MPE Calculation

Applicant:	LEEDARSON LIGHTING CO., LTD
Address:	Xingda Road, Xingtai Industrial Zone, Changtai County, Zhangzhou, Fujian, China
Product:	On/Off Switch
FCC ID:	2AB2QLZW30SN
Model No.:	LZW30-SN
Reference RF report #	68.912.19.0012.01

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
300–1,500	/	/	f/1500	30
1,500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to ANSI C63.10-2013 (9.5 Equations to calculate EIRP),

Calculate the EIRP from the radiated field strength in the far field using Equation (22):

$$\mathrm{EIRP} = E_{\mathrm{Meas}} + 20\log\left(d_{\mathrm{Meas}}\right) - 104.7 \qquad (22)$$

where

EIRP is the equivalent isotropically radiated power, in dBm
E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m
d_{Meas} is the measurement distance, in m

NOTE—Because this equation yields the identical result whether the field strength is extrapolated using the default 20 dB/decade of distance extrapolation factor, or the field strength is not extrapolated for distance, this equation can generally be applied directly (with no further correction) to determine EIRP. In some cases, a different distance correction factor may be required; see 9.1.

Field Strength (E_{Meas}):	93.27 (dBuV/m) (f=0.908GHz)
Measurement Distance(d_{Meas}):	3 (m)
Equivalent Isotropically Radiated Power(EIRP):	0.64 (mW)

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 (mW):	0.64
Prediction distance (cm):	20
Antenna Gain, typical (dBi):	-1.8
Maximum Antenna Gain (numeric):	0.66
The worst case is power density at predication frequency at 20 cm (mW/cm2):	0.000084
MPE limit for general population exposure at prediction frequency (mW/cm2):	0.6056

0.000084 (mW/cm2) < 0.6056 (mW/cm2)

Result: Compliant

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Date: 2019-08-08

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Date: 2019-08-08