

产品规格书

PRODUCT SPECIFICATION

- ◆ 产品名称 (Product Name) : KL8171 系列(KL8171 Series)
- ◆ 产品型号 (Product Model) : 4PIN 光电晶体管光耦合器
4PIN dip photo transistor photocoupler
- ◆ 版本号 (Version No.) : V1

描述 Description:

- 发光元件+受光元件 (IR+PT)
- 胶体颜色 (Colloid Color):黑色 (Black)
- 发光颜色 (Emission Color):不可见光 (Invisible Light)
- 产品构造 (Product structure):对照式 (Face to face)

研发中心 R&D Center		客户 Customer	
制作 Prepared by	批准 Approved by	确认 Confirmed by	批准 Approved by
客户名称 (Customer) :			
客户部品号 (Customer No.) :			
发行日期 (Issue Date) : 2023-11-01			
地址: 张家港市杨舍镇国泰北路 288 号 Add: No.288 of Guotai North Road, Yangshe Town, Zhangjiagang City 电话(Tel): 0512-35010333 传真(Fax): 0512-35010333 网址(Web): www.jt-led.com			

1. 产品特点 Product features

- 电流转换率(Current transfer ratio)
CTR: 100~350% at $I_F = 0.5\text{mA}$, $V_{CE} = 5\text{V}$
- 输入与输出高隔离电压(Viso=5000 V rms)
High isolation voltage between inputs and output (Viso=5000 V rms)
- 爬电距离大于 7.62mm
Creepage distance >7.62mm
- 工作温度可达+100°C
Operating temperature up to +110°C
- 4PIN 引脚封装模式
4PIN DIP encapsulation mode
- 符合无卤素(溴<900ppm, 氯<900ppm, 溴+氯<1500ppm)
Compliance Halogen Free (Br < 900ppm, Cl < 900ppm, Br+Cl < 1500ppm)
- CQC 认证已批准(编号:CQC23001407997)
CQC approved (No. CQC23001407997)

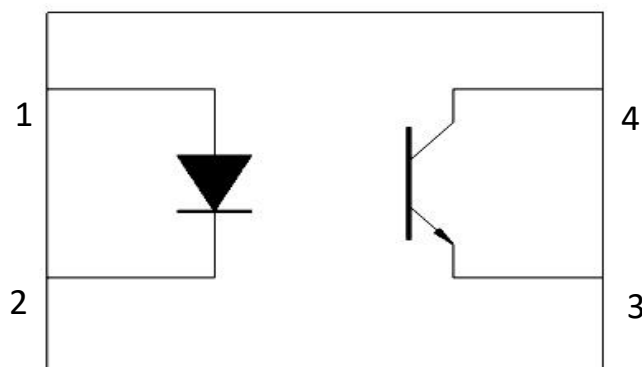
2. 产品描述 Product Description

- KL8171 光耦合器由每个组成的红外发射二极管, 光耦合到光电晶体管
KL8171 series of devices each consist of an infrared emitting diodes, optically couple detector with green compound
- 它们采用 4 引脚 DIP 封装, 并提供宽引线间距和 SMD 选项
Packaged in a 4-pin DIP package and available in wide-lead spacing and SMD option

3. 产品应用 Product Applications

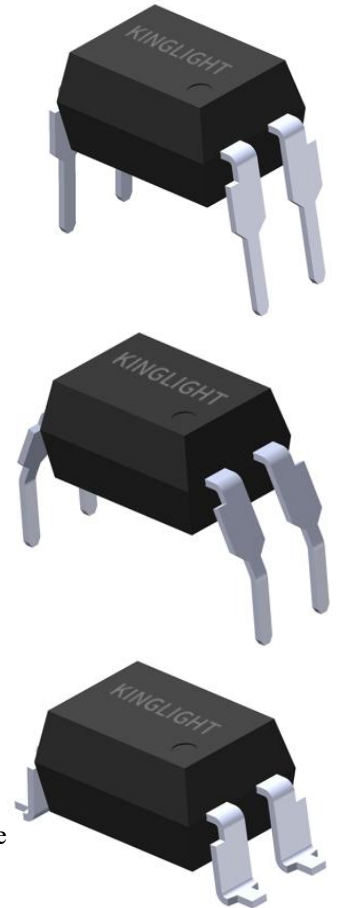
- 系统电器、测量仪器 System appliances, measuring instruments
- 可编程序控制器 Programmable controllers
- 家用电器, 如风扇加热器等 Home appliances, such as fan heaters, etc.
- 电信设备 Telecommunication equipments
- 不同电位,不同阻抗的电路之间的信号传输 Signal transmission between circuits of different potentials and impedances

4. 功能图 Functional Diagram



引脚配置 Pin Configuration

1. 阳极 Anode
2. 阴极 Cathode
3. 发射极 Emitter
4. 集电极 Collector



5. 光电特性 Electrical-Optical characteristics

- 最大限度额定值(温度=25±5° C) Absolute Maximum Ratings(Ta=25°C)

参数 Parameter		符号 Symbol	额定值 Rated Value	单位 Unit
输入 Input	正向电流 Forward current	I _F	10	mA
	反向电压 Reverse voltage	V _R	6	V
	功耗 Power dissipation	P _D	20	mW
输出 Output	功耗 Power dissipation	P _C	150	mW
	集电极电流 Collector current	I _C	50	mA
	集电极发射极电压 Collector-Emitter voltage	V _{CEO}	70	V
	发射极-集电极电压 Emitter-Collector voltage	V _{ECO}	6	V
总消耗功率 Total Consume Power		P _{TOT}	170	mW
隔离电压 (1*) Isolation Voltage		V _{iso}	5000	Vrms
工作温度 Operating temperature		T _{OPR}	-30 to +100	°C
储存温度 Storage temperature		T _{STG}	-55 to +125	°C
焊接温度 (2*) Soldering temperature		T _{SOL}	260	°C

1* 1个交流电源1分钟内,相对湿度在40~60%环境下,隔离电压测试方法如下

Within 1 minute of 1 AC power supply, the relative humidity is in 40~60% environment, and the isolation voltage test method is as follows

a. 引脚 1&2 短接在一起, 引脚 3&4 短接在一起

Pins 1 & 2 are short together and pins 3 & 4 are connected together

2* 焊接时间为10秒 Soldering time is 10 seconds

6. 电气特性 (Ta=25°C, 除非另有规定)

Electrical Characteristics (Ta=25°C unless specified otherwise)

参数 Parameter		符号 Symbol	最小值 Min.	规格值 Typ.	最大值 Max.	单位 Unit	条件 Condition
输入 In put	正向电压 Forward voltage	V _F	-	1.2	1.4	V	I _F =10mA
	反向电流 Reverse current	I _R	-	-	10	μA	V _R =4V
	输入电容 Input capacitance	C _{in}	-	-	250	pF	V=0, f=1kHz
输出 Out put	集电极与发射极间暗电流 Collector-Emitter dark current	I _{CEO}	-	-	100	nA	V _{CE} =20V I _F =0mA
	集电极与发射极间击穿电压 Collector-Emitter breakdown voltage	BV _{CEO}	70	-	-	V	I _C =0.1mA I _F =0mA
	发射极与集电极间击穿电压 Emitter-Collector breakdown voltage	BV _{ECO}	6	-	-	V	I _E =0.1mA I _F =0mA
传输特性 Transfer Characteristics	集电极与发射极间饱和电压 Collector-Emitter saturation voltage	V _{CE(sat)}	-	-	0.2	V	I _F =10mA I _C =1mA
	电流传输比 Current transfer ratio(1*)	CTR	100	-	350	%	I _F =0.5mA V _{CE} =5V
	隔离电阻 Isolation resistance	R _{IO}	5×10 ¹⁰	-	-	Ω	V _{IO} =500Vdc 40~60% R.H.
	浮动电容 Floating capacitance	C _{IO}	-	-	1.0	pF	V _{IO} =0, f=1MHz
	截止频率 Cut-off frequency	f _c	-	80	-	kHz	V _{CE} =5V, I _C =2mA R _L =100Ω, -3dB
	上升时间 Rise time	t _r	-	-	18	μs	V _{CE} =2V, I _C =2mA, R _L =100Ω
	下降时间 Fall time	t _f	-	-	18	μs	

- 温度 Ta=25°C 下规格值 Typical values at Ta = 25°C

7. 可靠性试验 Reliability Test

序号 NO.	试验项目 Test Items	参考标准 Reference	试验条件 Test conditions	试验过程 Test process	试验数 Qty.(pcs)	允收水准 LTPD
1	温度循环 TC	JESD22-A104C	H:125°C 15min f 5min L:-55°C 15min	300cycle	77	0/77
2	高温操作寿命 HTOL	JESD22-A108C	HTOL@110°C IF=10mA Vce=10V	168、500、1000hrs	77	0/77
3	高温反向偏压 HTRB	JESD22-A108C	HTRB@125°C Vce=60V	168、500、1000hrs	77	0/77
4	温湿度反向偏压寿命试验 H3TRB	JESD22-A101-B	H3TRB@ 85°C、 85%RH Vce=60V	168、500、1000hrs	77	0/77
5	压力锅 Autoclave	JESD22-A102-C	Ta=121°C, 100%RH, 2atm	96hrs	77	0/77
6	高温储存 HTS	JESD22-A103C	HTS@125°C	168、500、1000hrs	77	0/77
7	低温储存 LTS	JESD22-A119	LTS@-55°C	168、500、1000hrs	77	0/77
8	耐锡热试验 RSH	JESD22-B106C	RSH@260±5°C	10sec*3times	22	0/22
9	可焊性 SD	JESD22-B102D	Pb-free@ 245±5°C	3sec*1times	22	0/22
备注 Remarks	<p>以上试验项目如与客户试验要求存在差异或者特殊客户特殊要求的,可根据实际情况按照客户的要求进行试作,客户未要求依我司试验标准试作,不同产品使用不同电流进行测试</p> <p>All the tests should be performed according to customers' actual requirements, while difference of test standard or special requirements exist. Otherwise, all the tests are performed according to the standard listed above. Different current is applied to the tests of different product models</p>					

8. 特性曲线 Characteristic Curves

图 1 正向电流与正向电压的关系

Fig.1 Forward Current vs Forward Voltage

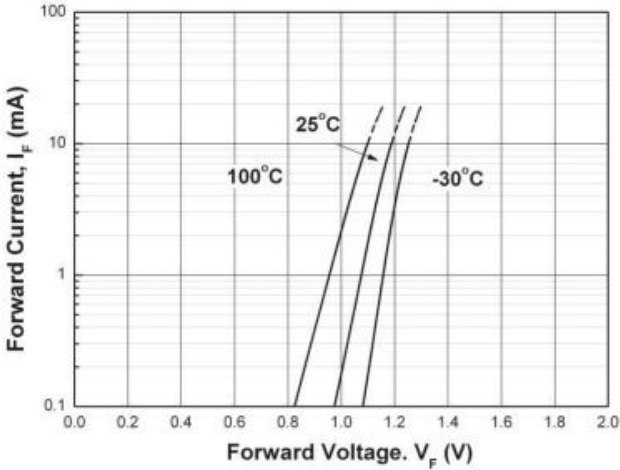


图 3 电流传输比与环境温度的关系

Fig.3 Current Transfer Ratio vs Ambient Temperature

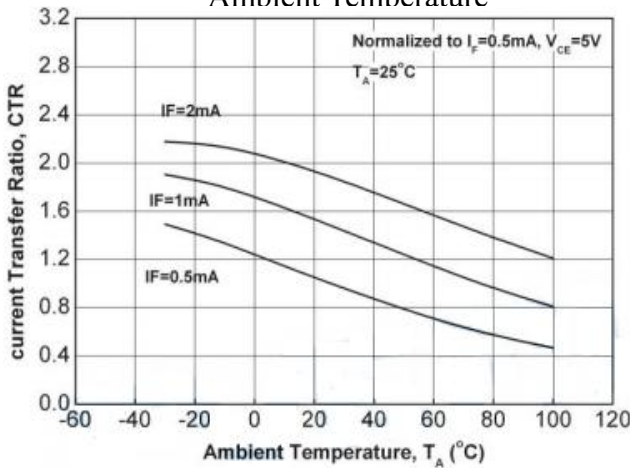


图 5 集电极电流与集电极发射极电压的关系

Fig.5 Collector Current vs Collector Emitter Voltage

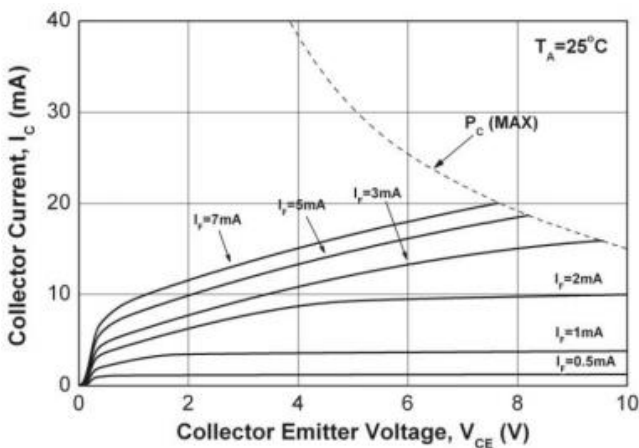


图 2 电流传输比与正向电流的关系

Fig.2 Normalized Current Transfer Ratio vs Forward Current

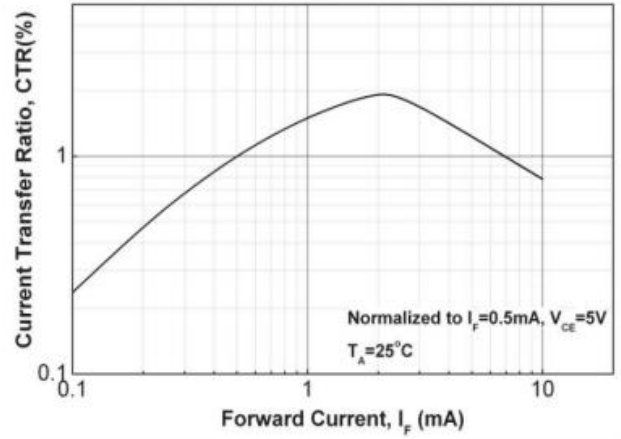


图 4 暗电流与环境温度的关系

Fig.4 Dark Current vs Ambient Temperature

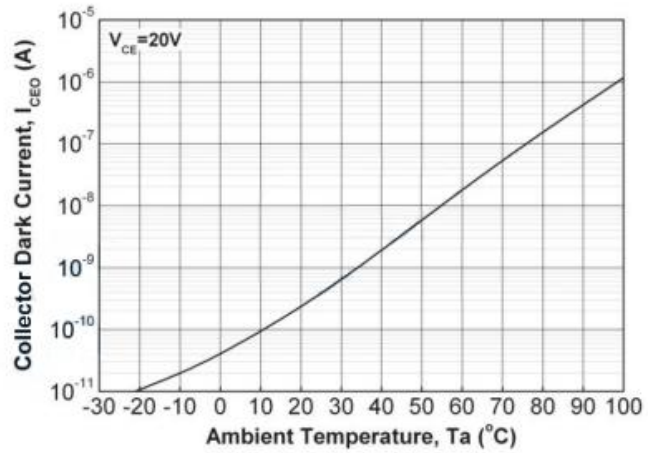


图 6 开关时间与负载电阻的关系

Fig.6 Switching Time vs Load Resistance

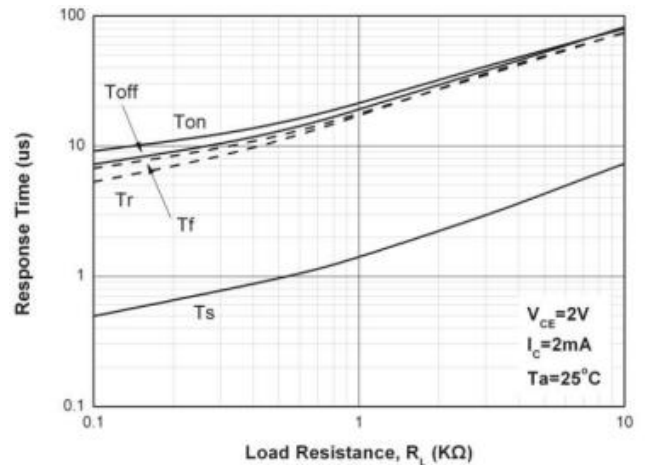
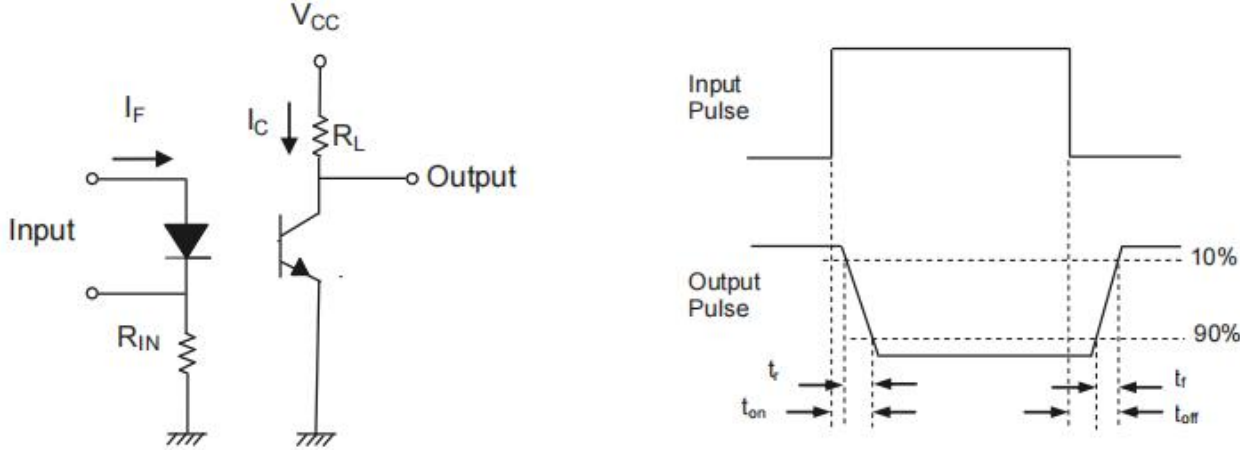


图 7 开关时间测试电路及波形
Figure 7. Switching Time Test Circuit & Waveforms



9. 订单信息 Order Information

- 零件编号 Part Number

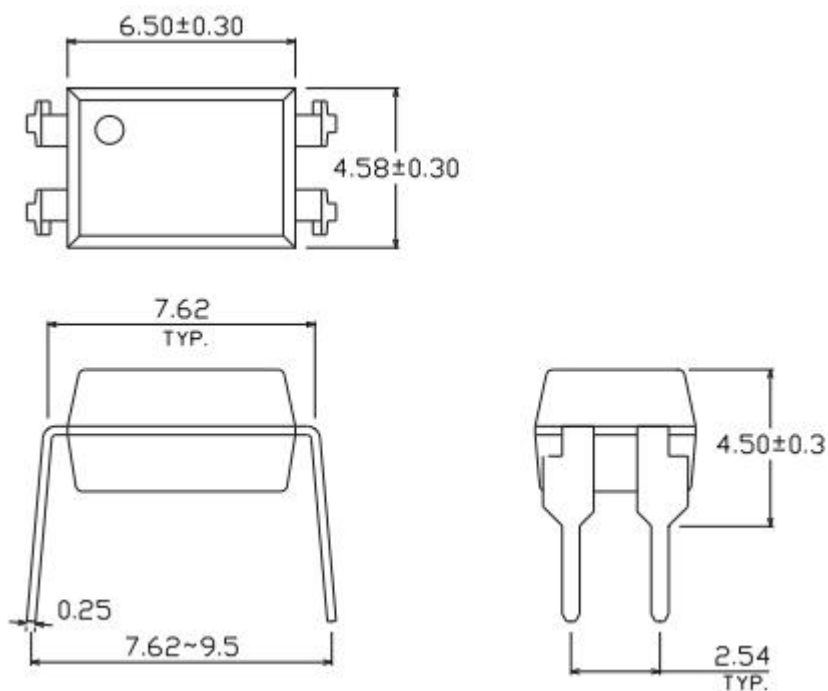
KL8171X(Z)-VG**Notes**

- X 表示引脚形式选项(S、S1、M 或无)
Lead form option (S, S1, M or none)
- Z 表示料带和卷盘选项(TA, TB, TU, TD or 无)
Tape and reel option (TA, TB, TU, TD or none)
- V 表示德国安规(可选) VDE (optional)
- G 无卤素 Halogens free

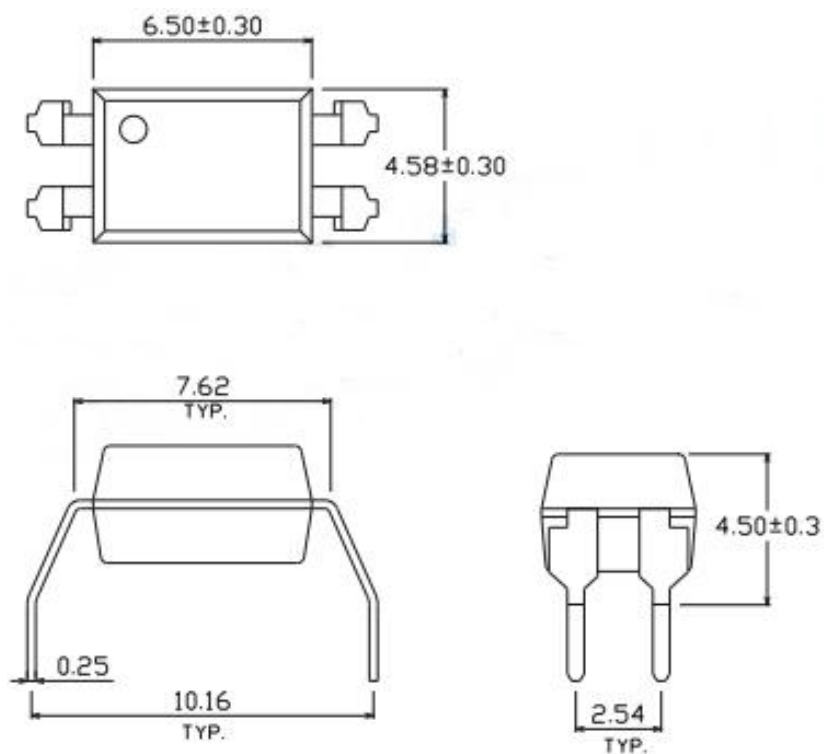
选项 Option	描述 Description	包装数量 Packing quantity
直脚 None	标准 DIP-4 Standard DIP-4	每管 100pcs 100 units per tube
M 脚	折弯脚(0.4 英寸间距) Wide lead bend (0.4 inch spacing)	每管 100pcs 100 units per tube
S (TA)	表面贴装脚型方式+ TA 料带 & 卷轴选择 Surface mount lead form + TA tape & reel option	每卷 1000pcs 1000 units per reel
S (TB)	表面贴装脚型方式+ TB 料带 & 卷轴选择 Surface mount lead form + TB tape & reel option	每卷 1000pcs 1000 units per reel
S1 (TA)	表面贴装脚型方式(低轮廓)+ TA 料带 & 卷轴选择 Surface mount lead form (low profile) + TA tape & reel option	每卷 1000pcs 1000 units per reel
S1 (TB)	表面贴装脚型方式(低轮廓)+ TB 料带 & 卷轴选择 Surface mount lead form (low profile) + TB tape & reel option	每卷 1000pcs 1000 units per reel
S (TU)	表面贴装脚型方式+ TU 料带 & 卷轴选择 Surface mount lead form + TU tape & reel option	每卷 1500pcs 1500 units per reel
S (TD)	表面贴装脚型方式+ TD 料带 & 卷轴选择 Surface mount lead form + TD tape & reel option	每卷 1500pcs 1500 units per reel
S1 (TU)	表面贴装脚型方式(低轮廓)+ TU 料带 & 卷轴选择 Surface mount lead form (low profile) + TU tape & reel option	每卷 1500pcs 1500 units per reel
S1 (TD)	表面贴装脚型方式(低轮廓)+ TD 料带 & 卷轴选择 Surface mount lead form (low profile) + TD tape & reel option	每卷 1500pcs 1500 units per reel

10. 封装尺寸(单位:毫米) Package Drawing(Unit:mm)

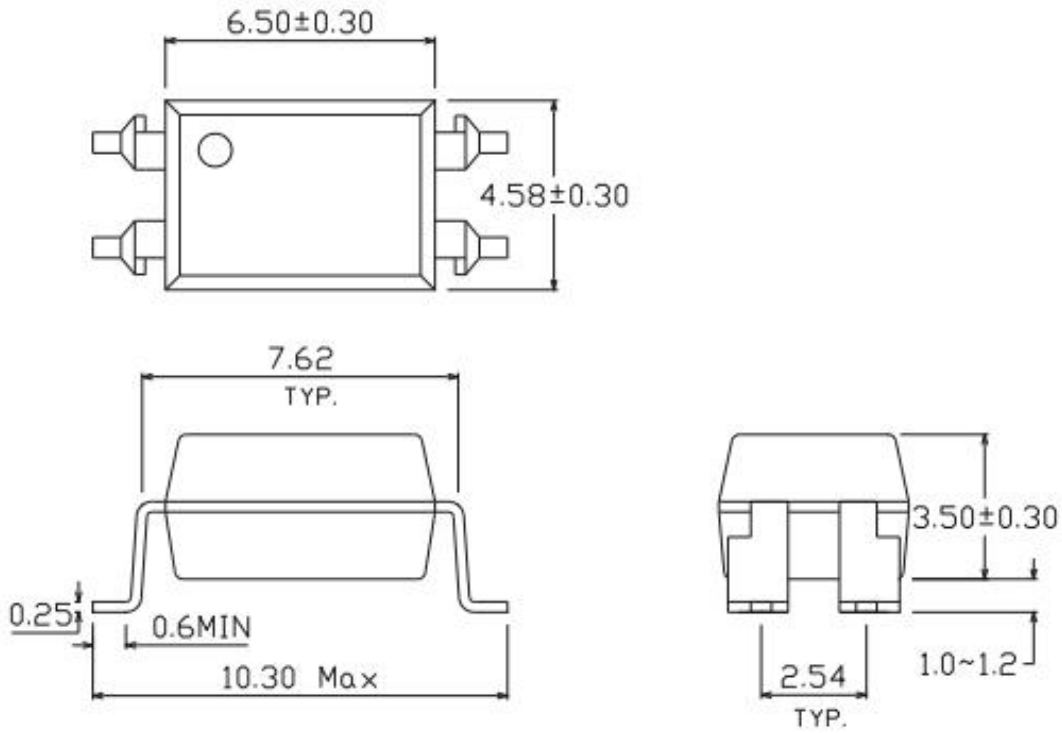
- 标准 DIP 型号 Standard DIP Type



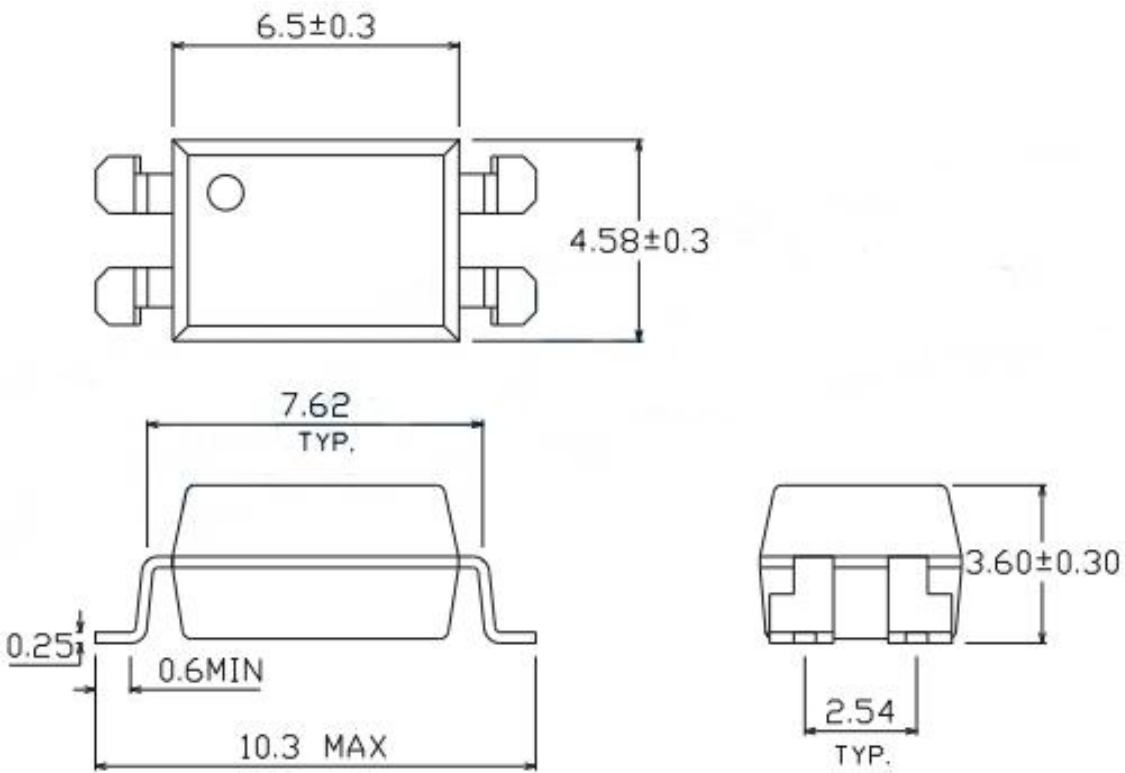
- 选择 M 型号 Option M Type



- 选择 S 型号 Option S Type

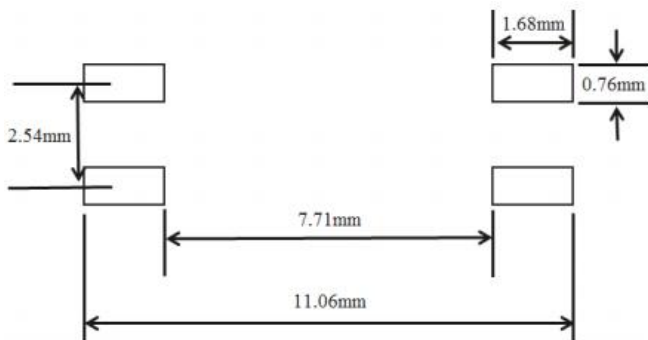


- 选择 S1 型号 Option S1 Type

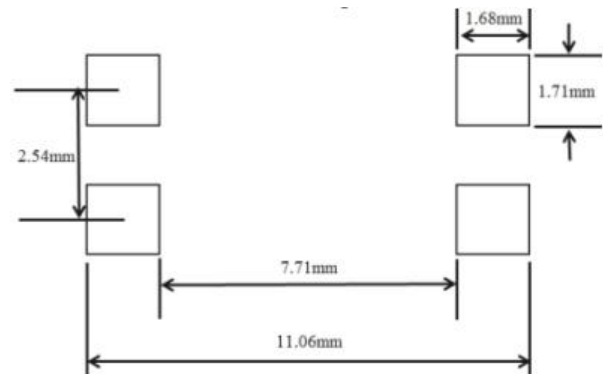


- 表面贴装引线框架 推荐焊盘布局 Recommended pad layout for surface mount leadform

S 脚型焊盘 S Options



S1 脚型焊盘 S1 Options



备注 Notes

- A. 建议焊盘尺寸仅供参考 Suggested pad dimension is just for reference only
- B. 请根据个人需要修改焊盘尺寸 Please modify the pad dimension based on individual need

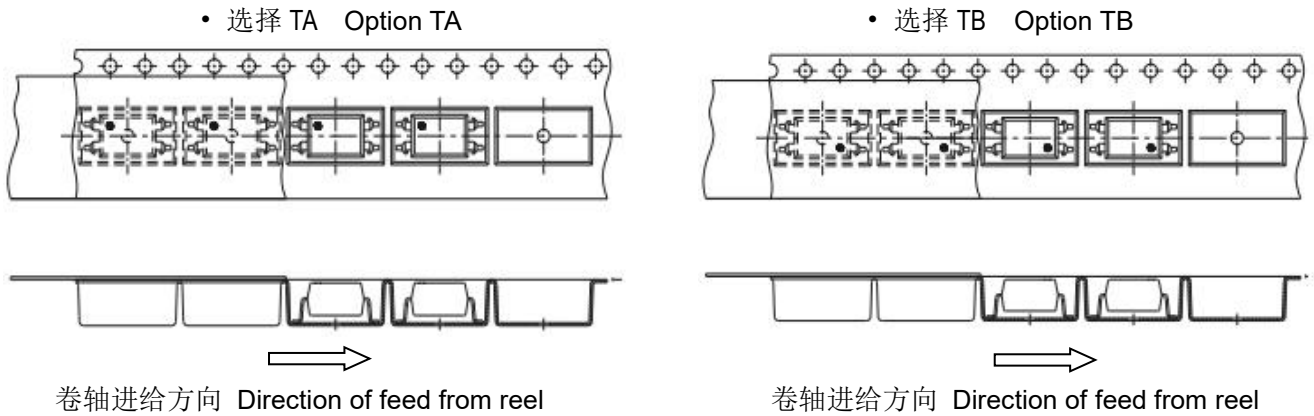
11. 设备标记 Device marking



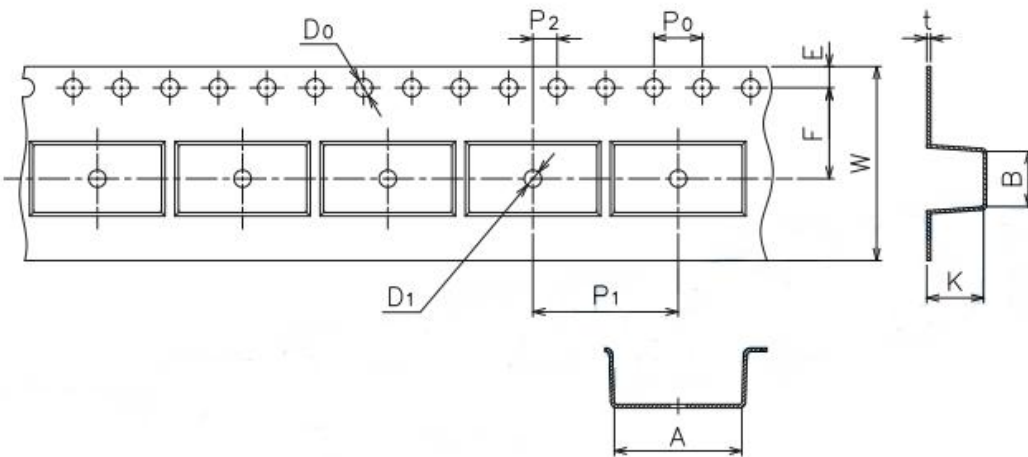
备注 Notes

- KL = 表示晶台光电有限公司 Denotes KingLight
- 8171 = 表示设备部件号 Denotes Device Part Number
- G = 表示环保材 Denotes Green part
- Y = 表示 1 位年份代码 Denotes 1 digit Year code
- WW = 表示 2 位周别代码 Denotes 2 digit Week code
- V = 表示 VDE(可选) Denotes VDE (optional)

12. 料带和卷轴包装规格 Tape & Reel Packing Specifications



料带尺寸 Material belt size



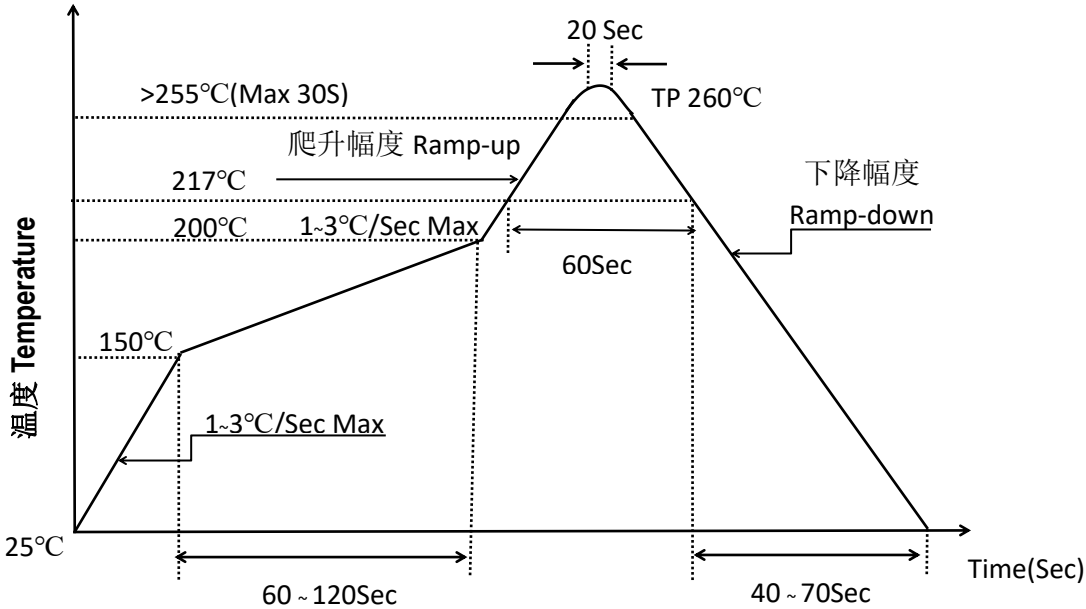
尺寸编号 Dimension No.	A	B	D0	D1	E	F
S 尺寸(mm) S Dimension(mm)	10.7±0.1	4.65±0.1	1.5±0.1	1.5±0.1	1.75±0.1	7.5±0.1
S1 尺寸(mm) S1 Dimension(mm)	10.7±0.1	4.65±0.1	1.5±0.1	1.5±0.1	1.75±0.1	7.5±0.1
尺寸编号 Dimension No.	P0	P1	P2	t	W	K
S 尺寸(mm) S Dimension(mm)	4.0±0.1	12.0±0.1	2.0±0.1	0.4±0.1	16.0±0.3	4.75±0.1
S1 尺寸(mm) S1 Dimension(mm)	4.0±0.1	12.0±0.1	2.0±0.1	0.4±0.1	16.0±0.3	3.90±0.1

13. 焊接温度曲线 Temperature Profile Of Soldering

• 回流焊温度曲线 Reflow soldering

建议在下面所示的温度和时间分布条件下, 进行一次回流焊作业, 不得超过三次

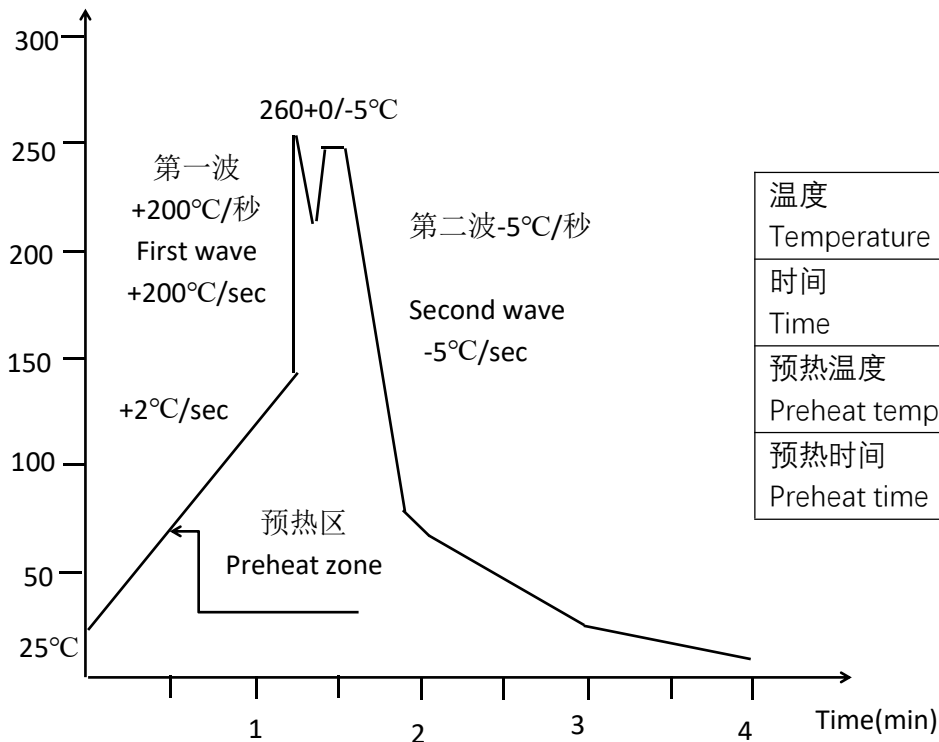
One time soldering reflow is recommended within the condition of temperature and time profile shown below. Do not solder more than three times.



• 波峰焊温度曲线 Wave Soldering

温度条件下, 建议一次焊接

One time soldering is recommended within the condition of temperature



14. 注意 Attention

- (1). 晶台持续不断改进质量、可靠性、功能或设计,保留此文件更改的权利恕不另行通知
KL continuously improve quality, reliability, function and design. We reserve the right to change this document without prior notice.
- (2). 请遵守产品规格书使用,晶台不对使用时不符合产品规格书条件而导致的质量问题负责
Please use in accordance with the product specification. KL is not responsible for the quality problems caused by non-compliance with the product specifications
- (3). 对于需要高可靠性或安全性的设备/装置需求,请联系我们的销售人员
For equipment/devices requiring high reliability or safety, please contact our sales representative
- (4). 当需要用于任何“特定”应用时,请咨询我们的销售人员
When requiring a device for any ” specific” application, please contact our sales in advice
- (5). 如对文件中表述的内容有疑问,欢迎联系我们
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