File number	Piece number

File Number TYS-PST3SH5-IDS

Stage mark FM

Page 14

PST3S-H5 Star Tracker IDS

Signature

Edit ： FUSHUXIN

Proofreading ： WANGHONGQIANG

Check ： XIAO MINGGUO

Standard check： CHAIYIN

Approval ： WANGHAIJUN

IDS 1：Performance Index

	File number	TYS-PST3SH5-IDS				
	Sub-system name					
	Device name	PST3S-H5 Star Tracker	Stage mark			
	Device code				FM	

Attitude Accuracy	Pointing: 3″ (3 σ) Rolling: 30″ (3 σ)
Dynamic Range	@ 0.1°/s: 5″ (Pointing, 3 σ); 50″ (Rolling, 3 σ); @0.5°/s: 8″ (Pointing, 3 σ); 60″ (Rolling, 3 σ); @1.0°/s: 15″ (Pointing, 3 σ); 120″ (Rolling, 3 σ); @ 3°/s: follow up
Data Validity	>98%@ 0.5°/s; >96%@0.5°/s ~1.5°/s;
Update Rate	≥10Hz
Acquisition Rate	Max. ≤2s
Start-up Time	Better than 5s
Exclusive Angle	Sun ≤35°; Earth or other stray light ＜25°
Timing Accuracy	0.5ms @ synchronization pulse（SYNC pulse）
quaternion Continuity	the scalar of the quaternion: non-negative
Life Time	5years（500Km）
Reliability	≥0.98 @ the end of 5years running

Edited（Date）：			WangHaijun2022-04-13
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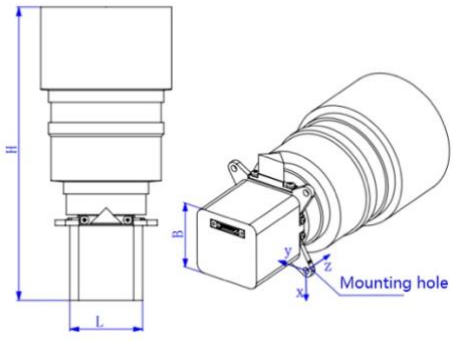
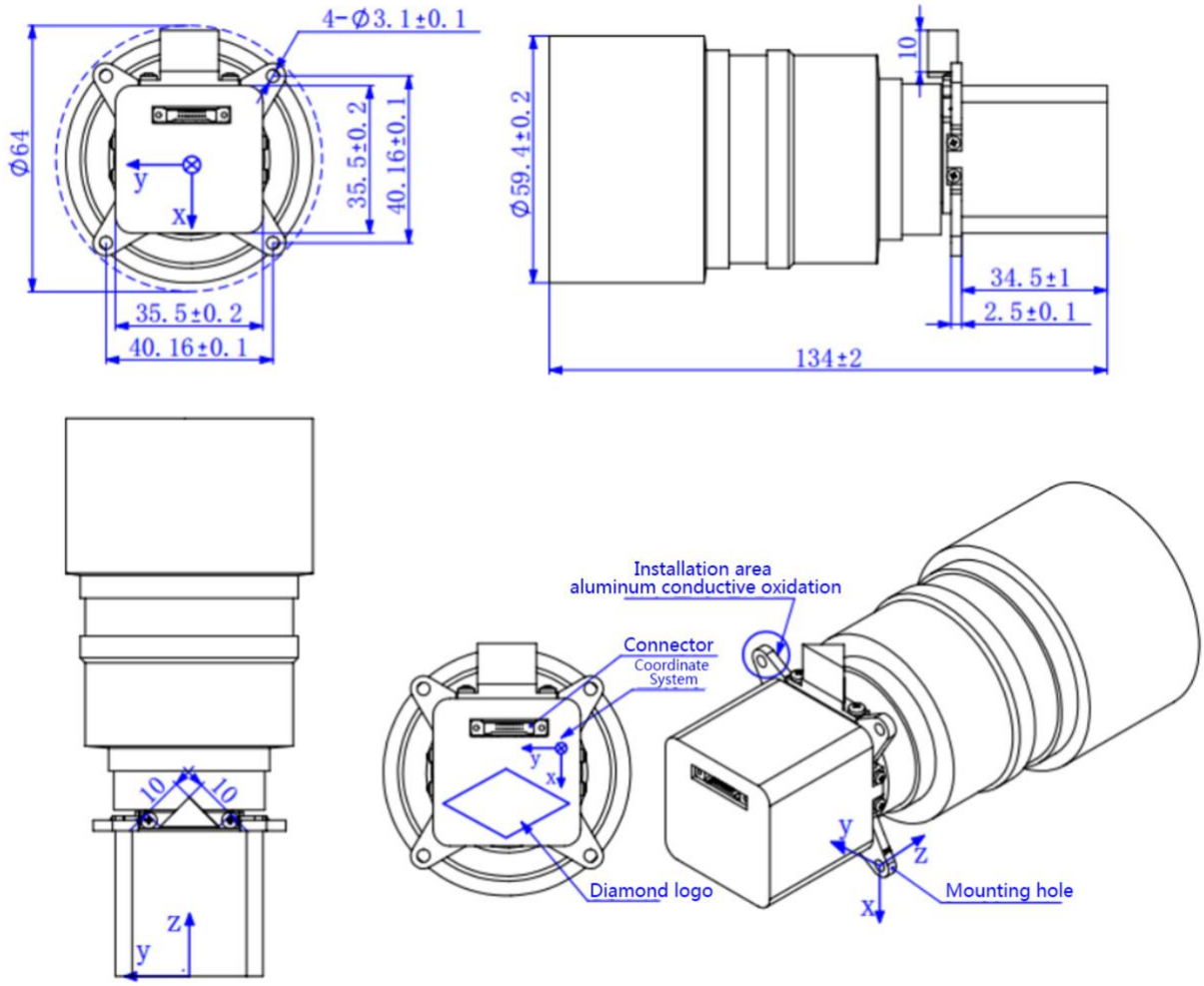
IDS 2：Mechanical Characteristics

<table>
<tr><td colspan="3" rowspan="4"></td><td>File number</td><td colspan="2">TYS-PST3SH5-IDS</td><td colspan="4"></td></tr>
<tr><td>Sub-system name</td><td colspan="2"></td><td colspan="4"></td></tr>
<tr><td>Device name</td><td colspan="2">PST3S-H5 Star Tracker</td><td colspan="4">Stage mark</td></tr>
<tr><td>Device code</td><td colspan="2"></td><td></td><td></td><td>FM</td><td></td></tr>
<tr><td colspan="3">Device weight[note] 130±10g</td><td colspan="3">Device number：1</td><td></td><td>√</td><td></td></tr>
<tr><td rowspan="4">Weight characteristics</td><td>Envelope size mm</td><td colspan="2">Envelope diameter：＜Φ64</td><td colspan="2">Height：134±2</td><td></td><td>√</td><td></td></tr>
<tr><td>Centroid position mm</td><td>X：-21±1</td><td>Y：20±1</td><td colspan="2">Z：16±1</td><td></td><td>√</td><td></td></tr>
<tr><td rowspan="2">Inertia of centroid kg.mm²</td><td rowspan="2">P_X = 220±2</td><td rowspan="2">P_Y =221±2</td><td rowspan="2" colspan="2">P_Z =55±2</td><td></td><td>√</td><td></td></tr>
<tr><td>Mea-sure-ment</td><td>Calc-ulatio-n</td><td>Esti-mate</td></tr>
<tr><td rowspan="5">Installation characteristics</td><td>Installed holes number：4</td><td colspan="2">Size of installed holes（tolerance）mm：Φ3.1±0.1</td><td colspan="2">Material:2A12-T4</td><td colspan="3">Determination method（√）</td></tr>
<tr><td colspan="2">Installation contacting area mm² ：200</td><td colspan="5" rowspan="4">Note：</td></tr>
<tr><td colspan="2">Installation surface flatness ：0.1mm/100mm²</td></tr>
<tr><td colspan="2">Installation surface roughness Ra μm: 3.2</td></tr>
<tr><td colspan="2">Installation surface state：the installation area is oxidized by conduction, and the remaining area is oxidized black.</td></tr>
<tr><td colspan="8">Parameter relationship diagram (the relative relationship between the coordinate frames, position of centroid, size of device body, location of installation surface, etc.):
Note: the determination method refers to the way to determine the weight of device.

Note：The origin of the coordinates is located at the geometric center of the outer surface of the lower shell (see "Instrument diagram");
 
</td></tr>
<tr><td colspan="3">Edited（Date）：</td><td></td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td colspan="3">Signed（Date）：</td><td>Mark</td><td colspan="2">Changed number</td><td colspan="2">Signature, date</td></tr>
</table>

IDS 3：Instrument Diagram

	File number	TYS-PST3SH5-IDS				
	Sub-system name					
	Device name	PST3SH5 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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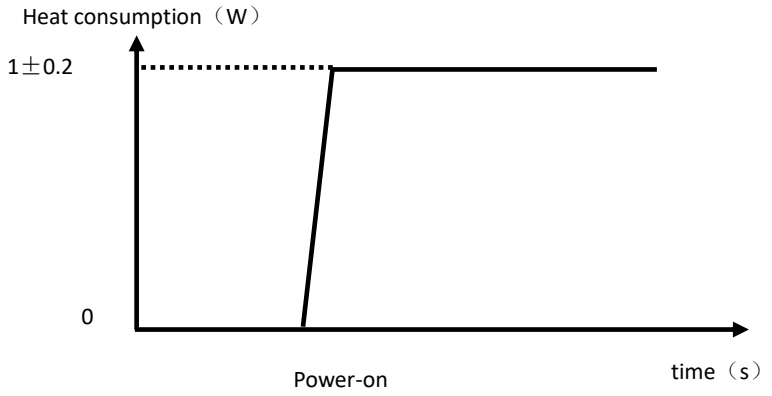
IDS 4：Thermal characteristics

	File number	TYS-PST3SH5-IDS					
	Sub-system name						
	Device name	PST3SH5 Star Tracker	Stage mark				
	Device code				FM		

Surface (except for mounting surface)	Aluminum alloy（2A12-T4）	Note: The inner surface of the baffle is treated with ultra black coating，ε_H：≥0.85，α_S：≥0.96
	Outside surface treatment: Black anodized	
	ε_H：≥0.85	
	α_S：≥0.96	

Start temperature ℃：-40~+45	The best operating temperature range ℃：-0~+10	Heat capacity J/K：100
Operating temperature range ℃：-40~+45	Operating relative humidity range：≤60 %	
Storage temperature range ℃：-40~+45	Storage relative humidity range：≤70 %	
Operating state heat consumption W：1±0.2（per device）	Preparing state heat consumption W：0（per device）	

Description:



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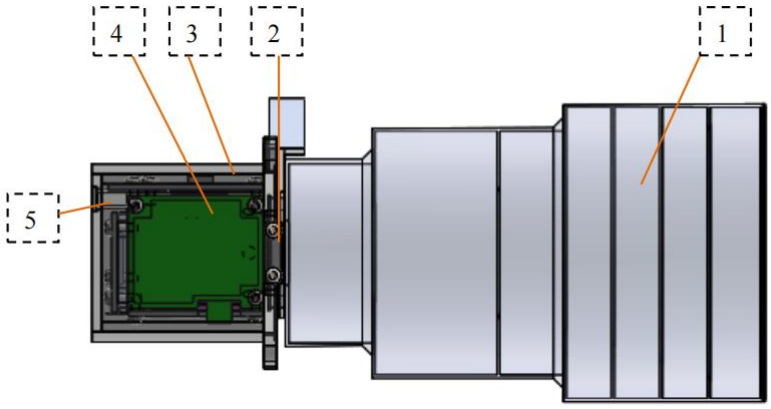
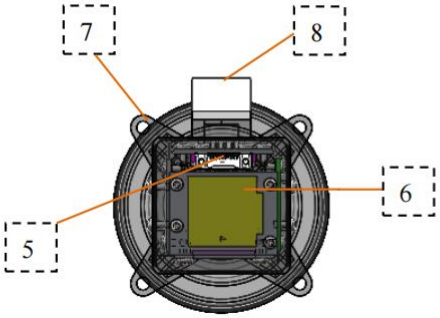
IDS 5：Thermal Diagram

	File number	TYS-PST3SH5-IDS				
	Sub-system name					
	Device name	PST3SH5 Star Tracker	Stage mark			
	Device code				FM	

Diagram：





1－Baffle　　2－Lens
3－Circuit box　　4－Circuit board of power and image processing
5－Connector　　6－Circuit board of image sensor
7－Installing lugs（Contact surfaces）　　8－optical prism
The power distribution is:
1,circuit board of image sensor : ＜0.5±0.1W;
2, circuit board of power and image processing: ＜0.5±0.1W.

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IDS 6：Power

	File number	TYS-PST3SH5-IDS				
	Sub-system name					
	Device name	PST3SH5 Star Tracker	Stage mark			
	Device code				FM	

Working mode (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 （P-P）	Device starting current characteristics （peak/duration）	Power W
5	5%	100	2A/5ms	1±0.2

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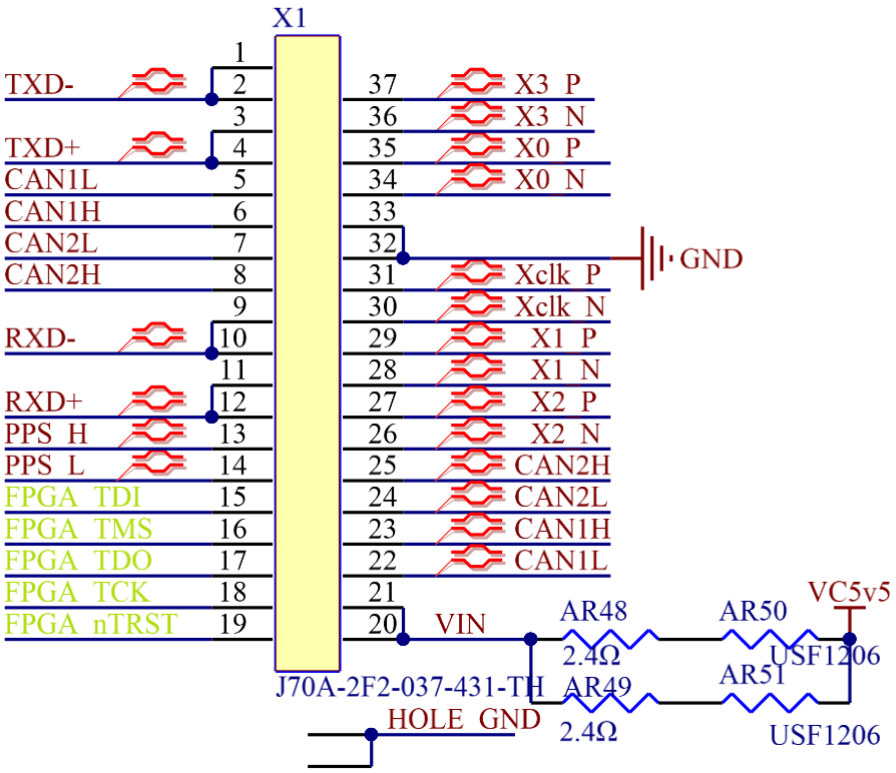
IDS 7: Electrical Connector Contact Assignment（Different）

		File number		TYS-PST3SH5-IDS					
		Sub-system name							
		Device name		PST3SH5 Star Tracker		Stage mark			
		Device code						FM	
Name (by function)	XK-01	Electrical connector P/N		J70A-2F2-037-431-TH		Needle / Hole		Hole	
Contact number	Signal (function) description	Voltage/V	Current/A	Polar	Remarks (shielded / twisted)				
13	PPS_H	RS-422 standard	RS-422 standard	PPS Receive +	13、14twisted				
14	PPS_L			PPS Receive -	13、14twisted				
20，21	VCC5	5V		Power	two-point two-wire				
32，33	GND	0V		power Ground	two-point two-wire				
3，4	TXD+	RS-422 standard	RS-422 standard	422 Transmit+	1、3 twisted				
1，2	TXD-			422 Transmit-	2、4 twisted				
11，12	RXD+	RS-422 standard	RS-422 standard	422 Receive+	9、11 twisted				
9，10	RXD-			422 Receive -	10、12 twisted				
5，22	CAN1L	CAN2.0 B standard	CAN2.0 B standard	CAN1L	5、6twisted				
6，23	CAN1H			CAN1H	22、23twisted				
7，24	CAN2L	CAN2.0 B standard	CAN2.0 B standard	CAN2L	7、8twisted				
8，25	CAN2H			CAN2H	24、25twisted				
26	X2_N	LVDS standard	LVDS standard	CameraLink X2-	26、27twisted				
27	X2_P			CameraLink X2+	26、27twisted				
28	X1_N	LVDS standard	LVDS standard	CameraLink X1-	28、29twisted				
29	X1_P			CameraLink X1+	28、29twisted				
30	Xclk_N	LVDS standard	LVDS standard	CameraLink Xclk -	30、31twisted				
31	Xclk_P			CameraLink Xclk +	30、31twisted				
34	X0_N	LVDS standard	LVDS standard	CameraLink X0-	34、35twisted				
35	X0_P			CameraLink X0+	34、35twisted				
36	X3_N	LVDS standard	LVDS standard	CameraLink X3-	36、37twisted				
37	X3_P			CameraLink X3+	36、37twisted				
15，16，17，18，19	Internal debug				Internal use, prohibit external use				



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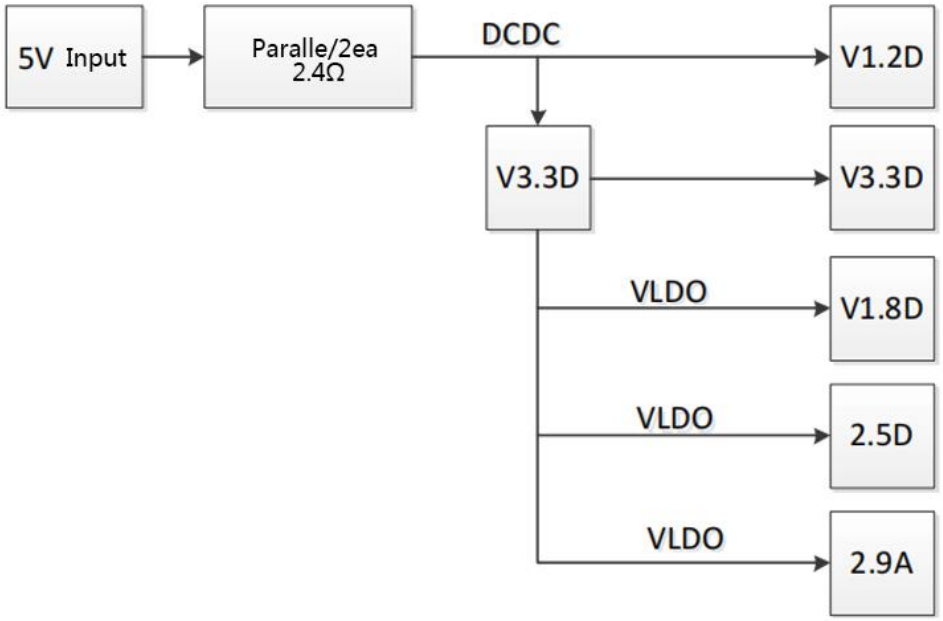
IDS 8: Electrical Interface Features-Power

	File number	TYS-PST3SH5-IDS	
	Sub-system name		
	Device name	PST3SH5 Star Tracker	Stage mark
	Device code		FM

Interface signal	Power supply;
Signal characteristics	5V power and the ground are two-point two-wire.
Interface Circuit	
Explanation	

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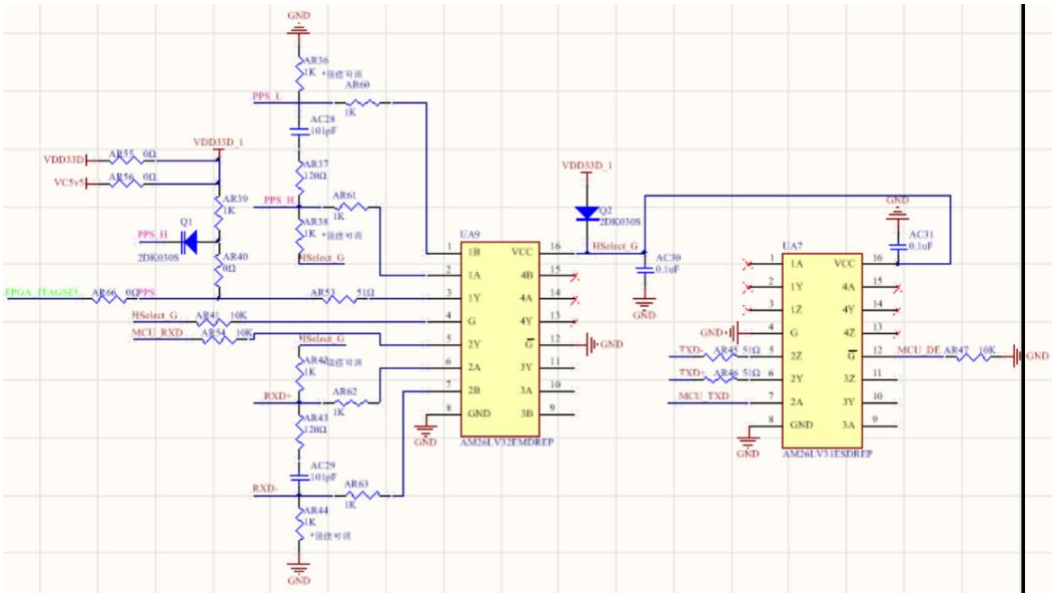
IDS 9：Electrical Interface Features-RS422

	File number	TYS-PST3SH5-IDS				
	Sub-system name					
	Device name	PST3SH5 Star Tracker	Stage mark			
	Device code				FM	

Interface signal	Digital signal, RS422.
Signal characteristics	422 communication baud rate: 115200bps; two-point two-wire
Interface circuit	
Explanation	

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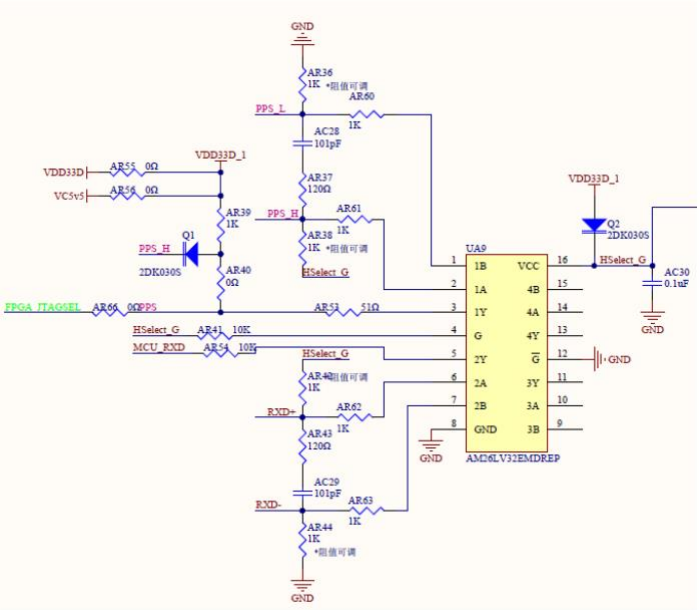
IDS 10：Electrical Interface Features-Second pulse (Different)

	File number	TYS-PST3SH5-IDS				
	Sub-system name					
	Device name	PST3SH5 Star Tracker	Stage mark			
	Device code				FM	

Interface signal	Second pulse
Signal characteristics	@ Differential PPS, the second integer is aligned by the lower edge, and the negative pulse width is 1ms.
Interface circuit	Seconds pulse circuit 
Explanation	AR40、AR39、AR56 and Q1are not weld @Differential PPS

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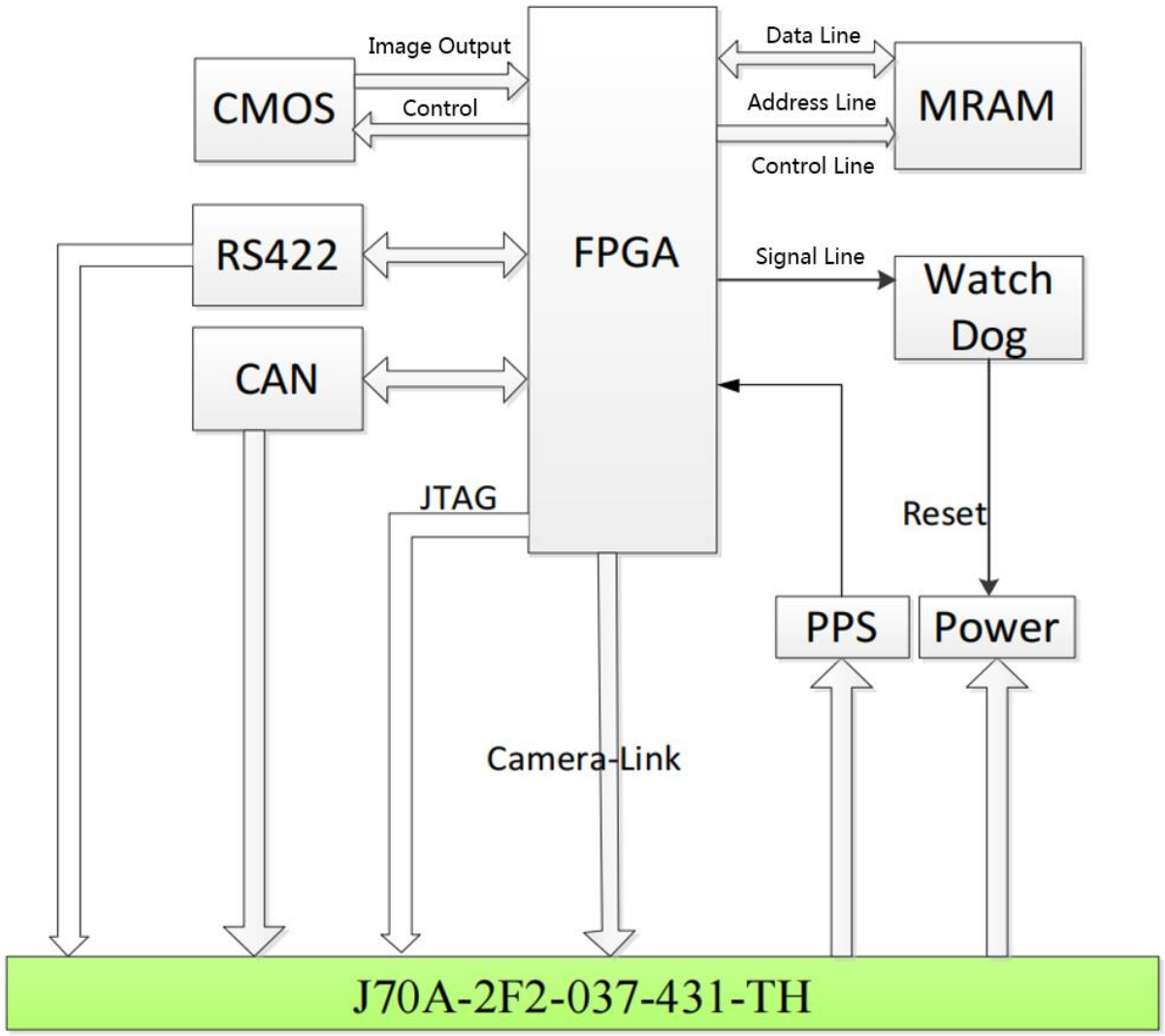
IDS 11：Circuit and Interface Schematics

	File number	TYS-PST3SH5-IDS				
	Sub-system name					
	Device name	PST3SH5 Star Tracker	Stage mark			
	Device code				FM	

Simplified diagram：



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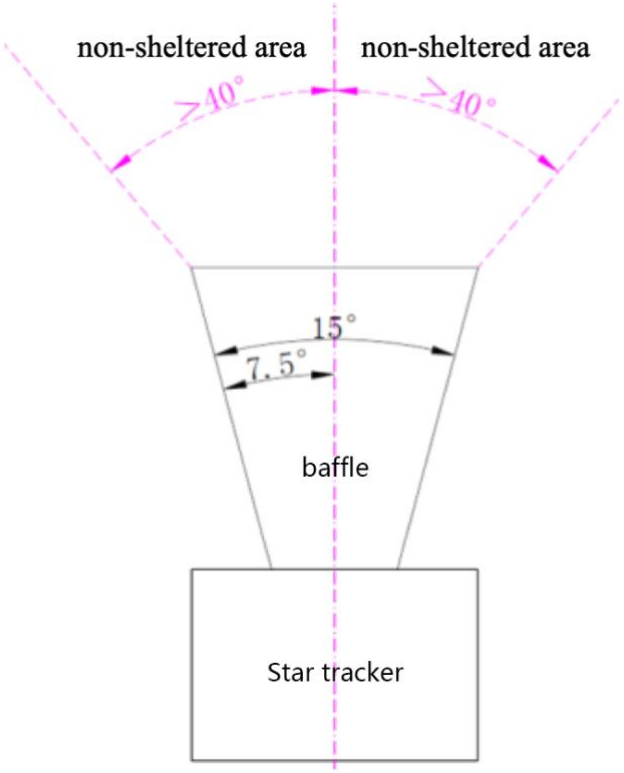
IDS 12：Installation requirements

	File number	TYS-PST3SH5-IDS	
	Sub-system name		
	Device name	PST3SH5 Star Tracker	Stage mark
	Device code		F M



Be sure: Nothing sheltered in the field of view: the circular cone of 80° around the top of the Baffle.

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