



TEST REPORT

FCC MPE Test for JA900-R3F
Certification

APPLICANT
AI SYSTEM Co.,Ltd.

REPORT NO.
HCT-RF-2312-FI008-R1

DATE OF ISSUE
December 26, 2023

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HCT-RF-2312-FI008-R1

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Additional model

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Applicant

AI SYSTEM Co.,Ltd.

B-748, IX Tower, 27, Dongtancheomdansaneop 1-ro, Hwaseong-si, Gyeonggi-do, Republic of Korea

Eut Type Model Name

UHF RFID READER
JA900-R3F

FCC ID

2BDZLJA900-R3F

Frequency range

2 402 MHz ~ 2 480 MHz (Bluetooth)
2 412 MHz ~ 2 462 MHz (WLAN)
902.75 MHz ~ 927.25 MHz (RFID)

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.

This test results were applied only to the test methods required by the standard.

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	December 18, 2023	Initial Release
1	December 26, 2023	Revised RFID Peak output Power

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance

A2LA Statement:

The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 and A2LA(American Association for Laboratory Accreditation) requirements, which signed the ILAC-MRA. (A2LA Certificate No. 4114.01)

If this report is required to confirmation of authenticity, please contact to www.hct.co.kr

RF Exposure Statement

1. Limit

According to § 1.1310, § 2.1091 RF exposure is calculated.

(B) Limits for General Population/Uncontrolled Exposures

Frequency range (MHz)	Electric field Strength (V/m)	Magnetic field Strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
0.3 - 1.34.....	614	1.63	^(a) (100)	30
1.34 - 30.....	824/f	2.19/f	^(a) (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

^(a) = Plane-wave equivalent power density

2. Maximum Permissible Exposure Prediction

Prediction of MPE limit at a given distance

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

S = Power density

P = Power input to antenna

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

R = Distance to the center of radiation of the antenna

3. TEST METHODOLOGY

According to KDB 447498 D01 v06 RF exposure is reported.

4. RESULTS

4-1. RFID

Peak output Power at antenna input terminal	27.50	dBm
Peak output Power at antenna input terminal	562.34	mW
Prediction distance	20.00	cm
Prediction frequency	902.75 – 927.25	MHz
Antenna Gain(typical)	2.16	dBi
Antenna Gain(numeric)	1.64	-
Power density at prediction frequency(S)	0.1840	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.6018	mW/cm ²

2.1091

EIRP	29.66	(dBm)
ERP	27.51	(dBm)
ERP	0.564	(W)
ERP Limit	3.00	(W)
MARGIN	7.26	(dB)

4-2. Bluetooth

Peak output Power at antenna input terminal	8.00	dBm
Peak output Power at antenna input terminal	6.31	mW
Prediction distance	20.00	cm
Prediction frequency	2 402 – 2 480	MHz
Antenna Gain(typical)	2.00	dBi
Antenna Gain(numeric)	1.58	-
Power density at prediction frequency(S)	0.0020	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.0000	mW/cm ²

2.1091

EIRP	10.00	(dBm)
ERP	7.85	(dBm)
ERP	0.006	(W)
ERP Limit	3.00	(W)
MARGIN	26.92	(dB)

4-3. DTS

Peak output Power at antenna input terminal	24.50	dBm
Peak output Power at antenna input terminal	281.84	mW
Prediction distance	20.00	cm
Prediction frequency	2 412 – 2 462	MHz
Antenna Gain(typical)	2.00	dBi
Antenna Gain(numeric)	1.58	-
Power density at prediction frequency(S)	0.0889	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.0000	mW/cm ²

2.1091

EIRP	26.50	(dBm)
ERP	24.35	(dBm)
ERP	0.272	(W)
ERP Limit	3.00	(W)
MARGIN	10.42	(dB)

Simultaneous transmission operations

$$\sum_{i=1}^n \frac{\text{Power density } i}{\text{Limit } i} < 1$$

Simultaneous MPE 20cm is RFID (0.1840/0.6018) + Bluetooth (0.0020/1.0) = 0.3057 < 1

Simultaneous MPE 20cm is RFID (0.1840/0.6018) + 2.4G WLAN (0.0889/1.0) = 0.3946 < 1