

RF Exposure Test Report

Test Report Number	HID-24032063-LCG -FCC-IC-EMF-Rev1.0		
FCC ID	JQ6-PWRGATE		
IC	2236B-PWRGATE		
Applicant	HID Global Corporation		
Applicant Address	611 Center Ridge Drive, Austin, TX, 78753, USA		
Product Name	PowerGate		
Model Number	PowerGateUA4		
Serial Model	PowerGateUM2		
Date of Receipt	06/04/2025		
Date of Test	06/10/2025 - 07/07/2025		
Report Issue Date	09/26/2025		
Test Standards	47 CFR §1.1307(b), 47 CFR §1.1310 RSS-102 Issue 6 December 2023		
Test Result	PASS		
		Issued by: Vista Compliance Laboratories 1261 Puerta Del Sol, San Clemente, CA 92673 USA www.vista-compliance.com	
 Minoush Niknam (Test Engineer)		 David Zhang (Technical Manager)	
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REVISION HISTORY

Report Number	Version	Description	Issued Date
HID-24032063-LCG -FCC-IC-EMF	01	Initial report	08/15/2025
HID-24032063-LCG -FCC-IC-EMF-Rev1.0	1.0	Update per client reiew	09/26/2025

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1 Test Summary

Test Item	Test Requirement	Test Method	Result
RF Exposure Evaluation	47 CFR §1.1307(b), 47 CFR §1.1310 RSS-102 Issue 6 December 2023	447498 D01 General RF Exposure Guidance v06 RSS-102 Issue 6 December 2023	Pass

2 General Information

2.1 Applicant

Applicant	HID Global Corporation
Applicant address	611 Center Ridge Drive, Austin, TX, 78753, USA
Manufacturer	HID Global Corporation
Manufacturer Address	611 Center Ridge Drive, Austin, TX, 78753, USA

2.2 Product information

Product Name	PowerGate
Model Number	PowerGateUA4
Family Models	PowerGateUM2
Serial Number	N/A
Frequency Band	902~928MHz
Type of modulation	DSB-ASK, PR-ASK
Equipment Class	DSS, EMC emission Class A
Antenna Information	Antenna 1: RFID UHF high gain wide beam antenna Antenna Name: Advantenna-SP11 TM Antenna Gain in dBiC: 7.8 dBiC (Max), 7.4 dBiC (Typical) Antenna Gain in dBi: 4.8 dBi (Max), 4.4 dBi (Typical) Antenna 2: Circular Polarity RFID Panel Antenna Antenna Name: S9028PCL Antenna Gain in dBiC: 9 dBiC Antenna Gain in dBi: 6 dBi
Clock Frequencies	240MHz
Input Power	100-240VAC, 50/60Hz
Power Adapter Manufacturer/Model	N/A
Power Adapter SN	N/A
Hardware version	N/A
Software version	N/A
Additional Info	The MasterGate RAIN RFID Reader Cabinet is a floor mounted RAIN RFID reader, which is installed in commercial laundry facilities to provide an isolated RF environment while reading numerous RAIN RFID tags that are embedded into linens and other items for inventory and ownership tracking. The cabinet shielding ensures that only the desired items on a cart or pallet inside are read. The radio equipment inside the cabinet is a system with these main components: - A RAIN RFID reader module - An extractor board connected between the standard UHF reader and its antennas (Rx/Tx signals); - A booster board connected to the extractor and providing power to extra antennas (Tx only signals). - Antennas (quantity is 8)

	The reader and booster each have 4 outputs, each of them cannot transmit simultaneously; one output from reader can transmit simultaneously with one output from booster. The RFID booster system is designed to improve tag reading performance by doubling the number of transmitting antennas connected to a single reader. The system transmits to one Tx/Rx antenna in combination with one (Tx only) antenna simultaneously with duplicate RF signals. The antennas are located behind non-conductive panels within the cabinet. Changing the combinations of antennas results in different reflections and reverberations inside the cabinet without using mechanical mode-stirring reflectors. The receive function of the reader uses only the Tx/Rx antennas. Operating temperature: 0°C to +50°C.
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2.3 Family model information

The PowerGate is specifically designed for automatic inventory of items using UHF RFID technology. The PowerGate shielded structure ensures only items placed inside are identified.

- The Manual version of the PowerGate has two doors at the front which need to be manually operated, and a closed panel at the rear.
- The automated version has mechanically operated front and rear doors. An operating panel is located on the front left side of the doors, and on the rear right side of the doors. These panels have a red and green light on them which report the stations status (Ready, Operation in progress, and Default). A push button to activate the inventory process is located below the lights

PowerGateCA4 is the base model as representative of the worst case model used for testing since this is the only model in production and the enclosure size does not affect any product RF or EMC performance. For FCC testing, its radio system and antennas are replaced with FCC versions. Refer to table below for the comparison of family model similarity and differences.

Product aspect	Model CA4 (reference)	Model UA4	Model UM2
Model number	PowerGateCA4	PowerGateUA4	PowerGateUM2
Enclosure	Sized for EU standards	Sized for NAM standards	Same as UA4 except height
Front doors	Qty 2; power operated	Same as CA4	Qty 2; manually operated
Rear doors	Qty 2; power operated	Same as CA4	None; replaced with panel
Front controls	Mounted on left door frame	Same as CA4	Same as CA4
Rear controls	Mounted on right door frame	Same as CA4	None
Color	Light Blue	Same as CA4	Same as CA4
HW	Baseplate open front and back	Same as CA4	Baseplate open front; floor stop in rear
SW	Compliant to ETSI	Compliant to FCC	Same as UA4
Radio system	865.6 MHz – 867.6 MHz	902MHz – 928MHz	Same as UA4
Reader (extractor) antenna	Qty 4; 8.5 dBic	Qty 4; 9.0 dBic	Same as UA4
Booster antenna	Qty 4; 7.7 dBic typ	Qty 4; 7.4 dBic typ	Same as UA4
Label location	Right upper corner of left side panel	Same as CA4	Same as CA4
Label content	Standard	Different model and PN	Different model, PN, and current rating

2.4 Test standard and method

Test standard	47 CFR §1.1307(b), 47 CFR §1.1310 RSS-102 Issue 6 December 2023
Test method	447498 D01 General RF Exposure Guidance v06 RSS-102 Issue 6 December 2023

3 Test Site Information

Lab performing tests	Vista Laboratories, Inc.
Lab Address	1261 Puerta Del Sol, San Clemente, CA 92673 USA
Phone Number	+1 (949) 393-1123
Website	www.vista-compliance.com

4 FCC RF Exposure Evaluation

4.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
☑ 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
300-1500	/	/	f/300	<6
1500-100,000	/	/	5	<6
☐ 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
300-1500	/	/	f/1500	<30
1500-100,000	/	/	1.0	<30

f = Frequency in MHz; *Plane-wave equivalent power density

4.2 MPE Calculation Formula

Equation: $S = PG / 4\pi R^2$ or $R = \sqrt{PG / 4\pi S}$

Where, S = Power Density

P = Power Input to Antenna

G = Antenna Gain

R = distance to the center of radiated antenna in cm

4.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as Mobile Device.

4.4 Test Results

Band	Frequency (MHz)	Conducted Output Power (dBm)	Max Antenna Gain (dBi)	Separation distance (cm)	Power Density (mW/ cm ²)	MPE Limit (mW/ cm ²)
UHF RFID	902-928	29.97	6	20	0.78656	3.007

Note:

- Maximum output power please refer to RF test report: HID-24092664-L-FCC-IC-RF
- The above results show that the device complies with the FCC RF exposure requirement with a separation distance of 20 cm. Separation is maintained by a shielded enclosure and door interlock for RF operation.

5 ISED RF Exposure Evaluation

5.1 ISED Field reference level exposure exemption limits

Per RSS-102 issue 6, section 5.3. 2 Electric field strength levels, magnetic field strength levels and power density levels (10 MHz to 300 GHz)

The electric and magnetic field strength reference levels, power density reference levels, and associated reference period for devices employed by the general public (uncontrolled environment) and controlled-use devices (controlled environment) are specified in table 7 and table 8. Note that the power density limits specified in these tables apply to whole body exposure conditions.

Table 7: RF field strength and power density limits for devices used by the general public (uncontrolled environment)

Frequency Range (MHz)	Electric Field (V _{RMS} /m)	Magnetic Field (A _{RMS} /m)	Power Density (W/m ²)	Reference Period (minutes)
☐ Limits For General Population / Uncontrolled Exposure				
10-20	27.46	0.0728	2	6
20-48	58.07/ $f^{0.25}$	0.1540/ $f^{0.25}$	8.944/ $f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 $f^{0.3417}$	0.008335 $f^{0.3417}$	0.02619 $f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ $f^{1.2}$
150000-300000	0.158 $f^{0.5}$	4.21 x 10 ⁻⁴ $f^{0.5}$	6.67 x 10 ⁻⁵ f	616000/ $f^{1.2}$

Note: f is frequency in MHz.

Table 8: RF field strength and power density limits for controlled-use devices (controlled environment)

Frequency Range (MHz)	Electric Field (V _{RMS} /m)	Magnetic Field (A _{RMS} /m)	Power Density (W/m ²)	Reference Period (minutes)
☒ Limits For General Population / Uncontrolled Exposure				
10-20	61.4	0.163	10	6
20-48	129.8 / $f^{0.25}$	0.3444 / $f^{0.25}$	44.72 / $f^{0.5}$	6
48-100	49.33	0.1309	6.455	6
100-6000	15.60 $f^{0.25}$	0.04138 $f^{0.25}$	0.6455 $f^{0.5}$	6
6000-15000	137	0.364	50	6
15000-150000	137	0.364	50	616000/ $f^{1.2}$
150000-300000	0.354 $f^{0.5}$	9.40 x 10 ⁻⁴ $f^{0.5}$	3.33 x 10 ⁻⁴ f	616000/ $f^{1.2}$

Note: f is frequency in MHz.

5.2 ISED Field reference level Calculation Formula

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

5.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as Mobile Device.

5.4 ISED Field reference level exposure exemption evaluation result

Band	Frequency (MHz)	Conducted Output Power (dBm)	Max Antenna Gain (dBi)	Separation distance (cm)	Power Density (W/m ²)	MPE Limit (W/m ²)
UHF RFID	902-928	29.97	6	20	7.86555	19.3865

Note:

- 1) Maximum output power please refer to RF test report: HID-24092664-L-FCC-IC-RF
- 2) The above results show that the device complies with the ISED RF exposure requirement with a separation distance of 0.2 m. Separation is maintained by a shielded enclosure and door interlock for RF operation.

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