**ELECTRONIC TECHNOLOGY SYSTEMS DR.GENZ GMBH**

**ELECTRONIC TECHNOLOGY SYSTEMS DR. GENZ GMBH - ETS -**
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Federal Communications Commission
Authorization and Evaluation Division
Equipment Authorization Branch
7435 Oakland Mills Road
Columbia, MD 21046

| IHR ZEICHEN / YOUR REF. | IHR SCHREIBEN / YOUR INFORM. | UNSER ZEICHEN / OUR REF. | DATUM / DATE |
|---|---|---|---|
| | | | 11-Jun-02 |

Re: FCC ID BCE-GN9050
Applicant: GN Netcom Inc
Correspondence Reference Number: 22894
731 Confirmation Number: EA425209

Dear Mr. Dichoso,

Submitted herewith, on behalf of our customer is an amendment to the subject application, provided in response to your request for technical information:

EMC questions

Q1. You filed both the base unit and handset unit under one FCC identifier. Unless this is a cordless telephone, two separate FCC identifiers are required, file another application and indicate which unit this pending application will apply to.
If you think it is a cordless telephone, indicate compliance with 15.214 and the definition of a cordless phone in 15.3(j).

Answer:

At first I would like to thank you for your explanatory email relating this question, dated May 16, 2002.

We consider this cordless headset phone as a cordless phone in compliance with the applicable requirements.
Rule 15.3(j) applies:
The system consists of two transceivers, one a base station that connects to the public switched telephone network via a corded phone and the other a mobile headset unit that communicates directly with the base station. Transmissions from the mobile unit are received by the base station and then placed on the public switched telephone network via corded phone.
Information received from the switched telephone network is transmitted by the base station to the mobile unit.

For compliance with Rule 15.214 please find attached a declaration from the applicant.

Q2. The confidential letter indicates several items to be held confidential. Only the schematic, block diagram and operational description exhibits were marked confidential.
Items such as the parts list or antenna description were not submitted. Please correct the confidential letter to list only the schematic, block diagram and operational description exhibits.

Answer:
According to your request please find attached a revised confidential letter.
It includes also the parts lists. The parts lists were submitted with the application originally. For reasons which I don't know they didn't come through. For this reason please find attached parts lists again.

Q3. For the headset power measurements, power output listings for Vnom, Vnom antenna 1 and Vnom antenna 2 were made. Please explain. Does the headset have different antennas that will be marketed? If so additional information may be requested.

Answer:
Both, antenna I and antenna II are internal antennas printed directly on the PCB layout. For evidence please see internal photo from base unit. The antennas in normal use are diversity selected in such a way that the antennas do not transmit simultaneously but are controlled separate by selection signals which selecting only one antenna at any time. Please see also circuit diagram page 2/3 for selection signals (SEL_ANT1 and SEL_ANT2). The diversity functionality is implemented.

Q4. Provide data showing compliance with the Radiated field strength levels limits in the Restricted band of 2483.5-2500 MHz with both the handset and base operating on the highest channel.

Answer:
Please find here an examination of the most critical measurement and test plot for remote unit, channel 78, antenna vertical:

All measurements are PEAK measurements.
This consideration refers to spurious emission measurement, channel 78,
exhibit: remote test report 2, page 44 of 71.

Max. radiated carrier power on channel 78 is $P_1 = 26{,}35$ dBm.
Max. conducted carrier power on channel 78 is $P_2 = 25{,}59$ dBm.

Real antenna gain calculated is $G_i = 0{,}76$ dBi
Numerical $G_N = 1{,}19$

Conducted measurements of Band-edge Compliance on channel 78 shows a power level of about – 25 dBm on point of intersection with frequency F1 = 2.4835 GHz. Please see exhibit remote test report 2, page 70 of 71).
Power level -25 dBm is equivalent to 3,16 µW.
d = 3m for 3m OATS.
With the formula: E = root (30 x P x G) / d we will determine the field strength.
E = 3.506 µV/m equivalent 70,9 dBµV/m.
This value is below the limit (74 dB µV/m).

For the other measurements and test plots please see:
- remote unit, channel 78, antenna horizontal: exhibit: remote test report 2, page 45 of 71
- base unit, channel 78, antenna1 vertical: exhibit: base test report 3, page 5 of 75
- base unit, channel 78, antenna1 horizontal: exhibit: base test report 3, page 6 of 75
- base unit, channel 78, antenna2 vertical: exhibit: base test report 3, page 47 of 75
- base unit, channel 78, antenna2 horizontal: exhibit: base test report 3, page 48 of 75

Q5. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. For this system, it operates in different modes depending on the type interference, see operational description. For the mode with no interferer or modes with different types of interferers; a) state the number of channels used, b)indicate how the pseudorandom hopping sequence is derived. c) Provide a list of channel frequencies and a sample of a few sequences (at least two).

Answer:
Respecting the operational description the applicant declares:
"The different modes depending on the type of interference described under "2. Avoidance method" is what I will call sales gimmick trying to explain the advantage of the method used. The 9050 always operate in the same mode whether the interference is a microwave oven or CW interference etc. The method is described in "3. Adaptation to 2.4GHz ISM band.""

For (a) number of used channels, (b) pseudorandom hopping sequence derivation,
(c) channel frequencies and sample of sequences please see detailed description in exhibit Operational Description, item 3 and following.

RF Safety questions

Q1. Suppl. C has been in effect since July 2001. FCC will not accept any future reports from this lab that do not apply Suppl C procedures. Suppl C liquid parameters and dipole validations must be used.

Answer:
Thank you for this information. We will keep this requirement for all future measurements.

The new measurement equipment already is ordered but unfortunately there is a long delivery period.

Q2. Demonstrate that crest factor=27 is correct.

Answer:
According to information from the manufacturer the GN 9050 is a DECT device operating in the 2400 MHz band. In accordance with the DECT-Standard the crest-factor is 27 (a framewidth of 10 ms and 24 channels results in a slotwidth of 416.6 µs including guard time. With 48.6 µs guard time the pulsewidth of each channel is 368 µs).

Measuring pulsed signals with the DASY3 the crest factor is used to calculate the peak power in the signal and perform the compensation for the diode compression of the peak power.
A short quotation from the DASY User Manual concerning the Crest Factor:
" Pulsed and modulated Signals: The probes have low-pass characteristics with a corner frequency of around 20 Hz, due to the high probe impedances and the amplifier filters. The probe output does not follow the fast modulations of the RF signal, but gives an averaged (RMS) reading. For signal levels in the square law region of the detector diode, this gives the desired RMS value for any modulation scheme. However, for larger signal levels the averaged signal might be below the compression point, while the peak signal is in the compression area. In that case a compensation would be necessary for all levels above the compression range. The DASY system allows the specification of the crest factor of the signal source. ....." .
The only limiting factor for SAR measurements is the dynamic range of DASY3 (0.003W/kg up to 100W/kg for an error less than 0.1 dB)

Q3. Please submit itemized SAR measurement uncertainty budget specific to your setup.

Answer:
The uncertainty budget has been determined by the manufacturer of the DASY3 measurement system according to the NIS81 and NIST1297 documents and is given in the following table

| Uncertainty Description | Error | Distrib. | Weight | STd. Dev | Offset |
|---|---|---|---|---|---|
| **Probe Uncertainty** | | | | | |
| axial isotropy | ± 0.2 db | U-shape | 0.5 | ± 2.4 % | |
| spherical isotropy | ± 0.4 db | U-shape | 0.5 | ± 4.8 % | |
| Isotropy from gradient | ± 0.5 db | U-shape | 0 | | |
| Spatial resolution | ± 0.5 % | normal | 1 | ± 0.5 % | |
| Linearity error | ± 0.2 db | rectangular | 1 | ± 2.7 % | |
| Calibration error | ± 3.3 % | normal | 1 | ± 3.3 % | |
| **SAR Evaluation Uncertainty** | | | | | |
| Data acquisition error | ± 1 % | rectangular | 1 | ± 0.6 % | |
| ELF and RF disturbance | ± 0.25 % | normal | 1 | ± 0.25 % | |
| Conductivity assesment | ± 10 % | rectangular | 1 | ± 5.8 % | |

| | | | | | |
|---|---|---|---|---|---|
| **Spatial Peak SAR Evaluation Uncertainty** | | | | | |
| Extrapol boundary effect | ± 3.3 % | normal | 1 | ± 3 % | ± 5 % |
| Probe positioning error | ± 0.1 mm | normal | 1 | ± 1 % | |
| Integrat. and cube orient. | ± 3 % | normal | 1 | ± 3 % | |
| Cube shape inaccuracies | ± 2 % | rectangular | 1 | ± 1.2 % | |
| Device positioning | ± 6 % | normal | 1 | ± 6 % | |
| **Combined Uncertainty** | | | | **± 11.7 %** | **± 5 %** |
| **Extended uncertainty (K=2)** | | | | **± 23.5 %** | |
| | | | | | |
| Generic Twin uncertainty with respect to 80% user group coverage | | | | ± 10 % | ± 15 % |
| **Overall extended uncertainty (K=2)** | | | | **± 32 %** | **± 15 %** |

Q4. Indicate whether or not the hopping function was disabled during SAR tests. If it was disabled, provide a description on how this was done.

Answer:
The SAR-measurements were done using the test-mode of the GN 9050. The parameters of the test-mode could be controlled via an interface and a laptop before measurement. One of the input parameters was a fixed channel number.

We hope this information is sufficient to issue the grant. If you have further questions please do not hesitate to contact us.

Sincerely,

Jürgen Baschin

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