

## HIGH FREQUENCY SECONDARY RECTIFIERS

### MAJOR PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	<b>2x40 A</b>
$V_{RRM}$	<b>300 V</b>
$V_F(max)$	<b>1 V</b>
$t_{rr}(max)$	<b>60 ns</b>

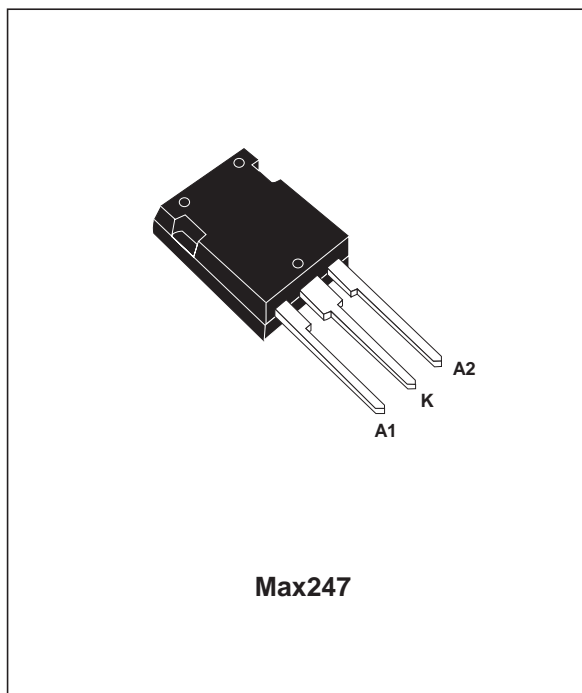
### FEATURES AND BENEFITS

- 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		$t_p = 100\text{ }\mu\text{s}$ 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 Total	0.8 0.5	°C/W
$R_{th(c)}$		Coupling	0.2	°C/W

### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
$I_R^*$	Reverse leakage current	$V_R = 300\text{ V}$	$T_j = 25^\circ\text{C}$			80	$\mu\text{A}$
			$T_j = 125^\circ\text{C}$		80	800	
$V_F^{**}$	Forward voltage drop	$I_F = 40\text{ A}$	$T_j = 25^\circ\text{C}$			1.25	V
			$T_j = 125^\circ\text{C}$		0.85	1	

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

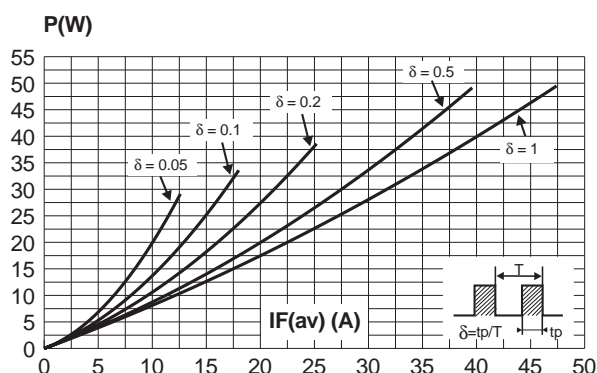
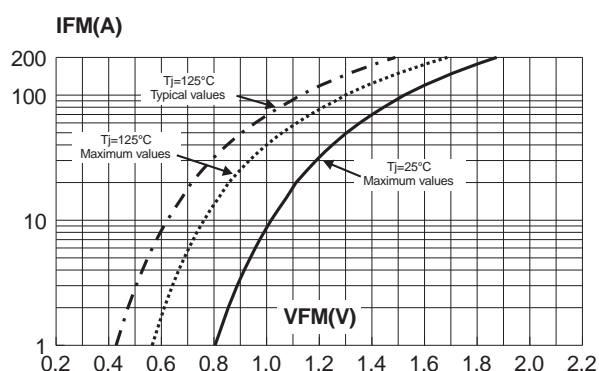
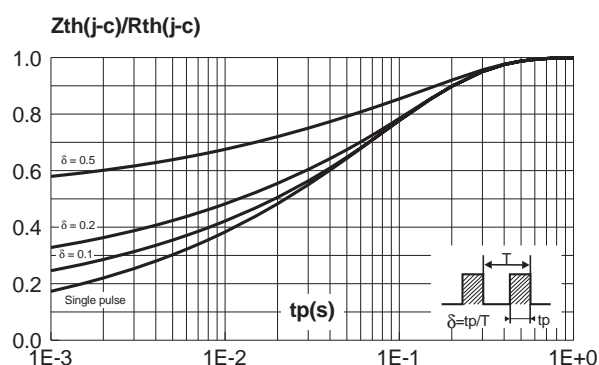
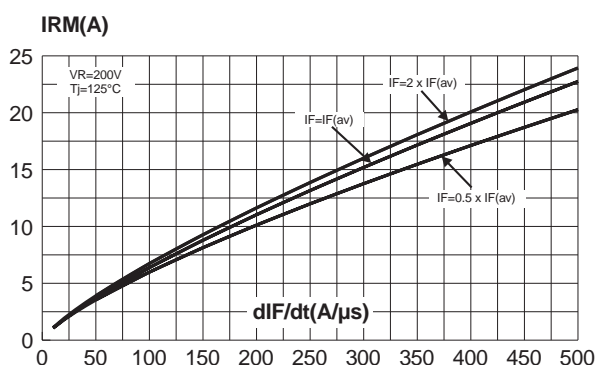
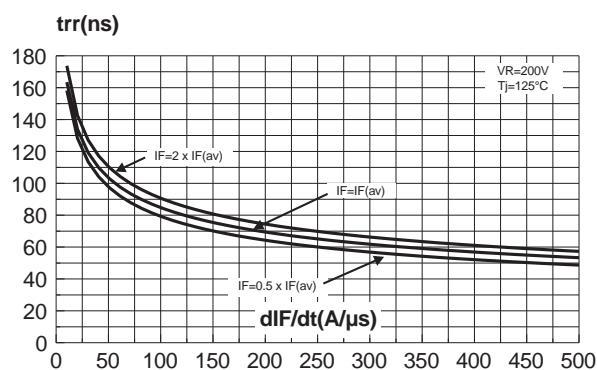
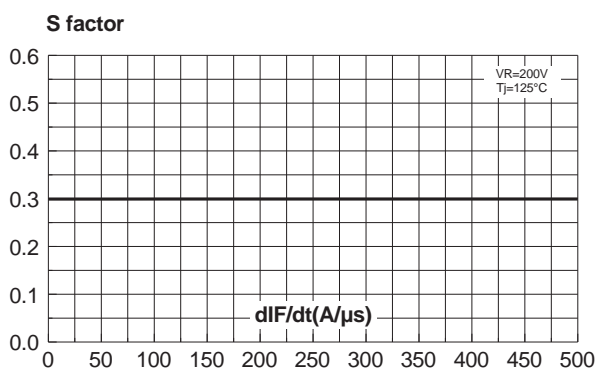
\*\*  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

To evaluate the maximum conduction losses use the following equation :

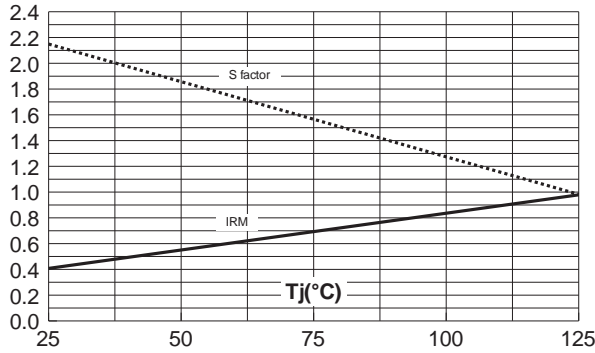
$$P = 0.75 \times I_{F(AV)} + 0.0062 I_{F(RMS)}^2$$

### DYNAMIC ELECTRICAL CHARACTERISTICS

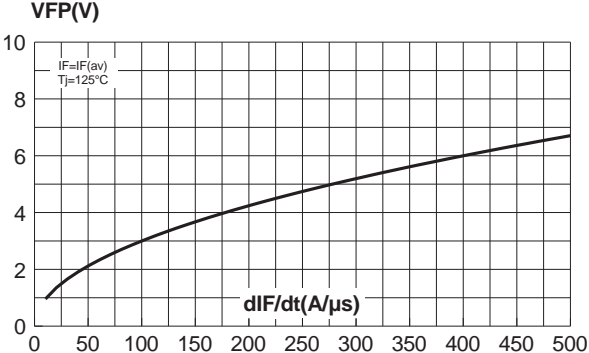
Symbol	Tests Conditions			Min.	Typ.	Max.	Unit
trr	$I_F = 0.5\text{ A}$	$I_{rr} = 0.25\text{ A}$	$I_R = 1\text{ A}$	$T_j = 25^\circ\text{C}$		50	ns
	$I_F = 1\text{ A}$	$dI_F/dt = -50\text{ A}/\mu\text{s}$	$V_R = 30\text{ V}$			60	
$I_{RM}$	$V_{CC} = 200\text{ V}$ $I_F = 40\text{ A}$ $dI_F/dt = -200\text{ A}/\mu\text{s}$			$T_j = 125^\circ\text{C}$		13	A
$S_{factor}$					0.3		-
tfr	$I_F = 40\text{ A}$ $dI_F/dt = 200\text{ A}/\mu\text{s}$ , $V_{FR} = 1.1 \times V_F \text{ max}$			$T_j = 25^\circ\text{C}$		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  $dI_F/dt$  (90% confidence, per diode)**Fig. 5:** Reverse recovery time versus  $dI_F/dt$  (90% confidence, per diode)**Fig. 6:** Softness factor ( $t_b/t_a$ ) versus  $dI_F/dt$  (typical values, per diode)

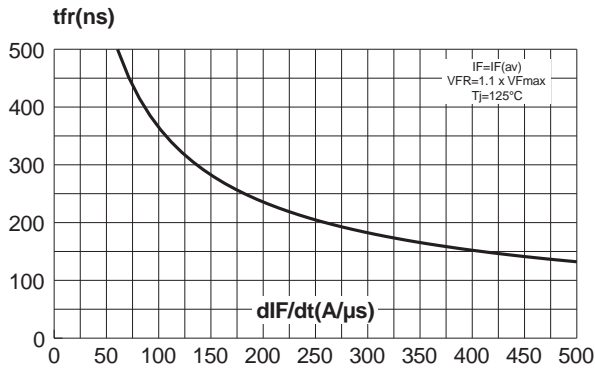
**Fig. 7:** Relative variation of dynamic parameters versus junction temperature (Reference:  $T_j = 125^\circ\text{C}$ )



**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

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.70	5.30	0.185	0.209
A1	2.20	2.60	0.087	0.102
b	1.00	1.40	0.038	0.055
b1	2.00	2.40	0.079	0.094
b2	3.00	3.40	0.118	0.133
c	0.40	0.80	0.016	0.031
D	19.70	10.30	0.776	0.799
e	5.35	5.55	0.211	0.219
E	15.30	15.90	0.602	0.626
L	14.20	15.20	0.559	0.598
L1	3.70	4.30	0.146	0.169

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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