RF Exposure Evaluation declaration

Product Name : Mobile Data Terminal

Model No. : MT7030

FCC ID : 2ABTU-MT7030

Applicant : RuggON Corporation

Address : 4F, No. 298, Yang Guang St., Neihu Dist., Taipei City, Taiwan

Date of Receipt : Mar. 31, 2020

Date of Declaration : Jul. 02, 2020

Report No. : 2030836R-SAUSP03V00

Report Version : V1.0

Testing Laboratory
3023

Issued Date: Jul. 02, 2020
Report No.: 2030836R-SAUSP03V00

Product Name	Mobile Data Terminal	
Applicant	RuggON Corporation	
Address	4F, No. 298, Yang Guang St., Neihu Dist., Taipei City, Taiwan	
Manufacturer	RuggON Corporation	
Model No.	MT7030	
FCC ID.	2ABTU-MT7030	
Trade Name	RuggON	
Applicable Standard	KDB 447498 D01 v06	☒ Minimum test separation distance ≥ 20 cm ☐ For low power devices
Test Result	Complied	

Documented By : Anny Chou
(Senior Adm. Specialist / Anny Chou)

Tested By : wen Lee
(Supervisor / Wen Lee)

Approved By :
(Director / Vincent Lin)

Revision History

Report No.	Version	Description	Issued Date
2030836R-SAUSP03V00	V0.1	Initial issue of report.	2020-07-02
2030836R-SAUSP03V00	V0.2	Adjust report layout.	2020-07-21

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Mobile Data Terminal
Trade Name	RuggON
Model No.	MT7030
FCC ID	2ABTU-MT7030
Contain FCC ID	2ABTU-MS01PRO
Frequency Range	13.56MHz
Modulation	ASK

1.2. Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	AnJie	AJDQ1J-B0029 (Main) AJDQ1J-W0022 (Aux)	PIFA	2.5 dBi for 2.4 GHz 3.7dBi for 5150-5250MHz 3.7dBi for 5250-5350MHz 3.6dBi for 5470-5725MHz
2	AnJie	AJLQ1J-B0033 (Main)	Internal	1.7 dBi for 704-751MHz 1.6 dBi for 824-862MHz 1.9 dBi for 880-915MHz 2.1 dBi for 1710-1785MHz 1.4 dBi for 1920-1980MHz 1.3 dBi for 2300-2400MHz 1.4 dBi for 2500-2620MHz
3	AnJie	AJLQ1J-W0005 (Aux) RX functions	Internal	1.9 dBi for 704-751MHz 1.8 dBi for 824-662MHz 1.9 dBi for 880-915MHz 2.9 dBi for 1710-1785MHz 1.4 dBi for 1920-1980MHz 1.3 dBi for 2300-2400MHz 1.4 dBi for 2500-2620MHz

2. RF Exposure Evaluation

2.1. Standard Applicable

According to KDB 447498 D01 (7.1), A minimum test separation distance ≥ 20 cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits.

2.2. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

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 (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $Pd = (Pout*G)/(4*pi*r^2)$

Where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

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

Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0

2.3. Test Result of RF Exposure Evaluation

Product : Mobile Data Terminal
Test Item : RF Exposure Evaluation
Test Site : N/A

WLAN 2.4G Peak Gain: 2.5dBi ; WLAN 5G Peak Gain: 3.7dBi

Band	Frequency (MHz)	Conducted maximum Peak Power (dBm)	Worst case Duty Cycle (%)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)	Limit (mW/cm2)	Pass/Fail
2.4G	2417	21.05	87.41	145.693	0.0515	1	Pass
5G	5720	21.45	78.38	178.154	0.0831	1	Pass
BT	2402	6.21	32.56	12.833	0.0045	1	Pass

Note: The conducted output power is refer to report No.: 2030820R-E3082100013 from the DEKRA.

WWAN Worst Case Power Density Configurations LTE Band 12 Peak Gain: 1.9dBi

Band	Frequency (MHz)	Conducted Peak Power (pre tune-up) (dBm)	Maximum EIRP (W)	Maximum EIRP Limit(W)	Duty Cycle (%)	Conducted Average Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)	Limit (mW/cm2)	Pass/Fail
12	699	25	0.3055	3	100	25	316.2	0.097	0.47	Pass

Note: The Worst Case Power Density is refer to report No.: 2030820R-E3082100013 from the DEKRA.

RFID:

Frequency (MHz)	H-Field (dBuV/3m)	H-Field (ERP) (dBm)	H-Field (ERP) (mW)	Power Density at R = 20 cm (mW/cm^2)	Limit (mW/cm^2)	Pass/Fail
13.56	76.47	-20.9087875	0.0081119	0.0000016138	0.979	Pass

Note: The H-Field power is refer to report No.: 2030836R-RFUSP17V01 from the DEKRA.

2.4. Calculations for Multi-Transsmitter

Mode	Exposure Calculations	result	Limit	Pass/Fail
WLAN	0.083	0.294	1	Pass
WWAN	0.206			
BT	0.005			
RFID	0			