



CTC Laboratories, Inc. (FCC Designation Number: CN1208)

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Maximum Permissible Exposure Evaluation

FCC ID: 2AJH3-TV-179K

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

EUT Specification

Applicant	Dune HD(HK) Limited
Address	10th Floor, Shun On Commercial Building, 112-114 Des Voeux Road Central, Central, Hong Kong
Product Name:	Kartina EVA
Trade Mark:	Kartina, Kartina TV, Dune HD
Model/Type Reference:	TV-179K
Listed Model(s):	/
Model Differences:	/
Frequency Band (Operating)	BT: 2402~2480MHz 2.4G WiFi: 2412-2462MHz 5G WiFi: 5150MHz~5250MHz, 5725MHz~5850MHz
Device Category	<input type="checkbox"/> Portable (<5mm separation) <input type="checkbox"/> Mobile (>20cm separation) <input checked="" type="checkbox"/> Fixed (>20cm separation) <input type="checkbox"/> Others ____
Exposure Classification	<input type="checkbox"/> Occupational/Controlled exposure (S=5mW/cm ²) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna Diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> TX diversity <input type="checkbox"/> RX diversity <input type="checkbox"/> TX/RX diversity
Antenna Gain (Max)	BT ANT: 1.88dBi 2.4G WiFi: ANT1&ANT2: 3.81dBi, Directional Gain: 6.82dBi 5G WiFi: ANT1&ANT2: 5.23dBi, Directional Gain: 8.24dBi
Evaluation Applied	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

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**Limits for Maximum 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 Exposure				
300-1500	--	--	F/300	<6
1500-100000	--	--	5	<6
(B) Limits for General Population/Uncontrolled Exposure				
300-1500	--	--	F/1500	<30
1500-100000	--	--	1	<30

Calculation Method

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

Where:

P_d = Power density in mW/cm²

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

P_d limit of MPE is 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

**Measurement Result**

Mode	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Tune Up Tolerance (dB)	Max. Tune Up Power (dBm)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Result
GFSK(BLE)	2440	1.88	6.64	±1	7.50	0.0017	1	Pass
8-DPSK	2402	1.88	10.24	±1	11.00	0.0039	1	Pass
802.11g	2462	3.81	16.73	±1	17.50	0.0269	1	Pass
802.11a	5180	5.23	16.85	±1	17.50	0.0373	1	Pass

The BT and WiFi can transmit simultaneously.

Mode	Frequency (MHz)	Power Density at 20cm (mW/cm ²)	Total Power density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Result
8-DPSK	2402	0.0020	0.0393	1	Pass
802.11a	5180	0.0373			

Note:

1. Calculate in the worst-case mode.
2. Max. Tune Up Power is declared by manufacturer, and used to calculate.
3. For a more detailed features description, please refer to the RF Test Report.

*****THE END*****