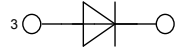


HiPerFRED²

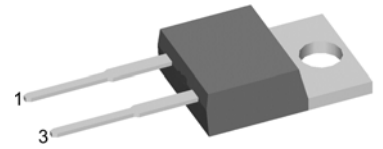
High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Single Diode

Part number

DPG 30 I 300 PA



$V_{RRM} = 300\text{ V}$
 $I_{FAV} = 30\text{ A}$
 $t_{rr} = 35\text{ ns}$



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:

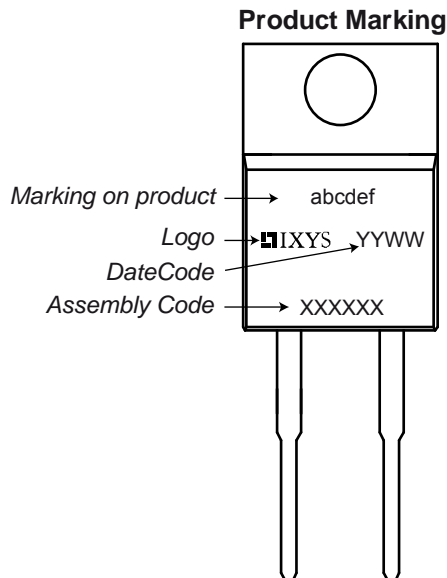
- Housing: TO-220
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

Ratings

| Symbol | Definition | Conditions | Ratings | | | Unit | |
|------------|-------------------------------------|---|------------------------------|------|------|------------------|---|
| | | | min. | typ. | max. | | |
| V_{RRM} | max. repetitive reverse voltage | | | | 300 | V | |
| I_R | reverse current | $V_R = 300\text{ V}$ | | | 1 | μA | |
| | | $V_R = 300\text{ V}$ | | | 0.1 | mA | |
| V_F | forward voltage | $I_F = 30\text{ A}$ | | | 1.35 | V | |
| | | $I_F = 60\text{ A}$ | | | 1.66 | V | |
| | | $I_F = 30\text{ A}$ | $T_{VJ} = 150^\circ\text{C}$ | | | 1.08 | V |
| | | $I_F = 60\text{ A}$ | $T_{VJ} = 150^\circ\text{C}$ | | | 1.43 | V |
| I_{FAV} | average forward current | rectangular $d = 0.5$ | $T_C = 140^\circ\text{C}$ | | 30 | A | |
| V_{F0} | threshold voltage | } for power loss calculation only | $T_{VJ} = 175^\circ\text{C}$ | | 0.70 | V | |
| r_F | slope resistance | | | | 11.1 | m Ω | |
| R_{thJC} | thermal resistance junction to case | | | | 0.85 | K/W | |
| T_{VJ} | virtual junction temperature | | -55 | | 175 | $^\circ\text{C}$ | |
| P_{tot} | total power dissipation | | $T_C = 25^\circ\text{C}$ | | 175 | W | |
| I_{FSM} | max. forward surge current | $t = 10\text{ ms}$ (50 Hz), sine | $T_{VJ} = 45^\circ\text{C}$ | | 360 | A | |
| I_{RM} | max. reverse recovery current | | $T_{VJ} = 25^\circ\text{C}$ | | 3 | A | |
| | | $I_F = 30\text{ A}; V_R = 200\text{ V}$ | $T_{VJ} = 125^\circ\text{C}$ | | 7 | A | |
| t_{rr} | reverse recovery time | $-di_F/dt = 200\text{ A}/\mu\text{s}$ | $T_{VJ} = 25^\circ\text{C}$ | | 35 | ns | |
| | | | $T_{VJ} = 125^\circ\text{C}$ | | 55 | ns | |
| C_J | junction capacitance | $V_R = 150\text{ V}; f = 1\text{ MHz}$ | $T_{VJ} = 25^\circ\text{C}$ | | 50 | pF | |

| Symbol | Definition | Conditions | Ratings | | | Unit |
|---------------|-------------------------------------|-----------------------|---------|------|------|------|
| | | | min. | typ. | max. | |
| I_{RMS} | RMS current | per pin ¹⁾ | | | 35 | A |
| R_{thCH} | thermal resistance case to heatsink | | | 0.50 | | K/W |
| T_{stg} | storage temperature | | -55 | | 150 | °C |
| Weight | | | | 2 | | g |
| M_D | mounting torque | | 0.4 | | 0.6 | Nm |
| F_C | mounting force with clip | | 20 | | 60 | N |

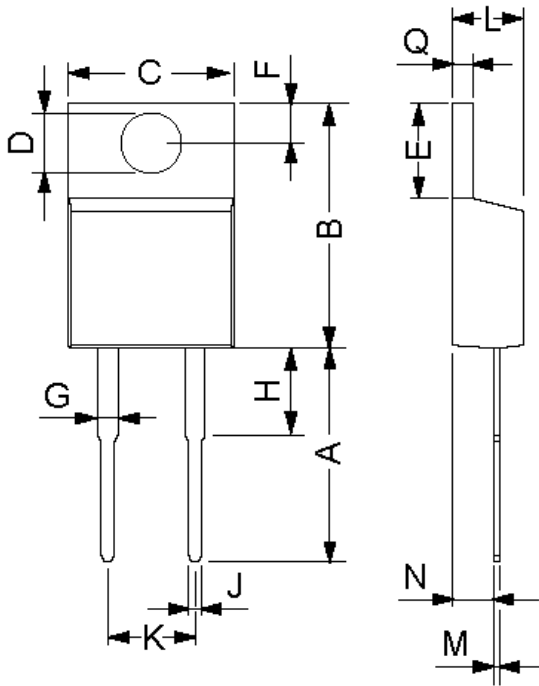
¹⁾ I_{RMS} is typically limited by: 1. pin-to-chip resistance; or by 2. current capability of the chip.
 In case of 1, a common cathode/anode configuration and a non-isolated backside, the whole current capability can be used by connecting the backside.


Part number

- D = Diode
- P = HiPerFRED
- G = extreme fast
- 30 = Current Rating [A]
- I = Single Diode
- 300 = Reverse Voltage [V]
- PA = TO-220AC (2)

| Ordering | Part Name | Marking on Product | Delivering Mode | Base Qty | Code Key |
|----------|-----------------|--------------------|-----------------|----------|----------|
| Standard | DPG 30 I 300 PA | DPG30I300PA | Tube | 50 | 505675 |

| Similar Part | Package | Voltage Class |
|--------------|--------------|---------------|
| DPG30I300HA | TO-247AD (2) | 300 |

Outlines TO-220


| Dim. | Millimeter | | Inches | |
|------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 12.7 | 14.73 | 0.5 | 0.58 |
| B | 14.23 | 16.51 | 0.56 | 0.65 |
| C | 9.66 | 10.66 | 0.38 | 0.42 |
| D | 3.54 | 4.08 | 0.139 | 0.161 |
| E | 5.85 | 6.85 | 2.3 | 0.42 |
| F | 2.54 | 3.42 | 0.1 | 0.135 |
| G | 1.15 | 1.77 | 0.045 | 0.07 |
| H | - | 6.35 | - | 0.25 |
| J | 0.64 | 0.89 | 0.025 | 0.035 |
| K | 4.83 | 5.33 | 0.19 | 0.21 |
| L | 3.56 | 4.82 | 0.14 | 0.19 |
| M | 0.51 | 0.76 | 0.02 | 0.03 |
| N | 2.04 | 2.49 | 0.08 | 0.115 |
| Q | 0.64 | 1.39 | 0.025 | 0.055 |

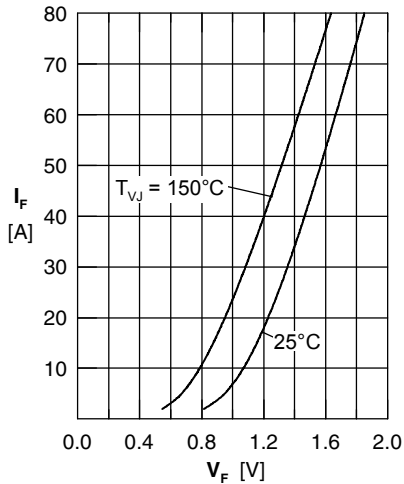


Fig. 1 Forward current I_F versus forward voltage V_F

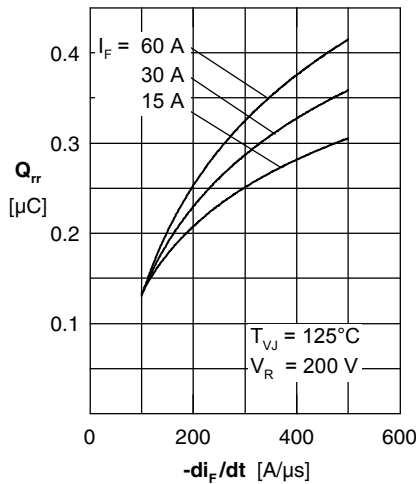


Fig. 2 Typ. reverse recovery charge Q_{rr} versus $-di_F/dt$

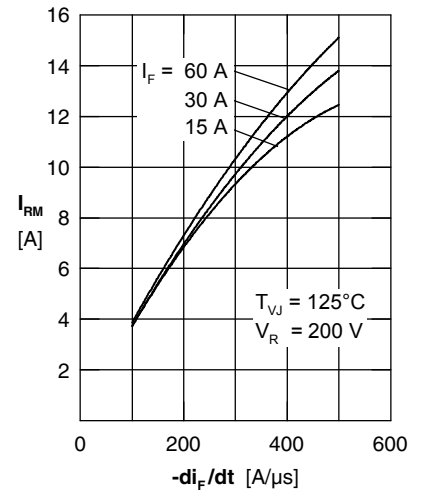


Fig. 3 Typ. reverse recovery current I_{RM} versus $-di_F/dt$

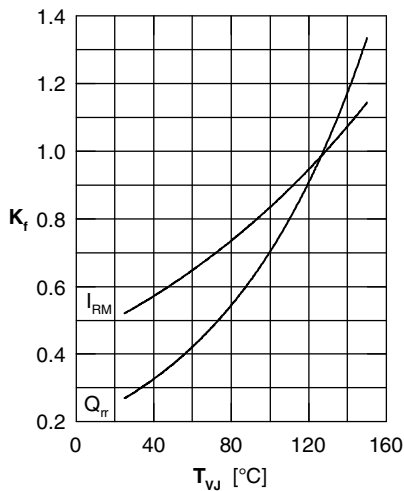


Fig. 4 Dynamic parameters Q_{rr} , I_{RM} versus T_{VJ}

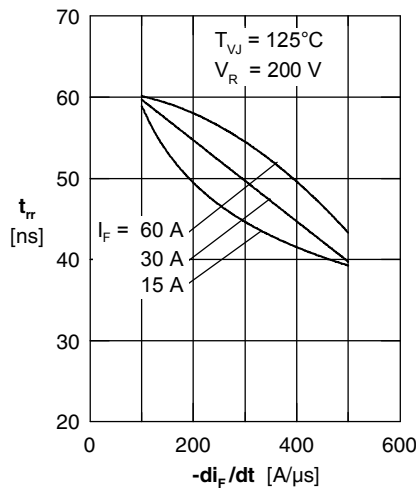


Fig. 5 Typ. reverse recovery time t_{rr} versus $-di_F/dt$

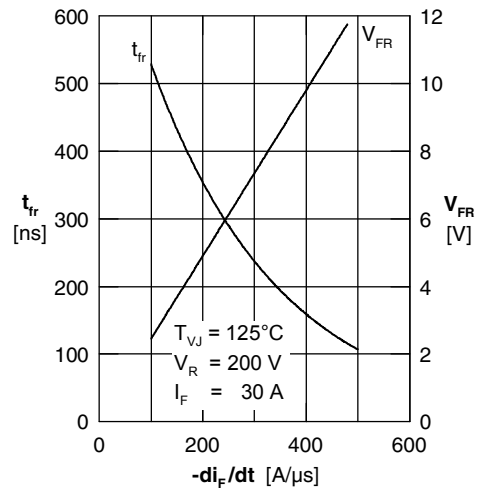


Fig. 6 Typ. forward recovery voltage V_{FR} & forward recovery time t_{fr} vs. di_F/dt

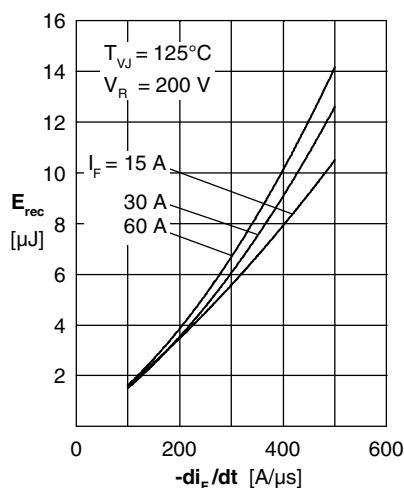


Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

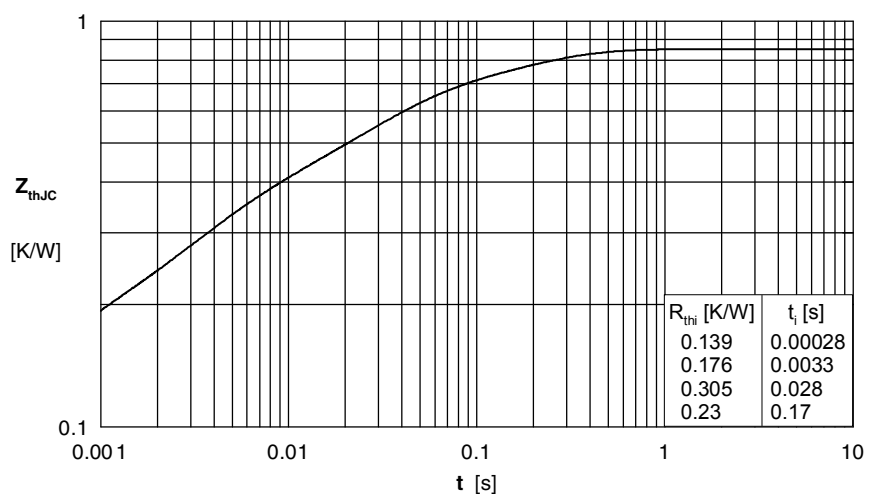


Fig. 8 Transient thermal impedance junction to case