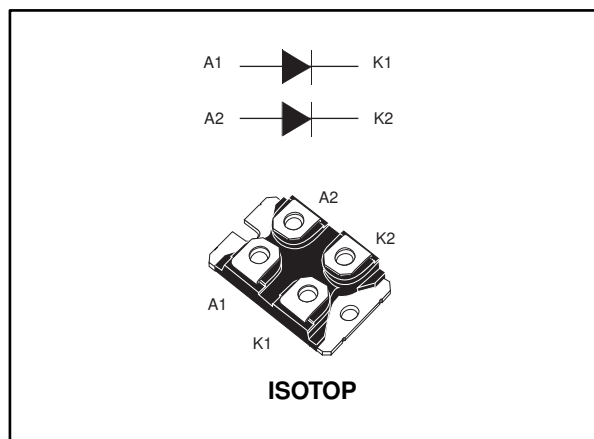


High voltage power Schottky rectifier

Datasheet - production data



Description

High frequency dual Schottky rectifier designed for high frequency telecom, computer SMPS and other power converters.

Packaged in ISOTOP, this device is intended for use in medium voltage operation and in high frequency circuitries where low switching losses and low noise are required.

Table 1: Device summary

| Symbol | Value |
|--------------|----------|
| $I_{F(AV)}$ | 2 x 80 A |
| V_{RRM} | 100 V |
| T_j (max.) | 150 °C |
| V_F (max.) | 0.68 V |

Features

- Negligible switching losses
- High junction temperature capability
- Low leakage current
- Good trade-off between leakage current and forward voltage drop
- Avalanche rated
- Low induction package
- Insulated package ISOTOP:
 - Insulated voltage: 2500 V_{RMS}
 - Capacitance: 45 pF

 TM: ISOTOP is a trademark of STMicroelectronics

1 Characteristics

Table 2: Absolute ratings (limiting values, per diode)

| Symbol | Parameter | | | Value | Unit |
|---------------------|-------------------------------------------------------|-----------------------------------------------------|-------------------------|-------------|------|
| V _{RRM} | Repetitive peak reverse voltage | | | 100 | V |
| I _{F(RMS)} | Forward rms current | | | 180 | A |
| I _{F(AV)} | Average forward current, $\delta = 0.5$ | T _C = 110 °C | Per diode Per device | 80 160 | A |
| I _{FSM} | Surge non repetitive forward current | t _p = 10 ms sinusoidal | | 1000 | A |
| I _{RRM} | Repetitive peak reverse current | t _p = 2 μ s square f = 1 kHz | | 2 | A |
| I _{RSM} | Non repetitive peak reverse current | t _p = 100 μ s square | | 10 | A |
| P _{ARM} | Repetitive peak avalanche power | t _p = 10 μ s T _j = 125 °C | | 5400 | W |
| T _{stg} | Storage temperature range | | | -55 to +150 | °C |
| T _j | Maximum operating junction temperature ⁽¹⁾ | | | 150 | °C |

Notes:

⁽¹⁾(dP_{tot}/dT_j) < (1/R_{th(j-a)}) condition to avoid thermal runaway for a diode on its own heatsink.

Table 3: Thermal parameters

| Symbol | Parameter | | Maximum values | Unit |
|----------------------|------------------|-----------|----------------|------|
| R _{th(j-c)} | Junction to case | Per diode | 0.9 | °C/W |
| | | Total | 0.5 | |
| R _{th(c)} | Coupling | | 0.14 | |

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j (\text{diode1}) = P_{(\text{diode1})} \times R_{\text{th(j-c)}} (\text{per diode}) + P_{(\text{diode2})} \times R_{\text{th(c)}}$$

Table 4: Static electrical characteristics

| Symbol | Parameter | Test conditions | | Min. | Typ. | Max. | Unit |
|-------------|-------------------------|-----------------------|----------------------|------|------|------|---------------|
| $I_R^{(1)}$ | Reverse leakage current | $T_j = 25\text{ °C}$ | $V_R = V_{RRM}$ | - | | 40 | μA |
| | | $T_j = 125\text{ °C}$ | | - | 13 | 50 | mA |
| $V_F^{(2)}$ | Forward voltage drop | $T_j = 25\text{ °C}$ | $I_F = 60\text{ A}$ | - | | 0.75 | V |
| | | $T_j = 125\text{ °C}$ | | - | 0.59 | 0.63 | |
| | | $T_j = 25\text{ °C}$ | $I_F = 80\text{ A}$ | - | | 0.80 | |
| | | $T_j = 125\text{ °C}$ | | - | 0.63 | 0.68 | |
| | | $T_j = 25\text{ °C}$ | $I_F = 120\text{ A}$ | - | | 0.87 | |
| | | $T_j = 125\text{ °C}$ | | - | 0.69 | 0.74 | |
| | | $T_j = 25\text{ °C}$ | $I_F = 160\text{ A}$ | - | | 0.92 | |
| | | $T_j = 125\text{ °C}$ | | - | 0.75 | 0.80 | |

Notes:

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

⁽²⁾Pulse test: $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the maximum conduction losses, use the following equation:

$$P = 0.56 \times I_{F(AV)} + 0.0015 \times I_{F(RMS)}^2$$

1.1 Characteristics (curves)

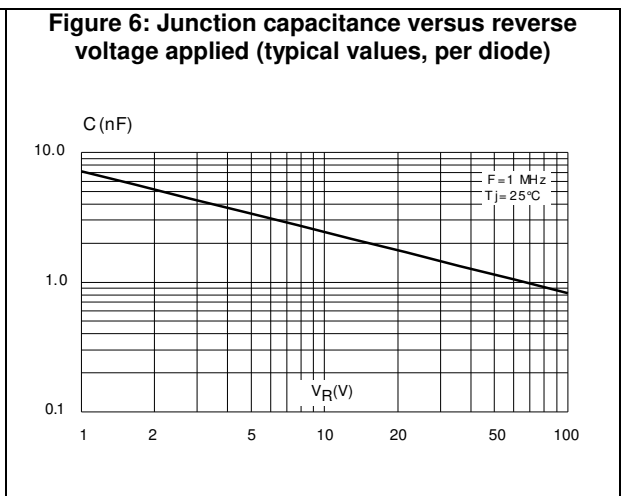
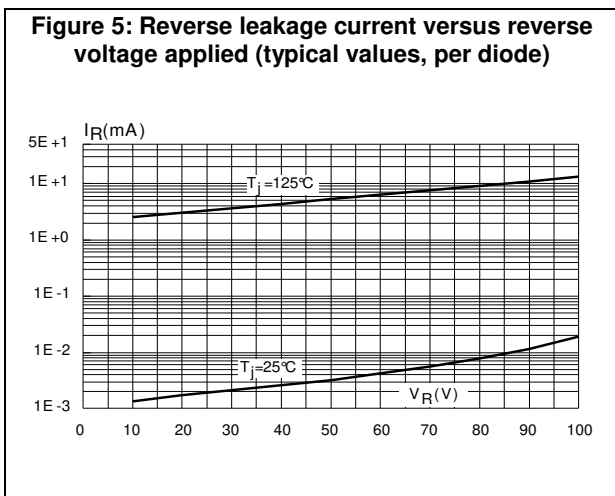
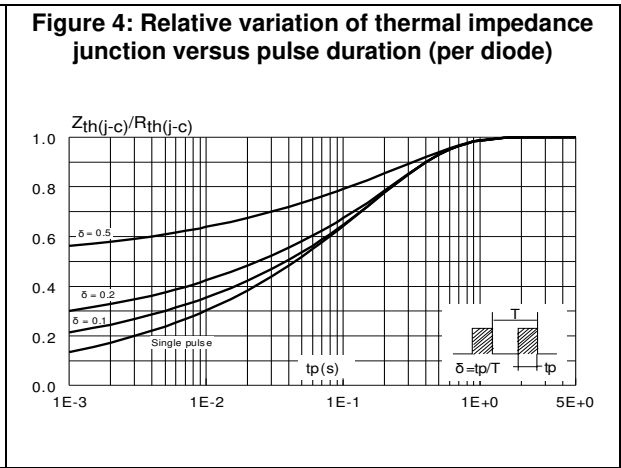
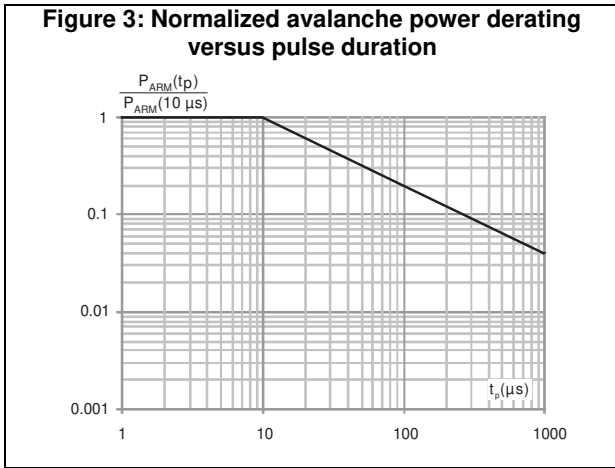
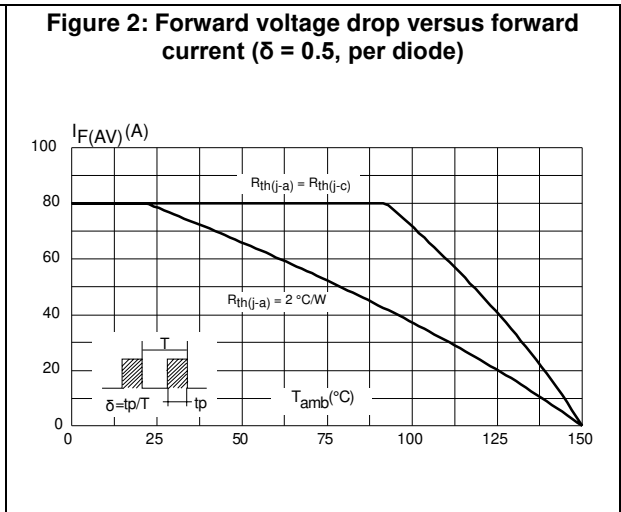
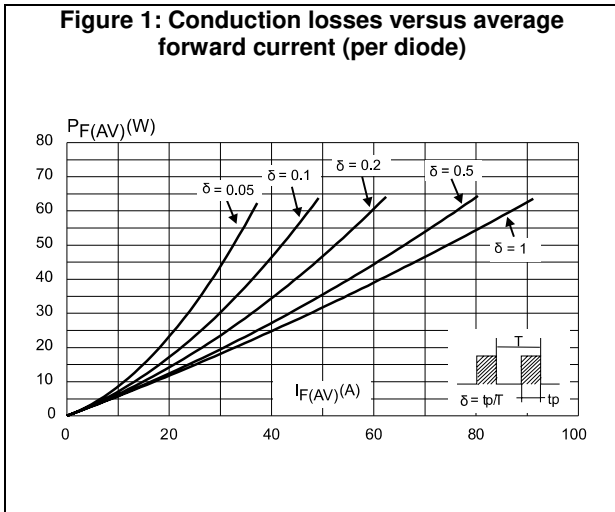
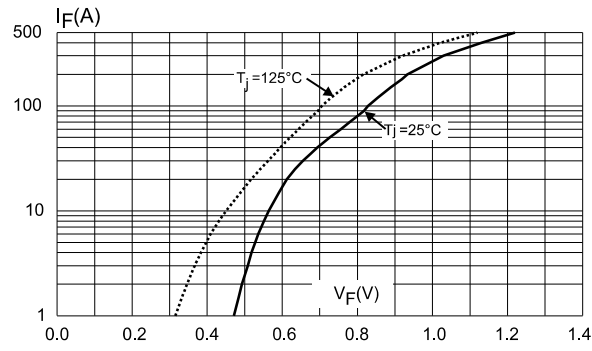


Figure 7: Forward voltage drop versus forward current (maximum values, per diode)



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.

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 1.3 N·m
- Maximum torque value: 1.5 N·m

STMicroelectronics strongly recommends the use of the screws delivered with this product.

The use of any other screws is entirely at the user's own risk and will invalidate the warranty.

2.1 ISOTOP package information

Figure 8: ISOTOP package outline

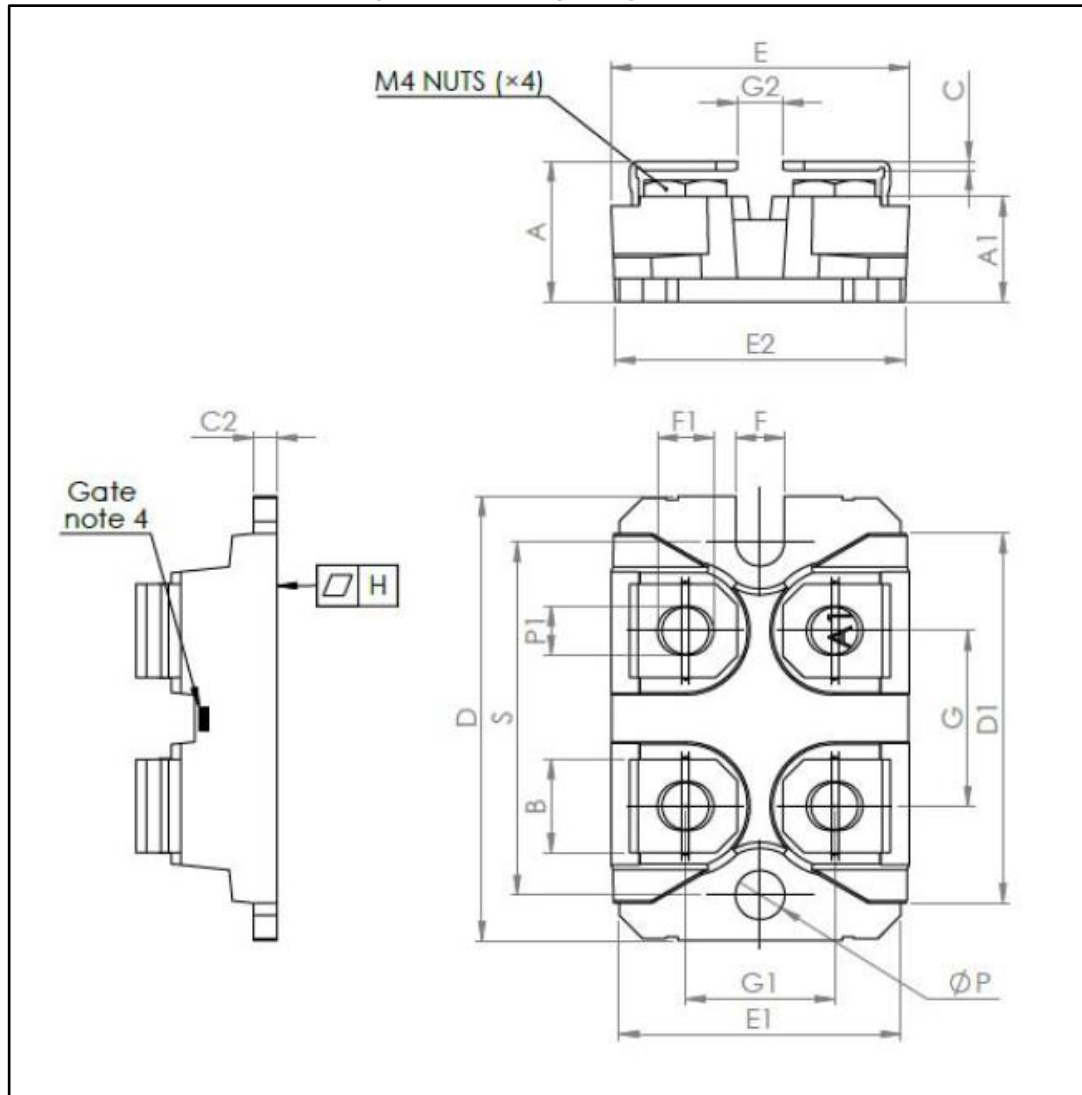


Table 5: ISOTOP package mechanical data

| Ref. | Dimensions | | | |
|--------|-------------|-------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 11.80 | 12.20 | 0.460 | 0.480 |
| A1 | 8.90 | 9.10 | 0.350 | 0.358 |
| B | 7.80 | 8.20 | 0.307 | 0.323 |
| C | 0.75 | 0.85 | 0.030 | 0.033 |
| C2 | 1.95 | 2.05 | 0.077 | 0.081 |
| D | 37.80 | 38.20 | 1.488 | 1.504 |
| D1 | 31.50 | 31.70 | 1.240 | 1.248 |
| E | 25.15 | 25.50 | 0.990 | 1.004 |
| E1 | 23.85 | 24.15 | 0.939 | 0.951 |
| E2 | 24.80 | | 0.976 | |
| G | 14.90 | 15.10 | 0.587 | 0.594 |
| G1 | 12.60 | 12.80 | 0.496 | 0.504 |
| G2 | 3.50 | 4.30 | 0.138 | 0.169 |
| F | 4.10 | 4.30 | 0.161 | 0.169 |
| F1 | 4.60 | 5 | 0.181 | 0.197 |
| H | -0.05 | 0.1 | -0.002 | 0.004 |
| Diam P | 4 | 4.30 | 0.157 | 0.169 |
| P1 | 4 | 4.40 | 0.157 | 0.173 |
| S | 30.10 | 30.30 | 1.185 | 1.193 |

3 Ordering information

Table 6: Ordering information

| Order code | Marking | Package | Weight | Base qty. | Delivery mode |
|---------------|---------------|---------|--------------------------|---------------------|---------------|
| STPS160H100TV | STPS160H100TV | ISOTOP | 27 g (without screws) | 10 (with screws) | Tube |

4 Revision history

Table 7: Document revision history

| Date | Revision | Changes |
|-------------|----------|---------------------------------------------------------------------|
| Jul-2003 | 3a | Last release. |
| 06-Jun-2017 | 4 | Updated Section 2.1: "ISOTOP package information" . |
| 24-Nov-2017 | 5 | Updated Table 5: "ISOTOP package mechanical data" . |

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