



FCC TEST REPORT FOR

Shanghai SmartPeak Technology Co.,Ltd.

POS Terminal

Test Model: P2000L

Prepared for : Shanghai SmartPeak Technology Co.,Ltd.
Address : Room 1, No.3 Building, NO.295, Qianqiao Road, Fengxian District, Shanghai, China

Prepared by : 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

Tel : (+86)755-82591330
Fax : (+86)755-82591332
Web : www.LCS-cert.com
Mail : webmaster@LCS-cert.com

Date of receipt of test sample : December 10, 2022
Number of tested samples : 2
Sample No. : A120822084-1, A120822084-2
Serial number : Prototype
Date of Test : December 10, 2022 ~ December 15, 2022
Date of Report : December 15, 2022



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: + (86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



FCC TEST REPORT FCC Part 22 /Part 24	
Report Reference No.	LCSA120822084EE
FCC ID	2A73S-P2000L
Date of Issue	December 15, 2022
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	Shanghai SmartPeak Technology Co.,Ltd.
Address	Room 1, No.3 Building, NO.295, Qianqiao Road, Fengxian District, Shanghai, China
Test specification	
Standard	FCC Part 22: Public Mobile Services FCC Part 24: Personal Communication Services
Test Report Form No	LCSEMC-1.0
TRF Originator	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	Dated 2011-03
Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved. This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen LCS Compliance Testing Laboratory Ltd. is acknowledged as copyright owner and source of the material. Shenzhen LCS Compliance Testing Laboratory Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.	
Test item description	POS Terminal
Trade Mark	SmartPeak
Test Model	P2000L
Ratings	Please Refer to Page 7
Hardware version	/
Software version	/
Frequency	GSM 850MHz; PCS 1900MHz
Result	PASS

Compiled by:

Vera Deng/ Administrator

Supervised by:

Cary Luo/ Technique principal

Approved by:

Gavin Liang/ Manager



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity

**TEST REPORT****Test Report No. : LCSA120822084EE**

December 15, 2022

Date of issue

EUT.....	: POS Terminal
Test Model.....	: P2000L
Applicant.....	: Shanghai SmartPeak Technology Co.,Ltd.
Address.....	: Room 1, No.3 Building, NO.295, Qianqiao Road, Fengxian District, Shanghai, China
Telephone.....	: /
Fax.....	: /
Manufacturer.....	: Shanghai SmartPeak Technology Co.,Ltd.
Address.....	: Room 1, No.3 Building, NO.295, Qianqiao Road, Fengxian District, Shanghai, China
Telephone.....	: /
Fax.....	: /
Factory.....	: Shanghai SmartPeak Technology Co.,Ltd.
Address.....	: Room 1, No.3 Building, NO.295, Qianqiao Road, Fengxian District, Shanghai, China
Telephone.....	: /
Fax.....	: /

Test Result:**PASS**

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.



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



Revision History

Report Version	Issue Date	Revision Content	Revised By
000	December 15, 2022	Initial Issue	---



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



Contents

1	TEST STANDARDS	6
2	SUMMARY	7
2.1	Product Description	7
2.2	Equipment under Test	9
2.3	Short description of the Equipment under Test (EUT)	10
2.4	Internal Identification of AE used during the test	10
2.5	Normal Accessory setting	10
2.6	EUT configuration	10
2.7	Related Submittal(s) / Grant (s)	10
2.8	Modifications	10
2.9	General Test Conditions/Configurations	11
3	TEST ENVIRONMENT	12
3.1	Address of the test laboratory	12
3.2	Test Facility	12
3.3	Environmental conditions	12
3.4	Test Description	13
3.5	Equipments Used during the Test	14
3.6	Measurement uncertainty	15
4	TEST CONDITIONS AND RESULTS	16
4.1	Radiated Spurious Emssion	16
5	TEST SETUP PHOTOGRAPHS OF EUT	20
6	EXTERIOR PHOTOGRAPHS OF THE EUT	20
7	INTERIOR PHOTOGRAPHS OF THE EUT	20



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



1 TEST STANDARDS

The tests were performed according to following standards:

[FCC Part 22 \(10-1-16 Edition\)](#): Cellular Radiotelephone Service.

[FCC Part 24\(10-1-16 Edition\)](#): Broadband PCS.

[ANSI/TIA-603-E-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.

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

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



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



2 SUMMARY

2.1 Product Description

The **Shanghai SmartPeak Technology Co.,Ltd.**'s Model: P2000L 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	: POS Terminal
Test Model	: P2000L
Power Supply	: Input: 5V $\overline{\text{---}}$ 2A For Adapter1 Input: 100-240V~, 50/60Hz, 0.40A For Adapter1 Output: 5.0V $\overline{\text{---}}$ 2.0A, 10.0W For Adapter2 Input: 100-240V~, 50/60Hz, 0.40A For Adapter2 Output: 5.0V $\overline{\text{---}}$ 2.0A, 10.0W DC 7.4V by Rechargeable Li-ion Battery, 2000mAh
Hardware Version	: /
Software Version	: /
Bluetooth	:
Frequency Range	: 2402MHz ~ 2480MHz
Channel Number	: 79 channels for Bluetooth V4.1(DSS) 40 channels for Bluetooth V4.1 (DTS)
Channel Spacing	: 1MHz for Bluetooth V4.1 (DSS) 2MHz for Bluetooth V4.1 (DTS)
Modulation Type	: GFSK, $\pi/4$ -DQPSK, 8-DPSK for Bluetooth V4.1(DSS) GFSK for Bluetooth V4.1 (DTS)
Bluetooth Version	: V4.1
Antenna Description	: PIFA Antenna, 0.5dBi(Max.)
WIFI(2.4G Band)	:
Frequency Range	: 2412MHz ~ 2462MHz
Channel Spacing	: 5MHz
Channel Number	: 11 Channels for 20MHz bandwidth (2412~2462MHz)
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, 0.5dBi(Max.)
2G	:
Support Band	: ☐ GSM 900 (EU-Band) ☐ DCS 1800 (EU-Band) ☒ GSM 850 (U.S.-Band) ☒ PCS 1900 (U.S.-Band)
Release Version	: R99
GPRS Class	: Class 12
EGPRS Class	: Class 12
Type Of Modulation	: GMSK for GSM/GPRS; GMSK/8PSK for EGPRS
Antenna Description	: PIFA Antenna 0.5dBi (max.) For GSM 850 0.5dBi (max.) For PCS 1900



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity

**3G**

Support Band : ☒ WCDMA Band II (U.S.-Band)
☒ WCDMA Band V (U.S.-Band)
☐ WCDMA Band IV (U.S.-Band)
☐ WCDMA Band I (EU-Band)
☐ WCDMA Band VIII (EU-Band)

Release Version : R9

Type Of Modulation : QPSK, 16QAM

Antenna Description : PIFA Antenna
0.5dBi (max.) For WCDMA Band II
0.5dBi (max.) For WCDMA Band V

LTE

Support Band : ☒ E-UTRA Band 2(U.S.-Band)
☒ E-UTRA Band 4(U.S.-Band)
☒ E-UTRA Band 7(U.S.-Band)

LTE Release Version : R9

Type Of Modulation : QPSK/16QAM

Antenna Description : PIFA Antenna
0.5dBi (max.) For E-UTRA Band 2
0.5dBi (max.) For E-UTRA Band 4
0.5dBi (max.) For E-UTRA Band 7

Power Class : Class 3

NFC

Operating Frequency : 13.56MHz

Modulation Type : ASK

Antenna Description : PCB Antenna, 0.5dBi(Max.)

GPS function

Extreme temp. : -30°C to +50°C

Tolerance

Extreme vol. Limits : 6.4VDC to 8.4VDC (nominal: 7.4VDC)



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



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) 7.4V DC	

Test frequency list

Test Mode	TX/RX	RF Channel		
		Low(L)	Middle (M)	High (H)
GSM850	TX	Channel 128	Channel 190	Channel 251
		824.2 MHz	836.6 MHz	848.8 MHz
	RX	Channel 128	Channel 190	Channel 251
		869.2 MHz	881.6 MHz	893.8 MHz
Test Mode	TX/RX	RF Channel		
		Low(L)	Middle (M)	High (H)
PCS1900	TX	Channel 512	Channel 661	Channel 810
		1850.2 MHz	1880.0 MHz	1909.8 MHz
	RX	Channel 512	Channel 661	Channel 810
		1930.2 MHz	1960.0 MHz	1989.8 MHz



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



2.3 Short description of the Equipment under Test (EUT)

2.3.1 General Description

P2000L is subscriber equipment in the BT/BLE/2.4GWIFI/GSM/WCDMA/LTE/NFC/GPS system. GSM/GPRS/EGPRS frequency band is Band II/V. The HSPA/UMTS frequency band is Band II/V. LTE frequency band is band 2/4/7. The HSPA/UMTS frequency band II and Band V test data included in this report. The P2000L 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 Internal Identification of AE used during the test

AE ID*	Description
AE1	Rechargeable Li-Polymer Battery
AE2	Switching Adapter
AE2	Power Adapter

AE1

Battery Model: 335880

DC 7.4V by Rechargeable Li-ion Battery, 2000mAh

AE2

Adapter Model: GLH50D2000HW

Adapter Input: 100-240V~, 50/60Hz, 0.40A

Adapter Output: 5.0V $\overline{\sim}$ 2.0A, 10.0W

.....

AE3

Adapter Model: GLH50A2000HW

Adapter Input: 100-240V~, 50/60Hz, 0.4A

Adapter Output: 5.0V $\overline{\sim}$ 2.0A, 10.0W

2.5 Normal Accessory setting

Fully charged battery was used during the test.

2.6 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. :	/

2.7 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2A73S-P2000L** filing to comply with FCC Part 22 and Part 24 Rules.

2.8 Modifications

No modifications were implemented to meet testing criteria.



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



2.9 General Test Conditions/Configurations

2.9.1 Test Modes

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

Test Mode	Test Modes Description
GSM/TM1	GSM system, GSM, GMSK modulation
GSM/TM2	GSM system, GPRS, GMSK modulation
GSM/TM3	GSM system, EDGE, 8PSK modulation

Note:

1. As GSM and GPRS with the same emission designator, test result recorded in this report at the worst case GSM/TM1 only after exploratory scan.

2.9.2 Test Environment

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Temperature	TN	Ambient
Voltage	VL	DC 6.4V
	VN	DC 7.4V
	VH	DC 8.4V

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



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



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 32.

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



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



3.4 Test Description

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

Test Item	FCC Rule No.	Requirements	Verdict
Field Strength of Spurious Radiation	§2.1053, §22.917	$\leq -13\text{dBm}/100\text{kHz}$.	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)

Test Item	FCC Rule No.	Requirements	Verdict
Field Strength of Spurious Radiation	§2.1053, §24.238	$\leq -13\text{dBm}/1\text{MHz}$.	Pass
NOTE 1: For the verdict, the "N/A" denotes "not applicable", the "N/T" de notes "not tested".			

Remark: The measurement uncertainty is not included in the test result.



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



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	2022-06-16	2023-06-15
2	Power Sensor	R&S	NRV-Z81	100458	2022-06-16	2023-06-15
3	Power Sensor	R&S	NRV-Z32	10057	2022-06-16	2023-06-15
4	LTE Test Software	Tonscend	JS1120-1	N/A	N/A	N/A
5	RF Control Unit	Tonscend	JS0806-1	158060009	2022-10-29	2023-10-28
6	MXA Signal Analyzer	Agilent	N9020A	MY512509 05	2022-10-29	2023-10-28
7	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2022-06-16	2023-06-15
8	DC Power Supply	Agilent	E3642A	N/A	2022-10-29	2023-10-28
9	EMI Test Software	AUDIX	E3	/	N/A	N/A
10	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03- HY	2022-06-16	2023-06-15
11	Positioning Controller	Max-Full	MF7802BS	MF780208 586	N/A	N/A
12	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2021-08-29	2024-08-28
13	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2021-09-12	2024-09-11
14	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D- 1925	2021-09-05	2024-09-04
15	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	791	2021-08-29	2024-08-28
16	Broadband Preamplifier	SCHWARZBECK	BBV9719	9719-025	2022-06-16	2023-06-15
17	EMI Test Receiver	R&S	ESR 7	101181	2022-06-16	2023-06-15
18	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2022-10-29	2023-10-28
19	Broadband Preamplifier	/	BP-01M18G	P190501	2022-06-16	2023-06-15
20	6dB Attenuator	/	100W/6dB	1172040	2022-06-16	2023-06-15
21	3dB Attenuator	/	2N-3dB	/	2022-10-29	2023-10-28
22	Temperature & Humidity Chamber	GUANGZHOU GOGNWEN	GDS-100	70932	2022-10-06	2023-10-05
23	EMI Test Software	Farad	EZ	/	N/A	N/A
24	RADIO COMMUNICATION TESTER	R&S	CMU 200	105988	2022-10-29	2023-10-28



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



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)
Occupied Bandwidth	9KHz~40GHz	-	(1)

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



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity

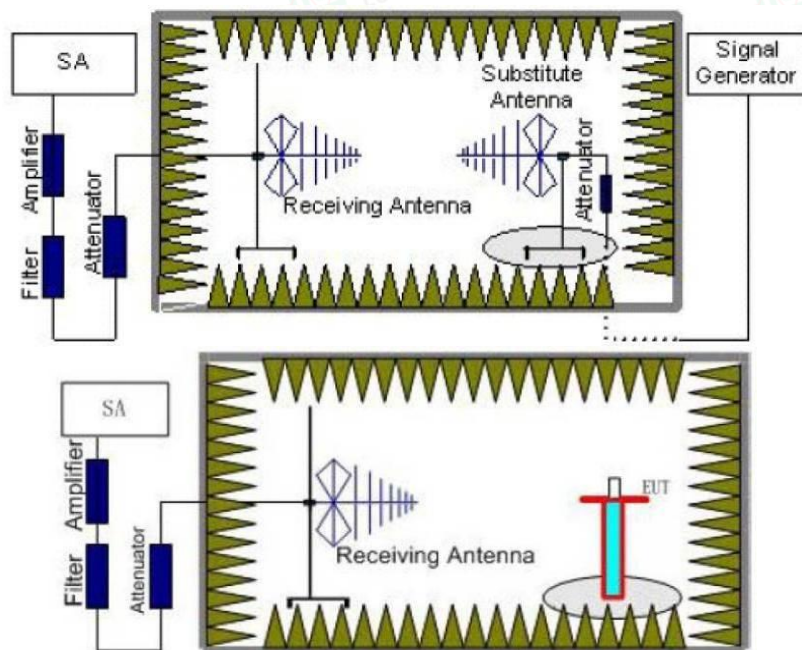
4 TEST CONDITIONS AND RESULTS

4.1 Radiated Spurious Emission

TEST APPLICABLE

According to the TIA/EIA 603D:2010 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, RSS-132 §5.5 and RSS-133 §6.5. The spectrum is scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of PCS1900 and GSM850.

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:

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

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, $ERP = EIRP - 2.15\text{dBi}$.
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)
TM1/GSM 850	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
TM1/GSM 1900	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

TEST LIMITS

According to 24.238 and 22.917 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.

Frequency	Channel	Frequency Range	Verdict
TM1/GSM 850	Low	9KHz -10GHz	PASS
	Middle	9KHz -10GHz	PASS
	High	9KHz -10GHz	PASS
TM1/GSM 1900	Low	9KHz -20GHz	PASS
	Middle	9KHz -20GHz	PASS
	High	9KHz -20GHz	PASS

TEST RESULTS

Remark:

1. We were tested all refer 3GPP TS151 010.
2. $EIRP = P_{Mea}(\text{dBm}) - P_{cl}(\text{dB}) + G_a(\text{dBi})$
3. We were not recorded other points as values lower than limits.
4. $\text{Margin} = EIRP - \text{Limit}$



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity

*GSM/TM1/GSM850_ Low Channel*

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1648.40	-43.15	3.86	3.00	8.56	-38.45	-13.00	-25.45	H
2472.60	-44.41	4.29	3.00	6.98	-41.72	-13.00	-28.72	H
1648.40	-39.46	3.86	3.00	8.56	-34.76	-13.00	-21.76	V
2472.60	-42.09	4.29	3.00	6.98	-39.40	-13.00	-26.40	V

GSM/TM1/GSM850_ Middle Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673.20	-41.58	3.9	3.00	8.58	-36.90	-13.00	-23.90	H
2509.80	-46.62	4.32	3.00	6.8	-44.14	-13.00	-31.14	H
1673.20	-37.57	3.9	3.00	8.58	-32.89	-13.00	-19.89	V
2509.80	-42.92	4.32	3.00	6.8	-40.44	-13.00	-27.44	V

GSM/TM1/GSM850_ High Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1697.60	-47.14	3.91	3.00	9.06	-41.99	-13.00	-28.99	H
2546.40	-49.76	4.32	3.00	6.65	-47.43	-13.00	-34.43	H
1697.60	-43.35	3.91	3.00	9.06	-38.20	-13.00	-25.20	V
2546.40	-44.69	4.32	3.00	6.65	-42.36	-13.00	-29.36	V

GSM/TM3/EDGE850_ Low Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1648.40	-45.68	3.86	3.00	8.56	-40.98	-13.00	-27.98	H
2472.60	-46.79	4.29	3.00	6.98	-44.10	-13.00	-31.10	H
1648.40	-42.02	3.86	3.00	8.56	-37.32	-13.00	-24.32	V
2472.60	-44.14	4.29	3.00	6.98	-41.45	-13.00	-28.45	V

GSM/TM3/EDGE850_ Middle Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673.20	-43.83	3.9	3.00	8.58	-39.15	-13.00	-26.15	H
2509.80	-48.45	4.32	3.00	6.8	-45.97	-13.00	-32.97	H
1673.20	-39.16	3.9	3.00	8.58	-34.48	-13.00	-21.48	V
2509.80	-45.03	4.32	3.00	6.8	-42.55	-13.00	-29.55	V

GSM/TM3/EDGE850_ High Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1697.60	-48.68	3.91	3.00	9.06	-43.53	-13.00	-30.53	H
2546.40	-51.36	4.32	3.00	6.65	-49.03	-13.00	-36.03	H
1697.60	-45.14	3.91	3.00	9.06	-39.99	-13.00	-26.99	V
2546.40	-47.42	4.32	3.00	6.65	-45.09	-13.00	-32.09	V



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity

*GSM/TM1/GSM1900_ Low Channel*

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3700.40	-45.34	5.26	3.00	9.88	-40.72	-13.00	-27.72	H
5550.60	-46.20	6.11	3.00	11.36	-40.95	-13.00	-27.95	H
3700.40	-41.63	5.26	3.00	9.88	-37.01	-13.00	-24.01	V
5550.60	-44.14	6.11	3.00	11.36	-38.89	-13.00	-25.89	V

GSM/TM1/GSM1900_ Middle Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3760.00	-43.86	5.32	3.00	10.03	-39.15	-13.00	-26.15	H
5640.00	-48.50	6.19	3.00	11.41	-43.28	-13.00	-30.28	H
3760.00	-39.46	5.32	3.00	10.03	-34.75	-13.00	-21.75	V
5640.00	-45.24	6.19	3.00	11.41	-40.02	-13.00	-27.02	V

GSM/TM1/GSM1900_ High Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3819.60	-48.74	5.36	3.00	9.62	-44.48	-13.00	-31.48	H
5729.40	-51.29	6.24	3.00	11.46	-46.07	-13.00	-33.07	H
3819.60	-45.35	5.36	3.00	9.62	-41.09	-13.00	-28.09	V
5729.40	-47.04	6.24	3.00	11.46	-41.82	-13.00	-28.82	V

GSM/TM3/EDGE1900_ Low Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3700.40	-47.52	5.26	3.00	9.88	-42.90	-13.00	-29.90	H
5550.60	-48.23	6.11	3.00	11.36	-42.98	-13.00	-29.98	H
3700.40	-43.59	5.26	3.00	9.88	-38.97	-13.00	-25.97	V
5550.60	-46.22	6.11	3.00	11.36	-40.97	-13.00	-27.97	V

GSM/TM3/EDGE1900_ Middle Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3760.00	-46.16	5.32	3.00	10.03	-41.45	-13.00	-28.45	H
5640.00	-50.59	6.19	3.00	11.41	-45.37	-13.00	-32.37	H
3760.00	-41.51	5.32	3.00	10.03	-36.80	-13.00	-23.80	V
5640.00	-46.67	6.19	3.00	11.41	-41.45	-13.00	-28.45	V

GSM/TM3/EDGE1900_ High Channel

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Diatance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3819.60	-50.55	5.36	3.00	9.62	-46.29	-13.00	-33.29	H
5729.40	-53.14	6.24	3.00	11.46	-47.92	-13.00	-34.92	H
3819.60	-47.24	5.36	3.00	9.62	-42.98	-13.00	-29.98	V
5729.40	-48.88	6.24	3.00	11.46	-43.66	-13.00	-30.66	V



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



5 TEST SETUP PHOTOGRAPHS OF EUT

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

6 EXTERIOR PHOTOGRAPHS OF THE EUT

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

7 INTERIOR PHOTOGRAPHS OF THE EUT

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

.....End of Report.....



Shenzhen LCS Compliance Testing Laboratory Ltd.

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

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity