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Client: AlphaTheta Corporation
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Kanagawa 220-0012, Japan

Test item: All-In-One DJ System

Identification: XDJ-AZ

FCC Requirement

According to §1.1307 (b)(1)(i)(A), transmitter device is qualified as exemption of RF human exposure, when the transmitter power is below a threshold calculated by its relevant formula defined in §1.1307 (b)(3)(i)(B):

Transmitter	Frequency [MHz]	ERP _{20cm} [mW]	Minimum Separation Distance d [cm] (**)	Body/Extremities	Threshold P _{th} [mW]
Original Wireless Communication	2402	3060	1.5	Extremities	55
			20	Body	3060
WLAN 5GHz	5745 (*)	3060	5.0	Extremities	425
		3060	20	Body	3060
Bluetooth	2402	3060	5.0	Extremities	550
		3060	20	Body	3060
WLAN 2.4GHz	2412	3060	5.0	Extremities	550
		3060	20	Body	3060

Note

(*) The worst frequency band of U-NII-3 was specified as per each conducted output power in the following.

(**) As per the intended use of the product, body and extremities exposures are considered at each separation distance.

Measurement Result

The maximum ERP from the transmitter (**EUT**) is given in the following table:

Transmitter	Antenna	Freq. Range [MHz]	Cond. Power [dBm]	Antenna Gain [dBi]	Maximum ERP [mW]
Original Wireless Communication	ANT1	2402-2480	6.27	2.02	4.111
	ANT2		6.30	1.45	3.631

Note: The conducted powers of Original Wireless Communication are cited from the test report JP2494EX 001 by TÜV Rheinland Japan.

ANT 1 and ANT 2 do **not** simultaneously transmit, as per the product specifications.

The ERP in mW is calculated in conjunction with the following formula:

$$\text{ERP [mW]} = 10^{(\text{Conducted Power [dBm]} + \text{Antenna Gain [dBi]} - 2.15)/10}$$

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The maximum ERP from the pre-certified transmitter module are given in the following table:

Transmitter		Freq. Range [MHz]	Cond. Average Power [dBm]	Antenna Gain (*) [dBi]	Maximum ERP [mW]
WLAN 5GHz	U-NII-1	5180-5240	16.38	2.77	50.119
	U-NII-2A	5260-5320	16.39	3.41	58.210
	U-NII-2C	5500-5720	16.32	2.45	45.920
	U-NII-3	5745-5825	16.38	3.63	61.094
Bluetooth		2402-2480	6.47	2.32	4.613
WLAN 2.4GHz		2412-2462	18.32	2.32	70.632

Note: (*) Each antenna gain is cited from the antenna data sheet by the antenna manufacture
The Conducted average power for Bluetooth and WLAN 2.4GHz/5GHz is cited from the test report MFBHVI-WTW-P22120237B by Bureau Veritas (WLAN/Bluetooth modular approval exhibit).

Evaluation for Single RF Sources

Standalone operation from each transmitter is evaluated by the following.

Transmitter	Frequency [MHz]	Maximum ERP [mW]	Minimum Separation Distance d [cm]	Body/Extremities	Threshold P _{th} [mW]
Original Wireless Communication, ANT1	2402	4.111	1.5	Extremities	55
			20	Body	3060
WLAN 5GHz, U-NII-3	5745	61.094	5.0	Extremities	425
			20	Body	3060
Bluetooth	2402	4.613	5.0	Extremities	550
			20	Body	3060
WLAN 2.4GHz	2412	70.632	5.0	Extremities	550
			20	Body	3060

Note: Hands of the operator may be close to each transmitting antenna during normal operation, while a body of the person can maintain a 20cm separation distance from the EUT. Therefore, both body and limb exposure are considered at this evaluation.

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As per §1.1307 (b)(3)(ii)(B) and the product specification, the following possible combinations are evaluated to identify the overall worst case for the Multiple RF Sources.

Transmitter	Maximum ERP [mW]	Body/Extremities	Threshold P_{th} [mW]	Ratio	Sum of Ratios	Limit
Original Wireless Communication, ANT1	4.111	Body	3060	0.0013	0.2497	1
		Extremities	55	0.0747		
WLAN 5GHz, UNII-3	61.094	Body	3060	0.0200		
		Extremities	425	0.1438		
Bluetooth	4.613	Body	3060	0.0015		
		Extremities	550	0.0084		

Transmitter	Maximum ERP [mW]	Body/Extremities	Threshold P_{th} [mW]	Ratio	Sum of Ratios	Limit
Original Wireless Communication, ANT1	4.111	Body	3060	0.0013	<u>0.2653</u>	1
		Extremities	55	0.0747		
WLAN 2.4GHz	70.632	Body	3060	0.0231		
		Extremities	425	0.1662		

Conclusion

This transmitter is classified as Portable Devices (for extremities) by the client. One pre-certified transmitter module is incorporated into the product with separation distance over 20cm. Therefore, simultaneous transmission operations are evaluated, too.

SAR evaluation is not required, since the ERP of each single RF source and all possible simultaneous transmissions are below the FCC SAR exemption threshold P_{th} and the summation ratio (≤ 1) (**0.2653**) at the separation distance of **20cm** between a body of an operator and transmitters, respectively.

Hence, the device can be qualified as exemption from Routine Environmental Evaluation.