



MUR1620CT
MURB1620CT
MURB1620CT-1

Ultrafast Rectifier

Features

- Ultrafast Recovery Time
- Low Forward Voltage Drop
- Low Leakage Current
- 175°C Operating Junction Temperature

| |
|---------------------|
| $t_{rr} = 25ns$ |
| $I_{F(AV)} = 16Amp$ |
| $V_R = 200V$ |

Description/Applications

International Rectifier's MUR.. series are the state of the art Ultra fast recovery rectifiers specifically designed with optimized performance of forward voltage drop and ultra fast recovery time.

The planar structure and the platinum doped life time control, guarantee the best overall performance, ruggedness and reliability characteristics.

These devices are intended for use in the output rectification stage of SMPS, UPS, DC-DC converters as well as free-wheeling diode in low voltage inverters and chopper motor drives.

Their extremely optimized stored charge and low recovery current minimize the switching losses and reduce over dissipation in the switching element and snubbers.

Absolute Maximum Ratings

| Parameters | Max | Units |
|--|---|------------|
| V_{RRM} Peak Repetitive Peak Reverse Voltage | 200 | V |
| $I_{F(AV)}$ Average Rectified Forward Current | Per Leg 8.0 | A |
| | Total Device, (Rated V_R), $T_C = 150^\circ C$ Total Device 16 | |
| I_{FSM} Non Repetitive Peak Surge Current | Per Leg 100 | |
| I_{FM} Peak Repetitive Forward Current | Per Leg 16 | |
| | (Rated V_R , Square wave, 20 KHz), $T_C = 150^\circ C$ | |
| T_J, T_{STG} Operating Junction and Storage Temperatures | -65 to 175 | $^\circ C$ |

| Case Styles | | |
|--|---|---|
| <p>MUR1620CT</p>  <p>TO-220AB</p> | <p>MURB1620CT</p>  <p>D²PAK</p> | <p>MURB1620CT-1</p>  <p>TO-262</p> |

Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

| Parameters | Min | Typ | Max | Units | Test Conditions |
|--|-----|-----|-------|-------|---|
| V _{BR} , V _F Breakdown Voltage, Blocking Voltage | 200 | - | - | V | I _R = 100μA |
| V _F Forward Voltage | - | - | 0.975 | V | I _F = 8A |
| | - | - | 0.895 | V | I _F = 8A, T _J = 150°C |
| I _R Reverse Leakage Current | - | - | 5 | μA | V _R = V _R Rated |
| | - | - | 250 | μA | T _J = 150°C, V _R = V _R Rated |
| C _T Junction Capacitance | - | 25 | - | pF | V _R = 200V |
| L _S Series Inductance | - | 8.0 | - | nH | Measured lead to lead 5mm from package body |

Dynamic Recovery Characteristics @ T_J = 25°C (unless otherwise specified)

| Parameters | Min | Typ | Max | Units | Test Conditions | |
|---|-----|-----|-----|------------------------|---|------------------------|
| t _{rr} Reverse Recovery Time | - | - | 35 | ns | I _F = 1.0A, di _F /dt = 50A/μs, V _R = 30V | |
| | - | - | 25 | | I _F = 0.5A, I _R = 1.0A, I _{REC} = 0.25A | |
| | - | 20 | - | A | T _J = 25°C | |
| | - | 34 | - | | T _J = 125°C | |
| I _{RRM} Peak Recovery Current | - | 1.7 | - | T _J = 25°C | I _F = 8A V _R = 160V di _F /dt = 200A/μs | |
| | - | 4.2 | - | T _J = 125°C | | |
| Q _{rr} Reverse Recovery Charge | - | 23 | - | nC | | T _J = 25°C |
| | - | 75 | - | nC | | T _J = 125°C |

Thermal - Mechanical Characteristics

| Parameters | Min | Typ | Max | Units |
|---|-----|------|-------------|--------|
| T _J Max. Junction Temperature Range | - | - | - 65 to 175 | °C |
| T _{Stg} Max. Storage Temperature Range | - | - | - 65 to 175 | |
| R _{thJC} Thermal Resistance, Junction to Case Per Leg | - | - | 3.0 | °C/W |
| R _{thJA} Thermal Resistance, Junction to Ambient Per Leg | - | - | 50 | |
| R _{thCS} ^① Thermal Resistance, Case to Heatsink | - | 0.5 | - | |
| Wt Weight | - | 2.0 | - | g |
| | - | 0.07 | - | (oz) |
| Mounting Torque | 6.0 | - | 12 | Kg-cm |
| | 5.0 | - | 10 | lbf.in |

① Mounting Surface, Flat, Smooth and Greased

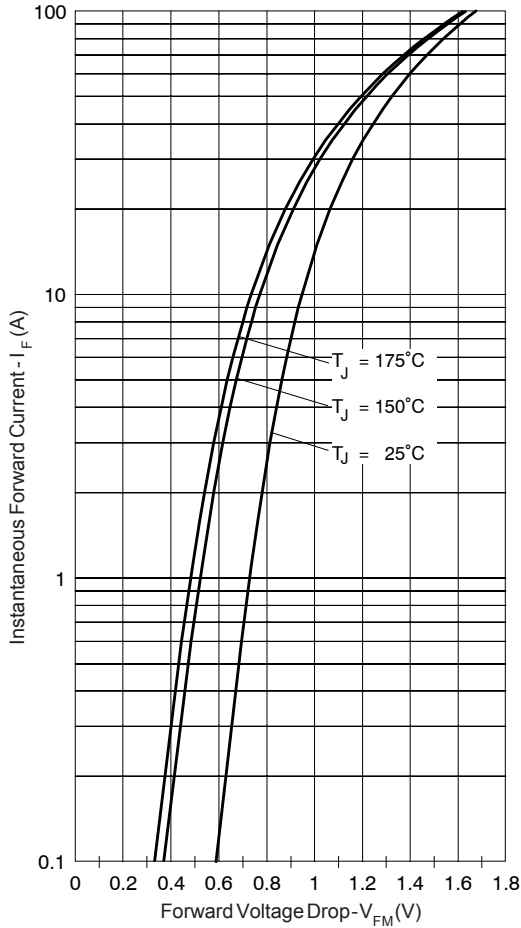


Fig. 1 - Typical Forward Voltage Drop Characteristics

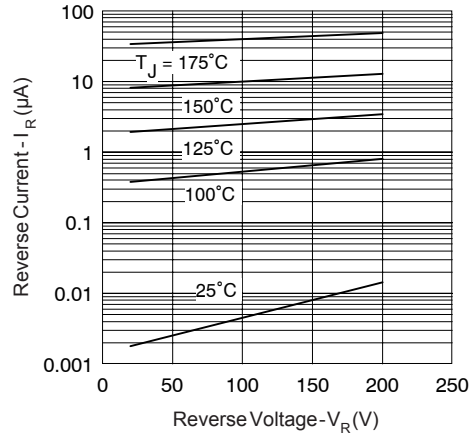


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

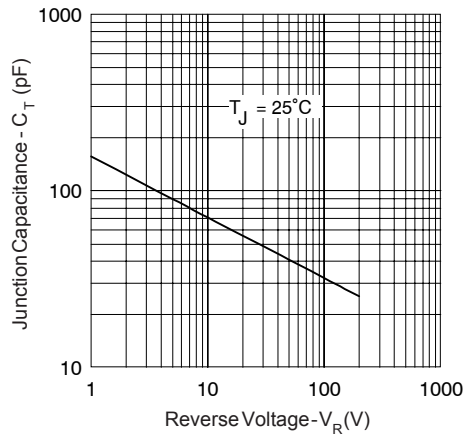


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

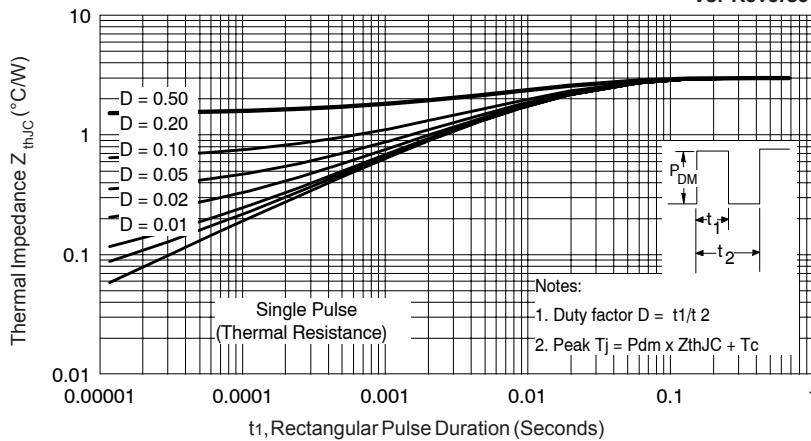


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

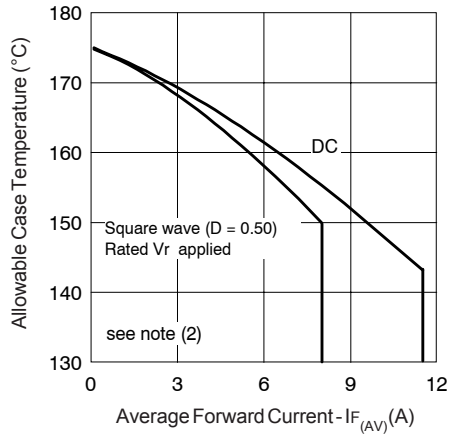


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

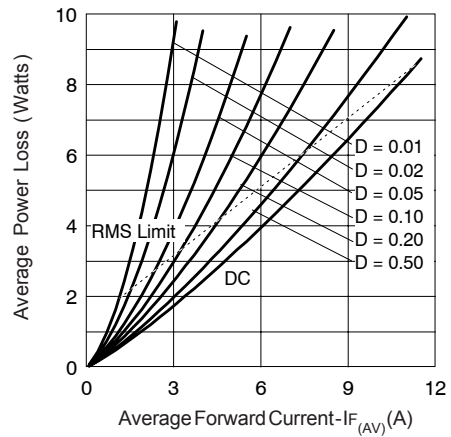


Fig. 6 - Forward Power Loss Characteristics

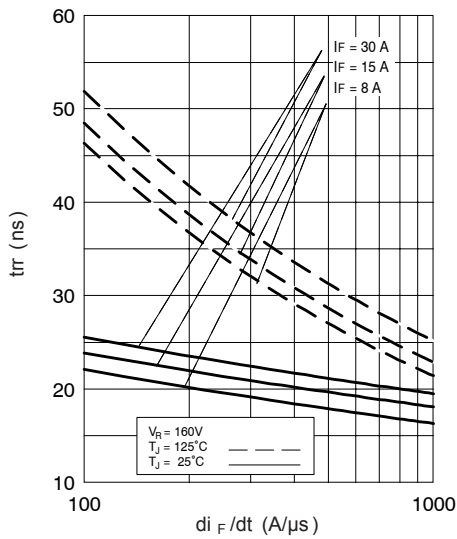


Fig. 7 - Typical Reverse Recovery vs. di_F/dt

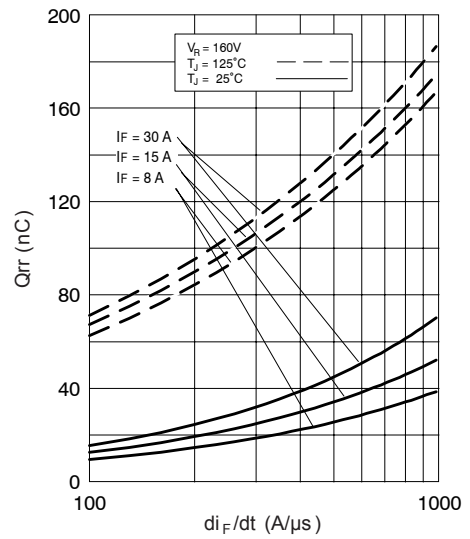


Fig. 8 - Typical Stored Charge vs. di_F/dt

(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
 $Pd = \text{Forward Power Loss} = I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
 $Pd_{REV} = \text{Inverse Power Loss} = V_{R1} \times I_R (1 - D); I_R @ V_{R1} = \text{rated } V_R$

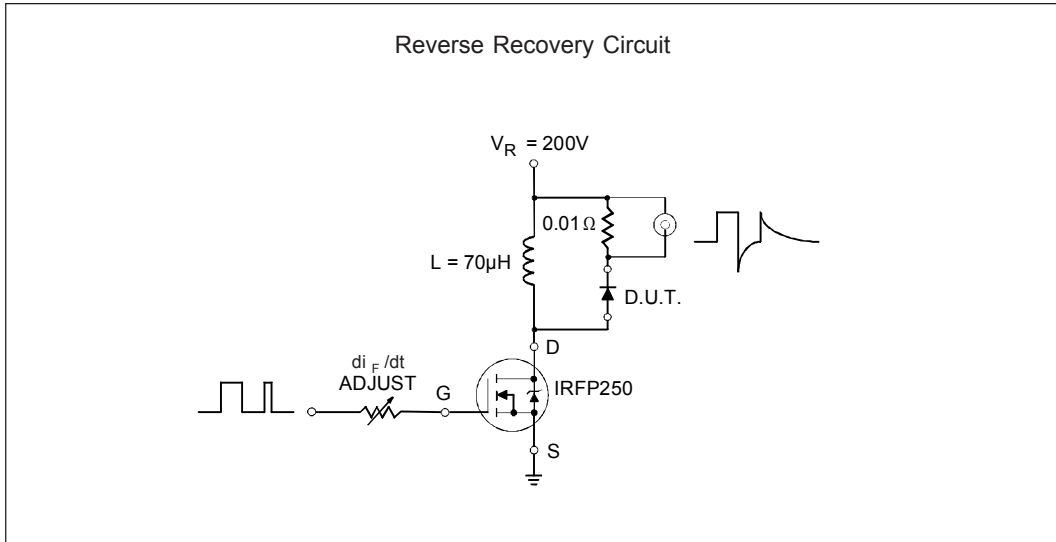


Fig. 9- Reverse Recovery Parameter Test Circuit

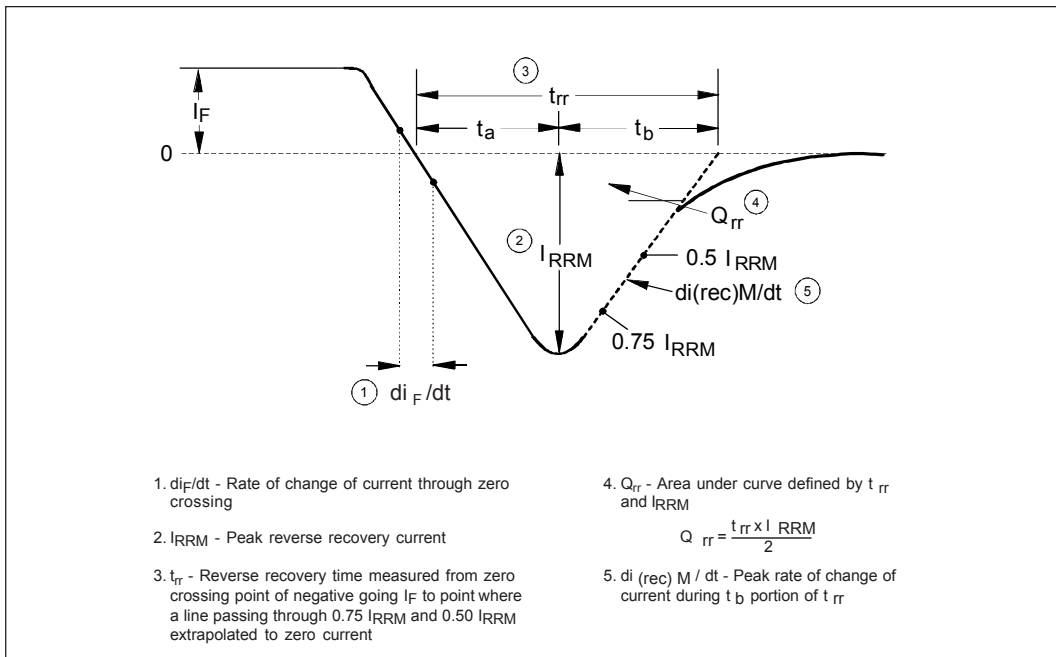
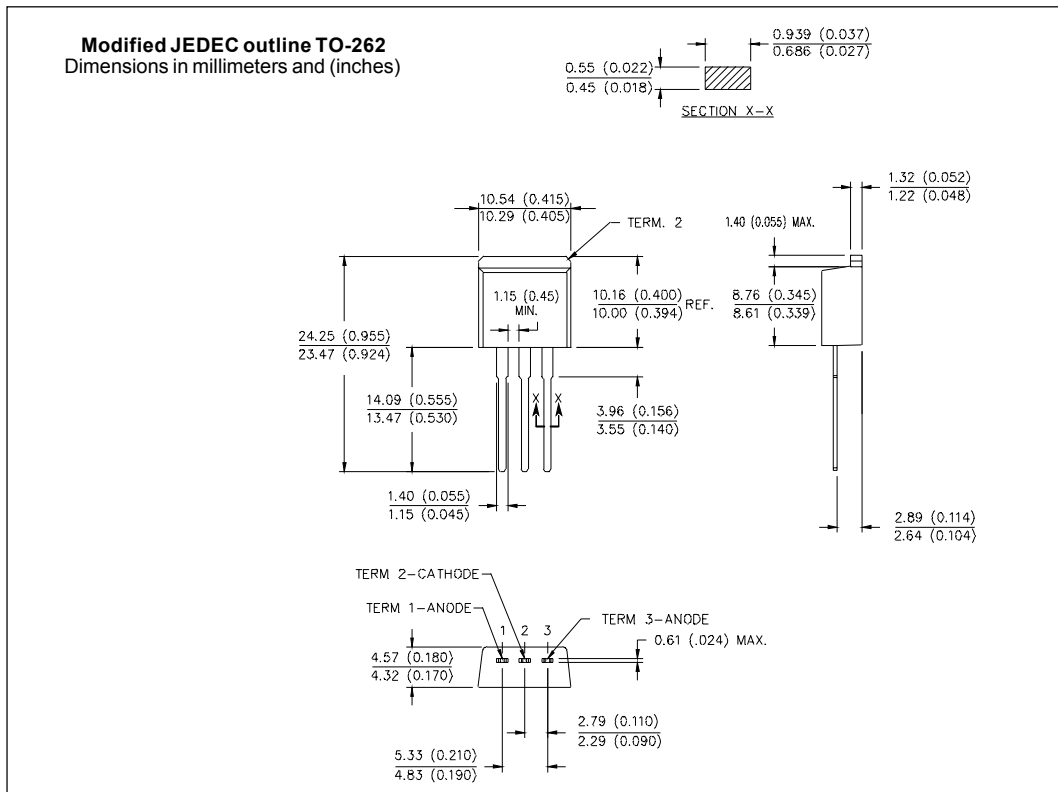
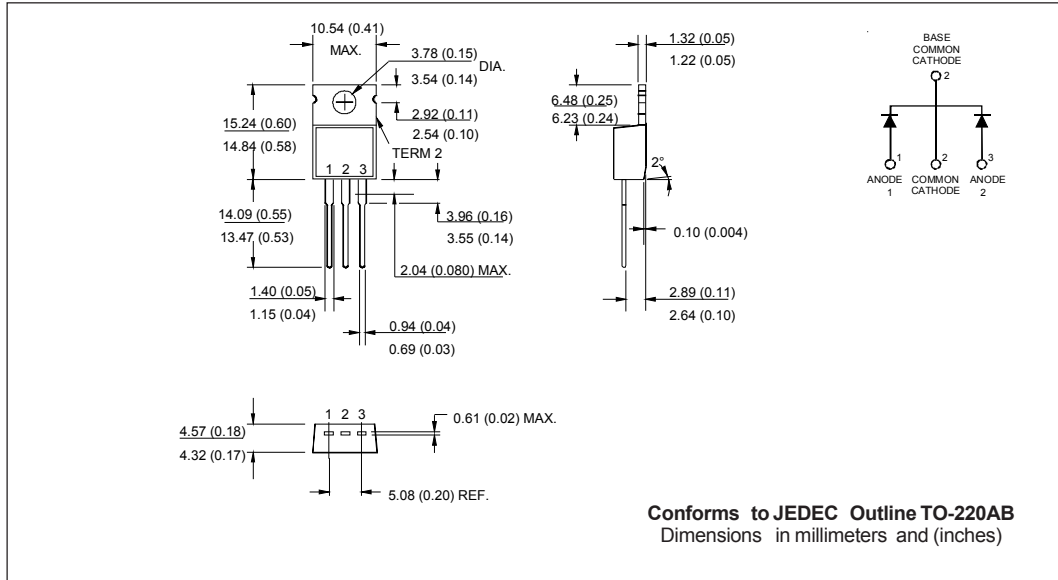
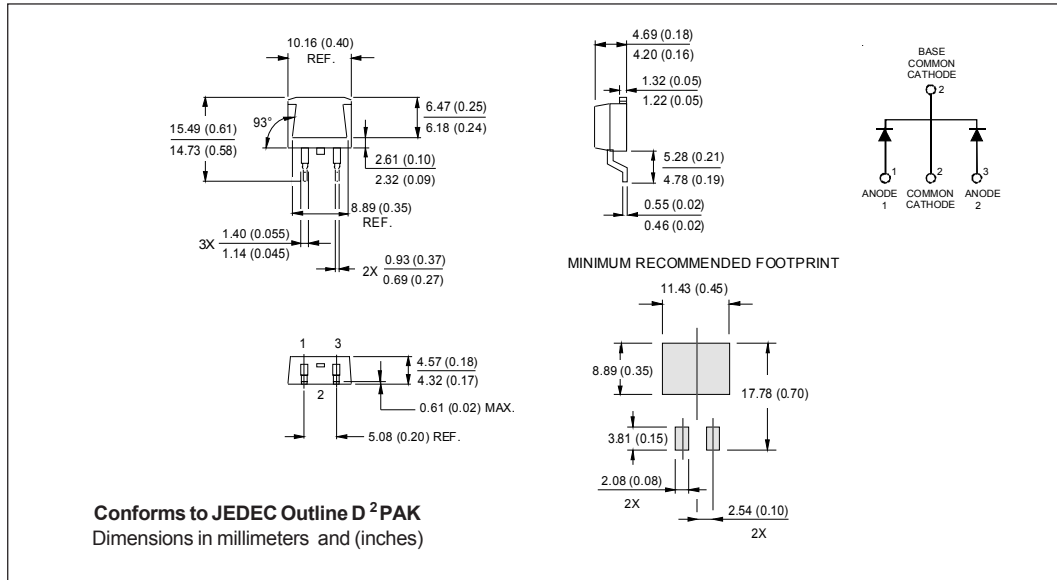


Fig. 10 - Reverse Recovery Waveform and Definitions

Outline Table



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Ordering Information Table

Device Code

| | | | | | |
|------------|----------|-----------|-----------|-----------|-----------|
| MUR | B | 16 | 20 | CT | -1 |
| 1 | 2 | 3 | 4 | 5 | 6 |

- 1** - Ultrafast MUR Series
- 2** - B = D²Pak / TO-262
None = TO-220AB
- 3** - Current Rating (16 = 16A)
- 4** - Voltage Rating (20 = 200V)
- 5** - CT = Center Tap (Dual) TO-220 / D²PAK / TO-262
- 6** - "-1" = TO-262 Option

MUR1620CT, MURB1620CT, MURB1620CT-1

Bulletin PD-20718 rev. C 12/03

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Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.

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