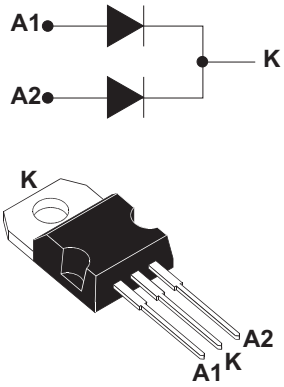
# FERD60U45C

## Field effect rectifier

**Datasheet - production data**




**TO-220AB**
**FERD60U45CT**

## Description

This dual rectifier is based on a proprietary technology that achieves the best in class $V_F/I_R$ for a given silicon surface.

Packaged in TO-220AB, this device is intended to be used in switch mode power supplies, or automotive applications

**Table 1. Device summary**

| | |
|---|---|
| $I_{F(AV)}$ | 2 x 30 A |
| $V_{RRM}$ | 45 V |
| $V_F$(typ) | 0.345 V |

## Features

- ST advanced rectifier process
- Stable leakage current over reverse voltage
- Low forward voltage drop
- High frequency operation



This is information on a product in full production. www.st.com

# 1 Characteristics

**Table 2. Absolute ratings (limiting values, per diode at 25° C, unless otherwise stated)**

| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | | | 45 | V |
| $I_{F(RMS)}$ | Forward rms current | | | 60 | A |
| $I_{F(AV)}$ | Average forward current, $\delta$ = 0.5 | $T_c$ =145° C<br>$T_c$ =135° C | Per diode<br>Per device | 30<br>60 | A |
| $I_{FSM}$ | Surge non repetitive forward current | $t_p$ = 10 ms sinusoidal | | 300 | A |
| $T_{stg}$ | Storage temperature range | | | -65 to + 175 | °C |
| $T_j$ | Maximum operating junction temperature (1) | | | 175 | °C |

1. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ condition to avoid thermal runaway for a diode on its own heatsink

**Table 3. Thermal resistances**

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $R_{th\ (j\text{-}c)}$ | Junction to case | Per diode<br>Total | 1.4<br>0.9 | °C/W |
| $R_{th(c)}$ | Coupling | | 0.4 | °C/W |

When the diodes 1 and 2 are used simultaneously:

$\Delta T_j$(diode 1) = P(diode1) x $R_{th(j\text{-}c)}$(Per diode) + P(diode2) x $R_{th(c)}$.

**Table 4. Static electrical characteristics (per diode)**

| Symbol | Parameter | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_R$(1) | Reverse leakage current | $T_j$ = 25° C | $V_R = V_{RRM}$ | | | 1500 | µA |
| | | $T_j$ = 125° C | | | 50 | 100 | mA |
| $V_F$(2) | Forward voltage drop | $T_j$ = 25° C | $I_F$ = 15 A | | 0.38 | 0.41 | V |
| | | $T_j$ = 125° C | | | 0.345 | 0.375 | |
| | | $T_j$ = 25° C | $I_F$ = 30 A | | 0.46 | 0.50 | |
| | | $T_j$ = 125° C | | | 0.47 | 0.51 | |

1. Pulse test: $t_p$ = 5 ms, $\delta$ < 2%
2. Pulse test: $t_p$ = 380 µs, $\delta$ < 2%

To evaluate the conduction losses use the following equation:

$P = 0.32 \times I_{F(AV)} + 0.0063\ I_F{}^2{}_{(RMS)}$

**Figure 1. Average forward power dissipation versus average forward current (per diode)**

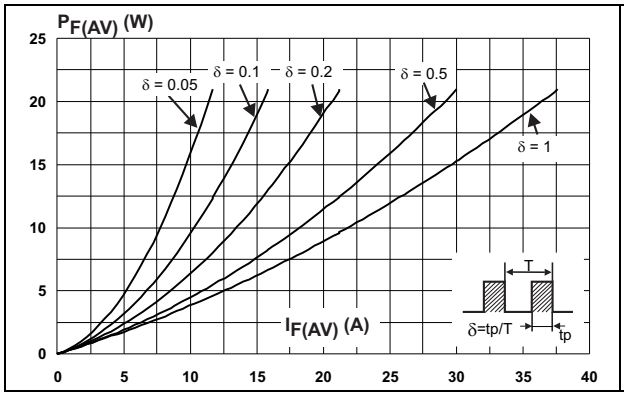



**Figure 2. Average forward current versus ambient temperature (δ = 0.5, per diode)**

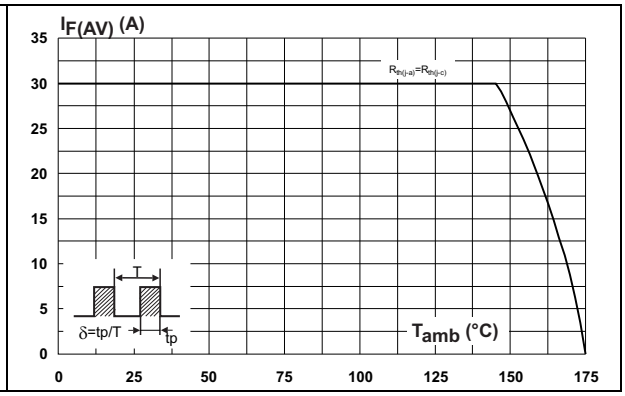



**Figure 3. Relative variation of thermal impedance junction to case versus pulse duration**

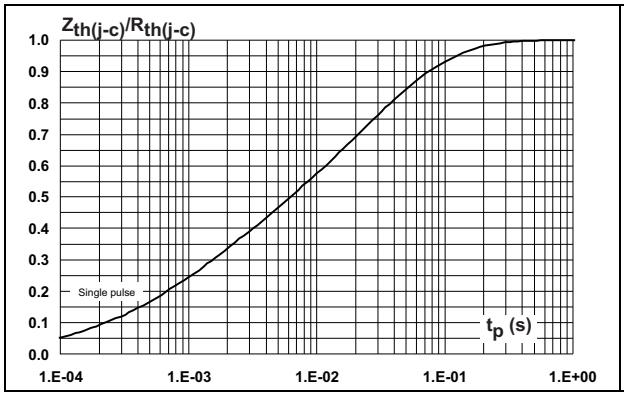



**Figure 4. Reverse leakage current versus reverse voltage applied (typical values, per diode)**

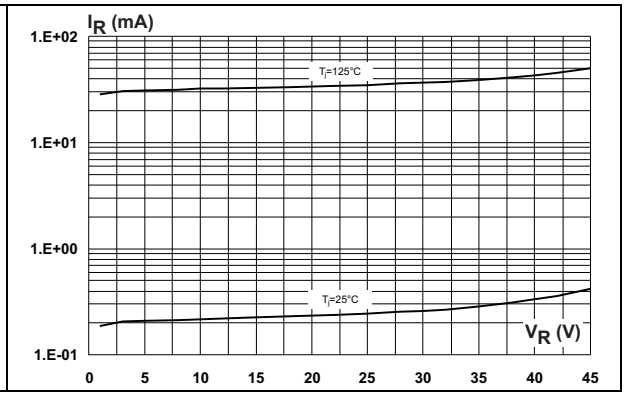



**Figure 5. Junction capacitance versus reverse voltage applied (typical values, per diode)**

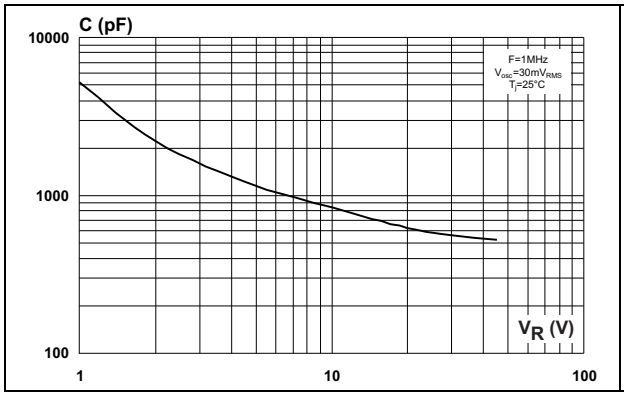
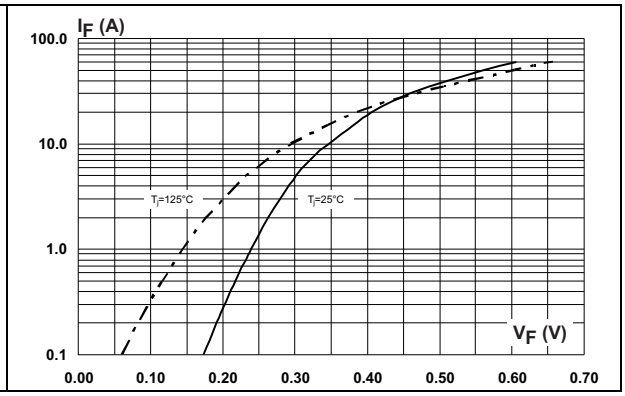



**Figure 6. Forward voltage drop versus forward current (typical values, per diode)**



# 2 Package Information

- Epoxy meets UL94,V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.4 to 0.6 N·m

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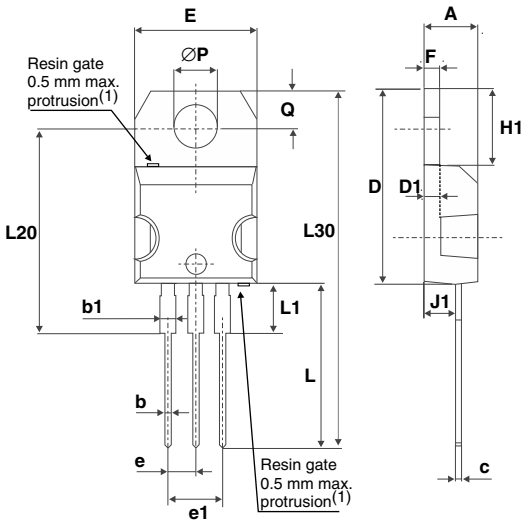
**Figure 7. TO-220AB dimension definitions**




(1) Resin gate position accepted in each of the two position shown as well as the symmetrical opposites

**Table 5. TO-220AB dimension values**

| Ref. | Dimensions | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.40 | 4.60 | 0.17 | 0.18 |
| b | 0.61 | 0.88 | 0.024 | 0.035 |
| b1 | 1.14 | 1.70 | 0.045 | 0.067 |
| c | 0.48 | 0.70 | 0.019 | 0.027 |
| D | 15.25 | 15.75 | 0.60 | 0.62 |
| D1 | 1.27 typ. | | 0.05 typ. | |
| E | 10 | 10.40 | 0.39 | 0.41 |
| e | 2.40 | 2.70 | 0.094 | 0.106 |
| e1 | 4.95 | 5.15 | 0.19 | 0.20 |
| F | 1.23 | 1.32 | 0.048 | 0.052 |
| H1 | 6.20 | 6.60 | 0.24 | 0.26 |
| J1 | 2.40 | 2.72 | 0.094 | 0.107 |
| L | 13 | 14 | 0.51 | 0.55 |
| L1 | 3.50 | 3.93 | 0.137 | 0.154 |
| L20 | 16.40 typ. | | 0.64 typ. | |
| L30 | 28.90 typ. | | 1.13 typ. | |
| ∅P | 3.75 | 3.85 | 0.147 | 0.151 |
| Q | 2.65 | 2.95 | 0.104 | 0.116 |

# 3 Ordering Information

**Table 6. Ordering information**

| Order code | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| FERD60U45CT | FERD60U45CT | TO-220AB | 2.2 g | 50 | Tube |

# 4 Revision history

**Table 7. Document revision history**

| Date | Revision | Description of Changes |
|---|---|---|
| 13-Nov-2013 | 1 | Previous version |

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