

RF Exposure Evaluation Report

Product Name : 23.1 inches Bar type Digital Signage
Model No. : D230
FCC ID : S8CD230

Applicant : Shuttle Inc.

Address : No.30,Lane76,Rei Kuang Rd.,Nei-Hu Dist.,Taipei, Taiwan R.O.C.

Date of Receipt : Aug. 29, 2019
Date of Declaration : Nov. 12, 2019
Report No. : 1980460R-SAUSP03V00
Report Version : V0.1-Draft

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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Issued Date: Nov. 12, 2019

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Product Name	23.1 inches Bar type Digital Signage	
Applicant	Shuttle Inc.	
Address	No.30,Lane76,Rei Kuang Rd.,Nei-Hu Dist.,Taipei, Taiwan R.O.C.	
Manufacturer	Shuttle Inc.	
Model No.	D230	
FCC ID.	S8CD230	
Trade Name	Shuttle	
Applicable Standard	KDB 447498 D01 v06	<input checked="" type="checkbox"/> Minimum test separation distance \geq 20 cm <input type="checkbox"/> For low power devices
Test Result	Complied	

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 (Senior Adm. Specialist / Rita Huang)

Tested By : wenlee
 (Supervisor / Wen Lee)

Approved By : Vincent Lin
 (Director / Vincent Lin)

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	23.1 inches Bar type Digital Signage
Trade Name	Shuttle
Model No.	D230
FCC ID.	S8CD230
Frequency Range	802.11b/g/n-20MHz:2412MHz~2462MHz 802.11a/n-20MHz: 5180-5320MHz, 5500-5700MHz, 5745-5825MHz 802.11n-40MHz: 5190-5310, 5510-5670MHz, 5755-5795MHz 802.11ac-20MHz: 5180-5320MHz, 5500-5720MHz, 5745-5825MHz 802.11ac-40MHz: 5190-5310, 5510-5710MHz, 5755-5795MHz 802.11ac-80MHz: 5210-5290MHz, 5530-5690MHz, 5775MHzBT : 2402-2480MHz
Channel Number	802.11b/g/n-20MHz: 13, n-40MHz: 9 802.11a/n-20MHz: 24; 802.11n-40MHz: 11 802.11ac-20MHz: 25, 802.11ac-40MHz: 12, 802.11ac-80MHz: 6 BT : 79 , BLE : 40
Type of Modulation	DSSS/OFDM/BPSK/QPSK/16QAM/64QAM/256QAM/1024-QAM FHSS: GFSK(1Mbps) / π /4DQPSK(2Mbps) / 8DPSK(3Mbps)
Antenna Type	PCB Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	WGT	43R-D23001-0300	PCB Antenna	3.2 dBi for 2.4 GHz 3.71 dBi for 5.15~5.25GHz 2.54 dBi for 5.25~5.35GHz 3.45 dBi for 5.47~5.725GHz 3.67 dBi for 5.725~5.85GHz

2. RF Exposure Evaluation

2.1. Standard Applicable

According to KDB 447498 D01 (7.1), A minimum test separation distance ≥ 20 cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits.

2.2. Limits

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)

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 Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	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

2.3. Test Result of RF Exposure Evaluation

Product : 23.1 inches Bar type Digital Signage
 Test Item : RF Exposure Evaluation

WLAN 2.4G Peak Gain: 3.2dBi

Band	Frequency (MHz)	Conducted maximum Peak Power (dBm)	Worst case Duty Cycle (%)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
2.4G	2462	22.59	96.43	188.273	0.0783	1	Pass

Note: The conducted output power is refer to report No.: 1980460R-RFUSP01V00-B from the DEKRA.

WLAN 5G Peak Gain: 3.71dBi

Band	Frequency (MHz)	Conducted maximum Average Power (dBm)	Worst case Duty Cycle (%)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
5G	5710	17.55	79.98	71.124	0.0332	1	Pass

Note: The conducted output power is refer to report No.: 1980460R-RFUSP08V00 from the DEKRA.