# KL852

# HIGH VOLTAGE PHOTO DARLINGTON PHOTOCOUPLER

## DIP4/SMD4 高压达林顿光耦




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# 1. 产品特点 Product features

- 符合无卤素标准 (仅铜框架)(溴<900ppm, 氯<900ppm, 溴+氯<1500ppm)
  Compliance Halogens free (Only copper leadframe )
  (Br < 900ppm, Cl < 900ppm, Br+Cl < 1500ppm)
- 高集电极-发射极电压 ($V_{CEO}$=350V)　High collector- emitter voltage ($V_{CEO}$=350V)
- 电流传输比(CTR: 1000% min. at $I_F$ =1mA, $V_{CE}$ =2V)
  Current transfer ratio (CTR: 1000% min. at $I_F$ =1mA, $V_{CE}$ =2V)
- 输入与输出间高隔离电压(Viso=5000 V rms)
  High isolation voltage between input and output (Viso=5000 V rms)
- 爬电距离 > 7.6 mm  Creepage distance > 7.6 mm
- 工作温度高达 +100°C  Operating temperature up to +100°C
- 紧凑型小型封装  Compact small outline package
- 无Pb且符合ROHS标准 Pb free and RoHS compliant
- 安全审批 Safety approval
  CQC认证已批准(编号:CQC23001407997) CQC approved (No.CQC23001407997)
  UL认证已批准 (编号:UL-CA-2340753-0)  UL approved (No: UL-CA-2340753-0 )
  VDE认证已批准(编号:40059021) VDE approved (No.40059021)

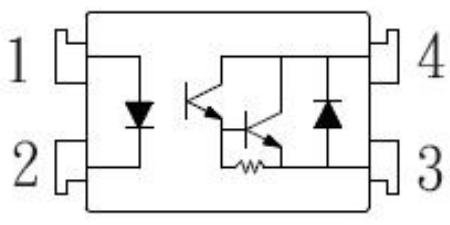
# 2. 产品描述 Product Description

- KL852系列由一个红外发射二极管和一个高压光电达林顿检测器组成
  The KL852 series consists of an infrared emitting diode, optically coupled to a high voltage Photo Darlington detector
- 采用4引脚 DIP 封装，有宽引线间距和 SMD 两种选择
  It is packaged in a 4-pin DIP package and available in wide-lead spacing and SMD option

# 3. 产品应用 Product Applications

- 电话机、电话交换机、程序控制器  Telephone set, telephone exchangers, Sequence controllers
- 系统设备，测量仪器  System appliances, measuring instruments
- 不同电位和阻抗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°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 | $I_F$ | 60 | mA |
| | 峰值正向电流 Peak forward current (t = 1μs) | $I_{FP}$ | 1 | A |
| | 反向电压 Reverse voltage | $V_R$ | 6 | V |
| | 功耗 Power dissipation<br>降额系数(高于100°C)<br>Derating factor (above 100°C) | $P_D$ | 100 | mW |
| 输出 Output | 集电极-发射极电压 Collector-Emitter voltage | $V_{CEO}$ | 350 | V |
| | 集电极电流 Collector current | $I_C$ | 150 | mA |
| | 发射极-集电极电压 Emitter-Collector voltage | $V_{ECO}$ | 0.1 | V |
| | 功耗 Power dissipation | $P_C$ | 300 | mW |
| | 降额系数(高于80°C)<br>Derating factor (above 80°C) | | 5.8 | mW/°C |
| 总消耗功率 Total Consume Power | | $P_{TOT}$ | 320 | mW |
| 隔离电压 ( 1* ) Isolation Voltage | | $V_{iso}$ | 5000 | V rms |
| 工作温度 Operating temperature | | $T_{OPR}$ | -55 to +100 | °C |
| 储存温度 Storage temperature | | $T_{STG}$ | -55 to +125 | °C |
| 焊接温度 ( 2* )<br>Soldering temperature | | $T_{SOL}$ | 260 | °C |

附注 (Notes):

1* 交流电源1分钟内, 相对湿度在40~60%RH环境下, 隔离电压测试时, 1&2脚短接在一起, 3&4脚短接在一起
AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, Pins 1 and 2 are shorted together, and pins 3 and 4 are shorted together.

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

## 6. 电气特性(Ta=25℃,除非另有规定)

## Electrical Characteristics(Ta=25℃ 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 Input | 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 | $C_{in}$ | - | 30 | 250 | pF | V=0, f=1kHz |
| 输出 Output | 集电极暗电流 Collector-Emitter dark current | $I_{CEO}$ | - | - | 200 | nA | $V_{CE}$=200V $I_F$ =0mA |
| | 集电极-发射极击穿电压 Collector-Emitter breakdown voltage | $V_{CEO}$ | 350 | - | - | V | $I_C$=0.1mA $I_F$=0mA |
| | 发射极-集电极击穿电压 Emitter-Collector breakdown voltage | $V_{ECO}$ | 0.1 | - | - | V | $I_E$=0.1mA $I_F$=0mA |

• 附注(Notes):

Ta=25℃时的规格值 Typical values at Ta = 25°C

• 传输特性 (Ta=25℃, 除非另有规定)
Transfer Characteristics (Ta=25℃ unless specified otherwise)

| 参数<br>Parameter | 符号<br>Symbol | 最小值<br>Min. | 规格值<br>Typ.* | 最大值<br>Max. | 单位<br>Unit | 条件<br>Condition |
|---|---|---|---|---|---|---|
| 电流传输比<br>Current Transfer ratio | CTR | 1000 | - | 15000 | % | $I_F$=1mA<br>$V_{CE}$=2V |
| 集电极与发射极间饱和电压<br>Collector-Emitter saturation voltage | $V_{CE(sat)}$ | - | - | 1.2 | V | $I_F$=20mA<br>$I_C$=100mA |
| 隔离电阻<br>Isolation resistance | $R_{ISO}$ | $5\times10^{10}$ | - | - | Ω | $V_{IO}$=500Vdc<br>40~60% R.H |
| 浮动电容<br>Floating capacitance | $C_{IO}$ | - | 0.6 | 1.0 | pF | $V_{IO}$=0, f=1MHz |
| 截止频率 Cut-off frequency | $f_C$ | - | 7 | - | kHz | $V_{CE}$=2V<br>$I_C$=20mA<br>$R_L$=100Ω,<br>-3dB |
| 上升时间 Rise time | $t_r$ | - | - | 300 | μs | $V_{CE}$=2V<br>$I_C$=20mA<br>$R_L$=100Ω, |
| 下降时间 Fall time | $t_f$ | - | - | 100 | | |

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

# 7. 特性曲线 Characteristic Curves

图1.正向电流与正向电压的关系

Figure 1. Forward Current vs Forward Voltage

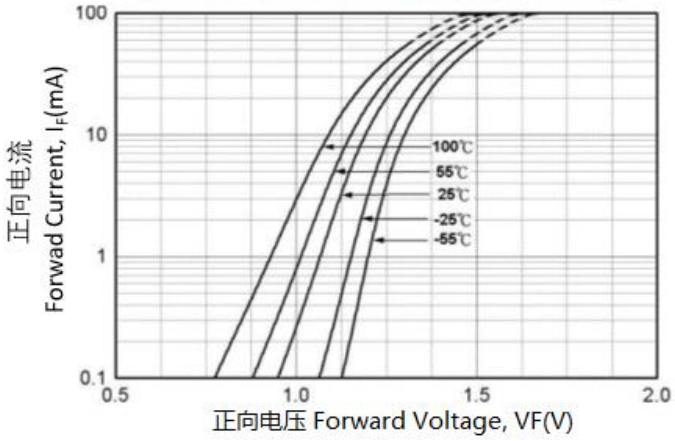



图2.集电极电流与集电极发射极电压的关系

Figure 2. Collector Current vs Collector Emitter Voltage

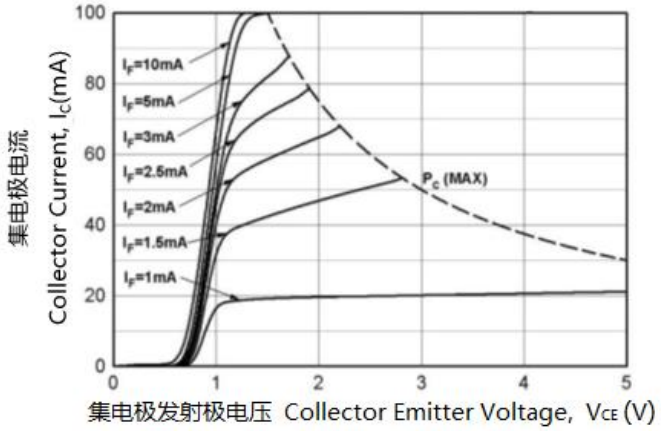



图3.集电极与发射极间饱和电压与环境温度的关系

Figure 3. Collector Emitter Saturation vs Ambient Temperature

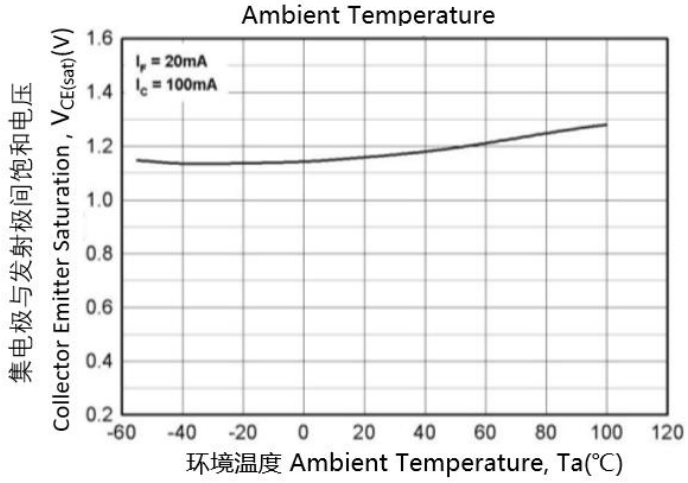



图4.集电极与发射极间饱和电压与正向电流的关系

Figure 4. Collector Emitter Saturation vs Forward Current

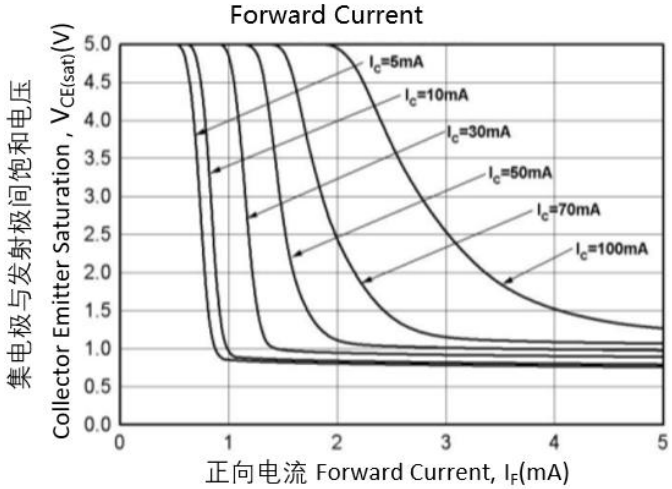



图5.电流传输比与正向电流的关系

Figure 5. Current Transferratio vs Forward Current

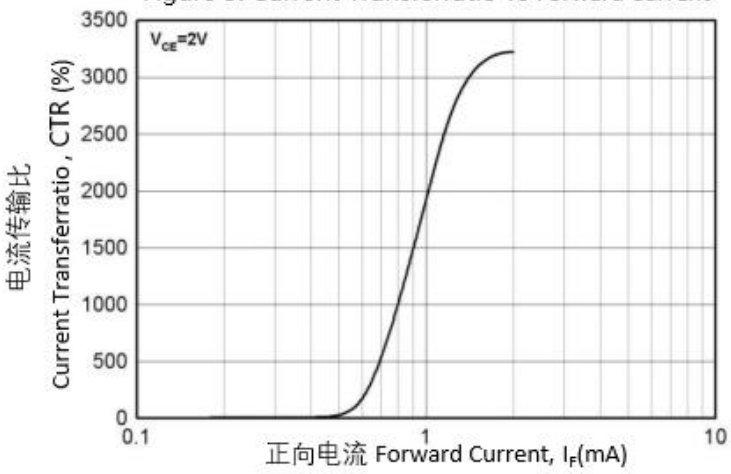



图6.电流传输比与环境温度的关系

Figure 6. Current Transferratio vs Ambient Temperature

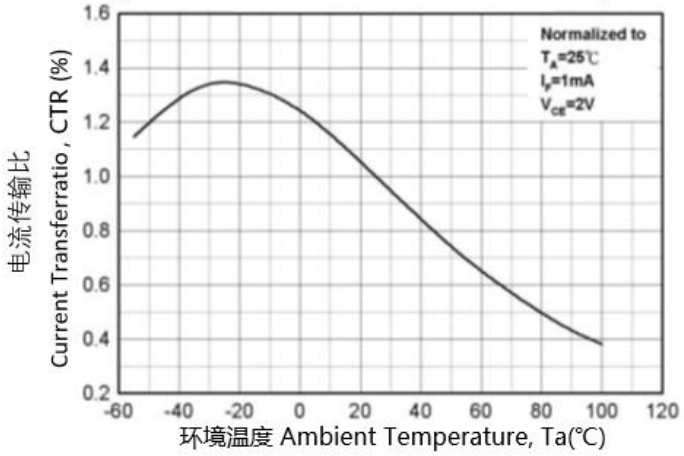


图7.集电极暗电流与环境温度的关系

Figure 7. Collector Dark Current vs Ambient Temperature

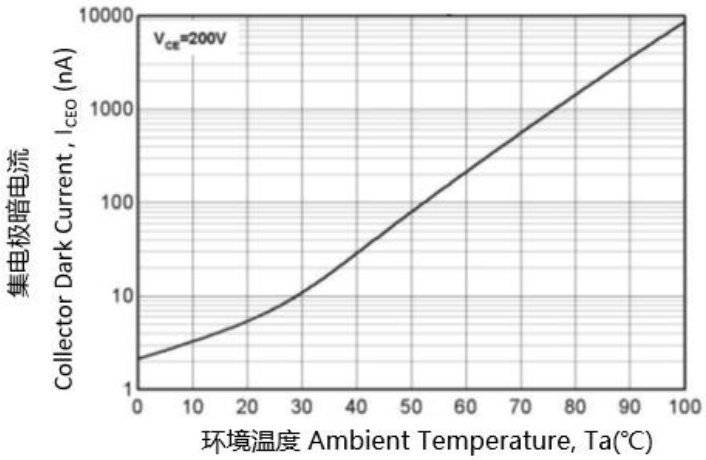



图8.响应时间与负载电阻的关系

Figure 8. Response Time vs Load Resistance

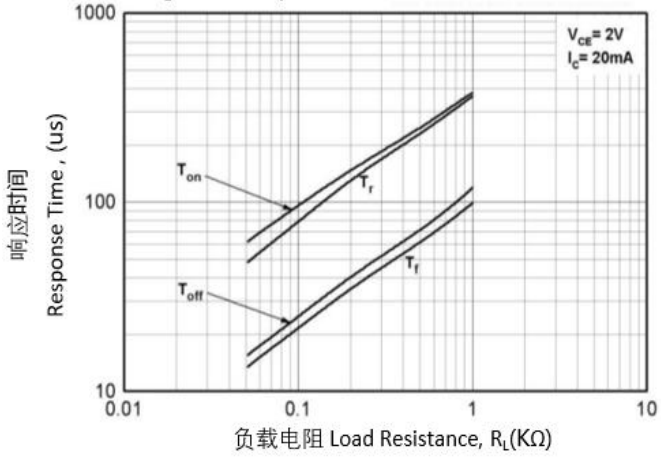
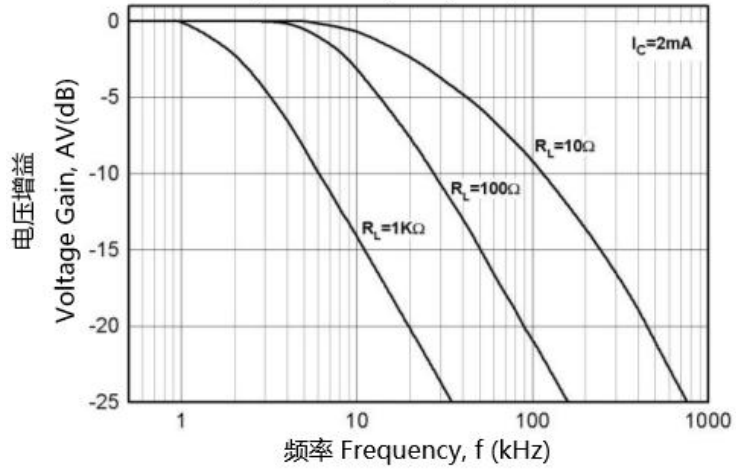



图9.频率响应

Figure 9. Frequency Response



# 8. 订单信息 Order Information

• 材料编号 Part Number

## KL852X-Y-V-W

**附注(Notes):**

X = 引脚形式选项(S1、M 、DIP) Lead form option (S1, M，DIP)

Y = 料带和卷轴选项(TU、TD ) Tape and reel option (TU, TD )

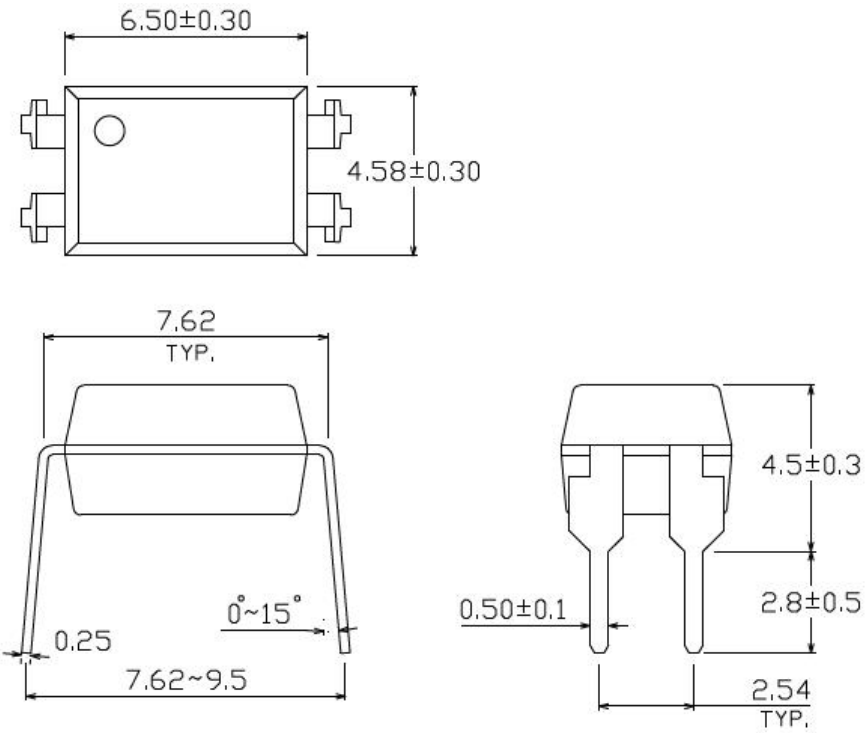
V = 表示VDE标识(客户指定镭射字符才加"V")
VDE (Only add "V" to laser characters specified by the customer)

W = 表示包装数量(T03)Packaging Quantity(T03)

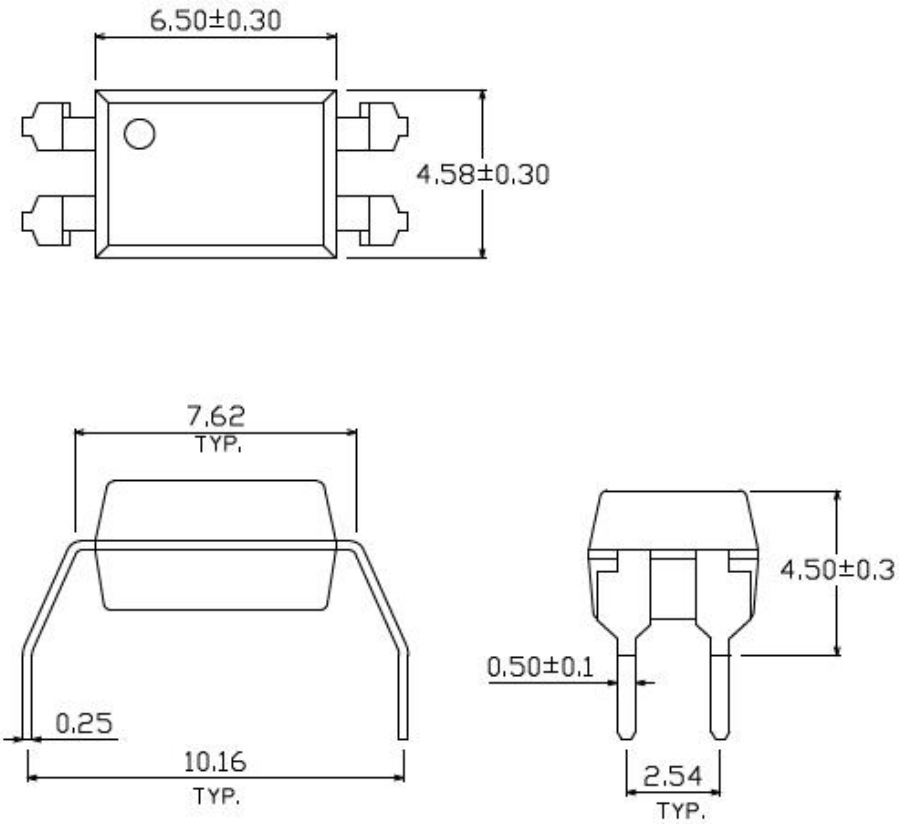
| 选项<br>Option | 描述<br>Description | 包装数量<br>Packing quantity |
|---|---|---|
| 直脚None | 标准DIP-4<br>Standard DIP-4 | 每管100pcs<br>100 units per tube |
| M | 折弯脚(0.4英寸间距)<br>Wide lead bend (0.4 inch spacing) | 每管100pcs<br>100 units per tube |
| S1-TU-T03 | 表面贴装脚型方式(低轮廓)+ TU料带 & 卷轴选择<br>Surface mount lead form (low profile) + TU tape & reel option | 每卷2000pcs<br>2000 units per reel |
| S1-TD-T03 | 表面贴装脚型方式(低轮廓)+ TD料带 & 卷轴选择<br>Surface mount lead form (low profile) + TD tape & reel option | 每卷2000pcs<br>2000 units per reel |

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

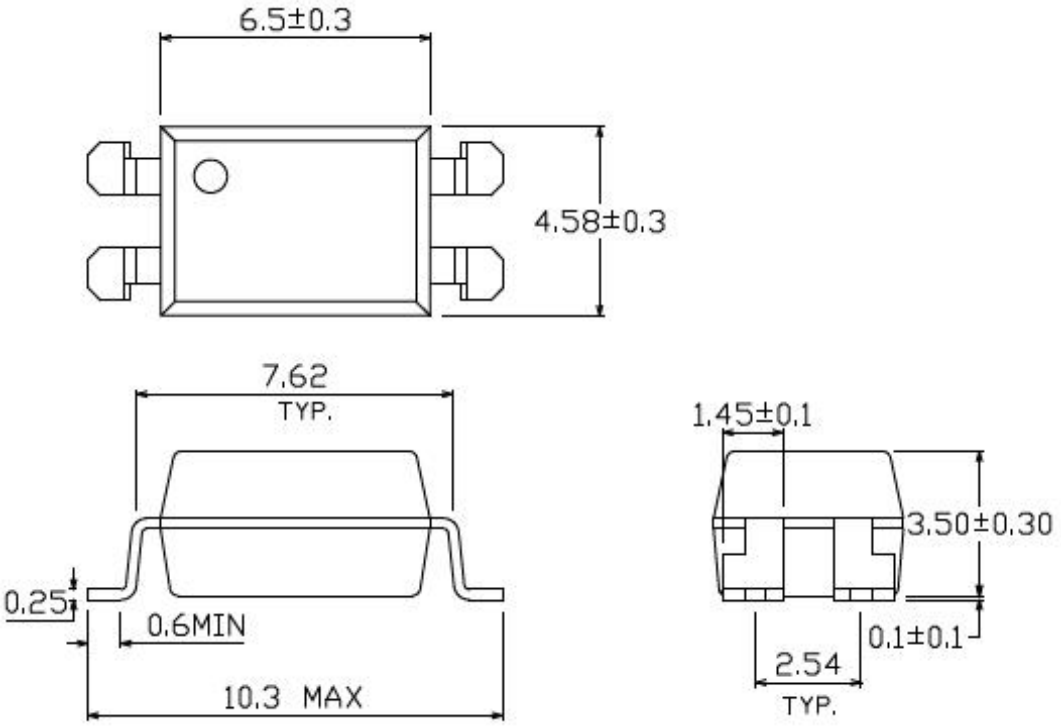
• 标准DIP型号 Standard DIP Type



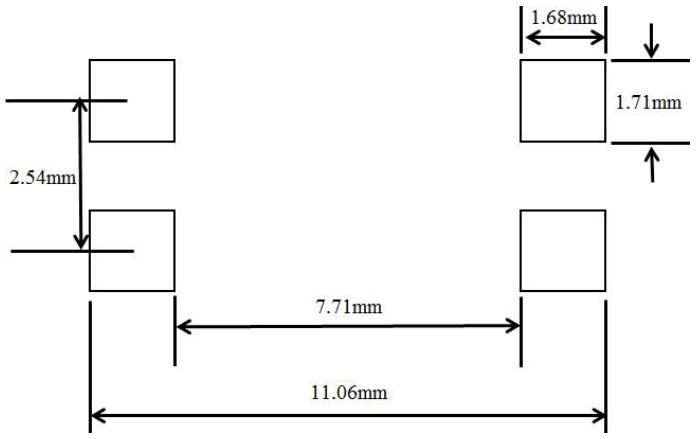

• 选择M型号 Option M Type



• 选择S1型号 Option S1 Type




• 表面贴片类型PIN脚焊盘布局 Surface patch type PIN foot pad layout



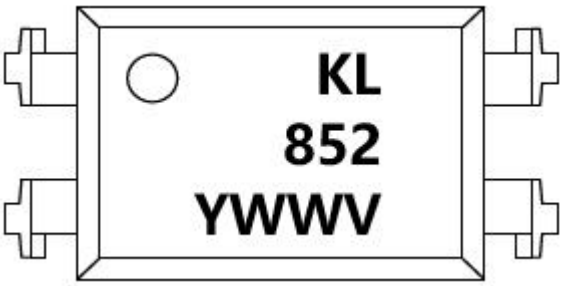

S1 选项　For S1 option

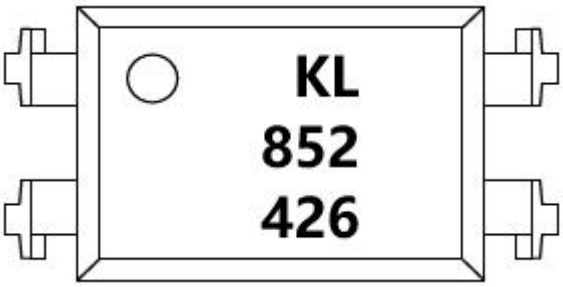
备注 Notes

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 needs

## 10. 设备标记 Device marking



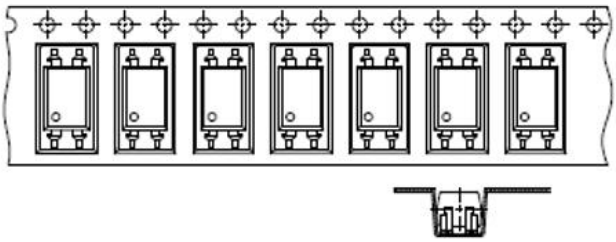

(范本参考 Template reference)

**附注(Notes):**

| | |
|---|---|
| KL | = 表示晶台微电子有限公司 Denotes Kinglight Microelectronics |
| 852 | = 表示材料部件号 Denotes Device Part Number |
| 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标识(客户指定镭射字符才加"V")<br>VDE (Only add "V" to laser characters specified by the customer) |

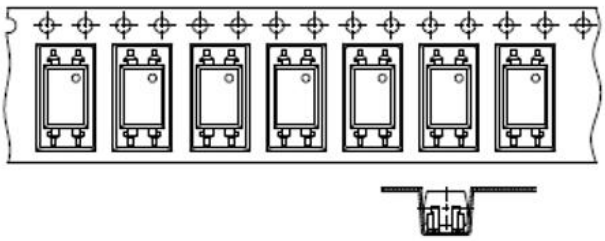
# 11. 料带和卷轴包装规格 Tape & Reel Packing Specifications

• 选择TD Option TD



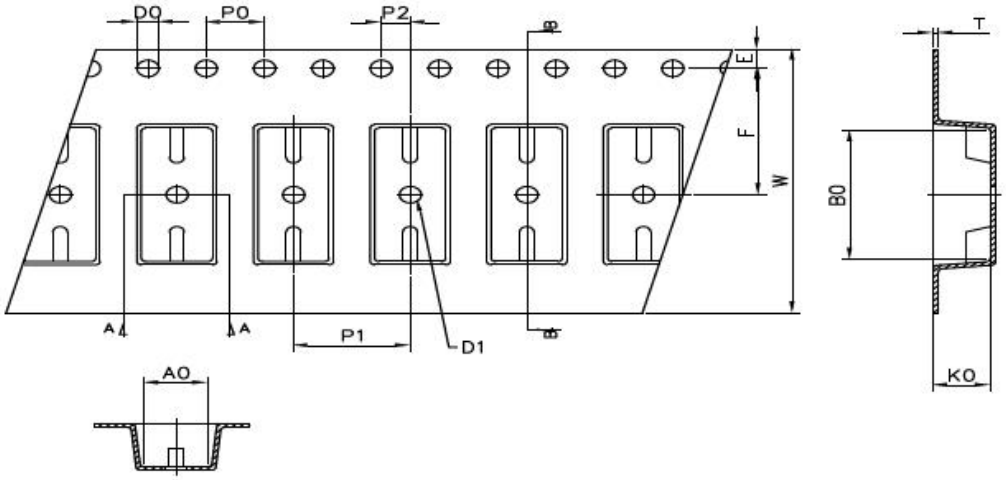
卷轴进给方向 Direction of feed from reel

• 选择TU Option TU



卷轴进给方向 Direction of feed from reel

**料带尺寸Material belt size**



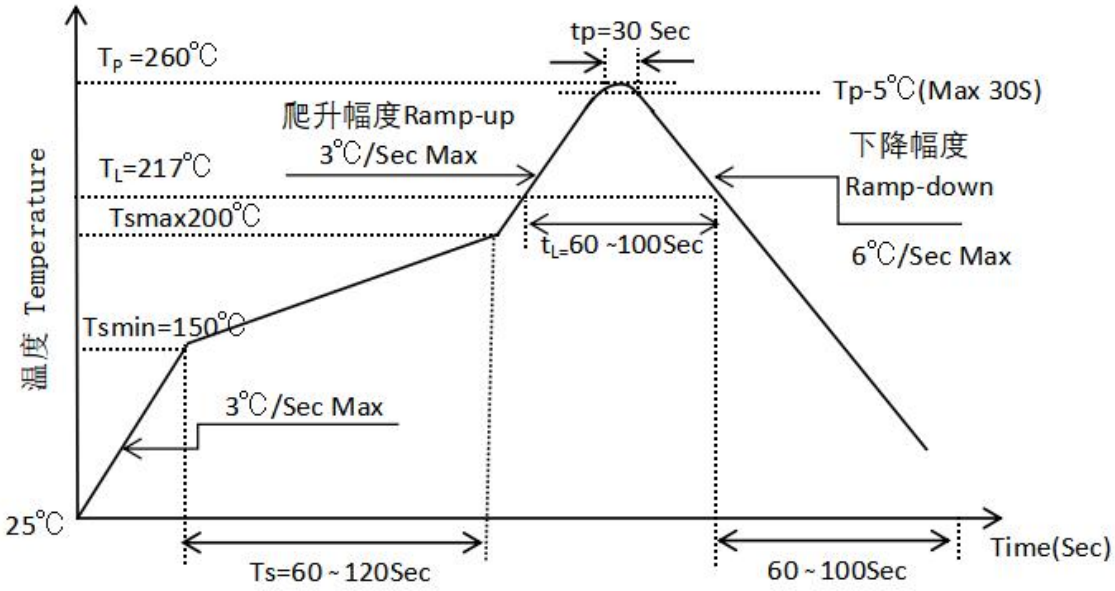

| 尺寸编号<br>Dimension No. | A0 | B0 | D0 | D1 | E | F |
|---|---|---|---|---|---|---|
| S1尺寸(mm)<br>S1 Dimension(mm) | 4.9±0.1 | 10.4±0.1 | 1.5±0.1 | 1.5±0.1 | 1.75±0.1 | 7.5±0.1 |
| 尺寸编号<br>Dimension No. | P0 | P1 | P2 | t | W | K0 |
| S1尺寸(mm)<br>S1 Dimension(mm) | 4.0±0.1 | 8.0±0.1 | 2.0±0.1 | 0.4±0.1 | 16.0±0.3 | 4.6±0.1 |

# 12. 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.

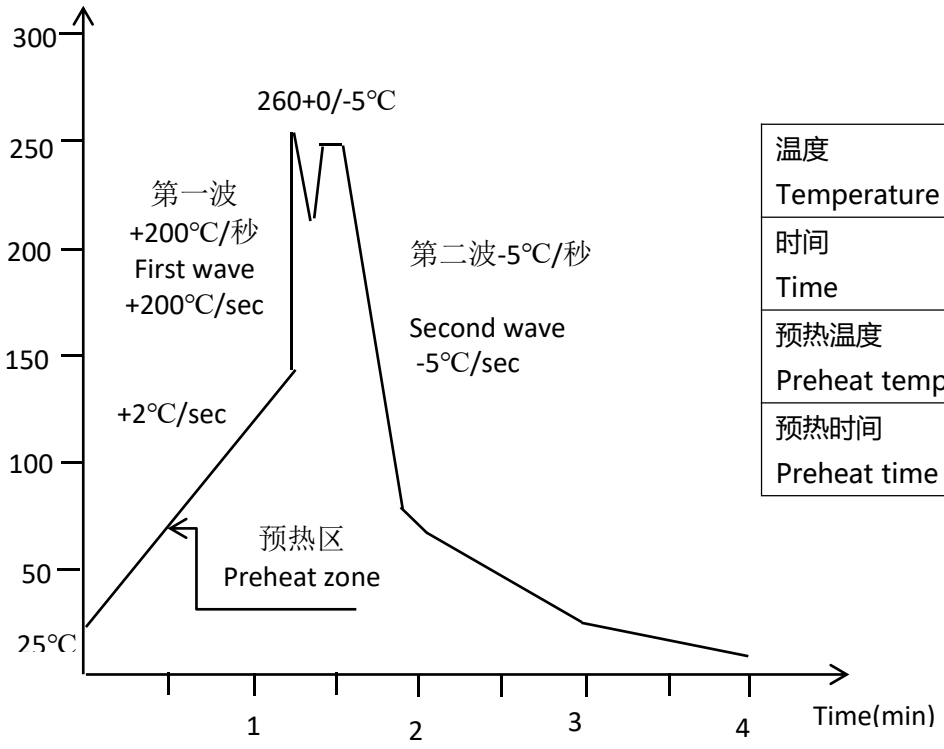



| 项目<br>Item | 符号<br>Symbol | 最小值<br>Min. | 最大值<br>Max. | 单位<br>Unit |
|---|---|---|---|---|
| 预热温度<br>Preheat Temperature | $T_s$ | 150 | 200 | ℃ |
| 预热时间<br>Preheat Time | ts | 60 | 120 | s |
| 升温速率<br>Ramp-Up Rate ($T_L$ to $T_P$) | - | - | 3 | ℃/s |
| 液相线温度<br>Liquidus Temperature | $T_L$ | 217 | | ℃ |
| 高于液相线温度($T_L$)的时间<br>Time above Liquidus Temperature $T_L$ | $t_L$ | 60 | 100 | s |
| 峰值温度<br>Peak Temperature | $T_P$ | - | 260 | ℃ |
| $T_c$ 在($T_P$-5)和 $T_P$之间的时间 Time During Which $T_c$ Is Between ($T_P$-5) and $T_P$ | $t_p$ | - | 30 | s |
| 降温速率<br>Ramp-down Rate($T_P$ to $T_L$ ) | - | - | 6 | ℃/s |

## • 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




| | |
|---|---|
| 温度<br>Temperature | 260℃+0/-5℃ |
| 时间<br>Time | 10秒<br>10S |
| 预热温度<br>Preheat temperature | 25至140℃<br>25 to 140℃ |
| 预热时间<br>Preheat time | 30至80秒<br>30 to 80 S |