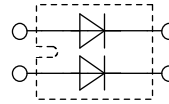


HiPerFRED

High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Parallel legs

Part number

DSEP2x31-06B



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:

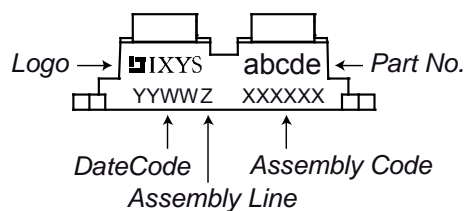
- Housing: SOT-227B (minibloc)
- Industry standard outline
- Cu base plate internal DCB isolated
- Isolation Voltage 3000 V
- Epoxy meets UL 94V-0
- RoHS compliant

Ratings

| Symbol | Definition | Conditions | Ratings | | | Unit |
|------------|-------------------------------------|---|---------|------|------|--------------------|
| | | | min. | typ. | max. | |
| V_{RRM} | max. repetitive reverse voltage | | | | 600 | V |
| I_R | reverse current | $V_R = 600\text{ V}$ | | | 250 | μA |
| | | $V_R = 600\text{ V}$ | | | 2 | mA |
| V_F | forward voltage | $I_F = 30\text{ A}$ | | | 2.49 | V |
| | | $I_F = 60\text{ A}$ | | | 3.16 | V |
| | | $I_F = 30\text{ A}$ | | | 1.59 | V |
| | | $I_F = 60\text{ A}$ | | | 2.20 | V |
| I_{FAV} | average forward current | rectangular $d = 0.5$ | | | 30 | A |
| V_{F0} | threshold voltage | } for power loss calculation only | | | 1.01 | V |
| r_F | slope resistance | | | | 19.2 | m Ω |
| R_{thJC} | thermal resistance junction to case | | | | 1.15 | K/W |
| T_{VJ} | virtual junction temperature | | -40 | | 150 | $^{\circ}\text{C}$ |
| P_{tot} | total power dissipation | | | | 100 | W |
| I_{FSM} | max. forward surge current | $t = 10\text{ ms}$ (50 Hz), sine | | | 250 | A |
| I_{RM} | max. reverse recovery current | | | | 7.5 | A |
| | | $I_F = 30\text{ A}; V_R = 300\text{ V}$ | | | 12.5 | A |
| t_{rr} | reverse recovery time | $-di_F/dt = 400\text{ A}/\mu\text{s}$ | | | 20 | ns |
| | | | | | 70 | ns |
| C_J | junction capacitance | $V_R = 400\text{ V}; f = 1\text{ MHz}$ | | | 26 | pF |

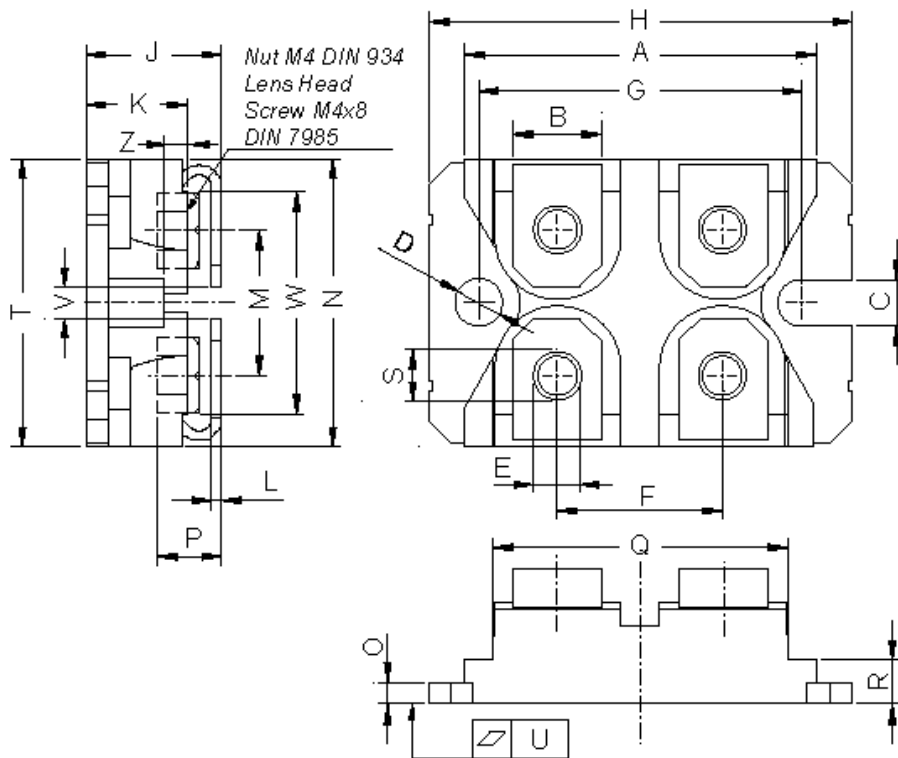
| Symbol | Definition | Conditions | Ratings | | | Unit |
|---------------|---|----------------------|---------|------|------|------|
| | | | min. | typ. | max. | |
| I_{RMS} | RMS current | per terminal | | | 100 | A |
| R_{thCH} | thermal resistance case to heatsink | | | 0.10 | | K/W |
| T_{stg} | storage temperature | | -40 | | 150 | °C |
| Weight | | | | 30 | | g |
| M_D | mounting torque | | 1.1 | | 1.5 | Nm |
| M_T | terminal torque | | 1.1 | | 1.5 | Nm |
| V_{ISOL} | isolation voltage | t = 1 second | 3000 | | | V |
| | | t = 1 minute | 2500 | | | V |
| $d_{Spp/App}$ | creepage striking distance on surface through air | terminal to terminal | 10.5 | 3.2 | | mm |
| $d_{Spb/Apb}$ | creepage striking distance on surface through air | terminal to backside | 8.6 | 6.8 | | mm |

Product Marking



| Ordering | Part Name | Marking on Product | Delivering Mode | Base Qty | Code Key |
|----------|--------------|--------------------|-----------------|----------|----------|
| Standard | DSEP2x31-06B | DSEP2x31-06B | Tube | 10 | 476285 |

| Similar Part | Package | Voltage Class |
|--------------|---------------------|---------------|
| DSEP2x31-06A | SOT-227B (minibloc) | 600 |

Outlines SOT-227B (minibloc)


| Dim. | Millimeter | | Inches | |
|------|------------|-------|--------|-------|
| | min | max | min | max |
| A | 31.50 | 31.88 | 1.240 | 1.255 |
| B | 7.80 | 8.20 | 0.307 | 0.323 |
| C | 4.09 | 4.29 | 0.161 | 0.169 |
| D | 4.09 | 4.29 | 0.161 | 0.169 |
| E | 4.09 | 4.29 | 0.161 | 0.169 |
| F | 14.91 | 15.11 | 0.587 | 0.595 |
| G | 30.12 | 30.30 | 1.186 | 1.193 |
| H | 37.80 | 38.23 | 1.488 | 1.505 |
| J | 11.68 | 12.22 | 0.460 | 0.481 |
| K | 8.92 | 9.60 | 0.351 | 0.378 |
| L | 0.74 | 0.84 | 0.029 | 0.033 |
| M | 12.50 | 13.10 | 0.492 | 0.516 |
| N | 25.15 | 25.42 | 0.990 | 1.001 |
| O | 1.95 | 2.13 | 0.077 | 0.084 |
| P | 4.95 | 6.20 | 0.195 | 0.244 |
| Q | 26.54 | 26.90 | 1.045 | 1.059 |
| R | 3.94 | 4.42 | 0.155 | 0.167 |
| S | 4.55 | 4.85 | 0.179 | 0.191 |
| T | 24.59 | 25.25 | 0.968 | 0.994 |
| U | -0.05 | 0.10 | -0.002 | 0.004 |
| V | 3.20 | 5.50 | 0.126 | 0.217 |
| W | 19.81 | 21.08 | 0.780 | 0.830 |
| Z | 2.50 | 2.70 | 0.098 | 0.106 |

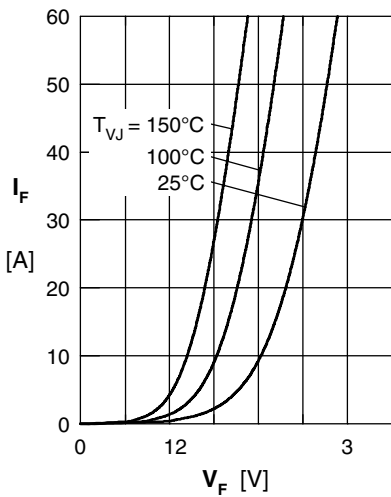


Fig. 1 Forward current I_F vs. V_F

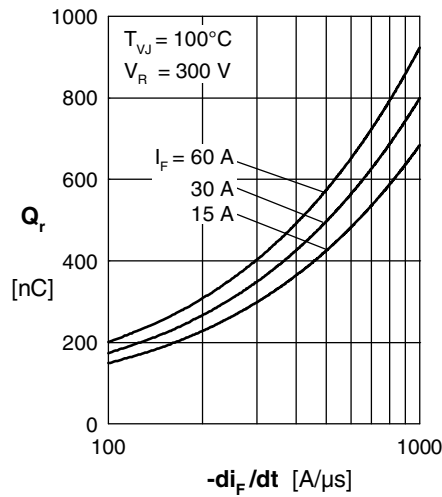


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

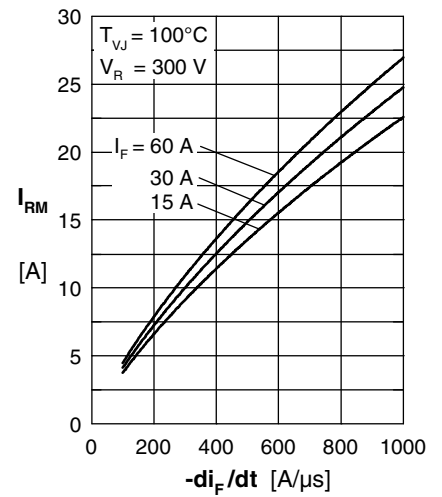


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

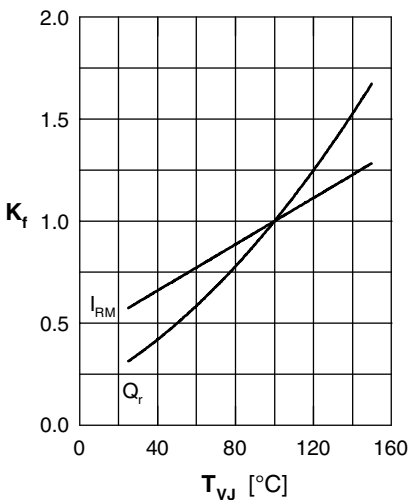


Fig. 4 Dynamic parameters Q_r , I_{RM} versus T_{VJ}

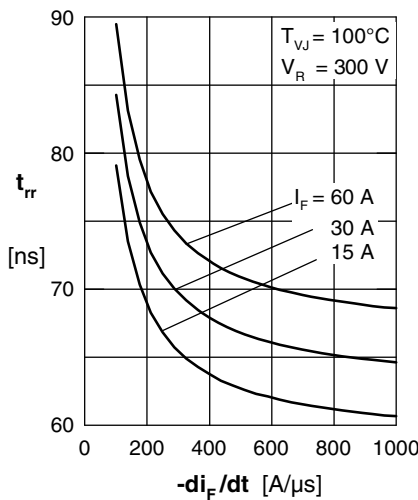


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

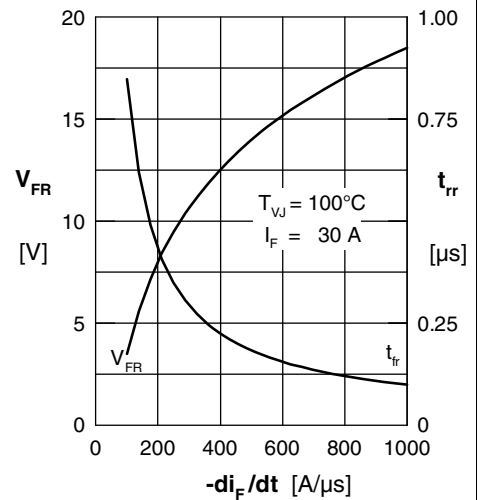


Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

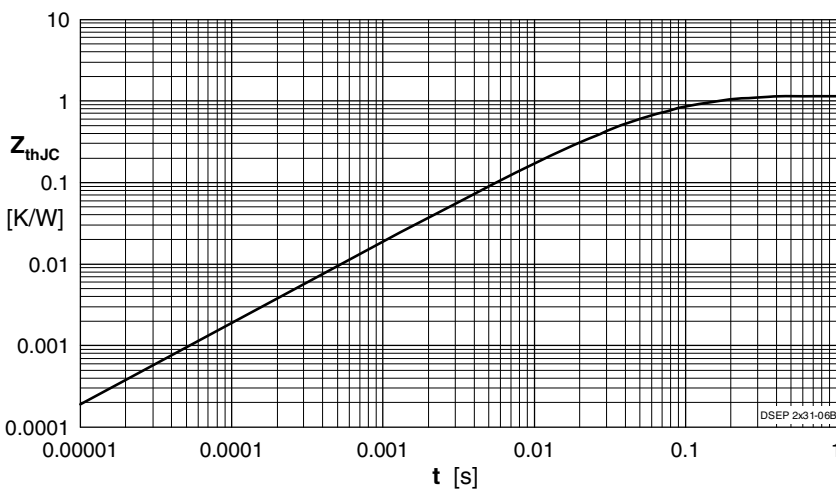


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

| i | R_{thi} (K/W) | t_i (s) |
|---|-----------------|-----------|
| 1 | 0.436 | 0.0055 |
| 2 | 0.482 | 0.0092 |
| 3 | 0.117 | 0.0007 |
| 4 | 0.115 | 0.0418 |