

## S7D090065H

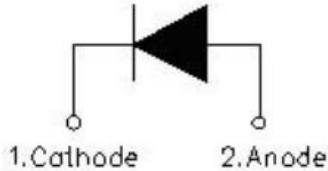
### 650V SiC POWER SCHOTTKY RECTIFIER



#### Description

S7D090065H is a SiC Schottky rectifier packaged in TO-247AC(TO-247-2) case. The device is a high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S7D090065H is ideal for energy sensitive, high frequency applications in challenging environments.

#### Circuit Diagram



#### Features

- 175°C T<sub>J</sub> operation
- Ultra-low switching loss
- Switching speeds independent of operating temperature
- Low total conduction losses
- High forward surge current capability
- High package isolation voltage
- Terminals finish: 100% Pure Tin
- "-A" is an AEC-Q101 qualified device
- Pb - Free Device
- All SMC parts are traceable to the wafer lot
- Additional electrical and life testing can be performed upon request

#### Applications

- Alternative energy inverters
- Power Factor Correction (PFC)
- Free-Wheeling diodes
- Switching supply output rectification
- Reverse polarity protection

## Maximum Ratings:

| Characteristics                                                                        | Symbol                             | Condition                                 | Max. | Units |
|----------------------------------------------------------------------------------------|------------------------------------|-------------------------------------------|------|-------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | $V_{RRM}$<br>$V_{RWM}$<br>$V_{DC}$ | -                                         | 650  | V     |
| Average Rectified Forward Current                                                      | $I_F (AV)1$                        | $T_C=25^{\circ}C$                         | 264  | A     |
|                                                                                        | $I_F (AV)2$                        | $T_C=135^{\circ}C$                        | 106  | A     |
|                                                                                        | $I_F (AV)3$                        | $T_C=142^{\circ}C$                        | 90   | A     |
| Repetitive Peak Forward Surge Current                                                  | $I_{FRM1}$                         | 10ms, Half Sine pulse, $T_C=25^{\circ}C$  | 560  | A     |
|                                                                                        | $I_{FRM2}$                         | 10ms, Half Sine pulse, $T_C=110^{\circ}C$ | 336  | A     |
| Peak One Cycle Non-Repetitive Surge Current                                            | $I_{FSM1}$                         | 10ms, Half Sine pulse, $T_C=25^{\circ}C$  | 640  | A     |
|                                                                                        | $I_{FSM2}$                         | 10ms, Half Sine pulse, $T_C=110^{\circ}C$ | 384  | A     |
| Power Dissipation                                                                      | $P_{tot1}$                         | $T_C=25^{\circ}C$                         | 790  | W     |
|                                                                                        | $P_{tot2}$                         | $T_C=110^{\circ}C$                        | 342  | W     |

## Electrical Characteristics:

| Characteristics           | Symbol   | Condition                                                               | Typ. | Max. | Units   |
|---------------------------|----------|-------------------------------------------------------------------------|------|------|---------|
| Forward Voltage Drop*     | $V_{F1}$ | @ 90A, Pulse, $T_J = 25^{\circ}C$                                       | 1.4  | 1.65 | V       |
|                           | $V_{F2}$ | @ 90A, Pulse, $T_J = 175^{\circ}C$                                      | 1.6  | 2.0  | V       |
| Reverse Current*          | $I_{R1}$ | @ $V_R = \text{rated } V_R$ , $T_J = 25^{\circ}C$                       | 1    | 50   | $\mu A$ |
|                           | $I_{R2}$ | @ $V_R = \text{rated } V_R$ , $T_J = 175^{\circ}C$                      | 10   | 200  | $\mu A$ |
| Junction Capacitance      | $C_T$    | $V_R=0V$ , $T_J=25^{\circ}C$ , $f=1MHz$                                 | 5232 | -    | pF      |
| Reverse Recovery Charge   | $Q_c$    | $I_F = 90A$ ,<br>$di/dt=200A/\mu s$<br>$V_R = 400V$ , $T_J=25^{\circ}C$ | 80   | -    | nC      |
| Capacitance Stored Energy | $E_C$    | $V_R = 400V$ , $T_J=25^{\circ}C$                                        | 46   | -    | $\mu J$ |

\* Pulse width < 300  $\mu s$ , duty cycle < 2%

### Thermal-Mechanical Specifications:

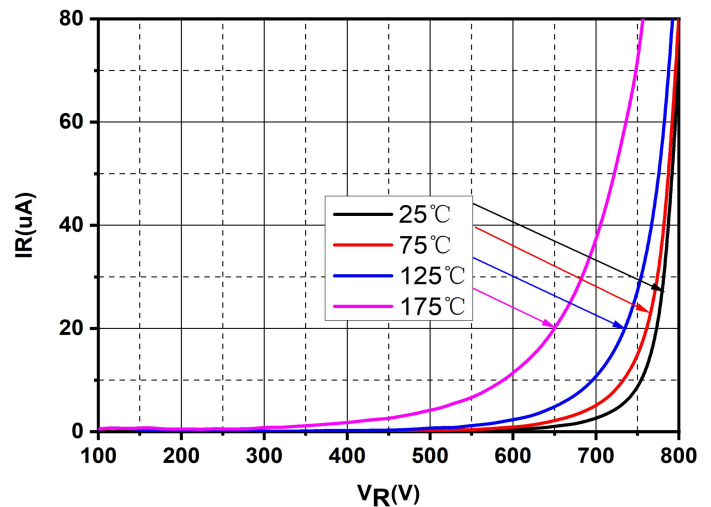
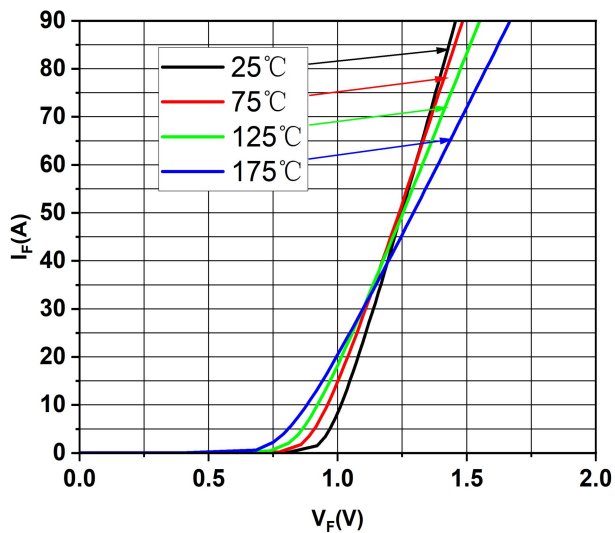
| Characteristics                                | Symbol          | Condition    | Specification | Units |
|------------------------------------------------|-----------------|--------------|---------------|-------|
| Junction Temperature                           | $T_J$           | -            | -55 to +175   | °C    |
| Storage Temperature                            | $T_{stg}$       | -            | -55 to +175   | °C    |
| Typical Thermal Resistance<br>Junction to Case | $R_{\theta jc}$ | DC operation | 0.24          | °C/W  |

### Ordering Information

| Device     | Package            | Plating | Shipping     |
|------------|--------------------|---------|--------------|
| S7D090065H | TO-247AC(TO-247-2) | Pure Sn | 30pcs / tube |

For information on tape and reel specifications, including part orientation and tape sizes, please refer to our tape and reel packaging specification.

### Ratings and Characteristics Curves



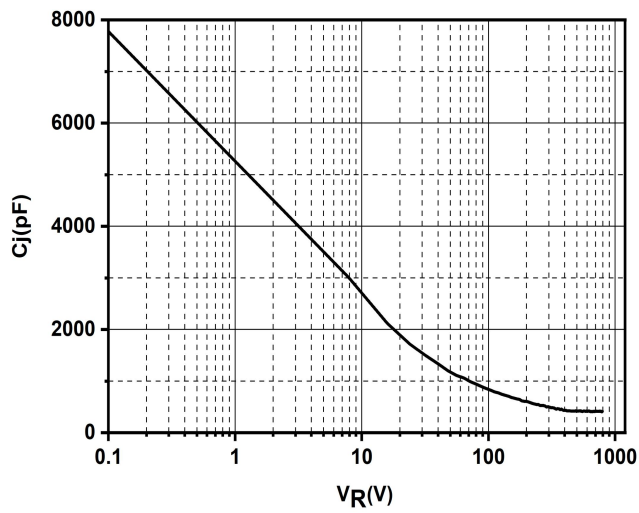


Fig.3-Capacitance vs. Reverse Voltage

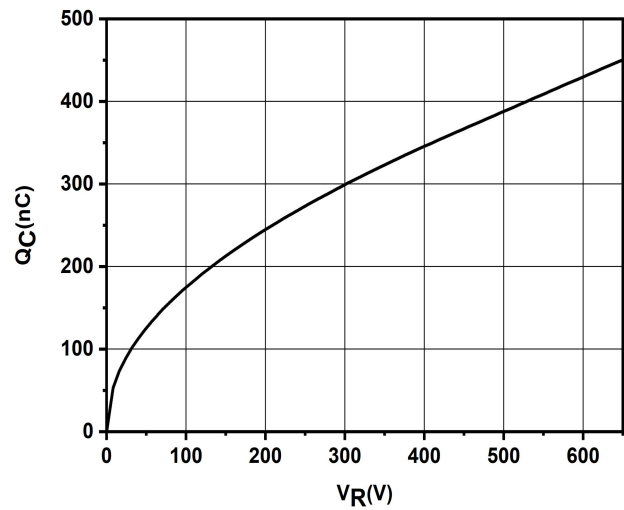


Fig.4-Total Capacitance Charge vs. Reverse Voltage

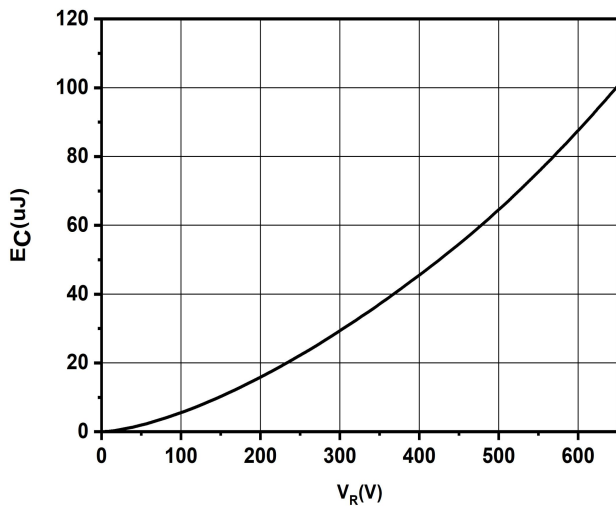


Fig.5-Capacitance Stored Energy

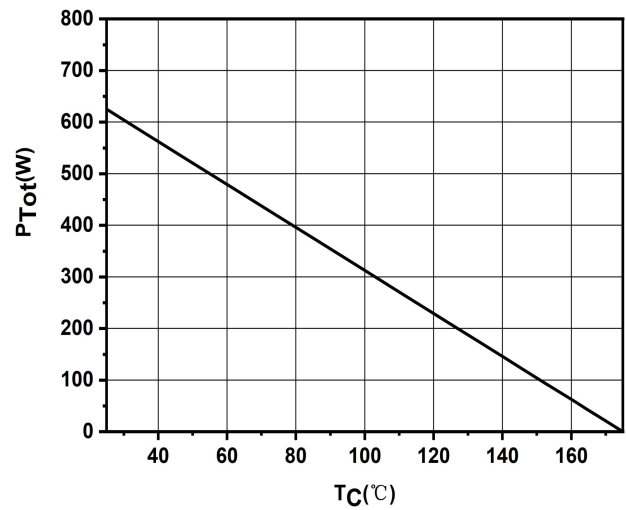


Fig.6-Power Derating

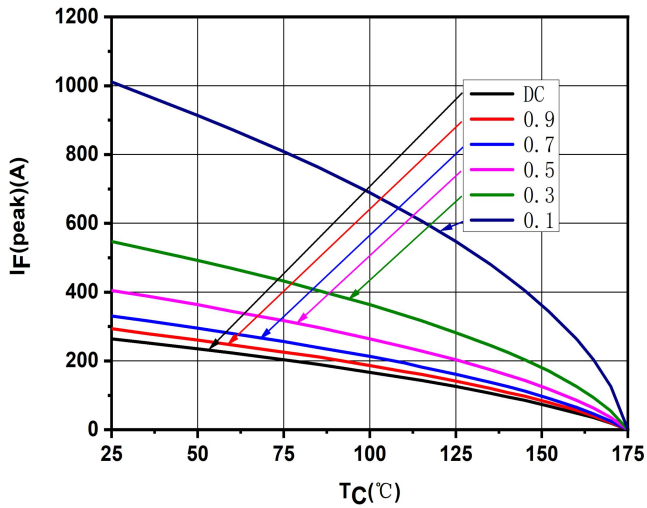
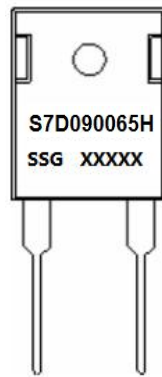


Fig.7-Power Derating

## Marking Diagram

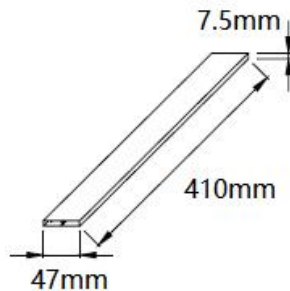


Where XXXXX is YYWWL

S7D = Device Type  
H = Package type  
90 = Forward Current (90A)  
065 = Reverse Voltage (650V)  
SSG = SSG  
YY = Year  
WW = Week  
L = Lot Number

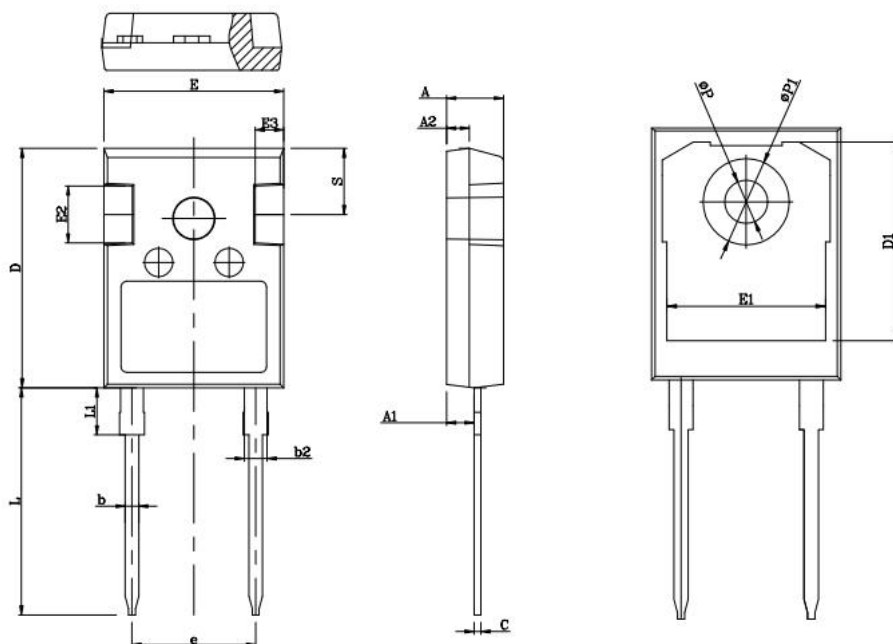
Cautions: Molding resin  
Epoxy resin UL94V-0

## Tube Specification



(TO-247-2)

**Mechanical Dimensions TO-247AC(TO-247-2)**



| SYMBOL | mm    |       |       | SYMBOL | mm       |       |       |
|--------|-------|-------|-------|--------|----------|-------|-------|
|        | Min   | Nom   | Max   |        | Min      | Nom   | Max   |
| A      | 4.80  | 5.00  | 5.20  | E1     | 13.00    | 13.26 | 13.56 |
| A1     | 2.23  | 2.41  | 2.59  | E2     | 4.80     | 5.00  | 5.20  |
| A2     | 1.85  | 2.00  | 2.15  | E3     | 2.30     | 2.50  | 2.70  |
| b      | 1.11  | 1.21  | 1.36  | e      | 10.88BSC |       |       |
| b2     | 1.91  | 2.01  | 2.21  | L      | 19.82    | 19.92 | 20.22 |
| c      | 0.51  | 0.61  | 0.75  | L1     | 3.94     | 4.12  | 4.30  |
| D      | 20.80 | 21.00 | 21.30 | ØP     | 3.40     | 3.60  | 3.80  |
| D1     | 16.25 | 16.55 | 16.85 | ØP1    | 7.08     | 7.19  | 7.30  |
| E      | 15.50 | 15.80 | 16.10 | S      | 6.15BSC  |       |       |

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