

HiPerFRED Module

| | | |
|-----------|---|-------|
| V_{RRM} | = | 600 V |
| I_{DAV} | = | 44 A |
| t_{rr} | = | 35 ns |

High Performance Fast Recovery Diode
 Low Loss and Soft Recovery
 1~ Rectifier Bridge

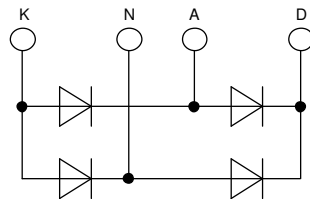
Part number

VBE26-06NO7



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: ECO-PAC1

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Base plate: Copper internally DCB isolated
- Advanced power cycling

Disclaimer Notice

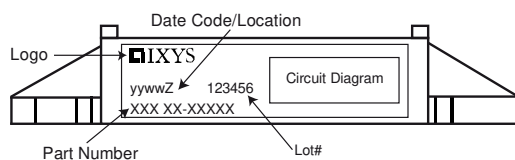
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| Fast Diode | | | | Ratings | | | |
|------------|--|--|------------------------------|------------------------------|------|------|---------------|
| Symbol | Definition | Conditions | | min. | typ. | max. | Unit |
| V_{RSM} | max. non-repetitive reverse blocking voltage | | | | | 600 | V |
| V_{RRM} | max. repetitive reverse blocking voltage | | | | | 600 | V |
| I_R | reverse current, drain current | $V_R = 600\text{ V}$ | $T_{VJ} = 25^\circ\text{C}$ | | | 100 | μA |
| | | $V_R = 600\text{ V}$ | $T_{VJ} = 150^\circ\text{C}$ | | | 0.5 | mA |
| V_F | forward voltage drop | $I_F = 15\text{ A}$ | $T_{VJ} = 25^\circ\text{C}$ | | | 2.01 | V |
| | | $I_F = 30\text{ A}$ | | | | 2.25 | V |
| | | $I_F = 15\text{ A}$ | $T_{VJ} = 150^\circ\text{C}$ | | | 1.34 | V |
| | | $I_F = 30\text{ A}$ | | | | 1.55 | V |
| I_{DAV} | bridge output current | $T_C = 85^\circ\text{C}$ rectangular $d = 0.5$ | $T_{VJ} = 150^\circ\text{C}$ | | | 44 | A |
| V_{FO} | threshold voltage | } for power loss calculation only | | | | 1.13 | V |
| r_F | slope resistance | | | | | 13 | m Ω |
| R_{thJC} | thermal resistance junction to case | | | | | 1.6 | K/W |
| R_{thCH} | thermal resistance case to heatsink | | | | 0.30 | | K/W |
| P_{tot} | total power dissipation | | | $T_C = 25^\circ\text{C}$ | | 80 | W |
| I_{FSM} | max. forward surge current | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$ | $T_{VJ} = 45^\circ\text{C}$ | | | 110 | A |
| C_J | junction capacitance | $V_R = 400\text{ V}$ $f = 1\text{ MHz}$ | $T_{VJ} = 25^\circ\text{C}$ | | 12 | | pF |
| I_{RM} | max. reverse recovery current | } $I_F = 15\text{ A}; V_R = 300\text{ V}$ $-di_F/dt = 200\text{ A}/\mu\text{s}$ | | $T_{VJ} = 25^\circ\text{C}$ | | 4 | A |
| | | | | $T_{VJ} = 100^\circ\text{C}$ | | 7 | A |
| t_{rr} | reverse recovery time | | | $T_{VJ} = 25^\circ\text{C}$ | | 35 | ns |
| | | | | $T_{VJ} = 100^\circ\text{C}$ | | 95 | ns |



| Package ECO-PAC1 | | Ratings | | | | |
|------------------|--|----------------------|------|------|------|------|
| Symbol | Definition | Conditions | min. | typ. | max. | Unit |
| I_{RMS} | RMS current | per terminal | | | 100 | A |
| T_{VJ} | virtual junction temperature | | -40 | | 150 | °C |
| T_{op} | operation temperature | | -40 | | 125 | °C |
| T_{stg} | storage temperature | | -40 | | 125 | °C |
| Weight | | | | 19 | | g |
| M_D | mounting torque | | 1.4 | | 2 | Nm |
| $d_{Spp/App}$ | creepage distance on surface / striking distance through air | terminal to terminal | 6.0 | | | mm |
| $d_{Spb/Apb}$ | | terminal to backside | 10.0 | | | mm |
| V_{ISOL} | isolation voltage | t = 1 second | 3600 | | | V |
| | | t = 1 minute | 3000 | | | V |

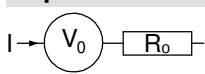


| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-----------------|--------------------|---------------|----------|----------|
| Standard | VBE26-06NO7 | VBE26-06NO7 | Box | 25 | 482358 |

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 150^{\circ}C$

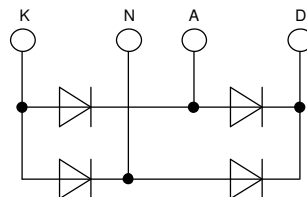
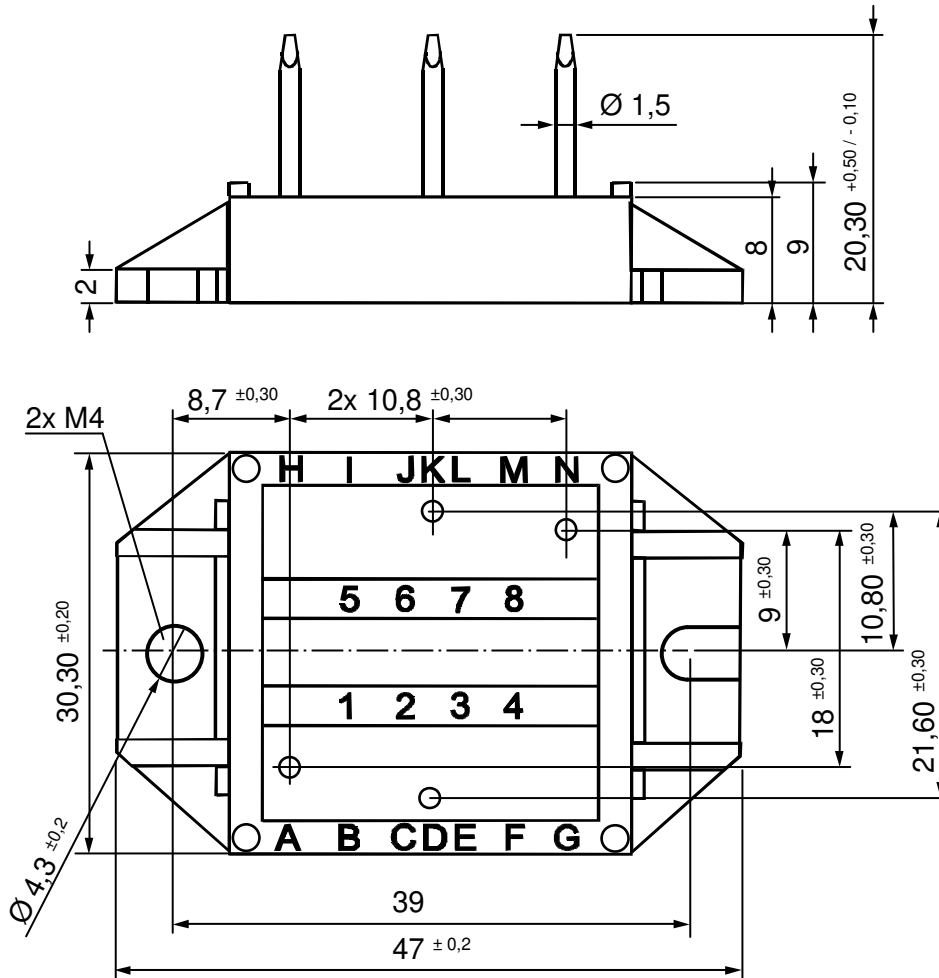


Fast Diode

| | | | |
|--------------|--------------------|------|----|
| $V_{0\ max}$ | threshold voltage | 1.13 | V |
| $R_{0\ max}$ | slope resistance * | 11 | mΩ |



Outlines ECO-PAC1



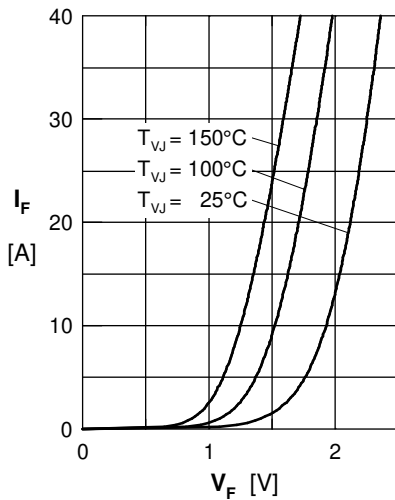
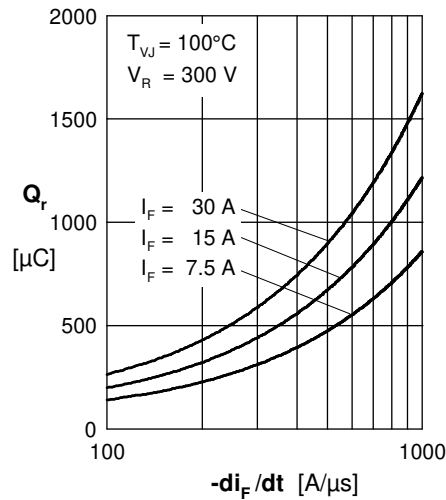
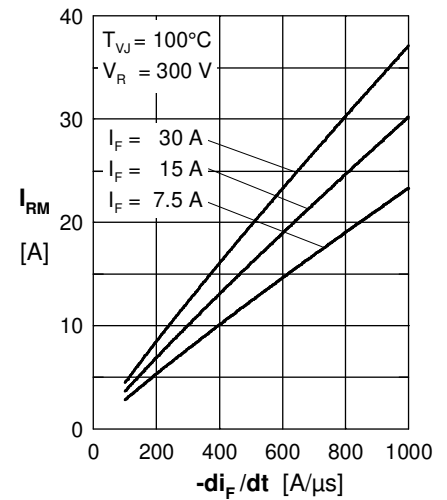
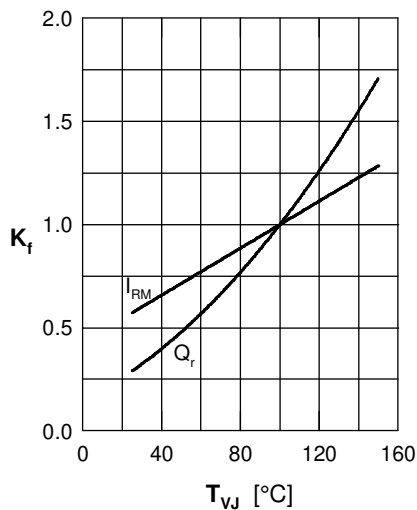
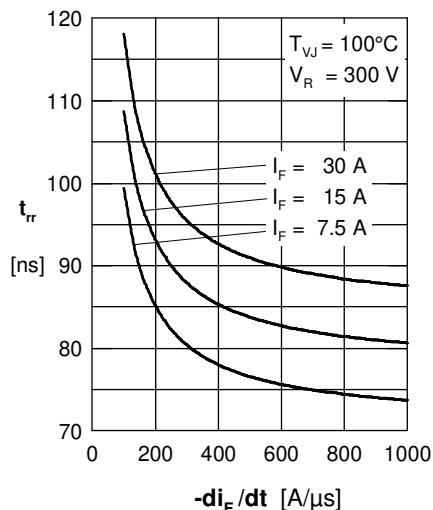
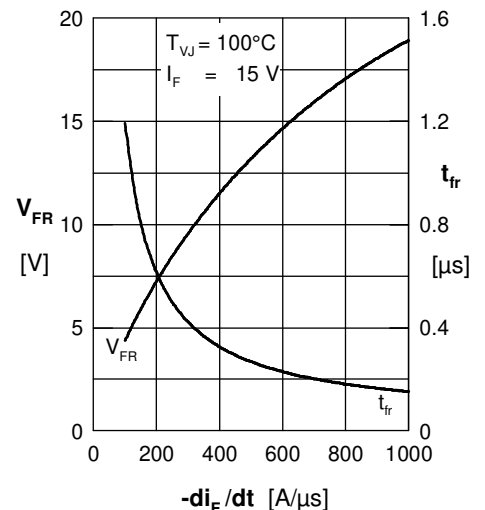
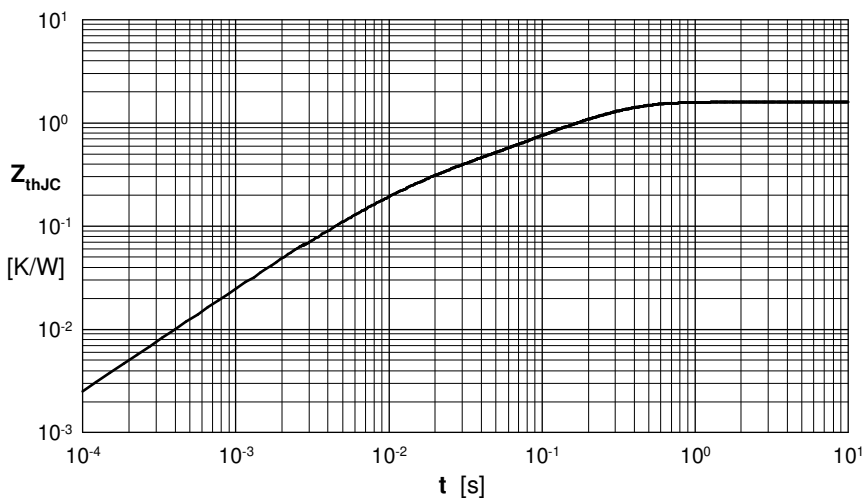
Fast Diode

 Fig. 1 Forward current I_F vs. V_F

 Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

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

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

 Fig. 5 Recovery time t_{tr} vs. $-di_F/dt$

 Fig. 6 Peak forward voltage V_{FR} and t_{tr} vs. $-di_F/dt$


Fig. 7 Transient thermal resistance junction to case

 Constants for Z_{thJC} calculation:

| i | R_{thi} (K/W) | t_i (s) |
|---|-----------------|-----------|
| 1 | 0.5464 | 0.0052 |
| 2 | 0.2104 | 0.0003 |
| 3 | 0.0432 | 0.0004 |
| 4 | 0.8000 | 0.0092 |