

# JianYan Testing Group Shenzhen Co., Ltd.

Report No: JYTSZB-R12-2102457

# FCC REPORT (GSM)

Applicant: TECNO MOBILE LIMITED

Address of Applicant: FLAT 39 8/F BLOCK D WAH LOK INDUSTRIAL CENTRE 31-

35 SHAN MEI STREET FOTAN NT

**Equipment Under Test (EUT)** 

Product Name: Mobile Phone

Model No.: LE6h

Trade mark: TECNO

FCC ID: 2ADYY-LE6H

**Applicable standards:** FCC CFR Title 47 Part 2

FCC CFR Title 47 Part 22 Subpart H FCC CFR Title 47 Part 24 Subpart E

Date of sample receipt: 08 Nov., 2021

**Date of Test:** 09 Nov., to 29 Nov., 2021

Date of report issued: 30 Nov., 2021

Test Result: PASS\*

#### Authorized Signature:



#### Bruce Zhang Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the JYT product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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<sup>\*</sup> In the configuration tested, the EUT complied with the standards specified above.





## 2. Version

Version No.	Date	Description
00	30 Nov., 2021	Original

Tested by:	_///(Ke.UU	Date:	30 Nov., 2021	
	Test Engineer			

Winner Thang Project Engineer Reviewed by: Date: 30 Nov., 2021





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# 4. Test Summary

Test Item	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Pass (Please refer to SAR Report)
RF Output Power	Part 2.1046 Part 22.913 (a)(5) Part 24.232 (c)	Appendix A – GSM
Peak-to-Average Power Ratio	Part 24.232 (d)	Appendix B – GSM
Modulation Characteristics	Part 2.1047	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917(b) Part 24.238(b)	Appendix C – GSM
Out of band emission at antenna terminals	Part 2.1053 Part 22.917 (a) Part 24.238 (a)	Appendix D – GSM Appendix E – GSM
Field strength of spurious radiation	Part 22.917 (a) Part 24.238 (a)	Pass
Frequency stability vs. temperature	Part 22.355 Part 24.235 Part 2.1055(a)(1)(b)	Appendix F – GSM
Frequency stability vs. voltage	Part 22.355 Part 24.235 Part 2.1055(d)(2)	Appendix F – GSM

#### Remark:

1. Pass: The EUT complies with the essential requirements in the standard.

2. The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB(Fundamental Frequency below 1GHz)/1.0dB(Fundamental Frequency above 1GHz) (provided by the customer).

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

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# 5. General Information

### 5.1 Client Information

Applicant:	TECNO MOBILE LIMITED
Address:	FLAT 39 8/F BLOCK D WAH LOK INDUSTRIAL CENTRE 31-35 SHAN MEI STREET FOTAN NT
Manufacturer:	TECNO MOBILE LIMITED
Address:	FLAT 39 8/F BLOCK D WAH LOK INDUSTRIAL CENTRE 31-35 SHAN MEI STREET FOTAN NT
Factory:	SHENZHEN TECNO TECHNOLOGY CO., LTD.
Address:	101, Building 24, Waijing Industrial Park, Fumin Community, Fucheng Street, Longhua District, Shenzhen City, P.R.China

# 5.2 General Description of E.U.T.

Product Name:	Mobile Phone		
Model No.:	LE6h		
Operation Frequency range:	GSM 850: 824.20MHz-848.80MHz		
	PCS1900: 1850.20MHz-1909.80MHz		
Modulation type:	2G SVoice(GMSK) SGPRS(GMSK) SEGPRS(GMSK, 8PSK)		
Antenna type:	Internal Antenna GSM 850: -1.6 dBi(declare by Applicant)		
Antenna gain:			
	PCS 1900: -0.7 dBi(declare by Applicant)		
Power supply:	Rechargeable Li-ion Polymer Battery DC3.85V, 5850mAh		
AC adapter:	Model: U180TSA		
	Input: AC100-240V, 50/60Hz, 0.6A		
	Output: DC 5.0V-9.0V, 2.0A, DC 9.0V-12.0V, 1.5A		
Test Sample Condition:	The test samples were provided in good working order with no visible defects.		

#### **Operation Frequency List:**

GSM 850 Channel Frequency (MHz)		PCS1900		
		Channel	Frequency (MHz)	
128	824.20	512	1850.20	
129	824.40	513	1850.40	
 189 836.40				
		660	1879.80	
190	836.60	661	1880.00	
191 836.80  250 848.60		662	1880.20	
		809	1909.60	
251	848.80	810	1909.80	

Regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

GSM850			PCS1900		
Channel		Frequency(MHz)	Channel		Frequency(MHz)
Lowest	128	824.20	Lowest	512	1850.20
Middle	190	836.60	Middle	661	1880.00
Highest	251	848.80	Highest	810	1909.80

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#### 5.3 Test environment and mode

Operating Environment:		
Temperature:	Normal: $15^{\circ}$ C ~ $35^{\circ}$ C, Extreme: $-30^{\circ}$ C ~ $+50^{\circ}$ C	
Humidity:	20 % ~ 75 % RH	
Atmospheric 1008 mbar		
Voltage:	Nominal: 3.85Vdc, Extreme: Low 3.5 Vdc, High 4.40 Vdc	
Test mode:		
GSM mode	Keep the EUT communication with simulated station in GSM mode	
GPRS mode	Keep the EUT communication with simulated station in GPRS mode	
EGPRS mode	Keep the EUT communication with simulated station in EGPRS mode	
Remark: The EUT has been tested under continuous transmitting mode. Channel Low, Mid and High		

Remark: The EUT has been tested under continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing. The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for these modes. Just the worst case position (H mode) shown in report.

5.4 Description of Test Auxiliary Equipment

Test Equipment	Manufacturer	Model No.	Serial No.
Simulated Station	Anritsu	MT8820C	6201026545

5.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Radiated Emission (9kHz ~ 30MHz electric field) for 3m SAC	3.13 dB
Radiated Emission (9kHz ~ 30MHz magnetic field) for 3m SAC	3.13 dB
Radiated Emission (30MHz ~ 1GHz) for 3m SAC	4.45 dB
Radiated Emission (1GHz ~ 18GHz) for 3m SAC	5.34 dB
Radiated Emission (18GHz ~ 40GHz) for 3m SAC	5.34 dB

# 5.6 Additions to, deviations, or exclusions from the method

No

# 5.7 Laboratory Facility

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

#### • FCC - Designation No.: CN1211

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

#### • ISED - CAB identifier.: CN0021

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

#### A2LA - Registration No.: 4346.01

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <a href="https://portal.a2la.org/scopepdf/4346-01.pdf">https://portal.a2la.org/scopepdf/4346-01.pdf</a>

# 5.8 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.

Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.

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## 5.9 Test Instruments list

Radiated Emission:	Radiated Emission:					
Test Equipment Manufacturer		Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)	
3m SAC	ETS	RFD-100	Q1984	04-14-2021	04-13-2024	
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-044	03-07-2021	03-06-2022	
BiConiLog Antenna	SCHWARZBECK	VULB9163	9163-1246	03-07-2021	03-06-2022	
Biconical Antenna	SCHWARZBECK	VUBA 9117	9117#359	06-17-2021	06-17-2022	
Horn Antenna	SCHWARZBECK	BBHA9120D	912D-916	03-07-2021	03-06-2022	
Broad-Band Horn Antenna	SCHWARZBECK	BBHA9170	1067	04-02-2021	04-01-2022	
Broad-Band Horn Antenna	SCHWARZBECK	BBHA9170	1068	04-02-2021	04-01-2022	
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-03-2021	03-02-2022	
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-03-2021	03-02-2022	
Consistences and beauty	Marria laula t	NO040D	MY60240202	11-27-2020	11-26-2021	
Spectrum analyzer	Keysight	N9010B		11-27-2021	11-26-2022	
Simulated Station	Anritsu	MT8820C	6201026545	03-03-2021	03-02-2022	
Low Pre-amplifier	SCHWARZBECK	BBV9743B	00305	03-07-2021	03-06-2022	
High Pre-amplifier	SKET	LNPA_0118G-50	MF280208233	03-07-2021	03-06-2022	
Cable	Qualwave	Qualwave         JYT3M-1G-NN-8M         JYT3M-1         03-07-2021           Qualwave         JYT3M-18G-NN-8M         JYT3M-2         03-07-2021		03-07-2021	03-06-2022	
Cable	Qualwave			03-06-2022		
Cable	Cable Qualwave JYT3M-1G-BB-5M JYT3M-3 03-07-2021		03-06-2022			
Cable	Bost	JYT3M-40G-SS-8M	JYT3M-4	04-02-2021	04-01-2022	
EMI Test Software	Tonscend	TS+	Version:3.0.0.1		·	

Conducted method:						
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)	
Spectrum Analyzer	Keysight	N9020B	MY57431500	07-02-2021	07-01-2022	
Simulated Station	Rohde & Schwarz	CMW500	108209	07-02-2021	07-01-2022	
RF Control Unit	Tonscend	JS0806-1	N/A	N/A	N/A	
Band Reject Filter Group	Tonscend	JS0806-F	21A8060360	N/A	N/A	
Test Software	Tonscend	TS+	Ve	ersion: 2.6.9.0526	3	

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# 6. Test results

# 6.1 Conducted Output Power, ERP and EIRP

Test Requirement:	FCC part 22.913(a)(5), FCC part 24.232(c)			
Limit:	GSM 850: 7W, PCS 1900: 2W			
Test setup:	System simulator EUT			
Test Procedure:	The transmitter output was connected to a calibrated attenuator, the other end of which was connected to the simulated station. Transmitter output power was read off in dBm.			
Test Instruments:	Refer to section 5.9 for details			
Test mode:	Refer to section 5.3 for details			
Test results:	Passed			

Measurement Data: Refer to Appendix A – GSM

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# 6.2 Peak-to-Average Power Ratio

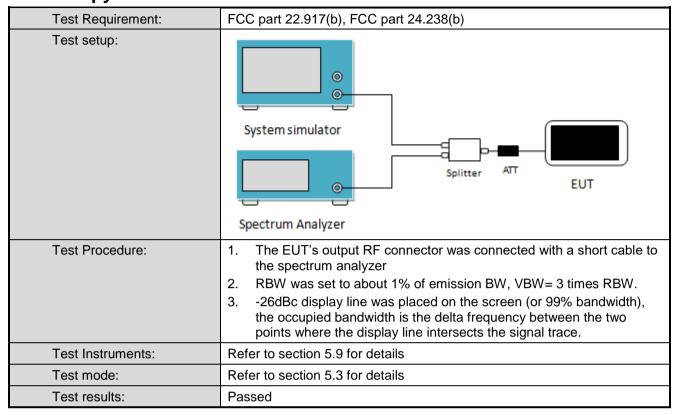
Test Requirement:	FCC part 24.232(d)		
Limit:	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.		
Test setup:	System simulator  Spectrum Analyzer  Spectrum Analyzer		
Test Procedure:	<ol> <li>The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.</li> <li>Set the CCDF option in spectrum analyzer, RBW ≥ OBW,</li> <li>Set the EUT working in highest power level, measured and recorded the 0.1% as PAPR level.</li> <li>Repeat step 1~3 at other frequency and modulations.</li> </ol>		
Test Instruments:	Refer to section 5.9 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Passed		

Measurement Data: Refer to Appendix B - GSM

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# 6.3 Occupy Bandwidth



Measurement Data: Refer to Appendix C - GSM

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## 6.4 Modulation Characteristic

According to FCC  $\S$  2.1047(d), Part 22H & 24E there is no specific requirement for digital modulation, Just Report only, refer to Appendix G – GSM

## 6.5 Out of band emission at antenna terminals

Test Requirement:	FCC part 22.917(a), FCC part 24.238(a)		
Limit:	-13dBm		
Test setup:	System simulator Spectrum Analyzer		
Test Procedure:	The RF output of the transceiver was connected to a spectrum		
rest i roccuure.	<ul> <li>analyzer through appropriate attenuation.</li> <li>For the out of band: For GSM850&amp;WCDMA850 set the RBW=100 kHz, VBW=300 kHz and for PCS1900 &amp; WCDMA1900 set the RBW=1MHz, VBW=3MHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic.</li> <li>Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.</li> </ul>		
Test Instruments:	Refer to section 5.9 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Passed		

#### **Measurement Data:**

Band edge emission: Refer to Appendix D - GSM

Spurious emission: Refer to Appendix E – GSM

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# 6.6 Field strength of spurious radiation measurement

Test Requirement:	FCC part 22.917(a), FCC part 24.238(a)
Limit:	-13dBm
Test setup:	Below 1GHz  Camera  Antenna Tower  Ground Reference Plane  Ground Reference Plane  Signal  Generator  Amplifier
	Above 1GHz
	Ground Reference Plane Test Receiver
Test Procedure:	<ol> <li>The EUT was placed on the top of a rotating table 0.8m(below 1GHz)/1.5m(above 1GHz) above the ground at a 3 meter camber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.</li> <li>During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.</li> <li>The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.</li> <li>The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.         ERP / EIRP = S.G. output (dBm) + Antenna Gain(dB/dBi) – Cable Loss (dB)     </li> </ol>
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details.
Test results:	Passed

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#### Measurement Data (worst case):

	GSM850						
Lowest channel							
Frequency (MHz)	Spurous Emission level (dBm)	Factor (dB)	Level at antenna terminals (dBm)	Limit Line (dBm)	Margin (dB)	Polarization	
1648.40	-48.42	-9.89	-58.31	-13.00	45.31	Vertical	
2472.60	-46.72	-5.57	-52.29	-13.00	39.29	Vertical	
3296.80	-45.84	-2.14	-47.98	-13.00	34.98	Vertical	
1648.40	-44.39	-9.89	-54.28	-13.00	41.28	Horizontal	
2472.60	-39.77	-5.57	-45.34	-13.00	32.34	Horizontal	
3296.80	-47.65	-2.14	-49.79	-13.00	36.79	Horizontal	
	Middle channel						
Frequency (MHz)	Spurous Emission level (dBm)	Factor (dB)	Level at antenna terminals (dBm)	Limit Line (dBm)	Margin (dB)	Polarization	
1673.20	-48.12	-9.88	-58.00	-13.00	45.00	Vertical	
2509.80	-46.69	-5.29	-51.98	-13.00	38.98	Vertical	
3346.40	-46.03	-2.05	-48.08	-13.00	35.08	Vertical	
1673.20	-44.23	-9.88	-54.11	-13.00	41.11	Horizontal	
2509.80	-39.80	-5.29	-45.09	-13.00	32.09	Horizontal	
3346.40	-47.86	-2.05	-49.91	-13.00	36.91	Horizontal	
		Highest	channel				
Frequency (MHz)	Spurous Emission level (dBm)	Factor (dB)	Level at antenna terminals (dBm)	Limit Line (dBm)	Margin (dB)	Polarization	
1697.60	-48.90	-9.87	-58.77	-13.00	45.77	Vertical	
2546.40	-47.01	-5.13	-52.14	-13.00	39.14	Vertical	
3395.20	-45.46	-1.97	-47.43	-13.00	34.43	Vertical	
1697.60	-44.49	-9.87	-54.36	-13.00	41.36	Horizontal	
2546.40	-40.12	-5.13	-45.25	-13.00	32.25	Horizontal	
3395.20	-47.26	-1.97	-49.23	-13.00	36.23	Horizontal	

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





	PCS1900						
	Lowest channel						
Frequency (MHz)	Spurous Emission level (dBm)	Factor (dB)	Level at antenna terminals (dBm)	Limit Line (dBm)	Margin (dB)	Polarization	
3700.40	-47.92	-1.40	-49.32	-13.00	36.32	Vertical	
5550.60	-49.44	5.27	-44.17	-13.00	31.17	Vertical	
3700.40	-47.78	-1.40	-49.18	-13.00	36.18	Horizontal	
5550.60	-49.47	5.27	-44.20	-13.00	31.20	Horizontal	
	Middle channel						
Frequency (MHz)	Spurous Emission level (dBm)	Factor (dB)	Level at antenna terminals (dBm)	Limit Line (dBm)	Margin (dB)	Polarization	
3760.00	-47.82	-1.03	-48.85	-13.00	35.85	Vertical	
5640.00	-49.92	6.06	-43.86	-13.00	30.86	Vertical	
3760.00	-47.61	-1.03	-48.64	-13.00	35.64	Horizontal	
5640.00	-49.03	6.06	-42.97	-13.00	29.97	Horizontal	
		Highest	channel				
Frequency (MHz)	Spurous Emission level (dBm)	Factor (dB)	Level at antenna terminals (dBm)	Limit Line (dBm)	Margin (dB)	Polarization	
3819.60	-47.54	-0.83	-48.37	-13.00	35.37	Vertical	
5729.40	-49.72	6.82	-42.90	-13.00	29.90	Vertical	
3819.60	-47.71	-0.83	-48.54	-13.00	35.54	Horizontal	
5729.40	-49.31	6.82	-42.49	-13.00	29.49	Horizontal	

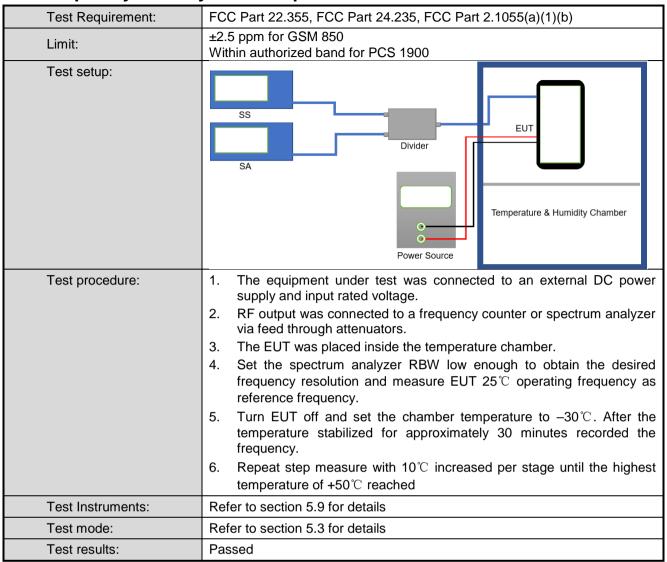
Remark:

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



## 6.7 Frequency stability V.S. Temperature measurement



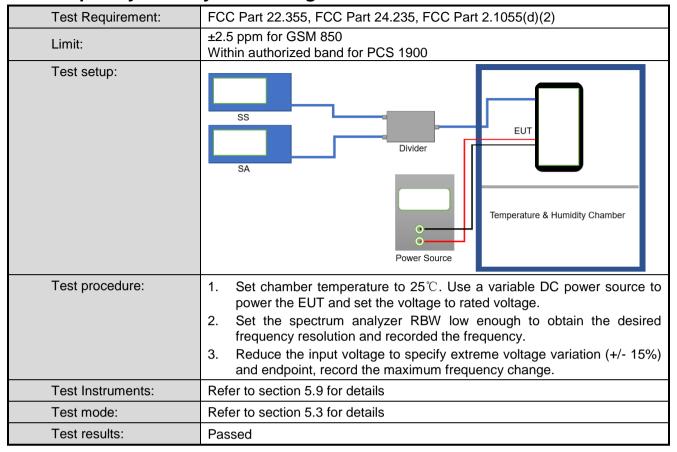
Measurement Data: Refer to Appendix F - GSM

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## 6.8 Frequency stability V.S. Voltage measurement



Measurement Data: Refer to Appendix F – GSM

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