



H.B. Compliance Solutions

Intentional Radiator Test Report

For the

Aether RF LLC

Wiegand Wave

Tested under

The FCC Rules contained in Title 47 of the CFR, Part 15.247 and ISSED RSS-247 Issue 2 Class II
Permissive Change for

Digitally Transmitting Sequence

Prepared for:

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Reviewed By:

A handwritten signature in black ink, appearing to read 'Hoosamuddin Bandukwala'.

Hoosamuddin Bandukwala



Cert # ATL-0062-E

Engineering Statement: The measurements shown in this report were made in accordance with the procedure indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurement made, the equipment tested is capable of operation in accordance with the requirements of Part 15 of the FCC Rules under normal use and maintenance. All results contained herein relate only to the sample tested.

Report Status Sheet

Revision #	Report Date	Reason for Revision
Ø	January 09, 2025	Initial Issue

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EXECUTIVE SUMMARY

1. Testing Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15.247. All tests were conducted using measurement procedure from ANSI C63.10-2013, FCC Guidance document 558074 D01 v05r02 April 02, 2019 as appropriate.

Test Name	Test Method/Standard	ISED Standard	Result	Comments
Radiated Spurious Emissions & Restricted Band	15.247(d), 15.209(a), 15.205	RSS-247 (5.5) RSS-Gen (7.0)	Pass	

Class II Permissive Change:

Device was changed from Metal to plastic enclosure and same antenna type but higher antenna gain antenna is used.

EQUIPMENT CONFIGURATION

1. Overview

H.B Compliance Solutions was contracted by Aether RF, LLC. to perform testing on the Wiegand Wave under the quotation number Q24121007.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Aether RF, LLC. Wiegand Wave.

The tests were based on FCC Part 15 Rules. The tests described in this document were formal tests as described with the objective of the testing was to evaluate compliance of the Equipment Under Test (EUT) to the requirements of the aforementioned specifications. Aether RF, LLC. should retain a copy of this document and it should be kept on file for at least five years after the manufacturing of the EUT has been permanently discontinued. The results obtained relate only to the item(s) tested.

Product Name:	Wiegand Wave
Model(s) Tested:	100
FCC ID:	2BGQ6WW100
Supply Voltage Input:	Primary Power: 16-24 VAC/VDC
Frequency Range:	902-928 MHz
No. of Channels:	128 Channels
Necessary Bandwidth	N/A
Type(s) of Modulation:	OQPSK
Range of Operation Power:	0.824W
Emission Designator:	N/A
Channel Spacing(s)	200kHz
Test Item:	Pre-Production
Type of Equipment:	Mobile
Antenna Requirement (§15.203):	Type of Antenna: External Whip Antenna Gain of Antenna: 2.7dBi
Environmental Test Conditions:	Temperature: 15-35°C Humidity: 30-60% Barometric Pressure: 860-1060 mbar
Modification to the EUT:	None
Evaluated By:	Staff at H.B. Compliance Solutions
Test Date(s):	January 08, 2025

2. Test Facility

All testing was performed at H.B. Compliance Solutions. This facility is located at 5005 S. Ash Avenue, Suite # A-10, Tempe AZ-85282. All equipment used in making physical determination is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a GTEM chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at H.B. Compliance Solutions.

Test facility H.B. Compliance Solutions is an ANAB accredited test site. The ANAB certificate number is L2458. The scope of accreditation can be found on ANAB website www.anab.org

FCC Registered Number: 738876

ISED Test Site Registration number is 9481A



3. Description of Test Sample

The Wiegand Wave Model 100 (WW100) system wirelessly connects an industry standard Wiegand card or fob reader, status signals, and relay outputs to an industry standard access control system.

The Module is integrated consistent with the grant notes and manufacturer's integration guide.

4. Equipment Configuration

Ref. ID	Name / Description	Model Number	Serial Number
# 1	Wiegand Wave	100	-

Table 1. Equipment Configuration

5. Support Equipment

All support equipment supplied is listed in the following Support Equipment List.

Ref ID	Name / Description	Manufacturer	Model #	Serial #
# 2	AC/DC Adapter	HON-KWANG	-	-
# 3	Laptop Computer	Acer	Swift SF314-52	-

Table 2. Support Equipment

6. Ports and Cabling Information

Ref ID	Port name on the EUT	Cable Description	Qty.	Length (m)	Shielded? (Y/N)	Termination Box ID & Port ID
# 4	Power Input	2 Wire	1	1	N	# 2 / AC Power
#	Mini B USB	USB	1	0.5	N	# 3

Table 3. Ports and Cabling Information

7. Method of Monitoring EUT Operation

A test receiver will be used to monitor the data transmission from the EUT.

8. Mode of Operation

To Support FCC testing, a test firmware was provided to allow configuration of the duty cycle, transmission channel, and power level, as well as to enable frequency hopping for worst case emissions.

9. Modifications

9.1 Modifications to EUT

No modifications were made to the EUT

9.2 Modifications to Test Standard

No Modifications were made to the test standard.

10. Disposition of EUT

The test sample including all support equipment submitted to H.B Compliance Solutions for testing will be returned to Aether RF at the completion of testing & certification.

Criteria for Intentional Radiators

1. Radiated Spurious Emissions and Restricted Band

Test Requirement(s):	§15.247(d), 15.209(a), 15.205 and RSS-247 §5.5, RSS GEN §7.0	Test Engineer(s):	Sean E.
Test Results:	Pass	Test Date(s):	January 08, 2025

Test Procedures: As required by 47 CFR 15.247 and RSS-247 §5.5, Radiated spurious measurements were made in accordance with the procedures of the FCC Guidance Document 558074 D01 and ANSI C63.10.

The EUT was placed on a non-reflective table inside a 3-meter semi-anechoic room. The EUT was set on continuous transmit.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The frequency range up to the 10th harmonic was investigated included all the restricted band frequencies include 2483.5MHz. Measurement 10dB below the limits were not reported.

To get a maximum emission level from the EUT, the EUT was rotated throughout the X-axis, Y-axis and Z-axis. Worst case is X-axis

Detector Setting	Resolution Bandwidth	Video Bandwidth	Span
Peak	1MHz	3MHz	As necessary
Average	1MHz	10Hz	0 Hz

Table 11. Analyzer Settings

Test Setup:

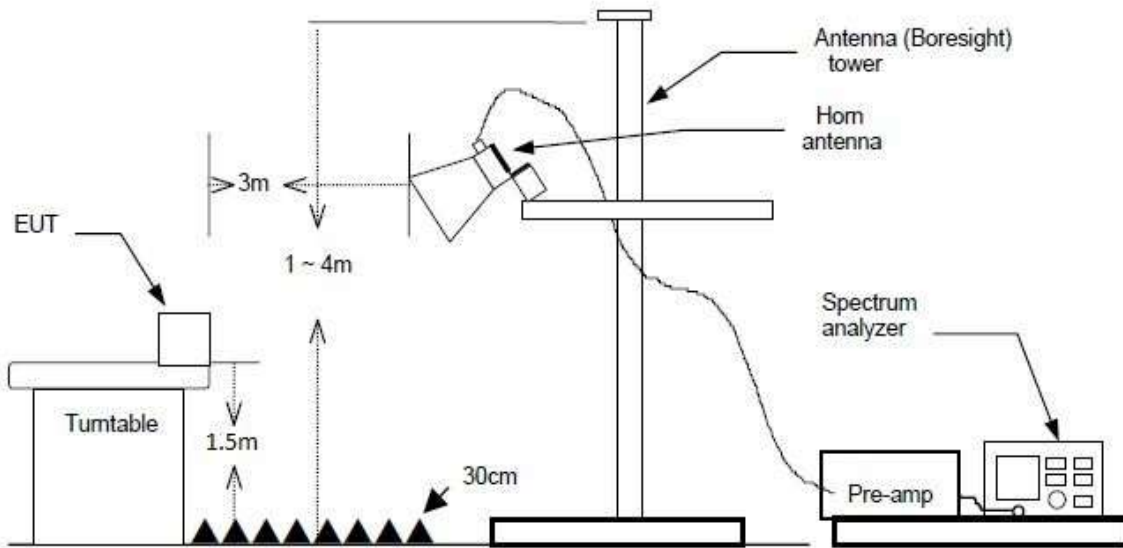


Figure 5. Radiated Emission Above 1GHz Test Setup

Test Result:

Frequency (MHz)	Peak Amplitude (dbuV/m)	Peal Limit (dBuV/m)	Average Amplitude (dBuV/m))	Average Limit (dBuV/m)
1805	41.62	97.0	-	77.0
2707.5*	37.92	74.0	-	54.0
3610*	44.95	74.0	-	54.0
4512.5*	38.38	74.0	-	54.0

Table 12 - Spurious Radiated Emission Data – Low Band - Internal Antenna

Frequency (MHz)	Peak Amplitude (dbuV/m)	Peak Limit (dBuV/m)	Average Amplitude (dBuV/m)	Average Limit (dBuV/m)
1830.22	38.42	97.0	-	77.0
2745.33*	40.98	74.0	-	54.0
3660.44*	39.37	74.0	-	54.0
4575.55*	38.13	74.0	-	54.0

Table 13– Spurious Radiated Emission Data – Mid Band - Internal Antenna

Frequency (MHz)	Peak Amplitude (dbuV/m)	Peak Limit (dBuV/m)	Average Amplitude (dBuV/m)	Average Limit (dBuV/m)
1855.04	43.87	97.0	-	77.0
2782.56*	43.44	74.0	-	54.0
3710.08*	42.37	74.0	-	54.0
4637.6*	39.23	74.0	-	54.0

Table 14- Spurious Radiated Emission Data – High Band - Internal Antenna

NOTE 1: There were no detectable emissions above the 2nd harmonic.

NOTE 2: Frequency marked with “*” falls under the restricted band

6. Test Equipment

Equipment	Manufacturer	Model	Serial #	Last Cal Date	Cal Due Date
EMI Test Receiver	Rohde & Schwarz	ESMI26	840607/005	Nov-15-23	Nov-15-25
High Pass Filter	Mini-Circuits	VHF-3100+	1023	Verified	
High Pass Filter	Mini-Circuits	VHF-1320+	1034	Verified	
Attenuator 10dB	Huber+Suhner	6810.17.A	747300	Verified	
Horn Antenna	Com-Power	AHA-118	711150	09-Jan-23	09-Jan-25
Antenna	EMCO	GTEM 5417	1063	Verified	

Table 19 – Test Equipment List

***Statement of Traceability:** Test equipment is maintained and calibrated on a regular basis. All calibrations have been performed by a 17025 accredited test facility, traceable to National Institute of Standards and Technology (NIST)

7. Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. These measurements figures are calculated in accordance with ETSI TR 100 028 Parts 1 and 2. Instrumentation measurement uncertainty has **not** been taken into account to determine compliance.

The following measurement uncertainty values have been calculated as show in the table below:

Measured Parameter	Measurement Unit	Frequency Range	Expanded Uncertainty
Conducted Emissions (AC Power)	dBuV or dBuA	150kHz – 30MHz	± 4.3dB
Radiated Emission below 30MHz	dBuV/m	9kHz-30MHz	± 2.96dB
Radiated Emissions below 1GHz	dBuV/m	30 – 1000MHz	± 5.6dB
Radiated Emissions above 1GHz	dBuV/m	1 – 26.5GHz	± 4.1dB

The reported expanded uncertainty has been estimated at a 95% confidence level (k=2)

END OF TEST REPORT