

产品规格书

PRODUCT SPECIFICATION

- ◆ 产品名称 (Product Name) : KL357 系列(KL357 Series)
- ◆ 产品型号 (Product Model) : 4PIN SOP 光电晶体管光耦合器
4PIN SOP 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) : 2023-06-05			
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

- 不含卤素 Halogens free
(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm)
- 电流转换率(Current transfer ratio)
CTR: 50~600% at IF =5mA, VCE =5V
- 输入与输出高隔离电压(Viso=3750 V rms)
High isolation voltage between inputs and output (Viso=3750 V rms)
- 紧凑型 4 引脚 SOP,外形尺寸为 2.0mm
Compact 4 Pin SOP with a 2.0 mm profile
- 符合欧盟 REACH 法规
Compliance with EU REACH
- 无 Pb 且符合 ROHS 标准
Pb free and RoHS compliant t



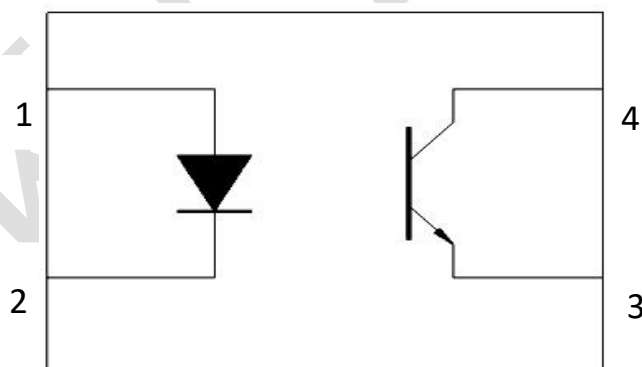
2. 产品描述 Product Description

- KL357 系列包含一个红外发射二极管,光耦合到一个光电晶体管检测器件
KL357 series contains an infrared emitting diode, optically coupled to a phototransistor detector.
- 采用 4 引脚小外形 SMD 封装的器件
The devices in a 4-pin small outline SMD package

3. 产品应用 Product Applications

- 直流转换器 DC Converters
- 可编程控制器 Programmable controllers
- 电性设备 Telecommunication equipments
- 不同电位和阻抗电路间的信号传输 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	60	mA
	峰值正向电流(1us 脉冲) Peak forward current (1us pulse)	I _{FP}	1	A
	反向电压 Reverse voltage	V _R	6	V
	输入功耗 Input Power dissipation	P _D	70	mW
	降额因子(约 Ta=100°C) Derating factor (about Ta=100°C)		2.9	mW/°C
输出 Output	集电极电流 Collector current	I _C	50	mA
	集电极与发射极间电压 Collector and emitter Voltage	V _{CEO}	80	V
	发射极与集电极间电压 Emitter and Collector Voltage	V _{ECO}	7	V
	输出功耗 Output Power dissipation	P _O	150	mW
	降额因子(约 Ta=70°C) Derating factor (above Ta = 70°C)		3.7	mW/°C
总消耗功率 Total Consume Power		P _{TOT}	200	mW
隔离电压 (1*) Isolation Voltage		V _{iso}	3750	Vrms
工作温度 Operating temperature		T _{OPR}	-55 to +110	°C
储存温度 Storage temperature		T _{STG}	-55 to +125	°C
焊接温度 (2*) Soldering temperature		T _{SOL}	260	°C

附注(Notes):

- 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

- b. 采用带有零电路的隔离耐压测试仪 Use an isolated pressure withstand tester with a zero circuit

- 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 =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 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}	80	-	-	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}	7	-	-	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)}	-	0.1	0.2	V	I _F =20mA I _C =1mA
	电流传输比 Current transfer ratio	CTR	50	-	600	%	I _F =5mA V _{CE} =5V
	隔离电阻 Isolation resistance	R _{ISO}	5×10 ¹⁰	-	-	Ω	V _{IO} =500Vdc 40~60% R.H.
	浮动电容 Floating capacitance	C _f	-	0.6	1.0	pF	V _{IO} =0, f=1MHz
	上升时间 Rise time	t _r	-	3	18	μs	V _{CE} =2V, I _C =2mA, R _L =100Ω
	下降时间 Fall time	t _f	-	4	18	μs	

- 传输特性等级表(Ta=25°C, 除非另有规定)

Transfer Characteristics level table (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
电流传输比 Current Transferratio	KL357	CTR	50	-	600	%	IF=5mA VCE=5V
	KL357A		80	-	160		
	KL357B		130	-	260		
	KL357C		200	-	400		
	KL357D		300	-	600		
	KL357E		100	-	200		
	KL357F		150	-	300		

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 ↓ 5min L:-55°C 15min	300cycle	45	0/45
2	高温操作寿命 HTOL	JESD22-A108C	HTOL@110°C IF=10mA Vce=10V	168、500、1000hrs	45	0/45
3	高温反向偏压 HTRB	JESD22-A108C	HTRB@125°C Vce=60V	168、500、1000hrs	45	0/45
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	45	0/45
5	压力锅 Autoclave	JESD22-A102-C	Ta=121°C, 100%RH, 2atm	96hrs	45	0/45
6	高温储存 HTS	JESD22-A103C	HTS@125°C	168、500、1000hrs	45	0/45
7	低温储存 LTS	JESD22-A119	LTS@-55°C	168、500、1000hrs	45	0/45
8	耐锡热试验 RSH	JESD22-B106C	RSH@260±5°C	10sec*3times	45	0/45
9	可焊性 SD	JESD22-B102D	Pb-free@ 245±5°C	3sec*1times	22	0/22

备注
Remarks
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
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

8. 特性曲线 Characteristic Curves

图1. 正向电流与环境温度关系

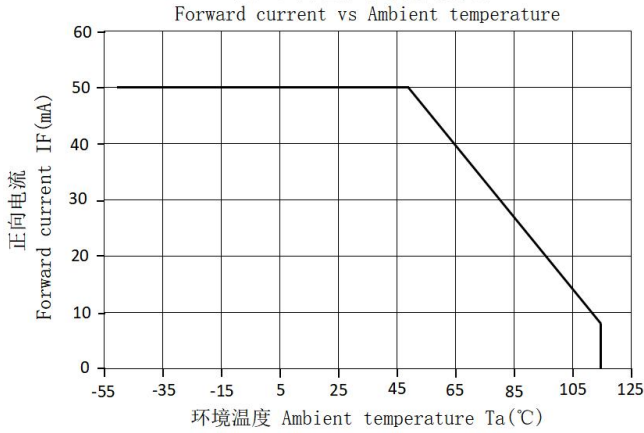


图2. 正向电流与正向电压的关系

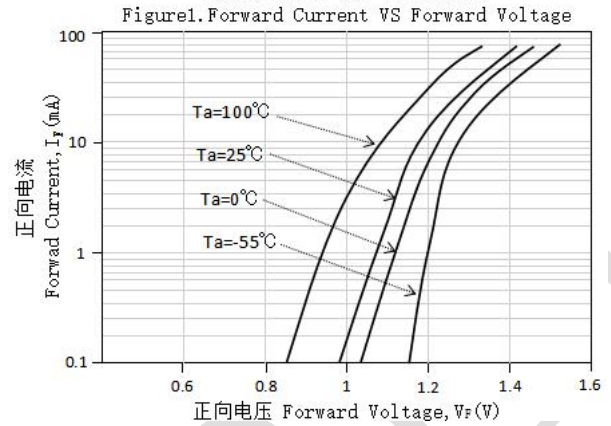


图3. 电流传输比与正向电流

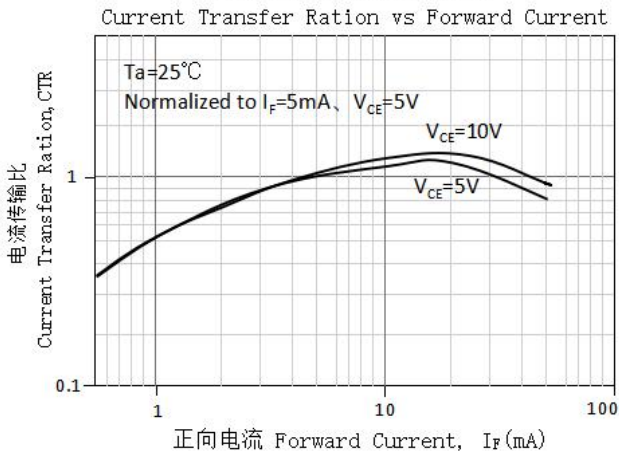


图4. 集电极电流与集电极-发射极电压

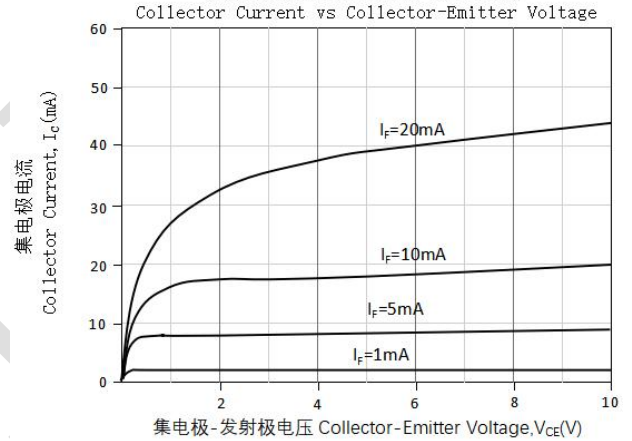


图5. 集电极电流与环境温度关系

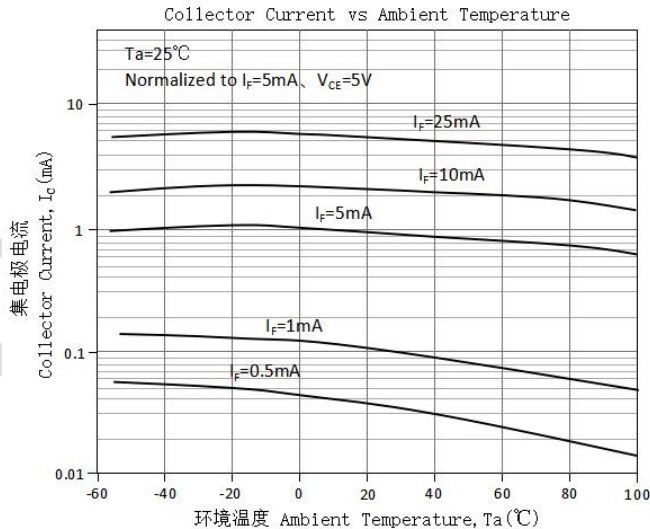


图6. 集电极暗电流与环境温度的关系

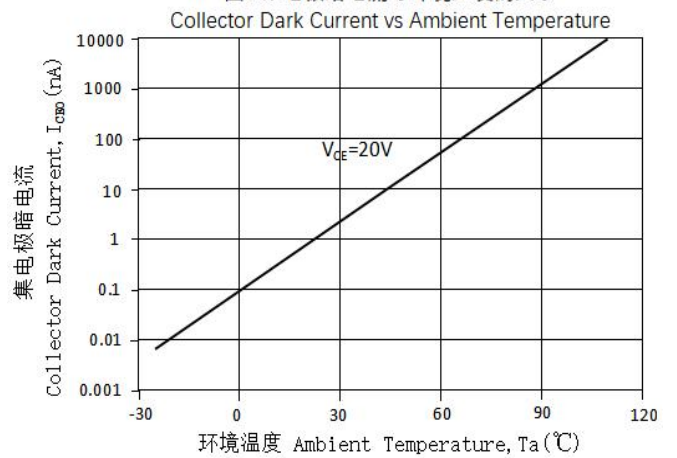


图7. 集电极-发射极饱和电压与环境温度关系
Collector-Emitter Saturation Voltage vs Ambient Temperature

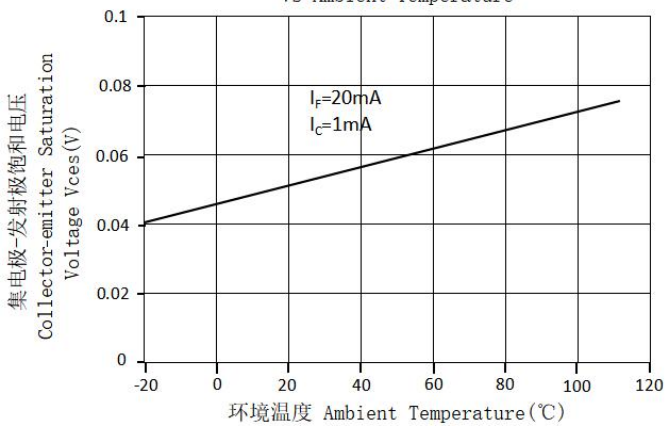


图8. 开关时间与负载电阻的关系
Switching Time vs Load Resistance

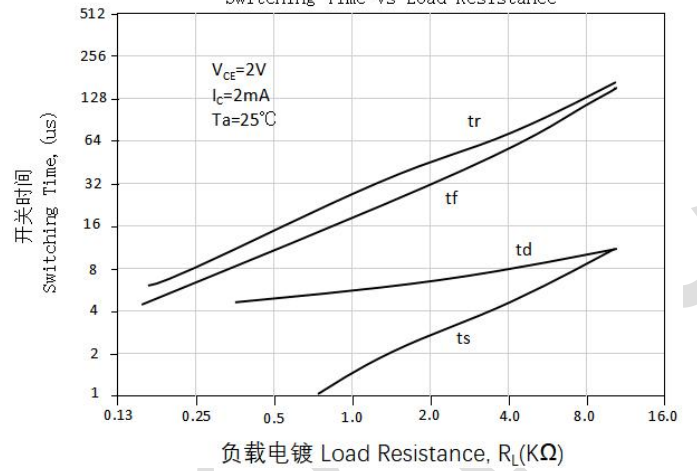
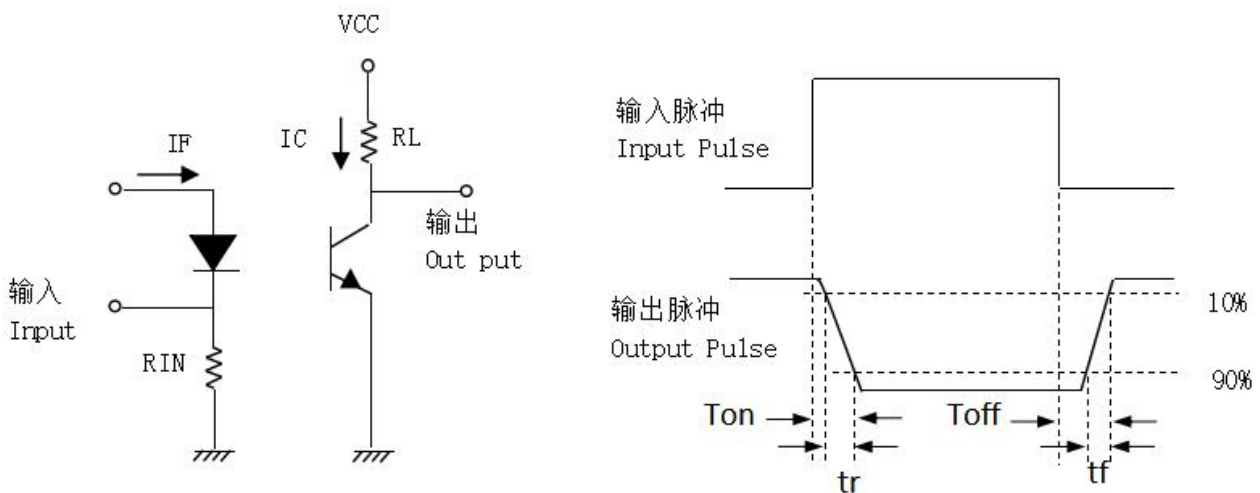


图9. 开关时间测试电路与波形
Switching Time Test Circuit vs Waveforms



9. 订单信息 Order Information

- 零件编号 Part Number

KL357(X)(Y)-VG

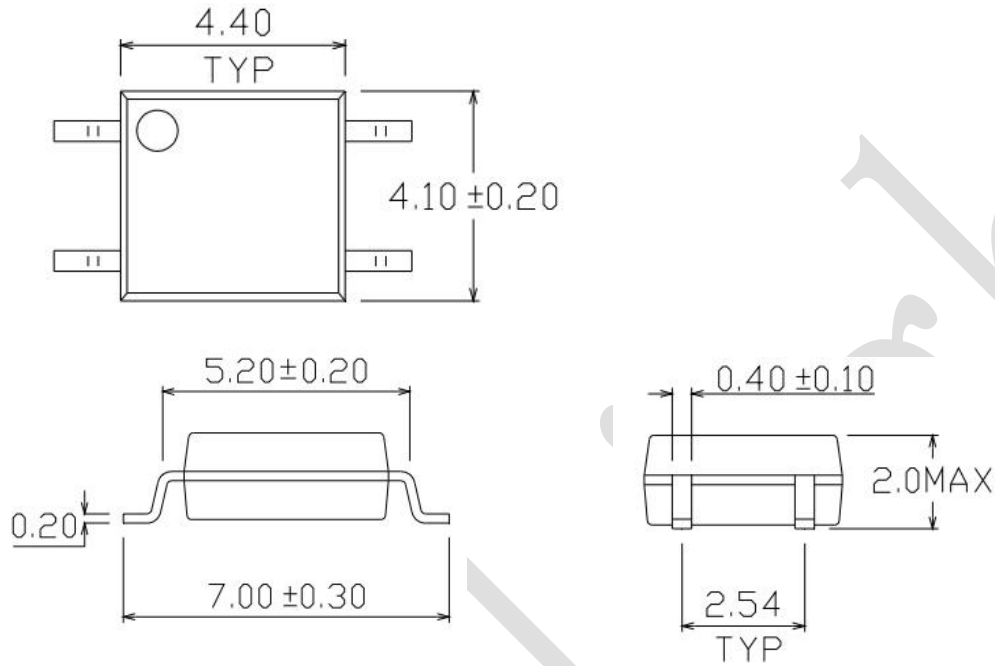
Notes

- X 表示 CTR 等级(A、B、C、D、E 或无)
CTR Rank (A, B, C, D, E, or none)
- Y 载带和卷轴包装方式(TA、TB 或无)
Tape and reel option (TA, TB or none)
- V VDE(可选项)
VDE (option)
- G 环保无卤
Halogen free

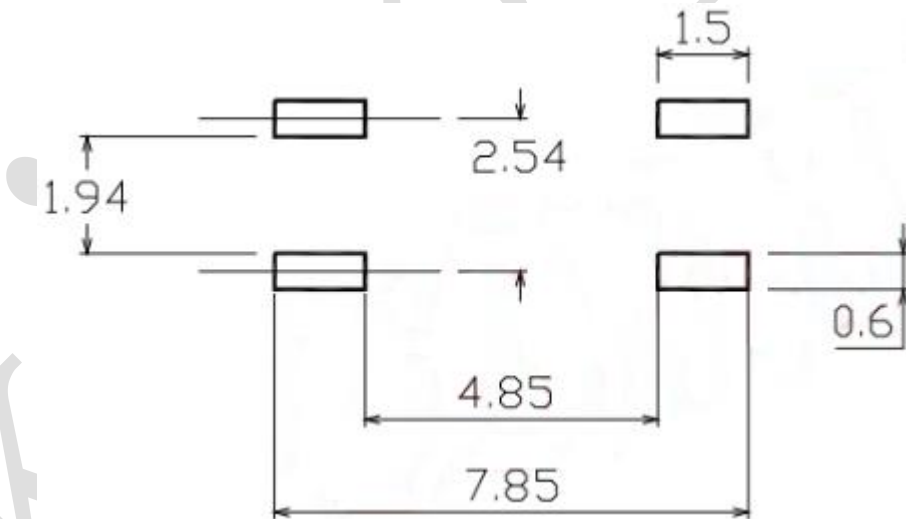
选项 Option	描述 Description	包装数量 Packing quantity
(TA)	TA 载带和卷轴选项 TA Tape & reel option	每卷 3000pcs 3000 units per tube
(TB)	TB 载带和卷轴选项 TB Tape & reel option	每卷 3000pcs 3000 units per tube
(TA)-V	TA 载带和卷轴选项 +VDE TA Tape & reel option + VDE	每卷 3000pcs 3000 units per reel
(TB)-V	TB 载带和卷轴选项 + VDE TB Tape & reel option + VDE	每卷 3000pcs 3000 units per reel

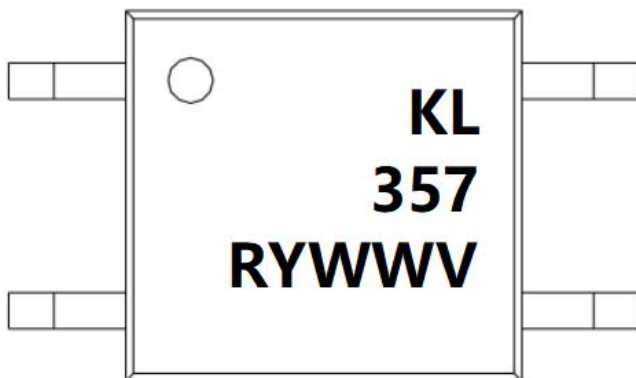
10. 封装尺寸(单位:毫米) Package Drawing(Unit:mm)

- 包装尺寸 (尺寸单位为 mm)
Package Dimension (Dimensions in mm)



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



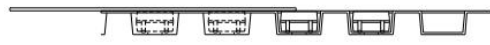
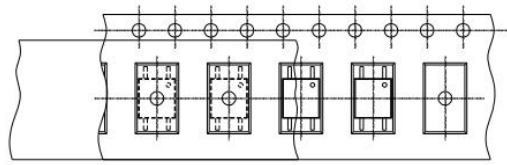
11. 设备标记 Device marking**注意 Notes**

- KL 表示晶台光电有限公司
denotes KingLight
- 357 表示设备部件号
denotes Device Part Number
- R 表示 CTR 等级
denotes CTR Rank
- 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

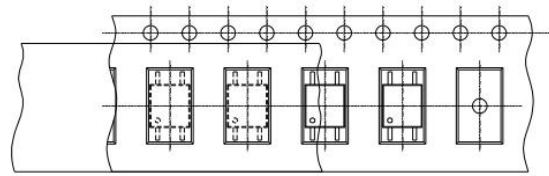
Tape & Reel Packing Specifications

• 选择 TA Option TA



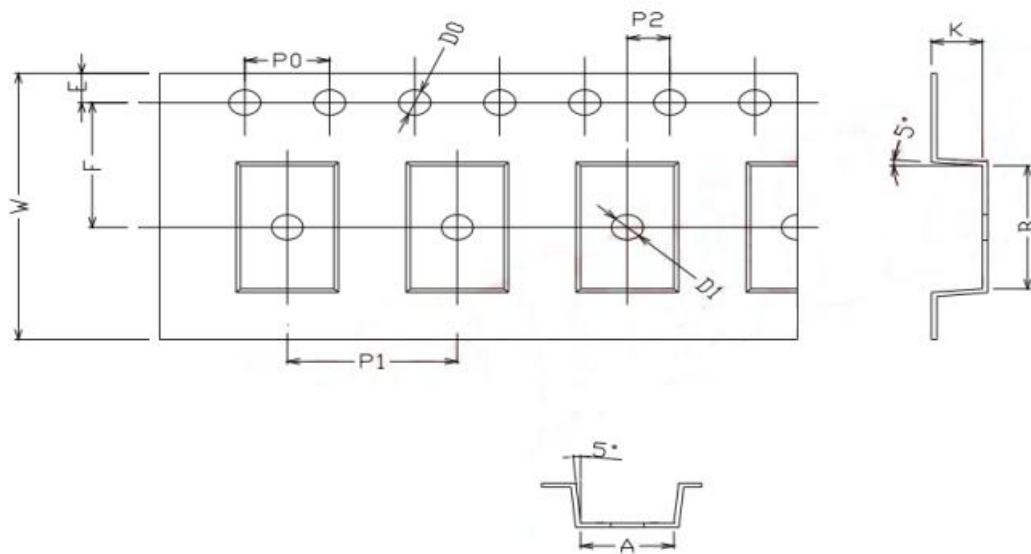
卷轴进给方向 Direction of feed from reel

• 选择 TB Option TB



卷轴进给方向 Direction of feed from reel

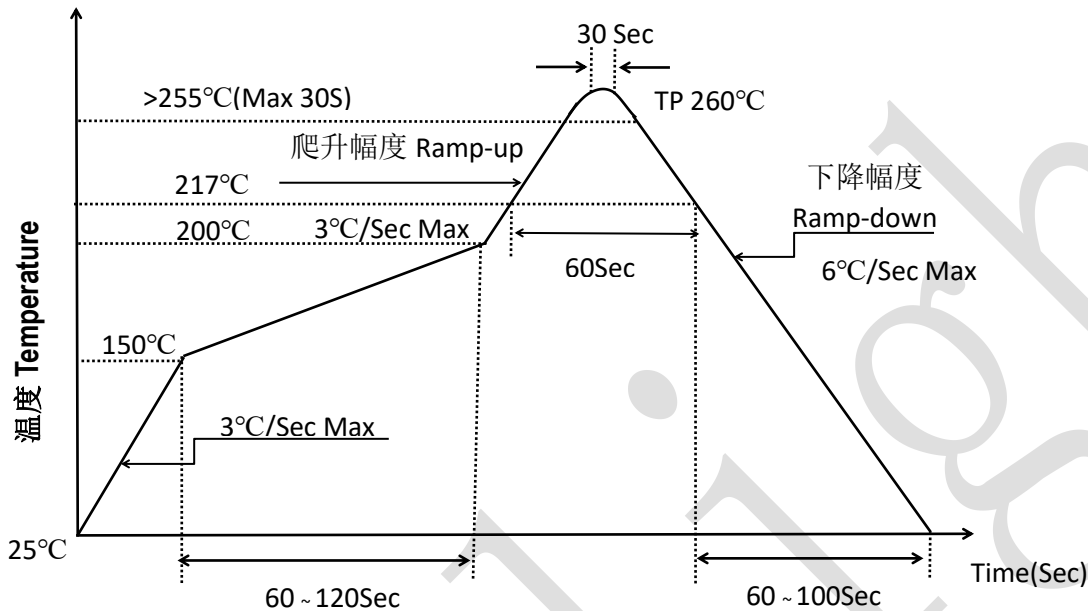
料带尺寸 Material belt size



尺寸编号 Dimension No.	A	B	D0	D1	E	F
尺寸(mm) Dimension(mm)	4.4±0.1	7.4±0.1	1.5+0.1/-0	1.5±0.1	1.75±0.1	7.5±0.05
尺寸编号 Dimension No.	P0	P1	P2	t	W	K
尺寸(mm) Dimension(mm)	4.0±0.15	8.0±0.1	2.0±0.1	0.25±0.03	16.0±0.2	2.4±0.1

13. 焊接温度曲线 Temperature Profile Of Soldering

- 回流焊焊接条件 Reflow soldering Soldering Condition



14. 免责声明 Disclaimer

- 本规格书中的规格如有变更，恕不另行通知，本公司保留对上述产品规格变更权力
The specifications in this specification are subject to change without notice, and the Company reserves the right to change the above product specifications
- 使用本产品时，请注意应用参数若超出产品本身最大额定值，造成产品损害，我司概不负责
When using this product, please note that if the application parameters exceed the maximum rating of the product itself, we will not cause the product damage