

TEST REPORT

of

FCC CFR 47 part 1, 1.1307(b), 1.1310

FCC ID: 2AWMDA312

Equipment Under Test : RFID Fixed Reader
Model Name : a312
Variant Model Name(s) : -
Applicant : Apulse Technology Co., Ltd.
Manufacturer : Apulse Technology Co., Ltd.
Date of Receipt : 2020.01.17
Date of Test(s) : 2020.09.24 ~ 2021.01.28
Date of Issue : 2022.09.27

In the configuration tested, the EUT complied with the standards specified above. This test report does not assure KOLAS accreditation.

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Tested by:



Murphy Kim

Technical
Manager:



Jinhyoung Cho

SGS Korea Co., Ltd. Gunpo Laboratory



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1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

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- Designation number: KR0150

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1.2. Details of Applicant

Applicant : Apulse Technology Co., Ltd

Address : C-1211, 60, Haan-ro, Gwangmyeong-si, Gyeonggi-do, South Korea, 14322

Contact Person : Jang, Robin

Phone No. : +82 10 5526 0605

1.3. Details of Manufacturer

Company : Same as applicant

Address : Same as applicant

1.4. Description of EUT

Kind of Product	RFID Fixed Reader
Model Name	a312
Power Supply	DC 12 V
Frequency Range	902.75 MHz ~ 927.25 MHz (RFID)
Modulation Technique	ASK
Number of Channels	50 channels (RFID)
Antenna Type	External antenna
Antenna Gain*	5.34 dBi
H/W Version	Main B/D : Version 1.2, RFID Module : Version 2.0
S/W Version	Main B/D : Version 2.0.4, RFID Module : Version 1.0

1.5. Test Report Revision

Revision	Report Number	Date of Issue	Description
0	F690501-RF-RTL001617	2021.01.28	Initial
1	F690501-RF-RTL001617-1	2022.09.27	Added EUT Information of Simultaneous transmission condition

2. RF Exposure Evaluation

2.1. Environmental evaluation and exposure limit according to FCC CFR 47 part 1, 1.1307(b), 1.1310

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time
(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
<u>300-1 500</u>	<u>:</u>	<u>:</u>	<u>f/1500</u>	<u>30</u>
1 500-100 000	-	-	1.0	30

2.1.1. Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

2.1.2. Test Result of RF Exposure Evaluation

Test Item : RF Exposure Evaluation Data
Test Mode : Normal Operation

2.1.3. Output Power into Antenna & RF Exposure Evaluation Distance

RFID

- Maximum tune up tolerance

Frequency Range (MHz)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
902 - 928	23	5.34	0.135 747	0.60

Note;

- The power density Pd (5th column) at a distance of 20 cm calculated from the friis transmission formula is far below the limit of 1 mW/cm².
- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
- This equipment should be installed and operated with minimum 20 cm between the radiator and your body.
- The antenna gain of this transmitter is less than 6 dB i and must not be collocated or operating in conjunction with any other antenna or transmitter unless authorized to do so by the FCC.
- According to KDB 447498 D01 RF Exposure Guidance 4.1.
- The RF exposure was evaluated by output average power of tune-up procedure considering tolerance. So, maximum peak conducted power may exceed the power mentioned in this report.
- Simultaneous Condition.
The EUT has four antenna ports switch the output of the same power amp to the four ports by applying an RF switch. Switch each port with a time difference without using for ports at the same time. When one port is operating, other ports not transmit at the same time.

- End of the Test Report -