



# Variant FCC RF Test Report

**APPLICANT** : Doro AB  
**EQUIPMENT** : GSM Tri-band Digital Mobile Telephone  
**BRAND NAME** : Doro  
**MODEL NAME** : Doro PhoneEasy 410gsm  
**FCC ID** : WS5DORO410G  
**STANDARD** : FCC Part 15 Subpart C §15.247  
**CLASSIFICATION** : (DSS) Spread Spectrum Transmitter

This is a variant report which is only valid together with the original test report. The product was received on Oct. 22, 2012 and completely tested on Oct. 26, 2012. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the 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 / Manager



**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
FR951903-04	Rev. 01	This is a variant report for Doro PhoneEasy 410gsm. The product equality declaration could be referred to Appendix C. All test cases were performed on original test report which can be referred to SPORTON Report Number FR952506. Based on the original test report, only the worst case of Radiated Spurious Emission was verified for the differences.	Nov. 02, 2012



### SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1.8	15.247(d)	A8.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 7.32 dB at 2483.660 MHz

# 1 General Description

## 1.1 Applicant

**Doro AB**

Magistratsvägen 10 SE-226 43 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	
<b>Equipment</b>	GSM Tri-band Digital Mobile Telephone
<b>Brand Name</b>	Doro
<b>Model Name</b>	Doro PhoneEasy 410gsm
<b>FCC ID</b>	WS5DORO410G
<b>EUT supports Radios application</b>	GSM / Bluetooth
<b>HW Version</b>	SHELL-V1.0
<b>SW Version</b>	SHELL_S02_2V8_DORO410_L14EN_215_091201_MCP12 8+32_BT_FM_TB
<b>EUT Stage</b>	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.

Product Specification subjective to this standard	
<b>Tx/Rx Frequency Range</b>	2402 MHz ~ 2480 MHz
<b>Number of Channels</b>	79
<b>Carrier Frequency of Each Channel</b>	2402+n*1 MHz; n=0~78
<b>Antenna Type</b>	Dipole Antenna with gain -2
<b>Type of Modulation</b>	Bluetooth (1Mbps) : GFSK



### 1.4 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.
	03CH01-KS	149928/4086E-1

### 1.5 Applied Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC Public Notice DA 00-705
- ♦ ANSI C63.4-2003 and ANSI C63.10-2009
- ♦ IC RSS-210 Issue 8
- ♦ IC RSS-Gen Issue 3

**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.

### 1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Base Station	R&S	CBT	N/A	N/A	Unshielded, 1.8 m



## 2 Test Configuration of Equipment Under Test

### 2.1 Test Mode

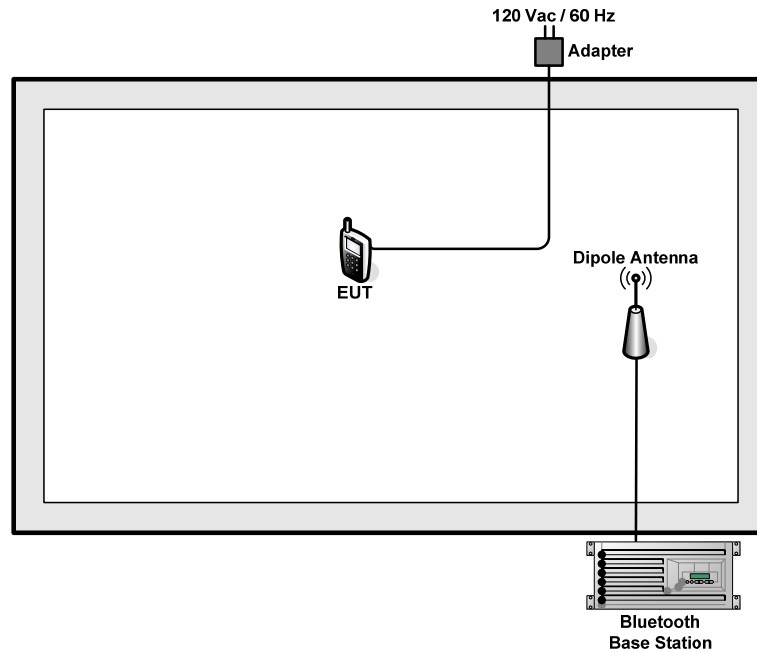
The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and ANSI C63.10-2009 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations.

The following tables are showing the test modes as the worst cases (X plane) and recorded in this report.

Test Cases	
Test Item	Data Rate / Modulation
	Bluetooth 1Mbps GFSK
Radiated TCs	Mode 1: CH78_2480 MHz
<b>Remark:</b> For radiated TCs, CH78 of 1Mbps was the worst case; so only the data of this mode was reported.	

## 2.2 Connection Diagram of Test System



## 2.3 RF Utility

For Bluetooth function, key in "\* # 13646633 #" on the EUT directly. Then, the EUT will get into the engineering modes to contact with Bluetooth base station for continuous transmitting and receiving signals.





### 3 Test Result

#### 3.1 Radiated Band Edges and Spurious Emission Measurement

##### 3.1.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 KHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(KHz)	300
0.490 – 1.705	24000/F(KHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

##### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.



### 3.1.3 Test Procedures

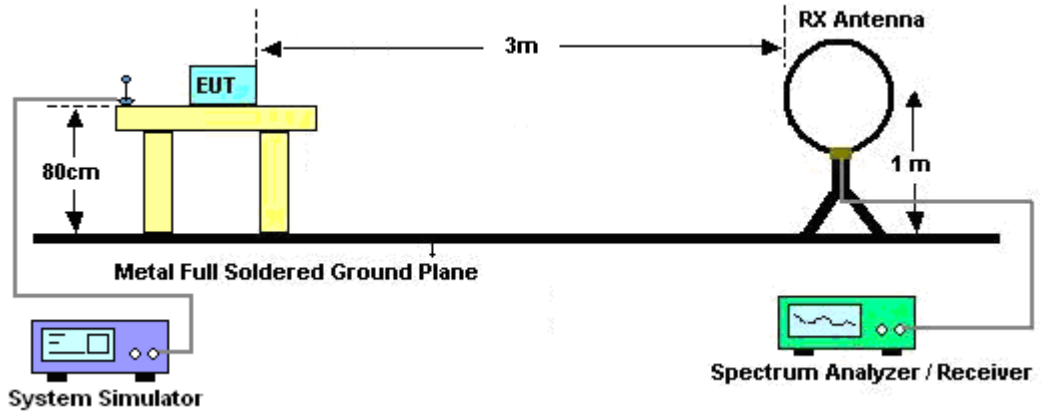
1. The testing follows the guidelines in Spurious Radiated Emissions of FCC Public Notice DA 00-705 Measurement Guidelines and fulfills ANSI C63.4-2003 and the guidelines in ANSI C63.10-2009 test site requirement.
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. Use the following spectrum analyzer settings:
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Set RBW=100 KHz for  $f < 1$  GHz, RBW=1MHz for  $f > 1$ GHz ; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak
  - (3) For average measurement: use duty cycle correction factor method per 15.35(c).  
Duty cycle = On time/100 milliseconds  
On time =  $N_1 * L_1 + N_2 * L_2 + \dots + N_{n-1} * L_{n-1} + N_n * L_n$   
Where  $N_1$  is number of type 1 pulses,  $L_1$  is length of type 1 pulses, etc.  
Average Level = Peak Level +  $20 * \log(\text{Duty cycle})$
6. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (24.5dB) derived from  $20 \log(\text{dwell time}/100\text{ms})$ .

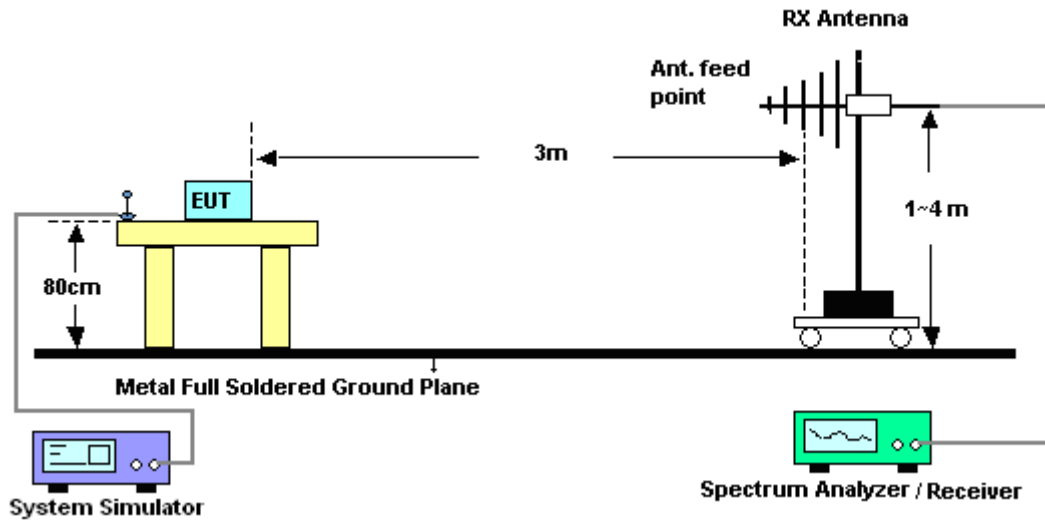
For example: Average level =  $45.61\text{dBuV/m} - 24.5 \text{ (dB)} = 21.11\text{dBuV/m}$ .

### 3.1.4 Test Setup

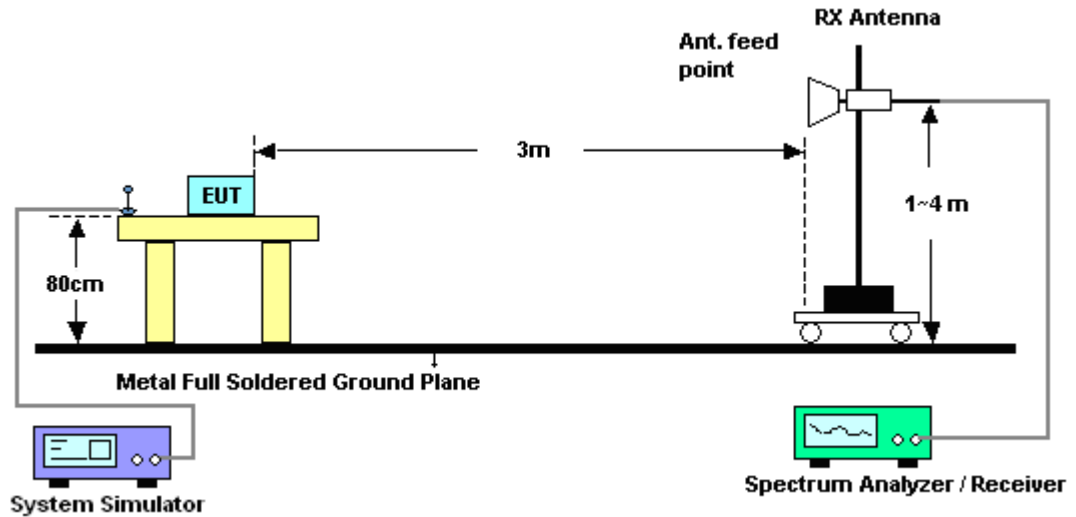
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

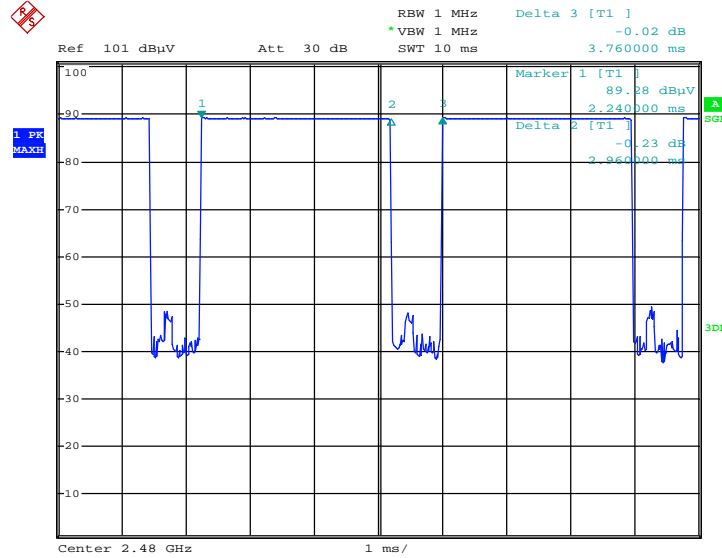


### 3.1.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

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.

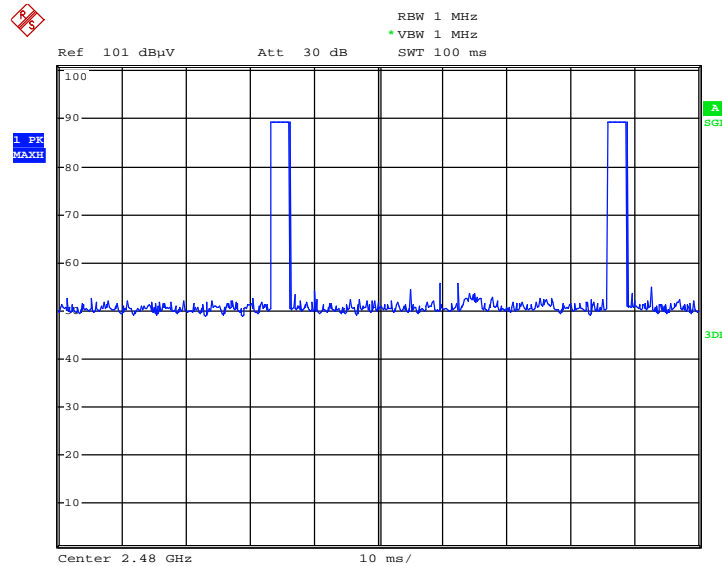
### 3.1.6 Duty cycle correction factor for average measurement

#### DH5 on time/100ms (One Pulse) Plot on Channel 78



Date: 26.OCT.2012 02:49:38

#### DH5 on time/100ms (Count Pulses) Plot on Channel 78



Date: 26.OCT.2012 02:50:16

**Note:**

1. Duty cycle = on time/100 milliseconds = 2 \* 2.96 / 100 = 5.92 %
2. Duty cycle correction factor = 20\*log(Duty cycle) = -24.55 dB
3. DH5 has the highest duty cycle and is reported.



3.1.7 Test Result of Radiated Band Edges

Test Mode :	1Mbps	Temperature :	21~22°C
Test Channel :	78	Relative Humidity :	46~47%
		Test Engineer :	Chenmy Cheng

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.66	66.68	-7.32	74	59.52	33.01	4.89	30.74	200	31	Peak
2483.66	42.13	-11.87	54	-	-	-	-	-	-	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.6	64.08	-9.92	74	56.92	33.01	4.89	30.74	100	166	Peak
2483.6	39.53	-14.47	54	-	-	-	-	-	-	Average

**Note:** The average levels were calculated from the peak level corrected with duty cycle correction factor (24.55dB) derived from 20log (dwell time/100ms).

For example: Average level = 66.68 dBuV/m – 24.55 (dB) = 42.13dBuV/m.



3.1.8 Test Result of Radiated Emission (30 MHz ~ 10<sup>th</sup> Harmonic)

Test Mode :	1Mbps	Temperature :	21~22°C
Test Channel :	78	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	2480 MHz is fundamental signal which can be ignored.		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level (dBμV)	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
31.843	19.07	-20.93	40	35.75	16.55	0.35	33.58	-	-	Peak
54.452	17.9	-22.1	40	44.53	6.49	0.46	33.58	-	-	Peak
91.495	17.1	-26.4	43.5	41.05	9.12	0.55	33.62	-	-	Peak
134.088	19.04	-24.46	43.5	40.55	11.39	0.69	33.59	-	-	Peak
416.179	21.13	-24.87	46	37.17	16.08	1.16	33.28	-	-	Peak
945.44	34.04	-11.96	46	44.02	20.71	1.75	32.44	200	0	Peak
2480	97.18	-	-	90.02	33.01	4.89	30.74	100	261	Peak
2480	72.63	-	-	-	-	-	-	-	-	Average

**Note:** The average levels were calculated from the peak level corrected with duty cycle correction factor (24.55dB) derived from 20log (dwell time/100ms).

For example: Average level = 97.18 dBuV/m -24.55 (dB) = 72.63 dBuV/m.

Test Mode :	1Mbps	Temperature :	21~22°C
Test Channel :	78	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	2480 MHz is fundamental signal which can be ignored.		

Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level (dBμV)	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
30.853	21.55	-18.45	40	37.5	17.29	0.34	33.58	-	-	Peak
41.713	19.44	-20.56	40	41.73	10.95	0.4	33.64	-	-	Peak
61.778	17.05	-22.95	40	44.88	5.27	0.49	33.59	-	-	Peak
93.113	20.35	-23.15	43.5	43.9	9.51	0.56	33.62	-	-	Peak
131.297	20.74	-22.76	43.5	42.02	11.63	0.68	33.59	-	-	Peak
945.44	35.3	-10.7	46	45.28	20.71	1.75	32.44	100	198	Peak
2480	94.74	-	-	87.58	33.01	4.89	30.74	100	96	Peak
2480	70.19	-	-	-	-	-	-	-	-	Average



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 09, 2011	Oct. 26, 2012	Nov. 08, 2012	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Oct. 26, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 08, 2011	Oct. 26, 2012	Dec. 07, 2012	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 03, 2012	Oct. 26, 2012	Jul. 02, 2014	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2012	Oct. 26, 2012	Jan. 05, 2013	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060004	30MHz~2GHz	Dec. 30, 2011	Oct. 26, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 30, 2011	Oct. 26, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2011	Oct. 26, 2012	Nov. 06, 2012	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Oct. 10, 2012	Oct. 26, 2012	Oct. 09, 2013	Radiation (03CH01-KS)
Bluetooth Base Station	R&S	CBT	100783	N/A	Aug. 17, 2012	Oct. 26, 2012	Aug. 16, 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
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### Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.72
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## **Appendix C. Product Equality Declaration**

# CK TELECOM LTD.

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

TEL:0755-26739633/FAX:0755-26739500

Date: November 5, 2012

## Product Equality Declaration

We, CK TELECOM LTD., declare on our sole responsibility for the product of Doro PhoneEasy 410gsm below:

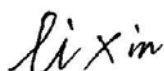
The differences between previous model Doro PhoneEasy 410gsm and current of Doro PhoneEasy 410gsm are as below:

- 1.Model name of LCD from TFT1P4448-E to TFT3P4064-E
- 2.Software changed from SHELL\_S02\_DORO410\_L14EN\_200\_090525\_MCP128+32\_BT\_FM to SHELL\_S02\_2V8\_DORO410\_L14EN\_215\_091201\_MCP128+32\_BT\_FM\_TB

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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