

# HiPerDynFRED™ Epitaxial Diode

## ISOPLUS220™

Electrically Isolated Back Surface

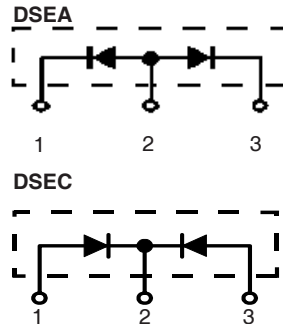
$$I_{FAV} = 2 \times 8 \text{ A}$$

$$V_{RRM} = 600 \text{ V}$$

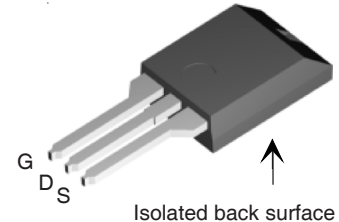
$$t_{rr} = 30 \text{ ns}$$

### Preliminary Data Sheet

| $V_{RSM}$<br>V | $V_{RRM}$<br>V | Type         |
|----------------|----------------|--------------|
| 600            | 600            | DSEA 16-06BC |
| 600            | 600            | DSEC 16-06BC |



ISOPLUS220™  
E153432



| Symbol     | Conditions   | Maximum Ratings    |                  |
|------------|--|--------------------|------------------|
| $I_{FRMS}$ |  | 19                 | A                |
| $I_{FAVM}$ | $T_C = 110^\circ\text{C}$ ; rectangular, $d = 0.5$   | 8                  | A                |
| $I_{FSM}$  | $T_{VJ} = 45^\circ\text{C}$ ; $t_p = 10 \text{ ms}$ (50 Hz), sine                                | 50                 | A                |
| $E_{AS}$   | $T_{VJ} = 25^\circ\text{C}$ ; non-repetitive<br>$I_{AS} = 0.9 \text{ A}$ ; $L = 180 \mu\text{H}$ | 0.1                | mJ               |
| $I_{AR}$   | $V_A = 1.5 \cdot V_R$ typ.; $f = 10 \text{ kHz}$ ; repetitive                                    | 0.1                | A                |
| $T_{VJ}$   |  | -55...+175         | $^\circ\text{C}$ |
| $T_{VJM}$  |  | 175                | $^\circ\text{C}$ |
| $T_{stg}$  |  | -55...+150         | $^\circ\text{C}$ |
| $T_L$      | 1.6 mm (0.063 in) from case for 10 s   | 260                | $^\circ\text{C}$ |
| $P_{tot}$  | $T_C = 25^\circ\text{C}$   | 60                 | W                |
| $V_{ISOL}$ | 50/60 Hz RMS; $I_{ISOL} \leq 1 \text{ mA}$   | 2500               | V~               |
| $F_C$      | mounting force with clip   | 11...65 / 2.5...15 | N / lb           |
| Weight     |  | 2                  | g                |

### Features

- Silicon chip on Direct-Copper-Bond substrate
- High power dissipation
- Isolated mounting surface
- 2500V electrical isolation
- Low cathode to tab capacitance (<15pF)
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low  $I_{RM}$ -values
- Soft recovery behaviour
- Epoxy meets UL 94V-0

### Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

### Advantages

- 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

| Symbol                   | Conditions  | Characteristic Values |                             |
|--------------------------|---|-----------------------|-----------------------------|
|                          |   | typ.                  | max.                        |
| $I_R$ ①                  | $T_{VJ} = 25^\circ\text{C}$ $V_R = V_{RRM}$<br>$T_{VJ} = 150^\circ\text{C}$ $V_R = V_{RRM}$                           |                       | 60 $\mu\text{A}$<br>0.25 mA |
| $V_F$ ②                  | $I_F = 8 \text{ A}$ ; $T_{VJ} = 150^\circ\text{C}$<br>$T_{VJ} = 25^\circ\text{C}$                                     | 1.65                  | V<br>3.0 V                  |
| $R_{thJC}$<br>$R_{thCH}$ |   | 0.4                   | 2.5 K/W<br>K/W              |
| $t_{rr}$                 | $I_F = 1 \text{ A}$ ; $-di/dt = 50 \text{ A}/\mu\text{s}$ ;<br>$V_R = 30 \text{ V}$ ; $T_{VJ} = 25^\circ\text{C}$     | 30                    | ns                          |
| $I_{RM}$                 | $V_R = 100 \text{ V}$ ; $I_F = 12 \text{ A}$ ; $-di_F/dt = 100 \text{ A}/\mu\text{s}$<br>$T_{VJ} = 100^\circ\text{C}$ | 1.4                   | 1.9 A                       |

Notes: Data given for  $T_{VJ} = 25^\circ\text{C}$  and per diode unless otherwise specified

② Pulse test: pulse Width = 5 ms, Duty Cycle < 2.0 %

③ Pulse test: pulse Width = 300  $\mu\text{s}$ , Duty Cycle < 2.0 %

IXYS reserves the right to change limits, test conditions and dimensions.

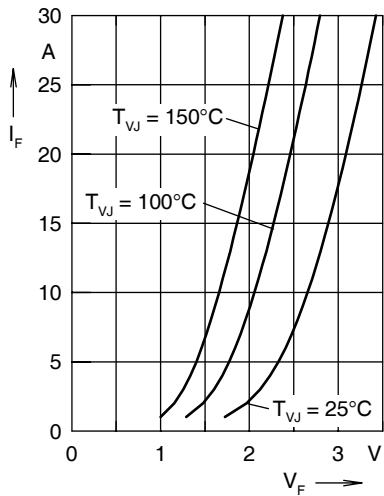


Fig. 1. Forward current  $I_F$  versus  $V_F$

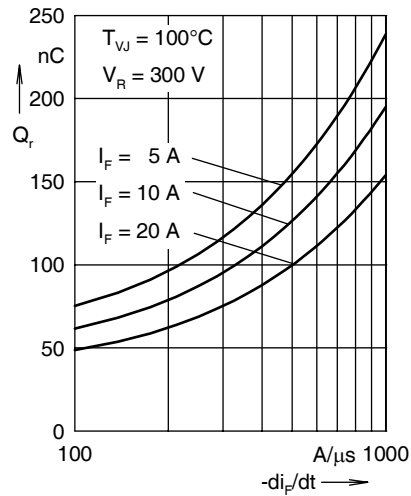


Fig. 2. Reverse recovery charge  $Q_r$  versus  $-di_F/dt$

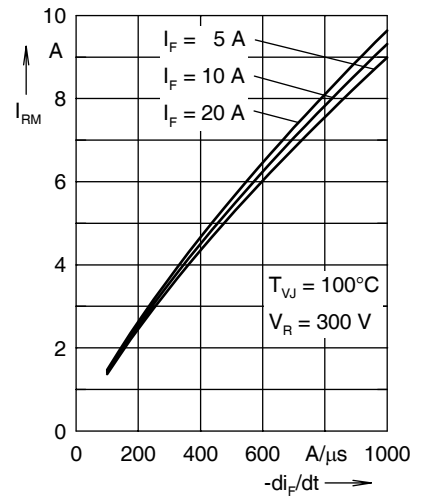


Fig. 3. Peak reverse current  $I_{RM}$  versus  $-di_F/dt$

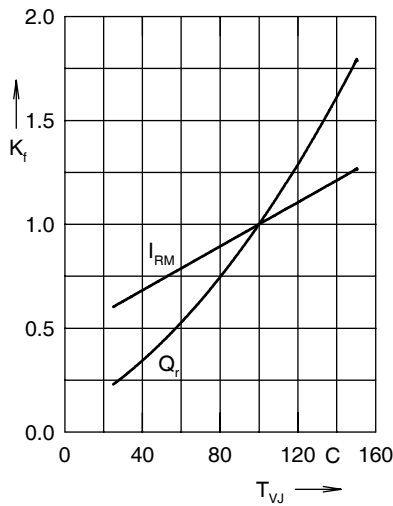


Fig. 4. Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$

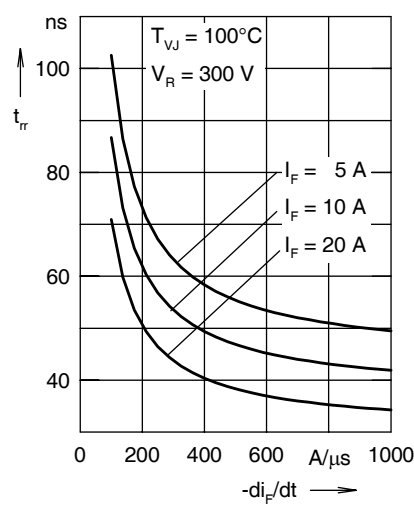


Fig. 5. Recovery time  $t_{rr}$  versus  $-di_F/dt$

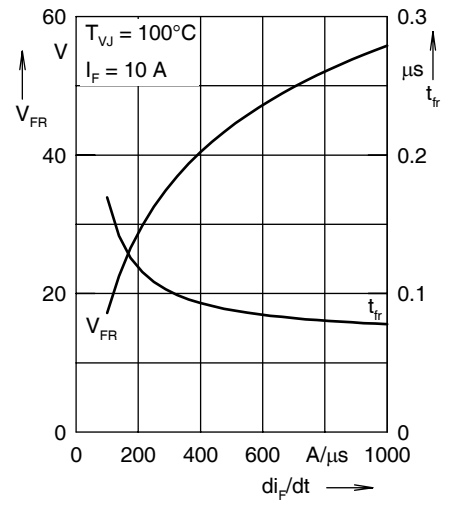


Fig. 6. Peak forward voltage  $V_{FR}$  and  $t_{fr}$  versus  $di_F/dt$

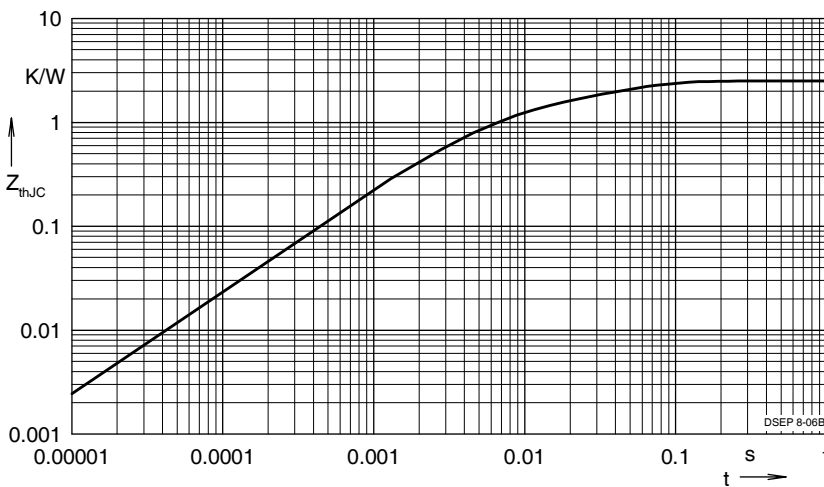


Fig. 7. Transient thermal resistance junction-to-case

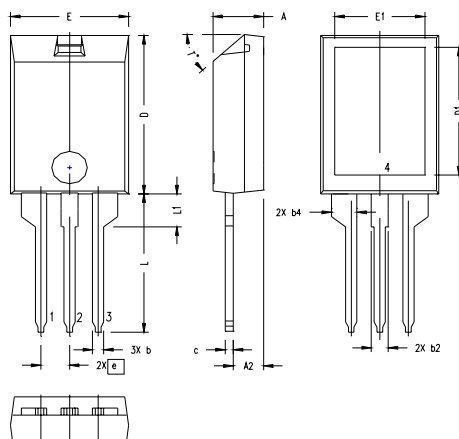
Constants for  $Z_{thJC}$  calculation:

| i | $R_{thi}$ (K/W) | $t_i$ (s) |
|---|-----------------|-----------|
| 1 | 1.449           | 0.0052    |
| 2 | 0.5578          | 0.0003    |
| 3 | 0.4931          | 0.0169    |

NOTE: Fig. 2 to Fig. 6 shows typical values

# ISOPLUS220 OUTLINE

## ISOPLUS220 Outline



| SYM | INCHES     |      | MILLIMETERS |       |
|-----|------------|------|-------------|-------|
|     | MIN        | MAX  | MIN         | MAX   |
| A   | .157       | .197 | 4.00        | 5.00  |
| A2  | .098       | .118 | 2.50        | 3.00  |
| b   | .035       | .051 | 0.90        | 1.30  |
| b2  | .049       | .065 | 1.25        | 1.65  |
| b4  | .093       | .100 | 2.35        | 2.55  |
| c   | .028       | .039 | 0.70        | 1.00  |
| D   | .591       | .630 | 15.00       | 16.00 |
| D1  | .472       | .512 | 12.00       | 13.00 |
| E   | .394       | .433 | 10.00       | 11.00 |
| E1  | .295       | .335 | 7.50        | 8.50  |
| e   | .100 BASIC |      | 2.55 BASIC  |       |
| L   | .512       | .571 | 13.00       | 14.50 |
| L1  | .118       | .138 | 3.00        | 3.50  |
| T*  |            |      | 42.5*       | 47.5* |

### Notes:

1. All terminals are tin plated.
2. Back surface (4) is electrically isolated from pins 1,2 and 3.

### Pin connections:

- DSEA:** 1 - Cathode  
2 - Anode  
3 - Cathode
- DSEC:** 1 - Anode  
2 - Cathode  
3 - Anode