

HIGH FREQUENCY SECONDARY RECTIFIERS

MAJOR PRODUCTS CHARACTERISTICS

| | |
|----------------------|---------------|
| $I_{F(AV)}$ | 2x40 A |
| V_{RRM} | 300 V |
| $V_F(\text{max})$ | 1 V |
| $t_{rr}(\text{max})$ | 60 ns |

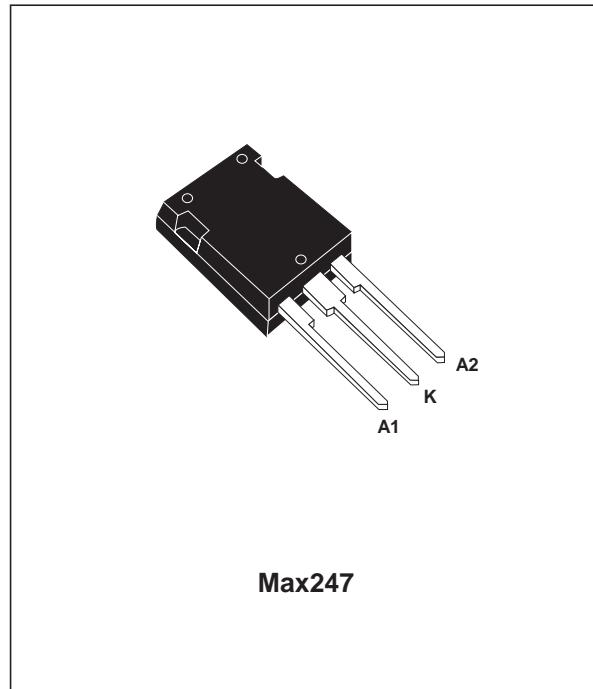
FEATURES AND BENEFITS

- COMBINES HIGHEST RECOVERY AND VOLTAGE PERFORMANCE.
- ULTRA-FAST, SOFT AND NOISE-FREE RECOVERY.
- HIGH OPERATING TEMPERATURE THANKS TO LOW LEAKAGE CURRENT.

DESCRIPTION

Dual rectifiers suited for Switch Mode Power Supply and high frequency DC to DC converters.

Packaged in Max247, this device is intended for use in low voltage, high frequency inverters, free wheeling operation, welding equipment and telecom power supplies.



ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | | Value | Unit |
|--------------|--|---|------------------------------------|----------|------------------|
| V_{RRM} | Repetitive peak reverse voltage | | | 300 | V |
| $I_{F(RMS)}$ | RMS forward current | | | 50 | A |
| $I_{F(AV)}$ | Average forward current | $T_c = 105^\circ\text{C}$ $\delta = 0.5$ | Per diode Per device | 40 80 | A |
| I_{FSM} | Surge non repetitive forward current | | $t_p = 10\text{ ms}$ sinusoidal | 400 | A |
| I_{RSM} | Non repetitive avalanche current | | $t_p = 100\ \mu\text{s}$ square | 4 | A |
| T_{stg} | Storage temperature range | | | -55 +175 | $^\circ\text{C}$ |
| T_j | Maximum operating junction temperature | | | + 175 | $^\circ\text{C}$ |

STTH8003CY

THERMAL RESISTANCES

| Symbol | Parameter | | Value | Unit |
|----------------------|-------------------------------------|-----------|-------|------|
| R _{th(j-c)} | Junction to case thermal resistance | Per diode | 0.8 | °C/W |
| | | Total | 0.5 | |
| R _{th(c)} | | Coupling | 0.2 | °C/W |

STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests Conditions | | Min. | Typ. | Max. | Unit |
|-------------------|-------------------------|------------------------|------------------------|------|------|------|------|
| I _R * | Reverse leakage current | V _R = 300 V | T _j = 25°C | | | 80 | μA |
| | | | T _j = 125°C | | 80 | 800 | |
| V _F ** | Forward voltage drop | I _F = 40 A | T _j = 25°C | | | 1.25 | V |
| | | | T _j = 125°C | | 0.85 | 1 | |

Pulse test : * t_p = 5 ms, δ < 2 %

** t_p = 380 μs, δ < 2%

To evaluate the maximum conduction losses use the following equation :

$$P = 0.75 \times I_{F(AV)} + 0.0062 I_{F(RMS)}^2$$

DYNAMIC ELECTRICAL CHARACTERISTICS

| Symbol | Tests Conditions | | | Min. | Typ. | Max. | Unit |
|---------------------|---|---------------------------------|---------------------------------|------------------------|------|------|------|
| trr | I _F = 0.5 A | I _{rr} = 0.25 A | I _R = 1 A | T _j = 25°C | | 50 | ns |
| | I _F = 1 A | dI _F /dt = - 50 A/μs | V _R = 30 V | | | 60 | |
| I _{RM} | V _{CC} = 200 V | I _F = 40 A | dI _F /dt = -200 A/μs | T _j = 125°C | | 13 | A |
| S _{factor} | | | | | 0.3 | | - |
| tfr | I _F = 40 A dI _F /dt = 200 A/μs, V _{FR} = 1.1 x V _F max | | | T _j = 25°C | | 450 | ns |
| V _{FP} | | | | | | 5 | V |

Fig. 1: Conduction losses versus average current (per diode)

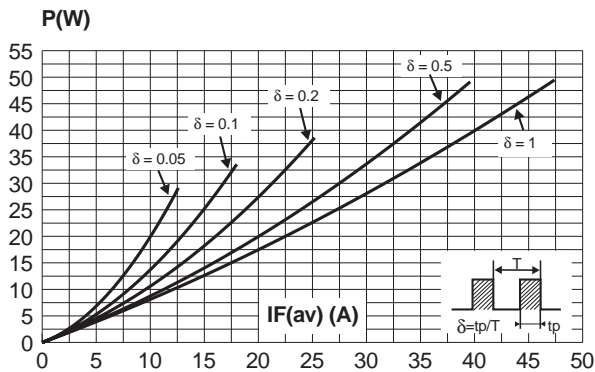


Fig. 2: Forward voltage drop versus forward current (per diode)

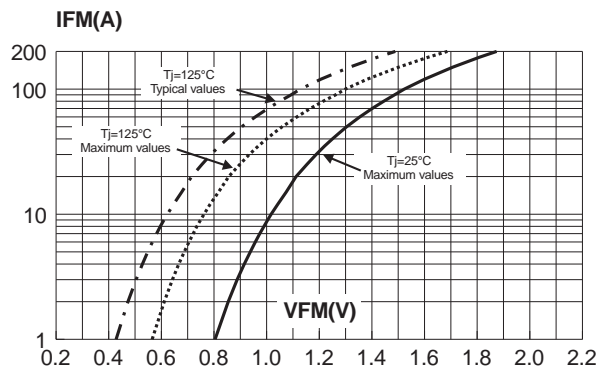


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration

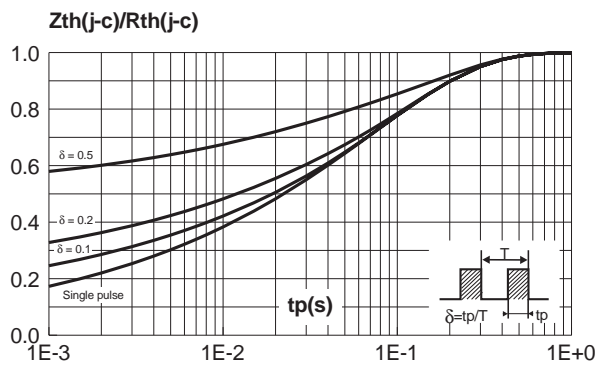


Fig. 4: Peak reverse recovery current versus dIF/dt (90% confidence, per diode)

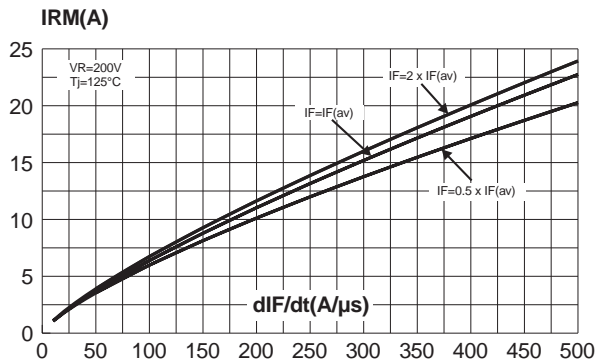


Fig. 5: Reverse recovery time versus dIF/dt (90% confidence, per diode)

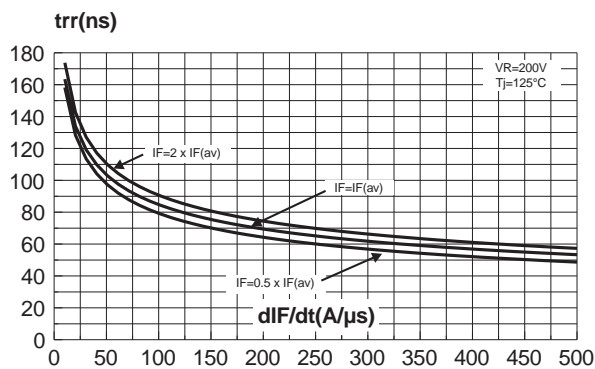


Fig. 6: Softness factor (tb/ta) versus dIF/dt (typical values, per diode)

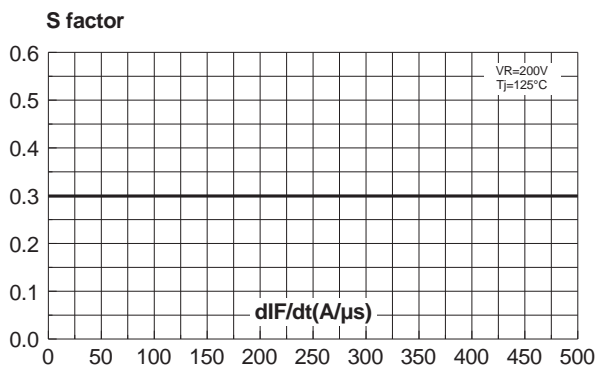


Fig. 7: Relative variation of dynamic parameters versus junction temperature (Reference: $T_j = 125^\circ\text{C}$)

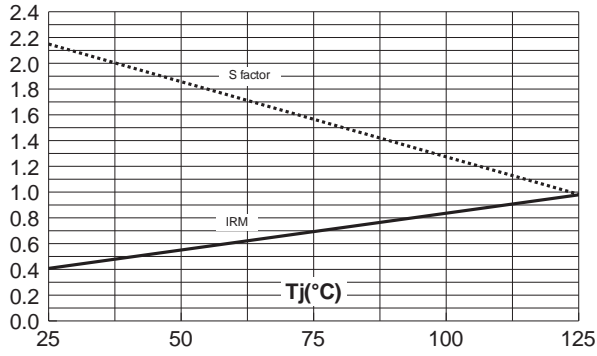


Fig. 8: Transient peak forward voltage versus dI_F/dt (90% confidence, per diode)

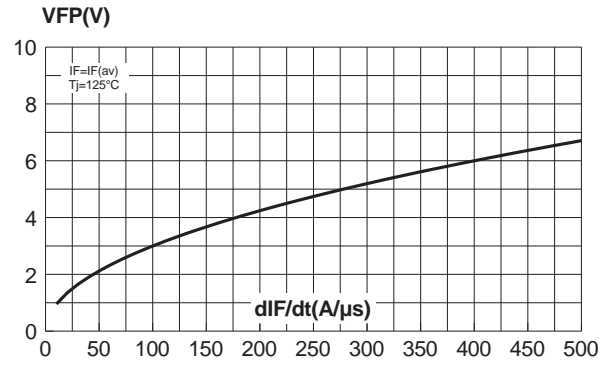
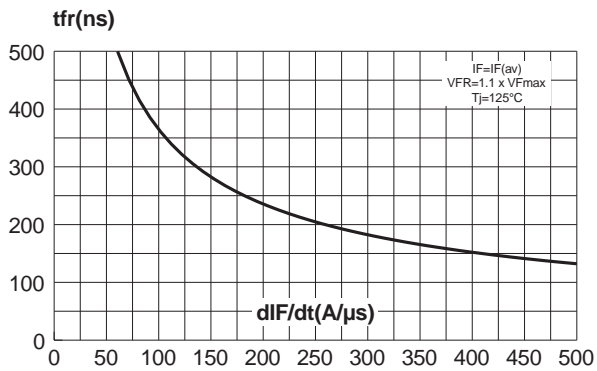
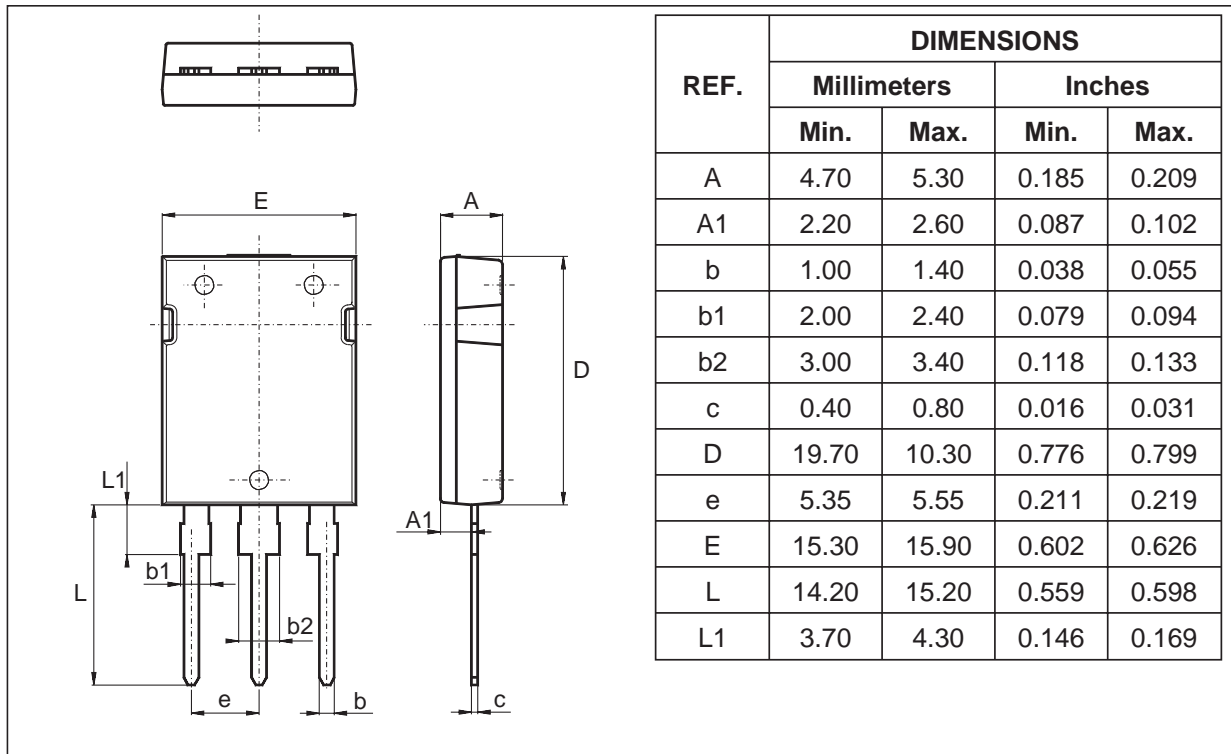


Fig. 9: Forward recovery time versus dI_F/dt (90% confidence, per diode)



PACKAGE MECHANICAL DATA
 Max247


| Ordering code | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|------------|---------|--------|----------|---------------|
| STTH8003CY | STTH8003CY | Max247 | 4.4 g. | 30 | Tube |

- Cooling method: C
- Epoxy meets UL94,V0

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