ST110S Phase Control Thyristor

Feature

- Hermetic ceramics-metal stud structure
- Capacity of supporting high surge current

Typical Application

- DC motor control,Control DC power supplie
- AC swith and thermal control,Synchronous motor excitation

$I_{T(AV)}$	100A
V_{DRM}/V_{RRM}	100-3000V
I_{TSM}	2830A
I^2t	23.5 KA^2s

Voltage Ratings

Type number	Voltage Code	V_{DRM}/V_{RRM} max. repetitive peak and off-state voltage (1) V	V_{RSM} maximum non-repetitive peak voltage (2) V	I_{DRM}/I_{RRM} @$T_J=T_J$ mA
ST110S	10	100	150	20
	20	200	300	
	40	400	500	
	60	600	700	
	80	800	900	
	100	1000	1100	
	120	1200	1300	
	140	1400	1500	
	160	1600	1700	

On-state Conduction

Symbol	Charteristic	ST110S 10-120	ST110S 140-160	Units	Conditions		
$I_{T(AV)}$	Max. average on-state current @ Case temperature	100	100	A	180℃sinusoidal conduction		
$I_{T(RMS)}$	Max. RMS on-state current	175	175	A			
I_{TSM}	Max. peak, one-cycle non-repetitive surge current	2700	2700	A	t=10ms	No voltage reapplied	Sinusoidal half wave InitialTJ=TJ Max
		2830	2830		t=8.3ms		
		2700	2700		t=10ms	100%V_{RRM} reapplied	
		2830	2830		t=8.3ms		
I^2t	Maximum I2t for fusing	33.2	33.2	KA^2S	t=10ms	No voltage	
		36.4	36.4		t=8.3ms		
		23.5	23.5		t=10ms	100%V_{RRM} reapplied	
		25.8	25.8		t=8.3ms		
$V_{T(TO)1}$	Low level value of threshold voltage	0.90	0.90	V	(16.7% x x $I_{T(AV)}$ < I < π x $I_{T(AV)}$, $T_J=T_J$ Max		
$V_{T(TO)2}$	High level value of threshold voltage	0.92	0.92		(I > x $I_{T(AV)}$), $T_J=T_J$ Max		
R_{t1}	Low level value of on-state slope resistance	1.79	1.79	mΩ	(16.7% x x $I_{T(AV)}$ < I < π x $I_{T(AV)}$, $T_J=T_J$ Max		
R_{t2}	High level value of on-state slope resistance	1.81	1.81		(I > x $I_{T(AV)}$), $T_J=T_J$ Max		
V_{TM}	Max. on-state voltage	1.52	1.52		I_{PK}=79A, T_J=25℃		
I_H	Maximum holding current	600		mA	T_J=25℃， Anode supply 6V,resistive load		
I_L	Latching current	100					

Symbol	Charteristic	ST110S	Units	Conditions
di/dt	Critical rate of rise of on-state current V_{DRM}≦600V V_{DRM}≦800V V_{DRM}≦1000V V_{DRM}≦1600V	500	A/us	T_J=T_J max., V_{DM} = V_{DRM} ,15Ω ,t_q= 6us, t_r= 0.1us max I_{TM}= (2×rated di/dt) A
t_{qt}	Typical turn-on time	0.9	us	T_J=25℃ At=V_{DRM}/V_{RRM},T_J=125℃
t_{rr}	Typical reverse recovery time	4		T_J=T_J max, I_{TM}=$I_{T(AV)}$,t_q＞200us,di/dt=-10A/us
t_q	Typical turn-off time	110		T_J=T_J max,I_{TM}=$I_{T(AV)}$,t_q＞200us,V_R=100V di/dt=-10A/us,dv/dt=-20A/us,V_{DM}=67％V_{DRM} 0V-100W
dv/dt	Max. critical rate of rise of off-state voltage	200	V/us	T_J=T_J max,V_{DM}=67％V_{DRM}
I_{DRM},I_{RRM}	Gate trigger current	20	mA	TJ = TJ max, rated V_{DRM}/V_{RRM} applied
P_{GM}	Gate trigger voltage	5	W	T_J=T_J max
$P_{G(AV)}$	Stored temperature	1	W	T_J=T_J max
I_{GM}	Thermal impedance node to the shell	2.0	A	T_J=T_J max
+V_{GM}	Thermal impedance (shell to powder)	20	V	
-V_{GM}	Mounting torque	5	V	
I_{GT}	Approximate weight	180 90 40	mA	T_J=-40℃ T_J=25℃ T_J=125℃
V_{GT}	Critical rate of rise of on-state current V_{DRM}≦600V V_{DRM}≦800V V_{DRM}≦1000V V_{DRM}≦1600V	2.9 1.8 1.2	V	T_J=-45℃ T_J=25℃ T_J=125℃
I_{GD}	Typical turn-on time	10	mA	T_J=T_J max，V_{DRM}=67％V_{DRM}
V_{GD}	Typical reverse recovery time	0.25	V	T_J=T_J max，V_{DRM}=67％V_{DRM}
T_J	Typical turn-off time	-40-125	℃	
T_{stg}	Max. critical rate of rise of off-state voltage	-40-125	℃	
$R_{th(j-c)}$	Gate trigger current	0.195	K/W	
$R_{th(c-s)}$	Gate trigger voltage	0.08	K/W	
T	Stored temperature	15.5	Nm	
W_t	Thermal impedance node to the shell	142	g	

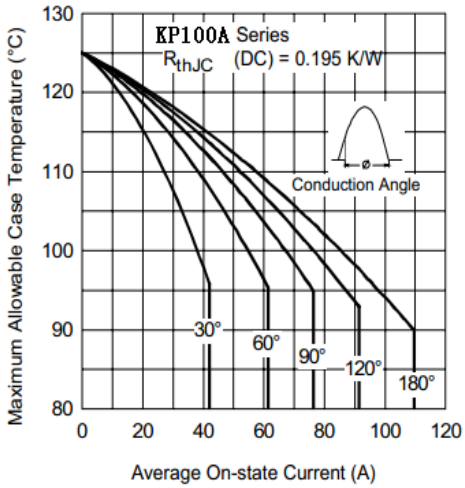

Fig. 1 - Current Ratings Characteristics

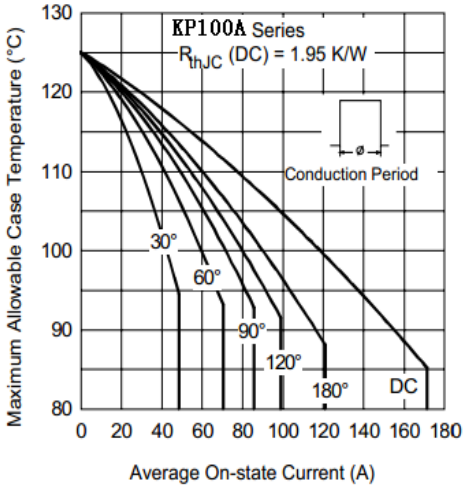

Fig. 2 - Current Ratings Characteristics

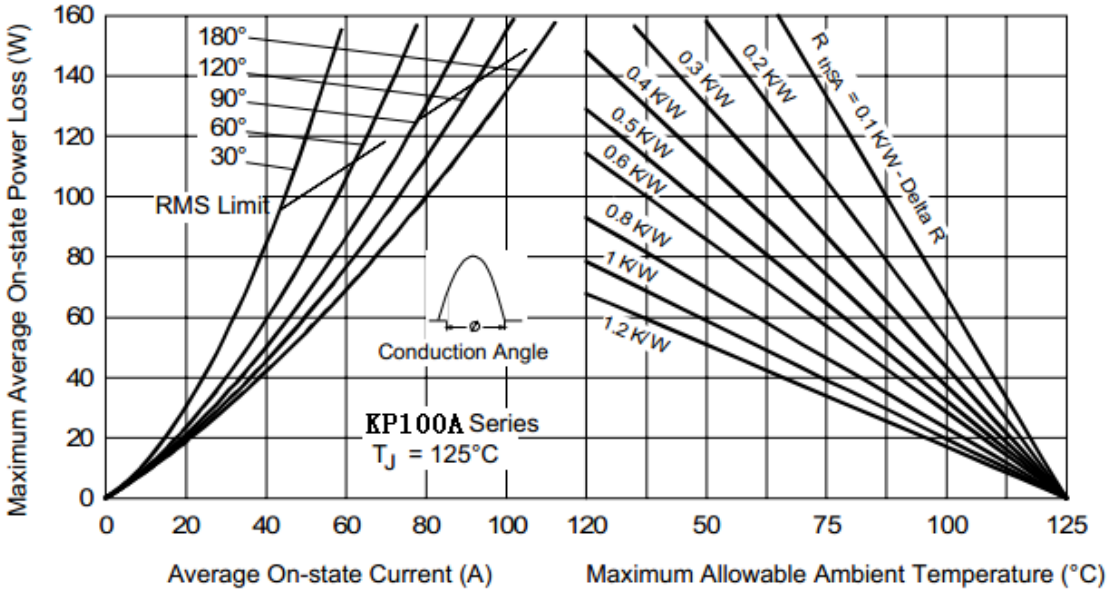

Fig. 3 - On-State Power Loss Characteristics

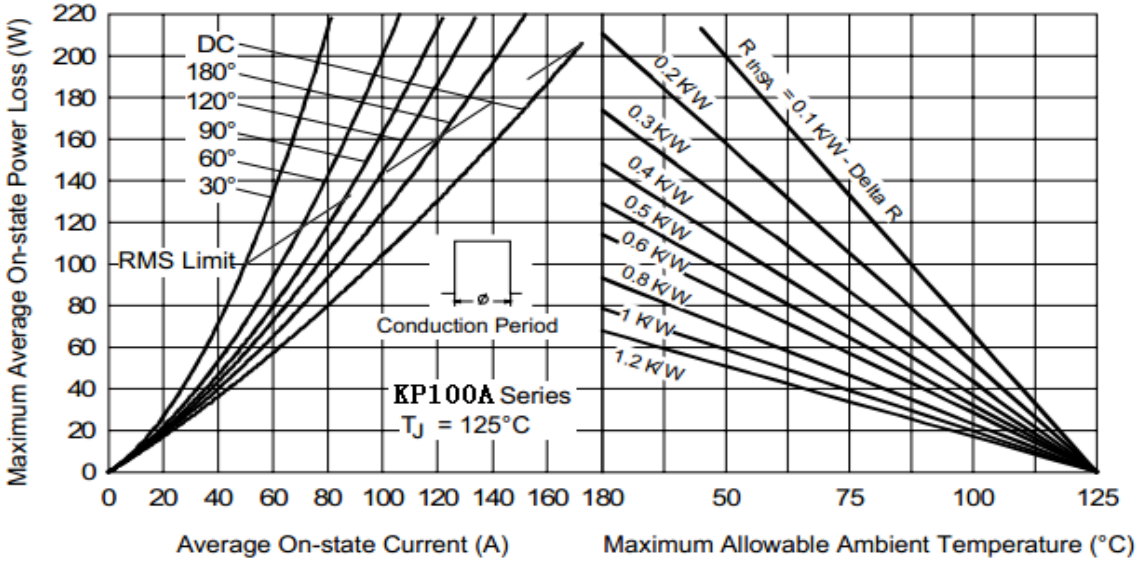

Fig. 4 - On-State Power Loss Characteristics

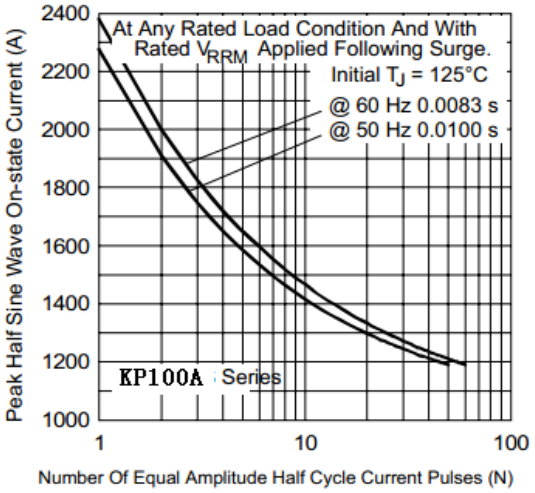

Fig. 5 - Maximum Non-Repetitive Surge Current

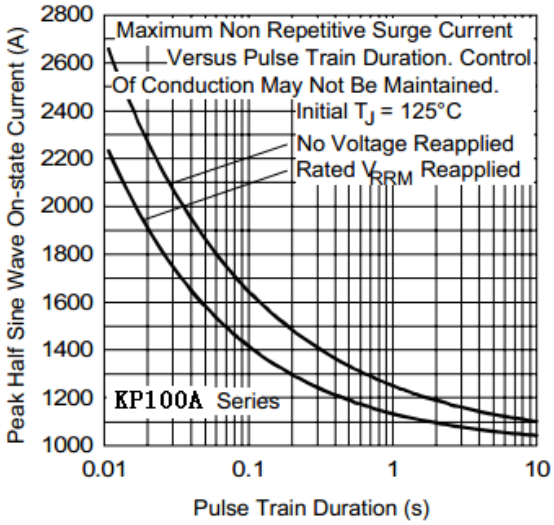

Fig. 6 - Maximum Non-Repetitive Surge Current

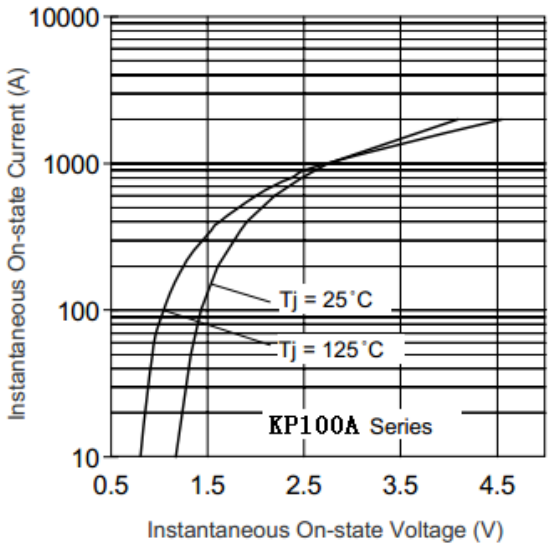

Fig. 7 - On-State Voltage Drop Characteristics

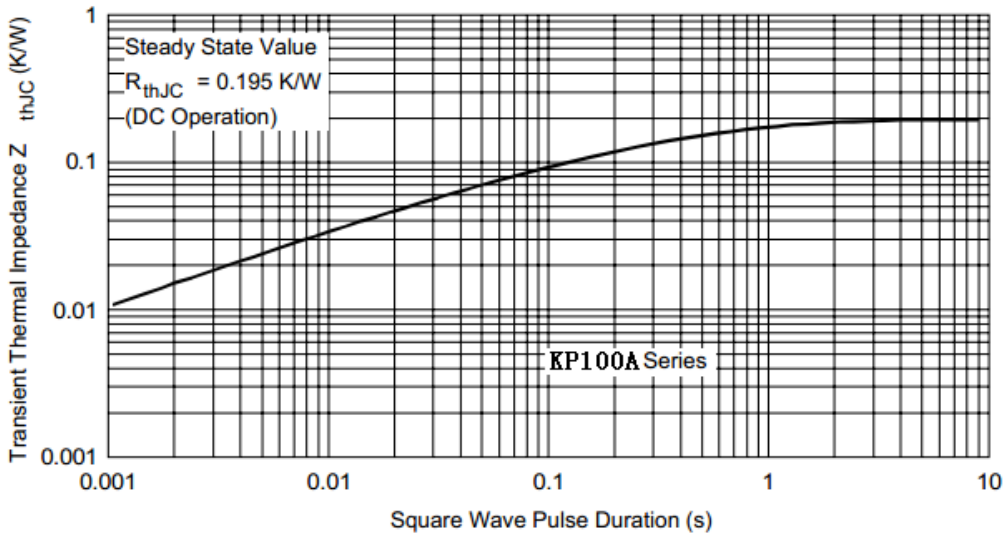

Fig. 8 - Thermal Impedance Z_{thJC} Characteristic