



Report No.: SZEM181200015202

Page: 1 of 9

## SAR Evaluation Report

**Application No.:** SZEM1812000152CR  
**Applicant:** ALIGN CORPORATION LIMITED  
**Address of Applicant:** NO. 345, SHUI YUAN RD., FENG YUAN DIST. TAICHUNG 42076, TAIWAN  
**Manufacturer:** ALIGN CORPORATION LIMITED  
**Address of Manufacturer:** NO. 345, SHUI YUAN RD., FENG YUAN DIST. TAICHUNG 42076, TAIWAN  
**Factory:** FLYSKY RC Model Technology Co., Ltd  
**Address of Factory:** Building 3, West of Huangjinyuan Ind Park, North Gate of Qiaoli, Changping Lek, Dongguan, China  
**Equipment Under Test (EUT):**  
**EUT Name:** A13 GST Transmitter  
**Model No.:** A13  
**Trade mark:** ALIGN  
**FCC ID:** Y6IA13  
**Standards:** 47 CFR Part 1.1307  
47 CFR Part 2.1093  
KDB447498D01 General RF Exposure Guidance v06  
**Date of Receipt:** 2018-12-22  
**Date of Test:** 2018-12-26 to 2019-01-29  
**Date of Issue:** 2019-02-01

<b>Test Result :</b>	<b>PASS*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu

Keny Xu  
EMC Laboratory Manager



SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch EMC Laboratory

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## 2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2019-02-01		Original

Authorized for issue by:				
				
		Harry Wu /Project Engineer		
				
		Eric Fu /Reviewer		



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## 4 General Information

### 4.1 General Description of EUT

Power supply:	DC7.4V Rechargeable Battery or AC/DC adapter, Model: SR-C6B1201500U2 Input: AC100-240V, 50/60Hz, 0.55A Max. Output: DC 12V, 1500mA
Cable:	DC cable: 100cm, Unshielded
For 2.4GHz RF	
Operation Frequency:	2408-2475MHz
Modulation Type:	GFSK
Channel Spacing:	0.5MHz
Number of Channels:	135
Antenna Type:	Integral Antenna
Antenna Gain:	Antenna 1: 1.91dBi; Antenna 2: 1.91dBi Two antennas cannot synchronously transmit.
For BLE	
Operation Frequency	2402MHz to 2480MHz
Antenna Gain	2dBi
Antenna Type	Integral Antenna
Channel Spacing	2MHz
Modulation Type	GFSK
Number of Channels	40





## 4.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China  
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

## 4.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.



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#### **4.4 Deviation from Standards**

None.

#### **4.5 Abnormalities from Standard Conditions**

None.

#### **4.6 Other Information Requested by the Customer**

None.



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## 5 SAR Evaluation

### 5.1 RF Exposure Compliance Requirement

#### 5.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

##### 4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

#### 5.1.2 Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$$\left[ \frac{\text{max. power of channel, including tune-up tolerance, mW}}{[\sqrt{f(\text{GHz})}]} \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where} \right.$$

$f(\text{GHz})$  is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation<sup>17</sup>

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion

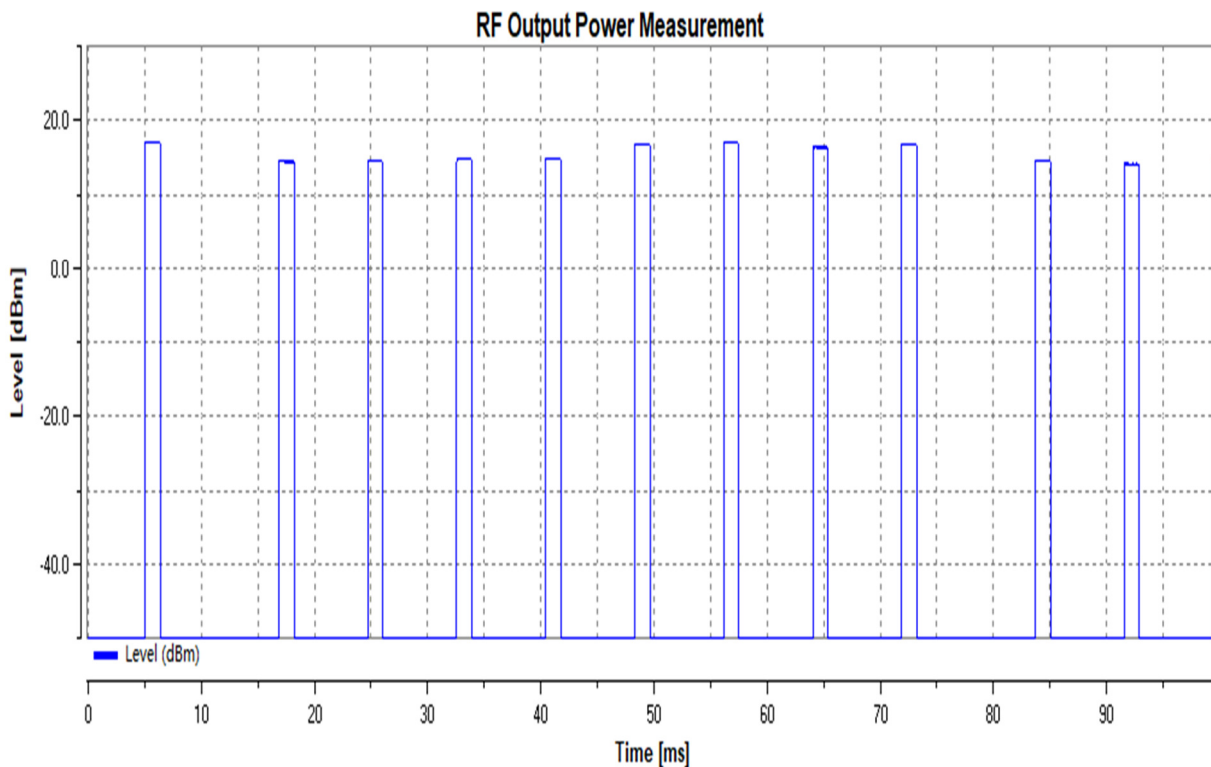
#### 5.1.3 EUT RF Exposure



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**Duty cycle=15.62%**

The Conducted Output Power of the EUT is 16.6dBm(45.71mW).

**Source-based time-averaging power:**

$(45.71 \times 15.62\%) \text{ mW} = 7.14 \text{ mW};$

According to the formula, calculate the test exclusion thresholds:

$[(\text{max. power of channel, including tune-up tolerance, mW}) /$

$(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}]$

General RF Exposure =  $(7.14 \text{ mW} / 5 \text{ mm}) \times \sqrt{2.475 \text{ GHz}} = 2.25$

(1)

SAR requirement:  $S=3$

(2)

$(1) < (2)$



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**BLE:**

The Max. power (including tune-up tolerance) is 6.21 dBm on the lowest channel 2.402 GHz (\*)  
6.21 dBm logarithmic terms convert to numeric result is nearly 4.18 mW  
According to the formula. calculate the test exclusion thresholds:

$$\text{General RF Exposure} = \frac{(\text{Max. Power of channel, including tune-up tolerance, mW}) * \sqrt{f \text{ (GHz)}}}{(\text{min. test separation distance, mm})}$$

$$\text{General RF Exposure} = (4.18 \text{ mW} / 5 \text{ mm}) * \sqrt{2.402 \text{ GHz}} = 1.30 \quad (1)$$

SAR requirement:

$$S = 3.0 \quad (2)$$

$$(1) < (2)$$

So the SAR report is not required.

(\*) Max. power refer to Report No.:GTS201811000096F01

**SAR test exclusion for simultaneously transmitting mode:**

**For 2.4GHz RF**

Because the min test separation distance is ≤50mm, so the SAR values is[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]·[√f(GHz)/x] W/kg  
=(7.14/5)·(√2.475/7.5) W/kg =0.300W/kg.

**For BLE**

Because the min test separation distance is ≤50mm, so the SAR values is[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]·[√f(GHz)/x] W/kg  
=(4.18/5)·(√2.402/7.5) W/kg =0.173W/kg.

**Exposure conditions for simultaneous transmission operations**

Simultaneous transmission SAR test is not required,because the sum of estimated SAR for 2.4GHz RF and BLE is (0.300+0.173)W/kg=0.473W/kg<1.6 W/kg.

- End of the Report -

