

# BRCS150P04SCQ

Rev.A Dec.-2023

## 描述 / Descriptions

SOP-8 塑封封装 P 沟道场效应管。

P-Channel Enhancement Mode Field Effect Transistor in a SOP-8 Plastic Package.

## 特征 / Features

$V_{DS} (V) = -40V$

$I_D = -10 A (V_{GS} = \pm 20V)$

$R_{DS(ON)} < 15m\Omega (V_{GS} = -10V)$

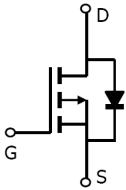
符合 AEC-Q101 标准高可靠性要求，无卤产品。Qualified to AEC-Q101 Standards for High Reliability, HF Product.

## 用途 / Applications

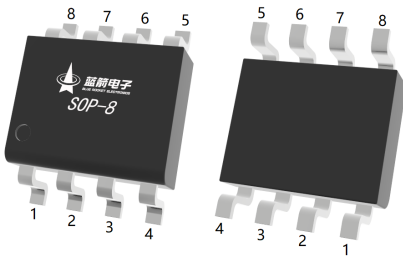
用于电源管理，便携式设备和电池供电系统，满足汽车应用的严格要求。

Power Management in Notebook computer, Portable Equipment and Battery powered systems, Meet the stringent requirements of automotive applications.

## 内部等效电路 / Equivalent Circuit



## 引脚排列 / Pinning



PIN 1 : S    PIN 2 : S    PIN 3 : S    PIN 4 : G  
PIN 5 : D    PIN 6 : D    PIN 7 : D    PIN 8 : D

## 印章代码 / Marking

见印章说明。

See Marking Instructions.

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

| 参数<br>Parameter                        | 符号<br>Symbol                          | 数值<br>Rating | 单位<br>Unit |
|--|---------------------------------------|--------------|------------|
| Drain-Source Voltage                   | V <sub>DSS</sub>                      | -40          | V          |
| Gate-Source Voltage                    | V <sub>GSS</sub>                      | ±20          | V          |
| Continuous Drain Current               | I <sub>D</sub> (T <sub>a</sub> =25°C) | -10          | A          |
| Continuous Drain Current               | I <sub>D</sub> (T <sub>a</sub> =70°C) | -8           | A          |
| Power Dissipation for Single Operation | P <sub>D</sub> (T <sub>a</sub> =25°C) | 1.7          | W          |
| Power Dissipation for Single Operation | P <sub>D</sub> (T <sub>a</sub> =70°C) | 1.1          | W          |
| Maximum Junction Temperature           | T <sub>j</sub>                        | 150          | °C         |
| Storage Temperature Range              | T <sub>stg</sub>                      | -55 ~ 150    | °C         |
| Thermal Resistance-Junction to Ambient | R <sub>θJA</sub> ( t ≤ 10s )          | 40           | °C/W       |
| Thermal Resistance-Junction to Ambient | R <sub>θJA</sub>                      | 75           | °C/W       |
| Maximum Junction-to-Lead               | R <sub>θJL</sub>                      | 24           | °C/W       |

## 电性能参数 / Electrical Characteristics(Ta=25°C)

| 参数<br>Parameter                   | 符号<br>Symbol | 测试条件<br>Test Conditions  | 最小值<br>Min    | 典型值<br>Typ | 最大值<br>Max | 单位<br>Unit |
|-----------------------------------|--------------|--|---------------|------------|------------|------------|
| Drain-Source Breakdown Voltage    | $BV_{DSS}$   | $I_D=-250\mu A$ $V_{GS}=0V$                                    | -40           |            |            | V          |
| Zero Gate Voltage Drain Current   | $I_{DSS}$    | $V_{DS}=-40V$ $V_{GS}=0V$                                      |               |            | -1.0       | $\mu A$    |
|                                   |              | $V_{DS}=-40V$ $V_{GS}=0V$<br>$T_J=55^\circ C$                  |               |            | -5.0       |            |
| Gate-Body leakage current         | $I_{GSS}$    | $V_{DS}=0V$ $V_{GS}=\pm 20V$                                   |               |            | $\pm 100$  | nA         |
| Gate Threshold Voltage            | $V_{GS(th)}$ | $V_{DS}=V_{GS}$ $I_D=-250\mu A$                                | -1.2          | -1.6       | -2.5       | V          |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}=-10V$ $I_D=-10A$                                       |               | 13.1       | 15         | m $\Omega$ |
|                                   |              | $V_{GS}=-4.5V$ $I_D=-7A$                                       |               | 18         | 21         |            |
| Forward Transconductance          | $g_{FS}$     | $V_{DS}=-5V$ $I_D=-10A$  |               | 9.5        |            | S          |
| Diode Forward Voltage             | $V_{SD}$     | $I_S=-1A$ $V_{GS}=0V$  |               | -0.8       | -1.0       | V          |
| Total Gate Charge                 | $Q_g(10V)$   | $V_{GS}=-10V$ $V_{DS}=-20V$<br>$I_D=-10A$                      |               | 42         | 55         | nC         |
| Total Gate Charge                 | $Q_g(4.5V)$  |  |               | 18.6       |            |            |
| Gate-Source Charge                | $Q_{gs}$     |  |               | 7          |            |            |
| Gate-Drain Charge                 | $Q_{gd}$     |  |               | 8.6        |            |            |
| Gate Resistance                   | $R_g$        | $V_{GS}=0V$ $f=1MHz$   | $V_{DS}=0V$   |            | 8.5        | $\Omega$   |
| Input Capacitance                 | $C_{iss}$    | $V_{GS}=0V$ $f=1MHz$   | $V_{DS}=-25V$ |            | 3300       | pF         |
| Output Capacitance                | $C_{oss}$    |  |               |            | 135        |            |
| Reverse Transfer Capacitance      | $C_{riss}$   |  |               |            | 177        |            |
| Turn-on Delay Time                | $t_{d(ON)}$  | $V_{GS}=-10V$ $V_{DS}=-20V$<br>$R_L=2\Omega$ $R_{GEN}=3\Omega$ |               | 9.4        |            | ns         |
| Turn-on Rise Time                 | $t_r$        |  |               | 20         |            |            |
| Turn-off Delay Time               | $t_{d(OFF)}$ |  |               | 55         |            |            |
| Turn-off Fall Time                | $t_f$        |  |               | 30         |            |            |

电参数曲线图 / Electrical Characteristic Curve

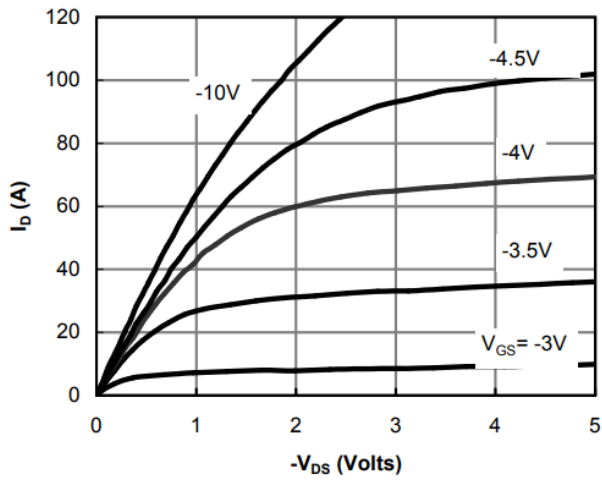


Figure 1: On-Region Characteristics

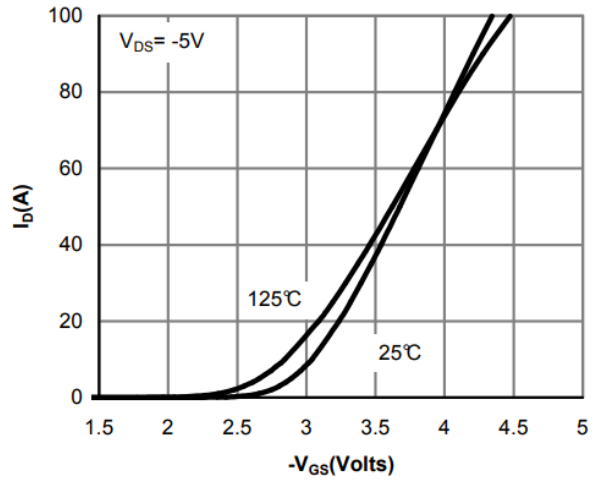


Figure 2: Transfer Characteristics

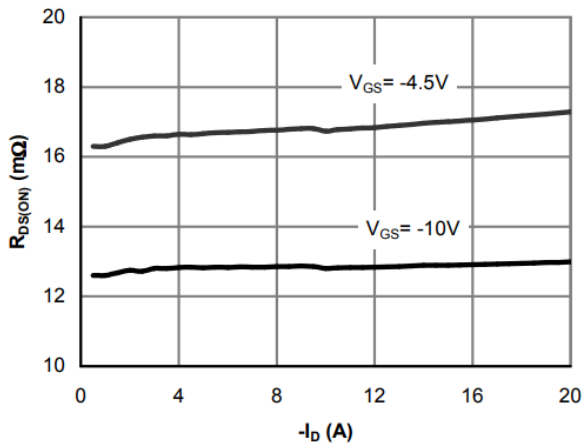


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

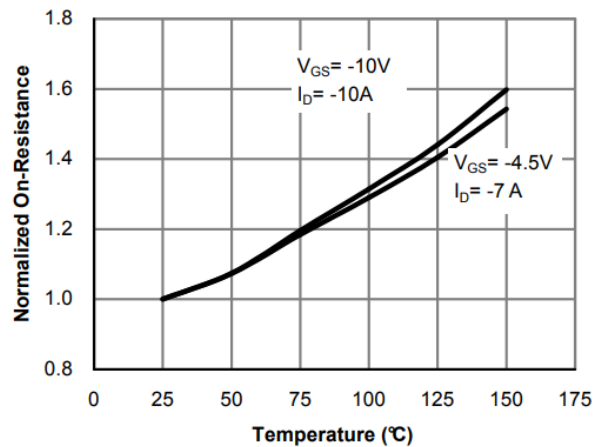


Figure 4: On-Resistance vs. Junction Temperature

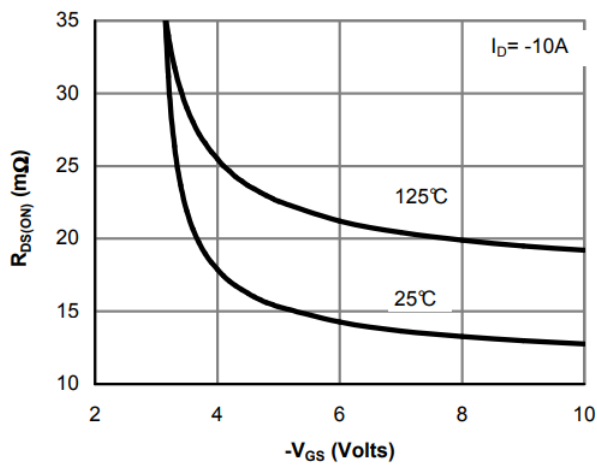


Figure 5: On-Resistance vs. Gate-Source Voltage

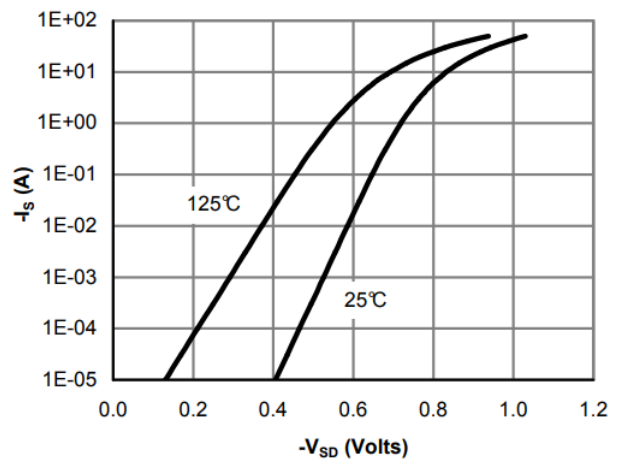


Figure 6: Body-Diode Characteristics

电参数曲线图 / Electrical Characteristic Curve

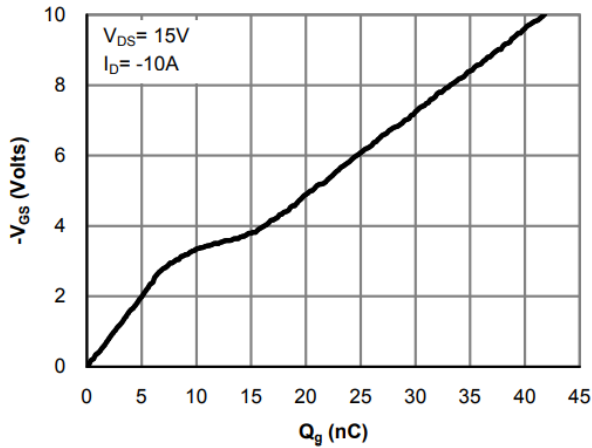


Figure 7: Gate-Charge Characteristics

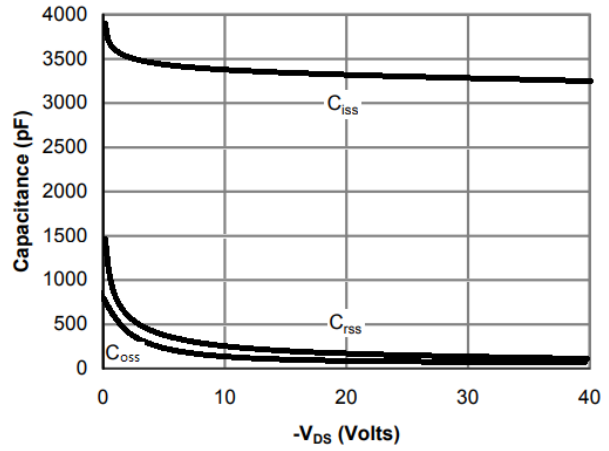


Figure 8: Capacitance Characteristics

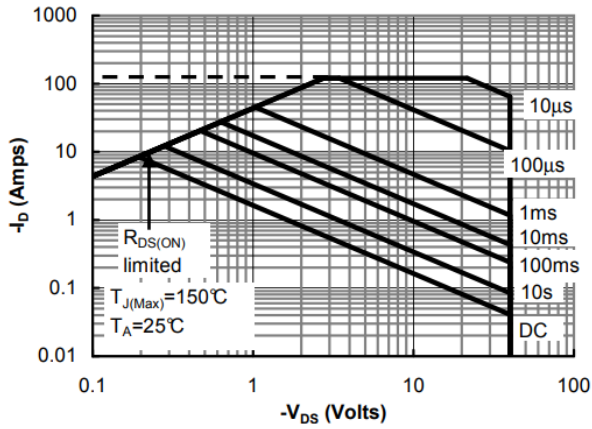


Figure 9: Maximum Forward Biased Safe Operating Area

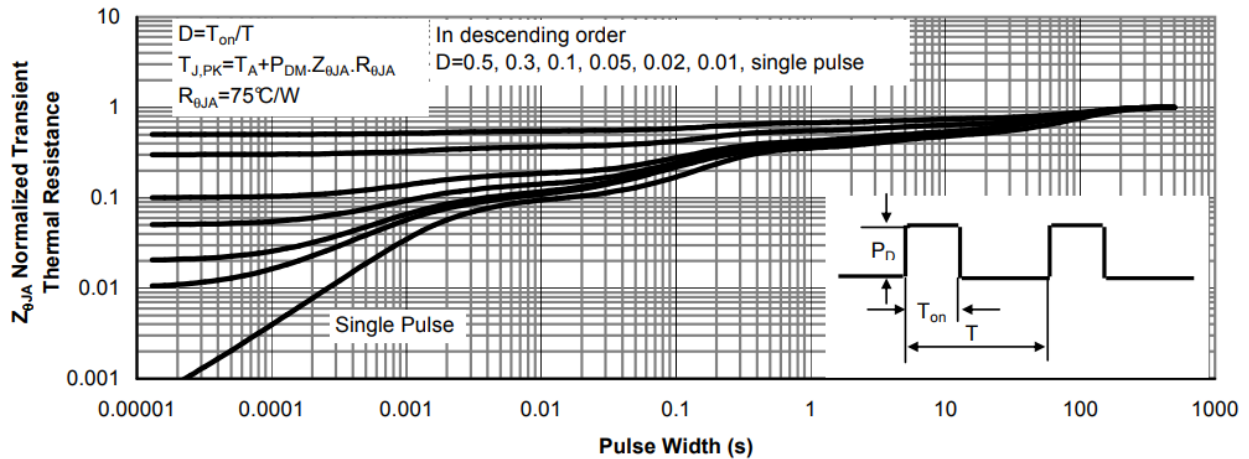
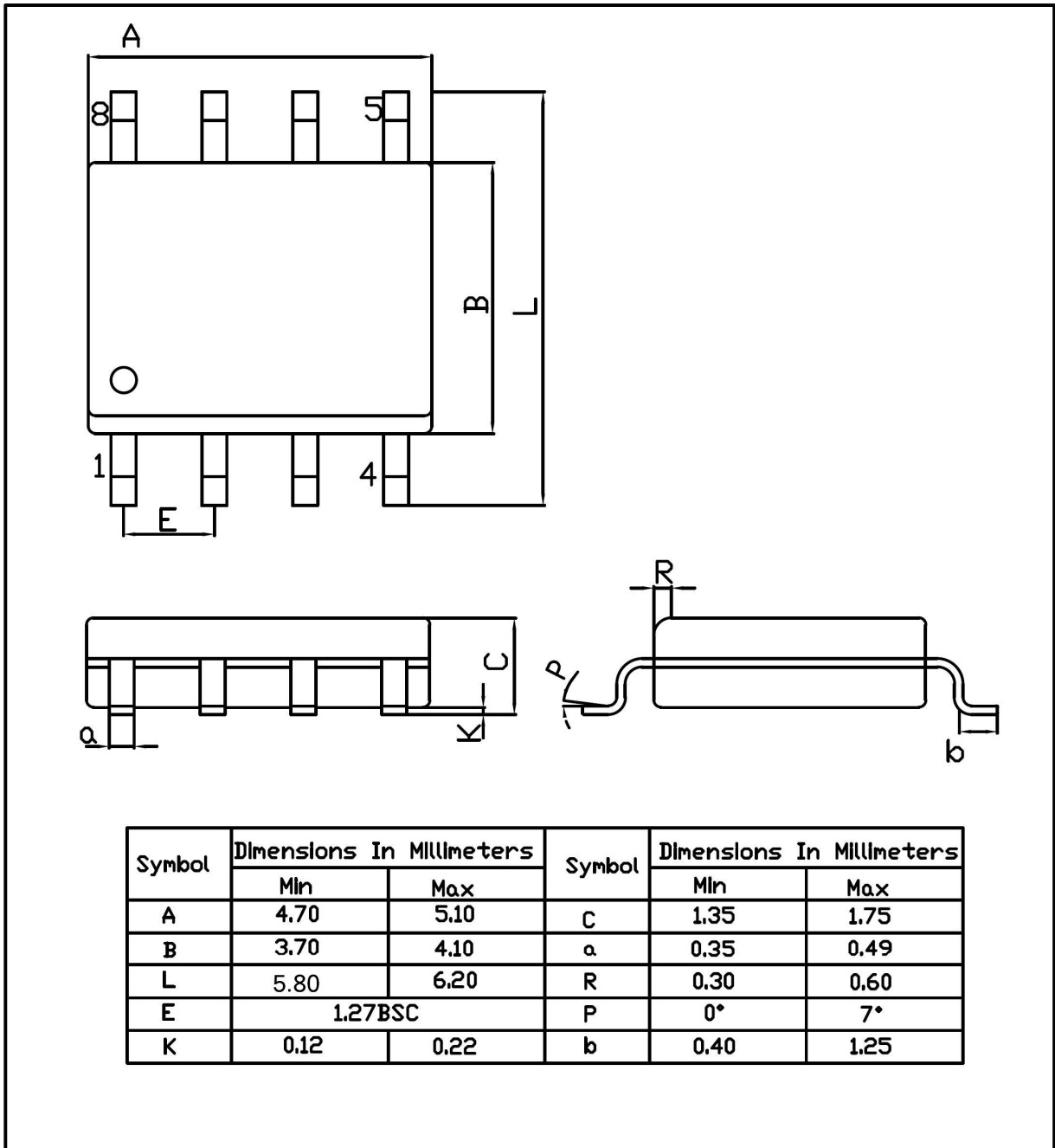


Figure 10: Normalized Maximum Transient Thermal Impedance

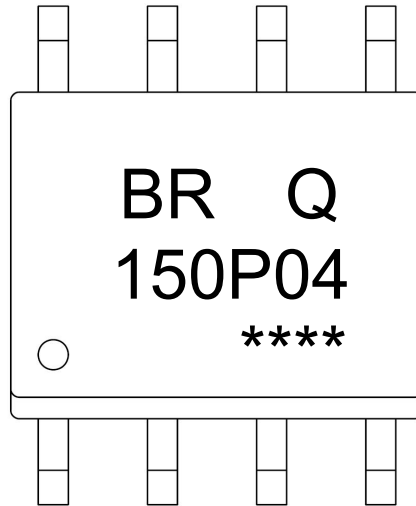
外形尺寸图 / Package Dimensions

SOP-8

Unit:mm



**印章说明 / Marking Instructions**



说明：

BR： 为公司代码

Q： 为汽车无卤产品标识

150P04： 为型号代码

\*\*\*\*： 为生产批号代码，随生产批号变化

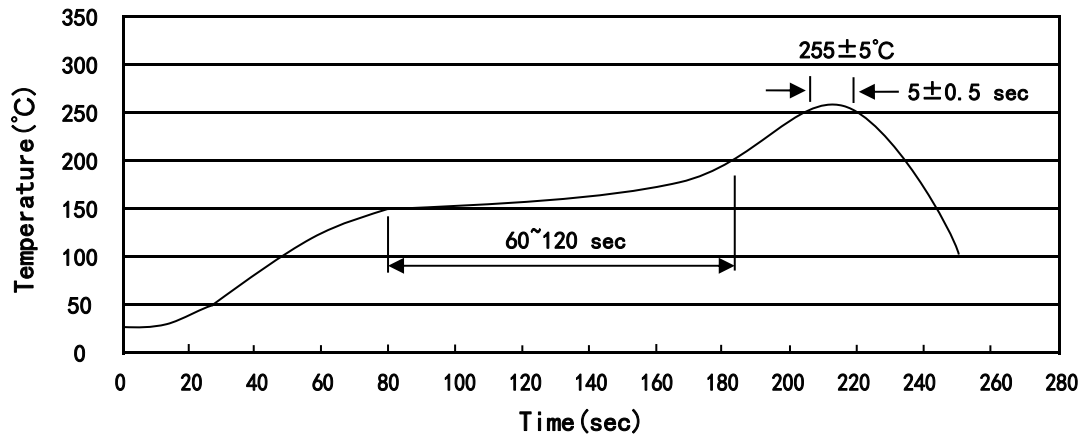
Note:

BR: Company Code

Q: Automobile halogen-free product Code

150P04: Product Type Code

\*\*\*\*: Lot No. Code, code change with Lot No

**回流焊温度曲线图(无铅) / Temperature Profile for IR Reflow Soldering(Pb-Free)**


说明：

- 1、预热温度 150~200°C，时间 60~120sec;
- 2、峰值温度 255±5°C，时间持续为 5±0.5sec;
- 3、焊接制程冷却速度为 2~10°C/sec.

Note:

- 1.Preheating:150~200°C, Time:60~120sec.
- 2.Peak Temp.:255±5°C, Duration:5±0.5sec.
3. Cooling Speed: 2~10°C/sec.

**耐焊接热试验条件 / Resistance to Soldering Heat Test Conditions**

温度：260±5°C

时间：10±1 sec.

Temp.:260±5°C

Time:10±1 sec

**包装规格 / Packaging SPEC.**

卷盘包装 / REEL

| Package Type<br>封装形式 | Units 包装数量         |                         |                        |                              |                        | Dimension 包装尺寸 (unit: mm <sup>3</sup> ) |             |             |
|----------------------|--------------------|-------------------------|------------------------|------------------------------|------------------------|---|-------------|-------------|
|                      | Units/Reel<br>只/卷盘 | Reels/Inner Box<br>卷盘/盒 | Units/Inner Box<br>只/盒 | Inner Boxes/Outer Box<br>盒/箱 | Units/Outer Box<br>只/箱 | Reel                                    | Inner Box 盒 | Outer Box 箱 |
| SOP/ESOP-8           | 4,000              | 2                       | 8,000                  | 6                            | 48,000                 | 13" ×12                                 | 360×360×50  | 380×335×366 |

**使用说明 / Notices**