

Maximum Permissible Exposure Report

1. Product Information

Product Name : RFID Reader
Model Number : BF-IDU05
Model Difference Declaration : N/A
Test Model : BF-IDU05
Power Supply : DC 24V
Hardware version : 1.1
Software version : 1.0

RFID

Frequency Range : 902.25 – 927.75 MHz
Channel Number : 52 Channels
Modulation Technology : PR-ASK

Antenna information :
Antenna 1:
Model: BIS U-303-C1-TNCB
Type: Detachable
Antenna Gain: 5.5 dBi (8.5 dBic)
Antenna 2:
Model: BIS U-301-C1-TNCB
Type: Detachable
Antenna Gain: 2.5 dBi (5.5 dBic)

Cable information :
Cable 1:
Model: BIS U-500-EF-05
Type: TNC type
Cable Loss: 1.8 dB
Cable 2:
Model: BIS U-500-EF-02
Type: TNC type
Cable Loss: 0.7 dB

Note: Antenna position refer to EUT Photos.

2. 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 1 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.

3. Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
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 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 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

4. MPE Calculation Method

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

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

Where: S=power density

P=power input to antenna

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

R=distance to the center of radiation of the antenna

5. Antenna Information

This Product can only use antennas certificated as follows provided by manufacturer;

Internal Identification	Antenna Description	Antenna type	Operate frequency band	Maximum antenna gain
Antenna 1	BIS U-303-C1-TNCB	Detachable Antenna	860 MHz - 960 MHz	5.5 dBi (8.5 dBic)
Antenna 2	BIS U-301-C1-TNCB	Detachable Antenna	860 MHz - 960 MHz	2.5 dBi (5.5 dBic)

6. Conducted Power

Mode	Channel.	Maximum Peak Output Power [dBm]
PR-ASK	LCH	28.61
PR-ASK	MCH	28.74
PR-ASK	HCH	29.00

Note 1: limit = 30 – Max(Antenna gain, 6) + 6

7. Manufacturing Tolerance

PR-ASK (Peak)			
Channel	LCH	MCH	HCH
Target (dBm)	29.0	29.0	29.0
Tolerance ±(dB)	1.0	1.0	1.0

8. Measurement Results

8.1 Standalone MPE

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 50 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, $r = 50\text{cm}$, as well as the gain of the used antenna refer to antenna information, the RF power density can be obtained.

Frequency(MHz)	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	dBm	mW					
902.25	30.00	1000.00	5.5	3.5481	100%	0.1130	0.6015
915.25	30.00	1000.00	5.5	3.5481	100%	0.1130	0.6102
927.75	30.00	1000.00	5.5	3.5481	100%	0.1130	0.6185

Remark:

1. Output power including tune-up tolerance;
2. MPE evaluate distance is 50cm from user manual provide by manufacturer;

8.2 Simultaneous Transmission MPE

The four Antenna ports can't work Simultaneous,

So it is not necessary consider simultaneous transmission;

9. Conclusion

Compliance

-----THE END OF REPORT-----