



RF TEST REPORT

Product Name: WorldPenScan WiFi

Model Name: MSE10

FCC ID: QIC-MSE10

Issued For : PenPower Technology Ltd.

7F., No.47, Lane 2, Sec. 2, Guangfu Rd., Hsinchu 300,
Taiwan, R.O.C

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

Room 205, Building 13, Zone B, Chen Hsong Industrial Park,
No.177 Renmin West Road, Jinsha Community, Kengzi
Street, Pingshan New District, Shenzhen, China

Report Number: LGT22K038RF08

Sample Received Date: Nov. 14, 2022

Date of Tested: Nov. 14, 2022 - Dec. 14, 2022

Date of Issue: Dec. 14, 2022

The test report is effective only with both signature and specialized stamp. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report only apply to the tested sample.



TEST REPORT CERTIFICATION

Applicant PenPower Technology Ltd.
Address 7F., No.47, Lane 2, Sec. 2, Guangfu Rd., Hsinchu 300,
Taiwan, R.O.C

Manufacturer Shenzhen TwoMonkeys Technology Co., Ltd.
Address Room 1201, 12 / F, Dachong Building (Shangmei Keji),
Dachong Community, Yuehai Street, Nanshan District,
Shenzhen, China

Product Name WorldPenScan WiFi

Trademark PenPower

Model Name MSE10

Sample Status: Normal

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

Prepared by:

Zane Shan

Zane Shan
Engineer

Approved by:

Vita Li

Vita Li
Technical Director





Table of Contents

1. SUMMARY OF TEST RESULTS	6
1.1 TEST FACTORY	7
1.2 MEASUREMENT UNCERTAINTY	7
2. GENERAL INFORMATION	8
2.1 GENERAL DESCRIPTION OF THE EUT	8
2.2 DESCRIPTION OF THE TEST MODES	10
2.3 TEST SOFTWARE AND POWER LEVEL	10
2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS	11
2.5 EQUIPMENTS LIST	12
3. EMC EMISSION TEST	13
3.1 CONDUCTED EMISSION MEASUREMENT	13
3.2 TEST PROCEDURE	14
3.3 TEST SETUP	14
3.4 EUT OPERATING CONDITIONS	14
4. RADIATED EMISSION MEASUREMENT	17
4.1 RADIATED EMISSION LIMITS	17
4.2 TEST PROCEDURE	19
4.3 TEST SETUP	20
4.4 EUT OPERATING CONDITIONS	20
4.5 FIELD STRENGTH CALCULATION	21
4.6 TEST RESULTS	22
5. CONDUCTED SPURIOUS & BAND EDGE EMISSION	34
5.1 LIMIT	34
5.2 TEST PROCEDURE	34
5.3 TEST SETUP	34
5.4 EUT OPERATION CONDITIONS	34
5.5 TEST RESULTS	34
FOR THE MEASUREMENT RECORDS, REFER TO THE APPENDIX I.	34
6. POWER SPECTRAL DENSITY TEST	35
6.1 LIMIT	35
6.2 TEST PROCEDURE	35
6.3 TEST SETUP	35
6.4 EUT OPERATION CONDITIONS	35



Table of Contents

6.5 TEST RESULTS	35
7. BANDWIDTH TEST	36
7.1 LIMIT	36
7.2 TEST PROCEDURE	36
7.3 TEST SETUP	36
7.4 EUT OPERATION CONDITIONS	36
7.5 TEST RESULTS	36
8. PEAK OUTPUT POWER TEST	37
8.1 LIMIT	37
8.2 TEST PROCEDURE	37
8.3 TEST SETUP	37
8.4 EUT OPERATION CONDITIONS	37
8.5 TEST RESULTS	37
9. ANTENNA REQUIREMENT	38
9.1 STANDARD REQUIREMENT	38
9.2 EUT ANTENNA	38
APPENDIX I:TEST RESULTS	39
DUTY CYCLE	39
MAXIMUM PEAK CONDUCTED OUTPUT POWER	41
-6DB BANDWIDTH	42
OCCUPIED CHANNEL BANDWIDTH	44
MAXIMUM POWER SPECTRAL DENSITY LEVEL	46
BAND EDGE	48
CONDUCTED RF SPURIOUS EMISSION	51
APPENDIX II: TEST PHOTO	54



Revision History

Rev.	Issue Date	Contents
00	Dec. 14, 2022	Initial Issue



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	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	--
15.247 (a)(2)	6dB Bandwidth	PASS	--
15.247 (b)(3)	Output Power	PASS	--
15.209	Radiated Spurious Emission	PASS	--
15.247 (d)	Conducted Spurious & Band Edge Emission	PASS	--
15.247 (e)	Power Spectral Density	PASS	--
15.205	Restricted Band Edge Emission	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.



1.1 TEST FACTORY

Company Name:	Shenzhen LGT Test Service Co., Ltd.
Address:	Room 205, Building 13, Zone B, Chen Hsong Industrial Park, No.177 Renmin West Road, Jinsha Community, Kengzi Street, Pingshan New District, Shenzhen, China
Accreditation Certificate	FCC Registration No.: 746540
	A2LA Certificate No.: 6727.01

1.2 MEASUREMENT UNCERTAINTY

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

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



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	WorldPenScan WiFi	
Trademark	PenPower	
Model Name	MSE10	
Series Model	N/A	
Model Difference	N/A	
Product Description	The EUT is a WorldPenScan WiFi	
	Operation Frequency:	2402~2480 MHz
	Modulation Type:	GFSK
	Radio Technology:	BLE
	Bluetooth Configuration:	1M PHY
	Number Of Channel:	40
	Antenna Designation:	Please refer to the Note 3.
	Antenna Gain (dBi)	2.5
Channel List	Please refer to the Note 2.	
Rating	Input: DC 5V,1A Output: DC 5V,330mA	
Battery	Capacity: 1200mAh Rated Voltage:3.8V Charge Limit Voltage:4.3V	
Hardware version number	V0.1	
Software version number	a133_android10_c3_uart0_20221109.img	
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.

Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	10	2422	20	2442	30	2462
01	2404	11	2424	21	2444	31	2464
02	2406	12	2426	22	2446	32	2466
03	2408	13	2428	23	2448	33	2468
04	2410	14	2430	24	2450	34	2470
05	2412	15	2432	25	2452	35	2472
06	2414	16	2434	26	2454	36	2474
07	2416	17	2436	27	2456	37	2476
08	2418	18	2438	28	2458	38	2478
09	2420	19	2440	29	2460	39	2480

3.

Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	PenPower	MSE10	FPC	N/A	2.5	BLE ANT

Note: The antenna information provide by manufacturer, applicable only to the tested sample identified in the report.



2.2 DESCRIPTION OF THE TEST MODES

For conducted test items and radiated spurious emissions
Each of these EUT operation mode(s) or test configuration mode(s) mentioned below was evaluated respectively.

Worst Mode	Description	Data/Modulation
Mode 1	TX CH00(2402MHz)	1 MHz/GFSK
Mode 2	TX CH19(2440MHz)	1 MHz/GFSK
Mode 3	TX CH39(2480MHz)	1 MHz/GFSK

Note:

(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

(2) We have be tested for all avaiable U.S. voltage and frequency(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.

(3) The battery is fully-charged during the radited and RF conducted test.

For AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 4: Keeping BT 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.

Test software Version	Test program: BLE	
CMD	1M	6



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	TEN PAO INDUSTRIAL CO LTD	S005CAU0500100	N/A	Input: 100-240V ~ 50/60Hz 0.2A Output: 5V, 2A
USB A to USB C	Pinsheng Electronics Co., Ltd	Micro USB	N/A	1m, shielded, without ferrite core
Laptop	HUAWEI	HKF-16	N/A	N/A

Note:

- (1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (2) “YES” is means “with core”; “NO” is means “without core”.



2.5 EQUIPMENTS LIST

Conducted Emission

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Until
EMI Test Receiver	R&S	ESU	100372	2022.04.12	2023.04.11
LISN	COM-POWER	LI-115	02032	2022.04.13	2023.04.12
LISN	SCHWARZBECK	NNLK 8121	00847	2022.08.19	2023.08.18
CE Cable	N.A	C01	N.A	2022.05.05	2023.05.04
Transient Limiter	CYBERTEK	EM5010A	E2250100049	2022.06.02	2023.06.01
Temperature & Humidity	KTJ	TA218B	N.A	2022.05.05	2023.05.04
Testing Software	EMC-I_V1.4.0.3_SKET				

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESU	100372	2022.04.12	2023.04.11
Spectrum Analyzer	Kesight	N9010B	MY60242508	2022.04.29	2023.04.28
Bilog Antenna	SCHAFFNER	CBL6112B	270S	2022.06.05	2025.06.04
Horn Antenna(18GHz)	SCHWARZBECK	3115	10SL0060	2022.06.02	2025.06.01
Horn Antenna(40 GHz)	A-INFO	LB-180400-KF	J211060273	2022.03.28	2025.03.27
Pre-amplifier(3GHz)	HP	8447D	2727A05655	2022.04.11	2023.04.10
Pre-amplifier(26.5G)	Agilent	8449B	3008A4722	2022.04.12	2023.04.11
Pre-amplifier(40 GHz)	com-mw	LNPA_18-40-01	18050001	2022.06.08	2023.06.07
RE Cable (9K-1G)	N.A	R01	N.A	2022.05.05	2023.05.04
RE Cable (1-26G)	N.A	R02	N.A	2022.05.05	2023.05.04
Temperature & Humidity	KTJ	TA218B	N.A	2022.05.05	2023.05.04
Testing Software	EMC-I_V1.4.0.3_SKET				

RF Connected Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Signal Generator	Keysight	N5182B	MY59100717	2022.04.30	2023.04.29
Signal Analyzer	Keysight	N9010B	MY60242508	2022.04.29	2023.04.28
Temperature & Humidity	KTJ	TA218B	N/A	2022.05.05	2023.05.04
Temperature & Humidity test chamber	AISRY	LX-1000L	171200018	2022.05.10	2023.05.09
Attenuator	eastsheep	90db	N/A	2022.04.29	2023.04.28
Testing Software	MTS 8310_2.0.0.0_MWRF-TEST				



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.

FREQUENCY (MHz)	Conducted Emission limit (dBuV)	
	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.

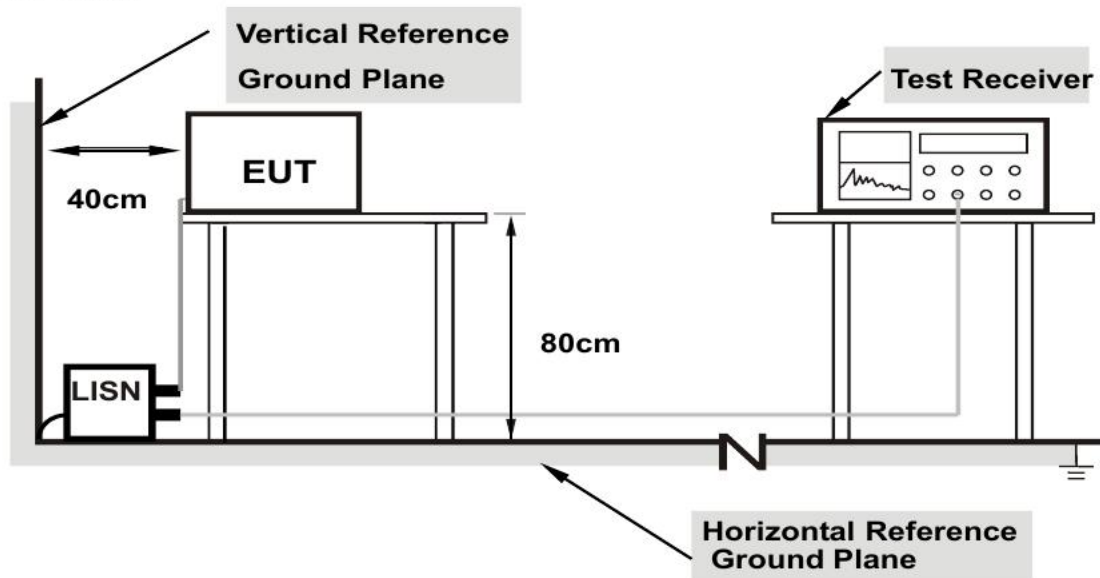
The following table is the setting of the receiver

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

3.2 TEST PROCEDURE

- 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.
- 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.
 - 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.
 - LISN is at least 80 cm from the nearest part of EUT chassis.
 - For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3 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.**

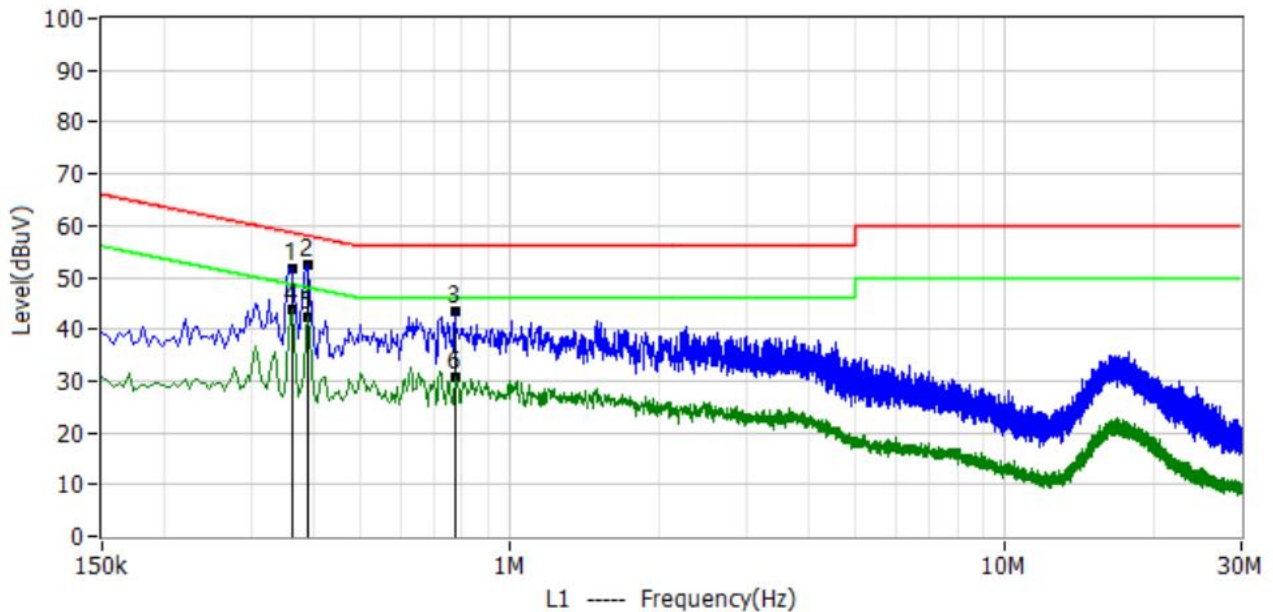
3.4 EUT OPERATING CONDITIONS

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.



3.5 TEST RESULTS

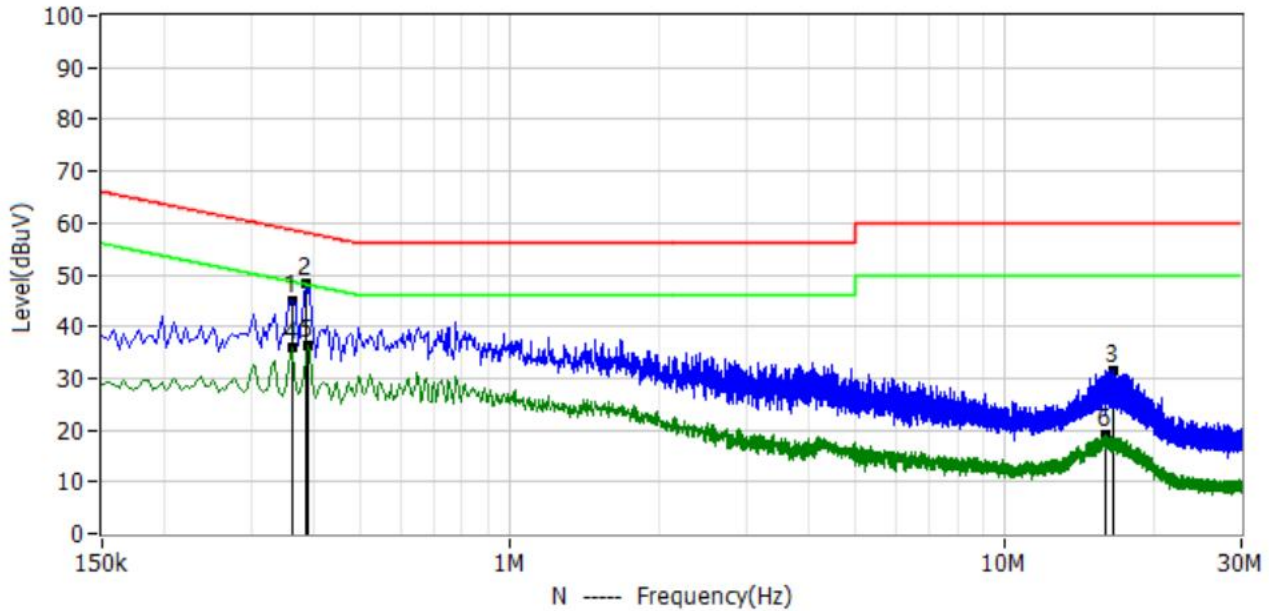
Project: LGT22K038	Test Engineer: Dylan.shi
EUT: WorldPenScan WiFi	Temperature: 26.4°C
M/N: MSE10	Humidity: 55%RH
Test Voltage: AC 120V/60Hz	Test Data: 2022-11-18
Test Mode: TX BT	
Note:	



No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Detector	Polar
1*	362.000kHz	41.26	10.50	51.76	58.68	-6.92	PK	L1
2*	390.000kHz	41.94	10.50	52.44	58.06	-5.63	PK	L1
3*	774.000kHz	32.88	10.52	43.40	56.00	-12.60	PK	L1
4*	362.000kHz	33.14	10.50	43.64	48.68	-5.04	AV	L1
5*	390.000kHz	31.96	10.50	42.46	48.06	-5.60	AV	L1
6*	778.000kHz	20.12	10.52	30.64	46.00	-15.36	AV	L1



Project: LGT22K038	Test Engineer: Dylan.shi
EUT: WorldPenScan WiFi	Temperature: 26.4°C
M/N: MSE10	Humidity: 55%RH
Test Voltage: AC 120V/60Hz	Test Data: 2022-11-18
Test Mode: TX BT	
Note:	



No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Detector	Polar
1*	362.000kHz	34.51	10.50	45.01	58.68	-13.67	PK	N
2*	386.000kHz	37.87	10.50	48.37	58.15	-9.78	PK	N
3*	16.490MHz	20.56	11.08	31.64	60.00	-28.36	PK	N
4*	362.000kHz	25.54	10.50	36.04	48.68	-12.65	AV	N
5*	390.000kHz	25.76	10.50	36.26	48.06	-11.81	AV	N
6*	15.982MHz	7.96	11.07	19.03	50.00	-30.97	AV	N



4. RADIATED EMISSION MEASUREMENT

4.1 RADIATED EMISSION LIMITS

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 (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (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)	
	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			



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)
RB / VB (emission in restricted band)	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz); 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)
RB / VB (emission in restricted band)	1 MHz / 3 MHz(Peak) 1 MHz/1/T MHz(AVG)

For Restricted band

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 2310 to 2410 MHz Upper Band Edge: 2475 to 2500 MHz
RB / VB	1 MHz / 3 MHz(Peak) 1 MHz/1/T MHz(AVG)



Receiver Parameter	Setting
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

4.2 TEST PROCEDURE

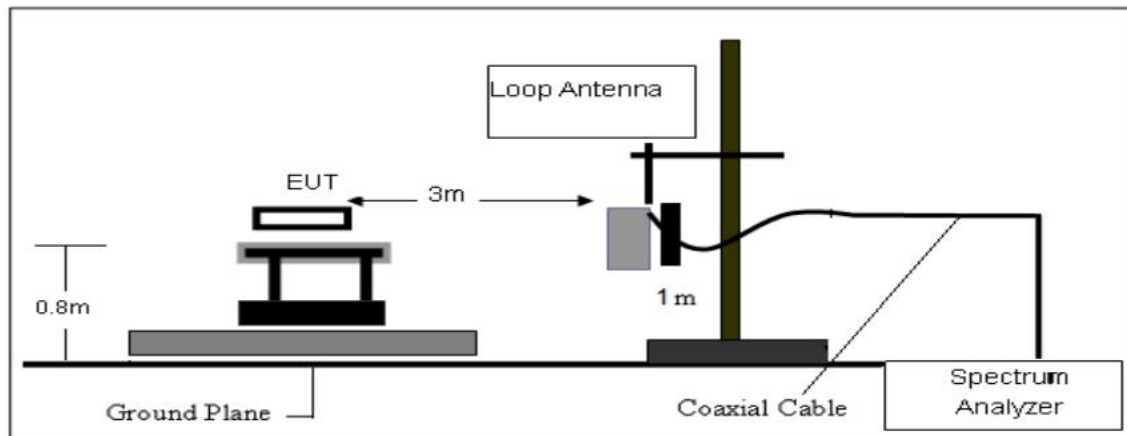
- The measuring distance at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree to determine the position of the highest radiation.
- 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.
- 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.
- 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.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

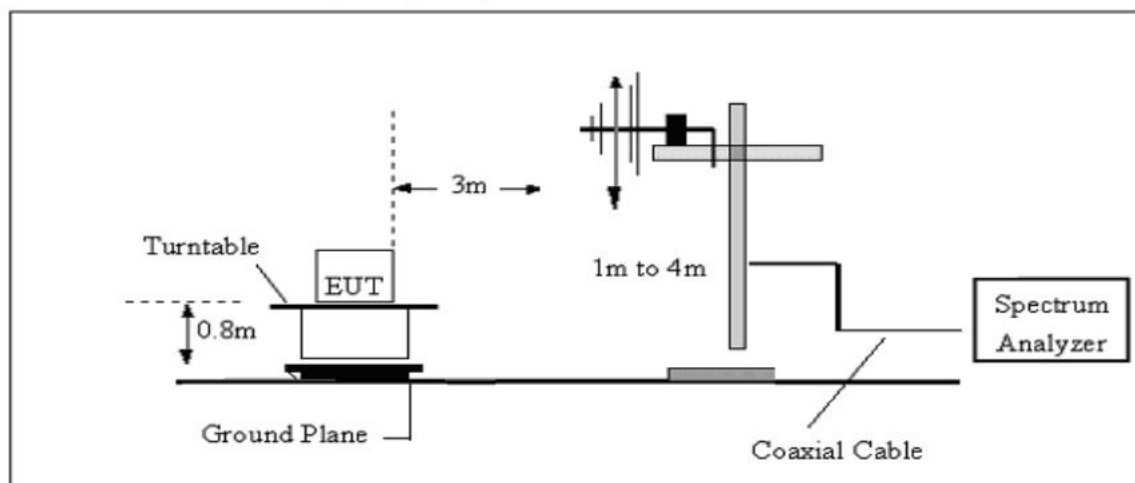
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

4.3 TEST SETUP

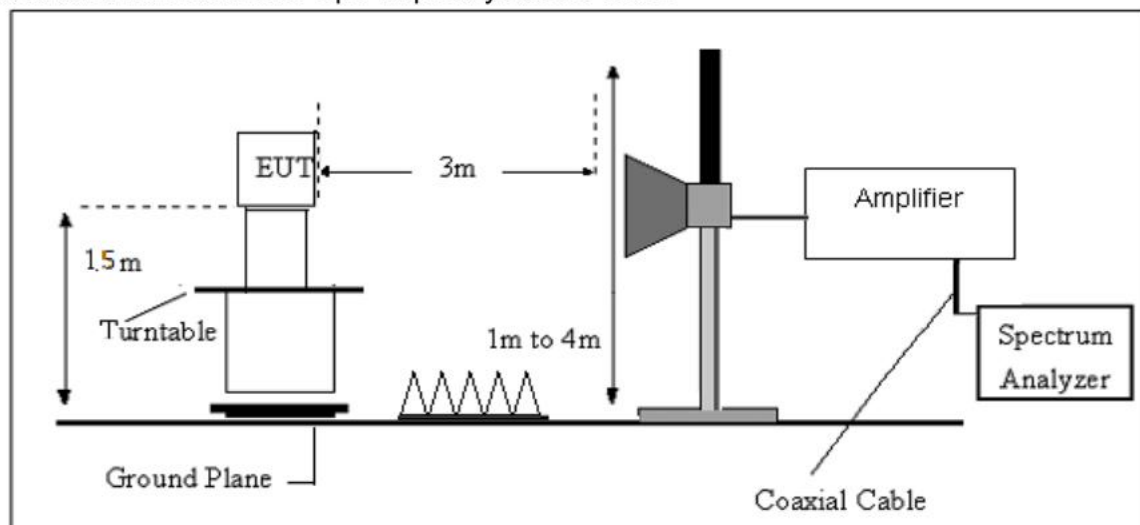
(A) Radiated Emission Test-Up Frequency Below 30MHz



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



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



4.4 EUT OPERATING CONDITIONS

Please refer to section 3.4 of this report.



4.5 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

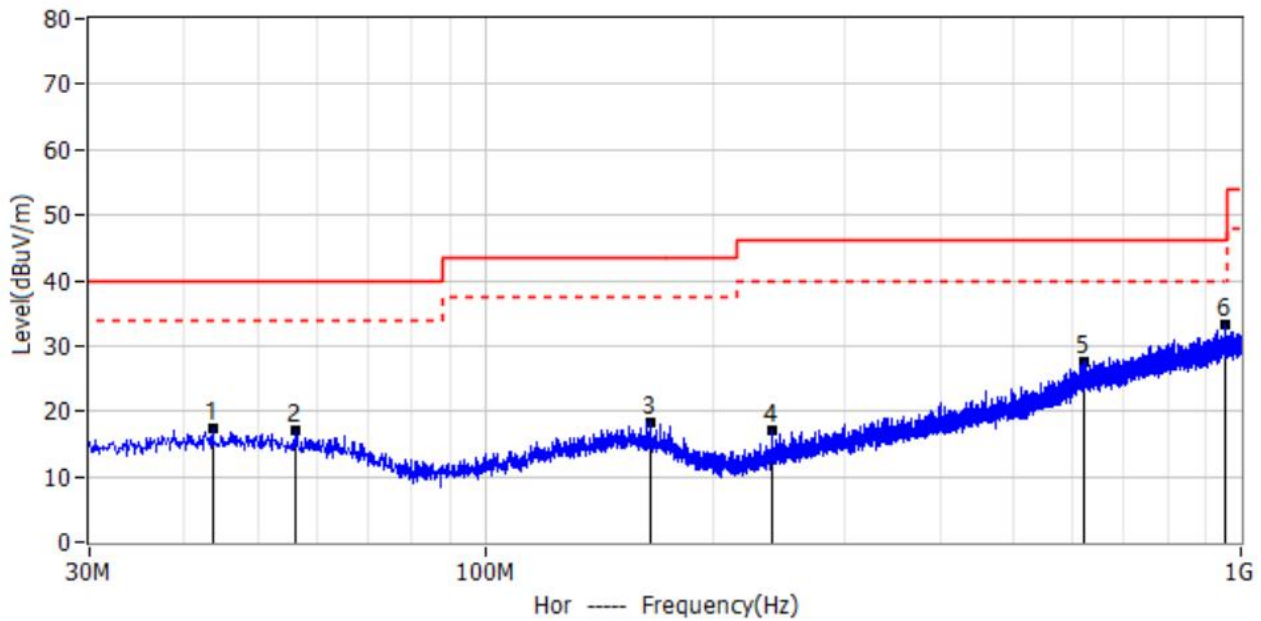
Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

$$\text{Factor} = \text{AF} + \text{CL} - \text{AG}$$



4.6 TEST RESULTS

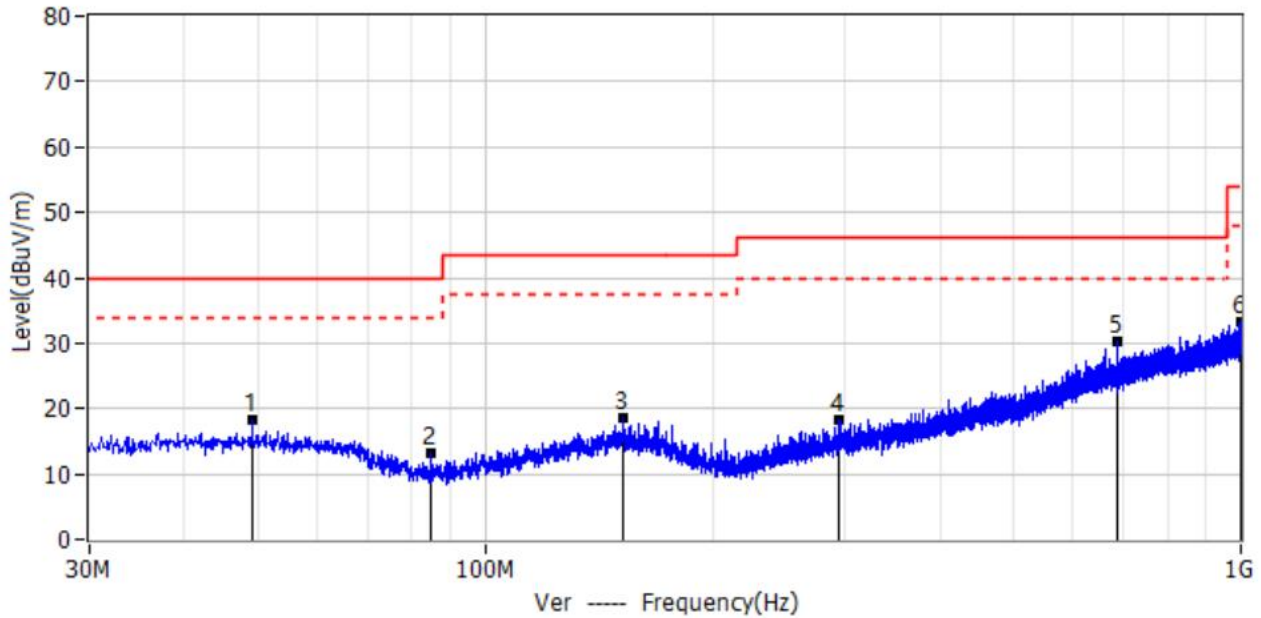
Project: LGT22K038	Test Engineer: Dylan.shi
EUT: WorldPenScan WiFi	Temperature: 24.8°C
M/N: MSE10	Humidity: 48%RH
Test Voltage: Battery 3.8V	Test Data: 2022-11-21
Test Mode: TX BT	
Note:	



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	43.580MHz	3.48	13.75	17.23	40.00	-22.77	PK	Hor
2*	56.190MHz	3.69	13.30	16.99	40.00	-23.01	PK	Hor
3*	165.679MHz	4.22	14.05	18.27	43.50	-25.23	PK	Hor
4*	239.641MHz	4.76	12.21	16.97	46.00	-29.03	PK	Hor
5*	619.760MHz	5.00	22.58	27.58	46.00	-18.42	PK	Hor
6*	955.380MHz	5.39	27.76	33.15	46.00	-12.85	PK	Hor



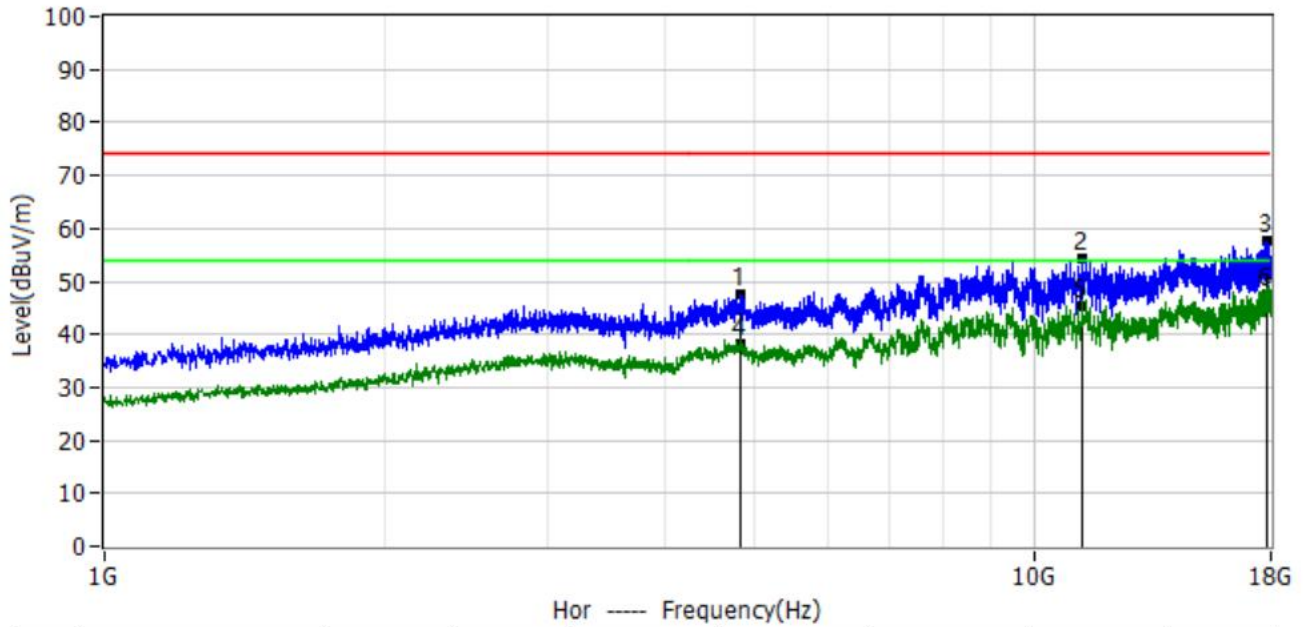
Project: LGT22K038	Test Engineer: Dylan.shi
EUT: WorldPenScan WiFi	Temperature: 24.8°C
M/N: MSE10	Humidity: 48%RH
Test Voltage: Battery 3.8V	Test Data: 2022-11-21
Test Mode: TX BT	
Note:	



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	49.279MHz	4.37	13.78	18.15	40.00	-21.85	PK	Ver
2*	85.048MHz	3.55	9.51	13.06	40.00	-26.94	PK	Ver
3*	152.705MHz	4.50	14.20	18.70	43.50	-24.80	PK	Ver
4*	293.476MHz	4.03	14.20	18.23	46.00	-27.77	PK	Ver
5*	687.539MHz	6.81	23.39	30.20	46.00	-15.80	PK	Ver
6*	998.181MHz	5.44	27.87	33.31	54.00	-20.69	PK	Ver



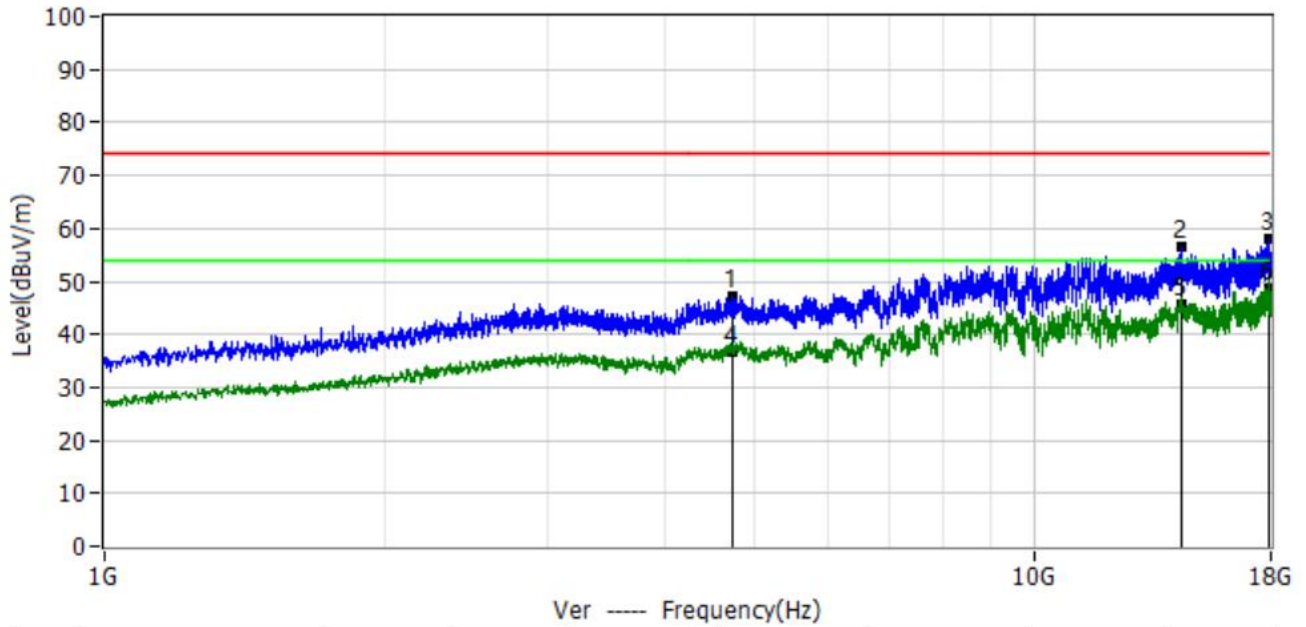
Project: LGT22K038	Test Engineer: Dylan.shi
EUT: WorldPenScan WiFi	Temperature: 27.3°C
M/N: MSE10	Humidity: 56%RH
Test Voltage: Battery 3.8V	Test Data: 2022-11-30
Test Mode: BLE 1M 2402	
Note:	



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.842GHz	53.73	-6.02	47.71	74.00	-26.29	PK	Hor
2*	11.277GHz	52.55	1.79	54.34	74.00	-19.66	PK	Hor
3*	17.843GHz	49.38	8.41	57.79	74.00	-16.21	PK	Hor
4*	4.842GHz	44.12	-6.02	38.10	54.00	-15.90	AV	Hor
5*	11.277GHz	43.71	1.79	45.50	54.00	-8.50	AV	Hor
6*	17.843GHz	39.19	8.41	47.60	54.00	-6.40	AV	Hor



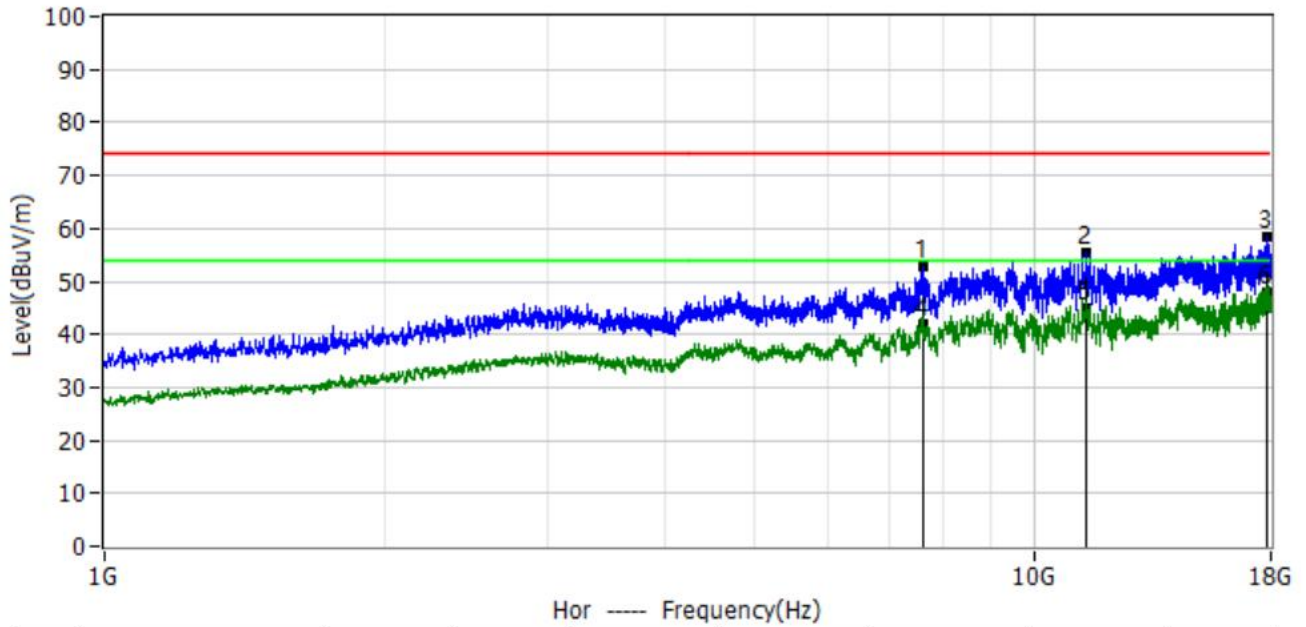
Project: LGT22K038	Test Engineer: Dylan.shi
EUT: WorldPenScan WiFi	Temperature: 27.3°C
M/N: MSE10	Humidity: 56%RH
Test Voltage: Battery 3.8V	Test Data: 2022-11-30
Test Mode: BLE 1M 2402	
Note:	



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.744GHz	53.15	-5.94	47.21	74.00	-26.79	PK	Ver
2*	14.419GHz	50.83	5.91	56.74	74.00	-17.26	PK	Ver
3*	17.949GHz	49.59	8.48	58.07	74.00	-15.93	PK	Ver
4*	4.744GHz	42.54	-5.94	36.60	54.00	-17.40	AV	Ver
5*	14.419GHz	39.89	5.91	45.80	54.00	-8.20	AV	Ver
6*	17.949GHz	40.32	8.48	48.80	54.00	-5.20	AV	Ver



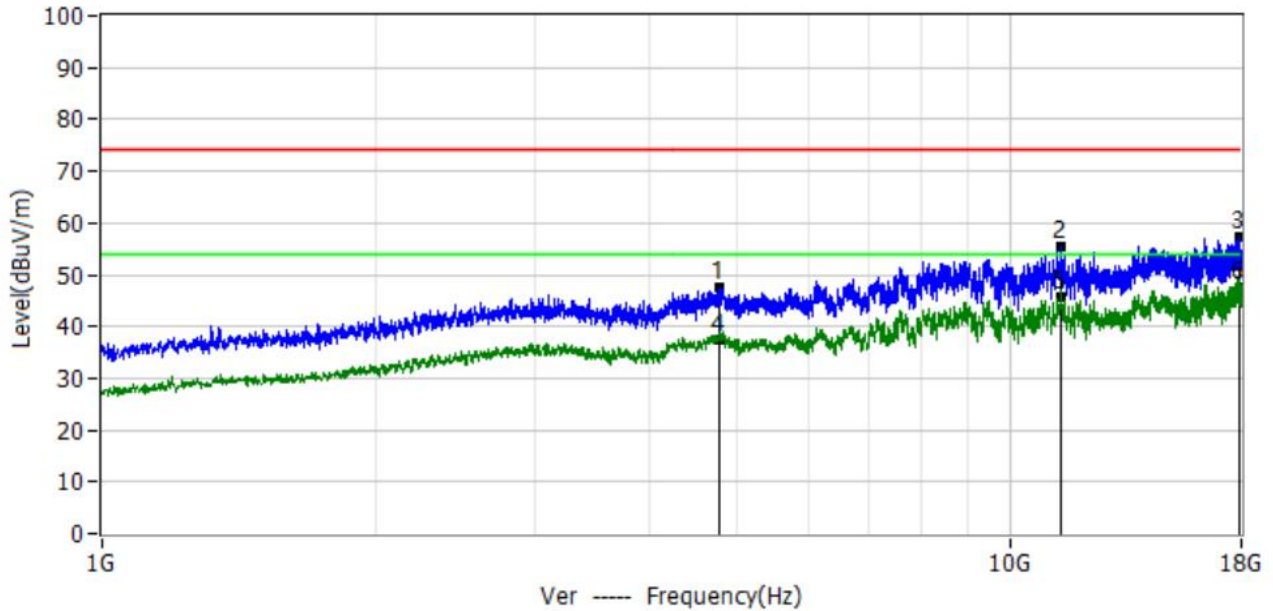
Project: LGT22K038	Test Engineer: Dylan.shi
EUT: WorldPenScan WiFi	Temperature: 27.3°C
M/N: MSE10	Humidity: 56%RH
Test Voltage: Battery 3.8V	Test Data: 2022-11-30
Test Mode: BLE 1M 2440	
Note:	



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	7.596GHz	56.90	-4.24	52.66	74.00	-21.34	PK	Hor
2*	11.374GHz	53.55	1.85	55.40	74.00	-18.60	PK	Hor
3*	17.841GHz	50.19	8.41	58.60	74.00	-15.40	PK	Hor
4*	7.596GHz	46.34	-4.24	42.10	54.00	-11.90	AV	Hor
5*	11.374GHz	43.25	1.85	45.10	54.00	-8.90	AV	Hor
6*	17.841GHz	39.59	8.41	48.00	54.00	-6.00	AV	Hor



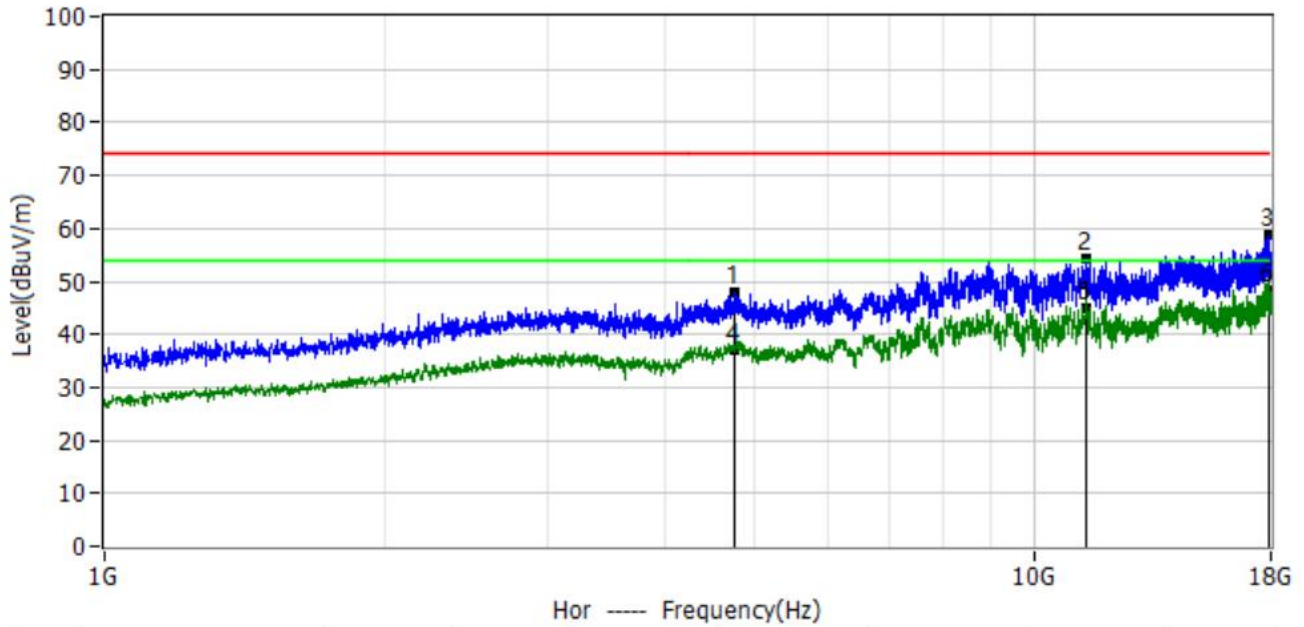
Project: LGT22K038	Test Engineer: Dylan.shi
EUT: WorldPenScan WiFi	Temperature: 27.3°C
M/N: MSE10	Humidity: 56%RH
Test Voltage: Battery 3.8V	Test Data: 2022-11-30
Test Mode: BLE 1M 2440	
Note:	



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.791GHz	53.50	-5.98	47.52	74.00	-26.48	PK	Ver
2*	11.396GHz	53.48	1.86	55.34	74.00	-18.66	PK	Ver
3*	17.932GHz	48.79	8.47	57.26	74.00	-16.74	PK	Ver
4*	4.791GHz	43.58	-5.98	37.60	54.00	-16.40	AV	Ver
5*	11.396GHz	43.84	1.86	45.70	54.00	-8.30	AV	Ver
6*	17.932GHz	39.03	8.47	47.50	54.00	-6.50	AV	Ver



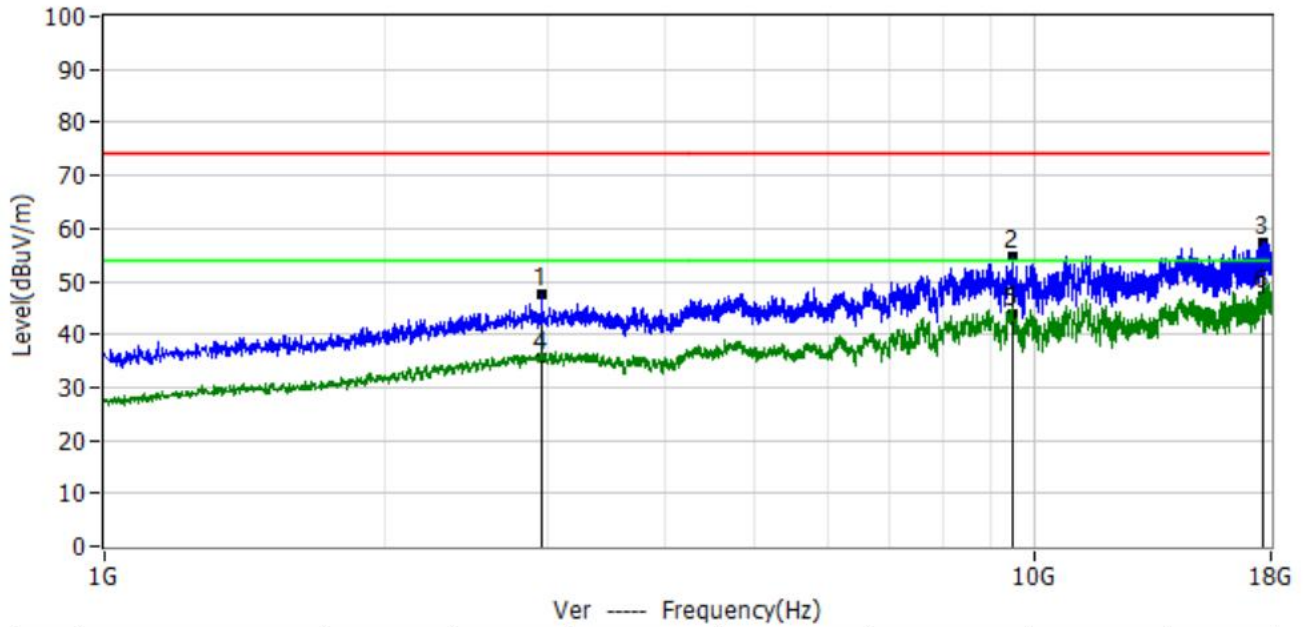
Project: LGT22K038	Test Engineer: Dylan.shi
EUT: WorldPenScan WiFi	Temperature: 27.3°C
M/N: MSE10	Humidity: 56%RH
Test Voltage: Battery 3.8V	Test Data: 2022-11-30
Test Mode: BLE 1M 2480	
Note:	



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	4.772GHz	53.83	-5.96	47.87	74.00	-26.13	PK	Hor
2*	11.381GHz	52.44	1.85	54.29	74.00	-19.71	PK	Hor
3*	17.941GHz	50.25	8.48	58.73	74.00	-15.27	PK	Hor
4*	4.772GHz	42.86	-5.96	36.90	54.00	-17.10	AV	Hor
5*	11.381GHz	42.95	1.85	44.80	54.00	-9.20	AV	Hor
6*	17.941GHz	40.02	8.48	48.50	54.00	-5.50	AV	Hor



Project: LGT22K038	Test Engineer: Dylan.shi
EUT: WorldPenScan WiFi	Temperature: 27.3°C
M/N: MSE10	Humidity: 56%RH
Test Voltage: Battery 3.8V	Test Data: 2022-11-30
Test Mode: BLE 1M 2480	
Note:	

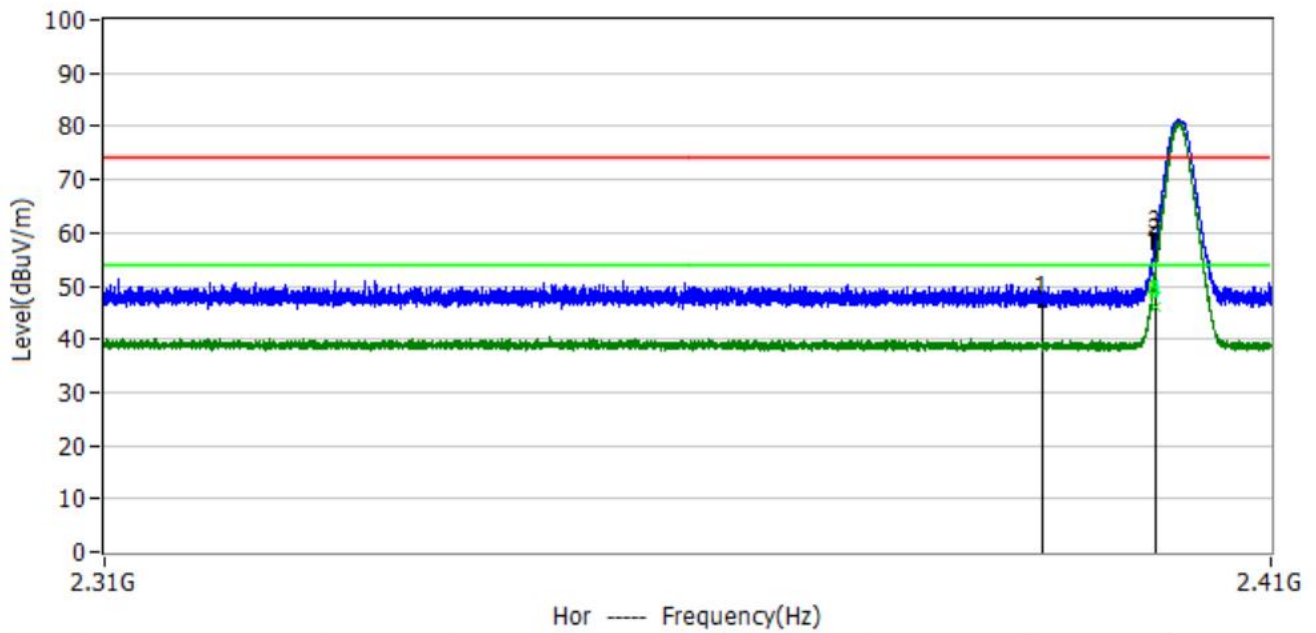


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	2.959GHz	56.10	-8.56	47.54	74.00	-26.46	PK	Ver
2*	9.483GHz	56.01	-1.17	54.84	74.00	-19.16	PK	Ver
3*	17.607GHz	49.22	8.24	57.46	74.00	-16.54	PK	Ver
4*	2.959GHz	44.26	-8.56	35.70	54.00	-18.30	AV	Ver
5*	9.483GHz	45.07	-1.17	43.90	54.00	-10.10	AV	Ver
6*	17.607GHz	38.96	8.24	47.20	54.00	-6.80	AV	Ver



4.7 TEST RESULTS (RESTRICTED BANDS REQUIREMENTS)

Project: LGT22K038	Test Engineer: Dylan.shi
EUT: WorldPenScan WiFi	Temperature: 27.1°C
M/N: MSE10	Humidity: 59%RH
Test Voltage: Battery 3.8V	Test Data: 2022-11-24
Test Mode: BLE 2402	
Note:	



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	2.3900GHz	13.05	33.95	47.00	74.00	-27.00	PK	Hor
2*	2.3999GHz	23.87	33.93	57.80	74.00	-16.20	PK	Hor
3*	2.4000GHz	25.27	33.93	59.20	74.00	-14.80	PK	Hor
4	2.3999GHz	12.28	33.90	46.18	54.00	-7.82	CAV	Hor
5	2.4000GHz	12.30	33.90	46.20	54.00	-7.80	CAV	Hor