



厦 门 华 联 电 子 股 份 有 限 公 司

Xiamen Hualian Electronics Corp., Ltd.

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# 产 品 规 格 书

## SPECIFICATION

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产 品 名 称：光敏晶体管输出型光耦合器

DESCRIPTION: Photo-transistor Output Opto-coupler

产 品 型 号：HPC817×

PART NO.: HPC817×

| 拟制<br>Prepared | 审核<br>Verified | 批准<br>Approved |
|----------------|----------------|----------------|
|                |                |                |

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## 1 概述 General

光敏晶体管输出型光耦合器是将红外 LED 芯片和光敏晶体管芯片封装在一起，以实现电—光—电转换。

Photo-transistor Output Opto-coupler which is infrared LED chip and Photo-transistor chip are assembled on lead frame, in order to change the electricity-light-electricity.



图 1 产品 Figure 1-Product

## 2 特点 Features

- 光敏晶体管输出 Phototransistor output
- 输入、输出端之间绝缘电压高 Isolation voltage between input and output  $V_{ISO} \geq 5000V_{rms}$
- 双列直插式 4L 塑料封装 (DIP4L Plastic Package)
- UL 安全认证文件号 UL File No.: E178703
- VDE 安全认证文件号 VDE License No.:40004708
- 符合 RoHS 指令最新要求及 REACH 法规最新要求。

Comply with the latest requirements of the RoHS directive and the latest requirements of REACH regulations.

## 3 应用 Applications

- 数字逻辑的传输及变换 Transmission and conversion of digital logic;
- 电源控制及开关 Power control and switch ;
- 电路与电路之间、系统与系统之间的电气绝缘隔离与阻抗变换 Electric insulation and impedance conversion between circuits systems.

## 4 极限参数 Absolute Maximum Ratings

表 1 极限参数

Table 1-Absolute Maximum Ratings

$T_a = (25 \pm 5)^{\circ}C$ , RH=45~75%

| 参数名称 Characteristic |                                                                  | 符号<br>Symbol  | 额定值<br>Rating | 单位<br>Unit |
|---------------------|------------------------------------------------------------------|---------------|---------------|------------|
| 输入端<br>Input        | 正向电流 Forward Current                                             | $I_{FM}$      | 50            | mA         |
|                     | 反向电压 Reverse Voltage                                             | $V_R$         | 6             | V          |
|                     | 耗散功率 Power Dissipation                                           | $P_M$         | 70            | mW         |
| 输出端<br>Output       | 集电极-发射极反向击穿电压<br>Collector- Emitter<br>Reverse Breakdown Voltage | $V_{(BR)CEO}$ | 80            | V          |
|                     | 发射极-集电极反向击穿电压<br>Emitter -Collector<br>Reverse Breakdown Voltage | $V_{(BR)ECO}$ | 6             | V          |
|                     | 集电极直流电流 Collector Current                                        | $I_{CM}$      | 50            | mA         |
|                     | 集电极耗散功率<br>Collector Power Dissipation                           | $P_C$         | 150           | mW         |

|                                                                                     |                  |         |                  |
|-------------------------------------------------------------------------------------|------------------|---------|------------------|
| 工作温度 Operating Temperature Range                                                    | T <sub>OPR</sub> | -55~110 | °C               |
| 贮存温度 Storage Temperature Range                                                      | T <sub>STG</sub> | -55~125 | °C               |
| 波峰焊焊接温度 Wave Soldering<br>(10 seconds )                                             | T <sub>h</sub>   | 260     | °C               |
| 总耗散功率 Total Power Dissipation                                                       | P <sub>T</sub>   | 200     | mW               |
| 输入-输出间绝缘电压<br>Isolation voltage between input and output<br>(AC, 60Seconds, RH<60%) | V <sub>ISO</sub> | 5000    | V <sub>rms</sub> |

## 5 电参数 Electrical Parameters

表 2 光电参数

Table 2-Opto-Electrical Characteristics

Ta=(25±5)°C, RH=45~75%

| 参数名称 Characteristic                                 |                                                                 | 符号<br>Symbol         | 测试条件<br>Test<br>Conditions                                         | 最小值<br>Min.      | 典型值<br>Typ.      | 最大值<br>Max. | 单位<br>Unit       |
|-----------------------------------------------------|-----------------------------------------------------------------|----------------------|--------------------------------------------------------------------|------------------|------------------|-------------|------------------|
| 输入端<br>Input                                        | 正向电压 Forward Voltage                                            | V <sub>F</sub>       | I <sub>F</sub> =10mA                                               |                  | 1.2              | 1.4         | V                |
|                                                     | 反向电流 Reverse Current                                            | I <sub>R</sub>       | V <sub>R</sub> =6V                                                 |                  |                  | 10          | μ A              |
| 输出端<br>Output                                       | 集电极-发射极反向击穿电压<br>Collector-Emitter Reverse<br>Breakdown Voltage | V <sub>(BR)CEO</sub> | I <sub>C</sub> =0.1mA                                              | 80               |                  |             | V                |
|                                                     | 发射极-集电极反向击穿电压<br>Emitter-Collector Reverse<br>Breakdown Voltage | V <sub>(BR)ECO</sub> | I <sub>E</sub> =0.1mA                                              | 6                |                  |             | V                |
|                                                     | 集电极-发射极反向电流<br>Collector- Emitter Reverse Current               | I <sub>CEO</sub>     | V <sub>CE</sub> =20V                                               |                  |                  | 100         | nA               |
| 传输<br>隔离<br>特性<br>Transfer<br>Isolation<br>Features | 直流电流传输比<br>Current Transfer Ratio                               | CTR                  | 具体见表 3<br>See table 3                                              |                  |                  |             | %                |
|                                                     | 饱和压降<br>Saturation voltage                                      | V <sub>CE(sat)</sub> | I <sub>F</sub> =20mA<br>I <sub>C</sub> =2mA                        |                  | 0.1              | 0.2         | V                |
|                                                     | 输入-输出间隔电容<br>Isolation Capacitance between Input<br>and Output  | C <sub>ISO</sub>     | V=0V<br>F=1MHz                                                     |                  | 10               |             | pF               |
|                                                     | 输入-输出间绝缘电阻<br>Isolation Resistance between Input<br>and Output  | R <sub>ISO</sub>     | V=500V                                                             | 10 <sup>12</sup> | 10 <sup>14</sup> |             | Ω                |
|                                                     | 输入-输出间绝缘电压<br>Isolation Voltage<br>between Input and Output     | V <sub>ISO</sub>     | I <sub>off</sub> <0.3mA,AC,60S                                     | 5000             |                  |             | V <sub>rms</sub> |
|                                                     | 脉冲上升时间 Rise Time                                                | t <sub>r</sub>       | V <sub>CE</sub> =5V<br>R <sub>L</sub> =100Ω<br>I <sub>C</sub> =2mA |                  | 3                | 18          | μ s              |
|                                                     | 脉冲下降时间 Fall Time                                                | t <sub>f</sub>       |                                                                    |                  | 4                | 18          | μ s              |

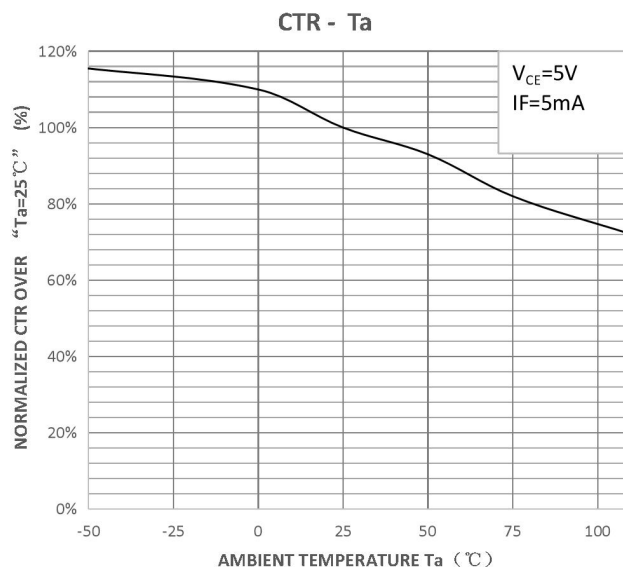
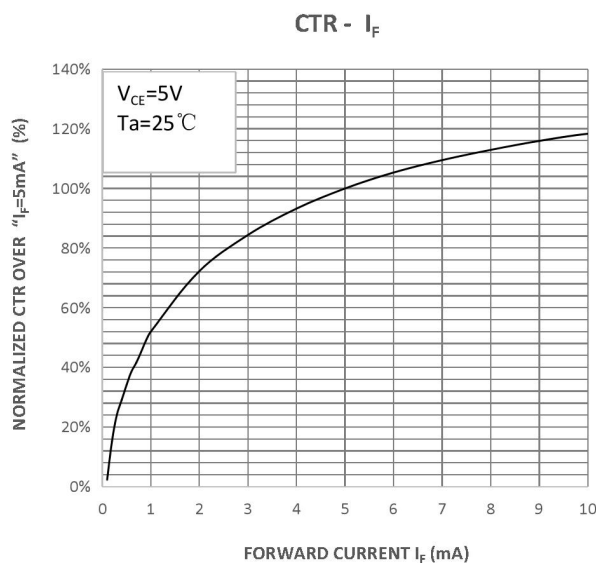
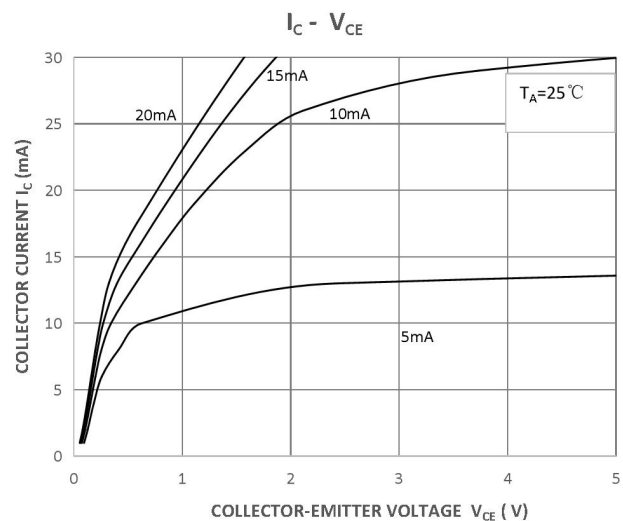
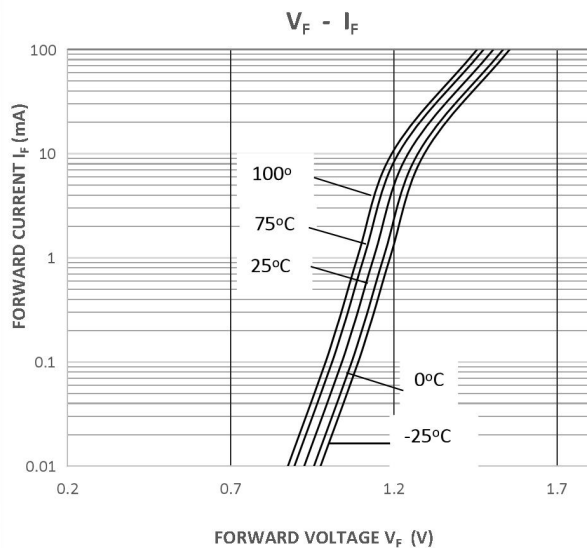
\*CTR 代码: HPC817×, “×” 为 CTR 代码, 具体见下表:

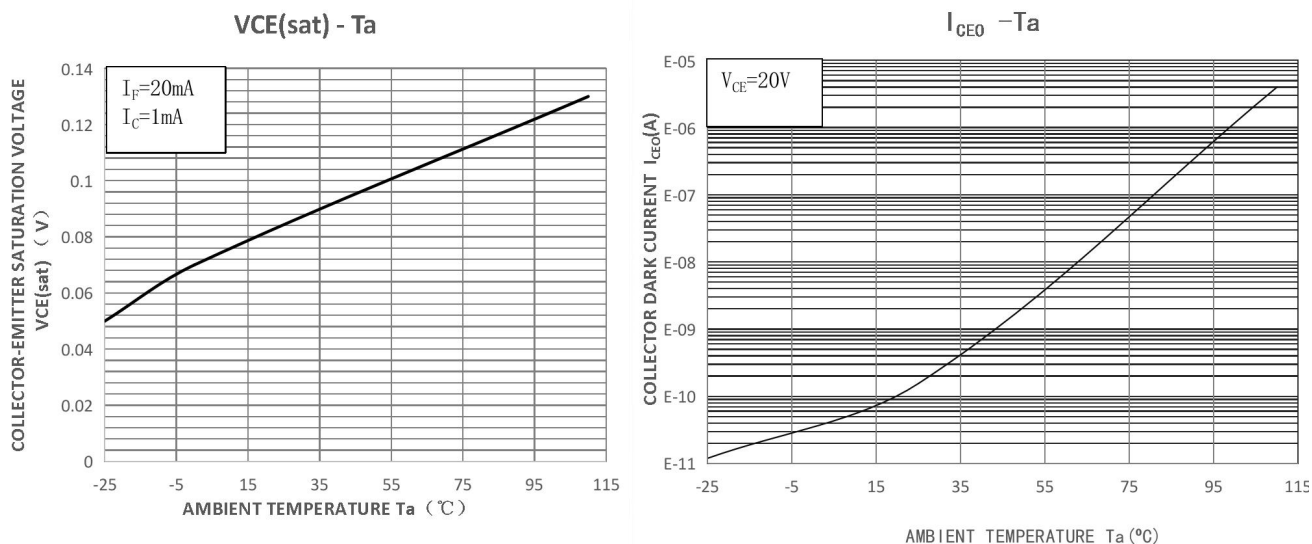
\*CTR code: HPC817×, the “×” was CTR code as below:

表 3 CTR 分档表 Table 3-Binning table of CTR

| 代码Code  | 测试条件Test Condition                    | 最小值Min. | 最大值Max. |
|---------|---------------------------------------|---------|---------|
| 空格blank | $I_F=5\text{mA}$ , $V_{CE}=5\text{V}$ | 50      | 600     |
| A       | $I_F=5\text{mA}$ , $V_{CE}=5\text{V}$ | 80      | 160     |
| B       | $I_F=5\text{mA}$ , $V_{CE}=5\text{V}$ | 130     | 260     |
| C       | $I_F=5\text{mA}$ , $V_{CE}=5\text{V}$ | 200     | 400     |
| D       | $I_F=5\text{mA}$ , $V_{CE}=5\text{V}$ | 300     | 600     |
| D3      | $I_F=5\text{mA}$ , $V_{CE}=5\text{V}$ | 300     | 450     |
| F       | $I_F=5\text{mA}$ , $V_{CE}=5\text{V}$ | 63      | 125     |
| G       | $I_F=5\text{mA}$ , $V_{CE}=5\text{V}$ | 100     | 200     |
| H       | $I_F=5\text{mA}$ , $V_{CE}=5\text{V}$ | 160     | 320     |
| L       | $I_F=5\text{mA}$ , $V_{CE}=5\text{V}$ | 100     | 300     |

## 6 特性曲线 Performance Curves





## 7 电原理图 Schematic Diagram

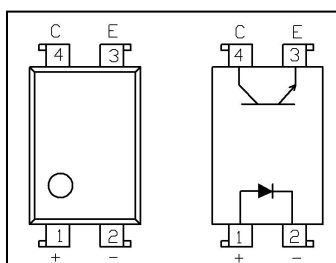


图 2 电原理图 Figure 2-Schematic

## 8 外形尺寸图 Dimensions Diagram

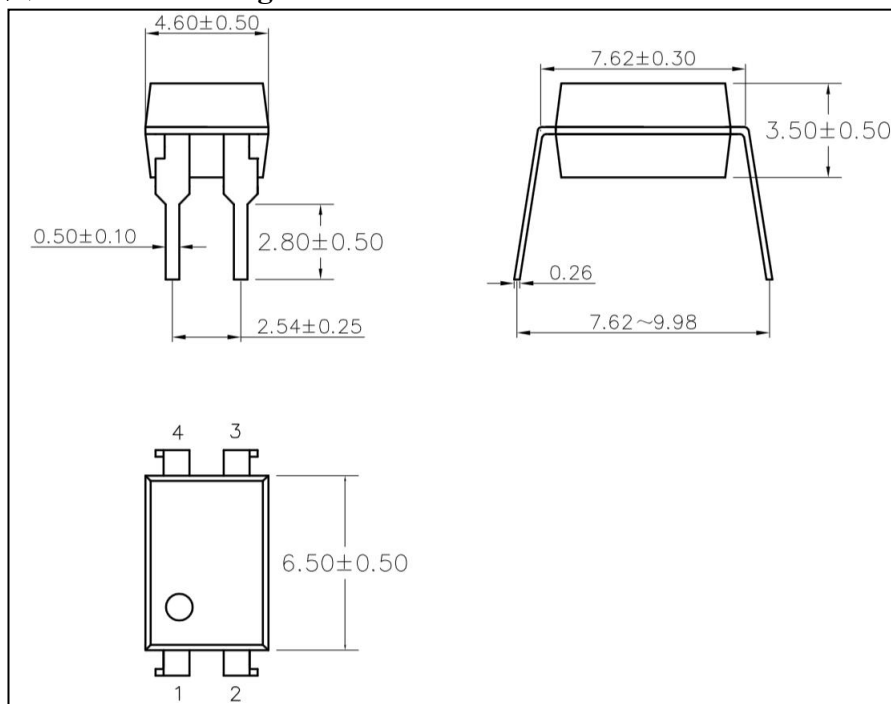


图 3 HPC817× 外形尺寸

Figure 3- The dimensions of HPC817×

## 9 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：HPC817×产品印章如图4。  
Print type characters, trade mark and Lot. No. on the Photo-transistor Coupler. For example the marking of product HPC817× is shown as figure 4.

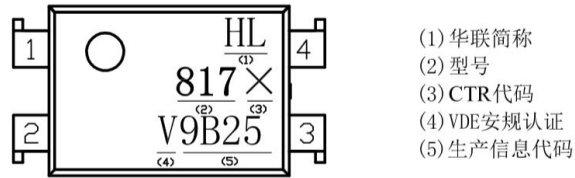


图4 产品印章  
Figure 3- Marking

## 10 包装方式 Packing

### 10.1 条管包装 (Tube)：适用于 For HPC817×。

#### 10.1.1 每箱数量 (Qty/ctn)：50000 只 (pcs)。

#### 10.1.2 内包装 (Inner packing)：

每条管 100 只，采用防静电条管，条管上有商标、防静电标志。

100pcs/tube, antistatic tube, indication of trade mark and antistatic.

每纸匣 5000 只，贴合格证 (型号、生产日期代号、检验员代号)。

5000pcs/bundle, certificate on one end (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)：

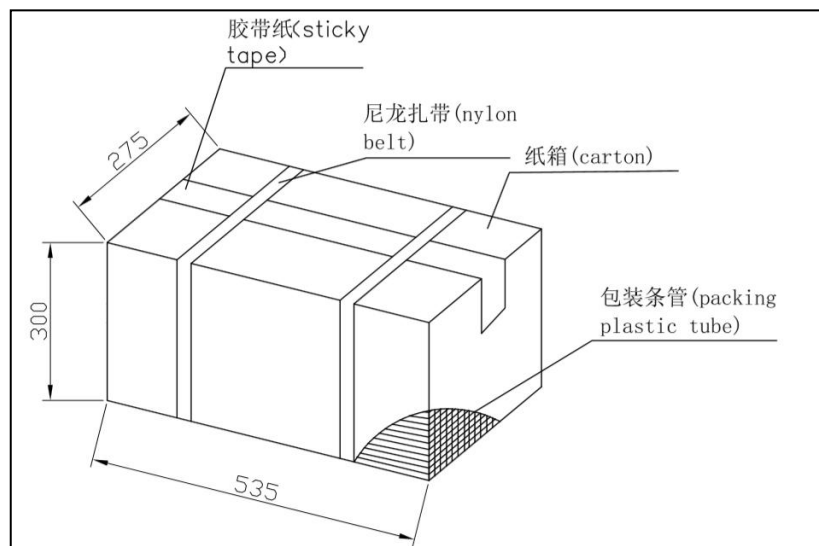


图5 条管外包装  
Figure 5- Outer packing for Tube

## 10.2 标识 Label



图 6 标识 Figure 6-Label

10.3 引脚镀锡厚度: 大于等于  $3\mu\text{m}$ , 平均  $5\mu\text{m} \sim 15\mu\text{m}$ 。

Thickness of Sn which plated on lead frame:  $\geq 3\mu\text{m}$ , average  $5\mu\text{m} \sim 15\mu\text{m}$ .