

RF TEST REPORT

Product Name: Integrated RFID Reader

Model Name: UR1A

FCC ID: 2AC6AUR1A

Issued For : Shenzhen Chainway Information Technology Co., Ltd

9F Building 2, Dagian Industrial Park, District 67, XingDong

Community, Xin'an Street, Bao'an District, Shenzhen, Guangdong,

China

Issued By : Shenzhen LGT Test Service Co., Ltd.

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Shenzhen, Guangdong, China

Report Number: LGT24H095RF02

Sample Received Date: Aug. 22, 2024

Date of Test: Aug. 22, 2024 ~ Nov. 27, 2024

Date of Issue: Nov. 27, 2024

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TEST REPORT CERTIFICATION

Applicant: Shenzhen Chainway Information Technology Co., Ltd

9F Building 2, Daqian Industrial Park, District 67, XingDong

Address: Community, Xin'an Street, Bao'an District, Shenzhen, Guangdong,

China

Manufacturer: Shenzhen Chainway Information Technology Co., Ltd

9F Building 2, Dagian Industrial Park, District 67, XingDong

Address: Community, Xin'an Street, Bao'an District, Shenzhen, Guangdong,

China

Product Name: Integrated RFID Reader

Trademark: CHAINWAY

Model Name: UR1A

Sample Status: Normal

APPLICABLE STANDARDS				
STANDARD TEST RESULTS				
FCC Part 15.247, Subpart C ANSI C63.10-2013	PASS			

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Technical Director



Table of Contents	Page
1. SUMMARY OF TEST RESULTS	6
1.1 TEST FACTORY 1.2 MEASUREMENT UNCERTAINTY	7 7
	•
2. GENERAL INFORMATION 2.2 DESCRIPTION OF THE TEST MODES	8 10
2.3 TEST SOFTWARE AND POWER LEVEL	10
2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS	11
2.6 EQUIPMENTS LIST	12
3. EMC EMISSION TEST	13
3.1 CONDUCTED EMISSION MEASUREMENT	13
3.2 RADIATED EMISSION MEASUREMENT	17
4. CONDUCTED SPURIOUS & BAND EDGE EMISSION	33
4.1 LIMIT	33
4.2 TEST PROCEDURE	33
4.3 TEST SETUP	34
4.4 EUT OPERATION CONDITIONS	34
4.5 TEST RESULTS	34
5. NUMBER OF HOPPING CHANNEL	35
5.1 LIMIT	35
5.2 TEST PROCEDURE	35
5.3 TEST SETUP 5.4 EUT OPERATION CONDITIONS	35 35
5.5 TEST RESULTS	35
6. AVERAGE TIME OF OCCUPANCY	36
6.1 LIMIT	36
6.2 TEST PROCEDURE	36
6.3 TEST SETUP	36
6.4 EUT OPERATION CONDITIONS	36
6.5 TEST RESULTS	36
7. HOPPING CHANNEL SEPARATION MEASUREMEN	37
7.1 LIMIT	37
7.2 TEST PROCEDURE	37
7.3 TEST SETUP	37
7.4 EUT OPERATION CONDITIONS	37

Report No.: LGT24H095RF02



7.5 TEST RESULTS	37
8. BANDWIDTH TEST	38
8.1 LIMIT	38
8.2 TEST PROCEDURE	38
8.3 TEST SETUP	38
8.4 EUT OPERATION CONDITIONS	38
8.5 TEST RESULTS	38
9. OUTPUT POWER TEST	39
9.1 LIMIT	39
9.2 TEST PROCEDURE	39
9.3 TEST SETUP	39
9.4 EUT OPERATION CONDITIONS	39
9.5 TEST RESULTS	39
10. ANTENNA REQUIREMENT	40
10.1 STANDARD REQUIREMENT	40
10.2 EUT ANTENNA	40
APPENDIX I - TEST RESULTS	41
DUTY CYCLE	41
CONDUCTED OUTPUT POWER	42
-20DB BANDWIDTH	43
CARRIER FREQUENCIES SEPARATION	45
BAND EDGE	47
BAND EDGE(HOPPING)	49
CONDUCTED RF SPURIOUS EMISSION	50
NUMBER OF HOPPING CHANNEL	52
DWELL TIME	53
APPENDIX II - MEASUREMENT PHOTOS	56
APPENDIX III - PHOTOGRAPHS OF FUT CONSTRUCTIONAL DETAILS	57

Report No.: LGT24H095RF02 Page 4 of 57



Revision History

Rev.	Issue Date	Revisions
00	Nov. 27, 2024	Initial Issue

Report No.: LGT24H095RF02 Page 5 of 57



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards: KDB 558074 D01 15.247 Meas Guidance v05r02.

FCC Part 15.247, Subpart C						
Standard Section	I I I I I I I I I I I I I I I I I I I					
15.207	Conducted Emission PASS -					
15.247(a)(1)	Hopping Channel Separation	PASS				
15.247(a)(1)&(b)(1)	Output Power	PASS				
15.209	Radiated Spurious Emission	PASS				
15.247(d)	Conducted Spurious & Band Edge Emission	PASS				
15.247(a)(1)(i)	Number of Hopping Frequency	PASS				
15.247(a)(1)(i)	Dwell Time	PASS				
15.247(a)(1)	Bandwidth	PASS				
15.205	Restricted bands of operation	PASS				
Part 15.247(d)/part 15.209(a)	Band Edge Emission	PASS				
15.203	Antenna Requirement	PASS				

NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report.
- (2) All tests are according to ANSI C63.10-2013.

Report No.: LGT24H095RF02 Page 6 of 57



1.1 TEST FACTORY

Company Name:	Shenzhen LGT Test Service Co., Ltd.	
Address:	Room 205, Building 13, Zone B, Zhenxiong Industrial Park, No.1 Renmin West Road, Jinsha, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China	
	A2LA Certificate No.: 6727.01	
Accreditation Certificate	FCC Registration No.: 746540	
	CAB ID: CN0136	

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $\mathbf{y} \pm \mathbf{U}$, where expended uncertainty \mathbf{U} is based on a standard uncertainty multiplied by a coverage factor of $\mathbf{k=2}$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	RF output power, conducted	±0.68dB
2	Unwanted Emissions, conducted	±2.988dB
3	All emissions, radiated 9K-30MHz	±2.84dB
4	All emissions, radiated 30M-1GHz	±4.39dB
5	All emissions, radiated 1G-6GHz	±5.10dB
6	All emissions, radiated>6G	±5.48dB
7	Conducted Emission (9KHz-150KHz)	±2.79dB
8	Conducted Emission (150KHz-30MHz)	±2.80dB

Note: The measurement uncertainty is not included in the test result.

Report No.: LGT24H095RF02 Page 7 of 57



2. GENERAL INFORMATION

Product Name	Integrated RFID Reader		
Trademark	CHAINWAY		
Model Name	UR1A		
Series Model	N/A		
Model Difference	N/A		
	The EUT is a Integrated Operation Frequency:	RFID Reader 902.75~927.25 MHz	
Draduct Description	Modulation Type:	FSK	
Product Description	Number Of Channel:	50	
	Antenna Designation:	Circular polarization	
	Antenna Gain (dBi)	9	
Channel List	Please refer to the Note 3		
Rating:	DC12V/2A		
Hardware Version:	UR1A _Hardware_version		
Software Version:	UR1A _Software_version		
Connecting I/O Port(s)	Please refer to the Note	1.	

Note:

- 1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.
- 2. The antenna information refers to the manufacturer provide report, applicable only to the tested sample identified in the report. Due to the incorrect antenna information, a series of problems such as the accuracy of the test results will be borne by the customer.

Report No.: LGT24H095RF02 Page 8 of 57



3. Operation Frequency each of channel Channel Channel Frequency Frequency Channel Frequency Channel Frequency 1 16 910.25MHz 31 917.75MHz 46 902.75MHz 925.25MHz 2 903.25MHz 17 910.75MHz 32 918.25MHz 47 925.75MHz 3 903.75MHz 18 33 48 911.25MHz 918.75MHz 926.25MHz 926.75MHz 4 904.25MHz 19 911.75MHz 34 919.25MHz 49 5 20 35 919.75MHz 50 927.25MHz 904.75MHz 912.25MHz 6 905.25MHz 21 912.75MHz 36 920.25MHz 7 905.75MHz 22 913.25MHz 37 920.75MHz 8 906.25MHz 23 913.75MHz 38 921.25MHz 9 906.75MHz 24 914.25MHz 39 921.75MHz 10 907.25MHz 25 914.75MHz 40 922.25MHz 11 907.75MHz 26 915.25MHz 41 922.75MHz 12 27 42 923.25MHz 908.25MHz 915.75MHz 13 908.75MHz 28 916.25MHz 43 923.75MHz 14 909.25MHz 29 916.75MHz 44 924.25MHz

15

909.75MHz

30

917.25MHz

45

924.75MHz

Report No.: LGT24H095RF02 Page 9 of 57



2.2 DESCRIPTION OF THE TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Worst Mode	Frequency (MHz)		
Mode 1	902.75		
Mode 2	915.25		
Mode 3	927.25		

Note:

(1) We tested for all available U.S. voltage and frequencies (For 120V, 50/60Hz and 240V, 50/60Hz) for which the device is capable of operation, and the worst case of 120V/ 60Hz is shown in the report.

For AC Conducted Emission

Test Case		
AC Conducted Emission	Mode 4: Keeping TX	

2.3 TEST SOFTWARE AND POWER LEVEL

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

Туре	Mode Or Modulation type	ANT Gain(dBi)	Power Class	Software For Testing
RF ID	ASK	9	20	UHFAPP_1.0.0.0

Report No.: LGT24H095RF02 Page 10 of 57



2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Accessories Equipment

Description	Manufacturer	Model	S/N	Rating

Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Adapter	SHENZHEN YINGHUI YUAN ELECTRONICS CO.,LTO	YHY-120015 00	N/A	Input: 100-240V ~ 50/60Hz 1A Output: 12V, 1.5A
Laptop	Lenovo	HKF-16	N/A	N/A
RJ45 Cable	N/A	N/A	N/A	1m
RJ45 Cable	N/A	N/A	N/A	1m

Note:

- (1) For detachable type I/O cable should be specified the length in cm in <code>"Length_"</code> column.
- (2) "YES" is means "with core"; "NO" is means "without core".

Report No.: LGT24H095RF02 Page 11 of 57



2.6 EQUIPMENTS LIST

Conducted Emission							
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until		
EMI Test Receiver	R&S	ESU8	100372	2024.03.09	2025.03.08		
LISN	COM-POWER	LI-115	02032	2024.03.09	2025.03.08		
LISN	SCHWARZBECK	NNLK 8122	00160	2024.03.09	2025.03.08		
Transient Limiter	CYBERTEK	EM5010A	E2250100049	2024.03.09	2025.03.08		
Temperature & Humidity	KTJ	TA218B	N.A	2024.03.09	2025.03.08		
Testing Software	EMC-I_V1.4.0.3_SKET						

Radiated Test equipment							
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until		
EMI Test Receiver	R&S	ESU8	100372	2024.03.09	2025.03.08		
Active loop Antenna	ETS	6502	00049544	2023.10.13	2025.10.12		
Spectrum Analyzer	Keysight	N9010B	MY60242508	2024.08.05	2025.08.04		
Bilog Antenna(30M-1G)	SCHWARZBECK	VULB 9168	2705	2022.12.12	2025.12.11		
Horn Antenna(1-18G)	SCHWARZBECK	3115	10SL0060	2022.06.02	2025.06.01		
Horn Antenna(18-40G)	A-INFO	LB-180400-KF	J211060273	2022.06.08	2025.06.07		
Pre-amplifier(30M-1G)	EMtrace	RP01A	02019	2024.03.09	2025.03.08		
Pre-amplifier(1-26.5G)	Agilent	8449B	3008A4722	2024.03.09	2025.03.08		
Pre-amplifier(18-40G)	com-mw	LNPA_18-40-01	18050003	2024.03.09	2025.03.08		
Wireless Communications Test Set	R&S	CMW 500	137737	2024.03.09	2025.03.08		
Antenna Tower	SAEMC	BK-4AT-BS-D	SK2021093008	N.A	N.A		
Temperature & Humidity	JINGCHUANG	BT-3	N.A	2024.03.11	2025.03.10		
Testing Software	EMC-I_V1.4.0.3_SKET						

RF Conducted Test equipment						
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until	
Signal Analyzer	Keysight	N9010B	MY60242508	2024.08.05	2025.08.04	
Signal Analyzer	Keysight	N9020A	MY50530994	2024.03.09	2025.03.08	
RF Automatic Test system	MW	MW100-RFCB	MW220322LG-033	2024.03.09	2025.03.08	
MXG Vector Signal Generator	Keysight	N5182B	MY59100717	2024.03.09	2025.03.08	
Temperature& Humidity test chamber	AISRY	LX-1000L	171200018	2024.03.09	2025.03.08	
Attenuator	eastsheep	90db	N.A	2024.03.09	2025.03.08	
Temperature & Humidity	JINGCHUANG	BT-3	N.A	2024.03.11	2025.03.10	
Digital multimeter	MASTECH	MS8261	MBGBC83053	2024.03.09	2025.03.08	
Testing Software	MTS8310_V2.0.0.0_MW					

Report No.: LGT24H095RF02 Page 12 of 57



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table.

EDEOLIENOV (MH-)	Conducted Emissionlimit (dBuV)		
FREQUENCY (MHz)	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	
0.50 -5.0	56.00	46.00	
5.0 -30.0	60.00	50.00	

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

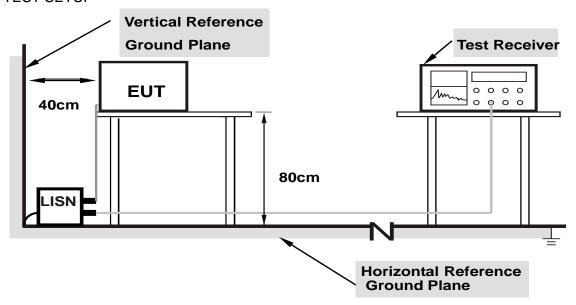
Report No.: LGT24H095RF02 Page 13 of 57



3.1.2 TEST PROCEDURE

- a. The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN is at least 80 cm from the nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

3.1.3 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes support units.

3.1.4 EUT OPERATING CONDITIONS

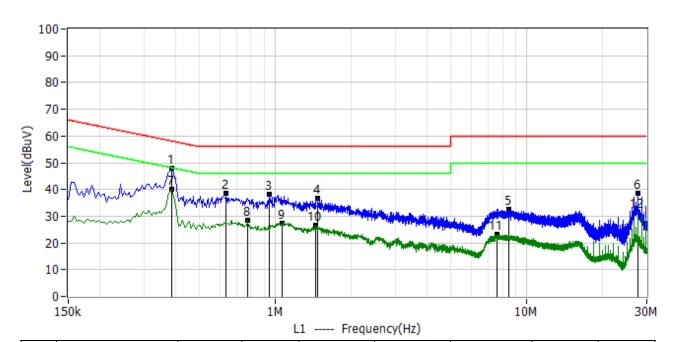
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

Report No.: LGT24H095RF02 Page 14 of 57



3.1.5 TEST RESULT

Project: LGT24H095	Test Engineer: LiuH
EUT: Integrated RFID Reader	Temperature: 29.1°C
M/N: UR1A	Humidity: 52%RH
Test Voltage: AC 120V/60Hz	Test Data: 2024-09-02
Test Mode: TX	
Note:	

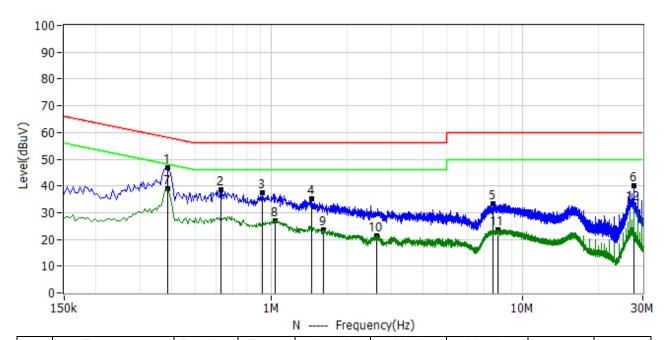


Frequency Factor Reading Level Limit Margin No. Detector Polar MHz dBuV dΒ dBuV dBuV dΒ 1* 0.386 37.44 10.57 48.01 58.15 -10.14 QΡ L1 2* 27.96 10.57 38.53 -17.47 QP 0.638 56.00 L1 3* -17.93 QP 27.40 10.67 56.00 L1 0.950 38.07 4* 1.474 25.82 10.83 36.65 56.00 -19.35 QP L1 5* 8.454 21.52 11.01 32.53 60.00 -27.47 QP L1 6* 27.718 11.90 38.63 60.00 -21.37 QP L1 26.73 7* 0.386 29.45 10.57 40.02 48.15 -8.13 ΑV L1 8* 0.778 17.82 10.60 28.42 46.00 -17.58 ΑV L1 9* 1.066 16.76 10.71 27.47 46.00 -18.53 ΑV L1 10* 1.442 15.59 10.82 26.41 46.00 -19.59 ΑV L1 11* 7.598 12.12 11.00 23.12 50.00 -26.88 ΑV L1 12* 27.718 19.40 11.90 31.30 50.00 -18.70 L1

Report No.: LGT24H095RF02 Page 15 of 57



Project: LGT24H095	Test Engineer: LiuH
EUT: Integrated RFID Reader	Temperature: 29.1°C
M/N: UR1A	Humidity: 52%RH
Test Voltage: AC 120V/60Hz	Test Data: 2024-09-02
Test Mode: TX	
Note:	



No.	Frequency	Reading	Factor	Level	Limit	Margin	Detector	Polar
INO.	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	rulai
1*	0.386	36.07	10.59	46.66	58.15	-11.49	QP	Ν
2*	0.630	28.19	10.56	38.75	56.00	-17.25	QP	Ν
3*	0.922	26.73	10.55	37.28	56.00	-18.72	QP	Ν
4*	1.450	24.59	10.64	35.23	56.00	-20.77	QP	Ν
5*	7.586	22.46	10.84	33.30	60.00	-26.70	QP	Ν
6*	27.718	28.20	11.87	40.07	60.00	-19.93	QP	N
7*	0.386	28.40	10.59	38.99	48.15	-9.16	AV	Ν
8*	1.038	16.57	10.55	27.12	46.00	-18.88	AV	Ν
9*	1.618	13.08	10.68	23.76	46.00	-22.24	AV	Ν
10*	2.614	10.65	10.77	21.42	46.00	-24.58	AV	Ν
11*	7.938	12.91	10.86	23.77	50.00	-26.23	AV	N
12*	27.718	21.15	11.87	33.02	50.00	-16.98	AV	N



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205 (a)&209(a) limit in the table and according to ANSI C63.10-2013 below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

Frequencies	Field Strength	Measurement Distance
(MHz)	(micorvolts/meter)	(meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (1GHz-25 GHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)		
FREQUENCT (MITZ)	PEAK	AVERAGE	
Above 1000	74	54	

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RESTRICTED FREQUENCY BANDS

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

Report No.: LGT24H095RF02 Page 17 of 57



For Radiated Emission

Spectrum Parameter	Setting				
Attenuation	Auto				
Detector	Peak/QP/AV				
Start Frequency	9 KHz/150KHz (Peak/QP/AV)				
Stop Frequency	150KHz/30MHz (Peak/QP/AV)				
	200Hz (From 9kHz to 0.15MHz)/				
DR / \/R (omission in restricted hand)	9KHz (From 0.15MHz to 30MHz);				
RB / VB (emission in restricted band)	200Hz (From 9kHz to 0.15MHz)/				
	9KHz (From 0.15MHz to 30MHz)				

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/QP
Start Frequency	30 MHz (Peak/QP)
Stop Frequency	1000 MHz (Peak/QP)
RB / VB (emission in restricted band)	120 KHz / 300 KHz

Spectrum Parameter	Setting			
Attenuation	Auto			
Detector	Peak			
Start Frequency	1000 MHz (Peak/AV)			
Stop Frequency	10th carrier hamonic (Peak/AV)			
DD / VD (emission in restricted hand)	1 MHz / 3 MHz(Peak)			
RB / VB (emission in restricted band)	1 MHz/1/T MHz(AVG)			

For Restricted band

Spectrum Parameter	Setting			
Detector	Peak			
Stort/Stop Eroguanov	Lower Band Edge: 2310 to 2410 MHz			
Start/Stop Frequency	Upper Band Edge: 2476 to 2500 MHz			
DD /VD	1 MHz / 3 MHz(Peak)			
RB / VB	1 MHz/1/T MHz(AVG)			

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

Report No.: LGT24H095RF02 Page 18 of 57



3.2.2 TEST PROCEDURE

- a. The measuring distance at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- b. The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree to determine the position of the highest radiation.
- c. The height of the equipment shall be 0.8 m (above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarization of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and QuasiPeak detector mode will be re-measured.
- e. If the Peak Mode measured value is compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and no additional QP Mode measurement was performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

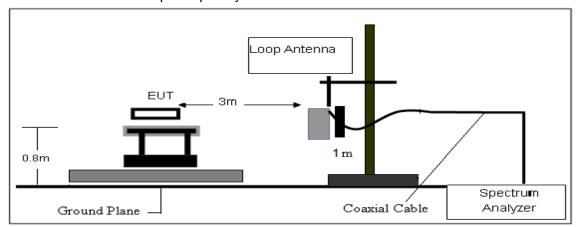
3.2.3 DEVIATION FROM TEST STANDARD No deviation.

Report No.: LGT24H095RF02 Page 19 of 57

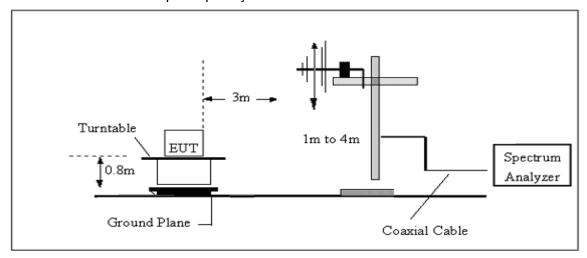


3.2.4 TESTSETUP

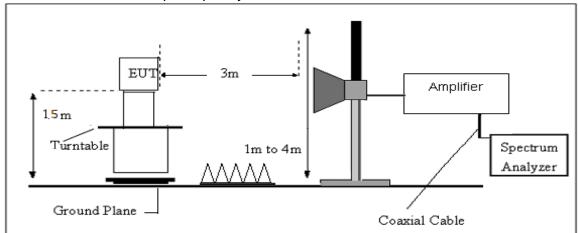
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 EUT OPERATING CONDITIONS

Please refer to section 3.1.4 of this report.

Report No.: LGT24H095RF02 Page 20 of 57



3.2.6 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBµV/m)	(dBµV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

Factor=AF+CL-AG

Report No.: LGT24H095RF02 Page 21 of 57



3.2.7 TEST RESULTS

Results of Radiated Emissions (9 KHz~30MHz)

No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Remark
1*	-	-	1	-	-	-	-	See Note

Note:

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and the permissible value has no need to be reported.

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

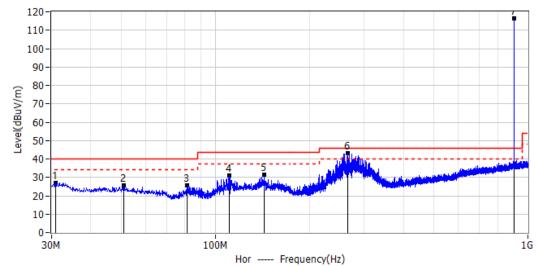
Limit line = specific limits (dBuV) + distance extrapolation factor.

Report No.: LGT24H095RF02 Page 22 of 57

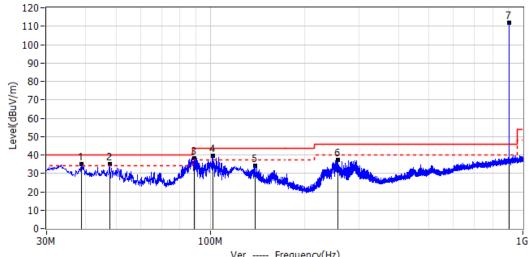


Results of Radiated Emissions (30MHz~1000MHz)

Project: LGT24H095	Test Engineer: LiuH	
EUT: Integrated RFID Reader	Temperature: 25.4°C	
M/N: UR1A	Humidity: 55%RH	
Test Voltage: AC 120V/60Hz	Test Data: 2024-11-19	
Test Mode: 902.75M		
Note:		



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	30.849	7.55	19.48	27.03	40.00	-12.97	PK	Hor
2*	50.976	4.74	20.66	25.40	40.00	-14.60	PK	Hor
3*	81.410	9.50	16.23	25.73	40.00	-14.27	PK	Hor
4*	110.753	12.55	18.29	30.84	43.50	-12.66	PK	Hor
5*	143.248	10.01	21.34	31.35	43.50	-12.15	PK	Hor
6*	264.983	23.45	19.89	43.34	46.00	-2.66	PK	Hor
!7*	902.758	83.16	33.14	116.30	46.00	70.30	PK	Hor

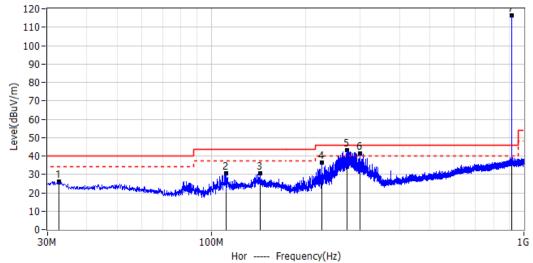


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No.	Frequency	Reading	Factor	Level	Limit	Margin	Detector	Polar
INO.	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Polal
1*	38.851	15.38	19.86	35.24	40.00	-4.76	PK	Ver
2*	47.703	14.62	20.30	34.92	40.00	-5.08	PK	Ver
3*	88.806	22.01	16.25	38.26	43.50	-5.24	PK	Ver
4*	101.901	22.14	17.31	39.45	43.50	-4.05	PK	Ver
5*	139.125	13.22	20.95	34.17	43.50	-9.33	PK	Ver
6*	256.495	16.95	20.16	37.11	46.00	-8.89	PK	Ver
!7*	902.758	78.83	33.14	111.97	46.00	65.97	PK	Ver

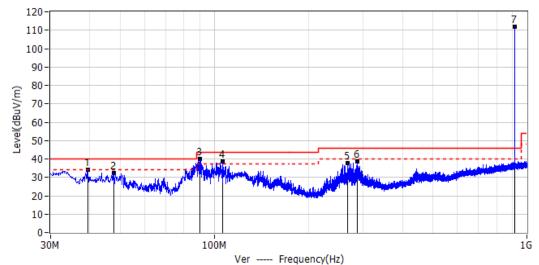
Report No.: LGT24H095RF02 Page 23 of 57



Project: LGT24H095	Test Engineer: LiuH
EUT: Integrated RFID Reader	Temperature: 25.4°C
M/N: UR1A	Humidity: 55%RH
Test Voltage: AC 120V/60Hz	Test Data: 2024-11-20
Test Mode: 915.25M	
Note:	



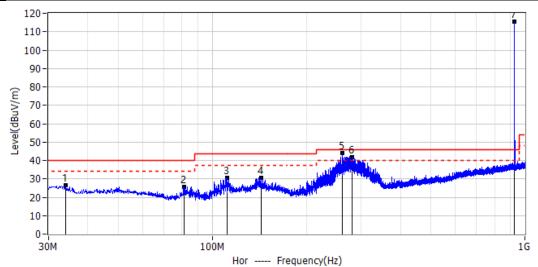
No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	32.668	6.43	19.42	25.85	40.00	-14.15	PK	Hor
2*	111.601	12.13	18.39	30.52	43.50	-12.98	PK	Hor
3*	143.248	9.30	21.34	30.64	43.50	-12.86	PK	Hor
4*	226.304	18.51	18.10	36.61	46.00	-9.39	PK	Hor
5*	272.015	22.87	20.09	42.96	46.00	-3.04	PK	Hor
6*	299.054	19.99	21.37	41.36	46.00	-4.64	PK	Hor
!7*	915.246	83.46	32.89	116.35	46.00	70.35	PK	Hor



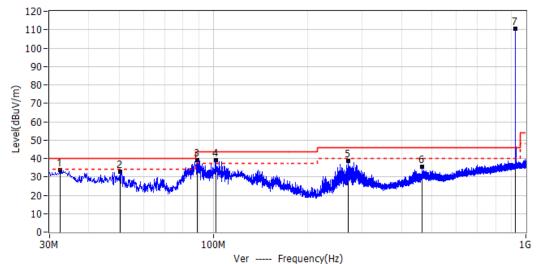
No.	Frequency	Reading	Factor	Level	Limit	Margin	Detector	Polar
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	20100101	. 0.6
1*	39.458	14.38	19.92	34.30	40.00	-5.70	PK	Ver
2*	47.703	12.02	20.30	32.32	40.00	-7.68	PK	Ver
3*	90.261	23.90	16.19	40.09	43.50	-3.41	PK	Ver
4*	106.630	21.09	17.49	38.58	43.50	-4.92	PK	Ver
5*	267.650	17.99	19.95	37.94	46.00	-8.06	PK	Ver
6*	287.171	17.63	21.04	38.67	46.00	-7.33	PK	Ver
!7*	915.246	78.84	32.89	111.73	46.00	65.73	PK	Ver



Project: LGT24H095	Test Engineer: LiuH
EUT: Integrated RFID Reader	Temperature: 25.4°C
M/N: UR1A	Humidity: 55%RH
Test Voltage: AC 120V/60Hz	Test Data: 2024-11-20
Test Mode: 927.25M	
Note:	



No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	34.001	6.67	19.63	26.30	40.00	-13.70	PK	Hor
2*	81.410	9.48	16.23	25.71	40.00	-14.29	PK	Hor
3*	111.480	12.33	18.39	30.72	43.50	-12.78	PK	Hor
4*	143.248	9.42	21.34	30.76	43.50	-12.74	PK	Hor
5*	260.254	23.92	20.15	44.07	46.00	-1.93	PK	Hor
6*	280.381	21.05	20.93	41.98	46.00	-4.02	PK	Hor
!7*	927.250	82.20	33.12	115.32	46.00	69.32	PK	Hor

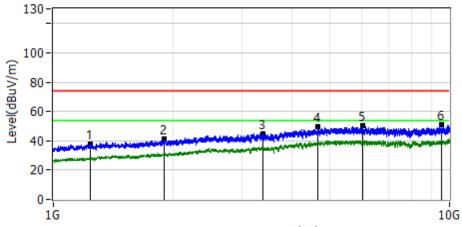


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No.	Frequency	Reading	Factor	Level	Limit	Margin	Detector	Polar
INO.	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	i Olai
1*	32.425	14.16	19.35	33.51	40.00	-6.49	PK	Ver
2*	50.370	12.36	20.47	32.83	40.00	-7.17	PK	Ver
3*	88.806	22.93	16.25	39.18	43.50	-4.32	PK	Ver
4*	101.901	21.70	17.31	39.01	43.50	-4.49	PK	Ver
5*	270.439	18.75	20.02	38.77	46.00	-7.23	PK	Ver
6*	465.166	9.48	25.94	35.42	46.00	-10.58	PK	Ver
!7*	927.250	77.26	33.12	110.38	46.00	64.38	PK	Ver



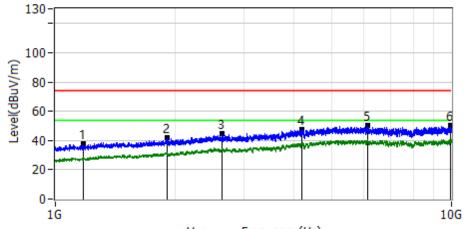
Results of Radiated Emissions (Above 1000MHz)

Project: LGT24H095	Test Engineer: LiuH
EUT: Integrated RFID Reader	Temperature: 27°C
M/N: UR1A	Humidity: 51%RH
Test Voltage: AC 120V/60Hz	Test Data: 2024-10-31
Test Mode: L	
Note:	



Hor ---- Frequency(Hz)

No.	Frequency MHz	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1237.4000	38.03	74.00	-35.97	PK	Hor
2*	1904.5000	41.04	74.00	-32.96	PK	Hor
3*	3374.9000	45.00	74.00	-29.00	PK	Hor
4*	4643.9000	49.32	74.00	-24.68	PK	Hor
5*	6022.0000	50.39	74.00	-23.61	PK	Hor
6*	9555.6000	51.08	74.00	-22.92	PK	Hor



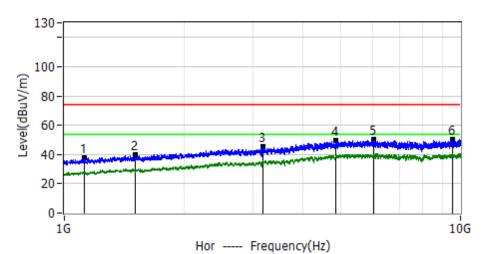
Ver -	 Frequ	uenc	.y(H	Z)

No.	Frequency MHz	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1175.5000	37.47	74.00	-36.53	PK	Ver
2*	1910.1000	42.18	74.00	-31.82	PK	Ver
3*	2627.9000	44.78	74.00	-29.22	PK	Ver
4*	4186.0000	47.19	74.00	-26.81	PK	Ver
5*	6141.2000	50.05	74.00	-23.95	PK	Ver
6*	9922.4000	50.21	74.00	-23.79	PK	Ver

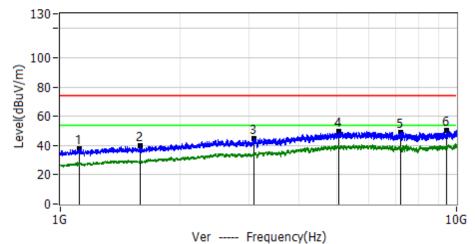
Report No.: LGT24H095RF02 Page 26 of 57



Project: LGT24H095	Test Engineer: LiuH	
EUT: Integrated RFID Reader	Temperature: 27°C	
M/N: UR1A	Humidity: 51%RH	
Test Voltage: AC 120V/60Hz	Test Data: 2024-10-31	
Test Mode: M		
Note:		



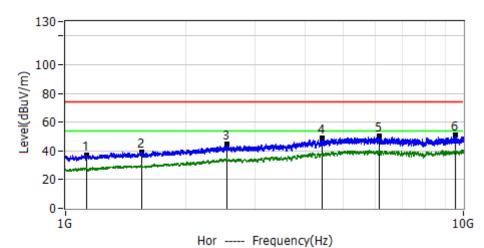
No.	Frequency MHz	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1121.5000	37.48	74.00	-36.52	PK	Hor
2*	1506.2000	39.74	74.00	-34.26	PK	Hor
3*	3174.6000	45.23	74.00	-28.77	PK	Hor
4*	4843.0000	49.40	74.00	-24.60	PK	Hor
5*	6036.6000	50.35	74.00	-23.65	PK	Hor
6*	9545.5000	50.07	74.00	-23.93	PK	Hor



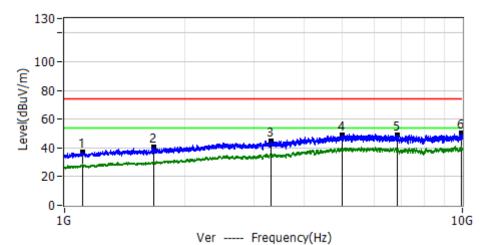
				7 ()		
No.	Frequency MHz	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1114.7000	37.76	74.00	-36.24	PK	Ver
2*	1588.4000	39.61	74.00	-34.39	PK	Ver
3*	3079.0000	44.67	74.00	-29.33	PK	Ver
4*	5039.9000	49.37	74.00	-24.63	PK	Ver
5*	7224.6000	49.11	74.00	-24.89	PK	Ver
6*	9443.1000	50.43	74.00	-23.57	PK	Ver



Project: LGT24H095	Test Engineer: LiuH	
EUT: Integrated RFID Reader	Temperature: 27°C	
M/N: UR1A	Humidity: 51%RH	
Test Voltage: AC 120V/60Hz	Test Data: 2024-10-31	
Test Mode: H		
Note:		



No.	Frequency MHz	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1132.7000	37.04	74.00	-36.96	PK	Hor
2*	1554.6000	39.41	74.00	-34.59	PK	Hor
3*	2539.0000	44.39	74.00	-29.61	PK	Hor
4*	4424.5000	48.94	74.00	-25.06	PK	Hor
5*	6135.6000	50.19	74.00	-23.81	PK	Hor
6*	9560.1000	50.69	74.00	-23.31	PK	Hor

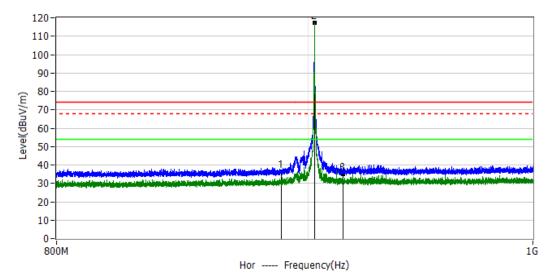


No.	Frequency	Level	Limit	Margin	Detector	Polar
INO.	MHz	dBuV/m	dBuV/m	dB	Detector	Polal
1*	1108.0000	36.80	74.00	-37.20	PK	Ver
2*	1671.6000	40.72	74.00	-33.28	PK	Ver
3*	3300.6000	44.86	74.00	-29.14	PK	Ver
4*	4994.9000	48.58	74.00	-25.42	PK	Ver
5*	6866.9000	49.15	74.00	-24.85	PK	Ver
6*	9934.7000	50.15	74.00	-23.85	PK	Ver



3.2.8 TEST RESULTS (BAND EDGE REQUIREMENTS)

Project: LGT24H095	Test Engineer: LiuH
EUT: Integrated RFID Reader	Temperature: 25.5°C
M/N: UR1A	Humidity: 52%RH
Test Voltage: AC 120V/60Hz	Test Data: 2024-10-30
Test Mode: L	
Note:	

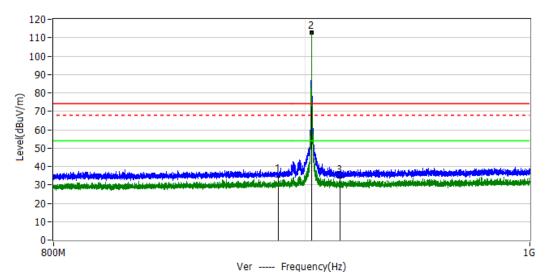


No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	889.000	2.94	33.26	36.20	74.00	-37.80	PK	Hor
!2*	902.750	84.06	33.14	117.20	/	/	PK	Hor
3*	915.000	2.24	32.86	35.10	74.00	-38.90	PK	Hor

Report No.: LGT24H095RF02 Page 29 of 57



Project: LGT24H095	Test Engineer: LiuH
EUT: Integrated RFID Reader	Temperature: 25.5°C
M/N: UR1A	Humidity: 52%RH
Test Voltage: AC 120V/60Hz	Test Data: 2024-10-30
Test Mode: L	
Note:	

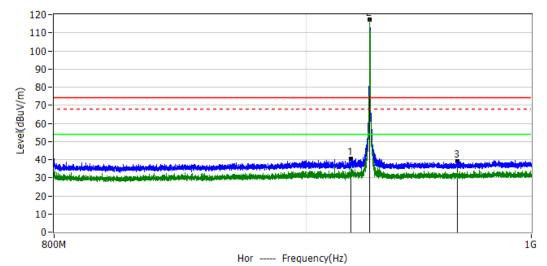


No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	889.000	1.84	33.26	35.10	74.00	-38.90	PK	Ver
!2*	902.750	79.67	33.14	112.81	/	/	PK	Ver
3*	915.000	1.54	32.86	34.40	74.00	-39.60	PK	Ver

Report No.: LGT24H095RF02 Page 30 of 57



Project: LGT24H095	Test Engineer: LiuH
EUT: Integrated RFID Reader	Temperature: 25.5°C
M/N: UR1A	Humidity: 52%RH
Test Voltage: AC 120V/60Hz	Test Data: 2024-10-30
Test Mode: H	
Note:	

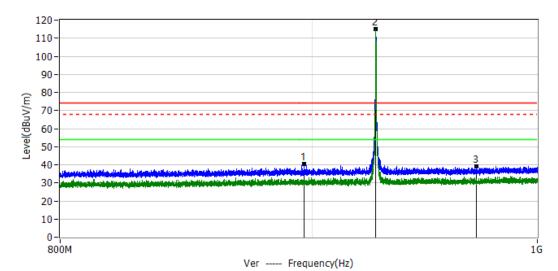


No.	Frequency MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	919.175	7.05	33.29	40.34	74.00	-33.66	PK	Hor
!2*	927.250	84.10	33.12	117.22	/	/	PK	Hor
3*	966.150	5.51	33.59	39.10	74.00	-34.90	PK	Hor

Report No.: LGT24H095RF02 Page 31 of 57



Project: LGT24H095	Test Engineer: LiuH
EUT: Integrated RFID Reader	Temperature: 25.5°C
M/N: UR1A	Humidity: 52%RH
Test Voltage: AC 120V/60Hz	Test Data: 2024-10-30
Test Mode: H	
Note:	



No.	Frequency	Reading	Factor	Level	Limit	Margin	Detector	Polar
INO.	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Polai
1*	896.675	7.23	33.06	40.29	74.00	-33.71	PK	Ver
!2*	927.250	81.80	33.12	114.92	/	/	PK	Ver
3*	971.750	5.29	33.60	38.89	74.00	-35.11	PK	Ver



4. CONDUCTED SPURIOUS & BAND EDGE EMISSION

4.1 LIMIT

According to FCC section 15.247(d), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

4.2 TEST PROCEDURE

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	30 MHz to 10th carrier harmonic
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

For Band edge

Spectrum Parameter	Setting			
Detector	Peak			
Stort/Ston Fraguency	Lower Band Edge: 800 – 904 MHz			
Start/Stop Frequency	Upper Band Edge: 924 – 1000 MHz			
RB / VB (emission in restricted band)	100 KHz/300 KHz			
Trace-Mode:	Max hold			

For Hopping Band edge

Spectrum Parameter	Setting	
Detector	Peak	
Start/Stop Frequency	Lower Band Edge: 800 – 904 MHz	
	Upper Band Edge: 924 – 1000 MHz	
RB / VB (emission in restricted band)	100 KHz/300 KHz	
Trace-Mode:	Max hold	

Report No.: LGT24H095RF02 Page 33 of 57



4.3 TEST SETUP



The EUT is connected to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 500hm; the path loss as the factor is calibrated to correct the reading. Tune the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, the span is set to be greater than RBW.

4.4 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

4.5 TEST RESULTS

For the measurement records, refer to the appendix I.

Note: Not recorded emission from 9 KHz to 30 MHz as emission level at least 20dBc lower than emission limit.

Report No.: LGT24H095RF02 Page 34 of 57



5. NUMBER OF HOPPING CHANNEL

5.1 LIMIT

FCC Part 15.247, Subpart C							
Section	Test Item	Limit	Note	Result			
15.247 Number of Hoppi (a)(1)(i) Channel		≥25	if the 20 dB bandwidth	- PASS			
	Number of Hopping Channel		≥250 kHz				
		≥50	if the 20 dB bandwidth				
			≤250 kHz				

Spectrum Parameters	Setting		
Attenuation	Auto		
Span Frequency	> Operating FrequencyRange		
RB	100KHz		
VB	300KHz		
Detector	Peak		
Trace	Max Hold		
Sweep Time	Auto		

5.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Spectrum Setting: RBW= 100KHz, VBW=300KHz, Sweep time = Auto.

5.3 TEST SETUP



5.4 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

5.5 TEST RESULTS

For the measurement records, refer to the appendix I.

Report No.: LGT24H095RF02 Page 35 of 57



6. AVERAGE TIME OF OCCUPANCY

6.1 LIMIT

FCC Part 15.247, Subpart C						
Section	Test Item	Limit	FrequencyRange (MHz)	Result		
15.247 (a)(1)(i)	Average Time of Occupancy	0.4sec	902-928	PASS		

6.2 TEST PROCEDURE

- a. The transmitter output (antenna port) was connected to the spectrum analyzer.
- b. Set RBW =100KHz/VBW =300KHz.
- c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
- d. Sweep Time is 20 second.
 - Set the center frequency on any frequency would be measure and set the frequency span to
- e. zero span.
- f. Measure the maximum time duration of one single pulse.

6.3 TEST SETUP



6.4 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

6.5 TEST RESULTS

For the measurement records, refer to the appendix I.

Report No.: LGT24H095RF02 Page 36 of 57



7. HOPPING CHANNEL SEPARATION MEASUREMEN

7.1 LIMIT

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> 20 dB Bandwidth or Channel Separation
RB	30 kHz (20dB Bandwidth) / 30 kHz (Channel Separation)
VB	100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

7.2 TEST PROCEDURE

- a. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
- b. The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for 20 dB bandwidth measurement.
- c. The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for channel separation measurement.

7.3 TEST SETUP



7.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

7.5 TEST RESULTS

For the measurement records, refer to the appendix I.

Report No.: LGT24H095RF02 Page 37 of 57



8. BANDWIDTH TEST

8.1 LIMIT

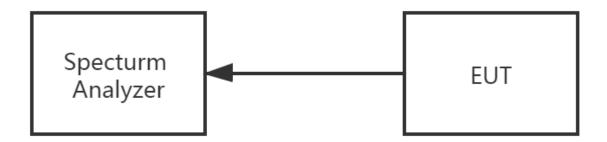
FCC Part15 15.247, Subpart C					
Section	Test Item	Limit	FrequencyRange (MHz)	Result	
15.247 (a)(1)(i)	20dB Bandwidth	500KHz	902-928	PASS	

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	1 kHz
VB	3 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

8.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Spectrum Setting: RBW= 1KHz, VBW=3KHz, Sweep time = Auto.

8.3 TEST SETUP



8.4 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

8.5 TEST RESULTS

For the measurement records, refer to the appendix I.

Report No.: LGT24H095RF02 Page 38 of 57



9. OUTPUT POWER TEST

9.1 LIMIT

FCC Part 15.247, Subpart C						
Section	Section Test Item Limit Frequency Range (MHz)					
15.247 (b)(2)	Output Power	1 W	902-928	PASS		

9.2 TEST PROCEDURE

This is an RF-conducted test to evaluate maximum peak output power. Use a direct connection between the antenna port of the unlicensed wireless device and the spectrum analyzer, through suitable attenuation. The hopping shall be disabled for this test:

- a) Use the following spectrum analyzer settings:
- 1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
- 2) RBW > 20 dB bandwidth of the emission being measured.
- 3) VBW ≥ RBW.
- 4) Sweep: Auto.
- 5) Detector function: Peak.
- 6) Trace: Max hold.
- b) Allow trace to stabilize.
- c) Use the marker-to-peak function to set the marker to the peak of the emission.
- d) The indicated level is the peak output power, after any corrections for external attenuators and cables.
- e) A plot of the test results and setup description shall be included in the test report.
- NOTE—A peak responding power meter may be used, where the power meter and sensor system video bandwidth is greater than the occupied bandwidth of the unlicensed wireless device, rather than a spectrum analyzer.

PKPM1 Peak power meter method:

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DSS bandwidth and shall use a fast-responding diode detector.

9.3 TEST SETUP

EUT	SPECTRUM
	ANALYZER

9.4 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

9.5 TEST RESULTS

For the measurement records, refer to the appendix I.

Report No.: LGT24H095RF02 Page 39 of 57



10. ANTENNA REQUIREMENT

10.1 STANDARD REQUIREMENT

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

10.2 EUT ANTENNA

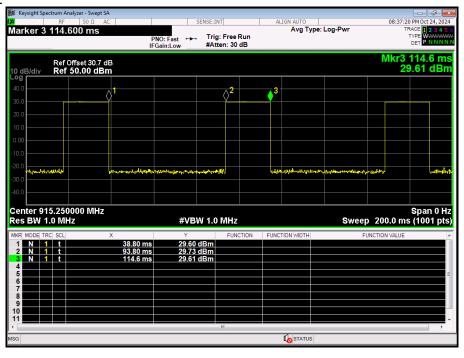
The EUT antenna is Circular polarization Antenna. It comply with the standard requirement.

Report No.: LGT24H095RF02 Page 40 of 57



APPENDIX I - TEST RESULTS

DUTY CYCLE





CONDUCTED OUTPUT POWER

Modulation	Modulation Frequency (MHz)		Limit (dBm)
FSK	902.75	26.64	29
	915.25	26.88	29
	927.25	26.48	29

If the antenna gain is greater than 6dB, the power limit will be reduced by 1dB for every 3dB exceeded.

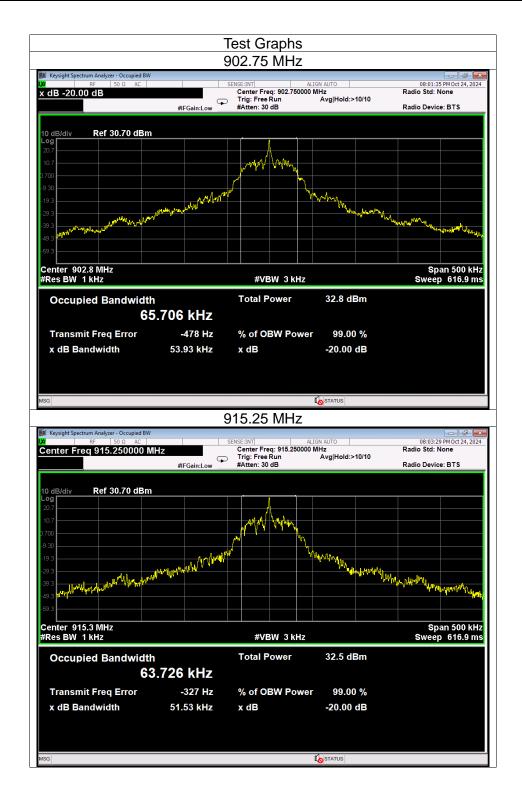
Limit :30-1=29 dBm

Report No.: LGT24H095RF02 Page 42 of 57



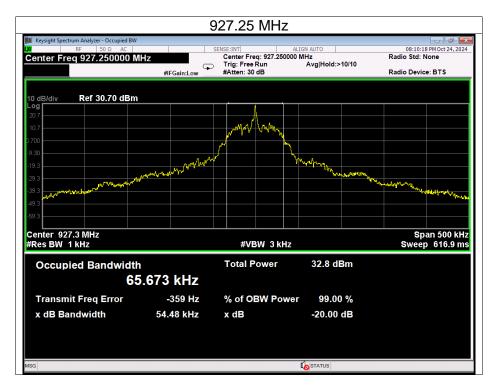
-20DB BANDWIDTH

Modulation	Frequency	-20 dB Bandwidth	Result	
	(MHz)	(KHz)		
FSK	902.75	53.93	PASS	
	915.25	51.53	PASS	
	927.25	54.48	PASS	



Report No.: LGT24H095RF02 Page 43 of 57

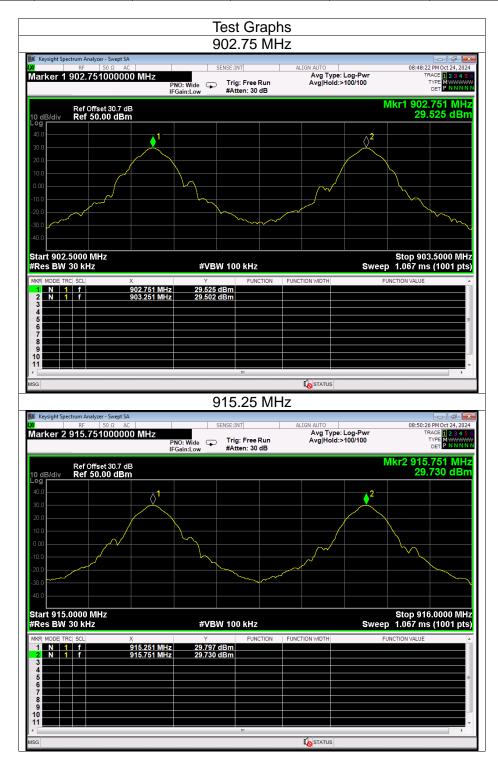






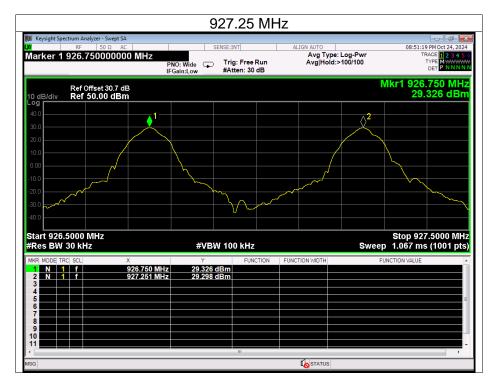
Carrier Frequencies Separation

Modulation	Frequency (MHz)	Mark1 Frequency (MHz)	Mark2 Frequency (MHz)	Channel Separation (KHz)	Limit (KHz)	Result
FSK	902.75	902.751	903.251	500.000	53.93	Pass
	915.25	915.251	915.751	500.000	51.53	Pass
	927.25	926.750	927.251	501.000	54.48	Pass



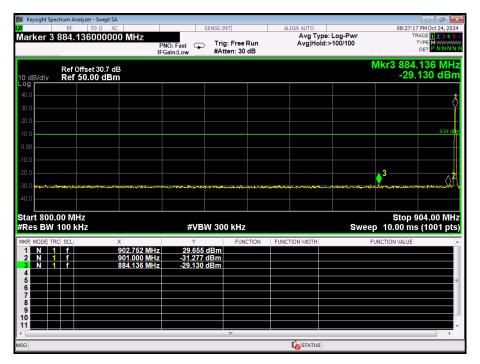
Report No.: LGT24H095RF02 Page 45 of 57

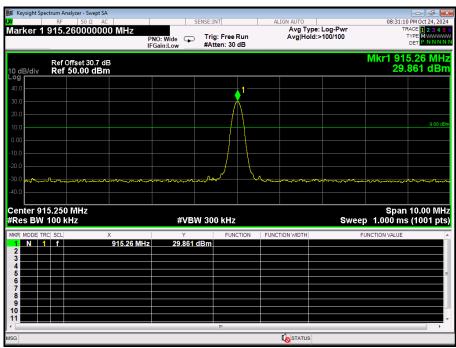




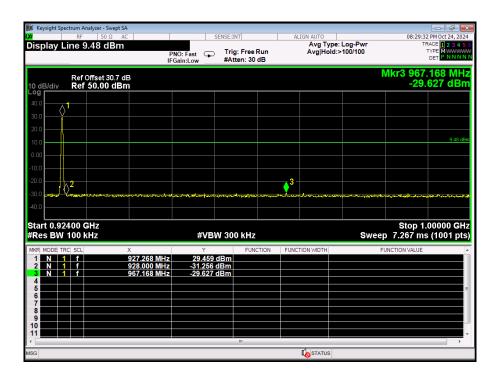


Band Edge



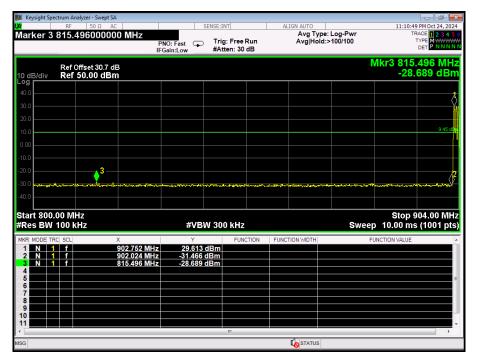


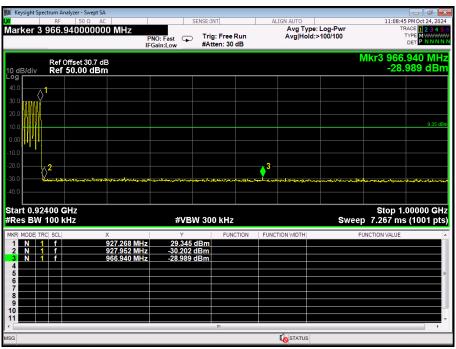






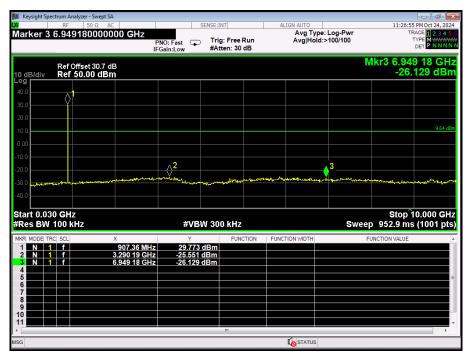
Band Edge(Hopping)

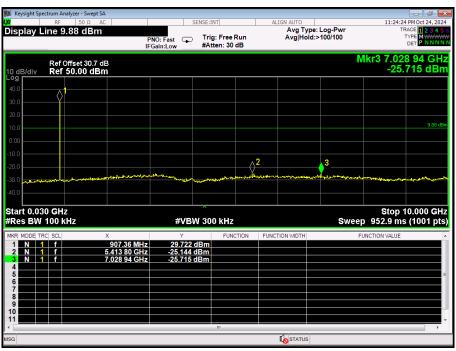






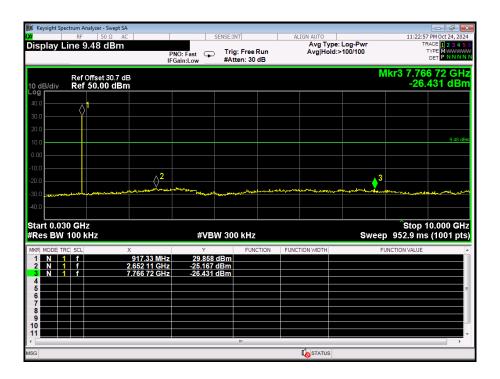
Conducted RF Spurious Emission





Report No.: LGT24H095RF02 Page 50 of 57

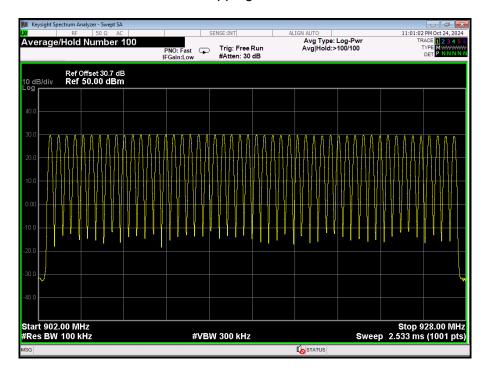






Number of Hopping Channel

50 Hopping Channel



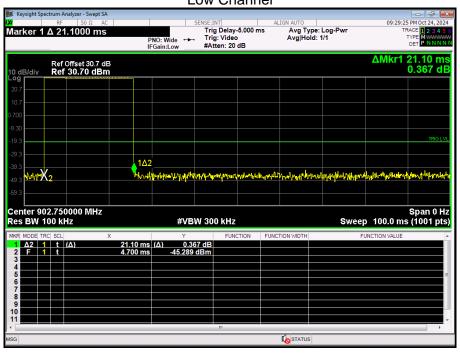
Report No.: LGT24H095RF02 Page 52 of 57

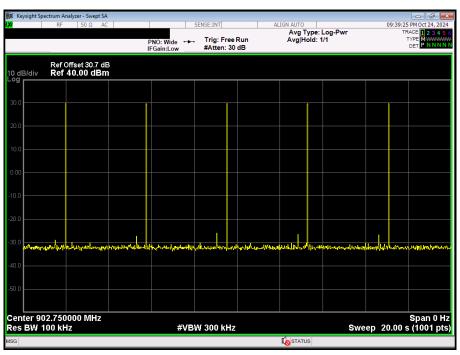


Dwell Time

Frequency (MHz)	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
902.75	21.1	105.5	5	20000	400	Pass
915.25	21.4	107	5	20000	400	Pass
927.25	21.4	107	5	20000	400	Pass

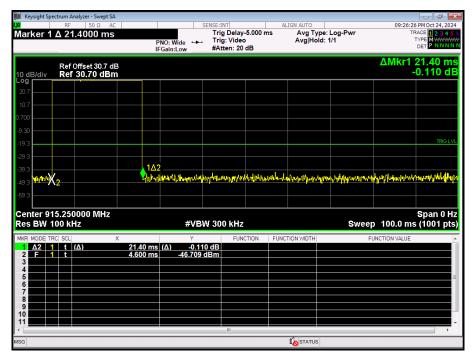


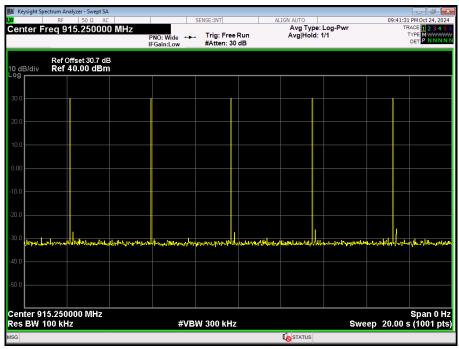






Middle Channel

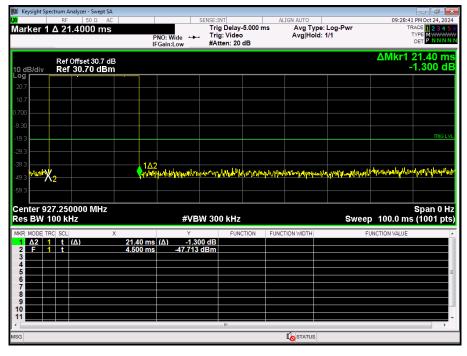


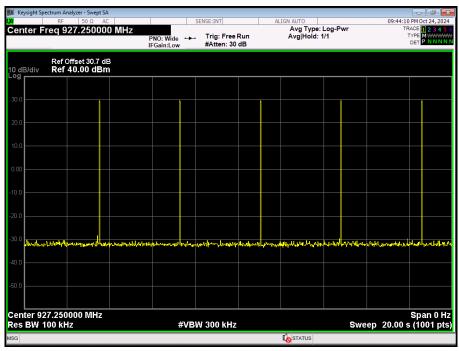


Report No.: LGT24H095RF02 Page 54 of 57



High Channel





Report No.: LGT24H095RF02 Page 55 of 57



APPENDIX II - MEASUREMENT PHOTOS

Note: Please see the attached RF_Test Setup photos for FCC ID & IC_0.009-30M.

Report No.: LGT24H095RF02 Page 56 of 57



APPENDIX III - PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS

Note: Please see the attached UR1A_External Photos/ UR1A_Internal Photos.

*****END OF THE REPORT***

Report No.: LGT24H095RF02 Page 57 of 57