STUD TYPE THYRISTOR

Features

- Hermetic glass -metal seal
- tested according to IEC standards
- High surge capability

160A

Typical Application

- DC motor controls
- Controlled DC power supplies
- AC controllers

Major Ratings and Characteristics

Parameters		T160As 1K8VN	Units
$I_{T(AV)}$		160	A
	@ T_C	85	°C
$I_{T(RMS)}$		280	A
I_{TSM}	@ 50Hz	5005	A
	@ 60Hz	5230	A
I^2t	@ 50Hz	125	KA^2s
	@ 60Hz	114	KA^2s
V_{DRM}/V_{RRM}		400 to 1600	V
Tq	typical	100	µs
T_J	range	- 40 to 125	°C

ELECTRICAL SPECIFICATIONS

Voltage Ratings

Type number	Voltage Code	V_{RRM} /V_{DRM} , maximum repetitive peak reverse voltage V	V_{RSM} , maximum non-repetitive peak rev. voltage V	I_{RRM} /I_{DRM} max. @ T_J = T_J max. mA
T160As.	04	400	500	30
	08	800	900	
	12	1200	1300	
	14	1400	1500	
	18	1800	1900	

On-state Conduction

Parameter		T160As	Units	Conditions		
$I_{T(AV)}$	Maximum average on-state current	160	A	180° conduction, half sine wave		
	@ Case temperature	85	°C			
$I_{(RMS)}$	Maximum RMS on-state current	314	A	180° conduction, half sine wave @ T_C = 80°C		
I_{TSM},	Maximum peak, one-cycle non-repetitive surge current	5000	A	t = 10ms	No voltage reapplied	Sinusoidal half wave, Initial T = T max.
		5230		t = 8.3ms		
		4200		t = 10ms	100% V_{RRM} reapplied	
		4400		t = 8.3ms		
I^2t	Maximum I^2t for fusing	125	KA^2s	t = 10ms	No voltage reapplied	
		114		t = 8.3ms		
		88		t = 10ms	100% V_{RRM} reapplied	
		81		t = 8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	1250	$KA^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied		
V_{TM}	Maximum on-state or forward	1.30	V	pk = 600A, T_J = 25°C, t p = 10ms sine pulse		
I_H	Maximum holding current	600	mA	T_J = 25°C, anode supply 12V resistive load		
I_L	Typical latching current	1000(300)				

Switching

	Parameter	T160As.	Units	Conditions
di/dt	ax. non-repetitive rate of rise of turned-on current	1000	A/µs	Gate drive 20V, 20Ω, $t_r \leq 1$µs T_J = T_J max, anode voltage ≤ 80% V_{DRM}
t_d	ical delay time	1.0	µs	Gate current 1A, di_g/dt = 1A/µs V_d = 0.67% V_{DRM}, T_J = 25°C
Tq	pical turn-off time	200	µs	I_{TM} = 300A, T_J = T_J max, di/dt = 20A/µs, V_R = 50V dv/dt = 20V/µs, Gate 0V 100Ω, t_p = 500µs

Blocking

	Parameter	T160As	Units	Conditions
dv/dt	Maximum critical rate of rise of off-state voltage	500	V/µs	T_J = T_J max linear to 80% rated V_{DRM}
I_{DRM} I_{RRM}	Max. peak reverse and off-state leakage current	30	mA	T_J = T_J max, rated V_{DRM}/V_{RRM} applied

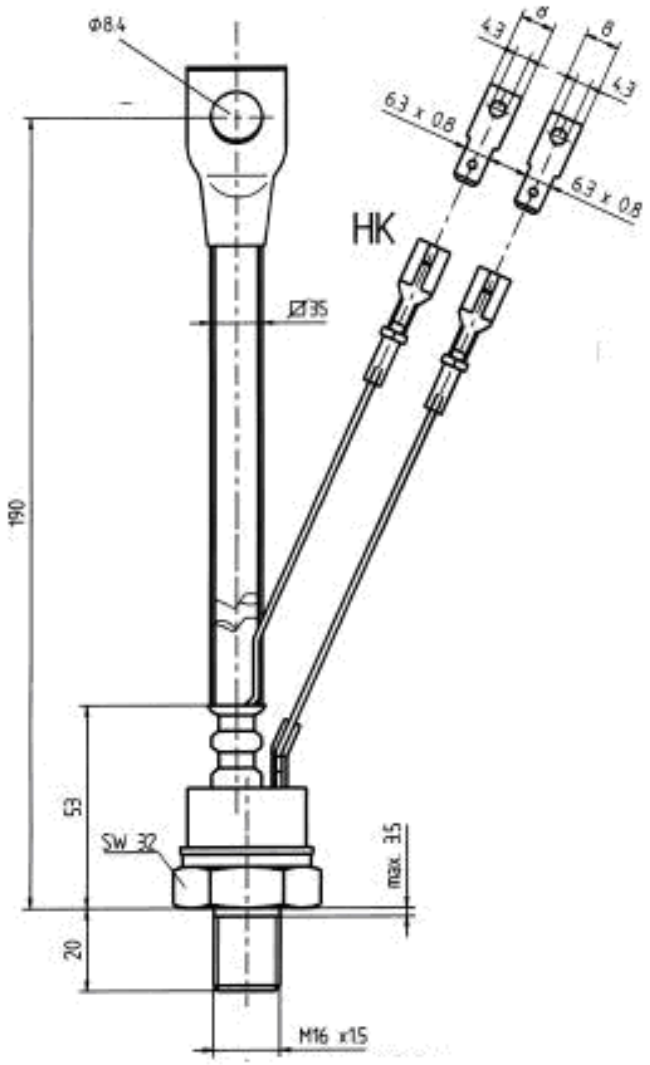
Triggering

	Parameter	T160As		Units	Conditions	
P_{GM}	Maximum peak gate power	10		W	T_J = T_J max, $t_p \leq$ 5ms	
$P_{G(AV)}$	Maximum average gate power	2.0			T_J = T_J max, f = 50Hz, d% = 50	
I_{GM}	Max. peak positive gate current	3.0		A	T_J = T_J max, $t_p \leq$ 5ms	
$+V_{GM}$	Maximum peak positive gate voltage	20		V	T_J = T_J max, $t_p \leq$ 5ms	
$-V_{GM}$	Maximum peak negative gate voltage	5.0				
I_{GT}	DC gate current required to trigger	TYP.	MAX.	mA		
		180	-		T_J =- 40°C	Max. required gate trigger/ current/ voltage are the lowest value which will trigger all units 12V anode-to-cathode applied
		90	150		T_J = 25°C	
		40	-		T_J = 125°C	
V_{GT}	DC gate voltage required to trigger	2.9	-	V	T_J =- 40°C	
		1.8	3.0		T_J = 25°C	
		1.2	-		T_J = 125°C	
I_{GD}	DC gate current not to trigger	10		mA	T_J = T_J max	Max. gate current/ voltage not to trigger is the max. value which will not trigger any unit with rated V anode-to-cathode applied
V_{GD}	DC gate voltage not to trigger	0.25		V		

Thermal and Mechanical Specification

	Parameter	T160As	Units	Conditions
T_J	Max. operating temperature range	-40 to 125	°C	
T_{stg}	Max. storage temperature range	-40 to 150		
R_{thJC}	Max. thermal resistance, junction to case	0.105	K/W	DC operation
R_{thCS}	Max. thermal resistance, case to heatsink	0.04		Mounting surface, smooth, flat and greased
T	Mounting torque, ± 10%	31(275)	Nm	Non lubricated threads
		24.5(210)	(lbf-in)	Lubricated threads
wt	Approximate weight	283	g	

Outline Table



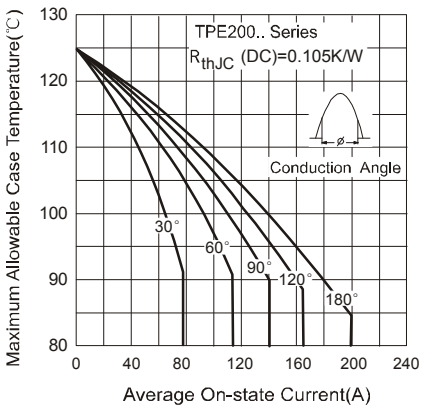


Fig.1-Current Ratings Characteristics

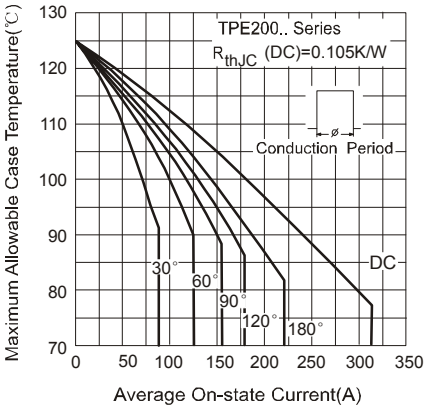


Fig.2-Current Ratings Characteristics

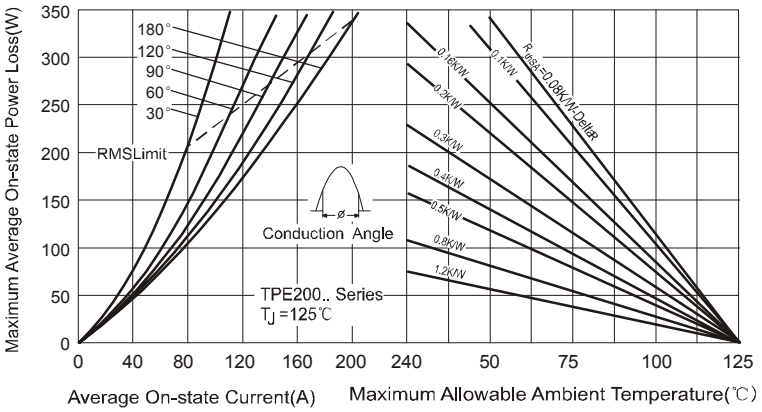


Fig.3-On-state Power Loss Characteristics

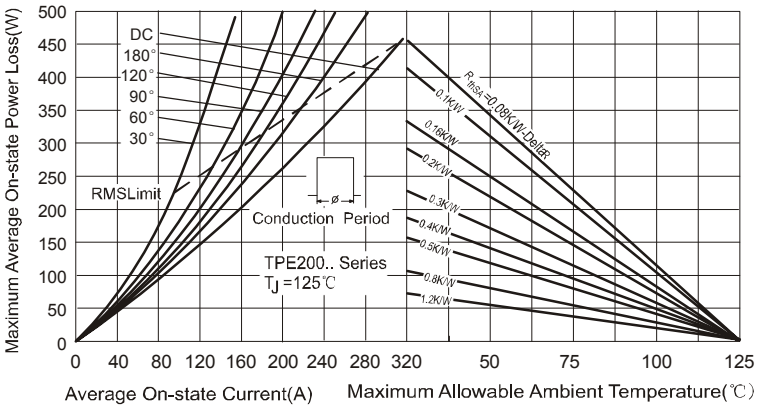


Fig.4-On-state Power Loss Characteristics