

PHD**T80As 1K6V...SERIES****PHASE CONTROL THYRISTORS****Stud Version****Features**

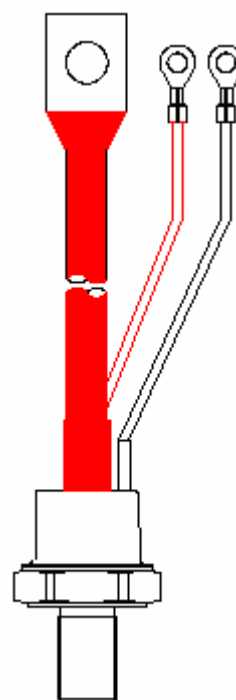
- Hermetic ceramic -metal seal
- high dv/dt
- tested according to IEC standards

80A**Typical Applications**

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

Major Ratings and Characteristics

Parameters		T80As 1K6V	Units
$I_{T(AV)}$		80	A
	@ T_c	85	°C
$I_{T(RMS)}$		160	A
I_{TSM}	@ 50Hz	2000	A
	@ 60Hz	2100	A
$I^2 t$	@ 50Hz	20	KA ² s
	@ 60Hz	18	KA ² s
V_{DRM} / V_{RRM}		400 to 1600	V
T_q	typical	200	μs
T_J	range	- 40 to 125	°C



case style
TO-209AB (TO-93)

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
T80As	04	400	500	30
	08	800	900	
	12	1200	1300	
	14	1400	1500	
	16	1600	1700	

On-state Conduction

Parameter	T80As	Units	Conditions
$I_{T(AV)}$ Maximum average on-state current @ Case temperature	80	A	180° conduction, half sine wave
	85	°C	
$I_{(RMS)}$ Maximum RMS on-state current	160	A	180° conduction, half sine wave @ $T_C = 80^\circ\text{C}$
I_{TSM} Maximum peak, one-cycle non-repetitive surge current	2000	A	t = 10ms No voltage
	2100		t = 8.3ms reappplied
	1850		t = 10ms 100% V_{RRM}
	1900		t = 8.3ms reappplied
$I^2 t$ Maximum $I^2 t$ for fusing	20	$\text{KA}^2 \text{s}$	t = 10ms No voltage
	18		t = 8.3ms reappplied
	17		t = 10ms 100% V_{RRM}
	16		t = 8.3ms reappplied
$I^2 \sqrt{t}$ Maximum $I^2 \sqrt{t}$ for fusing	200	$\text{KA}^2 \sqrt{\text{s}}$	t = 0.1 to 10ms, no voltage reappplied
V_{TM} Maximum on-state or forward	2.2	V	pk = 600A, $T_J = 25^\circ\text{C}$, t p = 10ms sine pulse
I_H Maximum holding current	200	mA	$T_J = 25^\circ\text{C}$, anode supply 12V resistive load
I_L Typical latching current	350		

Switching

Parameter	T80As	Units	Conditions
di/dt ax. non-repetitive rate of rise of turned-on current	200	A/μs	Gate drive 20V, 20Ω, t _r ≤ 1μs $T_J = T_J$ max, anode voltage ≤ 80% V_{DRM}
t _d ical delay time	1.0	μs	Gate current 1A, dig/dt = 1A/μs $V_d = 0.67\% V_{DRM}$, $T_J = 25^\circ\text{C}$
T _q 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	T80As	Units	Conditions
dv/dt Maximum critical rate of rise of off-state voltage	400	V/μs	T _J = T _J max linear to 80% rated V _{DRM}
I _{DRM} Max. peak reverse and off-state leakage current	15	mA	T _J = T _J max, rated V _{DRM} /V _{RRM} applied

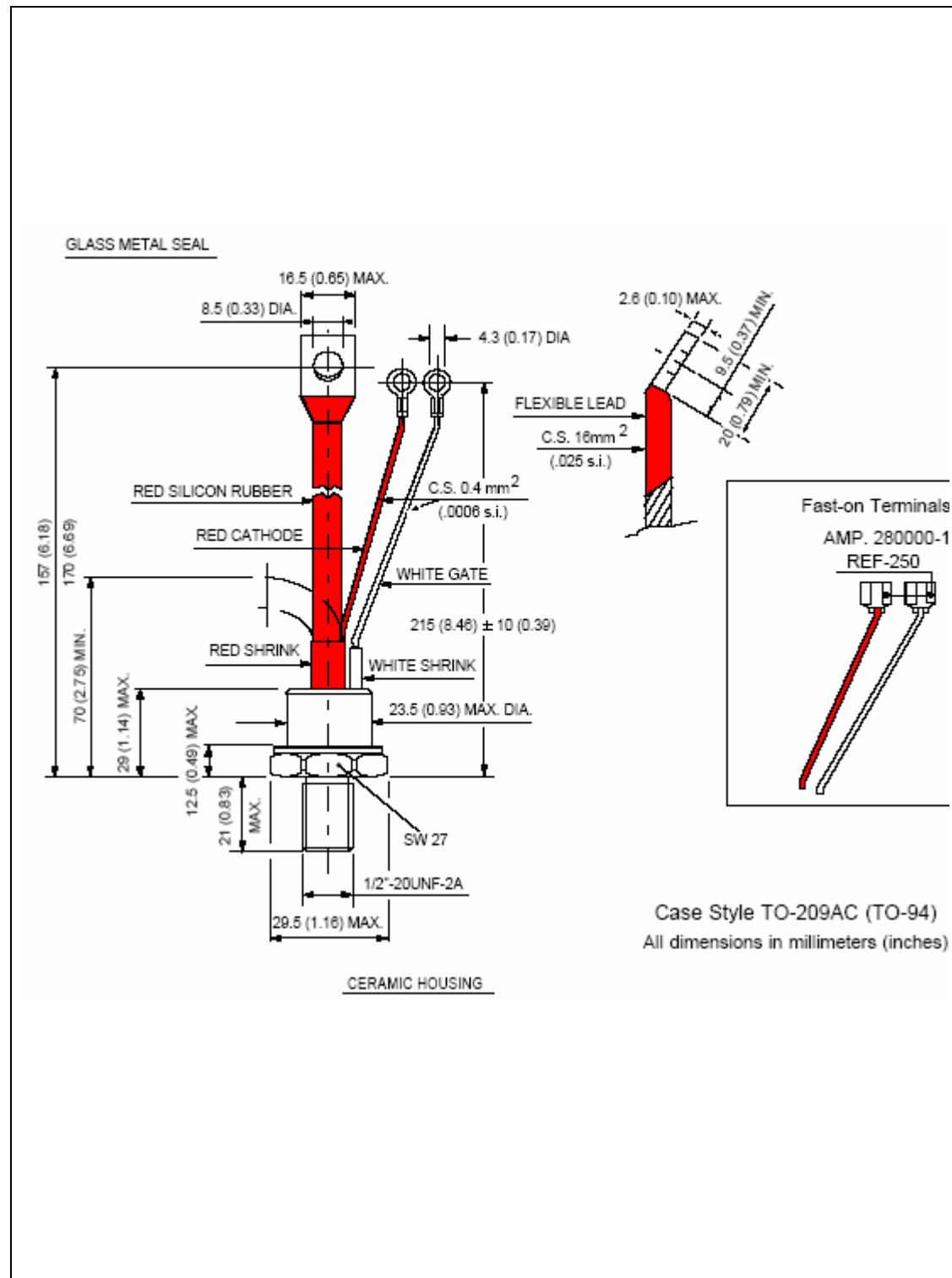
Triggering

Parameter		T80As		Units	Conditions
P _{GM}	Maximum peak gate power	13		W	T _J = T _J max, t _p ≤ 5ms
P _{G(AV)}	Maximum average gate power	3.0			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 ≤ 5ms
+V _{GM}	Maximum peak positive gate voltage	20		V	T _J = T _J max, t _p ≤ 5ms
-V _{GM}	Maximum peak negative gate voltage	8			
I _{GT}	DC gate current required to trigger	TYP.	MAX.	mA	T _J =- 40°C T _J = 25°C T _J = 125°C Max. required gate trigger/ current/ voltage are the lowest value which will trigger all units 12V anode-to-cathode applied
		180	-		
		90	150		
		40	-		
V _{GT}	DC gate voltage required to trigger	2.9	-	V	T _J =- 40°C T _J = 25°C T _J = 125°C
		1.8	30		
		1.2	-		
I _{GD}	DC gate current not to trigger	8		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	T80As	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	0.3	K/W	DC operation
R _{thCS} Max. thermal resistance, case to heatsink	0.1		Mounting surface, smooth, flat and greased
T Mounting torque, ± 10%	16(138)	Nm	Non lubricated threads
	14(120)	(lbf-in)	Lubricated threads
wt Approximate weight	200	g	

Outline Table



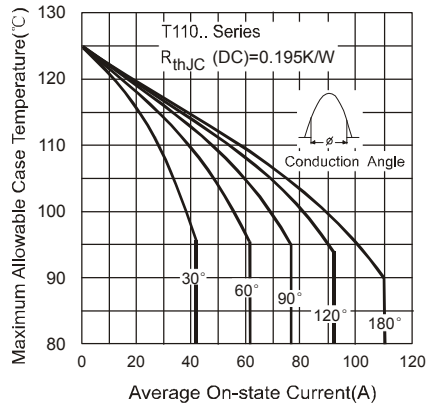


Fig.1-Current Ratings Characteristics

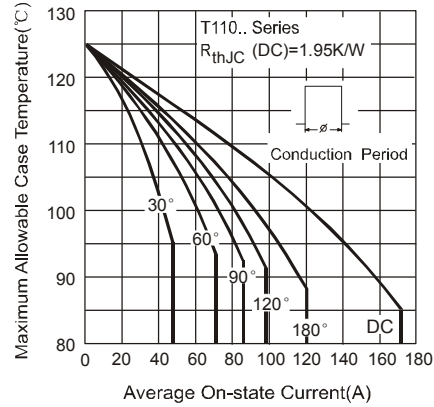


Fig.2-Current Ratings Characteristics

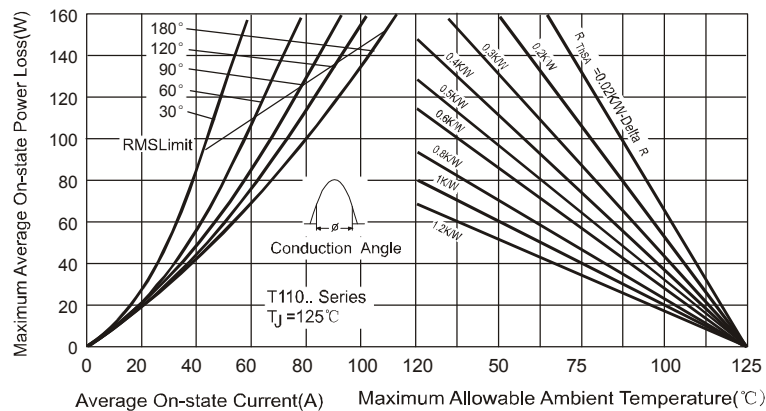


Fig.3-On-state Power Loss Characteristics

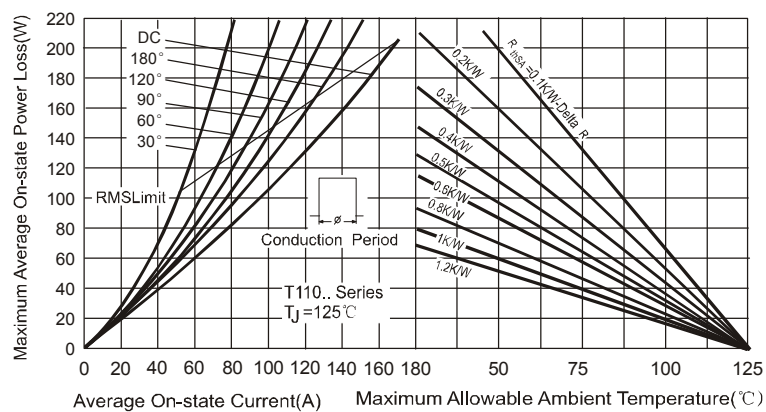


Fig.4-On-state Power Loss Characteristics

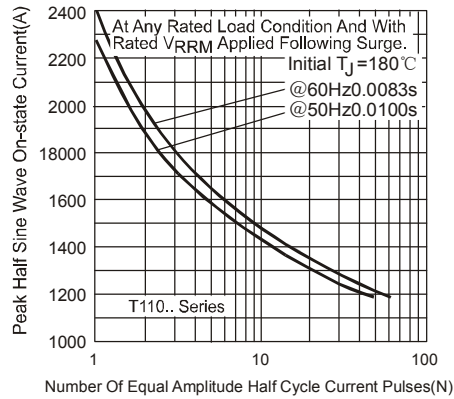


Fig.5-Maximum Non-Repetitive Surge Current

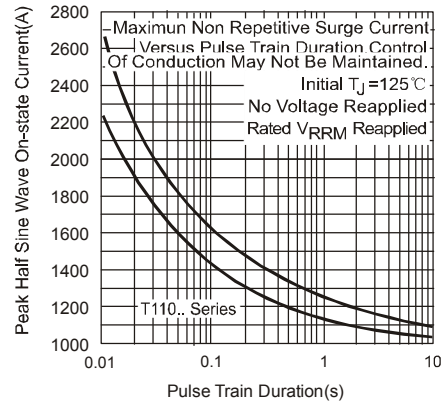


Fig.6-Maximum Non-Repetitive Surge Current

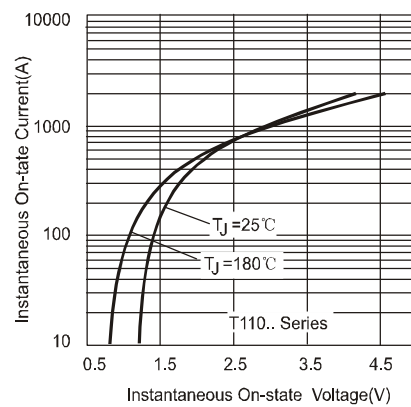


Fig.7-On-state Voltage Drop Characteristics

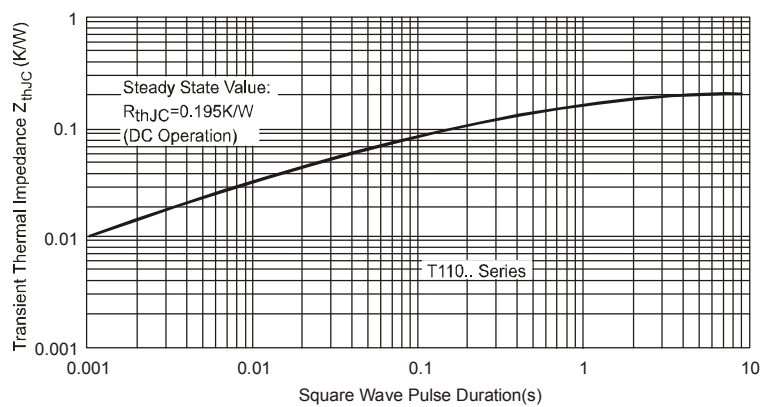


Fig.8-Thermal Impedance Z_{thJC} Characteristics