



flow90CON 1

1600 V / 43 A

Topology features

- Three-phase Half Controlled Converter

Component features

- High inrush current capability

Housing features

- Base isolation: Al_2O_3
- 90° mounting angle between heatsink and PCB
- Screw-on heatsink mounting
- Clip-in PCB mounting
- Thermo-mechanical push-and-pull force relief
- Solder pin

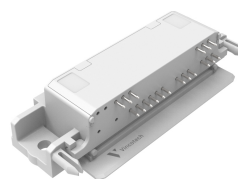
Target applications

- Industrial Drives
- Servo Drives

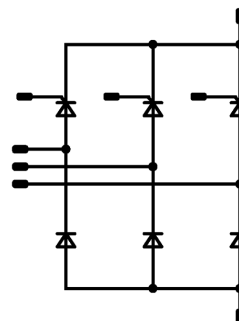
Types

- V23990-P718-H10-PM

flow90 1 housing



Schematic





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Maximum Ratings

$T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Rectifier Thyristor				
Repetitive peak reverse voltage	V_{RRM}		1200	V
Maximum RMS on-state current	I_{TRMSM}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	60	A
Surge on-state current	I_{TSM}	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 150\text{ °C}$	540	A
I2t value	I^2t	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 150\text{ °C}$	1460	A ² s
Mean total power loss	$P_{tot(AV)}$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	64	W
Maximum Junction Temperature	T_{jmax}		150	°C

Rectifier Diode

Peak repetitive reverse voltage	V_{RRM}		1600	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	69	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 150\text{ °C}$	740	A
Surge current capability	I^2t		2740	A ² s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	88	W
Maximum junction temperature	T_{jmax}		150	°C

Module Properties

Thermal Properties

Storage temperature	T_{stg}		-40...+125	°C
Operation temperature under switching condition	T_{jop}		-40...+($T_{jmax} - 25$)	°C

Isolation Properties

Isolation voltage	V_{isol}	DC Test Voltage* $t_p = 2\text{ s}$	6000	V
Creepage distance			>12,7	mm
Clearance			11,84	mm
Comparative Tracking Index	CTI		≥ 200	

*100 % tested in production



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Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max	

Rectifier Thyristor

Static

On-state voltage	V_T				60	25 125		1,32 1,33	1,26 1,28	V
On-state threshold voltage	$V_{T(TO)}$				0	125			0,89	V
On-state slope resistance	r_T				0	125			6	mΩ
Direct reverse current	I_{RD}	$V_r = 1200$ V				25 125			50 5000	μA
Holding current	I_H	$I_T = A$		6		25		75		mA
Latching current	I_L	$t_p = 10$ μs $I_G = 0,45$ A $di_G/dt = 0,45$ A/μs				25		125		mA
Gate trigger voltage	V_{GT}			6		25			1,5	V
Gate trigger current	I_{GT}			6		25			50	mA
Gate non-trigger current	I_{GD}					25			5	mA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						1,1		K/W
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Rectifier Diode

Static

Forward voltage	V_F				80	25 125 150		1,33 1,35	1,23 ⁽¹⁾ 1,17 ⁽¹⁾	V
Reverse leakage current	I_R	$V_r = 1600$ V				25 150			50 1500	μA

Thermal

Thermal resistance junction to sink ⁽²⁾	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						0,79		K/W
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⁽¹⁾ Value at chip level

⁽²⁾ Only valid with pre-applied Vincotech thermal interface material.

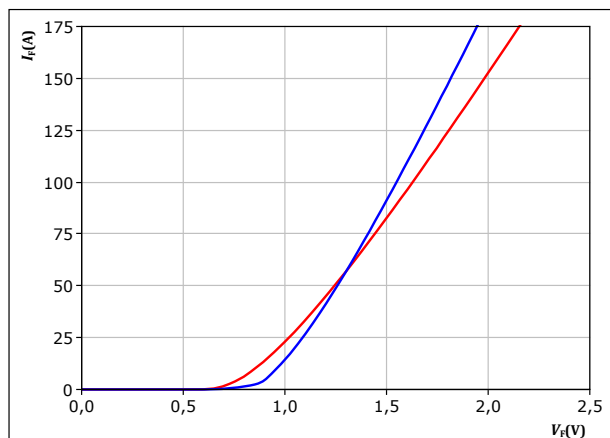


Rectifier Thyristor Characteristics

figure 1. Thyristor

Typical forward characteristics

$$I_F = f(V_F)$$

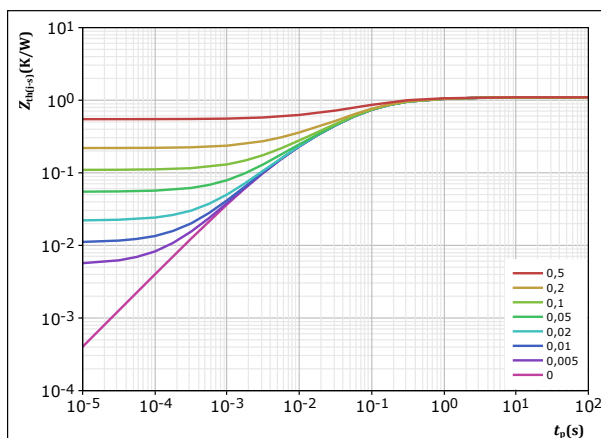


$t_p = 250 \mu s$
 T_j : — 25 °C
— 125 °C

figure 2. Thyristor

Transient thermal impedance as a function of pulse width

$$Z_{th(j-s)} = f(t_p)$$



$D = t_p / T$
 $R_{th(j-s)} = 1,096 \text{ K/W}$
Thyristor thermal model values

$R \text{ (K/W)}$	$\tau \text{ (s)}$
8,69E-02	1,86E+00
3,24E-01	1,95E-01
4,90E-01	5,57E-02
1,65E-01	1,01E-02
3,08E-02	2,31E-03



Rectifier Diode Characteristics

figure 3. Rectifier

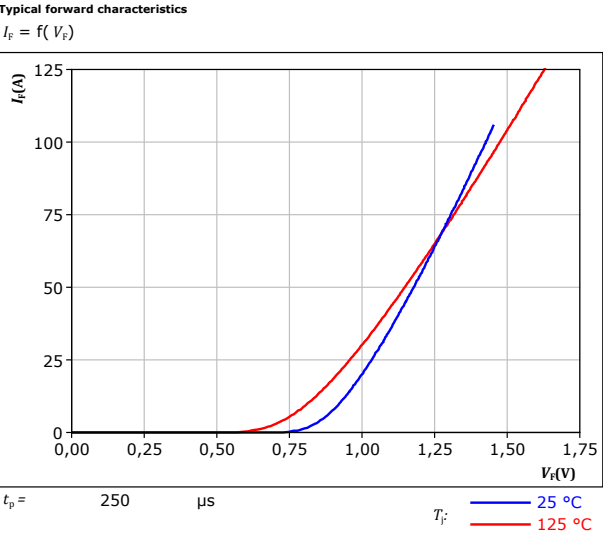
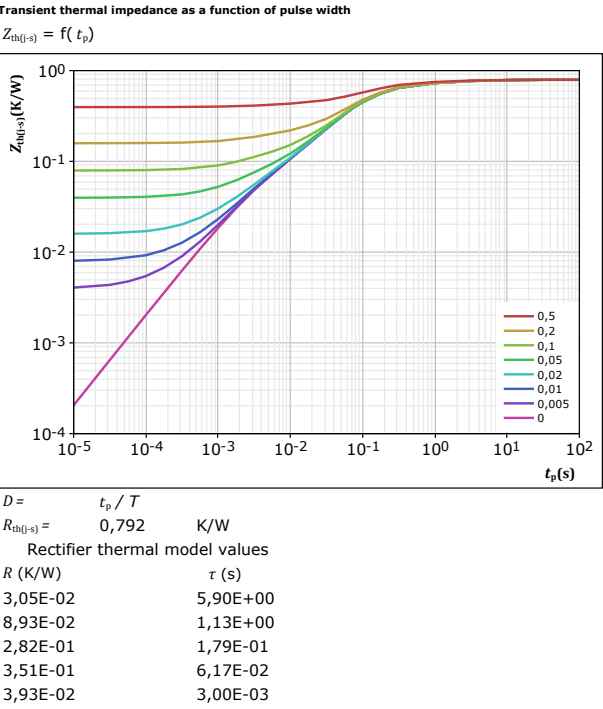


figure 4. Rectifier





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V23990-P718-H10-PM
datasheet

Ordering Code	
Version	Ordering Code
Without thermal paste	V23990-P718-H10-PM
With thermal paste (5,2 W/mK, PTM6000HV)	V23990-P718-H10-/7/-PM

Marking						
	Text	VIN	Date code	Type&Ver	UL	Lot
		VIN	WWYY	TTTTTIV	UL	LLLL
	Datamatrix	Type&Ver	Lot number	Serial	Date code	
		TTTTTIV	LLLL	SSSS	WWYY	

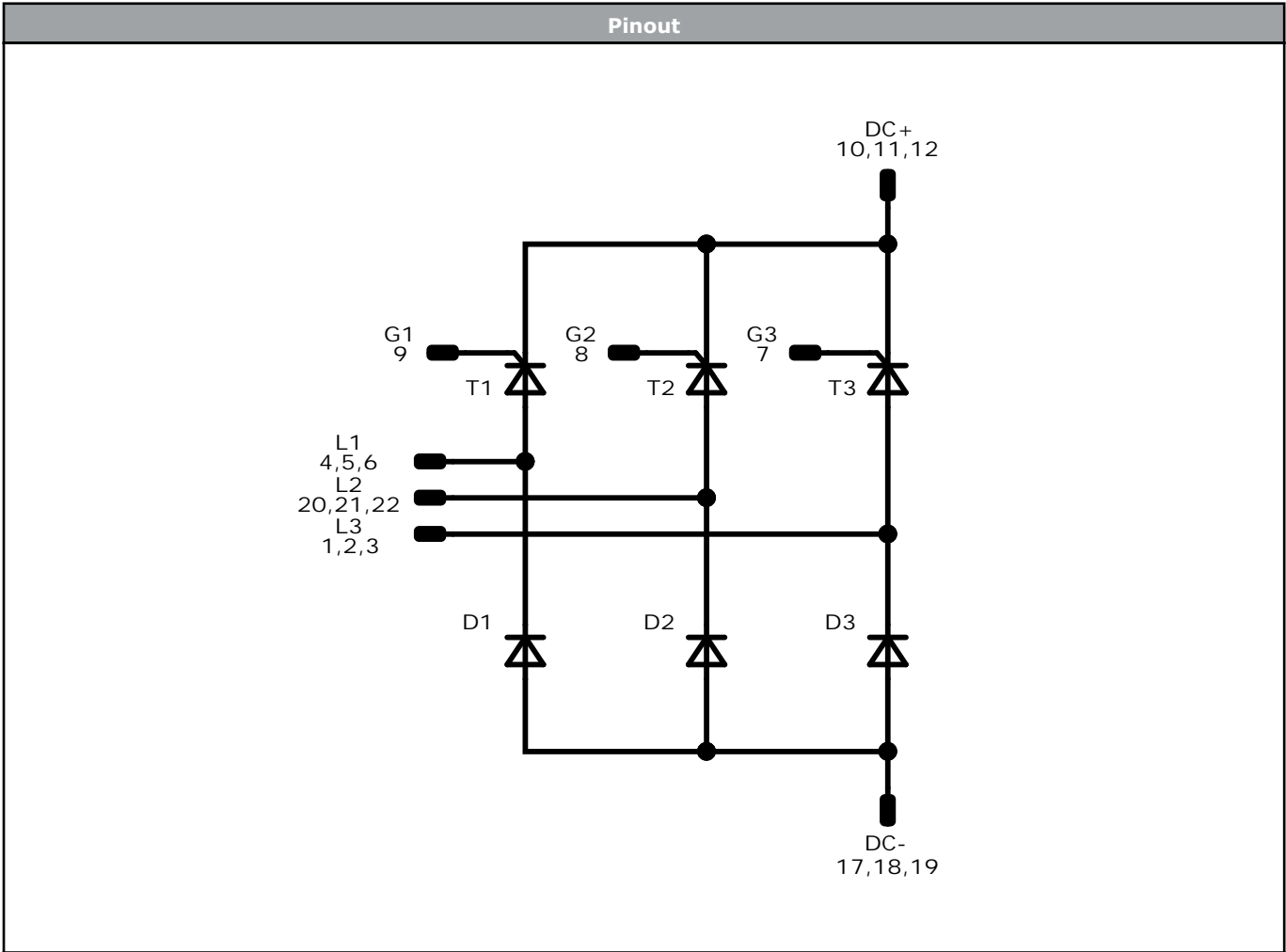
Outline

Pin table [mm]

Pin	X	Y	Function
1	53	0	L3
2	50,1	0	L3
3	47,2	0	L3
4	40,2	0	L1
5	37,3	0	L1
6	34,4	0	L1
7	27,4	0	G3
8	24,5	0	G2
9	21,6	0	G1
10	18,7	0	DC+
11	15,8	0	DC+
12	12,9	0	DC+
13	7,1	0	NA
14	0	0	NA
15	0	7	NA
16	3	7	NA
17	7	7	DC-
18	9,9	7	DC-
19	12,8	7	DC-
20	44	7	L2
21	47	7	L2
22	50	7	L2


The image shows two views of a rectangular electronic component. The top view is a plan view showing 22 pins arranged in two rows. The pins are numbered 1 through 22. The dimensions are: total width 113, total length 26.5, and a central offset of 17.36 ±0.5. The bottom view is a perspective view showing the component's profile and the pins. The dimensions are: total width 113, total length 26.5, and a central offset of 17.36 ±0.5. The pins are numbered 1 through 22. The drawing includes a coordinate system with X and Y axes.

Tolerance of pinpositions: ±0.5mm at the end of pins
Dimension of coordinate axis is only offset without tolerance



Identification					
ID	Component	Voltage	Current	Function	Comment
T1, T2, T3	Thyristor	1200 V	60 A	Rectifier Thyristor	
D1, D2, D3	Rectifier	1600 V	80 A	Rectifier Diode	



Packaging instruction				
Standard packaging quantity (SPQ) 80	>SPQ	Standard	<SPQ	Sample
Handling instruction				
Handling instructions for <i>flow90</i> 1 packages see vincotech.com website.				
Package data				
Package data for <i>flow90</i> 1 packages see vincotech.com website.				
Vincotech thermistor reference				
See Vincotech thermistor reference table at vincotech.com website.				
UL recognition and file number				
This device is UL 1557 recognized under E192116 up to a junction temperature under switching condition $T_{j,sp}=175^{\circ}\text{C}$ and up to 3500VAC/1min isolation voltage. For more information see vincotech.com website.				

Document No.:	Date:	Modification:	Pages
V23990-P718-H10-PM-D4-14	11 Mar. 2025	New Datasheet format. No change in the module	

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