



TEST REPORT

No. 2009TAR160

for

ZTE Corporation

GSM Dual-band GPRS Digital Mobile Phone

Model Name: ZTE-G R220

Marketing Name: ZTE-G R220

FCC ID: Q78-GR220I

with

Hardware Version: g8eA

Software Version: CE-ZTE4B9-P103D1FB JV1.0.0

Issued Date: 2009-11-11



No. DAT-P-114/01-01

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

Test Laboratory:

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology

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1. Test Laboratory

1.1. Testing Location

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT
Address: No 52, Huayuan beilu, Haidian District, Beijing, P.R.China
Postal Code: 100191
Telephone: 00861062303288
Fax: 00861062304793

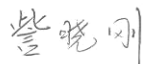
1.2. Testing Environment

Normal Temperature: 15-35℃
Extreme Temperature: -20/+55℃
Relative Humidity: 20-75%

1.3. Project data

Project Leader: Zi Xiaogang
Testing Start Date: 2009-10-20
Testing End Date: 2009-11-11

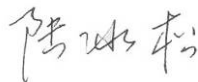
1.4. Signature



Zi Xiaogang
(Prepared this test report)



Sun Xiangqian
(Reviewed this test report)



Lu Bingsong
Deputy Director of the laboratory
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name: ZTE Corporation
Address /Post: #68 Zijin Hua Road, Nanjing,Jiangsu Province, China
City: Nanjing
Postal Code: /
Country: P.R.China
Telephone: +8613913024004
Fax: /

2.2. Manufacturer Information

Company Name: ZTE Corporation
Address /Post: #68 Zijin Hua Road, Nanjing,Jiangsu Province, China
City: Nanjing
Postal Code: /
Country: P.R.China
Telephone: +8613913024004
Fax: /

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	GSM Dual-band GPRS Digital Mobile Phone
Model	ZTE-G R220
FCC ID	Q78-GR220I
GSM Frequency Band	GSM850/PCS1900
Power Class	GSM850:4, PCS1900:1
GPRS Multislot Class	12
Extreme Temperature	-20/+55℃
Normal Voltage	3.7V
Extreme Low Voltage	3.5V
Extreme High Voltage	4.2V

Note: Photographs of EUT are shown in ANNEX A of this test report.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
N01	355191030 128159	g8eA	CE-ZTE4B9-P103D1FBJV1.0.0
N12	355191030 130239	g8eA	CE-ZTE4B9-P103D1FBJV1.0.0

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

3.3. Internal Identification of AE used during the test

AE ID*	Description	Type	SN
AE1	Battery	Li3707T42P3h463548	40040812250002693
AE2	Travel Adapter	STC-A22O50U8-C	80081140793451

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

4. Reference Documents

4.1. Documents supplied by applicant

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

4.2. Reference Documents for testing

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

FCC Part15	FCC CFR 47, Part 15, Subpart C:	July 10, 2008 Edition
	15.205 Restricted bands of operation;	
	15.209 Radiated emission limits, general requirements;	
ANSI C63.4	15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	2003
	Methods of Measurement of Radio-Noise Emissions from	
	Low-Voltage Electrical and Electronic Equipment in the	
FCC Public Notice DA 00-705	Range of 9 kHz to 40 GHz	March 2000
	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems	

5. LABORATORY 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

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
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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

6. SUMMARY OF 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)	P
Frequency Band Edges	15.247 (d)	P
Conducted Emission	15.247 (d)	P
Radiated Emission	15.247, 15.205, 15.209	P
Time of Occupancy (Dwell Time)	15.247 (a) (1)(iii)	P
20dB Bandwidth	15.247 (a)(1)	NA
Carrier Frequency Separation	15.247 (a)(1)	P
Number of hopping channels	15.247 (a)(b)(iii)	P
AC Powerline Conducted Emission	15.107, 15.207	P

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 applicant /manufacturer as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.2

7. Test Equipments Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
-----	-----------	-------	---------------	--------------	----------------------

1	Vector Signal Analyzer	FSU26	200030	Rohde & Schwarz	2010-06-18
2	Bluetooth Tester	CBT32	100649	Rohde & Schwarz	2010-01-22

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	2010-08-14

Anechoic chamber

Fully anechoic chamber by Frankonia German.

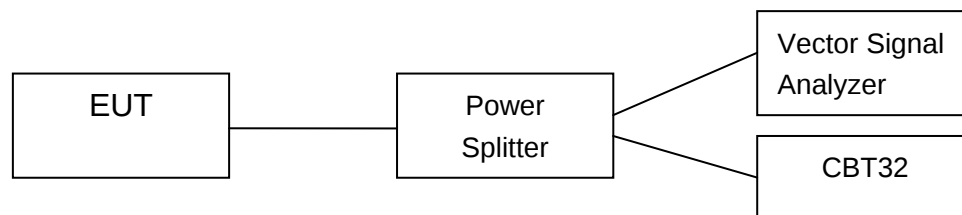
ANNEX A: MEASUREMENT RESULTS

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
Peak Conducted Output Power (dBm)	-1.15	-0.94	-0.86	P

Conclusion: PASS

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	P
	Hopping ON	Fig.2	-44.15	P
78	Hopping OFF	Fig.3	-57.41	P
	Hopping ON	Fig.4	-43.09	P

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	P
	30 MHz ~ 1 GHz	Fig.6	P
	1 GHz ~ 26 GHz	Fig.7	P
Ch 39 2441 MHz	Center Frequency	Fig.8	P
	30 MHz ~ 1 GHz	Fig.9	P
	1 GHz ~ 26 GHz	Fig.10	P
Ch 78 2480 MHz	Center Frequency	Fig.11	P
	30 MHz ~ 1 GHz	Fig.12	P
	1 GHz ~ 26 GHz	Fig.13	P

See annex B for test graphs.

Conclusion: PASS

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	P
	1 GHz ~ 4 GHz	Fig.15	P
	4 GHz ~ 18 GHz	Fig.16	P
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.17	P
	1 GHz ~ 4 GHz	Fig.18	P
	4 GHz ~ 18 GHz	Fig.19	P
Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.20	P
	1 GHz ~ 4 GHz	Fig.21	P
	4 GHz ~ 18 GHz	Fig.22	P
Power	2.45GHz~2.5GHz	Fig.23	P
For all channels	18 GHz ~ 26 GHz	Fig.24	P

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

Measurement Result:

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.25	128.11	P
		Fig.26		
	DH3	Fig.27	177.58	P
		Fig.28		
	DH5	Fig.29	173.00	P
		Fig.30		

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.31	698.72	NA
39	Fig.32	666.67	NA
78	Fig.33	698.72	NA

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)	over 25 kHz or (2/3) * 20dB bandwidth

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) * 20dB bandwidth, whichever is greater.

Measurement Result:

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.34	1158.65	P

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)	At least 15 non-overlapping channels

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.35	79	P
40~78	Fig.36		

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 μ V)	Result (dB μ V)	Conclusion
		With Charger	
0.15 to 0.5	66 to 56	Fig.37	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 μ V)	Result (dB μ V)	Conclusion
		With Charger 1	
0.15 to 0.5	56 to 46	Fig.37	P
0.5 to 5	46		
5 to 30	50		

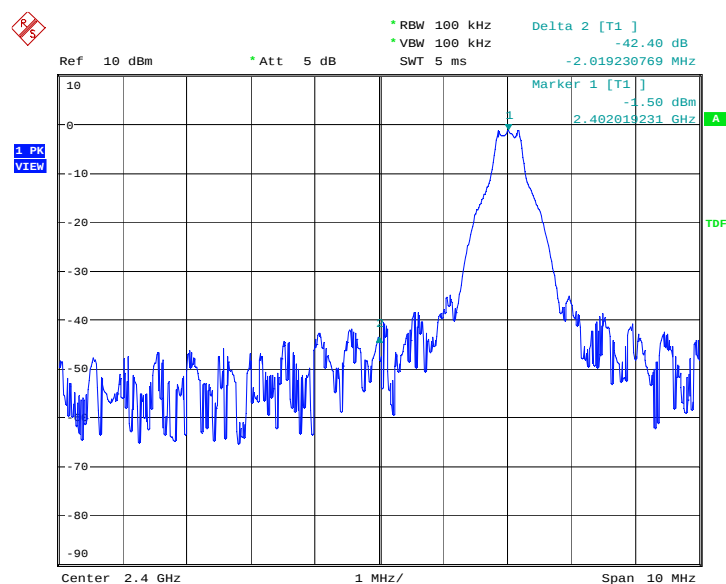
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

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

See annex B for test graphs.

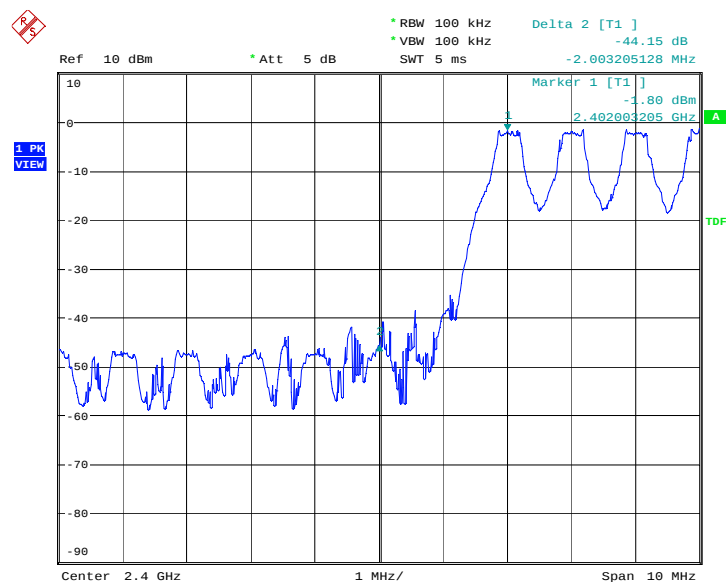
Conclusion: PASS

ANNEX B: TEST FIGURE LIST



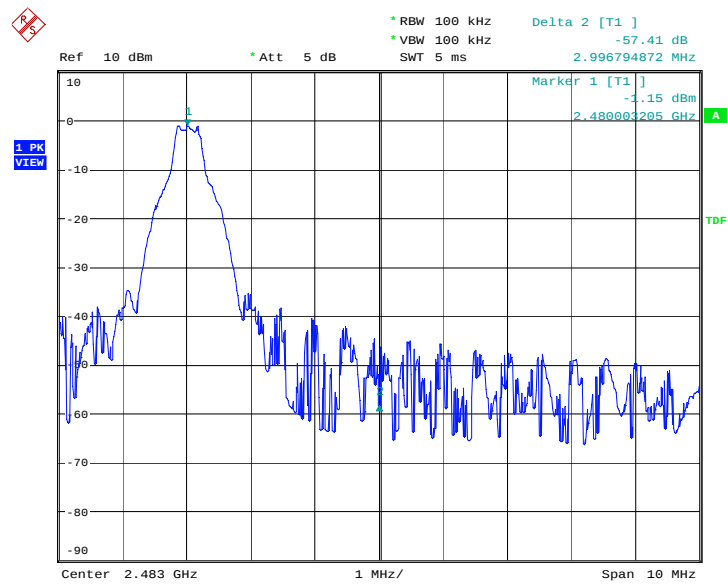
Date: 20.OCT.2009 06:38:02

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



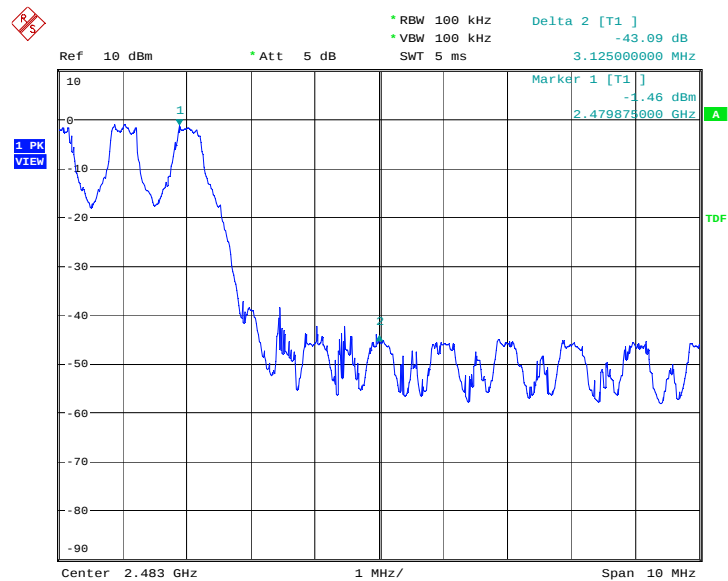
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Fig. 2 Frequency Band Edges: Channel 0, Hopping On



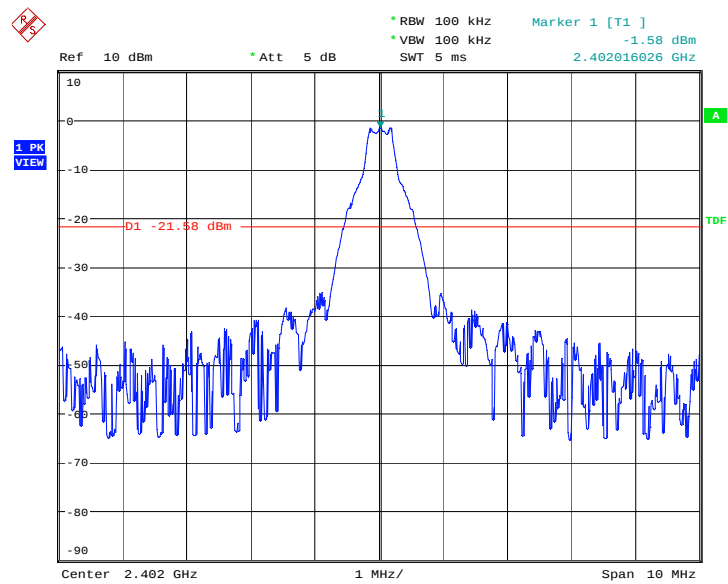
Date: 20.OCT.2009 06:38:20

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



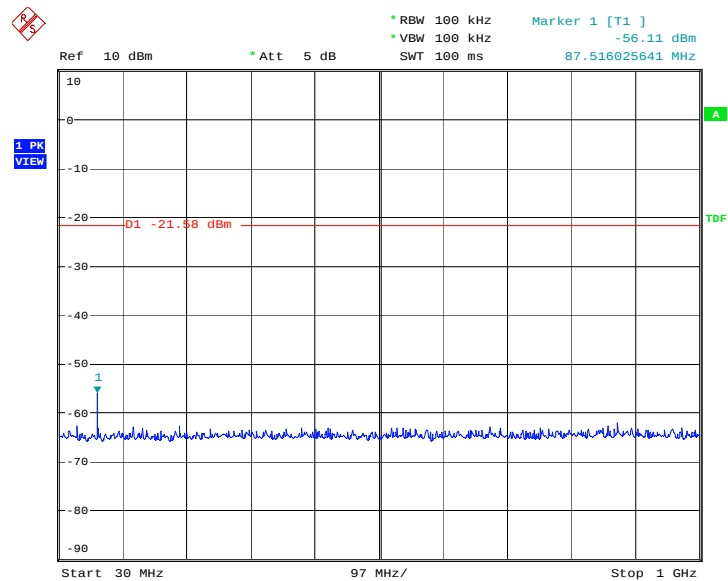
Date: 20.OCT.2009 06:48:24

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



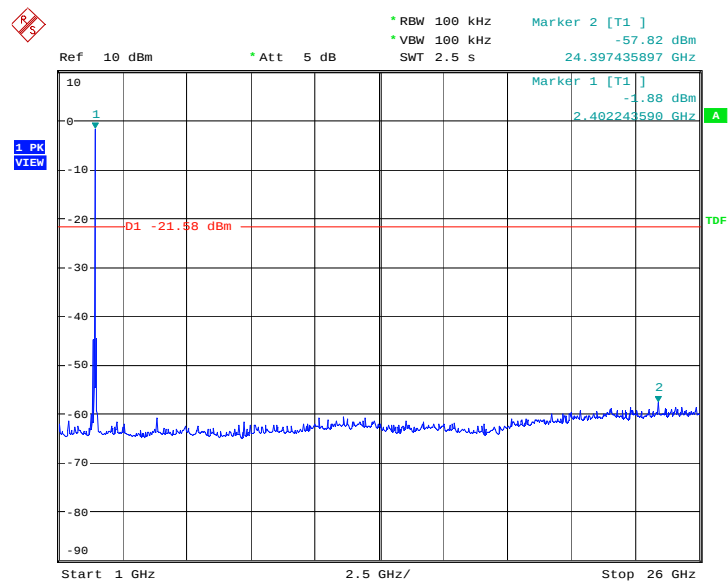
Date: 20.OCT.2009 06:48:42

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



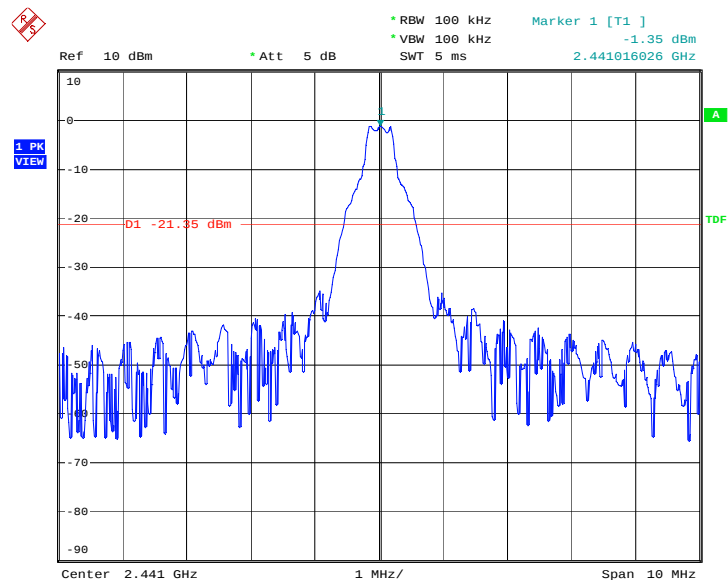
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Fig. 6 Conducted spurious emission: Channel 0, 30MHz - 1GHz



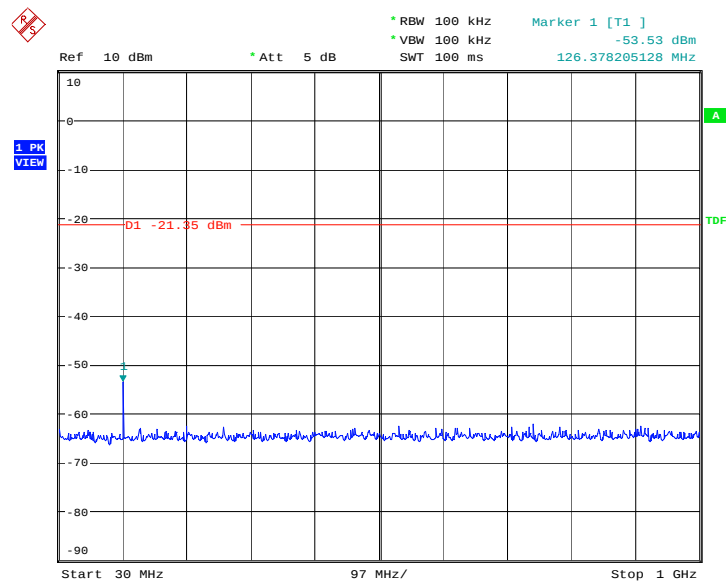
Date: 20.OCT.2009 06:49:30

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



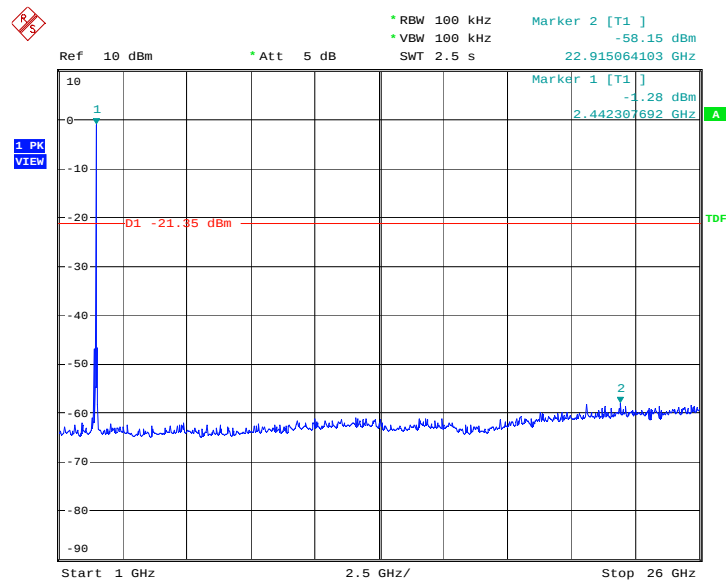
Date: 20.OCT.2009 06:49:47

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



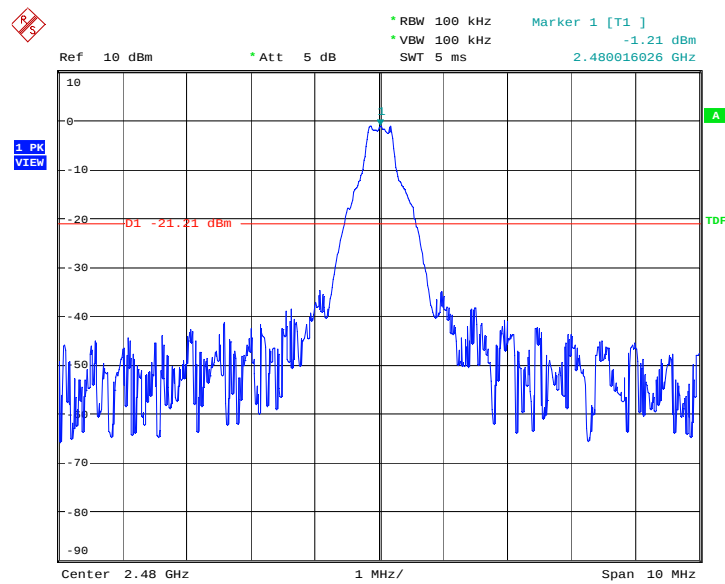
Date: 20.OCT.2009 06:50:03

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



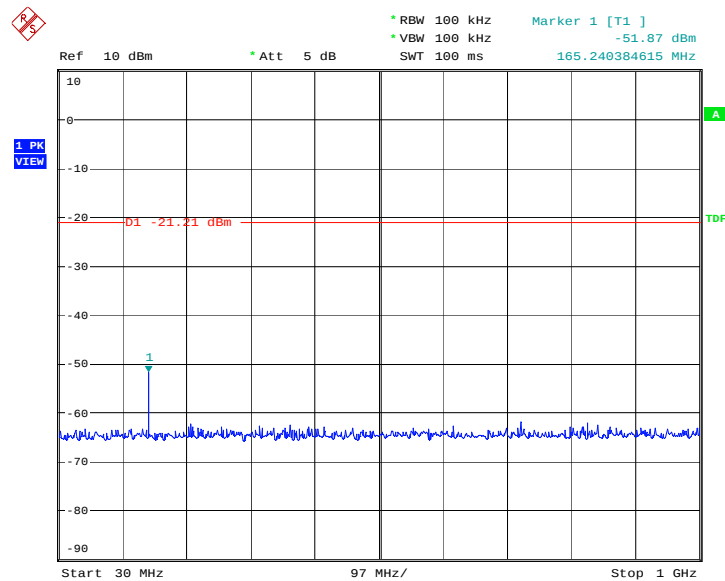
Date: 20.OCT.2009 06:50:34

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



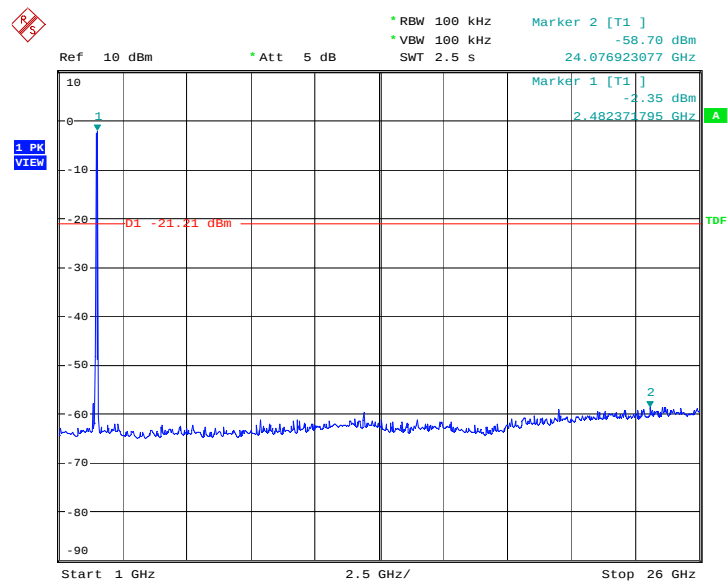
Date: 20.OCT.2009 06:50:50

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



Date: 20.OCT.2009 06:51:06

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



Date: 20.OCT.2009 06:51:37

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

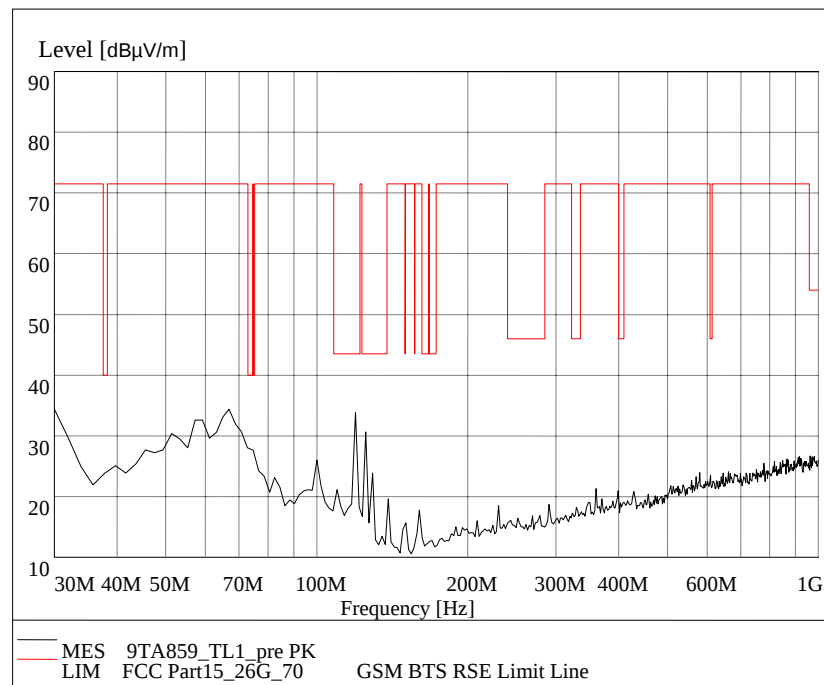


Fig. 14 Radiated emission: Channel 0, 30 MHz - 1 GHz

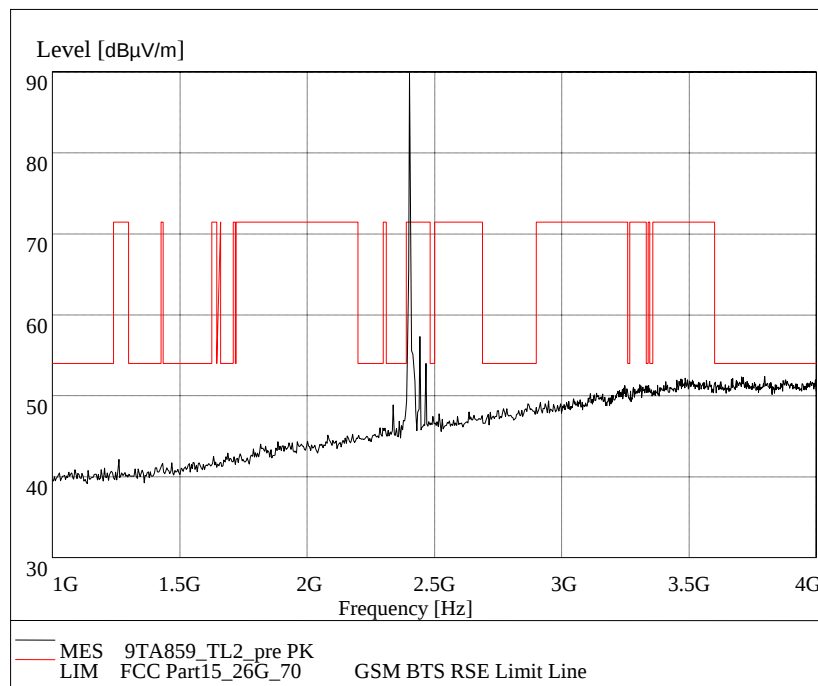


Fig. 15 Radiated emission: Channel 0, 1 GHz - 4 GHz

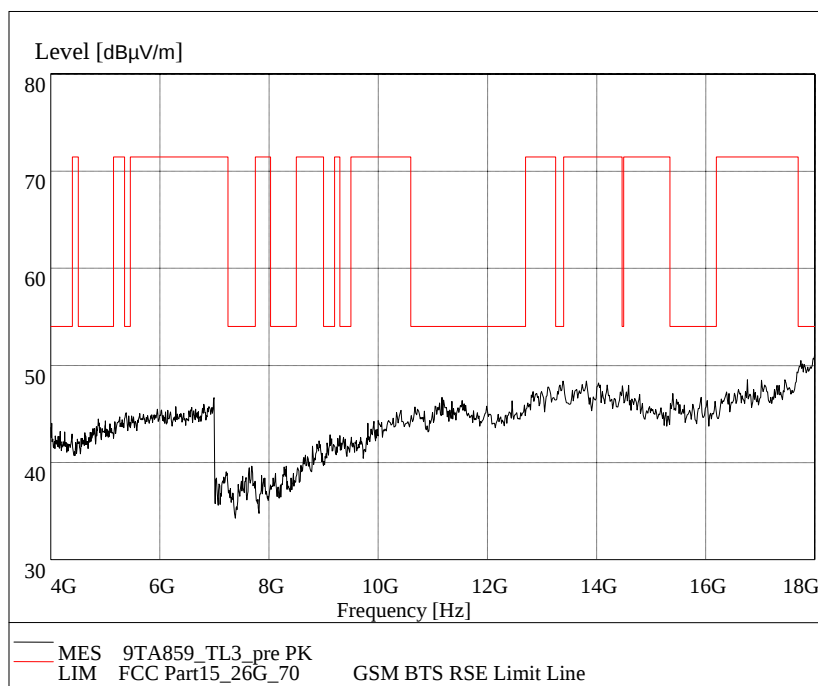


Fig. 16 Radiated emission: Channel 0, 4 GHz - 18 GHz

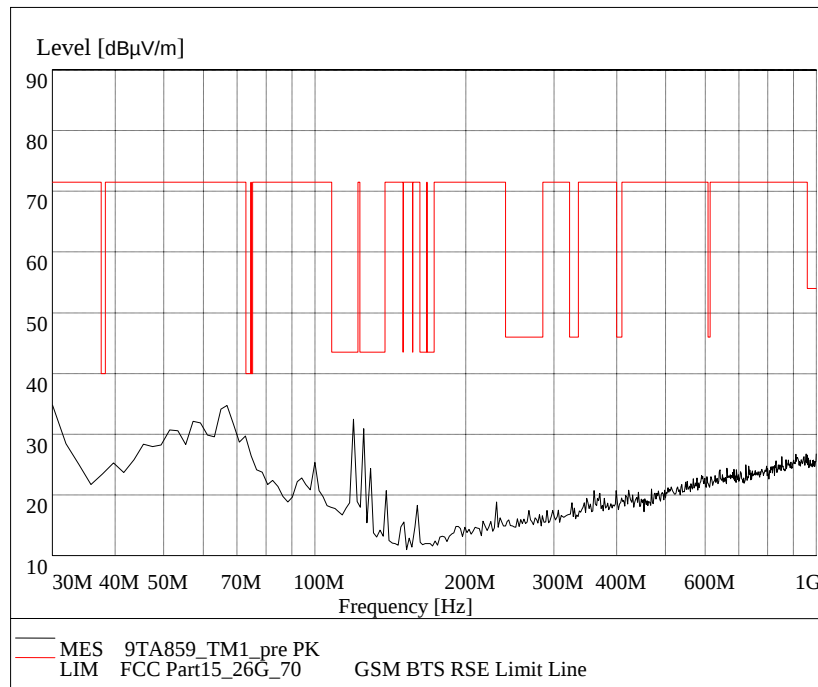


Fig. 17 Radiated emission: Channel 39, 30 MHz - 1 GHz

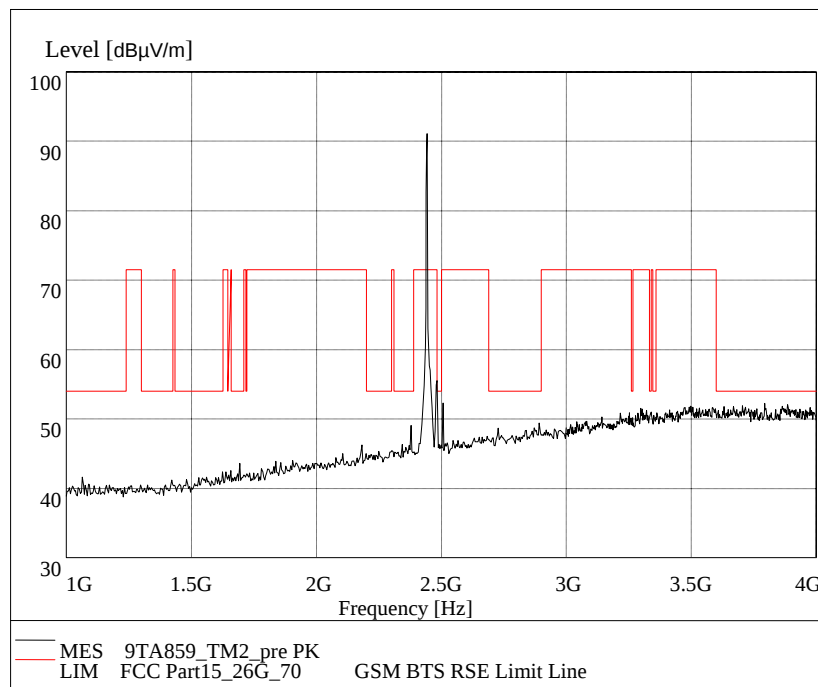


Fig. 18 Radiated emission: Channel 39, 1 GHz - 4 GHz

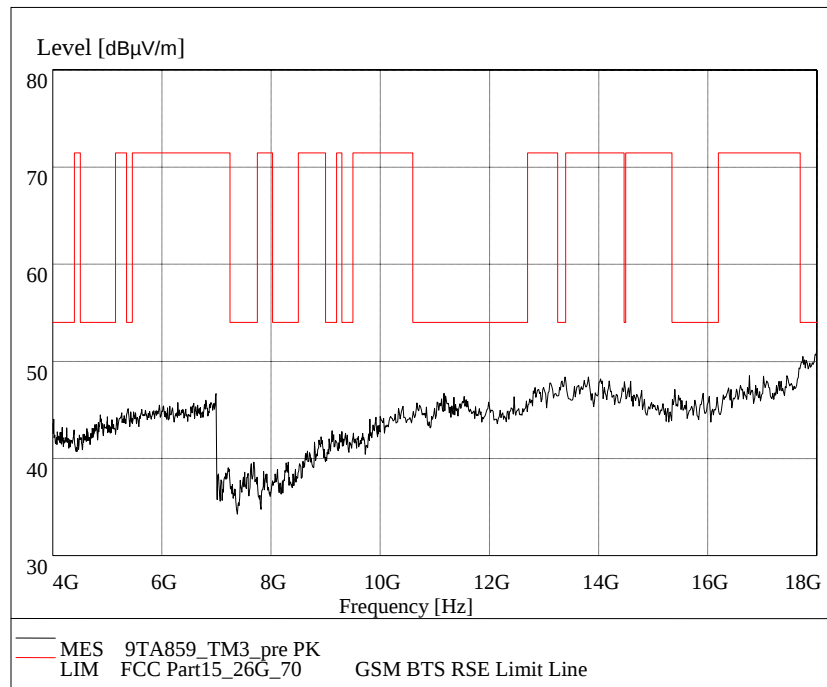


Fig. 19 Radiated emission: Channel 39, 4 GHz - 18 GHz

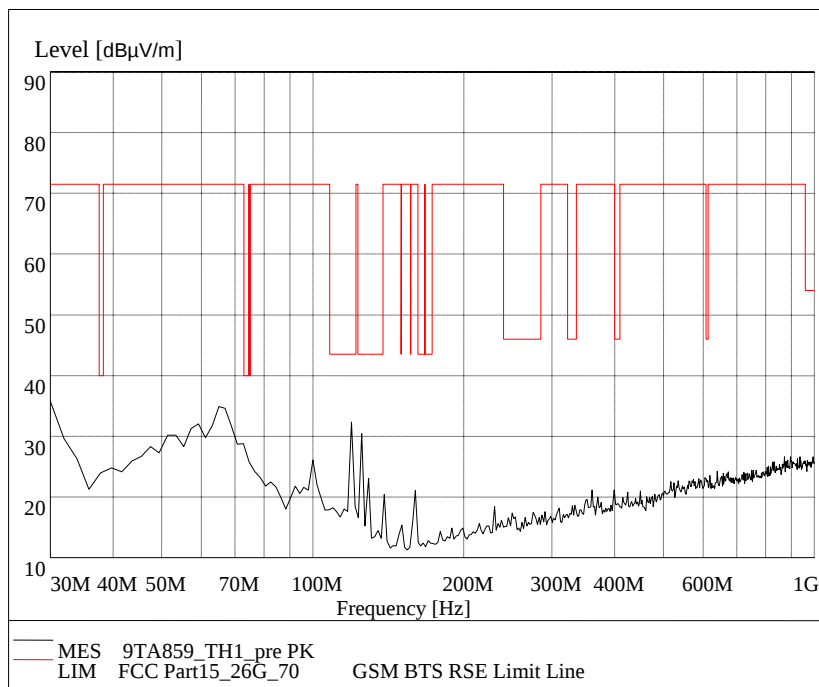


Fig. 20 Radiated emission: Channel 78, 30 MHz - 1 GHz

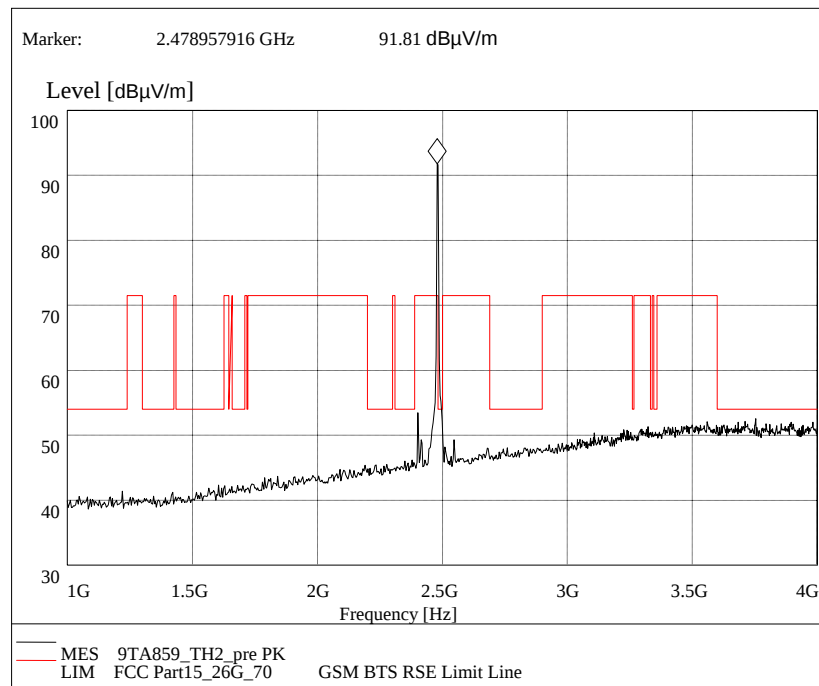


Fig. 21 Radiated emission: Channel 78, 1 GHz - 4 GHz

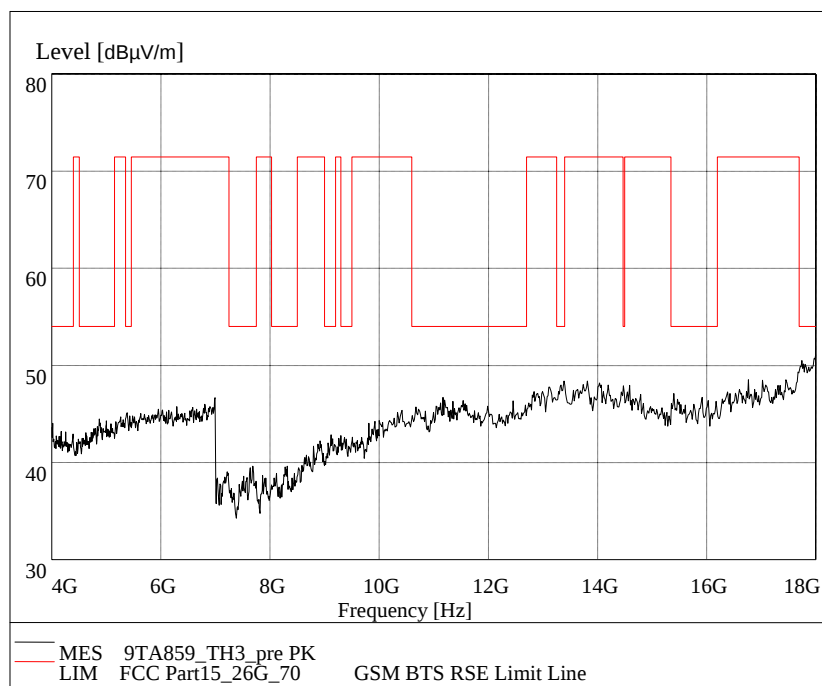


Fig. 22 Radiated emission: Channel 78, 4 GHz - 18 GHz

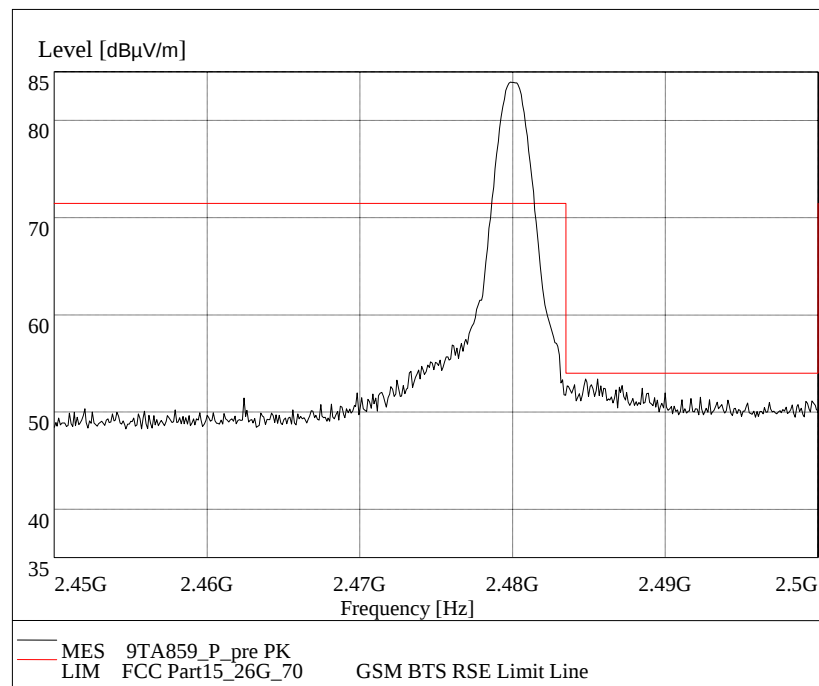


Fig. 23 Radiated emission (Power): 2.45GHz - 2.5GHz

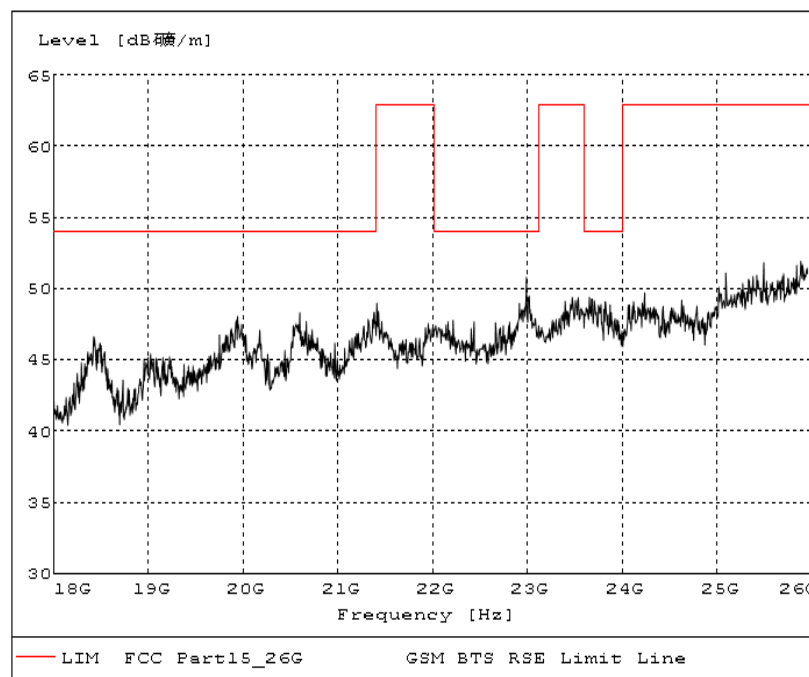
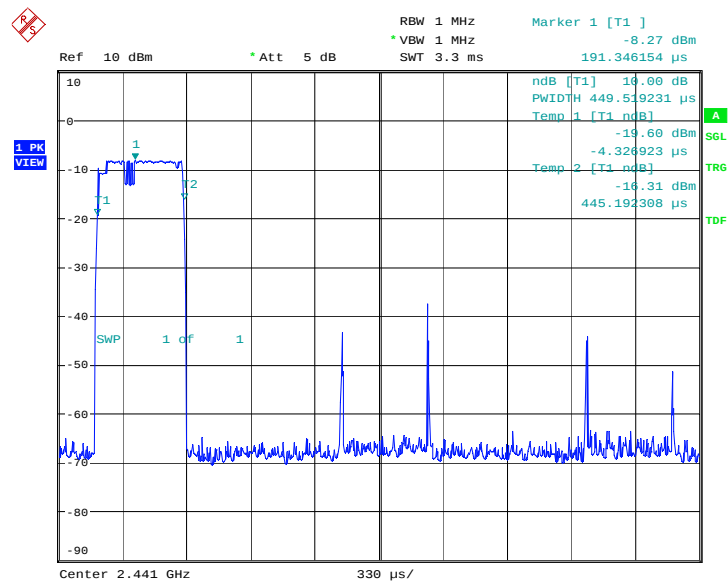
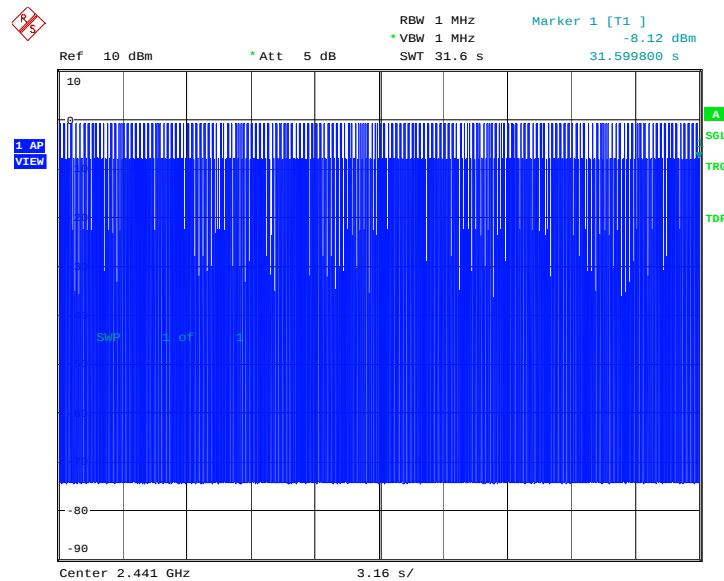


Fig. 24 Radiated emission: 18 GHz - 26 GHz



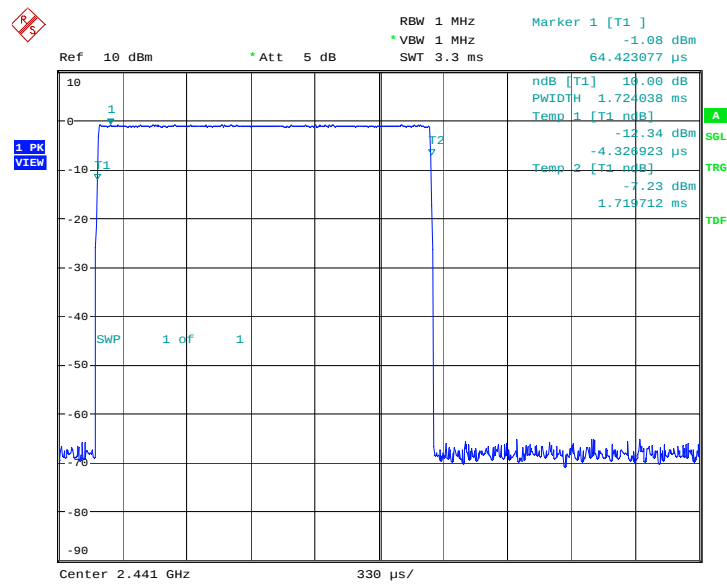
Date: 20.OCT.2009 07:00:24

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



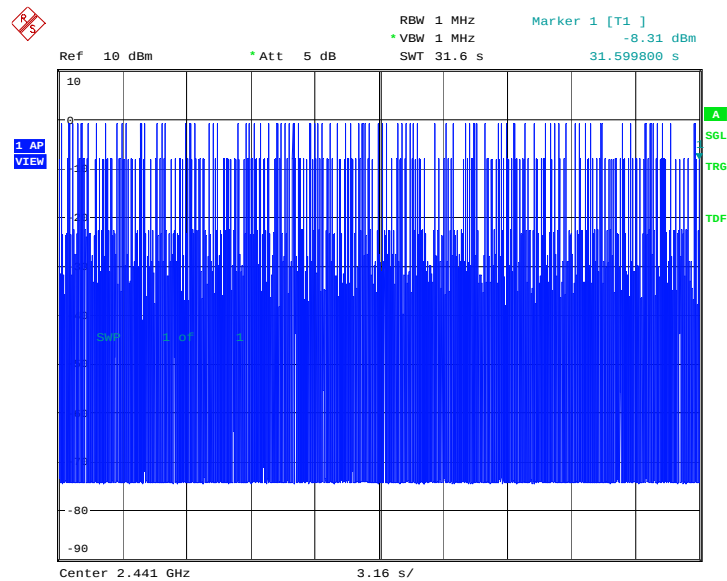
Date: 20.OCT.2009 07:00:12

Fig. 26 Number of Transmissions Measurement:Channel 39,Packet DH1



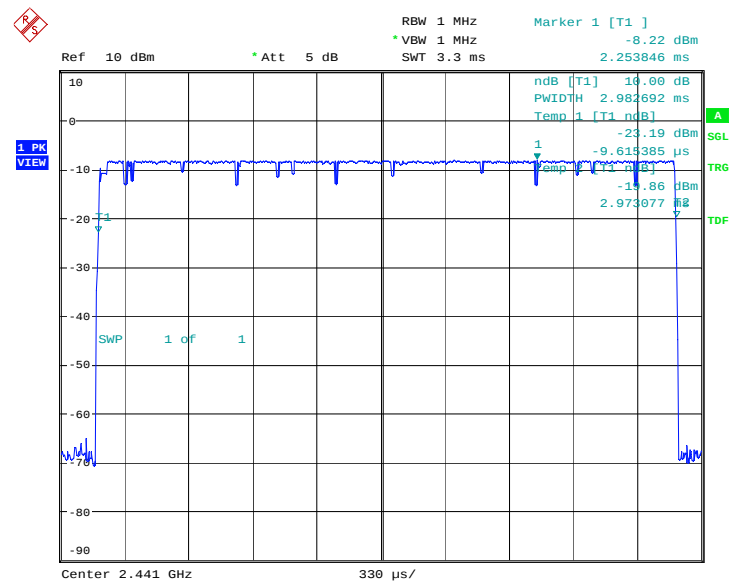
Date: 20.OCT.2009 07:01:44

Fig. 27 Time of occupancy (Dwell Time): Channel 39, Packet DH3



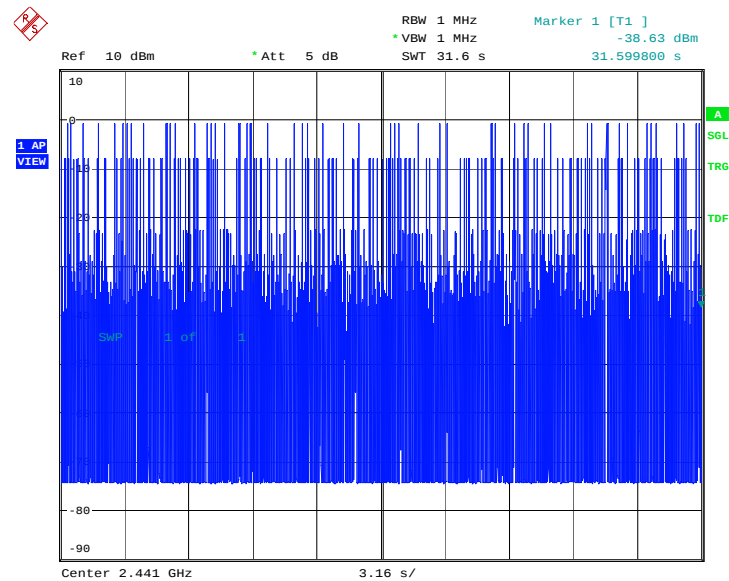
Date: 20.OCT.2009 07:01:33

Fig. 28 Number of Transmissions Measurement:Channel 39,Packet DH3



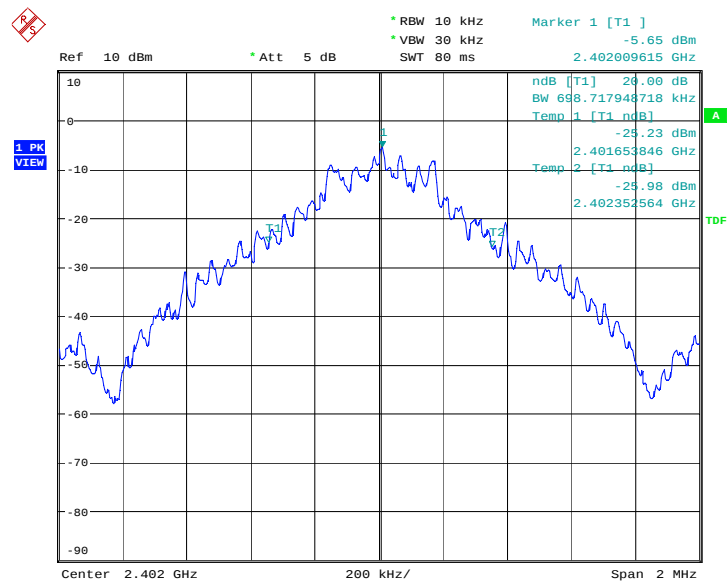
Date: 20.OCT.2009 07:03:04

Fig. 29 Time of occupancy (Dwell Time): Channel 39, Packet DH5



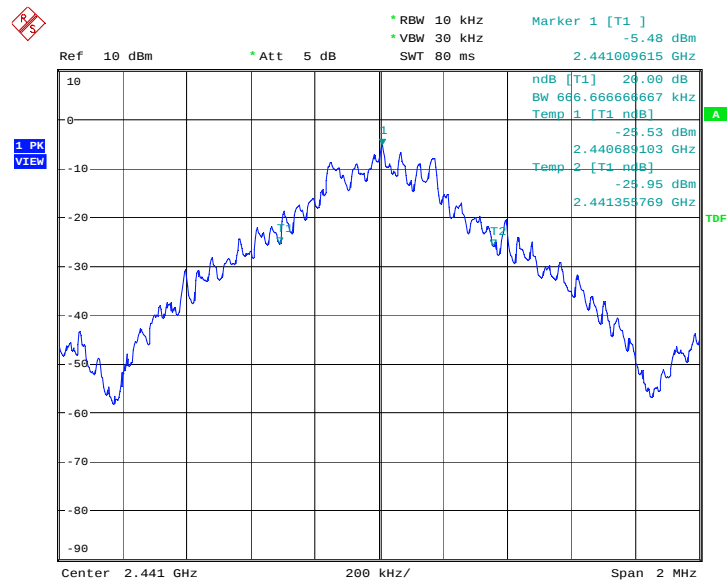
Date: 20.OCT.2009 07:02:52

Fig. 30 Number of Transmissions Measurement:Channel 39,Packet DH5



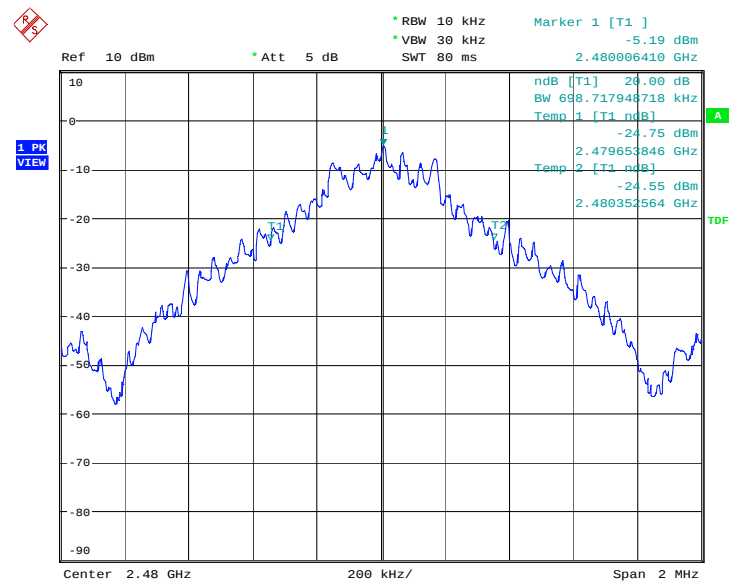
Date: 20.OCT.2009 07:03:37

Fig. 31 20dB Bandwidth: Channel 0



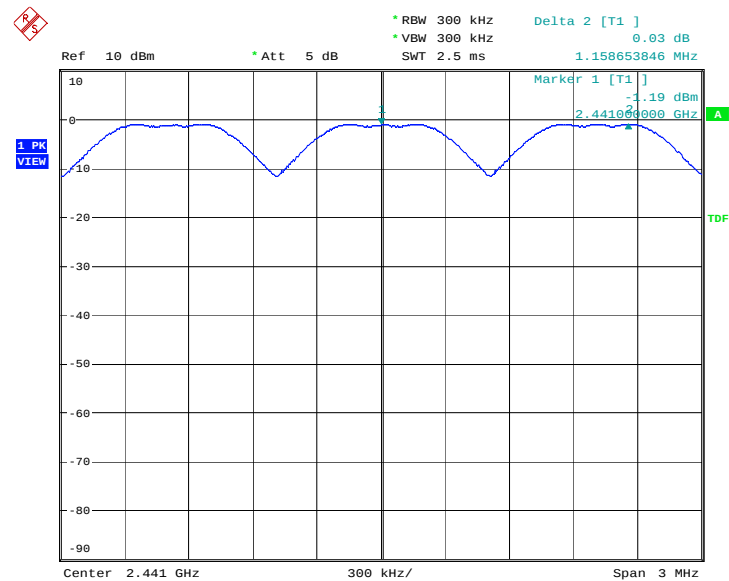
Date: 20.OCT.2009 07:04:09

Fig. 32 20dB Bandwidth: Channel 39



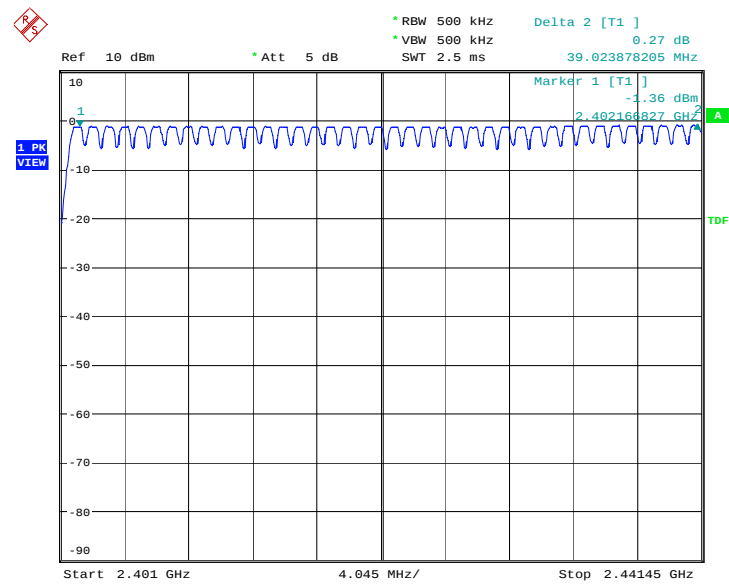
Date: 20.OCT.2009 07:04:40

Fig. 33 20dB Bandwidth: Channel 78



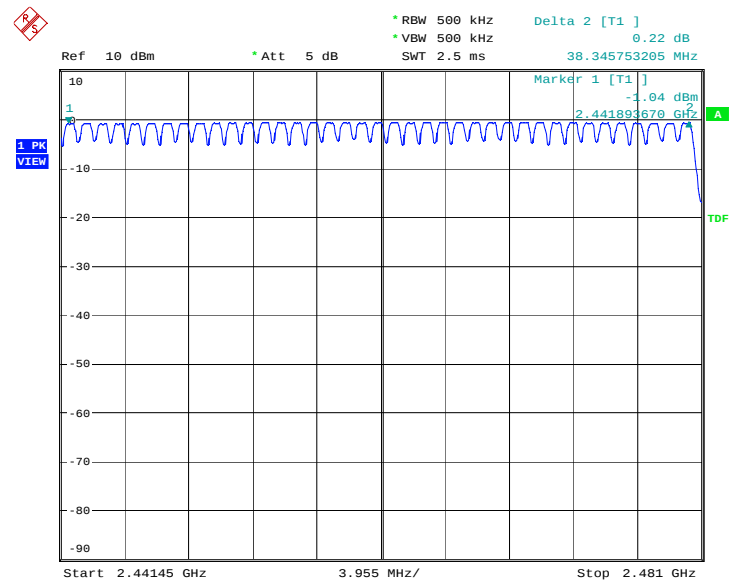
Date: 20.OCT.2009 07:09:44

Fig. 34 Carrier frequency separation measurement: Channel 39



Date: 20.OCT.2009 07:12:18

Fig. 35 Number of hopping frequencies: Channel 0 - 39



Date: 20.OCT.2009 07:14:50

Fig. 36 Number of hopping frequencies: Channel 40 - 78

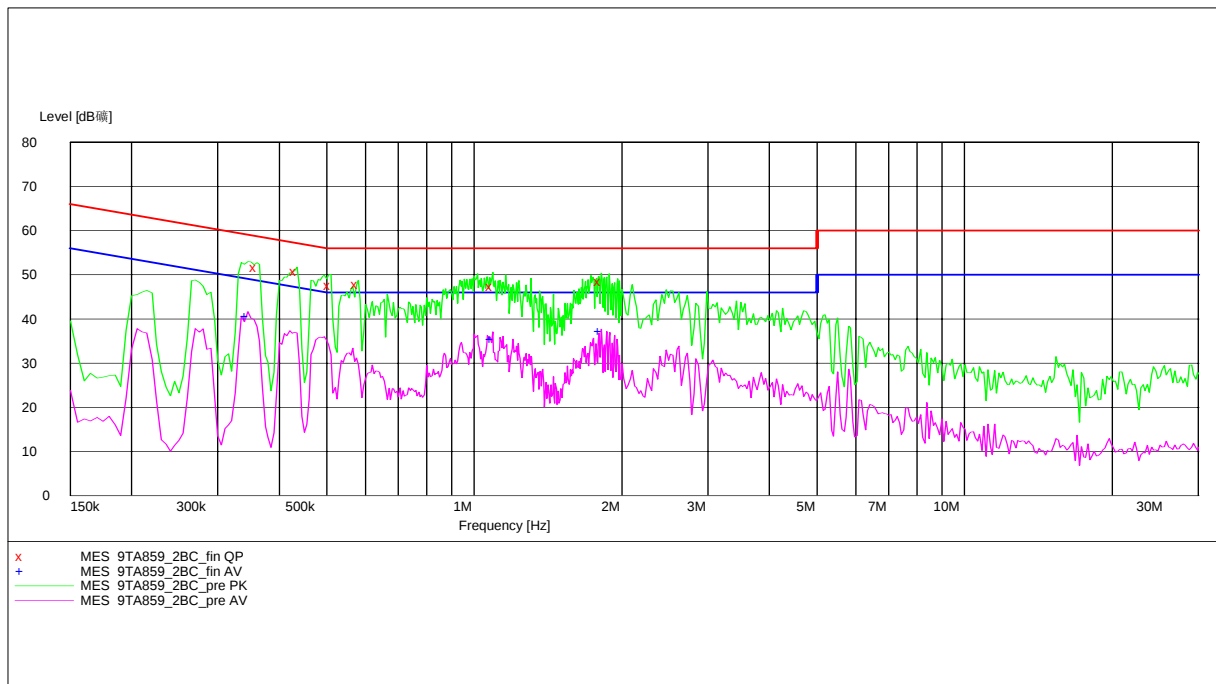


Fig. 37 AC Powerline Conducted Emission with charger

MEASUREMENT RESULT: "9TA859_2BC_fin QP"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.360000	51.70	10.1	59	7.1	L1	GND
0.435000	50.80	10.1	57	6.4	L1	GND
0.510000	47.70	10.1	56	8.3	L1	GND
0.580000	47.80	10.1	56	8.2	L1	FLO
1.090000	47.40	10.1	56	8.6	L1	GND
1.815000	48.40	10.1	56	7.6	L1	GND

MEASUREMENT RESULT: "9TA859_2BC_fin AV"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.345000	40.60	10.1	49	8.5	L1	FLO
1.090000	35.30	10.1	46	10.7	L1	GND
1.815000	37.30	10.1	46	8.7	L1	FLO

*** END OF REPORT BODY ***