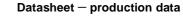
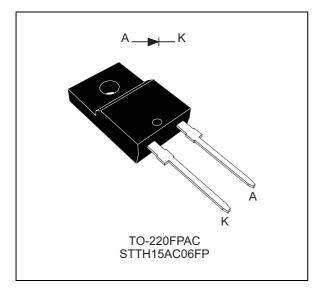


STTH15AC06

Turbo 2 ultrafast high voltage rectifier





Description

The STTH15AC06 uses ST Turbo 2 600 V technology and is suited as a boost diode in air conditioning equipment for continuous mode interleaved power factor correction.

The device is also intended for use as a freewheeling diode in power supplies and other power switching applications.

Symbol	Value
I _{F(AV)}	15 A
V _{RRM}	600 V
t _{rr} (max)	30 ns
V _F (max)	1.5 V
T _j (max)	175 °C

Features

- Ultrafast switching
- Low reverse current
- Reduces switching and conduction losses
- Low thermal resistance
- Insulated package TO-220FPAC:
 - Insulated voltage: 1500 V rms

This is information on a product in full production.

1 Characteristics

Table 2. Absolute ratings (limiting values at 25 °C, unless otherwise specified)

Symbol	Parameter	Value	Unit	
V _{RRM}	Repetitive peak reverse voltage	600	V	
I _{F(RMS)}	Forward rms current		30	А
I _{F(AV)}	Average forward current	15	А	
I _{FSM}	Surge non repetitive forward current	120	А	
T _{stg}	Storage temperature range	-65 to +175	°C	
Тj	Maximum operating junction temperature	175	°C	

Table 3. Thermal parameters

Symbol	Parameter	Value	Unit
R _{th(j-c)}	Junction to case	5.2	°C/W

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
I _R ⁽¹⁾						2	μA
'R`	IR ⁽¹⁾ Reverse leakage current	T _j = 150 °C	$V_R = V_{RRM}$		20	200	μΑ
V_(2)	V _F ⁽²⁾ Forward voltage drop	T _j = 25 °C	I _F = 15 A			1.9	V
VF`'		T _j = 150 °C	1F = 13 A		1.15	1.50	

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

2. Pulse test: $t_p = 380 \ \mu s, \ \delta < 2\%$

To evaluate the conduction losses use the following equation:

 $P = 1.2 \text{ x } I_{F(AV)} + 0.02 I_{F}^{2}_{(RMS)}$

Table 5. Dynamic characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
+	Povorso rocovoru timo	T _i = 25 °C	$I_{F} = 0.5 \text{ A}, I_{rr} = 0.25 \text{ A}, I_{R} = 1 \text{ A}$			30	ns
t _{rr} Reverse recovery time	$I_j = 25 {}^{\circ}C$	$I_F = 1 \text{ A}, V_R = 30 \text{ V}, dI_F/dt = -50 \text{ A}/\mu\text{s}$		40	55	115	
I _{RM}	Reverse recovery current	T _j = 125 °C	I _F = 15 A, V _R = 400 V, dI _F /dt = -100 A/µs		4.4	6	A
t _{fr}	Forward recovery time	T _i = 25 °C	$I_F = 15 \text{ A}, V_{FR} = 1.6 \text{ V},$ $dI_F/dt = 100 \text{ A}/\mu\text{s}$			300	ns
V _{FP}	Forward recovery voltage	$r_{j} = 25 \text{ C}$			2.5		V



Figure 1. Average forward power dissipation versus average forward current

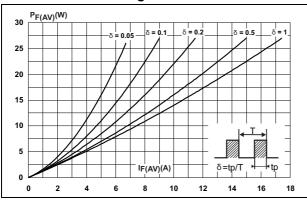


Figure 3. Forward voltage drop versus forward current (maximum values)

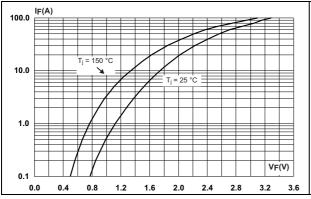


Figure 5. Peak reverse recovery current versus dl_F/dt (typical values)

Figure 2. Forward voltage drop versus forward current (typical values)

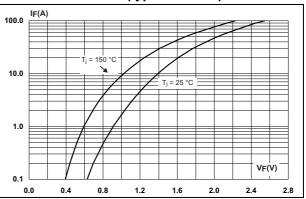


Figure 4. Relative variation of thermal impedance, junction to case, versus pulse duration

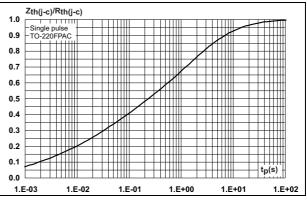
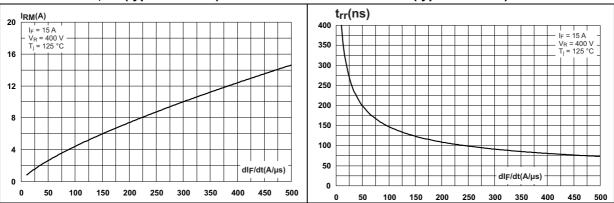


Figure 6. Reverse recovery time versus dl_F/dt (typical values)





dIF/dt(A/µs)

500

350 400 450

Figure 7. Reverse recovery charges versus dl_F/dt (typical values)

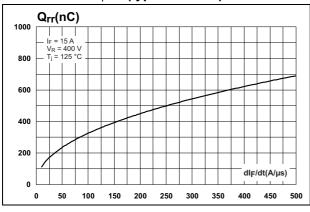


Figure 9. Relative variations of dynamic parameters versus junction temperature

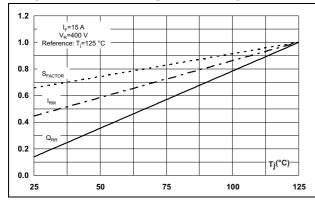


Figure 10. Transient peak forward voltage versus dl_F/dt (typical values)

250 300

Figure 8. Reverse recovery softness factor

versus dl_F/dt (typical values)

SFACTOR

| | I⊧ = 15 A

V_R = 400 V T_j = 125 °C

100 150 200

3.0

2.5

2.0

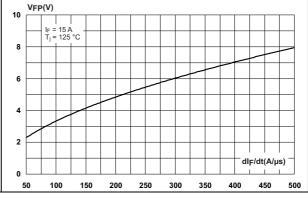
1.5

1.0

0.5

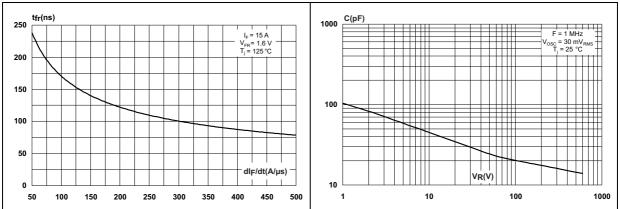
0.0

0 50



(typical values)

Figure 11. Forward recovery time versus dl_F/dt Figure 12. Junction capacitance versus reverse voltage applied (typical values)



2 Package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque values:
 - 0.8 to 1.0 N·m (TO-220FPAC)

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK[®] packages, depending on their level of environmental compliance. ECOPACK[®] specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK[®] is an ST trademark.

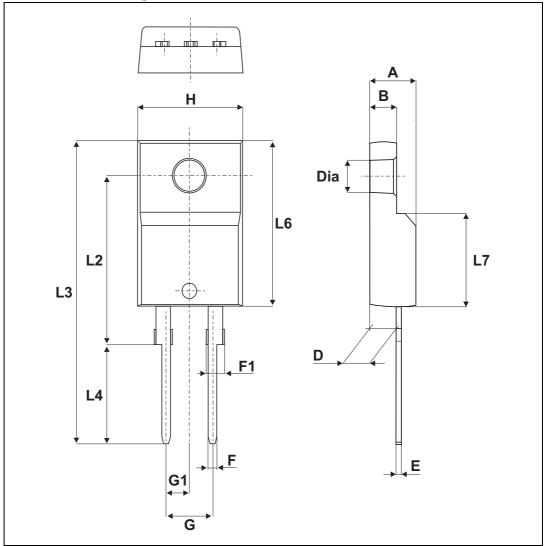


Figure 13. TO-220FPAC dimension definitions



			Dime	ensions			
Ref.	Millimeters			Inches			
	Min.	Тур.	Max.	Min.	Тур.	Max.	
А	4.4		4.6	0.173		0.181	
В	2.5		2.7	0.098		0.106	
D	2.5		2.75	0.098		0.108	
E	0.45		0.70	0.018		0.027	
F	0.75		1	0.030		0.039	
F1	1.15		1.70	0.045		0.067	
G	4.95		5.20	0.195		0.205	
G1	2.4		2.7	0.094		0.106	
Н	10		10.4	0.393		0.409	
L2		16 Тур.			0.63 Тур.		
L3	28.6		30.6	1.126		1.205	
L4	9.8		10.6	0.386		0.417	
L6	15.9		16.4	0.626		0.646	
L7	9.00		9.30	0.354		0.366	
Dia.	3.00		3.20	0.118		0.126	

Table 6. TO-220FPAC dimension values



3 Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STTH15AC06FP	STTH15AC06FP	TO-220FPAC	1.8 g	50	Tube

4 Revision history

Table 8. Document revision history

Date	Revision	Changes
17-Apr-2014	1	First release.



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