

HIGH EFFICIENCY ULTRAFAST DIODE

MAIN PRODUCT CHARACTERISTICS

| | |
|----------------------------|---------------|
| I_{F(AV)} | 3A |
| V_{RRM} | 200 V |
| T_j (max) | 175 °C |
| V_F (max) | 0.75 V |
| trr (max) | 35 ns |

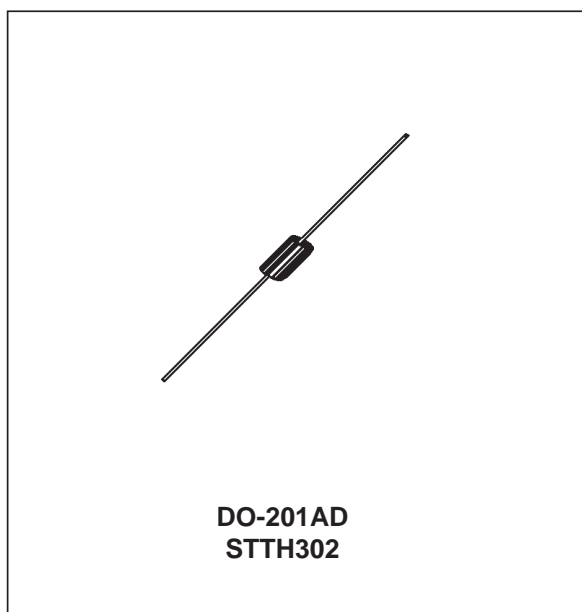
FEATURES AND BENEFITS

- Very low conduction losses
- Negligible switching losses
- Low forward and reverse recovery times
- High junction temperature

DESCRIPTION

The STTH302 which is using ST's new 200V planar technology, is specially suited for switching mode base drive & transistor circuits.

The device is also intended for use as a free wheeling diode in power supplies and other power switching applications.



ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|--------------------|--|-------------------------------------|---------------|------|
| V _{RRM} | Repetitive peak reverse voltage | | 200 | V |
| I _{F(AV)} | Average forward current | T _I = 107°C δ = 0.5 | 3 | A |
| I _{FSM} | Surge non repetitive forward current | t _p = 10ms Sinusoidal | 130 | A |
| T _{stg} | Storage temperature range | | - 65 to + 175 | °C |
| T _j | Maximum operating junction temperature | | 175 | °C |

THERMAL PARAMETERS

| Symbol | Parameter | Value | Unit |
|----------------------|-------------------|-------|------|
| R _{th(j-a)} | Junction-ambient* | 25 | °C/W |

* On infinite heatsink with 10mm lead length.

STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Test Conditions | | Min. | Typ. | Max. | Unit |
|------------------------------|-------------------------|------------------------|------------------------------------|------|------|------|------|
| I _R [*] | Reverse leakage current | T _j = 25°C | V _R = V _R RM | | | 3 | μA |
| | | T _j = 125°C | | | 4 | 75 | |
| V _F ^{**} | Forward voltage drop | T _j = 25°C | I _F = 3A | | | 0.95 | V |
| | | T _j = 125°C | | | 0.66 | 0.75 | |

Pulse test : * tp = 5 ms, δ < 2 %

** tp = 380 μs, δ < 2 %

To evaluate the maximum conduction losses use the following equations:

$$P = 0.60 \times I_{F(AV)} + 0.05 I_{F(RMS)}^2$$

DYNAMIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Test conditions | | Min. | Typ. | Max. | Unit |
|-----------------|--------------------------|--|-----------------------|------|------|------|------|
| trr | Reverse recovery time | I _F = 1A dI _F /dt = - 50A/μs V _R = 30V | T _j = 25°C | | | 35 | ns |
| tfr | Forward recovery time | I _F = 3A dI _F /dt = 50A/μs V _{FR} = 1.1 x V _F max | T _j = 25°C | | 70 | | ns |
| V _{FP} | Forward recovery voltage | | T _j = 25°C | | 1.6 | | V |

Fig. 1: Average forward power dissipation versus average forward current.

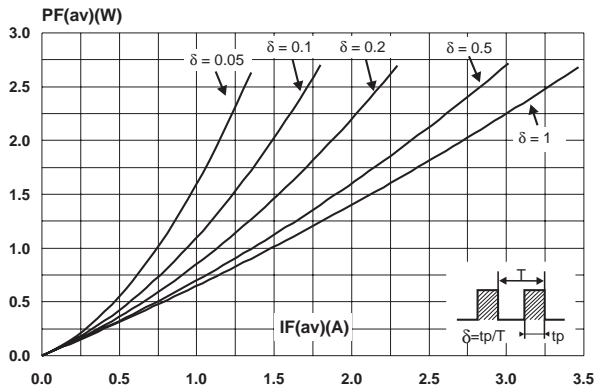


Fig. 2: Average forward current versus ambient temperature ($\delta=0.5$).

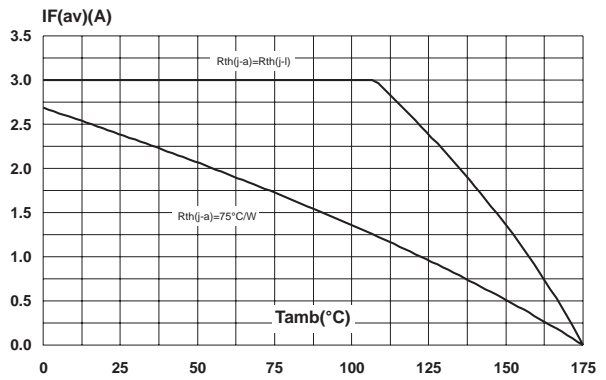


Fig. 3: Thermal resistance versus lead length.

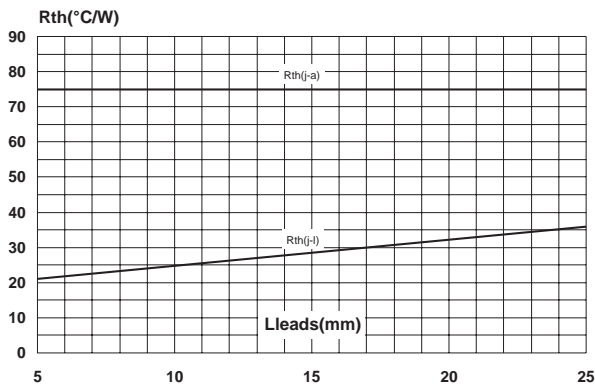


Fig. 4: Relative variation of thermal impedance junction ambient versus pulse duration (printed circuit board epoxy FR4, Leads = 10mm).

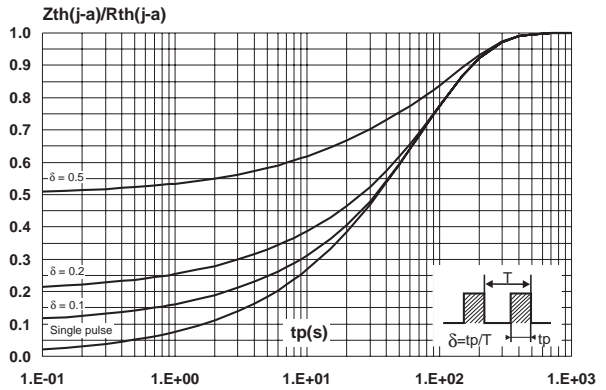


Fig. 5: Forward voltage drop versus forward current.

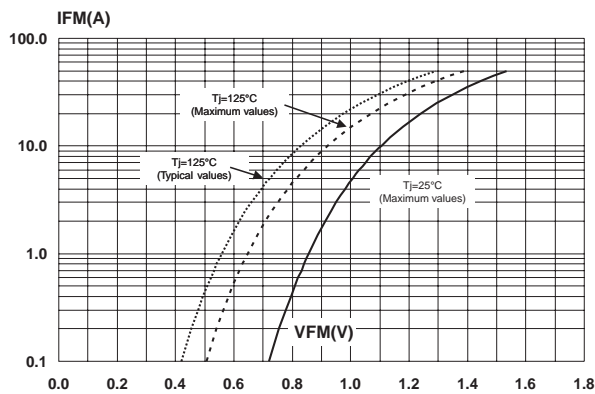


Fig. 6: Junction capacitance versus reverse voltage applied (typical values).

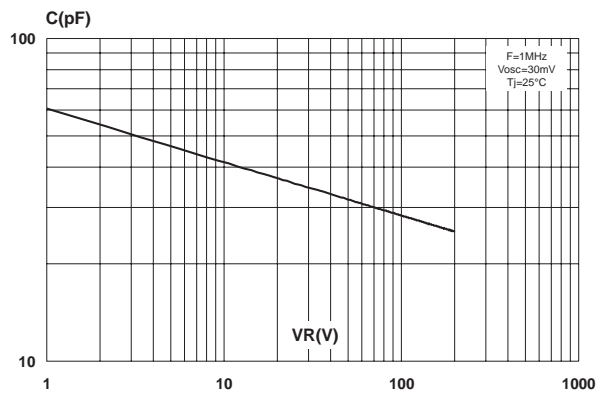


Fig. 7: Reverse recovery time versus di_F/dt (90% confidence).

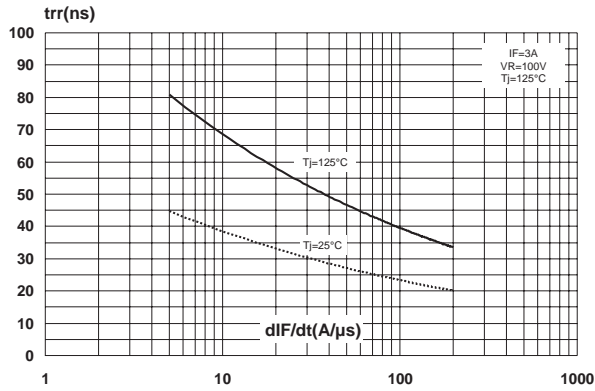


Fig. 8: Peak reverse recovery current versus di_F/dt (90% confidence).

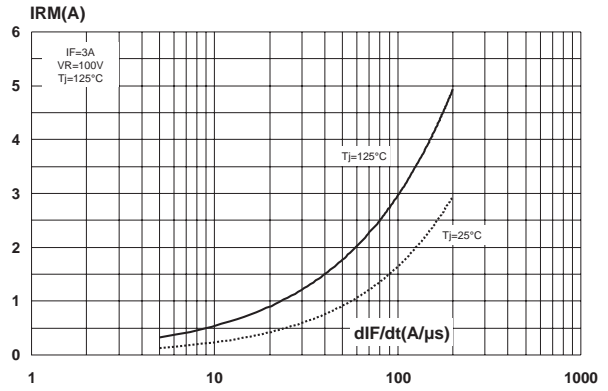
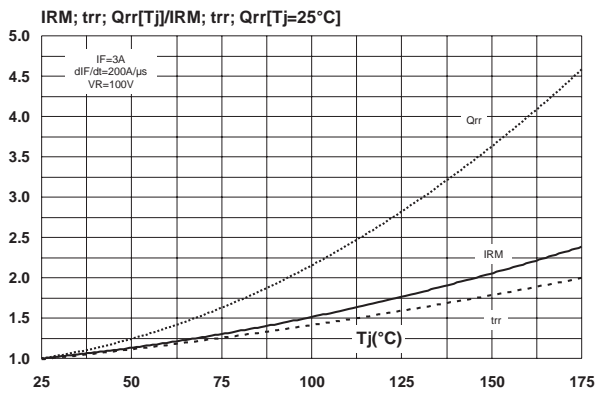
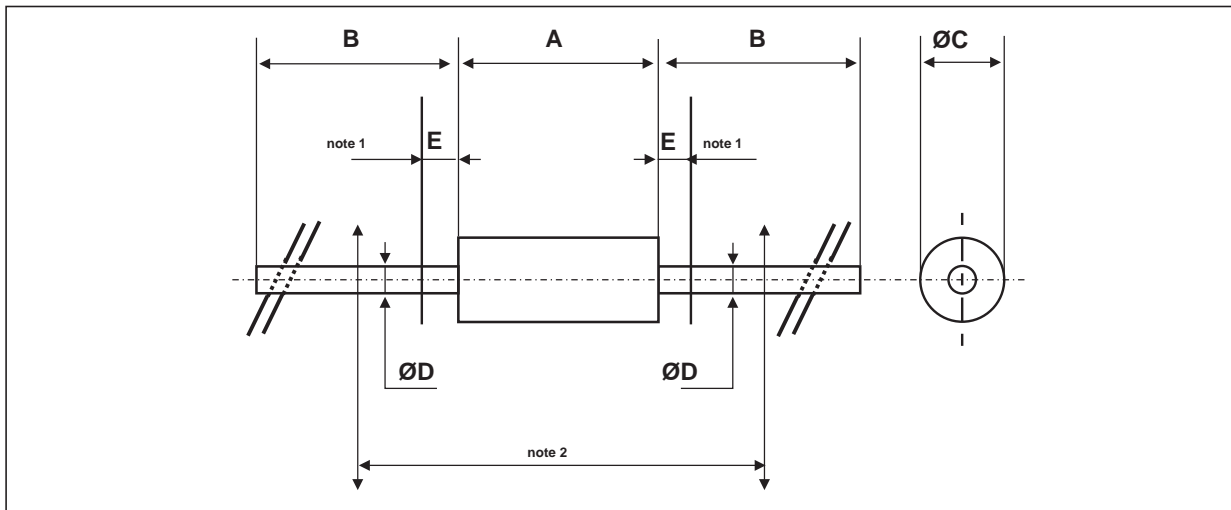


Fig. 9: Relative variations of dynamic parameters versus junction temperature.



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 axial length within which the device may be placed with its leads bent at right angles is 0.59" (15 mm) |
| B | 25.40 | | 1.000 | | |
| $\varnothing C$ | | 5.30 | | 0.209 | |
| $\varnothing D$ | | 1.30 | | 0.051 | |
| E | | 1.25 | | 0.049 | |

| Ordering code | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|---------|----------|--------|----------|---------------|
| STTH302 | STTH302 | DO-201AD | 1.16 g | 600 | Ammopack |
| STTH302RL | STTH302 | DO-201AD | 1.16 g | 1900 | Tape and reel |

- White band indicates cathode
- Epoxy meets UL94,V0

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