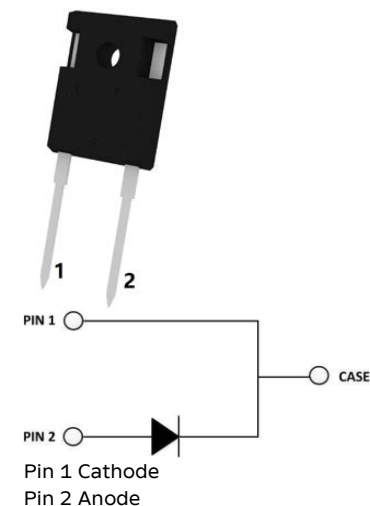


## SCD040HA120S24F

5th Generation 1200V/40A SiC Schottky Barrier Diode

第五代 1200V/40A 碳化硅肖特基二极管

Package Type: TO-247-2L

 $V_{RRM} = 1200\text{ V}$  $I_F(135^\circ\text{C}) = 46\text{ A}$  $V_F(25^\circ\text{C}) = 1.45\text{ V}$ 

- High-speed switching performance  
高速开关表现
- No reverse recovery  
无反向恢复

Maximum ratings 最大额定值<sup>1 2</sup>

| PARAMETER<br>参数                                   | SYMBOL<br>符号  | CONDITIONS<br>条件                                                              | MIN<br>最小 | MAX<br>最大 | UNIT<br>单位           |
|---------------------------------------------------|---------------|-------------------------------------------------------------------------------|-----------|-----------|----------------------|
| Repetitive peak reverse voltage<br>重复反向峰值电压       | $V_{RRM}$     | $T_{vj} = 25^\circ\text{C}$                                                   |           | 1200      | V                    |
| Surge peak reverse voltage<br>浪涌峰值反向电压            | $V_{RSM}$     |                                                                               |           | 1200      | V                    |
| DC reverse voltage 直流反向电压                         | $V_{DC}$      |                                                                               |           | 1200      | V                    |
| Continuous forward current<br>连续正向电流              | $I_F$         | $T_C = 25^\circ\text{C}$                                                      |           | 89        | A                    |
|                                                   |               | $T_C = 135^\circ\text{C}$                                                     |           | 46        | A                    |
|                                                   |               | $T_C = 146^\circ\text{C}$                                                     |           | 40        | A                    |
| Surge non-repetitive forward current<br>非重复正向浪涌电流 | $I_{FSM}$     | $T_C = 25^\circ\text{C}$<br>$t_p = 10\text{ ms}$ , half sine pulse            |           | 395       | A                    |
| Repetitive peak forward current<br>重复峰值正向电流       | $I_{FRM}$     | $T_C = 25^\circ\text{C}$ ,<br>$t_p = 10\text{ ms}$ , half sine wave $D = 0.1$ |           | 166       | A                    |
| Power dissipation 耗散功率                            | $P_{tot}$     |                                                                               |           | 429       | W                    |
| $i^2t$ value 安秒平方值                                | $\int i^2 dt$ | $T_C = 25^\circ\text{C}$ , $t_p = 10\text{ ms}$                               |           | 780       | $\text{A}^2\text{s}$ |
| Operation junction temperature<br>工作结温范围          | $T_{vj}$      |                                                                               | -55       | 175       | $^\circ\text{C}$     |
| Storage temperature 存储温度范围                        | $T_{stg}$     |                                                                               | -55       | 175       | $^\circ\text{C}$     |



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<sup>1</sup> Maximum rated values indicate limits beyond which damage to the device may occur per IEC 60747<sup>2</sup> 根据标准 IEC 60747 要求，最大额定值表示超过该限值可能会对器件造成损坏<sup>2</sup>  $T_{vj} = 25^\circ\text{C}$ , unless otherwise specified / 除非另有规定,  $T_{vj} = 25^\circ\text{C}$



## SiC Diode<sup>3 4</sup>

| PARAMETER<br>参数                     | SYMBOL<br>符号    | CONDITIONS<br>条件                               | MIN<br>最小 | TYP<br>典型 | MAX<br>最大 | UNIT<br>单位 |
|-------------------------------------|-----------------|------------------------------------------------|-----------|-----------|-----------|------------|
| DC blocking voltage 直流击穿电压          | V <sub>DC</sub> | I <sub>R</sub> = 100 µA                        | 1200      |           |           | V          |
| Forward voltage 正向导通压降              | V <sub>F</sub>  | I <sub>F</sub> = 40 A                          |           | 1.45      | 1.65      | V          |
|                                     |                 |                                                |           | 2.15      | 2.50      | V          |
| Reverse current 反向电流                | I <sub>R</sub>  | V <sub>R</sub> = 1200 V                        |           | 5         | 100       | µA         |
|                                     |                 |                                                |           | 40        | 640       | µA         |
| Total capacitance 总电容               | C               | f = 1 MHz                                      |           | 2429      |           | pF         |
|                                     |                 |                                                |           | 155       |           | pF         |
|                                     |                 |                                                |           | 112       |           | pF         |
| Total capacitive charge 总电容电荷       | Q <sub>C</sub>  | V <sub>R</sub> = 800 V (∫C(V)dV)               |           | 166       |           | nC         |
| Capacitance stored energy<br>电容储存能量 | E <sub>C</sub>  | V <sub>R</sub> = 800 V (∫Q <sub>C</sub> (V)dV) |           | 47        |           | µJ         |

## Package properties 封装特性

| PARAMETER<br>参数                                   | SYMBOL<br>符号         | CONDITIONS<br>条件 | MIN<br>最小 | TYP<br>典型 | MAX<br>最大 | UNIT<br>单位 |
|---------------------------------------------------|----------------------|------------------|-----------|-----------|-----------|------------|
| Thermal resistance from junction to case<br>结到壳热阻 | R <sub>th(j-c)</sub> |                  |           | 0.35      |           | K/W        |

<sup>3</sup> Characteristic values according to IEC 60747-2 / 特性值依据 IEC 60747-2

<sup>4</sup> T<sub>vj</sub> = 25 °C, unless otherwise specified / 除非另有规定, T<sub>vj</sub> = 25 °C



## Characteristics 特性曲线

Figure 1. Forward characteristics

图 1. 正向特性

$$I_F = f(V_F)$$

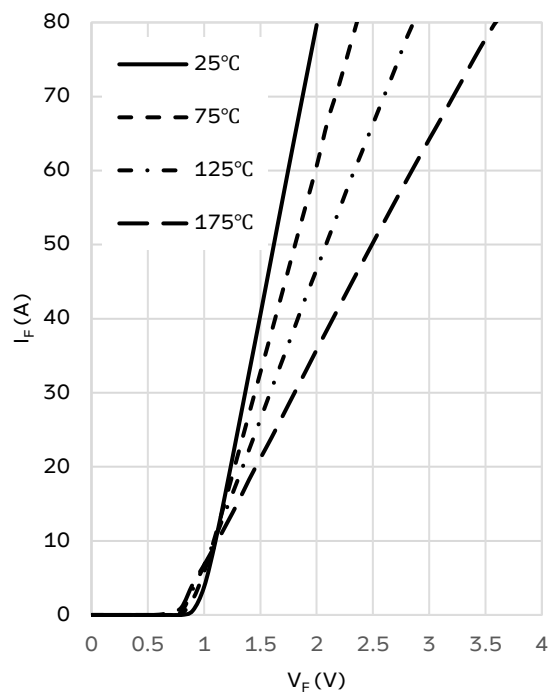


Figure 2. Reverse characteristics

图 2. 反向特性

$$I_R = f(V_R)$$

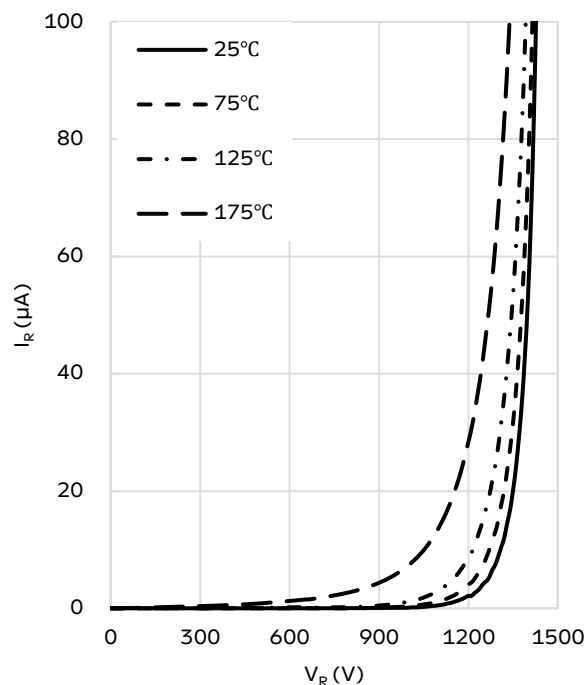


Figure 3. Current derating

图 3. 电流降额

$$I_{F(\text{peak})} = f(T_C)$$

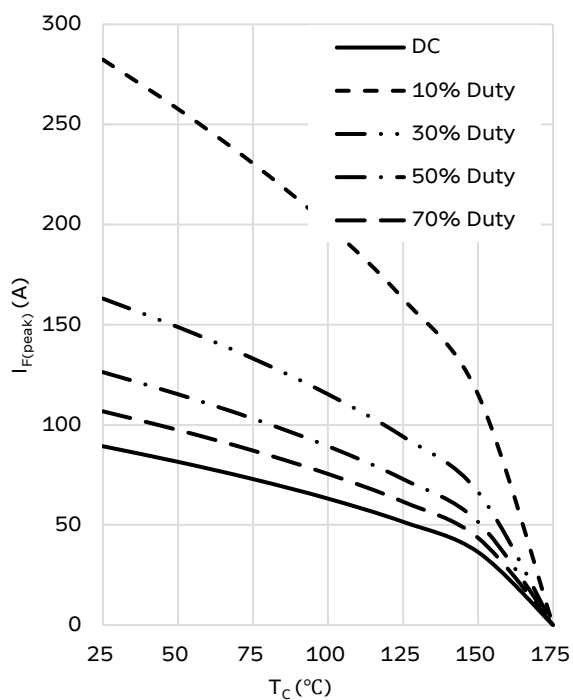
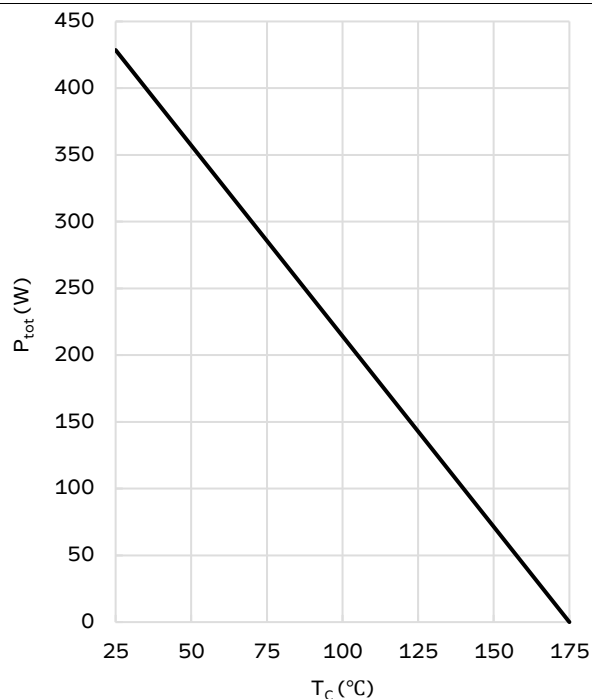


Figure 4. Power derating

图 4. 功率降额

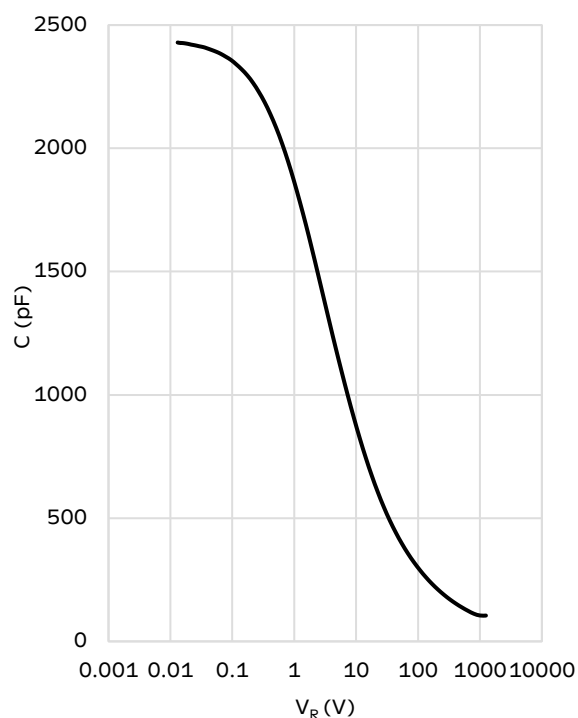
$$P_{\text{tot}} = f(T_C)$$



**Figure 5. Capacitance vs. reverse voltage**

图 5. 电容 vs 反向电压

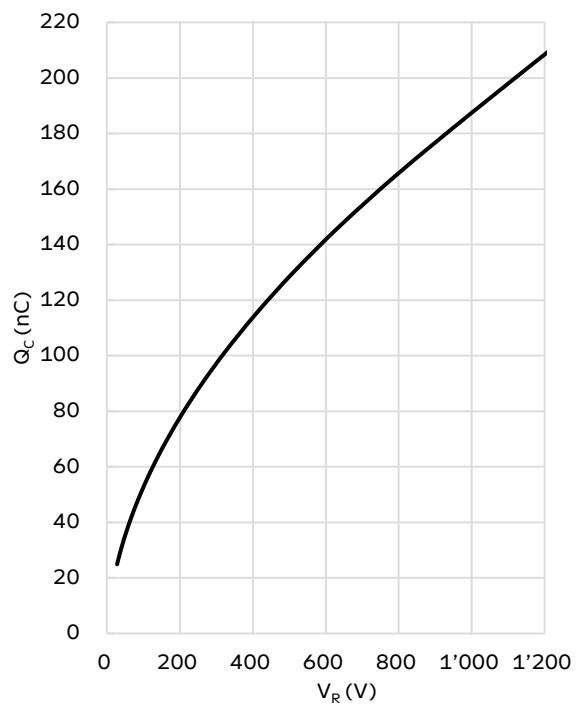
$$C = f(V_R)$$



**Figure 6. Total capacitance charge vs. reverse voltage**

图 6. 总电容电荷 vs 反向电压

$$Q_C = f(V_R)$$



**Figure 7. Capacitance stored energy**

图 7. 电容储存能量

$$E_C = f(V_R)$$

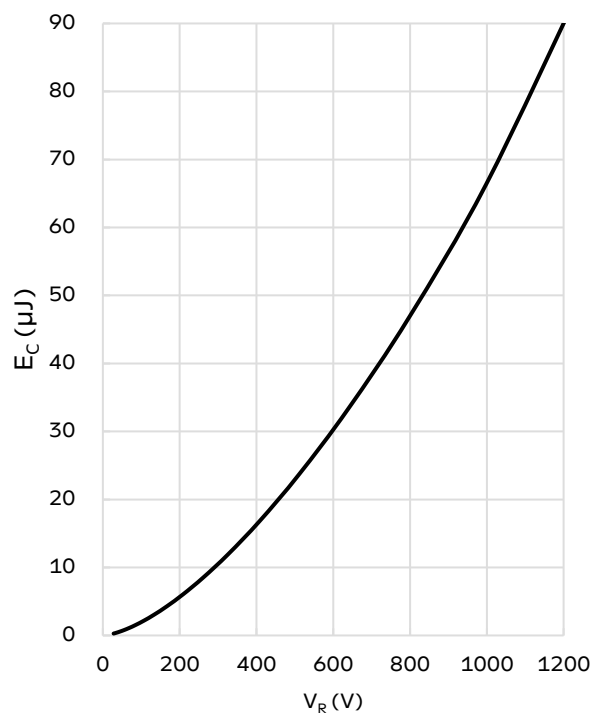
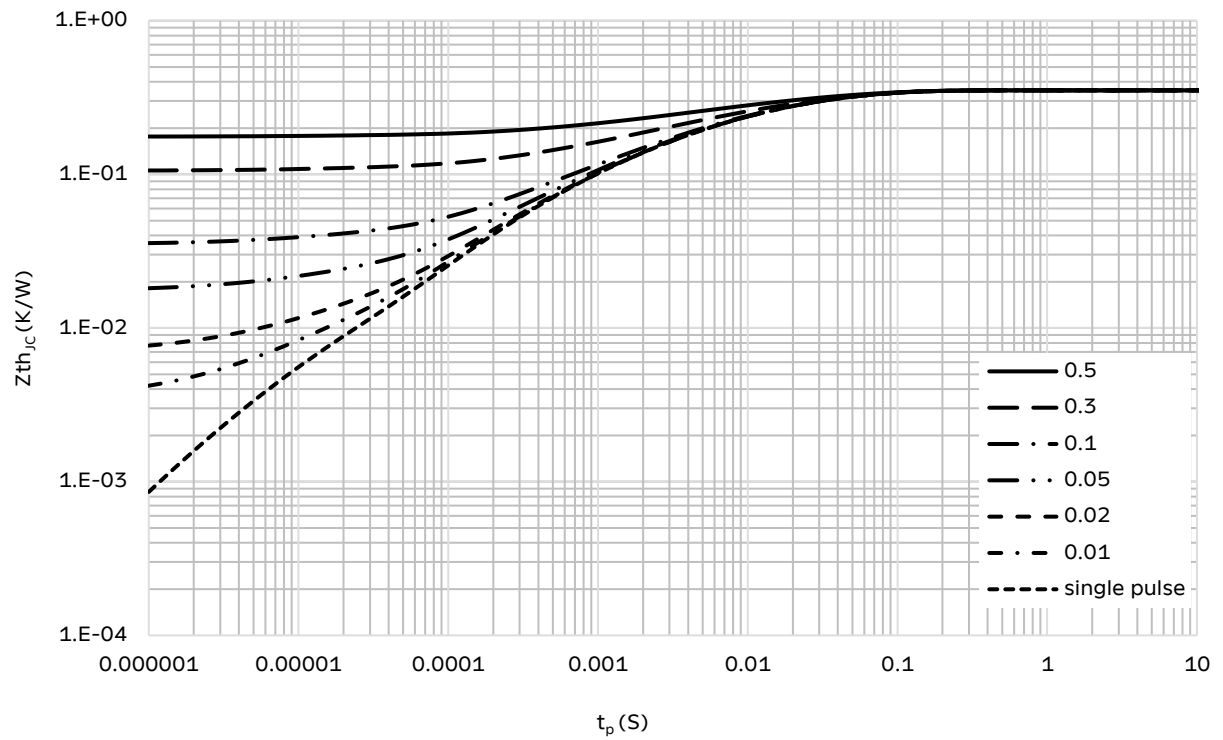




Figure 8. Transient thermal impedance (Junction - Case)

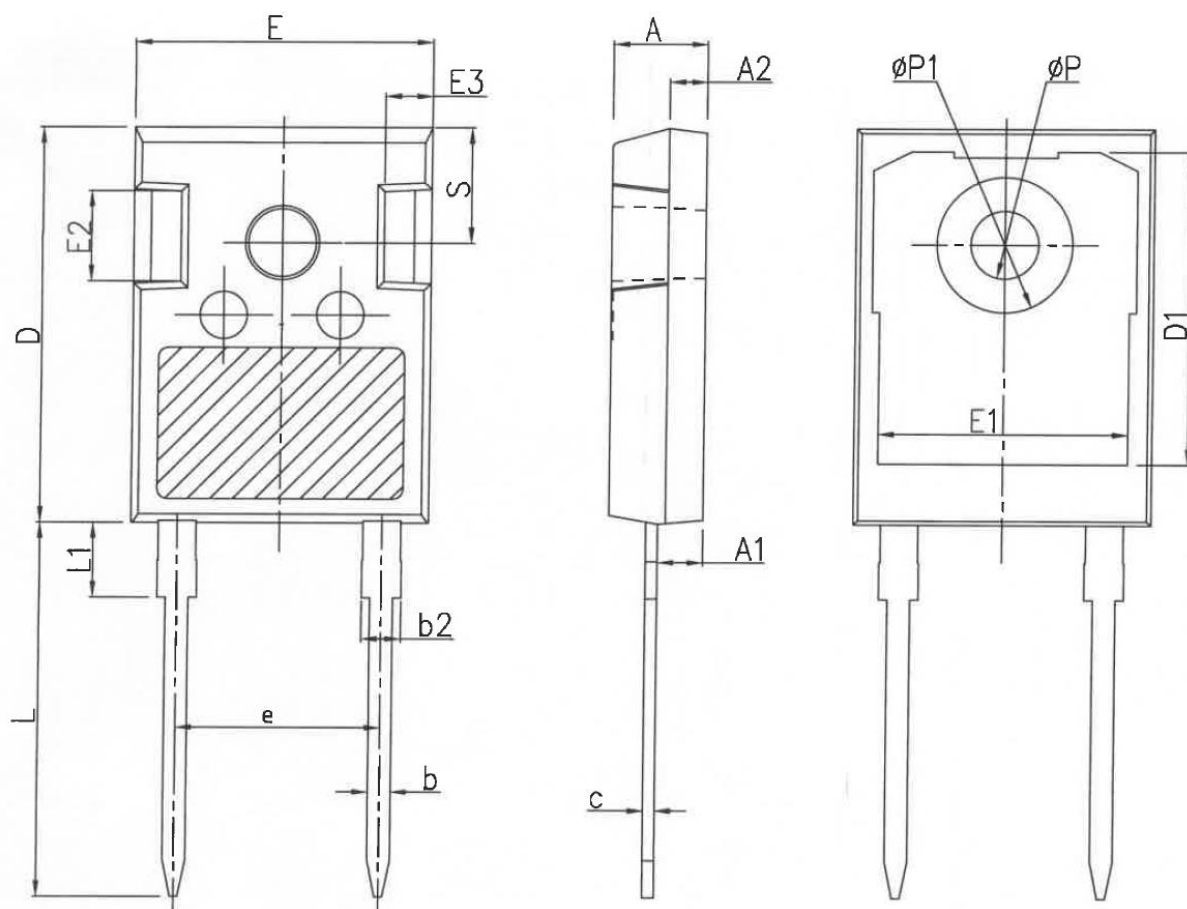
图 8. 瞬态热阻

$$Z_{th,jc} = f(t_p)$$



## Outline drawing 外形图

Marking SCDS24F040HA120



| Sym-<br>bol | Dimensions In Mil-<br>limeters |       |
|-------------|--------------------------------|-------|
|             | Min.                           | Max.  |
| A           | 4.80                           | 5.20  |
| A1          | 2.21                           | 2.59  |
| A2          | 1.85                           | 2.15  |
| b           | 1.11                           | 1.36  |
| b2          | 1.91                           | 2.21  |
| c           | 0.51                           | 0.75  |
| D           | 20.70                          | 21.30 |
| D1          | 16.25                          | 16.85 |
| E           | 15.50                          | 16.10 |
| E1          | 13.00                          | 13.60 |
| E2          | 4.80                           | 5.20  |
| E3          | 2.30                           | 2.70  |
| e           | 10.88 BSC                      |       |
| L           | 19.62                          | 20.22 |

| Sym-<br>bol | Dimensions In Mil-<br>limeters |      |
|-------------|--------------------------------|------|
|             | Min.                           | Max. |
| L1          | -                              | 4.30 |
| ØP          | 3.40                           | 3.80 |
| ØP1         | -                              | 7.30 |
| S           | 6.15 BSC                       |      |

This is an electrostatic sensitive device. 本产品对静电特别敏感.

This product has been designed and qualified for Industrial Level. 本产品的设计符合工业级标准.

Note: All dimensions are in mm



Ordering Information 订购信息

| OPTION<br>选项          |                | ARTICLE NUMBER<br>商品编号 |
|-----------------------|----------------|------------------------|
| Qualification grade   | Industrial (F) | SCD040HA120S24F        |
| Packaging Method 包装方式 | Tube (_P20)    | SCD040HA120S24F_P20    |

Revision History 修订历史

| Release 发布 | Version 版本 | Description 描述              |
|------------|------------|-----------------------------|
| 2026-07-29 | v1.0       | Preliminary Datasheet 初始规格书 |