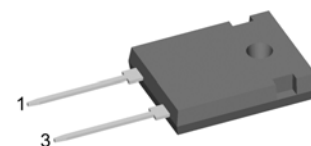


# Sonic Fast Recovery Diode

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

Part number

DH60-18A



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:

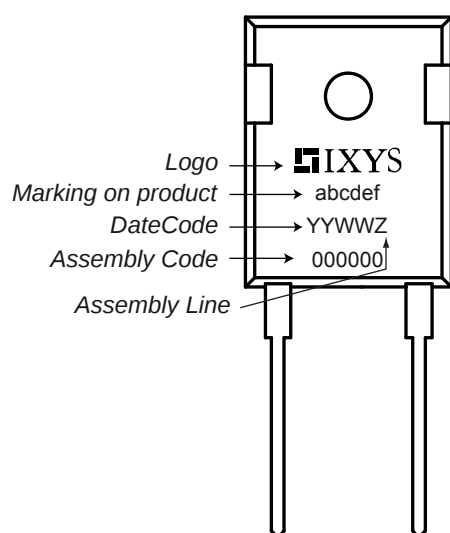
- Housing: TO-247
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

## Ratings

| Symbol     | Definition                          | Conditions                               |                                | min.                           | typ. | max. | Unit               |
|------------|-------------------------------------|------------------------------------------|--------------------------------|--------------------------------|------|------|--------------------|
| $V_{RRM}$  | max. repetitive reverse voltage     |                                          | $T_{VJ} = 25^{\circ}\text{C}$  |                                |      | 1800 | V                  |
| $I_R$      | reverse current                     | $V_R = 1800\text{ V}$                    | $T_{VJ} = 25^{\circ}\text{C}$  |                                |      | 200  | $\mu\text{A}$      |
|            |                                     | $V_R = 1800\text{ V}$                    | $T_{VJ} = 125^{\circ}\text{C}$ |                                |      | 2    | mA                 |
| $V_F$      | forward voltage                     | $I_F = 60\text{ A}$                      | $T_{VJ} = 25^{\circ}\text{C}$  |                                |      | 2.04 | V                  |
|            |                                     | $I_F = 120\text{ A}$                     |                                |                                |      | 2.57 | V                  |
|            |                                     | $I_F = 60\text{ A}$                      | $T_{VJ} = 125^{\circ}\text{C}$ |                                |      | 2.03 | V                  |
|            |                                     | $I_F = 120\text{ A}$                     |                                |                                |      | 2.73 | V                  |
| $I_{FAV}$  | average forward current             | rectangular $d = 0.5$                    | $T_C = 100^{\circ}\text{C}$    |                                |      | 60   | A                  |
| $V_{FO}$   | threshold voltage                   | } for power loss calculation only        |                                | $T_{VJ} = 150^{\circ}\text{C}$ |      | 1.28 | V                  |
| $r_F$      | slope resistance                    |                                          |                                |                                |      | 12   | m $\Omega$         |
| $R_{thJC}$ | thermal resistance junction to case |                                          |                                |                                |      | 0.30 | K/W                |
| $T_{VJ}$   | virtual junction temperature        |                                          |                                | -55                            |      | 150  | $^{\circ}\text{C}$ |
| $P_{tot}$  | total power dissipation             |                                          | $T_C = 25^{\circ}\text{C}$     |                                |      | 415  | W                  |
| $I_{FSM}$  | max. forward surge current          | $t = 10\text{ ms (50 Hz), sine}$         | $T_{VJ} = 45^{\circ}\text{C}$  |                                |      | 700  | A                  |
| $I_{RM}$   | max. reverse recovery current       |                                          | $T_{VJ} = 25^{\circ}\text{C}$  |                                | 60   |      | A                  |
|            |                                     | $I_F = 60\text{ A}; V_R = 1200\text{ V}$ | $T_{VJ} = 100^{\circ}\text{C}$ |                                | 70   |      | A                  |
| $t_{rr}$   | reverse recovery time               | $-di_F/dt = 800\text{ A}/\mu\text{s}$    | $T_{VJ} = 25^{\circ}\text{C}$  |                                | 230  |      | ns                 |
|            |                                     |                                          | $T_{VJ} = 100^{\circ}\text{C}$ |                                | 350  |      | ns                 |
| $C_J$      | junction capacitance                | $V_R = 1200\text{ V}; f = 1\text{ MHz}$  | $T_{VJ} = 25^{\circ}\text{C}$  |                                | 32   |      | pF                 |

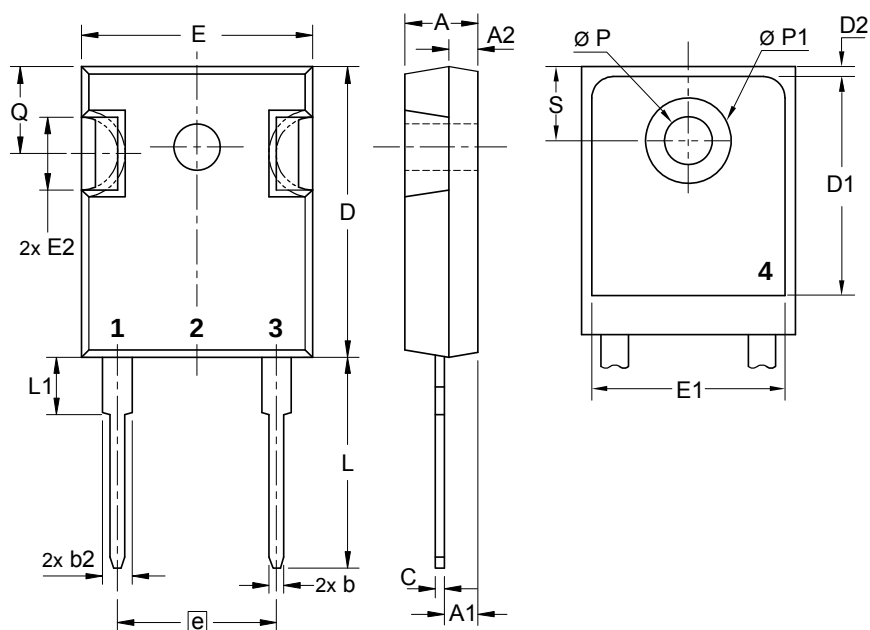
| Symbol     | Definition                          | Conditions   | Ratings |      |      | Unit |
|------------|-------------------------------------|--------------|---------|------|------|------|
|            |                                     |              | min.    | typ. | max. |      |
| $I_{RMS}$  | RMS current                         | per terminal |         |      | 70   | A    |
| $R_{thCH}$ | thermal resistance case to heatsink |              |         | 0.25 |      | K/W  |
| $T_{stg}$  | 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



| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-----------------|--------------------|---------------|----------|----------|
| Standard | DH60-18A        | DH60-18A           | Tube          | 30       | 496553   |

| Similar Part | Package      | Voltage Class |
|--------------|--------------|---------------|
| DH60-14A     | TO-247AD (2) | 1400          |
| DH60-16A     | TO-247AD (2) | 1600          |

**Outlines TO-247**


| Sym. | Inches    |       | Millimeter |       |
|------|-----------|-------|------------|-------|
|      | min.      | max.  | min.       | 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    | 0.430 BSC |       | 10.92 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  |

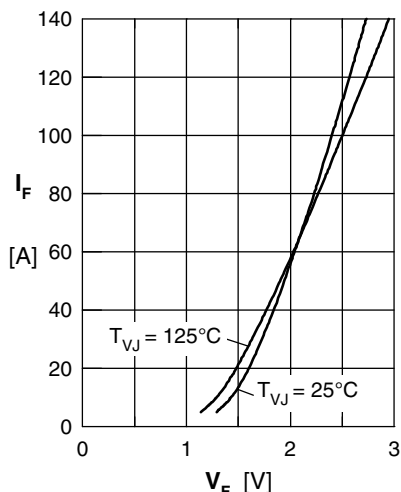


Fig. 1 Typ. rward current  $I_F$  versus  $V_F$

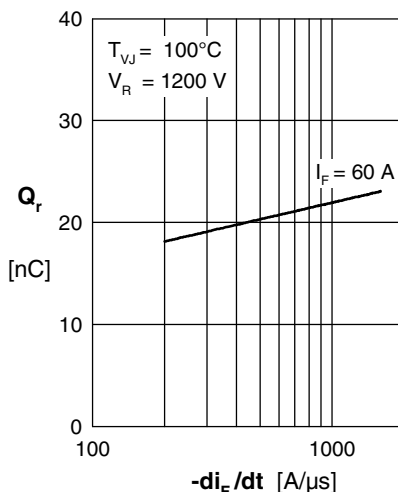


Fig. 2 Typ. reverse recovery charge  $Q_r$  versus  $-di_F/dt$

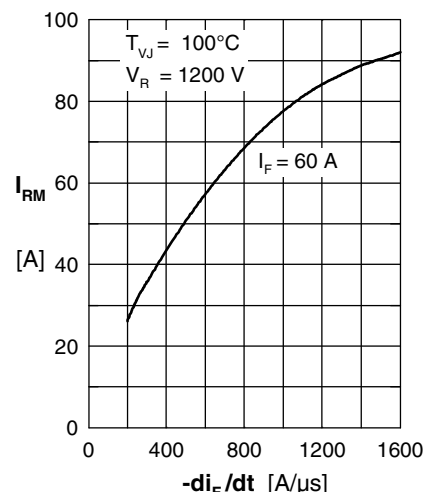


Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $-di_F/dt$

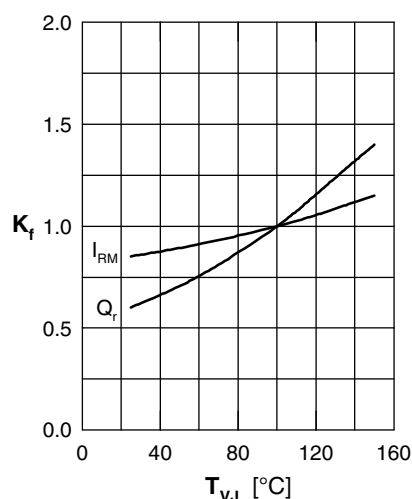


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$

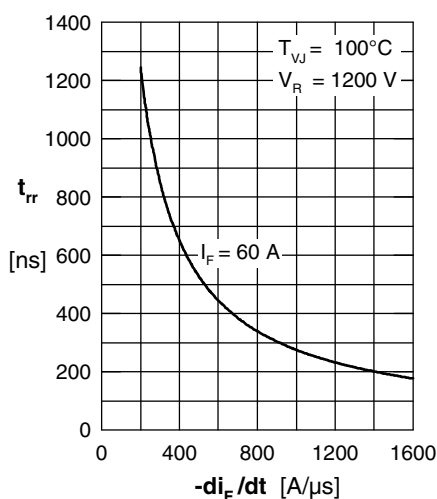


Fig. 5 Typ. recovery time  $t_{rr}$  versus  $-di_F/dt$

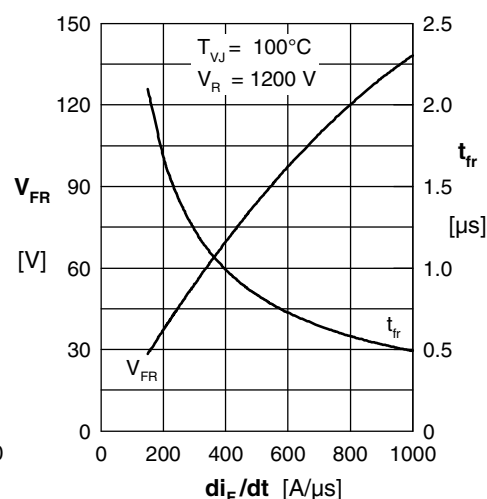


Fig. 6 Typ. peak forward voltage  $V_{FR}$  & typ. forward recovery time  $t_{fr}$  versus  $di_F/dt$

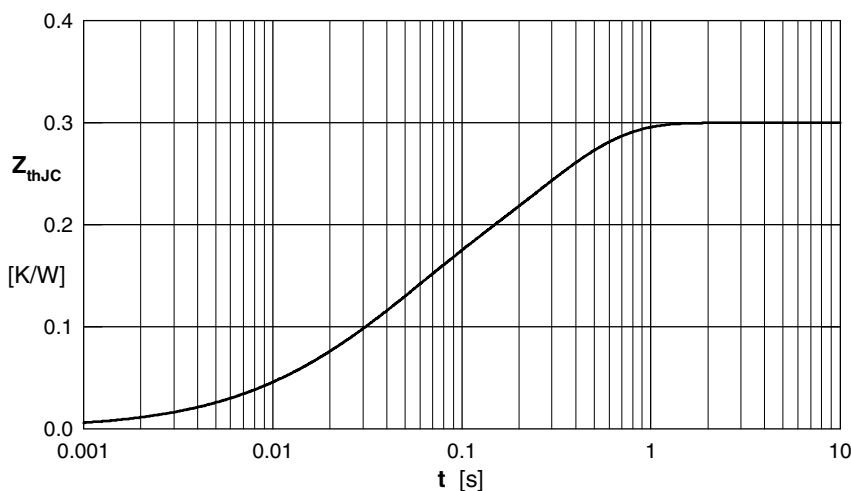


Fig. 7 Transient thermal resistance junction to case

| i | $R_i$ | $\theta_{JA}$ |
|---|-------|---------------|
| 1 | 0.021 | 0.0093        |
| 2 | 0.11  | 0.038         |
| 3 | 0.169 | 0.274         |