KP50A Standard Rectifier Diode

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

$I_{T(AV)}$	50A
V_{DRM}/V_{RRM}	100-3000V
I_{TSM}	415A
I^2t	725 A^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
KP50A	10	100	150	15
	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	KP50A		Units	Conditions		
		10-120	140-160				
$I_{T(AV)}$	Max. average on-state current @ Case temperature	50	50	A	180℃sinusoidal conduction		
$I_{T(RMS)}$	Max. RMS on-state current	80	80	A			
I_{TSM}	Max. peak, one-cycle non-repetitive surge current	1430	1200	A	t=10ms	No voltage reapplied	Sinusoidal half wave InitialT_J= T_J Max
		1490	1257		t=8.3ms		
		1200	1010		t=10ms	100%V_{RRM} reapplied	
		1255	1057		t=8.3ms		
I^2t	Maximum I2t for fusing	9.3	6.58	KA^2S	t=10ms	No voltage	
		10.18	7.21		t=8.3ms		
		6.56	5.10		t=10ms	100%V_{RRM} reapplied	
		7.20	4.65		t=8.3ms		
$V_{T(TO)1}$	Low level value of threshold voltage	0.94	1.02	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	1.08	1.17		(I > x $I_{T(AV)}$), $T_J=T_J$ Max		
R_{t1}	Low level value of on-state slope resistance	4.08	4.78	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	3.34	3.97		(I > x $I_{T(AV)}$), $T_J=T_J$ Max		
V_{TM}	Max. on-state voltage	1.60	1.78		I_{PK}=79A, T_J=25℃		
I_H	Maximum holding current	200		mA	T_J=25℃, Anode supply 6V,resistive load		
I_L	Latching current	400					

Symbol	Charteristic	KP50A	Units	Conditions
di/dt	Critical rate of rise of on-state current V_{DRM}≦600V V_{DRM}≦800V V_{DRM}≦1000V V_{DRM}≦1600V	200 100	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}
P_{GM}	Gate trigger current	10	W	T_J=T_J max
$P_{G(AV)}$	Gate trigger voltage	2.5	W	T_J=T_J max
I_{GM}	Stored temperature	2.5	A	T_J=T_J max
+V_{GM}	Thermal impedance node to the shell	20	V	
-V_{GM}	Thermal impedance (shell to powder)	10	V	
I_{GT}	Mounting torque	250 100 50	mA	T_J=-40℃ T_J=25℃ T_J=125℃
V_{GT}	Approximate weight	3.5 2.5	V	T_J=-45℃ T_J=25℃
I_{GD}	Critical rate of rise of on-state current V_{DRM}≦600V V_{DRM}≦800V V_{DRM}≦1000V V_{DRM}≦1600V	5.0	mA	T_J=T_J max，V_{DRM}=67%V_{DRM}
V_{GD}	Typical turn-on time	2.0	V	T_J=T_J max，V_{DRM}=67%V_{DRM}
T_J	Typical reverse recovery time	-40-125	℃	
T_{stg}	Typical turn-off time	-40-125	℃	
$R_{th(j-c)}$	Max. critical rate of rise of off-state voltage	0.35	K/W	
$R_{th(c-s)}$	Gate trigger current	0.25	K/W	
T	Gate trigger voltage	2.8	Nm	
W_t	Stored temperature	142	g	

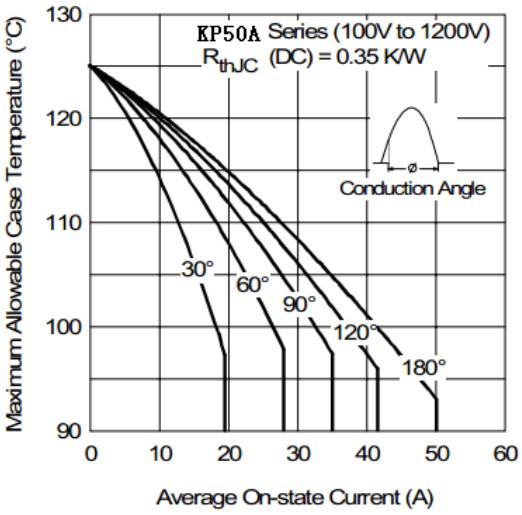


Fig. 1 - Current Ratings Characteristic

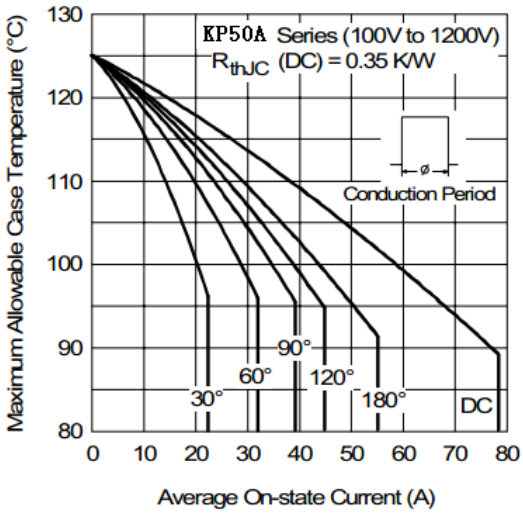


Fig. 2 - Current Ratings Characteristic

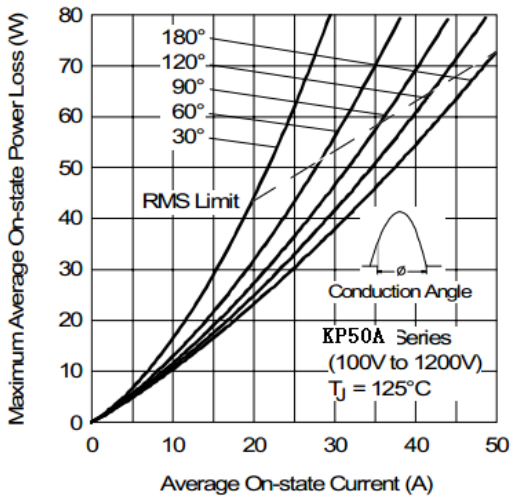


Fig. 3 - On-state Power Loss Characteristics

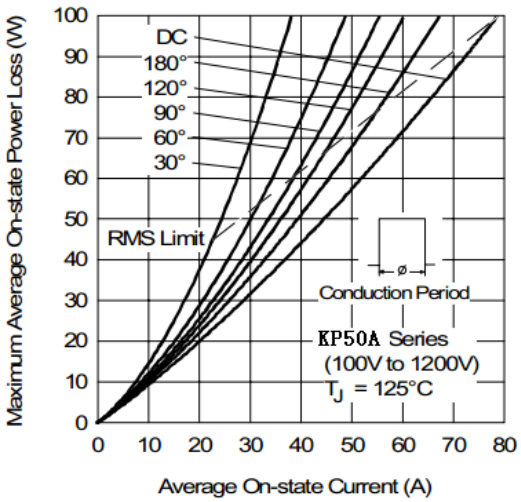


Fig. 4 - On-state Power Loss Characteristics

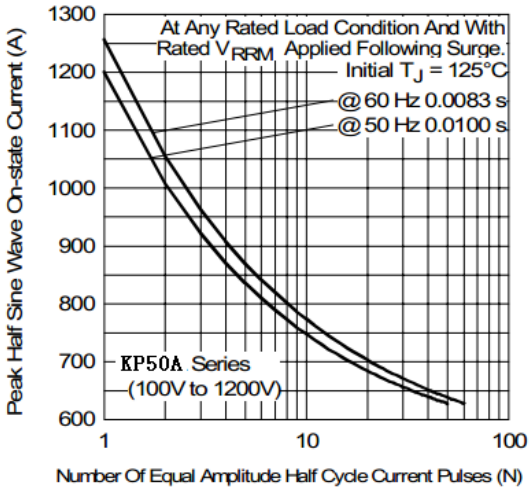


Fig. 5 - Maximum Non-Repetitive Surge Current

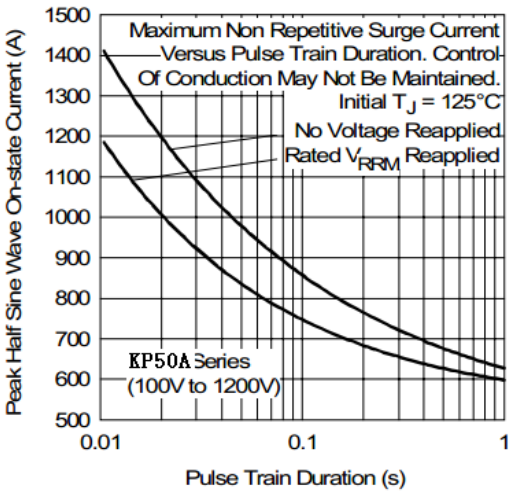


Fig. 6 - Maximum Non-Repetitive Surge Current

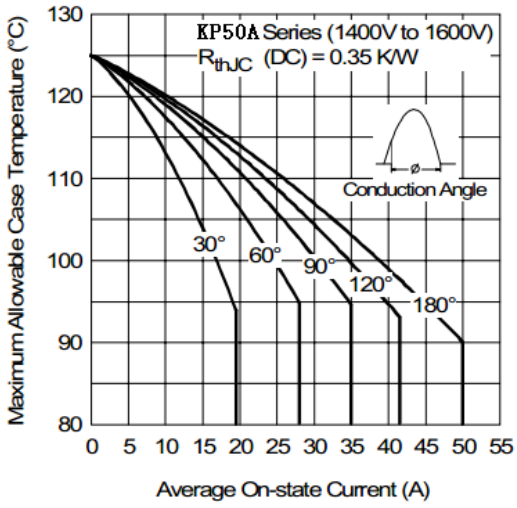


Fig. 7 - Current Ratings Characteristics

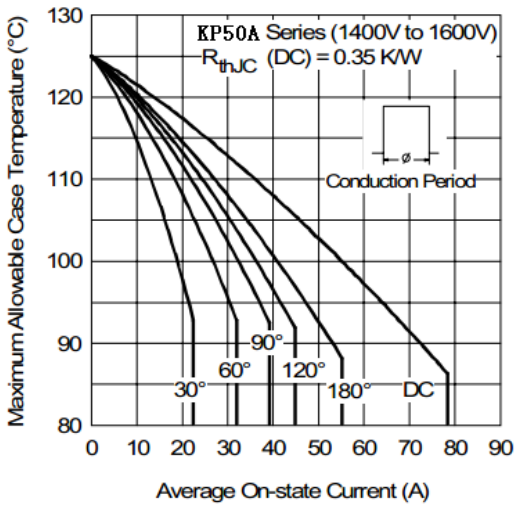


Fig. 8 - Current Ratings Characteristics

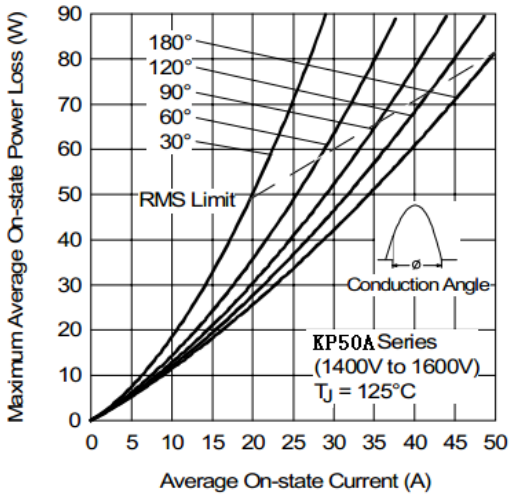


Fig. 9 - On-state Power Loss Characteristics

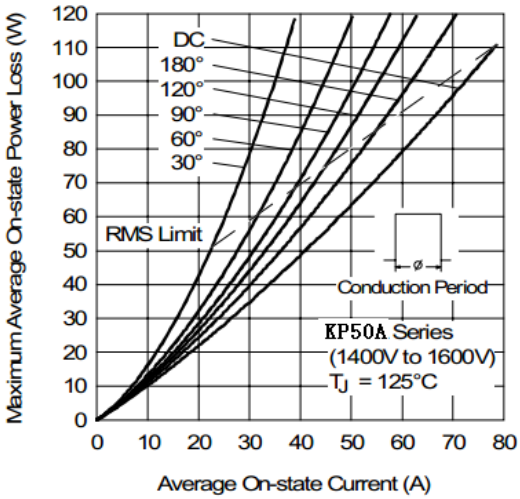


Fig. 10 - On-state Power Loss Characteristics

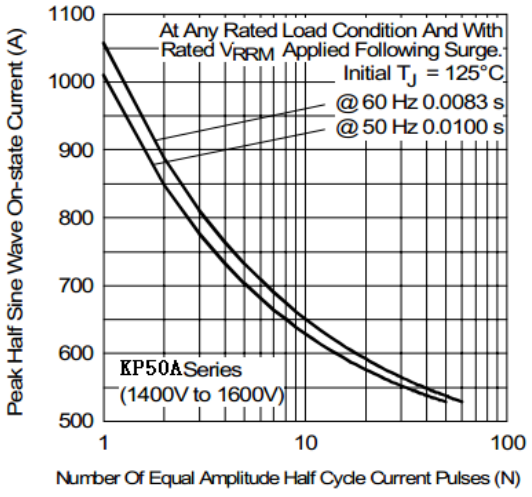


Fig. 11 - Maximum Non-Repetitive Surge Current

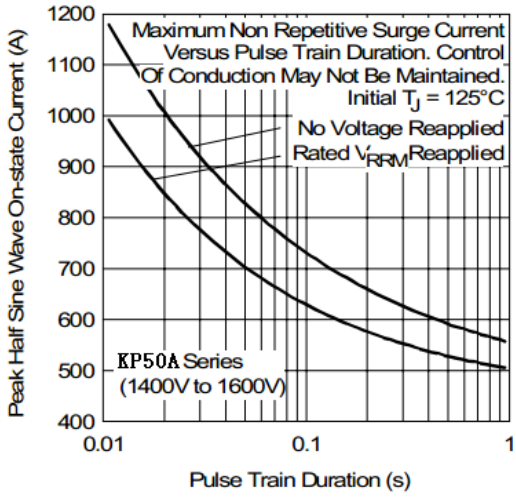


Fig. 12 - Maximum Non-Repetitive Surge Current

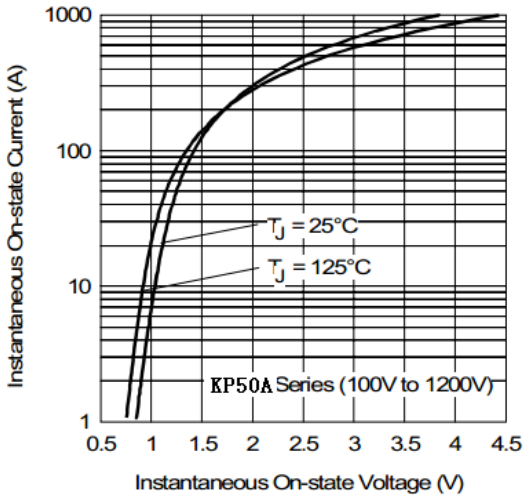


Fig. 13 - Forward Voltage Drop Characteristics

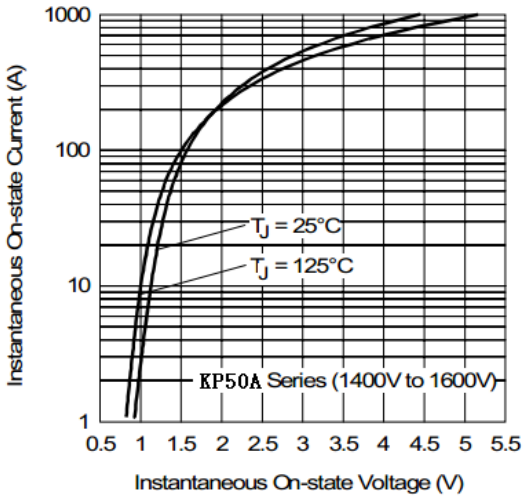


Fig. 14 - Forward Voltage Drop Characteristics

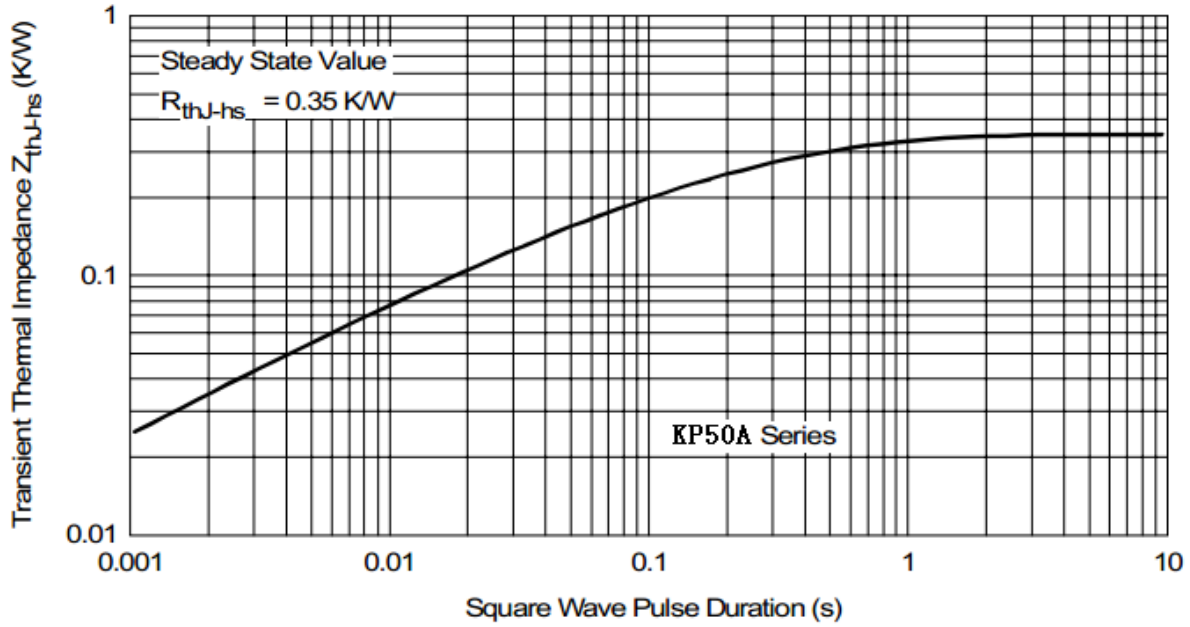
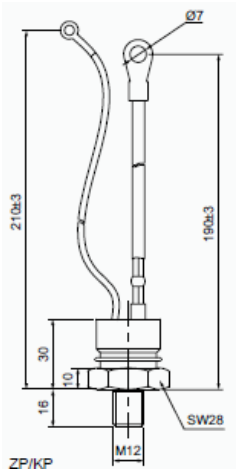


Fig. 15 - Thermal Impedance Z_{thJC} Characteristics

Outline：



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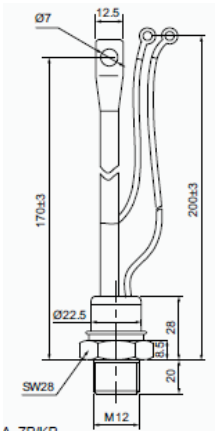

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