



## General Description

This product family offers state of the art performance. It is designed for high frequency applications where high efficiency and high reliability are required.

## Features

- Low conduction loss due to low  $V_F$
- Extremely low switching loss by tiny  $Q_C$
- Highly rugged due to better surge current
- Industrial standard quality and reliability

## Applications

- UPS
- Power Inverter
- High performance SMPS
- Power factor correction



| Part Number   | Package   | Marking |
|---------------|-----------|---------|
| GC10MPS12-220 | TO-220-2L | G1012CG |



TO-220-2L



AEC-Q101 Qualified

## Maximum Ratings ( $T_C = 25^\circ\text{C}$ unless otherwise specified)

| Symbol         | Parameter                                  | Value          | Unit                 | Test Conditions                                                                                                                   |
|----------------|--------------------------------------------|----------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| $V_{RRM}$      | Repetitive Peak Reverse Voltage            | 1200           | V                    |                                                                                                                                   |
| $V_{RSM}$      | Surge Peak Reverse Voltage                 | 1200           | V                    |                                                                                                                                   |
| $V_R$          | DC Blocking Voltage                        | 1200           | V                    |                                                                                                                                   |
| $I_F$          | Continuous Forward Current                 | 39<br>20<br>12 | A                    | $T_C=25^\circ\text{C}$<br>$T_C=135^\circ\text{C}$<br>$T_C=153^\circ\text{C}$                                                      |
| $I_{FRM}$      | Repetitive Peak Forward Surge Current      | 84<br>63       | A                    | $T_C=25^\circ\text{C}$ , $t_p = 10$ ms, Half Sine Wave<br>$T_C=110^\circ\text{C}$ , $t_p=10$ ms, Half Sine Wave                   |
| $I_{FSM}$      | Non-Repetitive Peak Forward Surge Current  | 130<br>108     | A                    | $T_C=25^\circ\text{C}$ , $t_p = 10$ ms, Half Sine Wave<br>$T_C=110^\circ\text{C}$ , $t_p = 10$ ms, Half Sine Wave                 |
| $\int i^2 dt$  | $i^2 dt$ value                             | 84.5<br>58     | $\text{A}^2\text{s}$ | $T_C = 25^\circ\text{C}$ , $t_p=10\text{ms}$ , Half Sine Pulse<br>$T_C = 110^\circ\text{C}$ , $t_p=10\text{ms}$ , Half Sine Pulse |
| $P_{tot}$      | Power Dissipation                          | 150<br>65      | W                    | $T_C=25^\circ\text{C}$<br>$T_C=110^\circ\text{C}$                                                                                 |
| $T_J, T_{stg}$ | Operating Junction and Storage Temperature | -55 to<br>+150 | $^\circ\text{C}$     |                                                                                                                                   |
| $T_J$          | Operating junction Range                   | -55 to<br>+175 | $^\circ\text{C}$     |                                                                                                                                   |



## Electrical Characteristics

| Parameter               | Symbol | Value |      |      | Unit    | Test Condition                                                    |
|-------------------------|--------|-------|------|------|---------|-------------------------------------------------------------------|
|                         |        | min.  | typ. | max. |         |                                                                   |
| Forward Voltage         | $V_F$  | -     | 1.35 | 1.7  | V       | $I_F=12A$<br>$T_j=25^{\circ}C$<br>$T_j=175^{\circ}C$              |
| Reverse Current         | $I_R$  | -     | -    | 150  | $\mu A$ | $V_R=1200V$<br>$T_j=25^{\circ}C$<br>$T_j=175^{\circ}C$            |
| Total Capacitive Charge | $Q_C$  | -     | 75.6 | -    | nC      | $V_R=800V, T_j=25^{\circ}C$<br>$Q_C = \int_0^{V_R} C(V) dV$       |
| Total Capacitance       | C      | -     | 1022 | -    | pF      | $T_j=25^{\circ}C, f=1MHz$<br>$V_R=0V$<br>$V_R=400V$<br>$V_R=800V$ |

## Thermal Characteristics

| Symbol          | Parameter                                | Typ. | Unit          |
|-----------------|------------------------------------------|------|---------------|
| $R_{\theta JC}$ | Thermal Resistance from Junction to Case | 1.0  | $^{\circ}C/W$ |

## Characteristics Curve

Fig 1: Forward Characteristics

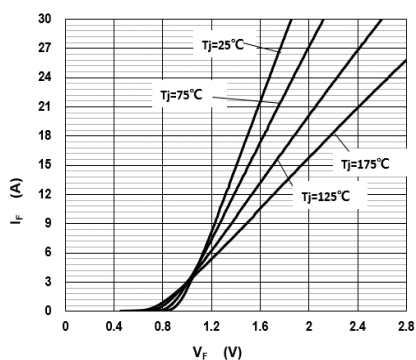


Fig 2: Reverse Characteristics

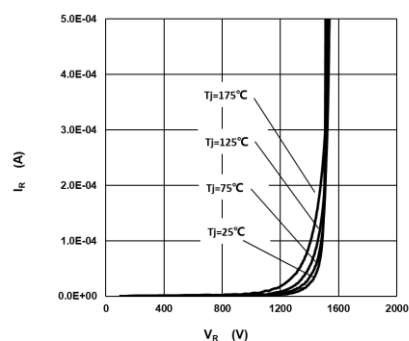




Fig 3: Current Derating

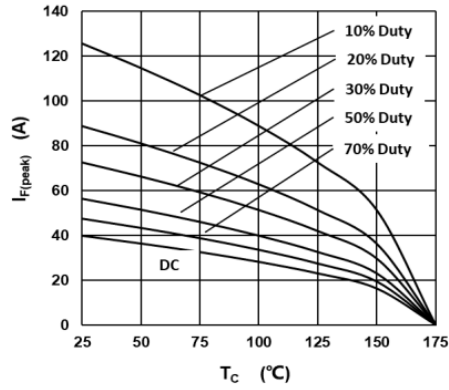


Fig 4: Power Derating

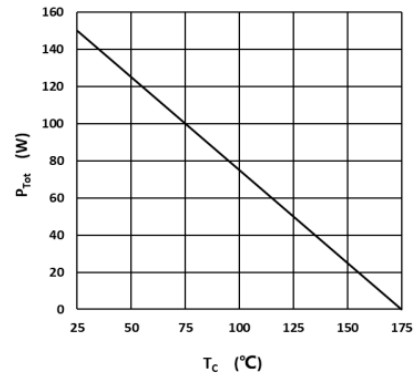


Fig 5: Capacitance vs. Reverse Voltage

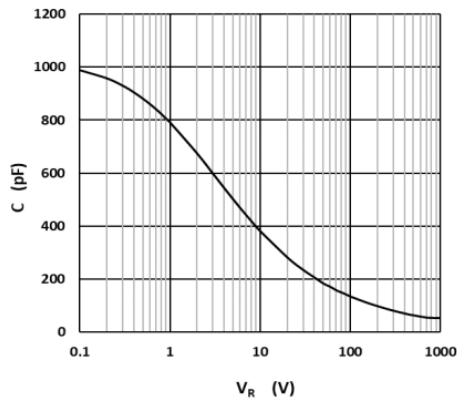


Fig 6: Reverse Charge vs. Reverse Voltage

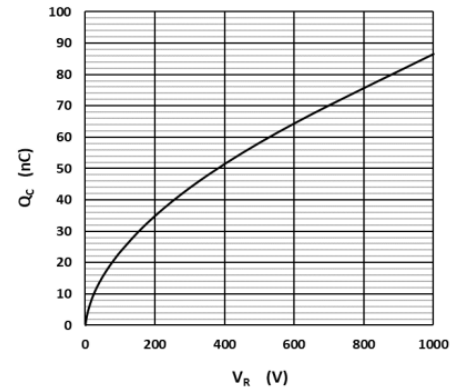


Fig 7: Typical Capacitance Stored Energy

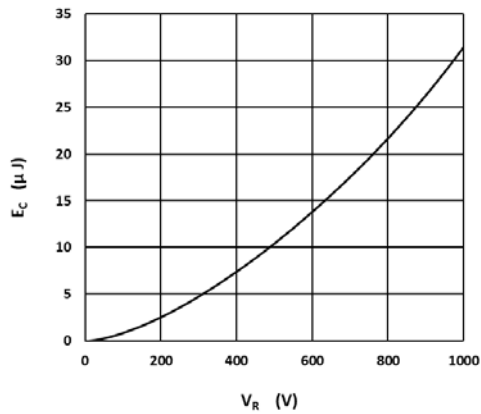
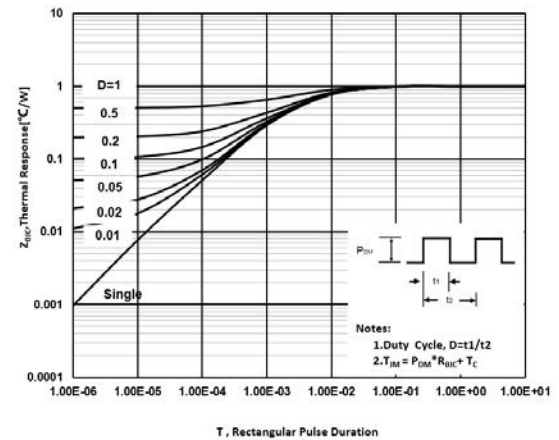
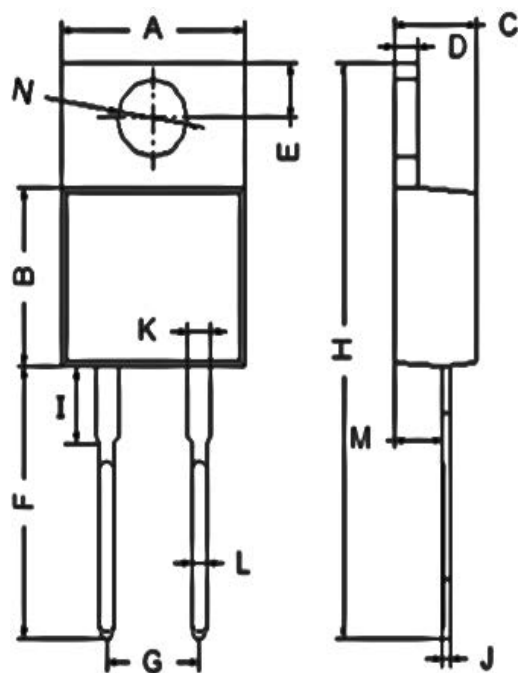


Fig 8: Transient Thermal Impedance





## Package Information TO-220-2L



| POS | Millimeters |       |
|-----|-------------|-------|
|     | Min.        | Max.  |
| A   | 9.80        | 10.50 |
| B   | 8.60        | 9.20  |
| C   | 4.37        | 4.77  |
| D   | 1.07        | 1.47  |
| E   | 2.40        | 3.00  |
| F   | 13.14       | 14.20 |
| G   | 4.90        | 5.24  |
| H   | 28.00       | 29.20 |
| I   | 3.50        | 4.00  |
| J   | 0.28        | 0.50  |
| K   | 1.20        | 1.50  |
| L   | 0.70        | 0.90  |
| M   | 2.40        | 2.90  |
| N   | 3.70        | 4.00  |



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