preliminary

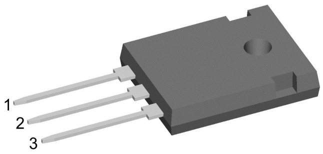
# HiPerFRED²

$V_{RRM}$ = 200 V
$I_{FAV}$ = 2x 40 A
$t_{rr}$ = 55 ns

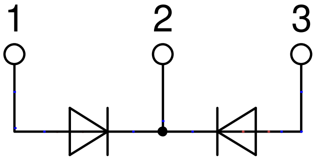
## High Performance Fast Recovery Diode
## Low Loss and Soft Recovery
## Common Cathode

**Part number**

**DPF80C200HB**



Backside: cathode



### Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low Irm-values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low Irm 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

### Disclaimer Notice

## Fast Diode

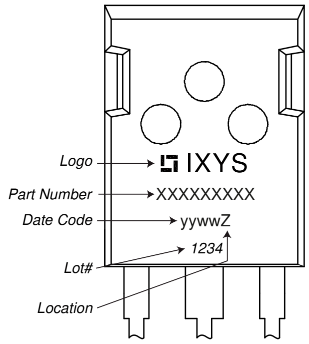
| Symbol | Definition | Conditions | | Ratings | | | |
|---|---|---|---|---|---|---|---|
| | | | | min. | typ. | max. | Unit |
| **$V_{RSM}$** | *max. non-repetitive reverse blocking voltage* | | $T_{VJ}$ = 25°C | | | 200 | V |
| **$V_{RRM}$** | *max. repetitive reverse blocking voltage* | | $T_{VJ}$ = 25°C | | | 200 | V |
| **$I_R$** | *reverse current, drain current* | $V_R$ = 200 V | $T_{VJ}$ = 25°C | | | 1 | µA |
| | | $V_R$ = 200 V | $T_{VJ}$ = 150°C | | | 0.2 | mA |
| **$V_F$** | *forward voltage drop* | $I_F$ = 40 A | $T_{VJ}$ = 25°C | | | 1.22 | V |
| | | $I_F$ = 80 A | | | | 1.45 | V |
| | | $I_F$ = 40 A | $T_{VJ}$ = 150°C | | | 0.95 | V |
| | | $I_F$ = 80 A | | | | 1.20 | V |
| **$I_{FAV}$** | *average forward current* | $T_C$ = 145°C<br>rectangular d = 0.5 | $T_{VJ}$ = 175°C | | | 40 | A |
| **$V_{F0}$** | *threshold voltage* | *for power loss calculation only* | $T_{VJ}$ = 175°C | | | 0.67 | V |
| **$r_F$** | *slope resistance* | | | | | 5.8 | mΩ |
| **$R_{thJC}$** | *thermal resistance junction to case* | | | | | 0.7 | K/W |
| **$R_{thCH}$** | *thermal resistance case to heatsink* | | | | 0.3 | | K/W |
| **$P_{tot}$** | *total power dissipation* | | $T_C$ = 25°C | | | 215 | W |
| **$I_{FSM}$** | *max. forward surge current* | t = 10 ms; (50 Hz), sine; $V_R$ = 0 V | $T_{VJ}$ = 45°C | | | 560 | A |
| **$C_J$** | *junction capacitance* | $V_R$ = 100 V f = 1 MHz | $T_{VJ}$ = 25°C | | 81 | | pF |
| **$I_{RM}$** | *max. reverse recovery current* | $I_F$ = 40 A; $V_R$ = 100 V<br>$-di_F/dt$ = 200 A/µs | $T_{VJ}$ = 25°C | | 6 | | A |
| | | | $T_{VJ}$ = 125°C | | 11 | | A |
| **$t_{rr}$** | *reverse recovery time* | | $T_{VJ}$ = 25°C | | 55 | | ns |
| | | | $T_{VJ}$ = 125°C | | 85 | | ns |

Data according to IEC 60747and per semiconductor unless otherwise specified preliminary

## Package TO-247

| | | | Ratings | | | |
|---|---|---|---|---|---|---|
| **Symbol** | **Definition** | **Conditions** | **min.** | **typ.** | **max.** | **Unit** |
| $I_{RMS}$ | *RMS current* | per terminal [1)] | | | 70 | 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 description

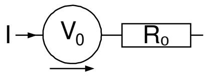
D = Diode
P = HiPerFRED
F = ultra fast
80 = Current Rating [A]
C = Common Cathode
200 = Reverse Voltage [V]
HB = TO-247AD (3)

| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|---|---|---|---|---|---|
| Standard | DPF80C200HB | DPF80C200HB | Tube | 30 | 508214 |

| Similar Part | Package | Voltage class |
|---|---|---|
| DPF60C200HJ | ISOPLUS247 (3) | 200 |

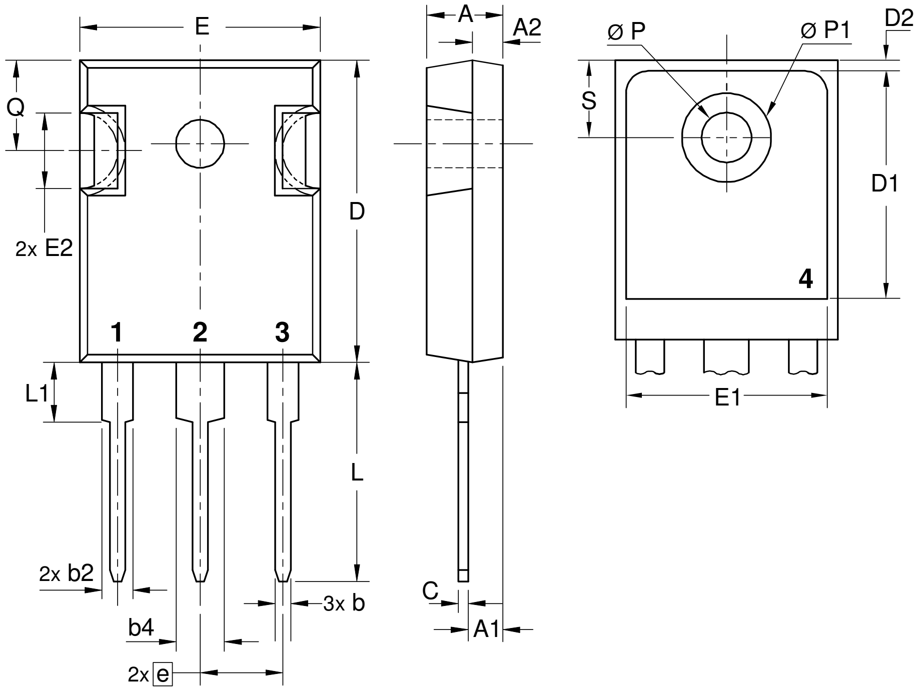
## Equivalent Circuits for Simulation

** on die level* $T_{VJ} = 175°C$



| | | Fast Diode | |
|---|---|---|---|
| $V_{0\,max}$ | *threshold voltage* | 0.67 | V |
| $R_{0\,max}$ | *slope resistance ** | 3.2 | mΩ |

## Outlines TO-247



| Sym. | Inches min. | Inches max. | Millimeter min. | Millimeter 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 |