Variant FCC RF Test Report

APPLICANT	**:**	**Doro AB**
EQUIPMENT	**:**	**Mobile Telephone**
BRAND NAME	**:**	**Doro**
MODEL NAME	**:**	**Doro PhoneEasy 615**
FCC ID	**:**	**WS5DORO615W**
STANDARD	**:**	**FCC 47 CFR Part 2, 22(H), 24(E)**
CLASSIFICATION	**:**	**PCS Licensed Transmitter Held to Ear (PCE)**

This is a variant report which is only valid together with the original test report. The product was received on Nov. 14, 2012 and completely tested on Feb. 05, 2013. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai

Jones Tsai / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG222402-01	Rev. 01	This is a variant report for Doro PhoneEasy 615. The product equality declaration could be referred to Appendix C. All the test cases were performed on original report which can be referred to Sporton Report Number FG222402. Based on the original test report, only the Conducted Power, ERP/EIRP, and Radiated Spurious Emissions were verified for the differences.	Feb. 19, 2013

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	§2.1046	RSS-132 (5.4) RSS-133 (6.4)	Conducted Output Power	N/A	PASS	-
3.2	§22.913(a)(2)	RSS-132(5.4) SRSP-503(5.1.3)	Effective Radiated Power	< 7 Watts	PASS	-
3.2	§24.232(c)	RSS-133 (6.4) SRSP-510(5.1.2)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.3	§2.1053 §22.917(a) §24.238(a)	RSS-132 (5.5) RSS-133 (6.5)	Field Strength of Spurious Radiation	< $43+10\log_{10}$(P[Watts])	PASS	Under limit 27.96 dB at 9400.000 MHz

1 General Description

1.1 Applicant

Doro AB
Magistratsvägen 10 SE-226 44 Lund Sweden

1.2 Manufacturer

CK TELECOM LTD.
Technology Road, High-Tech Development Zone, Heyuan, Guangdong, P.R.China.

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Telephone
Brand Name	Doro
Model Name	Doro PhoneEasy 615
FCC ID	WS5DORO615W
EUT supports Radios application	GSM/GPRS/WCDMA/Bluetooth
HW Version	BOAT-V3.0
SW Version	BOAT-S05B_DORO615_L18EN_202_130130
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx Frequency	GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz
Rx Frequency	GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band V: 871.4 MHz ~ 891.6 MHz
Maximum Output Power to Antenna	GSM1900 : 29.79 dBm WCDMA Band V : 23.10 dBm
Antenna Type	Fixed Internal Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK WCDMA: QPSK (Uplink)

1.5 Maximum ERP/EIRP Power

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (W)
Part 22	WCDMA Band V RMC 12.2Kbps	QPSK	0.09
Part 24	GSM1900 GSM	GMSK	0.83

1.6 Testing Site

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.		
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958		
Test Site No.	**Sporton Site No.**		**FCC/IC Registration No.**
	TH01-KS	03CH01-KS	149928/4086E-1

1.7 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- Preliminary Guidance for Receiving Applications for Certification of 3G Device. May 9, 2006.
- FCC 47 CFR Part 2, 22(H), 24(E)
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v01
- IC RSS-132 Issue 3
- IC RSS-133 Issue 6
- IC RSS-Gen Issue 3
- NOTICE 2012-DRS0126

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.
3. Per the section 2.2.3 of Notice of 2012-DRS0126, " Receivers Excluded from Industry Canada Requirements", only radio communication receivers operating in stand-alone mode within the band 30-960 MHz and scanner receivers are subject to Industry Canada requirements.

2 Test Configuration of Equipment Under Test

2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for WCDMA Band V.
2. 30 MHz to 19000 MHz for GSM1900.

Test Modes		
Band	**Radiated TCs**	**Conducted TCs**
GSM 1900	■ GSM Link	■ GSM Link
WCDMA Band V	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link

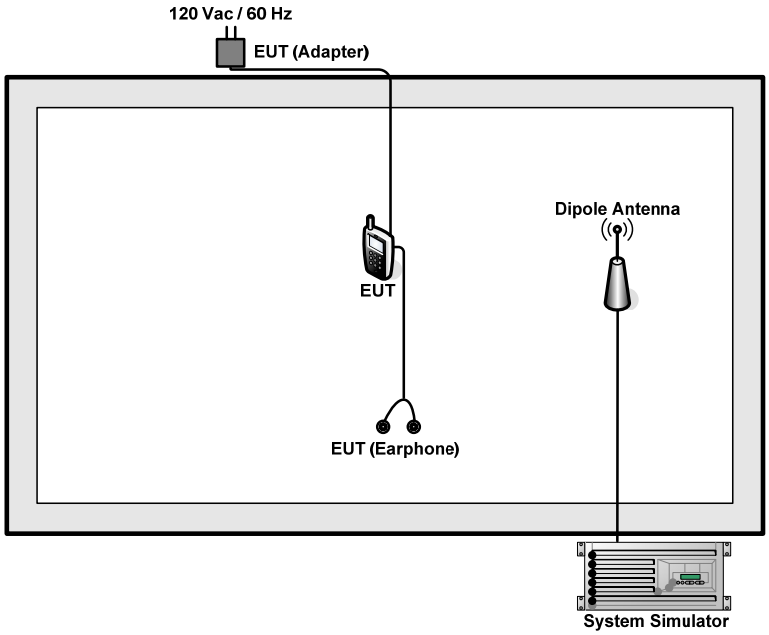
Note: The maximum power levels are GSM mode for GMSK link, and RMC 12.2Kbps mode for WCDMA band II, only these modes were used for all tests.

The conducted power tables are as follows:

Conducted Power (*Unit: dBm)			
Band	**GSM1900**		
Channel	**512**	**661**	**810**
Frequency	**1850.2**	**1880.0**	**1909.8**
GSM	29.69	29.59	**29.79**
GPRS 8	29.69	29.58	29.78
GPRS 10	28.95	28.86	29.13
GPRS 11	27.15	27.06	27.35
GPRS 12	26.05	25.97	26.26

Conducted Power (*Unit: dBm)			
Band	**WCDMA Band V**		
Channel	**4132**	**4182**	**4233**
Frequency	**826.4**	**836.4**	**846.6**
RMC 12.2K	23.08	**23.10**	22.94

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GWINSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Example :

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

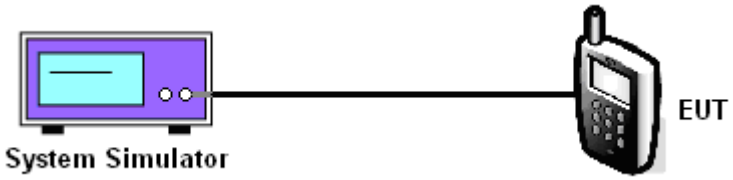
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure the maximum burst average power for GSM and maximum average power for other modulation signal.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

PCS Band			
Modes	**GSM1900 (GSM)**		
Channel	**512 (Low)**	**661 (Mid)**	**810 (High)**
Frequency (MHz)	**1850.2**	**1880**	**1909.8**
Conducted Power (dBm)	29.69	29.59	29.79
Conducted Power (Watts)	0.93	0.91	0.95

Note: maximum burst average power for GSM, and maximum average power for WCDMA.

Cellular Band			
Modes	**WCDMA Band V (RMC 12.2Kbps)**		
Channel	**4132 (Low)**	**4182 (Mid)**	**4233 (High)**
Frequency (MHz)	**826.4**	**836.4**	**846.6**
Conducted Power (dBm)	23.08	23.10	22.94
Conducted Power (Watts)	0.20	0.20	0.20

3.2 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

3.2.1 Description of the ERP/EIRP Measurement

The substitution method, in ANSI / TIA / EIA-603-C-2004, was used for ERP/EIRP measurement, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v01. The ERP of mobile transmitters must not exceed 7 Watts and the EIRP of mobile transmitters are limited to 2 Watts.

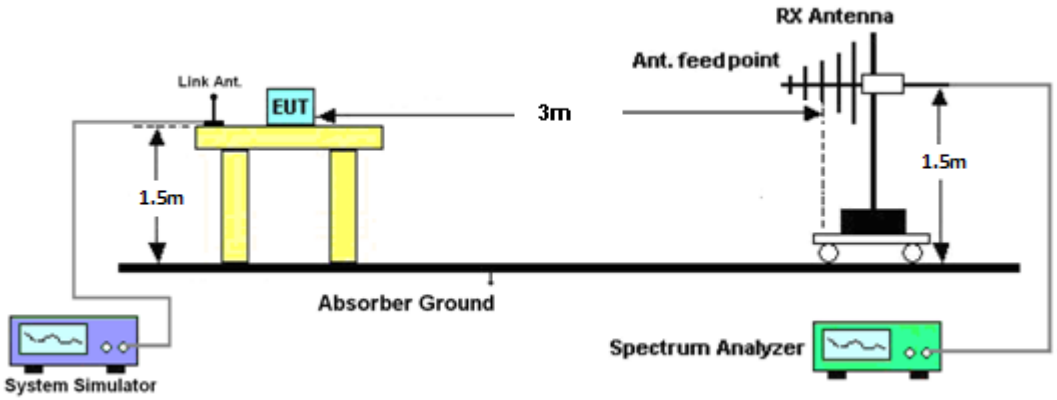
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. GSM operating modes: Set RBW= 1MHz, VBW= 3MHz, RMS detector over burst;
   UMTS operating modes: Set RBW= 100 KHz, VBW= 300 KHz, RMS detector over frame, and use channel power option with bandwidth=5MHz, per section 4.0 of KDB 971168 D01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10. ERP/EIRP = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs
    Ps (dBm)：Input power to substitution antenna.
    Gs (dBi or dBd)：Substitution antenna Gain.
    Et = Rt + AF
    Es = Rs + AF
    AF (dB/m)：Receive antenna factor
    Rt：The highest received signal in spectrum analyzer for EUT.
    Rs：The highest received signal in spectrum analyzer for substitution antenna.

3.2.4 Test Setup



3.2.5 Test Result of ERP

WCDMA Band V (RMC 12.2Kbps) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-29.97	-48.12	0.00	-1.08	17.07	0.05
836.40	-29.31	-48.28	0.00	-0.93	18.04	0.06
846.60	-28.01	-48.35	0.00	-0.76	19.58	0.09
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-40.25	-47.97	0.00	-1.08	6.64	0.00
836.40	-39.66	-48.01	0.00	-0.93	7.42	0.01
846.60	-38.02	-48.05	0.00	-0.76	9.27	0.01

3.2.6 Test Result of EIRP

GSM1900 (GSM) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-25.12	-51.88	0.00	1.96	28.72	0.74
1880.00	-26.98	-52.99	0.00	2.00	28.01	0.63
1909.80	-28.00	-54.28	0.00	1.98	28.26	0.67
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-24.90	-52.13	0.00	1.96	29.19	0.83
1880.00	-26.66	-53.17	0.00	2.00	28.51	0.71
1909.80	-27.76	-54.13	0.00	1.98	28.35	0.68

3.3 Field Strength of Spurious Radiation Measurement

3.3.1 Description of Field Strength of Spurious Radiated Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.3.2 Measuring Instruments

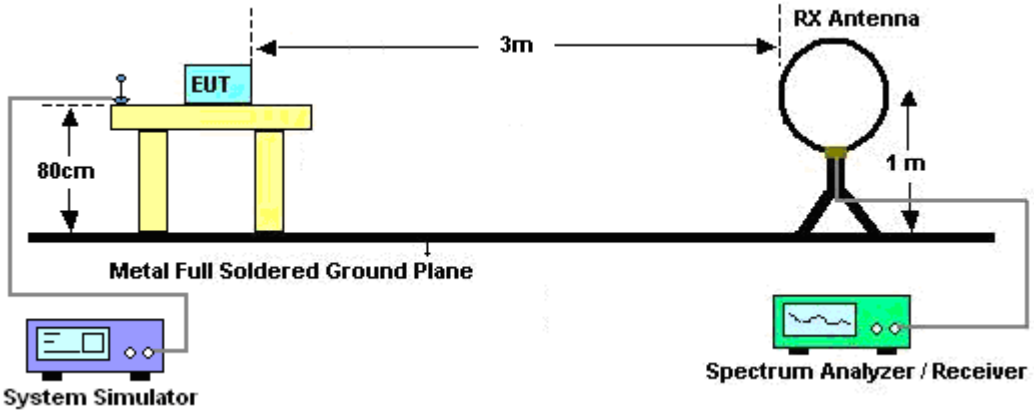
See list of measuring instruments of this test report.

3.3.3 Test Procedures

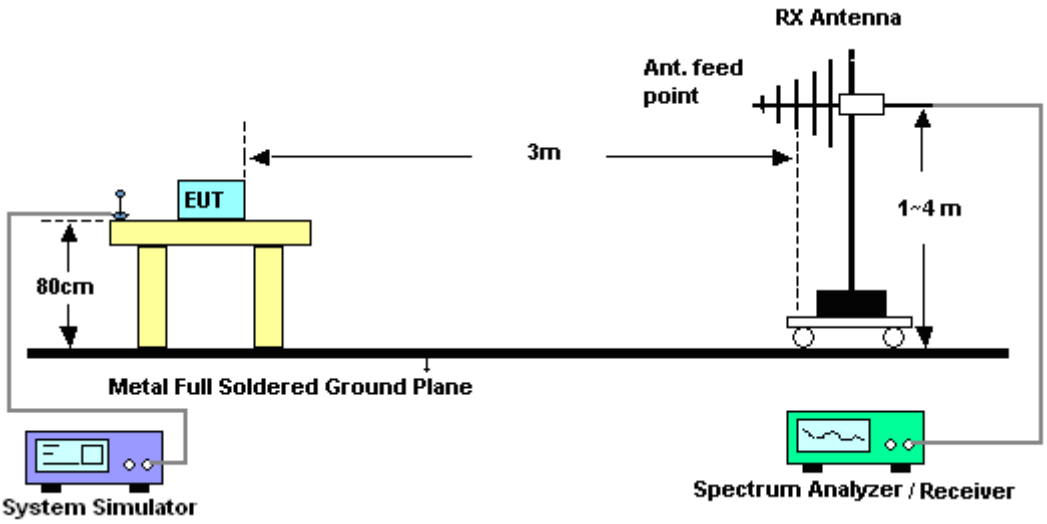
11. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
12. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
13. The table was rotated 360 degrees to determine the position of the highest spurious emission.
14. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
15. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
16. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
17. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
18. Taking the record of output power at antenna port.
19. Repeat step 7 to step 8 for another polarization.
20. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
21. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)
    = P(W) - [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.
22. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
23. ERP (dBm) = EIRP - 2.15

3.3.4 Test Setup

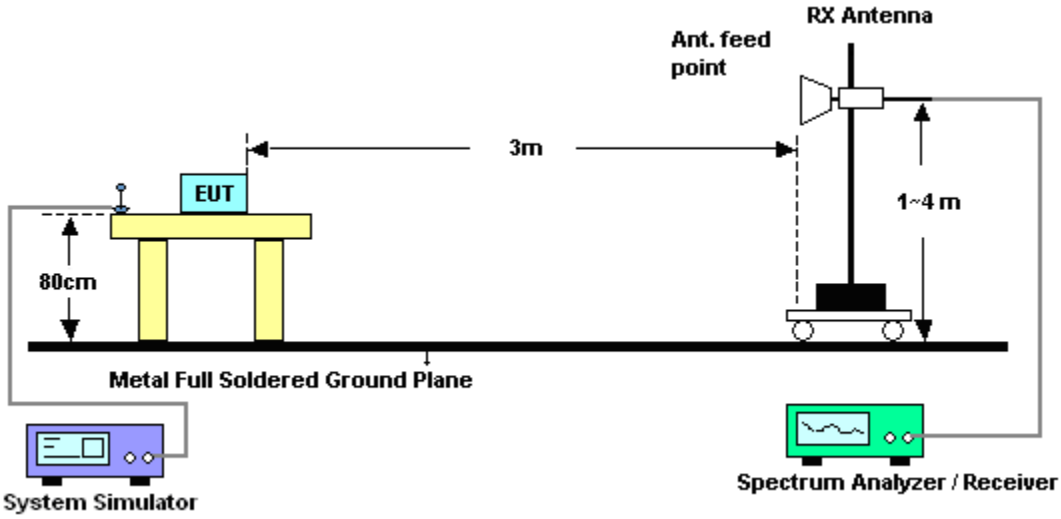
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

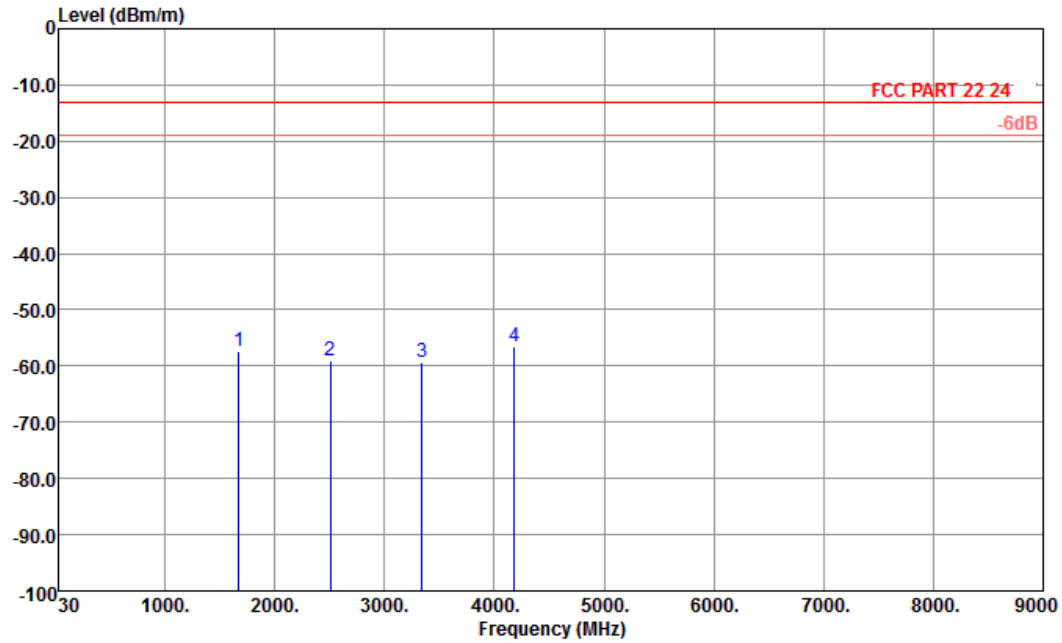


3.3.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.3.6 Test Result of Field Strength of Spurious Radiated

Band :	GSM1900	**Temperature :**	22~23°C
Test Mode :	GSM Link	**Relative Humidity :**	42~43%
Test Engineer :	Steven Hao	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

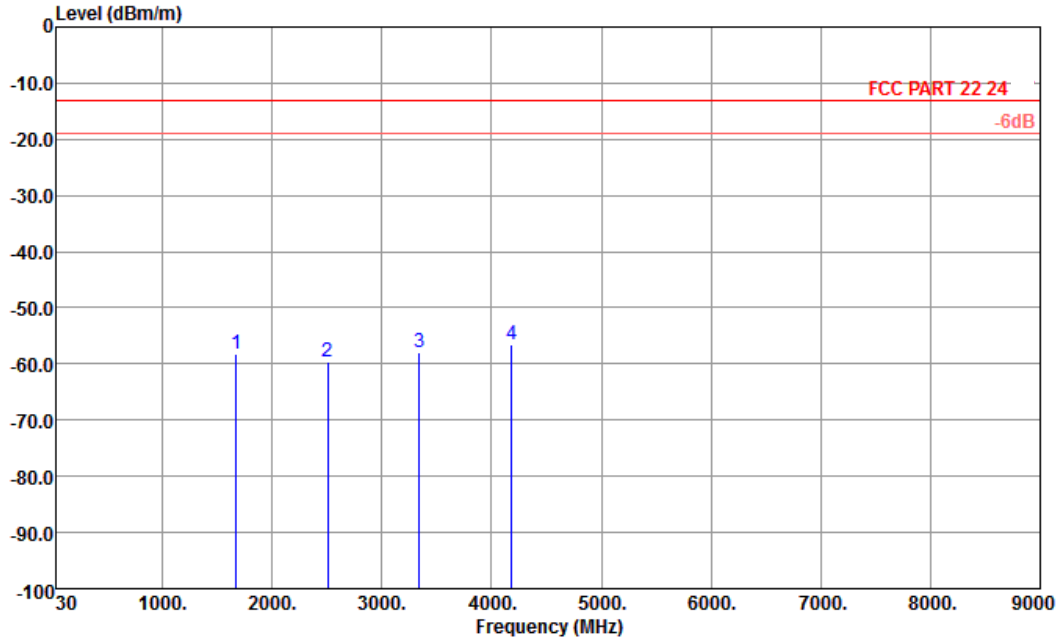


Site : 03CH01-KS
Condition : FCC PART 22 24 3m HF EIRP FACTOR-09020 HORIZONTAL
Project : (FG) 222402-01

Plane : E1

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-57.50	-13	-44.50	-70.42	-60.47	0.88	6.00	H	Pass
2509	-59.16	-13	-46.16	-78.77	-61.77	1.08	5.84	H	Pass
3345	-59.25	-13	-46.25	-69.85	-63.62	1.14	7.66	H	Pass
4182	-56.51	-13	-43.51	-71.27	-61.78	1.37	8.79	H	Pass

Band :	GSM1900	Temperature :	22~23°C
Test Mode :	GSM Link	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

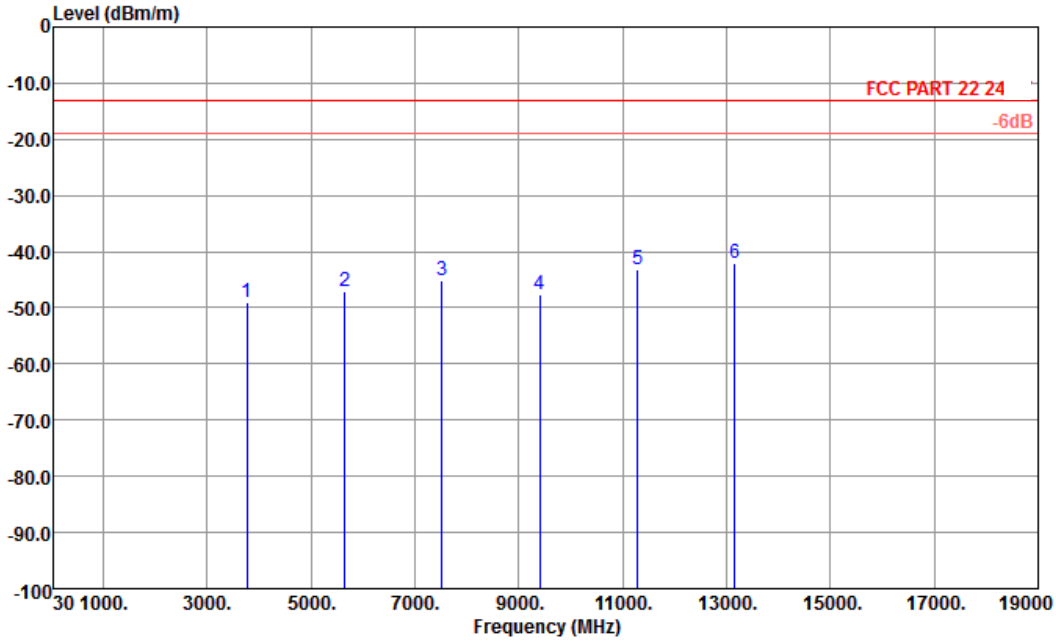


Site : 03CH01-KS
Condition : FCC PART 22 24 3m HF EIRP FACTOR-09020 VERTICAL
Project : (FG) 222402-01

Plane : E1

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-58.29	-13	-45.29	-68.92	-61.26	0.88	6.00	V	Pass
2509	-59.70	-13	-46.70	-78.55	-62.31	1.08	5.84	V	Pass
3345	-58.04	-13	-45.04	-69.87	-62.41	1.14	7.66	V	Pass
4182	-56.41	-13	-43.41	-71.63	-61.68	1.37	8.79	V	Pass

Band :	WCDMA Band V	Temperature :	22~23°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

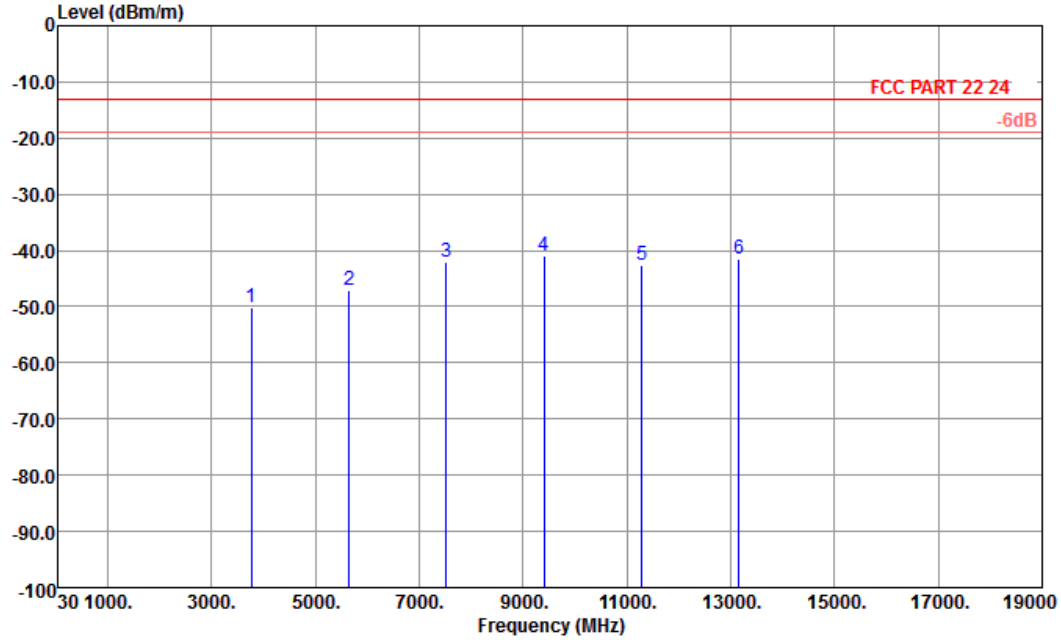


Site : 03CH01-KS
Condition : FCC PART 22 24 3m HF EIRP FACTOR-09020 HORIZONTAL
Project : (FG) 222402-01

Plane : E2

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-49.04	-13	-36.04	-62.54	-55.78	1.28	8.02	H	Pass
5640	-47.14	-13	-34.14	-65.13	-55.56	1.58	10.00	H	Pass
7520	-45.23	-13	-32.23	-67.17	-55.55	1.78	12.10	H	Pass
9400	-47.77	-13	-34.77	-69.89	-58.55	2.22	13.00	H	Pass
11280	-43.31	-13	-30.31	-71.80	-54.16	2.16	13.01	H	Pass
13160	-41.94	-13	-28.94	-72.52	-53.00	2.64	13.70	H	Pass

Band :	WCDMA Band V	Temperature :	22~23°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-KS
Condition : FCC PART 22 24 3m HF EIRP FACTOR-09020 VERTICAL
Project : (FG) 222402-01

Plane : E2

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-50.01	-13	-37.01	-65.04	-56.75	1.28	8.02	V	Pass
5640	-47.18	-13	-34.18	-64.26	-55.60	1.58	10	V	Pass
7520	-42.19	-13	-29.19	-64.44	-52.51	1.78	12.1	V	Pass
9400	-40.96	-13	-27.96	-64.58	-51.74	2.22	13	V	Pass
11280	-42.62	-13	-29.62	-71.21	-53.47	2.16	13.01	V	Pass
13160	-41.56	-13	-28.56	-72.21	-52.62	2.64	13.7	V	Pass

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 29, 2012	Feb. 05, 2013	Dec. 28, 2013	Conducted (TH01-KS)
System Simulator	R&S	CMU200	837587/066	2G Full-Band	Dec. 29, 2012	Feb. 05, 2013	Dec. 28, 2013	Conducted (TH01-KS)
DC Power Supply	GWINSTEK	GPS-3030D	E1884515	N/A	Aug. 22, 2012	Feb. 05, 2013	Aug. 21, 2013	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 29, 2012	Feb. 05, 2013	Dec. 28, 2013	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 08, 2012	Feb. 05, 2013	Nov. 07, 2013	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	100400	9kHz~30GHz	Jun. 01, 2012	Feb. 05, 2013	May 31, 2013	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 07, 2012	Feb. 05, 2013	Dec. 06, 2013	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2013	Feb. 05, 2013	Jan. 05, 2014	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161069	1MHz~1GHz	Jun. 01, 2012	Feb. 05, 2013	May 31, 2013	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 29, 2012	Feb. 05, 2013	Dec. 28, 2013	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	9170249	15GHz~40GHz	Nov. 23, 2012	Feb. 05, 2013	Nov. 22, 2013	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/001	9KHz ~ 30MHz	Jul. 03, 2012	Feb. 05, 2013	Jul. 02, 2014	Radiation (03CH01-KS)
System Simulator	R&S	CMU200	116456	Full-Band	Sep. 19, 2012	Feb. 05, 2013	Sep. 18, 2013	Radiation (03CH01-KS)

5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.54**

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.72**

Appendix A. Photographs of EUT

Please refer to Sporton report number EP222402-01 as below.

Appendix C. Product Equality Declaration

CK TELECOM LTD.

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Date: February 19, 2013

Product Equality Declaration

We, **CK TELECOM LTD.,** declare on our sole responsibility for the product of **Doro PhoneEasy 615** below:

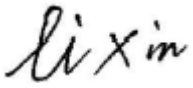
The differences between previous and current model of **Doro PhoneEasy 615** are as below:

1. Update the flash, FM, USB cable, T-flash card connector, WWAN Antenna and PCB
2. Change software version to “BOAT-S05B_DORO615_L18EN_202_130130”
3. LCD change from TFT1N5470-E to TFT1N5690-E

Except listings above, the others are all the same as previous version.

Should you have any questions or comments regarding this matter, please have my best attention.

Sincerely yours,



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