Recognized by the
Federal Communications Commission
FCC–Identification Number: 90462
TCB ID: DE 0001

Accredited by the
German Accreditation Council
DAR–Registration Number
TTI–P–G 166/98

Independent ETSI
compliance test house

Accredited Bluetooth™ Test Facility (BQTF)

Test Report No.: 4-0977-01-02-C/03
FCC Part 15.247 / CANADA RSS-210
PE2030 A
FCC ID: BEJPDA-PE2030A

CETECOM – ICT Services GmbH
Untertürkheimerstr. 6-10
66117 Saarbrücken, Germany

Telephone: + 49 (0) 681 / 598-0
Fax: + 49 (0) 681 / 9075

Table of Contents

1 General information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in 1.5. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM ICT Services GmbH.

1.2 Testing laboratory

CETECOM ICT Services GmbH
Untertürkheimer Straße 6 - 10
66117 Saarbrücken
Germany
Telefone : + 49 681 598 - 9100
Telefax : + 49 681 598 - 9075
E-mail : Michael.Berg@ict.cetecom.de
Internet : www.cetecom.de

Accredited testing laboratory
DAR-registration number : TTI-P-G-166/98-30
Accredited Bluetooth™ Test Facility (BQTF)
BLUETOOTH™ is a trademark owned by Bluetooth SIG, Inc. and licensed to CETECOM

1.3 Details of applicant

Name : **Hewlett Packard Company**
Street : **MS 060607**
City : **20555 SH 249 Houston ,TX 77070-2698**
Country : **USA**
Telephone: **+1 281 514 2756**
Telefax : **+1 281 514 8029**
Contact : **Walter Overcash**
Telephone: **+1 281 514 2756**

1.4 Application details

Date of receipt of application : 2003-04-17
Date of receipt of test item : 2003-04-28
Date of test : 2003-04-28/29/30 and 2003-05-02

1.5 Test item

Type of equipment	:	**2.4 GHz WLAN**
Type designation	:	**SKU B**
Manufacturer	:	**LG Electronics Inc.**
Street	:	**19-1 Cheongho-Ri, Jinwuy-Myeon**
City	:	**Pyungtaik-Shi Kyunggi-Do**
Country	:	**Republic of Korea 451-713**
Serial number	:	see auxilary equipment list
FCC ID	:	**BEJPDA-PE2030A**
Hardware	:	**0.4**
Software	:	**1. OS version: Windows CE 4.2** **2. Bluetooth: Firmware version: 1.7.0 - 1.8.0 (S/W ver.)** **3. Wireless LAN: Firmware version: 0.100.5.39 (S/W ver.)**

Additional informations: :

Frequency	:	2412 – 2462 MHz
Type of modulation	:	22M0P7D (DSSS) Ch.Sep. : 5 MHz
Number of channels	:	11
Antenna	:	integral antenna
Power supply	:	3.7 V rechargeable battery
Output power cond.	:	60,39 mW / 87,70 mW EIRP
Type of equipment	:	Class B
Temperature range	:	0°C - +40°C
Field strength	:	95.50 dBµV/m
Occupied bandwidth	:	12866 kHz
Transmitter spurious	:	46.0 dBµV/m at 2758.9 MHz
Receiver spurious	.	37.5 dbµ/m at 4138 MHz
Temperature range	:	0°C - +40°C

1.6 Test standards: FCC Part 15 §15.247 / CANADA RSS-210

Test set-ups:

Full test is done with following test set-up: 1b; 2a; 3a; 8; 6; 5; 9; 10 !

Additional test is done with following test set-up : 1a; 2b; 3b; 4; 7; 9; 10 !

Auxiliary Equipment (AE) List

No.	AE	Manufacture		Type	S/N
1	AC/DC Adapter	a	PHIHONG	PSC10A-050 (for USA) PSC10E-050 (for EU)	N/A
		b	DELTA	ADP-10SB REV.BH (for USA) ADP-10SB REV.CH (for EU)	N/A
2	Battery	a	DANIONICS / Denmark	PE2032A	N/A
		b	SAMSUNG SDI / Korea	PE2032B	N/A
3	LCD Panel	a	Philips Electronics / China	LPH7123-1	
		b	Sharp Corp. / Japan	LQ038Q7DB01	
4	Cradle (Docking)			PE2035A	N/A
5	Y-Cable			250177-B21	251275-001
6	SD memory card	TOSHIBA		SD-M128	0120506615D
7	CF memory card	SanDisk		AA0112MT	N/A
8	CF card Jacket w/Battery			PE2036	8Y22KD53701X
9	Headphone	N/A		N/A	N/A
10	Laptop computer	COMPAQ		CM2030	359802-293

2 Technical test

2.1 Summary of test results

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 20 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber.

The receiving antennas are conform with specifications ANSI C63.2-1987 clause 15 and ANSI C63.4-1992 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received.

The wanted and unwanted emissions are received by spectrum analyzers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63-4-1992 clause 4.2.

Antennas are conform with ANSI C63.2-1996 item 15.
9 kHz - 30 MHz: Quasi Peak measurement, 9kHz Bandwidth, passive loop antenna.
30 MHz - 200 MHz: Quasi Peak measurement, 120KHz Bandwidth, biconical antenna
200MHz - 1GHz: Quasi Peak measurement, 120KHz Bandwidth, log periodic antenna
1GHz: Average, RBW 1MHz, VBW 10 Hz, wave-guide horn

All measurement settings are according to FCC 15.35, 15.205, 15.209, 15.247 and the „Measurement guidelines for DSSS systems“.

No deviations from the technical specification(s) were ascertained in the course of the tests performed.
The product fulfills also the requirements for CANADA RSS-210.

FINAL VERDICT : PASS

Technical responsibility for area of testing :

2003-05-12	**RSC 8411**	**Berg M.**	
Date	**Section**	**Name**	**Signature**

Technical responsibility for area of testing :

2003-05-12	**RSC8412**	**Hausknecht D.**	
Date	**Section**	**Name**	**Signature**

DECLARATION OF COMPLIANCE: I declare that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned Industry Canada standard(s); and that the equipment identified in this application has been subjected to all the applicable test conditions specified in the Industry Canada standards and all of the requirements of the standard have been met.

Signature: _____

Date: __2003-05-12____Michael Berg _____Test Management_
NAME AND TITLE (Please print or type):

2.2 Test report

TEST REPORT

Test report no. : 4-0977-01-02-C/03

TEST REPORT REFERENCE

LIST OF MEASUREMENTS

Antenna Gain SUBCLAUSE § 15.204

The antenna gain of the complete system is calculated by the difference of conducted power of the module and the radiated power in EIRP.

	low channel	mid channel	high channel
Conducted power	**17.31 dBm**	**17.81 dBm**	**17.12 dBm**
Radiated power	**19.18 dBm**	**19.09 dBm**	**19.43 dBm**
Gain	**1.87 dBi**	**1.28 dB**	**2.31 dB**

The calculated antenna gain is between 1.28 and 2.31 dB for the build-in antenna.

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

Spectrum Bandwith of a DSSS System §15.247(a)

6 dB bandwidth

TEST CONDITIONS		6 dB BANDWIDTH (kHz)		
Frequency (MHz)		2412	2437	2462
T_{nom}(23.0)°C	V_{nom}(3.7)V	12775	12866	12425
Measurement uncertainty		±1kHz		

RBW / VBW as provided in the „Measurement Guidelines“ (DA 00-705, March 30, 2000)

LIMIT SUBCLAUSE §15.247(a) (2)

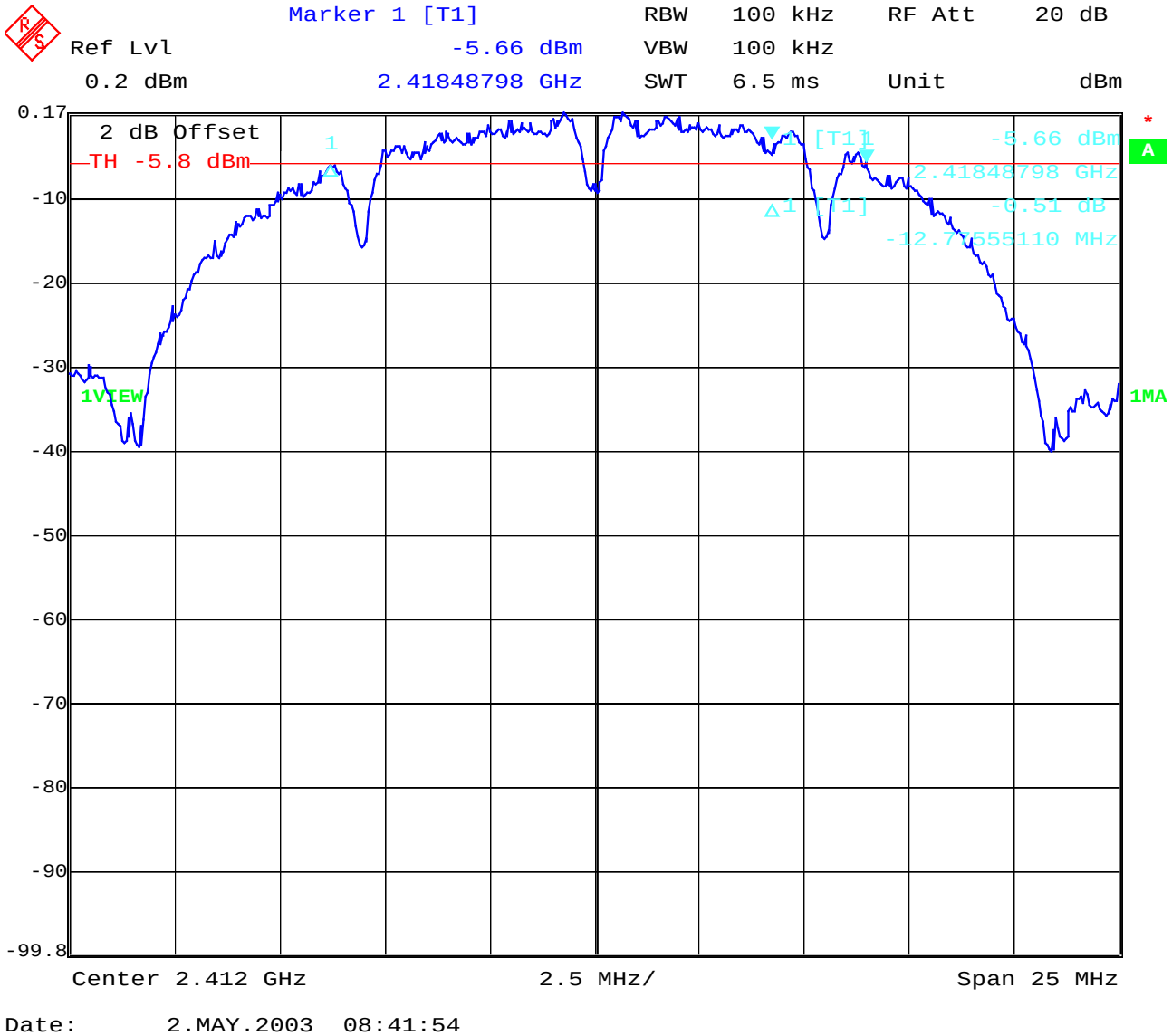
The minimum 6dB bandwith shall be at least 500 KHz

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24 . 64

Spectrum Bandwith of a DSSS System **§15.247(a)**

6 dB bandwidth

Channel 1



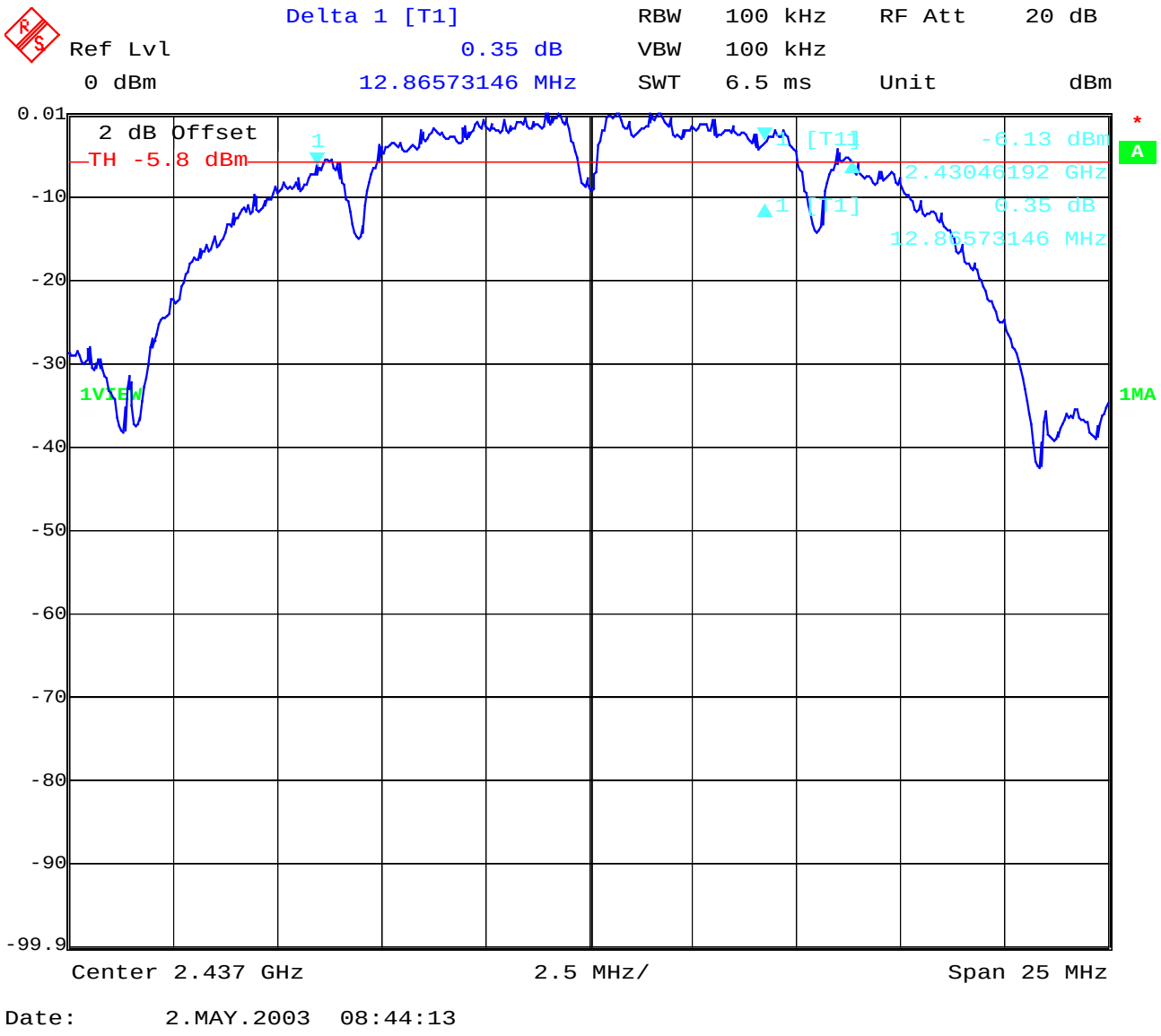
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Spectrum Bandwith of a DSSS System

§15.247(a)

6 dB bandwidth

Channel 6

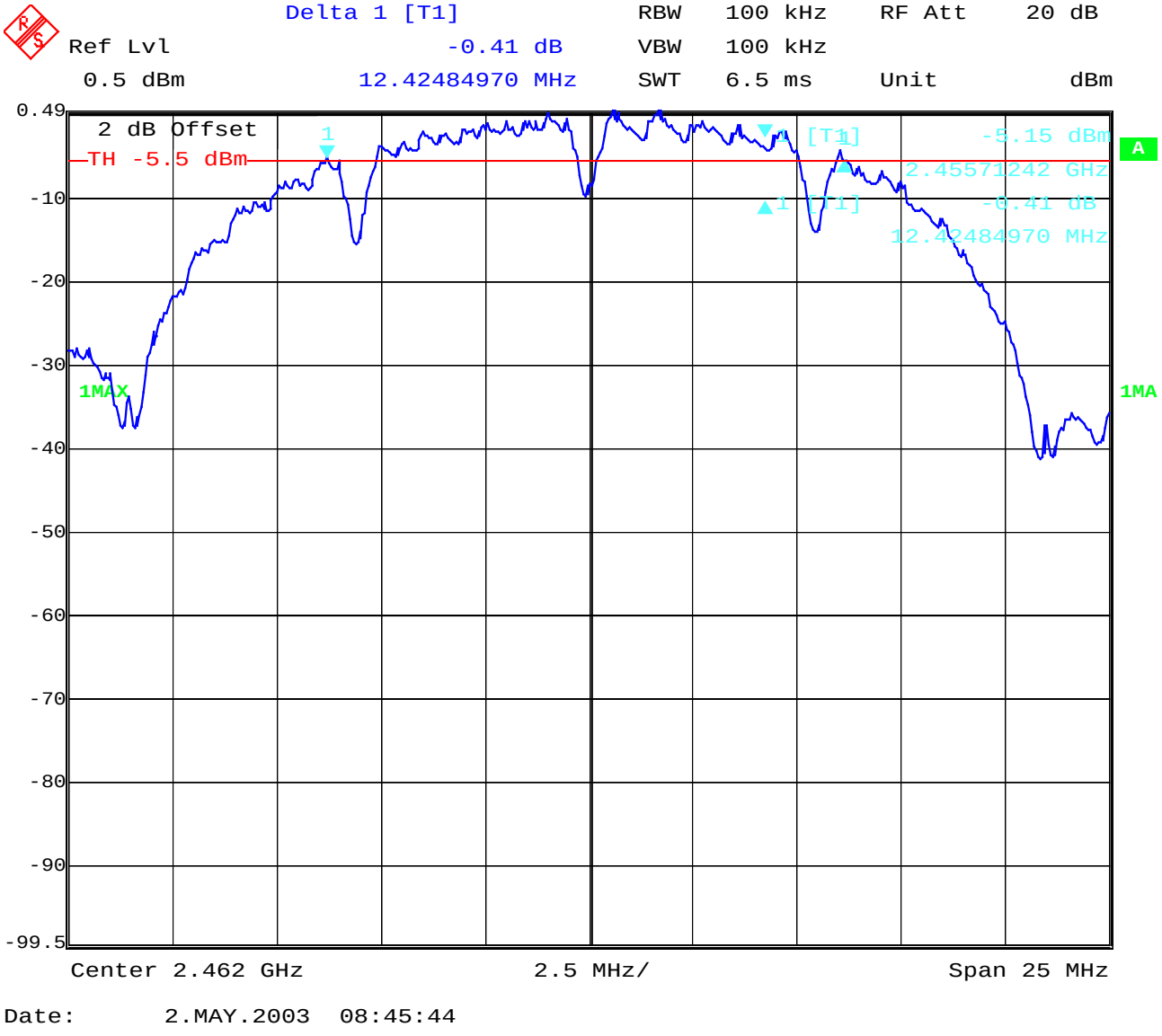


REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Spectrum Bandwith of a DSSS System **§15.247(a)**

6 dB bandwidth

Channel 11:



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

MAXIMUM PEAK OUTPUT POWER (CONDUCTED) **SUBCLAUSE § 15.247 (b) (1)**

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (mW)		
Frequency (MHz)		2412	2437	2462
T_{nom}(23.0)°C	V_{nom}(3.7)V	Peak :54.58 AV : 13.03	Peak :60.39 AV : 14.83	Peak :51.52 AV : 13.93
Measurement uncertainty		±0.5dB		

RBW/VBW : 10 MHz

LIMIT **SUBCLAUSE § 15.247 (b) (1)**

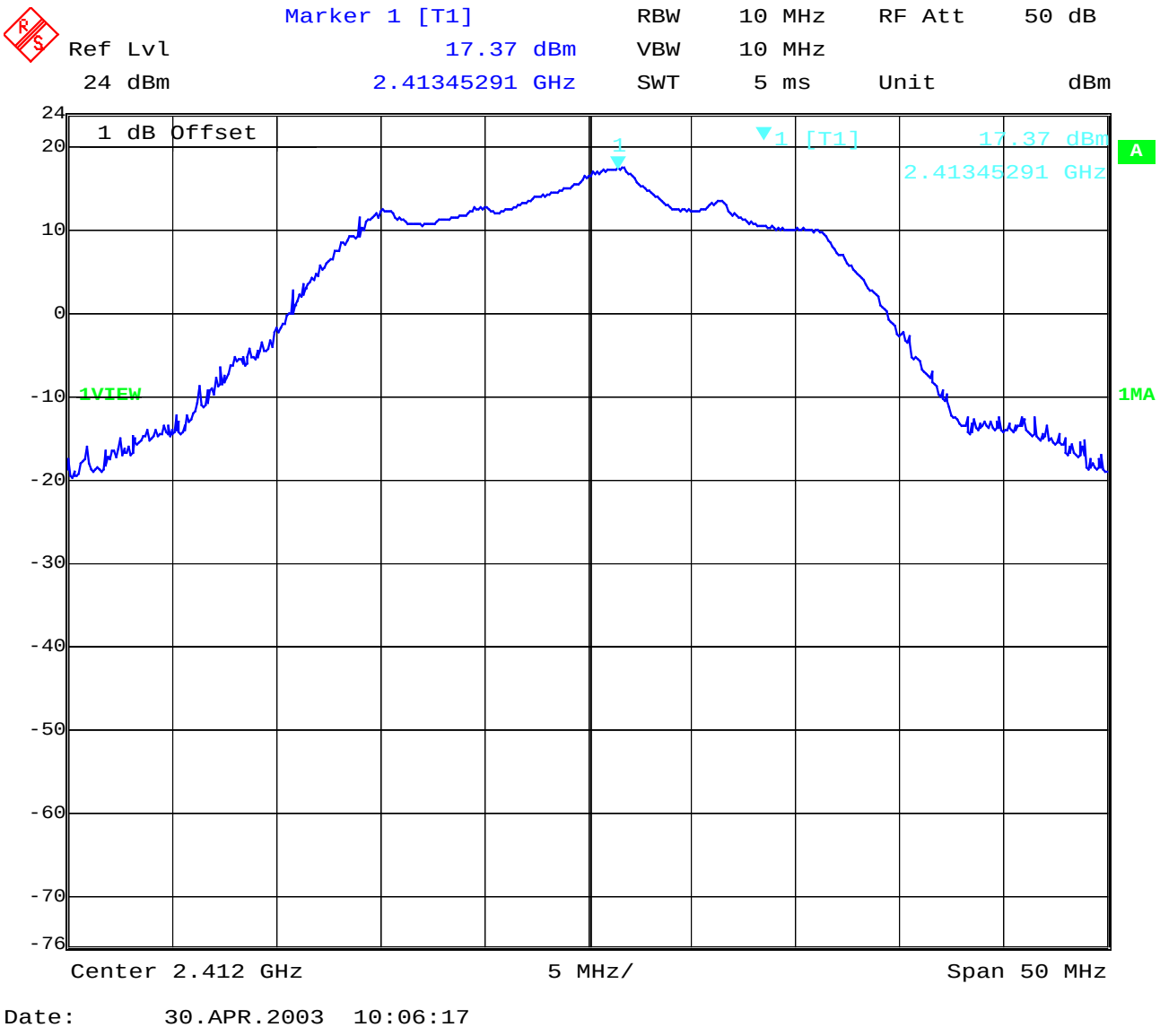
Frequency range	RF power output
2400-2483.5 MHz	1.0 Watt/ 30dBm

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

MAXIMUM PEAK OUTPUT POWER (CONDUCTED)

SUBCLAUSE § 15.247 (b) (1)

low channel peak

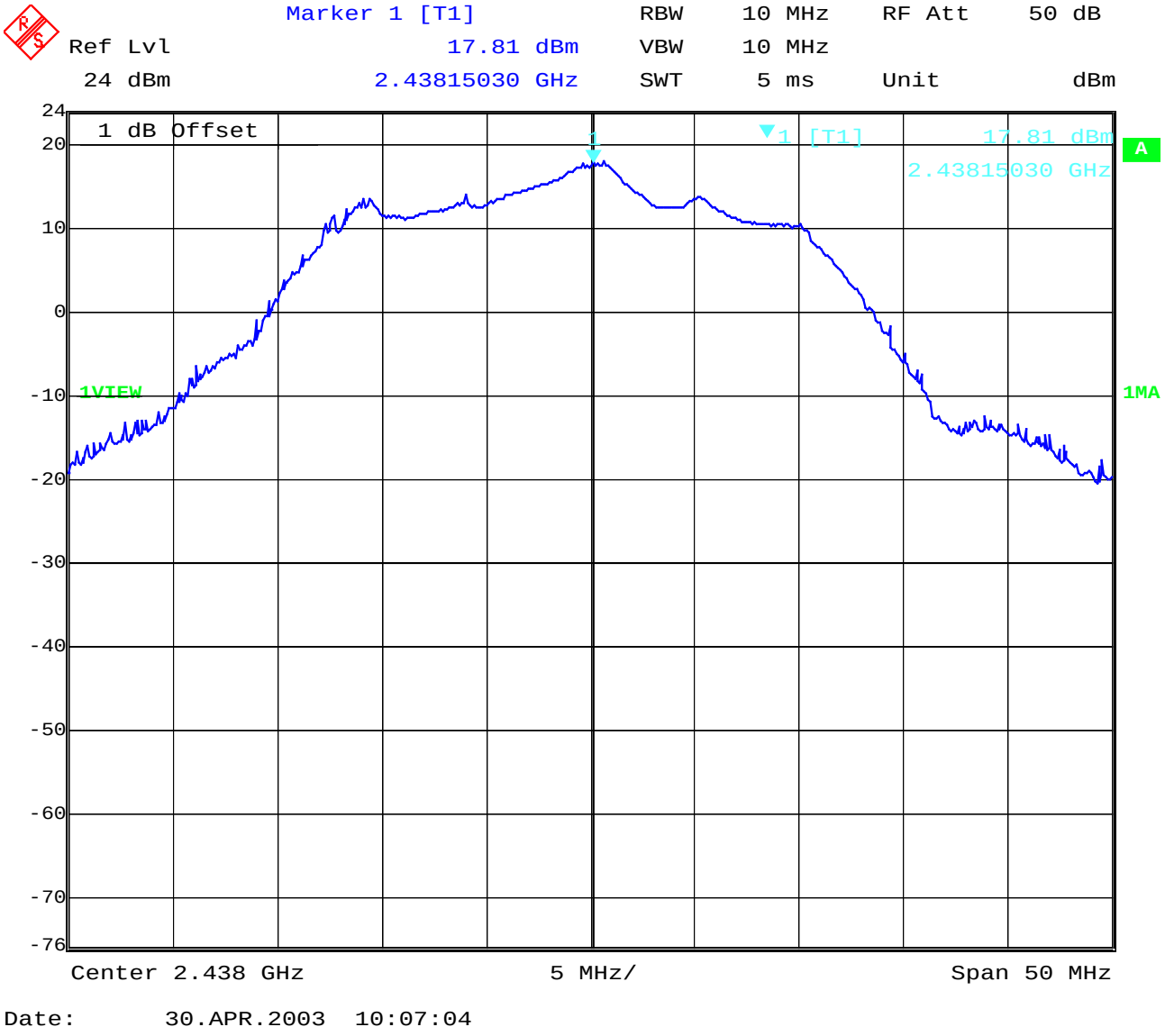


REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

MAXIMUM PEAK OUTPUT POWER (CONDUCTED)

SUBCLAUSE § 15.247 (b) (1)

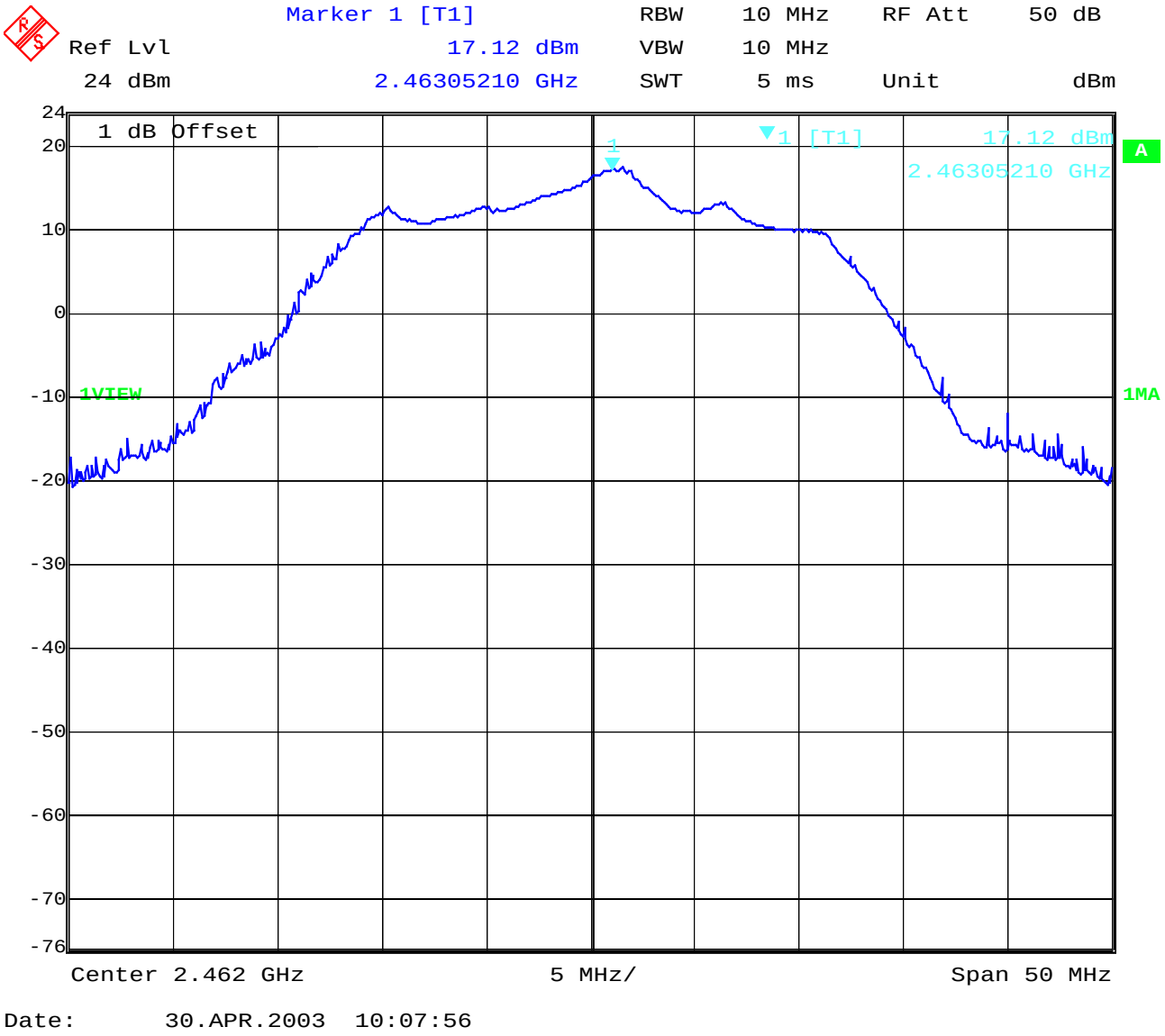
mid channel peak



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

MAXIMUM PEAK OUTPUT POWER (CONDUCTED) SUBCLAUSE § 15.247 (b) (1)

high channel peak



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

MAXIMUM PEAK OUTPUT POWER (RADIATED) **SUBCLAUSE § 15.247 (b) (1)**

TEST CONDITIONS		MAXIMUM PEAK OUTPUT POWER (mW)		
Frequency (MHz)		2412	2437	2462
T_{nom}(23.0)°C	V_{nom}(3.70)V	82.79 mW	81.10 mW	87.70 mW
		-	-	-
Measurement uncertainty		±3dB		

RBW/VBW : 10 MHz

Measured at a distance of 3m

LIMIT **SUBCLAUSE § 15.247 (b) (1)**

Frequency range	RF power output
2400-2483.5 MHz	1.0 Watt

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Power spectral density **§15.247 (d)**

TEST CONDITIONS		RF POWER LEVEL IN 3 kHz BW		
Frequency (MHz)		2412	2437	2462
T_{nom}(22.4)°C	V_{nom}(5.0)V	-18.00 dBm	-18.42 dBm	-16.66 dBm
Measurement uncertainty		±3dB		

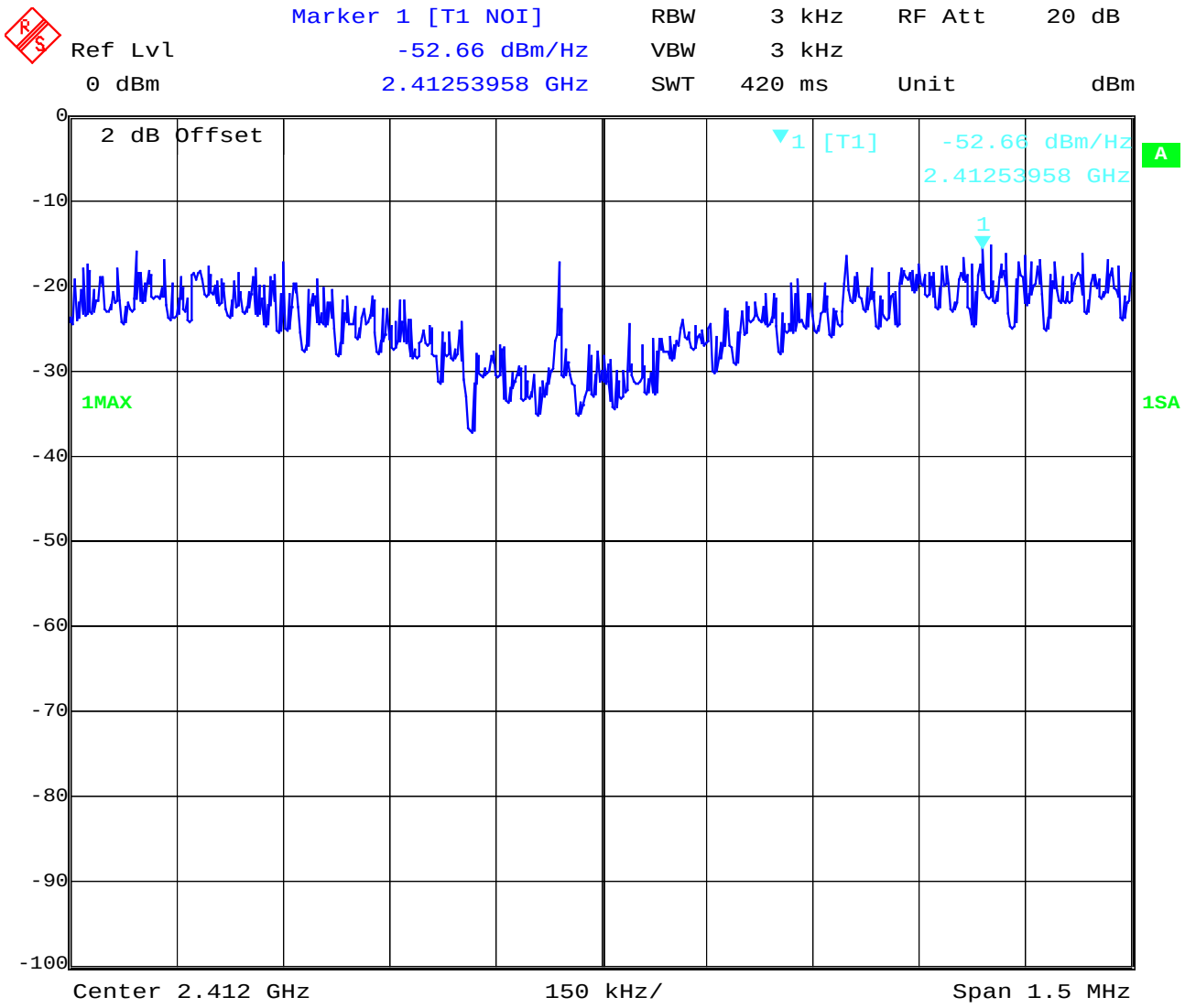
The measurement was performed with the power density funktion of the analyzer. The readout is related to 1 Hz BW. For 3 kHz BW we have to add 34.8 dB.

LIMIT **SUBCLAUSE §15.247(d)**

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

POWER SPECTRAL DENSITY **SUBCLAUSE § 15.247 (d)**
2412 MHz

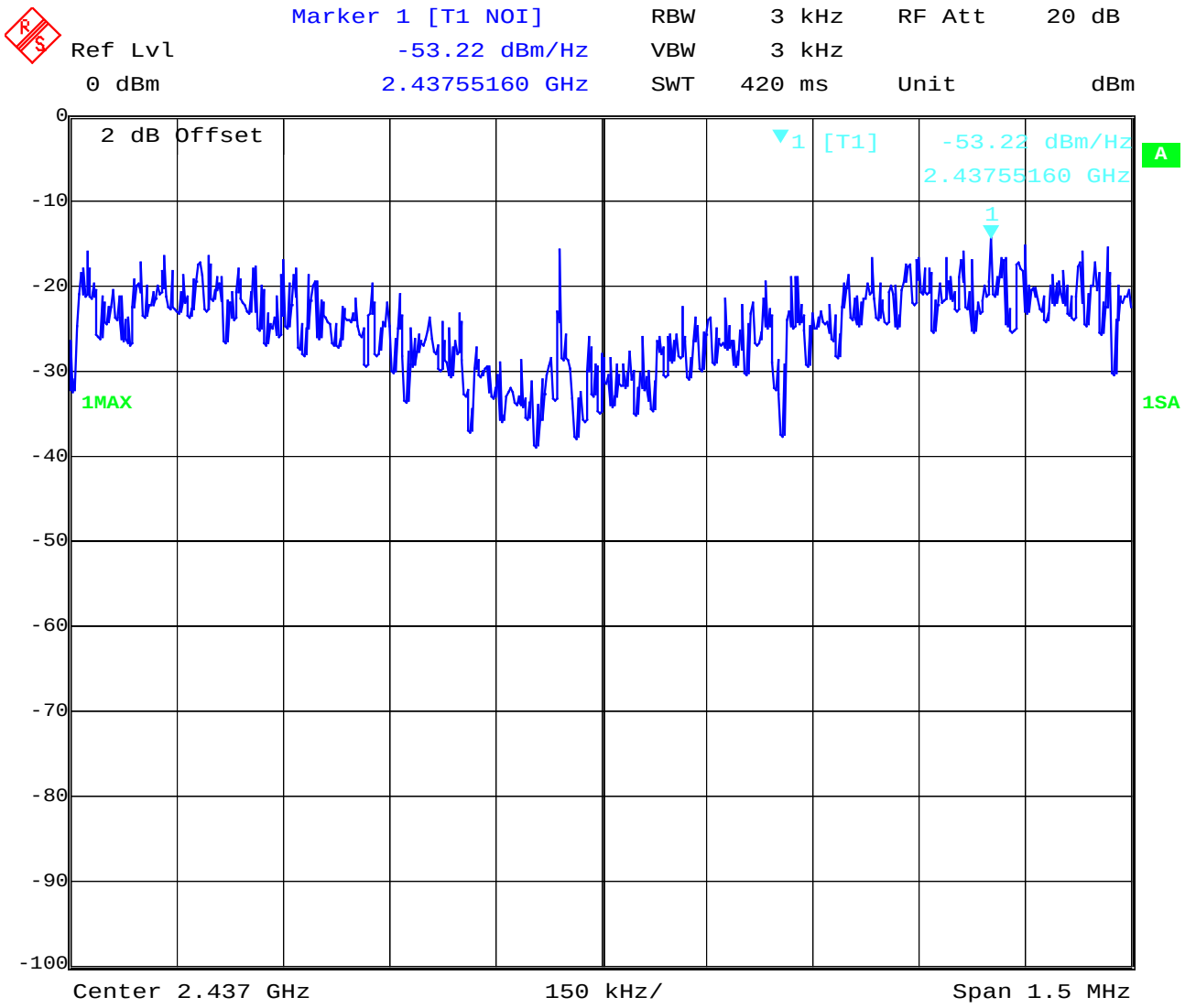


LIMIT **SUBCLAUSE §15.247(d)**

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

POWER SPECTRAL DENSITY **SUBCLAUSE § 15.247 (d)**
2437 MHz



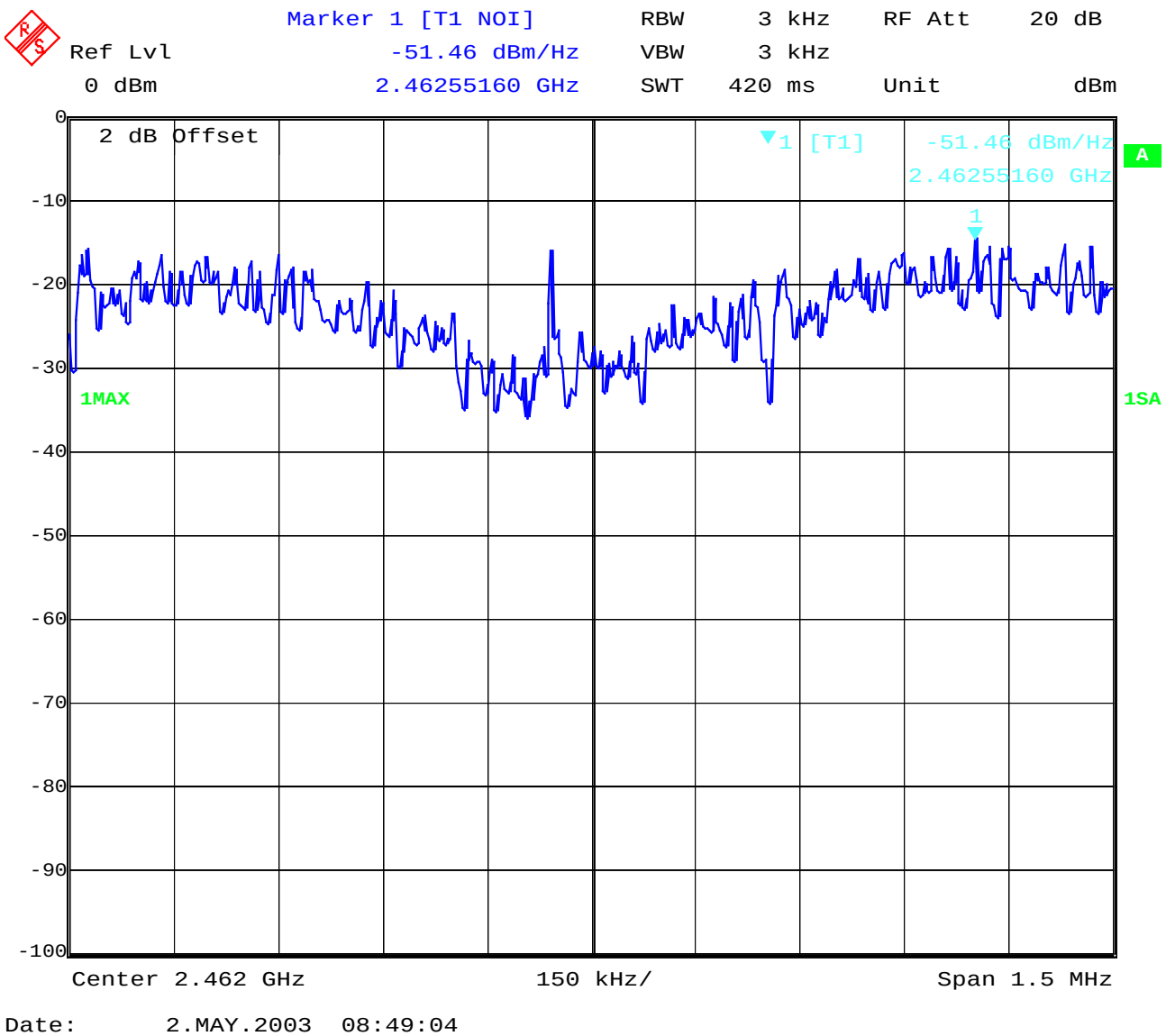
LIMIT **SUBCLAUSE §15.247(d)**

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

POWER SPECTRAL DENSITY **SUBCLAUSE § 15.247 (d)**

2462 MHz



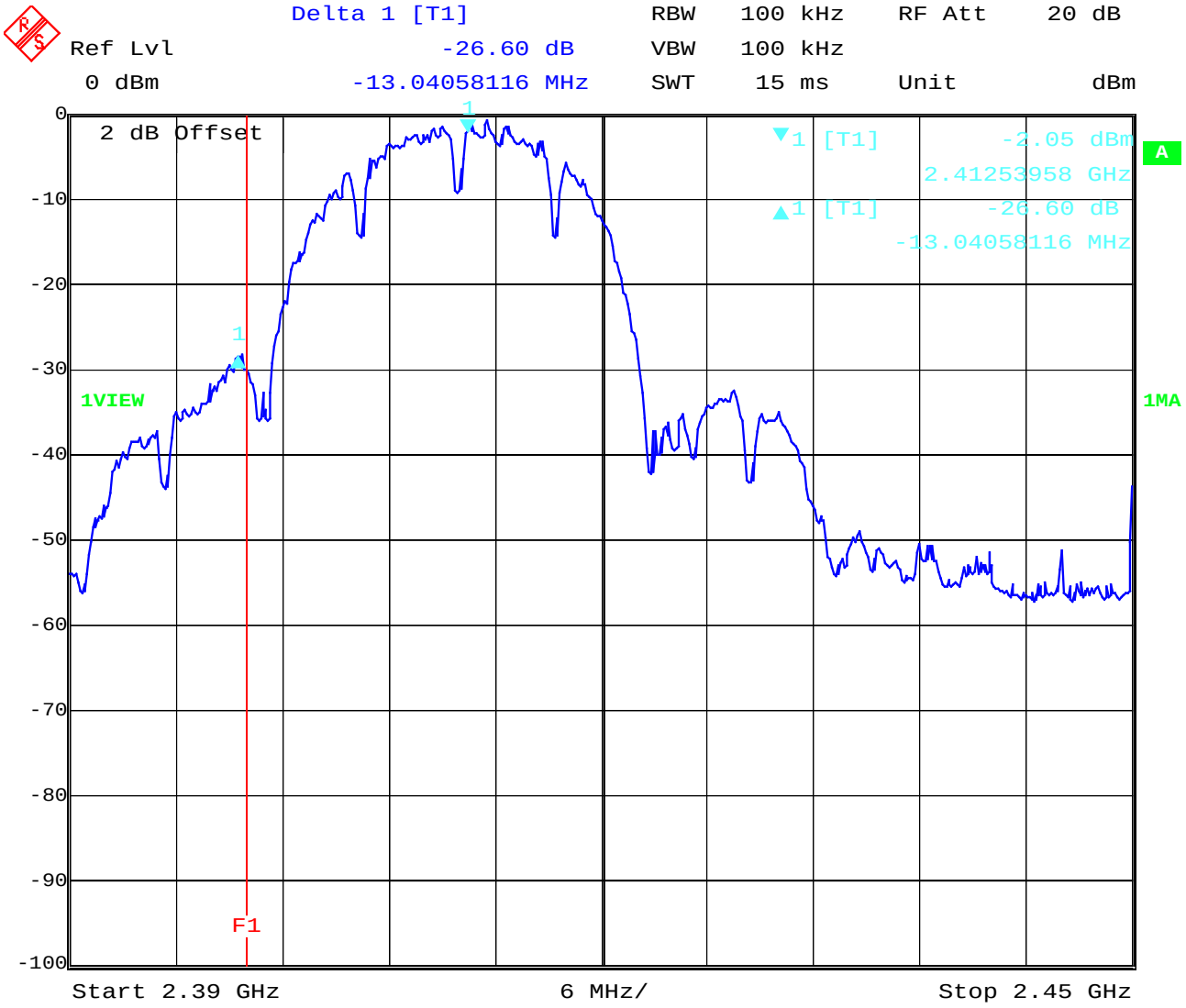
LIMIT **SUBCLAUSE §15.247(d)**

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Band-edge compliance of conducted emissions §15.247 (c)

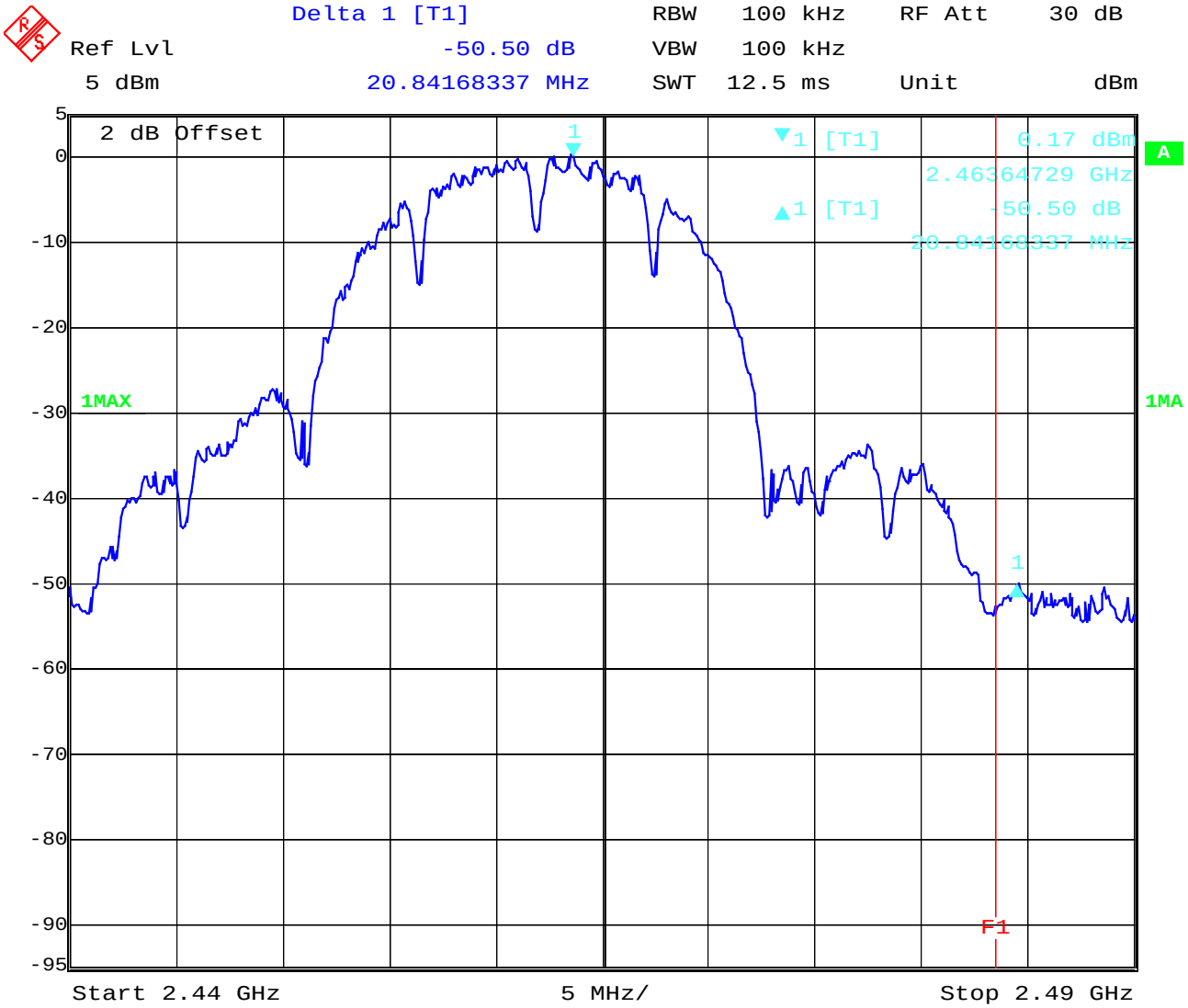
Low channel



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Band-edge compliance of conducted emissions **§15.247 (c)**

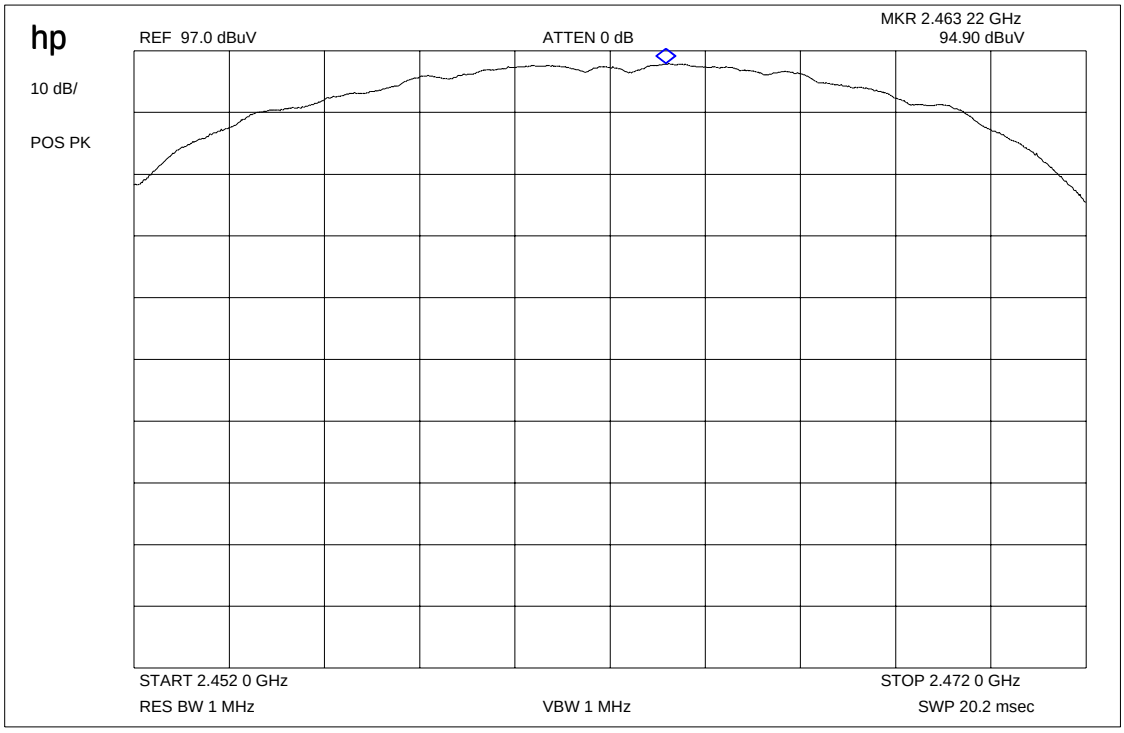
high channel



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Band-edge compliance radiated **§15.247 (c)**

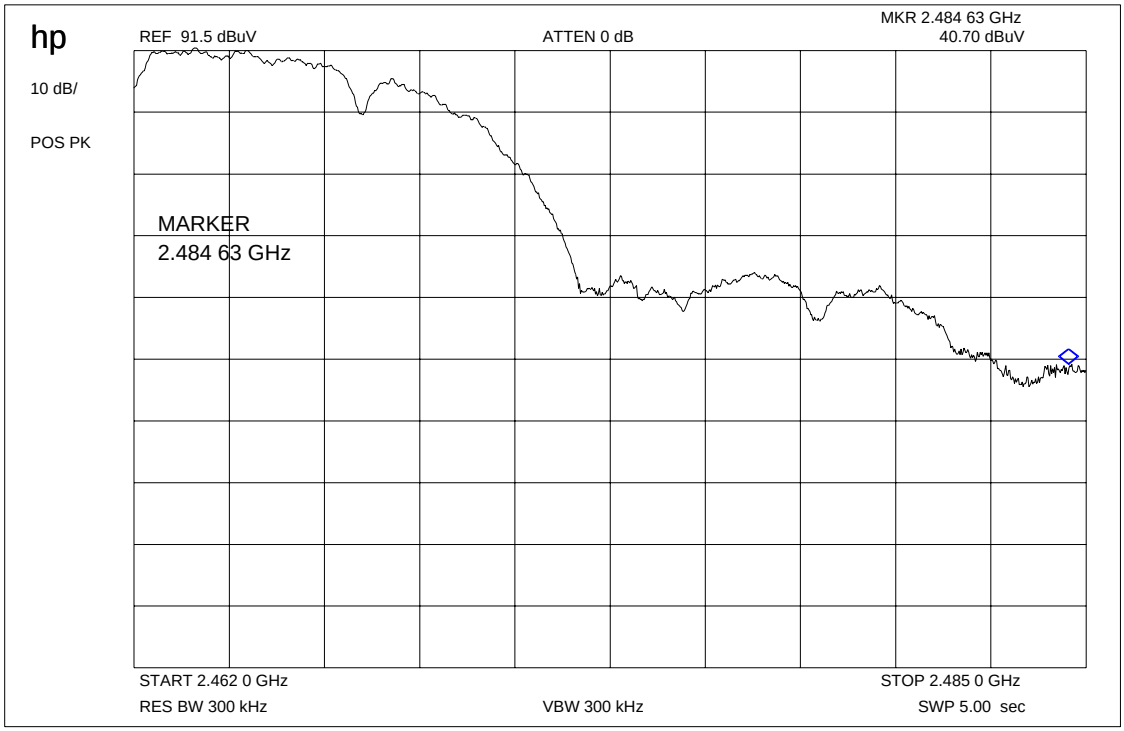
Max. field strength in 3m distance



Frequency	Meter reading	Cable loss	Antenna factor	Results
2480 MHz	94.90 dBµV	7.8 dB	-7.2	95.50 dBµV/m

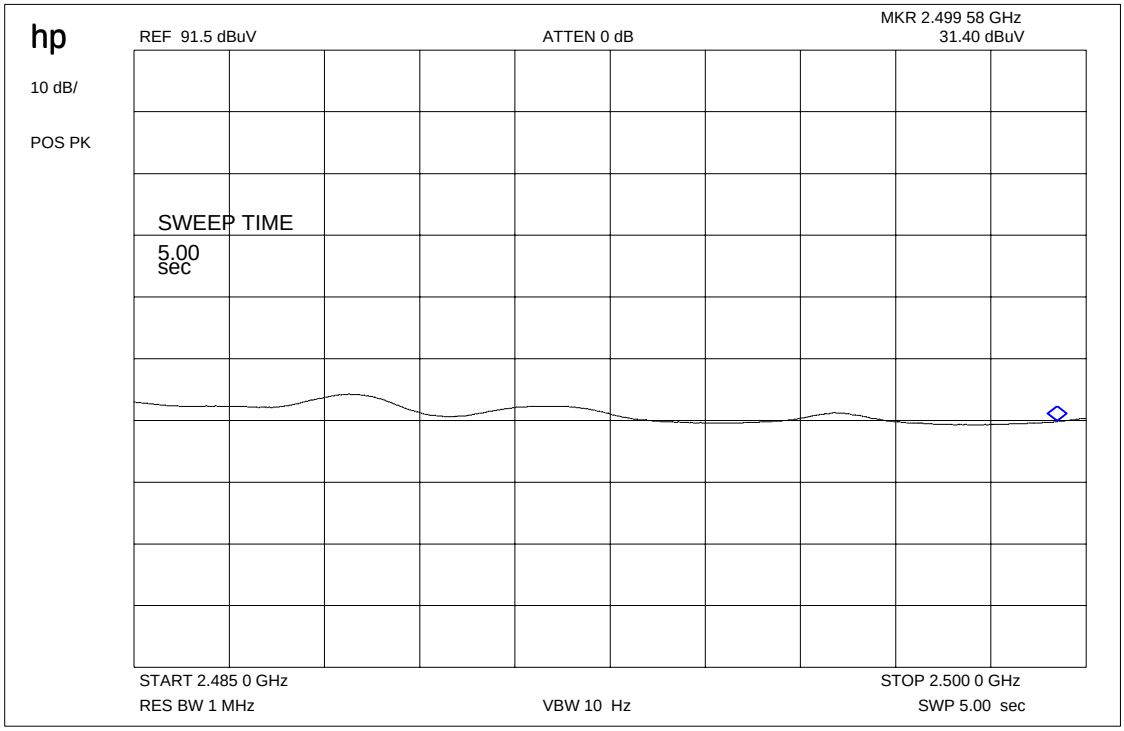
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Band-edge compliance radiated **§15.247 (c)**



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Band-edge compliance radiated (restricted band 2483.5 – 2500 MHz) §15.247 (c)



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

Band-edge compliance of radiated emissions §15.205

Radiated field strength

The field strength was measured with an EMI measuring receiver and 1 MHz RBW / VBW for peak and with 1MHz RBW / 10Hz VBW for average at a distance of 3m.

high channel	setup	measured value (3m)	correction factor (3m)	calculated value (3m)
Max. peak value	1 MHz RBW 1 MHz VBW	94.90 dBµV/m	+0,6 dB	95.50 dBµV/m
Max. average value	1 MHz RBW 10 Hz VBW	89.22	+0,6	89.82 dBµV/m
Delta value	Peak 30 kHz RBW/VBW	40.7 dB	-	-
Value at band edge	limit 54 dBµV/m			49.12 dBµV/m
Statement:				Complies

The product complies with the limit of the restricted bands.

Delta marker plots see above pages

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

EMISSION LIMITATIONS- Conducted (Transmitter) § 15.247 (c) (1)

EMISSION LIMITATIONS					
f (MHz)		amplitude of emission (dBm)	limit max. allowed emmision power	actual attenuation below frequency of operation (dB)	results
2412		17.37	30 dBm	-	Operating frequency
701.41		-66.11	-20 dBc (-2.63 dBm)	83.48	complies
2755.5		-47.64		65.01	complies
4859.7		-55.49		72.86	complies
2437		17.81	30 dBm	-	Operating frequency
701.41		-69.11	-20 dBc (-2.19dBm)	86.92	complies
2805.6		-52.95		70.76	complies
4859.7		-55.49		73.3	complies
2462		17.12	30 dBm		Operating frequency
701.41		-70.79	-20 dBc (-2.88dBm)	87.91	complies
2805.6		-66.02		83.14	complies
4909.8		-55.93		73.05	complies
Measurement uncertainty		± 3dB			

RBW : 100 kHz VBW: 100 kHz

For emissions that fall into restricted bands you find the radiated emissions later in the report.

LIMITS SUBCLAUSE § 15.247 (c)

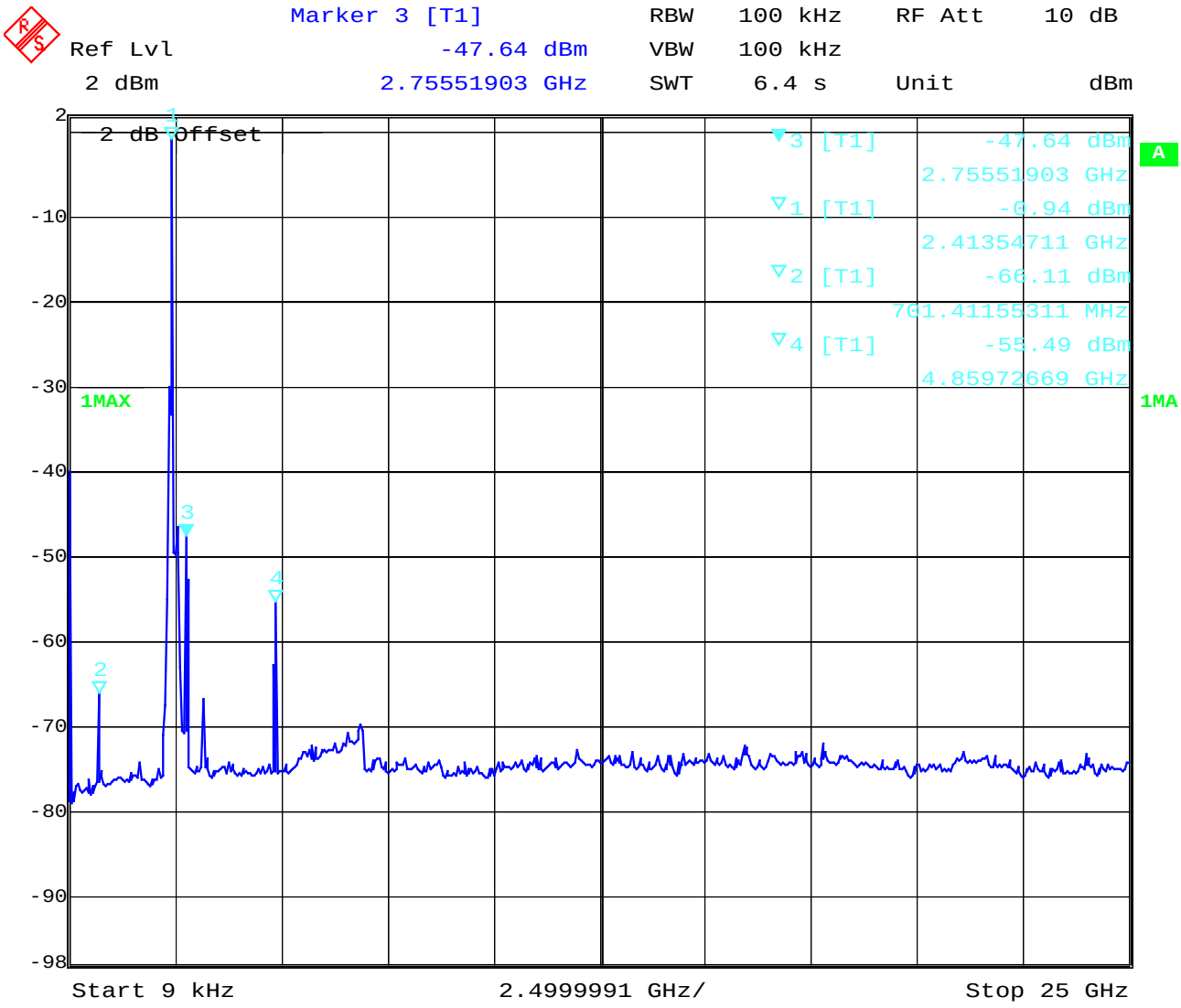
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

SPURIOUS EMISSION LIMITATION **§ 15.247 (c) (1)**
CONDUCTED

No peak found < 20 dB below Limit (20dBc)

Low channel

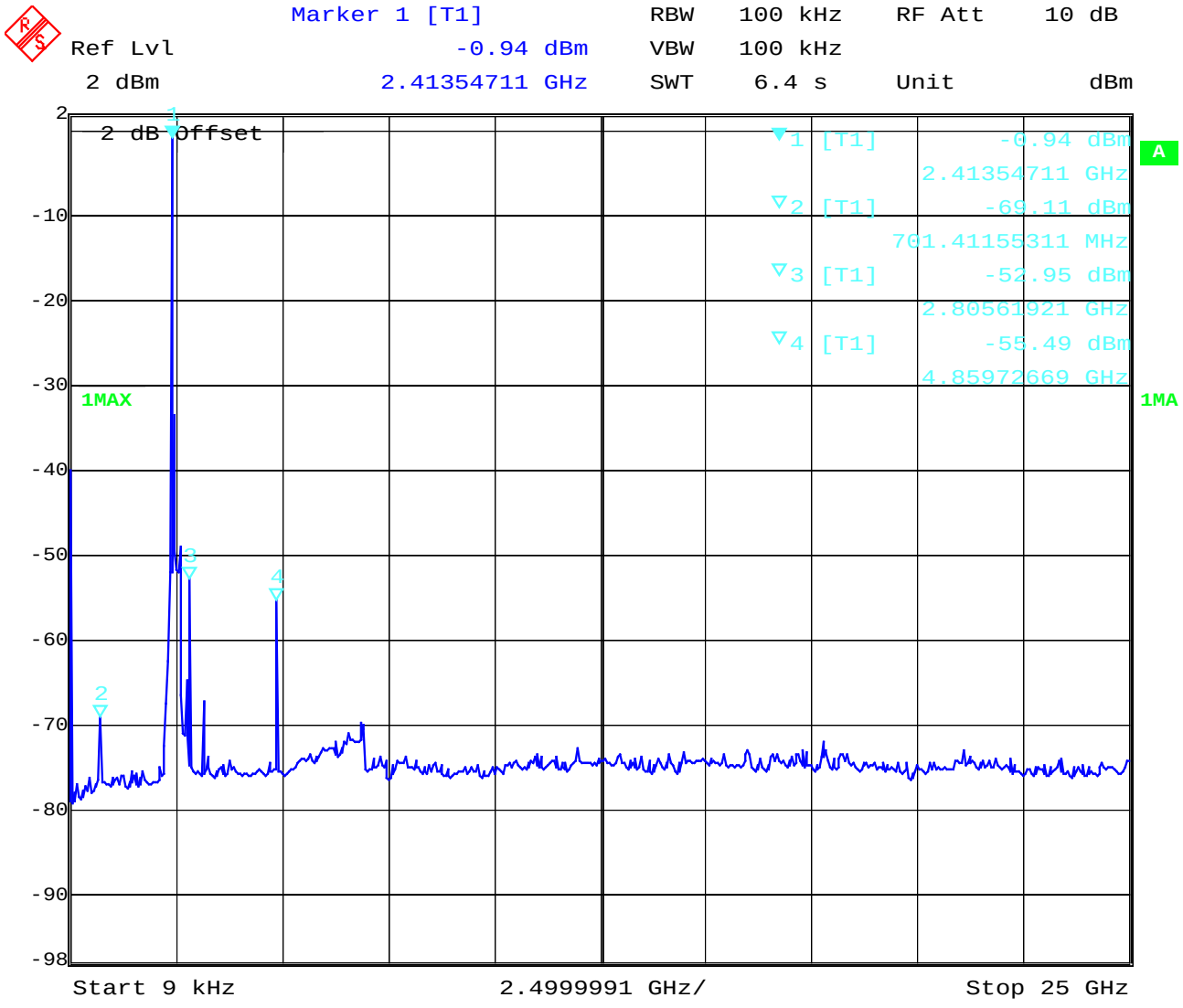


No spurious found in the restricted bands (2310 – 2390 MHz and 2483,5 – 2500 MHz)

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

SPURIOUS EMISSION **§ 15.247 (c) (1)**
CONDUCTED

Mid channel (peak)

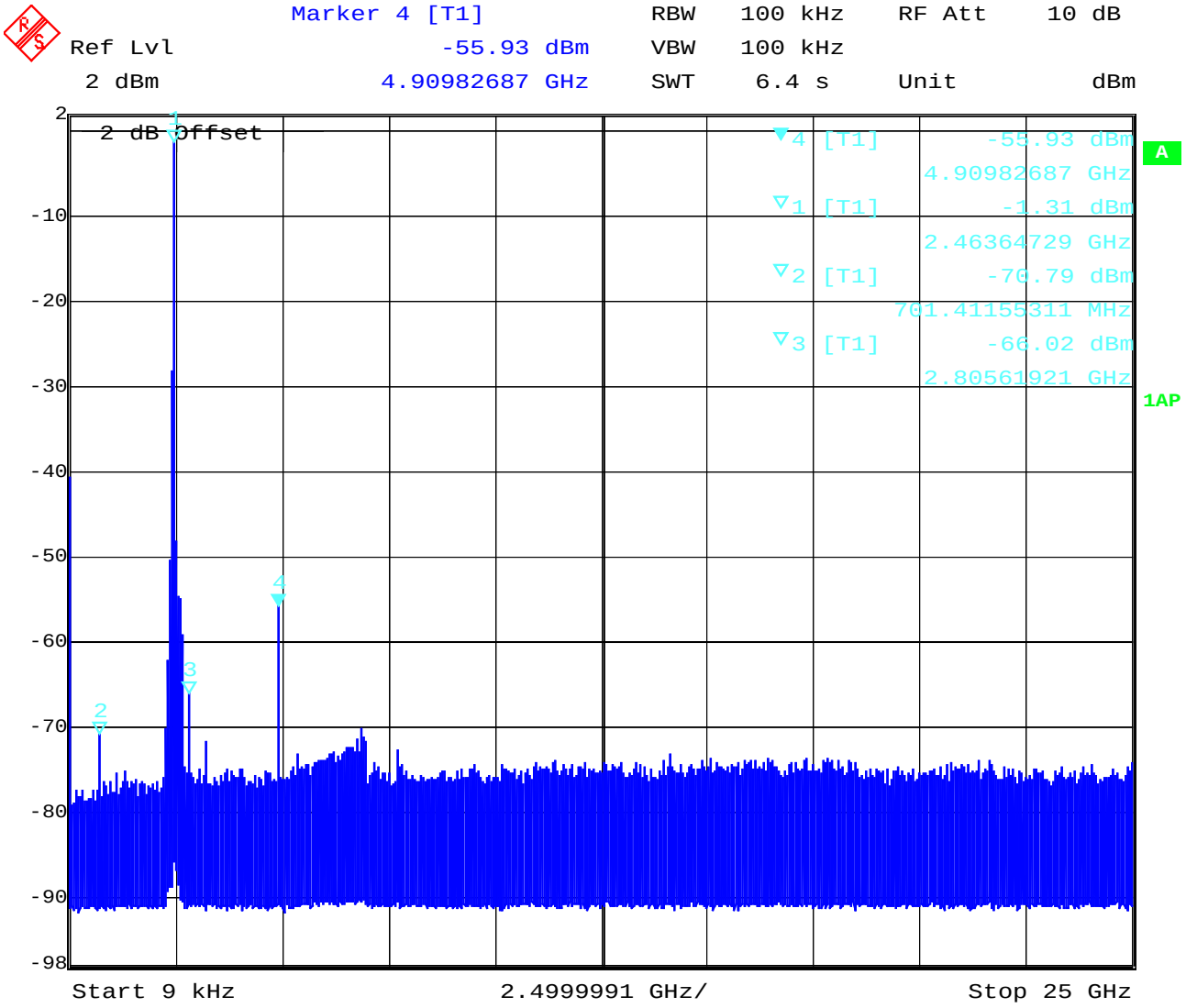


No spurious found in the restricted bands (2310 – 2390 MHz and 2483,5 – 2500 MHz)

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

SPURIOUS EMISSION **§ 15.247 (c) (1)**
CONDUCTED

High channel



No spurious found in the restricted bands (2310 – 2390 MHz and 2483,5 – 2500 MHz)

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
64

SPURIOUS EMISSION(radiated) **§ 15.247 (c) (1)**

SPURIOUS EMISSIONS LEVEL (µV/m)								
2412 MHz			2437 MHz			2462 MHz		
f (MHz)	Detector	Level (µV/m)	f (MHz)	Detector	Level (µV/m)	f (MHz)	Detector	Level (µV/m)
2785.9	AV	46.0	2785.9	AV	39.5	2785.9	AV	43.1
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW: 1 MHz**

LIMITS **SUBCLAUSE § 15.247 (c)**

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Limits **SUBCLAUSE § 15.209**

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
30 - 88	100 (40 dBµV/m)	3
88 - 216	150 (43.5 dBµV/m)	3
216 - 960	200 (46 dBµV/m)	3
above 960	500 (54 dBµV/m)	3

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24; 64

EMISSION LIMITATIONS- Radiated § 15.247 (c) (1)

Transmitter up to 30 MHz

this plot is valid for all channels

```
EUT:                PE2030 A
Manufacturer:       LG Electronics Inc.
Operating Condition: Tx mode with DELTA with Damionics Bat.
Test Site:          Cetecom, Room 6
Operator:           Berg
Test Specification:
Comment:
Start of Test:      29.04.03 / 15:22:54
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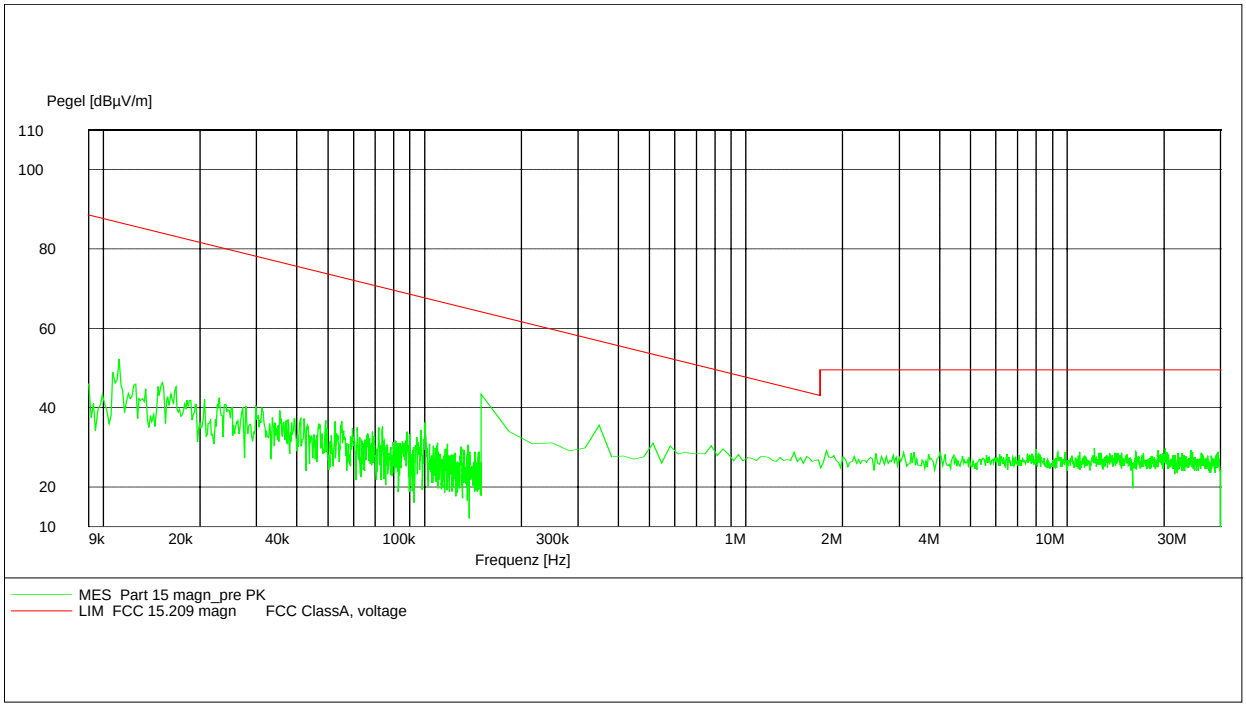
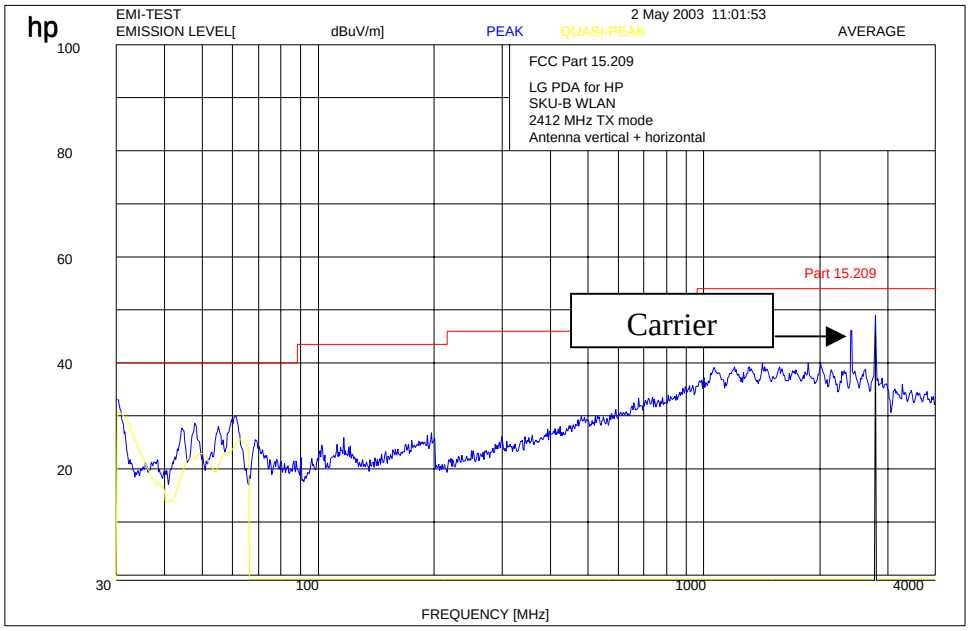
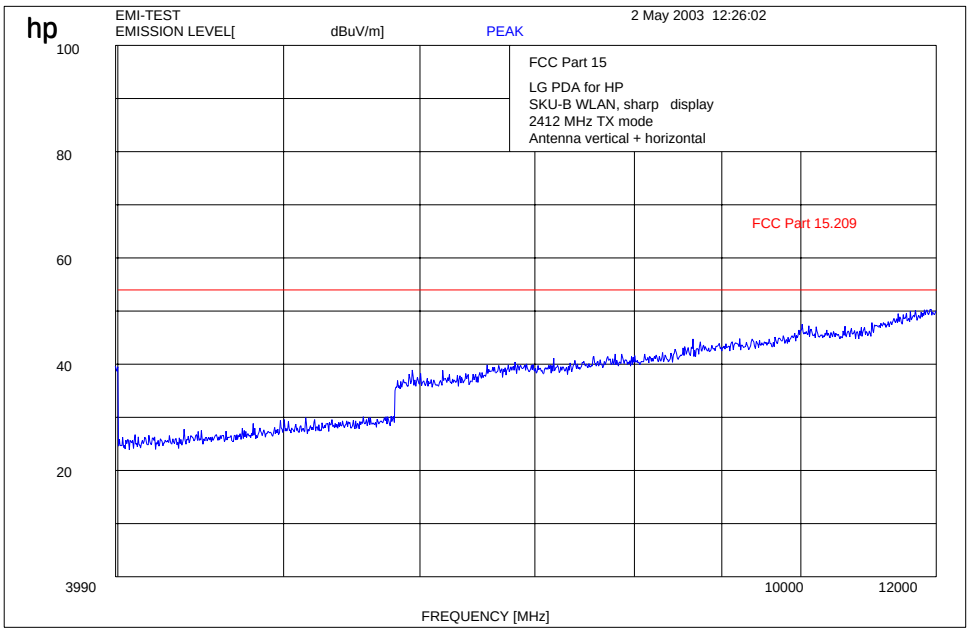


REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24; 64

EMISSION LIMITATIONS- Radiated **§ 15.247 (c) (1)**
low channel up to 12 GHz
carrier suppressed by a rejection filter

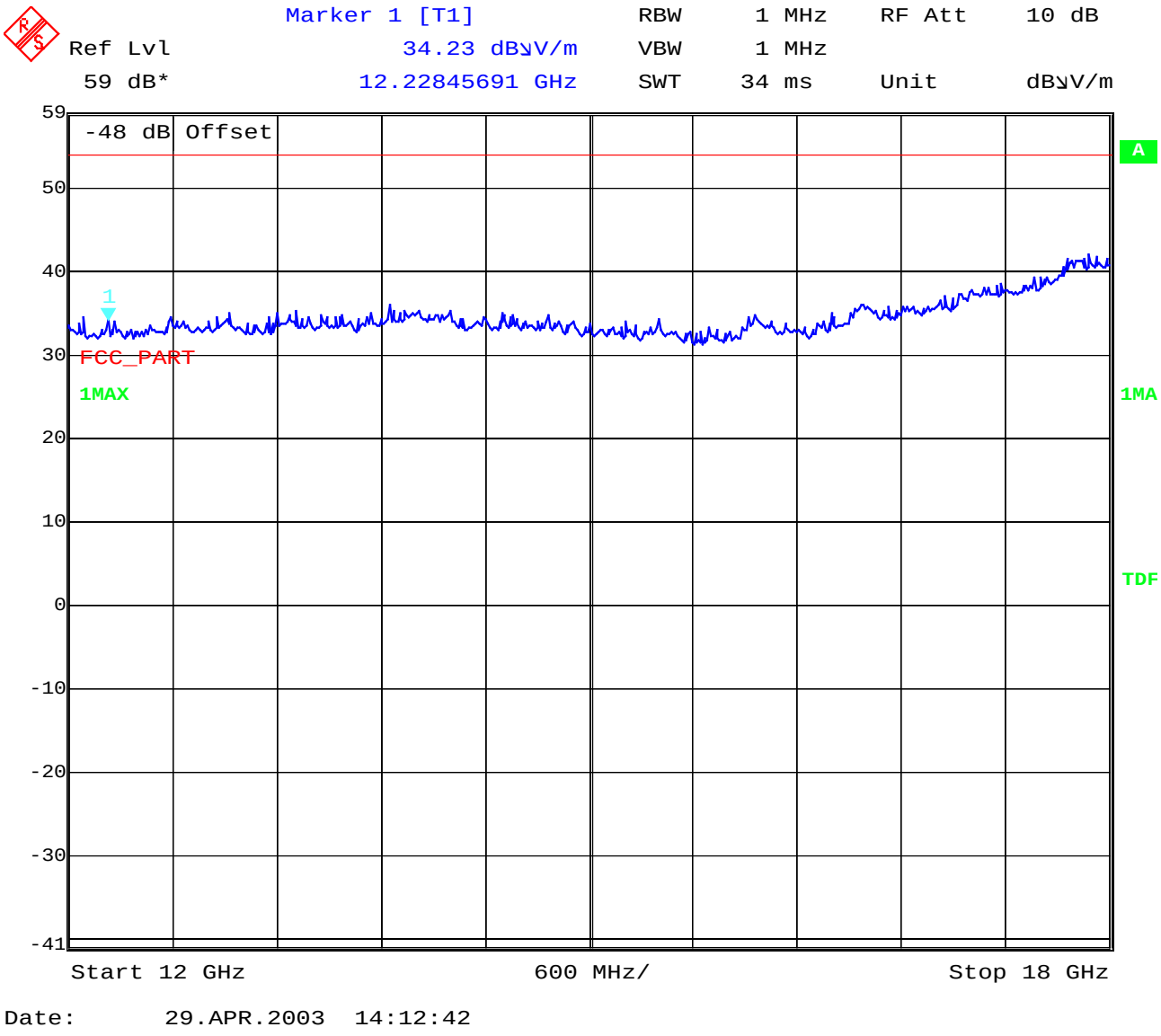




REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24; 64

EMISSION LIMITATIONS- Radiated **§ 15.247 (c) (1)**

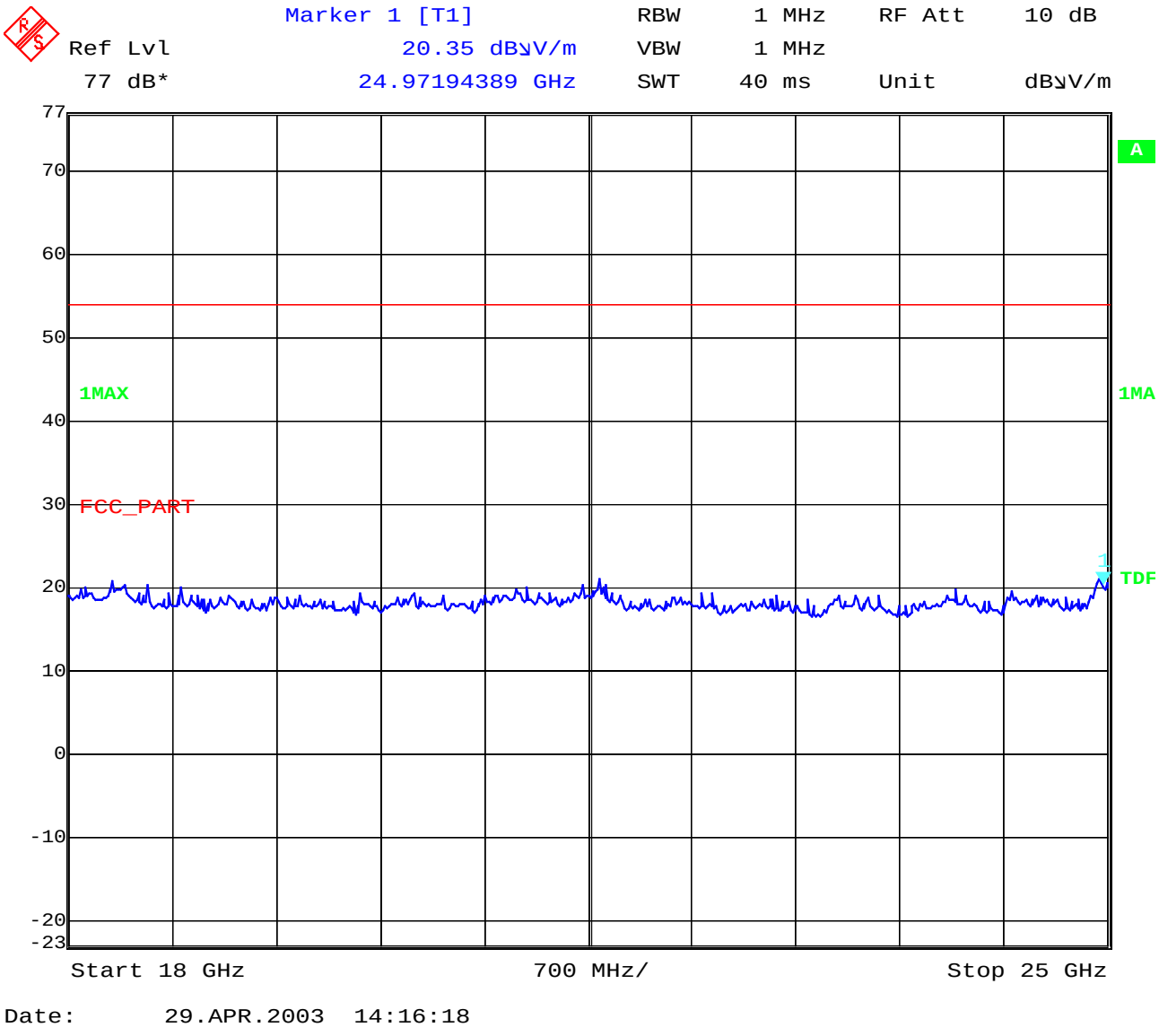
up to 18 GHz
this plot is valid for all 3channels



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24; 64

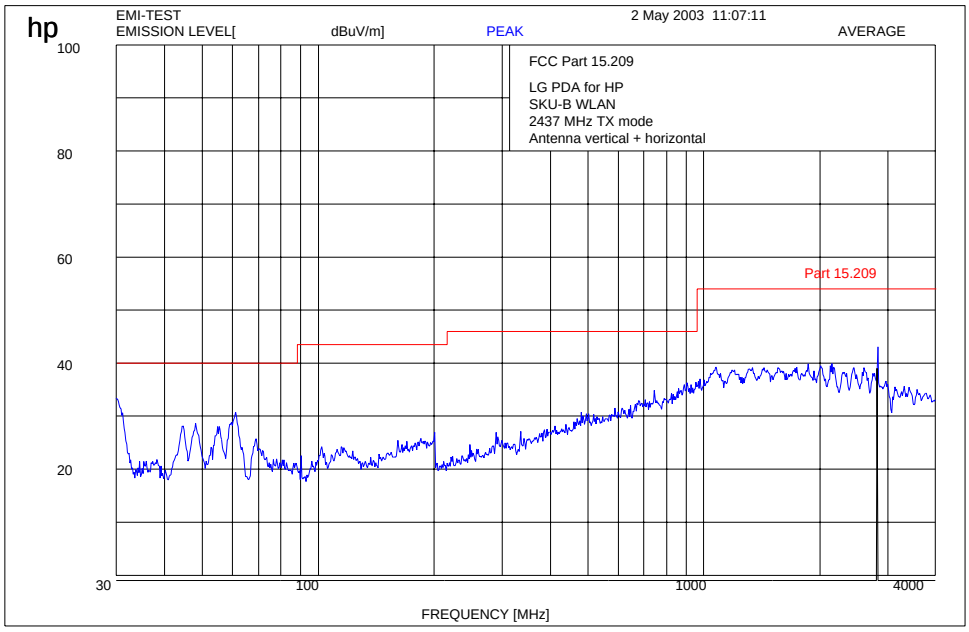
EMISSION LIMITATIONS- Radiated **§ 15.247 (c) (1)**

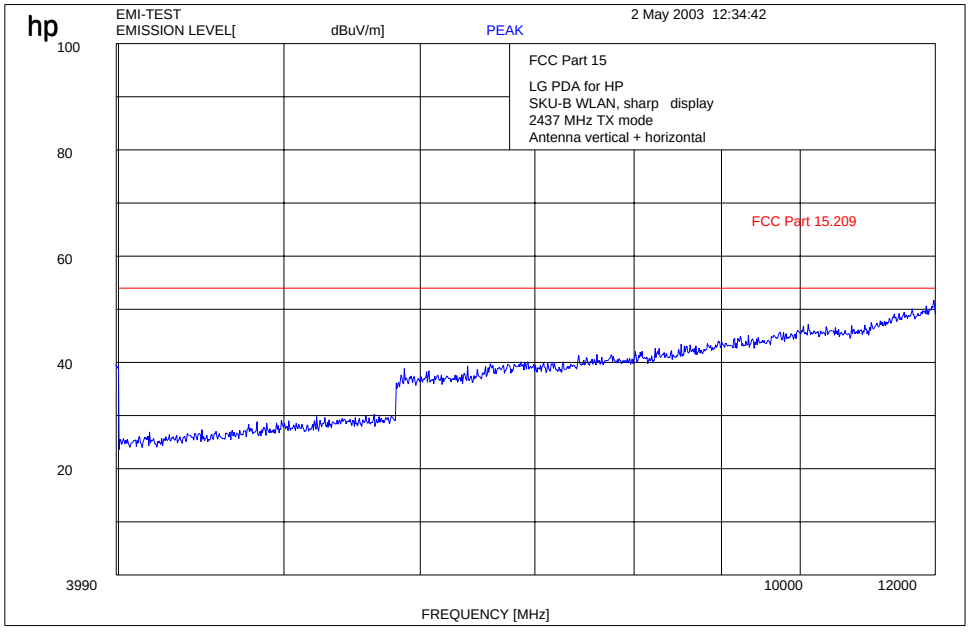
up to 25 GHz
this plot is valid for all 3channels



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24; 64

EMISSION LIMITATIONS- Radiated **§ 15.247 (c) (1)**
Mid channel up to 12 GHz
carrier suppressed by a rejection filter

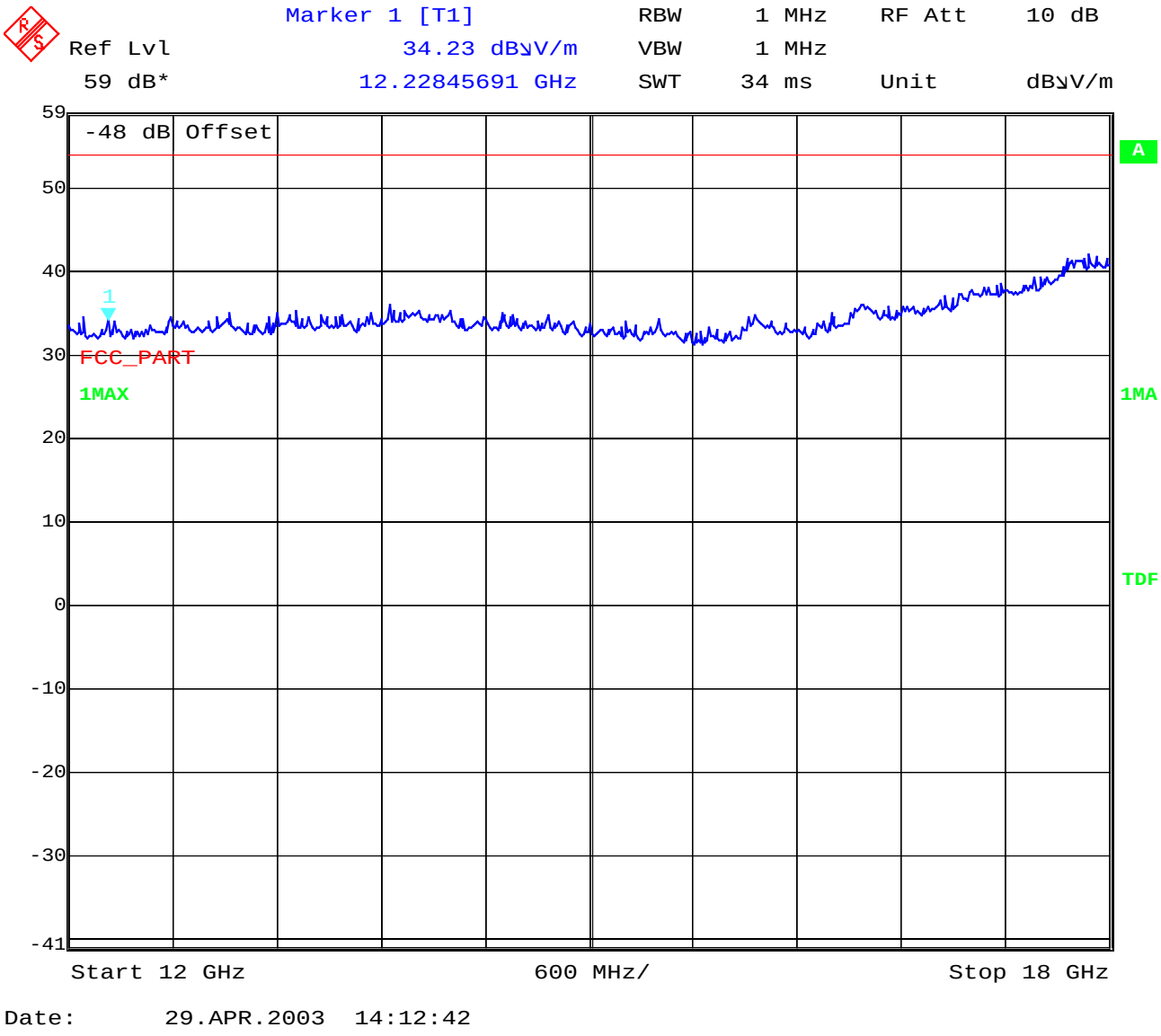




REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24; 64

EMISSION LIMITATIONS- Radiated **§ 15.247 (c) (1)**

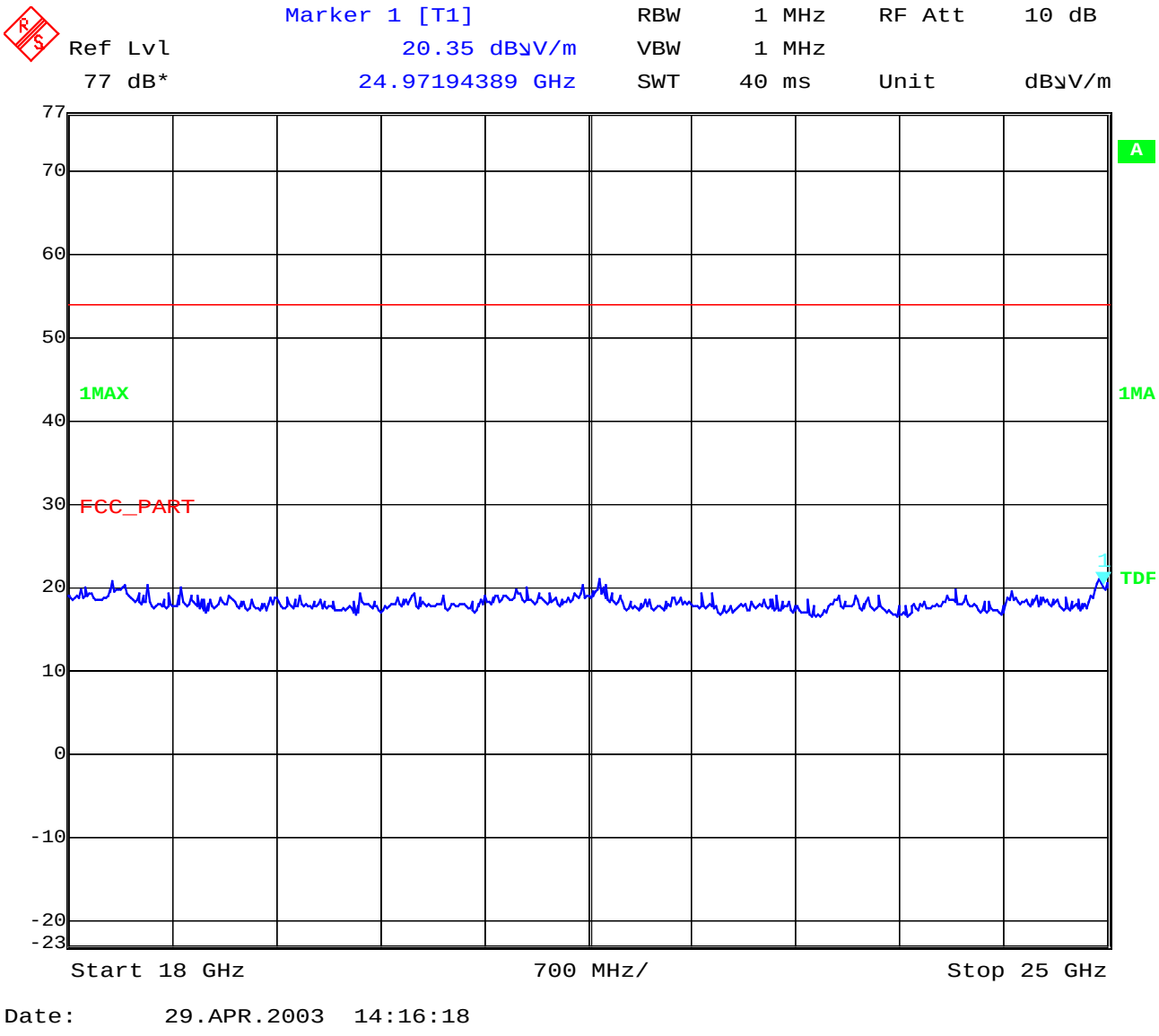
up to 18 GHz
this plot is valid for all 3channels



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24; 64

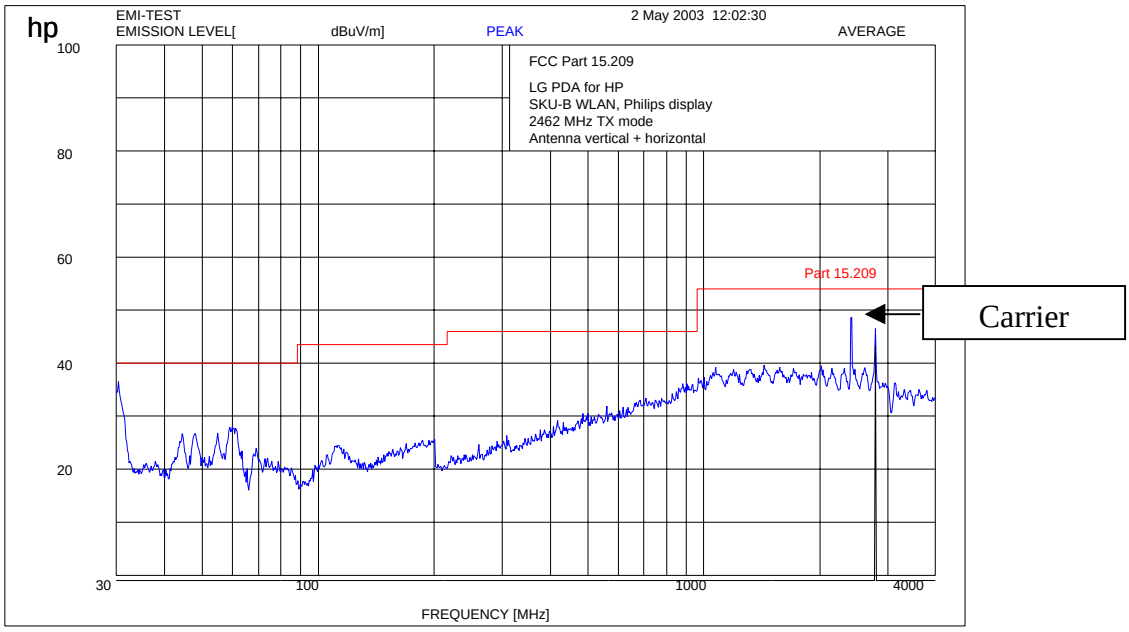
EMISSION LIMITATIONS- Radiated § 15.247 (c) (1)

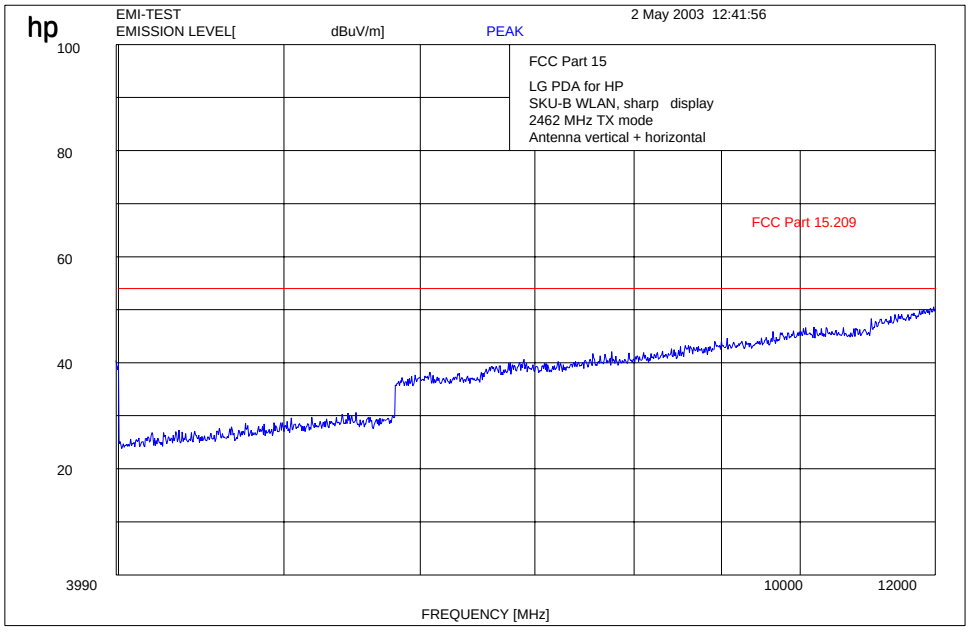
up to 25 GHz
this plot is valid for all 3channels



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24; 64

EMISSION LIMITATIONS- Radiated **§ 15.247 (c) (1)**
high channel up to 12 GHz
carrier suppressed by a rejection filter

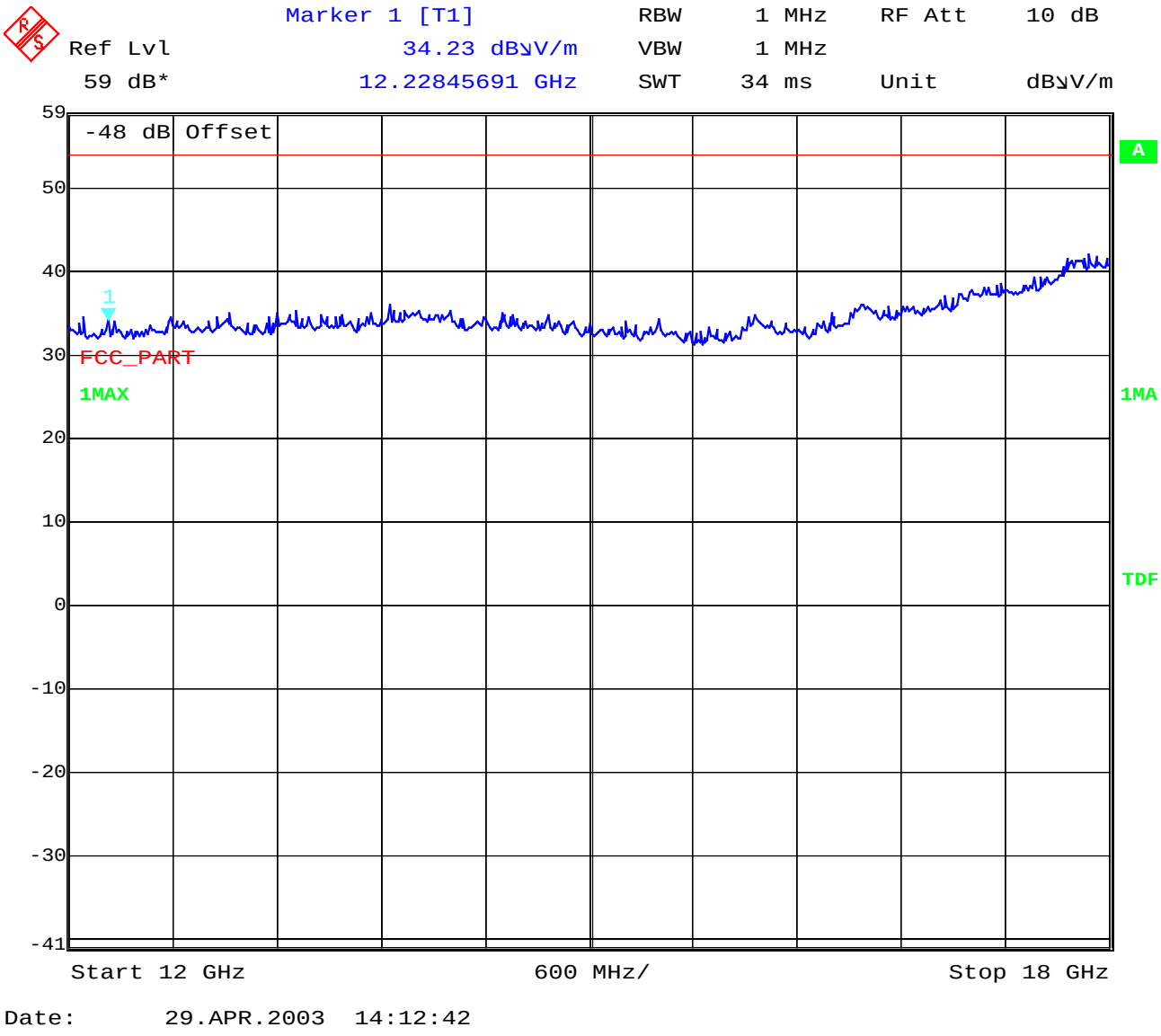




REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24; 64

EMISSION LIMITATIONS- Radiated **§ 15.247 (c) (1)**

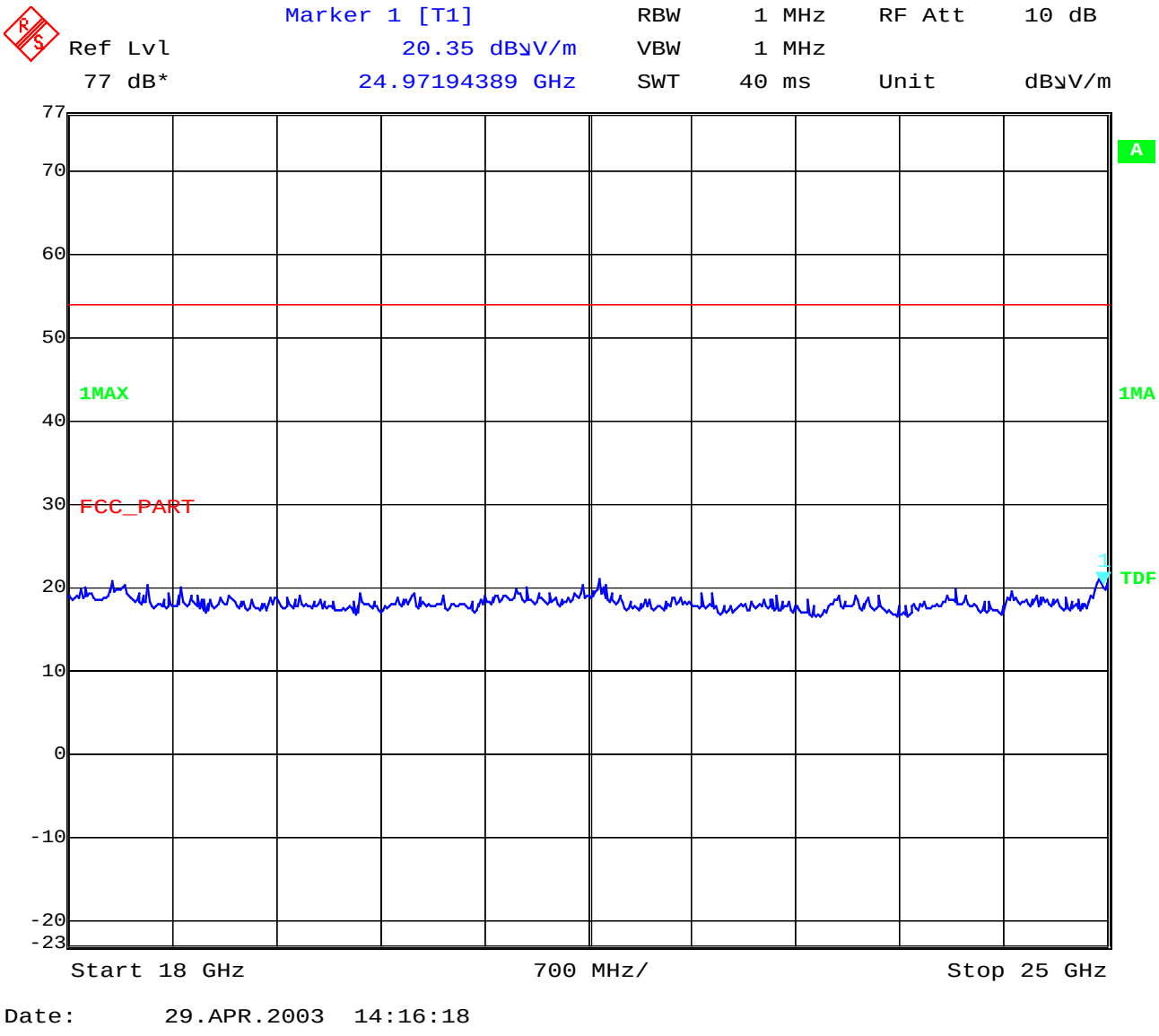
up to 18 GHz
this plot is valid for all 3channels



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24; 64

EMISSION LIMITATIONS- Radiated § 15.247 (c) (1)

up to 25 GHz
this plot is valid for all 3channels



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24; 64

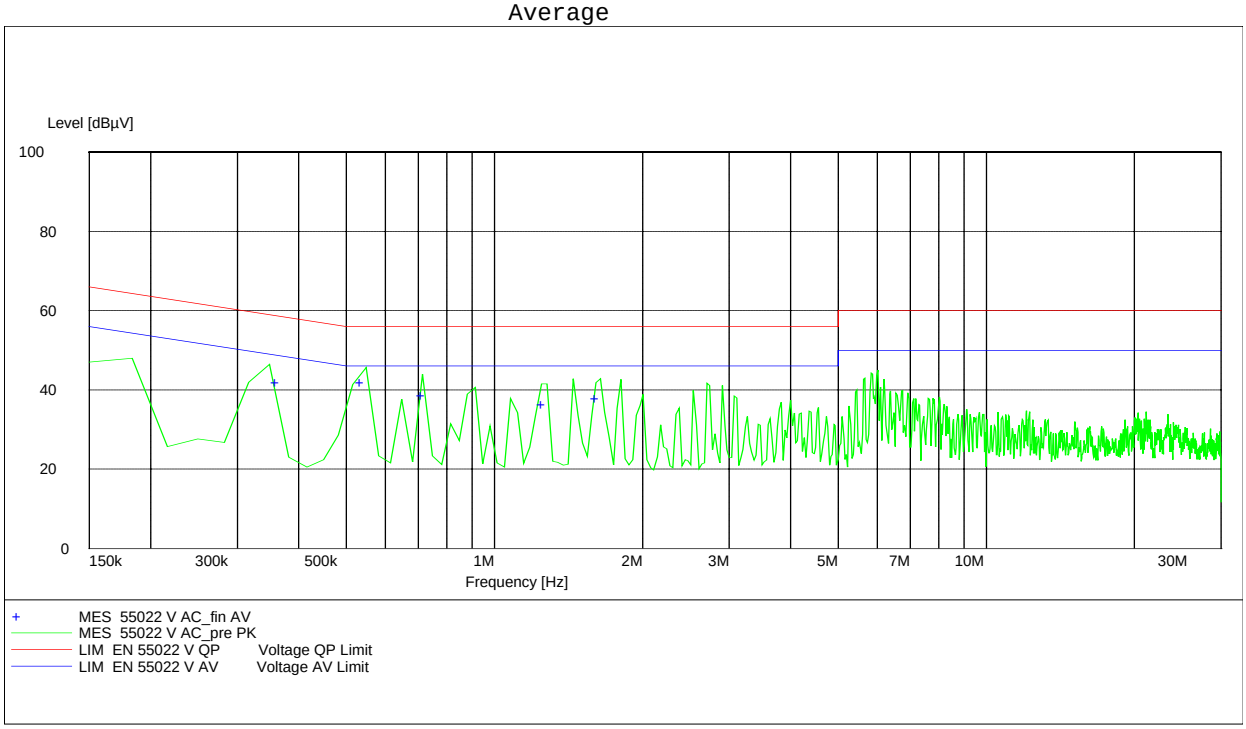
Conducted emissions § 15.107/207

EN 55022 / CISPR 22

```
EUT:                  PE2030 A
Manufacturer:         LG Electronics Inc.
Operating Condition:  Rx-mode with Charger DELTA and Damionics Battery
Test Site:            Room 006
Operator:             Berg
Test Specification:   110V / 60 Hz Rx mode
Comment:
Start of Test:        29.04.03 / 15:31:51
```

SCAN TABLE: "EN 55022 V"

```
Short Description:              Voltage Mains 1.60
Start      Stop       Step      Detector  Meas.     IF      Transducer
Frequency  Frequency  Width               Time      Bandw.
150.0 kHz  30.0 MHz   7.5 kHz   MaxPeak   100.0 ms  10 kHz  ESH3-Z5 L1 1458
                               Average
```



Limit 15.207

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* **Decreases with the logarithm of the frequency.**

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24; 64

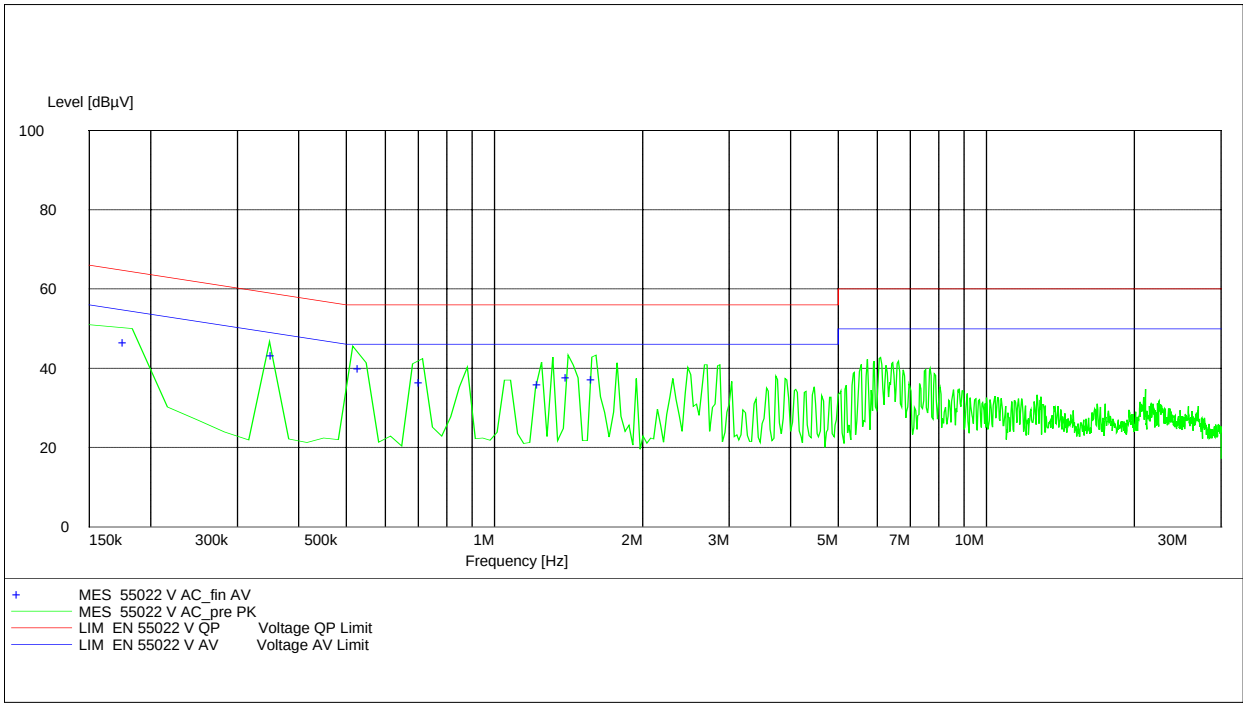
EN 55022 / CISPR 22

EUT: PE2030 A
Manufacturer: LG Electronics Inc.
Operating Condition: Tx mode with Charger DELTA and Battery Damionics
Test Site: Room 006
Operator: Berg
Test Specification: EN 55022
Comment: 110V / 60 Hz Tx-mode
Start of Test: 29.04.03 / 15:26:18

SCAN TABLE: "EN 55022 V"

Short Description: Voltage Mains 1.60

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	7.5 kHz	MaxPeak Average	100.0 ms	10 kHz	ESH3-Z5 L1 1458



Limit § 15.207

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* **Decreases with the logarithm of the frequency.**

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24; 64

EMISSION LIMITATIONS- Receiver radiated § 15.209

SPURIOUS EMISSIONS LEVEL (µV/m)								
CH 1 / 2 / 3								
f (MHz)	Detector	Level (µV/m)	f (MHz)	Detector	Level (µV/m)	f (MHz)	Detector	Level (µV/m)
all	peaks	<<limit						
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW: 1 MHz
see above plots

Measurement distance see table

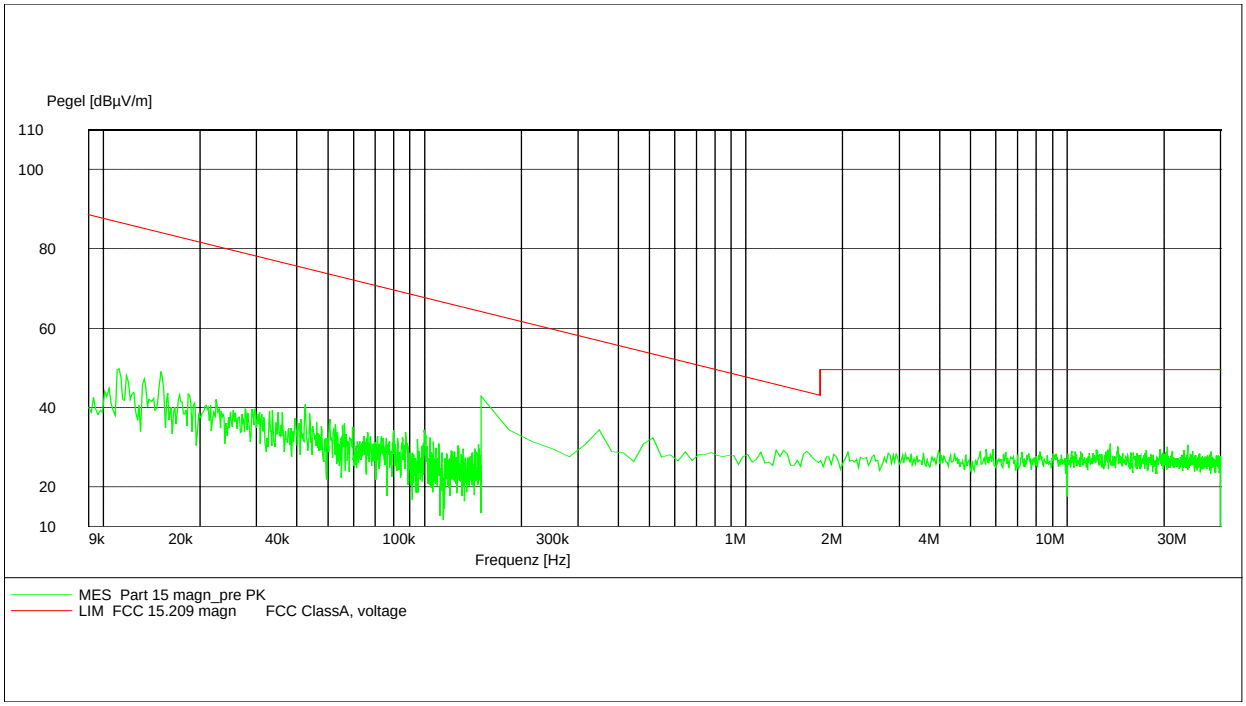
Limits SUBCLAUSE § 15.109

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30 / 29.5 dBµV/m	30
30 - 88	100 / 40 dBµV/m	3
88 - 216	150 / 43.5 dBµV/m	3
216 - 960	200 / 46 dBµV/m	3
above 960	500 / 54 dBµV/m	3

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

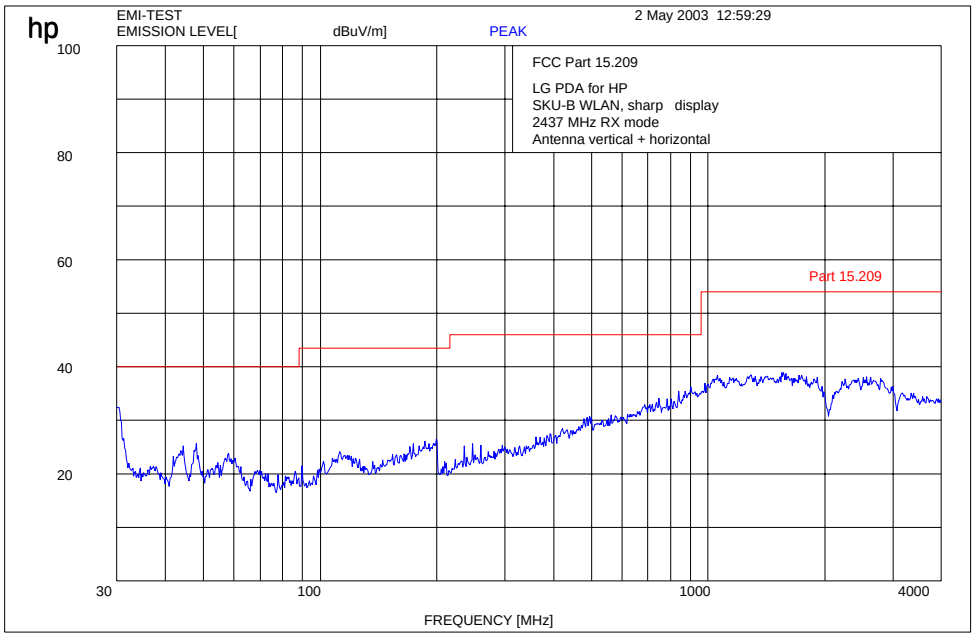
EMISSION LIMITATIONS- Radiated § 15.209
Receiver up to 30 MHz

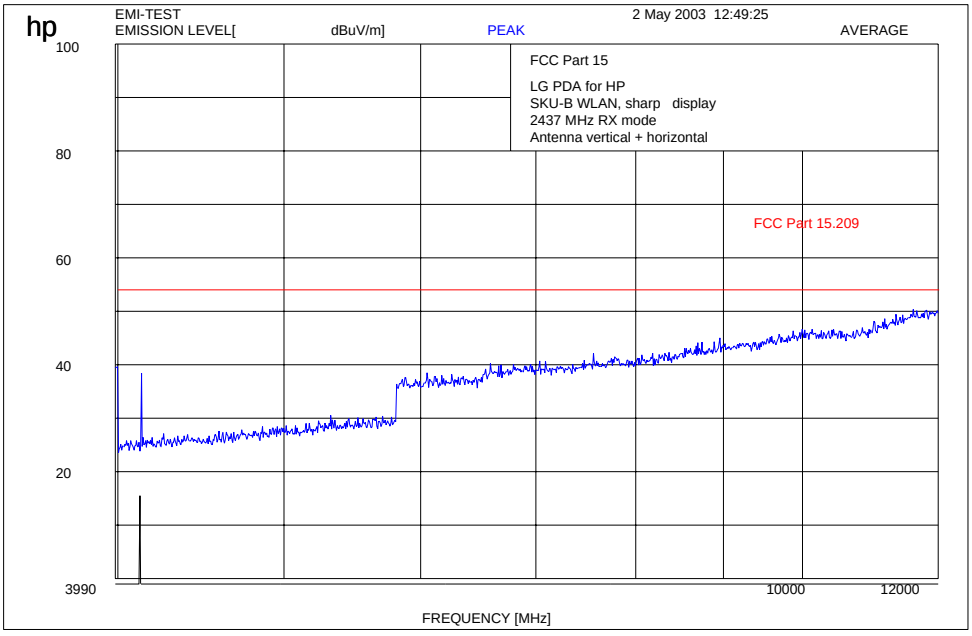
EUT: PE2030 A
Manufacturer: LG Electronics Inc.
Operating Condition: Rx mode with DELTA with Damionics Bat.
Test Site: Cetecom, Room 6
Operator: Berg
Test Specification:
Comment:
Start of Test: 29.04.03 / 15:20:35



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

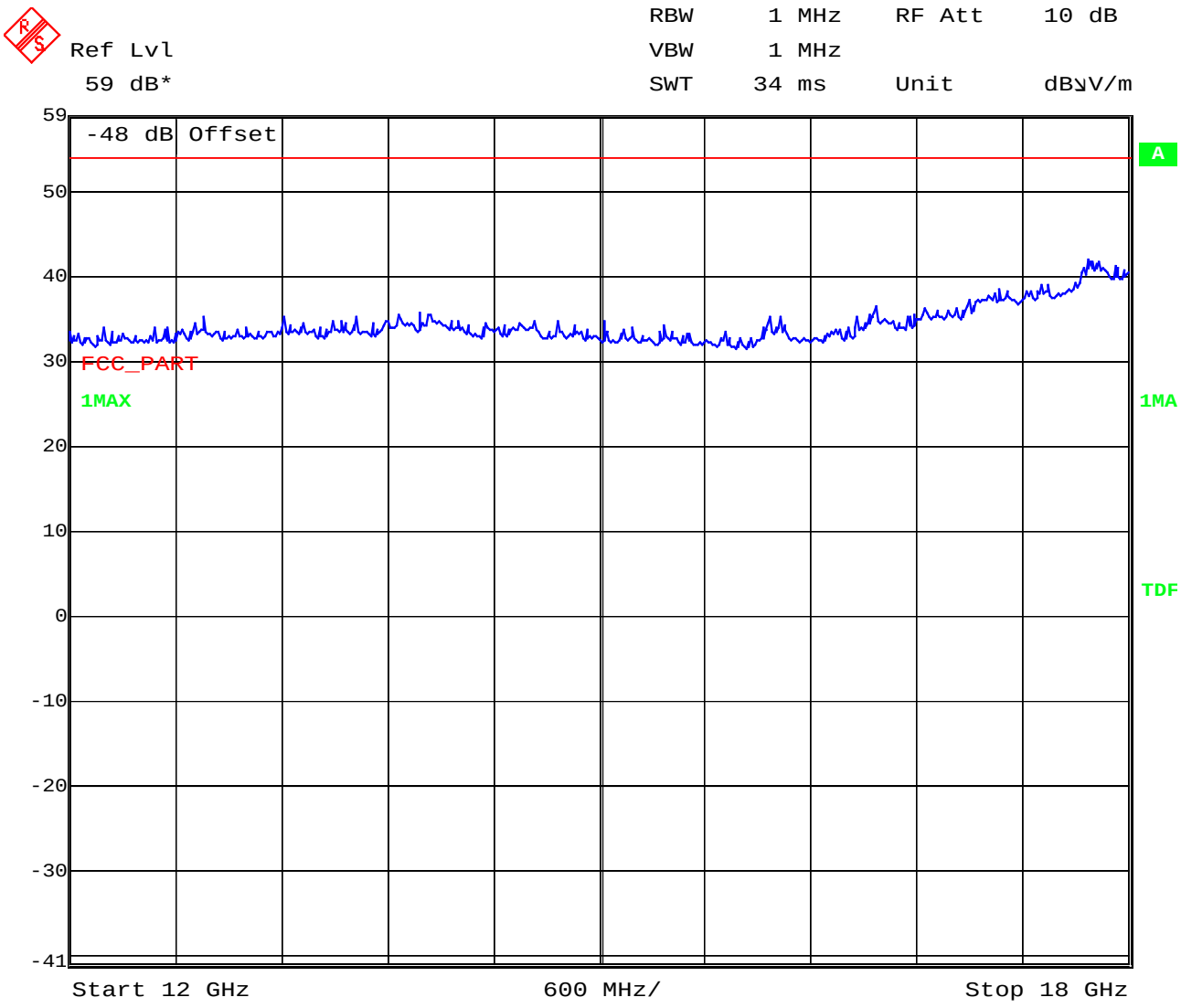
EMISSION LIMITATIONS- Radiated § 15.209
Receiver up to 12 GHz





REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

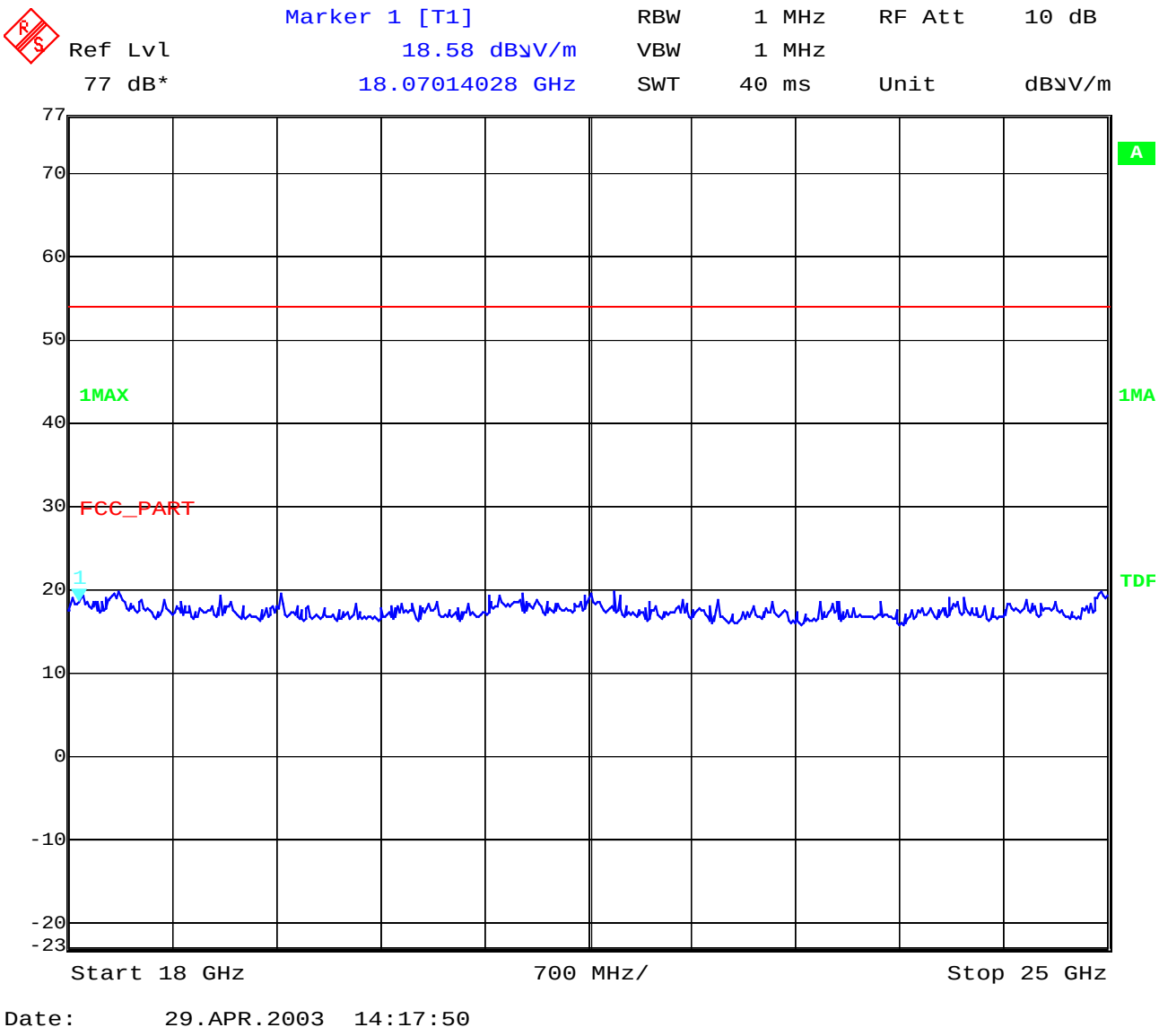
EMISSION LIMITATIONS- Radiated **§ 15.209**
Receiver up to 18 GHz



Date: 29.APR.2003 14:11:12

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

EMISSION LIMITATIONS- Radiated **§ 15.209**
Receiver up to 25 GHz



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

Additional measurements for the ancillary equipment PART 15.109

Test set-ups:

Additional test is done with following test set-up : 1a; 2b; 3b; 4; 7; 9; 10 !

Auxiliary Equipment (AE) List

No.	AE	Manufacture		Type	S/N
1	AC/DC Adapter	a	PHIHONG	PSC10A-050 (for USA) PSC10E-050 (for EU)	N/A
		b	DELTA	ADP-10SB REV.BH (for USA) ADP-10SB REV.CH (for EU)	N/A
2	Battery	a	DANIONICS / Denmark	PE2032A	N/A
		b	SAMSUNG SDI / Korea	PE2032B	N/A
3	LCD Panel	a	Philips Electronics / China	LPH7123-1	
		b	Sharp Corp. / Japan	LQ038Q7DB01	
4	Cradle (Docking)			PE2035A	N/A
5	Y-Cable			250177-B21	251275-001
6	SD memory card	TOSHIBA		SD-M128	0120506615D
7	CF memory card	SanDisk		AA0112MT	N/A
8	CF card Jacket w/Battery			PE2036	8Y22KD53701X
9	Headphone	N/A		N/A	N/A
10	Laptop computer	COMPAQ		CM2030	359802-293

All test were done with each combination and reported is the worst case !

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

SPURIOUS RADIATION § 15.109

Tx mode:

Data File : /40977_45.DOC 29 Apr 2003

No	EMISSION FREQUENCY MHz	SPEC LIMIT dBuV/m	MEASUREMENTS ABS	dLIM dB	MODE	POL	SITE HGT cm	AZM deg	CORR FACTOR dB	COMMENTS
1	40.6	40.0	24.9	-15.1	PK	V	97	73	N/T	
2	47.6	40.0	22.0	-18.0	PK	V	97	3	N/T	
3	77.8	40.0	22.1	-17.9	PK	V	99	0	N/T	
4	89.7	44.0	22.8	-21.2	PK	V	99	0	N/T	
5	147.8	44.0	24.9	-19.1	PK	V	99	0	N/T	
6	168.2	44.0	23.5	-20.5	PK	V	99	0	N/T	
7	347.7	46.0	28.0	-18.1	PK	V	101	113	N/T	

N/T in CORR FACTOR column denotes a non-traceable signal.

Rx mode:

Data File : /40977_40.DOC 29 Apr 2003

No	EMISSION FREQUENCY MHz	SPEC LIMIT dBuV/m	MEASUREMENTS ABS	dLIM dB	MODE	POL	SITE HGT cm	AZM deg	CORR FACTOR dB	COMMENTS
1	40.6	40.0	25.1	-14.9	PK	V	97	200	N/T	
2	99.3	44.0	21.9	-22.1	PK	V	97	267	N/T	
3	149.0	44.0	21.9	-22.1	PK	V	97	322	N/T	
4	248.1	46.0	24.6	-21.4	PK	H	154	122	N/T	
5	353.4	46.0	26.5	-19.5	PK	V	101	360	N/T	
6	497.1	46.0	29.3	-16.7	PK	V	101	360	N/T	

N/T in CORR FACTOR column denotes a non-traceable signal.

Measurement distance see table

Limits SUBCLAUSE § 15.109

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30 / 29.5 dBµV/m	30
30 - 88	100 / 40 dBµV/m	3
88 - 216	150 / 43.5 dBµV/m	3
216 - 960	200 / 46 dBµV/m	3
above 960	500 / 54 dBµV/m	3

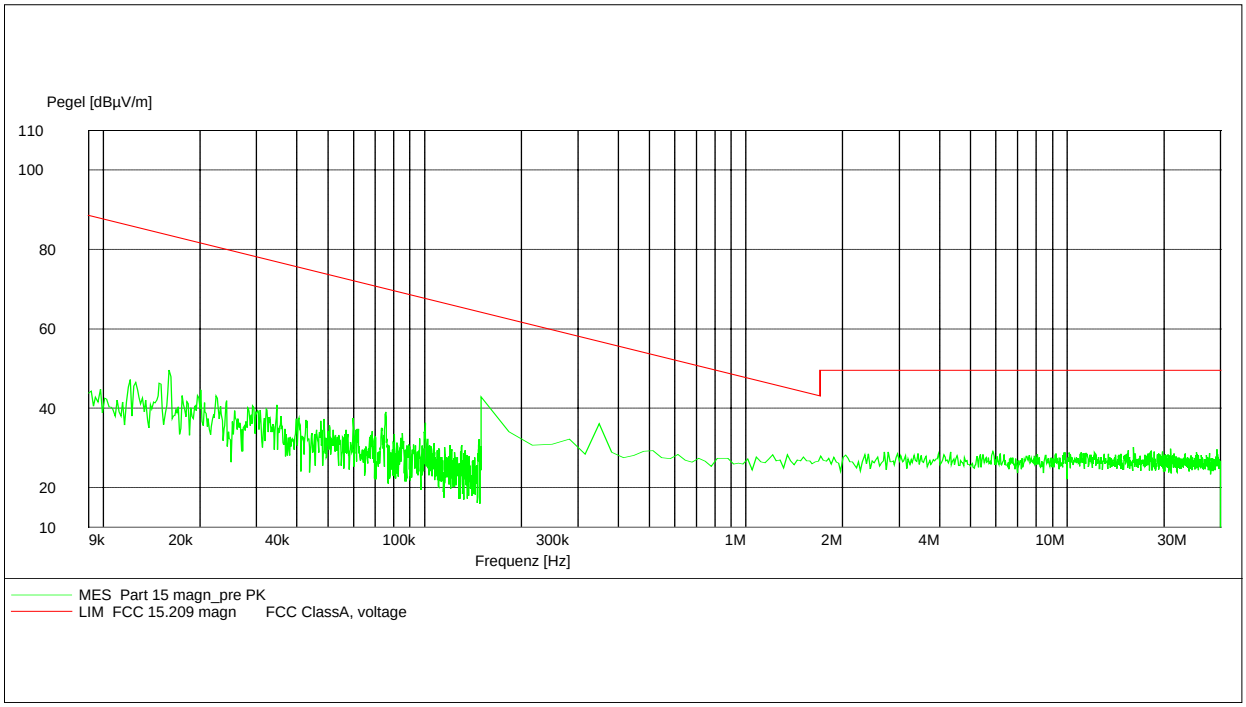
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

SPURIOUS RADIATION § 15.109

9 kHz – 30 MHz

Part 15.209 Magnetics

```
EUT:                PE2030 A
Manufacturer:       LG Electronics Inc.
Operating Condition: receiving mode with AC/DC PHIHONG and Samsung Battery
Test Site:          Cetecom, Room 6
Operator:           Berg
Test Specification:
Comment:
Start of Test:      29.04.03 / 15:00:04
```

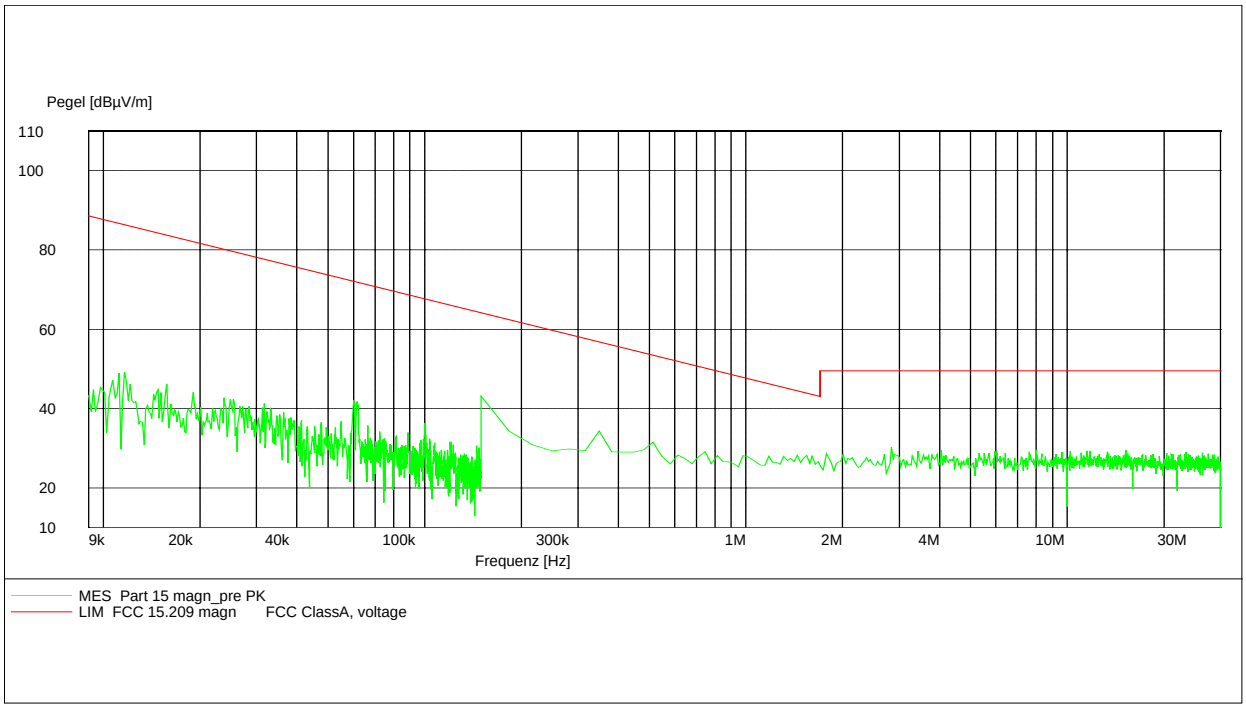


REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

SPURIOUS RADIATION § 15.109

9 kHz – 30 MHz
Part 15.209 Magnetics

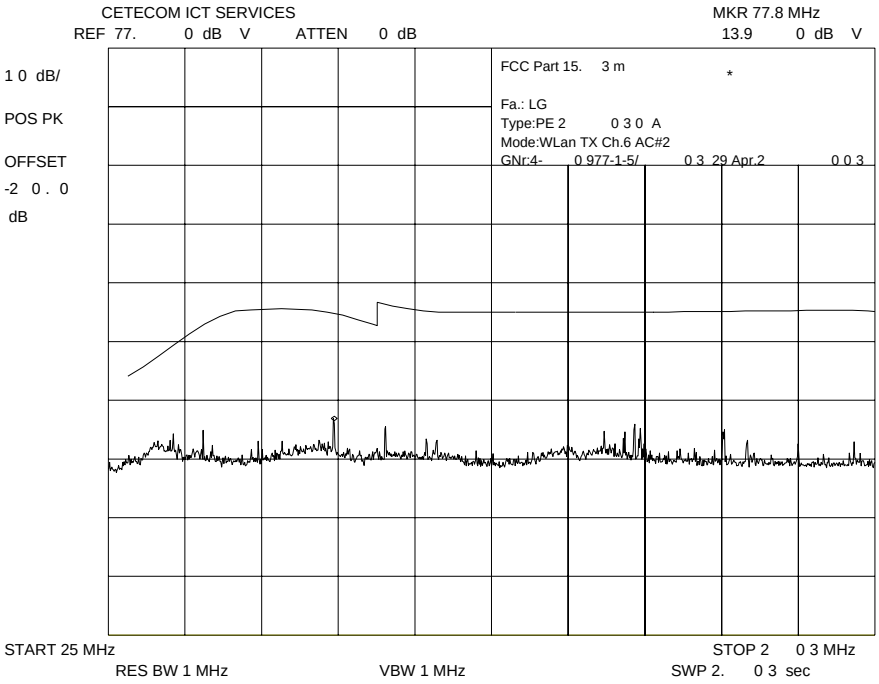
```
EUT:                 PE2030 A
Manufacturer:        LG Electronics Inc.
Operating Condition: Tx mode with AC/DC PHIHONG and Samsung Battery
Test Site:           Cetecom, Room 6
Operator:            Berg
Test Specification:
Comment:
Start of Test:       29.04.03 / 14:55:40
```

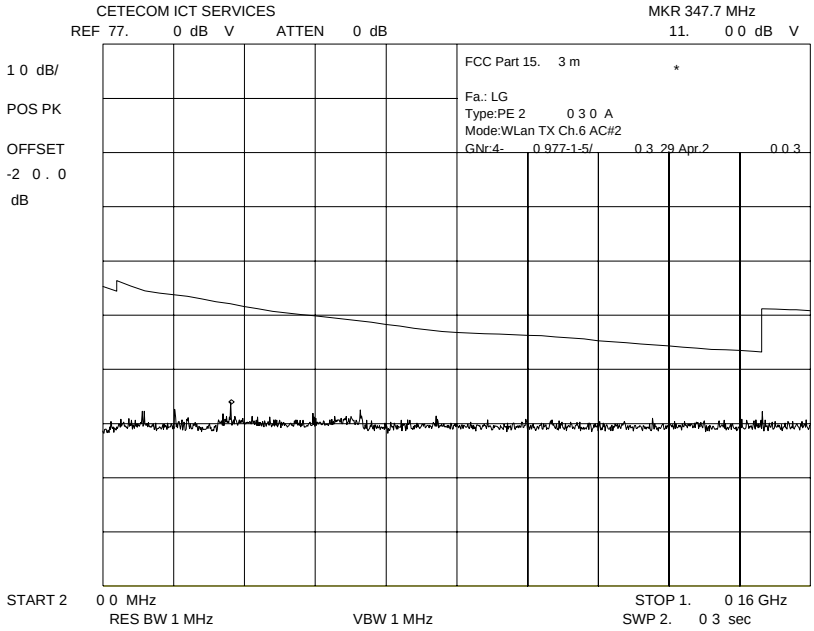


REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

SPURIOUS RADIATION § 15.109

2437 MHz vertical (up to 1000 MHz)

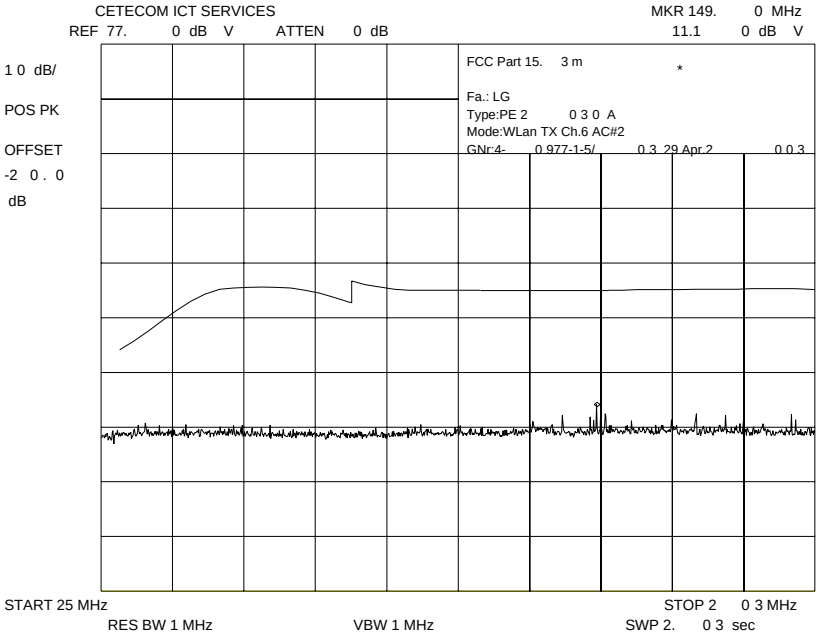


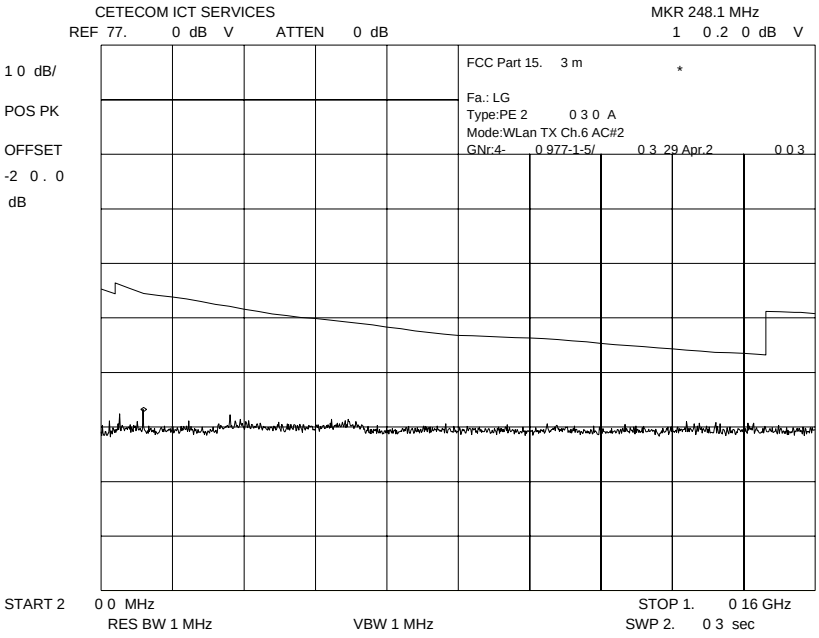


REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

SPURIOUS RADIATION § 15.109

2437 MHz horizontal (up to 1000 MHz)

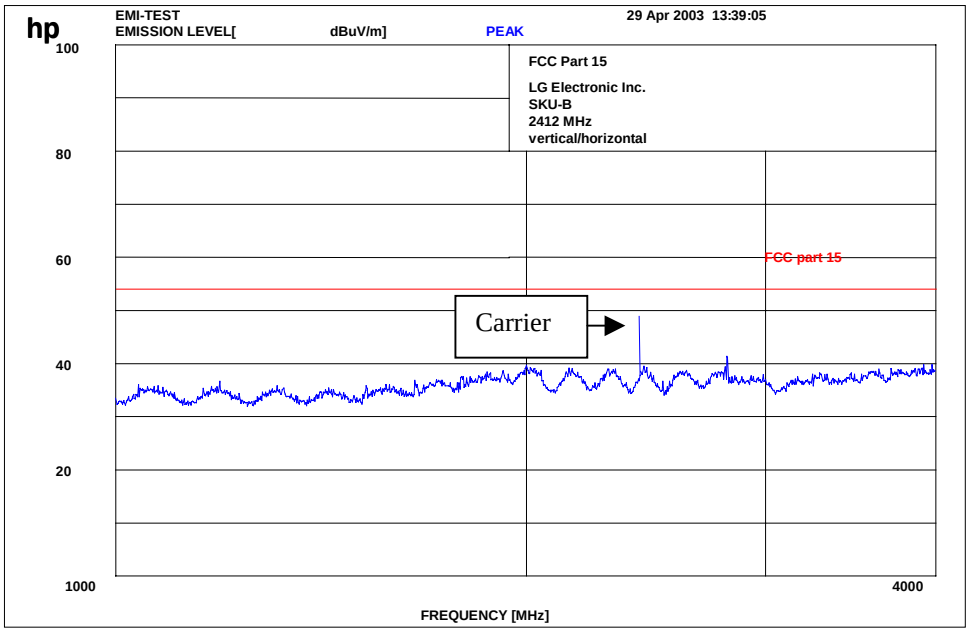


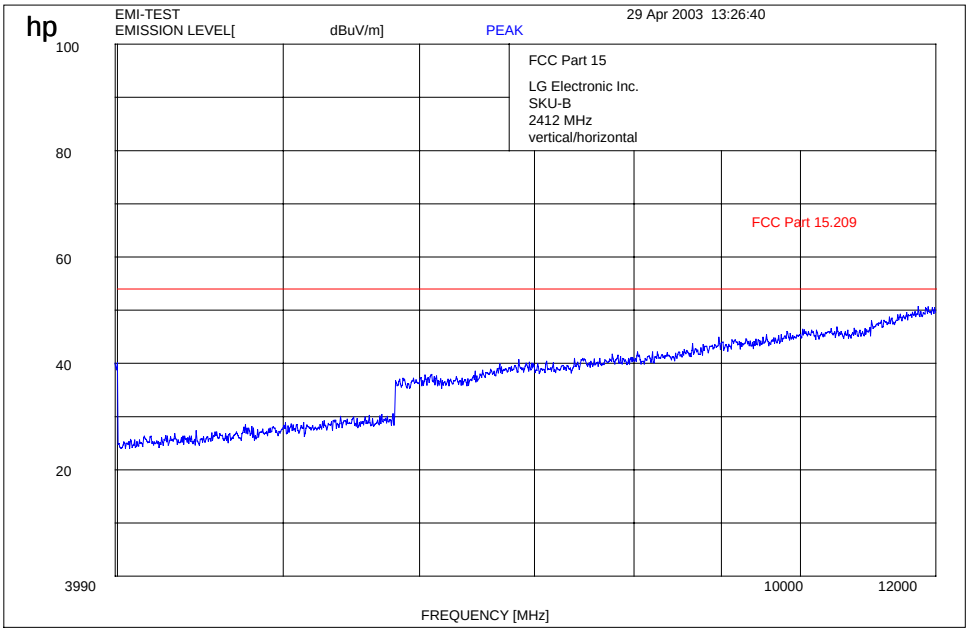


REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

SPURIOUS RADIATION § 15.109

2437 MHz (up to 12 GHz)





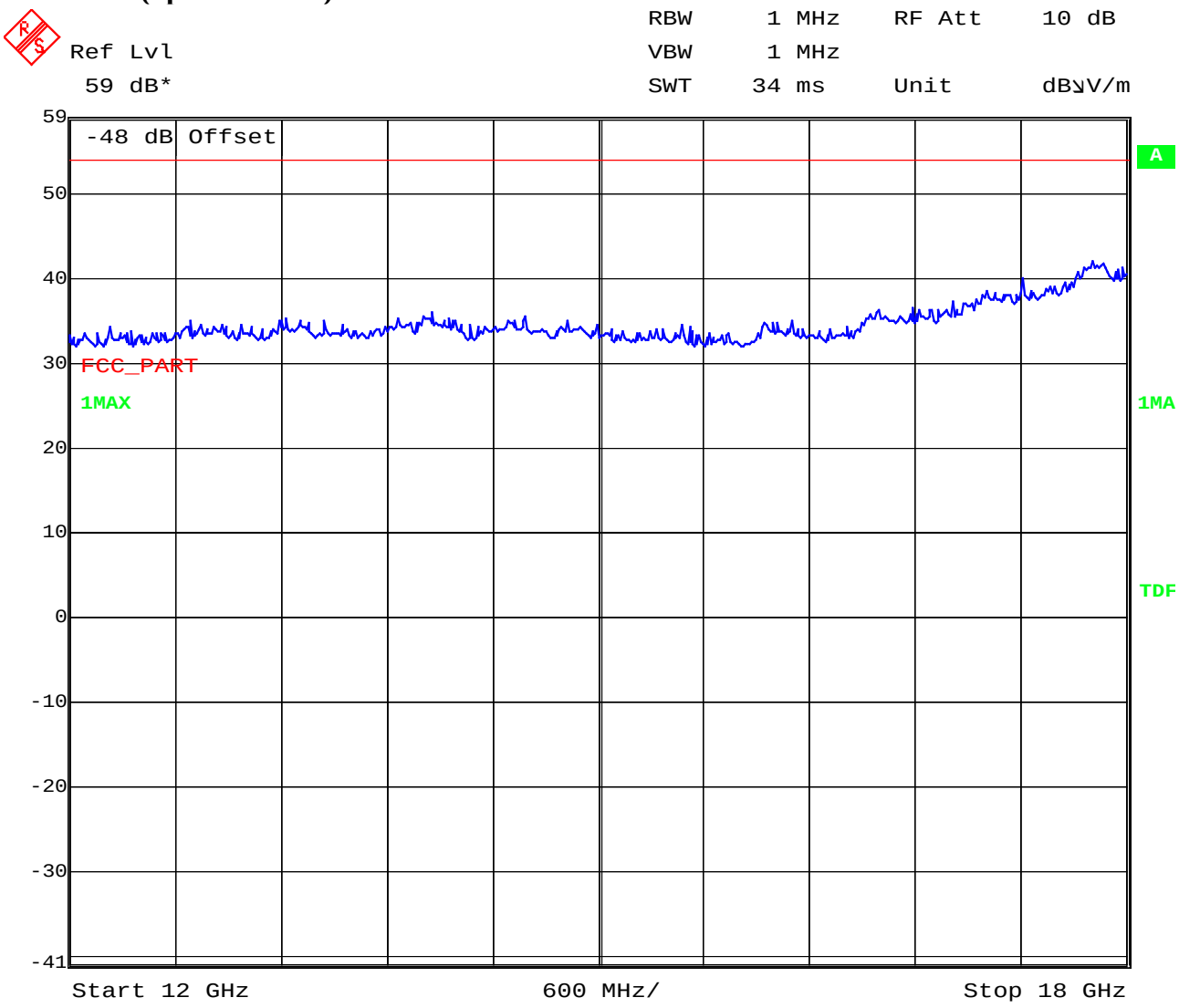
f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW 1 MHz**

Carrier suppressed with a rejection filter

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

SPURIOUS RADIATION **§ 15.109**

2437 MHz (up to 18 GHz)



Date: 29.APR.2003 14:12:21

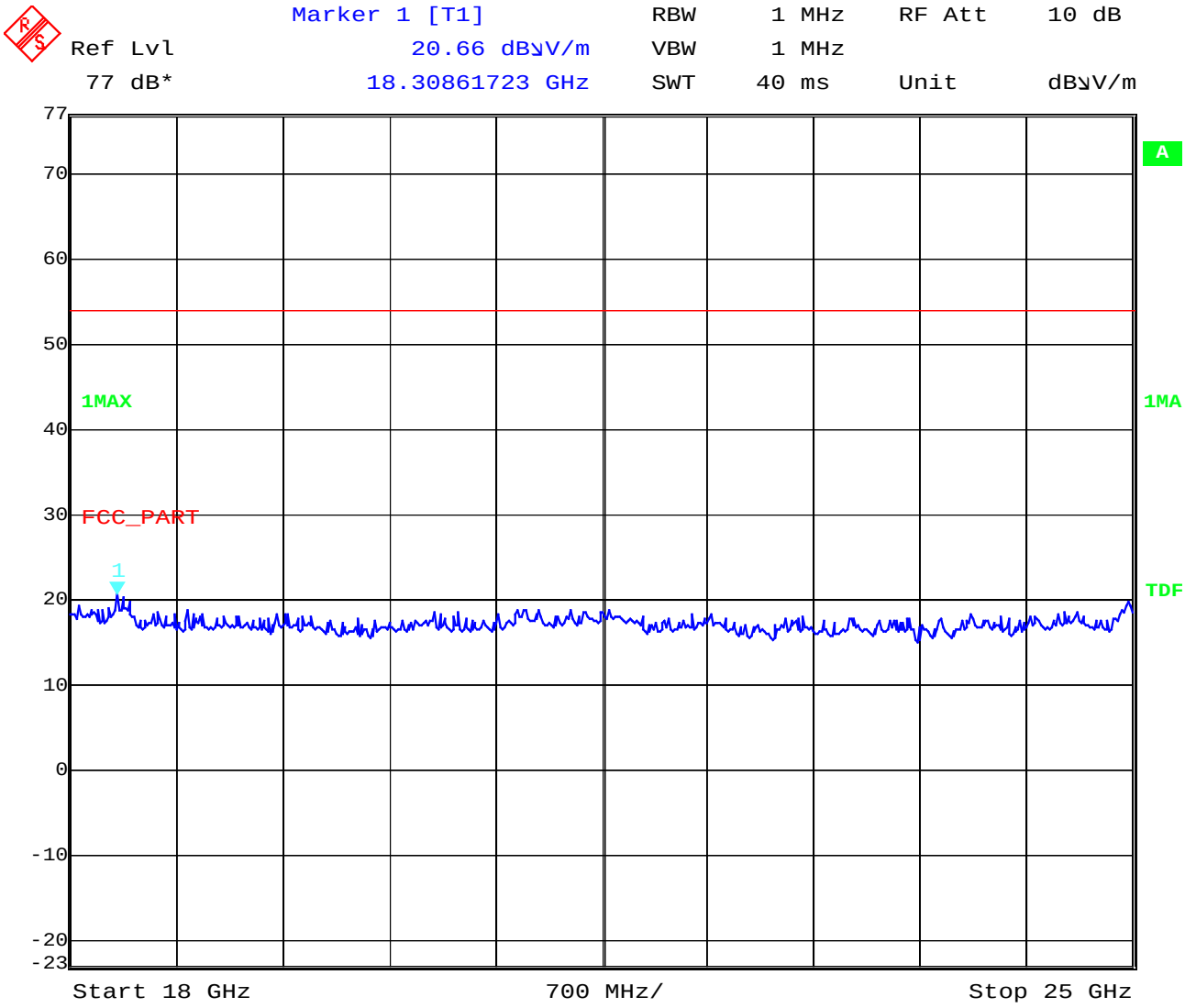
f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW 1 MHz**

Carrier suppressed with a rejection filter

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

SPURIOUS RADIATION **§ 15.109**

2437 MHz (up to 25 GHz)



Date: 29.APR.2003 14:16:33

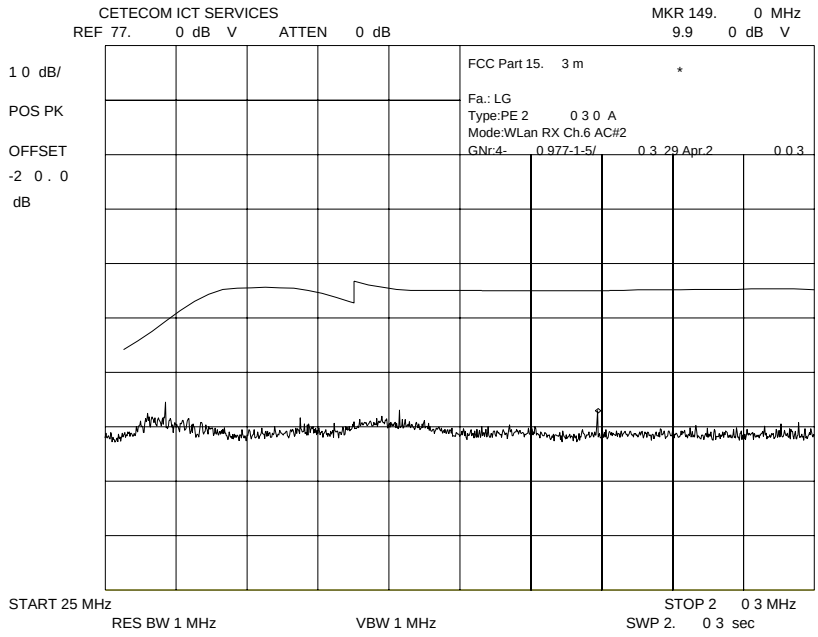
f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW 1 MHz**

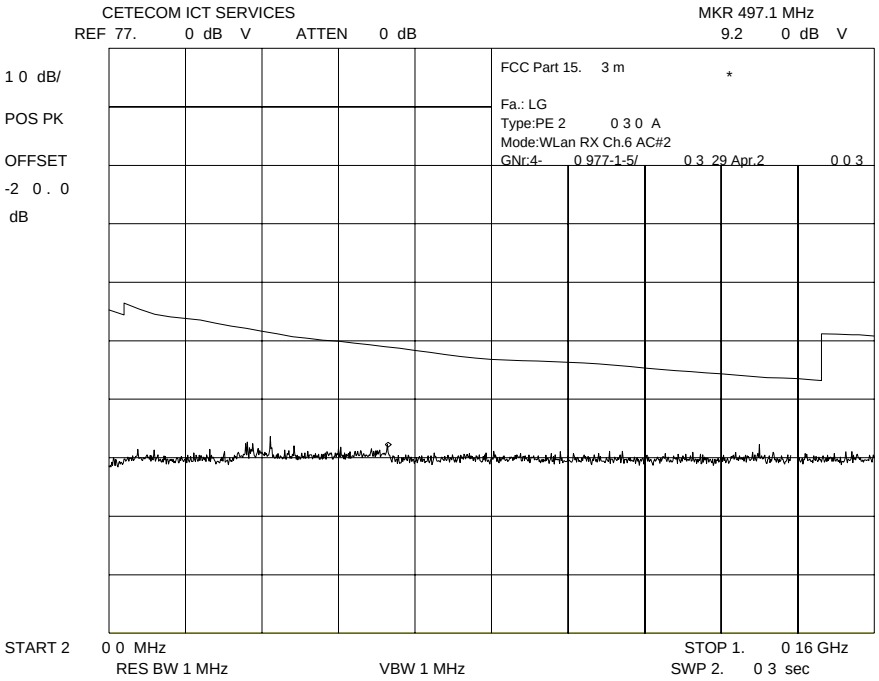
Carrier suppressed with a rejection filter

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

SPURIOUS RADIATION – Receiver radiated § 15.109

Rx mode vertical (up to 1 GHz)

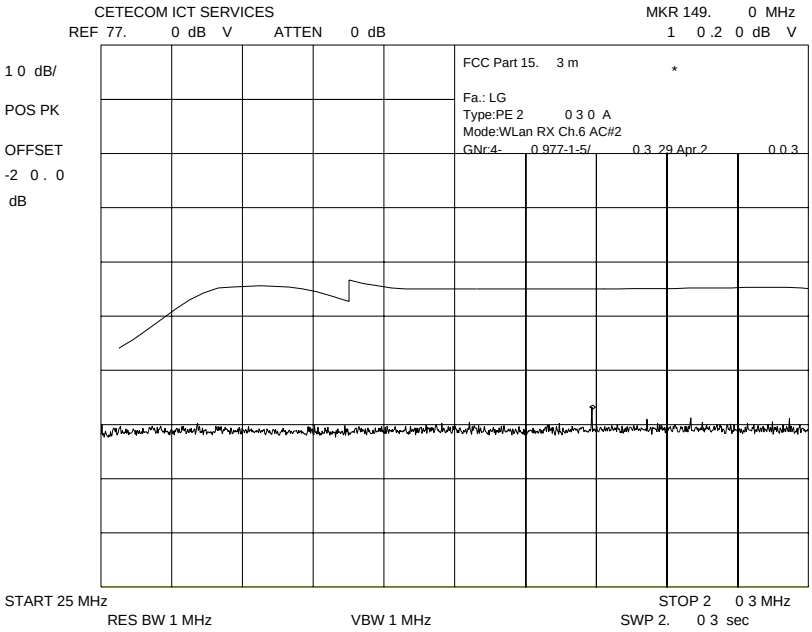


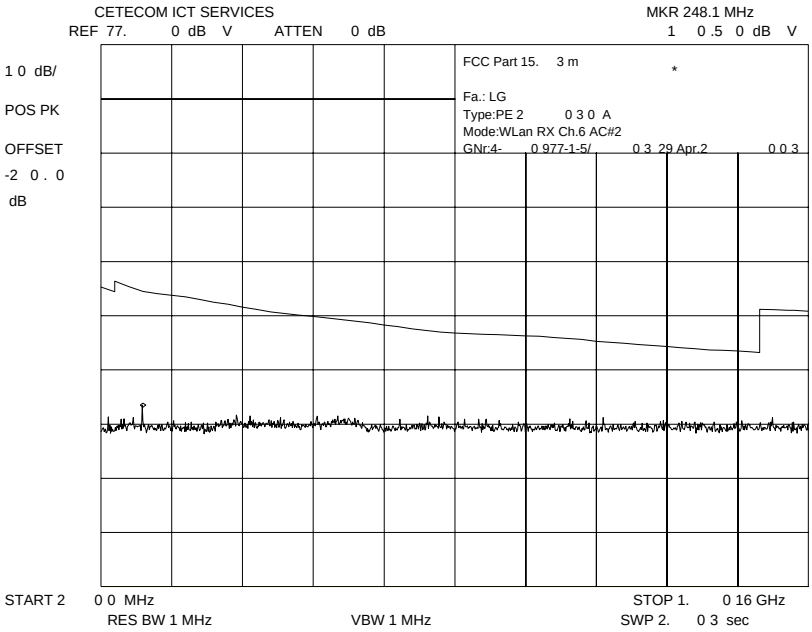


REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

SPURIOUS RADIATION § 15.109

Rx mode horizontal (up to 1 GHz)

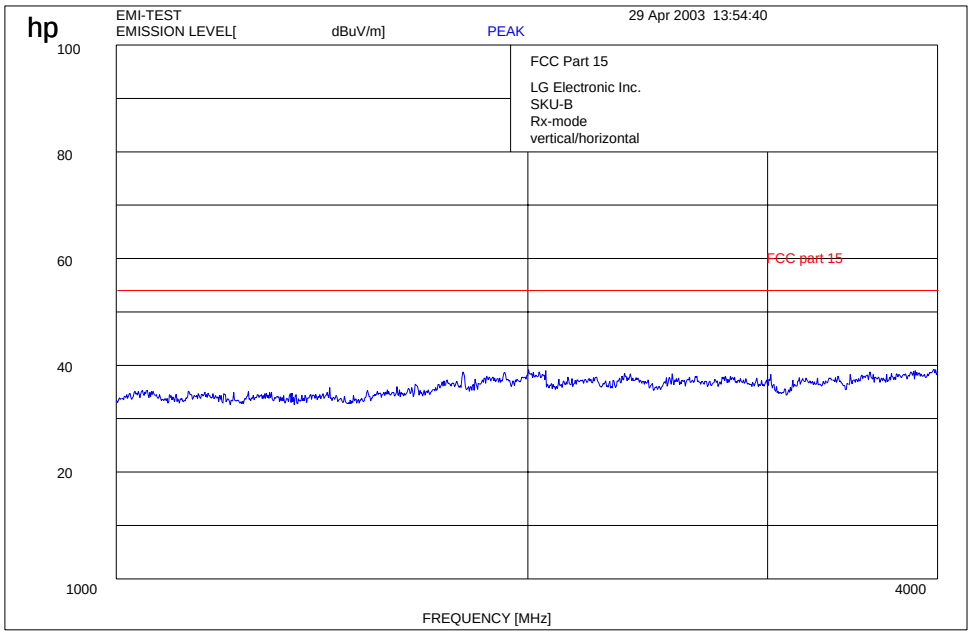


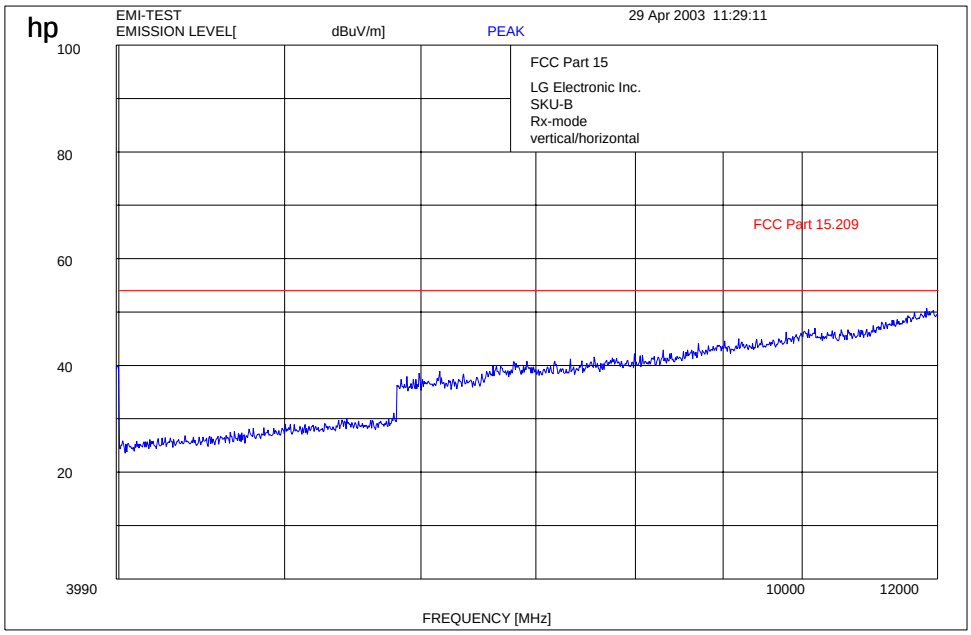


REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

SPURIOUS RADIATION **§ 15.109**

Idle mode up to 12 GHz



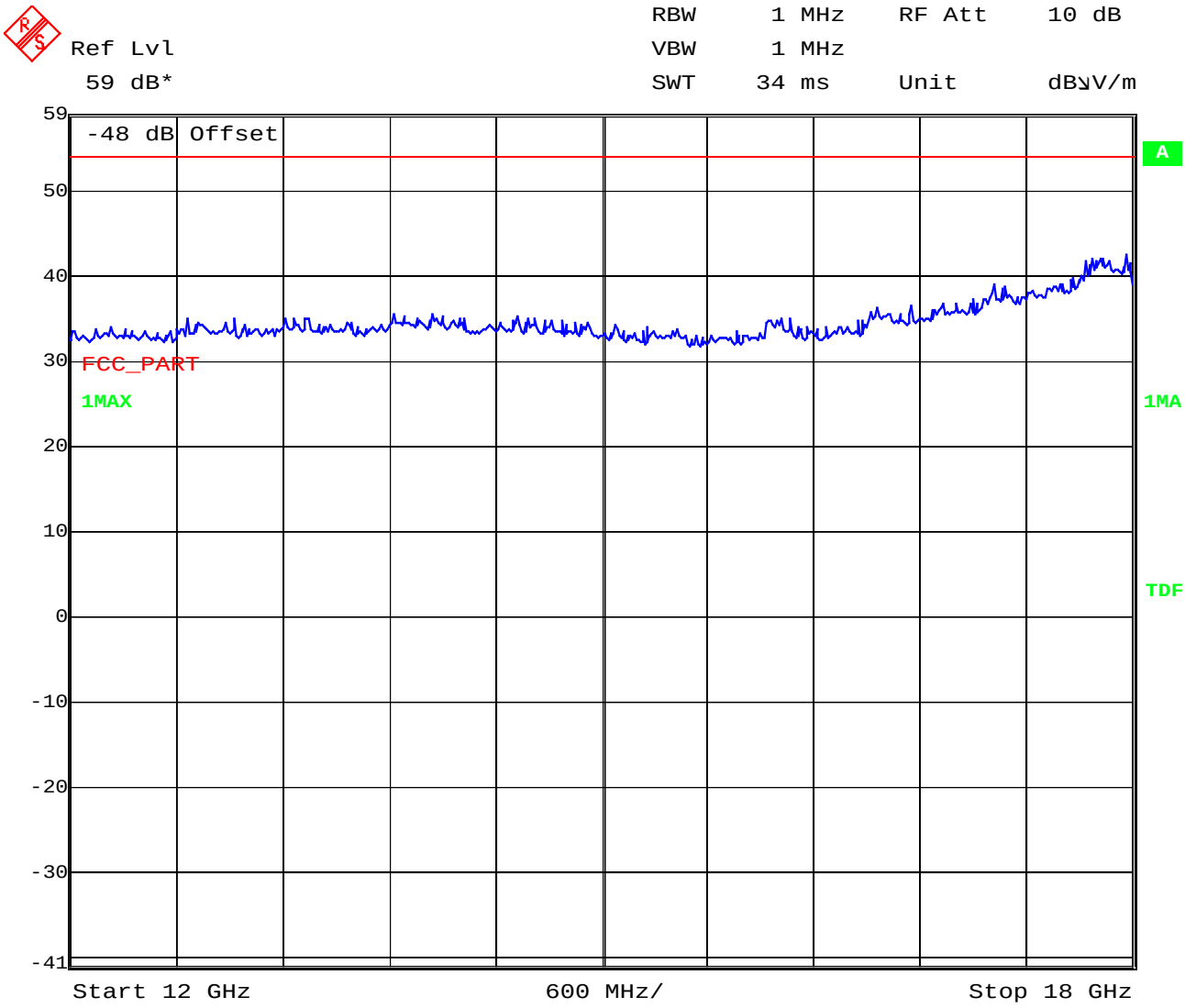


f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW 1 MHz**

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

SPURIOUS RADIATION § 15.109

Idle mode up to 18 GHz



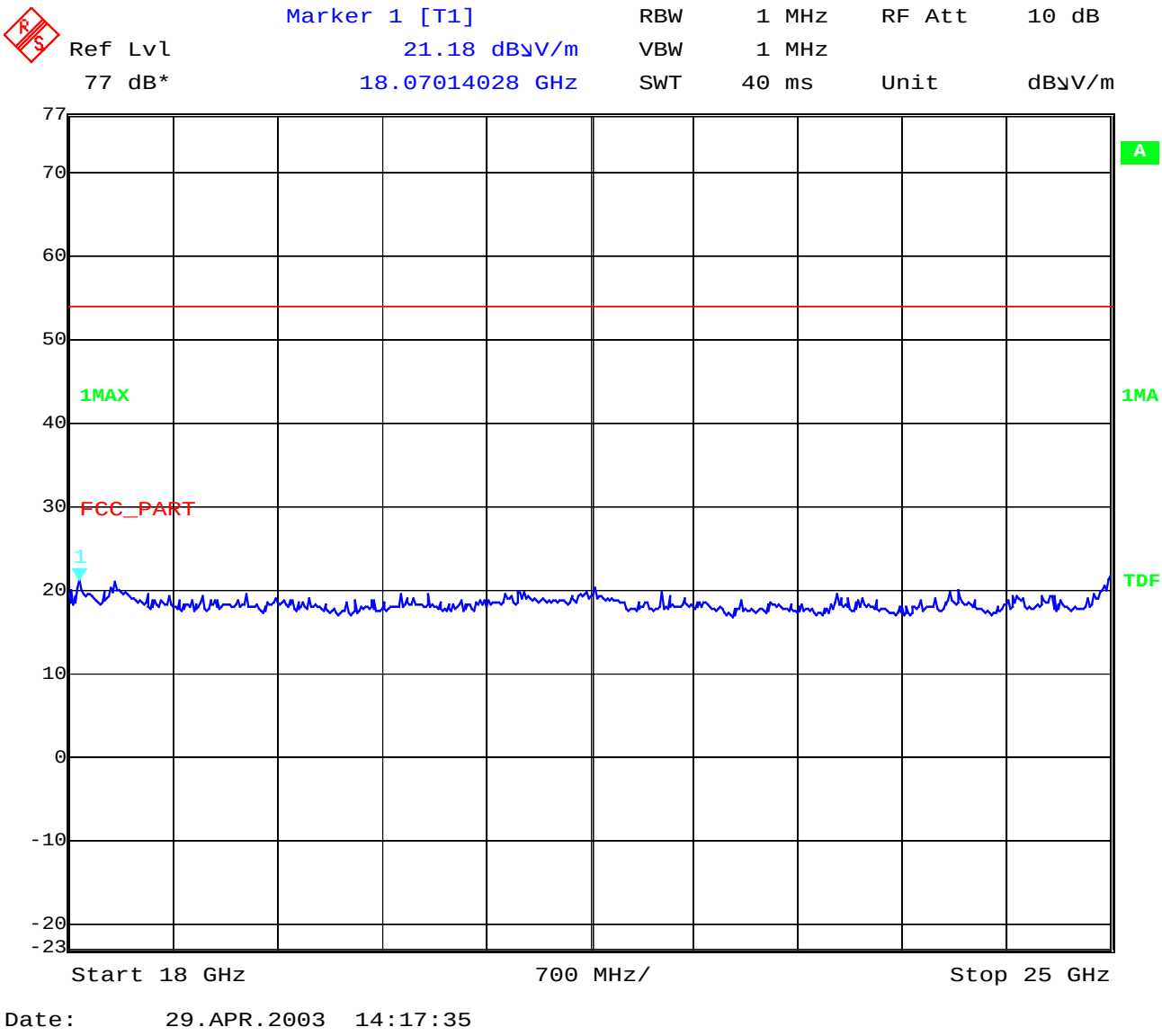
Date: 29.APR.2003 14:11:47

f < 1 GHz : RBW/VBW: 100 kHz **f ≥ 1GHz : RBW/VBW 1 MHz**

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

SPURIOUS RADIATION § 15.109

Idle mode up to 25 GHz



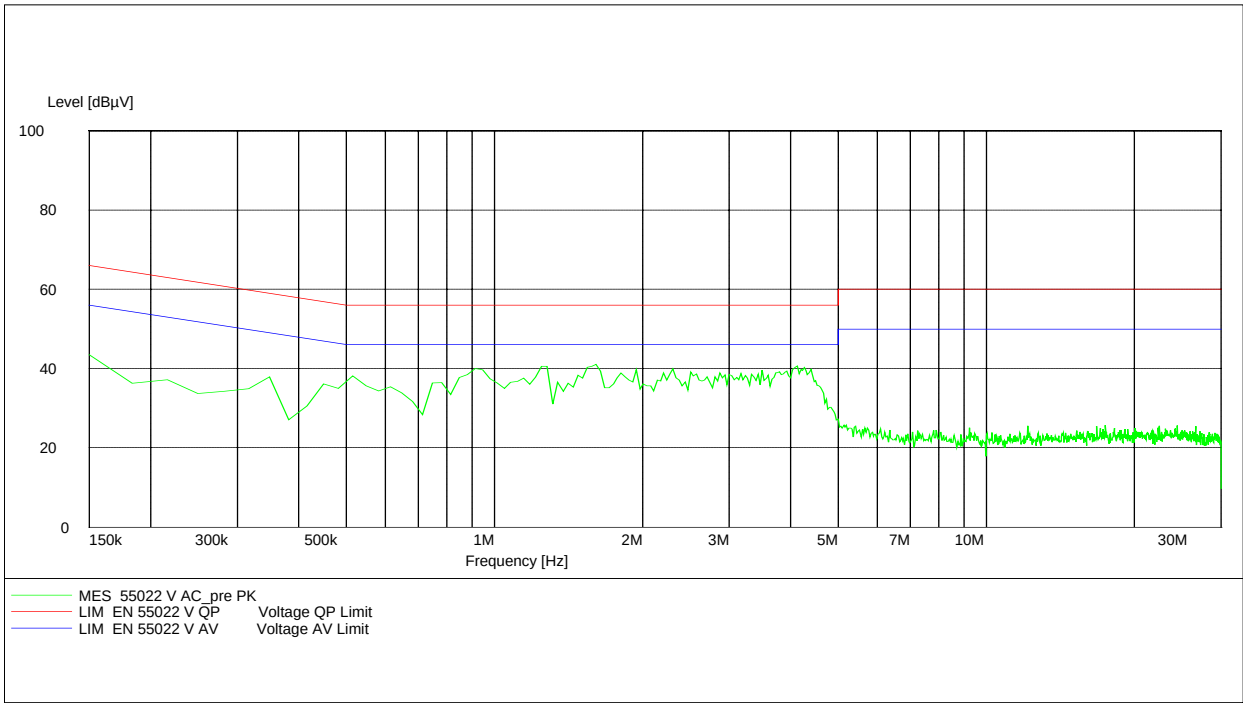
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24; 64

Conducted emissions § 15.107/207

```
EUT:                  PE2030 A
Manufacturer:         LG Electronic Inc.
Operating Condition:  Idle mode with charger PHIHONG
Test Site:            Room 006
Operator:             Berg
Test Specification:   FCC Part 15
Comment:
Start of Test:        29.04.03 / 14:37:53
```

SCAN TABLE: "EN 55022 V"

Short Description:			Voltage Mains 1.60				
Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer	
150.0 kHz	30.0 MHz	7.5 kHz	MaxPeak Average	100.0 ms	10 kHz	ESH3-Z5 L1 1458	



Limit § 15.207

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* **Decreases with the logarithm of the frequency.**

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24; 64

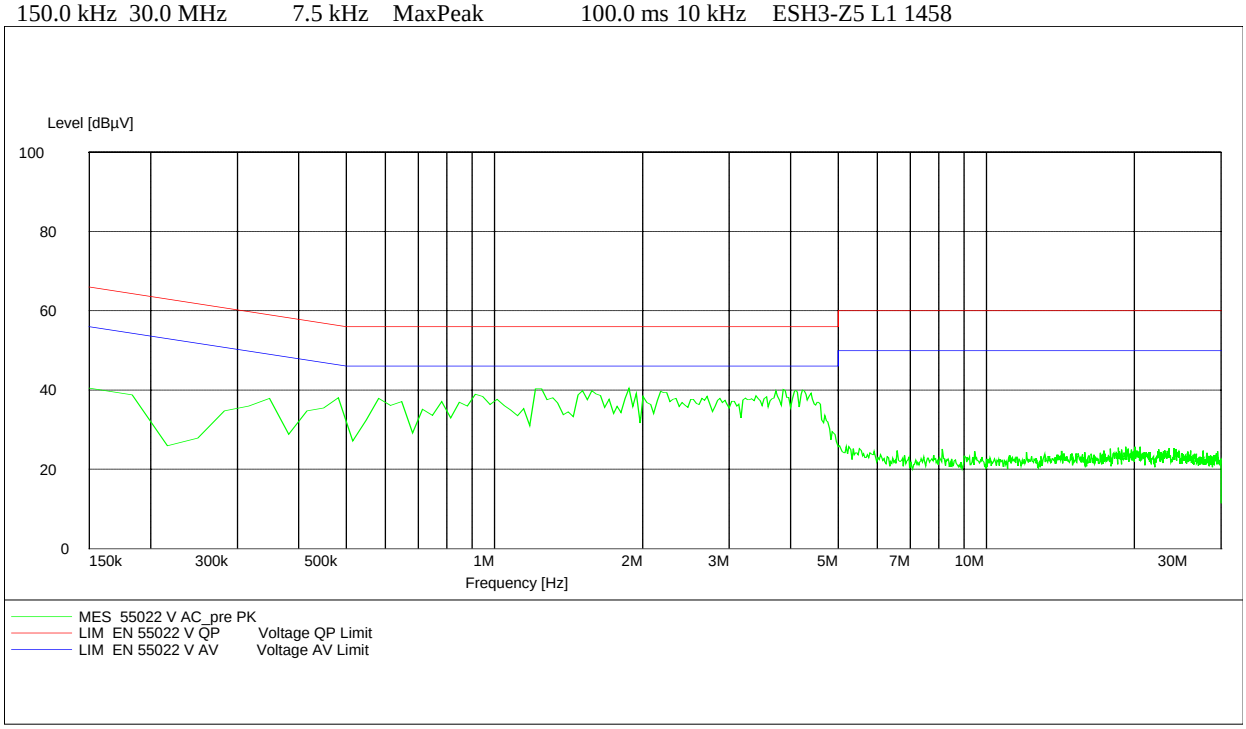
Conducted emissions§ 15.107/207

```
EUT:                  PE2030 A
Manufacturer:         LG Electronics Inc.
Operating Condition:  Tx mode with Charger PHIHONG and Samsung Battery
Test Site:            Room 006
Operator:             M.Berg
Test Specification:   FCC Part 15
Comment:
Start of Test:        29.04.03 / 14:44:55
```

SCAN TABLE: "EN 55022 V"

Short Description: Voltage Mains 1.60

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	7.5 kHz	MaxPeak	100.0 ms	10 kHz	ESH3-Z5 L1 1458



Limit § 15.207

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5-30	60	50

*** Decreases with the logarithm of the frequency.**

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24; 64

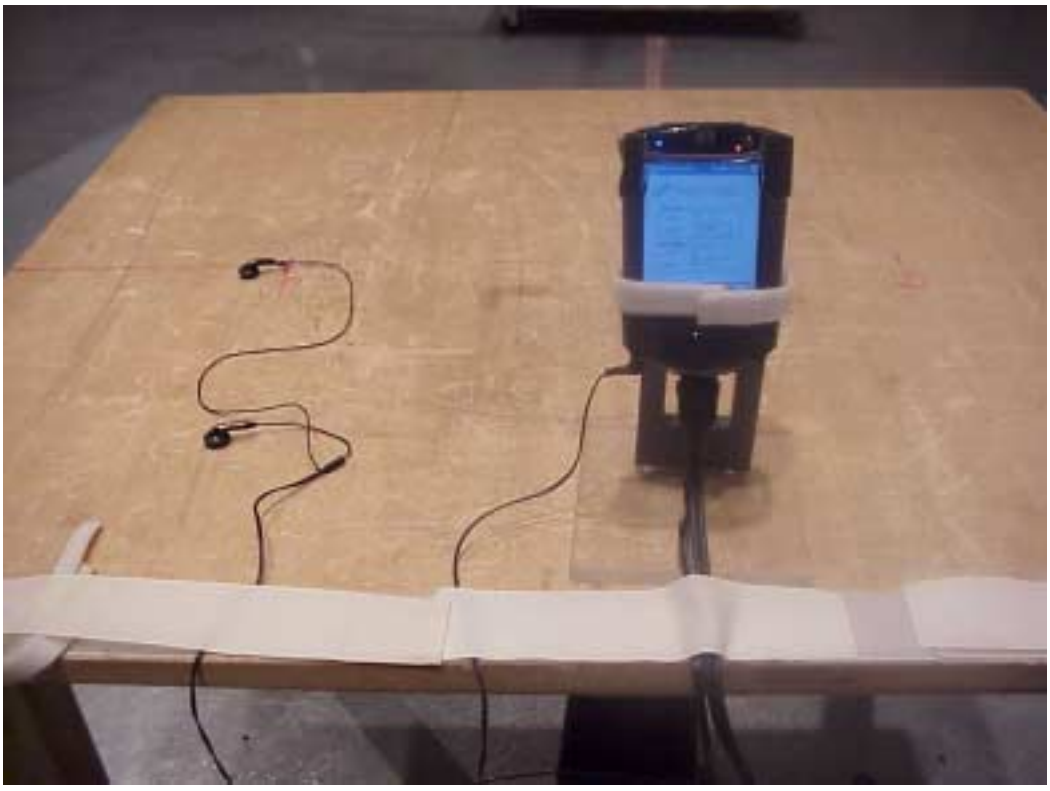
TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

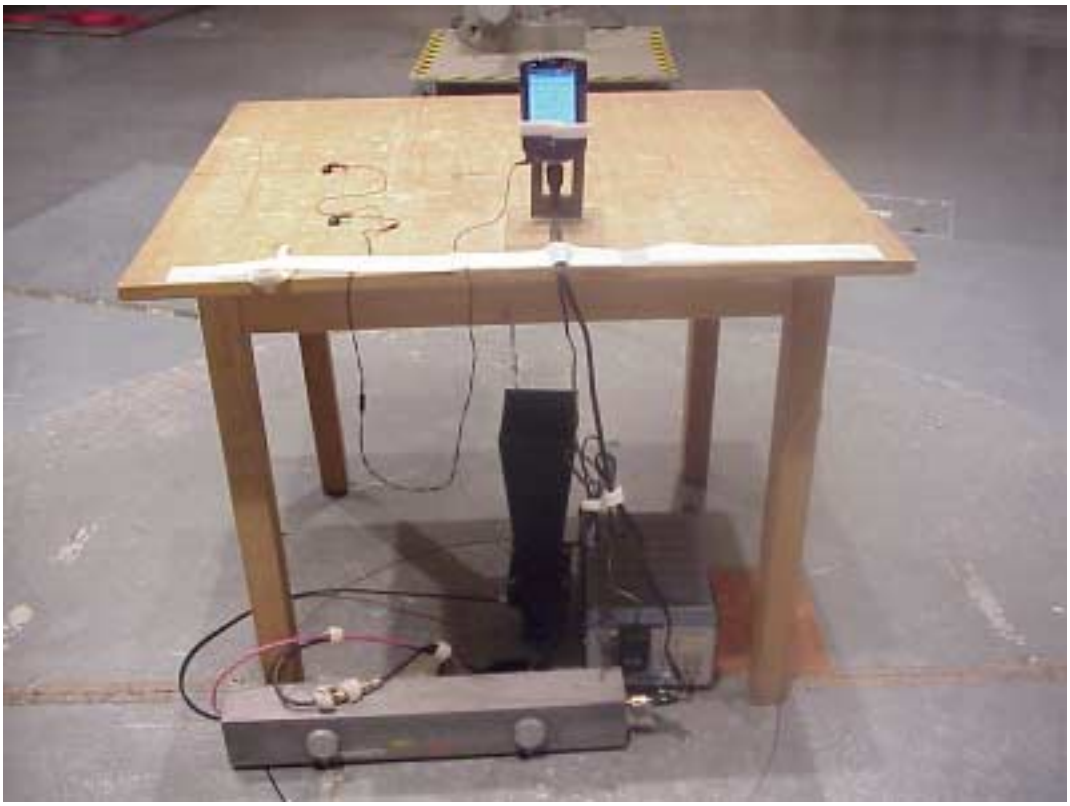
To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
01	Spectrum Analyzer	8566 A	Hewlett-Packard	1925A00257
02	Analyzer Display	8566 A	Hewlett-Packard	1925A00860
03	Oscilloscope	7633	Tektronix	230054
04	Radio Analyzer	CMTA 54	Rohde & Schwarz	894 043/010
05	System Power Supply	6038 A	Hewlett-Packard	2848A07027
06	Signal Generator	8111 A	Hewlett-Packard	2215G00867
07	Signal Generator	8662 A	Hewlett-Packard	2224A01012
08	Funktionsgenerator	AFGU	Rohde & Schwarz	862 480/032
09	Regeltrenntrafo	MPL	Erfi	91350
10	Netznachbildung	NNLA 8120	Schwarzbeck	8120331
11	Relais-Matrix	PSU	Rohde & Schwarz	893 285/020
12	Power-Meter	436 A	Hewlett-Packard	2101A12378
13	Power-Sensor	8484 A	Hewlett-Packard	2237A10156
14	Power-Sensor	8482 A	Hewlett-Packard	2237A00616
15	Modulationsmeter	9008	Racal-Dana	2647
16	Frequenzzähler	5340 A	Hewlett-Packard	1532A03899
17	Absorber Schirmkabine	---	MWB	87400/002
18	Spectrum Analyzer	85660 B	Hewlett-Packard	2747A05306
19	Analyzer Display	85662 A	Hewlett-Packard	2816A16541
20	Quasi Peak Adapter	85650 A	Hewlett-Packard	2811A01131
21	RF-Preselector	85685 A	Hewlett-Packard	2833A00768
22	Biconical Antenne	3104	Emco	3758
23	Log. Per. Antenne	3146	Emco	2130
24	Double Ridge Horn	3115	Emco	3088
25	EMI-Testreceiver	ESAI	Rohde & Schwarz	863 180/013
26	EMI-Analyzer-Display	ESAI-D	Rohde & Schwarz	862 771/008
27	Biconical Antenne	HK 116	Rohde & Schwarz	888 945/013
28	Log. Per. Antenne	HL 223	Rohde & Schwarz	825 584/002
29	Relais-Switch-Unit	RSU	Rohde & Schwarz	375 339/002
30	Highpass	HM985955	FSY Microwave	001
31	Amplifier	P42-GA29	Tron-Tech	B 23602
32	Absorber Schirmkabine		Frankonia	
33	Steuerrechner	PSM 7	Rohde & Schwarz	834 621/004
34	EMI Test Reciever	ESMI	Rohde & Schwarz	827 063/010
35	EMI Test Receiver	Display	Rohde & Schwarz	829 808/010

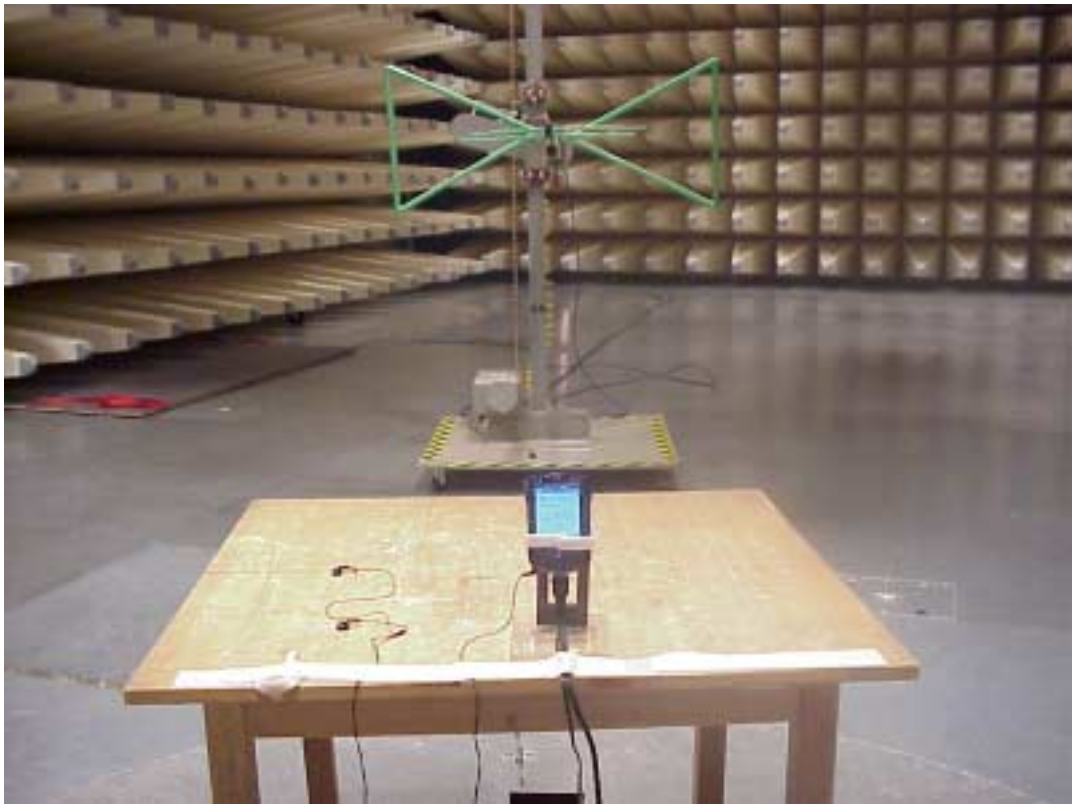
No	Instrument/Ancillary	Type	Manufacturer	Serial No.
36	Controler	HD 100	Deisel	100/322/93
37	Relais Matrix	PSN	Rohde & Schwarz	829 065/003
38	Control Unit	GB 016 A2	Rohde & Schwarz	344 122/008
39	Relais Switch Unit	RSU	Rohde & Schwarz	316 790/001
40	Power Supply	6032A	Hewlett Packard	2846A04063
41	Spektrum Monitor	EZM	Rohde & Schwarz	883 720/006
42	Meßempfänger	ESH 3	Rohde & Schwarz	890 174/002
43	Meßempfänger	ESVP	Rohde & Schwarz	891 752/005
44	Biconi Ant. 20-300MHz	HK 116	Rohde & Schwarz	833 162/011
45	Logper Ant. 0.3-1 GHz	HL 223	Rohde & Schwarz	832 914/010
46	Amplifier 0.1-4 GHz	AFS4	Miteq Inc.	206461
47	Logper Ant. 1-18 GHz	HL 024 A2	Rohde & Schwarz	342 662/002
48	Polarisationsnetzwerk	HL 024 Z1	Rohde & Schwarz	341 570/002
49	Double Ridge G Horn Antenne 1-26.5 GHz	3115	EMCO	9107-3696
50	Microw. Sys. Amplifier 0.5- 26.5 GHz	8317A	Hewlett Packard	3123A00105
51	Audio Analyzer	UPD	Rohde & Schwarz	1030.7500.04
52	Steuerrechner	PSM 7	Rohde & Schwarz	883 086/026
53	DC V-Netzwerk	ESH3-Z6	Rohde & Schwarz	861 406/005
54	DC V-Netzwerk	ESH3-Z6	Rohde & Schwarz	893 689/012
55	AC 2 Phasen V-Netzwerk	ESH3-Z5	Rohde & Schwarz	861 189/014
56	AC 2 Phasen V-Netzwerk	ESH3-Z5	Rohde & Schwarz	894 981/019
57	AC-3 Phasen V-Netzwerk	ESH2-Z5	Rohde & Schwarz	882 394/007
58	Stromversorgung	6032A	Rohde & Schwarz	2933A05441
59	HF-Test Empfänger	ESVP.52	Rohde & Schwarz	881 487/021
60	Spectrum Monitor	EZM	Rohde & Schwarz	883 086/026
61	HF-Test Empfänger	ESH3	Rohde & Schwarz	881 515/002
62	Relais Matrix	PSU	Rohde & Schwarz	882 943/029
63	Relais Matrix	PSU	Rohde & Schwarz	828 628/007
64	Spectrum Analyzer	FSIQ 26	Rohde & Schwarz	119.6001.27
65	Spectrum Analyzer	HP 8565E	Hewlett Packard	3473A00773
66				

Test site
RADIATED EMISSIONS





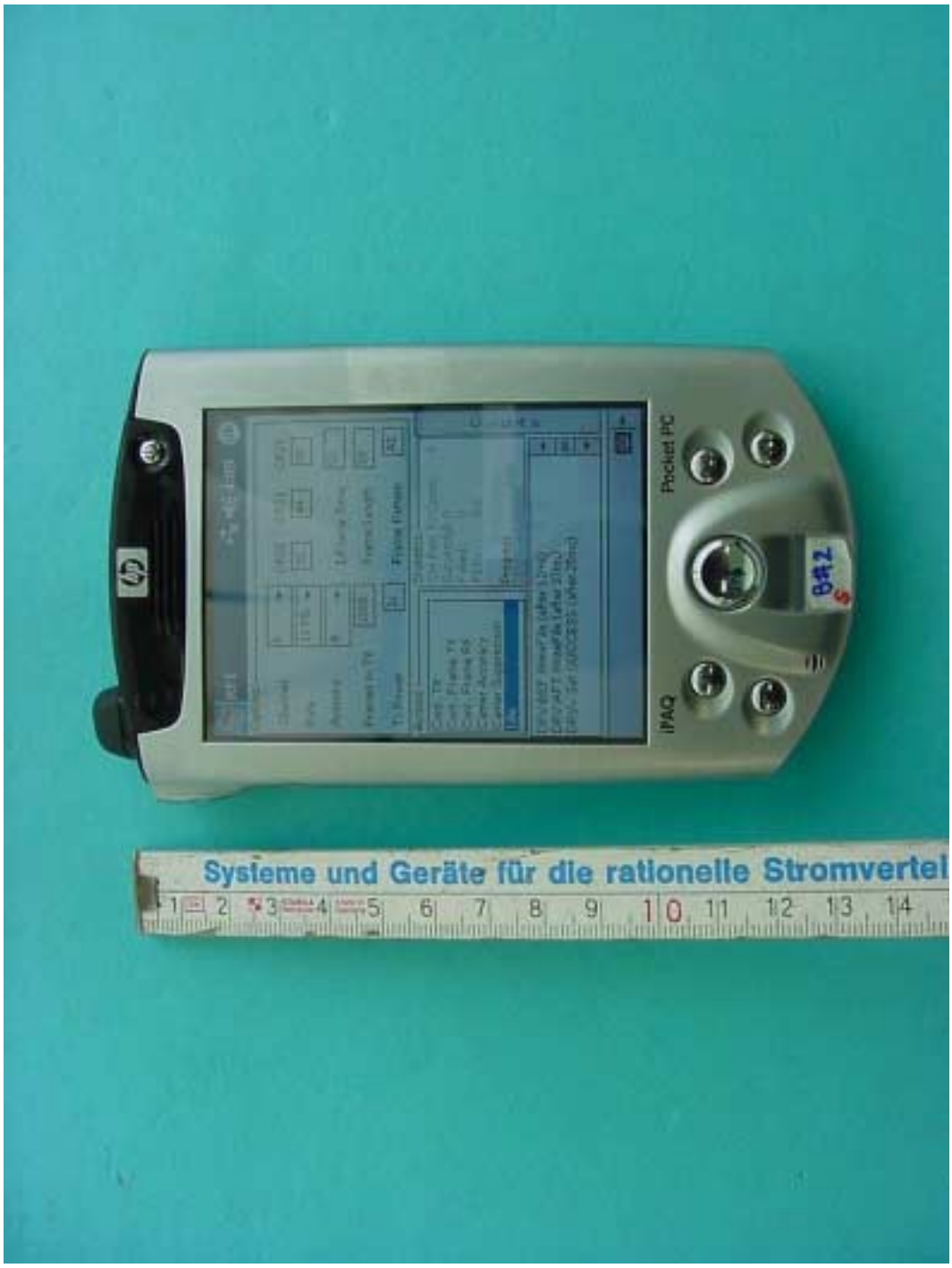
Test site
Radiated Emissions



Test site
Conducted emissions

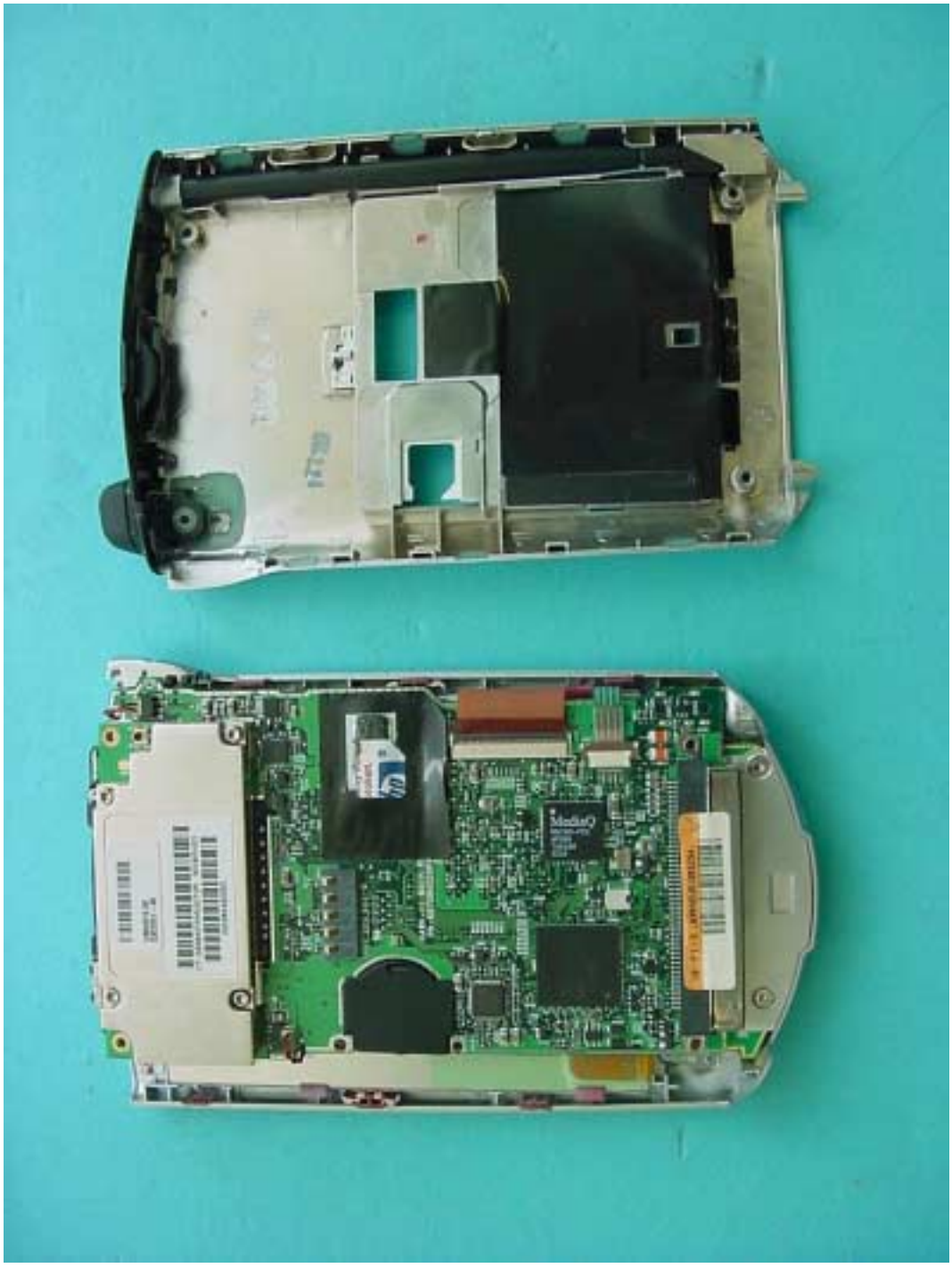
Test site
Conducted emissions

Photographs of the equipment



Photographs

Photographs



Photographs

Photographs
PDA with Sharp Corp. LCD Panel

Photographs
WLAN Module

Photographs
WLAN Module

Photographs
LCD panel Philps Electronics

Photographs
LCD panel Philps Electronics

Photographs
SAMSUNG Battery

Photographs
DANIONICS Battery

Photographs
AC/DC Adapter PHIHONG

Photographs
AC/DC Adapter DELTA ELECTRONICS INC.

Photographs
Headphone

Photographs
Y-Cable

Photographs
Y-Cable

Photographs
Cradle (Docking)

Photographs