

Prüfbericht-Nr.: <i>Test report No.:</i>	50064681 004	Auftrags-Nr.: <i>Order No.:</i>	164074884	Seite 1 von 20 <i>Page 1 of 20</i>	
Kunden-Referenz-Nr.: <i>Client reference No.:</i>	N/A	Auftragsdatum: <i>Order date.:</i>	26.09.2016		
Auftraggeber: <i>Client:</i>	BBB Inc. 28, Yatap-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, South Korea				
Prüfgegenstand: <i>Test item:</i>	Mobile Phone				
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	EZ-100 (elemark™, mobihealth)				
Auftrags-Inhalt: <i>Order content:</i>	FCC Certification				
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 22: Subpart H CFR47 FCC Part 24: Subpart E				
Wareneingangsdatum: <i>Date of receipt:</i>	08.08.2016	Please refer to photo documents			
Prüfmuster-Nr.: <i>Test sample No.:</i>	STR16098108I-1				
Prüfzeitraum: <i>Testing period:</i>	08.08.2016 - 07.12.2016				
Ort der Prüfung: <i>Place of testing:</i>	Shenzhen SEM.Test Technology Co., Ltd.				
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.				
Prüfergebnis*: <i>Test result*:</i>	Pass				
geprüft von / tested by:		kontrolliert von / reviewed by:			
 29.12.2016 Lin Lin / Project Manager		 29.12.2016 Sam Lin / Technical Certifier			
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>
Sonstiges / Other:					
FCC ID: 2AKGP-EZ100					
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>			Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged:</i>		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n)			4 = ausreichend 5 = mangelhaft N/A = nicht anwendbar N/T = nicht getestet		
Legend: 1 = very good 2 = good 3 = satisfactory P(ass) = passed a.m. test specifications(s) F(ail) = failed a.m. test specifications(s)			4 = sufficient 5 = poor N/A = not applicable N/T = not tested		
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>					

Test Summary

5.1.1 RADIATED POWER

RESULT: Pass

5.1.2 OCCUPIED BANDWIDTH

RESULT: Pass

5.1.3 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

RESULT: Pass

5.1.4 BANDEDGE SPURIOUS EMISSIONS AT ANTENNA TERMINALS

RESULT: Pass

5.1.5 RADIATED SPURIOUS EMISSIONS

RESULT: Pass

5.1.6 FREQUENCY STABILITY

RESULT: Pass

5.1.7 PEAK-AVERAGE RATIO

RESULT: Pass

Table of Contents

1	GENERAL REMARKS	4
1.1	COMPLEMENTARY MATERIALS	4
2	TEST SITES	5
2.1	TEST FACILITIES	5
2.2	LIST OF TEST AND MEASUREMENT INSTRUMENTS	5
2.3	TRACEABILITY	5
2.4	CALIBRATION	5
2.5	MEASUREMENT UNCERTAINTY	6
2.6	LOCATION OF ORIGINAL DATA.....	6
2.7	STATUS OF FACILITY USED FOR TESTING	6
3	GENERAL PRODUCT INFORMATION.....	7
3.1	PRODUCT FUNCTION AND INTENDED USE.....	7
3.2	RATINGS AND SYSTEM DETAILS	7
3.3	INDEPENDENT OPERATION MODES	8
3.4	NOISE GENERATING AND NOISE SUPPRESSING PARTS	8
3.5	SUBMITTED DOCUMENTS.....	8
4	TEST SET-UP AND OPERATION MODES	9
4.1	PRINCIPLE OF CONFIGURATION SELECTION.....	9
4.2	TEST OPERATION AND TEST SOFTWARE	9
4.3	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	9
4.4	TEST SETUP DIAGRAM	9
5	TEST RESULTS	11
5.1	TRANSMITTER REQUIREMENT & TEST SUITES	11
5.1.1	<i>Radiated Power</i>	11
5.1.2	<i>Occupied Bandwidth</i>	12
5.1.3	<i>Spurious Emissions at Antenna Terminals</i>	13
5.1.4	<i>Bandedge Spurious Emissions at Antenna Terminals</i>	14
5.1.5	<i>Radiated Spurious Emissions</i>	15
5.1.6	<i>Frequency Stability</i>	16
5.1.7	<i>Peak-Average Ratio</i>	17
6	PHOTOGRAPHS OF THE TEST SET-UP	18
7	LIST OF TABLES	20
8	LIST OF PHOTOGRAPHS.....	20

Prüfbericht - Nr.: 50064681 004
Test Report No.

Seite 4 von 20
Page 4 of 20

1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:
Appendix A: Test Results of GSM and WCDMA

2 Test Sites

2.1 Test Facilities

Shenzhen SEM.Test Technology Co., Ltd.
1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, China

FCC Registration No.: 934118

The tests at the test sites have been conducted under the supervision of a TÜV engineer.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Shenzhen SEM.Test Technology Co., Ltd.

Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
Communication Tester	Rohde & Schwarz	CMW500	148650	2016-06-04	2017-06-03
GSM Tester	Rohde & Schwarz	CMU200	104036	2016-06-04	2017-06-03
Spectrum Analyzer	Agilent	E4407B	MY41440400	2016-06-04	2017-06-03
Spectrum Analyzer	Agilent	N9020A	US47140102	2016-06-04	2017-06-03
Signal Generator	Agilent	83752A	3610A01453	2016-06-04	2017-06-03
Vector Signal Generator	Agilent	N5182A	MY47070202	2016-06-04	2017-06-03
Power Divider	Weinschel	1506A	PM204	2016-06-04	2017-06-03
Power Divider	RF-Lambda	RFLT4W5M18G	14110400027	2016-06-04	2017-06-03
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2016-06-04	2017-06-03
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2016-06-04	2017-06-03
Amplifier	Agilent	8447F	3113A06717	2016-06-04	2017-06-03
Amplifier	C&D	PAP-1G18	2002	2016-06-04	2017-06-03
Loop Antenna	Schwarz beck	FMZB 1516	9773	2016-06-04	2017-06-03
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2016-06-04	2017-06-03
Horn Antenna	ETS	3117	00086197	2016-06-04	2017-06-03
Horn Antenna	ETS	3116B	00088203	2016-06-04	2017-06-03
Horn Antenna	Schwarbeck	BBHA9170	BBHA9170582	2016-06-04	2017-06-03
Temperature Chamber cycling	Zhongjian	YX-KHWS150A	ZJI130929	2016-11-18	2017-11-17

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table:

Table 2: Measurement Uncertainty

Item	Conditions	Extended Uncertainty
RF Output Power	Conducted	$\pm 0.42\text{dB}$
Occupied Bandwidth	Conducted	$\pm 1.5\%$
Frequency Stability	Conducted	2.3%
Conducted Spurious Emission	Conducted	$\pm 2.17\text{dB}$
Transmitter Spurious Emissions	Radiated	$\pm 5.1\text{dB}$

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The Shenzhen SEM.Test Technology Co., Ltd. Test facility located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The EUT is a Mobile Phone which supports Bluetooth V4.0 (dual mode) and WiFi 802.11 b/g/n/ wireless technology. This report is only for GSM and WCDMA functions of PCE. Other functions with different technologies are reported in the related reports.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

General Description of EUT	
Product Name:	Mobile Phone
Brand Name:	elemark™/mobihealth
Model No.:	EZ-100
Rated Voltage:	DC 3.8V
Battery Capacity:	3000mAh
Software Version:	I3501_65u_l1_20160928175345
Hardware Version:	I3501-MB-V2
Type of Product	Portable Device
GSM	
Support Networks:	GSM, GPRS, EDGE
Support Bands:	GSM850, PCS1900
Frequency Range:	GSM850: Tx: 824-849MHz, Rx: 869-894MHz DCS1900: Tx: 1850-1910MHz, Rx: 1930-1990MHz
Modulation Type:	GMSK, 8PSK
Channel Spacing:	200KHz
State the minimum channel separation:	200KHz
Antenna Type:	Integral Antenna
Antenna Gain:	GSM850: 1.55dBi, DCS1900: 2.51dBi
GPRS/EDGE Class:	Class 12
Device Class:	B
WCDMA	
Support Networks:	WCDMA, HSDPA, HSUPA
Category:	HSDPA UE Category:4 HSUPA UE Category:5
Support Bands:	WCDMA Band 2, WCDMA Band 5
Frequency Range:	WCDMA Band 2: Tx: 1850-1910MHz, Rx: 1930-1990MHz WCDMA Band 5: Tx: 824-849MHz, Rx: 869-894MHz
Modulation Type:	BPSK, QPSK, 16QAM
Channel Spacing:	200KHz
State the minimum channel separation:	5MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	WCDMA Band 2: 2.49dBi, WCDMA Band 5: 1.51dBi

Table 4: RF Channel and Frequency of GSM and WCDMA

Support Band	Support Standard	Channel Frequency	Channel Number
GSM 850	GSM/GPRS/EDGE	824.2 MHz	128

PCS 1900	GSM/GPRS/EDGE	836.6 MHz	190
		848.8 MHz	251
		1850.2 MHz	512
		1880.0 MHz	661
		1909.8 MHz	810
WCDMA Band 5	WCDMA/HSDPA/HSUPA	826.5 MHz	4132
		836.6 MHz	4183
		846.6 MHz	4233
WCDMA Band 2	WCDMA/HSDPA/HSUPA	1852.5 MHz	9262
		1880.0 MHz	9400
		1907.6 MHz	9538

Note: the transmitter has been tested on the communications mode of GSM, GPRS, EDGE, WCDMA, HSDPA, HSUPA compliance test and record the worst case.

3.3 Independent Operation Modes

Test Mode	Description	Remark
TM1	GSM 850	Low, Middle, High Channels
TM2	GPRS 850	Low, Middle, High Channels
TM3	EDGE 850	Low, Middle, High Channels
TM4	GSM 1900	Low, Middle, High Channels
TM5	GPRS 1900	Low, Middle, High Channels
TM6	EDGE 1900	Low, Middle, High Channels
TM7	WCDMA Band 5	Low, Middle, High Channels
TM8	HSDPA Band 5	Low, Middle, High Channels
TM9	HSUPA Band 5	Low, Middle, High Channels
TM10	WCDMA Band 2	Low, Middle, High Channels
TM11	HSDPA Band 2	Low, Middle, High Channels
TM12	HSUPA Band 2	Low, Middle, High Channels

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form
- Block Diagram
- Schematics
- Technical Description
- FCC/IC Label and Location Info
- Photo Document
- User Manual

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All testing were performed according to the procedures in KDB 971168 D01 and ANSI/TIA-603-D.

4.3 Special Accessories and Auxiliary Equipment

--

4.4 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

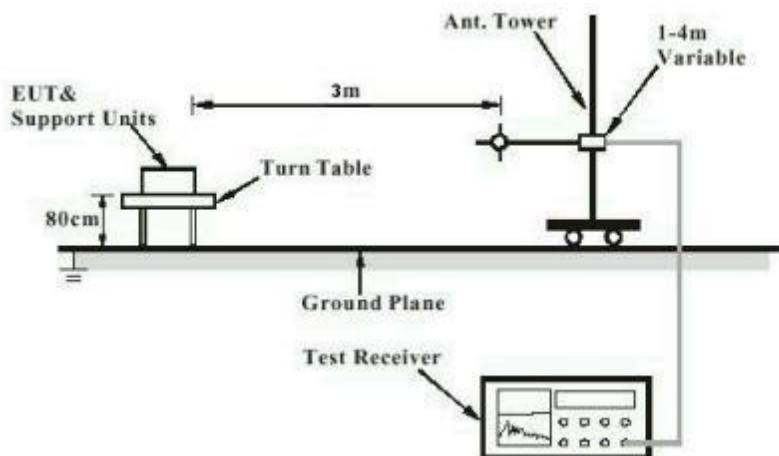


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

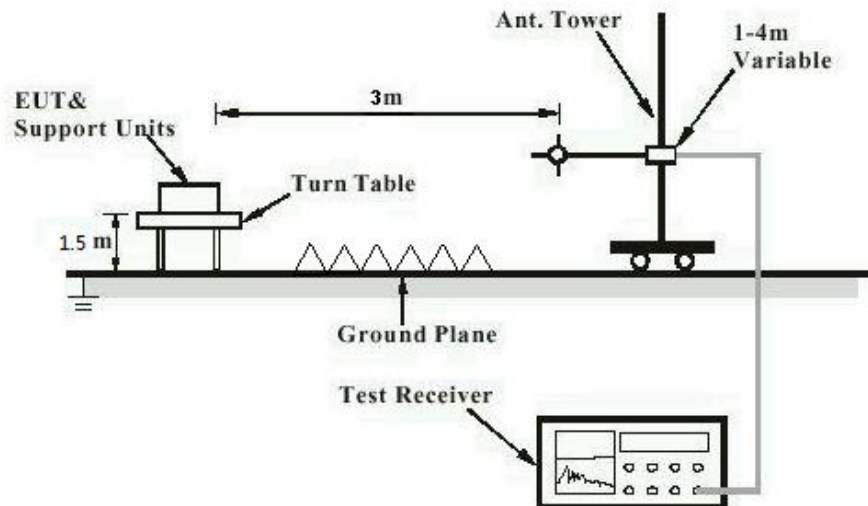
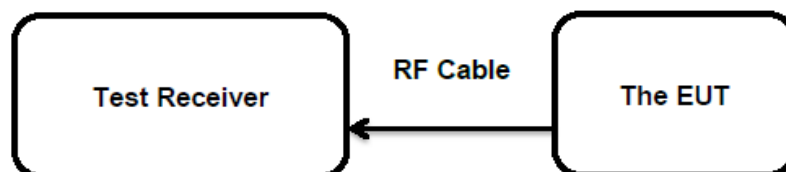


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Radiated Power

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 22.913 (a) (2)
	: FCC Part 24.232 (c)
Limits	: $\leq 7\text{W ERP}$ (GSM850MHz and WCDMA band5)
	: $\leq 2\text{W EIRP}$ (PCS1900MHz and WCDMA band2)
Kind of test site	: 3m Full-anechoic Chamber

Test Setup

Date of testing	: 26.10.2016
Input voltage	: Fully charged Lithium battery
Operation mode	: TM1 to TM12
Ambient temperature	: 25 °C
Relative humidity	: 56 %
Atmospheric pressure	: 101 kPa

Refer to 50064681 004 Appendix A for detail test data.

5.1.2 Occupied Bandwidth**RESULT:****Pass****Test Specification**

Test standard	: FCC Part 2.1049
Limits	: N/A (99% bandwidth and 26dB bandwidth)
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 26.10.2016
Input voltage	: Fully charged Lithium battery
Operation mode	: TM1 to TM12
Ambient temperature	: 25 °C
Relative humidity	: 56 %
Atmospheric pressure	: 101 kPa

Refer to 50064681 004 Appendix A for detail test data.

5.1.3 Spurious Emissions at Antenna Terminals**RESULT:****Pass****Test Specification**

	FCC Part 2.1051
Test standard	: FCC Part 22.917 (a)
	FCC Part 24.238 (a)
Limits	: Less than -13dBm
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 26.10.2016
Input voltage	: Fully charged Lithium battery
Operation mode	: TM1 to TM12
Ambient temperature	: 25 °C
Relative humidity	: 56 %
Atmospheric pressure	: 101 kPa

Refer to 50064681 004 Appendix A for detail test data.

5.1.4 Bandedge Spurious Emissions at Antenna Terminals**RESULT:****Pass****Test Specification**

	FCC Part 2.1051
Test standard	: FCC Part 22.917 (a)
	FCC Part 24.238 (a)
Limits	: Less than -13dBm
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 26.10.2016
Input voltage	: Fully charged Lithium battery
Operation mode	: TM1 to TM12
Ambient temperature	: 25 °C
Relative humidity	: 56 %
Atmospheric pressure	: 101 kPa

Refer to 50064681 004 Appendix A for detail test data.

5.1.5 Radiated Spurious Emissions**RESULT:****Pass****Test Specification**

	FCC Part 2.1053
Test standard	: FCC Part 22.917 (a)
	FCC Part 24.238 (a)
Limits	: Less than -13dBm
Kind of test site	: 3m Semi-anechoic Chamber & 3m Full-anechoic Chamber

Test Setup

Date of testing	: 26.10.2016
Input voltage	: Fully charged Lithium battery
Operation mode	: TM1 to TM12
Ambient temperature	: 25 °C
Relative humidity	: 56 %
Atmospheric pressure	: 101 kPa

Refer to 50064681 004 Appendix A for detail test data.

5.1.6 Frequency Stability**RESULT:****Pass****Test Specification**

	FCC Part2.1055
Test standard	: FCC Part 22.355
	FCC Part 24.235
Limits	: ±2.5ppm for FCC Part 22.355
	Within assigned bands for FCC Part 24.235
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 26.10.2016
Input voltage	: Fully charged Lithium battery
Operation mode	: TM1 to TM12
Ambient temperature	: 25 °C
Relative humidity	: 56 %
Atmospheric pressure	: 101 kPa

Refer to 50064681 004 Appendix A for detail test data.

5.1.7 Peak-Average Ratio**RESULT:****Pass****Test Specification**

Test standard	: FCC Part 24.232 (d)
Limits	: <13dB
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 26.10.2016
Input voltage	: Fully charged Lithium battery
Operation mode	: TM1 to TM12
Ambient temperature	: 25 °C
Relative humidity	: 56 %
Atmospheric pressure	: 101 kPa

Refer to 50064681 004 Appendix A for detail test data.