



Pressure contact
Low switching losses
Low reverse recovery charge
High power cycling capability
Distributed amplified gate for high di_T/dt

Fast Stud Thyristor Type TFI271-250-14

Mean on-state current	I_{TAV}	250 A	
Repetitive peak off-state voltage	V_{DRM}	1000 ÷ 1400 V	
Repetitive peak reverse voltage	V_{RRM}		
Turn-off time	t_q	25.0; 32.0 μ s	
V_{DRM}, V_{RRM}, V	1000	1200	1400
Voltage code	10	12	14
$T_j, ^\circ C$	- 60 ÷ 125		

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions
ON-STATE				
I_{TAV}	Mean on-state current	A	250 440	$T_c=93^\circ C$; $T_c=55^\circ C$; 180° half-sine wave; 50 Hz
I_{TRMS}	RMS on-state current	A	393	$T_c=93^\circ C$; 180° half-sine wave; 50 Hz
I_{TSM}	Surge on-state current	kA	7.0 8.1	180° half-sine wave; 50 Hz ($t_p=10$ ms); single pulse; $V_D=V_R=0$ V; Gate pulse: $I_G=I_{FGM}$; $V_G=20$ V; $t_{GP}=50$ μ s; $di_G/dt=1$ A/ μ s
			8.0 9.2	180° half-sine wave; 60 Hz ($t_p=8.3$ ms); single pulse; $V_D=V_R=0$ V; Gate pulse: $I_G=I_{FGM}$; $V_G=20$ V; $t_{GP}=50$ μ s; $di_G/dt=1$ A/ μ s
I^2t	Safety factor	$A^2s \cdot 10^3$	245 325	180° half-sine wave; 50 Hz ($t_p=10$ ms); single pulse; $V_D=V_R=0$ V; Gate pulse: $I_G=I_{FGM}$; $V_G=20$ V; $t_{GP}=50$ μ s; $di_G/dt=1$ A/ μ s
			265 350	180° half-sine wave; 60 Hz ($t_p=8.3$ ms); single pulse; $V_D=V_R=0$ V; Gate pulse: $I_G=I_{FGM}$; $V_G=20$ V; $t_{GP}=50$ μ s; $di_G/dt=1$ A/ μ s
BLOCKING				
V_{DRM}, V_{RRM}	Repetitive peak off-state and Repetitive peak reverse voltages	V	1000÷1400	$T_{j\ min} < T_j < T_{j\ max}$; 180° half-sine wave; 50 Hz; Gate open
V_{DSM}, V_{RSM}	Non-repetitive peak off-state and Non-repetitive peak reverse voltages	V	1100÷1500	$T_{j\ min} < T_j < T_{j\ max}$; 180° half-sine wave; 50 Hz; single pulse; Gate open
V_D, V_R	Direct off-state and Direct reverse voltages	V	0.75· V_{DRM} 0.75· V_{RRM}	$T_j=T_{j\ max}$; Gate open

TRIGGERING				
I_{FGM}	Peak forward gate current	A	6	$T_j = T_{j\ max}$
V_{RGM}	Peak reverse gate voltage	V	5	
P_G	Gate power dissipation	W	3	$T_j = T_{j\ max}$ for DC gate current
SWITCHING				
$(di_T/dt)_{crit}$	Critical rate of rise of on-state current non-repetitive (f=1 Hz)	A/ μ s	1600	$T_j = T_{j\ max}; V_D = 0.67 \cdot V_{DRM}; I_{TM} = 2 I_{TAV};$ Gate pulse: $I_G = I_{FGM}; V_G = 20\ V;$ $t_{GP} = 50\ \mu s; di_G/dt = 1\ A/\mu s$
THERMAL				
T_{stg}	Storage temperature	$^{\circ}C$	-60 ÷ 125	
T_j	Operating junction temperature	$^{\circ}C$	-60 ÷ 125	
MECHANICAL				
M	Tightening torque	Nm	25 ÷ 35	
a	Acceleration	m/s ²	100	

CHARACTERISTICS

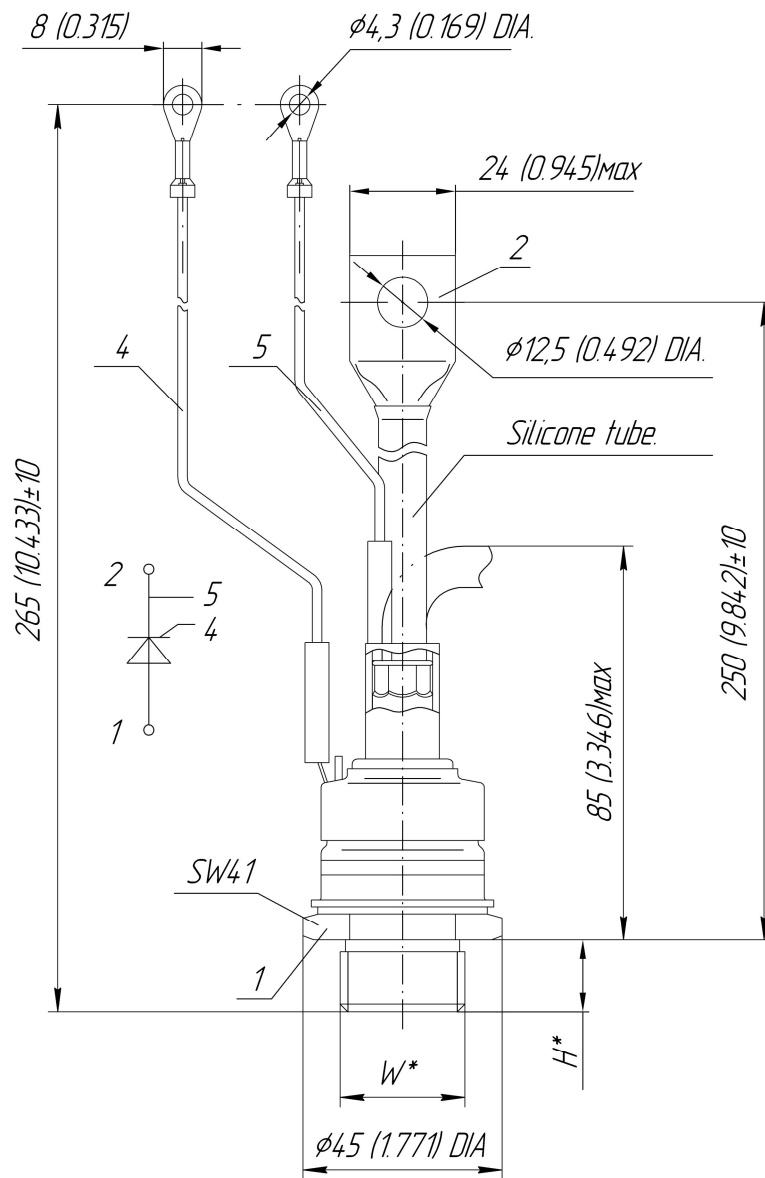
Symbols and parameters		Units	Values	Conditions	
ON-STATE					
V_{TM}	Peak on-state voltage, max	V	1.70	$T_j = 25\ ^{\circ}C; I_{TM} = 785\ A$	
$V_{T(TO)}$	On-state threshold voltage, max	V	1.05	$T_j = T_{j\ max};$	
r_T	On-state slope resistance, max	m Ω	0.850	$0.5\ \pi\ I_{TAV} < I_T < 1.5\ \pi\ I_{TAV}$	
I_H	Holding current, max	mA	500	$T_j = 25\ ^{\circ}C;$ $V_D = 12\ V;$ Gate open	
BLOCKING					
I_{DRM}, I_{RRM}	Repetitive peak off-state and Repetitive peak reverse currents, max	mA	70	$T_j = T_{j\ max};$ $V_D = V_{DRM}; V_R = V_{RRM}$	
$(dv_D/dt)_{crit}$	Critical rate of rise of off-state voltage ¹⁾ , min	V/ μ s	1000	$T_j = T_{j\ max};$ $V_D = 0.67 \cdot V_{DRM};$ Gate open	
TRIGGERING					
V_{GT}	Gate trigger direct voltage, max	V	4.00 2.50 2.00	$T_j = T_{j\ min}$ $T_j = 25\ ^{\circ}C$ $T_j = T_{j\ max}$	$V_D = 12\ V; I_D = 3\ A;$ Direct gate current
I_{GT}	Gate trigger direct current, max	mA	400 250 200	$T_j = T_{j\ min}$ $T_j = 25\ ^{\circ}C$ $T_j = T_{j\ max}$	
V_{GD}	Gate non-trigger direct voltage, min	V	0.25	$T_j = T_{j\ max};$	
I_{GD}	Gate non-trigger direct current, min	mA	10.00	$V_D = 0.67 \cdot V_{DRM};$ Direct gate current	
SWITCHING					
t_{gd}	Delay time	μ s	2.00	$T_j = 25\ ^{\circ}C; V_D = 0.4 \cdot V_{DRM}; I_{TM} = I_{TAV};$ Gate pulse: $I_G = I_{FGM}; V_G = 20\ V;$ $t_{GP} = 50\ \mu s; di_G/dt = 1\ A/\mu s$	
t_q	Turn-off time ²⁾ , max	μ s	25.0; 32.0	$dv_D/dt = 50\ V/\mu s; T_j = T_{j\ max}; I_{TM} = I_{TAV};$ $di_R/dt = -10\ A/\mu s; V_R = 100V;$ $V_D = 0.67\ V_{DRM}$	
Q_{rr}	Total recovered charge, max	μ C	200	$T_j = T_{j\ max}; I_{TM} = I_{TAV};$	
t_{rr}	Reverse recovery time, typ	μ s	4.0	$di_R/dt = -50\ A/\mu s;$	
I_{rrM}	Peak reverse recovery current, max	A	100	$V_R = 100\ V$	

THERMAL				
R_{thjc}	Thermal resistance, junction to case, max	$^{\circ}\text{C}/\text{W}$	0.0800	Direct current
MECHANICAL				
w	Weight, typ	g	440	
D_s	Surface creepage distance	mm (inch)	12.4 (4.882)	
D_a	Air strike distance	mm (inch)	12.4 (4.882)	

NOTES		PART NUMBERING GUIDE																												
¹⁾ Critical rate of rise of off-state voltage <table border="1"> <tr> <td>Symbol of group</td> <td colspan="2">A2</td> </tr> <tr> <td>$(dv_D/dt)_{crit}$, V/μs</td> <td colspan="2">1000</td> </tr> </table>		Symbol of group	A2		$(dv_D/dt)_{crit}$, V/ μs	1000		<table border="1"> <tr> <td>TFI</td> <td>271</td> <td>250</td> <td>14</td> <td>A2</td> <td>M3</td> <td colspan="2">N</td> </tr> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td colspan="2">7</td> </tr> </table>							TFI	271	250	14	A2	M3	N		1	2	3	4	5	6	7	
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²⁾ Turn-off time ($dv_D/dt=50$ V/ μs) <table border="1"> <tr> <td>Symbol of group</td> <td>M3</td> <td>K3</td> </tr> <tr> <td>t_{qr}, μs</td> <td>25.0</td> <td>32.0</td> </tr> </table>		Symbol of group	M3	K3	t_{qr} , μs	25.0	32.0	<ol style="list-style-type: none"> High Frequency Inverter Grade Thyristor Design version Mean on-state current, A Voltage code Critical rate of rise of off-state voltage Group of turn-off time ($dv_D/dt=50$ V/μs) Ambient conditions: N – normal; T – tropical 																						
Symbol of group	M3	K3																												
t_{qr} , μs	25.0	32.0																												

OVERALL DIMENSIONS

Package type: T.SB1



Type of screw	W	H
Metric Screw Type C	M24x1,5	18
Metric Screw Type B (upon request)	M20x1,5	18

Polarity	Example of code designation	Reference designation	Colors		
			Anode	Cathode	Gate
Anode to stud	TFI271-250-14		-	Red tube	White

All dimensions in millimeters (inches)

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