



RF EXPOSURE REPORT

REPORT NO. : SA931123L11

MODEL NO. : IT7000

OEM MODEL NO. : DLI7000; CX1100

ACCORDING : FCC Guidelines for Human Exposure
IEEE C95.1

APPLICANT : BITATEK CO., LTD.

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ISSUED BY : Advance Data Technology Corporation

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RF Exposure Measurement (Portable Device)

1. Introduction

In this document, we try to prove the safety of radiation harmfulness to the human body for our product. The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The Gain of the antenna used in this product is measured in a Fully Anechoic Chamber (FAC) calibrated for antenna measurement in ADT, and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.

Although the Friis transmission formula is a far field assumption, the calculated result of that is an over-prediction for near field power density. We will take that as the worst case to specify the safety range.

2. RF Exposure Limit

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
(A)Limits For Occupational / Control Exposures				
300-1500	...	...	F/300	6
1500-100,000	...	...	5	6
(B)Limits For General Population / Uncontrolled Exposure				
300-1500	...	...	F/1500	6
1500-100,000	...	...	1.0	30

F = Frequency in MHz



3. Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

where

P_d = power density in mW/cm^2

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

If we know the maximum Gain of the antenna and the total power input to the antenna, through the calculation, we will know the MPE value at distance 20cm.

Ref.: David K. Cheng, *Field and Wave Electromagnetics*, Second Edition,
Page 640, Eq. (11-133).

4 EUT Operating condition

The software provided by Manufacturer enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

5. Classification

This device is not fixed inside the host equipment that is classified as **Portable Device**.



6 Conclusion

For WLAN:

No Evaluation Required if power is below this threshold:

F(GHz)		mW
Low	2.412	24.62
High	2.462	

Maximum measured transmitter power:

Pout (dBm)		Pout (mW)
Conducted Power	12.62	18.281
EIRP Power	10.82	12.050

***Note:** The antenna is PIFA antenna with -1dBi gain

Threshold for no SAR evaluation is 24.585mW

Transmitter power is 18.281mW

Conclusion: No SAR evaluation required since Transmitter Pout is below FCC threshold

For Bluetooth:

No Evaluation Required if power is below this threshold:

F(GHz)		mW
Low	2.402	24.58
High	2.480	

Maximum measured transmitter power:

Pout (dBm)		Pout (mW)
Conducted Power	-1.8	0.661
EIRP Power	-7.0	0.200

***Note:** The antenna is PIFA antenna with -5.2dBi gain

Threshold for no SAR evaluation is 24.585mW

Transmitter power is 0.661mW

Conclusion: No SAR evaluation required since Transmitter Pout is below FCC threshold