

File number	Piece number



Label TYS-NST10G1-IDS

Stage mark FM

Page 15

NST10-G1 Star Tracker IDS

Signature

Edit : Fu ShuXin

Proofreading : Wang HongQiang

Check : Xiao MingGuo

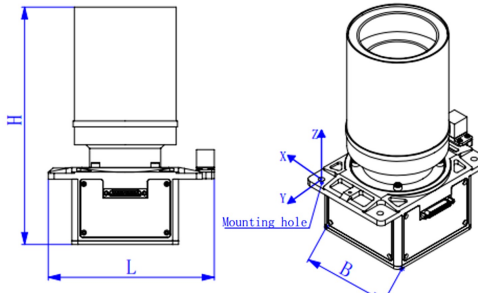
Standard check: Chai Yin

Approval : Wang HaiJun

IDS: DATA SHEET

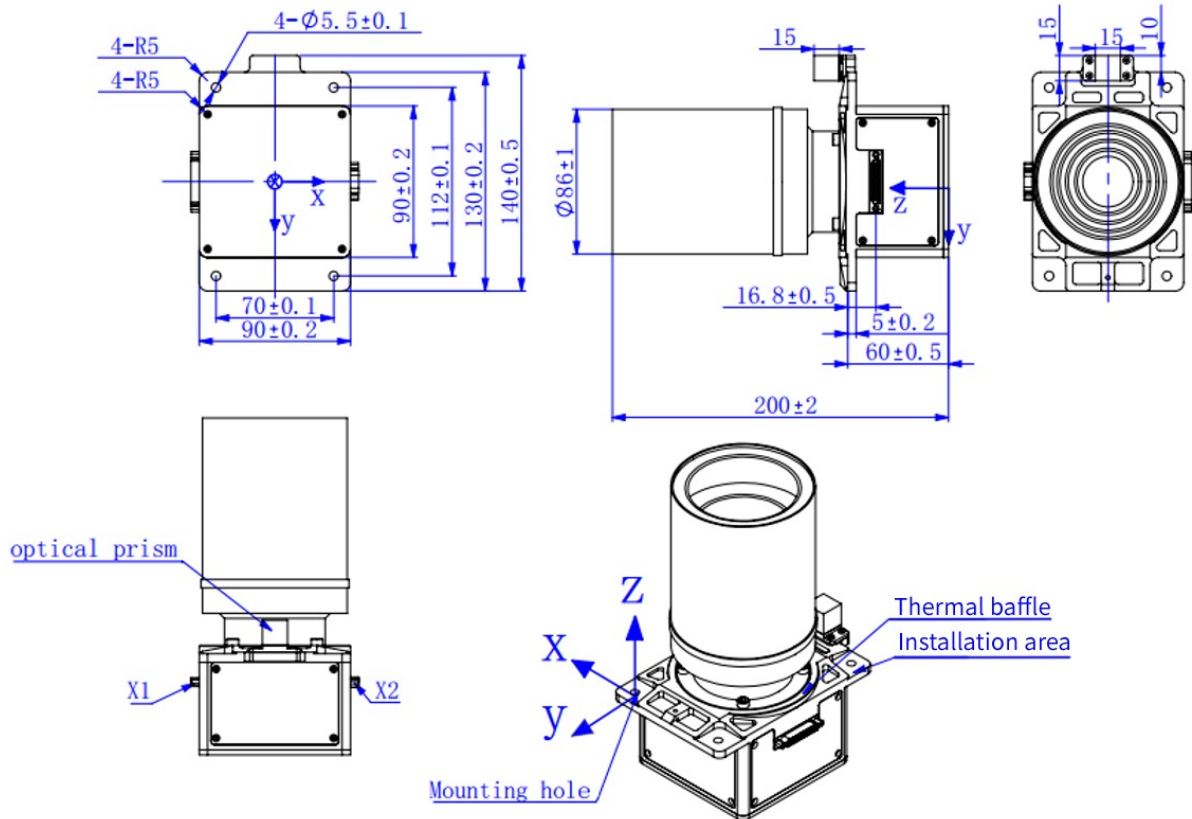
	File number	TYS-NST10G1-IDS	Page 1 of 14		
	Sub-system name				
	Device name	NST10-G1 Star Tracker	Stage mark		
	Device code				FM
FOV	$18^{\circ} \times 18^{\circ}$				
Attitude Accuracy	Pointing: 5" (3σ) Rolling: 50" (3σ)				
Dynamic Range	@10 %s: 20" (Pointing, 3σ); 200" (Rolling, 3σ); @ ≤ 10 %s: follow up				
Update Rate	$\geq 10\text{Hz}$				
Acquisition Rate	Max. $\leq 2\text{s}$				
Start-up Time	Better than 5s				
Exclusive Angle	Sun $\leq 35^{\circ}$; Earth or other stray light $\leq 25^{\circ}$				
Timing Accuracy	0.1ms @ synchronization pulse (SYNC pulse)				
Quaternion Continuity	the scalar of the quaternion: non-negative				
Life Time	5years @500Km Orbit. 3years @1000Km Orbit.				
Reliability	≥ 0.98 @ the end of a 5years running				
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IDS: Mechanical Characteristics

		File number		TYS-NST10G1-IDS		Page 2 of 14	
		Sub-system name					
		Device name		NST10-G1 Star Tracker		Stage mark	
		Device code					
Device weight ^{note)} 500±50 g		Device number:					√
Weight charact eristics	Envelope size mm	90mm×90mm×200±2mm					√
	Centroid position mm	X:0.532	Y: -0.684	Z: 53.944		√	
	Inertia of centroid kg.mm ²	1352.208	1404.944	686.622		√	
Install ation charact eristics	Installed holes number: 4	Size of installed holes (tolerance) mm: 4×Φ5.5±0.1		Material:2A12-T4		Determination method (√)	
	Installation contacting area: 2550 mm ²			Note:			
	Installation surface flatness: 0.1						
	Installation surface roughness Ra : 3.2 μm						
	Installation surface state: aluminum color						
Parameter relationship diagram (it should show 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 quality of device.							
							
Note: The origin of the coordinates lies in the geometric center of the outer surface of the lower shell (see "Instrument diagram");							
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IDS: Instrument Diagram

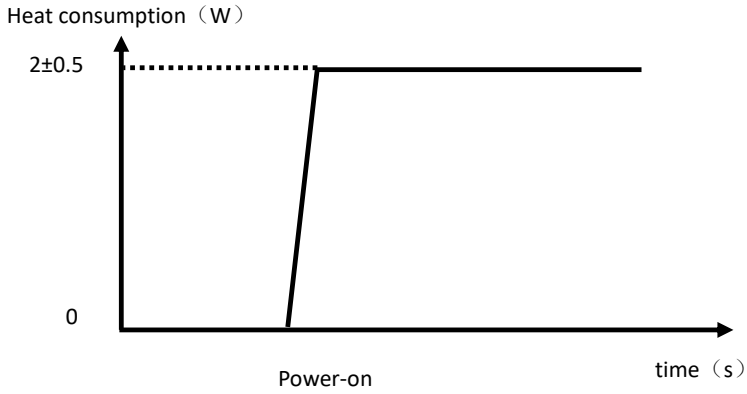
	File number	TYS-NST10G1-IDS	Page 3 of 14	
	Sub-system name			
	Device name	NST10-G1 Star Tracker	Stage mark	
	Device code			FM



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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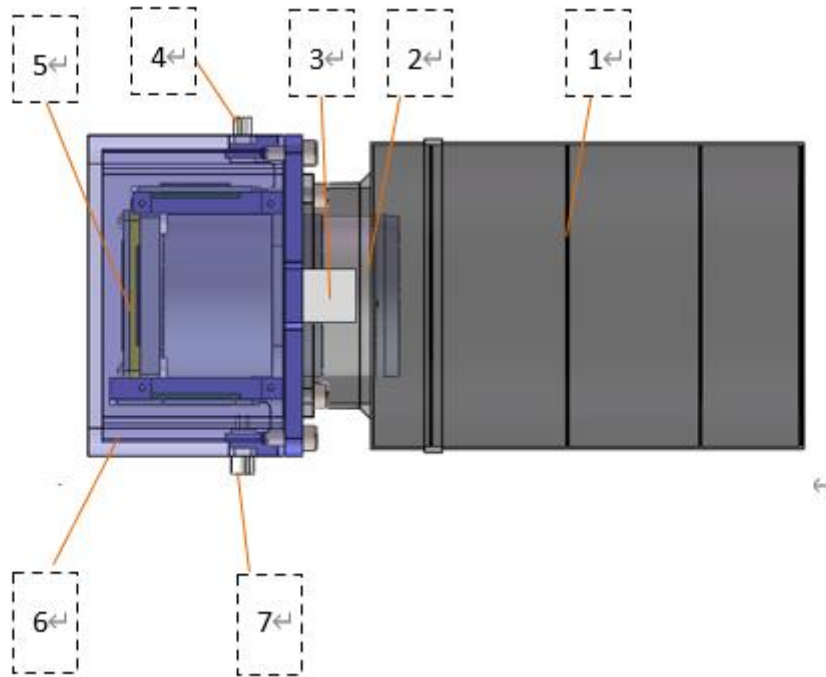
IDS: Thermal characteristics

		File number	TYS-NST10G1-IDS		Page 4 of 14
		Sub-system name			
		Device name	NST10-G1 Star Tracker		Stage mark
		Device code			FM
Surface (except for mounting surface)	Aluminum alloy (2A12-T4)	Note:			
	Outside surface treatment: aluminum anodization				
	$\epsilon_H: \geq 0.85$				
Start temperature °C: -30~+45		Better Operating @ °C: 0~+10		Heat capacity J/K: 600	
Operating temperature range °C: -40~+45		Operating relative humidity range: $\leq 60\%$			
Storage temperature range °C: -40~+45		Storage relative humidity range: $\leq 70\%$			
Operating state heat consumption W: 2 ± 0.5 (per device)					
 <p style="text-align: center;">Heat consumption (W)</p> <p style="text-align: center;">time (s)</p>					
Edited (Date):					
Signed (Date):		Mark	Changed number	Signature, date	

IDS 6: Thermal Diagram

	File number	TYS-NST10G1-IDS	Page 5 of 14	
	Sub-system name			
	Device name	NST10-G1 Star Tracker	Stage mark	
	Device code			FM

Diagram:



- 1—Baffle 2—Lens
 3—Prism 4—X1 Connector
 5—Image sensor & Circuit board 6—Circuit box
 7—X2 Connector

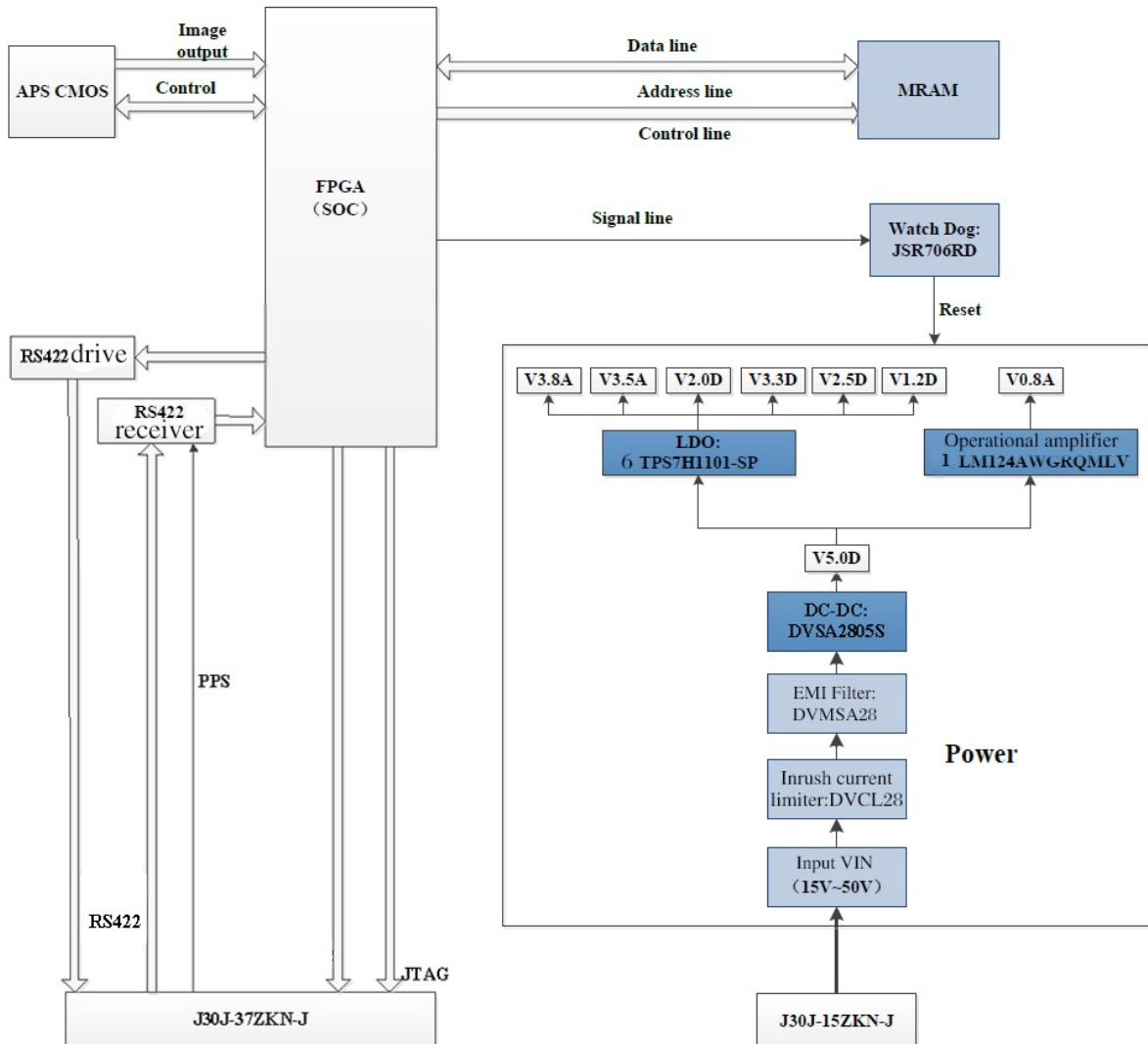
The structure of NST10-G1 Star Tracker is shown as above,
 The power of the circuit board: about $2 \pm 0.5W$;

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IDS : Circuit and Interface Schematics

	File number	TYS-NST10G1-IDS	Page 6 of 14	
	Sub-system name			
	Device name	NST10-G1 Star Tracker	Stage mark	
	Device code			FM

Simplified diagram:



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IDS : Power

		File number		TYS-NST10G1-IDS		Page 7 of 14	
		Sub-system name					
		Device name		NST10-G1 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 V	Ripple voltage mV (P-P)	Device starting current characteristics (peak/duration)			Power W	
5	±0.2	100	2A/5ms			2±0.5	
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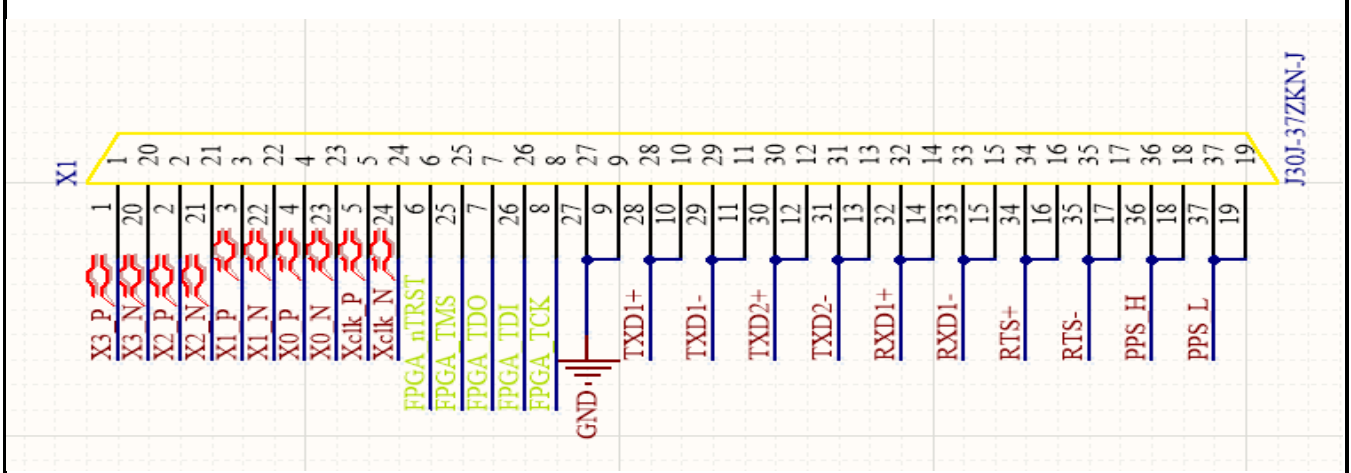
IDS: Electrical Connector

		File number	TYS-NST10G1-IDS		Page 8 of 14
		Sub-system name			
		Device name	NST10-G1 Star Tracker		Stage mark
		Device code			FM
Name of the connector	Needle/ Hole	Number of the Needle/Hole	Connector	Electrical Connector P/N	Note
X1	Hole	37	Communication	J30J-37ZKN-J	X1
X2	Hole	15	Power	J30J-15ZKN-J	X2
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IDS: Electrical Connector Contact Assignment (X1)

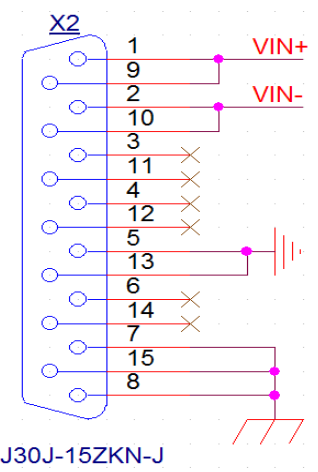
		File number	TYS-NST10G1-IDS		Page 9 of 14
		Sub-system name			
		Device name	NST10-G1 Star Tracker		Stage mark
		Device code			FM
Name of the connector: X1		P/N: J30J-37ZKN-J		Needle / Hole: Hole	
Contact Number	Signal (function)	Voltage(V)	Current (A)	Polar	Remarks (shielded/ twisted)
9、27	GND	0	0	-	
10、28	TXD1+	RS-422	RS-422	422Transmit+	10、11twisted
11、29	TXD1-	standard	standard	422Transmit-	28、29twisted
12、30	TXD2+	RS-422	RS-422	422Transmit+	12、13twisted
13、31	TXD2-	standard	standard	422Transmit-	30、31twisted
14、32	RXD1+	RS-422	RS-422	422Receive+	14、15twisted
15、33	RXD1-	standard	standard	422Receive-	32、33twisted
16、34	RTS+	RS-422	RS-422	RTS Differential+	16、17twisted
17、35	RTS-	standard	standard	RTS Differential-	34、35twisted
18、36	PPS_H	RS-422	RS-422	Differential PPS+	18、19twisted
19、37	PPS_L	standard	standard	Differential PPS-	36、37twisted
1	X3_P	LVDS	LVDS	CameraLink X3+	Internal use, prohibit external use
20	X3_N	standard	standard	CameraLink X3-	
2	X2_P	LVDS	LVDS	CameraLink X2+	
21	X2_N	standard	standard	CameraLink X2-	
3	X1_P	LVDS	LVDS	CameraLink X1+	
22	X1_N	standard	standard	CameraLink X1-	
4	X0_P	LVDS	LVDS	CameraLink X0+	
23	X0_N	standard	standard	CameraLink X0-	
5	Xclk_P	LVDS	LVDS	CameraLink Xclk+	
24	Xclk_N	standard	standard	CameraLink Xclk-	
6	FPGA_nTRST			JTAG_nTRST	

25	FPGA_TMS			JTAG_TMS	
7	FPGA_TDO			JTAG_TDO	
26	FPGA_TDI			JTAG_TDI	
8	FPGA_TCK			JTAG_TCK	

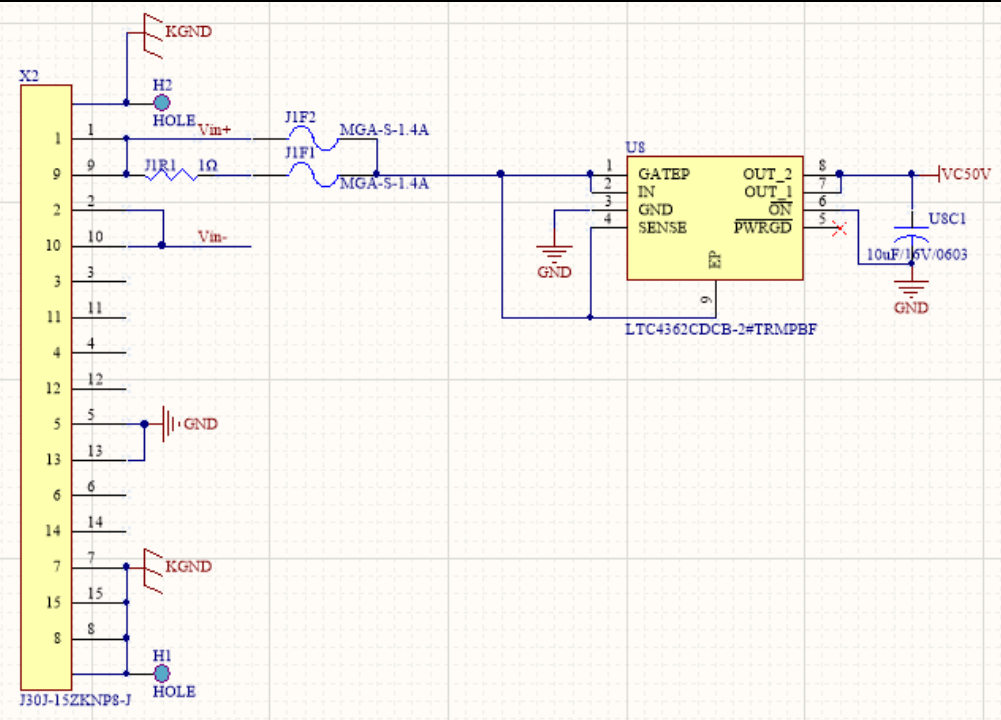


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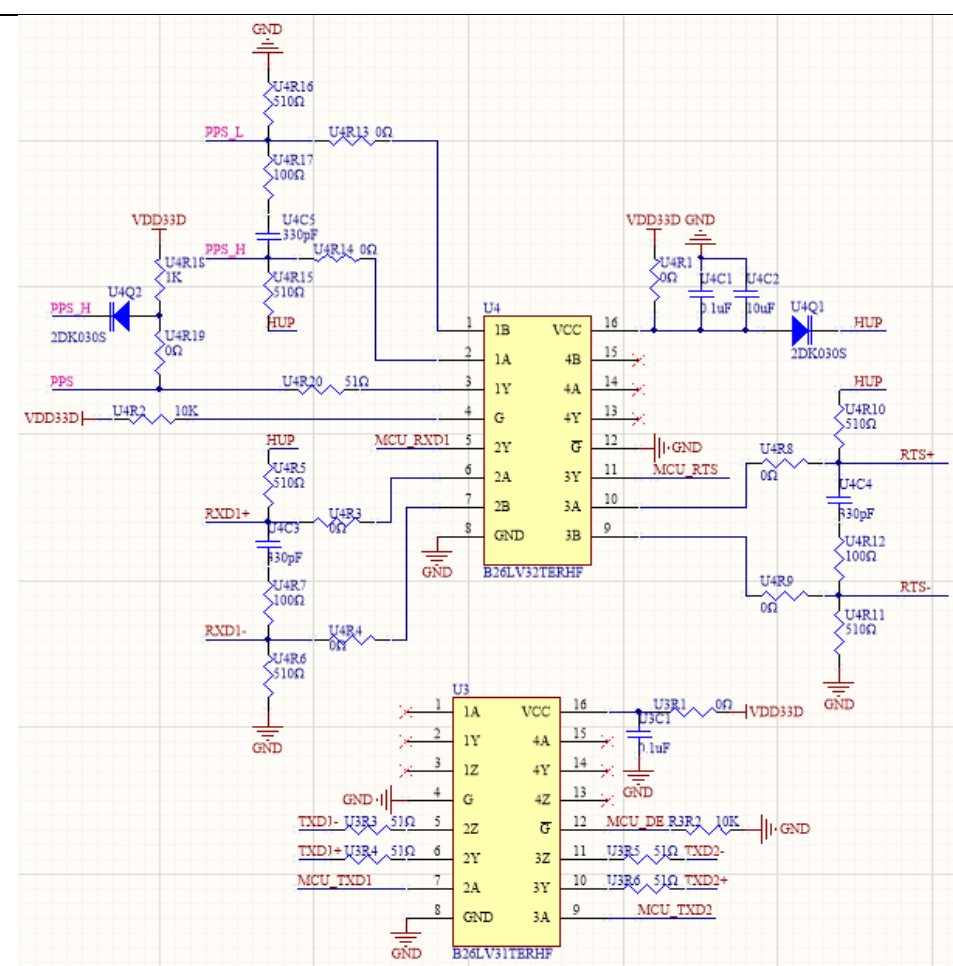
IDS: Electrical Connector Contact Assignment (X2)

		File number	TYS-NST10G1-IDS		Page 10 of 14	
		Sub-system name				
		Device name	NST10-G1 Star Tracker		Stage mark	
		Device code				FM
Name of the connector: X2 P/N: J30J-15ZKN-J Needle / Hole: Hole						
Contact number	Signal (Function)	Voltage (V)	Current (A)	Polar	Note (shielded/twisted)	
1、9	VIN+ Power+	4.8~5.2	0.2A	+	1、5twisted 9、13twisted	
5、13	GND	0	0	-		
2、10	VIN-	0	0	-	Hanging	
7、8、15	Structure Ground	0	0	-		
3、4、6、11、12、14	None				Internal use, prohibit external use	
						
Edited (Date):						
Signed (Date):		Mark	Changed number	Signature, date		

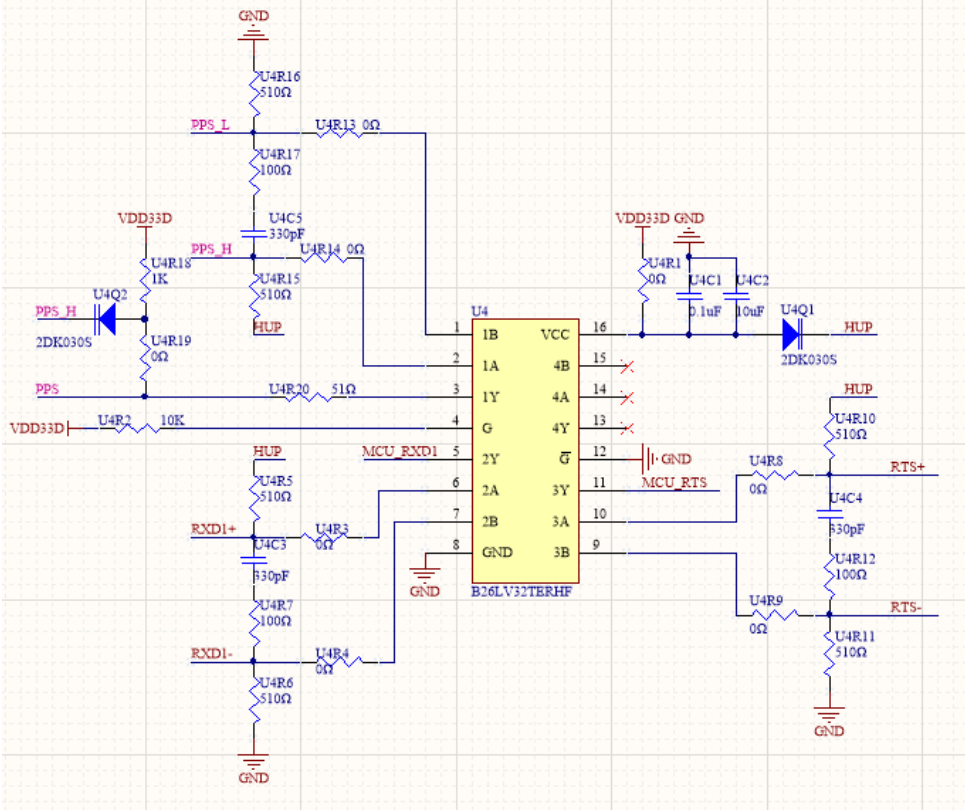
IDS: Electrical Interface Features - Power

	File number	TYS-NST10G1-IDS	Page 11 of 14	
	Sub-system name			
	Device name	NST10-G1 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: Electrical Interface Features - 422

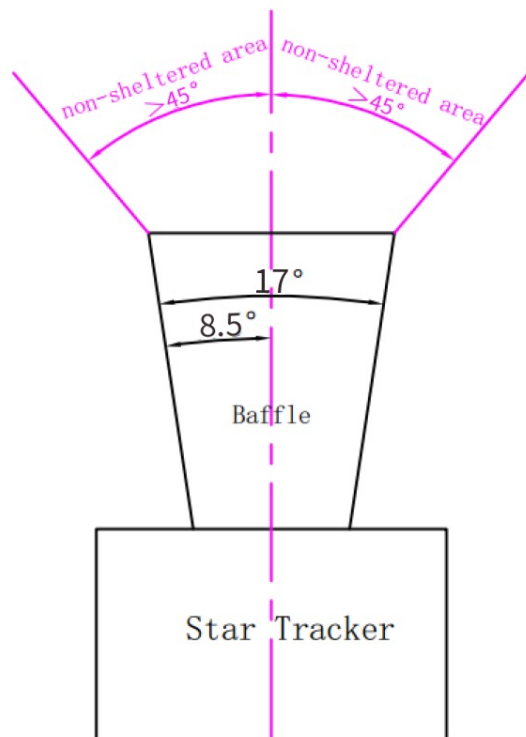
	File number	TYS-NST10G1-IDS	Page 12 of 14	
	Sub-system name			
	Device name	NST10-G1 Star Tracker	Stage mark	
	Device code			FM
Interface signal	Digital signal, RS422. (Sent)			
Signal characteristics	422 communication baud rate: 115200bps; two-point two-wire			
Interface Circuit				
Explanation				
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IDS: Electrical Interface Features - PPS

	File number	TYS-NST10G1-IDS	Page 13 of 14	
	Sub-system name			
	Device name	NST10-G1 Star Tracker	Stage mark	
	Device code			
Interface signal	PPS			
Signal characteristics	@ Differential PPS, the second integer is aligned by the lower edge, and the negative pulse width is 1ms.			
Interface circuit				
Explanation	U4R18、U4R19、 and U4Q2 are not weld @Differential PPS			
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IDS: Installation requirements

	File number	TYS-NST10G1-IDS	Page 14 of 14	
	Sub-system name			
	Device name	NST10-G1 Star Tracker	Stage mark	
	Device code		FM	



Installation Notes:

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

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