

## 1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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### Client Information

Applicant: DATA DISPLAY SYSTEMS LLC  
Address of applicant: 14001 Townsend Road, Philadelphia PA 19154

Manufacturer: Luen Fung Electronics (Shenzhen) Ltd., Co.Ltd  
Address of manufacturer: Block 2, Luen Fung Electronics Factory, Jinlong Fourth Road North, Baolong Industrial City, Longgang District, Shenzhen, China

General Description of EUT	
Product Name:	15.6 inch HD Advertising Player
Brand Name:	/
Model No.:	ATAP156T-V22.1-01-15
Adding Model(s):	/
Rated Voltage:	DC12V
Power Adapter:	MODEL:SJ-12015001 INPUT: AC100-240V~ 50/60Hz, 0.6A OUTPUT: DC12V, 1.5A
Device Type:	Mobile device
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 802.11b/g/n-HT20
RF Output Power:	8.94dBm (Conducted)
Type of Modulation:	DBPSK,BPSK,DQPSK,QPSK,16QAM,64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Quantity of Channels:	11 for 802.11b/g/n-HT20
Channel Separation:	5MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	2.0dBi

Technical Characteristics of EUT	
Bluetooth Version:	V4.0 (BLE mode)
Frequency Range:	2402-2480MHz
RF Output Power:	5.825dBm (Conducted)
Data Rate:	1Mbps
Modulation:	GFSK
Quantity of Channels:	40
Channel Separation:	2MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	2.0dBi

Technical Characteristics of EUT	
Bluetooth Version:	V4.0 (BDR/EDR mode)
Frequency Range:	2402-2480MHz
RF Output Power:	7.767dBm (Conducted)
Data Rate:	1Mbps, 2Mbps, 3Mbps
Modulation:	GFSK, Pi/4 QDPSK, 8DPSK
Quantity of Channels:	79
Channel Separation:	1MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	2.0dBi

## 1.2 Standard Applicable

According to § 1.1307(b)(1) and KDB 447498 D01 General RF Exposure Guidance v06, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

### (a) Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100000	/	/	1	30

Note: f = frequency in MHz: \* = Plane-wave equivalent power density

### 1.3 MPE Calculation Method

$$S = (30 * P * G) / (377 * R^2)$$

S = power density (in appropriate units, e.g., mW/cm<sup>2</sup>)

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,  
the power gain factor is normally numeric gain.

R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

## 1.4 MPE Calculation Result

Product is a mobile device

For this product WLAN and BT cannot transmitting simultaneous

WIFI

Maximum Tune-Up output power: 9 (dBm)

Maximum peak output power at antenna input terminal: 7.94(mW)

Prediction distance: >20(cm)

Prediction frequency: 2437(MHz)

Antenna gain: 2 (dBi)

Directional gain (numeric gain): 1.58

The worst case is power density at prediction frequency at 20cm: 0.002 (mw/cm<sup>2</sup>)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm<sup>2</sup>)

BT BR EDR

Maximum Tune-Up output power: 8 (dBm)

Maximum peak output power at antenna input terminal: 6.31mW)

Prediction distance: >20(cm)

Prediction frequency: 2402(MHz)

Antenna gain: 2 (dBi)

Directional gain (numeric gain): 1.58

The worst case is power density at prediction frequency at 20cm: 0.002 (mw/cm<sup>2</sup>)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm<sup>2</sup>)

BT BLE

Maximum Tune-Up output power: 6 (dBm)

Maximum peak output power at antenna input terminal: 3.98mW)

Prediction distance: >20(cm)

Prediction frequency: 2440(MHz)

Antenna gain: 2 (dBi)

Directional gain (numeric gain): 1.58

The worst case is power density at prediction frequency at 20cm: 0.001 (mw/cm<sup>2</sup>)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm<sup>2</sup>)

Result: Pass