

Optical Encoder PCN10 Series

High Performance Incremental Optical Encoder

高性能增量式光电编码器



PCN10 Series are high-performance incremental optical encoders with A and B channel digital outputs. By using very small housing components and thin packages for emitting infrared LED and detecting photo IC, establish both high-quality outputs and compact outline. The Photo-IC uses phase array technology which effectively improves the error correction capability of the signal. PCN10 series also have a variety of resolution options to suit different detection needs.

PCN10 系列是 A 和 B 通道数字输出的高性能增量式光电编码器。通过使用非常小的结构组件和超薄封装的红外 LED 和光电检测 IC，建立起了高质量的信号输出和紧凑的外形。光电检测 IC 使用了相位阵技术，有效的提高了信号的纠错能力。PCN10 系列还拥有多种分辨率可选，以适合于不同检测需求的应用。

FEATURES

- Gap 间隙: 2.0 mm
- Height 高度: 7.55 mm
- Incremental output 增量输出:
 - Digital output (A, B 2-Channel)
 - 数字输出 (A, B 通道)
- Installation Method 安装方式:
 - Standard mounting
 - 标准型安装方式

TYPICAL APPLICATIONS

- Robots 机器人
- FA equipments 工业控制
- OA equipments 办公设备
- Motor control 电机控制



PCN10CF-□□



PCN10C-□□

KEY CHARACTERISTICS

Parameter	Value	Unit
Gap 间隙	2.0	mm
Vcc 工作供电电压	2.7~6.0	V
Response freq. 响应频率	max. 60	kHz

PREMA Optical Encoders Overview 普芮玛光电编码器概览

PCN 10CF - 36

- PCN PREMA Encoder Module
- 10 Holder Type
- C Chip Version
- F Forming Lead: F, Straight Lead: Null
- 36 Resolution

Resolution 分辨率	-45	-09	-15	-18	-30	-36
PCN10CF-□□	45 LPI	90 LPI	150 LPI	180 LPI	300 LPI	360 LPI

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ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

	Parameter	Symbol	Min	Max	Unit
Input 输入	Forward current 顺电流	I_F		40	mA
	Reverse voltage 逆电压	V_R		3	V
Output 输出	Supply voltage 供电电压	V_{CC}	-0.3	7	V
Operating Temperature 动作温度 *1		T_{opr}	0	85	°C
Storage Temperature 储存温度 *1		T_{stg}	-40	85	°C
Soldering Temperature 焊接温度 *2		T_{sol}		260	°C

*1. No ice-bound or dew

无结霜或者露水

*2. Min. 1 mm away from resin within 5 seconds

ELECTRO-OPTICAL CHARACTERISTICS (Ta=25°C)

	Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input 输入	Forward current 顺电流	I_F	$I_F=20\text{mA}$	-	1.60	-	V
	Peak wavelength 峰值波长	λ_p	$I_F=20\text{mA}$		850		nm
Operating supply voltage 工作供电电压		V_{CC}	-	2.7		6.0	V
A, B 相输出 A, B Phase Output	Phase difference 相位差 *3 *4	θ	$I_F=20\text{mA}$ $V_{CC}=2.7 \text{ to } 6.0\text{V}$	45	90	135	deg
	Duty ratio 占空比 *3 *5	Dt		30	50	70	%
	High level output voltage 高电平输出电压 *3 *4	V_{OH}		$V_{CC} \times 0.8$	-	-	V
	Low level output voltage 低电平输出电压 *3 *4	V_{OL}		-	-	0.4	V
	Response frequency 响应频率	fmax		-	-	25 *6	kHz
				-	-	60 *7	kHz

*6. Applied to the resolutions of 90 LPI and less

适用于 90 LPI 及以下分辨率

*7. Applied to the resolutions of 150 LPI and above

适用于 150 LPI 及以上分辨率

Optical Encoder PCN10 Series

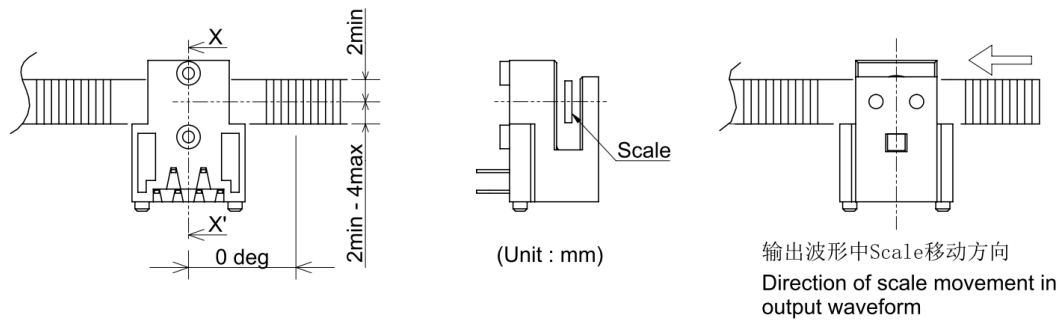
High Performance Incremental Optical Encoder

高性能增量式光电编码器

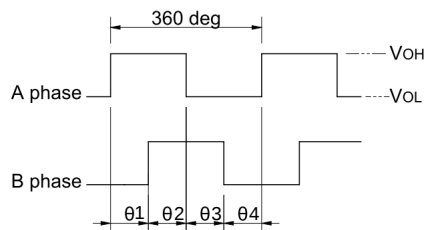


Measurement Conditions 测量条件

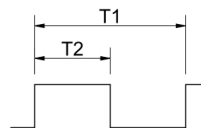
*3 Measurement methods



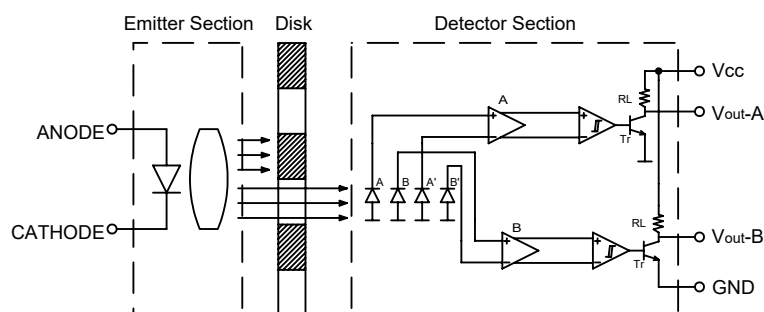
*4 Output waveform



*5 Duty ratio (Dt) $Dt = T2/T1 \times 100$



Block Diagram 原理图



Code Disk	RL (Pull Up)
45 LPI	10 KΩ
90 LPI	10 KΩ
150 LPI	5 KΩ
180 LPI	5 KΩ
300 LPI	2.5 KΩ
360 LPI	2.5 KΩ

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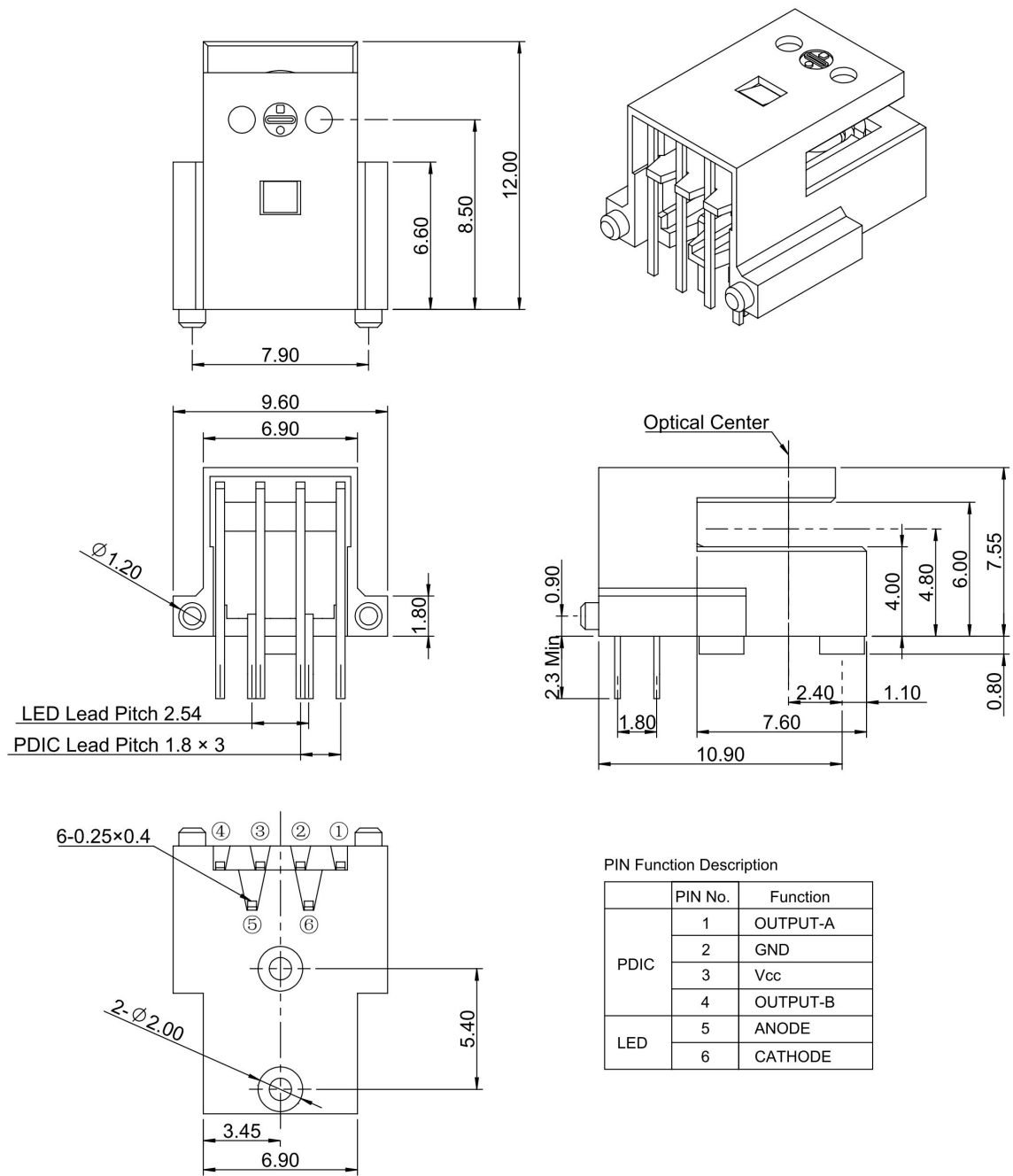
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Dimensions 外形尺寸

PCN10CF



PIN Function Description

	PIN No.	Function
PDIC	1	OUTPUT-A
	2	GND
	3	Vcc
	4	OUTPUT-B
LED	5	ANODE
	6	CATHODE

Optical Encoder PCN10 Series

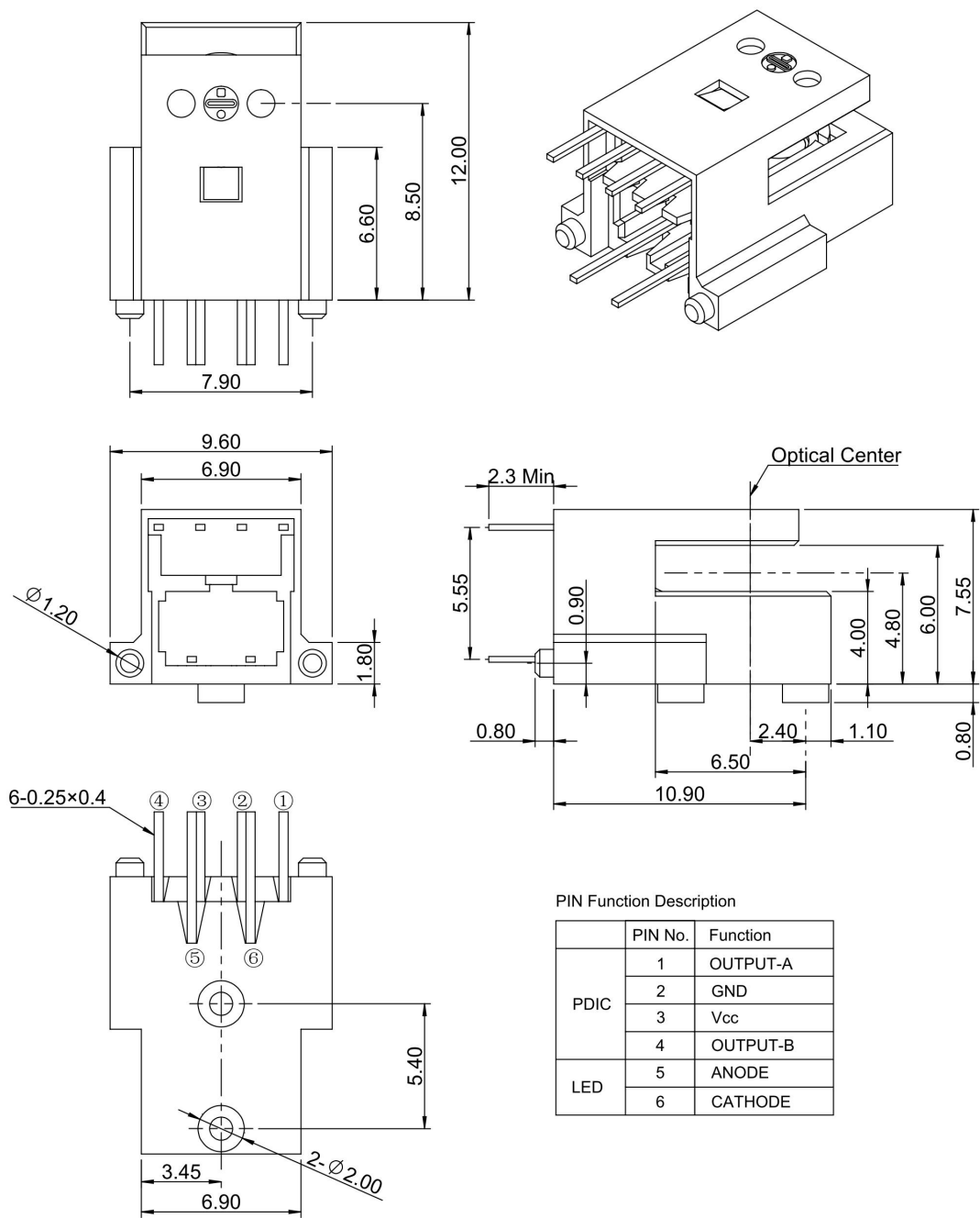
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Dimensions 外形尺寸

PCN10C



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Ordering Information 订货信息

Model	Height (mm)	Gap (mm)	Screw Mounting Wing	Output (Ch)	Resolutions (LPI)
PCN10C-□□	7.55	2.0	-	A & B	45,90,150,180,300,360
PCN10CF-□□	7.55	2.0	-	A & B	45,90,150,180,300,360
PCN11C-□□	7.55	2.0	●	A & B	45,90,150,180,300,360
PCN11CF-□□	7.55	2.0	●	A & B	45,90,150,180,300,360
PCN31C-□□	6.55	0.5	●	A & B	150,300,360
PCN31CF-□□	6.55	0.5	●	A & B	150,300,360

□□: Resolution Indication 分辨率区分

-45	-09	-15	-18	-30	-36
45 LPI	90 LPI	150 LPI	180 LPI	300 LPI	360 LPI

Notes for Use 使用上的注意事项

1. The products is recommended to use under the conditions at $I_F=10\text{mA}$, $V_{CC}=3.3\text{ V}$ or 5.0 V .
推荐的使用条件: $I_F = 10\text{mA}$, $V_{CC} = 3.3\text{ V}$ 或 5.0 V .
2. In order to stabilize power supply, connect a by-pass capacitor of $0.1\text{ }\mu\text{F}$ or more between V_{CC} and GND.
为使供电更稳定, 推荐在 V_{CC} 和 GND 之间添加 $0.1\text{ }\mu\text{F}$ 以上的旁路电容
3. Disk: set the printing side of the disk as the light receiving side.
请将码盘的印刷面朝向发光侧使用
4. Please do not share the GND terminal of the encoder with other components such as motor circuits.
请不要把编码器的 GND 管脚和其他电路, 如电机, 共地使用
5. Do not get dust or dirt blocking the light path.
发光侧和接收侧的光路不可有灰尘堵塞

Disclaimer

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Life Support Policy

PREMA products are not authorized for use as critical components in life support devices or systems without the express written approval of PREMA. As used here in:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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