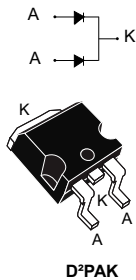



100 V, 2 x 30 A field-effect rectifier diode



Features

- AEC-Q101 qualified 
- PPAP capable
- Operating T_j from -40 °C to 175 °C
- ST patented rectifier process
- Stable leakage current over reverse voltage
- Low forward voltage drop
- High frequency operation
- ECOPACK compliant

Applications

- Battery charger
- DC / DC converter
- OBC (on-board battery charger)
- PHEV – EV charging station
- Resonant LLC topology
- PFC functions (power factor correction)

Description

The FERD60H100C-Y is based on proprietary technology that achieves the best in class V_F/I_R trade-off for a given silicon surface.

This 100 V automotive diode has been optimized for use in confined applications where both efficiency and thermal performance are key parameters.

This device is suitable to be used in DCDC converter by improving the efficiency.

Product status link

[FERD60H100C-Y](#)

Product summary

| | |
|--------------|----------|
| $I_{F(AV)}$ | 2 x 30 A |
| V_{RRM} | 100 V |
| T_j (max.) | 175 °C |
| V_F (typ.) | 0.64 V |

Product label



1 Characteristics

Table 1. Absolute ratings (limiting values per diode at 25 °C , unless otherwise specified)

| Symbol | Parameter | | | Value | Unit |
|---------------------|--|----------------------------------|-----------------------------------|-------------|------|
| V _{RRM} | Repetitive peak reverse voltage (T _j = -40 °C to +175 °C) | | | 100 | V |
| I _{F(RMS)} | Forward rms current | | | 60 | A |
| I _{F(AV)} | Average forward current | T _c = 145 °C, δ = 0.5 | Per diode | 30 | A |
| | | | Per device | 60 | |
| I _{FSM} | Surge non repetitive forward current | | t _p = 10 ms sinusoidal | 290 | A |
| T _{stg} | Storage temperature range | | | -65 to +175 | °C |
| T _j | Operating junction temperature range | | | -40 to +175 | °C |

Table 2. Thermal resistance parameters

| Symbol | Parameter | | Value | | Unit |
|---------------|------------------|------------|-------|------|------|
| | | | Typ. | Max. | |
| $R_{th(j-c)}$ | Junction to case | Per diode | 0.60 | 1.06 | °C/W |
| | | Per device | 0.30 | 0.53 | |

For more information, please refer to the following application note:

- AN5088: Rectifiers thermal management, handling and mounting recommendations

Table 3. Static electrical characteristics (per diode)

| Symbol | Parameter | Test conditions | | Typ. | Max. | Unit |
|-------------|-------------------------|-----------------------|---------------------|------|------|------|
| $I_R^{(1)}$ | Reverse leakage current | $T_j = 25\text{ °C}$ | $V_R = V_{RRM}$ | | 60 | μA |
| | | $T_j = 125\text{ °C}$ | | | 10 | mA |
| | | $T_j = 125\text{ °C}$ | $V_R = 70\text{ V}$ | | 5 | mA |
| $V_F^{(2)}$ | Forward voltage drop | $T_j = 25\text{ °C}$ | $I_F = 5\text{ A}$ | 0.46 | 0.52 | V |
| | | $T_j = 125\text{ °C}$ | | 0.41 | 0.45 | |
| | | $T_j = 25\text{ °C}$ | $I_F = 15\text{ A}$ | 0.62 | 0.70 | |
| | | $T_j = 125\text{ °C}$ | | 0.56 | 0.61 | |
| | | $T_j = 25\text{ °C}$ | $I_F = 30\text{ A}$ | 0.75 | 0.85 | |
| | | $T_j = 125\text{ °C}$ | | 0.64 | 0.70 | |
| | | $T_j = 25\text{ °C}$ | $I_F = 60\text{ A}$ | 0.92 | | |
| | | $T_j = 125\text{ °C}$ | | 0.76 | | |

1. Pulse test: $t_p = 5\text{ ms}$, $\delta < 2\%$

2. Pulse test: $t_p = 380\text{ μs}$, $\delta < 2\%$

To evaluate the conduction losses, use the following equation: $P = 0.55 \times I_{F(AV)} + 0.005 \times I_F^2_{(RMS)}$

For more information, please refer to the following application notes related to the power losses:

- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

1.1 Characteristics (curves)

Figure 1. Average forward current versus case temperature ($\delta = 0.5$, per diode)

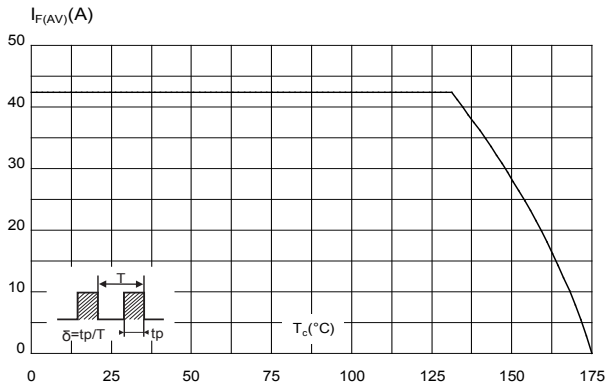


Figure 2. Relative variation of thermal impedance junction to case versus pulse duration

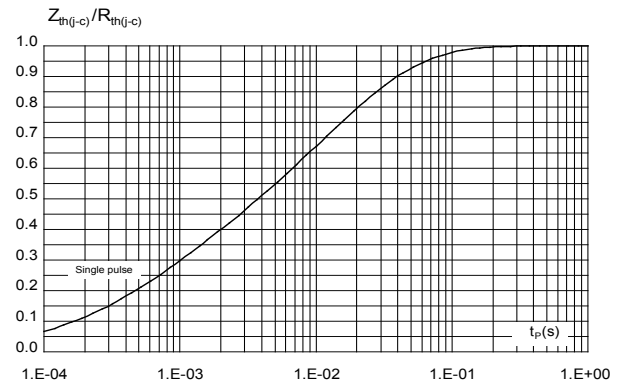


Figure 3. Reverse leakage current versus reverse voltage applied (typical values, per diode)

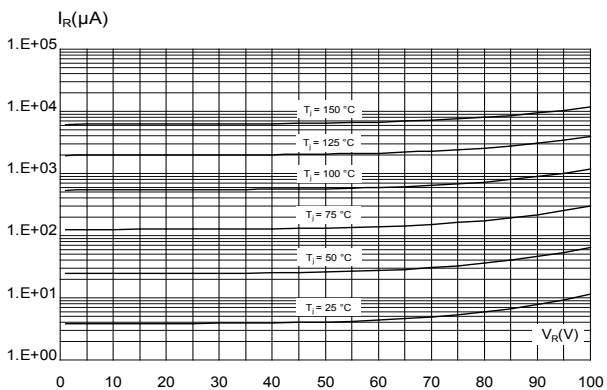


Figure 4. Junction capacitance versus reverse voltage applied (typical values, per diode)

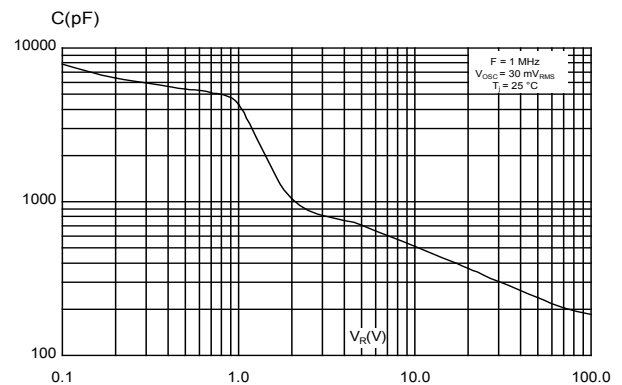


Figure 5. Forward voltage drop versus forward current (typical values, per diode)

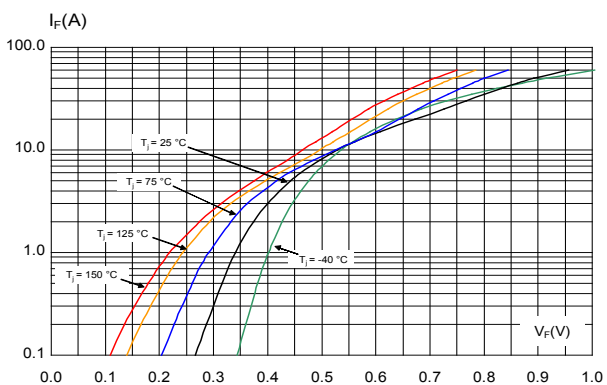
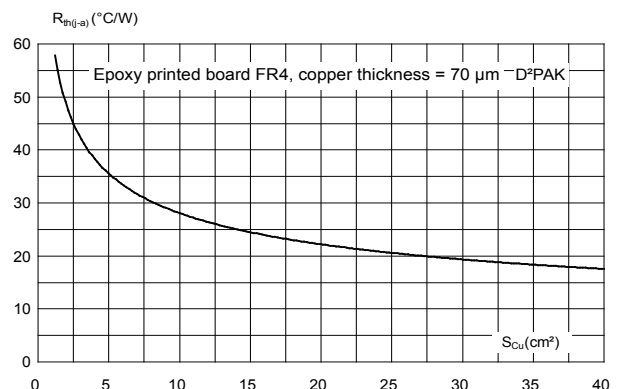


Figure 6. Thermal resistance junction to ambient versus copper surface under tab (typical values)



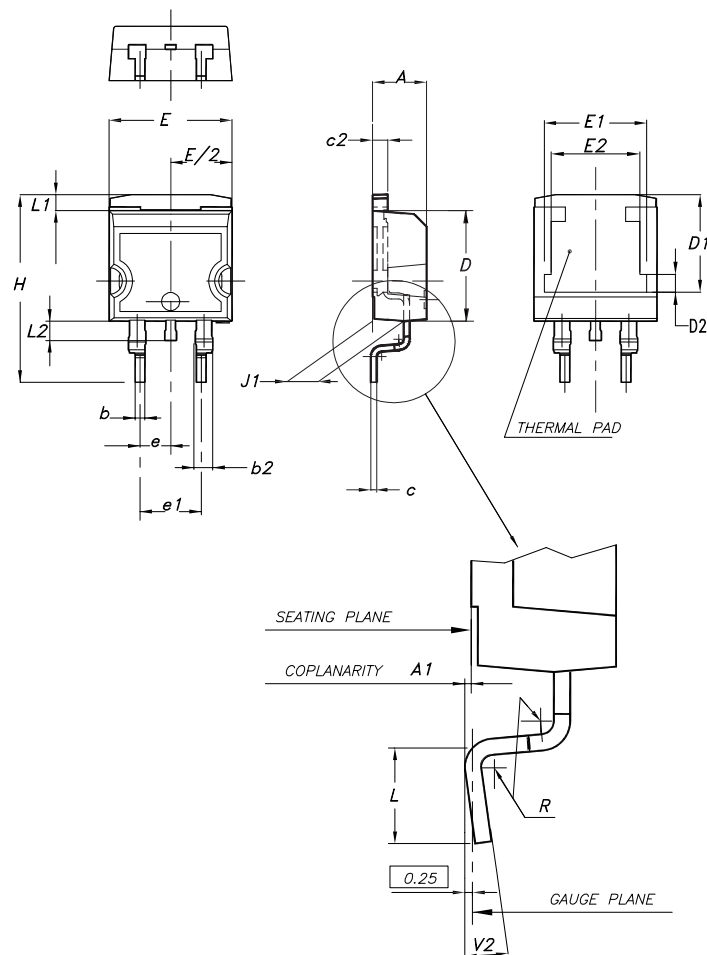
2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of **ECOPACK** packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions and product status are available at: www.st.com. ECOPACK is an ST trademark.

2.1 D²PAK package information

- Epoxy meets UL94, V0.
- Cooling method: by conduction (C)

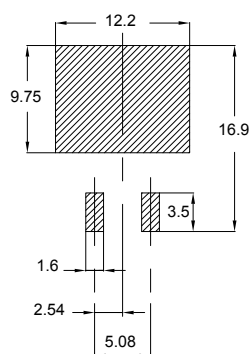
Figure 7. D²PAK package outline



Note: This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

Table 4. D²PAK package mechanical data

| Ref. | Dimensions | | | | | |
|------|-------------|------|-------|-----------------------------|-------|-------|
| | Millimeters | | | Inches (for reference only) | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 4.40 | | 4.60 | 0.173 | | 0.181 |
| A1 | 0.03 | | 0.23 | 0.001 | | 0.009 |
| b | 0.70 | | 0.93 | 0.028 | | 0.037 |
| b2 | 1.14 | | 1.70 | 0.045 | | 0.067 |
| c | 0.45 | | 0.60 | 0.018 | | 0.024 |
| c2 | 1.23 | | 1.36 | 0.048 | | 0.053 |
| D | 8.95 | | 9.35 | 0.352 | | 0.368 |
| D1 | 7.50 | 7.75 | 8.00 | 0.295 | 0.305 | 0.315 |
| D2 | 1.10 | 1.30 | 1.50 | 0.043 | 0.051 | 0.060 |
| E | 10.00 | | 10.40 | 0.394 | | 0.409 |
| E1 | 8.30 | 8.50 | 8.70 | 0.335 | 0.343 | 0.346 |
| E2 | 6.85 | 7.05 | 7.25 | 0.266 | 0.278 | 0.282 |
| e | | 2.54 | | | 0.100 | |
| e1 | 4.88 | | 5.28 | 0.190 | | 0.205 |
| H | 15.00 | | 15.85 | 0.591 | | 0.624 |
| J1 | 2.49 | | 2.69 | 0.097 | | 0.106 |
| L | 2.29 | | 2.79 | 0.090 | | 0.110 |
| L1 | 1.27 | | 1.40 | 0.049 | | 0.055 |
| L2 | 1.30 | | 1.75 | 0.050 | | 0.069 |
| R | | 0.40 | | | 0.015 | |
| V2 | 0° | | 8° | 0° | | 8° |

Figure 8. D²PAK recommended footprint (dimensions are in mm)


3 Ordering information

Table 5. Ordering information

| Order code | Marking | Package | Weight | Base qty. | Delivery mode |
|------------------|-------------|--------------------|--------|-----------|---------------|
| FERD60H100CGY-TR | FD60H100CGY | D ² PAK | 1.38 g | 1000 | Tape and reel |

Revision history

Table 6. Document revision history

| Date | Revision | Changes |
|-------------|----------|---|
| 25-Mar-2021 | 1 | First issue. |
| 06-Apr-2021 | 2 | Updated Features and Applications . |

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