MPE Calculation

Applicant: American Standard Brands
Address: 865 Centennial Avenue, Piscataway, NJ, USA
Product: Bluetooth Speaker Box
Model No.: 1660808
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.

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):	4.075
Maximum peak output power at antenna input terminal (mW):	2.556
Prediction distance (cm):	20
Antenna Gain, typical (dBi):	1
Maximum Antenna Gain (numeric):	1.259
The worst case is power density at predication frequency at 20 cm (mW/cm2):	0.00064
MPE limit for general population exposure at prediction frequency (mW/cm2):	1.0

0.00064 (mW/cm2) < 1 (mW/cm2)

Result: Compliant

TUV SUD China, Shenzhen Branch

Reviewed by:

Phoebe Hu/EMC Project Manager
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Prepared By:

Calvin Weng/EMC Project Engineer
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