

FCC RF EXPOSURE REPORT

FCC ID: APIHKOMNI50P

Project No. : 1510C025
Equipment : Streaming wireless speaker
Model : OMNI 50+
Applicant : Harman International Industries
Address : 8500 Balboa Blvd, Northridge, CA 91329, UNITED STATES

According: : FCC Guidelines for Human Exposure IEEE C95.1

B T L I N C .

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MPE CALCULATION METHOD:

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi^2} = \frac{EIRP}{4\pi^2 R^2}$$

where:

S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

Table for Filed Antenna

Bluetooth:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain(dBi)
1	Harman/Kardon	N/A	Internal	N/A	2

2.4G WIFI:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain(dBi)
1	Harman/Kardon	N/A	Internal	N/A	2
2	Harman/Kardon	N/A	Internal	N/A	2

Note: The EUT incorporates a MIMO function. Physically, the EUT provides two complete two transmitters and two receivers (2T2R).

Operating Mode	2TX
TX Mode	
802.11b	V (ANT 1 + ANT 2)
802.11g	V (ANT 1 + ANT 2)
802.11n(20MHz)	V (ANT 1 + ANT 2)
802.11n(40MHz)	V (ANT 1 + ANT 2)

5G

Ant.	Brand	Model Name	Antenna Type	Connector	Gain(dBi)
1	Harman/Kardon	N/A	Internal	N/A	2
2	Harman/Kardon	N/A	Internal	N/A	2

Note: The EUT incorporates a MIMO function. Physically, the EUT provides two completed two transmitters and two receivers (2T2R).

Operating Mode	2TX
TX Mode	
802.11a	V (ANT 1+ANT 2)
802.11n (20MHz)	V (ANT 1+ANT 2)
802.11n (40MHz)	V (ANT 1+ANT 2)
802.11ac (20MHz)	V (ANT 1+ANT 2)
802.11ac (40MHz)	V (ANT 1+ANT 2)
802.11ac (80MHz)	V (ANT 1+ANT 2)

TEST RESULTS

BT:

EUT:	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	25 °C	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX Mode _1Mbps		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	2.91	1.9543	0.00061652	1	Complies
2	1.5849	4.20	2.6303	0.00082976	1	Complies
2	1.5849	2.58	1.8113	0.00057141	1	Complies

EUT:	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	25 °C	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX Mode _3Mbps		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	2.31	1.7022	0.00053697	1	Complies
2	1.5849	3.25	2.1135	0.00066673	1	Complies
2	1.5849	1.68	1.4723	0.00046446	1	Complies

BT LE:

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature :	24 °C	Relative Humidity:	60%
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX Mode _1Mbps		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	1.44	1.3932	0.00043949	1	Complies
2	1.5849	1.47	1.4028	0.00044254	1	Complies
2	1.5849	1.57	1.4355	0.00045285	1	Complies

2.4G WIFI:

EUT:	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature :	25 °C	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX B MODE /CH01, CH06, CH11_Total		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	17.49	56.1048	0.01769907	1	Complies
2	1.5849	16.82	48.0839	0.01516877	1	Complies
2	1.5849	16.65	46.2381	0.01458648	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature :	25 °C	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX G MODE /CH01, CH06, CH11_Total		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	23.36	216.7704	0.06838335	1	Complies
2	1.5849	26.56	452.8976	0.14287307	1	Complies
2	1.5849	25.77	377.5722	0.11911059	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	25 °C	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-20M MODE_ Total /CH01, CH06, CH11		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	22.32	170.6082	0.05382083	1	Complies
2	1.5849	27.13	516.4164	0.16291098	1	Complies
2	1.5849	22.24	167.4943	0.05283849	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	25 °C	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-40M MODE_ Total /CH03, CH06, CH09		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	20.81	120.5036	0.03801460	1	Complies
2	1.5849	25.48	353.1832	0.11141672	1	Complies
2	1.5849	25.50	354.8134	0.11193100	1	Complies

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EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX A MODE_Total / CH36, CH40, CH48		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	22.07	161.0646	0.05081014	1	Complies
2	1.5849	23.02	200.4472	0.06323396	1	Complies
2	1.5849	22.89	194.5360	0.06136919	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-20M MODE_Total / CH36, CH40, CH48		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	21.31	135.2073	0.04265308	1	Complies
2	1.5849	22.94	196.7886	0.06207981	1	Complies
2	1.5849	23.59	228.5599	0.07210251	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-40M MODE_Total / CH38, CH46		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	18.57	71.9449	0.02269605	1	Complies
2	1.5849	23.50	223.8721	0.07062368	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC-20M MODE_Total / CH36, CH40, CH48		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	21.45	139.6368	0.04405045	1	Complies
2	1.5849	23.05	201.8366	0.06367228	1	Complies
2	1.5849	23.12	205.1162	0.06470687	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC-40M MODE_Total / CH38, CH46		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	17.74	59.4292	0.01874780	1	Complies
2	1.5849	23.11	204.6445	0.06455804	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC-80M MODE_Total /CH42		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	19.70	93.3254	0.02944085	1	Complies

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EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX A MODE_Total / CH52, CH60, CH64		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	21.72	148.5936	0.04687598	1	Complies
2	1.5849	21.87	153.8155	0.04852330	1	Complies
2	1.5849	20.90	123.0269	0.03881060	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-20M MODE_Total / CH52, CH60, CH64		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	21.85	153.1087	0.04830036	1	Complies
2	1.5849	21.78	150.6607	0.04752809	1	Complies
2	1.5849	20.72	118.0321	0.03723492	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-40M MODE_Total / CH54, CH62		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	22.34	171.3957	0.05406925	1	Complies
2	1.5849	19.74	94.1890	0.02971326	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC-20M MODE_Total / CH52, CH60, CH64		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	21.87	153.8155	0.04852330	1	Complies
2	1.5849	21.87	153.8155	0.04852330	1	Complies
2	1.5849	20.94	124.1652	0.03916971	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC-40M MODE_Total / CH54, CH62		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	22.12	162.9296	0.05139849	1	Complies
2	1.5849	19.22	83.5603	0.02636030	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC-80M MODE_Total / CH58		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	20.39	109.3956	0.03451043	1	Complies

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EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX A MODE_Total / CH100, CH116, CH140		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	21.64	145.8814	0.04602040	1	Complies
2	1.5849	21.87	153.8155	0.04852330	1	Complies
2	1.5849	19.13	81.8465	0.02581965	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-20M MODE_Total / CH100, CH116, CH140		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	21.52	141.9058	0.04476621	1	Complies
2	1.5849	21.82	152.0548	0.04796786	1	Complies
2	1.5849	19.36	86.2979	0.02722390	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-40M MODE_Total / CH102, CH110, CH134		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	18.16	65.4636	0.02065144	1	Complies
2	1.5849	21.52	141.9058	0.04476621	1	Complies
2	1.5849	20.12	102.8016	0.03243026	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC-20M MODE_Total / CH100, CH116, CH140		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	21.00	125.8925	0.03971462	1	Complies
2	1.5849	21.86	153.4617	0.04841170	1	Complies
2	1.5849	19.08	80.9096	0.02552410	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC-40M MODE_Total / CH102, CH110, CH134		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	17.63	57.9429	0.01827891	1	Complies
2	1.5849	22.10	162.1810	0.05116234	1	Complies
2	1.5849	19.71	93.5406	0.02950872	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC-80M MODE_Total / CH106, CH122		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	19.75	94.4061	0.02978176	1	Complies
2	1.5849	22.00	158.4893	0.04999774	1	Complies

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EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX A MODE_Total / CH149, CH157, CH165		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	19.99	99.7700	0.03147389	1	Complies
2	1.5849	23.57	227.5097	0.07177123	1	Complies
2	1.5849	21.86	153.4617	0.04841170	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-20M MODE_Total / CH149, CH157, CH165		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	20.26	106.1696	0.03349272	1	Complies
2	1.5849	23.43	220.2926	0.06949449	1	Complies
2	1.5849	21.36	136.7729	0.04314698	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-40M MODE_Total / CH151, CH159		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	17.12	51.5229	0.01625363	1	Complies
2	1.5849	22.09	161.8080	0.05104467	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC-20M MODE_Total / CH149, CH157, CH165		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	19.79	95.2796	0.03005733	1	Complies
2	1.5849	23.40	218.7762	0.06901609	1	Complies
2	1.5849	21.20	131.8257	0.04158631	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC-40M MODE_Total / CH151, CH159		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	16.07	40.4576	0.01276293	1	Complies
2	1.5849	21.11	129.1219	0.04073337	1	Complies

EUT :	Streaming wireless speaker	Model Name :	OMNI 50+
Temperature:	24 °C	Relative Humidity:	52 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC-80M MODE_Total / CH155		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	18.29	67.4528	0.02127896	1	Complies

Note: the calculated distance is 20 cm.