

STTH12S06

Turbo 2 ultrafast high voltage rectifier

I _{F(AV)}	12 A			
V _{RRM}	600 V			
I _{RM (typ.)} 6 A				
T _{j (max)} 175 °C				
V _{F (typ)} 1.5 V				
t _{rr (typ)}	14 ns			

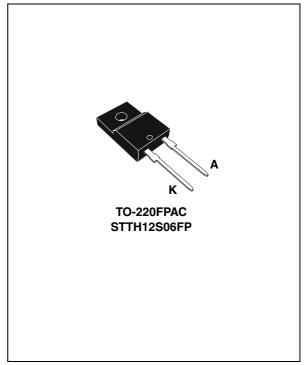
Table 1. Main product characteristics

Features and benefits

- Ultrafast recovery
- Low reverse recovery current
- Reduces losses in diode and switching transistor
- Low thermal resistance
- Higher frequency operation
- Insulated voltage: 1500 V_{RMS}

Description

ST's STTH12S06 is a state of the art Ultrafast recovery diode. By the use of 600 V Pt doping Planar technology, this diode will outperform the power factor correction circuits operating in hardswitching conditions. The extremely low reverse recovery current of the STTH12S06, reduces significantly the switching power losses of the MOSFET, and thus increases the



efficiency of the application. This allows designers to reduce the size of their heatsinks.

This device is also intended for applications in power supplies and power conversions systems, and other power switching applications.

Symbol	Parameter	Value	Unit
V _{RRM}	Repetitive peak reverse voltage	600	V
I _{F(AV})	Average forward current	12	А
I _{FSM}	Surge non repetitive forward current	100	А
T _{stg}	Storage temperature range	- 65 + 175	°C
Тj	Maximum operating junction temperature	175	°C

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Characteristics 1

Table 3. The	mal resistances
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Symbol	Parameter	Value	Unit
Rth (j-c)	Junction to case	4.6	°C/W

Table 4.

Static electrical characteristics

Symbol	Parameter	Tests co	onditions	Min.	Тур.	Max.	Unit
1_	Reverse leakage current	V _B = 600 V	T _j = 25 °C			30	μA
IR	Theverse leakage current	v _R = 000 v	T _j = 125 °C		35	400	μΛ
V _F	Forward voltage drop	I _F = 12 A	T _j = 25 °C			3.4	V
۷F		F = 12 A	T _j = 150 °C		1.5	1.9	v

Dynamic electrical characteristics Table 5.

Symbol	Tests conditions		Min.	Тур.	Max.	Unit
t _{rr}	$I_F = 1 \text{ A} \text{ d}I_F/\text{d}t = -200 \text{ A}/\mu \text{s} \text{ V}_R = 30 \text{ V}$			14	21	ns
I _{RM}	V _R = 400 V I _F = 12A dI _F /dt = - 200 A/µs			6.0	8.0	A
S factor	V _R = 200 V I _F = 12A	T _j = 125 °C		0.3		
Q _{rr}	dI _F /dt = - 200 A/µs			160		nC

Figure 1. **Conduction losses versus** average current

Figure 2. Forward voltage drop versus forward current

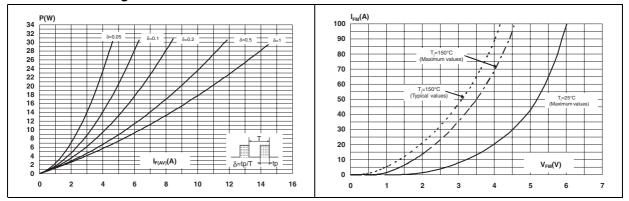




Figure 3. Relative variation of thermal impedance, junction to case, versus pulse duration

Figure 4. Peak reverse recovery current versus dl_F/dt (typical values)

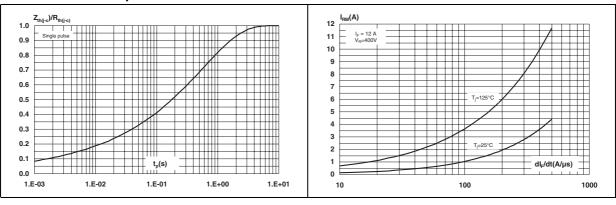


Figure 5. Reverse recovery time versus dl_F/dt (typical values)

Figure 6. Reverse recovery charges versus dl_F/dt (typical values)

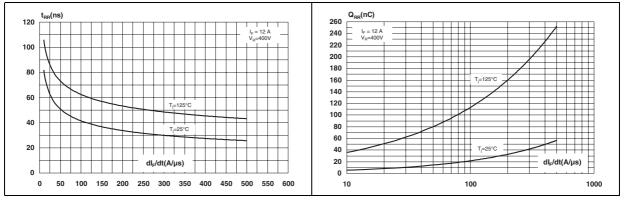
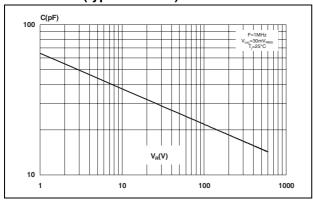


Figure 7. Junction capacitance versus reverse voltage applied (typical values)



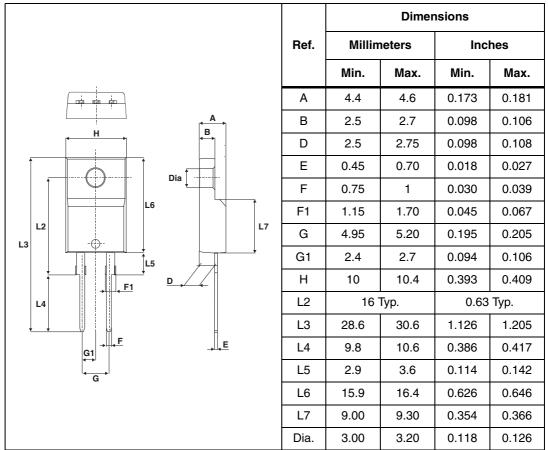
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2 Package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.55 Nm
- Maximum torque value: 0.7 Nm

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

Table 6.TO-220FPAC dimensions





3 Ordering information

Table 7. Ordering information

Part number	Marking	Package	Weight	Base qty	Delivery mode
STTH12S06FP	STTH12S06FP	TO-220FPAC	1.64	50	Tube

4 Revision history

Table 8.Revision history

Date	Revision	Changes
02-Oct-2007	1	Initial release.



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