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HIGH EFFICIENCY ULTRAFAST DIODE

MAIN PRODUCT CHARACTERISTICS

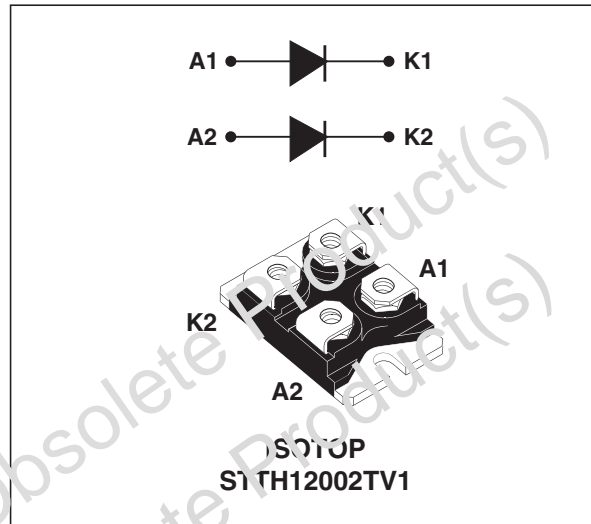
| | |
|----------------|----------|
| $I_{F(AV)}$ | 2 x 60 A |
| V_{RRM} | 200 V |
| T_j (max) | 150 °C |
| V_F (typ) | 0.73 V |
| t_{rr} (typ) | 35 ns |

FEATURES AND BENEFITS

- Suited for welding and high power equipment
- Very low forward losses
- Low recovery times
- High surge current capability
- Insulated:
Insulating voltage = 2500 V_{RMS}
Capacitance < 45 pF
- Low leakage current

DESCRIPTION

Dual center tap rectifier suited for welding equipment and high power industrial application. Packaged in ISOTOP, this device is intended for use in the secondary rectification of power converters.



ABSOLUTE RATINGS (limiting values, per diode)

| Symbol | Parameter | | Value | Unit |
|--------------|--|-------------------------------------|------------|------|
| V_{RRM} | Repetitive peak reverse voltage | | 200 | V |
| $I_{F(RMS)}$ | RMS forward current | Per diode | 100 | A |
| $I_{F(AV)}$ | Average forward current $\delta = 0.5$ | $T_c = 105^\circ\text{C}$ Per diode | 60 | A |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10$ ms Sinusoidal per diode | 700 | A |
| T_{stg} | Storage temperature range | | - 55 + 150 | °C |
| T_j | Maximum operating junction temperature | | 150 | °C |

STTH12002TV

THERMAL PARAMETERS

| Symbol | Parameter | Maximum | Unit |
|----------------------|------------------|------------|------|
| R _{th(j-c)} | Junction to case | Per diode | 0.76 |
| | | Per device | 0.43 |
| R _{th(j-c)} | Coupling | 0.1 | °C/W |

When the diodes 1 and 2 are used simultaneously:

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

STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests conditions | Min. | Typ. | Max. | Unit | | |
|-------------------|-------------------------|------------------------|-----------------------|------|------------------------|------|------|------|
| I _R * | Reverse leakage current | T _j = 25°C | | | 50 | μA | | |
| | | T _j = 125°C | | | 50 | | 500 | |
| V _F ** | Forward voltage drop | T _j = 25°C | i _F = 60 A | | 1.05 | V | | |
| | | T _j = 25°C | | | I _F = 120 A | | 1.15 | |
| | | T _j = 150°C | | | I _F = 60 A | | 0.73 | 0.82 |
| | | T _j = 150°C | | | I _F = 120 A | | | 0.98 |

Pulse test: * tp = 5ms, δ < 1%

** tp = 390μs, δ < 2%

To evaluate the maximum conduction losses use the following equation :

$$P = 0.56 \times I_{F(AV)} + 0.00266 I_{F(RMS)}^2$$

DYNAMIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests conditions | Min. | Typ. | Max. | Unit |
|-----------------|--------------------------|--|------|------|------|------|
| t _{rr} | Reverse recovery time | T _j = 25°C I _F = 1 A V _R = 30V di _F /dt = 200 A/μs | | 35 | 43 | ns |
| I _{RM} | Reverse recovery current | T _j = 125°C I _F = 60 A V _R = 160V di _F /dt = 200 A/μs | | 10.4 | 13.5 | A |
| t _{fr} | Forward recovery time | T _j = 25°C I _F = 60 A di _F /dt = 200 A/μs V _{FR} = 1.1 x V _{Fmax} | | | 560 | ns |
| V _{FP} | Forward recovery voltage | T _j = 25°C I _F = 60 A di _F /dt = 200 A/μs | | 2.5 | | V |

Fig. 1: Peak current versus duty cycle (per diode).

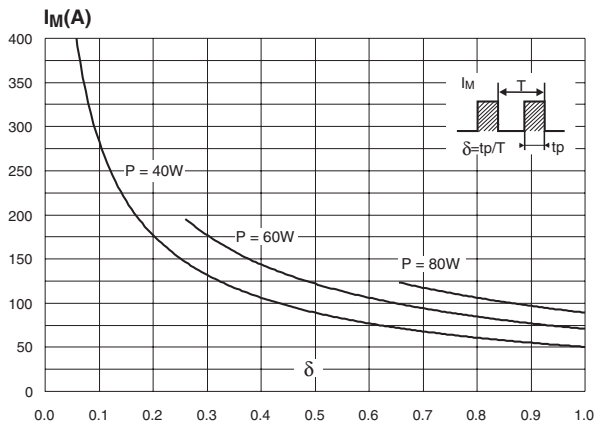


Fig. 2-1: Forward voltage drop versus forward current (typical values, per diode).

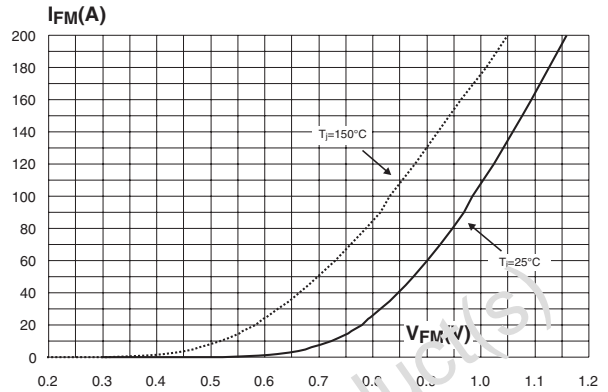


Fig. 2-2: Forward voltage drop versus forward current (maximum values, per diode).

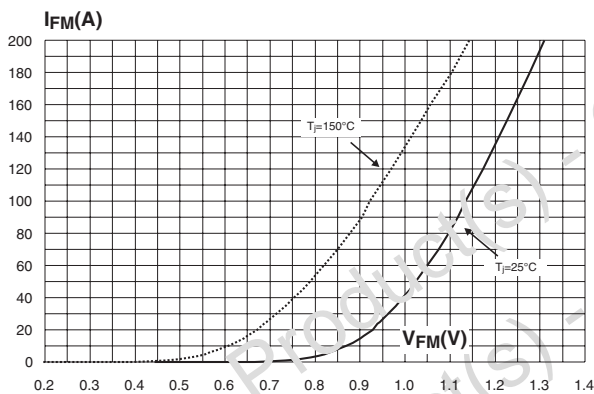


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

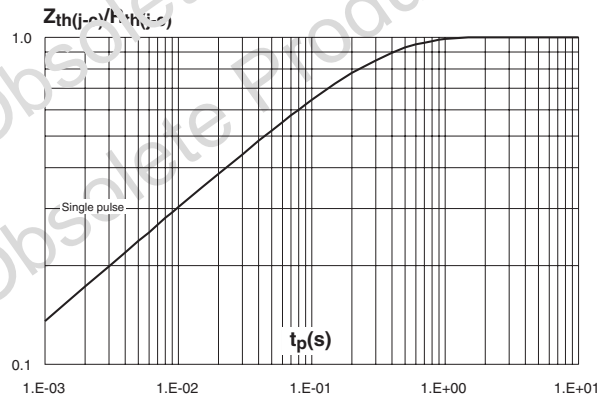


Fig. 4: Junction capacitance versus reverse voltage applied (typical values, per diode).

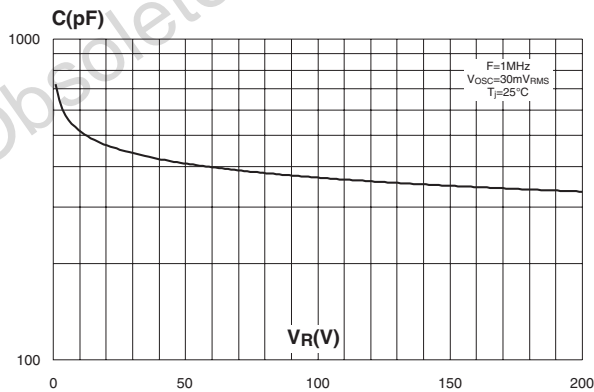


Fig. 5: Reverse recovery charges versus di_F/dt (typical values, per diode).

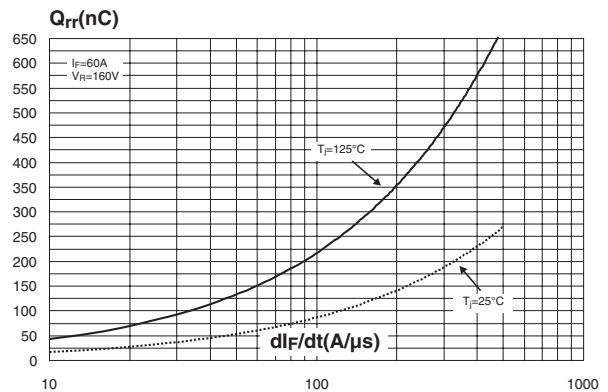


Fig. 6: Reverse recovery time versus di_F/dt (typical values, per diode).

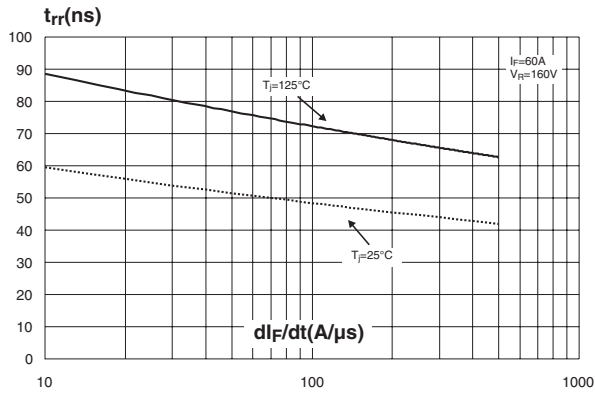


Fig. 7: Peak reverse recovery current versus di_F/dt (typical values, per diode).

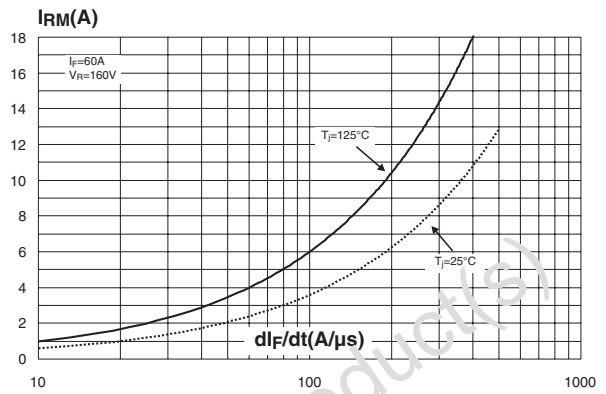
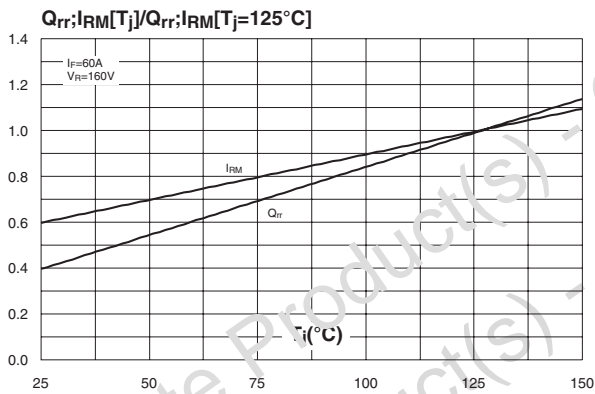


Fig. 8: Dynamic parameters versus junction temperature.



PACKAGE MECHANICAL DATA
ISOTOP

| REF. | DIMENSIONS | | | |
|------|-------------|-------|------------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 11.80 | 12.20 | 0.465 | 0.480 |
| A1 | 8.90 | 9.10 | 0.350 | 0.358 |
| B | 7.8 | 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 typ. | | 0.976 typ. | |
| G | 11.00 | 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 | 5.00 | 0.181 | 0.197 |
| P | 4.00 | 4.30 | 0.157 | 0.69 |

| Ordering code | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|--------------|---------|--------------------------|---------------------|---------------|
| STTH12002TV1 | STTH12002TV1 | ISOTOP | 27 g (without screws) | 10 (with screws) | Tube |

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