

MPE REPORT

FCC

APPLICANT

Socket Mobile, Inc.

MODEL NAME

S370

FCC ID

LUBS370

REPORT NUMBER

HA230602-SOC-001-R02

TEST REPORT

Date of Issue
September 26, 2023

Test Site
Hyundai C-Tech, Inc. dba HCT America, Inc.
1726 Ringwood Ave, San Jose, CA 95131, USA

Applicant	Socket Mobile, Inc.
Applicant Address	40675 Encyclopedia Cir., Fremont, CA 94538, U.S.A.
FCC ID	LUBS370
Model Name	S370
EUT Type	Contactless Membership Card Reader / Writer
FCC Classification	Low Power Communication Device Transmitter (DXX) Digital Transmission System (DTS)
FCC Rule Part(s)	Part 1 (§1.1310), Part 2 (§2.1091)
Test Procedure	KDB 447498 D01 v06

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was in accordance with the procedures specified in §2.947. The results in this report apply only to the product which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Hyundai C-Tech, Inc. dba HCT America, Inc. certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

Tested By



Tim Lee

Test Engineer

Reviewed By



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REVISION HISTORY

The revision history for this document is shown in table.

TEST REPORT NO.	DATE	DESCRIPTION
HA230602-SOC-001-R02	September 26, 2023	Initial Issue

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1. EUT DESCRIPTION

Model	S370	
EUT Type	Contactless Membership Card Reader / Writer	
Power Supply	5 V d.c. (USB Port) Li Polymer Battery : 3.7 VDC (4.2 VDC max), 1800 mAh	
RF Specification	13.56 MHz : ASK Bluetooth LE V4.2 (1Mbps) : GFSK	
Antenna Specification ¹⁾	13.56 MHz	Antenna Type : Loop antenna
	Bluetooth LE V4.2	Antenna Type : PCB trace Peak Gain : 1.0 dBi
Transmitter Chain	WIFI 2.4 GHz / 5 GHz : 2x2 MIMO Bluetooth LE / Bluetooth BR/EDR : SISO	
Operating Environment ²⁾	Indoor	
Operating Temperature ²⁾	-20 °C ~ 70 °C	

Note :

1. Antenna information is based on the document provided.
2. Environmental operating condition is declared by the manufacturer

2. INTRODUCTION

2.1. LIMIT

The limit for Maximum Permissible Exposure (MPE), specified in FCC Rule Part §1.1310 listed in the table below, shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation specified in §1.1310 (b)

Frequency Range (MHz)	E- Field Strength (V/m)	H- 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

2.2. MAXIMUM PERMISSIBLE EXPOSURE PREDICTION

Prediction of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S : Power density (mW/cm²)

P : Output power to antenna (mW)

G : Antenna gain in linear scale

R : Distance between the center of radiator and observation point (cm)

3. RESULT

3.1. MPE Calculation

13.56 MHz				
Frequency (MHz)	13.56	MHz		
MPE Limit (mW/cm ²)	0.98	mW/cm ²		
Distance (R)	20	Cm		
Max. EIRP	-18.60	dBm	0.01	mW
Power density (S) at distance 20 cm	0.000003	mW/cm ²	at 20 cm separation distance	

Bluetooth LE				
Frequency (MHz)	2402 – 2480	GHz		
MPE Limit (mW/cm ²)	1.0	mW/cm ²		
Distance (R)	20	Cm		
Max Conducted Output Power	8.90	dBm	7.76	mW
Antenna Gain	1.00	dBi	1.26	-
Power density (S) at distance 20 cm	0.001944	mW/cm ²	at 20 cm separation distance	

Note :

1. Max. EIRP (dBm) = Maximum electric field strength level (dBuV @3m) – 95.2
76.6 dBuV @3 m – 95.2 = -18.6 dBm
(Maximum field strength level is referenced in test report number : HA230602-SOC-001-R01-1)
2. Maximum conducted output power including tune-up tolerance according to the operating description provided by manufacturer
3. The minimum separation distance has been indicated in the user manual.

3.2. SUMMARY OF RESULTS

Mode	Frequency Range (MHz)	Ant Gain (dBi)	MPE Calculation (mW/cm ²)	MPE Ratio (PD/MPE Limit)
13.56 MHz	13.56	-	0.000003	0.000003
Bluetooth LE	2402 – 2480	1.00	0.001944	0.001944

Bluetooth LE and 13.56 MHz transmit simultaneously. Therefore, the calculated MPE at 20 cm is 0.001947.

Sample Calculation

TOTAL MPE (20cm distance) = 0.000003 / 0.98 + 0.001944 / 1.0 = **0.001947** < 1.0

END OF TEST REPORT