



FCC RF Exposure Evaluation

1. Product Information

Report Reference No. : LCSA07194128E
Applicant : Mapleprint Inc
Address : 140 58TH STREET BLDG A DOCK 4A BROOKLYN NY 11220
United States
FCC ID : 2A4KN-PM220S
Product name : Label Maker
Test Model : PM220S
Power Supply : PM220S
Hardware Version : Input: 5V===1A
Battery: 7.4V===, 1200mAh
Software Version : V2.0R
Bluetooth : 2402MHz ~ 2480MHz
Channel Number : 79 channels for Bluetooth V5.4 (DSS)
40 channels for Bluetooth V5.4 (DTS)
Channel Spacing : 1MHz for Bluetooth V5.4(DSS)
2MHz for Bluetooth V5.4(DTS)
Modulation Type : GFSK for Bluetooth V5.4 (DSS)
GFSK for Bluetooth V5.4 (DTS)
Bluetooth Version : V5.4
Antenna Type : PCB Antenna
Antenna Gain : -0.93dBi
RF ID :
Operating Frequency : 13.56MHz
Modulation Type : ASK
Antenna Description : Internal Antenna, 0dBi(Max.)
Exposure category : General population/uncontrolled environment
EUT Type : Production Unit
Device Type : Portable Device

2. Evaluation method and Limit

According to KDB447498 D01 General RF Exposure Guidance v06 Section 4.3.1 Standalone SAR test exclusion considerations: "Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.22 The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander (see 5) of section 4.1). To qualify for SAR test





exclusion, the test separation distances applied must be fully explained and justified by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, typically in the SAR measurement or SAR analysis report, according to the required published RF exposure KDB procedures. When no other RF exposure testing or reporting is required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for the SAR test exclusion. When required, the device specific conditions described in the other published RF exposure KDB procedures must be satisfied before applying these SAR test exclusion provisions; for example, handheld PTT two-way radios, handsets, laptops & tablets etc."

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f \text{ (GHz)}}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where:}$$

- f (GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to f) in section 4.1 is applied to determine SAR test exclusion.

When one of the following test exclusion conditions is satisfied for all combinations of simultaneous transmission configurations, further equipment approval is not required to incorporate transmitter modules in host devices that operate in the mixed mobile and portable host platform exposure conditions. The grantee is responsible for documenting this according to Class I permissive change requirements. Antennas that qualify for standalone SAR test exclusion must apply the estimated standalone SAR to determine simultaneous transmission test exclusion.

a) The $[\sum \text{ of (the highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance) / 1.6 W/kg}] + [\sum \text{ of MPE ratios}] \leq 1.0$.

b) The SAR to peak location separation ratios of all simultaneously transmitting antenna pairs operating in portable device exposure conditions are all ≤ 0.04 , and the $[\sum \text{ of MPE ratios}] \leq 1.0$. At frequencies below 100 MHz, the following may be considered for SAR test exclusion, and as illustrated in Appendix C:

a) The power threshold at the corresponding test separation distance at 100 MHz in step 2) is multiplied by $[1 + \log(100/f(\text{MHz}))]$ for test separation distances > 50 mm and < 200 mm

b) The power threshold determined by the equation in a) for 50 mm and 100 MHz is multiplied by $\frac{1}{2}$ for test separation distances ≤ 50 mm

c) SAR measurement procedures are not established below 100 MHz. When SAR test exclusion cannot be applied, a KDB inquiry is required to determine SAR evaluation requirements for any test results to be acceptable.

3. Refer Evaluation Method

[ANSI C95.1-1999](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

[FCC KDB publication 447498 D01 General RF Exposure Guidance v06](#): Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

[FCC CFR 47 part1 1.1310](#): Radiofrequency radiation exposure limits.

[FCC CFR 47 part2 2.1093](#): Radiofrequency radiation exposure evaluation: portable devices



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4. Conducted Power Results

<BT>

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
GFSK	0	2402	-0.37
	39	2441	0.01
	78	2480	-0.75

<BLE>

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
GFSK	0	2402	-0.44
	19	2440	-0.09
	39	2480	-0.82

[NFC]

Mode	Frequency (MHz)	Field Strength (dBuV/m@3m)	EIRP(dBm)	Conducted Output Power(dBm)
ASK	13.56MHz	26.71	-67.55	-67.55

Note: Add the appropriate maximum ground reflection factor to the EIRP

so for NFC: $E(\text{dBuV/m@3m}) = \text{EIRP}(\text{dBm}) - 20 \lg 3(\text{m}) + 104.8 = \text{EIRP}(\text{dBm}) + 94.26$; $\text{EIRP} = E - 94.26$

5. Manufacturing Tolerance

<BT>

GFSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	0	0	0
Tolerance $\pm$ (dB)	1.0	1.0	1.0

<BLE>

GFSK (Peak)			
Channel	Channel 0	Channel 19	Channel 39
Target (dBm)	0	0	0
Tolerance $\pm$ (dB)	1.0	1.0	1.0

[NFC]

[NFC]	
Frequency	13.56MHz
Target (dBm)	-67
Tolerance $\pm$ (dB)	1.0





6. Evaluation Results

6.1 Standalone Evaluation

Band/Mode		f (GHz)	Antenna Distance (mm)	RF output power		SAR Test Exclusion Threshold	SAR Test Exclusion
				dBm	mW		
BT	GFSK	2.480	5	1.0	1.2589	0.3965< 3.0	Yes
BLE	GFSK	2.480	5	1.0	1.2589	0.3965< 3.0	Yes

Band/Mode		f (MHz)	Antenna Distance (mm)	RF output power		SAR Test Exclusion Threshold (mW)	SAR Test Exclusion
				dBm	mW		
NFC	ASK	13.56	5	-66	0.000000025	0.000000006<442.97	Yes

Remark:

1. Output power including tune up tolerance;
2. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to f) in section 4.1 is applied to determine SAR test exclusion.

6.2 Simultaneous Transmission for SAR Exclusion

According to KDB447498 for Transmitters used in mobile exposure conditions for simultaneous transmission operations;
 $\sum \sum$ of MPE ratios ≤ 1.0

Simultaneous Transmission				
BT MPE (mW/cm ²)	NFC MPE (mW/cm ²)	$\sum$ MPE ratios	Limit	Results
0.3965	0.000000006	0.396500006	1.0	Pass

7. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v06.

8. Description of Test Facility

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

ISED Designation Number is 9642A.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

.....THE END OF REPORT.....



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