

TEST REPORT

Applicant: InHand Networks, Inc.
EUT Description: Industrial Wireless Gateway
Test Model: IR202
Series Models: IR212, IR252, IR292
Brand: 
FCC ID: 2BPWU-IR202
Standards: FCC CFR Title 47 Part 2
FCC CFR Title 47 Part 22
FCC CFR Title 47 Part 24
FCC CFR Title 47 Part 27
FCC CFR Title 47 Part 90
Date of Receipt: 2025/10/02
Date of Test: 2025/10/02 to 2025/11/06
Date of Issue: 2025/11/20

TOWE. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

the results documented in this report apply only the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility assure that additional production units of the model are manufactured with identical electrical and mechanical components. All sample tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise. without written approval of TOWE, the test report shall not be reproduced except in full.



Jim Huang
Approved By:



Carey Chen
Reviewed By:

Revision History

Rev.	Issue Date	Description	Revised by
01	2025/11/20	Original	Carey Chen

Summary of Test Results

FCC Part	Test Band	Test Item	Test Result
§2.1046 §22.913(a)(5) §27.50(b)(10) §27.50(c)(10) §90.542(a)	WCDMA Band V/LTE Band 5 LTE Band 13 LTE Band 12/71 LTE Band 14	Effective Radiated Power	Pass*
§2.1046 §24.232(c) §27.50(d)(4)	WCDMA Band II/LTE Band 2 WCDMA Band IV/LTE Band 4/66	Effective Isotropic Radiated Power	Pass*
§22.913(d) §24.232(d) §27.50(d)(5)	WCDMA Band V/LTE Band 5 WCDMA Band II/LTE Band 2 Others Band	Peak-Average Ratio	Pass*
§2.1049	All Band	Occupied Bandwidth	Pass*
§2.1051 §90.210(b)	LTE Band 14	Emission Mask	Pass*
§2.1051 §22.917(a) §24.238(a) §27.53(c) §27.53(g) §27.53(h) §90.543(e)(2)(3) §27.53(g)	WCDMA Band V/LTE Band 5 WCDMA Band II/LTE Band 2 LTE Band 13 LTE Band 12 WCDMA Band IV/LTE Band 4/66 LTE Band 14 LTE Band 71	Band Edge	Pass*
§2.1051 §22.917(a) §24.238(a) §27.53(c) §27.53(g) §27.53(h) §90.543(c)(f) §27.53(g)	WCDMA Band V/LTE Band 5 WCDMA Band II/LTE Band 2 LTE Band 13 LTE Band 12 WCDMA Band IV/LTE Band 4/66 LTE Band 14 LTE Band 71	Spurious Emission at Antenna Terminals	Pass*
§2.1053 §22.917(a) §24.238(a) §27.53(c)&(f) §27.53(g) §27.53(h) §90.543(c)(f) 27.53(g)	WCDMA Band V/LTE Band 5 WCDMA Band II/LTE Band 2 LTE Band 13 LTE Band 12 WCDMA Band IV/LTE Band 4/66 LTE Band 14 LTE Band 71	Field Strength of Spurious Radiation	Pass
§2.1055 §22.355 §24.235 §27.54 §90.213	WCDMA Band V/LTE Band 5 WCDMA Band II/LTE Band 2 Others Band LTE Band 14	Frequency Stability	Pass*

FCC Part	Test Band	Test Item	Test Result
Remark: 1. Pass: Meet the requirement. 2. Pass*: Refer to Module FCC ID: XMR202008EC25AFXD, Detailed data reference Report No.: R2203A0238-R1 & R2203A0238-R2 & R2203A0238-R3 & R2203A0238-R4, provided by TA Technology (Shanghai) Co., Ltd. 3. The items of power data refer to the previous report, updated the ERP/EIRP and only the maximum power of all frequency bands displayed in this report.			

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1 General Description

1.1 Lab Information

1.1.1 Testing Location

These measurements tests were conducted at the Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. facility located at F401 and F101, Building E, Hongwei Industrial Zone, Liuxian 3rd Road, Bao'an District, Shenzhen, China. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014

Tel.: +86-755-27212361

Contact Email: info@towewireless.com

1.1.2 Test Facility / Accreditations

A2LA (Certificate Number: 7088.01)

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

FCC Designation No.: CN1353

Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. has been recognized as an accredited testing laboratory. Designation Number: CN1353.

ISED CAB identifier: CN0152

Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0152

Company Number: 31000

1.2 Client Information

1.2.1 Applicant

Applicant:	InHand Networks, Inc.
Address:	3650 Concorde Pkwy, Suite 200, Chantilly, VA 20151, USA

1.2.2 Manufacturer

Manufacturer:	InHand Networks, Inc.
Address:	3650 Concorde Pkwy, Suite 200, Chantilly, VA 20151, USA

1.3 Product Information

EUT Description:	Industrial Wireless Gateway		
Test Model:	IR202		
Series Models:	IR212, IR252, IR292		
Brand:			
Hardware Version:	V1.0		
Software Version:	V1.0		
Device Capabilities:			
Modulation Type:	WCDMA:	☒ QPSK, ☒ 16QAM	
	LTE:	☒ QPSK, ☒ 16QAM	
Operation Frequency Range:	Band	TX Frequency	RX Frequency
	WCDMA Band II	1850 ~ 1910 MHz	1930 ~ 1990 MHz
	WCDMA Band IV	1710 ~ 1755 MHz	2110 ~ 2155 MHz
	WCDMA Band V	824 ~ 849 MHz	869 ~ 894 MHz
	LTE Band 2	1850 ~ 1910 MHz	1930 ~ 1990 MHz
	LTE Band 4	1710 ~ 1755 MHz	2110 ~ 2155 MHz
	LTE Band 5	824 ~ 849 MHz	869 ~ 894 MHz
	LTE Band 12	699 ~ 716 MHz	729 ~ 746 MHz
	LTE Band 13	777 ~ 787 MHz	746 ~ 756 MHz
	LTE Band 14	788 ~ 798 MHz	758 ~ 768 MHz
	LTE Band 66	1710 ~ 1780 MHz	2110 ~ 2200 MHz
	LTE Band 71	663 ~ 698 MHz	617 ~ 652 MHz
Power Class:	Class 3: All		
Antenna Type:	☐ External, ☒ Integrated		
Antenna Gain:	Band	Ant (dBi)	
	WCDMA Band II	-2.63	
	WCDMA Band IV	-2.63	
	WCDMA Band V	1.25	
	LTE Band 2	-2.63	
	LTE Band 4	-2.63	
	LTE Band 5	1.25	
	LTE Band 12	-1.57	
	LTE Band 13	0.33	
	LTE Band 14	0.33	
	LTE Band 66	-2.63	
	LTE Band 71	-1.57	
Remark: 1.The above EUT's information was declared by applicant, please refer to the specifications or user manual for more detailed description. 2. Please refer to the "Declaration letter" provided by the customer for specific model differences.			

2 Test Configuration

2.1 Test Channel

Band	TX Frequency			RX Frequency		
	Range	Channel	Frequency	Range	Channel	Frequency
WCDMA Band II	Low	9262	1852.4 MHz	Low	9662	1932.4 MHz
	Middle	9400	1880.0 MHz	Middle	9800	1960.0 MHz
	High	9538	1907.6 MHz	High	9938	1987.6 MHz
WCDMA Band IV	Low	1312	1712.4MHz	Low	1537	2112.4 MHz
	Middle	1413	1732.6 MHz	Middle	1638	2132.6 MHz
	High	1513	1752.6 MHz	High	1738	2152.6 MHz
WCDMA Band V	Low	4132	826.4 MHz	Low	4357	871.4 MHz
	Middle	4182	836.4 MHz	Middle	4407	881.4 MHz
	High	4233	846.6 MHz	High	4458	891.6 MHz

Band	Bandwidth	TX Frequency			RX Frequency		
		Range	Channel	Frequency	Range	Channel	Frequency
LTE Band 2	1.4MHz	Low	18607	1850.7 MHz	Low	607	1930.7 MHz
		Middle	18900	1880 MHz	Middle	900	1960 MHz
		High	19193	1909.3 MHz	High	1193	1989.3 MHz
	3MHz	Low	18615	1851.5 MHz	Low	615	1931.5 MHz
		Middle	18900	1880 MHz	Middle	900	1960 MHz
		High	19185	1908.5 MHz	High	1185	1988.5 MHz
	5MHz	Low	18625	1852.5 MHz	Low	625	1932.5 MHz
		Middle	18900	1880 MHz	Middle	900	1960 MHz
		High	19175	1907.5 MHz	High	1175	1987.5 MHz
	10MHz	Low	18650	1855 MHz	Low	650	1935 MHz
		Middle	18900	1880 MHz	Middle	900	1960 MHz
		High	19150	1905 MHz	High	1150	1985 MHz
	15MHz	Low	18675	1857.5 MHz	Low	675	1937.5 MHz
		Middle	18900	1880 MHz	Middle	900	1960 MHz
		High	19125	1902.5 MHz	High	1125	1982.5 MHz
LTE Band 4	1.4MHz	Low	19957	1710.7 MHz	Low	1957	2110.7 MHz
		Middle	20175	1732.5 MHz	Middle	2175	2132.5MHz
		High	20393	1754.3 MHz	High	2393	2154.3 MHz
	3MHz	Low	19965	1711.5 MHz	Low	1965	2111.5 MHz
		Middle	20175	1732.5 MHz	Middle	2175	2132.5MHz
		High	20385	1753.5 MHz	High	2385	2153.5 MHz
	5MHz	Low	19975	1712.5 MHz	Low	1975	2112.5 MHz
		Middle	20175	1732.5 MHz	Middle	2175	2132.5MHz
		High	20375	1752.5 MHz	High	2375	2152.5 MHz
	10MHz	Low	20000	1715 MHz	Low	2115	2115 MHz
		Middle	20175	1732.5 MHz	Middle	2175	2132.5MHz
		High	20350	1750 MHz	High	2350	2150 MHz
	15MHz	Low	20025	1717.5 MHz	Low	2025	2117.5 MHz
		Middle	20175	1732.5 MHz	Middle	2175	2132.5MHz
		High	20325	1747.5 MHz	High	2325	2147.5 MHz
	20MHz	Low	20050	1720 MHz	Low	2050	2120 MHz
		Middle	20175	1732.5 MHz	Middle	2175	2132.5MHz
		High	20300	1745 MHz	High	2300	2145 MHz
LTE Band 5	1.4MHz	Low	20407	824.7 MHz	Low	2407	869.7 MHz
		Middle	20525	836.5 MHz	Middle	2525	881.5 MHz
		High	20643	848.3 MHz	High	2643	893.3 MHz
	3MHz	Low	20415	825.5 MHz	Low	2415	870.5 MHz

Band	Bandwidth	TX Frequency			RX Frequency		
		Range	Channel	Frequency	Range	Channel	Frequency
		Middle	20525	836.5 MHz	Middle	2525	881.5 MHz
		High	20635	847.5 MHz	High	2635	892.5 MHz
		Low	20425	826.5 MHz	Low	2425	871.5 MHz
	5MHz	Middle	20525	836.5 MHz	Middle	2525	881.5 MHz
		High	20625	846.5 MHz	High	2625	891.5 MHz
		Low	20450	829 MHz	Low	2450	874 MHz
	10MHz	Middle	20525	836.5 MHz	Middle	2525	881.5 MHz
		High	20600	844 MHz	High	2600	889 MHz
LTE Band 12	1.4MHz	Low	23017	699.7 MHz	Low	5017	729.7 MHz
		Middle	23095	707.5 MHz	Middle	5095	737.5 MHz
		High	23173	715.3 MHz	High	5173	745.3 MHz
	3MHz	Low	23025	700.5 MHz	Low	5025	730.5 MHz
		Middle	23095	707.5 MHz	Middle	5095	737.5 MHz
		High	23165	714.5 MHz	High	5165	744.5 MHz
	5MHz	Low	23035	701.5 MHz	Low	5035	731.5 MHz
		Middle	23095	707.5 MHz	Middle	5095	737.5 MHz
		High	23155	713.5 MHz	High	5155	743.5 MHz
	10MHz	Low	23060	704 MHz	Low	5060	734 MHz
		Middle	23095	707.5 MHz	Middle	5095	737.5 MHz
		High	23130	711 MHz	High	5130	741 MHz
LTE Band 13	5MHz	Low	23205	779.5 MHz	Low	5205	748.5 MHz
		Middle	23230	782 MHz	Middle	5230	751 MHz
		High	23255	784.5 MHz	High	5255	753.5 MHz
	10MHz	Low	23230	782 MHz	Low	5230	751 MHz
		Middle	23230	782 MHz	Middle	5230	751 MHz
		High	23230	782 MHz	High	5230	751 MHz
LTE Band 14	5MHz	Low	23305	790.5 MHz	Low	5305	760.5 MHz
		Middle	23330	793 MHz	Middle	5330	763 MHz
		High	23355	795.5 MHz	High	5355	765.5 MHz
	10MHz	Low	23330	793 MHz	Low	5330	763 MHz
		Middle	23330	793 MHz	Middle	5330	763 MHz
		High	23330	793 MHz	High	5330	763 MHz
LTE Band 66	1.4MHz	Low	131979	1710.7 MHz	Low	66443	2110.7 MHz
		Middle	132322	1745 MHz	Middle	66786	2145MHz
		High	132665	1779.3 MHz	High	67329	2199.3 MHz
	3MHz	Low	131987	1711.5 MHz	Low	66451	2111.5 MHz
		Middle	132322	1745 MHz	Middle	66786	2145MHz
		High	132657	1778.5MHz	High	67321	2198.5MHz
	5MHz	Low	131997	1712.5 MHz	Low	66461	2112.5 MHz
		Middle	132322	1745 MHz	Middle	66786	2145MHz
		High	132647	1777.5 MHz	High	67311	2197.5 MHz
	10MHz	Low	132022	1715 MHz	Low	66486	2115 MHz
		Middle	132322	1745 MHz	Middle	66786	2145MHz
		High	132622	1775 MHz	High	67286	2195 MHz
	15MHz	Low	132047	1717.5 MHz	Low	66511	2117.5 MHz
		Middle	132322	1745 MHz	Middle	66786	2145MHz
		High	132597	1772.5 MHz	High	67261	2192.5 MHz
	20MHz	Low	132072	1720 MHz	Low	66536	2120 MHz
		Middle	132322	1745 MHz	Middle	66786	2145MHz
		High	132572	1770 MHz	High	67236	2190 MHz
LTE Band 71	5MHz	Low	133147	665.5 MHz	Low	68611	619.5 MHz
		Middle	133297	680.5 MHz	Middle	68761	634.5 MHz
		High	133447	695.5 MHz	High	68911	649.5 MHz
	10MHz	Low	133172	668 MHz	Low	68636	622 MHz
		Middle	133297	680.5 MHz	Middle	68761	634.5 MHz
		High	133422	693 MHz	High	68886	647 MHz

Band	Bandwidth	TX Frequency			RX Frequency		
		Range	Channel	Frequency	Range	Channel	Frequency
	15MHz	Low	133197	670.5 MHz	Low	68661	624.5 MHz
		Middle	133297	680.5 MHz	Middle	68761	634.5 MHz
		High	133397	690.5 MHz	High	68861	644.5 MHz
	20MHz	Low	133222	673 MHz	Low	68686	627 MHz
		Middle	133297	680.5 MHz	Middle	68761	634.5 MHz
		High	133372	688 MHz	High	68836	642 MHz

2.2 Test Mode

Test Mode	Description
TM 1	EUT communication with simulated station in WCDMA/RMC mode
TM 2	EUT communication with simulated station in WCDMA/HSPA+ mode
TM 3	EUT communication with simulated station in LTE/QPSK mode
TM 4	EUT communication with simulated station in LTE/16QAM mode

2.3 Support Unit used in test

The EUT has been tested as an independent unit.

2.4 Test Environment

Temperature:	Normal: 15°C ~ 35°C
Relative Humidity	45 ~ 56 % RH Ambient
Voltage:	Nominal: 3.8 Vdc

2.5 Test RF Cable

For all conducted test items: The offset level is set spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

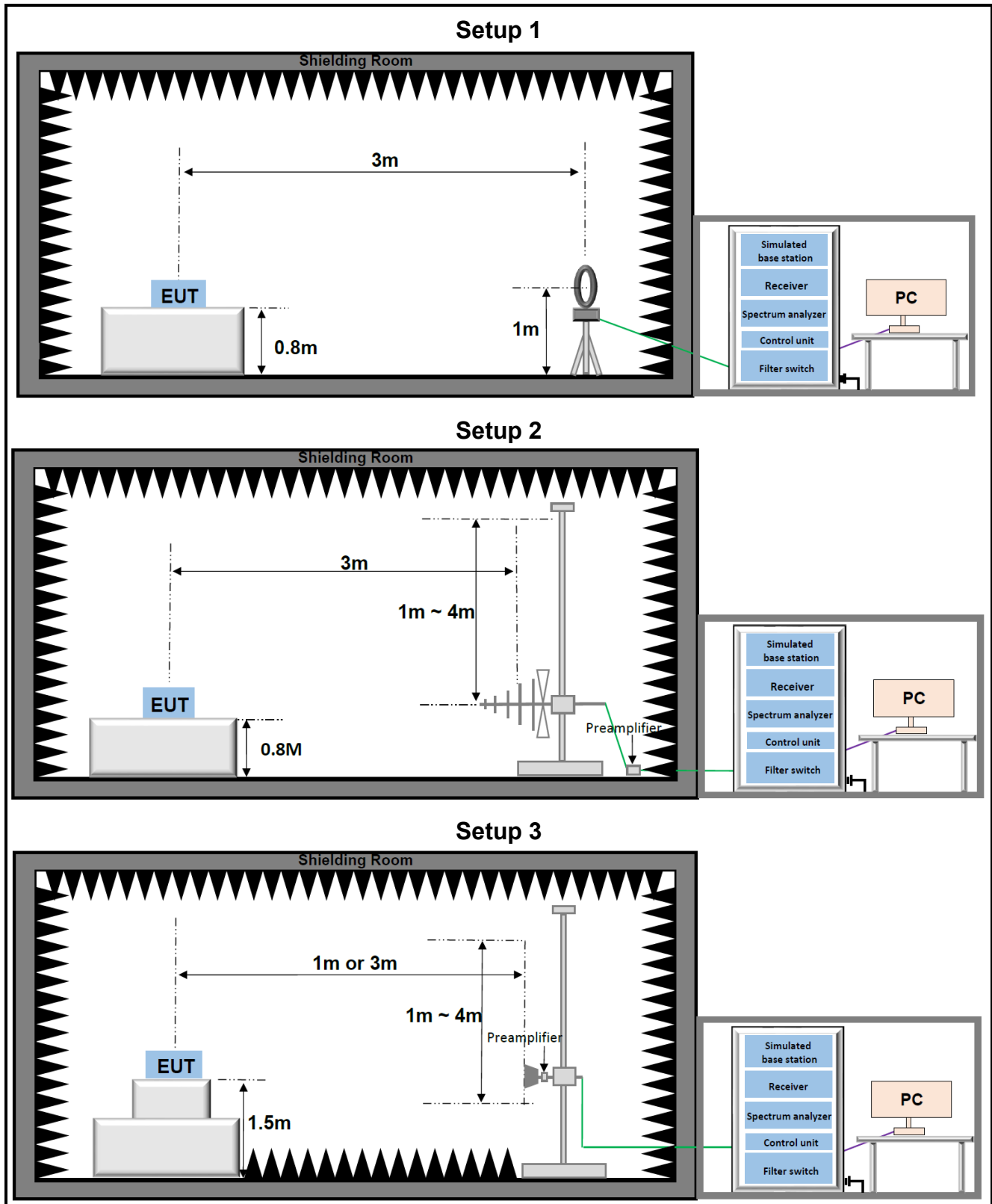
Offset = RF cable loss + attenuator factor.

2.6 Modifications

No modifications were made during testing.

2.7 Test Setup Diagram

2.7.1 Radiated Configuration



3 Equipment and Measurement Uncertainty

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, whichever is less, and where applicable is traceable recognized national standards.

3.1 Test Equipment List

Radiated Emission					
Description	Manufacturer	Model	S.N.	Last Due	Cal Due
Biconic Logarithmic Periodic Antennas	Schwarzbeck	VULB9163	1643	2023/06/25	2026/06/24
Double-Ridged Horn Antennas	Schwarzbeck	BBHA 9120D	2809	2023/06/25	2026/06/24
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	1290	2023/06/25	2026/06/24
Loop Antenna	Schwarzbeck	FMZB 1519C	1519C-028	2023/06/29	2026/06/28
Signal Analyzer	Keysight	N9020A	MY49100252	2025/03/11	2026/03/10
EXA Signal Analyzer, Multi-touch	Keysight	N9010B	MY63440541	2025/05/29	2026/05/28
Wideband Radio Communication Tester	R&S	CMW500	150645	2025/03/11	2026/03/10
Low Noise Amplifier	Tonscend	TAP9K3G40	AP23A8060273	2025/03/11	2027/03/10
Low Noise Amplifier	Tonscend	TAP01018050	AP22G806258	2025/03/11	2027/03/10
Low Noise Amplifier	Tonscend	TAP18040048	AP22G806247	2025/03/11	2027/03/10
Hygrometer	BINGYU	HTC-1	N/A	2025/07/25	2026/07/24
Test Software	Tonscend	TS+	Version: 5.0.0	N/A	N/A

3.2 Measurement Uncertainty

Parameter	U _{lab}
Radiated Emissions(9kHz~30MHz)	2.40dB
Radiated Emissions(30MHz~1000MHz)	4.66dB
Radiated Emissions(1GHz~18GHz)	5.42dB
Radiated Emissions(18GHz~40GHz)	5.46dB

Uncertainty figures are valid to a confidence level of 95%

4 Test Results

4.1 Field Strength of Spurious Radiation

Limits

FCC part	Test Band	Limit
§2.1053 §22.917(a) §24.238(a) §27.53(g) §27.53(h)	WCDMA Band V/LTE Band 5 WCDMA Band II/LTE Band 2 LTE Band 12/71 WCDMA Band IV/LTE Band 4/66	The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.
§27.53(c)(f)	LTE Band 13	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; For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.
§90.543(e)(f)	LTE Band 14	least $43 + 10 \log(P)$ dB. For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals.

Test Procedure

KDB 971168 D01 V03r01 Section 7

Test Settings

- For radiated emissions measurements performed at frequencies less than or equal to 1GHz, the EUT shall be placed on a RF-transparent table or support at a nominal height of 80cm above the reference ground plane.
- For radiated emissions measurements performed at frequencies above 1GHz, the EUT shall be placed on a RF-transparent table or support at a nominal height of 150cm above the ground plane.
- Radiated measurements shall be made with the measurement antenna positioned in both horizontal and vertical polarization. The measurement antenna shall be varied from 1m to 4m in height above the reference ground in a search for the relative positioning that produces the maximum radiated signal level (i.e, field strength or received power), when orienting the measurement antenna in vertical polarization, the minimum height of the lowest element of the antenna shall clear the site reference ground plane by at least 25cm.
- For each suspected emission, the EUT was ranged its worst case and then tune the antenna tower(from 1~4m) and turntable(from 0~360°) find the maximum reading. Preamplifier and a high pass filter are used for the test in order get better signal level comply with the guidelines.
- The simulated base station was set to force the EUT to its maximum transmitting power.
- spectrum analyzer setting:
Measurements 9kHz ~150kHz: RBW = 300Hz; VBW ≥ 3kHz; Detector = RMS
Measurements 150kHz ~30MHz: RBW = 10kHz; VBW ≥ 30kHz; Detector = RMS

Measurements 30MHz~1000MHz: RBW = 100kHz or 1MHz; VBW ≥ 1MHz or 3MHz; Detector = RMS

Measurements Above 1000MHz: RBW = 1 MHz; VBW ≥ 3 MHz; Detector = RMS

7. The field strength is calculated by adding the Antenna Factor, Cable Factor. The basic equation with a sample calculation is as follows:

$E(\text{dB}\mu\text{V/m}) = \text{Measured amplitude level (dB}\mu\text{V)} + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$.

$E(\text{dB}\mu\text{V/m}) = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$.

$E(\text{dB}\mu\text{V/m}) = \text{EIRP(dBm)} - 20\log(D) + 104.8$; where D is the measurement distance(in the far field region) in m.

$\text{EIRP(dBm)} = E(\text{dB}\mu\text{V/m}) + 20\log(D) - 104.8$; where D is the measurement distance(in the far field region) in m.

So, from d: The measuring distance is usually at 3m, then $20\log(3)=9.5424$*

Then, $\text{EIRP (dBm)} = E(\text{dB}\mu\text{V/m}) + 9.5424 - 104.8 = E(\text{dB}\mu\text{V/m}) - 95.2576$

8. Repeat above procedures until all frequencies measured was complete.
9. Measure and record the results in the test report.

Test notes

1. This device employs UMTS technology with WCDMA(AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2kbps RMC and TPC bits all set to "1".
2. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst-case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
3. Emissions below 18GHz were measured at a 3-meter test distance while emissions above 18GHz were measured at a 1-meter test distance with the application of a distance correction factor.
4. Radiated spurious emissions were investigated from 9kHz to 30MHz, 30MHz-1GHz and above 1GHz. the disturbance between 9kHz to 30MHz, 30MHz-1GHz and 18GHz to 40GHz was very low. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be recorded, so only the harmonics had been displayed.
5. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

Test Setup

Refer to section 2.7.1 for details.

Measuring Instruments

The measuring equipment is listed in the section 3.1 of this test report.

Test Result

The detailed test data see: **Appendix**.

5 Test Setup Photos

The detailed test data see: **Appendix-A WWAN Setup Photos**

Appendix

Maximum Power

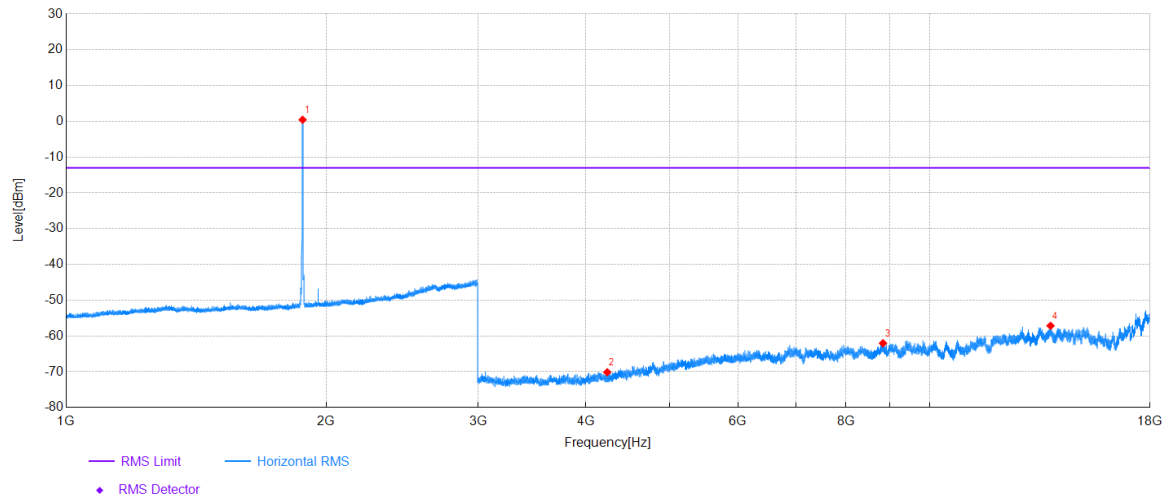
Frequency Band	Frequency Range (MHz)		Emission Designator	Conducted Power	Gain	EIRP/ERP		Limit
	Low	High		dBm	dBd	dBm	W	dBm
WCDMA Band V	826.4	846.6	4M15F9W	23.01	1.25	22.11	0.163	38.45
LTE Band 5	824.7	848.3	8M99G7D	23.61	1.25	22.71	0.187	38.45
LTE Band 5	824.7	848.3	8M98W7D	22.01	1.25	21.11	0.129	38.45
LTE Band 5	824.7	848.3	4M50W7D	21.94	1.25	21.04	0.127	38.45
WCDMA Band II	1852.4	1907.6	4M13F9W	23.17	-2.63	20.54	0.113	33.00
LTE Band 2	1850.7	1909.3	9M05G7D	23.85	-2.63	21.22	0.132	33.00
LTE Band 2	1850.7	1909.3	17M9G7D	23.80	-2.63	21.17	0.131	33.00
LTE Band 2	1850.7	1909.3	2M77W7D	23.05	-2.63	20.42	0.110	33.00
LTE Band 2	1850.7	1909.3	17M9W7D	22.99	-2.63	20.36	0.109	33.00
WCDMA Band IV	1712.4	1752.6	4M13F9W	23.39	-2.63	20.76	0.119	30.00
LTE Band 4	1710.7	1754.3	2M75G7D	23.72	-2.63	21.09	0.129	30.00
LTE Band 4	1710.7	1754.3	17M9G7D	23.64	-2.63	21.01	0.126	30.00
LTE Band 4	1710.7	1754.3	2M76W7D	23.40	-2.63	20.77	0.119	30.00
LTE Band 4	1710.7	1754.3	17M9W7D	23.34	-2.63	20.71	0.118	30.00
LTE Band 12	699.7	715.3	9M05G7D	23.69	-1.57	19.97	0.099	34.77
LTE Band 12	699.7	715.3	2M76W7D	23.24	-1.57	19.52	0.090	34.77
LTE Band 12	699.7	715.3	9M04W7D	23.18	-1.57	19.46	0.088	34.77
LTE Band 13	779.5	784.5	9M03G7D	23.85	0.33	22.03	0.160	34.77
LTE Band 13	779.5	784.5	9M03W7D	23.41	0.33	21.59	0.144	34.77
LTE Band 66	1710.7	1779.3	9M04G7D	23.82	-2.63	21.19	0.132	30.00
LTE Band 66	1710.7	1779.3	17M9G7D	23.77	-2.63	21.14	0.130	30.00
LTE Band 66	1710.7	1779.3	2M77W7D	22.81	-2.63	20.18	0.104	30.00
LTE Band 66	1710.7	1779.3	17M9W7D	22.79	-2.63	20.16	0.104	30.00
LTE Band 71	665.5	695.5	9M03G7D	23.47	-1.57	19.75	0.094	34.77
LTE Band 71	665.5	695.5	17M9G7D	23.44	-1.57	19.72	0.094	34.77
LTE Band 71	665.5	695.5	9M04W7D	22.94	-1.57	19.22	0.084	34.77
LTE Band 71	665.5	695.5	17M9W7D	22.88	-1.57	19.16	0.082	34.77
LTE Band 14	790.5	795.5	4M53G7D	23.91	0.33	22.09	0.162	34.77
LTE Band 14	790.5	795.5	9M02G7D	23.85	0.33	22.03	0.160	34.77
LTE Band 14	790.5	795.5	9M03W7D	23.38	0.33	21.56	0.143	34.77

Field Strength of Spurious Radiation

Test Result for WCDMA

Project Information			
Mode:	WCDMA Link	Band:	II
Bandwidth:	-	Channel:	-
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph

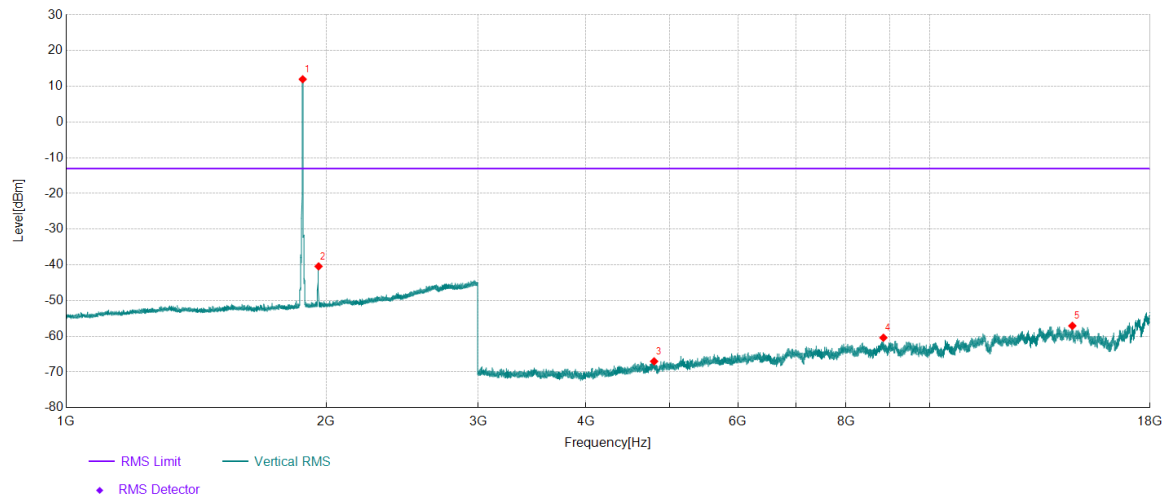


Data List								
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1878.80	85.38	-84.95	0.43	-	-	Horizontal	NA
2	4233.00	34.98	-105.13	-70.15	-13.00	57.15	Horizontal	PASS
3	8831.00	30.70	-92.74	-62.04	-13.00	49.04	Horizontal	PASS
4	13804.50	30.10	-87.26	-57.16	-13.00	44.16	Horizontal	PASS

Project Information

Mode:	WCDMA Link	Band:	II
Bandwidth:	-	Channel:	-
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



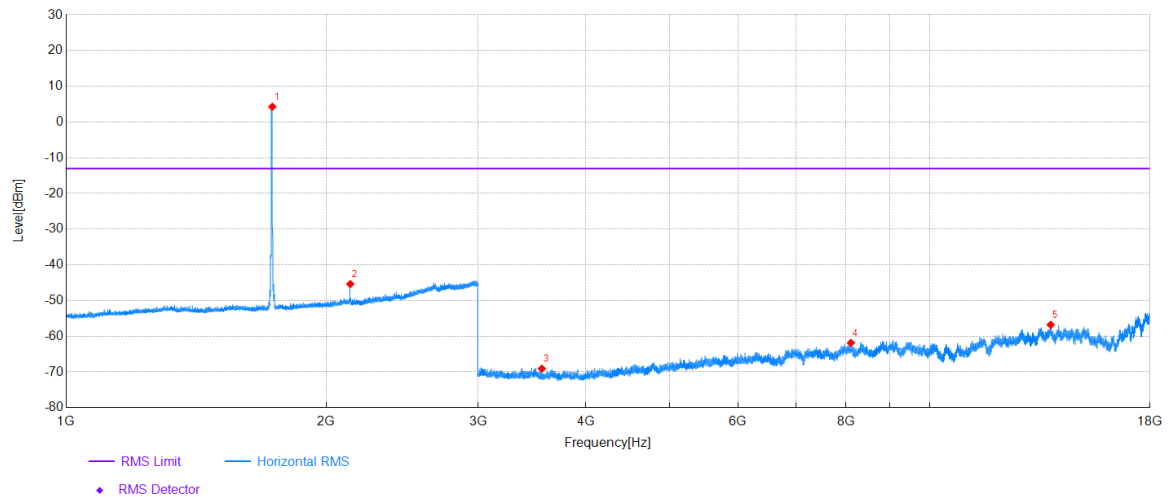
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1879.20	96.94	-84.95	11.99	-	-	Vertical	NA
2	1960.40	44.35	-84.77	-40.42	-	-	Vertical	NA
3	4796.50	35.80	-102.82	-67.02	-13.00	54.02	Vertical	PASS
4	8840.50	32.25	-92.65	-60.40	-13.00	47.40	Vertical	PASS
5	14631.00	28.72	-85.79	-57.07	-13.00	44.07	Vertical	PASS

Project Information

Mode:	WCDMA	Band:	IV
Bandwidth:	-	Channel:	-
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



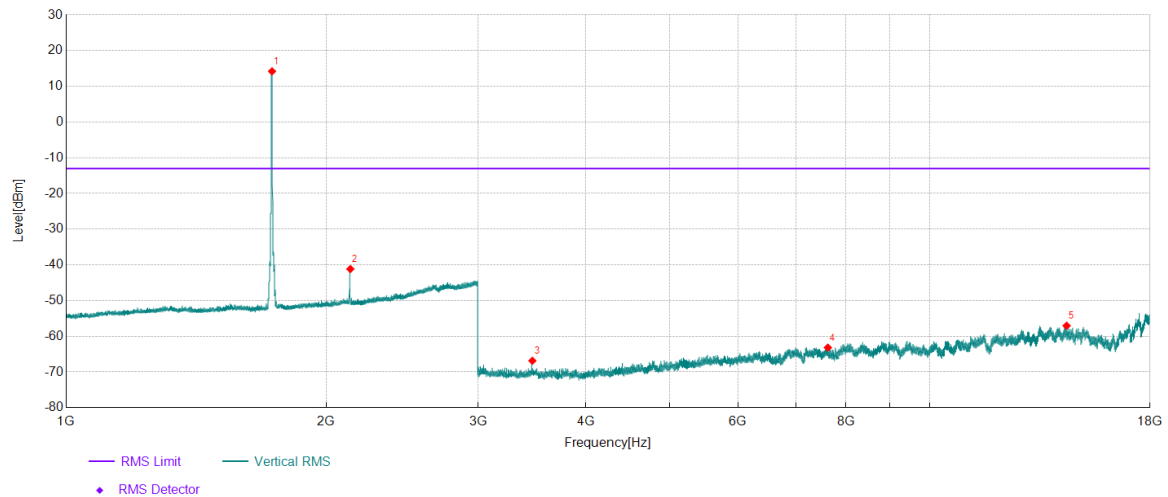
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1732.80	89.48	-85.20	4.28	-	-	Horizontal	NA
2	2133.20	39.14	-84.52	-45.38	-	-	Horizontal	NA
3	3555.50	38.46	-107.53	-69.07	-13.00	56.07	Horizontal	PASS
4	8107.00	33.02	-94.87	-61.85	-13.00	48.85	Horizontal	PASS
5	13811.00	30.37	-87.15	-56.78	-13.00	43.78	Horizontal	PASS

Project Information

Mode:	WCDMA	Band:	IV
Bandwidth:	-	Channel:	-
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



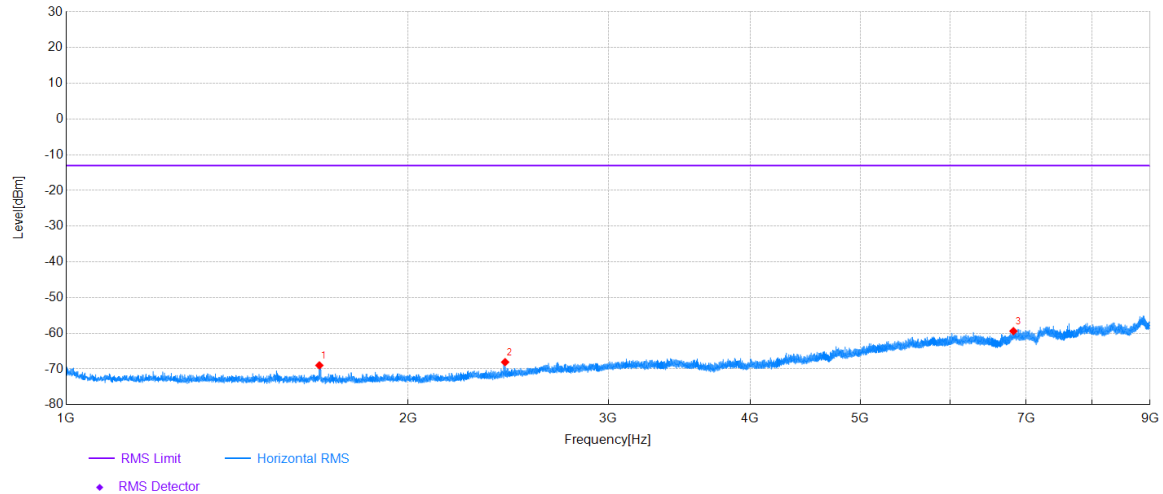
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1731.60	99.45	-85.22	14.23	-	-	Vertical	NA
2	2133.60	43.36	-84.52	-41.16	-	-	Vertical	NA
3	3467.00	40.32	-107.18	-66.86	-13.00	53.86	Vertical	PASS
4	7623.50	33.13	-96.31	-63.18	-13.00	50.18	Vertical	PASS
5	14411.00	30.09	-87.14	-57.05	-13.00	44.05	Vertical	PASS

Project Information

Mode:	WCDMA	Band:	V
Bandwidth:	-	Channel:	-
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



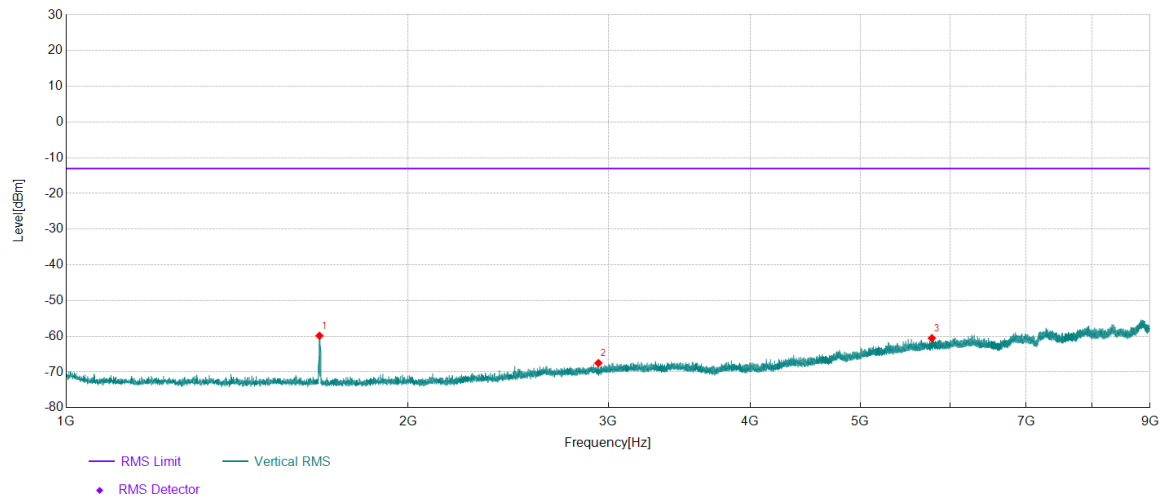
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1670.93	45.14	-114.13	-68.99	-13.00	55.99	Horizontal	PASS
2	2434.93	43.37	-111.45	-68.08	-13.00	55.08	Horizontal	PASS
3	6822.67	38.53	-97.92	-59.39	-13.00	46.39	Horizontal	PASS

Project Information

Mode:	WCDMA	Band:	V
Bandwidth:	-	Channel:	-
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



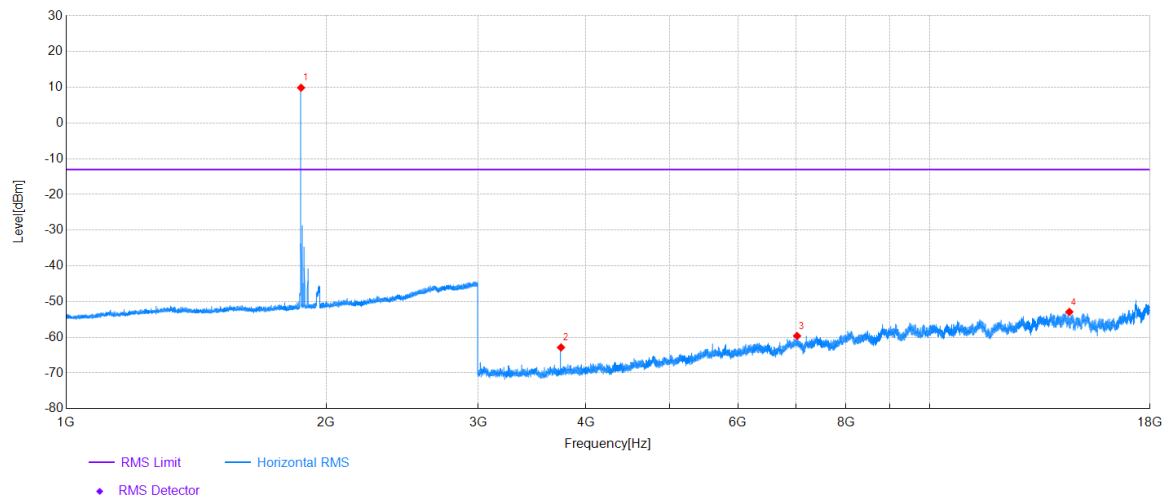
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1671.20	54.28	-114.13	-59.85	-13.00	46.85	Vertical	PASS
2	2941.60	41.71	-109.21	-67.50	-13.00	54.50	Vertical	PASS
3	5783.20	39.57	-100.10	-60.53	-13.00	47.53	Vertical	PASS

Test Result for LTE

Project Information			
Mode:	LTE Link	Band:	B2
Bandwidth:	20MHz	Channel:	Mid
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph

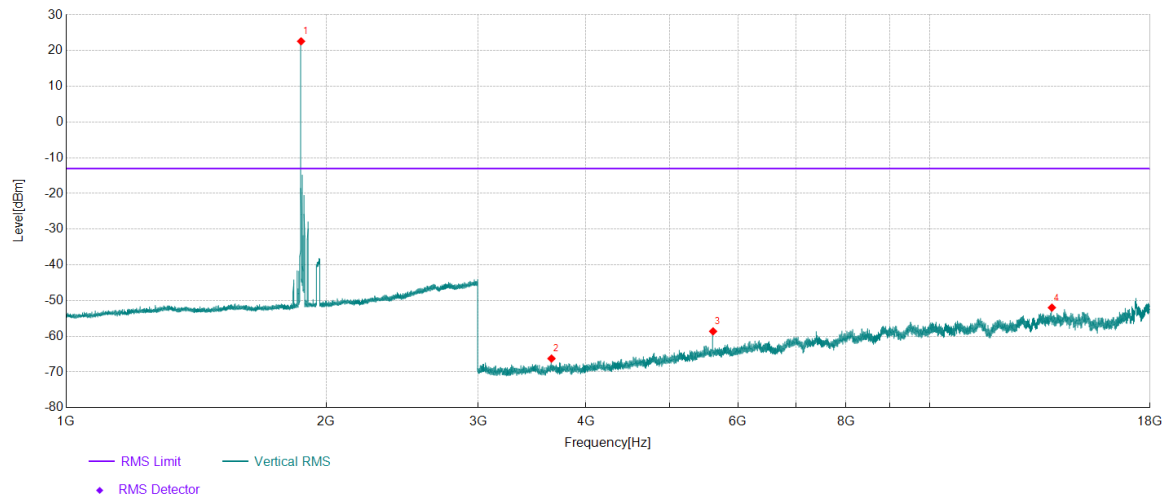


Data List								
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1871.00	94.87	-84.97	9.90	-	-	Horizontal	NA
2	3742.00	44.59	-107.43	-62.84	-13.00	49.84	Horizontal	PASS
3	7022.50	37.56	-97.19	-59.63	-13.00	46.63	Horizontal	PASS
4	14514.00	34.41	-87.30	-52.89	-13.00	39.89	Horizontal	PASS

Project Information

Mode:	LTE Link	Band:	B2
Bandwidth:	20MHz	Channel:	Mid
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



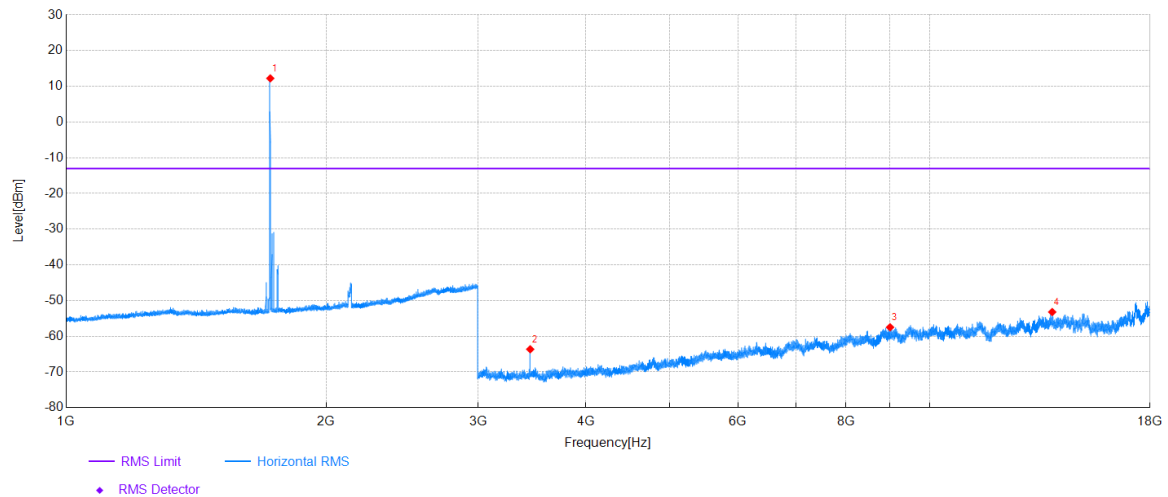
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1871.00	107.60	-84.97	22.63	-	-	Vertical	NA
2	3648.00	40.69	-106.93	-66.24	-13.00	53.24	Vertical	PASS
3	5613.50	42.57	-101.19	-58.62	-13.00	45.62	Vertical	PASS
4	13854.50	34.64	-86.61	-51.97	-13.00	38.97	Vertical	PASS

Project Information

Mode:	LTE Link	Band:	B4
Bandwidth:	20MHz	Channel:	Mid
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



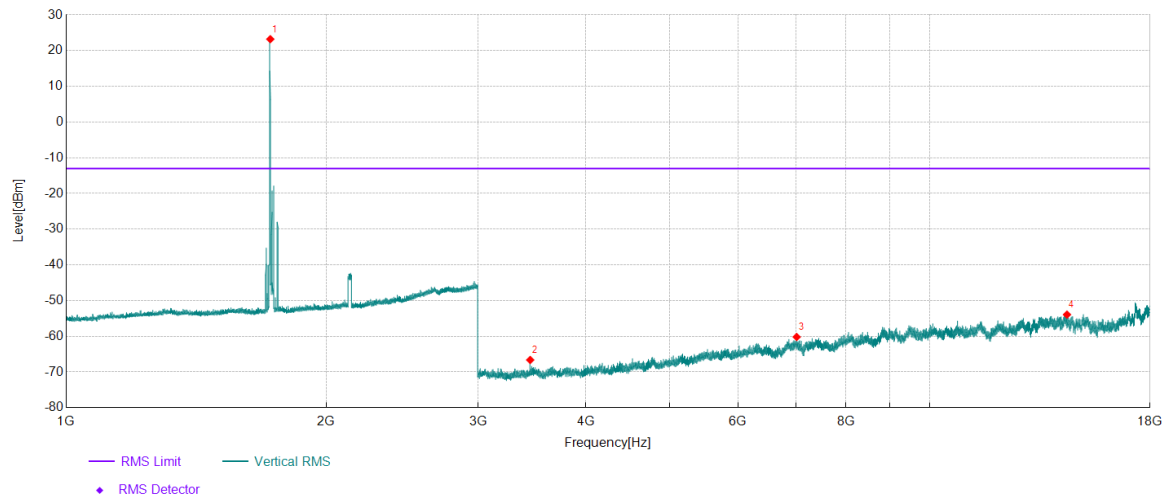
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1723.60	97.52	-85.28	12.24	-	-	Horizontal	NA
2	3447.00	43.66	-107.30	-63.64	-13.00	50.64	Horizontal	PASS
3	8998.50	35.77	-93.25	-57.48	-13.00	44.48	Horizontal	PASS
4	13867.50	33.62	-86.83	-53.21	-13.00	40.21	Horizontal	PASS

Project Information

Mode:	LTE Link	Band:	B4
Bandwidth:	20MHz	Channel:	Mid
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



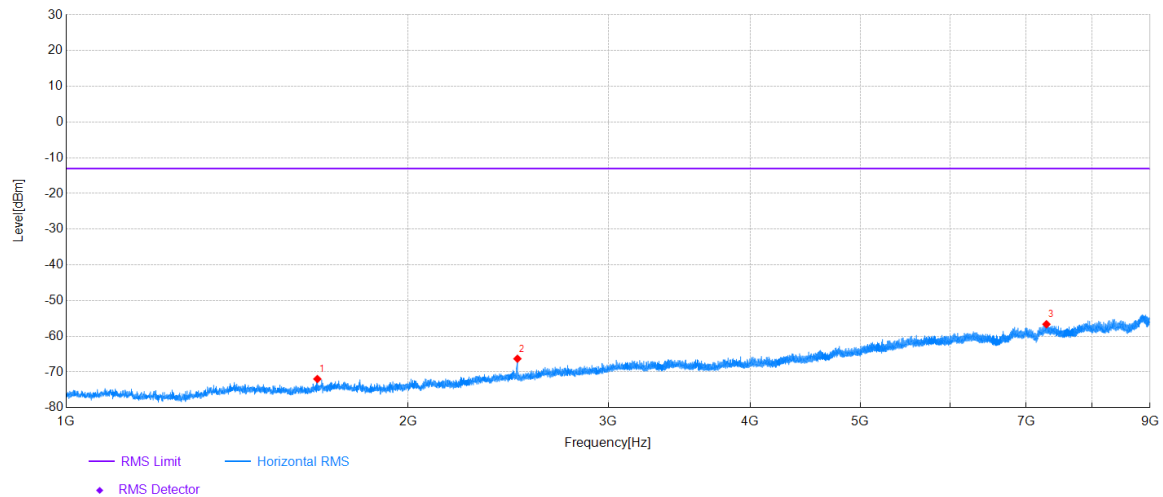
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1723.60	108.50	-85.28	23.22	-	-	Vertical	NA
2	3447.00	40.67	-107.30	-66.63	-13.00	53.63	Vertical	PASS
3	7015.00	36.94	-97.13	-60.19	-13.00	47.19	Vertical	PASS
4	14424.50	33.42	-87.36	-53.94	-13.00	40.94	Vertical	PASS

Project Information

Mode:	LTE Link	Band:	B5
Bandwidth:	10MHz	Channel:	Mid
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



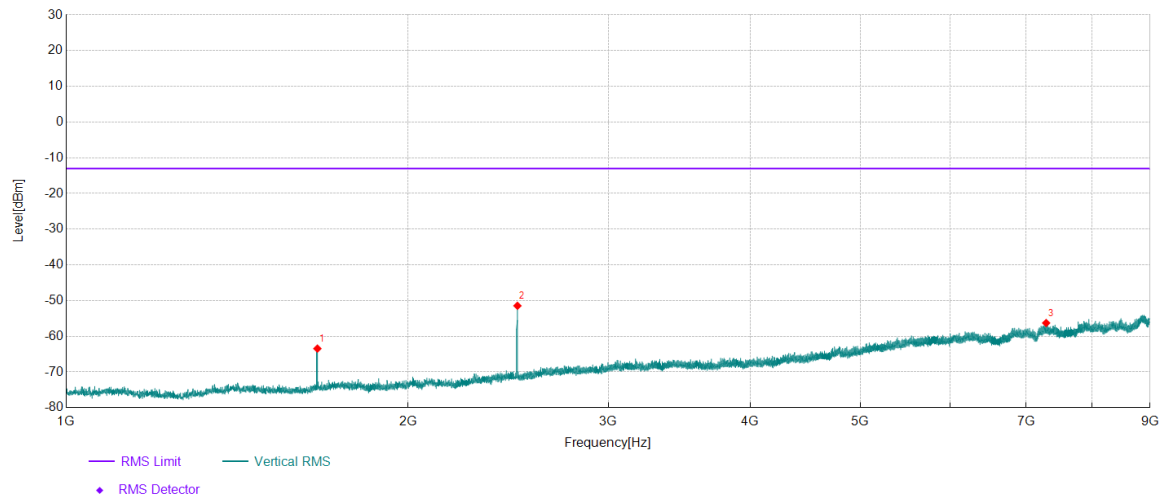
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1664.00	42.15	-114.12	-71.97	-13.00	58.97	Horizontal	PASS
2	2496.27	45.08	-111.37	-66.29	-13.00	53.29	Horizontal	PASS
3	7295.20	39.36	-95.98	-56.62	-13.00	43.62	Horizontal	PASS

Project Information

Mode:	LTE Link	Band:	B5
Bandwidth:	10MHz	Channel:	Mid
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



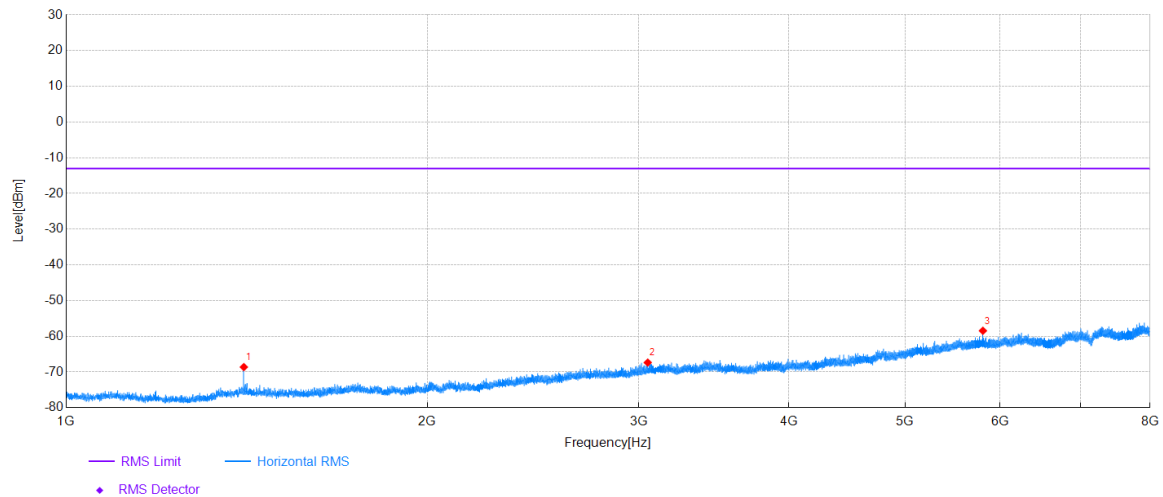
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1664.00	50.67	-114.12	-63.45	-13.00	50.45	Vertical	PASS
2	2496.27	59.91	-111.37	-51.46	-13.00	38.46	Vertical	PASS
3	7290.93	39.78	-96.06	-56.28	-13.00	43.28	Vertical	PASS

Project Information

Mode:	LTE Link	Band:	B12
Bandwidth:	10MHz	Channel:	Mid
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



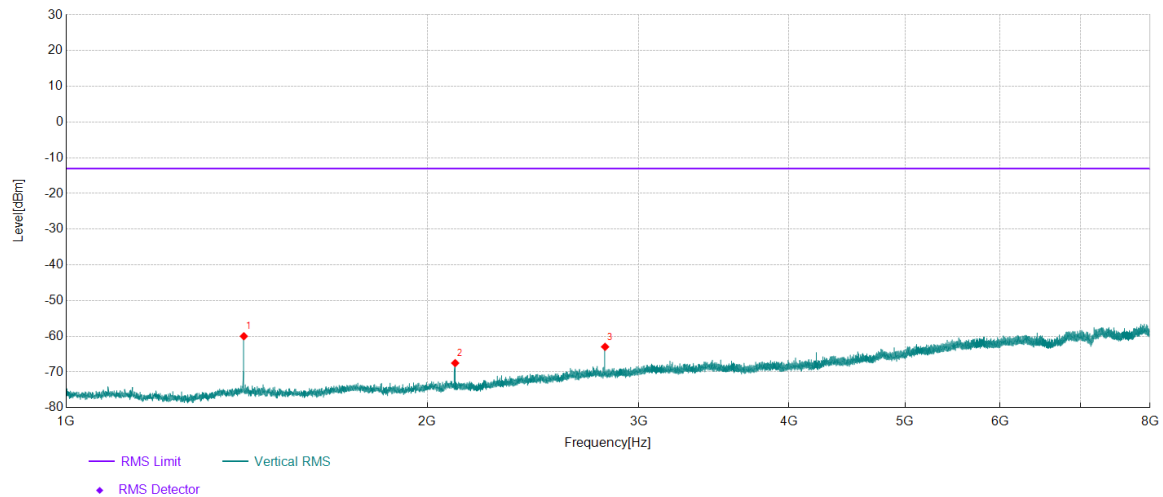
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1406.23	45.71	-114.33	-68.62	-13.00	55.62	Horizontal	PASS
2	3051.93	41.43	-108.79	-67.36	-13.00	54.36	Horizontal	PASS
3	5805.50	41.58	-100.04	-58.46	-13.00	45.46	Horizontal	PASS

Project Information

Mode:	LTE Link	Band:	B12
Bandwidth:	10MHz	Channel:	Mid
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



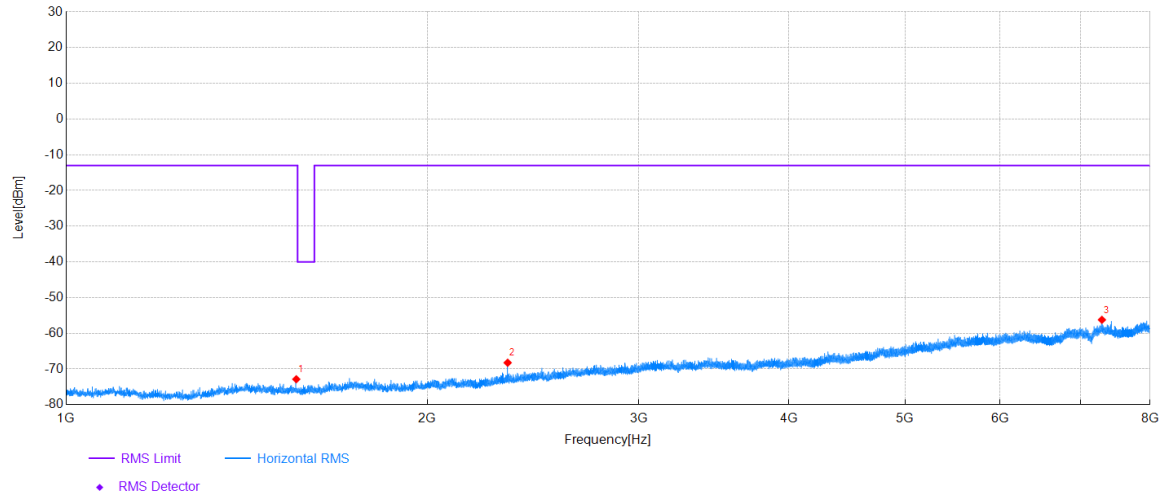
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1406.23	54.34	-114.33	-59.99	-13.00	46.99	Vertical	PASS
2	2109.27	45.70	-113.21	-67.51	-13.00	54.51	Vertical	PASS
3	2812.07	46.86	-109.81	-62.95	-13.00	49.95	Vertical	PASS

Project Information

Mode:	LTE Link	Band:	B13
Bandwidth:	10MHz	Channel:	Mid
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



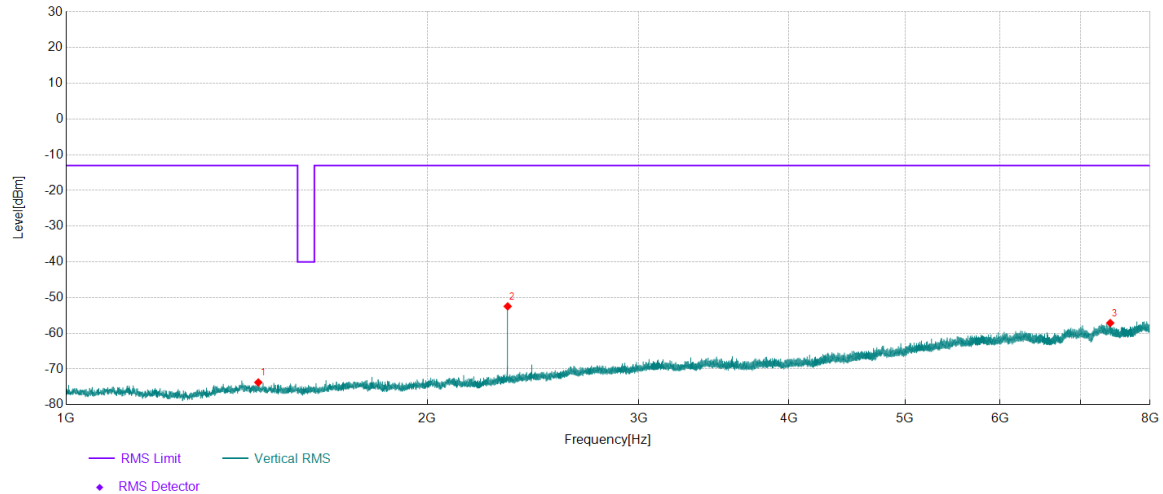
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1555.10	41.20	-114.07	-72.87	-13.00	59.87	Horizontal	PASS
2	2332.80	44.14	-112.39	-68.25	-13.00	55.25	Horizontal	PASS
3	7294.87	39.76	-95.99	-56.23	-13.00	43.23	Horizontal	PASS

Project Information

Mode:	LTE Link	Band:	B13
Bandwidth:	10MHz	Channel:	Mid
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



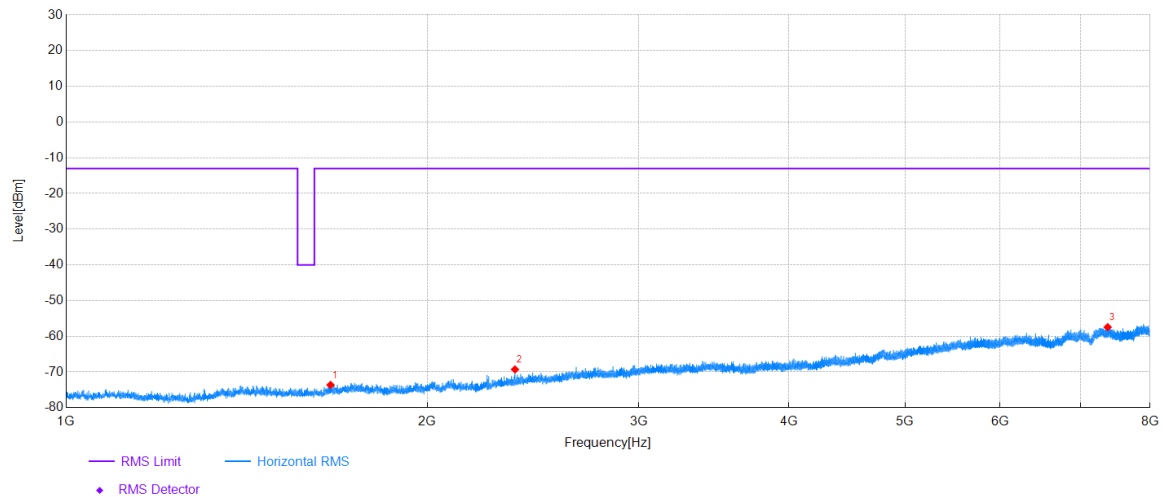
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1445.90	40.70	-114.46	-73.76	-13.00	60.76	Vertical	PASS
2	2332.80	59.93	-112.39	-52.46	-13.00	39.46	Vertical	PASS
3	7411.77	39.50	-96.62	-57.12	-13.00	44.12	Vertical	PASS

Project Information

Mode:	LTE Link	Band:	B14
Bandwidth:	10MHz	Channel:	Mid
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



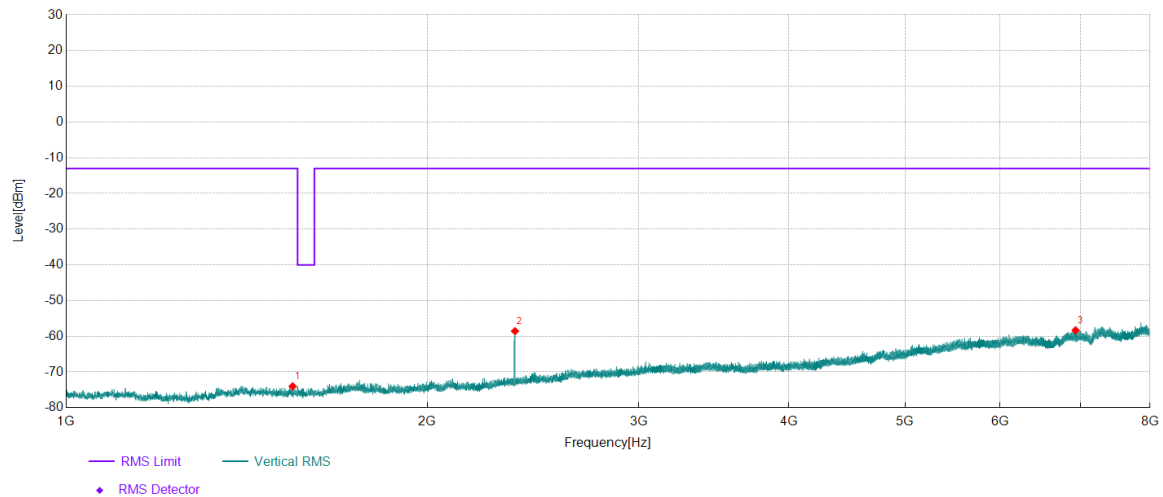
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1660.57	40.48	-114.11	-73.63	-13.00	60.63	Horizontal	PASS
2	2365.70	43.13	-112.42	-69.29	-13.00	56.29	Horizontal	PASS
3	7374.90	39.19	-96.64	-57.45	-13.00	44.45	Horizontal	PASS

Project Information

Mode:	LTE Link	Band:	B14
Bandwidth:	10MHz	Channel:	Mid
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



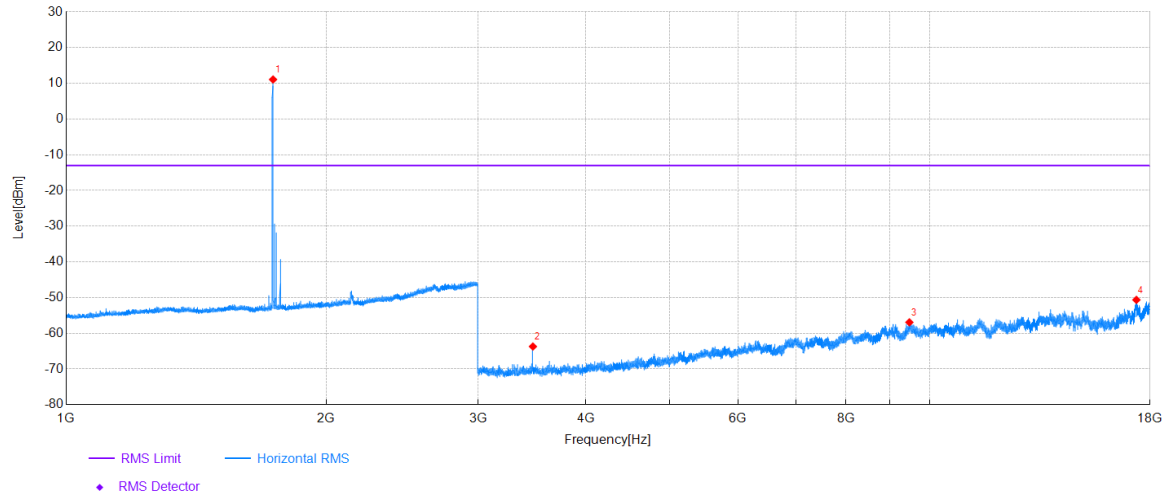
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1544.37	40.06	-114.06	-74.00	-13.00	61.00	Vertical	PASS
2	2365.70	53.86	-112.42	-58.56	-13.00	45.56	Vertical	PASS
3	6935.07	39.49	-97.82	-58.33	-13.00	45.33	Vertical	PASS

Project Information

Mode:	LTE Link	Band:	B66
Bandwidth:	20MHz	Channel:	Mid
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



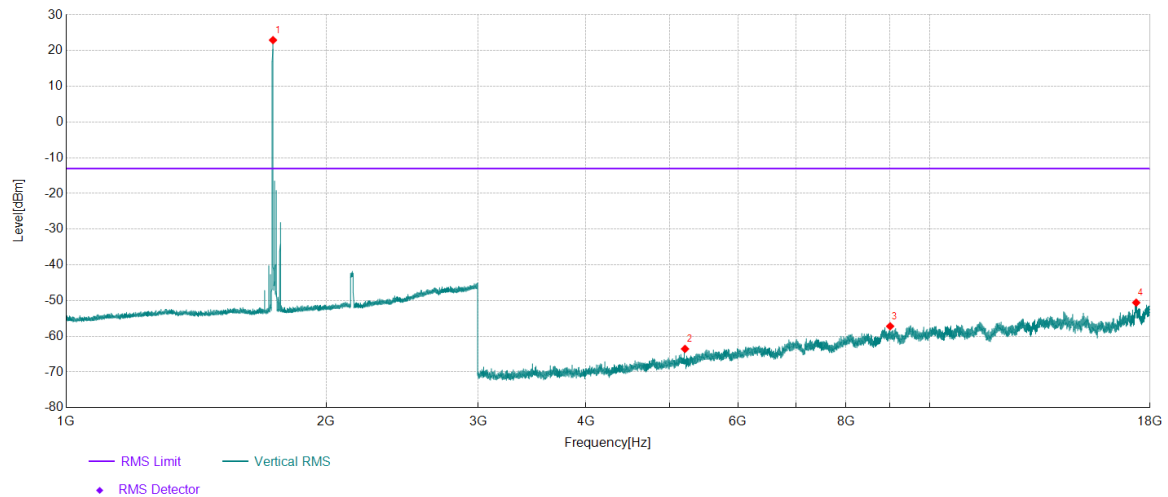
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1736.20	96.27	-85.18	11.09	-	-	Horizontal	NA
2	3472.00	43.44	-107.15	-63.71	-13.00	50.71	Horizontal	PASS
3	9475.50	36.12	-93.05	-56.93	-13.00	43.93	Horizontal	PASS
4	17357.00	32.03	-82.67	-50.64	-13.00	37.64	Horizontal	PASS

Project Information

Mode:	LTE Link	Band:	B66
Bandwidth:	20MHz	Channel:	Mid
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



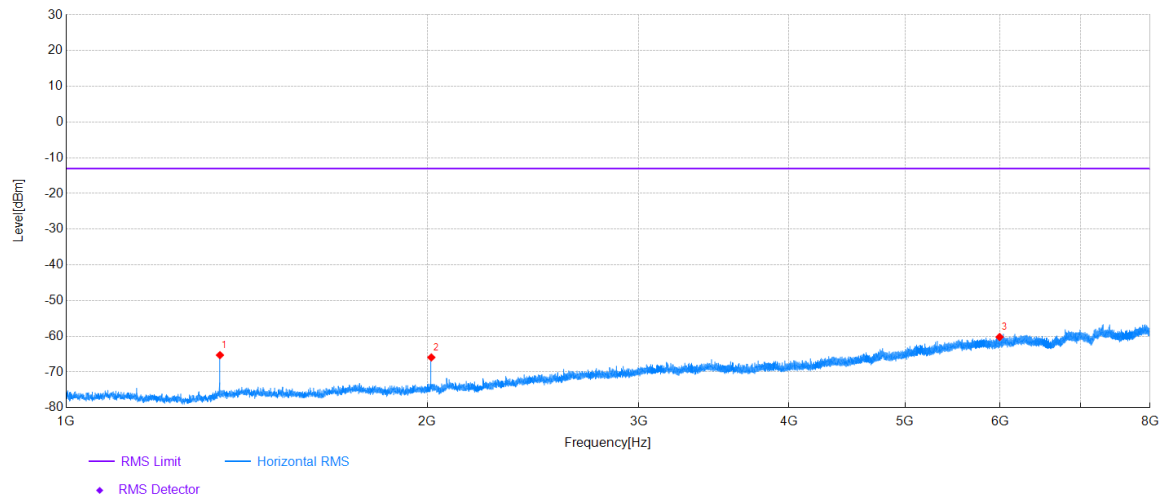
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1736.00	108.14	-85.18	22.96	-	-	Vertical	NA
2	5208.50	38.65	-102.19	-63.54	-13.00	50.54	Vertical	PASS
3	9000.50	36.04	-93.23	-57.19	-13.00	44.19	Vertical	PASS
4	17348.50	31.89	-82.47	-50.58	-13.00	37.58	Vertical	PASS

Project Information

Mode:	LTE Link	Band:	B71
Bandwidth:	20MHz	Channel:	Mid
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



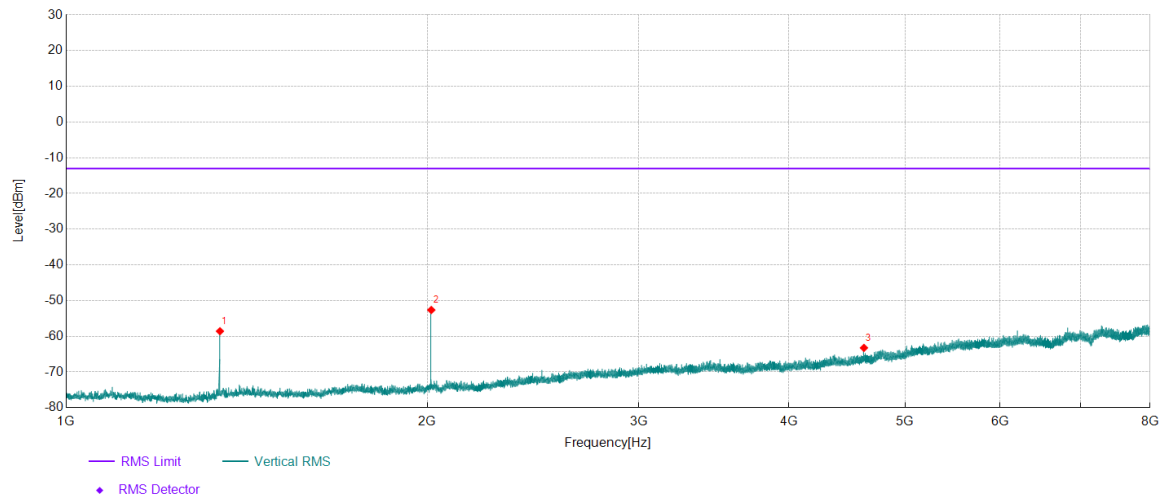
Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1343.23	48.93	-114.21	-65.28	-13.00	52.28	Horizontal	PASS
2	2015.00	47.59	-113.51	-65.92	-13.00	52.92	Horizontal	PASS
3	5994.73	39.80	-100.01	-60.21	-13.00	47.21	Horizontal	PASS

Project Information

Mode:	LTE Link	Band:	B71
Bandwidth:	20MHz	Channel:	Mid
IMEI:		Engineer:	Tian Shuo
Remark:	-		

Test Graph



Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBm]	Limit [dBm]	Margin [dB]	Polarity	Verdict
1	1343.23	55.63	-114.21	-58.58	-13.00	45.58	Vertical	PASS
2	2014.77	60.88	-113.51	-52.63	-13.00	39.63	Vertical	PASS
3	4620.87	40.56	-103.81	-63.25	-13.00	50.25	Vertical	PASS

~The End~