

Phase Control Thyristors (Hockey PUK Version), 990 A



TO-200AC (B-PUK)

PRODUCT SUMMARY						
Package	TO-200AC (B-PUK)					
Diode variation	Single SCR					
I _{T(AV)}	990 A					
V _{DRM} /V _{RRM}	800 V, 1200 V, 1400 V, 1600 V, 1800 V, 2000 V					
V_{TM}	1.62 V					
I _{GT}	100 mA					
TJ	-40 °C to 125 °C					

FEATURES

- · Center amplifying gate
- Metal case with ceramic insulator
- International standard case TO-200AC (B-PUK)



- Designed and qualified for industrial level
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

TYPICAL APPLICATIONS

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

MAJOR RATINGS AND CHARACTERISTICS						
PARAMETER	TEST CONDITIONS	VALUES	UNITS			
1		990	А			
I _{T(AV)}	T _{hs}	55	°C			
1		2000	Α			
I _{T(RMS)}	T _{hs}	25	°C			
1	50 Hz	17 800	Δ.			
ITSM	60 Hz	18 700	A			
l ² t	50 Hz	1591	kA ² s			
1-1	60 Hz	1452	KA-5			
V _{DRM} /V _{RRM}		800 to 2000	V			
t _q	Typical	150	μs			
T _J		-40 to 125	°C			

VOLTAGE RATINGS									
TYPE VOLTAGE CODE		V _{DRM} /V _{RRM} , MAXIMUM REPETITIVE PEAK AND OFF-STATE VOLTAGE V	V _{RSM} , MAXIMUM NON-REPETITIVE PEAK VOLTAGE V	$I_{DRM}/I_{RRM} \ MAXIMUM \ AT$ $T_J = T_J \ MAXIMUM \ MA$					
	08	800	900						
	12	1200	1300						
VS-ST730CL	14	1400	1500	80					
	16	1600	1700	00					
	18	1800	1900						
	20	2000	2100						



ABSOLUTE MAXIMUM RATINGS	3					
PARAMETER	SYMBOL		VALUES	UNITS		
Maximum average on-state current	L	180° condu	ction, half sine v	wave	990 (375)	Α
at heatsink temperature	I _{T(AV)}	double side	double side (single side) cooled			°C
Maximum RMS on-state current	I _{T(RMS)}	DC at 25 °C	heatsink tempe	erature double side cooled	2000	
		t = 10 ms	No voltage		17 800	
Maximum peak, one-cycle	1	t = 8.3 ms	reapplied		18 700	A kA ² s
non-repetitive surge current	I _{TSM}	t = 10 ms	100 % V _{RRM}		15 000	
		t = 8.3 ms	reapplied	Sinusoidal half wave,	15 700	
Maximum I ² t for fusing		t = 10 ms	No voltage	initial $T_J = T_J$ maximum	1591	
	I ² t	t = 8.3 ms reapplied	reapplied		1452	
	1-1	t = 10 ms	100 % V _{RRM}		1125	
		t = 8.3 ms	reapplied		1027	
Maximum $I^2\sqrt{t}$ for fusing	I ² √t	t = 0.1 to 10	t = 0.1 to 10 ms, no voltage reapplied			kA²√s
Low level value of threshold voltage	V _{T(TO)1}	(16.7 % x π	$x \ I_{T(AV)} < I < \pi \ x$	$I_{T(AV)}$), $T_J = T_J$ maximum	0.98	V
High level value of threshold voltage	V _{T(TO)2}	$(I > \pi \times I_{T(AV)})$	$(I > \pi \times I_{T(AV)}), T_J = T_J \text{ maximum}$			v
Low level value of on-state slope resistance	r _{t1}	(16.7 % x π x $I_{T(AV)}$ < I < π x $I_{T(AV)}$), $T_J = T_J$ maximum			0.32	mΩ
High level value of on-state slope resistance	r _{t2}	$(I > \pi \times I_{T(AV)}), T_J = T_J \text{ maximum}$			0.27	11152
Maximum on-state voltage	V_{TM}	$I_{pk} = 2000 \text{ A}, T_J = T_J \text{ maximum}, t_p = 10 \text{ ms sine pulse}$			1.62	V
Maximum holding current	Ι _Η	T. = 25 °C	T 05 °C anada ayanlı 10 V vaciatiya II			mA
Typical latching current	lμ	T _J = 25 °C, anode supply 12 V resistive load			1000	IIIA

SWITCHING							
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS			
Maximum non-repetitive rate of rise of turned-on current	dl/dt	Gate drive 20 V, 20 Ω , $t_r \le 1~\mu s$ $T_J = T_J$ maximum, anode voltage $\le 80~\%~V_{DRM}$	1000	A/μs			
Typical delay time	t _d	Gate current 1 A, $dl_g/dt = 1 A/\mu s$ $V_d = 0.67 \% V_{DRM}, T_J = 25 °C$	1.0				
Typical turn-off time	tq	I_{TM} = 750 A, T_J = T_J maximum, dI/dt = 60 A/ μ s, V_R = 50 V, dV/dt = 20 V/ μ s, gate 0 V 100 Ω , t_p = 500 μ s	150	μs			

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



TRIGGERING						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES		UNITS
FANAMETEN	STWIBOL	I Ex	31 CONDITIONS	Тур.	Max.	UNITS
Maximum peak gate power	P _{GM}	$T_J = T_J$ maximum,	$t_p \leq 5 \ ms$	10.0		W
Maximum average gate power	P _{G(AV)}	$T_J = T_J$ maximum,	f = 50 Hz, d% = 50	2	.0	VV
Maximum peak positive gate current	I _{GM}	$T_J = T_J$ maximum,	$t_p \le 5 \text{ ms}$	3	.0	Α
Maximum peak positive gate voltage	+ V _{GM}	T - T maximum	+ < 5 ma	2	.0	V
Maximum peak negative gate voltage	- V _{GM}	$T_J = T_J$ maximum, $t_p \le 5$ ms			5.0	
		T _J = -40 °C	Maximum required gate trigger/	200	-	mA
DC gate current required to trigger	I_{GT}	T _J = 25 °C		100	200	
		T _J = 125 °C		50	-	
		T _J = -40 °C	current/voltage are the lowest value which will trigger all units	2.5	-	
DC gate voltage required to trigger	V_{GT}	T _J = 25 °C	= 25 °C 12 V anode to cathode applied	1.8	3.0	V
		T _J = 125 °C		1.1	-	
DC gate current not to trigger	I _{GD}	T T	Maximum gate current/voltage not to trigger is the maximum	1	0	mA
DC gate voltage not to trigger	V _{GD}	$T_J = T_J$ maximum	value which will not trigger any unit with rated V _{DRM} anode to cathode applied	0.:	25	V

THERMAL AND MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS		
Maximum operating junction temperature range	T_{J}		-40 to 125	°C		
Maximum storage temperature range	T _{Stg}		-40 to 150			
Maximum thermal registeres innetion to heataink	D	DC operation single side cooled	0.073			
Maximum thermal resistance, junction to heatsink	R _{thJ-hs}	DC operation double side cooled	0.031	K/W		
Maximum thermal resistance, each to heateigh	R _{thC-hs}	DC operation single side cooled	0.011			
Maximum thermal resistance, case to heatsink		DC operation double side cooled	0.006			
Mounting force, ± 10 %			14 700 (1500)	N (kg)		
Approximate weight			255	g		
Case style		See dimensions - link at the end of datasheet	TO-200AC (B-PUK)		

∆R _{thJ-hs} CONDUCTIO	△R _{thJ-hs} CONDUCTION							
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION		RECTANGULAR CONDUCTION		TEST CONDITIONS	UNITS		
CONDUCTION ANGLE	SINGLE SIDE	DOUBLE SIDE	SINGLE SIDE	DOUBLE SIDE	TEST CONDITIONS	UNITS		
180°	0.009	0.009	0.006	0.006	$T_J = T_J$ maximum			
120°	0.011	0.011	0.010	0.011				
90°	0.014	0.014	0.015	0.015		K/W		
60°	0.020	0.020	0.021	0.021				
30°	0.036	0.036	0.036	0.036				

Note

[•] The table above shows the increment of thermal resistance RthJ-hs when devices operate at different conduction angles than DC

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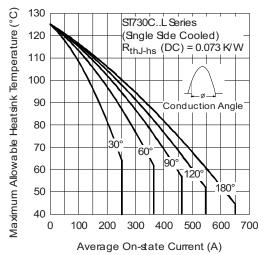


Fig. 1 - Current Ratings Characteristics

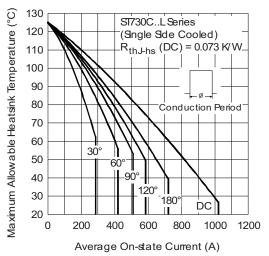


Fig. 2 - Current Ratings Characteristics

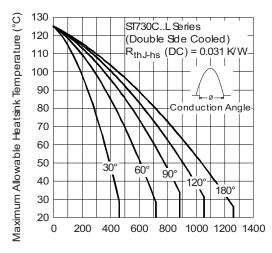


Fig. 3 - Current Ratings Characteristics

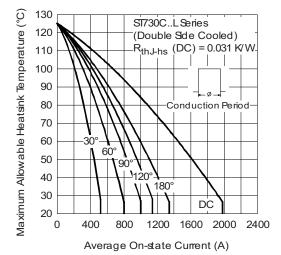


Fig. 4 - Current Ratings Characteristics

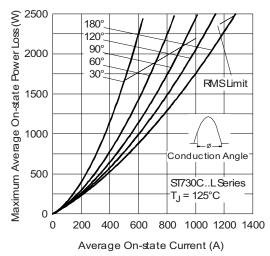


Fig. 5 - On-State Power Loss Characteristics

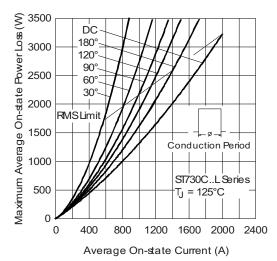


Fig. 6 - On-State Power Loss Characteristics

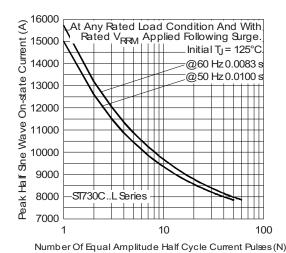


Fig. 7 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

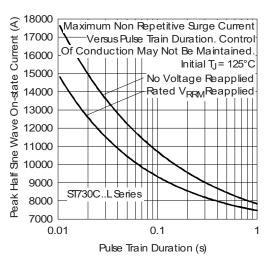


Fig. 8 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

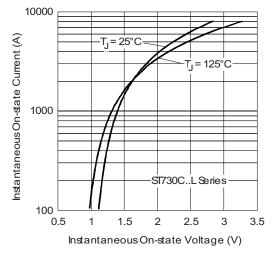


Fig. 9 - On-State Voltage Drop Characteristics

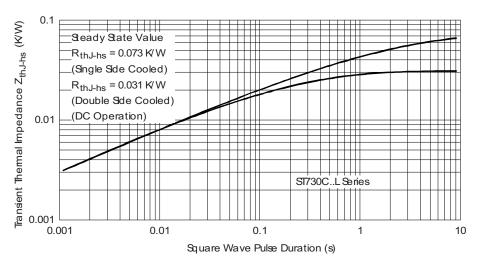


Fig. 10 - Thermal Impedance Z_{thJ-hs} Characteristics

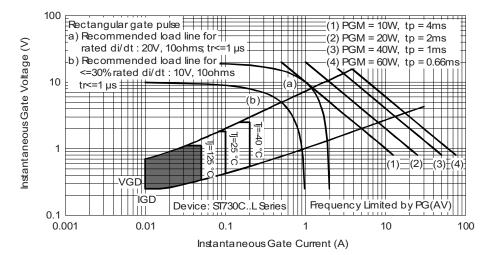
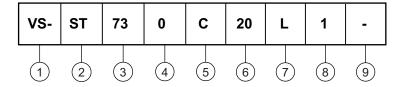


Fig. 11 - Gate Characteristics

ORDERING INFORMATION TABLE

Device code



1 - Vishay Semiconductors product

2 - Thyristor

3 - Essential part number

4 - 0 = Converter grade

5 - C = Ceramic PUK

Voltage code x 100 = V_{RRM} (see Voltage Ratings table)

7 - L = PUK case TO-200AC (B-PUK)

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)

9 - Critical dV/dt: • None = 500 V/µs (standard selection)

• L = 1000 V/µs (special selection)

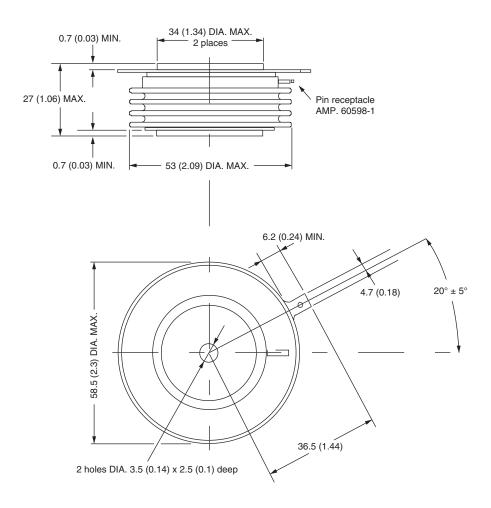
LINKS TO RELATED DOCUMENTS				
Dimensions	www.vishay.com/doc?95076			



TO-200AC (B-PUK)

DIMENSIONS in millimeters (inches)

Creepage distance: 36.33 (1.430) minimum Strike distance: 17.43 (0.686) minimum



Quote between upper and lower pole pieces has to be considered after application of mounting force (see thermal and mechanical specification)



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