



佛山市国星光电股份有限公司

FOSHAN NATIONSTAR OPTOELECTRONICS CO., LTD

产品规格书

SPECIFICATION

顾客名称 Customer		产品名称 Product	光电耦合器 Photocoupler
顾客型号 Customer Type		产品型号 Type	FOC-817XX-X
顾客部品号 Customer No.		版本号 Version NO	A1 版



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邮编 (Zip): 528000

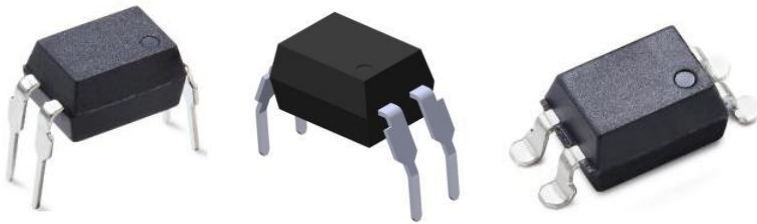
<http://www.nationstar.com>

光电子研发部 Research & Development			客户 (加盖公章) Customer (Stamp)
制 定 DRAW	审 核 CHECK	批 准 APPROVE	确 认 CONFIRM
林 格兰	喻 晓鹏	朱 明军	
发放日期 (Release Date): 2024-01-16			

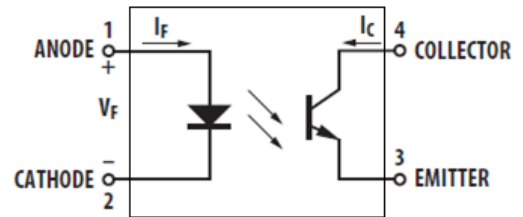
一、概述 Description

FOC-817 产品由一个红外发光二极管和一个光电晶体管组成; 光耦器件可实现不同电路之间的电气隔离和信号传输, 产品广泛应用于电源设备上, 例如手机充电器, 家电产品电源供应器等。

FOC-817 photocoupler consist of an infrared light-emitting diode and a phototransistor. The devices can realize electrical isolation and signal transmission between different circuits, The products are widely used in power supply equipment, such as mobile phone charger, home appliance product power supply device, etc.



Schematic



引脚排列 Pin Configuration

1. 正极 Anode
2. 负极 Cathode
3. 发射极 Emitter
4. 集电极 Collector

二、特性 Features

✧ 电流转换比(CTR: 50%-600% @ $I_F=5\text{mA}$, $V_{CE}=5\text{V}$)

Current transfer ratio (CTR: 50%-600% @ $I_F=5\text{mA}$, $V_{CE}=5\text{V}$)

✧ 输入-输出隔离电压: ($V_{iso}=5,000\text{Vrms}$)

High isolation voltage between input and output($V_{iso}=5,000\text{Vrms}$)

✧ 爬电距离>7.62mm

Creepage distance > 7.62mm

✧ 工作温度最高可达+ 110℃

Operating temperature up to +110℃

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

Collector-Emitter voltage $BV_{CEO} \geq 80\text{V}$

✧ CQC认证 (证书编号: CQC22001368068)

CQC approved (No. CQC22001368068)

✧ VDE认证 (证书编号: 40056339)

VDE approved (No. 40056339)

✧ UL和cUL认证 (证书编号: E531268)

UL&cUL approved (No. E531268)

✧ 产品符合RoHS、REACH及HF等环保法规要求;

The products comply with RoHS, REACH and HF;

三、电性参数 Electrical Characteristics

◇最大绝对额定值 (常温=25℃)

Absolute Maximum Ratings (Temperature=25 ℃)

参数名称 Parameter		符号 Symbol	数值 Rating	单位 Unit
输入 Input	正向电流 Forward Current	I_F	50	mA
	反向电压 Reverse Voltage	V_R	6	V
	功耗 Power Dissipation	P_D	70	mW
输出 Output	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}	6	
	集电极电流 Collector current	I_C	50	mA
	功耗 Power Dissipation	P_C	180	mW
总功率消耗 Total Power Dissipation		P_{tot}	200	mW
*1 隔离电压 *1 Isolation Voltage		V_{iso}	5,000	Vrms
工作温度 Operating Temperature		T_{opr}	-55 to + 110	℃
存贮温度 Storage Temperature		T_{stg}	-55 to + 125	
*2 焊锡温度 *2 Soldering Temperature		T_{sol}	260	

* 注:

*1.交流测试, 时间 1 分钟, 湿度.=40~60%;

*1.AC For 1 Minute, R.H. = 40 ~ 60%;

隔离电压测试的方法如下:

Isolation voltage shall be measured using the following method:

(1) 将产品的两端短路;

(1) Short between anode and cathode on the primary side and between collector and emitter on the secondary side;

(2) 测试隔离电压时无电流通过;

(2) The isolation voltage tester with zero-cross circuit shall be used;

(3) 测试时加正弦波形电压。

(3) The waveform of applied voltage shall be a sine wave.

*2.锡焊时间为 10 秒

*2. Soldering time is 10 seconds

◇ 电性参数 (温度=25℃):

Electrical Characteristics (Temperature=25 °C)

参数名称 Parameter	符号 Symbol	条件 Condition	最小值 Min.	典型值 Typ.	最大值 Max.	单位 Unit
输入 Input	正向电压 Forward Voltage	$I_F=20\text{mA}$	---	1.2	1.4	V
	反向电流 Reverse Current	$V_R=4\text{V}$	---	---	10	μA
	终端电容 Terminal Capacitance	$V=0, f=1\text{MHz}$	---	30	250	pF
输出 Output	集电极暗电流 Collector dark current	$V_{CE}=20\text{V}, I_F=0$	---	---	100	nA
	集电极-发射极击穿电压 Collector-Emitter breakdown voltage	$I_C=0.1\text{mA}$ $I_F=0\text{mA}$	80	---	---	V
	发射极-集电极击穿电压 Emitter-Collector breakdown voltage	$I_E=10\mu\text{A}$ $I_F=0\text{mA}$	6	---	---	V
传输特性 transfer characteristic	集电极电流 Collector Current	$I_F=5\text{mA}$	2.5	---	30	mA
	*1 电流转换比 *1 Current conversion ratio	$V_{CE}=5\text{V}$	50	---	600	%
	集电极-发射极饱和电压 Collector-Emitter Saturation Voltage	$I_F=20\text{mA}$ $I_C=1\text{mA}$	---	0.1	0.2	V
	绝缘电阻 Isolation resistance	DC500V 40~60%R.H.	1×10^{12}	---	---	Ω
	隔离电容 Floating Capacitance	$V=0, f=1\text{MHz}$	---	0.6	1	pF
	转换频率 Cut-off Frequency	$V_{CE}=5\text{V}, I_C=2\text{mA}$ $R_L=100\Omega, -3\text{dB}$	---	80	---	kHz
	上升时间 Rise time	$V_{CE}=2\text{V}, I_C=2\text{mA}$	---	4	18	μs
	下降时间 Fall time	$R_L=100\Omega$	---	3	18	μs

注: *1 电流转换比= $I_C / I_F \times 100\%$, 公差 $\pm 3\%$ 。

*1 Current Conversion Ratio = $I_C / I_F \times 100\%$, Tolerance: $\pm 3\%$.

◇ 电流转换比等级表(温度=25℃):

Rank Table of Current Transfer Ratio(Temperature=25 °C)

等级标识 Grade Sign	最小.Min (%)	最大.Max (%)
L	50	100
A	80	160
B	130	260
C	200	400
D	300	600
L or A or B or C or D	50	600

四、特性曲线 Characteristics Curves

Fig.1 正向电流与环境温度特性曲线
Forward Current vs. Ambient Temperature

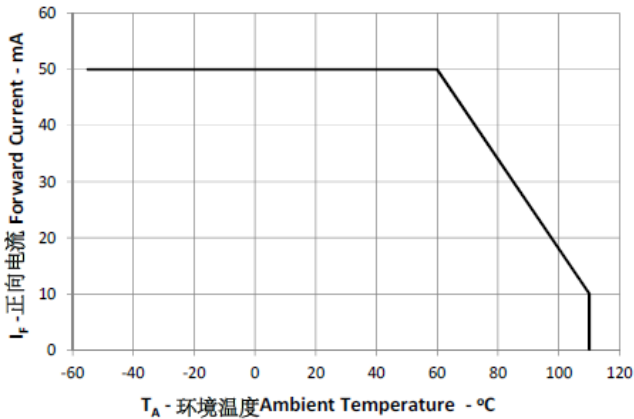


Fig.2 正向电流与正向压降特性曲线
Forward Current vs. Forward Voltage

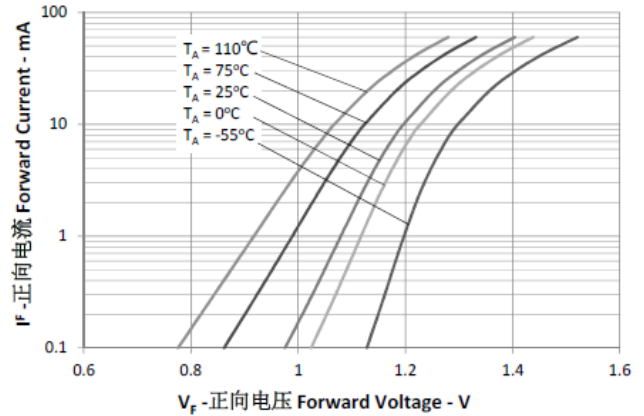


Fig.3 集电极功耗与环境温度特性曲线
Collector Power Dissipation vs. Ambient Temperature

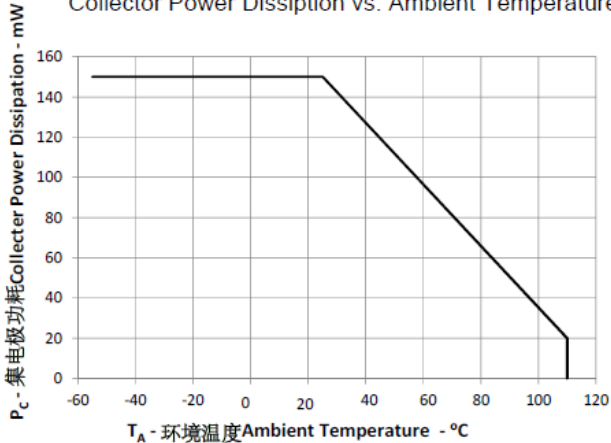


Fig.4 集电极电流与集电极-发射极电压特性曲线
Collector Current vs. Collector-emitter Voltage

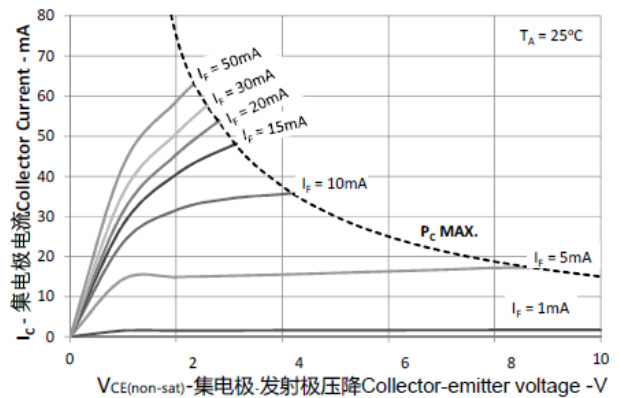


Fig.5 电流转换比与正向电流特性曲线
Current Transfer Ratio vs. Forward Current

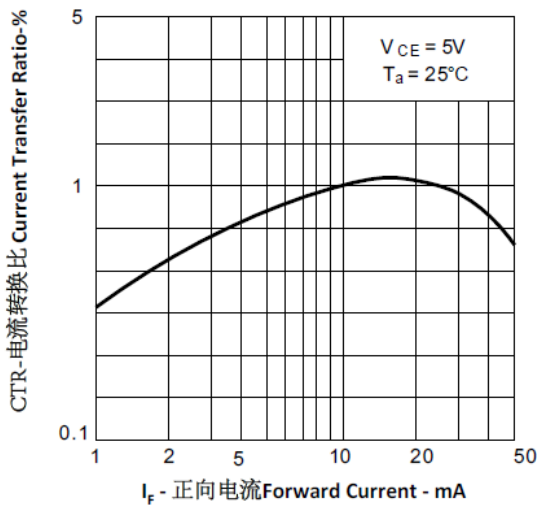


Fig.6 相对电流转换比与环境温度特性曲线
Relative Current Transfer Ratio vs. Ambient Temperature

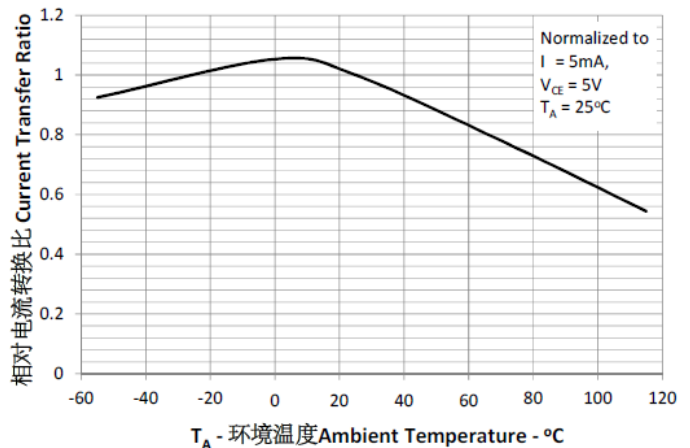


Fig.7 集电极-发射极饱和压降与环境温度特性曲线
Collector-emitter Saturation Voltage vs. Ambient Temperature

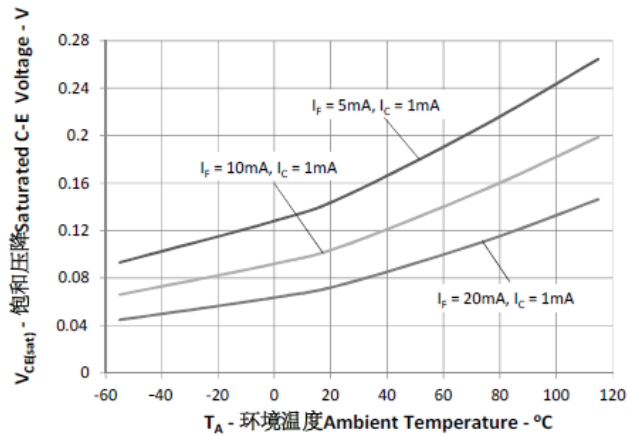


Fig.8 集电极暗电流与环境温度特性曲线
Collector Dark Current vs. Ambient Temperature

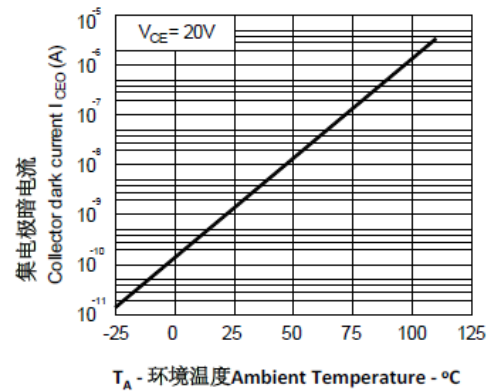


Fig.9 集电极-发射极饱和压降与正向电流特性曲线
Collector-emitter Saturation Voltage vs. Forward Current

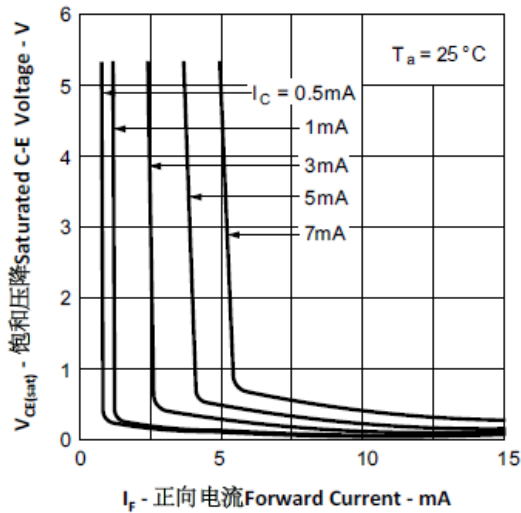


Fig.10 响应时间与负载电阻特性曲线
Response Time vs. Load Resistance

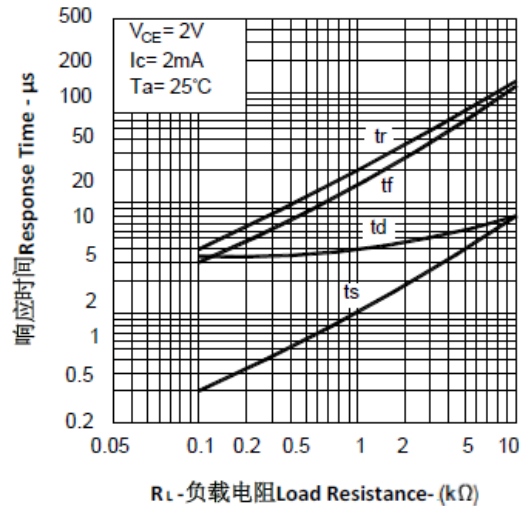
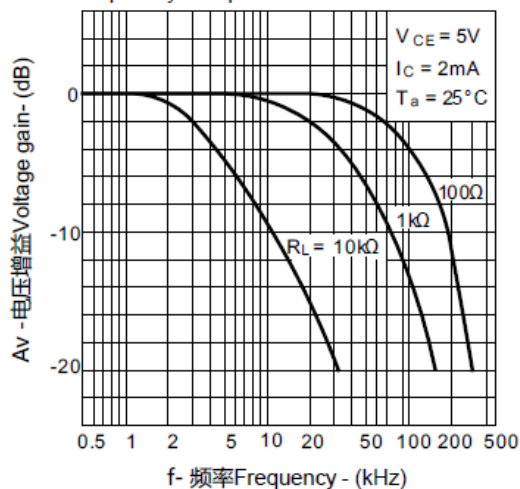
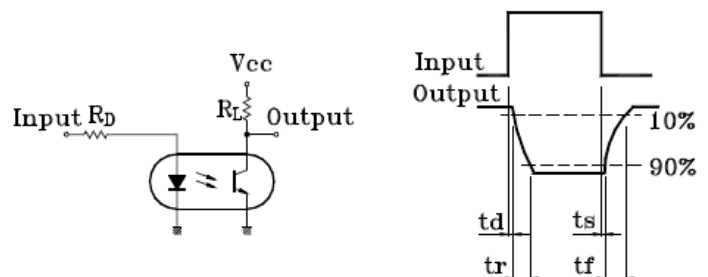


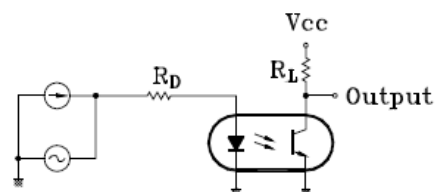
Fig.11 频率响应特性曲线
Frequency Response



响应时间测试电路 Test Circuit for Response Time

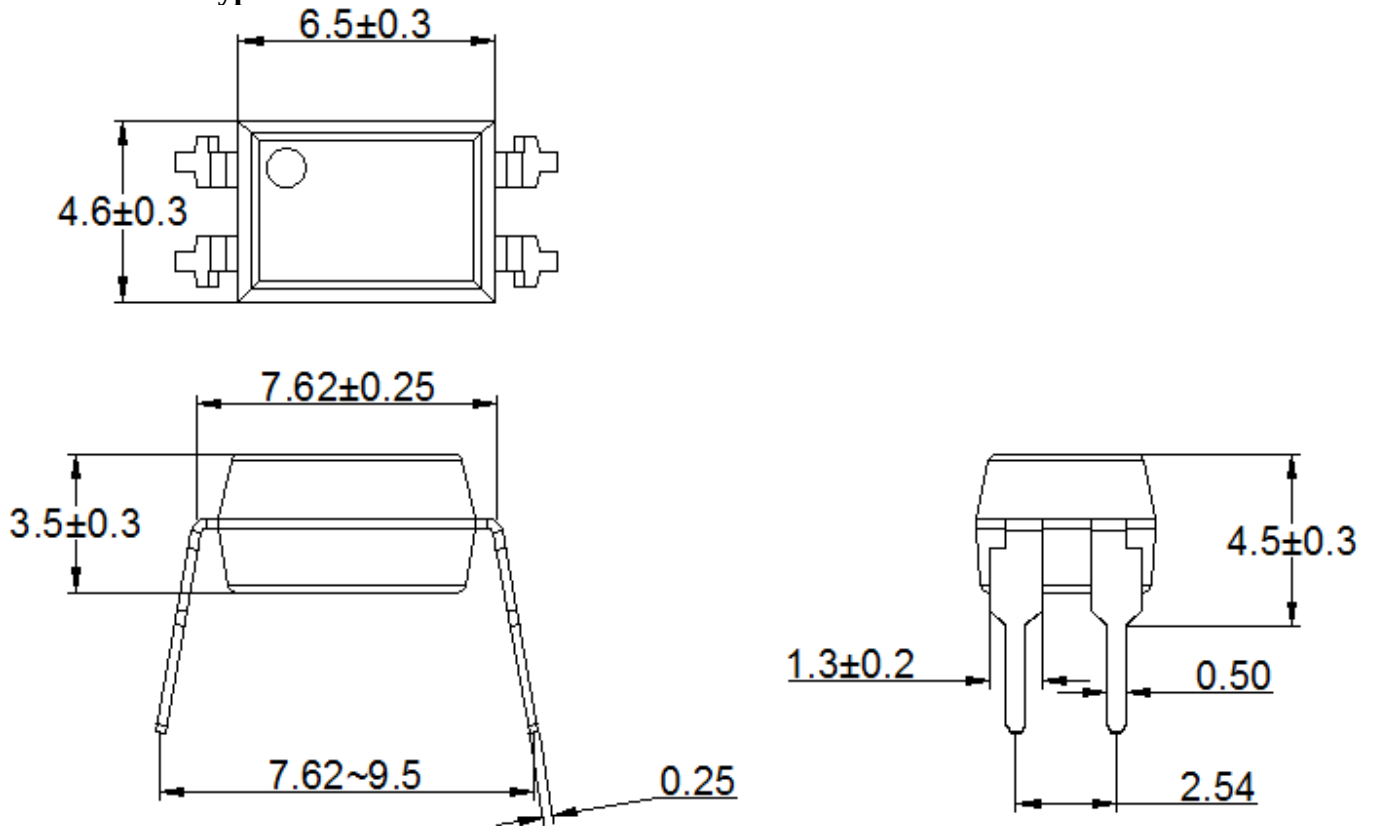


频率响应测试电路 Test Circuit for Frequency Response

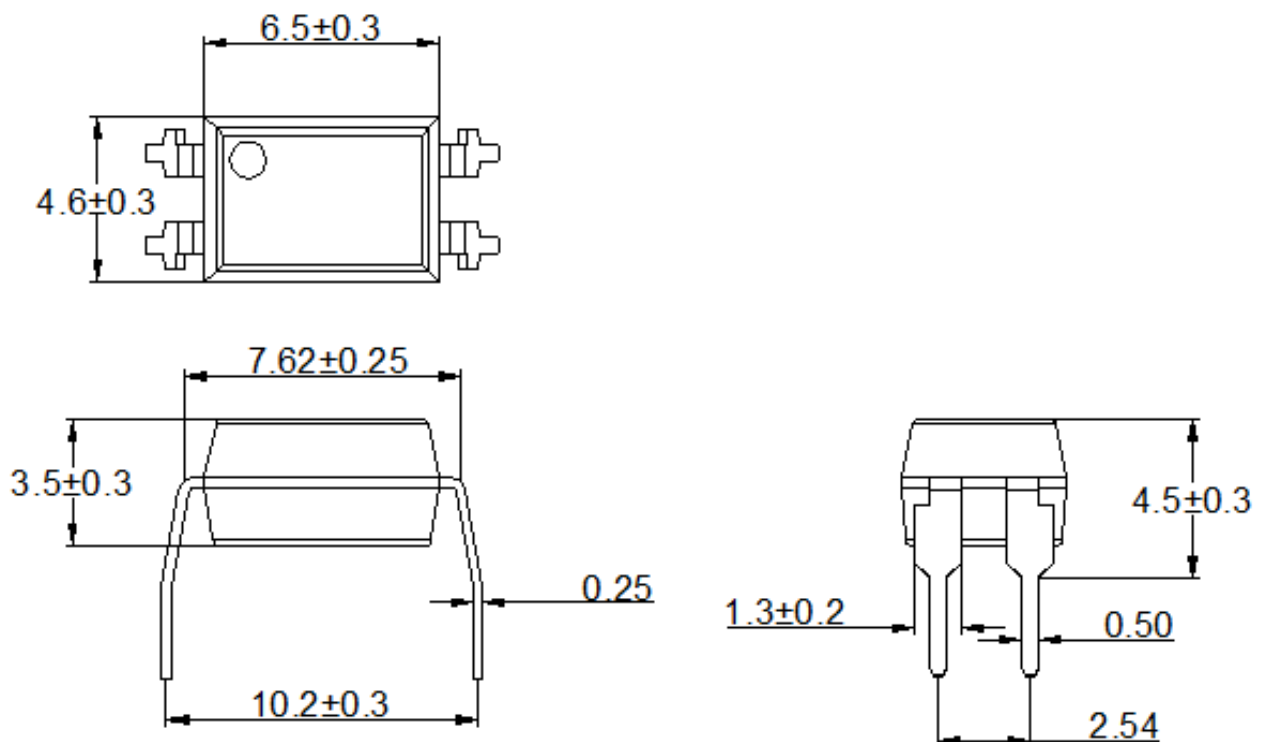


五、外形尺寸 (单位: mm) Package Dimension (Unit: mm)

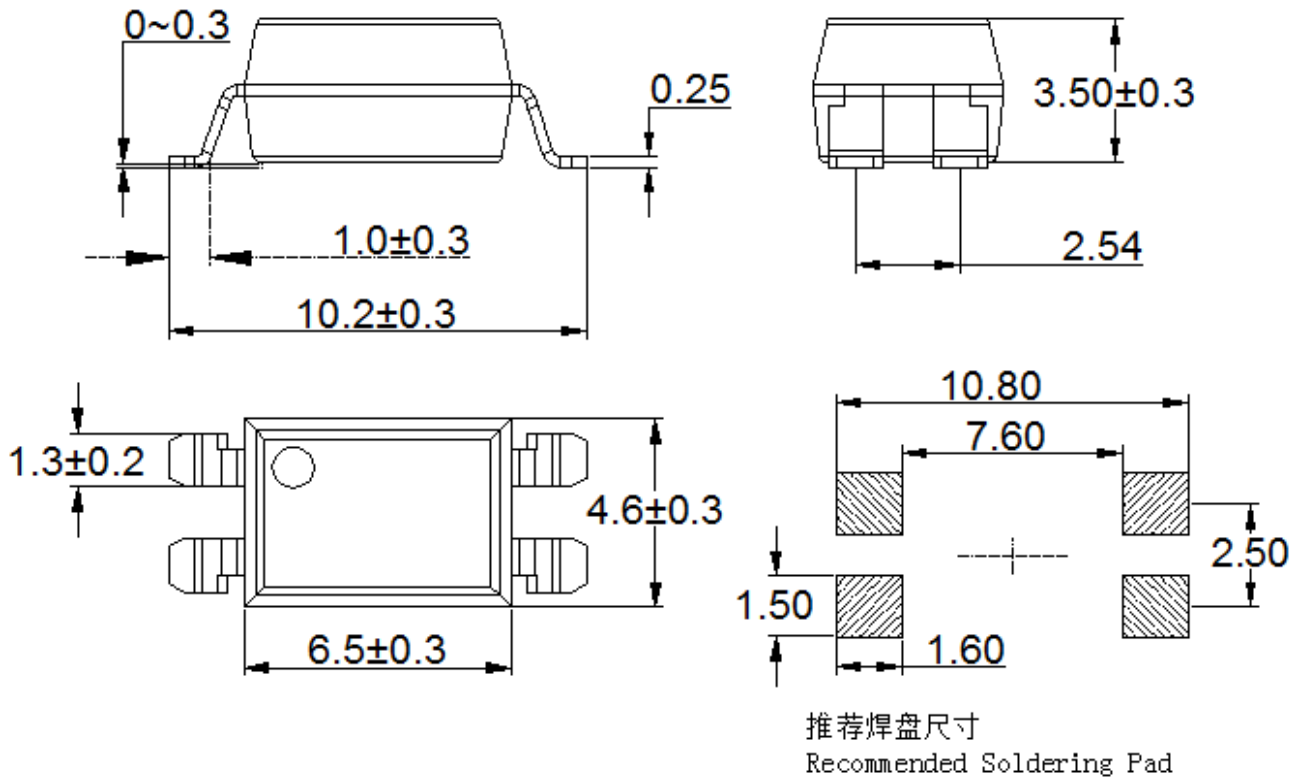
Standard DIP Type:



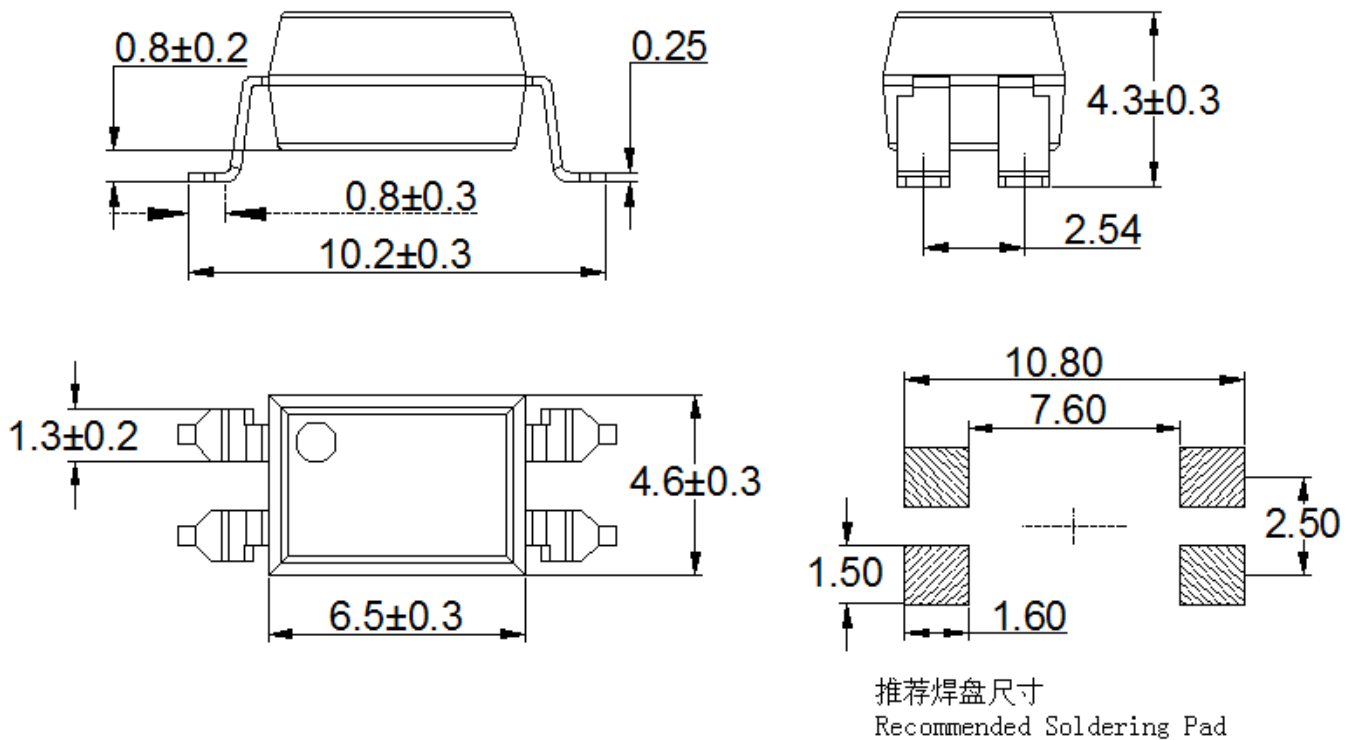
Option M Type:



Option S Type:



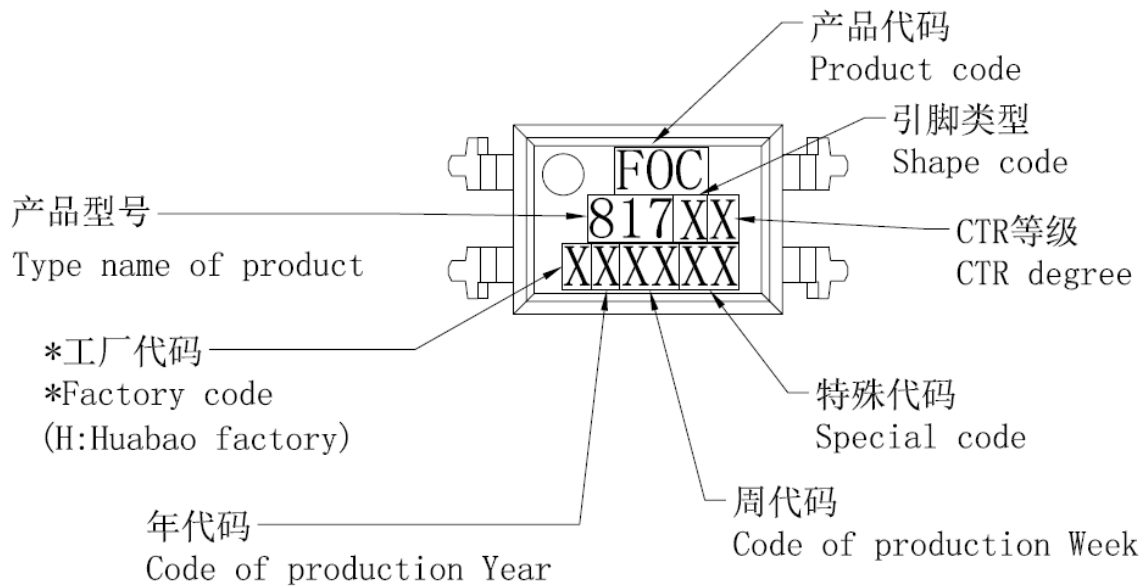
Option S1 Type:



未注公差: ±0.1mm

The Tolerances Unless Mentioned is : ±0.1mm

六、产品印字 Device Marking



七、产品包装 Packaging

Standard DIP& M Type:

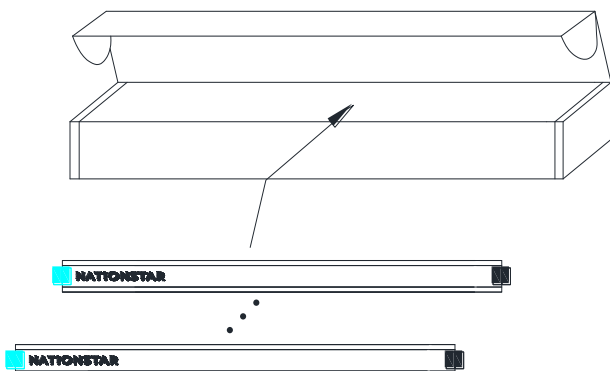
◇ 包装管 Packaging Tube



包装管长 500mm, 每条包装管装 100pcs 产品, 每管使用蓝白胶塞, 方向一致;

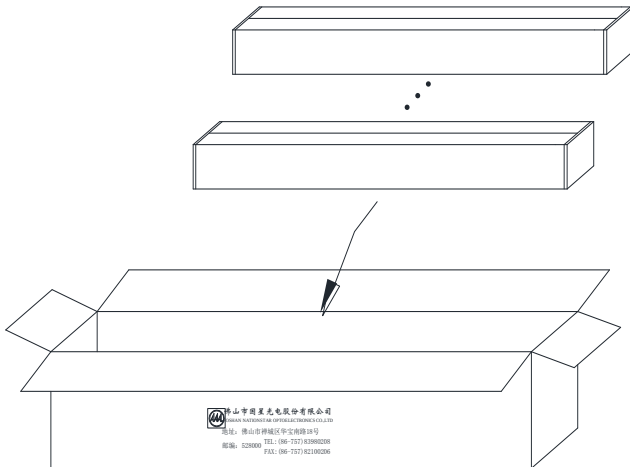
The packing tube is 500mm long, contains 100 units per tube, Blue and white plugs were used for each tube In the same direction;

◇ 内盒 Inner Box



每个内盒装 50 条包装管, 每盒 5000pcs 产品;
Each inner box contains 50 packing tube, 5000pcs product per box;

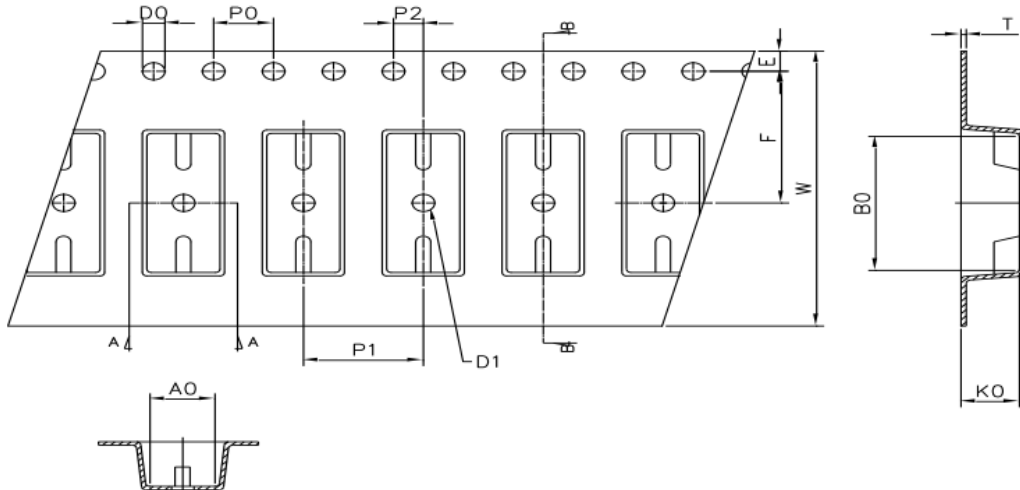
◇ 包装外箱 Cardboard Box



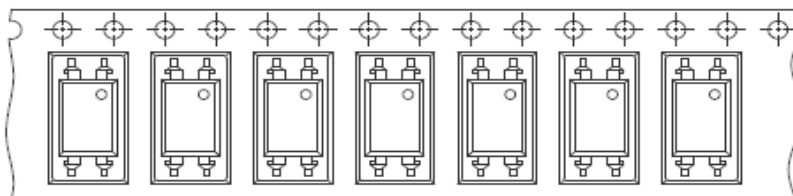
每个外箱装 10 个内盒，
每箱共装 50000pcs 产品；
Each outer box contains 10
inner boxes，
50000pcs product per box

S & S1 Type:

◇ 包装 : **S Type:**2000pcs/卷; **S1 Type:**1500pcs/卷



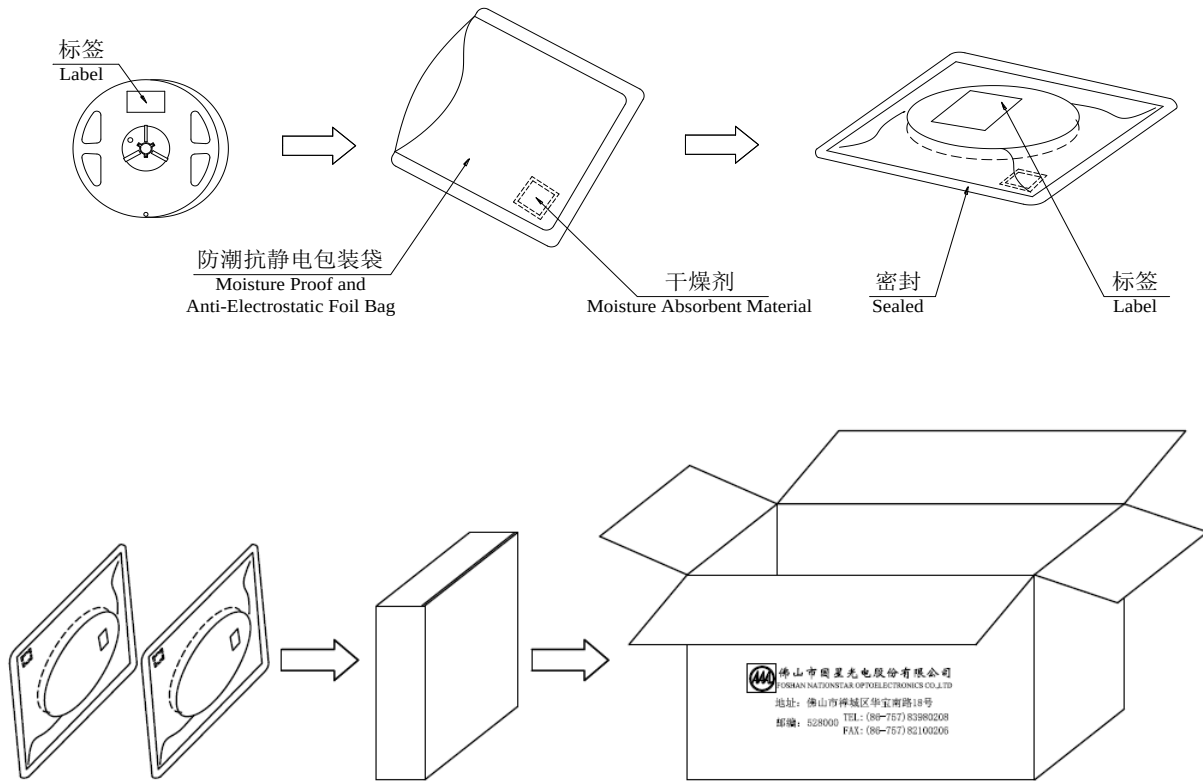
Dimension No.	Ao	Bo	Do	D1	Po	P1	P2	E	F	T	W	Ko
	+0.10 -0.10	+0.10 -0.10	+0.10 -0.00	+0.10 -0.00	+0.10 -0.10	+0.10 -0.10	+0.10 -0.10	+0.10 -0.10	+0.10 -0.10	+0.05 -0.05	+0.30 -0.10	+0.10 -0.10
Dimension (mm) S	5.10	10.50	1.50	1.50	4.00	8.00	2.00	1.75	7.50	0.40	16.00	4.20
Dimension (mm) S1	5.00	10.50	1.50	1.50	4.00	8.00	2.00	1.75	7.50	0.40	16.00	4.80



Direction of feed from reel



◇ **防潮抗静电真空包装 Moisture Proof and Anti-Electrostatic Foil Bag**



每个内盒装 2 卷; 每个外箱装 10 个内盒;

Each inner box contains 2 packing bag; Each outer box contains 10 inner boxes;

◇ **标签说明 Label Explanation**

TYPE: 产品型号

QTY: 数量 Quantity

BIN: 分档 Rank

SC: 分档表编号

LOT: 批号 Lot Number

IF: 测试电流 Testing Current

CTR: CTR 等级 CTR Rank

	光耦 817	
TYPE: FOC-817XX-X		
QTY: XXXX	IF(mA): XX	
SC: XXX	CTR: X	
BIN: XXX	QC: 	
LOT: XXXXXX		
FOSHAN NATIONSTAR OPTOELECTRONICS CO., LTD 佛山市国星光电股份有限公司		

备注: 标签模板仅供参考, 请以实际参数为准!

八、使用注意事项 Precautions for Use

✧ 波峰焊接条件 Wave soldering Condition

建议在以下温度条件下进行一次性焊接:

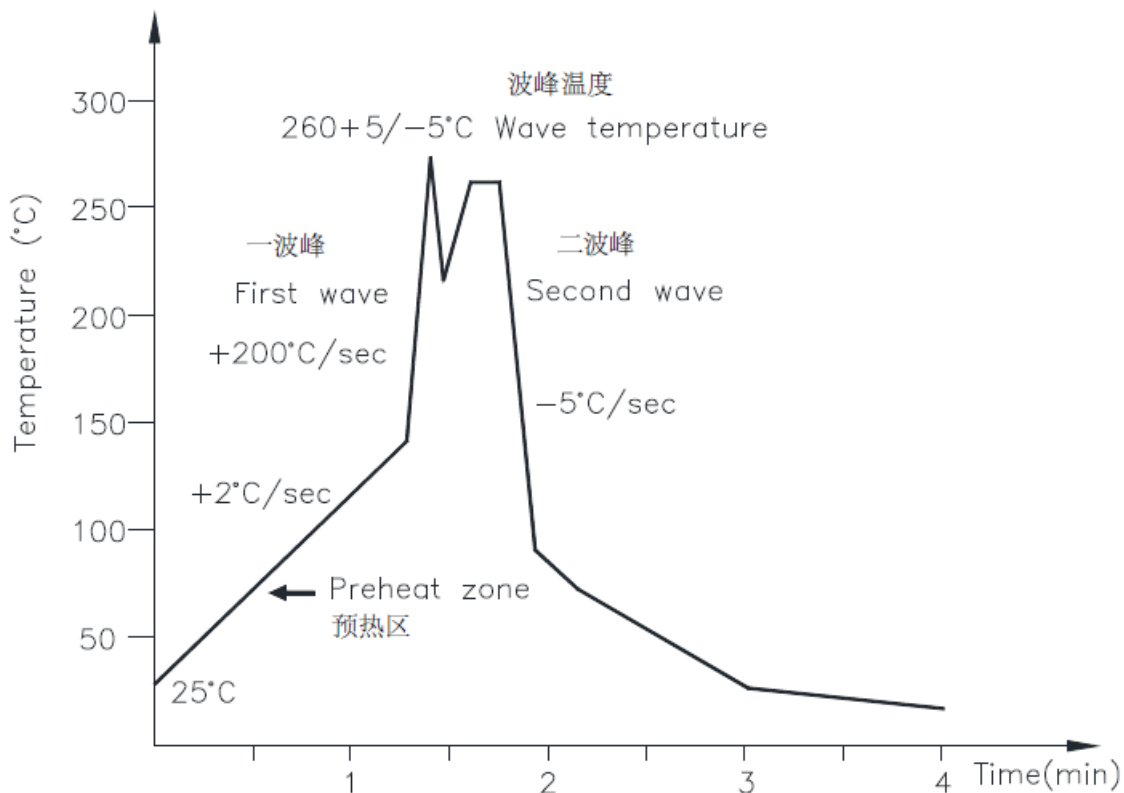
One time soldering is recommended within the condition of temperature:

温度 Temperature: $260 \pm 5 / -5^\circ\text{C}$

时间 Time: 10 sec

预热温度 Preheat temperature: 25 to 140°C

预热时间 Preheat time: 30 to 80 sec



✧ 手工焊接条件 Hand soldering Condition

用电烙铁一次性手工性焊接条件:

Hand soldering by soldering iron, One time soldering is recommended:

温度 Temperature: $380 \pm 5 / -5^\circ\text{C}$

时间 Time: 3 sec max

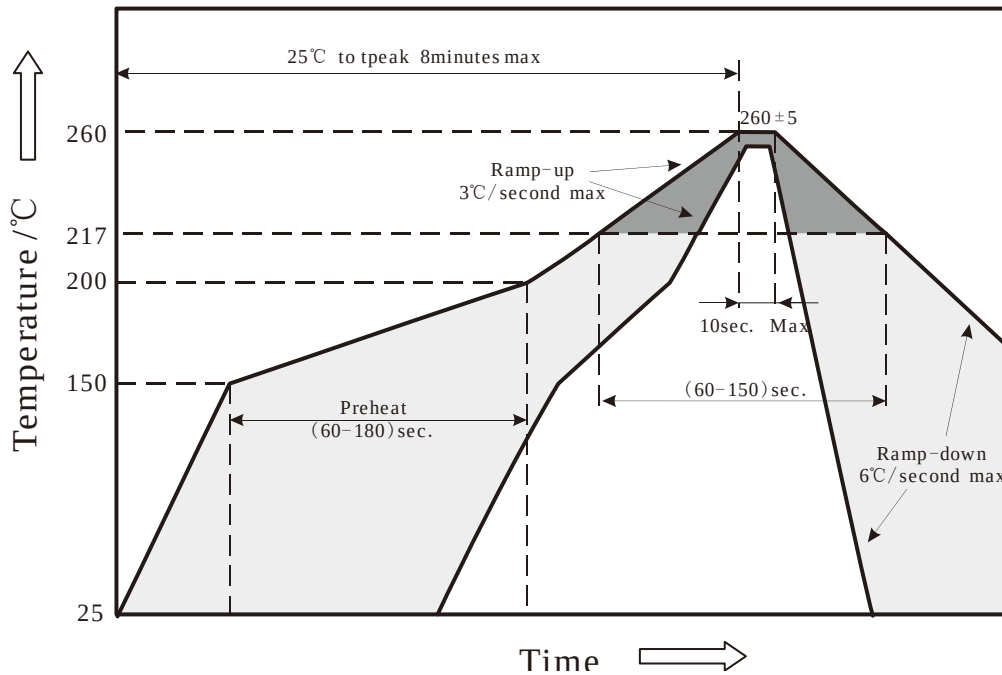
✧ 回流焊接: Reflow Soldering

在回流焊接升温过程中, 请不要对器件施加任何压力。

Stress on the product should be avoided during heating in soldering process.

在焊接完成后, 待产品温度下降到室温之后, 再进行其他处理。

After soldering, do not deal with the product before its temperature drop down to room temperature.



九、免责声明 Precautions for Use

- 1、国星光电保留随时更改其产品和规格的权利, 恕不另行通知;
- 1、Nationstar reserves the right to make changes to its products and specifications at any time without notice;
- 2、规格书中所示的图表仅表示典型数据, 而非保证值;
- 2、The graphs shown in this datasheet are representing typical data only and do not show guaranteed values;
- 3、在最终设计、购买或使用之前, 客户应获取并确认最新的产品信息和规格;
- 3、Customers should obtain and confirm the latest product information and specifications before final design, purchase or use;