

### Feature

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

### Typical Application

- DC motor control, Control DC power supply
- AC switch and thermal control, Synchronous motor excitation

$I_{T(AV)}$	30A
$V_{DRM}/V_{RRM}$	100-3000V
$I_{TSM}$	415A
$I^2t$	725 A <sup>2</sup> s

### Voltage Ratings

Type number	Voltage Code	$V_{DRM}/V_{RRM}$ max. repetitive peak and off-state voltage (1) V	$V_{RSM}$ non-repetitive maximum peak voltage (2) V	$I_{DRM}/I_{RRM}$ @ $T_J=T_J$ mA
KP30A	10	100	150	10
	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	Characteristic	KP30A		Units	Conditions		
		10-120	140-160				
$I_{T(AV)}$	Max. average on-state current @ Case temperature	30	30	A	180°C sinusoidal conduction		
$I_{T(RMS)}$	Max. RMS on-state current	40	40	A			
$I_{TSM}$	Max. peak, one-cycle non-repetitive surge current	420	398	A	t=10ms	No voltage reappplied	Sinusoidal half wave Initial $T_J=T_J$ Max
		440	415		t=8.3ms		
		350	335		t=10ms	100% $V_{RRM}$ reappplied	
		370	350		t=8.3ms		
$I^2t$	Maximum $I^2t$ for fusing	790	795	A <sup>2</sup> s	t=10ms	No voltage	
		867	725		t=8.3ms		
		560	560		t=10ms	100% $V_{RRM}$ reappplied	
		615	510		t=8.3ms		
$V_{T(TO)1}$	Low level value of threshold voltage	0.99	0.99	V	$(16.7\% \times I_{T(AV)} < I < \pi \times I_{T(AV)}, T_J=T_J$ Max		
$V_{T(TO)2}$	High level value of threshold voltage	1.40	1.15		$(I > \pi \times I_{T(AV)}, T_J=T_J$ Max		
$R_{t1}$	Low level value of on-state slope resistance	10.1	11.73	mΩ	$(16.7\% \times I_{T(AV)} < I < \pi \times I_{T(AV)}, T_J=T_J$ Max		
$R_{t2}$	High level value of on-state slope resistance	5.7	10.05		$(I > \pi \times I_{T(AV)}, T_J=T_J$ Max		
$V_{TM}$	Max. on-state voltage	1.70	1.80	$I_{PK}=79A, T_J=25^\circ C$			
$I_H$	Maximum holding current	130		mA	$T_J=25^\circ C$ , Anode supply 6V, resistive load		
$I_L$	Latching current	200					

Symbol	Charteristic	KP30A	Units	Conditions
di/dt	Critical rate of rise of on-state current $V_{DRM} \leq 600V$ $V_{DRM} \leq 800V$ $V_{DRM} \leq 1000V$ $V_{DRM} \leq 1600V$	200	A/us	$T_J = T_J \text{ max.}, V_{DM} = V_{DRM}$ $, 15 \Omega, t_q = 6\mu s,$ $t_r = 0.1\mu s \text{ max}$ $I_{TM} = (2 \times \text{rated di/dt}) A$
		180		
		160		
		150		
$t_{qt}$	Typical turn-on time	0.9	us	$T_J = 25^\circ C \text{ At} = V_{DRM}/V_{RRM}, T_J = 125^\circ C$
$t_{rr}$	Typical reverse recovery time	4		$T_J = T_J \text{ max}, I_{TM} = I_{T(AV)}, t_q >$ $200\mu s, di/dt = -10A/\mu s$
$t_q$	Typical turn-off time	110		$T_J = T_J \text{ max}, I_{TM} = I_{T(AV)}, t_q >$ $200\mu s, V_R = 100V$ $di/dt = -10A/\mu s, dv/dt = -20A/\mu s, V_{DM} = 67\%$ $V_{DRM}$ $0V-100W$
dv/dt	Max. critical rate of rise of off-state voltage	100	V/us	$T_J = T_J \text{ max}, V_{DM} = 67\% V_{DRM}$
$P_{GM}$	Gate trigger current	8.0	W	$T_J = T_J \text{ max}$
$P_{G(AV)}$	Gate trigger voltage	2.0	W	$T_J = T_J \text{ max}$
$I_{GM}$	Stored temperature	1.5	A	$T_J = T_J \text{ max}$
$-V_{GM}$	Thermal impedance node to the shell	10	V	$T_J = T_J \text{ max}$
$I_{GT}$	Thermal impedance ( shell to powder)	90 60 35	mA	$T_J = -65^\circ C \text{ } T_J = 25^\circ C \text{ } T_J = 125^\circ C$
$V_{GT}$	Mounting torque	3.0 2.0 1.0	V	$T_J = -65^\circ C \text{ } T_J = 25^\circ C \text{ } T_J = 125^\circ C$
$I_{GD}$	Approximate weight	2.0	mA	$T_J = T_J \text{ max}, 67\% V_{DRM}$
$V_{GD}$	Critical rate of rise of on-state current $V_{DRM} \leq 600V$ $V_{DRM} \leq 800V$ $V_{DRM} \leq 1000V$ $V_{DRM} \leq 1600V$	0.2	V	$T_J = T_J \text{ max}, 67\% V_{DRM}$
$T_J$	Typical turn-on time	-65-125	°C	
$T_{stg}$	Typical reverse recovery time	-65-125	°C	
$R_{th(j-c)}$	Typical turn-off time	0.75	K/W	
$R_{th(c-s)}$	Max. critical rate of rise of off-state voltage	0.35	K/W	
T	Gate trigger current	3.1	Nm	
$W_t$	Gate trigger voltage	112	g	

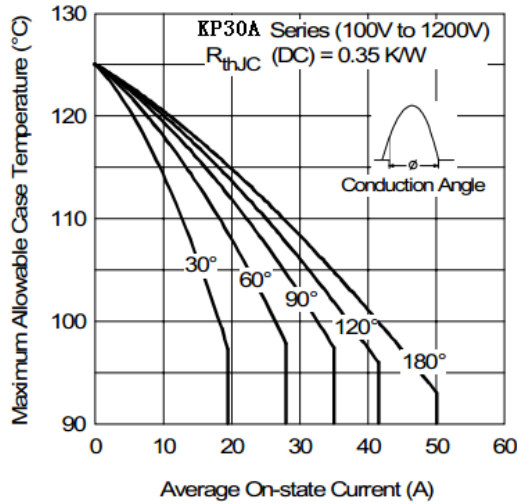


Fig. 1 - Current Ratings Characteristic

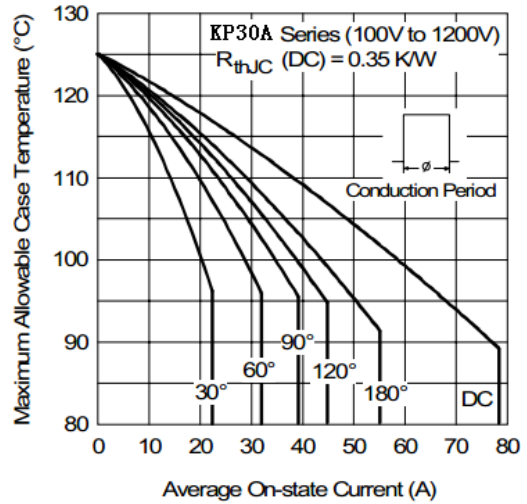


Fig. 2 - Current Ratings Characteristic

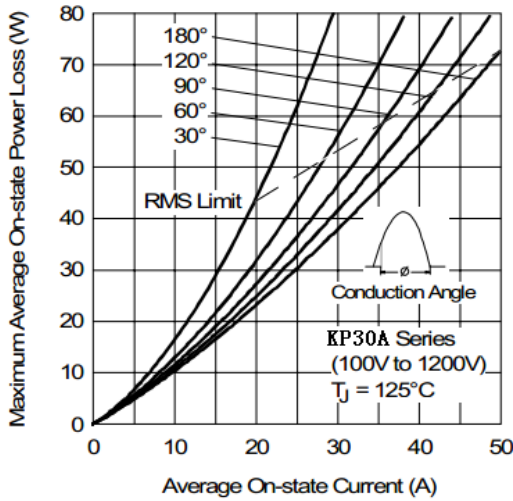


Fig. 3 - On-state Power Loss Characteristics

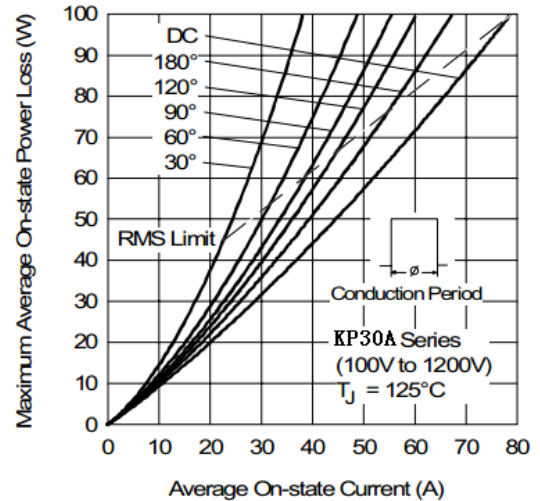


Fig. 4 - On-state Power Loss Characteristics

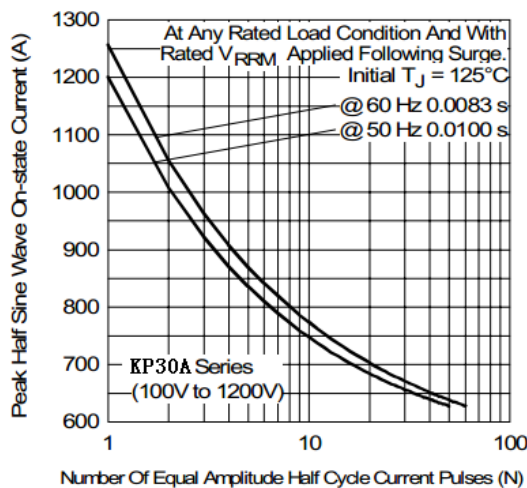


Fig. 5 - Maximum Non-Repetitive Surge Current

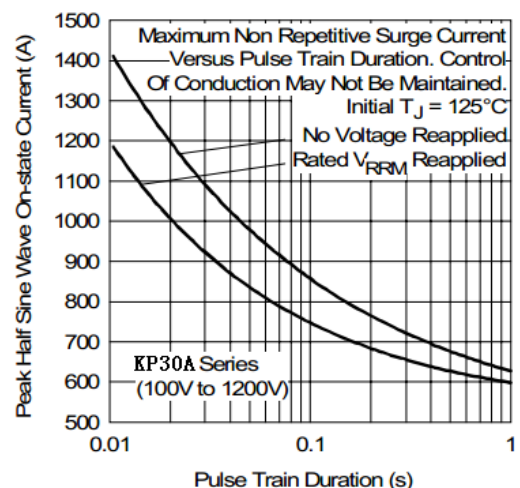


Fig. 6 - Maximum Non-Repetitive Surge Current

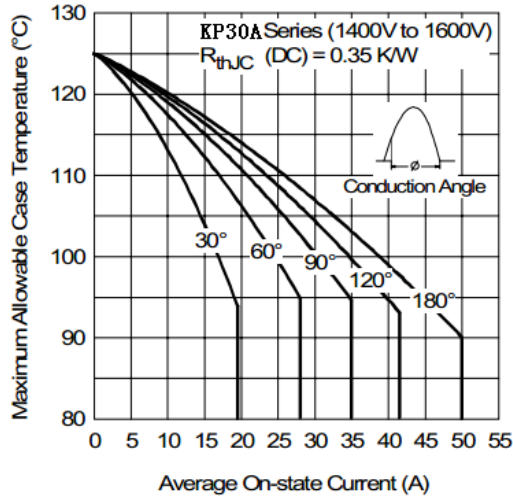


Fig. 7 - Current Ratings Characteristics

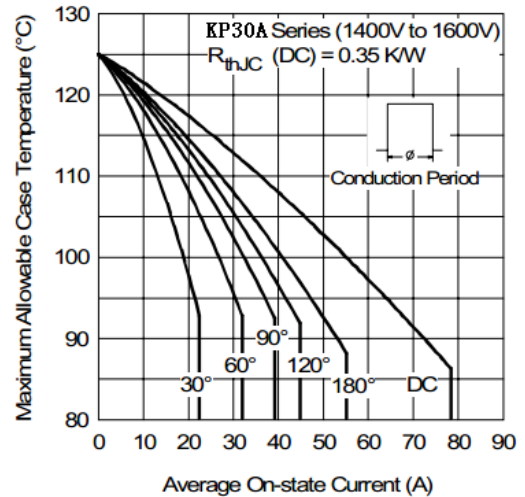


Fig. 8 - Current Ratings Characteristics

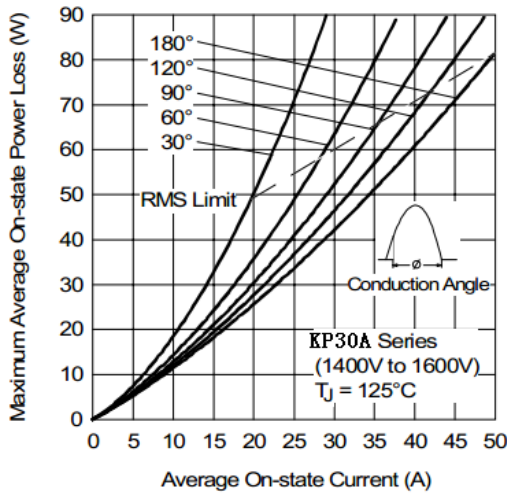


Fig. 9 - On-state Power Loss Characteristics

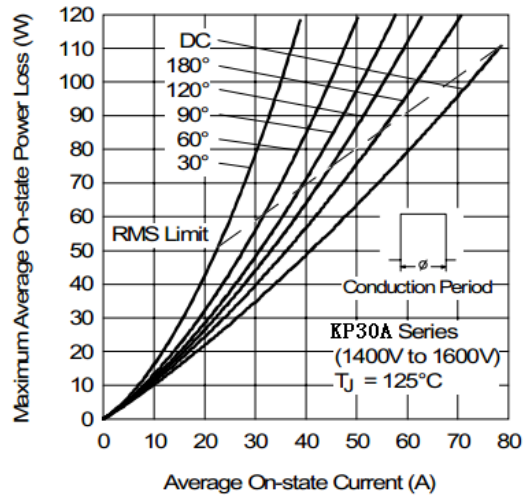


Fig. 10 - On-state Power Loss Characteristics

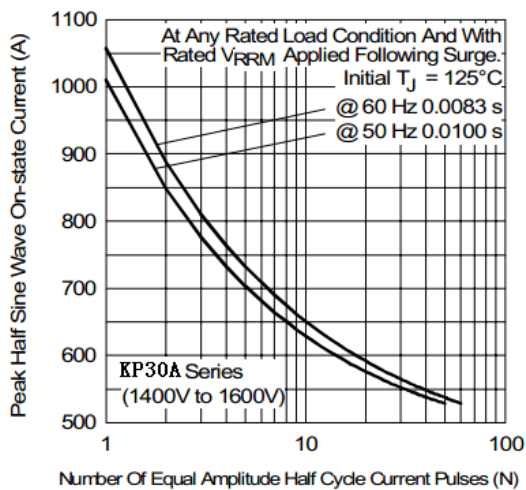


Fig. 11 - Maximum Non-Repetitive Surge Current

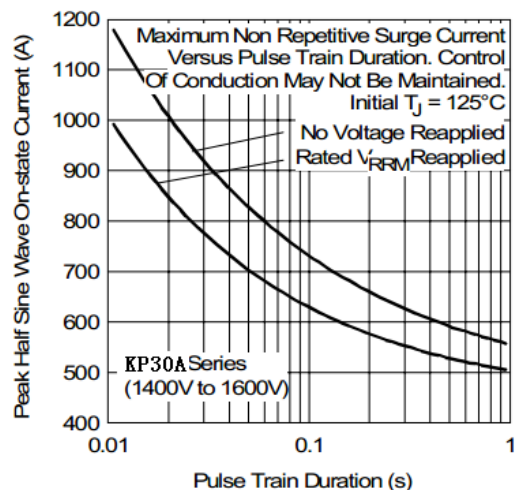


Fig. 12 - Maximum Non-Repetitive Surge Current

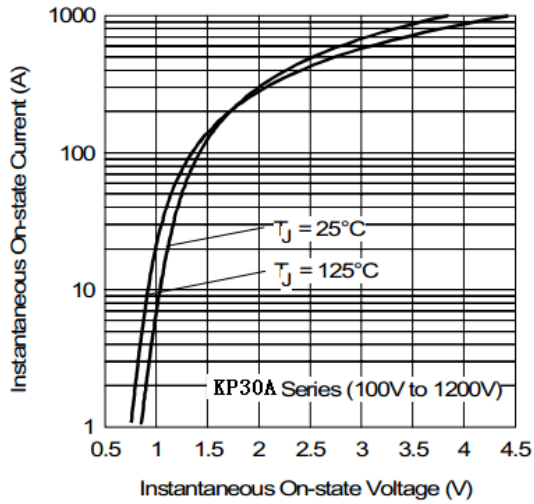


Fig. 13 - Forward Voltage Drop Characteristics

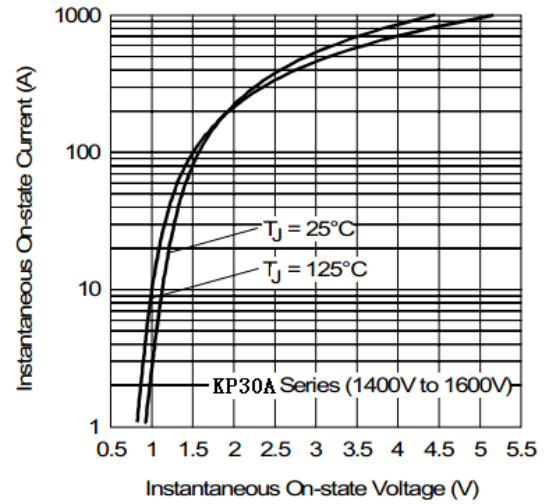


Fig. 14 - Forward Voltage Drop Characteristics

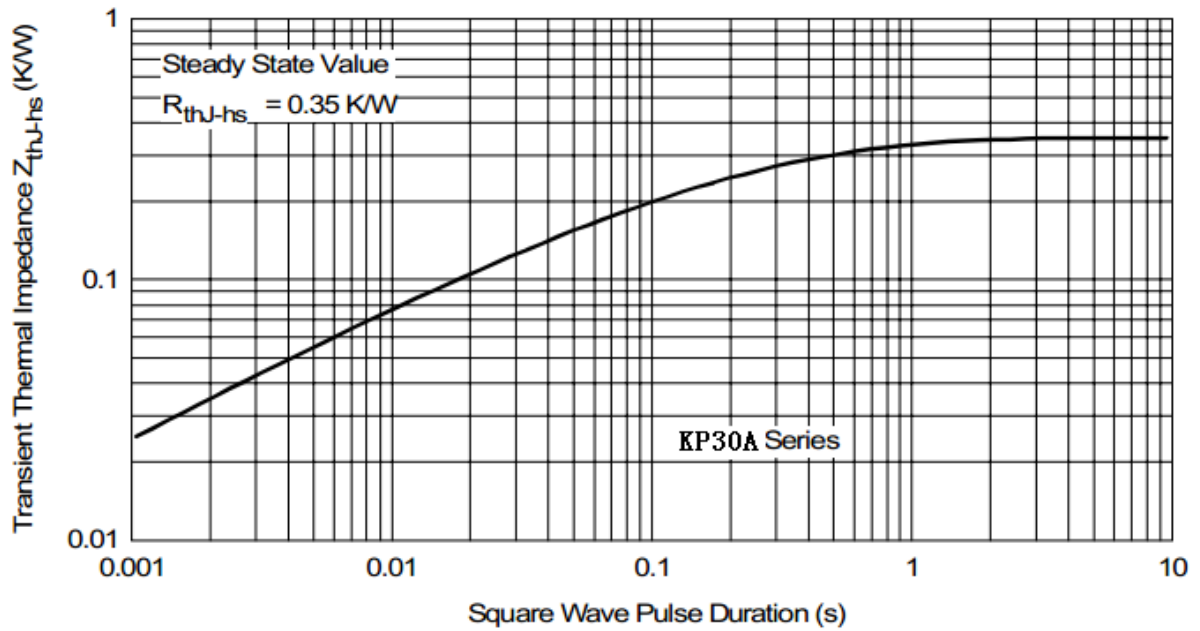


Fig. 15 - Thermal Impedance  $Z_{thJC}$  Characteristics

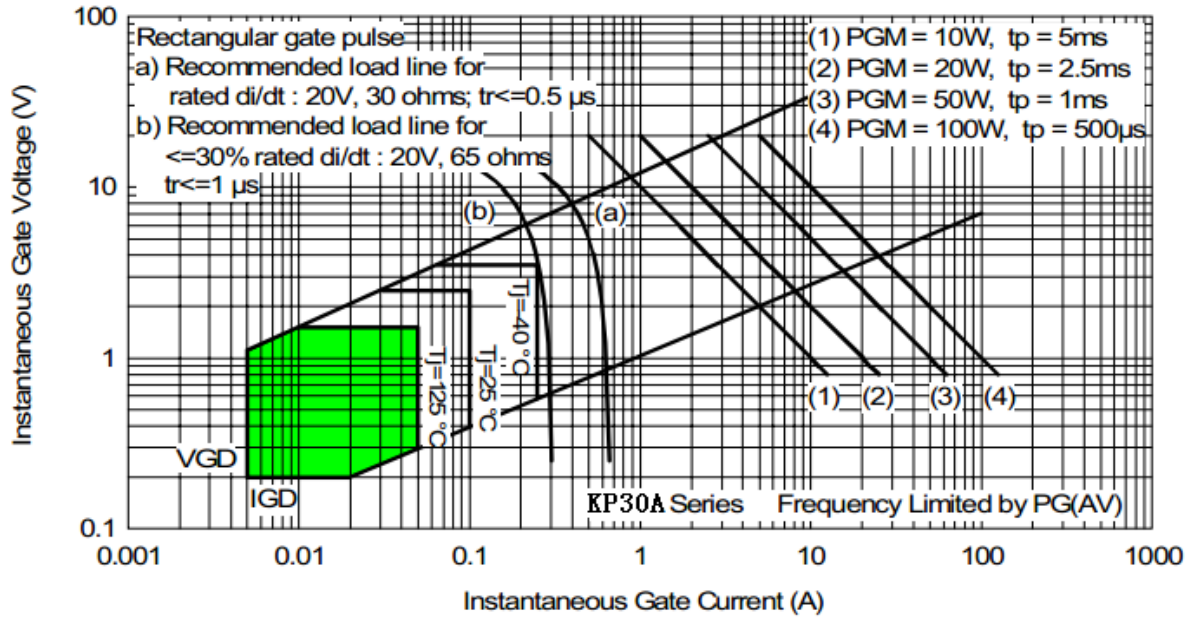


Fig. 16 - Gate Characteristics

Outline:

