FCC ID: HED1045USB

# EMC

## TEST REPORT

REPORT NO. : F87081861
MODEL NO. : 3C19250
DATE OF TEST : Aug. 20, 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

NVLAP®
Accredited Laboratory

No. 81, Lu Liao Keng, 9 Ling, Wu Lung Tsuen,
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# 1. CERTIFICATION

Issue Date: Oct. 7, 1998

| | | |
|---|---|---|
| Product | : | USB ETHERNET ADAPTER |
| Trade Name | : | 3COM |
| Model No. | : | 3C19250 |
| 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 Aug. 20, 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: 10/7/98
( Rita Yi )

TESTED BY: James Chen , DATE: 10/7/98
( James Chen )

APPROVED BY: Stephen W.F. Chen DATE: 10/7/98
( Stephen W.F. Chen )

**ADVANCE DATA TECHNOLOGY CORPORATION**

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# 2. GENERAL INFORMATION

## 2.1 GENERAL DESCRIPTION OF EUT

| | | |
|---|---|---|
| Product | : | USB ETHERNET ADAPTER |
| Model No. | : | 3C19250 |
| Power Supply | : | DC 4.25-5.25V/ 0.525W MAX |
| Power Cord | : | N/A |
| Data Cable | : | USB Shielded cable (0.6m) |

Note: The EUT is a USB to Ethernet adapter which allows a client system on a Ethernet 10Base-T network to attach and communicate using the standard USB port found in PC systems, and it also allows connectivity to a 10Bbase-T Ethernet LAN with peak performance of 8Mbps with typical sustained performance of 6Mbps in an unshared USB topology.

The form-factor is a small external box that has one upstream USB type "B" connector and one standard RJ-45 Ethernet connector.

For more detailed features description, please refer to ATTACHMENT 1 - TECHNICAL DESCRIPTION OF EUT and user's manual.

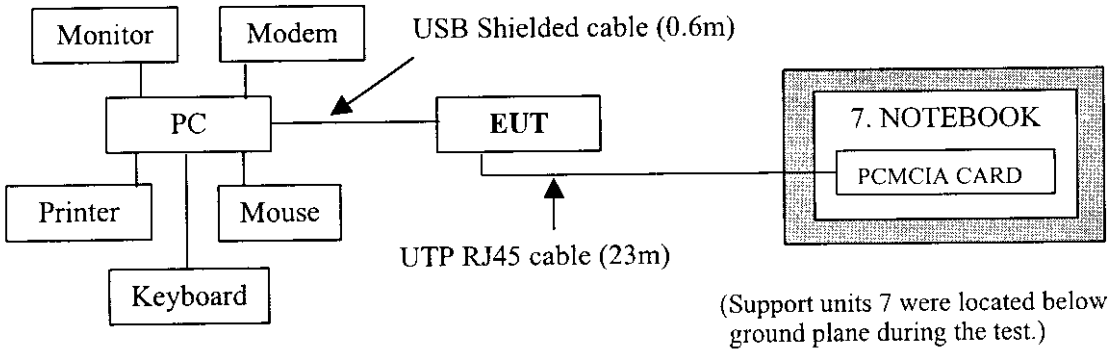
## 2.2 DESCRIPTION OF SUPPORT UNITS

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 | Vectra VL 5/166 MMX Series 5MT | B94VECTRA500T | Nonshielded Power (1.8m) |
| 2. | COLOR MONITOR | COMPAQ | V410 | BJMC4A | Shielded Signal (1.5m)<br>Nonshielded Power (1.8m) |
| 3. | KEYBOARD | FORWARD | FDA-104GA | F4ZDA-104G | Shielded Signal (1.4m) |
| 4. | MOUSE | DEXIN | A2P800A | NIYA2P800A | Shielded Signal (1.5m) |
| 5. | MODEM | ACEEX | 1414 | IFAXDM1414 | Shielded Signal (1.2m)<br>Nonshielded Power (2.4m) |
| 6. | PRINTER | HP | C2642A | B94C2642X | Shielded Signal (1.1m)<br>Nonshielded Power (2.4m) |
| 7. | NOTEBOOK | DELL | TS30H | LLRTS30HT | Nonshielded Power (1.8m) |
| 8. | PCMCIA CARD | ACCTON | ACCTON | N/A | N/A |

Note: 1. Support unit 1 acted as SERVER PC and communicated with support unit 7-8, which acted as HOST PC and systems of communication partner. They communicated with each other via EUT at 8Mbps speed with an USB shielded cable (0.6M) and a UTP RJ45 cable (23m). The HOST PC was kept in the control room.

## 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 | 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) dBuV/m | Class B (at 10m) 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 | : | 24 ℃ |
| Humidity | : | 47 % |
| Atmospheric Pressure | : | 984 mbar |

| TEST RESULT | Remarks |
|---|---|
| PASS | Minimum passing margin of conducted emission: -16.8 dB at 0.150 MHz<br>Minimum passing margin of radiated emission: -5.0 dB at 456.33 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: **USB ETHERNET ADAPTER** MODEL: **3C19250**

6 dB Bandwidth: 10 kHz

TEST PERSONNEL:

| 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 |
| 0.150 | 47.20 | - | 49.20 | - | 66.00 | 50.00 | -18.8 | - | -16.8 | - |
| 0.239 | 37.70 | - | 38.70 | - | 62.13 | 52.13 | -24.4 | - | -23.4 | - |
| 1.578 | 29.00 | - | 26.10 | - | 56.00 | 46.00 | -27.0 | - | -29.9 | - |
| 2.062 | 31.00 | - | 27.90 | - | 56.00 | 46.00 | -25.0 | - | -28.1 | - |
| 7.156 | 36.40 | - | 36.60 | - | 60.00 | 50.00 | -23.6 | - | -23.4 | - |
| 24.570 | 35.50 | - | 36.50 | - | 60.00 | 50.00 | -24.5 | - | -23.5 | - |

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

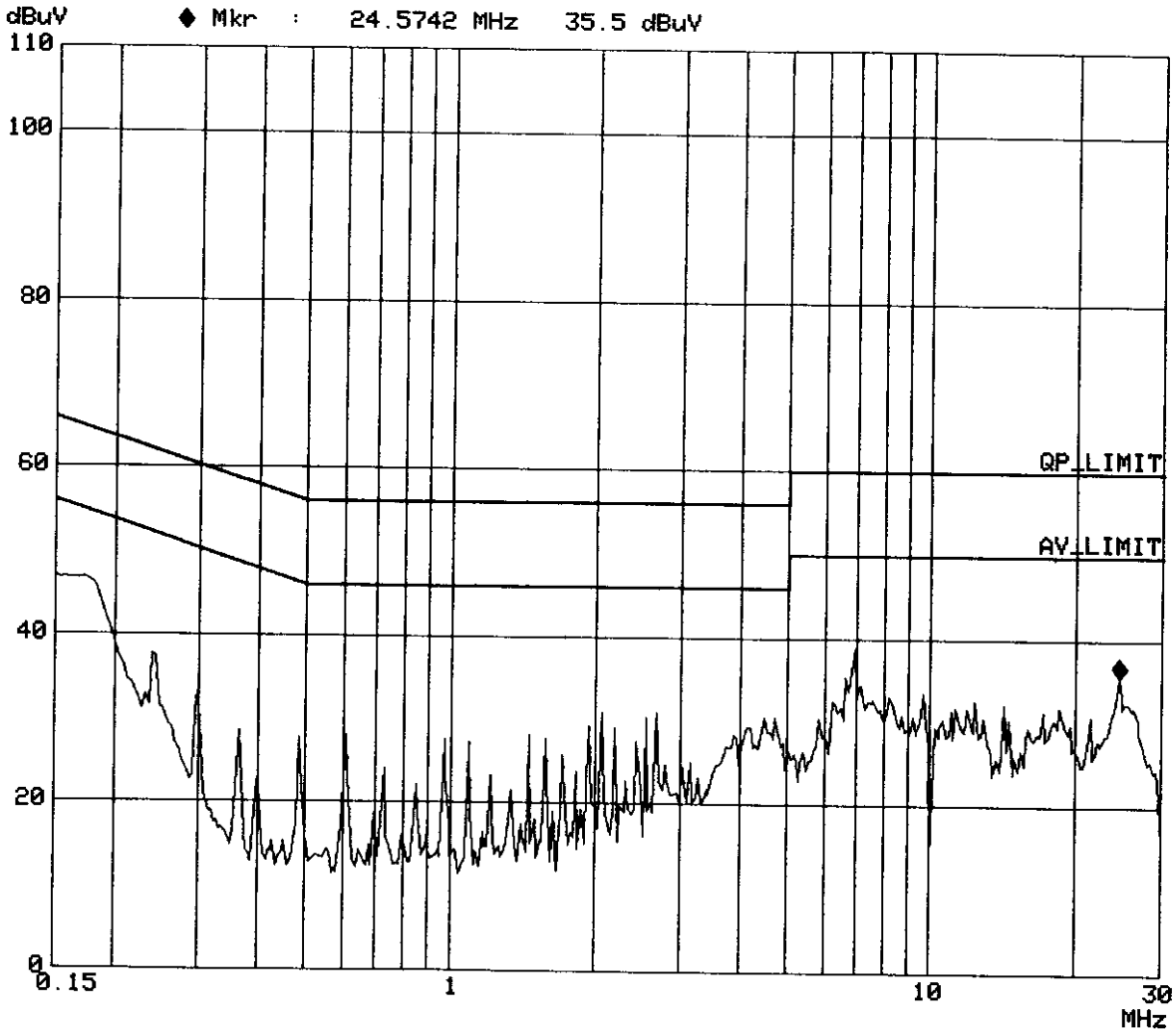
EUT: 3C19250 (USB ETHERNET ADAPTER)
Operator: JAMES CHEN
Test Spec: LISN :L
Comment: 120V AC / 60Hz
UTP 75 FEETS:USB CABLE 2 FEETS
File name: EN_22CB.SPC
Date: 19. Aug 98 10:58

*Report No.:* *F87081861*
*Page:* *9-1*
*Test By:*

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 | 0.05ms | 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

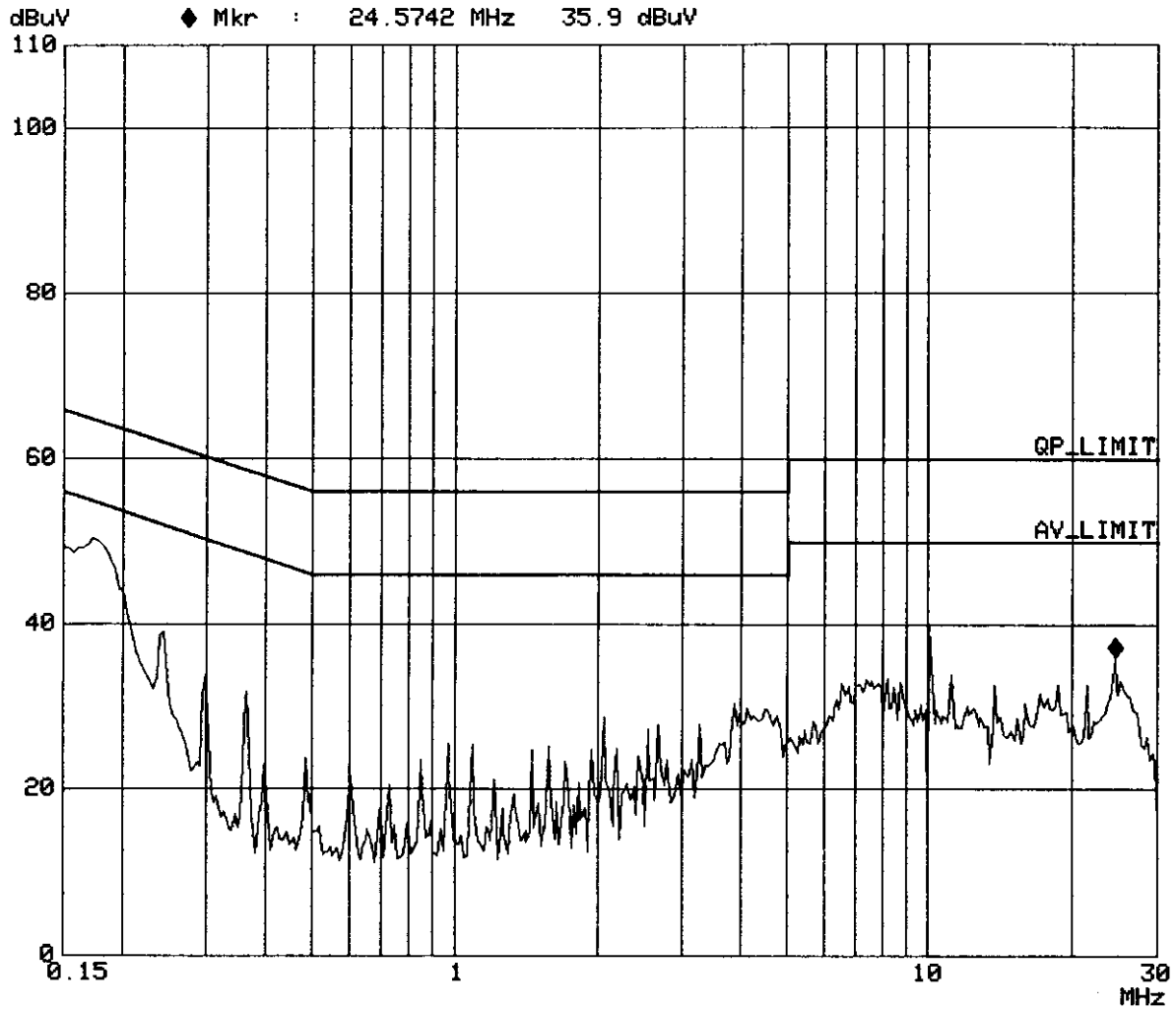
EUT: 3C19250 (USB ETHERNET ADAPTER)
Operator: JAMES CHEN
Test Spec: LISN :N
Comment: 120V AC / 60Hz
UTP 75 FEETS:USB CABLE 2 FEETS
File name: EN_22CB.SPC
Date: 19. Aug 98 11:05

*Report No.:* *F87081861*
*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 | 0.05ms | 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: **USB ETHERNET ADAPTER** MODEL: **3C19250**

ANTENNA: CHASE BILOG CBL6112A POLARITY: Horizontal

DETECTOR FUNCTION: Quasi-peak 6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

TEST PERSONNEL:

| Frequency (MHz) | Correction Factor (dB/m) | Reading Data (dBuV) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|
| 59.99 | 6.2 | 11.7 | 17.9 | 30.0 | -12.1 |
| 130.02 | 12.5 | 7.8 | 20.3 | 30.0 | -9.7 |
| 144.01 | 11.8 | 9.4 | 21.2 | 30.0 | -8.8 |
| 192.03 | 11.0 | 9.8 | 20.8 | 30.0 | -9.2 |
| 216.05 | 10.0 | 8.0 | 18.0 | 30.0 | -12.0 |
| 240.03 | 11.7 | 15.3 | 27.0 | 37.0 | -10.0 |
| 299.13 | 15.7 | 12.8 | 28.5 | 37.0 | -8.5 |
| 432.04 | 18.6 | 12.1 | 30.7 | 37.0 | -6.3 |
| 465.33 | 19.2 | 10.7 | 29.9 | 37.0 | -7.1 |

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

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# TEST DATA OF RADIATED EMISSION

EUT: **USB ETHERNET ADAPTER** MODEL: **3C19250**

ANTENNA: CHASE BILOG CBL6112A POLARITY: Vertical

DETECTOR FUNCTION: Quasi-peak 6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

TEST PERSONNEL: James Chen

| Frequency (MHz) | Correction Factor (dB/m) | Reading Data dBuV) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|
| 60.00 | 6.5 | 15.0 | 21.5 | 30.0 | -8.5 |
| 144.02 | 13.5 | 7.8 | 21.3 | 30.0 | -8.7 |
| 160.01 | 12.8 | 5.6 | 18.4 | 30.0 | -11.6 |
| 199.43 | 11.5 | 11.8 | 23.3 | 30.0 | -6.7 |
| 216.05 | 11.2 | 7.3 | 18.5 | 30.0 | -11.5 |
| 220.24 | 11.1 | 8.7 | 19.8 | 30.0 | -10.2 |
| 240.02 | 12.5 | 19.3 | 31.8 | 37.0 | -5.2 |
| 299.16 | 15.9 | 11.2 | 27.1 | 37.0 | -9.9 |
| 456.33 | 19.1 | 12.9 | 32.0 | 37.0 | -5.0 |

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