



FCC TEST REPORT FOR

Mulberry tech group LLC

Mobile phone

Test Model: F31tx

Additional Model No.: Please Refer to Page 6

Prepared for : Mulberry tech group LLC
Address : 108 Wall st,lakewood,New Jersey,08701,USA

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : December 15, 2025
Number of tested samples : 2
Sample No. : A251212063-1, A251212063-2
Serial number : Prototype
Date of Test : December 15, 2025 ~ December 30, 2025
Date of Report : December 30, 2025



**FCC PART 22/24/27 TEST REPORT****FCC Part 22H / Part 24E /Part 27****Report Reference No.**: **LCSA12125017EI****FCC ID.**: **2A6B4-F31TX****Date of Issue.**: **December 30, 2025****Testing Laboratory Name**: **Shenzhen LCS Compliance Testing Laboratory Ltd.****Address**: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China**Applicant's name**: **Mulberry tech group LLC****Address**: 108 Wall st,lakewood,New Jersey,08701,USA**Test specification**:**Standard**: **FCC Part 22H: Cellular Radiotelephone Service****FCC Part 24E: Broadband PCS****FCC Part 27: MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES****Test Report Form No**: TRF-4-E-152 A/0**TRF Originator**: Shenzhen LCS Compliance Testing Laboratory Ltd.**Master TRF**: Dated 2011-03**Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.**

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Test item description: **Mobile phone****Trade Mark**: Fig**Test Model**: F31tx**Ratings**: Input: 5V

DC 3.85V by Rechargeable Li-ion Battery, 1600mAh

Frequency: UMTS Band II/IV/V**Result**: **PASS****Compiled by:**

Jack Liu/ Administrator

Supervised by:

Kevin Huang/ RF Manager

Approved by:

Gavin Liang/ Manager



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**TEST REPORT**

Test Report No. :	LCSA12125017EI	December 30, 2025
		Date of issue

Test Model.....	: F31tx
EUT.....	: Mobile phone
Applicant.....	: Mulberry tech group LLC
Address.....	: 108 Wall st,lakewood,New Jersey,08701,USA
Telephone.....	: /
Fax.....	: /
Manufacturer.....	: ShenZhen Lanshuo Communication Equipment Co., Ltd.
Address.....	: No.19, Minfu Road, Shajing Town, Bao'an District, Shenzhen, China
Telephone.....	: /
Fax.....	: /
Factory.....	: ShenZhen Lanshuo Communication Equipment Co., Ltd.
Address.....	: No.19, Minfu Road, Shajing Town, Bao'an District, Shenzhen, China
Telephone.....	: /
Fax.....	: /

Test Result:	PASS
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.



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Revision History

Report Version	Issue Date	Revision Content	Revised By
000	December 30, 2025	Initial Issue	---





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1 TEST STANDARDS

The tests were performed according to following standards:

[FCC Part 22H](#): Cellular Radiotelephone Service.

[FCC Part 24E](#): Broadband PCS.

[FCC Part 27](#): MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES

[TIA-603-E March 2016](#): Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

[47 CFR FCC Part 15 Subpart B](#): Unintentional Radiators.

[FCC Part 2](#): Frequency Allocations And Radio Treaty Matters; General Rules And Regulations.

[ANSI C63.4:2014](#): Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

[FCC KDB971168 D01](#): Power Meas License Digital Systems v03r01.

[ANSI C63.26-2015](#): Compliance Testing of Transmitters Used in Licensed Radio Services.



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2 SUMMARY

2.1 Product Description

The **Mulberry tech group LLC**'s Model: F31tx or the "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

EUT	: Mobile phone
Test Model	: F31tx
Additional Model No.	: F31, F72, F72TO
Model Declaration	: PCB board, structure and internal of these model(s) are the same, So no additional models were tested
Ratings	: Input: 5V DC 3.85V by Rechargeable Li-ion Battery, 1600mAh
Hardware Version	: F31-MB-V1.7
Software Version	: F72-V1.2
Bluetooth	:
Frequency Range	: 2402MHz~2480MHz
Channel Number	: 79 channels for Bluetooth V5.0 (DSS) 40 channels for Bluetooth V5.0 (DTS)
Channel Spacing	: 1MHz for Bluetooth V5.0 (DSS) 2MHz for Bluetooth V5.0 (DTS)
Modulation Type	: GFSK, $\pi/4$ -DQPSK, 8-DPSK for Bluetooth V5.0 (DSS) GFSK for Bluetooth V5.0 (DTS)
Bluetooth Version	: V5.0
Antenna Description	: PIFA Antenna, 3.88dBi(Max.)
WIFI(2.4G Band)	:
Frequency Range	: 2412MHz~2462MHz
Channel Spacing	: 5MHz
Channel Number	: 11 Channels for 20MHz bandwidth (2412~2462MHz) 7 Channels for 40MHz bandwidth (2422~2452MHz)
Modulation Type	: IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: PIFA Antenna, 3.88dBi(Max.)
WIFI(5.2G Band)	:
Frequency Range	: 5180MHz~5240MHz
Channel Number	: 4 Channels for 20MHz bandwidth(5180MHz~5240MHz) 2 channels for 40MHz bandwidth(5190MHz~5230MHz)
Modulation Type	: IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: PIFA Antenna, 0.42dBi(Max.)
WIFI(5.3G Band)	:
Frequency Range	: 5260MHz~5320MHz
Channel Number	: 4 Channels for 20MHz bandwidth(5260MHz~5320MHz) 2 channels for 40MHz bandwidth(5270MHz~5310MHz)
Modulation Type	: IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: PIFA Antenna, 0.87dBi(Max.)
WIFI(5.5G Band)	:
Frequency Range	: 5500MHz~5700MHz
Channel Number	: 11 Channels for 20MHz bandwidth(5500MHz~5700MHz) 5 Channels for 40MHz bandwidth(5510MHz~5670MHz)



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Modulation Type	: IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: PIFA Antenna, 1.72dBi(Max.)
WIFI(5.8G Band)	:
Frequency Range	: 5745MHz~5825MHz
Channel Number	: 5 channels for 20MHz bandwidth(5745MHz~5825MHz) 2 channels for 40MHz bandwidth(5755MHz~5795MHz)
Modulation Type	: IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: PIFA Antenna, 2.85dBi(Max.)
2G	:
Support Band	: ☒ GSM 900 (EU-Band) ☒ DCS 1800 (EU-Band) ☒ GSM 850 (U.S.-Band) ☒ PCS 1900 (U.S.-Band)
Release Version	: R9
GPRS Class	: Class 12
EGPRS Class	: Class 12
Type Of Modulation	: GMSK for GSM/GPRS; GMSK/8PSK for EGPRS
Antenna Description	: PIFA Antenna 0.73dBi (max.) For GSM 850 1.24dBi (max.) For PCS 1900
3G	:
Support Band	: ☒ WCDMA Band I (EU-Band) ☒ WCDMA Band II (U.S.-Band) ☒ WCDMA Band IV (U.S.-Band) ☒ WCDMA Band V (U.S.-Band) ☒ WCDMA Band VIII (EU-Band)
Release Version	: R9
Type Of Modulation	: QPSK, 16QAM
Antenna Description	: PIFA Antenna 1.24dBi (max.) For WCDMA Band II 2.85dBi (max.) For WCDMA Band IV 0.73dBi (max.) For WCDMA Band V
LTE	:
Support Band	: ☒ E-UTRA Band 1(EU-Band) ☒ E-UTRA Band 2(U.S.-Band) ☒ E-UTRA Band 3(EU-Band) ☒ E-UTRA Band 4(U.S.-Band) ☒ E-UTRA Band 5(U.S.-Band) ☒ E-UTRA Band 7(U.S.-Band) ☒ E-UTRA Band 8(EU-Band) ☒ E-UTRA Band 12(U.S.-Band) ☒ E-UTRA Band 13(U.S.-Band) ☒ E-UTRA Band 17(U.S.-Band) ☒ E-UTRA Band 20(EU-Band) ☒ E-UTRA Band 28(EU-Band) ☒ E-UTRA Band 66(U.S.-Band) ☒ E-UTRA Band 71(U.S.-Band)
LTE Release Version	: R9
Type Of Modulation	: QPSK/16QAM
Antenna Description	: PIFA Antenna 1.24dBi (max.) For E-UTRA Band 2 2.85dBi (max.) For E-UTRA Band 4





0.73dBi (max.) For E-UTRA Band 5
-1.93dBi (max.) For E-UTRA Band 7
-8.62dBi (max.) For E-UTRA Band 12
-7.88dBi (max.) For E-UTRA Band 13
-8.62dBi (max.) For E-UTRA Band 17
2.85dBi (max.) For E-UTRA Band 66
-8.93dBi (max.) For E-UTRA Band 71

Power Class : Class 3

GPS Function : Support and only RX

Extreme temp. Tolerance : -30°C to +50°C

Extreme vol. Limits : 3.3VDC to 4.4VDC (nominal: 3.85VDC)

Note: For a more detailed antenna description, please refer to the antenna specifications or the antenna report provided by the customer.



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2.2 Equipment under Test

Power supply system utilised

Power supply voltage	:	☒ 120V / 60 Hz ☐ 115V / 60Hz
		☐ 12 V DC ☐ 24 V DC
		☐ Other (specified in blank below)

Test frequency list

Test Mode	TX/RX	RF Channel		
		Low(L)	Middle (M)	High (H)
WCDMA Band V	TX	Channel 4132	Channel 4182	Channel 4233
		826.4 MHz	836.4 MHz	846.6 MHz
	RX	Channel 4357	Channel 4407	Channel 4458
		871.4 MHz	881.4 MHz	891.6 MHz
Test Mode	TX/RX	RF Channel		
		Low(L)	Middle (M)	High (H)
WCDMA Band II	TX	Channel 9262	Channel 9400	Channel 9538
		1852.4 MHz	1880.0 MHz	1907.6 MHz
	RX	Channel 9662	Channel 9800	Channel 9938
		1932.4 MHz	1960.0 MHz	1987.6 MHz
Test Mode	TX/RX	RF Channel		
		Low(L)	Middle (M)	High (H)
WCDMA Band IV	TX	Channel1312	Channel1413	Channel1513
		1712.4MHz	1732.6MHz	1752.6MHz
	RX	Channel1537	Channel1638	Channel1738
		2112.4MHz	2132.6MHz	2152.6MHz

2.3 Short description of the Equipment under Test (EUT)

2.3.1 General Description

Mobilephone is subscriber equipment in the BT/BLE/2.4GWIFI/5.2GWIFI/5.3GWIFI/5.5GWIFI/5.8GWIFI/GSM/WCDMA/LTE system. GSM/GPRS/EGPRS frequency band is Band II/V. The HSPA/UMTS frequency band is Band II/IV/V. LTE frequency band is band 2/4/5/7/12/17/66/71. The HSPA/UMTS frequency band II and Band IV and Band V test data included in this report. The Mobilephone implements such functions as RF signal receiving/transmitting, GSM/GPRS/EGPRS/HSPA/UMTS/LTE protocol processing, video MMS service and etc. Externally it provides SIM card interface.

2.4 Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
SHENZHEN TIANYIN ELECTRONICS CO., LTD	Power Adapter	TPA-46050200UU	--	FCC

Note: The adapter is supplied by lab and only use tested.

2.5 External I/O Port

I/O Port Description	Quantity	Cable
Type-C USB Port	1	N/A

2.6 Normal Accessory setting

N/A



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2.7 Test Sample

The application provides 2 samples to meet requirement;

Sample Number	Description
Sample 1(A251212063-1)	Engineer sample – continuous transmit
Sample 2(A251212063-2)	Normal sample – Intermittent transmit

2.8 EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

○ Power Cable	Length (m) :	/
	Shield :	/
	Detachable :	/
○ Multimeter	Manufacturer :	/
	Model No. :	/

2.9 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2A6B4-F31TX** filing to comply with FCC Part 22H, Part 24E, **Part 27** Rules.

2.10 Modifications

No modifications were implemented to meet testing criteria.

2.11 General Test Conditions/Configurations

2.11.1 Test Modes

NOTE: The test mode(s) are selected according to relevant radio technology specifications.

Test Mode	Test Modes Description
UMTS/TM1	WCDMA system, QPSK,16QAM modulation
UMTS/TM2	HSDPA system, QPSK,16QAM modulation
UMTS/TM3	HSUPA system, QPSK,16QAM modulation

Note: As WCDMA, HSDPA and HSUPA with the same emission designator, test result recorded in this report at the worst case UMTS/TM1 only after exploratory scan.

2.11.2 Test Environment

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Temperature	TN	Ambient
Voltage	VL	DC 3.3V
	VN	DC 3.85V
	VH	DC 4.4V

NOTE: VL=lower extreme test voltage VN=nominal voltage
VH=upper extreme test voltage TN=normal temperature





3 TEST ENVIRONMENT

3.1 Address of the test laboratory

Shenzhen LCS Compliance Testing Laboratory Ltd

101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

The sites are constructed in conformance with the requirements of ANSI C63.4 (2014) and CISPR Publication 22.

3.2 Test Facility

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

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

Test Firm Registration Number: 254912

3.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

(1)expressed at approximately the 95% confidence level using a coverage factor of k=1.96.



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3.4 Test Description

3.4.1 Cellular Band (824-849MHz paired with 869-894MHz) (Band V)

Test Item	FCC Rule No.	Requirements	Verdict
Effective(Isotropic) Radiated Output Power	§2.1046, §22.913	FCC: ERP $\leq$ 7W.	Pass
Field Strength of Spurious Radiation	§2.1053, §22.917	$\leq$ -13dBm/100kHz.	Pass
NOTE 1: For the verdict, the "N/A" denotes "not applicable", the "N/T" de notes "not tested".			

3.4.2 PCS Band (1850-1910MHz paired with 1930-1990MHz) (Band II)

Test Item	FCC Rule No.	Requirements	Verdict
Effective(Isotropic) Radiated Output Power	§2.1046, §24.232	EIRP $\leq$ 2W	Pass
Field Strength of Spurious Radiation	§2.1053, §24.238	$\leq$ -13dBm/1MHz.	Pass
NOTE 1: For the verdict, the "N/A" denotes "not applicable", the "N/T" de notes "not tested".			



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**3.4.3 AWS Band (1710-1755MHz paired with 2110-2155MHz) (Band IV)**

Test Item	FCC RuleNo.	Requirements	Verdict
Effective(Isotropic) Radiated Power Output Data	§2.1046, §27.50(d)	EIRP ≤ 1W;	Pass
Radiated spurious emission	§2.1053, §27.53(h)	≤ -13dBm/1MHz.	Pass
NOTE 1: For the verdict, the "N/A" denotes "not applicable", the "N/T" de notes "not tested"			





3.5 Equipments Used during the Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Power Meter	R&S	NRVS	100444	2025-05-22	2026-05-21
2	Power Sensor	R&S	NRV-Z81	100458	2025-05-22	2026-05-21
3	Power Sensor	R&S	NRV-Z32	10057	2025-05-22	2026-05-21
4	LTE Test Software	Tonscend	JS1120-1	N/A	N/A	N/A
5	RF Control Unit	Tonscend	JS0806-1	158060009	2025-11-07	2026-11-06
6	MXA Signal Analyzer	Agilent	N9020A	MY23311067	2025-05-22	2026-05-21
7	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	166586	2025-05-22	2026-05-21
8	DC Power Supply	Agilent	E3642A	N/A	2025-09-27	2026-09-26
9	EMI Test Software	Farad	EZ-EMC	Ver.FARAD-3A1.1+	N/A	N/A
10	3m Semi Anechoic Chamber	Maorui	966	/	2023-10-12	2026-10-11
11	Positioning Controller	Max-Full	MF7802BS	MF780208586	N/A	N/A
12	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2024-07-13	2027-07-12
13	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2024-08-03	2027-08-02
14	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2024-07-13	2027-07-12
15	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	791	2024-07-13	2027-07-12
16	Broadband Preamplifier	SCHWARZBECK	BBV9719	9719-025	2024-07-30	2027-07-29
17	EMI Test Receiver	R&S	ESR 7	101181	2025-05-22	2026-05-21
18	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2025-05-22	2026-05-21
19	Low-frequency amplifier	SchwarzZBECK	BBV9745	00253	2025-09-27	2026-09-26
20	High-frequency amplifier	JS Denki Pte	PA0118-43	JSPA21009	2025-09-27	2026-09-26
21	6dB Attenuator	/	100W/6dB	1172040	2025-05-22	2026-05-21
22	3dB Attenuator	/	2N-3dB	/	2025-09-28	2026-09-27
23	Temperature & Humidity Chamber	Baro	/	/	2025-06-04	2026-06-03
24	EMI Test Software	Farad	EZ-EMC	Ver. EMC-CON 3A1.1+	N/A	N/A
25	Antenna Mast	Max-Full	MFA-515BSN	1308572	N/A	N/A
26	Pulse Limiter	R&S	ESH3-Z2	102750	2025-05-23	2026-05-22
27	RADIO COMMUNICATION TESTER	Anritsu	MT8821C	6262257865	2025-05-22	2026-05-21
28	RADIO COMMUNICATION TESTER	Anritsu	MT8000A	6262208376	2025-10-21	2026-10-20
29	Signal Analyzer	Anritsu	MS2840A	6201591940	2025-05-22	2026-05-21
30	Signal Generator	Anritsu	MG3710E	626220421	2025-05-22	2026-05-21
31	Signal Generator	Anritsu	MG3692C	222804	2025-02-13	2026-02-12
32	RF Filter	Micro-Tronics	BRC50718	017	2025-09-27	2026-09-26
33	RF Filter	Micro-Tronics	BRC50719	011	2025-09-27	2026-09-26
34	RF Filter	Micro-Tronics	BRC50720	011	2025-09-27	2026-09-26
35	RF Filter	Micro-Tronics	BRC50721	013	2025-09-27	2026-09-26
36	RF Filter	Micro-Tronics	BRM50702	S/N-195	2025-09-27	2026-09-26



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3.6 Measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to ETSI TR 100 028 " Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics" and is documented in the Shenzhen LCS Compliance Testing Laboratory Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen LCS Compliance Testing Laboratory Ltd. is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	3.10 dB	(1)
Radiated Emission	1~18GHz	3.80 dB	(1)
Radiated Emission	18-40GHz	3.90 dB	(1)
Conducted Disturbance	0.15~30MHz	1.63 dB	(1)
Conducted Power	9KHz~18GHz	0.61 dB	(1)
Spurious RF Conducted Emission	9KHz~40GHz	1.22 dB	(1)
Band Edge Compliance of RF Emission	9KHz~40GHz	1.22 dB	(1)
Occuiped Bandwidth	9KHz~40GHz	-	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.



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4 TEST CONDITIONS AND RESULTS

4.1 Radiated Output Power

TEST DESCRIPTION

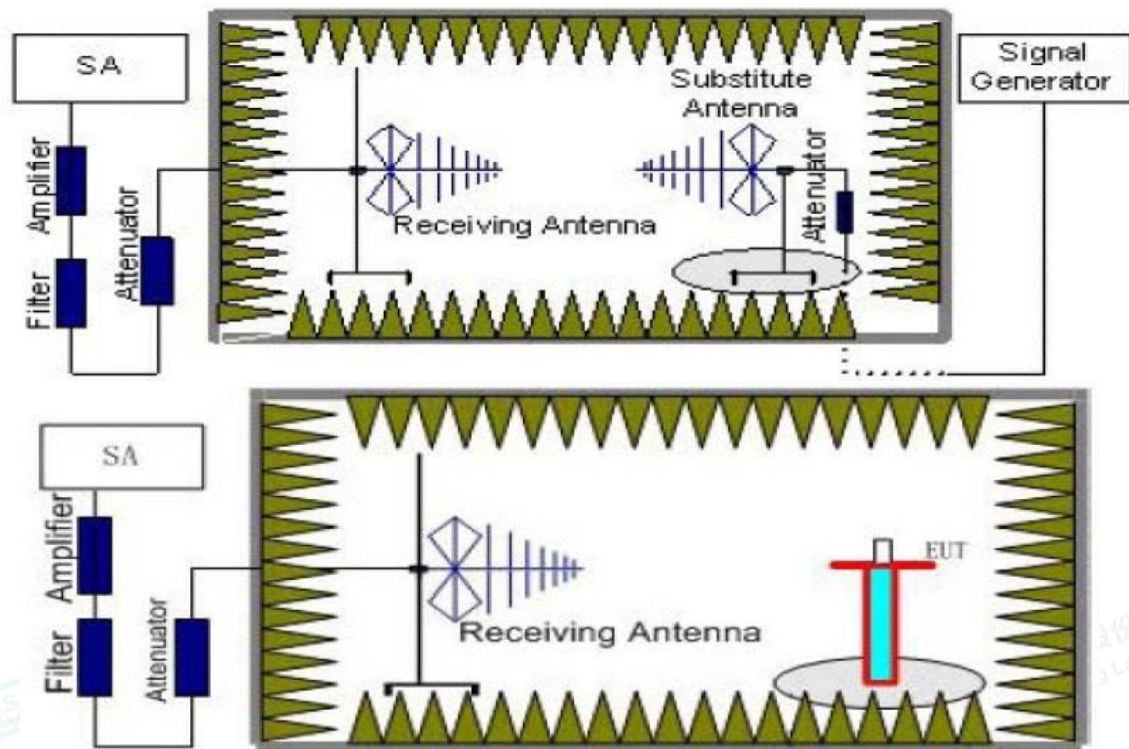
This is the test for the maximum radiated power from the EUT.

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

Rule Part 22.913(a) specifies "The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts."

Per Part 27.50(d) (4) specifies, Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755MHz band are limited to 1W EIRP. Fixed stations operating in this band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in this band must employ a means for limiting power to the minimum necessary for successful communications.

TEST CONFIGURATION



TEST PROCEDURE

1. EUT was placed on a 1.50 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.50m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide 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.





3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=10MHz, VBW=10MHz, And the maximum value of the receiver should be recorded as (P_r).
4. 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 (P_{Mea}) 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 (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. 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 (P_{cl}), the Substitution Antenna Gain (G_a) and the Amplifier Gain (P_{Ag}) should be recorded after test.
The measurement results are obtained as described below:
$$\text{Power(EIRP)} = P_{Mea} + P_{Ag} - P_{cl} + G_a$$
6. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
7. ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15\text{dBi}$.

TEST LIMIT

According to 22.913(a)(5), 24.232(c), §27.50(d) the ERP(EIRP) should be not exceeding following table limits:

	Burst Average EIRP
UMTS Band II	FCC: $\leq 33.01\text{dBm}$ (2W)

	Burst Average ERP
UMTS Band V	FCC: $\leq 38.45\text{dBm}$ (7W)

	Burst Average EIRP
UMTS Band IV	FCC: $\leq 30.00\text{dBm}$ (1W)



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**TEST RESULTS**

Remark:

1. We were tested all Configuration refer 3GPP TS134 121.
2. $EIRP = P_{Mea}(dBm) - P_{cl}(dB) + P_{Ag}(dB) + G_a(dBi)$
3. $ERP = EIRP - 2.15dBi$ as EIRP by subtracting the gain of the dipole.
4. $Margin = Emission Level - Limit$
5. We tested the worst-case records for H and V directions, and only the worst-case records for V direction were recorded in the report.

UMTS/TM1/UMTS Band II

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain (dB)	P_{Ag} (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1852.4	-19.52	4.03	8.38	35.51	20.34	33.01	-12.67	V
1880.0	-19.24	4.08	8.33	35.56	20.57	33.01	-12.44	V
1907.6	-19.56	4.14	8.26	35.63	20.19	33.01	-12.82	V

UMTS/TM1/UMTS Band V

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain (dB)	Correction (dB)	P_{Ag} (dB)	Burst Average ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
826.4	-16.61	3.45	8.45	2.15	33.79	20.03	38.45	-18.42	V
836.4	-16.96	3.49	8.45	2.15	33.85	19.70	38.45	-18.75	V
846.6	-16.61	3.55	8.36	2.15	33.88	19.93	38.45	-18.52	V

UMTS/TM1/UMTS Band IV

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain (dB)	P_{Ag} (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1712.4	-19.49	3.93	9.05	34.96	20.59	30.00	-9.41	V
1732.6	-19.94	3.93	8.89	35.01	20.03	30.00	-9.97	V
1752.6	-19.67	3.94	8.76	35.08	20.23	30.00	-9.77	V



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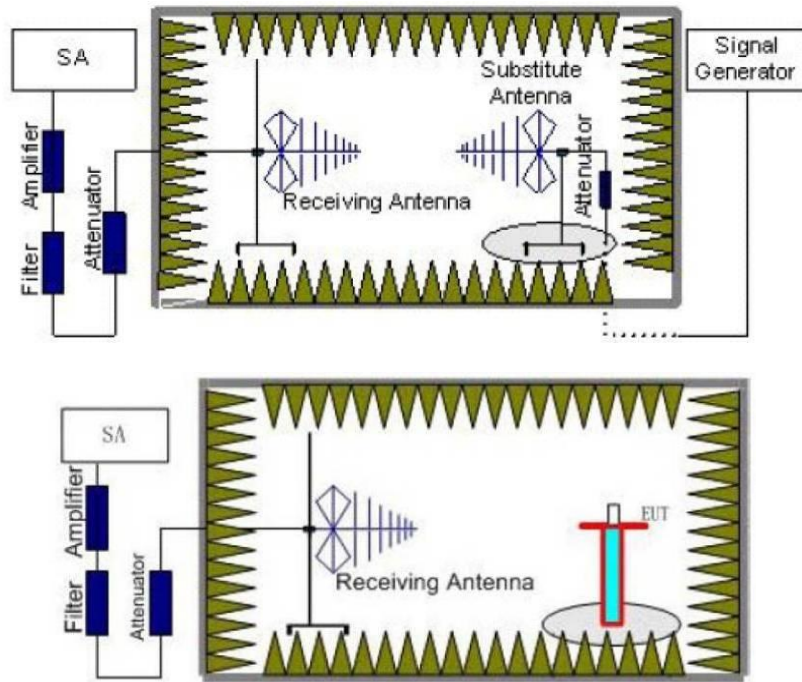
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4.2 Radiated Spurious Emission

TEST APPLICABLE

According to the TIA-603-E:2016 and FCC Part 2.1033 test method, The Receiver or Spectrum was scanned from lowest frequency frequency generated within the equipment to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 1910 MHz. The resolution bandwidth is set as outlined in Part 24.238, Part 22.917, Part 27.53 The spectrum is scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of WCDMA Band II , WCDMA Band V and WCDMA Band IV.

TEST CONFIGURATION



TEST PROCEDURE

1. EUT was placed on a 1.50 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.50 m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide 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.
3. 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 (P_r).
4. 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 (P_{Mea}) 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 (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.





5. 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 (P_{cl}), the Substitution Antenna Gain (G_a) and the Amplifier Gain (P_{Ag}) should be recorded after test.

The measurement results are obtained as described below:

$$\text{Power(EIRP)} = P_{\text{Mea}} + P_{\text{Ag}} - P_{\text{cl}} + G_a$$

6. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
7. ERP can be calculated from EIRP by subtracting the gain of the dipole, $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$.
8. In order to make sure test results more clearly, we set frequency range and sweep time for difference frequency range as follows table:

Working Frequency	Subrange (GHz)	RBW	VBW	Sweep time (s)
UMTS/TM1/ WCDMA Band V	0.00009~0.15	1KHz	3KHz	30
	0.00015~0.03	10KHz	30KHz	10
	0.03~1	100KHz	300KHz	10
	1~2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~10	1 MHz	3 MHz	3
UMTS/TM1/ WCDMA Band II	0.00009~0.15	1KHz	3KHz	30
	0.00015~0.03	10KHz	30KHz	10
	0.03~1	100KHz	300KHz	10
	1~2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~11	1 MHz	3 MHz	3
	11~14	1 MHz	3 MHz	3
	14~18	1 MHz	3 MHz	3
	18~20	1 MHz	3 MHz	2
UMTS/TM1/ WCDMA Band IV	0.00009~0.15	1KHz	3KHz	30
	0.00015~0.03	10KHz	30KHz	10
	0.03~1	100KHz	300KHz	10
	1~2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~11	1 MHz	3 MHz	3
	11~14	1 MHz	3 MHz	3
	14~18	1 MHz	3 MHz	3
	14~18	1 MHz	3 MHz	3

TEST LIMITS

According to 24.238, 22.917, 27.53, specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.



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Frequency	Channel	Frequency Range	Verdict
UMTS/TM1/ WCDMA Band V	Low	9KHz - 10GHz	PASS
	Middle	9KHz - 10GHz	PASS
	High	9KHz - 10GHz	PASS
UMTS/TM1/ WCDMA Band II	Low	9KHz - 20GHz	PASS
	Middle	9KHz - 20GHz	PASS
	High	9KHz - 20GHz	PASS
UMTS/TM1/ WCDMA Band IV	Low	9KHz - 18GHz	PASS
	Middle	9KHz - 18GHz	PASS
	High	9KHz - 18GHz	PASS

TEST RESULTS

Remark:

1. We were tested all Configuration refer 3GPP TS134 121.
2. $EIRP = P_{Mea}(dBm) - P_{cl}(dB) + P_{Ag}(dB) + G_a(dBi)$
3. $ERP = EIRP - 2.15dBi$ as $EIRP$ by subtracting the gain of the dipole.
4. $Margin = EIRP - Limit$

Note: All adapters and all the modes have been tested and recorded worst mode in the report.

UMTS/TM1/ WCDMA Band II _ Low Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3704.8	-40.11	5.26	3.00	9.88	-35.49	-13.00	-22.49	H
5557.2	-45.63	6.11	3.00	11.36	-40.38	-13.00	-27.38	H
3704.8	-45.06	5.26	3.00	9.88	-40.44	-13.00	-27.44	V
5557.2	-48.65	6.11	3.00	11.36	-43.40	-13.00	-30.40	V

UMTS/TM1/ WCDMA Band II _ Middle Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3760.0	-37.71	5.32	3.00	10.03	-33.00	-13.00	-20.00	H
5640.0	-43.42	6.19	3.00	11.41	-38.20	-13.00	-25.20	H
3760.0	-43.95	5.32	3.00	10.03	-39.24	-13.00	-26.24	V
5640.0	-47.67	6.19	3.00	11.41	-42.45	-13.00	-29.45	V

UMTS/TM1/ WCDMA Band II _ High Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3815.2	-43.17	5.36	3.00	9.62	-38.91	-13.00	-25.91	H
5722.8	-51.45	6.24	3.00	11.46	-46.23	-13.00	-33.23	H
3815.2	-46.89	5.36	3.00	9.62	-42.63	-13.00	-29.63	V
5722.8	-53.67	6.24	3.00	11.46	-48.45	-13.00	-35.45	V

UMTS/TM1/ WCDMA Band V _ Low Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1652.8	-47.79	3.86	3.00	8.56	-43.09	-13.00	-30.09	H
2479.2	-49.03	4.29	3.00	6.98	-46.34	-13.00	-33.34	H
1652.8	-44.34	3.86	3.00	8.56	-39.64	-13.00	-26.64	V
2479.2	-44.66	4.29	3.00	6.98	-41.97	-13.00	-28.97	V



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*UMTS/TM1/ WCDMA Band V _ Middle Channel*

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1672.8	-49.01	3.9	3.00	8.58	-44.33	-13.00	-31.33	H
2509.2	-50.81	4.32	3.00	6.8	-48.33	-13.00	-35.33	H
1672.8	-44.96	3.9	3.00	8.58	-40.28	-13.00	-27.28	V
2509.2	-45.37	4.32	3.00	6.8	-42.89	-13.00	-29.89	V

UMTS/TM1/ WCDMA Band V _ High Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1693.2	-51.99	3.91	3.00	9.06	-46.84	-13.00	-33.84	H
2539.8	-54.54	4.32	3.00	6.65	-52.21	-13.00	-39.21	H
1693.2	-49.12	3.91	3.00	9.06	-43.97	-13.00	-30.97	V
2539.8	-51.27	4.32	3.00	6.65	-48.94	-13.00	-35.94	V

UMTS/TM1/ WCDMA Band IV _ Low Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3424.8	-46.04	4.62	3.00	9.81	-40.85	-13.00	-27.85	H
5137.2	-49.87	5.94	3.00	10.86	-44.95	-13.00	-31.95	H
3424.8	-49.05	4.62	3.00	9.81	-43.86	-13.00	-30.86	V
5137.2	-53.80	5.94	3.00	10.86	-48.88	-13.00	-35.88	V

UMTS/TM1/ WCDMA Band IV _ Middle Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3465.2	-41.12	4.63	3.00	9.84	-35.91	-13.00	-22.91	H
5197.8	-46.11	5.94	3.00	10.86	-41.19	-13.00	-28.19	H
3465.2	-44.67	4.63	3.00	9.84	-39.46	-13.00	-26.46	V
5197.8	-49.43	5.94	3.00	10.86	-44.51	-13.00	-31.51	V

UMTS/TM1/ WCDMA Band IV _ High Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3505.2	-48.06	4.65	3.00	9.9	-42.81	-13.00	-29.81	H
5257.8	-51.07	5.95	3.00	10.91	-46.11	-13.00	-33.11	H
3505.2	-50.74	4.65	3.00	9.9	-45.49	-13.00	-32.49	V
5257.8	-53.94	5.95	3.00	10.91	-48.98	-13.00	-35.98	V



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5 Test Setup Photos of the EUT

Please refer to separated files for Test Setup Photos of the EUT.

6 External Photos of the EUT

Please refer to separated files for External Photos of the EUT.

7 Internal Photos of the EUT

Please refer to separated files for Internal Photos of the EUT.

-----THE END OF TEST REPORT-----



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