

HIGH VOLTAGE ULTRAFAST RECTIFIER
MAIN PRODUCT CHARACTERISTICS

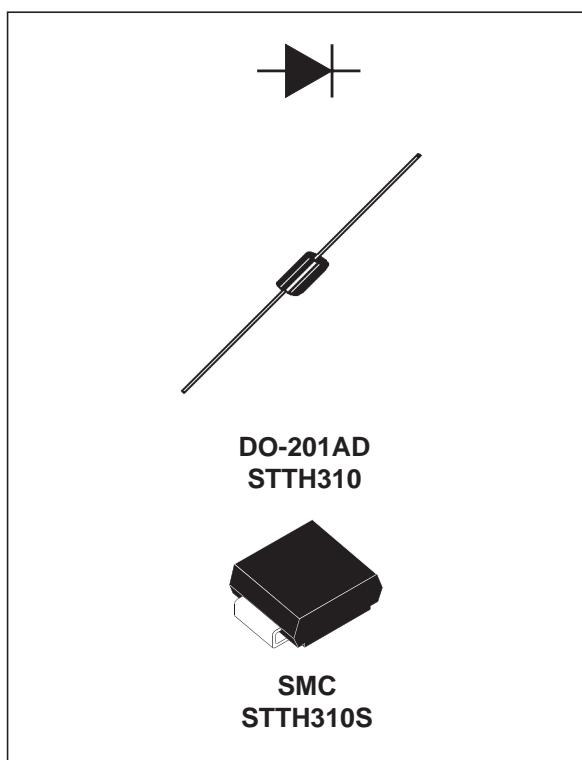
| | |
|----------------------------|---------------|
| I_{F(AV)} | 3 A |
| V_{RRM} | 1000 V |
| T_j (max) | 175 °C |
| V_F (max) | 1.42 V |

FEATURES AND BENEFITS

- Low forward voltage drop
- High reliability
- High surge current capability
- Soft switching for reduced EMI disturbances
- Planar technology

DESCRIPTION

The STTH310, which is using ST ultrafast high voltage planar technology, is specially suited for free-wheeling, clamping, snubbing, demagnetization in power supplies and other power switching applications.


ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit | |
|--------------------|--|-------------------|------------|------|---|
| V _{RRM} | Repetitive peak reverse voltage | | 1000 | V | |
| V _(RMS) | RMS voltage | | 700 | V | |
| I _{F(AV)} | Average forward current | TI = 75°C δ = 0.5 | DO-201AD | 3 | A |
| | | TI = 75°C δ = 0.5 | SMC | 3 | |
| I _{FSM} | Forward surge current t = 8.3 ms | | DO-201AD | 55 | A |
| | | | SMC | 45 | |
| T _{stg} | Storage temperature range | | - 50 + 175 | °C | |
| T _j | Maximum operating junction temperature | | + 175 | °C | |

THERMAL PARAMETERS

| Symbol | Parameter | | | Value | Unit |
|----------------------|---------------------|-----------|----------|-------|------|
| R _{th(j-l)} | Junction to lead | L = 10 mm | DO-201AD | 20 | °C/W |
| | | | SMC | 20 | |
| R _{th(j-a)} | Junction to ambient | L = 10 mm | DO-201AD | 75 | |

STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests conditions | | Min. | Typ. | Max. | Unit |
|----------------|-------------------------|------------------------|------------------------|------|------|------|------|
| I _R | Reverse leakage current | V _R = 1000V | T _j = 25°C | | | 10 | µA |
| | | | T _j = 125°C | | | 50 | |
| V _F | Forward voltage drop | I _F = 3 A | T _j = 25°C | | | 1.7 | V |
| | | | T _j = 150°C | | 0.98 | 1.42 | |

To evaluate the maximum conduction losses use the following equation :
 $P = 1.20 \times I_{F(AV)} + 0.075 \times I_{F(RMS)}^2$

DYNAMIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests conditions | | Min. | Typ. | Max. | Unit |
|-----------------|--------------------------|---|-----------------------|------|------|------|------|
| t _{rr} | Reverse recovery time | I _F = 0.5 A I _{rr} = 0.25 A I _R = 1A | T _j = 25°C | | | 75 | ns |
| t _{fr} | Forward recovery time | I _F = 3 A dI _F /dt = 50 A/µs V _{FR} = 1.1 x V _F max | T _j = 25°C | | | 300 | ns |
| V _{FP} | Forward recovery voltage | | | | | | 12 |

Fig. 1: Conduction losses versus average current.

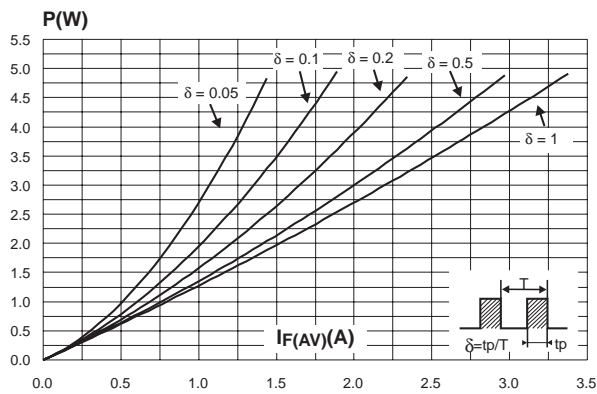


Fig. 2: Forward voltage drop versus forward current.

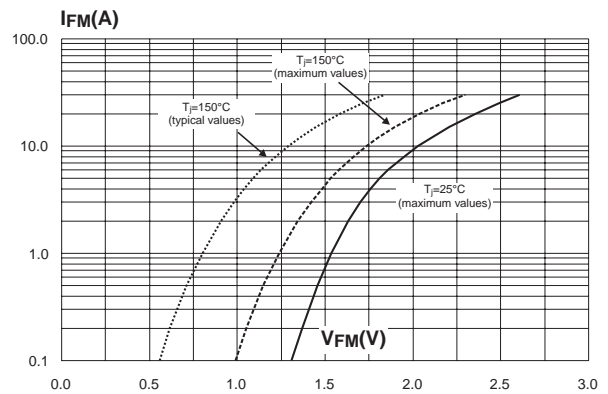


Fig. 3-1: Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4, $L_{leads} = 10\text{mm}$) (DO-201AD).

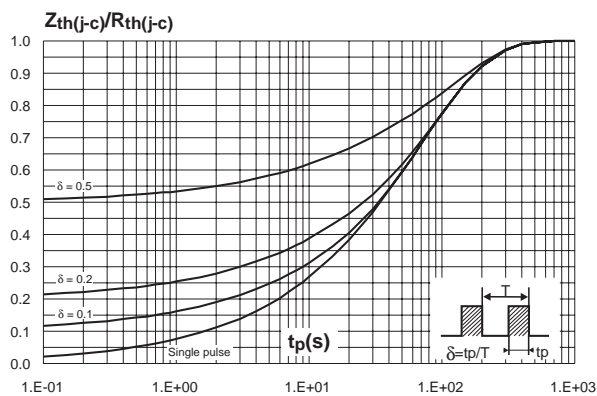


Fig. 3-2: Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4, $S=1\text{cm}^2$) (SMC).

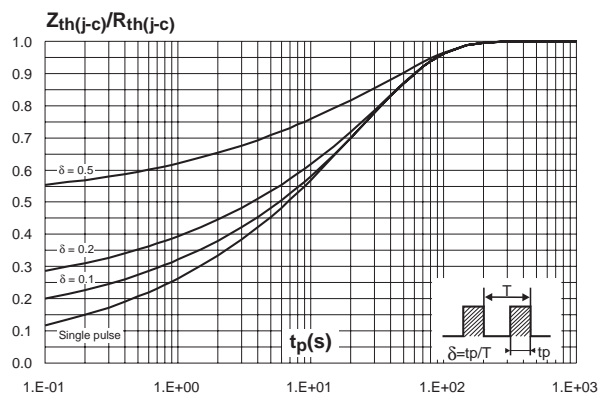
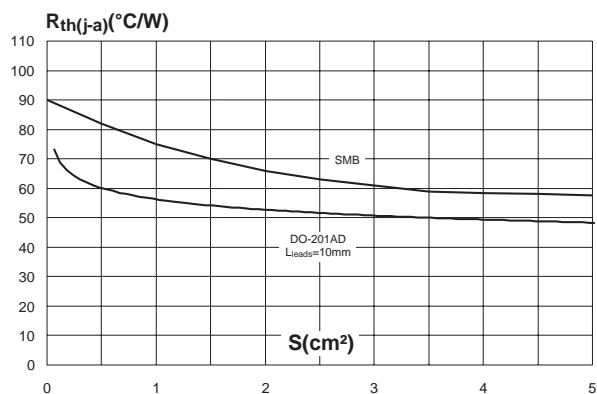
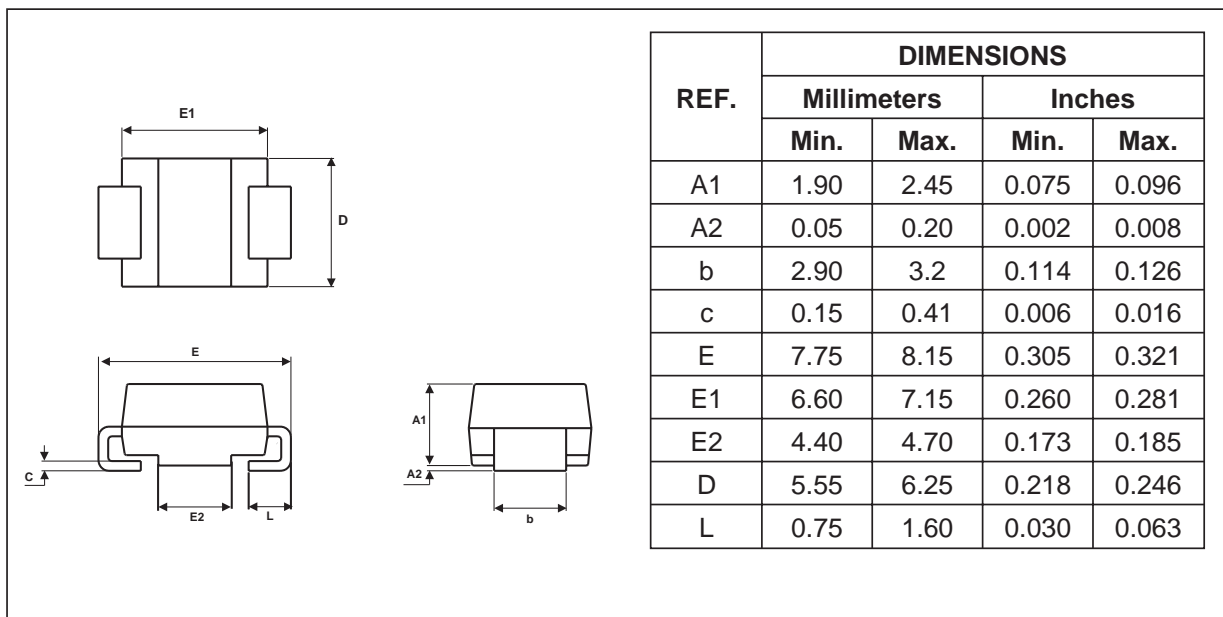


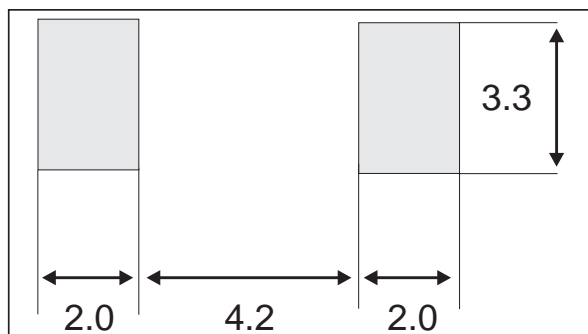
Fig. 4: Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed circuit board FR4, copper thickness: $35\mu\text{m}$).

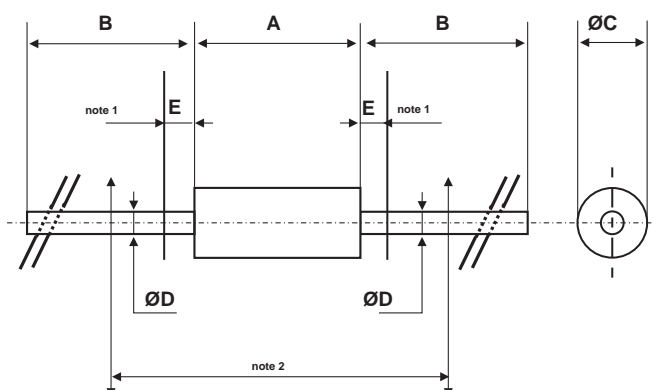


PACKAGE MECHANICAL DATA
SMC



FOOTPRINT (in millimeters)



PACKAGE MECHANICAL DATA
 DO-201AD


| REF. | DIMENSIONS | | | | NOTES |
|------|-------------|------|--------|-------|---|
| | Millimeters | | Inches | | |
| | Min. | Max. | Min. | Max. | |
| A | | 9.50 | | 0.374 | 1 - The lead diameter $\varnothing D$ is not controlled over zone E 2 - The minimum length which must stay straight between the right angles after bending is 0.59"(15 mm) |
| B | 25.40 | | 1.000 | | |
| C | | 5.30 | | 0.209 | |
| D | | 1.30 | | 0.051 | |
| E | | 1.25 | | 0.049 | |

| Ordering code | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|---------|----------|---------|----------|---------------|
| STTH310 | STTH310 | DO-201AD | 1.12 g | 600 | Ammopack |
| STTH310S | S10 | SMC | 0.245 g | 2500 | Tape & reel |
| STTH310RL | STTH310 | DO-201AD | 1.12 g | 1900 | Tape & reel |

- Epoxy meets UL 94,V0

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