

EMF Evaluation Report

Date of Report	3/04/2019	Client's Contact person:	Joaquin Gomez Serrano
Number of pages:	9	Responsible Test engineer:	Juho Tuohino
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Tested device	WLC4090 (BK-BT)		
Related reports:	-		
Testing has been carried out in accordance with:	680106 D01 RF Exposure Wireless Charging App v03 Rf exposure considerations for low power consumer wireless power transfer applications		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory		
Test Results:	The EUT complies with the requirements in respect of all parameters subject to the test. The test results relate only to devices specified in this document		
Date and signatures:	03.04.2019		

Laboratory Manager

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1. SUMMARY OF EMF TEST REPORT

1.1 Test Details

Equipment under Test (EUT):

Product:	WLC4090
Manufacturer:	Datalogic
Serial Number:	Z18P01595
FCC ID	U4FWRLCHR
Type:	BK-BT
DUT Number:	22821
State of the Sample	Production sample

Testing information:

Testing performed:	12.10.2018
Notes:	
Document ID:	FCC_EMF_Report_BK-BT_ID3121_03042019.docx
Measurement performed by:	Juho Tuohino

1.2 Maximum Results

1.2.1 KDB 680106 D01

The maximum reported electric field and magnetic field strength values are shown in tables below. The device conforms to the requirements of the standards when the maximum measurement value is less than the MPE limit.

Test	Distance to EUT* [cm]	MPE Limits	Measured value	Result
Electric field strength	15	614 V/m	0.93 V/m	PASS
Magnetic field strength	15	1.63 A/m	0.48 A/m	PASS

*measured from the center of the probe(s) to the edge of the device

Test	Measurement location	Distance to EUT* [cm]	MPE Limits- 50%	Measured value	Result
Magnetic field	sides	15	0.815 A/m	0.34 A/m	PASS
Magnetic field	top	20	0.815 A/m	0.20 A/m	PASS

*FCC measured from the center of the probe(s) to the edge of the device

2. DESCRIPTION OF THE DEVICE UNDER TEST (DUT)

The DUT is a cradle for a bar code reader with a wireless charging capability. It can be powered via host communication port or aux power port.

Device Category	Mobile
Exposure Environment	Uncontrolled

2.1 Technical data of the DUT

Operating Frequency	120-200 kHz
Antenna Type	Inductive loop coil antenna
Power Supply	AC 230 V / DC 5V usb
Maximum Nominal Power	5W

3. TEST EQUIPMENT

Test Equipment	Model	Serial Number	Calibration Date
E and H field meter	Narda EHP-200AC	170WX80310	19.3.2018

3.1 Test setup

3.1.1 KDB 680106 D01

E- and H-field was measured from all sides and top of the DUT. The separation distance reported is measured from the center of the probe to the edge of the device. Photos of the test setup are shown in appendix A.

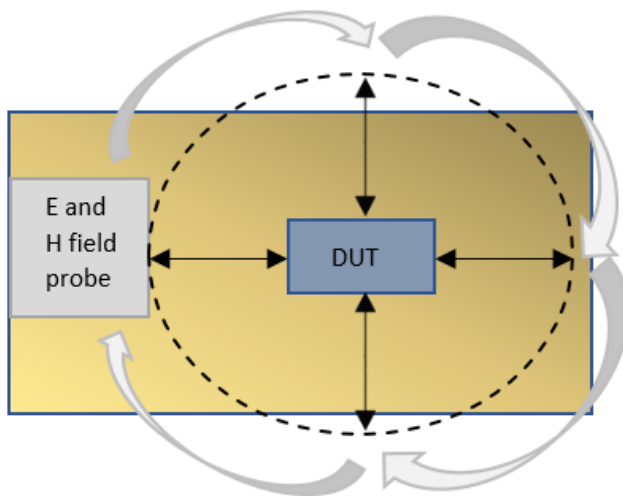


Figure 1 The top view of the test setup.

3.2 Limits

Limints for MPE

TABLE 1 - LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	* 100	6
3.0-30	1842/f	4.89/f	* 900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	* 100	30
1.34-30	824/f	2.19/f	* 180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

3.3 Measurement uncertainty

Magnetic field

30kHz-30MHz

Quantity	Relative standard uncertainty in (%)	Probability distribution	Sensitivity coefficient	Degrees of freedom	Relative uncertainty contribution
Uncertainty of the calibration of the sensor	3.9	normal	1	infinite	0.039
Uncertainty of the frequency response of the sensor	2.7	rectangular	1	infinite	0.027
Uncertainty of the non-linearity	3.4	rectangular	1	infinite	0.034
Uncertainty of the anisotropy	4.5	rectangular	1	infinite	0.045
Uncertainty of the resolution of the measurement system	1	rectangular	1	infinite	0.01
Uncertainty of the temperature variation	2.3	rectangular	1	infinite	0.023
Uncertainty of the repeatability of the measurements	2	normal	1	4	0.02
Combined standard uncertainty		normal		infinite	0.08
Expanded uncertainty (k=2)					16 %

Electric field

9kHz-27MHz

Quantity	Relative standard uncertainty in (%)	Probability distribution	Sensitivity coefficient	Degrees of freedom	Relative uncertainty contribution
Uncertainty of the calibration of the sensor	3.9	normal	1	infinite	0.039
Uncertainty of the frequency response of the sensor	1.7	rectangular	1	infinite	0.017
Uncertainty of the non-linearity	2.7	rectangular	1	infinite	0.027
Uncertainty of the anisotropy	4.1	rectangular	1	infinite	0.041
Uncertainty of the resolution of the measurement system	1.9	rectangular	1	infinite	0.019
Uncertainty of the temperature variation	2.3	rectangular	1	infinite	0.023
Uncertainty of the repeatability of the measurements	2	normal	1	4	0.02
Combined standard uncertainty		normal		infinite	0.074
Expanded uncertainty (k=2)					14.8 %

4. TEST RESULTS

Test description	Findings
A frequency span from 3 kHz to 30 MHz was scanned to check for spurious.	No spurious above -20 dBc was identified.
Occupied Band Width check.	OBW was measured and found to be less than 1kHz. RBW set to 1 kHz, Span 20 kHz.
All sides and top of DUT were scanned.	Maximum emissions from top side of loop (Appendix A: Photos of DUT)
E- and H-field measurement was performed with increased monitoring period.	Results in the table below.

4.1 Electric Field Results

Measurement direction	Separation distance* [cm]	Measured E-Field [V/m]	Power supply	Battery charge status
Top	15	Peak 0.75	AC 230V	~90%
Top	15	Peak 0.77	AC 230V	~50%
Top	15	Peak 0.93 / 6 min Avg 0.56	AC 230V	~1%
Top	15	Peak 0.82	DC 5V	
Side 1	15	Peak 0.69	AC 230V	
Side 2	15	Peak 0.79	AC 230V	
Side 3	15	Peak 0.66	AC 230V	
Side 4	15	Peak 0.64	AC 230V	

*measured from the center of the probe(s) to the edge of the device

4.2 Magnetic Field Results

Measurement direction	Separation distance* [cm]	Measured H-Field [A/m]	Power supply	Charge status
Top	15	Peak 0.42	AC 230V	~90%
Top	15	Peak 0.46	AC 230V	~50%
Top	15	Peak 0.48 / 6 min Avg 0.41	AC 230V	~1%
Top	20	Peak 0.20/6 min Avg 0.19	AC 230V	
Top	15	Peak 0.40	DC 5V	
Side 1	15	Peak 0.34	AC 230V	
Side 2	15	Peak 0.13	AC 230V	
Side 3	15	Peak 0.09	AC 230V	
Side 4	15	Peak 0.12	AC 230V	

*measured from the center of the probe(s) to the edge of the device