Technical Documentation

0628-DOC-PM-ASTRO

Product homologation with embedded Astronode S
White Paper

For feedback or questions: *support@astrocast.com*

Document history

Issue/rev.	Date	Modifications
0/1	22.12.2021	Initial preliminary version

Reference documents

Document name	Document number
Astronode S - Datasheet	0532
Astronode Patch Antenna Datasheet & Integration guide	0534
Astronode Serial Commands	0656

In this document

This is an information

This is a warning

Acronyms

Acronym	Description
FCC	Federal communications commission
RF	Radio Frequency
UART	Universal asynchronous receiver transmitter

Table of Content

1   Introduction

This document is a guide through the process of radio testing and product homologation for applications integrating Astrocast's Astronode S or Astronode S+. For this purpose, a variant of the corresponding product with a special firmware enabling test modes will be needed. Please contact Astrocast to obtain the device you need for your application:

Item Number	Item Description
AST50165-00	TST Astronode S
AST50166-00	TST Astronode S+

These products feature serial commands not available on the standard variants, enabling antenna testing for CE and FCC certification.

> ⚠️   Serial test commands are authorized for exclusive use on TST products installed in anechoic chambers, shielded boxes or in a conducted measurement setup

2   Setup

All test modes can be controlled through the serial interface of the Astronode S, see *0656 Astronode Serial Command Reference* for details.

Figure 1 shows the typical setup for radiated and conducted radio testing:
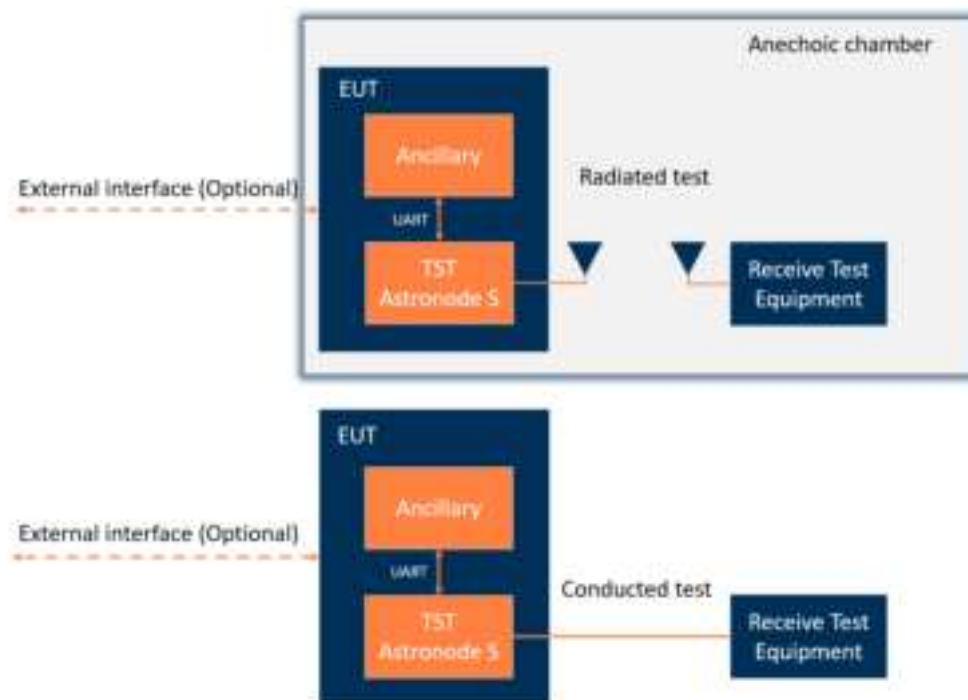

Figure 1 - Test setup

3 Recommendations

It is highly recommended to foresee the mounting of an optional RF connector at the place of the antenna. Additional RF lines should be avoided, especially stubs (branch off the main RF line to the connector) which could impact the RF performance with the antenna mounted.

The RF connector footprint will allow for conducted testing to be done without modifying the hardware of the final product.
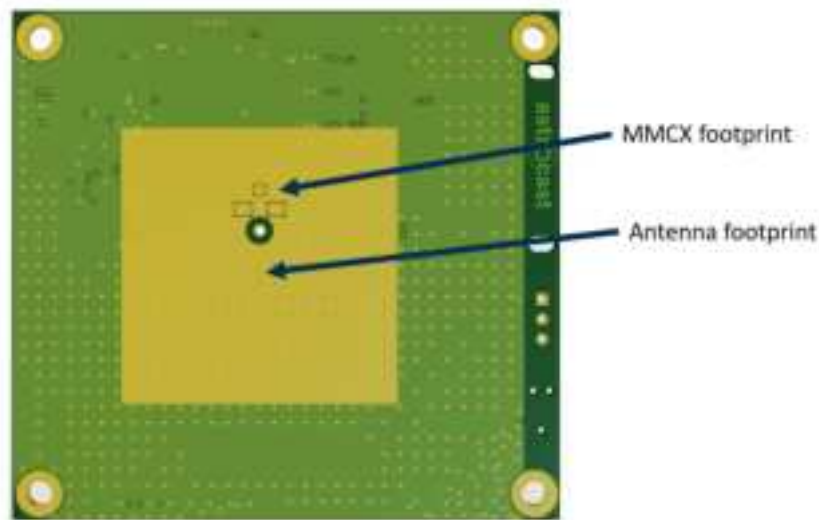

Figure 2 - Footprints

3.1 Implementation example

On the Astronode S+ with the standard mounted patch antenna (Figure 3), Astrocast placed an optional surface mounted MMCX connector footprint, see Figure 4.

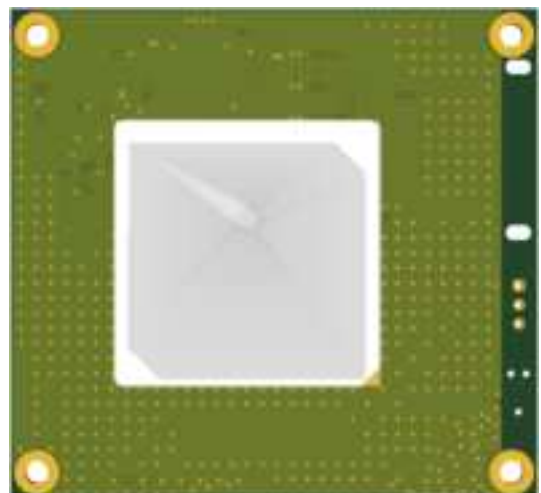Astronode S+ as standard product, with mounted antenna patch, ready for **radiated radio testing**:

Figure 3 - Antenna mounted

Astronode S+ without antenna, and with the optional MMCX connector mounted for **conducted radio testing**. Note the connector placement next to the antenna pin to avoid additional RF lines on the PCB:
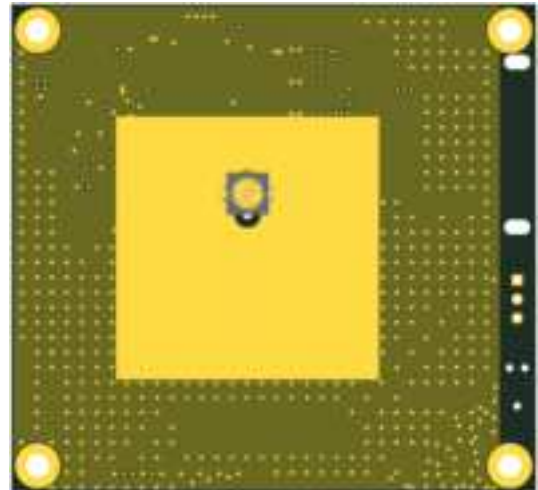

Figure 4 - Connector mounted

-⬭- As laboratory instruments are based on SMA connectors, providing a MMCX to SMA cable is recommended for the homologation process

4   Product information:

Some information might be needed for product certification in addition to the data provided in the respective datasheets. The following list is provided to customers. If more information is needed, please contact Astrocast (*support@astrocast.com*).

Parameter	Specification
Highest frequency	1659.5 MHz
TX L-band range	1627.5 MHz to 1659.5 MHz
RX L-band range	1525 MHz to 1559 MHz
Modulation	QPSK
Operating channel width	Any 150 KHz within the L-band
Channel spacing	150 KHz
Transmission time max.	1.4s
Maximum duty cycle	54%

5   Test mode commands

Please refer to the document *0656 Astronode Serial Command Reference* for more details on test commands for homologation.

The TST products listed in Chapter 1 feature the special test command HTX_SR which allows to start a continuous TX transmission with PRBS9 data format or unmodulated at the desired frequency. This test mode is needed for spurious and EMC homologation tests.