

# TEST REPORT

Reference No..... : WTS15S0122185E  
FCC ID ..... 2ADTE-DG280  
Applicant..... : Shenzhen KVD Communication Equipment  
Address..... : 13C, Block C, Shenzhen Electronic Technology Building, Shennan  
Middle Road, Futian District, Shenzhen, China  
Manufacturer ..... : Shenzhen KVD Communication Equipment  
Address..... : 13C, Block C, Shenzhen Electronic Technology Building, Shennan  
Middle Road, Futian District, Shenzhen, China  
Product Name..... : Mobile Phone  
Model No..... : LEO DG280  
Brand..... : DOOGEE  
Standards ..... : FCC PART15 SUBPART B: 2014  
Date of Receipt sample .... : Jan.13, 2015  
Date of Test ..... : Jan.15- 20, 2015  
Date of Issue..... : Jan.23, 2015  
Test Result..... : Pass

## Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

## Prepared By:

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## 1 Test Summary

Test Item	Test Requirement	Class	Test Method	Test Result
Power Line Conducted Emission (150kHz to 30MHz)	FCC PART 15, SUBPART B: 2014	Class B	ANSI C63.4: 2003	Pass
Radiated Emission 30MHz to 1GHz)	FCC PART 15, SUBPART B: 2014	Class B	ANSI C63.4: 2003	Pass
Radiated Emission (Above 1GHz)	FCC PART 15, SUBPART B: 2014	Class B	ANSI C63.4: 2003	Pass

Remark:

Pass Test item meets the requirement

Fail Test item does not meet the requirement

N/A Test case does not apply to the test object

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### 3 General Information

#### 3.1 General Description of E.U.T.

Product Name	: Mobile Phone
Model No.	: LEO DG280
Model Description	: N/A
GSM Band(s)	: GSM 850/900/1800/1900MHz
GPRS Class	: 12
WCDMA Band(s)	: FDD Band I/II/V
Wi-Fi Specification	: 802.11b/g/n HT20/n HT40
Bluetooth Version	: Bluetooth v4.0 with BLE
GPS	: Support
NFC	: N/A
Hardware Version	: G156MB-A2-BOM2
Software Version	: 14-12-31 g156f-daoge-a30-fwvga-850-1900-2100-kk-64g8g-DG280-4.4-R07

#### 3.2 Details of E.U.T.

Operation Frequency	: GSM/GPRS 850: 824~849MHz GSM/GPRS 900: 925-960MHz DCS 1800: 1805-1880MHz PCS 1900: 1850~1910MHz WCDMA Band I: 1920-1980MHz WCDMA Band II: 1850-1910MHz WCDMA Band V: 824~849MHz WiFi: 802.11b/g/n HT20: 2412-2462MHz 802.11n HT40: 2422-2452MHz Bluetooth: 2402-2480MHz GPS: 1.57GHz
Max. RF output power	: GSM 850: 32.81dBm PCS1900: 29.69dBm WCDMA Band II: 20.95dBm WCDMA Band V: 22.86dBm WiFi: 9.24dBm Bluetooth: 0.86dBm
Type of Modulation	: GSM,GPRS: GMSK WCDMA: QPSK

	WiFi: CCK, OFDM
	Bluetooth: GFSK, Pi/4 DQPSK, 8DPSK
Antenna installation	: GSM/WCDMA: Wire antenna WiFi/Bluetooth: Metal Dome
Antenna Gain	: GSM 850: -4.0dBi PCS1900: -4.0dBi WCDMA Band II: -4.0dBi WCDMA Band V: -4.0dBi WiFi: -1.0dBi Bluetooth: -1.0dBi
Technical Data	: Battery DC 3.8V 1800mAh DC 5V, 1.0A, charging from adapter (Adapter Input: 100-240V~50/60Hz, 0.15A)
Adapter	: Manufacture: Shenzhen KVD Communication Equipment Model No.: TN-050100UZ

### 3.3 Standards Applicable for Testing

The tests were performed according to following standards:

FCC PART 15, SUBPART B: Electronic Code of Federal Regulations- Unintentional Radiators 2014

### 3.4 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A-1**

Waltek Services (Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration 7760A-1, July 12, 2012.

- **FCC Test Site 1#– Registration No.: 880581**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, April 29, 2014.

- **FCC Test Site 2#– Registration No.: 328995**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 328995, December 3, 2014.

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### 3.5 Subcontracted

Waltek Services (Shenzhen) Co.,Ltd.

<http://www.waltek.com.cn>

Whether parts of tests for the product have been subcontracted to other labs:

☐ Yes      ☒ No

If Yes, list the related test items and lab information:

Test Lab:      N/A

Lab address: N/A

Test items:    N/A

### **3.6 Abnormalities from Standard Conditions**

None.

## 4 Equipment Used during Test

### 4.1 Equipment List

Conducted Emissions Test Site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	100947	Sep.15,2014	Sep.14,2015
2.	LISN	R&S	ENV216	101215	Sep.15,2014	Sep.14,2015
3.	Cable	Top	TYPE16(3.5M)	-	Sep.15,2014	Sep.14,2015
Conducted Emissions Test Site 2#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	101155	Sep.15,2014	Sep.14,2015
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.15,2014	Sep.14,2015
3.	Limiter	York	MTS-IMP-136	261115-001-0024	Sep.15,2014	Sep.14,2015
4.	Cable	LARGE	RF300	-	Sep.15,2014	Sep.14,2015
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	EMC Analyzer	Agilent	E7405A	MY45114943	Sep.15,2014	Sep.14,2015
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Sep.15,2014	Sep.14,2015
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.19,2014	Apr.18,2015
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.15,2014	Sep.14,2015
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.19,2014	Apr.18,2015
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Apr.19,2014	Apr.18,2015
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Mar.17,2014	Mar.16,2015
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	Apr.10,2014	Apr.09,2015
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	Equipment	Manufacturer	Model No.	Serial No	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	Sep.15,2014	Sep.14,2015
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Sep.15,2014	Sep.14,2015
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Sep.15,2014	Sep.14,2015

4	Cable	HUBER+SUHNER	CBL2	525178	Sep.15,2014	Sep.14,2015
Item	Equipment	Manufacturer	Model No.	Serial No	Last Calibration Date	Calibration Due Date
<b>RF Conducted Testing</b>						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	Sep.15,2014	Sep.14,2015
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	Sep.15,2014	Sep.14,2015
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	Sep.15,2014	Sep.14,2015

#### 4.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
MacBook Air	APPLE	A1465	C17KTQDNF5N7

#### 4.3 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conduction disturbance	150kHz~30MHz	±3.64dB	(1)
Radiation Emission	30MHz~1000MHz	±5.03dB	(1)
	1GHz~6GHz	±5.47dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .



## 5 Emission Test Results

### 5.1 Power Line Conducted Emission, 150kHz to 30MHz

Test Requirement ..... : FCC PART 15, SUBPART B  
 Test Method ..... : ANSI C63.4  
 Test Result ..... : Pass  
 Frequency Range ..... : 150kHz to 30MHz  
 Class ..... : Class B  
 Limit ..... :

Frequency (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15 to 0.5	66 to 56*	5 to 46*
0.5 to 5	56	46
5 to 30	60	50

#### 5.1.1 E.U.T. Operation

Operating Environment:

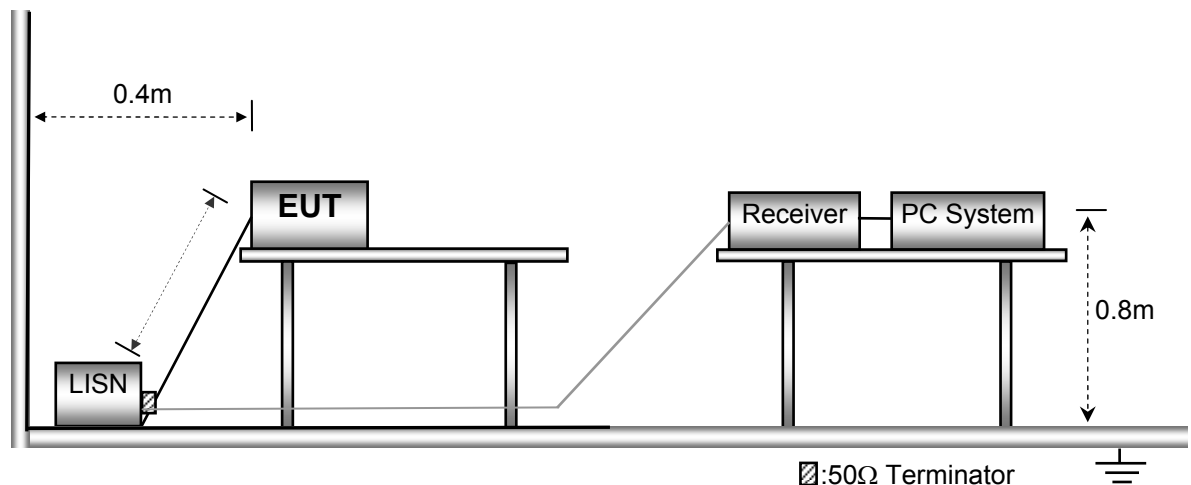
Temperature ..... : 23°C  
 Humidity ..... : 53.6%RH  
 Atmospheric Pressure ..... : 101kPa

EUT Operation:

Input Voltage ..... : (1)DC 5V by adapter input AC120V/60Hz  
 (2)DC 5V by PC  
 Operating Mode ..... : GPS receiving mode, Charging mode, Data transmission with PC mode.  
 Remark ..... : The worse case is Data transmission with PC mode and the data is shown as follow.

#### 5.1.2 Block Diagram of Test Setup

The Mains Terminals Disturbance Voltage tests were performed in accordance with the ANSI C63.4 .

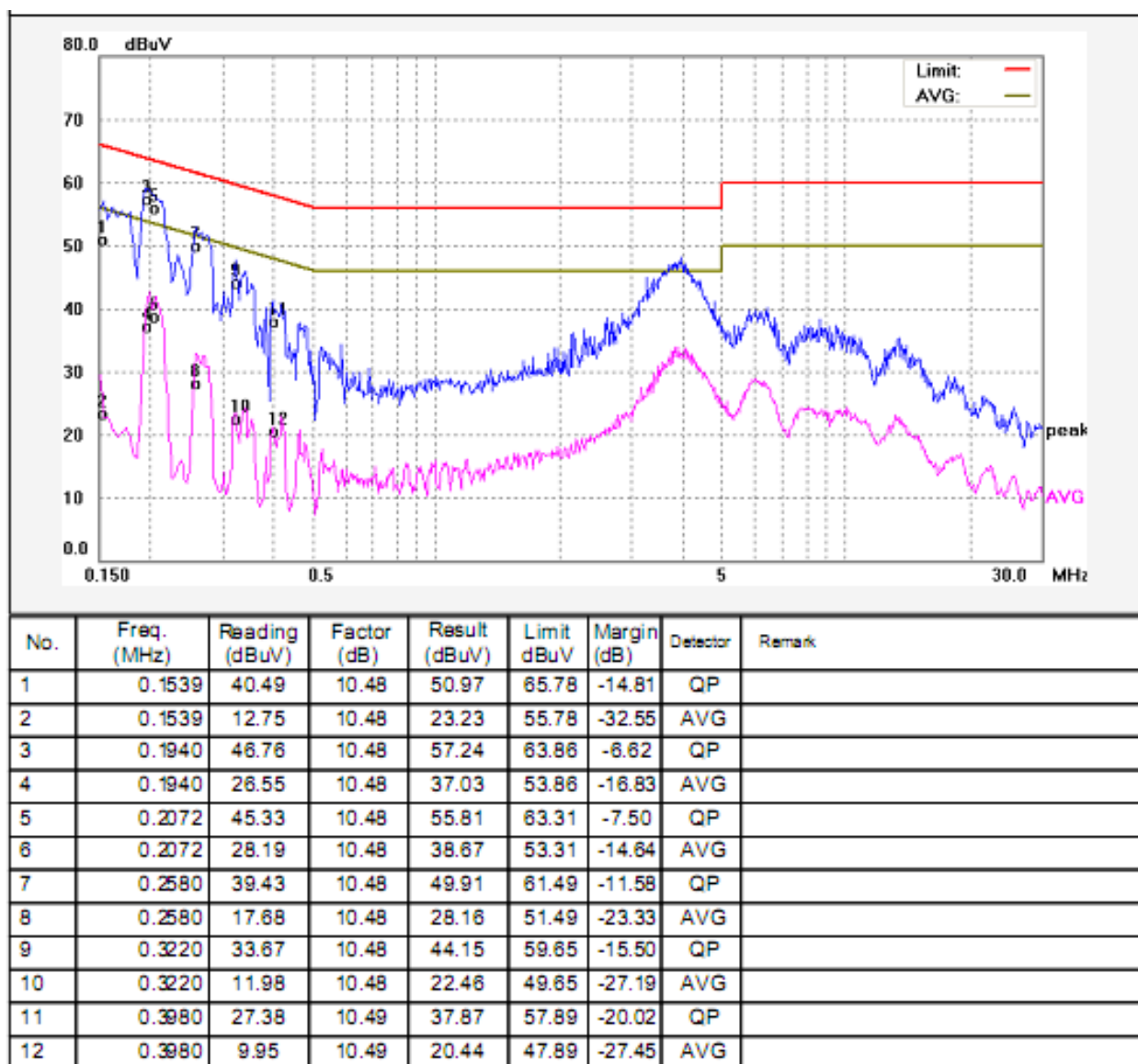


### 5.1.3 Measurement Data

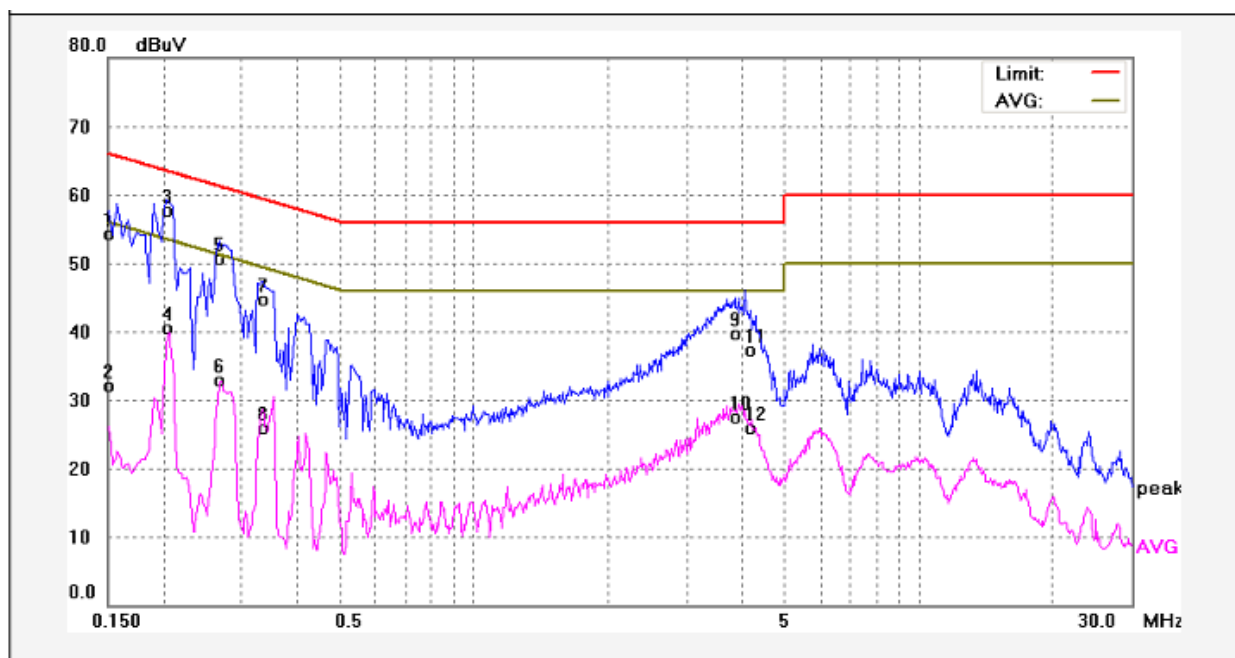
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line. According to the data in section 5.1.4, the EUT complied with the FCC PART 15, SUBPART B standards.

### 5.1.4 Power Line Conducted Emission Test Data

Live Line:



Neutral Line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	43.74	10.48	54.22	65.99	-11.77	QP	
2	0.1500	21.55	10.48	32.03	55.99	-23.96	AVG	
3	0.2020	47.30	10.48	57.78	63.52	-5.74	QP	
4	0.2020	29.98	10.48	40.46	53.52	-13.06	AVG	
5	0.2660	40.30	10.48	50.78	61.24	-10.46	QP	
6	0.2660	22.34	10.48	32.82	51.24	-18.42	AVG	
7	0.3339	34.15	10.48	44.63	59.35	-14.72	QP	
8	0.3339	15.47	10.48	25.95	49.35	-23.40	AVG	
9	3.8500	28.99	10.65	39.64	56.00	-16.36	QP	
10	3.8500	16.95	10.65	27.60	46.00	-18.40	AVG	
11	4.1779	26.67	10.65	37.32	56.00	-18.68	QP	
12	4.1779	15.19	10.65	25.84	46.00	-20.16	AVG	

## 5.2 Radiation Emission, 30MHz to 1000MHz

Test Requirement ..... : FCC PART 15, SUBPART B  
 Test Method ..... : ANSI C63.4  
 Test Result ..... : Pass  
 Frequency Range ..... : 30MHz to 1000MHz  
 Class. .... : Class B  
 Limit..... :

Frequency (MHz)	Distance (Meter)	Limit (dB $\mu$ V/m Quasi-peak)
30 to 88	3	40
88 to 216	3	43.5
216 to 960	3	46
960 to 1000	3	54

### 5.2.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 22.5°C  
 Humidity ..... : 52.6%RH  
 Atmospheric Pressure..... : 101.2kPa

EUT Operation:

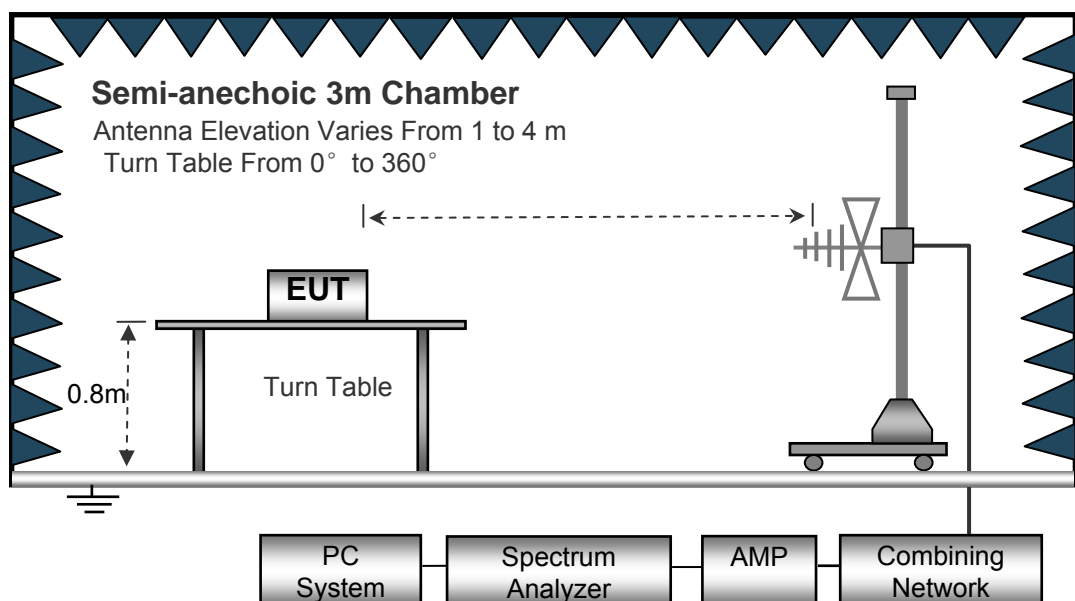
Input Voltage..... : (1)DC 5V by Adapter Input AC 120V/60Hz  
 (2)DC 5V by PC  
 (3)DC 3.7V by Battery

Operating Mode ..... : GPS receiving mode, Charging mode, Data transmission with PC mode.

Remark ..... : The worse case is Data transmission with PC mode and the data is shown as follow.

### 5.2.2 Block Diagram of Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4.

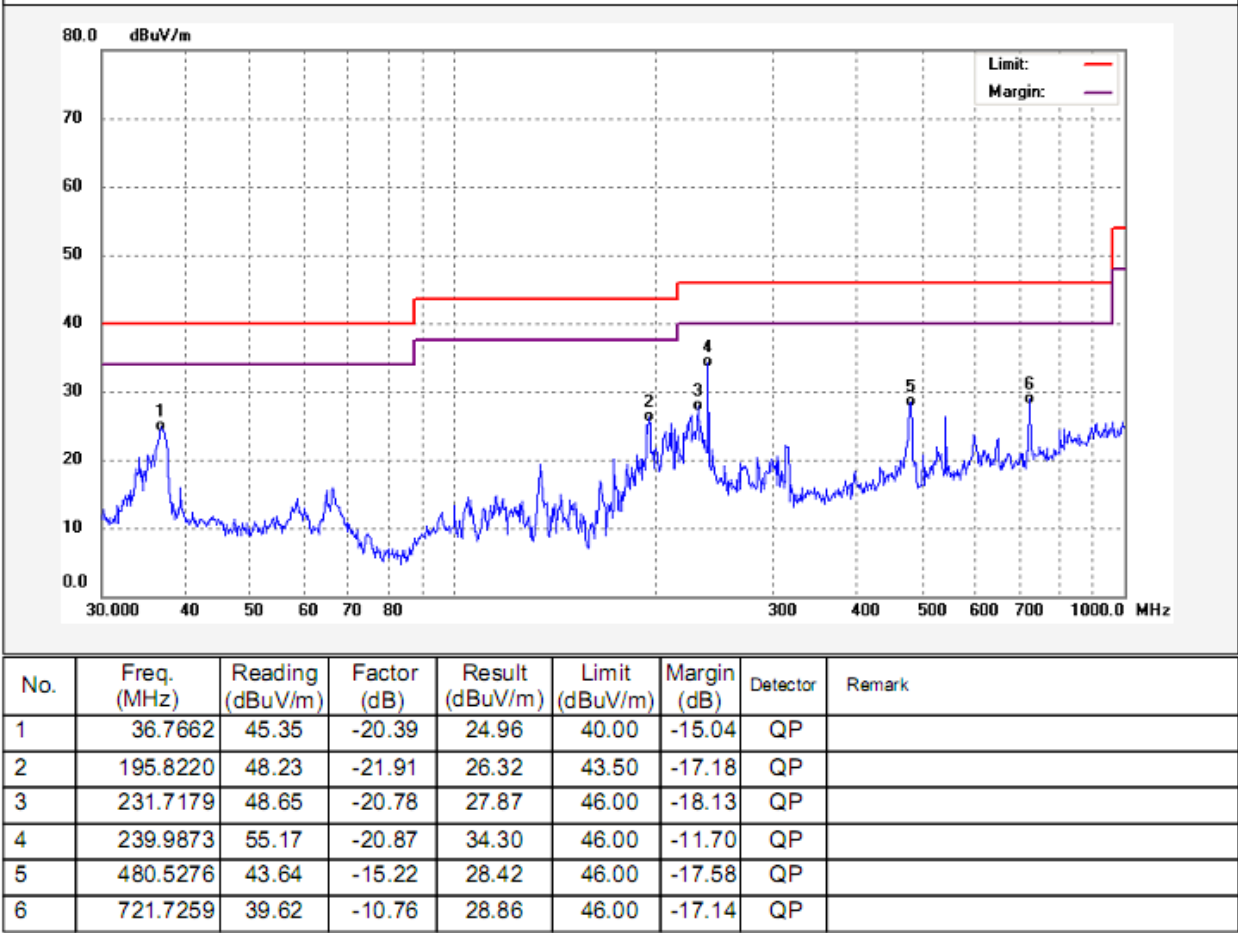


5.2.3 Measurement Data

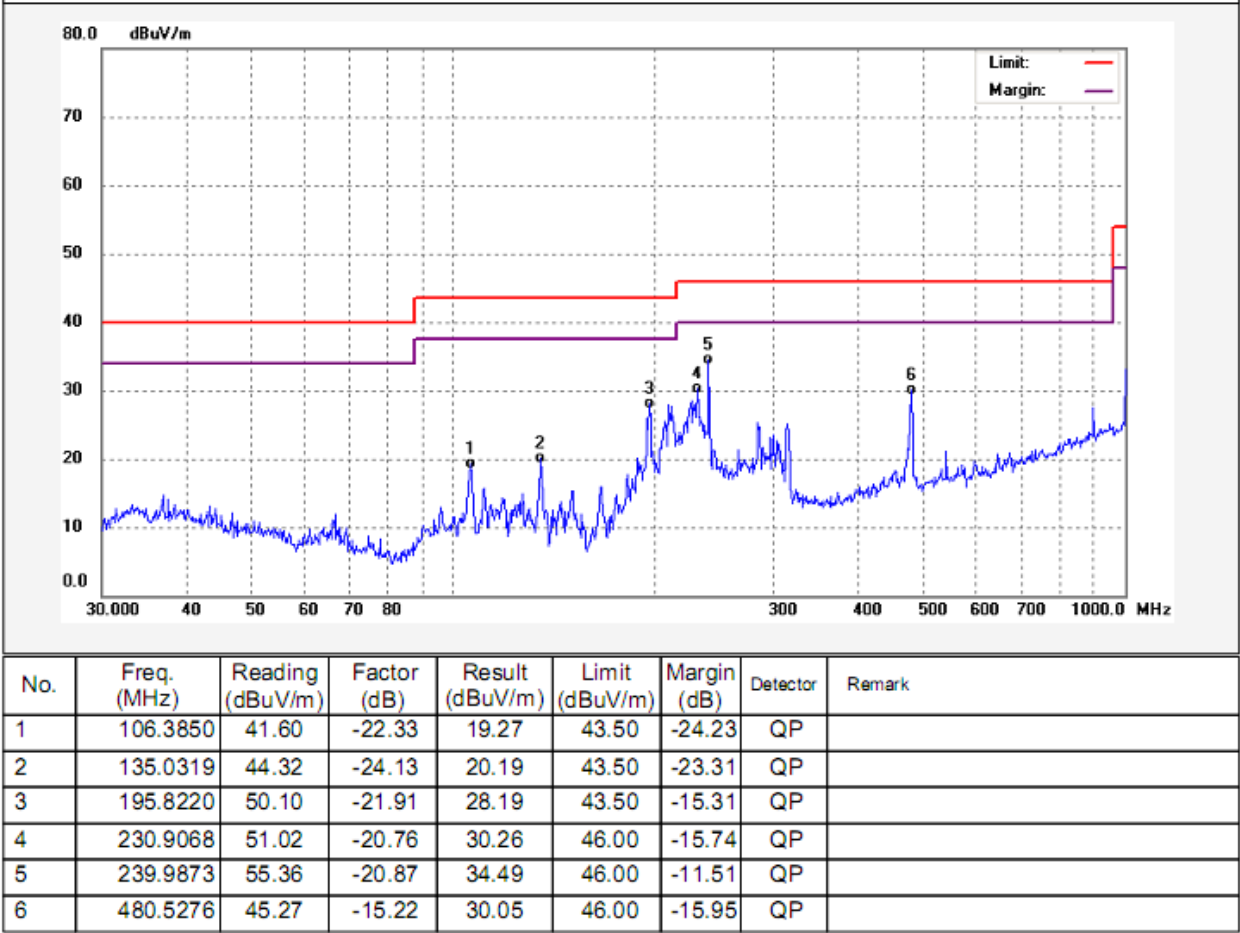
The maximised peak emissions from the EUT was scanned and measured for both the Antenna Vertical Polarization and Antenna Horizontal Polarization. Quasi-peak measurements were performed if peak emissions were within 6dB of the Quasi-peak limit line.

5.2.4 Radiated Emission Test Data, 30MHz to 1000MHz

Antenna Polarization: Vertical



Antenna Polarization: Horizontal



### 5.3 Radiation Emission, Above 1000MHz

Test Requirement ..... : FCC PART 15, SUBPART B  
 Test Method ..... : ANSI C63.4  
 Test Result ..... : Pass  
 Frequency Range ..... : 1GHz~6GHz  
 Class. .... : Class B  
 Limit. .... :

Frequency Range (MHz)	Distance (Meter)	Average Limit dB(uV/m)	Peak Limit (dBuV/m)
Above 1GHz	3	54	74

#### 5.3.1 E.U.T. Operation

Operating Environment:

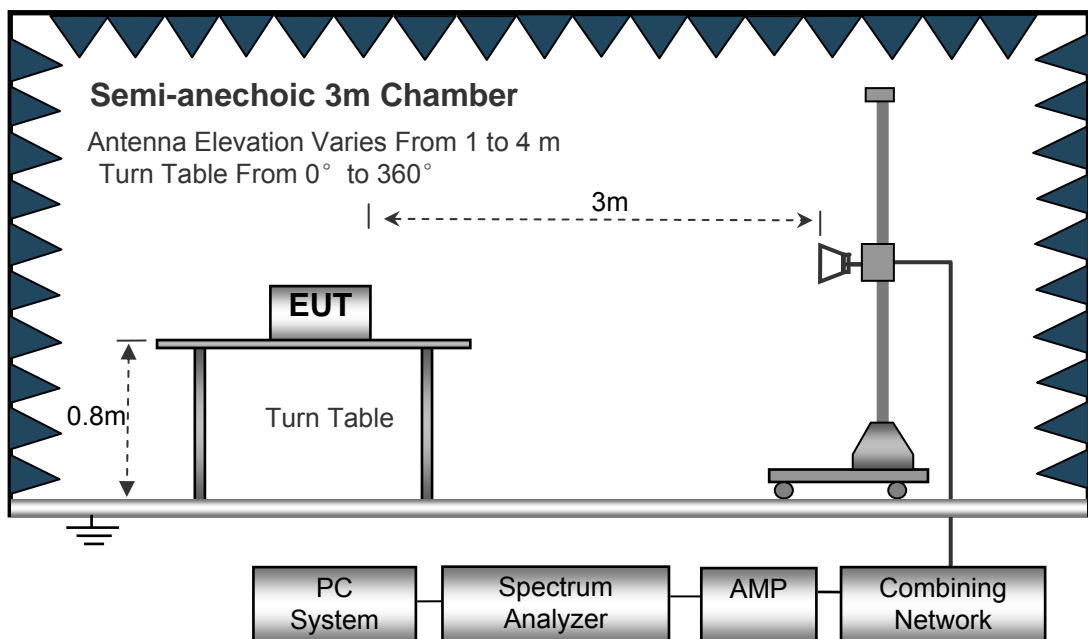
Temperature ..... : 22.4°C  
 Humidity ..... : 52.3%RH  
 Atmospheric Pressure ..... : 101.3kPa

EUT Operation:

Input Voltage ..... : (1)DC 5V by Adapter Input AC 120V/60Hz  
 (2)DC 5V by PC  
 (3)DC 3.7V by Battery  
 Operating Mode ..... : GPS receiving mode, Charging mode, Data transmission mode with PC.  
 Remark ..... : The worse case is date transmission mode and the data is shown as follow.

#### 5.3.2 Block Diagram of Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4.

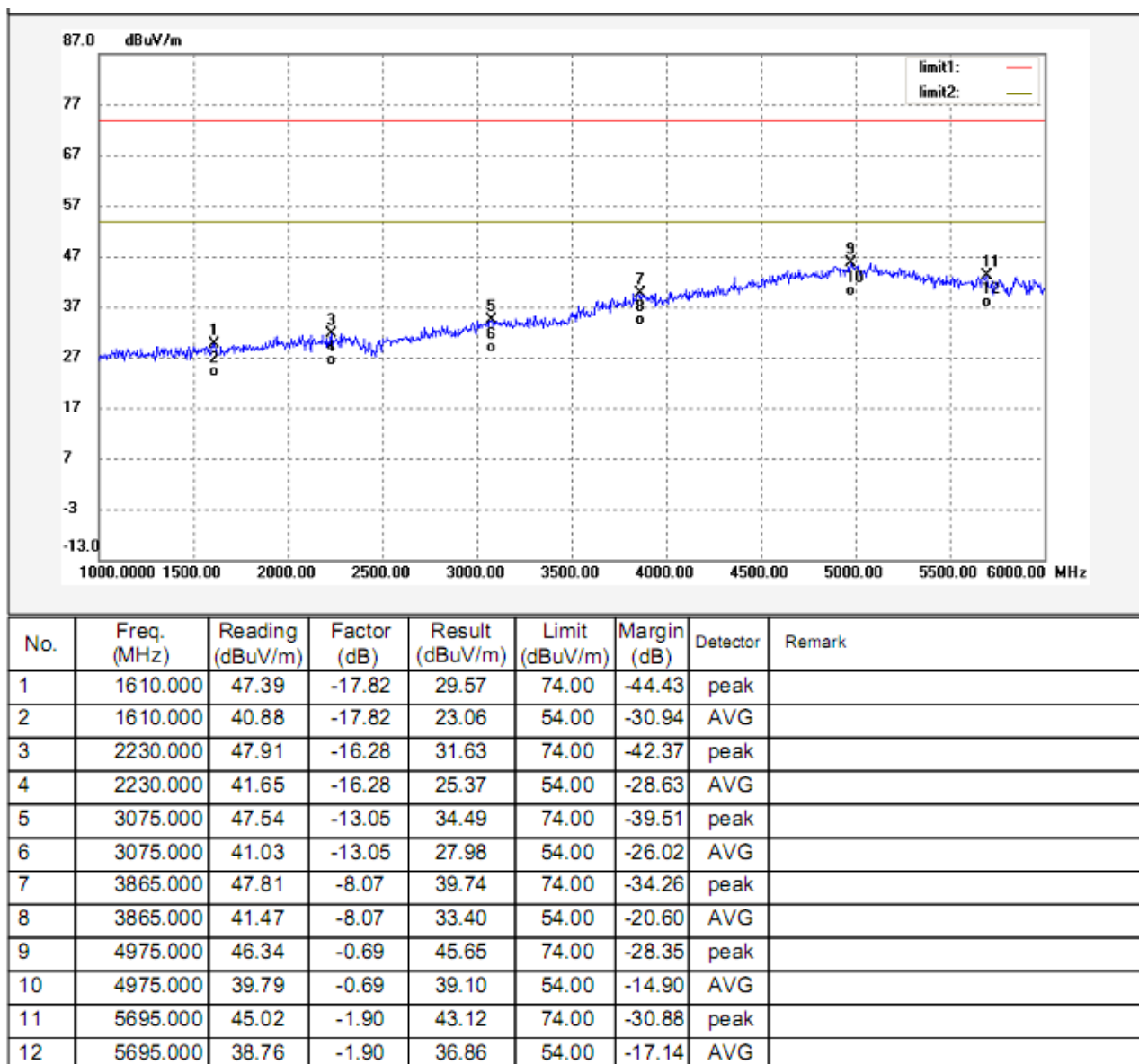


### 5.3.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for both the Antenna Vertical Polarization and Antenna Horizontal Polarization. Average measurements were performed if peak emissions were within 6dB of the average limit line

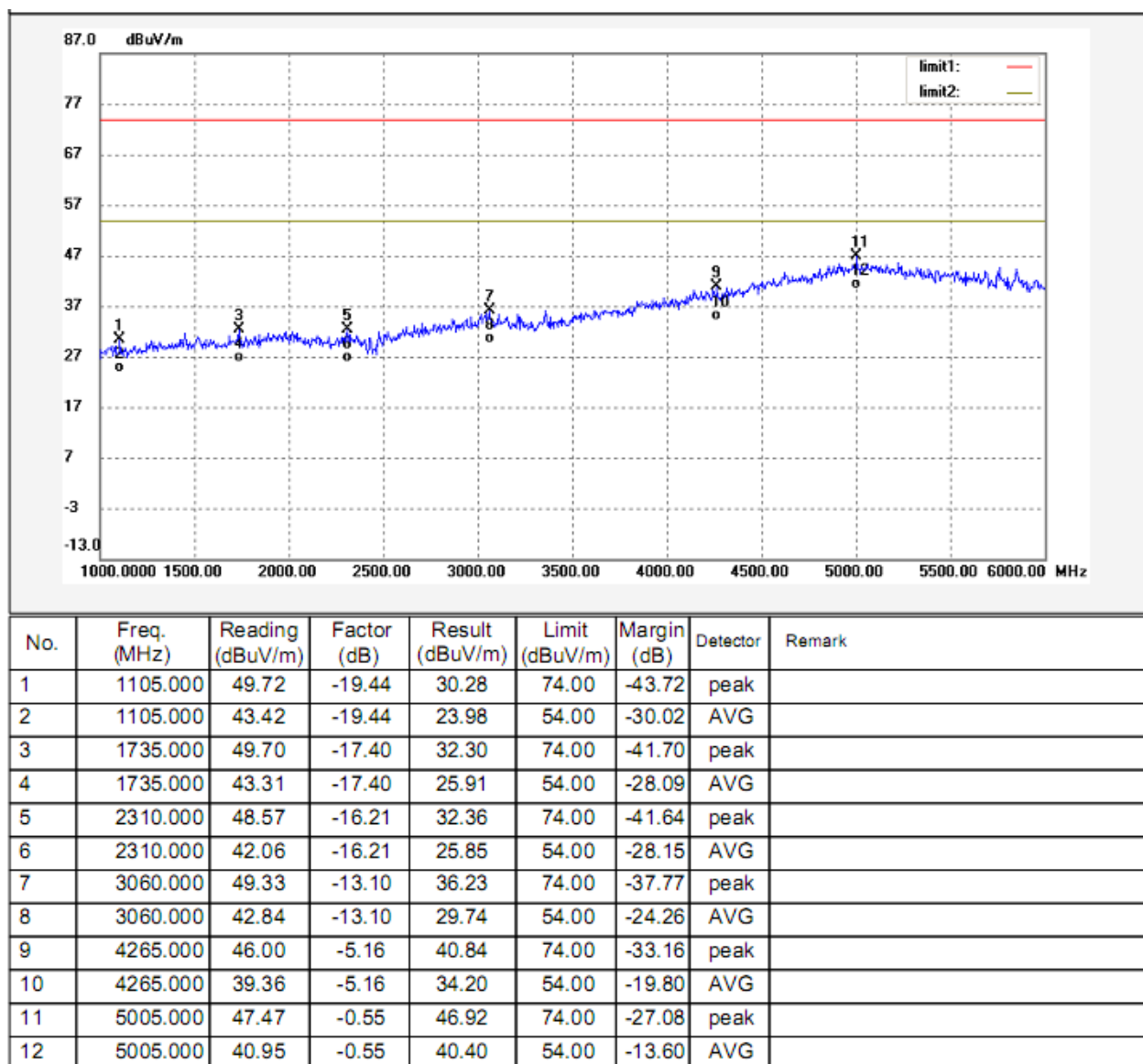
### 5.3.4 Radiated Emission Test Data, Above 1000MHz

Antenna Polarization: Vertical





Antenna Polarization: Horizontal

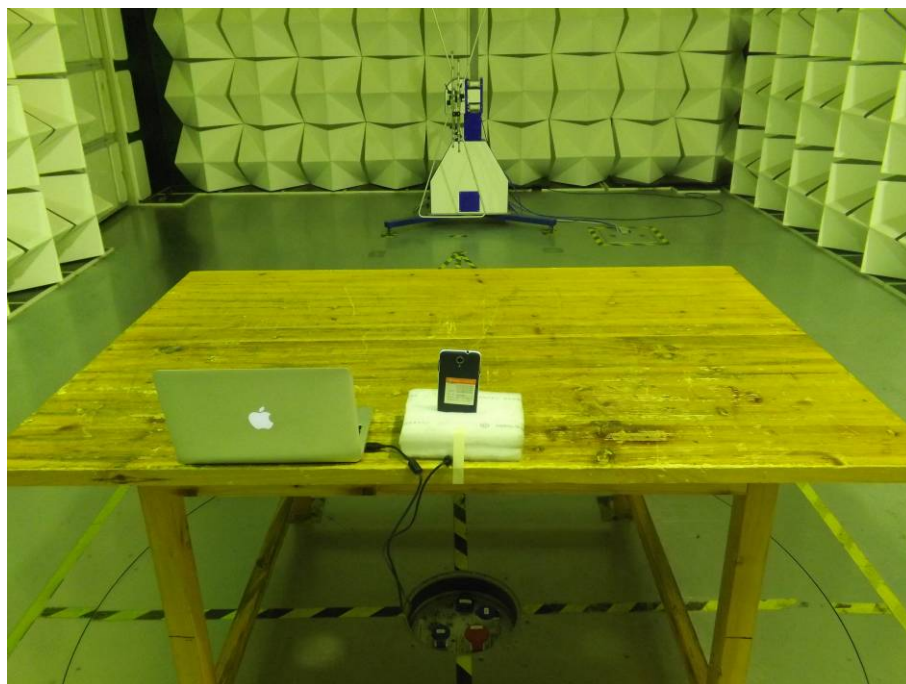


## **6 Photographs – Test Setup**

### **6.1 Photograph –Power Line Conducted Emission Test Setup at Test Site 2#**



### **6.2 Photograph – Radiated Emission Test Setup for 30~1000MHz at Test Site 2#**



### 6.3 Photograph – Radiated Emission Test Setup for Above 1GHz at Test Site 1#



## 7 Photographs - Constructional Details

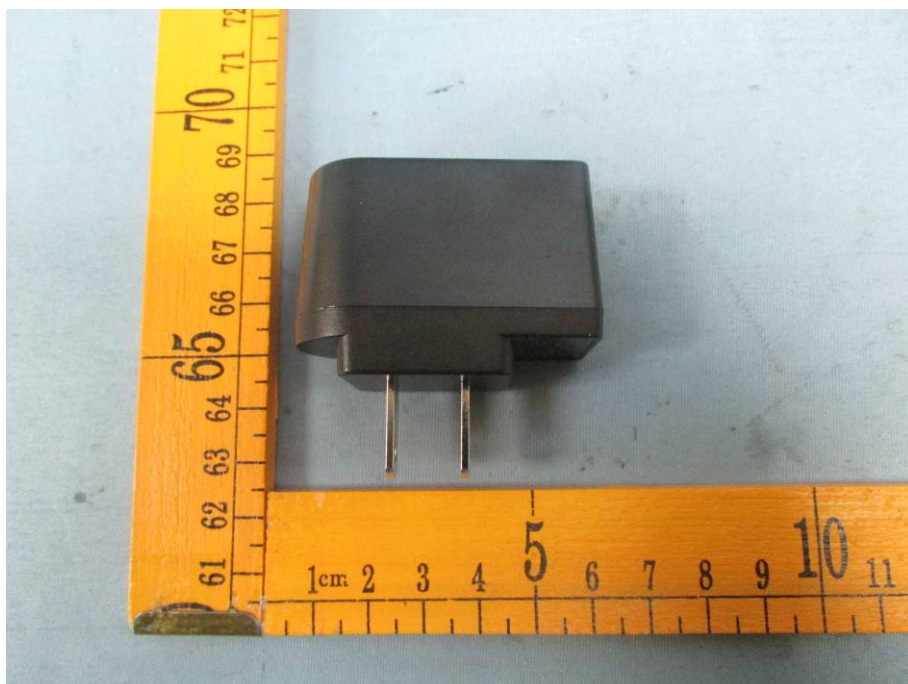
### 7.1 Model LEO DG280 - External View





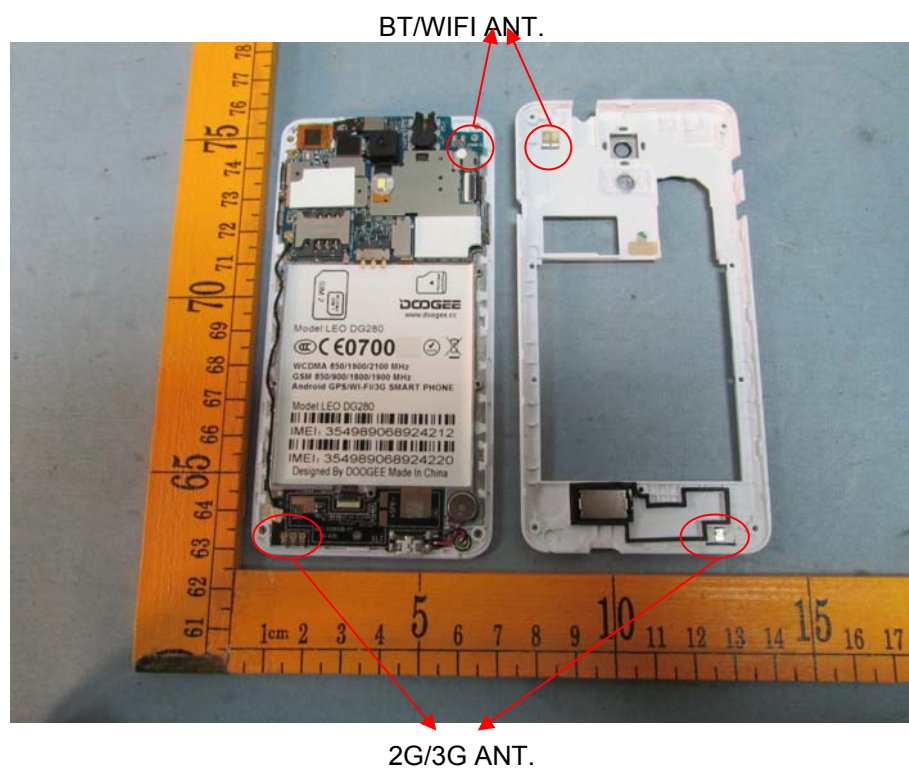




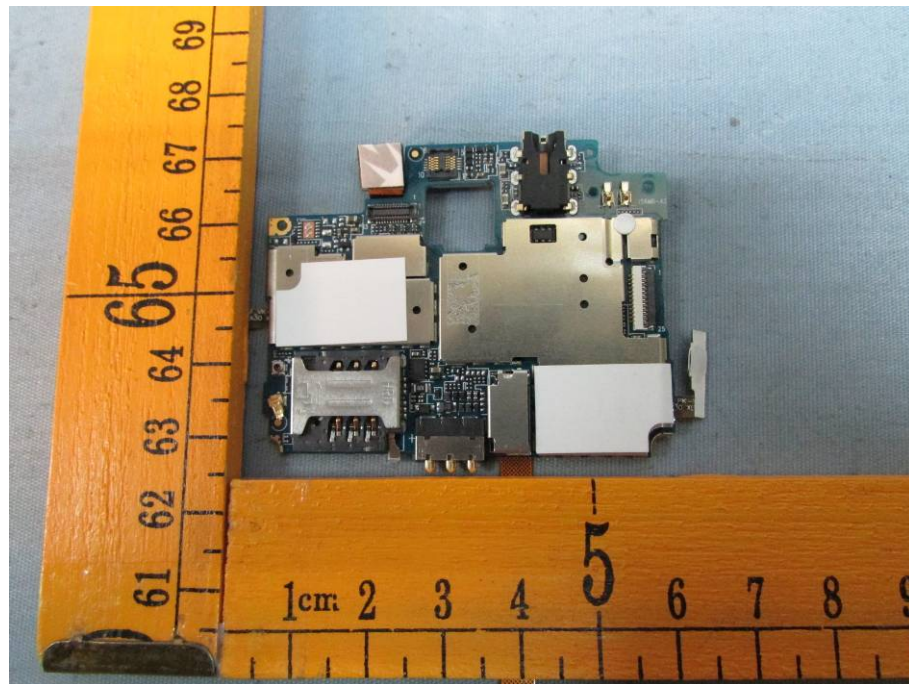


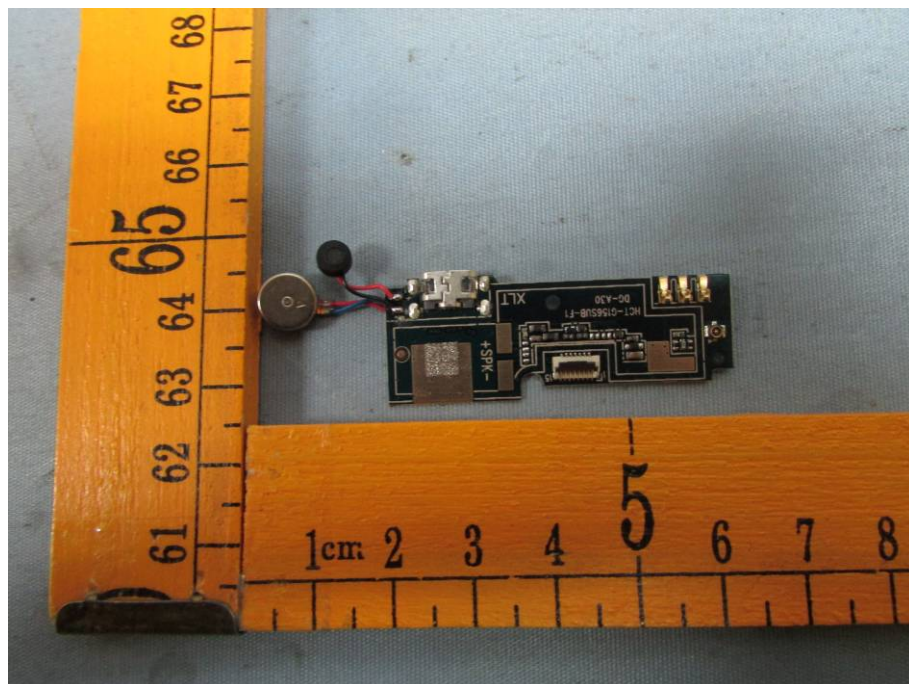
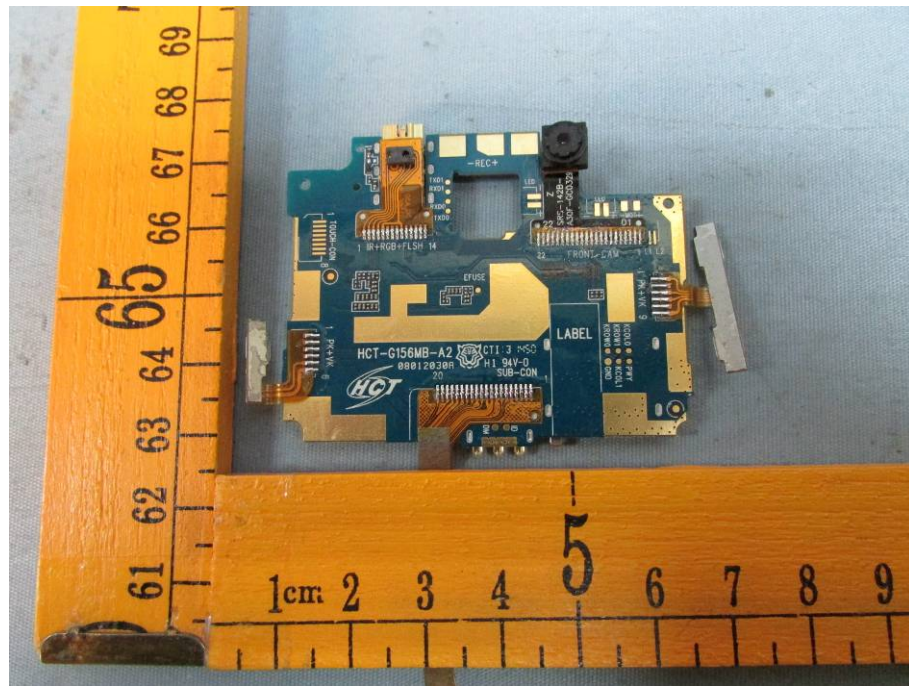


## 7.2 Model LEO DG280 - Internal View

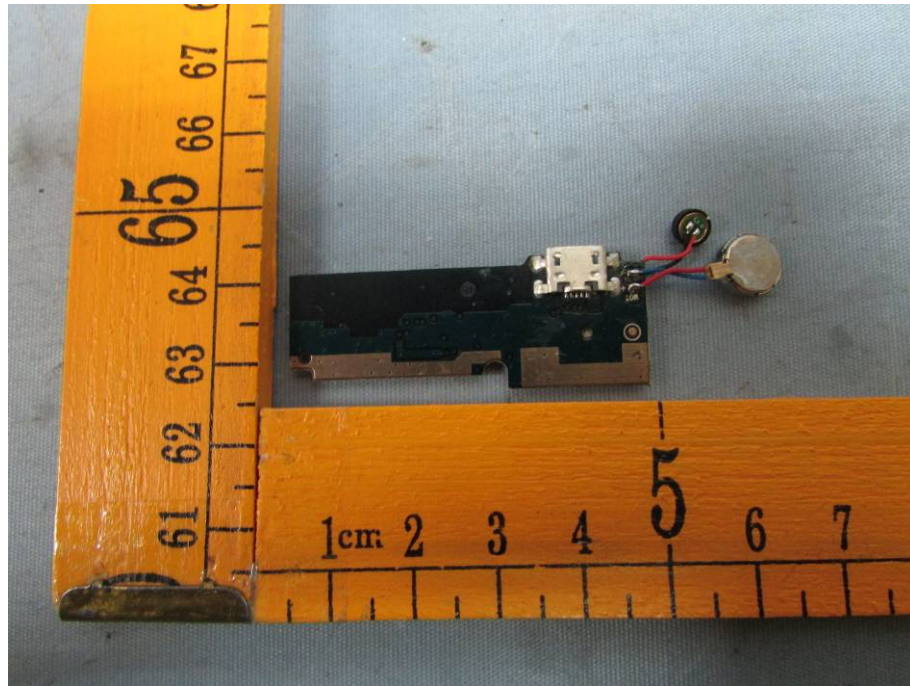














=====End of Report=====