

**Table ROSA DATA SHEET**

|   |   |  |
|---|---|--|
| <b>ROSA INSTRUMENT</b>                                | Radio Occultation Sounder the Atmosphere (ROSA) Instrument.                             |  |
| <b>Frequency Band:</b>                                | L1: 1575.42 MHz   | Receiver                                     |
|   | L2: 1227.6 MHz  |  |
|   | 1217 MHz – 1620 MHz   | Radio Occultation Antenna                    |
|   | 1212 MHz – 1590 MHz   | Navigation Antenna                           |
| <b>Dual-Frequency Channels (Navigation Purpose)</b>   | 16 max (without observation mode)<br>8 max (in observation mode)                        |  |
| <b>Dual-Frequency Channels (Observation Purpose)</b>  | 8   |  |
| <b>Dynamic Conditions:</b>                            | Doppler Shift:  | ± 50 kHz                                     |
|   | Doppler Rate:   | ± 110 Hz/s                                   |
|   | Doppler Acceleration:   | ± 0.5 Hz/s <sup>2</sup>                      |
| <b>Time-To-First-Fix: (95%)</b>                       | Warm Start:   | 120 sec (with almanac, position, time known) |
|   | Cold Start:   | 30 min (blind search)                        |
| <b>Navigation Data Accuracy (SPS Solution, 1σ3D):</b> | Position:   | 20 m   |
|   | Velocity:   | 0.5 m/s                                      |
|   | Time:   | ± 400 ns                                     |
| <b>Navigation Data Accuracy (NKF Solution, 1σ3D):</b> | Position:   | 8 m  |
|   | Velocity:   | 0.1 m/s                                      |
|   | Time:   | ± 400 ns                                     |
| <b>Updating Rate:</b>                                 | 1 Hz  |  |
| <b>Pseudorange precision: (Sampled at 1Hz)</b>        | <b>GPS</b>  |  |
|   | 1. L1 C/A CODE:   | 0.5 m  |
|   | L1 and L2 P Code:   | 0.25 m (AS Off)                              |
|   | L2 P (Y) Code:  | 1 m (AS On)                                  |
| <b>Carrier Phase Error</b>                            | <b>Navigation</b>   |  |
|   | L1 error: 1 mm ( $h > h_{orbit}$ )  |  |
|   | L2 error: 1 mm (AS off, $h > h_{orbit}$ km)   |  |
|   | L2 error: 5 mm (AS on, $h > h_{orbit}$ km)  |  |
|   | <b>Observation</b>  |  |
|   | L1 error: 1 mm (100 km $<h < h_{orbit}$ )   |  |
|   | L2 error: 1 mm (AS off, 100 km $<h < h_{orbit}$ )                                       |  |
|   | L2 error: 5 mm (AS on, 100 km $<h < h_{orbit}$ )  |  |
| L1 error: 1 mm to 3 mm (12 km $<h < 100$ km)          |   |  |
| L2 error: 5 mm to 7 mm (AS on, 12 km $<h < 100$ km)   |   |  |
| L2 error: 5 mm to 7 mm (AS off, 12 km $<h < 100$ km)  |   |  |
| L1 error: 3 mm to 30 mm (1 km $<h < 12$ km)           |   |  |
| L2 error: NA (AS on, 12 km $<h < 100$ km)             |   |  |
| L2 error: NA (AS off, 12 km $<h < 100$ km)            |   |  |
| <b>Interface:</b>                                     | Data/Command: MIL-STD-1553B<br>PPS output: RS-422 (dedicated Receiver connector)        |  |
| <b>Power:</b>   | Input Voltage: 21 ÷ 40 V  | Consumption: 38 W Operating Mode             |
| <b>Dimensions:</b>                                    | Receiver  | 287 x 250 x 206 mm                           |
|   | Radio Occultation Antenna   | 1035 x 500 x 165 mm                          |
|   | Navigation Antenna  | 127 x 49 mm                                  |
| <b>Weight</b>   | 16.1 kg (with RF cables connecting Antennas to Receiver, length 3 m)                    |  |
| <b>RADIO OCCULTATION ANTENNA</b>                      | high gain GPS Antenna, totally passive, developed for Radio Occultation Applications    |  |
| <b>Polarization</b>                                   | RHCP  |  |
| <b>Gain</b>   | 12 dB max (reduced coverage)  |  |
|   | -3 dB max (minimum gain in extended coverage)   |  |
| <b>NAVIGATION ANTENNA</b>                             | Omni directional, zenith point GPS Antenna used to do POD (Precise Orbit Determination) |  |
| <b>Polarization</b>                                   | RHCP  |  |
| <b>Gain</b>   | 5 dB max (at zenith)  |  |