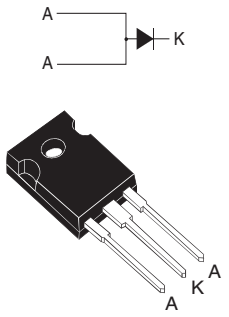
STTH60P03S

ULTRAFAST RECTIFIER PDP ENERGY RECOVERY

Table 1: Main Product Characteristics

$I_{F(AV)}$	60 A
V_{RRM}	300 V
V_{FP} (typ)	2.5 V
I_{RM} (typ)	6 A
T_j	175°C
V_F (typ)	0.9 V



TO-247
STTH60P03SW

FEATURES AND BENEFITS

- Ultrafast recovery allowing High Sustain Frequency
- Decrease charge evacuation time in the inductance (see figure 1)
- Minimize switching-on and total power losses
- Increase luminuous efficiency and brightness
- Soft and noise-free recovery
- High surge capability
- High junction temperature

Table 2: Order Code

Part Number	Marking
STTH60P03SW	STTH60P03SW

DESCRIPTION

The **STTH60P03SW** is an Ultrafast Recovery Power Rectifier dedicated to **energy recovery in PDP application**.
The key parameters of the D_{ERC} diode for the energy recovery cicuit have been optimized in order to decrease power losses.

Table 3: Absolute Ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		300	V
$I_{F(RMS)}$	RMS forward voltage		80	A
$I_{F(AV)}$	Average forward current		60	A
I_{FSM}	Surge non repetitive forward current	tp = 10ms sinusoidal	250	A
I_{FRM}	Forward repetitive peak surge current	F = 200 kHz, tp = 500 ns Sinusoidal waveform, Tc = 155°C	150	A
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j	Maximum operating junction temperature		175	°C

Table 4: Thermal Parameters

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	0.8	°C/W
$Z_{th(j-c)}$	Transient thermal resistance at 1µs	0.002	°C/W

Table 5: Static Electrical Characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
I_R *	Reverse leakage current	T_j = 25°C	$V_R = V_{RRM}$			100	µA
		T_j = 125°C			0.1	1	mA
V_F **	Forward voltage drop	T_j = 25°C	I_F = 30A			1.5	V
		T_j = 125°C			0.9	1.15	

Pulse test: * tp = 5 ms, δ < 2%

** tp = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation: $P = 0.88 \times I_{F(AV)} + 0.009\ I_F{}^2{}_{(RMS)}$

Table 6: Switching Characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
I_{RM}	Reverse recovery current	T_j = 100°C	I_F = 60A V_R = 100V dI_F/dt = 200 A/µs		6	7.5	A
S_{factor}	Softness factor				0.5		
V_{FP}	Peak forward voltage	T_j = 25°C	I_F = 60A dI_F/dt = 400 A/µs		2.5	3.5	V

Figure 1: Application Characteristics

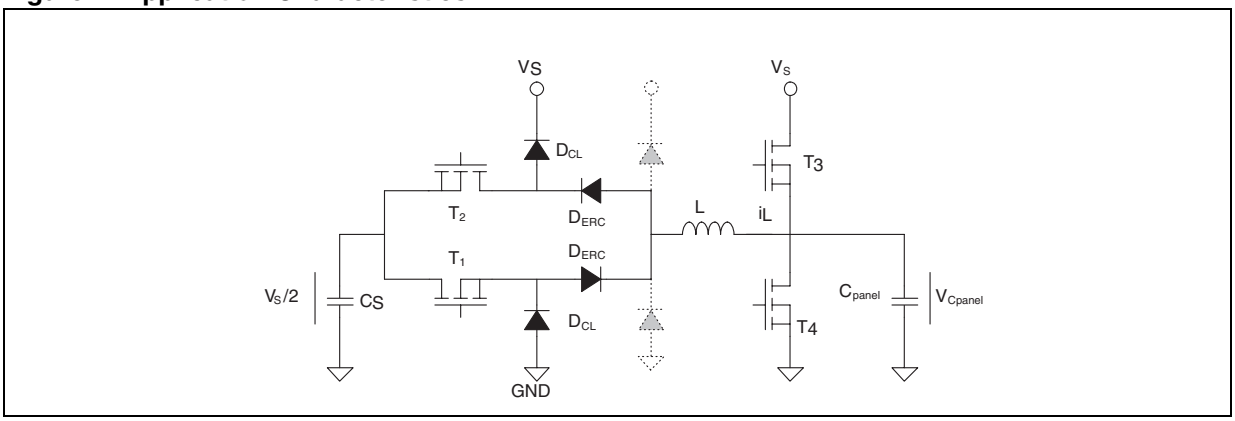


Figure 2: Application Waveforms

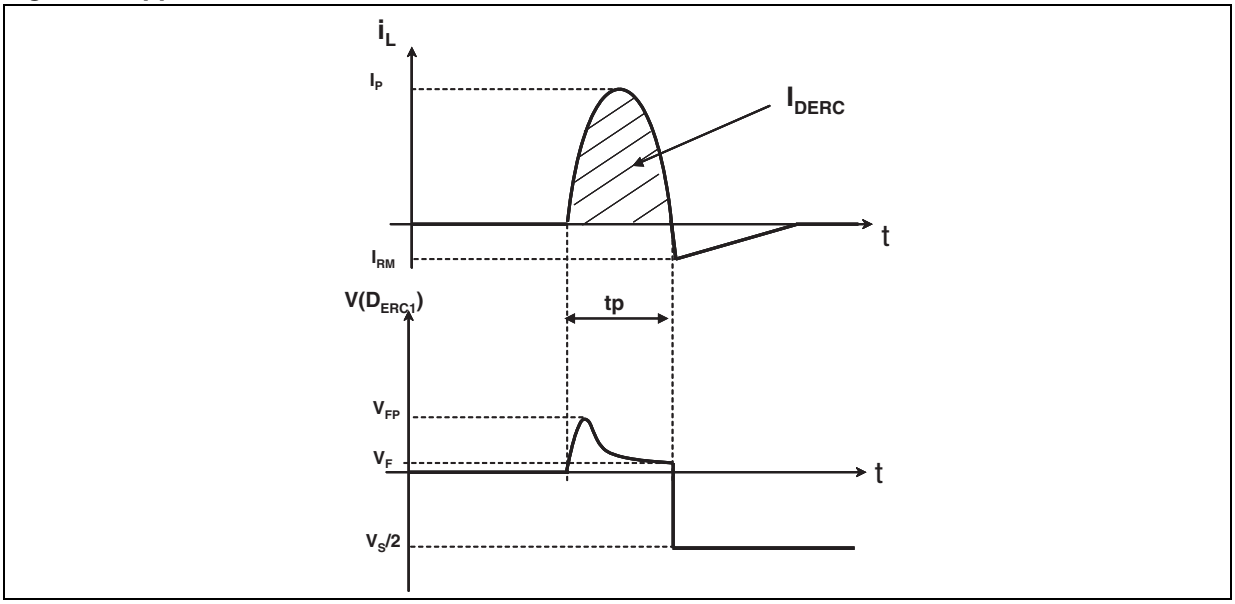


Figure 3: Forward voltage drop versus forward current

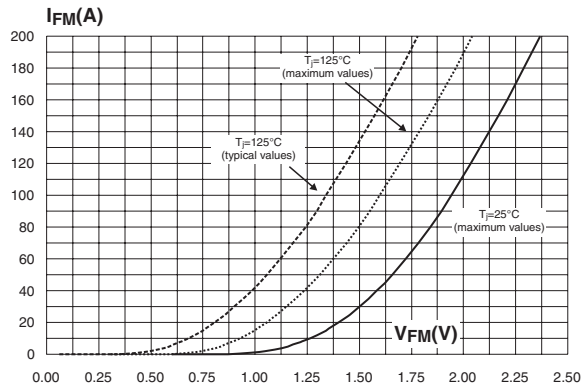


Figure 4: Relative variation of thermal impedance junction to case versus pulse duration

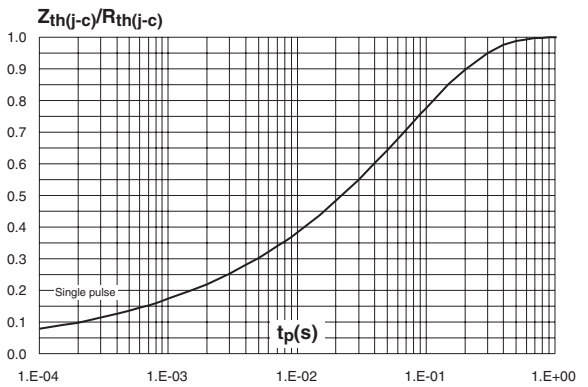


Figure 5: Peak reverse recovery current versus dI_F/dt (typical values)

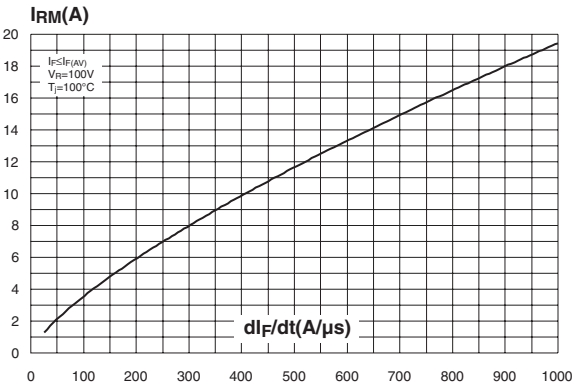


Figure 6: Reverse recovery time versus dI_F/dt (typical values)

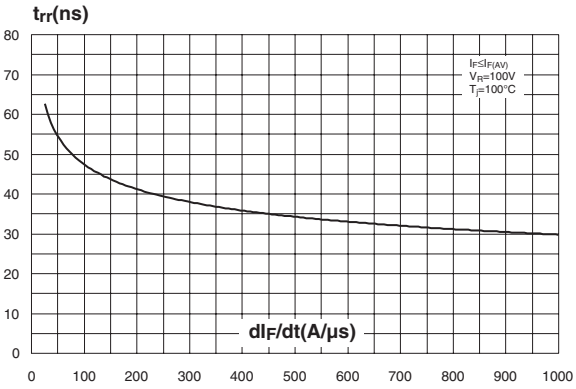


Figure 7: Reverse recovery softness factor versus dI_F/dt (typical values)

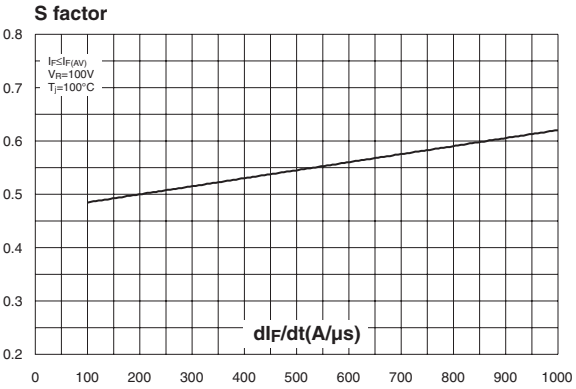


Figure 8: Relative variations of dynamic parameters versus junction temperature

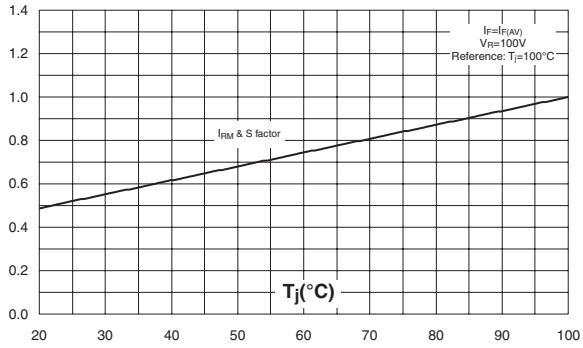


Figure 9: Transient peak forward voltage versus dI_F/dt (typical values)

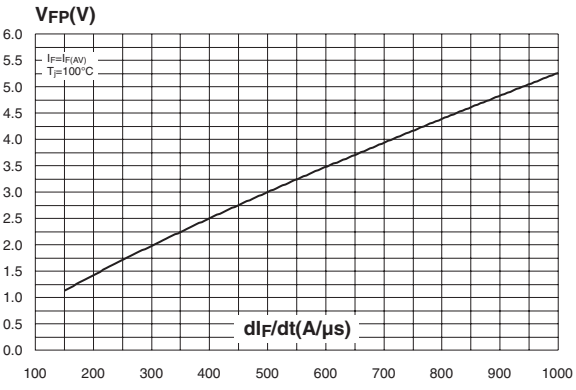


Figure 10: Forward recovery time versus dI_F/dt (typical values)

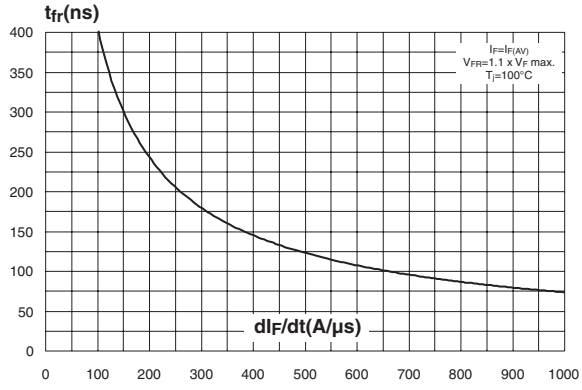
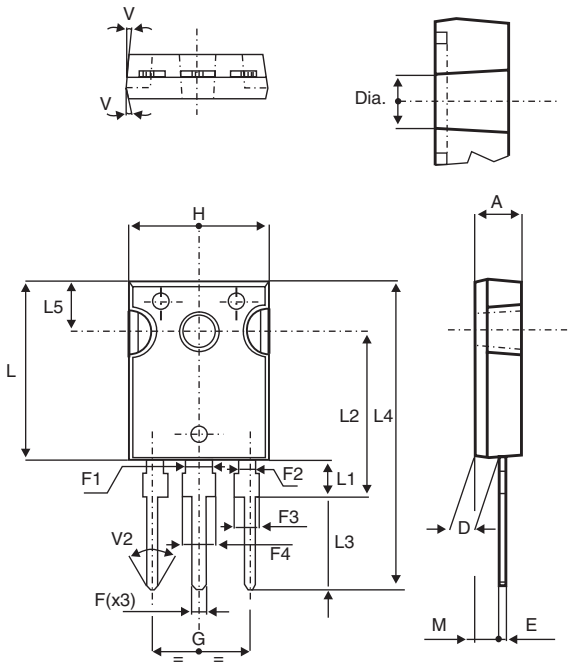


Figure 11: TO-247 Package Mechanical Data



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.15	0.191		0.203
D	2.20		2.60	0.086		0.102
E	0.40		0.80	0.015		0.031
F	1.00		1.40	0.039		0.055
F1		3.00			0.118	
F2		2.00			0.078	
F3	2.00		2.40	0.078		0.094
F4	3.00		3.40	0.118		0.133
G		10.90			0.429	
H	15.45		15.75	0.608		0.620
L	19.85		20.15	0.781		0.793
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
L3	14.20		14.80	0.559		0.582
L4		34.60			1.362	
L5		5.50			0.216	
M	2.00		3.00	0.078		0.118
V		5°			5°	
V2		60°			60°	
Dia.	3.55		3.65	0.139		0.143

Table 7: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STTH60P03SW	STTH60P03SW	TO-247	4.46 g	30	Tube

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.8 m.N.
- Maximum torque value: 1.0 m.N.

Table 8: Revision History

Date	Revision	Description of Changes
04-Nov-2004	1	First issue.
10-Jan-2005	2	Minor layout update. No content change.
04-03-2005	3	Table 7 on page 5: base quantity delivery from 50 to 30.