ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR TRANSMITTER

Test Report No.	**: OT-197-RWD-005**
AGR No.	**: A196A-235**
Applicant	**: Suntech International Ltd.**
Address	**: (Gasan-dong, Greatvally), B-1506, 32, Digital-ro9-gil, Geumchon-gu, Seoul, Korea**
Manufacturer	**: Suntech International Ltd.**
Address	**: (Gasan-dong, Greatvally), B-1506, 32, Digital-ro9-gil, Geumchon-gu, Seoul, Korea**
Type of Equipment	**: Tracking Device**
FCC ID.	**: WA2ST3500**
Model Name	**: ST3500**
Serial number	**: N/A**
Total page of Report	**: 9 pages (including this page)**
Date of Incoming	**: June 21, 2019**
Date of issue	**: July 08, 2019**

SUMMARY

The equipment complies with the regulation; ***FCC PART* Part 2, Part 22 Subpart H, Part 24 Subpart E**

This test report only contains the result of a single test of the sample supplied for the examination. It is not a generally valid assessment of the features of the respective products of the mass-production.

Reviewed by: Tae-Ho, Kim / Senior Manager
ONETECH Corp.

Approved by: Ki-Hong, Nam / Chief Engineer
ONETECH Corp.

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

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Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-197-RWD-005	July 08, 2019	Initial Release	All

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1. VERIFICATION OF COMPLIANCE

Applicant : Suntech International Ltd.
Address : (Gasan-dong, Greatvally), B-1506, 32, Digital-ro9-gil, Geumchon-gu, Seoul, Korea
Contact Person : Yohan Kim / Manager
Telephone No. : 82-2-6327-5661
FCC ID : WA2ST3500
Model Name : ST3500
Serial Number : N/A
Date : July 08, 2019

EQUIPMENT CLASS	PCB-PCS Licensed Transmitter
KIND OF EQUIPMENT	Tracking Device
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.26:2015, KDB Publication 971168 D01
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART Part 2, Part 22 Subpart H, Part 24 Subpart E
Modifications on the Equipment to Achieve Compliance	None
Final Test was Conducted On	3 m, Semi Anechoic Chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

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2. GENERAL INFORMATION

2.1 Product Description

The Suntech International Ltd., Model ST3500 (referred to as the EUT in this report) is a Tracking Device. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Tracking Device		
OPERATING FREQUENCY	WCDMA Band 2	TX	1 852.4 MHz ~ 1 907.6 MHz
		RX	1 932.4 MHz ~ 1 987.6 MHz
	WCDMA Band 5	TX	826.4 MHz ~ 846.6 MHz
		RX	871.4 MHz ~ 891.6 MHz
Modulation Type	QPSK, 16QAM		
Maximum EIRP Power	WCDMA Band 2	20.63 dBm	
Maximum ERP Power	WCDMA Band 5	21.55 dBm	
ANTENNA TYPE	PIFA Antenna		
ANTENNA GAIN	WCDMA Band 2	5.2 dBi	
	WCDMA Band 5	0.0 dBi	
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	26 MHz		

2.2 Alternative type(s)/model(s); also covered by this test report.

-. None

3. EUT MODIFICATIONS

-. None

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4. MAXIMUM PERMISSIBLE EXPOSURE

4.1 RF Exposure Calculation

According to the FCC rule 1.1310 table 1B, the limit for the maximum permissible RF exposure for an uncontrolled environment are f/1500 mW/cm² for the frequency range between 300 MHz and 1 500 MHz and 1.0 mW/cm² for the frequency range between 1 500 MHz and 100 000 MHz.

The electric field generated for a 1 mW/cm² exposure is calculated as follows:

$E = \sqrt{(30 * P * G)} / d$, and $S = E^2 / Z = E^2 / 377$, because 1 mW/cm² = 10 W/m²

Where

S = Power density in mW/cm², Z = Impedance of free space, 377 Ω

E = Electric filed strength in V/m, G = Numeric antenna gain, and d = distance in meter

Combing equations and rearranging the terms to express the distance as a function of the remaining variable

$d = \sqrt{(30 * P * G) / (377 * 10 S)}$

Changing to units of mW and cm, using P (mW) = P (W) / 1 000, d (cm) = 0.01 * d (m)

$d = 0.282 * \sqrt{(P * G) / S}$

Where

d = distance in cm, P = Power in mW, G = Numeric antenna gain, and S = Power density in mW/cm²

IMPORTANT NOTE:

To comply with the FCC RF exposure compliance requirements, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with ant other antenna or transmitter. No change to the antenna or the device is permitted. Any change to the antenna or the device could result in the device exceeding the RF exposure requirements and void user's authority to operate the device.

There is no simultaneous operation within the bands used in this EUT

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4.2 EUT Description

Kind of EUT	Tracking Device		
Operating Frequency Band	WCDMA Band 2	TX	1 852.4 MHz ~ 1 907.6 MHz
		RX	1 932.4 MHz ~ 1 987.6 MHz
	WCDMA Band 5	TX	826.4 MHz ~ 846.6 MHz
		RX	871.4 MHz ~ 891.6 MHz
MAX. RF OUTPUT POWER	WCDMA Band 2	21.29 dBm	
	WCDMA Band 5	23.16 dBm	
Antenna Gain	WCDMA Band 2	5.2 dBi	
	WCDMA Band 5	0.0 dBi	
Exposure Evaluation Applied	■ MPE ☐ SAR ☐ N/A		

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5 Evaluation Results

5.1 Assessment result of RF Power and Antenna gain

5.1.1 WCDMA Band 2

Operating Mode	Operating Frequency (MHz)	Avg. Power Level	
		(dBm)	(W)
WCDMA Band 2	1 852.4	21.29	0.135

5.1.2 WCDMA Band 5

Operating Mode	Operating Frequency (MHz)	Avg. Power Level	
		(dBm)	(W)
WCDMA Band 5	836.6	23.16	0.207

Tested by: Ju Yun Park / Assistant Manager

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5.1.3 Calculated MPE Safe Distance

According to above equation, the following result was obtained.

Operating Mode	Operating Frequency (MHz)	Conducted Average Power		Antenna Gain (dBi)		Safe Distance (cm)	Power Density (mW/cm²) @ 20 cm Separation	Limit (mW/cm²)
		(dBm)	(mW)	Log	Linear			
WCDMA Band 2	1 852.4	21.29	134.59	5.20	3.311	5.95	0.088 7	1.00

Operating Mode	Operating Frequency (MHz)	Conducted Average Power		Antenna Gain (dBi)		Safe Distance (cm)	Power Density (mW/cm²) @ 20 cm Separation	Limit (mW/cm²)
		(dBm)	(mW)	Log	Linear			
WCDMA Band 5	836.6	23.16	207.01	0.00	1.000	4.06	0.041 2	0.55

limit = 836.6/1500 = 0.55 mW/cm^2

WCDMA Band 2 Power Density = Conducted Average Power * Antenna Gain(dBi) / (4πR^2)

= (134.59*3.311)/(4*π*20^2) = 0.088 7 mW/cm^2

WCDMA Band 5 Power Density = Conducted Average Power * Antenna Gain(dBd) / (4πR^2)

= (207.01*1.000)/(4*π*20^2) = 0.041 2 mW/cm^2

Tested by: Ju Yun Park / Assistant Manager

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