

概述 Description

CY354 是一块小外形的贴片光电耦合器件，适合表面贴装生产。CY354 是由一个砷化镓发光二极管和一个光电晶体管组成的光电耦合器，它的体积比 DIP 小，适用于高密度表面贴装应用，如可编程控制器等。

The CHEUK YUI mini flat coupler CY354 is a small outline coupler, suitable for surface mount assembly. CY354 consist of a photo-transistor optically coupled to a gallium arsenide infrared emitting diode, The CYTLP354 is smaller than DIP package, it's suitable for high-density surface mounting applications such as programmable controllers.

特性 Features

- 电流转换比 (CTR)范围: (CTR: 20~300% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)

Current transfer ratio (CTR: 20~300% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)

- 输入-输出隔离电压($V_{iso} = 3750\text{ Vrms}$)

High isolation voltage between input and output ($V_{iso} = 3750\text{ Vrms}$)

- 集电极-发射极击穿电压 $BV_{CEO} \geq 80\text{V}$

Minimum BV_{CEO} of 80V guaranteed

- 工作温度: -55 to 110°C

Operation temperature: -55 to 110°C

- 符合 EU REACH 和 RoHS

Compliance with EU REACH and RoHS

电性应用 Applications

- 开关电源，智能电表

Switching power supply, intelligent meter

- 工业控制，测量仪器

Industrial control, measuring instruments

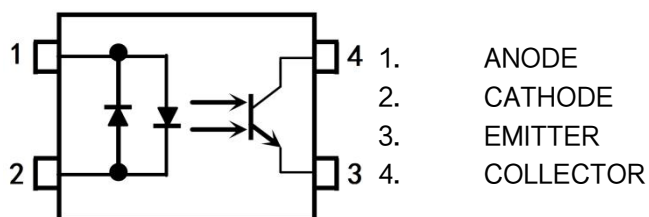
- 办公设备，比如复印机

Office equipment such as copiers

- 家用电器，比如空调、风扇、热水器等

Household appliances, such as air conditioners, fans, water heaters, etc.

结构图和封装 Block Diagram and Package



极限参数(Ta=25°C)Absolute Maximum Ratings (Ta=25°C)

参数 Parameter		符号 Symbol	额定值 Rating	单位 Unit
输入 Input	正向电流 Forward Current	I_F	± 50	mA
	正向脉冲电流 Pulse forward current	I_{FP}	± 1	A
	功耗 Power Dissipation	P	70	mW
	结温 Junction temperature	T_j	125	°C
输出 Output	集电极功耗 Collector 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}	80	V
	发射极-集电极电压 Emitter-Collector Voltage	V_{ECO}	7	V
	结温 Junction temperature	T_j	125	°C
总功耗 Total Power Dissipation		P_{tot}	200	mW
隔离电压 Isolation Voltage		V_{iso}	3750	V _{rms}
工作温度 Operating Temperature		T_{opr}	-55~+110	°C
储存温度 Storage Temperature		T_{stg}	-55~+125	°C
焊接温度 Soldering Temperature		T_{sol}	260(10s)	°C

光电特性 (Ta =25°C)Electro-optical Characteristics (Ta=25°C)

参数 Parameter		符号 Symbol	条件 Condition	Min.	Typ.	Max.	单位 Unit
输入 Input	正向电压 Forward Voltage	V_F	$I_F = \pm 20\text{mA}$	1.1	1.2	1.4	V
	输入端电容 Terminal Capacitance	C_{in}	$V=0, f=1\text{kHz}$	-	30	250	pF
输出 Output	集电极暗电流 Collector Dark Current	I_{CEO}	$V_{CE}=20\text{V}, I_F=0\text{mA}$	-	-	100	nA
	集电极-发射极击穿电压 Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C=0.1\text{mA}, I_F=0$	80	-	-	V
	发射极-集电极击穿电压 Emitter-Collector Breakdown Voltage	BV_{ECO}	$I_E=0.1\text{mA}, I_F=0$	7	-	-	V

参数 Parameter	符号 Symbol	条件 Condition	Min.	Typ.	Max.	单位 Unit
传输特性 Transfer Characteristics	电流转换比 Current Transfer Ratio	$I_F = \pm 1\text{mA}$, $V_{CE} = 5\text{V}$	20		300	%
	饱和压降 Collector-Emitter Saturation Voltage	$I_F = \pm 20\text{mA}$, $I_C = 1\text{mA}$	–	0.1	0.2	V
	集电极-发射极饱和压降 Isolation Resistance	DC500V, 40~60%R.H.	5×10^{10}	1×10^{11}	–	Ω
	隔离电容 Floating Capacitance	$V = 0$, $f = 1\text{MHz}$	–	0.6	1.0	pF
	集电极-发射极电容 Capacitance (Collector to emitter)	$V = 0$, $f = 1\text{MHz}$		10		pF
	输入-输出电容 Capacitance (input to output)	$V = 0$, $f = 1\text{MHz}$		0.8		pF
	截止频率 Cut-off Frequency	$V_{CE} = 5\text{V}$, $I_C = 2\text{mA}$, $R_L = 100\Omega$, –3dB	–	80	–	kHz
	隔离电压 Isolation Voltage	AC, 1 minute	3750			Vrms
开关时间 Switching Characteristics	上升时间 Rise Time	$V_{CE} = 2\text{V}$, $I_C = 2\text{mA}$, $R_L = 100\Omega$	–	–	18	μs
	下降时间 Fall Time		–	–	18	μs

* $\text{CTR} = I_C / I_F \times 100\%$

CTR 分级表 Rank Table of CTR

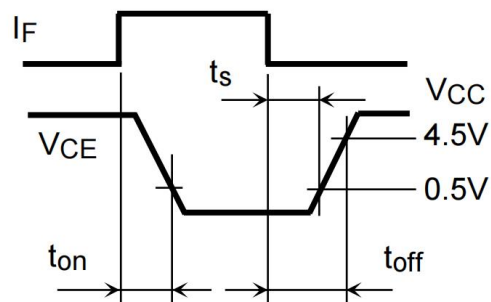
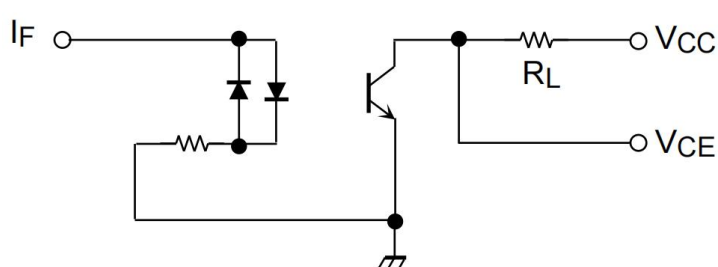
型号 Type	分级标准 Classification	电流转换率(%) (IC/IF) Current Transfer Ratio (%) (Ic/I _f)			标志分类 Marking of classification
		I _F = ± 5mA, V _{CE} = 5V, T _a = 25° C			
		Min	Type	Max	
CY354	Standard	20	—	300	Blank,A,B
	A	50	—	150	A
	B	100	—	300	B

推荐的操作条件 Recommended Operating Condition(Note)

参数 Characteristic	符号 Symbol	最小值 Min	典型值 Typ.	最大值 Max	单位 Unit
电源电压 Supply voltage	V_{CC}	–	5	48	V
正向电流 Forward current	I_F	–	16	20	mA
集电极电流 Collector current	I_C	–	1	10	mA

推荐的操作条件作为仅仅作为设计指南，以获得预期的性能设备。Recommended operating conditions are given as a design guideline to obtain expected performance of the device

开关时间测试电路 Switching time test circuit



典型光电特性曲线 Typical Electro-Optical Characteristics Curves

Fig.1 Relative Current Transfer Ratio vs. Forward Current

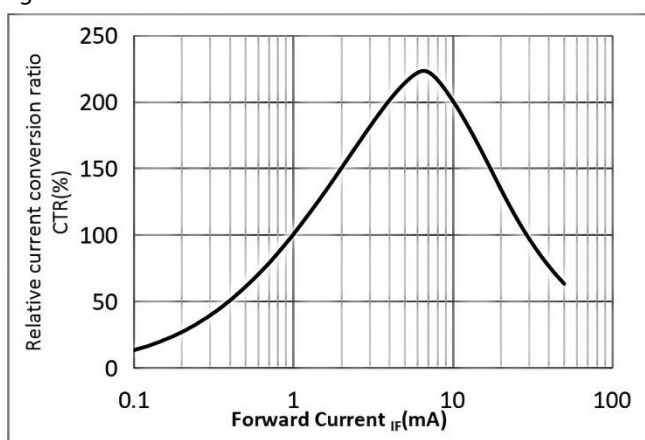


Fig.2 Forward Current vs. Forward Voltage

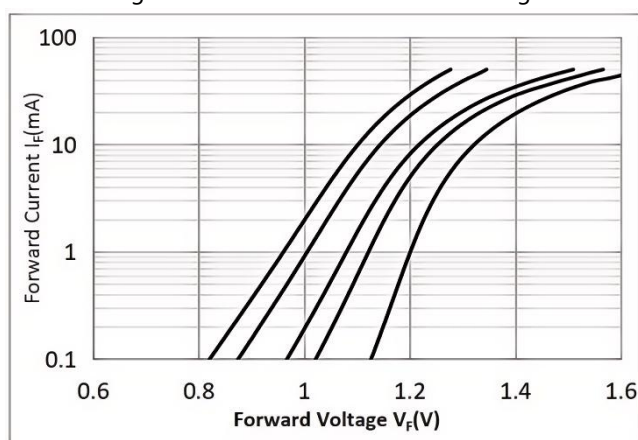


Fig.3 Collector Current vs. Collector-emitter Voltage

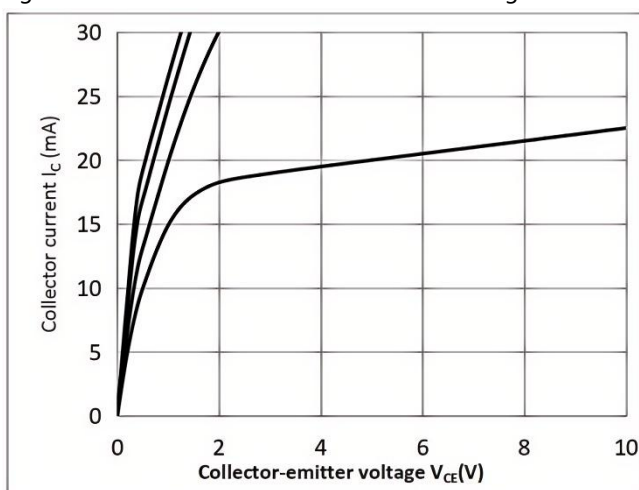


Fig.4 Relative Current Transfer Ratio vs. Ambient Temperature

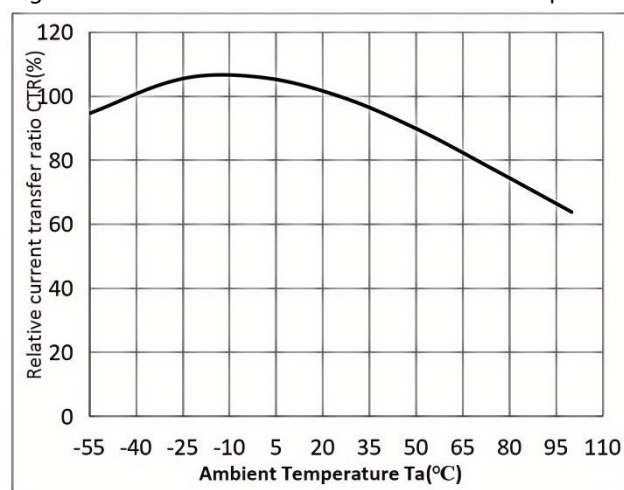


Fig.5 Collector-emitter Saturation Voltage vs. Ambient Temperature

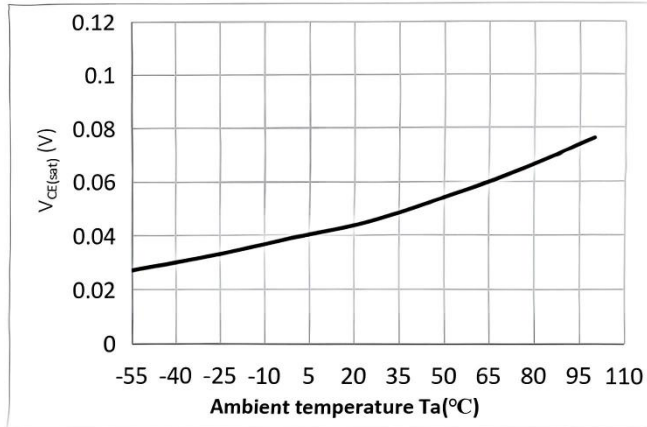


Fig.6 Collector Dark Current vs Ambient Temperature

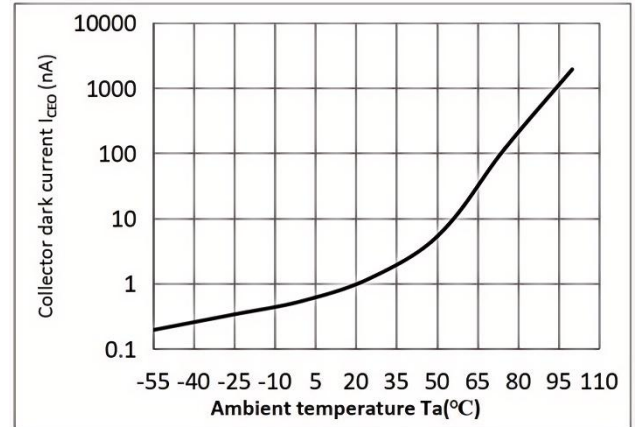


Fig.7 Response Time vs. Load Resistance



Fig.8 Frequency Response

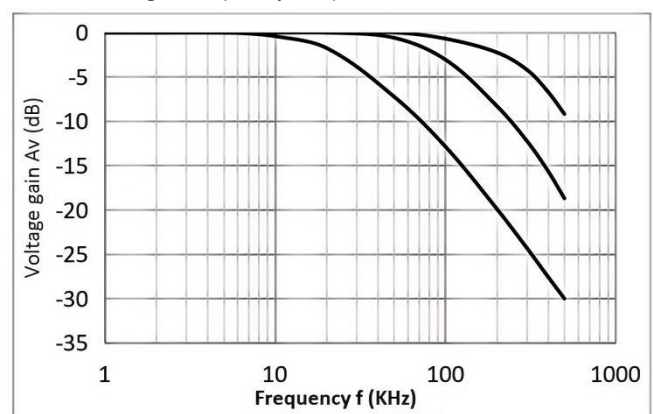
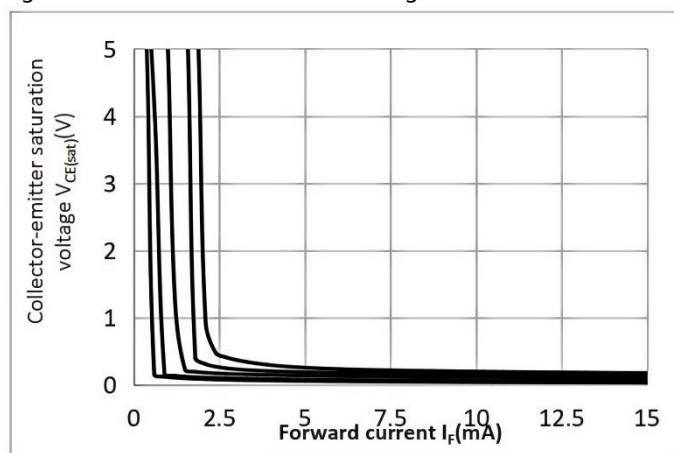


Fig.9 Collector-emitter Saturation Voltage vs Forward Current



回流焊温度曲线图 Solder Reflow Profile

1. 焊接注意事项

不管是使用烙铁还是回流焊，焊接温度应尽可能接近下面所示的条件。

• 回流焊时

回流焊不超过 260° C 时须在 10 秒内完成焊接，焊接温度曲线是基于塑封体表面温度（见下图，以塑封体表面温度为基准）

回流焊只限过一至两次。

拆开包装后必须在 2 周内使用完。

Welding precautions

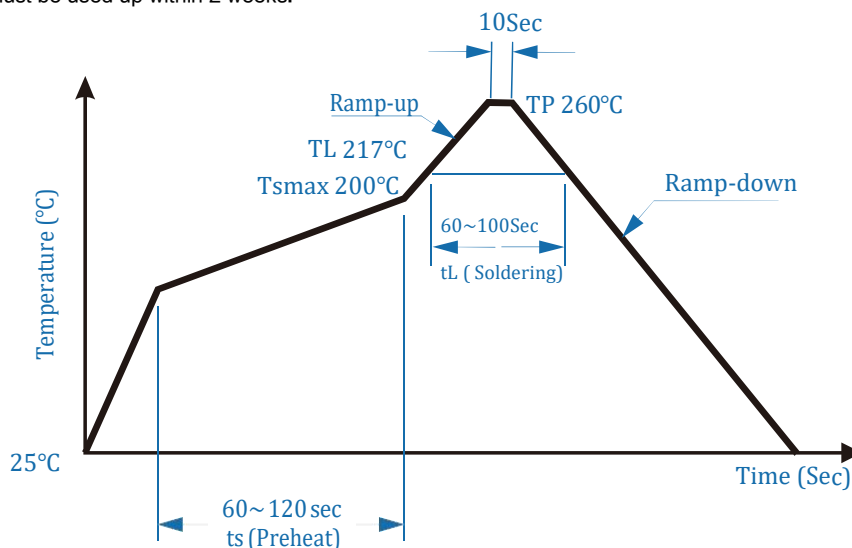
Whether using a soldering iron or reflow soldering, the soldering temperature should be as close as possible to the conditions shown below.

During reflow soldering

When reflow soldering does not exceed 260 ° C, the soldering must be completed within 10 seconds. The soldering temperature curve is based on the surface temperature of the plastic enclosure (see the figure below, with the surface temperature of the plastic enclosure as the reference)

Reflow soldering is only allowed once or twice.

After unpacking, it must be used up within 2 weeks.



• 波峰焊

建议在温度条件下进行一次性焊接。

温度：260+0/-5°C

时间：10 秒。

预热温度：25 至 140°C，

预热时间：30 至 80 秒。

• Wave soldering

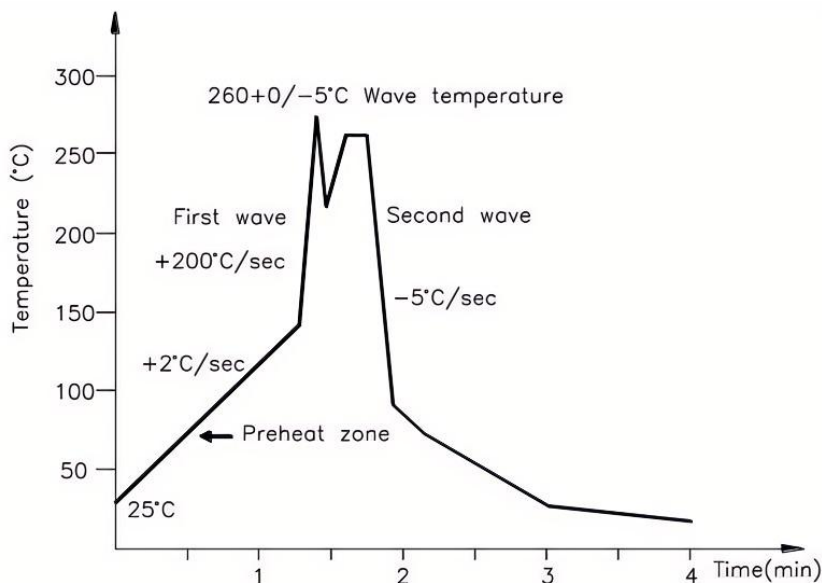
It is recommended to perform one-time welding under temperature conditions.

Temperature: 260+0/-5 °C

Time: 10 seconds.

Preheating temperature: 25 to 140 °C,

Preheating time: 30 to 80 seconds.



• 使用烙铁焊接

建议在温度条件下进行一次性焊接。

温度: 260+0/-5 ° C; 时间: 10 秒。

预热温度: 25 至 140 ° C, 预热时间: 30 至 80 秒。

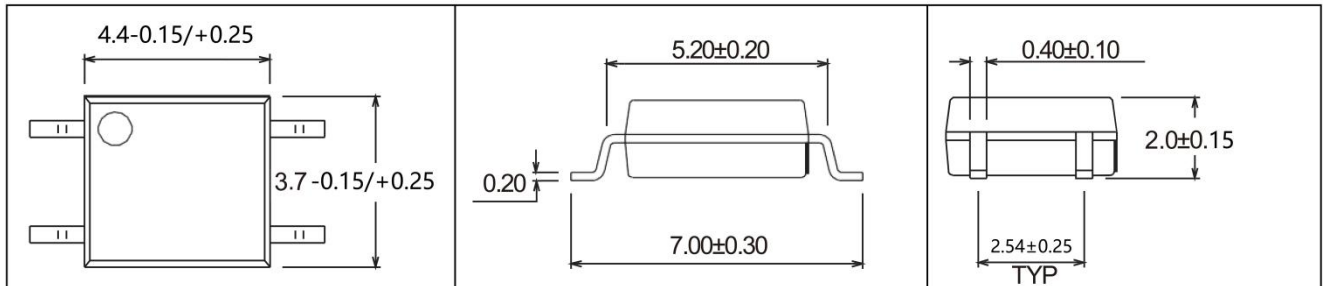
• Use a soldering iron to weld

It is recommended to perform one-time welding under temperature conditions.

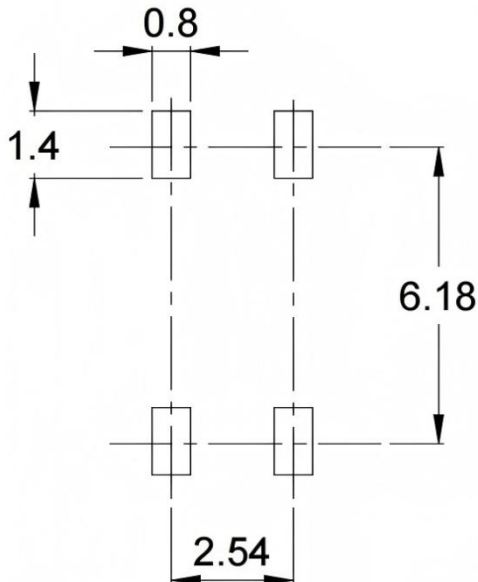
Temperature: 260+0/-5 ° C; Time: 10 seconds.

Preheating temperature: 25 to 140 ° C, preheating time: 30 to 80 seconds.

封装尺寸(单位:mm)Outline Dimension (Unit:mm)



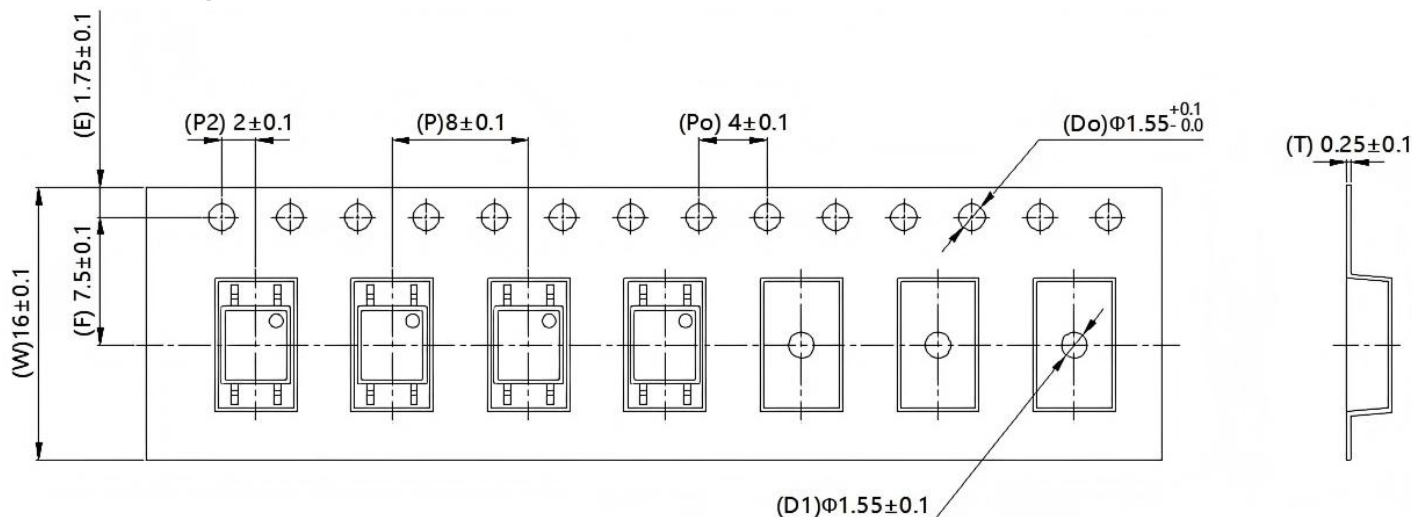
建议焊盘布局 (单位: mm) Recommended pad layout (Unit: mm)



包装 Packing

封装形式 Package Type	包装方式 Packing Form	盘数量 Quantity per Reel	盒数量 Quantity per Box	箱数量 Quantity per Carton	静电袋 Antistatic Bag Specification	盒规格 Box Specification	箱规格 Carton Specification
SOP4	卷盘 Reel (φ330mm)	3000 PCS/盘 (reel)	15000 PCS/盒 (box)	60000 PCS/箱 (ctn)	-	355*90*337mm	377*347*355mm

编带尺寸 Tape dimensions



产品型号命名规则 Order Code

CY 354 (X - W) (ZZ)

①

②

③

④

⑤

1. 公司代码：CY 代表公司简称

Company code: CY stands for Company Abbreviation

2. 产品系列：354

Product series: 354

3. CTR 档位：X 代表档位，如 A、B；也可为空

CTR gear: X represents gear, such as A, B; can also be empty

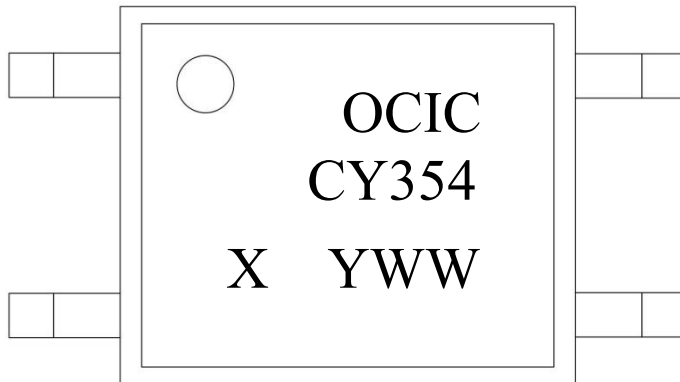
4. 包装形式：W 代表包装形式，如 TP 为卷盘包装，空为管装

Packaging form: W represents packaging form, such as TP for reel packaging and empty for tube packaging

5. 内部补充代码：ZZ 代表内部补充代码，数字或者空白

Internal supplementary code: ZZ represents internal supplementary code, numerical or blank

印丝 Marking Information



- 印字中“OCIC”表示为品牌 LOGO

In the printing, "OCIC" represents the brand logo

- 印字中“CY354”表示为产品系列

In the printing, "CY354" represents the product series

- 印字中“XX”代表档位：A、B...

In the printing, "XX" represents the gear position: A、B...

- 印字中“Y”代表年份：1(2021),2(2022),3(2023)...

In the printing, "Y" represents the year: 1 (2021), 2 (2022), 3 (2023)

- 印字中“WW”代表周期：01 (第一周),02(第二周)....

In the printing, "WW" represents the cycle: 01 (first week), 02 (second week)

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Before placing an order, please confirm that the information on hand is the latest version, and the customer needs to confirm that the chip does meet their needs and can meet their requirements.

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