

TEST REPORT

Report Number. : 14919986-E2V2

Applicant : BELKIN INTERNATIONAL, INC.
555 S. AVIATION BLVD., SUITE 180
EL SEGUNDO, CA 90245, USA

Model : WIZ022

FCC ID : K7SWIZ022

EUT Description : BoostCharge Portable USB-C Apple Watch Charger

Test Standard(s) : FCC PART 1 SUBPART I
FCC PART 2 SUBPART J

Date Of Issue:
2024-01-26

Prepared by:
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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2023-12-15	Initial Issue	---
V2	2024-01-26	Updated Section 6.1, 6.3 to address TCB's question	Tina Chu

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: BELKIN INTERNATIONAL, INC.
555 S. AVIATION BLVD., SUITE 180
EL SEGUNDO, CA 90245, USA

EUT DESCRIPTION: BoostCharge Portable USB-C Apple Watch Charger

MODEL NUMBER: WIZ022

BRAND: belkin

SERIAL NUMBER: 61E10F6AD00051

SAMPLE RECEIPT DATE: 2023-10-18

DATE TESTED: 2023-10-20 TO 2023-11-06

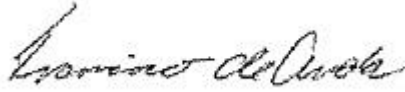
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 1 SUBPART I & PART 2 SUBPART J	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document.

Approved & Released For
UL Verification Services Inc. By:



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Staff Engineer
Consumer Technology Division
UL Verification Services Inc.

Prepared and Co-reviewed By:



Tina Chu
Senior Project Engineer
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UL Verification Services Inc.

2. TEST METHODOLOGY

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

All testing / calculations were made in accordance with;

- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 447498 D03 Supplement C Cross-Reference v01
- FCC KDB 680106 D01 Wireless Power Transfer v04

3. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, certification #0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☐	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
☒	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
☐	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA			

4. DECISION RULES AND MEASUREMENT UNCERTAINTY

4.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

4.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U_{Lab}
Magnetic Field Reading (A/m)	+/-0.04284 (A/m)
Electric Field Reading (V/m)	+/-0.03682 (V/m)

Uncertainty figures are valid to a confidence level of 95.45%.

5. KDB 680106 D01 SECTION 5b EQUIPMENT APPROVAL CONSIDERATIONS

Requirement	Device
(1) The power transfer frequency is below 1 MHz.	No. The maximum operating frequency is 1.778MHz.
(2) The output power from each transmitting element (e.g., coil) is less than or equal to 15 watts.	Yes. The maximum power is 5W.
(3) A client device providing the maximum permitted load is placed in physical contact with the transmitter (i.e., the surfaces of the transmitter and client device enclosures need to be in physical contact)	Yes. The client device is placed directly in contact with the transmitter.
(4) Only § 2.1091-Mobile exposure conditions apply (i.e., this provision does not cover § 2.1093-Portable exposure conditions).	No. EUT can be portable and mobile. Mobile mode is evaluated in this report only. See separate report for portable mode result.
(5) The E-field and H-field strengths, at and beyond 20 cm surrounding the device surface, are demonstrated to be less than 50% of the applicable MPE limit, per KDB 447498, Table 1. These measurements shall be taken along the principal axes of the device, with one axis oriented along the direction of the estimated maximum field strength, and for three points per axis or until a 1/d (inverse distance from the emitter structure) field strength decay is observed. Symmetry considerations may be used for test reduction purposes. The device shall be operated in documented worst-case compliance scenarios (i.e., the ones that lead to the maximum field components), and while all the radiating structures (e.g., coils or antennas) that by design can simultaneously transmit are energized at their nominal maximum power.	Yes. In mobile mode: E-field: 0.28% H-field: 0.73% *all sides tested at 15cm as worst case, except top tested as 20cm.
(6) For systems with more than one radiating structure, the conditions specified in (5) must be met when the system is fully loaded (i.e., clients absorbing maximum power available), and with all the radiating structures operating at maximum power at the same time, as per design conditions. If the design allows one or more radiating structures to be powered at a higher level while other radiating structures are not powered, then those cases must be tested as well. For instance, a device may use three RF coils powered at 5 W, or one coil powered at 15 W: in this case, both scenarios shall be tested.	No. The system has one individual coil only and allows for capable wireless power transfer between one source and one client at same time.

Table 1

Summary of E- and H-fields as percentage of RF exposure limits						
Frequency / coil	326.5kHz (Standby)		326.5kHz (Legacy Watch)		1778kHz (New Watch)	
Test Config	E	H	E	H	E	H
1	0.02%	0.55%				
2			0.28%	0.61%		
3					0.05%	0.73%
Worst E-field (in relative to limit)	0.28%					
	1.72(V/m)					
Worst H-field (in relative to limit)	0.73%					
	0.009 (A/m)					

6. EQUIPMENT UNDER TEST

6.1. DESCRIPTION OF EUT

The EUT, BoostCharge Portable USB-C Apple Watch Charger, is a single coil wireless charger capable of charging one client device at a time. It is used to charge an Apple Watch at 326.5kHz or 1.778MHz (5W Max).

The EUT is powered through a USB-C port that can output at least 5V/1A (5W).

6.2. SOFTWARE AND FIRMWARE

The firmware version installed in the EUT during testing was:
326.5kHz/1.778MHz: V20.30

6.3. WORST-CASE CONFIGURATION AND MODE

Testing for watch is based on direct contact with no shifts in position due to the embedded magnet in the charger pad.

The EUT can be a mobile and a portable device. (e.g. portable when it connects to a laptop with Type C port). This report does not cover portable mode. See separate report for this mode.

Config	Descriptions	Frequency	Client and worst-case orientation
1	EUT is powered by AC/DC adapter.	326.5kHz only. 1.778MHz is not observed	No WPT client used. Stand-by.
2	EUT is powered by AC/DC adapter. Direct contact during charging/operating between the EUT & WPT Client.	326.5kHz (1W)	Legacy watch. With the digital crown/home button facing the USB Type-C port
3		1.778MHz (5W)	Series 8 watch. 270 degrees with the digital crown/home button is on the right, 3 o'clock relative to the USB Type-C port

7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was used for the tests documented in this report:

Test Equipment List					
Description	Manufacturer	Model	Label ID	Cal Due	Cal Date
Near-field Electric and Magnetic Field Sensor System	SPEAG Schmid & Partner Engineering AG	MAGPy-8H3D+E3d	235867	2024-08-31	2023-08-24
Thermometer - Digital	Control Company	14-650-118	170361	2024-02-29	2023-02-09

8. DUTY CYCLE

LIMITS

None; for reporting purposes only.

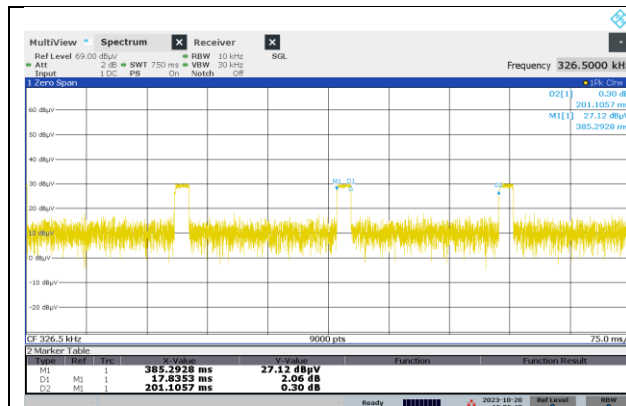
PROCEDURE

Zero-Span Spectrum Analyzer Method.

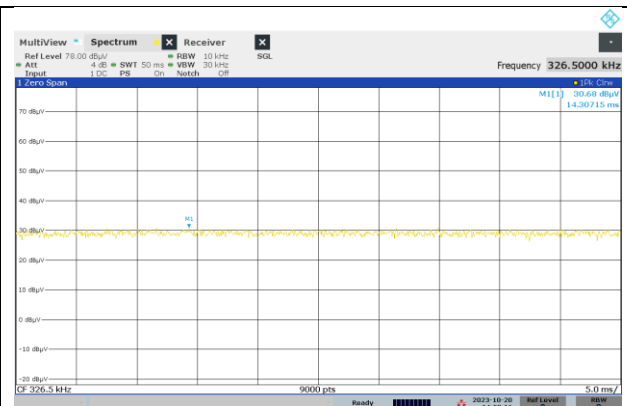
ON TIME AND DUTY CYCLE RESULTS

Test Engineer:	28199 JM
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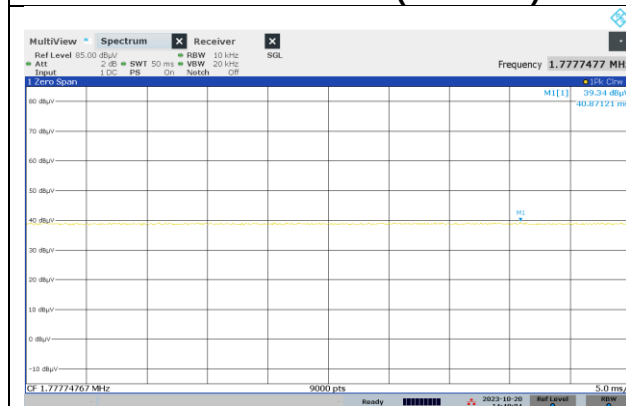
Configuration	Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
1	Standby @ 326.5kHz	17.84	201.11	0.09	8.87	10.52
2	Operating Frequency @ 326.5kHz (1W)	1.00	1.00	1.00	100.00	0.00
3	Operating Frequency @ 1.778MHz (5W)	1.00	1.00	1.00	100.00	0.00



CONFIGURATION 1 (326.5kHz)



CONFIGURATION 2 (326.5kHz)



CONFIGURATION 3 (1.778MHz)

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9. MAXIMUM PERMISSIBLE RF EXPOSURE

9.1. FCC LIMITS AND SUMMARY

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

Table 1 to § 1.1310(e)(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)
(i) 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
(ii) 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

f = frequency in MHz. * = Plane-wave equivalent power density.

According to KDB 680106 D01 Wireless Power Transfer, section 3.2, for § 2.1091-Mobile devices, the MPE limits between 100 kHz to 300 kHz are to be considered the same as those at 300 kHz in Table 1 of § 1.1310, that is, 614 V/m and 1.63 A/m, for the electric field and magnetic field, respectively. For § 2.1093-Portable devices below 4 MHz and down to 100 kHz, the MPE limits in § 1.1310 (with the 300 kHz limit applicable all the way down to 100 kHz) can be used for the purpose of equipment authorization in lieu of SAR evaluations.

RESULT

Test Engineer:	27957 CC, 27979 HN	Test Date:	2023-10-23 TO 2023-11-06
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9.1.1. MAXIMUM RESULT SUMMARY

FCC Config 1: 326.5kHz					
Electric Field Limit			Magnetic Field Limit		
FCC RF Exposure Limit	Maximum Average (V/m)	Percentage (%)	FCC RF Exposure Limit	Maximum Average (A/m)	Percentage (%)
614	0.104	0.02%	1.63	0.009	0.55%
FCC Config 2: Legacy Watch 326.5kHz					
Electric Field Limit			Magnetic Field Limit		
FCC RF Exposure Limit	Maximum Average (V/m)	Percentage (%)	FCC RF Exposure Limit	Maximum Average (A/m)	Percentage (%)
614	1.720	0.28%	1.63	0.010	0.61%
FCC Config 3: New Watch 1.778MHz					
Electric Field Limit			Magnetic Field Limit		
FCC RF Exposure Limit	Maximum Average (V/m)	Percentage (%)	FCC RF Exposure Limit	Maximum Average (A/m)	Percentage (%)
463.44	0.250	0.05%	1.23	0.009	0.73%

9.1.2. E- FIELD AND H- FIELD MEASUREMENTS

Note: Peak measurements were performed. RMS values were calculated from the peak measurement. Please refer to the formula for calculating the RMS values: [Field Strength x $\sqrt{\text{Duty Cycle}}$].

CONFIGURATION 1: WPT ON STANDBY

Configuration	Test Mode	Measuring Distance (cm)	Electric Field Limit (V/m)	Electric Field Reading (V/m)				Magnetic Field Limit (A/m)	Magnetic Field Reading (A/m)			
			FCC Limit	Location	Peak	Duty Cycle %	FCC Average	FCC Limit	Location	Peak	Duty Cycle %	FCC Average
1	Standby	15 cm surrounding the device (S1 - S4, bottom) and 20 cm above the top surface of the EUT	614	S1	0.230	8.87	0.068	1.63	S1	0.009	8.87	0.003
				S2	0.350		0.104		S2	0.006		0.002
				S3	0.130		0.039		S3	0.010		0.003
				S4	0.200		0.060		S4	0.010		0.003
				Top	0.140		0.042		Top	0.010		0.003
				Bottom	0.230		0.068		Bottom	0.020		0.006
				Max	0.350		0.104		Max	0.030		0.009
				S1	0.170	100	0.170	1.63	S1	0.010	100	0.010
				S2	0.240		0.240		S2	0.010		0.010
				S3	0.250		0.250		S3	0.004		0.004
				S4	0.290		0.290		S4	0.009		0.009
				Top	0.380		0.380		Top	0.005		0.005
				Bottom	0.130		0.130		Bottom	0.004		0.004
				Max	0.380		0.380		Max	0.010		0.010
				S1	0.240		0.240		S1	0.007		0.007
				S2	0.420		0.420		S2	0.010		0.010
				S3	0.330		0.330		S3	0.008		0.008
				S4	0.420		0.420		S4	0.010		0.010
				Top	0.130		0.130		Top	0.007		0.007
				Bottom	0.180		0.180		Bottom	0.006		0.006
				Max	0.420		0.420		Max	0.010		0.010
				S1	0.280	100	0.280		S1	0.003	100	0.003
				S2	1.720		1.720		S2	0.008		0.008
				S3	0.400		0.400		S3	0.007		0.007
				S4	0.350		0.350		S4	0.006		0.006
				Top	0.280		0.280		Top	0.003		0.003
				Bottom	0.330		0.330		Bottom	0.007		0.007
				Max	1.720		1.720		Max	0.008		0.008

CONFIGURATION 2: OPERATING MODE WITH Apple Watch (326.5kHz)

Configuration	Test Mode	Measuring Distance (cm)	Electric Field Limit (V/m)	Electric Field Reading (V/m)				Magnetic Field Limit (A/m)	Magnetic Field Reading (A/m)			
			FCC	Location	Peak	Duty Cycle %	FCC Average	FCC	Location	Peak	Duty Cycle %	FCC Average
2	Operating Real Product (Power ~10% Charging)	15 cm surrounding the Device (S1 - S4, bottom) and 20 cm above the top surface of the EUT	614	S1	0.170	100	0.170	1.63	S1	0.010	100	0.010
				S2	0.240		0.240		S2	0.010		0.010
				S3	0.250		0.250		S3	0.004		0.004
				S4	0.290		0.290		S4	0.009		0.009
				Top	0.380		0.380		Top	0.005		0.005
				Bottom	0.130		0.130		Bottom	0.004		0.004
				Max	0.380		0.380		Max	0.010		0.010
				S1	0.240		0.240		S1	0.007		0.007
	Operating Real Product (Power 20% ~ 60% Charging)		S2	0.420	0.420	S2	0.010	0.010				
			S3	0.330	0.330	S3	0.008	0.008				
			S4	0.420	0.420	S4	0.010	0.010				
			Top	0.130	0.130	Top	0.007	0.007				
			Bottom	0.180	0.180	Bottom	0.006	0.006				
			Max	0.420	0.420	Max	0.010	0.010				
			S1	0.280	0.280	S1	0.003	0.003				
			S2	1.720	1.720	S2	0.008	0.008				
	Operating Real Product (Power >75% Charging)		S3	0.400	0.400	S3	0.007	0.007				
			S4	0.350	0.350	S4	0.006	0.006				
			Top	0.280	0.280	Top	0.003	0.003				
			Bottom	0.330	0.330	Bottom	0.007	0.007				
			Max	1.720	1.720	Max	0.008	0.008				

CONFIGURATION 3: OPERATING MODE WITH Apple Watch (1.778MHz)

Configuration	Test Mode	Measuring Distance (cm)	Electric Field Limit (V/m)	Electric Field Reading (V/m)				Magnetic Field Limit (A/m)	Magnetic Field Reading (A/m)			
				FCC	Location	Peak	Duty Cycle %		FCC Average	FCC	Location	Peak
3	Operating Real Product (Power ~10% Charging)	15 cm surrounding the device (S1 - S4, bottom) and 20 cm above the top surface of the EUT	463.44	S1	0.150	100	0.150	1.23	S1	0.003	100	0.003
				S2	0.180		0.180		S2	0.008		0.008
				S3	0.170		0.170		S3	0.004		0.004
				S4	0.250		0.250		S4	0.008		0.008
				Top	0.080		0.080		Top	0.002		0.002
				Bottom	0.190		0.190		Bottom	0.003		0.003
				Max	0.250		0.250		Max	0.008		0.008
				S1	0.100		0.100		S1	0.003		0.003
	Operating Real Product (Power 20% ~ 60% Charging)		S2	0.120	0.120	S2	0.006	0.006				
			S3	0.210	0.210	S3	0.005	0.005				
			S4	0.110	0.110	S4	0.004	0.004				
			Top	0.120	0.120	Top	0.003	0.003				
			Bottom	0.150	0.150	Bottom	0.004	0.004				
			Max	0.210	0.210	Max	0.006	0.006				
			S1	0.160	0.160	S1	0.002	0.002				
			S2	0.200	0.200	S2	0.005	0.005				
	Operating Real Product (Power >75% Charging)		S3	0.160	0.160	S3	0.006	0.006				
			S4	0.170	0.170	S4	0.009	0.009				
			Top	0.120	0.120	Top	0.004	0.004				
			Bottom	0.200	0.200	Bottom	0.004	0.004				
			Max	0.200	0.200	Max	0.009	0.009				

10. RF EXPOSURE TEST SETUP AND SETUP PHOTO

Please see description of RF exposure test up and setup photo report 14919986-EP1

END OF TEST REPORT