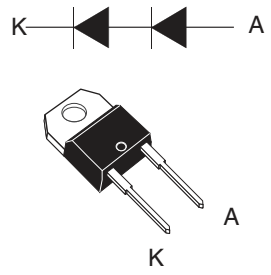
STTH1008DTI

800 V tandem hyperfast diode

Datasheet – production data



TO-220AC ins
STTH1008DTI

Table 1. Device summary

$I_{F(AV)}$	10 A
I_{FRM}	20 A
V_{RRM}	800 V
t_{rr}	40 ns
I_{RM}	8.5 A
V_F	1.7 V
T_j	150 °C

Features

- High voltage rectifier
- Tandem diodes in series
- Very low switching losses
- Insulated device with internal ceramic
- Equal thermal conditions for both 400 V diodes
- Static and dynamic equilibrium of internal diodes are warranted by design

Description

The STTH1008DTI is an ultrahigh performance diode composed of two 400 V dice in series.

1 Characteristics

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

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		800	V
$I_{F(RMS)}$	Forward rms current		16	A
$I_{F(AV)}$	Average forward current, δ = 0.5	T_c = 85 °C	10	A
I_{FRM}	Repetitive peak forward current	T_c = 135 °C, δ = 0.3	20	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	120	A
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Maximum junction temperature		150	°C

Table 3. Thermal resistance

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	2.5	°C/W

Table 4. Static electrical characteristics

Symbol	Parameters	Test conditions		Min.	Typ	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$			20	µA
		T_j = 150 °C			20	200	
V_F(2)	Forward voltage drop	T_c = 25 °C	I_F = 10 A		2.15	2.5	V
		T_c = 150 °C			1.7	2.05	
		T_c = 25 °C	I_F = 20 A		2.45	2.85	
		T_c = 150 °C			2.05	2.45	

1. Pulse test: t_p = 5 ms, δ < 2%
2. Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:

$P = 1.65 \times I_{F(AV)} + 0.04 \times I_F{}^2{}_{(RMS)}$

Table 5. Dynamic electrical characteristics

Symbol	Parameters	Test conditions		Min.	Typ	Max.	Unit
I_{RM}	Reverse recovery current	T_j = 125 °C	I_F = 10 A, V_R = 400 V, dI_F/dt = -200 A/µs		8.5	11.5	A
S_{factor}	Softness factor				0.8		
t_{rr}	Reverse recovery time	T_j = 25 °C	I_F = 1 A, V_R = 30 V, dI_F/dt = -50 A/µs		40	55	ns
		T_j = 125 °C	I_F = 10 A, V_R = 400 V, dI_F/dt = -200 A/µs		80		
t_{fr}	Forward recovery time	T_j = 25 °C	I_F = 10 A, V_{FR} = 3 V, dI_F/dt = 100 A/µs			180	ns
V_{FP}	Forward recovery voltage	T_j = 25 °C			4.5	7	V

Figure 1. Conduction losses versus average current

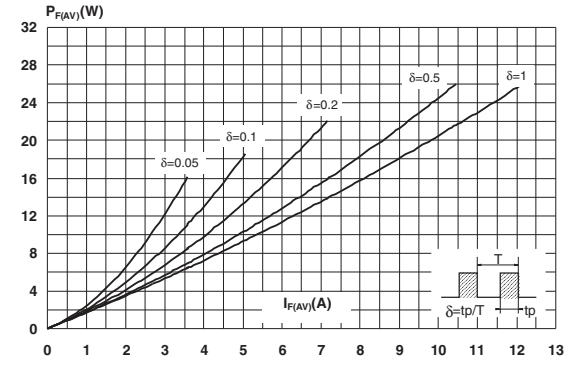


Figure 2. Forward voltage drop versus forward current (typical values)

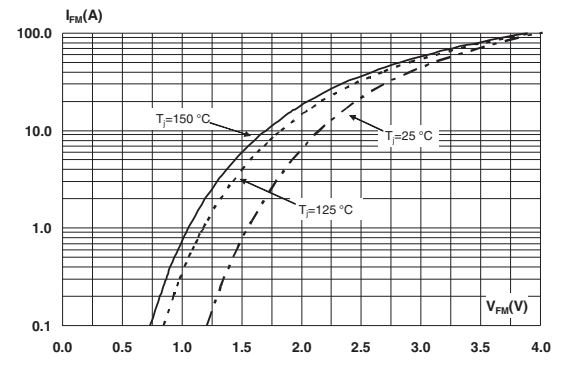


Figure 3. Relative variation of thermal impedance junction to case versus pulse duration

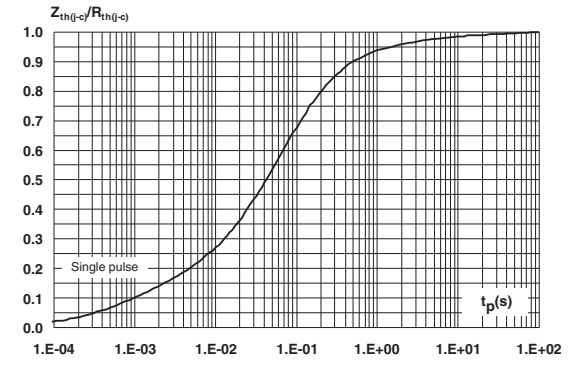


Figure 4. Peak reverse recovery current versus dI_F/dt (typical values)

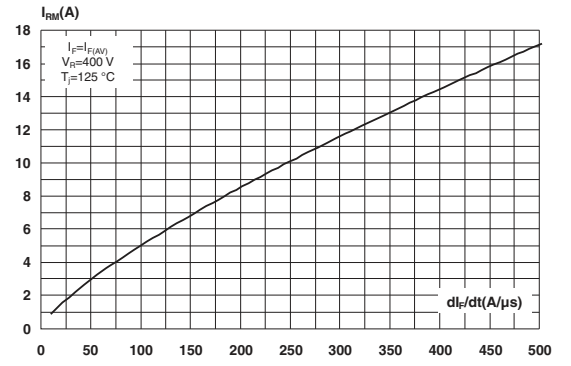


Figure 5. Reverse recovery time versus dI_F/dt (typical values)

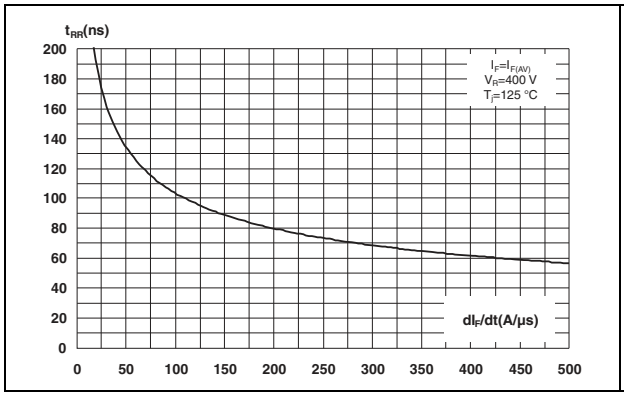


Figure 6. Reverse recovery charges versus dI_F/dt (typical values)

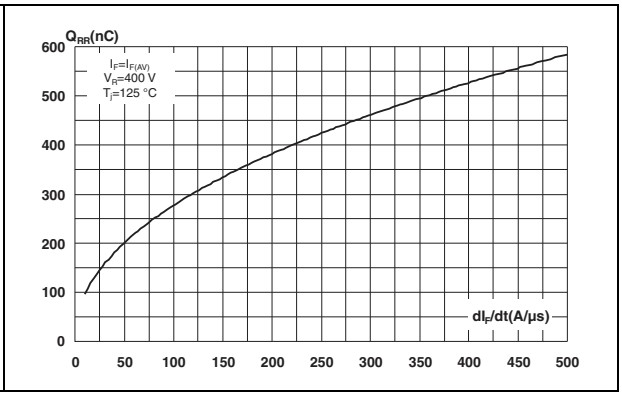


Figure 7. Reverse recovery softness factor versus dI_F/dt (typical values)

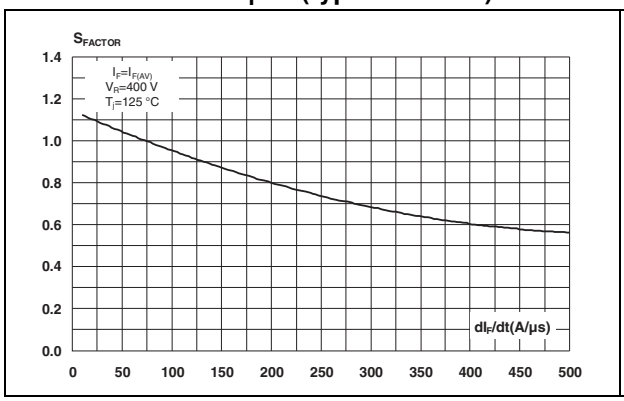


Figure 8. Relative variations of dynamic parameters versus junction temperature

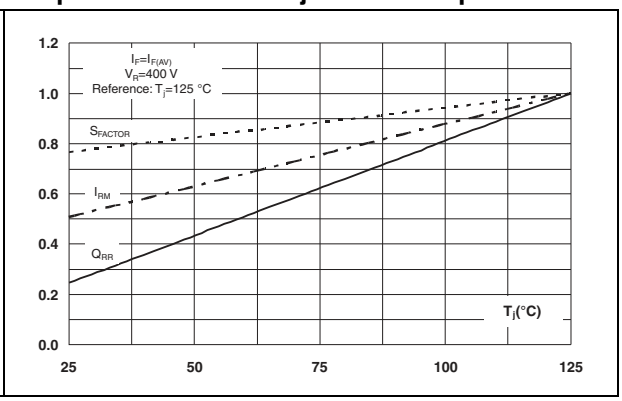


Figure 9. Transient peak forward voltage versus dI_F/dt (typical values)

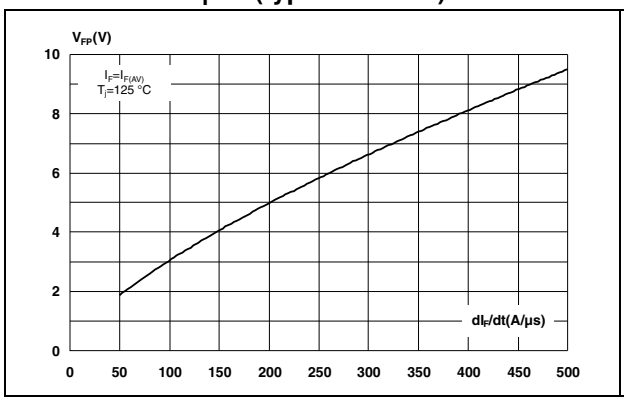


Figure 10. Forward recovery time versus dI_F/dt (typical values)

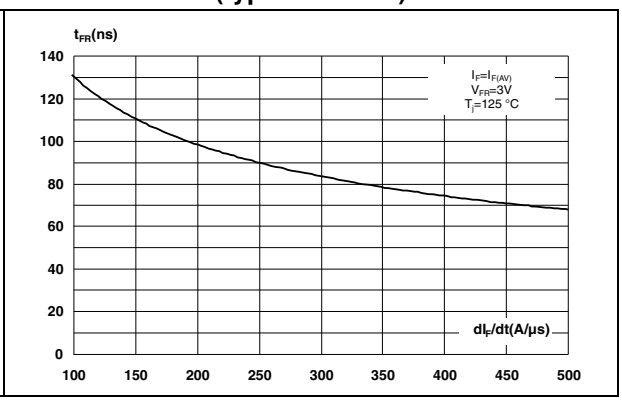
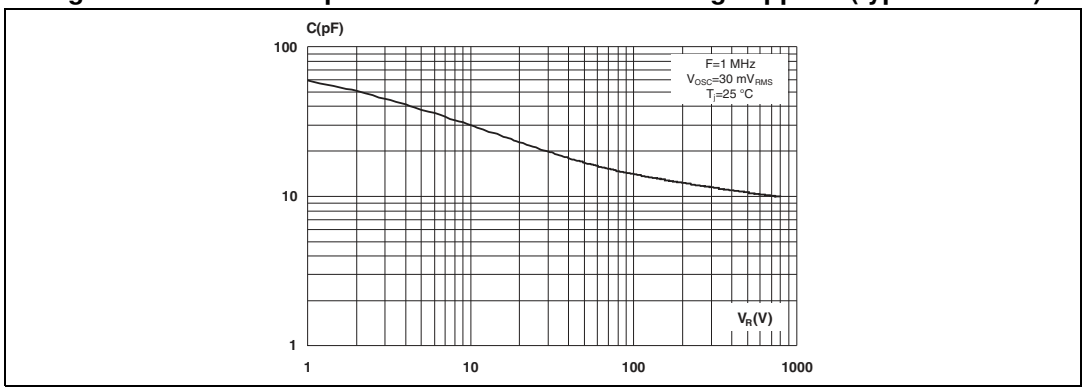


Figure 11. Junction capacitance versus reverse voltage applied (typical values)



2 Package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque: 0.4 to 0.6 N·m

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Figure 12. TO-220AC ins dimension definitions

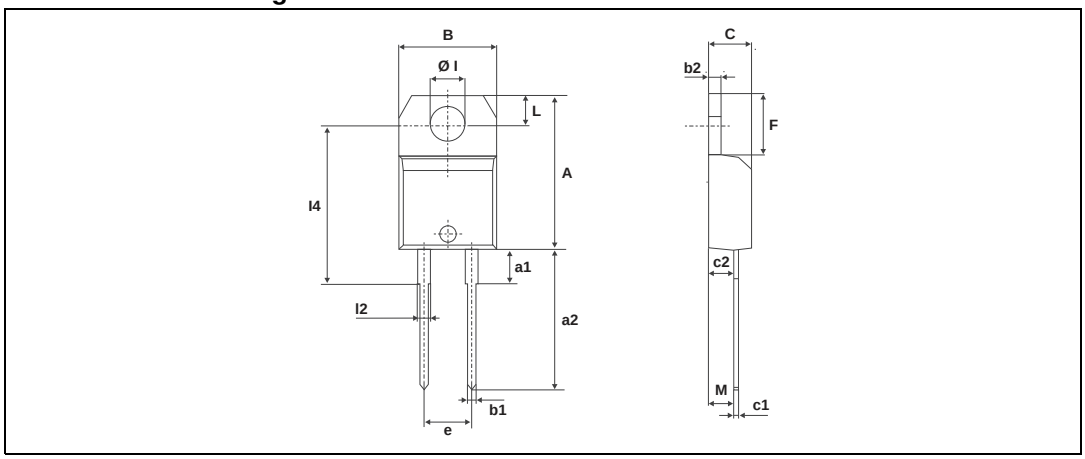

Table 6. TO-220AC ins dimension values

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
B	10.00		10.40	0.393		0.409
b1	0.61		0.88	0.024		0.034
b2	1.23		1.32	0.048		0.051
C	4.40		4.60	0.173		0.181
c1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
e	4.80		5.40	0.189		0.212
F	6.20		6.60	0.244		0.259
ØI	3.75		3.85	0.147		0.151
l4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
l2	1.14		1.70	0.044		0.066
M		2.60			0.102	

3 Ordering information

Table 7. Ordering information

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH1008DTI	STTH1008DTI	TO-220AC insulated	2.3 g	50	Tube

4 Revision history

Table 8. Document revision history

Date	Revision	Changes
05-Mar-2013	1	Initial release.

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