

# RF Exposure Evaluation

Report No. : ESTRGC2311-008

IC ID : 2703H-TFHOBINN0D

FCC ID : BEJTFHOBINN0D

Product name : Car Telematics Device

Model name : TFHOBINN0D2, TFHOBINN0D1

Date of Test : 2023, 11, 23

Tested by	Engineer H.G. Lee	(Signature)
Reviewed by	Engineering Manager I.K. Hong	(Signature)
Test Items	Result (Pass / Fail)	Remark
Maximum Permissible Exposure	Pass	-
Abbreviation	Pass = Complied, Fail = Failed, N/A = not applicable	

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with regulation limits or requirements declared by manufacturers.

Comments and Explanations:

None

# 1 Human Exposure Assessment

## 1.1 Maximum Permissible Exposure

### 1.1.1 Limit of Maximum Permissible Exposure

Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (minutes)
0.3 – 1.34	614	1.63	*(100)	30
1.34 – 30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	–	–	F/1500	30
1500 – 100,000	–	–	1.0	30

Limits for RF Field Strength Limits for Controlled Use Devices (Controlled Environment)

Frequency Range (MHz)	Electric Field Strength (V/m)(RMS)	Magnetic Field Strength(A/m)	Power Density (W/m <sup>2</sup> )	Reference Period (minutes)
0.003 – 10 <sup>23</sup>	170	180	–	Instantaneous *
0.1–10	–	1.6/ f	–	6**
1.1–10	193/ f <sup>0.5</sup>	–	–	6**
10 – 20	61.4	0.163	10.0	6
20 – 48	129.8/ f <sup>0.25</sup>	0.3444/ f <sup>0.25</sup>	44.72/ f <sup>0.5</sup>	6
48 – 300	49.33	0.1309	6.455	6
300 – 6000	15.6 f <sup>0.25</sup>	0.04138 f <sup>0.25</sup>	0.6455f <sup>0.5</sup>	6
6000 – 15000	137	0.364	50	6
15000 – 150000	137	0.364	50	616000/ f <sup>1.2</sup>
150000 – 300000	0.354 f <sup>0.5</sup>	9.4 x 10 <sup>-4</sup> f <sup>0.5</sup>	3.33 x 10 <sup>-4</sup> f	616000/ f <sup>1.2</sup>

band	Channel Frequency (MHz)	max output power (dBm)	Ant gain (dBi)	EIRP (dBm)	EIRP (mW)	Power Density (mW/cm <sup>2</sup> )	Power Density Limit (mW/cm <sup>2</sup> )
Band n2	1850.00 ~ 1910.00	23.60	1.78	27.68	586	0.117	1
Band n5	824.00 ~ 849.00	23.68	2.44	23.39	218	0.043	1
Band n66	1710.00 ~ 1780.00	23.83	1.88	27.9	617	0.123	1
Band 77 (FCC)	3450.00 ~ 3550.00	24.08	2.75	21.19	132	0.026	1
Band 77 (FCC)	3700.00 ~ 3980.00	24.03	2.75	20.13	103	0.021	1
Band 77 (ISED)	3450.00 ~ 3900.00	23.87	2.75	22.05	160	0.032	1
LTE Band 2	1850.00 ~ 1910.00	23.28	0.92	26.22	419	0.083	1
LTE Band 5	824.00 ~ 849.00	23.28	0.49	22.20	166	0.033	1
LTE Band 7	2500.00 ~ 2570.00	23.69	2.27	25.13	326	0.065	1
LTE Band 12	699.00 ~ 716.00	23.38	-1.52	22.30	170	0.034	1
LTE Band 66(4)	1710.00 ~ 1780.00	23.50	1.10	27.31	538	0.107	1

\* FCC limit is worst case

$$R = \sqrt{\frac{EIRP}{4\pi S}}$$

EIRP = Equivalent Isotropic Radiated Power(mW)

S = Distance (20 cm)

Pi = 3.14

#### WLAN

Band	Antenna gain(dBi)	Numeric
WLAN 2.4GHz	2.82	1.91

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Power Density Limit (mW/cm <sup>2</sup> )
First ch	2412	8.77	0.003334	1
Middle ch	2437	9.94	0.003779	1
Last ch	2462	9.61	0.003653	1

\* FCC limit is worst case

$$R = \sqrt{\frac{PG}{4\pi S}}$$

P<sub>out</sub> = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.14

#### Max Simultaneous transmission scenarios

$$0.123+0.107+0.0038=0.2338$$