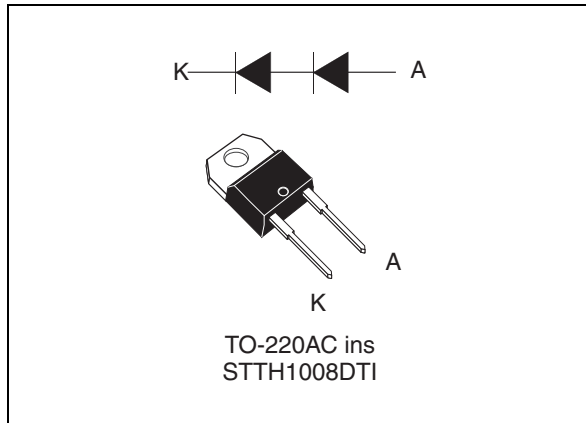


## 800 V tandem hyperfast diode

Datasheet — production data



**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, $\delta = 0.5$	$T_c = 85\text{ °C}$	10	A
$I_{FRM}$	Repetitive peak forward current	$T_c = 135\text{ °C}$ , $\delta = 0.3$	20	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ ms}$ 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	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$			20	$\mu\text{A}$
		$T_j = 150\text{ °C}$			20	200	
$V_F^{(2)}$	Forward voltage drop	$T_c = 25\text{ °C}$	$I_F = 10\text{ A}$		2.15	2.5	V
		$T_c = 150\text{ °C}$			1.7	2.05	
		$T_c = 25\text{ °C}$	$I_F = 20\text{ A}$		2.45	2.85	
		$T_c = 150\text{ °C}$			2.05	2.45	

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

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

To evaluate the conduction losses use the following equation:

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

Table 5. Dynamic electrical characteristics

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

Figure 1. Conduction losses versus average current

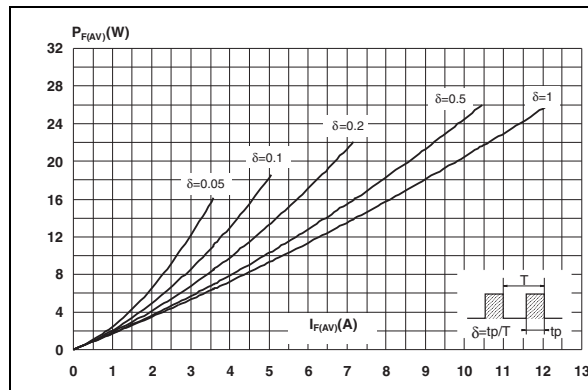


Figure 2. Forward voltage drop versus forward current (typical values)

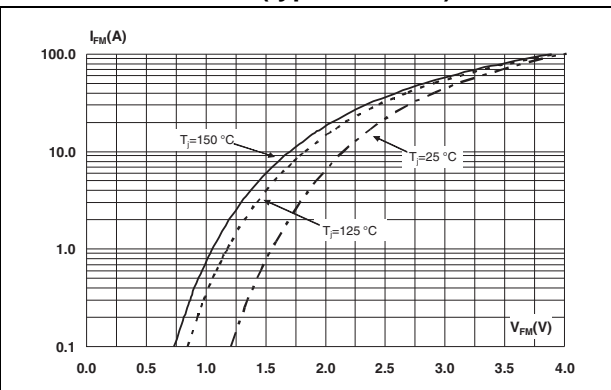


Figure 3. Relative variation of thermal impedance junction to case versus pulse duration

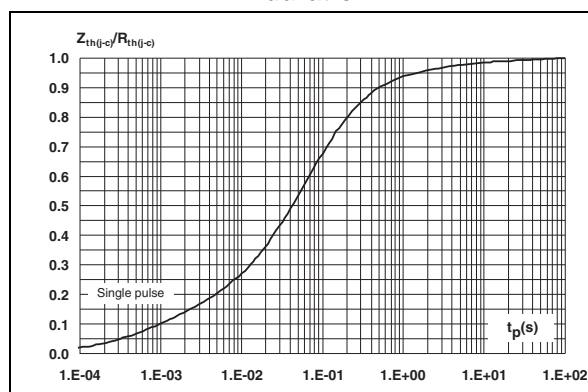


Figure 4. Peak reverse recovery current versus dI\_F/dt (typical values)

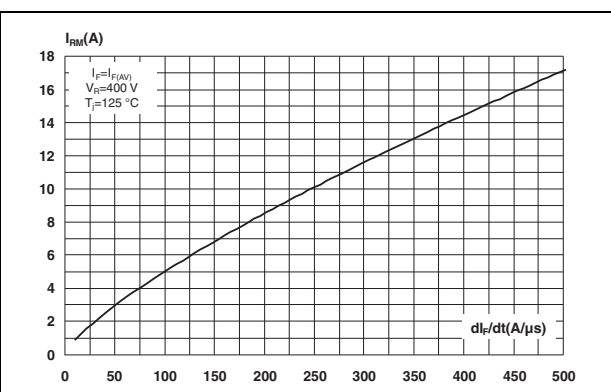


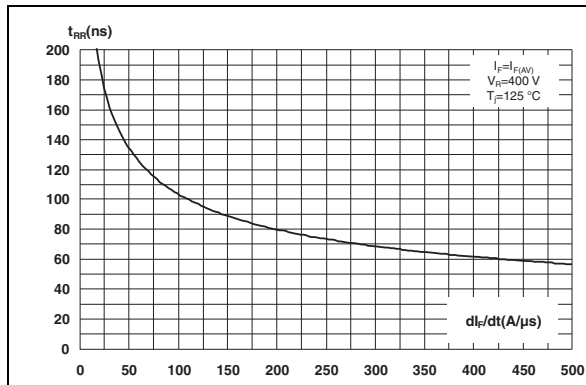
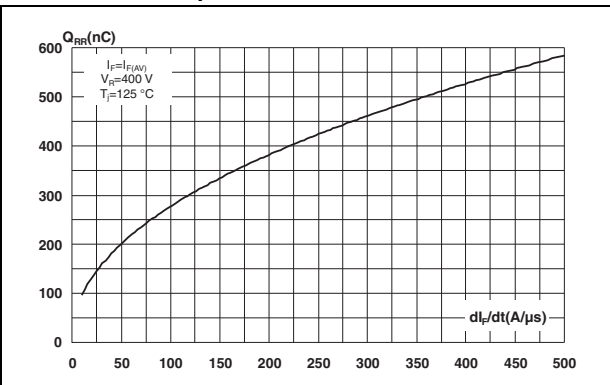
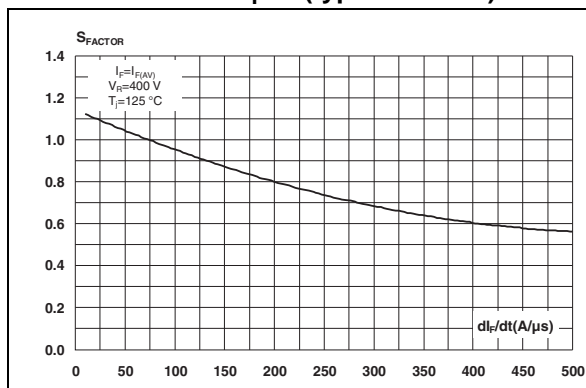
Figure 5. Reverse recovery time versus  $dl_F/dt$  (typical values)Figure 6. Reverse recovery charges versus  $dl_F/dt$  (typical values)Figure 7. Reverse recovery softness factor versus  $dl_F/dt$  (typical values)

Figure 8. Relative variations of dynamic parameters versus junction temperature

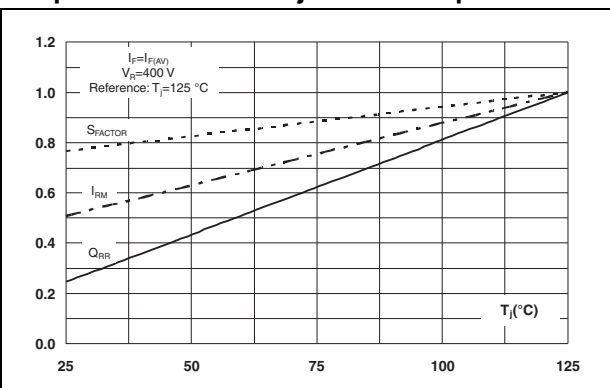
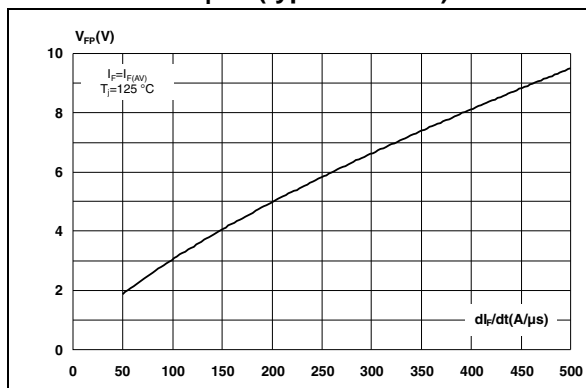
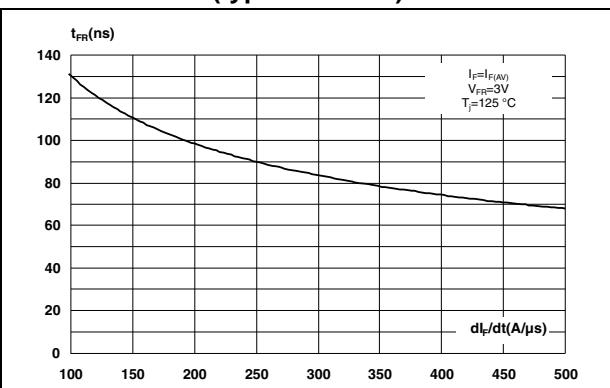
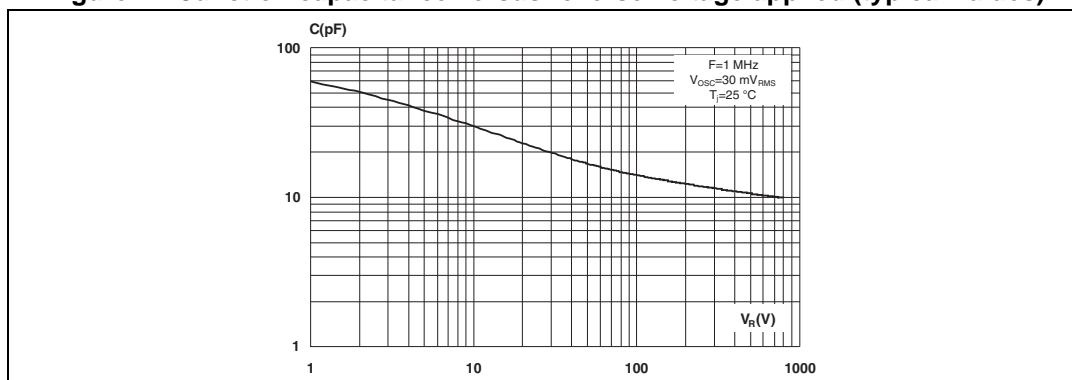
Figure 9. Transient peak forward voltage versus  $dl_F/dt$  (typical values)Figure 10. Forward recovery time versus  $dl_F/dt$  (typical values)

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**

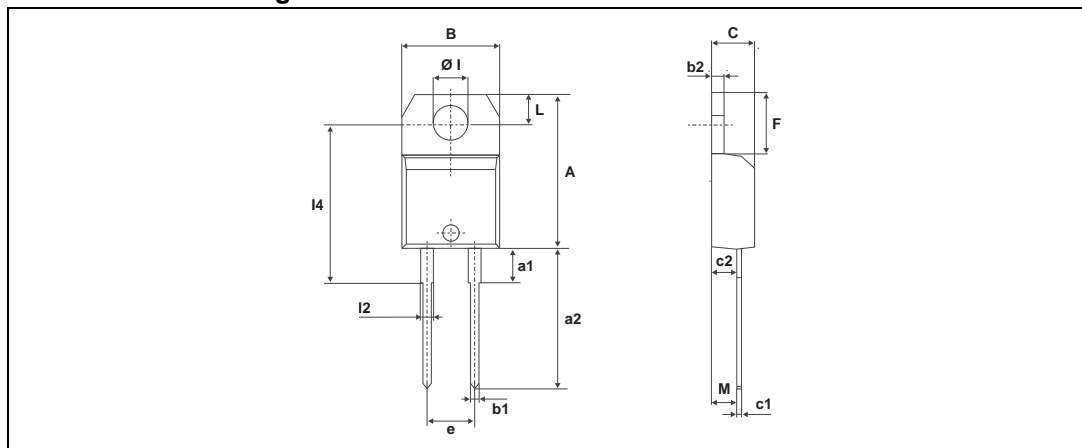


Table 6. TO-220AC ins dimension values

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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