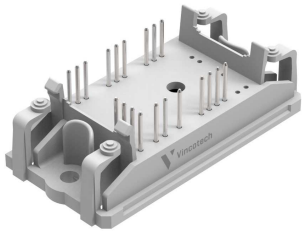
Vincotech

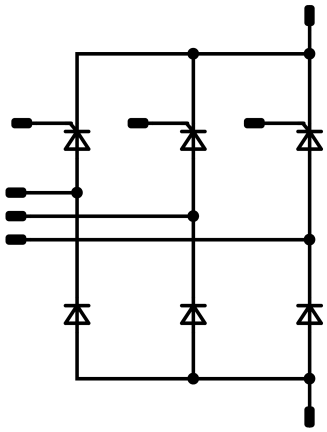
V23990-P649-H10-PM
datasheet

flowCON 0 — **1600 V / 34 A**

Features
- Three-phase half-controlled rectifier

flow 0 17 mm housing


Target applications
- Industrial Drives
- Embedded Drives
- UPS

Schematic


Types
- V23990-P649-H10-PM

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
Rectifier Diode				
Peak repetitive reverse voltage	V_{RRM}		1600	V
Continuous (direct) forward current	I_F		42	A
Surge (non-repetitive) forward current	I_{FSM}	50 Hz Single Half Sine Wave, t_p = 10 ms, T_j = 150 °C	520	A
Surge current capability	I^2t	50 Hz Single Half Sine Wave, t_p = 10 ms, T_j = 150 °C	1350	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$, T_s = 80 °C	73	W
Maximum junction temperature	T_{jmax}		150	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Condition		Value	Unit
Rectifier Thyristor					
Repetitive peak reverse voltage	V_{RRM}			1600	V
Forward average current	I_{FAV}	sine, d = 0,5 $T_j = T_{jmax}$	T_s = 80 °C	36	A
Surge forward current	I_{FSM}	t_p = 10 ms	T_j = 130°C	280	A
I^2t value	I^2t			390	A^2s
Mean total power loss	$P_{tot(AV)}$	$T_j = T_{jmax}$	T_s = 80 °C	53	W
Maximum Junction Temperature	T_{jmax}			130	°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 s	6000	V
		AC Voltage	t_p = 1 min	2500	V
Creepage distance				min. 12,7	mm
Clearance				min. 12,7	mm
Comparative Tracking Index	CTI			> 200	

*100 % tested in production

Characteristic Values

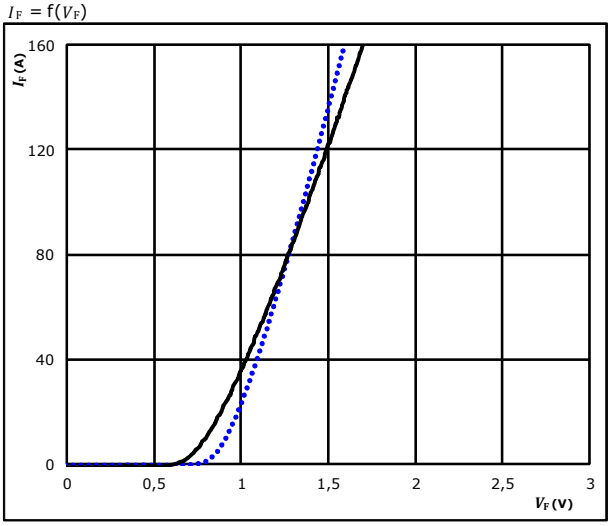
Parameter	Symbol	Conditions					Value			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max	
Rectifier Diode										
Static										
Forward voltage	V_F				42	25 125		1,10 1,04		V
Reverse leakage current	I_R			1600		25 150			20 1500	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,97		K/W
Rectifier Thyristor										
Static										
Forward voltage	V_F				25	25 125		1,68 1,80	1,2	V
On-state threshold voltage	$V_{T(TO)}$				25	130			0,85	V
On-state slope resistance	r_T				25	130			13,9	mΩ
Critical rate of rise of off-state voltage	$(dv/dt)_{cr}$					130			1000	V/µs
Critical rate of rise of on-state current	$(di_T/dt)_{cr}$					130			50	A/µs
Circuit commutated turn-off time	t_q					130		150		µs
Holding current	I_H					130			165	mA
Latching current	I_L					130			330	mA
Gate $t_r$igger voltage	V_{GT}					130			1,98	V
Gate $t_r$igger current	I_{GT}					130			100	mA
Gate non-trigger voltage	V_{GD}					130	0,25			V
Gate non-trigger current	I_{GD}					130	6			mA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,94		K/W

Rectifier Diode Characteristics

figure 1. **Rectifier Diode**

Typical forward characteristics

$I_F = f(V_F)$



t_p = 250 µs

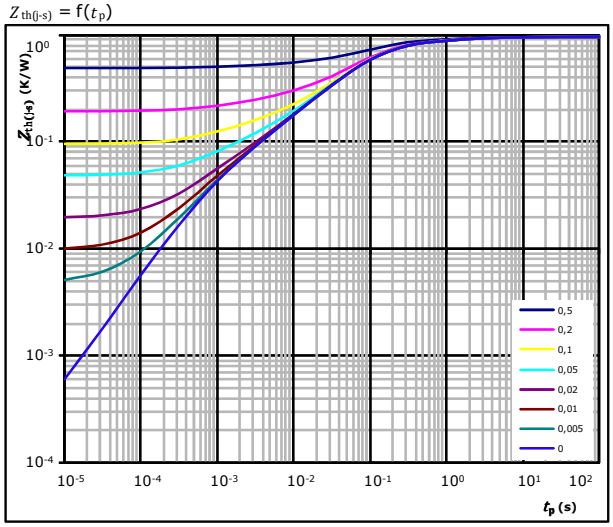
T_j: 25 °C

125 °C

figure 2. **Rectifier Diode**

Transient thermal impedance as a function of pulse width

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



D = t_p / T

$R_{th(j-s)}$ = 0,97 K/W

Diode thermal model values

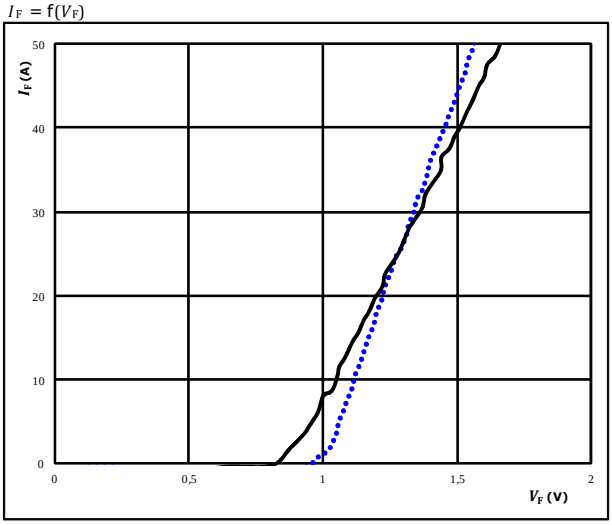
R (K/W)	τ (s)
3,98E-02	7,88E+00
1,29E-01	8,64E-01
4,20E-01	1,32E-01
2,76E-01	4,24E-02
6,63E-02	5,80E-03
3,37E-02	8,90E-04

Rectifier Thyristor Characteristics

figure 1. **Thyristor**

Typical forward characteristics

$I_F = f(V_F)$



t_p = 250 µs

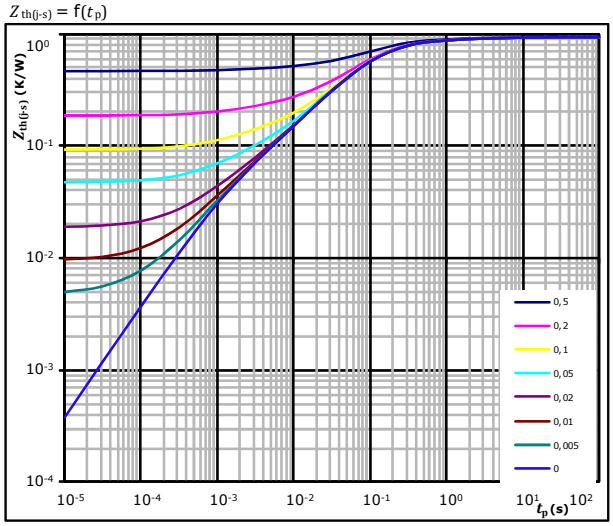
T_j: 25 °C

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

$R_{th(j-s)}$ = 0,94 K/W

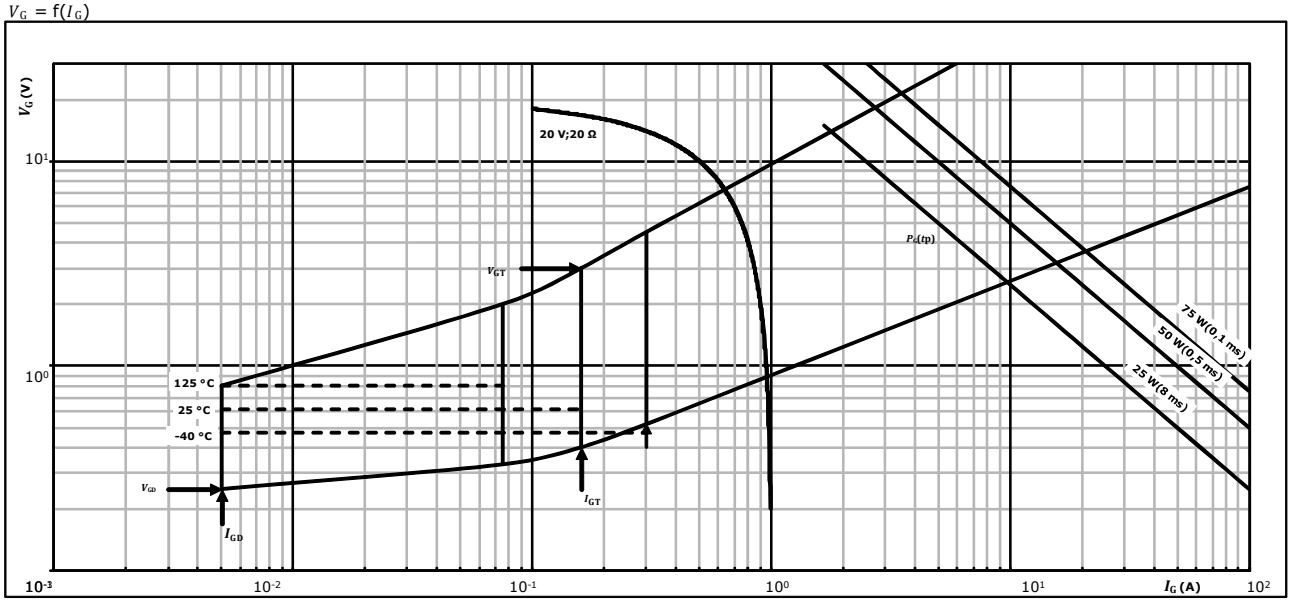
Thyristor thermal model values

R (K/W)	τ (s)
4,51E-02	4,82E+00
1,19E-01	6,06E-01
5,11E-01	1,05E-01
1,92E-01	3,55E-02
4,55E-02	6,62E-03
2,73E-02	1,14E-03

figure 3. **Thyristor**

Gate trigger characteristics

$V_G = f(I_G)$



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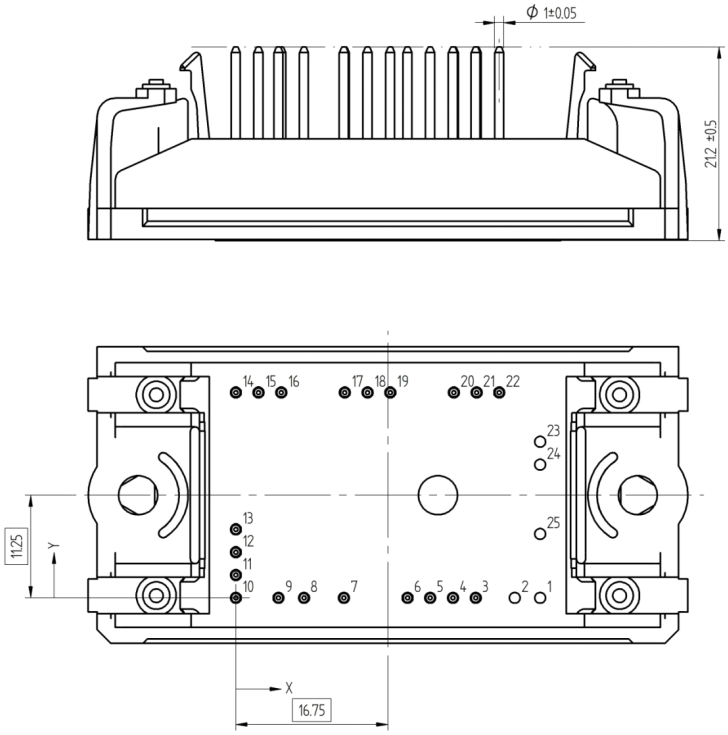
Ordering Code & Marking

Version	Ordering Code
without thermal paste 17 mm housing with solder pins	V23990-P649-H10-PM

Text	**VIN**	**Date code**	**Name&Ver**	**UL**	**Lot**	**Serial**
	VIN	WWYY	NNNNNNNVV	UL	LLLLL	SSSS
Datamatrix	**Type&Ver**	**Lot number**	**Serial**	**Date code**		
	TTTTTTTVV	LLLLL	SSSS	WWYY		

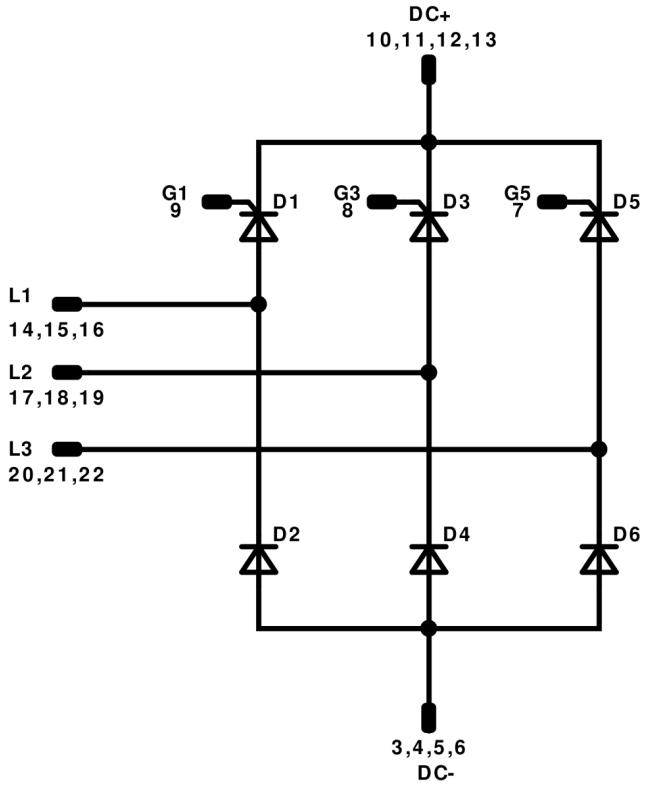
Outline

Pin table			
Pin	X	Y	Function
1	Not assembled		
2	Not assembled		
3	26,4	0	DC-
4	23,9	0	DC-
5	21,4	0	DC-
6	18,9	0	DC-
7	11,9	0	G5
8	7,5	0	G3
9	4,7	0	G1
10	0	0	DC+
11	0	2,5	DC+
12	0	5	DC+
13	0	7,5	DC+
14	0	22,5	L1
15	2,5	22,5	L1
16	5	22,5	L1
17	12	22,5	L2
18	14,5	22,5	L2
19	17	22,5	L2
20	24	22,5	L3
21	26,5	22,5	L3
22	29	22,5	L3
23	Not assembled		
24	Not assembled		
25	Not assembled		



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

Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
D2, D4, D6	Rectifier	1600 V	42 A	Rectifier Diode	
D1, D3, D5	Thyristor	1600 V	60 A	Rectifier Thyristor	

Packaging instruction				
Standard packaging quantity (SPQ) 135	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for *flow* 0 packages see vincotech.com website.

Package data
Package data for *flow* 0 packages see vincotech.com website.

UL recognition and file number
This device is certified according to UL 1557 standard, UL file number E192116. For more information see vincotech.com website.

Document No.:	Date:	Modification:	Pages
V23990-P649-H10-D1-14	12 Jul. 2018		