RF Exposure Evaluation

Clear Touch Solutions, Inc.
For
Document Camera

Model No.: DC110, DC100, DC200, DC400

FCC ID: 2ARWS-DC1NX

Prepared for :	**Clear Touch Solutions, Inc.** **561 Keystone Avenue, Suite 821,Reno, NV 89503 USA**
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Date of Report:	**Sep. 24, 2020**

1 General Description of EUT

Equipment	Document Camera			
Model Name	DC110			
Serial No.	DC100, DC200, DC400			
Model Difference	All model's the function, software and electric circuit are the same, only model named different. Test sample model: DC110			
Trade Mark	ClearTouch			
FCC ID	2ARWS-DC1NX			
Hardware Version:	V1.6.2			
Software Version:	V1.0			
Frequency Range :	Band	Mode	Operation frequency	Channels
	BAND III	IEEE802.11 a HT20 IEEE802.11 ac HT20 IEEE802.11 ac HT40	5745-5825 MHz 5745-5825 MHz 5755-5795 MHz	5 5 2
Antenna Type	Internal antenna			
Antenna Gain	Antenna: 2dBi			
Power Source	DC 5.0V from adapter/pc or DC3.7V from battery			

2 RF Exposure Compliance Requirement

2.2 Standard Requirement

According to FCC Part1.1310: 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 part1.1307(b)

TABLE 1—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 Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	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	*($180/f^2$)	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 Friis

Formula

Friis transmission formula: Pd = (Pout*G)/(4* Pi * R 2) Where

Pd = power density in mW/cm2

Pout = output power to antenna in mW

G =gain of antenna in linear scale

Pi = 3.1416

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

Pd id the limit of MPE . If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

3 EUT RF Exposure

Antenna Gain: 2Bi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data				
a (20MHz) mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(5745MHz)	7.101	7±1	8	6.310
Middle(5785MHz)	7.024	7±1	8	6.310
Highest(5825MHz)	6.937	7±1	8	6.310

ac (20MHz) mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(5745MHz)	8.575	8±1	9	7.943
Middle(5785MHz)	7.617	8±1	9	7.943
Highest(5825MHz)	8.672	8±1	9	7.943

ac (40MHz) mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(5755MHz)	8.257	8±1	9	7.943
Highest(5795MHz)	8.036	8±1	9	7.943

Maximum tune-up Power (mW)	**Antenna Gain (dBi)**	**Power Density at R = 20 cm (mW/cm2)**	**Limit**	**Result**
7.943	2	0.0025	**1**	PASS

Remark: The Max Conducted Peak Output Power data refer to report Report No.: **HK2009222672-E**