RF Exposure Evaluation

of

E.U.T.   : 2.4GHz DSS 2-Line Multi Handset With

Dual Keypad, CID Type II and Mailbox

System

FCC ID.   : G9H2-1230A

MODEL   : 21230XXX-A

for

APPLICANT   : ATLINKS USA Inc.

ADDRESS   : 101 West 103rd Street Indianapolis, IN 46290-1102 USA

Prepared by

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Product Information:

Type of EUT: 2.4GHz DSS 2-Line Multi Handset With Dual Keypad, CID Type II and Mailbox System

FCC ID: G9H2-1230A

Manufacturer: Universal Scientific Industrial Co., Ltd.

Model: 21230XXX-A

Description: The 21230XXX-A Cordless Telephone operates in the ISM (Industrial Scientific and Medical) band (2400 ~ 2483.5 MHz). The 20dB bandwidth of the hopping channels used in 21230XXX-A is less than 1MHz. And the number of channels used in 21230XXX-A is 90. It complies with FCC part 15.247(a)(1)(ii). The 21230XXX-A is a Digital spread spectrum, it uses the full available frequencies in the ISM band for operation and can make it difficult for other 2400MHz devices to operate correctly.

Maximum conducted output power (measured):

Handset Unit:
23.37 dBm or **217.27** mW
Base Unit:
22.70 dBm or **186.21** mW

The following table lists the provided authorized antennas:

Model	Antenna Type	Antenna Gain	
		(dBi)	Numeric
671-000461	STD2.45GHz Dipole Antenna	0	1.0

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:

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

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

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

For our device

(a) Handset Unit:

P = 217.27 mW

Dwell Time of each channel within a period of 0.4 seconds multiplied by 90 hopping channels = 35.64 ms

Time Division Source Based Average Power

= 217.27 x (35.64 ms x 90 CHs / 36 s period)

= 19.35 mW

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 = 186.21 mW
Dwell Time of each channel within a period of 0.4 seconds multiplied by 90 hopping channels = 9.9 ms
Time Division Source Based Average Power
= 186.21 x (9.9 ms x 90 CHs / 36 s period)
= 4.61 mW
G = 1.0
S = Exposure limit = 1.0 mW/cm^2

R = ((4.61 * 1.0) / (4*   *1.0))$^{1/2}$
  = **<u>0.61 cm</u>**

For complying the FCC limits for general population/uncontrolled exposure, the minimum MPE distance is 0.61 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).