



TEST REPORT

No. 2010TAR011

for

TCT Mobile Limited

GSM/GPRS/EDGE 850/1900 dual band mobile phone

Model Name: Piano A

Marketing Name: OT-880A

FCC ID: RAD126

with

Hardware Version: PIO

Software Version: V121

Issued Date: 2010-01-20



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:

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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: 2010-01-14
Testing End Date: 2010-01-20

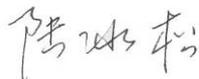
1.4. Signature



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: TCT Mobile Limited
Address /Post: 4/F, South Building, No.2966, Jinke Road, Zhangjiang High-Tech Park,
Pudong, Shanghai, 201203, P.R.China
City: Shanghai
Postal Code: 201203
Country: P.R.China
Telephone: 0086-21-61460890
Fax: 0086-21-61460602

2.2. Manufacturer Information

Company Name: TCT Mobile Limited
Address /Post: 4/F, South Building, No.2966, Jinke Road, Zhangjiang High-Tech Park,
Pudong, Shanghai, 201203, P.R.China
City: Shanghai
Postal Code: 201203
Country: P.R.China
Telephone: 0086-21-61460890
Fax: 0086-21-61460602

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

3.1. About EUT

| | |
|--------------------|---|
| Description | GSM/GPRS/EDGE 850/1900 dual band mobile phone |
| Model Name | Piano A |
| Marketing Name | OT-880A |
| FCC ID | RAD126 |
| Frequency Band | ISM 2400MHz~2483.5MHz |
| Type of Modulation | FHSS |
| Number of Channels | 79 |
| Power Supply | 3.7V DC by Battery |

3.2. Internal Identification of EUT used during the test

| EUT ID* | SN or IMEI | HW Version | SW Version |
|----------------|-------------------|-------------------|-------------------|
| N10 | 012108000200102 | PIO | V121 |
| N13 | 012108000200599 | PIO | V121 |

*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 | / | / |
| AE2 | Travel Charger | / | / |

*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 CFR 47, Part 15, Subpart C: | |
| | 15.205 Restricted bands of operation; | July 10, |
| FCC Part15 | 15.209 Radiated emission limits, general requirements; | 2008 |
| | 15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz. | Edition |
| ANSI C63.4 | Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment 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 |

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 |

Fully-anechoic chamber2 (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 | 2011-01-21 |

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 | 2010-12-24 |
| 4 | Universal Radio Communication Tester | CMU200 | 105948 | Rohde & Schwarz | 2010-08-14 |

Anechoic chamber

Fully anechoic chamber by Frankonia German.

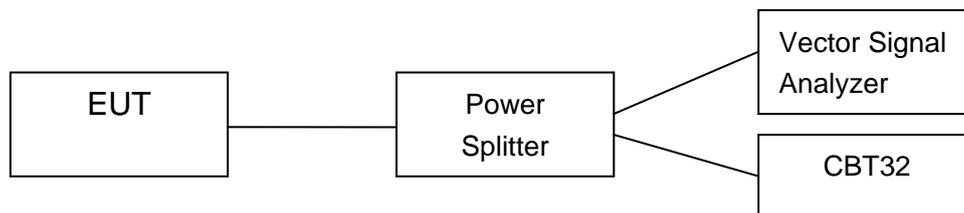
ANNEX A: MEASUREMENT RESULTS

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) | -0.02 | -0.53 | 0.68 | 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 | -58.01 | P |
| | Hopping ON | Fig.2 | -56.23 | P |
| 78 | Hopping OFF | Fig.3 | -59.93 | P |
| | Hopping ON | Fig.4 | -56.65 | 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 |

Test Condition

| Frequency of emission (MHz) | RBW/VBW | Sweep Time(s) |
|-----------------------------|---------------|---------------|
| 30-1000 | 100KHz/300KHz | 5 |
| 1000-4000 | 1MHz/1MHz | 15 |
| 4000-18000 | 1MHz/1MHz | 40 |
| 18000-26500 | 1MHz/1MHz | 20 |

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 | 106.94 | P |
| | | Fig.26 | | |
| | DH3 | Fig.27 | 178.20 | P |
| | | Fig.28 | | |
| | DH5 | Fig.29 | 183.25 | 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 | 746.79 | NA |
| 39 | Fig.32 | 756.41 | NA |
| 78 | Fig.33 | 746.79 | 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 | 1153.85 |
| | | 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 |
| 40~78 | Fig.36 | |
| | | P |

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 (dBμV) | Result (dBμV) | 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)

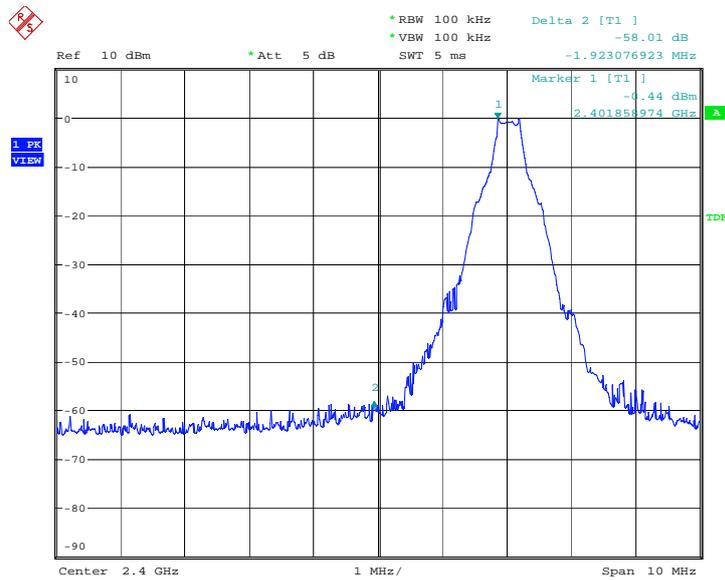
| Frequency range (MHz) | Average Limit (dB μ V) | Result (dB μ V) | Conclusion |
|--|-------------------------------|---------------------|------------|
| | | With Charger 1 | |
| 0.15 to 0.5 | 56 to 46 | Fig.37 | P |
| 0.5 to 5 | 46 | | |
| 5 to 30 | 50 | | |
| NOTE: The limit decreases linearly with 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.

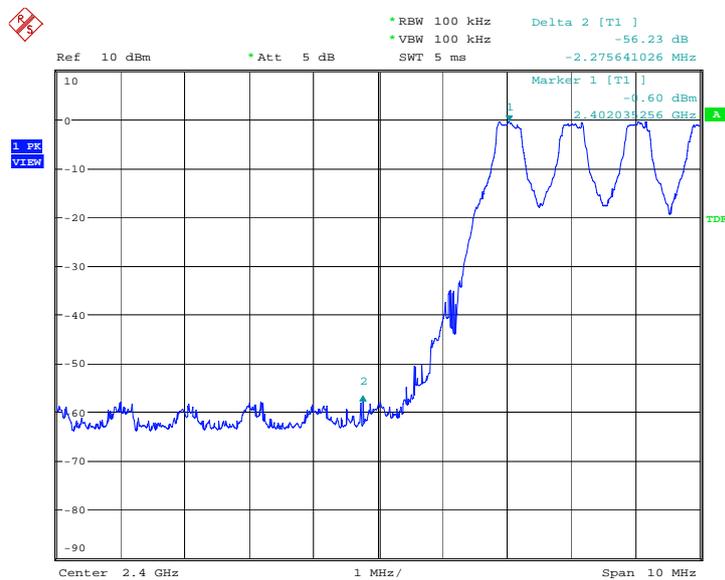
Conclusion: PASS

ANNEX B: TEST FIGURE LIST



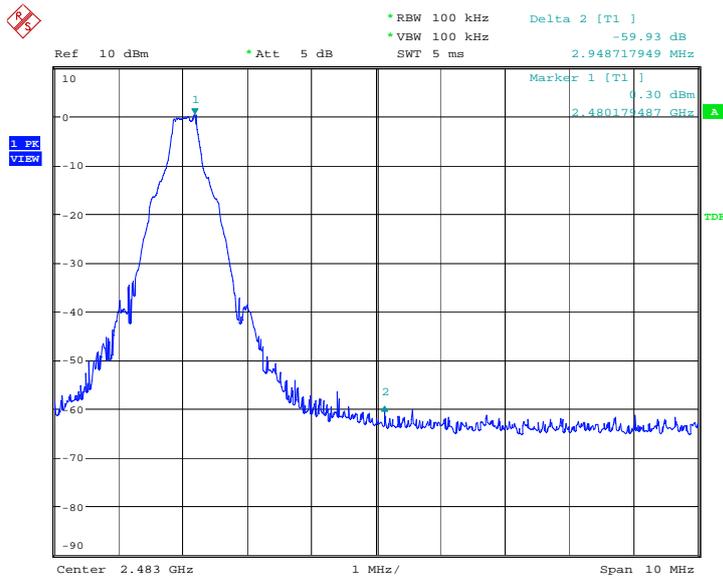
Date: 14.JAN.2010 08:04:10

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



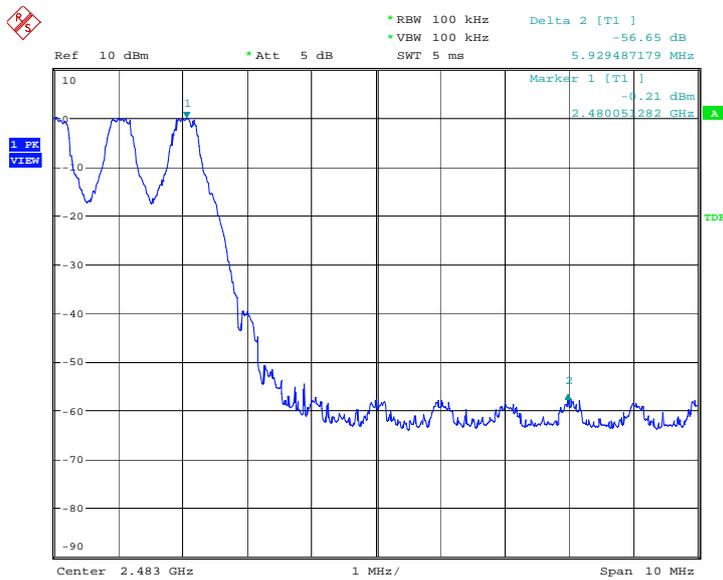
Date: 14.JAN.2010 08:09:29

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



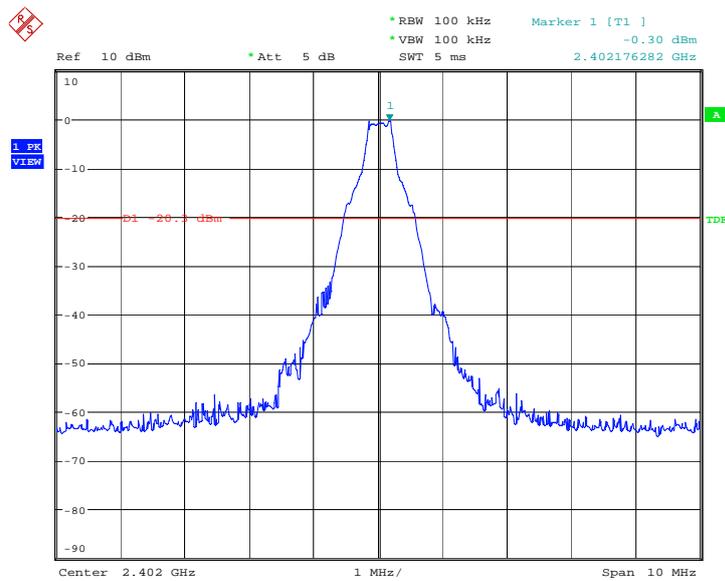
Date: 14.JAN.2010 08:04:27

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



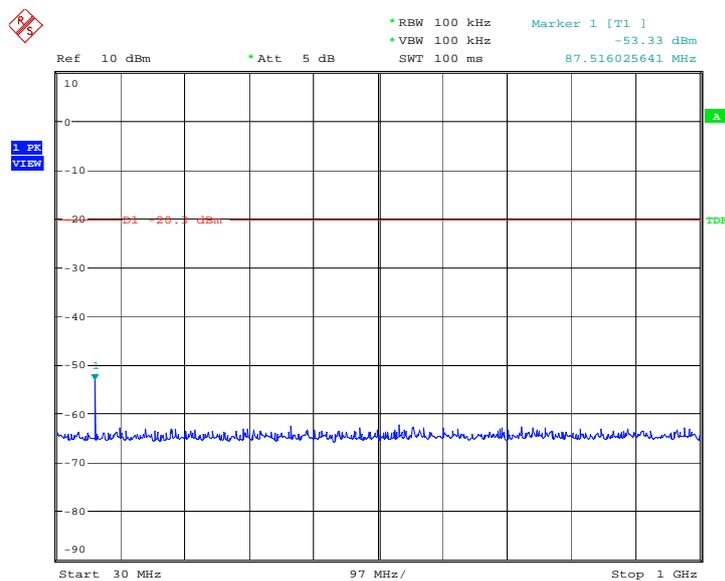
Date: 14.JAN.2010 08:14:31

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



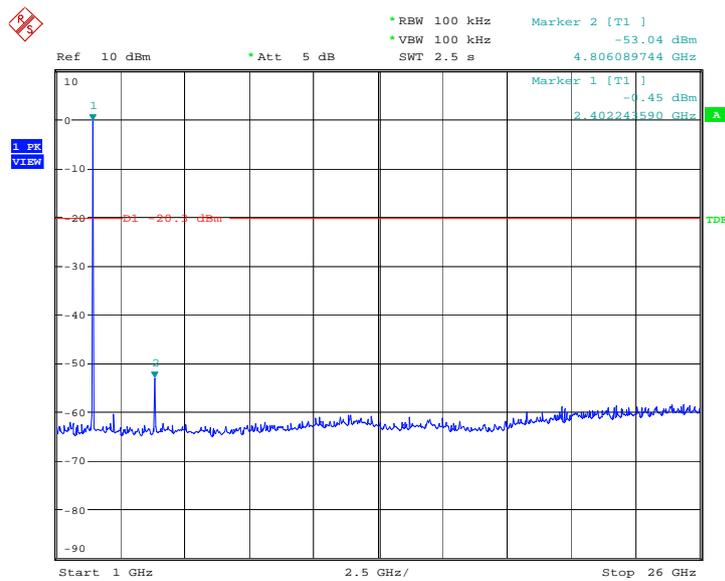
Date: 14.JAN.2010 08:14:49

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



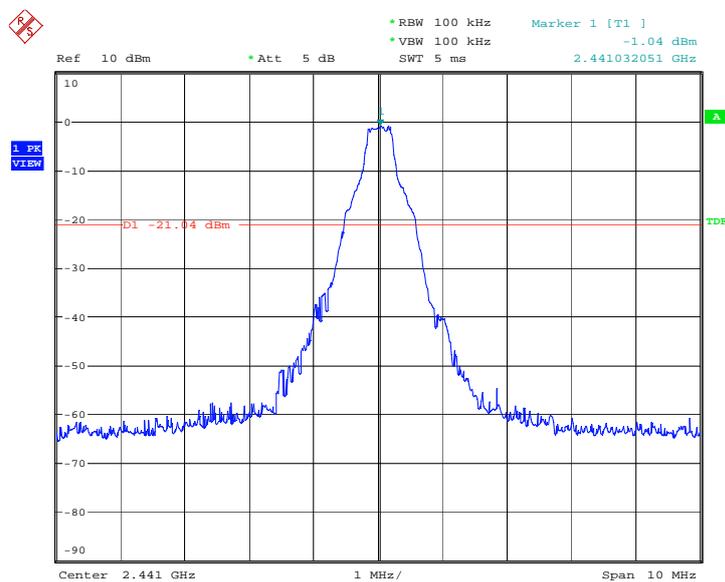
Date: 14.JAN.2010 08:15:06

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



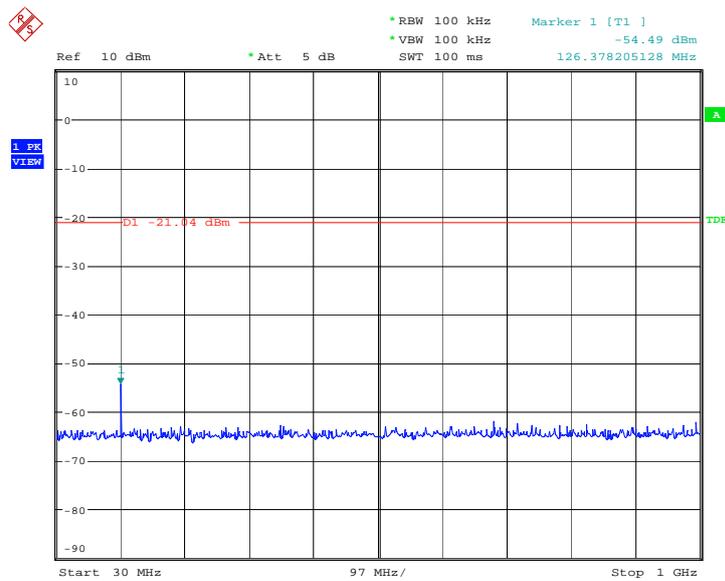
Date: 14.JAN.2010 08:15:37

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



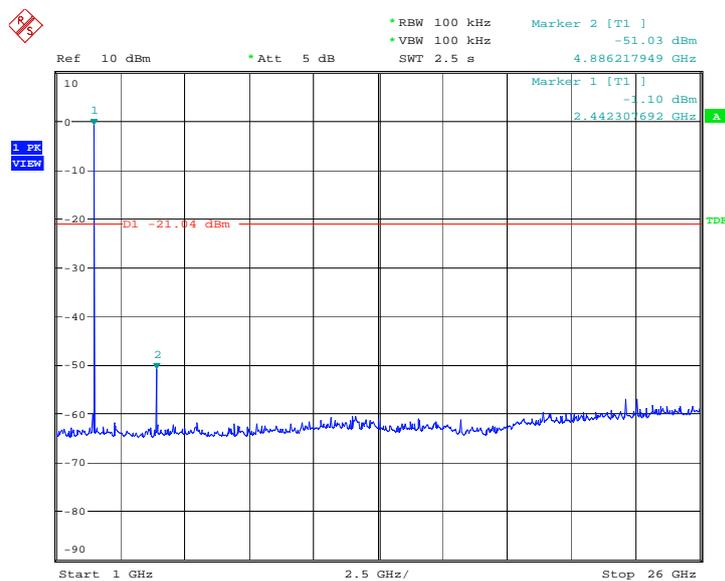
Date: 14.JAN.2010 08:15:54

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



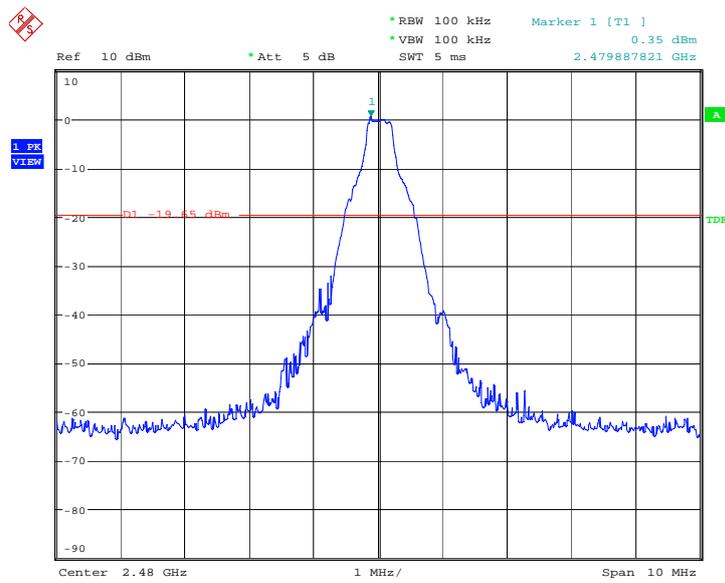
Date: 14.JAN.2010 08:16:10

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



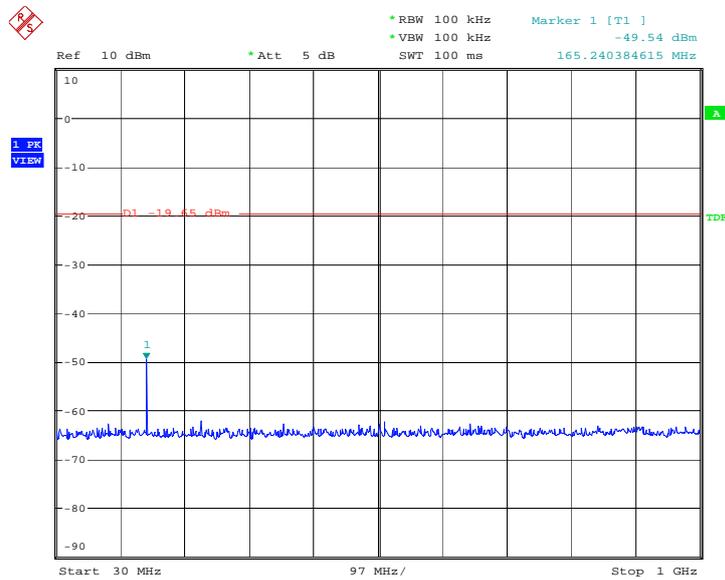
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Fig. 10 Conducted spurious emission: Channel 39, 1GHz – 26GHz



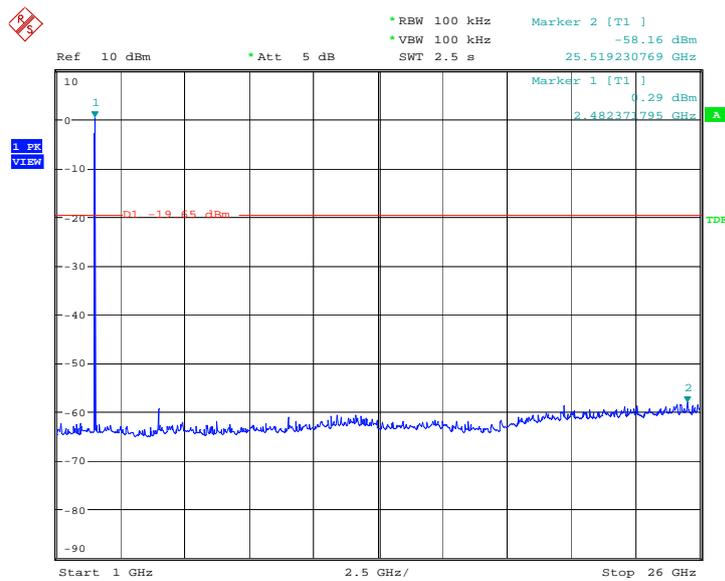
Date: 14.JAN.2010 08:16:59

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



Date: 14.JAN.2010 08:17:15

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



Date: 14.JAN.2010 08:17:47

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

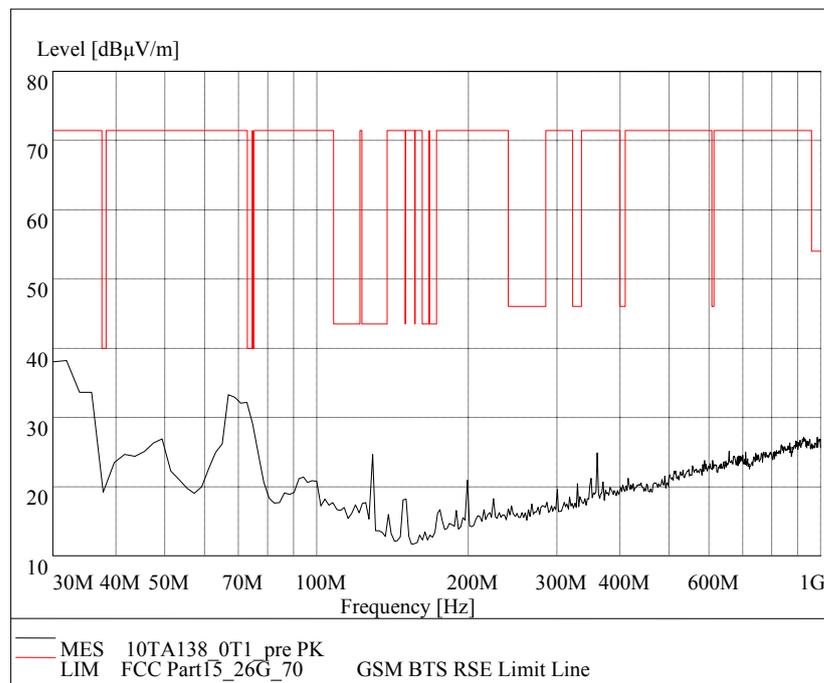


Fig. 14 Radiated emission: Channel 0, 30 MHz - 1 GHz

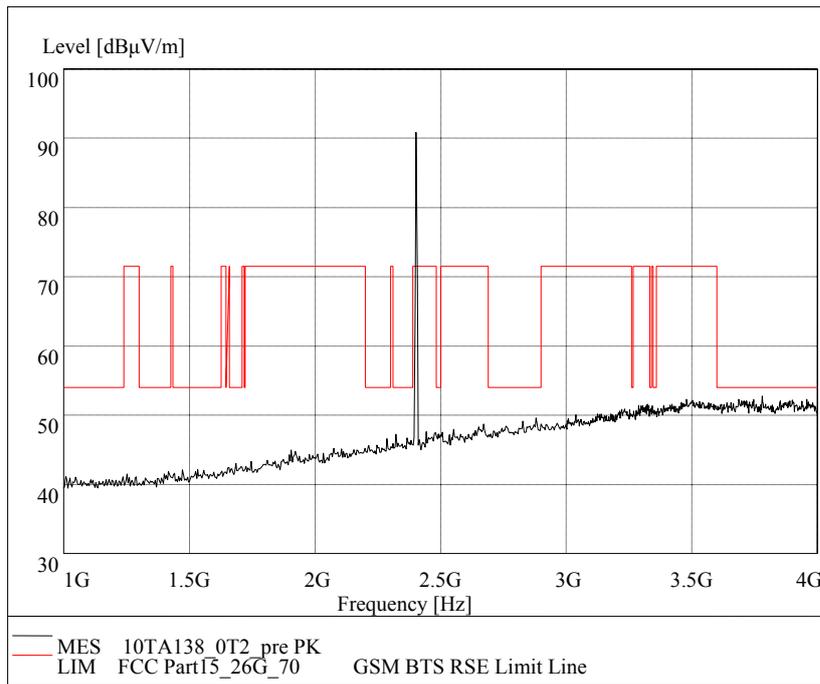


Fig. 15 Radiated emission: Channel 0, 1 GHz - 4 GHz

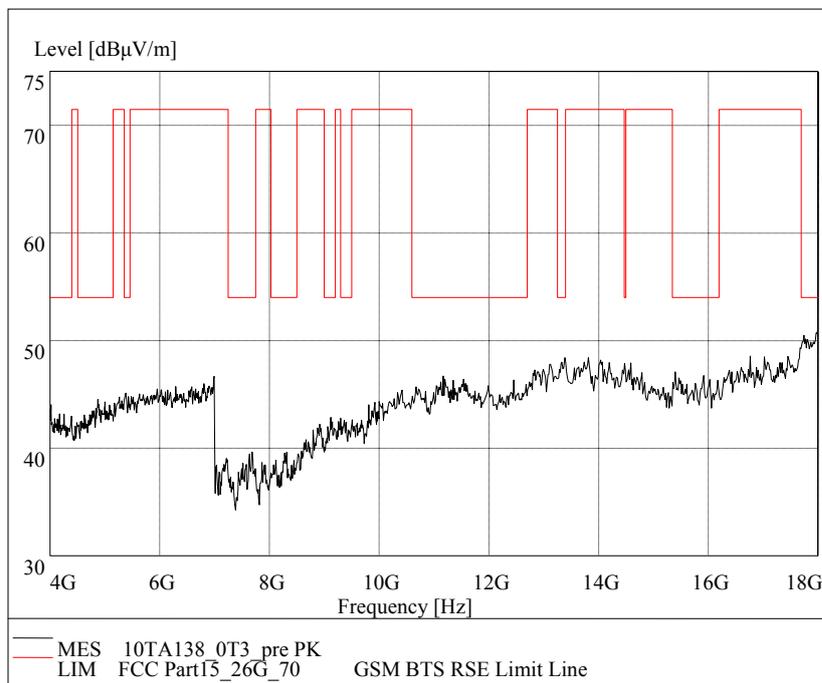


Fig. 16 Radiated emission: Channel 0, 4 GHz - 18 GHz

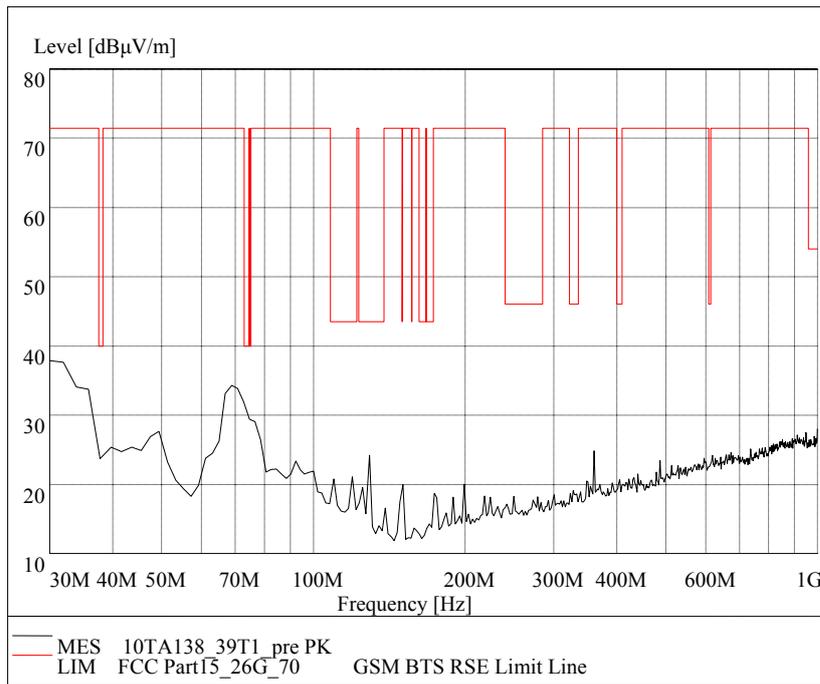


Fig. 17 Radiated emission: Channel 39, 30 MHz - 1 GHz

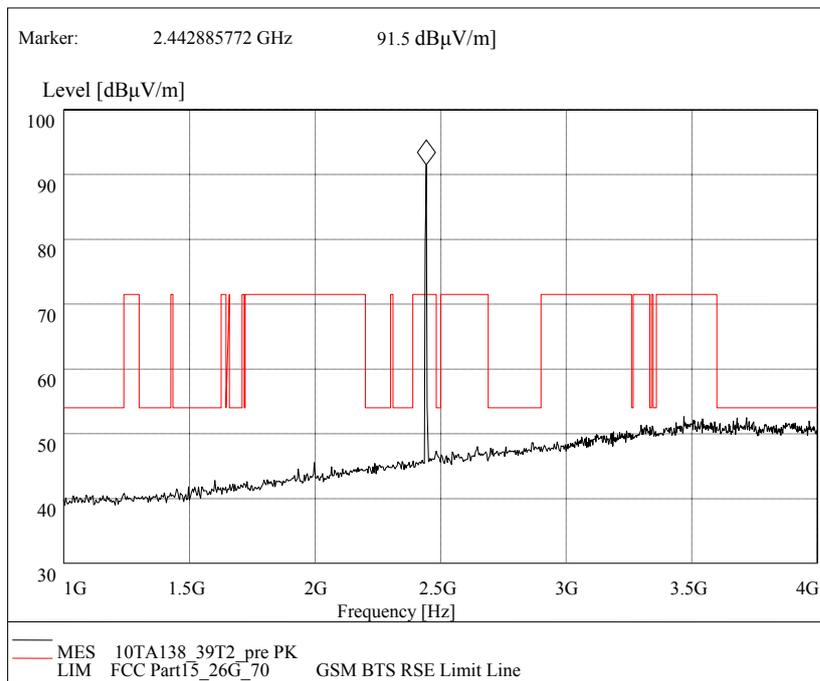


Fig. 18 Radiated emission: Channel 39, 1 GHz - 4 GHz

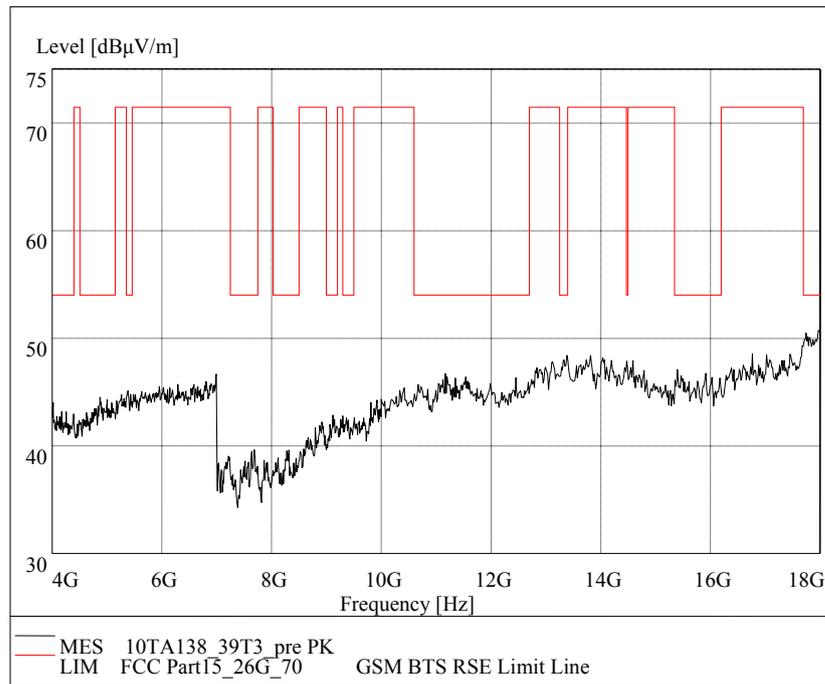


Fig. 19 Radiated emission: Channel 39, 4 GHz - 18 GHz

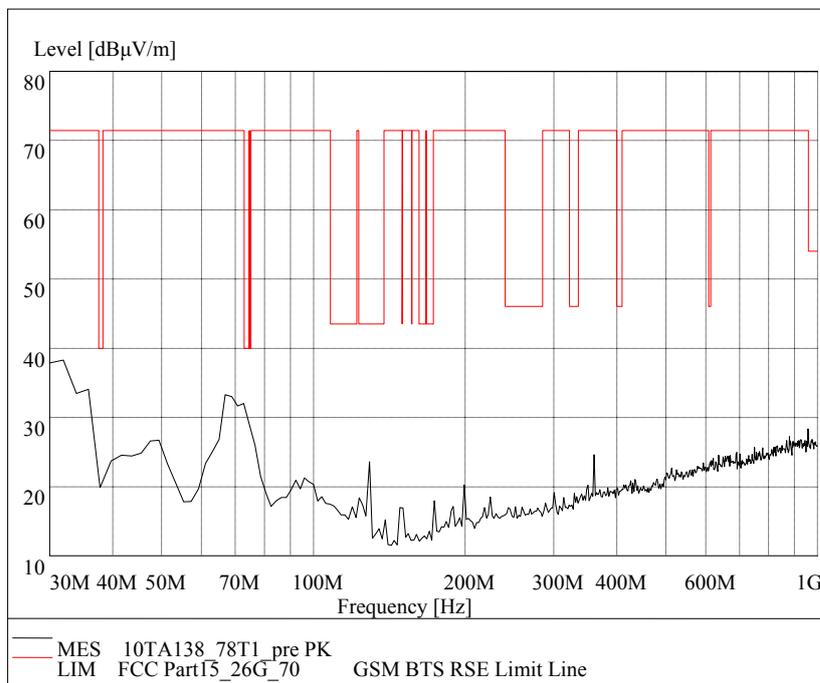


Fig. 20 Radiated emission: Channel 78, 30 MHz - 1 GHz

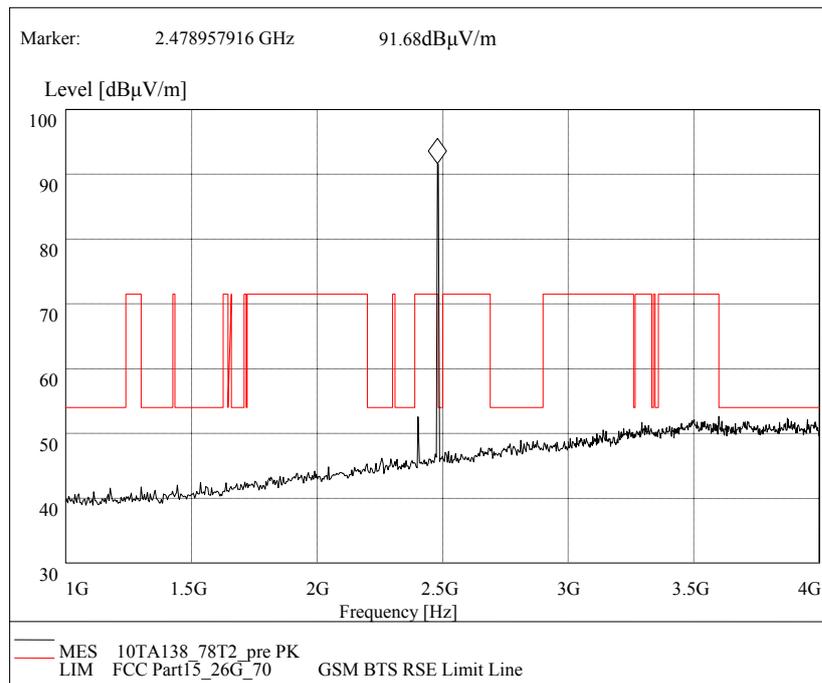


Fig. 21 Radiated emission: Channel 78, 1 GHz - 4 GHz

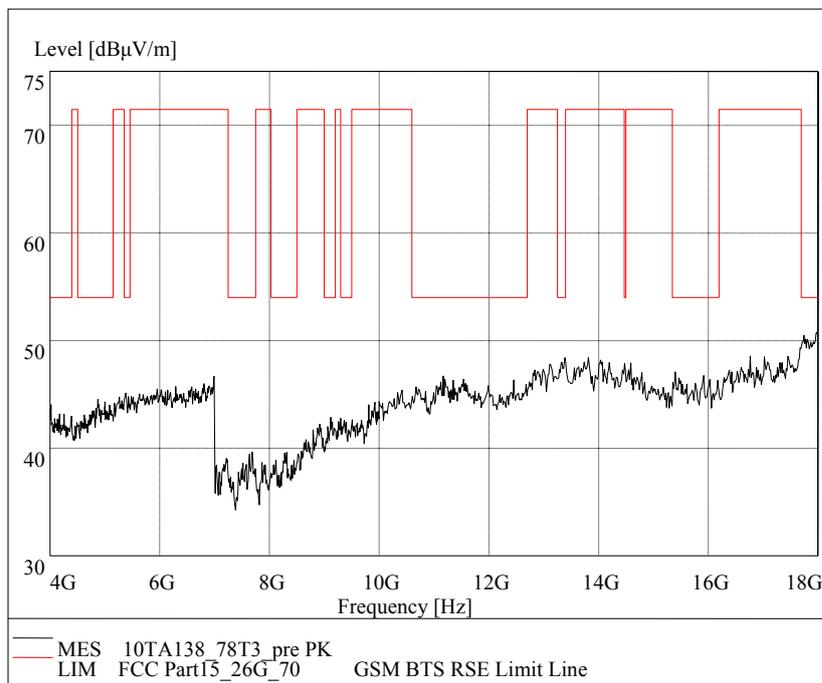


Fig. 22 Radiated emission: Channel 78, 4 GHz - 18 GHz

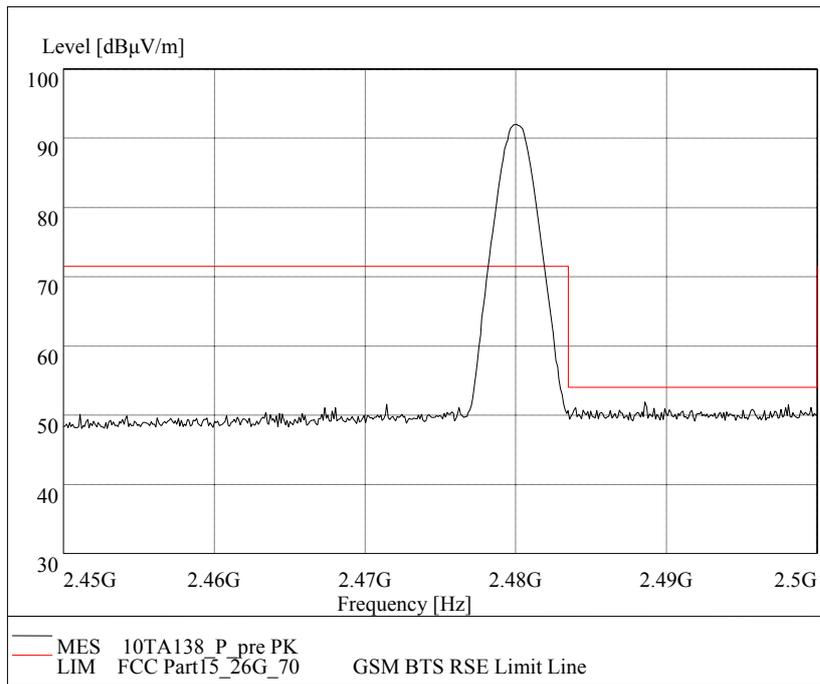


Fig. 23 Radiated emission (Power): 2.45GHz - 2.5GHz

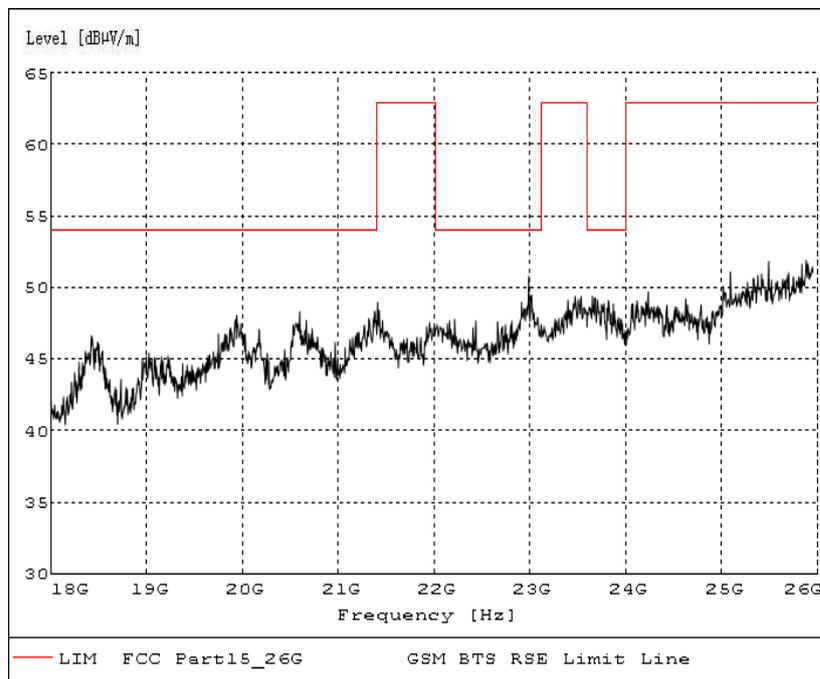
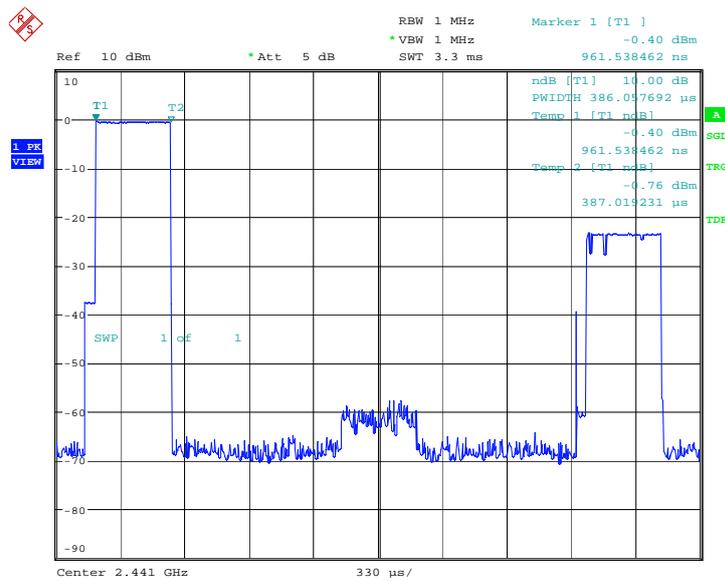
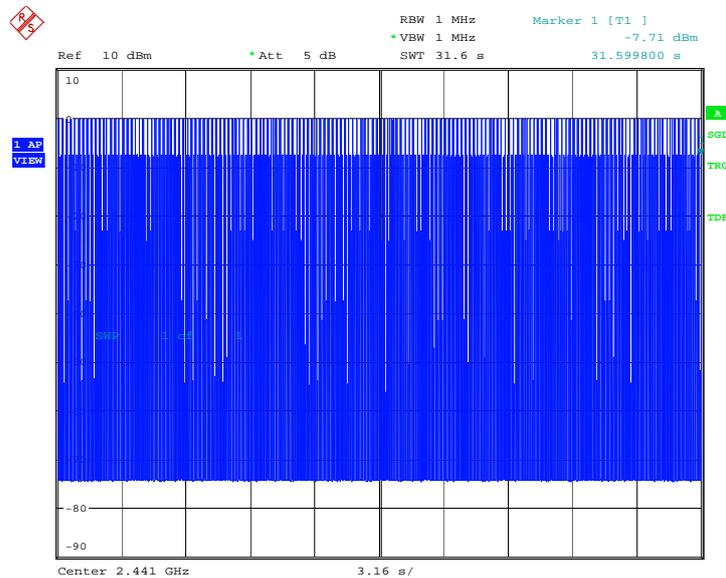


Fig. 24 Radiated emission: 18 GHz - 26 GHz



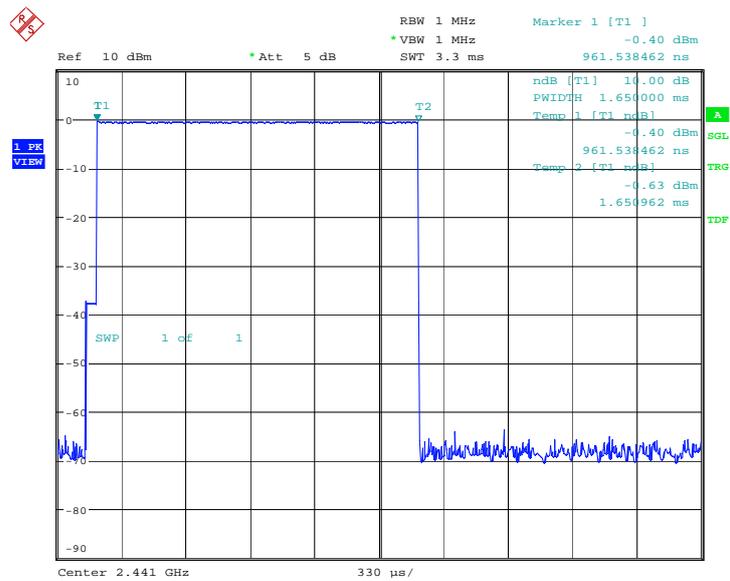
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Fig. 25 Time of occupancy (Dwell Time): Channel 39, Packet DH1



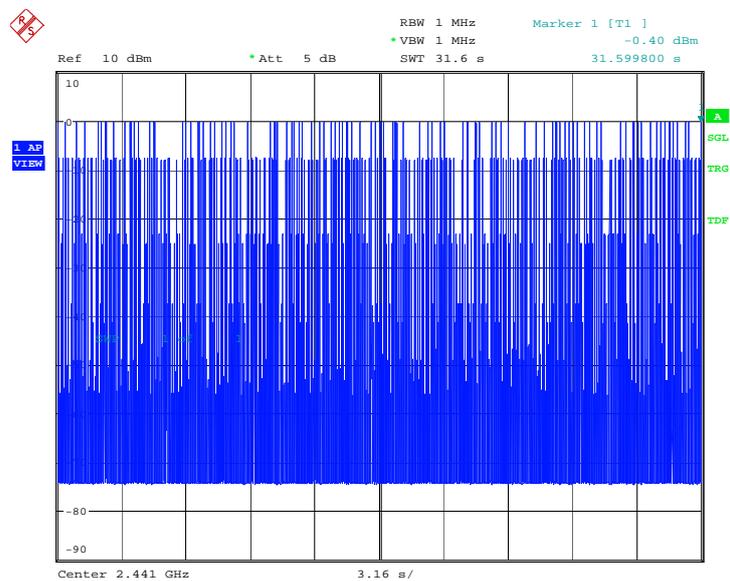
Date: 14.JAN.2010 08:18:58

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



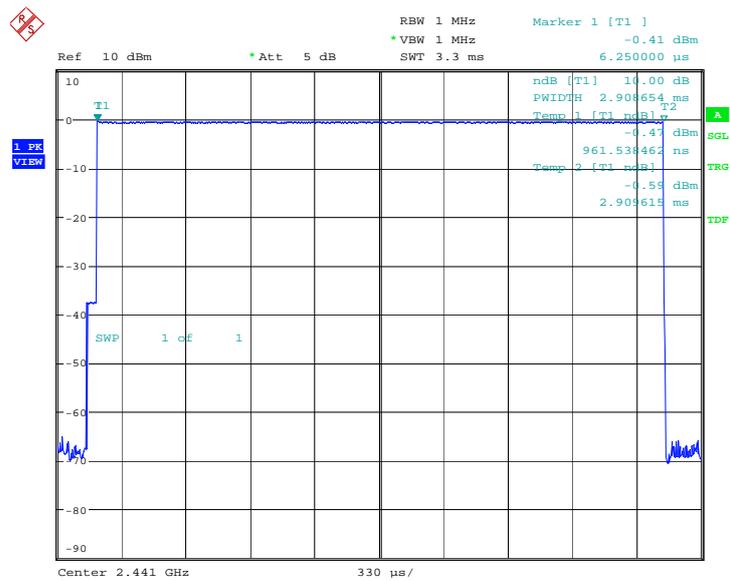
Date: 14.JAN.2010 08:20:27

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



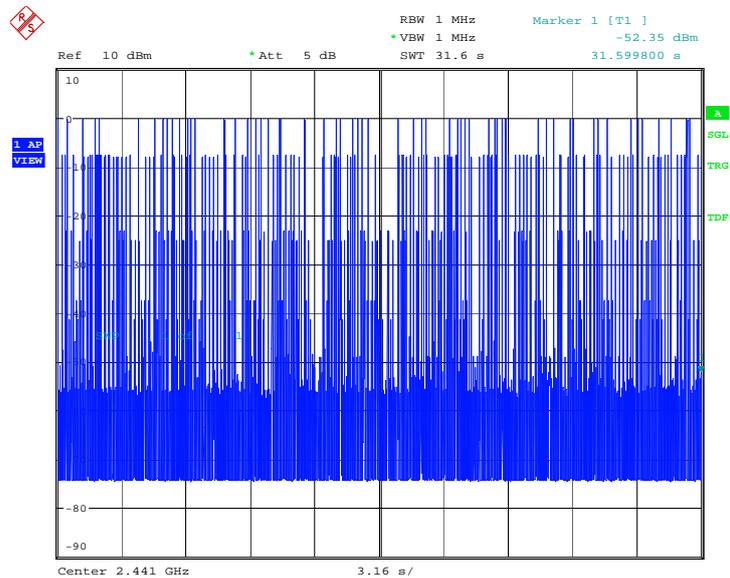
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Fig. 28 Number of Transmissions Measurement: Channel 39, Packet DH3



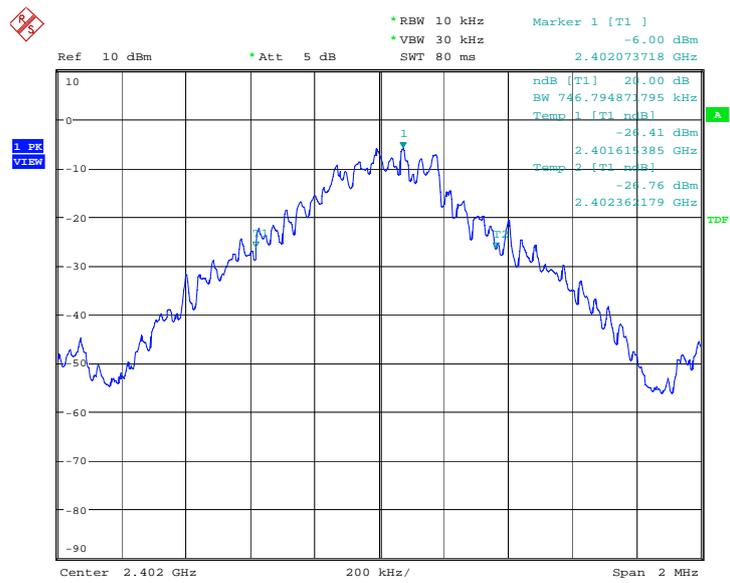
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Fig. 29 Time of occupancy (Dwell Time): Channel 39, Packet DH5



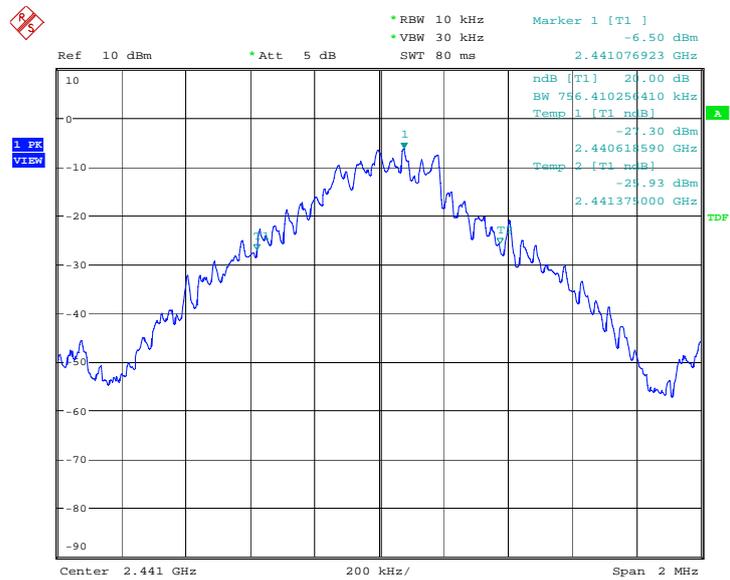
Date: 14.JAN.2010 08:21:33

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



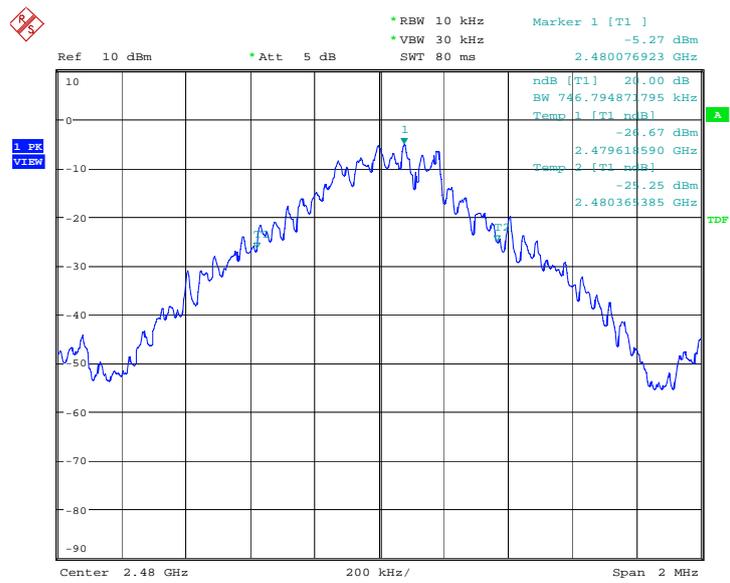
Date: 14.JAN.2010 08:22:18

Fig. 31 20dB Bandwidth: Channel 0



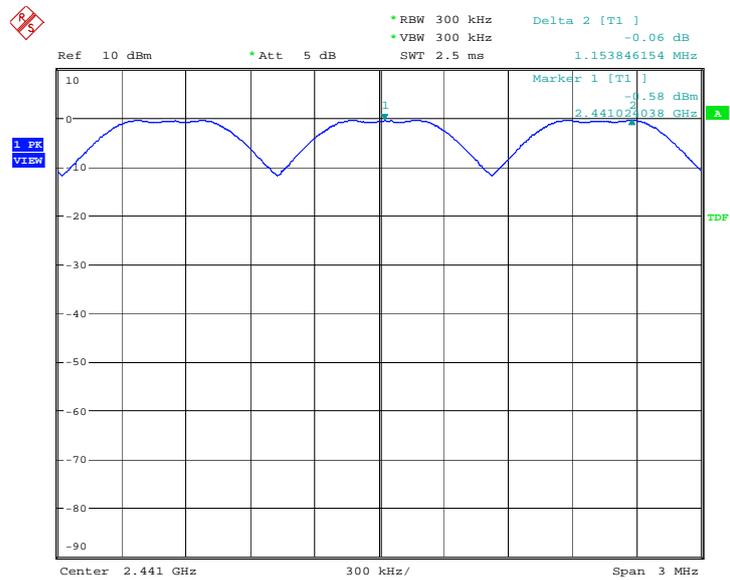
Date: 14.JAN.2010 08:22:50

Fig. 32 20dB Bandwidth: Channel 39



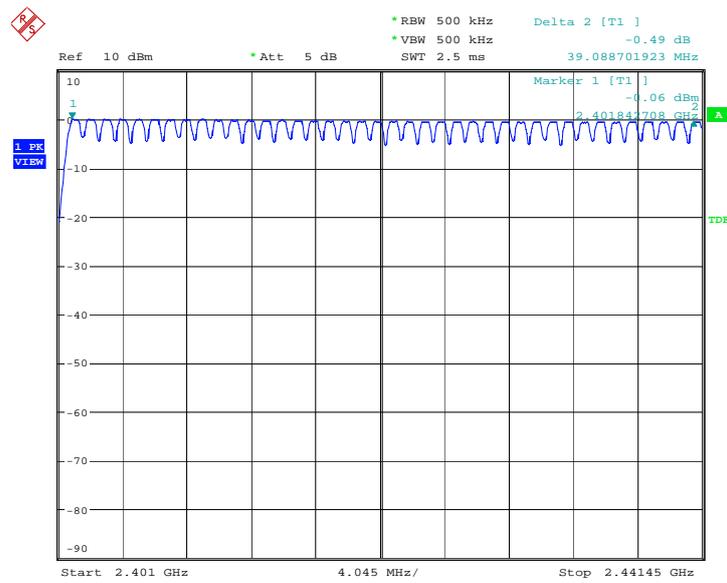
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Fig. 33 20dB Bandwidth: Channel 78



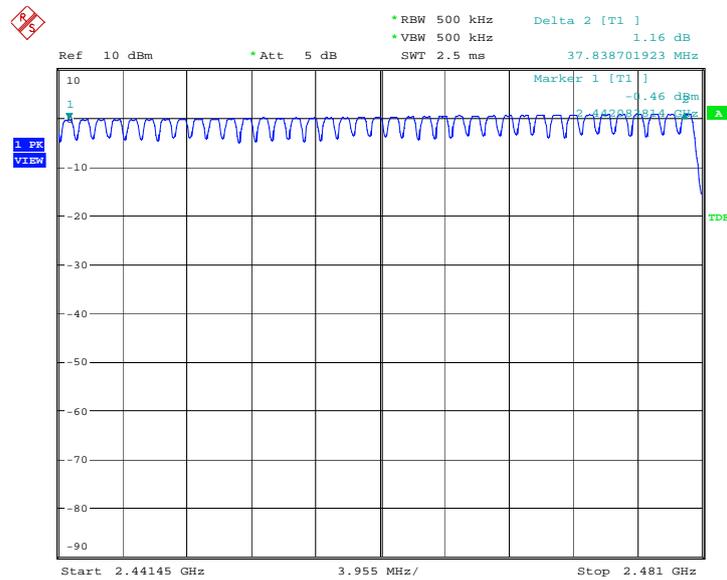
Date: 14.JAN.2010 08:28:25

Fig. 34 Carrier frequency separation measurement: Channel 39



Date: 14.JAN.2010 08:30:59

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



Date: 14.JAN.2010 08:33:31

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

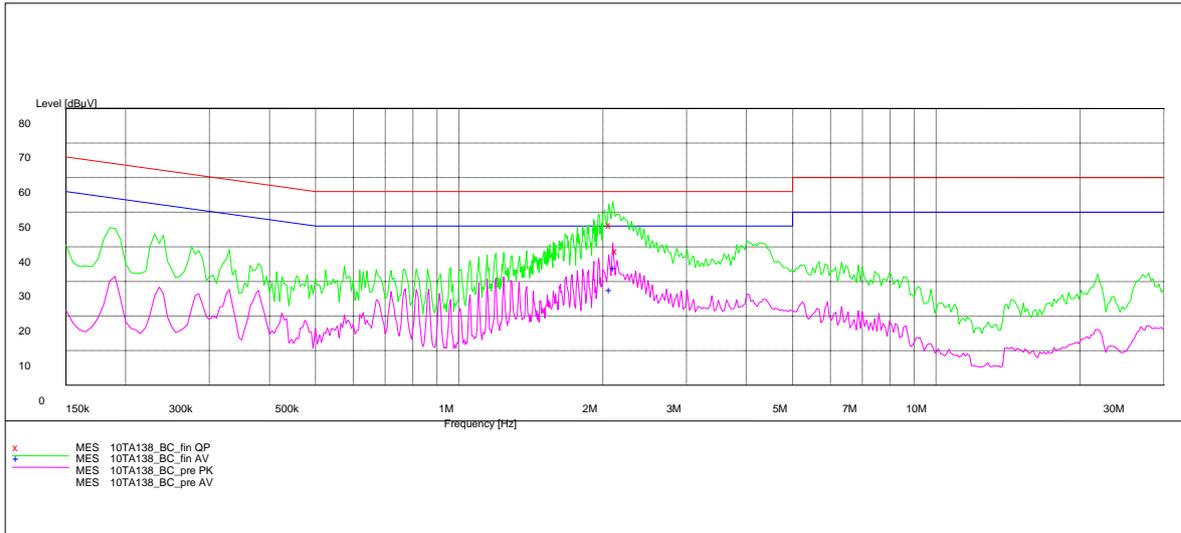


Fig. 37 AC Powerline Conducted Emission with charger

MEASUREMENT RESULT: "10TA138_BC_fin QP"

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|------------------|---------------|--------------|---------------|--------------|------|-----|
| 2.102020 | 50.40 | 10.1 | 56 | 5.6 | L1 | GND |
| 2.165713 | 43.20 | 10.1 | 56 | 12.8 | L1 | FLO |

MEASUREMENT RESULT: "10TA138_BC_fin AV"

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|------------------|---------------|--------------|---------------|--------------|------|-----|
| 2.102020 | 31.90 | 10.1 | 46 | 14.1 | L1 | GND |
| 2.144271 | 38.00 | 10.1 | 46 | 8.0 | L1 | GND |

*** END OF REPORT BODY ***