



Variant FCC RF Test Report

APPLICANT : Doro AB
EQUIPMENT : GSM/WCDMA Mobile Telephone
BRAND NAME : doro
MODEL NAME : Doro PhoneEasy 516
FCC ID : WS5DORO516
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 Apr. 03, 2014 and testing was completed on Jun. 06, 2014. We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-C-2004 and has been in 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 (SHENZHEN) INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL (SHENZHEN) INC.
No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C.



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REVISION HISTORY



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	N/A	PASS	-
3.2	§22.913(a)(2)	Effective Radiated Power	< 7 Watts	PASS	-
3.2	§24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.3	§2.1049 §22.917(b)	Occupied Bandwidth	N/A	PASS	-
3.4	§2.1051 §22.917(a)	Band Edge Measurement	$< 43+10\log_{10}(P[\text{Watts}])$	PASS	-
3.5	§2.1051 §22.917(a)	Conducted Spurious Emission	$< 43+10\log_{10}(P[\text{Watts}])$	PASS	-
3.6	§2.1053 §22.917(a) §24.238(a)	Field Strength of Spurious Radiation	$< 43+10\log_{10}(P[\text{Watts}])$	PASS	Under limit 25.56 dB at 5729.400 MHz
3.7	§2.1055 §22.355	Frequency Stability for Temperature & Voltage	< 2.5 ppm	PASS	-



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 Product Feature of Equipment Under Test

Product Feature	
Equipment	GSM/WCDMA Mobile Telephone
Brand Name	doro
Model Name	Doro PhoneEasy 516
FCC ID	WS5DORO516
EUT supports Radios application	GSM/GPRS/WCDMA Bluetooth v2.1+EDR
HW Version	RESORT-V2.0
SW Version	RESORT-S03A_DORO516_L17EN_200_140328
EUT Stage	Production Unit

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 subjective to this standard

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 : 29.90 dBm WCDMA Band V : 22.59 dBm
Antenna Type	Fixed Internal Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK WCDMA: QPSK (Uplink)



1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (W)	Frequency Tolerance (ppm)	Emission Designator
Part 22	WCDMA Band V RMC 12.2Kbps	QPSK	0.0849	0.01 ppm	4M18F9W
Part 24	GSM1900 GSM	GMSK	1.6848	-	-

1.7 Testing Location

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.		
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C. TEL: +86-755- 3320-2398		
Test Site No.	Sportun Site No.		FCC Registration No.
	TH01-SZ	03CH01-SZ	831040

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.		
Test Site Location	No. 101, Complex Building C, Guanlong Village, Xili Town, Nanshan District, Shenzhen, Guangdong, P.R.C. TEL:+86-755-8637-9589 FAX: +86-755-8637-9595		
Test Site No.	Sportun Site No.		
	OTA01-SZ		



1.8 Applicable Standards

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

- FCC 47 CFR Part 2, 22(H), 24(E)
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r01

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.



2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r01 with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

Frequency range investigated for radiated emission: 30MHz to 10th harmonic.

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 chosen to test as the worst case configuration as follows:

GSM mode for GMSK modulation,

RMC 12.2Kbps mode for WCDMA band V, only these modes were used for all tests.

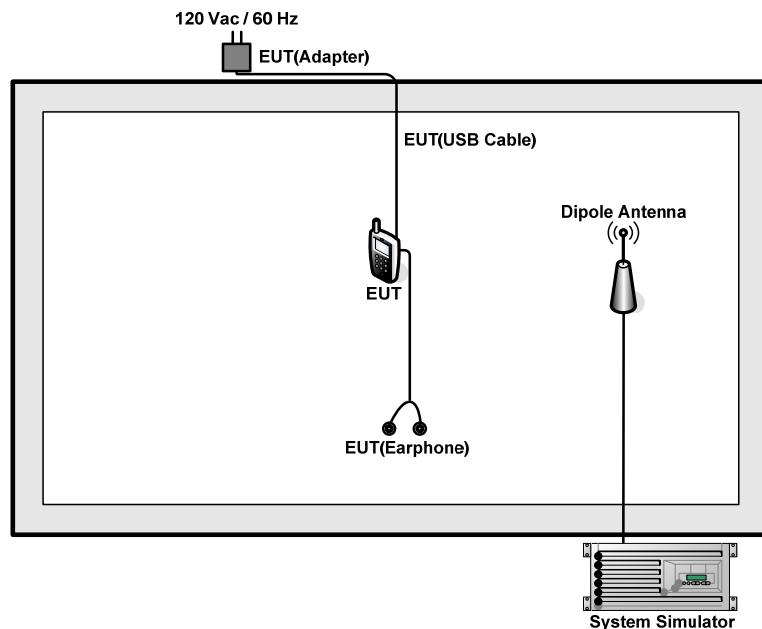
Conducted Power Measurement Results:

Conducted Power (*Unit: dBm)			
Band	GSM1900		
Channel	512	661	810
Frequency	1850.2	1880.0	1909.8
GSM	29.88	29.81	29.90
GPRS class 8	29.87	29.80	29.87
GPRS class 10	28.96	28.90	29.08
GPRS class 11	26.85	26.95	27.07
GPRS class 12	25.72	25.82	25.94

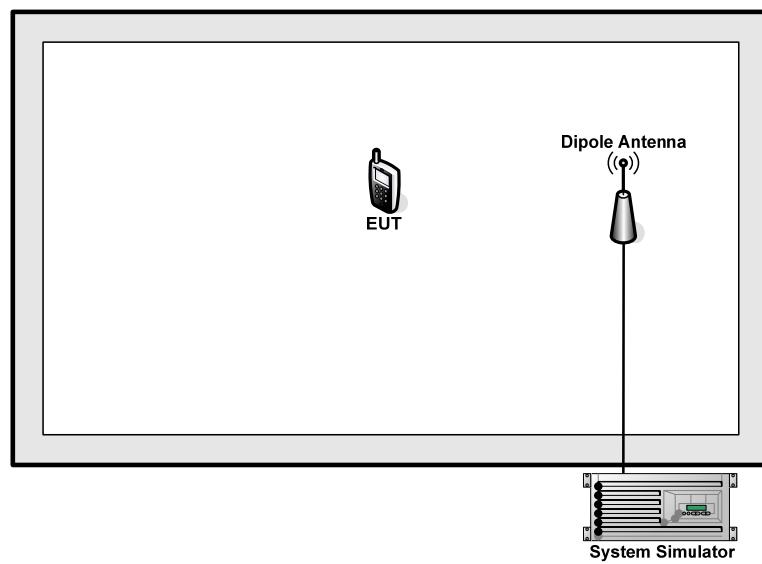
Conducted Power (*Unit: dBm)			
Band	WCDMA Band V		
Channel	4132	4182	4233
Frequency	826.4	836.4	846.6
AMR 12.2K	22.42	22.23	22.58
RMC 12.2K	22.43	22.24	22.59

2.2 Connection Diagram of Test System

For 22H



For 24E





2.3 Support Unit used in test configuration

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	TOPWORD	3303DR	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 RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

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

Offset = RF cable loss + attenuator factor.

The following shows an offset computation example with RF cable loss 7 dB and a 10dB attenuator.

Example :

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

$$=7 + 10 = 17 \text{ (dB)}$$

3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

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

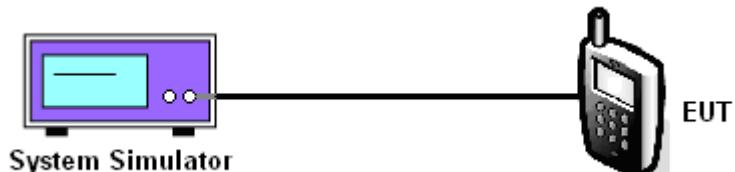
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. 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

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)	22.43	22.24	22.59

PCS Band			
Modes	GSM1900 (GSM)		
Channel	512 (Low)	661 (Mid)	810 (High)
Frequency (MHz)	1850.2	1880	1909.8
Conducted Power (dBm)	29.88	29.81	29.90

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



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 v02r01. The ERP of mobile transmitters must not exceed 7 Watts and the EIRP of mobile transmitters are limited to 2 Watts.

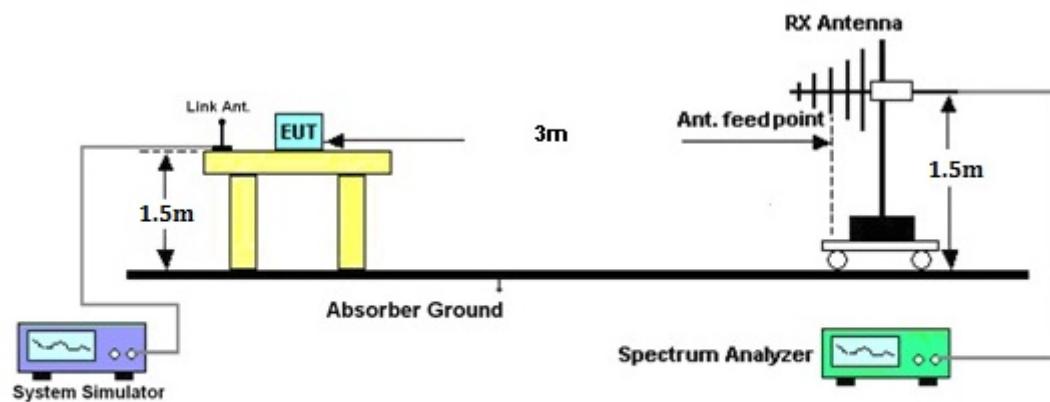
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

1. The EUT was placed on a turntable 1.5 meters high in a fully anechoic chamber.
2. The EUT was placed 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 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	-29.40	-48.12	0.00	-1.08	17.64	0.0581
836.40	-29.05	-48.28	0.00	-0.93	18.30	0.0676
846.60	-28.30	-48.35	0.00	-0.76	19.29	0.0849

Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
826.40	-44.10	-47.97	0.00	-1.08	2.79	0.0019
836.40	-43.54	-48.01	0.00	-0.93	3.54	0.0023
846.60	-42.52	-48.05	0.00	-0.76	4.77	0.0030



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	-22.72	-51.88	0.00	1.96	31.12	1.2945
1880.00	-23.16	-52.99	0.00	2.00	31.83	1.5239
1909.80	-23.99	-54.28	0.00	1.98	32.27	1.6848

Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1850.20	-22.81	-52.13	0.00	1.96	31.28	1.3419
1880.00	-23.63	-53.17	0.00	2.00	31.54	1.4268
1909.80	-24.14	-54.13	0.00	1.98	31.97	1.5755

3.3 99% Occupied Bandwidth and 26dB Bandwidth Measurement

3.3.1 Description of 99% Occupied Bandwidth and 26dB Bandwidth Measurement

The 99% occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

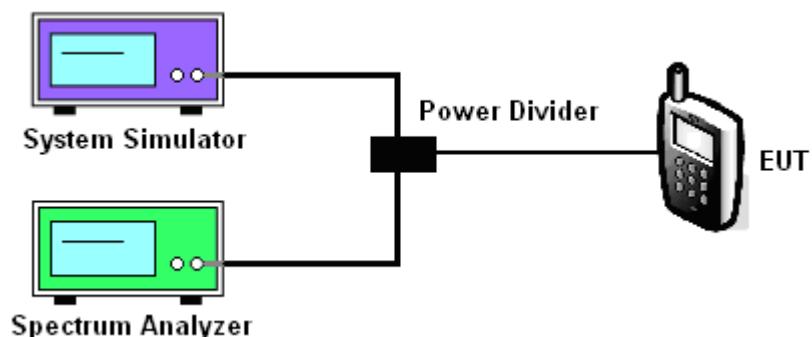
3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

1. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
2. The RF output of the EUT was connected to the spectrum analyzer by RF cable and attenuator.
The path loss was compensated to the results for each measurement.
3. The 99% occupied bandwidth were measured, set RBW= 1% of span, VBW= 3*RBW, sample detector, trace maximum hold.
4. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW= 3*RBW, peak detector, trace maximum hold.

3.3.4 Test Setup





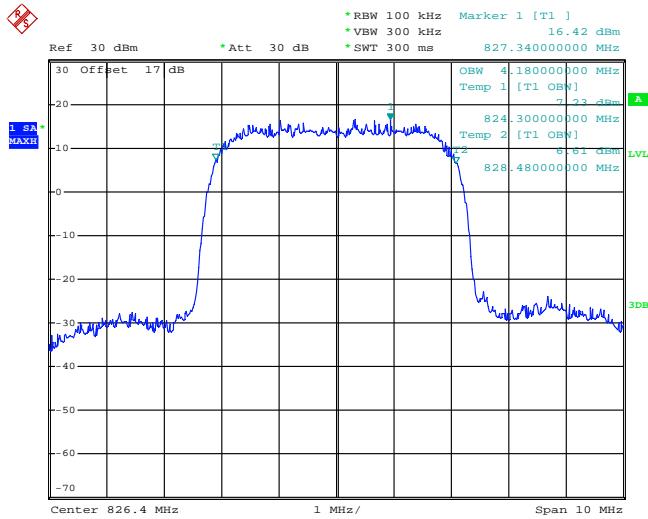
3.3.5 Test Result of Occupied Bandwidth and 26dB Bandwidth

Cellular Band			
Modes	WCDMA Band V (RMC 12.2Kbps)		
Channel	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	826.4	836.4	846.6
99% OBW (MHz)	4.18	4.18	4.16
26dB BW (MHz)	4.68	4.70	4.68

3.3.6 Test Result (Plots) of Occupied Bandwidth and 26dB Bandwidth

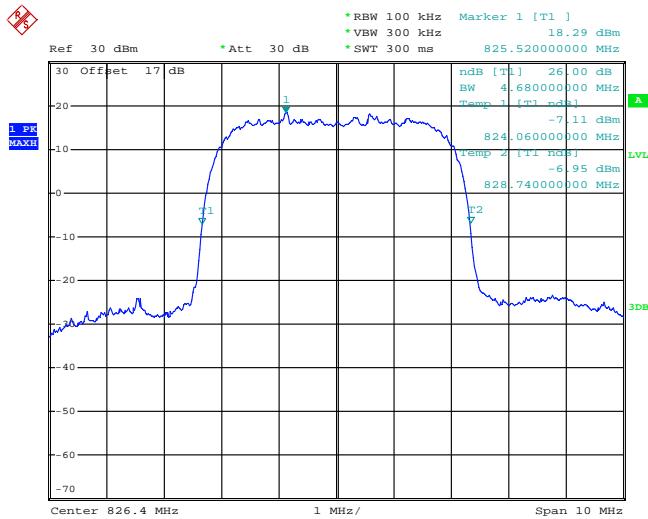
Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link (QPSK)
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99% Occupied Bandwidth Plot on Channel 4132 (826.4 MHz)

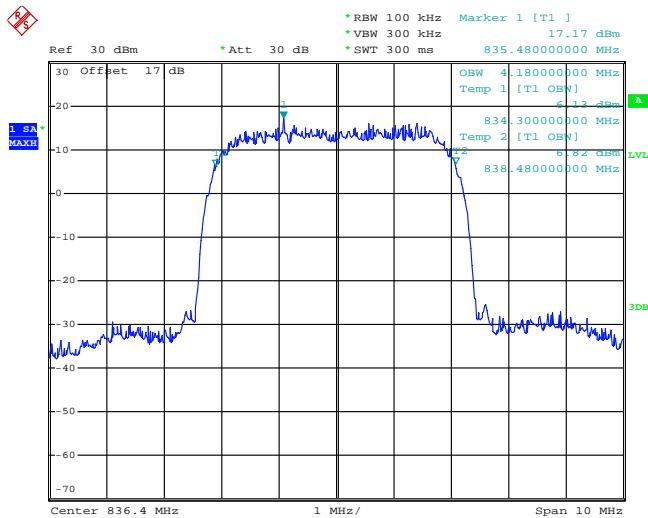


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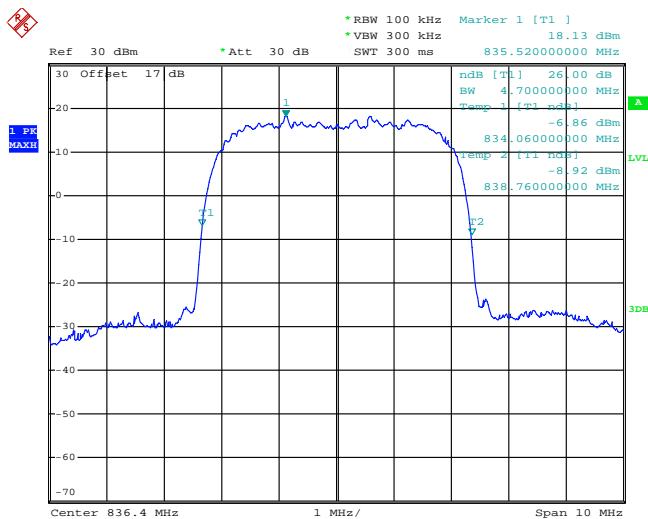
26dB Bandwidth Plot on Channel 4132 (826.4 MHz)



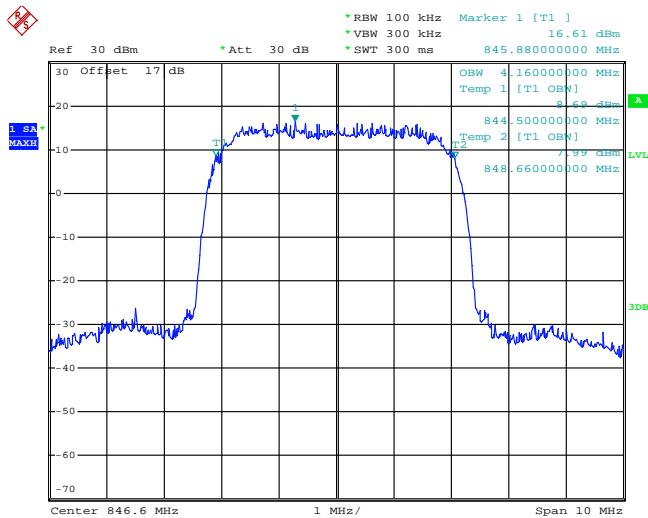
Date: 27.APR.2014 16:36:23

99% Occupied Bandwidth Plot on Channel 4182 (836.4 MHz)


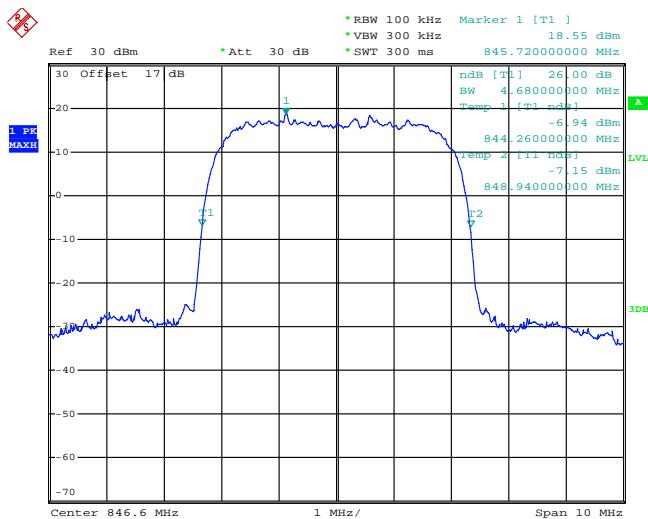
Date: 27.APR.2014 16:40:40

26dB Bandwidth Plot on Channel 4182 (836.4 MHz)


Date: 27.APR.2014 16:35:21

99% Occupied Bandwidth Plot on Channel 4233 (846.6 MHz)


Date: 27.APR.2014 16:38:23

26dB Bandwidth Plot on Channel 4233 (846.6 MHz)


Date: 27.APR.2014 16:37:16

3.4 Band Edge Measurement

3.4.1 Description of Band Edge Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

3.4.2 Measuring Instruments

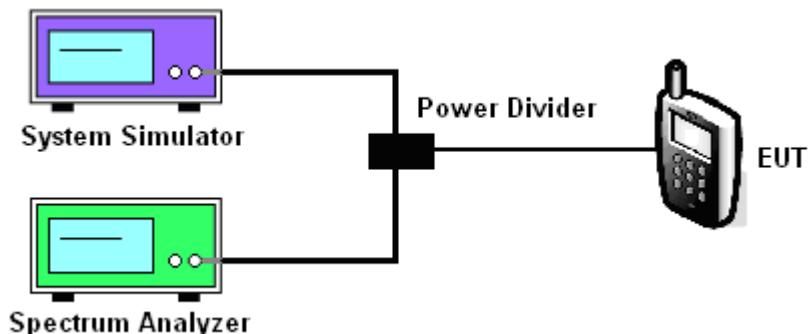
The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

1. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The band edges of low and high channels for the highest RF powers were measured.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)]$ (dB)
 $= [30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
 $= -13$ dBm.

3.4.4 Test Setup

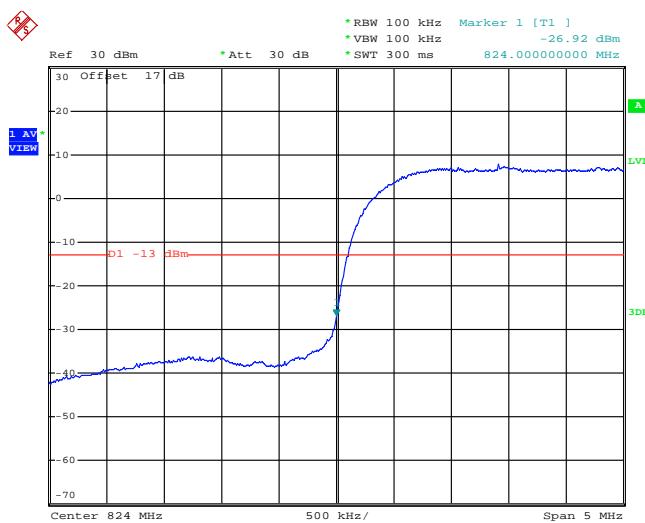
<Conducted Band Edge >



3.4.5 Test Result (Plots) of Conducted Band Edge

Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link (QPSK)
Correction Factor :	-3.28dB	Maximum 26dB Bandwidth :	4.700MHz
Band Edge :	-30.20dBm	Measurement Value :	-26.92dBm

Lower Band Edge Plot on Channel 4132 (826.4 MHz)

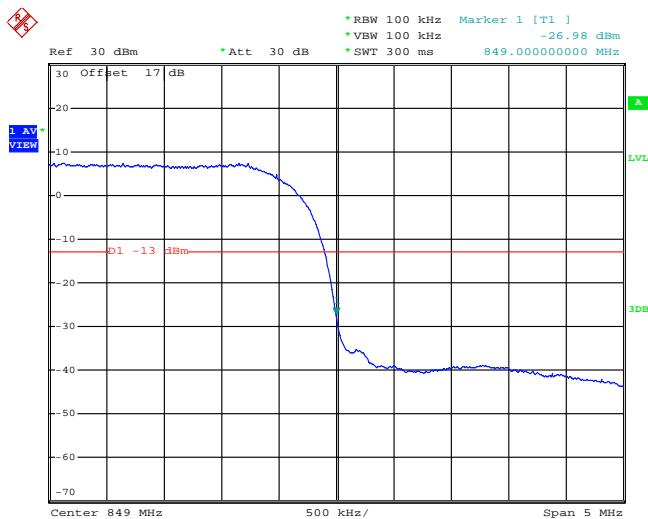


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1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW}/\text{RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

Band :	WCDMA Band V	Test Mode :	RMC 12.2Kbps Link (QPSK)
Correction Factor :	-3.28dB	Maximum 26dB Bandwidth :	4.700MHz
Band Edge :	-30.26dBm	Measurement Value :	-26.98dBm

Higher Band Edge Plot on Channel 4233 (846.6 MHz)



Date: 27.APR.2014 16:43:46

1. Correction Factor(dB)= $10\log(1\% \text{ Emission BW}/\text{RBW})$
2. Band Edge= Measurement Value + Correction Factor(dB)

3.5 Conducted Spurious Emission Measurement

3.5.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

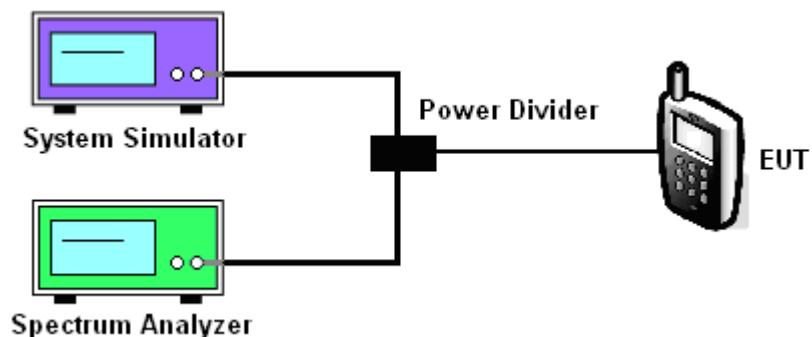
3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

1. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)]$ (dB)
 $= [30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
 $= -13$ dBm.

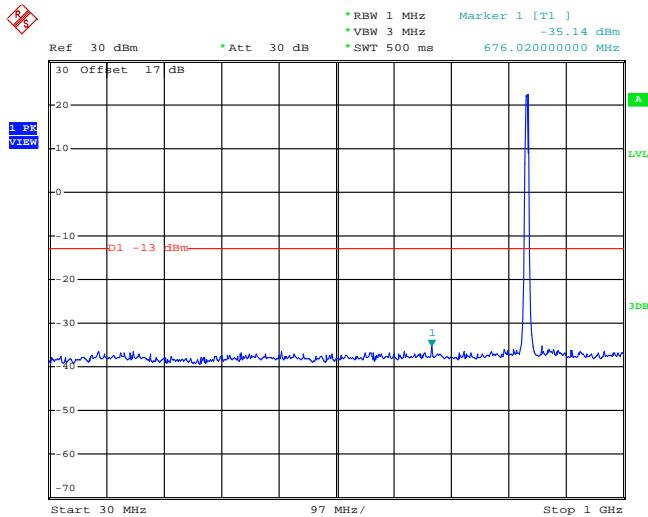
3.5.4 Test Setup



3.5.5 Test Result (Plots) of Conducted Spurious Emission

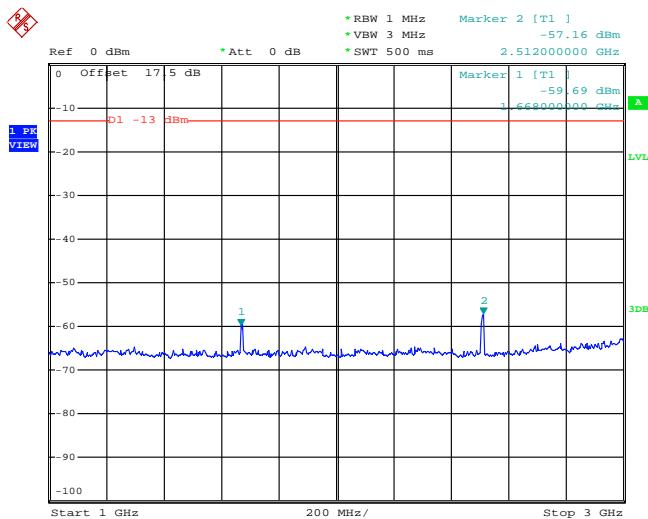
Band :	WCDMA Band V	Channel :	CH4182
Test Mode :	RMC 12.2Kbps Link (QPSK)	Frequency :	836.4 MHz

Conducted Spurious Emission Plot between 30MHz ~ 1GHz



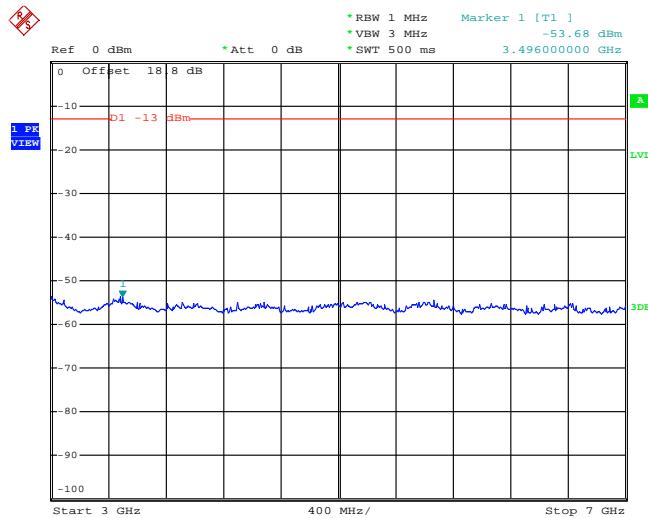
Date: 27.APR.2014 16:52:46

Conducted Spurious Emission Plot between 1GHz ~ 3GHz



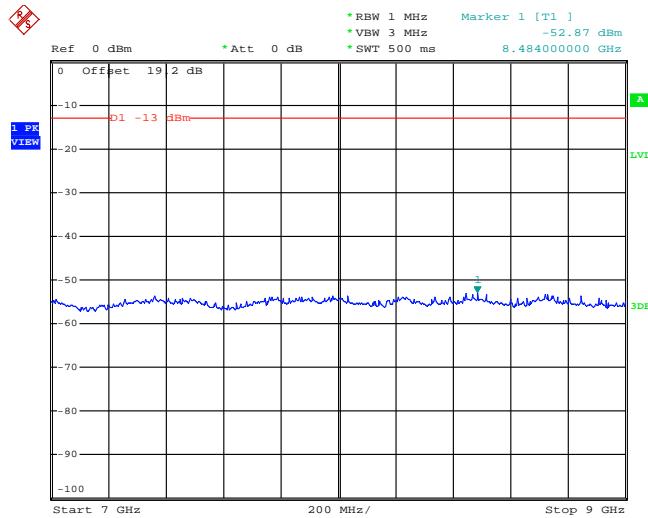
Date: 27.APR.2014 16:48:35

Conducted Spurious Emission Plot between 3GHz ~ 7GHz



Date: 27.APR.2014 16:50:12

Conducted Spurious Emission Plot between 7GHz ~ 9GHz



Date: 27.APR.2014 16:51:29



3.6 Field Strength of Spurious Radiation Measurement

3.6.1 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.

3.6.2 Measuring Instruments

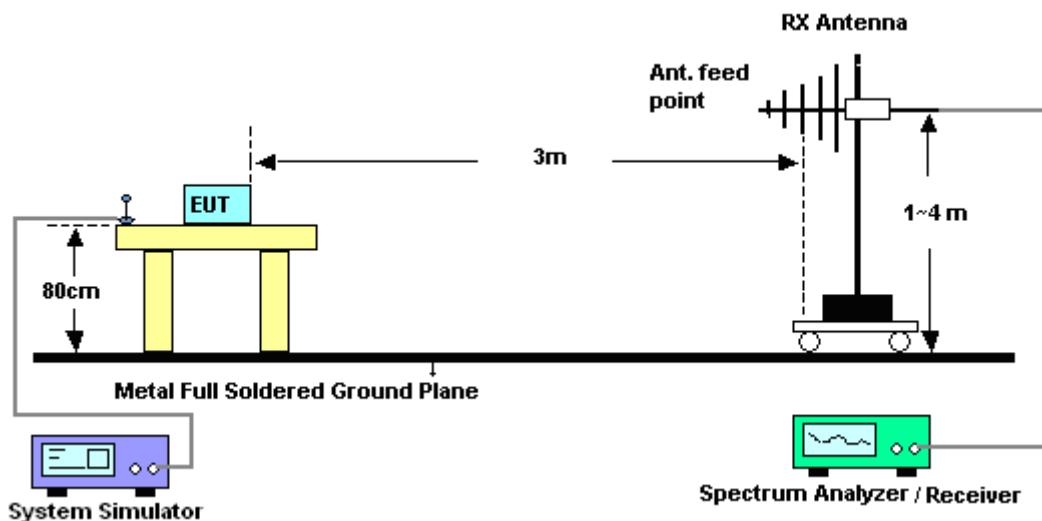
The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

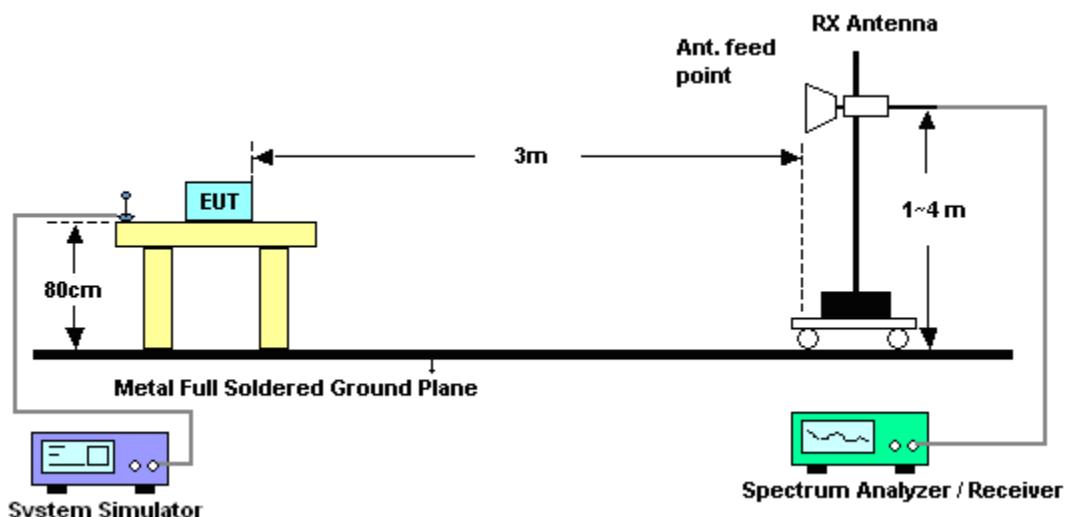
1. The EUT was placed on a rotatable wooden table 0.8 meters above the ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving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

3.6.4 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz





3.6.5 Test Result of Field Strength of Spurious Radiated

Band :	GSM1900 for CH512				Temperature :	24~25°C			
Test Mode :	GSM Link (GMSK)				Relative Humidity :	48~49%			
Test Engineer :	Rock Tang				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3700.4	-52.99	-13	-39.99	-64.54	-59.74	1.2	7.95	H	Pass
5550.6	-50.58	-13	-37.58	-67.97	-58.68	1.5	9.60	H	Pass
7400.8	-53.98	-13	-40.98	-75.56	-64.17	1.7	11.89	H	Pass

Band :	GSM1900 for CH512				Temperature :	24~25°C			
Test Mode :	GSM Link (GMSK)				Relative Humidity :	48~49%			
Test Engineer :	Rock Tang				Polarization :	Vertical			
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3700.4	-50.48	-13	-37.48	-64.91	-57.23	1.2	7.95	V	Pass
5550.6	-50.37	-13	-37.37	-66.85	-58.47	1.5	9.6	V	Pass
7400.8	-53.52	-13	-40.52	-75.41	-63.71	1.7	11.89	V	Pass



Band :	GSM1900 for CH661				Temperature :		24~25°C		
Test Mode :	GSM Link (GMSK)				Relative Humidity :		48~49%		
Test Engineer :	Rock Tang				Polarization :		Horizontal		
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.								
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
3760	-47.17	-13	-34.17	-61.60	-53.91	1.28	8.02	H	Pass
5640	-46.85	-13	-33.85	-64.84	-55.27	1.58	10.00	H	Pass
7520	-51.88	-13	-38.88	-73.82	-62.20	1.78	12.10	H	Pass

Band :	GSM1900 for CH661				Temperature :		24~25°C		
Test Mode :	GSM Link (GMSK)				Relative Humidity :		48~49%		
Test Engineer :	Rock Tang				Polarization :		Vertical		
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.								
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
3760	-47.80	-13	-34.80	-62.83	-54.54	1.28	8.02	V	Pass
5640	-39.15	-13	-26.15	-58.62	-47.57	1.58	10	V	Pass
7520	-50.49	-13	-37.49	-72.74	-60.81	1.78	12.1	V	Pass



Band :	GSM1900 for CH810				Temperature :	24~25°C			
Test Mode :	GSM Link (GMSK)				Relative Humidity :	48~49%			
Test Engineer :	Rock Tang				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3819.6	-46.09	-13	-33.09	-60.21	-52.86	1.23	8.00	H	Pass
5729.4	-45.26	-13	-32.26	-63.43	-53.39	1.52	9.65	H	Pass
7639.2	-49.06	-13	-36.06	-71.30	-59.24	1.82	12.00	H	Pass

Band :	GSM1900 for CH810				Temperature :	24~25°C			
Test Mode :	GSM Link (GMSK)				Relative Humidity :	48~49%			
Test Engineer :	Rock Tang				Polarization :	Vertical			
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3819.6	-49.80	-13	-36.80	-64.25	-56.57	1.23	8	V	Pass
5729.4	-38.56	-13	-25.56	-57.95	-46.69	1.52	9.65	V	Pass
7639.2	-49.31	-13	-36.31	-71.86	-59.49	1.82	12	V	Pass



Band :	WCDMA Band V for CH4132				Temperature :	24~25°C			
Test Mode :	RMC 12.2Kbps Link (QPSK)				Relative Humidity :	48~49%			
Test Engineer :	Rock Tang				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.								
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1652.8	-55.24	-13	-42.24	-68.96	-58.23	0.81	5.95	H	Pass
2479.2	-48.09	-13	-35.09	-69.68	-50.54	1.2	5.80	H	Pass
3305.6	-61.34	-13	-48.34	-71.94	-65.64	1.25	7.70	H	Pass

Band :	WCDMA Band V for CH4132				Temperature :	24~25°C			
Test Mode :	RMC 12.2Kbps Link (QPSK)				Relative Humidity :	48~49%			
Test Engineer :	Rock Tang				Polarization :	Vertical			
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.								
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1652.8	-57.88	-13	-44.88	-69.31	-60.87	0.81	5.95	V	Pass
2479.2	-50.20	-13	-37.20	-69.56	-52.65	1.20	5.80	V	Pass
3305.6	-60.25	-13	-47.25	-72.08	-64.55	1.25	7.70	V	Pass



Band :	WCDMA Band V for CH4182				Temperature :	24~25°C			
Test Mode :	RMC 12.2Kbps Link (QPSK)				Relative Humidity :	48~49%			
Test Engineer :	Rock Tang				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.								
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-52.15	-13	-39.15	-65.71	-55.12	0.88	6.00	H	Pass
2510	-48.68	-13	-35.68	-70.32	-51.29	1.08	5.84	H	Pass
3346	-61.25	-13	-48.25	-71.85	-65.62	1.14	7.66	H	Pass

Band :	WCDMA Band V for CH4182				Temperature :	24~25°C			
Test Mode :	RMC 12.2Kbps Link (QPSK)				Relative Humidity :	48~49%			
Test Engineer :	Rock Tang				Polarization :	Vertical			
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.								
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-58.80	-13	-45.80	-69.43	-61.77	0.88	6.00	V	Pass
2510	-51.11	-13	-38.11	-70.49	-53.72	1.08	5.84	V	Pass
3346	-60.31	-13	-47.31	-72.14	-64.68	1.14	7.66	V	Pass



Band :	WCDMA Band V for CH4233				Temperature :	24~25°C			
Test Mode :	RMC 12.2Kbps Link (QPSK)				Relative Humidity :	48~49%			
Test Engineer :	Rock Tang				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.								
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1693.2	-52.16	-13	-39.16	-66.34	-55.49	0.82	6.30	H	Pass
2539.8	-49.35	-13	-36.35	-70.82	-51.96	1.08	5.84	H	Pass
3386.4	-60.82	-13	-47.82	-71.71	-64.94	1.23	7.50	H	Pass

Band :	WCDMA Band V for CH4233				Temperature :	24~25°C			
Test Mode :	RMC 12.2Kbps Link (QPSK)				Relative Humidity :	48~49%			
Test Engineer :	Rock Tang				Polarization :	Vertical			
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.								
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1693.2	-55.23	-13	-42.23	-66.48	-58.56	0.82	6.30	V	Pass
2539.8	-50.07	-13	-37.07	-69.94	-52.68	1.08	5.84	V	Pass
3386.4	-59.95	-13	-46.95	-72.07	-64.07	1.23	7.50	V	Pass

3.7 Frequency Stability Measurement

3.7.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

3.7.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

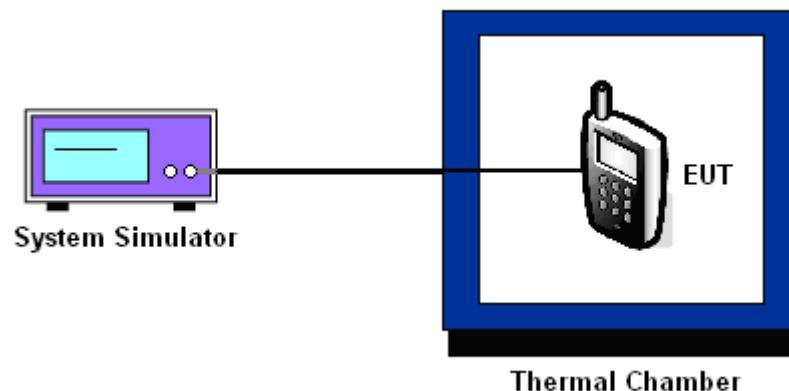
3.7.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C steps up to 50°C . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.7.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at $25\pm 5^\circ\text{C}$ and connected with the system simulator.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

3.7.5 Test Setup





3.7.6 Test Result of Temperature Variation

Band :	WCDMA Band V		Channel :	4182	
Limit (ppm) :	2.5		Frequency :	836.4 MHz	
Temperature (°C)	RMC 12.2Kbps			Result	
	Freq. Dev. (Hz)	Deviation (ppm)			
-30	-10	-0.01		PASS	
-20	-6	-0.01			
-10	-8	-0.01			
0	-9	-0.01			
10	-7	-0.01			
20(Ref.)	-9	-0.01			
30	-8	-0.01			
40	-6	-0.01			
50	-9	-0.01			



3.7.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
WCDMA Band V CH4182	RMC 12.2Kbps	3.7	-9	-0.01	2.5	Pass
		BEP	-8	-0.01		
		4.2	-10	-0.01		

Note:

1. Normal Voltage = 3.7V.
2. Battery End Point (BEP) = 3.6 V.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP30	101400	9kHz~30GHz	Mar. 03, 2014	Apr. 27, 2014	Mar. 02, 2015	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	13dBm~20dBm	Mar. 03, 2014	Apr. 27, 2014	Mar. 02, 2015	Conducted (TH01-SZ)
Power Sensor	Anritsu	MA2411B	1207253	0.3GHz~40GHz	Mar. 03, 2014	Apr. 27, 2014	Mar. 02, 2015	Conducted (TH01-SZ)
Thermal Chamber	Hongzhan	LP-150U	HD20120425	-40°C~150°C	Feb. 21, 2014	Apr. 27, 2014	Feb. 20, 2015	Conducted (TH01-SZ)
ESClO TEST Receiver	R&S	ESCI	100724	9kHz~3GHz	Feb. 21, 2014	Jun. 05, 2014	Feb. 20, 2015	Radiation (03CH01-SZ)
Spectrum Analyzer	Agilent Technologies	N9038A	MY52260185	20Hz~26.5GHz	May 26, 2014	Jun. 05, 2014	May 25, 2015	Radiation (03CH01-SZ)
Bilog Antenna	TESEQ	CBL 6112D	23188	30MHz~2GHz	Oct. 26, 2013	Jun. 05, 2014	Oct. 25, 2014	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS Lindgren	3117	00119436	1GHz~18GHz	Oct. 26, 2013	Jun. 05, 2014	Oct. 25, 2014	Radiation (03CH01-SZ)
Double Ridged Horn Antenna	COM-POWER	AH-840	101073	18GHz~40GHz	Jan. 27, 2014	Jun. 05, 2014	Jan. 26, 2015	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz~3000MHz	Feb. 21, 2014	Jun. 05, 2014	Feb. 20, 2015	Radiation (03CH01-SZ)
Amplifier	Yrai	AV3860B	04030	2GHz~26.5GHz	May 08, 2014	Jun. 05, 2014	May 07, 2015	Radiation (03CH01-SZ)
AC Source(AVR)	Chroma	61601	616010001985	100Vac~250Vac	Mar. 25, 2014	Jun. 05, 2014	Mar. 24, 2015	Radiation (03CH01-SZ)
Turn Table	EM Electronics	EM 1000	N/A	0~360 degree	NCR	Jun. 05, 2014	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM Electronics	EM 1000	N/A	1 m~4 m	NCR	Jun. 05, 2014	NCR	Radiation (03CH01-SZ)
Spectrum Analyzer	R&S	FSP 7	100818	9kHz~7GHz	Sep. 03, 2013	Jun. 06, 2014	Sep. 02, 2014	ERP/EIRP (OTA01-SZ)
Quad-Ridged Horn	ETS-Lindgren	3164-08	00102954	700MHz~10000MHz	N/A	Jun. 06, 2014	N/A	ERP/EIRP (OTA01-SZ)
Multi-Devices Controller	ETS-Lindgren	2090-OPT1	00108147	N/A	N/A	Jun. 06, 2014	N/A	ERP/EIRP (OTA01-SZ)
Switch Control Mainframe	Agilent	3499A	MY42005451	N/A	N/A	Jun. 06, 2014	N/A	ERP/EIRP (OTA01-SZ)



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))	3.9
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Appendix A. Photographs of EUT

Please refer to Sporton report number EP382804-01 which is issued separately.



Appendix C. Product Equality Declaration

CK TELECOM LTD.

Technology Road.High-Tech Development Zone. Heyuan, Guangdong,P.R.China.
Tel: +86-755-26739633; Fax: +86-755-26739500

Date: July 8, 2014

Product Equality Declaration

We, **CK TELECOM LTD**, declare on our sole responsibility for the product of **Doro PhoneEasy 516** (Band1&Band5) as below:

The difference between Doro PhoneEasy 516(Band1&Band5) and Doro PhoneEasy 516

- ◆ S.W. changed fromRESORT_S01A_DORO516_L17EN_107_130904 to
RESORT-S03A_DORO516_L17EN_200_140328
- ◆ H.W. By WCDMA Band8 changed to WCDMA Band5;
- ◆ In order to satisfy the WCDMA Band 5 antenna performance, adjust the RF matching circuit.
- ◆ Adjusted GSM900 RX circuit.
- ◆ Add Australian Charging adapter “HKC0035050-9B”
- ◆ Add a new battery “DBC-800B”

Except Listings above, the others are the same as previous version.

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

Sincerely yours,



Contact Person: Xin Li

Applicant: CK TELECOM LTD.

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