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**16740 Peters Road**  
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**United States of America**  
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## **CERTIFICATION TEST REPORT**

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**Manufacturer:** Alliance ID  
2199 Manton Drive  
Covington, Louisiana 70433 USA

**Applicant:** Microchip ID Systems, Inc.  
2199 Manton Drive  
Covington, Louisiana 70433 USA

**Product Name:** Hero

**Product Description:** Universal reader for use with radio frequency identification devices (RFID), such as injectable microchips, external ear tags, and similar products use for animal identification. The device can read and display technologies operating at radio frequencies of 125 and 134.2 kHz.

**Model:** 1001

**FCC ID:** 2AKVC1001

**Testing Commenced:** Nov. 1, 2016

**Testing Ended:** Nov. 2, 2016

**Summary of Test Results:** In Compliance

**Standards:**

- FCC Part 15 Subpart C, Section 15.209



Order Number: F2LQ9085

Applicant: Microchip ID Systems, Inc.  
Model: 1001

**Evaluation Conducted by:**

Joe Knepper, EMC Proj. Eng.

**Report Reviewed by:**

Ken Littell, Director of EMC & Wireless Operations

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## 1 ADMINISTRATIVE INFORMATION

### 1.1 Measurement Location:

F2 Labs in Middlefield, Ohio. Site description and attenuation data are on file with the FCC's Sampling and Measurement Branch at the FCC Laboratory in Columbia, MD.

### 1.2 Measurement Procedure:

All measurements were performed according to the 2013 version of ANSI C63.10 and recommended FCC procedure of measurement of equipment operating under Section 15.209. A list of the measurement equipment can be found in Section 6.

### 1.3 Uncertainty Budget:

The uncertainty in EMC measurements arises from several factors which affect the results, some associated with environmental conditions in the measurement room, the test equipment being used and the measurement techniques adopted.

The measurement uncertainty budgets detailed below are calculated from the test and calibration data, and are expressed with a 95% confidence factor. Note: Only measurements listed below which relate to tests included in this Test Report are applicable to it.

Measurement Range	Expanded Uncertainty	Combined Uncertainty
Radiated Emissions <1 GHz @ 3m	$\pm 5.07\text{dB}$	$\pm 2.54$
Radiated Emissions <1 GHz @ 10m	$\pm 5.09\text{dB}$	$\pm 2.55$
Radiated Emissions 1 GHz to 2.7 GHz	$\pm 3.62\text{dB}$	$\pm 1.81$
Radiated Emissions 2.7 GHz to 18 GHz	$\pm 3.10\text{dB}$	$\pm 1.55$
AC Power Line Conducted Emissions, 150kHz to 30 MHz	$\pm 2.76\text{dB}$	$\pm 1.38$

This Uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

### 1.4 Document History

Document Number	Description	Issue Date	Approved By
F2LQ9085-01E	First Issue	Nov. 2, 2016	K. Littell

**2 SUMMARY OF TEST RESULTS**

Test Name	Standard(s)	Results
Radiated Emissions	FCC Part 15 Subpart C 15.209	Complies
Variation of input power	15.31(e) was met by using new batteries.	Complies

Modifications Made to the Equipment
No modifications were made to the EUT.



### 3 **ENGINEERING STATEMENT**

This report has been prepared on behalf of Microchip ID Systems, Inc. to provide documentation for the testing described herein. This equipment has been tested and found to comply with Part 15.209 of the FCC Rules using ANSI C63.10 2013 and Part 15 standards. The test results found in this test report relate only to the items tested.

### 4 **EUT INFORMATION AND DATA**

#### 4.1 **Equipment Under Test:**

Product: Hero

Model: 1001

Serial Number: None Specified

FCC ID: 2AKVC1001

#### 4.2 **Trade Name:**

Microchip ID Systems, Inc.

#### 4.3 **Power Supply:**

Battery-operated

#### 4.4 **Applicable Rules:**

CFR 47, Part 15.209, subpart C

#### 4.5 **Equipment Category:**

RFID

#### 4.6 **Antenna:**

Integral Antenna

#### 4.7 **Accessories:**

N/A

#### 4.8 **Test Item Condition:**

The equipment to be tested was received in good condition.

#### 4.9 **Testing Algorithm:**

EUT was set up in a normal testing manner, powered by a new 9V battery. EUT scanned RFID tags at 128kHz. The highest emissions were recorded in the data tables.

**5 LIST OF MEASUREMENT INSTRUMENTATION**

Equipment Type	Asset Number	Manufacturer	Model	Serial Number	Calibration Due Date
Shielded Chamber	CL166-E	AlbatrossProjects	B83117-DF435-T261	US140023	May 12, 2017
Temp/Hum. Recorder	CL137	Extech	RH520	CH16992	June 3, 2017
Receiver	CL151	Rohde & Schwarz	ESU40	100319	Nov. 25, 2016
Antenna Combination, JB3	CL175	Sunol Sciences	JB3	A030315	April 1, 2017
Amplifier w/Monopole & 18" Loop	CL163	A.H. Systems, Inc.	EHA-52B	100	May 2, 2017
Software:	Tile Version 1.0		Software Verified: Nov. 1, 2016		
Software:	EMC 32, Version 5.20.2		Software Verified: Nov. 1, 2016		



## 6 RADIATED EMISSIONS

### 6.1 Requirements

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

### 6.2 Test Procedure

The EUT was tested at distances of 3/10 meters. The emissions were maximized by rotating the table and raising/lowering the antenna mounted on a 4-meter mast and by positioning the EUT in all three orthogonal positions. Both horizontal and vertical polarities were measured for frequencies above 30MHz, and all three orientations of the loop antenna were scanned to determine worst case emission. The output of the antenna was connected to the input of the receiver and emissions were measured in the range 9 kHz to 1 GHz. The values up to 1 GHz with a resolution bandwidth of 1, 9, and 120 kHz are quasi-peak readings made at 3/10 meters. The raw measurements were corrected to allow for antenna factor and cable loss, and correction factors were applied to account for the measurement distance in the frequency range of 9kHz to 30MHz.





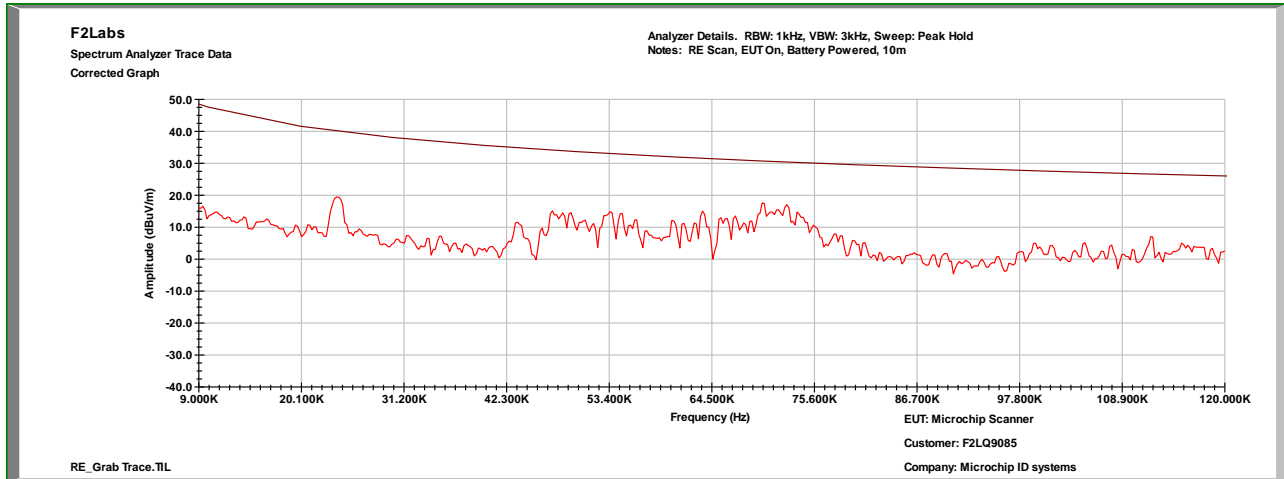
### 6.3 Test Data

<b>Test Date(s):</b>	Nov. 1, 2016	<b>Test Engineer:</b>	J. Knepper
<b>Standards:</b>	FCC CFR 47 15.209	<b>Air Temperature:</b>	22.7°C
		<b>Relative Humidity:</b>	47%

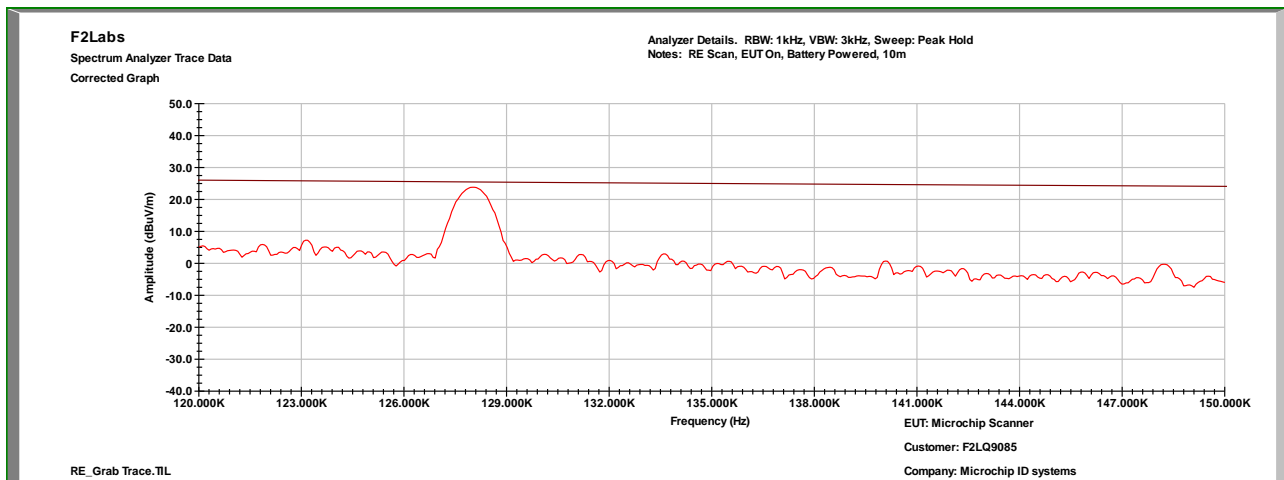
Frequency (MHz)	Antenna Polarization	Reading (dB $\mu$ V)	Correction Factor (dB)	Emission (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
0.128000	Parallel	30.5	-36.4	-5.90	25.46	-31.4
30.388000	V	-1.9	21.3	19.40	40.0	-20.6
31.164000	H	-1.8	22.1	20.30	40.0	-19.7
40.680000	V	-2.6	13.9	11.30	40.0	-28.7
52.116000	V	-2.3	9.4	7.10	40.0	-32.9
123.508000	V	-2.5	17.2	14.70	43.5	-28.8
125.060000	H	-1.6	17.2	15.60	43.5	-27.9
198.780000	V	-1.2	17.6	16.40	43.5	-27.1
198.780000	H	-1.1	17.3	16.20	43.5	-27.3
233.312000	H	-1.9	16.6	14.70	46.0	-31.3
270.172000	V	-1.7	18.6	16.90	46.0	-29.1
319.448000	H	1.0	19.9	20.90	46.0	-25.1
368.724000	H	-1.7	21.4	19.70	46.0	-26.3



### Characterization Scan, 9kHz to 120 kHz

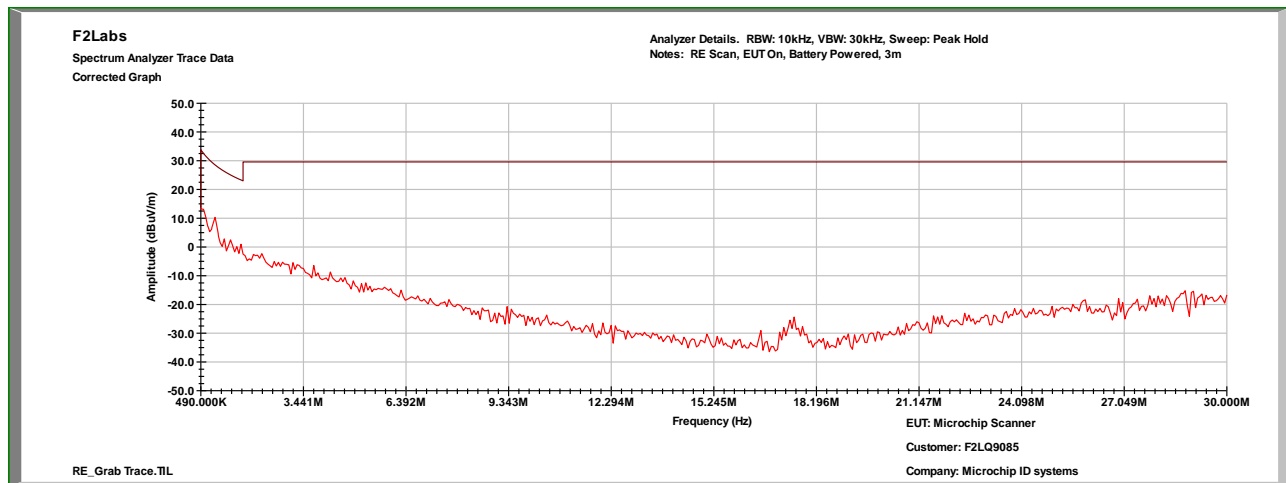


### Characterization Scan, 120kHz to 150 kHz



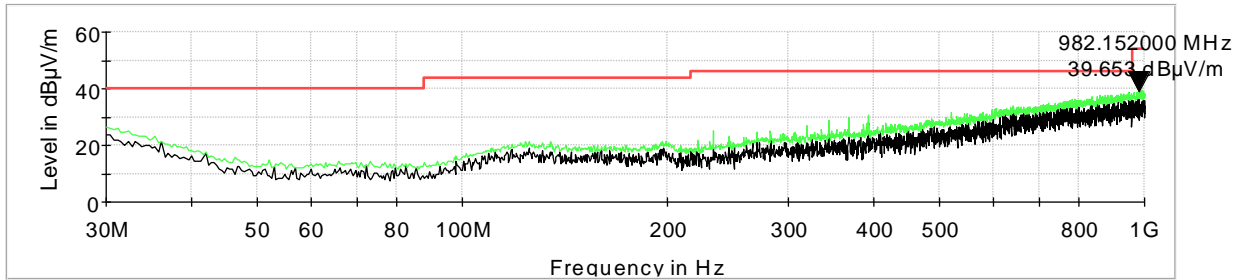


### Characterization Scan, 0.15 MHz to 30 MHz

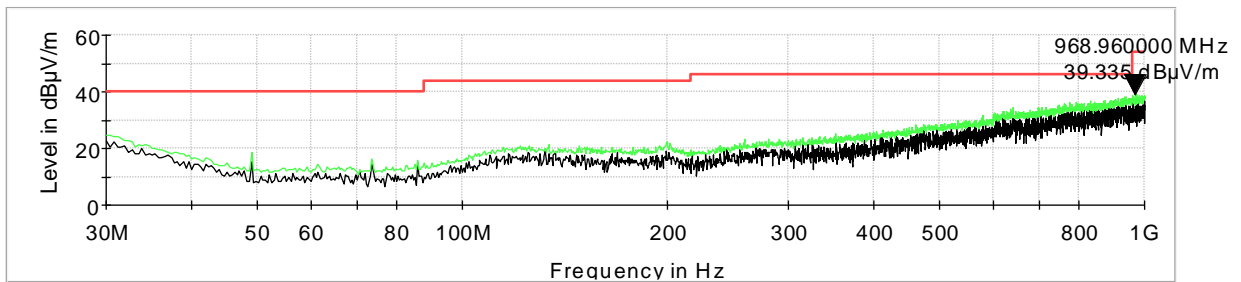




Characterization Scan, 30 MHz to 1000 MHz, Horizontal



Characterization Scan, 30 MHz to 1000 MHz, Vertical





## 7 PHOTOGRAPHS/EXHIBITS

3m



10m





### 3m Chamber

