RF Exposure Evaluation

of

E.U.T. : 2.4GHz True Digital Cordless Handset

FCC ID. : G9H2-1900A

MODEL : 21900XXX-A, 21920XXX-A
(extra handset+charger)

for

APPLICANT : Thomson Inc.

ADDRESS : 10330 North Meridian Street Indianapolis, IN 46290

Prepared by

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Product Information:

Type of EUT: 2.4GHz True Digital Cordless Handset
FCC ID: G9H2-1900A
Manufacturer: Huiyang CCT Telecommunications Products Co., Ltd.
Model: 21900XXX-A, 21920XXX-A(extra handset+charger)
Description: This device is the base unit of a 40-channel 2.4GHz cordless telephone. It provides connection to PSTN (Public Switched Telephone Network). The connection between base and handset unit employs 2.4GHz frequency bands.

Maximum conducted output power (measured): Handset Unit:
18.33 dBm or **68.077** mW
Base Unit:
18.45 dBm or **69.984** mW

The following table lists the provided authorized antennas:

Model	Antenna Type	Antenna Gain	
		(dBi)	Numeric
21900XXX-A, 21920XXX-A(extra handset+charger)	2401-2478.5MHz L-typ Antenna (Handset)	1	1.26
21900XXX-A, 21920XXX-A(extra handset+charger)	2401-2478.5MHz monopole/helical Antenna (Base)	1.5	1.41

Below is an example of the RF Exposure Statement:

FCC RF Radiation Exposure Statement
This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body. This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter."

For body worn operation, this phone has been tested and meets the FCC RF exposure guidelines when used with the belt clip supplied with this product. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

Relative Requirement for Compliance

According to section 1.1310 of FCC 47 CFR Part 1, limits for maximum permissible exposure (MPE) are as following:

TABLE 1 – LIMITS FOR MAXIMUN PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0 ……	614	1.63	*(100)	6
3-30 ……	1842/f	4.89/f	*($900/f^2$)	6
30-300 ……	61.4	0.163	1.0	6
300-1500 ……...	…….	…….	f/300	6
1500-100,000 ……	…….	…….	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34 ……	614	1.63	*(100)	30
1.34-30 ……	824/f	2.19/f	*(180/f2)	30
30-300 ……	27.5	0.073	0.2	30
300-1500 ……...	…….	…….	f/1500	30
1500-100,000 ……	…….	…….	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational / controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

RF Exposure Calculations:

The following information provides the minimum separation distance for the highest gain antenna provided. This calculation is based on the highest EIRP possible from the system, considering maximum power and antenna gain, and considering a 1.0 mW/cm^2 uncontrolled exposure limit. The formula shown in OET Bulletin 65 is used in the calculation.

Equation from page 19 of OET Bulletin 65, Edition 97-01 is:

$$S = PG / 4\pi R^2$$

where: S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units, e.g., mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

hence

$$R = (PG / 4\pi S)^{1/2}$$

For our device

(a) Handset Unit:

P = 68.077 mW
Maximum TX Duty Cycle of 1900 Handset = 2mS / 10mS = 20%

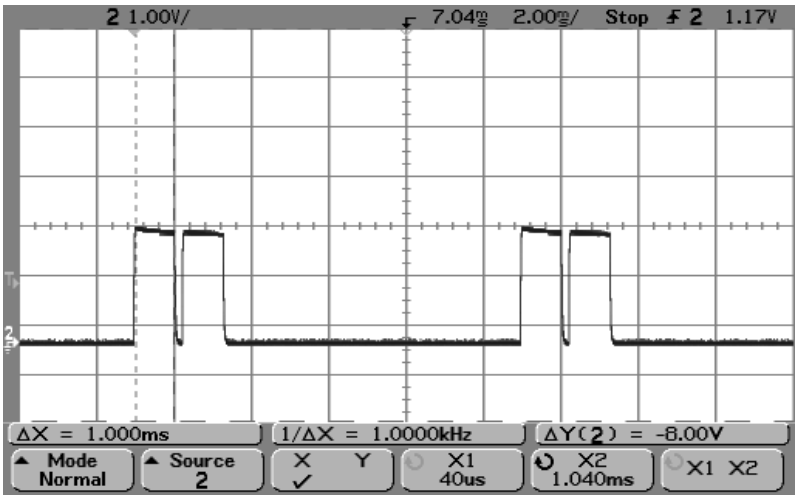

Fig1: Monitored at TXEN pin. It shows one slot duration is 1mS, with double slots, there is 2mS.

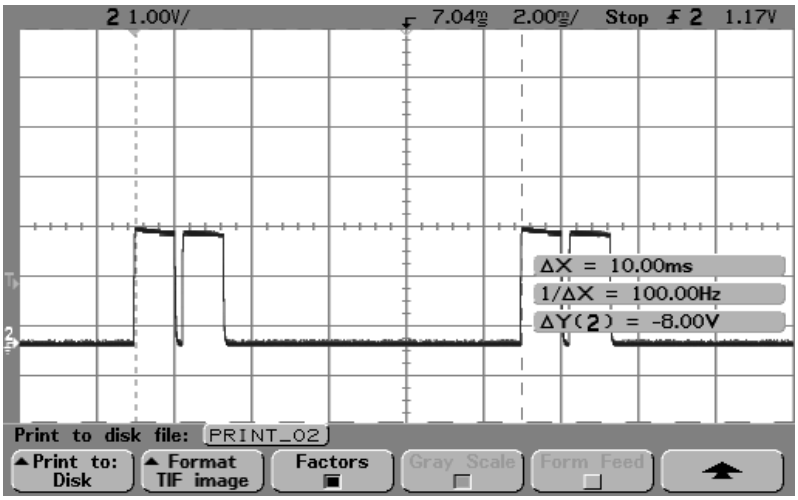

Fig2: It shows one TDD cycle is 10mS

Time-averaged output power = 68.077mW(peak power) X 20% = 13.6mW (<25mW)

This device complies with the MPE requirements by virtue of the fact that it is considered to comply with SAR evaluation without testing.

(b) Base Unit:

P = 69.984 mW
Dwell Time of each channel within a 30 second period = 144 ms
Time Division Source Based Average Power
= 69.984 x (144 ms x 45 CHs / 30 second period)
= 15.12 mW
G = 1.41
S = Exposure limit = 1.0 mW/cm^2

$R = ((15.12 * 1.41) / (4 * \pi * 1.0))^{1/2}$
= **1.30 cm**

For complying the FCC limits for general population/uncontrolled exposure, the minimum MPE distance is 1.30 cm.
According to OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01), the equipment fulfills the requirements on power density for general population/uncontrolled exposure and therefore fulfills the requirements of 47 CFR Part 15.247 (b)(5).