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# TEST REPORT

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**REPORT NUMBER** : ANKK-103102

**APPLICANT** : TOSHIBA CORPORATION  
DIGITAL MEDIA NETWORK COMPANY

**MODEL NUMBER** : DAZ8841A

**FCC ID** : QVCCMDAZ8841A

**REGULATION** : FCC Part15 Subpart C



NVLAP accreditation is valid for  
FCC Part15 (Digital Devices),  
CISPR22 and AS/NZS 3548.  
NVLAP accreditation does not cover  
ICES-003.

**Akzo Nobel K. K.**  
**EMC Division**  
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**ABBREVIATIONS**

**LISN** = Line Impedance Stabilization Network

**AMN** = Artificial Mains Network

**ANT** = Antenna

**BBA** = Broad-band Antenna

**DIP** = Dipole Antenna

**AMP** = Amplifier

**ATT** = Attenuator

**EUT** = Equipment Under Test

**Q-P** = Quasi-peak

**AVG** = Average

**Ch** = Channel

**EIRP** = Effective Isotropic Radiated Power

**SECTION 1. TEST CERTIFICATION****APPLICANT INFORMATION**

Company	:	TOSHIBA CORPORATION DIGITAL MEDIA NETWORK COMPANY
Address	:	1, Toshiba-cho, Fuchu-shi, Tokyo, 183-8511, Japan
Telephone number	:	+81 42 333 2878
Fax number	:	+81 42 340 8011

**DESCRIPTION OF TEST ITEM**

Kind of equipment	:	Cable Modem
Condition of equipment	:	Pre Production
Type	:	Tabletop
Trademark	:	TOSHIBA
FCC ID	:	QVCCMDAZ8841A
Model number	:	DAZ8841A
Serial number	:	None

**TEST PERFORMED**

Location	:	Kashima No. 3 Test Site (FCC Reg. No. : 90433)
EUT received	:	March 24, 2003
Test started	:	March 25, 2003
Test completed	:	March 28, 2003
Regulation	:	FCC Part15 Subpart C Section 15.247 Intentional Radiators
Test setup	:	ANSI C63.4-1992

Report issue date : April 17, 2003

Test engineer : Kazuhiro Ando



Report approved by : Takeshi Yamanaka  
[Site Manager]



**On the basis of the measurements made, the equipment tested is capable of operation in compliance with the requirements of Part 15 of the FCC Rules under normal use and maintenance.**

**Note**

- The test result of this report is effective for equipment under test itself and under the test configuration described on the report.
- This test report does not assure that whether the test result taken in other testing laboratory is compatible or reproducible to the test result on this report or not.
- This test report shall not be reproduced except in full, without issuer's permission.

**SECTION 2. SUMMARY OF RESULTS**

<b>Test</b>	<b>Reference</b>	<b>Result</b>
Minimum 6dB Bandwidth	15.247(a)(2)	Pass
Maximum Peak Output Power	15.247(b)	Pass
Spurious Emissions - RF Antenna Conducted Test	15.247(c)	Pass
Spurious Emissions - Radiated Emission Test	15.247(c) 15.205 15.209	Pass
Power Spectral Density	15.247(d)	Pass
Antenna Requirement	15.203	Pass
Restricted Bands of Operation	15.247(c) 15.205 15.209	Pass
AC Conducted Emission	15.207	Pass

**SECTION 3. EQUIPMENT UNDER TEST**

The equipment under test (EUT) consisted of the following equipment.  
Indication in the following left side column corresponds to Section 6.

Symbol	Item	Model No.	Serial No.	FCC ID / DoC	Manufacturer	Remarks
A)	Cable Modem	DAZ8841A	None	QVCCMDAZ8841A	TOSHIBA CORPORATION	
B)	AC Adapter	AD-121ADT	None	N.A.	TOSHIBA CORPORATION	

Power ratings of EUT : [Input] AC120V, 60Hz  
[Output] DC 12V, 1A

DoC : Device for Declaration of Conformity

**3.1 Overview of EUT**

Operating Frequency Range	2400 – 2483.5 MHz
Modulation Method	PBCC/CCK/QPSK/BPSK
Number of Operating Channel	11
Data Transfer Rate	22Mbps / 11Mbps / 5.5Mbps / 2Mbps / 1Mbps
Antenna Gain	2.0 dBi
Output Power	51.3 mW
EIRP	81.3 mW

**3.2 Operating channels and frequencies**

Ch	Frequency (MHz)	Ch	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

Note:

1. This is for sure that all frequencies are in 2412 MHz to 2462 MHz.
2. Section 15.31(m): Measurements on intentional radiators or receivers shall be performed at three frequencies for operating frequency range over 10 MHz.  
(The locations of these frequencies one near the low, one near the middle and one near the high.)
3. After test, the EUT operating frequencies are in 2412 MHz to 2462 MHz.  
So all the items as followed in testing report are need to test these three frequencies:  
low: Ch 1, middle: Ch 6, high: Ch 11.

**3.3 Port(s)/Connector(s) :**

Port name	Connector type	Connector pin	Remarks
LAN	RJ-45	8 pin	10 Base-T, 100BASE-TX
USB	Mini B	5 pin	
RF	F type	1 pin	

**3.4 Oscillator(s)/Crystal(s) :**

Oscillator	Operating frequency	Board name	Remarks
25 MHz	125 MHz	Main Board	Highest frequency
22 MHz	22 MHz	Mini-PCI Board	
	2.412 – 2.462 GHz	Main Board	

**SECTION 4. SUPPORT EQUIPMENT USED**

The EUT was supported by the following equipment during the test.  
Indication in the following left side column corresponds to Section 6.

Symbol	Item	Model No.	Serial No.	FCC ID / DoC	Manufacturer	Remarks
C)	Cable Modem Termination System	DE3801E02	011300490301	N.A.	NORTEL	
D)	Computer	2655	97-179W1	DoC	IBM	
E)	Computer	2655	97-206V2	DoC	IBM	
F)	Computer	PAP302JA	29025137	N.A.	TOSHIBA	
G)	Hub	LX-5090/516	09712856	N.A.	TOSHIBA	
H)	AC Adapter	02K6665	11S02K6665Z 1Z2U8192PED	N.A.	IBM	
I)	AC Adapter	02K6665	11S02K6665Z 1Z2U81774H2	N.A.	IBM	
J)	AC Adapter	PA2501U	0288847	N.A.	TOSHIBA	

DoC : Device was tested and authorized under a Declaration of Conformity to the applicable FCC rules.



**SECTION 5. CABLE (S) USED**

The following cable(s) was used for the test.

Indication number in the following left side column corresponds to Section 6.

Number	Name	Length	Shield	Connector	Core
1)	USB cable	1.50 m	Yes	Plastic	
2)	Ethernet cable	10.00 m	None	Plastic	
3)	RF Coaxial cable	10.00 m	Yes	Metal	
4)	RF Coaxial cable	0.40 m	Yes	Metal	
5)	RF Coaxial cable	0.40 m	Yes	Metal	
6)	Ethernet cable	1.80 m	None	Plastic	
7)	Ethernet cable	1.80 m	None	Plastic	
8)	Power cable for AC Adapter(B) (DC)	1.80 m	None		
9)	Power cable for AC Adapter(B) (AC)	1.80 m	None		
10)	Power cable for AC Adapter(H) (DC)	1.80 m	None		
11)	Power cable for AC Adapter(H) (AC)	1.80 m	None		
12)	Power cable for AC Adapter(I) (DC)	1.80 m	None		
13)	Power cable for AC Adapter(I) (AC)	1.80 m	None		
14)	Power cable for AC Adapter(J) (DC)	1.80 m	None		
15)	Power cable for AC Adapter(J) (AC)	1.80 m	None		
16)	Power cable for Cable Modem Termination System	1.90 m	None		
17)	Power cable for Hub	1.90 m	None		

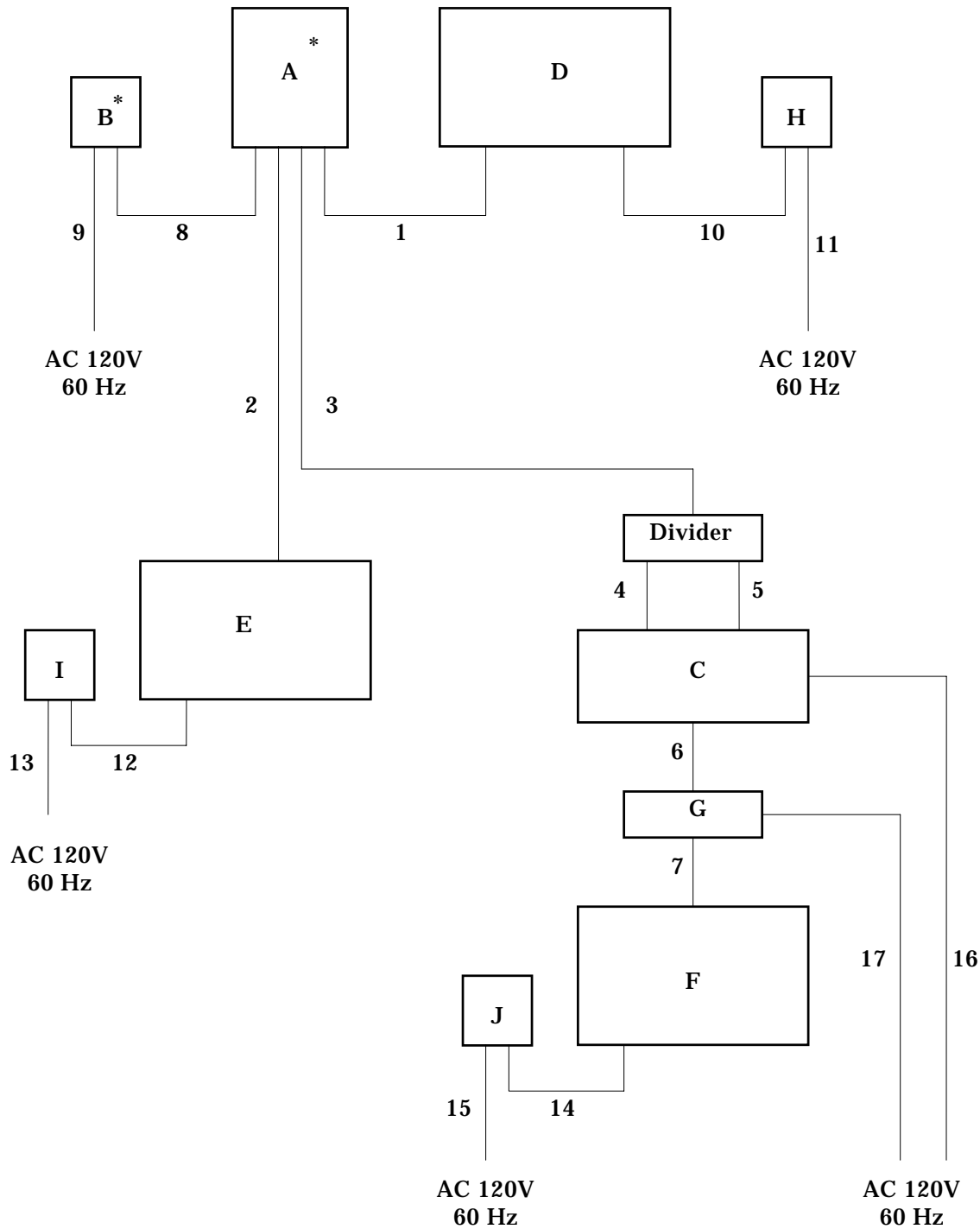
Note : a. No ferrite core is attached to the outer cables.

SECTION 6. CONSTRUCTION OF EQUIPMENT

The construction of EUT during the test was as follows.

System configuration

\* : EUT



Symbols or numbers assigned to equipment or cables on this diagram are corresponded to the symbols or numbers assigned to equipment or cables on tables in Sections 3 to 5.

## SECTION 7. GENERAL TEST CONDITIONS

The EUT was operated under the following conditions during the test.

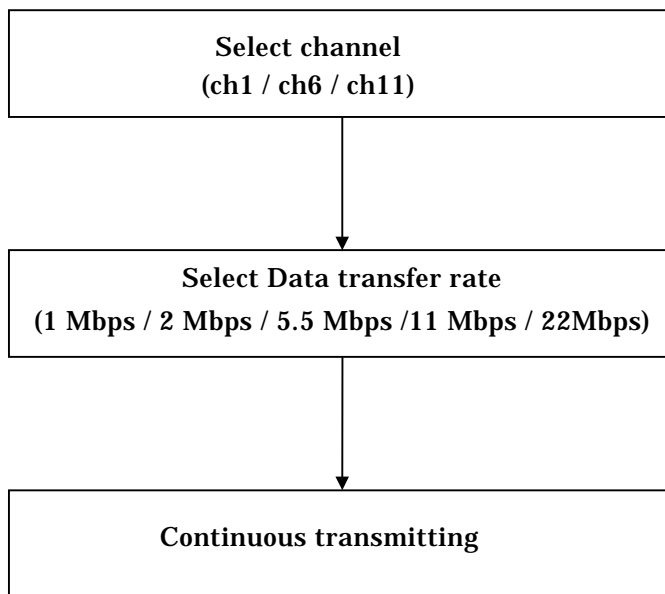
### 7.1 Operating condition

The test was carried out with the transmitter set at maximum power in Test mode.  
EUT was examined in the operating conditions that had maximum emissions.

### 7.2 Operating flow

Following operations were performed continuously.

#### 7.2.1 Test mode



## SECTION 8. TEST PROCEDURE(S)

Test was carried out under the following conditions.

Test was carried out with no deviations from standards and test methods.

### 8.1 Conducted Emission Test [15.207]

#### 8.1.1 Equipment Setup

System configuration and Equipment setup are shown on Section 6 and Section 10.

##### 8.1.1.1 Table-Top Equipment

EUT is placed on the wooden table raised 0.8meter above the metal ground plane.

##### 8.1.1.2 Interconnecting Cables

Excess part of the interconnecting cables longer than 1 meter are bundled in the center. Cables that hang closer than 40 cm to the ground plane is folded back and forth forming bundle 30 to 40 cm long, hanging approx, in the middle between ground plane and table.

##### 8.1.1.3 AC Power Cable

AC power cable for EUT is connected to one LISN which is placed on the ground plane. The LISN is placed in 80 cm from the nearest part of EUT chassis.

The excess power cable is bundled in the center, or shortened to appropriate length. AC cables except from the EUT are connected second LISN.

#### 8.1.2 Measuring Instruments

Brief description of Measuring Instruments are as follows;

##### 8.1.2.1 Spectrum Analyzer

The Spectrum analyzer is used for preliminary measurement.

##### 8.1.2.2 EMI Test Receiver

The Quasi-peak detector (IF bandwidth : 10 kHz) and average detector (IF bandwidth : 10 kHz) built in test receiver is used for final measurement.

The test receiver is complied with the specification of the CISPR publication 16.

##### 8.1.2.3 LISN

Two 50 $\mu$ H//50 $\Omega$  LISN are used. The chassis of the LISN is bonded to the ground plane by the copper blade.

One LISN is connected to the EUT. Other LISN (2nd LISN) is connected to the support equipment. The signal output of the 2nd LISN is terminated with a 50 $\Omega$  termination.

### **8.1.3 Test Procedure**

#### **8.1.3.1 Preliminary Measurement**

EUT is tested on all operating conditions.

The spectrum analyzer is controlled by the computer program to sweep the frequency range to be measured, then spectrum chart are plotted out to find the worst emission conditions in operating mode and/or configuration decision for the final test.

All leads other than safety ground are tested.

#### **8.1.3.2 Final Measurement**

The EUT is operated in the worst emission condition found by the preliminary test. The equipment and cables are arranged or manipulated within the range of the test standard in the above condition.

At least six highest spectrum are measured in quasi-peak and average (if necessary) using the test receiver.

## **8.2 Radiated Emission Test [15.209]**

### **8.2.1 Equipment Setup**

System configuration and Equipment setup are shown on Section 6 and Section 10.

#### **8.2.1.1 Table-Top Equipment**

EUT is placed on the wooden table raised 0.8meter above the metal ground plane (turntable).

#### **8.2.1.2 Interconnecting Cables**

Excess part of the interconnecting cables longer than 1 meter are bundled in the center. Cables that hang closer than 40 cm to the ground plane is folded back and forth forming bundle 30 to 40 cm long, hanging approx, in the middle between ground plane and table.

### **8.2.2 Measuring Instruments**

Brief description of Measuring Instruments are as follows;

#### **8.2.2.1 Antennas**

The broadband Tri-log antenna is used for measurement on the frequency range 30 – 1000 MHz.

The Double ridged guide antenna and the Standard gain horn antennas are used for frequency higher than 1000 MHz.

If uncertain result was obtained, the broadband antenna is replaced by the half wave length dipole, then measurement is carried out over again.

#### **8.2.2.2 Pre-amplifier**

The broadband pre-amplifier is used for radiated emission measurement.

The signal to noise ratio is improved by using pre-amplifier.

#### **8.2.2.3 Spectrum Analyzer**

The spectrum analyzer is used for preliminary measurement of frequency range 30 – 1000 MHz, and also used for final measurement of higher than 1000 MHz (Resolution bandwidth : 1 MHz).

#### **8.2.2.4 EMI Test Receiver**

The Quasi-peak detector (IF bandwidth : 120 kHz) built in test receiver is used for final measurement of the frequency 30 – 1000 MHz.

The test receiver is complied with the specification of the CISPR publication 16.

#### **8.2.2.5 Turntable**

The turntable is capable for EUT weight and rotatable 0 to 360 degree horizontally by remote control in the test room.

#### **8.2.2.6 Antenna Mast**

The antenna mast is attachable to all antennas described on clause 8.2.2.1 and antenna height is adjustable 1 to 4 meters continuously by remote control at the test room, and antenna polarization is also changed by the remote control.

### **8.2.3 Test Procedure**

#### **8.2.3.1 Preliminary Measurement**

EUT is tested on all operating conditions.

The spectrum analyzer is set max-hold mode and swept during turntable was rotated 0 to 360 degree. Then spectrum chart are plotted out to detect the worst conditions in configuration, operating mode, or ambient noise notation.

#### **8.2.3.2 Final Measurement**

The EUT operated in the condition where maximum emission is detected in the preliminary test.

The turntable azimuth (EUT direction) and antenna height are adjusted the position so that maximum field strength is obtained for each frequency spectrum to be measured. The equipment and cables are arranged or manipulated within the range of the test standard in the above condition.

When the uncertain result was obtained, the measurement is retried by using the half wave dipole antenna instead of the broadband antenna.

**SECTION 9. TEST DATA****9.1 Minimum 6dB Bandwidth [15.247(a)(2)]****MEASUREMENT PROCEDURE:**

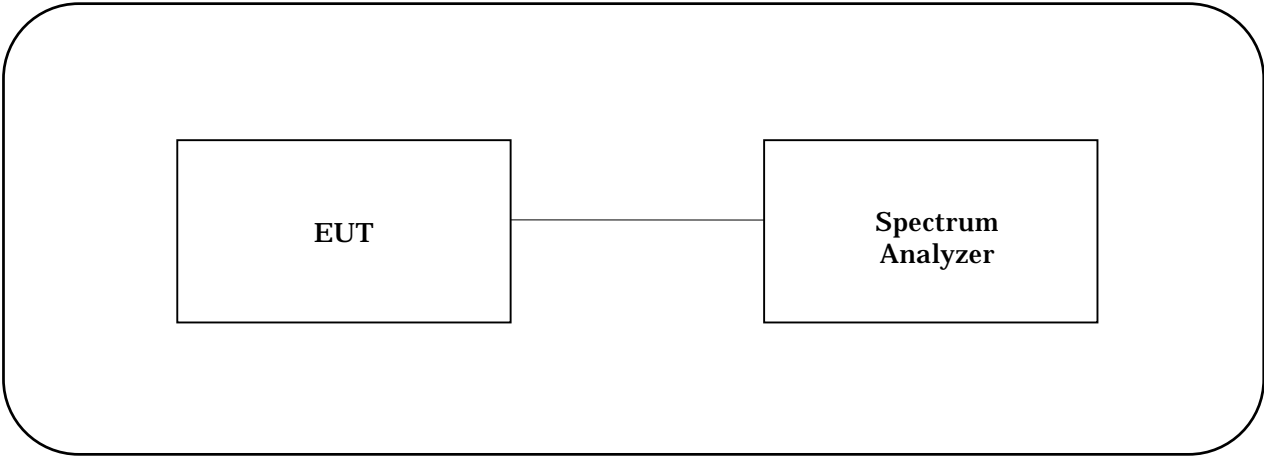
1. The EUT was set to operate with following conditions.
  - ch1 / ch6 / ch11
  - Data Transfer Rate (1 Mbps / 2 Mbps / 5.5 Mbps / 11 Mbps / 22 Mbps)
2. The Spectrum Analyzer was connected directly to the transmitter output.
3. The Spectrum Analyzer was setup using RBW = 100kHz, VBW = 100kHz, and span = 50MHz (span>>RBW).
4. As for the typical chart of the observed RF profiles, refer to page 18 - 19.

Test date : March 28, 2003  
 Temperature : 22 °C  
 Humidity : 41 %

Ch	Frequency (MHz)	Data Transfer Rate (Mbps)	6dB Bandwidth (MHz)	15.247(a)(2) Limit (kHz)	Chart
1	2412	1	12.58	500	-
		2	12.75	500	-
		5.5	12.33	500	-
		11	12.33	500	-
		22	12.25	500	Page 18
6	2437	1	12.67	500	-
		2	12.67	500	-
		5.5	12.17	500	-
		11	12.17	500	-
		22	12.00	500	Page 18
11	2462	1	12.58	500	-
		2	12.83	500	-
		5.5	12.08	500	Page 19
		11	12.17	500	-
		22	12.33	500	-

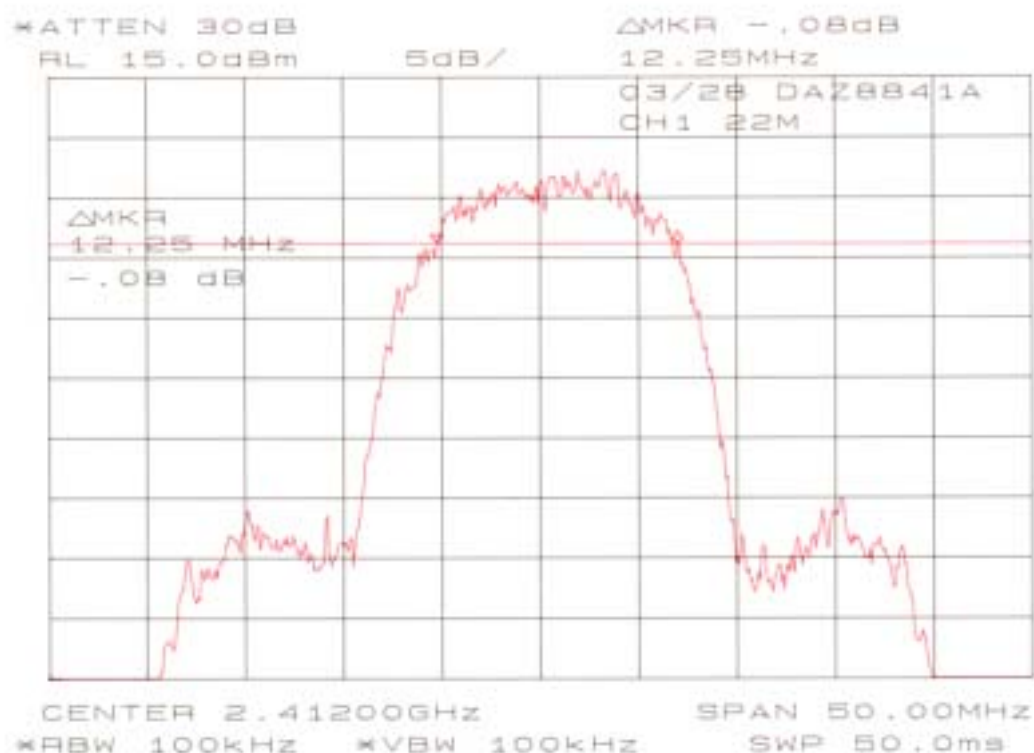
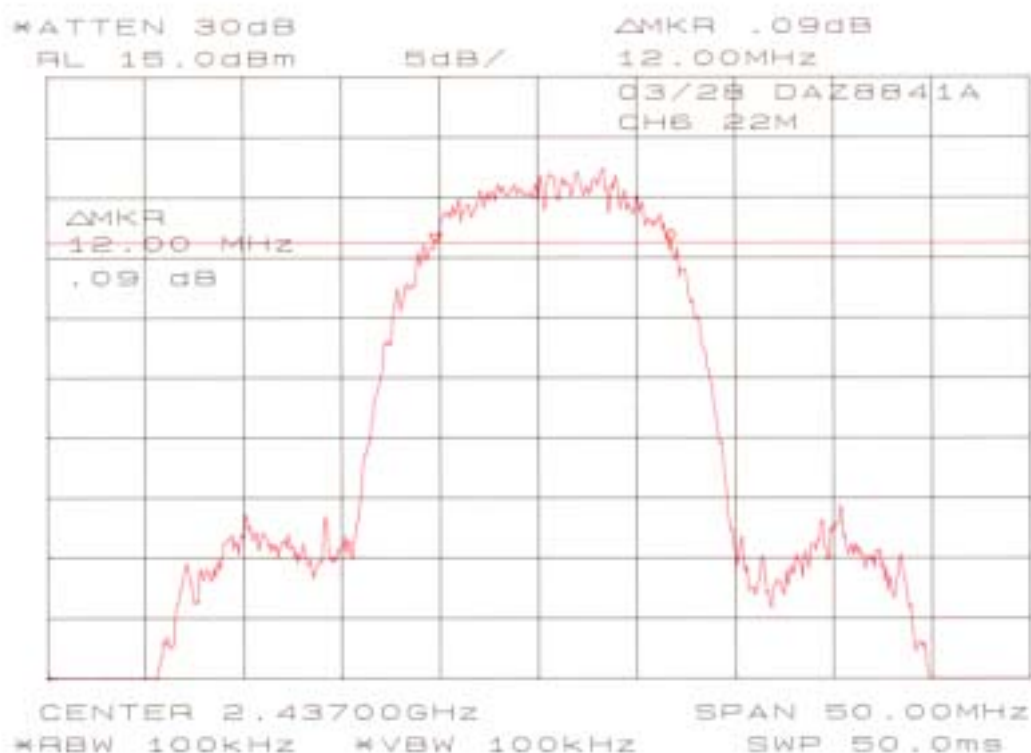


TEST INSTRUMENTS CONFIGURATION



TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Spectrum Analyzer	8564E	3643A00665	HEWLETT PACKARD	Jun. 28, 02	1 Year

**Chart of ch 1 with 22 Mbps****Chart of ch 6 with 22 Mbps**

**Chart of ch 11 with 5.5 Mbps**

**9.2 Maximum Peak Output Power [15.247(b)]****MEASUREMENT PROCEDURE:**

1. The EUT was set to operate with following conditions.
  - ch1 / ch6 / ch11
  - Data Transfer Rate (1 Mbps / 2 Mbps / 5.5 Mbps / 11 Mbps / 22 Mbps)
2. The power Meter was connected directly to the transmitter output.
3. Maximum Antenna Gain = 2.0 dBi

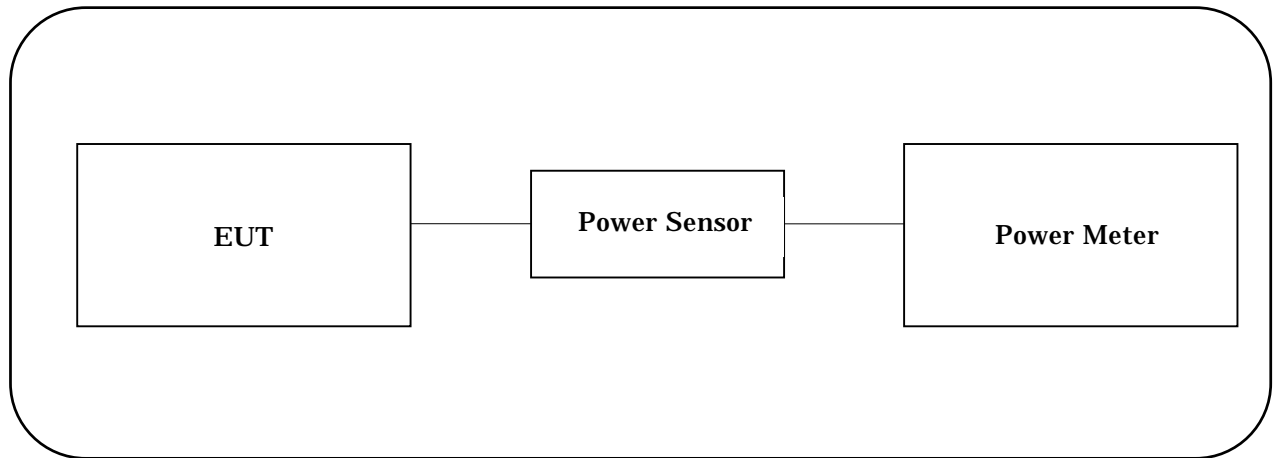
Test date : March 25, 2003  
 Temperature : 22 °C  
 Humidity : 43 %

Ch	Frequency (MHz)	Data Transfer Rate (Mbps)	Reading (dBm)	Cable Loss (dB)	Maximum Peak Output Power (dBm)	Maximum Peak Output Power (mW)	15.247(b) Limit (mW)
1	2412	1	16.1	1.0	17.1	51.3	1000
		2	16.1	1.0	17.1	51.3	1000
		5.5	16.1	1.0	17.1	51.3	1000
		11	16.1	1.0	17.1	51.3	1000
		22	16.0	1.0	17.0	50.1	1000
6	2437	1	16.1	1.0	17.1	51.3	1000
		2	16.1	1.0	17.1	51.3	1000
		5.5	16.1	1.0	17.1	51.3	1000
		11	16.1	1.0	17.1	51.3	1000
		22	16.0	1.0	17.0	50.1	1000
11	2462	1	15.9	1.0	16.9	49.0	1000
		2	15.9	1.0	16.9	49.0	1000
		5.5	15.9	1.0	16.9	49.0	1000
		11	15.9	1.0	16.9	49.0	1000
		22	15.8	1.0	16.8	47.9	1000

Note: Maximum peak output power was detected at Ch1 with 1Mbps.

= 17.1 dBm (=51.3 mW)

Therefore, the maximum EIRP = 17.1 dBm + 2.0 dBi = 19.1 dBm (=81.3 mW)

**TEST INSTRUMENTS CONFIGURATION****TEST INSTRUMENTS**

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Power Meter	438A	2634A03211	HEWLETT PACKARD	Jan. 14, 03	1 Year
Power Sensor	8481A	3318A99780	HEWLETT PACKARD	Jan. 22, 03	1 Year

### 9.3 Power Spectral Density [15.247(d)]

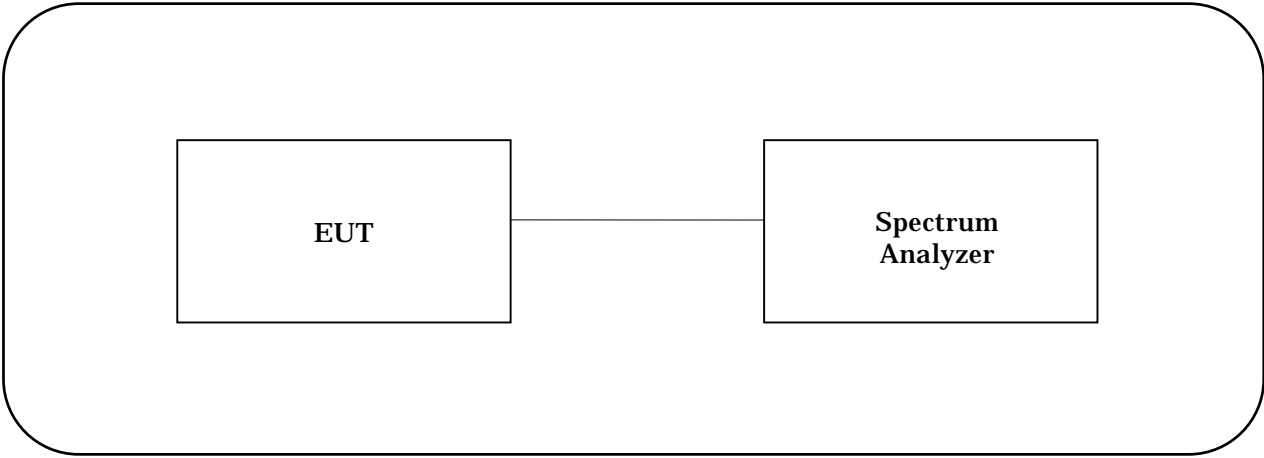
#### MEASUREMENT PROCEDURE:

1. The EUT was set to operate with following conditions.
  - ch1 / ch6 / ch11
  - Data Transfer Rate (1 Mbps / 2 Mbps / 5.5 Mbps / 11 Mbps / 22 Mbps)
2. The Spectrum Analyzer was connected directly to the transmitter output.
3. The Spectrum Analyzer was setup using RBW = 3kHz, VBW = 10kHz, span = 300kHz and sweep = 100sec.(span/3kHz).
4. As for the typical chart of the observed RF profiles, refer to page 24 - 25.

Test date : March 28, 2003  
 Temperature : 22 °C  
 Humidity : 41 %

Ch	Frequency (MHz)	Data Transfer Rate (Mbps)	Reading (dBm)	Cable Loss (dB)	Peak Power Spectral Dencity (dBm)	15.247(d) Limit (dBm)	Chart
1	2412	1	-6.0	1.0	-5.0	8	-
		2	-5.8	1.0	-4.8	8	-
		5.5	-5.3	1.0	-4.3	8	Page 24
		11	-5.8	1.0	-4.8	8	-
		22	-6.3	1.0	-5.3	8	-
6	2437	1	-6.0	1.0	-5.0	8	Page 24
		2	-6.5	1.0	-5.5	8	-
		5.5	-6.0	1.0	-5.0	8	-
		11	-6.2	1.0	-5.2	8	-
		22	-6.5	1.0	-5.5	8	-
11	2462	1	-6.5	1.0	-5.5	8	Page 25
		2	-6.7	1.0	-5.7	8	-
		5.5	-6.5	1.0	-5.5	8	-
		11	-6.8	1.0	-5.8	8	-
		22	-6.8	1.0	-5.8	8	-

TEST INSTRUMENTS CONFIGURATION



TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Spectrum Analyzer	8564E	3643A00665	HEWLETT PACKARD	Jun. 28, 02	1 Year

Chart of ch 1 with 5.5 Mbps

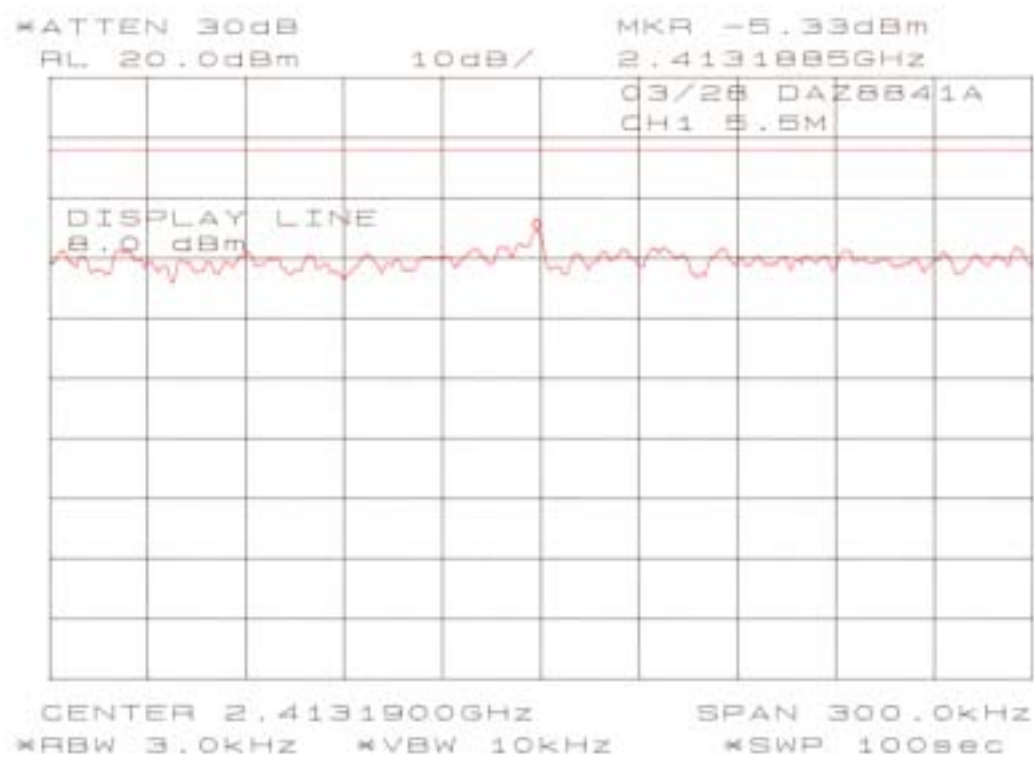


Chart of ch 6 with 1 Mbps

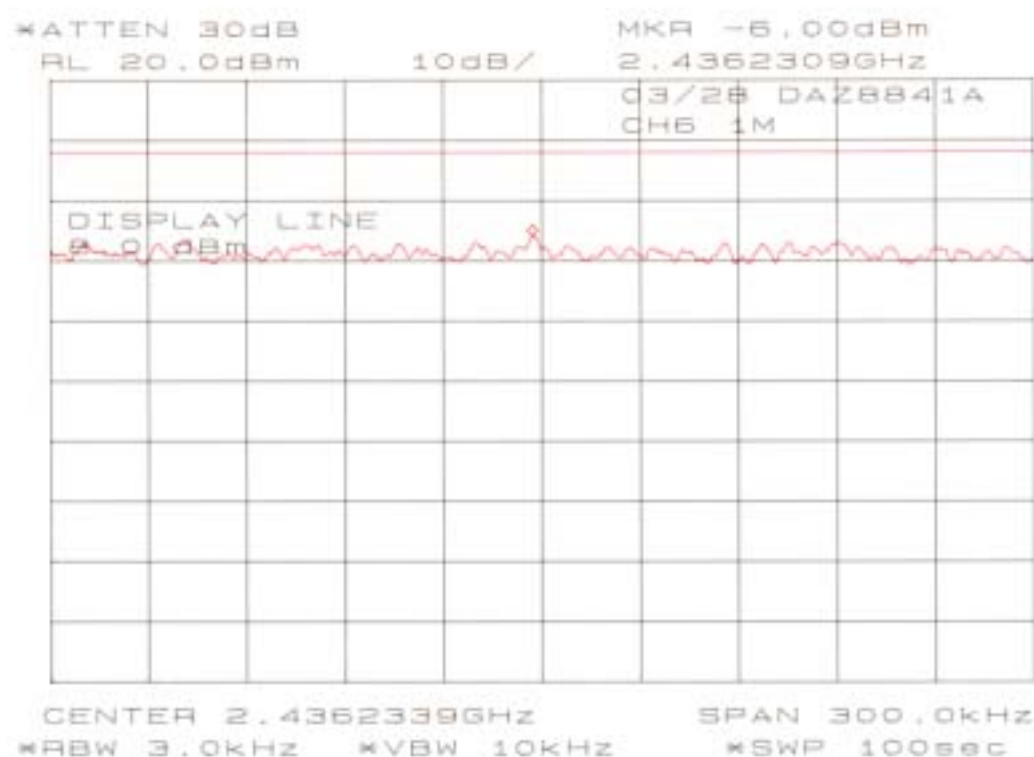
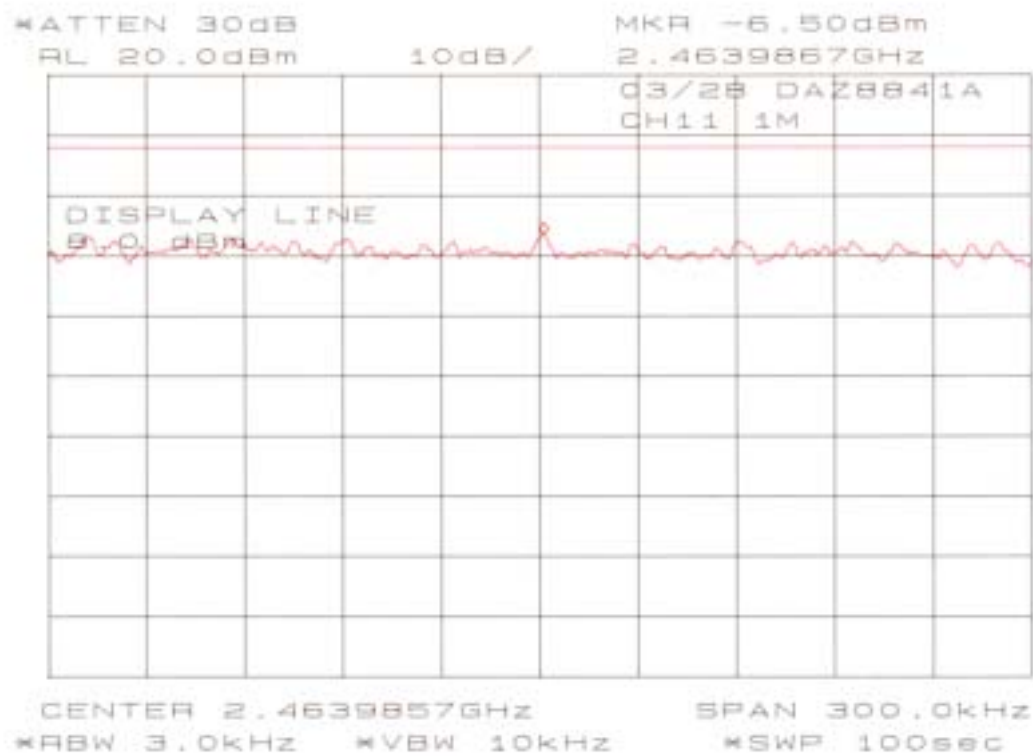




Chart of ch 11 with 1 Mbps



**9.4 Spurious Emissions – RF Antenna Conducted Test [15.247(c)]****MEASUREMENT PROCEDURE:**

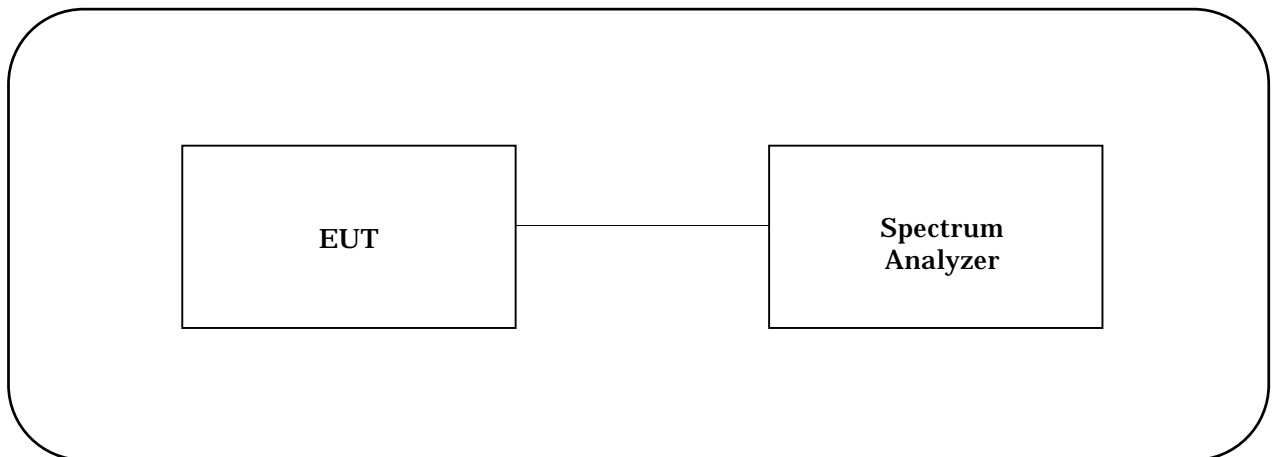
1. The EUT was set to operate with following conditions.
  - ch1 / ch6 / ch11
  - Data Transfer Rate (1 Mbps / 2 Mbps / 5.5 Mbps / 11 Mbps / 22 Mbps)
2. The Spectrum Analyzer was connected directly to the transmitter output.
3. The Spectrum Analyzer was setup using RBW = 100kHz, VBW = 100kHz.
4. As for the typical chart of the observed RF profiles, refer to Annex A.

Test date : March 27, 2003  
 Temperature : 25 °C  
 Humidity : 38 %

Ch	Frequency (MHz)	Chart
1	2412	Annex A page 2-4
6	2437	Annex A page 5-7
11	2462	Annex A page 8-10

**Note:**

1. All out-of-band conducted emissions were more than 20 dB below a carrier.

**TEST INSTRUMENTS CONFIGURATION****TEST INSTRUMENTS**

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Spectrum Analyzer	8564E	3643A00665	HEWLETT PACKARD	Jun. 28, 02	1 Year

**9.5 Spurious Emissions – Radiated Emission Test [15.247(c), 15.205, 15.209]****MEASUREMENT PROCEDURE:**

1. The EUT was set to operate with following conditions.
  - ch1 / ch6 / ch11
  - Data Transfer Rate (1 Mbps / 2 Mbps / 5.5 Mbps / 11 Mbps / 22 Mbps)
2. The Spectrum Analyzer was setup using
  - Peak mode: RBW = 1MHz, VBW = 1MHz
  - Average mode: RBW = 1MHz, VBW = 10Hz
3. Following data is the worst case.

**Data of CH11 with 1Mbps (30MHz-1000MHz)****Akzo Nobel K. K.****Kashima No.3 Test Site****Spurious Emissions**

APPLICANT : TOSHIBA CORPORATION  
 EUT NAME : Cable Modem  
 MODEL NO. : DAZ8841A  
 SERIAL NO. : None  
 TEST MODE : TX CH11 1Mbps  
 POWER SOURCE : AC120V/60Hz  
 DATE TESTED : Mar 26 2003

FILE NO. : ANKK-103102  
 REGULATION : FCC 15.247(c), 15.209  
 TEST METHOD : ANSI C63.4-1992  
 DISTANCE : 3.0 [m]  
 TEMPERATURE : 24.0 [degC]  
 HUMIDITY : 40.0 [%]  
 NOTE :

ENGINEER : Kazuhiro Ando

FREQUENCY [No]	ANT. [MHz]		READING [dBuV]		FACTOR [dB/m]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	36.00	BBA	-	43.5	-9.6	-9.6	-	33.9	40.0	-	6.1
2	48.00	BBA	-	38.4	-8.4	-8.4	-	30.0	40.0	-	10.0
3	125.10	BBA	-	45.1	-8.2	-8.2	-	36.9	43.5	-	6.6
4	249.99	BBA	-	43.0	-7.3	-7.3	-	35.7	46.0	-	10.3
5	373.35	BBA	42.3	-	-3.0	-3.0	39.3	-	46.0	6.7	-
6	374.99	BBA	45.0	41.9	-3.0	-3.0	42.0	38.9	46.0	4.0	7.1
7	499.99	BBA	41.6	36.0	0.4	0.4	42.0	36.4	46.0	4.0	9.6
8	624.99	BBA	33.7	32.5	4.5	4.5	38.2	37.0	46.0	7.8	9.0
9	699.98	BBA	34.1	32.4	5.3	5.3	39.4	37.7	46.0	6.6	8.3
10	749.98	BBA	33.1	32.5	6.6	6.6	39.7	39.1	46.0	6.3	6.9
11	799.98	BBA	32.5	-	7.3	7.3	39.8	-	46.0	6.2	-
12	874.98	BBA	30.5	33.8	8.6	8.6	39.1	42.4	46.0	6.9	3.6

-----

Other frequencies : Below the FCC 15.247(c), 15.209 limit

Emission Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)

ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

**Data of CH1 with 1Mbps (1GHz-25GHz)**
**Akzo Nobel K. K.**  
**Kashima No.3 Test Site**  
**Spurious Emissions**

APPLICANT : TOSHIBA CORPORATION  
 EUT NAME : Cable Modem  
 MODEL NO. : DAZ8841A  
 SERIAL NO. : None  
 TEST MODE : TX CH1 1Mbps  
 POWER SOURCE : AC120V/60Hz  
 DATE TESTED : Mar 25 2003

FILE NO. : ANKK-103102  
 REGULATION : FCC 15.247(c), 15.209  
 TEST METHOD : ANSI C63.4:1992  
 DISTANCE : 1.0 [m]  
 TEMPERATURE : 22.0 [degC]  
 HUMIDITY : 43.0 [%]  
 NOTE :

ENGINEER : Kazuhiro Ando

FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	4076.00	PEK	64.5	57.6	-5.3	-5.3	59.2	52.3	74.0	14.8	21.7
2	4076.00	AVG	56.8	48.1	-5.3	-5.3	51.5	42.8	54.0	2.5	11.2
3	4824.00	PEK	48.3	48.3	-4.0	-4.0	44.3	44.3	74.0	29.7	29.7
4	4824.00	AVG	44.8	44.7	-4.0	-4.0	40.8	40.7	54.0	13.2	13.3
5	7238.75	PEK	44.0	41.7	2.2	2.2	46.2	43.9	74.0	27.8	30.1
6	7238.75	AVG	35.0	31.8	2.2	2.2	37.2	34.0	54.0	16.8	20.0
7	8151.97	PEK	44.4	40.9	4.0	4.0	48.4	44.9	74.0	25.6	29.1
8	8151.97	AVG	39.4	32.5	4.0	4.0	43.4	36.5	54.0	10.6	17.5
9	9647.97	PEK	39.4	39.6	7.1	7.1	46.5	46.7	74.0	27.5	27.3
10	9647.97	AVG	31.5	32.2	7.1	7.1	38.6	39.3	54.0	15.4	14.7
-----											
Other frequencies : Below the FCC 15.247(c), 15.209 limit											
Emission Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)											
ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)											

**Data of CH6 with 1Mbps (1GHz-25GHz)**
**Akzo Nobel K. K.**  
**Kashima No.3 Test Site**  
**Spurious Emissions**

APPLICANT : TOSHIBA CORPORATION  
 EUT NAME : Cable Modem  
 MODEL NO. : DAZ8841A  
 SERIAL NO. : None  
 TEST MODE : TX CH6 1Mbps  
 POWER SOURCE : AC120V/60Hz  
 DATE TESTED : Mar 25 2003

FILE NO. : ANKK-103102  
 REGULATION : FCC 15.247(c), 15.209  
 TEST METHOD : ANSI C63.4:1992  
 DISTANCE : 1.0 [m]  
 TEMPERATURE : 22.0 [degC]  
 HUMIDITY : 43.0 [%]  
 NOTE :

ENGINEER : Kazuhiro Ando

FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	4126.00	PEK	63.0	55.6	-5.2	-5.2	57.8	50.4	74.0	16.2	23.6
2	4126.00	AVG	55.2	47.0	-5.2	-5.2	50.0	41.8	54.0	4.0	12.2
3	4874.00	PEK	49.3	47.6	-3.9	-3.9	45.4	43.7	74.0	28.6	30.3
4	4874.00	AVG	44.6	44.1	-3.9	-3.9	40.7	40.2	54.0	13.3	13.8
5	7313.70	PEK	43.0	42.9	2.2	2.2	45.2	45.1	74.0	28.8	28.9
6	7313.70	AVG	32.8	32.8	2.2	2.2	35.0	35.0	54.0	19.0	19.0
7	8251.93	PEK	45.1	41.6	4.8	4.8	49.9	46.4	74.0	24.1	27.6
8	8251.93	AVG	38.9	33.8	4.8	4.8	43.7	38.6	54.0	10.3	15.4
9	9748.00	PEK	38.3	38.3	7.1	7.1	45.4	45.4	74.0	28.6	28.6
10	9748.00	AVG	26.9	27.1	7.1	7.1	34.0	34.2	54.0	20.0	19.8

Other frequencies : Below the FCC 15.247(c), 15.209 limit

Emission Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)

ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

**Data of CH11 with 1Mbps (1GHz-25GHz)****Akzo Nobel K. K.****Kashima No.3 Test Site****Spurious Emissions**

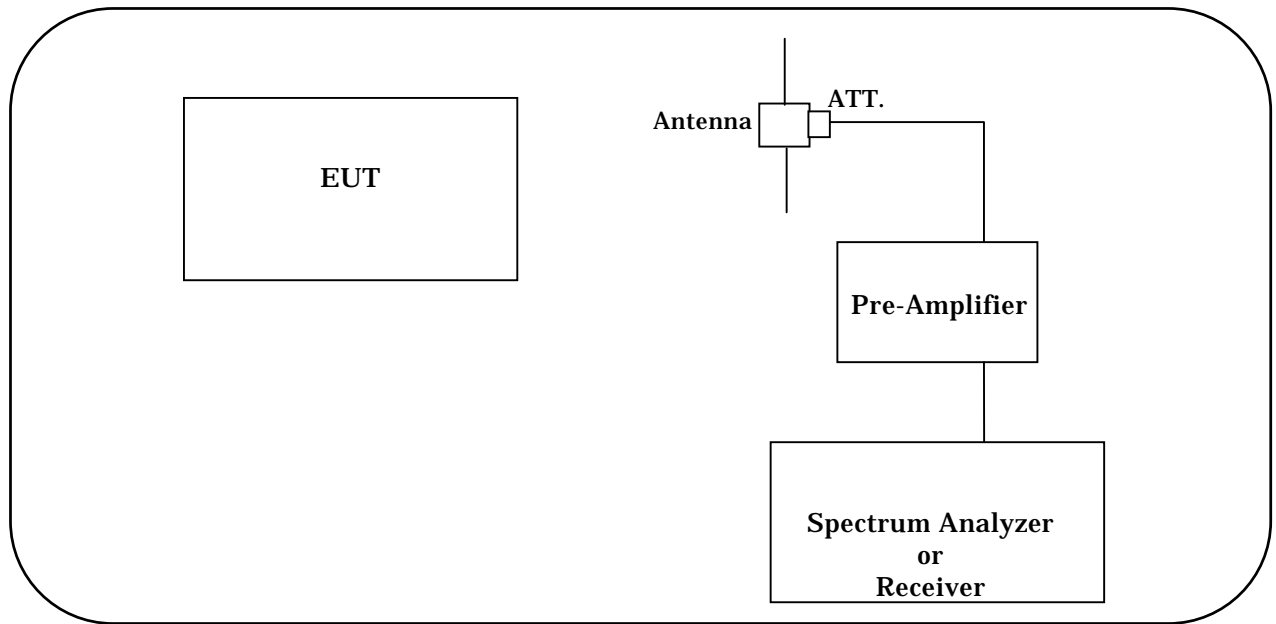
APPLICANT : TOSHIBA CORPORATION  
 EUT NAME : Cable Modem  
 MODEL NO. : DAZ8841A  
 SERIAL NO. : None  
 TEST MODE : TX CH11 1Mbps  
 POWER SOURCE : AC120V/60Hz  
 DATE TESTED : Mar 25 2003

FILE NO. : ANKK-103102  
 REGULATION : FCC 15.247(c), 15.209  
 TEST METHOD : ANSI C63.4:1992  
 DISTANCE : 1.0 [m]  
 TEMPERATURE : 22.0 [degC]  
 HUMIDITY : 43.0 [%]  
 NOTE :

ENGINEER : Kazuhiro Ando

FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	4176.00	PEK	61.8	51.8	-5.1	-5.1	56.7	46.7	74.0	17.3	27.3
2	4176.00	AVG	50.4	43.1	-5.1	-5.1	45.3	38.0	54.0	8.7	16.0
3	4924.00	PEK	50.3	48.0	-3.8	-3.8	46.5	44.2	74.0	27.5	29.8
4	4924.00	AVG	45.6	44.2	-3.8	-3.8	41.8	40.4	54.0	12.2	13.6
5	7388.77	PEK	44.4	43.1	2.3	2.3	46.7	45.4	74.0	27.3	28.6
6	7388.77	AVG	36.1	33.8	2.3	2.3	38.4	36.1	54.0	15.6	17.9
7	8352.00	PEK	44.7	42.2	5.4	5.4	50.1	47.6	74.0	23.9	26.4
8	8352.00	AVG	39.2	34.3	5.4	5.4	44.6	39.7	54.0	9.4	14.3
9	9847.01	PEK	38.0	38.5	7.2	7.2	45.2	45.7	74.0	28.8	28.3
10	9847.01	AVG	27.8	27.3	7.2	7.2	35.0	34.5	54.0	19.0	19.5
-----											
Other frequencies : Below the FCC 15.247(c), 15.209 limit											
Emission Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)											
ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)											

## TEST INSTRUMENTS CONFIGURATION



## TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Test Receiver	ESS	842886/011	ROHDE & SCHWARZ	Mar. 19, 03	1 Year
Spectrum Analyzer	8564E	3643A00665	HEWLETT PACKARD	Jun. 28, 02	1 Year
Pre-Amplifier	8447D	2443A03849	HEWLETT PACKARD	Oct. 4, 02	1 Year
	83051A	3332A00329	HEWLETT PACKARD	Mar. 07, 03	1 Year
6dB Attenuator	MP721B	M57593	ANRITSU	Jan. 15, 03	1 Year
3dB Attenuator	6803.17.B	None	SUHNER	Mar. 07, 03	1 Year
Tri-log Antenna	VULB9168	107	Schwarzbeck	Jul. 31, 02	1 Year
Double Ridged Antenna	3115	5044	EMCO	Jul. 09, 02	1 Year
Standard Gain Horn Antenna	3160-04	1080	EMCO	Jan. 15, 03	1 Year
	3160-05	1114	EMCO	Jan. 15, 03	1 Year
	3160-06	1075	EMCO	Jan. 15, 03	1 Year
	3160-07	1160	EMCO	Jan. 15, 03	1 Year
	3160-08	1144	EMCO	Jan. 15, 03	1 Year
	3160-09	1262	EMCO	Jan. 15, 03	1 Year



**9.6 Restricted Bands of Operation [15.247(c), 15.205, 15.209]****MEASUREMENT PROCEDURE:**

1. The EUT was set to operate with following conditions.
  - ch1 / ch11
  - Data Transfer Rate (1 Mbps / 2 Mbps / 5.5 Mbps / 11 Mbps / 22 Mbps)
2. Measurement distance was 1 meter.
3. The Spectrum Analyzer was setup using
  - Peak mode: RBW = 1MHz, VBW = 1MHz
  - Average mode: RBW = 1MHz, VBW = 10Hz
4. Following data is the worst case.
- 5 As for the typical chart of the observed RF profiles, refer to Page 37 – 38.

**Data of CH1 with 11Mbps****Akzo Nobel K. K.****Kashima No.3 Test Site****Spurious Emissions - Bandedge**

APPLICANT : TOSHIBA CORPORATION  
 EUT NAME : Cable Modem  
 MODEL NO. : DAZ8841A  
 SERIAL NO. : None  
 TEST MODE : TX CH1 11Mbps  
 POWER SOURCE : AC120V/60Hz  
 DATE TESTED : Mar 26 2003

FILE NO. : ANKK-103102  
 REGULATION : FCC 15.247(c), 15.205, 15.209  
 TEST METHOD : ANSI C63.4:1992  
 DISTANCE : 1.0 [m]  
 TEMPERATURE : 24.0 [degC]  
 HUMIDITY : 40.0 [%]  
 NOTE :

ENGINEER : Kazuhiro Ando

FREQUENCY MODE			READING		FACTOR		EMISSION		LIMIT	MARGIN	
[No]	[MHz]		[dBuV]		[dB/m]		[dBuV/m]		[dBuV/m]	[dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	2390.00	PEK	39.3	40.2	18.3	18.3	57.6	58.5	74.0	16.4	15.5
2	2390.00	AVG	27.7	28.3	18.3	18.3	46.0	46.6	54.0	8.0	7.4

Other frequencies : Below the FCC 15.247(c), 15.205, 15.209 limit

Emission Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)

ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

**Data of CH11 with 11Mbps****Akzo Nobel K. K.****Kashima No.3 Test Site****Spurious Emissions - Bandedge**

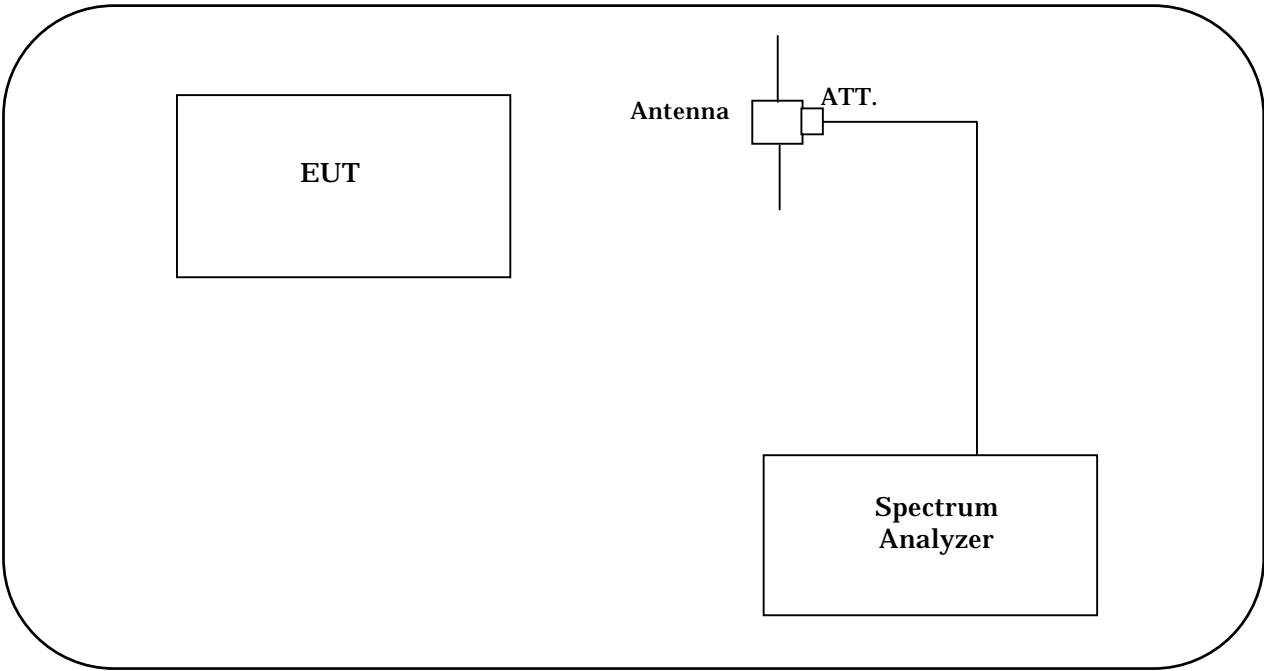
APPLICANT : TOSHIBA CORPORATION  
 EUT NAME : Cable Modem  
 MODEL NO. : DAZ8841A  
 SERIAL NO. : None  
 TEST MODE : TX CH11 11Mbps  
 POWER SOURCE : AC120V/60Hz  
 DATE TESTED : Mar 26 2003

FILE NO. : ANKK-103102  
 REGULATION : FCC 15.247(c), 15.205, 15.209  
 TEST METHOD : ANSI C63.4:1992  
 DISTANCE : 1.0 [m]  
 TEMPERATURE : 24.0 [degC]  
 HUMIDITY : 40.0 [%]  
 NOTE :

ENGINEER : Kazuhiro Ando

FREQUENCY MODE			READING		FACTOR		EMISSION		LIMIT	MARGIN	
[No]	[MHz]		[dBuV]		[dB/m]		[dBuV/m]		[dBuV/m]	[dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	2483.50	PEK	39.0	40.7	18.4	18.4	57.4	59.1	74.0	16.6	14.9
2	2483.50	AVG	27.8	28.7	18.4	18.4	46.2	47.1	54.0	7.8	6.9
-----											
Other frequencies : Below the FCC 15.247(c), 15.205, 15.209 limit											
Emission Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)											
ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)											

TEST INSTRUMENTS CONFIGURATION



TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Spectrum Analyzer	8564E	3643A00665	HEWLETT PACKARD	Jun. 28, 02	1 Year
3dB Attenuator	6803.17.B	None	SUHNER	Mar. 07, 03	1 Year
Double Ridged Guide Antenna	3115	5044	EMCO	Jul. 09, 02	1 Year

Chart of ch 1 with 11 Mbps

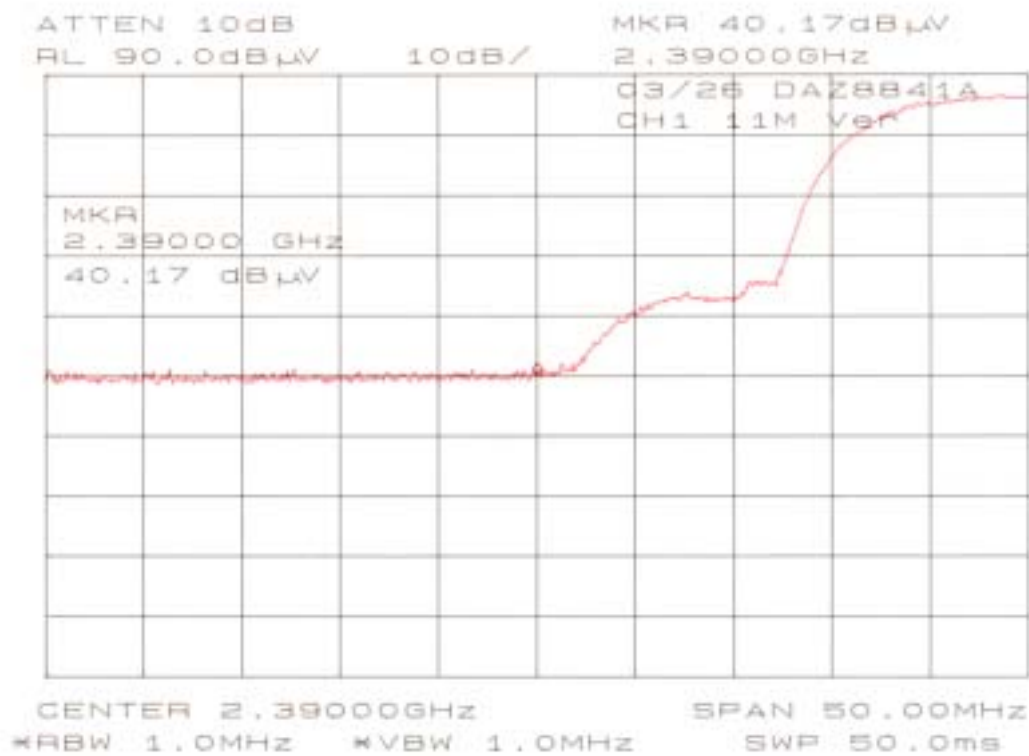


Chart of ch 1 with 11 Mbps

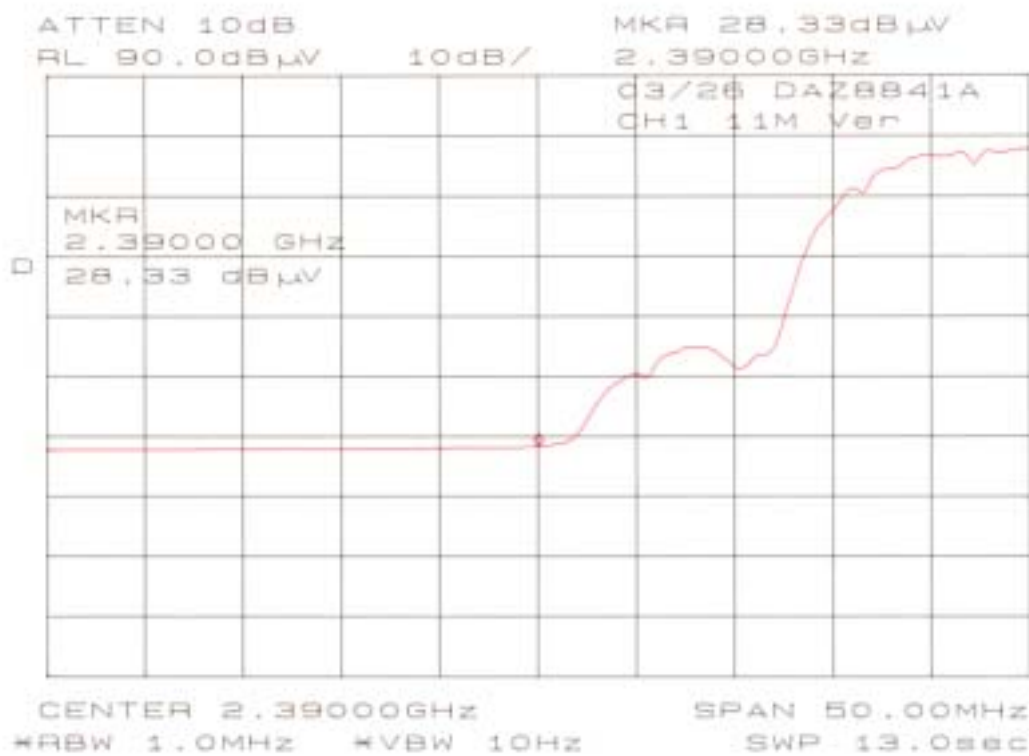


Chart of ch 11 with 11 Mbps

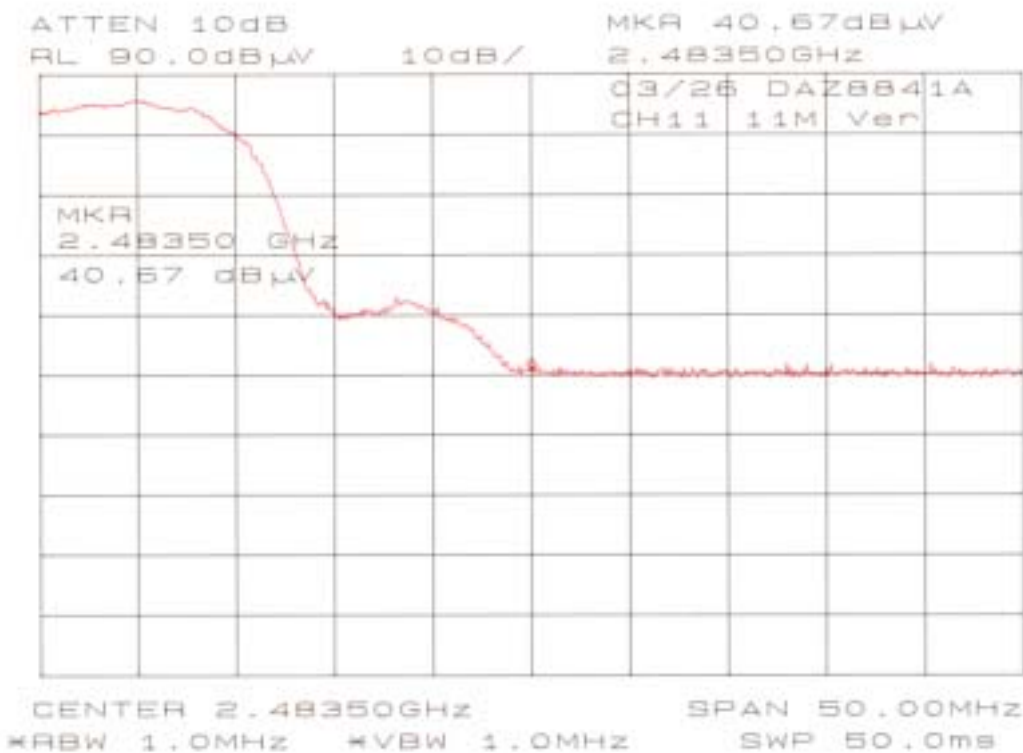
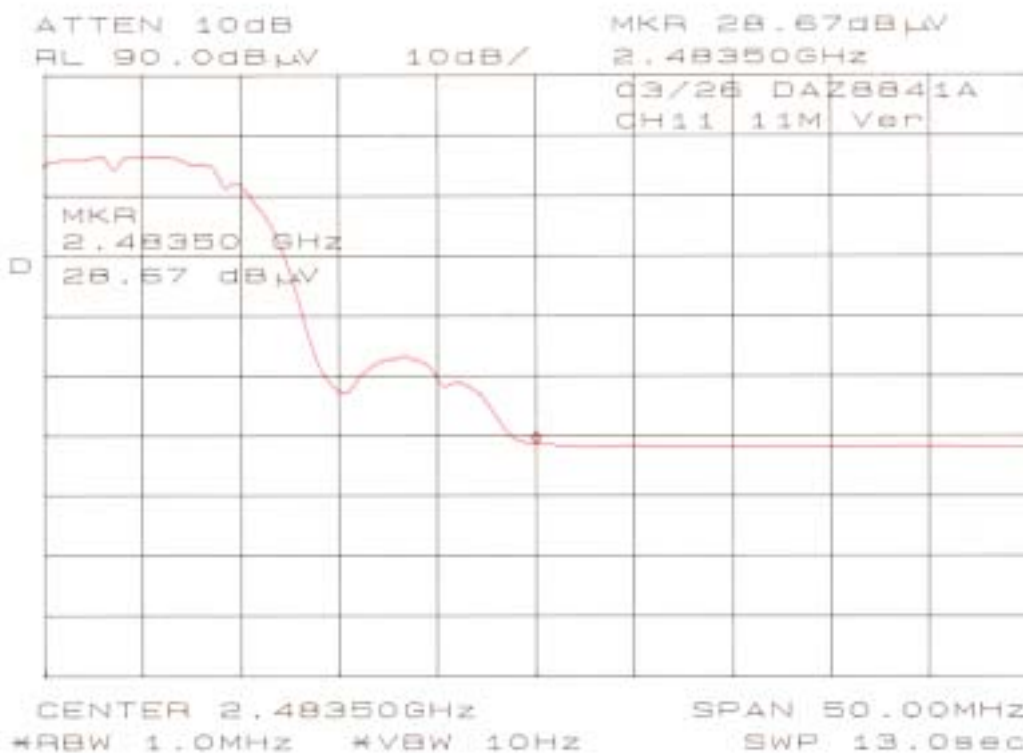


Chart of ch 11 with 11 Mbps



## **9.7 AC Conducted Emissions [15.207]**

### **MEASUREMENT PROCEDURE:**

- 1. The EUT was set to operate with following conditions.**
  - ch1 / ch6 / ch11
  - Data Transfer Rate (1 Mbps / 2 Mbps / 5.5 Mbps / 11 Mbps / 22 Mbps)
- 2. The Test Receiver is complied with the specification of the CISPR publication 16.**
- 3. Following data is the worst case.**

**Data of CH6 with 22Mbps****Akzo Nobel K. K.****Kashima No.3 Test Site****Conducted Voltages on Mains Port**

APPLICANT : TOSHIBA CORPORATION  
 EUT NAME : Cable Modem  
 MODEL NO. : DAZ8841A  
 SERIAL NO. : None  
 TEST MODE : TX CH6 22Mbps  
 POWER SOURCE : AC120V/60Hz  
 DATE TESTED : Mar 27 2003

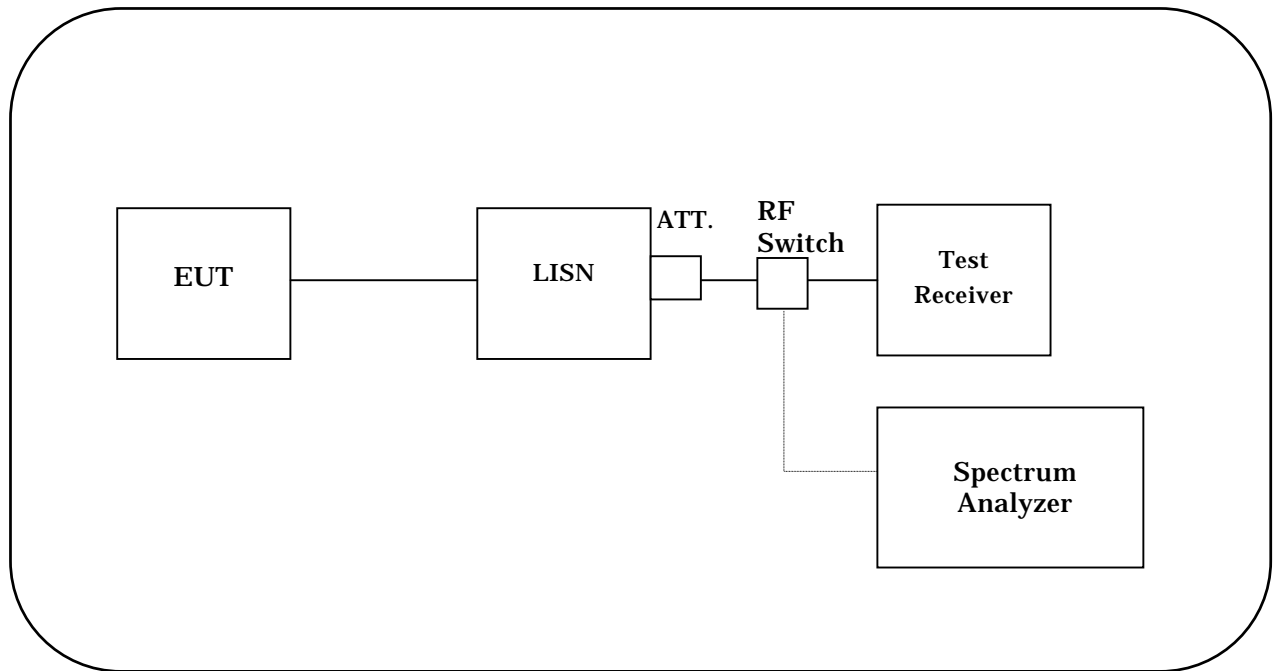
FILE NO. : ANKK-103102  
 REGULATION : FCC 15.207  
 TEST METHOD : ANSI C63.4-1992  
 TEMPERATURE : 25.0 [degC]  
 HUMIDITY : 38.0 [%]  
 NOTE :

ENGINEER : Kazuhiro Ando

FREQUENCY MODE			READING		FACTOR		EMISSION		LIMIT	MARGIN	
[No]	[MHz]		[dBuV]		[dB]		[dBuV]		[dBuV]	[dB]	
			Line1	Line2	Line1	Line2	Line1	Line2		Line1	Line2
1	0.1500	QP	45.0	45.2	6.7	6.7	51.7	51.9	66.0	14.3	14.1
2	0.2500	QP	43.0	43.3	6.7	6.7	49.7	50.0	61.8	12.1	11.8
3	0.2500	AVG	12.8	13.3	6.7	6.7	19.5	20.0	51.8	32.3	31.8
4	0.3500	QP	41.0	41.9	6.7	6.7	47.7	48.6	59.0	11.3	10.4
5	0.3500	AVG	10.8	11.6	6.7	6.7	17.5	18.3	49.0	31.5	30.7
6	0.5000	QP	34.9	36.5	6.7	6.7	41.6	43.2	56.0	14.4	12.8
7	0.7000	QP	26.4	29.2	6.7	6.7	33.1	35.9	56.0	22.9	20.1
8	1.7234	QP	36.7	38.0	6.8	6.9	43.5	44.9	56.0	12.5	11.1
9	1.7234	AVG	24.0	25.2	6.8	6.9	30.8	32.1	46.0	15.2	13.9
10	9.7637	QP	25.0	32.2	7.1	7.1	32.1	39.3	60.0	27.9	20.7
11	16.1920	QP	31.6	34.9	7.3	7.3	38.9	42.2	60.0	21.1	17.8
-----											
Other frequencies : Below the FCC 15.207 limit											
Emission Level = Read + Factor(LISN,Pad,Cable)											



## TEST INSTRUMENTS CONFIGURATION



## TEST INSTRUMENTS

Instrument	Model No.	Serial No.	MANUFACTURER	Last cal. date	Period
Test receiver	ESS	842886/011	ROHDE & SCHWARZ	Mar. 19, 03	1 Year
LISN (EUT)	ESH2-Z5	881492/014	ROHDE & SCHWARZ	Sep. 30, 02	1 Year
6dB Attenuator	CFA-01	None	TME	Jan. 15, 03	1 Year
LISN (Peripheral)	KNW-407	8-532-11	KYORITSU	Mar. 19, 03	1 Year
50Ω Termination	CT-01	A030CON50	TME	Jun. 26, 02	1 Year
RF Switch	ACX-150	None	AKZO NOBEL	Jan. 15, 03	1 Year

## SECTION 10. MEASUREMENT UNCERTAINTY

The uncertainty of the measurements performed for this report lies:

Minimum 6dB Bandwidth [15.247(a)(2)]		
Above 1 GHz .....		+/- 46.7kHz
Maximum Peak Output Power [15.247(b)]		
Above 1 GHz .....		+/- 0.2 dB
Spurious Emissions [15.247(c)]		
- RF Antenna Conducted Test		
Above 1 GHz .....		+/- 2.9 dB
Spurious Emissions [15.247(c), 15.205, 15.209]		
- Radiated Emission Test		
Above 1 GHz .....		+/- 3.9 dB
Power Spectral Density [15.247(d)]		
Above 1 GHz .....		+/- 2.9 dB
AC Conducted Emission [15.207]		
9 kHz – 30 MHz .....		+/- 1.8 dB

### Note on Radiated Emission measurement uncertainty

The following items are not included in the calculations in spite of their own uncertainty components because it is impracticable to find the value.

It is our problem awaiting solution in future.

#### (1) Repeatability of measurement

It is not possible to calculate repeatability since the measurement was carried out only one time.

#### (2) Antenna factor variation

The definition of measured (radiated electric field strength) is not completed on the referred standard(s).

#### (3) Loss of EUT radiation propagation

It is certainly one of the uncertainty components, however is not able to calculate.

Please note that these uncertainties are not reflected to the compliance judgement of the test results in this report.

## SECTION 11. DESCRIPTION OF TEST LABORATORY

### 11.1 Outline of Akzo Nobel K. K. (formerly Akzo Kashima Limited), EMC Division

Akzo Nobel K. K., the country organization in Japan for Akzo Nobel NV, was established in 1968. The shares are owned by Akzo Nobel NV (100%). Akzo Nobel NV, headquartered in the Netherlands, is one of the world's leading companies in selected areas of chemicals, coatings, healthcare products and fibers with work force of approximately 70,000 people in over 50 countries.

In 1984, in order to respond to the growing testing demand, in particular, for FCC filing, Akzo Nobel K. K. started EMI testing business, installing the first open air test site in Kashima, Ibaraki prefecture. Further the business has been expanded by installing additional testing facilities not only in Ibaraki but also in other areas such as Shizuoka, Nagano, Kanagawa and Tochigi. As results, Akzo Nobel K. K. has now 16 open air test sites and 4 anechoic chambers for EMI/EMC testing. As the largest EMC testing laboratory in number of testing facilities and staffs, EMC Division has been organized separately in the company and independently operated in conformity with the requirements of ISO/IEC 17025 for its competency as a testing laboratory.

Akzo Nobel K. K. EMC Division is the first foreign private laboratory accredited by NVLAP, National Voluntary Laboratory Accreditation Program-NIST, USA. The division has been certified, authorized and/or filed as a competent testing laboratory by various testing organizations/authorities as described below.

### 11.2 Filing, certification, authorization and accreditation list

#### EMI/EMC testing

FCC	(USA)
NVLAP	(USA)
NEMKO	(Norway)
VCCI	(Japan)
ETL SEMKO	(Sweden)
TÜV PRODUCT SERVICE	(Germany)

#### Telecommunications terminal testing

FCC	(USA)
NVLAP	(USA)
NATA	(Australia)
IC	(Canada)

Note 1 : NVLAP accreditation does not constitute any product endorsement by NVLAP or any agent of the U.S. Government.