**CSD01060**

**Silicon Carbide Schottky Diode**

# *ZERO RECOVERY®* RECTIFIER

$V_{RRM}$=600V
$I_{F=1A}$

## Features

- 600 Volt Schottky Rectifier
- Zero Reverse Recovery
- Zero Forward Recovery
- High Frequency Operation
- Temperature Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on $V_F$

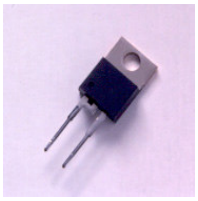
## Benefits

- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- Higher Efficiency
- Reduction Of Rectifier Heat Sink
- Parallel Devices without Thermal Runaway

## Applications

- Switch Mode Power Supplies
- Power Factor Correction
- Motor Control

## Package



CSD01060A

CSD01060E

## Maximum Ratings

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Repetitive Peak Reverse Voltage | $V_{RRM}$ | 600 | V |
| Surge Peak Reverse Voltage | $V_{RSM}$ | 600 | V |
| DC Blocking Voltage | $V_{DC}$ | 600 | V |
| Average Forward Current<br>$T_C$=150°C | $I_{F(AV)}$ | 1 | A |
| Repetitive Peak Forward Surge Current<br>$T_C$=25°C, $t_P$=8.3ms, Half Sine Wave | $I_{FRM}$ | 5 | A |
| Non-Repetitive Peak Forward Surge Current<br>$T_C$=25°C, $t_p$=10µs, Pulse | $I_{FSM}$ | 20 | A |
| Power Dissipation<br>$T_C$ = 25°C | $P_{tot}$ | 21.4 | W |
| Operating Junction and Storage Temperature | $T_J$ , $T_{stg}$ | -55 to +175 | °C |

## ELECTRICAL CHARACTERISTICS

| Parameter | Symbol | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Forward Voltage<br>$I_F$ = 1A $T_J$=25°C<br>$I_F$ = 1A $T_J$=150°C | $V_F$ | | 1.6<br>2.0 | 1.8<br>2.4 | V |
| Reverse Current<br>$V_R$ = 600V $T_J$=25°C<br>$V_R$ = 600V $T_J$=150°C | $I_R$ | | 20<br>40 | 100<br>500 | µA |
| Total Capacitive Charge<br>$V_R$ = 600V,$I_F$ = 1A, d*i*/d*t* = 500 A/µs, $T_J$ = 25°C | $Q_C$ | | 3.3 | | nC |
| Total Capacitance<br>$V_R$ = 0V, $T_J$ = 25 °C, f =1MHz<br>$V_R$ = 200V, $T_J$ = 25 °C, f =1MHz<br>$V_R$ = 400V, $T_J$ = 25 °C, f =1MHz | C | | 80<br>11<br>8.5 | | pF |

NOTE:
1. This is a majority carrier diode, so there is no reverse recovery charge.

## THERMAL CHARACTERISTICS

| Characteristic | Symbol | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Thermal Resistance from Junction to Case | $R_{\theta JC}$ | | 7 | | °C/W |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | | 60 | | °C/W |

# Typical Performance

**Figure 1. Forward Characteristics**

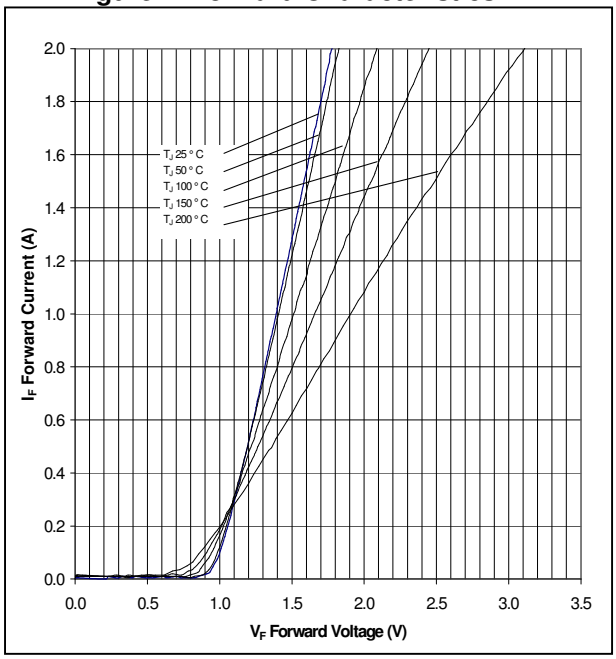



**Figure 2. Reverse Characteristics**

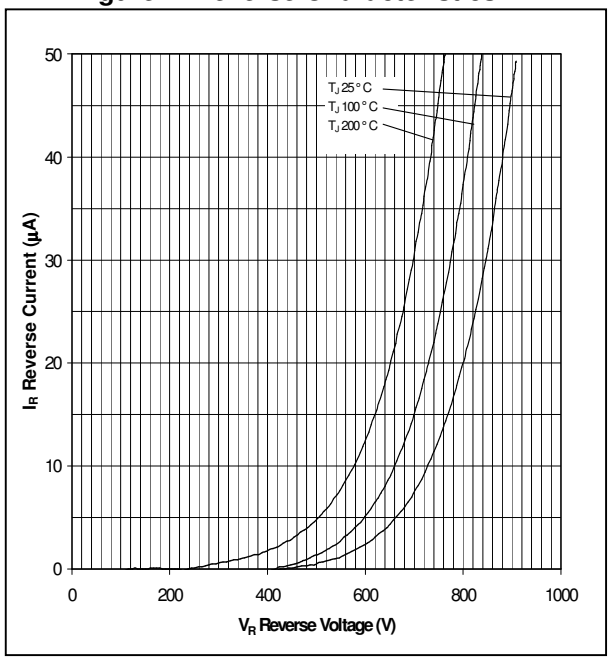


**Figure 3. Current Derating**

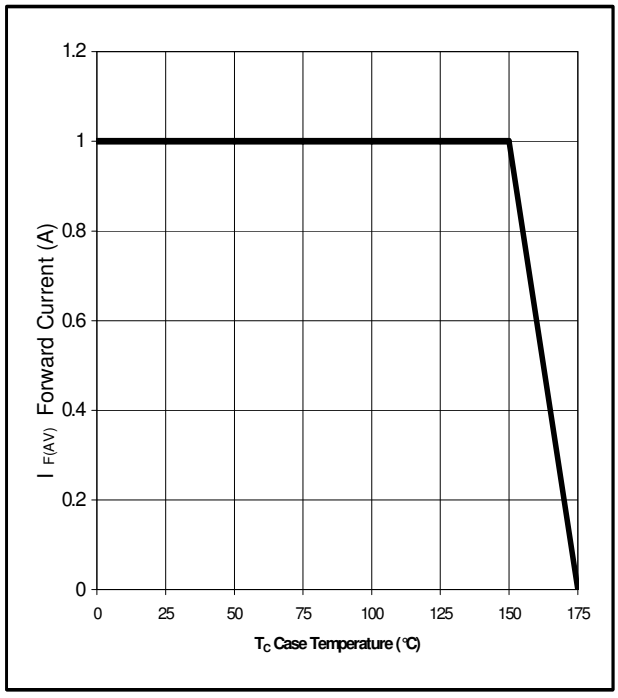
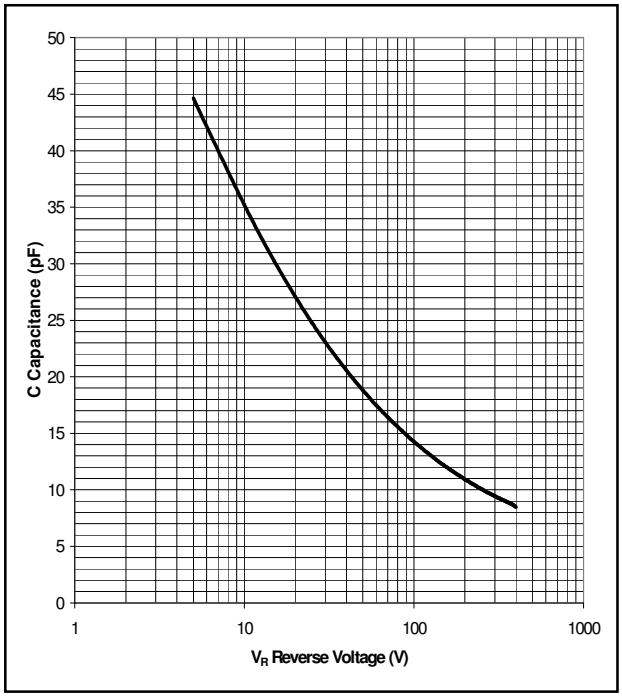
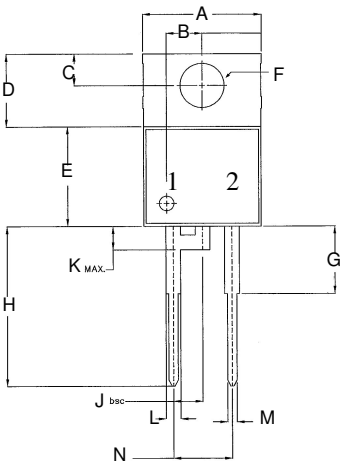


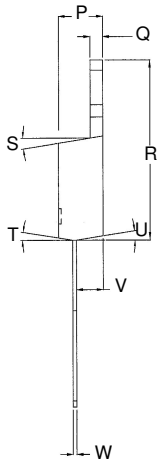

**Figure 4. Capacitance vs. Reverse Voltage**

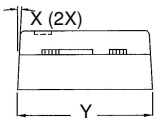



# Package Dimensions

## Package TO-220-2

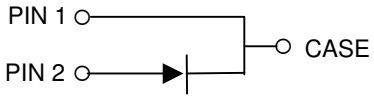


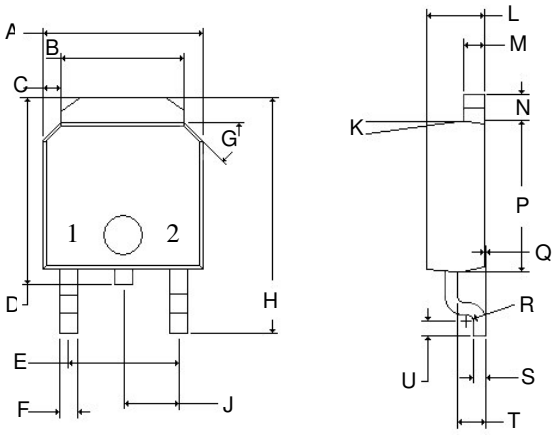




| POS | Inches | | Millimeters | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | .402 | .408 | 10.211 | 10.364 |
| B | .120 | .124 | 3.048 | 3.150 |
| C | .106 | .110 | 2.692 | 2.794 |
| D | .245 | .251 | 6.223 | 6.375 |
| E | .335 | .345 | 8.509 | 8.763 |
| F | .149 | .153 | 3.784 | 3.886 |
| G | .220 | .240 | 5.588 | 6.096 |
| H | .540 | .550 | 13.716 | 13.970 |
| J | .100 REF | | 2.540 REF | |
| K | | .080 | | 2.032 |
| L | .050 | .056 | 1.270 | 1.422 |
| M | .032 | .038 | .813 | .956 |
| N | .197 | .203 | 5.004 | 5.156 |
| P | .170 | .180 | 4.318 | 4.572 |
| Q | .048 | .052 | 1.219 | 1.321 |
| R | .583 | .593 | 14.808 | 15.062 |
| S | 6.5° | 8.5° | 6.5° | 8.5° |
| T | 6.5° | 8.5° | 6.5° | 8.5° |
| U | 6.5° | 8.5° | 6.5° | 8.5° |
| V | .103 | .107 | 2.616 | 2.718 |
| W | .015 | .021 | .381 | .533 |
| X | 2.0° | 4.0° | 2.0° | 4.0° |
| Y | .396 | .406 | 10.058 | 10.312 |

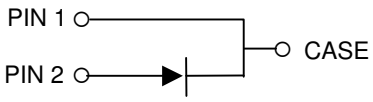
NOTE:
1. Dimension L, M, W apply for Solder Dip Finish.



## Package TO-252-2

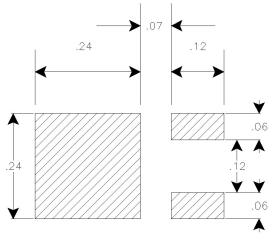



| POS | Inches | | Millimeters | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | .255 | .265 | 6.477 | 6.731 |
| B | .197 | .205 | 5.004 | 5.207 |
| C | .027 | .033 | .686 | .838 |
| D | .292 | .322 | 7.417 | 8.179 |
| E | .178 | .182 | 4.521 | 4.623 |
| F | .025 | .035 | .635 | .889 |
| G | 44° | 46° | 44° | 46° |
| H | .382 | .397 | 9.703 | 10.084 |
| J | .090TYP | | 2.286TYP | |
| K | 6° | 8° | 6° | 8° |
| L | .086 | .094 | 2.184 | 2.388 |
| M | .030 | .034 | .762 | .864 |
| N | .040 | .044 | 1.016 | 1.118 |
| P | .235 | .245 | 5.969 | 6.223 |
| Q | 0.00 | .004 | 0.00 | .102 |
| R | R0.01TYP | | R0.31TYP | |
| S | .017 | .023 | .428 | .588 |
| T | .040 | .044 | 1.016 | 1.118 |
| U | .021 | .027 | .534 | .686 |

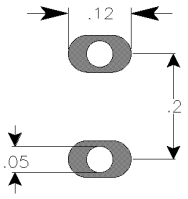



| Part Number | Package | Marking |
|---|---|---|
| CSD01060A | TO-220-2 | CSD01060 |
| CSD01060E | TO-252-2 | CSD01060 |

## Recommended solder pad layout.




TO-252-2




TO-220-2

This product has not been designed or tested for use in, and is not intended for use in, applications implanted into the human body nor in applications in which failure of the product could lead to death, personal injury or property damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines, cardiac defibrillators or similar emergency medical equipment, aircraft navigation or communication or control systems, air traffic control systems, or weapons systems.



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