Test Report

Date : 2022-08-05
No. : HMD22070002

Applicant	:	PIN Genie Inc, DBA LOCKLY. 676 Transfer Rd., St. Paul, MN 55114
Supplier / Manufacturer	:	Smart Electronic Industrial (Dongguan) Co., Ltd Qing Long Road, Long Jian Tian Village, Huang Jiang Town, Dong Guan, Guang Dong, China
Description of Sample(s)	:	Submitted sample(s) said to be Product: Secure Plus Latch Edition with RFID Brand Name: LOCKLY Model No.: PGD628FC FCC ID: 2ASIVPGD628FC
Date Samples Received	:	2022-07-18
Date Tested	:	2022-07-18 to 2022-07-22
Investigation Requested	:	Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 and ANSI C63.10: 2013 for FCC Certification.
Conclusions	:	The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15, Subpart C. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.
Remarks	:	13.56MHz

Dr.CHAN Kwok Hung, Brian
Authorized Signatory

The Hong Kong Standards and Testing Centre Limited
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Test Report

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1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.
EMC Laboratory
10 Dai Wang Street, Taipo Industrial Estate, New Territories, Hong Kong
Telephone: 852 2666 1888
Fax: 852 2664 4353

1.2 Equipment Under Test [EUT]

Description of Sample(s)

Product:	Secure Plus Latch Edition with RFID
Manufacturer:	Smart Electronic Industrial (Dongguan) Co., Ltd Qing Long Road, Long Jian Tian Village, Huang Jiang Town, Dong Guan, Guang Dong, China
Brand Name:	LOCKLY
Model Number:	PGD628FC
Rating:	6Vd.c.(“AA” battery *4)

1.2.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Secure Plus Latch Edition with RFID. It is a transceiver operating at 13.56MHz and the RF signal was modulated by IC.

1.3 Date of Order

2022-07-15

1.4 Submitted Sample(s):

1 Sample

1.5 Test Duration

2022-07-15 to 2022-07-22

1.6 Country of Origin

China

1.7 RF Module Details

Module Model Number:	N/A
Module FCC ID:	N/A
Modulation:	ASK
Frequency Range:	13.553-13.567MHz
Test Channel:	13.56MHz

1.8 Antenna Details

Antenna Type:	FPC antenna
Antenna Gain:	N/A

1.9 Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	13.56		

2.0 Technical Details

2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 Regulations and ANSI C63.10: 2013 for FCC Certification.
The device was realized by test software, there is no the power level setting.

2.2 Test Standards and Results Summary Tables

EMISSION
Results Summary

Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Field strength of emissions within the band 13.110 MHz -14.010 MHz	FCC 47CFR 15.225(a)(b)(c)	ANSI C63.10: 2013	N/A	☒	☐	☐
Field strength of emissions outside of the band 13.110 MHz -14.010 MHz	FCC 47CFR 15.225(d) FCC 47CFR 15.209	ANSI C63.10: 2013	N/A	☒	☐	☐
AC Mains Conducted Emissions	FCC 47CFR 15.207	ANSI C63.10: 2013	N/A	☐	☐	☒
Antenna requirement	FCC 47CFR 15.203	N/A	N/A	☒	☐	☐
20dB Emission bandwith	FCC 47CFR 15.215(c)	ANSI C63.10: 2013	N/A	☒	☐	☐
The frequency tolerance of the carrier signal	FCC 47CFR 15.225(e)	ANSI C63.10: 2013	N/A	☒	☐	☐

Note: N/A - Not Applicable

3.0 Test Results

3.1 Emission

3.1.1 Field strength of emissions within the band 13.110 MHz -14.010 MHz

Ambient temperature 25°C Relative humidity 57%

Test Requirement:	FCC 47CFR 15.225(a)(b)(c)
Test Method:	ANSI C63.10:2013
Test Date:	2021-07-21
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 semi-anechoic 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. The emissions worst-case are shown in Test Results of the following pages.

* Semi-Anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

Test limit:

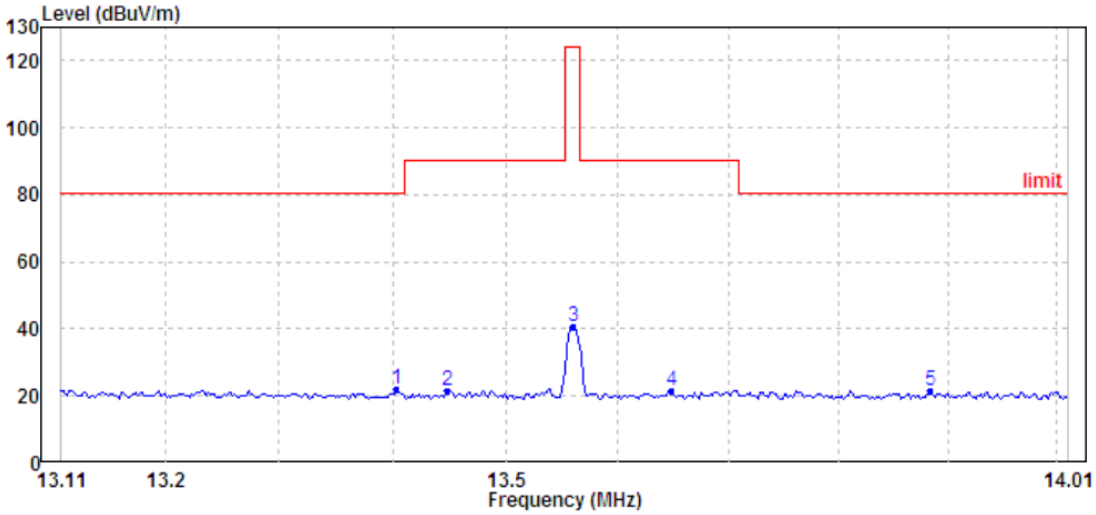
(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

(c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

Test Result: PASS

Emissions within the band 13.110 MHz -14.010 MHz



Ambient Temperature: 25.0C
Relative Humidity : 50.2%

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB		
1	13.403	21.85	80.50	-58.65	QP	Horizontal
2	13.448	21.51	90.50	-68.99	QP	Horizontal
3	13.560	40.89	124.00	-83.11	QP	Horizontal
4	13.648	21.75	90.50	-68.75	QP	Horizontal
5	13.884	21.51	80.50	-58.99	QP	Horizontal

3.1.2 Field strength of emissions outside of the band 13.110 MHz -14.010 MHz

Ambient temperature 25°C Relative humidity 57%

Test Requirement:	FCC 47CFR 15.225(d) & FCC 47CFR 15.209
Test Method:	ANSI C63.10:2013
Test Date:	2021-07-21
Mode of Operation:	Tx mode

Test Method:

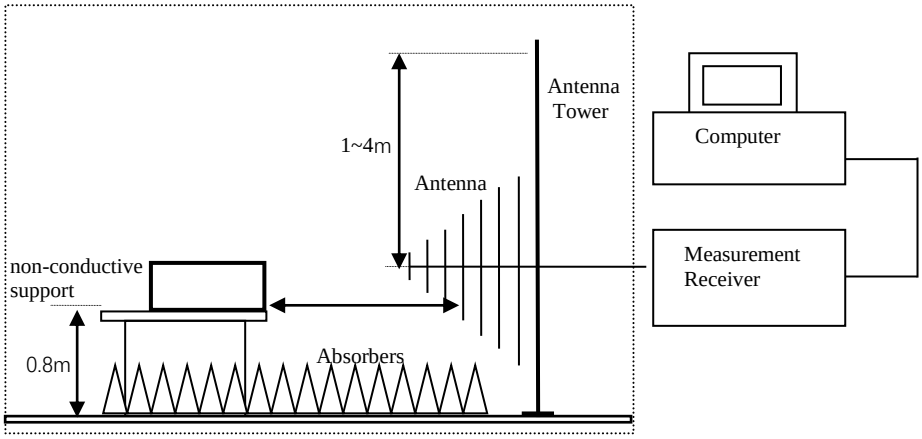
For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. 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. The emissions worst-case are shown in Test Results of the following pages.

* Semi-Anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

Spectrum Analyzer Setting:

9KHz – 0.15MHz (Pk)	RBW:	200Hz
	VBW:	1KHz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold
0.15MHz – 30MHz (Pk)	RBW:	10kHz
	VBW:	30kHz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold
30MHz – 1GHz (QP)	RBW:	120kHz
	VBW:	120kHz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold
Above 1GHz (Pk & Av)	RBW:	1MHz
(PK value with PK detector	VBW:	1MHz
AV value with AV detector)	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	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.

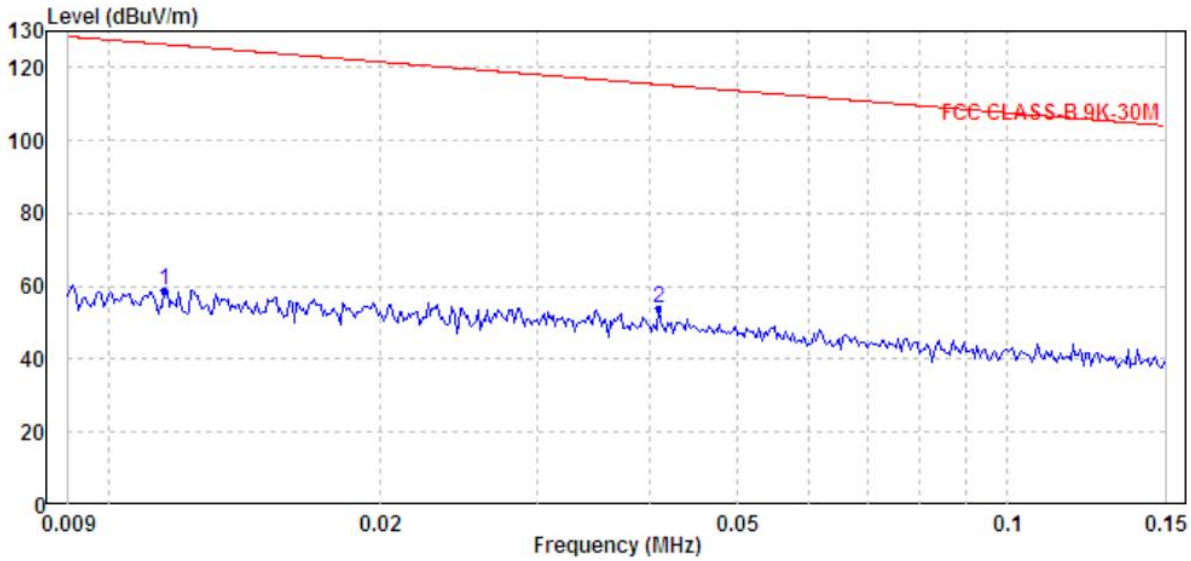
Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.209]:

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:
Calculated measurement uncertainty (9kHz-30MHz): 2.0dB / (30MHz – 1GHz): 4.9dB
Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

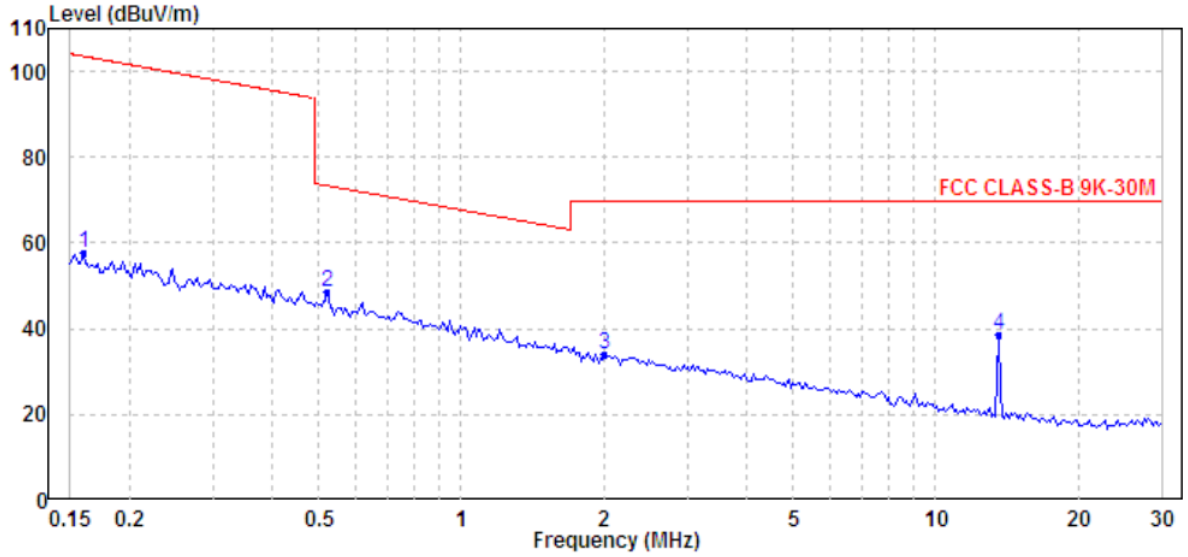
Results of TX mode (9kHz – 150KHz): PASS



Ambient Temperature: 25.0C
Relative Humidity : 50.2%

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB		
1	0.012	58.98	126.37	-67.39	QP	Horizontal
2	0.041	53.92	115.37	-61.45	QP	Horizontal

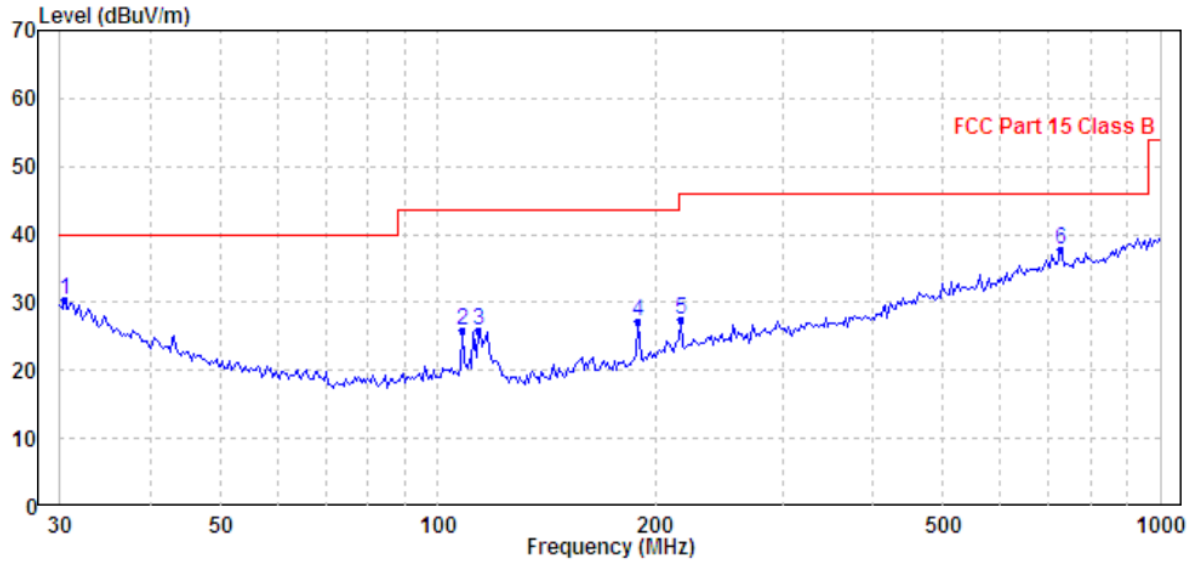
Results of TX mode (150KHz - 30MHz): PASS



Ambient Temperature: 25.0C
Relative Humidity : 50.2%

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB		
1	0.160	57.71	103.53	-45.82	QP	Horizontal
2	0.524	48.40	73.22	-24.82	QP	Horizontal
3	2.012	34.02	69.54	-35.52	QP	Horizontal
4	13.551	38.64	69.54	-30.90	QP	Horizontal

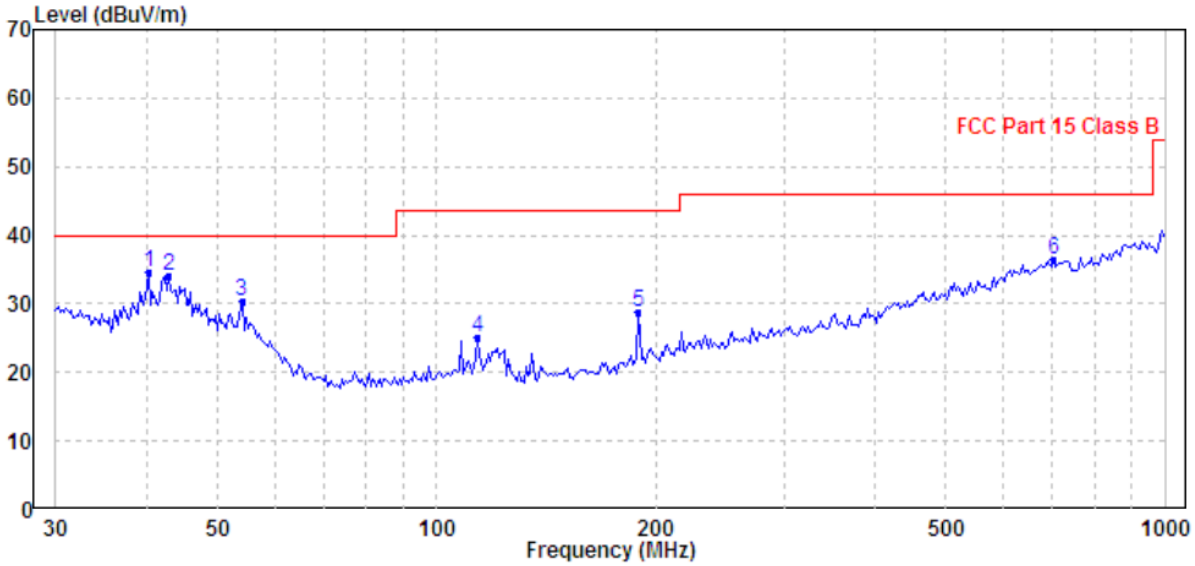
Results of TX mode (30MHz – 1GHz): PASS
Horizontal



Ambient Temperature: 25C
Relative Humidity : 50%

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB		
1	30.424	30.50	40.00	-9.50	QP	Horizontal
2	108.267	25.98	43.50	-17.52	QP	Horizontal
3	113.714	26.02	43.50	-17.48	QP	Horizontal
4	189.739	27.24	43.50	-16.26	QP	Horizontal
5	216.783	27.38	46.00	-18.62	QP	Horizontal
6	729.358	37.72	46.00	-8.28	QP	Horizontal

Results of TX mode (30MHz – 1GHz): PASS
Vertical



Ambient Temperature: 25C
Relative Humidity : 50%

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB		
1	40.276	34.56	40.00	-5.44	QP	Vertical
2	42.900	34.16	40.00	-5.84	QP	Vertical
3	54.071	30.40	40.00	-9.60	QP	Vertical
4	113.714	25.19	43.50	-18.31	QP	Vertical
5	189.739	28.81	43.50	-14.69	QP	Vertical
6	704.226	36.42	46.00	-9.58	QP	Vertical

3.1.3 Antenna Requirement

Ambient temperature 25°C Relative humidity 57%

Test Requirements: § 15.203

Test Specification:

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 use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Test Results:

This is FPC antenna. There is no external antenna. User is unable to remove or changed the Antenna.

3.1.4 20dB Bandwidth of Fundamental Emission

Ambient temperature 25°C Relative humidity 57%

Test Requirement:	FCC 47 CFR 15.215(c)
Test Method:	ANSI C63.10:2013
Test Date:	2021-07-22
Mode of Operation:	Tx mode

Test Method:

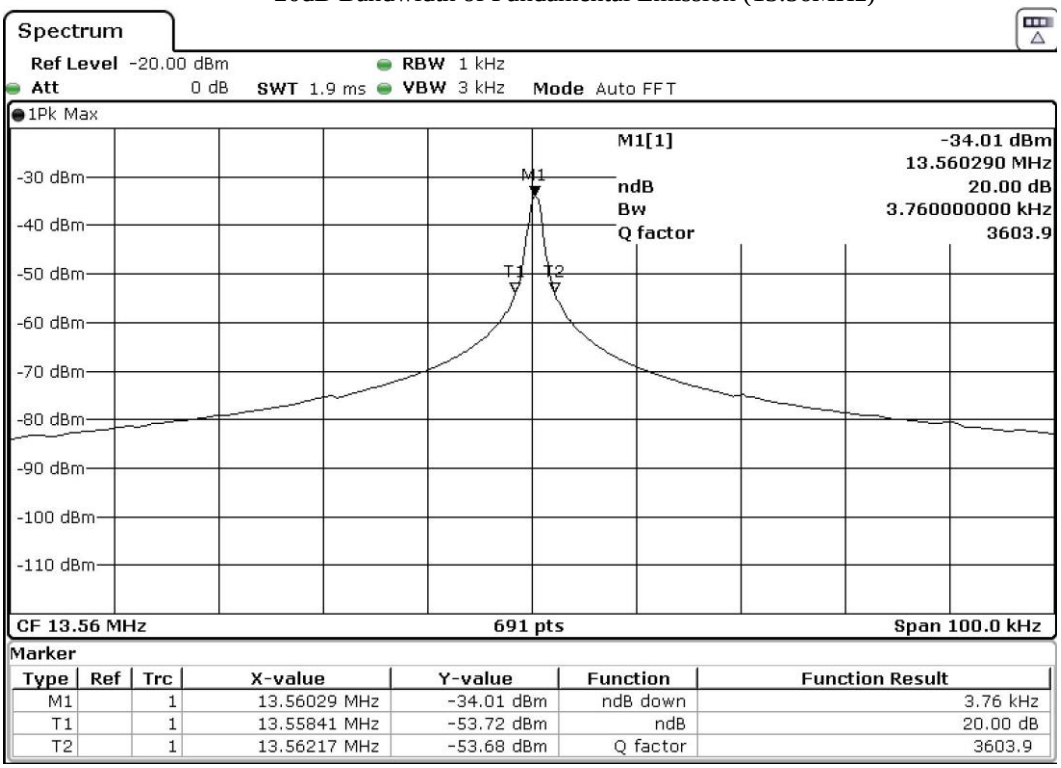
The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

The measurement bandwidth settings are RBW = 1 kHz
VBW = 3 kHz

Limits for 20dB Bandwidth of Fundamental Emission (13.56MHz):

Frequency [MHz]	20dB Bandwidth [kHz]	Flow – 20dB [MHz]	Fhigh – 20dB [MHz]	**Limit** [MHz]	Result
13.56	3.76	13.55841	13.56217	13.553-13.567	PASS

20dB Bandwidth of Fundamental Emission (13.56MHz)



3.1.5 The frequency tolerance of the carrier signal

Ambient temperature 20°C Relative humidity 57%

Test Requirement:	FCC 47 CFR 15.215(c)
Test Method:	ANSI C63.10:2013
Test Date:	2021-07-22
Mode of Operation:	Tx mode

Test Method:

The measurement bandwidth settings are RBW = 1 kHz
VBW = 3 kHz

Limit:
±0.01% of the operating frequency

Test Results:

Operating frequency (MHz)	Test Condition	Measured frequency (MHz)	Frequency Drift (ppm)	Limit (ppm)	
13.56	Tnom:50°C, Unom: 6Vd.c.	13.56045	33.18584	100	PASS
	Tnom:40°C, Unom: 6Vd.c.	13.56041	30.23599	100	PASS
	Tnom:30°C, Unom: 6Vd.c.	13.56035	25.81121	100	PASS
	Tnom:20°C, Unom: 6Vd.c.	13.56039	28.76106	100	PASS
	Tnom:10°C, Unom: 6Vd.c.	13.56033	24.33628	100	PASS
	Tnom:0°C, Unom: 6Vd.c.	13.5604	29.49853	100	PASS
	Tnom:-10°C, Unom: 6Vd.c.	13.56041	30.23599	100	PASS
	Tnom:-20°C, Unom: 6Vd.c.	13.56044	32.44838	100	PASS
	Tnom:20°C, Unom: 6Vd.c.	13.5604	29.49853	100	PASS
	Tnom:20°C, Low: 5.1Vd.c.	13.56036	26.54867	100	PASS
	Tnom:20°C, High: 6.9Vd.c.	13.56038	28.02360	100	PASS

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	--	2019/04/16	2024/04/16
EM356	ANTENNA POSITIONING TOWER	ETS-LINDGREN	2171B	00150346	N/A	N/A
EM293	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	N9020A	MY50510152	2020/11/25	2022/11/25
EM299	BROADBAND HORN ANTENNA	ETS-LINDGREN	3115	00114120	2020/11/24	2022/11/24
EM300	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-09	00130130	2020/11/25	2022/11/25
EM301	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-10	00130988	2020/11/25	2022/11/25
EM353	LOOP ANTENNA	ETS_LINDGREN	6502	00206533	2020/06/10	2022/09/10
EM355	Biconilog Antenna	ETS-Lindgren	3143B	00094856	2020/06/17	2022/09/17
EM200	DUAL CHANNEL POWER METER	R & S	NRVD	100592	2019/10/11	2022/10/11
EM012	PRE-AMPLIFIER	HP	HP8448B	3008A00262	2019/11/08	2022/11/08
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A

Remarks: -

N/A Not Applicable or Not Available

Appendix B

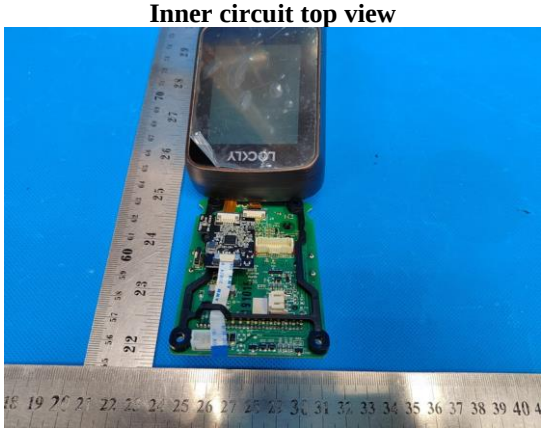
Photographs of EUT

View of the product

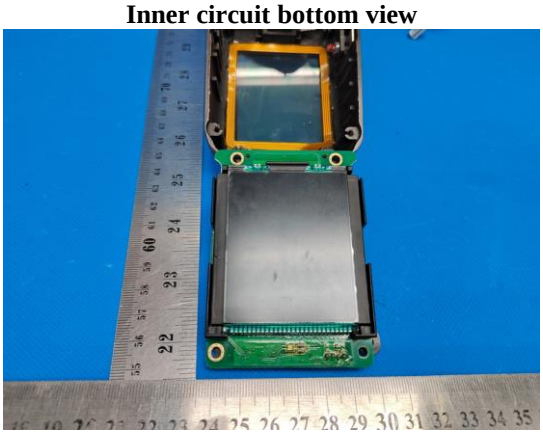
View of the product

Inside View of the product

Inner circuit top view



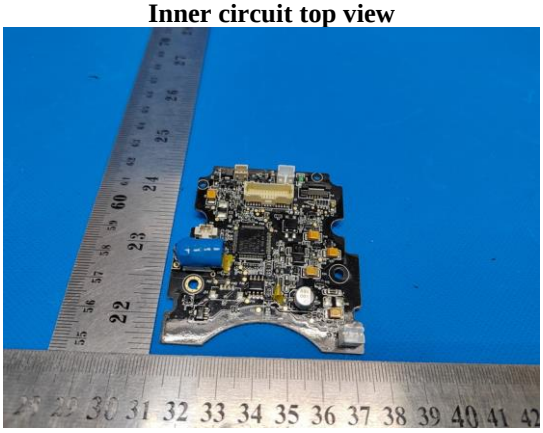
Inner circuit bottom view



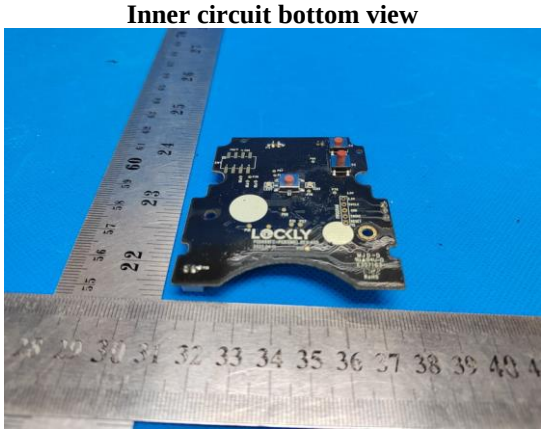
Inside View of the product

Photographs of EUT

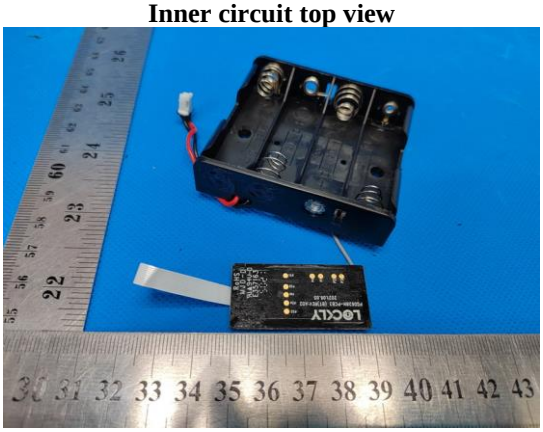
Inner circuit top view



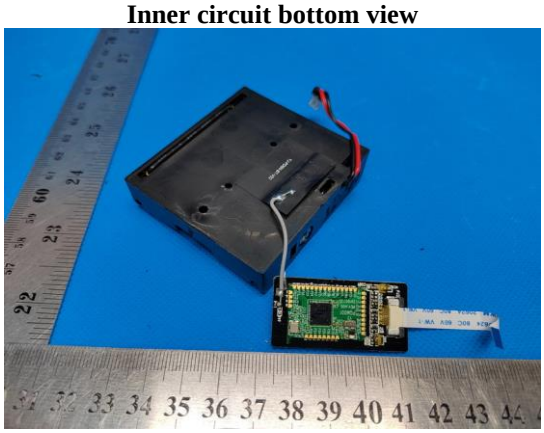
Inner circuit bottom view



Inner circuit top view



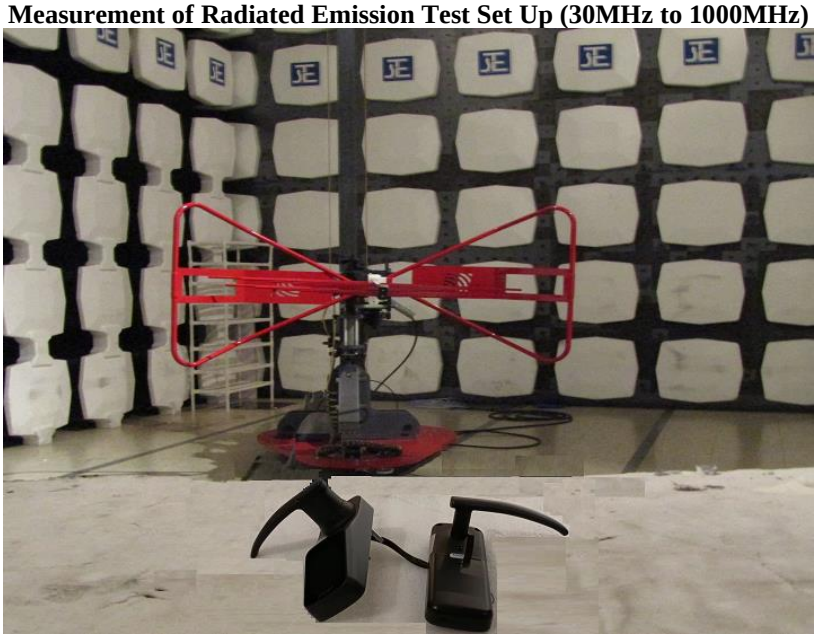
Inner circuit bottom view



Photographs of EUT

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

Measurement of Radiated Emission Test Set Up (30MHz to 1000MHz)



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

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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.