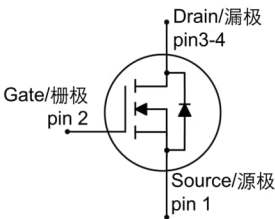
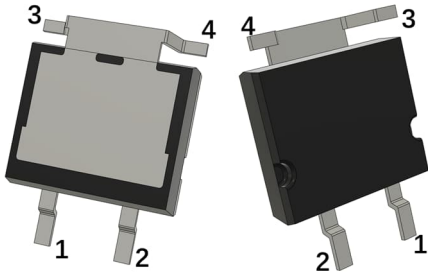


HC070N120H6T

1200V N-Channel SiC MOSFET

Product features/产品特点

- Top side cooling technology  
顶部散热技术
- High blocking voltage with low on-resistance  
高反向耐压及低导通电阻
- High-speed switching with low capacitances  
低电容实现的快速开关特性
- Higher System Efficiency  
更高的系统效率
- Increased power density  
提高功率密度
- Fast intrinsic diode with low reverse recovery  
具有低反向恢复电荷的快速体二极管
- Halogen free, RoHS compliant  
无卤，符合RoHS



Applications/应用领域

- High Voltage DC/DC Converters  
高压 DC/DC 转换器
- Switching Mode Power Supply  
开关模式电源 (SMPS)
- Electric Vehicle Charging Stations  
电动汽车充电站
- Solar PV inverters  
太阳能光伏逆变器
- Motor Drives  
电机驱动



Key performance parameters/关键性能参数

| Parameter        | Value | Unit      |
|------------------|-------|-----------|
| $V_{DS}$         | 1200  | V         |
| $R_{DS(on),typ}$ | 70    | $m\Omega$ |
| $I_{DM}$         | 105   | A         |

Package parameters/封装信息

| Type/型号      | Package/封装 | Marking/标识 | Packaging method/包装方式 |
|--------------|------------|------------|-----------------------|
| HC070N120H6T | TSC263-4L  | HC070N120T | Tape and Reel/卷带包装    |

# 1200V N-Channel SiC MOSFET

## HC070N120H6T



### 1. Maximum ratings at $T_{vj}=25^{\circ}\text{C}$ , unless otherwise specified.

#### 最大额定值 默认 $T_{vj}=25^{\circ}\text{C}$ 除非另有说明

Table 1 Maximum ratings/最大额定值

| Parameter<br>参数                                  | Symbol<br>符号 | Test conditions<br>测试条件                      | Value<br>值 | Unit<br>单位 |
|--------------------------------------------------|--------------|----------------------------------------------|------------|------------|
| Drain-source voltage<br>漏极-源极电压                  | $V_{DSS}$    | $T_{vj}\geq 25^{\circ}\text{C}$              | 1200       | V          |
| Drain current <sup>1</sup><br>连续漏极电流             | $I_D$        | $T_C=25^{\circ}\text{C}, V_{GS}=18\text{V}$  | 44         | A          |
|                                                  |              | $T_C=100^{\circ}\text{C}, V_{GS}=18\text{V}$ | 31         |            |
| Peak drain current <sup>2</sup><br>峰值漏极电流        | $I_{DM}$     | $T_C=25^{\circ}\text{C}$                     | 105        | A          |
| Continuous diode current <sup>1</sup><br>连续二极管电流 | $I_S$        | $T_C=25^{\circ}\text{C}, V_{GS}=-4\text{V}$  | 44         | A          |
| Peak diode current <sup>2</sup><br>峰值二极管电流       | $I_{SM}$     | $T_C=25^{\circ}\text{C}, V_{GS}=-4\text{V}$  | 105        | A          |
| Maximum gate source voltage<br>栅源最大电压            | $V_{GS,MAX}$ |                                              | -10~22     | V          |
| Recommend gate source voltage<br>推荐的栅源电压         | $V_{GS,op}$  |                                              | -4~18      | V          |
| Power dissipation<br>总耗散功率                       | $P_{tot}$    | $T_C=25^{\circ}\text{C}$                     | 217        | W          |
|                                                  |              | $T_C=100^{\circ}\text{C}$                    | 109        |            |

1. Limited by  $T_{vj(max)}$ /受限于最大结温

2. Pulse width  $t_p$  limited by  $T_{vj(max)}$  /脉宽受限于最大结温



2. Thermal characteristics  
热特性

Table 2 Thermal characteristics/热特性

| Parameter<br>参数                                    | Symbol<br>符号         | Test conditions<br>测试条件 | Value/值 |      |      | Unit<br>单位 |
|----------------------------------------------------|----------------------|-------------------------|---------|------|------|------------|
|                                                    |                      |                         | Min.    | Typ. | Max. |            |
| Storage Temperature<br>存储温度                        | T <sub>stg</sub>     |                         | -55     |      | 175  | °C         |
| Operating junction Temperature<br>工作结温             | T <sub>vj</sub>      |                         | -55     |      | 175  | °C         |
| Thermal resistance, junction-case<br>结-壳热阻         | R <sub>th(j-c)</sub> |                         |         | 0.53 | 0.69 | °C/W       |
| Thermal resistance, junction-ambient<br>结-环境热阻     | R <sub>th(j-a)</sub> |                         |         | 30   |      | °C/W       |
| Soldering temperature, reflow solderin<br>焊接温度，回流焊 | T <sub>sold</sub>    | reflow MSL1             |         |      | 260  | °C         |



### 3. Electrical characteristics at $T_{vj}=25^{\circ}\text{C}$ , unless otherwise specified.

电气特性 默认  $T_{vj}=25^{\circ}\text{C}$  除非另有说明

Table 3 Static characteristics/静态特性

| Parameter<br>参数                               | Symbol<br>符号  | Test conditions<br>测试条件                                           | Value/值                      |      |      | Unit<br>单位 |
|-----------------------------------------------|---------------|-------------------------------------------------------------------|------------------------------|------|------|------------|
|                                               |               |                                                                   | Min.                         | Typ. | Max. |            |
| Drain-source breakdown voltage<br>漏源击穿电压      | $V_{(BR)DSS}$ | $I_D=100\mu\text{A}, V_{GS}=0\text{V}$                            | 1200                         |      |      | V          |
| Gate threshold voltage<br>门极开启阈值电压            | $V_{GS(th)}$  | $I_D=5\text{mA}, V_{DS}=V_{GS}$                                   | $T_{vj}=25^{\circ}\text{C}$  | 1.8  | 3    | 5          |
|                                               |               |                                                                   | $T_{vj}=175^{\circ}\text{C}$ |      | 2.4  |            |
| Drain-source on-state resistance<br>漏极-源极导通电阻 | $R_{DS(on)}$  | $I_D=20\text{A}, V_{GS(on)}=15\text{V}$                           | $T_{vj}=25^{\circ}\text{C}$  |      | 90   |            |
|                                               |               |                                                                   | $T_{vj}=175^{\circ}\text{C}$ |      | 137  |            |
|                                               |               | $I_D=20\text{A}, V_{GS(on)}=18\text{V}$                           | $T_{vj}=25^{\circ}\text{C}$  |      | 70   |            |
|                                               |               |                                                                   | $T_{vj}=175^{\circ}\text{C}$ |      | 129  |            |
| Zero gate voltage drain current<br>集电极-发射极漏电流 | $I_{DSS}$     | $V_{DS}=1200\text{V}, V_{GS}=0\text{V}$                           | $T_{vj}=25^{\circ}\text{C}$  |      | 0.1  | 10         |
|                                               |               |                                                                   | $T_{vj}=175^{\circ}\text{C}$ |      | 5    |            |
| Gate to source Leakage current<br>门极-源极漏电流    | $I_{GSS}$     | $V_{DS}=0\text{V}, V_{GS}=22\text{V}, T_{vj}=25^{\circ}\text{C}$  |                              |      | 100  |            |
|                                               |               | $V_{DS}=0\text{V}, V_{GS}=-10\text{V}, T_{vj}=25^{\circ}\text{C}$ |                              |      | 100  |            |
| Forward transconductance<br>正向跨导              | $g_{fs}$      | $I_D=20\text{A}, V_{DS}=20\text{V}$                               |                              | 20   |      | S          |
| Integrated gate resistor<br>内部门极电阻            | $R_G$         | $f=1\text{MHz}$                                                   |                              | 2.1  |      | $\Omega$   |

# 1200V N-Channel SiC MOSFET HC070N120H6T



**Table 4 Dynamic characteristics/动态特性**

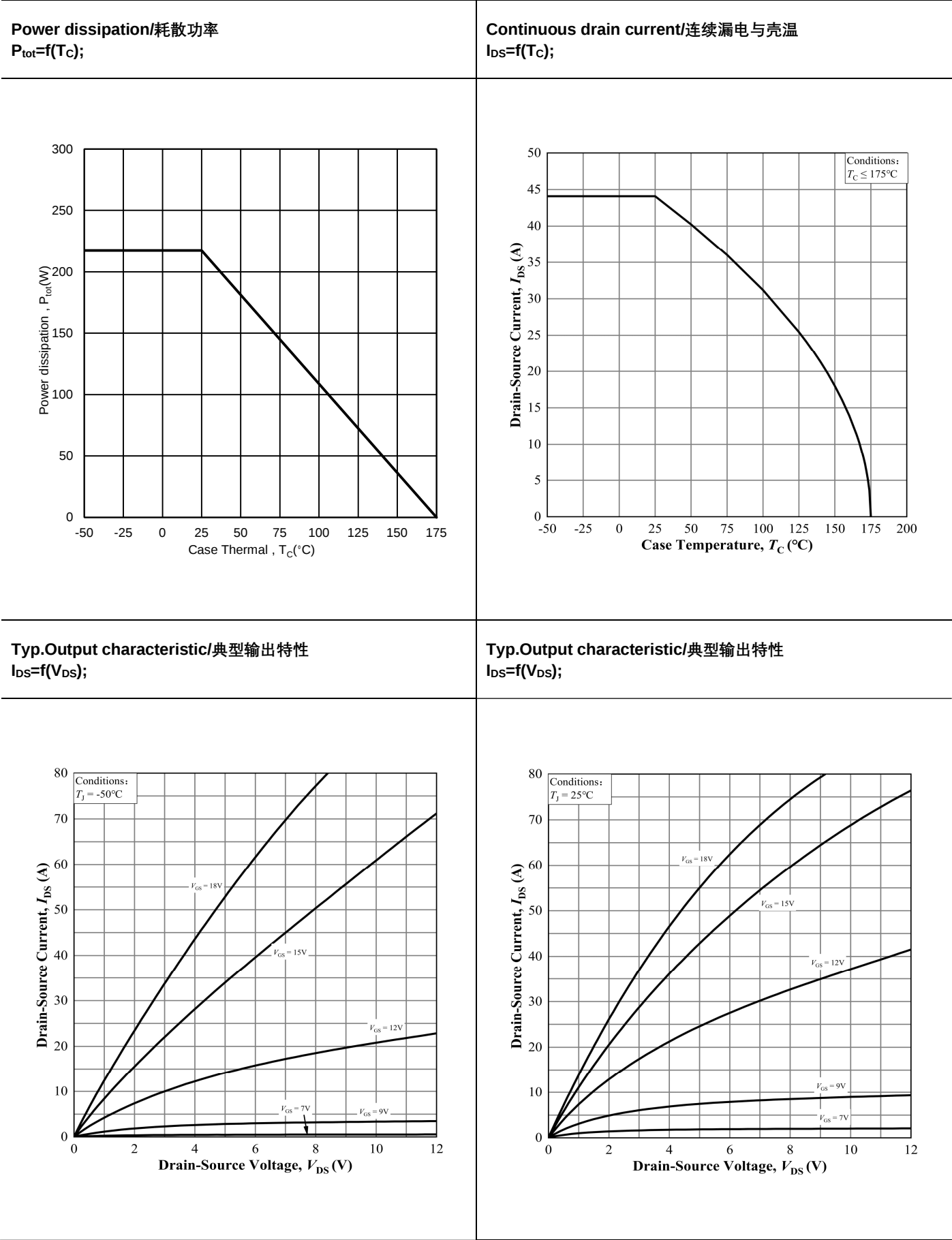
| Parameter<br>参数                        | Symbol<br>符号 | Test conditions<br>测试条件                           | Value/值 |      |      | Unit<br>单位 |
|----------------------------------------|--------------|---------------------------------------------------|---------|------|------|------------|
|                                        |              |                                                   | Min.    | Typ. | Max. |            |
| Input capacitance<br>输入电容              | $C_{iss}$    | $V_{DS}=1000V$ ,<br>$V_{GS}=0V$ ,<br>$f=100KHz$   |         | 990  |      | pF         |
| Output capacitance<br>输出电容             | $C_{oss}$    |                                                   |         | 50.7 |      |            |
| Reverse transfer capacitance<br>反向传输电容 | $C_{rss}$    |                                                   |         | 4.6  |      |            |
| Coss stored energy<br>输出电容存储能量         | $E_{oss}$    | Calculated based on $C_{oss}$                     |         | 28   |      | $\mu J$    |
| Total gate charge<br>总栅极电荷             | $Q_{G(tot)}$ | $V_{DD}=800V$ ,<br>$I_D=20A$ ,<br>$V_{GS}=-4/18V$ |         | 54   |      | nC         |
| Gate source charge<br>栅-源极电荷           | $Q_{GS}$     |                                                   |         | 14   |      |            |
| Gate-drain charge<br>栅-漏极电荷            | $Q_{GD}$     |                                                   |         | 27   |      |            |

**Table 5 Reverse diode characteristics/体二极管反向特性**

| Parameter<br>参数                          | Symbol<br>符号 | Test conditions<br>测试条件                  |                       | Value/值 |      |      | Unit<br>单位 |
|------------------------------------------|--------------|------------------------------------------|-----------------------|---------|------|------|------------|
|                                          |              |                                          |                       | Min.    | Typ. | Max. |            |
| Drain-source reverse voltage<br>体二极管正向压降 | $V_{SD}$     | $I_S=10A, V_{GS}=0V, T_{vj}=25^{\circ}C$ |                       |         | 3.9  |      | V          |
|                                          |              | $I_S=10A, V_{GS}=-4V$                    | $T_{vj}=25^{\circ}C$  |         | 5.5  |      |            |
|                                          |              |                                          | $T_{vj}=175^{\circ}C$ |         | 4.8  |      |            |

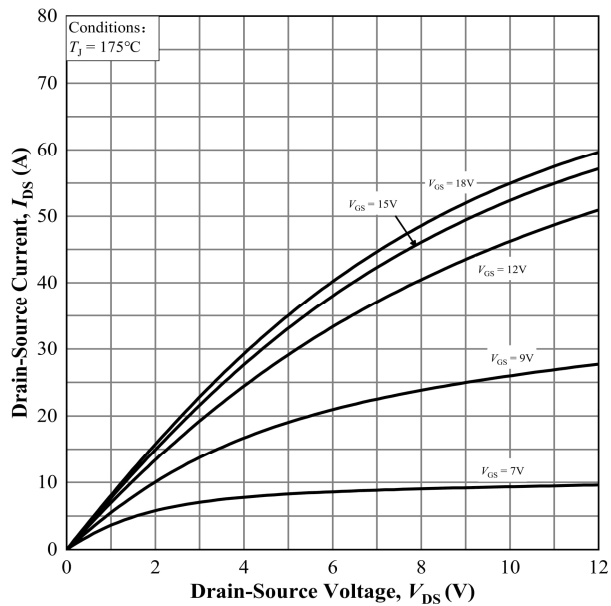


4. Electrical characteristics diagrams  
电气特性图表

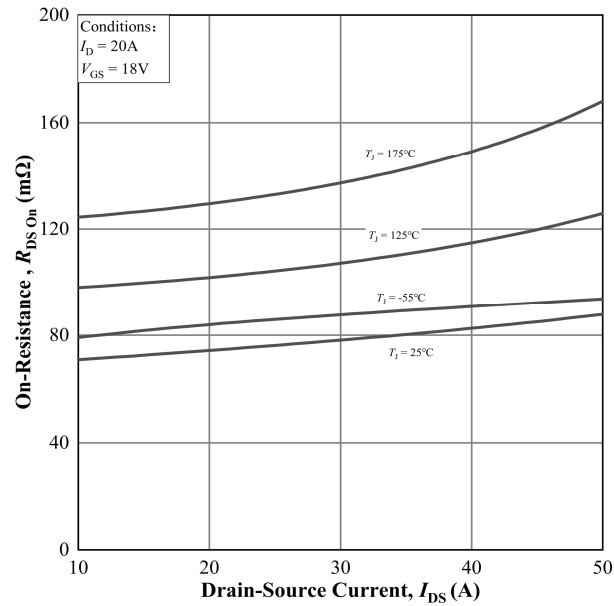




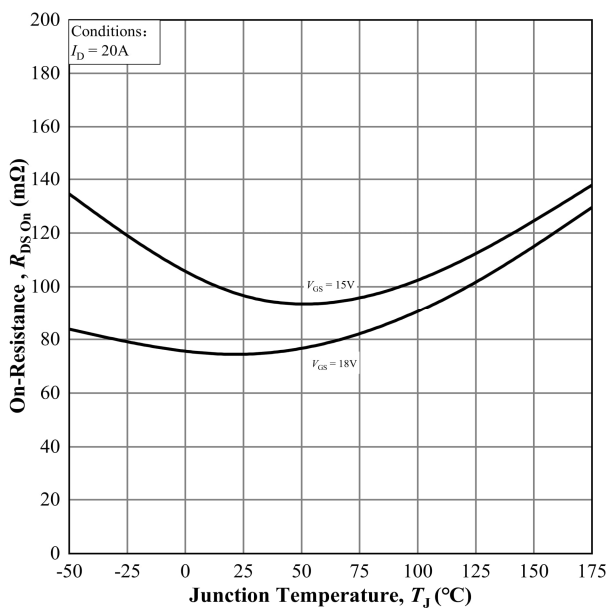
Typ.Output characteristic/典型输出特性  
 $I_{DS}=f(V_{DS})$ ;



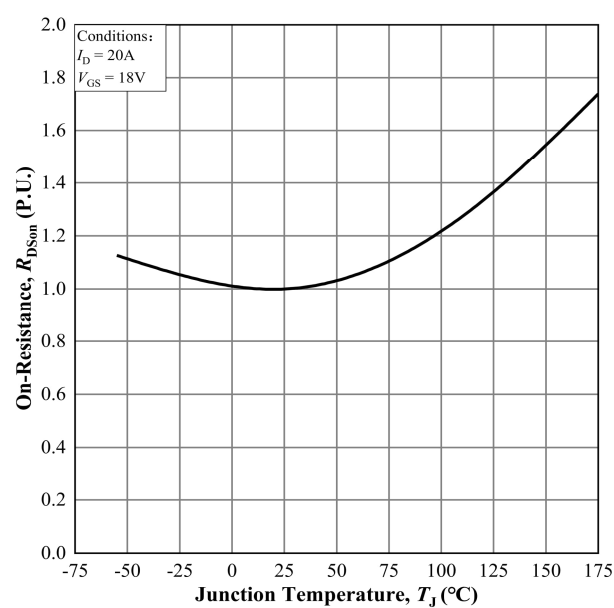
Typ.Drain-source on-state resistance/典型漏源导通电阻  
 $R_{DS(on)}=f(I_{DS})$ ;



Typ.Drain-source on-state resistance/漏源导通电阻  
 $R_{DS(on)}=f(T_J)$ ;

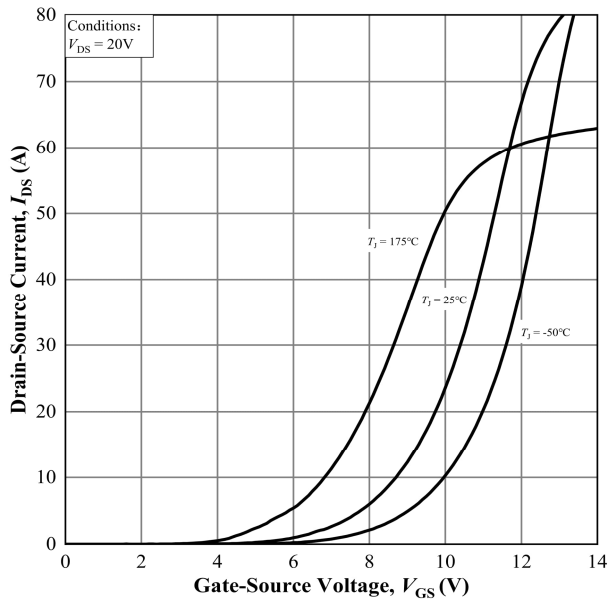


Typ.Drain-source on-state resistance/漏源导通电阻  
 $R_{DS(on)}=f(T_J)$ ;

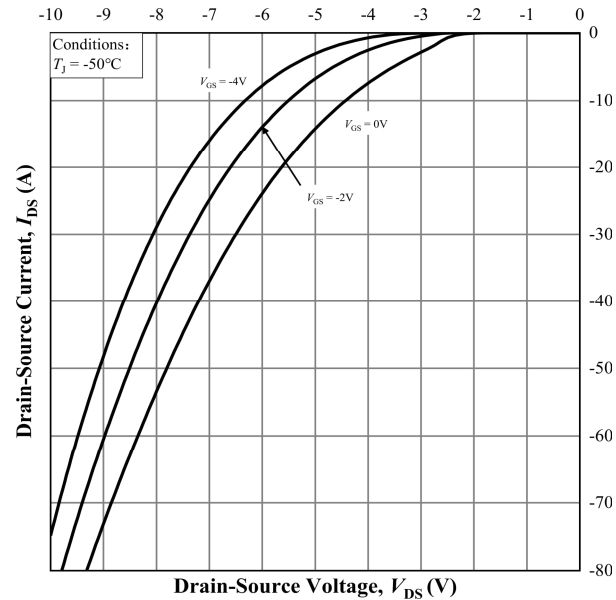




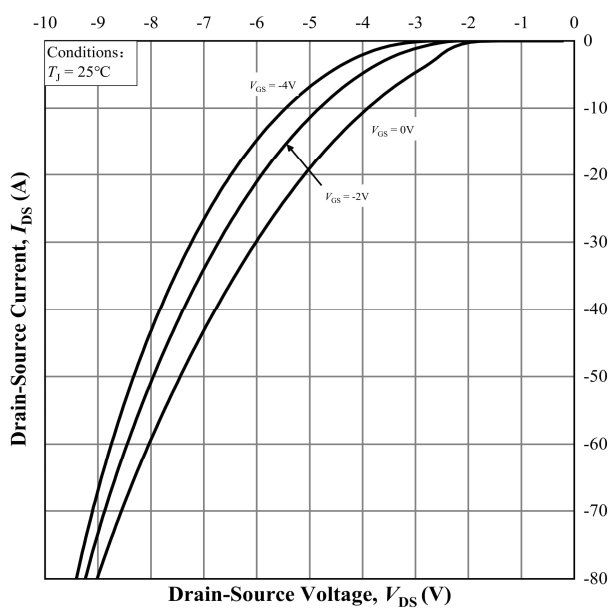
Typ.Transfer characteristics/传输特性  
 $I_{DS}=f(V_{GS})$ ;



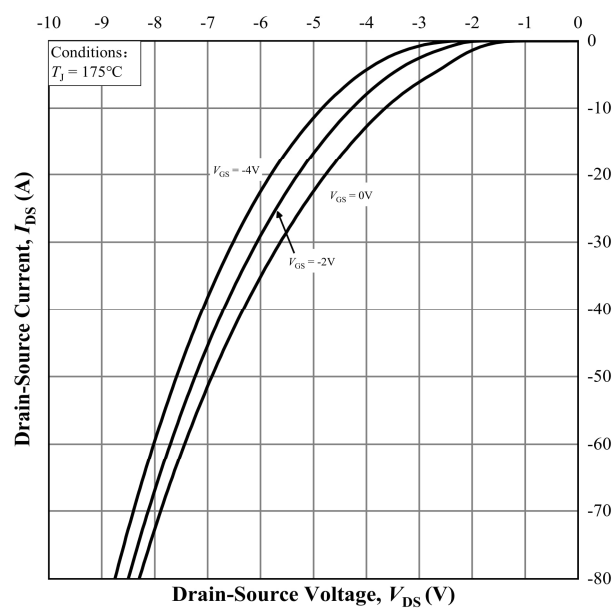
Typ.Reverse drain current characteristics/典型二极管特性  
 $I_{DS}=f(V_{DS})$ ;



Typ.Reverse drain current characteristics/典型二极管特性  
 $I_{DS}=f(V_{DS})$ ;

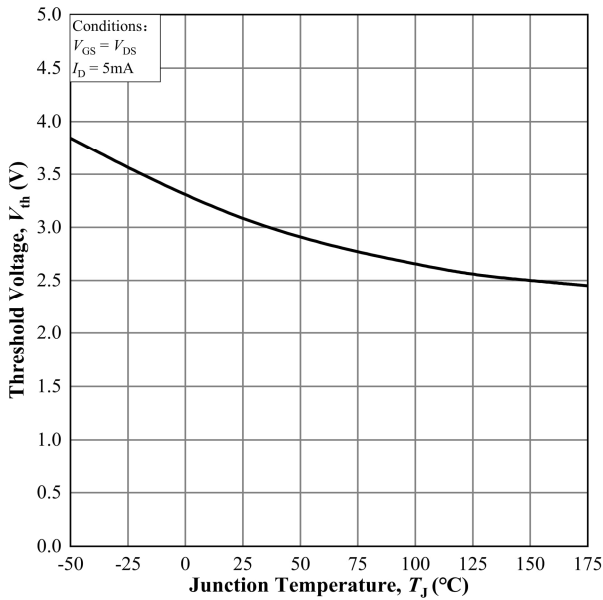


Typ.Reverse drain current characteristics/典型二极管特性  
 $I_{DS}=f(V_{DS})$ ;

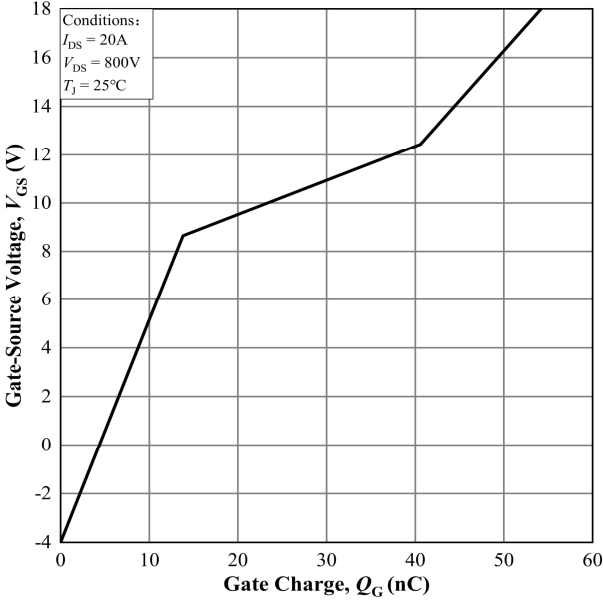




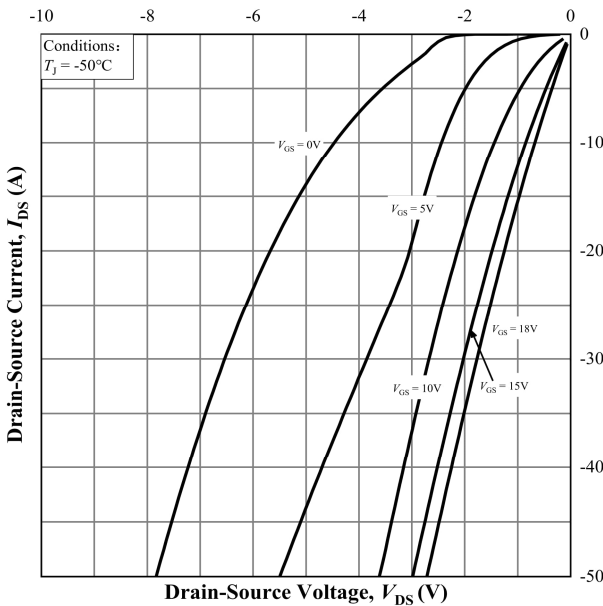
Typ.Gate threshold voltage/门级阈值电压结温特性  
 $V_{GSth}=f(T_j)$ ;



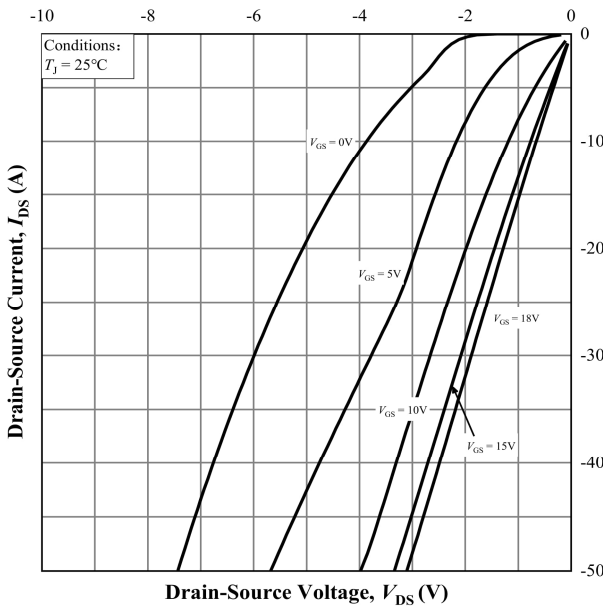
Typ.Gate charge/典型门级电荷  
 $V_{GS}=f(Q_G)$ ;



Typ.3rd Quadrant Characteristics/典型第三象限特性  
 $I_{DS}=f(V_{DS})$ ;

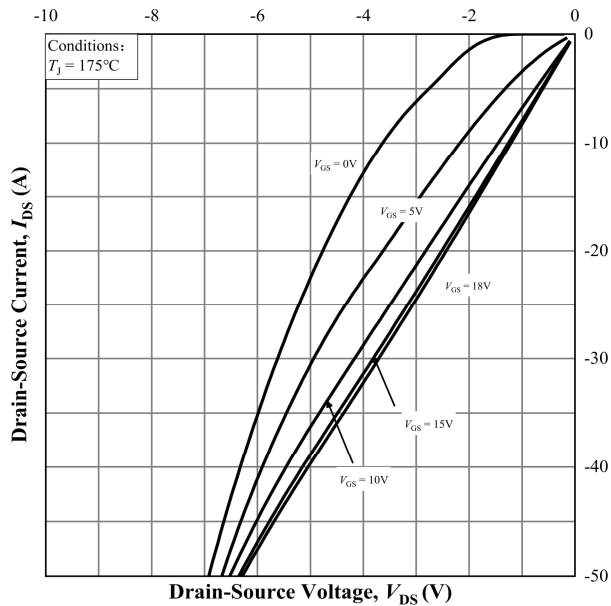


Typ.3rd Quadrant Characteristics/典型第三象限特性  
 $I_{DS}=f(V_{DS})$ ;

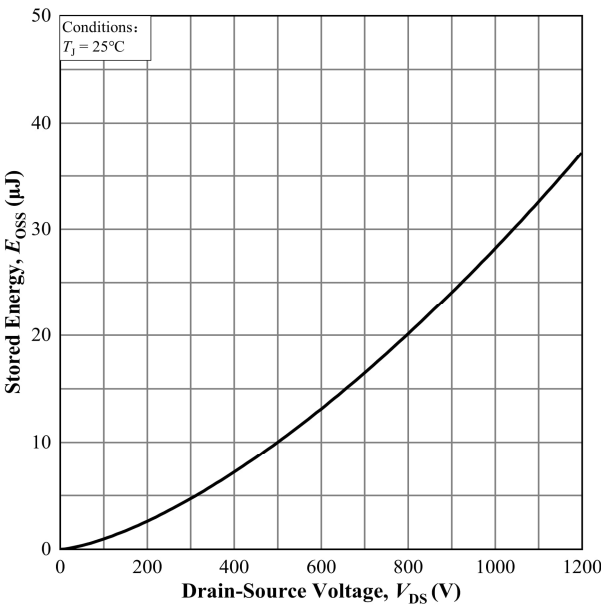




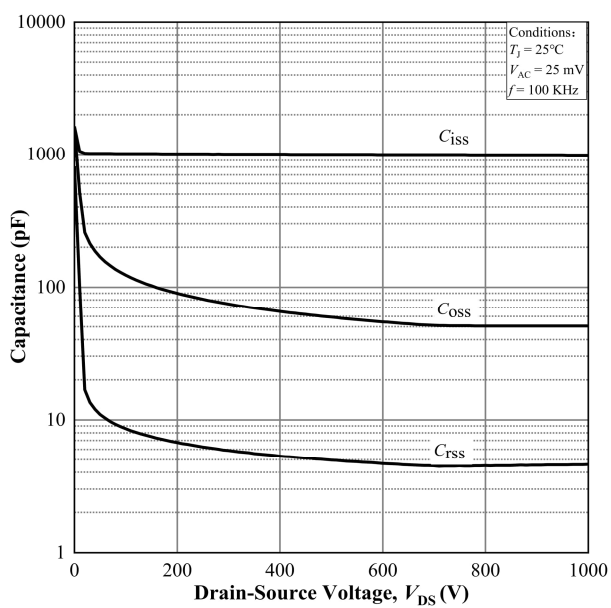
Typ.3rd Quadrant Characteristics/典型第三象限特性  
 $I_{DS}=f(V_{DS})$ ;



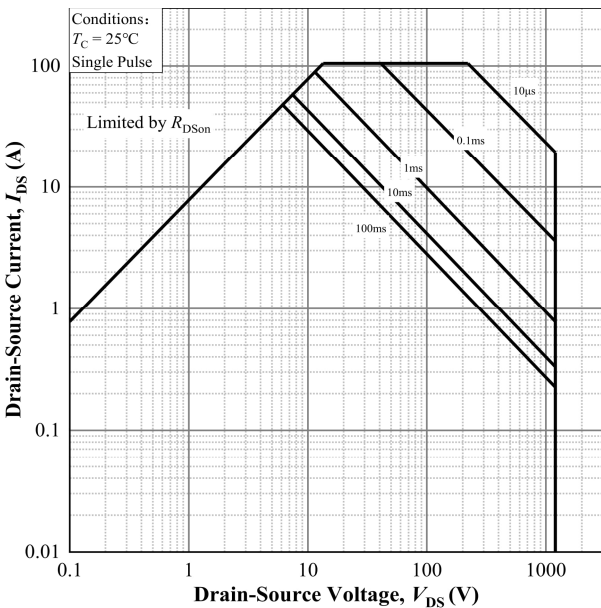
Typ.Coss stored energy/典型Coss存储能量  
 $E_{OSS}=f(V_{DS})$ ;



Typ.Capacitances/典型电容特性  
 $C=f(V_{DS})$ ;



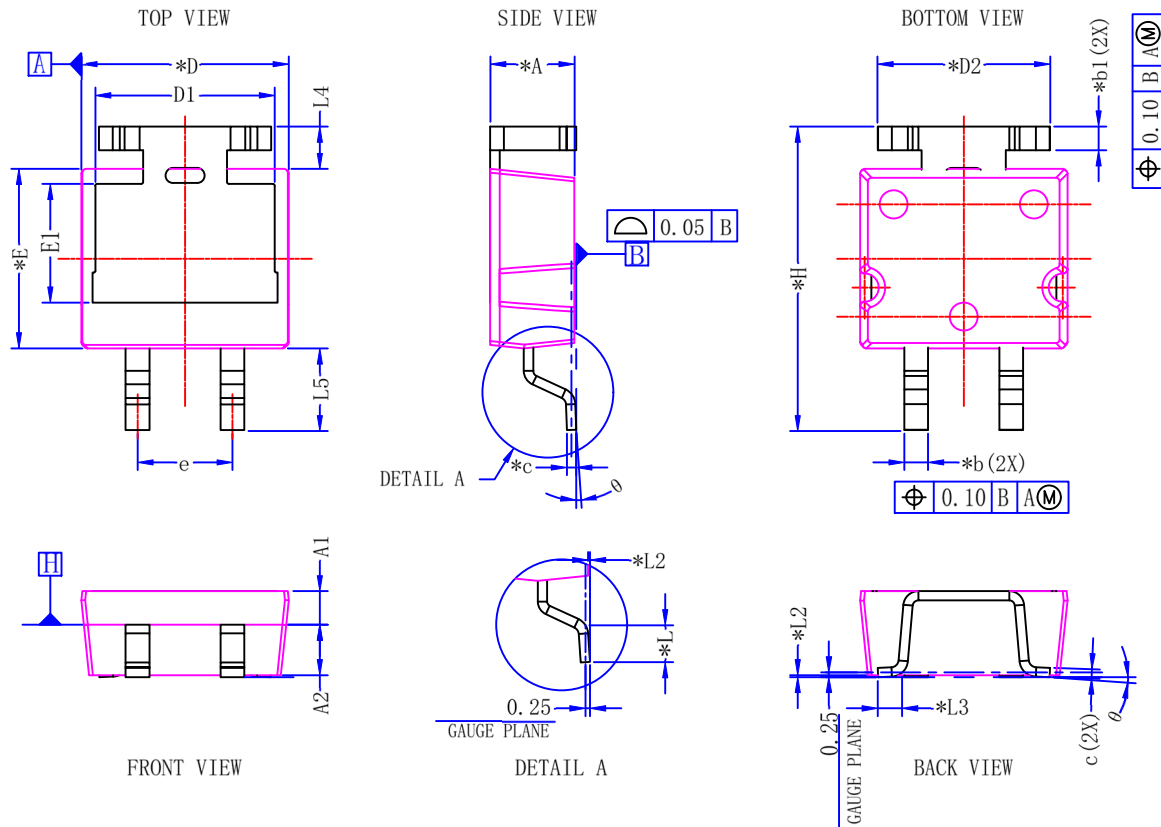
Forward bias safe operating area/安全工作区  
 $I_{DS}=f(V_{DS})$ ;



## 5. Package outline

### 封装外形

Figure 1. Outline TSC263-4L, dimensions in mm/TSC263-4L外形尺寸 (毫米)



| DIM SYMBOL | MIN.  | TYP.  | MAX.  | DIM SYMBOL | MIN.     | TYP.  | MAX.  |
|------------|-------|-------|-------|------------|----------|-------|-------|
| *A         | 4.40  | 4.50  | 4.60  | *E         | 9.45     | 9.60  | 9.75  |
| A1         | 1.75  | 1.80  | 1.85  | E1         | 6.15     | 6.35  | 6.55  |
| A2         | 2.65  | 2.70  | 2.75  | e          | 5.08 BSC |       |       |
| *b         | 1.22  | 1.27  | 1.32  | *H         | 16.02    | 16.22 | 16.42 |
| *b1        | 1.22  | 1.27  | 1.32  | *L         | 1.70     | 1.90  | 2.10  |
| *c         | 0.45  | 0.50  | 0.55  | *L2        | 0.05     | 0.10  | 0.15  |
| *D         | 10.95 | 11.10 | 11.25 | *L3        | 1.10     | 1.30  | 1.50  |
| D1         | 9.50  | 9.60  | 9.70  | L4         | 2.27 REF |       |       |
| *D2        | 9.00  | 9.20  | 9.40  | L5         | 4.15     | 4.35  | 4.55  |
|            |       |       |       | Θ          | 0°       | -     | 8°    |

#### NOTES:

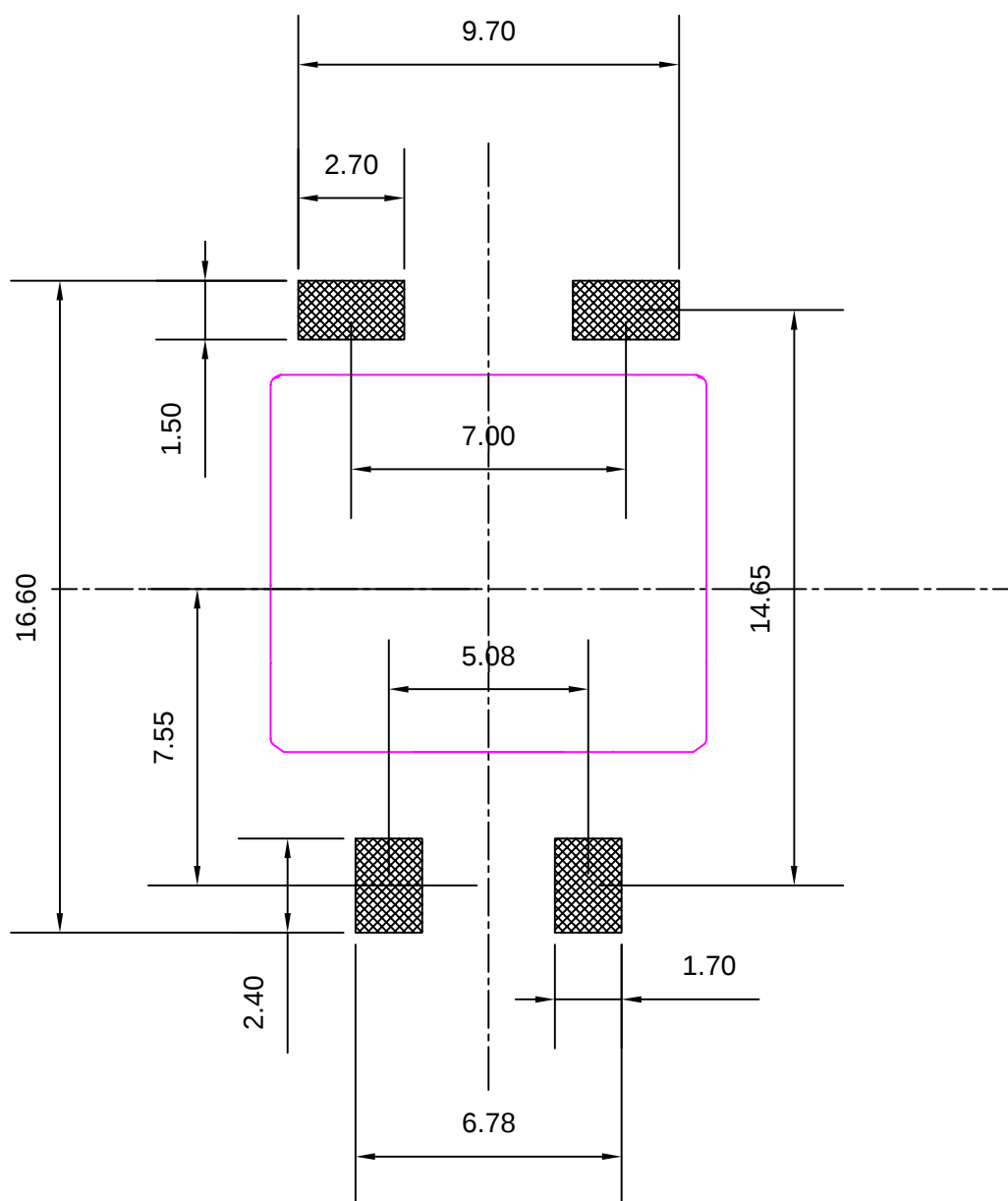
- ALL DIMENSIONS ARE IN MILLIMETER. ANGLES ARE IN DEGREE.
- DIMENSION "D" DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSIONS. INTERLEAD FLASH SHALL NOT EXCEED 0.150 MM PER SIDE. DIMENSION "E" DOES NOT INCLUDE MOLD FLASH, GATE BURRS, THE GATE BURRS SHALL NOT EXCEED 0.15MM.
- DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY EXCLUSIVE OF MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY.

#### 注:

- 所有尺寸均以毫米为单位。角度以度为单位。
- 尺寸 D 不包括引脚间飞边或突出物。引脚间飞边在每侧不得超过0.15mm。尺寸 E 不包括模具飞边、浇口残余物，浇口残余物不得超过0.15mm。
- 尺寸 D、E 是在塑胶本体的最外极限确定的，不包括模具飞边、连接条残余、浇口残余和引脚间飞边，但包括塑胶本体顶部和底部之间可能存在的任何不匹配或错位。

## 6. Recommended Land Pattern 推荐焊盘尺寸

Figure 2. TSC263-4L Effective Solderable Area for Reflow Soldering/ TSC263-4L 回流焊接有效可焊面积



solder land/焊盘区域

----- Package Reference Centerline/封装参考中心线

dimensions in mm/单位为毫米

注：  
所示焊盘尺寸仅供参考。为确保最佳散热性能及焊接质量，建议根据实际应用中的 PCB 板材、层数及散热设计对焊盘进行优化调整  
The land pattern dimensions provided are for reference only. To achieve optimal thermal performance, actual design adjustments should be considered based on the specific PCB materials, layer stack-up, and thermal dissipation requirements.



7. Revision history  
修订历史

Table 6 Date and version number/日期与版本号

| Date日期     | Revision版本 | Changes更改内容              |
|------------|------------|--------------------------|
| 2026-04-12 | Rev.G1.0   | Target Datasheet (目标规格书) |

8. Matters needing attention  
注意事项

Appendix 1. Important Technical Guidance, Application Policy, and Copyright Notice/重要技术指南、应用规范与版权声明

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>[Data and Design Guidance]</b></p> <p>The information provided herein, including typical values and application examples, serves as technical guidance only and should not be construed as a formal guarantee of product characteristics. This documentation is intended for qualified engineering personnel, who bear the ultimate responsibility for evaluating the product's suitability for their specific application and compliance with all industry standards.</p>                                    | <p><b>【数据与设计指引】</b></p> <p>本文件中提供的所有信息，包括任何典型值和应用示例，仅作为技术指引，不应被视为对产品特性的正式保证。本资料专供具备资质的工程技术人员使用，客户的技术部门应对产品在特定应用中的适用性和对所有行业标准的符合性负最终评估责任。</p>                                                  |
| <p><b>[Copyright and Revision Management]</b></p> <p>We reserve all rights to the intellectual property contained within this document, and unauthorized reproduction is prohibited. For the sake of continuous improvement, the content is subject to change without prior notice. Designers are obligated to consult and use the latest revision of this datasheet to ensure optimal performance and accuracy in their final product.</p>                                                                         | <p><b>【版权与版本管理】</b></p> <p>本文件的所有知识产权和版权均归我方所有，严禁未经授权的复制与传播。为持续优化产品性能，本文件内容可能随时变更，恕不另行通知。设计人员有义务查阅并使用最新的版本数据手册，以确保设计准确性并实现最佳系统性能。</p>                                                         |
| <p><b>[Application Safety and Intellectual Property]</b></p> <p>Our product supply does not confer any license or right under any third-party intellectual property. Customers are fully responsible for the patent clearance and functional safety of their end application. Furthermore, this product is not intended for use in life-critical or high-risk systems (such as Class III medical devices or aerospace control) unless explicitly approved by us through a dedicated high-reliability agreement.</p> | <p><b>【应用安全与知识产权】</b></p> <p>我方提供本产品，不应被视为授予任何第三方知识产权的许可或权利。客户应对其终端应用中的功能安全性、系统鲁棒性以及不侵犯任何第三方专利负全部责任。此外，本产品未被设计或认证用于生命维持或极高风险的关键系统。在将本产品用于此类高可靠性应用之前，客户必须设计充分的冗余和安全机制，并事先与我方签署专门的高可靠性供货协议。</p> |

<http://www.hmwsemi.com/>