FCC APPLICATION INQUIRY RESPONSE
L82-228869: SIEMENS GIGASET 2400 HANDSET
Correspondence Number: 3654
September 25, 1998

1.0 Overview

This package was compiled to reply to address some questions for the Handset portion of the Siemens SOHO system. This document is based on a request for data provided by Rich Fabina on September 25, 1998.

2.0 Inquiry Responses

(1) **The bandwidth plot for channel 95 of this transmitter does not appear to be centered on the operating frequency specified for channel 95 in the test report. The operating frequency for channel 95 shown on page 16 is 2483.136 MHz. This bandwidth plot is centered on 2482.83 MHz, a difference of 306 kHz. This may not seem like much, but if I assume that the center frequency of the submitted channel 95 bandwidth plot is 2583.136 MHz, the 2483.5 MHz bandedge is only 2.5 divisions above the center of the plot. At this point, transmitter emission on channel 95 is NOT 20 dB down from the peak. It is approximately 17 dB down. Also, if the peak radiated field strength of the fundamental emission on channel 95 is 124.2 dBuV/m, the peak field strength of the emission peak located at the restricted band frequency of 2483.5 MHz is 107.2 dBuV/m (126.2 - 17 dB = 109.2). This is 33.2 dB above the peak limit of 74 dBuV/m. Please address this issue of possible non-compliance.**

Answer:

The original version of Part 15 (Oct 1996) version that we were using showed the limit for this section (15.247(c)) shall be either 20 dB down or meet 15.209, whichever has the least attenuation. The revised (July 1998) version of this document states the 20 dB criteria without a 'least attenuation' criteria. The appropriate portions of 15.205 must also be met.

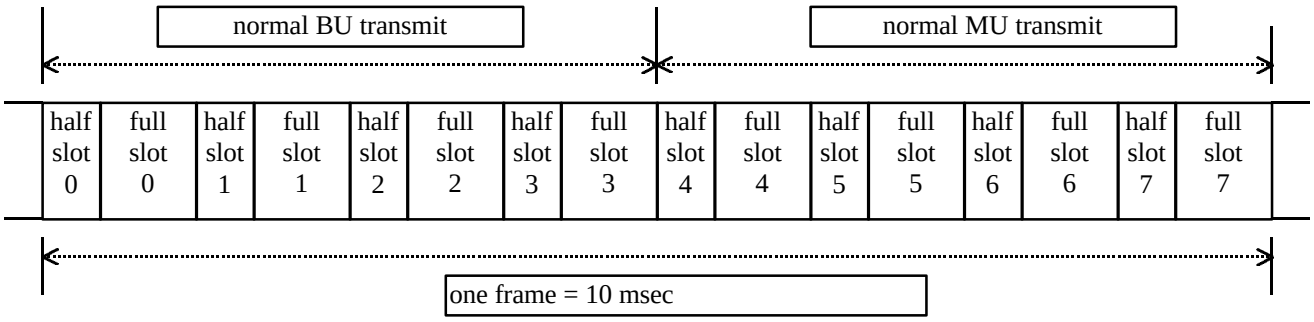
Following the last inquiry made by Joe Dichoso, a recheck of the center frequencies for the Desk Station and Handsets were made. Revised occupied bandwidth data was taken with full calibration and tuning of the analyzer verified as well as the integrity of the shield cover for the EUT verified (this was found to be a factor in the center frequency for the devices). The emission center frequency is now very close to the nominal figure and all bandedges are now within the 20 dB criteria. The occupied bandwidth still meets the requirements of the Rules. All of these tests were made with the EUT in fixed freuqency mode.

Measurements of the emissions of the EUT in fixed frequency mode set to Channel 95 were made at the base of this restricted band. Measurements were made using average detection criteria in accordance with Section 15.205 (b) of the Rules (measurement above 1 GHz). All emissions in this area were below the 15.205/15.209 limit. Data indicating compliance with the 15.205 restricted band is included with this submission.

(2) Provide information that verifies that the worst case duty cycle for this transmitter is 1/8 based upon RF on versus RF off time. No such information can be found in the filing.

Answer:

Following this morning's request, a more detailed explaination of the timing for the transmit cycle of the Siemens SOHO System was performed. The net duty cycle for the system is actually lower for the handset than previously provided The analysis of the duty cycle for this system is derived from the timing diagram for the transmit cycle of the Siemens SOHO System shown below:



The half time slots are used for processor activities inside the system components and no transmissions (from either component) occur during these periods. Each full slot is equal to two half slots, which divides the total time for the period into 24 segments (half slot lengths).

The base unit can transmit during all base unit labelled full time slots (in the normal BU bracket), but the an individual handset can only transmit during one full time slot (two segments wide) in the normal MU (Mobile Unit) bracket. This is due to the presence of only one base unit but multiple handsets per system configuration.

Based on this analysis, the 'on time' for the handset is calculated in terms of segments below:

Total number of segments = 24

Number of Segments the Handset can be transmitting = 2

Hnadset Duty Cycle = 2/24 = 1/12

(3) Redo the output power tests with the EUT in fixed transmit (non-hopping) mode. Perform the ERP calculation based on the following formula:

P(EIRP) = {(E * d)^2 } / 30

Answer:

Radiated emissions data for Channels 00, 46 and 95 are included with this document. Calculations of ERP based on the corrected formula are included with this data. We request that the Comission correct the 731 data as necessary. For all measurements, the test distance was 1 meter.

(4) Re-evaluation the RF Safety issue based on the revised EIRP results.

Answer:

Based on a conversation with Kwok Chan of the Commission on September 16, 1998, the following RF Safety analysis is provided:

The power used for evaluation to the RF Safety Hazard Specification can be derated based on the percentage that the transmit signal is actually present over time. For the Gigaset 2400 Handset, the duty cycle of the transmit signal over time is 1/8. The Power level used for comparison to the OET-65C limit can be calculated as follows:

Ref. Power = (Peak Power) * (Duty Cycle) = (0.225 watts) * (1/12) = 0.0187 watts

This figure is below the threshold (<0.2 watts at 2450 MHz for cordless phone handsets and most other trasnmitters using monopole or dipole type antennas as an integral part of the device) for this device. The Gigaset 2400 Handset uses an integral monopole antenna. Based on this criteria, special warnings or instructions are not required to show compliance for this device.

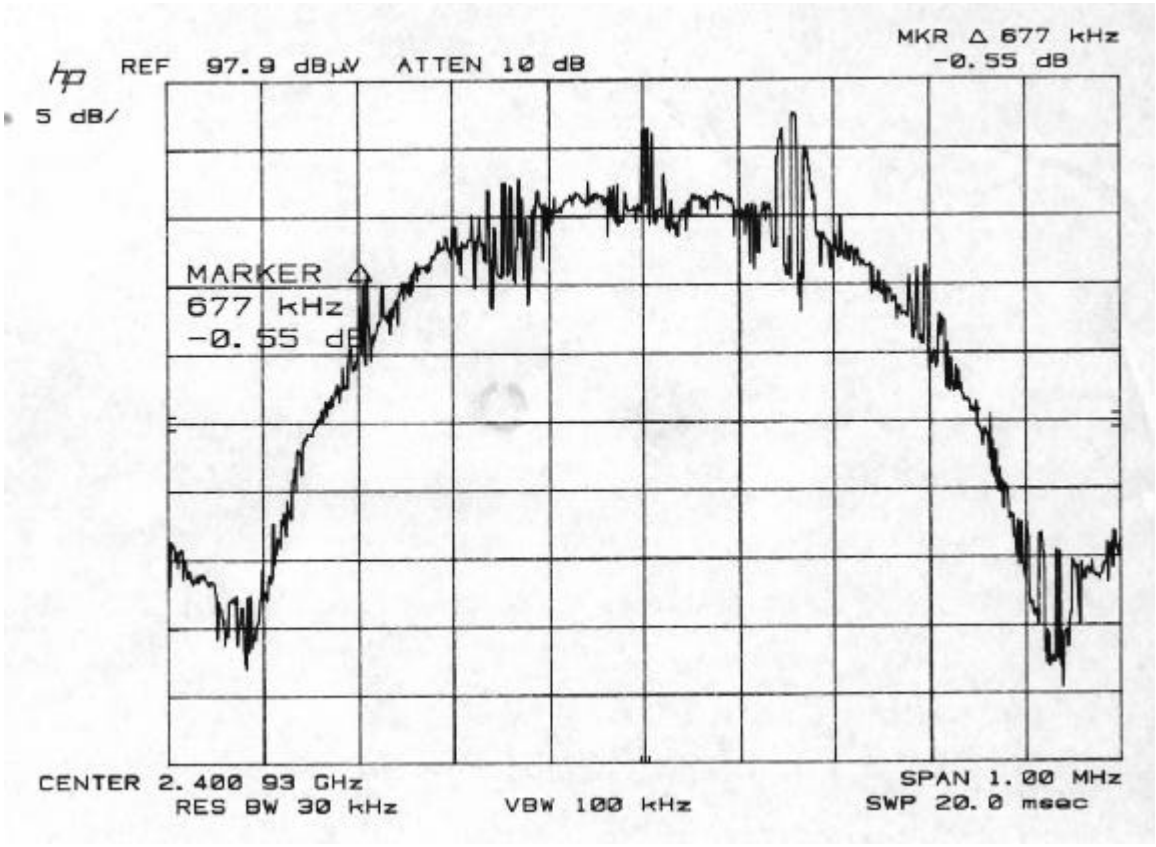
APPENDIX

EIRP, OCCUPIED BANDWIDTH AND RESTRICTED BAND DATA

Occupied Bandwidth Data Sheet

Siemens Business Communication Systems
Gigaset 2420HS Handset

SERIAL #: 6-057 PROJECT #: 99-016
DATE: September 24, 1998



COMMENT #1: Channel Setting = 00

COMMENT #2: 20dB Bandwidth = 677 kHz

TEST ENGINEER:_____ **APPROVED BY**: _____
John O'Brien Jeffrey Lenk

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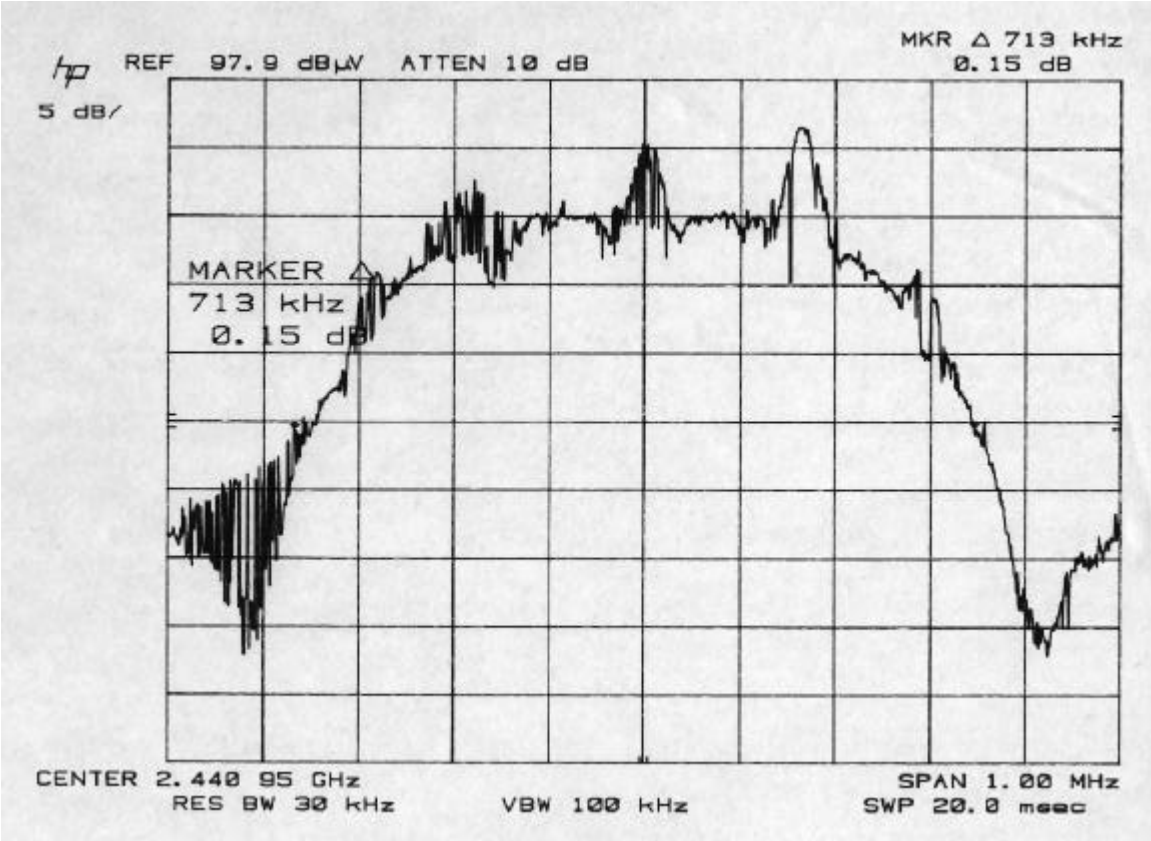

COMMENT #1: Channel Setting = 46

COMMENT #2: 20dB Bandwidth = 713 kHz

TEST ENGINEER:_____ **APPROVED BY**: _____
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Occupied Bandwidth Data Sheet

Siemens Business Communication Systems
Gigaset 2420HS Handset

SERIAL #: 6-057 PROJECT #: 99-016
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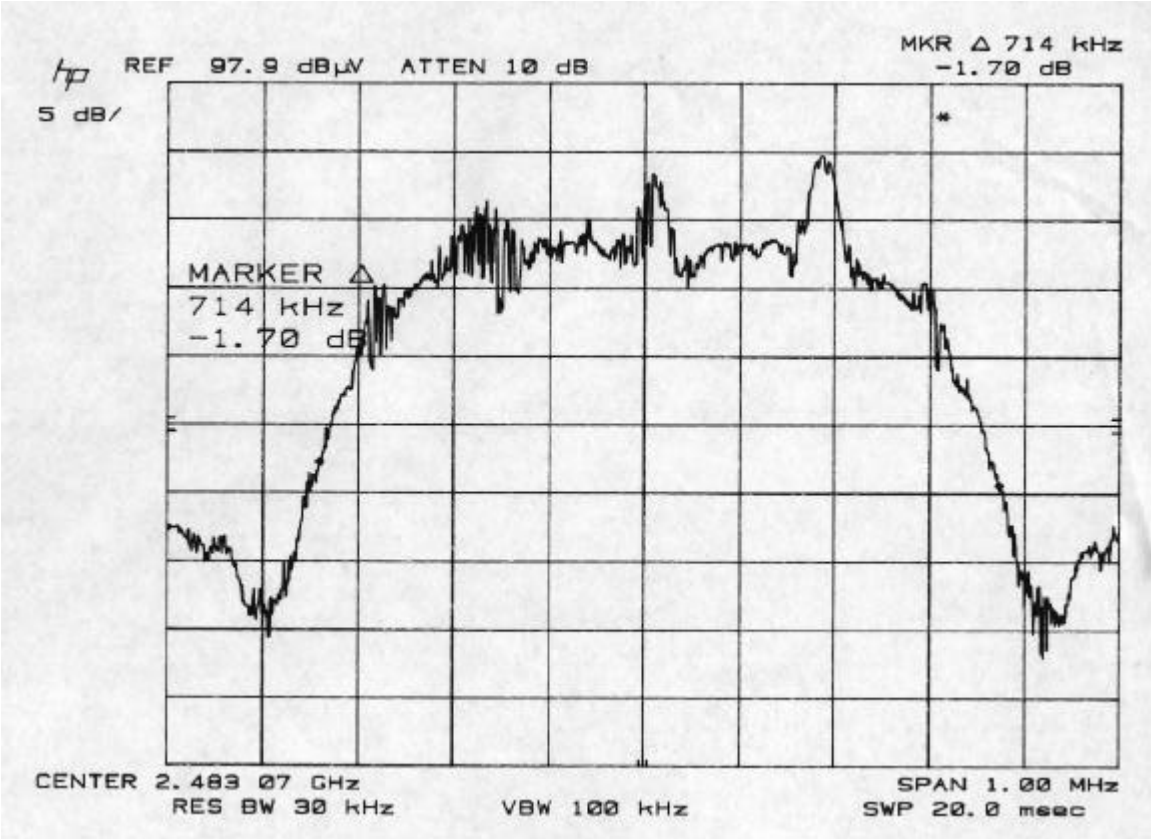

COMMENT #1: Channel Setting = 95

COMMENT #2: 20dB Bandwidth = 714 kHz

TEST ENGINEER:_____ **APPROVED BY**: _____
John O'Brien Jeffrey Lenk

Radiated Data Sheet

Siemens Business Communication Systems
Gigaset 2420HS Handset

SERIAL #: 6-057
DATE: September 25, 1998
PROJECT #: 99-016

MEASUREMENT DISTANCE (m): 1
MEASUREMENT HEIGHT: 1 meter
EUT Orientation: 180

RESTRICTED BAND TEST

Freq. (MHz)	Notes and Polarization	Recorded Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.5	(1) Vertical	32.2	26.8	1.6	60.6	63.5	-2.9
2483.5	(1) Horizontal	32.1	26.8	1.6	60.5	63.5	-3.0

Corrected Level = Recorded Level + Antenna Factor + Cable Loss

COMMENT #1: All measurements are average measurements

COMMENT #2: Test Distance 1 meter

TEST ENGINEER:_____ **APPROVED BY**: _____
John O'Brien Jeffery Lenk

Radiated Data Sheet

Siemens Business Communication Systems
Gigaset 2420HS Handset

SERIAL #: 6-057
DATE: September 25, 1998
PROJECT #: 99-016

MEASUREMENT DISTANCE (m): 1
MEASUREMENT HEIGHT: 1 meter
EUT Orientation: 180

20 dB BAND EDGE TEST: LOWER END (TX = CHANNEL 00) (1)

Freq. (MHz)	Notes and Polarization	Recorded Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2401.00	(2) Vertical	92.1	26.8	1.6	120.5	Ref	Ref
2400.60	(2) Vertical	64.7	26.8	1.6	93.1	100.5	-7.4
2400.60	(2) Horizontal	66.3	26.8	1.6	94.7	100.5	-5.8

20 dB BAND EDGE TEST: UPPER END (TX = CHANNEL 95) (3)

Freq. (MHz)	Notes and Polarization	Recorded Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.13	(2) Vertical	92.2	26.8	1.6	120.6	Ref	Ref
2483.53	(2) Vertical	69.3	26.8	1.6	97.7	100.6	-2.9
2483.53	(2) Horizontal	61.4	26.8	1.6	89.8	100.6	-10.8

Corrected Level = Recorded Level + Antenna Factor + Cable Loss

COMMENT #1:
Low Band Edge Measurement Point = Bottom Channel - ½ OBW - ½ RBW
= 2401.00 - 1/2 (682k) - ½ (100k) = 2401.00 - 0.391 = 2400.6 MHz

COMMENT #2: Peak Measurements; 100k/100k BW Settings.

COMMENT #3:
High Band Edge Measurement Point = Bottom Channel - ½ OBW - ½ RBW
= 2483.13 + 1/2 (697k) + ½ (100k) = 2483.13 - 0.399 = 2483.53 MHz

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Radiated Data Sheet

Siemens Business Communication Systems
Gigaset 2420HS Handset

SERIAL #: 6-057
DATE: Septmber 24, 1998
PROJECT #: 99-016

MEASUREMENT DISTANCE (m): 1
MEASUREMENT HEIGHT: 1 meter
EUT Orientation: 180

EIRP

Freq. (MHz)	Channel Setting	Recorded Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBuV/m)	EIRP (Watts)
2401.0	0.0	99.0	26.8	1.6	127.4	0.1832
2440.8	46.0	99.9	26.8	1.6	128.3	0.2254
2483.1	95.0	99.4	26.8	1.6	127.8	0.2009

Corrected Level = Recorded Level + Antenna Factor + Cable Loss

COMMENT #1: All measurements for this test based on peak measurement methods

COMMENT #2:

TEST ENGINEER:_____ **APPROVED BY**: _____
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