

MURF6060P

Ultrafast Soft Recovery Rectifier



**Voltage:** 600 Volts

**Current:** 60 A

**Package:** TO-247AC

**Features**

- NH'S Epiraxial Chip Technology
- Low Switching Loss For High Efficiency
- Low Leakage Current For High Reliability
- Ultra Fast Soft Switching Feature

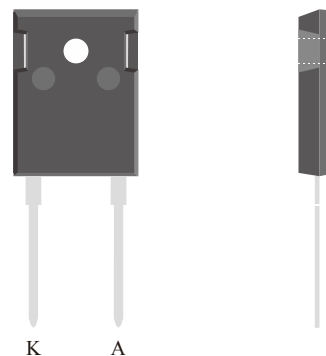
**Mechanical Data**

- **Case:** Molded With UL-94 ClassV-0 Recognized, RoHS-Compliant
- **Polarity:** Look At The Diagram And Polarity On The Right
- **Terminals:** Tin Plated Leads,Solderable Per J-STD-002 And JESD22-B102

**Typical Applications**

- Switch Mode Power Supplies (SMPS)
- Fast Chargers
- LED Driver And Monitor Lighting
- Automotive Electronics And Charging Posts

**Diagram:**



**Polarity:**



Single Phase,Half Wave,60Hz,Resistive Or Inductive Load.For Capacitive Load,Derate Current By 20%

**Maximum Ratings (Ta=25°C Unless Otherwise Specified)**

| Parameter                                        | Test Conditions                                          | Symbol      | Ratings | Unit               |
|--------------------------------------------------|----------------------------------------------------------|-------------|---------|--------------------|
| Maximum Repetitive Peak Reverse Voltage          |                                                          | $V_{RRM}$   | 600     | V                  |
| Maximum RMS Voltag                               |                                                          | $V_{RMS}$   | 420     | V                  |
| Maximum DC Blocking Voltage                      |                                                          | $V_{DC}$    | 600     | V                  |
| Maximum Average Forward Rectified Current(Note2) |                                                          | $I_{F(AV)}$ | 60      | A                  |
| Peak Forward Surge Current                       | 8.3ms Single Half Sine-wave<br>Superimposed On Rate Load | $I_{FSM}$   | 600     | A                  |
| Current Squared Time                             | $t < 8.3ms$                                              | $I^2t$      | 1494.0  | A <sup>2</sup> sec |
| Maximum Mounting Torque                          | M3 screw                                                 | $T_{MM}$    | 1.1     | N.m                |

**Electrical Characteristics (Ta=25°C Unless Otherwise Specified )**

| Parameter                                               | Test Conditions                   | Symbol    | Ratings |      |      | Unit |
|---------------------------------------------------------|-----------------------------------|-----------|---------|------|------|------|
|                                                         |                                   |           | Min.    | Typ. | Max. |      |
| Instaneous Forward Voltage Per Diode                    | $I_F = 60 A$                      | $V_F$     | --      | 1.35 | 1.70 | V    |
| Maximum DC Reverse Current at Rated DC Blocking Voltage | Ta=25°C , $V_R = V_{RRM}$         | $I_{RRM}$ | --      | 1    | 5    | uA   |
|                                                         | Ta=125°C , $V_R = V_{RRM} * 80\%$ |           | --      | 25   | 200  | uA   |
| Typical Junction Capacitance                            | 4 V,1MHz                          | $C_J$     | --      | 24   | --   | pF   |
| Maximum Reverse Recovery Time                           | IF=0.5A, IR=1.0A, IRR=0.25A       | $T_{rr}$  | --      | 50   | 75   | nS   |

**Thermal Characteristics (Ta=25°C Unless Otherwise Specified )**

| Parameter                                                   | Test Conditions                                     | Symbol           | Ratings |    |     | Unit |
|-------------------------------------------------------------|-----------------------------------------------------|------------------|---------|----|-----|------|
| Operating Junction Temperature Range                        |                                                     | T <sub>J</sub>   | -55     | to | 175 | °C   |
| Storage Temperature Range                                   |                                                     | T <sub>STD</sub> | -55     | to | 175 |      |
| Thermal Resistance Junction To Ambient<br>With Steady-State | Still Air Environment<br>With Ta=25°C               | R <sub>θJA</sub> | 35      |    |     | °C/W |
| Thermal Resistance Junction-Case<br>With Steady-State       | Device Mounted On<br>75mm x 45mm x 2.5mm Alu. Heat. | R <sub>θJC</sub> | 0.8     |    |     |      |

Notes: 1.Pulse Test: 300 Us Pulse Width,1% Duty Cycle

2.Device mounted on 250mm x 250mm x 2.0mm Aluminum Plate Heatsink.

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Typical Characteristics Curves

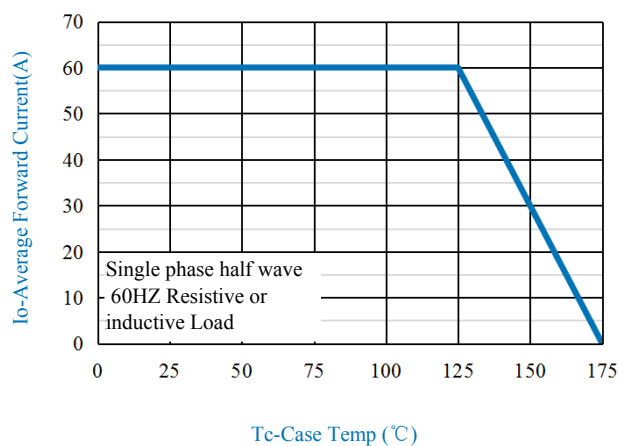


Fig.1-Forward Current Derating Curve

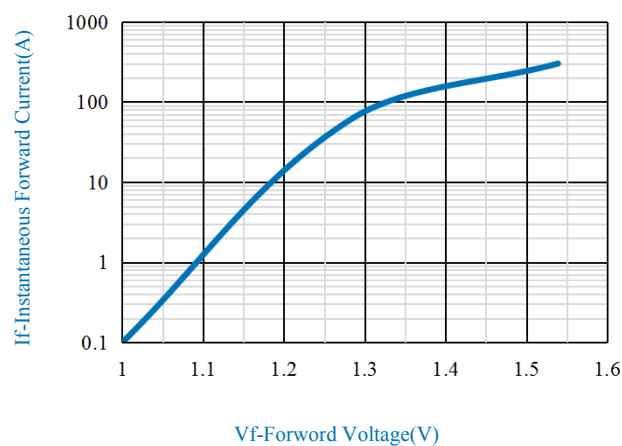


Fig.2-Typical Instantaneous Forward

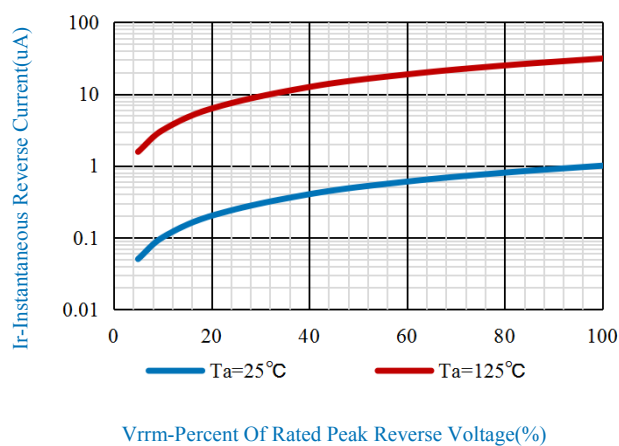


Fig.3-Typical Reverse Characteristics

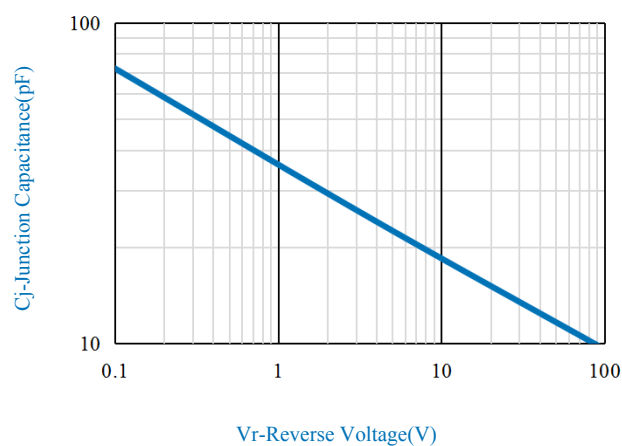


Fig.4-Typical Junction Capacitance

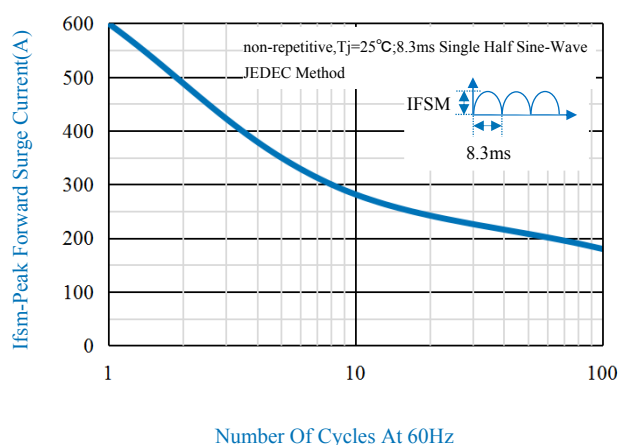


Fig.5-Max. Non-Repetitive Surge Current

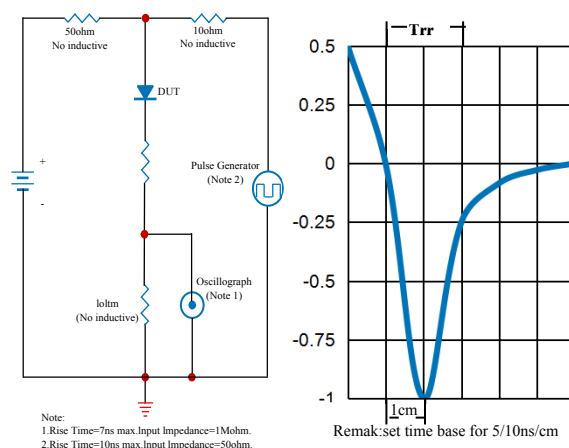


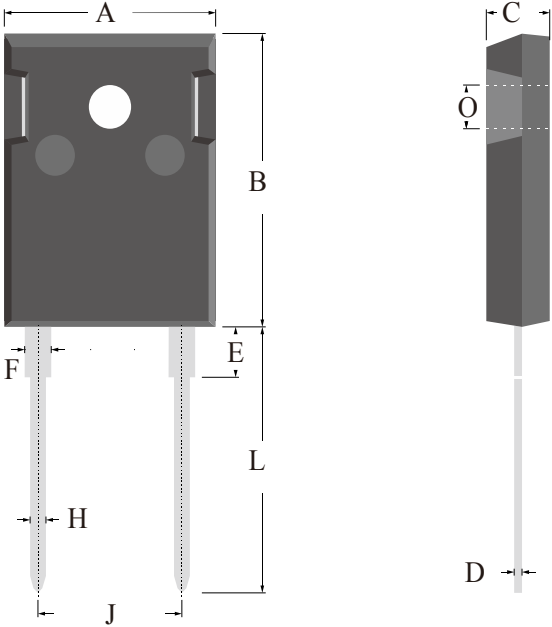
Fig.6-Reverse Recovery Time Characteristic And Test Circuit

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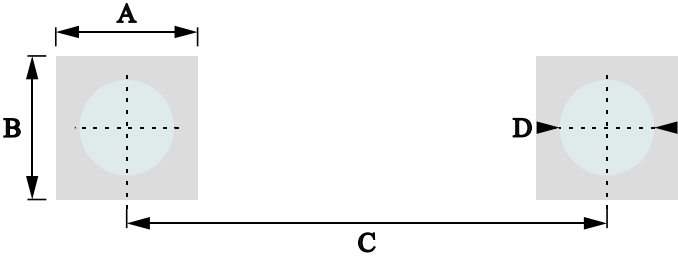
OUTLINE DRAWINGS



TO-247AC

| OUTLINE DIMENSIONS |            |      |       |        |      |        |
|--------------------|------------|------|-------|--------|------|--------|
| Dim.               | Milimeters |      |       | Inches |      |        |
|                    | Min.       | Typ. | Max.  | Min.   | Typ. | Max.   |
| A                  | 15.25      | -    | 16.75 | 0.6004 | -    | 0.6594 |
| B                  | 20.50      | -    | 22.50 | 0.8071 | -    | 0.8858 |
| C                  | 4.50       | -    | 5.10  | 0.1772 | -    | 0.2008 |
| D                  | 0.40       | -    | 0.80  | 0.0157 | -    | 0.0315 |
| E                  | 3.40       | -    | 4.00  | 0.1339 | -    | 0.1575 |
| F                  | 1.80       | -    | 2.20  | 0.0709 | -    | 0.0866 |
| H                  | 1.00       | -    | 1.40  | 0.0394 | -    | 0.0551 |
| J                  | 5.15       | -    | 5.75  | 0.2028 | -    | 0.2264 |
| L                  | 18.50      | -    | 20.50 | 0.7283 | -    | 0.8071 |
| O                  | 2.85       | -    | 3.15  | 0.1122 | -    | 0.1240 |

RECOMMEDND LAYOUT DRAWINGS



TO-247AC

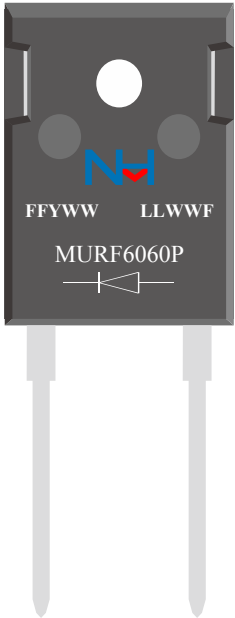
| OUTLINE DIMENSIONS |            |       |      |        |        |      |
|--------------------|------------|-------|------|--------|--------|------|
| Dim.               | Milimeters |       |      | Inches |        |      |
|                    | Min.       | Typ.  | Max. | Min.   | Typ.   | Max. |
| A                  | -          | 2.00  | -    | -      | 0.0787 | -    |
| B                  | -          | 2.00  | -    | -      | 0.0787 | -    |
| C                  | -          | 11.00 | -    | -      | 0.4331 | -    |
| D                  | -          | 1.40  | -    | -      | 0.0551 | -    |

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MARKING



MARKING INSTRUCTION

NH=Niuhan Trademark  
FF=Product Line Code,According To Actual Changes  
YWW=Date Code,According To Actual Changes  
LLWWF=Inernal Code,According To Actual Changes  
MURF6060P=Model

PACKING INFORMATION

| Package Type | Package Code | Product Weight<br>Approx(g/Pcs) | Package Method | Quantity<br>(Pcs/Min. Pack.) | Quantity<br>(Pcs/Inner Box) | Quantity<br>(Pcs/Carton) |
|--------------|--------------|---------------------------------|----------------|------------------------------|-----------------------------|--------------------------|
| TO-247AC     | P1           | 5.4                             | Tube           | 30                           | 450                         | 2250                     |

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Recommended wave soldering condition

| Product         | Peak Temperature | Soldering Time  |
|-----------------|------------------|-----------------|
| Pb-free devices | 260 +0/-5 °C     | 5 +1/-1 seconds |

Recommended temperature profile for IR reflow

|  | Profile feature                                                                                                                          | Sn-Pb eutectic Assembly          | Pb-free Assembly                 |
|--|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------|
|  | Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )                                                                              | 3°C/second max.                  | 3°C/second max.                  |
|  | Preheat-Temperature Min (T <sub>S</sub> min)<br>-Temperature Max (T <sub>S</sub> max)<br>-Time(t <sub>s</sub> min to t <sub>s</sub> max) | 100°C<br>150°C<br>60-120 seconds | 150°C<br>200°C<br>60-180 seconds |
|  | Time maintained above:<br>-Temperature (T <sub>L</sub> )<br>- Time (t <sub>L</sub> )                                                     | 183°C<br>60-150 seconds          | 217°C<br>60-150 seconds          |
|  | Peak Temperature(T <sub>P</sub> )                                                                                                        | 240 +0/-5 °C                     | 260 +0/-5 °C                     |
|  | Time within 5°C of actual peak temperature (t <sub>p</sub> )                                                                             | 10-30 seconds                    | 20-40 seconds                    |
|  | Ramp down rate                                                                                                                           | 6°C/second max.                  | 6°C/second max.                  |
|  | Time 25 °C to peak temperature                                                                                                           | 6 minutes max.                   | 8 minutes max.                   |

Note : All temperatures refer to topside of the package, measured on the package body surface.

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Specification Revision History

| Rev.        | Date       | Changed Items | Pre-Changed Content | Changed Content |
|-------------|------------|---------------|---------------------|-----------------|
| A/1         | 2014-10-20 | First Issue   |                     |                 |
| Blank Below |            |               |                     |                 |