

Optical Encoder PCN2X Series

High Performance Incremental Optical Encoder

高性能增量式光电编码器



PCN2X 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. PCN2X series also have a variety of resolution options to suit different detection needs.

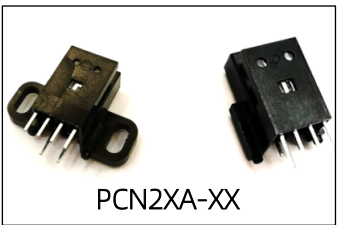
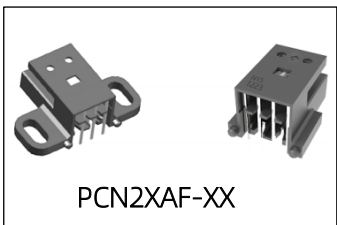
PCN2X 系列是 A 和 B 通道数字输出的高性能增量式光电编码器。通过使用非常小的结构组件和超薄封装的红外 LED 和光电检测 IC，建立起了高质量的信号输出和紧凑的外形。光电检测 IC 使用了相位阵技术，有效的提高了信号的纠错能力。PCN2X 系列还拥有多种分辨率可选，以适合于不同检测需求的应用。

FEATURES

- Gap 间隙: 2.0 mm
- Height 高度: 7.35 mm
- Incremental output 增量输出:
 - Digital output (A, B 2-Channel)
 - 数字输出 (A, B 通道)
- Frequency 响应频率: 300kHz (Max)
- Installation Method 安装方式:
 - Standard or screw mounting
 - 标准型或螺丝型固定

TYPICAL APPLICATIONS

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



KEY CHARACTERISTICS

Parameter	Value	Unit
Gap 间隙	2.0	mm
Vcc 工作供电电压	3.0~6.0	V
Response freq. 响应频率	300 Max.	kHz

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

PCN 20AF - Z36

- PCN PREMA Encoder Module
- 20 Holder Type
- A Chip Version
- F Forming Lead: F, Straight Lead: Null
- Z ABZ: Z, AB: Null
- 36 Resolution

Resolution 分辨率	45 LPI	90 LPI	150 LPI	180 LPI	300 LPI	360 LPI
PCN2XAF-□□	45	09	15	18	30	36

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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	14	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

距树脂至少 1 mm, 最长 5 秒。

ELECTRO-OPTICAL CHARACTERISTICS (Ta=25°C)

	Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input 输入	Forward current 顺电流	I_F	-		4.0		mA
	Peak wavelength 峰值波长	λ_P	$I_F=20mA$		850		nm
Operating supply voltage 工作供电电压		V_{CC}	-	3.0		6.0	V
A, B 相输出	Phase difference 相位差	θ	$I_F=4mA$ $V_{CC}=3.0$ to 6.0V	45	90	135	deg
	Duty ratio 占空比	Dt		35	50	65	%
	High level output voltage 高电平输出电压	V_{OH}		$V_{CC} \times 0.8$	-	-	V
A, B Phase Output	Low level output voltage 低电平输出电压	V_{OL}		-	-	0.4	V
	Response frequency 响应频率	f				300	kHz

RECOMMENDED USING CONDITIONS:

1. The products are recommended to use under the conditions of $I_F = 4mA$, $V_{CC} = 3.3V$ or $5.0V$.

推荐的使用条件: $I_F = 4mA$, $V_{CC} = 3.3V$ or $5.0V$.

2. In order to stabilize power supply, connect a by-pass capacitor of $0.1\mu F$ 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 $0.1\mu F$ 以上的旁路电容

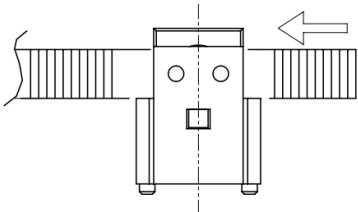
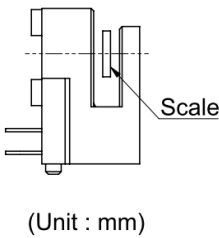
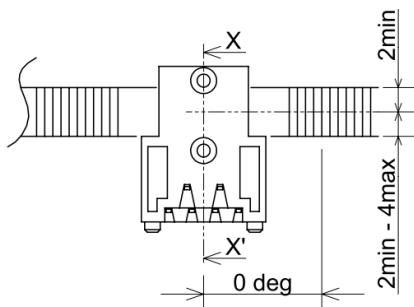
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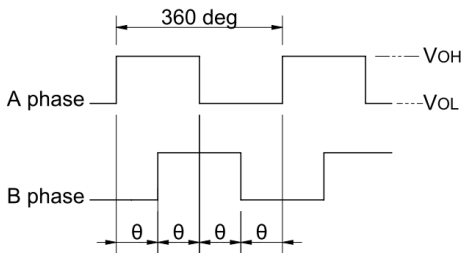


Measurement Conditions 测量条件

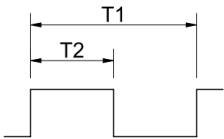


输出波形中Scale移动方向
Direction of scale movement in output waveform

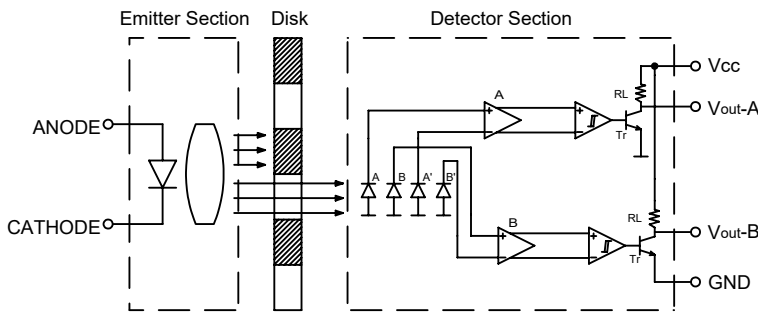
Output waveform



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



Block Diagram 原理图



Code Disk	RL (Pull Up)
45 LPI	12 KΩ
90 LPI	12 KΩ
150 LPI	6.5 KΩ
180 LPI	6.5 KΩ
300 LPI	3.7 KΩ
360 LPI	3.7 KΩ

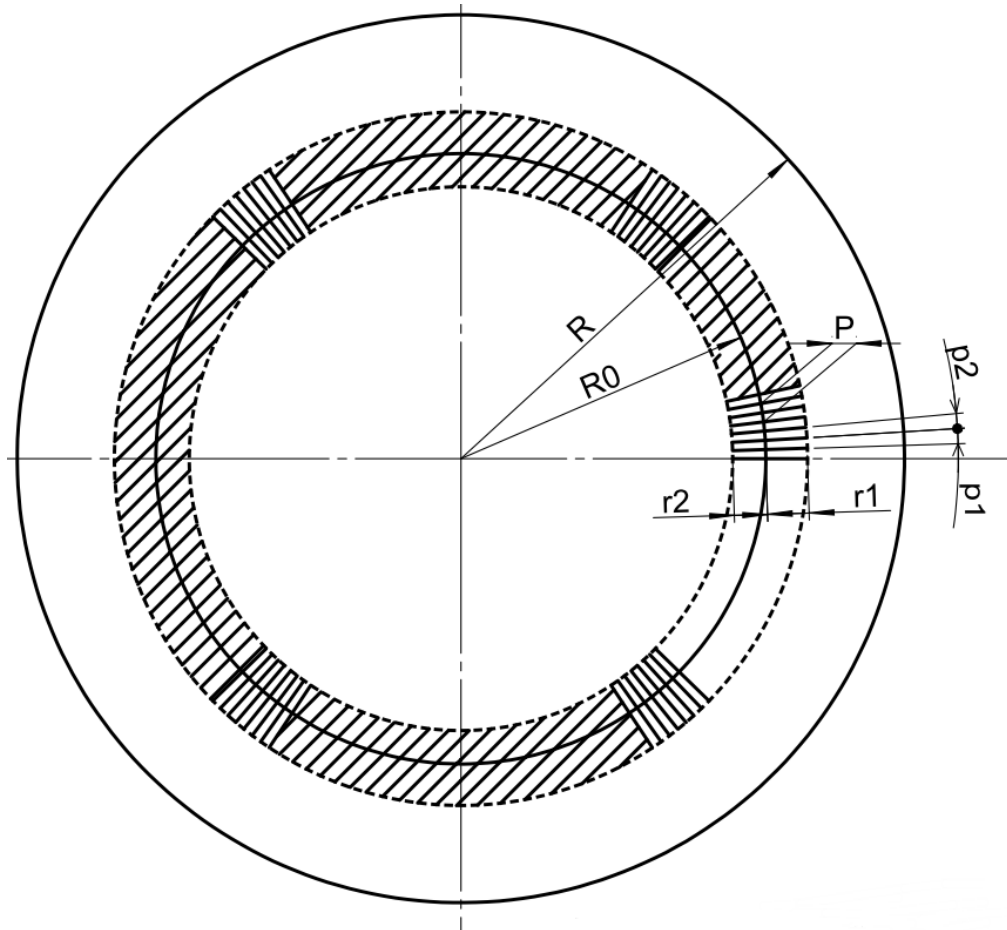
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Disk design Reference 码盘设计参考



R0: Rotary Disk Center Radius - 码盘中心半径

P: Slit Pitch on R0 - R0上的狭缝间距

N: Slit Counts - 狭缝数

$$- R0 = P * N / 2\pi$$

Conditions 条件: $P = 25.4 / \text{LPI}(\text{分辨率})$,

$$20 \leq R0 \leq \infty, \infty = \text{Linear scale}$$

$$- R \leq R0 + 4$$

$$- p1 = p2 = P / 2$$

$$- 2 \leq r1 \leq 4, r2 \geq 2$$

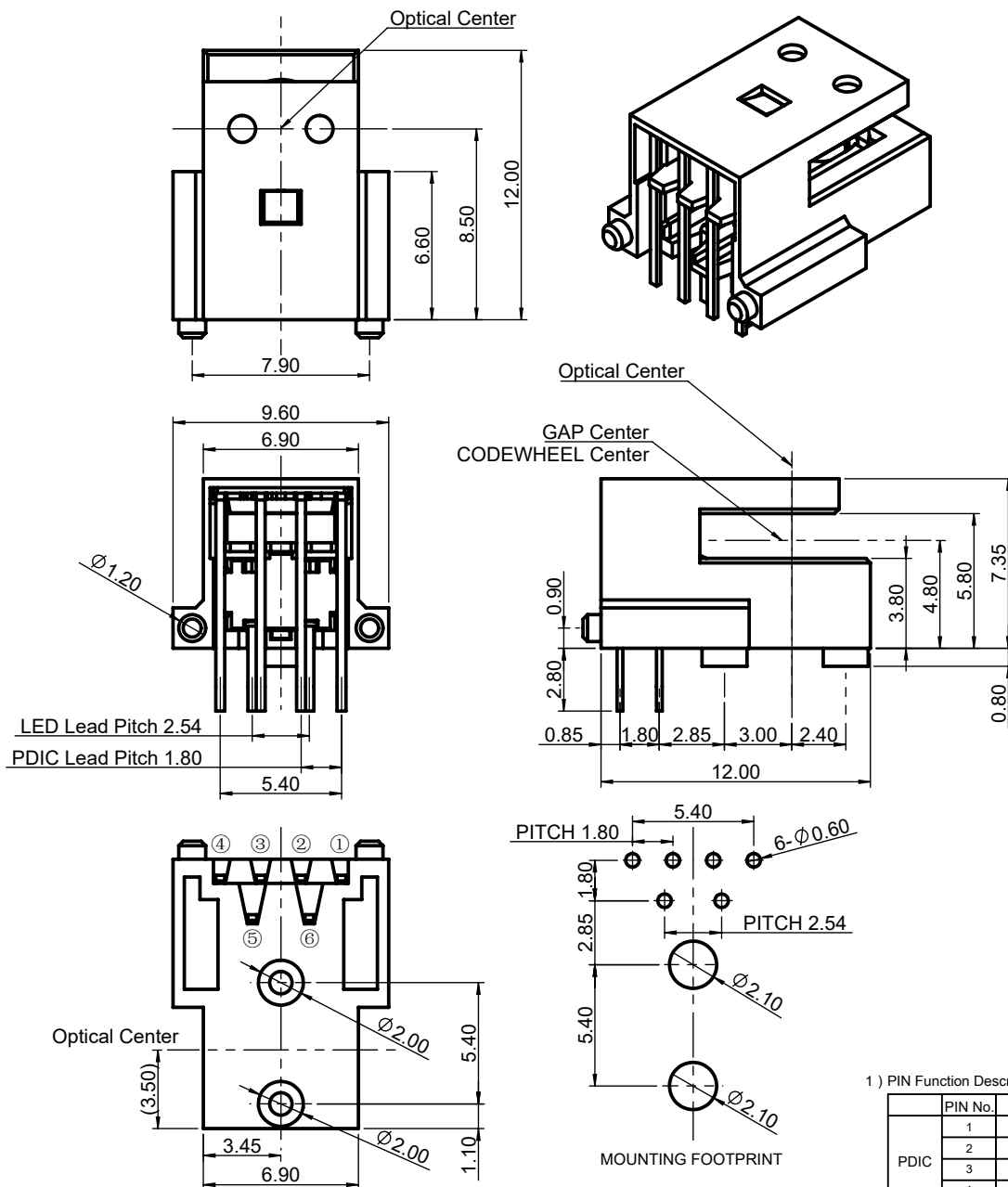
Units: (mm)

高性能增量式光电编码器



Dimensions 外形尺寸

PCN20AF



1) PIN Function Description

	PIN No.	Function
PDIC	1	OUTPUT-A
	2	GND
	3	V _{cc}
	4	OUTPUT-B
IRED	5	ANODE
	6	CATHODE

2) General Tolerance : ± 0.2 mm

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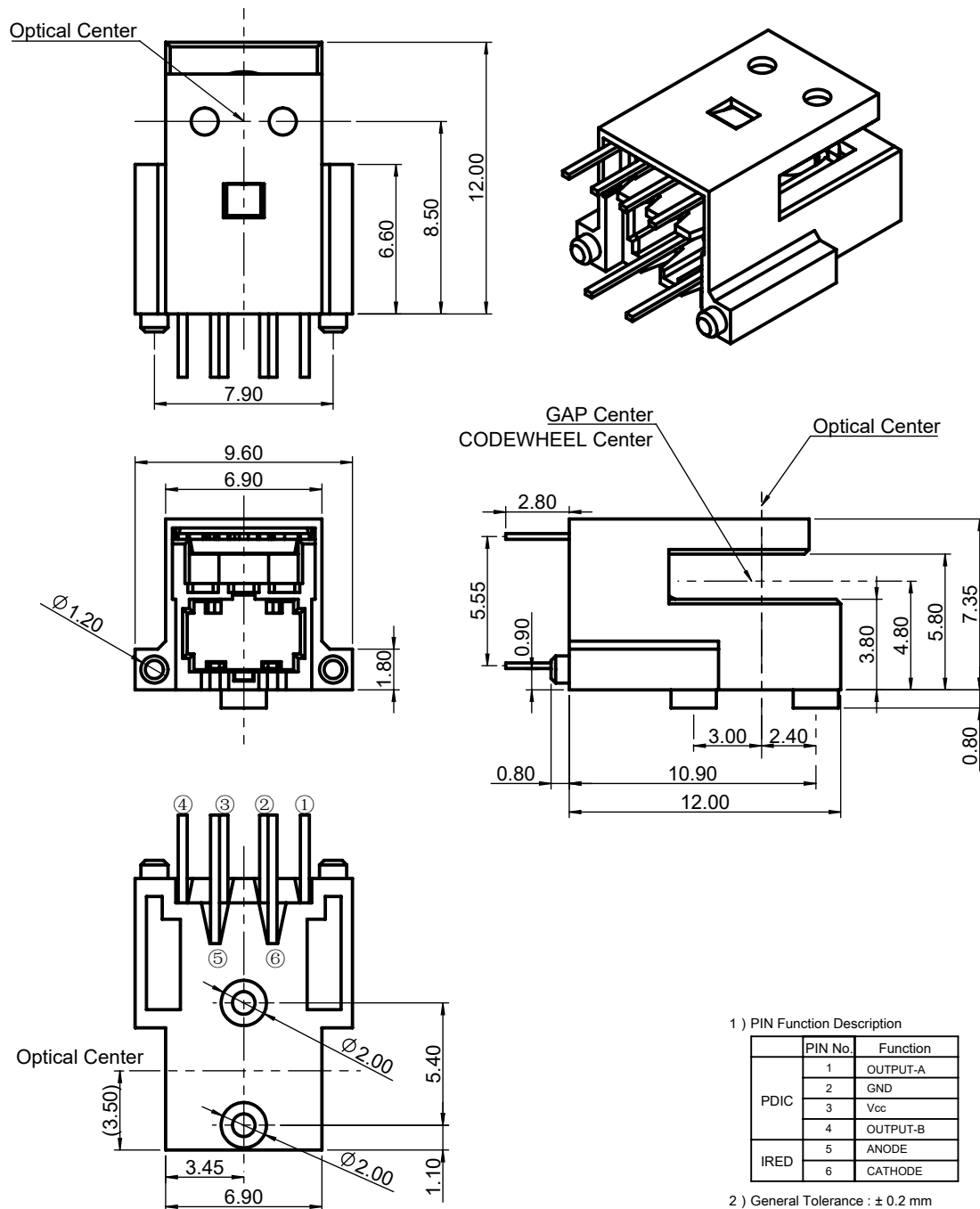
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Dimensions 外形尺寸

PCN20A



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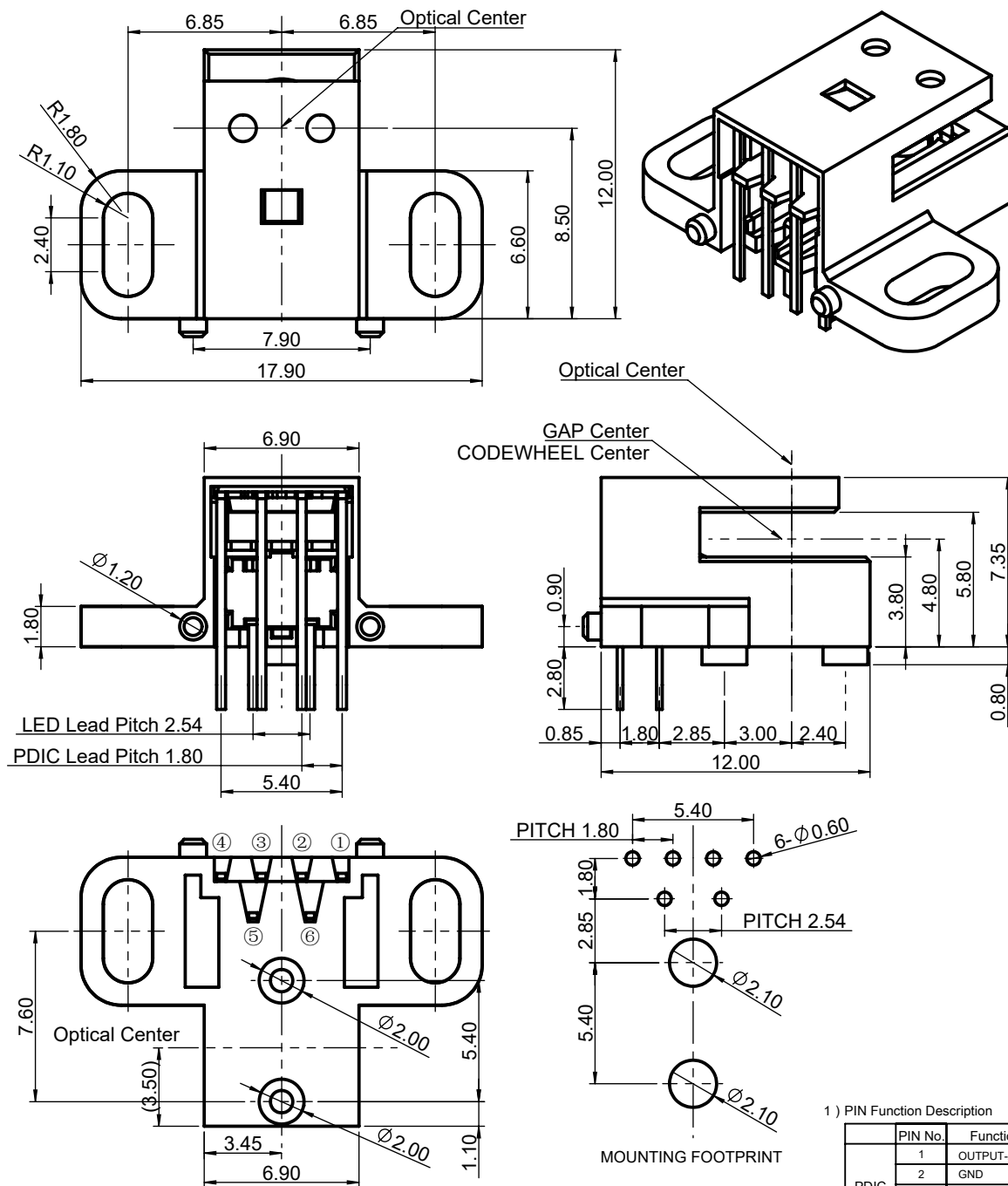
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Dimensions 外形尺寸

PCN21AF



1) PIN Function Description

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

2) General Tolerance : ± 0.2 mm

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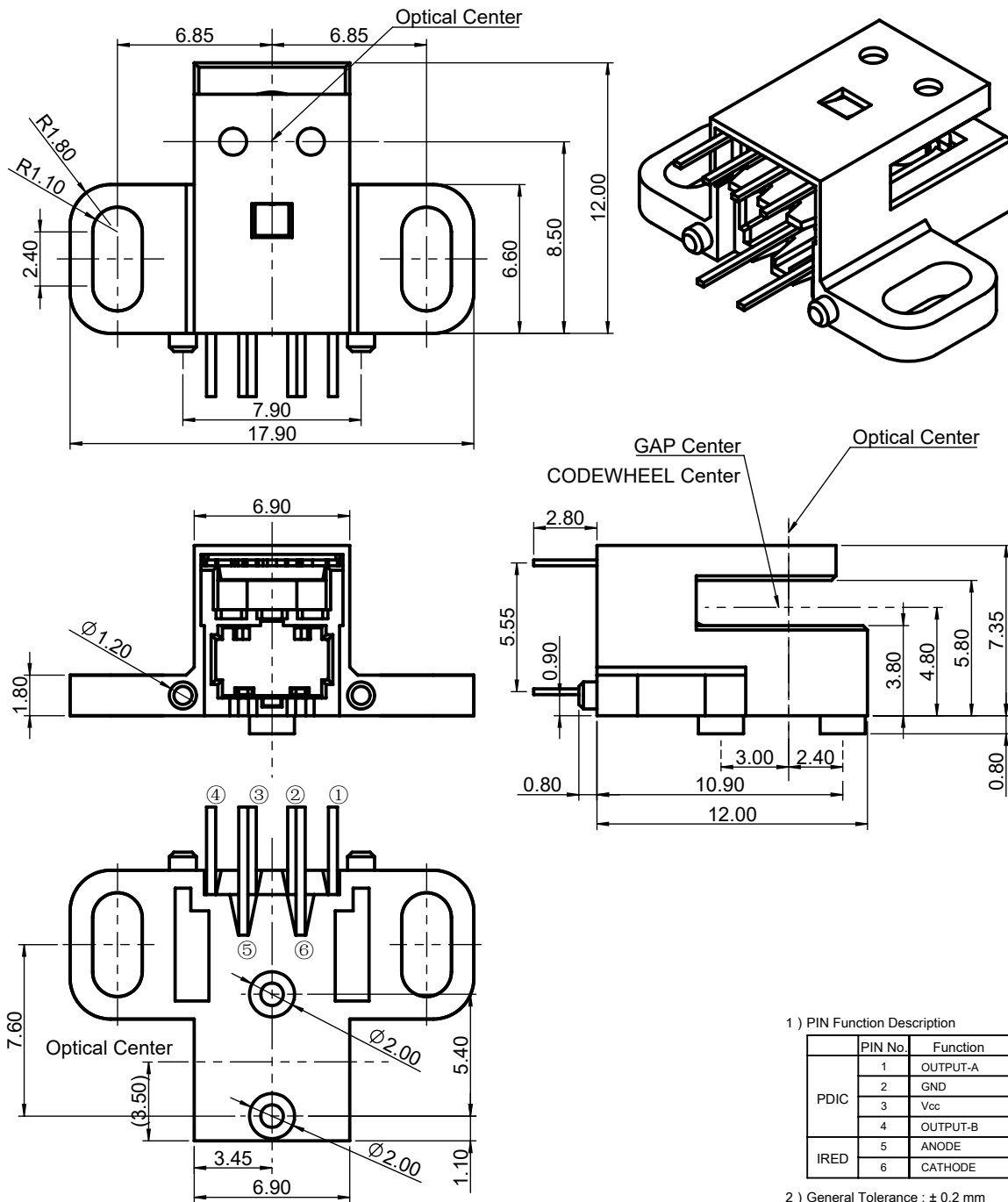
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Dimensions 外形尺寸

PCN21A



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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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