Test Report

Prepared for: EMC Technologies Canada, Ltd.

Model: Aspire 400 AES6

Description: Aircraft earth station

Serial Number: 1928- 11496

FCC ID: K6K-HP
K6K-MK5

To

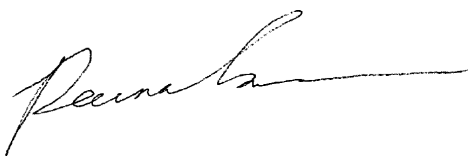
FCC Part 1.1310

Date of Issue: September 14, 2020

On the behalf of the applicant:	**EMS Technologies Canda LTD** **FRN:0019381896** **400 Maple Groove** **Ottawa Ontario K2V1B8** **Canada**
Attention of:	**Dennis Teske** **613-595-7935** **Dennis.teske@honeywell.com**

Prepared by
Compliance Testing, LLC
1724 S. Nevada Way
Mesa, AZ 85204
(480) 926-3100 phone / (480) 926-3598 fax
www.compliancetesting.com

Project No:p2020007



Poona Saber
Project Test Engineer

Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	September 14, 2020	Poona Saber	Original Document
2.0	October 20,2020	Poona Saber	Limit and minimum safe distance changed

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. #349717

IC Site Reg. #2044A-2

Non-accredited tests contained in this report:

N/A

Model: Aspire 400 AES6 – HPA 400
Description: aircraft earth station
Firmware: NA
Software: EMG49-L011-010K, VDD-90406277-REV-R00

Additional Information:

The Aspire 400 AES6, AES7 SATCOM Avionics is an integral part of the complete L-band Inmarsat Satellite communications system, as shown in Figure 1 and is composed of the following components:

- • Compact Satellite Data Unit (CSDU)
- • CSDU Configuration Module (SCM)
- • High Power Amplifier (HPA)
- • RF Diplexer and LNA (DLNA)
- • High Gain Antenna (HGA) for AES6
- • Intermediate Gain Antenna (IGA) for AES7
- • Associated wiring

The CSDU is the central communications processing and control unit, largely determining the functionality of the complete SATCOM system. The signal-in-space parameters are determined by the CSDU in relation to modulation/demodulation, error correction, coding, interleaving and data rates associated with the communication channel(s). The CSDU contains circuits for conversion of digital and/or analog inputs/outputs to/from radio frequency (RF). The CSDU requires external Amplifier and Antenna functions in order to complete the SATCOM Avionics Suite. The CSDU is capable of sending and receiving various data rates. The rate is dynamically selected by the individual applications and by the network assessment of current operating conditions.

The external SCM contains the Secure Owner Requirements Table (ORT), the User Owner Requirements Table (ORT), and the 2 SwiftBroadband Universal Subscriber Identity Module (USIM). The SCM also contains the AES PKI information (Public/Private Keys and certificate information stored in a UICC smart card).
The High Power Amplifier (HPA) provides signal amplification to attain the required EIRP level for the given services and class definition.

Diplexer and Low-Noise Amplifier functions are combined into the DLNA (Type F) standalone LRU. The Low-Noise Amplifier (LNA) provides the signal amplification for the receive RF signal, and the diplexer provides signal filtering to separate the TX and RX signals. The DLNA provides the interfaces between the CSDU and the Antenna on the receive path, and between the HPA and the Antenna on the transmit path.

The CSDU has the following physical characteristics. Some key elements are listed below:

• Unit Assembly: Aspire 400 CSDU, AC Powered

• Part Number: 90402651

The HPA has the following physical characteristics. Some key elements are listed below:

• Unit Assembly: HPA–115 Vac Powered

• Part Number: 90404514

The SCM has the following physical characteristics. Some key elements are listed below

• Unit Assembly: Aspire 400 SCM

• Part Number: 90402652

Article	FCC ID
Aspire 400 SDU	K6K-MK5
AC Aspire 400 HPA	K6K-HP

List of frequencies tested:

Frequency (MHz)
1626.5
1643.5
1660.5

List of Antennas:

Manufacturer	Model number	AES Class	Max Gain
Honeywell	AMT-3800 HGA	6	17 dBiC
Chelton	HGA-2100 HGA	6	12 dBiC

Honeywell	AMT-1800 IGA	7	12 dBiC
CMC Electronics	CMA-2200SB IGA	7	8.5 dBiC

Average Power calculations

Average Power = Peak Power * duty-cycle%

Tuned Frequency (MHz)	Conducted Peak Output Power (mW)	Duty Cycle (%)	Average Power (mW)
1660.5	21820	100	mW

MPE Evaluation

This is a mobile device used in Uncontrolled Exposure environment.

Limits Uncontrolled Exposure 47 CFR 1.1310 Table 1, (B)	0.3-1.234 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)	21820
Antenna Gain Isotropic	17 dBi
Antenna Gain Numeric (G)	50.11
Antenna Type	HGA
Distance (R)	20 cm

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

Power Density (S) = 217.53
Limit = (from above table) = 1.0

Minimum Safe Distance Evaluation

Limits Uncontrolled Exposure 47 CFR 1.1310 Table 1, (B)	0.3-1.234 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)	21820
Antenna Gain Isotropic	17 dBi
Antenna Gain Numeric (G)	50.11
Antenna Type	HGA
Limit (L)	1.107

R=√(PG/4πL)			
Distance (R) cm	Power mW (P)	Numeric Gain (G)	Limit (L)
295.05	21820	50.11	1.0

The minimum safe distance for installation is 295.05 centimeters.

END OF TEST REPORT