



Optimum power handling
Low on-state and switching losses
Designed for traction and industrial applications

Phase Control Stud Thyristor Type T161-160-16

Mean on-state current							I_{TAV}			160 A						
Repetitive peak off-state voltage*							V_{DRM}			100÷1600 V						
Repetitive peak reverse voltage*							V_{RRM}									
Turn-off time							t_q			125 μ s						
V_{DRM}, V_{RRM}, V	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
Voltage code	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
$T_{jv}, ^\circ C$	-60÷125															

* **1800 V** – Voltage class on demand

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions	
ON-STATE					
I_{TAV}	Mean on-state current	A	160 220	$T_c = 99\text{ }^\circ C$; $T_c = 85\text{ }^\circ C$; 180° half-sine wave; 50 Hz	
I_{TRMS}	RMS on-state current	A	251	$T_c = 99\text{ }^\circ C$; 180° half-sine wave; 50 Hz	
I_{TSM}	Surge on-state current	kA	4.0 4.6	$T_j = T_{j\max}$ $T_j = 25\text{ }^\circ C$ 180° half-sine wave; 50 Hz ($t_p = 10\text{ ms}$); single pulse; $V_D = V_R = 0\text{ V}$; Gate pulse: $I_G = 2\text{ A}$; $t_{GP} = 50\text{ }\mu s$; $di_G/dt \geq 1\text{ A}/\mu s$	
			5.0 5.8	$T_j = T_{j\max}$ $T_j = 25\text{ }^\circ C$ 180° half-sine wave; 60 Hz ($t_p = 8.3\text{ ms}$); single pulse; $V_D = V_R = 0\text{ V}$; Gate pulse: $I_G = 2\text{ A}$; $t_{GP} = 50\text{ }\mu s$; $di_G/dt \geq 1\text{ A}/\mu s$	
I^2t	Safety factor	$A^2s \cdot 10^3$	80 105	$T_j = T_{j\max}$ $T_j = 25\text{ }^\circ C$ 180° half-sine wave; 50 Hz ($t_p = 10\text{ ms}$); single pulse; $V_D = V_R = 0\text{ V}$; Gate pulse: $I_G = 2\text{ A}$; $t_{GP} = 50\text{ }\mu s$; $di_G/dt \geq 1\text{ A}/\mu s$	
			100 135	$T_j = T_{j\max}$ $T_j = 25\text{ }^\circ C$ 180° half-sine wave; 60 Hz ($t_p = 8.3\text{ ms}$); single pulse; $V_D = V_R = 0\text{ V}$; Gate pulse: $I_G = 2\text{ A}$; $t_{GP} = 50\text{ }\mu s$; $di_G/dt \geq 1\text{ A}/\mu s$	
BLOCKING					
V_{DRM}, V_{RRM}	Repetitive peak off-state and Repetitive peak reverse voltages	V	100÷1600	$T_{j\min} < T_j < T_{j\max}$; 180° half-sine wave; 50 Hz; Gate open	
V_{DSM}, V_{RSM}	Non-repetitive peak off-state and Non-repetitive peak reverse voltages	V	110÷1700	$T_{j\min} < T_j < T_{j\max}$; 180° half-sine wave; 50 Hz; single pulse; Gate open	
V_D, V_R	Direct off-state and Direct reverse voltages	V	$0.75 \cdot V_{DRM}$ $0.75 \cdot V_{RRM}$	$T_j = T_{j\max}$; Gate open	

TRIGGERING				
I_{FGM}	Peak forward gate current	A	5	$T_j = T_{j\ max}$
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	250	$T_j = T_{j\ max}; V_D = 0.67 \cdot V_{DRM}; I_{TM} = 2 I_{TAV};$ Gate pulse: $I_G = 2\ A;$ $t_{GP} = 50\ \mu s; di_G/dt \geq 1\ A/\mu s$
THERMAL				
T_{stg}	Storage temperature	$^{\circ}C$	-60÷125	
T_j	Operating junction temperature	$^{\circ}C$	-60÷125	
MECHANICAL				
M	Tightening torque	Nm	20÷30	
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	$T_j = 25\ ^{\circ}C; I_{TM} = 502\ A$	
$V_{T(TO)}$	On-state threshold voltage, max	V	1.05	$T_j = T_{j\ max};$	
r_T	On-state slope resistance, max	m Ω	1.360	$0.5\ \pi\ I_{TAV} < I_T < 1.5\ \pi\ I_{TAV}$	
I_L	Latching current, max	mA	500	$T_j = 25\ ^{\circ}C; V_D = 12\ V;$ Gate pulse: $I_G = 2\ A;$ $t_{GP} = 50\ \mu s; di_G/dt \geq 1\ A/\mu s$	
I_H	Holding current, max	mA	250	$T_j = 25\ ^{\circ}C;$ $V_D = 12\ V; \text{Gate open}$	
BLOCKING					
I_{DRM}, I_{RRM}	Repetitive peak off-state and Repetitive peak reverse currents, max	mA	50	$T_j = T_{j\ max};$ $V_D = V_{DRM}; V_R = V_{RRM}$	
$(dv_D/dt)_{crit}$	Critical rate of rise of off-state voltage ¹⁾ , min	V/ μ s	1000	$T_j = T_{j\ max};$ $V_D = 0.67 \cdot V_{DRM}; \text{Gate open}$	
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	$T_j = T_{j\ max};$ $V_D = 0.67 \cdot V_{DRM};$	
I_{GD}	Gate non-trigger direct current, min	mA	10.00	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: $I_G = 2\ A;$ $t_{GP} = 50\ \mu s; di_G/dt \geq 1\ A/\mu s$	
t_q	Turn-off time ²⁾ , max	μ s	125	$dv_D/dt = 50\ V/\mu s; T_j = T_{j\ max}; I_{TM} = I_{TAV};$ $di_R/dt = -10\ A/\mu s; V_R = 100V;$ $V_D = 0.67 \cdot V_{DRM};$	

THERMAL				
R _{thjc}	Thermal resistance, junction to case, max	°C/W	0.1000	Direct current
MECHANICAL				
w	Weight, typ	g	250	
D _s	Surface creepage distance	mm (inch)	12.40 (4.882)	
D _a	Air strike distance	mm (inch)	12.40 (4.882)	

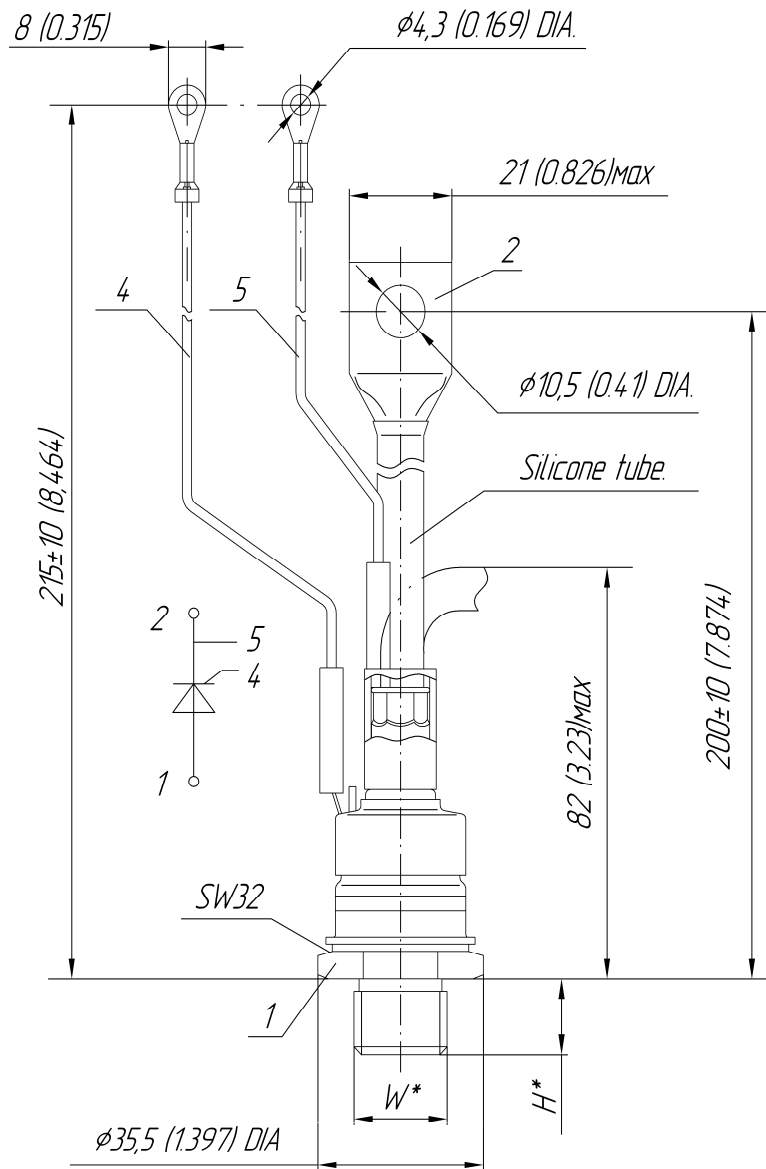
PART NUMBERING GUIDE

T	161	160	16	N
1	2	3	4	5

1. Phase Control Thyristor
2. Design version
3. Mean on-state current, A
4. Voltage code
5. Ambient conditions: N – normal; T – tropical

OVERALL DIMENSIONS

Package type: T.SA1



Type of screw	W	H
Metric Screw Type B	M20x1,5	16
Metric Screw Type A(upon request)	M16x1,5	13

Polarity	Example of code designation	Reference designation	Colors		
			Anode	Cathode	Gate
Anode to stud	T161-160-16		-	Red tube	White

All dimensions in millimeters (inches)

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