



ST1230C..K SERIES

PHASE CONTROL THYRISTORS

Hockey Puk Version

Features

- Center amplifying gate
- Metal case with ceramic insulator
- International standard case A-24 (K-PUK)
- High profile hockey-puk

1745A

Typical Applications

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



case style A-24 (K-PUK)

Major Ratings and Characteristics

Parameters	ST1230C..K	Units
$I_{T(AV)}$	1745	A
@ T_{hs}	55	°C
$I_{T(RMS)}$	3200	A
@ T_{hs}	25	°C
I_{TSM}	@ 50Hz	A
	33500	A
	@ 60Hz	A
I^2t	@ 50Hz	KA ² s
	5615	KA ² s
	@ 60Hz	KA ² s
	5126	KA ² s
V_{DRM}/V_{RRM}	800 to 1600	V
t_q typical	200	μs
T_J	- 40 to 125	°C

ELECTRICAL SPECIFICATIONS**Voltage Ratings**

Type number	Voltage Code	V_{DRM}/V_{RRM} , max. repetitive peak and off-state voltage V	V_{RSM} , maximum non-repetitive peak voltage V	I_{DRM}/I_{RRM} max. @ $T_J = T_J$ max mA
ST1230C..K	08	800	900	100
	12	1200	1300	
	14	1400	1500	
	16	1600	1700	

On-state Conduction

Parameter	ST1230C..K	Units	Conditions
$I_{T(AV)}$ Max. average on-state current @ Heatsink temperature	1745 (710)	A	180° conduction, half sine wave
	55 (85)	°C	double side (single side) cooled
$I_{T(RMS)}$ Max. RMS on-state current	3200	A	DC @ 25°C heatsink temperature double side cooled
I_{TSM} Max. peak, one-cycle non-repetitive surge current	33500		$t = 10\text{ms}$ No voltage reapplied
	35100		$t = 8.3\text{ms}$ reapplied
	28200		$t = 10\text{ms}$ 100% V_{RRM} reapplied
	29500		$t = 8.3\text{ms}$ reapplied
i^2t Maximum i^2t for fusing	5615	KA ² s	$t = 10\text{ms}$ No voltage reapplied
	5126		$t = 8.3\text{ms}$ reapplied
	3971		$t = 10\text{ms}$ 100% V_{RRM} reapplied
	3625		$t = 8.3\text{ms}$ reapplied
$i^2\sqrt{t}$ Maximum $i^2\sqrt{t}$ for fusing	56150	KA ² s	$t = 0.1$ to 10ms , no voltage reapplied
$V_{T(TO)1}$ Low level value of threshold voltage	0.93	V	$(16.7\% \times \pi \times I_{T(AV)} < I < \pi \times I_{T(AV)})$, $T_J = T_J$ max.
$V_{T(TO)2}$ High level value of threshold voltage	1.02		$(I > \pi \times I_{T(AV)})$, $T_J = T_J$ max.
r_{t1} Low level value of on-state slope resistance	0.17	mΩ	$(16.7\% \times \pi \times I_{T(AV)} < I < \pi \times I_{T(AV)})$, $T_J = T_J$ max.
r_{t2} High level value of on-state slope resistance	0.16		$(I > \pi \times I_{T(AV)})$, $T_J = T_J$ max.
V_{TM} Max. on-state voltage	1.62	V	$I_{pk} = 4000\text{A}$, $T_J = T_J$ max, $t_p = 10\text{ms}$ sine pulse
I_H Maximum holding current	600	mA	$T_J = 25^\circ\text{C}$, anode supply 12V resistive load
I_L Typical latching current	1000		

Switching

Parameter	ST1230C..K	Units	Conditions
di/dt Max. non-repetitive rate of rise of turned-on current	1000	A/μs	Gate drive 20V, 20Ω, $t_r \leq 1\mu s$ $T_J = T_J$ max, anode voltage $\leq 80\%$ V_{DRM}
t_d Typical delay time	1.9	μs	Gate current 1A, $d_i_g/dt = 1A/\mu s$ $V_d = 0.67\% V_{DRM}$, $T_J = 25^\circ C$
t_q Typical turn-off time	200		$I_{TM} = 550A$, $T_J = T_J$ max, di/dt = 40A/μs, $V_R = 50V$ $dv/dt = 20V/\mu s$, Gate 0V 100Ω, $t_p = 500\mu s$

Blocking

Parameter	ST1230C..K	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_{RRM}_{DRM} Max. peak reverse and off-state leakage current	100	mA	$T_J = T_J$ max, rated V_{DRM}/V_{RRM} applied

Triggering

Parameter	ST1230C..K	Units	Conditions
P_{GM} Maximum peak gate power	16	W	$T_J = T_J$ max, $t_p \leq 5ms$
$P_{G(AV)}$ Maximum average gate power	3	W	$T_J = T_J$ 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	V	$T_J = T_J$ max, $t_p \leq 5ms$
I_{GT} DC gate current required to trigger	TYP.	MAX.	
	200	-	$T_J = -40^\circ C$
	100	200	$T_J = 25^\circ C$
	50	-	$T_J = 125^\circ C$
V_{GT} DC gate voltage required to trigger	1.4	-	$T_J = -40^\circ C$
	1.1	3.0	$T_J = 25^\circ C$
	0.9	-	$T_J = 125^\circ C$
I_{GD} DC gate current not to trigger	10	mA	Max. required gate trigger/ current/voltage are the lowest value which will trigger all units 12V anode-to-cathode applied
V_{GD} DC gate voltage not to trigger	0.25	V	

ST1230C..K Series

Thermal and Mechanical Specification

Parameter	ST1230C..K	Units	Conditions	
T _J	Max. operating temperature range	-40 to 125		
T _{stg}	Max. storage temperature range	-40 to 150	°C	
R _{thJ-hs}	Max. thermal resistance, junction to heatsink	0.042 0.021	K/W	DC operation single side cooled DC operation double side cooled
R _{thC-hs}	Max. thermal resistance, case to heatsink	0.006 0.003	K/W	DC operation single side cooled DC operation double side cooled
F	Mounting force, ± 10%	24500 (2500)	N (Kg)	
wt	Approximate weight	425	g	
Case style	A-24 (K-PUK)	See Outline Table		

ΔR_{thJ-hs} Conduction

(The following table shows the increment of thermal resistance R_{thJ-hs} when devices operate at different conduction angles than DC)

Conduction angle	Sinusoidal conduction		Rectangular conduction		Units	Conditions
	Single Side	Double Side	Single Side	Double Side		
180°	0.003	0.003	0.002	0.002	K/W	T _J = T _J max.
120°	0.004	0.004	0.004	0.004		
90°	0.005	0.005	0.005	0.005		
60°	0.007	0.007	0.007	0.007		
30°	0.012	0.012	0.012	0.012		

Ordering Information Table

Device Code		ST 123 0 C 16 K 1							
1	- Thyristor	1	2	3	4	5	6	7	8
2	- Essential part number								
3	- 0 = Converter grade								
4	- C = Ceramic Puk								
5	- Voltage code: Code x 100 = V _{RRM} (See Voltage Rating Table)								
6	- K = Puk Case A-24 (K-PUK)								
7	- 0 = Eyelet terminals (Gate and Auxiliary Cathode Unsoldered Leads)								
	1 = Fast-on terminals (Gate and Auxiliary Cathode Unsoldered Leads)								
	2 = Eyelet terminals (Gate and Auxiliary Cathode Soldered Leads)								
	3 = Fast-on terminals (Gate and Auxiliary Cathode Soldered Leads)								
8	- Critical dv/dt: None = 500V/μsec (Standard selection)								
	L = 1000V/μsec (Special selection)								

Outline Table

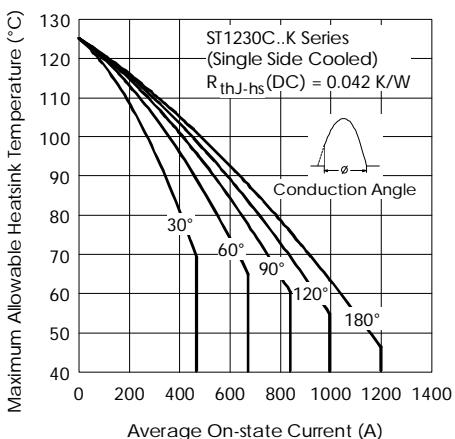
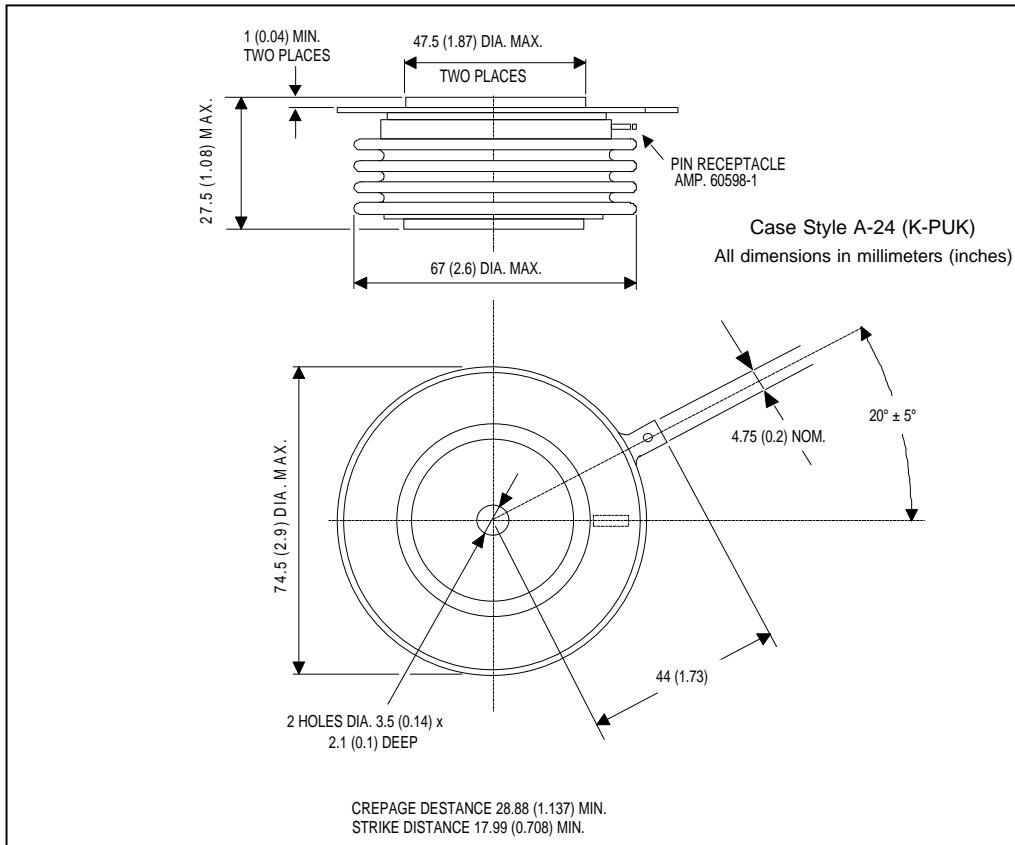


Fig. 1 - Current Ratings Characteristics

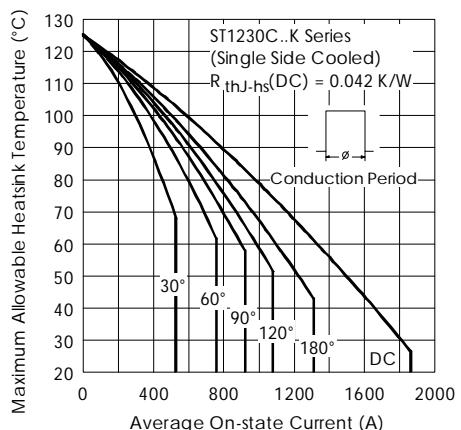


Fig. 2 - Current Ratings Characteristics



**Стандарт
Электрон
Связь**

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Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

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