

Bureau Veritas Consumer Product Services, Inc.	Test Report Number:
One Distribution Center Circle #1, Littleton, MA 01460	EX0020-3 Issue 4



CFR Title 47 FCC Parts

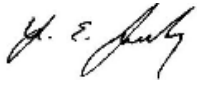
1.1307, 1.1310, 2.1091

RF Exposure Exhibit

Prepared for Hayward Industries, Inc.

Product Name: BT923

Model: G066000227A

Prepared by Yunus Faziloglu Sr. Wireless Engineer	Approved by Ahmed Ait Ahmed EMC Supervisor
	
Issue Date: Dec 10, 2024	Issue Number: 4



This test result relates only to the described test object.

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The test is traceable to national standard or related international standard

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1 Device Under Test Information

1.1 Product Information

Project Number:	X0020
Applicant Information:	Hayward Industries, Inc.
	One Hayward Industrial Drive, Clemmons NC 27012
Test Item Description:	BT and 900 Wireless Module 2023
Product Marketing Name:	BT923
Model	G066000227A
Separation Distance:	20cm
Exposure Category of DUT:	Mobile
Multiple Simultaneous RF Sources:	No
Type of Evaluation:	MPE Calculation
Evaluation Method:	447498 D01 General RF Exposure Guidance v06
Deviations from Standard:	None

1.2 Technical Information

Radio 1 Description	Bluetooth Low Energy
FCC ID:	RNW-BT923
Exposure Category of Transmitter:	Mobile
Maximum Conducted Output Power (mW):	1.5mW (Average) External Antenna 1.3mW (Average) Internal Antenna
Maximum Tune-up Tolerance (dB):	N/A
Maximum Antenna Gain (dBi):	4.7dBi External Antenna 5dBi Internal Antenna

Radio 2 Description	900MHz Frequency Hopping Spread Spectrum
FCC ID:	RNW-BT923
Exposure Category of Transmitter:	Mobile
Maximum Conducted Output Power (mW):	7.1mW (Peak) External Antenna 10mW (Peak) Internal Antenna
Maximum Tune-up Tolerance (dB):	N/A
Maximum Antenna Gain (dBi):	3.4dBi External Antenna 5dBi Internal Antenna

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2 Test Laboratory Information

Location of Test Lab:	One Distribution Center Circle #1 Littleton, MA 01460 (978) 486-8880
Key Contact:	Yunus Faziloglu Yunus.faziloglu@bureauveritas.com
Laboratory Accreditations:	BUREAU VERITAS CONSUMER PRODUCTS SERVICES, INC is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories.
ISO/IEC 17025:2017:	1627-01
FCC Test Site Number:	US1028

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3 RF Exposure Limit:

According to CFR Title 47 FCC section 1.1310, the criteria listed in the table shall be used to evaluate Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields.

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.

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4 RF Exposure – MPE Evaluation

BLE External Antenna:

Prediction of MPE limit at a given distance	
Equation from page 18 of OET Bulletin 65, Edition 97-01	
$S = \frac{PG}{4\pi R^2}$	
where:	S = power density
	P = power input to the antenna
	G = power gain of the antenna in the direction of interest relative to an isotropic radiator
	R = distance to the center of radiation of the antenna
Maximum peak output power at the antenna terminal:	1.71 (dBm)
Maximum peak output power at the antenna terminal:	1.481153264 (mW)
Antenna gain(typical):	4.7 (dBi)
Maximum antenna gain:	2.951209227 (numeric)
Prediction distance:	20 (cm)
Prediction frequency:	2480 (MHz)
MPE limit for uncontrolled exposure at prediction frequency:	1 (mW/cm^2)
Power density at prediction frequency:	0.000870 (mW/cm^2)

BLE Internal Antenna:

Prediction of MPE limit at a given distance	
Equation from page 18 of OET Bulletin 65, Edition 97-01	
$S = \frac{PG}{4\pi R^2}$	
where:	S = power density
	P = power input to the antenna
	G = power gain of the antenna in the direction of interest relative to an isotropic radiator
	R = distance to the center of radiation of the antenna
Maximum peak output power at the antenna terminal:	1.12 (dBm)
Maximum peak output power at the antenna terminal:	1.295388389 (mW)
Antenna gain(typical):	5 (dBi)
Maximum antenna gain:	3.16227766 (numeric)
Prediction distance:	20 (cm)
Prediction frequency:	2480 (MHz)
MPE limit for uncontrolled exposure at prediction frequency:	1 (mW/cm^2)
Power density at prediction frequency:	0.000815 (mW/cm^2)

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900MHz External Antenna:

Prediction of MPE limit at a given distance	
Equation from page 18 of OET Bulletin 65, Edition 97-01	
$S = \frac{PG}{4\pi R^2}$	
where:	S = power density
	P = power input to the antenna
	G = power gain of the antenna in the direction of interest relative to an isotropic radiator
	R = distance to the center of radiation of the antenna
Maximum peak output power at the antenna terminal:	8.50 (dBm)
Maximum peak output power at the antenna terminal:	7.079457844 (mW)
Antenna gain(typical):	3.4 (dBi)
Maximum antenna gain:	2.187761624 (numeric)
Prediction distance:	20 (cm)
Prediction frequency:	902.2 (MHz)
MPE limit for uncontrolled exposure at prediction frequency:	0.6 (mW/cm^2)
Power density at prediction frequency:	0.003081 (mW/cm^2)

900MHz Internal Antenna:

Prediction of MPE limit at a given distance	
Equation from page 18 of OET Bulletin 65, Edition 97-01	
$S = \frac{PG}{4\pi R^2}$	
where:	S = power density
	P = power input to the antenna
	G = power gain of the antenna in the direction of interest relative to an isotropic radiator
	R = distance to the center of radiation of the antenna
Maximum peak output power at the antenna terminal:	10.00 (dBm)
Maximum peak output power at the antenna terminal:	10 (mW)
Antenna gain(typical):	5 (dBi)
Maximum antenna gain:	3.16227766 (numeric)
Prediction distance:	20 (cm)
Prediction frequency:	902.2 (MHz)
MPE limit for uncontrolled exposure at prediction frequency:	0.6 (mW/cm^2)
Power density at prediction frequency:	0.006291 (mW/cm^2)

Device does not have simultaneous transmission capability between BLE and 900MHz radios and it also does not have MIMO capability between antennas. Since radios and antennas can only transmit one at a time, RF exposure collocation calculations are not applicable to this device.

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5 Conclusion

EUT complies with FCC section 1.1310 MPE limits for general population as a mobile device.

Document Revisions

Issue No.	Summary of Changes	Date Issued	Prepared by	Approved by
1	Original Release	Feb 7, 2024	YF	AA
2	To address TCB review comments: Added FCC rule sections 1.1307 and 1.1310 Removed references to exemption from MPE evaluation	Jul 30, 2024	YF	AA
3	To address TCB review comments: Added compliance statement for reference to FCC section 1.1310 for MPE limits.	Aug 22, 2024	YF	AA
4	To address TCB review comments: Model number corrected	Dec 10, 2024	YF	AA

End of Report