FCC ID: H79DD-556

EMC

TEST REPORT

REPORT NO. : F87092202
MODEL NO. : DD-556 AA, DD-556 BA
DATE OF TEST : Oct. 10, 1998

PREPARED FOR: DELTA ELECTRONICS INC.

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PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION

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1. CERTIFICATION

Issue Date: Oct. 19, 1998

Product	:	COLOR MONITOR
Trade Name	:	DELTA
Model No.	:	DD-556 AA, DD-556 BA
Applicant	:	DELTA ELECTRONICS INC.
Standard	:	FCC Part 15, Subpart B, Class B ANSI C63.4-1992 CISPR 22:1993+A1: 1995+A2: 1997

We hereby certify that one sample of the designation has been tested in our facility on Oct. 10, 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.

TESTED BY: Ken Liu , DATE: 98.10.19
(Ken Liu)

CHECKED BY: Ariel Hsieh , DATE: 10/19/'98
(Ariel Hsieh)

APPROVED BY: Mike Su , DATE: 10/19/98
(Mike Su)

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	COLOR MONITOR
Model No.	:	DD-556 AA, DD-556 BA
Power Supply Type	:	Switching
Power Cord	:	Nonshielded (1.5 m)
Data Cable	:	Shielded (1.5 m)

Note: The EUT is a 15" color monitor with resolution up to 1024 x 768.

The EUT has two model names, which are identical to each other in all aspects except for their marketing distinction only:

- MODEL: DD-556 AA
- MODEL: DD-556 BA

From the above models, model: **DD-556 AA** was selected as the representative during the test and therefore only its data is recorded in this report.

The EUT is a high performance digital color monitor for use with IBM PC/XT/AT and PS/2 computers or compatibles with analog RGB output.

There is one ferrite core on the video cable outside the monitor.

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	D4572A	FCC DoC Approved	Nonshielded Power (1.8m)
2	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded Signal (1.4m)
3	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (2.3m) Nonshielded Power (1.8m)
4	MODEM	ACEEX	1414	IFAXDM1414	Shielded Signal (1.2m) Nonshielded Power (1.8m)
5	MOUSE	DEXIN	A2P800A	NIYA2P800A	Shielded Signal (1.5m)
6	VGA CARD	GORDIA	DSV3365	LUT-DSV3365	N/A

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	3520A01861	Feb. 12, 1999
HP Preamplifier	8447D	2944A08118	Dec. 31, 1998
ROHDE & SCHWARZ TEST RECEIVER	ESVS 10	840241/010	Sept. 10, 1999
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE BILOG Antenna	CBL6111A	1079	July 17, 1999
CHANCE Turn Table	U200	9701	N/A
CHANCE Tower	AT-100	CM-A003	N/A
Open Field Test Site	Site 3	ADT-R03	July 16, 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	ESHS30	828109/007	July 22, 1999
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	892107/003	July 20, 1999
EMCO L.I.S.N.	3825/2	9504-2359	July 20, 1999
Shielded Room	Site 3	ADT-C03	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	:	25 ℃
Humidity	:	69 %
Atmospheric Pressure	:	998 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -3.6 dB at 0.191 MHz Minimum passing margin of radiated emission: -4.0 dB at 65.05 MHz

Note: The EUT was pretested under the following resolution & horizontal synchronization speed mode:

* 1024x768 mode (48 kHz),
* 800x600 mode (53 kHz)
* 640x480 mode (31.5 kHz)

The worst emission levels were found under 1024x768 mode (48 kHz) and therefore the test data of only this mode is recorded.

4.2 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. PC runs a test program to enable all functions.
3. PC reads and writes messages from FDD and HDD.
4. PC sends "H" messages to monitor (EUT) and monitor displays "H" patterns on screen.
5. PC sends "H" messages to modem.
6. PC sends "H" messages to printer, and the printer prints them on paper.
7. Repeat steps 3-7.

4.3 TEST DATA OF CONDUCTED EMISSION

EUT: **COLOR MONITOR** MODEL: **DD-556 AA**

MODE: **1024x768 (48 kHz)**

6 dB Bandwidth: 10 kHz

TEST PERSONNEL: Ken Liu

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
0.191	56.90	49.30	58.40	50.40	63.99	53.99	-7.1	-4.7	-5.6	-3.6
0.238	53.90	45.20	55.00	46.30	62.17	52.17	-8.3	-7.0	-7.2	-5.9
0.817	22.50	-	30.20	-	56.00	46.00	-33.5	-	-25.8	-
2.108	20.00	-	26.60	-	56.00	46.00	-36.0	-	-29.4	-
16.263	34.90	-	34.10	-	60.00	50.00	-25.1	-	-25.9	-
24.703	38.50	-	37.90	-	60.00	50.00	-21.5	-	-22.1	-

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 levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value

4.4 TEST DATA OF RADIATED EMISSION

EUT: **COLOR MONITOR** MODEL: **DD-556 AA**

MODE: **1024x768 (48 kHz)**

ANTENNA: CHASE BILOG CBL6111A POLARITY: Horizontal

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

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

TEST PERSONNEL: ken Lin

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
54.02	9.2	9.2	18.4	30.0	-11.6
65.06	7.5	13.5	21.0	30.0	-9.0
75.89	8.1	7.1	15.2	30.0	-14.8
114.32	13.6	5.8	19.4	30.0	-10.6
146.37	12.9	4.3	17.2	30.0	-12.8
178.88	11.5	7.4	18.9	30.0	-11.1
184.33	11.6	6.9	18.5	30.0	-11.5
195.17	11.8	5.1	16.9	30.0	-13.1

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

TEST DATA OF RADIATED EMISSION

EUT: **COLOR MONITOR** MODEL: **DD-556 AA**

MODE: **1024x768 (48 kHz)**

ANTENNA: CHASE BILOG CBL6111A POLARITY: Vertical

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

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

TEST PERSONNEL: Ken Liu

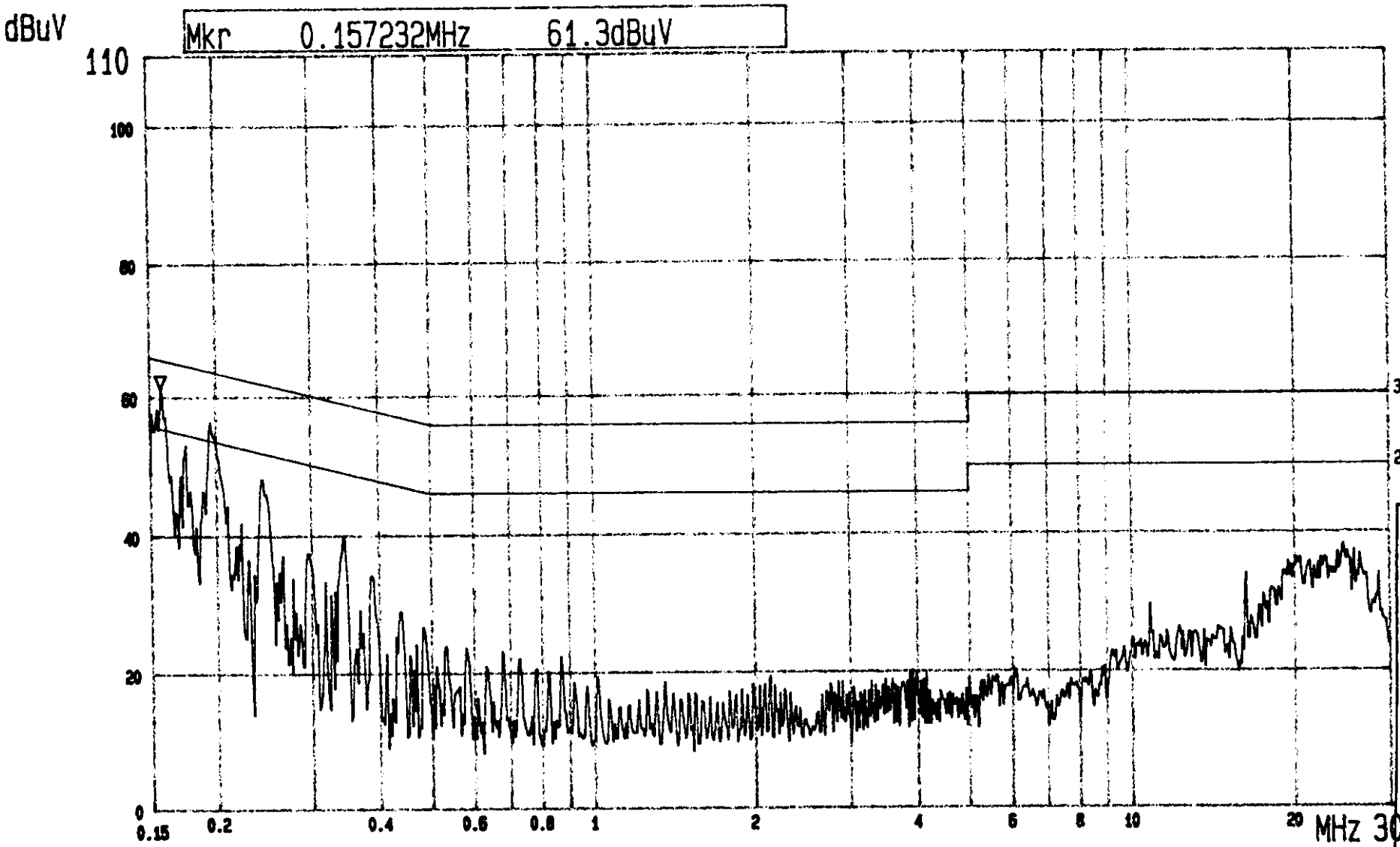
Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
54.22	6.8	17.4	24.2	30.0	-5.8
65.05	6.6	19.4	26.0	30.0	-4.0
75.90	7.1	13.5	20.6	30.0	-9.4
81.32	7.8	14.1	21.9	30.0	-8.1
146.38	13.3	6.1	19.4	30.0	-10.6
178.89	11.4	8.5	19.9	30.0	-10.1
184.34	11.6	9.3	20.9	30.0	-9.1

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

6. ATTACHMENT I -TECHNICAL DESCRIPTION OF EUT

SPECIFICATIONS

CRT	SIZE	15" DIAGONAL (>13.8" VIEWABLE)
	DEFLECTION ANGLE	90 DEGREES
	PHOSPHOR PITCH	0.28 mm
	SCREEN	DOT TYPE.
GRAPHICS STANDARDS COMPATIBILITY		NON-INTERLACED 1024x768, XGA, SUPPER VGA, VGA
RESOLUTION (MAX.)		NON-INTERLACED 1024x768
VIDEO BANDWIDTH (HXV)		75 MHz
SYNCHRONI-ZATION	HORIZONTAL	30-56 KHz
	VERTICAL	50-120 Hz
INPUT SIGNAL	VIDEO	RGB ANALOG 0.7 VP-P/75 OHMS POSTIVE
	SYNC	TTL SEPARATEC/COMPOSITE (+/-)
DISPLAY COLORS		UNLIMITED
DISPLAY AREA (HXV)		266mm x 200mm (RECOMMENDED) THE DISPLAY AREA DEPENDS ON ACTUAL SIGNAL TIMINGS
POWER SOURCE		90-264 VAC
POWER CONSUMPTION		80 W
INPUT CONNECTOR		15 PIN MINI D-SUB
DIMENSION		365mm (D) x 398mm (W) x 328mm (H)
WEIGHT		14 KG (30.8 LBS)
USER CONTROLS		POWER SWITCH, CONTRAST, BRIGHTNESS V. POSITION H. POSITION, V. SIZE, H. SIZE, TRAPEZOID, COLOR, OSD FUNCTION EXIT, STATUS
OPERATING TEMPERATURE		0 °C TO 40 °C
OPERATING HUMIDITY		10 % TO 80 %
PLUG & PLAY		DDC ½B
POWER MANAGEMENT		VESA (NUTEK)



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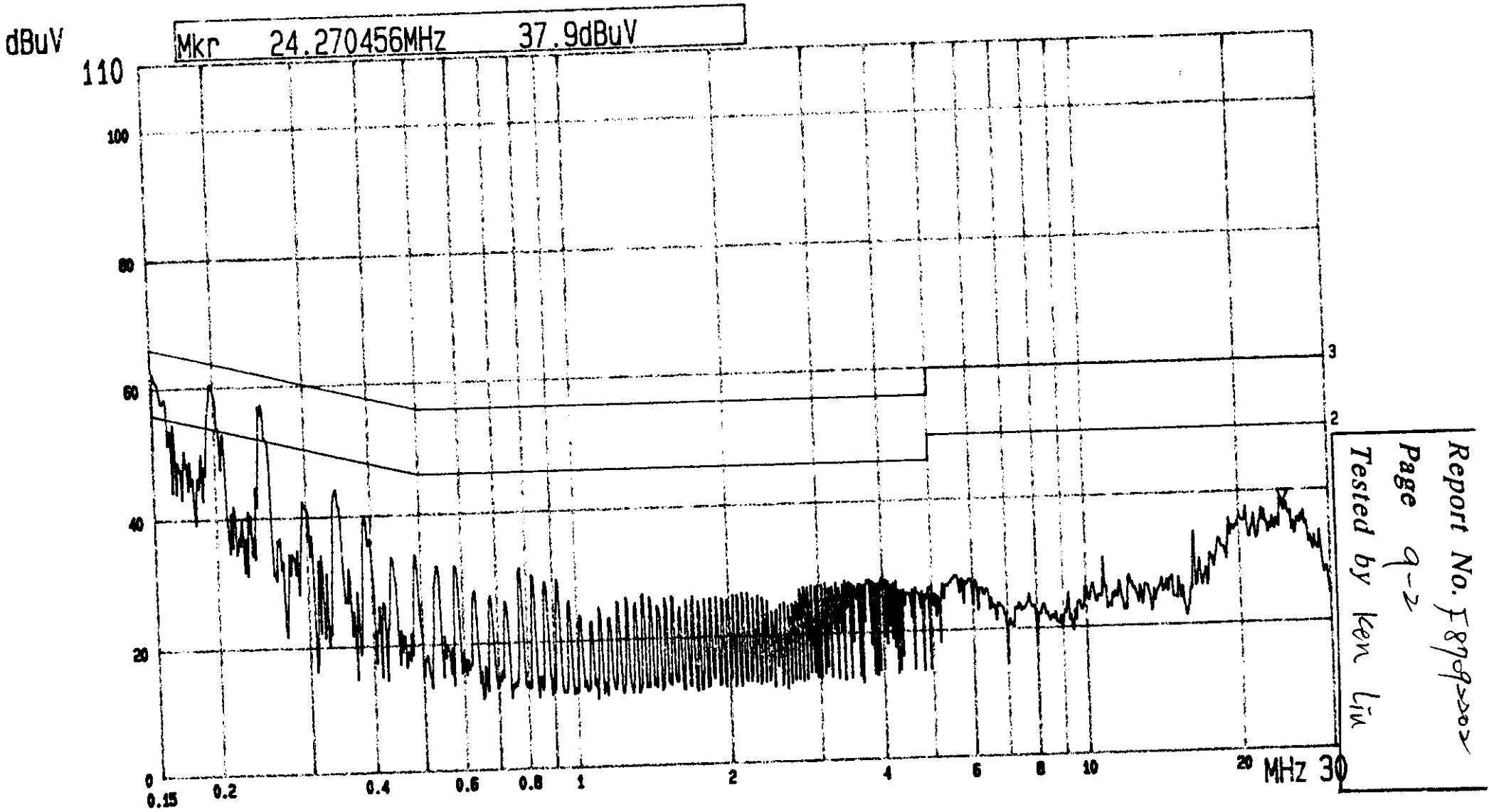
Tested by Ken Liu

|--- Date 10.OCT '98 Time 13:50:03
CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE) ADT CORP.
MODEL: DD-556 XX 1024X768 60HZ/48KHZ LISN : L



|--- Date 10.OCT '98 Time 13:55:50
CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE) ADT CORP.
MODEL: DD-556 XX 1024X768 60HZ/48KHZ LISN : N