MPE Calculation

Applicant: Ningbo Somle Audio-Visual Technology Co.,Ltd
Address: No.39, Lane150, Beihai Road, Jiangbei, Ningbo, China
Product: SOUNDBAR
Model No.: Silent 1420

According to subpart 15.247(i)and subpart §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

<< Silent 1220 >> have the same electrical component and PCB layout with << Silent 1420 >> . The only difference is the colour and size.
Model No. << S1094 >> have the same electrical component and PCB layout with << Silent 1220 >> << Silent 1420 >> . The only difference is the colour, shape and size.
So tests are applied on Silent 1420, other models deem to fulfil the EMC requirement without further testing.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm2)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f²)	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; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:
Predication of MPE limit at a given distance
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Calculated Data:

Maximum peak output power at antenna input terminal (dBm):	4.27
Maximum peak output power at antenna input terminal (mW):	2.67
Prediction distance (cm):	20
Antenna Gain, typical (dBi):	-0.61
Maximum Antenna Gain (numeric):	0.869
The worst case is power density at predication frequency at 20 cm (mW/cm2):	0.00046
MPE limit for general population exposure at prediction frequency (mW/cm2):	1.0

0.00046 (mW/cm2) < 1 (mW/cm2)

Result: Compliant

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