

# **TEST REPORT**

No. 2009TAR178

for

**GOWELL** 

**UMTS Mobile Phone** 

**Model Name: G328** 

FCC ID: XZA-GOWELLG328

**IC ID: 8757A-GOWELLG328** 

with

Hardware Version: ws6B

Software Version: T106 T01

Issued Date: 2009-12-30



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 No. 52, Huayuan Bei Road, Haidian District, Beijing, P. R. China 100191.

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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:  $15-35^{\circ}$ C Extreme Temperature:  $-20/+55^{\circ}$ C Relative Humidity: 20-75%

# 1.3. Project data

Project Leader: Zi Xiaogang
Testing Start Date: 2009-11-20
Testing End Date: 2009-12-30

# 1.4. Signature

运见川

Zi Xiaogang

(Prepared this test report)

孙何前

Sun Xiangqian

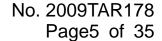
(Reviewed this test report)

Lu Bingsong

路城村

Deputy Director of the laboratory

(Approved this test report)





# 2. Client Information

# 2.1. Applicant Information

Company Name: GOWELL

Address /Post: Room1715,17F,Great China International Exchange Square, No.1

Fuhua Rd, Futian District, Shenzhen, P.R. China

City: Shenzhen
Postal Code: 518048
Country: China

Telephone: 0086 755 82521169 Fax: 0086 755 82804609

## 2.2. Manufacturer Information

Company Name: GOWELL

Address /Post: Room1715,17F,Great China International Exchange Square, No.1

Fuhua Rd, Futian District, Shenzhen, P.R. China

City: Shenzhen
Postal Code: 518048
Country: China

Telephone: 0086 755 82521169 Fax: 0086 755 82804609



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

## 3.1. About EUT

Description UMTS Mobile Phone

Model G328

FCC ID XZA-GOWELLG328 IC ID 8757A-GOWELLG328

Frequency Band ISM 2400MHz~2483.5MHz

Type of Modulation FHSS
Number of Channels 79
UMTS Band FDDI,IV

GSM Frequency Band EGSM900/DCS1800/GSM850/PCS1900

Power Class EGSM900:4, DCS1800:1, GSM850:4, PCS1900:1,FDDI:3

FDDIV:3

GPRS Multislot Class 12 EGPRS Multislot Class 12

Extreme Temperature -20/+55℃

Normal Voltage 3.8V

Extreme Low Voltage 3.6V

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	<b>HW Version</b>	SW Version
N07	35403030004253	ws6B	T106 T01
N15	35403030004535	ws6B	T106 T01

<sup>\*</sup>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	Туре	SN
AE1	Battery	Li3710T42P3h553457	/
AE2	Travel Charger	STC-A22O50U8-C	/

<sup>\*</sup>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:	July 10,
	15.205 Restricted bands of operation;	2008
FCC Part15	15.209 Radiated emission limits, general requirements;	Edition
	15.247 Operation within the bands 902–928MHz,	Edition
	2400-2483.5 MHz, and 5725-5850 MHz.	
	Methods of Measurement of Radio-Noise Emissions from	
ANSI C63.4	Low-Voltage Electrical and Electronic Equipment in the	2003
	Range of 9 kHz to 40 GHz	
FCC Public Notice	Filing and Measurement Guidelines for Frequency Hopping	March
DA 00-705	Spread Spectrum Systems	2000
	Spectrum Management and Telecommunications - Radio	
RSS - 210 Issue 7	Standards Specification	2007-06
K33 - 210 1880e 1	Low-power Licence-exempt Radiocommunication Devices	2007-00
	(All Frequency Bands): Category I Equipment	

# 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 $^{\circ}$ C, Max. = 30 $^{\circ}$ 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 $^{\circ}$ C, Max. = 35 $^{\circ}$ 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 $^{\circ}$ C, Max. = 30 $^{\circ}$ 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:

and ing and and ing ing			
Temperature	Min. = 15 $^{\circ}$ C, Max. = 30 $^{\circ}$ 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)	Р
Frequency Band Edges	15.247 (d)	Р
Conducted Emission	15.247 (d)	Р
Radiated Emission	15.247, 15.205, 15.209	Р
Time of Occupancy (Dwell Time)	15.247 (a) (1)(iii)	Р
20dB Bandwidth	15.247 (a)(1)	NA
Carrier Frequency Separation	15.247 (a)(1)	Р
Number of hopping channels	15.247 (a)(b)(iii)	Р
AC Powerline Conducted Emission	15.107, 15.207	Р

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	2010-01-24
4	Universal Radio Communication Tester	CMU200	105948	Rohde & Schwarz	2010-08-14

## **Anechoic chamber**

Fully anechoic chamber by Frankonia German.



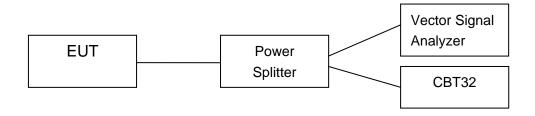
## **ANNEX A: MEASUREMENT RESULTS**

#### 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	5.81	4.38	2.10	Р
(dBm)				

**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	-57.18	Р
0	Hopping ON	Fig.2	-58.63	Р
78	Hopping OFF	Fig.3	-62.23	Р
70	Hopping ON	Fig.4	-62.91	Р

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
01.0	Center Frequency	Fig.5	Р
Ch 0 2402 MHz	30 MHz ~ 1 GHz	Fig.6	Р
2402 111112	1 GHz ~ 26 GHz	Fig.7	Р
Ch 39 2441 MHz	Center Frequency	Fig.8	Р
	30 MHz ~ 1 GHz	Fig.9	Р
	1 GHz ~ 26 GHz	Fig.10	Р
Ch 70	Center Frequency	Fig.11	Р
Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.12	Р
2-100 WII 12	1 GHz ~ 26 GHz	Fig.13	Р

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	Field strength(uV/m)	Field strength(dBuV/m)
(MHz)		
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
	30 MHz ~ 1 GHz	Fig.14	Р
Ch 0 2402 MHz	1 GHz ~ 4 GHz	Fig.15	Р
2402 WII 12	4 GHz ~ 18 GHz	Fig.16	Р
01-00	30 MHz ~ 1 GHz	Fig.17	Р
Ch 39 2441 MHz	1 GHz ~ 4 GHz	Fig.18	Р
2441 101112	4 GHz ~ 18 GHz	Fig.19	Р
01 -0	30 MHz ~ 1 GHz	Fig.20	Р
Ch 78 2480 MHz	1 GHz ~ 4 GHz	Fig.21	Р
2400 WII 12	4 GHz ~ 18 GHz	Fig.22	Р
Power	2.45GHz~2.5GHz	Fig.23	Р
For all channels	18 GHz ~ 26 GHz	Fig.24	Р
idle	30 MHz ~ 1 GHz	Fig.25	Р
	1 GHz ~ 4 GHz	Fig.26	Р
	4 GHz ~ 18 GHz	Fig.27	Р
	18 GHz ~ 26 GHz	Fig.28	Р

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
	DH1	Fig.29	113.04	Р
	DH1	Fig.30		
20	39 DH3	Fig.31	174.36	Р
39		Fig.32		
	DHE	Fig.33	210.18	В
	DH5	Fig.34	∠10.10	P

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

#### **Measurement Results:**

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.35	762.82	NA
39	Fig.36	762.82	NA
78	Fig.37	759.62	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

## **Measurement Result:**

Channel	Carrier frequency	Conclusion	
39	Fig.38	990.38	Р

See annex B for test graphs.

**Conclusion: PASS** 

<sup>\*</sup> 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.

<sup>\*</sup> Comment: This limit should be over 25 kHz or (2/3) \* 20dB bandwidth, whichever is greater.



# 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.39	70	В
40~78	Fig.40	79	P 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	Quasi-peak	Result (dBμV)	Conclusion
(MHz)	Limit (dBμV)	With Charger	Conclusion
0.15 to 0.5	66 to 56	Fig.41	
0.5 to 5	56		Р
5 to 30	60		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range  $0.15\,\mathrm{MHz}$  to  $0.5\,\mathrm{MHz}$ .

## Bluetooth (Average Limit)

Frequency range	Average Limit	Result (dBμV)	Canalusian
(MHz)	(dBμV)	With Charger 1	Conclusion
0.15 to 0.5	56 to 46		
0.5 to 5	46	Fig.41	Р
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.

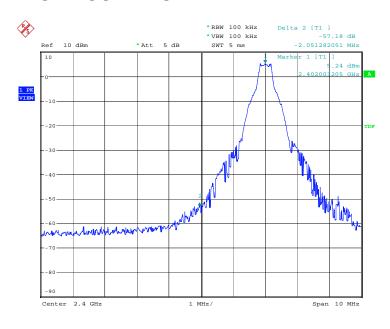
The measurement is made according to Public notice DA 00-705 and ANSI C63.4

See annex B for test graphs.

**Conclusion: PASS** 

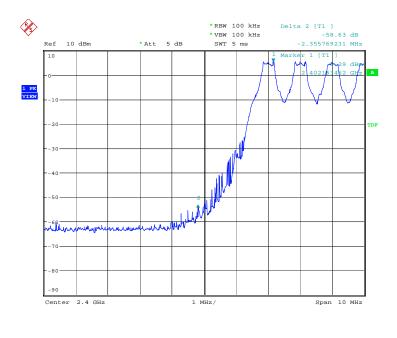


# **ANNEX B: TEST FIGURE LIST**



Date: 23.NOV.2009 03:35:41

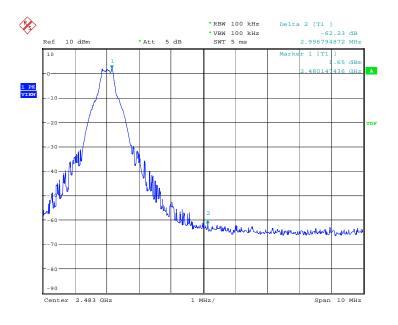
Fig. 1 Frequency Band Edges: Channel 0, Hopping Off



Date: 23.NOV.2009 03:41:01

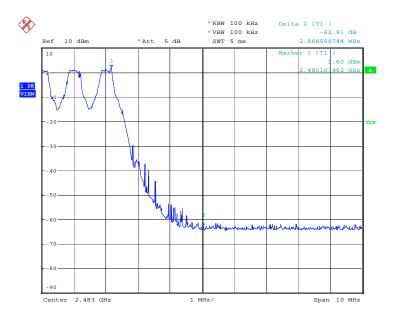
Fig. 2 Frequency Band Edges: Channel 0, Hopping On





Date: 23.NOV.2009 03:35:58

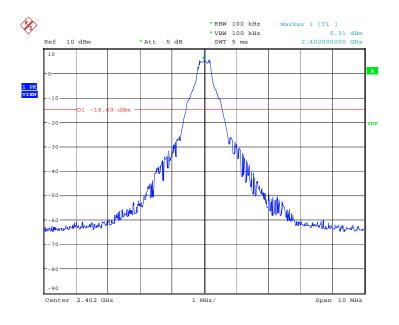
Fig. 3 Frequency Band Edges: Channel 78, Hopping Off



Date: 23.NOV.2009 03:46:03

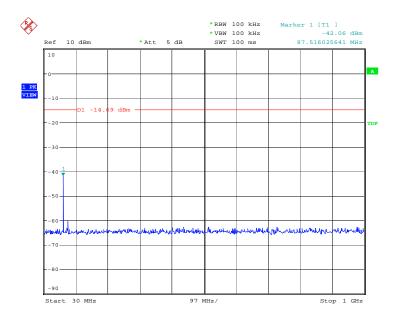
Fig. 4 Frequency Band Edges: Channel 78, Hopping On





Date: 23.NOV.2009 03:46:21

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



Date: 23.NOV.2009 03:46:37

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



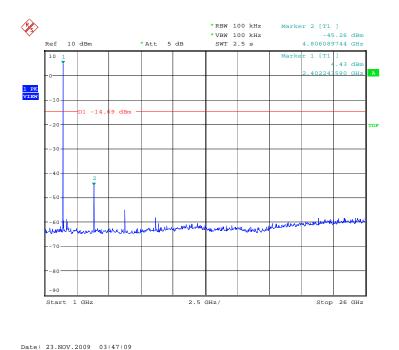


Fig. 7 Conducted spurious emission: Channel 0,1GHz - 26GHz

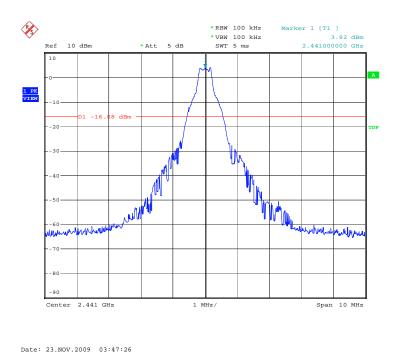


Fig. 8 Conducted spurious emission: Channel 39, 2441MHz



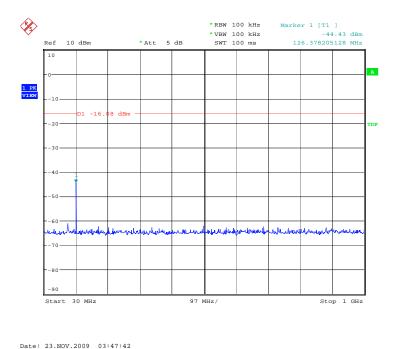


Fig. 9 Conducted spurious emission: Channel 39, 30MHz - 1GHz

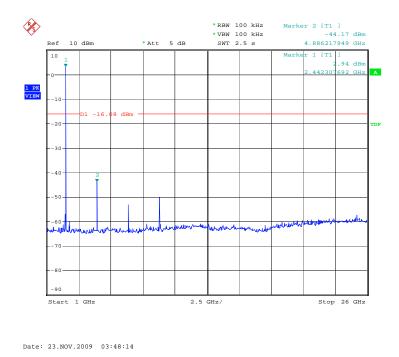
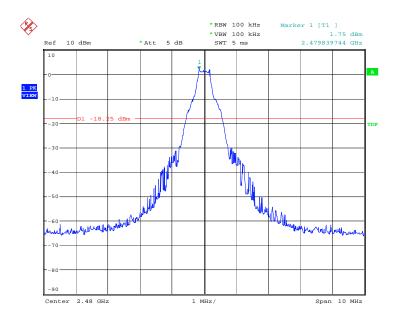


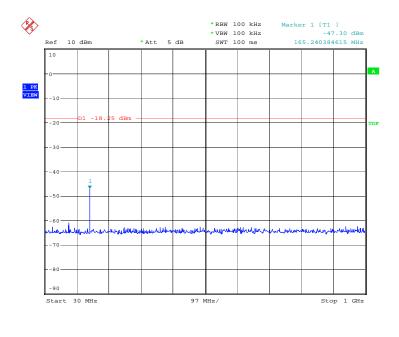
Fig. 10 Conducted spurious emission: Channel 39, 1GHz – 26GHz





Date: 23.NOV.2009 03:48:30

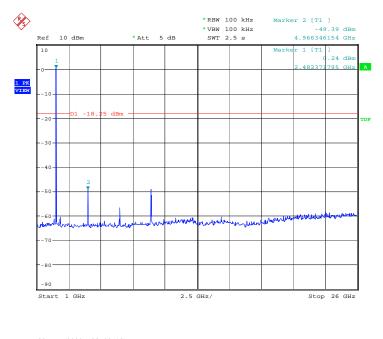
Fig. 11 Conducted spurious emission: Channel 78, 2480MHz



Date: 23.NOV.2009 03:48:47

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





Date: 23.NOV.2009 03:49:18

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

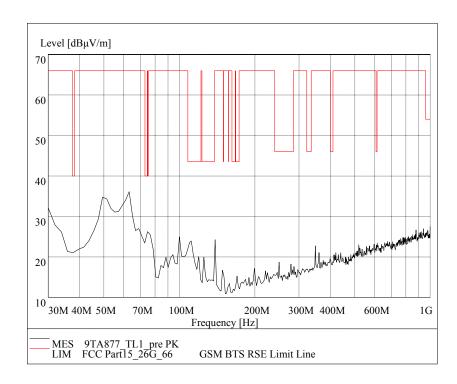


Fig. 14 Radiated emission: Channel 0, 30 MHz - 1 GHz



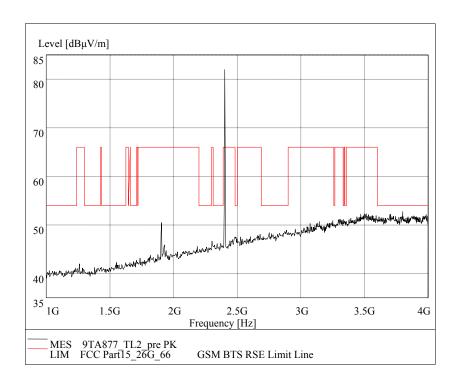


Fig. 15 Radiated emission: Channel 0, 1 GHz - 4 GHz

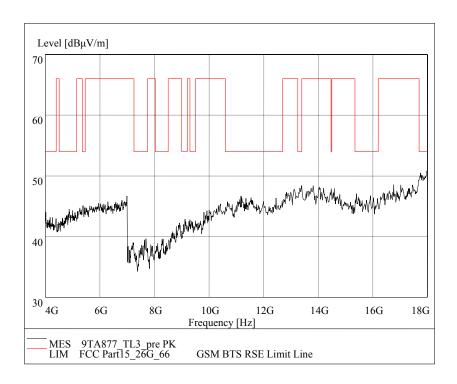


Fig. 16 Radiated emission: Channel 0, 4 GHz - 18 GHz



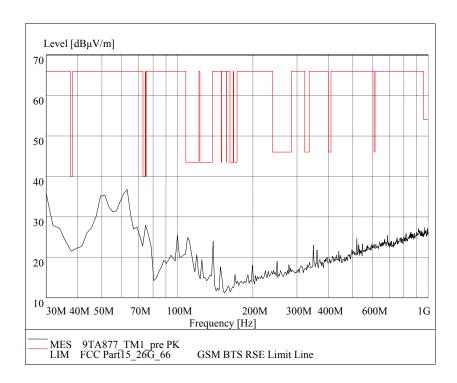


Fig. 17 Radiated emission: Channel 39, 30 MHz - 1 GHz

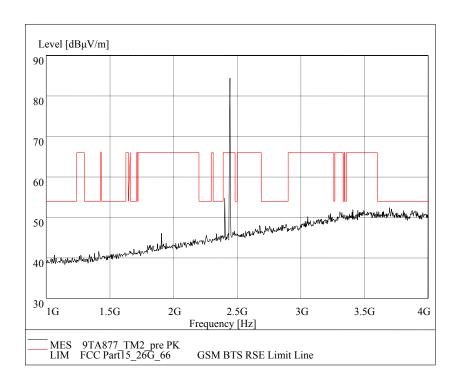


Fig. 18 Radiated emission: Channel 39, 1 GHz - 4 GHz



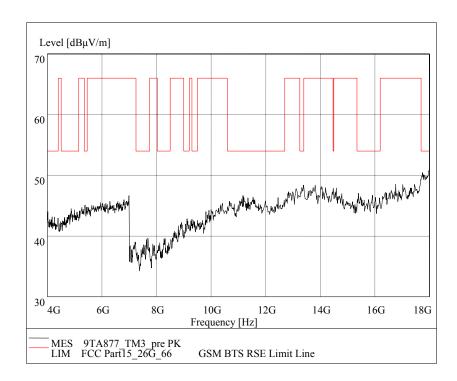


Fig. 19 Radiated emission: Channel 39, 4 GHz - 18 GHz

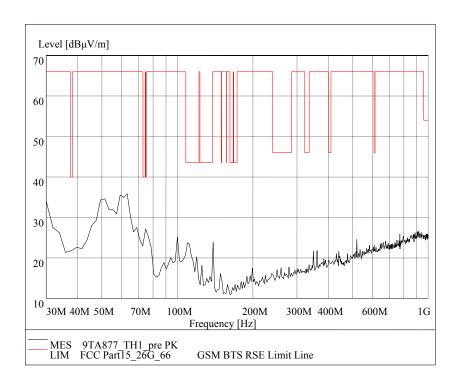


Fig. 20 Radiated emission: Channel 78, 30 MHz - 1 GHz



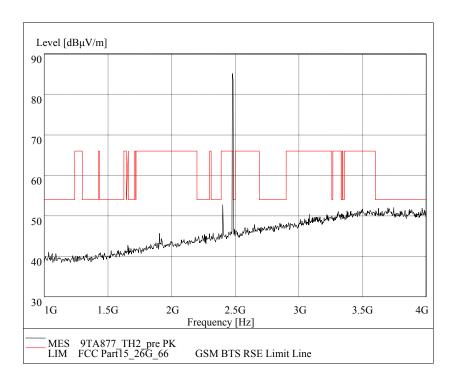


Fig. 21 Radiated emission: Channel 78, 1 GHz - 4 GHz

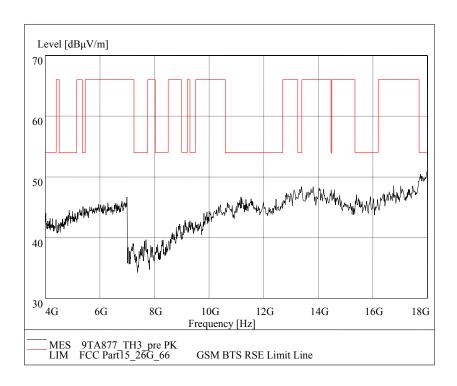


Fig. 22 Radiated emission: Channel 78, 4 GHz - 18 GHz



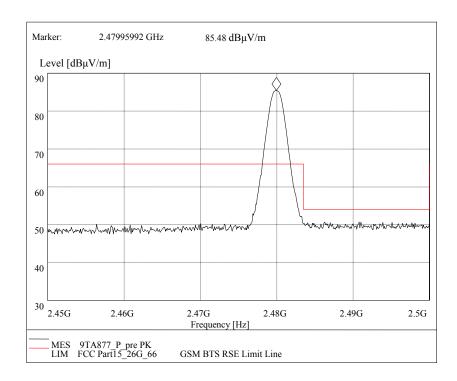


Fig. 23 Radiated emission (Power): 2.45GHz - 2.5GHz

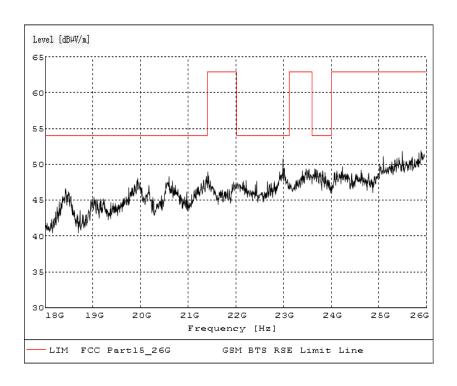


Fig. 24 Radiated emission: 18 GHz - 26 GHz



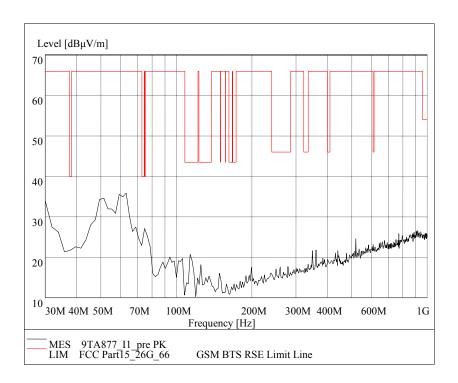


Fig. 25 Radiated emission Idle: 30 MHz - 1 GHz

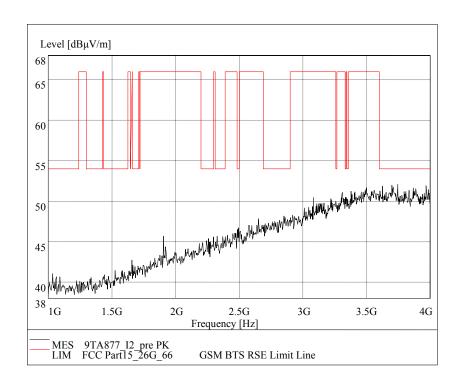


Fig. 26 Radiated emission Idle: 1 GHz - 4 GHz



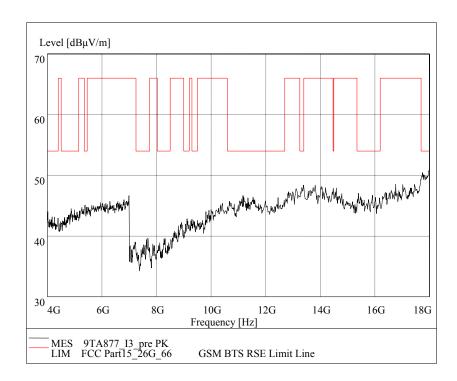


Fig. 27 Radiated emission Idle: 4 GHz - 18 GHz

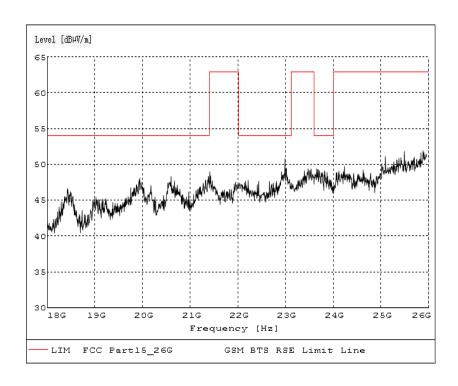


Fig. 28 Radiated emission Idle: 18 GHz - 26 GHz



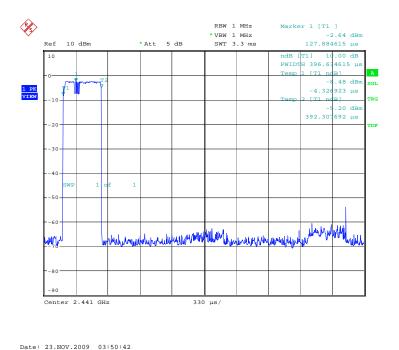


Fig. 29 Time of occupancy (Dwell Time): Channel 39, Packet DH1

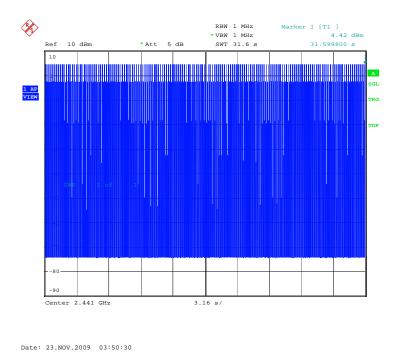
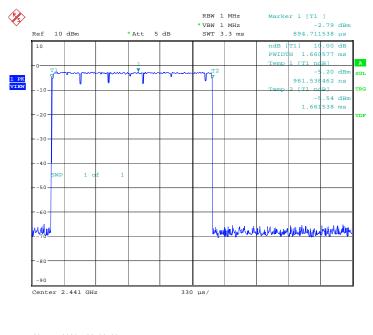


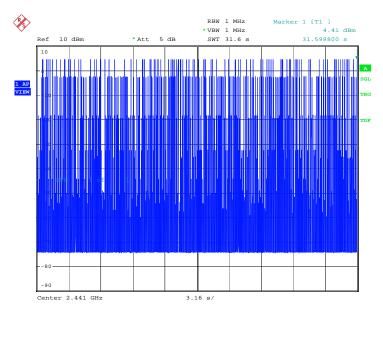
Fig. 30 Number of Transmissions Measurement: Channel 39, Packet DH1





Date: 23.NOV.2009 03:52:00

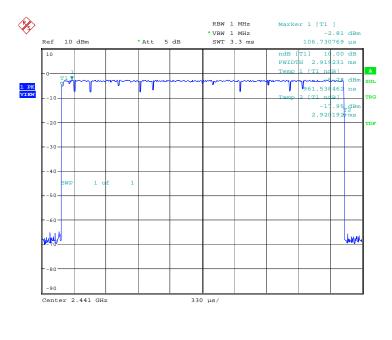
Fig. 31 Time of occupancy (Dwell Time): Channel 39, Packet DH3



Date: 23.NOV.2009 03:51:48

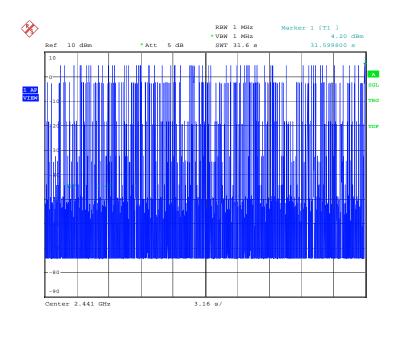
Fig. 32 Number of Transmissions Measurement: Channel 39, Packet DH3





Date: 23.NOV.2009 03:53:19

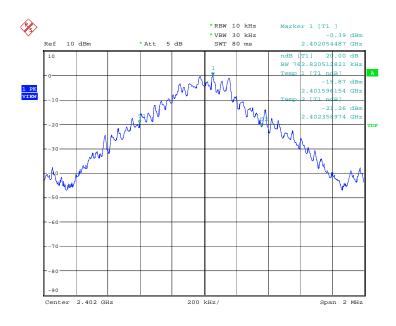
Fig. 33 Time of occupancy (Dwell Time): Channel 39, Packet DH5



Date: 23.NOV.2009 03:53:07

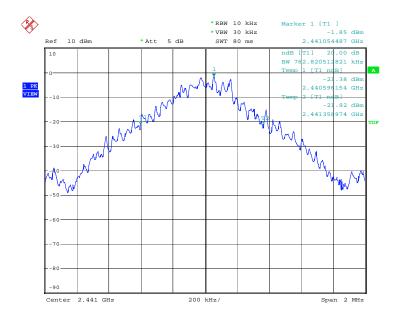
Fig. 34 Number of Transmissions Measurement: Channel 39, Packet DH5





Date: 23.NOV.2009 03:53:52

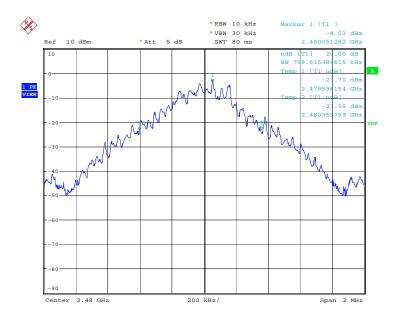
Fig. 35 20dB Bandwidth: Channel 0



Date: 23.NOV.2009 03:54:24

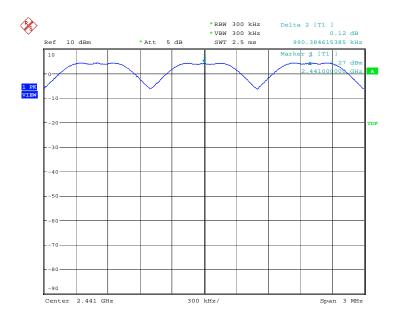
Fig. 36 20dB Bandwidth: Channel 39





Date: 23.NOV.2009 03:54:55

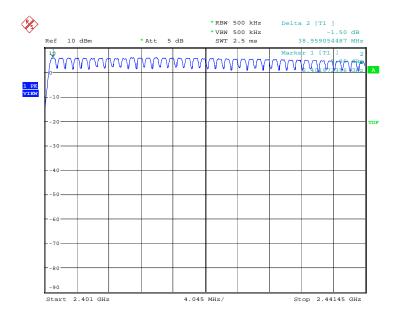
Fig. 37 20dB Bandwidth: Channel 78



Date: 23.NOV.2009 03:59:59

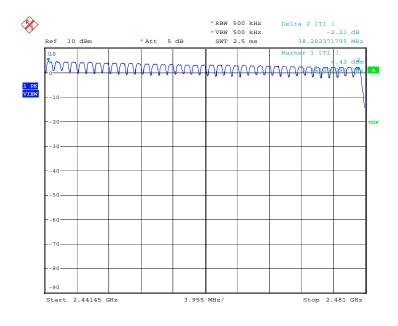
Fig. 38 Carrier frequency separation measurement: Channel 39





Date: 23.NOV.2009 04:02:33

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



Date: 23.NOV.2009 04:05:05

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



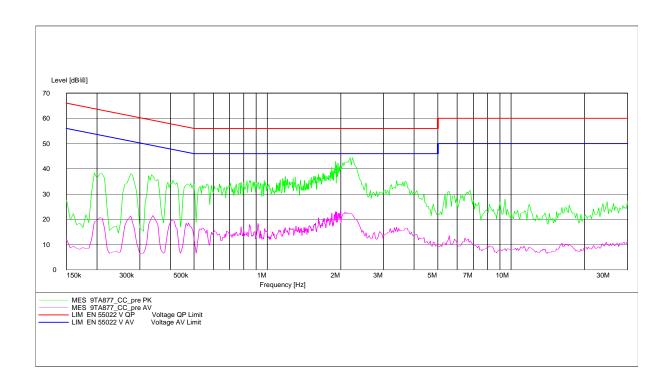


Fig. 41 AC Powerline Conducted Emission with charger

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