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# **FCC Test Report**

Application No.: HKES131000258501
Applicant: Captial Prospect Ltd.

Address Room 03, 13/F., Block B, Veristrong Ind. Centre

34-36 Au Pui Wan Street, Fo Tan, N.T.

Hong Kong

**Product Information:** 

Product Description: Wireless Keypad

Model: KN-318

Product Class: Low Power Communication Device – Transmitter (318 MHz)

FCC ID: KUTKN318

Requirement: CFR 47 FCC PART 15 SUBPART C, 2012

- Intentional Radiators.(Section 15.231)

 Date of Receipt:
 2013-10-11

 Date of Test:
 2013-10-31

 Date of Issue:
 2013-11-05

Test Result : PASS\*

\* In the configuration tested, the EUT complied with the requirements for the relevant clauses of Federal Communications Commission Rules as specified above

Authorized Signature:

LOKE Sai Kit, Wilson Senior Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of International Electrical Certification Centre Ltd. or testing done by International Electrical Certification Centre Ltd. in connection with, distribution or use of the product described in this report must be approved by International Electrical Certification Centre Ltd. in writing.

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## 2 Test Summary

Test	Test Requirement	Test Method	Result
Antenna Requirement	FCC PART 15, SUBPART C: 2012	ANSI C63.4:2009	PASS
Radiated Emission	FCC PART 15, SUBPART C: 2012	ANSI C63.4:2009	PASS
Bandwidth	FCC PART 15, SUBPART C: 2012	ANSI C63.4:2009	PASS
Provision of Momentary operation	FCC PART 15, SUBPART C: 2012	ANSI C63.4:2009	PASS

#### Remark:

1) Please refer to section 6.1 of this report for explanation



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## 4 General Information

### 4.1 General Description of EUT

EUT Name: Wireless Keypad

Model: KN-318

Serial No.: --

Type of modification: OOK
Operating frequency: 318MHz

Antenna type: Integral antenna

### 4.2 Details of EUT

Power Supply: DC 1.5V (AAA battery x 1)

Power Cord: ---

#### 4.3 Conditions of EUT

The received sample was under good condition.

### 4.4 Description of Support Units

The EUT has been tested as an independent unit.

### 4.5 Standards Applicable for Testing

CFR 47, FCC Part 15, Oct 2012 ANSI C63.4:2009

#### 4.6 Test Location

FCC ID: KUTKN318

All tests were performed at: -

SGS IECC Limited (Member of the SGS Group (SGS SA))

Units 303-305, 3/F., 31 Lok Yip Road, On Lok Tsuen, Fanling, N.T., Hong Kong

Tel: +852 2305 2570 Fax: +852 2756 4480.

No tests were sub-contracted.

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### 4.7 Test Facility

Measurement facility located at Fanling (Hong Kong), placed on file with the FCC Pursuant to Section 2.948 of the FCC Rules (FCC Registration No.: 97774).

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

#### FCC - CAB Registration No.: 446297

Measurement facility located at Fanling (Hong Kong), accredited as a Conformity Assessment Body (CAB) and was designated by FCC to perform compliance testing on equipment subject to Declaration Of Conformity (DOC) and Certification under Part 15 and 18 of the Commission's Rules.

### 4.8 Deviation from Standards

None.

#### 4.9 Abnormalities from Standard Conditions

None.

### 4.10 Declaration of Family Grouping

None.

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#### 4.11 Abbreviations

N/A: Not Applicable

**EUT: Equipment Under Test** 

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## 5 Equipments Used during Test

Radiated Emission		Ι		T	
Equipment	Manufacturer	Model / Serial No.	Cal. Date	Cal. Due Date	
3m Semi-Anechoic Chamber (pre-test)					
3m / 10m Open Aera Test Site			2012/02/24	2015/02/23	
Test Receiver	Rohde & Schwarz	ESCS 30 / 100388	2013/10/23	2014/10/22	
Spectrum Analyzer	Rohde & Schwarz	FSP 30 / 101474	2013/08/08	2014/08/07	
Antenna 30-1000MHz	Schaffner	CBL6111C / 2791	2012/10/12	2014/10/11	
Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D / 9120D-1070	2012/11/13	2014/11/12	
Preamplifier 10MHz – 6GHz	Schwarzbeck	BBV9743 / 9743-052	2012/11/13	2014/11/12	
Preamplifier 1-18GHz	Schwarzbeck	BBV9718 / 9718-223	2012/11/13	2014/11/12	
Coaxial Cable		E167	2012/02/06	2014/02/05	
RF Cable	HUBER+SUHNER	E207	2012/11/14	2013/11/13	
Antenna Mast System	Schwarzbeck	AM9104 / -			
Turntable with Controller	Drehtisch	DT312 / -			
General Use Equipment					
Equipment	Manufacturer	Model / Serial No.	Cal. Date	Cal. Due Date	
Digital Multimeter	Fluke	189 / 83640020	2013/04/10	2014/04/09	
Temperature / Humidity meter	-	E158	2012/11/06	2013/11/05	

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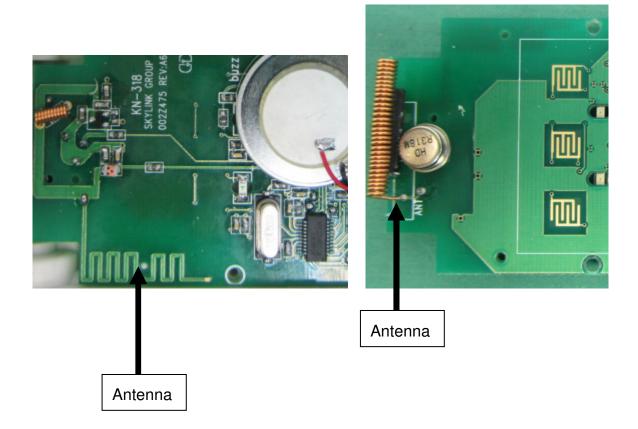
### 6 Test Results

### 6.1 Antenna Requirment

According to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

The EuT has component antenna, which accordance to the above sections, is considered sufficient to comply with the provisions of these sections.

Remark: These two antennas connected together. The etched antenna on the PCB hasthe directional issue, added the coil type is to improve the performance. They transmit at the same time to extend the cover distance.



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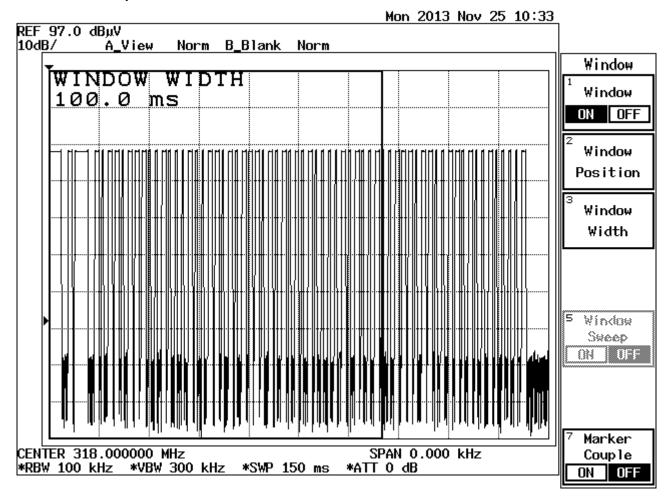
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### 6.2 Average Factor

#### 6.2.1 Measurement Data

Time Domain Plots (Fundamental frequency of Transmitter at 318MHz, worst case):

Test results on operation with control for transmition mode :

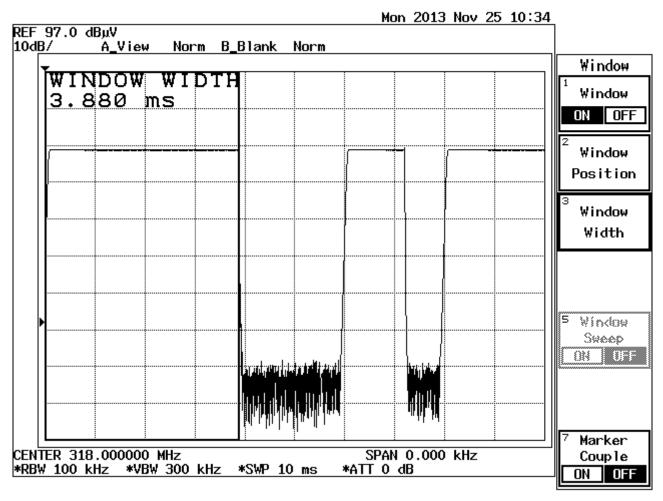


Pulse cycle period > 100ms

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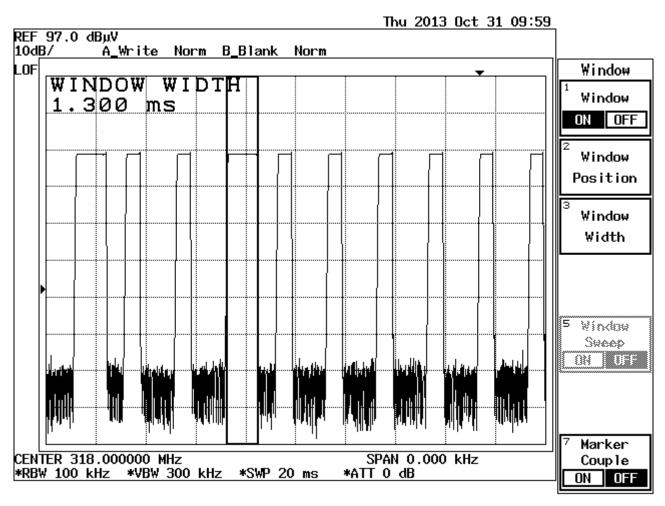


Pulse width = 3.88ms (total no. of pulse : 2)

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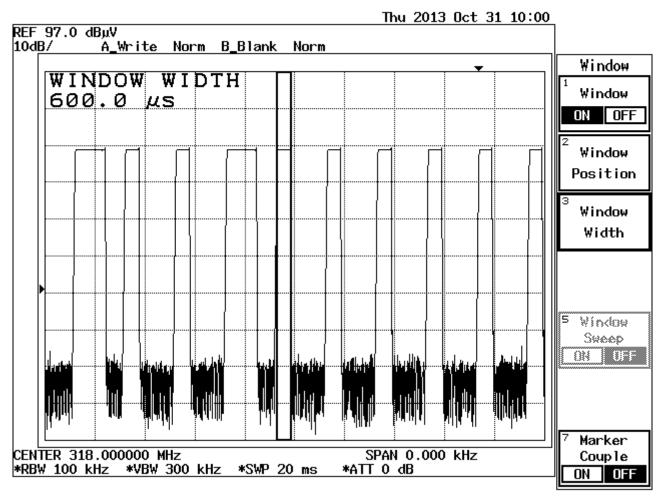
Pulse width = 1.3ms (total no. of pulse : 22)

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Pulse width = 0.6 ms (total no. of pulse : 23)

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#### Calculation for radiation (average):

Formula:

Duty cycle = (N1L1 + N2L2 + ... + Nn-1Ln-1 + NnLn) / 100 or T where

N1 is the number of type 1 pulse, L1 is length of type 1 pulse, etc.

T is the period of the pulse train (if less than 100ms)

According to the time domain plots shown on the next two pages :

Duty cycle of the EUT =  $(3.88 \times 2 + 1.3 \times 22 + 0.6 \times 23) / 100 = 0.502$ 

Av correction factor =  $20 \times \log(0.502) dB$ = -5.99 dB

#### Remarks:

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Average factor of three buttons are measured and the wrost case average factor is shown above.

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### 6.3 Radiated Emissions

Test Requirement: FCC Part15 Subpart C Section 15.231(b)

Test Method: ANSI C63.4
Test Date: 2013-10-31

Frequency Range: 30MHz to 3180MHz

Measurement Distance: 3m

Detector: Peak for pre-scan (120kHz resolution bandwidth)

Quasi-Peak if maximised peak within 6dB of limit

Start frequency	Stop frequency	Resolution	Video	Step size	Measurement	Detector
(MHz)	(MHz)	bandwidth	bandwidth		time	
30	1000	120 kHz	1 MHz	40 kHz	100ms	Peak
1000	3180	1 MHz	3 MHz	400 kHz	100ms	Peak

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#### 6.3.1 Measurement Data

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. The EUT was measured by Bilog antenna with 2 orthogonal polarities and frequencies of peak emissions from the EUT were detected within 6dB of the limit line. Final measurement was conducted in the open area test site with data as follows:

#### Test results on operation with control for transmittion mode (Fundamental frequency of Transmitter at 318MHz):

Frequency (MHz)	Antenna Polarization	Correction Factor (dB/m)	Receiver Reading (dBµV)	Emission Level (dBµV/m)	PK Limit (dBμV/m)	Over Limit (dB)
318.00	Н	14.1	62.90	77.00	95.8	-18.80
318.00	V	14.1	60.90	75.00	95.8	-20.80
635.82	V	20.1	34.95	55.05	75.8	-20.75
953.74	V	22.5	22.55	45.05	75.8	-30.75
1272.00	Н	-9.7	42.00	32.30	75.8	-43.50
1908.00	Н	-8.31	41.11	32.80	75.8	-43.00
2544.00	Н	-5.75	41.15	35.40	75.8	-40.40

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Frequency (MHz)	Antenna Polarization	Detector	Emission Level (dBµV/m)	Average Factor (dB)	Calculated Average Value (dBµV/m)	AV Limit (dBμV/m)	Over Limit (dB)
318.00	Н	Peak	77.00	-5.99	71.01	75.8	-4.79
318.00	V	Peak	75.00	-5.99	69.01	75.8	-6.79
635.82	Н	Peak	55.05	-5.99	49.06	55.8	-6.74
953.74	Н	Peak	45.05	-5.99	39.06	55.8	-16.74
1272.00	Н	Peak	32.30	-5.99	26.31	55.8	-29.49
1908.00	Н	Peak	32.80	-5.99	26.81	55.8	-28.99
2544.00	Н	Peak	35.40	-5.99	29.41	55.8	-26.39

#### Note:

- 1) Correction Factor = Antenna Factor + Cable Loss.
- 2) The actual frequencies of maximum emission were confirmed in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance.
- 3) The above results were the worst case results with the EUT positioned in all 3 axis during the test. The EUT was positioned vertically and horizontally on the table for vertical and horizontal measurement respectively.
- 4) Other emission more than 20dB below is not recorded.



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#### 6.4 **Bandwidth**

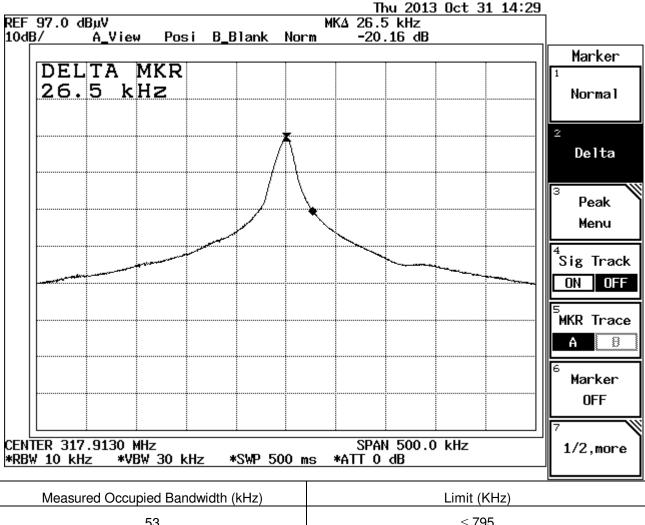
Test Requirement: FCC Part15 Subpart C Section 15.231(C)

Test Method: **ANSI C63.4** Test Date: 2013-10-31

#### 6.4.1 Measurement data

Frequency Domain Plots (Fundamental frequency of Transmitter at 318MHz):

Test results on operation with control for transmittion mode :



Measured Occupied Bandwidth (kHz)	Limit (KHz)
53	≤ 795

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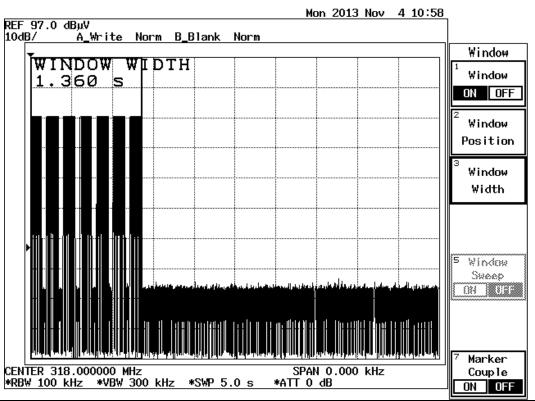
### 6.5 Provision of Momentary operation

Test Requirement: FCC Part15 Subpart C Section 15.231(a) (1)

Test Method: ANSI C63.4
Test Date: 2013-10-31

#### 6.5.1 Measurement data

Time Domain Plots (Fundamental frequency of Transmitter at <u>318MHz</u>): Test results on operation with control for transmittion mode:



The time of stopping transmission after switch releasing (s)	Limit (s)
1.36s	5.00

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## **Photographs**

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## 6.6 Radiatd Emission Test Setup



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### 6.7 EUT Constructional Details





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