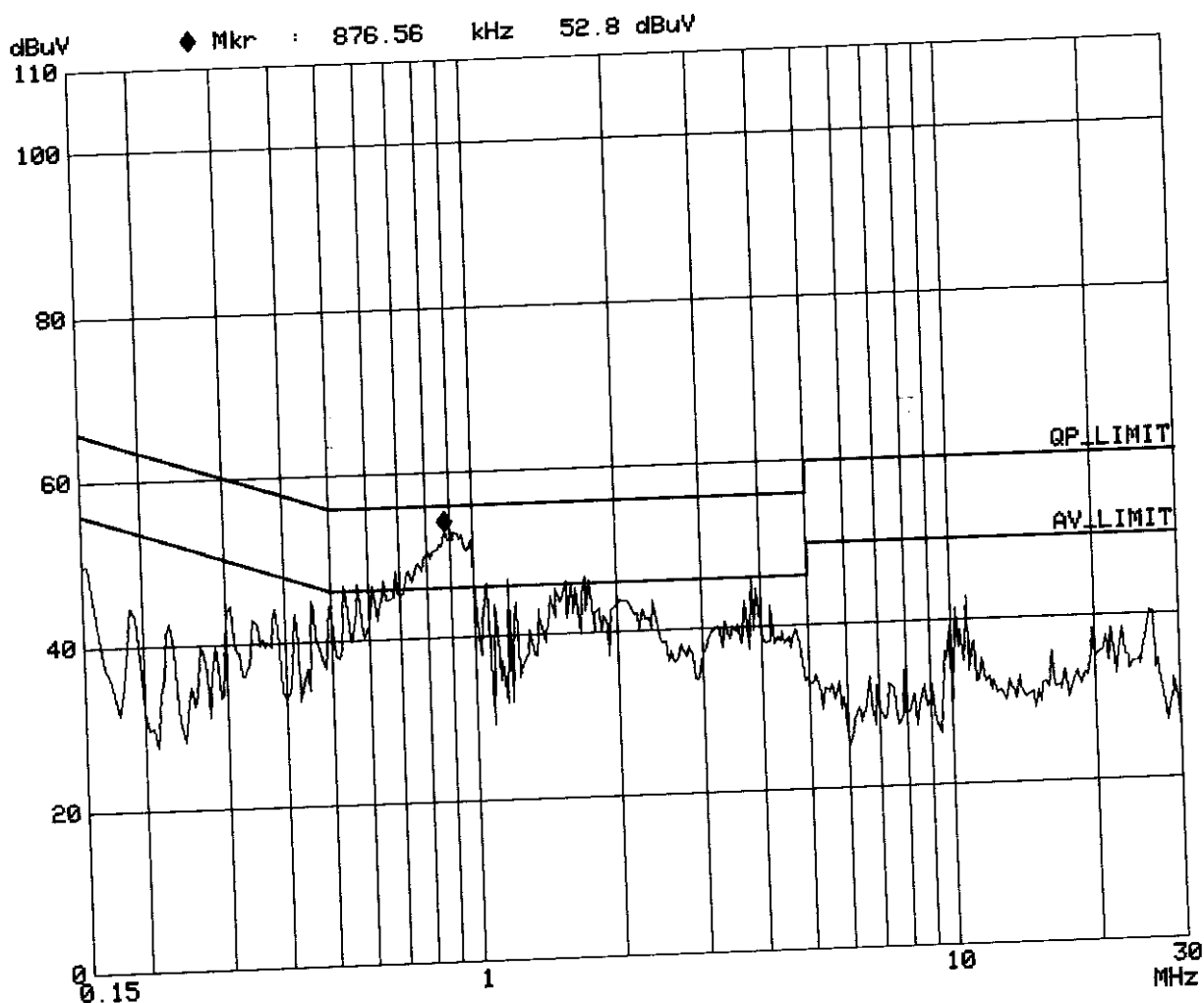
Page: 9-1

Test By: *James Chen*

Overview Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150K	1M	3.90625k	9k	PK	10ms	10dBLN	OFF
1M	10M	3.90625k	9k	PK	0.10ms	10dBLN	OFF
10M	30M	3.90625k	9k	PK	0.10ms	10dBLN	OFF

Transducer No. Start Stop Name
 1 150k 30M C_CA_01A



ADT CORP. SHIELDED ROOM A CISPR 22 CLASS B

EUT: 3C16750
Operator: JAMES CHEN
Test Spec: LISN :N
Comment: 120V AC / 60Hz
File name: EN_22CB.SPC
Date: 09. Oct 98 10:43

Report No.: F87080361A

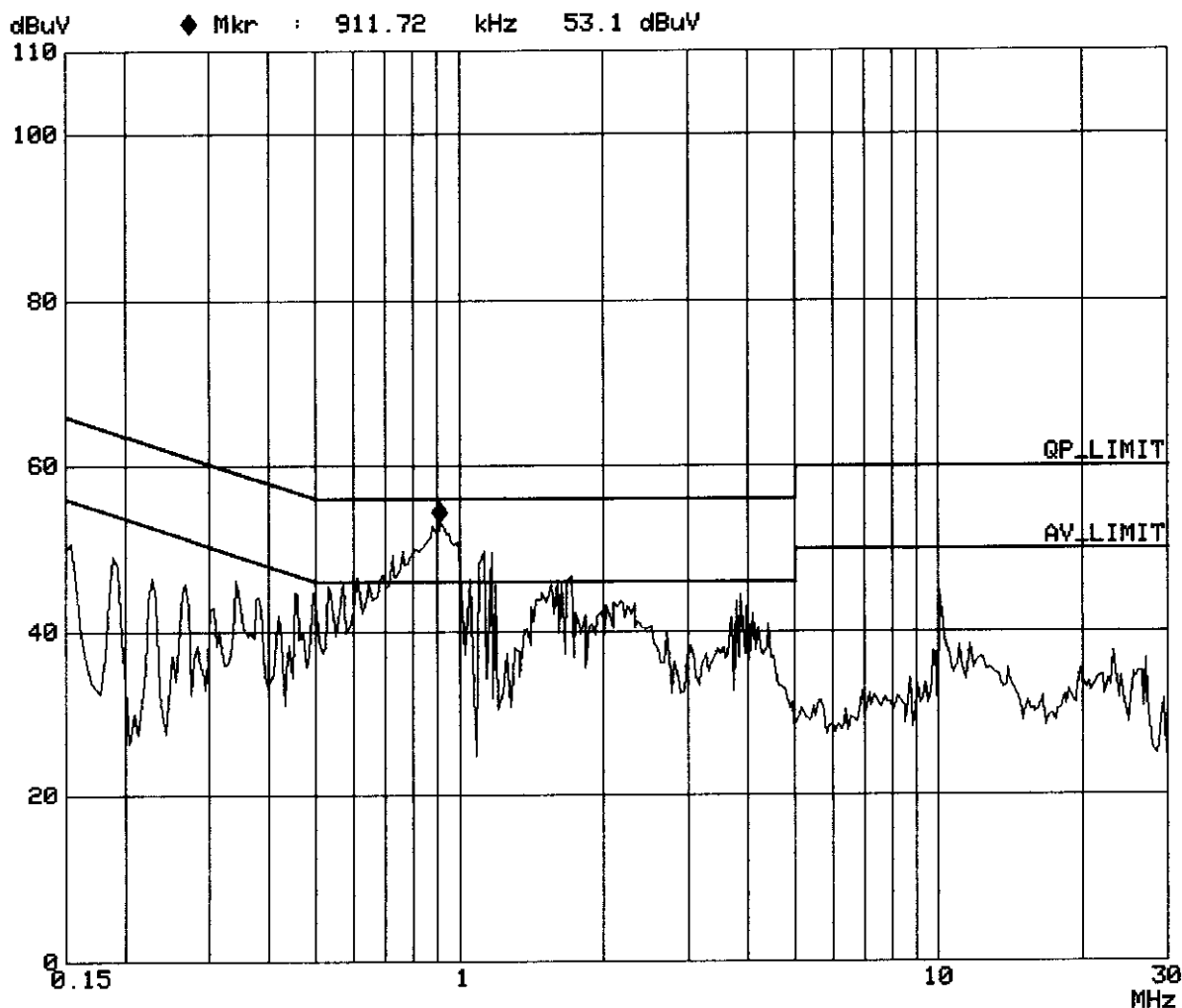
Page: 9-2

Test By: *James Chen*

Overview Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	1M	3.90625k	9k	PK	10ms	10dBLN	OFF
1M	10M	3.90625k	9k	PK	0.10ms	10dBLN	OFF
10M	30M	3.90625k	9k	PK	0.10ms	10dBLN	OFF

Transducer No.	Start	Stop	Name
1	150k	30M	C_CA_01A





4.3 TEST DATA OF RADIATED EMISSION

EUT: SwitchHUBMODEL: 3C16750ANTENNA: CHASE BILOG CBL6112APOLARITY: Horizontal

DETECTOR FUNCTION AND BANDWIDTH:

Quasi peak, 120 kHz (30-1000 MHz)
Peak, 1 MHz (1000 MHz-2000 MHz)

FREQUENCY RANGE: 30-1000 MHzMEASURED DISTANCE: 10 MFREQUENCY RANGE: 1000-2000 MHzMEASURED DISTANCE: 3 M

TEST PERSONNEL:

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
31.97	17.3	6.0	23.3	30.0	-6.7
75.00	7.3	4.3	11.6	30.0	-18.4
200.01	10.7	9.9	20.6	30.0	-9.4
225.02	10.3	5.8	16.1	30.0	-13.9
250.01	13.5	5.6	19.1	37.0	-17.9
425.01	18.5	6.4	24.9	37.0	-12.1
500.01	19.8	8.0	27.8	37.0	-9.2
550.01	20.8	10.3	31.1	37.0	-5.9
700.00	21.6	6.3	27.9	37.0	-9.1
750.01	22.8	7.6	30.4	37.0	-6.6
800.02	23.9	8.3	32.2	37.0	-4.8
850.00	24.1	6.2	30.3	37.0	-6.7

- REMARKS :
1. Emission level (dBuV/m) = Correction Factor(dB/m) + Meter Reading (dBuV).
 2. Correction Factor(dB/m) = Ant. Factor(dB/m)+Cable loss(dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value



TEST DATA OF RADIATED EMISSION

EUT: SwitchHUBMODEL: 3C16750ANTENNA: CHASE BILOG CBL6112APOLARITY: Vertical

DETECTOR FUNCTION AND BANDWIDTH:

Quasi peak, 120 kHz (30-1000 MHz)
Peak, 1 MHz (1000 MHz-2000 MHz)
FREQUENCY RANGE: 30-1000 MHzMEASURED DISTANCE: 10 MFREQUENCY RANGE: 1000-2000 MHzMEASURED DISTANCE: 3 M

TEST PERSONNEL:

Frequency (MHz)	Correction Factor (dB/m)	Reading Data dBuV	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.59	17.1	7.5	24.6	30.0	-5.4
68.34	6.4	15.3	21.7	30.0	-8.3
125.01	12.4	4.8	17.2	30.0	-12.8
175.01	11.5	10.1	21.6	30.0	-8.4
200.00	11.5	8.3	19.8	30.0	-10.2
225.01	11.5	6.1	17.6	30.0	-12.4
250.00	13.5	5.7	19.2	37.0	-17.8
550.01	20.8	5.9	26.7	37.0	-10.3
700.01	21.5	4.6	26.1	37.0	-10.9
1000.02	24.1	4.9	29.0	37.0	-8.0

REMARKS :

1. Emission level (dBuV/m) = Correction Factor(dB/m) + Meter Reading (dBuV).
2. Correction Factor(dB/m) = Ant. Factor(dB/m)+Cable loss(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value



6. ATTACHMENT 1 - TECHNICAL DESCRIPTION OF EUT

Specifications:

Environmental

- | | |
|---------------------------------|----------------------------|
| * Ambient Operation Temperature | 0 to 40 degrees Celsius |
| * Storage temperature | -10 to +70 degrees Celsius |
| * Humidity | 0% to 90% non-condensing |

Reliability

- * The reliability calculations and HALT testing required is detailed in the document 800d-006.
- * This document will be provided as a separate document to this product specificationl
- * Reliability MTBF Target
 - > 60,000 hours @ 25°C
 - > 25,000 hours @ 50°C
 - (Mil HDBK 217F Notice 1)

Mechanical

- * Dimensions** Height: 54.6 mm (1U)
 Width: 220mm
 Depth: 185.4mm
- * Weight** TBD kg.

Switch Performance

- * 4k maximum addresses
- * Learning rate 0 addresses/second max.
- * Ageing period default 21 hours.
- * Filtering 163,680 frames/second
- * Forwarding 10Mbps ->100Mbps 14,880 frames/second
- 100Mbps ->10Mbps 14,800 frames/second
- * Latency (store & forward only) <=40uS