

6 FREQUENCY STABILITY, Part 2, Paragraph 2.1055

The following data lists the significant emission frequencies, measured levels, correction factor (which includes cable and antenna corrections), the corrected reading, and the limit.

See following page(s).

See test setup photos for test setup.

6.1 FREQUENCY STABILITY, Part 2, Paragraph 2.1055

The measurements were performed at the following test location :
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☐ - Test not applicable
--

Lab Open Area

Test Equipment Used :

Model No.	Prop. No.	Description	Manufacturer	Serial No.	Cal Date
437B	572	Power Meter	Hewlett Packard	312U19308	04/02
836640B	791	Signal Generator	Hewlett Packard	3844A00726	03/02
8566B	744	Spectrum Analyzer	Hewlett Packard	2618A02913	05/02
AA-190-06.00.0	787	Cable	United Microwave	--	*
11691D	6447	Directional Coupler	Hewlett Packard	--	*
778D	502	Directional Coupler	Hewlett Packard	1144A07633	*
47-10-34	764	Attenuator 10 dB	Weinschel	BF4000	N/A
CMU200	--	Universal Radio Comm. Tester	Rohde & Schwarz	Siemens # 201618	03/02
34401A	776	Volt Meter	Hewlett Pakcard	US36086974	11/02
T30RC	6225	Temperature Chamber	Tenney	27244-02	04/02

Remarks: (*) Verified internally.



Relative Humidity: 45 %

[illegible]

Signature

FREQUENCY STABILITY

Test Report # SC-107139 Test Area: TR-2
 Test Method FCC PART 2.1055(a) Date: 31 OCT 2001



EUT Model #: "S46"
 EUT POWER: ☐ 230 Vac/50 Hz ☐ 120 Vac/60 Hz
☒ Other: 4.1 VDC

Temperature: 24 °C

EUT Description: FCC ID: PNX S46

Air Pressure: 100.3 kPa

NOTES: 2 BAND, 3 mode Mobile Phone

Relative Humidity: 51 %

TDMA 800, Mid-Channel 836.49 MHz 2045

TEST LEVEL	VDC	DURATION	FREQUENCY Hz	TEMP °C	COMPLIES		REMARKS
					YES	NO	
4.1		30 MIN	-84	-10	✓		ON FROM COLD START
4.1		1 MIN	-91	-10	✓		
4.1		1 MIN	-84	-10	✓		
4.1		1 MIN	-88	-10	✓		
4.1		1 MIN	-77	-10	✓		
4.1		1 MIN	-80	-10	✓		
4.1		1 MIN	-62	-10	✓		
4.1		1 MIN	-65	-10	✓		
4.1		1 MIN	-68	-10	✓		
4.1		1 MIN	-70	-10	✓		
4.1		30 MIN	-90	0	✓		ON FROM COLD START
4.1		1 MIN	-73	0	✓		
4.1		1 MIN	-74	0	✓		
4.1		1 MIN	-75	0	✓		
4.1		1 MIN	-76	0	✓		
4.1		1 MIN	-77	0	✓		
4.1		1 MIN	-77	0	✓		
4.1		1 MIN	-78	0	✓		
4.1		1 MIN	-79	0	✓		
4.1		1 MIN	-79	0	✓		
4.1		30 MIN	-67	+10	✓		ON FROM COLD START

Tested By: DAVE BERNARDIN
 Printed

[Signature]
 Signature

FREQUENCY STABILITY

Test Report # SC-107139 Test Area: TR-2
 Test Method FCC PART 2.1055(a) Date: 31 OCT 2001



EUT Model #: "S46"
 EUT POWER:
☐ 230 Vac/50 Hz ☐ 120 Vac/60 Hz
☒ Other: 4.1 VDC

Temperature: 24 °C

EUT Description: FCC ID: PNX S46

Air Pressure: 100.3 kPa

NOTES: 2 BAND, 3 Mode Mobile Phone

Relative Humidity: 51 %

TDMA 800, Mid-Channel 836.49 MHz 3 of 5

TEST LEVEL	VDC	DURATION	FREQUENCY Hz	TEMP °C	COMPLIES		REMARKS
					YES	NO	
4.1		30 MIN	-67	10	✓		ON FROM COLD START
4.1		1 MIN	-69	10	✓		
4.1		1 MIN	-69	10	✓		
4.1		1 MIN	-69	10	✓		
4.1		1 MIN	-70	10	✓		
4.1		1 MIN	-69	10	✓		
4.1		1 MIN	-68	10	✓		
4.1		1 MIN	-68	10	✓		
4.1		1 MIN	-69	10	✓		
4.1		1 MIN	-69	10	✓		
4.1		30 MIN	-66	20	✓		ON FROM 20°C SOAK
4.1		1 MIN	-68	20	✓		
4.1		1 MIN	-72	20	✓		
4.1		1 MIN	-75	20	✓		
4.1		1 MIN	-76	20	✓		
4.1		1 MIN	-78	20	✓		
4.1		1 MIN	-79	20	✓		
4.1		1 MIN	-80	20	✓		
4.1		1 MIN	-57	20	✓		
4.1		1 MIN	-57	20	✓		
4.1		30 MIN	-68	30	✓		ON FROM 30°C SOAK

Tested By: DAVE BERNARDIN
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DAVE BERNARDIN
 Signature

FREQUENCY STABILITY

Test Report # SC-107139
 Test Method FCC PART 2.1055(a)

Test Area: TR-2
 Date: 31 OCT 2001



EUT Model #: "S46"

EUT POWER:
☐ 230 Vac/50 Hz ☐ 120 Vac/60 Hz
☒ Other: 4.1 VDC

Temperature: 24 °C

EUT Description: FCC ID: PNX S46

Air Pressure: 100.3 kPa

NOTES: 2 BAND, 3 mode Mobile Phone

Relative Humidity: 51 %

TDMA 800, Mid-Channel 836.49 MHz 4-F5

TEST LEVEL	VDC	DURATION	FREQUENCY Hz	TEMP °C	COMPLIES		REMARKS
					YES	NO	
A.1		30 MIN	-68	30	✓		ON FROM 30°C SOAK
A.1		1 MIN	-64	30	✓		
A.1		1 MIN	-61	30	✓		
A.1		1 MIN	-57	30	✓		
A.1		1 MIN	-52	30	✓		
A.1		1 MIN	-48	30	✓		
A.1		1 MIN	-41	30	✓		
A.1		1 MIN	-59	30	✓		
A.1		1 MIN	-57	30	✓		
A.1		1 MIN	-54	30	✓		
A.1		30 MIN	-35	40	✓		ON FROM 40°C SOAK
A.1		1 MIN	-47	40	✓		
A.1		1 MIN	-41	40	✓		
A.1		1 MIN	-33	40	✓		
A.1		1 MIN	-31	40	✓		
A.1		1 MIN	-43	40	✓		
A.1		1 MIN	-31	40	✓		
A.1		1 MIN	-19	40	✓		
A.1		1 MIN	-35	40	✓		
A.1		1 MIN	-53	40	✓		
A.1		30 MIN	-58	50	✓		ON FROM 50°C SOAK

Tested By: DAVE FERNARDIN
 Printed

Dave Ferdinand
 Signature

Test Report # SC-107139 Test Area: TR-2
Test Method FCC PART 2.1055(a) Date: 31 OCT 2001



EUT Model #: "S46"

EUT POWER:
☐ 230 Vac/50 Hz ☐ 120 Vac/60 Hz
☒ Other: 4.1 VDC

Temperature 24 °C

EUT Description: FCC ID: PWX 546

Air Pressure: 100.3 kPa

NOTES: 2 BAND, 3 mode Mobile Phone

Relative Humidity: 51 %

TDMA 800, Mid-Channel 836.49 MHz 5x5

[illegible]

Tested By: DAVE BERNARDIN
Printed

Signature

FREQUENCY STABILITY

Test Report # SC-107139 Test Area: TR-2
 Test Method FCC PART 2.1055(a) Date: 30 OCT 2001



EUT Model # "S46" EUT POWER:
☐ 230 Vac/50 Hz ☐ 120 Vac/60 Hz
☒ Other: 4.1 VDC

Temperature 24 °C

EUT Description: FCC ID: PWR S46

Air Pressure: 100.8 kPa

NOTES: 2 BAND, 3 mode Mobile Phone

Relative Humidity: 47% %

TDMA 1900, mid-channel 1879.98 MHz 10P

TEST LEVEL		FREQUENCY Hz	TEMP °C	COMPLIES		REMARKS
VOL	DURATION			YES	NO	
4.1	30 MIN	-93	25	✓		Room Temp Nominal
4.1	30 MIN	-102	-30	✓		ON FROM COLD START
4.1	1 MIN	-97	-30	✓		
4.1	1 MIN	-97	-30	✓		
4.1	1 MIN	-97	-30	✓		
4.1	1 MIN	-100	-30	✓		
4.1	1 MIN	-103	-30	✓		
4.1	1 MIN	-107	-30	✓		
4.1	1 MIN	-108	-30	✓		
4.1	1 MIN	-114	-30	✓		
4.1	1 MIN	-117	-30	✓		
4.1	30 MIN	-127	-20	✓		ON FROM COLD START
4.1	7 MIN	-130	-20	✓		
4.1	1 MIN	-125	-20	✓		
4.1	1 MIN	-131	-20	✓		
4.1	1 MIN	-108	-20	✓		
4.1	1 MIN	-117	-20	✓		
4.1	1 MIN	-123	-20	✓		
4.1	1 MIN	-125	-20	✓		
4.1	1 MIN	-86	-20	✓		
4.1	1 MIN	-90	-20	✓		
4.1	30 MIN	-144	-10	✓		ON FROM COLD START

Tested By: DAVE BERNARDIN
 Printed

[Signature]
 Signature

FREQUENCY STABILITY

Test Report #: SL-107139

Test Area: TR-2

Test Method FCC PART 2.1055(a)

Date: 30 OCT 2001



EUT Model #: "S46"

EUT POWER:

☒ 230 Vac/50 Hz ☐ 120 Vac/60 Hz

☒ Other: 4. LVDC

Temperature 24 °C

EUT Description: FCC ID: PWX 546

Air Pressure: 100.8 kPa

NOTES: 2 BAND, 3 mode Mobile Phone

Relative Humidity: 47% %

TOMA 1900, mid-CHANNEL 1879.98 m² Jof

[illegible]

Tested By: DAVE BERNARDIN
Printed


Signature

FREQUENCY STABILITY

Test Report #: SC-107139

Test Area: TR-2

Test Method: FCC PART 2.1055(a)

Date: 30 OCT 2001



EUT Model #: "S46"

EUT POWER:
☐ 230 Vac/50 Hz ☐ 120 Vac/60 Hz
☒ Other: 4.1 VDC

Temperature: 24 °C

EUT Description: FCC ID: PWR S46

Air Pressure: 100.8 kPa

NOTES: 2 BAND, 3 mode Mobile Phone

Relative Humidity: 47% %

TDMA 1900, mid-channel 1879.98 MHz 3of

TEST LEVEL		FREQUENCY MHz	TEMP °C	COMPLIES		REMARKS
VOL	DURATION			YES	NO	
4.1	30 MIN	-113	10	✓		ON FROM COLD START
4.1	1 MIN	-120	10	✓		
4.1	1 MIN	-120	10	✓		
4.1	1 MIN	-125	10	✓		
4.1	1 MIN	-128	10	✓		
4.1	1 MIN	-127	10	✓		
4.1	1 MIN	-130	10	✓		
4.1	1 MIN	-134	10	✓		
4.1	1 MIN	-135	10	✓		
4.1	1 MIN	-135	10	✓		
4.1	30 MIN	-100	20	✓		ON FROM START @ 20°C
4.1	1 MIN	-107	20	✓		
4.1	1 MIN	-114	20	✓		
4.1	1 MIN	-121	20	✓		
4.1	1 MIN	-126	20	✓		
4.1	1 MIN	-127	20	✓		
4.1	1 MIN	-81	20	✓		
4.1	1 MIN	-81	20	✓		
4.1	1 MIN	-83	20	✓		
4.1	1 MIN	-84	20	✓		

Tested By: DAVE BERNARDIN
 Printed

[Signature]
 Signature

1

Test Area: TR-2

Date: 30 OCT 2001



EUT Model #: "S46"

EUT POWER:

☒ 230 Vac/50 Hz ☐ 120 Vac/60 Hz

☒ Other: 4.1 VDC

Temperature 24 °C

EUT Description: FCC ID: PWX 546

Air Pressure: 100.8 kPa

NOTES: 2 BANK, 3 mode Mobile Phone

Relative Humidity: 47% %

TDMA 1900, mid-channel 1879.98 MHz

[illegible]

Tested By: LOUI BERNARDINI
Printed


Signature

FREQUENCY STABILITY

Test Report #: SC-107139 Test Area: TR-2

Test Method FAC PART 2.1055(a) Date: 30 OCT 2001



EUT Model #: "S46"

EUT POWER:
☐ 230 Vac/50 Hz ☐ 120 Vac/60 Hz
☒ Other: 4.1VDC

Temperature 24 °C

EUT Description: FCC ID: PWR 546

Air Pressure: 100.8 kPa

NOTES: 2 BAND, 3 mode Mobile Phone

Relative Humidity: 47% %

TDMA 1900, Mid-Channel 1879.98 MHz

[illegible]

Tested By: LAUREN BERNARDIN
Printed

Signature

FREQUENCY STABILITY

Test Report #: SC-107137

Test Area: TR-2

Test Method: FCC PART 2.1055(a)

Date: 29 OCT 2001



EUT Model #: "S46"

EUT POWER:
☐ 230 Vac/50 Hz ☐ 120 Vac/60 Hz
☒ Other: Vac 4.1

Temperature: 24 °C

EUT Description: FCC ID: PWX S46

Air Pressure: 100.8 kPa

NOTES: 2 Band, 3 Mode Mobile Phone

Relative Humidity: 49 %

GSM 1900, Mid-Channel 1800 MHz

TEST LEVEL		FREQUENCY MHz	TEMP °C	COMPLIES		REMARKS
VOL	URATION			YES	NO	
4.1	30MIN	-60Hz	25	✓		Room Temp Nominal
4.1	30MIN	-7.2	-30	✓		ON FROM Cold Start
4.1	1MIN	-74	-30	✓		
4.1	1MIN	-73	-30	✓		
4.1	1MIN	-73	-30	✓		
4.1	1MIN	-74	-30	✓		
4.1	1MIN	-74	-30	✓		
4.1	1MIN	-73	-30	✓		
4.1	1MIN	-76	-30	✓		
4.1	1MIN	-75	-30	✓		
4.1	1MIN	-76	-30	✓		
4.1	1MIN	-74	-30	✓		
4.1	30MIN	-77	-20	✓		ON FROM Cold Start
4.1	1MIN	-80	-20	✓		
4.1	1MIN	-73	-20	✓		
4.1	1MIN	-80	-20	✓		
4.1	1MIN	-80	-20	✓		
4.1	1MIN	-78	-20	✓		
4.1	1MIN	-80	-20	✓		
4.1	1MIN	-78	-20	✓		
4.1	1MIN	-78	-20	✓		
4.1	1MIN	-74	-20	✓		
4.1	30MIN	-78	-10	✓		ON FROM Cold Start

Tested By: DAVE BERNARDIN
 Printed

[Signature]
 Signature

FREQUENCY STABILITY

Test Report # SC-107139

Test Area: TR-2

Test Method FCC PART 2.1055(a)

Date: 29 Oct 2001

EUT Model #: "S46"

EUT POWER:
☐ 230 Vac/50 Hz ☐ 120 Vac/60 Hz
☒ Other: 4.1 VDC

Temperature 24 °C

EUT Description: FCC ID: Pwx 846

Air Pressure: 100.8 kPa

NOTES: 2 Band, 3 mode mobile phone

Relative Humidity: 49 %

GSM 1900, mid-channel 1880 MHz

[illegible]

Tested By: ALICE BERNARDIN
Printed

Signature

FREQUENCY STABILITY

Test Report # SC-107139

Test Area: TR-2

Test Method FCC PART 2.1055(a)

Date: 29 OCT 2001

EUT Model #: "S46"

EUT POWER:
☐ 230 Vac/50 Hz ☐ 120 Vac/60 Hz
☒ Other: 4.1 VDC

Temperature 24 °C

EUT Description: FCC ID: PNX 846

Air Pressure: 100.8 kPa

NOTES: 2 Band, 3 mode mobile phone

Relative Humidity: 49 %

GSM 1900, mid-channel 1880 MHz

[illegible]

Tested By: LESLIE BERNARDIN
Printed

Signature

7 FIELD STRENGTH OF SPURIOUS RADIATION and SIGNAL SUBSTITUTION, FCC Part 2, Paragraph 2.1053; Part 22, Paragraph 22.917(b)(2); Part 24, Paragraph 24.238(a)

The following data lists the significant emission frequencies, measured levels, correction factor (which includes cable and antenna corrections), the corrected reading, and the limit.

See following page(s).

See test setup photos for test setup.

For Radiated Spurious measurements the procedure was as follows:

1. For each mode and for the High, mid and low of each mode of operation the phone was set up and the peak value of the fundamental was measured
2. This value was then compared to the expected value to validate the phone was operating at its peak power output.
3. Then all spurious emissions were measured and any found to be within 20dB of the limit, signal substitution was performed. Since all emissions measured in peak mode were below the -13dB limit any measurements meant to factor in the burst nature of the TDMA signal were not implemented. Please note however, the burst rate was factored into the conducted spurious measurements included in this report as it was needed for FCC Part 22.917(f) compliance. This was included as appendix A.

7.1 FIELD STRENGTH OF SPURIOUS RADIATION and SIGNAL SUBSTITUTION, FCC Part 2, Paragraph 2.1053; Part 22, Paragraph 22.917(b)(2); Part 24, Paragraph 24.238(a)

The measurements were performed at the following test location :
--

☐ - Test not applicable
--

Roof Test Site, 3 meters

Test Equipment Used :

Model No.	Prop. No.	Description	Manufacturer	Serial No.	Cal Date
3146	244	LPA	EMCO	1063	02/02
AA-190-30.00.0	733	Coax Cable	United Microwave	--	N/A
3115	453	Horn Antenna	EMCO	9412-4364	10/02
AMF-5D-010180-35-109	719	Amplifier	Miteq	54960	N/A
AA-190-06.00.0	657	Coax Cable	United Microwave	--	N/A
8566B	823	Spectrum Analyzer	Hewlett Packard	2332A02751	08/02
8445B	809	Pre-Selector	Hewlett Packard	1442A01127	N/A
--	6685	Coax Cable	United Microwave	--	N/A
3115	798	Horn Antenna	EMCO	9908-5927	03/02

Remarks: _____

7.2 Field Strength Calculation

If a preamplifier was used during the Radiated Emission Testing, it is required that the amplifier gain must be subtracted from the Spectrum Analyzer (Meter) Reading. In addition, a correction factor for the antenna, cable used and a distance factor, if any, must be applied to the Meter Reading before a true field strength reading can be obtained. In the automatic measurement, these considerations are automatically presented as a part of the print out. In the case of manual measurements and for greater efficiency and convenience, instead of using these correlation factors for each meter reading, the specification limit was modified to reflect these correlation factors at each frequency value so that the meter readings can be compared directly to the modified specification limit. This modified specification limit is referred to as the "Corrected Meter Reading Limit" or simply the CMRL, which is the actual field strength present at the antenna. The quantity can be derived in the following manner:

$$\text{Corrected Meter Reading Limit (CMRL)} = \text{SAR} + \text{AF} + \text{CL} - \text{AG} - \text{DC}$$

Where, SAR = Spectrum Analyzer Reading

AF = Antenna Factor

CL = Cable Loss

AG = Amplifier Gain (if any)

DC = Distance Correction (if any)

Assume the following situation: A meter reading of 29.4 dBuV was obtained from a Class A computing device measured at 83 MHz. Assume an antenna factor of 9.2 dB, a cable loss of 1.4 dB and amplifier gain of 20.0 dB at 83 MHz. The final field strength would be determined as follows:

$$\text{CMRL} = 29.4 \text{ dBuV} + 9.2 \text{ dB} - 1.4 \text{ dB} - 20 \text{ dB/M} - 0.0 \text{ dB}$$

$$\text{CMRL} = 20.0 \text{ dBuV/M}$$

This result is well below the FCC and CSA Class A limit of 29.5 dbuV/m at 83 MHz.

For the manual mode of measurement, a table of corrected meter reading limit was used to permit immediate comparison of the meter reading to determine if the measure emission amplitude exceeded the specification limit at that specific frequency.

REPORT No: SC107139 TESTER: Dave Bernardin SPEC: FCC Part 22 para 22.917(b)(2)

Part 2. Para. 2.1053

CUSTOMER: Siemens

TEST DIST: 3 Meters

E U T: "S46" FCC ID PWX S46

TEST SITE: Roof

EUT MODE: TDMA 800

BICONICAL: N/A

DATE: OCT 24, 2001

LOG: 244

NOTES: With Hands-Free Headset Model UHF-P35 OTHER: 453

above 1GHz: RBW & VBW 1 MHz for Pk; RBW 1MHz and VBW 10Hz for AVG

below 1GHz: RBW & VBW 100 kHz for Pk; RBW 100kHz and VBW 10Hz for AVG

CF = Antenna Factor + Cable Loss - Preamplifier Gain + Preselector Loss

v.beta1a

FREQ (MHz)	VERTICAL (dBuV) pk av		HORIZONTAL (dBuV) pk av		CF (dB/m)	MAX LEVEL (dBm(d)) pk av		SPEC LIMIT (dBm) pk av		MARGIN (dB) pk av		Rotation EUT	Antenna Height	Notes	dBuV/m PK	dBuV/m AVG
824.04	99.62				25.0	27.3								Fundamental Low	124.6	
1648.08	63.7	43	59.1	38.1	-7.0	-40.7	-61.4	-13.0	-13.0	-27.7	-48.4	0	1		56.7	36.0
2472.12	54.7	34.6	52	37.1	-0.1	-42.7	-60.3	-13.0	-13.0	-29.7	-47.3	278	1		54.6	37.0
3296.16	48.5	31.7	48.3	32	4.6	-44.3	-60.8	-13.0	-13.0	-31.3	-47.8	301	1	AVG @ Noise Level	53.1	36.6
4120.2	44.2		52		5.3	-40.1		-13.0		-27.1		0	1	Noise	57.3	5.3
4944.24					6.4							163	1	Noise	6.4	
5768.28					11.6									Noise	11.6	
6592.32					14.0									Noise	14.0	
7416.36					15.3									Noise	15.3	
8240.4					16.6									Noise	16.6	
836.49	100.5				25.0	28.1						291	1.2	Fundamental Mid	125.5	
1672.98	56.6	40.3	53.6	37	-6.6	-47.3	-63.6	-13.0	-13.0	-34.3	-50.6	268	1		50.0	33.7
2509.47	56.3	38.9	54.1	36	0.1	-41.0	-58.4	-13.0	-13.0	-28	-45.4	2	1		56.4	39.0
3345.96	52.4	35	52.1	36.2	4.7	-40.3	-56.5	-13.0	-13.0	-27.3	-43.5	355	1		57.1	40.9
4182.45	58	34.4	56.3	37.9	5.0	-34.4	-54.5	-13.0	-13.0	-21.4	-41.5	2	1		63.0	42.9
5018.94	45		44		7.0	-45.4		-13.0		-32.4		148	1	AVG @ Noise Level	52.0	7.0
5855.43					11.7									Noise	11.7	
6691.92					14.1									Noise	14.1	
7528.41					15.6									Noise	15.6	
8364.9					16.5									Noise	16.5	
848.97	100.2		95.5		25.3	28.1						10	1	Fundamental High	125.5	
1697.94	61.9	43	55.9	41.4	-6.2	-41.6	-60.5	-13.0	-13.0	-28.6	-47.5	60	1		55.7	36.8
2546.91	51	36.3	52.5	35.3	0.4	-44.5	-60.7	-13.0	-13.0	-31.5	-47.7	4	1		52.9	36.7
3395.88	55	37.7	54.1	37.4	4.8	-37.6	-54.9	-13.0	-13.0	-24.6	-41.9	0	1		59.8	42.5
4244.85	50	33.2	48.8	32.9	4.6	-42.7	-59.5	-13.0	-13.0	-29.7	-46.5	0	1		54.6	37.8
5093.82	45.5		43.6		7.6	-44.2		-13.0		-31.2				AVG @ Noise Level	53.1	7.6
5942.79					11.8									Noise	11.8	
6791.76					14.3									Noise	14.3	
7640.73					15.8									Noise	15.8	
8489.7					16.4									Noise	16.4	

REPORT No: SC107139 TESTER: Dave Bernardin SPEC: FCC Part 24 para 24.238(a)

Part 2, Para 2.1053

CUSTOMER: Siemens

TEST DIST: 3 Meters

E U T: "S46" FCC ID PWX S46

TEST SITE: Roof

EUT MODE: TDMA 1900

BICONICAL: N/A

DATE: OCT 24,2001

LOG: 244

NOTES: With Hands-Free Headset Model UHF-P35 OTHER: 457

above 1GHz: RBW & VBW 1 MHz for Pk; RBW 1MHz and VBW 10Hz for AVG

below 1GHz: RBW & VBW 100 kHz for Pk; RBW 100kHz and VBW 10Hz for AVG

CF = Antenna Factor + Cable Loss - Preamplifier Gain + Preselector Loss

v.beta1a

FREQ (MHz)	VERTICAL (dBuV) pk av		HORIZONTAL (dBuV) pk av		CF (dB/m)	MAX LEVEL (dBm(d)) pk av		SPEC LIMIT (dBm) pk av		MARGIN (dB) pk av		EUT Rotation	Antenna Height	Notes	dBuV/m PK	dBuV/m AVG
1850.04	95.4		88.5		32.0	32.1						391	1	Fundamental Low	127.4	
3700.08	55.4	35.6	57.5	36	5.4	-32.4	-53.9	-13.0	-13.0	-19.4	-40.9	15	1		62.9	41.4
5550.12	53.7	38.8	52.9	38	11.3	-30.3	-45.2	-13.0	-13.0	-17.3	-32.2	123	1		65.0	50.1
7400.16					15.3									Noise Level	15.3	
9250.2	47.2		45.9		17.9	-30.2		-13.0		-17.2		178	1	AVG Noise Level	65.1	17.9
11100.24	46		47.3		22.3	-25.7		-13.0		-12.7		228	1	AVG Noise Level	69.6	22.3
12950.28					21.1									Noise Level	21.1	
14800.32					23.9									Noise Level	23.9	
16650.36					27.7									Noise Level	27.7	
1879.98	95		91.6		32.2	31.9						390	1	Fundamental Mid	127.2	
3759.96	58.6	39.2	58.7	37.6	5.5	-31.1	-50.6	-13.0	-13.0	-18.1	-37.6	65	1.1		64.2	44.7
5639.94	50.2	33	50.8	35	11.4	-33.1	-48.9	-13.0	-13.0	-20.1	-35.9	206	1.1		62.2	46.4
7519.92					15.5									Noise Level	15.5	
9399.9					17.5									Noise Level	17.5	
11279.88					22.2									Noise Level	22.2	
13159.86					22.1									Noise Level	22.1	
15039.84					24.4									Noise Level	24.4	
16919.82					29.6									Noise Level	29.6	
1909.92	94.3		89.8		32.4	31.4						390	1	Fundamental High	126.7	
3819.84	64.8	44.6	57.9	40.2	5.6	-24.9	-45.1	-13.0	-13.0	-11.9	-32.1	60	1		70.4	50.2
5729.76	49.8		49		11.5	-33.9		-13.0		-20.9		200	1	AVG Noise level	61.3	11.5
7639.68					15.8									Noise Level	15.8	
9549.6					17.5									Noise Level	17.5	
11459.52					22.1									Noise Level	22.1	
13369.44					23.4									Noise Level	23.4	
15279.36					24.6									Noise Level	24.6	
17189.28					31.0									Noise Level	31.0	

REPORT No: SC107139

TESTER:

Dave Bernardin

SPEC:

FCC Part 24 para 24.238(a)

Part 2. Para 2.1053

CUSTOMER: Siemens

TEST DIST:

3 Meters

E U T: "S46" FCC ID PWX S46

TEST SITE:

Roof

EUT MODE: GSM 1900

BICONICAL:

N/A

DATE: OCT 24, 2001

LOG:

244

NOTES:

With Hands-Free Headset Model UHF-P35

OTHER:

453

above 1GHz: RBW & VBW 1 MHz for Pk; RBW 1MHz and VBW 10Hz for AVG

below 1GHz: RBW & VBW 100 kHz for Pk; RBW 100kHz and VBW 10Hz for AVG

CF = Antenna Factor + Cable Loss - Preamplifier Gain + Preselector Loss

v beta1a

FREQ (MHz)	VERTICAL (dBuV) pk av		HORIZONTAL (dBuV) pk av		CF (dB/m)	MAX LEVEL (dBm(d)) pk av		SPEC LIMIT (dBm) pk av		MARGIN (dB) pk av		EUT Rotation	Antenna Height	Notes	dBuV/m PK	dBuV/m AVG
1850.2	95.9		91.7		32.2	32.8						65	1.9	Fundamental Low	128.1	
3700.4	56	33.6	58	34.5	5.4	-31.9	-55.4	-13.0	-13.0	-18.9	-42.4	90	1		63.4	39.9
5550.6	57.5	35.5	59.9	35.6	11.3	-24.1	-48.4	-13.0	-13.0	-11.1	-35.4	50	1		71.2	46.9
7400.8	56.9	34.8	55.9	34.4	15.3	-23.1	-45.2	-13.0	-13.0	-10.1	-32.2	65	1		72.2	50.1
9251	51.6	34.1	49.3	34.5	17.9	-25.8	-42.9	-13.0	-13.0	-12.8	-29.9	68	1		69.5	52.4
11101.2	46.9	33.2	46.9	33.2	22.3	-26.1	-39.8	-13.0	-13.0	-13.1	-26.8	82	1		69.2	55.5
12951.4					21.1									Noise Level	21.1	
14801.6					23.9									Noise Level	23.9	
16651.8					27.7									Noise Level	27.7	
1860	95.7		90.8		32.3	32.8								Fundamental Mid	128.0	
3760	57.7	35.1	61	35.7	5.5	-28.8	-54.1	-13.0	-13.0	-15.8	-41.1	90	1		66.5	41.2
5640	54.8	34.3	56.3	34.4	11.4	-27.6	-49.5	-13.0	-13.0	-14.6	-36.5	123	1		67.7	45.8
7520	47.9		49.5		15.5	-30.2		-13.0		-17.2		135	1	AVG at Noise level	65.0	15.5
9400	49.2		47.2		17.5	-28.5		-13.0		-15.5		26	1	AVG at Noise level	66.7	17.5
11280	48.2		48		22.2	-24.9		-13.0		-11.9		8	1	AVG at Noise level	70.4	22.2
13160					22.1									Noise Level	22.1	
15040					24.4									Noise Level	24.4	
16920					29.6									Noise Level	29.6	
1909.8	94.6		91.1		32.5	31.8								Fundamental High	127.1	
3819.6	52.7	33.9	57.8	34.4	5.6	-31.9	-55.3	-13.0	-13.0	-18.9	-42.3	0	1.2		63.4	40.0
5729.4	47.7	31.4	48.1	32	11.5	-35.6	-51.7	-13.0	-13.0	-22.6	-38.7	124	1.1		59.6	43.5
7639.2	51.4	33.3	53.6	34.7	15.8	-25.8	-44.7	-13.0	-13.0	-12.8	-31.7	338	1.3		69.4	50.5
9549	53.1	34.9	51.9	35	17.5	-24.7	-42.8	-13.0	-13.0	-11.7	-29.8	132	1.2		70.6	52.5
11458.8	47.6		49.2		22.1	-23.9		-13.0		-10.9		57	1	AVG at Noise level	71.3	22.1
13368.6					23.4									Noise Level	23.4	
15278.4					24.6									Noise Level	24.6	
17188.2					31.0									Noise Level	31.0	

Siemens Substitution SC107139

10-26-2001

SAB

Frequency mHz	target level dBmV	Horn Gain dBi	cable loss dB	Signal Generator dBm	Total (EIRP) dBm	Spec dBm	Margin dBm
3700.4	58.0	7.9	7.1	-39.9	-39.1	-13	-26.1
5550.6	57.5	8.9	8.9	-30.2	-30.2	-13	-17.2
7400.8	42.0	9.5	10.3	-30	-30.8	-13	-17.8
9251	51.1	11	11.9	-28.2	-29.1	-13	-16.1
11101.2	41.0	10.9	13.2	-26.2	-28.5	-13	-15.5
3760	45.8	7.9	7.1	-24	-23.2	-13	-10.2
5640	42.8	8.8	9.0	-24.3	-24.5	-13	-11.5
7520	42.0	9.5	10.4	-25.5	-26.4	-13	-13.4
9400	51.1	10.6	12.0	-26	-27.4	-13	-14.4
11280	41.0	10.8	13.2	-24.0	-26.4	-13	-13.4
3819.6	45.8	7.8	7.3	-26	-25.5	-13	-12.5
5729.4	42.8	8.8	9.4	-31	-31.6	-13	-18.6
7639.2	42.0	9.8	10.5	-27.5	-28.2	-13	-15.2
9549	51.1	10.1	12.0	-24	-25.9	-13	-12.9
11458.8	41.0	11	13.4	-21.5	-23.9	-13	-10.9

GSM 1900 Low Band

#6706 Hp 8350B Swept Signal Generator

Transmit: #798 Model 3115 Horn

ATTESTATION STATEMENT

GENERAL REMARKS:

SUMMARY:

All tests were performed per CFR 47, *Part 2, Paragraphs 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055; Part 22, Paragraphs 22.913; 22.917(b)(2); and Part 24, Paragraphs 24.232(b); 24.238(a) and (b).*

■ - Performed

The Equipment Under Test

■ - **Fulfills** the requirements of CFR 47, *Part 2, Paragraphs 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055; Part 22, Paragraphs 22.913; 22.917(b)(2); and Part 24, Paragraphs 24.232(b); 24.238(a) and (b)*

- TÜV PRODUCT SERVICE, INC. -

Responsible Engineer:



Dave Bernardin
(EMC Senior Engineer)

Appendix A

Additional Data
RX Spurious Emission (FCC Part 22, Paragraph 22.917(f))

Evans, Judy

From: Fleury, Chip
Sent: Friday, November 02, 2001 9:12 AM
To: Evans, Judy
Subject: FW: Your question / TDMA

-----Original Message-----

From: FCOPERIC@fcc.gov [mailto:FCOPERIC@fcc.gov]
Sent: Friday, September 14, 2001 5:57 AM
To: cfleury@tuvglobal.com
Cc: Raymond Laforge
Subject: Your question / TDMA

Sorry for the delay in response.

First, regarding the general measurement of (out of band) spurious emissions, the correct measurement RBW setting is 30 kHz per Section 22.917(h). When a lesser value of RBW is used, the attenuation requirement is adjusted by the ratio of the required RBW to the actual RBW. For example, if 300 Hz is used, then the attenuation requirement is increased by $10\log(30\text{k}/300) = 20 \text{ dB}$.

Regarding the measurement for emissions under Section 22.917(f), your second proposed method is preferred since the entire 869 - 896 MHz frequency band can be displayed.

From: <cfleury@tuvam.com>
To: <rlaforge@fcc.gov>
Date: 9/5/01 4:19PM

Hello Mr. LaForge:

I have very little experience with TDMA and I need to ask a question about testing and reviewing a report. The device is a handset tested to part 22. In Part 22.917 (f) and (h)(ii), I have the following questions.

1. I have noted in previous reports that the FCC has allowed limited bandwidths down to 1kHz and 300Hz for testing spurious emission. The procedure calls for 30kHz. Which is correct? Since this is a TDMA only the suppression circuitry is used without a duplexer and the procedure for testing becomes significant. I have stated below two options are either of these correct or is some other method better. Thanks...

TDMA-cell phone in "base frequency range": title 47 part 22.917(f). The question is caused by the fact we do not have AMPS in our cell phone and so another kind of emission suppression circuitry is used without duplexer.

Because in 22.917(f) and (ii) is stated a limit of

- 1) -80 dBm for
- 2) mean power
- 3) of any emission appearing in the base station frequency range and a resolution bandwidth of
- 4) 30 kHz for any emission more than 45 kHz removed from carrier

we are using the following settings on our spectrum analyzer:

(First Method)

- 1) Limit line = -80 dBm
- 2) averaging versus time: 100 times
- zero frequency span mode,

Ala

- sample detector,
 - minimum sweep time 100 ms and
 - free run
- 3) each frequency between 869 MHz to 894 MHz in steps of 30 kHz
- 4) resolution bandwidth = 30 kHz, video bandwidth = 30 kHz.

which is similar to GSM 11.10 = ETSI EN 300 607-1 V8.1.1 (200-10), 13.4.4.2
b

or
(Second method, because have no gated measurements as for GSM):

- 1) Limit line = -80 dBm
- 2) averaging versus time: 100 times
- sample detector,
 - automatic selected sweep time (approx. 85 ms) and
 - free run
- 3) 869 MHz to 894 MHz (span = 25 MHz)
- 4) resolution bandwidth = 30 kHz, video bandwidth = 100 kHz.

Measurement are planned to be done at three different transmitter frequencies: low, mid and high channels.

Because the number of involved transmit and receive time slots are not specified we ask hereby for clarification, whether these spectrum analyzer settings are in accordance to the FCC requirements.

Thanks for your help.

CHIP

A1b

RX SPURIOUS EMISSION

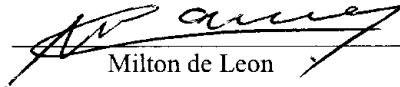
Test of: SIEMENS S46, FCC ID PWX-S46

Date(s) of Test: 10/18/01
10/19/01

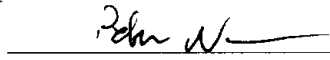
Lab:

**Siemens
Information and
Communication Mobile LLC
16745 West Bernardo Drive
Suite 400
San Diego, CA 92127**

Tested by:


Milton de Leon

Checked by:


Peter Nevermann

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1 INTRODUCTION

THIS DOCUMENT SHOWS THE PERFORMANCE OF S46 SIEMENS MOBILE PHONE, REGARDING TO SPURIOUS EMISSION ON RX FREQUENCIES DURING TDMA OPERATION AT CELLULAR BAND.

2 TEST SET UP

2.1 Equipment Description

1. FSP7 – Spectrum Analyzer 9Khz to 7Ghz RODE&SCHWARTZ	Serial No. 100175 Calibration Certificate No. 20-70452
2. 8652A – Power Meter Giga-tronics	Serial No. 8650929 Calibration Ref. No. 29864/ 441274
3. 80420A – Power Sensor Giga-tronics	Serial No. 1834334 Calibration Ref. No. 29864/ 441274
4. CMU-200 – Radio Communication Tester RODE&SCWARTZ	Serial No. 100432 Calibration Certificate No. 20-74539
5. 85902A – Burst Carrier Trigger Agilent	Serial No. 3308A01293 Calibration Certificate No. N/A
6. 66319D – Mobile Communication DC Source Agilent	Serial No. US40180455 Calibration Certificate No. N/A

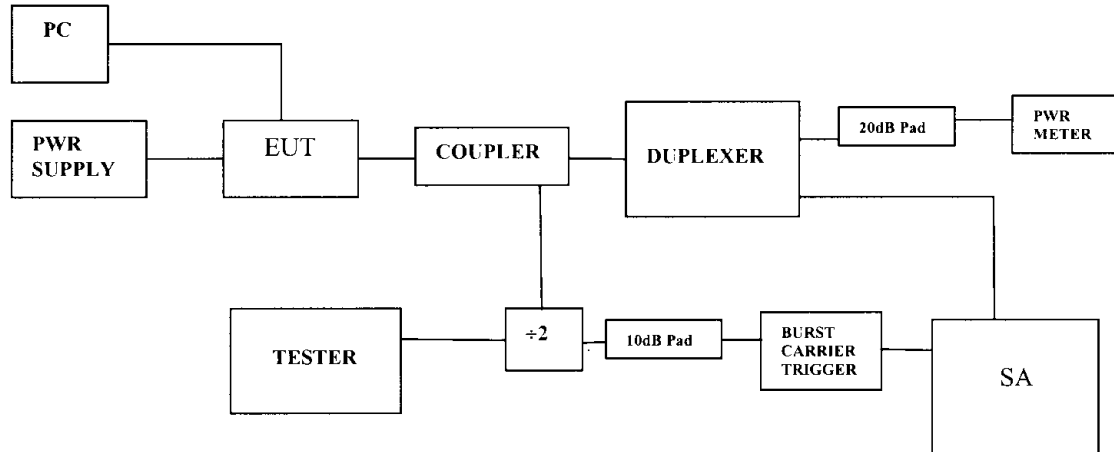
2.2 Accessories

1. 1538RA-20 – Directional Coupler 0.5 to 2Ghz Narda Microwave
2. WD-00003 – Duplexer Filter Lorch Microwave
3. 6B5W – 5Watts 20 dB Attenuator INMET
4. 47-10 – 2 Watts 10 dB Attenuator Weinschel
5. 64671 – Power Splitter INMET
6. Coaxial Adapters (several)
7. Coaxial Cables (several)
8. Test Software Morpheus Version 3.90

2.3 Equipment Under Test

S46 Siemens Mobile Phone	Serial No. 07104 IMEI: 00499951094951
S46 Siemens Mobile Phone	Serial No. 07035 IMEI: 00499951094796

2.4 Test Set –up Block Diagram



3 TEST DESCRIPTION

3.1 Equipment settings

66319D - Power Supply	Nominal Operational Voltage Imax=3.0A
CMU200 – Communication Tester	IS136800 Signaling Mode/Default settings RF Attenuation = according total set-up losses
FSP7 – Spectrum Analyzer	Frequency: 869 Mhz to 894 Mhz RBW: 30 KHz (Manual) VBW: 30 KHz (Manual) Sweep: Auto selected (140ms) Detector: Sample Trace: Averaging over 200 cycles Trigger: pulsed, gated to transmit pulse Offset: according total set-up losses
8652A Power Meter	Sensor Set-up: Pulse Average Power Duty Cycle=33.3% Offset: according total set-up losses

3.2 Test procedure

3.2.1 Using software tool Morpheus 3.90 (Unit 07104 used)

- Using the CMU200 as a base station and Morpheus 3.90 as test software, establish a call with the EUT.
- Set the EUT power level to MAC=2 (Unit operates at +25.9 dBm at this power level)
- Set the Tx channel No. to 991 (824.04 Mhz)
- Measure the Spurious emission at RX Band with the Spectrum Analyzer
- Repeat the procedure for TX channel No. 384 (836.52 Mhz) and 799 (848.97 Mhz)

3.2.2 Using normal call software (Unit 07035 used)

- Using the CMU200 as a base station and the MMI to establish a call with the EUT.
- Set the EUT power level to MAC=2 (Unit operates at +26.0 dBm at this power level)
- Set the Tx channel No. to 991 (824.04 Mhz)
- Measure the Spurious emission at RX Band with the Spectrum Analyzer
- Repeat the procedure for TX channel No. 384 (836.52 Mhz) and 799 (848.97 Mhz)

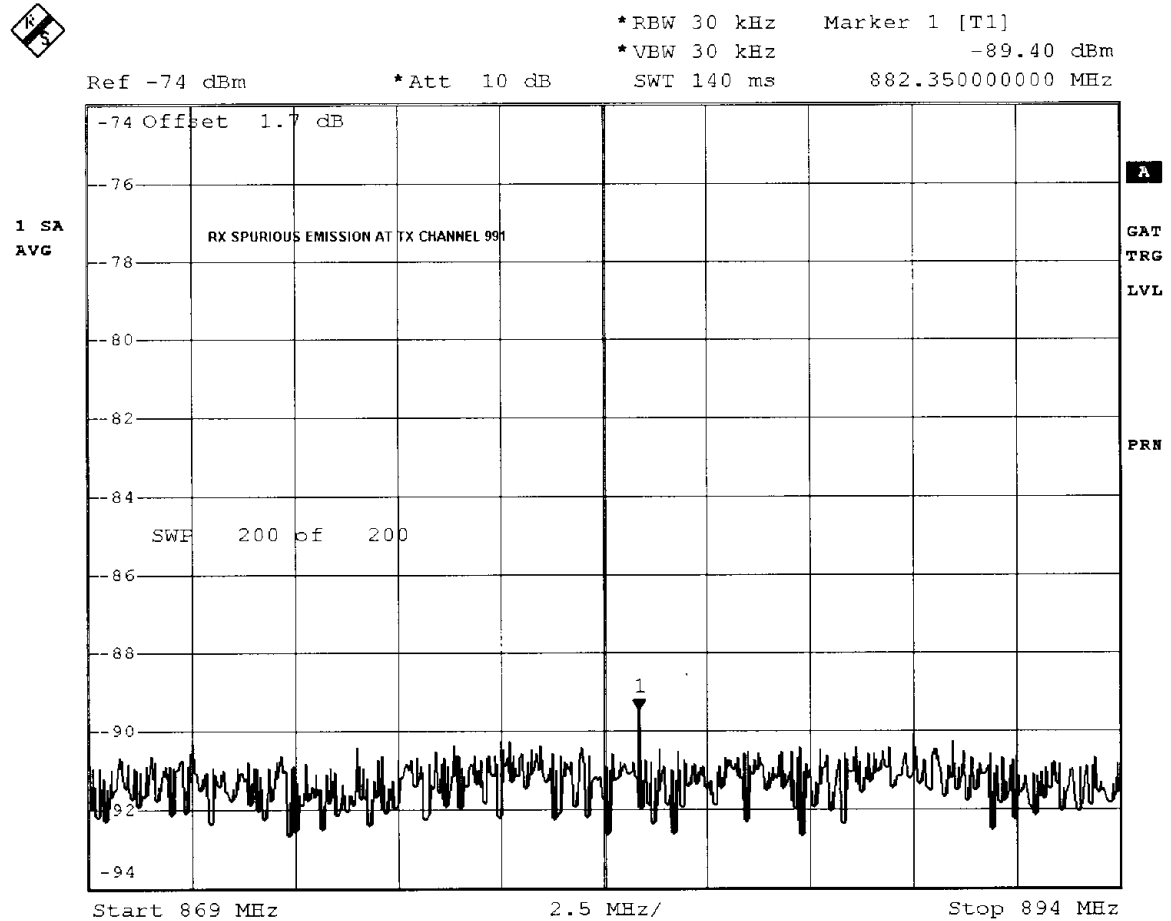
3.3 Specification

- The power level of any emissions at the receive band, measure with 30Khz RBW, shall not exceed -80dBm.

4 Test Results

4.1 Unit SN 07104

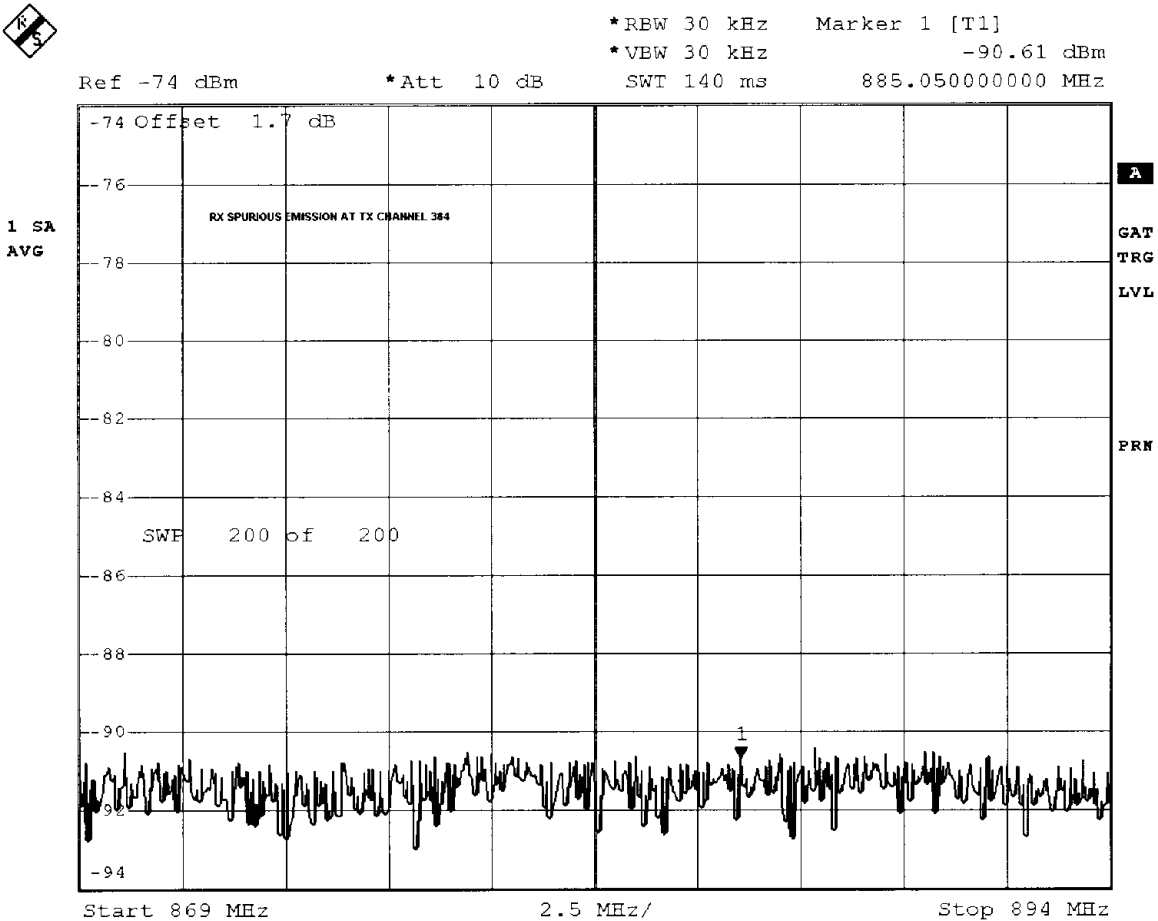
4.1.1 Spurious emission at TX Channel 991(824.04 MHz)



Date: 18.OCT.2001 11:43:38

AK

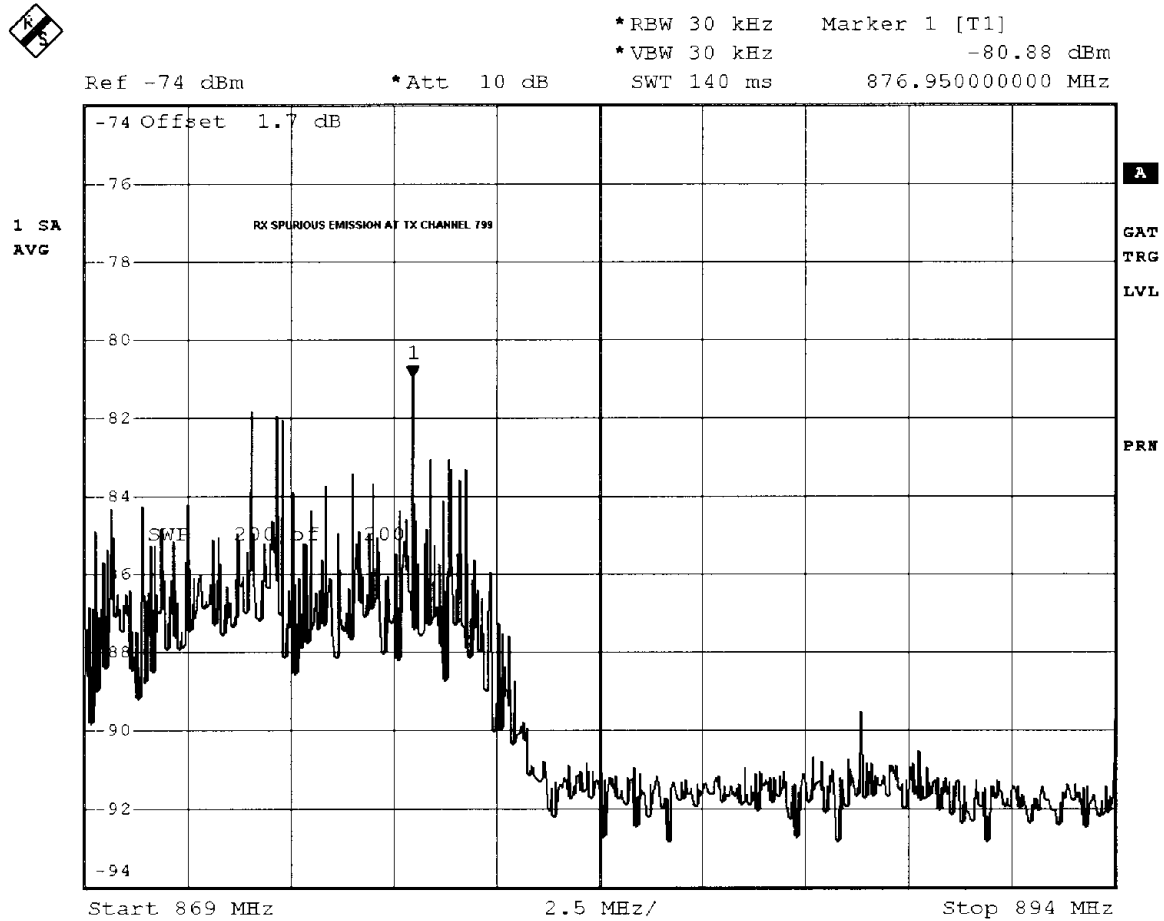
4.1.2 Spurious emission at TX Channel 384 (836.52 MHz)



Date: 18.OCT.2001 11:37:56

A7

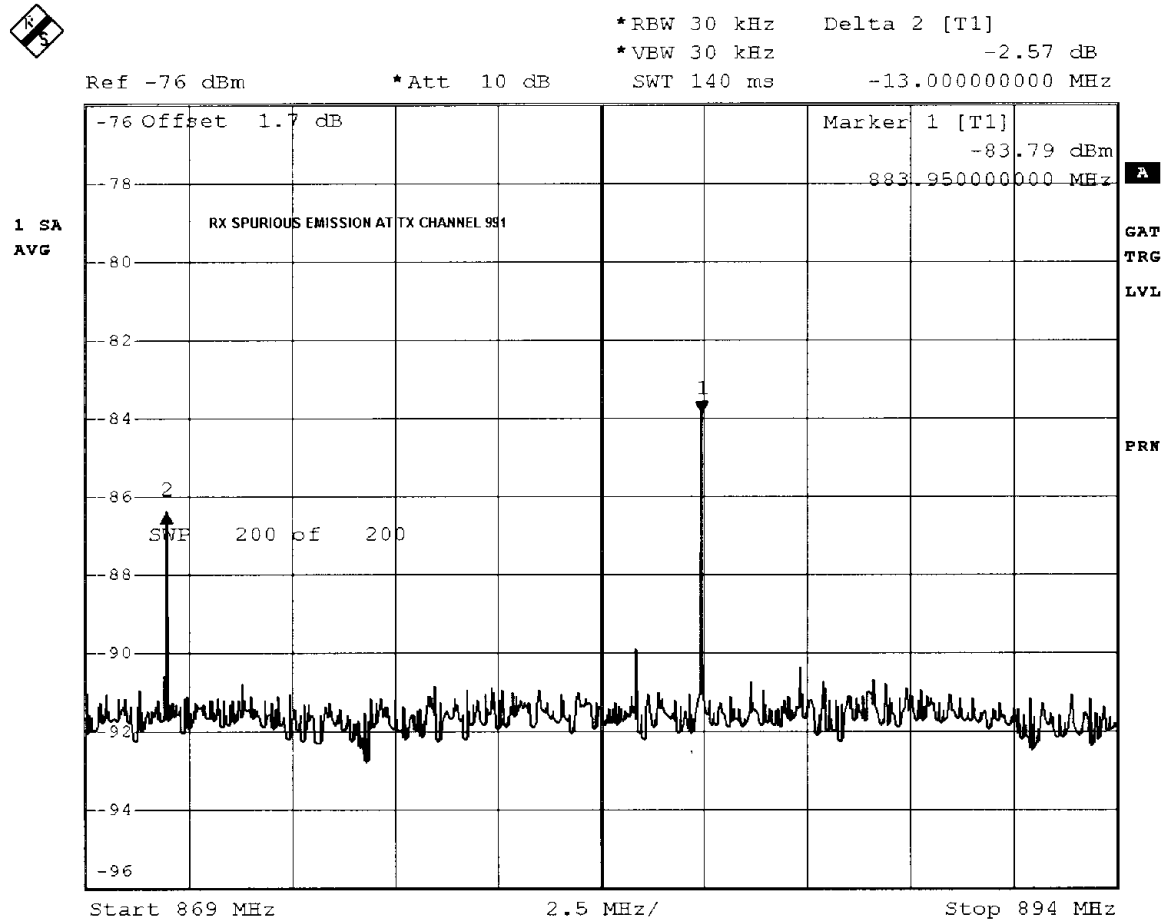
4.1.3 Spurious emission at TX Channel 799 (848.97MHz)



Date: 18.OCT.2001 11:15:18

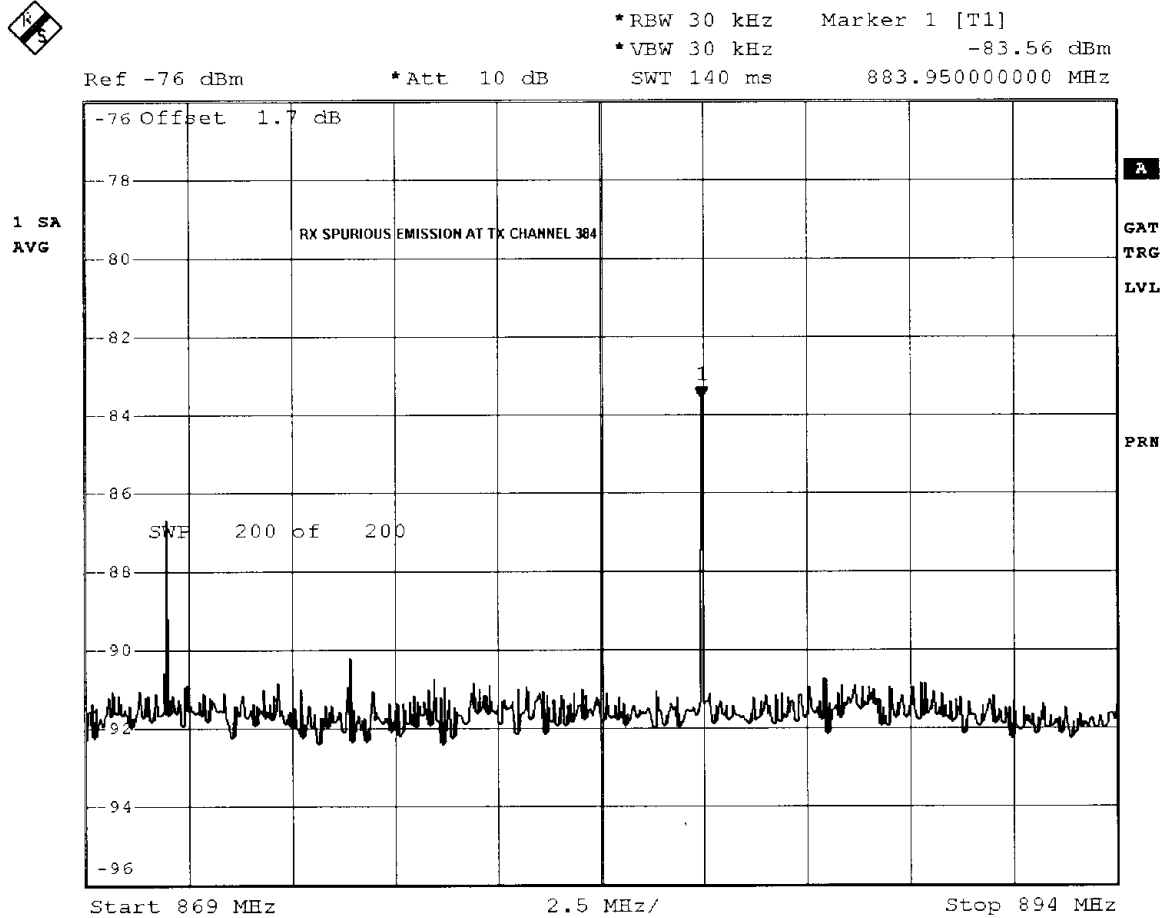
4.2 Unit SN 07035

4.2.1 Spurious emission at TX Channel 991(824.04 MHz)



Date: 19.OCT.2001 14:53:56

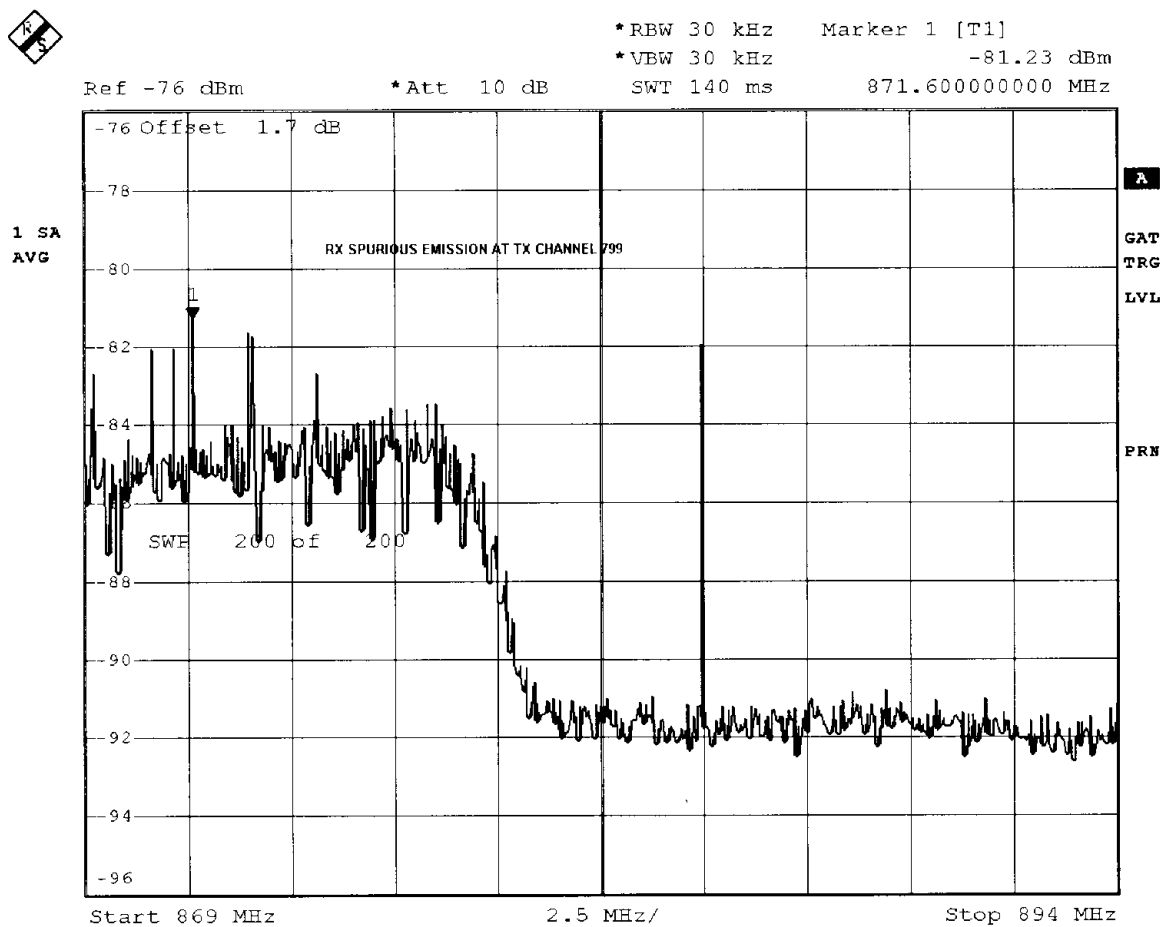
4.1.2 Spurious emission at TX Channel 384 (836.52 MHz)



Date: 19.OCT.2001 14:49:11

AID

4.1.3 Spurious emission at TX Channel 799 (848.97MHz)



Date: 19.OCT.2001 14:33:32

All

**ROHDE & SCHWARZ**

Messgerätebau GmbH

Kalibrierschein
Calibration Certificate

Nummer 20-74539

Number

Gegenstand
Item UNIVERSAL RADIO COMMUNICATION
TESTERHersteller
Manufacturer ROHDE & SCHWARZTyp
Type CMU200Material Nr.
Material No. 1100.0008K02Serial Nr.
Serial No. 100432Auftraggeber
CustomerBestellung Nr.
Order No.Ort u. Datum d. Kalibrierung
Place and date of calibration Memmingen, 2001-05-15Umfang der Kalibrierung
Scope of calibration Standard CalibrationEingangsprüfung
Performance on receiptKalibrierergebnis
Result of calibration Measurement results within
specificationsUmfang des Kalibrierscheins
Extent of the certificate 2 pages incl. this

Dieser Kalibrierschein dokumentiert, daß der genannte Gegenstand nach festgelegten Vorgaben geprüft und gemessen wurde. Die Meßwerte lagen im Regelfall mit einer Wahrscheinlichkeit von annähernd 95 % im zugeordneten Werteintervall (Erweiterte Meßunsicherheit mit $k = 2$).

Die Kalibrierung erfolgte mit Meßmitteln und Normen, die direkt oder indirekt durch Ableitung mittels anerkannter Kalibriertechniken rückgeführt sind auf Normale der PTB/DKD oder anderer nationale/internationaler Standards zur Darstellung der physikalischen Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI). Wenn keine Normale existieren, erfolgt die Rückführung auf Bezugsnormale der R&S-Laboratorien.

Grundsätze und Verfahren der Kalibrierung entsprechen IEC/ISO 17025. Das Bestätigungssystem für die verwendeten Meßmittel entspricht DIN ISO 10012-1.

Das angewandte Qualitätsmanagement-System ist zertifiziert nach DIN EN ISO 9001.

Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Kalibrierscheine ohne Signifizierungen sind ungültig.

Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.

This calibration certificate documents, that the named item is tested and measured against defined specifications.

Measurement results are located usually in the corresponding interval with a probability of approx. 95 % (coverage factor $k = 2$).

Calibration is performed with test equipment and standards directly or indirectly traceable by means of approved calibration techniques to the PTB/DKD or other national/international standards, which realize the physical units of measurement according to the International System of Units (SI). In all cases where no national standards are available, measurements are referenced to standards of the R&S laboratories.

Principles and methods of calibration correspond with IEC/ISO 17025. The metrological confirmation system for the measuring equipment used is in compliance with DIN ISO 10012-1. The applied quality system is certified to DIN EN ISO 9001.

This calibration certificate may not be reproduced other than in full. Calibration certificates without signatures are not valid.

The user is obliged to have the item recalibrated at appropriate intervals.

ROHDE & SCHWARZ
RefNo. 20-74539
Cal 2001-05-15 Customized Due Date

Ausstellungsdatum
Date of issue

2001-05-16

Laborleitung
Head of laboratory
SteigmüllerBearbeiter
Person responsible

Rampp

A12

Type CMU200
Item UNIVERSAL RADIO COMMUNICATION
TESTER
Page 2/2

Serial No. 100432
Material No. 1100.0008K02
Cal. Date 2001-05-15
Calibration Certificate No.

 **ROHDE & SCHWARZ**
Messgerätebau GmbH, Memmingen
20-74539

Kalibrieranweisung 1100.0008.01-T-03.00
Calibration instruction

Umgebungstemperatur $(23^{+7}_{-3})^{\circ}\text{C}$
Ambient temperature

Eingangsdatum
Date of receipt

Relative Luftfeuchte 20%-60%
Relative humidity

Verwendete Gebrauchsnormale
Working Standards used

Gegenstand Item	Typ Type	Serial Nr. Serial No.	Kalibrierschein Nr. Certificate No.	Kalibr. bis Cal. due
Power Splitter 0 - 18 GHz	1870A	4383	99890	2002-03-31
Signal Analyzer	FSIQ7	834767/003	111967	2002-12-31
Coupler 0,05 ... 1 GHz	NA3020A	39996	119233	2002-03-31
Coupler 0,05 ... 1 GHz	NA3022	77472	119234	2002-03-31
Power Sensor 50 Ohm	NRV-Z4	834165/012	99665	2002-03-31
Power Sensor 50 Ohm	NRV-Z4	834165/037	100977	2002-04-30
Power Sensor 50 Ohm	NRV-Z4	834165/036	100976	2002-04-30
Power Sensor 50 Ohm	NRV-Z4	834165/039	100978	2002-04-30
Power Sensor 50 Ohm	NRV-Z4	834165/013	99666	2002-03-31
Power Sensor 50 Ohm	NRV-Z4	834165/009	99664	2002-03-31
Thermal Power Sensor 50 Ohm	NRV-Z51	834151/006	100969	2002-04-30
Thermal Power Sensor 50 Ohm	NRV-Z51	834151/005	100970	2002-04-30
Thermal Power Sensor 50 Ohm	NRV-Z51	834151/027	100971	2002-04-30
Dual Channel Power Meter	NRVD	834501/010	100973	2002-04-30
Dual Channel Power Meter	NRVD	834501/009	100974	2002-04-30
Dual Channel Power Meter	NRVD	834501/006	100972	2002-04-30
Dual Channel Power Meter	NRVD	834501/003	99771	2002-03-31
Dual Channel Power Meter	NRVD	834501/002	99770	2002-03-31
Signal Generator 5 kHz - 3 GHz	SME03	834617/015	100979	2003-04-30
Signal Generator 5 kHz - 3 GHz	SME03	834191/038	99472	2003-03-31
Vector Signal Generator	SMIQ03B	834855/040	121258	2004-04-30
Audio Analyzer	UPL	833465/007	119240	2004-03-31
RMS Peak Voltmeter	URE3	833674/002	121256	2003-04-30

Anmerkungen
Notes

Installed Options are included in calibration. Depending on installed options, numbers of pages of the record are not consecutive.

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CERTIFICATE OF CALIBRATION

To Whom It May Concern:

MODEL: 8652A

SERIAL NO: 8650929

REFERENCE/S.O. NO: 29864/ 441274

CALIBRATION TEMPERATURE (CELSIUS): 22 HUMIDITY (%): 45

CAL DATE: 01MAY29 DATE PLACED IN SERVICE: _____ * DUE DATE: _____ *

*The due date may be established (by the customer) by adding the recommended cal interval to the 'DATE PLACED IN SERVICE'.

GIGA-TRONICS RECOMMENDED CAL INTERVAL IS 12 MONTHS

CALIBRATION TECHNICIAN STAMP: 29

LOCATION NUMBER(S): 62011

EQUIPMENT TRACEABILITY LIST REQUIRED: ☒ NO ☐ YES (SEE ATTACHED LIST)

GIGA-TRONICS Incorporated certifies that this instrument meets all its published specifications and has been calibrated using standards whose accuracies have been compared at planned intervals and are traceable to the National Institute of Standards and Technology (NIST), and have been derived from accepted values of natural physical constants or have been derived from ratio type of self-calibration technique. The environment in which this instrument was calibrated is maintained within the operating specifications of the instrument and of the standards.

Copies of data are on file and are available for an additional charge up to one year after calibration.

Tom Kramer
Tom Kramer, Director of Quality Assurance
QUF08007 08/02/99

01-MAY-25
(Date Signed)

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Calibration Documents

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**ROHDE & SCHWARZ**

Messgerätebau GmbH

Kalibrierschein
Calibration Certificate**Nummer** 20-70452**Number**

Gegenstand
Item

SPECTRUMANALYZER 9KHZ TO 7GHZ
-140..+30DBM;RBW 10HZ TO 10MHZ
TFT COLOURDISPLAY;

Hersteller
Manufacturer

ROHDE & SCHWARZ

Typ
Type

FSP7

Material Nr.
Material No.

1093.4495K07

Serial Nr.
Serial No.

100175

Auftraggeber
Customer

Dieser Kalibrierschein dokumentiert, daß der genannte Gegenstand nach festgelegten Vorgaben geprüft und gemessen wurde. Die Meßwerte lagen im Regelfall mit einer Wahrscheinlichkeit von annähernd 95 % im zugeordneten Werteintervall (Erweiterte Meßunsicherheit mit $k = 2$).

Die Kalibrierung erfolgte mit Meßmitteln und Normen, die direkt oder indirekt durch Ableitung mittels anerkannter Kalibriertechniken rückgeführt sind auf Normale der PTB/DKD oder anderer nationaler/internationaler Standards zur Darstellung der physikalischen Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI). Wenn keine Normale existieren, erfolgt die Rückführung auf Bezugsnormale der R&S-Laboratorien.

Grundsätze und Verfahren der Kalibrierung entsprechen IEC/ISO 17025. Das Bestätigungssystem für die verwendeten Meßmittel entspricht DIN ISO 1 0012-1.

Das angewandte Qualitätsmanagement-System ist zertifiziert nach DIN EN ISO 9001.

Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Kalibrierscheine ohne Signifizierungen sind ungültig.

Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.

This calibration certificate documents, that the named item is tested and measured against defined specifications.

Measurement results are located usually in the corresponding interval with a probability of approx. 95 % (coverage factor $k = 2$).

Calibration is performed with test equipment and standards directly or indirectly traceable by means of approved calibration techniques to the PTB/DKD or other national/international standards, which realize the physical units of measurement according to the International System of Units (SI). In all cases where no national standards are available, measurements are referenced to standards of the R&S laboratories.

Principles and methods of calibration correspond with IEC/ISO 17025. The metrological confirmation system for the measuring equipment used is in compliance with DIN ISO 10012-1. The applied quality system is certified to DIN EN ISO 9001.

This calibration certificate may not be reproduced other than in full. Calibration certificates without signatures are not valid.

The user is obliged to have the item recalibrated at appropriate intervals.

Bestellung Nr.
Order No.

Ort u. Datum d. Kalibrierung
Place and date of calibration

Memmingen, 2001-04-02

Umfang der Kalibrierung
Scope of calibration

Standard Calibration

Eingangsprüfung
Performance on receipt

Kalibrierergebnis
Result of calibration

Measurement results within specifications

Umfang des Kalibrierscheins
Extent of the certificate

2 pages incl. this

RefNo. 20-70452

Cal 2001-04-02 Customized Due Date

Ausstellungsdatum
Date of issue

2001-04-02

Laborleitung
Head of laboratory

Steigmüller

Bearbeiter
Person responsible

Olgun

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Type FSP7
Item SPECTRUMANALYZER 9KHZ TO 7GHZ
-140...+30DBM;RBW 10HZ TO 10MHZ
Page 2/2

Serial No. 100175
Material No. 1093.4495K07
Cal. Date 2001-04-02
Calibration Certificate No.


ROHDE & SCHWARZ
Messgerätebau GmbH, Memming
20-70452

Kalibrieranweisung 1093.4495.01-PB-01.06
Calibration instruction
Umgebungstemperatur $(23^{+7}_{-3})^{\circ}\text{C}$
Ambient temperature

Eingangsdatum
Date of receipt
Relative Luftfeuchte 20%-60%
Relative humidity

Verwendete Gebrauchsnormale
Working Standards used

Gegenstand Item	Typ Type	Serial Nr. Serial No.	Kalibrierschein Nr. Certificate No.	Kalibr. bis Cal. due
Power Splitter 0 - 18 GHz	11667A	23050	105244	2001-07-31
Power Sensor 50 Ohm	NRV-Z4	825038/023	105348	2003-07-31
Power Sensor 50 Ohm	NRV-Z5	825039/009	105354	2003-07-31
Dual Channel Power Meter	NRVD	849708/003	105337	2003-07-31
HW RSF MP337	RSF-337	503808001	105513	2001-07-31
Signal Generator	SMHU	825041/012	105480	2003-07-31

Anmerkungen
Notes

Installed Options are included in calibration. Depending on installed options, numbers of pages of the record are not consecutive

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CERTIFICATE OF CALIBRATION

To Whom It May Concern:

MODEL: 80420A

SERIAL NO: 1834334

REFERENCE/S.O. NO: 29864/ 441274

CALIBRATION TEMPERATURE (CELSIUS): 22 HUMIDITY (%): 56

CAL DATE: 01 MAY 23 DATE PLACED IN SERVICE: _____ * DUE DATE: _____ *

*The due date may be established (by the customer) by adding the recommended cal interval to the 'DATE PLACED IN SERVICE'.

GIGA-TRONICS RECOMMENDED CAL INTERVAL IS 12 MONTHS

CALIBRATION TECHNICIAN STAMP: 42

LOCATION NUMBER(S): 682002, 57, 58

EQUIPMENT TRACEABILITY LIST REQUIRED: ☒ NO ☐ YES (SEE ATTACHED LIST)

GIGA-TRONICS Incorporated certifies that this instrument meets all its published specifications and has been calibrated using standards whose accuracies have been compared at planned intervals and are traceable to the National Institute of Standards and Technology (NIST), and have been derived from accepted values of natural physical constants or have been derived from ratio type of self-calibration technique. The environment in which this instrument was calibrated is maintained within the operating specifications of the instrument and of the standards.

Copies of data are on file and are available for an additional charge up to one year after calibration.

Anita Manis
Tom Kramer, Director of Quality Assurance
QUP08007 08/02/99

01-MAY-25
(Date Signed)

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