

Pb Free Plating Product

STTH1506TPI



ThinkiSemi 15A,600V(2x300V) Dual Tandem Structure Ultra Fast Recovery Rectifiers

APPLICATION

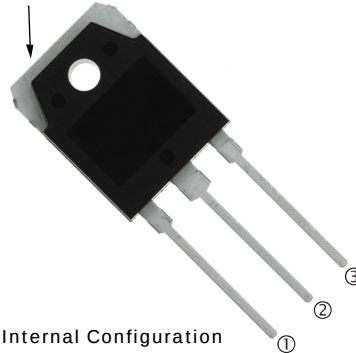
- Freewheeling, Snubber, Clamp
- Inversion Welder
- PFC
- Plating Power Supply
- Ultrasonic Cleaner and Welder
- Converter & Chopper
- UPS

PRODUCT FEATURE

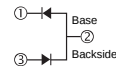
- Ultrafast Recovery Time
- Soft Recovery Characteristics
- Low Recovery Loss
- Low Forward Voltage
- High Surge Current Capability
- Low Leakage Current

TO-3PB(TO-3PN)

② Bottom Side Metal Heatsink



Internal Configuration

Tandem Structure
In Series Connection

GENERAL DESCRIPTION

STTH1506TPI use ThinkiSemi matured&latest FRED FAB process(planar passivation chip) with ultrafast and soft recovery characteristic.

ABSOLUTE RATINGS (limiting values for both diodes in series)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		600	V
$I_{F(RMS)}$	RMS forward current		26	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms}$ sinusoidal	130	A
T_{stg}	Storage temperature range		-65 +150	°C
T_j	Maximum operating junction temperature		+ 150	°C

THERMAL AND POWER DATA

Symbol	Parameter	Test conditions	Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	2.9	°C/W
$R_{th(c)}$		Coupling	0.3	
$R_{th(j-c)}$	Junction to case	Total	1.6	
P_1	Conduction power dissipation for both diodes	$I_{F(AV)} = 15\text{ A}$ $\delta = 0.5$ $T_c = 70^\circ\text{C}$	50	W

STATIC ELECTRICAL CHARACTERISTICS (for both diodes)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I_R^*	Reverse leakage current	$V_R = V_{RRM}$	$T_j = 25^\circ\text{C}$			20	μA
			$T_j = 125^\circ\text{C}$		30	200	
V_F^{**}	Forward voltage drop	$I_F = 15\text{ A}$	$T_j = 25^\circ\text{C}$			3.6	V
			$T_j = 125^\circ\text{C}$		2.1	2.6	

Pulse test: * $t_p = 5\text{ms}$, $\delta < 2\%$ ** $t_p = 380\mu\text{s}$, $\delta < 2\%$

To evaluate the maximum conduction losses use the following equation:

$$P = 1.8 \times I_{F(AV)} + 0.053 \times I_F^2(\text{RMS})$$

RECOVERY CHARACTERISTICS

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	$I_F = 0.5\text{ A}$ $I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$	$T_j = 25^\circ\text{C}$		16		ns
		$I_F = 1\text{ A}$ $dI_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{ V}$				35	
I_{RM}	Reverse recovery current	$V_R = 400\text{ V}$ $I_F = 15\text{ A}$ $dI_F/dt = -200\text{ A}/\mu\text{s}$	$T_j = 125^\circ\text{C}$		4.8	6.0	A
S_{factor}					0.4		-

TURN-ON SWITCHING CHARACTERISTICS

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
t_{fr}	Forward recovery time	$I_F = 15\text{ A}$ $dI_F/dt = 100\text{ A}/\mu\text{s}$, $V_{FR} = 1.1 \times V_{Fmax}$	$T_j = 25^\circ\text{C}$			200	ns
V_{FP}	Forward recovery voltage	$I_F = 15\text{ A}$ $dI_F/dt = 100\text{ A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$			6	V

Fig. 1: Conduction losses versus average current.

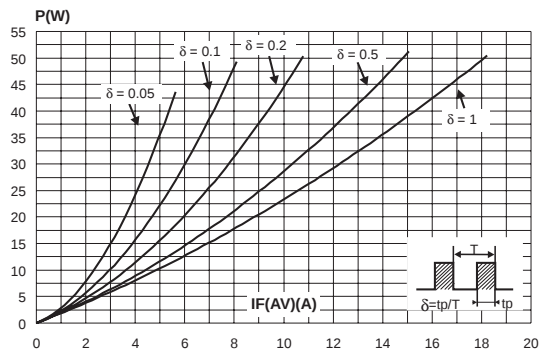


Fig. 2: Forward voltage drop versus forward current.

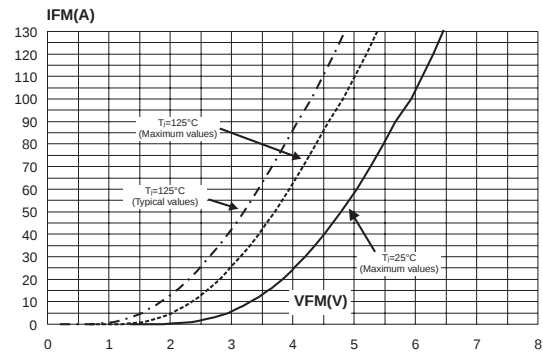


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

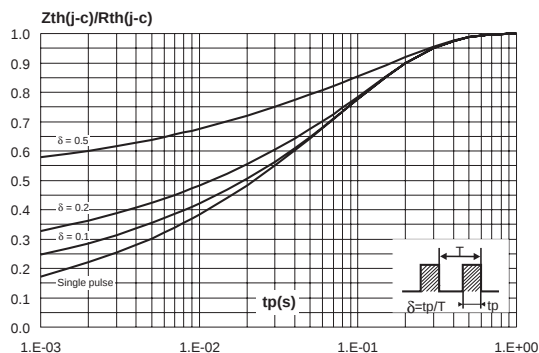


Fig. 4: Peak reverse recovery current versus dIF/dt (90% confidence).

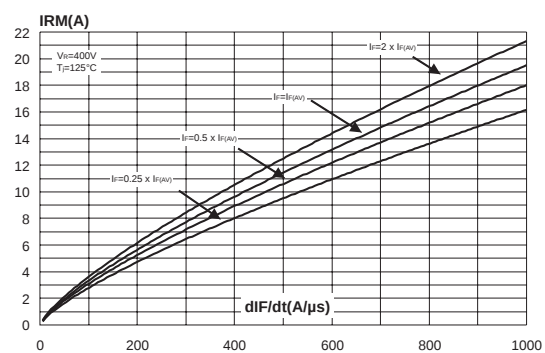


Fig. 5: Reverse recovery time versus dIF/dt (90% confidence).

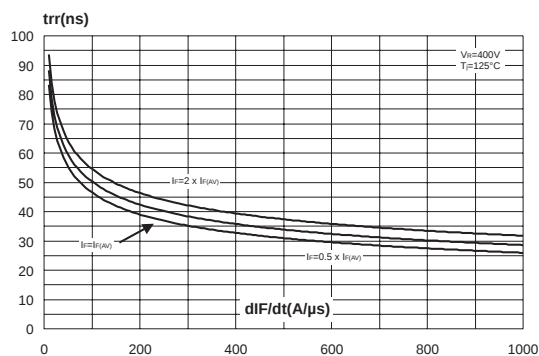


Fig. 6: Reverse recovery charges versus dIF/dt (90% confidence).

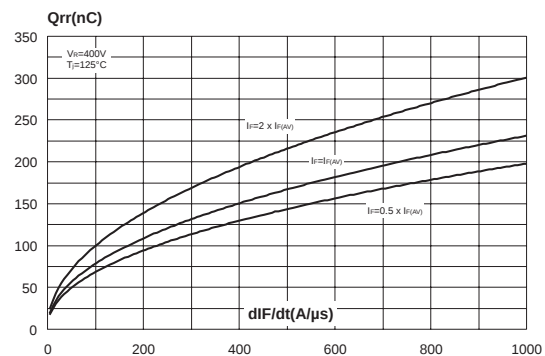


Fig. 7: Softness factor versus dI_F/dt (typical values).

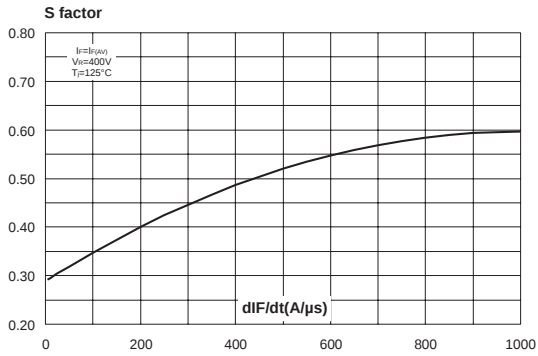


Fig. 8: Relative variations of dynamic parameters versus junction temperature.

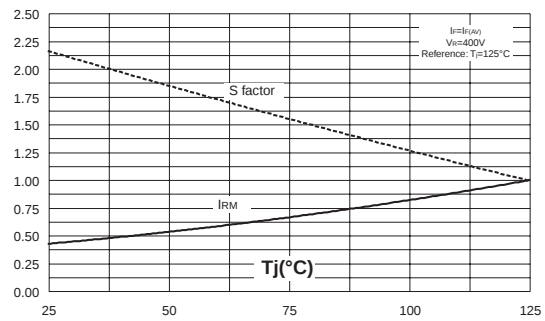


Fig. 9: Transient peak forward voltage versus dI_F/dt (90% confidence).

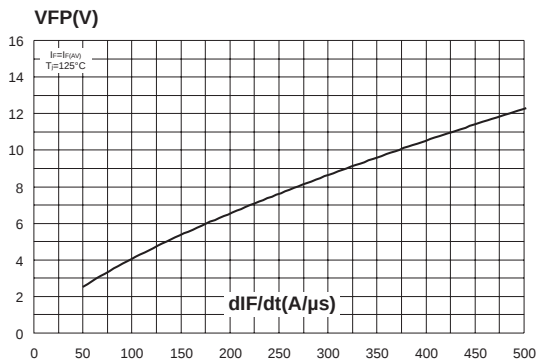


Fig. 10: Forward recovery time versus dI_F/dt (90% confidence).

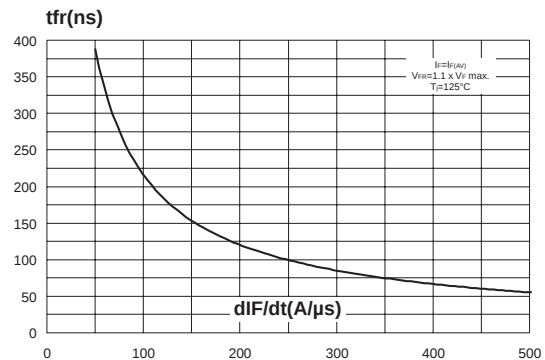
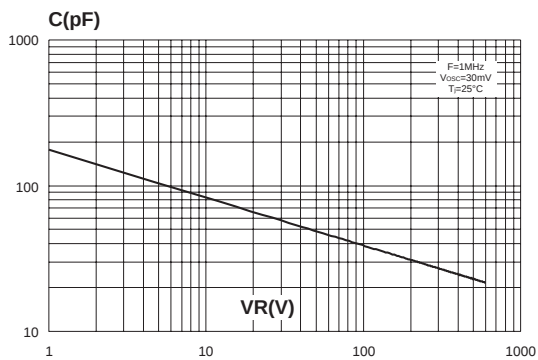
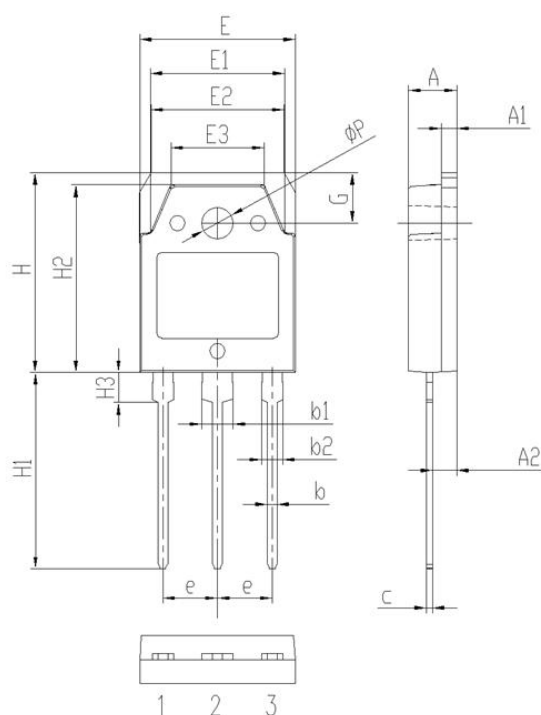


Fig. 11: Junction capacitance versus reverse voltage applied (typical values).



TO-3PB/TO-3PN package outline



Symbol	Dimensions(millimeters)	
	Min.	Max.
A	4.60	5.00
A1	1.50	2.00
A2	2.20	2.60
b	0.80	1.20
b1	2.90	3.30
b2	1.90	2.30
c	0.40	0.80
e	5.25	5.65
E	15.3	15.7
E1	13.2	13.6
E2	13.1	13.5
E3	9.10	9.50
H	19.7	20.1
H1	19.1	20.1
H2	18.3	18.7
H3	2.80	3.20
G	4.80	5.20
ΦP	3.00	3.40