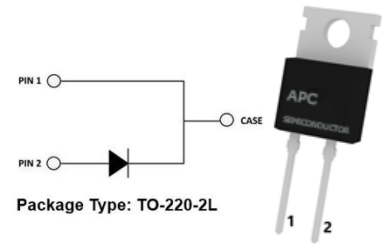




# High Power SiC Schottky Barrier Diode ASA010V120A5



## Applications:

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

## Features:

- Revolutionary semiconductor material - Silicon Carbide (SiC)
- No reverse recovery
- High-speed switching performance
- System cost / size saving due to reduced cooling requirement
- Junction Temp range -55°C to 175°C

### Absolute Maximum Ratings (T<sub>amb</sub>=25°C, unless specified otherwise)

| Symbol             | Parameter                            |  | ASA010V120A5 | Unit             |
|--------------------|--------------------------------------|--|--------------|------------------|
| V <sub>DC</sub>    | DC reverse voltage                   |  | 1200         | V                |
| V <sub>RRM</sub>   | Repetitive peak reverse voltage      |  |              |                  |
| V <sub>RSM</sub>   | Surge peak reverse voltage           |  |              |                  |
| I <sub>F</sub>     | Continuous Forward Current           | T <sub>C</sub> = 25°C  | 30           | A                |
|                    |                                      | T <sub>C</sub> = 135°C   | 16           |                  |
|                    |                                      | T <sub>C</sub> = 156°C   | 10           |                  |
| I <sub>FSM</sub>   | Surge non-repetitive forward current | T <sub>C</sub> = 25°C, t <sub>p</sub> = 10ms, half sine pulse        | 118          |                  |
|                    |                                      | T <sub>C</sub> = 150°C, t <sub>p</sub> = 10ms, half sine pulse       | 94           |                  |
| I <sub>F,Max</sub> | Non-repetitive peak forward current  | T <sub>C</sub> = 25°C, t <sub>p</sub> = 10µs, pulse                  | 713          |                  |
| I <sub>FRM</sub>   | Surge repetitive forward current     | T <sub>C</sub> = 25°C, t <sub>p</sub> = 10ms, half sine wave D = 0.1 | 67           |                  |
| P <sub>tot</sub>   | Total Power Dissipation              |  | 188          | W                |
| ∫i <sup>2</sup> dt | i <sup>2</sup> t value               |  | 70           | A <sup>2</sup> s |
| T <sub>j</sub>     | Operating junction temperature range |  | -55 to 175   | °C               |
| T <sub>stg</sub>   | Storage temperature range            |  | -55 to 175   |                  |
| M                  | Mounting torque                      | M3 screw   | 1            | Nm               |

**Static Electrical Characteristics ( $T_A = 25^\circ\text{C}$ , unless specified otherwise)**

| Symbol   | Parameter           | Test Conditions                               | Min  | Typ  | Max  | Unit          |
|----------|---------------------|---|------|------|------|---------------|
| $V_{DC}$ | DC blocking voltage | $I_R = 100 \mu\text{A}$                       | 1200 | -    | -    | V             |
| $V_F$    | Forward voltage     | $I_F = 10\text{A}, T_j = 25^\circ\text{C}$    | -    | 1.40 | 1.60 | V             |
|          |                     | $I_F = 10\text{A}, T_j = 175^\circ\text{C}$   | -    | 2.00 | 2.40 |               |
| $I_R$    | Reverse current     | $V_R = 1200\text{V}, T_j = 25^\circ\text{C}$  | -    | 5    | 40   | $\mu\text{A}$ |
|          |                     | $V_R = 1200\text{V}, T_j = 175^\circ\text{C}$ | -    | 15   | 160  |               |

**Thermal Characteristics**

| Symbol          | Parameter                           | Test conditions | Min | Typ  | Max | Unit                      |
|-----------------|-------------------------------------|-----------------|-----|------|-----|---------------------------|
| $R_{\theta JC}$ | Junction-to-case Thermal Resistance |                 | -   | 0.80 | -   | $^\circ\text{C}/\text{W}$ |

**Dynamic Characteristics ( $T_A = 25^\circ\text{C}$ , unless specified otherwise)**

|       |                           |                                      |   |      |   |               |
|-------|---------------------------|--------------------------------------|---|------|---|---------------|
| $C$   | Total capacitance         | $V_R = 0\text{V}, f = 1\text{MHz}$   | - | 690  | - | pF            |
|       |                           | $V_R = 400\text{V}, f = 1\text{MHz}$ | - | 45   | - |               |
|       |                           | $V_R = 800\text{V}, f = 1\text{MHz}$ | - | 32   | - |               |
| $Q_C$ | Total capacitive charge   | $V_R = 800\text{V}$                  | - | 48   | - | nC            |
| $E_C$ | Capacitance stored energy | $V_R = 800\text{V}$                  | - | 13.6 | - | $\mu\text{J}$ |

### Electrical Characteristic Diagrams

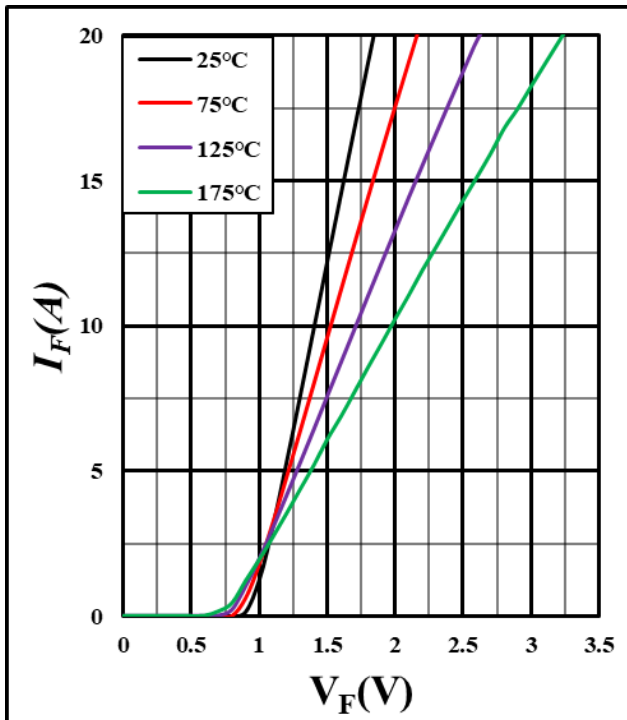


Figure 1. Forward characteristics

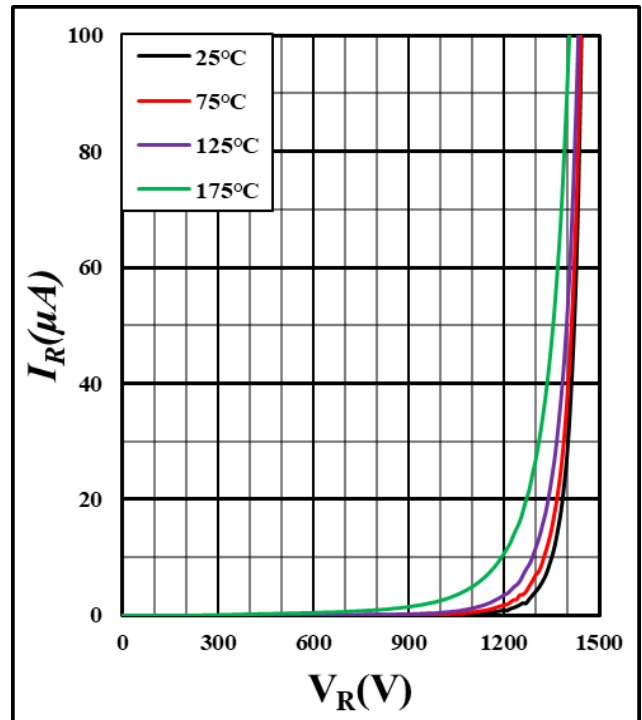


Figure 2. Reverse characteristics

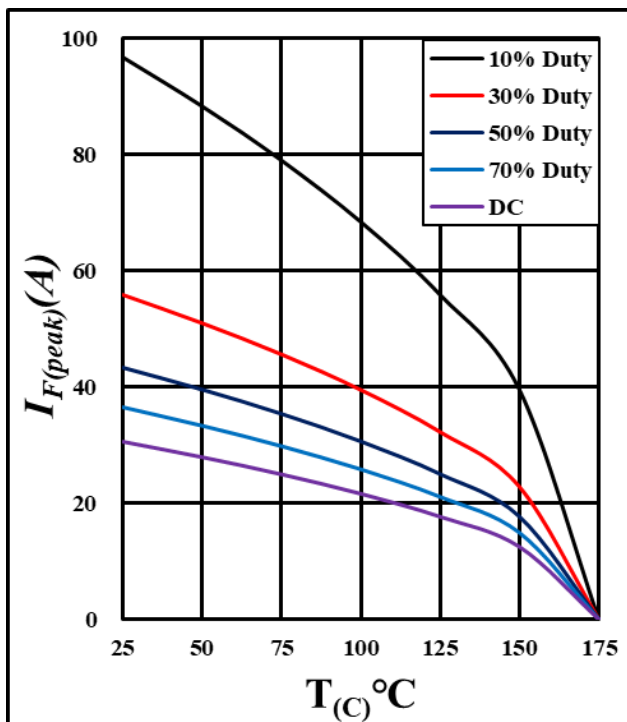


Figure 3. Current derating

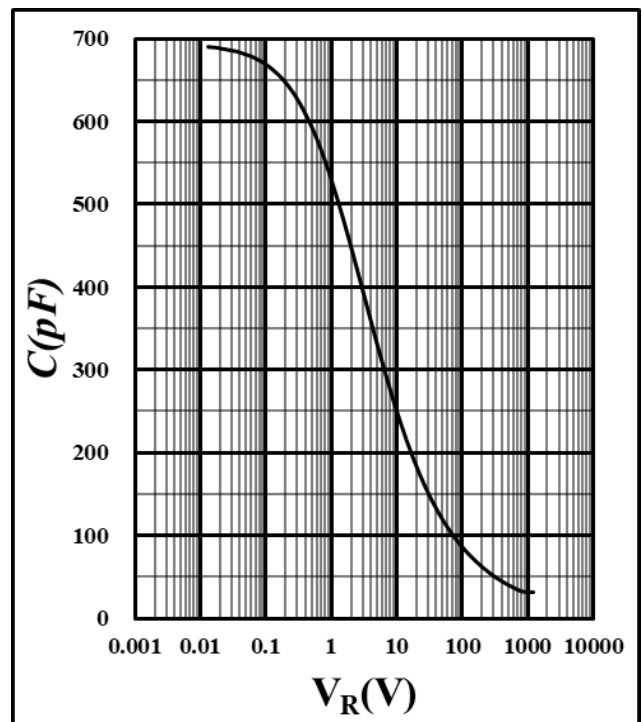


Figure 4. Capacitance vs. reverse voltage

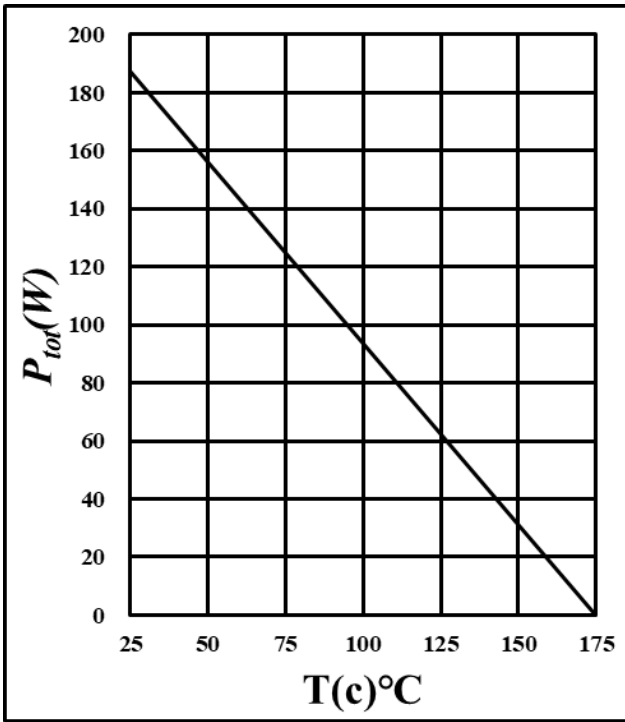


Figure 5. Power derating

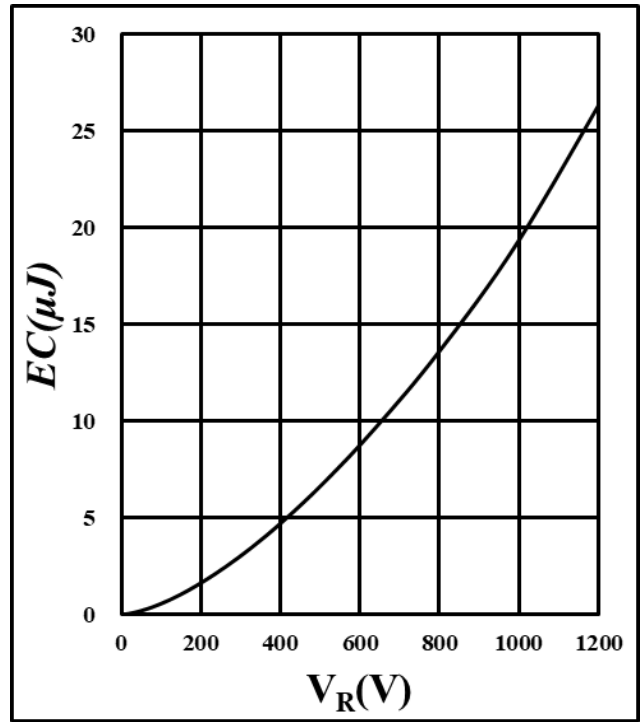


Figure 6. Capacitance stored energy

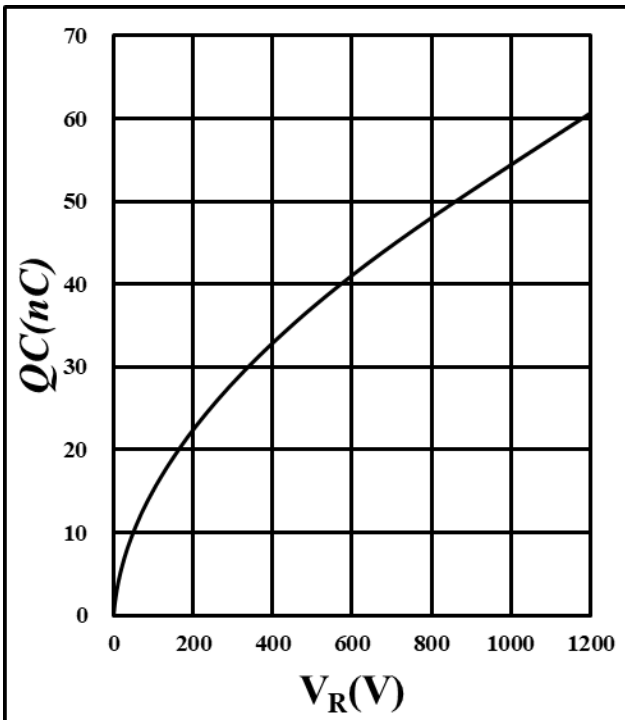


Figure 7. Total capacitance charge vs. reverse voltage

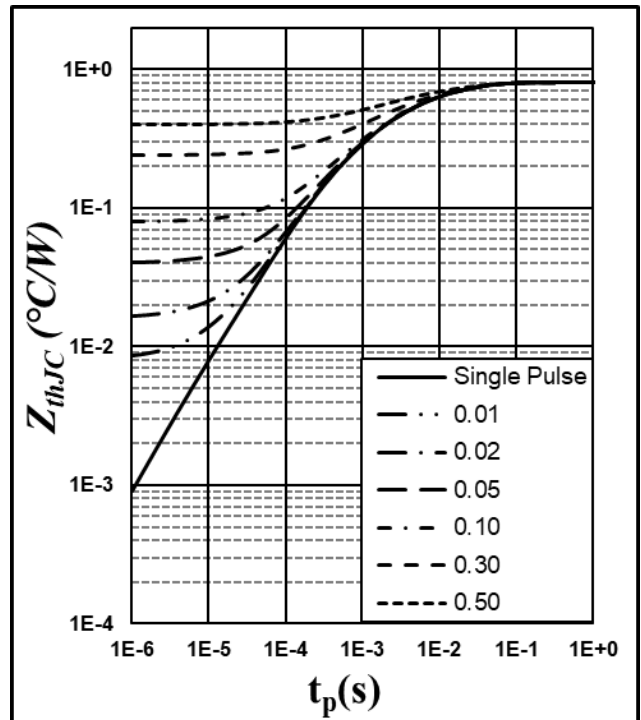
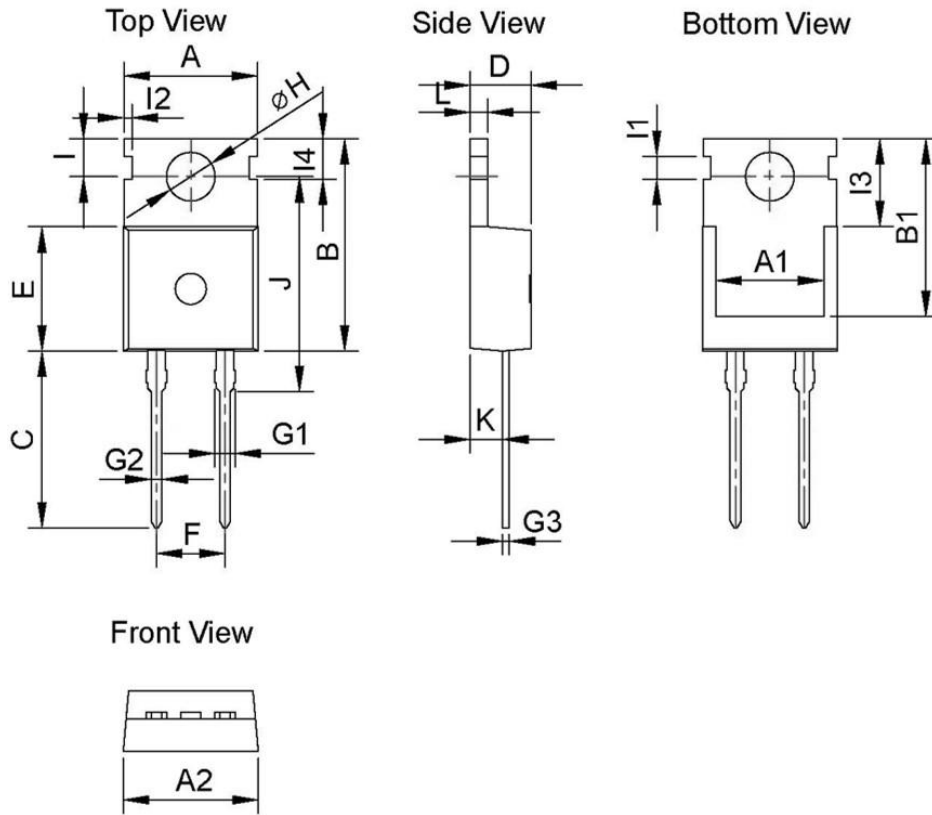


Figure 8. Transient Thermal Impedance  
(Junction - Case)

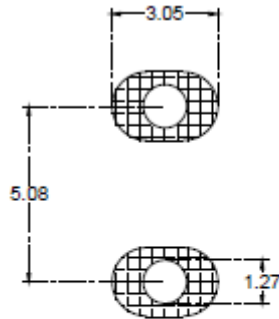
### Package Information



| Dimension unit: [mm] |           |       |       |
|----------------------|-----------|-------|-------|
| Symbol               | Min       | Nom   | Max   |
| A                    | 9.66      | 9.90  | 10.28 |
| A1                   | 6.90      | -     | -     |
| A2                   | 9.80      | 10.00 | 10.20 |
| B                    | 15.60     | 15.70 | 15.80 |
| B1                   | 13.16 REF |       |       |
| C                    | 12.70     | 13.08 | 14.27 |
| D                    | 4.30      | 4.50  | 4.70  |
| E                    | 8.59      | 9.20  | 9.40  |
| F                    | 5.08 BSC  |       |       |
| G1                   | 1.32      | 1.52  | 1.62  |
| G2                   | 0.70      | 0.80  | 0.95  |
| G3                   | 0.45      | 0.50  | 0.60  |
| $\phi H$             | 3.53      | 3.60  | 3.70  |
| I                    | 2.70      | 2.80  | 2.90  |
| I1                   | 1.70 REF  |       |       |
| I2                   | 0.59 REF  |       |       |
| I3                   | 6.50 REF  |       |       |
| I4                   | 3.00 REF  |       |       |
| J                    | 15.70     | 15.90 | 16.25 |
| K                    | 2.20      | 2.40  | 2.60  |
| L                    | 1.15      | 1.30  | 1.40  |

## Recommended Solder Pad Layout

Note: All dimensions are in mm



TO-220-2L

## Ordering Information

|               |              |
|---------------|--------------|
| Part number   | ASA010V120A5 |
| Package       | TO-220-2L    |
| Unit quantity | 1000 EA      |
| Packing type  | Tube         |