Prüfbericht - Nr.: 14029823 001

Test Report No.:

Auftraggeber: *Client:*	**XIRING SA** **River Seine** **25 Quai Gallieni** **92158 Suresnes Cedex** **France**
Gegenstand der Prüfung: *Test Item:*	**Short Range Device - Bluetooth Barcode and RFID Reader**
Bezeichnung: *Identification:*	**BOD-L, BOD-LA, BOD-FE, BOD-FS, BOD-LE**
Serien-Nr.: *Serial No.:*	**Engineering Sample**
Wareneingangs-Nr.: *Receipt No.:*	**00120319039-001**
Eingangsdatum: *Date of Receipt:*	**19.03.2012**
Prüfort: *Testing Location:*	**TÜV Rheinland Hong Kong Ltd.** 8/F., First Group Centre, 14 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong **Hong Kong Productivity Council** HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong
Prüfgrundlage: *Test Specification:*	**FCC Part 15 Subpart C** **ANSI C63.4-2003** **CISPR 22:1997**
Prüfergebnis: *Test Results:*	**Das vorstehend beschriebene Gerät wurde geprüft und entspricht oben genannter Prüfgrundlage.** The above mentioned product was tested and **passed**.
Prüflaboratorium: *Testing Laboratory:*	**TÜV Rheinland Hong Kong Ltd.** 8 - 10/F., Goldin Financial Global Square, 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong

geprüft/ *tested by:*

07.05.2012 — Mika Chan, Senior Project Engineer

Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

kontrolliert/ *reviewed by:*

07.05.2012 — Sharon Li, Section Manager

Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*

Sonstiges: **FCCID: QSHAIOKTD**
Other Aspects

Abkürzungen:				***Abbreviations:***			
	P(ass)	=	***entspricht Prüfgrundlage***		***P(ass)***	=	***passed***
	F(ail)	=	***entspricht nicht Prüfgrundlage***		***F(ail)***	=	***failed***
	N/A	=	***nicht anwendbar***		***N/A***	=	***not applicable***
	N/T	=	***nicht getestet***		***N/T***	=	***not tested***

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Product information

The equipment under test (EUT) is a batteries operated barcode and RFID reader operating at 13.56MHz.

Main EUT

Product Name		orKan Dual			
Part Number	B40170400//xxx	B40170403//xxx	B40170501//xxx	B40170502//xxx	B40170402//xxx
Reference	BOD-I	BOD-I F	BOD-FE	BOD-FS	BOD-LA
Assembled component . to get HW version : . to connect the Scan-engine (FPC)	J4	R7-R9 ; R17-R19 ; R28-R29 ; R122-R125 J7	J8		J4
Housing		Flat window			Tilted window
Scan Engine	EV10 Lite Intermec	EV15 Intermec	Honeywell IT5180SR	Honeywell IT5180SF	SE950 Motorola

Submitted documents

Circuit Diagram
Block Diagram
Bill of material
User manual

List of Test and Measurement Instruments

Hong Kong Productivity Council (Registration number: 90656)

Equipment used	Manufacturer	Model No.	S/N	Due Date
Semi-anechoic Chamber	Frankonia	Nil	Nil	25-May-12
Test Receiver	R & S	ESU40	100190	26-May-12
Bi-conical Antenna	R & S	HK116	100241	05-May-13
Log Periodic Antenna	R & S	HL223	841516/020	06-May-13
Coaxial cable 50ohm	Rosenberger	RTK081-05S-05S-10m	LA2-001-10M / 001	15-Nov-13
Microwave amplifer 0.5-26.5GHz, 25dB gain	HP	83017A	3950M00241	03-Oct-13
High Pass Filter (cutoff freq. =1000MHz)	Trilithic	23042	9829213	28-Oct-13
Horn Antenna	EMCO	3115	9002-3351	11-May-13
Spectrum Analyser	R & S	FSP 30	100416	17-Sep-12
Active Loop Antenna	EMCO	6502	9107-2651	19-Apr-12

Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions measurements is ±5.10dB (30MHz to 200MHz) and ±5.08dB (200MHz to 1000MHz).

Results FCC Part 15 – Subpart C

Subclause 15.203 – Antenna Information	**Pass**
Requirement:	No antenna other than that furnished by the responsible party shall be used with the device
Results:	Permanent attached antenna
Verdict:	Pass

Subclause 15.204 – Antenna Information	**Pass**
Requirement:	Provide information for every antenna proposed for the use with the EUT
Results:	a) Antenna type: Coil Antenna b) Manufacturer and model no: N.A. c) Gain with reference to an isotropic radiator: N/A dBi
Verdict:	Pass

Subclause 15.207 – Disturbance Voltage on AC Mains	**N/A**
Test Port: AC mains input port of the charger Applied voltage: -- Adaptor Model: -- Mode of operation: EUT did not operate during battery charging	

Subclause 15.209 – Radiated Emissions (30MHz to 1GHz)	**Pass**
Test Specification : ANSI C63.4 – 2003 Mode of operation : Operating mode Supply voltage : DC3.7V, 1X3.7V Li-ion Rechargeable Battery Measurement distance : 3 meters Detector : Quasi-Peak detector for frequency below 1000MHz except for frequency bands 9-90KHz and 110-490KHz. Average detector for frequency bands 9-90KHz, 110-490KHz and above 1000MHz. Temperature : 23ºC Humidity : 50%	
Requirement:	The emissions from an intentional radiator shall not exceed the field strength levels specified in the table mentioned in section 15.209.

Vertical Polarization

Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
40.680	18.1	40.0 / QP
501.764	37.7	46.0 / QP
602.117	38.8	46.0 / QP

Horizontal Polarization		
Freq MHz	**Level dBuV/m**	**Limit/ Detector dBuV/m**
198.657	31.2	43.5 / QP
351.234	40.6	46.0 / QP
602.116	43.2	46.0 / QP
Verdict: Pass		

Remark: There is no spurious emission found between 9kHz to 30 MHz.

Subclause 15.215 (c) – 20 dB Bandwidth **Pass**

Requirement: The intentional radiators must be designed to ensure that the 20dB bandwidth of the emission, is contained within the frequency band designated in the rule section under which the equipment is operated.

Test Specification : ANSI C63.4 – 2003
Mode of operation : Operating mode
RBW/VBW : 10KHz/10KHz
Supply voltage : DC6V, 4 X AA size batteries
Temperature : 23ºC
Humidity : 50%

Results: For test protocols refer to Appendix 1, page 2.

Frequency (MHz)	**20 dB left (MHz)**	**Limit (MHz)**	**20 dB right (MHz)**	**Limit (MHz)**
13.564	13.480	> 13.110	13.700	< 14.010

Subclause 15.225 (a-d) – Radiated Emission **Pass**

Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

MR = R + AF + CF + FA – PA

Where MR = Measurement Results in dBuV/m at 3 meters.
R = Reading of Spectrum Analyzer in dBuV.
AF = Antenna Factor in dB.
CF = Cable Attenuation Factor in dB.
FA = Filter Attenuation Factor in dB.
PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

Requirement:

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters (124 dBuV /m at 3 meters with extrapolation factor of 40 dB/decade).

(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters (90.5 dBuV /m at 3 meters with extrapolation factor of 40 dB/decade).

(c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters (80.5 dBuV /m at 3 meters with extrapolation factor of 40 dB/decade).

(d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

Test Specification : FCC Part 15 Subpart A – Subclause 15.31
Mode of operation : Operating mode
Detector : quasi-peak detector
Temperature : 23ºC
Humidity : 50%

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
13.560	56.89	124.0 / QP

Results: For test Results plots refer to Appendix 1, page 3.

Verdict: Pass

Subclause 15.225 (e) – Frequency Tolerance **Pass**

Requirement: The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C in 10 degrees C steps at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage or battery end point at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

Test Specification : FCC Part 15 Subpart A – Subclause 15.31
Mode of operation : Operating mode
Detector : Peak
RBW/VBW : 30 Hz / 30 Hz

Temp. (°C)	Supply Voltage (V)	Frequency (MHz)	Tolerance (Hz)	Limit (KHz)	Verdict
-20	3.80	13.560400	+40	±1.3560360	Pass
-10	3.80	13.560410	+50	±1.3560360	Pass
0	3.80	13.560390	+30	±1.3560360	Pass
10	3.80	13.560360	0	±1.3560360	Pass
20	3.80	13.560360	-	-	Reference
20	3.61 **(Battery end point)**	13.560360	0	±1.3560360	Pass
30	3.80	13.560350	-10	±1.3560360	Pass
40	3.80	13.560350	-10	±1.3560360	Pass
+50	3.80	13.560360	0	±1.3560360	Pass

Results: The measured peak frequency is within +/- 0.01% of the fundamental frequency.

Verdict: Pass