

## Ultra-Fast Recovery Diodes 5A\*2 FRED



### Features

- Adopt FRED chip
- Low forward Voltage drop
- Fast reverse recovery time
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability

### Typical Applications

Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

### Mechanical Data

- **Package:** TO-252  
Molding compound meets UL 94 V-0 flammability rating, -
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Polarity:** As marked

### ■Maximum Ratings (T<sub>j</sub>=25°C Unless otherwise specified)

| PARAMETER                                                                                   | SYMBOL           | UNIT             | MUR1040CD  |
|---------------------------------------------------------------------------------------------|------------------|------------------|------------|
| Device marking code                                                                         |                  |                  | MUR1040CD  |
| Repetitive Peak Reverse Voltage                                                             | V <sub>RRM</sub> | V                | 400        |
| Average Rectified Output Current<br>@60Hz sine wave, R-load, T <sub>c</sub> (FIG.1)         | I <sub>O</sub>   | A                | 10         |
| Surge(Non-repetitive)Forward Current<br>@60Hz half sine-wave, 1 cycle, T <sub>j</sub> =25°C | I <sub>FSM</sub> | A                | 50         |
| Current Squared Time @1ms≤t≤8.3ms<br>T <sub>j</sub> =25°C,                                  | I <sup>2</sup> t | A <sup>2</sup> s | 10         |
| Storage Temperature                                                                         | T <sub>stg</sub> | °C               | -55 ~ +175 |
| Junction Temperature                                                                        | T <sub>j</sub>   | °C               | -55 ~ +175 |
| Typical Junction capacitance @4V,1MHz                                                       | C <sub>j</sub>   | pF               | 50         |

# MUR1040CD

## ■Electrical Characteristics

| PARAMETER                                                 | SYMBOL     | UNIT | TEST CONDITIONS                                            | Min | Typ   | Max  |
|-----------------------------------------------------------|------------|------|------------------------------------------------------------|-----|-------|------|
| Instantaneous forward voltage drop per diode              | $V_{FM}$   | V    | $I_{FM}=5.0A$ @ $T_j=25^{\circ}C$                          | -   | 1.15  | 1.25 |
|                                                           |            |      | $I_{FM}=5.0A$ @ $T_j=150^{\circ}C$                         |     | 0.9   | 1    |
| DC reverse current at rated DC blocking voltage per diode | $I_{RRM1}$ | uA   | $V_{RM}=V_{RRM}$<br>$T_j=25^{\circ}C$                      | -   | -     | 5    |
|                                                           | $I_{RRM2}$ |      | $V_{RM}=V_{RRM}$<br>$T_j=150^{\circ}C$                     | -   | 25    | 100  |
| Reverse Recovery Time                                     | $T_{rr}$   | ns   | $I_F=0.5A$ $I_{RR}=1A$<br>$I_{RR}=0.25A$ $T_j=25^{\circ}C$ | -   | 25    | 35   |
|                                                           |            |      | $T_j=25^{\circ}C$                                          | -   | 29.5  | -    |
|                                                           |            |      | $T_j=125^{\circ}C$                                         | -   | 46.6  | -    |
| Peak recovery current                                     | $I_{RRM}$  | A    | $T_j=25^{\circ}C$                                          | -   | 3.49  | -    |
|                                                           |            |      | $T_j=125^{\circ}C$                                         | -   | 5.71  | -    |
| Reverse recovery charge                                   | $Q_{rr}$   | nC   | $T_j=25^{\circ}C$                                          | -   | 55.22 | -    |
|                                                           |            |      | $T_j=125^{\circ}C$                                         | -   | 130   | -    |

## ■Thermal Characteristics ( $T_j=25^{\circ}C$ Unless otherwise specified)

| PARAMETER          |                           | SYMBOL           | UNIT          | MUR1040CD |
|--------------------|---------------------------|------------------|---------------|-----------|
| Thermal Resistance | Between junction and case | $R_{\theta J-C}$ | $^{\circ}C/W$ | 5.0       |
| Thermal Resistance | Between junction and Air  | $R_{\theta J-A}$ | $^{\circ}C/W$ | 50        |

## ■Ordering Information (Example)

| PREFERRED P/N | UNIT WEIGHT(g)   | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---------------|------------------|----------------------|-------------------------|----------------------------|---------------|
| MUR1040CD     | Approximate 0.32 | 2500                 | 2500                    | 25000                      | Reel          |

## ■Characteristics (Typical)

FIG1: $I_o$  - $T_c$  Curve

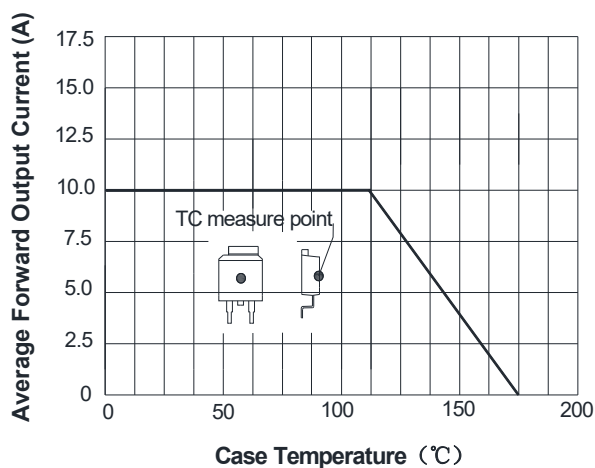


FIG2:Surge Forward Current Capability

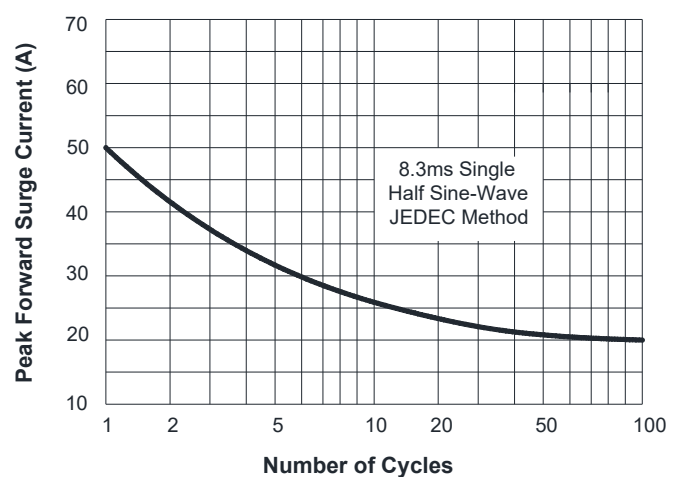


FIG3: Forward Voltage

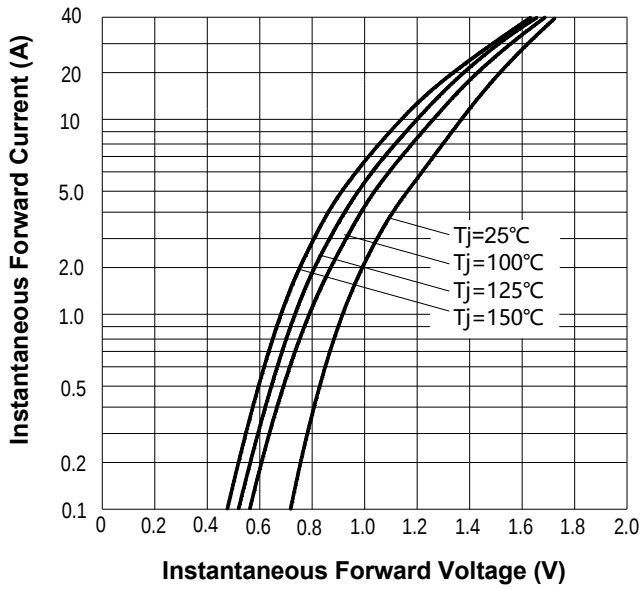


FIG.4: Instantaneous Reverse Characteristics

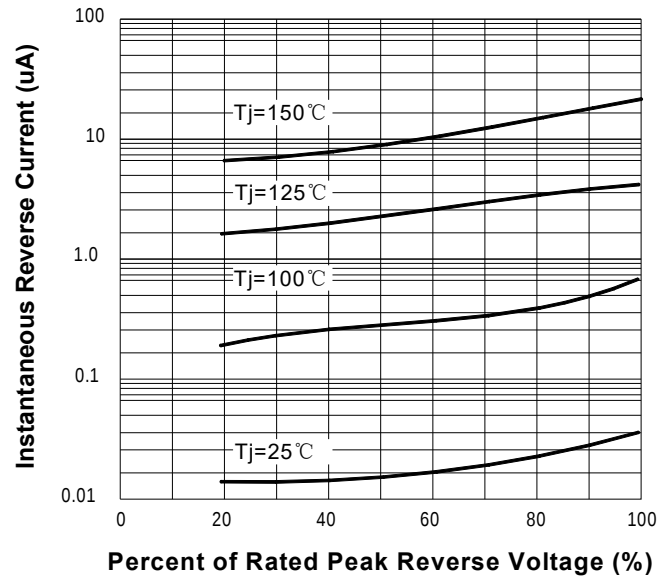
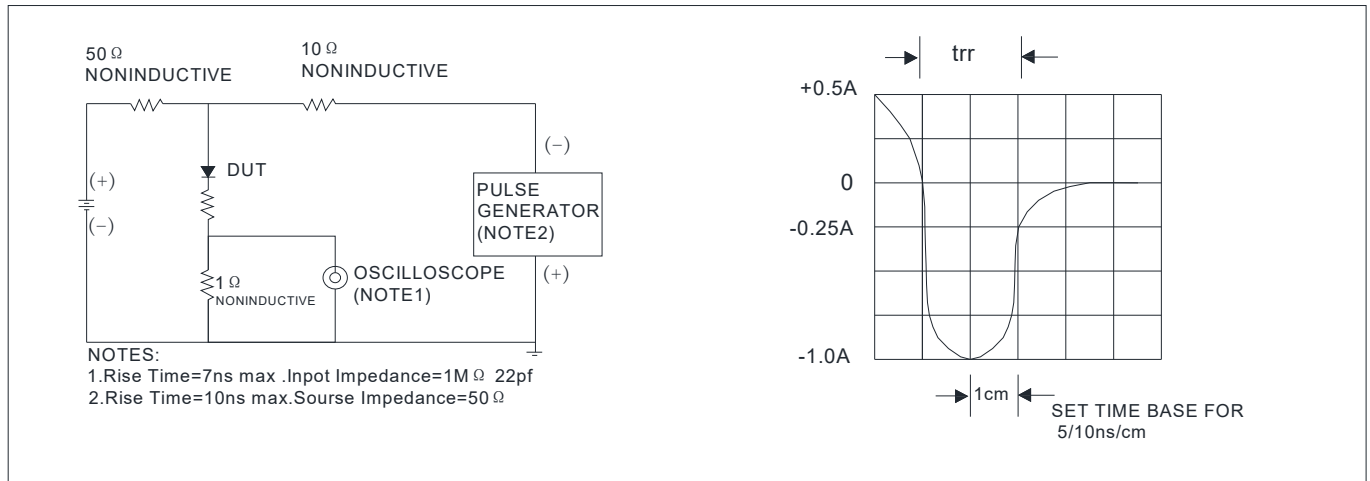
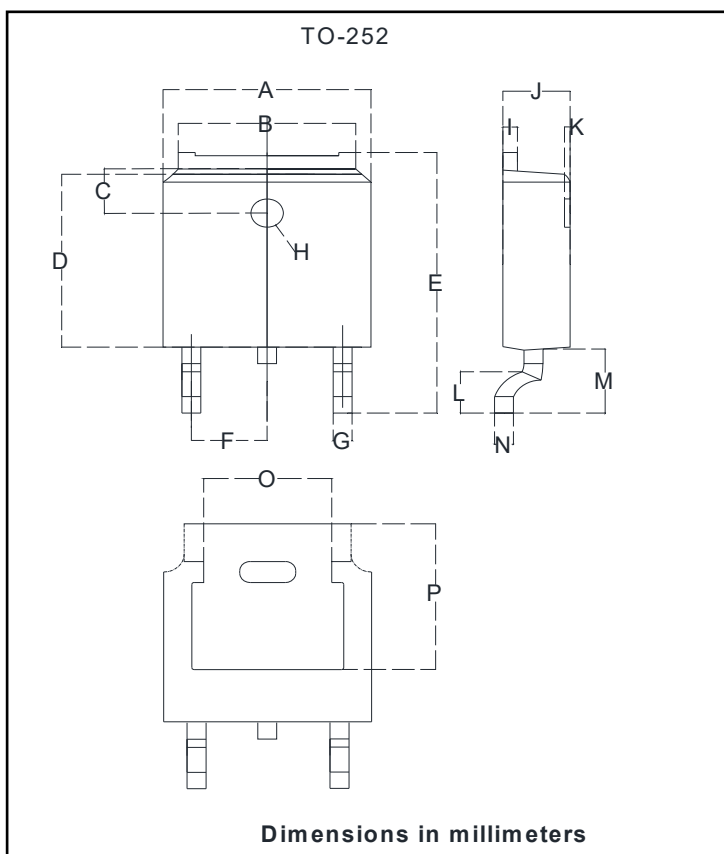


FIG.5: Diagram of circuit and Testing wave form of reverse recovery time

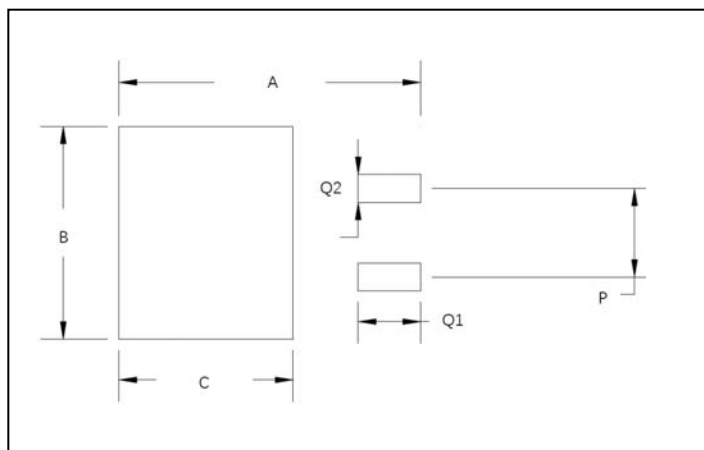


■ Outline Dimensions



| TO-252 |        |        |
|--------|--------|--------|
| Dim    | Min    | Max    |
| A      | 6.500  | 6.700  |
| B      | 5.100  | 5.460  |
| C      | 1.400  | 1.800  |
| D      | 6.000  | 6.200  |
| E      | 10.000 | 10.400 |
| F      | 2.166  | 2.366  |
| G      | 0.660  | 0.860  |
| H      | Φ1.05  | Φ1.35  |
| I      | 0.460  | 0.580  |
| J      | 2.200  | 2.400  |
| K      | 0      | 0.300  |
| L      | 0.890  | 2.290  |
| M      | 2.730  | 3.080  |
| N      | 0.430  | 0.580  |
| O      | 4.2    | 4.95   |
| P      | 5.15   | 5.45   |

■ Suggested Pad Layout



| Dim | Millimeters |
|-----|-------------|
| A   | 11.4        |
| B   | 6.74        |
| C   | 6.23        |
| P   | 4.56        |
| Q1  | 2.28        |
| Q2  | 1.52        |

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