

# ZERO RECOVERY™ RECTIFIER

## 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  $V_F$

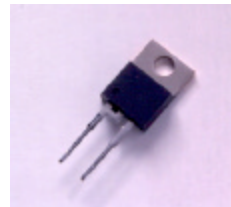
## Benefits

- 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



## 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>$T_C=150^{\circ}\text{C}$                                                    | $I_{F(AV)}$       | 1           | A                  |
| Repetitive Peak Forward Surge Current<br>$T_C=25^{\circ}\text{C}$ , $t_p=8.3\text{ms}$ , Half Sine Wave | $I_{FRM}$         | 5           | A                  |
| Non-Repetitive Peak Forward Surge Current<br>$T_C=25^{\circ}\text{C}$ , $t_p=10\mu\text{s}$ , Pulse     | $I_{FSM}$         | 20          | A                  |
| Power Dissipation<br>$T_C = 25^{\circ}\text{C}$                                                         | $P_{tot}$         | 21.4        | W                  |
| Operating Junction and Storage Temperature                                                              | $T_J$ , $T_{stg}$ | -55 to +175 | $^{\circ}\text{C}$ |

## ELECTRICAL CHARACTERISTICS

| Parameter                                                                                                                                           | Symbol | Min | Typ             | Max        | Units   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----|-----------------|------------|---------|
| Forward Voltage<br>$I_F = 1A$ $T_J = 25^\circ C$<br>$I_F = 1A$ $T_J = 150^\circ C$                                                                  | $V_F$  |     | 1.6<br>2.0      | 1.8<br>2.4 | V       |
| Reverse Current<br>$V_R = 600V$ $T_J = 25^\circ C$<br>$V_R = 600V$ $T_J = 150^\circ C$                                                              | $I_R$  |     | 20<br>40        | 100<br>500 | $\mu A$ |
| Total Capacitive Charge<br>$V_R = 600V, I_F = 1A, di/dt = 500 A/\mu s, T_J = 25^\circ C$                                                            | $Q_C$  |     | 3.3             |            | nC      |
| Total Capacitance<br>$V_R = 0V, T_J = 25^\circ C, f = 1MHz$<br>$V_R = 200V, T_J = 25^\circ C, f = 1MHz$<br>$V_R = 400V, T_J = 25^\circ C, f = 1MHz$ | 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   |     | $^\circ C/W$ |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ |     | 60  |     | $^\circ C/W$ |

## Typical Performance

Figure 1. Forward Characteristics

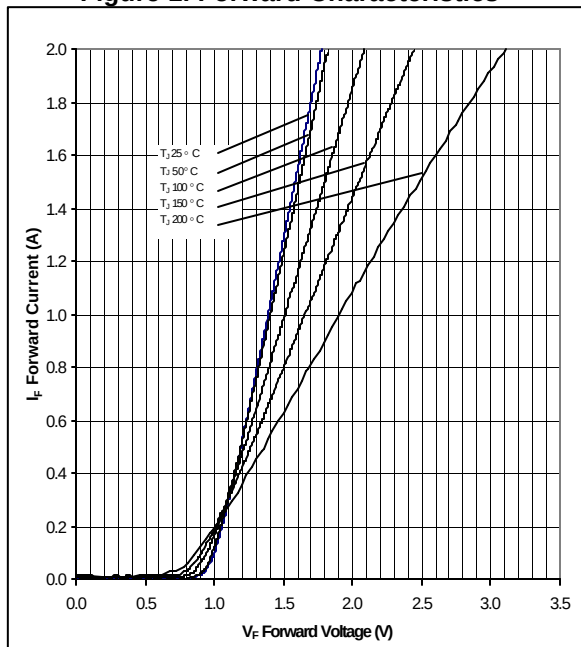


Figure 2. Reverse Characteristics

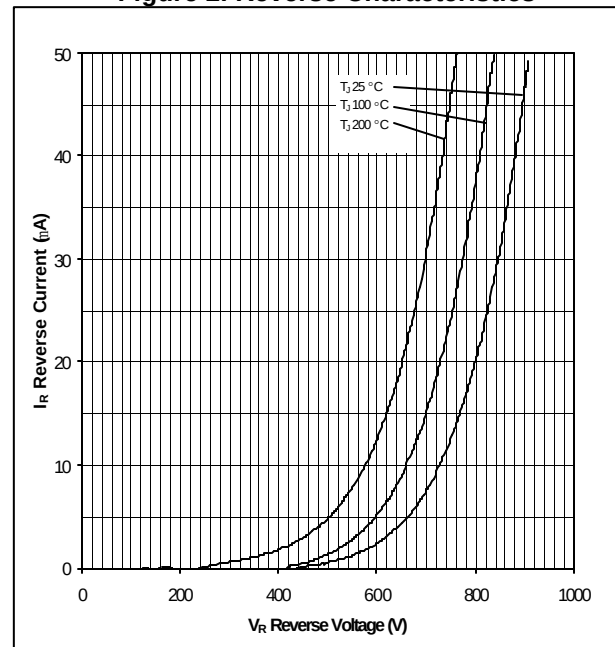


Figure 3. Current Derating

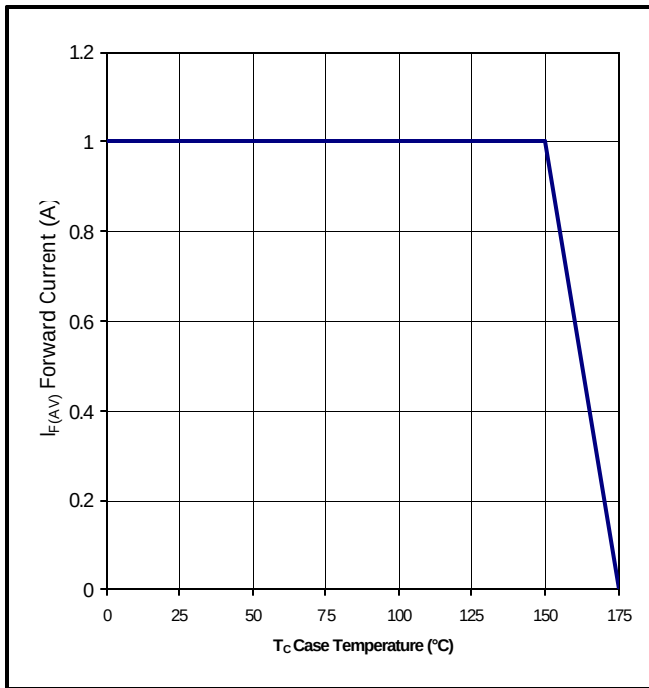
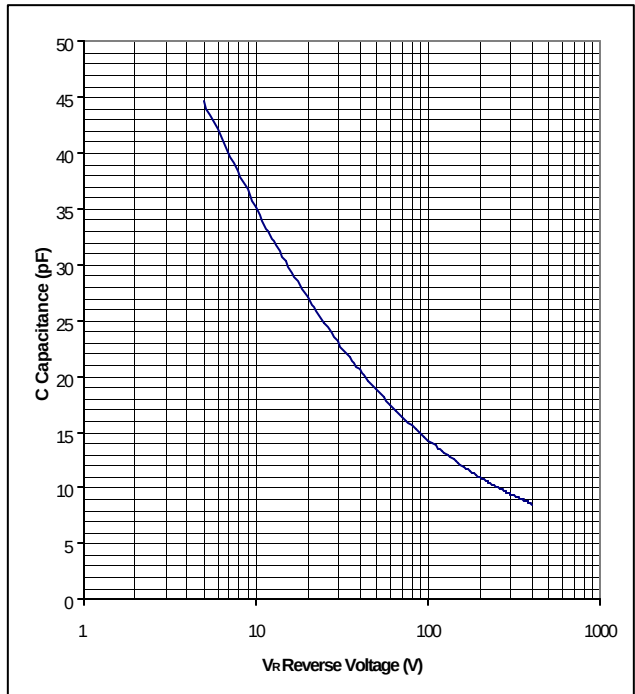
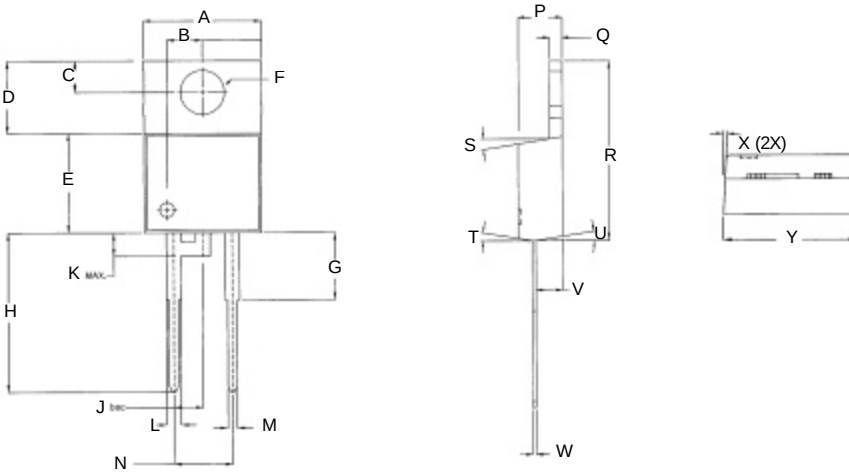


Figure 4. Capacitance vs. Reverse Voltage



## Package Dimensions

### Package TO-220-2

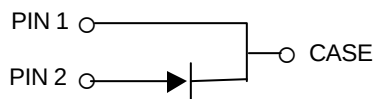
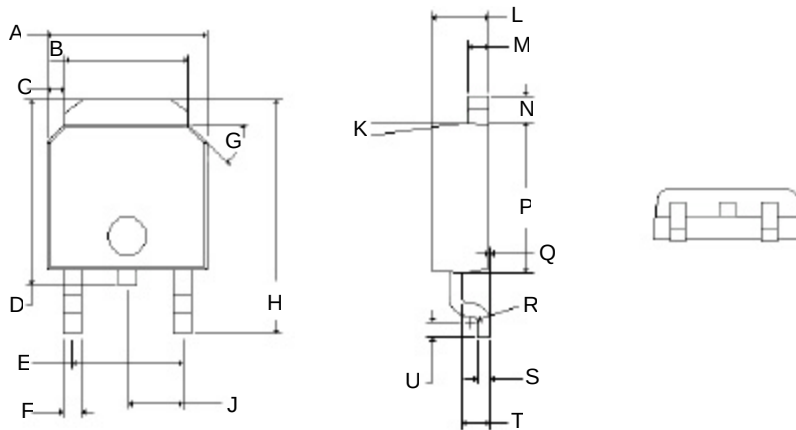


| POS | Inches   |      | Millimeters |        |
|-----|----------|------|-------------|--------|
|     | Min      | Max  | Min         | Max    |
| A   | .402     | .408 | 10.211      | 10.364 |
| B   | .120     | .124 | 3.048       | 3.150  |
| C   | .106     | .110 | 2.692       | 2.794  |
| D   | .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   | 65°      | 85°  | 6.5°        | 8.5°   |
| T   | 65°      | 85°  | 6.5°        | 8.5°   |
| U   | 65°      | 85°  | 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   | .090 TYP  |      | 2.286 TYP   |        |
| 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   | R0.01 TYP |      | R0.31 TYP   |        |
| 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 | SD01060 |
| CSD01060E   | TO-252-2 | SD01060 |

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