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RADIO TEST REPORT

Report No: STS1904154H01

Issued for

Nortek Security & Control LLC

5919 Sea Otter Place, Suite 100, Carlsbad, CA 92010, USA

Product Name:	EL-SC-100
Brand Name:	ELAN
Model Name:	EL-SC-100
Series Model:	N/A
FCC ID:	EF400186
Test Standard:	FCC 47CFR§2.1091

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Test Report Certification

Applicant's name : **Nortek Security & Control LLC**
Address : 5919 Sea Otter Place, Suite 100, Carlsbad, CA 92010, USA

Manufacture's Name : **Linear Electronics(Shenzhen) Limited**
Address : Hourui Second Industrila Zone, Hourui village, Hangcheng, Baoan, Shenzhen, P.R.C

Product description

Product Name : EL-SC-100
Brand Name : ELAN
Model Name : EL-SC-100
Series Model : N/A

Standards : FCC 47CFR§2.1091

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Date of Test :

Date (s) of performance of tests : 09 Nov. 2018 -15 Nov. 2018

Date of Issue : 20 May 2019

Test Result : **Pass**

Testing Engineer :

(Chris chen)

Technical Manager :

(Sean she)

Authorized Signatory :

(Vita Li)





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**Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	20 May 2019	STS1904154H01	ALL	Initial Issue





1. GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF THE EUT

Product Name	EL-SC-100	
Brand Name	ELAN	
Model Name	EL-SC-100	
Series Model	N/A	
Model Difference	N/A	
Product Description	The EUT is EL-SC-100 which supports Wi-Fi 802.11 b/g/n wireless technology.	
	Operation Frequency:	2412 - 2462 MHz for 802.11b/g/n(HT20)
	Modulation Type:	DSSS(DBPSK/DQPSK/CCK) OFDM(BPSK/QPSK/16QAM/64QAM)
	Bit Rate of Transmitter:	1/2/5.5/11 Mbps for 802.11b 6/9/12/18/24/36/48/54 Mbps for 802.11g MCS0 ~ MCS7 for 802.11n
	Number Of Channel:	11 channels for 802.11b/g/n(HT20)
	Antenna Designation:	Please see Note 4
	Antenna Gain (dBi):	3.5dBi
	Duty Cycle:	>98%
Power Rating	DC 12V@1000mA via AC/DC adapter POE Interface	
Hardware Version	N/A	
Software Version	N/A	

Note: 1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

1.2 TEST FACTORY

Shenzhen STS Test Services Co., Ltd.

Add. : 1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong, China

CNAS Registration No.: L7649; FCC Registration No.: 625569

IC Registration No.: 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 ²)
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/cm² aaa

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 EUT OPERATION CONDITION

EUT was enabled to transmit and receive at lowest, middle and highest channels.

2.4 CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm or more separation distance from the antenna should be included in the User manual. So, this device is classified as Mobile device.



2.4TEST RESULT

Turn up

Mode	Detector	Turn up
802.11b-Low	PEAK	19±1dBm
802.11b-Mid	PEAK	19±1dBm
802.11b-High	PEAK	19±1dBm
802.11g-Low	PEAK	22±1dBm
802.11g-Mid	PEAK	22±1dBm
802.11g-High	PEAK	22±1dBm
802.11n(HT20)-Low	PEAK	21±1dBm
802.11n(HT20)-Mid	PEAK	21±1dBm
802.11n(HT20)-High	PEAK	21±1dBm

ANT Gain (G)

2402-2483.5MHz: 3.5dBi (gain of antenna in linear scale=2.239)

Protocol	Output Power to Antenna (mW)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
802.11b-Low	100.000	0.04457	1	Pass
802.11b-Mid	100.000	0.04457	1	Pass
802.11b-High	100.000	0.04457	1	Pass
802.11g-Low	199.526	0.08892	1	Pass
802.11g-Mid	199.526	0.08892	1	Pass
802.11g-High	199.526	0.08892	1	Pass
802.11n(HT20)-Low	158.489	0.07063	1	Pass
802.11n(HT20)-Mid	158.489	0.07063	1	Pass
802.11n(HT20)-High	158.489	0.07063	1	Pass

*****END OF THE REPORT*****