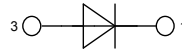


HiPerFRED²

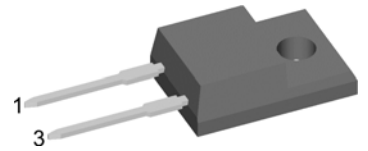
High Performance Fast Recovery Diode
 Low Loss and Soft Recovery
 Single Diode

Part number

DPG 10 I 400 PM



V_{RRM} = 400 V
I_{FAV} = 10 A
t_{rr} = 45 ns



Backside: isolated

E72873

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:

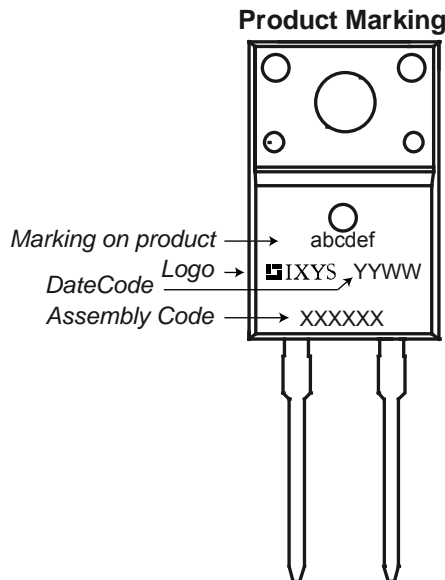
- Housing: TO-220FP
- Industry standard outline
- Plastic overmolded tab for electrical isolation
- Isolation Voltage 2500 V
- Epoxy meets UL 94V-0
- RoHS compliant

Ratings

| Symbol | Definition | Conditions | Ratings | | | Unit |
|-------------------|-------------------------------------|---|-------------------------|------|------|------|
| | | | min. | typ. | max. | |
| V _{RRM} | max. repetitive reverse voltage | T _{VJ} = 25°C | | | 400 | V |
| I _R | reverse current | V _R = 400V | | | 1 | μA |
| | | V _R = 400V | | | 0.15 | mA |
| V _F | forward voltage | I _F = 10A | T _{VJ} = 25°C | | 1.32 | V |
| | | | | | 1.51 | V |
| | | I _F = 10A | T _{VJ} = 150°C | | 1.03 | V |
| | | | | | 1.24 | V |
| I _{FAV} | average forward current | rectangular d = 0.5 | T _C = 120°C | | 10 | A |
| V _{F0} | threshold voltage | } for power loss calculation only | T _{VJ} = 175°C | | 0.77 | V |
| r _F | slope resistance | | | | 19.8 | mΩ |
| R _{thJC} | thermal resistance junction to case | | | | 4.40 | K/W |
| T _{VJ} | virtual junction temperature | | -55 | | 175 | °C |
| P _{tot} | total power dissipation | | | | 35 | W |
| I _{FSM} | max. forward surge current | t = 10 ms (50 Hz), sine | T _{VJ} = 45°C | | 150 | A |
| I _{RM} | max. reverse recovery current | | T _{VJ} = 25°C | | 4 | A |
| | | I _F = 10 A; V _R = 270 V | T _{VJ} = 125°C | | 6 | A |
| | | | T _{VJ} = 25°C | | 45 | ns |
| t _{rr} | reverse recovery time | -di _F /dt = 200 A/μs | T _{VJ} = 125°C | | 65 | ns |
| | | | T _{VJ} = 25°C | | | |
| C _J | junction capacitance | V _R = 150 V; f = 1 MHz | T _{VJ} = 25°C | | 15 | 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 |
| V_{ISOL} | isolation voltage | t = 1 second | 2500 | | | V |
| | | t = 1 minute | 2000 | | | V |
| d_s | creepage distance on surface | | 1.07 | | | mm |
| d_A | striking distance through air | | 1.07 | | | mm |

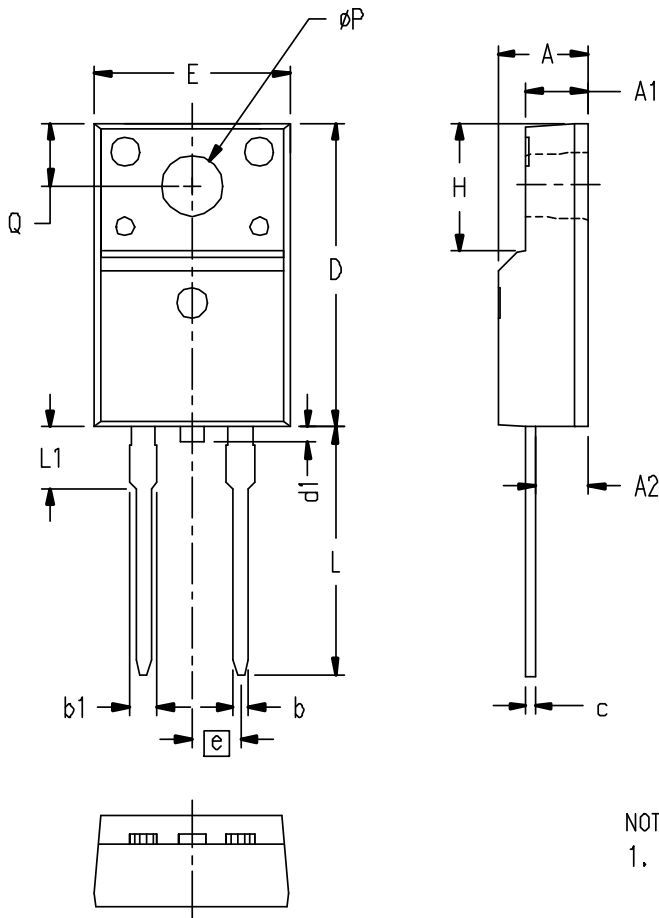
¹⁾ I_{RMS} is typically limited by: 1. pin-to-chip resistance; or by 2. current capability of the chip.
 In case of 1, a common cathode/anode configuration and a non-isolated backside, the whole current capability can be used by connecting the backside.


Part number

- D = Diode
- P = HiPerFRED
- G = extreme fast
- 10 = Current Rating [A]
- I = Single Diode
- 400 = Reverse Voltage [V]
- PM = TO-220ACFP (2)

| Ordering | Part Name | Marking on Product | Delivering Mode | Base Qty | Code Key |
|----------|-----------------|--------------------|-----------------|----------|----------|
| Standard | DPG 10 I 400 PM | DPG10I400PM | Tube | 50 | 503778 |

| Similar Part | Package | Voltage Class |
|--------------|--------------|---------------|
| DPG10I400PA | TO-220AC (2) | 400 |

Outlines TO-220FP


| SYM | INCHES | | MILLIMETERS | |
|-----------------|----------|------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .177 | .193 | 4.50 | 4.90 |
| A1 | .092 | .108 | 2.34 | 2.74 |
| A2 | .101 | .117 | 2.56 | 2.96 |
| b | .028 | .035 | 0.70 | 0.90 |
| b1 | .050 | .058 | 1.27 | 1.47 |
| c | .018 | .024 | 0.45 | 0.60 |
| D | .617 | .633 | 15.67 | 16.07 |
| d1 | 0 | .043 | 0 | 1.10 |
| E | .392 | .408 | 9.96 | 10.36 |
| e | .100 BSC | | 2.54 BSC | |
| H | .255 | .271 | 6.48 | 6.88 |
| L | .499 | .523 | 12.68 | 13.28 |
| L1 | .119 | .135 | 3.03 | 3.43 |
| $\varnothing P$ | .121 | .129 | 3.08 | 3.28 |
| Q | .126 | .134 | 3.20 | 3.40 |

NOTE:

1. All metal surface are matte pure tin plated except trimmed area.

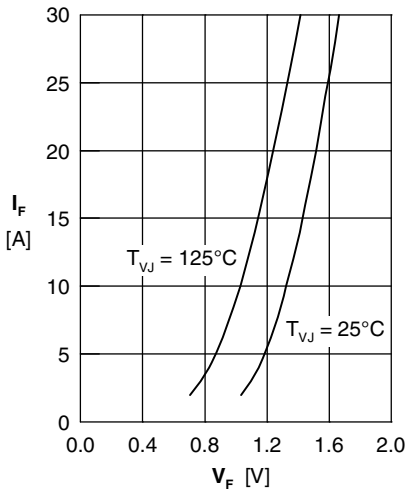


Fig. 1 Forward current I_F versus forward voltage drop V_F

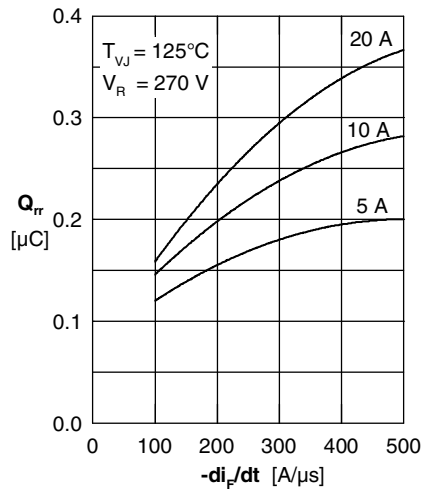


Fig. 2 Typ. reverse recovery charge Q_{rr} versus $-di_F/dt$

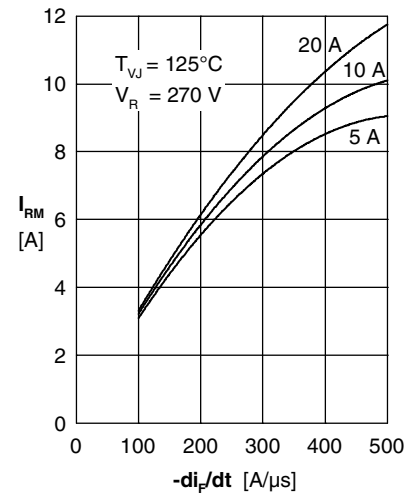


Fig. 3 Typ. reverse recovery current I_{RM} versus $-di_F/dt$

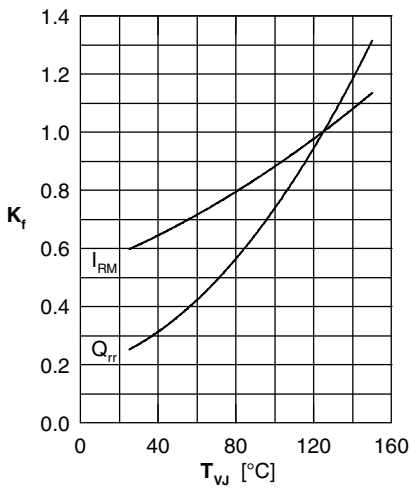


Fig. 4 Dynamic parameters Q_{rr} , I_{RM} versus T_{VJ}

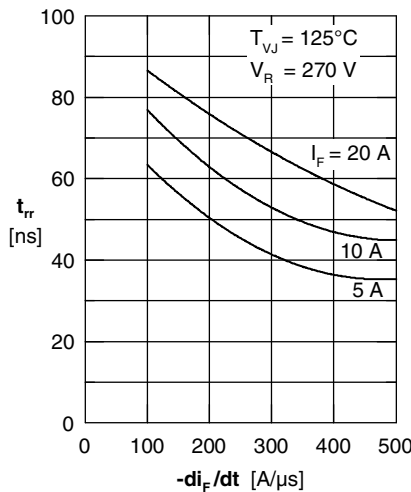


Fig. 5 Typ. reverse recovery time t_{rr} versus $-di_F/dt$

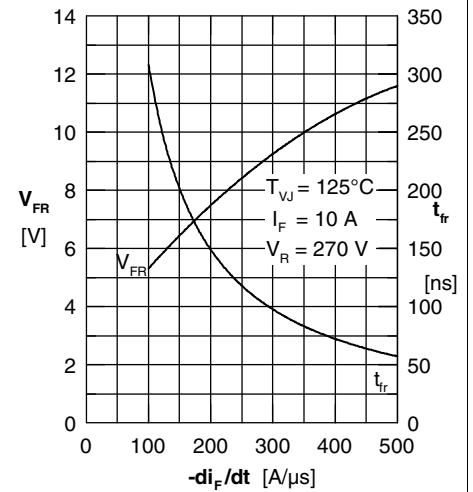


Fig. 6 Typ. forward recovery voltage V_{FR} and t_{fr} versus di_F/dt

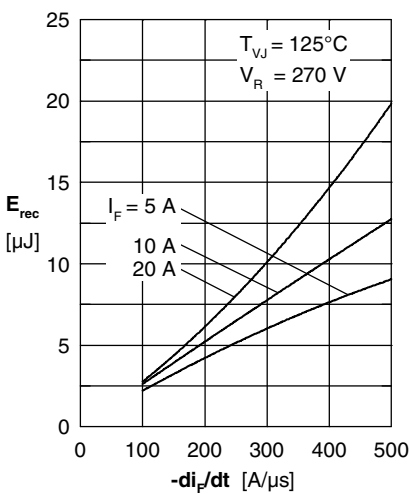


Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

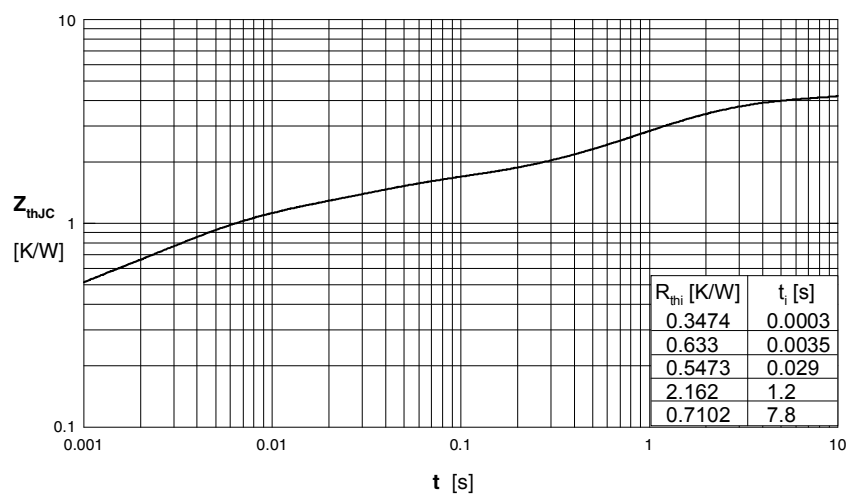


Fig. 8 Transient thermal resistance junction to case