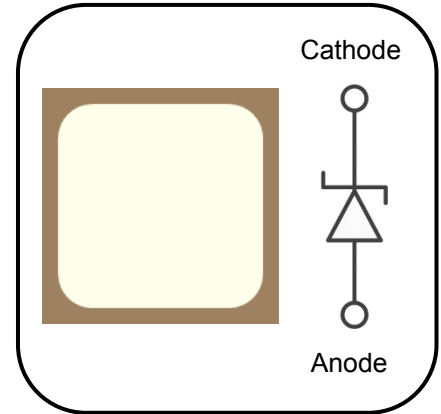


## 3<sup>rd</sup> Generation 1200V/1A SiC Schottky Barrier Diode

### Features

- Revolutionary semiconductor material - Silicon Carbide (SiC)
- No reverse recovery
- High-speed switching performance
- Temperature-independent switching behavior
- System cost / size savings due to reduced cooling requirements
- Junction temperature range from -55°C to 175°C
- RoHS compliant



### Potential Applications

- Industrial power supplies: Industrial UPS
- Battery chargers
- Solar inverters
- Switch mode power supplies



### Description

The ADS120J001B3 SiC Schottky Barrier Diode (SBD) has been developed using Sanan's advanced 3<sup>rd</sup> generation SiC SBD technology with the highest performance and reliability. It registers higher efficiency, higher operation temperature and lower loss and can be operated at higher frequency than Si-based solutions. As to the Schottky structure, it shows no recovery at turn-off and allows a low leakage current with reverse voltage up to 1200V. It can contribute to system miniaturization and achieve lightweight system design. Using RoHS compliant components, it is qualified for use in industrial application.

### Product Specifications

| Device       | $V_{RRM}$ | $I_F$ (135°C) | $V_F$ (25°C) | $Q_C$ |
|--------------|-----------|---------------|--------------|-------|
| ADS120J001B3 | 1200V     | 1.1A          | 1.35V        | 6.4nC |

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**Table 1. Maximum Ratings**

(T<sub>c</sub> = 25°C, unless otherwise specified)

| Parameter                            | Symbol             | Value   | Unit             | Test conditions                                                      |
|--------------------------------------|--------------------|---------|------------------|----------------------------------------------------------------------|
| Repetitive peak reverse voltage      | V <sub>RRM</sub>   | 1200    | V                | T <sub>C</sub> = 25°C                                                |
| Surge peak reverse voltage           | V <sub>RSM</sub>   | 1200    |                  | T <sub>C</sub> = 25°C                                                |
| DC reverse voltage                   | V <sub>DC</sub>    | 1200    |                  | T <sub>C</sub> = 25°C                                                |
| Continuous forward current           | I <sub>F</sub>     | 2.4     | A                | T <sub>C</sub> = 25°C                                                |
|                                      |                    | 1.1     |                  | T <sub>C</sub> = 135°C                                               |
|                                      |                    | 1.0     |                  | T <sub>C</sub> = 145°C                                               |
| Surge non-repetitive forward current | I <sub>FSM</sub>   | 15      | A                | T <sub>C</sub> = 25°C, t <sub>p</sub> = 10ms, half sine pulse        |
| Repetitive peak forward current      | I <sub>FRM</sub>   | 9       | A                | T <sub>C</sub> = 25°C, t <sub>p</sub> = 10ms, half sine wave D = 0.1 |
| i <sup>2</sup> t value               | ∫i <sup>2</sup> dt | 1.13    | A <sup>2</sup> s | T <sub>C</sub> = 25°C, t <sub>p</sub> = 10ms                         |
| Operating junction temperature       | T <sub>j</sub>     | -55~175 | °C               |                                                                      |
| Storage temperature                  | T <sub>stg</sub>   | -55~175 | °C               |                                                                      |

**Table 2. Thermal Resistance**

| Parameter                                | Symbol               | Values |      |      | Unit | Test condition |
|------------------------------------------|----------------------|--------|------|------|------|----------------|
|                                          |                      | Min.   | Typ. | Max. |      |                |
| Thermal resistance from junction to case | R <sub>th(j-c)</sub> | /      | 19   | /    | °C/W |                |

\*Thermal Resistance is collected in SMBF

**Table 3. Static Electrical Characteristics**

( $T_j = 25^\circ\text{C}$ , unless otherwise specified)

| Parameter           | Symbol   | Values |      |      | Unit          | Test conditions                                  |
|---------------------|----------|--------|------|------|---------------|--------------------------------------------------|
|                     |          | Min.   | Typ. | Max. |               |                                                  |
| DC blocking voltage | $V_{DC}$ | 1200   | /    | /    | V             | $I_R = 100\ \mu\text{A}$                         |
| Forward voltage     | $V_F$    | /      | 1.35 | 1.50 | V             | $I_F = 1\text{A}$ , $T_j = 25^\circ\text{C}$     |
|                     |          | /      | 1.80 | 2.20 |               | $I_F = 1\text{A}$ , $T_j = 175^\circ\text{C}$    |
| Reverse current     | $I_R$    | /      | 1    | 8    | $\mu\text{A}$ | $V_R = 1200\text{V}$ , $T_j = 25^\circ\text{C}$  |
|                     |          | /      | 2    | 16   |               | $V_R = 1200\text{V}$ , $T_j = 175^\circ\text{C}$ |

**Table 4. Dynamic Electrical Characteristics**

( $T_j = 25^\circ\text{C}$ , unless otherwise specified)

| Parameter                 | Symbol | Values |      |      | Unit          | Test conditions                         |
|---------------------------|--------|--------|------|------|---------------|-----------------------------------------|
|                           |        | Min.   | Typ. | Max. |               |                                         |
| Total capacitance         | C      | /      | 88   | /    | pF            | $V_R = 0\text{V}$ , $f = 1\text{MHz}$   |
|                           |        | /      | 6.2  | /    |               | $V_R = 400\text{V}$ , $f = 1\text{MHz}$ |
|                           |        | /      | 4.5  | /    |               | $V_R = 800\text{V}$ , $f = 1\text{MHz}$ |
| Total capacitive charge   | $Q_C$  | /      | 6.4  | /    | nC            | $V_R = 800\text{V}$                     |
| Capacitance stored energy | $E_C$  | /      | 1.8  | /    | $\mu\text{J}$ | $V_R = 800\text{V}$                     |

## Electrical Characteristic Diagrams

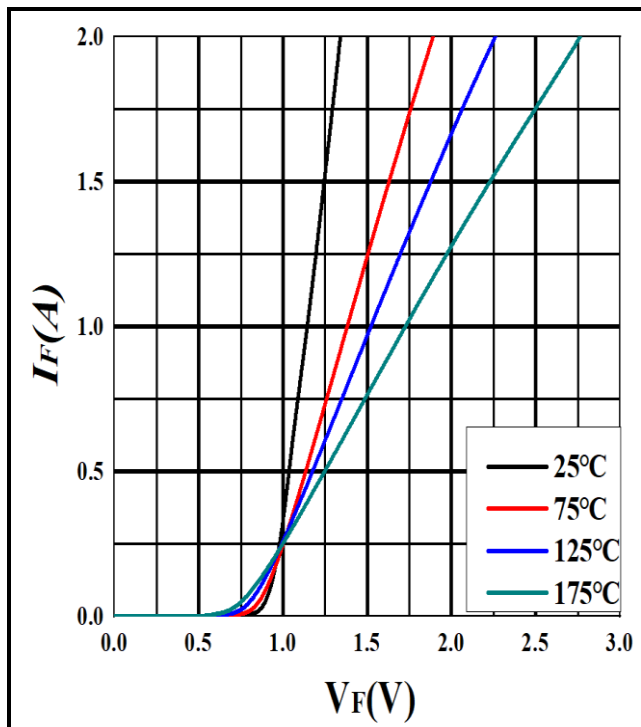


Figure 1. Forward characteristics

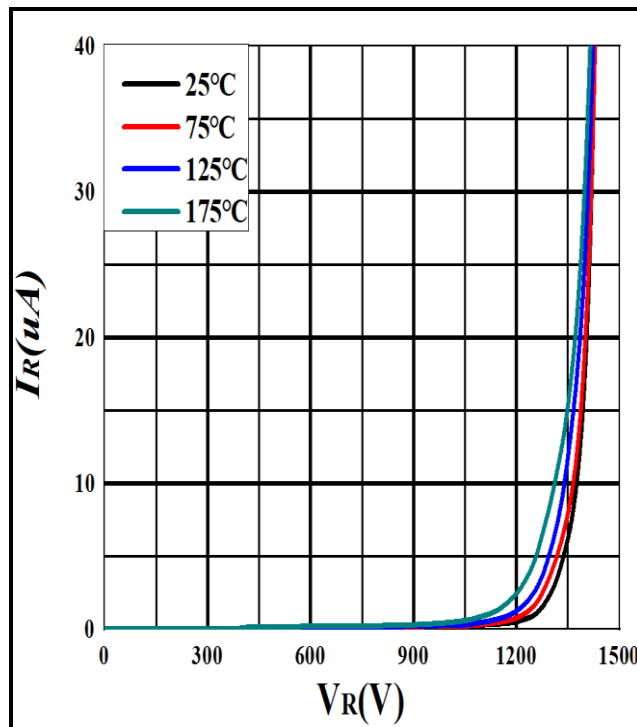


Figure 2. Reverse characteristics

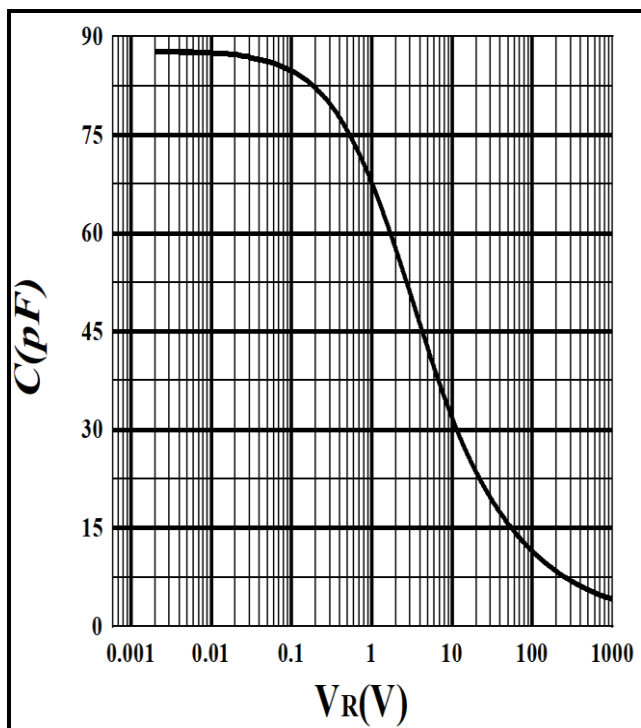


Figure 3. Capacitance vs. reverse voltage

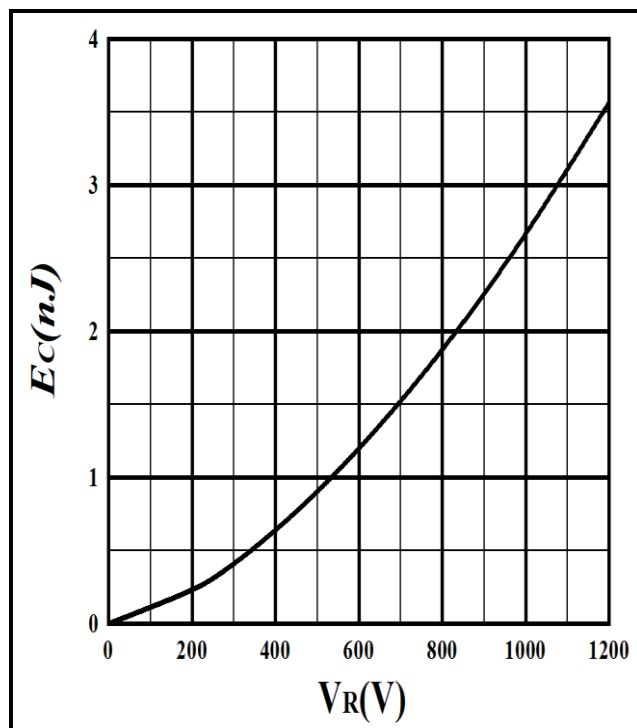


Figure 4. Capacitance stored energy

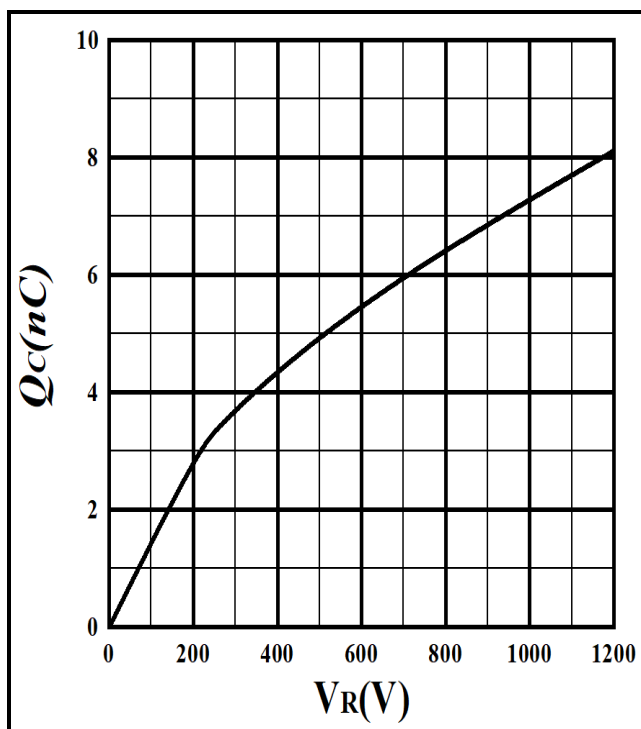


Figure 5. Total capacitance charge vs. reverse voltage

## Ordering Information

|                |              |
|----------------|--------------|
| Part Number    | ADS120J001B3 |
| Package        | Bare Die     |
| Packing Method | Wafer        |
| RoHS           | Yes          |

## Important Notices – Read Carefully

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