

TO-220AC Plastic-Encapsulate Diode

HYPERFAST RECTIFIER, FRED

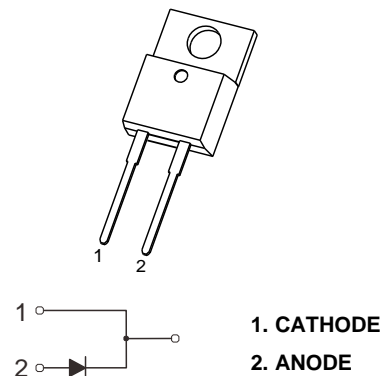
Features:

- Ultrafast Recovery Times and Low Recovery Loss
- Low Forward Voltage
- Low Reverse Leakage Current

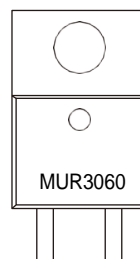
Applications:

Specifically designed to improve efficiency of PFC and output rectification stages of EV / HEV battery charging stations, booster stage of solar inverters and UPS applications, these devices are perfectly matched to operate with MOSFETs or high speed IGBTs.

TO-220AC



MARKING



MAIN CHARACTERISTICS

| | |
|--------------|---|
| I_O | 30A |
| V_{RRM} | 600V |
| T_{rr} | 29ns |
| T_j | 175°C |
| $V_{F(typ)}$ | 1.06V(@$T_j=150^\circ\text{C}$) |

MAXIMUM RATINGS ($T_C=25^\circ\text{C}$ unless otherwise noted)

| Symbol | Parameter | KMUR3060 | Unit |
|-----------------|--|------------|---------------------------|
| V_{RRM} | Peak Repetitive Reverse Voltage | 600 | V |
| V_R | DC Blocking Voltage | | |
| $I_{F(AV)}$ | Average Forward Current($T_C=125^\circ\text{C}$) | 30 | A |
| $I_{F(RMS)}$ | RMS Forward Current($T_C=125^\circ\text{C}$) | 42 | A |
| I_{FSM} | Non-Repetitive Surge Forward Current (8.3ms) | 344 | A |
| P_D | Power dissipation | 188 | W |
| $R_{\theta JC}$ | Thermal Resistance From Junction to Case | 0.80 | $^\circ\text{C}/\text{W}$ |
| T_j | Operating Junction Temperature Range | -55 ~ +175 | $^\circ\text{C}$ |
| T_{stg} | Storage Temperature Range | -55 ~ +175 | $^\circ\text{C}$ |

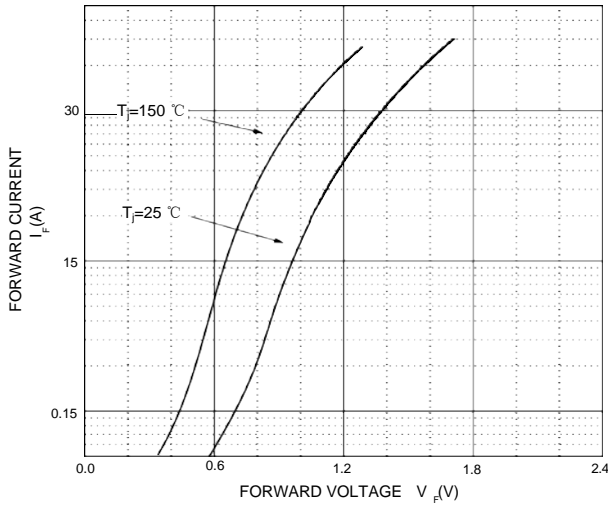
ELECTRICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$ unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|------------|-----------------------|--|-------------------------|------|------|---------------|
| $V_{(BR)}$ | Reverse Voltage | $I_R=100\mu\text{A}$ | 600 | | | V |
| I_R | Reverse Current | $V_R=600\text{V}$ | $T_j=25^\circ\text{C}$ | | 10 | μA |
| | | | $T_j=150^\circ\text{C}$ | | 500 | μA |
| V_F | Forward Voltage | $I_F=30\text{A}$ | $T_j=25^\circ\text{C}$ | 1.36 | 1.6 | V |
| | | | $T_j=150^\circ\text{C}$ | 1.06 | | V |
| C_{tot} | Total Capacitance | $V_R=200\text{V}, f=1\text{MHz}$ | | 50 | | pF |
| trr | Reverse Recovery time | $I_F=0.5\text{A}, I_R=1\text{A}, I_{rr}=0.25\text{A}$ | | 32 | 38 | ns |
| | | $I_F=1\text{A}, V_R=30\text{V}, di_F/dt=200\text{A}/\mu\text{s}$ | | 24 | 29 | ns |

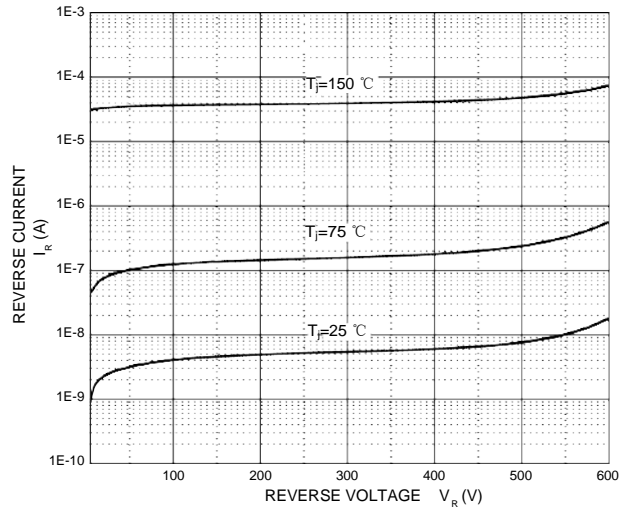
ELECTRICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$ unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-----------|-------------------------------|---|------|------|------|------|
| trr | Reverse Recovery Time | $I_F=30\text{A}, V_R=300\text{V}, di_F/dt=200\text{A}/\mu\text{s}$ | | 35 | | ns |
| I_{RRM} | Max. Reverse Recovery Current | | | 3.0 | | A |
| Qrr | Reverse Recovery Charge | | | 128 | | nC |
| trr | Reverse Recovery Time | $I_F=30\text{A}, V_R=300\text{V}, di_F/dt=200\text{A}/\mu\text{s}, T_j=150^\circ\text{C}$ | | 145 | | ns |
| I_{RRM} | Max. Reverse Recovery Current | | | 7.0 | | A |
| Qrr | Reverse Recovery Charge | | | 550 | | nC |
| trr | Reverse Recovery Time | $I_F=30\text{A}, V_R=400\text{V}, di_F/dt=500\text{A}/\mu\text{s}, T_j=125^\circ\text{C}$ | | 79 | | ns |
| I_{RRM} | Max. Reverse Recovery Current | | | 24 | | A |
| Qrr | Reverse Recovery Charge | | | 1037 | | nC |

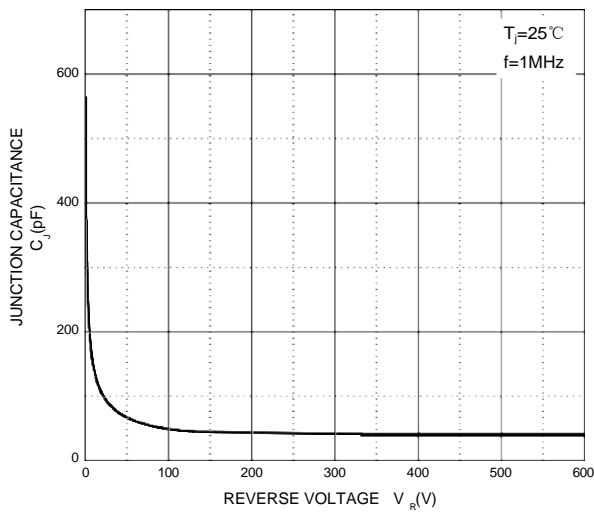
Forward Characteristics



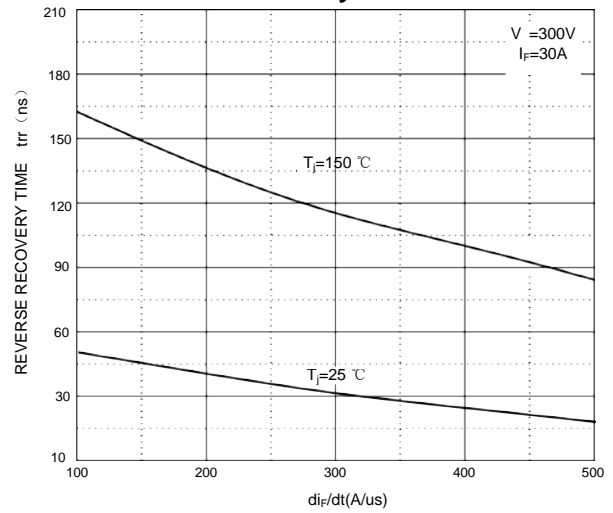
Reverse Characteristics



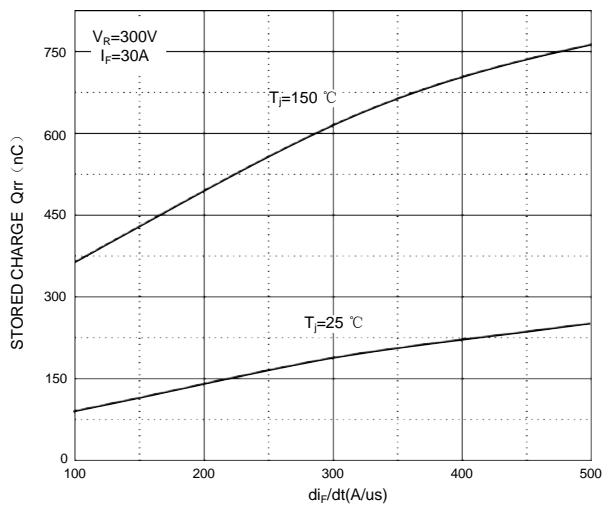
Capacitance Characteristics Per Diode



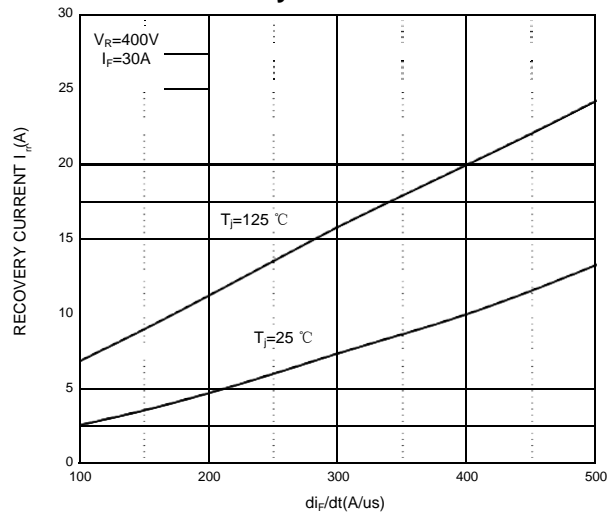
Reverse Recovery Time vs. di_F/dt

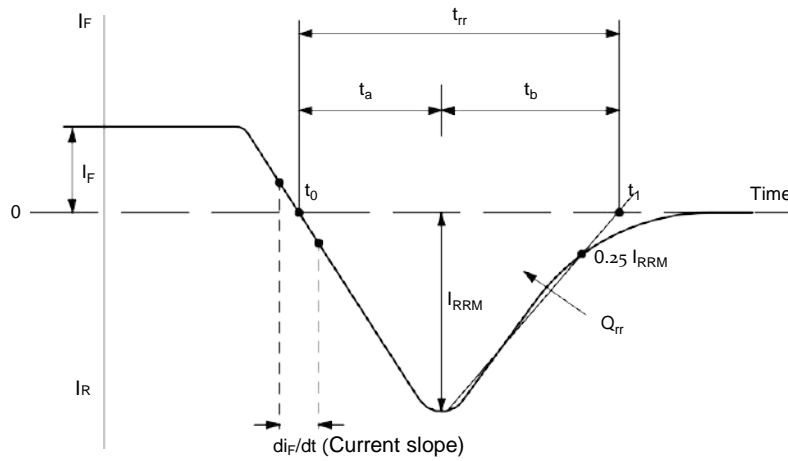


Stored Charge vs. di_F/dt



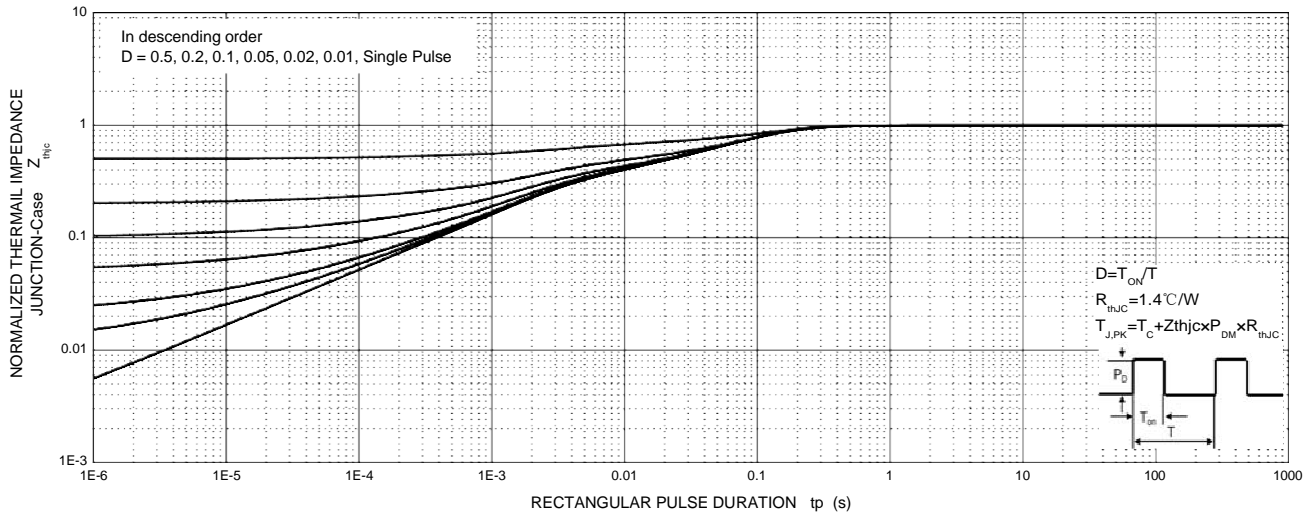
Recovery Current vs. di_F/dt



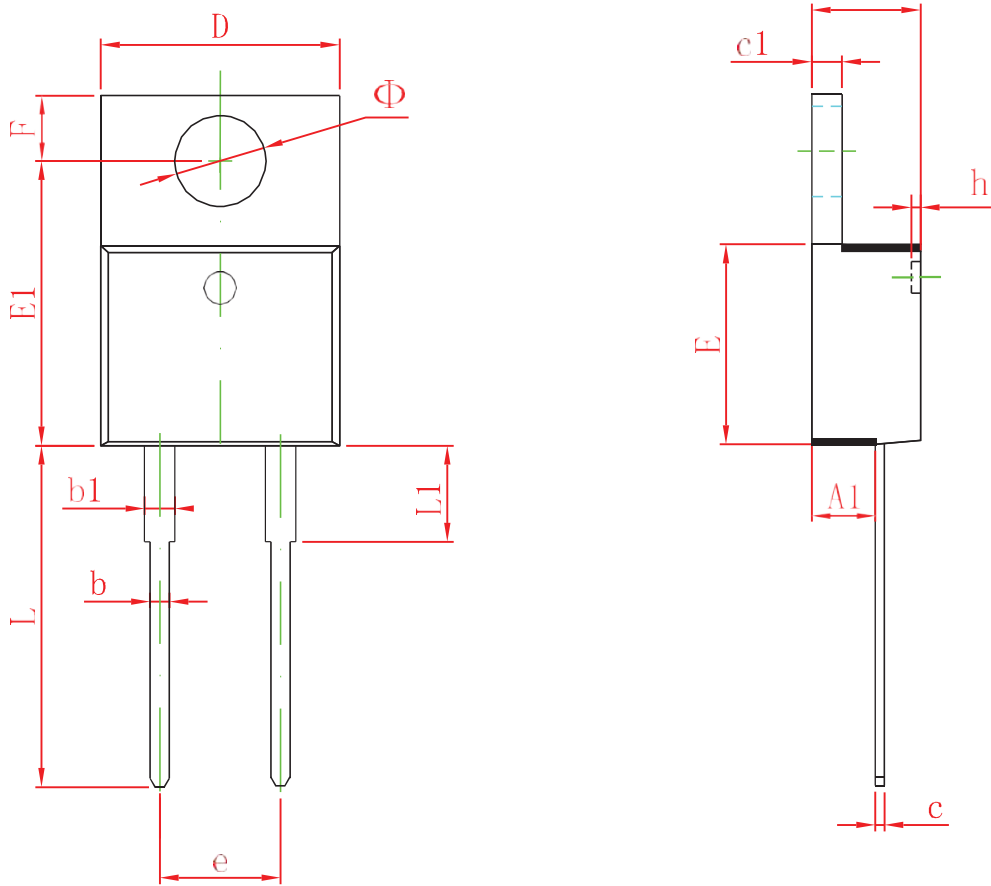


Reverse Recovery Waveform and Definitions

KMUR3060 Transient Thermal Impedance, Junction-Case



TO-220AC Package Outline Dimensions



| Symbol | Dimensions In Inches | |
|--------|----------------------|-----------|
| | Min | Max |
| A | 4.450 | 4.750 |
| b | 2.520 | 2.820 |
| b1 | 0.710 | 0.910 |
| c | 1.170 | 1.370 |
| c1 | 0.300 | 0.500 |
| D | 0.099 | 0.111 |
| E | 0.028 | 0.036 |
| E1 | 0.046 | 0.054 |
| e | 0.012 | 0.020 |
| F | 1.170 | 1.370 |
| h | 0.046 | 0.054 |
| L | 0.387 | 0.407 |
| L1 | 0.335 | 0.350 |
| Φ | 12.050 | 12.650 |
| | 5.080 TYP | 0.200 TYP |
| | 2.540 | 2.940 |
| | 0.100 TYP | 0.004 TYP |
| | 13.300 | 13.800 |
| | 0.523 | 0.543 |
| | 3.540 | 3.940 |
| | 0.139 | 0.155 |
| | 3.735 | 3.935 |
| | 0.147 | 0.155 |