

Date : 2019-07-05 No. : HM19050032 Page 1 of 26

Applicant:	Gatekeeper Systems (HK) Ltd. 36/F, Tower 2, Times Square, 1 Matheson Street, Causeway Bay, Hong Kong					
Manufacturer:	Gatekeeper Systems (HK) Ltd. 36/F, Tower 2, Times Square, 1 Matheson Street, Causeway Bay, Hong Kong					
<b>Description of Sample(s):</b>	Product:Retrieval KeyBrand Name:Gatekeeper SystemsModel Number:K-9300FCC ID:W3Z-K9300					
Date Sample(s) Received:	2019-05-27					
Date Tested:	2019-06-08 to 2019-06-11					
Investigation Requested:	Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2017 and ANSI C63.10:2013 for FCC Certification.					
Conclusion(s):	The submitted product <u>COMPLIED</u> with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.					
Remark(s):						

0

CHEUNG Chi, Kenneth Authorized Signatory

NJO CEN



### Date : 2019-07-05 No. : HM19050032

Page 2 of 26

CON	TENT:	
	Cover Content	Page 1 of 26 Page 2 of 26
<u>1.0</u>	General Details	
1.1	Equipment Under Test [EUT] Description of EUT operation	Page 3 of 26
1.2	Description of EUT Operation	
1.3	Date of Order	Page 3 of 26
1.4	Submitted Sample	Page 3 of 26
1.5	Test Duration	Page 3 of 26
1.6	Country of Origin	Page 3 of 26
<u>2.0</u>	Technical Details	
2.1	Investigations Requested	Page 4 of 26
2.2	Test Standards and Results Summary	Page 4 of 26
<u>3.0</u>	Test Results	
3.1	Emission	Page 5-20 of 26
	<u>Appendix A</u>	
	List of Measurement Equipment	Page 21 of 26
	Appendix B	
	Photographs	Page 22-26of 26



### Date : 2019-07-05

No. : HM19050032

Page 3 of 26

### **<u>1.0</u>** General Details

#### 1.1 Equipment Under Test [EUT] Description of Sample(s)

Product: Manufacturer:	Retrieval Key Gatekeeper Systems (HK) Ltd. 36/F, Tower 2, Times Square, 1 Matheson Street, Causeway Bay, Hong Kong
Brand Name:	Gatekeeper Systems
Model Number:	K-9300
Rating:	3.0Vd.c, "CR123A" x2 parallel

### **1.2 Description of EUT Operation**

The Equipment Under Test (EUT) is transmitter of Gatekeeper Systems (HK) Ltd., which is 2.4GHz transceiver.

The K-9300 Operational mode transmissions are modulated at FSK. The EUT was tested under test mode which was set in maximum output power and transmit continuously.

#### 1.3 Date of Order

2019-05-27

#### **1.4** Submitted Sample(s):

2 Samples

#### 1.5 Test Duration

2019-06-08 to 2019-06-11

#### 1.6 Country of Origin

China



### Date : 2019-07-05

No. : HM19050032

Page 4 of 26

### 2.0 <u>Technical Details</u>

### 2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2017 Regulations and ANSI C63.10:2013 for FCC Certification.

#### 2.2 Test Standards and Results Summary Tables

EMISSION Results Summary								
Test Condition	Class /	Test I	Result					
			Severity	Pass	Fail			
Field Strength of Fundamental & Harmonics Emissions	FCC 47CFR 15.249	ANSI C63.10:2013	N/A					
AC power-line conducted emissions	FCC 47CFR 15.207	ANSI C63.10:2013	N/A		$\boxtimes$			
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.10:2013	N/A					

Note: N/A - Not Applicable



### Date : 2019-07-05

### No. : HM19050032

- 3.0 Test Results
- 3.1 Emission

#### 3.1.1 Field Strength of Fundamental & Harmonics Emissions

Test Requirement:	FCC 47CFR 15.249
Test Method:	ANSI C63.10:2013
Test Date:	2019-06-11
Mode of Operation:	Tx Mode

### **Test Method:**

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semianechoic Chamber\*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber\*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. In the frequency range of 9kHz to 30MHz, The center of the loop antenna shall be 1 meter above the ground and rotated loop axis for maximum reading. The emissions worst-case are shown in Test Results of the following pages.

Remark: 3 orthogonal axis apply to hand-held device only.

\*: Semi-anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. FCC Test Firm Registration Number <u>723883</u> Designation Number <u>HK0001</u>

Page 5 of 26

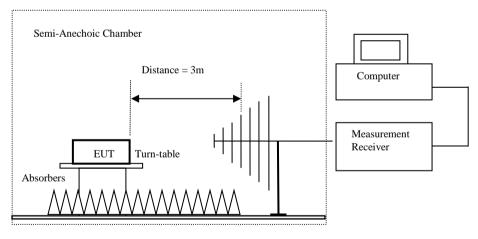


Date : 2019-07-05 No. : HM19050032 Page 6 of 26

#### **Spectrum Analyzer Setting:**

9KHz – 30MHz (Pk & Av)	RBW: VBW: Sweep: Span: Trace:	
30MHz – 1GHz (QP)	RBW: VBW: Sweep: Span: Trace:	120kHz 120kHz Auto Fully capture the emissions being measured Max. hold
Above 1GHz (Pk & Av)	RBW: VBW: Sweep: Span: Trace:	3MHz 3MHz Auto Fully capture the emissions being measured Max. hold

#### **Test Setup:**



Ground Plane

- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.

- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used,

9kHz to 30MHz loop antennas are used.

-For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground

The Hong Kong Standards and Testing Centre Limited 10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: hkstc@stc.group Website: www.stc.group

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

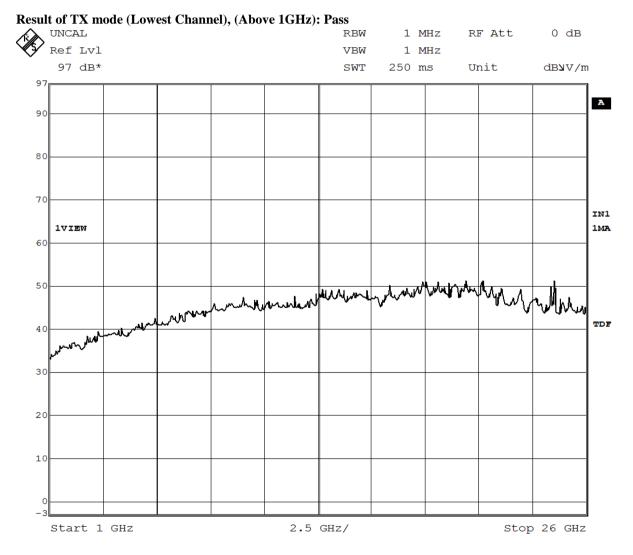
For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



Date : 2019-07-05 No. : HM19050032 Page 7 of 26

#### Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Fundamental frequency [MHz]	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500



The Hong Kong Standards and Testing Centre Limited 10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong Tel: +852 2666 1888 Fax: +852 2664 4353 Email: hkstc@stc.group Website: www.stc.group This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited. For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



### Date : 2019-07-05 No. : HM19050032

Page 8 of 26

### Result of TX mode (Lowest Channel), (Above 1GHz): Pass

	Field Strength of Fundamental and Harmonics Emissions							
	Peak Value							
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field		
	Level @3m	Factor	Strength	Strength		Polarity		
MHz	dBµV/m	dBµV/m	dBµV/m	$\mu V/m$	μV/m			
2402.0	64.4	27.9	92.3	41,209.8	500,000	Vertical		
* 4804.0	4.1	32.1	36.2	64.6	5,000	Vertical		
7206.0	1.1	38.6	39.7	96.6	5,000	Vertical		
9608.0					5,000	Vertical		
* 12010.0					5,000	Vertical		
14412.0					5,000	Vertical		
16814.0	E	missions detec	5,000	Vertical				
* 19216.0	I	20 dB below	5,000	Vertical				
21618.0	I		5,000	Vertical				
24020.0	[				5,000	Vertical		

Field Strength of Fundamental and Harmonics Emissions								
	Average Value							
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field		
	Level @3m	Factor	Strength	Strength		Polarity		
MHz	dBµV/m	dBµV/m	dBµV/m	$\mu V/m$	$\mu V/m$			
2402.0	53.9	27.9	81.8	12,302.7	50,000	Vertical		
* 4804.0	0.8	32.1	32.9	44.2	500	Vertical		
7206.0	-1.3	38.6	37.3	73.3	500	Vertical		
9608.0					500	Vertical		
* 12010.0					500	Vertical		
14412.0					500	Vertical		
16814.0	E	missions detec	500	Vertical				
* 19216.0	]	20 dB below	500	Vertical				
21618.0	l					Vertical		
24020.0					500	Vertical		

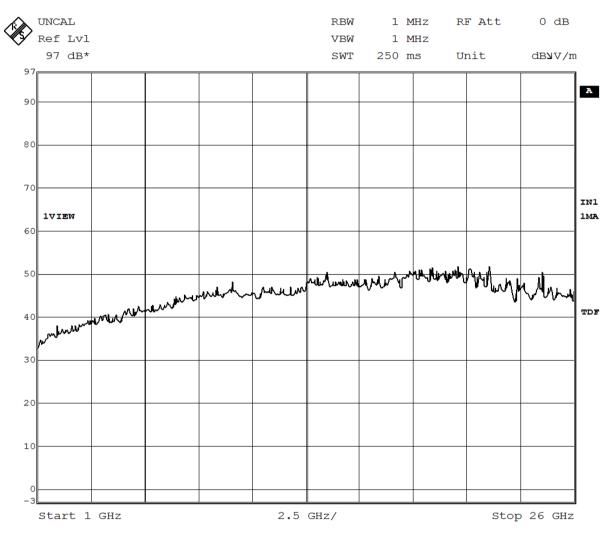
Remarks: The fundamental frequency was not included in the pre-scan plot, a 2.4G notch filter was added prior to the Receiver, please refer the band-edge plot for the level of fundamental frequency.



#### Date : 2019-07-05 No. : HM19050032

Page 9 of 26

### Result of TX mode (Middle Channel), (Above 1GHz): Pass



The Hong Kong Standards and Testing Centre Limited 10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong Tel: +852 2666 1888 Fax: +852 2664 4353 Email: hkstc@stc.group Website: www.stc.group This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited. For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



#### Date : 2019-07-05 No. : HM19050032

Page 10 of 26

### Result of TX mode (Middle Channel), (Above 1GHz): Pass

Field Strength of Fundamental and Harmonics Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field		
	Level @3m	Factor	Strength	Strength		Polarity		
MHz	$dB\mu V/m$	dBµV/m	dBµV/m	$\mu V/m$	μV/m			
2440.0	63.7	27.9	91.6	38,018.9	500,000	Vertical		
* 4880.0	3.8	32.1	35.9	62.4	5,000	Vertical		
* 7320.0	1.9	38.6	40.5	105.9	5,000	Vertical		
9760.0					5,000	Vertical		
* 12200.0	]				5,000	Vertical		
14640.0	]				5,000	Vertical		
17080.0	Emissions detected are more than 5,000 Vertical					Vertical		
* 19520.0	20 dB below the FCC Limits 5,000 Vertica					Vertical		
21960.0	]	5,000 Vertical						
24400.0	<u>]</u>				5,000	Vertical		

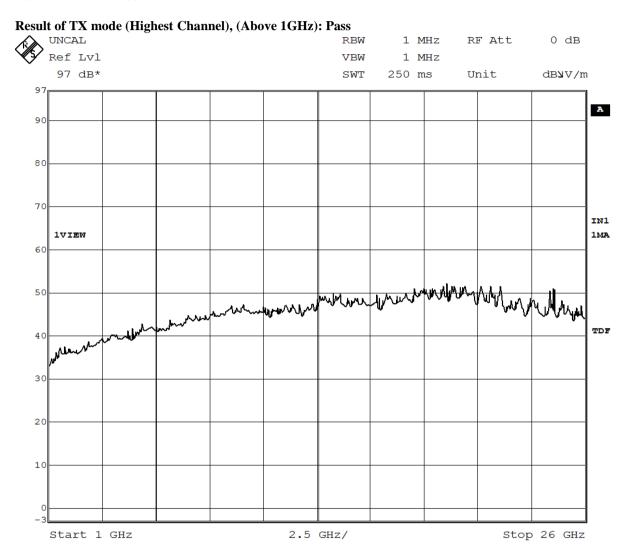
Field Strength of Fundamental and Harmonics Emissions							
Average Value							
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field	
	Level @3m	Factor	Strength	Strength		Polarity	
MHz	dBµV/m	dBµV/m	dBµV/m	$\mu V/m$	$\mu V/m$		
2440.0	54.7	27.9	82.6	13,489.6	50,000	Vertical	
* 4880.0	0.9	32.1	33.0	44.7	500	Vertical	
* 7320.0	-1.5	38.6	37.1	71.6	500	Vertical	
9760.0					500	Vertical	
* 12200.0	]				500	Vertical	
14640.0	]				500	Vertical	
17080.0	Emissions detected are more than				500	Vertical	
* 19520.0	Ţ	20 dB below	500	Vertical			
21960.0	Ţ					Vertical	
24400.0	]				500	Vertical	

Remarks: The fundamental frequency was not included in the pre-scan plot, a 2.4G notch filter was added prior to the Receiver, please refer the band-edge plot for the level of fundamental frequency.



#### Date : 2019-07-05 No. : HM19050032

Page 11 of 26



The Hong Kong Standards and Testing Centre Limited 10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong Tel: +852 2666 1888 Fax: +852 2664 4353 Email: hkstc@stc.group Website: www.stc.group This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited. For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



#### Date : 2019-07-05 No. : HM19050032

Page 12 of 26

#### Result of TX mode (Highest Channel), (Above 1GHz): Pass

Field Strength of Fundamental and Harmonics Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field		
	Level @3m	Factor	Strength	Strength		Polarity		
MHz	dBµV/m	dBµV/m	dBµV/m	$\mu V/m$	μV/m			
2480.0	70.5	27.9	98.4	83,176.4	500,000	Vertical		
* 4960.0	5.7	32.1	37.8	77.6	5,000	Vertical		
* 7440.0	1.9	38.6	40.5	105.9	5,000	Vertical		
9920.0					5,000	Vertical		
* 12400.0					5,000	Vertical		
14880.0					5,000	Vertical		
17360.0	Emissions detected are more than 5,000 Vertical							
* 19840.0	20 dB below the FCC Limits 5,000 Vertical							
22320.0	5,000 Vertical							
24800.0					5,000	Vertical		

	Field Strength of Fundamental and Harmonics Emissions									
Average Value										
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field				
	Level @3m	Factor	Strength	Strength		Polarity				
MHz	dBµV/m	dBµV/m	dBµV/m	$\mu V/m$	$\mu V/m$					
2480.0	59.7	27.9	87.6	23,988.3	50,000	Vertical				
* 4960.0	1.3	32.1	33.4	46.8	500	Vertical				
* 7440.0	-1.5	38.6	37.1	71.6	500	Vertical				
9920.0					500	Vertical				
* 12400.0					500	Vertical				
14880.0					500	Vertical				
17360.0	E	missions detec	cted are more	than	500	Vertical				
* 19840.0	[	20 dB below	500	Vertical						
22320.0	[				500	Vertical				
24800.0					500	Vertical				

Remarks: The fundamental frequency was not included in the pre-scan plot, a 2.4G notch filter was added prior to the Receiver, please refer the band-edge plot for the level of fundamental frequency.

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

\*: Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

:

Calculated measurement uncertainty

9kHz to 30MHz: 2.4dB 30MHz to 18GHz: 5.0dB 18GHz - 26.5Hz: 5.24dB



#### Date : 2019-07-05 No. : HM19050032

Page 13 of 26

Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range	20dB Bandwidth
[MHz]	[MHz]
2402.0	1.126

TX mode (Lowest Channel)

20dB Bandwidth of Fundamental Emission

10 dB/div	Ref 96.9	9 dBµV		•					Mkr1		868 GH2  5 dBµ\
Log						1					
-20.0					mar /	hanne and					
				$\sim$			July way				
40.0			7					N,			
50.0	~~~~~	ma								<u>~</u>	
60.0	$\overline{\mathbf{N}}$	' 'দেন'							<b>1</b>	Y · M	
70.0 80.0 <del>"".~~~~~</del>	dr.										Wi
90.0											
-100											
Center 2.40 #Res BW 30					VE	W 300 kH	Iz				an 3 MH: 3.133 m
Occupie	ed Band	width				Total Po	ower		93.6	dBµV	
		1.04	42	2 MI	Hz						
Transmit	Freq Err	or	19	).776 I	kHz	OBW Power			99	.00 %	
x dB Bar	dwidth		1.	.126 N	ЛНz	x dB			-20.0	00 dB	

The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: hkstc@stc.group Website: www.stc.group

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



### Date : 2019-07-05 No. : HM19050032

Page 14 of 26

Frequency Range	20dB Bandwidth
[MHz]	[MHz]
2440.0	1.148

TX mode (Middle Channel)

20dB Bandwidth of Fundamental Emission

10 dB/div	Ref 76.99 dBj	JV		Mkr1	2.4018	68 GH: dBµ\
- <sup>og</sup> 1						•
40.0		~~~	- a			
50.0						
60.0						
ro.o			<u>۱</u>	2		
	m			- Land		
0.0 0.0 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	$\mathcal{N}$				Mary and a	
0.0					~~ w	
100						
110						
120						
120						
enter 2.4	4 GHz					an 3 MH
Res BW 3	30 kHz	V	'BW 300 kHz		Sweep	3.133 m
Occupi	ed Bandwid	th	Total Power	73.5	dBµV	
	1.	0372 MHz				
Transmi	it Freq Error	-99.117 kHz	OBW Power	99	.00 %	
x dB Ba	ndwidth	1.148 MHz	x dB	-20.0	00 dB	



#### Date : 2019-07-05 No. : HM19050032

Page 15 of 26

Frequency Range	20dB Bandwidth
[MHz]	[MHz]
2480.0	1.148

TX mode : CC2430 Highest Channel

20dB Bandwidth of Fundamental Emission

10 dB/div	Ref 106.9	9 dBµV	Ţ					Mkr1		868 GHz dBµ∨
Log 1 -10.0										
-20.0				~~	_					
				- <u>-</u>						
-30.0		[				22	~~~			
-40.0		الم م					Jan			
-50.0		~~{							~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
سم سمہ 60.0									- Way	
-70.0									+4	M Lawy
-80.0										
-90.0										
Center 2.48 #Res BW 3				VB	N 300 kH	łz				ban 3 MHz 3.133 ms
Occupie	ed Bandv	width			Total P	owei	r	101		
		1.04	468 MH	z						
Transmit	Freq Erro	or	-90.555 kl	Ηz	<b>OBW Power</b>		r	99	.00 %	
x dB Bar	x dB Bandwidth 1.148 MHz		Ιz	x dB			-20.00 dB			

The Hong Kong Standards and Testing Centre Limited 10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong Tel: +852 2666 1888 Fax: +852 2664 4353 Email: hkstc@stc.group Website: www.stc.group This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited. For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.

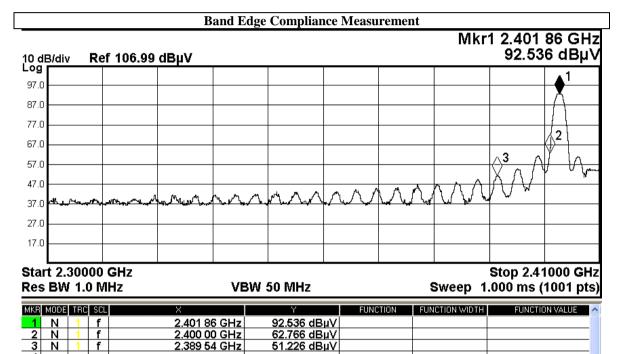


### Date : 2019-07-05 No. : HM19050032

Page 16 of 26

#### **Band Edge Measurement:**

Frequency Range	Radiated Emission Attenuated below the Fundamental
[MHz]	[dB]
2400MHz – Lowest Fundamental	30.6





### Date : 2019-07-05 No. : HM19050032

Page 17 of 26

### Band Edge Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
Highest Fundamental – 2483.5MHz	36.0

	Band Edg	ge Compliance	Measuremen	nt		
10 dB/div Ref 106.99	dBµV			Mkr	2 2.483 61.91	62 GHz 5 dBµV
Log	<b>1</b>					
97.0						
87.0						
77.0						
67.0		<b>_</b> 2				
			S			
57.0	Land 1			~		
47.0			$\sim$	-/	$\uparrow \land \downarrow$	$\sum_{i=1}^{n}$
37.0			~ ~		mar hu	ر المريالسالور ال
27.0					<b>۳</b>	
17.0						
Start 2.47000 GHz		· · ·		· · · · · · · · · · · · · · · · · · ·	Stop 2.50	000 GHz
Res BW 270 kHz	VBW	V 2.7 MHz		Sweep 1	.000 ms (′	
MKR MODE TRC SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTIO	IN VALUE
1 N 1 f	2.479 93 GHz	98.762 dBµV				
2 N 1 f 3 N 1 f	2.483 62 GHz 2.487 67 GHz	61.915 dBµV 55.396 dBµV				
4 I	2.407 07 012	55.536 dBµv				

#### **Band-edge measurement: PASS**

	Field Strength of Fundamental and Harmonics Emissions									
Peak Value										
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field				
	Level @3m	Factor	Strength	Strength		Polarity				
MHz	dBµV/m	dBµV/m	dBµV/m	$\mu V/m$	μV/m					
2389.5	23.3	27.9	51.2	363.1	5,000	Vertical				
2487.7	27.5	27.9	55.4	588.8	5,000	Vertical				

Field Strength of Fundamental and Harmonics Emissions Average Value									
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field			
	Level @3m	Factor	Strength	Strength		Polarity			
MHz	dBµV/m	dBµV/m	dBµV/m	$\mu V/m$	$\mu V/m$				
2389.5	12.8	27.9	40.7	108.4	500	Vertical			
2487.7	16.4	27.9	44.3	164.1	500	Vertical			

The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: hkstc@stc.group Website: www.stc.group

This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited.

For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



### Date : 2019-07-05 No. : HM19050032

Page 18 of 26

### Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [µV/m]		
0.009-0.490	2400/F (kHz)		
0.490-1.705	24000/F (kHz)		
1.705-30	30		
30-88	100		
88-216	150		
216-960	200		
Above960	500		

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Remarks: Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate in the table below is the worst case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases.

#### Result of TX mode, (9kHz - 30MHz): PASS

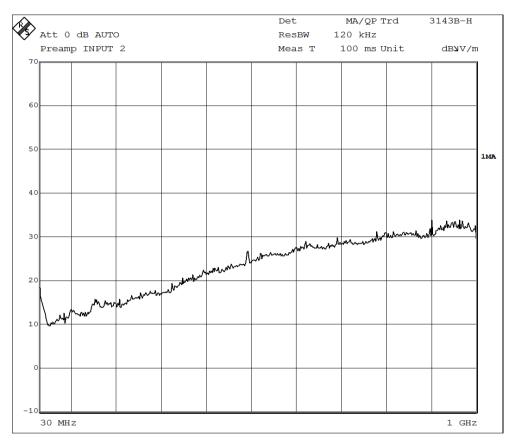
Emissions detected are more than 20 dB below the FCC Limits



#### Date : 2019-07-05 No. : HM19050032

Page 19 of 26

### Result of TX mode (30MHz - 1GHz): PASS



Field Strength of Fundamental and Harmonics Emissions Quasi-Peak Value									
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field			
	Level @3m	Factor	Strength	Strength		Polarity			
MHz	dBµV/m	dBµV/m	dBµV/m	μV/m	$\mu V/m$				
38.4	9.8	7.5	17.3	7.3	100	Horizontal			
111.4	5.4	8.4	13.8	4.9	150	Horizontal			
224.5	4.8	10.5	15.3	5.8	150	Horizontal			
387.4	6.8	18.2	25.0	17.8	200	Horizontal			
512.8	3.4	21.2	24.6	17.0	200	Horizontal			
598.4	2.3	21.1	23.4	14.8	200	Horizontal			

The Hong Kong Standards and Testing Centre Limited 10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: hkstc@stc.group Website: www.stc.group This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited. For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



Date : 2019-07-05 No. : HM19050032 Page 20 of 26

Result of Receiver mode, (9kHz - 30MHz): N/A

Result of Receiver mode, (30MHz - 1GHz): N/A

Result of Receiver mode, (1GHz – 18GHz): N/A

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty

: (9kHz - 30MHz): 2.4dB (30MHz - 18GHz): 5.0dB (18GHz - 26GHz): 5.24dB



### Date : 2019-07-05 No. : HM19050032

Page 21 of 26

### Appendix A

### LIST OF MEASUREMENT EQUIPMENT

#### **Radiated Emission**

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-LINDGREN	FACT-3		2019/04/24	2020/04/24
EM356	ANTENNA POSITIONING TOWER	ETS-LINDGREN	2171B	00150346	N/A	N/A
EM355	BICONILOG ANTENNA	ETS-LINDGREN	3143B	00201783	2019/03/11	2021/03/11
EM229	EMI TEST RECEIVER	R&S	ESIB40	100248	2019/06/11	2020/06/11
EM299	DOUBLE-RIDGED WAVEGUIDE HORN ANTENNA	ETS-LINDGREN	3115	00114120	2018/04/27	2020/04/27
EM300	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-09	00130130	2018/05/13	2020/05/13
EM353	LOOP ANTENNA	ETS_LINDGREN	6502	00206533	2018/03/16	2020/03/16

### Remarks:

- CM Corrective Maintenance
- N/A Not Applicable or Not Available

TBD To Be Determined



Date : 2019-07-05 No. : HM19050032 Page 22 of 26

### **Appendix B**

Photographs of EUT



**Rear View of the product** 

**Rear View of the product** 



**Rear View of the product** 







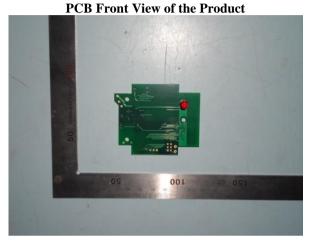
### Date : 2019-07-05 No. : HM19050032

**Photographs of EUT** 

Page 23 of 26



**PCB Bottom View of the Product** 







Date : 2019-07-05 No. : HM19050032 Page 24 of 26

**Photographs of EUT** 

Measurement of Radiated Emission Test Set Up (9kHz to 30MHz)





Date : 2019-07-05 No. : HM19050032 Page 25 of 26

Photographs of EUT



The Hong Kong Standards and Testing Centre Limited 10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong Tel: +852 2666 1888 Fax: +852 2664 4353 Email: hkstc@stc.group Website: www.stc.group This report shall not be reproduced unless with prior written approval from The Hong Kong Standards and Testing Centre Limited. For Conditions of Issuance of this test report, please refer to "Conditions of Issuance of Test Reports" section or Website.



Date : 2019-07-05 No. : HM19050032 Page 26 of 26

**Photographs of EUT** 





\*\*\*\*\* End of Test Report \*\*\*\*\*

### **Conditions of Issuance of Test Reports**

- 1. All samples and goods are accepted by The Hong Kong Standards & Testing Centre Limited (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The Company provides its services on the basis that such terms and conditions constitute express agreement between the Company and any person, firm or company requesting its services (the "Clients").
- 2. Any report issued by the Company as a result of this application for testing service (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to his customer, supplier or other persons directly concerned. Subject to clause 3, the Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
- 3. The Company shall be at liberty to disclose the testing-related documents and/or files anytime to any third-party accreditation and/or recognition bodies for audit or other related purposes. No liabilities whatsoever shall attach to the Company's act of disclosure.
- 4. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
- 5. The results in Report apply only to the sample as received and do not apply to the bulk, unless the sampling has been carried out by the Company and is stated as such in the Report.
- 6. When a statement of conformity to a specification or standard is provided, the ILAC-G8 Guidance document (and/or IEC Guide 115 in the electrotechnical sector) will be adopted as a decision rule for the determination of conformity unless it is inherent in the requested specification or standard, or otherwise specified in the Report.
- 7. In the event of the improper use the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
- 8. Sample submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
- 9. The Company will not be liable for or accept responsibility for any loss or damage howsoever arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
- 10. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
- 11. Subject to the variable length of retention time for test data and report stored hereinto as to otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of this test report for a period of three years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after the retention period. Under no circumstances shall we be liable for damages of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.
- 12. Issuance records of the Report are available on the internet at www.stc.group. Further enquiry of validity or verification of the Reports should be addressed to the Company.