

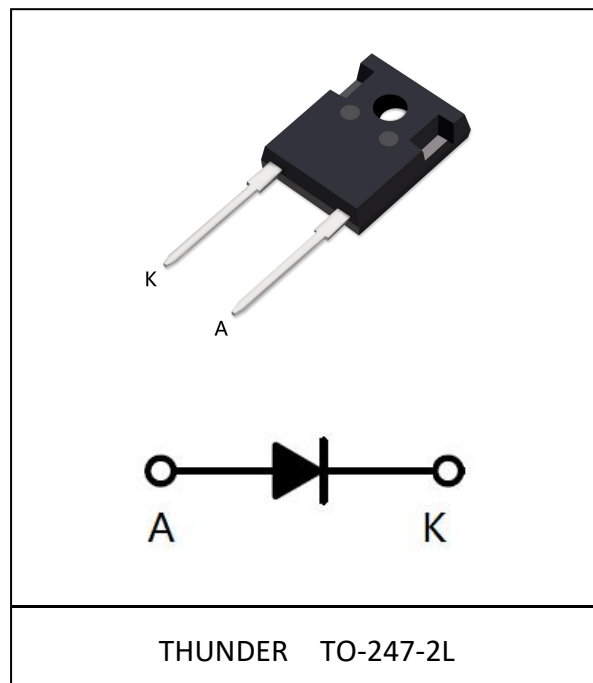
## FRED

### Ultrafast Soft Recovery Diode, 30A

#### Features:

- Ultrafast Recovery
- 175°C operating junction temperature
- High frequency operation
- Low power loss, less RFI and EMI
- Low  $I_R$  value
- High surge capacity
- Epitaxial chip construction

| Product Summary |       |
|-----------------|-------|
| $V_R$           | 600 V |
| $I_{F(AV)}$     | 30A   |
| $t_{rr}$        | 28 ns |



#### Description/Applications

These diodes are optimized to less losses and EMI/RFI in high frequency power conditioning system. The soft recovery behavior of the diodes offers the need as snubber in most applications. These devices are ideally suited for HF welding power converters and other applications where the switching losses are not significant portion of the total losses.

#### Absolute Maximum Ratings

| Parameter                          | Symbol      | Test Conditions           | Values      | Unit             |
|------------------------------------|-------------|---------------------------|-------------|------------------|
| Repetitive peak reverse voltage    | $V_{RRM}$   |                           | 600         | V                |
| Continuous forward current         | $I_{F(AV)}$ | $T_c = 110^\circ\text{C}$ | 30          | A                |
| Single pulse forward current       | $I_{FSM}$   | $T_c = 25^\circ\text{C}$  | 300         |                  |
| Maximum repetitive forward current | $I_{FRM}$   | Square wave, 20kHz        | 60          |                  |
| Operating junction                 | $T_j$       |                           | 175         | $^\circ\text{C}$ |
| Storage temperatures               | $T_{stg}$   |                           | -55 to +175 | $^\circ\text{C}$ |

**Electrical characteristics (Ta=25°C unless otherwise specified)**

| Parameter                             | Symbol              | Test Conditions                                                | Min. | Typ. | Max. | Unit    |
|---------------------------------------|---------------------|----------------------------------------------------------------|------|------|------|---------|
| Breakdown voltage<br>Blocking voltage | $V_{BR}$ ,<br>$V_R$ | $I_R=100\mu A$                                                 | 600  |      |      | V       |
| Forward voltage                       | $V_F$               | $I_F=30A$                                                      |      | 1.30 | 1.60 |         |
|                                       |                     | $I_F=30A, T_J=125^\circ C$                                     |      | 1.05 | 1.40 |         |
| Reverse leakage current               | $I_R$               | $V_R=V_{RRM}$                                                  |      |      | 20   | $\mu A$ |
|                                       |                     | $T_J=150^\circ C, V_R=600V$                                    |      |      | 200  |         |
| Reverse recovery time                 | $t_{rr}$            | $I_F=0.5A, I_R=1A, I_{RR}=0.25A$                               |      | 35   | 50   | ns      |
|                                       |                     | $I_F=1A, V_R=30V, di/dt=200A/\mu s$                            |      | 28   | 40   |         |
| Reverse recovery time                 | $t_{rr}$            | $I_F=30A, V_R=300V,$<br>$di_F/dt=-200A/\mu s, T_J=25^\circ C$  |      | 34   |      | ns      |
| Maximum Reverse Recovery Current      | $I_{RM}$            |                                                                |      | 3    |      | A       |
| Reverse Recovery Charge               | $Q_{rr}$            |                                                                |      | 118  |      | nC      |
| Reverse recovery time                 | $t_{rr}$            | $I_F=30A, V_R=300V,$<br>$di_F/dt=-200A/\mu s, T_J=125^\circ C$ |      | 108  |      | ns      |
| Maximum Reverse Recovery Current      | $I_{RM}$            |                                                                |      | 7    |      | A       |
| Reverse Recovery Charge               | $Q_{rr}$            |                                                                |      | 465  |      | nC      |

**Thermal characteristics**

| Paramter         | Symbol          | Typ. | Unit         |
|------------------|-----------------|------|--------------|
| Junction-to-Case | $R_{\theta JC}$ | 0.8  | $^\circ C/W$ |

## Electrical performance (typical)

FIG.1 Forward Characteristic (typical)

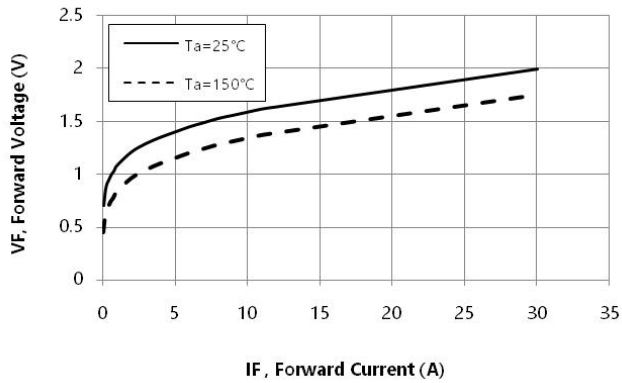


FIG.2 Reverse Characteristic (Typical)

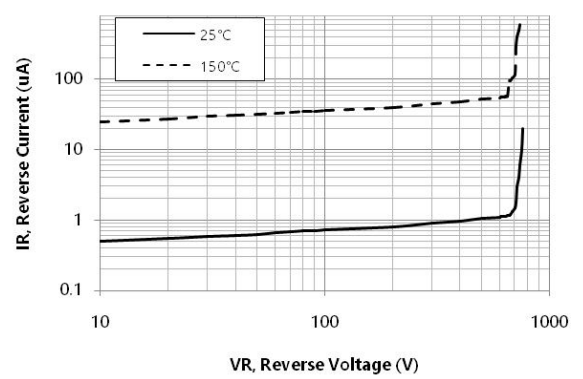


FIG.3 Reverse Recover Time vs. Current Rate of Change

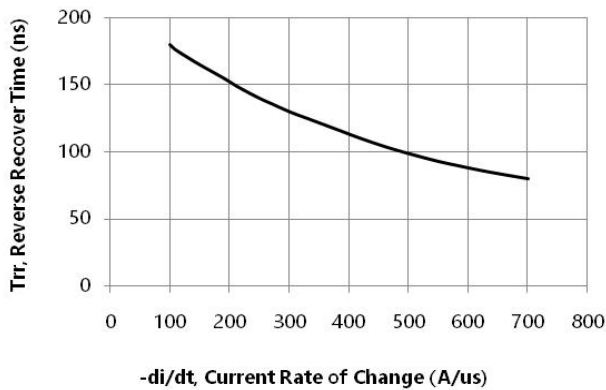


FIG.4 Reverse Recover Charge vs. Current Rate of Change

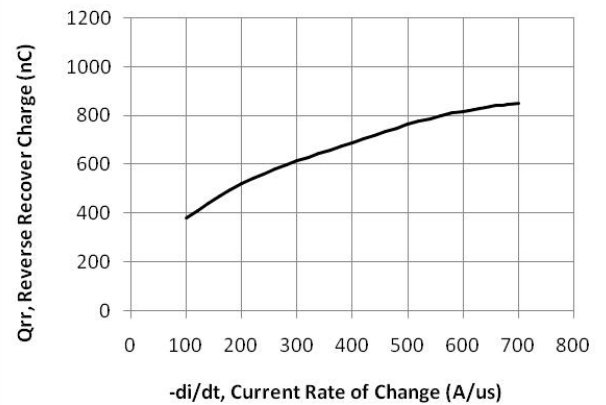


FIG.5 Reverse Recover Current vs. Current Rate of Change

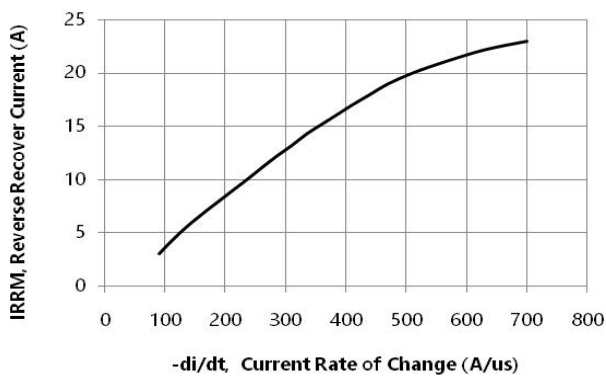
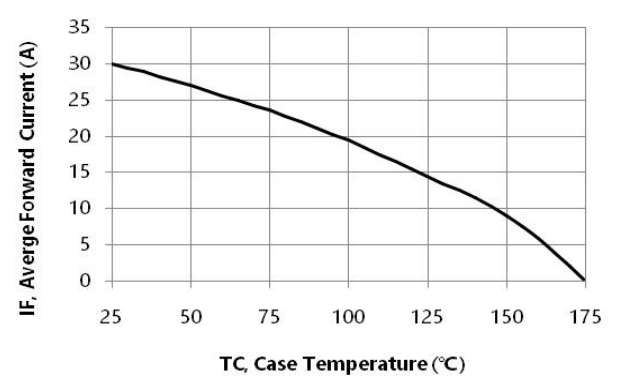


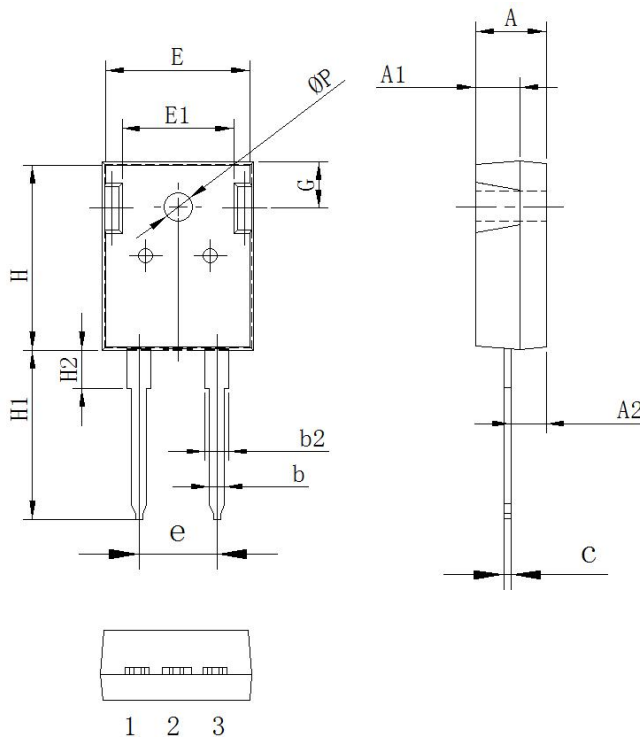
FIG.6 Average Forward Current vs. Case Temperature



## Package Information

### TO-247-2L PACKAGE

基本尺寸



| Symbol   | 单位 mm |      |      |
|----------|-------|------|------|
|          | Min   | Nom  | Max  |
| A        | 4.8   | 5.00 | 5.20 |
| A1       | 3.3   | 3.5  | 3.7  |
| A2       | 2.20  | 2.40 | 2.60 |
| b        | 1.00  | 1.2  | 1.40 |
| b1       | 2.90  | 3.10 | 3.30 |
| b2       | 1.90  | 2.10 | 2.30 |
| c        | 0.50  | 0.60 | 0.70 |
| e        | 10.5  | 10.9 | 11.3 |
| E        | 15.2  | 15.7 | 16.2 |
| E1       | 10.2  | 10.7 | 11.2 |
| H        | 20.8  | 21   | 21.2 |
| H1       | 19.5  | 20.0 | 20.5 |
| H2       | 4.00  | 4.20 | 4.40 |
| G        | 5.60  | 5.80 | 600  |
| $\Phi P$ | 3.50  | 3.70 | 3.90 |

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