

FCC ID: 2ASEORFM90C

RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	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

MPE Calculation Method

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

E = Electric field (V/m)

P = Average 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

$$Pd = \frac{30 * P * G}{377 * D^2}$$

From the 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.

MAX OUTPUT POWER
DTS

Test Channel	Frequency (MHz)	Power Setting	Average Output Power (dBm)	LIMIT (dBm)	Verdict
CH64	903.0	Default	14.860	30	PASS
CH72	923.3	Default	14.664	30	PASS
CH78	926.9	Default	14.367	30	PASS

Test Channel	Frequency	Power Setting	Peak Output Power	LIMIT	Verdict
	(MHz)		(dBm)	(dBm)	
1Mbps					
0	902.3	Default	18.24	30	PASS
31	908.5	Default	18.09	30	PASS
63	914.9	Default	17.98	30	PASS

Measurement Result

Operation Frequency: DTS: 903.0MHz~926.9MHz

DSS: 902.3 MHz~914.9MHz

Antenna Type: Reverse SMA interface Rubber Bar antenna

Power density limited: 0.602mW/ cm²

Antenna gain: 2.15 dBi,
R=20cm

LORA:

DTS

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
903.0	LORA)	14.860	14±1	15	31.623	2.15	1.64	0.0103	0.602
923.3		14.664	14±1	15	31.623	2.15	1.64	0.0103	0.616
926.9		14.367	14±1	15	31.623	2.15	1.64	0.0103	0.618

DSS

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
902.3	LORA)	18.24	18±1	19	79.433	2.15	1.64	0.0259	0.602
908.5		18.09	18±1	19	79.433	2.15	1.64	0.0259	0.606
914.9		17.98	18±1	19	79.433	2.15	1.64	0.0259	0.610

Conclusion:

For the max result : 0.00259 ≤ 0.602 for Max Power Density, compliance RF exposure..



Signature:

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