

RF Exposure Evaluation Declaration

FCC ID: BKMAE-STI6110

APPLICANT: SEIKO EPSON CORPORATION

Application Type: Certification

Product: Streaming Media Player

Model No.: STI6110-D101(RoHS)

Trademark: EPSON

FCC Classification: FCC Part 15 Spread Spectrum Transmitter (DSS)
Digital Transmission System (DTS)
Unlicensed National Information Infrastructure (NII)

Test Procedure(s): KDB 447498 D01v06

Test Date: June 13, 2019

Reviewed By:



(Paddy Chen)

Approved By:



(Chenz Ker)



Testing Laboratory
3261

The test results relate only to the samples tested.

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

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Revision History

Report No.	Version	Description	Issue Date	Note
1905TW0109-U5	Rev. 01	Initial report	06-18-2019	Valid

1. PRODUCT INFORMATION

1.1. Equipment Description

Product Name:	Streaming Media Player
Model No.:	STI6110-D101(RoHS)
Brand Name:	EPSON
Wi-Fi Specification:	802.11a/b/g/n/ac
Bluetooth Specification:	v4.2 dual mode

1.2. Description of Available Antennas

Antenna Type	Frequency Band (MHz)	TX Paths	Max Antenna Gain (dBi)	CDD Directional Gain (dBi)	
				For Power	For PSD
Wi-Fi Antenna					
PCB Antenna	2412 ~ 2462	2	1.8	1.8	4.81
	5150 ~ 5250	2	7.1	7.1	10.11
	5725 ~ 5850	2	3.0	3.0	6.01
Bluetooth Antenna					
PCB Antenna	2402 ~ 2480	1	1.6	--	--

Note:

The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

For CDD transmissions, directional gain is calculated as follows, $N_{ANT} = 2$, $N_{SS} = 1$.

If all antennas have the same gain, G_{ANT} , Directional gain = $G_{ANT} + \text{Array Gain}$, where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,
Array Gain = $10 \log (N_{ANT} / N_{SS})$ dB = 3.01;
- For power measurements on IEEE 802.11 devices,
Array Gain = 0 dB for $N_{ANT} \leq 4$;

1.3. Description of Antenna RF Port

Wi-Fi & Bluetooth Antenna RF Port		
Software Control Port	Ant 1 (Wi-Fi)	Ant 2 (Wi-Fi & Bluetooth)
		

2. RF Exposure Evaluation

2.1. 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

Calculation 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 is the limit of MPE, 1mW/cm². 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.

2.2. Test Result of RF Exposure Evaluation

Product	Streaming Media Player
Test Item	RF Exposure Evaluation

Antenna Gain: Refer to clause 1.2.

Test Mode	Frequency Band (MHz)	Max Conducted Power (dBm)	Antenna Gain (dBi)	Maximum EIRP (dBm)
Bluetooth	2402 ~ 2480	4.43	1.6	6.03
802.11b/g/n	2412 ~ 2462	23.03	1.8	24.83
802.11a/n/ac	5180 ~ 5240	15.17	7.1	22.27
	5745 ~ 5825	21.96	3.0	24.96

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)
Bluetooth	2402 ~ 2480	6.03	0.0008	1
802.11b/g/n	2412 ~ 2462	24.83	0.0605	1
802.11a/n/ac	5180 ~ 5240,	22.27	0.0336	1
	5745 ~ 5825	24.96	0.0623	1

CONCLUSION:

Due to WLAN 2.4GHz Band or WLAN 5GHz Band can transmit simultaneously with Bluetooth. The max Power Density at R (20 cm) = $0.0008\text{mW/cm}^2 + 0.0623\text{mW/cm}^2 = 0.0631\text{mW/cm}^2 < 1\text{mW/cm}^2$.

So the safety distance is 20cm for **Streaming Media Player** installed without any other radio equipment.

The End

Appendix A - EUT Photograph

Refer to "1905TW0109-UE" file.