RF TEST REPORT

Applicant	Quectel Wireless Solutions Co., Ltd
FCC ID	XMR202106EG91NAL
Product	LTE Module
Brand	Quectel
Model	EG91-NAL
Report No.	R2105A0463-R2
Issue Date	June 17, 2021

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2020)/ FCC CFR 47 Part 24E (2020)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Prepared by: Peng Tao | *Approved by: Kai Xu*

TA Technology (Shanghai) Co., Ltd.

No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China

TEL: +86-021-50791141/2/3

FAX: +86-021-50791141/2/3-8000

TABLE OF CONTENT

1. Test Laboratory 4
1.1. Notes of the test report 4
1.2. Test facility 4
1.3. Testing Location 4
2. General Description of Equipment under Test 5
2.1. Applicant and Manufacturer Information 5
2.2. General information 5
3. Applied Standards 6
4. Test Configuration 7
5. Test Case Results 8
5.1. RF Power Output and Effective Isotropic Radiated Power 8
5.2. Occupied Bandwidth 13
5.3. Band Edge Compliance 22
5.4. Peak-to-Average Power Ratio (PAPR) 29
5.5. Frequency Stability 31
5.6. Spurious Emissions at Antenna Terminals 35
5.7. Radiates Spurious Emission 47
6. Main Test Instruments 52
ANNEX A: The EUT Appearance 53
ANNEX B: Test Setup Photos 54

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Summary of measurement results

No.	Test Case	Clause in FCC rules	Verdict
1	RF Power Output and Effective Isotropic Radiated Power	2.1046 24.232(c)	PASS
2	Occupied Bandwidth	2.1049	PASS
3	Band Edge Compliance	2.1051 /24.238(a)	PASS
4	Peak-to-Average Power Ratio	24.232/KDB 971168 D01(5.7)	PASS
5	Frequency Stability	2.1055 / 24.235	PASS
6	Spurious Emissions at Antenna Terminals	2.1051 / 24.238(a)	PASS
7	Radiates Spurious Emission	2.1053 / 24.238(a)	PASS
Date of Testing: May 25, 2018 ~ June 27, 2018			
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard. All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			

EG91-NAL (Report No.: R2105A0463-R2) is a variant model of EG91-NA (Report No.: R1805A0250-R2). This report only changes software version and Model. After laboratory evaluation, only tested Radiates Spurious Emission and did not worsen, so they were not recorded in the report. The detailed product change description please refers to the Difference Declaration Letter.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

1. Test Laboratory

1.1. Notes of the test report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform measurement.

1.3. Testing Location

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City:	Shanghai
Post code:	201201
Country:	P. R. China
Contact:	Xu Kai
Telephone:	+86-021-50791141/2/3
Fax:	+86-021-50791141/2/3-8000
Website:	http://www.ta-shanghai.com
E-mail:	xukai@ta-shanghai.com

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

Applicant	Quectel Wireless Solutions Co., Ltd
Applicant address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China
Manufacturer	Quectel Wireless Solutions Co., Ltd
Manufacturer address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China

2.2. General information

EUT Description			
Model	EG91-NAL		
IMEI	862831030088426		
Hardware Version	R1.0		
Software Version	EG91NALGAR05A01M4G		
Power Supply	External Power Supply		
Antenna Gain	Band	Frequency (MHz)	Gain (dBi)
	LTE Band 2	1840	1.36
		1860	1.25
		1880	1.38
		1900	1.59
		1920	1.36
Test Mode(s)	LTE Band 2;		
Test Modulation	(LTE)QPSK,16QAM		
LTE Category	1		
Maximum E.I.R.P./ E.R.P.	LTE Band 2:	26.29dBm	
Rated Power Supply Voltage	3.8V		
Extreme Voltage	Minimum: 3.3V Maximum: 4.3V		
Extreme Temperature	Lowest: -40°C Highest: +85°C		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	LTE Band 2	1850 ~ 1910	1930 ~ 1990
Note: 1. The information of the EUT is declared by the manufacturer. 2. For LTE, 16QAM only supports 25%RB.			

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

3. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards:
FCC CFR 47 Part 24E (2020)

ANSI C63.26 (2015)

Reference standard:

FCC CFR47 Part 2 (2020)

KDB 971168 D01 Power Meas License Digital Systems v03r01

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

4. Test Configuration

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (Z axis, horizontal polarization) and the worst case was recorded.

All mode and data rates and positions and RB size and modulations were investigated.Subsequently, only the worst case emissions are reported.
The following testing in LTE is set based on the maximum RF Output Power.

Test modes are chosen to be reported as the worst case configuration below for LTE Band 2:

Test items	Bandwidth (MHz)						Modulation		RB			Test Channel		
	1.4	3	5	10	15	20	QPSK	16QAM	1	50%	100%	L	M	H
RF power output and Effective Isotropic Radiated power	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Occupied Bandwidth	O	O	O	O	O	O	O	O	O	-	O	O	O	O
Band Edge Compliance	O	O	O	O	O	O	O	O	O	-	O	O	-	O
Peak-to-Average Power Ratio	O	O	O	O	O	O	O	O	O	-	O	O	O	O
Frequency Stability	O	O	O	O	O	O	O	O	O	-	O	O	-	O
Conducted Spurious Emissions	O	O	O	O	O	O	O	-	O	-	-	O	O	O
Radiates Spurious Emission	O	-	O	-	-	O	O	-	O	-	-	O	O	O
Note	1. The mark “O” means that this configuration is chosen for testing. 2. The mark “-” means that this configuration is not testing. 3. For LTE, 16QAM only supports 25%RB.													

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

5. Test Case Results

5.1. RF Power Output and Effective Isotropic Radiated Power

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT was connected to the Base Station Simulator with a known loss. The EUT is controlled by the Base Station Simulator test set to ensure max power transmission with proper modulation.

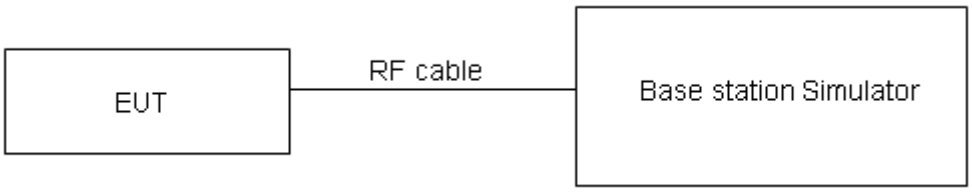
The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI/TIA-603-E (2016).

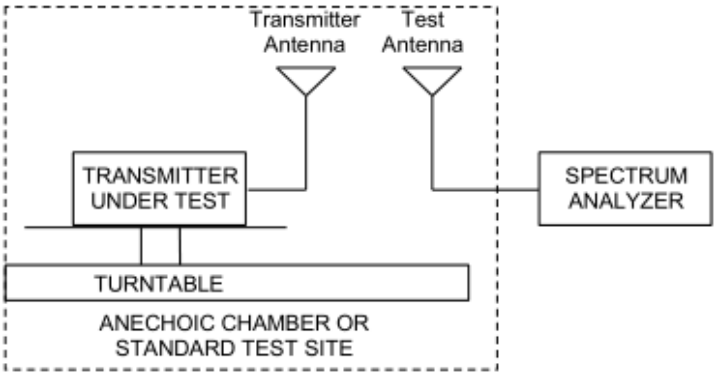
a) Connect the equipment as illustrated. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a RF anechoic chamber (preferred) or a standard radiation site.
b) Key the transmitter, then rotate the EUT 360° azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. (Note: several batteries may be needed to offset the effect of battery voltage droop, which should not exceed 5% of the manufactured specified battery voltage during transmission).
c) Replace the transmitter under test with a vertically polarized half-wave dipole (or an antenna whose gain is known relative to an ideal half-wave dipole). The center of the antenna should be at the same location as the center of the antenna under test.
d) Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading.LOSS = Generator Output Power (dBm) – Analyzer reading (dBm)
e) Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation:ERP (dBm) = LVL (dBm) + LOSS (dB)
f) The maximum ERP is the maximum value determined in the preceding step.
g) When calculating ERP, in addition to knowing the antenna radiation and matching characteristics, it is necessary to know the loss values of all elements (e.g.transmission line attenuation, mismatches, filters, combiners) interposed between the point where transmitter output power is measured, and the point where power is applied to the antenna. ERP can then be calculated as follows:
ERP (dBm) = Output Power (dBm) - Losses (dB) + Antenna Gain (dBd)
where:dBd refers to gain relative to an ideal dipole.
EIRP (dBm) = ERP (dBm) + 2.15 (dB.)

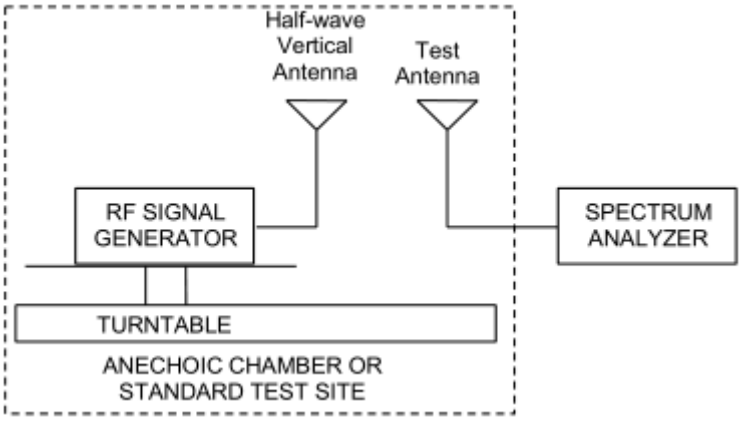
The RB allocation refers to section 5.1, using the maximum output power configuration.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Test Setup







Limits

No specific RF power output requirements in part 2.1046.

Rule Part 24.232(c) Mobile and portable stations are limited to 2 watts EIRP.
Rule Part 24.232(e) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

Limit	≤ 2 W (33 dBm)

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 0.4 dB for RF power output, k = 2, U= 1.19 dB for EIRP.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Test Results

LTE Band 2				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				18607/1850.7	18900/1880	19193/1909.3
1.4MHz	QPSK	1	0	23.90	23.76	23.58
		1	2	24.19	23.97	23.68
		1	5	24.22	23.89	23.78
		3	0	23.86	23.87	23.81
		3	2	23.96	23.65	23.86
		3	3	24.12	23.89	23.67
		6	0	22.98	22.88	22.84
	16QAM	1	0	22.89	22.67	23.09
		1	2	23.05	22.96	23.17
		1	5	22.95	22.85	22.95
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				18615/1851.5	18900/1880	19185/1908.5
3MHz	QPSK	1	0	23.98	23.77	23.64
		1	7	24.13	23.84	24.43
		1	14	23.82	23.58	23.52
		8	0	22.96	22.95	22.74
		8	4	22.90	22.82	22.94
		8	7	22.87	22.88	22.89
		15	0	22.82	22.89	22.98
	16QAM	1	0	23.17	22.99	23.43
		1	7	23.76	22.88	24.14
		1	14	23.09	22.90	23.32
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				18625/1852.5	18900/1880	19175/1907.5
5MHz	QPSK	1	0	23.95	23.75	23.60
		1	13	24.11	23.80	24.40
		1	24	23.79	23.53	23.48
		12	0	22.93	22.90	22.70
		12	6	22.88	22.78	22.89
		12	13	22.85	22.86	22.85
		25	0	22.80	22.88	22.96
	16QAM	1	0	23.14	22.95	23.40
		1	13	23.73	22.86	24.11
		1	24	23.06	22.88	23.28

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				18650/1855	18900/1880	19150/1905
10MHz	QPSK	1	0	23.97	23.76	23.63
		1	25	24.14	23.85	24.44
		1	49	23.81	23.57	23.51
		25	0	22.96	22.95	22.74
		25	13	22.91	22.83	22.93
		25	25	22.87	22.90	22.90
		50	0	22.88	22.90	23.00
	16QAM	1	0	23.16	22.98	23.42
		1	25	23.76	22.90	24.14
		1	49	23.09	22.90	23.31
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				18675/1857.5	18900/1880	19125/1902.5
15MHz	QPSK	1	0	23.96	23.72	23.61
		1	38	24.12	23.84	24.41
		1	74	23.78	23.52	23.47
		36	0	22.94	22.91	22.71
		36	18	22.88	22.78	22.89
		36	39	22.84	22.87	22.86
		75	0	22.86	22.86	22.95
	16QAM	1	0	23.11	22.96	23.40
		1	38	23.74	22.87	24.12
		1	74	23.06	22.86	23.28
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				18700/1860	18900/1880	19100/1900
20MHz	QPSK	1	0	23.93	23.68	23.58
		1	50	24.11	23.80	24.39
		1	99	23.76	23.51	23.44
		50	0	22.91	22.86	22.67
		50	25	22.86	22.74	22.86
		50	50	22.81	22.82	22.82
		100	0	22.83	22.81	22.91
	16QAM	1	0	23.09	22.92	23.35
		1	50	23.70	22.85	24.08
		1	99	23.04	22.83	23.26

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

The measurement is performed for both of horizontal and vertical antenna Polarization, and only the data of worst mode is recorded in this report.

LTE Band 2						
bandwidth	**Channel**	**Frequency (MHz)**	**Polarization**	**EIRP (dBm)**	**Limit (dBm)**	**Conclusion**
1.4 MHz (QPSK)	Low	1850.7	Horizontal	25.62	33	Pass
	Mid	1880	Horizontal	25.87	33	Pass
	High	1909.3	Horizontal	25.89	33	Pass
3 MHz (QPSK)	Low	1851.5	Horizontal	25.95	33	Pass
	Mid	1880	Horizontal	26.14	33	Pass
	High	1908.5	Horizontal	26.29	33	Pass
5 MHz (QPSK)	Low	1852.5	Horizontal	25.68	33	Pass
	Mid	1880	Horizontal	26.22	33	Pass
	High	1907.5	Horizontal	26.23	33	Pass
10 MHz (QPSK)	Low	1855	Horizontal	25.54	33	Pass
	Mid	1880	Horizontal	25.60	33	Pass
	High	1905	Horizontal	25.50	33	Pass
15 MHz (QPSK)	Low	1857.5	Horizontal	25.34	33	Pass
	Mid	1880	Horizontal	25.59	33	Pass
	High	1902.5	Horizontal	25.79	33	Pass
20 MHz (QPSK)	Low	1860	Horizontal	25.78	33	Pass
	Mid	1880	Horizontal	25.89	33	Pass
	High	1900	Horizontal	26.03	33	Pass
1.4 MHz (16QAM)	Low	1850.7	Horizontal	25.31	33	Pass
	Mid	1880	Horizontal	25.47	33	Pass
	High	1909.3	Horizontal	25.51	33	Pass
3 MHz (16QAM)	Low	1851.5	Horizontal	25.56	33	Pass
	Mid	1880	Horizontal	25.79	33	Pass
	High	1908.5	Horizontal	25.92	33	Pass
5 MHz (16QAM)	Low	1852.5	Horizontal	25.34	33	Pass
	Mid	1880	Horizontal	25.89	33	Pass
	High	1907.5	Horizontal	25.69	33	Pass
10 MHz (16QAM)	Low	1855	Horizontal	25.32	33	Pass
	Mid	1880	Horizontal	25.29	33	Pass
	High	1905	Horizontal	25.19	33	Pass
15 MHz (16QAM)	Low	1857.5	Horizontal	25.05	33	Pass
	Mid	1880	Horizontal	25.12	33	Pass
	High	1902.5	Horizontal	25.19	33	Pass
20 MHz (16QAM)	Low	1860	Horizontal	25.47	33	Pass
	Mid	1880	Horizontal	25.88	33	Pass
	High	1900	Horizontal	25.87	33	Pass

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

5.2. Occupied Bandwidth

Ambient condition

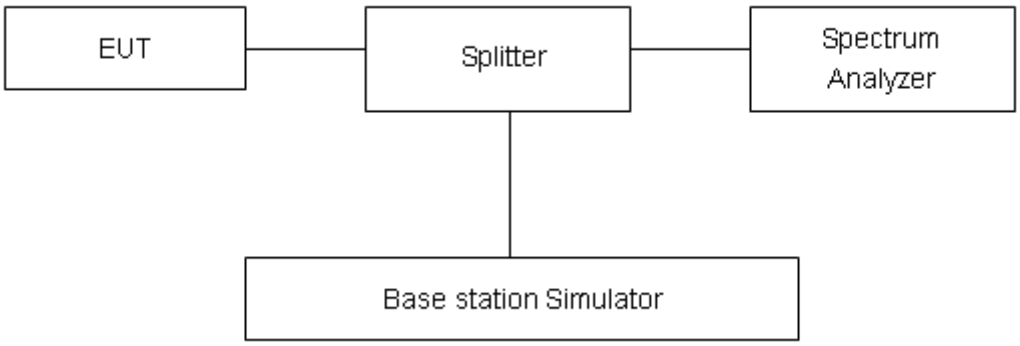
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer.
RBW is set to 51kHz, VBW is set to 160kHz for LTE Band 2(1.4MHz),
RBW is set to 100kHz,VBW is set to 300kHz for LTE Band 2(3MHz/5MHz),
RBW is set to 300kHz,VBW is set to 1MHz for LTE Band 2(10MHz/15MHz/20MHz).

99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

No specific occupied bandwidth requirements in part 2.1049.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor *k* = 2, *U*= 624Hz.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

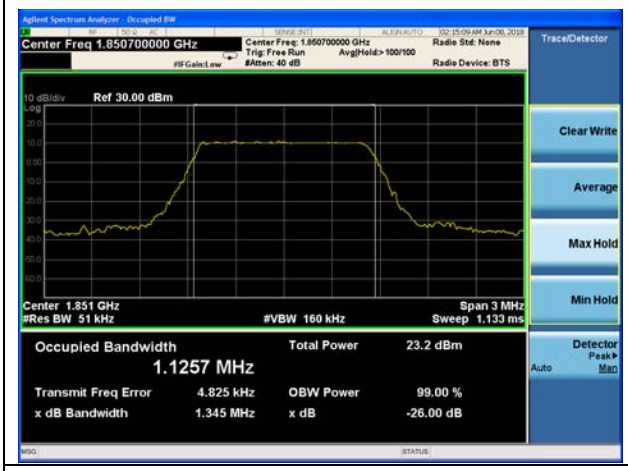
Test Result

LTE Band 2					
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
QPSK	1.4	18607	1850.7	1.1257	1.3450
		18900	1880.0	1.1328	1.3440
		19193	1909.3	1.1144	1.3380
	3	18615	1851.5	2.7424	3.0600
		18900	1880	2.7347	3.0530
		19185	1908.5	2.7321	3.0530
	5	18625	1852.5	4.5299	5.0310
		18900	1880	4.5307	5.0310
		19175	1907.5	4.5335	5.0630
	10	18650	1855	9.0476	10.0100
		18900	1880	9.0180	9.9160
		19150	1905	9.0078	9.9850
	15	18675	1857.5	13.4420	14.7200
		18900	1880	13.4500	14.6800
		19125	1902.5	13.4090	14.5700
	20	18700	1860	17.8420	19.1800
		18900	1880	17.8690	19.1400
		19100	1900	17.8360	19.1900
16QAM	1.4	18607	1850.7	0.3327	0.4677
		18900	1880.0	0.3270	0.4657
		19193	1909.3	0.3159	0.4742
	3	18615	1851.5	0.4106	0.5634
		18900	1880	0.4071	0.5594
		19185	1908.5	0.4095	0.5682
	5	18625	1852.5	0.4905	0.6986
		18900	1880	0.4973	0.7215
		19175	1907.5	0.4732	0.6778
	10	18650	1855	0.9149	1.2710
		18900	1880	0.8973	1.2150

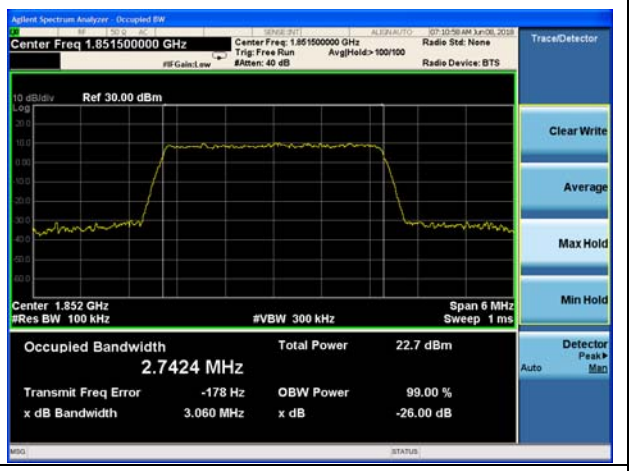
This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

		19150	1905	0.8933	1.1940
	15	18675	1857.5	1.1602	1.6300
		18900	1880	1.1659	1.6020
		19125	1902.5	1.1132	1.5630
	20	18700	1860	1.2621	1.7960
		18900	1880	1.2355	1.7650
		19100	1900	1.2209	1.7690

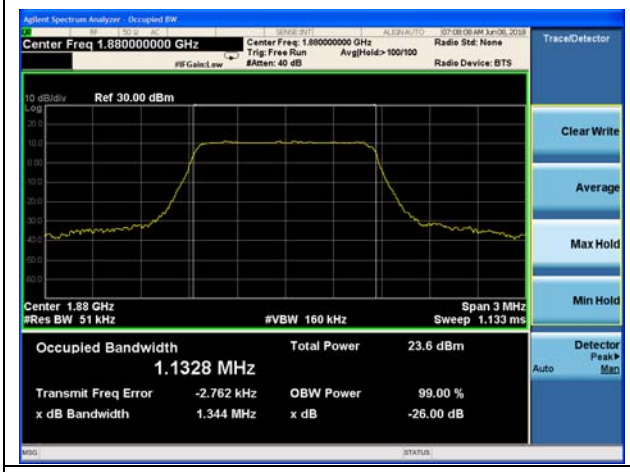
LTE Band 2 1.4MHz QPSK CH-Low



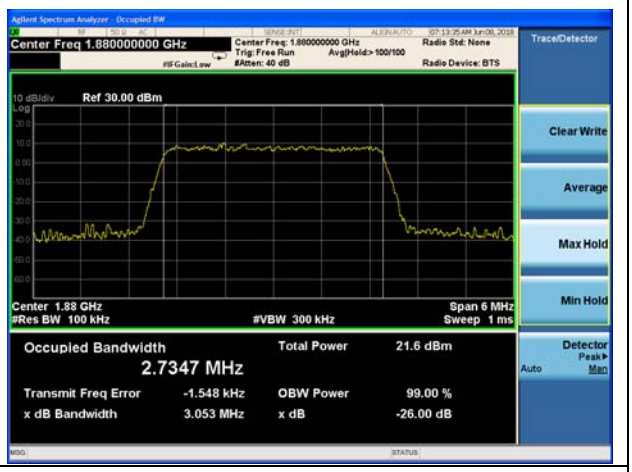
LTE Band 2 3MHz QPSK CH-Low



LTE Band 2 1.4MHz QPSK CH-Middle



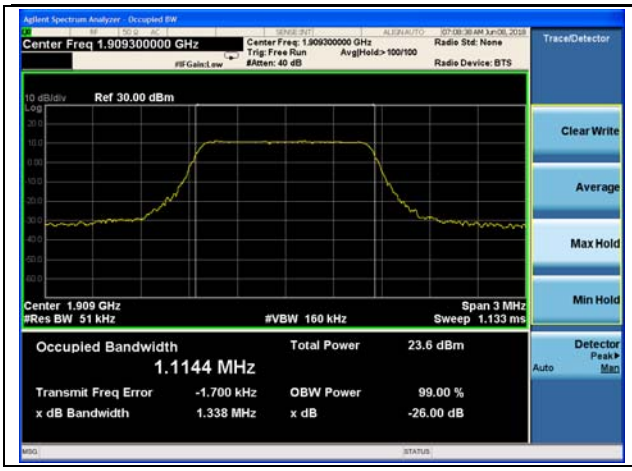
LTE Band 2 3MHz QPSK CH-Middle

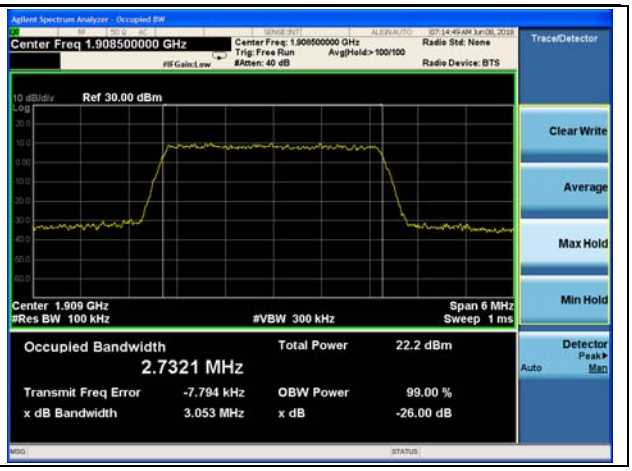


LTE Band 2 1.4MHz QPSK CH-High

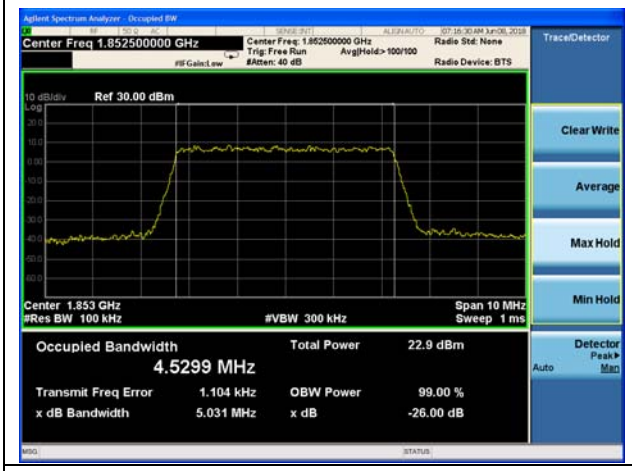
LTE Band 2 3MHz QPSK CH-High

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

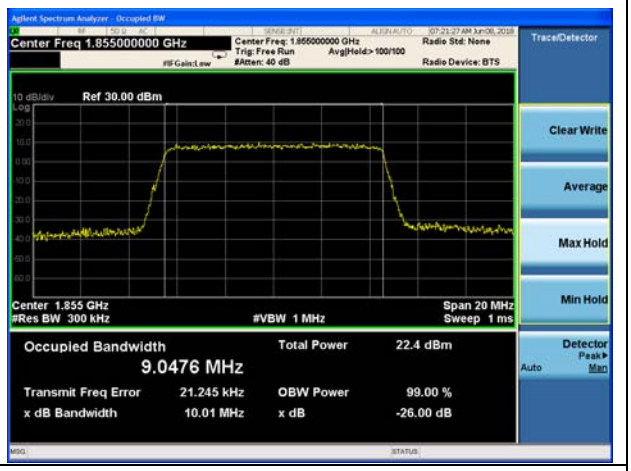




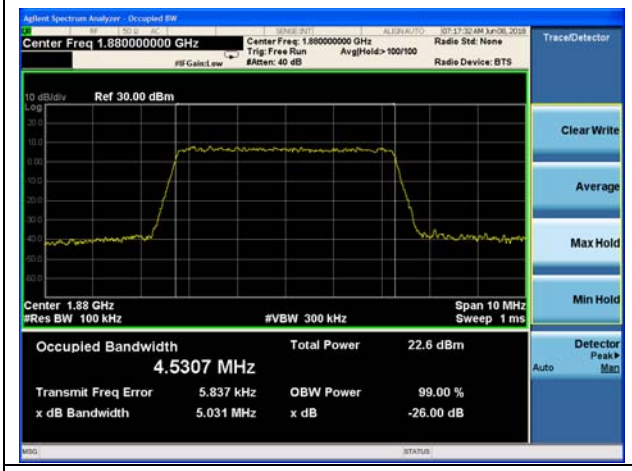
LTE Band 2 5MHz QPSK CH-Low



LTE Band 2 10MHz QPSK CH-Low



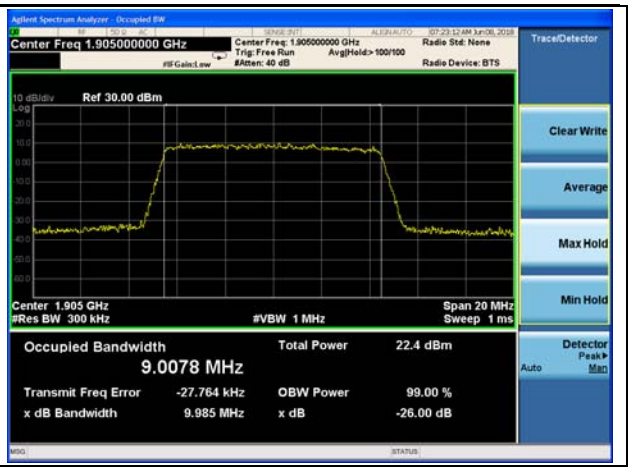
LTE Band 2 5MHz QPSK CH-Middle



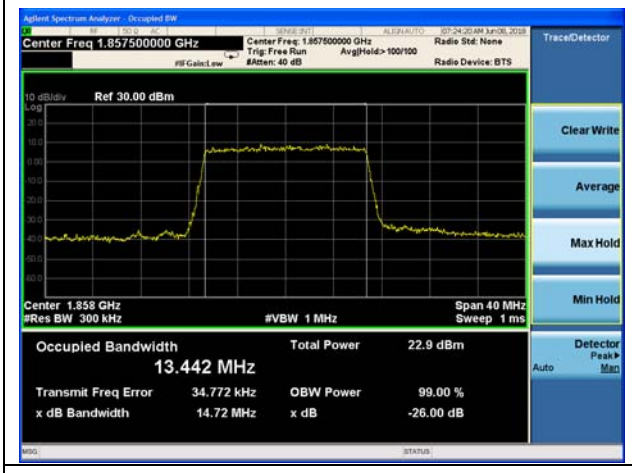
LTE Band 2 10MHz QPSK CH-Middle

LTE Band 2 5MHz QPSK CH-High | LTE Band 2 10MHz QPSK CH-High

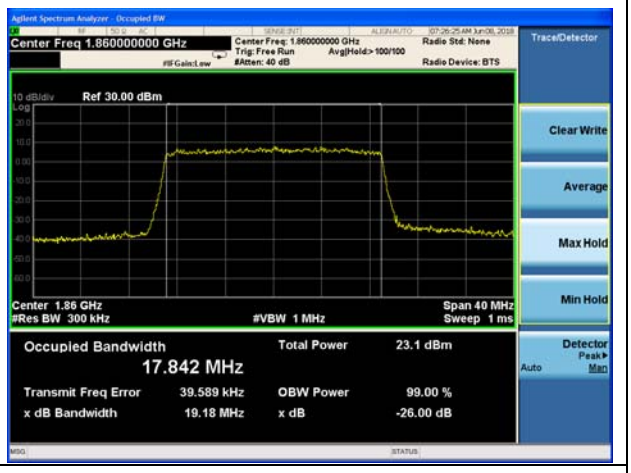
This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.



LTE Band 2 15MHz QPSK CH-Low

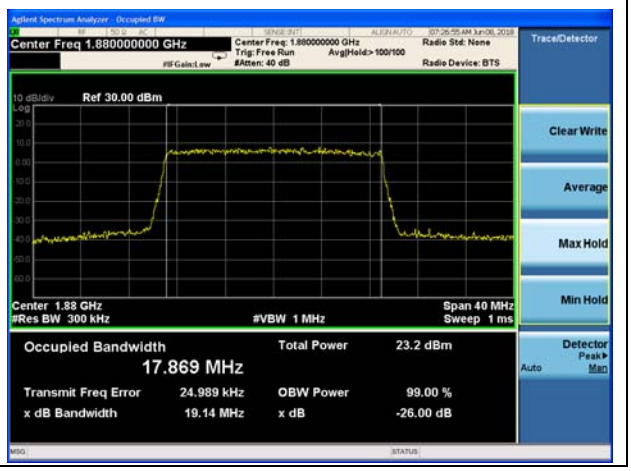


LTE Band 2 20MHz QPSK CH-Low



LTE Band 2 15MHz QPSK CH-Middle

LTE Band 2 20MHz QPSK CH-Middle

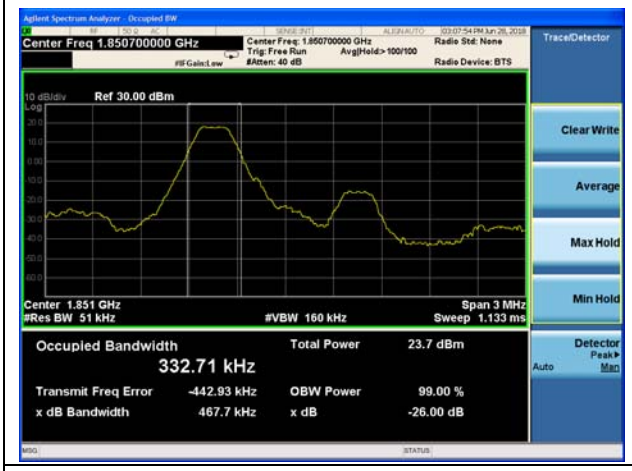


This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

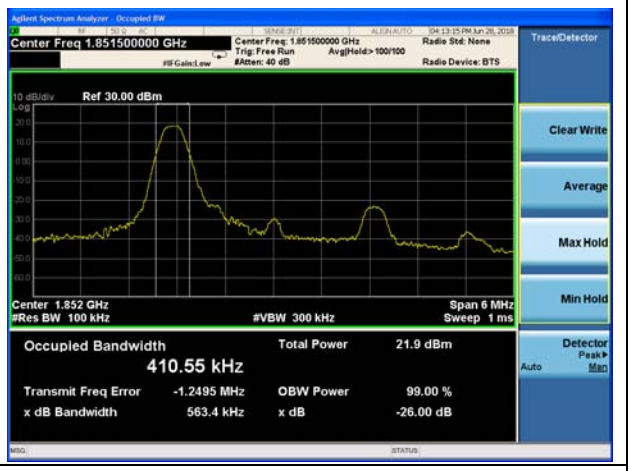
LTE Band 2 15MHz QPSK CH-High	LTE Band 2 20MHz QPSK CH-High

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

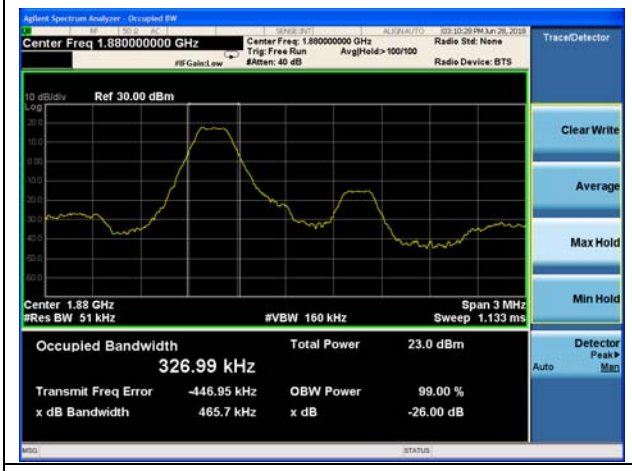
LTE Band 2 1.4MHz 16QAM CH-Low



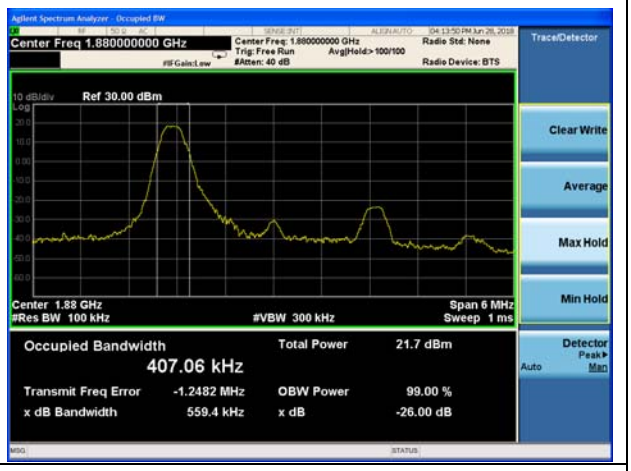
LTE Band 2 3MHz 16QAM CH-Low



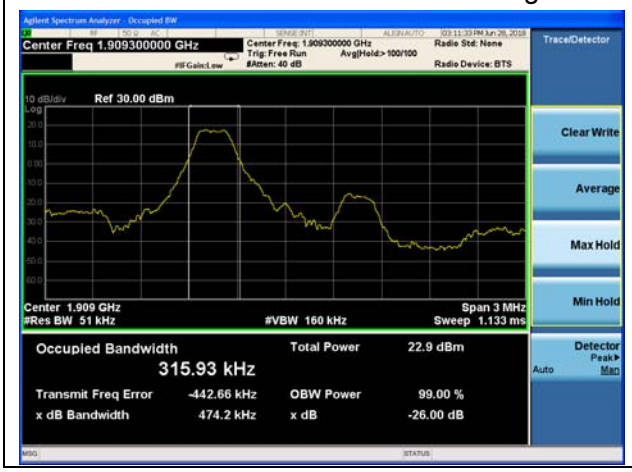
LTE Band 2 1.4MHz 16QAM CH-Middle



LTE Band 2 3MHz 16QAM CH-Middle



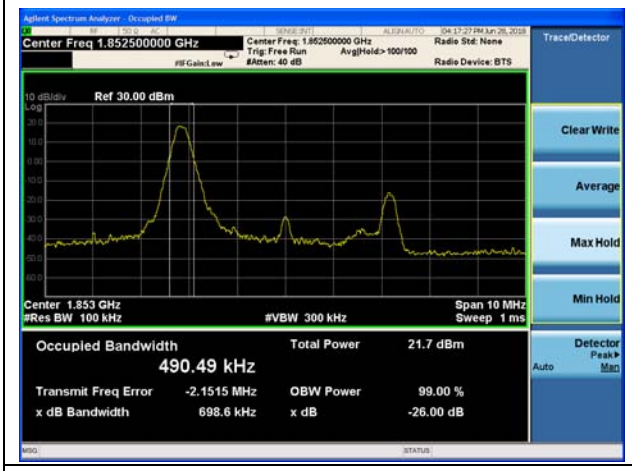
LTE Band 2 1.4MHz 16QAM CH-High



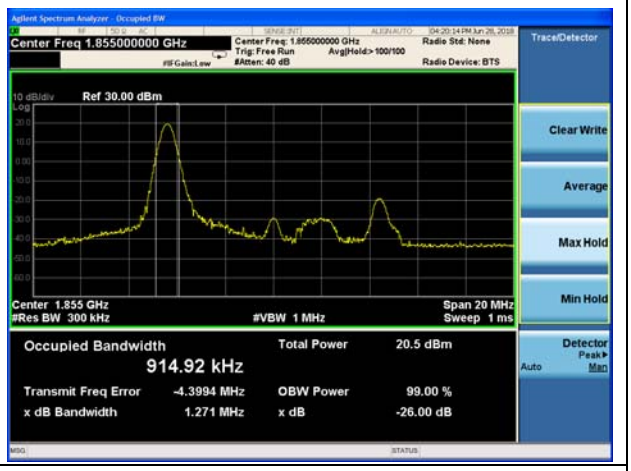
LTE Band 2 3MHz 16QAM CH-High

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

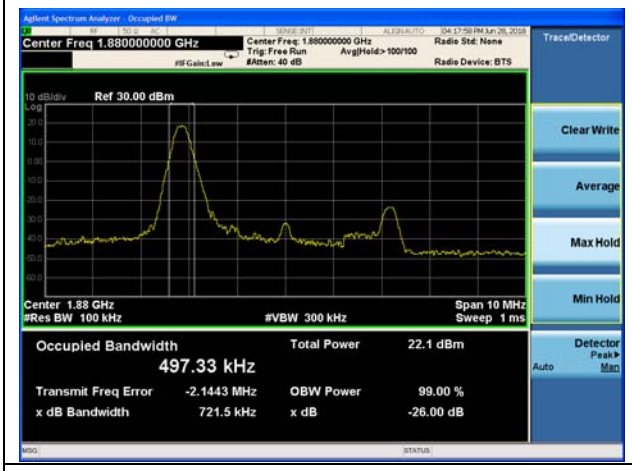
LTE Band 2 5MHz 16QAM CH-Low



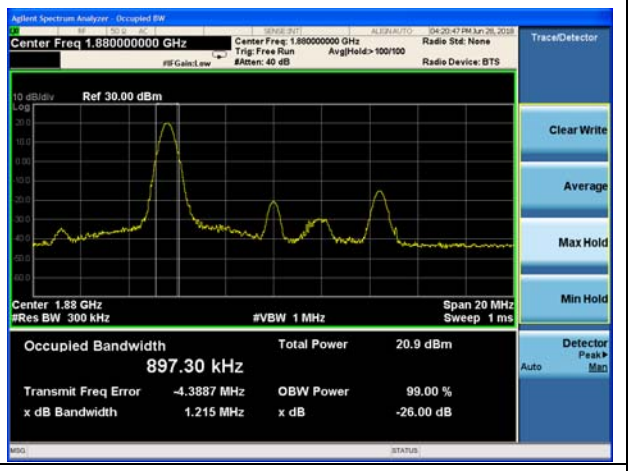
LTE Band 2 10MHz 16QAM CH-Low



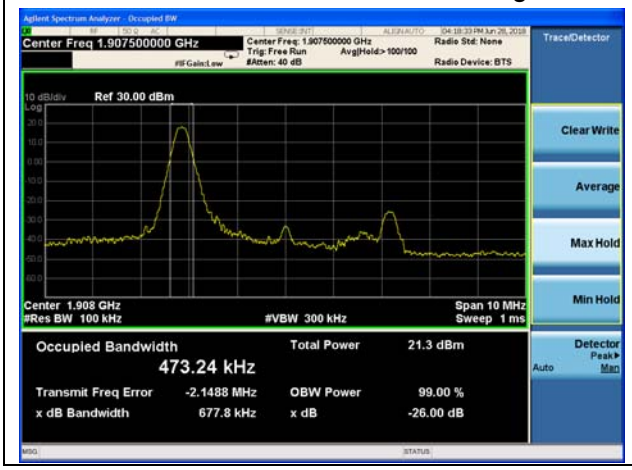
LTE Band 2 5MHz 16QAM CH-Middle



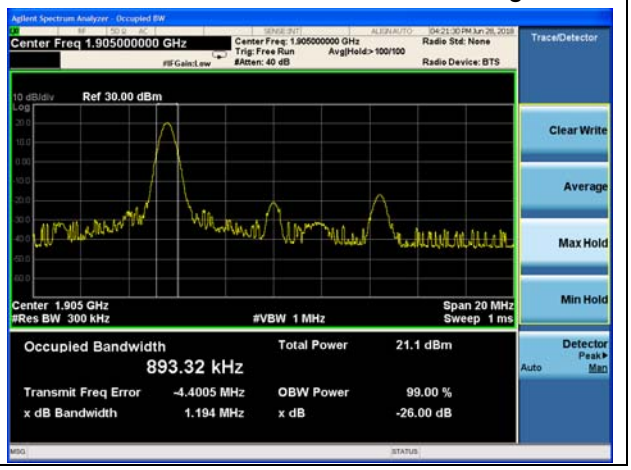
LTE Band 2 10MHz 16QAM CH-Middle



LTE Band 2 5MHz 16QAM CH-High

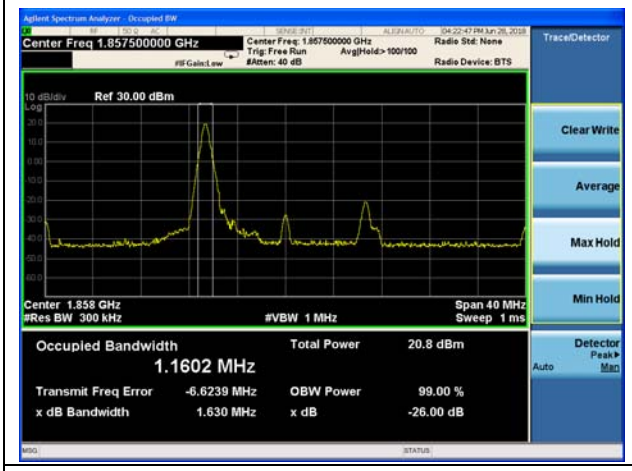


LTE Band 2 10MHz 16QAM CH-High

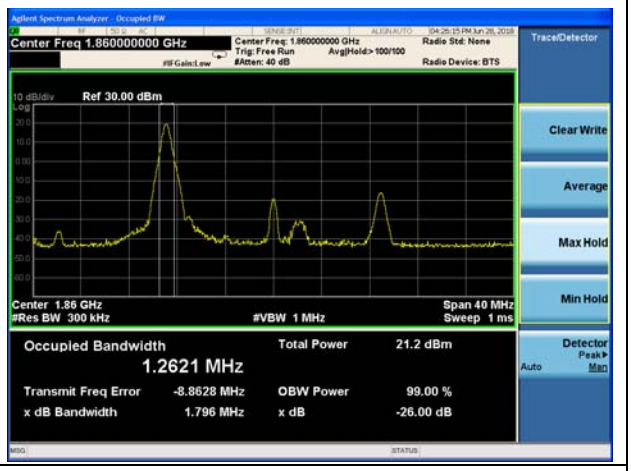


This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

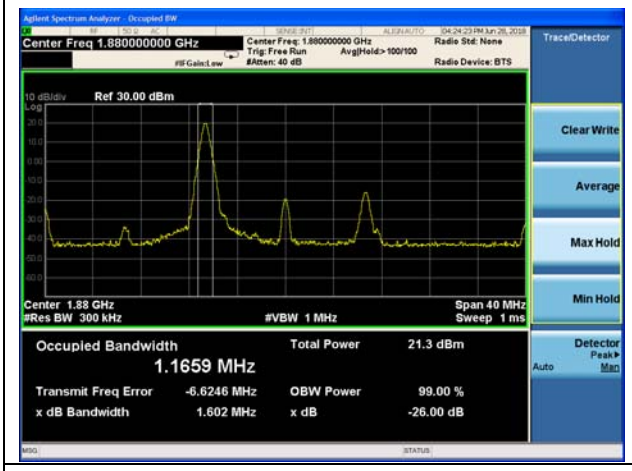
LTE Band 2 15MHz 16QAM CH-Low



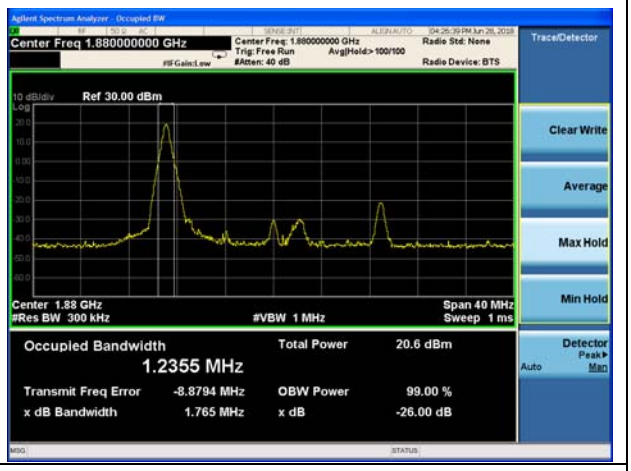
LTE Band 2 20MHz 16QAM CH-Low



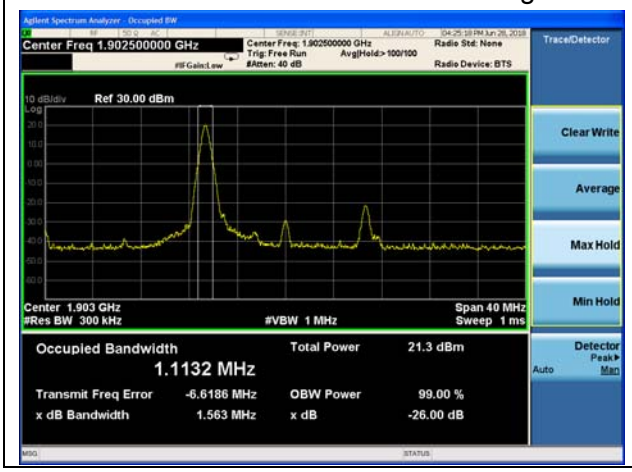
LTE Band 2 15MHz 16QAM CH-Middle



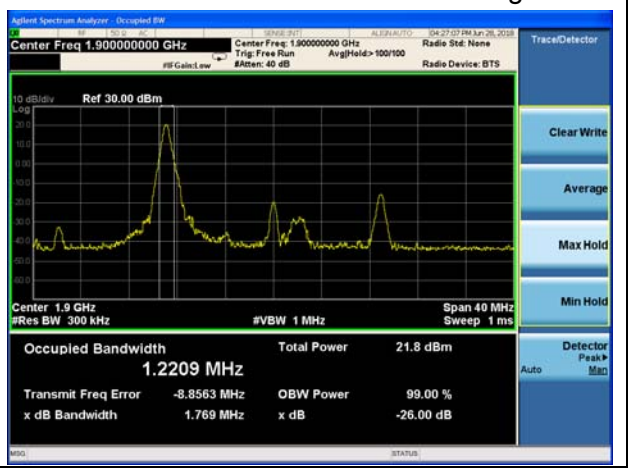
LTE Band 2 20MHz 16QAM CH-Middle



LTE Band 2 15MHz 16QAM CH-High



LTE Band 2 20MHz 16QAM CH-High



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

5.3. Band Edge Compliance

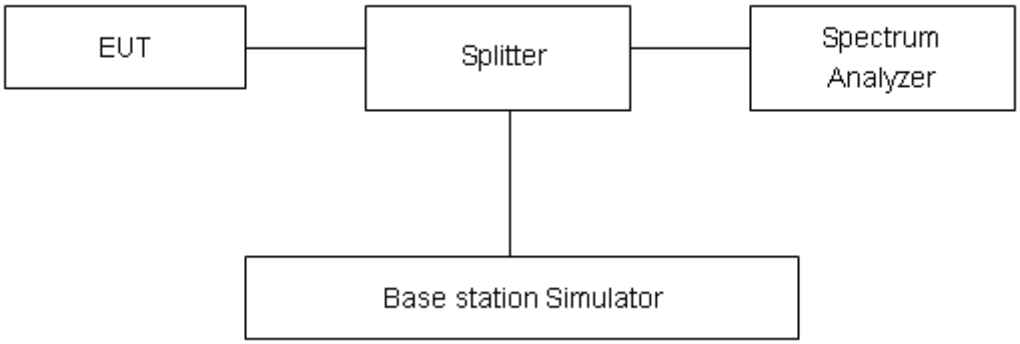
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured. The Average detector is used and
RBW is set to 15kHz, VBW is set to 51kHz for LTE Band 2(1.4MHz),
RBW is set to 30kHz,VBW is set to 100kHz for LTE Band 2(3MHz),
RBW is set to 51kHz,VBW is set to 160kHz for LTE Band 2(5MHz),
RBW is set to 100kHz,VBW is set to 300kHz for LTE Band 2(10MHz),
RBW is set to 150kHz,VBW is set to 510kHz for LTE Band 2(15MHz),
RBW is set to 200kHz,VBW is set to 620kHz for LTE Band 2(20MHz).
Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log10 (P) dB.”

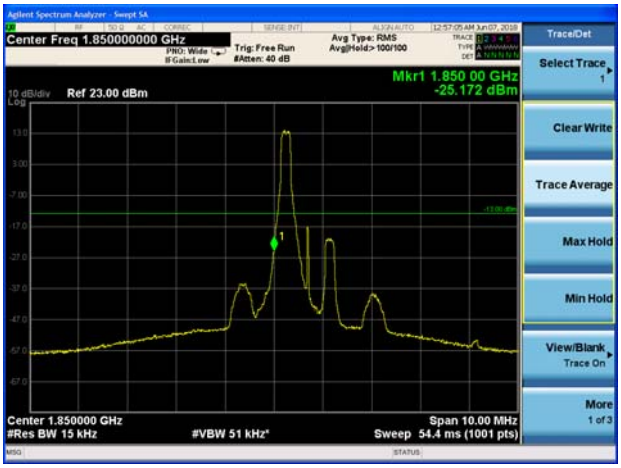
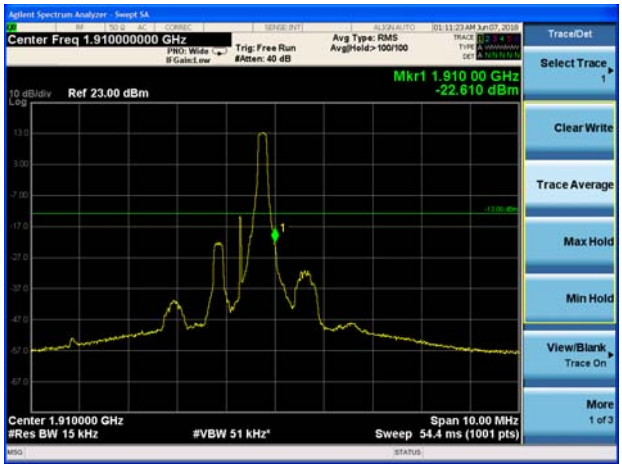
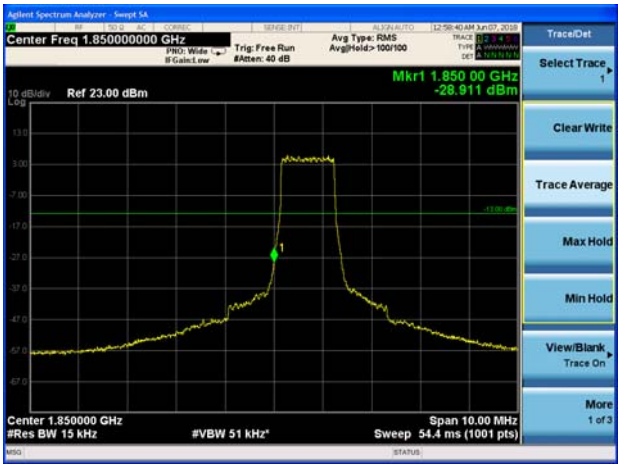
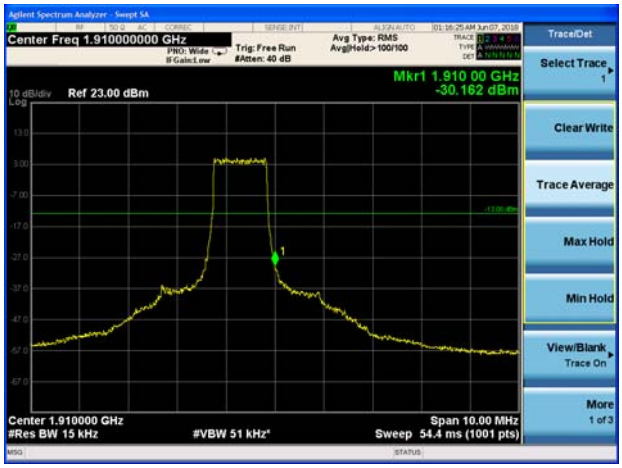
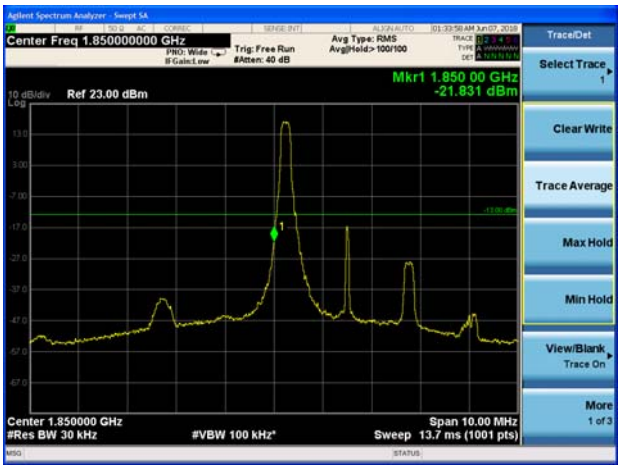
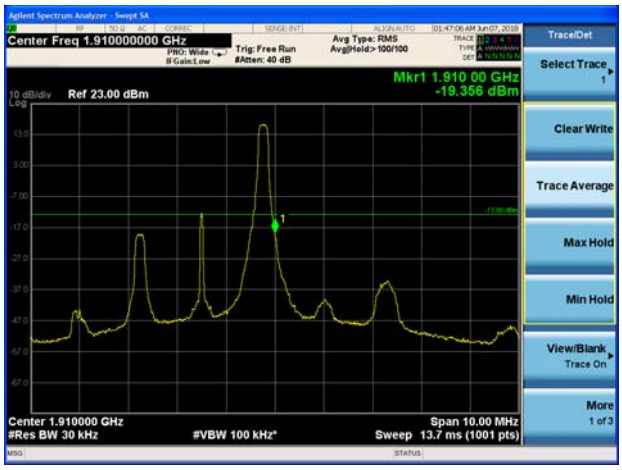
Limit	-13 dBm

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96, U=0.684dB.

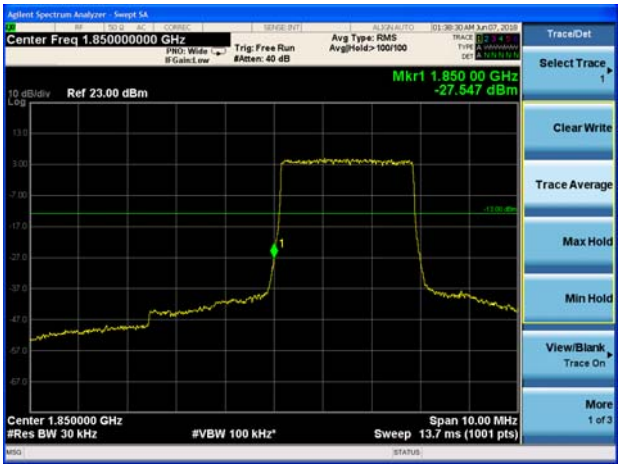
This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Test Result:

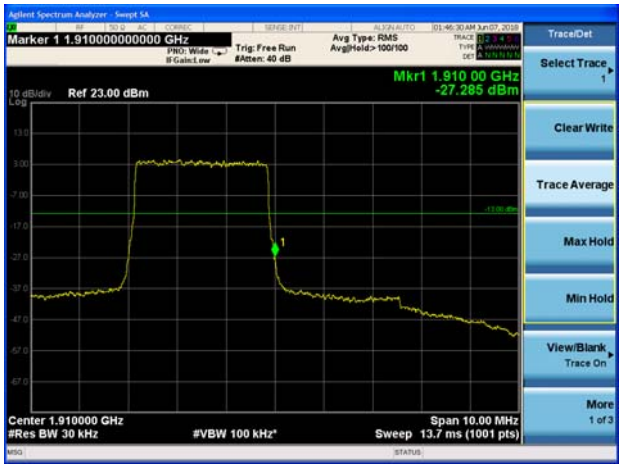
LTE Band 2 1.4MHz QPSK 1RB CH-Low	LTE Band 2 1.4MHz QPSK 1RB CH-High
	
LTE Band 2 1.4MHz QPSK 100%RB CH-Low	LTE Band 2 1.4MHz QPSK 100%RB CH-High
	
LTE Band 2 3MHz QPSK 1RB CH-Low	LTE Band 2 3MHz QPSK 1RB CH-High
	

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

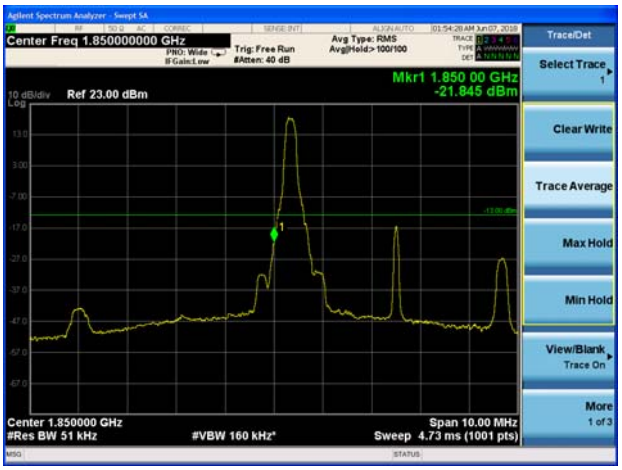
LTE Band 2 3MHz QPSK 100%RB CH-Low



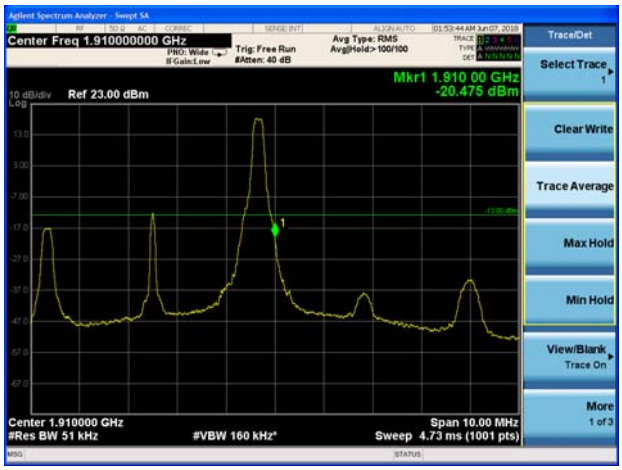
LTE Band 2 3MHz QPSK 100%RB CH-High



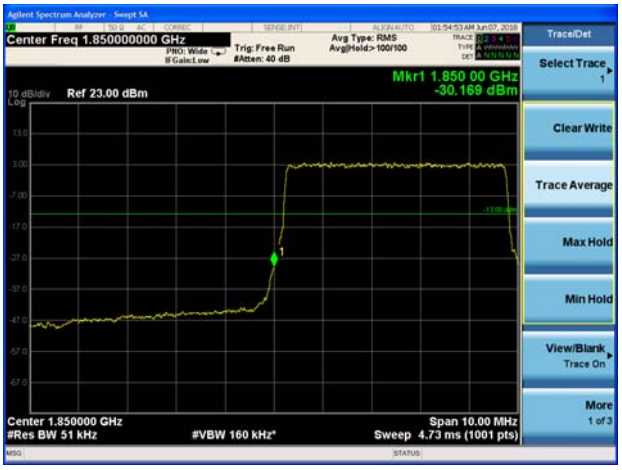
LTE Band 2 5MHz QPSK 1RB CH-Low



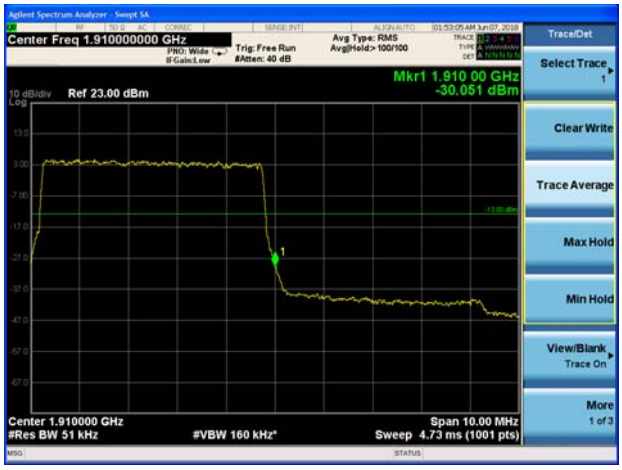
LTE Band 2 5MHz QPSK 1RB CH-High



LTE Band 2 5MHz QPSK 100%RB CH-Low

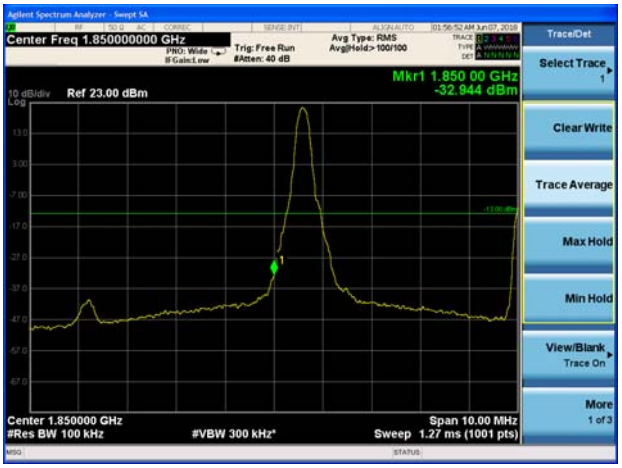


LTE Band 2 5MHz QPSK 100%RB CH-High

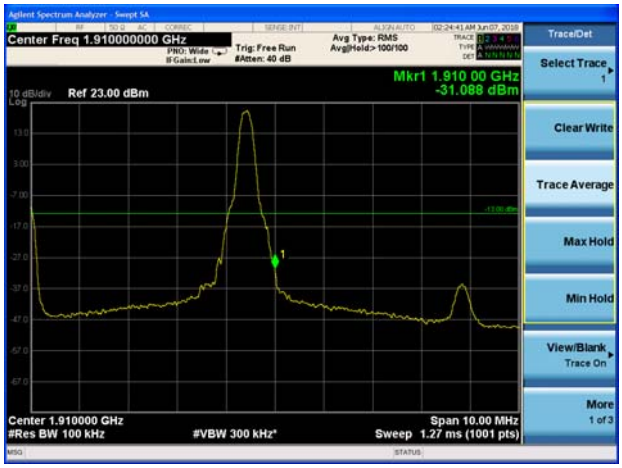


This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

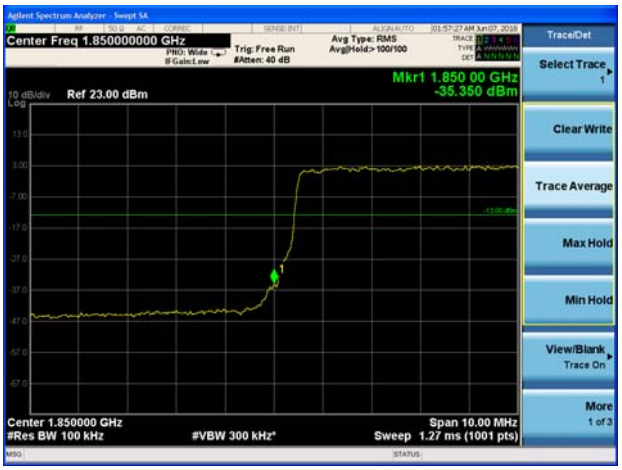
LTE Band 2 10MHz QPSK 1RB CH-Low



LTE Band 2 10MHz QPSK 1RB CH-High

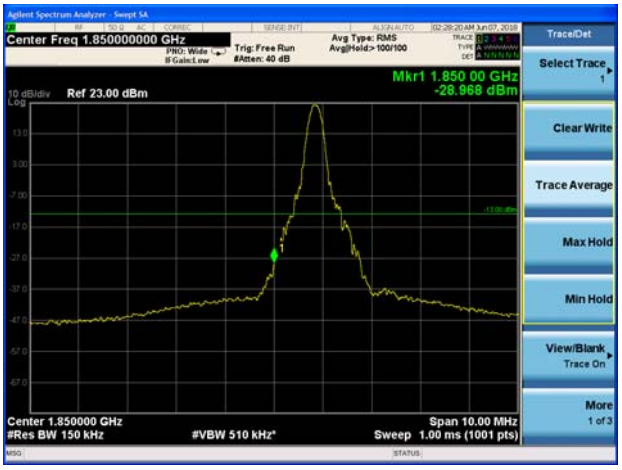


LTE Band 2 10MHz QPSK 100%RB CH-Low

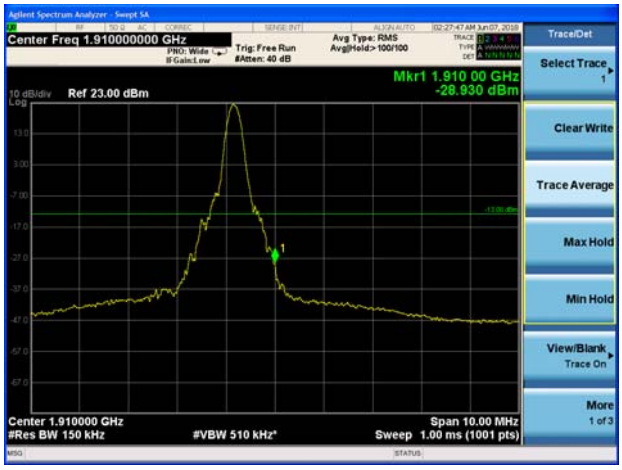


LTE Band 2 10MHz QPSK 100%RB CH-High

LTE Band 2 15MHz QPSK 1RB CH-Low



LTE Band 2 15MHz QPSK 1RB CH-High

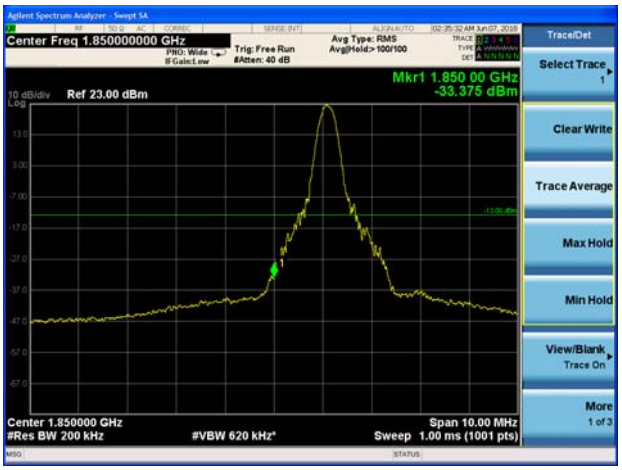


This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

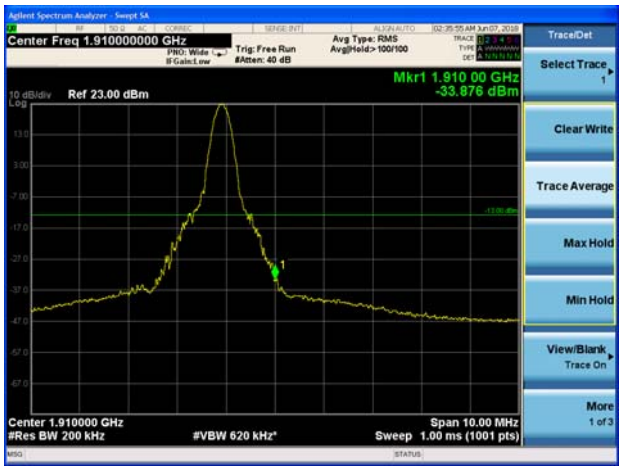
LTE Band 2 15MHz QPSK 100%RB CH-Low

LTE Band 2 15MHz QPSK 100%RB CH-High

LTE Band 2 20MHz QPSK 1RB CH-Low



LTE Band 2 20MHz QPSK 1RB CH-High

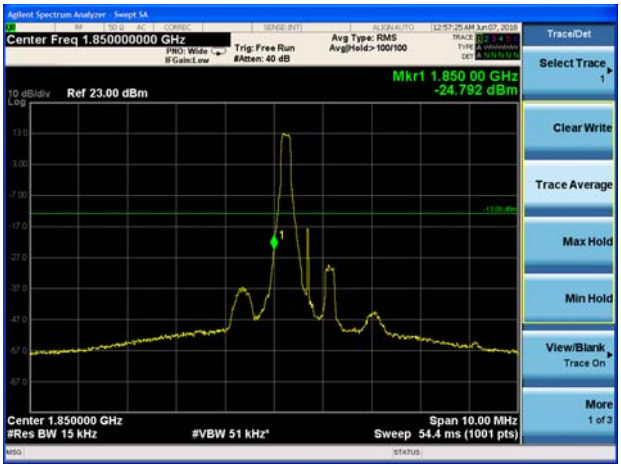


LTE Band 2 20MHz QPSK 100%RB CH-Low

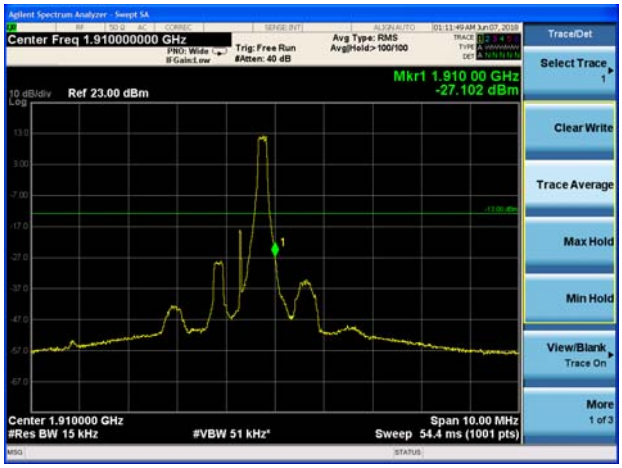
LTE Band 2 20MHz QPSK 100%RB CH-High

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

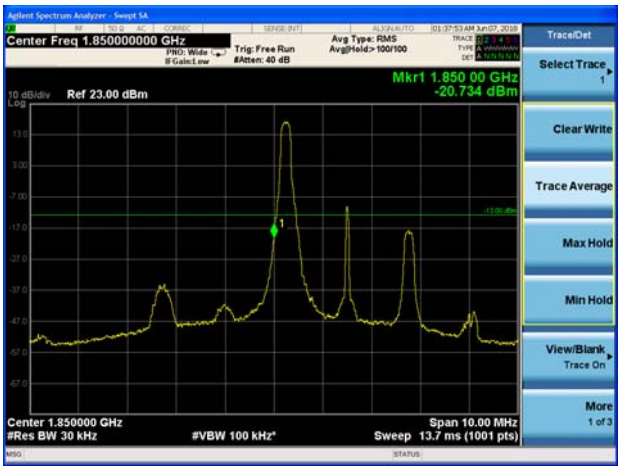
LTE Band 2 1.4MHz 16QAM 1RB CH-Low



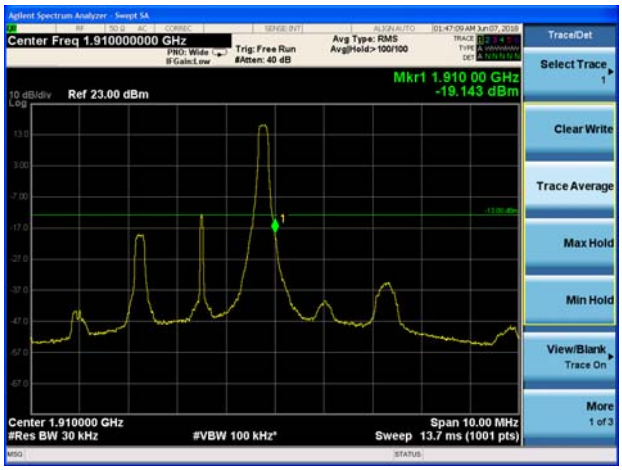
LTE Band 2 1.4MHz 16QAM 1RB CH-High



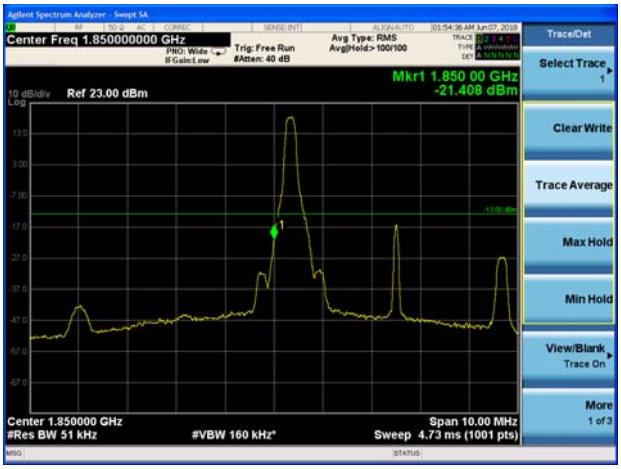
LTE Band 2 3MHz 16QAM 1RB CH-Low



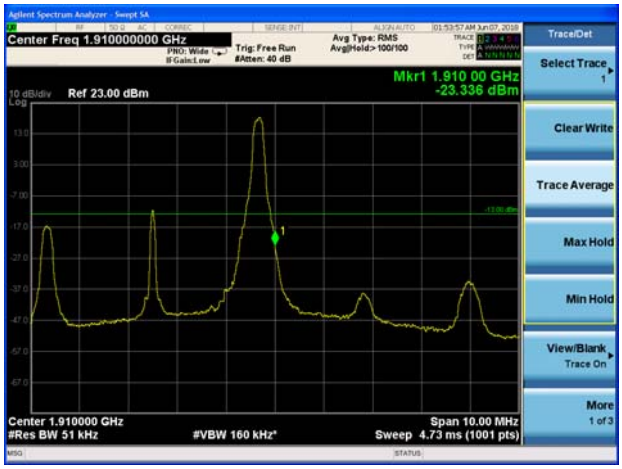
LTE Band 2 3MHz 16QAM 1RB CH-High



LTE Band 2 5MHz 16QAM 1RB CH-Low

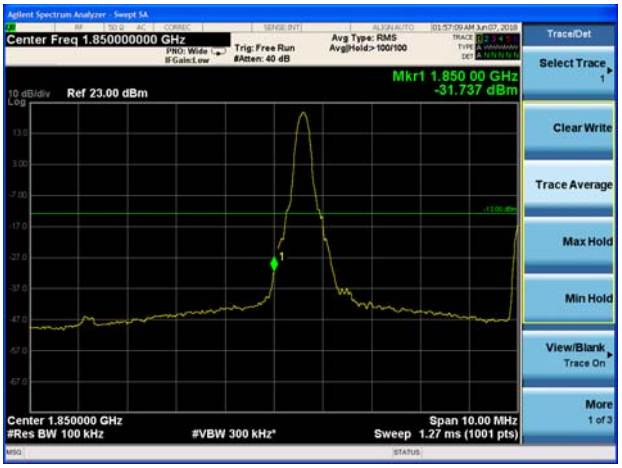


LTE Band 2 5MHz 16QAM 1RB CH-High

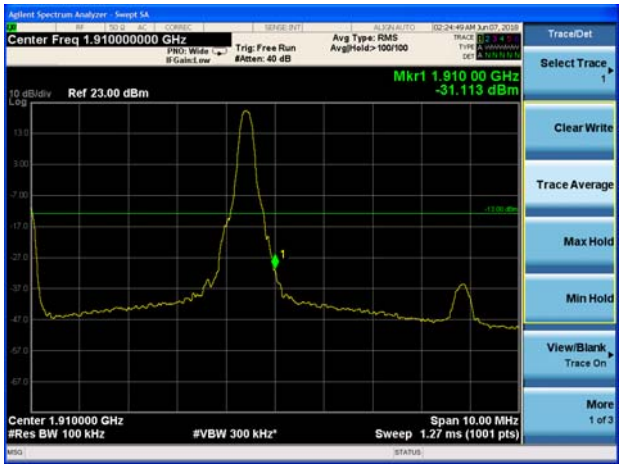


This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

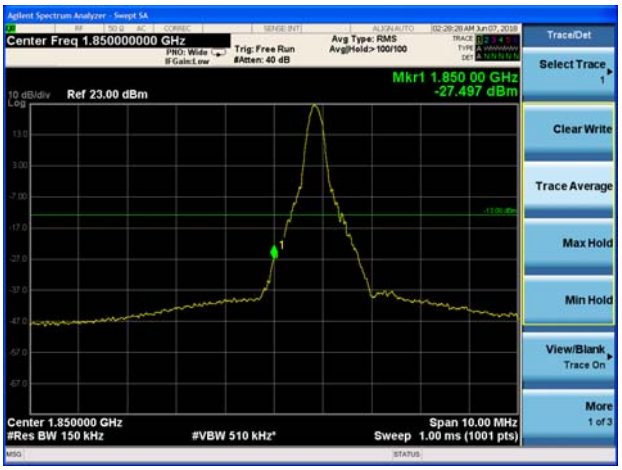
LTE Band 2 10MHz 16QAM 1RB CH-Low



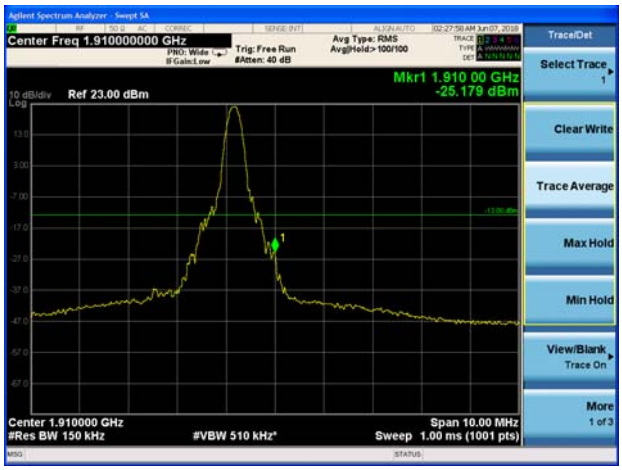
LTE Band 2 10MHz 16QAM 1RB CH-High



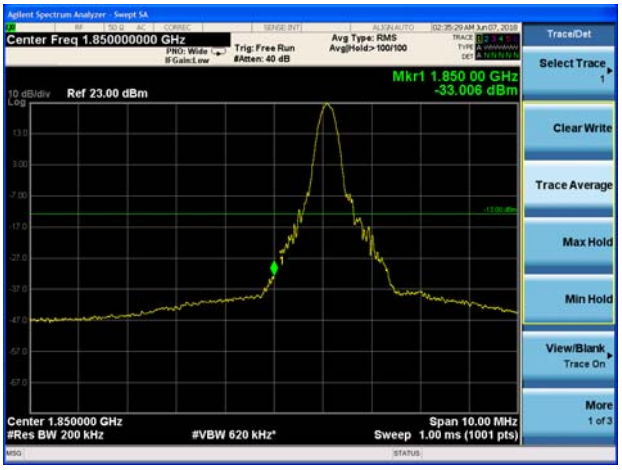
LTE Band 2 15MHz 16QAM 1RB CH-Low



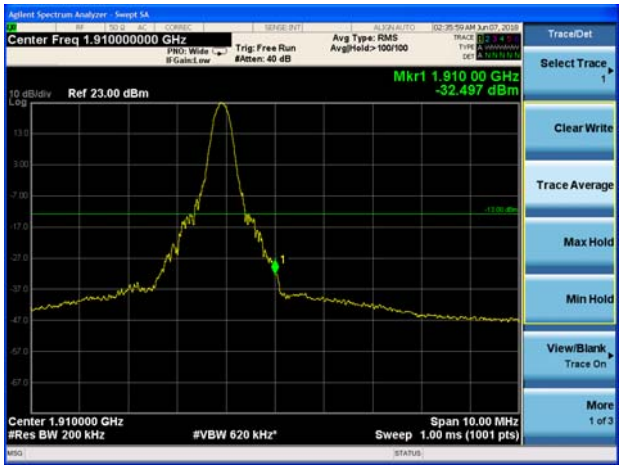
LTE Band 2 15MHz 16QAM 1RB CH-High



LTE Band 2 20MHz 16QAM 1RB CH-Low



LTE Band 2 20MHz 16QAM 1RB CH-High



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

5.4. Peak-to-Average Power Ratio (PAPR)

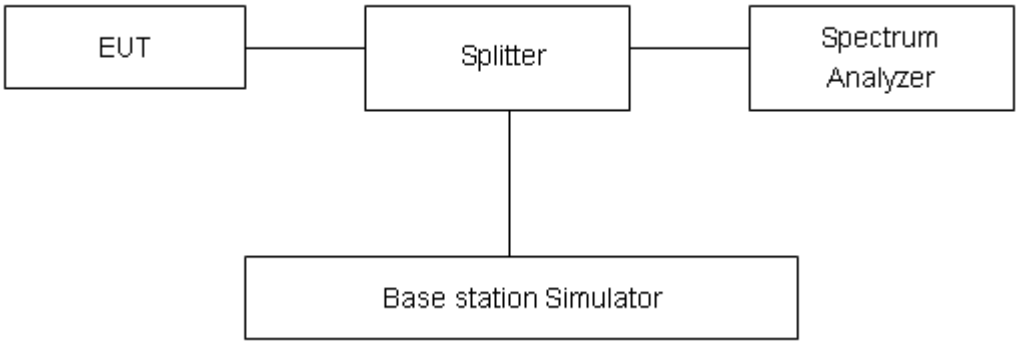
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

Measure the total peak power and record as PPk. And measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (*e.g.*, dBm). Determine the PAPR from:
PAPR (dB) = PPk (dBm) - PAvg (dBm).

Test Setup



Limits

In measuring transmissions in this band using an average power technique, the peakto-average ratio (PAR) of the transmission may not exceed 13 dB in 24.232(d).

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the

normal distribution is with the coverage factor k = 2, U= 0.4 dB.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Test Results

LTE Band 2								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	18607	1850.7	28.27	22.98	5.29	≤13	PASS
		18900	1880.0	28.26	22.88	5.38	≤13	PASS
		19193	1909.3	28.83	22.84	5.99	≤13	PASS
	3	18615	1851.5	27.82	22.82	5.00	≤13	PASS
		18900	1880	29.32	22.89	6.43	≤13	PASS
		19185	1908.5	28.12	22.98	5.14	≤13	PASS
	5	18625	1852.5	27.57	22.80	4.77	≤13	PASS
		18900	1880	28.43	22.88	5.55	≤13	PASS
		19175	1907.5	28.15	22.96	5.19	≤13	PASS
	10	18650	1855	28.60	22.88	5.72	≤13	PASS
		18900	1880	29.23	22.90	6.33	≤13	PASS
		19150	1905	29.05	23.00	6.05	≤13	PASS
	15	18675	1857.5	27.96	22.86	5.10	≤13	PASS
		18900	1880	29.03	22.86	6.17	≤13	PASS
		19125	1902.5	29.05	22.95	6.10	≤13	PASS
	20	18700	1860	28.30	22.83	5.47	≤13	PASS
		18900	1880	27.74	22.81	4.93	≤13	PASS
		19100	1900	28.85	22.91	5.94	≤13	PASS
16QAM	1.4	18607	1850.7	29.27	22.89	6.38	≤13	PASS
		18900	1880.0	27.53	22.67	4.86	≤13	PASS
		19193	1909.3	29.13	23.09	6.04	≤13	PASS
	3	18615	1851.5	28.43	23.17	5.26	≤13	PASS
		18900	1880	28.97	22.99	5.98	≤13	PASS
		19185	1908.5	28.72	23.43	5.29	≤13	PASS
	5	18625	1852.5	29.01	23.14	5.87	≤13	PASS
		18900	1880	28.61	22.95	5.66	≤13	PASS
		19175	1907.5	28.30	23.40	4.90	≤13	PASS
	10	18650	1855	29.39	23.16	6.23	≤13	PASS
		18900	1880	29.54	22.98	6.56	≤13	PASS
		19150	1905	28.37	23.42	4.95	≤13	PASS
	15	18675	1857.5	29.81	23.11	6.70	≤13	PASS
		18900	1880	28.76	22.96	5.80	≤13	PASS
		19125	1902.5	29.69	23.40	6.29	≤13	PASS
	20	18700	1860	28.02	23.09	4.93	≤13	PASS
		18900	1880	28.87	22.92	5.95	≤13	PASS
		19100	1900	28.61	23.35	5.26	≤13	PASS

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

5.5. Frequency Stability

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from-40°C to +85°C in 10°C step size,

(1) With all power removed, the temperature was decreased to 0°C and permitted to stabilize for three hours.

(2) Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.

(3) Repeat the above measurements at 10°C increments from-40°C to +85°C in 10°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

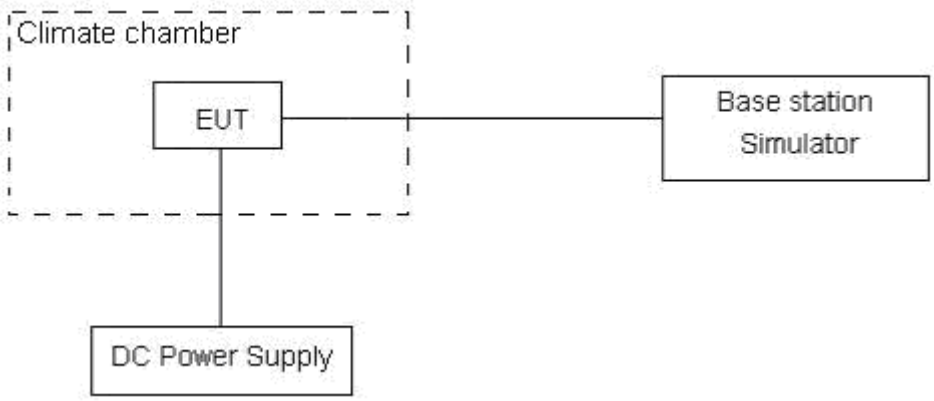
Frequency Stability (Voltage Variation)

The frequency stability shall be measured with variation of primary supply voltage as follows:

Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

This transceiver is specified to operate with an input voltage of between 3.3 V and 4.3 V, with a nominal voltage of 3.8V.

Test setup



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Limits

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block

Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75％ confidence level for the normal distribution is with the coverage factor *k* = 3, U= 0.01ppm.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Test Result

LTE Band 2					
(QPSK, 20MHz BANDWIDTH)					
Condition		1850	1910	Delta(Hz)	Frequency Stability(ppm)
Temperature	Voltage	F low@-13dBm(MHz)	F high@-13dBm(MHz)		
Normal（25°C）	Normal	1850.6449	1909.4818	1.24	0.00066
Extreme（85°C）		1850.6458	1909.4814	0.60	0.00032
Extreme（80°C）		1850.6419	1909.4846	2.53	0.00135
Extreme（70°C）		1850.6438	1909.4832	1.71	0.00091
Extreme（60°C）		1850.6424	1909.4841	-0.22	-0.00012
Extreme（50°C）		1850.6430	1909.4835	-0.59	-0.00031
Extreme（40°C）		1850.6443	1909.4822	1.36	0.00072
Extreme（30°C）		1850.6450	1909.4815	3.96	0.00211
Extreme（20°C）		1850.6429	1909.4836	-0.59	-0.00031
Extreme（10°C）		1850.6441	1909.4824	2.10	0.00112
Extreme（0°C）		1850.6428	1909.4844	0.41	0.00022
Extreme（-10°C）		1850.6423	1909.4842	-0.22	-0.00012
Extreme（-20°C）		1850.6434	1909.4831	-0.59	-0.00031
Extreme（-30°C）		1850.6470	1909.4798	1.36	0.00072
Extreme（-40°C）		1850.6479	1909.4786	3.96	0.00211
25°C	LV	1850.6431	1909.4834	-0.68	-0.00036
	HV	1850.6442	1909.4828	-0.33	-0.00018
(16QAM, 20MHz BANDWIDTH)					
Condition		1850	1910	Delta(Hz)	Frequency Stability(ppm)
Temperature	Voltage	F low@-13dBm(MHz)	F high@-13dBm(MHz)		
Normal（25°C）	Normal	1850.5812	1909.4459	3.45	0.00184
Extreme（85°C）		1850.5823	1909.4448	0.46	0.00024
Extreme（80°C）		1850.5784	1909.4510	3.39	0.00180
Extreme（70°C）		1850.5803	1909.4468	2.18	0.00116
Extreme（60°C）		1850.5789	1909.4482	2.83	0.00151
Extreme（50°C）		1850.5795	1909.4476	2.39	0.00127
Extreme（40°C）		1850.5808	1909.4463	4.85	0.00258
Extreme（30°C）		1850.5815	1909.4456	2.91	0.00155
Extreme（20°C）		1850.5794	1909.4478	-0.76	-0.00040
Extreme（10°C）		1850.5806	1909.4465	-0.94	-0.00050
Extreme（0°C）		1850.5793	1909.4478	-0.27	-0.00015
Extreme（-10°C）		1850.5788	1909.4483	2.83	0.00151
Extreme（-20°C）		1850.5799	1909.4472	2.39	0.00127

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Extreme（-30°C）		1850.5832	1909.4439	4.85	0.00258
Extreme（-40°C）		1850.5844	1909.4436	2.91	0.00155
25°C	LV	1850.5796	1909.4475	1.22	0.00065
	HV	1850.5802	1909.4469	-0.48	-0.00026

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

5.6. Spurious Emissions at Antenna Terminals

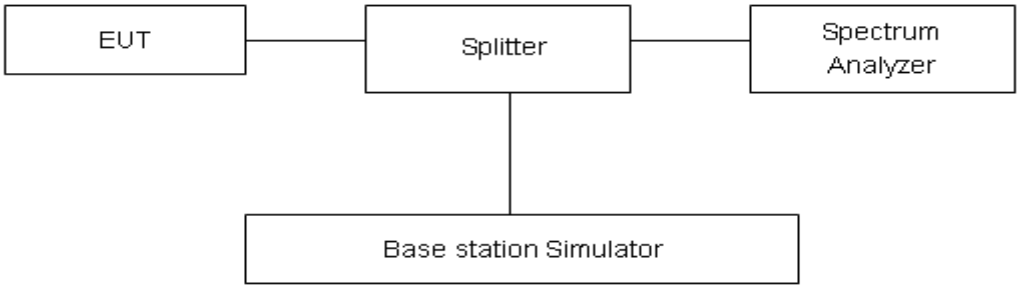
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 9kHz to the 10th harmonic of the carrier. The peak detector is used.
RBW is set to 100kHz, VBW is set to 300kHz for 30MHz~1GHz
RBW is set to 1MHz, VBW is set to 3MHz for above 1GHz, Sweep is set to ATUO.
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup



Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log10 (P) dB.”

Limit	-13 dBm

Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75％ confidence level for the normal distribution is with the coverage factor *k* = 1.96.

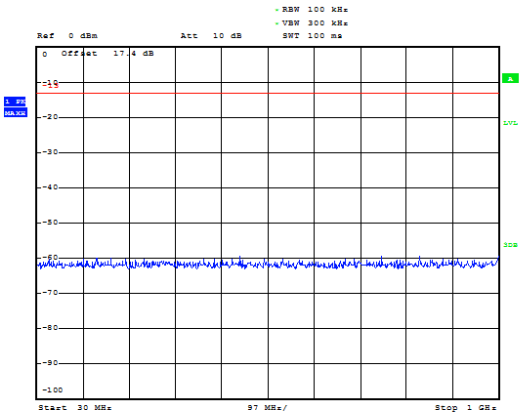
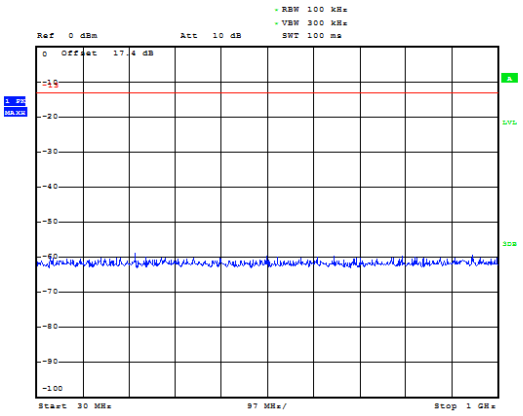
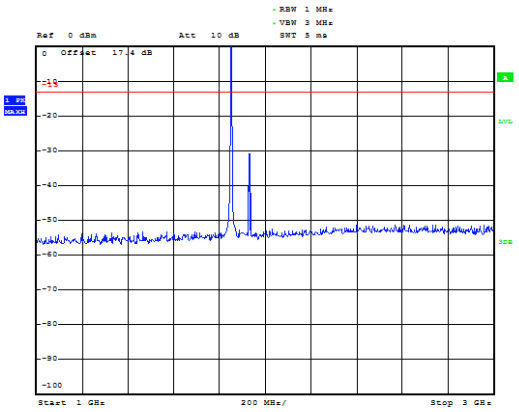
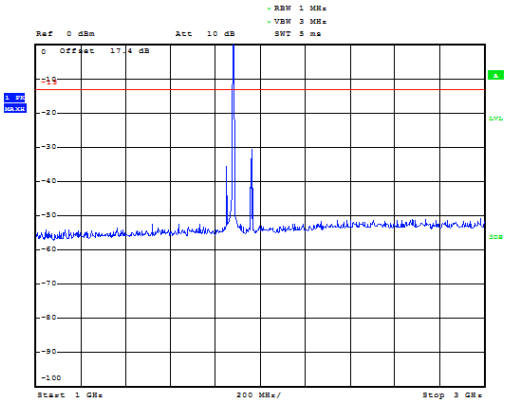
Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-20GHz	1.407 dB

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

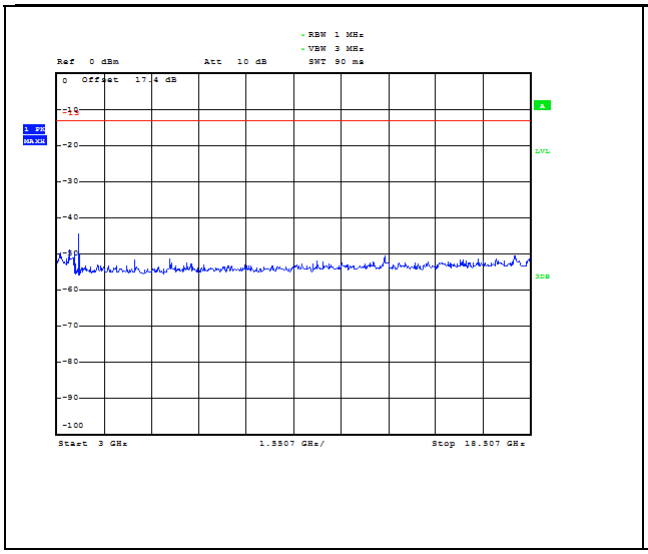
Test Result

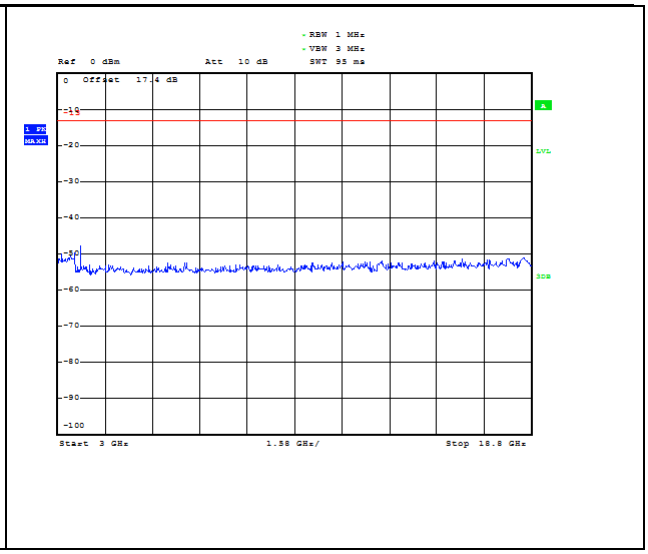
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

LTE Band 2 1.4MHz CH-Low 30MHz~1GHz  	LTE Band 2 1.4MHz CH-Middle 30MHz~1GHz 
LTE Band 2 1.4MHz CH-Low 1GHz~3GHz  	LTE Band 2 1.4MHz CH-Middle 1GHz~3GHz 
LTE Band 2 1.4MHz CH-Low 3GHz~20GHz	LTE Band 2 1.4MHz CH-Middle 3GHz~20GHz

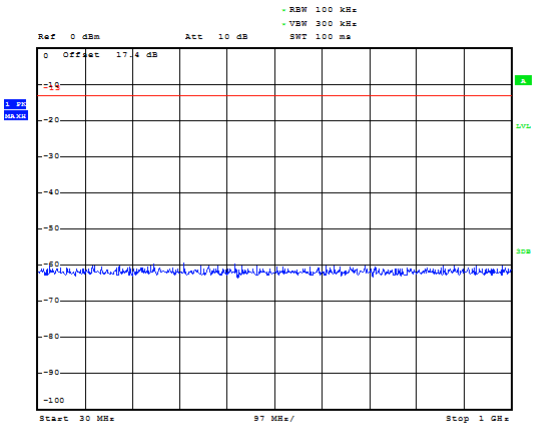
This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.



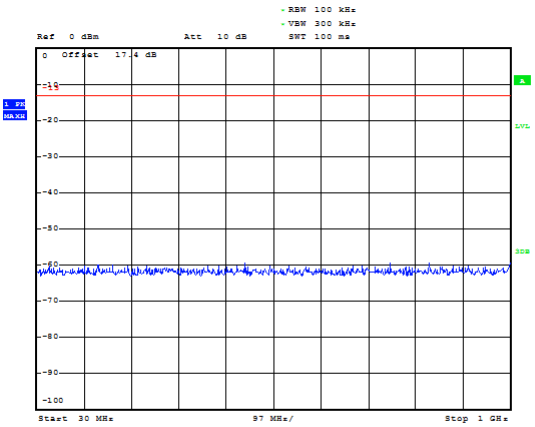


This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

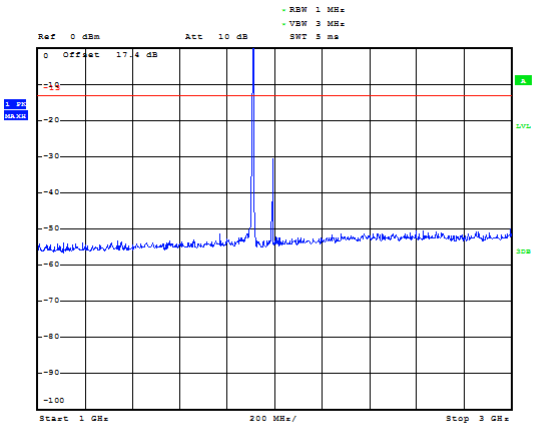
LTE Band 2 1.4MHz CH-High 30MHz~1GHz



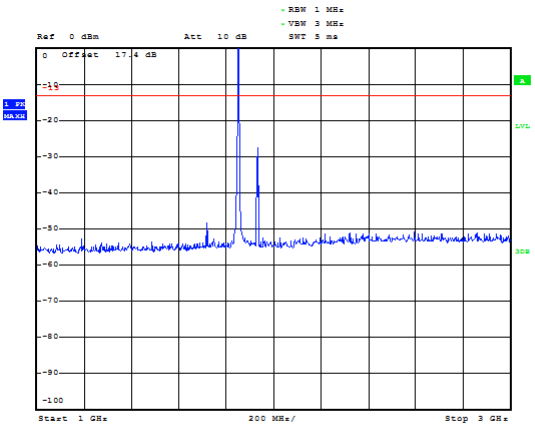
LTE Band 2 3MHz CH-Low 30MHz~1GHz



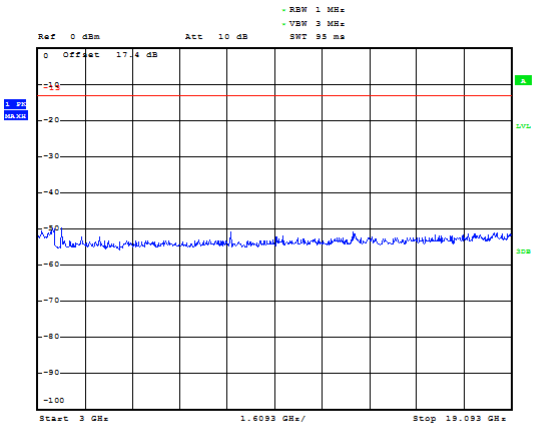
LTE Band 2 1.4MHz CH-High 1GHz~3GHz



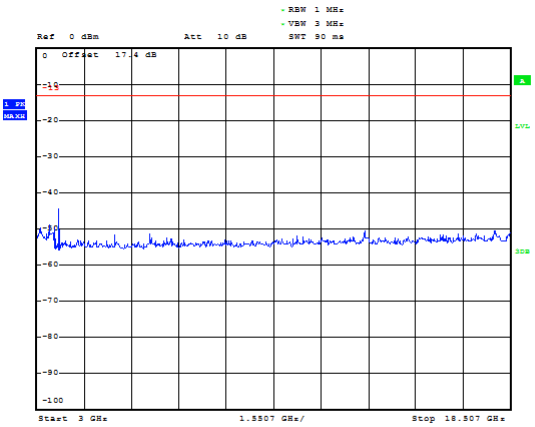
LTE Band 2 3MHz CH-Low 1GHz~3GHz



LTE Band 2 1.4MHz CH-High 3GHz~20GHz

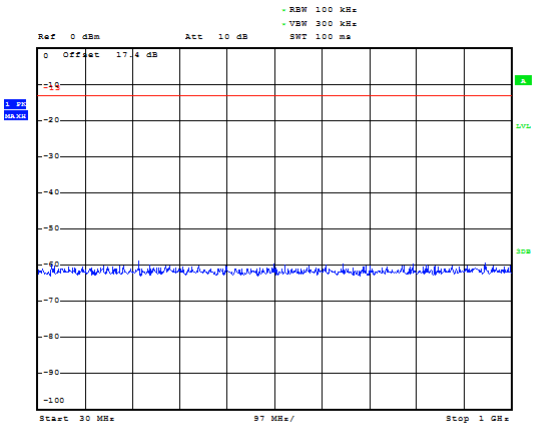


LTE Band 2 3MHz CH-Low 3GHz~20GHz

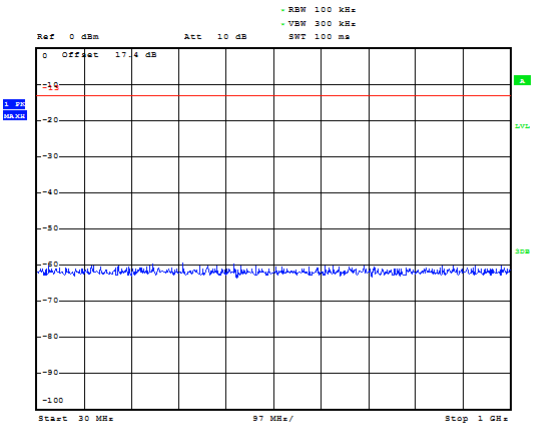


This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

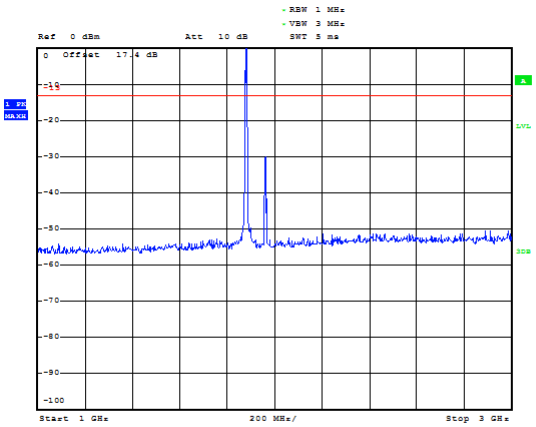
LTE Band 2 3MHz CH-Middle 30MHz~1GHz



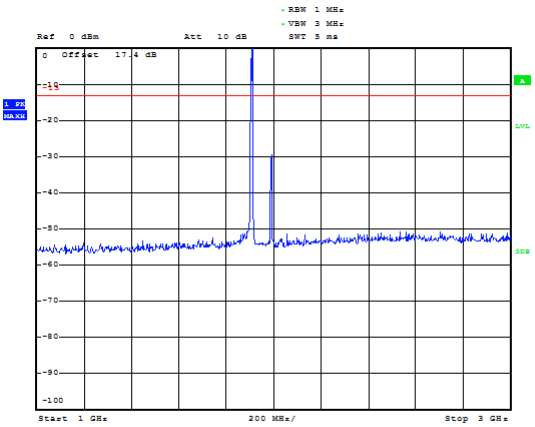
LTE Band 2 3MHz CH-High 30MHz~1GHz



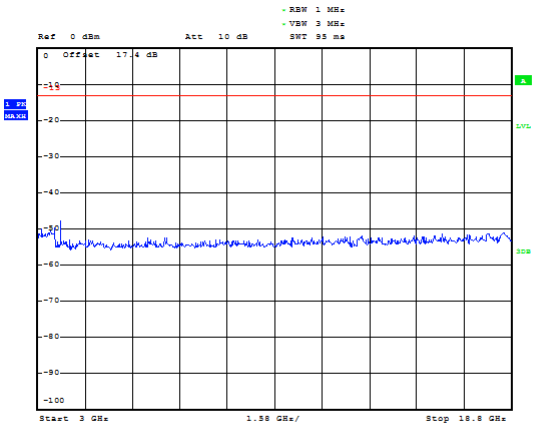
LTE Band 2 3MHz CH-Middle 1GHz~3GHz



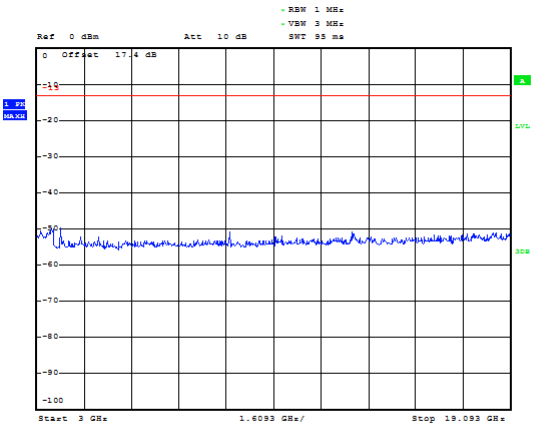
LTE Band 2 3MHz CH-High 1GHz~3GHz



LTE Band 2 3MHz CH-Middle 3GHz~20GHz

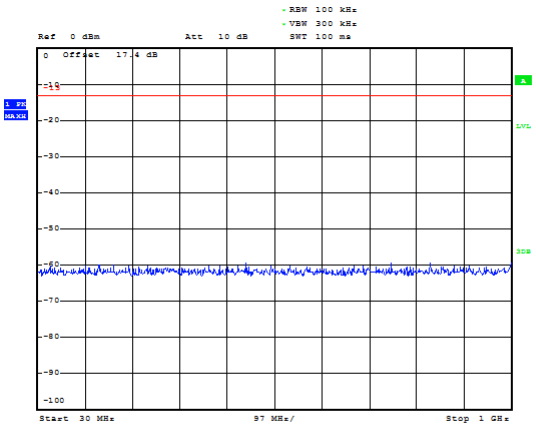


LTE Band 2 3MHz CH-High 3GHz~20GHz

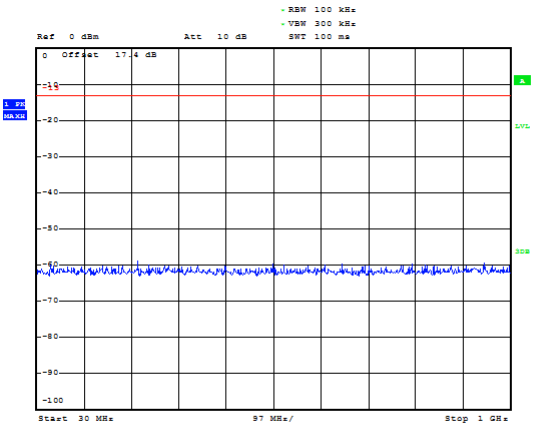


This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

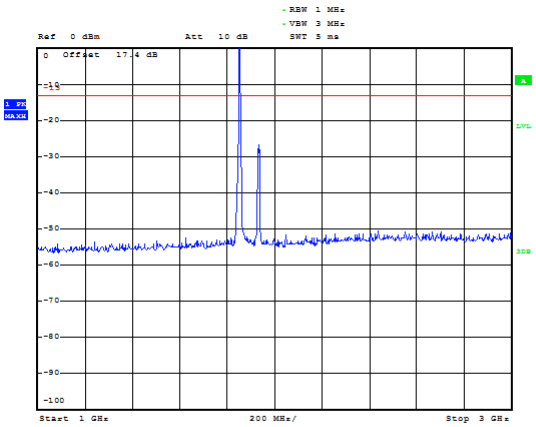
LTE Band 2 5MHz CH-Low 30MHz~1GHz



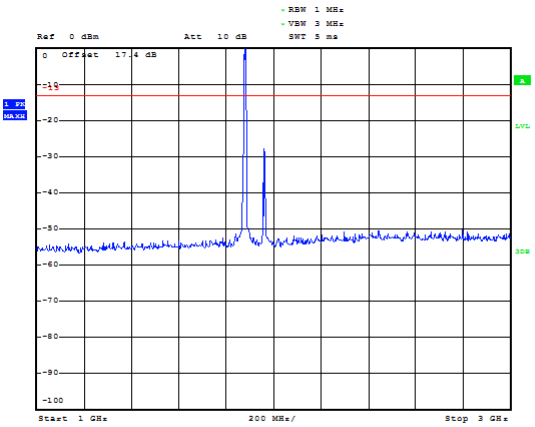
LTE Band 2 5MHz CH-Middle 30MHz~1GHz



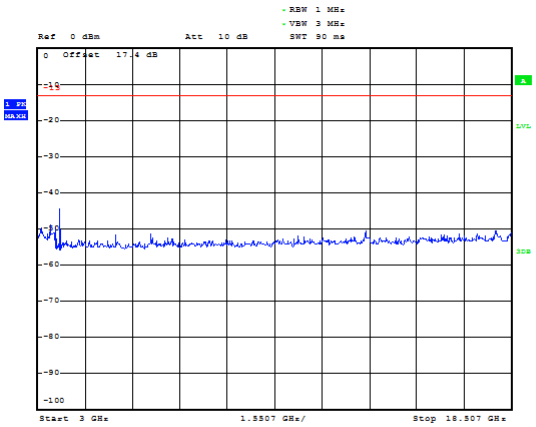
LTE Band 2 5MHz CH-Low 1GHz~3GHz



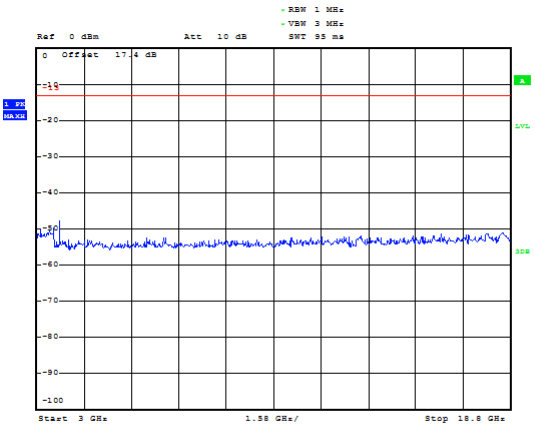
LTE Band 2 5MHz CH-Middle 1GHz~3GHz



LTE Band 2 5MHz CH-Low 3GHz~20GHz

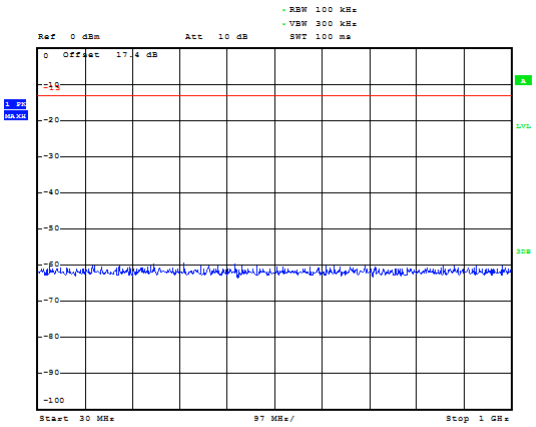


LTE Band 2 5MHz CH-Middle 3GHz~20GHz

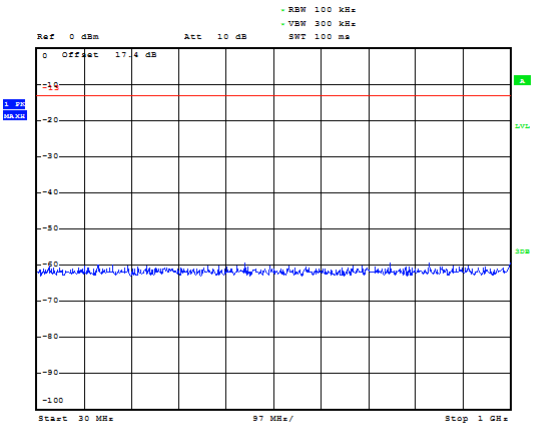


This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

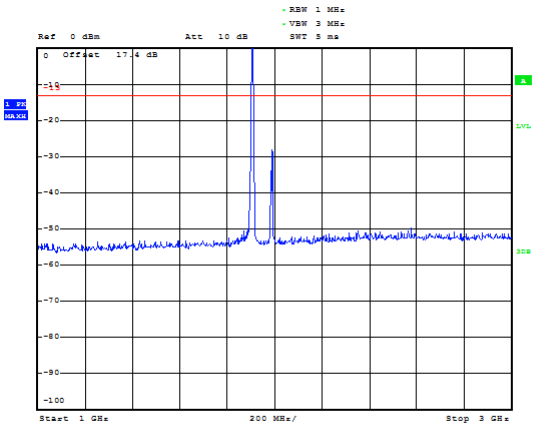
LTE Band 2 5MHz CH-High 30MHz~1GHz



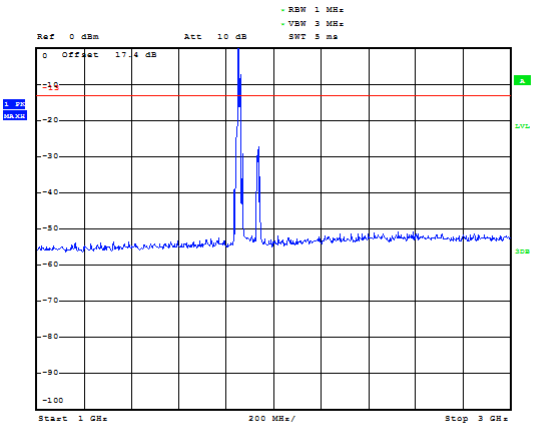
LTE Band 2 10MHz CH-Low 30MHz~1GHz



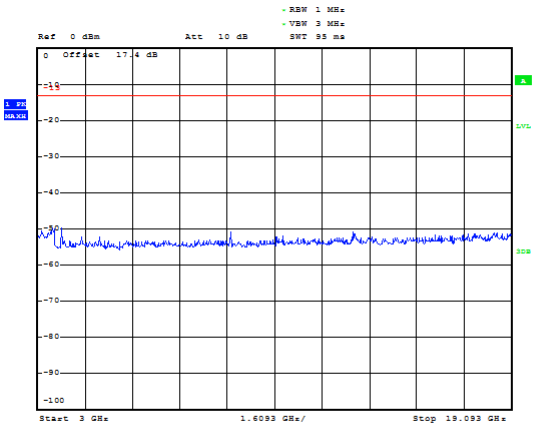
LTE Band 2 5MHz CH-High 1GHz~3GHz



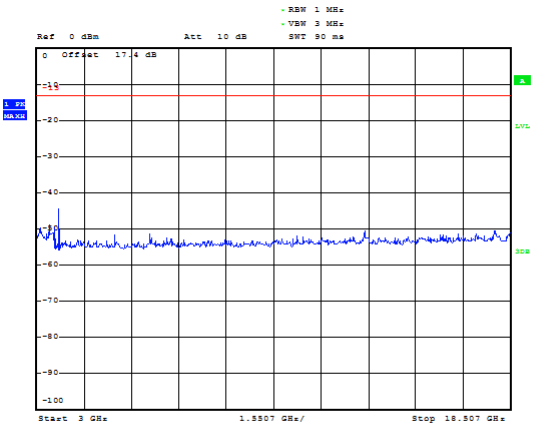
LTE Band 2 10MHz CH-Low 1GHz~3GHz



LTE Band 2 5MHz CH-High 3GHz~20GHz

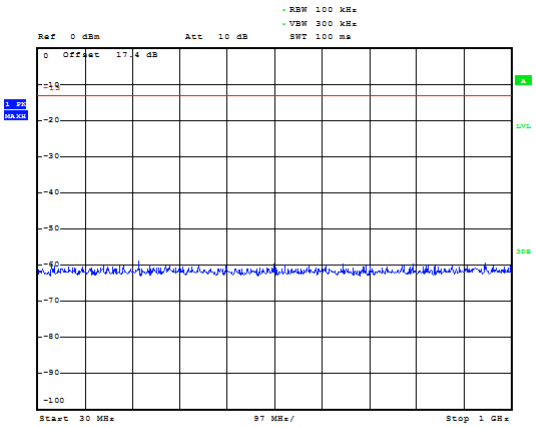


LTE Band 2 10MHz CH-Low 3GHz~20GHz

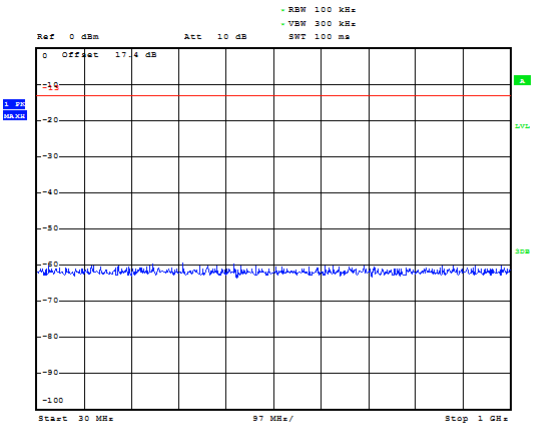


This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

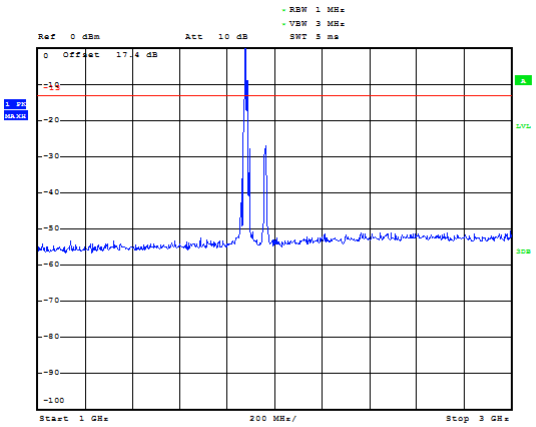
LTE Band 2 10MHz CH-Middle 30MHz~1GHz



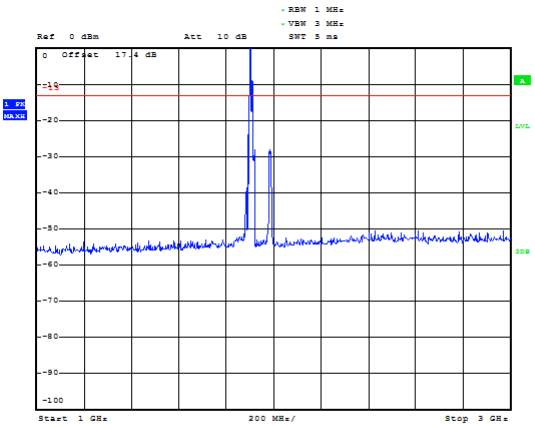
LTE Band 2 10MHz CH-High 30MHz~1GHz



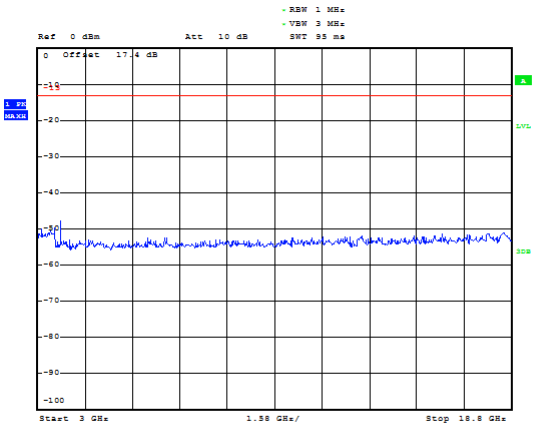
LTE Band 2 10MHz CH-Middle 1GHz~3GHz



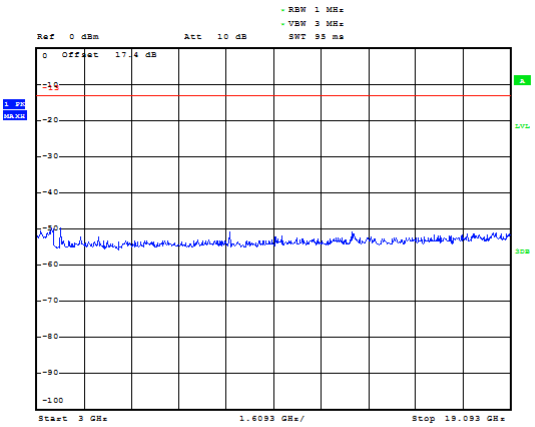
LTE Band 2 10MHz CH-High 1GHz~3GHz



LTE Band 2 10MHz CH-Middle 3GHz~20GHz

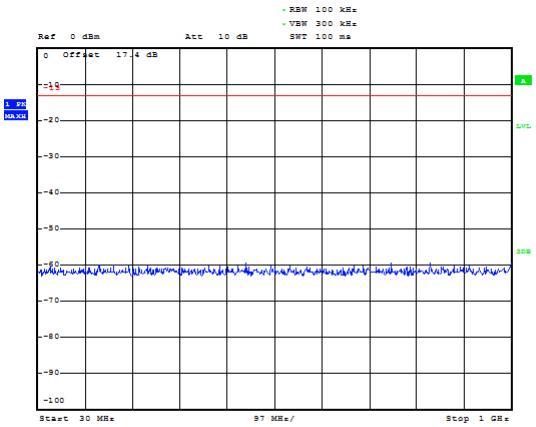


LTE Band 2 10MHz CH-High 3GHz~20GHz

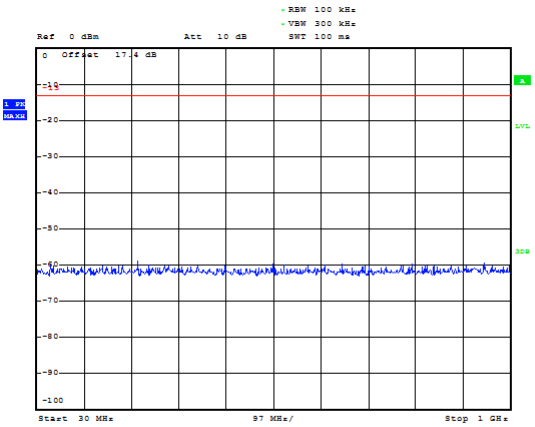


This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

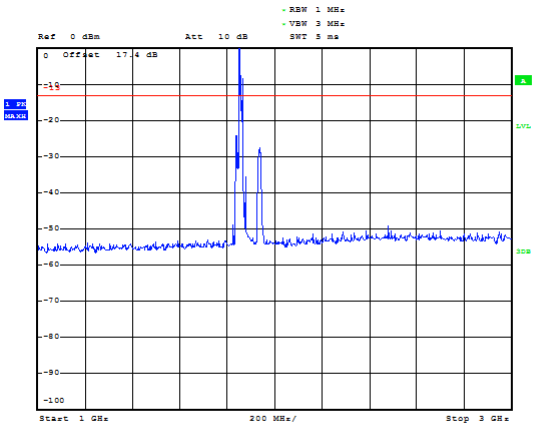
LTE Band 2 15MHz CH-Low 30MHz~1GHz



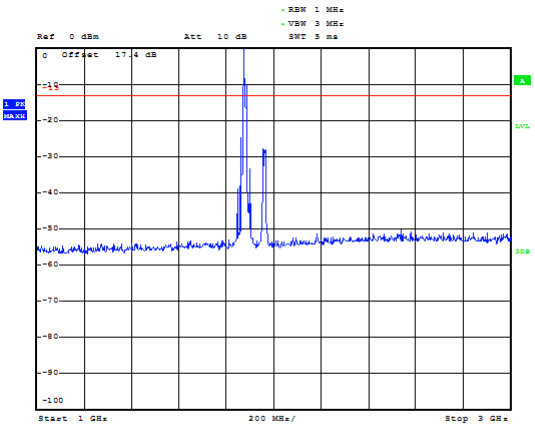
LTE Band 2 15MHz CH-Middle 30MHz~1GHz



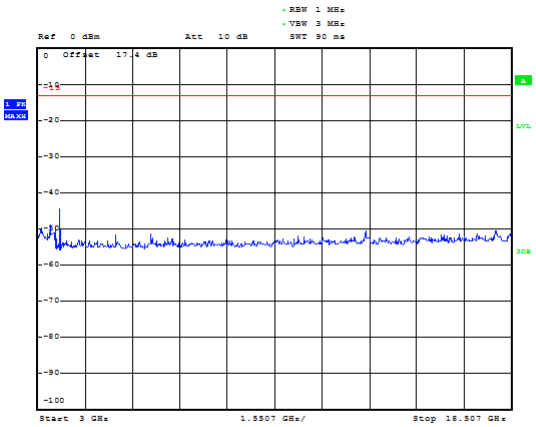
LTE Band 2 15MHz CH-Low 1GHz~3GHz



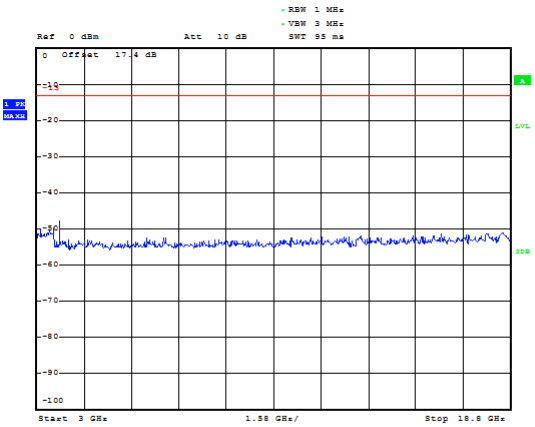
LTE Band 2 15MHz CH-Middle 1GHz~3GHz



LTE Band 2 15MHz CH-Low 3GHz~20GHz

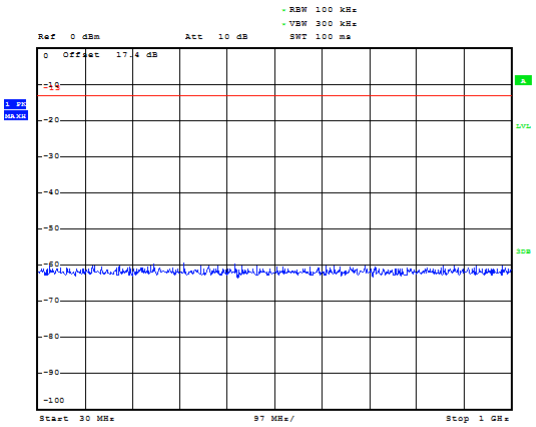


LTE Band 2 15MHz CH-Middle 3GHz~20GHz

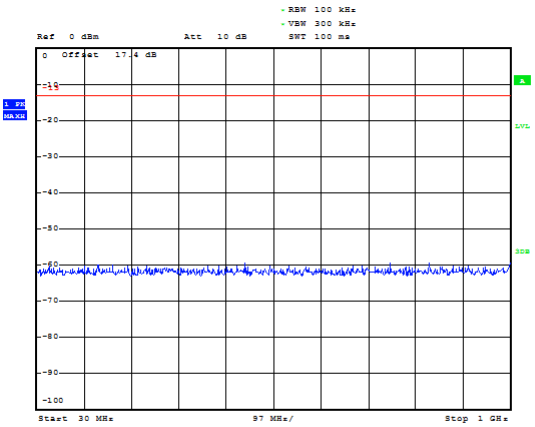


This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

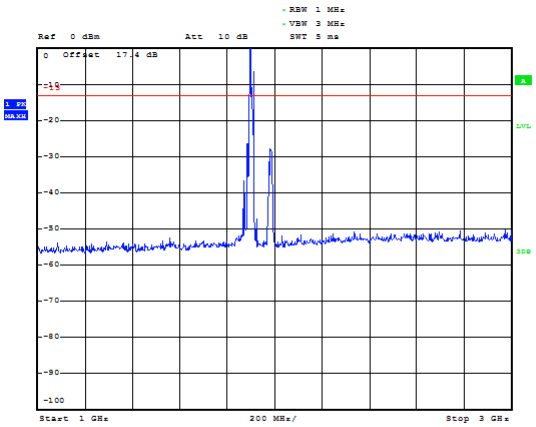
LTE Band 2 15MHz CH-High 30MHz~1GHz



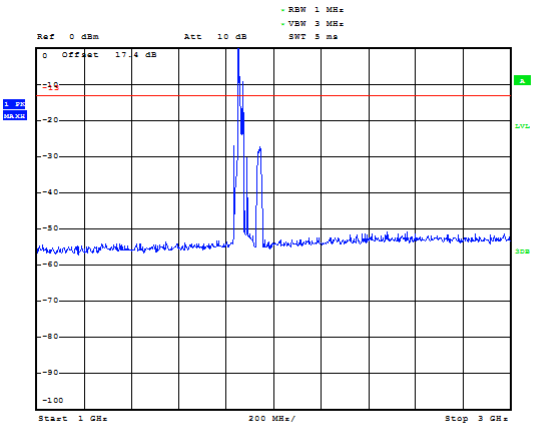
LTE Band 2 20MHz CH-Low 30MHz~1GHz



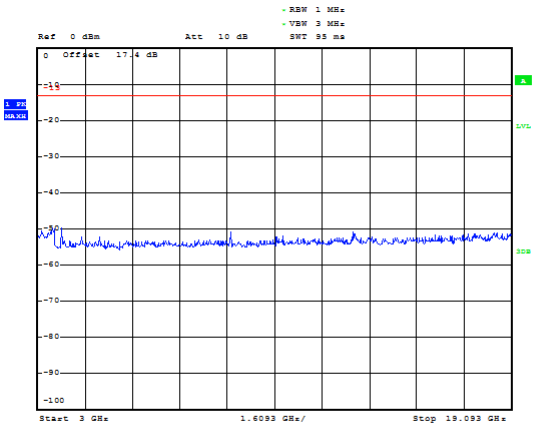
LTE Band 2 15MHz CH-High 1GHz~3GHz



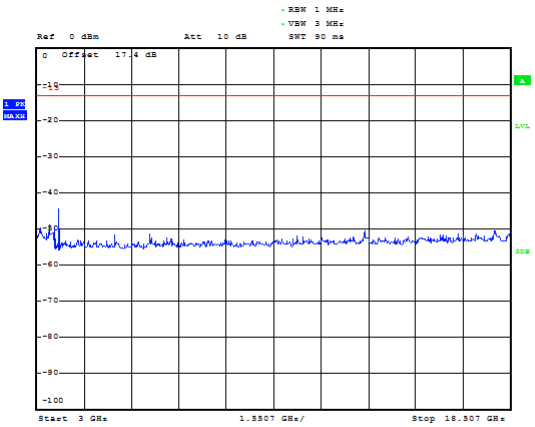
LTE Band 2 20MHz CH-Low 1GHz~3GHz



LTE Band 2 15MHz CH-High 3GHz~20GHz

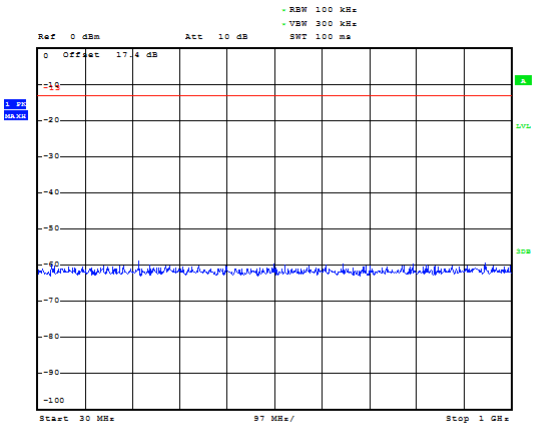


LTE Band 2 20MHz CH-Low 3GHz~20GHz

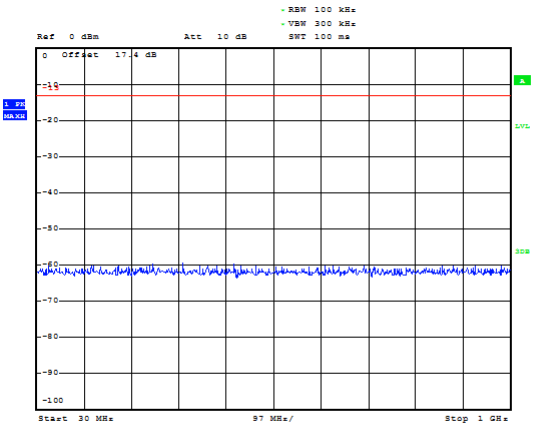


This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

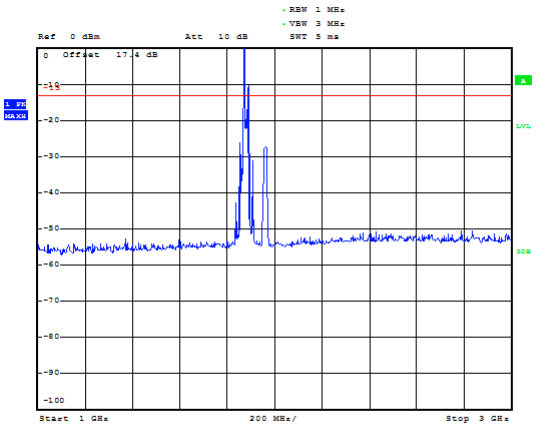
LTE Band 2 20MHz CH-Middle 30MHz~1GHz



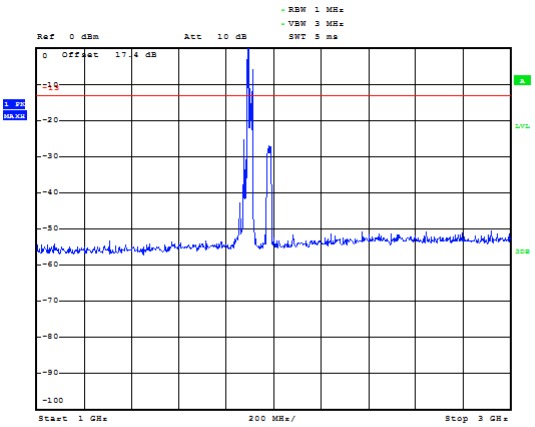
LTE Band 2 20MHz CH-High 30MHz~1GHz



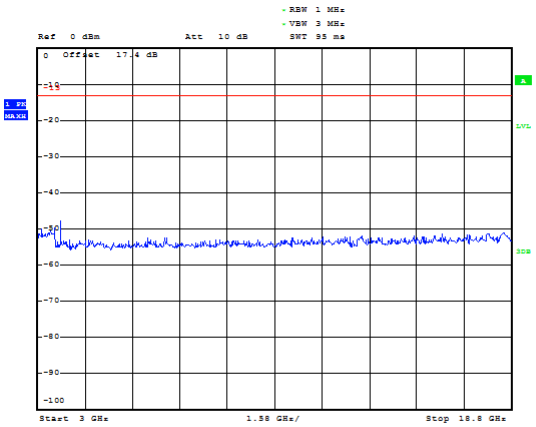
LTE Band 2 20MHz CH-Middle 1GHz~3GHz



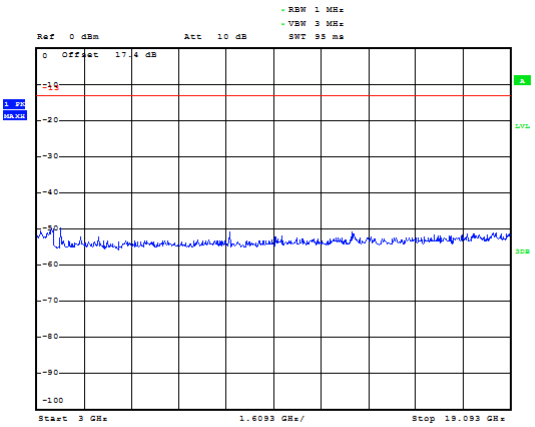
LTE Band 2 20MHz CH-High 1GHz~3GHz



LTE Band 2 20MHz CH-Middle 3GHz~20GHz



LTE Band 2 20MHz CH-High 3GHz~20GHz



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

5.7. Radiates Spurious Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A loop antenna, A log-periodic antenna or horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, and the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
7. The measurement results are obtained as described below:
Power(EIRP)=PMea- PAg - Pcl + Ga
The measurement results are amend as described below:
Power(EIRP)=PMea- Pcl + Ga
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP

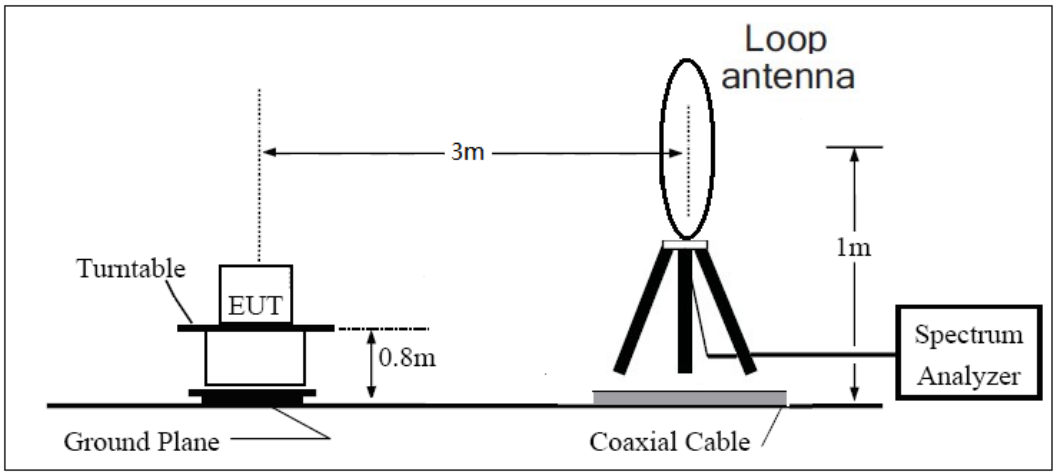
This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

= EIRP-2.15dBi.

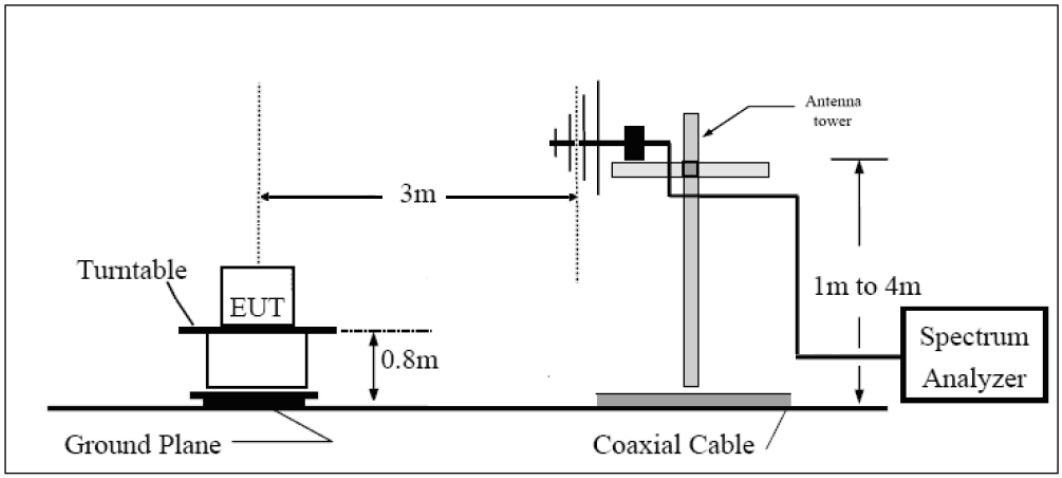
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

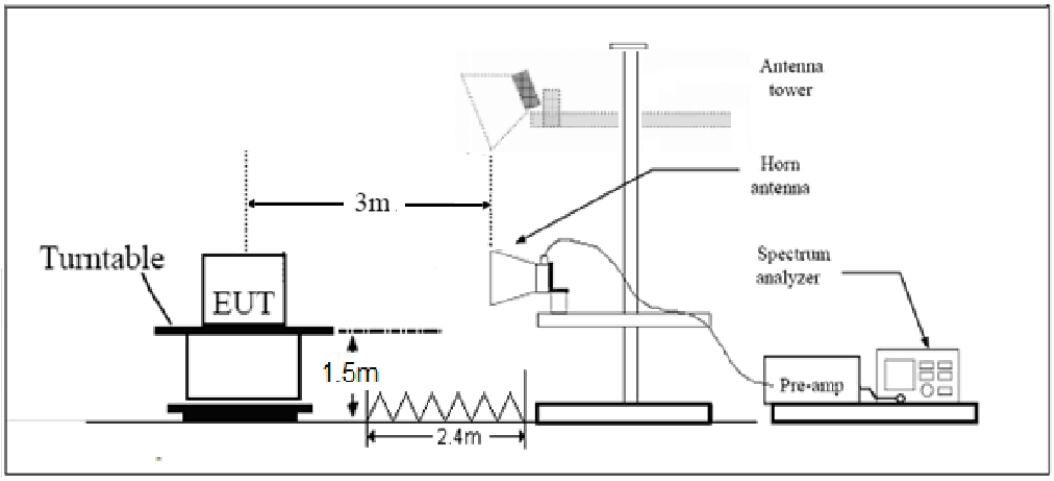
9KHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Note: Area side: 2.4mX3.6m

Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log10 (P) dB.”

Limit	-13 dBm

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95％ confidence level for the normal distribution is with the coverage factor *k* = 1.96, *U*= 3.55 dB.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Test Result

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions below the noise floor will not be recorded in the report.

LTE Band 2 1.4MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3759.0	-47.65	2.60	12.50	Horizontal	-39.90	-13.00	26.90	45
3	5638.9	-47.25	3.30	12.50	Horizontal	-40.20	-13.00	27.20	45
4	7520.0	-51.55	4.20	12.20	Horizontal	-45.70	-13.00	32.70	135
5	9400.0	-49.25	4.30	11.10	Horizontal	-44.60	-13.00	31.60	0
6	11280.0	-47.25	5.90	11.90	Horizontal	-43.40	-13.00	30.40	0
7	13160.0	-48.65	5.70	14.00	Horizontal	-42.50	-13.00	29.50	225
8	15040.0	-46.15	5.80	13.10	Horizontal	-41.00	-13.00	28.00	315
9	16920.0	-46.25	6.10	14.60	Horizontal	-39.90	-13.00	26.90	90
10	18800.0	-	-	-	-	-	-	-	-
Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor. 2. The worst emission was found in the antenna is Horizontal position.									

LTE Band 2 5MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3755.6	-49.25	2.60	12.50	Horizontal	-41.50	-13.00	28.50	90
3	5633.6	-47.75	3.30	12.50	Horizontal	-40.70	-13.00	27.70	45
4	7520.0	-52.95	4.20	12.20	Horizontal	-47.10	-13.00	34.10	135
5	9400.0	-49.05	4.30	11.10	Horizontal	-44.40	-13.00	31.40	180
6	11280.0	-47.55	5.90	11.90	Horizontal	-43.70	-13.00	30.70	180
7	13160.0	-48.75	5.70	14.00	Horizontal	-42.60	-13.00	29.60	180
8	15040.0	-46.35	5.80	13.10	Horizontal	-41.20	-13.00	28.20	45
9	16920.0	-47.45	6.10	14.60	Horizontal	-41.10	-13.00	28.10	0
10	18800.0	-	-	-	-	-	-	-	-
Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor. 2. The worst emission was found in the antenna is Horizontal position.									

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

LTE Band 2 20MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3742.1	-49.95	2.60	12.50	Horizontal	-42.20	-13.00	29.20	180
3	5613.4	-47.65	3.30	12.50	Horizontal	-40.60	-13.00	27.60	45
4	7484.6	-52.15	4.20	12.20	Horizontal	-46.30	-13.00	33.30	0
5	9400.0	-50.45	4.30	11.10	Horizontal	-45.80	-13.00	32.80	0
6	11280.0	-48.05	5.90	11.90	Horizontal	-44.20	-13.00	31.20	135
7	13160.0	-49.75	5.70	14.00	Horizontal	-43.60	-13.00	30.60	90
8	15040.0	-46.45	5.80	13.10	Horizontal	-41.30	-13.00	28.30	270
9	16920.0	-45.15	6.10	14.60	Horizontal	-38.80	-13.00	25.80	270
10	18800.0	-	-	-	-	-	-	-	-
Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor. 2. The worst emission was found in the antenna is Horizontal position.									

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMU200	118133	2018-05-13	2019-05-12
Base Station Simulator	R&S	CMW500	113645	2018-05-13	2019-05-12
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	NA	NA
Spectrum Analyzer	Agilent	N9010A	MY47191109	2018-05-20	2019-05-19
Universal Radio Communication Tester	Agilent	E5515C	MY48367192	2018-05-20	2019-05-19
Signal Analyzer	R&S	FSV30	100815	2017-12-17	2018-12-16
EMI Test Receiver	R&S	ESCI	100948	2018-05-20	2019-05-19
Signal generator	R&S	SMB 100A	102594	2018-05-13	2019-05-12
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2014-12-06	2019-12-05
Trilog Antenna	SCHWARZBECK	VUBL 9163	9163-201	2017-11-18	2020-11-17
Horn Antenna	R&S	HF907	100126	2014-12-06	2019-12-05
Climatic Chamber	Re Ce	PT-30B	20101891	2015-07-18	2018-07-17
Horn Antenna	ETS-Lindgren	3160-09	00102644	2015-01-30	2020-01-29
RF Cable	Agilent	SMA 15cm	0001	2018-02-03	2018-08-02
Preampflier	R&S	SCU18	102327	2018-05-20	2019-05-19
Software	R&S	EMC32	V 8.52.0	NA	NA
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2018-05-07	2019-05-06

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

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.