

產品名稱: Car Telematics Device(WIFI, WCDMA, LTE)

產品型號: TA4HEB-W; TA4LEN-W

1.1 適用標準

依據國家通訊傳播委員會低功率射頻器材技術規範 6.20.2節之規定，若受測物於正常操作模式下，其發射機距離人體20公分以上者，可測試最大暴露允許值 (Maximum Permissible Exposure (MPE)以證明其符合電波暴露量之要求。

限制如下：

(1)職業性/可控制之暴露

頻率範圍 (MHz)	電場強度 (V/m)	磁場強度 (A/m)	功率密度 (mW/cm ²)	平均時間 (分)
0.3~3.0	614	1.63	*100	6
3~30	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	-----	-----	5.0	6

註1: 標記*表平面波等效功率密度。

註2: f表測試頻率，單位：MHz。

(2) 一般人/不可控制之暴露

頻率範圍 (MHz)	電場強度 (V/m)	磁場強度 (A/m)	功率密度 (mW/cm ²)	平均時間 (分)
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

註1：標記*表平面波等效功率密度。

註2：f表測試頻率，單位：MHz。

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4\pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

1.2 Maximum Permissible Exposure (MPE) Evaluation

Wifi 2.4GHz Mode

The worst case of Average power a mode: refer to RF test report for detail measurement date.

Power measurement:

Mode	Freq. (MHz)	Output Power (dBm)				Duty Factor (dB)	Total Output Power (dBm)	Output Power Limit (dBm)
		Chain 0	Chain 1	Chain 2	Chain 3			
802.11n HT40	2422	21.53	NA	NA	NA	0	21.53	30
	2437	21.69	NA	NA	NA	0	21.69	30
	2452	21.59	NA	NA	NA	0	21.59	30

Antenna Gain: **0.94** dBi

Tune-Up Tolerance: **1** dB

Measurement Result:

The predicted power density level at 20 cm is **0.0459146** mW/cm².

This is below the uncontrolled exposure limit of **1** mW/cm².

1.3 Maximum Permissible Exposure (MPE) Evaluation

5150MHz – 5250MHz Mode

The worst case of Average power a mode: refer to RF test report for detail measurement date.

Power measurement:

Band	Mode	Freq. (MHz)	Output Power (dBm)				Duty Factor (dB)	Total Output Power (dBm)	Output Power Limit (dBm)
			Chain 0	Chain 1	Chain 2	Chain 3			
UNII-1	HT20	5180	10.56	NA	NA	NA	0.409	10.969	23.979
		5200	10.88	NA	NA	NA	0.409	11.289	23.979
		5240	10.81	NA	NA	NA	0.409	11.219	23.979

Antenna Gain: **5.71** dBi

Tune-Up Tolerance: **1** dB

Measurement Result:

The predicted power density level at 20 cm is **0.0114275** mW/cm².

This is below the uncontrolled exposure limit of **1** mW/cm².

1.4 Maximum Permissible Exposure (MPE) Evaluation

5725MHz – 5850MHz Mode

The worst case of Average power a mode: refer to RF test report for detail measurement date.

Power measurement:

Band	Mode	Freq. (MHz)	Output Power (dBm)				Duty Factor (dB)	Total Output Power (dBm)	Output Power Limit (dBm)
			Chain 0	Chain 1	Chain 2	Chain 3			
UNII-3	HT20	5745	10.97	NA	NA	NA	0.409	11.379	30
		5785	10.64	NA	NA	NA	0.409	11.049	30
		5825	10.77	NA	NA	NA	0.409	11.179	30

Antenna Gain: **3.79** dBi

Tune-Up Tolerance: **1** dB

Measurement Result:

The predicted power density level at 20 cm is **0.0065441** mW/cm².

This is below the uncontrolled exposure limit of **1** mW/cm².

1.5 Maximum Permissible Exposure (MPE) Evaluation

Band 1: 2100MHz mode

Maximum Average output power at antenna input	24.68	(dBm)
Power Tolerance	1	dB
Maximum peak output power at antenna input terminal:	369.8281798	(mW)
Duty cycle:	99	(%)
Maximum Pav :	366.129898	(mW)
Antenna gain (typical):	-0.16	(dBi)
Maximum antenna gain:	0.963829024	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	0.45	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.0702402	(mW/cm ²)

The Max. predicted power density level at 20 cm is 0.0702402mW/cm². This is below the uncontrolled exposure limit of .1.0 mW/cm².

Band 3: 1800MHz mode

Maximum Average output power at antenna input	24.68	(dBm)
Power Tolerance	1	dB
Maximum peak output power at antenna input terminal:	369.8281798	(mW)
Duty cycle:	99	(%)
Maximum Pav :	366.129898	(mW)
Antenna gain (typical):	0.85	(dBi)
Maximum antenna gain:	1.216186001	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	0.45	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.0886310	(mW/cm ²)

The Max. predicted power density level at 20 cm is 0.0886310mW/cm². This is below the uncontrolled exposure limit of .0.9 mW/cm².

Band 7: 2600MHz mode

Maximum Average output power at antenna input	24.68	(dBm)
Power Tolerance	1	dB
Maximum peak output power at antenna input terminal:	369.8281798	(mW)
Duty cycle:	99	(%)
Maximum Pav :	366.129898	(mW)
Antenna gain (typical):	1.16	(dBi)
Maximum antenna gain:	1.306170888	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	0.45	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.0951887	(mW/cm ²)

The Max. predicted power density level at 20 cm is 0.0951887mW/cm². This is below the uncontrolled exposure limit of .1.0 mW/cm².

Band 8: 900MHz mode

Maximum Average output power at antenna input	24.67	(dBm)
Power Tolerance	1	dB
Maximum peak output power at antenna input terminal:	368.9775986	(mW)
Duty cycle:	99	(%)
Maximum Pav :	365.2878226	(mW)
Antenna gain (typical):	-0.8	(dBi)
Maximum antenna gain:	0.831763771	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	0.45	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.0604763	(mW/cm ²)

The Max. predicted power density level at 20 cm is 0.0604763mW/cm². This is below the uncontrolled exposure limit of .0.45 mW/cm².

Band 28: 700MHz mode

Maximum Average output power at antenna input	24.66	(dBm)
Power Tolerance	1	dB
Maximum peak output power at antenna input terminal:	368.1289736	(mW)
Duty cycle:	99	(%)
Maximum Pav :	364.4476839	(mW)
Antenna gain (typical):	-1.09	(dBi)
Maximum antenna gain:	0.778036551	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	0.45	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.0564398	(mW/cm ²)

The Max. predicted power density level at 20 cm is 0.0564398mW/cm². This is below the uncontrolled exposure limit of .0.35 mW/cm².