

**HiPerFRED<sup>2</sup>**

$$V_{RRM} = 200V$$

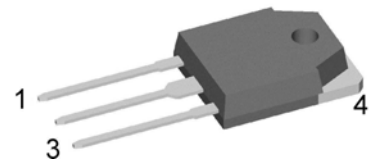
$$I_{FAV} = 2x \quad 30A$$

$$t_{rr} = 35ns$$

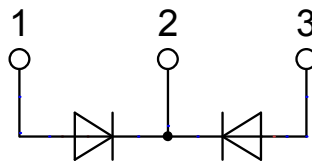
High Performance Fast Recovery Diode  
 Low Loss and Soft Recovery  
 Common Cathode

Part number

**DPG60C200QB**



Backside: cathode

**Features / Advantages:**

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low  $I_{rm}$ -values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low  $I_{rm}$  reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

**Applications:**

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)

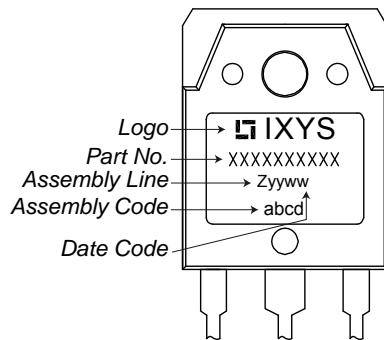
**Package: TO-3P**

- Industry standard outline compatible with TO-247
- RoHS compliant
- Epoxy meets UL 94V-0

| Fast Diode |  |   |                         | Ratings |      |            |
|------------|--|---|-------------------------|---------|------|------------|
| Symbol     | Definition                                   | Conditions  | min.                    | typ.    | max. | Unit       |
| $V_{RSM}$  | max. non-repetitive reverse blocking voltage | $T_{VJ} = 25^{\circ}C$                                  |                         |         | 200  | V          |
| $V_{RRM}$  | max. repetitive reverse blocking voltage     | $T_{VJ} = 25^{\circ}C$                                  |                         |         | 200  | V          |
| $I_R$      | reverse current, drain current               | $V_R = 200 V$   | $T_{VJ} = 25^{\circ}C$  |         | 1    | $\mu A$    |
|            |  | $V_R = 200 V$   | $T_{VJ} = 150^{\circ}C$ |         | 0.1  | mA         |
| $V_F$      | forward voltage drop                         | $I_F = 30 A$  | $T_{VJ} = 25^{\circ}C$  |         | 1.34 | V          |
|            |  |   |                         |         | 1.63 | V          |
|            |  | $I_F = 60 A$  | $T_{VJ} = 150^{\circ}C$ |         | 1.06 | V          |
|            |  |   |                         |         | 1.39 | V          |
| $I_{FAV}$  | average forward current                      | $T_C = 140^{\circ}C$<br>rectangular $d = 0.5$           | $T_{VJ} = 175^{\circ}C$ |         | 30   | A          |
| $V_{FO}$   | threshold voltage                            | } for power loss calculation only                       | $T_{VJ} = 175^{\circ}C$ |         | 0.70 | V          |
| $r_F$      | slope resistance                             |   |                         |         | 10.5 | m $\Omega$ |
| $R_{thJC}$ | thermal resistance junction to case          |   |                         |         | 0.95 | K/W        |
| $R_{thCH}$ | thermal resistance case to heatsink          |   |                         | 0.25    |      | K/W        |
| $P_{tot}$  | total power dissipation                      |   | $T_C = 25^{\circ}C$     |         | 160  | W          |
| $I_{FSM}$  | max. forward surge current                   | $t = 10 ms; (50 Hz), sine; V_R = 0 V$                   | $T_{VJ} = 45^{\circ}C$  |         | 360  | A          |
| $C_J$      | junction capacitance                         | $V_R = 150 V f = 1 MHz$                                 | $T_{VJ} = 25^{\circ}C$  |         | 42   | pF         |
| $I_{RM}$   | max. reverse recovery current                | } $I_F = 30 A; V_R = 130 V$<br>$-di_F/dt = 200 A/\mu s$ | $T_{VJ} = 25^{\circ}C$  |         | 3    | A          |
| $t_{rr}$   | reverse recovery time                        |   | $T_{VJ} = 125^{\circ}C$ |         | 7    | A          |
|            |  |   | $T_{VJ} = 25^{\circ}C$  |         | 35   | ns         |
|            |  |   | $T_{VJ} = 125^{\circ}C$ |         | 55   | ns         |

| Package TO-3P |                              |                            | Ratings |      |      |      |
|---------------|------------------------------|----------------------------|---------|------|------|------|
| Symbol        | Definition                   | Conditions                 | min.    | typ. | max. | Unit |
| $I_{RMS}$     | RMS current                  | per terminal <sup>1)</sup> |         |      | 50   | A    |
| $T_{VJ}$      | virtual junction temperature |                            | -55     |      | 175  | °C   |
| $T_{op}$      | operation temperature        |                            | -55     |      | 150  | °C   |
| $T_{stg}$     | storage temperature          |                            | -55     |      | 150  | °C   |
| <b>Weight</b> |                              |                            |         | 5    |      | g    |
| $M_D$         | mounting torque              |                            | 0.8     |      | 1.2  | Nm   |
| $F_C$         | mounting force with clip     |                            | 20      |      | 120  | N    |

### Product Marking



### Part number

- D = Diode
- P = HiPerFRED
- G = extreme fast
- 60 = Current Rating [A]
- C = Common Cathode
- 200 = Reverse Voltage [V]
- QB = TO-3P (3)

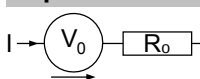
| Ordering | Part Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-------------|--------------------|---------------|----------|----------|
| Standard | DPG60C200QB | DPG60C200QB        | Tube          | 30       | 502213   |

| Similar Part | Package        | Voltage class |
|--------------|----------------|---------------|
| DPG60C200HB  | TO-247AD (3)   | 200           |
| DPF60C200HB  | TO-247AD (3)   | 200           |
| DPF60C200HJ  | ISOPLUS247 (3) | 200           |

### Equivalent Circuits for Simulation

\* on die level

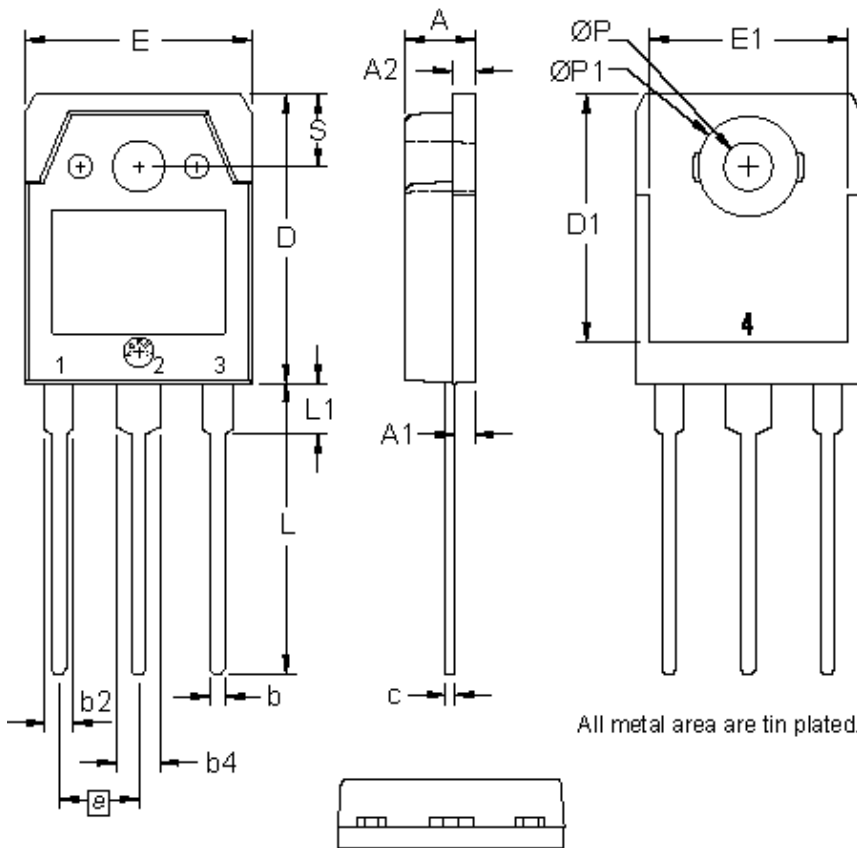
$T_{VJ} = 175^\circ\text{C}$



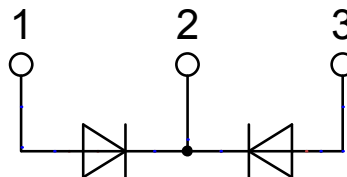
**Fast Diode**

|              |                    |     |    |
|--------------|--------------------|-----|----|
| $V_{0\ max}$ | threshold voltage  | 0.7 | V  |
| $R_{0\ max}$ | slope resistance * | 7.9 | mΩ |

## Outlines TO-3P



| Dim. | Millimeter |       | Inches    |       |
|------|------------|-------|-----------|-------|
|      | min        | max   | min       | max   |
| A    | 4.70       | 4.90  | 0.185     | 0.193 |
| A1   | 1.30       | 1.50  | 0.051     | 0.059 |
| A2   | 1.45       | 1.65  | 0.057     | 0.065 |
| b    | 0.90       | 1.15  | 0.035     | 0.045 |
| b2   | 1.90       | 2.20  | 0.075     | 0.087 |
| b4   | 2.90       | 3.20  | 0.114     | 0.126 |
| c    | 0.55       | 0.80  | 0.022     | 0.031 |
| D    | 19.80      | 20.10 | 0.780     | 0.791 |
| D1   | 16.90      | 17.20 | 0.665     | 0.677 |
| E    | 15.50      | 15.80 | 0.610     | 0.622 |
| E1   | 13.50      | 13.70 | 0.531     | 0.539 |
| e    | 5.45 BSC   |       | 0.215 BSC |       |
| L    | 19.80      | 20.20 | 0.780     | 0.795 |
| L1   | 3.40       | 3.60  | 0.134     | 0.142 |
| Ø P  | 3.20       | 3.40  | 0.126     | 0.134 |
| ØP1  | 6.90       | 7.10  | 0.272     | 0.280 |
| S    | 4.90       | 5.10  | 0.193     | 0.201 |



## Fast Diode

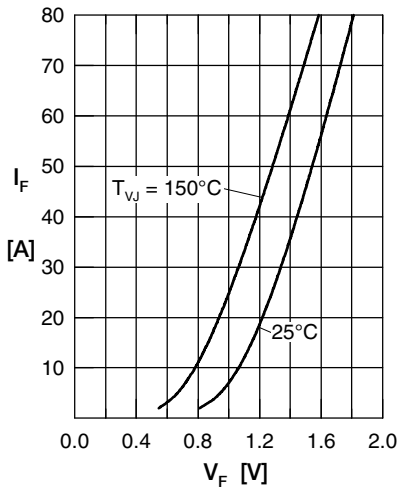


Fig. 1 Forward current  $I_F$  versus  $V_F$

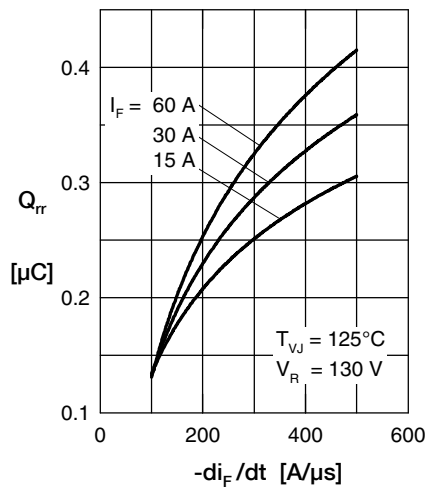


Fig. 2 Typ. reverse recov. charge  $Q_{rr}$  versus  $-di_F/dt$

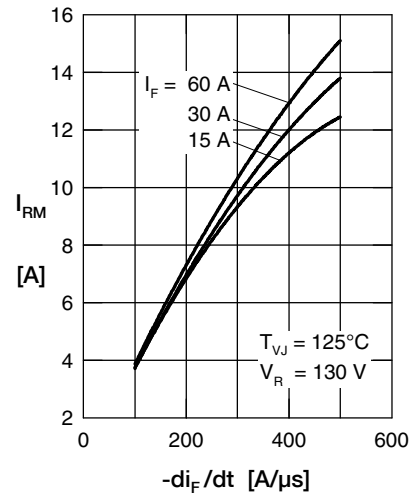


Fig. 3 Typ. reverse recov. current  $I_{RM}$  versus  $-di_F/dt$

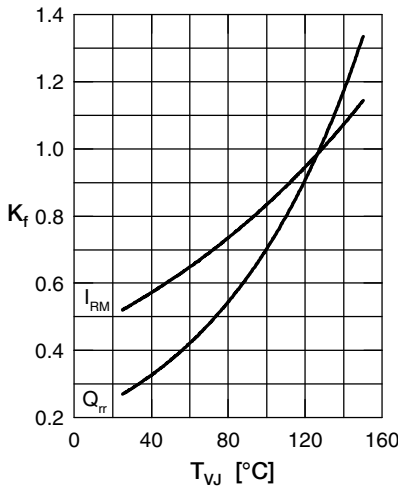


Fig. 4 Typ. dynamic parameters  $Q_{rr}$ ,  $I_{RM}$  versus  $T_{VJ}$

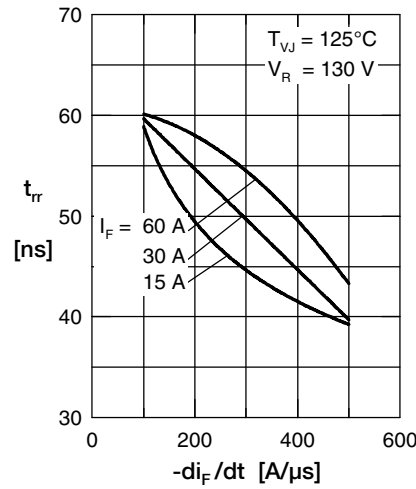


Fig. 5 Typ. reverse recov. time  $t_{rr}$  versus  $-di_F/dt$

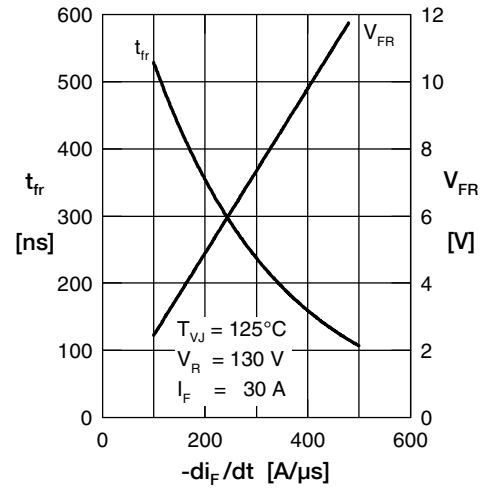


Fig. 6 Typ. forward recov. voltage  $V_{FR}$  and  $t_{fr}$  versus  $di_F/dt$

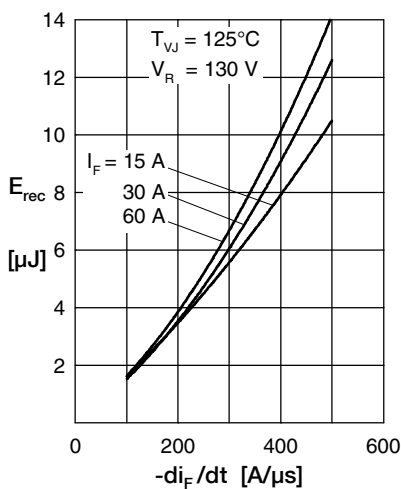


Fig. 7 Typ. recovery energy  $E_{rec}$  versus  $-di_F/dt$

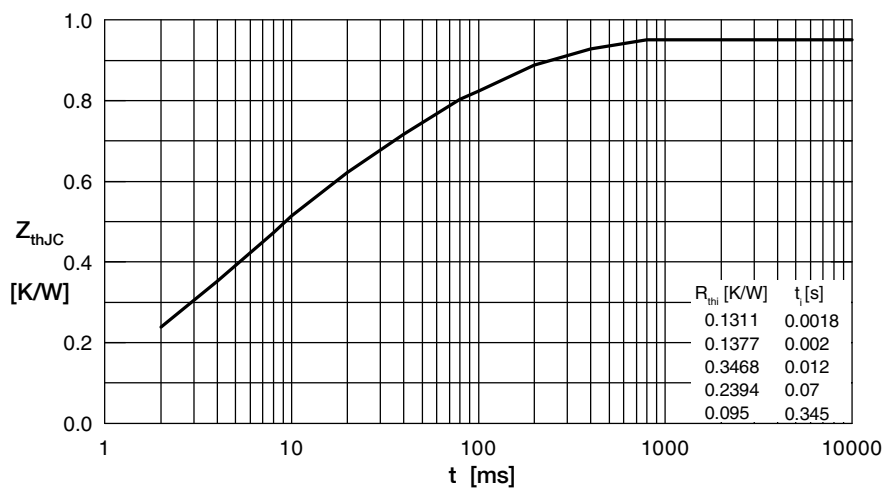


Fig. 8 Transient thermal impedance junction to case

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[IXYS:](#)

[DPG60C200QB](#)