



厦 门 华 联 电 子 股 份 有 限 公 司

Xiamen Hualian Electronics Corp., Ltd.

产 品 规 格 书

SPECIFICATION

产品名称：高速逻辑门输出型光耦合器

DESCRIPTION: High Speed Logic Gate Opto-coupler

产品型号：HPL6W×××

PART NO.: HPL6W×××

拟制 Prepared	审核 Verified	批准 Approved

电 话 Tel: 86-0592-2950777

传 真 Fax: 86-0592-6037471

网 址 Web: www.xmhl.com

地 址：厦门市思明区前埔路 502 号

Add: No.502, Qianpu Road, Siming District, Xiamen China

邮 编 P.C.: 361008

1 概述 General

光耦产品 HPL6W×××由 850nm 砷化铝镓红外发光二极管同超高速逻辑门光敏芯片耦合封装构成, 产品输出端为 CMOS 输出, 产品具有很强的共模抑制能力。正常工作温度可达-40°C ~ +105°C。



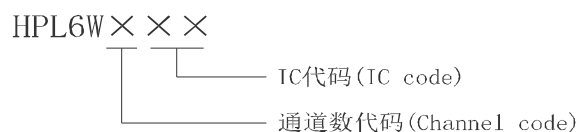
图 1 产品 Figure 1-Product

The HPL6W××× optocouplers consist of a 850 nm AlGaAS LED, optically coupled to a very high speed integrated photo-detector logic gate with a strobable output. The output end of the product is a CMOS output, and the product has a strong common mode rejection capability. The coupled parameters are guaranteed over the temperature range of -40°C to +105°C.

2 特点 Features

- 数据传输速率快。High speed .
- 逻辑门输出。Logic gate output.
- 输入、输出间绝缘电压高。The isolation voltage between input and output is high: VISO≥7500Vrms.
- 双列贴片宽体式 8L 塑料封装。WSOP8 plastic package.
- 符合 RoHS 指令最新要求及 REACH 法规最新要求。Compliance with the latest requirements of the RoHS Directive and the latest REACH requirements.

3 型号说明



通道数代码 Channel code		IC 代码 IC code		
Code	Channel Type	Code	IC Type	CTR
1	Single	35	1Mbit/s Transistor	7%~50%
2	Dual	36	1Mbit/s Transistor	19%~50%
		37	10Mbit/s OC	
		38	1Mbit/s Darlington	≥300%
		39	1Mbit/s Darlington	≥500%
		47	15Mbit/s CMOS	
		57	25Mbit/s CMOS	

4 应用 Applications

- 通讯接口: RS-485, CAN 总线。Communication Interface: RS-485, CAN Bus.
- 用于 A/D, D/A 转换的数字隔离。Digital isolation for A/D, D/A conversion.
- 高压电源系统, 例如 690 V 驱动器。High-voltage power systems, e.g., 690 V drives.
- 可再生能源逆变器。Renewable energy inverters.
- 医学成像和病人监护。Medical imaging and patient monitoring.

5 真值表及电原理图 Truth Table and Schematic

表 1 真值表
Table 1-Truth Table

LED	OUTPUT Vo
ON	L
OFF	H

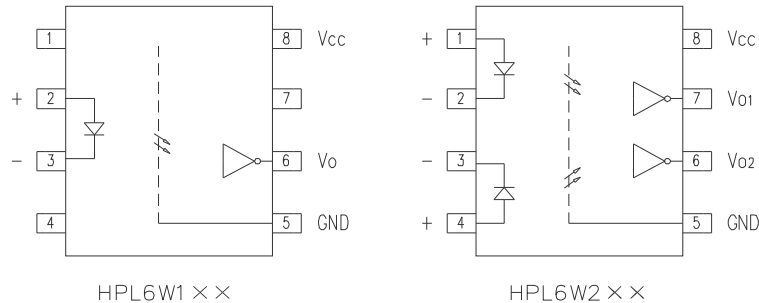


图 2 电原理图
Figure 2-Schematic

6 极限参数 Absolute Maximum Ratings

表 2 极限参数

Table 2-Absolute Maximum Ratings

(Ta=25℃, RH=30~75%)

参数名称 Characteristic		符号 Symbol	额定值 Rating	单位 Unit
输入端 Input	正向电流 Forward Current	I _F	10	mA
	正向脉冲电流 Pulse Forward Current (<1s Pulse Width, <10% Duty Cycle)	I _{FP}	80	mA
	反向电压 Reverse Voltage	V _R	5	V
	输入端功耗 Input Power Dissipation	P _I	20	mW
输出端 output	输出电流 Output Current	I _O	10	mA
	电源电压 Supply Voltage (1min Max)	V _{DD}	5	V
	输出电压 Output Voltage	V _O	V _{DD} +0.5	V
	输出端功耗 Output Power Dissipation	P _O	22	mW
工作温度 Operating temp.		T _{aop}	-40 ~ +105	℃
贮存温度 Storage temp.		T _{stg}	-55 ~ +125	℃
焊接温度 Soldering Temperature	手工焊 Hand Soldering (5 Sec.)	T _{sld}	350	℃
	回流焊 Reflow Soldering (5 Sec.)		260	
绝缘电压 Isolation voltage (RH≤60%,交流 1 分钟) (RH≤60%, AC 1min.)		V _{ISO}	7500	V _{rms}

7 推荐工作条件 Recommended Operating Conditions

表 3 推荐工作条件
Table 3-Recommended Operating Conditions

参数名称 Characteristic	符号 Symbol	最小值 Min.	最大值 Max.	单位 Unit.
低电平输入电流 Input Current,Low Level	I_{FL}	0	250	μA
高电平输入电流 Input Current,High Level	I_{FH}	4.5	8	mA
输出端电源电压 Power Supply Voltage	V_{DD}	2.7	5.5	V
正向电压 Forward Voltage	$V_{F(OFF)}$		0.8	V

8 光电参数 Opto-Electrical Characteristics

表 4 光电参数

Table 4-Opto-Electrical Characteristics

$T_a=25^{\circ}C$

	参数 Parameters	符号 Symb.	测试条件 Test Conditions	最小值 Min.	特征 值 Typ.	最大 值 Max.	单位 Unit
输入端 Input	正向电压 Forward Voltage	V_F	$I_F=10mA$	1.20	1.35	1.7	V
	输入端反向击穿电压 Input Reverse Breakdown Voltage	BV_R	$I_R=10\mu A$	7			V
输出端 Output	高电平电源电流 High Level Supply Current	I_{DDH}	$V_{DD}=5V, I_F=0 mA$			5	mA
	低电平电源电流 Low Level Supply Current	I_{DDL}	$V_{DD}=5V, I_F=10 mA$			5	mA
耦合 Coupler	高电平输出电压 Logic High Output Voltage	V_{OH}	$I_F=0mA$	$V_{DD}-0.1$	V_{DD}		V
	低电平输出电压 Logic Low Output Voltage	V_{OL}	$I_F=7mA, V_{DD}=5V$		0.02	0.1	V
	触发电流 Input Threshold Current	I_{TH}	$V_{DD}=5V$		2	5	mA
开关 Switching	输出端逻辑由高到低的传输延迟 时间 Propagation Delay Time to Logic Low Output	t_{PHL}	$I_F=7mA, C_L=15pF$		40	100	ns
	输出端逻辑由低到高的传输延迟 时间 Propagation Delay Time to Logic High Output	t_{PLH}	$I_F=7mA, C_L=15pF$		40	100	ns
	输出端为高电平时的共模抑制能 力 Common Mode Transient Immunity at Logic High Level Output	$ CM_H $	$ V_{CM} =1000V_{P-P},$ $I_F=0mA, C_L=15pF,$ $V_{DD}=5V$	10000			V/ μs
	输出端为低电平时的共模抑制能 力 Common Mode Transient Immunity at Logic Low Level Output	$ CM_L $	$ V_{CM} =1000V_{P-P},$ $I_F=7mA, C_L=15pF$ $V_{DD}=5V$	10000			V/ μs
	输出端上升时间 Output Rise Time(10%~90%)	t_r	$C_L=15pF, I_F=7mA$		10		ns
	输出端下降时间 Output Fall Time(90%~10%)	t_f			10		

隔离 Isolation	绝缘电压 Isolation voltage	V_{ISO}	$I_{off} \leq 0.3mA$, AC, 60s	7500			V
	输入-输出电容 Capacitance (Input to Output)	C_{I-O}^a	$f = 1MHz$		0.6		pF

^a C_{I-O} 测试是将PIN1,2,3,4短接在一起, PIN5,6,7,8短接在一起。Device considered a two-terminal device: Pins 1, 2, 3 and 4 shorted together, and Pins 5, 6, 7 and 8 shorted together.

9 外形尺寸 Dimensions

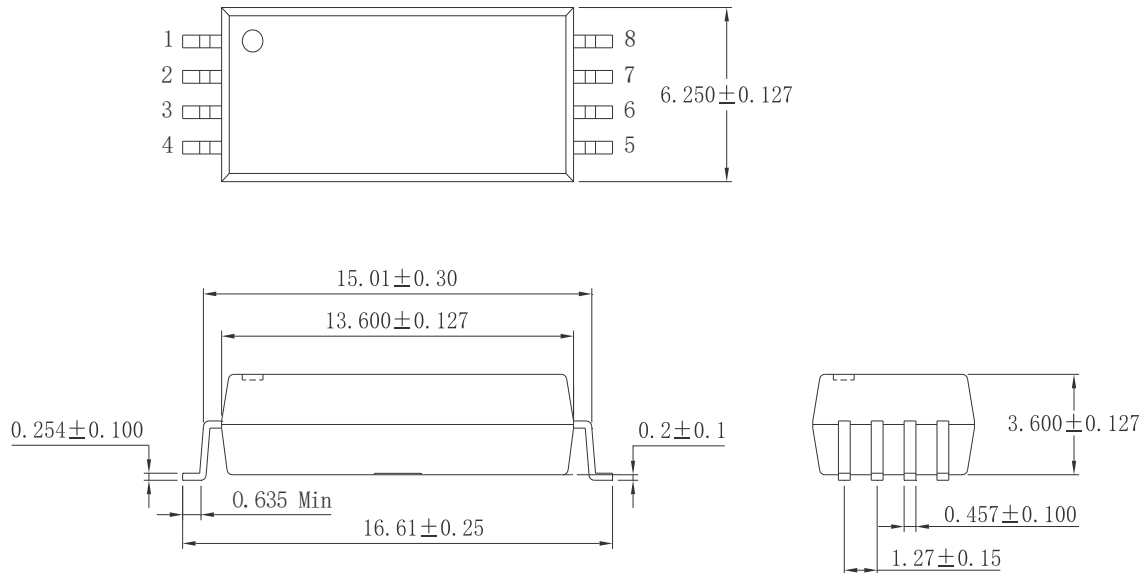


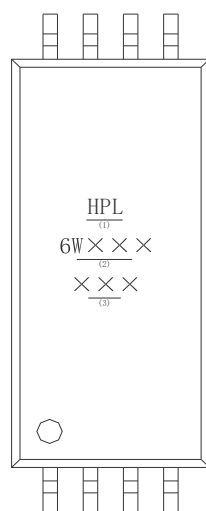
图 3 HPL6W×××外形尺寸

Figure 3- The dimensions of HPL6W×××

10 标志 Mark

产品上应有型号、公司商标、生产日期代码、引出端识别标记。例如: **HPL6W×××**产品印章如图 4。

Print type characters ,trade mark and Lot.No.on the Photo Coupler.For example the marking of product **HPL6W×××** is shown as Figure 4.



- (1) 高速逻辑门输出型光耦合器简称
High-Speed Logic Gate Opto-coupler
abbreviation
- (2) 型号 Model
- (3) 生产年周代码
Production year and week code

图 4 产品印章

Figure 4- Marking

11 包装方式 Packing

10.1 编带包装 (Tape and reel) : 适用于 For HPL6W×××

10.1.1 每卷数量 (Qty/reel) : 1000 只 (pcs)。每箱数量 (Qty/ctn) : 20000 只 (pcs)。

10.1.2 内包装 (Inner packing) :

每卷盘 1000 只, 贴合格证 (型号、生产日期代号、检验员代号)。

1000pcs/reel, certificate on reel (model, code of product date, Inspector's code)

10.1.3 外包装 (Outer packing):

公司名称、地址、商标、产品型号、数量等标志。

Indication of company name, address, trade mark, model and quantity.

10.1.4 示意图 (Schematic) :

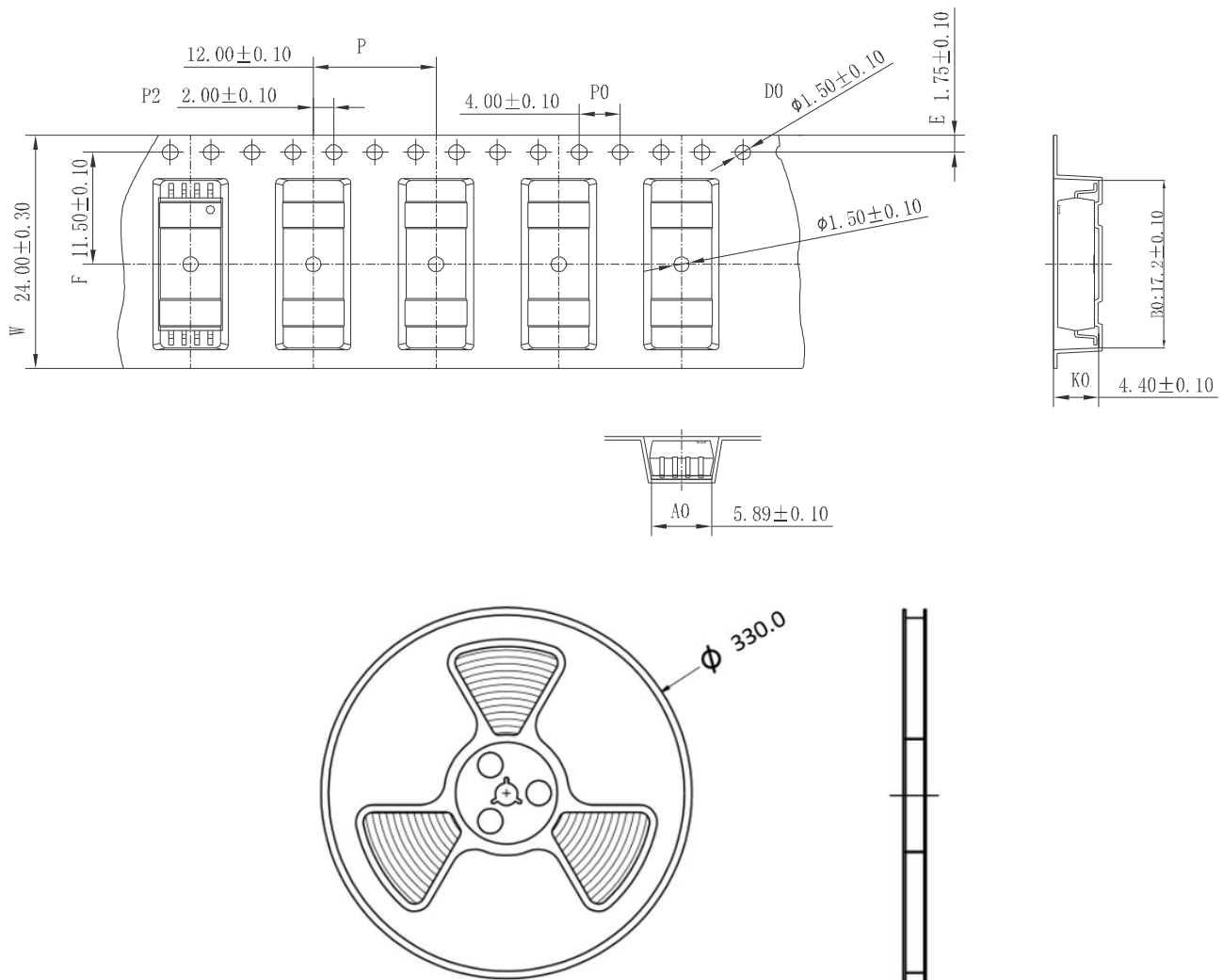


图 5 编带包装示意图

Figure 5- Taping Packing Schematic

10.2 标识 Label



图 6 标识 Figure 12-Label

10.3 注意事项 Note

10.3.1 推荐贮存温度 Recommend storage Temp.: 0~40℃;

推荐贮存湿度 Recommend storage humidity: <70%;

密封包装贮存有效期一年 Storage life of sealed packaging: One year.

10.3.2 湿气敏感度等级 1 级。MSL level: MSL 1.

10.4 引脚镀锡厚度: 大于等于 3μm, 平均 5μm~8μm。

Thickness of Sn which plated on lead frame: ≥3 μm, average 5μm~8 μm.

10.5 推荐焊接条件 Recommended soldering conditions

10.5.1 施加在环氧树脂上的温度不要超过最高贮存温度。

Not to apply high temperature exceeding the maximum storage temperature to the epoxy resin.

10.5.2 在高温下不要对环氧树脂施加压力。

Not to apply any force to the epoxy resin at high temperature.

10.5.3 焊接过程 Soldering process

1、在焊接过程中不要对器件施加任何压力。

Not to apply any stress to the component during the soldering process.

2、回流焊 Reflow soldering

1) 推荐锡膏规格 Recommend tin glue specifications:

a) 熔点 Melting temperature: 217℃

b) 组分 Contains: SnAg3Cu0.5

2) 回流焊之后的工序必须在器件冷却至室温后进行。Never take next process until the component is cooled down to room temperature after reflow.

3) 推荐回流焊接参数, 如下图所示: The recommended reflow soldering profile is following:

Temperature Zone	Time	Heating Rate	Peak Temperature	Cooling Rate
Preheat (40~150℃)	60~150s	≤ 2℃/s	---	---
Soak(150~200℃)	60~120s	≤ 1℃/s	---	---
Reflow (> 217℃)	30~90s	---	230~260℃	---
Cooling (220~150℃)	---	---	---	1℃/s~5℃/s

图7 回流焊参数

Figure 7-Recommended reflow soldering profile

11 产地 Production Place

11.1 产地 Production Place: 中国厦门 Xiamen China;

11.2 工厂名称 Production NO.: 厦门华联电子股份有限公司; Xiamen Hualian Electronics Corp. , Ltd.;

11.3 工厂地址 Production Add.: 中国厦门市思明区前埔路 502 号 No.502, Qianpu Road, Siming District, Xiamen China.

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