MRT Technology (Suzhou) Co., Ltd Phone: +86-512-66308358

Web: www.mrt-cert.com

Report No.: 2107RSU044-U5 Report Version: V01 Issue Date: 03-02-2022

RF Exposure Evaluation Declaration

FCC ID: 2AUBBV9OTM45

Applicant: China Starwin Science & Technology Co., Ltd

Application Type: Certification

Product: mobile satellite communication terminal

Model No.: V9 OTM45

Brand Name: Star Win

FCC Classification: Digital Transmission System (DTS)

Licensed Non-Broadcast Station Transmitter (TNB)

Approved By:

Reviewed By:

Jame Yuan

Robin Wu

Robin Wu

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Taiwan) Co., Ltd.





Revision History

Report No.	Version	Description	Issue Date	Note
2107RSU044-U5	Rev. 01	Initial Report	03-02-2022	Valid



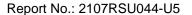


1. PRODUCT INFORMATION

Product Name	mobile satellite communication terminal			
Model No.	V9 OTM45			
Hardware Version	XY-V9-OTM45-202111			
Software Version	XY-V9-OTM45-V1.17B			
Wi-Fi Specification	802.11b/g/n			
Bluetooth Version	V4.2 single mode, BLE only			
Satallita Specification	Transmit: 13.75~14.50GHz			
Satellite Specification	Receive: 10.70~12.75GHz			
GNSS Specification	GPS, BDS			
Operating Temperature	-25 ~ 50 °C			
Antenna Type	Bluetooth: Dipole Antenna			
	2.4G Wi-Fi: Dipole Antenna			
	Satellite: Slotted Waveguide Array Antenna			
Antenna Gain	Bluetooth: 1.5 dBi			
	2.4G Wi-Fi: 10.0 dBi			
	Satellite: 33.21 dBi (in range of ±10 degree)			
	3.69 dBi (out range of ±10 degree)			
Power Supply	By AC Power			

Remark:

The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.





2. RF Exposure Evaluation

2.1. Test Limit

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	Electric Field	Magnetic Field	Power Density	Average Time		
(MHz)	Strength	Strength	(mW/cm ²)	(Minutes)		
	(V/m)	(A/m)				
(A) Limits for Occupational / Control Exposures						
300-1500		f/300		6		
1500-100000			5	6		
(B) Limits for General Population / Uncontrolled Exposures						
300-1500		-	f/1500	6		
1500-100000		1		30		

f= Frequency in MHz

Calculation Formula: $P_d = (P_{out}*G)/(4*pi*r^2)$

Where

 P_d = power density in mW/cm²

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

P_d is the limit of MPE, 1mW/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 r where the MPE limit is reached.



Report No.: 2107RSU044-U5

2.2. Test Result

Product	mobile satellite communication terminal
Test Item	RF Exposure Evaluation

For -10 ~ +10 degrees on-axis:

Test Mode	Frequency Band	Max Conducted	Maximum	Maximum EIRP	Power Density	Limit
	(MHz)	Power	EIRP	(mW)	at R = 1292 cm	(mW/cm ²)
		(dBm)	(dBm)		(mW/cm ²)	
BLE	2400 ~ 2483.5	5.0	6.5	4.47	0.0000	1
2.4G Wi-Fi	2400 ~ 2483.5	17.5	27.5	562.34	0.0000	1
Satellite	13750 ~ 14500	40.0	73.21	20941124.56	0.9983	1

Conclusion:

BLE, 2.4G Wi-Fi and Satellite can transmit simultaneously.

So the Power Density at R (1292 cm) = 0.0000mW/cm² + 0.0000mW/cm² + 0.9983mW/cm² = 0.9983mW/cm² < 1mW/cm².

Therefore, the Compliance Distance is 1292 cm (for -10 ~ +10 degrees on-axis).

For out range of ±10 degrees on-axis:

Test Mode	Frequency Band	Max Conducted	Maximum	Maximum EIRP	Power Density	Limit
	(MHz)	Power	EIRP	(mW)	at R = 44 cm	(mW/cm ²)
		(dBm)	(dBm)		(mW/cm ²)	
BLE	2400 ~ 2483.5	5.0	6.5	4.47	0.0002	1
2.4G Wi-Fi	2400 ~ 2483.5	17.5	27.5	562.34	0.0231	1
Satellite	13750 ~ 14500	40.0	43.69	23388.37	0.9614	1

Conclusion:

BLE, 2.4G Wi-Fi and Satellite can transmit simultaneously.

So the Power Density at R $(44 \text{ cm}) = 0.0002 \text{mW/cm}^2 + 0.0231 \text{mW/cm}^2 + 0.9614 \text{mW/cm}^2 = 0.9847 \text{mW/cm}^2 < 1 \text{mW/cm}^2$.

Therefore, the Compliance Distance is 44 cm (for out range of ±10 degrees on-axis).

 The End	
 rne Ena	