FCC REPORT
(LTE)

Applicant:	Nebra LTD.
Address of Applicant:	Unit 4 Bells Yew Green Business Court, Bells Yew Green, Tunbridge Wells TN3 9BJ

Equipment Under Test (EUT)

Product Name:	Nebra Smart Outdoor LoRa Gateway / Nebra HNT Outdoor Hotspot Miner
Model No.:	HNTOUT-915-G-LT+, HNTOUT-915-G-LT, HNTOUT-915-LT+, HNTOUT-915 –LT, HNTOUT-915-G-LT+, HNTOUT-915-G, HNTOUT-915
Trade mark:	Nebra
FCC ID:	2AZDM-HNTOUT
Applicable standards:	FCC CFR Title 47 Part 2 FCC CFR Title 47 Part 22 Subpart H FCC CFR Title 47 Part 24 Subpart E FCC CFR Title 47 Part 27 Subpart L FCC CFR Title 47 Part 27 Subpart M FCC CFR Title 47 Part 27 Subpart H FCC CFR Title 47 Part 27 Subpart E FCC CFR Title 47 Part 90 Subpart S
Date of sample receipt:	01 Jun., 2021
Date of Test:	01 Jun., to 08 Jul., 2021
Date of report issued:	09 Jul., 2021
Test Result:	PASS*

*In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Bruce Zhang
Laboratory Manager

2. Version

Version No.	Date	Description
00	*09 Jul., 2021*	*Original*

Tested by: _____ ***Date:*** *09 Jul., 2021*

Test Engineer

Reviewed by: _____ ***Date:*** *09 Jul., 2021*

Project Engineer

3. Contents

Page

4. Test Summary

Test Items	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Pass* (Please refer to SAR Report)
RF Output Power	Part 2.1046 Part 22.913 (a)(5) Part 24.232 (c) Part 27.50 (b)(10) Part 27.50 (c)(10) Part 27.50 (d)(4) Part 27.50 (h)(2) Part 90.635 (b)	Pass*
Peak-to-Average Ratio	Part 24.232 (d) Part 22.913 (d) Part 27.50(d)(5)	Pass*
Modulation Characteristics	Part 2.1047	Pass*
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917(b) Part 24.238(b) Part 27.53(c) Part 27.53(g) Part 27.53(h) Part 27.53(m) Part 90.691(a)	Pass*
Out of band emission at antenna terminals	Part 2.1053 Part 22.917(a) Part 24.238 (a) Part 27.53(c) Part 27.53 (g) Part 27.53 (h) Part 27.53(m) Part 90.691(a)	Pass*
Field strength of spurious radiation	Part 22.917(a) Part 24.238 (a) Part 27.53(c) Part 27.53 (g) Part 27.53 (h) Part 27.53(m) Part 90.691(a)	Pass
Frequency stability vs. temperature	Part 22.355 Part 24.235 Part 27.54 Part 90.539 Part 2.1055(a)(1)(b)	Pass*

Frequency stability vs. voltage	Part 22.355 Part 24.235 Part 27.54 Part 90.539 Part 2.1055(d)(1)	Pass*

Remark:

1. *Pass: The EUT complies with the essential requirements in the standard.*
2. *The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB(Fundamental Frequency below 1GHz)/1.0dB(Fundamental Frequency above 1GHz) (provided by the customer).*

Test Method:	*ANSI/TIA-603-E-2016* *ANSI C63.26-2015*

5. General Information

5.1 Client Information

Applicant:	Nebra LTD.
Address:	Unit 4 Bells Yew Green Business Court, Bells Yew Green, Tunbridge Wells TN3 9BJ
Manufacturer:	Nebra LTD.
Address:	Unit 4 Bells Yew Green Business Court, Bells Yew Green, Tunbridge Wells TN3 9BJ
Factory:	SUNSOAR TECH CO., LIMITED
Address:	4/F, Block E, Fengze Building, Huafeng No.2 Industrial Park, Hangkong Road, XiXiang Town, BaoAn District, Shenzhen, China

5.2 General Description of E.U.T.

Product Name:			
Model No.:			
Operation Frequency range:	LTE Band 2:	TX: 1850MHz-1910MHz	RX: 1930MHz-1990MHz
	LTE Band 4:	TX: 1710MHz-1755MHz	RX: 2110MHz-2155MHz
	LTE Band 5:	TX: 824MHz-849MHz	RX: 869MHz-894MHz
	LTE Band 7:	TX: 2500MHz-2570MHz	RX: 2620MHz-2690MHz
	LTE Band 12:	TX: 699MHz-716MHz	RX: 729MHz-746MHz
	LTE Band 13:	TX: 777MHz-787MHz	RX: 746MHz-756MHz
	LTE Band 25:	TX: 1850MHz-1915MHz	RX: 1930MHz-1995MHz
	LTE Band 26:	TX: 814MHz-894MHz	RX: 859MHz-894MHz
	LTE Band 38:	TX: 2570MHz-2620MHz	RX: 2570MHz-2620MHz
	LTE Band 41:	TX: 2496MHz-2690MHz	RX: 2496MHz-2690MHz
Modulation type:	☒QPSK	☒16QAM	☐64QAM
Antenna type:	Internal Antenna		
Antenna gain:	LTE Band 2:	2.39 dBi(declare by Applicant)	
	LTE Band 4:	2.31 dBi(declare by Applicant)	
	LTE Band 5:	1.75 dBi(declare by Applicant)	
	LTE Band 7:	2.78 dBi(declare by Applicant)	
	LTE Band 12:	1.75 dBi(declare by Applicant)	
	LTE Band 13:	1.75 dBi(declare by Applicant)	
	LTE Band 25:	2.39 dBi(declare by Applicant)	
	LTE Band 26:	1.75 dBi(declare by Applicant)	
	LTE Band 38:	2.78 dBi(declare by Applicant)	
	LTE Band 41:	2.78 dBi(declare by Applicant)	
Test Power supply:	AC 120V / 60Hz		
Test Sample Condition:	The applicant provided engineering samples for staying in continuously transmitting for testing.		
Remark:	Model No.: HNTOUT-915-G-LT+, HNTOUT-915-G-LT, HNTOUT-915-LT+, HNTOUT-915 –LT, HNTOUT-915-G-LT+, HNTOUT-915-G, HNTOUT-915 The difference: we will offer the unit with or without a GPS module included. Models with the GPS Included are indicated with a -G on the end of the model number. For example a unit with model no HNTOUT-915 is 915 Mhz, no GPS. A unit with Model No HNTOUT-915-G, is 915Mhz with GPS. We offer the unit using the Raspberry Pi Compute Module 3+ 32GB by standard (no suffix) but have an -LT		

	variant which uses the Raspberry Pi Compute Module 3 Lite with a 32 GB eMMC to SD adapter card and a -LT+ variant which uses the Raspberry Pi Compute Module 3+ Lite with a 32 GB eMMC to SD adapter card. These suffixes can be applied to the models both with and without GPS as described above. We also provide customers the ability to, optionally, add both cellular connectivity and an additional 8 channel LoRa gateway to any of these models by using an mPCIe module however these come as optional extras.

Operation Frequency List:

LTE Band 2 (1.4MHz)		LTE Band 2 (3MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
18607	1850.70	18615	1851.50
18608	1850.80	18616	1851.60
….	….	….	….
18899	1879.90	18899	1879.90
18900	1880.00	18900	1880.00
18901	1880.10	18901	1880.10
…	…	…	…
19193	1909.20	19185	1908.40
19194	1909.30	19186	1908.50
LTE Band 2 (5MHz)		LTE Band 2 (10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
18625	1852.50	18650	1855.00
18626	1852.60	18651	1855.10
….	….	….	….
18899	1879.90	18899	1879.90
18900	1880.00	18900	1880.00
18901	1880.10	18901	1880.10
…	…	…	…
19175	1907.40	19150	1904.90
19176	1907.50	19151	1905.00
LTE Band 2 (15MHz)		LTE Band 2 (20MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
18675	1857.50	18700	1860.00
18676	1857.60	18701	1860.10
….	….	….	….
18899	1879.90	18899	1879.90
18900	1880.00	18900	1880.00
18901	1880.10	18901	1880.10
…	…	…	…
19125	1902.40	19100	1899.90
19126	1902.50	19101	1900.00

LTE Band 4 (1.4MHz)		LTE Band 4 (3MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
19957	1710.70	19965	1711.50
19958	1710.80	19966	1711.60
….	….	….	….
20174	1732.40	20174	1732.40
20175	1732.50	20175	1732.50
20176	1732.60	20176	1732.60
…	…	…	…
20392	1754.20	20384	1753.40
20393	1754.30	20385	1753.50
LTE Band 4 (5MHz)		LTE Band 4 (10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
19975	1712.50	20000	1715.00
19976	1712.60	20001	1715.10
….	….	….	….
20174	1732.40	20174	1732.40
20175	1732.50	20175	1732.50
20176	1732.60	20176	1732.60
…	…	…	…
20374	1752.40	20349	1749.90
20375	1752.50	20350	1750.00
LTE Band 4 (15MHz)		LTE Band 4 (20MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
20025	1717.50	20050	1720.00
20026	1717.60	20051	1720.10
….	….	….	….
20174	1732.40	20174	1732.40
20175	1732.50	20175	1732.50
20176	1732.60	20176	1732.60
…	…	…	…
20324	1747.40	20299	1744.90
20325	1747.50	20300	1745.00

LTE Band 5 (1.4MHz)		LTE Band 5 (3MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
20407	824.70	20415	825.50
20408	824.80	20416	825.60
….	….	….	….
20524	836.40	20524	836.40
20525	836.50	20525	836.50
20526	836.60	20526	836.60
…	…	…	…
20642	848.20	20634	847.40
20643	848.30	20635	847.50
LTE Band 5 (5MHz)		LTE Band 5 (10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
20425	826.50	20450	829.00
20426	826.60	20451	829.10
….	….	….	….
20524	836.40	20524	836.40
20525	836.50	20525	836.50
20526	836.60	20526	836.60
…	…	…	…
20624	846.40	20599	839.90
20625	846.50	20600	844.00

LTE Band 7 (5MHz)		LTE Band 7 (10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
20775	2502.50	20800	2505.00
20776	2502.60	20801	2502.10
….	….	….	….
21099	2534.90	21099	2534.90
21100	2535.00	21100	2535.00
21101	2535.20	21101	2535.20
…	…	…	…
21424	2567.40	21399	2564.90
21425	2567.50	21400	2565.00
LTE Band 7 (15MHz)		LTE Band 7 (20MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
20825	2507.50	20850	2510.00
20826	2507.60	20851	2510.10
….	….	….	….
21099	2534.90	21099	2534.90
21100	2535.00	21100	2535.00
21101	2535.20	21101	2535.20
…	…	…	…
21374	2562.40	21349	2559.90
21375	2562.50	21350	2560.00

LTE Band 12 (1.4MHz)		LTE Band 12 (3MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
23017	699.70	23025	700.50
23756	699.80	23026	700.60
….	….	….	….
23094	707.40	23094	707.40
23095	707.50	23095	707.50
23096	707.60	23096	707.60
…	…	…	…
23172	715.20	23164	714.40
23173	715.30	23165	714.50
LTE Band 12 (5MHz)		LTE Band 12 (10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
23035	701.50	23060	704.00
23036	701.60	23061	704.10
….	….	….	….
23094	707.40	23094	707.40
23095	707.50	23095	707.50
23096	707.60	23096	707.60
…	…	…	…
23154	713.40	23129	710.90
23155	713.50	23130	711.00

LTE Band 13 (5MHz)		LTE Band 13 (10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
23025	779.50	23230	751.00
23026	779.60		
….	….		
23229	781.90		
23230	782.00		
23231	782.10		
…	…		
23254	784.40		
23255	784.50		

LTE Band 25 (1.4MHz)		LTE Band 25 (3MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
26047	1850.70	26055	1851.50
26048	1850.80	26056	1851.60
….	….	….	….
26364	1882.40	26364	1882.40
26365	1882.50	26365	1882.50
26366	1882.60	26366	1882.60
…	…	…	…
26682	1914.20	26674	1913.40
26683	1914.30	26675	1913.50
LTE Band 25 (5MHz)		LTE Band 25 (10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
26065	1852.50	26090	1855.00
26066	1852.60	26091	1855.10
….	….	….	….
26364	1882.40	26364	1882.40
26365	1882.50	26365	1882.50
26366	1882.60	26366	1882.60
…	…	…	…
26664	1912.40	26639	1909.90
26665	1912.50	26640	1910.00
LTE Band 25 (15MHz)		LTE Band 25 (20MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
26115	1857.50	26140	1860.00
26116	1857.60	26141	1860.10
….	….	….	….
26364	1882.40	26364	1882.40
26365	1882.50	26365	1882.50
26366	1882.60	26366	1882.60
…	…	…	…
26614	1907.40	26589	1904.90
26615	1907.50	26590	1905.00

LTE Band 26 (1.4MHz)	
Channel	Frequency (MHz)
26697	814.70
26698	814.80
….	….
26864	831.40
26865	831.50
26866	831.60
…	…
27032	848.20
27033	848.30

LTE Band 26 (3MHz)	
Channel	Frequency (MHz)
26705	815.50
26706	815.60
….	….
26864	831.40
26865	831.50
26866	831.60
…	…
27024	847.40
27025	847.50

LTE Band 26 (5MHz)	
Channel	Frequency (MHz)
26715	816.50
26716	816.60
….	….
26864	831.40
26865	831.50
26866	831.60
…	…
27014	846.40
27015	846.50

LTE Band 26 (10MHz)	
Channel	Frequency (MHz)
26750	820.00
26751	820.10
….	….
26864	831.40
26865	831.50
26866	831.60
…	…
26989	843.90
26990	844.00

LTE Band 26 (15MHz)	
Channel	Frequency (MHz)
26775	822.50
26776	822.60
….	….
26864	831.40
26865	831.50
26866	831.60
…	…
26964	841.40
26965	841.50

LTE Band 38 (5MHz)	
Channel	Frequency (MHz)
37775	2572.50
37776	2572.60
….	….
37999	2594.90
38000	2595.00
38001	2595.10
…	…
38224	2617.40
38225	2617.50

LTE Band 38 (10MHz)	
Channel	Frequency (MHz)
37800	2575.00
37801	2575.10
….	….
37999	2594.90
38000	2595.00
38001	2595.10
…	…
38199	2614.90
38200	2615.00

LTE Band 38 (15MHz)	
Channel	Frequency (MHz)
37825	2577.50
37826	2577.60
….	….
37999	2594.90
38000	2595.00
38001	2595.10
…	…
38174	2612.40
38175	2612.50

LTE Band 38 (20MHz)	
Channel	Frequency (MHz)
37850	2580.00
37851	2580.10
….	….
37999	2594.90
38000	2595.00
38001	2595.10
…	…
38149	2609.90
38150	2610.00

LTE Band 41 (5MHz)	
Channel	Frequency (MHz)
39675	2498.50
39676	2498.60
….	….
40619	2592.90
40620	2593.00
40621	2593.10
…	…
41564	2687.40
41565	2687.50

LTE Band 41 (10MHz)	
Channel	Frequency (MHz)
39700	2501.00
39701	2501.10
….	….
40619	2592.90
40620	2593.00
40621	2593.10
…	…
41539	2679.90
41540	2680.00

LTE Band 41 (15MHz)	
Channel	Frequency (MHz)
39725	2503.50
39726	2503.60
….	….
40619	2592.90
40620	2593.00
40621	2593.10
…	…
41514	2682.40
41515	2682.50

LTE Band 41 (20MHz)	
Channel	Frequency (MHz)
39750	2506.00
39751	2506.10
….	….
40619	2592.90
40620	2593.00
40621	2593.10
…	…
41489	2679.90
41490	2680.00

Regards to the operating frequency range, the lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channels as below:

LTE Band 2 (1.4MHz)			LTE Band 2 (3MHz)		
Channel		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	18607	1850.70	Lowest channel	18615	1851.50
Middle channel	18900	1880.00	Middle channel	18900	1880.00
Highest channel	19193	1909.30	Highest channel	19185	1908.50
LTE Band 2 (5MHz)			LTE Band 2 (10MHz)		
Channel		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	18625	1852.50	Lowest channel	18650	1855.00
Middle channel	18900	1880.00	Middle channel	18900	1880.00
Highest channel	19175	1907.50	Highest channel	19150	1905.00
LTE Band 2 (15MHz)			LTE Band 2 (20MHz)		
Channel		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	18675	1857.50	Lowest channel	18700	1860.00
Middle channel	18900	1880.00	Middle channel	18900	1880.00
Highest channel	19125	1902.50	Highest channel	19100	1900.00

LTE Band 4 (1.4MHz)			LTE Band 4 (3MHz)		
Channel:		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	19957	1710.70	Lowest channel	19965	1711.50
Middle channel	20175	1732.50	Middle channel	20175	1732.50
Highest channel	20393	1754.30	Highest channel	20385	1753.50
LTE Band 4 (5MHz)			LTE Band 4 (10MHz)		
Channel		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	19975	1712.50	Lowest channel	20000	1715.00
Middle channel	20175	1732.50	Middle channel	20175	1732.50
Highest channel	20375	1752.50	Highest channel	20350	1750.00
LTE Band 4 (15MHz)			LTE Band 4 (20MHz)		
Channel		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	20025	1717.50	Lowest channel	20050	1720.00
Middle channel	20175	1732.50	Middle channel	20175	1732.50
Highest channel	20325	1747.50	Highest channel	20300	1745.00

LTE Band 5 (1.4MHz)			LTE Band 5 (3MHz)		
Channel:		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	20407	824.70	Lowest channel	20415	825.50
Middle channel	20525	836.50	Middle channel	20525	836.50
Highest channel	20643	848.30	Highest channel	20635	847.50
LTE Band 5 (5MHz)			LTE Band 5 (10MHz)		
Channel		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	20425	826.50	Lowest channel	20450	829.00
Middle channel	20525	836.50	Middle channel	20525	836.50
Highest channel	20625	846.50	Highest channel	20600	844.00

LTE Band 7 (5MHz)		
Channel		Frequency (MHz)
Lowest channel	20775	2502.50
Middle channel	21100	2535.00
Highest channel	21425	2567.50

LTE Band 7 (10MHz)		
Channel		Frequency (MHz)
Lowest channel	20800	2505.00
Middle channel	21100	2535.00
Highest channel	21400	2565.00

LTE Band 7 (15MHz)		
Channel		Frequency (MHz)
Lowest channel	20825	2507.50
Middle channel	21100	2535.00
Highest channel	21375	2562.50

LTE Band 7 (20MHz)		
Channel		Frequency (MHz)
Lowest channel	20850	2510.00
Middle channel	21100	2535.00
Highest channel	21350	2560.00

LTE Band 12(1.4MHz)		
Channel		Frequency (MHz)
Lowest channel	23017	699.70
Middle channel	23095	707.50
Highest channel	23173	715.30

LTE Band 12(3MHz)		
Channel		Frequency (MHz)
Lowest channel	23025	700.50
Middle channel	23095	707.50
Highest channel	23165	714.50

LTE Band 12(5MHz)		
Channel		Frequency (MHz)
Lowest channel	23035	701.50
Middle channel	23095	707.50
Highest channel	23155	713.50

LTE Band 12(10MHz)		
Channel		Frequency (MHz)
Lowest channel	23060	704.00
Middle channel	23095	707.50
Highest channel	23130	711.00

LTE Band 13(5MHz)		
Channel		Frequency (MHz)
Lowest channel	23025	779.50
Middle channel	23230	782.00
Highest channel	23255	784.50

LTE Band 13(10MHz)		
Channel		Frequency (MHz)
Lowest channel	23230	782.00
Middle channel	23230	782.00
Highest channel	23230	782.00

LTE Band 25 (1.4MHz)		
Channel		Frequency (MHz)
Lowest channel	26047	1850.70
Middle channel	26365	1882.50
Highest channel	26683	1914.30

LTE Band 25 (3MHz)		
Channel		Frequency (MHz)
Lowest channel	26055	1851.50
Middle channel	26365	1882.50
Highest channel	26675	1913.50

LTE Band 25 (5MHz)		
Channel		Frequency (MHz)
Lowest channel	26065	1852.50
Middle channel	26365	1882.50
Highest channel	26665	1912.50

LTE Band 25 (10MHz)		
Channel		Frequency (MHz)
Lowest channel	26090	1855.00
Middle channel	26365	1882.50
Highest channel	26640	1910.00

LTE Band 25 (15MHz)		
Channel		Frequency (MHz)
Lowest channel	26115	1857.50
Middle channel	26365	1882.50
Highest channel	26615	1907.50

LTE Band 25 (20MHz)		
Channel		Frequency (MHz)
Lowest channel	26140	1860.00
Middle channel	26365	1882.50
Highest channel	26590	1905.00

LTE Band 26 (1.4MHz)		
Channel		Frequency (MHz)
Lowest channel	26697	814.70
Middle channel	26865	831.50
Highest channel	27033	848.30

LTE Band 26 (3MHz)		
Channel		Frequency (MHz)
Lowest channel	26705	815.50
Middle channel	26865	831.50
Highest channel	27025	847.50

LTE Band 26 (5MHz)		
Channel		Frequency (MHz)
Lowest channel	26715	816.50
Middle channel	26865	831.50
Highest channel	27015	846.50

LTE Band 26 (10MHz)		
Channel		Frequency (MHz)
Lowest channel	26750	820.00
Middle channel	26865	831.50
Highest channel	26990	844.00

LTE Band 26 (15MHz)		
Channel		Frequency (MHz)
Lowest channel	26775	822.50
Middle channel	26865	831.50
Highest channel	26965	841.50

LTE Band 38 (5MHz)		
Channel		Frequency (MHz)
Lowest channel	37775	2572.50
Middle channel	38000	2595.00
Highest channel	38225	2617.50

LTE Band 38 (10MHz)		
Channel		Frequency (MHz)
Lowest channel	37800	2575.00
Middle channel	38000	2595.00
Highest channel	38200	2615.00

LTE Band 38 (15MHz)		
Channel		Frequency (MHz)
Lowest channel	37825	2577.50
Middle channel	38000	2595.00
Highest channel	38175	2612.50

LTE Band 38 (20MHz)		
Channel		Frequency (MHz)
Lowest channel	37850	2580.00
Middle channel	38000	2595.00
Highest channel	38150	2610.00

LTE Band 41 (5MHz)		
Channel		Frequency (MHz)
Lowest channel	39675	2498.50
Middle channel	40620	2593.00
Highest channel	41565	2687.50

LTE Band 41 (10MHz)		
Channel		Frequency (MHz)
Lowest channel	39700	2501.00
Middle channel	40620	2593.00
Highest channel	41540	2685.00

LTE Band 41 (15MHz)		
Channel		Frequency (MHz)
Lowest channel	39725	2503.50
Middle channel	40620	2593.00
Highest channel	41515	2682.50

LTE Band 41 (20MHz)		
Channel		Frequency (MHz)
Lowest channel	39750	2506.00
Middle channel	40620	2593.00
Highest channel	41490	2680.00

5.3 Test environment and mode, and test samples plans

Operating Environment:	
Temperature:	Normal: 15℃ ~ 35℃, Extreme: -30℃ ~ +50℃
Humidity:	20 % ~ 75 % RH
Atmospheric Pressure:	1008 mbar
Voltage:	Nominal: 120Vac, Extreme: Low 102 Vac, High 138Vac
Test mode:	
LTE QPSK mode	Keep the EUT communication with simulated station in QPSK mode
LTE 16-QAM mode	Keep the EUT communication with simulated station in 16-QAM mode
Remark: The EUT has been tested under continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing. The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for these modes. Just the worst case position (H mode) shown in report.	

5.4 Description of Support Units

Test Equipment	Manufacturer	Model No.	Serial No.
Simulated Station	Rohde & Schwarz	CMW500	140493

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Radiated Emission (9kHz ~ 30MHz)	±3.12 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.32 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.16 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±3.20 dB (k=2)

5.6 Related Submittal(s) / Grant (s)

This is an original grant, no related submittals and grants.

5.7 Additions to, deviations, or exclusions from the method

No

5.8 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Designation No.: CN1211**

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The test firm Registration No. is 727551.

- **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

5.9 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.
Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.
Tel: +86-755-23118282, Fax: +86-755-23116366
Email: info-JYTee@lets.com, Website: http://www.ccis-cb.com

5.10 Test Instruments list

Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	ETS	9m*6m*6m	966	01-19-2021	01-18-2024
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-03-2021	03-02-2022
Biconical Antenna	SCHWARZBECK	VUBA9117	359	06-18-2020	06-17-2021
				06-17-2021	06-16-2022
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-03-2021	03-02-2022
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-18-2020	06-17-2021
				06-17-2021	06-16-2022
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170582	11-18-2020	11-17-2021
EMI Test Software	AUDIX	E3	Version: 6.110919b		
Pre-amplifier	HP	8447D	2944A09358	03-03-2021	03-02-2022
Pre-amplifier	CD	PAP-1G18	11804	03-03-2021	03-02-2022
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-03-2021	03-02-2022
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-18-2020	11-17-2021
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-03-2021	03-02-2022
Spectrum Analyzer	Agilent	N9020A	MY50510123	11-18-2020	11-17-2021
Signal Generator	Rohde & Schwarz	SMX	835454/016	03-03-2021	03-02-2022
Signal Generator	R&S	SMR20	1008100050	03-03-2021	03-02-2022
RF Switch Unit	MWRFTEST	MW200	N/A	N/A	N/A
Test Software	MWRFTEST	MTS8200	Version: 2.0.0.0		
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-03-2021	03-02-2022
Cable	MICRO-COAX	MFR64639	K10742-5	03-03-2021	03-02-2022
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-03-2021	03-02-2022
DC Power Supply	XinNuoEr	WYK-10020K	1409050110020	09-25-2020	09-24-2021
Temperature Humidity Chamber	HengPu	HPGDS-500	20140828008	11-01-2020	10-31-2021
Simulated Station	Rohde & Schwarz	CMW500	140493	07-22-2020	07-21-2021

6. Test results

6.1 Conducted Output Power, ERP and EIRP

Test Requirement:	Part 22.913(a)(5), Part 24.232(c), part 27.50(b)(10), part 27.50(c)(10), Part 27.50(d)(4), Part 27.50 (h)(2), part 90.635(b)
Limit:	LTE Band 2: 2W, LTE Band 4: 1W, LTE Band 5: 7W, LTE Band 7: 2W, LTE Band 12: 3W, LTE Band 13: 3W, LTE Band 25: 2W, LTE Band 26: 7W, LTE Band 38: 2W, LTE Band 41: 2W,
Test setup:	**Refer to the FCC ID:XMR201903EG25G**
Test Procedure:	
Test Instruments:	
Test mode:	
Measurement Data:	
Test results:	Passed

Measurement Data: Refer to Appendix A – LTE

6.2 Peak-to-Average Ratio

Test Requirement:	Part 24.232(d), Part 24.232 (d), Part 27.50(d)(5)
Limit:	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.
Test setup:	**Refer to the FCC ID:XMR201903EG25G**
Test Procedure:	
Test Instruments:	
Test mode:	
Measurement Data:	
Test results:	Passed

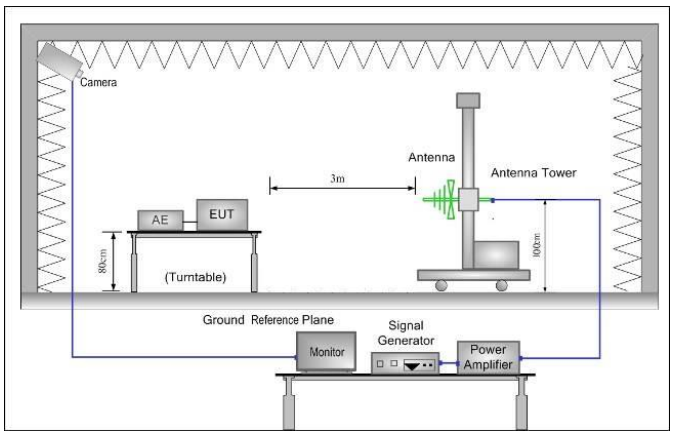
6.3 Occupy Bandwidth

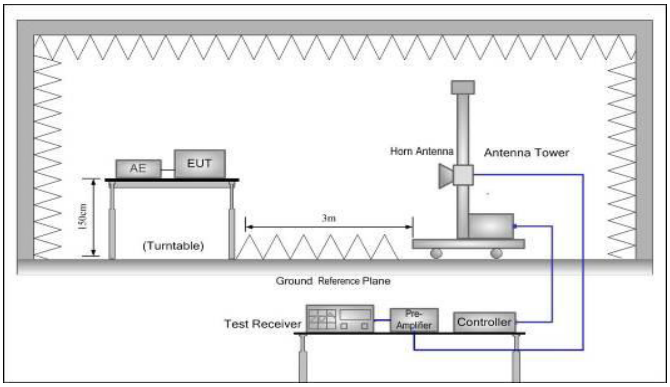
Test Requirement:	Part 22.917(b), Part 24.238(b), Part 27.53(c), Part 27.53(g), Part 27.53(h), Part 27.53(m), Part 90.691(a)
Test setup:	**Refer to the FCC ID:XMR201903EG25G**
Test Procedure:	
Test Instruments:	
Test mode:	
Measurement Data:	
Test results:	Passed

6.4 Out of band emission at antenna terminals

Test Requirement:	Part 22.917(a), Part 24.238 (a), Part 27.53(c), part 27.53(g), part 27.53(h), Part 27.53(m), Part 90.691(a)
Limit:	LTE Band 2 & 4 & 5 & 12 & 25 & 26: The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\log_{10}$(P) dB (-13 dBm). LTE Band 13: (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed (6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment LTE Band 7 & 38 & 41: For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.
Test setup:	**Refer to the FCC ID:XMR201903EG25G**
Test Procedure:	
Test Instruments:	
Test mode:	
Measurement Data:	
Test results:	Passed

6.5 Field strength of spurious radiation measurement

Test Requirement:	Part 22.917(a), Part 24.238 (a), Part 27.53(c), part 27.53(g), part 27.53(h), Part 27.53(m), Part 90.691(a)
Limit:	LTE Band 2 & 4 & 5 & 12 & 25 & 26: The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\log_{10}$(P) dB (-13 dBm). LTE Band 13: (7) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB (8) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB (9) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations (10) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations (11) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed (12) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment LTE Band 7 & 38 & 41: For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.
Test setup:	Below 1GHz  Above 1GHz

	
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8m(below 1GHz)/1.5m(above 1GHz) above the ground at a 3 meter camber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. 2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations. 3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method. 4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. ERP / EIRP = S.G. output (dBm) + Antenna Gain(dB/dBi) – Cable Loss (dB)
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details.
Test results:	Passed

Measurement Data:

LTE Band 2 part:

Band 2 (1.4MHz)						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3701.40	-60.11	-1.40	-61.51	-13.00	48.51	Vertical
5552.10	-64.14	5.27	-58.87	-13.00	45.87	Vertical
7402.00	-63.66	13.00	-50.66	-13.00	37.66	Vertical
3701.40	-60.24	-1.40	-61.64	-13.00	48.64	Horizontal
5552.10	-63.76	5.27	-58.49	-13.00	45.49	Horizontal
7402.00	-64.22	13.00	-51.22	-13.00	38.22	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3760.00	-59.90	-1.03	-60.93	-13.00	47.93	Vertical
5640.00	-64.43	6.06	-58.37	-13.00	45.37	Vertical
7520.00	-63.98	13.29	-50.69	-13.00	37.69	Vertical
3760.00	-60.24	-1.03	-61.27	-13.00	48.27	Horizontal
5640.00	-63.75	6.06	-57.69	-13.00	44.69	Horizontal
7520.00	-63.94	13.29	-50.65	-13.00	37.65	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3816.60	-60.37	-0.83	-61.20	-13.00	48.20	Vertical
5724.90	-64.00	6.82	-57.18	-13.00	44.18	Vertical
7633.20	-63.41	13.44	-49.97	-13.00	36.97	Vertical
3816.60	-59.93	-0.83	-60.76	-13.00	47.76	Horizontal
5724.90	-63.51	6.82	-56.69	-13.00	43.69	Horizontal
7633.20	-63.79	13.44	-50.35	-13.00	37.35	Horizontal
Remark:						
The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.						

Band 2 (20MHz)						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3720.00	-60.26	-1.28	-61.54	-13.00	48.54	Vertical
5580.00	-63.66	5.36	-58.30	-13.00	45.30	Vertical
7440.00	-64.00	13.04	-50.96	-13.00	37.96	Vertical
3720.00	-60.11	-1.28	-61.39	-13.00	48.39	Horizontal
5580.00	-63.42	5.36	-58.06	-13.00	45.06	Horizontal
7440.00	-64.61	13.04	-51.57	-13.00	38.57	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3760.00	-60.52	-1.03	-61.55	-13.00	48.55	Vertical
5640.00	-64.05	6.06	-57.99	-13.00	44.99	Vertical
7520.00	-63.62	13.29	-50.33	-13.00	37.33	Vertical
3760.00	-60.49	-1.03	-61.52	-13.00	48.52	Horizontal
5640.00	-63.85	6.06	-57.79	-13.00	44.79	Horizontal
7520.00	-63.99	13.29	-50.70	-13.00	37.70	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3800.00	-60.59	-0.83	-61.42	-13.00	48.42	Vertical
5700.00	-64.24	6.62	-57.62	-13.00	44.62	Vertical
7600.00	-63.24	13.71	-49.53	-13.00	36.53	Vertical
3800.00	-60.20	-0.83	-61.03	-13.00	48.03	Horizontal
5700.00	-63.81	6.62	-57.19	-13.00	44.19	Horizontal
7600.00	-63.97	13.71	-50.26	-13.00	37.26	Horizontal
Remark:						
The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.						

LTE Band 4 part:

Band 4 (1.4MHz)						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3421.40	-60.45	-1.82	-62.27	-13.00	49.27	Vertical
5132.10	-63.70	4.62	-59.08	-13.00	46.08	Vertical
6842.80	-63.50	10.44	-53.06	-13.00	40.06	Vertical
3421.40	-60.51	-1.82	-62.33	-13.00	49.33	Horizontal
5132.10	-63.77	4.62	-59.15	-13.00	46.15	Horizontal
6842.80	-64.22	10.44	-53.78	-13.00	40.78	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3465.00	-60.27	-1.73	-62.00	-13.00	49.00	Vertical
5197.50	-63.66	4.76	-58.90	-13.00	45.90	Vertical
6930.00	-63.03	10.76	-52.27	-13.00	39.27	Vertical
3465.00	-60.82	-1.73	-62.55	-13.00	49.55	Horizontal
5197.50	-63.98	4.76	-59.22	-13.00	46.22	Horizontal
6930.00	-64.65	10.76	-53.89	-13.00	40.89	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3508.60	-60.58	-1.64	-62.22	-13.00	49.22	Vertical
5262.90	-63.94	5.04	-58.90	-13.00	45.90	Vertical
7017.20	-63.10	11.33	-51.77	-13.00	38.77	Vertical
3508.60	-60.25	-1.64	-61.89	-13.00	48.89	Horizontal
5262.90	-63.54	5.04	-58.50	-13.00	45.50	Horizontal
7017.20	-64.11	11.33	-52.78	-13.00	39.78	Horizontal
Remark: *The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.*						

Band 4 (20MHz)						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3440.00	-60.07	-1.82	-61.89	-13.00	48.89	Vertical
5160.00	-63.94	4.71	-59.23	-13.00	46.23	Vertical
6880.00	-63.14	10.54	-52.60	-13.00	39.60	Vertical
3440.00	-60.13	-1.82	-61.95	-13.00	48.95	Horizontal
5160.00	-63.94	4.71	-59.23	-13.00	46.23	Horizontal
6880.00	-64.46	10.54	-53.92	-13.00	40.92	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3465.00	-60.95	-1.73	-62.68	-13.00	49.68	Vertical
5197.50	-64.17	4.76	-59.41	-13.00	46.41	Vertical
6930.00	-63.28	10.76	-52.52	-13.00	39.52	Vertical
3465.00	-60.08	-1.73	-61.81	-13.00	48.81	Horizontal
5197.50	-64.21	4.76	-59.45	-13.00	46.45	Horizontal
6930.00	-64.31	10.76	-53.55	-13.00	40.55	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
3490.00	-60.81	-1.65	-62.46	-13.00	49.46	Vertical
5235.00	-63.57	4.95	-58.62	-13.00	45.62	Vertical
6980.00	-63.25	10.98	-52.27	-13.00	39.27	Vertical
3490.00	-60.88	-1.65	-62.53	-13.00	49.53	Horizontal
5235.00	-63.81	4.95	-58.86	-13.00	45.86	Horizontal
6980.00	-64.50	10.98	-53.52	-13.00	40.52	Horizontal
Remark:						
The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.						

LTE Band 5 part:

Band 5 (1.4MHz)						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1649.40	-36.36	-9.89	-46.25	-13.00	33.25	Vertical
2474.10	-57.96	-5.57	-63.53	-13.00	50.53	Vertical
3298.80	-57.36	-2.14	-59.50	-13.00	46.50	Vertical
1649.40	-28.93	-9.89	-38.82	-13.00	25.82	Horizontal
2474.10	-57.94	-5.57	-63.51	-13.00	50.51	Horizontal
3298.80	-57.33	-2.14	-59.47	-13.00	46.47	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1673.30	-36.65	-9.88	-46.53	-13.00	33.53	Vertical
2509.50	-57.88	-5.29	-63.17	-13.00	50.17	Vertical
3346.00	-57.31	-2.05	-59.36	-13.00	46.36	Vertical
1673.30	-28.55	-9.88	-38.43	-13.00	25.43	Horizontal
2509.50	-57.56	-5.29	-62.85	-13.00	49.85	Horizontal
3346.00	-57.69	-2.05	-59.74	-13.00	46.74	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1696.60	-36.81	-9.87	-46.68	-13.00	33.68	Vertical
2544.90	-57.79	-5.13	-62.92	-13.00	49.92	Vertical
3393.20	-57.50	-1.97	-59.47	-13.00	46.47	Vertical
1696.60	-28.61	-9.87	-38.48	-13.00	25.48	Horizontal
2544.90	-58.30	-5.13	-63.43	-13.00	50.43	Horizontal
3393.20	-57.18	-1.97	-59.15	-13.00	46.15	Horizontal
Remark:						
The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.						

Band 5 (10MHz)						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1658.00	-36.34	-9.89	-46.23	-13.00	33.23	Vertical
2487.00	-58.30	-5.45	-63.75	-13.00	50.75	Vertical
3316.00	-57.85	-2.09	-59.94	-13.00	46.94	Vertical
1658.00	-28.49	-9.89	-38.38	-13.00	25.38	Horizontal
2487.00	-57.56	-5.45	-63.01	-13.00	50.01	Horizontal
3316.00	-57.09	-2.09	-59.18	-13.00	46.18	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1673.30	-36.10	-9.88	-45.98	-13.00	32.98	Vertical
2509.50	-58.43	-5.29	-63.72	-13.00	50.72	Vertical
3346.00	-56.88	-2.05	-58.93	-13.00	45.93	Vertical
1673.30	-28.49	-9.88	-38.37	-13.00	25.37	Horizontal
2509.50	-57.94	-5.29	-63.23	-13.00	50.23	Horizontal
3346.00	-57.01	-2.05	-59.06	-13.00	46.06	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1688.00	-36.77	-9.87	-46.64	-13.00	33.64	Vertical
2532.00	-58.00	-5.13	-63.13	-13.00	50.13	Vertical
3376.00	-57.77	-1.97	-59.74	-13.00	46.74	Vertical
1688.00	-28.97	-9.87	-38.84	-13.00	25.84	Horizontal
2532.00	-57.59	-5.13	-62.72	-13.00	49.72	Horizontal
3376.00	-57.42	-1.97	-59.39	-13.00	46.39	Horizontal
Remark: *The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.*						

LTE Band 7 part:

Band 7 (5MHz)						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
5005.00	-60.37	4.56	-55.81	-25.00	30.81	Vertical
7507.50	-64.54	13.14	-51.40	-25.00	26.40	Vertical
10010.00	-64.11	16.93	-47.18	-25.00	22.18	Vertical
5005.00	-59.85	4.56	-55.29	-25.00	30.29	Horizontal
7507.50	-63.35	13.14	-50.21	-25.00	25.21	Horizontal
10010.00	-64.05	16.93	-47.12	-25.00	22.12	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
5070.00	-59.91	4.55	-55.36	-25.00	30.36	Vertical
7605.00	-64.98	13.58	-51.40	-25.00	26.40	Vertical
10140.00	-63.94	17.44	-46.50	-25.00	21.50	Vertical
5070.00	-59.50	4.55	-54.95	-25.00	29.95	Horizontal
7605.00	-63.53	13.58	-49.95	-25.00	24.95	Horizontal
10140.00	-64.22	17.44	-46.78	-25.00	21.78	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
5135.00	-60.13	4.62	-55.51	-25.00	30.51	Vertical
7702.50	-64.76	13.24	-51.52	-25.00	26.52	Vertical
10270.00	-64.42	18.40	-46.02	-25.00	21.02	Vertical
5135.00	-59.64	4.62	-55.02	-25.00	30.02	Horizontal
7702.50	-63.48	13.24	-50.24	-25.00	25.24	Horizontal
10270.00	-64.06	18.40	-45.66	-25.00	20.66	Horizontal
Remark:						
The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.						

Band 7 (20MHz)						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
5020.00	-60.52	4.56	-55.96	-25.00	30.96	Vertical
7530.00	-64.55	13.29	-51.26	-25.00	26.26	Vertical
10040.00	-64.00	16.98	-47.02	-25.00	22.02	Vertical
5020.00	-59.11	4.56	-54.55	-25.00	29.55	Horizontal
7530.00	-63.62	13.29	-50.33	-25.00	25.33	Horizontal
10040.00	-64.47	16.98	-47.49	-25.00	22.49	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
5070.00	-60.11	4.55	-55.56	-25.00	30.56	Vertical
7605.00	-64.14	13.58	-50.56	-25.00	25.56	Vertical
10140.00	-63.90	17.44	-46.46	-25.00	21.46	Vertical
5070.00	-60.10	4.55	-55.55	-25.00	30.55	Horizontal
7605.00	-63.20	13.58	-49.62	-25.00	24.62	Horizontal
10140.00	-64.28	17.44	-46.84	-25.00	21.84	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
5120.00	-60.84	4.62	-56.22	-25.00	31.22	Vertical
7680.00	-64.60	13.18	-51.42	-25.00	26.42	Vertical
10240.00	-63.87	18.27	-45.60	-25.00	20.60	Vertical
5120.00	-60.26	4.62	-55.64	-25.00	30.64	Horizontal
7680.00	-63.07	13.18	-49.89	-25.00	24.89	Horizontal
10240.00	-63.76	18.27	-45.49	-25.00	20.49	Horizontal
Remark:						
The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.						

LTE Band 12 part:

Band 12 (1.4MHz)						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1399.40	-41.12	-8.43	-49.55	-13.00	36.55	Vertical
2099.10	-57.53	-7.76	-65.29	-13.00	52.29	Vertical
2798.80	-57.40	-3.98	-61.38	-13.00	48.38	Vertical
1399.40	-35.78	-8.43	-44.21	-13.00	31.21	Horizontal
2099.10	-58.29	-7.76	-66.05	-13.00	53.05	Horizontal
2798.80	-57.66	-3.98	-61.64	-13.00	48.64	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1415.00	-41.39	-8.60	-49.99	-13.00	36.99	Vertical
2122.50	-57.43	-7.65	-65.08	-13.00	52.08	Vertical
2830.00	-57.87	-3.91	-61.78	-13.00	48.78	Vertical
1415.00	-35.53	-8.60	-44.13	-13.00	31.13	Horizontal
2122.50	-57.94	-7.65	-65.59	-13.00	52.59	Horizontal
2830.00	-58.04	-3.91	-61.95	-13.00	48.95	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1430.60	-41.51	-8.77	-50.28	-13.00	37.28	Vertical
2145.90	-57.53	-7.54	-65.07	-13.00	52.07	Vertical
2861.20	-57.82	-3.78	-61.60	-13.00	48.60	Vertical
1430.60	-35.33	-8.77	-44.10	-13.00	31.10	Horizontal
2145.90	-58.17	-7.54	-65.71	-13.00	52.71	Horizontal
2861.20	-57.50	-3.78	-61.28	-13.00	48.28	Horizontal
Remark:						
The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.						

Band 12 (10MHz)						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1408.00	-41.41	-8.60	-50.01	-13.00	37.01	Vertical
2112.00	-57.68	-7.65	-65.33	-13.00	52.33	Vertical
2816.00	-57.68	-3.91	-61.59	-13.00	48.59	Vertical
1408.00	-35.63	-8.60	-44.23	-13.00	31.23	Horizontal
2112.00	-57.94	-7.65	-65.59	-13.00	52.59	Horizontal
2816.00	-57.63	-3.91	-61.54	-13.00	48.54	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1415.00	-41.57	-8.60	-50.17	-13.00	37.17	Vertical
2122.50	-57.46	-7.65	-65.11	-13.00	52.11	Vertical
2830.00	-57.63	-3.91	-61.54	-13.00	48.54	Vertical
1415.00	-35.30	-8.60	-43.90	-13.00	30.90	Horizontal
2122.50	-58.41	-7.65	-66.06	-13.00	53.06	Horizontal
2830.00	-57.46	-3.91	-61.37	-13.00	48.37	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1422.00	-40.84	-8.60	-49.44	-13.00	36.44	Vertical
2133.00	-57.59	-7.54	-65.13	-13.00	52.13	Vertical
2844.00	-57.21	-3.85	-61.06	-13.00	48.06	Vertical
1422.00	-35.36	-8.60	-43.96	-13.00	30.96	Horizontal
2133.00	-58.26	-7.54	-65.80	-13.00	52.80	Horizontal
2844.00	-57.91	-3.85	-61.76	-13.00	48.76	Horizontal

Remark:

The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.

LTE Band 13 part:

Band 13 (5MHz)						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1559.00	-40.87	-9.65	-50.52	-13.00	37.52	Vertical
2338.50	-57.76	-6.29	-64.05	-13.00	51.05	Vertical
3118.00	-57.52	-2.31	-59.83	-13.00	46.83	Vertical
1559.00	-35.89	-9.65	-45.54	-13.00	32.54	Horizontal
2338.50	-58.38	-6.29	-64.67	-13.00	51.67	Horizontal
3118.00	-57.77	-2.31	-60.08	-13.00	47.08	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1564.00	-40.46	-9.65	-50.11	-13.00	37.11	Vertical
2346.00	-57.73	-6.16	-63.89	-13.00	50.89	Vertical
3128.00	-57.30	-2.31	-59.61	-13.00	46.61	Vertical
1564.00	-36.21	-9.65	-45.86	-13.00	32.86	Horizontal
2346.00	-58.36	-6.16	-64.52	-13.00	51.52	Horizontal
3128.00	-58.22	-2.31	-60.53	-13.00	47.53	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1569.00	-40.83	-9.83	-50.66	-13.00	37.66	Vertical
2353.50	-57.59	-6.16	-63.75	-13.00	50.75	Vertical
3138.00	-57.71	-2.31	-60.02	-13.00	47.02	Vertical
1569.00	-35.48	-9.83	-45.31	-13.00	32.31	Horizontal
2353.50	-58.06	-6.16	-64.22	-13.00	51.22	Horizontal
3138.00	-58.13	-2.31	-60.44	-13.00	47.44	Horizontal
Remark: *The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.*						

Band 13 (10MHz)						
Lowest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1564.00	-41.06	-9.65	-50.71	-13.00	37.71	Vertical
2346.00	-57.29	-6.16	-63.45	-13.00	50.45	Vertical
3128.00	-57.95	-2.31	-60.26	-13.00	47.26	Vertical
1564.00	-36.14	-9.65	-45.79	-13.00	32.79	Horizontal
2346.00	-57.91	-6.16	-64.07	-13.00	51.07	Horizontal
3128.00	-58.12	-2.31	-60.43	-13.00	47.43	Horizontal
Middle channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1564.00	-40.55	-9.65	-50.20	-13.00	37.20	Vertical
2346.00	-58.23	-6.16	-64.39	-13.00	51.39	Vertical
3128.00	-57.06	-2.31	-59.37	-13.00	46.37	Vertical
1564.00	-35.46	-9.65	-45.11	-13.00	32.11	Horizontal
2346.00	-58.05	-6.16	-64.21	-13.00	51.21	Horizontal
3128.00	-57.37	-2.31	-59.68	-13.00	46.68	Horizontal
Highest channel						
Frequency (MHz)	Level at antenna terminals (dBm)	Factor (dB)	Spurous Emission level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
1564.00	-41.35	-9.65	-51.00	-13.00	38.00	Vertical
2346.00	-57.83	-6.16	-63.99	-13.00	50.99	Vertical
3128.00	-57.09	-2.31	-59.40	-13.00	46.40	Vertical
1564.00	-35.71	-9.65	-45.36	-13.00	32.36	Horizontal
2346.00	-58.84	-6.16	-65.00	-13.00	52.00	Horizontal
3128.00	-58.02	-2.31	-60.33	-13.00	47.33	Horizontal
Remark:						
The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.						

6.6 Frequency stability V.S. Temperature measurement

Test Requirement:	Part 22.355, Part 24.235, Part 27.54, Part 2.1055(a)(1)(b)
Limit:	±2.5 ppm for Band 5&26 Within authorized band for Band 2 & 4 & 7 & 12 & 13 & 25 & 38 & 41
Test setup:	**Refer to the FCC ID:XMR201903EG25G**
Test Procedure:	
Test Instruments:	
Test mode:	
Measurement Data:	
Test results:	Passed

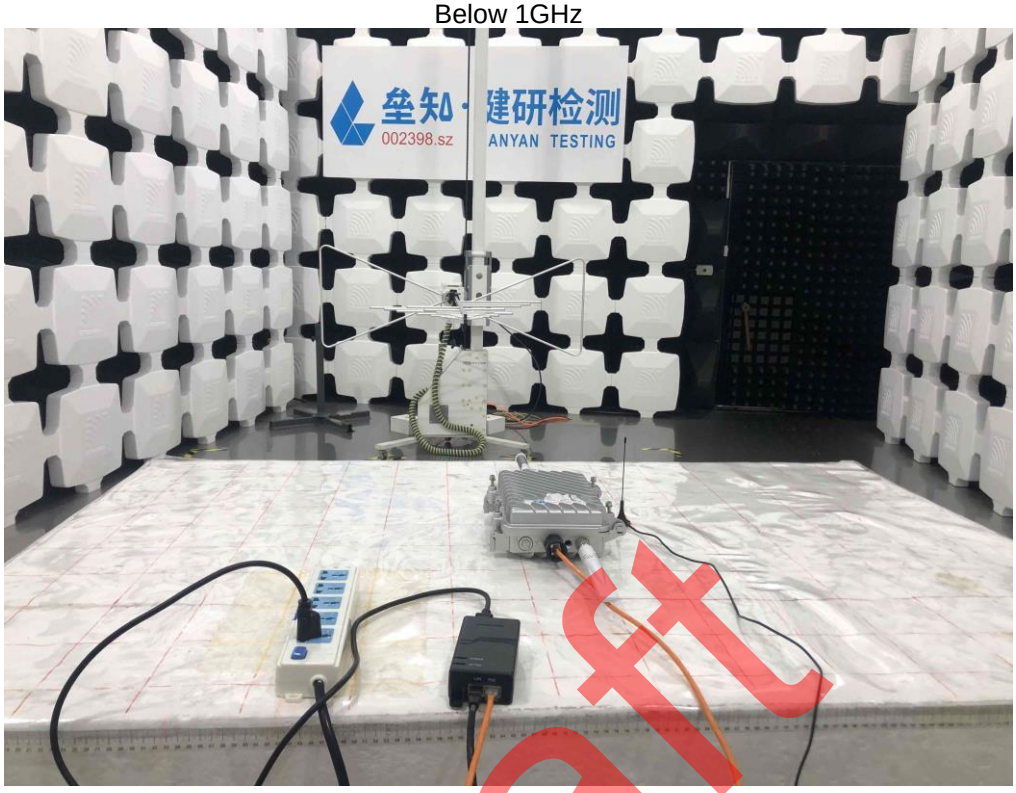
6.7 Frequency stability V.S. Voltage measurement

Test Requirement:	Part 22.355, Part 24.235, Part 27.54, Part 2.1055(d)(1)
Limit:	±2.5 ppm for Band 5&26 Within authorized band for Band 2 & 4 & 7 & 12 & 13 & 25 & 38 & 41
Test setup:	**Refer to the FCC ID:XMR201903EG25G**
Test Procedure:	
Test Instruments:	
Test mode:	
Measurement Data:	
Test results:	Passed

7 Test Setup Photo

Radiated Spurious Emission

Below 1GHz



Above 1GHz

8 EUT Constructional Details

Reference to the test report No. JYTSZB-R12-2100992

------End of report------