

**Accredited Bluetooth™ Test Facility (BQTF)**

**Test report no.: 2-3731-01-01/04**  
(Appendix to test report no.: 2\_3450-01-02/03)

**FCC Part 24**

**MC55**

**FCC ID: QIPMC55**

**IC: 267W-MC55**

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## 1.2 Testing laboratory

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Accredited testing laboratory

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

DAR registration number: TTI-P-G-081/94-D0

Listed by : Federal Communications Commission (FCC)

Identification/Registration No : 90462

Accredited Bluetooth™ Test Facility (BQTF)

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## 1.3 Details of applicant

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## 1.4 Application details

Date of test : 2004-08-23

**1.5 Test item**

Type of equipment : Tripple Band GSM/PCS Module (900/1800/1900 MHz)  
Type designation : MC55  
Manufacturer : Siemens AG  
Street : Siemensdamm 50  
City : D-13629 Berlin  
Country : Germany  
Serial number : IMEI: 004999002727211

**Additional information**

Frequency : 1850.2 – 1909.8 MHz  
Type of modulation : 300KGXW  
Number of channels : 300 (PCS1900)  
Antenna : Coax adapter for use with external antennas, here a standard car magnet antenna  
Power supply : 4.5 VDC via connector  
Type of equipment : Temperature range : -30°C - +60°C  
FCC – ID : QIPMC55  
IC : 267W-MC55  
Hardware : Release 2 ( B1.4)  
Software : Rev. 01.95 (v.218)

**1.5 Test standards**

FCC Part 24

## **2 TECHNICAL TEST**

For Part 24 we use the substitution method (TIA/EIA 603).

All measurements in this report are done in GSM mode. Device is able to transmit data in GPRS mode also. But because the current measurements are performed in PEAK mode no other results from GPRS mode are possible. The only different is the modulation average power, which is 3 dB higher (by using 2 timeslots in the Up-link (GPRS mode 10)).

### **2.1 Remarks**

The card was tested due to small changes in parts on the PCB board. We tested only the radiated spurious.

Test set-up :                    The sample was tested in a special test board to bring power to the card and connect RF over a special coax connector to a standard coax adapter.  
For radiated measurements we used a standard magnetic dual-band mobile antenna mounted on a metal plate to get comparative results.

### **2.2 Summary of test results:**

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

**FINAL VERDICT: PASS**

### **3 TEST RESULTS**

#### **1.1 Emissions Limits**

**§24.238**

##### **Measurement Procedure:**

The following steps outline the procedure used to measure the radiated emissions from the mobile station. The site is constructed in accordance with ANSI C63.4 – 1992 requirements and is recognised by the FCC to be in compliance for a 3 and a 10 meter site. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 1910 MHz. This was rounded up to 20 GHz. The resolution bandwidth is set as outlined in Part 24.238. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the USPCS band.

##### **The final open field emission ( here 10m semi-anechoic chamber listed by FCC) test procedure is as follows:**

- a) The test item was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna.
- b) The antenna output was terminated in a 50 ohm load.
- c) A double ridged wave-guide antenna was placed on an adjustable height antenna mast 3 meters from the test item for emission measurements.
- d) Detected emissions were maximised at each frequency by rotating the test item and adjusting the receive antenna height and polarisation. The maximum meter reading was recorded. The radiated emission measurements of the harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and 1 MHz bandwidth. If the harmonic could not be detected above the noise floor, the ambient level was recorded.
- e) Now each detected emissions were substituted by the Substitution method, in accordance with the TIA/EIA 603.

##### **Measurement Limit:**

Sec. 24.238 Emission Limits.

- (a) On any frequency outside a licensee' s frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least  $43+10\text{Log}(P)$  dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

##### **Measurement Results:**

Radiated emissions measurements were made only at the upper, centre, and lower carrier frequencies of the USPCS band (1850.2 MHz, 1879.8 MHz and 1909.8 MHz). It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the USPCS band into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

## 1.2 Results of open field radiated tests for FCC-24:

The final open field radiated levels are presented on the next pages.

**All measurements were done in horizontal and vertical polarisation, the plots show the worst case.**

As can be seen from this data, the emissions from the test item were within the specification limit.

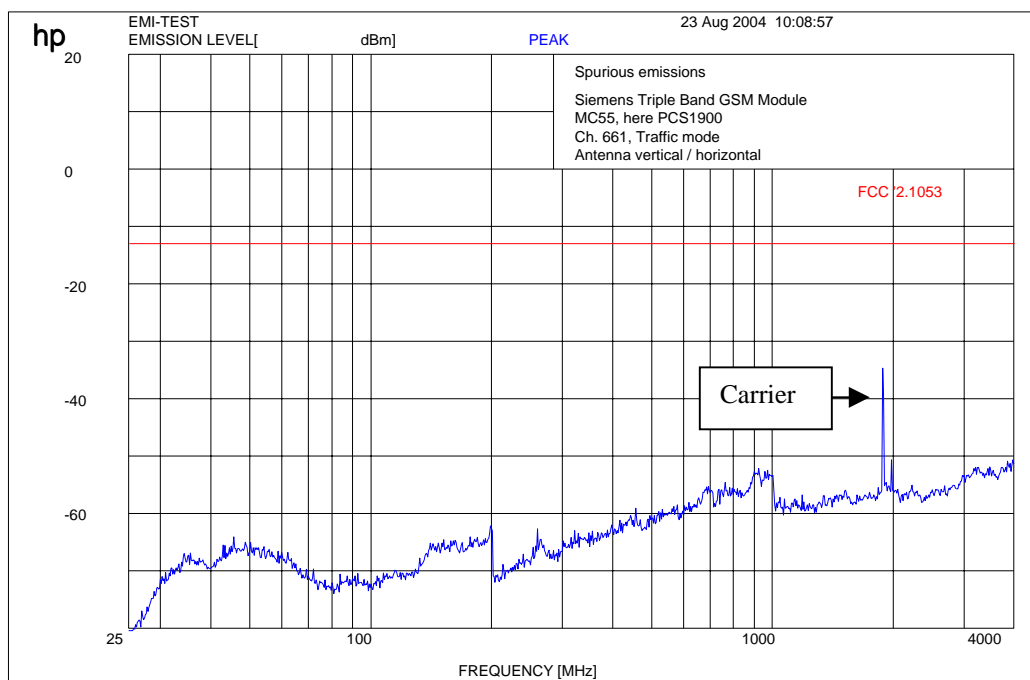
EMISSIONS LIMITS

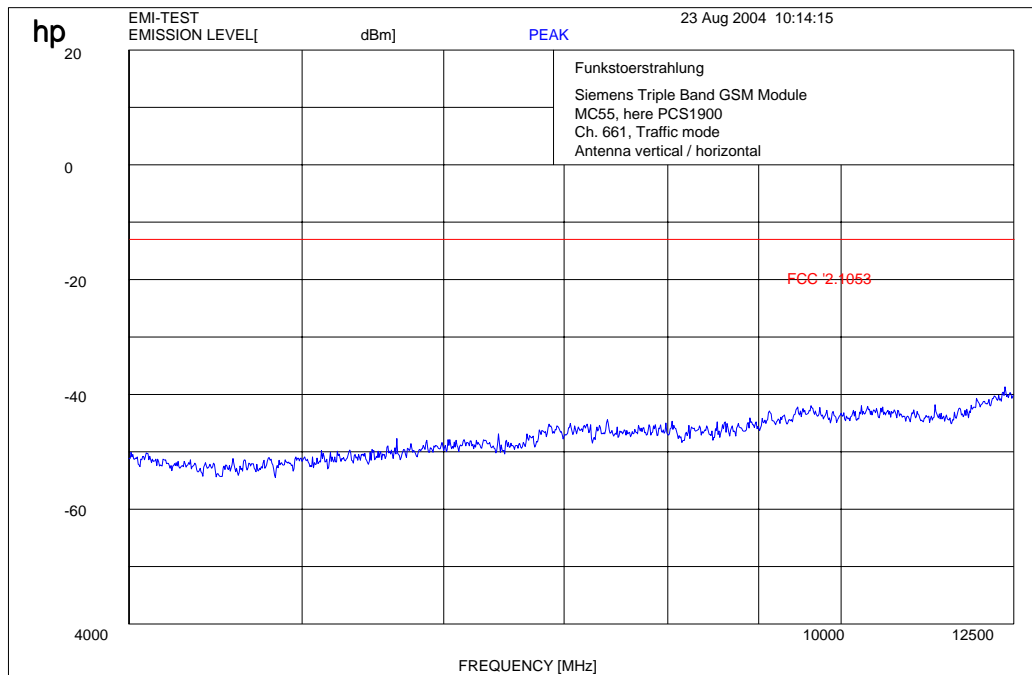
§24.238

RESULTS OF OPEN FIELD RADIATED TEST FOR FCC-24:

EMISSION LIMITATIONS					
f (MHz)		amplitude of emission (dBm)	limit max. allowed emission power (dBm)	actual attenuation below frequency of operation (dBc)	results
CH 661					
1880.0		27.4	-13.0 (40.4 dBc)		carrier
Measurement uncertainty			± 0.5dB		

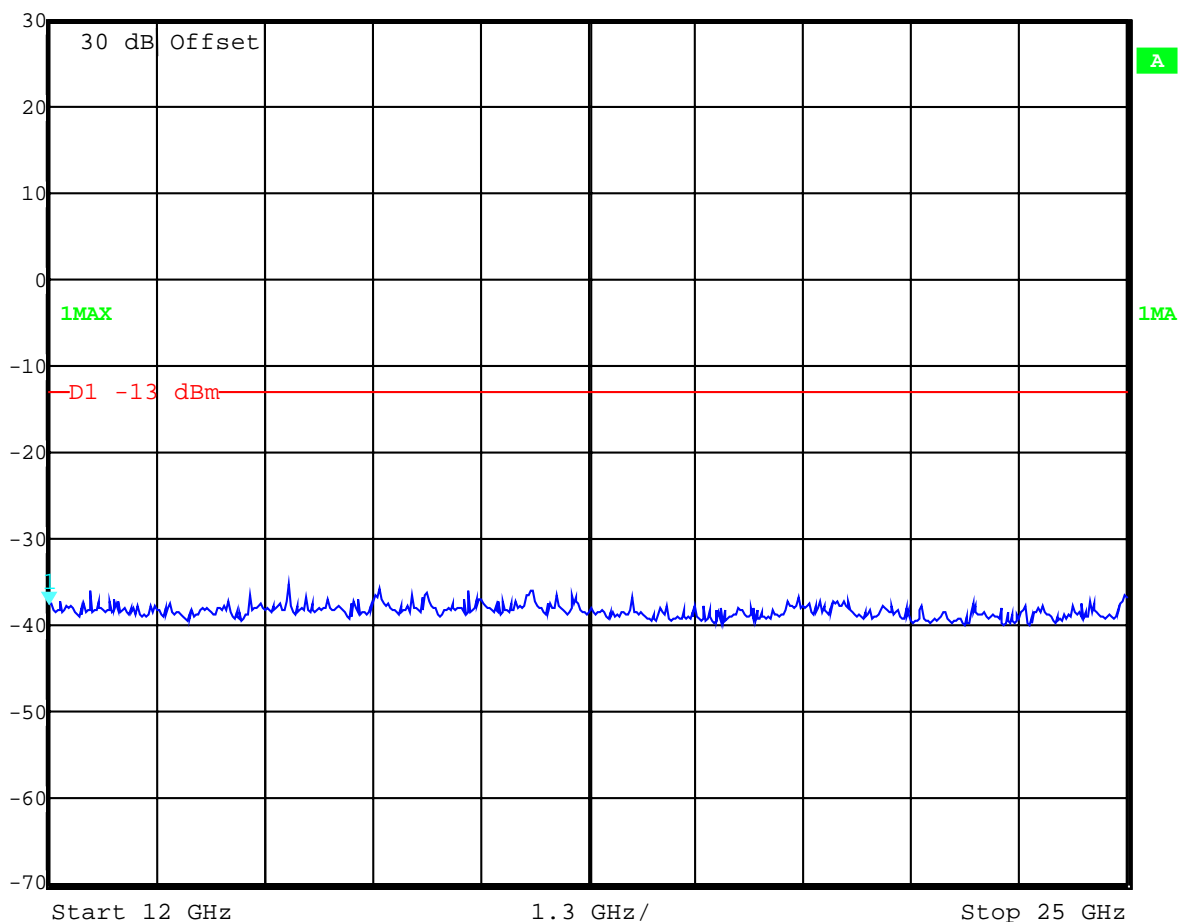


**Channel 661 (up to 4 GHz)****f < 1 GHz : RBW/VBW: 100 kHz****f ≥ 1GHz : RBW / VBW 1 MHz****Carrier suppressed with a rejection filter.**

**Channel 661 (up to 12 GHz)****f < 1 GHz : RBW/VBW: 100 kHz****f ≥ 1GHz : RBW / VBW 1 MHz**

## Channel 661 (up to 25 GHz)

	Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	10 dB
	30 dBm	-37.74 dBm	VBW	1 MHz		
		12.00000000 GHz	SWT	74 ms	Unit	dBm



## 4. TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
01	Spectrum Analyzer	8566 A	Hewlett-Packard	1925A00257
02	Analyzer Display	8566 A	Hewlett-Packard	1925A00860
03	Oscilloscope	7633	Tektronix	230054
04	Radio Communication Analyzer	CMTA 54	Rohde & Schwarz	894 043/010
05	System Power Supply	6038 A	Hewlett-Packard	2848A07027
06	Signal Generator	8111 A	Hewlett-Packard	2215G00867
07	Signal Generator	8662 A	Hewlett-Packard	2224A01012
08	Function Generator	AFGU	Rohde & Schwarz	862 480/032
09	Regulating Transformer	MPL	Erfi	91350
10	LISN	NNLA 8120	Schwarzbeck	8120331
11	Relay-Matrix	PSU	Rohde & Schwarz	893 285/020
12	Power-Meter	436 A	Hewlett-Packard	2101A12378
13	Power-Sensor	8484 A	Hewlett-Packard	2237A10156
14	Power-Sensor	8482 A	Hewlett-Packard	2237A00616
15	Modulation Meter	9008	Racal-Dana	2647
16	Frequency Counter	5340 A	Hewlett-Packard	1532A03899
17	Anechoic Chamber	---	MWB	87400/002
18	Spectrum Analyzer	85660 B	Hewlett-Packard	2747A05306
19	Analyzer Display	85662 A	Hewlett-Packard	2816A16541
20	Quasi Peak Adapter	85650 A	Hewlett-Packard	2811A01131
21	RF-Preselector	85685 A	Hewlett-Packard	2833A00768
22	Biconical Antenna	3104	Emco	3758
23	Log. Per. Antenna	3146	Emco	2130
24	Double Ridged Horn	3115	Emco	3088
25	EMI-Testreceiver	ESAI	Rohde & Schwarz	863 180/013
26	EMI-Analyzer-Display	ESAI-D	Rohde & Schwarz	862 771/008
27	Biconical Antenna	HK 116	Rohde & Schwarz	888 945/013
28	Log. Per. Antenna	HL 223	Rohde & Schwarz	825 584/002
29	Relay-Switch-Unit	RSU	Rohde & Schwarz	375 339/002
30	Highpass Amplifier	HM985955	FSY Microwave	001
31	Amplifier	P42-GA29	Tron-Tech	B 23602
32	Anechoic Chamber		Frankonia	
33	Control Computer	PSM 7	Rohde & Schwarz	834 621/004
34	EMI Test Receiver	ESMI	Rohde & Schwarz	827 063/010
35	EMI Test Receiver	Display	Rohde & Schwarz	829 808/010

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
36	Control Computer	HD 100	Deisel	100/322/93
37	Relay Matrix	PSN	Rohde & Schwarz	829 065/003
38	Control Unit	GB 016 A2	Rohde & Schwarz	344 122/008
39	Relay Switch Unit	RSU	Rohde & Schwarz	316 790/001
40	Power Supply	6032A	Hewlett Packard	2846A04063
41	Spectrum Monitor	EZM	Rohde & Schwarz	883 720/006
42	Measuring Receiver	ESH 3	Rohde & Schwarz	890 174/002
43	Measuring Receiver	ESVP	Rohde & Schwarz	891 752/005
44	Bicon Ant. 20-300MHz	HK 116	Rohde & Schwarz	833 162/011
45	Logger Ant. 0.3-1 GHz	HL 223	Rohde & Schwarz	832 914/010
46	Amplifier 0.1-4 GHz	AFS4	Miteq Inc.	206461
47	Logger Ant. 1-18 GHz	HL 024 A2	Rohde & Schwarz	342 662/002
48	Polarisation Network	HL 024 Z1	Rohde & Schwarz	341 570/002
49	Double Ridged Horn Antenna 1-26.5 GHz	3115	EMCO	9107-3696
50	Microw. Sys. Amplifier 0.5-26.5 GHz	8317A	Hewlett Packard	3123A00105
51	Audio Analyzer	UPD	Rohde & Schwarz	1030.7500.04
52	Controler	PSM 7	Rohde & Schwarz	883 086/026
53	DC V-Network	ESH3-Z6	Rohde & Schwarz	861 406/005
54	DC V-Network	ESH3-Z6	Rohde & Schwarz	893 689/012
55	AC 2 Phase V-Network	ESH3-Z5	Rohde & Schwarz	861 189/014
56	AC 2 Phase V-Network	ESH3-Z5	Rohde & Schwarz	894 981/019
57	AC-3 Phase V-Network	ESH2-Z5	Rohde & Schwarz	882 394/007
58	Power Supply	6032A	Rohde & Schwarz	2933A05441
59	RF-Test Receiver	ESVP.52	Rohde & Schwarz	881 487/021
60	Spectrum Monitor	EZM	Rohde & Schwarz	883 086/026
61	RF-Test Receiver	ESH3	Rohde & Schwarz	881 515/002
62	Relay Matrix	PSU	Rohde & Schwarz	882 943/029
63	Relay Matrix	PSU	Rohde & Schwarz	828 628/007
64	Spectrum Analyzer	FSIQ 26	Rohde & Schwarz	119.6001.27
65	Spectrum Analyzer	HP 8565E	Hewlett Packard	3473A00773
66				
67				
68				

**5. PHOTOGRAPHS**

MC 55

Photo No.: 01





Photo No.: 02

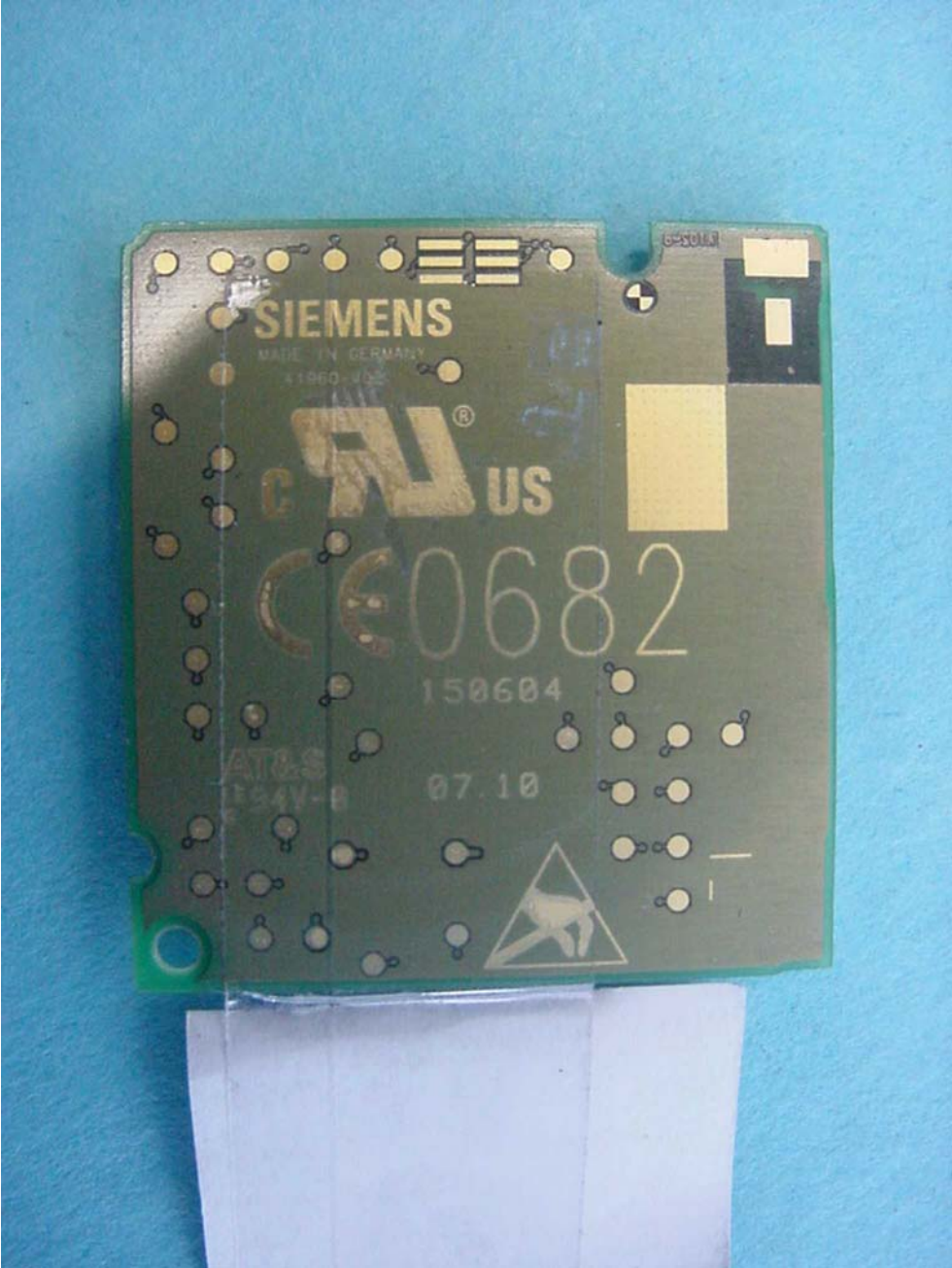


Photo No.: 03

