

TEST REPORT

Test Report No: 1-1930-207-04/10



Testing Laboratory

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Accredited Test Laboratory:

The test laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025

DAR registration number: DGA-PL-176/94-D1

Area of Testing: Radio Satellite Communications

Applicant and Manufacturer

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Test Standard/s

ETSI EN 301 511 V9.0.2

Global System for Mobile communications(GSM);Harmonized EN for mobile stations in the GSM 900 and GSM 1800 bands covering essential requirements under article 3.2 of the R&TTE directive(1999/5/EC)

ETSI TS 151 010-1 V4.9.0

Digital cellular telecommunications system(Phase 2+);Mobile Station(MS) conformance specification

Test Item

Kind of test item: HSPA+ Module
Model name: EM820W
S/N serial number: W9V2B110A1400032
HW hardware status: MD1EM820WM
SW software status: 11.805.03.07.00
Frequency [MHz]: 900MHz/1800MHz
Type of Modulation: GMSK, 8 PSK
Number of channels: 6
Antenna: Non- Integrated Antenna
Power Supply: Max 2.8 W
Temperature Range: - 10°C-+ 55°C



Test performed:

Date
2010-12-7

Name
zhangting

Zhang Ting

Test Report authorised:

Date
2010-12-15

Name
Michael Berg

Michael Berg

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2 General information

2.1 Notes

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM ICT Services GmbH.

2.2 Application details

Date of receipt of order:	Nov.16.2010
Date of receipt of test item:	Nov.16.2010
Start of test:	Nov.20.2010
End of test:	Dec.07.2010

3 Test standard/s:

Test Standard	Version	Test Standard Description
ETSI EN 301 511	V9.0.2	Global System for Mobile communications(GSM);Harmonized EN for mobile stations in the GSM 900 and GSM 1800 bands covering essential requirements under article 3.2 of the R&TTE directive(1999/5/EC)
ETSI TS 151 010-1	V4.9.0	Digital cellular telecommunications system(Phase 2+);Mobile Station(MS) conformance specification

4 Test Environment

Temperature:	T_{nom}	25 °C during room temperature tests
	T_{max}	55 °C during high temperature test
	T_{min}	-10 °C during low temperature test
Relative humidity content:		from 5 %RH to 95 %RH
Air pressure:		not relevant for this kind of testing
Power supply:	V_{nom}	3.3 V
	V_{max}	3.6 V
	V_{min}	3.0 V

5 Test Laboratories sub-contracted

EMC LABORATORY OF RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD
Street: Bantian Longgang District Shenzhen
Country: P.R.China

6 Results

6.1 Test Plan / Test Summary

Table 1. Summary of results

Conformance requirement according to ETSI EN 301 511 v9.0.2	Result
1 Transmitter - Frequency error and phase error The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.1 and 5.2.1	PASS
2 Transmitter - Frequency error under multipath and interference conditions The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.2 and 5.2.2	PASS
3 Frequency error and phase error in GPRS multislot configuration The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.4 and 5.2.4	PASS
4 Transmitter output power and burst timing The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.5 and 5.2.5	PASS
5 Transmitter - Output RF spectrum The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.6 and 5.2.6	PASS
6 Transmitter output power in GPRS multislot configuration The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.10 and 5.2.10	PASS
7 Output RF spectrum in GPRS multislot configuration The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.11 and 5.2.11	PASS
8 Conducted spurious emissions - MS allocated a channel The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.12 and 5.2.12	PASS
9 Conducted spurious emissions - MS in idle mode The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.13 and 5.2.13	PASS
10 Radiated spurious emissions - MS allocated a channel The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.16 and 5.2.16	PASS
11 Radiated spurious emissions - MS in idle mode The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.17 and 5.2.17	PASS
12 Receiver Blocking and spurious – speech channels The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.20 and 5.2.20	PASS
13 Frequency error and Modulation accuracy in EGPRS Configuration The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.22 and 5.2.22	PASS
14 Frequency error under multipath and interference conditions in EGPRS Configuration The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.23 and 5.2.23	PASS
15 EGPRS Transmitter output power The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.24 and 5.2.24	PASS
16 Output RF spectrum in EGPRS configuration The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.25 and 5.2.25	PASS
17 Blocking and spurious response in EGPRS configuration The requirements and tests accordance with EN301 511 v9.0.2 , subclause 4.2.26 and 5.2.26	PASS

NOTE: Measurement taken is within the measurement uncertainty of measurement system.

7 Equipment Specification

7.1 General Description

EM820W HSPA+/HSUPA/HSDPA/WCDMA/EDGE/GPRS/GSM dual mode module is subscriber equipment in the UMTS/GSM system. But only EGSM900MHz & DCS1800MHz bands test data included in this report. The TX frequency is 880MHz-915MHz and RX frequency is 925MHz-960MHz. for DCS 1800, the TX frequency is 1710MHz-1785MHz and the RX frequency is 1805MHz-1880MHz. EM820W implement such functions as RF signal receiving/transmitting, HSPA+/WCDMA and EDGE/GPRS/GSM protocol processing, data service etc. Externally it provides PCIE MINI CARD interface (to connect to the notebook etc.). EM820W has no internal antenna .

7.2 Technical Data

Description:	HSPA+ Module
Models:	EM820W
Input Rated Voltage:	3.3V DC
Extreme voltage :	3.0V-3.6V
Rated Power:	Max 2.8 W
Dimensions:	51 (length) × 30 (width) × 4.5 (height) (mm3)
Weight:	About 15g



Figure1. EUT Appearance of EM820W

7.3 Sub-Assembly Identity

Table 2. Sub-Assembly Identity

Model Name	Qty.	Hardware Version	Description
EM820W	1	MD1EM820WM	Main board of data card

7.4 Lists of Test Instruments

Table 3. List of instruments

Instrument name	Type	amount	Manufacturer	Calibration date	Cal Interval (month)
Wireless Communication Test	8960	1	Agilent	Mar. 23, 2010	12
Spectrum Analysis	FSQ40	1	Agilent	Mar. 07, 2010	12
Fading simulator	ABFS	1	R&S	May .02, 2010	12
Wireless Communication Test	CMU200	1	R&S	May. 21, 2010	12
CW signal Generator	E8247C	1	Agilent	Sep. 12, 2010	12
Signal Generator	SMIQ03	1	R&S	May .20, 2010	12
Directional couple	MB210140100	1	TAIGE	May .12, 2010	12
Tunable Band reject Filter	WRCT 1900/2200/5/40/10EEK	1	Wainwright Instruments GmbH	May. 25, 2010	12
Tunable Band reject Filter	WRCT 880/960/5/10EEK	1	Wainwright Instruments GmbH	May. 25, 2010	12
Tunable Band reject Filter	WRCD 1700/1800 -0.2/40-5EEK	1	Wainwright Instruments GmbH	May. 25, 2010	12
Power Division or Combine	11667A	3	Agilent	April .11, 2010	12

8 Product Description

8.1 Type Designation

TYPE DESIGNATION (NOTE)
EM820W

NOTE: If the equipment comprises of two or more bands, then the following set of equipment definition tables shall be completed for each band.

- (1) This is the manufacturer's numeric or alphanumeric code or name that is specific to particular equipment. It may contain information in coded form on the characteristics of the equipment e.g. frequency, power. The manufacturer is free to choose the form of the type designation.
- (2) This is the number, code or trade name used by the manufacturer to describe a series or 'family' of equipment of substantially the same mechanical and electrical construction which will include a number of related equipments. This number is often referred to as the "model no."
- (3) This is the manufacturer's identification number given to specific equipment in the series or 'family' of equipments. It is often referred to as the "identification number".

8.2 Type of Equipment

TYPE OF EQUIPMENT: Module

8.2.1 Frequency Range

TYPE OF EQUIPMENT	
Transmitter Frequency Range	
☒ []	E-GSM900 MS
☒ []	P-GSM900 MS
☒ []	DCS1800 MS
[]	PCS1800 MS
[]	Other

NOTE: About the specific frequency range, refer to ETSI TS 100910 V8.19.0, clause 2.

8.2.2 Technical Characteristics

TYPE OF EQUIPMENT:	USB Stick
Max. Number of Transceivers:	1
MS Power Class:	GSM900 Class [4] DCS 1800 Class [1]
Main Antenna Type :	Non- Integrated Antenna
Option Antenna Type :	Non- Integrated Antenna
Support data service:	GPRS EDGE
GPRS Class	GPRS Multi-slot class 12
EDGE Class	EDGE Multi-slot class 12

8.2.3 Transmitter Technical Characteristics

METHOD OF FREQUENCY GENERATION	SYNTHESIZER
Transmitter frequency range:	E-GSM900: 880MHz~915MHz DCS1800:1710MHz~1785MHz

8.2.4 Transmitter Modulation Characteristics

TRANSMITTER MODULATION INPUT CHARACTERISTICS					
Maximum Modulation bit rate		236.8Kbps		DL	
Type of modulation:		DIRECT			
SUBCARRIER:			DIRECT:		
MSK	YES√]	NO[]	Direct FSK	YES[]	NO[✓]
FFSK	YES[]	NO[]	QPSK	YES[]	NO[✓]
			GMSK	YES[✓]	NO[]
			DSSS	YES[]	NO[✓]
			OFDM	YES[]	NO[✓]
			PLL-4PSK	YES[]	NO[✓]
			8 PSK	YES[✓]	NO[]
			16 QAM	YES[]	NO[✓]
			Other		

8.2.5 Receiver Technical Characteristics

RECEIVER TECHNICAL CHARACTERISTICS		
RECEIVER - FREQUENCY		
METHOD OF FREQUENCY GENERATION: SYNTHESIZER		
INTERMEDIATE FREQUENCIES		
[]	1st	__MHz
[]	2nd	__MHz
[]	3rd	__kHz
[✓]		None intermediate frequency
Is local oscillator injection frequency higher or lower than the receiver nominal frequency?		
[]	Higher (.....Hz to MHz)	
[]	Lower (.....Hz to MHz)	
[]	Identical Give details	
RECEIVER FREQUENCY RANGE		
E-GSM900:925 MHz~960 MHz DCS1800:1805 MHz~1880 MHz		
[]	Receiver Diversity	

8.3 Common Technical Characteristics

TRANSMITTER AND RECEIVER CHARACTERISTICS	
Channel separation:	200 kHz
State the minimum channel spacing:	200 kHz

8.3.1 Temperature Range

EXTREME TEMPERATURE RANGE over which equipment is to be type tested	
Minimum Temperature:	[- 10°C]
Maximum Temperature:	[+ 55°C]

8.3.2 Construction of the Equipment

CONSTRUCTION OF EQUIPMENT: Multiple units

NOTE: Unit means a physically separate item of the equipment.

8.3.3 Power Source

POWER SOURCE		
[✓]	DC INPUT :	
	Rated Voltage:	 3.3 V
	Range:	 3.0V-3.6V
	Rated Power:	Max 2.8 W

CO SITING OPERATION		
Is the equipment suitable for co-sitting with:-		
PHS	Yes []	No[]
P-GSM900	Yes [✓]	No[]
E-GSM900	Yes [✓]	No[]
DCS1800	Yes [✓]	No[]
Others	Yes [✓]	No[]

FREQUENCY RANGE LIMITATIONS
Are there any differences between the configurations, if so please state:- (e.g. limited frequency range due to ancillaries, i.e. combiners, duplexers, etc.)
N.A

NOTE: The frequency shall be marked as not applicable if the equipment is able to operate on any designated channel within the specified frequency range.

9 Summary of Testing

IDENTIFICATION		DESCRIPTION	CONFIGURATION CODE			
			EGSM	DCS		
EM820W		HSPA+ Module	√	√		
Conformance Requirements	Clause Number of Test Procedure	Description	TEST STATUS			
The requirements covered by ETSI EN 301 511 v9.0.2						
4.2.1	13.1.3	4.2.1 Transmitter - Frequency error and phase error	√	√		
4.2.2	13.2.3	4.2.2 Transmitter - Frequency error under multipath and interference conditions	√	√		
4.2.4	13.16.1	4.2.4 Frequency error and phase error in GPRS multislot configuration	√	√		
4.2.5	13.3.3	4.2.5 Transmitter output power and burst timing	√	√		
4.2.6	13.4.3	4.2.6 Transmitter - Output RF spectrum	√	√		
4.2.10	13.16.2	4.2.10 Transmitter output power in GPRS multislot configuration	√	√		
4.2.11	13.16.3	4.2.11 Output RF spectrum in GPRS multislot configuration	√	√		
4.2.12	12.1.1	4.2.12 Conducted spurious emissions - MS allocated a channel	√	√		
4.2.13	12.1.2	4.2.13 Conducted spurious emissions - MS in idle mode	√	√		
4.2.16	12.2.1	4.2.16 Radiated spurious emissions - MS allocated a channel	√	√		
4.2.17	12.2.2	4.2.17 Radiated spurious emissions - MS in idle mode	√	√		
4.2.20	14.7.1	4.2.20 Receiver Blocking and spurious response – speech channels	√	√		
4.2.22	13.17.1	4.2.22 Frequency error and Modulation accuracy in EGPRS Configuration	√	√		
4.2.23	13.17.2	4.2.23 Frequency error under multipath and interference conditions in EGPRS Configuration	√	√		
4.2.24	13.17.3	4.2.24 EGPRS Transmitter output power	√	√		
4.2.25	13.17.4	4.2.25 Output RF spectrum in EGPRS configuration	√	√		
4.2.26	14.18.5	4.2.26 Blocking and spurious response in EGPRS configuration	√	√		

NOTE: The clause of Conformance Requirement is in the standard of EN 301 511 V9.0.2. And the Clause Number of Test Procedure in the standard of ETSI TS 151 010-1 V4.9.0.

9.1 Common Configuration

9.1.1 Test Condition

	Channel (GSM900)	Channel(DCS1800)	Temperature(°C)	Voltage (V)
High	124	885	55	3.6
Middle	62	698	25	3.3
Low	975	512	-10	3.0

10 Short Test plan

Test Item		Status
ETSI EN 301 511 v9.0.2		
6.1	Transmitter - Frequency error and phase error	P
6.2	Transmitter - Frequency error under multipath and interference conditions	P
6.3	Frequency error and phase error in GPRS multislot configuration	P
6.4	Transmitter output power and burst timing	P
6.5	Transmitter - Output RF spectrum	P
6.6	Transmitter output power in GPRS multislot configuration	P
6.7	Output RF spectrum in GPRS multislot configuration	P
6.8	Conducted spurious emissions - MS allocated a channel	P
6.9	Conducted spurious emissions - MS in idle mode	P
6.10	Radiated spurious emissions - MS allocated a channel	P
6.11	Radiated spurious emissions - MS in idle mode	P
6.12	Receiver Blocking and spurious response – speech channels	P
6.13	Frequency error and Modulation accuracy in EGPRS Configuration	P
6.14	Frequency error under multipath and interference conditions in EGPRS Configuration	P
6.15	EGPRS Transmitter output power	P
6.16	Output RF spectrum in EGPRS configuration	P
6.17	Blocking and spurious response in EGPRS configuration	P

NOTE: P = pass
F = fail
N.A. = not application

11 Measurements Result

11.1 Transmitter - Frequency error and phase error

11.1.1 Test Conditions

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Traffic Channel	975/62/124
MS Tx Level	5(Typical:33dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Traffic Channel	512/698/885
MS Tx Level	0(Typical:30dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.1.2 Test Result

RMS phase error(degree)	Power control LEVEL	Result			
		EGSM900			
		ARFCN			
		975	62	124	Result
Tnorm (°C)=25; Vnorm=3.3	5	0.95	0.98	0.99	PASS
	19	0.94	0.98	1.00	PASS
When the MS is being vibrated	5	0.98	1.01	1.02	PASS
	19	0.97	1.00	1.03	PASS
Tmin(°C)=-10; Vmin=3.0	5	0.94	0.98	0.98	PASS
	19	0.94	0.97	1.00	PASS
Tmin(°C)=-10; Vmax=3.6	5	0.94	0.98	0.99	PASS
	19	0.95	0.98	1.01	PASS
Tmax(°C)=55; Vmin=3.0	5	0.95	0.99	0.99	PASS
	19	0.94	0.98	1.01	PASS
Tmax(°C)=55; Vmax=3.6	5	0.95	0.99	0.98	PASS
	19	0.95	0.98	1.01	PASS

RMS phase error(degree)	Power control LEVEL	Result			
		DCS1800			
		ARFCN			
		512	698	885	Result
Tnorm (°C)=25; Vnorm=3.3	0	1.01	1.11	1.02	PASS
	15	0.99	1.10	1.02	PASS
When the MS is being vibrated	0	1.04	1.14	1.05	PASS
	15	1.02	1.13	1.04	PASS
Tmin(°C)=-10; Vmin=3.0	0	1.01	1.11	1.02	PASS
	15	0.98	1.09	1.01	PASS
Tmin(°C)=-10; Vmax=3.6	0	1.01	1.11	1.02	PASS
	15	0.98	1.10	1.01	PASS
Tmax(°C)=55; Vmin=3.0	0	1.02	1.12	1.04	PASS
	15	0.99	1.11	1.02	PASS
Tmax(°C)=55; Vmax=3.6	0	1.02	1.12	1.05	PASS
	15	1.00	1.11	1.04	PASS

Peak phase error(degree)	Power control LEVEL	Result			
		EGSM900			
		ARFCN			
		975	62	124	Result
Tnorm (°C)=25; Vnorm=3.3	5	2.37	2.37	2.43	PASS
	19	2.28	2.33	2.45	PASS
When the MS is being vibrated	5	2.37	2.40	2.44	PASS
	19	2.31	2.36	2.47	PASS
Tmin(°C)=-10; Vmin=3.0	5	2.31	2.36	2.41	PASS
	19	2.27	2.33	2.43	PASS
Tmin(°C)=-10; Vmax=3.6	5	2.28	2.34	2.40	PASS
	19	2.29	2.34	2.50	PASS
Tmax(°C)=55; Vmin=3.0	5	2.31	2.37	2.40	PASS
	19	2.28	2.34	2.47	PASS
Tmax(°C)=55; Vmax=3.6	5	2.27	2.40	2.40	PASS
	19	2.32	2.33	2.49	PASS

Peak phase error(degree)	Power control LEVEL	Result			
		DCS1800			
		ARFCN			
		512	698	885	Result
Tnorm (°C)=25; Vnorm=3.3	0	3.20	3.46	2.91	PASS
	15	2.95	3.33	2.91	PASS
When the MS is being vibrated	0	3.23	3.46	2.93	PASS
	15	2.96	3.33	2.93	PASS
Tmin(°C)=-10; Vmin=3.0	0	3.20	3.40	2.90	PASS
	15	2.91	3.27	2.89	PASS
Tmin(°C)=-10; Vmax=3.6	0	3.21	3.45	2.91	PASS
	15	2.93	3.30	2.91	PASS
Tmax(°C)=55; Vmin=3.0	0	3.23	3.50	2.95	PASS
	15	2.96	3.37	2.92	PASS
Tmax(°C)=55; Vmax=3.6	0	3.33	3.55	2.98	PASS
	15	3.01	3.41	2.98	PASS

frequency error(Hz)	Power control LEVEL	Result			
		EGSM900			
		ARFCN			
		975	62	124	Result
Tnorm (°C)=25; Vnorm=3.3	5	-16.79	-11.49	-15.82	PASS
	19	-21.63	-16.98	-20.86	PASS
When the MS is being vibrated	5	-18.47	-13.65	-17.15	PASS
	19	-23.29	-18.89	-21.93	PASS
Tmin(°C)=-10; Vmin=3.0	5	-20.21	-15.88	-18.53	PASS
	19	-24.99	-20.86	-23.05	PASS
Tmin(°C)=-10; Vmax=3.6	5	-17.56	-14.21	-18.79	PASS
	19	-24.02	-19.18	-23.18	PASS
Tmax(°C)=55; Vmin=3.0	5	-13.69	-10.53	-13.69	PASS
	19	-19.76	-15.37	-18.98	PASS
Tmax(°C)=55; Vmax=3.6	5	-30.74	-6.13	-9.30	PASS
	19	-26.80	-10.20	-15.05	PASS

frequency error(Hz))	Power control LEVEL	Result			
		DCS1800			
		ARFCN			
		512	698	885	Result
Tnorm (°C)=25; Vnorm=3.3	0	-63.54	-77.68	-54.24	PASS
	15	-40.49	-52.88	-49.46	PASS
When the MS is being vibrated	0	-61.83	-71.93	-42.43	PASS
	15	-35.82	-43.16	-35.64	PASS
Tmin(°C)=-10; Vmin=3.0	0	-60.18	-66.25	-30.67	PASS
	15	-31.19	-33.51	-21.89	PASS
Tmin(°C)=-10; Vmax=3.6	0	-62.25	-66.44	-53.34	PASS
	15	-30.48	-54.89	-28.67	PASS
Tmax(°C)=55; Vmin=3.0	0	-69.29	-74.97	-48.24	PASS
	15	-38.16	-43.84	-42.36	PASS
Tmax(°C)=55; Vmax=3.6	0	-71.67	-77.10	-53.59	PASS
	15	-47.46	-50.88	-50.50	PASS

11.1.3 Essential Conformance Requirements

11.1.3.1 Phase error requirement

For all measured bursts, the "RMS phase error" < 5 degree
For all measured bursts, the "Peak phase error" < 20 degree

11.1.3.2 Frequency error requirement

For all measured bursts, frequency error does not exceed 0.1ppm, that is:

The "GSM (900M Hz) band" < 90 Hz

The "DCS (1800M Hz) band" < 180 Hz

11.1.4 Result

The equipment met the requirement of this clause.

11.2 Transmitter - Frequency error under multipath and interference conditions

11.2.1 Test Condition

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Traffic Channel	975/62/124
MS Tx Level	5(Typical:33dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Traffic Channel	512/698/885
MS Tx Level	0(Typical:30dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.2.2 Test Result

frequency error(Hz)	Test conditions	Power control LEVEL	Result		
			EGSM900		
			ARFCN		
Fading set			975	62	124
RA250	Tnorm (°C)=25; Vnorm=3.3	5	2.20	7.81	2.96
		19	-4.06	2.68	-9.75
	Tmin(°C)=-10; Vmin=3.0	5	-5.25	-0.12	0.83
		19	-5.45	0.37	-4.74
	Tmin(°C)=-10; Vmax=3.6	5	-5.48	2.44	1.11
		19	-6.82	-6.20	-5.09
	Tmax(°C)=55; Vmin=3.0	5	1.11	3.23	0.42
		19	-5.26	-6.95	-7.55
	Tmax(°C)=55; Vmax=3.6	5	2.28	6.48	4.05
		19	-2.76	-0.66	-1.10
HT100	Tnorm (°C)=25; Vnorm=3.3	5	2.46	6.10	-4.46
		19	-6.24	2.70	-1.07
	Tmin(°C)=-10; Vmin=3.0	5	0.06	-3.13	-3.42
		19	-5.53	-3.61	-8.87
	Tmin(°C)=-10; Vmax=3.6	5	-2.54	3.53	-6.11
		19	-5.47	-1.76	-3.30
	Tmax(°C)=55; Vmin=3.0	5	2.22	3.48	-3.97
		19	-4.11	-0.72	-3.58
	Tmax(°C)=55; Vmax=3.6	5	4.70	7.15	-2.16
		19	-8.20	4.12	0.99
TU50	Tnorm (°C)=25; Vnorm=3.3	5	1.74	7.17	4.05
		19	-3.87	0.78	-3.31
	Tmin(°C)=-10; Vmin=3.0	5	1.39	2.18	2.39
		19	-4.06	0.38	-3.31
	Tmin(°C)=-10; Vmax=3.6	5	-2.34	-2.75	-4.51
		19	-5.83	-2.31	-4.38
	Tmax(°C)=55; Vmin=3.0	5	-5.44	5.28	-0.08
		19	-10.63	-1.23	-7.21
	Tmax(°C)=55; Vmax=3.6	5	6.18	9.10	5.81
		19	-5.82	1.97	-0.58
TU3	Tnorm (°C)=25; Vnorm=3.3	5	-4.98	6.27	2.41
		19	-1.74	-5.37	-7.48
	Tmin(°C)=-10; Vmin=3.0	5	-0.20	-0.42	2.24
		19	-4.94	-1.09	-10.10
	Tmin(°C)=-10; Vmax=3.6	5	-3.16	3.31	-0.38
		19	-6.87	-2.36	-4.07
	Tmax(°C)=55; Vmin=3.0	5	-4.63	-3.59	0.24
		19	-9.03	-4.93	-5.46
	Tmax(°C)=55; Vmax=3.6	5	4.03	8.00	4.88
		19	-0.84	-0.02	0.82

frequency error(Hz)	Test Conditions	Power control LEVEL	Result		
			DCS1800		
			ARFCN		
Fading set			512	698	885
RA130	Tnorm (°C)=25; Vnorm=3.3	0	-50.85	-64.72	-36.25
		15	-21.35	-41.38	-29.56
	Tmin(°C)=-10; Vmin=3.0	0	-43.15	-54.31	-23.24
		15	-17.29	-25.39	-16.97
	Tmin(°C)=-10; Vmax=3.6	0	-40.34	-47.81	-12.56
		15	-12.67	-14.04	-4.05
	Tmax(°C)=55; Vmin=3.0	0	-43.27	-55.90	-34.97
		15	-10.88	-36.41	-14.43
HT100	Tnorm (°C)=25; Vnorm=3.3	0	-54.11	-57.03	-29.15
		15	-19.84	-25.37	-24.07
	Tmin(°C)=-10; Vmin=3.0	0	-46.38	-64.76	-36.63
		15	-24.95	-34.50	-34.50
	Tmin(°C)=-10; Vmax=3.6	0	-45.27	-60.81	-28.08
		15	-17.98	-25.04	-20.28
	Tmin(°C)=-10; Vmax=3.6	0	-41.05	-52.46	-16.66
		15	-13.42	-15.84	-4.89
TU50	Tmax(°C)=55; Vmin=3.0	0	-44.24	-52.17	-39.25
		15	-12.45	-35.20	-16.13
	Tmax(°C)=55; Vmax=3.6	0	-49.77	-61.17	-29.87
		15	-18.85	-25.31	-29.17
	Tnorm (°C)=25; Vnorm=3.3	0	-51.41	-62.70	-34.25
		15	-24.11	-42.12	-37.33
	Tmin(°C)=-10; Vmin=3.0	0	-42.22	-54.23	-24.30
		15	-16.32	-23.88	-22.70
TU1.5	Tmin(°C)=-10; Vmax=3.6	0	-41.04	-51.26	-15.49
		15	-11.51	-14.98	-3.77
	Tmax(°C)=55; Vmin=3.0	0	-44.63	-49.76	-33.73
		15	-10.68	-42.08	-16.46
	Tmax(°C)=55; Vmax=3.6	0	-52.00	-57.23	-36.19
		15	-19.75	-25.38	-26.53
	Tnorm (°C)=25; Vnorm=3.3	0	-45.91	-64.01	-40.80
		15	-22.85	-34.58	-30.87
	Tmin(°C)=-10; Vmin=3.0	0	-44.70	-54.08	-22.89
		15	-16.06	-24.96	-23.14
	Tmin(°C)=-10; Vmax=3.6	0	-41.71	-48.21	-11.11
		15	-11.26	-14.93	-3.30
	Tmax(°C)=55; Vmin=3.0	0	-44.36	-47.15	-35.60
		15	-12.86	-35.49	-11.97
	Tmax(°C)=55; Vmax=3.6	0	-51.63	-56.64	-29.34
		15	-18.22	-24.96	-27.10

Parameter	Measurement Uncertainty
radio frequency	≤0.1ppm
total RF power, conducted	≤0.9dB
temperature	≤1°C
humidity	≤3%
DC voltages	≤2%

11.2.3 Essential Conformance Requirements

GSM900		DCS1800	
Propagation condition	Permitted Frequency error	Propagation condition	Permitted Frequency error
RA250	±300 Hz	RA130	±400 Hz
HT100	±180 Hz	HT100	±350 Hz
TU50	±160 Hz	TU50	±260 Hz
TU3	±230 Hz	TU1,5	±320 Hz

11.2.4 Result

The equipment met the requirement of this clause.

11.3 Frequency error and phase error in GPRS multislot configuration

11.3.1 Test Condition

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN4UP
System Type	GPRS
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Coding scheme	CS-4
Traffic Channel	975/62/124
MS Tx Level	5(Typical:33dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN4UP
System Type	GPRS
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Coding scheme	CS-4
Traffic Channel	512/698/885
MS Tx Level	0(Typical:30dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.3.2 Test Result

RMS phase error(degree)	Power control LEVEL	Result			
		EGSM900			
		ARFCN			
		975	62	124	Result
Tnorm (°C)=25; Vnorm=3.3	5	0.94	0.97	0.98	PASS
	19	0.92	0.94	0.98	PASS
When the MS is being vibrated	5	0.96	1.00	1.01	PASS
	19	0.95	0.96	1.01	PASS
Tmin(°C)=-10; Vmin=3.0	5	0.94	0.97	0.98	PASS
	19	0.92	0.95	0.98	PASS
Tmin(°C)=-10; Vmax=3.6	5	0.93	0.97	0.98	PASS
	19	0.93	0.95	0.98	PASS
Tmax(°C)=55; Vmin=3.0	5	0.93	0.96	0.98	PASS
	19	0.93	0.95	0.98	PASS
Tmax(°C)=55; Vmax=3.6	5	0.94	0.96	0.98	PASS
	19	0.92	0.95	0.99	PASS

RMS phase error(degree)	Power control LEVEL	Result			
		DCS1800			
		ARFCN			
		512	698	885	Result
Tnorm (°C)=25; Vnorm=3.3	0	0.72	0.77	0.83	PASS
	15	0.71	0.77	0.82	PASS
When the MS is being vibrated	0	0.75	0.79	0.86	PASS
	15	0.74	0.80	0.85	PASS
Tmin(°C)=-10; Vmin=3.0	0	0.71	0.77	0.83	PASS
	15	0.71	0.77	0.83	PASS
Tmin(°C)=-10; Vmax=3.6	0	0.72	0.77	0.83	PASS
	15	0.71	0.77	0.83	PASS
Tmax(°C)=55; Vmin=3.0	0	0.72	0.77	0.83	PASS
	15	0.71	0.77	0.83	PASS
Tmax(°C)=55; Vmax=3.6	0	0.72	0.77	0.83	PASS
	15	0.71	0.77	0.83	PASS

Peak phase error(degree)	Power control LEVEL	Result			
		EGSM900			
		ARFCN			
		975	62	124	Result
Tnorm (°C)=25; Vnorm=3.3	5	2.09	2.27	2.26	PASS
	19	2.10	2.16	2.25	PASS
When the MS is being vibrated	5	2.13	2.29	2.28	PASS
	19	2.13	2.20	2.29	PASS
Tmin(°C)=-10; Vmin=3.0	5	2.11	2.25	2.24	PASS
	19	2.11	2.17	2.26	PASS
Tmin(°C)=-10; Vmax=3.6	5	2.09	2.23	2.25	PASS
	19	2.10	2.18	2.30	PASS
Tmax(°C)=55; Vmin=3.0	5	2.11	2.25	2.26	PASS
	19	2.06	2.21	2.27	PASS
Tmax(°C)=55; Vmax=3.6	5	2.11	2.22	2.27	PASS
	19	2.09	2.17	2.27	PASS

Peak phase error(degree)	Power control LEVEL	Result			
		DCS1800			
		ARFCN			
		512	698	885	Result
Tnorm (°C)=25; Vnorm=3.3	0	2.12	2.29	2.46	PASS
	15	2.09	2.28	2.46	PASS
When the MS is being vibrated	0	2.15	2.31	2.48	PASS
	15	2.12	2.31	2.48	PASS
Tmin(°C)=-10; Vmin=3.0	0	2.11	2.28	2.44	PASS
	15	2.08	2.27	2.44	PASS
Tmin(°C)=-10; Vmax=3.6	0	2.13	2.28	2.45	PASS
	15	2.07	2.27	2.45	PASS
Tmax(°C)=55; Vmin=3.0	0	2.12	2.29	2.45	PASS
	15	2.08	2.29	2.44	PASS
Tmax(°C)=55; Vmax=3.6	0	2.10	2.27	2.45	PASS
	15	2.10	2.28	2.46	PASS

frequency error(Hz)	Power control LEVEL	Result			
		EGSM900			
		ARFCN			
		975	62	124	Result
Tnorm (°C)=25; Vnorm=3.3	5	19.69	18.66	27.31	PASS
	19	-2.97	1.23	6.26	PASS
When the MS is being vibrated	5	16.91	19.69	24.28	PASS
	19	-5.62	0.55	3.68	PASS
Tmin(°C)=-10; Vmin=3.0	5	14.08	20.66	21.18	PASS
	19	-8.33	-0.19	1.03	PASS
Tmin(°C)=-10; Vmax=3.6	5	24.99	26.99	20.28	PASS
	19	3.68	-0.32	-5.23	PASS
Tmax(°C)=55; Vmin=3.0	5	15.37	21.57	29.25	PASS
	19	-6.59	2.84	2.26	PASS
Tmax(°C)=55; Vmax=3.6	5	7.36	21.83	23.18	PASS
	19	-7.62	1.03	-3.03	PASS

frequency error(Hz))	Power control LEVEL	Result			
		DCS1800			
		ARFCN			
		512	698	885	Result
Tnorm (°C)=25; Vnorm=3.3	0	18.47	5.94	20.99	PASS
	15	40.03	43.65	58.89	PASS
When the MS is being vibrated	0	18.37	5.26	12.01	PASS
	15	41.03	46.36	55.69	PASS
Tmin(°C)=-10; Vmin=3.0	0	18.21	4.52	2.97	PASS
	15	41.97	49.01	52.43	PASS
Tmin(°C)=-10; Vmax=3.6	0	18.08	-0.26	-0.58	PASS
	15	42.49	49.01	55.34	PASS
Tmax(°C)=55; Vmin=3.0	0	20.86	0.71	-1.49	PASS
	15	43.46	18.47	53.47	PASS
Tmax(°C)=55; Vmax=3.6	0	16.01	10.59	7.23	PASS
	15	43.65	54.43	52.17	PASS

11.3.3 Essential Conformance Requirements

11.3.3.1 Phase error requirement

For all measured bursts, the "RMS phase error" < 5 degree
For all measured bursts, the "Peak phase error" < 20 degree

11.3.3.2 Frequency error requirement

For all measured bursts, frequency error does not exceed 0.1ppm, that is:

The "GSM (900 MHz) band" < 90Hz

The "DCS (1800 MHz) band" < 180Hz

11.3.4 Result

The equipment met the requirement of this clause.
One transceiver has been measured, however in above section only the requirements of EN 301 511 V9.0.2 have been considered.

11.4 Transmitter output power and burst timing

11.4.1 Test Condition

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Traffic Channel	975/62/124
MS Tx Level	5(Typical:33dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Traffic Channel	512/698/885
MS Tx Level	0(Typical:30dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.4.2 Test Result

A. output power

Transmitter Output power(dBm)		Result			
		Traffic Channels			
EGSM900	Power level	975	62	124	Result
Tnorm (°C)=25; Vnorm=3.3	5	31.84	31.95	31.99	PASS
	12	18.39	18.51	18.51	PASS
	19	4.22	4.43	4.46	PASS
Tmin(°C)=-10; Vmin=3.0	5	31.80	31.90	31.95	PASS
	12	18.37	18.46	18.47	PASS
	19	4.19	4.40	4.45	PASS
Tmin(°C)=-10; Vmax=3.6	5	31.84	31.94	31.95	PASS
	12	18.35	18.47	18.47	PASS
	19	4.21	4.41	4.42	PASS
Tmax(°C)=55; Vmin=3.0	5	31.82	31.95	31.99	PASS
	12	18.36	18.51	18.51	PASS
	19	4.21	4.43	4.48	PASS
Tmax(°C)=55; Vmax=3.6	5	31.86	31.97	31.98	PASS
	12	18.39	18.51	18.53	PASS
	19	4.22	4.47	4.47	PASS

Transmitter Output power(dBm)	Power level	Result			
		Traffic Channels			
DCS1800		512	698	885	Result
Tnorm (□)=25; Vnorm=3.3	0	29.43	29.74	29.32	PASS
	8	13.72	13.79	13.64	PASS
	15	-0.10	-0.12	-0.17	PASS
Tmin(°C)=-10; Vmin=3.0	0	29.40	29.74	29.31	PASS
	8	13.73	13.80	13.62	PASS
	15	-0.09	-0.10	-0.17	PASS
Tmin(°C)=-10; Vmax=3.6	0	29.40	29.74	29.30	PASS
	8	13.70	13.77	13.58	PASS
	15	-0.14	-0.10	-0.15	PASS
Tmax(°C)=55; Vmin=3.0	0	29.45	29.73	29.35	PASS
	8	13.76	13.78	13.62	PASS
	15	-0.10	-0.11	-0.14	PASS
Tmax(□)=55; Vmax=3.6	0	29.71	29.78	29.35	PASS
	8	13.76	13.80	13.62	PASS
	15	-0.10	-0.09	-0.16	PASS

B. Power VS Time:

Power VS Time Graph	ACCESS BURST	Result		
		Traffic Channels		
EGSM900	Power level	975	62	124
Tnorm (°C)=25; Vnorm=3.3	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmin(°C)=-10; Vmin=3.0	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmin(°C)=-10; Vmax=3.6	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmax(°C)=55; Vmin=3.0	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmax(°C)=55; Vmax=3.6	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS

Power VS Time Graph	ACCESS BURST	Result		
		Traffic Channels		
DCS1800	Power level	512	698	885
Tnorm (°C)=25; Vnorm=3.3	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmin(°C)=-10; Vmin=3.0	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmin(°C)=-10; Vmax=3.6	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmax(°C)=55; Vmin=3.0	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmax(°C)=55; Vmax=3.6	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS

Parameter	Measurement Uncertainty
radio frequency	≤0.1ppm
total RF power, conducted	≤0.9dB
temperature	≤1°C
humidity	≤3%
DC voltages	≤2%

11.4.3 Essential Conformance Requirements

The transmitter output power, under every combination of normal and extreme test conditions, for normal bursts and access bursts, at each frequency and for each power control level applicable to the MS power class, shall be at the relevant level and tolerance shown in following tables.

GPRS power class of GMSK modulation

Power class	GSM 400 & GSM 900 & GSM 850 Nominal Maximum output power	DCS 1 800 Nominal Maximum output power	PCS 1 900 Nominal Maximum output power	Tolerance (dB) for conditions	
				normal	extreme
1	-----	1 W (30 dBm)	1 W (30 dBm)	±2	±2,5
2	8 W (39 dBm)	0,25 W (24 dBm)	0,25 W (24 dBm)	±2	±2,5
3	5 W (37 dBm)	4 W (36 dBm)	2 W (33 dBm)	±2	±2,5
4	2 W (33 dBm)			±2	±2,5
5	0,8 W (29 dBm)			±2	±2,5

Above figure is the GPRS power class of HSUPA/HSDPA/UMTS/EGPRS/GPRS/GSM Mobile handset. According it, the GSM900 band is power class 4 and the DCS1800 band is power class 1. So the GPRS maximum output power and lowest power control level should be according to its corresponding class ,as defined in the following tables below (see also 3GPP TS 02.06).
GPRS power control level list

GSM 400, GSM 700, GSM 850 and GSM 900 transmitter output power
for different power classes

Power class					Power control level	Transmitter output power	Tolerances	
2	3	4	5				normal	extreme
.	.	.	.	.	2	39	±2 dB	±2,5 dB
.	.	.	.	.	3	37	±3 dB (note)	±4 dB (note)
.	.	.	.	.	4	35	±3 dB	±4 dB
.	.	.	.	.	5	33	±3 dB (note)	±4 dB (note)
.	.	.	.	.	6	31	±3 dB	±4 dB
.	.	.	.	.	7	29	±3 dB (note)	±4 dB (note)
.	.	.	.	.	8	27	±3 dB	±4 dB
.	.	.	.	.	9	25	±3 dB	±4 dB
.	.	.	.	.	10	23	±3 dB	±4 dB
.	.	.	.	.	11	21	±3 dB	±4 dB
.	.	.	.	.	12	19	±3 dB	±4 dB
.	.	.	.	.	13	17	±3 dB	±4 dB
.	.	.	.	.	14	15	±3 dB	±4 dB
.	.	.	.	.	15	13	±3 dB	±4 dB
.	.	.	.	.	16	11	±5 dB	±6 dB
.	.	.	.	.	17	9	±5 dB	±6 dB
.	.	.	.	.	18	7	±5 dB	±6 dB
.	.	.	.	.	19	5	±5 dB	±6 dB

NOTE: When the power control level corresponds to the power class of the MS, then the tolerances shall be 2,0 dB under normal test conditions and 2,5 dB under extreme test conditions.

DCS 1 800 transmitter output power for different power classes

Power class			Power control level	Transmitter output power	Tolerances	
1	2	3		dBm	normal	extreme
		.	29	36	±2,0 dB	±2,5 dB
		.	30	34	±3,0 dB	±4,0 dB
		.	31	32	±3,0 dB	±4,0 dB
.	.	.	0	30	±3,0 dB (note)	±4 dB (note)
.	.	.	1	28	±3 dB	±4 dB
.	.	.	2	26	±3 dB	±4 dB
.	.	.	3	24	±3 dB (note)	±4 dB (note)
.	.	.	4	22	±3 dB	±4 dB
.	.	.	5	20	±3 dB	±4 dB
.	.	.	6	18	±3 dB	±4 dB
.	.	.	7	16	±3 dB	±4 dB
.	.	.	8	14	±3 dB	±4 dB
.	.	.	9	12	±4 dB	±5 dB
.	.	.	10	10	±4 dB	±5 dB
.	.	.	11	8	±4 dB	±5 dB
.	.	.	12	6	±4 dB	±5 dB
.	.	.	13	4	±4 dB	±5 dB
.	.	.	14	2	±5 dB	±6 dB
.	.	.	15	0	±5 dB	±6 dB

NOTE: When the power control level corresponds to the power class of the MS, then the tolerances shall be 2,0 dB under normal test conditions and 2,5 dB under extreme test conditions.

1. The difference between the transmitter output power at two adjacent power control levels, measured at the same frequency shall not be less than 0.5dB and not be more than 3.5dB.
2. The centre of the transmitted normal burst as defined by the transition of bits 13/14 of the midamble shall be 3 timeslot periods (1731us) +/-1 bit period (+/-13.69us) after the centre of the corresponding received burst.

11.4.4 Result

The equipment met the requirement of this clause.

For the measurement results refer to appendix A for EM820W, but only the worst case were listed in the appendix. One transceiver has been measured, however in above section only the requirements of EN 301 511 V9.0.2 have been considered.

11.5 Transmitter - Output RF spectrum

11.5.1 Test Condition

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Traffic Channel	975/62/124
MS Tx Level	5(Typical:33dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Traffic Channel	512/698/885
MS Tx Level	0(Typical:30dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.5.2 Test Result

A. Spurious emission in the MS receive bands

Spurious emission in the MS receive bands	Freq range	EGSM900			
		RBW(Hz)	Max.Limit(dBm)	62Ch(dBm)	Test Result
Vnorm=3.3	925MHz~935MHz	100k	-67	-76.84	PASS
	935MHz~960MHz	100k	-79	-81.25	PASS
	1805MHz~1880MHz	100k	-71	-74.81	PASS
Vmin=3.0	925MHz~935MHz	100k	-67	-75.85	PASS
	935MHz~960MHz	100k	-79	-80.94	PASS
	1805MHz~1880MHz	100k	-71	-74.18	PASS
Vmax=3.6	925MHz~935MHz	100k	-67	-76.28	PASS
	935MHz~960MHz	100k	-79	-82.49	PASS
	1805MHz~1880MHz	100k	-71	-75.42	PASS

Spurious emission in the MS receive bands(dBm)	Freq range	DCS1800			
		RBW(Hz)	Max.level(dBm)	698Ch(dBm)	Test Result
Vnorm=3.3	925MHz~935MHz	100k	-67	-80.53	PASS
	935MHz~960MHz	100k	-79	-82.42	PASS
	1805MHz~1880MHz	100k	-71	-76.75	PASS
Vmin=3.0	925MHz~935MHz	100k	-67	-80.28	PASS
	935MHz~960MHz	100k	-79	-81.86	PASS
	1805MHz~1880MHz	100k	-71	-78.09	PASS
Vmax=3.6	925MHz~935MHz	100k	-67	-80.78	PASS
	935MHz~960MHz	100k	-79	-82.32	PASS
	1805MHz~1880MHz	100k	-71	-77.75	PASS

B. Modulation and switch Spectrum

Modulation& switch Spectrum	Power level	Result		
		Traffic Channels		
		975	62	124
EGSM900				
Tnorm (°C)=25; Vnorm=3.3	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmin(°C)=-10; Vmin=3.0	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmin(°C)=-10; Vmax=3.6	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmax(°C)=55; Vmin=3.0	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmax(°C)=55; Vmax=3.6	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS

Modulation& switch Spectrum	Power level	Result		
		Traffic Channels		
		512	698	885
DCS1800				
Tnorm (°C)=25; Vnorm=3.3	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmin(°C)=-10; Vmin=3.0	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmin(°C)=-10; Vmax=3.6	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmax(°C)=55; Vmin=3.0	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmax(°C)=55; Vmax=3.6	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS

Parameter	Measurement Uncertainty
radio frequency	≤0.1ppm
total RF power, conducted	≤0.9dB
temperature	≤1°C
humidity	≤3%
DC voltages	≤2%

11.5.3 Essential Conformance Requirements CLAUSE 4.2.6.2

- 1) For the modulation sidebands out to less than 1 800 kHz offset from the carrier frequency (FT) and the measured power level in dB relative to the power level measured at FT, for all types of MS, shall not exceed the limits derived from the values shown in the following tables according to the actual transmit power and frequency offset from FT. However any failures in the combined range 600 kHz to less than 1 800 kHz above and below the carrier may be counted towards the exceptions allowed in test requirements 3) below.

GSM 400, GSM 700, GSM 850 and GSM 900 Spectrum due to modulation out to less than 1 800 kHz offset

	power levels in dB relative to the measurement at FT				
Power level	Frequency offset (kHz)				
(dBm)	0-100	200	250	400	600 to <1800
39	+0,5	-30	-33	-60	-66
37	+0,5	-30	-33	-60	-64
35	+0,5	-30	-33	-60	-62
≤ 33	+0,5	-30	-33	-60	-60
The values above are subject to the minimum absolute levels (dBm) below.					
	-36	-36	-36	-36	-51

DCS 1 800 Spectrum due to modulation out to less than 1 800 kHz offset

	power levels in dB relative to the measurement at FT				
Power level	Frequency offset (kHz)				
(dBm)	0-100	200	250	400	600 to <1800
≤ 36	+0,5	-30	-33	-60	-60
The values above are subject to the minimum absolute levels (dBm) below.					
	-36	-36	-36	-36	-56

NOTE:

- frequency offsets between 100 kHz and 600 kHz the requirement is derived by a linear interpolation between the points identified in the table with linear frequency and power in dB relative.
- For the modulation sidebands from 1 800 kHz offset from the carrier frequency (FT) and out to 2 MHz beyond the edge of the relevant transmit band, the measured power level in dB relative to the power level measured at FT, shall not exceed the values shown in the following table according to the actual transmit power, frequency offset from FT and system on which the MS is designed to operate. However any failures in the combined range 1 800 kHz to 6 MHz above and below the carrier may be counted towards the exceptions allowed in test requirements

- 3) below, and any other failures may be counted towards the exceptions allowed in test requirements

**Spectrum due to modulation from 1 800 kHz offset
to the edge of the transmit band (wideband noise)**

power levels in dB relative to the measurement at F1									
GSM 400, GSM 700, GSM 850 and GSM 900				DCS 1 800			PCS 1 900		
Power	Frequency offset			Power	Frequency offset		Power	Frequency offset	
Level	kHz			level	kHz		level	kHz	
(dBm)	1 800 to	3 000 to	>= 6 000	(dBm)	1 800 to	>= 6 000	(dBm)	1 800 to	>= 6 000
	< 3 000	< 6 000			< 6 000			< 6 000	
39	-69	-71	-77	30	-71	-79	33	-60	-70
37	-67	-69	-75	34	-69	-77	32	-67	-75
35	-65	-67	-73	32	-67	-75	30	-65	-73
<= 33	-63	-65	-71	30	-65	-73	28	-63	-71
				28	-63	-71	26	-61	-69
				26	-61	-69	<= 24	-59	-67
				<= 24	-59	-67			
The values above are subject to the minimum absolute levels (dBm) below.									
	-46	-46	-46		-51	-51		-51	-51

- 4) Any failures (from a) and b) above) in the combined range 600 kHz to 6 MHz above and below the carrier should be re-checked for allowed spurious emissions. For each of the three ARFCN used, spurious emissions are allowed in up to three 200 kHz bands centred on an integer multiple of 200 kHz so long as no spurious emission exceeds -36 dBm. Any spurious emissions measured in a 30 kHz bandwidth which spans two 200 kHz bands can be counted towards either 200 kHz band, whichever minimizes the number of 200 kHz bands containing spurious exceptions.
- 5) Any failures (from b) above) beyond 6 MHz offset from the carrier should be re-checked for allowed spurious emissions. For each of the three ARFCN used, up to twelve spurious emissions are allowed so long as no spurious emission exceeds -36 dBm.
- 6) For GSM 900 and DCS 1 800 MS the spurious emissions in the bands 925 MHz to 935 MHz, 935 MHz to 960 MHz and 1 805 MHz to 1 880 MHz shall not exceed the values shown in table 13-10 except in up to five measurements in the band 925 MHz to 960 MHz and five measurements in the band 1 805 MHz to 1 880 MHz where a level up to -36 dBm is permitted.

Spurious emissions in the MS receive bands

Band (MHz)	Spurious emissions level (dBm)	
	GSM 400, GSM 900 and DCS 1 800	GSM 700, GSM 850 and PCS 1 900
925 to 935	-67	
935 to 960	-79	
1 805 to 1 880	-71	
747 to 757		-79
757 to 762		-73
869 to 894		-79
1 930 to 1 990		-71

- 7) For the power ramp sidebands the power levels must not exceed the values shown in the following table.

GSM Spectrum due to switching transients

Power level	Maximum level for various offsets from carrier frequency			
	400 kHz	600 kHz	1 200 kHz	1 800 kHz
39 dBm	-13 dBm	-21 dBm	-21 dBm	-24 dBm
37 dBm	-15 dBm	-21 dBm	-21 dBm	-24 dBm
35 dBm	-17 dBm	-21 dBm	-21 dBm	-24 dBm
33 dBm	-19 dBm	-21 dBm	-21 dBm	-24 dBm
31 dBm	-21 dBm	-23 dBm	-23 dBm	-26 dBm
29 dBm	-23 dBm	-25 dBm	-25 dBm	-28 dBm
27 dBm	-23 dBm	-26 dBm	-27 dBm	-30 dBm
25 dBm	-23 dBm	-26 dBm	-29 dBm	-32 dBm
23 dBm	-23 dBm	-26 dBm	-31 dBm	-34 dBm
<= +21 dBm	-23 dBm	-26 dBm	-32 dBm	-36 dBm

DCS 1 800 Spectrum due to switching transients

Power level	Maximum level for various offsets from carrier frequency			
	400 kHz	600 kHz	1200 kHz	1 800 kHz
36 dBm	-16 dBm	-21 dBm	-21 dBm	-24 dBm
34 dBm	-18 dBm	-21 dBm	-21 dBm	-24 dBm
32 dBm	-20 dBm	-22 dBm	-22 dBm	-25 dBm
30 dBm	-22 dBm	-24 dBm	-24 dBm	-27 dBm
28 dBm	-23 dBm	-25 dBm	-26 dBm	-29 dBm
26 dBm	-23 dBm	-26 dBm	-28 dBm	-31 dBm
24 dBm	-23 dBm	-26 dBm	-30 dBm	-33 dBm
22 dBm	-23 dBm	-26 dBm	-31 dBm	-35 dBm
<= +20 dBm	-23 dBm	-26 dBm	-32 dBm	-36 dBm

11.5.4 Result

The equipment met the requirement of this clause.

For the measurement results refer to appendix B for EM820W, but only the worst case were listed in the appendix. One transceiver has been measured, however in above section only the requirements of EN 301 511 V9.0.2 have been considered.

11.6 Transmitter output power in GPRS multislot configuration

11.6.1 Test Condition

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN4UP
System Type	GPRS
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Coding scheme	CS-4
Traffic Channel	975/62/124
MS Tx Level	5(Typical:33dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN4UP
System Type	GPRS
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Coding scheme	CS-4
Traffic Channel	512/698/885
MS Tx Level	0(Typical:30dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.6.2 Test Result

A. output power

Transmitter Output power(dBm)	Power level	Result			
		Traffic Channels			
EGSM900		975	62	124	Result
Tnorm (°C)=25; Vnorm=3.3	5	26.25	26.23	26.09	PASS
	12	17.76	17.78	17.70	PASS
	19	3.71	3.85	3.82	PASS
Tmin(°C)=-10; Vmin=3.0	5	26.24	26.20	26.08	PASS
	12	17.73	17.77	17.68	PASS
	19	3.69	3.80	3.80	PASS
Tmin(°C)=-10; Vmax=3.6	5	26.25	26.21	26.09	PASS
	12	17.75	17.78	17.70	PASS
	19	3.70	3.83	3.80	PASS
Tmax(°C)=55; Vmin=3.0	5	26.27	26.23	26.09	PASS
	12	17.77	17.80	17.72	PASS
	19	3.71	3.84	3.81	PASS
Tmax(°C)=55; Vmax=3.6	5	26.30	26.25	26.11	PASS
	12	17.79	17.81	17.73	PASS
	19	3.72	3.85	3.82	PASS

Transmitter Output power(dBm)	Power level	Result			
		Traffic Channels			
DCS1800		512	698	885	Result
Tnorm (°C)=25; Vnorm=3.3	0	24.19	24.42	24.22	PASS
	8	12.07	12.32	12.24	PASS
	15	-1.63	-1.55	-1.61	PASS
Tmin(°C)=-10; Vmin=3.0	0	24.16	24.40	24.21	PASS
	8	12.07	12.30	12.23	PASS
	15	-1.61	-1.55	-1.62	PASS
Tmin(°C)=-10; Vmax=3.6	0	24.16	24.41	24.23	PASS
	8	12.06	12.31	12.24	PASS
	15	-1.61	-1.55	-1.63	PASS
Tmax(°C)=55; Vmin=3.0	0	24.21	24.44	24.24	PASS
	8	12.09	12.32	12.25	PASS
	15	-1.62	-1.58	-1.63	PASS
Tmax(°C)=55; Vmax=3.6	0	24.26	24.48	24.28	PASS
	8	12.12	12.36	12.27	PASS
	15	-1.61	-1.54	-1.61	PASS

C. Power VS Time:

Power VS Time Graph	ACCESS BURST	Result		
		Traffic Channels		
EGSM900	Power level	975	62	124
Tnorm (°C)=25; Vnorm=3.3	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmin(°C)=-10; Vmin=3.0	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmin(°C)=-10; Vmax=3.6	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmax(°C)=55; Vmin=3.0	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmax(°C)=55; Vmax=3.6	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS

Power VS Time Graph	ACCESS BURST	Result		
		Traffic Channels		
DCS1800	Power level	512	698	885
Tnorm (°C)=25; Vnorm=3.3	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmin(°C)=-10; Vmin=3.0	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmin(°C)=-10; Vmax=3.6	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmax(°C)=55; Vmin=3.0	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmax(°C)=55; Vmax=3.6	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS

Parameter	Measurement Uncertainty
radio frequency	≤0.1ppm
total RF power, conducted	≤0.9dB
temperature	≤1°C
humidity	≤3%
DC voltages	≤2%

11.6.3 Essential Conformance Requirements

The transmitter output power, under every combination of normal and extreme test conditions, for normal bursts and access bursts, at each frequency and for each power control level applicable to the MS power class, shall be at the relevant level and tolerances requirement shown in the following tables.

GSM 900 transmitter output power for different power classes

Power class					Power control level	GAMMA_TN (Γ_{CH})	Transmitter output power (note 2)	Tolerances	
2	3	4	5				dBm	normal	extreme
.	.	.	.	.	2	0	39	±2 dB	±2,5 dB
.	.	.	.	.	3	1	37	±3 dB (note 1)	±4 dB (note 1)
.	.	.	.	.	4	2	35	±3 dB	±4 dB
.	.	.	.	.	5	3	33	±3 dB (note 1)	±4 dB (note 1)
.	.	.	.	.	6	4	31	±3 dB	±4 dB
.	.	.	.	.	7	5	29	±3 dB (note 1)	±4 dB (note 1)
.	.	.	.	.	8	6	27	±3 dB	±4 dB
.	.	.	.	.	9	7	25	±3 dB	±4 dB
.	.	.	.	.	10	8	23	±3 dB	±4 dB
.	.	.	.	.	11	9	21	±3 dB	±4 dB
.	.	.	.	.	12	10	19	±3 dB	±4 dB
.	.	.	.	.	13	11	17	±3 dB	±4 dB
.	.	.	.	.	14	12	15	±3 dB	±4 dB
.	.	.	.	.	15	13	13	±3 dB	±4 dB
.	.	.	.	.	16	14	11	±5 dB	±6 dB
.	.	.	.	.	17	15	9	±5 dB	±6 dB
.	.	.	.	.	18	16	7	±5 dB	±6 dB
.	.	.	.	.	19	17	5	±5 dB	±6 dB

NOTE1: When the power control level corresponds to the power class of the MS, then the tolerances shall be 2,0 dB under normal test conditions and 2,5 dB under extreme test conditions.

NOTE 2: For R99 and Rel-4, the maximum output power in a multislot configuration may be lower within the limits defined in table 13.16.2-1a. From Rel-5 onwards, the maximum output power in a multislot configuration may be lower within the limits defined in table 13.16.2-1b.

DCS 1 800 transmitter output power for different power classes

Power class			Power control level	GAMMA_TN (Γ_{CH})	Transmitter output power (note 2)	Tolerances	
1	2	3			dBm	normal	extreme
		.	29	0	36	±2,0 dB	±2,5 dB
		.	30	1	34	±3,0 dB	±4,0 dB
		.	31	2	32	±3,0 dB	±4,0 dB
.	.	.	0	3	30	±3,0 dB	±4 dB
		.				(note_1)	(note_1)
.	.	.	1	4	28	±3 dB	±4 dB
.	.	.	2	5	26	±3 dB	±4 dB
.	.	.	3	6	24	±3 dB	±4 dB
		.				(note_1)	(note_1)
.	.	.	4	7	22	±3 dB	±4 dB
.	.	.	5	8	20	±3 dB	±4 dB
.	.	.	6	9	18	±3 dB	±4 dB
.	.	.	7	10	16	±3 dB	±4 dB
.	.	.	8	11	14	±3 dB	±4 dB
.	.	.	9	12	12	±4 dB	±5 dB
.	.	.	10	13	10	±4 dB	±5 dB
.	.	.	11	14	8	±4 dB	±5 dB
.	.	.	12	15	6	±4 dB	±5 dB
.	.	.	13	16	4	±4 dB	±5 dB
.	.	.	14	17	2	±5 dB	±6 dB
.	.	.	15	18	0	±5 dB	±6 dB

NOTE1: When the power control level corresponds to the power class of the MS, then the tolerances shall be 2,0 dB under normal test conditions and 2,5 dB under extreme test conditions.

NOTE 2: For R99 and Rel-4, the maximum output power in a multislot configuration may be lower within the limits defined in table 13.16.2-2a. From Rel-5 onwards, the maximum output power in a multislot configuration may be lower within the limits defined in table 13.16.2-2b.

GSM 400, GSM 700, GSM 850 and GSM 900 allowed maximum output power reduction in a multislot configuration

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power, (dB)
1	0
2	3,0
3	4,8
4	6,0
5	7,0
6	7,8
7	8,5
8	9,0

DCS 1 800 allowed maximum output power reduction in a multislot configuration

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power, (dB)
1	0
2	3,0
3	4,8
4	6,0
5	7,0
6	7,8
7	8,5
8	9,0

11.6.4 Result

The equipment met the requirement of this clause.

For the measurement results refer to appendix C for EM820W, but only the worst case were listed in the appendix. One transceiver has been measured, however in above section only the requirements of EN 301 511 V9.0.2 have been considered.

11.7 Output RF spectrum in GPRS multislot configuration

11.7.1 Test Condition

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN4UP
System Type	GPRS
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Coding scheme	CS-4
Traffic Channel	975/62/124
MS Tx Level	5(Typical:33dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN4UP
System Type	GPRS
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Coding scheme	CS-4
Traffic Channel	512/698/885
MS Tx Level	0(Typical:30dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.7.2 Test Result

A. Spurious emission in the MS receive bands

Spurious emission in the MS receive bands	Freq range	EGSM900			
		RBW(Hz)	Max.Limit(dBm)	62Ch(dBm)	Result
Vnorm=3.3	925MHz~935MHz	100k	-67	-76.32	PASS
	935MHz~960MHz	100k	-79	-80.60	PASS
	1805MHz~1880MHz	100k	-71	-76.76	PASS
Vmin=3.0	925MHz~935MHz	100k	-67	-75.89	PASS
	935MHz~960MHz	100k	-79	-81.85	PASS
	1805MHz~1880MHz	100k	-71	-76.12	PASS
Vmax=3.6	925MHz~935MHz	100k	-67	-76.33	PASS
	935MHz~960MHz	100k	-79	-81.79	PASS
	1805MHz~1880MHz	100k	-71	-75.27	PASS

Spurious emission in the MS receive bands	Freq range	DCS1800			
		RBW(Hz)	Max.Limit(dBm)	698Ch(dBm)	Test Result
Vnorm=3.3	925MHz~935MHz	100k	-67	-80.37	PASS
	935MHz~960MHz	100k	-79	-81.20	PASS
	1805MHz~1880MHz	100k	-71	-76.51	PASS
Vmin=3.0	925MHz~935MHz	100k	-67	-81.01	PASS
	935MHz~960MHz	100k	-79	-82.14	PASS
	1805MHz~1880MHz	100k	-71	-76.84	PASS
Vmax=3.6	925MHz~935MHz	100k	-67	-80.77	PASS
	935MHz~960MHz	100k	-79	-82.34	PASS
	1805MHz~1880MHz	100k	-71	-74.53	PASS

B. Modulation and switch Spectrum

Modulation& switch Spectrum	Power level	Result		
		Traffic Channels		
EGSM900		975	62	124
Tnorm (°C)=25; Vnorm=3.3	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmin(°C)=-10; Vmin=3.0	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmin(°C)=-10; Vmax=3.6	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmax(°C)=55; Vmin=3.0	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmax(°C)=55; Vmax=3.6	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS

Modulation& switch Spectrum	Power level	Result		
		Traffic Channels		
DCS1800		512	698	885
Tnorm (°C)=25; Vnorm=3.3	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmin(°C)=-10; Vmin=3.0	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmin(°C)=-10; Vmax=3.6	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmax(°C)=55; Vmin=3.0	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmax(°C)=55; Vmax=3.6	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS

Parameter	Measurement Uncertainty
radio frequency	≤0.1ppm
total RF power, conducted	≤0.9dB
temperature	≤1°C
humidity	≤3%
DC voltages	≤2%

11.7.3 Essential conformance requirements

- 1) For the modulation sidebands out to less than 1 800 kHz offset from the carrier frequency (FT) and the measured power level in dB relative to the power level measured at FT, for all types of MS, shall not exceed the limits derived from the values shown in the following tables according to the actual transmit power and frequency offset from FT. However any failures in the combined range 600 kHz to less than 1 800 kHz above and below the carrier may be counted towards the exceptions allowed in test requirements 3) below.

GSM 400, GSM 700, GSM 850 and GSM 900 Spectrum due to modulation out to less than 1 800 kHz offset

	power levels in dB relative to the measurement at FT				
Power level	Frequency offset (kHz)				
(dBm)	0-100	200	250	400	600 to <1800
39	+0,5	-30	-33	-60	-66
37	+0,5	-30	-33	-60	-64
35	+0,5	-30	-33	-60	-65
≤ 33	+0,5	-30	-33	-60	-60
The values above are subject to the minimum absolute levels (dBm) below.					
	-36	-36	-36	-36	-51

DCS 1 800 Spectrum due to modulation out to less than 1 800 kHz offset

	power levels in dB relative to the measurement at FT				
Power level	Frequency offset (kHz)				
(dBm)	0-100	200	250	400	600 to <1800
≤ 36	+0,5	-30	-33	-60	-60
The values above are subject to the minimum absolute levels (dBm) below.					
	-36	-36	-36	-36	-56

NOTE: For frequency offsets between 100 kHz and 600 kHz the requirement is derived by a linear interpolation between the points identified in the table with linear frequency and power in dB relative.

- 2) For the modulation sidebands from 1 800 kHz offset from the carrier frequency (FT) and out to 2 MHz beyond the edge of the relevant transmit band, the measured power level in dB relative to the power level measured at FT, shall not exceed the values shown in the following table according to the actual transmit power, frequency offset from FT and system on which the MS is designed to operate. However any failures in the combined range 1 800 kHz to 6 MHz above and below the carrier may be counted towards the exceptions allowed in test requirements 3) below, and any other failures may be counted towards the exceptions allowed in test requirements 4) below.

Spectrum due to modulation from 1 800 kHz offset
to the edge of the transmit band (wideband noise)

power levels in dB relative to the measurement at FT									
GSM 400, GSM 700, GSM 850 and GSM 900				DCS 1 800			PCS 1 900		
Power	Frequency offset			Power	Frequency offset		Power	Frequency offset	
Level	kHz			level	KHz		level	kHz	
(dBm)	1 800 to	3 000 to	>= 6 000	(dBm)	1 800 to	>= 6 000	(dBm)	1 800 to	>= 6 000
	< 3 000	< 6 000			< 6 000			< 6 000	
39	-69	-71	-77	36	-71	-79	33	-68	-76
37	-67	-69	-75	34	-69	-77	32	-67	-75
35	-65	-67	-73	32	-67	-75	30	-65	-73
<= 33	-63	-65	-71	30	-65	-73	28	-63	-71
				28	-63	-71	26	-61	-69
				26	-61	-69	<= 24	-59	-67
				<= 24	-59	-67			
The values above are subject to the minimum absolute levels (dBm) below.									
	-46	-46	-46		-51	-51		-51	-51

- 3) Any failures (from a) and b) above) in the combined range 600 kHz to 6 MHz above and below the carrier should be re-checked for allowed spurious emissions. For each of the three ARFCN used, spurious emissions are allowed in up to three 200 kHz bands centred on an integer multiple of 200 kHz so long as no spurious emission exceeds -36dBm. Any spurious emissions measured in a 30 kHz bandwidth which spans two 200 kHz bands can be counted towards either 200 kHz band, whichever minimizes the number of 200 kHz bands containing spurious exceptions.
- 4) Any failures (from b) above) beyond 6 MHz offset from the carrier should be re-checked for allowed spurious emissions. For each of the three ARFCN used, up to twelve spurious emissions are allowed so long as no spurious emission exceeds -36dBm.
- 5) For GSM 900 and DCS 1 800 MS the spurious emissions in the bands 925 MHz to 935 MHz, 935 MHz to 960 MHz and 1 805 MHz to 1 880 MHz shall not exceed the values shown in table 13-10 except in up to five measurements in the band 925 MHz to 960 MHz and five measurements in the band 1 805 MHz to 1 880 MHz where a level up to -36dBm is permitted.

Spurious emissions in the MS receive bands

Band (MHz)	Spurious emissions level (dBm)	
	GSM 400, GSM 900 and DCS 1 800	GSM 700, GSM 850 and PCS 1 900
925 to 935	-67	
935 to 960	-79	
1 805 to 1 880	-71	
747 to 757		-79
757 to 765		-73
869 to 894		-79
1 930 to 1 990		-71

- 6) For the power ramp sidebands the power levels must not exceed the values shown in the following table.

GSM Spectrum due to switching transients

Power level	Maximum level for various offsets from carrier frequency			
	400 kHz	600 kHz	1 200 kHz	1 800 kHz
39dBm	-13dBm	-21dBm	-21dBm	-24dBm
37dBm	-15dBm	-21dBm	-21dBm	-24dBm
35dBm	-17dBm	-21dBm	-21dBm	-24dBm
33dBm	-19dBm	-21dBm	-21dBm	-24dBm
31dBm	-21dBm	-23dBm	-23dBm	-26dBm
29dBm	-23dBm	-25dBm	-25dBm	-28dBm
27dBm	-23dBm	-26dBm	-27dBm	-30dBm
25dBm	-23dBm	-26dBm	-29dBm	-32dBm
23dBm	-23dBm	-26dBm	-31dBm	-34dBm
<= +21dBm	-23dBm	-26dBm	-32dBm	-36dBm

DCS 1 800 Spectrum due to switching transients

Power level	Maximum level for various offsets from carrier frequency			
	400 kHz	600 kHz	1200 kHz	1 800 kHz
36dBm	-16dBm	-21dBm	-21dBm	-24dBm
34dBm	-18dBm	-21dBm	-21dBm	-24dBm
32dBm	-20dBm	-22dBm	-22dBm	-25dBm
30dBm	-22dBm	-24dBm	-24dBm	-27dBm
28dBm	-23dBm	-25dBm	-26dBm	-29dBm
26dBm	-23dBm	-26dBm	-28dBm	-31dBm
24dBm	-23dBm	-26dBm	-30dBm	-33dBm
22dBm	-23dBm	-26dBm	-31dBm	-35dBm
<= +20dBm	-23dBm	-26dBm	-32dBm	-36dBm

11.7.4 Result

The equipment met the requirement of this clause.

For the measurement results refer to appendix D for EM820W, but only the worst case were listed in the appendix. One transceiver has been measured, however in above section only the requirements of EN 301 511 V9.0.2 have been considered.

11.8 Conducted spurious emissions - MS allocated a channel

11.8.1 Test Condition

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Traffic Channel	975/62/124
MS Tx Level	5(Typical:33dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Traffic Channel	512/698/885
MS Tx Level	0(Typical:30dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.8.2 Test Result

Conducted spurious emissions	EGSM900;Vnorm=3.3			
Frequency range	RBW(Hz)	Max.Limit(dBm)	62Ch(dBm)	Result
9kHz~100kHz	1k	-36	-82.06	PASS
100kHz~50MHz	10k	-36	-71.14	PASS
50MHz~500MHz	100k	-36	-78.60	PASS
500MHz~850MHz	3M	-36	-61.46	PASS
850MHz~860MHz	1M	-36	-63.20	PASS
860MHz~870MHz	300k	-36	-72.90	PASS
870MHz~880MHz	100k	-36	-56.28	PASS
915MHz~925MHz	100k	-36	-52.31	PASS
960MHz~1GHz	3M	-36	-64.37	PASS
1GHz~1805MHz	3M	-30	-64.53	PASS
1880MHz~12.75GHz	3M	-30	-60.63	PASS
1.8MHz~6MHz offset from the carrier frequency	30k	-36	-47.59	PASS
more than 6MHz offset from the carrier frequency	100k	-36	-42.45	PASS

Conducted spurious emissions	EGSM900;Vmin=3.0			
Frequency range	RBW(Hz)	Max.Limit(dBm)	62Ch(dBm)	Result
9kHz~100kHz	1k	-36	-81.16	PASS
100kHz~50MHz	10k	-36	-75.14	PASS
50MHz~500MHz	100k	-36	-78.90	PASS
500MHz~850MHz	3M	-36	-61.26	PASS
850MHz~860MHz	1M	-36	-62.60	PASS
860MHz~870MHz	300k	-36	-72.59	PASS
870MHz~880MHz	100k	-36	-56.46	PASS
915MHz~925MHz	100k	-36	-51.85	PASS
960MHz~1GHz	3M	-36	-64.73	PASS
1GHz~1805MHz	3M	-30	-63.94	PASS
1880MHz~12.75GHz	3M	-30	-59.56	PASS
1.8MHz~6MHz offset from the carrier frequency	30k	-36	-47.47	PASS
more than 6MHz offset from the carrier frequency	100k	-36	-42.27	PASS

Conducted spurious emissions	EGSM900;Vmax=3.6			
Frequency range	RBW(Hz)	Max.Limit(dBm)	62Ch(dBm)	Result
9kHz~100kHz	1k	-36	-81.60	PASS
100kHz~50MHz	10k	-36	-75.26	PASS
50MHz~500MHz	100k	-36	-78.27	PASS
500MHz~850MHz	3M	-36	-60.87	PASS
850MHz~860MHz	1M	-36	-62.69	PASS
860MHz~870MHz	300k	-36	-71.74	PASS
870MHz~880MHz	100k	-36	-56.01	PASS
915MHz~925MHz	100k	-36	-51.76	PASS
960MHz~1GHz	3M	-36	-64.66	PASS
1GHz~1805MHz	3M	-30	-63.74	PASS
1880MHz~12.75GHz	3M	-30	-60.08	PASS
1.8MHz~6MHz offset from the carrier frequency	30k	-36	-47.25	PASS
more than 6MHz offset from the carrier frequency	100k	-36	-42.24	PASS

Conducted spurious emissions	DCS1800;Vnorm=3.3			
Frequency range	RBW(Hz)	Max.Limit(dBm)	698Ch(dBm)	Result
9kHz~100kHz	1k	-36	-81.45	PASS
100kHz~50MHz	10k	-36	-73.89	PASS
50MHz~500MHz	100k	-36	-79.15	PASS
500MHz~925MHz	3M	-36	-63.26	PASS
960MHz~1GHz	3M	-36	-64.11	PASS
1GHz~1680MHz	3M	-30	-51.62	PASS
1680MHz~1690MHz	1M	-30	-54.00	PASS
1690MHz~1700MHz	300k	-30	-56.26	PASS
1700MHz~1710MHz	100k	-30	-65.17	PASS
1785MHz~1795MHz	100k	-30	-64.58	PASS
1795MHz~1805MHz	300k	-30	-57.24	PASS
1880MHz~12.75GHz	3M	-30	-48.25	PASS
1.8MHz~6MHz offset from the carrier frequency	30k	-36	-46.40	PASS
more than 6MHz offset from the carrier frequency	100k	-36	-46.10	PASS

Conducted spurious emissions	DCS1800;Vmin=3.0			
Frequency range	RBW(Hz)	Max.Limit(dBm)	698Ch(dBm)	Result
9kHz~100kHz	1k	-36	-82.21	PASS
100kHz~50MHz	10k	-36	-76.04	PASS
50MHz~500MHz	100k	-36	-78.61	PASS
500MHz~925MHz	3M	-36	-63.93	PASS
960MHz~1GHz	3M	-36	-63.64	PASS
1GHz~1680MHz	3M	-30	-51.72	PASS
1680MHz~1690MHz	1M	-30	-52.17	PASS
1690MHz~1700MHz	300k	-30	-56.87	PASS
1700MHz~1710MHz	100k	-30	-64.17	PASS
1785MHz~1795MHz	100k	-30	-64.11	PASS
1795MHz~1805MHz	300k	-30	-58.38	PASS
1880MHz~12.75GHz	3M	-30	-50.26	PASS
1.8MHz~6MHz offset from the carrier frequency	30k	-36	-46.86	PASS
more than 6MHz offset from the carrier frequency	100k	-36	-46.47	PASS

Conducted spurious emissions	DCS1800;Vmax=3.6			
Frequency range	RBW(Hz)	Max.Limit(dBm)	698Ch(dBm)	Result
9kHz~100kHz	1k	-36	-81.21	PASS
100kHz~50MHz	10k	-36	-74.91	PASS
50MHz~500MHz	100k	-36	-78.15	PASS
500MHz~925MHz	3M	-36	-62.01	PASS
960MHz~1GHz	3M	-36	-64.57	PASS
1GHz~1680MHz	3M	-30	-51.88	PASS
1680MHz~1690MHz	1M	-30	-53.67	PASS
1690MHz~1700MHz	300k	-30	-56.23	PASS
1700MHz~1710MHz	100k	-30	-64.62	PASS
1785MHz~1795MHz	100k	-30	-64.63	PASS
1795MHz~1805MHz	300k	-30	-57.55	PASS
1880MHz~12.75GHz	3M	-30	-48.58	PASS
1.8MHz~6MHz offset from the carrier frequency	30k	-36	-45.93	PASS
more than 6MHz offset from the carrier frequency	100k	-36	-46.32	PASS

Parameter	Measurement Uncertainty
radio frequency	≤0.1ppm
total RF power, conducted	≤0.9dB
temperature	≤1°C
humidity	≤3%
DC voltages	≤2%

11.8.3 Essential Conformance Requirements

The power of any spurious emission shall not exceed the levels given in following tables.

Frequency range		Power level in dBm		
		GSM 400, GSM 700, GSM 850, GSM 900	DCS 1 800	PCS 1 900
100 kHz to	1 GHz	-36	-36	-36
1 GHz to	12,75 GHz	-30		-30
1 GHz to	1710 MHz		-30	
1 710 MHz to	1 785 MHz		-36	
1 785 MHz to	12.75GHz		-30	

11.8.4 Result

The equipment met the requirement of this clause.

For the measurement results refer to appendix E for EM820W, but only the worst case were listed in the appendix. One transceiver has been measured, however in above section only the requirements of EN 301 511 V9.0.2 have been considered.

11.9 Conducted spurious emissions - MS in idle mode

11.9.1 Test Condition

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Traffic Channel	975/62/124
MS Tx Level	idle mode
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Traffic Channel	512/698/885
MS Tx Level	idle mode
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.9.2 Test Result

Conducted spurious emissions	EGSM900; Vnorm=3.3			
Frequency range	RBW(Hz)	Max.Limit(dBm)	62Ch(dBm)	Result
9kHz~100kHz	1k	-57	-80.75	PASS
100kHz~50MHz	10k	-57	-76.74	PASS
50MHz~880MHz	100k	-57	-79.03	PASS
880MHz~915MHz	100k	-59	-71.42	PASS
915MHz~1000MHz	100k	-57	-78.30	PASS
1GHz~1710MHz	100k	-47	-77.61	PASS
1710MHz~1785MHz	100k	-53	-76.44	PASS
1785MHz~12.75GHz	100k	-47	-69.12	PASS

Conducted spurious emissions	EGSM900; Vmin=3.0			
Frequency range	RBW(Hz)	Max.Limit(dBm)	62Ch(dBm)	Result
9kHz~100kHz	1k	-57	-81.90	PASS
100kHz~50MHz	10k	-57	-76.04	PASS
50MHz~880MHz	100k	-57	-79.49	PASS
880MHz~915MHz	100k	-59	-76.21	PASS
915MHz~1000MHz	100k	-57	-78.58	PASS
1GHz~1710MHz	100k	-47	-77.38	PASS
1710MHz~1785MHz	100k	-53	-71.89	PASS
1785MHz~12.75GHz	100k	-47	-68.09	PASS

Conducted spurious emissions	EGSM900; Vmax=3.6			
Frequency range	RBW(Hz)	Max.Limit(dBm)	62Ch(dBm)	Result
9kHz~100kHz	1k	-57	-80.53	PASS
100kHz~50MHz	10k	-57	-75.14	PASS
50MHz~880MHz	100k	-57	-79.47	PASS
880MHz~915MHz	100k	-59	-78.64	PASS
915MHz~1000MHz	100k	-57	-78.64	PASS
1GHz~1710MHz	100k	-47	-77.11	PASS
1710MHz~1785MHz	100k	-53	-76.49	PASS
1785MHz~12.75GHz	100k	-47	-68.36	PASS

Conducted spurious emissions	DCS1800; Vnorm=3.3			
Frequency range	RBW(Hz)	Max.Limit(dBm)	698Ch(dBm)	Result
9kHz~100kHz	1k	-57	-81.65	PASS
100kHz~50MHz	10k	-57	-74.10	PASS
50MHz~880MHz	100k	-57	-78.98	PASS
880MHz~915MHz	100k	-59	-74.51	PASS
915MHz~1000MHz	100k	-57	-78.64	PASS
1GHz~1710MHz	100k	-47	-77.22	PASS
1710MHz~1785MHz	100k	-53	-76.83	PASS
1785MHz~12.75GHz	100k	-47	-66.46	PASS

Conducted spurious emissions	DCS1800; Vmin=3.0			
Frequency range	RBW(Hz)	Max.Limit(dBm)	698Ch(dBm)	Result
9kHz~100kHz	1k	-57	-80.01	PASS
100kHz~50MHz	10k	-57	-75.38	PASS
50MHz~880MHz	100k	-57	-79.15	PASS
880MHz~915MHz	100k	-59	-76.85	PASS
915MHz~1000MHz	100k	-57	-77.85	PASS
1GHz~1710MHz	100k	-47	-77.39	PASS
1710MHz~1785MHz	100k	-53	-76.52	PASS
1785MHz~12.75GHz	100k	-47	-65.64	PASS

Conducted spurious emissions	DCS1800; Vmax=3.6			
Frequency range	RBW(Hz)	Max.Limit(dBm)	698Ch(dBm)	Result
9kHz~100kHz	1k	-57	-82.11	PASS
100kHz~50MHz	10k	-57	-76.04	PASS
50MHz~880MHz	100k	-57	-79.30	PASS
880MHz~915MHz	100k	-59	-78.63	PASS
915MHz~1000MHz	100k	-57	-78.37	PASS
1GHz~1710MHz	100k	-47	-77.29	PASS
1710MHz~1785MHz	100k	-53	-75.89	PASS
1785MHz~12.75GHz	100k	-47	-64.94	PASS

11.9.3 Essential Conformance Requirements

The power of any spurious emission shall not exceed the levels given in the following tables.

Frequency range		Power level in dBm	
		GSM 400, GSM 900, DCS 1 800	GSM 700, GSM 850, PCS 1 900
100 kHz to	880 MHz	-57	-57
880 MHz to	915 MHz	-59	-57
915 MHz to	1 000 MHz	-57	-57
1 GHz to	1 710 MHz	-47	
1 710 MHz to	1 785 MHz	-53	
1 785 MHz to	12,75 GHz	-47	
1 GHz to	1 850 MHz		-47
1 850 MHz to	1 910 MHz		-53
1 910 MHz to	12,75 GHz		-47

11.9.4 Result

The equipment met the requirement of this clause.

For the measurement results refer to appendix F for EM820W, but only the worst case were listed in the appendix. One transceiver has been measured, however in above section only the requirements of EN 301 511 V9.0.2 have been considered.

11.10 Radiated spurious emissions - MS allocated a channel

11.10.1 Test Condition

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Traffic Channel	975/62/124
MS Tx Level	5(Typical:33dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Traffic Channel	512/698/885
MS Tx Level	0(Typical:30dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.10.2 Test Result

EGSM900, Vmin=3.0V		
Frequency range	Max measure value (dBm)	Result
30 MHz to 1 GHz	<-36*	Pass
1 GHz to 4 GHz	<-30*	Pass

EGSM900, Vnorm=3.3V		
Frequency range	Max measure value (dBm)	Result
30 MHz to 1 GHz	<-36*	Pass
1 GHz to 4 GHz	<-30*	Pass

EGSM900, Vmax=3.6V		
Frequency range	Max measure value (dBm)	Result
30 MHz to 1 GHz	<-36*	Pass
1 GHz to 4 GHz	<-30*	Pass

DCS1800, Vmin=3.0V		
Frequency range	Max measure value (dBm)	Result
30 MHz to 1 GHz	<-36*	Pass
1 GHz to 1 710 MHz	<-30*	Pass
1 710 MHz to 1 785 MHz	<-36*	Pass
1 785 MHz to 4 GHz	<-30*	Pass

DCS1800, Vnorm=3.3V		
Frequency range	Max measure value (dBm)	Result
30 MHz to 1 GHz	<-36*	Pass
1 GHz to 1 710 MHz	<-30*	Pass
1 710 MHz to 1 785 MHz	<-36*	Pass
1 785 MHz to 4 GHz	<-30*	Pass

DCS1800, Vmax= 3.6 V		
Frequency range	Max measure value (dBm)	Result
30 MHz to 1 GHz	<-36*	Pass
1 GHz to 1 710 MHz	<-30*	Pass
1 710 MHz to 1 785 MHz	<-36*	Pass
1 785 MHz to 4 GHz	<-30*	Pass

*note: The plots of radiated spurious emission are included in EMC test report.

11.10.3 Essential Conformance Requirements

The power of any spurious emission shall not exceed the levels given in the following tables.

Frequency range		Power level in dBm		
		GSM 400, GSM 700, GSM 850, GSM 900	DCS 1 800	PCS 1 900
30 MHz to	1 GHz	-36	-36	-36
1 GHz to	4 GHz	-30		-30
1 GHz to	1 710 MHz		-30	
1 710 MHz to	1 785 MHz		-36	
1 785 MHz to	4GHz		-30	

11.10.4 Result

The equipment met the requirement of this clause.

For the measurement results, please refer to EMC Test Report 1-1930-207-03/10. One transceiver has been measured, however in above section only the requirements of EN 301 511 V9.0.2 have been considered.

11.11 Radiated spurious emissions - MS in idle mode

11.11.1 Test Condition

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Traffic Channel	975/62/124
MS Tx Level	idle mode
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Traffic Channel	512/698/885
MS Tx Level	idle mode
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.11.2 Test Result

EGSM900, Vmin=3.0V		
Frequency range	Max measure value (dBm)	Result
30 MHz to 880 MHz	<-57*	Pass
880 MHz to 915 MHz	<-59*	Pass
915 MHz to 1 000 MHz	<-57*	Pass
1 GHz to 1 710 MHz	<-47*	Pass
1 710 MHz to 1 785 MHz	<-53*	Pass
1 785 MHz to 4 GHz	<-47*	Pass

EGSM900, Vnorm=3.3V		
Frequency range	Max measure value (dBm)	Result
30 MHz to 880 MHz	<-57*	Pass
880 MHz to 915 MHz	<-59*	Pass
915 MHz to 1 000 MHz	<-57*	Pass
1 GHz to 1 710 MHz	<-47*	Pass
1 710 MHz to 1 785 MHz	<-53*	Pass
1 785 MHz to 4 GHz	<-47*	Pass

EGSM900, Vmax=3.6V		
Frequency range	Max measure value (dBm)	Result
30 MHz to 880 MHz	<-57*	Pass
880 MHz to 915 MHz	<-59*	Pass
915 MHz to 1 000 MHz	<-57*	Pass
1 GHz to 1 710 MHz	<-47*	Pass
1 710 MHz to 1 785 MHz	<-53*	Pass
1 785 MHz to 4 GHz	<-47*	Pass

DCS1800, Vmin=3.0V		
Frequency range	Max measure value (dBm)	Result
30 MHz to 880 MHz	<-57*	Pass
880 MHz to 915 MHz	<-59*	Pass
915 MHz to 1 000 MHz	<-57*	Pass
1 GHz to 1 710 MHz	<-47*	Pass
1 710 MHz to 1 785 MHz	<-53*	Pass
1 785 MHz to 4 GHz	<-47*	Pass

DCS1800, Vnorm=3.3V		
Frequency range	Max measure value (dBm)	Result
30 MHz to 880 MHz	<-57*	Pass
880 MHz to 915 MHz	<-59*	Pass
915 MHz to 1 000 MHz	<-57*	Pass
1 GHz to 1 710 MHz	<-47*	Pass
1 710 MHz to 1 785 MHz	<-53*	Pass
1 785 MHz to 4 GHz	<-47*	Pass

DCS1800, Vmax=3.6V		
Frequency range	Max measure value (dBm)	Result
30 MHz to 880 MHz	<-57*	Pass
880 MHz to 915 MHz	<-59*	Pass
915 MHz to 1 000 MHz	<-57*	Pass
1 GHz to 1 710 MHz	<-47*	Pass
1 710 MHz to 1 785 MHz	<-53*	Pass
1 785 MHz to 4 GHz	<-47*	Pass

*NOTE: The plots of radiated spurious emission are included in EMC test report.

11.11.3 Essential Conformance Requirements

The power of any spurious emission shall not exceed the levels given in the following tables.

Frequency range		Power level in dBm	
		GSM 400, GSM 900, DCS 1 800	GSM 700, GSM 850, PCS 1 900
30 MHz to	880 MHz	-57	-57
880 MHz to	915 MHz	-59	-57
915 MHz to	1 000 MHz	-57	-57
1 GHz to	1 710 MHz	-47	
1 710 MHz to	1 785 MHz	-53	
1 785 MHz to	4 GHz	-47	
1 GHz to	1 850 MHz		-47
1 850 MHz to	1 910 MHz		-53
1 910 MHz to	4GHz		-47

11.11.4 Result

The equipment met the requirement of this clause.

For the measurement results, please refer to EMC Test Report 1-1930-207-03/10. One transceiver has been measured, however in above section only the requirements of EN 301 511 V9.0.2 have been considered.

11.12 Receiver Blocking and spurious response – speech channels

11.12.1 Test Condition

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Traffic Channel	975/62/124
MS Tx Level	5(Typical:33dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN1UP
System Type	Circuit switch
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Traffic Channel	512/698/885
MS Tx Level	0(Typical:30dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.12.2 Test Result

FREQUENCY	Measurement Result	
	EGSM900	
	Small MS	
	Interference Level in dBμVemf()	Error rate (%)
FR +/- 600 kHz to FR +/- 800 kHz	70	0.00
FR +/- 800 kHz to FR +/- 1,6 MHz	70	0.00
FR +/- 1,6 MHz to FR +/- 3 MHz	80	0.01
915 MHz to FR - 3 MHz	90	0.01
FR + 3 MHz to 980 MHz	90	0.01
835 MHz to <915 MHz	113	0.01
>980 MHz to 1000 MHz	113	0.01
100 kHz to <835 MHz	90	0.01
>1000 MHz to 12,75 GHz	90	0.00

FREQUENCY	Measurement Result	
	DCS1800	
	Interference Level in dBμVemf()	Error rate (%)
FR +/- 600 kHz to FR +/- 800 kHz	70	0.01
FR +/- 800 kHz to FR +/- 1,6 MHz	70	0.00
FR +/- 1,6 MHz to FR +/- 3 MHz	80	0.01
1785 MHz to FR - 3 MHz	87	0.01
FR + 3 MHz to 1920 MHz	87	0.01
100 kHz to 1705 MHz	113	0.00
>1705 MHz to <1785 MHz	101	0.01
>1920 MHz to 1980 MHz	101	0.01
>1980 MHz to 12,75 GHz	90	0.01

11.12.3 Essential Conformance Requirements

The error rate measured in this test shall not exceed the test limit error rate values given in following table. This shall apply under normal test voltage and ambient temperature, and with the interfering signal at any frequency in the range specified.

Channel	Type of measurement	Test limit error rate %	Minimum number of samples
TCH/FS Class II	RBER	2,439	8 200

11.12.4 Result

The equipment met the requirement of this clause.

11.13 Frequency error and Modulation accuracy in EGPRS Configuration

11.13.1 Test Conditions

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN4UP
System Type	EGPRS
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Coding scheme	MCS-9
Traffic Channel	975/62/124
MS Tx Level	8(Typical:27dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN4UP
System Type	EGPRS
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Coding scheme	MCS-9
Traffic Channel	512/698/885
MS Tx Level	2(Typical:26dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.13.2 Test Result

900M

Tnorm (°C)=25; Vnorm=3.3			≤9%	≤15%	≤30%	≤10E-7	Result
BAND	ARFCN	PCL	RMS EVM	the 95% EVM	Peak EVM	Frequency error	
EGSM	975	8	1.17	2.20	3.20	27.60	PASS
		19	1.12	2.10	3.11	18.79	PASS
	62	8	1.25	2.40	3.50	28.57	PASS
		19	1.20	2.30	3.58	14.37	PASS
	124	8	1.30	2.50	3.68	28.86	PASS
		19	1.28	2.30	4.01	17.31	PASS

Tmax(°C)=55; Vmax=3.6			≤9%	≤15%	≤30%	≤10E-7	Result
BAND	ARFCN	PCL	RMS EVM	the 95% EVM	Peak EVM	Frequency error	
EGSM	975	8	1.16	2.20	3.18	21.83	PASS
		19	1.14	2.10	3.15	12.66	PASS
	62	8	1.24	2.40	3.49	25.93	PASS
		19	1.22	2.30	3.54	12.66	PASS
	124	8	1.29	2.40	3.71	25.67	PASS
		19	1.26	2.30	3.83	14.24	PASS

Tmax(°C)=55; Vmin=3.0			≤9%	≤15%	≤30%	≤10E-7	Result
BAND	ARFCN	PCL	RMS EVM	the 95% EVM	Peak EVM	Frequency error	
EGSM	975	8	1.16	2.20	3.23	25.51	PASS
		19	1.14	2.20	3.15	15.59	PASS
	62	8	1.25	2.40	3.53	25.83	PASS
		19	1.21	2.30	3.57	13.04	PASS
	124	8	1.28	2.40	3.58	28.70	PASS
		19	1.27	2.30	3.91	17.21	PASS

Tmin(°C)=-10; Vmax=3.6			≤9%	≤15%	≤30%	≤10E-7	Result
BAND	ARFCN	PCL	RMS EVM	the 95% EVM	Peak EVM	Frequency error	
EGSM	975	8	1.17	2.20	3.18	30.25	PASS
		19	1.14	2.10	3.15	20.11	PASS
	62	8	1.24	2.30	3.47	30.54	PASS
		19	1.18	2.20	3.36	17.79	PASS
	124	8	1.26	2.40	3.61	31.09	PASS
		19	1.30	2.40	4.04	19.60	PASS

Tmin(°C)=-10; Vmin=3.0			≤9%	≤15%	≤30%	≤10E-7	Result
BAND	ARFCN	PCL	RMS EVM	the 95% EVM	Peak EVM	Frequency error	
EGSM	975	8	1.16	2.20	3.25	30.06	PASS
		19	1.13	2.10	3.09	20.40	PASS
	62	8	1.22	2.30	3.42	29.57	PASS
		19	1.19	2.20	3.46	16.34	PASS
	124	8	1.28	2.40	3.60	29.54	PASS
		19	1.29	2.40	3.94	18.82	PASS

1800M

Tnorm (°C)=25; Vnorm=3.3			≤9%	≤15%	≤30%	≤10E-7	Result
BAND	ARFCN	PCL	RMS EVM	the 95% EVM	Peak EVM	Frequency error	
DCS	512	2	1.36	2.70	4.18	40.81	PASS
		14	2.03	3.40	4.54	20.34	PASS
	698	2	1.40	2.70	4.09	44.78	PASS
		14	2.29	3.80	5.38	26.96	PASS
	885	2	1.44	2.80	4.25	47.43	PASS
		14	2.21	3.80	5.13	31.51	PASS

Tmax(°C)=55; Vmax=3.6			≤9%	≤15%	≤30%	≤10E-7	Result
BAND	ARFCN	PCL	RMS EVM	the 95% EVM	Peak EVM	Frequency error	
DCS	512	2	1.35	2.70	4.03	39.68	PASS
		14	2.02	3.40	4.58	19.76	PASS
	698	2	1.39	2.70	4.05	44.94	PASS
		14	2.26	3.80	5.30	25.41	PASS
	885	2	1.45	2.90	4.36	45.91	PASS
		14	2.23	3.80	5.21	27.86	PASS

Tmax(°C)=55; Vmin=3.0			≤9%	≤15%	≤30%	≤10E-7	Result
BAND	ARFCN	PCL	RMS EVM	the 95% EVM	Peak EVM	Frequency error	
DCS	512	2	1.33	2.60	3.92	37.87	PASS
		14	2.02	3.40	4.50	17.50	PASS
	698	2	1.39	2.70	4.19	39.87	PASS
		14	2.31	3.90	5.36	25.09	PASS
	885	2	1.45	2.90	4.26	46.43	PASS
		14	2.24	3.80	5.15	30.32	PASS

Tmin(°C)=-10; Vmax=3.6			≤9%	≤15%	≤30%	≤10E-7	Result
BAND	ARFCN	PCL	RMS EVM	the 95% EVM	Peak EVM	Frequency error	
DCS	512	2	1.35	2.70	4.02	42.23	PASS
		14	2.06	3.50	4.62	16.98	PASS
	698	2	1.40	2.70	4.15	44.65	PASS
		14	2.25	3.80	5.22	29.35	PASS
	885	2	1.45	2.90	4.24	48.72	PASS
		14	2.20	3.70	4.99	31.48	PASS

Tmin(°C)=-10; Vmin=3.0			≤9%	≤15%	≤30%	≤10E-7	Result
BAND	ARFCN	PCL	RMS EVM	the 95% EVM	Peak EVM	Frequency error	
DCS	512	2	1.34	2.70	4.09	41.81	PASS
		14	2.02	3.40	4.49	13.01	PASS
	698	2	1.39	2.70	4.26	41.10	PASS
		14	2.27	3.90	5.34	19.53	PASS
	885	2	1.46	2.90	4.25	47.30	PASS
		14	2.21	3.80	5.18	33.77	PASS

11.13.3 Essential Conformance Requirements

For all measured bursts, the frequency error shall be less than $10E-7$.

For all measured bursts, the RMS EVM, shall not exceed 9.0 % under normal conditions and 10.0% under extreme conditions.

The (averaged) value of peak EVM shall not exceed 30 %.

The 95th percentile value shall not exceed 15 %.

The origin offset suppression shall exceed 30 dB for MS.

11.13.4 Result

The equipment met the requirement of this clause.

One transceiver has been measured, however in above section only the requirements of EN 301 511 V9.0.2 have been considered.

11.14 Transmitter - Frequency error under multipath and interference conditions

11.14.1 Test Condition

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN4UP
System Type	EGPRS
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Coding scheme	MCS-9
Traffic Channel	975/62/124
MS Tx Level	8(Typical:27dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN4UP
System Type	EGPRS
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Coding scheme	MCS-9
Traffic Channel	512/698/885
MS Tx Level	2(Typical:26dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.14.2 Test Result

BAND	ARFCN	Test Conditions		data	Result
EGSM	975	RA250	[-300Hz,300Hz]	27.58	PASS
		HT100	[-180Hz,180Hz]	31.94	PASS
		TU50	[-160Hz,160Hz]	30.10	PASS
		TU3	[-230Hz,230Hz]	25.87	PASS
	62	RA250	[-300Hz,300Hz]	31.11	PASS
		HT100	[-180Hz,180Hz]	28.50	PASS
		TU50	[-160Hz,160Hz]	28.74	PASS
		TU3	[-230Hz,230Hz]	29.56	PASS
	124	RA250	[-300Hz,300Hz]	31.16	PASS
		HT100	[-180Hz,180Hz]	30.07	PASS
		TU50	[-160Hz,160Hz]	30.36	PASS
		TU3	[-230Hz,230Hz]	29.82	PASS

BAND	ARFCN	Test Conditions		data	Result
DCS	512	RA130	[-400Hz,400Hz]	30.09	PASS
		HT100	[-350Hz,350Hz]	24.82	PASS
		TU50	[-260Hz,260Hz]	24.73	PASS
		TU1.5	[-320Hz,320Hz]	31.77	PASS
	698	RA130	[-400Hz,400Hz]	29.54	PASS
		HT100	[-350Hz,350Hz]	31.26	PASS
		TU50	[-260Hz,260Hz]	29.10	PASS
		TU1.5	[-320Hz,320Hz]	26.28	PASS
	885	RA130	[-400Hz,400Hz]	31.65	PASS
		HT100	[-350Hz,350Hz]	31.58	PASS
		TU50	[-260Hz,260Hz]	30.14	PASS
		TU1.5	[-320Hz,320Hz]	25.96	PASS

11.14.3 Essential Conformance Requirements

GSM900		DCS1800	
Propagation condition	Permitted Frequency error	Propagation condition	Permitted Frequency error
RA250	±300 Hz	RA130	±400 Hz
HT100	±180 Hz	HT100	±350 Hz
TU50	±160 Hz	TU50	±260 Hz
TU3	±230 Hz	TU1,5	±320 Hz

11.14.4 Result

One transceiver has been measured, however in above section only the requirements of EN 301 511 V9.0.2 have been considered.

11.15 EGPRS Transmitter output power

11.15.1 Test Condition

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN4UP
System Type	EGPRS
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Coding scheme	MCS-9
Traffic Channel	975/62/124
MS Tx Level	8(Typical:27dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN4UP
System Type	EGPRS
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Coding scheme	MCS-9
Traffic Channel	512/698/885
MS Tx Level	2(Typical:26dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.15.2 Test Result

output power

Transmitter Output power(dBm)	Power level	Result			
		Traffic Channels			
EGSM900		975	62	124	Result
Tnorm (°C)=25; Vnorm=3.3	8	21.81	21.85	21.74	PASS
	10	21.88	21.80	21.73	PASS
	12	17.84	17.83	17.71	PASS
	14	13.85	13.91	13.89	PASS
	16	9.90	9.97	9.92	PASS
	19	3.73	3.89	3.90	PASS
Tmin(°C)=-10; Vmin=3.0	8	21.83	21.81	21.72	PASS
	10	21.89	21.79	21.70	PASS
	12	17.77	17.76	17.66	PASS
	14	13.89	13.94	13.85	PASS
	16	9.85	9.94	9.87	PASS
	19	3.80	3.95	3.86	PASS
Tmin(°C)=-10; Vmax=3.6	8	21.88	21.79	21.74	PASS
	10	21.88	21.85	21.71	PASS
	12	17.76	17.76	17.71	PASS
	14	13.88	13.96	13.87	PASS
	16	9.83	9.97	9.94	PASS
	19	3.79	3.93	3.92	PASS
Tmax(°C)=55; Vmin=3.0	8	21.87	21.82	21.71	PASS
	10	21.90	21.79	21.69	PASS
	12	17.83	17.76	17.69	PASS
	14	13.87	13.89	13.85	PASS
	16	9.86	9.94	9.89	PASS
	19	3.82	3.93	3.90	PASS
Tmax(°C)=55; Vmax=3.6	8	21.88	21.89	21.75	PASS
	10	21.86	21.85	21.76	PASS
	12	17.81	17.82	17.70	PASS
	14	13.85	13.95	13.91	PASS
	16	9.89	9.99	9.93	PASS
	19	3.77	3.87	3.89	PASS

Transmitter Output power(dBm)	Power level	Result			
		Traffic Channels			
DCS1800		512	698	885	Result
Tnorm (°C)=25; Vnorm=3.3	2	20.16	20.39	20.21	PASS
	5	18.18	18.38	18.33	PASS
	8	12.08	12.34	12.25	PASS
	11	5.98	6.13	6.04	PASS
	15	-1.32	-1.27	-1.37	PASS
Tmin(°C)=-10; Vmin=3.0	2	20.19	20.40	20.25	PASS
	5	18.15	18.38	18.26	PASS
	8	12.12	12.35	12.29	PASS
	11	5.94	6.06	5.98	PASS
	15	-1.31	-1.24	-1.40	PASS
Tmin(°C)=-10; Vmax=3.6	2	20.14	20.42	20.31	PASS
	5	18.15	18.41	18.30	PASS
	8	12.08	12.36	12.22	PASS
	11	5.95	6.11	6.04	PASS
	15	-1.36	-1.31	-1.43	PASS
Tmax(°C)=55; Vmin=3.0	2	20.19	20.43	20.27	PASS
	5	18.17	18.36	18.27	PASS
	8	12.08	12.34	12.32	PASS
	11	5.96	6.10	6.06	PASS
	15	-1.39	-1.26	-1.41	PASS
Tmax(°C)=55; Vmax=3.6	2	20.13	20.43	20.23	PASS
	5	18.18	18.38	18.26	PASS
	8	12.10	12.35	12.30	PASS
	11	5.95	6.13	5.99	PASS
	15	-1.32	-1.28	-1.40	PASS

C. Power VS Time:

Power VS Time Graph	ACCESS BURST	Result		
		Traffic Channels		
EGSM900	Power level	975	62	124
Tnorm(°C)=25; Vnorm=5 V	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmin(°C)=-10; Vmin=4.75 V	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmin(°C)=-10; Vmax=5.6 V	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmax(°C)=45; Vmin=4.75 V	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmax(°C)=45; Vmax=5.6 V	5	PASS	PASS	PASS
	12	PASS	PASS	PASS
	19	PASS	PASS	PASS

Power VS Time Graph	ACCESS BURST	Result		
		Traffic Channels		
DCS1800	Power level	512	698	885
Tnorm(°C)=25; Vnorm=5 V	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmin(°C)=-10; Vmin=4.75 V	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmin(°C)=-10; Vmax=5.6 V	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmax(°C)=45; Vmin=4.75 V	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmax(°C)=45; Vmax=5.6 V	0	PASS	PASS	PASS
	8	PASS	PASS	PASS
	15	PASS	PASS	PASS

Parameter	Measurement Uncertainty
radio frequency	≤0.1ppm
total RF power, conducted	≤0.9dB
temperature	≤1°C
humidity	≤3%
DC voltages	≤2%

11.15.3 Essential conformance requirements

GSM 900 transmitter output power for different power classes 8PSK Modulated Signals

Power class			Power control level	GAMMA_TN (Γ_{CH})	Transmitter output power (note)	Tolerances	
E1	E2	E3				NORMAL	EXTREME
.			2-5	0-3	33	±2 dB	±2.5dB
			6	4	31	±3 dB	±4 dB
			7	5	29	±3 dB	±4 dB
	.		8	6	27	±3 dB	±4 dB
	.		9	7	25	±3 dB	±4 dB
	.	.	10	8	23	±3 dB	±4 dB
	.	.	11	9	21	±3 dB	±4 dB
	.	.	12	10	19	±3 dB	±4 dB
	.	.	13	11	17	±3 dB	±4 dB
	.	.	14	12	15	±3 dB	±4 dB
	.	.	15	13	13	±3 dB	±4 dB
	.	.	16	14	11	±5 dB	±6 dB
	.	.	17	15	9	±5 dB	±6 dB
	.	.	18	16	7	±5 dB	±6 dB
	.	.	19	17	5	±5 dB	±6 dB

DCS 1 800 and PCS 1 900 transmitter output power for different power classes 8-PSK Modulated Signals

Power class			Power control level	GAMMA_TN (Γ_{CH})	Transmitter output power (note)	Tolerances	
E1	E2	E3				NORMAL	EXTREME
.			29,0	0-3	30	±3 dB	±4dB
			1	4	28	±3 dB	±4 dB
	.		2	5	26	±3 dB	±4 dB
	.		3	6	24	±3 dB	±4 dB
	.	.	4	7	22	±3 dB	±4 dB
	.	.	5	8	20	±3 dB	±4 dB
	.	.	6	9	18	±3 dB	±4 dB
	.	.	7	10	16	±3 dB	±4 dB
	.	.	8	11	14	±4 dB	±4 dB
	.	.	9	12	12	±4 dB	±5 dB
	.	.	10	13	10	±4 dB	±5 dB
	.	.	11	14	8	±4 dB	±5 dB
	.	.	12	15	6	±4 dB	±5 dB
	.	.	13	16	4	±5 dB	±5 dB
	.	.	14	17	2	±5 dB	±6 dB
	.	.	15	18	0	±5 dB	±6 dB

GSM 400, GSM 700, GSM 850 and GSM 900 allowed maximum output power reduction in a multislot configuration

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power, (dB)
1	0
2	3,0
3	4,8
4	6,0
5	7,0
6	7,8
7	8,5
8	9,0

DCS 1 800 allowed maximum output power reduction in a multislot configuration

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power, (dB)
1	0
2	3,0
3	4,8
4	6,0
5	7,0
6	7,8
7	8,5
8	9,0

11.15.4 Result

The equipment met the requirement of this clause.

For the measurement results refer to appendix G for EM820W, but only the worst case were listed in the appendix. One transceiver has been measured, however in above section only the requirements of EN 301 511 V9.0.2 have been considered.

11.16 Spurious emissions in the MS receive bands in EGPRS multislot configuration

11.16.1 Test Condition

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN4UP
System Type	EGPRS
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Coding scheme	MCS-9
Traffic Channel	975/62/124
MS Tx Level	8(Typical:27dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN4UP
System Type	EGPRS
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Coding scheme	MCS-9
Traffic Channel	512/698/885
MS Tx Level	2(Typical:26dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.16.2 Test Result

A. Spurious emission in the MS receive bands

Spurious emission in the MS receive bands(dBm)	Freq range	EGSM900			
		RBW(Hz)	Max.level(dBm)	62Ch(dBm)	Result
Vnorm=3.3	925MHz~935MHz	100k	-67	-75.47	PASS
	935MHz~960MHz	100k	-79	-80.83	PASS
	1805MHz~1880MHz	100k	-71	-77.75	PASS
Vmin=3.0	925MHz~935MHz	100k	-67	-76.49	PASS
	935MHz~960MHz	100k	-79	-80.93	PASS
	1805MHz~1880MHz	100k	-71	-78.28	PASS
Vmax=3.6	925MHz~935MHz	100k	-67	-75.31	PASS
	935MHz~960MHz	100k	-79	-80.21	PASS
	1805MHz~1880MHz	100k	-71	-76.45	PASS

Spurious emission in the MS receive bands(dBm)	Freq range	DCS1800			
		RBW(Hz)	Max.level(dBm)	698Ch(dBm)	Test Result
Vnorm=3.3	925MHz~935MHz	100k	-67	-80.52	PASS
	935MHz~960MHz	100k	-79	-82.59	PASS
	1805MHz~1880MHz	100k	-71	-74.65	PASS
Vmin=3.0	925MHz~935MHz	100k	-67	-80.68	PASS
	935MHz~960MHz	100k	-79	-82.62	PASS
	1805MHz~1880MHz	100k	-71	-75.70	PASS
Vmax=3.6	925MHz~935MHz	100k	-67	-80.15	PASS
	935MHz~960MHz	100k	-79	-81.27	PASS
	1805MHz~1880MHz	100k	-71	-74.21	PASS

B. Modulation and switch Spectrum

Modulation& switch Spectrum	Power level	Result		
		Traffic Channels		
EGSM900		975	62	124
Tnorm (°C)=25; Vnorm=3.3	8	PASS	PASS	PASS
	11	PASS	PASS	PASS
	14	PASS	PASS	PASS
	17	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmin(°C)=-10; Vmin=3.0	8	PASS	PASS	PASS
	11	PASS	PASS	PASS
	14	PASS	PASS	PASS
	17	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmin(°C)=-10; Vmax=3.6	8	PASS	PASS	PASS
	11	PASS	PASS	PASS
	14	PASS	PASS	PASS
	17	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmax(°C)=55; Vmin=3.0	8	PASS	PASS	PASS
	11	PASS	PASS	PASS
	14	PASS	PASS	PASS
	17	PASS	PASS	PASS
	19	PASS	PASS	PASS
Tmax(°C)=55; Vmax=3.6	8	PASS	PASS	PASS
	11	PASS	PASS	PASS
	14	PASS	PASS	PASS
	17	PASS	PASS	PASS
	19	PASS	PASS	PASS

Modulation& switch Spectrum	Power level	Result		
DCS1800M		Traffic Channels		
		512	698	885
Tnorm (°C)=25; Vnorm=3.3	2	PASS	PASS	PASS
	5	PASS	PASS	PASS
	8	PASS	PASS	PASS
	11	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmin(°C)=-10; Vmin=3.0	2	PASS	PASS	PASS
	5	PASS	PASS	PASS
	8	PASS	PASS	PASS
	11	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmin(°C)=-10; Vmax=3.6	2	PASS	PASS	PASS
	5	PASS	PASS	PASS
	8	PASS	PASS	PASS
	11	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmax(°C)=55; Vmin=3.0	2	PASS	PASS	PASS
	5	PASS	PASS	PASS
	8	PASS	PASS	PASS
	11	PASS	PASS	PASS
	15	PASS	PASS	PASS
Tmax(°C)=55; Vmax=3.6	2	PASS	PASS	PASS
	5	PASS	PASS	PASS
	8	PASS	PASS	PASS
	11	PASS	PASS	PASS
	15	PASS	PASS	PASS

11.16.3 Essential conformance requirements clause

GSM 900 Spectrum due to switching transients

Power level	Maximum level for various offsets from carrier frequency			
	400 kHz	600 kHz	1 200 kHz	1 800 kHz
39dBm	-13dBm	-21dBm	-21dBm	-24dBm
37dBm	-15dBm	-21dBm	-21dBm	-24dBm
35dBm	-17dBm	-21dBm	-21dBm	-24dBm
33dBm	-19dBm	-21dBm	-21dBm	-24dBm
31dBm	-21dBm	-23dBm	-23dBm	-26dBm
29dBm	-23dBm	-25dBm	-25dBm	-28dBm
27dBm	-23dBm	-26dBm	-27dBm	-30dBm
25dBm	-23dBm	-26dBm	-29dBm	-32dBm
23dBm	-23dBm	-26dBm	-31dBm	-34dBm
<= +21dBm	-23dBm	-26dBm	-32dBm	-36dBm

DCS 1 800/PCS 1 900 Spectrum due to switching transients

Power level	Maximum level for various offsets from carrier frequency			
	400 kHz	600 kHz	1 200 kHz	1 800 kHz
36dBm	-16dBm	-21dBm	-21dBm	-24dBm
34dBm	-18dBm	-21dBm	-21dBm	-24dBm
32dBm	-20dBm	-22dBm	-22dBm	-25dBm
30dBm	-22dBm	-24dBm	-24dBm	-27dBm
28dBm	-23dBm	-25dBm	-26dBm	-29dBm
26dBm	-23dBm	-26dBm	-28dBm	-31dBm
24dBm	-23dBm	-26dBm	-30dBm	-33dBm
22dBm	-23dBm	-26dBm	-31dBm	-35dBm
<= +20dBm	-23dBm	-26dBm	-32dBm	-36dBm

Spurious emissions in the MS receive bands

Band (MHz)	Spurious emissions level (dBm)	
	GSM 400, GSM 900 and DCS 1 800	GSM 700, GSM 850 and PCS 1 900
925 to 935	-67	
935 to 960	-79	
1 805 to 1 880	-71	
747 to 757		-79
757 to 765		-73
869 to 894		-79
1 930 to 1 990		-71

11.16.4 Result

The equipment met the requirement of this clause.

For the measurement results refer to appendix H for EM820W, but only the worst case were listed in the appendix. One transceiver has been measured, however in above section only the requirements of EN 301 511 V9.0.2 have been considered.

11.17 Blocking and spurious response in EGPRS configuration

11.17.1 Test Condition

Parameter Item	EGSM 900MHz Band
SLOT	1DOWN4UP
System Type	EGPRS
Cell Power	-60dBm
Cell Band	EGSM
Cell Channel	EGSM
Broadcast channel	20
Coding scheme	MCS-9
Traffic Channel	975/62/124
MS Tx Level	8(Typical:27dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

Parameter Item	DCS 1800MHz Band
SLOT	1DOWN4UP
System Type	EGPRS
Cell Power	-60dBm
Cell Band	DCS
Cell Channel	DCS
Broadcast channel	520
Coding scheme	MCS-9
Traffic Channel	512/698/885
MS Tx Level	2(Typical:26dBm)
IMSI value	10123456787901
Ambient temperature	25 °C
Relative humidity	55-65 %

11.17.2 Test Result

FREQUENCY	Measurement Result	
	EGSM900	
	Small MS	
	Interference Level in dBμVemf()	Error rate (%)
FR +/- 600 kHz to FR +/- 800 kHz	70	0.00
FR +/- 800 kHz to FR +/- 1,6 MHz	70	0.00
FR +/- 1,6 MHz to FR +/- 3 MHz	80	0.00
915 MHz to FR - 3 MHz	90	0.01
FR + 3 MHz to 980 MHz	90	0.01
835 MHz to <915 MHz	113	0.00
>980 MHz to 1000 MHz	113	0.01
100 kHz to <835 MHz	113	0.01
>1000 MHz to 12,75 GHz	113	0.01

FREQUENCY	Measurement Result	
	DCS1800	
	Small MS	
	Interference Level in dBμVemf()	Error rate (%)
FR +/- 600 kHz to FR +/- 800 kHz	70	0.00
FR +/- 800 kHz to FR +/- 1,6 MHz	70	0.01
FR +/- 1,6 MHz to FR +/- 3 MHz	80	0.01
1785 MHz to FR - 3 MHz	87	0.01
FR + 3 MHz to 1920 MHz	87	0.00
100 kHz to 1705 MHz	113	0.01
>1705 MHz to <1785 MHz	101	0.01
>1920 MHz to 1980 MHz	101	0.00
>1980 MHz to 12,75 GHz	113	0.01

11.17.3 Essential conformance requirements clause

Blocking and spurious response for EGPRS mobiles						
		Orig. BLER	Derived	Target number	Target test	Target test time
	blocks per s	requirement	test limit	of samples	time (s)	(hh:mm:ss)
One time slot:						
PDTCH/MCS-4	50	0,100000	0,123400	2796	56	00:00:56
USF/MCS-4	50	0,010000	0,012340	27958	559	00:09:19
PDTCH/MCS-9	50	0,100000	0,123400	2796	56	00:00:56
USF/MCS-9	50	0,010000	0,012340	27958	559	00:09:19
Two time slots:						
PDTCH/MCS-4	100	0,100000	0,123400	2796	28	00:00:28
USF/MCS-4	100	0,010000	0,012340	27958	280	00:04:40
PDTCH/MCS-9	100	0,100000	0,123400	2796	28	00:00:28
USF/MCS-9	100	0,010000	0,012340	27958	280	00:04:40
Three time slots						
PDTCH/MCS-4	150	0,100000	0,123400	2796	19	00:00:19
USF/MCS-4	150	0,010000	0,012340	27958	186	00:03:06
PDTCH/MCS-9	150	0,100000	0,123400	2796	19	00:00:19
USF/MCS-9	150	0,010000	0,012340	27958	186	00:03:06
Four time slots						
PDTCH/MCS-4	200	0,100000	0,123400	2796	14	00:00:14
USF/MCS-4	200	0,010000	0,012340	27958	140	00:02:20
PDTCH/MCS-9	200	0,100000	0,123400	2796	14	00:00:14
USF/MCS-9	200	0,010000	0,012340	27958	140	00:02:20

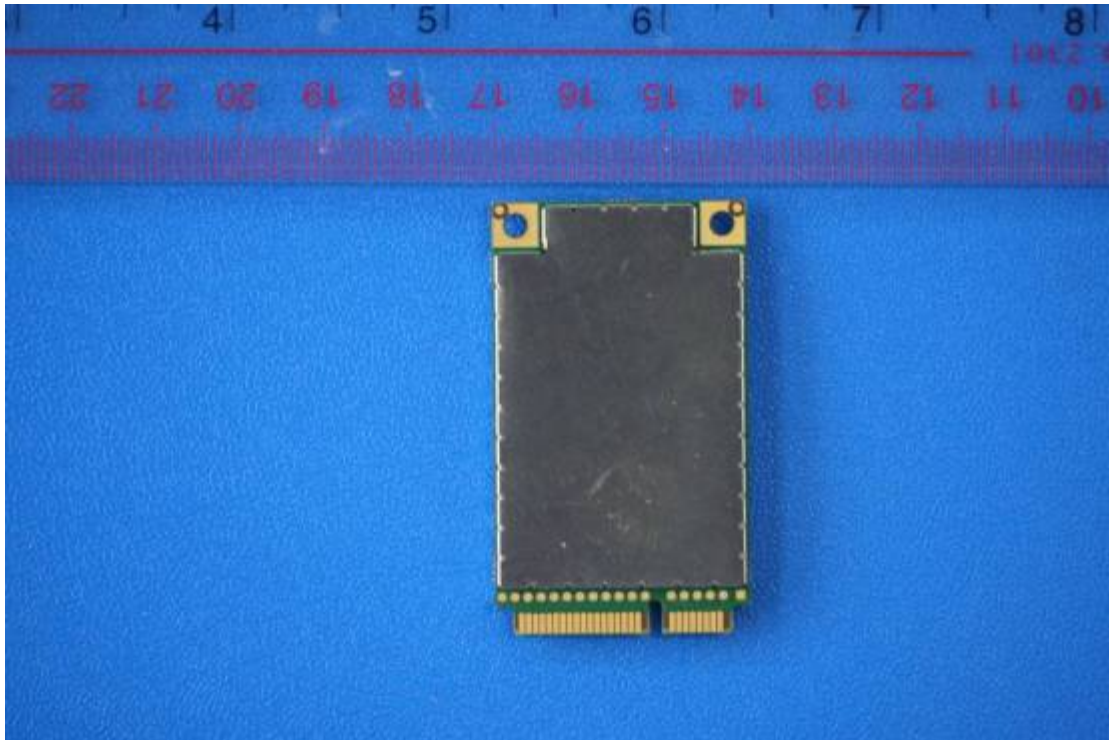
11.17.4 Result

One transceiver has been measured, however in above section only the requirements of EN 301 511 V9.0.2 have been considered.

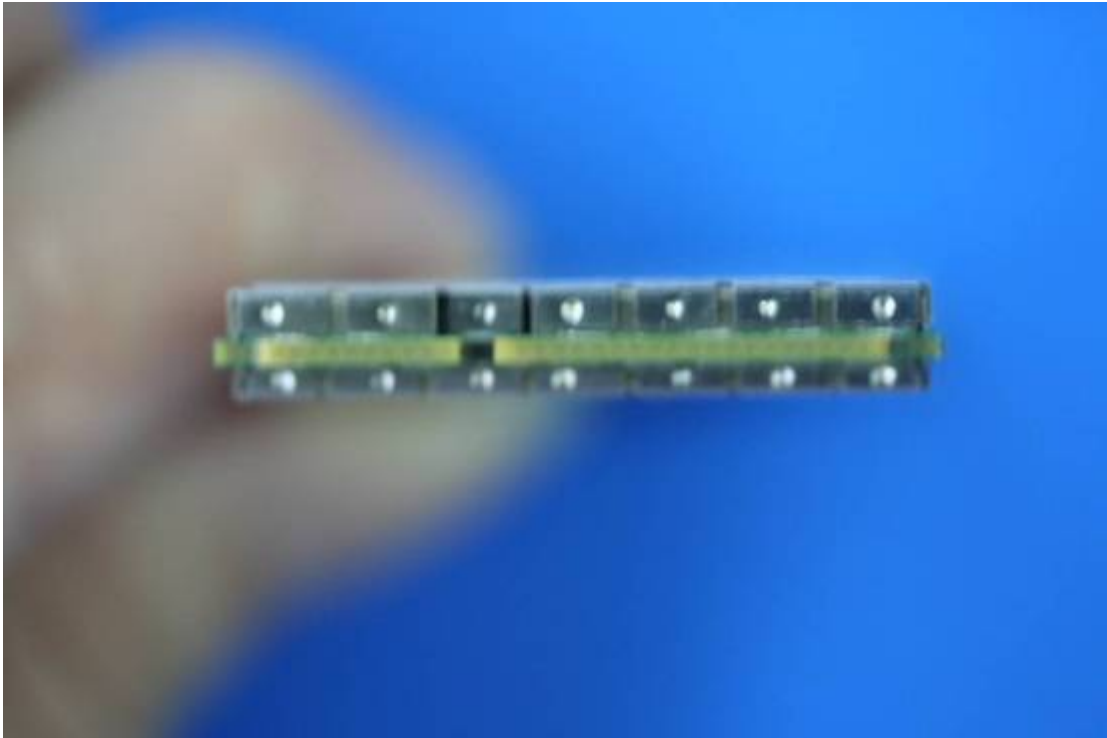
12 Photos of EUT

12.1 External Photographs of the EUT

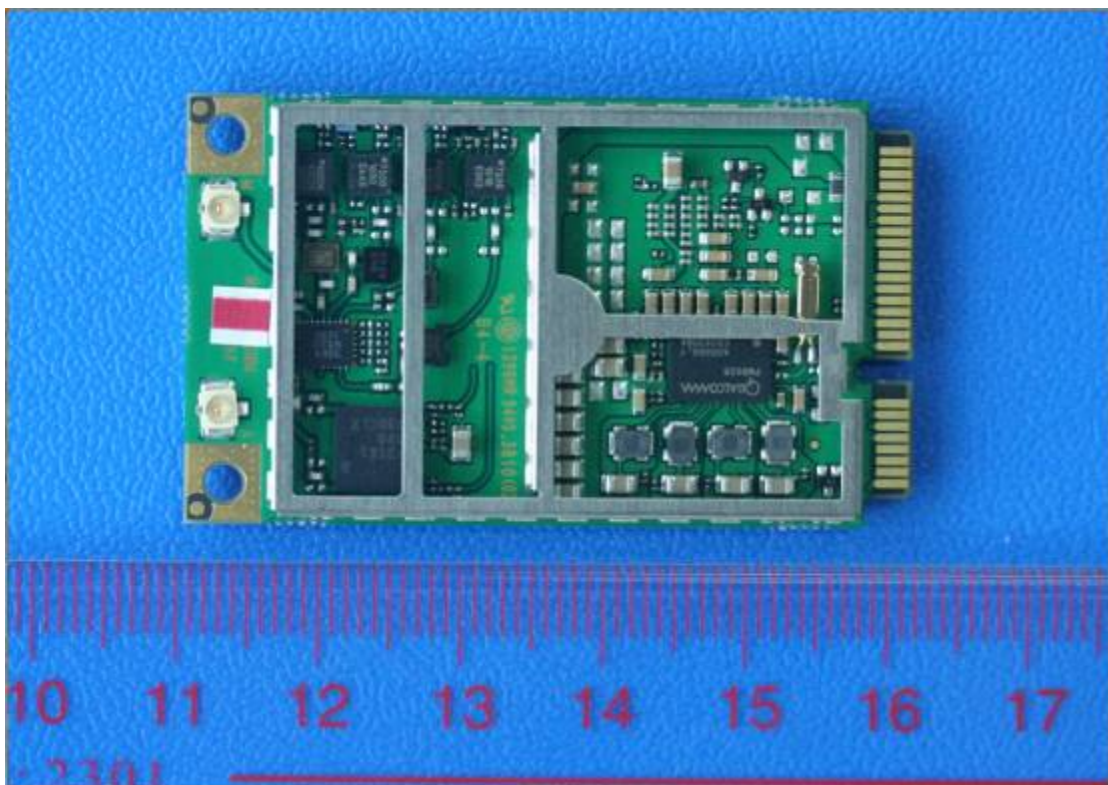


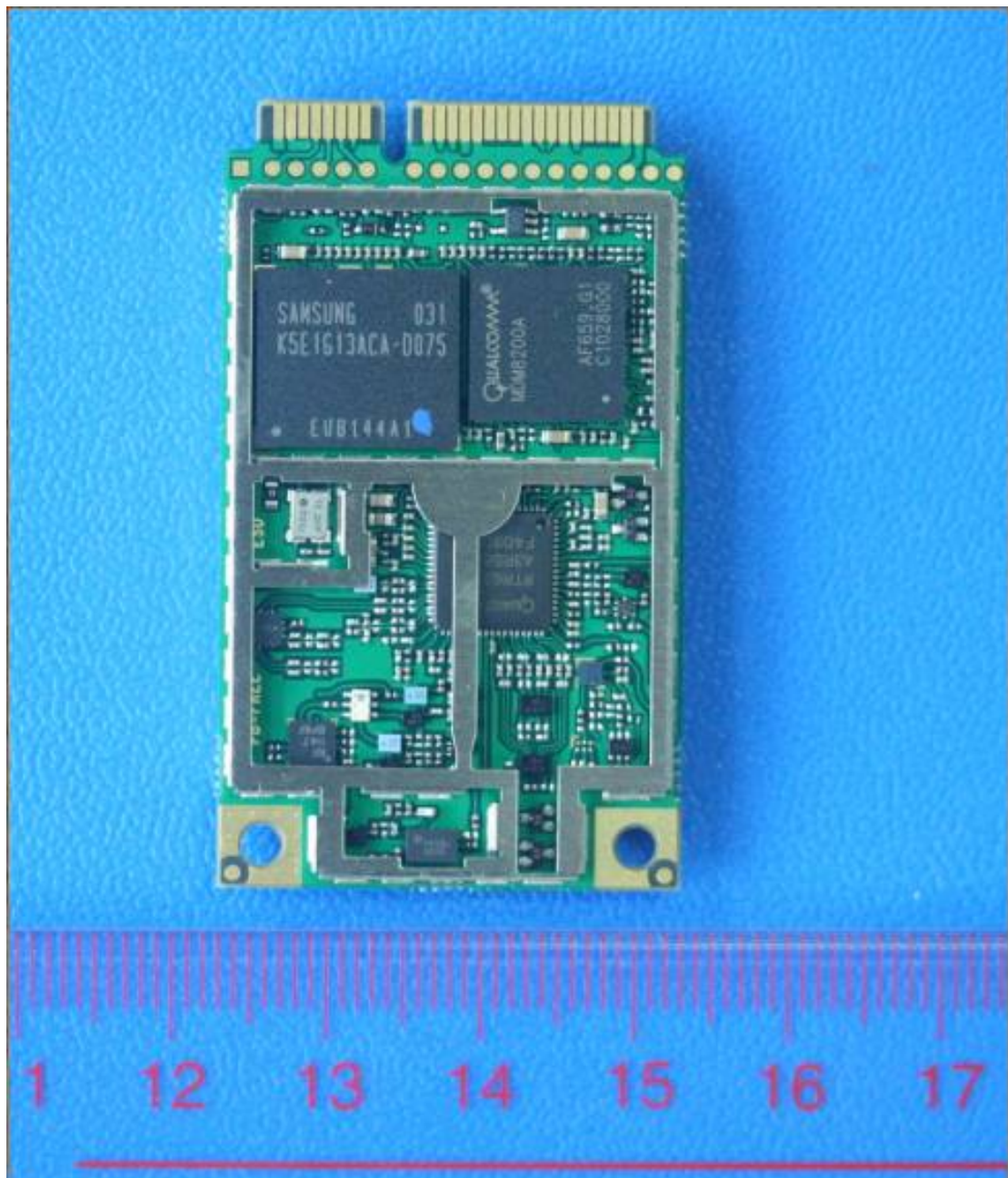






Internal Photographs of the EUT



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13 Appendixes

Appendix A	Graphs of output power and burst timing	6 Pages
Appendix B	Graphs of Spurious emissions in the MS receive bands	15 Pages
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