

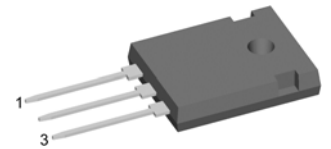
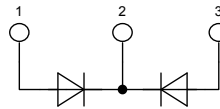
# HiPerFRED<sup>2</sup>

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

$V_{RRM} = 400\text{ V}$   
 $I_{FAV} = 2 \times 40\text{ A}$   
 $t_{rr} = 45\text{ ns}$

Part number

**DPG 80 C 400 HB**



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:

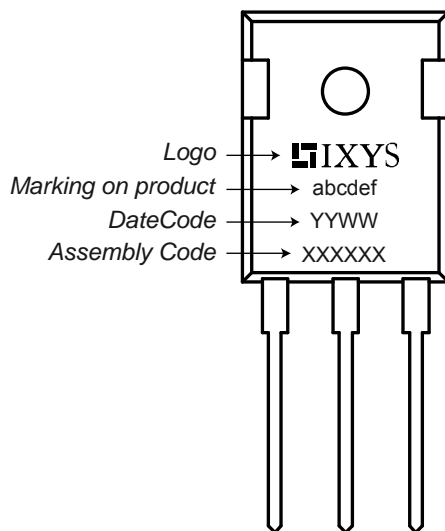
- Housing: TO-247
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

### Ratings

| Symbol     | Definition                          | Conditions                              | Ratings |      |      | Unit               |
|------------|-------------------------------------|---|---------|------|------|--------------------|
|            |                                     |   | min.    | typ. | max. |                    |
| $V_{RRM}$  | max. repetitive reverse voltage     |   |         |      | 400  | V                  |
| $I_R$      | reverse current                     | $V_R = 400\text{ V}$                    |         |      | 1    | $\mu\text{A}$      |
|            |                                     | $V_R = 400\text{ V}$                    |         |      | 0.4  | mA                 |
| $V_F$      | forward voltage                     | $I_F = 40\text{ A}$                     |         |      | 1.43 | V                  |
|            |                                     | $I_F = 80\text{ A}$                     |         |      | 1.77 | V                  |
|            |                                     | $I_F = 40\text{ A}$                     |         |      | 1.14 | V                  |
|            |                                     | $I_F = 80\text{ A}$                     |         |      | 1.51 | V                  |
| $I_{FAV}$  | average forward current             | rectangular $d = 0.5$                   |         |      | 40   | A                  |
| $V_{F0}$   | threshold voltage                   | } for power loss calculation only       |         |      | 0.79 | V                  |
| $r_F$      | slope resistance                    |   |         |      | 7.1  | $\text{m}\Omega$   |
| $R_{thJC}$ | thermal resistance junction to case |   |         |      | 0.70 | K/W                |
| $T_{VJ}$   | virtual junction temperature        |   | -55     |      | 175  | $^{\circ}\text{C}$ |
| $P_{tot}$  | total power dissipation             |   |         |      | 215  | W                  |
| $I_{FSM}$  | max. forward surge current          | $t = 10\text{ ms}$ (50 Hz), sine        |         |      | 400  | A                  |
| $I_{RM}$   | max. reverse recovery current       |   |         |      | 4    | A                  |
|            |                                     | $I_F = 40\text{ A}; V_R = 100\text{ V}$ |         |      | tbd  | A                  |
| $t_{rr}$   | reverse recovery time               | $-di_F/dt = 200\text{ A}/\mu\text{s}$   |         |      | 45   | ns                 |
|            |                                     |   |         |      | tbd  | ns                 |
| $C_J$      | junction capacitance                | $V_R = 200\text{ V}; f = 1\text{ MHz}$  |         |      | 46   | pF                 |

| Symbol        | Definition                          | Conditions            | Ratings |      |      | Unit |
|---------------|-------------------------------------|-----------------------|---------|------|------|------|
|               |                                     |                       | min.    | typ. | max. |      |
| $I_{RMS}$     | RMS current                         | per pin <sup>1)</sup> |         |      | 70   | A    |
| $R_{thCH}$    | thermal resistance case to heatsink |                       |         | 0.25 |      | K/W  |
| $T_{stg}$     | storage temperature                 |                       | -55     |      | 150  | °C   |
| <b>Weight</b> |                                     |                       |         | 6    |      | g    |
| $M_D$         | mounting torque                     |                       | 0.8     |      | 1.2  | Nm   |
| $F_C$         | mounting force with clip            |                       | 20      |      | 120  | N    |

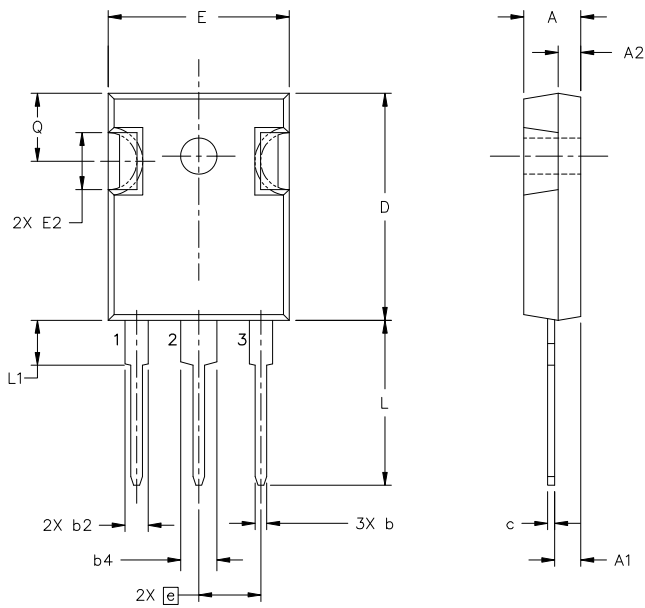
<sup>1)</sup>  $I_{RMS}$  is typically limited by: 1. pin-to-chip resistance; or by 2. current capability of the chip.  
 In case of 1, a common cathode/anode configuration and a non-isolated backside, the whole current capability can be used by connecting the backside.

**Product Marking**

**Part number**

D = Diode  
 P = HiPerFRED  
 G = extreme fast  
 80 = Current Rating [A]  
 C = Common Cathode  
 400 = Reverse Voltage [V]  
 HB = TO-247AD (3)

| Ordering | Part Name       | Marking on Product | Delivering Mode | Base Qty | Code Key |
|----------|-----------------|--------------------|-----------------|----------|----------|
| Standard | DPG 80 C 400 HB | DPG80C400HB        | Tube            | 30       | 506875   |

## Outlines TO-247



| Symbol | Inches    |       | Millimeters |       |
|--------|-----------|-------|-------------|-------|
|        | 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  |
| ØP     | 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       | -     |
| ØP1    | -         | 0.291 | -           | 7.39  |

