

FCC ID: EENDB102

## **Data Broadcast Systems**

**EXHIBIT NEEDED FOR FCC CERTIFICATION**  
**EUT: Data Broadcast Modem; Type: DB102**

# **Test report**

Philips Consumer Electronics EMC Competence Centre Building SFH-p 015 Eindhoven, The Netherlands	<b>EMC TEST REPORT</b>	Rep.No: AR6-877150
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**Customer:**

Philips Consumer Electronics, Data Broadcast Systems, Mr.G.Verschuren  
Building SFJ304, P.O.Box 80002  
5600JB Eindhoven  
The Netherlands

**Requirements:**

Acc.: Standards : FCC part 15: 1997

**Results:**

According to testing performed at Philips ASA-Lab. EMC Competence Centre, the in this report mentioned Equipment Under Test is **IN COMPLIANCE** with the Electromagnetic compatibility requirements defined in the standards.

Philips ASA-Lab. EMC Competence Centre reports apply only to the specific sample tested under stated test conditions.

It is the manufacturer's responsibility to assure the continued compliance of production units of this model.  
Philips ASA-Lab. EMC Competence Centre, shall have no liability for any deductions, inferences or generalisations drawn by the client or others from Philips ASA-Lab. EMC Competence Centre issued reports.

**Measurements:**

See overview at sheet 2

**Table of contents:**

See overview at sheet 3

**Equipment Under Test**

**DB102**  
(Data Broadcast Modem Card)  
**FCC-Certification**  
**FCC ID: EENDB102**

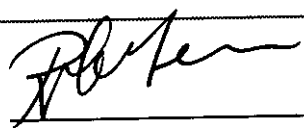
**Kind of test:**
**Short description of the tested device:**

Designed specially for reception of broadcast data services using the Teletext medium with PC or Notebook.  
It will receive and decode Packet 31 (WST Section 21) services as well as Teletext.

**Remarks:**

Eindhoven,  
The Netherlands

A.A. Janssen/T.v.Til  
EMC Test Engineer

  
P.J. van Oosten  
Supervisor EMC Test Lab.

**Philips Electronics N.V. 1998**

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Philips Consumer Electronics EMC Competence Centre Building SFH-p 015 Eindhoven, The Netherlands	<b>EMC TEST REPORT</b>	Rep.No: AR6-877150
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## EXECUTED MEASUREMENTS / TESTS:

Nature of measurement or test	Restriction fulfilled ? Yes / No	Results	Acc. Requirements of:
<b>GENERATED DISTURBANCES OF THE ENVIRONMENT:</b>			
Mains terminal disturbance voltage	Yes	No infringements of the requirements	FCC part 15
Local oscillator radiation	./.	Not applicable	EN55013
Spurious radiation	Yes	No infringements of the requirements	FCC part 15
Local oscillator voltage on aerial terminals	Yes	No infringements of the requirements Highest measured level = 13 dBpW = 0.02 nWatt	FCC part 15
Spurious local osc. Volt on aerial terminals	./.	Not applicable	EN55013
Disturbance radiation 1 GHz - 25 GHz	./.	Not applicable	EN55013
<b>IMMUNITY: Not applicable for FCC</b>			
Input immunity	./.		EN55020
Immunity against conducted voltages	./.		EN55020
Immunity against conducted currents	./.		EN55020
Immunity against radiated interference	./.		EN55020
Screen attenuation of the coax aerial input	./.		EN55020
Imm. against radiated interf. 80 - 1000 MHz	./.		EN61000-4-3
Conducted disturbances induced by EM-fields	./.		EN61000-4-6
Static Electricity Discharge (ESD)	./.		EN61000-4-2
Fast transient burst	./.		EN61000-4-4
Mains supply voltage, variations & voltage dips/short interruptions	./.		EN61000-4-11
Slow high energy voltage surge	./.		EN61000-4-5
Mains harmonics	./.		EN61000-3-2
Audio frequency common mode test	./.		ETS300-683

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Description and results of the Spurious Radiation test	11 up to & incl.: 15	Emission
Description and results of the Antenna Terminal Voltage test	16, 17 & 18	Emission
Description and results of the Radiated interference test 80 - 1000 MHz		Immunity (Not required for FCC)
Description and results of the Conducted disturbances induced by EM-field tests		Immunity (Not required for FCC)
Description and results of the ESD test		Immunity (Not required for FCC)
Description and results of the Fast transient/burst test		Immunity (Not required for FCC)
Description and results of the Mains supply voltage variations & voltage dips/short interruptions test		Immunity (Not required for FCC)
Description and results of the Slow/High energy voltage Surge test		Immunity (Not required for FCC)
Description and results of the Mains Harmonic tests		Immunity (Not required for FCC)
Photo's of test/measuring set-up's	19 up to & incl.: 24	

## EVALUATION OF THE DB102 TEST RESULTS:

This DB102 has been considered to be a peripheral of a computing device.  
That's why this DB102 has been tested according the FCC Standards for disturbances to the outside world.

This DB102 has been tested in a full configured system with all ports connected to their relevant cables and the cables connected to their specified load-impedance's.

During and directly after the tests no infringements of the requirements have been found

For more detailed information concerning photo session of the measuring set-up's see page 3 (Table of contents).

### **Radiation measurements; Explanation of terms used:**

FREQ :Frequency at which an emission has been found.

ANT :Type of used aerial: - BILOG aerial (30 - 2000 MHz)  
- Broad band horn aerial (1 - 6.5 GHz)

Pol. :HOR; Horizontal polarity of the antenna. VERT; Vertical polarity of the antenna.

Values :Values measured from the spectrum analyser (Including all corrections from site, antenna, cable and amplifier) expressed in dBuV/m (Quasi Peak).

The spurious radiation has been checked in the anechoic chamber (3 meter test site)

### **Conducted disturbances:**

Highest value measured in Quasi peak mode: 38.2 dBuV at 23.955 MHz.

Limit: 48 dBuV,(Quasi Peak) Margin: > 9 dBuV;

The EMC behaviour of this DB102 is good as far as judged according the requirements for achieving FCC-certification Class B.

In case this DB102 is extended with other sub-units/functions or options not included in this report, a new report has to be issued with the EMC-behaviour of the added parts included; unless it can be proven that the added part(s) does not influence the EMC-behaviour of the system.

## PRODUCT CONFIGURATION DESCRIPTION

### List of tested equipment:      (CONFIGURATION)

- Data Broadcast Modem: DB102
- Computer: HP Vectra 5L5 Series 5 DT, Tested to comply with FCC standards for home or office use.
- Keyboard: Philips type: P2818 000; FCC ID: GJK35U101UN2
- Mouse: Logitech type: M/N: M-SF14-6MD; FCC ID: DZLMSF14R
- Monitor: Olivetti DSM 28-143 PS, model number.: CDU1448G/PH  
FCC ID: A3KM043
- Printer: HP C2106A; FCC ID: B94C2106X
- USB Audio system: Philips type: DSS350/17 as load for the USB bus

### Operation of DB102 during tests

- During the measurements the module has been connected, via the antenna cable to the TV cable system of Eindhoven and automatically tuned to 703.86 MHz to receive the Nozema test-signal to check the performance of the module and let it run in full operation.

#### - Initial settings:

With the dBdiag-Notepad program the initial settings of the module checked or changed. With the DB102 Production test program first set the module (Configuration) and thereafter the test program started for checking and proper receiving the data information of the antenna cable. With the PROGRAM PLUS for windows program checked whether the received data is properly entering the computer. With this program we could check whether the data became disturbed during the measurements. (Continuous scrolling data-lines, teletext, of the TV-signal visible, transmitted by Nozema at "Nederland 3" TV-Channel.)

### Operation Environment requirements:

- Power supply : 120 Volt AC  $\pm$  10%
- Temperature : 25°C  $\pm$  5°C
- Rel.humidity : 50 % (30-60%)
- Atm. Pressure : 1000 mbar (860-1060 mbar)

### Measuring procedure:

- According the Ansi 63.4 standard of 1992.
- To maximise the emission, the configuration has been adjusted at each frequency.

### Connections made:

- Antenna cable, to the module, connected to the local cable system for receiving the test-signal.  
Coax antenna cable. (75 Ohm)
- Interconnection between module and the serial A port of the computer. (Shielded cable)
- From rear of computer, parallel port, to printer; Standard printer cable.
- Monitor cable to rear of computer; Standard monitor cable.
- Cable from mouse input port to mouse.
- Cable from keyboard input to keyboard.
- Standard USB cable to the Philips loudspeaker system DSS350 as load for the USB port.

### Clock-frequencies:

22.1184 MHz of the Micro controller AT89C55 or Philips second source P87C51RD  
12.00 Mhz of the teletext chip SMA5284  
55.25 - 801.25 tuning frequency range of the FI1236MK2 tuner

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## LIST OF USED TEST EQUIPMENT

Description according standard		Calibration up to
<b>SPURIOUS RADIATION:</b> The calibrated radiated measuring set up in the SIEPEL Anechoic- chamber of the EMC Competence Centre (Measuring Institute):	X	Nov '98
<b>AERIAL TYPE:</b> CHASE BIOLOG BROADBAND : CL611A / 30 - 1000 MHz	X	May '99
RHODE & SCHWARZ BICONICAL : HUF Z2 / 30 - 200 MHz		May '99
RHODE & SCHWARZ LOG. PER. : HUF Z3 / 200 - 1000 MHz		May '99
SCHWARZBECK BROADBAND HORN : BBA9120-B / 1 - 10 GHz	X	May '99
Advantest R3271 Spectrum Analyser 100 Hz - 26.5 GHz	X	July '99
HP85462A Spectrum Analyser 9 kHz - 6.5 GHz. (EMI receiver)	X	June '99
<b>MAIN DISTURBANCES:</b> EMCO TYPE 3810/2 LISN 250V/10A Artificial network	X	March '99
EMCO TYPE 3810/2 LISN 250V/10A Artificial network	X	March '99
<b>STATIC ELECTRICITY DISCHARGE (ESD):</b> Minizap Keytek ESD Simulator		Sept '99
<b>IMMUNITY AGAINST RADIATED INTERFERENCE:</b> The calibrated Immunity set up in the Anechoic-chamber of the EMC Competence Centre. (Measuring Institute) AT1080 Log. Per. Antenna of Amplifier of Amplifier Research 80 - 1000 MHz. 100W1000M2A 100 Watt HF-amplifier of Amplifier Research. FP3000A Isotropic field probe 10 kHz - 1 GHz. FP3080A Isotropic field probe 80 MHz - 40 GHz.		Oct '98 June '99 June '99 June '99 June '99
<b>FAST TRANSIENTS COMMON MODE:</b> MV2616 & UCS500 Transient Generator of EM-test.		Sept '99
<b>SURGE for Slow and High energy voltage.</b> MV2616 & UCS500 Surge Generator of EM-test.		Sept '99
<b>CONDUCTED DISTURBANCES induced by electromag. Field</b> Injection EM clamp of MEB and CDN's of Lüthi & MEB Local calibrated with calibrated HP-equipment		Oct '98
<b>MAINS supply voltage VARIATIONS &amp; DIPS interruptions</b> MV2616 & UCS500 Power Fail Generator of EM-test.		Sept '99
<b>MAINS HARMONICS:</b> HP6842A Harmonic Flicker tester.		June '99

## ADDRESS MEASURING SIDE

### EMC COMPETENCE CENTRE

Philips Consumer Electronics  
Buildings: SFHp-015  
Glaslaan 2  
P.O. Box 80002

5600 JB Eindhoven  
The Netherlands  
Tel: +31 40 2732680  
Fax: +31 40 2736177

# EMC TEST REPORT

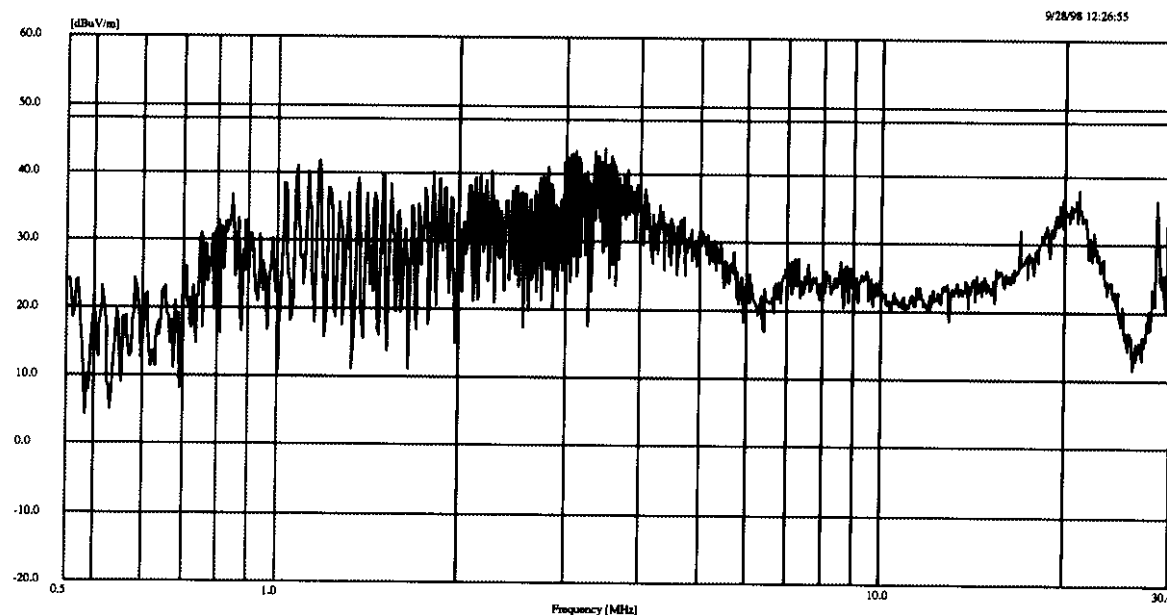
Rep.No: AR6-877150

## MAINS DISTURBANCE TEST

Equipment Under Test:	DB102	Serial Number:	EUT72
Test according to:	FCC part 15, class B equipment		
Test equipment used:	Calibrated EMCO LISN's and HP 8546A of EMC Comp. Centre		
Climatic conditions:	Tamb: 21°C	RH: 52 %	Air press: 1060 mbar
Mode of operation:	Receiving Teletext data via the antenna cable, while tuned at 703.86 MHz		

## TEST RESULTS MEASURED AT NEUTRAL:

### Composite Trace



### Pretest [15/574]

Frequency MHz	Freq Unc MHz	Peak dBuV	QP dBuV	QP Lmt dBuV	DelLim-QP Avg dB	Avg Lmt dBuV	DelLim-Avg dB	Time YYMMDDHHMMSS
1.081535	0.000210	47.24	33.90*	48.00	-14.10	39.31	48.00	980928:13:09:10
1.167822	0.000210	48.82	41.72	48.00	-6.28	40.59	48.00	980928:13:12:14
2.792114	0.000210	45.15	32.25*	48.00	-15.75	36.07*	48.00	980928:13:15:17
2.988167	0.000210	46.02	39.85	48.00	-8.15	33.95*	48.00	980928:13:18:21
3.028854	0.000210	46.63	41.62	48.00	-6.38	39.46	48.00	980928:13:19:41
3.072603	0.000210	47.00	42.88	48.00	-5.12	40.58	48.00	980928:13:20:53
3.117278	0.000210	46.75	43.11	48.00	-4.89	40.46	48.00	980928:13:22:12
3.167549	0.000210	46.37	40.60	48.00	-7.40	38.48	48.00	980928:13:23:24
3.343053	0.000210	47.45	42.78	48.00	-5.22	37.71	48.00	980928:13:24:44
3.388190	0.000210	47.43	43.19	48.00	-4.81	39.84	48.00	980928:13:25:56
3.432034	0.000210	47.40	43.35	48.00	-4.65	39.90	48.00	980928:13:27:15
3.480816	0.000210	47.36	42.09	48.00	-5.91	39.96	48.00	980928:13:28:26
3.522410	0.000210	47.00	42.97	48.00	-5.03	39.50	48.00	980928:13:31:29
3.568995	0.000210	46.86	42.20	48.00	-5.80	38.41	48.00	980928:13:34:33
3.601651	0.000210	46.43	29.05*	48.00	-18.95	29.97*	48.00	980928:13:37:37

### RESULT:

Positive; All measured values far below limit.

Tested by: v.Oosten

Test date:

28-Sept.-'98

# EMC TEST REPORT

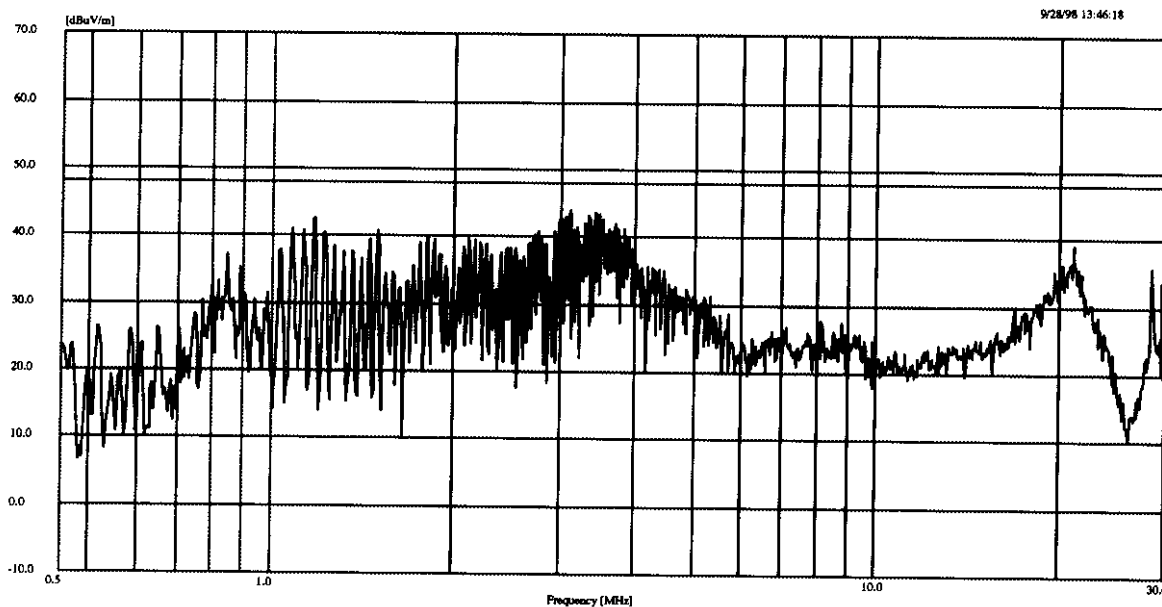
Rep.No: AR6-877150

## MAINS DISTURBANCE TEST

Equipment Under Test:	DB102	Serial Number:	EUT72
Test according to:	FCC PART 15: 1997, class B equipment		
Test equipment used:	Calibrated EMCO LISN's and HP 8546A of EMC Comp. Centre		
Climatic conditions:	Tamb: 21°C	RH: 52 %	Air press: 1060 mbar
Mode of operation:	Receiving Teletext data via the antenna cable, while tuned at 703.86 MHz		

## TEST RESULTS MEASURED AT LINE:

### Composite Trace



### Pretest [17/574]

Frequency MHz	Freq Unc MHz	Peak dBuV	QP dBuV	QP Lmt dBuV	DelLim-QP dB	Avg dBuV	Avg Lmt dBuV	DelLim-Avg dB	Time YYMMDDHHMMSS
1.167242	0.000210	48.37	42.08	48.00	-5.92	40.75	48.00	-7.25	980928:14:29:16
2.977163	0.000210	46.06	41.38	48.00	-6.62	38.99	48.00	-9.01	980928:14:32:20
3.026798	0.000210	46.85	41.85	48.00	-6.15	40.14	48.00	-7.86	980928:14:33:41
3.061226	0.000210	46.93	34.92*	48.00	-13.08	37.74	48.00	-10.26	980928:14:34:52
3.119946	0.000210	47.00	41.40	48.00	-6.60	39.92	48.00	-8.08	980928:14:37:55
3.160453	0.000210	45.47	42.32	48.00	-5.68	38.20	48.00	-9.80	980928:14:40:58
3.197965	0.000210	46.11	35.07*	48.00	-12.93	34.37	48.00	-13.63	980928:14:42:18
3.293819	0.000210	46.51	42.01	48.00	-5.99	36.01	48.00	-11.99	980928:14:43:29
3.342669	0.000210	47.36	41.39	48.00	-6.61	38.71	48.00	-9.29	980928:14:46:32
3.384734	0.000210	47.60	43.58	48.00	-4.42	39.58	48.00	-8.42	980928:14:47:52
3.429941	0.000210	47.29	43.48	48.00	-4.52	40.12	48.00	-7.88	980928:14:49:03
3.482570	0.000210	47.10	40.37	48.00	-7.63	39.03	48.00	-8.97	980928:14:50:24
3.524784	0.000210	47.10	40.92	48.00	-7.08	39.43	48.00	-8.57	980928:14:51:36
3.612089	0.000210	46.13	41.33	48.00	-6.67	37.25	48.00	-10.75	980928:14:54:38
3.699725	0.000210	45.51	40.59	48.00	-7.41	36.25	48.00	-11.75	980928:14:57:40
3.745455	0.000210	46.00	41.36	48.00	-6.64	35.92	48.00	-12.08	980928:14:59:01
3.838271	0.000210	45.24	39.97	48.00	-8.03	35.58	48.00	-12.42	980928:15:00:13

### RESULT:

Positive; All measured values far below limit.

Tested by: v.Oosten

Test date:

28-Sept.-'98

# EMC TEST REPORT

Rep.No: AR6-877150

## RADIATED EMISSION TEST

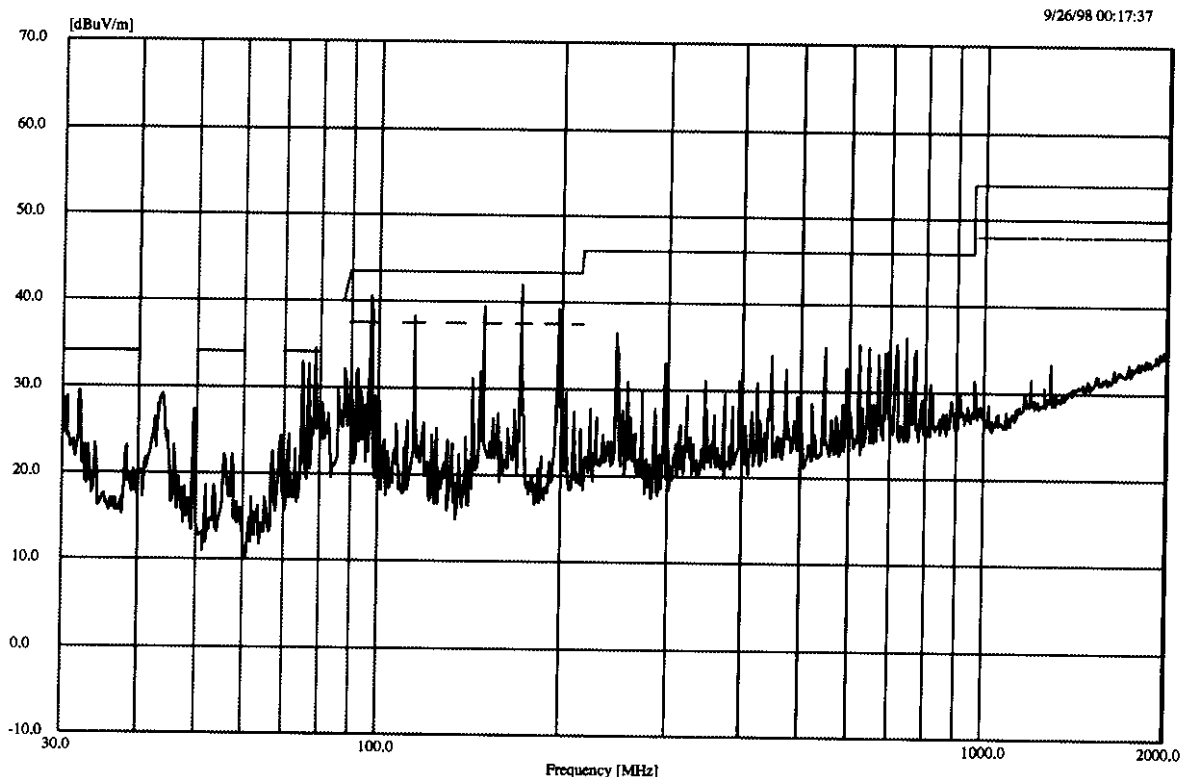
Equipment Under Test:	DB102	Serial Number:	EUT72
Test according to:	FCC PART 15: 1997, class B equipment		
Test equipment used:	Calibrated Immunity set up in the Anechoic-chamber of EMC Comp. Centre		
Climatic conditions:	Tamb: 21°C	RH: 52 %	Air press: 1060 mbar
Mode of operation:	Receiving Teletext data via the antenna cable, while tuned at 703.86 MHz		

### TEST DESCRIPTION:

The DB102 has been placed at 0.8 meter above the earth reference plane (Cage floor). The table dimension at which the DB102 has been placed is 2 by 1 meter. The table as well as the antenna (height and polarity) have been tuned for max. emission. The supply cables routed over the middle of the table downwards to the 120 Volt supply. The routing of the cables at the table has been changed 5 times for searching the most vulnerable position concerned for radiated emission. Scanned with the receiver aerial, from 30 up to 1000 MHz to tune to the frequencies at which the emission of the DB102 is maximised. The test has been executed with horizontal and vertical polarisation of the reception aerial. The worst levels of the horizontal and vertical polarisation have been registered.

### TEST RESULTS:

#### Composite Trace



Tested by: v.Oosten

Test date:

26-Sept.-'98

Philips Consumer Electronics EMC Competence Centre Building SFH-p 015 Eindhoven, The Netherlands	<b>EMC TEST REPORT</b>	Rep.No: AR6-877150
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## RADIATED EMISSION TEST

Equipment Under Test:	DB102	Serial Number:	EUT72
Test according to:	FCC PART 15: 1997, class B equipment		
Test equipment used:	Calibrated Immunity set up in the Anechoic-chamber of EMC Comp. Centre		
Climatic conditions:	Tamb: 21°C	RH: 52 %	Air press: 1060 mbar
Mode of operation:	Receiving Teletext data via the antenna cable, while tuned at 703.86 MHz		

### CONTINUATION OF TEST RESULTS: (WITH SWITCHMODE SUPPLY)

#### Pretest [15/681]

Frequency MHz	Freq Unc MHz	Peak dBuV/m	Peak LmtDelLim-Pk dBuV/m dB	Pol	Hgt cm	Angle deg
74.805487	1.461463	32.89	40.00 -7.11	Vert	99	355
76.727439	1.461463	32.75	40.00 -7.25	Vert	99	358
78.529268	1.461463	34.54	40.00 -5.46	Vert	99	358
88.139024	1.461463	32.14	43.50 -11.36	Horz	299	250
90.060975	1.461463	30.50	43.50 -13.00	Horz	249	265
91.982926	1.461463	32.10	43.50 -11.40	Horz	249	285
96.067072	1.461463	31.00	43.50 -12.50	Horz	299	275
97.148170	1.461463	40.69	43.50 -2.81	Horz	299	83
114.806097	1.461463	38.18	43.50 -5.32	Horz	299	107
143.275000	1.461463	31.05	43.50 -12.45	Vert	99	23
147.239024	1.461463	31.95	43.50 -11.55	Horz	200	266
148.680488	1.461463	39.51	43.50 -3.99	Horz	200	287
172.104268	1.461463	42.04	43.50 -1.46	Horz	150	262
198.290853	1.461463	39.23	43.50 -4.27	Horz	149	296
200.573170	1.461463	35.46	43.50 -8.04	Horz	149	296

#### Maximized Signals [15/885]

Frequency MHz	Peak dBuV/m	Hgt cm	Pol	Angle deg	QP dBuV/m	QP Lmt dBuV/m	DelLim-QP dB
74.696077	27.75	101	Vert	355	26.63	40.00	-13.37
76.636818	30.03	100	Vert	358	29.50	40.00	-10.50
78.554723	34.13	148	Vert	357	33.47	40.00	-6.53
88.095437	33.78	349	Horz	242	30.74	43.50	-12.76
90.005054	31.82	259	Horz	274	28.92	43.50	-14.58
91.910963	31.44	311	Horz	276	29.23	43.50	-14.27
96.811706	37.91	284	Horz	275	36.88	43.50	-6.62
96.814061	41.00	311	Horz	93	40.31	43.50	-3.19
114.581538	39.17	286	Horz	107	38.07	43.50	-5.43
143.200657	28.35	98	Vert	22	26.60	43.50	-16.90
147.107439	32.39	148	Horz	258	29.86*	43.50	-13.64
148.597956	39.31	134	Horz	287	38.34	43.50	-5.16
171.874097	42.97	159	Horz	270	41.75	43.50	-1.75
198.131266	39.21	99	Horz	295	38.35	43.50	-5.15
200.518239	36.19	100	Horz	294	35.24	43.50	-8.26

#### REMARK:

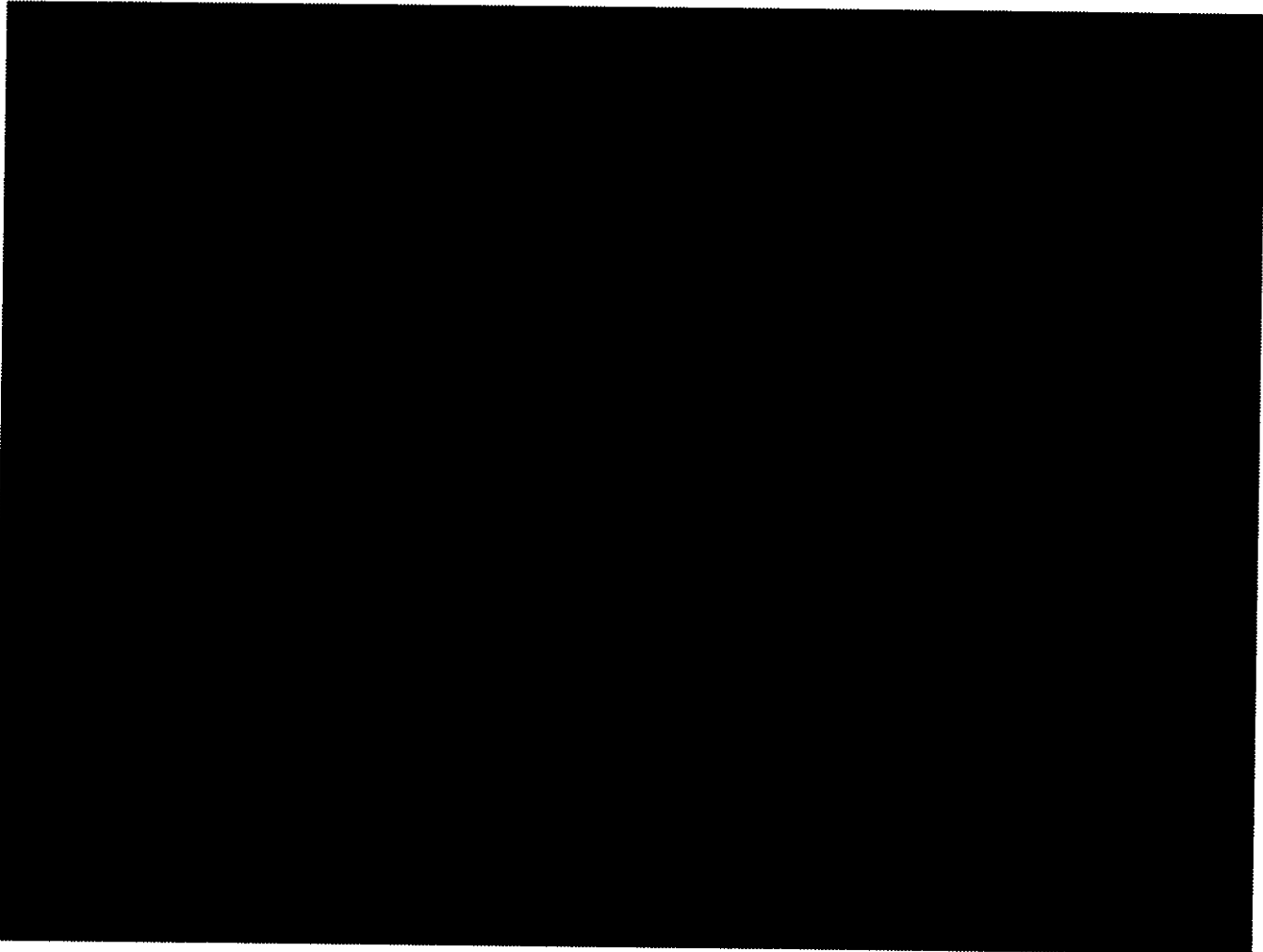
None.

Tested by:	v.Oosten	Test date:	26-Sept.-'98
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## RADIATED EMISSION TEST

Equipment Under Test:	DB102	Serial Number:	EUT72
Test equipment used:	EMI receiver HP85462A + Broad band horn Ant. : BBA9120-B		
Mode of operation:	Receiving Teletext data via the antenna cable, while tuned at 703.86 MHz		
TEST RESULTS: 1 up to 6.5 GHz			



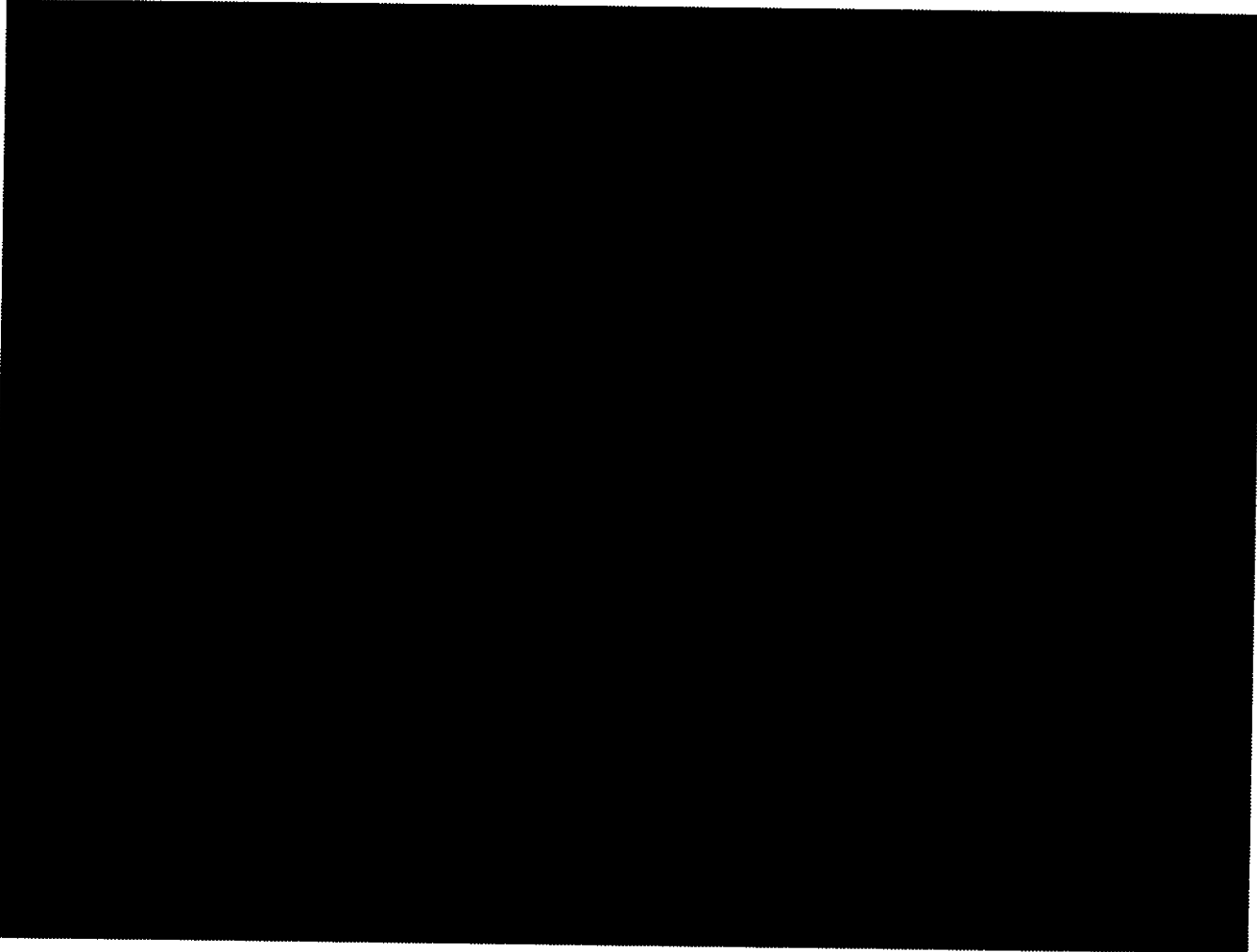
Tested by:	v.Oosten	Test date:	28-Sept.-'98
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## ANTENNA TERMINAL VOLTAGE TEST

Equipment Under Test:	DB102	Serial Number:	EUT72
Test equipment used:	Advantest R3271 analyser connected to input terminal via 50/75 $\Omega$ adapter		
Mode of operation:	Tuned with 1 MHz steps		

### TEST RESULTS: FIRST TV BAND



Maximum measured oscillator voltage level = 2.406 dBpW, The higher plotted levels are spurious disturbances.

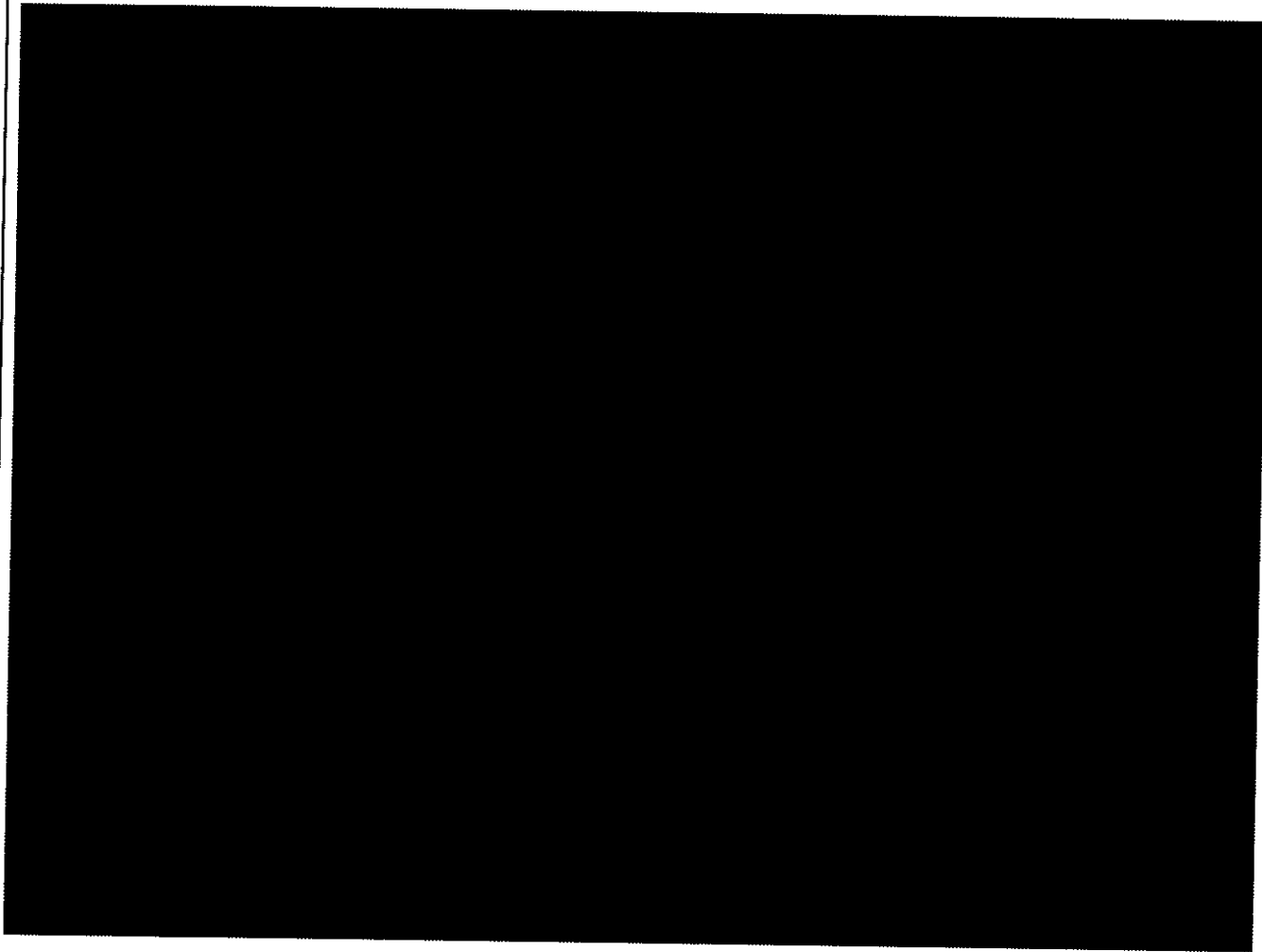
Tested by:	v.Oosten	Test date:	18-Sept.-'98
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Philips Consumer Electronics EMC Competence Centre Building SFH-p 015 Eindhoven, The Netherlands	<b>EMC TEST REPORT</b>	Rep.No: AR6-877150
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## ANTENNA TERMINAL VOLTAGE TEST

Equipment Under Test:	DB102	Serial Number:	EUT72
Test equipment used:	Advantest R3271 analyser connected to input terminal via 50/75 $\Omega$ adapter		
Mode of operation:	Tuned with 1 MHz steps		

### TEST RESULTS: SECOND TV BAND



Maximum measured oscillator voltage level = 3.406 dBpW, The higher plotted levels are spurious disturbances.

Tested by:	v.Oosten	Test date:	18-Sept.-'98
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Philips Consumer Electronics  
EMC Competence Centre  
Building SFH-p 015  
Eindhoven, The Netherlands

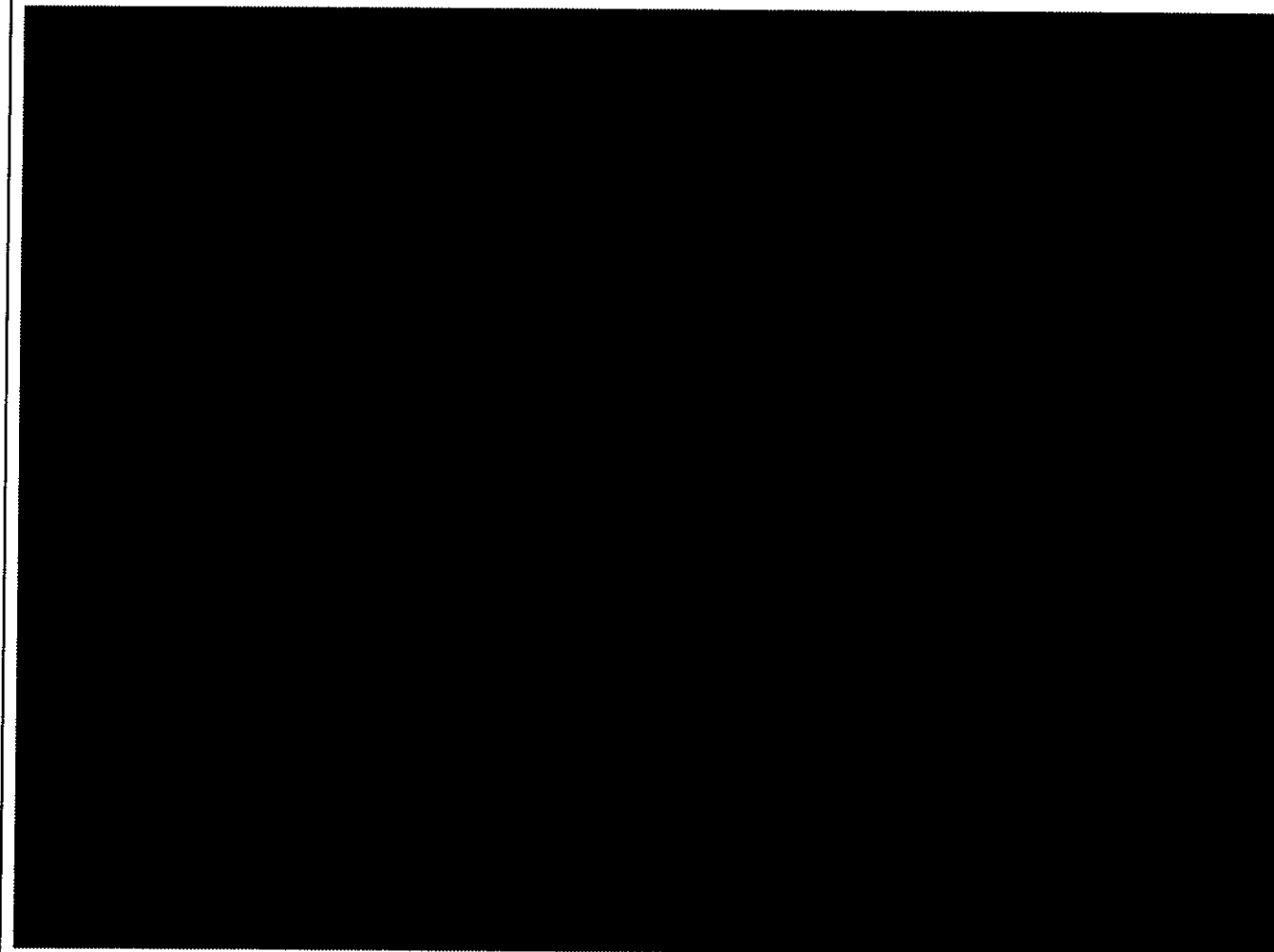
## EMC TEST REPORT

Rep.No: AR6-877150

### ANTENNA TERMINAL VOLTAGE TEST

Equipment Under Test:	DB102	Serial Number:	EUT72
Test equipment used:	Advantest R3271 analyser connected to input terminal via 50/75 $\Omega$ adapter		
Mode of operation:	Tuned with 1 MHz steps		

#### TEST RESULTS: THIRD TV BAND



Maximum measured oscillator voltage level = 10.00 dBpW.

Tested by:	v.Oosten	Test date:	18-Sept.-'98
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