

# Radio Test Report

Report No.: STS2307086H01

Issued for

FrSky Electronic Co., Ltd.

F-4, Building C, Zhongxiu Technology Park, No.3 Yuanxi  
Road, Wuxi, 214125, Jiangsu, China

Product Name: Wireless digital signal module

Brand Name: FRSKY

Model Name: TD PRO Module

Series Model(s): N/A

FCC ID: XYFTDPROMDL

Test Standard: FCC 47CFR §2.1091

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### TEST REPORT

**Applicant's Name**..... : FrSky Electronic Co., Ltd.  
 Address ..... : F-4, Building C, Zhongxiu Technology Park, No.3 Yuanxi Road,  
 Wuxi, 214125, Jiangsu, China  
**Manufacturer's Name** ..... : FrSky Electronic Co., Ltd.  
 Address ..... : F-4, Building C, Zhongxiu Technology Park, No.3 Yuanxi Road,  
 Wuxi, 214125, Jiangsu, China

#### Product Description

Product Name..... : Wireless digital signal module  
 Brand Name ..... : FRSKY  
 Model Name ..... : TD PRO Module  
 Series Model(s) ..... : N/A

**Test Standards**..... : FCC 47CFR §2.1091  
 447498 D04 Interim General RF Exposure Guidance v01

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#### Date of Test..... :

Date of receipt of test item ..... : 20 July 2023  
 Date (s) of performance of tests..... : 20 July 2023 ~ 24 Aug. 2023  
 Date of Issue..... : 24 Aug. 2023  
 Test Result..... : **Pass**

Testing Engineer : *Aaron Bu.*  
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 (Aaron Bu)

Technical Manager : *Sean She*  
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 (Sean she)

Authorized Signatory : *Chris Chen*  
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 (Chris Chen)





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**Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	24 Aug. 2023	STS2307086H01	ALL	Initial Issue



## 1. GENERAL INFORMATION

### 1.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Wireless digital signal module	
Brand Name	FRSKY	
Model Name	TD PRO Module	
Series Model(s)	N/A	
Model Difference	N/A	
Product Description	The EUT is Wireless digital signal module	
	Operation Frequency:	2.4G-LoRa: 2400.7~2482.5MHz 2.4G-FSK: 2400.6~2482.8MHz Hybrid system: 902~928MHz
	Modulation Type:	2.4G:LoRa/FSK 902~928MHz: LoRa
	Antenna gain:	2.4G-LoRa: ANT 1: 3.74dBi ,ANT 2: 3.95dBi, MIMO 1+2: 6.86 dBi 2.4G-FSK: ANT 1: 3.15dBi ,ANT 2: 4.33dBi, MIMO 1+2: 6.77dBi 902~928MHz: 1.8dBi
	Antenna Designation:	2.4G: PIFA 902~928MHz: Single-band
Rating	Input: DC 7.4V	
Hardware Version	Rev0.3	
Software Version	1.0.8	

### 1.2 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01



## 2. FCC 47CFR §2.1091 REQUIREMENT

### 2.1 TEST STANDARDS

The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.

Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

### 2.2 LIMIT

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of the 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 <sup>2</sup> )
Limits for Occupational / controlled Exposures			
300 - 1500	--	--	F/300
1500 – 100000	--	--	5.0
Limits for General population / Uncontrolled Exposure			
300 - 1500	--	--	F/1500
1500 – 100000	--	--	1.0

F= Frequency in MHz

Friss Formula

Friss Transmission Formula:  $Pd = (Pout * G) / (4*pi*r^2)$

Where

Pd = power density in mW/cm<sup>2</sup>

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

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

If we know the maximum gain of the antenna and the total output power to the antenna, through calculation, we will know MPE value at distance 20cm.



## 2.3 TEST RESULT

Turn up

Mode	Detector	Turn up Power
902~928MHz	AV	23±1dBm
2.4G LoRa ANT 1	AV	9±3.5dBm
2.4G LoRa ANT 2	AV	8±4dBm
2.4G LoRa MIMO	AV	11±4dBm
2.4G FSK ANT 1	AV	6±2.5dBm
2.4G FSK ANT 2	AV	5±2.5dBm
2.4G FSK MIMO	AV	9±2dBm

Protocol	Fre. (MHz)	Separation distance (cm)	Max Turn up power (dBm)	ANT Gain (dBi)	Max EIRP (dBm)	Max EIRP (mW)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Ratio	Result
902~928 MHz	924.5	20	24.00	1.8	25.80	380.189	0.0756	0.616333	0.1227	Pass
2.4G LoRa ANT 1	2442	20	12.50	3.74	16.24	42.073	0.0084	1	0.0084	Pass
2.4G LoRa ANT 2	2400.7	20	12.00	3.95	15.95	39.355	0.0078	1	0.0078	Pass
2.4G LoRa MIMO	2442	20	15.00	6.86	21.86	153.462	0.0305	1	0.0305	Pass
2.4G FSK ANT 1	2442	20	8.50	3.15	11.65	14.622	0.0029	1	0.0029	Pass
2.4G FSK ANT 2	2442	20	7.50	4.33	11.83	15.241	0.0030	1	0.0030	Pass
2.4G FSK MIMO	2442	20	11.00	6.77	17.77	59.841	0.0119	1	0.0119	Pass



**Multiple transmission: (Worst case)**

902~928MHz +2.4G Lora MIMO =0.1227+0.0305=0.1532<1

902~928MHz +2.4G FSK MIMO =0.1227+0.0119=0.1346<1

Note: 1. The Maximum power is less than the limit, complies with the exemption requirements.

2. ERP = EIRP - 2.15

※※※※※END OF THE REPORT※※※※※