RF EXPOSURE EVALUATION
FCC ID: 2AZ2V-ZSE44

Product Name	:	Temperature Humidity XS Sensor
Model Name	:	ZSE44
Operating frequency	:	908.40MHz 908.42MHz 916.00MHz 912 MHz 920 MHz
Type of Modulation	:	2FSK for 908.40MHz 2FSK for 908.42MHz 2GFSK for 916.00MHz DSSS OQPSK LR for 912 MHz and 920 MHz
Antenna Type	:	PCB Antenna
Antenna Gain	:	-15.59dBi
Power supply	:	Li-ion Battery : CR2450 Voltage: 3.0V
Hardware Version	:	1.0
Software Version	:	1.0

Standard Requirement

According to § 15.247(i) and § 1.1307b(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 levels in excess of the Commission's guidelines. See KDB 447498 D01 General RF Exposure Guidance v06, section 4. 3. 1.

The 1-g and 10-g SAR test exclusion thresholds for 100MHz to 6GHz at test separation distances ≤ 50mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]*[√f(GHz)] ≤3.0 for 1-g SAR and ≤7.5 for 10-g SAR extremity SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison.

The test exclusions are applicable only when the minimum test separation distance is ≤ 50mm and for transmission frequencies between 100MHz and 6GHz. When the minimum test separation distance is <5mm, a distance of 5mm is applied to determine SAR test exclusion. Routine SAR evaluation refers to that specifically required by § 2.1093, using measurements or computer simulation. When routine SAR evaluation is not required, portable transmitters with output power greater than the applicable low threshold require SAR evaluation to quality for TCB approval.

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: Pd (W/m²) = $\frac{E^2}{377}$

E = Electric field (V/m)

P = Peak RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd = $\frac{30 \times P \times G}{377 \times d^2}$ θφ

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

RF Output power

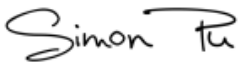
Freq. (MHz)	Field strength(max)(dBuV/m)	EIRP (max) (dBm)
908.40	89.90	-5.30
908.42	89.52	-5.68
916.00	89.74	-5.46

Note: EIRP=E-104.8+20logD,
Where
E is the electric field strength in dBμV/m.
EIRP is the equivalent isotropically radiated power in dBm.
d is the specified measurement distance in m.
where D=3, EIRP=E-95.2.

Channel (MHz)	Maximum output power (dBm)	Tune up tolerance (dBm)	Max Tune Up Power (mW)	Distance (mm)	Calculation results	Limit	Result
912MHz	-0.501	0.00±1	1.258925	5	0.240451	3	Pass
920MH	0.162	0.50±1	1.412538	5	0.270972	3	Pass
908.40MH	-5.30	-5.00±1	0.398107	5	0.075887	3	Pass
908.42MH	-5.68	-5.50±1	0.354813	5	0.067635	3	Pass
916.00MH	-5.46	-5.00±1	0.398107	5	0.076204	3	Pass

According to KDB 447498, no stand-alone required for the antenna, and no simultaneous SAR measurement is required.

Signature



Manager
Simon Pu
Date: 2023-11-25