

# TEST REPORT

of

FCC CFR 47 part 1, 1.1307(b), 1.1310

FCC ID: O8HGCUBE-100W

Equipment Under Test : POS PRINTER  
Model Name : GCUBE-100W  
Variant Model Names : Gcube-\*\*\*\*, GCUBE-\*\*\*\*, CALLISTO-\*\*\*\*  
(\*: 0 to 9 or A to Z)  
Approved Module ID : 2ADXS-WFM60-SFP2501  
Applicant : Shin Heung Precision Co., Ltd.  
Manufacturer : Shin Heung Precision Co., Ltd.  
Date of Receipt : 2019.09.24  
Date of Test(s) : 2019.09.24 ~ 2019.11.14  
Date of Issue : 2019.12.10

In the configuration tested, the EUT complied with the standards specified above.

Tested By:



Date:

2019.12.10

Murphy Kim

Technical  
Manager:



Date:

2019.12.10

Jungmin Yang

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RTT5041-19(2019.04.24)(1)

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A4(210 mm x 297 mm)

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## 1. General Information

### 1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- Designation number: KR0150

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### 1.2. Details of Applicant

Applicant : Shin Heung Precision Co., Ltd.

Address : 53, Je3gongdan 3-gil, Seoun-myeon, Anseong-si, Gyeonggi-do, Korea, 17605

Contact Person : Ha, Byoung-jo

Phone No. : +82 2 2102 9857

### 1.3. Details of Manufacturer

Company : Same as applicant

Address : Same as applicant

### 1.4. Description of EUT

<b>Kind of Product</b>	POS PRINTER
<b>Model Name</b>	GCUBE-100W
<b>Variant Model Name</b>	Gcube-****, GCUBE-****, CALLISTO-**** (*: 0 to 9 or A to Z)
<b>Approved module ID</b>	2ADXS-WFM60-SFP2501
<b>AC Adaptor Model Name</b>	GM60-240250-F
<b>Power Supply</b>	DC 24 V
<b>Frequency Range</b>	2 412 MHz ~ 2 462 MHz (11b/g/n_HT20) 5 180 MHz ~ 5 240 MHz (Band 1: 11a/n_HT20) 5 260 MHz ~ 5 320 MHz (Band 2A: 11a/n_HT20) 5 500 MHz ~ 5 700 MHz (Band 2C: 11a/n_HT20) 5 745 MHz ~ 5 825 MHz (Band 3: 11a/n_HT20)
<b>Modulation Technique</b>	DSSS, OFDM
<b>Number of Channels</b>	11 channels (11b/g/n_HT20) 4 channels (Band 1: 11a/n_HT20) 4 channels (Band 2A: 11a/n_HT20) 8 channels (Band 2C: 11a/n_HT20) 5 channels (Band 3: 11a/n_HT20)

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<b>Antenna Type</b>	WIFI Dual band PCB Antenna
<b>Antenna Gain</b>	2 412 MHz ~ 2 462 MHz: 1.98 dB i 5 150 MHz ~ 5 250 MHz: 2.90 dB i 5 250 MHz ~ 5 350 MHz: 3.50 dB i 5 470 MHz ~ 5 725 MHz: 3.34 dB i 5 725 MHz ~ 5 850 MHz: 3.01 dB i

### 1.5. Test Report Revision

Revision	Report Number	Date of Issue	Description
0	F690501/RF-RTL014586	2019.12.10	Initial

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## 2. RF Exposure Evaluation

### 2.1. Environmental evaluation and exposure limit according to FCC CFR 47 part 1, 1.1307(b), 1.1310

#### 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> )	Average Time
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f <sup>2</sup>	6
30-300	61.4	0.163	1.0	6
300-1 500	-	-	f/300	6
1 500-100 000	-	-	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f <sup>2</sup>	30
30-300	27.5	0.073	0.2	30
300-1 500	-	-	f/1500	30
<b>1 500-100 000</b>	-	-	<b>1.0</b>	<b>30</b>

#### 2.1.1. Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where  $P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

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

$P_d$  the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

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### 2.1.2. Test Result of RF Exposure Evaluation

Test Item : RF Exposure Evaluation Data

Test Mode : Normal Operation

### 2.1.3. Output Power into Antenna & RF Exposure Evaluation Distance

#### WLAN (2.4G)

##### - Maximum tune up tolerance

Frequency (MHz)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 cm (mW/cm <sup>2</sup> )	Limits (mW/cm <sup>2</sup> )
2 412 ~ 2 462	20	1.98	0.031 386	1

#### WLAN (5G)

##### - Maximum tune up tolerance

Frequency (MHz)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 cm (mW/cm <sup>2</sup> )	Limits (mW/cm <sup>2</sup> )
5 180 ~ 5 240	15.5	2.90	0.013 764	1
5 260 ~ 5 320	15.5	3.50	0.015 803	1
5 500 ~ 5 720	14.5	3.34	0.012 098	1
5 745 ~ 5 825	14.0	3.01	0.009 994	1

#### Note;

- The power density Pd (5th column) at a distance of 20 cm calculated from the friis transmission formula is far below the limit of 1 mW/cm<sup>2</sup>.
- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
- This equipment should be installed and operated with minimum 20 cm between the radiator and your body.
- The antenna gain of this transmitter is less than 6 dB i and must not be collocated or operating in conjunction with any other antenna or transmitter unless authorized to do so by the FCC.

### - End of the Test Report -

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