

Incremental Encoder Module Datasheet

8ECM-XX150A5 Series

增量型编码器模块



Features 产品特性

- Gap 间距: 2.0mm
- Height 高度: 7.35mm
- Incremental output method 增量型输出方式
- Digital output 数字输出 (A,B 2-Channel) A,B 双输出
- Built in pull-up resistor 包含内置电阻
- Resolution 分辨率: 150LPI



Description 产品描述

- 8ECM-XX150 Series is an optical encoder which is assembly with an infrared LED as a light source and a photo IC as a detector, with a digital output, provides sophisticated motion detection and variation of resolutions, makes closed-loop control very cost effective, can be used in a wide range of applications.
8ECM-XX150 系列是一款由一个红外光 LED 作为光源，以光电 IC 作为接收端的光学编码器。具有数字输出，并提供精密的移动检测及分辨率变化。使封闭回路的控制更加具有成本效益，且可被广泛的应用。

Applications 产品应用

- Printer 打印机
- Facsimile 传真机
- Copier 复印机
- Disc driver 磁盘驱动器

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Item Number Description 料号说明

Item Number Details: 料号明细

Product item No	Item number Description
8ECM150A5SB00001	Pin linear standard 150LPI tube packaging incremental encoder Pin 脚直线-短款标准型-150LPI Tube 包装 增量式编码器
8ECM150A5FB00001	Pin bending standard 150LPI tube packaging incremental encoder Pin 脚折弯-短款标准型-150LPI Tube 包装 增量式编码器

Absolute Maximum Ratings 最大额定值($T_a=25^{\circ}\text{C}$)

Parameter		Symbol	Rating	Unit
Input 输入	Forward Current 顺电流*1	I_F	20	mA
	Reverse Voltage 逆电压	V_R	3	V
Output 输出	Supply Voltage 供应电压	V_{CC}	7	V
Operating temp. 操作温度*2		$T_{opr.}$	0 ~ +85	$^{\circ}\text{C}$
Storage temp. 储存温度*2		$T_{stg.}$	-40 ~ +85	$^{\circ}\text{C}$
Soldering temp. 焊接温度*3		$T_{sol.}$	260	$^{\circ}\text{C}$
ESD level(HBM) 抗静电等级		EDS	+/-2	KV

Notes:

*1. Recommended Operating Forward Current : 10mA 建议正向工作电流 : 10mA

*2. No icebound or dew 没有结冰或结露

*3. For max 5 sec. at the position of 1mm from the resin edge

距离树脂边缘 1mm 的位置最长 5 秒

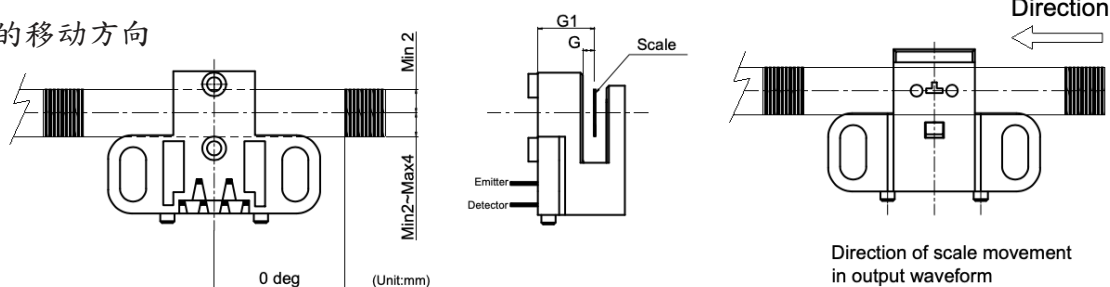
Electro-Optical Characteristics 光电特性($T_a=25^{\circ}\text{C}$)

ITEM		Symbol	Conditions	Min.	Typ.	Max.	Unit
LED Input	Forward voltage 顺向电压	V_F	$I_F=10\text{mA}$	—	1.7	—	V
LED 输入	Peak wavelength 峰值波长	λ_P	$I_F=10\text{mA}$	830	853	860	nm
Operating supply voltage range 操作电压范围				2.8	5	5.5	V
Phase difference 相位差 *4*5*7		θ		70	90	110	deg
IC Output	Duty ratio 占空比 *4*6	D_T	$V_{CC}=2.8$ to 5.5V $I_F=10\text{mA}$	40	50	60	%
A-B Phase Output	High level output voltage 高准位输出电压 *4*5	V_{OH}		$V_{CC} \times 0.8$	—	—	V
IC 输出	Low level output voltage 低准位输出电压 *4*5	V_{OL}		—	—	0.4	V
Response frequency 响应频率		f_o		—	—	60	KHz
Rise Time 上升时间		t_r	$C_L=25\text{pF}$	0.03	—	3	μs
Fall Time 下降时间		t_f	$C_L=1000\text{pF}$	0.03	—	3	μs

Notes:

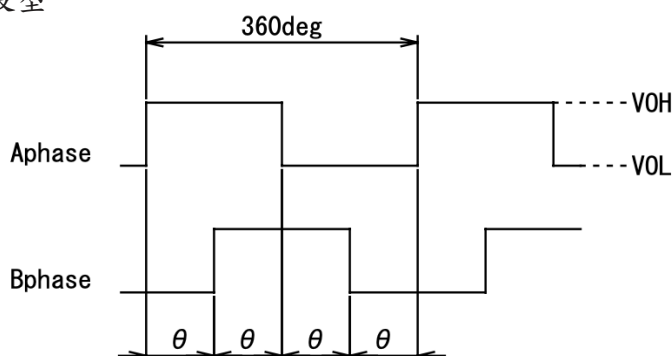
*4. Direction of scale movement

刻度的移动方向



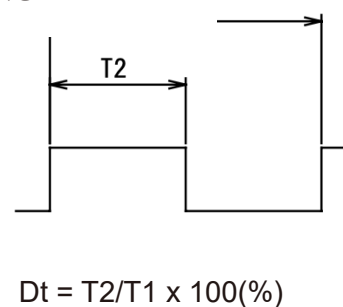
*5. Output waveform of *3

输出波型



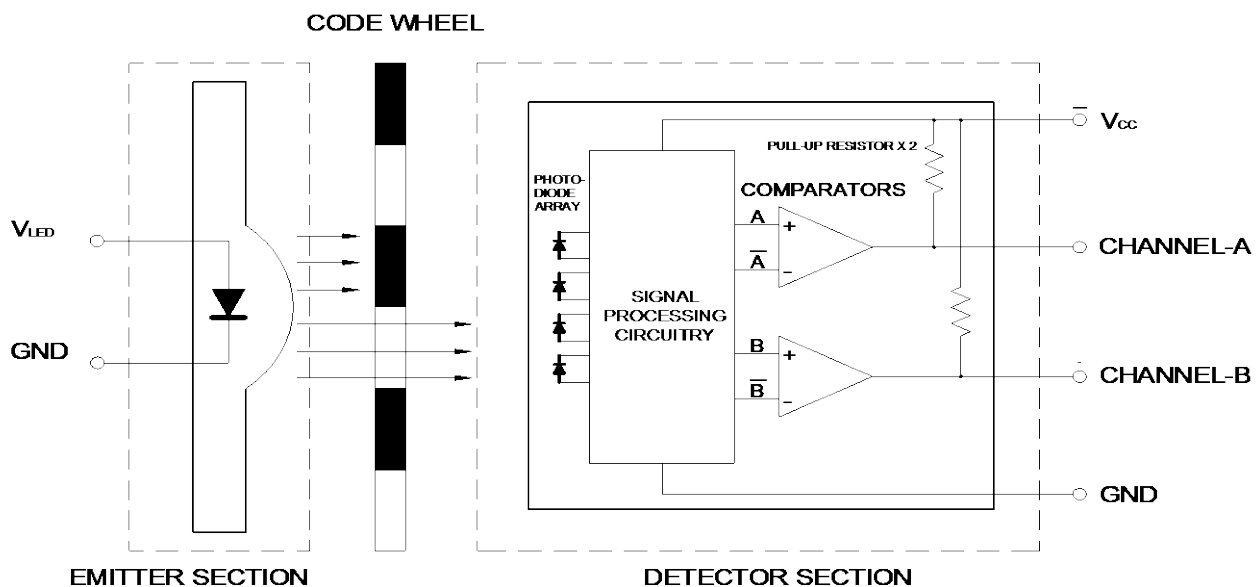
*6. Duty Ratio (D_t)

占空比



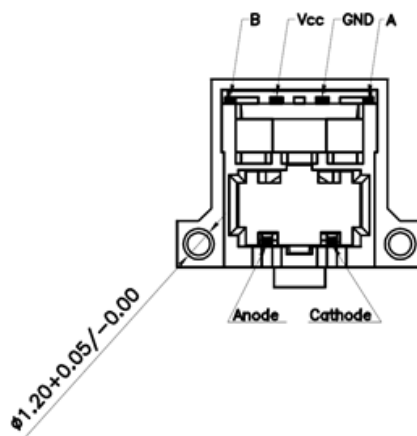
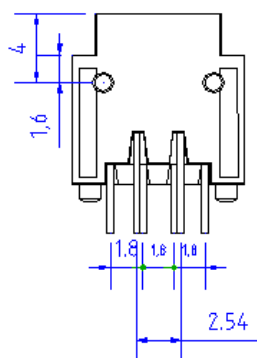
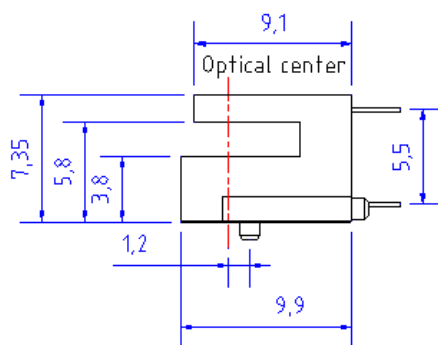
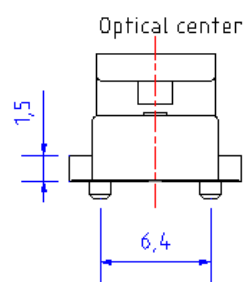
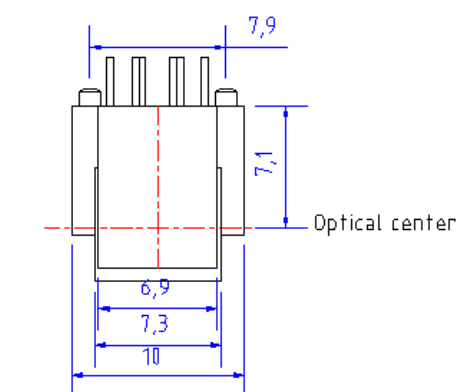
*7. No reverse in phase difference 反转方向无相位差

Block Diagram 方块图



Mechanical Dimension 机构尺寸

Straight PIN 直脚型



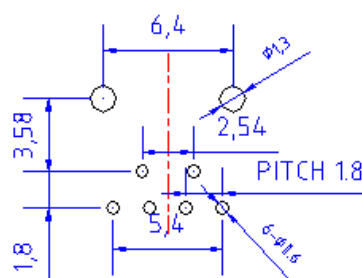
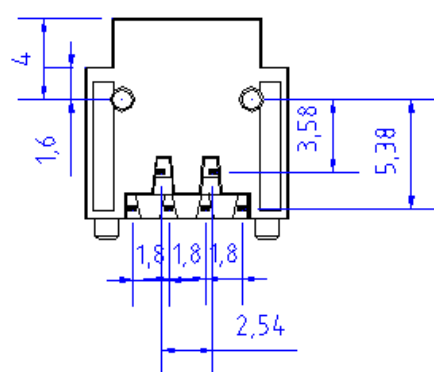
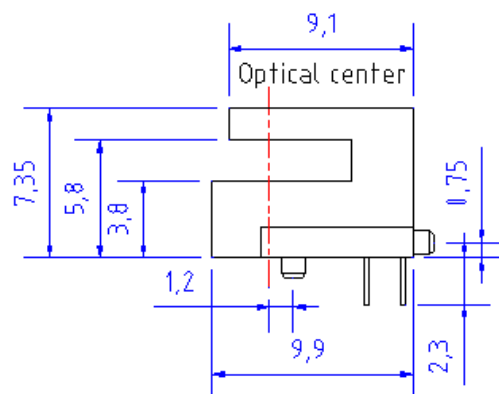
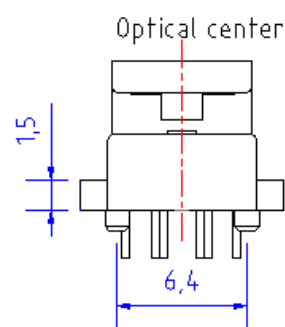
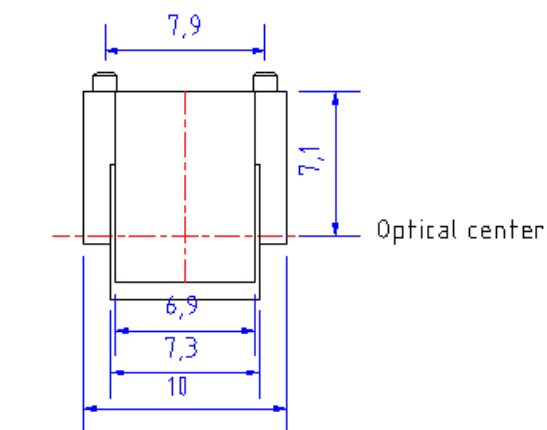
1) PIN CONFIGURATION

PIN NO.	CONFIGURATION	REMARK
1	CHANNEL-A	OUTPUT-A
2	GND	PDIC GND
3	Vcc	PDIC Vcc
4	CHANNEL-B	OUTPUT-B
5	V _{LED}	IRED ANODE
6	GND	IRED CATHODE

2) General Tolerance : $\pm 0.2\text{mm}$

Mechanical Dimension 机构尺寸

Folding PIN 折脚型



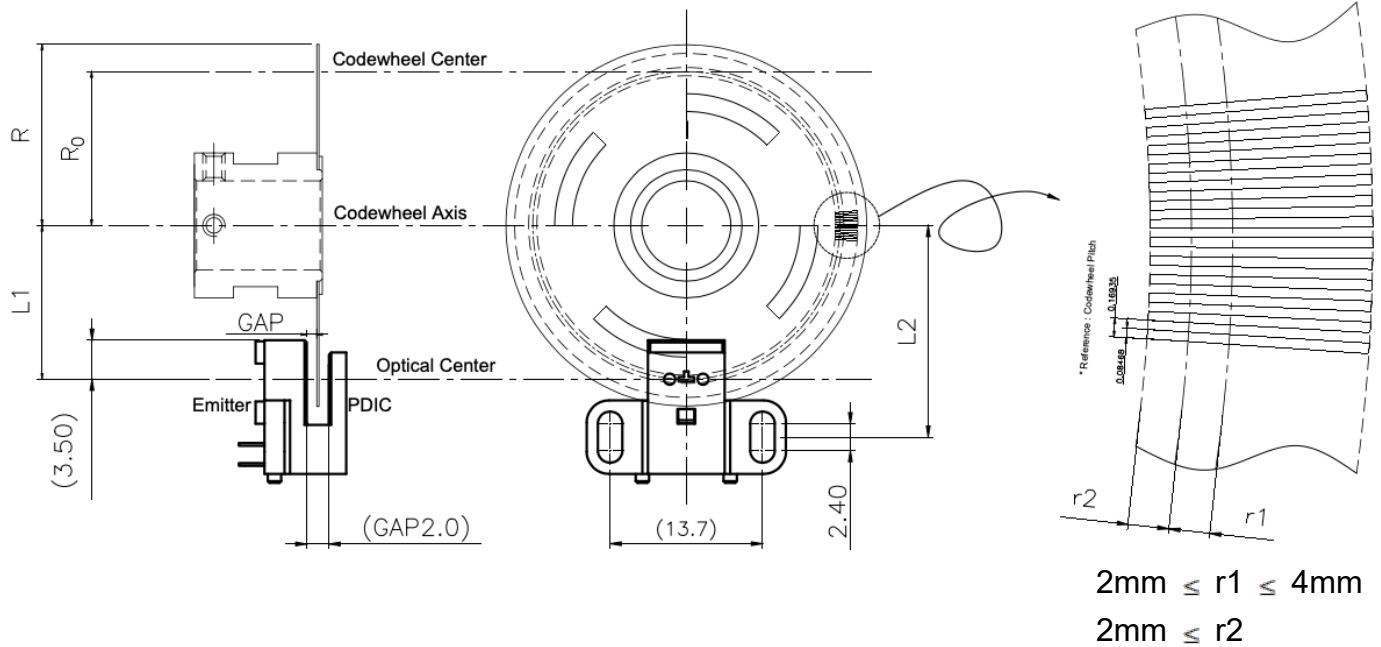
MOUNTING FOOTPRINT

1) PIN CONFIGURATION

PIN NO.	CONFIGURATION	REMARK
1	CHANNEL-A	OUTPUT-A
2	GND	PDIC GND
3	V _{CC}	PDIC V _{CC}
4	CHANNEL-B	OUTPUT-B
5	V _{LED}	IRE D ANODE
6	GND	IRE D CATHODE

2) General Tolerance : $\pm 0.2\text{mm}$

Mounting Consideration 安装注意事项



Note:

These dimensions include shaft end play and codewheel warp. All dimensions for mounting in the module and codewheel/codestrip should be measured with respect to the two mounting posts shown above.

这些尺寸包括轴端间隙和码盘翘曲。安装在模块和编码盘/编码条中的所有尺寸都应相对于上面显示的两个安装柱进行测量对比。

Code wheel Design reference 馬盤設計參考

- Rotary Disk Center Radius 馬盤中心半徑: R_0 (mm)
- Slit Pitch 狹縫間距: P (mm) on R_0
- Slit Counts 狹縫數量: N (P/R)
- $R_0 = P/2\pi \times N$
- $P=25.4\text{mm}/180\text{LPI}$, $20 \leq R_0 \leq \infty$
- $R_0 \leq R_0 + 4\text{mm}$
- $L1 = R_0$
- $L2 = L1 + 3.5\text{mm}$

Revision history 修订历史

Versions	Description	Release Date
1.0	Preliminary 初订	2024/03/26

About Edison Opto 关于艾笛森光电

Edison Opto is a leading manufacturer of high power LED and a solution provider experienced in LDMS. LDMS is an integrated program derived from the four essential technologies in LED lighting applications- Thermal Management, Electrical Scheme, Mechanical Refinement, Optical Optimization, to provide customer with various LED components and modules. More Information about the company and our products can be found at www.edison-opto.com

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