

| File number | Piece number |
|-------------|--------------|
|             |              |



File Number TYS-HSTA1-IDS  
Stage mark FM  
Page 18

# HST-A1 Star Tracker IDS

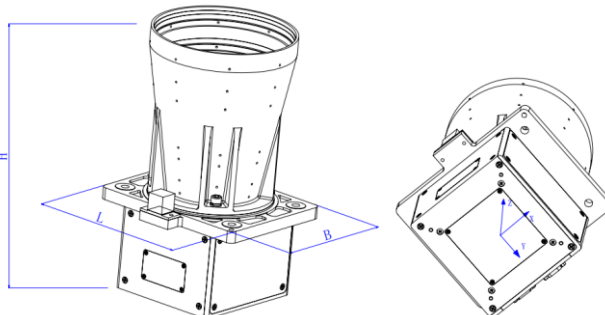
Signature

Edit : FUSHUXIN  
Proofreading : FANWEI  
Check : WANG HONGQIANG  
Standard check: LI YANAN  
Approval : WANGHAIJUN

## IDS 1: Performance Index

|                       |  |                     |  |            |                 |
|-----------------------|--|---------------------|--|------------|-----------------|
|                       | File number  | TYS-HSTA1-IDS       |  |            |                 |
|                       | Sub-system name  |                     |  |            |                 |
|                       | Device name  | HST-A1 Star Tracker |  | Stage mark |                 |
|                       | Device code  |                     |  |            | FM              |
| Attitude Accuracy     | Pointing: 0.3" (3 $\sigma$ )<br>Rolling: 5" (3 $\sigma$ )  |                     |  |            |                 |
| Dynamic Range         | @ 0.1°/s: 0.3" (Pointing, 3 $\sigma$ ); 5" (Rolling, 3 $\sigma$ );<br>@0.5°/s: 1" (Pointing, 3 $\sigma$ ); 15" (Rolling, 3 $\sigma$ );<br>@1.0°/s: 1.5" (Pointing, 3 $\sigma$ ); 20" (Rolling, 3 $\sigma$ );<br>@ 1.5° /s: follow up |                     |  |            |                 |
| Field of View         | $\geq 5.5^\circ \times 5.5^\circ$  |                     |  |            |                 |
| Update Rate           | $\geq 10\text{Hz}$   |                     |  |            |                 |
| Start-up Time         | $\leq 5\text{s}$   |                     |  |            |                 |
| Acquisition Rate      | Max. $\leq 2\text{s}$  |                     |  |            |                 |
| Exclusive Angle       | Sun: $\leq 30^\circ$ ;   |                     |  |            |                 |
| Timing Accuracy       | $\pm 1\mu\text{s}$ @ synchronization pulse (PPS Signal)  |                     |  |            |                 |
| Quaternion Continuity | the scalar of quaternion: non-negative   |                     |  |            |                 |
| Communication         | RS422  |                     |  |            |                 |
| Image Output          | Cameralink   |                     |  |            |                 |
| Life Time             | 7years @LEO Orbit  |                     |  |            |                 |
| Reliability           | $\geq 0.98$ @ the end of 7 years running   |                     |  |            |                 |
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| Signed (Date) :       |  | Mark                |  |            | Signature, date |

## IDS 2: Mechanical Characteristics-Body

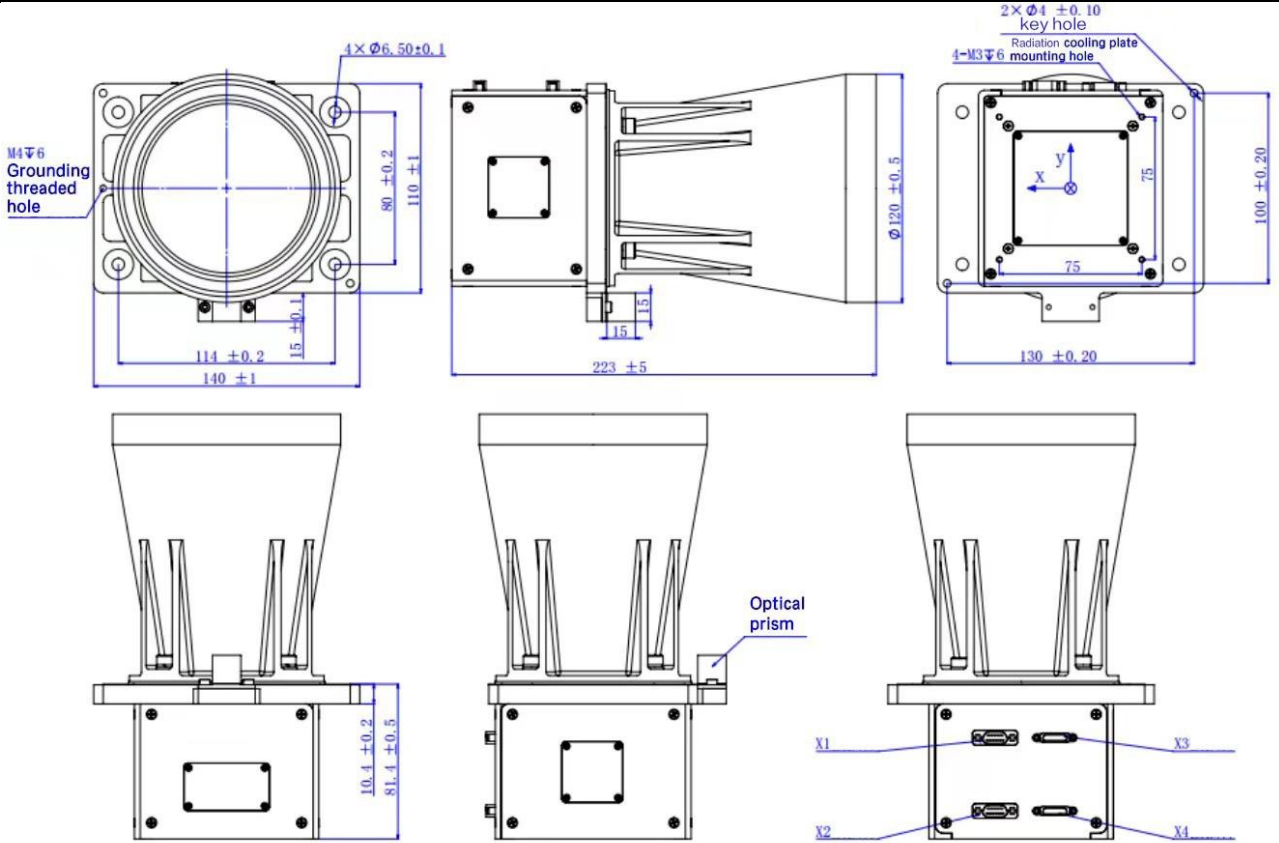
|   |   |                           |  |                               |                       |                          |                    |
|---|---|---------------------------|--|-------------------------------|-----------------------|--------------------------|--------------------|
|   |   | File number               |  | TYS-HSTA1-IDS                 |                       |                          |                    |
|   |   | Sub-system name           |  |                               |                       |                          |                    |
|   |   | Device name               |  | HST-A1 Star Tracker           |                       | Stage mark               |                    |
|   |   | Device code               |  |                               |                       | FM                       |                    |
| Device weight <sup>(note)</sup> 4.2kg±0.3kg(without baffle)   |   | Device number: 1          |  |                               |                       | √                        |                    |
| Weight<br>charact<br>eristics   | Envelope size mm  | Envelope: 140±1×130±1     |  | Height: 223±5                 |                       | √                        |                    |
|   | Centroid position mm  | X: -0.33±1                | Y: -0.46±1                                       | Z: 120.3±1                    |                       | √                        |                    |
|   | Inertia of centroid kg.mm <sup>2</sup>                                      | P <sub>X</sub> = 22658±5  | P <sub>Y</sub> =22822±5                          | P <sub>Z</sub> =7587±5        |                       | √                        |                    |
|   |   |                           |  |                               | Mea-<br>sure-<br>ment | Calc-<br>ulatio-<br>n    | Esti-<br>-ma<br>te |
|   |   | Installed holes number: 4 | Size of installed holes (tolerance) mm: Φ6.5±0.1 | Material: (Titanium Alloy)TC4 |                       | Determination method (√) |                    |
| Install<br>ation<br>charact<br>eristics   | Installation contacting area mm <sup>2</sup> : 5680                         |                           | Note:  |                               |                       |                          |                    |
|   | Installation surface flatness: 0.1mm  |                           |  |                               |                       |                          |                    |
|   | Installation surface roughness Ra μm: 3.2μm                                 |                           |  |                               |                       |                          |                    |
|   | Installation surface flatness: 0.1mm/100mm×100mm                            |                           |  |                               |                       |                          |                    |
|   | Installation surface state: the installation area is oxidized by conduction |                           |  |                               |                       |                          |                    |
| <p>Parameter relationship diagram:<br/>         Note: the determination method refers to the way to determine the mass of device.</p> <div style="text-align: center;">  </div> |   |                           |  |                               |                       |                          |                    |
| <p>Note: The origin of the coordinates lies in the geometric center of the outer surface of the lower shell (see "Instrument diagram");</p>   |   |                           |  |                               |                       |                          |                    |
| Edited (Date) :   |   |                           |  |                               |                       |                          |                    |
| Signed (Date) :   |   | Mark                      |  |                               |                       | Signature, date          |                    |

### IDS 3: Mechanical Characteristics-Baffle

|   |  |  |                          |                          |  |                          |             |
|---|--|--|--------------------------|--------------------------|--|--------------------------|-------------|
|   |  | File number                                      |                          | TYS-HSTA1-IDS            |  |                          |             |
|   |  | Sub-system name                                  |                          |                          |  |                          |             |
|   |  | Device name                                      |                          | HST-A1 Star Tracker      |  | Stage mark               |             |
|   |  | Device code                                      |                          |                          |  | FM                       |             |
| Device weight <sup>(note)</sup> 0.73kg±0.05kg(Baffle only)  |  | Device number: 1                                 |                          |                          |  | √                        |             |
| Weight characteristics  | Envelope size mm   | Envelope: 155±2                                  |                          | Height: 297±5            |  | √                        |             |
|   | Centroid position mm   | X: 0   | Y: 0                     | Z: 112.184               |  | √                        |             |
|   | Inertia of centroid kg.mm <sup>2</sup>   | P <sub>X</sub> = 6635.851                        | P <sub>Y</sub> =6635.851 | P <sub>Z</sub> =2837.181 |  | Measurement              | Calculation |
| Installation characteristics  | Installed holes number: 4  | Size of installed holes (tolerance) mm: Φ5.4±0.1 |                          | Material:2A12-T4         |  | Determination method (√) |             |
|   | Installation contacting area mm <sup>2</sup> : 6300  | Note:  |                          |                          |  |                          |             |
|   | Installation surface flatness: 0.1mm   |  |                          |                          |  |                          |             |
|   | Installation surface roughness Ra μm: 3.2μm  |  |                          |                          |  |                          |             |
|   | Installation surface flatness: 0.1mm/100mm×100mm   |  |                          |                          |  |                          |             |
|   | Installation surface state: the installation area is oxidized by conduction, and the remaining area is black anodized. |  |                          |                          |  |                          |             |
| <p>Parameter relationship diagram:<br/>         Note: the determination method refers to the way to determine the weight of device.</p> <div style="text-align: center;"> <p>The diagram includes a side view of the baffle with a height dimension 'H' and a ratio 'H/2 : 5'. It also shows a top view of the 'Envelope' and a perspective view of the lower shell with a coordinate system (X, Y, Z) centered on its geometric center. A 'Mounting surface' is also indicated.</p> </div> |  |  |                          |                          |  |                          |             |
| <p>Note: The origin of the coordinates lies in the geometric center of the outer surface of the lower shell (see "Instrument diagram");</p>   |  |  |                          |                          |  |                          |             |
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| Signed (Date) :   |  | Mark   |                          |                          |  | Signature, date          |             |

### IDS 4: Instrument Diagram-Body

|  |                 |                     |            |    |
|--|-----------------|---------------------|------------|----|
|  | File number     | TYS-HSTA1-IDS       |            |    |
|  | Sub-system name |                     |            |    |
|  | Device name     | HST-A1 Star Tracker | Stage mark |    |
|  | Device code     |                     |            | FM |

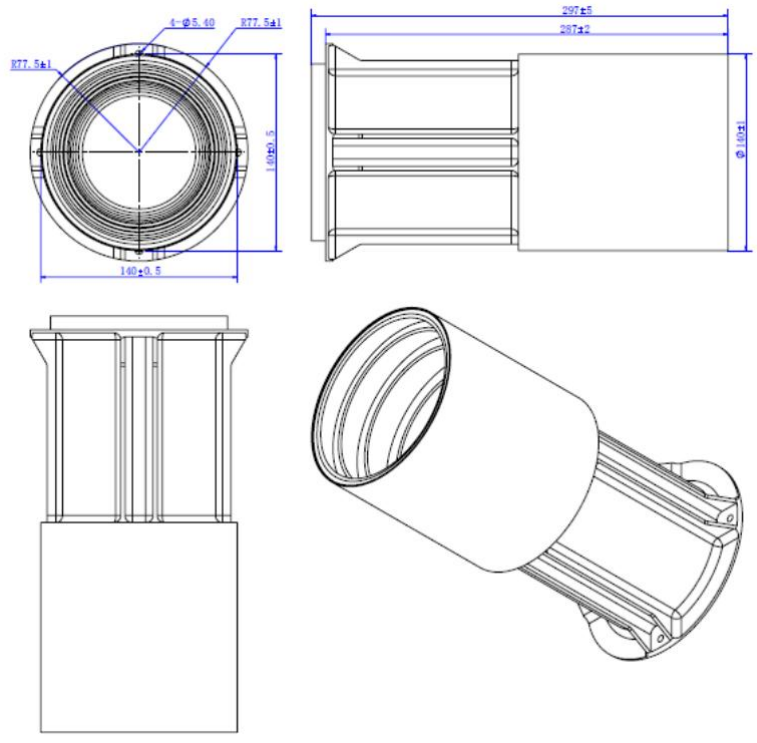


**Note:** This sketch should include body size, mounting size, mounting plane, mounting point (aperture and its tolerances, center distance and its tolerances), position tolerances for guide pins and holes, direction, location, type and number of electrical connectors, the operating hole, the lap (position and length), the registration measurement reference for calibration and testing.

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### IDS 5: Instrument Diagram-Baffle

|  |                 |                     |            |    |
|--|-----------------|---------------------|------------|----|
|  | File number     | TYS-HSTA1-IDS       |            |    |
|  | Sub-system name |                     |            |    |
|  | Device name     | HST-A1 Star Tracker | Stage mark |    |
|  | Device code     |                     |            | FM |

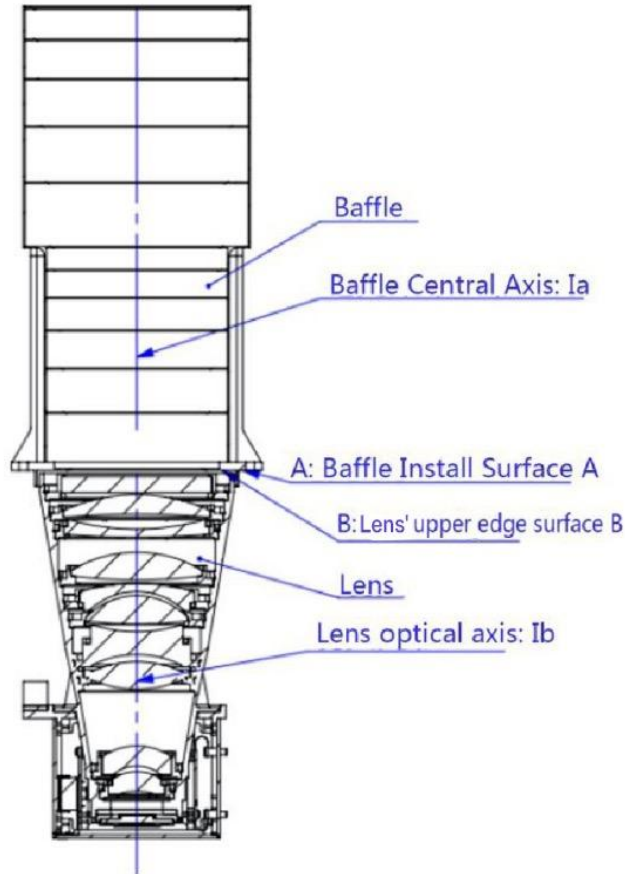


**Note: This sketch should include body size, mounting size, mounting plane, mounting point (aperture and its tolerances, center distance and its tolerances), position tolerances for guide pins and holes, direction, location, type and number of electrical connectors, the operating hole, the lap (position and length), the registration measurement reference for calibration and testing.**

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| Signed (Date) : | Mark |  | Signature, date |

### IDS 6: Instrument Diagram-Entirety

|  |                 |                     |            |    |
|--|-----------------|---------------------|------------|----|
|  | File number     | TYS-HSTA1-IDS       |            |    |
|  | Sub-system name |                     |            |    |
|  | Device name     | HST-A1 Star Tracker | Stage mark |    |
|  | Device code     |                     |            | FM |



**Note:**

1. Baffle Central Axis Ia and Lens optical axis Ib share the axis, angle Error  $\pm 0.5^\circ$  .
2. Baffle Install Surface A and upper edge surface B is Parallel installation, the gap between the two reference plane is 2mm.
3. A support should be designed for star tracker body and baffle in a whole.

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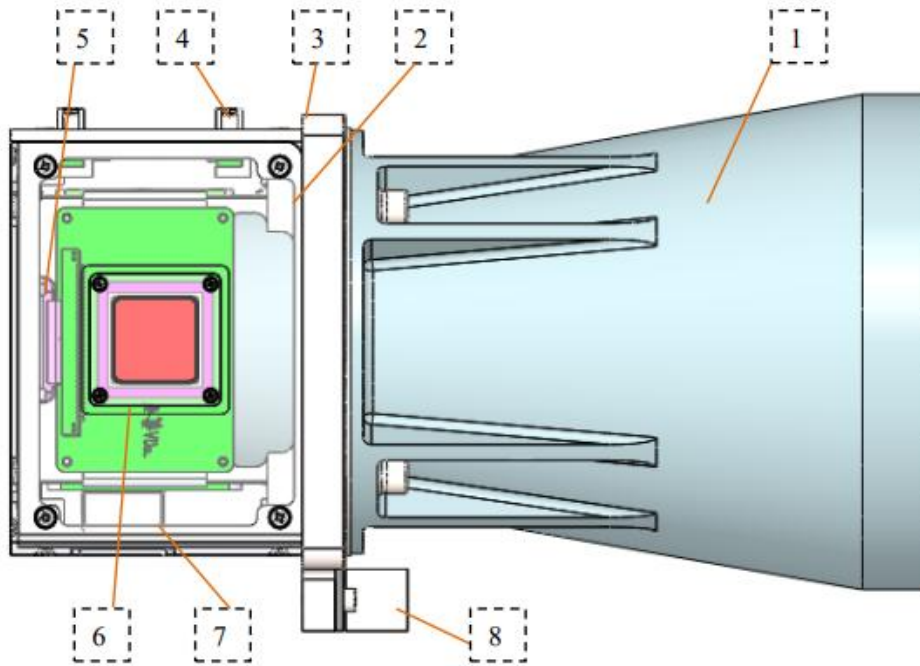
## IDS 7: Thermal characteristics

|  |  |  |  |                 |            |    |
|--|--|--|--|-----------------|------------|----|
|  |  | File number  | TYS-HSTA1-IDS                                  |                 |            |    |
|  |  | Sub-system name  |  |                 |            |    |
|  |  | Device name  | HST-A1 Star Tracker                            |                 | Stage mark |    |
|  |  | Device code  |  |                 |            | FM |
| Surface<br>(except<br>for<br>mounting<br>surface)                      | Material: Titanium alloy(TC4),<br>Aluminum alloy (2A12-T4) | Note: The inner surface of the baffle is treated with ultra black coating,<br>$\epsilon_H: \geq 0.85, \alpha_S: \geq 0.96$ |  |                 |            |    |
|  | Outside surface treatment:<br>aluminum anodization         |  |  |                 |            |    |
|  | $\epsilon_H: \geq 0.6$                                     |  |  |                 |            |    |
|  | Preparing state heat<br>consumption W: 0 (per device)      |  |  |                 |            |    |
| Electronic Start temperature $^{\circ}\text{C}$ : -30~+40              |  | Storage temperature range $^{\circ}\text{C}$ :<br>-10~+30  | Heat capacity J/K :<br>4200(Body), 730(Baffle) |                 |            |    |
| Electronic Operating temperature range $^{\circ}\text{C}$ : -30~+40    |  | The best operating temperature range $^{\circ}\text{C}$ : $20 \pm 0.5$   |  |                 |            |    |
| Lens Operating temperature range $^{\circ}\text{C}$ : -10~+30          |  | Operating relative humidity range: $\leq 60\%$   |  |                 |            |    |
| Operating state heat consumption W: $3.5 \pm 0.5\text{W}$ (per device) |  | Storage relative humidity range: $\leq 70\%$   |  |                 |            |    |
| Description:   |  |  |  |                 |            |    |
|  |  |  |  |                 |            |    |
| Edited (Date) :  |  |  |  |                 |            |    |
| Signed (Date) :  |  | Mark   |  | Signature, date |            |    |

## IDS 8: Thermal Diagram

|  |                 |                     |            |    |
|--|-----------------|---------------------|------------|----|
|  | File number     | TYS-HSTA1-IDS       |            |    |
|  | Sub-system name |                     |            |    |
|  | Device name     | HST-A1 Star Tracker | Stage mark |    |
|  | Device code     |                     |            | FM |

Diagram:



- |                                      |                                |
|--------------------------------------|--------------------------------|
| 1—Lens                               | 2—Circuit box                  |
| 3—Installing lugs (Contact surfaces) | 4—Connector                    |
| 5—Image processing circuit board     | 6—Image sensor & Circuit board |
| 7—Power circuit board                | 8—Prism                        |

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| Signed (Date) : | Mark |  | Signature, date |

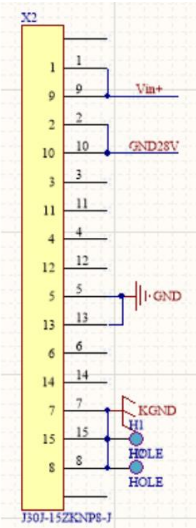
### IDS 9: Power

|   |                     |                            |  |                     |  |               |                 |
|---|---------------------|----------------------------|--|---------------------|--|---------------|-----------------|
|   |                     | File number                |  | TYS-HSTA1-IDS       |  |               |                 |
|   |                     | Sub-system name            |  |                     |  |               |                 |
|   |                     | Device name                |  | HST-A1 Star Tracker |  | Stage mark    |                 |
|   |                     | Device code                |  |                     |  | FM            |                 |
| Working mode<br>(long term/short term/others) |                     | Long term                  | Single non-long-term power-up working hours S              |                     |  | Device number | 1               |
| Voltage V                                     | Voltage stability % | Ripple voltage mV<br>(P-P) | Device starting current characteristics<br>(peak/duration) |                     |  | Power W       |                 |
| 28  | 5%                  | 300                        | 2A/5ms   |                     |  | 3.5±0.5       |                 |
|   |                     |                            |  |                     |  |               |                 |
| Edited (Date) :                               |                     |                            |  |                     |  |               |                 |
| Signed (Date) :                               |                     |                            |  | Mark                |  |               | Signature, date |

## IDS 10: Electrical Connector Contact Assignment-X1

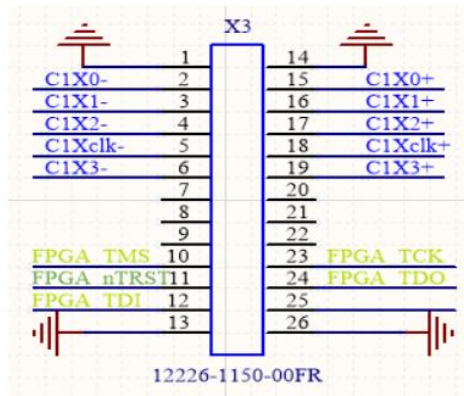
|  |                               |                            |                |                           |  |                              |  |                 |      |
|--|-------------------------------|----------------------------|----------------|---------------------------|--|------------------------------|--|-----------------|------|
|  |                               | File number                |                | TYS-HSTA1-IDS             |  |                              |  |                 |      |
|  |                               | Sub-system name            |                |                           |  |                              |  |                 |      |
|  |                               | Device name                |                | HST-A1 Star Tracker       |  | Stage mark                   |  |                 |      |
|  |                               | Device code                |                |                           |  | FM                           |  |                 |      |
| Name (by function)   |                               | X1 Communication Interface |                | Electrical connector code |  | J30J-15ZKNP8-J               |  | Needle / Hole   | Hole |
| Contact number   | Signal (function) description | Voltage/V                  | Current/A      | Polar                     |  | Remarks (shielded / twisted) |  |                 |      |
| 1,9  | RXD+                          | RS422 Standard             | RS422 Standard | RS422 Receivet+           |  | 1,2 twisted                  |  |                 |      |
| 2,10   | RXD-                          |                            |                | RS422 Receive-            |  | 9,10 twisted                 |  |                 |      |
| 3,11   | TXD+                          | RS422 Standard             | RS422 Standard | RS422 Transmit+           |  | 3,4 twisted                  |  |                 |      |
| 4,12   | TXD-                          |                            |                | RS422 Transmit-           |  | 11,12twisted                 |  |                 |      |
| 5,13   | PPS_H                         | RS422 Standard             | RS422 Standard | PPS Receive+              |  | 5,6 twisted                  |  |                 |      |
| 6,14   | PPS_L                         |                            |                | PPS Receive-              |  | 13,14 twisted                |  |                 |      |
| 7,15   | GND                           | 0V                         |                |                           |  | two-point two-wire           |  |                 |      |
| 8  | none                          |                            |                |                           |  |                              |  |                 |      |
| <p>The diagram shows a 15-pin connector labeled X1. The pins are numbered 1 through 15. The assignments are: Pin 1 and 9 are connected to CAN1+RXD+; Pin 2 and 10 are connected to CAN1-RXD-; Pin 3 and 11 are connected to CAN2+TXD+; Pin 4 and 12 are connected to CAN2-TXD-; Pin 5 and 13 are connected to PPS H; Pin 6 and 14 are connected to PPS L; Pin 7 and 15 are connected to GND. Pin 8 is not connected.</p> |                               |                            |                |                           |  |                              |  |                 |      |
| Edited (Date):   |                               |                            |                |                           |  |                              |  |                 |      |
| Signed (Date):   |                               | Mark                       |                |                           |  |                              |  | Signature, date |      |

## IDS 11: Electrical Connector Contact Assignment-X2

|  |                                       |                    |            |                           |  |                              |  |               |      |
|--|---------------------------------------|--------------------|------------|---------------------------|--|------------------------------|--|---------------|------|
|  |                                       | File number        |            | TYS-HSTA1-IDS             |  |                              |  |               |      |
|  |                                       | Sub-system name    |            |                           |  |                              |  |               |      |
|  |                                       | Device name        |            | HST-A1 Star Tracker       |  | Stage mark                   |  |               |      |
|  |                                       | Device code        |            |                           |  | FM                           |  |               |      |
| Name (by function)   |                                       | X2 Power Connector |            | Electrical connector code |  | J30J-15ZKNP8-J               |  | Needle / Hole | Hole |
| Contact number   | Signal (function) description         | Voltage/ V         | Current/ A | Polar                     |  | Remarks (shielded / twisted) |  |               |      |
| 1,9  | Vin+ positive power (primary power)   | 26~32V             | ≤0.23A     | +                         |  | 1,2 twisted<br>9,10 twisted  |  |               |      |
| 2,10   | GND28V negative power (primary power) | 0                  | 0          | -                         |  |                              |  |               |      |
| 5, 13  | Second ground GND                     | 0                  | 0          | -                         |  | two-point two-wire           |  |               |      |
| 7, 8, 15   | Structure Ground KGND                 | 0                  | 0          | -                         |  | three-point three-wire       |  |               |      |
| 3, 4, 6, 11, 12, 14  | none                                  |                    |            | -                         |  |                              |  |               |      |
|  <p style="text-align: center;">S</p> |                                       |                    |            |                           |  |                              |  |               |      |
| Edited (Date):   |                                       |                    |            |                           |  |                              |  |               |      |
| Signed (Date):   |                                       | Mark               |            |                           |  | Signature, date              |  |               |      |

## IDS 12: Electrical Connector Contact Assignment-X3

|                    |                               | File number     |           | TYS-HSTA1-IDS             |  |   |  |               |      |
|--------------------|-------------------------------|-----------------|-----------|---------------------------|--|---|--|---------------|------|
|                    |                               | Sub-system name |           |                           |  |   |  |               |      |
|                    |                               | Device name     |           | HST-A1 Star Tracker       |  | Stage mark                                |  |               |      |
|                    |                               | Device code     |           |                           |  | FM  |  |               |      |
| Name (by function) |                               | X3              |           | Electrical connector code |  | 12226-1150-00FR                           |  | Needle / Hole | Hole |
| Contact number     | Signal (function) description | Voltage/V       | Current/A | Polar                     |  | Remarks (shielded / twisted)              |  |               |      |
| 5                  | C1Xclk-                       | LVDS            | LVDS      | Camera-Link1 Xclk-        |  | Twisted shielded                          |  |               |      |
| 18                 | C1Xclk+                       | Standard        | Standard  | Camera-Link1 Xclk+        |  |   |  |               |      |
| 2                  | C1X0-                         | LVDS            | LVDS      | Camera-Link1 X0-          |  | Twisted shielded                          |  |               |      |
| 15                 | C1X0+                         | Standard        | Standard  | Camera-Link1 X0+          |  |   |  |               |      |
| 3                  | C1X1-                         | LVDS            | LVDS      | Camera-Link1 X1-          |  | Twisted shielded                          |  |               |      |
| 16                 | C1X1+                         | Standard        | Standard  | Camera-Link1 X1+          |  |   |  |               |      |
| 4                  | C1X2-                         | LVDS            | LVDS      | Camera-Link1 X2-          |  | Twisted shielded                          |  |               |      |
| 17                 | C1X2+                         | Standard        | Standard  | Camera-Link1 X2+          |  |   |  |               |      |
| 6                  | C1X3-                         | LVDS            | LVDS      | Camera-Link1 X3-          |  | Twisted shielded                          |  |               |      |
| 19                 | C1X3+                         | Standard        | Standard  | Camera-Link1 X3+          |  |   |  |               |      |
| 10                 | FPGA_TMS                      |                 |           | FPGA_TMS                  |  | Internal use,<br>prohibit<br>external use |  |               |      |
| 11                 | FPGA_nTRST                    |                 |           | FPGA_nTRST                |  |   |  |               |      |
| 12                 | FPGA_TDI                      |                 |           | FPGA_TDI                  |  |   |  |               |      |
| 23                 | FPGA_TCK                      |                 |           | FPGA_TCK                  |  |   |  |               |      |
| 24                 | FPGA_TDO                      |                 |           | FPGA_TDO                  |  |   |  |               |      |
| 1.13.14.26         | GND                           | 0               | 0         |                           |  | Second ground                             |  |               |      |
| 7,8,9,20,21,2      | None                          |                 |           |                           |  |   |  |               |      |



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| Signed (Date): | Mark |  | Signature, date |

### IDS 13: Electrical Connector Contact Assignment-X4

|  |                               | File number     |           | TYS-HSTA1-IDS             |  |                              |  |               |      |
|--|-------------------------------|-----------------|-----------|---------------------------|--|------------------------------|--|---------------|------|
|  |                               | Sub-system name |           |                           |  |                              |  |               |      |
|  |                               | Device name     |           | HST-A1 Star Tracker       |  | Stage mark                   |  |               |      |
|  |                               | Device code     |           |                           |  | FM                           |  |               |      |
| Name (by function)                                 |                               | X4              |           | Electrical connector code |  | 12226-1150-00FR              |  | Needle / Hole | Hole |
| Contact number                                     | Signal (function) description | Voltage/V       | Current/A | Polar                     |  | Remarks (shielded / twisted) |  |               |      |
| 5  | C2Xclk-                       | LVDS            | LVDS      | Camera-Link2 Xclk-        |  | Twisted shielded             |  |               |      |
| 18   | C2Xclk+                       | Standard        | Standard  | Camera-Link2 Xclk+        |  |                              |  |               |      |
| 2  | C2X0-                         | LVDS            | LVDS      | Camera-Link2 X0-          |  | Twisted shielded             |  |               |      |
| 15   | C2X0+                         | Standard        | Standard  | Camera-Link2 X0+          |  |                              |  |               |      |
| 3  | C2X1-                         | LVDS            | LVDS      | Camera-Link2 X1-          |  | Twisted shielded             |  |               |      |
| 16   | C2X1+                         | Standard        | Standard  | Camera-Link2 X1+          |  |                              |  |               |      |
| 4  | C2X2-                         | LVDS            | LVDS      | Camera-Link2 X2-          |  | Twisted shielded             |  |               |      |
| 17   | C2X2+                         | Standard        | Standard  | Camera-Link2 X2+          |  |                              |  |               |      |
| 6  | C2X3-                         | LVDS            | LVDS      | Camera-Link2 X3-          |  | Twisted shielded             |  |               |      |
| 19   | C2X3+                         | Standard        | Standard  | Camera-Link2 X3+          |  |                              |  |               |      |
| 1,13,14,26   | GND                           | 0               | 0         |                           |  | Second ground                |  |               |      |
| 7,8,9,10,11,<br>12,20,21,22,<br>23,24,25           | None                          |                 |           |                           |  |                              |  |               |      |
| <p style="text-align: center;">12226-1150-00FR</p> |                               |                 |           |                           |  |                              |  |               |      |
| Edited (Date):                                     |                               |                 |           |                           |  |                              |  |               |      |
| Signed (Date):                                     |                               | Mark            |           |                           |  | Signature, date              |  |               |      |

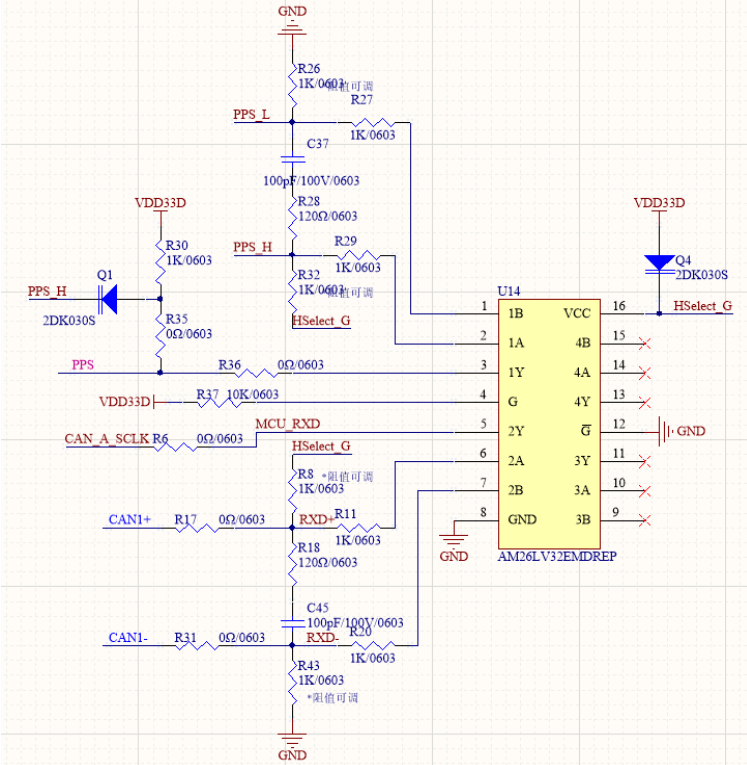
## IDS 14: Electrical Interface Features-Power

|                        |  |                     |  |            |                 |
|------------------------|--|---------------------|--|------------|-----------------|
|                        | File number                                      | TYS-HSTA1-IDS       |  |            |                 |
|                        | Sub-system name                                  |                     |  |            |                 |
|                        | Device name                                      | HST-A1 Star Tracker |  | Stage mark |                 |
|                        | Device code                                      |                     |  |            | FM              |
| Interface signal       | Power supply                                     |                     |  |            |                 |
| Signal characteristics | 28V power and the ground are two-point two-wire. |                     |  |            |                 |
| Interface Circuit      |  |                     |  |            |                 |
| Explanation            |  |                     |  |            |                 |
| Edited (Date):         |  |                     |  |            |                 |
| Signed (Date):         |  | Mark                |  |            | Signature, date |

## IDS 15: Electrical Interface Features-RS422

|                        |   |                     |  |            |                 |
|------------------------|---|---------------------|--|------------|-----------------|
|                        | File number   | TYS-HSTA1-IDS       |  |            |                 |
|                        | Sub-system name   |                     |  |            |                 |
|                        | Device name   | HST-A1 Star Tracker |  | Stage mark |                 |
|                        | Device code   |                     |  |            | FM              |
| Interface signal       | Digital signal: RS422   |                     |  |            |                 |
| Signal characteristics | 422 communication baud rate: 115200bps<br>Connection mode: two-point two-wire |                     |  |            |                 |
| Interface Circuit      |   |                     |  |            |                 |
| Explanation            |   |                     |  |            |                 |
| Edited (Date):         |   |                     |  |            |                 |
| Signed (Date):         |   | Mark                |  |            | Signature, date |

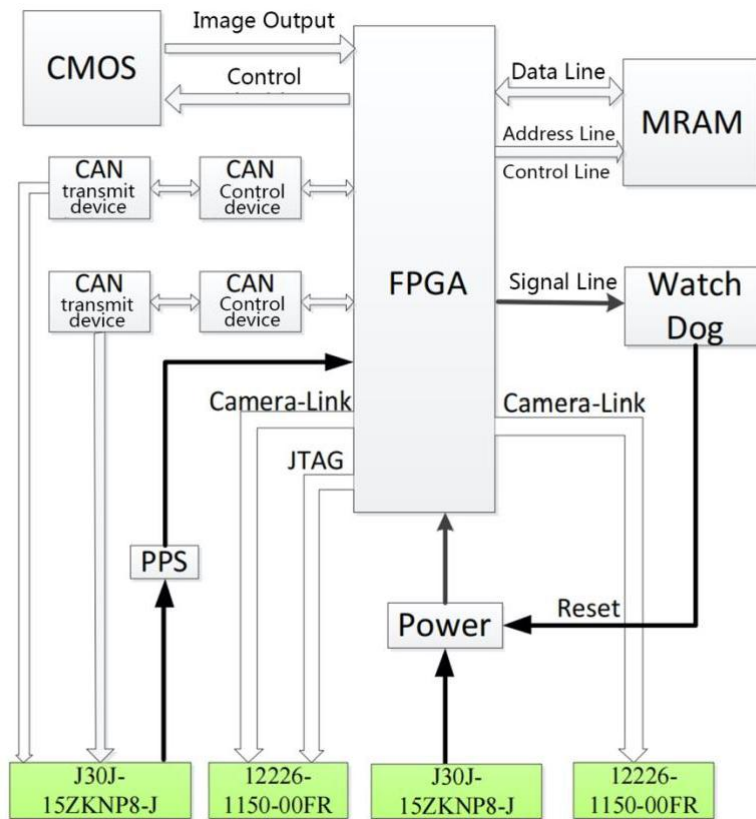
## IDS 16: Electrical Interface Features-Second Pulse(Different)

|                        |  |                     |                 |    |
|------------------------|--|---------------------|-----------------|----|
|                        | File number  | TYS-HSTA1-IDS       |                 |    |
|                        | Sub-system name  |                     |                 |    |
|                        | Device name  | HST-A1 Star Tracker | Stage mark      |    |
|                        | Device code  |                     |                 | FM |
| Interface signal       | Different second pulse   |                     |                 |    |
| Signal characteristics | @Different second pulse, the second integer is aligned by the lower edge, and the negative pulse width is 1ms.                               |                     |                 |    |
| Interface Circuit      | <p style="text-align: center;">Seconds pulse circuit</p>  |                     |                 |    |
| Explanation            | R30、 R35 and Q1 are not weld @Different second pulse   |                     |                 |    |
| Edited (Date):         |  |                     |                 |    |
| Signed (Date):         | Mark   |                     | Signature, date |    |

## IDS 17: Circuit and Interface Schematics

|  |                 |                     |            |    |
|--|-----------------|---------------------|------------|----|
|  | File number     | TYS-HSTA1-IDS       |            |    |
|  | Sub-system name |                     |            |    |
|  | Device name     | HST-A1 Star Tracker | Stage mark |    |
|  | Device code     |                     |            | FM |

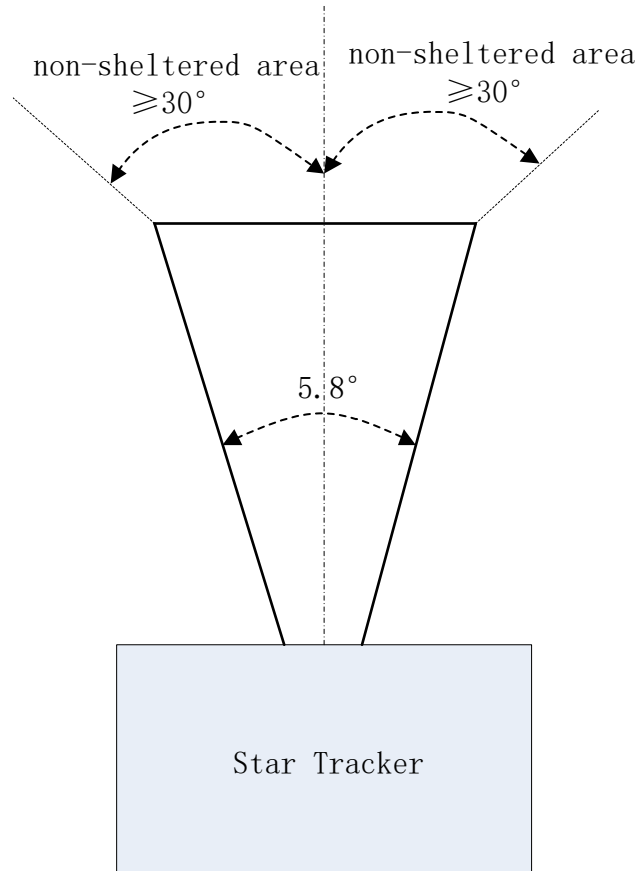
Simplified diagram:



|                |      |  |                 |
|----------------|------|--|-----------------|
| Edited (Date): |      |  |                 |
| Signed (Date): | Mark |  | Signature, date |

## IDS 18: Installation requirements

|  |                 |                     |            |    |
|--|-----------------|---------------------|------------|----|
|  | File number     | TYS-HSTA1-IDS       |            |    |
|  | Sub-system name |                     |            |    |
|  | Device name     | HST-A1 Star Tracker | Stage mark |    |
|  | Device code     |                     |            | FM |



Be sure: Nothing sheltered in the field of view: the circular cone of 60° around the top of the Baffle.

|                |      |  |                 |
|----------------|------|--|-----------------|
| Edited (Date): |      |  |                 |
| Signed (Date): | Mark |  | Signature, date |