CETECOM ICT Services GmbH

Radio Satellite Communication
Untertürkheimer Straße 6-10 . D-66117 Saarbrücken
Telefon: +49 (0)681 598-0 Telefax: - 9075

Recognized by the
Federal Communications Commission
Anechoic chamber registration no.: 90462 (FCC)
Anechoic chamber registration no.: 3463 (IC)
TCB ID: DE 0001

Accredited by the
German Accreditation Council
DAR–Registration Number
TTI–P–G 081/94-D0

Independent ETSI
compliance test house

Accredited Bluetooth™ Test Facility (BQTF)

Test report no.: 4-1220-19-03/04
Applicant: Sagem
Type A 2003aw
FCC Part 22/24/15
FCC ID: M9H95A03AW

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 generalizations 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
Telephone : + 49 681 598 - 9100
Telefax : + 49 681 598 - 9075
E-mail : info@ict.cetecom.de
Internet : www.cetecom-ict.de

Accredited testing laboratory
The test laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025.
DAR registration number: TTI-P-G-081/94-D0
Listed by : Federal Communications Commission (FCC)
Identification/Registration No : 90462
Accredited Bluetooth™ Test Facility (BQTF)
BLUETOOTH™ is a trademark owned by Bluetooth SIG, Inc. and licensed to CETECOM

1.3 Details of applicant

Name : Sagem SA
Street : 2-4, rue du Petit Albi
City : 95800 Cergy Saint – Christophe
Country : France
Telephone : + 33 1 34 25 37 37
Telefax : + 33 1 34 25 74 16
Contact : Jean Marquet
Telephone : + 33 1 34 25 37 37
e-mail : jean.marquet@sagem.com

1.4 Application details

Date of test : 2004-04-16
Date of receipt of test item : 2004-04-14
Date of receipt of application : 2004-04-14

1.5 Test item

Type of equipment	:	GSM/Dual band mobile phone 850/1900
Type designation	:	A2003aw
Manufacturer	:	applicant
Street	:	
City	:	
Country	:	
Serial numbers	:	

Additional information	**:**	
Frequency	:	1850.2 – 1909.8 MHz and 824.2 – 848.8 MHz
Type of modulation	:	300KGXW / 200KQ7W
Number of channels	:	300 (PCS1900) and 125 (PCS850)
Antenna	:	Integral antenna
Power supply (normal)	:	3,9 V DC Li-Polymer Battery
Output power GSM 850	:	u.a.
Output power GSM 1 900	:	u.a.
FCC – ID	:	M9H95A03AW
Hardware	:	V0x
Software	:	J3, FK

Test set up

Mobile; S/N: 2272040185; IMEI: 35181695000684-5
AC/DC Travel Adapter; S/N: 187849535

1.6 Test standards: FCC Part 24, 22
FCC Part 15

2 Technical test

For Part 24/22 we use the substitution method (TIA/EIA 603).

All measurements in this report are done in GSM mode. Device is able to transmit data in GPRS mode also. But because the current measurements are performed in PEAK mode no other results from GPRS mode are possible. The only different is the modulation average power, which is 3 dB higher (by using 2 timeslots in the Up-link).

Remarks:

Test setup:
The radiated measurements were performed with an AC/DC charging unit

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

FINAL VERDICT: PASS

Technical responsibility for area of testing :

2004-04-21	RSC 8414	Ames H.	
Date	Section	Name	Signature

Technical responsibility for area of testing :

2004-04-21	RSC 8412	Hausknecht D.	
Date	Section	Name	Signature

TEST REPORT REFERENCE

LIST OF MEASUREMENTS

PARAMETER TO BE MEASURED **PAGE**

PART PCS 850 / 1900

RESULTS OF OPEN FIELD RADIATED TEST FOR FCC-22

EMISSION LIMITATIONS					
Ch 128					
f (MHz)		Amplitude of emission (dBm)	limit max. allowed emission power (dBm)	Limit dBm	Results
No spurious found				**- 13.0**	**-**
				-	**-**
Measurement uncertainty			± 0.5dB		

EMISSION LIMITATIONS					
Ch 189					
f (MHz)		Amplitude of emission (dBm)	limit max. allowed emission power (dBm)	Limit dBm	Results
1 672		**- 39.3**		**- 13.0**	**complies**
-	**-**	**-**		**-**	**-**
Measurement uncertainty			± 0.5dB		

EMISSION LIMITATIONS					
Ch 251					
f (MHz)		Amplitude of emission (dBm)	limit max. allowed emission power (dBm)	Limit dBm	Results
878		**- 33.6**		**- 13.0**	**complies**
-	**-**	**-**		**-**	**-**
Measurement uncertainty			± 0.5dB		

RESULTS OF OPEN FIELD RADIATED TEST FOR FCC-22 / 24:
The final open field radiated levels are presented on the next pages.
All measurements were done in horizontal and vertical polarization, the plots show the worst case.
As can be seen from this data, the emissions from the test item were within the specification limit.

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

RESULTS OF OPEN FIELD RADIATED TEST FOR FCC-24:

EMISSION LIMITATIONS					
Ch 512					
f (MHz)		Amplitude of emission (dBm)	limit max. allowed emission power (dBm)	Limit (dBm)	Results
5 558		**- 47.3**		**- 13.0**	**complies**
-		-		-	-
Measurement uncertainty			± 0.5dB		

EMISSION LIMITATIONS					
Ch 661					
f (MHz)		Amplitude of emission (dBm)	limit max. allowed emission power (dBm)	Limit (dBm)	Results
3 764		**- 25.9**		**- 13.0**	**complies**
5 647		**- 45.3**		**- 13.0**	**complies**
Measurement uncertainty			± 0.5dB		

EMISSION LIMITATIONS					
Ch 810					
f (MHz)		Amplitude of emission (dBm)	limit max. allowed emission power (dBm)	Limit (dBm)	Results
No spurious found				**- 13.0**	**-**
-		-		-	-
Measurement uncertainty			± 0.5dB		

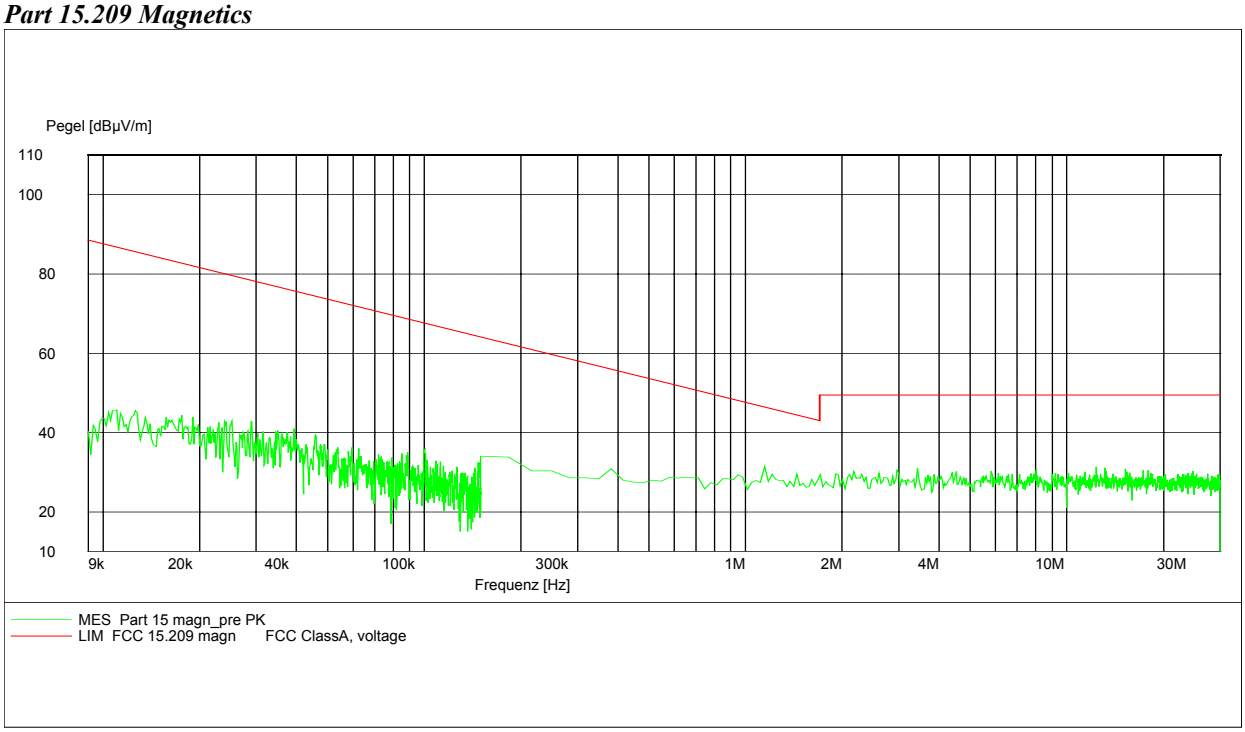
RESULTS OF OPEN FIELD RADIATED TEST FOR FCC-22 / 24:
The final open field radiated levels are presented on the next pages.
All measurements were done in horizontal and vertical polarization, the plots show the worst case.
As can be seen from this data, the emissions from the test item were within the specification limit.

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

Part 22 Traffic mode
Channel 128 - < 30 MHz (valid for all channels)

Plot No.: 01

Part 15.209 Magnetics



For peak measurement we use 100 kHz RBW/VBW
For CISPR QP measurement we use 200 Hz from 9 kHz to 150kHz
9 kHz from 150 kHz to 30 MHz

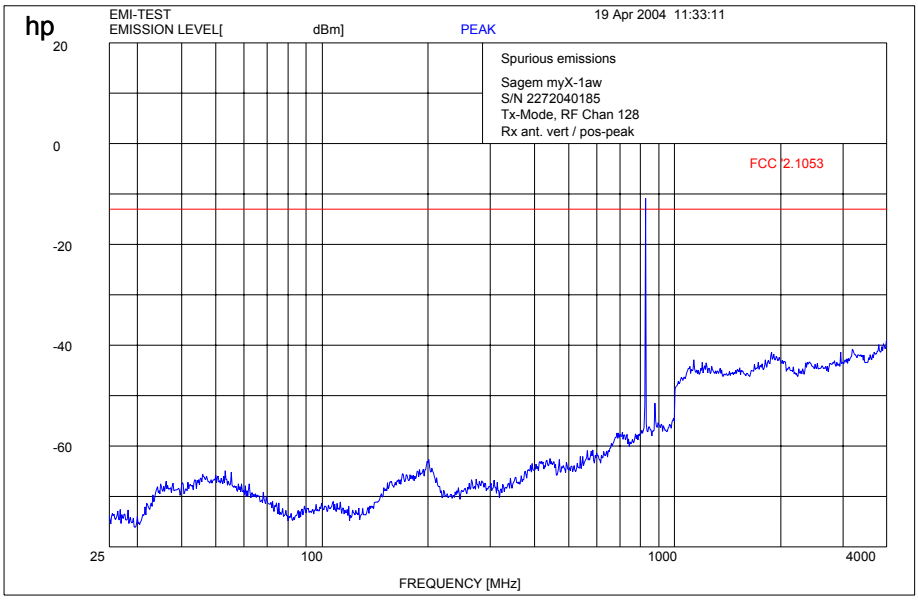
Limits **SUBCLAUSE § 15.109**

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

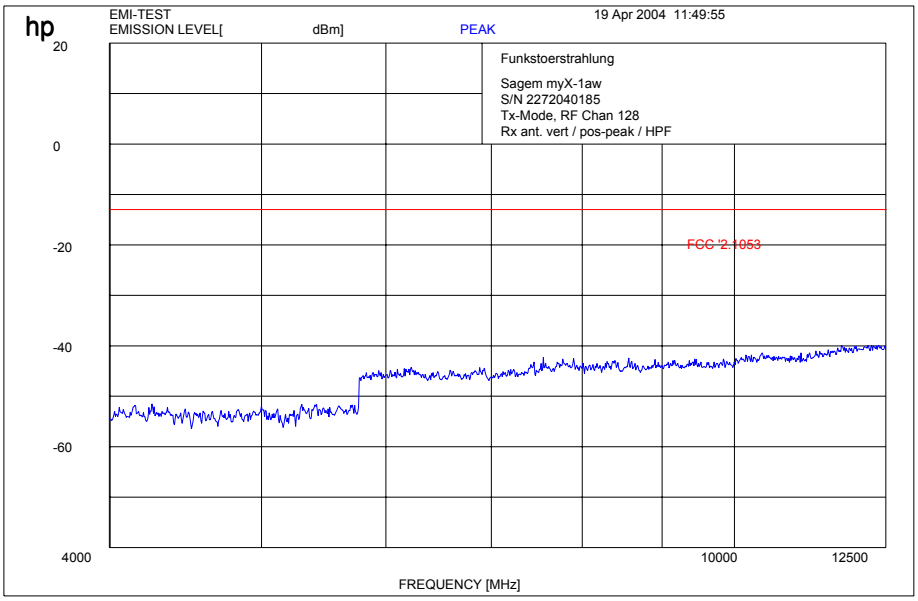
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

Part 22 Traffic mode
Channel 128 - 30 MHz – 12 GHz

Plot No.:02



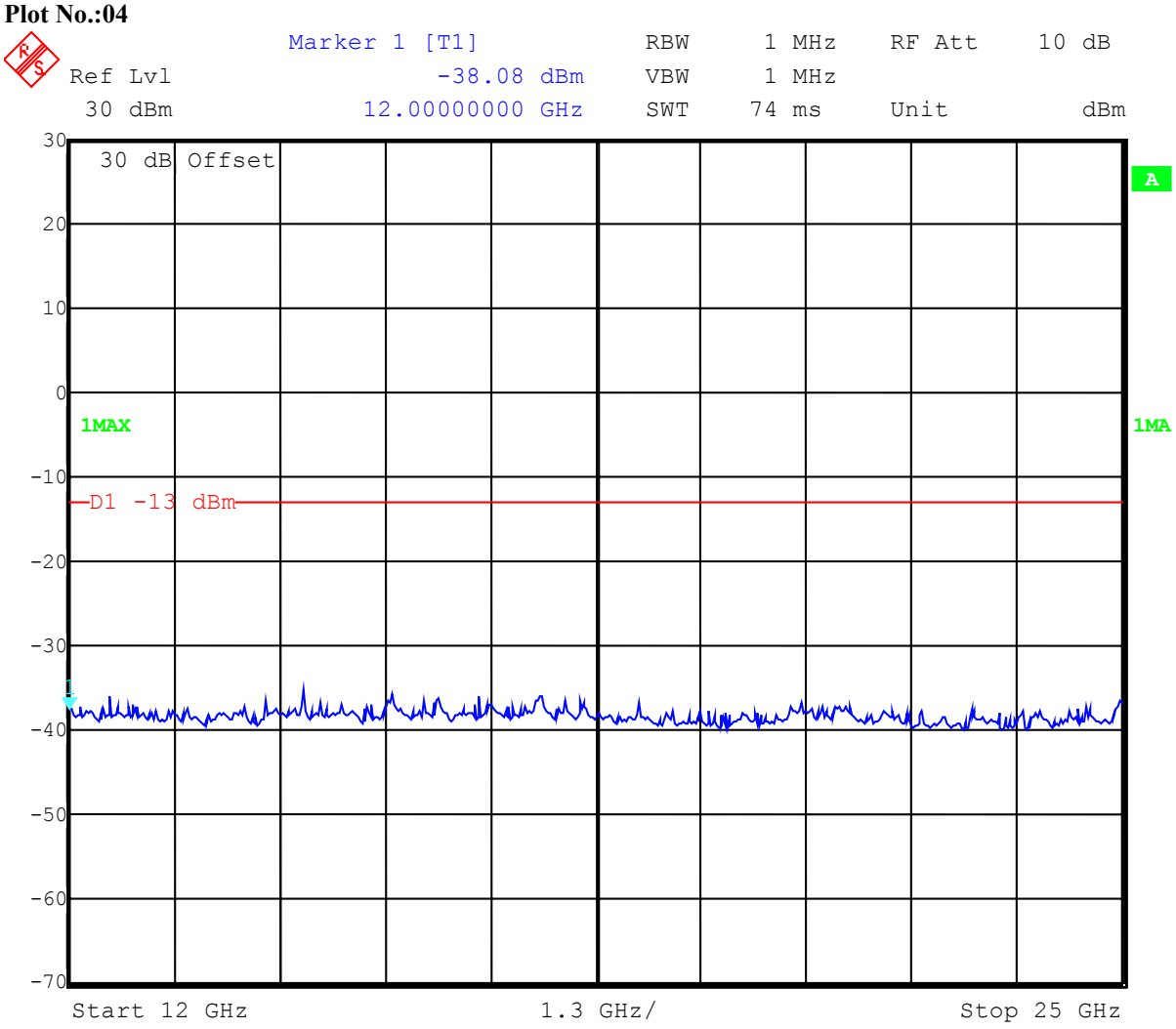
Plot No.:03



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

Part 22 Traffic mode
Channel 128 - 12 GHz – 25 GHz (valid for all channels)

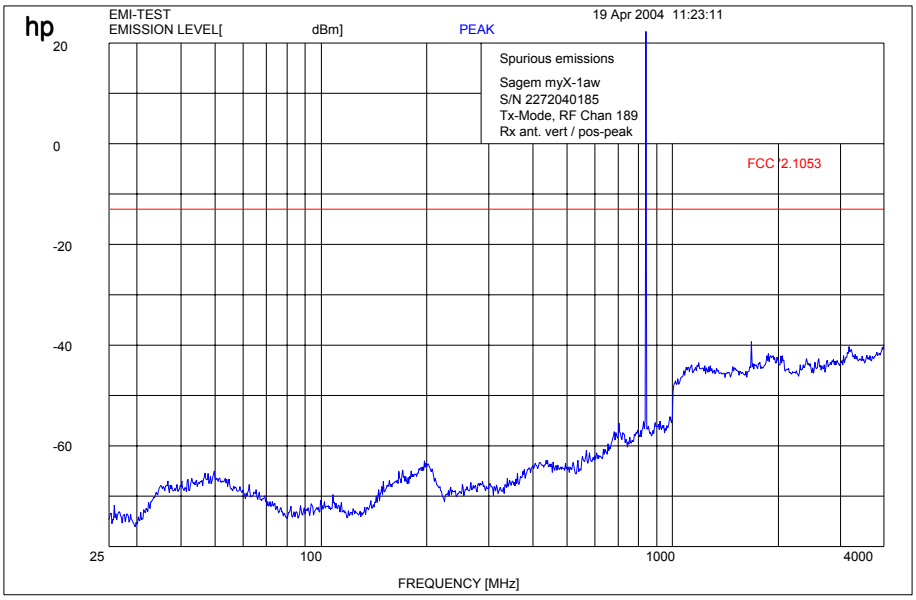
Plot No.:04



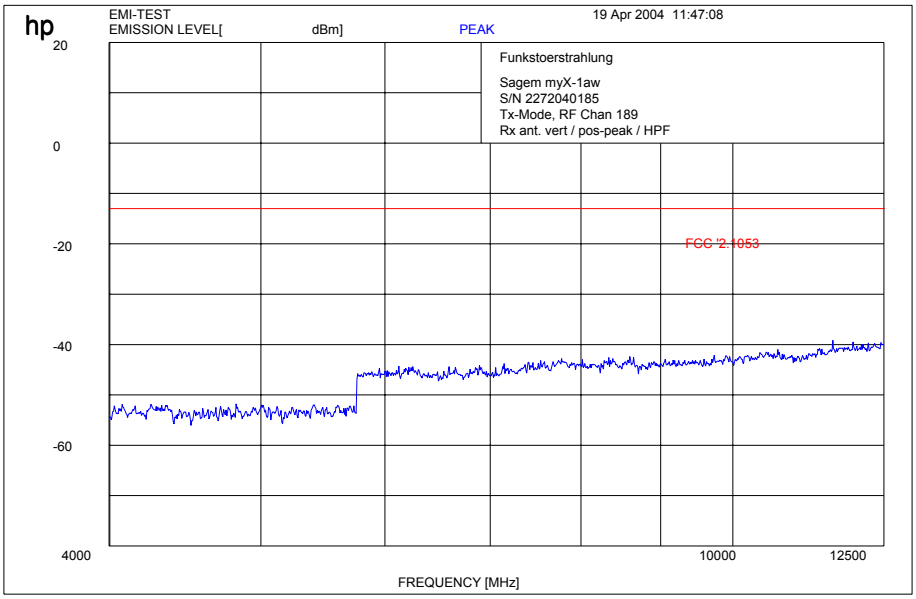
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

Part 22 Traffic mode
Channel 189 - 30 MHz – 12 GHz

Plot No.:05



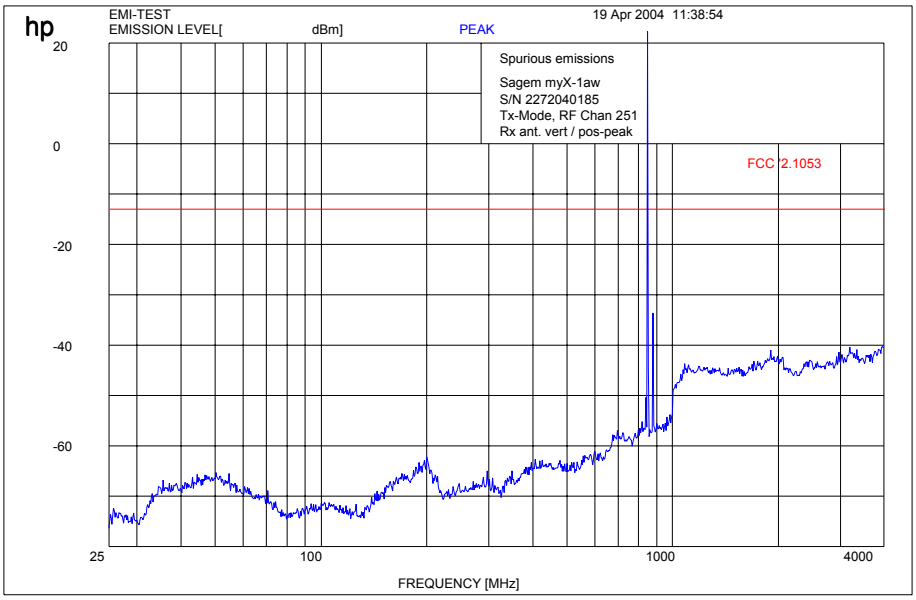
Plot No.:06



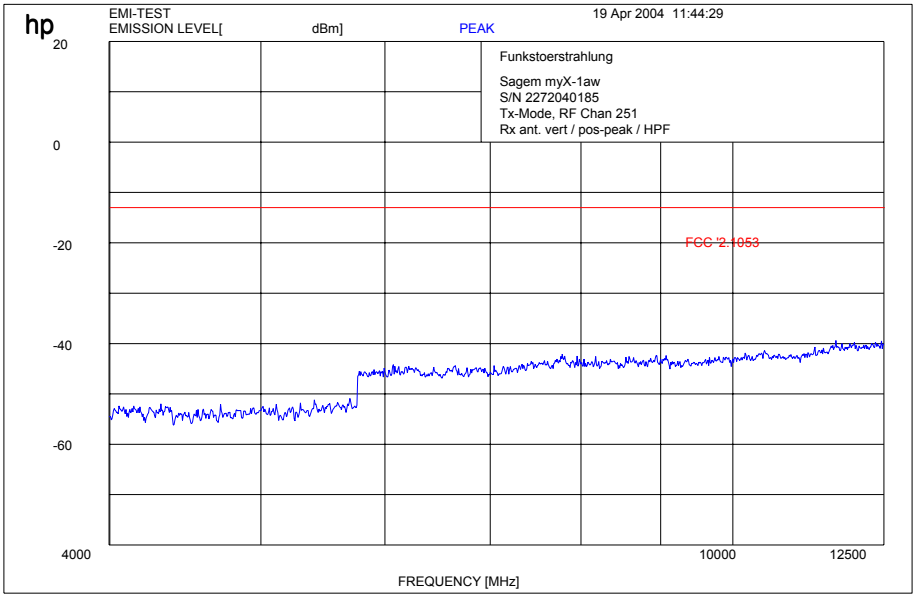
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

Part 22 Traffic mode
Channel 251 - 30 MHz – 12 GHz

Plot No.:07



Plot No.:08

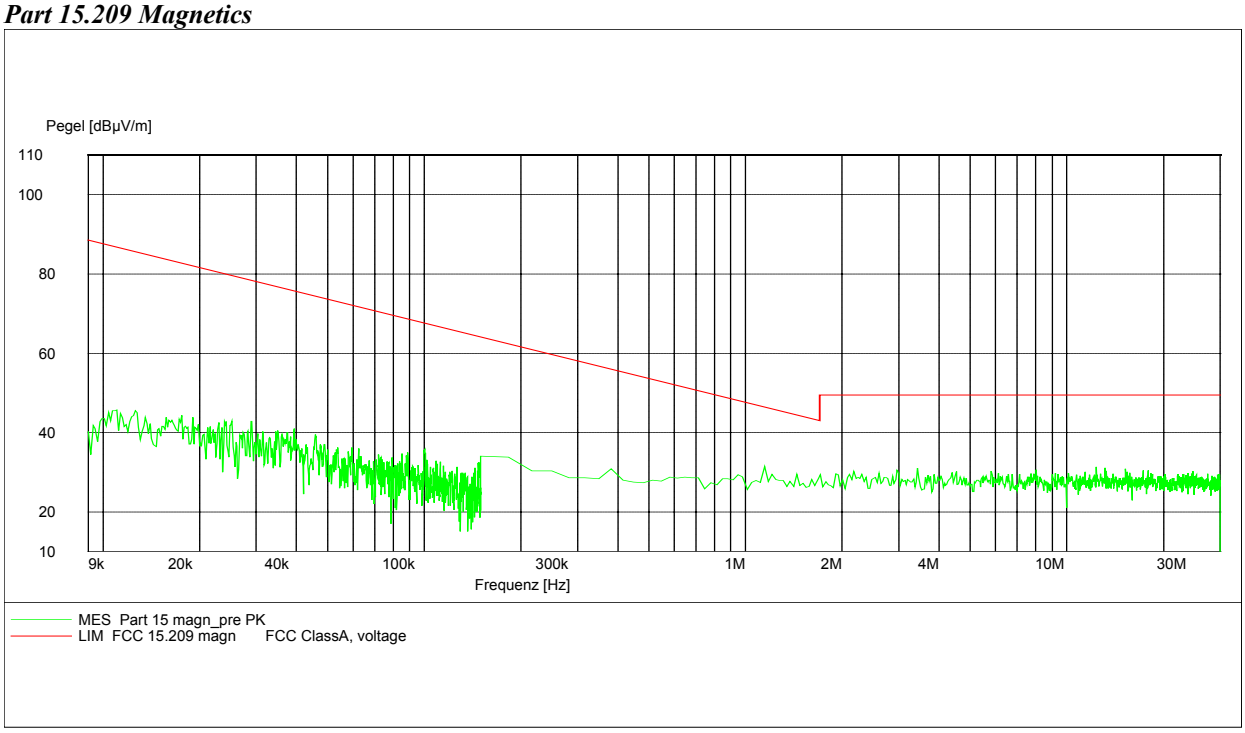


REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

Part 24 Traffic mode
Channel 512 - < 30 MHz (valid for all channels)

Plot No.: 09

Part 15.209 Magnetics



For peak measurement we use 100 kHz RBW/VBW
For CISPR QP measurement we use 200 Hz from 9 kHz to 150kHz
9 kHz from 150 kHz to 30 MHz

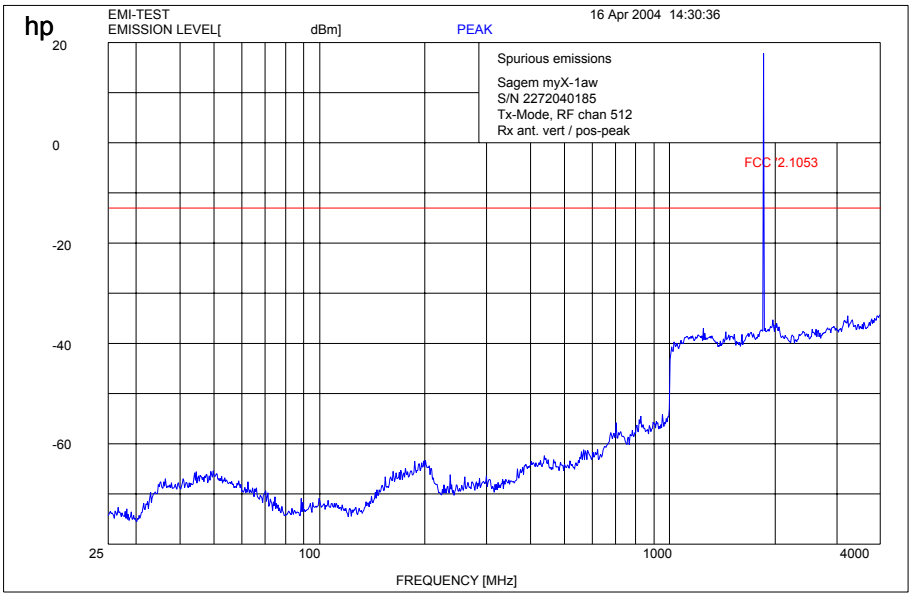
Limits **SUBCLAUSE § 15.109**

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

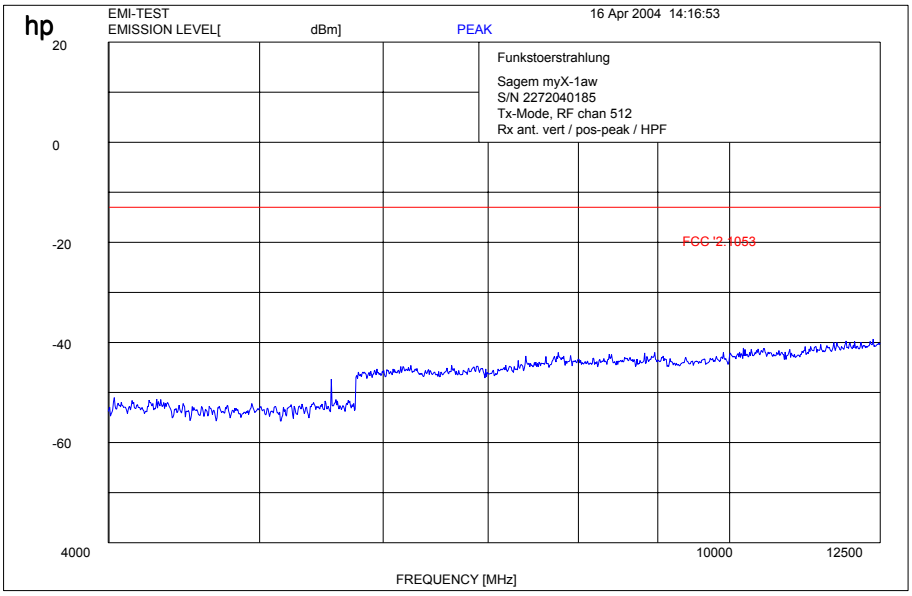
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

Part 24 Traffic mode
Channel 512 - 30 MHz – 12 GHz

Plot No.:10



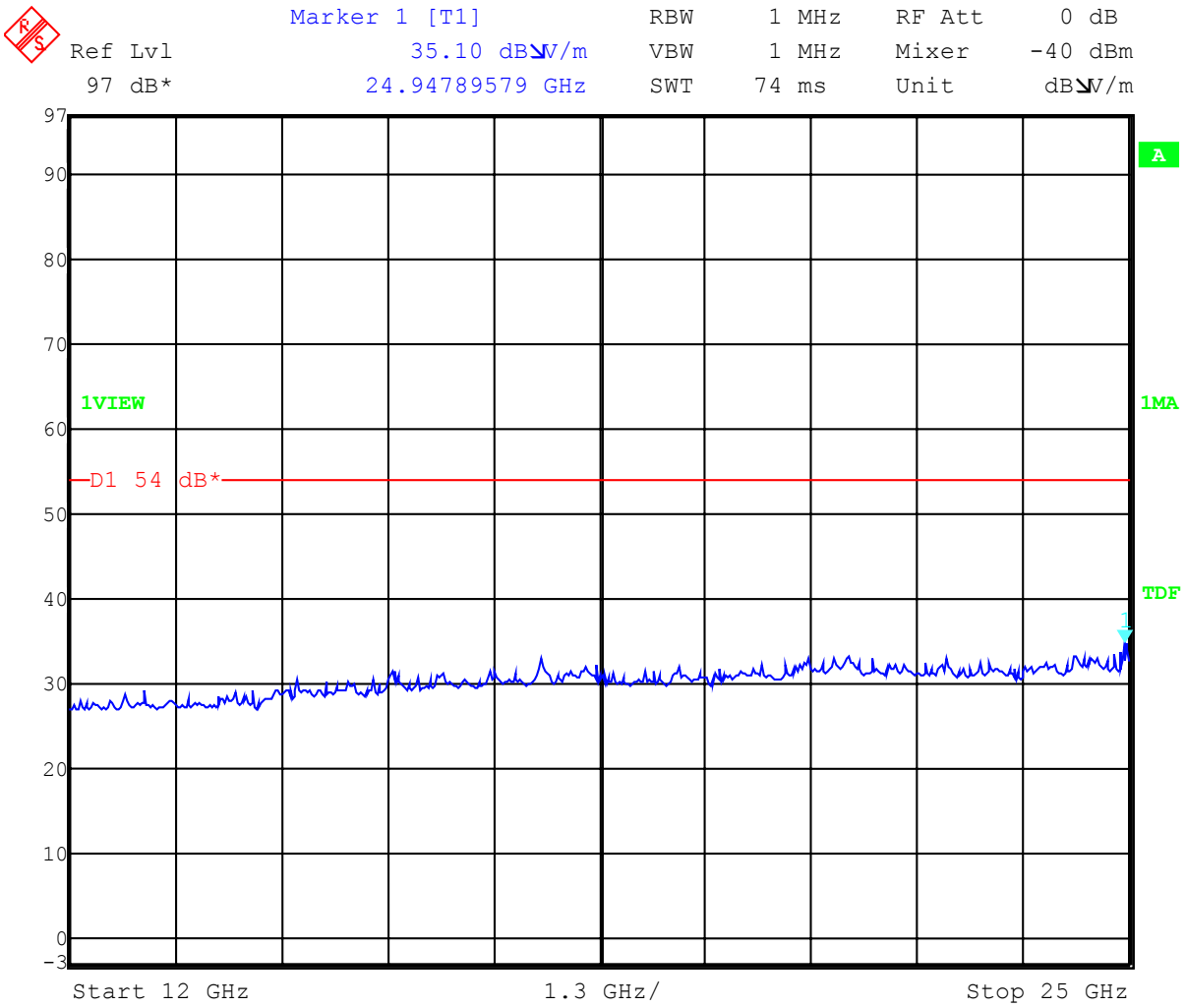
Plot No.:11



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

Part 24 Traffic mode
Channel 512 - 12 GHz – 25 GHz (valid for all channels)

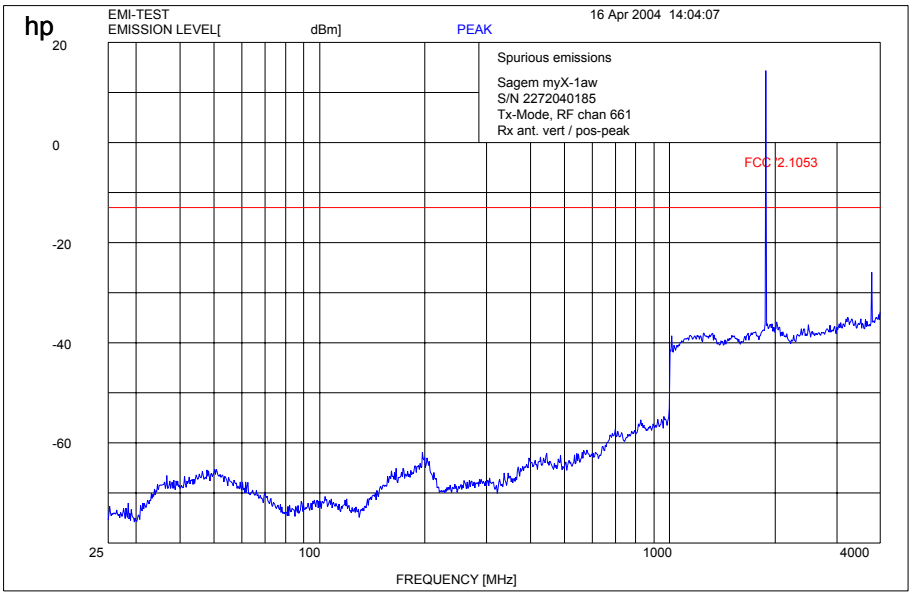
Plot No.:12



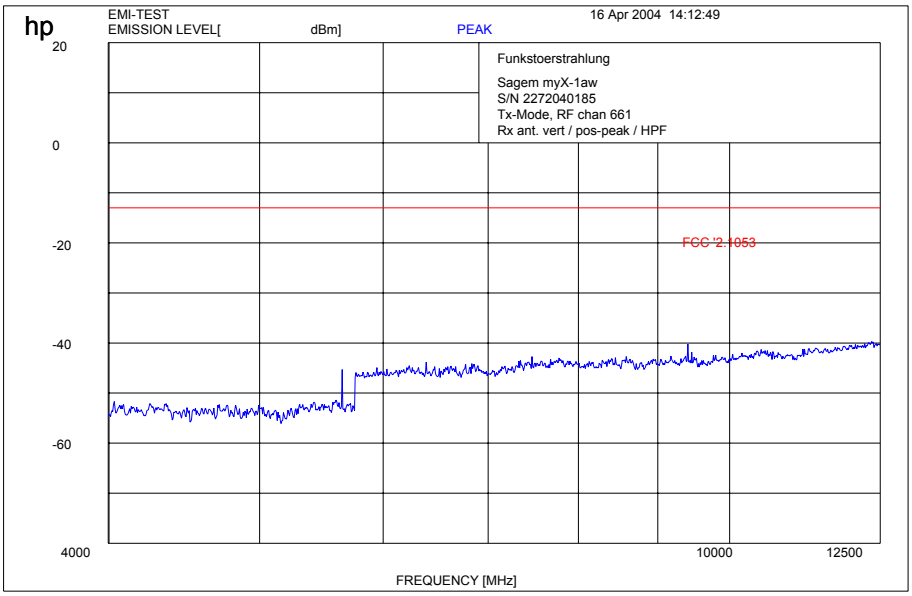
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

Part 24 Traffic mode
Channel 661 - 30 MHz – 12 GHz

Plot No.:13



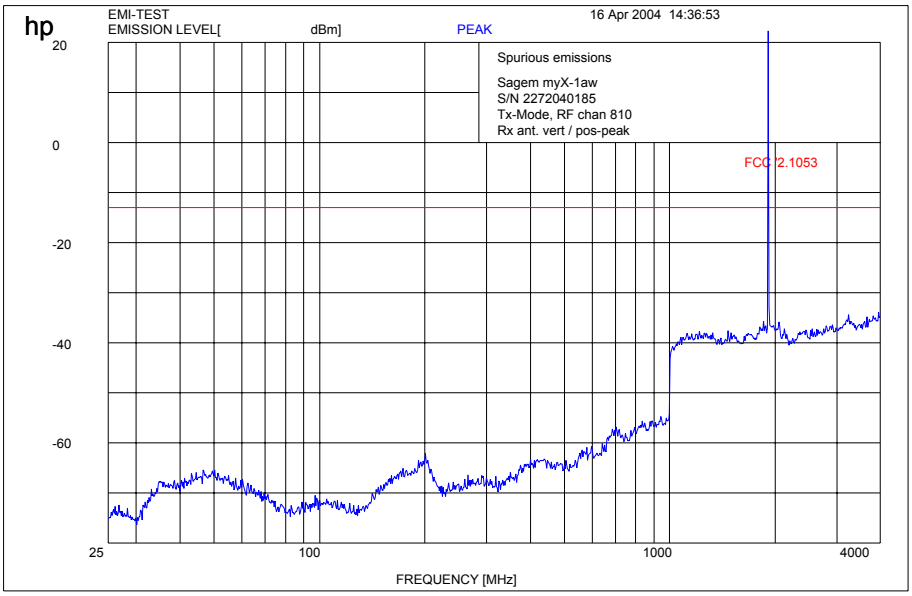
Plot No.:14



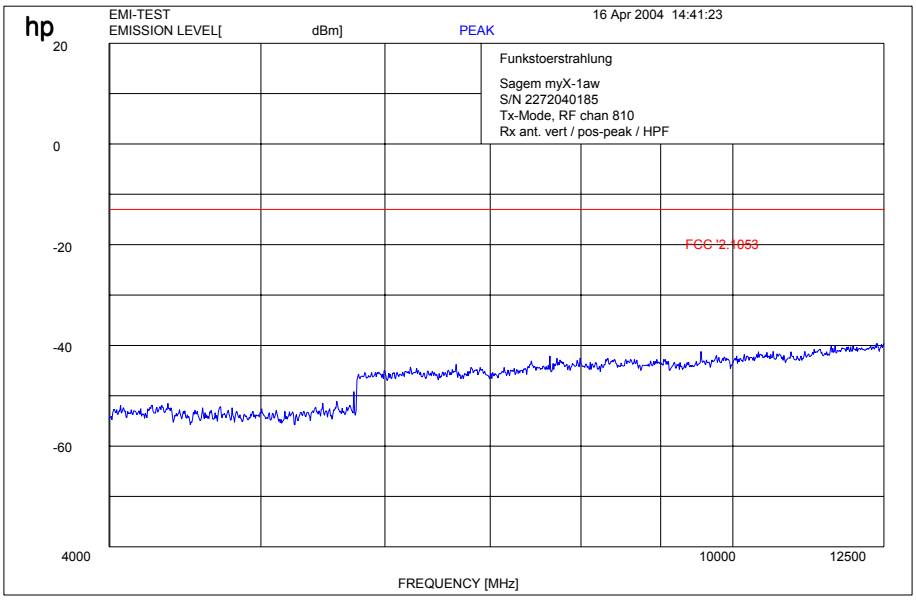
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

Part 24 Traffic mode
Channel 810 - 30 MHz – 12 GHz

Plot No.:15



Plot No.:16



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

RECEIVER SPURIOUS RADIATION **§ 15.109**

Radiated

SPURIOUS EMISSIONS LEVEL (µV/m)					
Ch 128			**CH 661c**		
f (MHz)	Detector	Level (µV/m)	f (MHz)	Detector	Level (µV/m)
no spurious found			**no spurious found**		
Measurement uncertainty			**±3 dB**		

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

H = Horizontal ; V= Vertical

Measurement distance see table

Limits **SUBCLAUSE § 15.109/209**

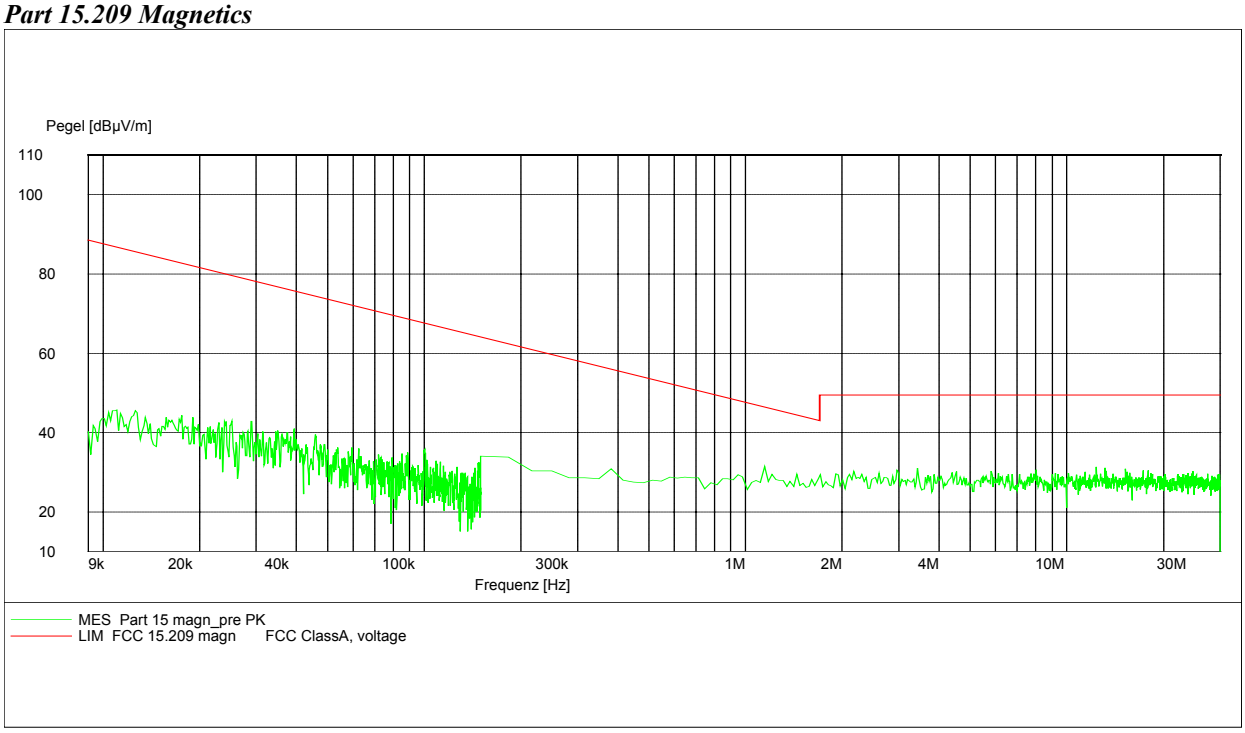
Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
0.009 – 0.490	**2400/F(kHz)**	**300**
0.490 – 1.705	**24000/F(kHz)**	**30**
1.705 – 30.0	**30**	**30**
30 - 88	**100**	**3**
88 - 216	**150**	**3**
216 - 960	**200**	**3**
above 960	**500**	**3**

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

Part 15 Idle mode
< 30 MHz (valid for all channels)

Plot No.: 17

Part 15.209 Magnetics



For peak measurement we use 100 kHz RBW/VBW
For CISPR QP measurement we use 200 Hz from 9 kHz to 150kHz
9 kHz from 150 kHz to 30 MHz

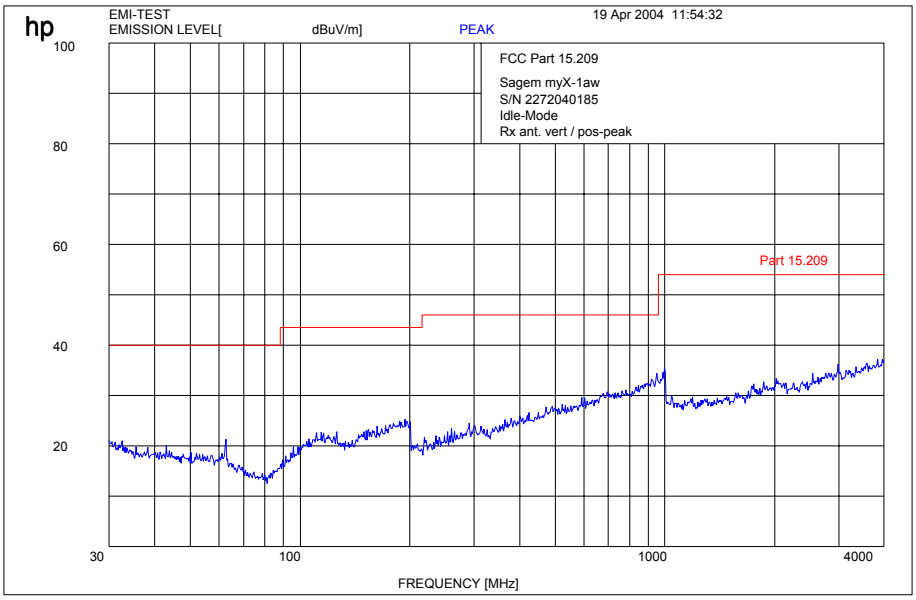
Limits **SUBCLAUSE § 15.109**

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

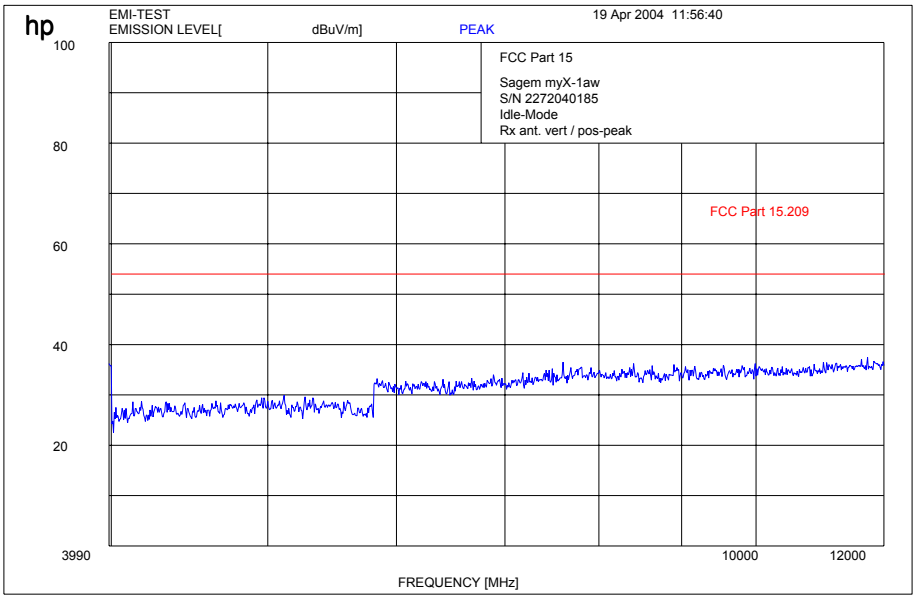
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 – 24, 64

Part 15 Idle mode
30 MHz – 12 GHz

Plot No.: 18



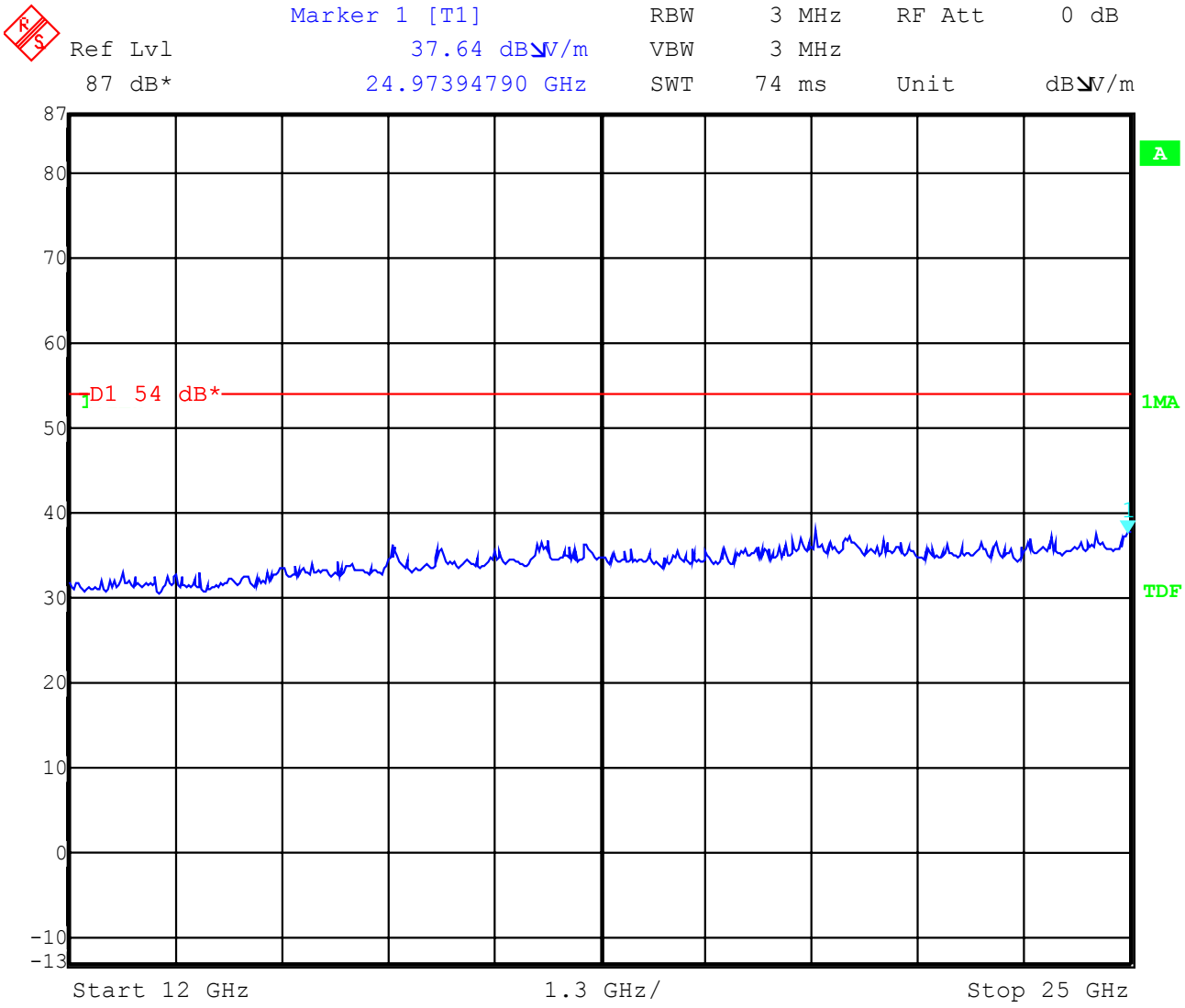
Plot No.:19



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

Part 15 Idle mode
12 GHz – 25 GHz

Plot No.:20



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 Communication 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	Function Generator	AFGU	Rohde & Schwarz	862 480/032
09	Regulating Transformer	MPL	Erfi	91350
10	LISN	NNLA 8120	Schwarzbeck	8120331
11	Relay-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	Modulation Meter	9008	Racal-Dana	2647
16	Frequency Counter	5340 A	Hewlett-Packard	1532A03899
17	Anechoic Chamber	---	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 Antenna	3104	Emco	3758
23	Log. Per. Antenna	3146	Emco	2130
24	Double Ridged 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 Antenna	HK 116	Rohde & Schwarz	888 945/013
28	Log. Per. Antenna	HL 223	Rohde & Schwarz	825 584/002
29	Relay-Switch-Unit	RSU	Rohde & Schwarz	375 339/002
30	Highpass	HM985955	FSY Microwave	001
31	Amplifier	P42-GA29	Tron-Tech	B 23602
32	Anechoic Chamber		Frankonia	
33	Control Computer	PSM 7	Rohde & Schwarz	834 621/004
34	EMI Test Receiver	ESMI	Rohde & Schwarz	827 063/010
35	EMI Test Receiver	Display	Rohde & Schwarz	829 808/010

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

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
36	Control Computer	HD 100	Deisel	100/322/93
37	Relay Matrix	PSN	Rohde & Schwarz	829 065/003
38	Control Unit	GB 016 A2	Rohde & Schwarz	344 122/008
39	Relay Switch Unit	RSU	Rohde & Schwarz	316 790/001
40	Power Supply	6032A	Hewlett Packard	2846A04063
41	Spectrum Monitor	EZM	Rohde & Schwarz	883 720/006
42	Measuring Receiver	ESH 3	Rohde & Schwarz	890 174/002
43	Measuring Receiver	ESVP	Rohde & Schwarz	891 752/005
44	Bicon 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	Polarisation Network	HL 024 Z1	Rohde & Schwarz	341 570/002
49	Double Ridged Horn Antenna 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	Controler	PSM 7	Rohde & Schwarz	883 086/026
53	DC V-Network	ESH3-Z6	Rohde & Schwarz	861 406/005
54	DC V-Network	ESH3-Z6	Rohde & Schwarz	893 689/012
55	AC 2 Phase V-Network	ESH3-Z5	Rohde & Schwarz	861 189/014
56	AC 2 Phase V-Network	ESH3-Z5	Rohde & Schwarz	894 981/019
57	AC-3 Phase V-Network	ESH2-Z5	Rohde & Schwarz	882 394/007
58	Power Supply	6032A	Rohde & Schwarz	2933A05441
59	RF-Test Receiver	ESVP.52	Rohde & Schwarz	881 487/021
60	Spectrum Monitor	EZM	Rohde & Schwarz	883 086/026
61	RF-Test Receiver	ESH3	Rohde & Schwarz	881 515/002
62	Relay Matrix	PSU	Rohde & Schwarz	882 943/029
63	Relay 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				
67				
68				

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

Photographs of Equipment

Photo No.: 01

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

Photographs of Equipment

Photo No.: 02

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

Photographs of Equipment

Photo No.: 03

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

Photographs of Equipment

Photo No.: 04

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

Photographs of Equipment

Photo No.: 05

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

Photographs of Equipment

Photo No.: 06

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

Photographs of Equipment

Photo No.: 07

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

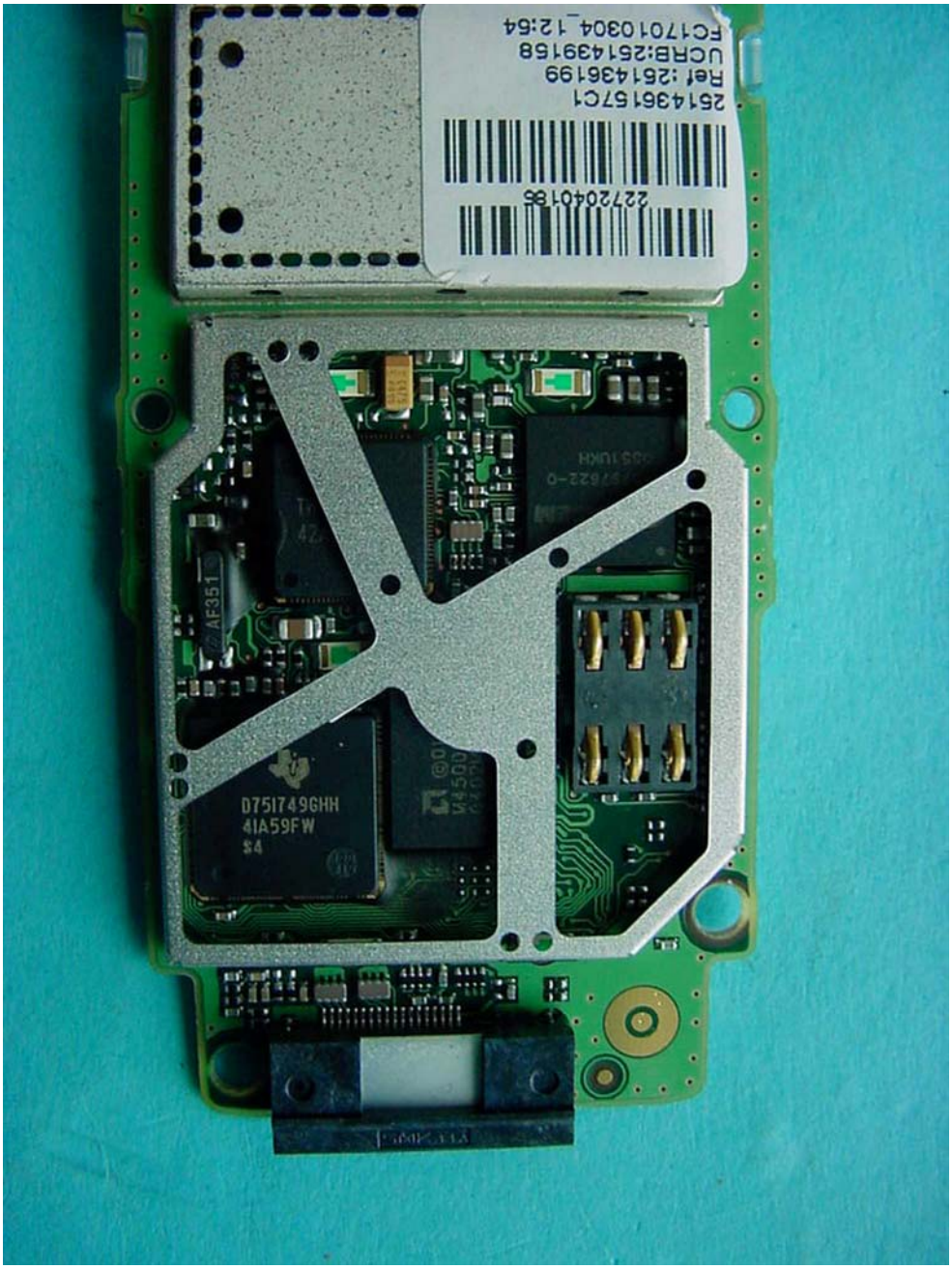
Photographs of Equipment

Photo No.: 08

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

Photographs of Equipment

Photo No.: 09



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