



No. DAT-P-114/01-01



TESTING  
CNAS L0442

# TEST REPORT

No. 2009BTH0134

<b>Product name</b>	<b>GSM Dual-band GPRS Digital Mobile Phone</b>
<b>Model</b>	<b>ZTE-G R232</b>
<b>Client</b>	<b>ZTE Corporation</b>
<b>Classification of test</b>	<b>Type Approval</b>

**Telecommunication Metrology Center  
of Ministry of Information Industry**

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<b>Product Name</b>	GSM Dual-band GPRS Digital Mobile Phone	<b>Model</b>	ZTE-G R232
		<b>Trade mark</b>	
<b>Client</b>	ZTE Corporation		
<b>Manufacturer</b>	ZTE Corporation		
<b>Arrival Date of sample</b>	June 01, 2009	<b>Carrier of the samples</b>	/
<b>Quantity of the samples</b>	2	<b>Date of product</b>	/
<b>Series number</b>	353896030000537, 353896030000511		
<b>Standard(s)</b>	FCC Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits; general requirements; 15.247 Operation within the bands 902-928MHz, 2400-2483.5 MHz, and 5725-5850 MHz. ANSI C63.4- 2003 FCC Public Notice DA 00-705, March 2000		
<b>Conclusion</b>	Pass 9 test cases were done. The test results are shown in the clause 6 and annex A. The samples passed all the tests required by the client.  Date of issue: 2009-06-15		
<b>Comment</b>	The test result relates only to the tested samples.		

Approved by 陆冰松  
(Lu Bingsong)

Reviewed by 高洪  
(Gao Hong)

Tested by 孙震宇  
(Sun Zhenyu)

(Lu Bingsong - Deputy Director of the laboratory)

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## **1. COMPETENCE AND WARRANTIES**

**Telecommunication Metrology Center of Ministry of Information Industry** is a test laboratory accredited by DAR (DATEch) – Deutschen Akkreditierungs Rat (The German Accreditation Body Technology) for the tests indicated in the Certificate No. **DAT-P-114/01-01**.

**Telecommunication Metrology Center of Ministry of Information Industry** is a test laboratory accredited by CNAS–China national Accreditation Service for Conformity Assessment, for the tests indicated in the Certificate No. **L0442**.

**Telecommunication Metrology Center of Ministry of Information Industry (hereinafter TMC of MII)** is a test laboratory competent to carry out the tests described in this test report.

**TMC of MII** guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at **TMC of MII** at the time of execution of the test.

**TMC of MII** is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test.

## **2. TESTING LABORATORY**

### **2.1. Testing Location**

Name of Company :	Telecommunication Metrology Center of Ministry of Information Industry
Address:	No 52, Hua Yuanbei Road, Haidian District, Beijing, P.R.China
Postal Code:	100083
Telephone:	+86-10-62303288
Fax:	+86-10-62304793

### **2.2. Testing Environment**

**Shielding Room1** (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

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**Control room** did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

**Fully-anechoic chamber1** (6.8 meters×3.08 meters×3.53 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

**Shielding Room2** (7.30 meters×4.00 meters×3.80 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

### 2.3. Testing Period

The performed test started on 3<sup>rd</sup> June, 2009 and finished on 22<sup>nd</sup> June, 2009.

## 3. APPLICANT INFORMATION

### 3.1. Client information

<b>Name of Company:</b>	ZTE Corporation
<b>Address /Post:</b>	#68 Zijin Hua Road, Nanjing, Jiangsu Province, China
<b>City:</b>	Nanjing
<b>Postal Code:</b>	/
<b>Country:</b>	China
<b>Telephone:</b>	+8613770706054
<b>Fax:</b>	/

### 3.2. Manufacturer information

<b>Name of Company:</b>	ZTE Corporation
<b>Address /Post:</b>	#68 Zijin Hua Road, Nanjing, Jiangsu Province, China
<b>City:</b>	Nanjing

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<b>Country:</b>	China
<b>Telephone:</b>	+8613770706054
<b>Fax:</b>	/

## 4. EQUIPMENT UNDER TEST(EUT) AND ANCILLARY EQUIPMENT(AE)

### 4.1. About EUT

Product name:	GSM Dual-band GPRS Digital Mobile Phone
Model:	ZTE-G R232
FCC ID:	Q78-GR232
With Bluetooth Function:	Yes
EUT operating voltage- Normal:	3.7
Extreme Low Voltage:	3.5
Extreme High Voltage:	4.2
Extreme temperature:	-20°C / + 55°C

Note: please refer to ANNEX A in this test report for Photographs of EUT.

### 4.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	353896030000537	g7hB	CE-ZTE-ZS-P103B12V1.0.0
EUT2	353896030000511	g7hB	CE-ZTE-ZS-P103B12V1.0.0

\*EUT ID is used to identify the test sample in the lab internally.

### 4.3. Internal Identification of AE used during the test

AE ID*	Description	Type	SN
AE1	Battery	Li3717T42P3h5637116	/
AE2	Travel Adapter	STC-A22O50U8-C	/

\*AE ID: is used to identify the test sample in the lab internally.

## 5. REFERENCE DOCUMENTS

### 5.1. Documents supplied by applicant

EUT feature information is supplied by the client or manufacturer, which is the basis of testing.

### 5.2. Reference Documents

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902–928MHz,	July 10, 2008 Edition

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	2400–2483.5 MHz, and 5725–5850 MHz.	
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipments in the Range of 9 kHz to 40 GHz	2003
FCC Public Notice DA 00-705	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems	March 2000

## 6. TEST RESULTS

### 6.1. Summary of Test Results

Abbreviations used in this clause:

**P** Pass

**F** Fail

**NA** not applicable

**NM** not measured

SUMMARY OF MEASUREMENT RESULTS	Sub-clause	Verdict
Peak Output Power - Conducted	15.247 (b)(1)	<b>P</b>
Frequency Band Edges	15.247 (d)	<b>P</b>
Conducted Emission	15.247 (d)	<b>P</b>
Radiated Emission	15.247, 15.205, 15.209	<b>P</b>
Time of Occupancy (Dwell Time)	15.247 (a) (1)(iii)	<b>P</b>
20dB Bandwidth	15.247 (a)(1)	<b>NA</b>
Carrier Frequency Separation	15.247 (a)(1)	<b>P</b>
Number of hopping channels	15.247 (a)(b)(iii)	<b>P</b>
AC Powerline Conducted Emission	15.107, 15.207	<b>P</b>

Please refer to **ANNEX A** for detail.

The measurement is made according to Public notice DA 00-705 and ANSI C63.4.

### 6.2. Statements

TMC has evaluated the test cases requested by the client/manufacture as listed in section 6.1 of this report for the EUT specified in section 4 according to the standards or reference documents listed in section 5.2.

## 7. TEST EQUIPMENTS

### Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Vector Signal Analyzer	FSQ26	200136	Rohde & Schwarz	2010-01-15
2	Bluetooth Tester	CBT	100135	Rohde & Schwarz	2009-11-12
3	Power Meter	NRVD	101078	Rohde & Schwarz	2009-09-02
4	DIODE Power Sensor	NRV-Z15	100103	Rohde & Schwarz	2009-09-02
5	Switch Panel	RSCP	/	Rohde & Schwarz	/
6	Microwave Signal Generator	SMP04	100140	Rohde & Schwarz	2009-10-19
7	Test Receiver	ESS	847151/015	Rohde & Schwarz	2009-10-30
8	LISN	ESH2-Z5	829991/012	Rohde & Schwarz	2009-08-13

### Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Test Receiver	ESI40	831564/002	Rohde & Schwarz	2010-02-12
2	BiLog Antenna	3142B	9908-1403	EMCO	2010-03-15
3	Dual-Ridge Waveguide Horn Antenna	3115	9906-5827	EMCO	2009-12-25
4	Universal Radio Communication Tester	CMU200	105948	Rohde & Schwarz	2009-08-15

### Anechoic chamber

Fully anechoic chamber by Frankonia German.

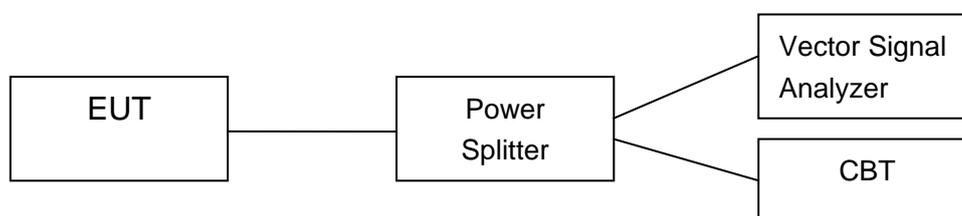
## **ANNEX A: MEASUREMENT RESULTS**

### **A.1. Measurement Method**

#### **A.1.1. Conducted Measurements**

The measurement is made according to Public notice DA 00-705 and ANSI C63.4.

- 1). Connect the EUT to the test system correctly.
- 2). Set the EUT to the required work mode (Transmitter, receiver or transmitter & receiver).
- 3). Set the EUT to the required channel.
- 4). Set the EUT hopping mode (hopping or hopping off).
- 5). Set the spectrum analyzer to start measurement.
- 6). Record the values. Vector Signal Analyzer



#### **A.1.2. Radiated Emission Measurements**

In the case of radiated emission, the used settings are as follows,

Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;

Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 1MHz;

### **A.2. Peak Output Power - Conducted**

#### **Measurement Limit and Method:**

Standard	Limit (dBm)
FCC Part 15.247(b)(1)	< 30

The measurement is made according to Public notice DA 00-705 and ANSI C63.4.

#### **Measurement Results:**

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
<b>Peak Conducted Output Power (dBm)</b>	-4.72	-6.37	-6.08	<b>P</b>

**Conclusion: PASS**

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**A.3. Frequency Band Edges - Conducted**

**Measurement Limit:**

Standard	Limit (dBc)
FCC 47 CFR Part 15.247 (d)	> 20

The measurement is made according to Public notice DA 00-705 and ANSI C63.4.

**Measurement Result:**

Channel	Hopping	Band Edge Power ( dBc)	Conclusion	
0	Hopping OFF	Fig.1	42.40	<b>P</b>
	Hopping ON	Fig.2	51.33	<b>P</b>
78	Hopping OFF	Fig.3	45.45	<b>P</b>
	Hopping ON	Fig.4	51.55	<b>P</b>

**See annex B for test graphs.**

**Conclusion: PASS**

**A.4. Conducted Emission**

**Measurement Limit:**

Standard	Limit
FCC 47 CFR Part 15.247 (d)	20dB below peak output power in 100 kHz bandwidth

The measurement is made according to Public notice DA 00-705 and ANSI C63.4

**Measurement Results:**

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	Center Frequency	Fig.5	<b>P</b>
	30 MHz ~ 1 GHz	Fig.6	<b>P</b>
	1 GHz ~ 26 GHz	Fig.7	<b>P</b>
Ch 39 2441 MHz	Center Frequency	Fig.8	<b>P</b>
	30 MHz ~ 1 GHz	Fig.9	<b>P</b>
	1 GHz ~ 26 GHz	Fig.10	<b>P</b>
Ch 78 2480 MHz	Center Frequency	Fig.11	<b>P</b>
	30 MHz ~ 1 GHz	Fig.12	<b>P</b>
	1 GHz ~ 26 GHz	Fig.13	<b>P</b>

**See annex B for test graphs.**

**Conclusion: PASS**

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**A.5. Radiated Emission**

**Measurement Limit:**

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209	20dB below peak output 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)).

The measurement is made according to Public notice DA 00-705 and ANSI C63.4

**Limit in restricted band:**

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

**Measurement Results:**

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30 MHz ~ 1 GHz	Fig.14	<b>P</b>
	1 GHz ~ 4 GHz	Fig.15	<b>P</b>
	4 GHz ~ 18 GHz	Fig.16	<b>P</b>
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.17	<b>P</b>
	1 GHz ~ 4 GHz	Fig.18	<b>P</b>
	4 GHz ~ 18 GHz	Fig.19	<b>P</b>
Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.20	<b>P</b>
	1 GHz ~ 4 GHz	Fig.21	<b>P</b>
	4 GHz ~ 18 GHz	Fig.22	<b>P</b>
Channel 78	2.45GHz~2.5GHz	Fig.23	<b>P</b>
For all channels	18 GHz ~ 26 GHz	Fig.24	<b>P</b>

**See annex B for test graphs.**

**Conclusion: PASS**

**A.6. Time of Occupancy (Dwell Time)**

**Measurement Limit:**

Standard	Limit (ms)
FCC 47 CFR Part 15.247(a) (1)(iii)	< 400

The measurement is made according to Public notice DA 00-705 and ANSI C63.4

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**Measurement Result:**

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.25	264.73	<b>P</b>
	DH3	Fig.26	345.87	<b>P</b>
	DH5	Fig.27	359.06	<b>P</b>

See annex B for test graphs.

**Conclusion: PASS**

**A.7. 20dB Bandwidth**

**Measurement Limit:**

Standard	Limit
FCC 47 CFR Part 15.247(a)(1)	NA *

The measurement is made according to Public notice DA 00-705 and ANSI C63.4

\* Comment: This test case is not required according to the latest FCC 47 CFR Part 15.247. But the test results are necessary for “carrier frequency separation” test case, in Annex A.8.

**Measurement Results:**

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.28	921.63	<b>NA</b>
39	Fig.29	918.21	<b>NA</b>
78	Fig.30	921.63	<b>NA</b>

See annex B for test graphs.

**Conclusion: NA**

**A.8. Carrier Frequency Separation**

**Measurement Limit:**

Standard	Limit(kHz)
FCC 47 CFR Part 15.247(a)(1)	>612.14

The measurement is made according to Public notice DA 00-705 and ANSI C63.4

\* Comment: This limit should be over 25 kHz or  $(2/3) * 20\text{dB bandwidth}$ , whichever is greater.

The value of  $(2/3) * 20\text{dB bandwidth}$  (value of channel 39 is 918.21 kHz) is 612.14 kHz, and it is greater than 25 kHz.

**Measurement Result:**

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.31	980.77	<b>P</b>

See annex B for test graphs.

**Conclusion: PASS**

**A.9. Number of Hopping Channels**

**Measurement Limit:**

Standard	Limit
FCC 47 CFR Part 15.247(a) (1)(iii)	> 75

The measurement is made according to Public notice DA 00-705 and ANSI C63.4

**Measurement Result:**

Channel	Number of hopping channels	Conclusion
0~39	Fig.32	79  <b>P</b>
40~78	Fig.33	

See annex B for test graphs.

**Conclusion: PASS**

**A.10. AC Powerline Conducted Emission**

**Test Condition**

Voltage (V)	Frequency (Hz)
110	60

**Measurement Result and limit:**

Bluetooth (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dB $\mu$ V)	Result (dB $\mu$ V)	Conclusion
		With charger	
0.15 to 0.5	66 to 56	Fig. 34	P
0.5 to 5	56		
5 to 30	60		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Bluetooth (Average Limit)

Frequency range (MHz)	Average Limit (dB $\mu$ V)	Result (dB $\mu$ V)	Conclusion
		With charger	
0.15 to 0.5	56 to 46	Fig. 34	P
0.5 to 5	46		
5 to 30	50		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

The measurement is made according to Public notice DA 00-705 and ANSI C63.4

See annex B for test graphs.

**Conclusion: PASS**

ANNEX B: TEST FIGURE LIST

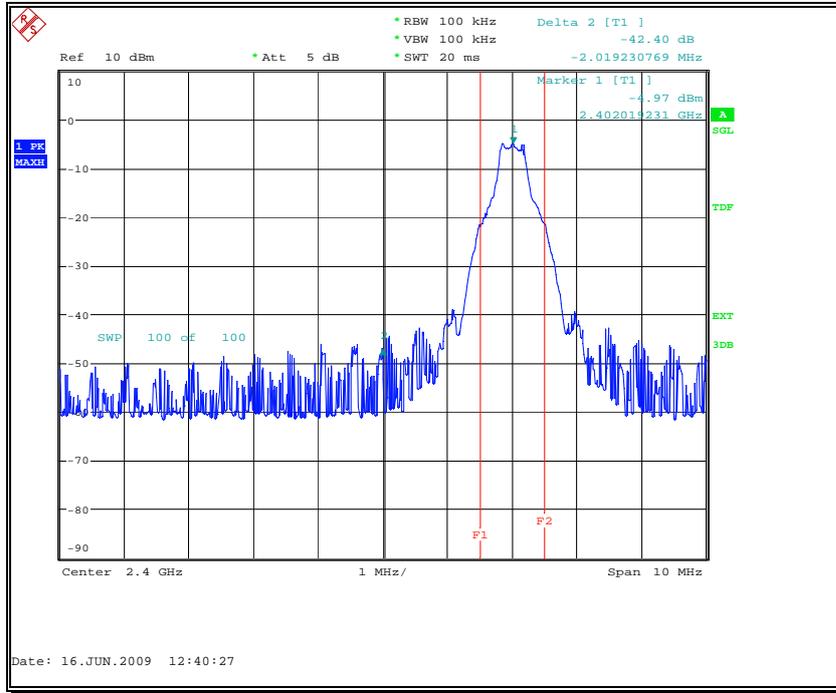


Fig. 1 Frequency Band Edges: Channel 0, Hopping Off

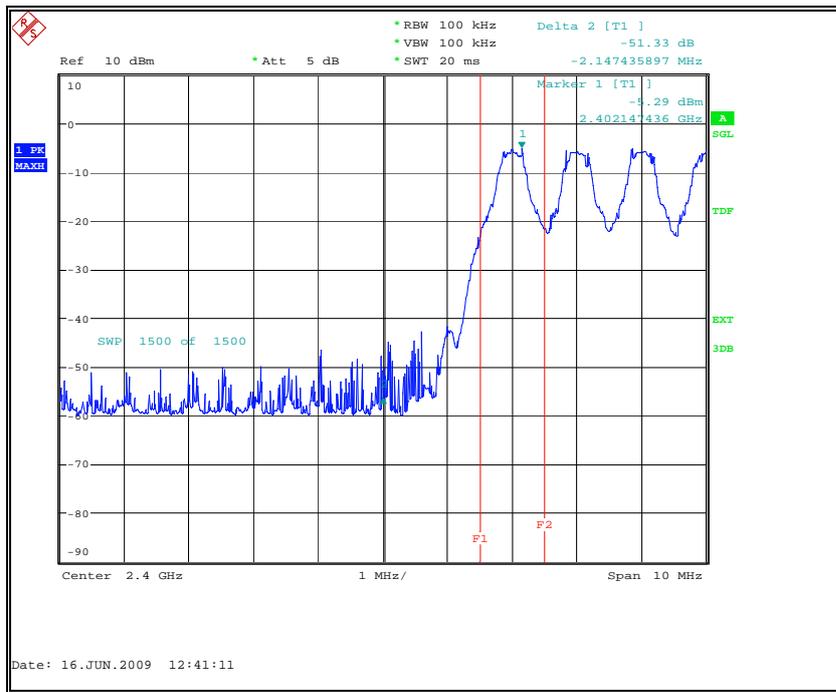


Fig. 2 Frequency Band Edges: Channel 0, Hopping On

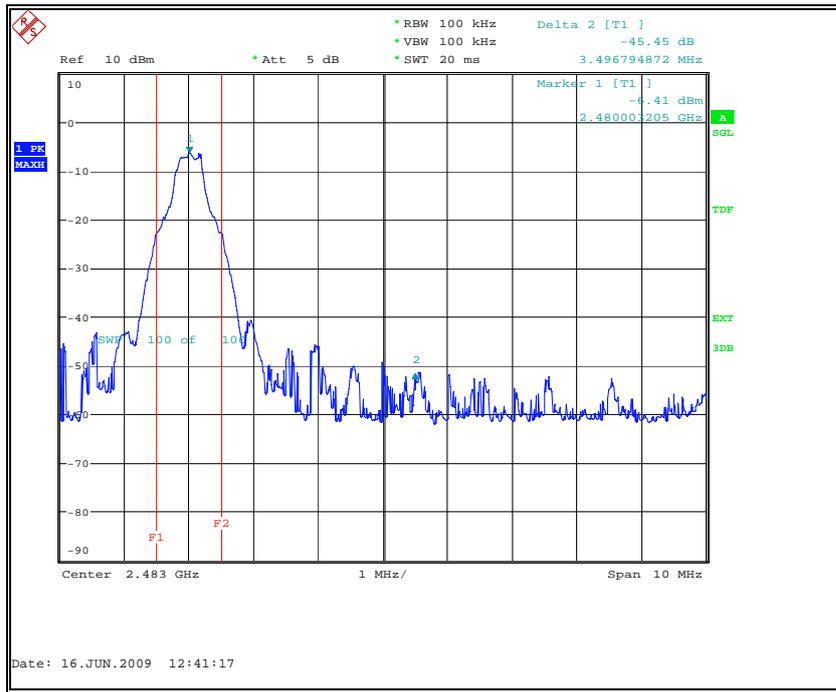


Fig. 3 Frequency Band Edges: Channel 78, Hopping Off

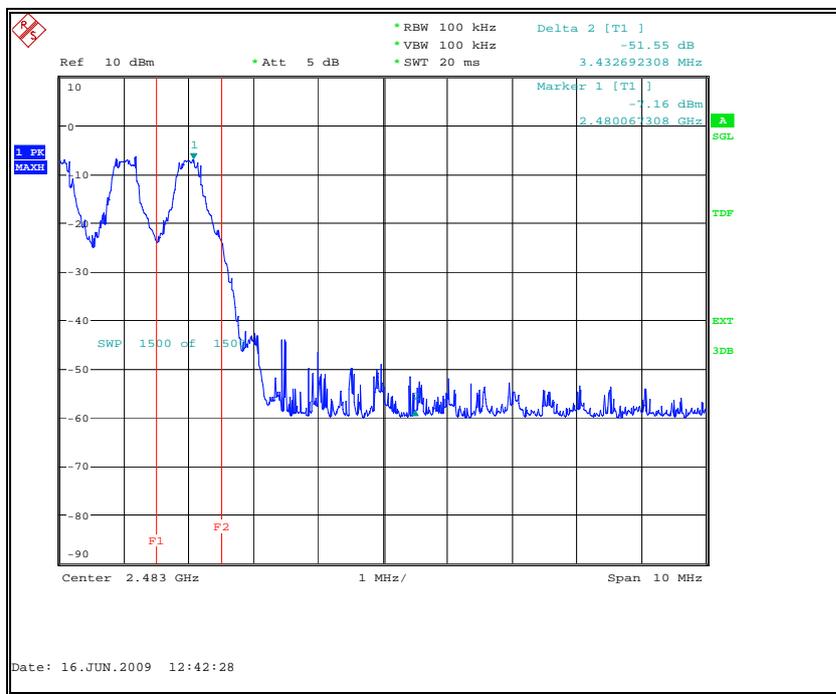
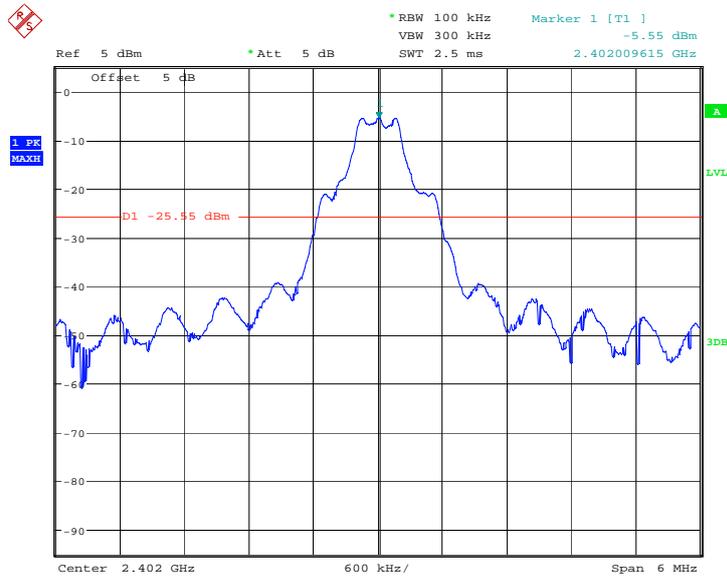
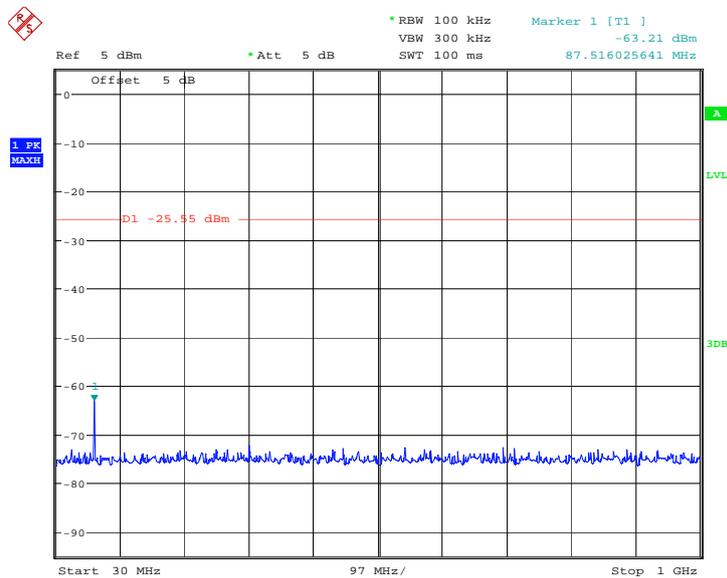


Fig. 4 Frequency Band Edges: Channel 78, Hopping On



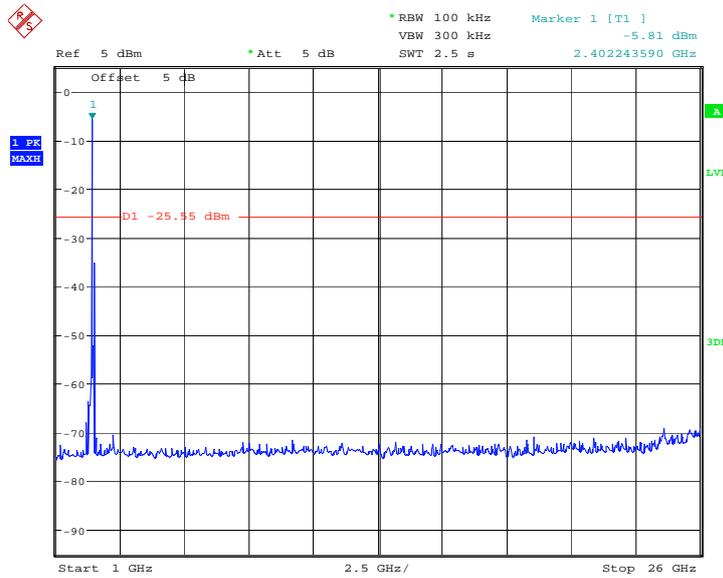
Date: 14.JUN.2009 18:30:12

Fig. 5 Conducted spurious emission: Channel 0,2402MHz



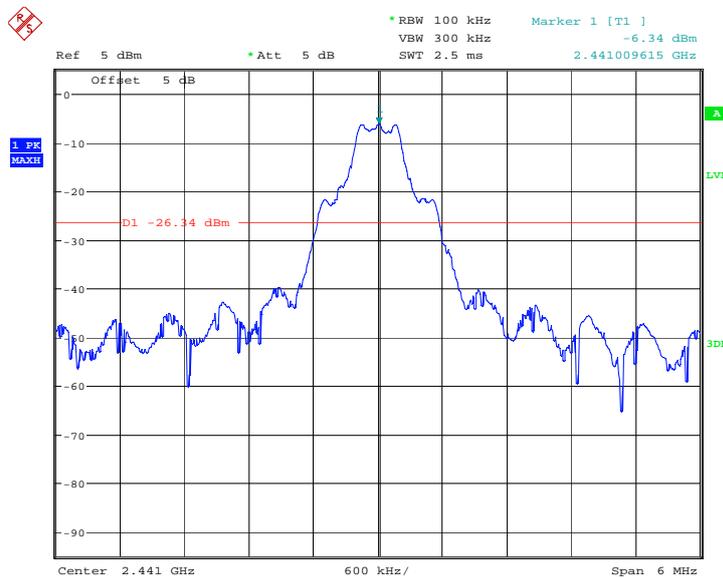
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Fig. 6 Conducted spurious emission: Channel 0, 30MHz - 1GHz



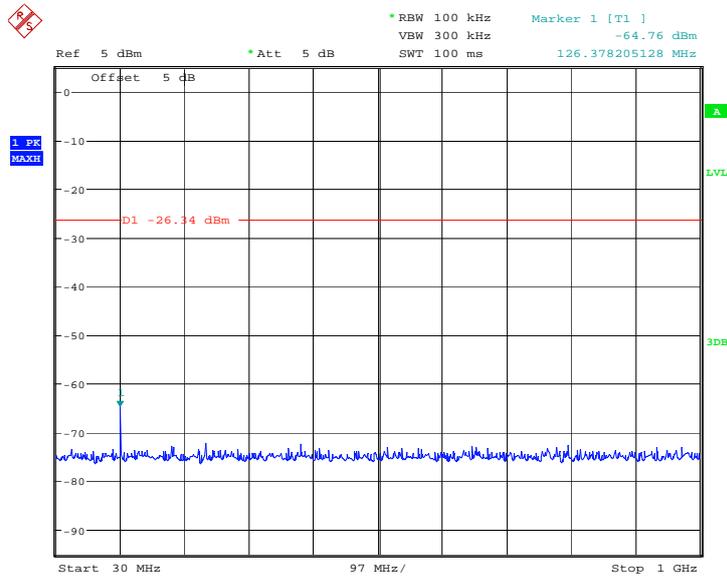
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Fig. 7 Conducted spurious emission: Channel 0, 1GHz - 26GHz



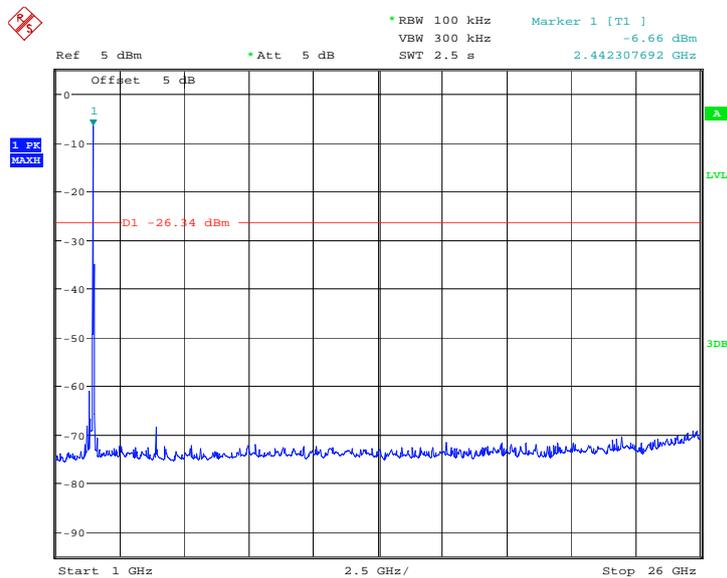
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Fig. 8 Conducted spurious emission: Channel 39, 2441MHz



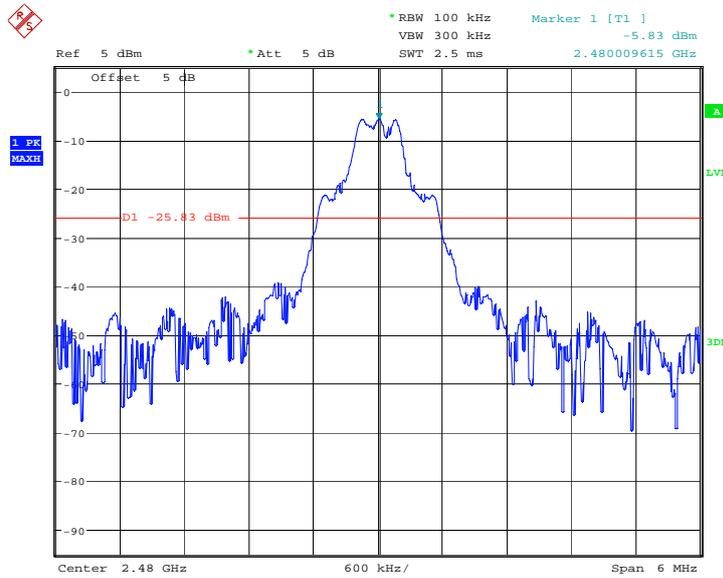
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Fig. 9 Conducted spurious emission: Channel 39, 30MHz - 1GHz



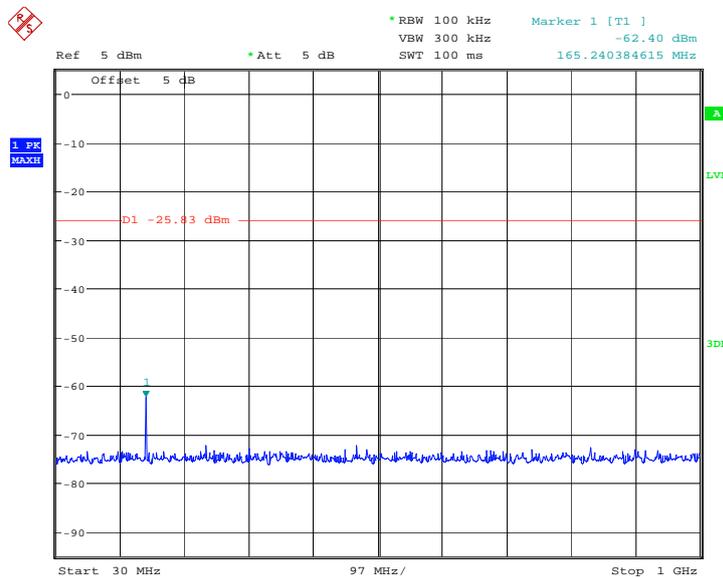
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Fig. 10 Conducted spurious emission: Channel 39, 1GHz - 26GHz



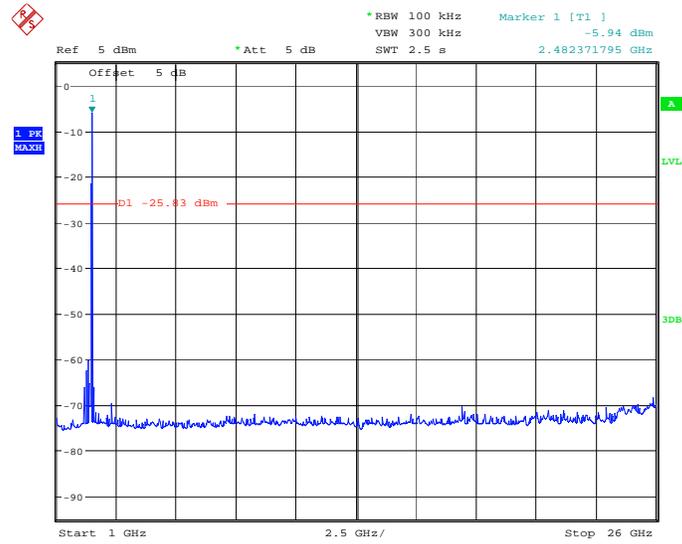
Date: 14.JUN.2009 18:33:43

Fig. 11 Conducted spurious emission: Channel 78, 2480MHz



Date: 14.JUN.2009 18:34:04

Fig. 12 Conducted spurious emission: Channel 78, 30MHz - 1GHz



Date: 14.JUN.2009 18:34:24

Fig. 13 Conducted spurious emission: Channel 78, 1GHz - 26GHz

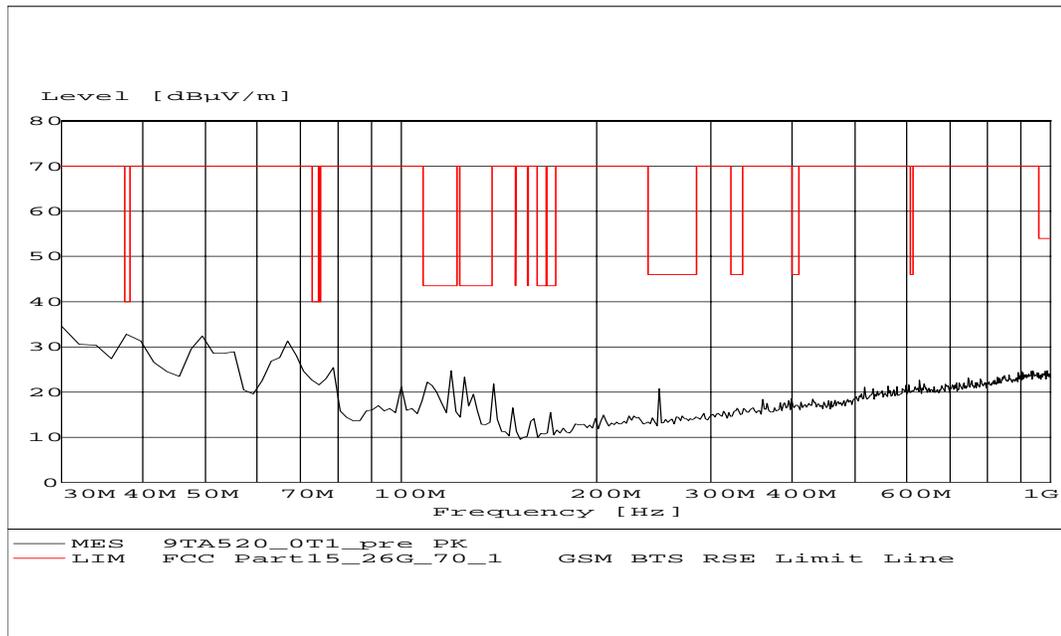


Fig. 14 Radiated emission: Channel 0, 30 MHz - 1 GHz

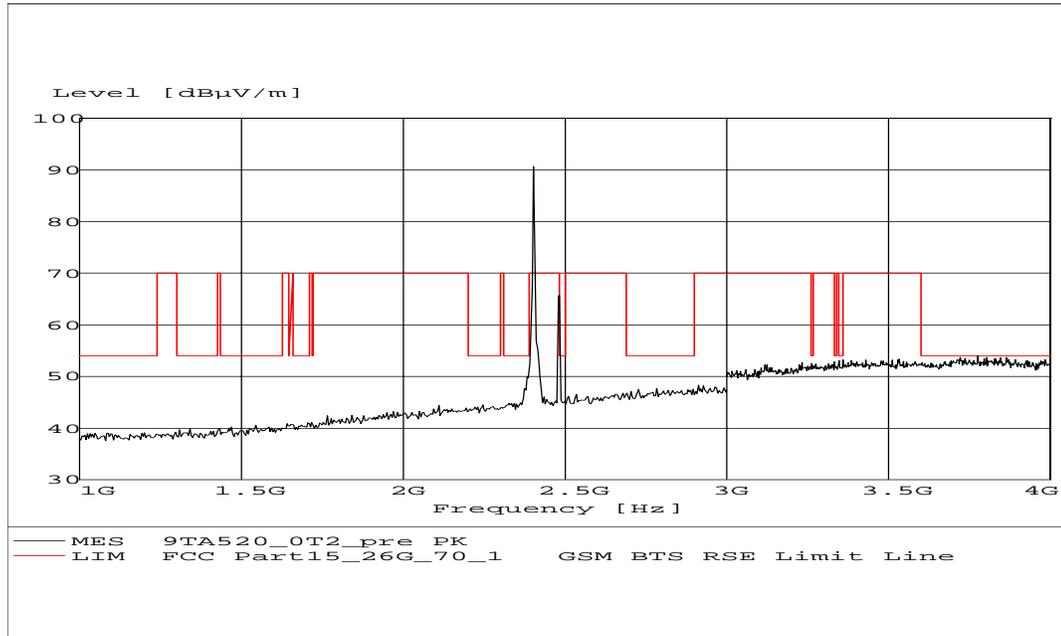


Fig. 15 Radiated emission: Channel 0, 1 GHz - 4 GHz

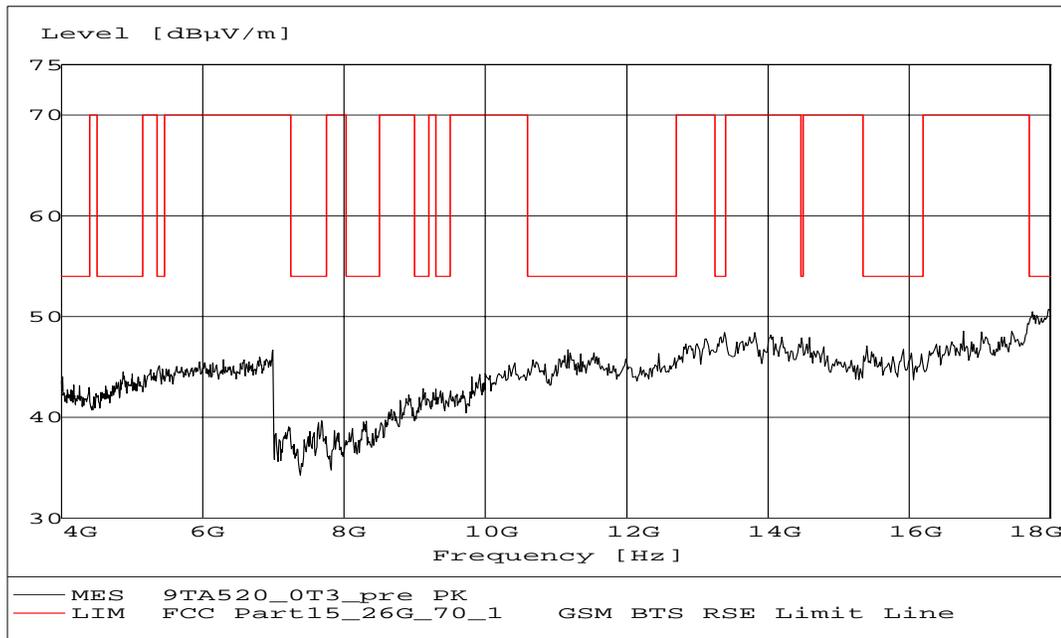


Fig. 16 Radiated emission: Channel 0, 4 GHz - 18 GHz

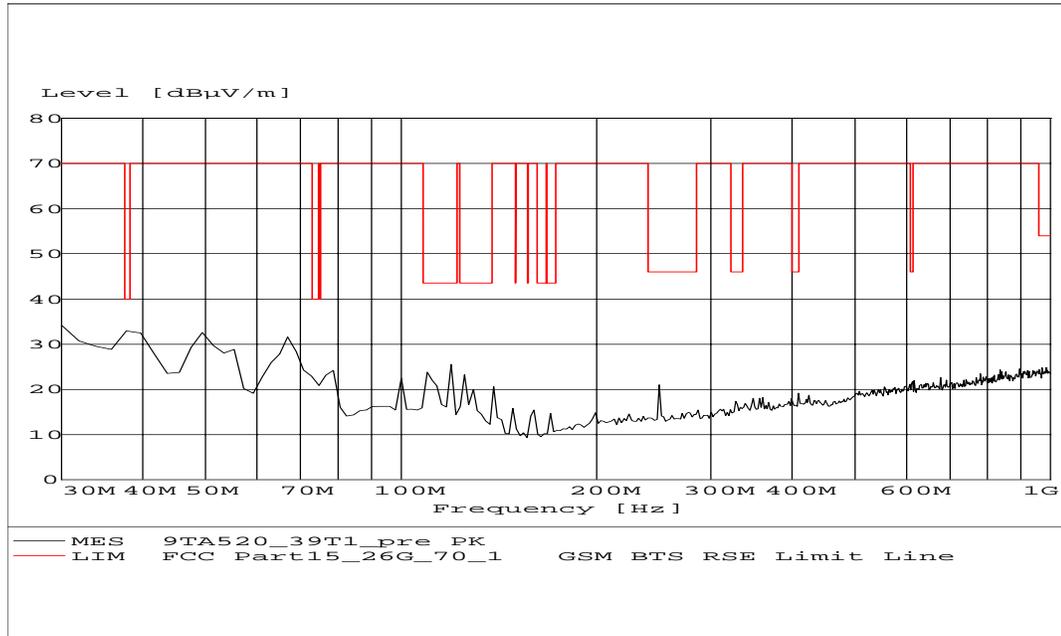


Fig. 17 Radiated emission: Channel 39, 30 MHz - 1 GHz

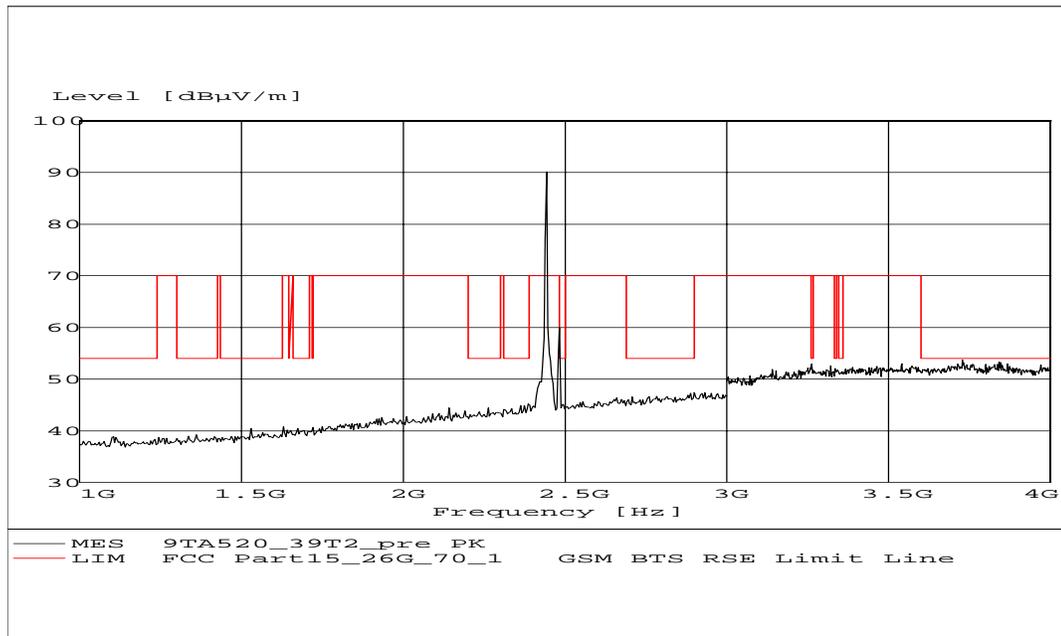


Fig. 18 Radiated emission: Channel 39, 1 GHz - 4 GHz

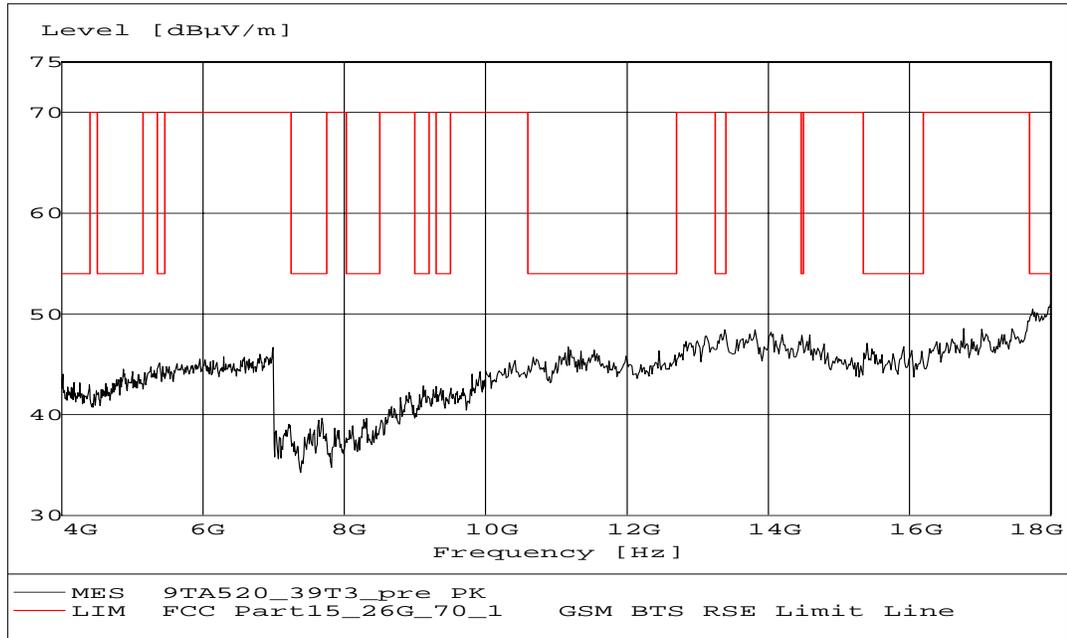


Fig. 19 Radiated emission: Channel 39, 4 GHz ~ 18 GHz

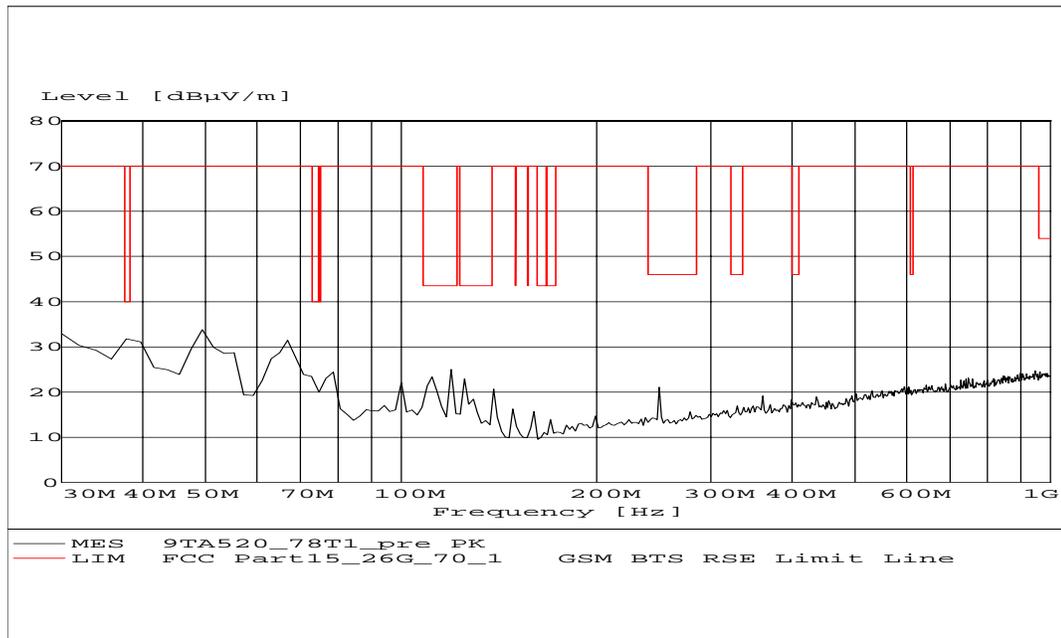


Fig. 20 Radiated emission: Channel 78, 30 MHz - 1 GHz

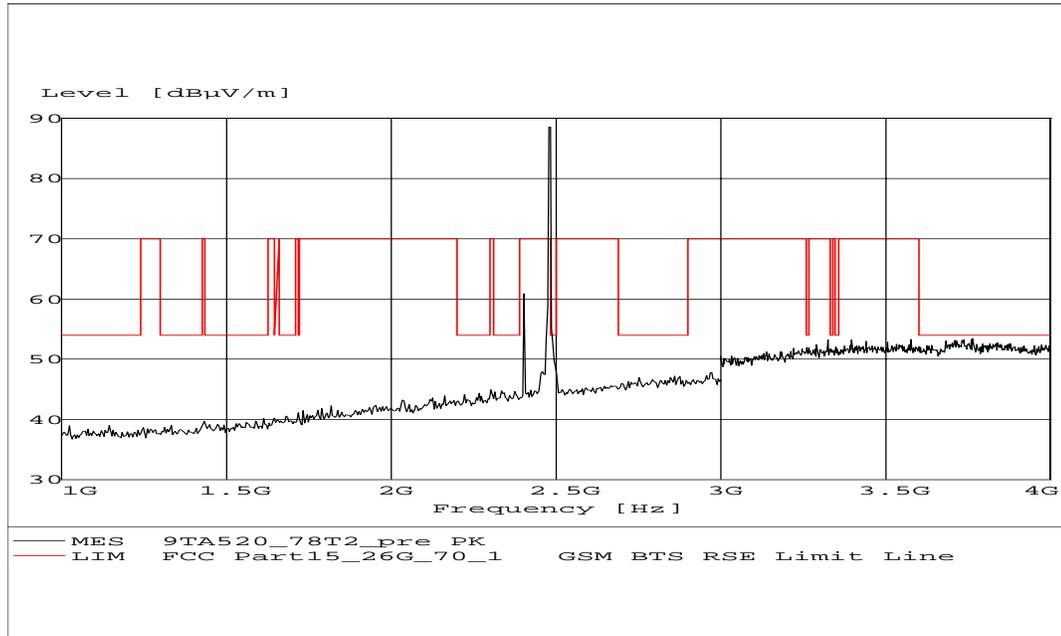


Fig. 21 Radiated emission: Channel 78, 1 GHz - 4 GHz

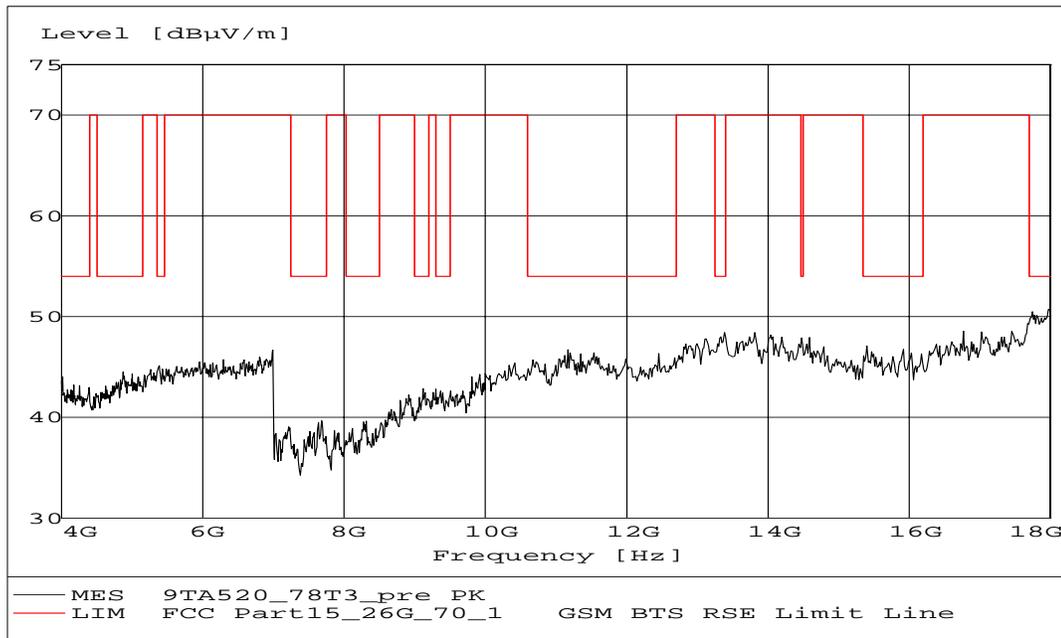


Fig. 22 Radiated emission: Channel 78, 4 GHz - 18 GHz

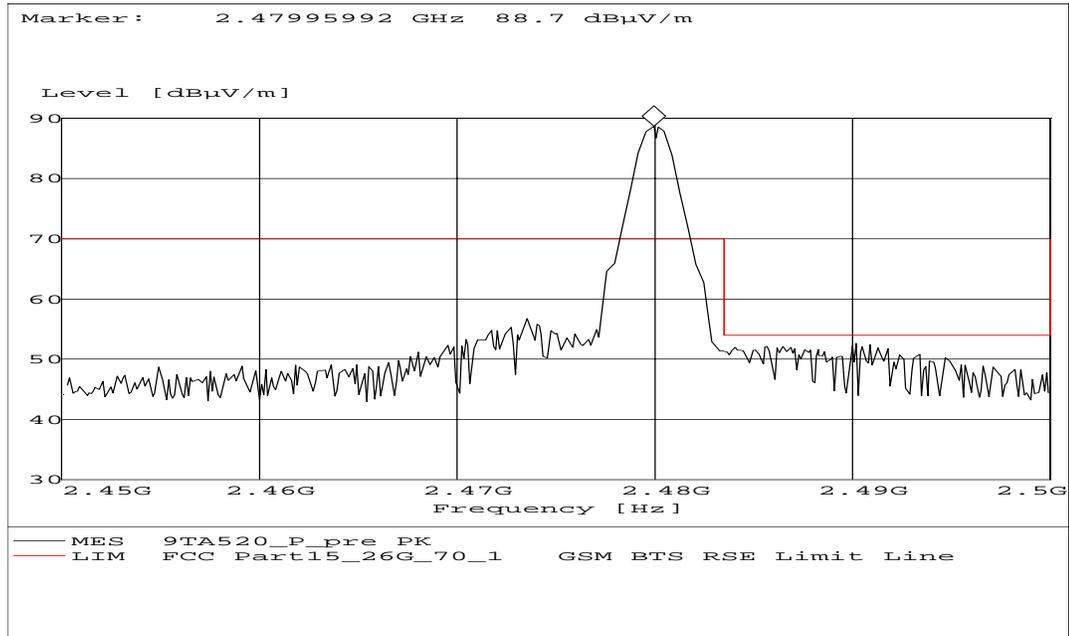


Fig. 23 Radiated emission (Power): channel 78, 2.45GHz - 2.5GHz

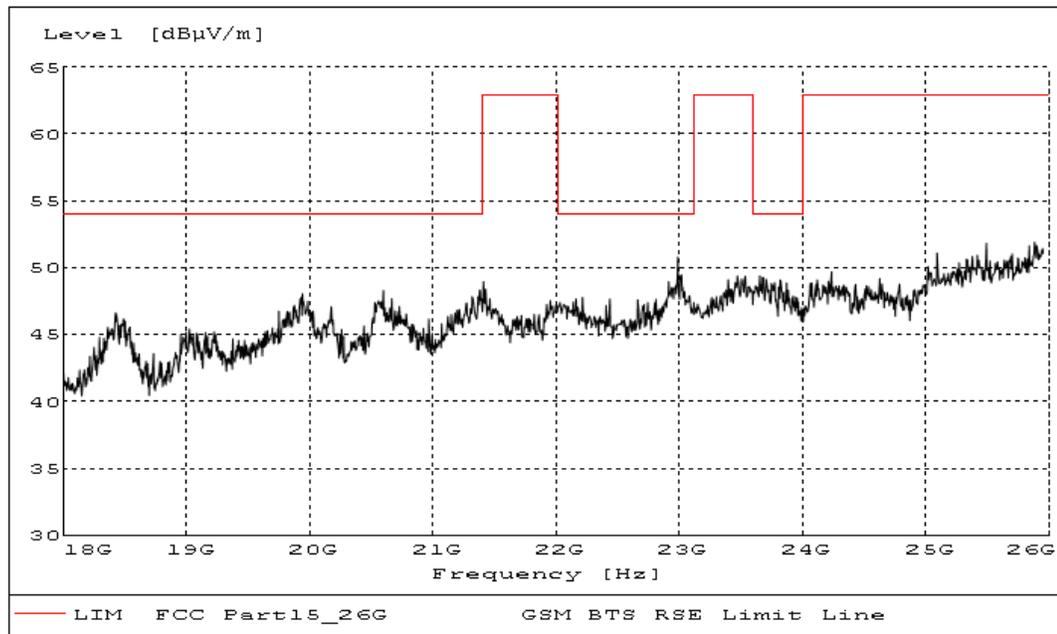
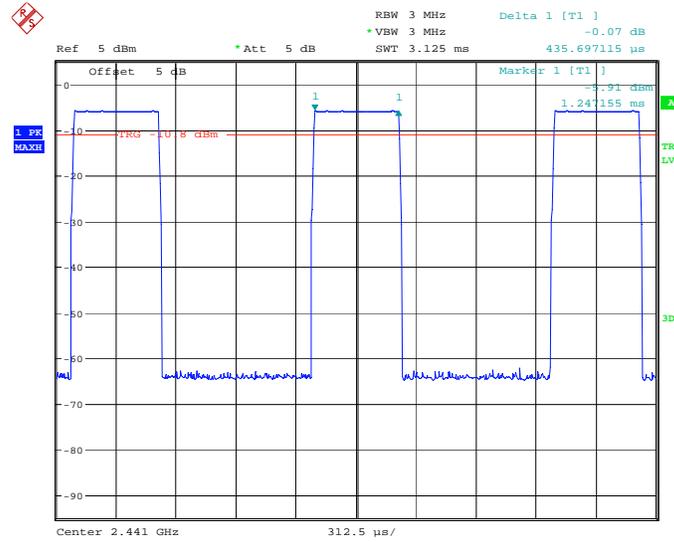
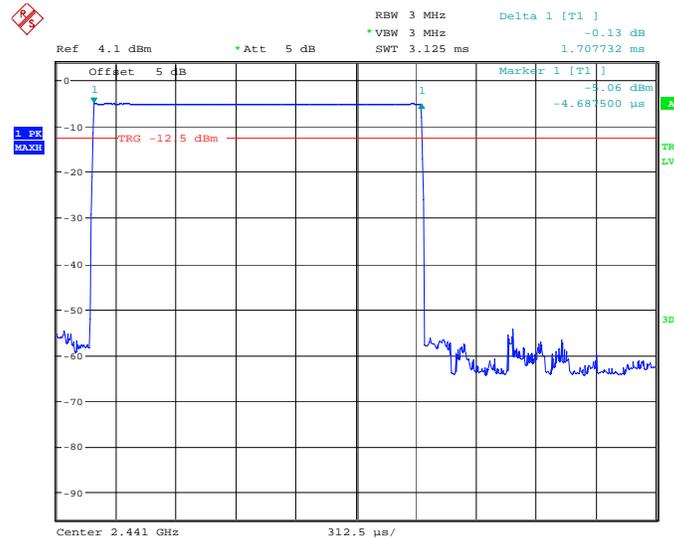


Fig. 24 Radiated emission: 18 GHz - 26 GHz



Date: 14.JUN.2009 18:37:20

Fig. 25 Time of occupancy (Dwell Time): Channel 39, Packet DH1



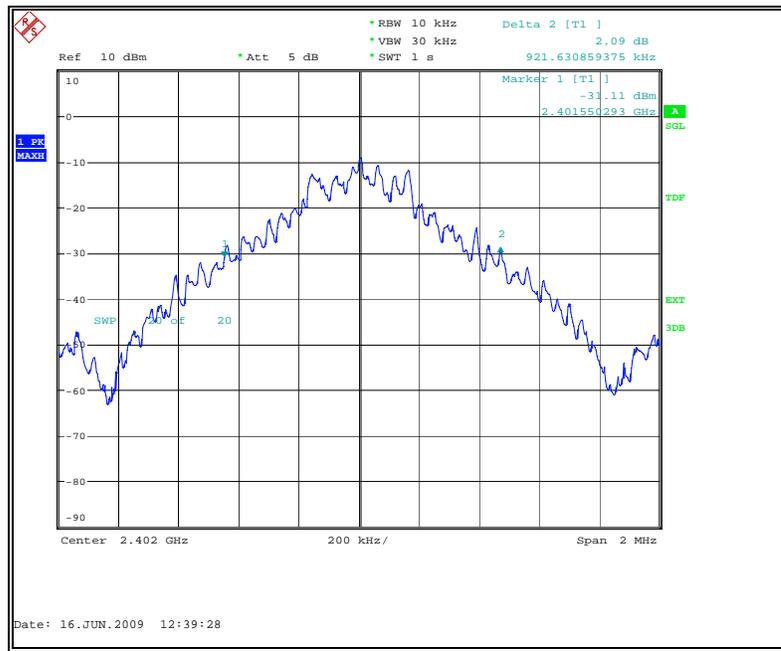
Date: 15.JUN.2009 14:46:24

Fig. 26 Time of occupancy (Dwell Time): Channel 39, Packet DH3



Date: 14.JUN.2009 18:36:15

Fig. 27 Time of occupancy (Dwell Time): Channel 39, Packet DH5



Date: 16.JUN.2009 12:39:28

Fig. 28 20dB Bandwidth: Channel 0

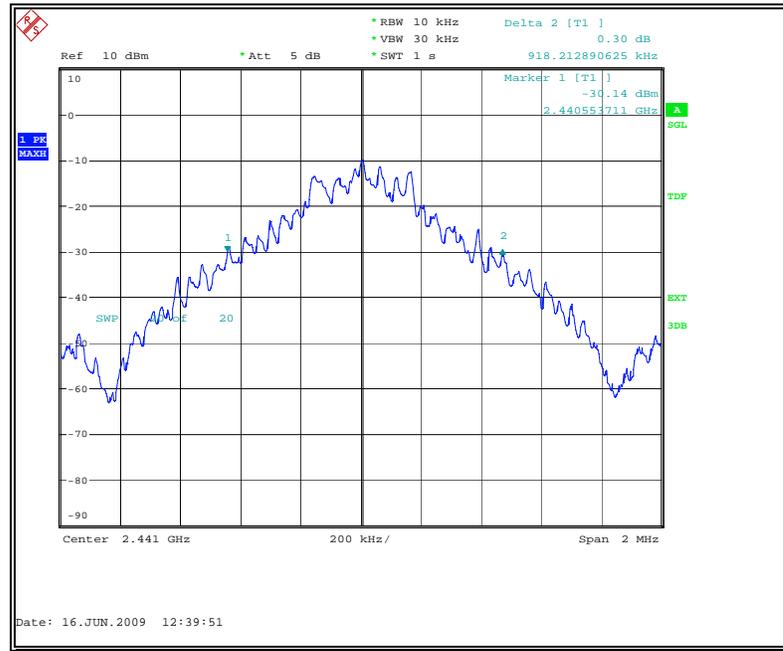


Fig. 29 20dB Bandwidth: Channel 39

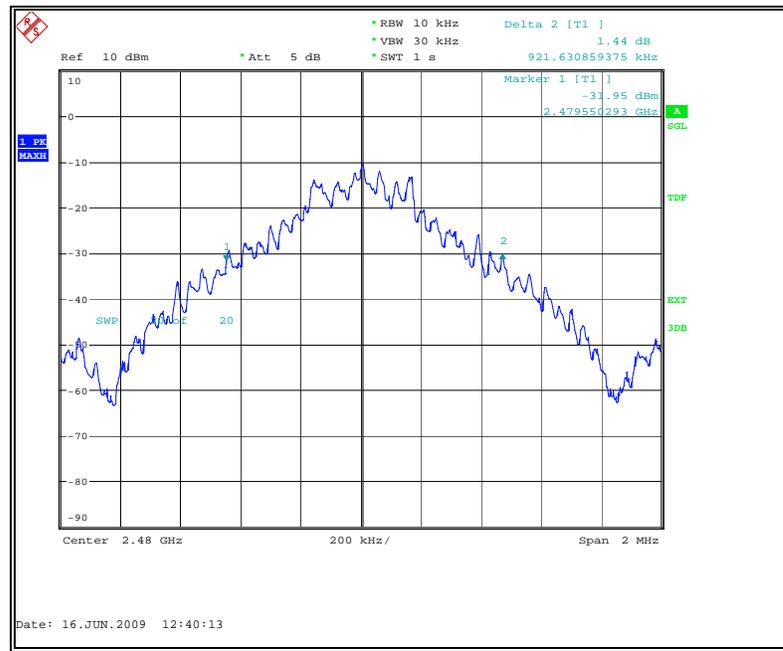


Fig. 30 20dB Bandwidth: Channel 78

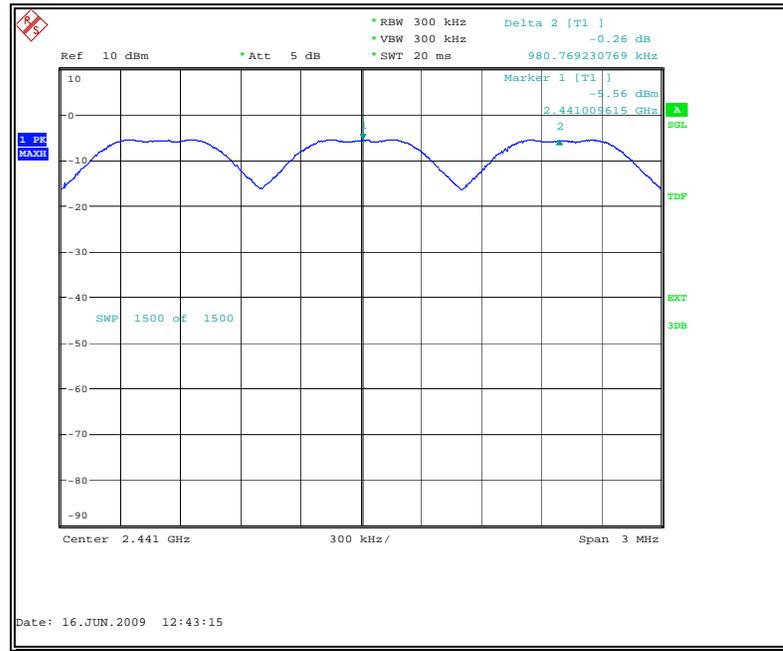


Fig. 31 Carrier frequency separation measurement: Channel 39

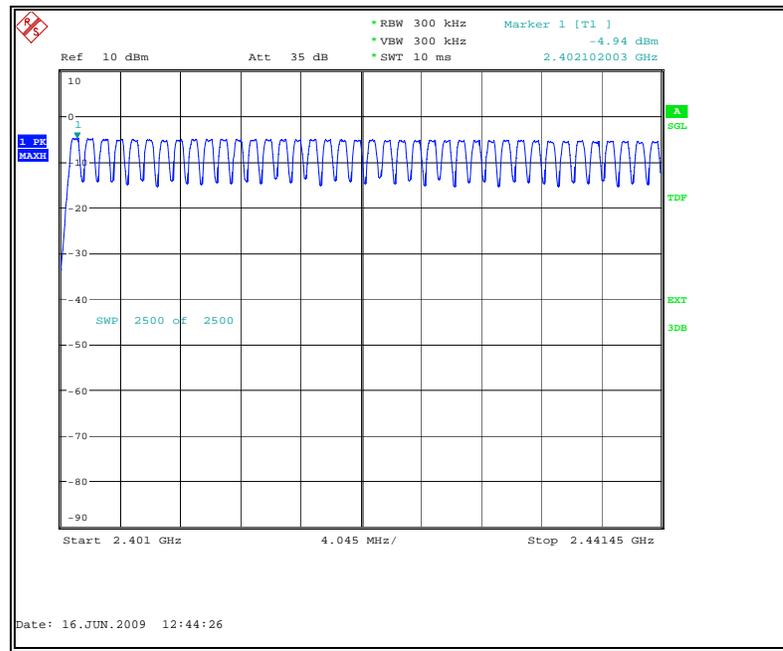


Fig. 32 Number of hopping frequencies: Channel 0 - 39

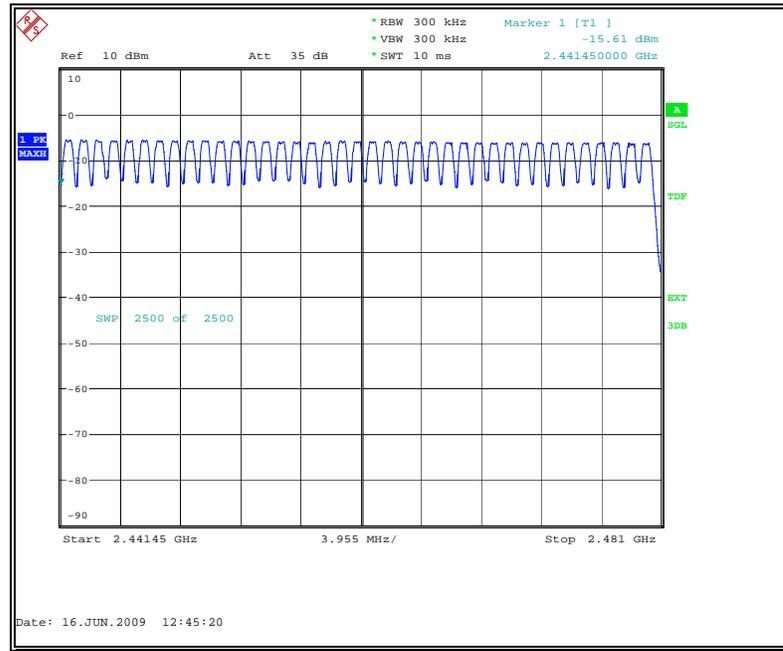


Fig. 33 Number of hopping frequencies: Channel 40 - 78

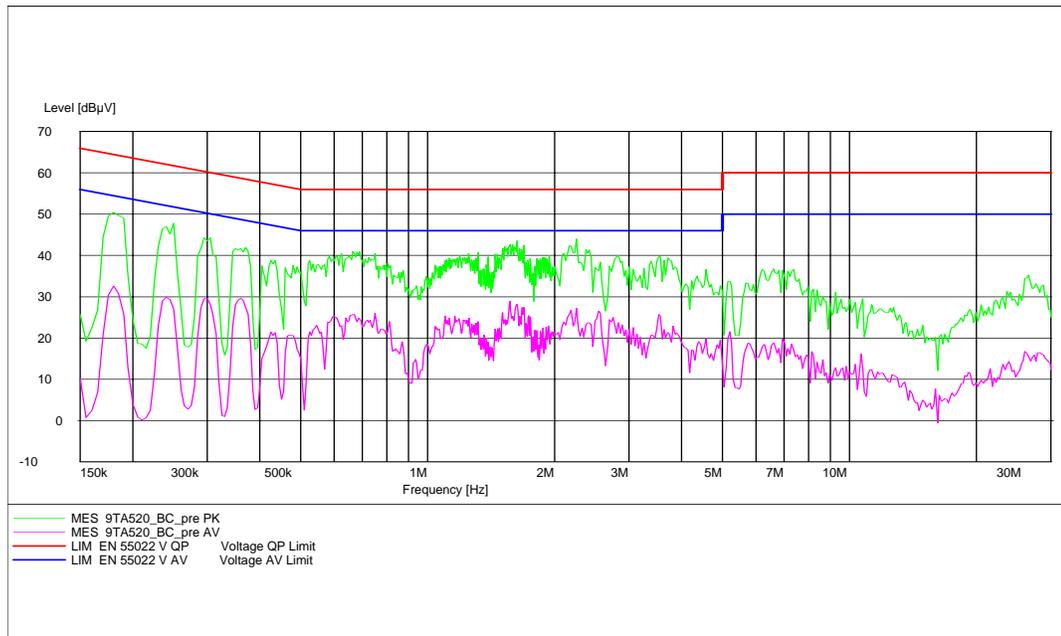


Fig. 34 AC Powerline Conducted Emission

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