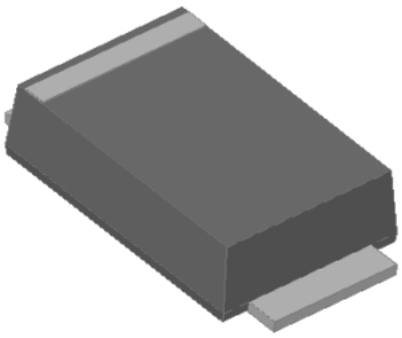
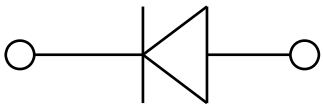
# Surface Mount Recovery Rectifier Diodes
# F3AF Through F3MF SMAF





## FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- High forward surge capability
- Fast reverse recovery time
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C

## TYPICAL APPLICATIONS

For use in high frequency rectification of power supplies, inverters, converters, and freewheeling diodes for consumer, and telecommunication.

## MECHANICAL DATA

- **Package**: SMAF
  Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant, halogen-free
- **Terminals**: Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Polarity:** Cathode line denotes the cathode end

## MAXIMUM RATINGS (Ta=25℃ Unless otherwise specified)

| PARAMETER | SYMBOL | UNIT | F3AF | F3BF | F3DF | F3GF | F3JF | F3KF | F3MF |
|---|---|---|---|---|---|---|---|---|---|
| Device marking code | | | F3AF | F3BF | F3DF | F3GF | F3JF | F3KF | F3MF |
| Maximum Repetitive Peak Reverse Voltage | $V_{RRM}$ | V | 50 | 100 | 200 | 400 | 600 | 800 | 1000 |
| Maximum RMS Voltage | $V_{RMS}$ | V | 35 | 70 | 140 | 280 | 420 | 560 | 700 |
| Maximum DC blocking Voltage | $V_{DC}$ | V | 50 | 100 | 200 | 400 | 600 | 800 | 1000 |
| Average rectified output current @60Hz sine wave, resistance load, TL (Fig.1) | $I_O$ | A | 3.0 | | | | | | |
| Forward Surge Current (Non-repetitive) @60Hz Half-sine wave,1 cycle, Tj=25℃ | $I_{FSM}$ | A | 80 | | | | | | |
| Forward Surge Current (Non-repetitive) @1ms, square wave, 1 cycle, Tj=25℃ | | | 160 | | | | | | |
| Current squared time @1ms≤t≤8.3ms Tj=25℃ | $I^2t$ | $A^2s$ | 26.56 | | | | | | |
| Storage temperature | $T_{stg}$ | ℃ | -55 ~ +150 | | | | | | |
| Junction temperature | $T_j$ | ℃ | -55 ~ +150 | | | | | | |

## ELECTRICAL CHARACTERISTICS (Ta=25℃ Unless otherwise specified)

| PARAMETER | SYMBOL | UNIT | TEST CONDITIONS | F3AF | F3BF | F3DF | F3GF | F3JF | F3KF | F3MF |
|---|---|---|---|---|---|---|---|---|---|---|
| Maximum instantaneous forward voltage | VF | V | $I_{FM}$=3.0A | 1.3 | | | | | | |
| Maximum reverse recovery time | $t_{rr}$ | ns | $I_F$=0.5A,$I_R$=1.0A, $I_{rr}$=0.25A | 150 | | | | 250 | 500 | |
| Maximum DC reverse current at rated DC blocking voltage | $I_R$ | μA | $T_j$=25℃ | 5.0 | | | | | | |
| | | | $T_j$=125℃ | 100 | | | | | | |
| Typical junction capacitance | Cj | pF | Measured at 1MHz and Applied Reverse Voltage of 4.0 V.D.C | 38 | | | | 18 | 16 | |

## ■ THERMAL CHARACTERISTICS (Ta=25℃ Unless otherwise specified)

| PARAMETER | SYMBOL | UNIT | F3AF | F3BF | F3DF | F3GF | F3JF | F3KF | F3MF |
|---|---|---|---|---|---|---|---|---|---|
| Typical Thermal resistance | RθJ-A(1) | ℃/W | 65 | | | | | | |
| | RθJ-L(1) | | 20 | | | | | | |
| | RθJ-C(1) | | 18 | | | | | | |

Note:
(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pad areas

## ■ CHARACTERISTICS (TYPICAL)

FIG.1: Io-TL Curve

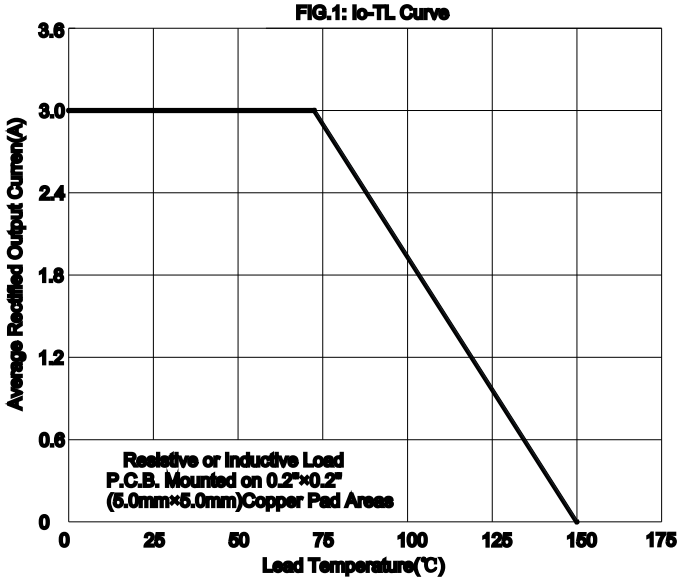



FIG2:Surge Forward Current Capability

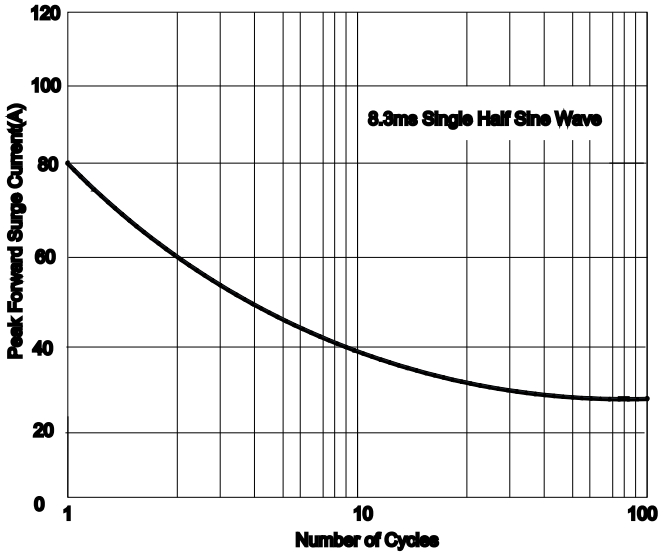



FIG.3: Typical Forward Characteristics

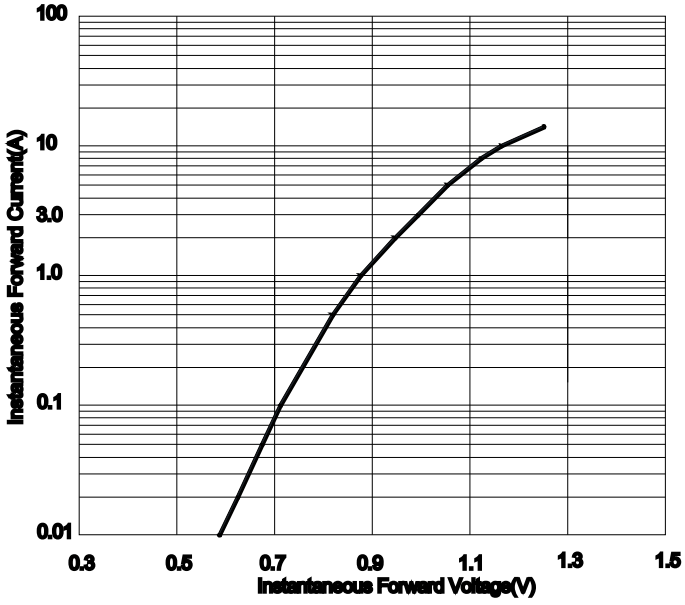



FIG4:Typical Reverse Characteristics

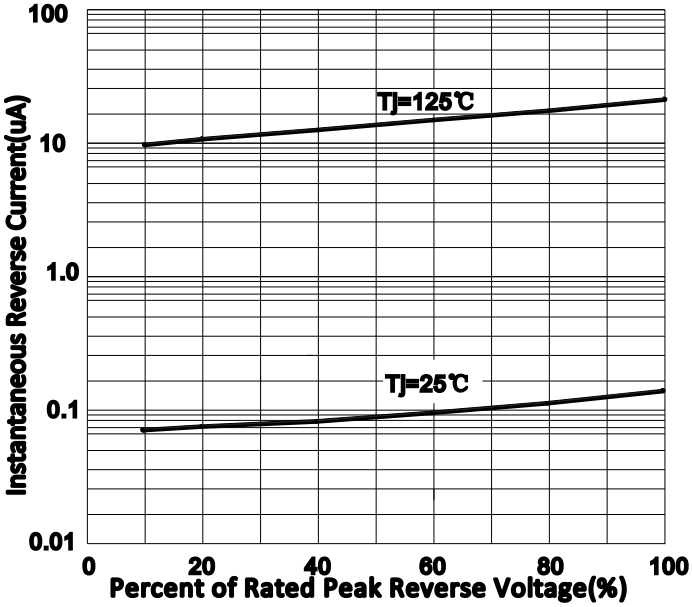
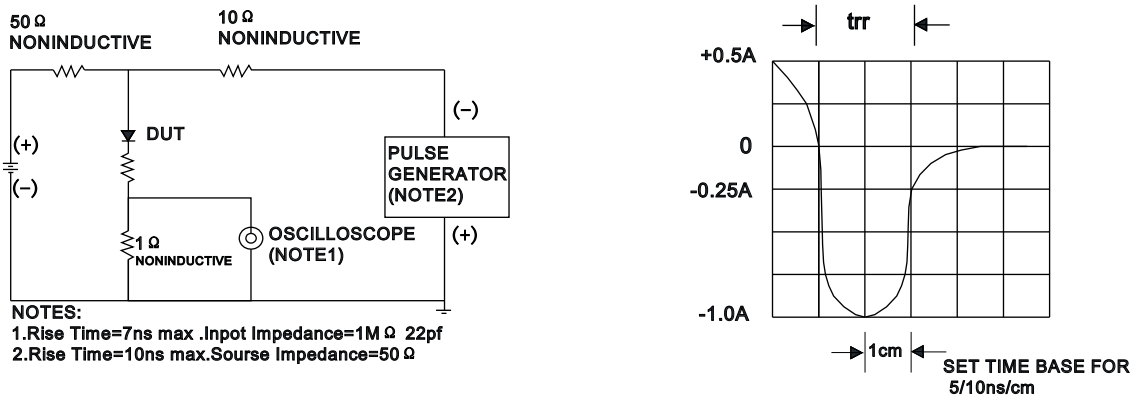


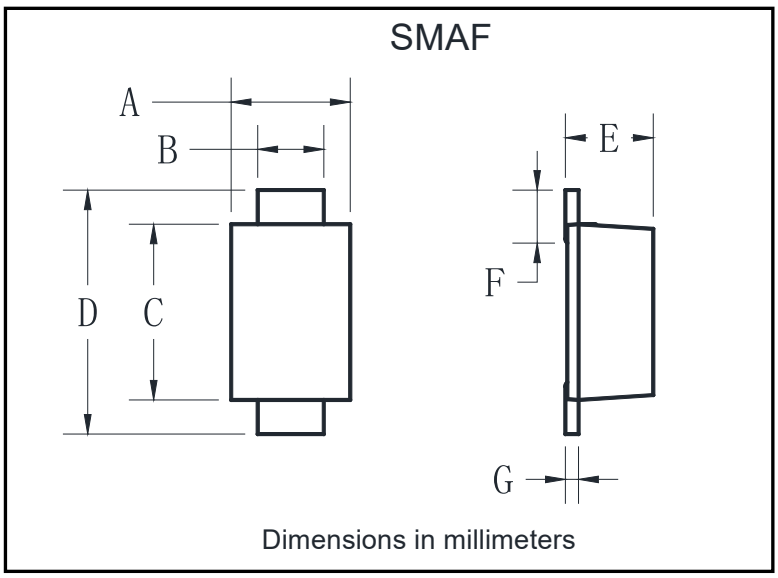
FIG.5: Diagram of circuit and Testing wave form of reverse recovery time




## ■ PACKAGING INFORMATION

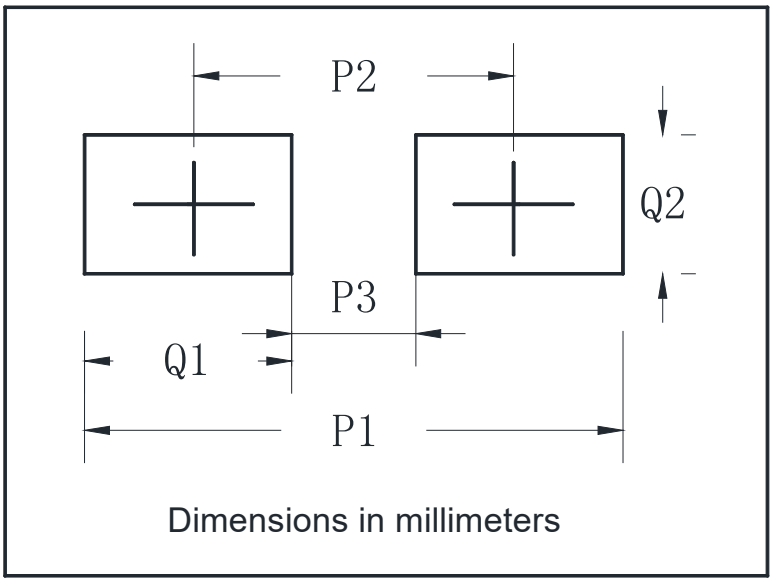
| PREFERED P/N | PACKING CODE | UNIT WEIGHT(g) | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---|---|---|---|---|---|---|
| F3AF-F3MF | F1 | Approximate 0.034 | 3000 | 24000 | 96000 | 7” reel |
| F3AF-F3MF | F3 | Approximate 0.034 | 10000 | / | 160000 | 13” reel |
| F3AF-F3MF | F3 | Approximate 0.034 | 10000 | / | 120000 | 13” reel |
| F3AF-F3MF | F4 | Approximate 0.034 | 7500 | / | 120000 | 13” reel |

## ■ OUTLINE DIMENSIONS




| SMAF | | |
|---|---|---|
| Dim | Min | Max |
| A | 2.40 | 2.80 |
| B | 1.35 | 1.45 |
| C | 3.40 | 3.60 |
| D | 4.40 | 4.80 |
| E | 1.05 | 1.25 |
| F | 0.50 | 1.00 |
| G | 0.15 | 0.22 |

## ■ SUGGESTED PAD LAYOUT




| SMAF | |
|---|---|
| Dim | Millimeters |
| P1 | 6.50 |
| P2 | 4.00 |
| P3 | 1.50 |
| Q1 | 2.50 |
| Q2 | 1.70 |