



REPORT No. : SZ18060143S01

RF EXPOSURE

EVALUATION REPORT

APPLICANT : CHIPSEA TECHNOLOGIES(SHENZHEN) CORP.

PRODUCT NAME : CSM84F12

MODEL NAME : CSM84F12

BRAND NAME : Chipsea

FCC ID : 2AGM5CSM84F12

STANDARD(S) : 47CFR 2.1091
KDB 447498

ISSUE DATE : 2018-07-12

Tested by:

Gan Yueming

Gan Yueming (Test engineer)

Approved by:

Peng Huarui

Peng Huarui (Supervisor)

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MORLAB

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DIRECTORY

1. Technical Information.....	3
1.1 Applicant and Manufacturer Information.....	3
1.2 Equipment Under Test (EUT) Description	3
1.3 Photographs of the EUT.....	4
1.4 Applied Reference Documents	5
2. Device Category and RF Exposure Limit	6
3. Measurement of RF Output Power	7
4. RF Exposure Evaluation	8
Annex A General Information.....	9

Change History		
Issue	Date	Reason for change
1.0	2018-07-12	First edition



1. Technical Information

Note: Provide by manufacturer.

1.1 Applicant and Manufacturer Information

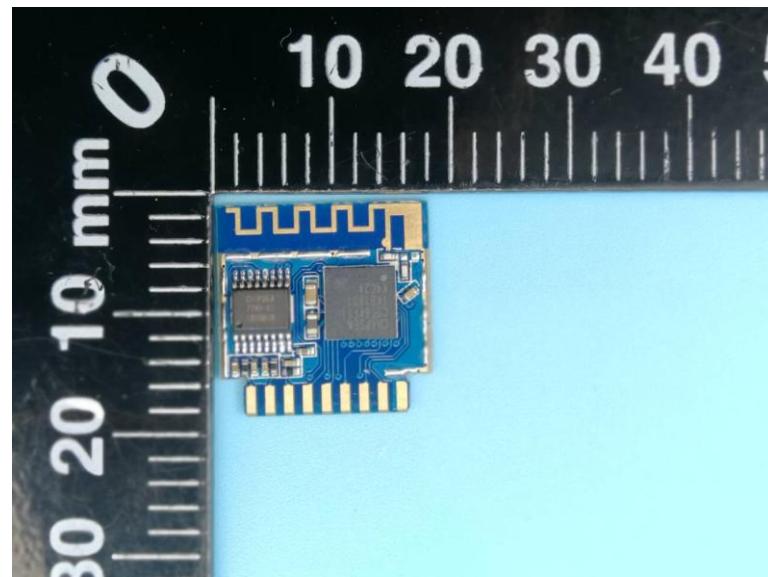
Applicant:	CHIPSEA TECHNOLOGIES(SHENZHEN) CORP.
Applicant Address:	9F,Block A,Garden City Digital Building,No.1079 Nanhai Road, Nanshan District,Shenzhen,China
Manufacturer:	CHIPSEA TECHNOLOGIES(SHENZHEN) CORP.
Manufacturer Address:	9F,Block A,Garden City Digital Building,No.1079 Nanhai Road, Nanshan District,Shenzhen,China

1.2 Equipment Under Test (EUT) Description

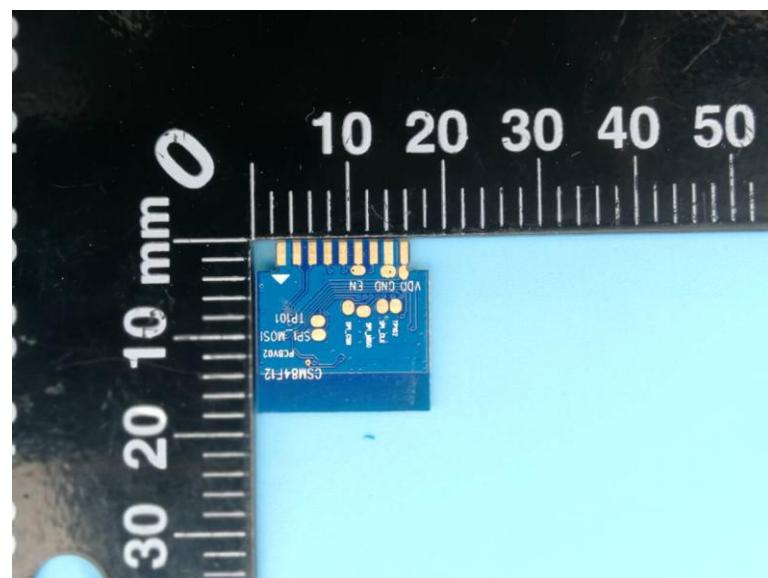
EUT Type:	CSM84F12
Hardware Version:	02
Software Version:	16850
Frequency Bands:	WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz
Modulation Mode:	WLAN2.4GHz 802.11b:DSSS WLAN2.4GHz 802.11g/n HT20: OFDM
Antenna Type:	N/A
Antenna Gain:	0.5dBi

1.3 Photographs of the EUT

1. EUT front view



2. EUT rear view





1.3.1 Identification of all used EUT

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

EUT Identity	Hardware Version	Software Version
1#	02	16850

1.4 Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	47 CFR§2.1091	Radio frequency Radiation Exposure Evaluation: mobile devices
2	KDB 447498 D01v06	General RF Exposure Guidance



2. Device Category and RF Exposure Limit

Per user manual, Based on 47CFR 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.

Mobile Devices:

47CFR 2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

GENERAL POPULATION / UNCONTROLLED EXPOSURE

The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

TABLE 1—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)
(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
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density



3. Measurement of RF Output Power

<Bluetooth Mode>

	Mode	Channel	Frequency (MHz)	Peak power (dBm)	Tune-Up Limit
WLAN 2.4GHz	802.11b 1Mbps	CH 1	2412	19.76	20.50
		CH 6	2437	19.89	20.50
		CH 11	2462	19.98	20.50
	802.11g 6Mbps	CH 1	2412	22.24	22.50
		CH 6	2437	22.23	22.50
		CH 11	2462	22.22	22.50
	802.11n-HT20 MCS0	CH 1	2412	22.32	22.50
		CH 6	2437	22.24	22.50
		CH 11	2462	22.22	22.50

Note: According to KDB 447498, maximum source-based time-average power will be used for calculating MPE.



4. RF Exposure Evaluation

Standalone transmission MPE evaluation

Bands	Frequency (MHz)	Maximum Tune-up Limit (dBm)	Antenna Gain (dBi)	EIRP (mW)	Power density (mW/cm ²)	Limit for MPE (mW/cm ²)
WLAN2.4GHz	2412	22.5	0.5	199.17	0.04	1.0

1. MPE calculation method

$$\text{Power Density} = \text{EIRP}/4\pi R^2$$

Where: EIRP = P·G

P = Peak output power

G = Antenna gain

R = Separation distance (20cm)



Annex A General Information

1. Identification of the Responsible Testing Laboratory

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Department:	Morlab Laboratory
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Responsible Test Lab Manager:	Mr. Su Feng
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2. Identification of the Responsible Testing Location

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