

S3D08065A 650V SIC POWER SCHOTTKY RECTIFIERS



Description

This 650V 8A diode is a high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S3D08065A is ideal for energy sensitive, high frequency applications in challenging environments.

Circuit Diagram



Features

- 175°C TJ 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 Working Peak Reverse Voltage DC Blocking Voltage | V_{RRM} V_{RWM} V_{DC} | - | 650 | V |
| Average Rectified Forward Current | $I_{F(AV)1}$ | $T_c=25^{\circ}C$ | 27 | A |
| | $I_{F(AV)2}$ | $T_c=153^{\circ}C$ | 8 | A |
| Repetitive Peak Forward Surge Current | I_{FRM1} | 10ms, Half Sine pulse, $T_c=25^{\circ}C$ | 37.5 | A |
| | I_{FRM2} | 10ms, Half Sine pulse, $T_c=110^{\circ}C$ | 25.5 | A |
| Peak One Cycle Non-Repetitive Surge Current | I_{FSM1} | 10ms, Half Sine pulse, $T_c=25^{\circ}C$ | 90 | A |
| | I_{FSM2} | 10ms, Half Sine pulse, $T_c=110^{\circ}C$ | 60 | A |
| Non-Repetitive Peak Forward Surge Current | $I_{F,Max}$ | 10 μ s. Pulse, $T_c=25^{\circ}C$ | 650 | A |
| | $I_{F,Max}$ | 10 μ s. Pulse, $T_c=110^{\circ}C$ | 530 | A |
| Power Dissipation | P_{tot1} | $T_c=25^{\circ}C$ | 103 | W |
| | P_{tot1} | $T_c=110^{\circ}C$ | 44.5 | W |

Electrical Characteristics:

| Characteristics | Symbol | Condition | Typ. | Max. | Units |
|---------------------------|----------|---|-------|------|---------|
| Forward Voltage Drop* | V_{F1} | @ 8A, Pulse, $T_J = 25^{\circ}C$ | 1.45 | 1.7 | V |
| | V_{F2} | @ 8A, Pulse, $T_J = 175^{\circ}C$ | 1.7 | 2.4 | V |
| Reverse Current* | I_{R1} | @ $V_R =$ rated V_R , $T_J = 25^{\circ}C$ | 0.3 | 10 | μ A |
| | I_{R2} | @ $V_R =$ rated V_R , $T_J = 175^{\circ}C$ | 3 | 100 | μ A |
| Junction Capacitance | C_T | $V_R=0V$, $T_J=25^{\circ}C$, $f=1MHz$ | 650 | - | pF |
| Reverse Recovery Charge | Q_c | $I_F = 8A$, $di/dt = 200A/\mu s$ $V_R = 400V$, $T_J = 25^{\circ}C$ | 40.55 | - | nC |
| Capacitance Stored Energy | E_c | $V_R = 400V$, $T_J = 25^{\circ}C$ | 9.93 | - | μ J |

* Pulse width < 300 μ 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 Junction to Case | $R_{\theta JC}$ | DC operation | 1.46 | °C/W |

Ordering Information

| Device | Package | Shipping |
|-----------|--------------------|--------------|
| S3D08065A | TO-220AC(TO-220-2) | 50pcs / tube |

Ratings and Characteristics Curves

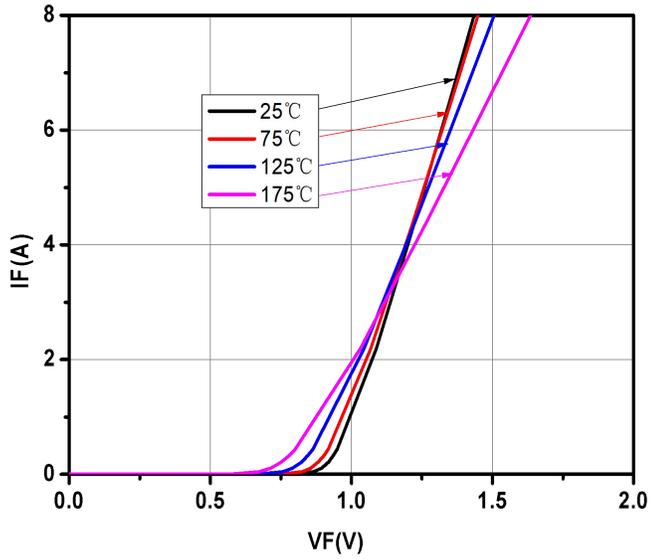


Fig.1-Typical Forward Voltage Characteristics

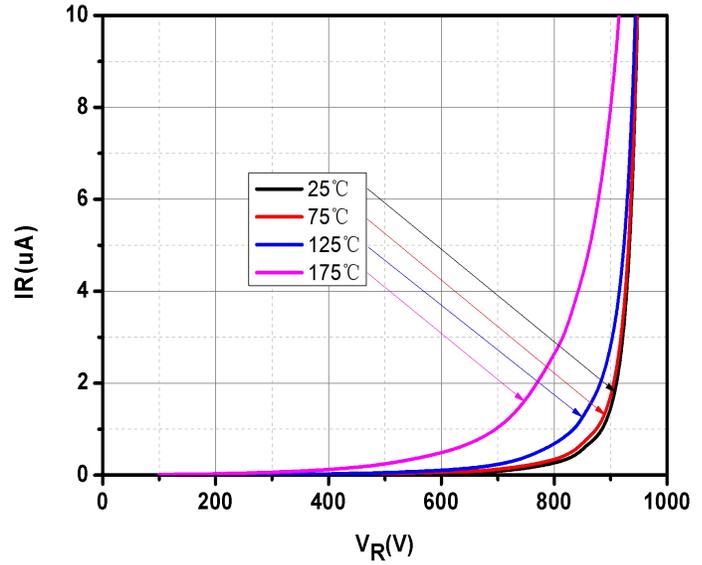


Fig.2-Typical Reverse Characteristics

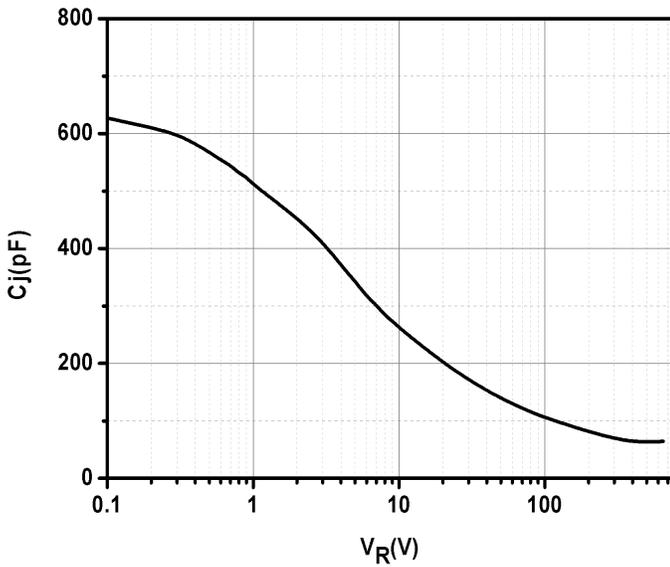


Fig.3-Capacitance vs. Reverse Voltage

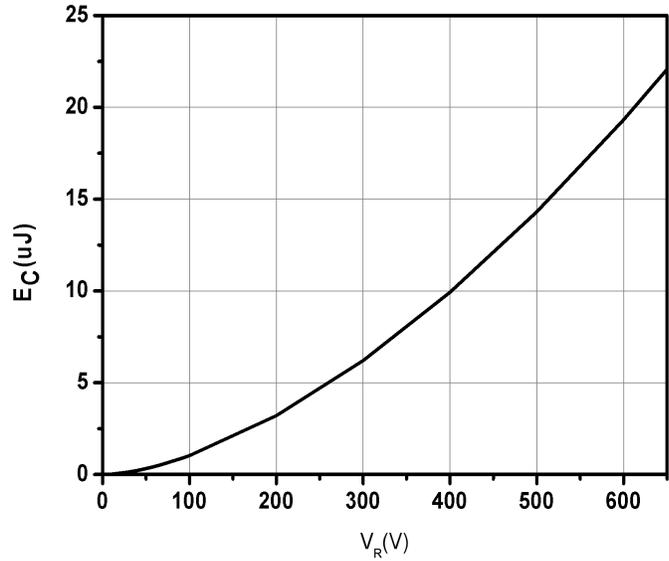


Fig.4-Total Capacitance Charge vs. Reverse Voltage

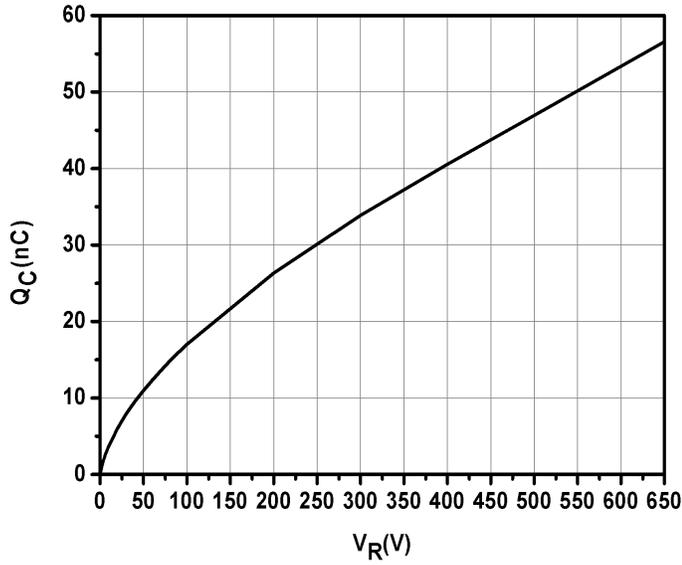


Fig.5-Capacitance Stored Energy

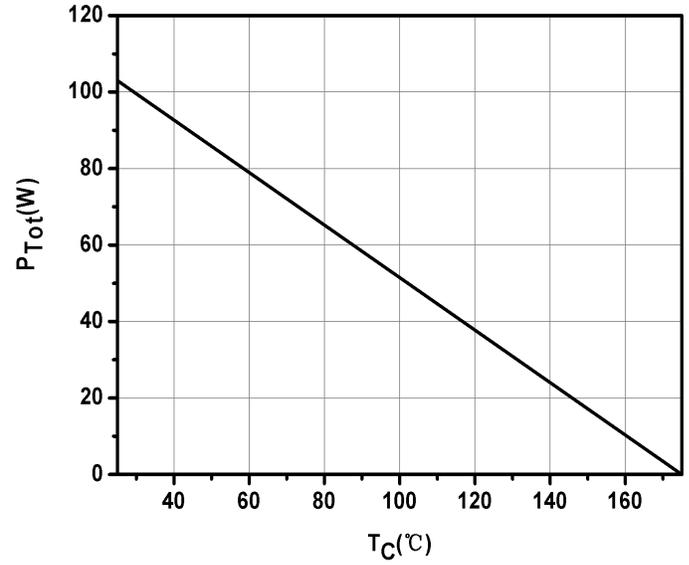


Fig.6-Power Derating

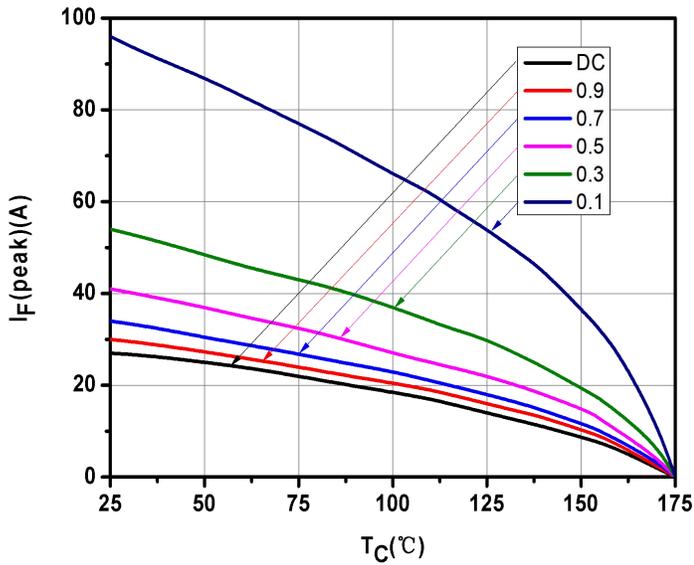
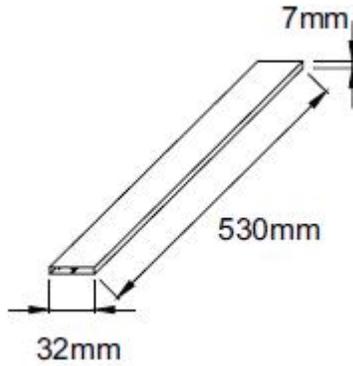


Fig.7-Current Derating

Tube Specification



Marking Diagram

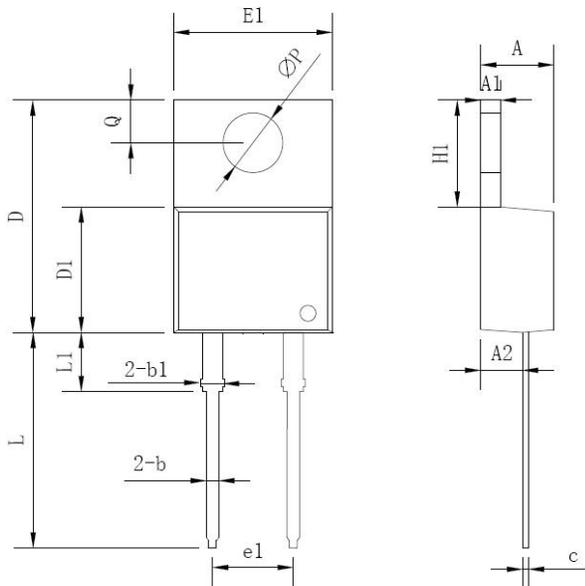


Where XXXXX is YYWWL

- S3D = Device Type
- A = Package type
- 08 = Forward Current (8A)
- 065 = Reverse Voltage (650V)
- SSG = SSG
- YY = Year
- WW = Week
- L = Lot Number

Cautions: Molding resin
Epoxy resin UL:94V-0

Mechanical Dimensions TO-220AC(TO-220-2)



| Symbol | Dimensions in millimeters | | |
|--------|---------------------------|---------|-------|
| | Min. | Typical | Max. |
| A | 3.56 | - | 4.83 |
| A1 | 0.51 | - | 1.40 |
| A2 | 2.03 | - | 2.92 |
| b | 0.38 | - | 1.02 |
| b1 | 1.14 | - | 1.78 |
| c | 0.31 | - | 0.61 |
| D | 14.22 | - | 16.51 |
| D1 | 8.38 | - | 9.42 |
| E1 | 9.65 | 10.16 | 10.67 |
| e1 | - | 5.08 | - |
| H1 | 5.84 | - | 6.86 |
| L | 12.70 | - | 14.73 |
| L1 | - | - | 6.35 |
| φP | - | 3.56 | - |
| Q | 2.54 | - | 3.43 |

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