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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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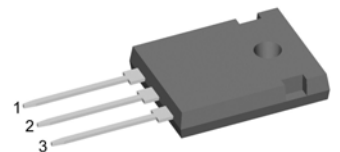
# HiPerFRED<sup>2</sup>

$$\begin{aligned} V_{RRM} &= 200\text{ V} \\ I_{FAV} &= 2 \times 15\text{ A} \\ t_{rr} &= 35\text{ ns} \end{aligned}$$

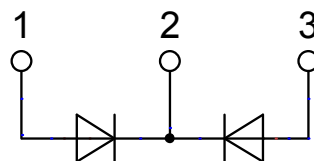
High Performance Fast Recovery Diode  
Low Loss and Soft Recovery  
Common Cathode

Part number

**DPG30C200HB**



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)

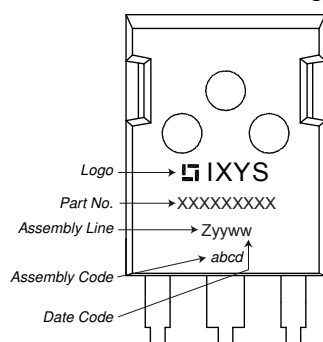
## Package: TO-247

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

| Fast Diode        |                                              |                                                                                  |                         | Ratings                 |      |      |      |  |
|-------------------|----------------------------------------------|----------------------------------------------------------------------------------|-------------------------|-------------------------|------|------|------|--|
| Symbol            | Definition                                   | Conditions                                                                       |                         | min.                    | typ. | max. | Unit |  |
| V <sub>RSM</sub>  | max. non-repetitive reverse blocking voltage | T <sub>VJ</sub> = 25°C                                                           |                         |                         |      | 200  | V    |  |
| V <sub>RRM</sub>  | max. repetitive reverse blocking voltage     | T <sub>VJ</sub> = 25°C                                                           |                         |                         |      | 200  | V    |  |
| I <sub>R</sub>    | reverse current, drain current               | V <sub>R</sub> = 200 V                                                           | T <sub>VJ</sub> = 25°C  |                         |      | 1    | μA   |  |
|                   |                                              | V <sub>R</sub> = 200 V                                                           | T <sub>VJ</sub> = 150°C |                         |      | 0.08 | mA   |  |
| V <sub>F</sub>    | forward voltage drop                         | I <sub>F</sub> = 15 A                                                            | T <sub>VJ</sub> = 25°C  |                         |      | 1.25 | V    |  |
|                   |                                              | I <sub>F</sub> = 30 A                                                            |                         |                         |      | 1.50 | V    |  |
|                   |                                              | I <sub>F</sub> = 15 A                                                            | T <sub>VJ</sub> = 150°C |                         |      | 1.00 | V    |  |
|                   |                                              | I <sub>F</sub> = 30 A                                                            |                         |                         |      | 1.27 | V    |  |
| I <sub>FAV</sub>  | average forward current                      | T <sub>C</sub> = 145°C<br>rectangular      d = 0.5                               | T <sub>VJ</sub> = 175°C |                         |      | 15   | A    |  |
| V <sub>FO</sub>   | threshold voltage                            | } for power loss calculation only                                                |                         | T <sub>VJ</sub> = 175°C |      | 0.69 | V    |  |
| r <sub>F</sub>    | slope resistance                             |                                                                                  |                         |                         |      | 17.3 | mΩ   |  |
| R <sub>thJC</sub> | thermal resistance junction to case          |                                                                                  |                         |                         |      | 1.7  | K/W  |  |
| R <sub>thCH</sub> | thermal resistance case to heatsink          |                                                                                  |                         |                         | 0.25 |      | K/W  |  |
| P <sub>tot</sub>  | total power dissipation                      | T <sub>C</sub> = 25°C                                                            |                         |                         |      | 90   | W    |  |
| I <sub>FSM</sub>  | max. forward surge current                   | t = 10 ms; (50 Hz), sine; V <sub>R</sub> = 0 V                                   |                         | T <sub>VJ</sub> = 45°C  |      | 240  | A    |  |
| C <sub>J</sub>    | junction capacitance                         | V <sub>R</sub> = 150 V   f = 1 MHz                                               |                         | T <sub>VJ</sub> = 25°C  | 20   |      | pF   |  |
| I <sub>RM</sub>   | max. reverse recovery current                | I <sub>F</sub> = 15 A; V <sub>R</sub> = 130 V<br>-di <sub>F</sub> /dt = 200 A/μs |                         | T <sub>VJ</sub> = 25°C  | 3    |      | A    |  |
|                   |                                              |                                                                                  |                         | T <sub>VJ</sub> = 125°C | 6.5  |      | A    |  |
| t <sub>rr</sub>   | reverse recovery time                        |                                                                                  |                         | T <sub>VJ</sub> = 25°C  | 35   |      | ns   |  |
|                   |                                              |                                                                                  |                         | T <sub>VJ</sub> = 125°C | 55   |      | ns   |  |

| Package TO-247 |                              |                            | 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   |
| Weight         |                              |                            |         | 6    |      | 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  
 30 = Current Rating [A]  
 C = Common Cathode  
 200 = Reverse Voltage [V]  
 HB = TO-247AD (3)

| Ordering | Part Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-------------|--------------------|---------------|----------|----------|
| Standard | DPG30C200HB | DPG30C200HB        | Tube          | 30       | 505797   |

| Similar Part | Package              | Voltage class |
|--------------|----------------------|---------------|
| DPG30C200PB  | TO-220AB (3)         | 200           |
| DPG30C200PC  | TO-263AB (D2Pak) (2) | 200           |

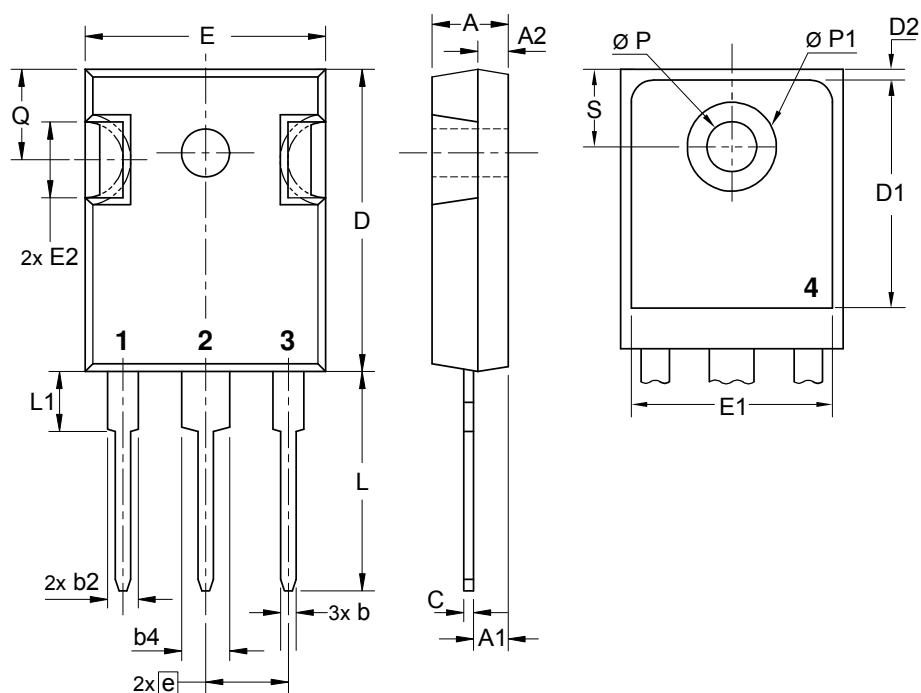
### Equivalent Circuits for Simulation

\* on die level

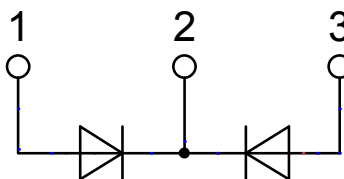
$T_{VJ} = 175\text{ °C}$

|                 |                    |       |            |    |
|-----------------|--------------------|-------|------------|----|
| $I \rightarrow$ | $V_0$              | $R_0$ | Fast Diode |    |
| $V_{0\max}$     | threshold voltage  | 0.69  |            | V  |
| $R_{0\max}$     | slope resistance * | 14.7  |            | mΩ |

## Outlines TO-247



| Sym. | Inches |       | Millimeter |       |
|------|--------|-------|------------|-------|
|      | min.   | max.  | min.       | max.  |
| A    | 0.185  | 0.209 | 4.70       | 5.30  |
| A1   | 0.087  | 0.102 | 2.21       | 2.59  |
| A2   | 0.059  | 0.098 | 1.50       | 2.49  |
| D    | 0.819  | 0.845 | 20.79      | 21.45 |
| E    | 0.610  | 0.640 | 15.48      | 16.24 |
| E2   | 0.170  | 0.216 | 4.31       | 5.48  |
| e    | 0.215  | BSC   | 5.46       | BSC   |
| L    | 0.780  | 0.800 | 19.80      | 20.30 |
| L1   | -      | 0.177 | -          | 4.49  |
| Ø P  | 0.140  | 0.144 | 3.55       | 3.65  |
| Q    | 0.212  | 0.244 | 5.38       | 6.19  |
| S    | 0.242  | BSC   | 6.14       | BSC   |
| b    | 0.039  | 0.055 | 0.99       | 1.40  |
| b2   | 0.065  | 0.094 | 1.65       | 2.39  |
| b4   | 0.102  | 0.135 | 2.59       | 3.43  |
| c    | 0.015  | 0.035 | 0.38       | 0.89  |
| D1   | 0.515  | -     | 13.07      | -     |
| D2   | 0.020  | 0.053 | 0.51       | 1.35  |
| E1   | 0.530  | -     | 13.45      | -     |
| Ø P1 | -      | 0.29  | -          | 7.39  |



## Fast Diode

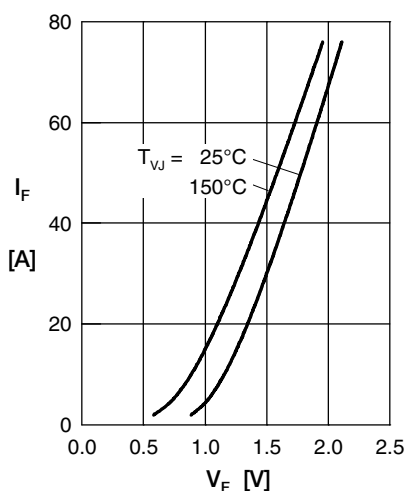


Fig. 1 Forward current  $I_F$  versus  $V_F$

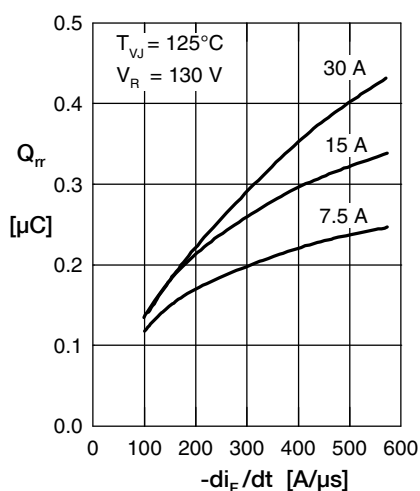


Fig. 2 Typ. reverse recov. charge  $Q_{rr}$  versus  $-di_F/dt$

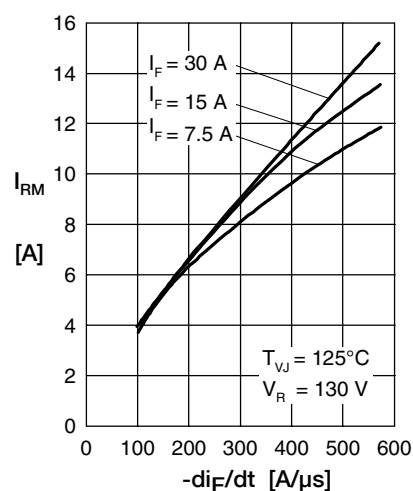


Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $-di_F/dt$

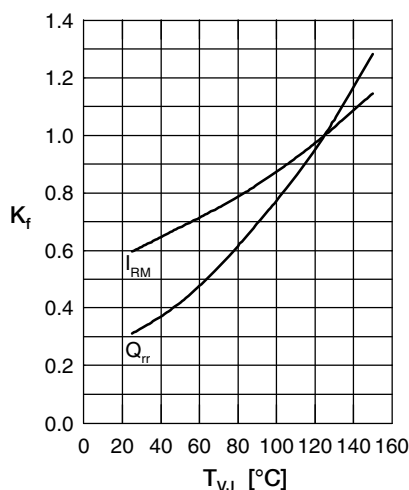


Fig. 4 Typ. dynamic parameters  $Q_{rr}$ ,  $I_{RM}$  versus  $T_{VJ}$

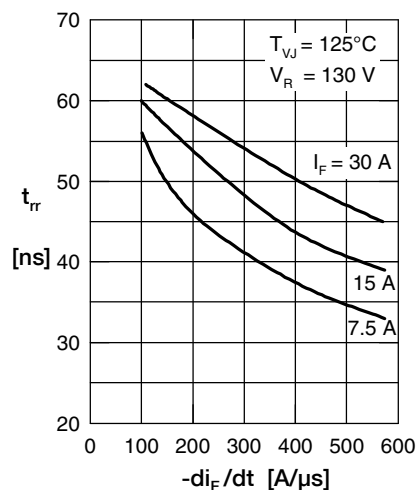


Fig. 5 Typ. recovery time  $t_{rr}$  versus  $-di_F/dt$

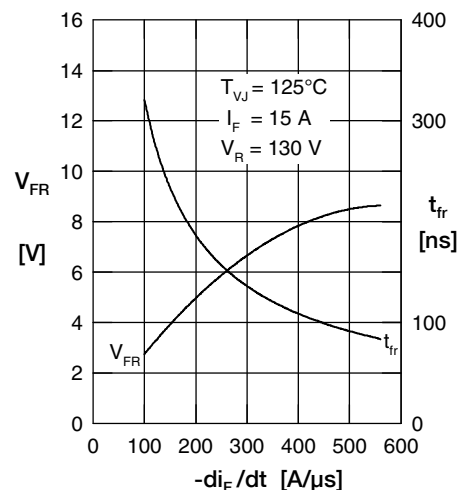


Fig. 6 Typ. peak forward voltage  $V_{FR}$  and  $t_{rr}$  versus  $di_F/dt$

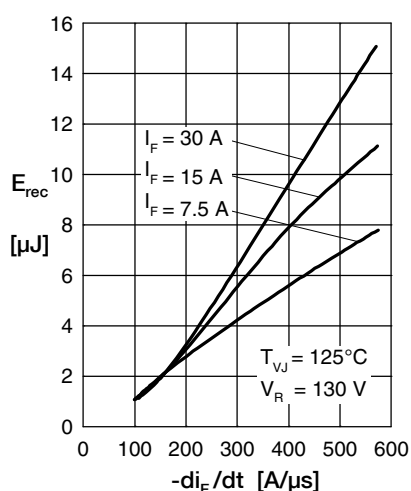


Fig. 7 Typ. recovery energy  $E_{rec}$  versus  $-di_F/dt$

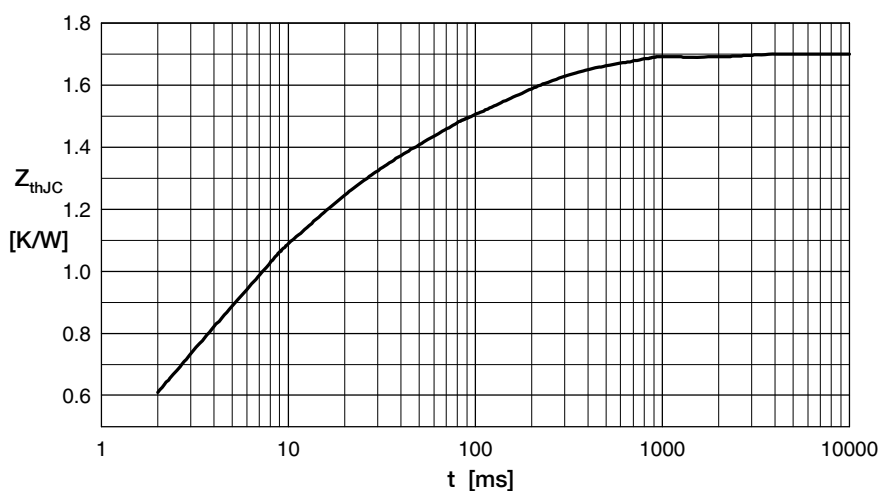


Fig. 8 Transient thermal resistance junction to case