

# **TEST REPORT**

# No. I22N02494-EMC-GSM

for

Honor Device Co., Ltd.

**Smart Phone** 

Model Name: CRT-LX3

With

**Hardware Version: HL3CRTM** 

Software Version: 6.1.0.90 (C900E21R1P2)

FCC ID:2AYGCCRT-LX3

Issued Date: 2022-12-09

**Designation Number: CN1210** 

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of SAICT.

#### **Test Laboratory:**

SAICT, Shenzhen Academy of Information and Communications Technology

Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China 518000.

Tel:+86(0)755-33322000, Fax:+86(0)755-33322001

Email: yewu@caict.ac.cn. www.saict.ac.cn



# **REPORT HISTORY**

Report Number	Revision	Description	Issue Date
I22N02494-EMC-GSM	Rev.0	1st edition	2022-12-09

Note: the latest revision of the test report supersedes all previous version.



# **CONTENTS**

1.	SUMMARY OF TEST REPORT	. 4
1.1.	TEST ITEMS	. 4
1.2.	TEST STANDARDS	. 4
1.3.	TEST RESULT	. 4
1.4.	TESTING LOCATION	. 4
1.5.	PROJECT DATA	. 4
1.6.	SIGNATURE	. 4
2.	CLIENT INFORMATION	. 5
2.1.	APPLICANT INFORMATION	. 5
2.2.	MANUFACTURER INFORMATION	. 5
3.	EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	. 6
3.1.	ABOUT EUT	. 6
3.2.	INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST	. 6
3.3.	INTERNAL IDENTIFICATION OF AE USED DURING THE TEST	. 6
3.4.	GENERAL DESCRIPTION	. 8
4.	REFERENCE DOCUMENTS	. 9
4.1.	REFERENCE DOCUMENTS FOR TESTING	. 9
5.	LABORATORY ENVIRONMENT	10
6.	SUMMARY OF TEST RESULTS	11
7.	STATEMENT	12
8.	TEST EQUIPMENTS UTILIZED	13
ANI	NEX A: MEASUREMENT RESULTS	14
<b>A.</b> 1	OUTPUT POWER	14
A.2	FIELD STRENGTH OF SPURIOUS RADIATION	20



# 1. SUMMARY OF TEST REPORT

## 1.1. Test Items

Description Smart Phone Model Name CRT-LX3

Applicant's name Honor Device Co., Ltd.

Manufacturer's Name Honor Device Co., Ltd.

#### 1.2. Test Standards

FCC Part 2/22/24 10-1-19 Edition ANSI C63.26 2015 KDB971168 D01 v03r01

## 1.3. Test Result

#### PASS/FAIL

Total test 2 items, pass 2 items. Please refer to "6 Summary of Test Results" for detail.

#### 1.4. Testing Location

Address: EMC Laboratory, Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China 518000

#### 1.5. Project Data

Testing Start Date: 2022-12-01 Testing End Date: 2022-12-09

## 1.6. Signature

到翔洲	97x
Liu Xiangzhou	Liang Yong
(Prepared this test report)	(Reviewed this test report)
· 说, 化	
Cao Junfei	
(Annroyed this test report)	



# 2. CLIENT INFORMATION

## 2.1. Applicant Information

Company Name: Honor Device Co., Ltd.

Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No. 8089, Hongli Address:

West Road, Xiangmihu Street, Futian District, Shenzhen, P.R.China

Contact Li Ming

Email liming136@hihonor.com

Tel. 0755-61886688

Fax: /

## 2.2. Manufacturer Information

Company Name: Honor Device Co., Ltd.

Address: Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No. 8089, Hongli

West Road, Xiangmihu Street, Futian District, Shenzhen, P.R.China

Contact Li Ming

Email liming136@hihonor.com

Tel. 0755-61886688

Fax: /



# 3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT

## (AE)

#### 3.1. About EUT

Description Smart Phone Model Name CRT-LX3

FCC ID 2AYGCCRT-LX3
Frequency Bands GSM 850/1900MHz

Antenna Integrated

Condition of EUT as received No obvious damage in appearance

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Shenzhen Academy of Information and Communications Technology.

#### 3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Receive Date
UT05aa	866902060024676	HL3CRTM	6.1.0.90(C900E21R1P2)	2022-12-01

<sup>\*</sup>EUT ID: is used to identify the test sample in the lab internally.

#### 3.3. Internal Identification of AE used during the test

AE ID*	Description
AE1	Battery
AE2	Adapter
AE3	Data Cable
AE4	Headset
AE5	Earphone, USB Type-C to 3.5mm Adapter
	Assembly

#### AE1-1

Model HB416594EGW

Manufacturer Honor Device Co., Ltd.(SCUD)

Capacity 4400mAh Nominal Voltage 3.89 V

AE1-2

Model HB416594EGW

Manufacturer Honor Device Co., Ltd.(Desay)

Capacity 4400mAh Nominal Voltage 3.89 V

AE2-1

Model HN-100225E00



### No. I22N02494-EMC-GSM

Manufacturer Honor Device Co., Ltd. (Huntkey/Salcomp)

AE2-2

Model HN-100225U00

Manufacturer Honor Device Co., Ltd. (Huntkey/Salcomp)

AE2-3

Model HW-100225E00

Manufacturer Honor Device Co., Ltd. (Huntkey)

AE2-4

Model HW-100225U00

Manufacturer Honor Device Co., Ltd. (Huntkey)

AE2-5

Model HW-100225B00

Manufacturer Honor Device Co., Ltd. (Huntkey)

AE2-6

Model HN-100225B00

Manufacturer Honor Device Co., Ltd. (Huntkey/Salcomp)

AE3-1

Model CUDU01B-HC451-EH

Manufacturer 04072295(FF)

AE3-2

Model AU2-CRO013HF
Manufacturer 04072295(LJ)

AE3-3

Model L125UC007-CS-H

Manufacturer 04072295(LX)

AE3-4

Model 2120-00001-0 Manufacturer 04072295(MG)

AE3-5

Model RY0002

Manufacturer 04072295(NB)

AE4-1

Model 1331-3301-6001-TC-347

Manufacturer 22070347 (QC)

AE4-2

Model MEND1532B528C00 Manufacturer 22040339 (LC)

AE4-3

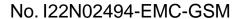
Model 1293-3283-3.5MM-339

Manufacturer 22040339 (QC)

AE5

Model USB042020090AW7

Manufacturer 22040348(LC)





\*AE ID: is used to identify the test sample in the lab internally.

AE: ancillary equipment.

AE2: The circuit boards of AE2-2 and AE2-6 are the same, the circuit boards of AE2-4 and AE2-5 are the same.

#### 3.4. General Description

The Equipment Under Test (EUT) is a model of Smart Phone with internal antenna.

It consists of normal options: Battery, Adapter, Data Cable, Headset.

Manual and specifications of the EUT were provided to fulfill the test.

Samples (EUT+AE) undergoing test were selected by the Client. Relevant information is provided by the client.



# 4. REFERENCE DOCUMENTS

## 4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 22	PUBLIC MOBILE SERVICES	(10-1-2020 Edition)
FCC Part 2	FREQUENCY ALLOCATIONS AND RADIO TREATY	(10-1-2020
	MATTERS; GENERAL RULES AND REGULATIONS	Edition)
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	(10-1-2020 Edition)
	American National Standard of Procedures for	
ANSI C63.26	Compliance Testing of Licensed Transmitters Used in Licensed Radio Service	2015
KDB971168 D01	Power Meas License Digital Systems	v03r01



# 5. LABORATORY ENVIRONMENT

**Anechoic chamber (FACT3-2.0)** did not exceed following limits along the EMC testing:

9.10m×6.10m×5.60m (L×W×H)

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 4Ω
Normalised site attenuation (NSA)	< ±4 dB, 3 m distance, from 30 to 1000 MHz
Voltage Standing Wave Ratio (VSWR)	≤ 6 dB, from 1 to 18 GHz, 3 m distance
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 MHz



# 6. SUMMARY OF TEST RESULTS

Abbreviations used in this clause:		
Р		Pass
Vardiet Column	F	Fail
Verdict Column	NA	Not applicable
	NM	Not measured
Location Column	A/B/C/D	The test is performed in test location A, B, C or D
Location Column	A/b/C/D	which are described in section 1.1 of this report

#### **GSM850**

Items	List	Clause in FCC rules	Section in this report	Verdict
1	Output Power	22.913	A.1	Р
2	Field Strength of Spurious Radiation	22.917	A.2	Р

## PCS1900

Items	List	Clause in FCC rules	Section in this report	Verdict
1	Output Power	24.232	A.1	Р
2	Field Strength of Spurious Radiation	24.238	A.2	Р

## No. I22N02494-EMC-GSM



# 7. STATEMENT

Since the information of samples in this report is provided by the client, the laboratory is not responsible for the authenticity of sample information.

This report takes measured values as criterion of test conclusion. The test conclusion meets the limit requirements.



# 8. TEST EQUIPMENTS UTILIZED

NO.	Description	TYPE	Manufacture	Series number	Calibration Due date
1	Test Receiver	ESR7	R&S	101676	2023.11.23
2	BiLog Antenna	3142E	ETS-Lindgren	0224831	2024.05.27
3	Horn Antenna	3117	ETS-Lindgren	00066577	2025.04.17
4	Horn Antenna	QSH-SL-18 -26-S-20	Q-par	17013	2023-01-06
5	Antenna	BBHA 9120D	Schwarzbeck	1593	2023-12-04
6	Antenna	VUBA 9117	Schwarzbeck	207	2023-07-15
7	Antenna	QWH-SL-18 -40-K-SG	Q-par	15979	2023-01-06
8	preamplifier	83017A	Agilent	MY39501110	/
9	Signal Generator	SMB100A	R&S	179725	2023-11-23
10	Anechoic Chamber	FACT3-2.0	ETS-Lindgren	1285	2023.05.29
11	Spectrum Analyzer	FSV40	R&S	101192	2023-01-12
12	Universal Radio Communication Tester	CMU200	R&S	114545	2023-01-12

#### **Test software**

ltem	Name	Vesion
Radiated	EMC32	V10.50.40



# **ANNEX A: MEASUREMENT RESULTS**

#### **A.1 OUTPUT POWER**

#### Reference

FCC: CFR Part 22.913, 24.232.

#### A.1.1 Summary

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMU-200) to ensure max power transmission and proper modulation.

This result contains max output power and EIRP measurements for the EUT. In all cases, output power is within the specified limits.

#### A.1.2 Radiated

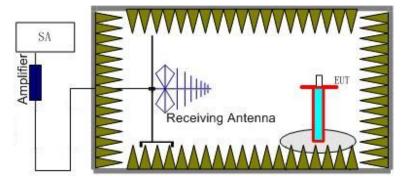
#### A.1.2.1 Description

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(c) 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."

#### A.1.2.2 Method of Measurement

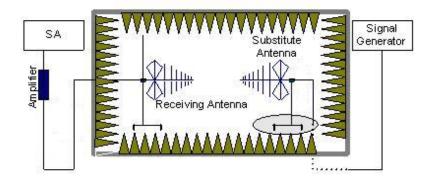
1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected 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. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
- 3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.







In the chamber, a 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 ( $P_{\text{Mea}}$ ) 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 ( $P_{\text{Mea}}$ ) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

- 4. A amplifier should be connected to the Signal Source output port. And the cable should be connected between the Amplifier and the Substitution Antenna.
  - The cable loss  $(P_{cl})$ , the Substitution Antenna Gain(dBi)  $(G_a)$  and the Amplifier Gain  $(P_{Ag})$  should be recorded after test.
  - The measurement results are obtained as described below:
  - $Power(EIRP)=P_{Mea}-P_{Ag}-P_{cl}+G_a$
- 5. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
- 6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dB.



## **GSM 850-ERP 22.913(a)**

#### Limits

	Power Step	Burst Peak ERP (dBm)
GSM	5	≤38.45dBm (7W)
GPRS	3	≤38.45dBm (7W)
EGPRS	6	≤38.45dBm (7W)

#### **Measurement result**

#### **GSM-UP**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
824.20	-3.52	-33.60	-0.79	2.15	27.13	38.45	Н
836.60	-4.03	-33.50	-0.74	2.15	26.58	38.45	Н
848.80	-4.21	-33.50	-0.73	2.15	26.41	38.45	Н

#### **GSM-DOWN**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
824.20	-3.30	-33.60	-0.79	2.15	27.36	38.45	Н
836.60	-3.72	-33.50	-0.74	2.15	26.90	38.45	Н
848.80	-3.85	-33.50	-0.73	2.15	26.77	38.45	Н

#### **GPRS-UP**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
824.20	-5.21	-33.60	-0.79	2.15	25.45	38.45	Н
836.60	-5.49	-33.50	-0.74	2.15	25.12	38.45	Н
848.80	-5.61	-33.50	-0.73	2.15	25.01	38.45	Н

#### **GPRS-DOWN**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
824.20	-4.34	-33.60	-0.79	2.15	26.32	38.45	Н
836.60	-4.64	-33.50	-0.74	2.15	25.97	38.45	Н
848.80	-4.74	-33.50	-0.73	2.15	25.88	38.45	Н

## No. I22N02494-EMC-GSM

#### **EGPRS-8PSK-UP**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
824.20	-9.61	-33.60	-0.79	2.15	21.05	38.45	Н
836.60	-10.08	-33.50	-0.74	2.15	20.53	38.45	Н
848.80	-10.30	-33.50	-0.73	2.15	20.32	38.45	Н

#### **EGPRS-8PSK-DOWN**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
824.20	-9.56	-33.60	-0.79	2.15	21.10	38.45	Н
836.60	-9.63	-33.50	-0.74	2.15	20.98	38.45	Н
848.80	-9.69	-33.50	-0.73	2.15	20.93	38.45	Н

Frequency: 824.20MHz

Peak ERP(dBm)=PMea(-3.30dBm)-( Pcl+PAg)(-33.60dB)+Ga(-0.79dB)-2.15dB=27.36dBm

ANALYZER SETTINGS: RBW = VBW = 3MHz

Note: The maximum value of expanded measurement uncertainty for this test item is U =

2.72dB(30MHz-3GHz)/3.60dB(3GHz-18GHz)/3.58dB(18GHz-40GHz), k = 2

Note: Both of Vertical and Horizontal polarizations are evaluated, but only the worst case is recorded in this report.



## PCS1900-EIRP 24.232(c)

#### Limits

	Power Step	Burst Peak EIRP (dBm)
GSM	0	≤33dBm (2W)
GPRS	3	≤33dBm (2W)
EGPRS	5	≤33dBm (2W)

#### **Measurement result**

#### **GSM-UP**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1850.20	-11.46	-29.30	8.10	25.94	33.00	V
1880.00	-12.07	-29.40	8.10	25.43	33.00	V
1909.80	-10.57	-29.30	8.10	26.83	33.00	V

#### **GSM-DOWN**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1850.20	-11.38	-29.30	8.10	26.03	33.00	V
1880.00	-11.79	-29.40	8.10	25.71	33.00	V
1909.80	-10.48	-29.30	8.10	26.92	33.00	V

#### **GPRS-UP**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1850.20	-14.01	-29.40	8.10	23.49	33.00	V
1880.00	-13.38	-29.30	8.10	24.02	33.00	V
1909.80	-13.30	-29.30	8.10	24.10	33.00	V

## **GPRS-DOWN**

Frequency(MHz) P <sub>Mea</sub> (dBm)		P <sub>cl</sub> (dB)+ P <sub>Aq</sub> (dB)	Ga Antenna	EIRP(dBm)	Limit(dBm)	Polarization
. , ,	, ,	, , , ,	Gain(dBi)	, ,	, ,	
1850.20	-13.72	-29.40	8.10	23.78	33.00	V
1880.00	-13.27	-29.30	8.10	24.13	33.00	V
1909.80	-13.13	-29.30	8.10	24.27	33.00	V



#### **EGPRS-8PSK-UP**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	Pcl(dB)+ PAg(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1850.20	-17.56	-29.40	8.10	19.94	33.00	V
1880.00	-16.97	-29.30	8.10	20.43	33.00	V
1909.80	-16.57	-29.30	8.10	20.83	33.00	V

#### **EGPRS-8PSK-DOWN**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)+ P <sub>Ag</sub> (dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1850.20	-16.96	-29.40	8.10	20.54	33.00	V
1880.00	-16.69	-29.30	8.10	20.71	33.00	V
1909.80	-16.51	-29.30	8.10	20.89	33.00	V

Frequency: 1909.80MHz

Peak EIRP(dBm)= PMea(-10.48dBm) -(Pcl+PAg)(-29.30dB)+Ga (8.10dB) =26.92dBm

ANALYZER SETTINGS: RBW = VBW = 3MHz

Note: The maximum value of expanded measurement uncertainty for this test item is U =

2.72dB(30MHz-3GHz)/3.60dB(3GHz-18GHz)/3.58dB(18GHz-40GHz), k = 2

Note: Both of Vertical and Horizontal polarizations are evaluated, but only the worst case is recorded in this report.



#### **A.2 FIELD STRENGTH OF SPURIOUS RADIATION**

#### Reference

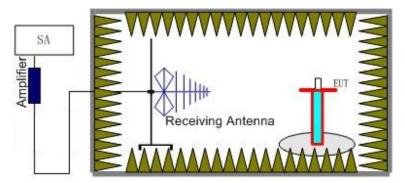
FCC: CFR 22.917, 24.238.

#### A.2.1 Measurement Method

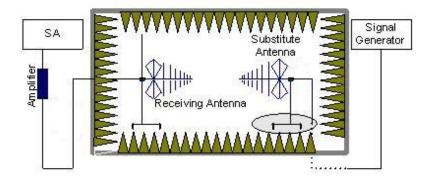
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 1910MHz. The resolution bandwidth is set 1MHz as outlined in Part 24.238 and Part 22.917. The spectrum is scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of PCS1900 and GSM850.

#### The procedure of radiated spurious emissions is as follows:

1. EUT was placed on a 1.5 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 1.5m. The test setup refers to figure below. 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 non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector.



- 2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
- 3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



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



#### No. I22N02494-EMC-GSM

with the radiation pattern of the antenna. A power ( $P_{\text{Mea}}$ ) 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 ( $P_{\text{r}}$ ). The power of signal source ( $P_{\text{Mea}}$ ) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. The Path loss (P<sub>pl</sub>) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain(dBi) (G<sub>a</sub>) should be recorded after test.

A amplifier should be connected in for the test.

The Path loss (Ppl) is the summation of the cable loss and the gain of the amplifier.

The measurement results are obtained as described below:

Power(EIRP)= $P_{Mea} - P_{pl} + G_a$ 

- 5. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
- 6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dB.

#### No. I22N02494-EMC-GSM



#### A.2.2 Measurement Limit

Part 24.238 and Part 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.

#### A.2.3 Measurement Results

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the PCS1900 band (1850.2 MHz, 1880 MHz and 1909.8 MHz) and GSM850 band (824.2MHz, 836.6MHz, 848.8MHz) . It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the PCS1900, GSM850 into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.



## A.2.4 Measurement Results Table

Frequency	Channel	Frequency Range	Result
	Low	30MHz-10GHz	Pass
GSM 850MHz	Middle	30MHz-10GHz	Pass
	High	30MHz-10GHz	Pass
	Low	30MHz-20GHz	Pass
GSM 1900MHz	Middle	30MHz-20GHz	Pass
	High	30MHz-20GHz	Pass

## A.2.5 Sweep Table

A.Z.5 Sweep Table				
Working Frequency	Subrange (GHz)	RBW	VBW	Sweep time (s)
	0.03~1	100KHz	300KHz	10
	1-2	1 MHz	3 MHz	2
850MHz	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~10	1 MHz	3 MHz	3
	0.03~1	100KHz	300KHz	10
	1-2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
4000041.1-	5~8	1 MHz	3 MHz	3
1900MHz	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



#### GSM Mode Channel 128/824.2MHz-UP

Fraguero (MIII)	D (dDm)	Path	Antenna	Peak	Limit	Delegization
Frequency(MHz)	P <sub>Mea</sub> (dBm)	loss	Gain(dBi)	ERP(dBm)	(dBm)	Polarization
7331.00	-49.25	1.70	12.00	-41.10	-13.00	Н
8483.00	-48.29	1.80	11.30	-40.94	-13.00	Н
9099.00	-47.77	2.20	11.60	-40.52	-13.00	Н
9298.50	-47.56	2.00	11.60	-40.11	-13.00	Н
9479.00	-47.41	2.10	11.60	-40.06	-13.00	V
9718.00	-47.08	2.20	11.20	-40.23	-13.00	Н

#### GSM Mode Channel 190/836.6MHz-UP

		Path	Antenna	Peak	Limit	
Frequency(MHz) P <sub>Mea</sub> (o	P <sub>Mea</sub> (dBm)	Palli	Antenna	Peak	LIIIIII	Polarization
	· Mea(GDIII)	loss	Gain(dBi)	ERP(dBm)	(dBm)	r olarization
8699.00	-48.84	2.00	12.00	-40.99	-13.00	V
9101.50	-48.28	2.20	11.60	-41.03	-13.00	Н
9301.50	-47.43	2.00	11.60	-39.98	-13.00	Н
9474.00	-48.17	2.10	11.60	-40.82	-13.00	V
9740.50	-47.70	2.20	11.20	-40.85	-13.00	Н
9789.00	-48.04	2.30	11.20	-41.29	-13.00	Н

#### GSM Mode Channel 251/848.8MHz-UP

Fragues av/MHz)	D. (dPm)	Path	Antenna	Peak	Limit	Delegization
Frequency(MHz)	P <sub>Mea</sub> (dBm)	loss	Gain(dBi)	ERP(dBm)	(dBm)	Polarization
7197.50	-49.10	1.80	12.00	-41.05	-13.00	Н
9105.00	-47.81	2.20	11.60	-40.56	-13.00	Н
9225.50	-47.17	2.10	11.60	-39.82	-13.00	Н
9372.00	-47.88	2.00	11.60	-40.43	-13.00	V
9670.00	-47.66	2.20	11.20	-40.81	-13.00	Н
9790.00	-47.72	2.30	11.20	-40.97	-13.00	Н



#### **GSM Mode Channel 128/824.2MHz-DOWN**

Fraguero (MIII)	D (dDm)	Path	Antenna	Peak	Limit	Delegization
Frequency(MHz)	P <sub>Mea</sub> (dBm)	loss	Gain(dBi)	ERP(dBm)	(dBm)	Polarization
7323.50	-49.09	1.70	12.00	-40.94	-13.00	Н
8387.00	-48.29	1.80	11.30	-40.94	-13.00	Н
9088.00	-48.27	2.20	11.60	-41.02	-13.00	Н
9289.00	-47.15	2.10	11.60	-39.80	-13.00	Н
9422.00	-47.89	2.10	11.60	-40.54	-13.00	Н
9754.00	-47.47	2.20	11.20	-40.62	-13.00	Н

#### **GSM Mode Channel 190/836.6MHz-DOWN**

Fragues av (MIII-)	D. (dPm)	Path	Antenna	Peak	Limit	Delegization
Frequency(MHz)	P <sub>Mea</sub> (dBm)	loss	Gain(dBi)	ERP(dBm)	(dBm)	Polarization
7319.00	-49.32	1.70	12.00	-41.17	-13.00	V
9090.00	-48.55	2.20	11.60	-41.30	-13.00	Н
9293.50	-46.93	2.00	11.60	-39.48	-13.00	Н
9474.50	-47.41	2.10	11.60	-40.06	-13.00	V
9738.50	-47.37	2.20	11.20	-40.52	-13.00	Н
9803.50	-47.62	2.30	11.20	-40.87	-13.00	Н

#### **GSM Mode Channel 251/848.8MHz-DOWN**

Fraguerov/MHz)	D (dDm)	Path	Antenna	Peak	Limit	Polarization
Frequency(MHz)	P <sub>Mea</sub> (dBm)	loss	Gain(dBi)	ERP(dBm)	(dBm)	Polarization
7375.50	-49.34	1.70	12.00	-41.19	-13.00	Н
7884.50	-48.02	1.70	11.30	-40.57	-13.00	Н
9302.50	-46.66	2.00	11.60	-39.21	-13.00	Н
9428.00	-47.82	2.10	11.60	-40.47	-13.00	Н
9749.00	-46.88	2.20	11.20	-40.03	-13.00	Н
9802.50	-47.61	2.30	11.20	-40.86	-13.00	Н

Note: The maximum value of expanded measurement uncertainty for this test item is U = 2.72dB(30MHz-3GHz)/3.60dB(3GHz-18GHz)/3.58dB(18GHz-40GHz), k = 2



## GSM Mode Channel 512/1850.2MHz-UP

Fragues (MIII)	MHz) P <sub>Mea</sub> (dBm)	Path	Antenna	Peak	Limit	Delegization
Frequency(MHz)		loss	Gain(dBi)	EIRP(dBm)	(dBm)	Polarization
16987.50	-41.34	2.90	16.50	-27.74	-13.00	Н
17209.50	-39.53	2.90	14.50	-27.93	-13.00	Н
17355.00	-40.12	3.20	14.50	-28.82	-13.00	Н
17509.50	-36.89	2.90	12.80	-26.99	-13.00	Н
17592.00	-36.84	3.30	12.80	-27.34	-13.00	Н
17697.00	-37.61	3.30	12.80	-28.11	-13.00	Н

#### GSM Mode Channel 661/1880.0MHz-UP

Frequency(MHz)	P <sub>Mea</sub> (dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit (dBm)	Polarization
16999.50	-41.71	2.90	16.50	-28.11	-13.00	Н
17145.00	-39.90	2.90	14.50	-28.30	-13.00	Н
17341.50	-39.75	3.20	14.50	-28.45	-13.00	Н
17521.50	-37.18	2.90	12.80	-27.28	-13.00	Н
17589.00	-37.06	3.30	12.80	-27.56	-13.00	Н
17829.00	-37.41	3.60	12.80	-28.21	-13.00	Н

#### GSM Mode Channel 810/1909.8MHz-UP

Frequency(MHz)	P <sub>Mea</sub> (dBm)	Path	Antenna	Peak	Limit	Delegization
		loss	Gain(dBi)	EIRP(dBm)	(dBm)	Polarization
16935.00	-41.78	2.90	16.50	-28.18	-13.00	Н
17116.50	-40.14	2.90	14.50	-28.54	-13.00	Н
17343.00	-39.84	3.20	14.50	-28.54	-13.00	Н
17517.00	-36.97	2.90	12.80	-27.07	-13.00	Н
17614.50	-36.74	3.30	12.80	-27.24	-13.00	Н
17818.50	-36.83	3.60	12.80	-27.63	-13.00	Н



#### GSM Mode Channel 512/1850.2MHz-DOWN

Frequency(MHz)	P <sub>Mea</sub> (dBm)	Path	Antenna	Peak	Limit	Polarization
		loss	Gain(dBi)	EIRP(dBm)	(dBm)	Polarization
16995.00	-42.19	2.90	16.50	-28.59	-13.00	Н
17119.50	-40.40	2.90	14.50	-28.80	-13.00	Н
17367.00	-39.58	3.20	14.50	-28.28	-13.00	Н
17505.00	-37.15	2.90	12.80	-27.25	-13.00	Н
17592.00	-36.87	3.30	12.80	-27.37	-13.00	Н
17830.50	-36.74	3.60	12.80	-27.54	-13.00	Н

#### GSM Mode Channel 661/1880.0MHz-DOWN

Frequency(MHz)	P <sub>Mea</sub> (dBm)	Path	Antenna	Peak	Limit	Polarization
		loss	Gain(dBi)	EIRP(dBm)	(dBm)	Polarization
16935.00	-41.89	2.90	16.50	-28.29	-13.00	Н
17161.50	-40.75	2.90	14.50	-29.15	-13.00	Н
17242.50	-40.25	3.20	14.50	-28.95	-13.00	Н
17422.50	-39.35	2.90	14.50	-27.75	-13.00	Н
17625.00	-37.01	3.30	12.80	-27.51	-13.00	Н
17778.00	-37.25	3.60	12.80	-28.05	-13.00	Н

#### GSM Mode Channel 810/1909.8MHz-DOWN

Frequency(MHz)	P <sub>Mea</sub> (dBm)	Path	Antenna	Peak	Limit	Delegization
		loss	Gain(dBi)	EIRP(dBm)	(dBm)	Polarization
16935.00	-42.28	2.90	16.50	-28.68	-13.00	Н
17115.00	-40.42	2.90	14.50	-28.82	-13.00	Н
17346.00	-40.39	3.20	14.50	-29.09	-13.00	Н
17443.50	-38.13	2.90	14.50	-26.53	-13.00	Н
17569.50	-36.56	3.30	12.80	-27.06	-13.00	Н
17773.50	-37.06	3.60	12.80	-27.86	-13.00	Н

Note: The maximum value of expanded measurement uncertainty for this test item is U = 2.72dB(30MHz-3GHz)/3.60dB(3GHz-18GHz)/3.58dB(18GHz-40GHz), k = 2

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