# Test Report

**Prepared for: Honeywell**

**Model: HSD Phase 4-CA**

**Description: Aircraft Earth Station**

**FCC ID: K6KHSD-PHASE4**

**Serial Number: 0020**

**Project No: p2420009**

**Test Result: PASS**

**To**

**FCC Part 1.1310**

**Date of Issue: June 26, 2025**

| | |
|---|---|
| **On the behalf of the applicant:** | **EMS Technologies Canada, LTD**<br>**400 Maple Grove Road**<br>**Ottawa, ON, Canada**<br>**K2V 1B8** |
| **Attention of:** | **Amitesh Kumar**<br>**Ph: (613) 591-9064**<br>**E-Mail:Amitesh.Kumar@Honeywell.com** |
| **Prepared By:** | **Compliance Testing, LLC**<br>**Mesa, AZ 85204**<br>**(480) 926-3100 phone / (480) 926-3598 fax**<br>**www.compliancetesting.com**<br>**ANAB Cert#: AT-2901**<br>**FCC Site Reg.750616**<br>**ISED Site Reg. #2044A-2** |

**Greg Corbin**
**Project Test Engineer**

## Test Report Revision History

| Revision | Date | Revised By | Reason for Revision |
|---|---|---|---|
| Rev 1.0 | 6/26/2025 | Greg Corbin | Original Document |
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## ANAB

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to the joint ISO-ILAC-IAF Communiqué dated January 2009).

The tests results contained within this test report all fall within our scope of accreditation, unless noted below.

Please refer to http://www.compliancetesting.com/labscope.html for current scope of accreditation.

**FCC Site Reg. #750616**

**IC Site Reg. #2044A-2**

**Non-accredited tests contained in this report:**

**N/A**

## EUT Description

| | |
|---|---|
| **Model:** | HSD Phase 4-CA |
| **Serial:** | 0020 (used for all tests except frequency stability)<br>0018 (used for frequency stability, refer to page 29 for details) |
| **Firmware:** | N/A |
| **Software:** | LI-g0412671 ver:B00 |
| **Description:** | Aircraft Earth Station |
| **Additional Information:** | High-speed data, satellite communications terminals that provide world-wide voice and data services to aircraft through high-speed communication links with the Inmarsat Satellite Network. |
| **Receipt of Sample(s):** | 4/16/2025 |
| **EUT Condition:** | **Visual Damage** No<br><br>**State of Development** Production/Production Equivalent |

## FCC Test Requirements

The HSD Phase 4 CA system operates within the frequency range of 1626.5 – 1660.5 MHz, requiring compliance with FCC Parts 25 and 87.

FCC Part 87 regulates the frequency range of 1646.5 to 1660.5 MHz for Mobile Earth Stations (MES) in the Mobile Satellite Service (MSS), which covers a portion of the required operational frequencies. To cover the full frequency range of 1626.5 to 1660.5 MHz, FCC Part 25 for Aircraft Earth Stations (AES) in the Aeronautical Mobile-Satellite Service and Aeronautical Mobile Service must also be considered.

The HSD Phase 4 CA SDU contains two channel cards: channel card #1, supports two SBB communication channels, while channel card #2 supports three Classic Aero communication channels and one SBB communication channel. The SBB services provide non-safety voice and data in the cabin, whereas the Classic Aero services are designated for safety classified voice and packet data. These services are enabled through separate RF transceiver ICs dedicated to each communication channel.

According to 47CFR 25.109(c), earth stations in the AMS(R)S service are subject to licensing under 47CFR Part 87. The “(R)” in AMS(R)S indicates that the spectrum is used for aeronautical communications related to the safety and regularity of flights. Due to the safety nature of Classic Aero service, Honeywell considers the SBB non-safety AMSS service to fall under the scope of FCC Part 25, while the Classic Aero AMS(R)S safety service is subject to both FCC Parts 87 and Part 25, as the Classic Aero operating frequency range is from 1626.5 to 1660.5 MHz.

This report shows compliance to Part 25 for the SBB service from 1626.5 – 1660.5 MHz and the Classic Aero service from 1626.5 - 1646.5 MHz.

There is a separate CTL test report (p2490002_Part 87_rev 1.0) showing compliance to the 47CFR Part 87 regulations for the HSD Phase 4 CA Classic Aero service operated from 1646.5 – 1660.5 MHz using G1D and G1E emission designators in the AMS(R)S service.

This RF Exposure report is for a Part 25 and Part 87 composite filing.

**Conducted Output Power**

The maximum output power for Part 87 is from the Part 87 test report,"p2420009_FCC Part 87_rev 1.0".
The maximum output power for Part 25 is from the Part 25 test report,"p2420009_FCC Part 25_rev 1.0".
The conducted power for each rule part is listed in the table below,

| Rule Part | Service | Bearer | Tuned Frequency (MHz) | Conducted Output Power (dBm) |
|---|---|---|---|---|
| 87 | Classic Aero | RTS10500 | 1660.5 | 47.78 |
| 25 | Classic Aero | RTS10500 | 1646.5 | 46.55 |
| 25 | SBB | R20T0.5QD | 1626.5 | 47.35 |

**Antenna Gain**

The manufacturer lists 2 types of antennas with the gain specified from 12 - 17 dBi.
The manufacturer states the minimum cable loss from the SDU RF output to the Antenna RF input is 2.5 dB. This cable loss will be used in the final EIRP calculation

| Unit Assembly | Part Number | Gain - dBi |
|---|---|---|
| AMT 700 HGA | 1428-A-1010-02 | 12 - 17 |
| AMT-3800 HGA | 1242-A-0101-xx | 12 - 17 |

Antenna Gain = max antenna gain (+17 dBi) + RF cable loss (-2.5 dB) = 17 – 2.5 = 14.5 dBi.

**MPE Evaluation**

The EUT is a mobile device used in an Uncontrolled Exposure environment.

| | | |
|---|---|---|
| **Limits Uncontrolled Exposure 47 CFR 1.1310 Table 1, (ii)** | 0.3-1.34 MHz: | Limit [mW/cm²] = 100 |
| | 1.34-30 MHz: | Limit [mW/cm²] = (180/f²) |
| | 30-300 MHz: | Limit [mW/cm²] = 0.2 |
| | 300-1500 MHz: | Limit [mW/cm²] = f/1500 |
| | 1500-100,000 MHz | Limit [mW/cm²] = 1.0 |

**Test Data**

Worst case RF exposure calculations were calculated using the highest gain antenna and the highest conducted output power.

## MPE calculation

| | |
|---|---|
| Test Frequency, MHz | 1660.5 |
| Power,EIRP mW (P) | 59979 |
| Antenna Gain Isotropic | 14.5 |
| Antenna Gain Numeric (G) | 28.18 |
| Antenna Type | High gain antenna |
| Distance (R) | 20 cm |

| |
|---|
| $S = \frac{P * G}{4\pi r^2}$ |
| Power Density (S) mw/cm$^2$ |

| |
|---|
| Power Density (S) =336.2 mW/cm$^2$ |
| Limit = (from above table) = 1.0 mW/cm$^2$ |

**The EUT Power Density of 336.2 mW/cm$^2$ is over the limit of 1.0 mW/cm$^2$ with a 14.5 dBi gain antenna at 20 cm distance.**

**The Minimum Safe Distance was calculated on the next page.**

**Minimum Safe Distance Evaluation**

This is a mobile device used in **Uncontrolled** Exposure environment.

| | | |
|---|---|---|
| **Limits Uncontrolled Exposure 47 CFR 1.1310 Table 1, (B)** | 0.3-1.34 MHz: | Limit [mW/cm²] = 100 |
| | 1.34-30 MHz: | Limit [mW/cm²] = (180/f²) |
| | 30-300 MHz: | Limit [mW/cm²] = 0.2 |
| | 300-1500 MHz: | Limit [mW/cm²] = f/1500 |
| | 1500-100,000 MHz | Limit [mW/cm²] = 1.0 |

**Test Data**

| | |
|---|---|
| Test Frequency, MHz | 1660.5 |
| Power, Conducted, mW (P) | 59979 |
| Antenna Gain Isotropic | 14.5 |
| Antenna Gain Numeric (G) | 28.18 |
| Antenna Type | High gain antenna |
| Limit (L) | 1.0 mW/cm$^2$ |

| R=√(PG/4πL) | | | |
|---|---|---|---|
| Distance (R) cm | Power mW (P) | Numeric Gain (G) | Limit (L) |
| 366.8 cm | 59979 | 28.18 | 1.0 |

**The minimum safe distance is 366.8 cm for a 14.5 dBi gain antenna.**

END OF TEST REPORT