



InterLab®

FCC Measurement/Technical Report on

GSM/UMTS Module

MO0301

**Report Reference:** MDE\_Opti\_0709\_FCCf

**Test Laboratory:**

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**Note:**

The following test results relate only to the devices specified in this document. This report shall not be reproduced in parts without the written approval of the testing laboratory.

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## **0 Summary**

### **0.1 Technical Report Summary**

#### **Type of Authorization**

Certification for a GSM cellular radiotelephone device

#### **Applicable FCC Rules**

Prepared in accordance with the requirements of FCC Rules and Regulations as listed in 47 CFR Ch.1 Parts 0 to 19 and Parts 20 to 69 (10-1-06 Edition). The following subparts are applicable to the results in this test report.

Part 2

Subpart J - Equipment Authorization Procedures, Certification

Part 22

Subpart H – Cellular Radiotelephone Service

Part 24

Subpart E - Broadband PCS

#### **Summary Test Results:**

**The EUT complied with all performed tests as listed in chapter 0.2 Measurement Summary.**

## 0.2 Measurement Summary

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### RF Power Output

The measurement was performed according to FCC §2.1046 10-1-06  
**OP-Mode**            **Setup**            **Port**            **Final Result**  
op-mode 1-6            Setup\_a01            antenna connector            passed

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### Frequency stability

The measurement was performed according to FCC §2.1055 10-1-06  
**OP-Mode**            **Setup**            **Port**            **Final Result**  
N/P

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### Spurious emissions at antenna terminals

The measurement was performed according to FCC §2.1051 10-1-06  
**OP-Mode**            **Setup**            **Port**            **Final Result**  
N/P

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### Field strength of spurious radiation

The measurement was performed according to FCC §2.1053 10-1-06  
**OP-Mode**            **Setup**            **Port**            **Final Result**  
N/P

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### Emission and Occupied Bandwidth

The measurement was performed according to FCC §2.1049 10-1-06  
**OP-Mode**            **Setup**            **Port**            **Final Result**  
N/P

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### Band edge compliance

The measurement was performed according to FCC §24.238 10-1-06  
**OP-Mode**            **Setup**            **Port**            **Final Result**  
N/P

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N/P: not performed

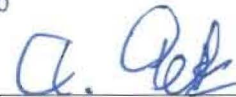


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Responsible for  
Accreditation Scope:



Responsible  
for Test Report:





## 1 Administrative Data

### 1.1 Testing Laboratory

Company Name: 7 Layers AG  
Address Borsigstr. 11  
40880 Ratingen  
Germany

This facility has been fully described in a report submitted to the FCC and accepted under the registration number 96716 .

The test facility is also accredited by the following accreditation organisation:  
- Deutscher Akkreditierungs Rat DAR-Registration no. DAT-P-192/99-01

Responsible for Accreditation Scope: Dipl.-Ing. Bernhard Retka  
Dipl.-Ing. Robert Machulec  
Dipl.-Ing. Thomas Hoell

Report Template Version: 2007-07-20

### 1.2 Project Data

Responsible for testing and report: Dipl.-Ing. Andreas Petz  
Receipt of EUT: See chapter 2.2  
Date of Test(s): 2007-08-10  
Date of Report: 2007-08-13

### 1.3 Applicant Data

Company Name: Option NV  
Address: Gaston Geenslaan 14  
3001 Leuven  
Belgium  
Contact Person: Mr. Lodeweyckx

### 1.4 Manufacturer Data

Company Name: please see applicant data  
Address:  
Contact Person:



## 2 Testobject Data

### 2.1 General EUT Description

<b>Equipment under Test:</b>	GSM/UMTS Module
<b>Type Designation:</b>	MO0301
<b>Kind of Device:</b>	GSM 850/900/1800/1900 + UTRA FDD I/II/V
<b>(optional)</b>	including HSDPA
<b>Voltage Type:</b>	DC
<b>Nominal Voltage:</b>	3.6 V
<b>Maximum Voltage:</b>	3.6 V
<b>Minimum Voltage:</b>	3.0 V

#### General product description:

The Equipment under Test (EUT) is a module that supports GSM/EDGE 850/900/1800/1900 and FDD I, II and V with HSDPA. The manufacturer declared that nominal voltage is equal to high voltage.

#### The EUT provides the following ports:

##### Ports

antenna connector  
enclosure

The main components of the EUT are listed and described in Chapter 2.2



## 2.2 EUT Main components

### Type, S/N, Short Descriptions etc. used in this Test Report

Short Description	Equipment under Test	Type Designation	Serial No.	HW Status	SW Status	Date of Receipt
EUT A (Code: 37250f01) Remark: none	GSM/UMTS Module	MO0301	PE2476COBG	2.0	2.5	2007-06-18

**NOTE:** The short description is used to simplify the identification of the EUT in this test report.

## 2.3 Ancillary Equipment

For the purposes of this test report, ancillary equipment is defined as equipment which is used in conjunction with the EUT to provide operational and control features to the EUT. It is necessary to configure the system in a typical fashion, as a customer would normally use it. But nevertheless Ancillary Equipment can influence the test results.

Short Description	Equipment under Test	Type Designation	HW Status	SW Status	Serial no.	FCC ID
AE1	Test Cradle	Cobra SPQ Cradle	V 1.0	-	-	-

## 2.4 EUT Setups

This chapter describes the combination of EUT's and ancillary equipment used for testing.

Setup No.	Combination of EUTs	Description
setup_a01	EUT A + AE1	

## 2.5 Operating Modes

This chapter describes the operating modes of the EUT's used for testing.

Op. Mode	Description of Operating Modes	Remarks
<b>UTRA FDD II HSDPA</b>		
op-mode 1	Call established on Traffic Channel (TCH) 9262, Carrier Frequency 1852.4 MHz	9262 is the lowest channel FDD II data call
op-mode 2	Call established on Traffic Channel (TCH) 9400, Carrier Frequency 1880 MHz	9400 is a mid channel FDD II data call
op-mode 3	Call established on Traffic Channel (TCH) 9538, Carrier Frequency 1907.6 MHz	9538 is the highest channel FDD II data call
<b>UTRA FDD V HSDPA</b>		
op-mode 4	Call established on Traffic Channel (TCH) 4132, Carrier Frequency 826.4 MHz	4132 is the lowest channel FDD V data call HSUPA
op-mode 5	Call established on Traffic Channel (TCH) 4183, Carrier Frequency 836.6 MHz	4183 is a mid channel FDD V data call HSUPA
op-mode 6	Call established on Traffic Channel (TCH) 4233, Carrier Frequency 846.6 MHz	4233 is the highest channel FDD V data call HSUPA

Subtests: (see Annex C of 3GPP TS 34.121, Table C.10.1.4)

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{HS}$ (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ .

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA,  $\Delta_{ACK}$  and  $\Delta_{NACK} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ , and  $\Delta_{CQI} = 24/15$  with  $\beta_{hs} = 24/15 * \beta_c$ .

Note 3: CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCCH, DPCCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 11/15$  and  $\beta_d = 15/15$ .





### 3 Test Results

#### 3.1 RF Power Output

<b>Standard</b>	FCC Part 22, 10-1-06 Subpart H	FCC Part 24, 10-1-06 Subpart E
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The test was performed according to: FCC §2.1046, 10-1-06

##### 3.1.1 Test Description

For performing the output power measurement the test system TS8950 GW by Rohde & Schwarz was used, which is a validated platform according to the PTCRB certification requirements.

The measured output power is an RMS value according to 3GPP requirements for 3G devices and was measured at the antenna connector of the EUT.

##### 3.1.2 Test Requirements / Limits

§2.1046 Measurements Required: RF Power Output

(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in § 2.1033(c)(8). The electrical characteristics of the output terminals when this test is made shall be stated.

§22.913 Effective radiated power limits

(a) Maximum ERP. ... The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

§24.232 Power and antenna height limits

(c) Mobile/portable stations are limited to 2 watts EIRP peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

(d) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.



### 3.1.3 Test Protocol

Temperature: 21 °C  
 Air Pressure: 1010 hPa  
 Humidity: 35 %

Op. Mode	Setup	Port
see table below	a01	antenna connector

subtest	op-mode	max. output power/dBm (RMS)
1	4	21.5
1	5	21.3
1	6	21.9
2	4	21.6
2	5	21.3
2	6	22.2
3	4	21.4
3	5	21.4
3	6	22.2
4	4	21.5
4	5	21.4
4	6	22.1

Remark: none

Temperature: 21 °C  
 Air Pressure: 1010 hPa  
 Humidity: 35 %

Op. Mode	Setup	Port
see table below	a01	antenna connector

subtest	op-mode	max. output power/dBm (RMS)
1	1	21.1
1	2	20.9
1	3	21.4
2	1	21.2
2	2	20.9
2	3	21.7
3	1	21.2
3	2	21.0
3	3	21.8
4	1	21.2
4	2	22.2
4	3	20.2

Remark: none



### 3.1.4 Test result: RF Power Output

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Test Setup	Result
a01	passed

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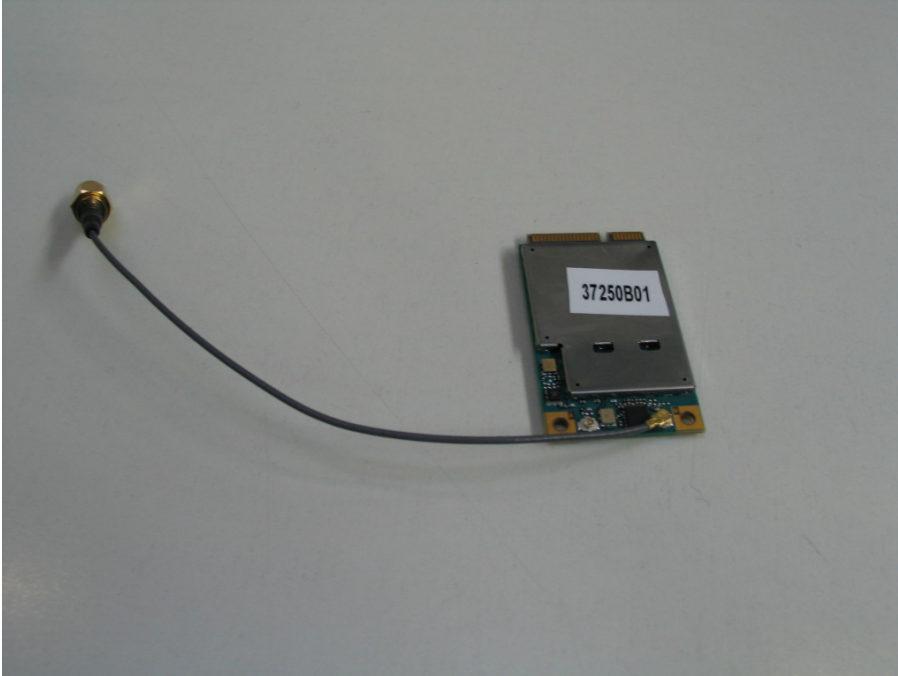


## 4 Test Equipment

TS8950GW

Name of Device	Type	Serial Number	Manufacturer
Spectrum Analyser	FSU26	100136	Rohde & Schwarz GmbH & Co.KG: ...
Dual Channel Power meter	NRVD	100668	Rohde & Schwarz GmbH & Co.KG: ...
Diode Power Sensor	NRV-Z1	100149	Rohde & Schwarz GmbH & Co.KG: ...
Diode Power Sensor	NRV-Z1	100052	Rohde & Schwarz GmbH & Co.KG: ...
Signal Generator	SMP02	100129	Rohde & Schwarz GmbH & Co.KG: ...
Vector Signal Generator	SMIQ B3	101698	Rohde & Schwarz GmbH & Co.KG: ...
Vector Signal Generator	SMIQ B3	101699	Rohde & Schwarz GmbH & Co.KG: ...
Vector Signal Generator	SMIQ B3	100580	Rohde & Schwarz GmbH & Co.KG: ...
Vector Signal Generator	SMIQ B3	100582	Rohde & Schwarz GmbH & Co.KG: ...
Vector Signal Generator	SMIQ B3	100583	Rohde & Schwarz GmbH & Co.KG: ...
Vector Signal Generator	SMIQ B3	832492/061	Rohde & Schwarz GmbH & Co.KG: ...
GSM Signaling Unit	CRTU-G	100025	Rohde & Schwarz GmbH & Co.KG: ...
W-CDMA Signaling Unit	CRTU-W	100033	Rohde & Schwarz GmbH & Co.KG: ...
Power Supply	NGSM 32/10 DC	100043	Rohde & Schwarz GmbH & Co.KG: ...
System Controller	TS-PC 36	100016	Rohde & Schwarz GmbH & Co.KG: ...
Advanced Signal Conditioning Unit	ASCU850	100009	Rohde & Schwarz GmbH & Co.KG: ...
Advanced Signal Conditioning Unit	ASCU900	100015	Rohde & Schwarz GmbH & Co.KG: ...
Advanced Signal Conditioning Unit	ASCU1800	100023	Rohde & Schwarz GmbH & Co.KG: ...
Advanced Signal Conditioning Unit	ASCU1900	100018	Rohde & Schwarz GmbH & Co.KG: ...
Fading Simulator	ABFS	100041	Rohde & Schwarz GmbH & Co.KG: ...
Fading Simulator	ABFS	100047	Rohde & Schwarz GmbH & Co.KG: ...
Protocol Unit W-CDMA	CRTU-PU	100046	Rohde & Schwarz GmbH & Co.KG: ...
Industrial System Controller (spare)	PSL3		Rohde & Schwarz GmbH & Co.KG: ...
Industrial System Controller	PSL3	100035	Rohde & Schwarz GmbH & Co.KG: ...
Advanced Signal Conditioning Unit	ASCU FDD I+II	100002	Rohde & Schwarz GmbH & Co.KG: ...
Radio Unit W-CDMA	CRTU-RU	100035	Rohde & Schwarz GmbH & Co.KG: ...
Signal Switching and Conditioning Unit	SSCU-GW	100020	Rohde & Schwarz GmbH & Co.KG: ...
Fading Simulator	ABFS	100040	Rohde & Schwarz GmbH & Co.KG: ...
Distribution Unit		100025	Rohde & Schwarz GmbH & Co.KG: ...
Spectrum Analyser	FSU26	100090	Rohde & Schwarz GmbH & Co.KG: ...
Vector Signal Generator	SMU200A	101498	Rohde & Schwarz GmbH & Co.KG: ...
Vector Signal Generator	SMU200A	101499	Rohde & Schwarz GmbH & Co.KG: ...
Advanced Signal Conditioning Unit	ASCU FDD V	100014	Rohde & Schwarz GmbH & Co.KG: ...
SSCU Signal switching and conditioning...	SSCU-EXT	100010	Rohde & Schwarz GmbH & Co.KG: ...
TS-COMB Combiner Box	TS-COMB	100004	Rohde & Schwarz GmbH & Co.KG: ...
CS-HUB Ethernet Hub / Optical Output	CS-HUB	100028	Rohde & Schwarz GmbH & Co.KG: ...
CS- TRIGA Trigger amplifier	CS- TRIGA	100041	Rohde & Schwarz GmbH & Co.KG: ...
ADU 200 Relay Box 5	Relay Box	A04388	Ontrak Control Systems Inc.: Mr. Fortin
Radio Unit W-CDMA	CRTU-RU	100212	Rohde & Schwarz GmbH & Co.KG: ...
Advanced Signal Conditioning Unit	ASCU IV-IX	100009	Rohde & Schwarz GmbH & Co.KG: ...

## 5 Photo Report



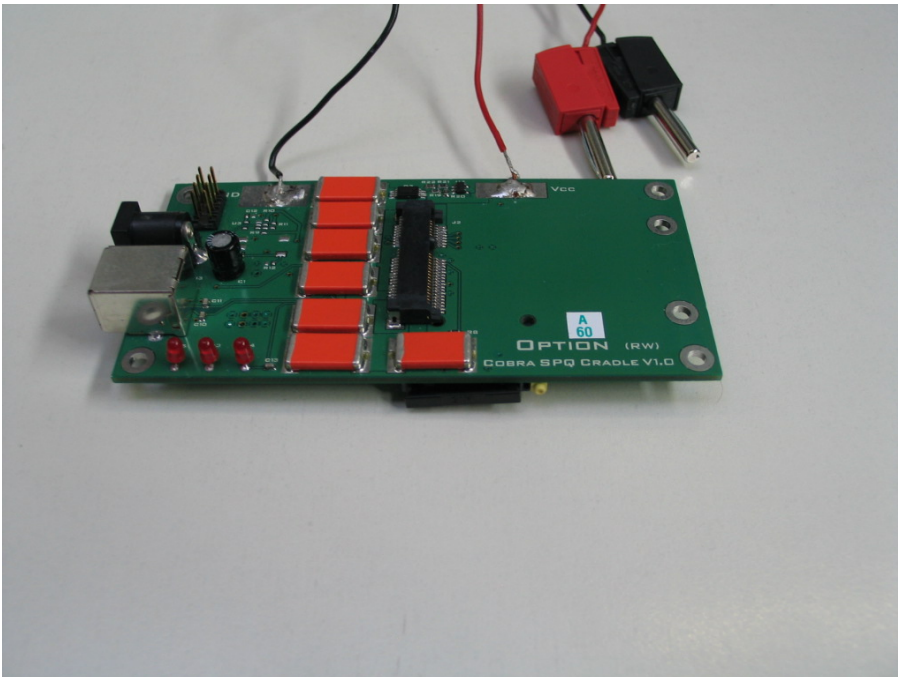
**Photo 1:** EUT (front side)



**Photo 2:** EUT (front side)



**Photo 3:** EUT (rear side)



**Photo 4:** Test cradle Cobra SPQ