

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

Phase Control Thyristor Type T161-160

Mean on-state current	I_{TAV}	160 A										
Repetitive peak off-state voltage	V_{DRM}	300 ÷ 1800 V										
Repetitive peak reverse voltage	V_{RRM}											
Turn-off time	t_q	80; 100; 160; 250 μ s										
V_{DRM}, V_{RRM}, V	300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1800											
Voltage code	3 4 5 6 7 8 9 10 11 12 13 14 15 16 18											
$T_j, ^\circ C$	$-60 \div 125$											

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions
ON-STATE				
I_{TAV}	Mean on-state current	A	160	$T_c=87^\circ C$; 180° half-sine wave, 50 Hz
I_{TRMS}	RMS on-state current	A	251	$T_c=87^\circ C$; Full cycle sine wave, 50 Hz
I_{TSM}	Surge on-state current	kA	4.0 4.4	$T_j=T_{j\max}$ $T_j=25^\circ C$ 180° half-sine wave, 50 Hz, single pulse; $V_R=0$ V; Gate pulse: 20 V, 5 Ω , 1 μ s rise time, 500 μ s
I^2t	Safety factor	$A^2 \cdot 10^3$	80 100	$T_j=T_{j\max}$ $T_j=25^\circ C$
BLOCKING				
V_{DRM}, V_{RRM}	Repetitive peak off-state and Repetitive peak reverse voltages	V	300 ÷ 1800	$T_j=T_{j\max}$; 180° half-sine wave, 50 Hz; Gate open
V_{DSM}, V_{RSM}	Non-repetitive peak off-state and Non-repetitive peak reverse voltages	V	335 ÷ 2000	$T_j=T_{j\max}$; 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
TURNING ON				
P_{GM}	Peak gate power dissipation	W	40	$T_j=T_{j\max}$
$P_{G(AV)}$	Mean gate power dissipation	W	6	$T_j=T_{j\max}$
V_{RGM}	Peak gate reverse voltage	V	5	$T_j=T_{j\max}$
SWITCHING				
$(di_T/dt)_{crit}$	Critical rate of rise of on-state current: non-repetitive repetitive	$A/\mu s$	125 60	$T_j=T_{j\max}$; $V_D=0.67 \cdot V_{DRM}$; $I_{TM} \leq 2I_{(AV)}$; Gate pulse: 20 V, 5 Ω , 1 μ s rise time, 500 μ s
THERMAL				
T_{stg}	Storage temperature	$^\circ C$	$-60 \div 50$	
T_j	Junction temperature	$^\circ C$	$-60 \div 125$	

CHARACTERISTICS

Symbols and parameters			Units	Values	Conditions
ON-STATE					
V _{TM}	Peak on-state voltage		V	1.70	T _j =25°C; I _{TM} =3.14·I _{TAV}
V _{T(TO)}	On-state threshold voltage		V	1.05	T _j =T _j max
r _T	On-state slope resistance		mΩ	1.36	T _j =T _j max
I _L	Latching current		mA	700	T _j =25°C; V _D =12 V; Gate pulse: 20 V, 5 Ω, 1 μs rise time, 50 μs
I _H	Holding current		mA	250	T _j =25°C; V _D =12 V; Gate open
BLOCKING					
I _{DRM} , I _{RRM}	Repetitive peak off-state and repetitive peak reverse currents		mA	15	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⁾		V/μs	20 1000	T _j =T _j max; V _D =0.67·V _{DRM} ; Gate open
TRIGGERING					
V _{GT}	Gate trigger direct voltage		V	3.50	T _j =25°C; V _D =12 V;
I _{GT}	Gate trigger direct current		A	0.20	Direct gate current
V _{GD}	Gate non-trigger direct voltage		V	0.45	T _j =T _j max; V _D =0.67·V _{DRM} ;
I _{GD}	Gate non-trigger direct current		mA	5.0	Direct gate current
SWITCHING					
t _{gt}	Turn-on time		μs	8.0	T _j =25°C; V _D =100 V; I _{TM} =I _{TAV} ; Gate pulse: 20 V, 5 Ω, 1 μs rise time, 50 μs
t _{gd}	Delay time		μs		
t _q	Turn-off time ²⁾		μs	80 250	T _j =T _j max; I _{TM} =I _{TAV} ; di _R /dt=5 A/μs; V _R =100 V; V _D =0.67 V _{DRM} ; dV _D /dt=50 V/μs
Q _{rr}	Recovered charge		μC	350	T _j =T _j max; I _{TM} =I _{TAV} ;
t _{rr}	Reverse recovery time		μs	15.0	di _R /dt=5 A/μs; V _R =100 V;
THERMAL					
R _{thjc}	Thermal resistance junction to case		°C/W	0.15	Direct current, double side cooled

Note:

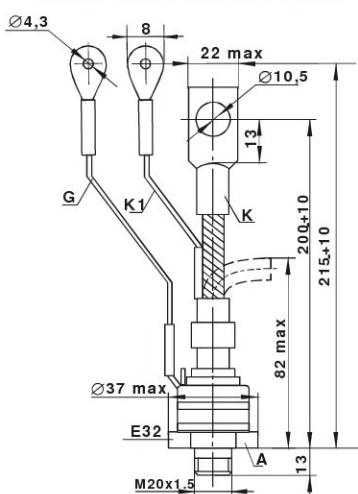
¹⁾ Critical rate of rise of off-state voltage

²⁾ Turn-off time

Symbol of group	P3	E3	A3	P2	K2	E2	A2
(dV _D /dt) _{crit} , V/μs	20	50	100	200	320	500	1000

Symbol of group	B3	A3	T2	M2
t _q , μs	80	100	160	250

OVERALL DIMENSIONS



PART NUMBERING GUIDE

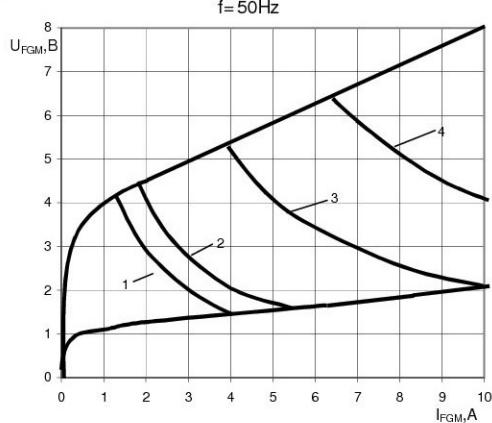
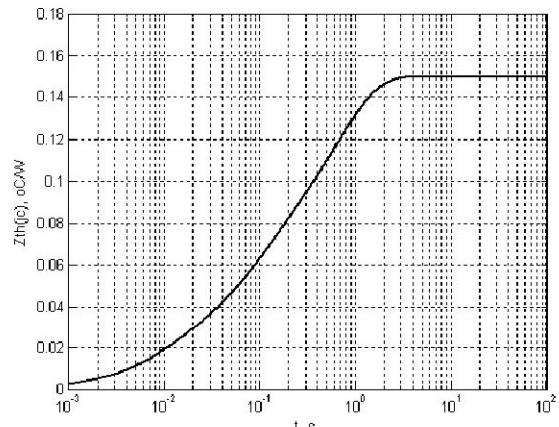
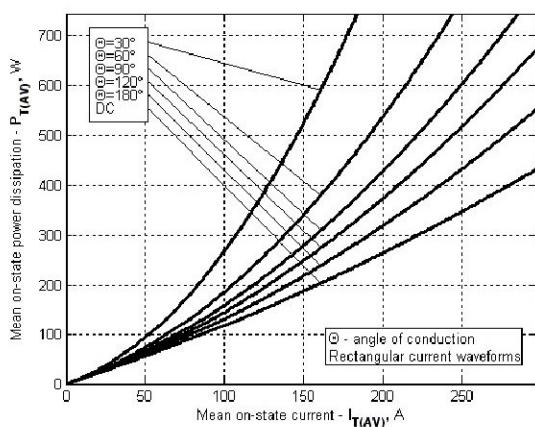
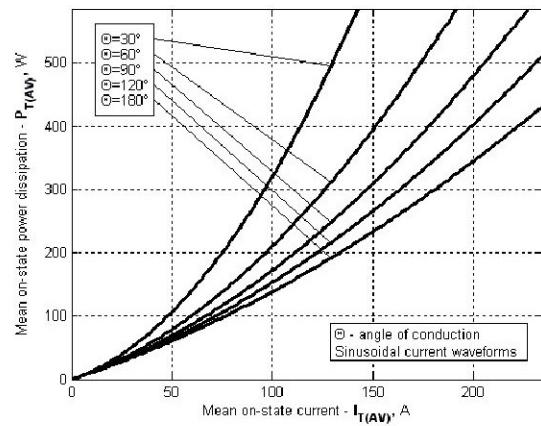
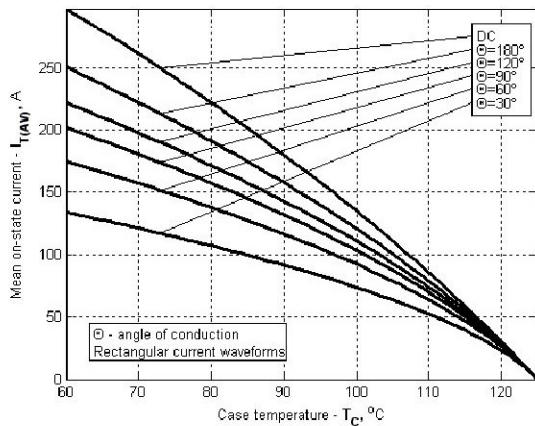
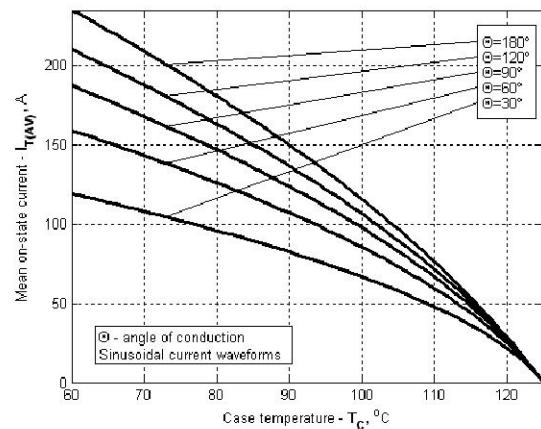
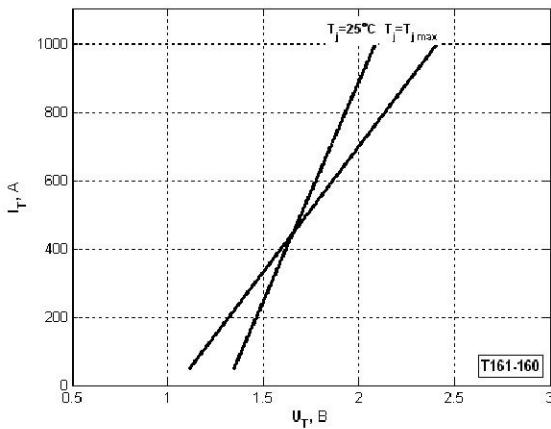
T	161	160	18	A2	B3	N
1	2	3	4	5	6	7

1. Thyristor
2. Design version
3. Mean on-state current, A
4. Voltage code
5. Critical rate of rise of off-state voltage
6. Group of turn-off time
7. Ambient conditions: N – normal; T – tropical

Weight: 240 grams

Tightening torque: 20 ÷ 30 Nm

Recommended heatsink: O171; O271; O371



Position (See Fig. 7)	On-Off time ratio	Gate pulse length, ms	Gate Pulse Power, W
1	1	DC	6
2	2	10	8
3	20	1	20
4	40	0,5	40