

產品名稱: Infotainment System with Bluetooth and WCDMA/UMTS and LTE

產品型號: LICU

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

BLE 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)
BLE 4.0	2402	5.65	2.126	5.65	30
	2442	5.995	2.126	5.995	30
	2480	4.407	2.126	4.407	30

Antenna Gain: **-1.5** dBi

Tune-Up Tolerance: **1** dB

Measurement Result:

The predicted power density level at 20 cm is **0.00398** mW/cm².

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

1.3 Maximum Permissible Exposure (MPE) Evaluation

BT Mode

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

Power measurement:

BDR Mode

Frequency (MHz)	Peak Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
Low	3.026	3.026	0.002007	1
Mid	3.296	3.296	0.002136	1
High	1.752	1.752	0.001497	1

Antenna Gain: -1.5 dBi

Tune-Up Tolerance: 1 dB

Measurement Result:

The predicted power density level at 20 cm is **0.00214** mW/cm².

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

1.4 Maximum Permissible Exposure (MPE) Evaluation

Band 3: 1800MHz mode

Maximum Average output power at antenna input	23.47	(dBm)
Power Tolerance	1	dB
Maximum peak output power at antenna input terminal:	279.898132	(mW)
Duty cycle:	99	(%)
Maximum Pav :	277.0991506	(mW)
Antenna gain (typical):	-2.12	(dBi)
Maximum antenna gain:	0.613762005	(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)	0.0338521	(mW/cm ²)

The Max. predicted power density level at 20 cm is 0.0338521mW/cm². This is below the uncontrolled exposure limit of .0.9 mW/cm².

Band 7: 2600MHz mode

Maximum Average output power at antenna input	23.49	(dBm)
Power Tolerance	1	dB
Maximum peak output power at antenna input terminal:	281.190083	(mW)
Duty cycle:	99	(%)
Maximum Pav :	278.3781822	(mW)
Antenna gain (typical):	-0.03	(dBi)
Maximum antenna gain:	0.993116048	(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)	0.0550282	(mW/cm ²)

The Max. predicted power density level at 20 cm is 0.0550282mW/cm². This is below the uncontrolled exposure limit of .1.0 mW/cm².

Band 8: 900MHz mode

Maximum Average output power at antenna input	23.51	(dBm)
Power Tolerance	1	dB
Maximum peak output power at antenna input terminal:	282.4879975	(mW)
Duty cycle:	99	(%)
Maximum Pav :	279.6631175	(mW)
Antenna gain (typical):	-0.25	(dBi)
Maximum antenna gain:	0.944060876	(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)	0.0525516	(mW/cm ²)

The Max. predicted power density level at 20 cm is 0.0525516mW/cm². This is below the uncontrolled exposure limit of .0.45 mW/cm².

Band 28: 700MHz mode

Maximum Average output power at antenna input	23.53	(dBm)
Power Tolerance	1	dB
Maximum peak output power at antenna input terminal:	283.7919028	(mW)
Duty cycle:	99	(%)
Maximum Pav :	280.9539838	(mW)
Antenna gain (typical):	-0.66	(dBi)
Maximum antenna gain:	0.859013522	(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)	0.0480381	(mW/cm ²)

The Max. predicted power density level at 20 cm is 0.0480381mW/cm². This is below the uncontrolled exposure limit of .0.35 mW/cm².

1.5 Maximum Permissible Exposure (MPE) Evaluation

WCDMA Band 1:

Maximum Average output power at antenna input	25.52	(dBm)
Power Tolerance	1	dB
Maximum peak output power at antenna input terminal:	448.7453899	(mW)
Duty cycle:	99	(%)
Maximum Pav :	444.257936	(mW)
Antenna gain (typical):	2	(dBi)
Maximum antenna gain:	1.584893192	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.1401476	(mW/cm ²)

The Max. predicted power density level at 20 cm is 0.1401476mW/cm². This is below the uncontrolled exposure limit of 1 mW/cm².

WCDMA Band 8:

Maximum Average output power at antenna input	25.7	(dBm)
Power Tolerance	1	dB
Maximum peak output power at antenna input terminal:	467.7351413	(mW)
Duty cycle:	99	(%)
Maximum Pav :	463.0577899	(mW)
Antenna gain (typical):	2	(dBi)
Maximum antenna gain:	1.584893192	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.1460783	(mW/cm ²)

The Max. predicted power density level at 20 cm is 0.4607831mW/cm². This is below the uncontrolled exposure limit of .1 mW/cm².