

EXHIBIT 4
RFI/EMI TEST REPORT



EMC

TEST REPORT

REPORT NO. : F87112562
MODEL NO. : 3C16593A
DATE OF TEST : Nov. 25, 1998

MULTIPLE LISTING FOR BRAND: 3COM

MODEL: 3C16592A

BRAND: ACCTON

MODEL: EH3024A-32, EH3012A-32

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



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**1. CERTIFICATION**

Issue Date: Dec. 10, 1998

Product : SuperStack II Baseline Dual Speed Hub
Trade Name : 3COM
Model No. : 3C16593A
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 Nov. 25, 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: 12/10/98
(Rita Yi)

TESTED BY: James Chen, DATE: 12/10/98
(James Chen)

APPROVED BY: Stephen W.F. Chen, DATE: 12/10/98
(Stephen W.F. Chen)

ADVANCE DATA TECHNOLOGY CORPORATION**NVLAP[®]**

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	SuperStack II Baseline Dual Speed Hub
Model No.	:	3C16593A
Power Supply	:	Switching
Power Cord	:	Nonshielded (1.8m)
Data Cable	:	Shielded cable

Note: The EUT, SuperStack II Baseline Switch is an easy-to-use, 10/100 autosensing hub. It is ideal for users who want to connect both Ethernet and Fast Ethernet devices (workstations and other equipment) to the same hub.

The EUT has 12 or 24 shielded RJ-45, 10/100 autosensing port on the front panel. Each port can be connected to either a 10BASE-T (Ethernet) or a 100BASE-TX (Fast Ethernet) device. Internally, the hub has two repeater segments (10Mbps and 100Mbps) which are linked by a switch, allowing connected 10Mbps and 100Mbps device to communicate. User can connect a 10BASE-T or 100BASE-TX hub or switch to the EUT.

The EUT has four model names which are identical to each other in all aspects except for the followings:

Model Name	Brand	Difference
3C16593A	3Com	24-Port
3C16592A	3Com	12-Port
EH3024A-32 (same as 3C16593A)	ACCTON	24-Port
EH3012A-32 (same as 3C16592A)	ACCTON	12-Port

All models use the same mechanical construction and electrical circuit except 3C16592A uses fewer components than 3C16593A does. From the above models, model: 3C16593A was selected as representative model for the test and its data is recorded in this report.

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



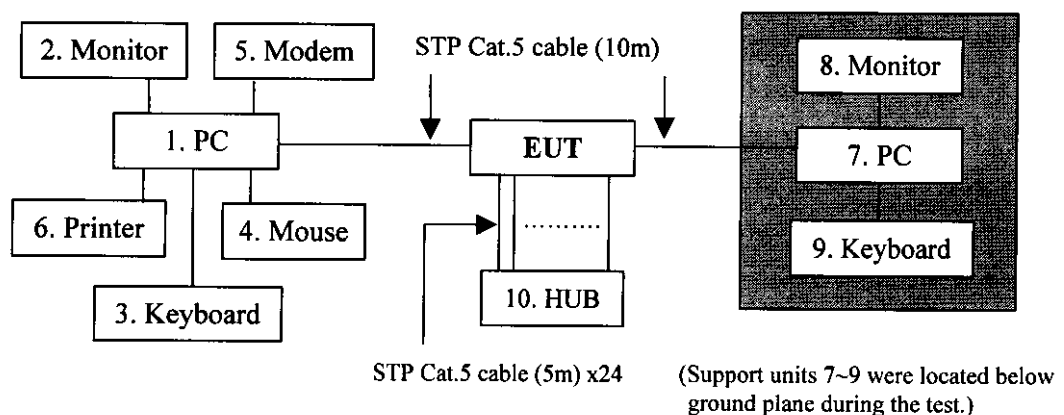
2.2 DESCRIPTION OF SUPPORT UNITS

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	NTi	PII-266	FCC DoC	Nonshielded Power (1.8m)
2.	COLOR MONITOR	ADI	937G	BR8937G	Shielded Signal (1.5m) Nonshielded Power (1.8m)
3.	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded Signal (1.4m)
4.	MOUSE	LOGITECH	M-S35	DZL2110029	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	NTi	PII-266	FCC DoC	Nonshielded Power (1.8m)
8.	COLOR MONITOR	COMPAQ	V410	BJMC4A	Shielded Signal (1.5m) Nonshielded Power (1.8m)
9.	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded Signal (1.4m)
10.	HUB	HP	J3289A	N/A	Shielded Signal (5.0m x 22) Nonshielded Power (1.8m)

- 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 shielded STP (Shielded Twisted Pair) Cat.5 cables (10M) The HOST PC was kept in the control room.
2. The other RJ-45 ports of EUT were connected with STP Cat.5 cable (5m) individually and all these cable were terminated by unit 10 to simulate real use. Unit 10 was located under test table during the test.

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 10 m 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	Nov. 13, 1999
ROHDE & SCHWARZ LISN	ESHS-Z5	848773/004	Nov. 11, 1999
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 : 58 %
Atmospheric Pressure : 993 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -15.20 dB at 4.457 MHz Minimum passing margin of radiated emission: -4.8 dB at 175.00 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: SuperStack II Baseline Dual Speed Hub

MODEL: 3C16593A

6 dB Bandwidth: 10 kHz

Freq.	L Level		N Level		Limit		Margin [dB (μV)]			
[MHz]	[dB (μV)]		[dB (μV)]		[dB (μV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.228	40.20	-	41.20	-	62.52	52.52	-22.32	-	-21.32	-
0.458	39.20	-	39.40	-	56.73	46.73	-17.53	-	-17.33	-
1.599	38.40	-	40.10	-	56.00	46.00	-17.60	-	-15.90	-
4.457	40.80	-	40.50	-	56.00	46.00	-15.20	-	-15.50	-
14.515	38.40	-	38.50	-	60.00	50.00	-21.60	-	-21.50	-
18.742	37.90	-	38.60	-	60.00	50.00	-22.10	-	-21.40	-

- 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: 3C16593A
Op Cond: STP (100 Mbps)
Operator: James Chen
Test Spec: LISN :L
Comment: 120V AC / 60Hz
File name: CNS_438B.SPC
Date: 25. Nov 98 16:33

Report No.: F87112562

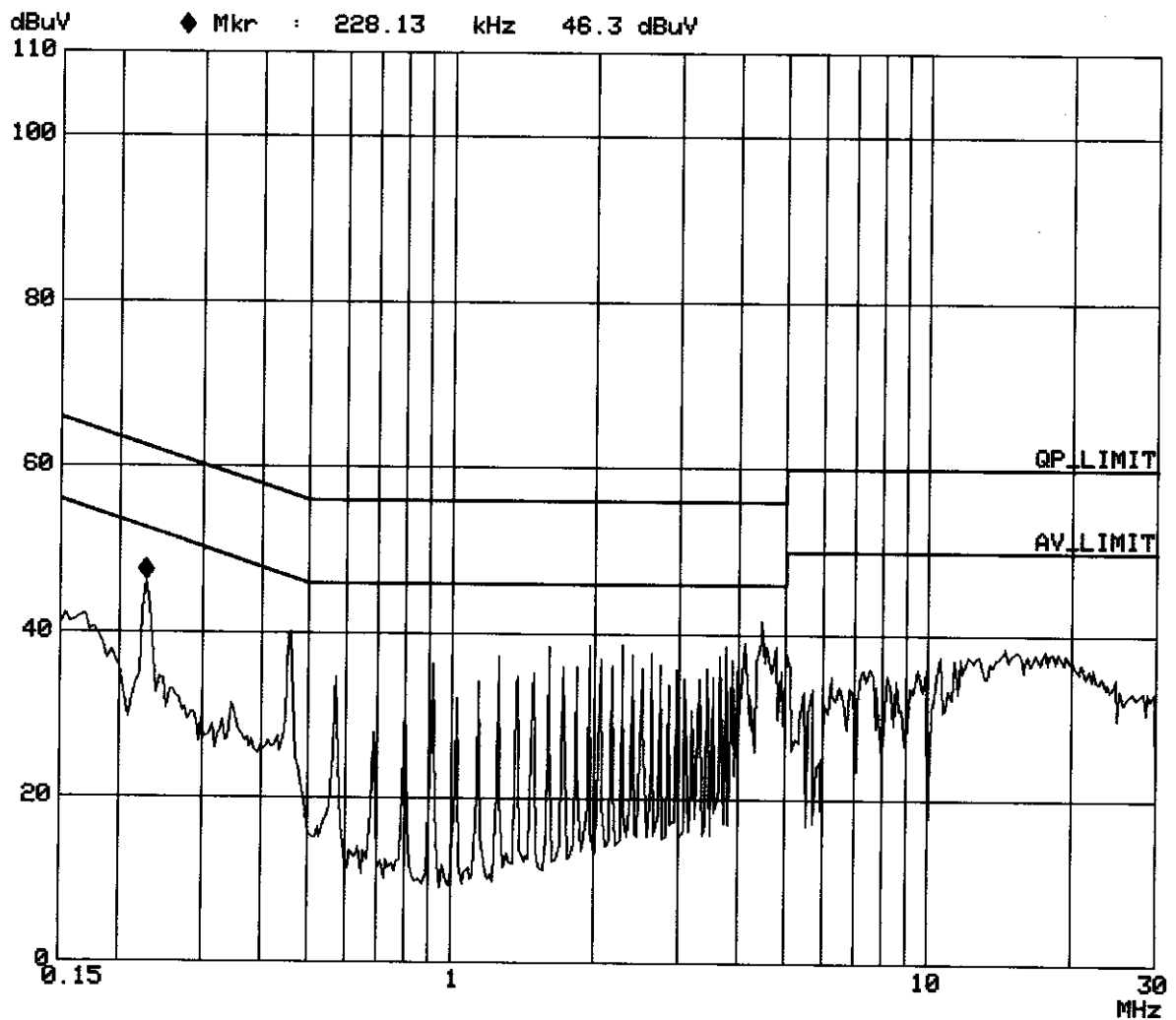
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Test By: *James Chen*

Overview Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	3M	3.90625k	9k	PK	10ms	10dBLN	OFF
3M	10M	3.90625k	9k	PK	0.05ms	10dBLN	OFF
10M	30M	3.90625k	9k	PK	0.05ms	10dBLN	OFF

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



ADT CORP. SHIELDED ROOM A CISPR 22 CLASS B

EUT: 3C16593A
Op Cond: STP (100 Mbps)
Operator: James Chen
Test Spec: LISN :N
Comment: 120V AC / 60Hz
File name: CNS_438B.SPC
Date: 25. Nov 98 16:42

Report No.: F87112562

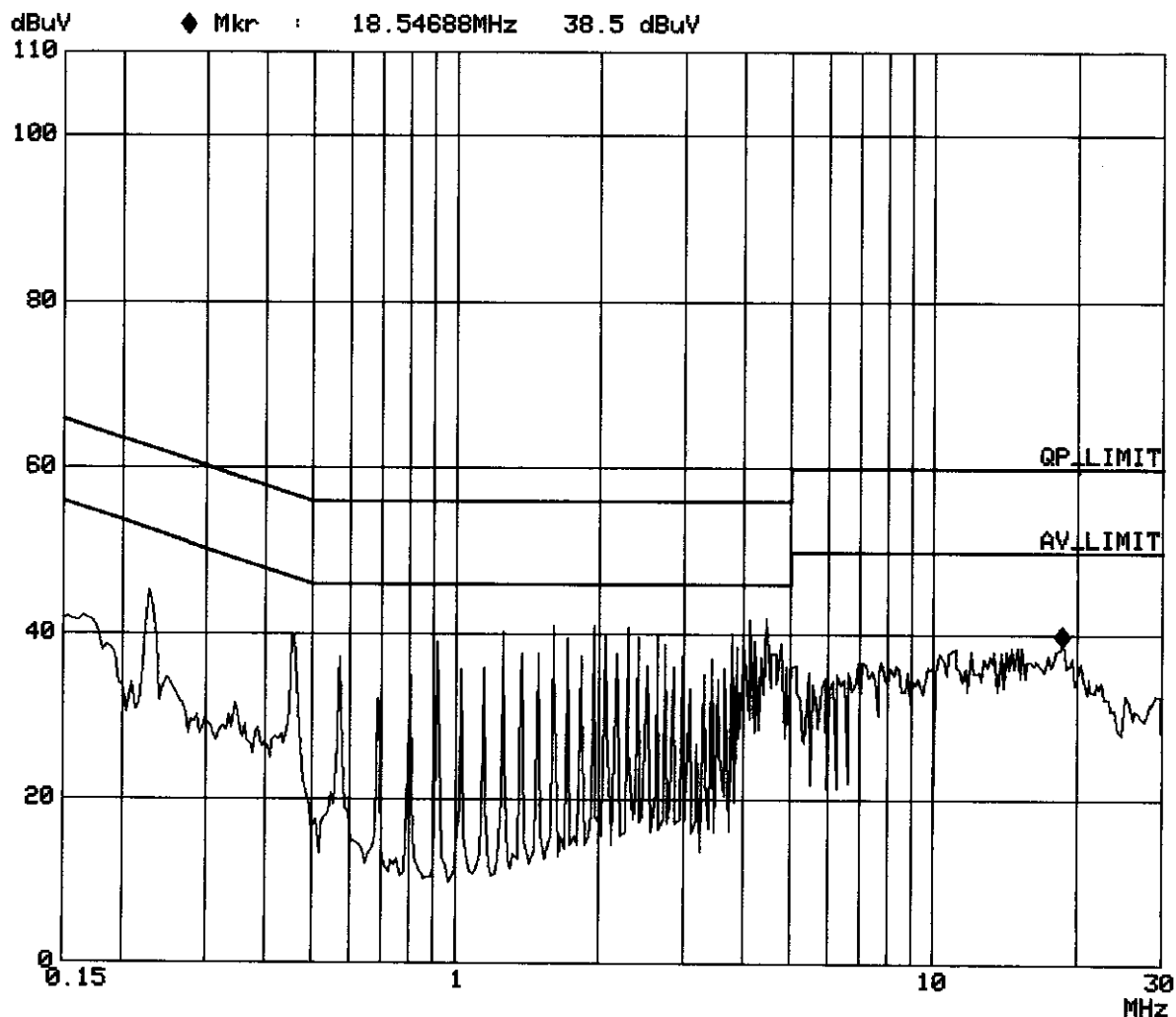
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Test By: *James Chen*

Overview Scan Settings (3 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	
150k	3M	3.90625k	9k	PK	10ms	10dBLN	OFF	
3M	10M	3.90625k	9k	PK	0.05ms	10dBLN	OFF	
10M	30M	3.90625k	9k	PK	0.05ms	10dBLN	OFF	

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





4.3 TEST DATA OF RADIATED EMISSION

EUT: SuperStack II Baseline Dual Speed Hub MODEL: 3C16593A
 ANTENNA: CHASE BILOG CBL6112A POLARITY: Horizontal
 DETECTOR FUNCTION: Quasi-peak 6 dB BANDWIDTH: 120 kHz
 FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
50.00	8.8	14.4	23.2	30.0	-6.8
125.00	12.9	6.2	19.1	30.0	-10.9
175.00	11.5	13.7	25.2	30.0	-4.8
199.97	10.7	11.9	22.6	30.0	-7.4
199.97	10.7	11.9	22.6	30.0	-7.4
225.00	10.3	7.7	18.0	30.0	-12.0
250.00	13.5	14.9	28.4	37.0	-8.6
375.00	17.4	11.5	28.9	37.0	-8.1
499.99	19.8	10.1	29.9	37.0	-7.1
550.00	20.8	8.8	29.6	37.0	-7.4
624.99	21.8	7.4	29.2	37.0	-7.8
774.98	23.3	4.6	27.9	37.0	-9.1
999.99	25.1	7.0	32.1	37.0	-4.9

- 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: SuperStack II Baseline Dual Speed HubMODEL: 3C16593AANTENNA: CHASE BILOG CBL6112APOLARITY: VerticalDETECTOR FUNCTION: Quasi-peak6 dB BANDWIDTH: 120 kHzFREQUENCY RANGE: 30-1000 MHzMEASURED DISTANCE: 10 M

Frequency (MHz)	Correction Factor (dB/m)	Reading Data dBuV	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
50.00	9.5	14.0	23.5	30.0	-6.5
75.00	7.1	9.7	16.8	30.0	-13.2
125.00	12.4	9.2	21.6	30.0	-8.4
150.00	13.3	6.6	19.9	30.0	-10.1
175.00	11.5	11.6	23.1	30.0	-6.9
200.01	11.5	8.1	19.6	30.0	-10.4
250.00	13.5	13.4	26.9	37.0	-10.1
375.00	17.3	7.5	24.8	37.0	-12.2
500.00	20.2	7.9	28.1	37.0	-8.9
625.00	21.4	5.0	26.4	37.0	-10.6
875.00	23.6	4.9	28.5	37.0	-8.5

- 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:

Related Standards:

Functional	ISO/IEC 8802-3, IEEE 802.3, IEEE 802.3u, IEEE 802.1D
Safety	UL 1950, EN 60950, CAN/CSA 22.2, TUV/GS, IEC 950
EMC	EN 55022 Class B*, VCCI Class B*, AS/NZS3548 Class B*, EN55022 Class A**, FCC Part 15 Class A**, ICESO-003 Class A**, VCCI Class A*

* This will only be achieved as a stand-alone product using commercially available Category 5 STP cables – not as part of a stack.

** This will only be achieved as a stand-alone product using commercially available Category 3 UTP cables, or using commercially available Category 5 STP cables as part of a system.

Category 5 screened cables must be used to ensure complete compliance with the Class B requirements of this standard.

The use of unscreened cables (Category 3 or 5 for 10BASE-T port or Category 5 for 100BASE-TX ports) complies with Class A requirements.

Environmental:

Operating Temperature 0 - 50°C (32 - 122°F)

Humidity 0 - 95% (non-condensing)

Physical:

Width 440mm (17.3in.)

Depth 173mm (6.8in.)

Height 44mm *1.7in.)

Weight 3C16592A: 2.2kg (5.6lb)
3C16593A: 2.2kg (5.8lb)

Mounting Free standing, or 19in, rack mounted using the mounting kit supplied

Electrical

Power Inlet IEC 320

AC Line Frequency 50/60 Hz

Power Consumption 3C16592A: 25VA
3C16593A: 42VA

Input Voltage 100-240VAC