**RoHS Compliant**
HALOGEN-FREE

**MagnaChip**

# MPKC2SA/CA200U60
# 600V FRD Module

## General Description
Ultra-FRD module devices are optimized to reduce losses and EMI/RFI in high frequency power conditioning electrical systems.
These diode modules are ideally suited for power converters, motors drives and other applications where switching losses are significant portion of the total losses.

## Features

■ Repetitive Reverse Voltage : $V_{RRM}$= 600V
■ Low Forward Voltage : $V_F$(typ.) = 1.45V
■ Average Forward Current : $I_F$(Av.)=200A @$T_C$=100℃
■ Ultra-Fast Reverse Recovery Time : $t_{rr}$(typ.) = 45ns
■ Extensive Characterization of Recovery Parameters
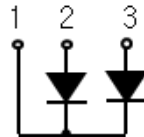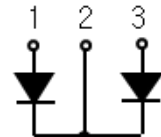■ Reduced EMI and RFI
■ Isolation Type Package

## Applications

■ High Speed & High Power converters, Welders
■ Various Switching and Telecommunication Power Supply

E301932

5DM-2

## Ordering Information

| Product Name | MPKC2SA200U60 | MPKC2CA200U60 |
|---|---|---|
| Optional Information | Side Common & N-type  1  2  3 | Center Common & N-type  1  2  3 |

## Absolute Maximum Ratings @$T_C$ = 25℃ (Per Leg)

| Characteristics | Conditions | | Symbol | Rating | Unit |
|---|---|---|---|---|---|
| Repetitive Peak Reverse Voltage | | | $V_{RRM}$ | 600 | V |
| Reverse DC Voltage | | | $V_{R(DC)}$ | 480 | V |
| Average Forward Current | $T_C$=25℃ | Resistive Load | $I_{F(AV)}$ | 400 | A |
| | $T_C$=100℃ | | | 200 | A |
| Surge(non-repetitive) Forward Current | One Half Cycle at 60Hz, Peak Value | | $I_{FSM}$ | 3300 | A |
| $I^2$t for Fusing | Value for One Cycle Current, $t_w$ = 8.3ms, $T_j$= 25℃ Start | | $I^2$t | 45.0* $10^3$ | $A^2$s |
| Junction Temperature | | | $T_J$ | -40 ~ 150 | ℃ |
| Maximum Power Dissipation | | | $P_D$ | 540 | W |
| Isolation Voltage | @AC 1 minutes | | $V_{isol}$ | 2500 | V |
| Storage Temperature | | | $T_{stg}$ | -40 ~ 150 | ℃ |
| Mounting Torque | | | - | 4.0 | N.m |
| Terminal Torque | Typical Including Screws | | - | 3.0 | N.m |
| Weight | | | - | 180 | g |

## Electrical Characteristics @Tc = 25°C(unless otherwise specified)

| Characteristics | Conditions | | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| Cathode Anode Breakdown Voltage | $I_R$=100uA | | $V_R$ | 600 | - | - | V |
| Diode Maximum Forward Voltage | $I_F$=200A | $T_C$=25℃ | $V_{FM}$ | - | 1.45 | 1.8 | V |
| | | $T_C$=100℃ | | - | 1.35 | - | |
| Diode Peak Reverse Recovery Current | $T_c$=100℃, $V_{RRM}$ applied | $T_C$=100℃ | $I_{RRM}$ | - | - | 1.0 | mA |
| Diode Reverse Recovery Time | $I_F$ =1A,$V_R$=30V di/dt = -400A/uS | $T_C$=25℃ | $t_{rr}$ | - | 45 | 60 | ns |
| Diode Reverse Recovery Time | $I_F$ =200A,$V_R$=300V di/dt = -400A/uS | $T_C$=25℃ | $t_{rr}$ | - | 110 | 140 | ns |
| | | $T_C$=100℃ | | - | 180 | - | |

## Thermal Characteristics

| Characteristics | Conditions | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Thermal Resistance(Isolation Type) | Junction to Case | $R_{th(j-c)}$ | - | - | 0.23 | ℃/W |

Fig.1 Typical Forward Voltage Drop with legend $T_c=25℃$ (dashed) and $T_c=125℃$ (solid). X-axis: Forward Voltage Drop,$V_F$[V] from 0.0 to 2.0. Y-axis: Forward Current,$I_F$[A] from 0 to 300.
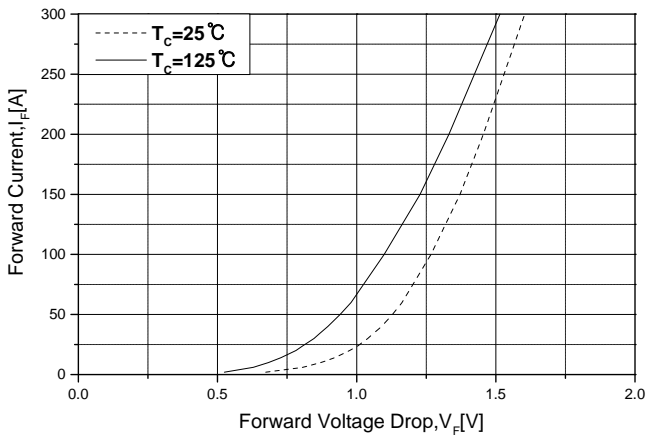
**Fig.1 Typical Forward Voltage Drop
vs. Instantaneous Forward Current**

Fig.2 X-axis: di/dt[A/us] from 100 to 500. Y-axis: Reverse Recovery Time[ns] from 0 to 150.
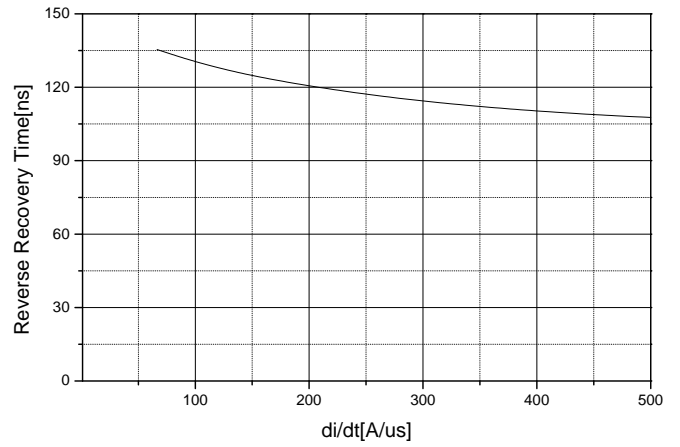
**Fig.2 Typical Reverse Recovery Time
Vs. −di/dt**

Fig.3 X-axis: Rectangular Pulse Duration Time[sec] from 1E-5 to 10. Y-axis: Thermal Response Zthjc[℃/W] from 1E-4 to 1. $T_C=25℃$.
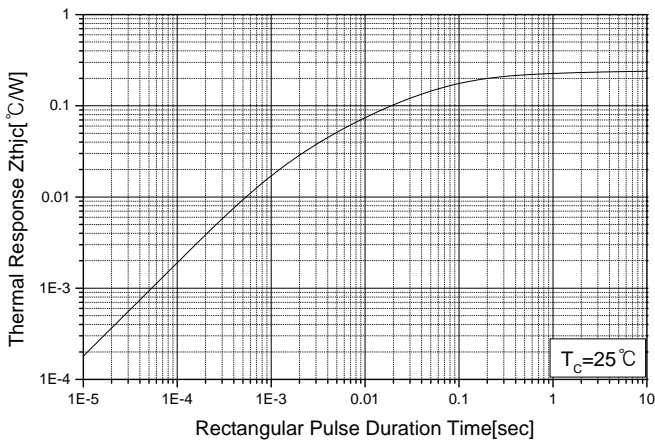
**Fig.3 Transient Thermal Impedance(Zthjc)
Characteristics**

Fig.4 X-axis: Case Temperatute, Tc[℃] from 0 to 160. Y-axis: Average Forward Current,$I_{F(AVG)}$[A] from 0 to 500. Curve labeled DC.
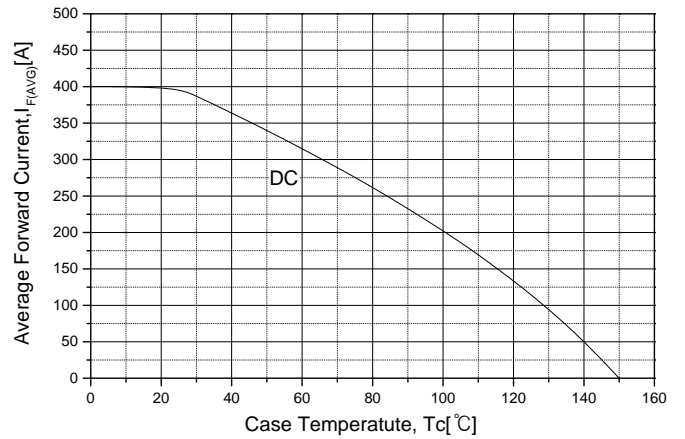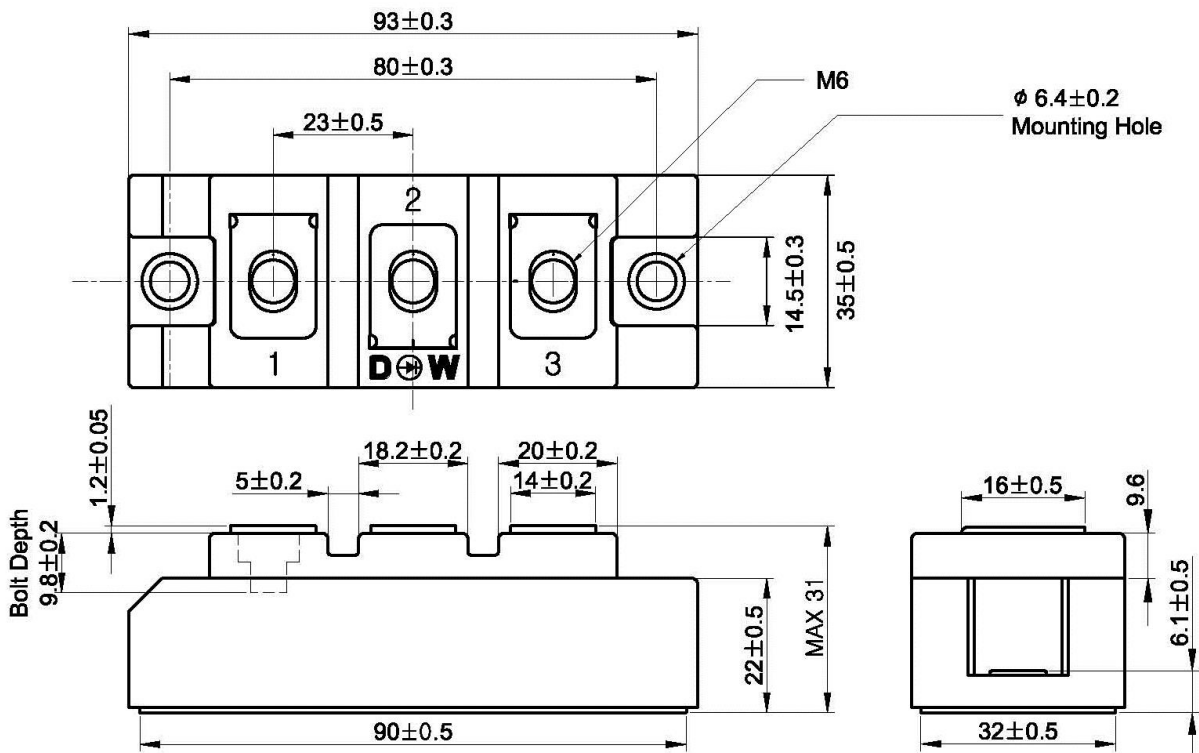
**Fig.4 Forward Current Derating Curve**

## Package Dimension

### 5DM-2

**Dimensions are in millimeters, unless otherwise specified**

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