

Date: 2023-07-24 Page 1 of 39 No.: HMD23070004

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: Lockly Vision
Brand Name: LOCKLY
Model No.: PGD698LL
FCC ID: 2ASIVPGD699

Date Samples Received: 2023-06-25

Date Tested : 2023-06-25 to 2023-07-07

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. The tests were performed in accordance with the standards described

above and on Section 2.2 in this Test Report.

Remarks: Bluetooth DTS (GFSK)

Test by Susu





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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: Lockly Vision

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: PGD698LL
Additional Model PGD698DL

Rating: 3.85Vd.c. 10000mAh

(Rechargeable Li-ion Battery Pack, model: PGA620)

1.2.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Lockly Vision. The transmission signal is digital modulated with channel frequency range 2402-2480MHz. The R.F. signal was modulated by IC; the type of modulation used was digital transmission Modulation.

1.3 Date of Order

2023-06-25

1.4 Submitted Sample(s):

1 Sample

1.5 Test Duration

2023-06-25 to 2023-07-07

1.6 Country of Origin

China



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1.7 RF Module Details

Module Model Number: N/A Module FCC ID: N/A

Module Transmission Type: Bluetooth 5.0 BLE

Modulation: GFSK Data Rates: 1Mbps

Frequency Range: 2400-2483.5MHz Carrier Frequencies: 2402MHz – 2480MHz

Module Specification (specification provided by manufacturer)

1.8 Antenna Details

Antenna Type: FPC antenna Antenna Gain: -0.1dBi

1.9 Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

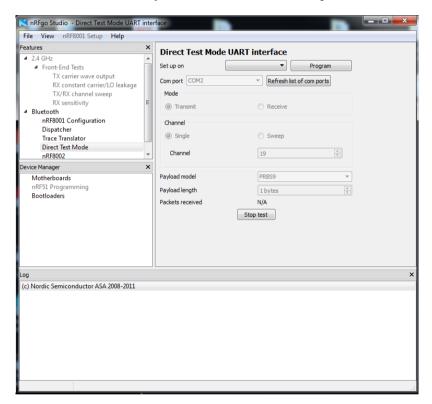


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2.0 Technical Details

2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2017 Regulations and ANSI C63.10:2013for FCC Certification. The device was realized by test software, and there is no power set.





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2.2 Test Standards and Results Summary Tables

	EMISSION Results Summary											
Test Condition Test Requirement Test Method Class / Test Resu												
			Severity	Pass	Failed	N/A						
Maximum Peak Output Power	FCC 47CFR 15.247(b)(3)	ANSI C63.10: 2013	N/A	\boxtimes								
Radiated Spurious	FCC 47CFR 15.209	ANSI C63.10: 2013	N/A	\boxtimes								
Emissions	FCC 47CFR 15.205											
AC Mains Conducted Emissions	FCC 47CFR 15.207	ANSI C63.10: 2013	N/A									
Conducted Spurious Emissions	FCC 47CFR 15.247(d)	ANSI C63.10: 2013	N/A	\boxtimes								
Power Spectral Density	FCC 47CFR 15.247(e)	ANSI C63.10: 2013	N/A	\boxtimes								
6dB Bandwidth	FCC 47CFR 15.247(a)(2)	ANSI C63.10: 2013	N/A	\boxtimes								
Band Edge Emissions	FCC 47CFR 15.247(d)	ANSI C63.10: 2013	N/A	\boxtimes								
(Radiated)												
Antenna requirement	FCC 47CFR 15.203	N/A	N/A	\boxtimes								

Note: N/A - Not Applicable



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3.0 Test Results

3.1 Emission

3.1.1 Maximum Peak Output Power

Test Requirement: FCC 47CFR 15.247(b)(3)
Test Method: ANSI C63.10: 2013

Test Date: 2023-07-02

Mode of Operation: Bluetooth DTS Tx mode

Ambient Temperature: 25°C Relative Humidity: 51% Atmospheric Pressure: 101 kPa

Test Method:

The RF output of the EUT was connected to the spectrum analyzer. All the attenuation or cable loss will be added to the measured maximum output power. The results are recorded in Watt.

Spectrum Analyzer Setting:

RBW = 2 MHz,

VBW= 6MHz,

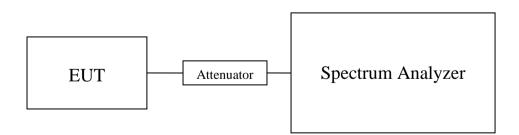
Sweep = Auto,

Span = 6MHz

Detector = Peak,

Trace = Max. hold

Test Setup:



Note: a temporary antenna connector was soldered to the RF output.



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Limits for Peak Output Power of Fundamental & Harmonics Emissions [FCC 47CFR 15.247]:

For Digital Transmission systems in 2400-2483.5 MHz Band: 1 Watt (30dBm)

Results of BT DTS Tx Mode (2402MHz to 2480MHz): Pass (TX Unit) (GFSK)									
Channel Frequency (MHz) Conducted Antenna E.I.R.P(dBm) E.I.R.P (Watt)									
0	2402	-1.273	-0.1	-1.373	0.000729				
19	2440	-1.403	-0.1	-1.503	0.000707				
39	2480	-1.482	-0.1	-1.582	0.000695				

Calculated measurement uncertainty : 30MHz to 1GHz 1.7dB

1GHz to 26GHz 1.7dB

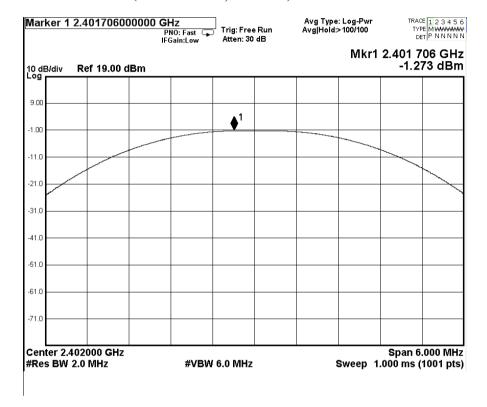


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Test plot of Maximum Peak Conducted Output Power:

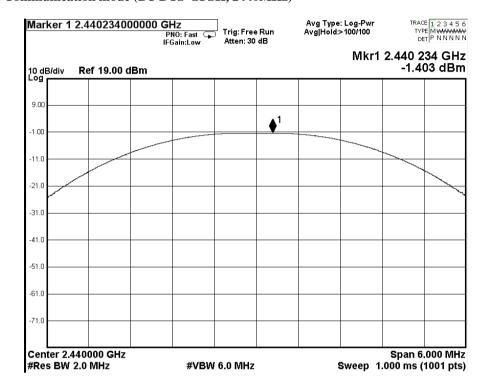
Bluetooth Communication mode (BT DTS-GFSK, 2402MHz)





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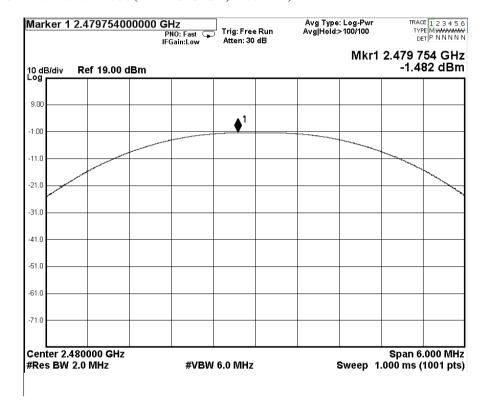
Bluetooth Communication mode (BT DTS-GFSK, 2440MHz)





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Bluetooth Communication mode (BT DTS-GFSK, 2480MHz)





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3.1.2 Radiated Emissions

Test Requirement: FCC 47CFR 15.209
Test Method: ANSI C63.10:2013

Test Date: 2023-07-02

Mode of Operation: Tx mode / Bluetooth Communication mode (GFSK)

Ambient Temperature: 25°C Relative Humidity: 50% Atmospheric Pressure: 101 kPa

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 Registration Number: HK0001

Test Firm Registration Number: 367672



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Spectrum Analyzer Setting:

9KHz – 30MHz (Pk & Av) 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) RBW: 1MHz

VBW: 1MHz Sweep: Auto

Span: Fully capture the emissions being measured

Trace: Max. hold

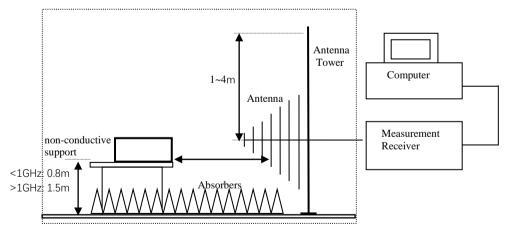
Above 1GHz (Av) RBW: 1MHz

VBW: 10Hz 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.



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Limits for Radiated Emissions FCC 47 CFR 15.2091:

Emilia for Radiated Emissions 1 CC 47 CTR 15:20	,>]•
Frequency Range	Quasi-Peak Limits
[MHz]	$[\mu V/m]$
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:

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 1000MHz 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.

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty (9kHz-30MHz): 2.0dB

(30MHz -1GHz): 4.9dB (1GHz -6GHz): 4.02dB (6GHz -26.5GHz): 4.03dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.



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Result of Tx mode (2402.0 MHz) (GFSK) (9kHz - 30MHz): Pass

tebute of 1% mode (2 to 2 to 1 till 2) (51 bit) (5 mile to till 2) (1 ubb									
Field Strength of Spurious Emissions									
	Peak Value								
Frequency	Frequency Measured Correction Field Field Limit E-Field								
	Level	Factor	Strength	Strength		Polarity			
MHz	MHz dBuV dB/m dBuV/m uV/m uV/m								
	Emissions detected are more than 20 dB below the FCC Limits								

Result of Tx mode (2402.0 MHz) (GFSK) (Above 1GHz): Pass

	Field Strength of Spurious Emissions Peak Value										
Frequency	Measured	Correction	Field	Limit	Margin	E-Field					
	Level @3m	Factor	Strength	@3m	_	Polarity					
MHz	dΒμV	dB/m	dBμV/m	dBμV/m	dB						
4804.0	56.8	0.8	57.6	74.0	16.4	Vertical					
4804.0	56.6	0.5	57.1	74.0	16.9	Horizontal					
7206.0	50.2	7.0	57.2	74.0	16.8	Vertical					
7206.0	49.4	6.5	55.9	74.0	18.1	Horizontal					
9608.0	47.1	8.5	55.6	74.0	18.4	Vertical					
9608.0	47.7	8.3	56.0	74.0	18.0	Horizontal					
12010.0	45.4	10.9	56.3	74.0	17.7	Vertical					
12010.0	45.2	10.8	56.0	74.0	18.0	Horizontal					

	Field Strength of Spurious Emissions Average Value										
Frequency	Measured	Correction	Field	Limit	Margin	E-Field					
	Level @3m	Factor	Strength	@3m		Polarity					
MHz	dΒμV	dB/m	$dB\mu V/m$	dBμV/m	dB						
4804.0	42.1	0.8	42.9	54.0	11.1	Vertical					
4804.0	41.8	0.5	42.3	54.0	11.7	Horizontal					
7206.0	35.2	7.0	42.2	54.0	11.8	Vertical					
7206.0	35.4	6.5	41.9	54.0	12.1	Horizontal					
9608.0	32.5	8.5	41.0	54.0	13.0	Vertical					
9608.0	32.2	8.3	40.5	54.0	13.5	Horizontal					
12010.0	31.1	10.9	42.0	54.0	12.0	Vertical					
12010.0	30.3	10.8	41.1	54.0	12.9	Horizontal					



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Result of Tx mode (2440.0 MHz) (GFSK) (9kHz - 30MHz): Pass

Field Strength of Spurious Emissions									
	Peak Value								
Frequency	Measured	Correction	Field	Field	Limit	E-Field			
	Level	Factor	Strength	Strength		Polarity			
MHz	MHz dBuV dB/m dBuV/m uV/m uV/m								
	Emissions detected are more than 20 dB below the FCC Limits								

Result of Tx mode (2440.0 MHz) (GFSK) (Above 1GHz): Pass

	Field Strength of Spurious Emissions Peak Value										
Frequency	Measured	Correction	Field	Limit	Margin	E-Field					
	Level @3m	Factor	Strength	@3m		Polarity					
MHz	dΒμV	dB/m	$dB\mu V/m$	dBμV/m	dB						
4880.0	57.2	0.8	58.0	74.0	16.0	Vertical					
4880.0	56.9	0.5	57.4	74.0	16.6	Horizontal					
7320.0	50.1	7.0	57.1	74.0	16.9	Vertical					
7320.0	50.7	6.5	57.2	74.0	16.8	Horizontal					
9760.0	47.4	8.5	55.9	74.0	18.1	Vertical					
9760.0	47.3	8.3	55.6	74.0	18.4	Horizontal					
12200.0	45.2	10.9	56.1	74.0	17.9	Vertical					
12200.0	45.1	10.8	55.9	74.0	18.1	Horizontal					

	Field Strength of Spurious Emissions Average Value										
Frequency	Measured	Correction	Field	Limit	Margin	E-Field					
	Level @3m	Factor	Strength	@3m		Polarity					
MHz	dΒμV	dB/m	$dB\mu V/m$	dBμV/m	dB						
4880.0	41.4	0.8	42.2	54.0	11.8	Vertical					
4880.0	41.7	0.5	42.2	54.0	11.8	Horizontal					
7320.0	34.5	7.0	41.5	54.0	12.5	Vertical					
7320.0	35.6	6.5	42.1	54.0	11.9	Horizontal					
9760.0	33.3	8.5	41.8	54.0	12.2	Vertical					
9760.0	33.4	8.3	41.7	54.0	12.3	Horizontal					
12200.0	30.9	10.9	41.8	54.0	12.2	Vertical					
12200.0	31.2	10.8	42.0	54.0	12.0	Horizontal					



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Result of Tx mode (2480.0 MHz) (GFSK) (9kHz - 30MHz): Pass

	Field Strength of Spurious Emissions								
	Peak Value								
Frequency	Measured	Correction	Field	Field	Limit	E-Field			
	Level	Factor	Strength	Strength		Polarity			
MHz	MHz dBuV dB/m dBuV/m uV/m uV/m								
	Emissions detected are more than 20 dB below the FCC Limits								

Result of Tx mode (2480.0 MHz) (GFSK) (Above 1GHz): Pass

	Field Strength of Spurious Emissions Peak Value										
Frequency	Measured	Correction	Field	Limit	Margin	E-Field					
	Level @3m	Factor	Strength	@3m		Polarity					
MHz	dΒμV	dB/m	dBμV/m	dBμV/m	dB	_					
4960.0	56.8	0.8	57.6	74.0	16.4	Vertical					
4960.0	57.3	0.5	57.8	74.0	16.2	Horizontal					
7440.0	50.2	7.0	57.2	74.0	16.8	Vertical					
7440.0	51.2	6.5	57.7	74.0	16.3	Horizontal					
9920.0	47.6	8.5	56.1	74.0	17.9	Vertical					
9920.0	47.4	8.3	55.7	74.0	18.3	Horizontal					
12400.0	45.2	10.9	56.1	74.0	17.9	Vertical					
12400.0	45.3	10.8	56.1	74.0	17.9	Horizontal					

	Field Strength of Spurious Emissions Average Value							
Frequency	Measured	Correction	Field	Limit	Margin	E-Field		
	Level @3m	Factor	Strength	@3m		Polarity		
MHz	dΒμV	dB/m	$dB\mu V/m$	dBμV/m	dB			
4960.0	41.5	0.8	42.3	54.0	11.7	Vertical		
4960.0	41.4	0.5	41.9	54.0	12.1	Horizontal		
7440.0	35.2	7.0	42.2	54.0	11.8	Vertical		
7440.0	35.4	6.5	41.9	54.0	12.1	Horizontal		
9920.0	33.1	8.5	41.6	54.0	12.4	Vertical		
9920.0	34.2	8.3	42.5	54.0	11.5	Horizontal		
12400.0	31.4	10.9	42.3	54.0	11.7	Vertical		
12400.0	30.8	10.8	41.6	54.0	12.4	Horizontal		



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Radiated Emissions Measurement:

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 5.205(c)).

Result: RF Radiated Emissions (Lowest)-GFSK

Field Strength of Band-edge Compliance							
	Peak Value						
Frequency	Measured	Correction	Field	Limit	Margin	E-Field	
	Level @3m	Factor	Strength	@3m		Polarity	
MHz	dΒμV	dB/m	$dB\mu V/m$	$dB\mu V/m$	dB		
2390.0	48.3	-4.8	43.5	74.0	30.5	Vertical	
2390.0	47.7	-4.7	43.0	74.0	31.0	Horizontal	

Field Strength of Band-edge Compliance							
Average Value							
Frequency	Measured	Correction	Field	Limit	Margin	E-Field	
	Level @3m	Factor	Strength	@3m		Polarity	
MHz	dΒμV	dB/m	dBμV/m	dBμV/m	dB		
2390.0	42.2	-4.8	37.4	54.0	16.6	Vertical	
2390.0	42.1	-4.7	37.4	54.0	16.6	Horizontal	

Result: RF Radiated Emissions (Highest) -GFSK

	Field Strength of Band-edge Compliance							
Peak Value								
Frequency	Measured	Correction	Field	Limit	Margin	E-Field		
	Level @3m	Factor	Strength	@3m		Polarity		
MHz	dΒμV	dB/m	$dB\mu V/m$	dBμV/m	dB			
2483.5	50.7	-4.8	45.9	74.0	28.1	Vertical		
2483.5	50.5	-4.7	45.8	74.0	28.2	Horizontal		

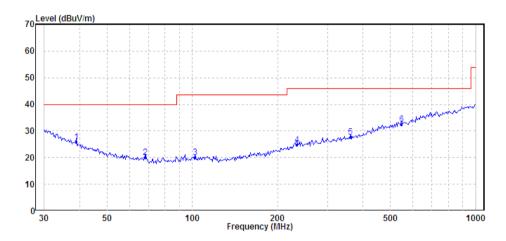
Field Strength of Band-edge Compliance							
Average Value							
Frequency	Measured	Correction	Field	Limit	Margin	E-Field	
	Level @3m	Factor	Strength	@3m		Polarity	
MHz	dΒμV	dB/m	$dB\mu V/m$	$dB\mu V/m$	dB		
2483.5	44.2	-4.8	39.4	54.0	14.6	Vertical	
2483.5	43.8	-4.7	39.1	54.0	14.9	Horizontal	



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Results of Bluetooth Communication mode (2402.0 MHz) (30MHz - 1GHz): Pass

Please refer to the following table for result details(The data is the worst cases) Horizontal



Ambient Temperature: 25.6C Relative Humidity : 52.7% Air Pressure : 100.9kPa

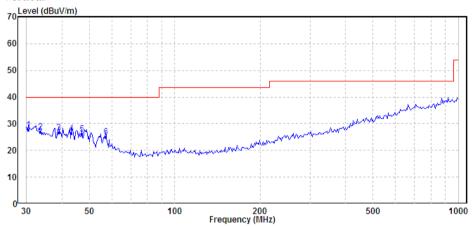
	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV/m	$\overline{\text{dBuV/m}}$	dB		
1	38.888	25.95	40.00	-14.05	QP	Horizontal
2	68.151	20.18	40.00	-19.82	QP	Horizontal
3	102.360	20.08	43.50	-23.42	QP	Horizontal
4	234.168	24.90	46.00	-21.10	QP	Horizontal
5	361.714	27.75	46.00	-18.25	QP	Horizontal
6	547.098	32.55	46.00	-13.45	QP	Horizontal



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Results of Bluetooth Communication mode (2402.0 MHz) (30MHz - 1GHz): Pass

Please refer to the following table for result details(The data is the worst cases) Vertical



Ambient Temperature: 25.6C Relative Humidity : 52.7% Air Pressure : 100.9kPa

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	$\overline{\text{dBuV/m}}$	$\overline{\text{dBuV/m}}$	dB		
1	30.424	27.62	40.00	-12.38	QP	Vertical
2	33.562	27.00	40.00	-13.00	QP	Vertical
3	38.888	26.80	40.00	-13.20	QP	Vertical
4	43.202	26.53	40.00	-13.47	QP	Vertical
5	46.995	26.03	40.00	-13.97	QP	Vertical
6	57.191	25.01	40.00	-14.99	QP	Vertical



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3.1.3 Power Spectral Density

Test Requirement: FCC 47CFR 15.247(e)
Test Method: ANSI C63.10:2013

Test Date: 2023-07-03 Mode of Operation: Tx mode

Ambient Temperature: 25°C Relative Humidity: 51% Atmospheric Pressure: 101 kPa

Test Method:

The RF output of the EUT was connected to the spectrum analyzer. Set the fundamental frequency as the center frequency of the spectral analyzer. Use RBW=3kHz, VBW= 10KHz, Set the span to 1.5 times the DTS channel bandwidth. Detector = peak, Sweep time = auto couple, Trace mode = max hold. Measure the Power Spectral Density (PSD) and record the results in dBm.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

Test Limit:

The maximum power spectral density (PSD) shall not exceeded 8dBm in any 3kHz band.

Results of Tx Mode GFSK (Tx:2402MHz to 2480MHz) : Pass (Tx Unit) Maximum power spectral density

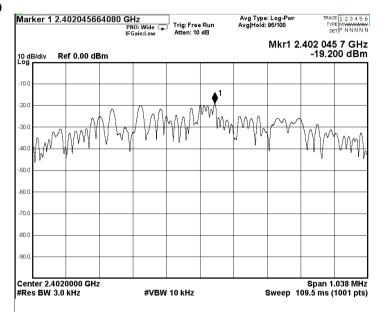
Transmitter Frequency (MHz)	Maximum Power spectral density level / 3kHz band (dBm)	Maximum Power spectral density / 3kHz band limit
2402.0	-19.200	8dBm
2440.0	-19.015	8dBm
2480.0	-19.195	8dBm



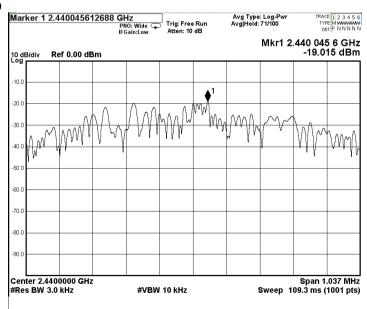
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Tx mode GFSK (Tx: 2402MHz to 2480MHz)

CH 0 (2402.0 MHz)



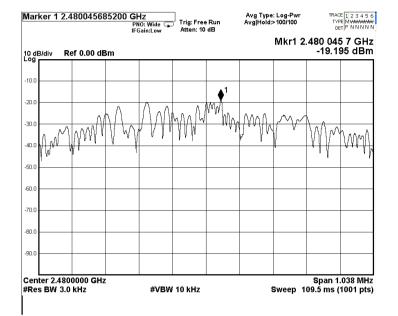
CH 19 (2440.0 MHz)





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CH 39 (2480.0 MHz)





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3.1.4 6dB Spectrum Bandwidth Measurement

Test Requirement: FCC 47CFR 15.247(a)(2)
Test Method: ANSI C63.10:2013

Test Date: 2023-07-03 Mode of Operation: Tx mode

Ambient Temperature: 25°C Relative Humidity: 51% Atmospheric Pressure: 101 kPa

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.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

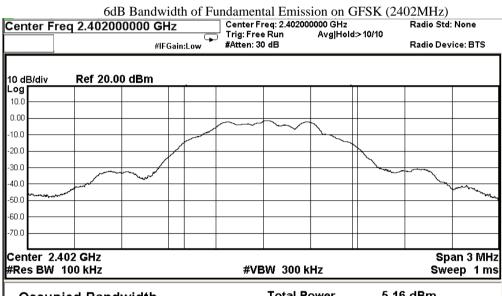


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Limits for 6dB Spectrum Bandwidth Measurement:

Center Frequency [MHz]	6dB Bandwidth [KHz]	FCC Limits [kHz]
2402.0	691.9	> 500



Occupied Bandwidtl	h	Total Power	5.16 dBm	
1.0	0679 MHz			
Transmit Freq Error	31.393 kHz	OBW Power	99.00 %	
x dB Bandwidth	691.9 kHz	x dB	-6.00 dB	

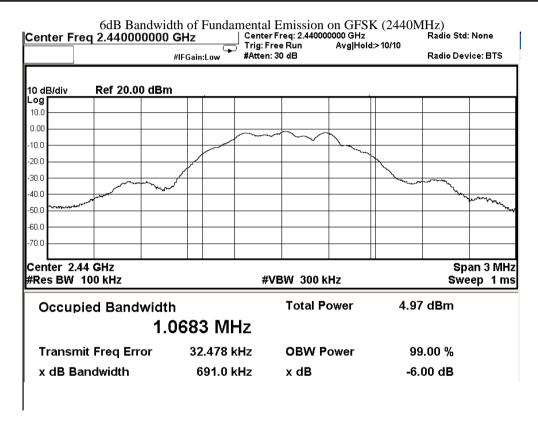


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Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range	6dB Bandwidth	FCC Limits
[MHz]	[KHz]	[kHz]
2440.0	691.0	> 500



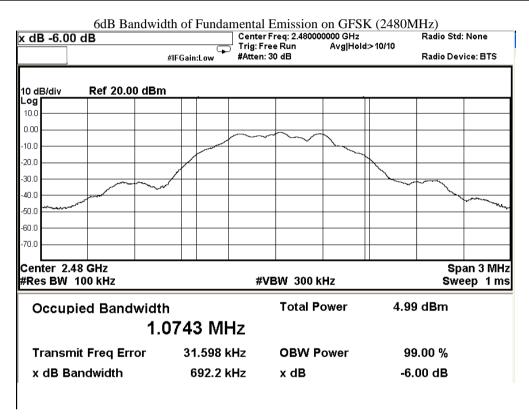


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Limits for 6dB Spectrum Bandwidth Measurement:

Frequency Range	6dB Bandwidth	FCC Limits
[MHz]	[KHz]	[kHz]
2480.0	692.2	> 500





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3.1.5 Band Edges Measurement

Test Requirement: FCC 47CFR 15.247
Test Method: ANSI C63.10:2013

Test Date: 2023-07-04 Mode of Operation: Tx mode

Ambient Temperature: 25°C Relative Humidity: 51% Atmospheric Pressure: 101 kPa

Test Method:

The band edge 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. The RBW are set to 100kHz and VBW are set to 300kHz for this measurement.

Test Setup:

As Test Setup of clause 3.1.2 in this test report.

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



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Band-edge Compliance of RF Conducted Emissions Measurement:

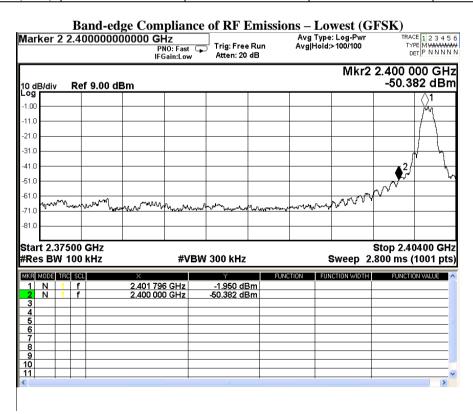
Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

Remark: Emissions under the fixed frequency mode and hopping mode have been investigated, the worst-case measurement results were recorded in the test report

Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2400 – Lowest Fundamental (2402)	-1.950	-21.950	-50.382	PASS

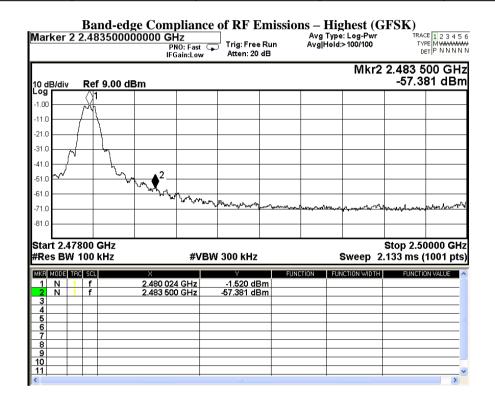




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Band-edge Compliance of RF Conducted Emissions Measurement:

Frequency Range	Reference level	Limit	The highest conducted band edge emission	Result
[MHz]	[dBm]	[dBm]	[dBm]	
2483.5 - Highest Fundamental (2480)	-1.520	-21.520	-57.381	PASS





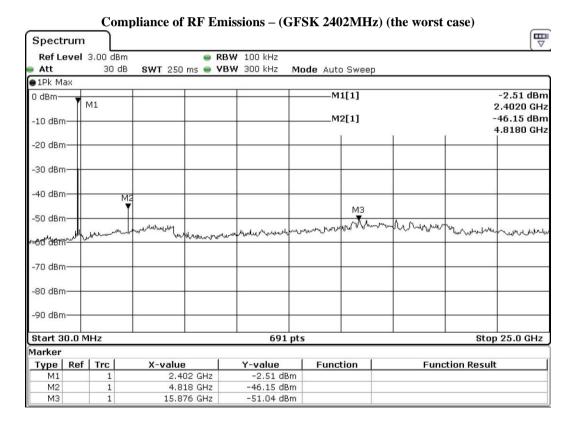
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Compliance of RF Emissions Measurement:

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

Remark: Emissions under the fixed frequency mode and hopping mode have been investigated, the worst-case measurement results were recorded in the test report





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3.1.6 Antenna Requirement

Ambient Temperature: 25°C Relative Humidity: 51% Atmospheric Pressure: 101 kPa

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, the antenna gain = -0.1dBi. User is unable to remove or changed the Antenna.



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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	2022/11/25	2024/11/25
EM299	BROADBAND HORN ANTENNA	ETS-LINDGREN	3115	00114120	2022/11/24	2024/11/24
EM300	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-09	00130130	2022/11/25	2024/11/25
EM301	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-10	00130988	2022/11/25	2024/11/25
EM353	LOOP ANTENNA	ETS_LINDGREN	6502	00206533	2022/06/10	2024/09/10
EM355	Biconilog Antenna	ETS-Lindgren	3143B	00094856	2022/06/17	2024/09/17
EM200	DUAL CHANNEL POWER METER	R & S	NRVD	100592	2022/10/11	2025/10/11
EM012	PRE-AMPLIFIER	HP	HP8448B	3008A00262	2022/11/08	2025/11/08
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A

Remarks:-

CM Corrective Maintenance

N/A Not Applicable
TBD To Be Determined



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Appendix B Photographs of EUT

View of the product



Inner circuit view



Inner circuit top view



View of the product



View of battery



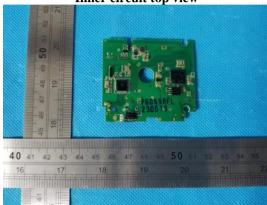
Inner circuit bottom view



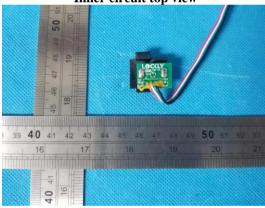


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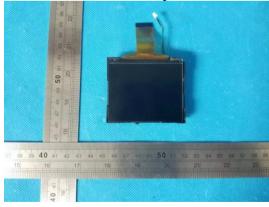




Inner circuit top view



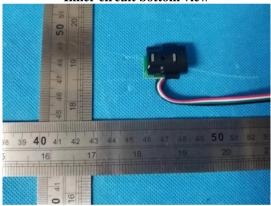
Inner circuit top view



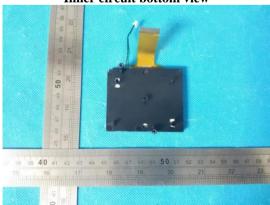
Inner circuit bottom view



Inner circuit bottom view



Inner circuit bottom view





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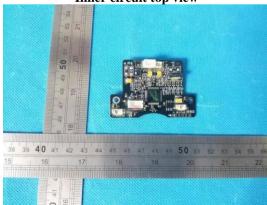




Inner circuit top view



Inner circuit top view



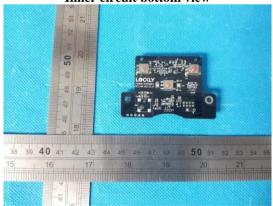
Inner circuit bottom view



Inner circuit bottom view



Inner circuit bottom view



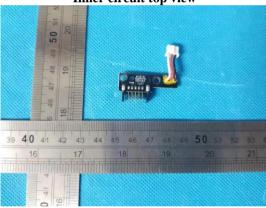


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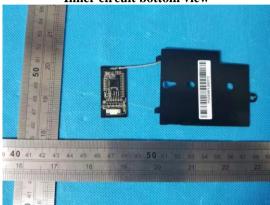
Inner circuit top view



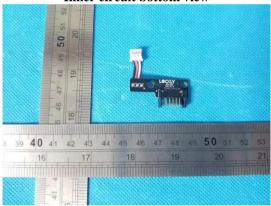
Inner circuit top view



Inner circuit bottom view



Inner circuit bottom view



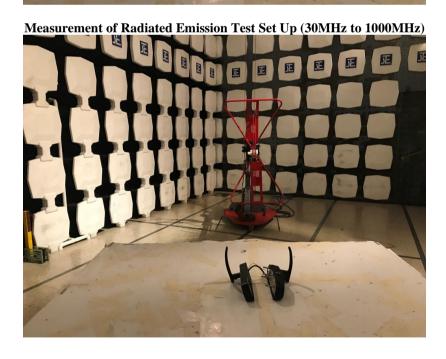
Inner circuit bottom view





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Photographs of EUT

Measurement of Radiated Emission Test Set Up (Above 1000MHz)

***** 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.
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- 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.