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7mm Optical Trackball Module

Specification V0.9
ATB00701MCL-3101N/C

Revision History

Revision	Description	Originator	Status	Date
Draft	Initial	D.C.	Release	May 07, 2008

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Product Specification V0.9

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1 Product Description

The Pacing® ***ATB00701MCL-3101N/C*** is a 7mm Optical Trackball Module with Pixart PAN3101 optical sensor internally to the sensor interface of trackball MCU used.

ATBM has the best cursor control ability among current market. It uses Pacing's Patented Mirrored Reflection Lens (known as MR Lens) technology. Hence, there is not patent-violating issue. Besides, ATBM has its own patent-pending dust-proof technology which can prolong the trackball life time. Next, ATBM can use different color of LED, like red, IR, blue, and white light. And, ATBM employs different material of ball. With different choices of LED and ball, it can help customers create more ideas in ID design.

2 Product Specification

2.1 Electrical

Electrical	Min	Typ	Max	Test Conditions	Comments
Power rating Supply voltage Supply current	4.5V	5.0V	5.5V 25mA	Wide operating supply range	

The following table shows the pin out of ZIF connector

Pin out	Signal of PAN3101
1	SDIO
2	SCLK
3	VCC
4	GND

2.2 Tracking

Tracking	PAN3101 Sensor			Test Conditions	Comments	TEST SPEED
	Min	Typ	Max			
Resolution – Optical (depend on Sensor)	720cpi	800cpi	880cpi	With SPCP868A MCU	USB interface and 100rpt	20 mm/sec
	765cpi	850cpi	935cpi			200 mm/sec

2.3 Physical

Physical	Min	Typ	Max	Test Conditions	Comments
Interface protocol		USB		With SPC868A	
Ball					
Operating force	0.3N (30gf)	2.0N (204gf)	10.0N (1000gf)	For both X and Y axis, Horizontal 0 degrees	
Operation Angle	-40 degrees		40 degrees		
TBM dimensions					
Height		17.63mm			
Length		30.00mm			
Width		24.00mm			
Weight (with ball)		8g			
Ball					
Weight	0.5g	1g	1.5g		
Diameter		7mm			
Color		Black			

2.4 Environmental Conditions

Environment	Min	Typ	Max	Test Conditions	Comments
Operating temperature	0°C (32°F)		60°C (140°F)		
Storage temperature	-40°C (-40°F)		70°C (158°F)		
Humidity (operating & storage)	5%		95%	Non condensing	

3 Tests

All tests and measurements were conducted under the following conditions unless otherwise specified:
(1) Temperature: 25°C ± 10°C (77°F ± 18°F)
(2) Humidity: 50% ~ 60% RH
(3) Atmospheric Pressure: 86kPa (860mBar) ~ 106kPa (1060mBar)

3.1 Tolerance & Reliability Tests

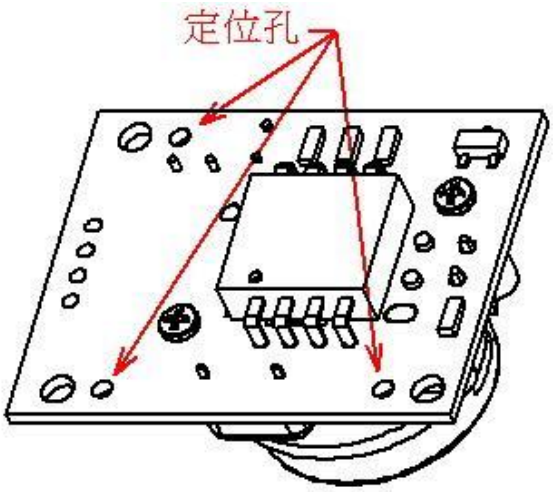
Item	*Test Conditions*	*Specifications*
Ball lifetime	(1) Operating angle 0 degrees (2) Drag force 1.0N ± 0.25N (100gf±25gf) load (3) Tracking speed 20cm/sec	Travel distance: 80km TBM tracking accuracy performance meets or exceeds the specification as described in section 2.2.
Shock tolerance	*Drop test conditions:* (1) Height: 70cm (2) Floor surface: asphalt tile over concrete or equivalent	No cracks or breakage (excl. cosmetic scratches) No functional defects for the switch actuation. TBM tracking accuracy performance meets or exceeds the specification described in section 2.2
Vibration Test		Meets IEC-68-2-36
Shock Test		Meets IEC-68-2-27
Electrical MTBF		150,000hr
Light sensitivity	900mcd	No performance degradation

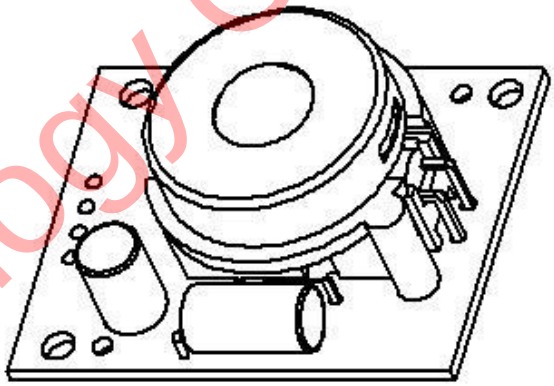
3.2 ESD Rating & Discharge Points

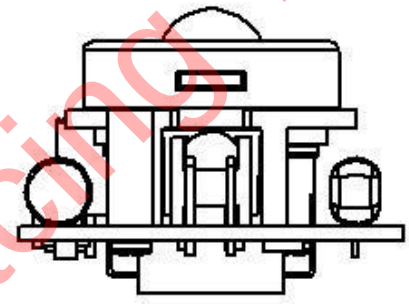
Item	*Test Conditions*	*Specifications*
EFT/B (Electrical Fast Transient/Burst)	Tested on IBM PC-Compatible systems	Meets IEC 801-4 level 2 1KV/5KHz
RS Performance (Radiation Susceptibility)	Tested on IBM PC-Compatible systems	Meets IEC 801-3 level 2 3V/m
ESD Rating (ElectroStatic Discharge)	Tested on IBM PC-Compatible systems With case With case Without case Without case	Meets IEC 801-2 level 2 No hardware errors @ 8KV No hardware damage @ 12KV No hardware errors @ 10KV No hardware damage @ 10KV

4 Mechanical Drawing

4.1 Track Ball Module Outline

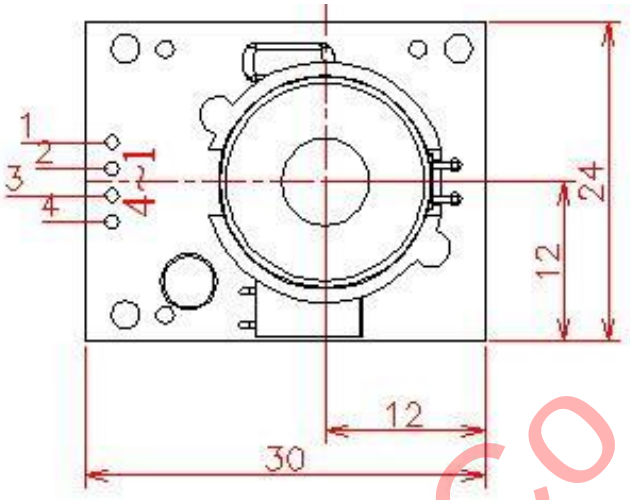


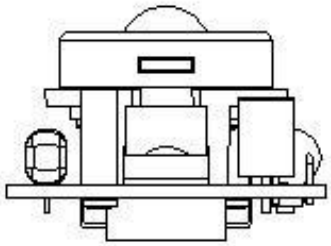


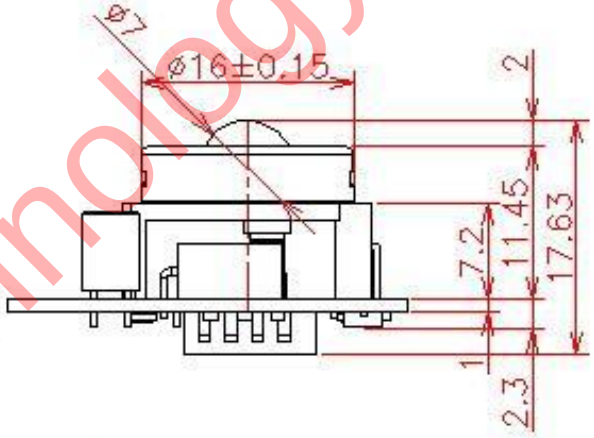


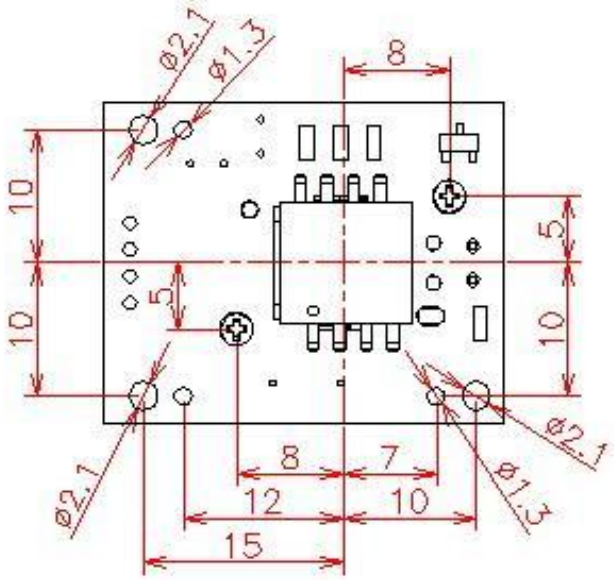
4.2 PCB Dimension *(Unit = mm)*

CONNECT PIN SIGNAL:
1. SDIO
2. SCLK
3. VCC
4. GND

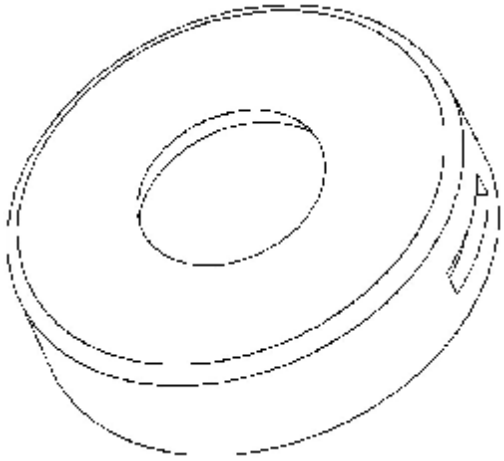




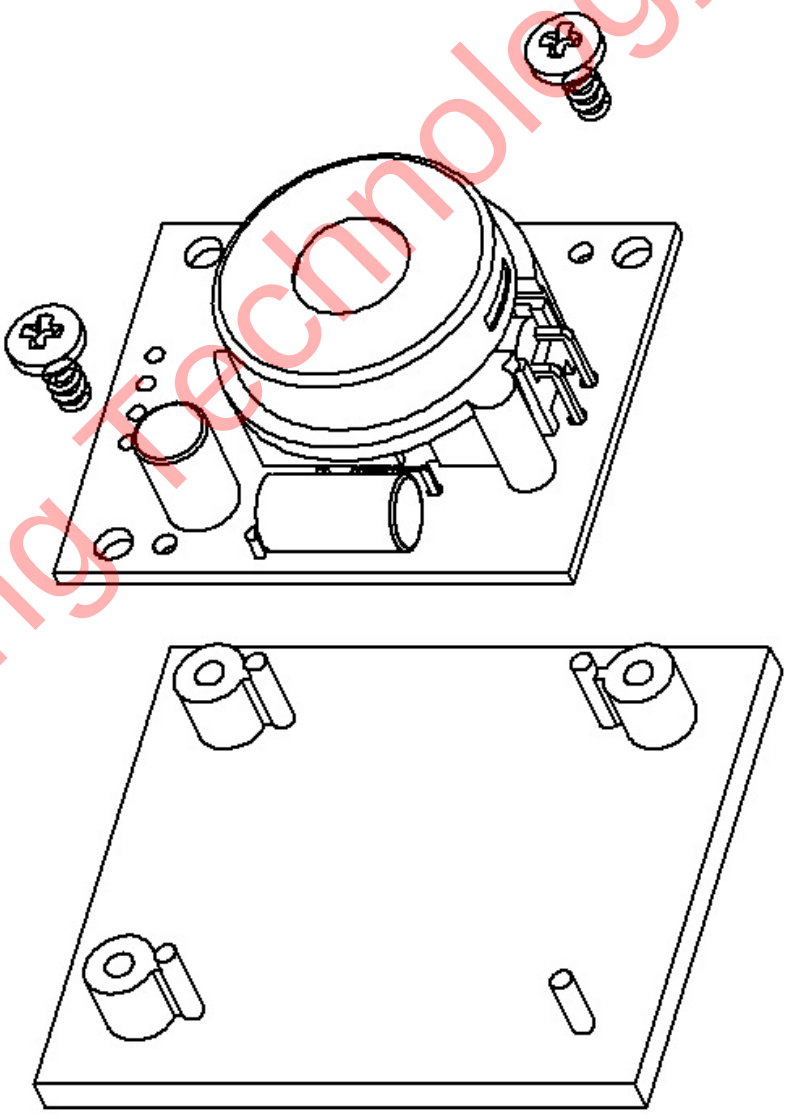




4.3 Retainer Ring



4.4 Assembly Drawing



5 Optical Path Drawing