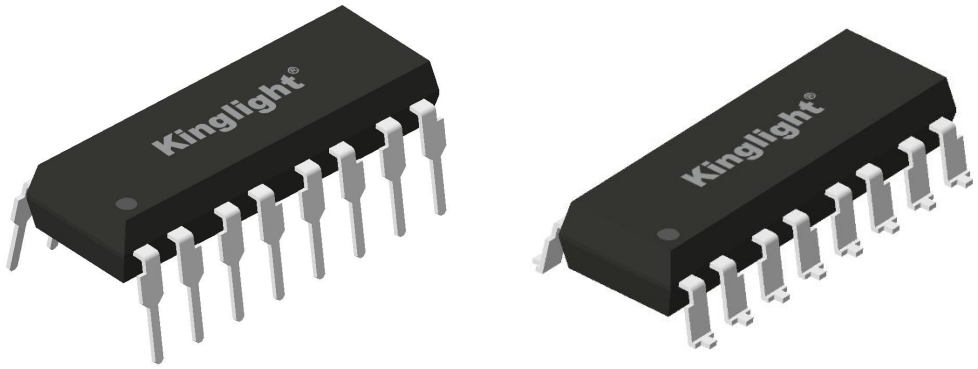
Kinglight®
晶台微电子

KL847
DIP16 PHOTOTRANSISTOR PHOTOCOUPLER

DIP16 晶体管光耦



* 本文档中包含的信息反映了具有代表性的使用场景，仅供技术参考。
  The information contained in this document reflects representative usage scenarios and is intended for technical reference only.
* 本文档中提到的产品型号和规格如有更改或改进，恕不另行通知。在生产使用之前，客户应参考产品规格书的最新数据表。
  Product models and specifications mentioned in this document are subject to change or improvement without notice. Customers should refer to the latest data sheets in the product specifications prior to production use.
* 在使用本文档中引用的产品时，请确保产品在数据手册中规定的环境和电气限制范围内运行。如果客户使用超过指定的限制，晶台微电子将不会对任何后续问题负责。
  When using the products referenced in this document, ensure that the products are operated within the environmental and electrical limits specified in the data sheet. If the customer uses the product beyond the specified limits, Kinglight Microelectronics will not be responsible for any subsequent problems.
* 本文档中的信息适用于电子元器件应用中的典型用法。如有任何特殊用途，请向晶台微电子咨询，以获得进一步的帮助。
  The information in this document applies to typical use in electronic component applications. For special applications, please contact Kinglight Microelectronics for further assistance.
* 未经晶台微电子允许，不得复制或转载本文件的内容和信息。对于最新的信息，请参考官方网站 Http://www.klmicro.com。
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1. 产品特点 Product features

- 电流传输比(CTR: 50～600% at I_F=5mA, V_{CE}=5V)
  Current transfer ratio (CTR: 50～600% at I_F=5mA, V_{CE}=5V)
- 输入与输出间高隔离电压(V_{iso}=5000 V rms)
  High isolation voltage between input and output (V_{iso}=5000 V rms)
- 爬电距离大于7.62mm Creepage distance ＞7.62mm
- 工作温度高达110℃ Operating temperature up to +110°C
- 无铅且符合 RoHS 标准 Pb free and RoHS compliant
- 安全审批 Safety approval
  CQC认证已批准(编号:CQC26001516432) CQC approved (No.CQC26001516432)

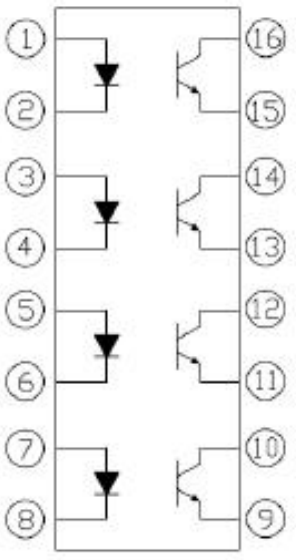
2. 产品描述 Product Description

- KL847系列器件由一个红外发射二极管和一个光电晶体管探测器组成，可提供四个隔离通道。
  The KL847 series devices each of consist of an infrared emitting diode, optically coupled to a phototransistor detector, and provides four isolated channels.
- 它们采用16引脚DIP封装，并提供SMD选项。
  They are packaged in a 16-pin DIP package and available in SMD option.

3. 产品应用 Product Applications

- 可编程序控制器 Programmable controllers
- 系统设备、测量仪器 System appliances, measuring instruments
- 电信设备 Telecommunication equipment
- 家用电器, 如暖风机等 Home appliances, such as fan heaters, etc.
- 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
①,③,⑤,⑦ 阳极 Anode
②,④,⑥,⑧ 阴极 Cathode
⑨,⑪,⑬,⑮ 发射极 Emitter
⑩,⑫,⑭,⑯ 集电极 Collector

5. 光电特性 Electrical-Optical characteristics

• 最大限度额定值(温度=25℃) Absolute Maximum Ratings(Ta=25℃)

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（脉冲 1us）Peak forward current (1us, pulse)	I_{FP}	1	A
	反向电压 Reverse voltage	V_R	6	V
	功耗 Power dissipation	P_D	100	mW
输出 Output	集电极-发射极电压 Collector-Emitter voltage	V_{CEO}	80	V
	集电极电流 Collector current	I_C	50	mA
	发射极-集电极电压 Emitter-Collector voltage	V_{ECO}	7	V
	功耗 Power dissipation	Pc	150	mW
总消耗功率 Total Power dissipation		P_{TOT}	200	mW
隔离电压 (1*) Isolation Voltage		V_{ISO}	5000	Vrms
工作温度 Operating temperature		T_{OPR}	-55 ~ +110	℃
储存温度 Storage temperature		T_{STG}	-55 ~ +125	℃
焊接温度 (2*) Soldering temperature		T_{SOL}	260	℃

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, 1~8脚短接, 9~16脚短接
1 AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1~8 are shorted together, and pins 9 ~16 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= 20mA
	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-发射极暗电流 Collector-Emitter dark current	I_{CEO}	-	-	100	nA	V_{CE} = 20V, I_F= 0mA
	集电极-发射极击穿电压 Collector-Emitter breakdown voltage	V_{CEO}	80	-	-	V	I_C= 0.1mA
	发射极-集电极击穿电压 Emitter-Collector breakdown voltage	V_{ECO}	7	-	-	V	I_E= 0.1mA

• 附注(Notes):

1*. 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 Parameter	符号 Symbol	最小值 Min.	规格值 Typ.	最大值 Max.	单位 Unit	条件 Condition
电流传输比 Current transfer ratio	CTR	50	-	600	%	I_F= 5mA V_{CE}= 5V
集电极与发射极间饱和电压 Collector-Emitter saturation voltage	$V_{CE(sat)}$	-	0.1	0.2	V	I_F= 20mA I_C= 1mA
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}	-	0.6	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=100 Ω,-3dB
上升时间 Rise time	t_r	-	6	18	μs	V_{CE}= 2V I_C=2mA R_L=100 Ω
下降时间 Fall time	t_f	-	8	18		

• 附注(Notes):
1*. Ta=25℃时的规格值 Typical values at Ta = 25°C

7. 特性曲线 Characteristic Curves

图1.正向电压与正向电流的关系
Figure1.Forward Current VS Forward Voltage

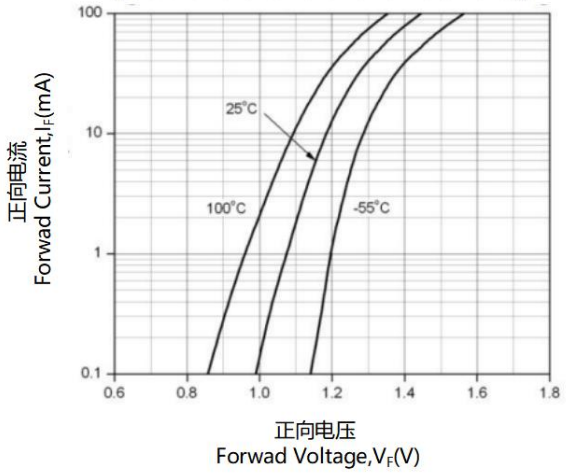


图2. 集电极电流与正向电流关系
Figure2.Normalized Collector Current vs Forwad Current

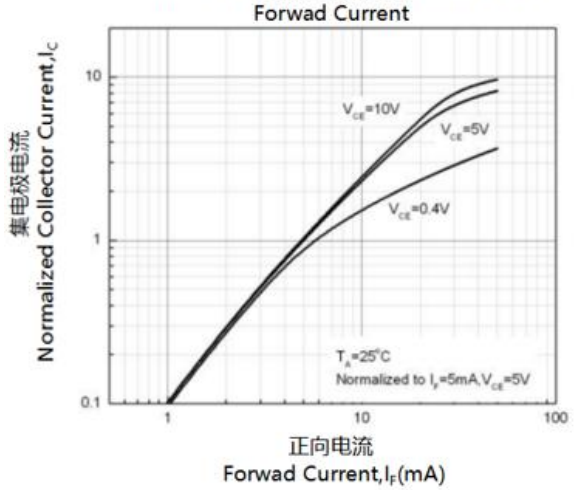


图3. 电流传输比与正向电流的关系
Figure 3.Normalized Current Transfer Ratio vs Forwad Current

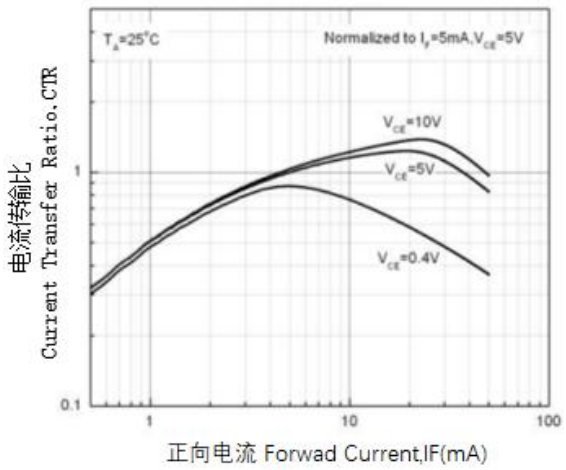


图4.集电极电流与环境温度的关系
Figure 4. Collector Current vs Ambient Temperature

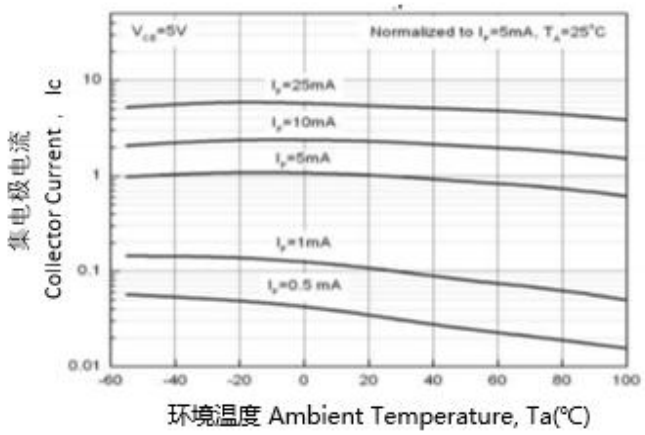


图5.集电极电流与集电极-发射极电压的关系
Figure5. Collector Current vs Collector-Emitter Voltage

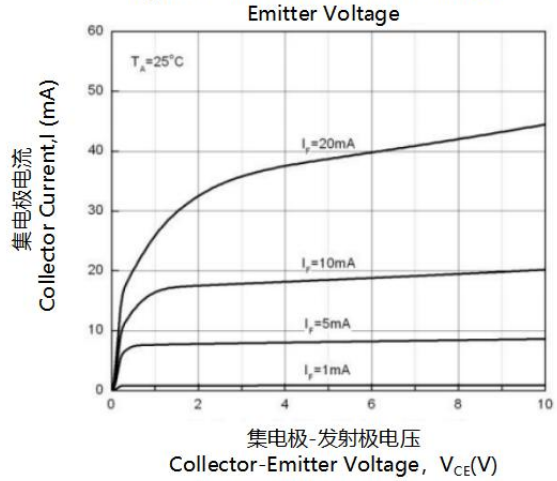


图6.集电极电流与集电极-发射极电压的关系
Figure6. Collector Current vs Collector-Emitter Voltage

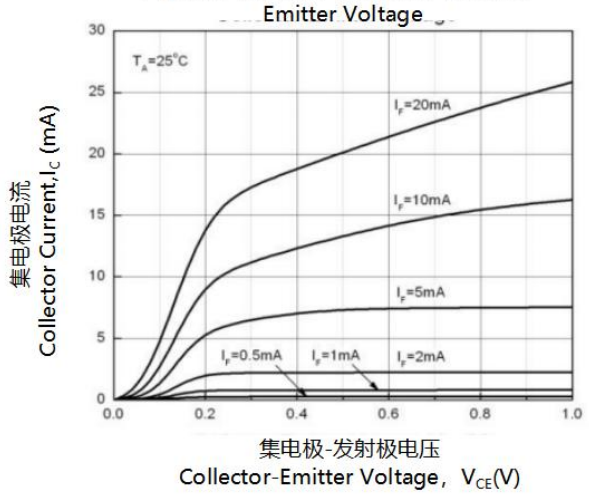


图7.集电极暗电流与环境温度的关系
Figure7. Collector Dark Current vs Ambient Temperature

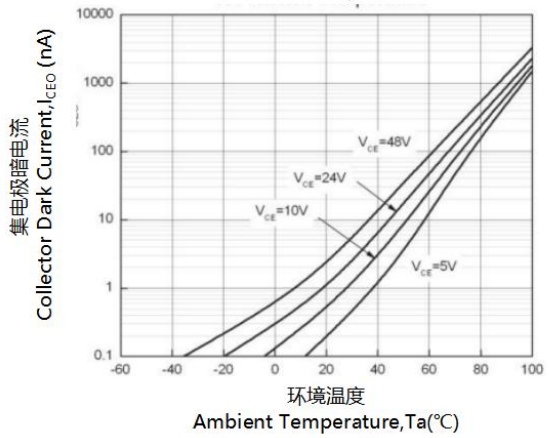


图8.开关时间与负载电阻的关系
Figure8. Switching Time vs Load Resistance

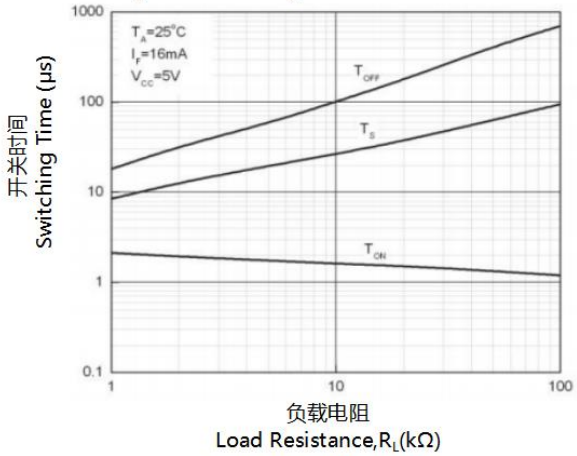


图9.集电极与发射极饱和电压与环境温度的关系
Figure9. Collector-Emitter Saturation Voltage vs Ambient Temperature

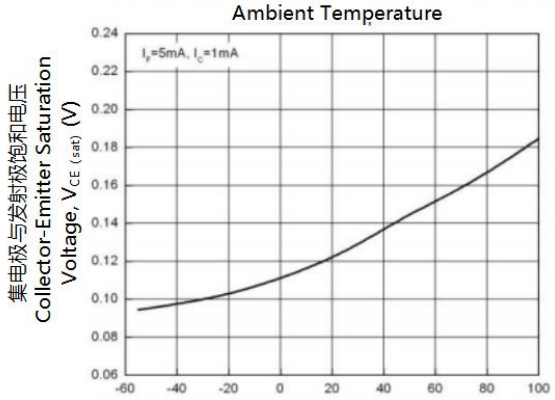
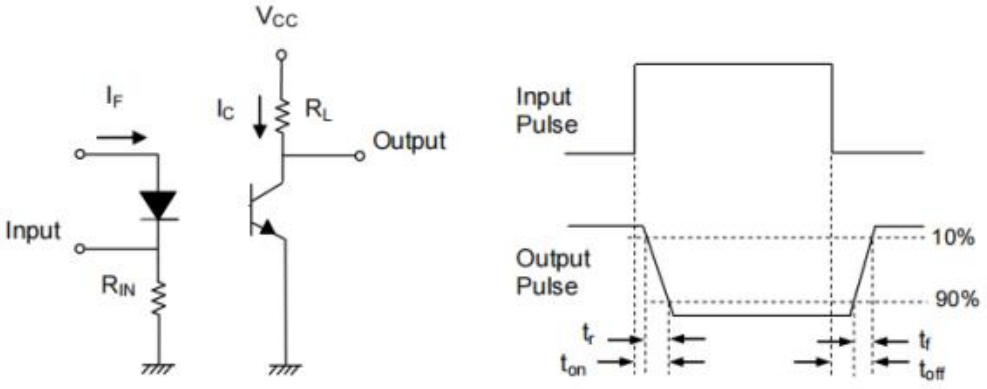


图10.开关时间测试电路及波形
Figure10. Switching Time Test Circuit & Waveform



8. 订单信息 Order Information

• 材料编号 Part Number

KL847X-V

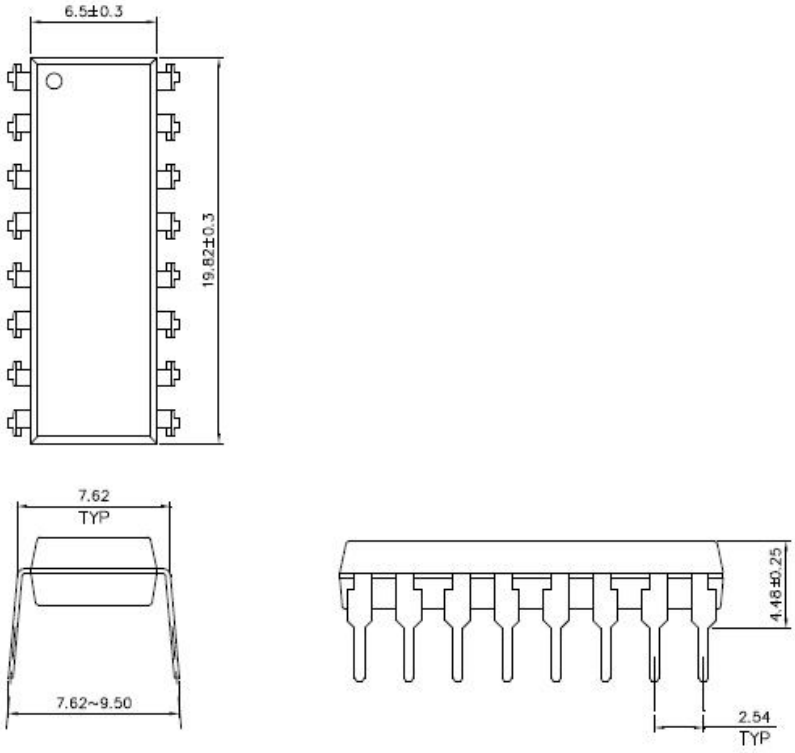
附注(Notes):

X = 引脚形式选项(S 或 无)
Lead form option (S or none)
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)

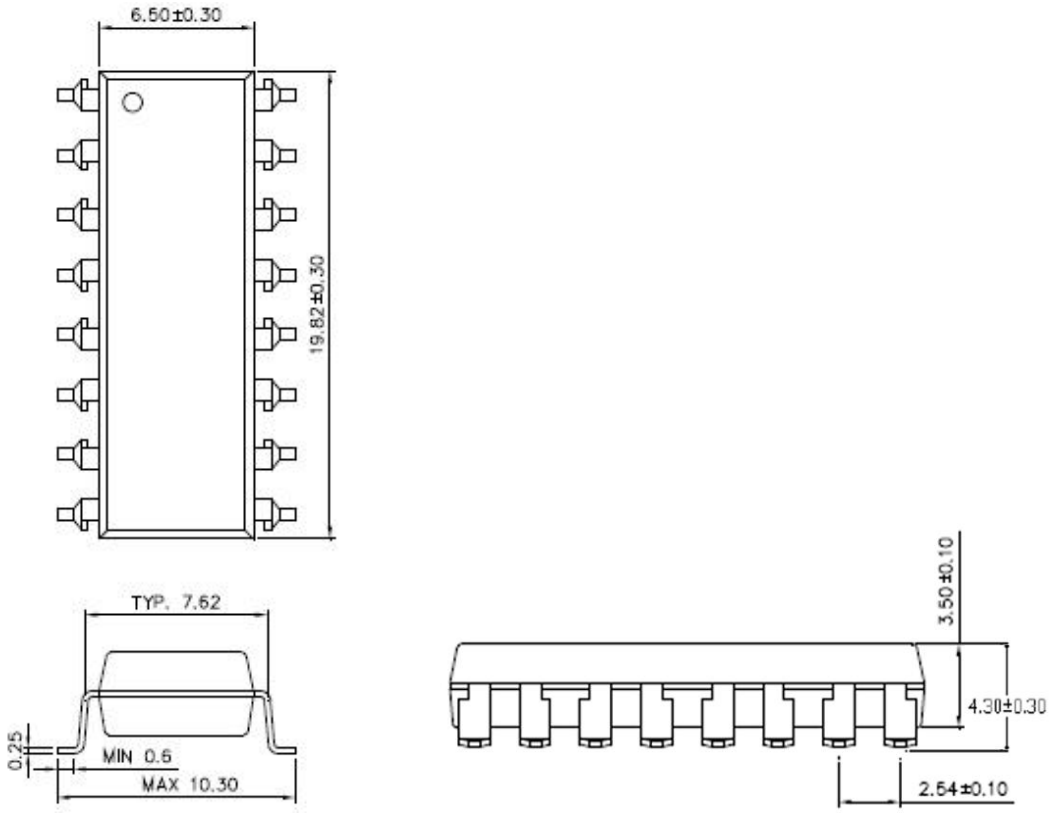
选项 Option	描述 Description	包装数量 Packing quantity
无 None	标准DIP-16 Standard DIP-16	每管20pcs 20 units per tube
S	表面贴装引线形式 Surface mount lead form	每管20pcs 20 units per tube

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

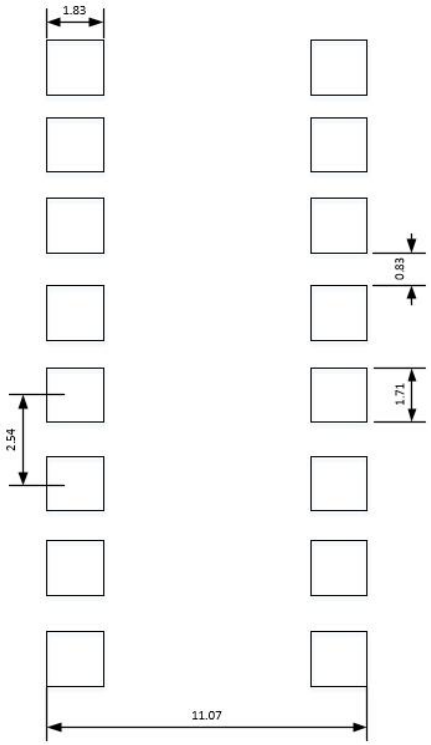
• 标准DIP型号 Standard DIP Type



• 选择S型号 Option S Type



• 表面贴片推荐焊盘布局 Recommended pad layout for surface mount lead frame

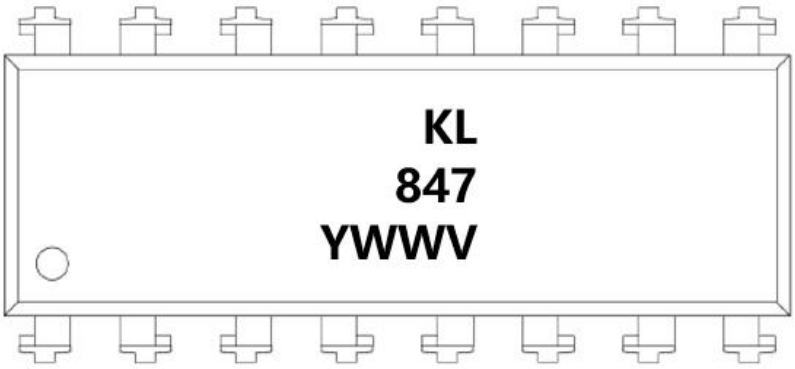


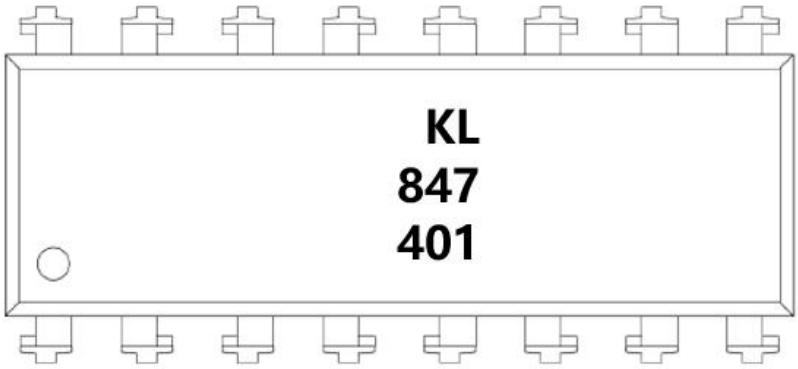
附注(Notes):

a. 推荐焊盘尺寸仅供参考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

847 = 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

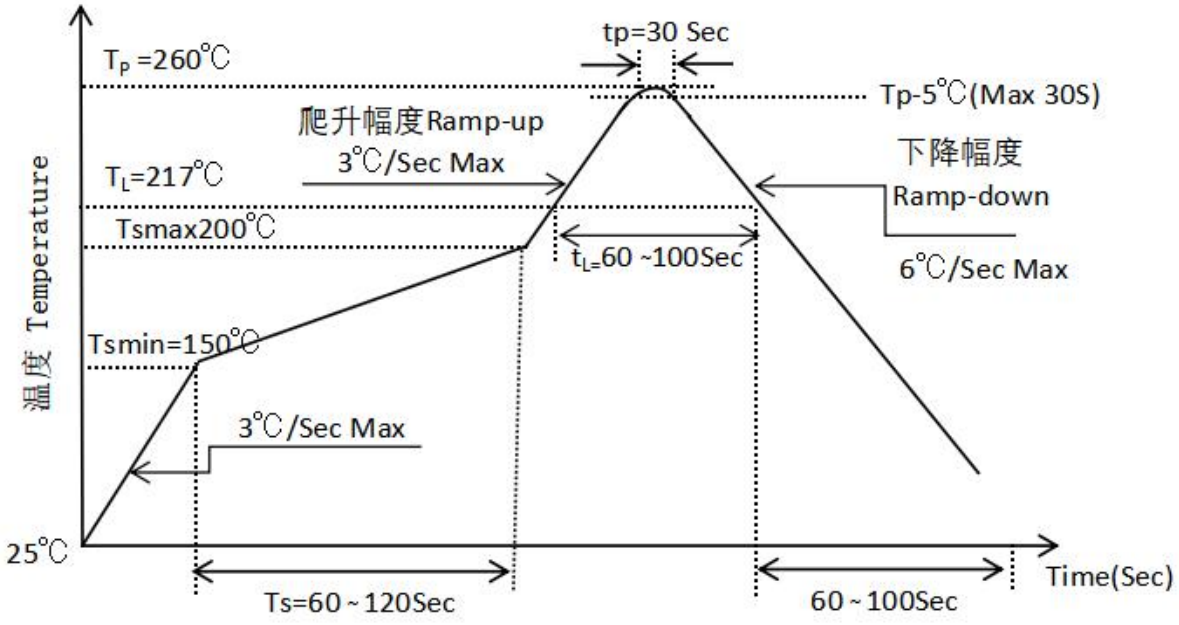
V = 表示VDE标识(客户指定镭射字符才加"V")
VDE (Only add "V" to laser characters specified by the customer)

11. 焊接温度曲线 Temperature Profile Of Soldering

• 回流焊焊接条件 Reflow soldering Soldering Condition

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.

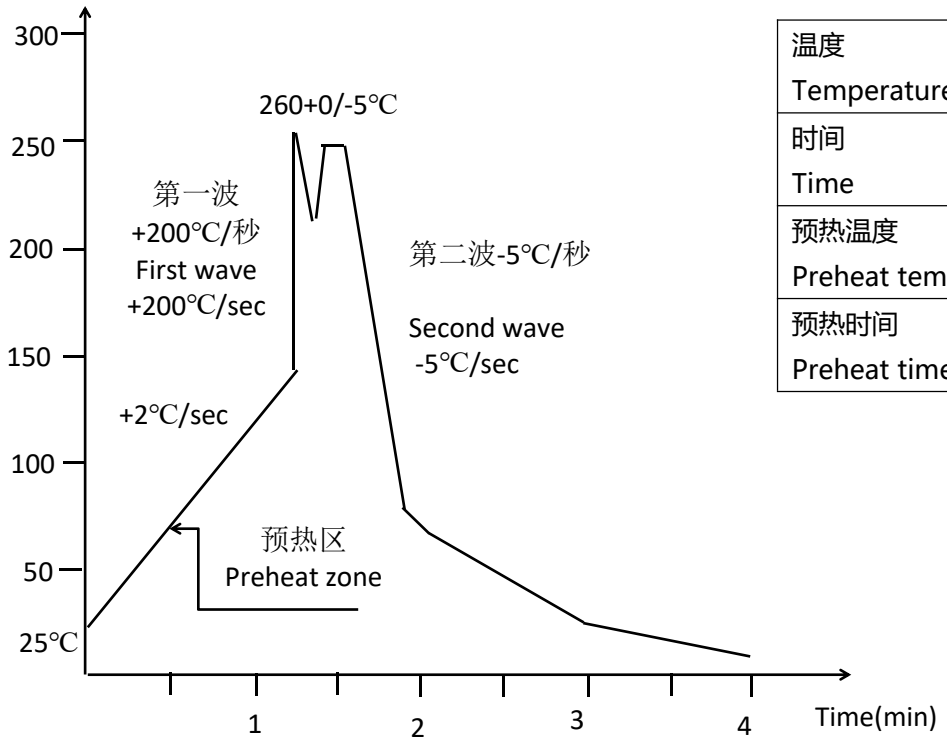


项目 Item	符号 Symbol	最小值 Min.	最大值 Max.	单位 Unit
预热温度 Preheat Temperature	T_s	150	200	℃
预热时间 Preheat Time	t_s	60	120	s
升温速率 Ramp-Up Rate (T_L to T_P)	-	-	3	℃/s
液相线温度 Liquidus Temperature	T_L	217		℃
高于液相线温度(T_L) 的时间 Time above Liquidus Temperature T_L	t_L	60	100	s
峰值温度 Peak Temperature	T_P	-	260	℃
T_c 在(T_P-5)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 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 Temperature	260℃+0/-5℃
时间 Time	10秒 10S
预热温度 Preheat temperature	25至140℃ 25 to 140℃
预热时间 Preheat time	30至80秒 30 to 80 S