PERFECT WIRELESS EXPERIENCE

FG132-GL-00-MiniPCIe
RF Test Report

V1.1

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Change History

V1.1(2025-03-06)	The chapter 5.6 add the SRS specifications
V1.0 (2024-10-21)	Initial version

1 Test Version Description

Table 1. Test version description

Product name	FG132-GL-00-MiniPCIe
Hardware version	V1.0
Software version	19003.1000.00.02.01.46

2 Test Device

Table 2. Test device list

No.	Device Name	Manufacturer	Model
1	Programmable constant temperature and humidity test chamber	XI'AN HUANKE TEST Equipment Co., Ltd.	GDJS-100C
2	Wideband radio communication tester	R&S	CMW500
3	Wideband radio communication tester	Anritsu	MT8821C
4	Wideband radio communication tester	R&S	CMX500
5	Wideband radio communication tester	Keysight	E7515R
6	DC power Analyzer	KEYSIGHT	N6705C
7	DC power supply	Agilent	66309D/66319D
8	Vector Signal Generator	R&S	SMBV100B

3 Test Summary

Table 3. Summary of test items

No.	Test Item	Test Result	Remarks (Failed Item)
1	LTE FDD	PASS	--
2	LTE TDD	PASS	--
3	LTE HPUE	PASS	--
4	5G RedCap FDD	PASS	--
5	5G RedCap TDD	PASS	--
6	5G RedCap SRS	PASS	--
7	GNSS	PASS	--
8	Max Throughput	PASS	--
9	Working Current	PASS	--

4 Test Standards and Conditions

4.1 Test Standards

Table 4. Supported systems and followed standards

No.	Communication System	Reference Standard/Specification
1	LTE	3GPP TS 36.521-1
2	5G RedCap	3GPP TS 38.521-1
3	GNSS	Product Specifications

4.2 Test Environment

Table 5. Test environment

No.	Test Environment	Test Temperature	Power Supply Voltage
1	Normal/NC	Normal temperature/room temperature: +25℃	Normal voltage: +3.8V
2	TL/VL	Low operating temperature: -35℃	Low voltage: +3.3V
3	TL/VH	Low operating temperature: -35℃	High voltage: +4.3V
4	TH/VL	High operating temperature: +75℃	Low voltage: +3.3V
5	TH/VH	High operating temperature: +75℃	High voltage: +4.3V

5 Test Items

5.1 LTE FDD Specifications

Description:

The maximum TX power of LTE FDD is measured by 10M QPSK 1RB. The RB position in low and medium channels is low, and the RB position in high channel is high.

Table 6. LTE-FDD maximum TX power & RX sensitivity (main+diversity) (Bandwidth=10M)

Band	Channel	Maximum TX Power (dBm)			RX Sensitivity (Main+Diversity) (dBm)		
		3GPP Requirement	Test Value		3GPP Requirement	Test Value	
			2799#	3631#		2799#	3631#
B1	L	23.0±2.7	23.3	23.1	-96.3	-101.9	-101.7
	M	23.0±2.7	23.4	23.3		-101.7	-101.5
	H	23.0±2.7	23.4	23.3		-101.7	-101.5
B2	L	23.0+2.7/-4.2	23.3	23.0	-94.3	-102.1	-101.7
	M	23.0±2.7	23.2	23.1		-102.3	-102.1
	H	23.0+2.7/-4.2	23.2	23.0		-102.3	-102.1
B3	L	23.0+2.7/-4.2	22.8	22.7	-93.3	-101.5	-101.5
	M	23.0±2.7	22.8	22.7		-101.9	-101.7
	H	23.0+2.7/-4.2	22.7	22.5		-101.7	-101.5
B4	L	23.0±2.7	22.6	22.6	-96.3	-101.9	-101.7
	M	23.0±2.7	22.6	22.6		-102.1	-102.1
	H	23.0±2.7	22.6	22.6		-101.7	-101.7
B5	L	23.0±2.7	22.8	22.8	-94.3	-102.7	-102.7
	M	23.0±2.7	22.9	22.9		-102.5	-102.5
	H	23.0±2.7	22.8	22.8		-102.5	-102.5
B7	L	23.0+2.7/-4.2	23.0	22.7	-94.3	-101.5	-101.5
	M	23.0±2.7	22.8	22.5		-101.3	-101.1
	H	23.0+2.7/-4.2	23.0	22.7		-100.9	-100.9
B8	L	23.0+2.7/-4.2	22.9	23.0	-93.3	-102.3	-102.3
	M	23.0±2.7	22.9	22.9		-102.5	-102.5
	H	23.0+2.7/-4.2	22.9	22.9		-102.3	-102.3

Band	Channel	Maximum TX Power (dBm)			RX Sensitivity (Main+Diversity) (dBm)		
		3GPP Requirement	Test Value		3GPP Requirement	Test Value	
			2799#	3631#		2799#	3631#
B12	L	23.0+2.7/-4.2	22.7	22.7	-93.3	-101.5	-101.5
	M	23.0±2.7	22.7	22.8		-101.7	-101.7
	H	23.0+2.7/-4.2	22.4	22.4		-101.7	-101.7
B13	L/M/H	23.0±2.7	22.7	22.7	-93.3	-101.7	-101.7
B14	L/M/H	23.0±2.7	22.7	22.7	-93.3	-101.5	-101.5
B17	L	23.0±2.7	22.6	22.7	-93.3	-101.7	-101.7
	M	23.0±2.7	22.7	22.7		-101.7	-101.7
	H	23.0±2.7	22.5	22.5		-101.7	-101.7
B18	L	23.0+2.7/-4.2	22.8	22.8	-96.3	-102.5	-102.5
	M	23.0±2.7	22.8	22.8		-102.5	-102.5
	H	23.0±2.7	22.9	22.8		-102.5	-102.5
B19	L	23.0±2.7	22.8	22.9	-96.3	-102.7	-102.5
	M	23.0±2.7	22.7	22.7		-102.5	-102.3
	H	23.0±2.7	22.8	22.9		-102.5	-102.3
B20	L	23.0+2.7/-4.2	22.8	22.9	-93.3	-102.5	-102.5
	M	23.0±2.7	22.8	22.9		-102.5	-102.5
	H	23.0+2.7/-4.2	22.9	22.9		-102.5	-102.3
B25	L	23.0+2.7/-4.2	23.4	23.1	-92.8	-101.8	-101.6
	M	23.0±2.7	23.4	23.2		-102.0	-101.8
	H	23.0+2.7/-4.2	23.4	23.1		-102.0	-102.0
B26	L	23.0+2.7/-4.2	22.8	22.9	-93.8	-102.4	-102.4
	M	23.0±2.7	22.8	23.0		-102.8	-102.8
	H	23.0+2.7/-4.2	22.8	22.8		-102.4	-102.4
B28	L	23.0+2.7/-3.2	22.6	22.8	-94.8	-102.4	-102.4
	M	23.0+2.7/-3.2	22.7	22.7		-103.0	-103.0
	H	23.0+2.7/-3.2	22.5	22.6		-102.8	-102.8
B30	L/M/H	23.0±2.7	22.9	22.5	-95.3	-101.1	-101.1
B66	L	23.0±2.7	23.5	23.4	-95.8	-101.6	-102.0
	M	23.0±2.7	23.5	23.4		-101.6	-101.9

Band	Channel	Maximum TX Power (dBm)			RX Sensitivity (Main+Diversity) (dBm)		
		3GPP Requirement	Test Value		3GPP Requirement	Test Value	
			2799#	3631#		2799#	3631#
B71	H	23.0±2.7	23.3	23.3	-93.5	-102.0	-101.8
	L	23.0+2.7/-3.2	22.7	22.9		-102.3	-102.1
	M	23.0+2.7/-3.2	22.7	22.8		-102.1	-101.9
	H	23.0+2.7/-3.2	22.7	22.7		-101.9	-101.9

Table 7. LTE-FDD maximum TX power & RX sensitivity (main&diversity) (Bandwidth=10M)

Band	Channel	Maximum TX Power (dBm)			RX Sensitivity (dBm)				
		3GPP Requirement	Test Value		3GPP Requirement	Test Value (Main)		Test Value (Diversity)	
			2799#	3631#		2799#	3631#	2799#	3631#
B1	L	23.0±2.7	23.3	23.1	-96.3	-98.3	-98.3	-99.7	-99.3
	M	23.0±2.7	23.4	23.3		-98.5	-98.1	-99.5	-99.1
	H	23.0±2.7	23.4	23.3		-98.3	-98.1	-99.5	-99.1
B2	L	23.0+2.7/-4.2	23.3	23.0	-94.3	-98.7	-98.5	-99.1	-99.3
	M	23.0±2.7	23.2	23.1		-99.3	-98.9	-99.1	-99.1
	H	23.0+2.7/-4.2	23.2	23.0		-99.1	-98.9	-99.1	-99.3
B3	L	23.0+2.7/-4.2	22.8	22.7	-93.3	-98.5	-98.3	-98.9	-98.9
	M	23.0±2.7	22.8	22.7		-98.9	-98.5	-99.3	-99.1
	H	23.0+2.7/-4.2	22.7	22.5		-98.7	-98.5	-98.7	-98.3
B4	L	23.0±2.7	22.6	22.6	-96.3	-98.5	-98.5	-99.5	-99.3
	M	23.0±2.7	22.6	22.6		-99.3	-99.5	-99.3	-99.1
	H	23.0±2.7	22.6	22.6		-98.7	-98.7	-99.3	-98.9
B5	L	23.0±2.7	22.8	22.8	-94.3	-99.3	-99.3	-100.5	-100.5
	M	23.0±2.7	22.9	22.9		-99.3	-99.1	-100.1	-100.1
	H	23.0±2.7	22.8	22.8		-99.3	-99.1	-99.9	-99.9
B7	L	23.0+2.7/-4.2	23.0	22.7	-94.3	-98.3	-98.3	-99.1	-98.9
	M	23.0±2.7	22.8	22.5		-97.7	-97.9	-99.1	-98.9
	H	23.0+2.7/-4.2	23.0	22.7		-97.3	-97.5	-98.7	-98.3
B8	L	23.0+2.7/-4.2	22.9	23.0	-93.3	-98.9	-98.7	-99.9	-100.1
	M	23.0±2.7	22.9	22.9		-99.1	-98.9	-100.1	-100.1

Band	Channel	Maximum TX Power (dBm)			RX Sensitivity (dBm)				
		3GPP Requirement	Test Value		3GPP Requirement	Test Value (Main)		Test Value (Diversity)	
			2799#	3631#		2799#	3631#	2799#	3631#
	H	23.0+2.7/-4.2	22.9	22.9		-98.9	-98.7	-99.9	-99.9
B12	L	23.0+2.7/-4.2	22.7	22.7	-93.3	-98.5	-98.5	-98.5	-98.9
	M	23.0±2.7	22.7	22.8		-98.5	-98.5	-98.9	-99.1
	H	23.0+2.7/-4.2	22.4	22.4		-98.5	-98.3	-99.1	-99.5
B13	L/M/H	23.0±2.7	22.7	22.7	-93.3	-98.5	-98.5	-99.3	-99.5
B14	L/M/H	23.0±2.7	22.7	22.7	-93.3	-98.5	-98.3	-98.7	-99.3
B17	L	23.0±2.7	22.6	22.7	-93.3	-98.5	-98.5	-99.1	-99.3
	M	23.0±2.7	22.7	22.7		-98.5	-98.5	-99.1	-99.3
	H	23.0±2.7	22.5	22.5		-98.5	-98.3	-99.1	-98.5
B18	L	23.0+2.7/-4.2	22.8	22.8	-96.3	-99.1	-98.7	-100.1	-100.3
	M	23.0±2.7	22.8	22.8		-99.1	-98.7	-100.3	-100.5
	H	23.0±2.7	22.9	22.8		-98.9	-98.7	-100.3	-100.5
B19	L	23.0±2.7	22.8	22.9	-96.3	-99.3	-99.1	-100.3	-100.3
	M	23.0±2.7	22.7	22.7		-99.1	-98.9	-99.9	-100.1
	H	23.0±2.7	22.8	22.9		-99.1	-98.9	-99.7	-99.9
B20	L	23.0+2.7/-4.2	22.8	22.9	-93.3	-98.7	-98.7	-100.1	-100.5
	M	23.0±2.7	22.8	22.9		-99.1	-98.9	-100.1	-100.1
	H	23.0+2.7/-4.2	22.9	22.9		-99.1	-98.9	-99.9	-99.9
B25	L	23.0+2.7/-4.2	23.4	23.1	-92.8	-98.8	-98.5	-99.2	-99.2
	M	23.0±2.7	23.4	23.2		-99.0	-98.6	-99.0	-99.0
	H	23.0+2.7/-4.2	23.4	23.1		-99.0	-98.8	-99.0	-99.0
B26	L	23.0+2.7/-4.2	22.8	22.9	-93.8	-99.0	-98.6	-100.0	-100.2
	M	23.0±2.7	22.8	23.0		-99.4	-99.2	-100.4	-100.4
	H	23.0+2.7/-4.2	22.8	22.8		-99.2	-99.0	-99.8	-99.8
B28	L	23.0+2.7/-3.2	22.6	22.8	-94.8	-99.2	-99.2	-99.6	-99.8
	M	23.0+2.7/-3.2	22.7	22.7		-99.8	-99.6	-100.4	-100.4
	H	23.0+2.7/-3.2	22.5	22.6		-99.4	-99.2	-100.2	-100.4
B30	L/M/H	23.0±2.7	22.9	22.5	-95.3	-97.7	-97.5	-98.5	-98.3

Band	Channel	Maximum TX Power (dBm)			RX Sensitivity (dBm)				
		3GPP Requirement	Test Value		3GPP Requirement	Test Value (Main)		Test Value (Diversity)	
			2799#	3631#		2799#	3631#	2799#	3631#
B66	L	23.0±2.7	23.5	23.4	-95.8	-98.4	-98.4	-99.2	-99.2
	M	23.0±2.7	23.5	23.4		-98.4	-98.4	-99.2	-98.8
	H	23.0±2.7	23.3	23.3		-99.0	-99.0	-99.2	-99.0
B71	L	23.0+2.7/-3.2	22.7	22.9	-93.5	-99.9	-99.9	-98.3	-98.3
	M	23.0+2.7/-3.2	22.7	22.8		-100.1	-99.7	-98.1	-98.1
	H	23.0+2.7/-3.2	22.7	22.7		-99.7	-99.5	-98.3	-98.3

Table 8. Other specifications of LTE-FDD

Band	Test Environment	Protocol Section	Test Case	Result
B1/B2/B3/ B4/B5/B7/ B8/B12/ B13/B14/ B17/B18/ B19/B20/ B25/B26/ B28/B30/ B66/B71	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.2.2	UE Maximum Output Power	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.2.3	Maximum Power Reduction (MPR)	PASS
	NC	6.2.4	Additional Maximum Power Reduction (A-MPR)	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.2.5	Configured UE transmitted Output Power	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.2	Minimum Output Power	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.3	Transmit OFF power	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.4.1	General ON/OFF time mask	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.4.2.1	PRACH time mask	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.4.2.2	SRS time mask	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.5.1	Power Control Absolute power tolerance	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.5.2	Power Control Relative power tolerance	PASS
	Normal	6.3.5.3	Aggregate power control tolerance	PASS

Band	Test Environment	Protocol Section	Test Case	Result
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.5.1	Frequency Error	PASS
	NC	6.5.2.1	Error Vector Magnitude (EVM) for PUSCH	PASS
	NC	6.5.2.1	Error Vector Magnitude (EVM) for PUCCH	PASS
	NC	6.5.2.1	Error Vector Magnitude (EVM) for PRACH	PASS
	Normal	6.5.2.1A	PUSCH-EVM with exclusion period	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.5.2.2	Carrier leakage	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.5.2.3	In-band emissions for non-allocated RB	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.5.2.4	EVM equalizer spectrum flatness	PASS
	Normal	6.6.1	Occupied bandwidth	PASS
	NC	6.6.2.1	Spectrum Emission Mask	PASS
	NC	6.6.2.2	Additional Spectrum Emission Mask	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.6.2.3	Adjacent Channel Leakage Power Ratio	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	7.3	Reference sensitivity level	PASS
	NC	7.4	Maximum input level	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.2.3_3	Maximum Power Reduction (MPR) for UL 64QAM	PASS
	NC	6.2.4_2	Additional Maximum Power Reduction (A-MPR) for UL 64QAM	PASS
	NC	6.5.2.1_1	Error Vector Magnitude (EVM) for UL 64QAM	PASS
	NC	6.6.2.2_1	Additional Spectrum Emission Mask for UL 64QAM	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.6.2.3_4	Adjacent Channel Leakage Power Ratio for Multi-Cluster PUSCH with UL 64QAM	PASS
	NC	7.4_H	Maximum input level for 256QAM in DL	PASS

5.2 LTE TDD Specifications

Description:

The maximum TX power of LTE TDD is measured by 10M QPSK 1RB. The RB position in low and medium channels is low, and the RB position in high channel is high.

Table 9. LTE-TDD maximum TX power & RX sensitivity (main+diversity) (Bandwidth=10M)

Band	Channel	Maximum TX Power (dBm)			RX Sensitivity (Main+Diversity) (dBm)		
		3GPP Requirement	Test Value		3GPP Requirement	Test Value	
			2799#	3631#		2799#	3631#
B34	L	23.0±2.7	22.6	22.6	-96.3	-101.1	-101.5
	M	23.0±2.7	22.6	22.6		-101.5	-101.1
	H	23.0±2.7	22.5	22.6		-101.1	-100.9
B38	L	23.0±2.7	22.7	22.7	-96.3	-101.7	-101.5
	M	23.0±2.7	22.9	22.4		-101.1	-101.3
	H	23.0±2.7	22.7	22.2		-101.1	-101.1
B39	L	23.0±2.7	23.3	23.1	-96.3	-101.7	-101.3
	M	23.0±2.7	23.3	23.2		-101.9	-101.3
	H	23.0±2.7	23.3	23.1		-101.9	-101.5
B40	L	23.0±2.7	23.4	23.4	-96.3	-101.1	-100.9
	M	23.0±2.7	23.4	23.5		-101.1	-101.3
	H	23.0±2.7	23.9	23.8		-100.5	-100.3
B41	L	23.0+2.7/-4.2	22.8	22.5	-94.3	-101.1	-100.7
	M	23.0±2.7	22.7	22.5		-101.1	-101.5
	H	23.0+2.7/-4.2	22.6	22.7		-101.3	-100.9
B42	L	23.0+3.0/-4.0	22.6	22.6	-95.0	-101.8	-101.8
	M	23.0+3.0/-4.0	22.7	22.8		-101.8	-101.8
	H	23.0+3.0/-4.0	22.7	22.7		-102.0	-101.8
B43	L	23.0+3.0/-4.0	22.7	22.9	-95.0	-102.0	-101.8
	M	23.0+3.0/-4.0	22.8	22.9		-102.2	-102.0
	H	23.0+3.0/-4.0	22.6	22.7		-102.2	-102.0
B48	L	23.0±3.3	23.4	23.5	-95.0	-102.0	-101.8
	M	23.0±3.3	23.2	23.3		-102.0	-102.0
	H	23.0±3.3	23.1	23.3		-102.0	-102.0

Table 10. LTE-TDD maximum TX power & RX sensitivity (main&diversity) (Bandwidth=10M)

Band	Channel	Maximum TX Power (dBm)			RX Sensitivity (dBm)				
		3GPP Requirement	Test Value		3GPP Requirement	Test Value (main)		Test Value (diversity)	
			2799#	3631#		2799#	3631#	2799#	3631#
B34	L	23.0±2.7	22.6	22.6	-96.3	-98.1	-98.3	-98.9	-98.5
	M	23.0±2.7	22.6	22.6		-98.1	-98.3	-98.9	-98.5
	H	23.0±2.7	22.5	22.6		-98.1	-98.3	-98.9	-98.5
B38	L	23.0±2.7	22.7	22.7	-96.3	-99.5	-99.5	-97.9	-97.7
	M	23.0±2.7	22.9	22.4		-99.1	-99.3	-98.3	-97.9
	H	23.0±2.7	22.7	22.2		-99.1	-98.9	-97.3	-97.3
B39	L	23.0±2.7	23.3	23.1	-96.3	-98.7	-98.5	-99.3	-98.5
	M	23.0±2.7	23.3	23.2		-98.9	-98.7	-99.3	-98.7
	H	23.0±2.7	23.3	23.1		-98.7	-98.5	-99.3	-98.9
B40	L	23.0±2.7	23.4	23.4	-96.3	-96.9	-96.7	-98.9	-98.7
	M	23.0±2.7	23.4	23.5		-97.5	-97.1	-98.9	-98.9
	H	23.0±2.7	23.9	23.8		-97.1	-97.1	-98.1	-97.9
B41	L	23.0+2.7/-4.2	22.8	22.5	-94.3	-98.7	-98.3	-97.3	-97.1
	M	23.0±2.7	22.7	22.5		-99.3	-99.3	-98.1	-98.1
	H	23.0+2.7/-4.2	22.6	22.7		-98.7	-98.5	-97.9	-97.9
B42	L	23.0+3.0/-4.0	22.6	22.6	-95.0	-98.8	-98.6	-98.8	-98.4
	M	23.0+3.0/-4.0	22.7	22.8		-99.2	-98.8	-98.8	-98.6
	H	23.0+3.0/-4.0	22.7	22.7		-99.2	-99.0	-98.6	-98.6
B43	L	23.0+3.0/-4.0	22.7	22.9	-95.0	-99.4	-99.2	-98.8	-98.8
	M	23.0+3.0/-4.0	22.8	22.9		-99.2	-99.0	-98.8	-98.8
	H	23.0+3.0/-4.0	22.6	22.7		-99.4	-99.0	-99.0	-98.8
B48	L	23.0±3.3	23.4	23.5	-95.0	-99.2	-99.0	-98.6	-98.6
	M	23.0±3.3	23.2	23.3		-99.4	-99.2	-98.8	-98.6
	H	23.0±3.3	23.1	23.3		-99.2	-99.0	-98.8	-98.8

Table 11. Other specifications of LTE-TDD

Band	Test Environment	Protocol Section	Test Case	Result
B34/B38/	Normal, TL/VL, TL/VH,	6.2.2	UE Maximum Output Power	PASS

Band	Test Environment	Protocol Section	Test Case	Result
B39/B40/ B41/B42/ B43/B48	TH/VL, TH/VH			
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.2.3	Maximum Power Reduction (MPR)	PASS
	NC	6.2.4	Additional Maximum Power Reduction (A-MPR)	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.2.5	Configured UE transmitted Output Power	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.2	Minimum Output Power	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.3	Transmit OFF power	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.4.1	General ON/OFF time mask	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.4.2.1	PRACH time mask	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.4.2.2	SRS time mask	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.5.1	Power Control Absolute power tolerance	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.5.2	Power Control Relative power tolerance	PASS
	Normal	6.3.5.3	Aggregate power control tolerance	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.5.1	Frequency Error	PASS
	NC	6.5.2.1	Error Vector Magnitude (EVM) for PUSCH	PASS
	NC	6.5.2.1	Error Vector Magnitude (EVM) for PUCCH	PASS
	NC	6.5.2.1	Error Vector Magnitude (EVM) for PRACH	PASS
	Normal	6.5.2.1A	PUSCH-EVM with exclusion period	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.5.2.2	Carrier leakage	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.5.2.3	In-band emissions for non-allocated RB	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.5.2.4	EVM equalizer spectrum flatness	PASS
	Normal	6.6.1	Occupied bandwidth	PASS

Band	Test Environment	Protocol Section	Test Case	Result
	NC	6.6.2.1	Spectrum Emission Mask	PASS
	NC	6.6.2.2	Additional Spectrum Emission Mask	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.6.2.3	Adjacent Channel Leakage Power Ratio	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	7.3	Reference sensitivity level	PASS
	NC	7.4	Maximum input level	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.2.3_3	Maximum Power Reduction (MPR) for UL 64QAM	PASS
	NC	6.2.4_2	Additional Maximum Power Reduction (A-MPR) for UL 64QAM	PASS
	NC	6.5.2.1_1	Error Vector Magnitude (EVM) for UL 64QAM	PASS
	NC	6.6.2.2_1	Additional Spectrum Emission Mask for UL 64QAM	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.6.2.3_4	Adjacent Channel Leakage Power Ratio for Multi-Cluster PUSCH with UL 64QAM	PASS
	NC	7.4_H	Maximum input level for 256QAM in DL	PASS

5.3 LTE HPUE Specifications

Description:

The maximum TX power is measured by 10MHz QPSK 1RB. The RB position in low and medium channels is low, and the RB position in high channel is high.

Table 12. LTE HPUE maximum TX power

Band	Channel	Maximum TX Power (dBm)		
		3GPP Requirement	Test Value	
			2799#	3631#
B38	L	26.0±2.7	26.1	25.7
	M	26.0±2.7	26.1	25.9
	H	26.0±2.7	25.8	25.7
B40	L	26.0±2.7	25.9	25.8
	M	26.0±2.7	26.5	26.5
	H	26.0±2.7	26.5	26.4

Band	Channel	Maximum TX Power (dBm)		
		3GPP Requirement	Test Value	
			2799#	3631#
B41	L	26.0+2.7/-4.2	25.9	25.8
	M	26.0±2.7	26.0	25.8
	H	26.0+2.7/-4.2	26.0	25.6
B42	L	26.0+3/-4	25.9	25.6
	M	26.0+3/-4	26.5	25.7
	H	26.0+3/-4	26.4	25.7
B43	L	26.0+3/-4	26.6	25.9
	M	26.0+3/-4	26.6	25.8
	H	26.0+3/-4	26.2	25.7

Table 13. Other specifications of LTE HPUE

Band	Test Environment	Protocol Section	Test Case	Result
B38/B40/ B41/B42/ B43	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.2.2_1	UE Maximum Output Power for HPUE	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.2.3_1	Maximum Power Reduction (MPR) for HPUE	PASS
	NC	6.2.4_1	Additional Maximum Power Reduction (A-MPR) for HPUE	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.2.5_1	Configured UE transmitted Output Power for HPUE	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.5_1.1	Power Control Absolute power tolerance for HPUE	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.5_1.2	Power Control Relative power tolerance for HPUE	PASS
	Normal	6.3.5_1.3	Aggregate power control tolerance for HPUE	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.6.2.3_1	Adjacent Channel Leakage Power Ratio for HPUE	PASS

5.4 5G RedCap FDD Specifications

Description:

- The maximum TX power of 5G RedCap is measured in FDD SCS=15KHz, TDD SCS=30KHz, UL DFT-s-OFDM QPSK Inner Full RB.

- The RX sensitivity of 5G RedCap is measured in FDD SCS=15KHz, TDD SCS=30KHz, the UL RB configure refer to 3GPP protocol 38.521-1 Table7.3.2.4.1-3.
- TT is the test tolerance, and the tolerance value of TX power is referred to 3GPP protocol 38.521-1 Table 6.2I.1.5-2, as shown in the following figure.

Table 6.2I.1.5-2: Test Tolerance (UE maximum output power)

	f ≤ 3.0GHz	3.0GHz < f ≤ 4.2GHz	4.2GHz < f ≤ 6.0GHz
BW ≤ 40MHz	0.7 dB	1.0 dB	1.0 dB

Figure 1. RedCap maximum TX power tolerance

Refer to 3GPP protocol 38.521-1 Table 7.3I.2.5-7 for tolerances of RX sensitivity, as shown in the following figure.

Table 7.3I.2.5-7: Test Tolerance (TT) for RX sensitivity level for RedCap UE

f ≤ 3.0GHz	3.0GHz < f ≤ 6.0 GHz
0.7 dB	1.0 dB

Figure 2. RedCap Tolerances of RX sensitivity

Table 14. RedCap maximum TX power & RX sensitivity (main+diversity)

Band	BW (MHz)	Channel	Maximum TX Power (dBm)			RX Sensitivity (Main+Diversity) (dBm)		
			3GPP Requirement	Test Value		3GPP requirement	Test Value	
				3631#	2989#		3631#	2989#
n1	20	L	23±2±TT	23.1	23.1	-93.8+TT	-98.3	-98.3
		M	23±2±TT	23.2	23.2		-98.5	-98.5
		H	23±2±TT	23.2	23.3		-98.5	-98.5
n2	20	L	23+2/-3.5±TT	23.1	23.0	-91.8+TT	-98.9	-98.9
		M	23±2±TT	23.0	23.0		-99.3	-98.9
		H	23+2/-3.5±TT	23.1	22.9		-99.3	-99.1
n3	20	L	23+2/-3.5±T	23.3	23.4	-90.8+TT	-98.5	-98.9
		M	23±2±TT	23.1	23.2		-98.7	-99.1
		H	23+2/-3.5±TT	22.7	23.1		-98.7	-98.7
n5	20	L	23±2±TT	23.2	23.6	-86.8+TT	-99.3	-99.3
		M	23±2±TT	23.3	23.6		-99.5	-99.3
		H	23±2±TT	23.1	23.4		-99.5	-99.3
		L	23+2/-3.5±TT	23.6	23.6		-98.5	-98.5

Band	BW (MHz)	Channel	Maximum TX Power (dBm)			RX Sensitivity (Main+Diversity) (dBm)		
			3GPP Requirement	Test Value		3GPP requirement	Test Value	
				3631#	2989#		3631#	2989#
n7	20	M	23±2±TT	23.5	23.7	-91.8+TT	-98.3	-98.3
		H	23+2/-3.5±TT	23.0	23.0		-98.3	-98.3
n8	20	L	23+2/-3.5±TT	23.4	23.2	-85.8+TT	-99.1	-99.1
		M	23±2±TT	23.3	23.4		-99.1	-99.1
		H	23+2/-3.5±TT	23.2	23.4		-99.1	-99.1
n12	10	L	23+2/-3.5±TT	23.2	23.1	-93.8+TT	-101.3	-101.1
		M	23±2±TT	23.2	23.1		-101.5	-101.3
		H	23+2/-3.5±TT	23.2	23.0		-101.5	-101.5
n13	10	L/M/H	23±2±TT	23.3	23.1	-93.8+TT	-101.5	-101.7
n14	10	L/M/H	23±2±TT	23.3	23.1	-93.8+TT	-101.5	-101.3
n18	10	L	/	23.1	23.4	/	-102.5	-102.3
		M	/	23.1	23.5		-102.5	-102.5
		H	/	23.1	23.5		-102.5	-102.5
n20	20	L	23+2/-3.5±TT	23.4	23.3	-89.8+TT	-99.1	-98.9
		M	23±2±TT	23.3	23.4		-99.1	-99.1
		H	23+2/-3.5±TT	23.2	23.3		-98.7	-98.9
n25	20	L	23+2/-3.5±TT	23.2	23.1	-90.3+TT	-99.0	-99.0
		M	23±2±TT	23.0	23.0		-99.0	-99.0
		H	23+2/-3.5±TT	23.0	23.0		-99.0	-99.2
n26	20	L	23+2/-3.5±TT	23.2	23.2	-87.6+TT	-99.3	-99.3
		M	23±2±TT	23.3	23.3		-99.3	-99.3
		H	23+2/-3.5±TT	23.3	23.2		-99.3	-99.3
n28	20	L	23+2+TT/-2.5-TT	23.2	23.5	-90.8+TT	-99.5	-99.5
		M	23+2+TT/-2.5-TT	23.3	23.3		-99.7	-99.5
		H	23+2+TT/-2.5-TT	23.2	23.4		-99.5	-99.5
n30	10	L/M/H	23±2±TT	22.5	22.8	-95.8+TT	-100.7	-100.5
n66	20	L	23±2±TT	23.4	23.3	-93.3+TT	-98.8	-98.6
		M	23±2±TT	23.2	23.3		-98.8	-98.8

Band	BW (MHz)	Channel	Maximum TX Power (dBm)			RX Sensitivity (Main+Diversity) (dBm)		
			3GPP Requirement	Test Value		3GPP requirement	Test Value	
				3631#	2989#		3631#	2989#
		H	23±2±TT	23.0	22.9		-99.0	-98.8
n70	15	L/M/H	23±2±TT	23.5	23.3	-95.0+TT	-100.3	-100.3
n71	20	L	23+2+TT/-2.5-TT	23.1	23.1	-86.0+TT	-99.5	-99.5
		M	23+2+TT/-2.5-TT	23.1	23.0		-99.5	-99.5
		H	23+2+TT/-2.5-TT	23.0	23.0		-99.0	-99.0

Table 15. RedCap maximum TX power & RX sensitivity (main&diversity)

Band	BW	Channel	Maximum TX Power (dBm)			RX Sensitivity (dBm)				
			3GPP Requirement	Test Value		3GPP Requirement	Test Value (main)		Test Value (diversity)	
				3631#	2989#		3631#	2989#	3631#	2989#
n1	20M	L	23±2±TT	23.1	23.1	-93.8+3+TT	-95.1	-95.3	-96.1	-95.9
		M	23±2±TT	23.2	23.2		-95.3	-95.3	-95.9	-95.9
		H	23±2±TT	23.2	23.3		-95.3	-95.3	-95.9	-96.1
n2	20M	L	23+2/-3.5±TT	23.1	23.0	-91.8+3+TT	-95.5	-95.5	-96.1	-96.3
		M	23±2±TT	23.0	23.0		-96.1	-95.9	-96.5	-96.3
		H	23+2/-3.5±TT	23.1	22.9		-95.9	-95.9	-96.3	-96.1
n3	20M	L	23+2/-3.5±T	23.3	23.4	-90.8+3+TT	-95.1	-95.5	-95.9	-96.3
		M	23±2±TT	23.1	23.2		-95.3	-95.9	-96.1	-96.3
		H	23+2/-3.5±TT	22.7	23.1		-95.5	-95.7	-95.7	-95.9
n5	20M	L	23±2±TT	23.2	23.6	-86.8+3+TT	-95.9	-96.1	-97.3	-97.3
		M	23±2±TT	23.3	23.6		-95.9	-96.1	-97.1	-97.1
		H	23±2±TT	23.1	23.4		-95.9	-96.1	-97.1	-97.1
n7	20M	L	23+2/-3.5±TT	23.6	23.6	-91.8+3+TT	-95.1	-95.1	-96.5	-96.5
		M	23±2±TT	23.5	23.7		-94.7	-94.7	-96.3	-96.5
		H	23+2/-3.5±TT	23.0	23.0		-94.9	-94.9	-95.9	-96.1
n8	20M	L	23+2/-3.5±TT	23.4	23.2	-85.8+3+TT	-95.7	-95.9	-96.7	-96.7
		M	23±2±TT	23.3	23.4		-95.7	-95.7	-96.5	-96.7
		H	23+2/-3.5±TT	23.2	23.4		-95.5	-95.7	-96.7	-96.7

Band	BW	Channel	Maximum TX Power (dBm)			RX Sensitivity (dBm)				
			3GPP Requirement	Test Value		3GPP Requirement	Test Value (main)		Test Value (diversity)	
				3631#	2989#		3631#	2989#	3631#	2989#
n12	10M	L	23+2/-3.5±TT	23.2	23.1	-93.8+3+TT	-98.5	-98.5	-98.3	-98.1
		M	23±2±TT	23.2	23.1		-98.5	-98.5	-98.7	-98.3
		H	23+2/-3.5±TT	23.2	23.0		-98.3	-98.1	-98.9	-98.7
n13	10M	L/M/H	23±2±TT	23.3	23.1	-93.8+3+TT	-98.7	-98.7	-98.7	-98.9
n14	10M	L/M/H	23±2±TT	23.3	23.1	-93.8+3+TT	-98.7	-98.7	-98.3	-98.9
n18	10M	L	/	23.1	23.4	/	-98.9	-99.1	-100.1	-100.1
		M	/	23.1	23.5		-98.9	-99.1	-100.1	-100.1
		H	/	23.1	23.5		-98.9	-99.1	-100.1	-100.1
n20	20M	L	23+2/-3.5±TT	23.4	23.3	-89.8+3+TT	-95.5	-95.3	-96.7	-96.7
		M	23±2±TT	23.3	23.4		-95.7	-95.7	-96.5	-96.5
		H	23+2/-3.5±TT	23.2	23.3		-95.7	-95.7	-96.1	-96.3
n25	20M	L	23+2/-3.5±TT	23.2	23.1	-90.3+3+TT	-95.6	-95.8	-96.0	-96.2
		M	23±2±TT	23.0	23.0		-96.0	-96.0	-96.2	-96.2
		H	23+2/-3.5±TT	23.0	23.0		-95.8	-95.6	-96.2	-96.2
n26	20M	L	23+2/-3.5±TT	23.2	23.2	-87.6+3+TT	-95.7	-95.9	-96.9	-96.9
		M	23±2±TT	23.3	23.3		-95.7	-95.9	-96.9	-96.9
		H	23+2/-3.5±TT	23.3	23.2		-95.9	-96.1	-96.7	-96.7
n28	20M	L	23+2+TT/-2.5-TT	23.2	23.5	-90.8+3+TT	-96.5	-96.5	-96.5	-96.7
		M	23+2+TT/-2.5-TT	23.3	23.3		-96.7	-96.7	-96.9	-96.9
		H	23+2+TT/-2.5-TT	23.2	23.4		-96.5	-96.5	-96.9	-96.7
n30	10M	L/M/H	23±2±TT	22.5	22.8	-95.8+3+TT	-97.9	-98.1	-98.1	-98.3
n66	20M	L	23±2±TT	23.4	23.3	-93.3+3+TT	-95.0	-94.8	-96.2	-96.2
		M	23±2±TT	23.2	23.3		-95.4	-95.2	-96.0	-96.0
		H	23±2±TT	23.0	22.9		-95.2	-95.0	-96.2	-96.2
n70	15M	L/M/H	23±2±TT	23.5	23.3	-95.0+3+TT	-97.1	-96.9	-97.3	-97.5
		L	23+2+TT/-2.5-	23.1	23.1		-97.0	-97.0	-95.7	-95.5

Band	BW	Channel	Maximum TX Power (dBm)			RX Sensitivity (dBm)				
			3GPP Requirement	Test Value		3GPP Requirement	Test Value (main)		Test Value (diversity)	
				3631#	2989#		3631#	2989#	3631#	2989#
			TT							
n71	20M	M	23+2+TT/-2.5-TT	23.1	23.0	-86.0+3+TT	-97.0	-97.0	-95.9	-95.7
		H	23+2+TT/-2.5-TT	23.0	23.0		-97.0	-97.0	-95.3	-95.3

Table 16. Other specifications of RedCap

Band	Test Environment	Protocol Section	Test Case	Result
n1/n2/n3/n5/n7/n8/n12/n13/n14/n18/n20/n25/n26/n28/n30/n66/n70/n71	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.2I.1	UE maximum output power for RedCap	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.2.2	Maximum Power Reduction (MPR)	PASS
	Normal	6.2.3	UE additional maximum output power reduction	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.2.4	Configured transmitted power	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.1	Minimum output power	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.2	Transmit OFF power	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.3	Transmit ON/OFF time mask	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.3.4	PRACH time mask	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.3.6	SRS time mask	PASS
	Normal	6.3.4.2	Absolute power tolerance	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.4.3	Power Control Relative power tolerance	PASS
	Normal	6.3.4.4	Aggregate power tolerance (PUCCH/PUSCH)	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.4.1	Frequency error	PASS

Band	Test Environment	Protocol Section	Test Case	Result
	Normal	6.4.2.1	Error Vector Magnitude (PUCCH/ PUSCH/PRACH)	PASS
	Normal	6.4.2.2	Carrier leakage	PASS
	Normal	6.4.2.3	In-band emissions (PUCCH/ PUSCH)	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.4.2.4	EVM equalizer spectrum flatness	PASS
	Normal	6.4.2.5	EVM equalizer spectrum flatness for Pi/2 BPSK	PASS
	Normal	6.5.1	Occupied bandwidth	PASS
	Normal	6.5.2.2	Spectrum Emission Mask	PASS
	Normal	6.5.2.3	Additional spectrum emission mask	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.5.2.4	Adjacent channel leakage ratio	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	7.3I.2	Reference sensitivity power level for RedCap	PASS
	Normal	7.4	Maximum input level	PASS

5.5 5G RedCap TDD Specifications

Description:

- The maximum TX power of 5G RedCap is measured in FDD SCS=15KHz, TDD SCS=30KHz, UL DFT-s-OFDM QPSK Inner Full RB.
- The RX sensitivity of 5G RedCap is measured in FDD SCS=15KHz, TDD SCS=30KHz, the UL RB configure refer to 3GPP protocol 38.521-1 Table7.3.2.4.1-3.
- TT is the test tolerance, and the tolerance value of TX power is referred to 3GPP protocol 38.521-1 Table 6.2I.1.5-2, as shown in the following figure.

Table 6.2I.1.5-2: Test Tolerance (UE maximum output power)

	f ≤ 3.0GHz	3.0GHz < f ≤ 4.2GHz	4.2GHz < f ≤ 6.0GHz
BW ≤ 40MHz	0.7 dB	1.0 dB	1.0 dB

Figure 3. RedCap maximum TX power tolerance

Refer to 3GPP protocol 38.521-1 Table 7.3I.2.5-7 for tolerances of RX sensitivity, as shown in the following figure.

Table 7.3I.2.5-7: Test Tolerance (TT) for RX sensitivity level for RedCap UE

f ≤ 3.0GHz	3.0GHz < f ≤ 6.0 GHz
0.7 dB	1.0 dB

Figure 4. RedCap Tolerances of RX sensitivity

Table 17. RedCap maximum TX power & RX sensitivity (main+diversity)

Band	BW (MHz)	Channel	Maximum TX Power (dBm)			RX Sensitivity (Main+Diversity) (dBm)		
			3GPP Requirement	Test Value		3GPP requirement	Test Value	
				3631#	2989#		3631#	2989#
n38	20	L	23±2±TT	23.4	23.4	-93.8+TT	-99.3	-98.9
		M	23±2±TT	23.4	23.3		-99.1	-98.9
		H	23±2±TT	23.2	23.2		-99.1	-98.7
n40	20	L	23±2±TT	23.0	23.0	-93.8+TT	-98.1	-98.3
		M	23±2±TT	23.4	23.3		-98.3	-98.3
		H	23±2±TT	23.6	23.5		-98.3	-98.5
n41	20	L	23+2/-3.5±TT	23.4	23.3	-91.8+TT	-99.0	-99.0
		M	23±2±TT	23.2	23.3		-99.5	-99.5
		H	23+2/-3.5±TT	22.9	22.8		-99.3	-99.3
n48	20	L	23+2+TT/-3-TT	23.2	23.1	-92.8+TT	-100.1	-99.7
		M	23+2+TT/-3-TT	23.3	23.2		-100.3	-99.9
		H	23+2+TT/-3-TT	23.4	23.3		-100.1	-99.7
n77	20	L	23+2+TT/-3-TT	23.4	23.9	-92.3+TT	-99.2	-98.8
		M	23+2+TT/-3-TT	23.4	23.8		-100.0	-99.6
		H	23+2+TT/-3-TT	23.2	24.0		-100.2	-100.0
n78	20	L	23+2+TT/-3-TT	23.0	23.8	-92.8+TT	-99.0	-99.1
		M	23+2+TT/-3-TT	23.4	22.8		-99.9	-99.9
		H	23+2+TT/-3-TT	23.6	23.8		-100.1	-99.9

Table 18. RedCap maximum TX power & RX sensitivity (main&diversity)

Band	BW	Channel	Maximum TX Power (dBm)			RX Sensitivity (dBm)				
			3GPP Requirement	Test Value		3GPP Requirement	Test Value (main)		Test Value (diversity)	
				3631#	2989#		3631#	2989#	3631#	2989#
n38	20M	L	23±2±TT	23.4	23.4	-93.8+2.5+TT	-96.7	-96.7	-95.5	-95.7
		M	23±2±TT	23.4	23.3		-96.7	-96.5	-95.9	-95.9
		H	23±2±TT	23.2	23.2		-96.5	-96.7	-95.7	-95.5
n40	20M	L	23±2±TT	23.0	23.0	-93.8+2.5+TT	-94.7	-94.7	-96.7	-96.5
		M	23±2±TT	23.4	23.3		-95.1	-95.3	-96.3	-96.5
		H	23±2±TT	23.6	23.5		-95.1	-95.1	-95.9	-96.1
n41	20M	L	23+2/-3.5±TT	23.4	23.3	-91.8+2.5+TT	-96.5	-97.0	-95.0	-95.3
		M	23±2±TT	23.2	23.3		-96.7	-96.5	-95.9	-96.3
		H	23+2/-3.5±TT	22.9	22.8		-96.9	-96.7	-95.7	-96.1
n48	20M	L	23+2+TT/-3-TT	23.2	23.1	-92.8+2.5+TT	-97.5	-97.3	-96.9	-96.9
		M	23+2+TT/-3-TT	23.3	23.2		-97.7	-97.5	-97.1	-97.1
		H	23+2+TT/-3-TT	23.4	23.3		-97.7	-97.5	-96.9	-96.9
n77	20M	L	23+2+TT/-3-TT	23.4	23.9	-92.3+2.5+TT	-97.0	-96.8	-96.0	-96.2
		M	23+2+TT/-3-TT	23.4	23.8		-97.6	-97.6	-97.0	-97.0
		H	23+2+TT/-3-TT	23.2	24.0		-98.0	-98.0	-96.6	-96.8
n78	20M	L	23+2+TT/-3-TT	23.0	23.8	-92.8+2.5+TT	-97.1	-96.9	-96.1	-96.5
		M	23+2+TT/-3-TT	23.4	22.8		-97.5	-97.3	-96.9	-97.3
		H	23+2+TT/-3-TT	23.6	23.8		-97.7	-97.7	-96.9	-97.3

Table 19. Other specifications of RedCap

Band	Test Environment	Protocol Section	Test Case	Result
n38/n40/ n41/n48/ n77/n78	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.2I.1	UE maximum output power for RedCap	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.2.2	Maximum Power Reduction (MPR)	PASS
	Normal	6.2.3	UE additional maximum output power reduction	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.2.4	Configured transmitted power	PASS

Band	Test Environment	Protocol Section	Test Case	Result
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.1	Minimum output power	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.2	Transmit OFF power	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.3	Transmit ON/OFF time mask	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.3.4	PRACH time mask	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.3.6	SRS time mask	PASS
	Normal	6.3.4.2	Absolute power tolerance	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.3.4.3	Power Control Relative power tolerance	PASS
	Normal	6.3.4.4	Aggregate power tolerance (PUCCH/PUSCH)	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.4.1	Frequency error	PASS
	Normal	6.4.2.1	Error Vector Magnitude (PUCCH/ PUSCH/PRACH)	PASS
	Normal	6.4.2.2	Carrier leakage	PASS
	Normal	6.4.2.3	In-band emissions (PUCCH/ PUSCH)	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.4.2.4	EVM equalizer spectrum flatness	PASS
	Normal	6.4.2.5	EVM equalizer spectrum flatness for Pi/2 BPSK	PASS
	Normal	6.5.1	Occupied bandwidth	PASS
	Normal	6.5.2.2	Spectrum Emission Mask	PASS
	Normal	6.5.2.3	Additional spectrum emission mask	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	6.5.2.4	Adjacent channel leakage ratio	PASS
	Normal, TL/VL, TL/VH, TH/VL, TH/VH	7.3I.2	Reference sensitivity power level for RedCap	PASS
	Normal	7.4	Maximum input level	PASS

5.6 5G RedCap SRS Specifications

Table 20. SA 1T2R

Band	Channel	Maximum TX Power (dBm)	
		Test Value (TX0)	Test Value (TX0_SRS)
n38	M	21.0	20.4
n40	M	21.2	20.7
n41	M	20.7	20.1
n48	M	20.8	20.5
n77	M	21.1	20.9
n78	M	20.8	20.7

5.7 GNSS Specifications

Table 21. GNSS specifications

Mode	Test Case	Unit	Test Value	
			3862#	2799#
GNSS	Tracking sensitivity	dBm	-156.5	-157.0
	Cold start (RX power@-130dBm)	s	30.8	30.7
	Warm start (RX power@-130dBm)	s	28.8	28.7
	Hot start (RX power@-130dBm)	s	1.2	1.3
	Acquisition Sensitivity at different power level (cold start)	dBm	-146.0	-145.5
	Position Accuracy (cold start@-130dBm, CEP 50%)	m	1.2	1.1
	C/N0 (RX power@-130dBm)	dB/Hz	38.7	38.7
	Current consumption fixing (Cold start - average current until TTFF with 20SVs @-130dBm)	mA	46.4	47.1
	Current consumption tracking (Weak signal,20SVs @-146dBm, no power saving, fix rate=1sec)	mA	45.8	46.5

5.8 Max Throughput

Single Band Max throughput

Description:

- For LTE single band maximum physical layer throughput test, the BW is the maximum BW defined by

the 3GPP protocol. The uplink-downlink configurations of the TDD band to be set 5 when DL max physical layer throughput test, and to be set 0 when UL max physical layer throughput test, and the special subframe is 4.

- For SA single band maximum physical layer throughput test, the BW is the maximum BW defined by the 3GPP protocol. The FDD SCS is 15kHz, TDD SCS is 30kHz, the uplink-downlink configurations of the TDD band to be set 5ms 8DS1U S(10:2:2) when DL max physical layer throughput test, and to be set 3DS6U S(10:2:2) when UL max physical layer throughput test.

Table 22. Single Band Max throughput

System	Band	BW	Channel	DL Theoretical Value (Mbps)	DL Test Value (Mbps)	UL Theoretical Value (Mbps)	UL Test Value (Mbps)
LTE-FDD RMS	B1	20M	CH18100	194.973	194.973	75.376	75.376
			CH18300	194.973	194.973	75.376	75.376
			CH18500	194.973	194.973	75.376	75.376
	B2	20M	CH18700	194.973	194.973	75.376	75.376
			CH18900	194.973	194.973	75.376	75.376
			CH19100	194.973	194.973	75.376	75.376
	B3	20M	CH19300	194.973	194.973	75.376	75.376
			CH19575	194.973	194.973	75.376	75.376
			CH19850	194.973	194.973	75.376	75.376
	B4	20M	CH20050	194.973	194.973	75.376	75.376
			CH20175	194.973	194.973	75.376	75.376
			CH20300	194.973	194.973	75.376	75.376
	B5	10M	CH20450	97.462	97.462	36.696	36.696
			CH20525	97.462	97.462	36.696	36.696
			CH20600	97.462	97.462	36.696	36.696
	B7	20M	CH20850	194.973	194.973	75.376	75.376
			CH21100	194.973	194.973	75.376	75.376
			CH21350	194.973	194.973	75.376	75.376
	B8	10M	CH21500	97.462	97.462	36.696	36.696
			CH21625	97.462	97.462	36.696	36.696
			CH21750	97.462	97.462	36.696	36.696
	B12	10M	CH23060	97.462	97.462	36.696	36.696
			CH23095	97.462	96.973	36.696	36.696

System	Band	BW	Channel	DL Theoretical Value (Mbps)	DL Test Value (Mbps)	UL Theoretical Value (Mbps)	UL Test Value (Mbps)
			CH23130	97.462	97.462	36.696	36.696
	B13	10M	CH23230	97.462	97.462	36.696	36.696
	B14	10M	CH23330	97.462	97.462	36.696	36.696
	B17	10M	CH23780	97.462	97.462	36.696	36.696
			CH23790	97.462	97.462	36.696	36.696
			CH23800	97.462	97.462	36.696	36.696
	B18	15M	CH23925	149.899	149.899	55.056	55.056
	B19	15M	CH24075	149.899	149.899	55.056	55.056
	B20	20M	CH24250	194.973	194.973	75.376	75.376
			CH24300	194.973	194.973	75.376	75.376
			CH24350	194.973	194.973	75.376	75.376
	B25	20M	CH26115	194.973	194.973	75.376	75.376
			CH26365	194.973	194.973	75.376	75.376
			CH26615	194.973	194.973	75.376	75.376
	B26	15M	CH26765	149.899	149.899	55.056	55.056
			CH26865	149.899	149.899	55.056	55.056
			CH26965	149.899	149.899	55.056	55.056
	B28	20M	CH27310	194.973	194.973	75.376	75.376
			CH27460	194.973	194.973	75.376	75.376
			CH27560	194.973	194.973	75.376	75.376
	B30	10M	CH27710	97.462	97.462	36.696	36.696
	B66	20M	CH132072	194.973	194.973	75.376	75.376
			CH132422	194.973	194.973	75.376	75.376
			CH132572	194.973	194.973	75.376	75.376
	B71	20M	CH133222	194.973	194.973	75.376	75.376
			CH133322	194.973	194.973	75.376	75.376
			CH133372	194.973	194.973	75.376	75.376
LTE-TDD RMS	B34	15M	CH36275	130.76	130.76	33.034	33.034
			CH37850	170.89	170.89	45.226	45.226

System	Band	BW	Channel	DL Theoretical Value (Mbps)	DL Test Value (Mbps)	UL Theoretical Value (Mbps)	UL Test Value (Mbps)
	B38	20M	CH38000	170.89	170.89	45.226	45.226
			CH38150	170.89	170.89	45.226	45.226
	B39	20M	CH38350	170.89	170.89	45.226	45.226
			CH38450	170.89	170.89	45.226	45.226
			CH38550	170.89	170.89	45.226	45.226
	B40	20M	CH38750	170.89	170.89	45.226	45.226
			CH39150	170.89	170.89	45.226	45.226
			CH39550	170.89	170.89	45.226	45.226
	B41	20M	CH39750	170.89	170.89	45.226	45.226
			CH40620	170.89	170.89	45.226	45.226
			CH41490	170.89	170.89	45.226	45.226
	B42	20M	CH41690	170.89	170.89	45.226	45.226
			CH42590	170.89	170.89	45.226	45.226
			CH43490	170.89	170.89	45.226	45.226
	B43	20M	CH43690	170.89	170.89	45.226	45.226
			CH44590	170.89	170.89	45.226	45.226
			CH45490	170.89	170.89	45.226	45.226
	B48	20M	CH55340	170.89	170.89	45.226	45.226
			CH55990	170.89	170.89	45.226	45.226
			CH56640	170.89	170.89	45.226	45.226
RedCap FDD RMS	n1	20M	CH424000	230.74	230.74	122.98	122.98
			CH428000	231.15	231.15	122.98	122.98
			CH432000	230.95	230.95	122.98	122.98
	n2	20M	CH388000	230.74	230.74	122.98	122.98
			CH392000	231.15	231.15	122.98	122.98
			CH396000	230.95	230.95	122.98	122.98
	n3	20M	CH363000	231.36	231.36	122.98	122.98
			CH368500	231.36	231.36	122.98	122.98
			CH374000	231.15	231.15	122.98	122.98

System	Band	BW	Channel	DL Theoretical Value (Mbps)	DL Test Value (Mbps)	UL Theoretical Value (Mbps)	UL Test Value (Mbps)
	n5	20M	CH175800	231.36	231.36	122.98	122.98
			CH176300	231.36	231.36	122.98	122.98
			CH176800	230.74	230.74	122.98	122.98
	n7	20M	CH526000	230.74	230.74	122.98	122.98
			CH531000	231.36	231.36	122.98	122.98
			CH536000	231.15	231.15	122.98	122.98
	n8	20M	CH187000	231.15	231.15	122.98	122.98
			CH188500	231.36	231.36	122.98	122.98
			CH190000	230.74	230.74	122.98	122.98
	n12	15M	CH147300	173.24	173.24	92.2	92.2
			CH147500	173.85	173.85	92.2	92.2
			CH147700	173.85	173.85	92.2	92.2
	n13	10M	CH150200	111.91	111.91	60.46	60.46
	n14	10M	CH152600	111.91	111.91	60.46	60.46
	n18	15M	CH173500	173.55	173.55	92.2	92.2
	n20	20M	CH160200	231.36	231.36	122.98	122.98
			CH161200	230.74	230.74	122.98	122.98
			CH162200	230.74	230.74	122.98	122.98
	n25	20M	CH388000	230.74	230.74	122.98	122.98
			CH392500	231.36	231.36	122.98	122.98
			CH397000	231.15	231.15	122.98	122.98
	n26	20M	CH173800	231.15	231.15	122.98	122.98
			CH175300	231.36	231.36	122.98	122.98
			CH176800	230.74	230.74	122.98	122.98
	n28	20M	CH153600	230.95	230.95	122.98	122.98
			CH156600	231.36	231.36	122.98	122.98
			CH158600	230.74	230.74	122.98	122.98
	n30	10M	CH471000	112.52	112.52	60.46	60.46
			CH424000	230.74	230.74	122.98	122.98

System	Band	BW	Channel	DL Theoretical Value (Mbps)	DL Test Value (Mbps)	UL Theoretical Value (Mbps)	UL Test Value (Mbps)
RedCap TDD RMS	n66	20M	CH429000	231.36	231.36	122.98	122.98
			CH434000	231.15	231.15	122.98	122.98
	n70	15M	CH400500	173.24	173.24	92.2	92.2
	n71	20M	CH125400	231.36	231.36	122.98	122.98
			CH126900	230.74	230.74	122.98	122.98
			CH128400	230.95	230.95	122.98	122.98
	n38	20M	CH516000	193.31	193.31	78.08	78.08
			CH519000	193.31	193.31	78.08	78.08
			CH522000	193.31	193.31	78.08	78.08
	n40	20M	CH462000	193.31	193.31	78.08	78.08
			CH470000	193.21	193.21	78.08	78.08
			CH478000	193.56	193.56	78.08	78.08
	n41	20M	CH501204	193.31	193.31	78.08	78.08
			CH518598	193.21	193.21	78.08	78.08
			CH535998	193.41	193.41	78.08	78.08
	n48	20M	CH637334	193.21	193.21	78.08	78.08
			CH641666	193.21	193.21	78.08	78.08
			CH646000	193.31	193.31	78.08	78.08
	n77	20M	CH620668	193.31	193.31	78.08	78.08
			CH650000	193.56	193.56	78.08	78.08
			CH679332	193.41	193.41	78.08	78.08
	n78	20M	CH620668	193.31	193.31	78.08	78.08
			CH636666	193.21	193.21	78.08	78.08
			CH652666	193.41	193.41	78.08	78.08

5.9 Working Current

1. Test conditions: normal temperature of 25°C/3.8V
2. Test data:

Table 23. Single band working current

System	Band	Channel	3631#		2989#	
			Test value (mA)	Power (dBm)	Test value (mA)	Power (dBm)
LTE-FDD RMS (10MHz 1RB)	B1	CH18050	689	23.1	695	23.3
		CH18300	628	23.3	634	23.4
		CH18550	702	23.3	712	23.4
	B2	CH18650	663	23.0	673	23.3
		CH18900	714	23.1	726	23.2
		CH19150	634	23.0	633	23.2
	B3	CH19250	647	22.7	642	22.8
		CH19575	689	22.7	675	22.8
		CH19900	774	22.5	780	22.7
	B4	CH20000	650	22.6	639	22.6
		CH20175	663	22.6	682	22.6
		CH20350	631	22.6	614	22.6
	B5	CH20450	681	22.8	673	22.8
		CH20525	672	22.9	662	22.9
		CH20600	714	22.8	702	22.8
	B7	CH20800	833	22.7	867	22.6
		CH21100	766	22.5	759	22.6
		CH21400	892	22.7	870	22.6
	B8	CH21500	636	23.0	629	22.9
		CH21625	622	22.9	610	22.9
		CH21750	678	22.9	646	22.9
	B12	CH23060	594	22.7	576	22.7
		CH23095	643	22.8	611	22.7
		CH23130	707	22.4	693	22.4
	B13	CH23230	702	22.7	687	22.7
	B14	CH23330	593	22.7	580	22.7
	B17	CH23780	645	22.7	625	22.6
		CH23790	679	22.7	652	22.7

System	Band	Channel	3631#		2989#	
			Test value (mA)	Power (dBm)	Test value (mA)	Power (dBm)
		CH23800	711	22.5	690	22.5
	B18	CH23900	633	22.8	626	22.8
		CH23925	632	22.8	616	22.8
		CH23950	610	22.8	601	22.9
	B19	CH24050	606	22.9	596	22.8
		CH24075	616	22.7	608	22.7
		CH24100	624	22.9	611	22.8
	B20	CH24200	689	22.9	672	22.8
		CH24300	632	22.9	618	22.8
		CH24400	663	22.9	652	22.9
	B25	CH26090	685	23.1	699	23.4
		CH26365	738	23.2	759	23.4
		CH26640	756	23.1	758	23.4
	B26	CH26740	685	22.9	678	22.8
		CH26865	669	23.0	655	22.8
		CH26990	705	22.8	687	22.8
	B28	CH27260	631	22.8	595	22.6
		CH27410	618	22.7	586	22.7
		CH27610	625	22.6	593	22.5
	B30	CH27710	794	22.5	770	22.9
	B66	CH132022	722	23.4	716	23.5
		CH132422	687	23.4	681	23.5
		CH132622	707	23.3	700	23.3
	B71	CH133172	663	22.9	637	22.7
		CH133297	592	22.8	567	22.7
		CH133422	615	22.7	600	22.7
LTE-TDD RMS (10MHz 1RB)	B34	CH36250	367	22.6	361	22.6
		CH36275	351	22.6	349	22.6
		CH36300	347	22.6	344	22.5

System	Band	Channel	3631#		2989#	
			Test value (mA)	Power (dBm)	Test value (mA)	Power (dBm)
	B38	CH37800	477	22.7	446	22.7
		CH38000	484	22.4	448	22.9
		CH38200	458	22.2	445	22.7
	B39	CH38300	361	23.1	347	23.3
		CH38450	363	23.2	350	23.3
		CH38600	363	23.1	352	23.3
	B40	CH38700	473	23.4	502	23.4
		CH39150	384	23.5	409	23.4
		CH39600	407	23.8	443	23.9
	B41	CH39700	436	22.5	416	22.8
		CH40620	499	22.5	492	22.7
		CH41540	511	22.7	483	22.6
	B42	CH41640	449	22.6	428	22.6
		CH42590	412	22.8	399	22.7
		CH43540	386	22.7	375	22.7
	B43	CH43640	366	22.9	355	22.7
		CH44590	362	22.9	352	22.8
		CH45540	395	22.7	392	22.6
	B48	CH55290	349	23.5	339	23.4
		CH55990	334	23.3	332	23.2
		CH56690	332	23.3	323	23.1
LTE-TDD HUPE RMS (10MHz 1RB)	B38	CH37800	636	26.1	648	25.7
		CH38000	686	26.1	683	25.9
		CH38200	675	25.8	672	25.7
	B40	CH38700	664	25.9	691	25.8
		CH39150	578	26.5	607	26.5
		CH39600	703	26.5	750	26.4
	B41	CH39700	616	25.9	623	25.8
		CH40620	677	26.0	703	25.8

System	Band	Channel	3631#		2989#	
			Test value (mA)	Power (dBm)	Test value (mA)	Power (dBm)
		CH41540	705	26.0	680	25.6
	B42	CH41640	610	25.9	583	25.6
		CH42590	576	26.5	530	25.7
		CH43540	514	26.4	492	25.7
	B43	CH43640	493	26.6	472	25.9
		CH44590	489	26.6	475	25.8
		CH45540	536	26.2	543	25.7
RedCap FDD RMS (10MHz Inner_Ful)	n1	CH423000	652	23.1	651	23.1
		CH428000	618	23.2	629	23.2
		CH433000	668	23.2	692	23.3
	n2	CH387000	627	23.1	638	23.0
		CH392000	692	23.0	702	23.0
		CH397000	614	23.1	613	22.9
	n3	CH362000	633	23.3	618	23.4
		CH368500	669	23.1	687	23.2
		CH375000	793	22.7	822	23.1
	n5	CH174800	633	23.2	646	23.6
		CH176300	629	23.3	658	23.6
		CH177800	620	23.1	644	23.4
	n7	CH525000	823	23.6	851	23.6
		CH531000	814	23.5	830	23.7
		CH537000	826	23.0	843	23.0
	n8	CH186000	633	23.4	625	23.2
		CH188500	602	23.3	628	23.4
		CH191000	592	23.2	628	23.4
	n12	CH146800	610	23.2	608	23.1
		CH147500	650	23.2	648	23.1
		CH148200	609	23.2	594	23.0
	n13	CH150200	627	23.3	628	23.1

System	Band	Channel	3631#		2989#	
			Test value (mA)	Power (dBm)	Test value (mA)	Power (dBm)
	n14	CH152600	611	23.3	586	23.1
	n18	CH173000	609	23.1	648	23.4
		CH173500	622	23.1	672	23.5
		CH174000	627	23.1	679	23.5
	n20	CH159200	688	23.4	689	23.3
		CH161200	663	23.3	673	23.4
		CH163200	683	23.2	727	23.3
	n25	CH387000	644	23.2	619	23.1
		CH392500	687	23.0	666	23.0
		CH398000	625	23.0	623	23.0
	n26	CH172800	658	23.2	658	23.2
		CH175300	631	23.3	629	23.3
		CH177800	635	23.3	634	23.2
	n28	CH152600	630	23.2	645	23.5
		CH156100	637	23.3	648	23.3
		CH159600	625	23.2	637	23.4
	n30	CH471000	821	22.5	823	22.8
	n66	CH423000	711	23.4	720	23.3
		CH429000	657	23.2	671	23.3
		CH435000	646	23.0	673	22.9
	n70	CH400000	718	23.5	647	22.3
		CH400500	723	23.5	651	22.3
		CH401000	758	23.4	729	23.3
	n71	CH124400	643	23.1	641	23.1
		CH126900	588	23.1	556	23.0
		CH129400	609	23.0	593	23.0
RedCap TDD RMS	n38	CH516000	311	23.4	307	23.4
		CH519000	312	23.4	313	23.3
		CH522000	308	23.2	307	23.2

System	Band	Channel	3631#		2989#	
			Test value (mA)	Power (dBm)	Test value (mA)	Power (dBm)
(20MHz Inner_Ful)	n40	CH462000	280	23.0	283	23.0
		CH470000	279	23.4	279	23.3
		CH478000	287	23.6	287	23.5
	n41	CH501204	255	23.4	264	23.3
		CH518598	302	23.2	297	23.3
		CH535998	296	22.9	298	22.8
	n48	CH637334	230	23.2	239	23.1
		CH641666	221	23.3	228	23.2
		CH646000	224	23.4	228	23.3
	n77	CH620668	298	23.7	311	23.9
		CH650000	279	23.8	279	23.8
		CH679332	371	23.9	368	24.0
	n78	CH620668	298	23.8	310	23.8
		CH636666	285	23.0	286	22.8
		CH652666	285	23.8	285	23.8