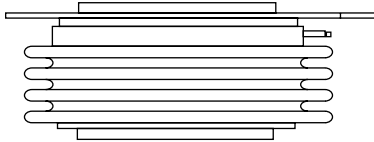




Phase Control Thyristors (Hockey PUK Version), 2310 A

**A-24 (K-PUK)****FEATURES**

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

**RoHS**
COMPLIANT**PRODUCT SUMMARY**

$I_{T(AV)}$	2310 A
-------------	--------

TYPICAL APPLICATIONS

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

MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{T(AV)}$		2310	A
	T_{hs}	55	°C
$I_{T(RMS)}$		4150	A
	T_{hs}	25	°C
I_{TSM}	50 Hz	42 500	A
	60 Hz	44 500	
I^2t	50 Hz	9027	kA ² s
	60 Hz	8240	
V_{DRM}/V_{RRM}		400 to 600	V
t_q	Typical	200	μs
T_J		- 40 to 125	°C

ELECTRICAL SPECIFICATIONS**VOLTAGE RATINGS**

TYPE NUMBER	VOLTAGE CODE	V_{DRM}/V_{RRM} , MAXIMUM REPETITIVE PEAK AND OFF-STATE VOLTAGE V	V_{RSM} , MAXIMUM NON-REPETITIVE PEAK VOLTAGE V	I_{DRM}/I_{RRM} MAXIMUM AT $T_J = T_J$ MAXIMUM mA
ST1280C..K	04	400	500	100
	06	600	700	

ST1280C..K Series



Vishay High Power Products Phase Control Thyristors
(Hockey PUK Version),
2310 A

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES
Maximum average on-state current at heatsink temperature	$I_{T(AV)}$	180° conduction, half sine wave Double side (single side) cooled		2310 (885)
				55 (85)
Maximum RMS on-state current	$I_{T(RMS)}$	25 °C heatsink temperature double side cooled		4150
Maximum peak, one-cycle non-repetitive surge current	I_{TSM}	t = 10 ms	No voltage reapplied	42 500
		t = 8.3 ms	No voltage reapplied	44 500
		t = 10 ms	100 % V_{RRM} reapplied	35 700
		t = 8.3 ms	100 % V_{RRM} reapplied	37 400
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied	9027
		t = 8.3 ms	No voltage reapplied	8241
		t = 10 ms	100 % V_{RRM} reapplied	6383
		t = 8.3 ms	100 % V_{RRM} reapplied	5828
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied		90 270
Low level value of threshold voltage	$V_{T(TO)1}$	$(16.7 \% \times \pi \times I_{T(AV)} < I < \pi \times I_{T(AV)})$, $T_J = T_J$ maximum		0.83
High level value of threshold voltage	$V_{T(TO)2}$	$(I > \pi \times I_{T(AV)})$, $T_J = T_J$ maximum		0.90
Low level value of on-state slope resistance	r_{t1}	$(16.7 \% \times \pi \times I_{T(AV)} < I < \pi \times I_{T(AV)})$, $T_J = T_J$ maximum		0.077
High level value of on-state slope resistance	r_{t2}	$(I > \pi \times I_{T(AV)})$, $T_J = T_J$ maximum		0.068
Maximum on-state voltage	V_{TM}	$I_{pk} = 8000$ A, $T_J = T_J$ maximum, $t_p = 10$ ms sine pulse		1.44
Maximum holding current	I_H	$T_J = 25$ °C, anode supply 12 V resistive load		600
Typical latching current	I_L			1000

SWITCHING				
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES
Maximum non-repetitive rate of rise of turned-on current	di/dt	Gate drive 20 V, 20 Ω , $t_r \leq 1$ μ s $T_J = T_J$ maximum, anode voltage ≤ 80 % V_{DRM}		1000
Typical delay time	t_d	Gate current 1 A, $di_g/dt = 1$ A/ μ s $V_d = 0.67$ % V_{DRM} , $T_J = 25$ °C		1.9
Typical turn-off time	t_q	$I_{TM} = 550$ A, $T_J = T_J$ maximum, $di/dt = 40$ A/ μ s, $V_R = 50$ V, $dV/dt = 20$ V/ μ s, gate 0 V 100 Ω , $t_p = 500$ μ s		200

BLOCKING				
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES
Maximum critical rate of rise of off-state voltage	dV/dt	$T_J = T_J$ maximum linear to 80 % rated V_{DRM}		500
Maximum peak reverse and off-state leakage current	I_{RRM} , I_{DRM}	$T_J = T_J$ maximum, rated V_{DRM}/V_{RRM} applied		100



ST1280C..K Series

Phase Control Thyristors Vishay High Power Products
(Hockey PUK Version),
2310 A

TRIGGERING					
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES		UNITS
			TYP.	MAX.	
Maximum peak gate power	P_{GM}	$T_J = T_J$ maximum, $t_p \leq 5$ ms	16		W
Maximum average gate power	$P_{G(AV)}$	$T_J = T_J$ maximum, $f = 50$ Hz, $d\% = 50$	3		
Maximum peak positive gate current	I_{GM}	$T_J = T_J$ maximum, $t_p \leq 5$ ms	3.0		A
Maximum peak positive gate voltage	$+V_{GM}$		20		V
Maximum peak negative gate voltage	$-V_{GM}$		5.0		
DC gate current required to trigger	I_{GT}	$T_J = -40$ °C	200	-	mA
		$T_J = 25$ °C	100	200	
		$T_J = 125$ °C	50	-	
DC gate voltage required to trigger	V_{GT}	$T_J = -40$ °C	1.4	-	V
		$T_J = 25$ °C	1.1	3.0	
		$T_J = 125$ °C	0.9	-	
DC gate current not to trigger	I_{GD}	$T_J = T_J$ maximum	10		mA
DC gate voltage not to trigger	V_{GD}		0.25		V

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum operating temperature range	T_J		- 40 to 125	°C
Maximum storage temperature range	T_{Stg}		- 40 to 150	
Maximum thermal resistance, junction to heatsink	R_{thJ-hs}	DC operation single side cooled	0.042	K/W
		DC operation double side cooled	0.021	
Maximum thermal resistance, case to heatsink	R_{thC-hs}	DC operation single side cooled	0.006	
		DC operation double side cooled	0.003	
Mounting force, ± 10 %			24 500 (2500)	N (kg)
Approximate weight			425	g
Case style		See dimensions - link at the end of datasheet	A-24 (K-PUK)	

ΔR_{thJC} CONDUCTION						
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION		RECTANGULAR CONDUCTION		TEST CONDITIONS	UNITS
	SINGLE SIDE	DOUBLE SIDE	SINGLE SIDE	DOUBLE SIDE		
180°	0.003	0.003	0.002	0.002	T _J = T _J maximum	K/W
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		

Note

- The table above shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC

ST1280C..K Series

Vishay High Power Products Phase Control Thyristors
(Hockey PUK Version),
2310 A

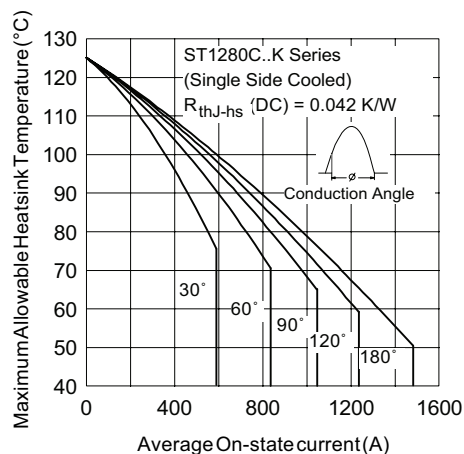


Fig. 1 - Current Ratings Characteristics

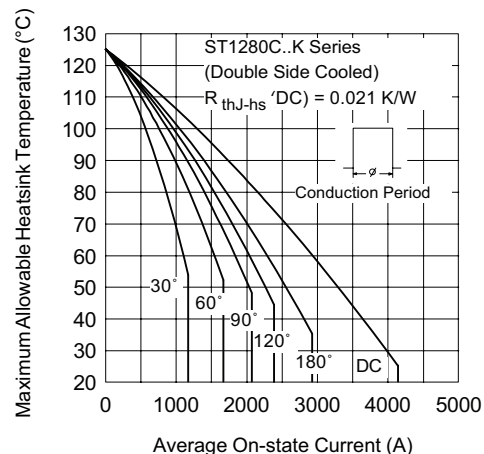


Fig. 4 - Current Ratings Characteristics

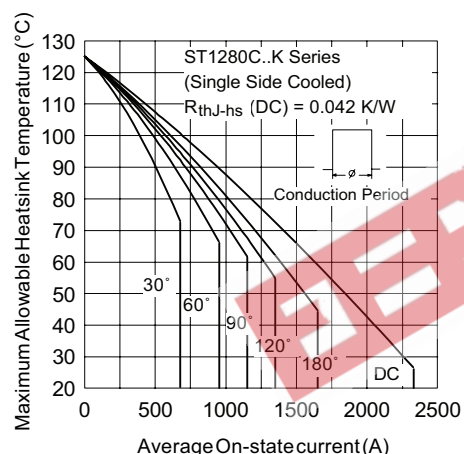


Fig. 2 - Current Ratings Characteristics

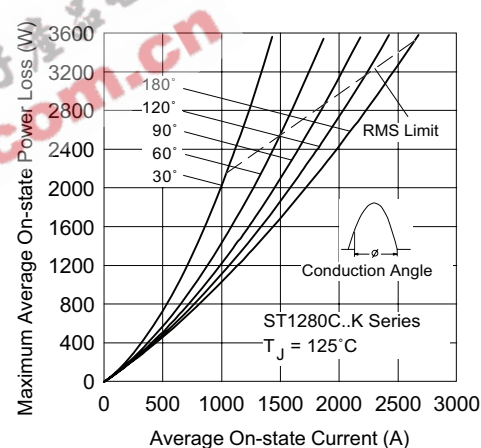


Fig. 5 - On-State Power Loss Characteristics

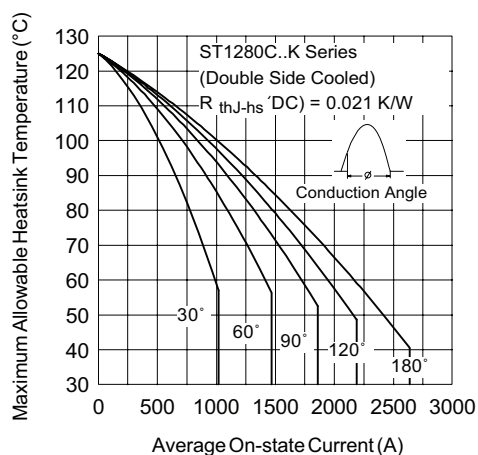


Fig. 3 - Current Ratings Characteristics

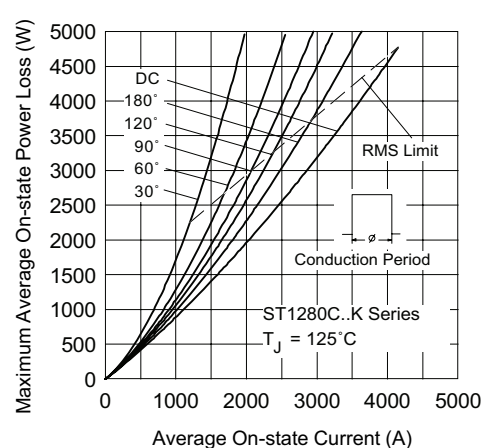


Fig. 6 - On-State Power Loss Characteristics



ST1280C..K Series

Phase Control Thyristors Vishay High Power Products
(Hockey PUK Version),
2310 A

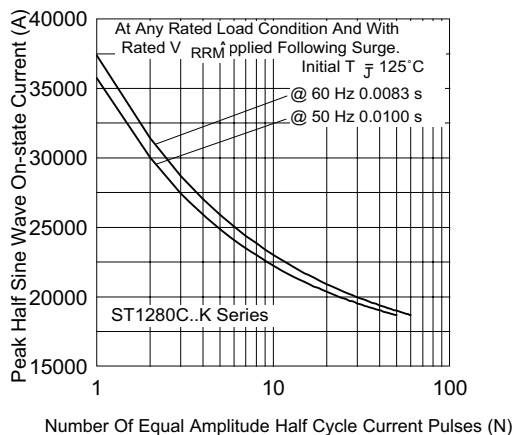


Fig. 7 - Maximum Non-Repetitive Surge Current
Single and Double Side Cooled

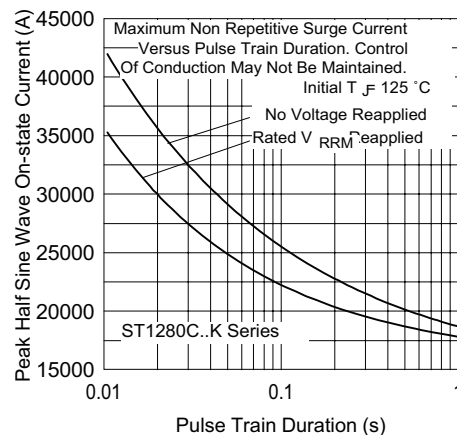


Fig. 8 - Maximum Non-Repetitive Surge Current
Single and Double Side Cooled

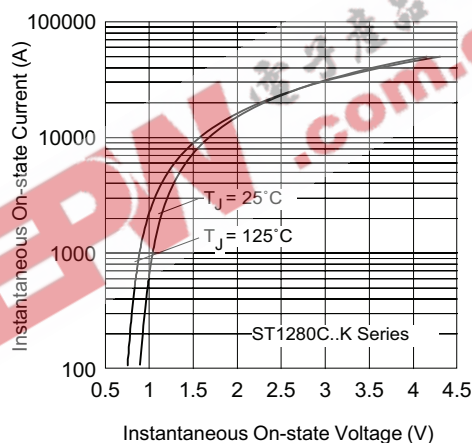


Fig. 9 - On-State Voltage Drop Characteristics

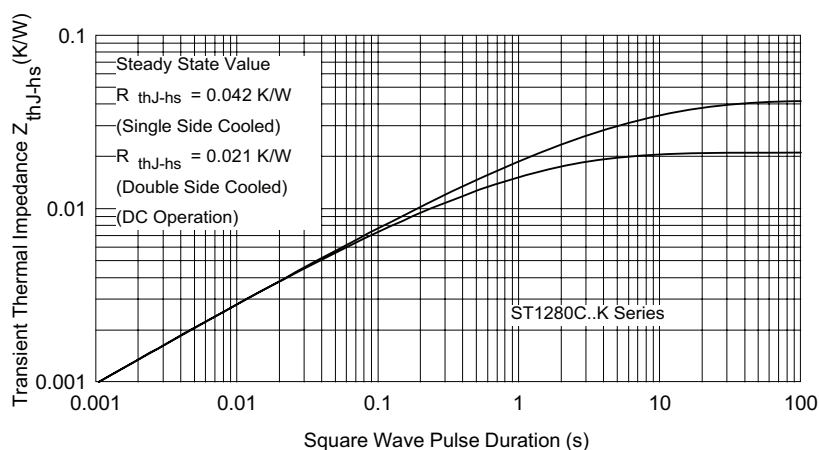


Fig. 10 - Thermal Impedance Z_{thJ-hs} Characteristics

ST1280C..K Series



Vishay High Power Products Phase Control Thyristors
(Hockey PUK Version),
2310 A

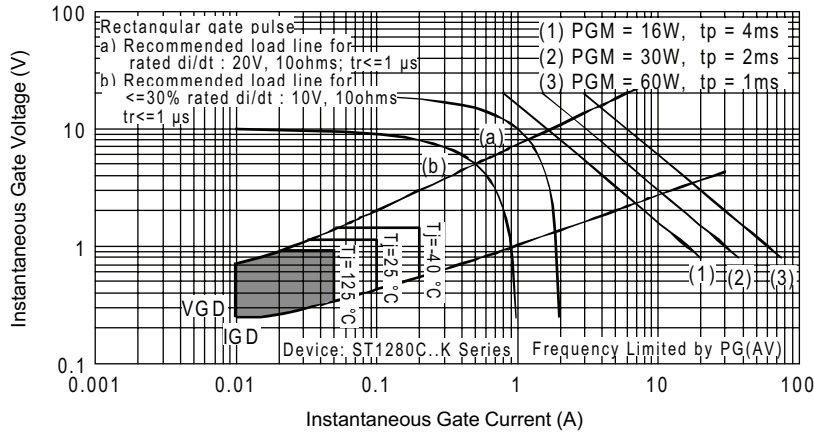


Fig. 11 - Gate Characteristics

ORDERING INFORMATION TABLE

Device code	ST	128	0	C	06	K	1	-
	1	2	3	4	5	6	7	8
1	Thyristor							
2	Essential part number							
3	0 = Converter grade							
4	C = Ceramic PUK							
5	Voltage code x 100 = V_{RRM} (see Voltage Ratings 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 = 500 V/ μ s (standard selection) • L = 1000 V/ μ s (special selection)							

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95081



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.