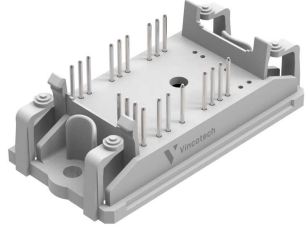
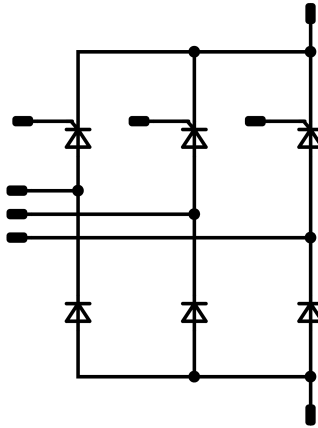




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<i>flowCON 0</i>	1600 V / 34 A
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center; background-color: #ccc; margin: 0;">Features</p> <ul style="list-style-type: none"> Three-phase half-controlled rectifier </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center; background-color: #ccc; margin: 0;">Target applications</p> <ul style="list-style-type: none"> Industrial Drives Embedded Drives UPS </div> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #ccc; margin: 0;">Types</p> <ul style="list-style-type: none"> V23990-P649-H10-PM </div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center; background-color: #ccc; margin: 0;"><i>flow 0 17 mm housing</i></p>  </div> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #ccc; margin: 0;">Schematic</p>  </div>

Maximum Ratings

$T_j = 25\text{ °C}$, 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 $t_p = 10\text{ ms}$ $T_j = 150\text{ °C}$	520	A
Surge current capability	I_{Pt}		1350	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	73	W
Maximum junction temperature	T_{jmax}		150	$^{\circ}C$



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Maximum Ratings

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

Parameter	Symbol	Condition	Value	Unit
Rectifier Thyristor				
Repetitive peak reverse voltage	V_{RRM}		1600	V
Forward average current	I_{FAV}	sine, $d = 0,5$ $T_j = T_{jmax}$	36	A
Surge forward current	I_{FSM}	$t_p = 10\text{ ms}$ $T_j = 130\text{ °C}$	280	A
I^2t value	I^2t		390	A ² s
Mean total power loss	$P_{tot(AV)}$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	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* $t_p = 2\text{ s}$	6000	V
		AC Voltage $t_p = 1\text{ min}$	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_{CE} [V]	I_C [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	μ A

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)					0,97		K/W
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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	m Ω
Critical rate of rise of off-state voltage	$(dv/dt)_{cr}$				130			1000	V/ μ s
Critical rate of rise of on-state current	$(di_T/dt)_{cr}$				130			50	A/ μ s
Circuit commutated turn-off time	t_q				130		150		μ s
Holding current	I_H				130			165	mA
Latching current	I_L				130			330	mA
Gate trigger voltage	V_{GT}				130			1,98	V
Gate trigger 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	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)					0,94		K/W
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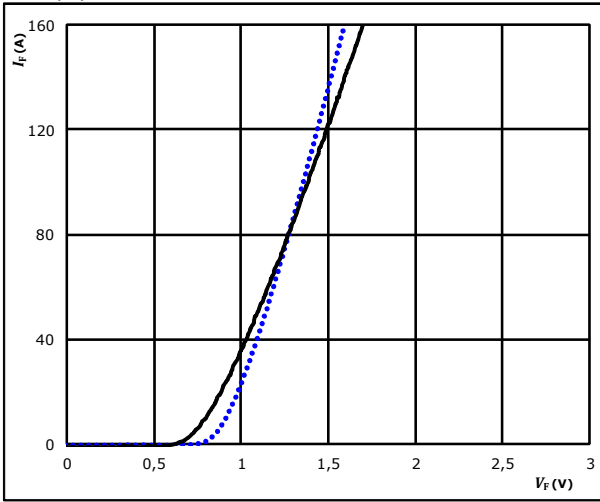


Rectifier Diode Characteristics

figure 1. Rectifier Diode

Typical forward characteristics

$$I_F = f(V_F)$$

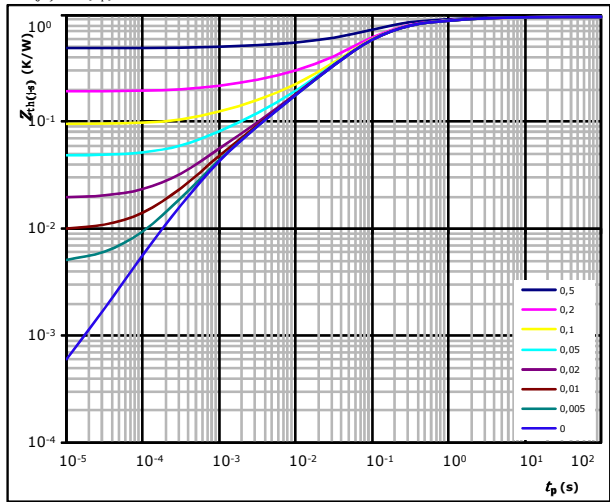


$t_p = 250 \mu s$ $T_j: 25 \text{ }^\circ\text{C}$ (dotted blue line)
 $125 \text{ }^\circ\text{C}$ (solid black line)

figure 2. Rectifier Diode

Transient thermal impedance as a function of pulse width

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



$D = t_p / T$
 $R_{th(j-s)} = 0,97 \text{ K/W}$

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

$$I_F = f(V_F)$$

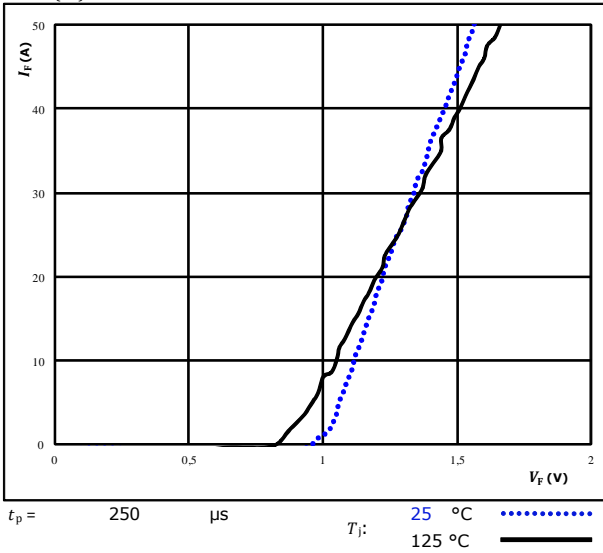
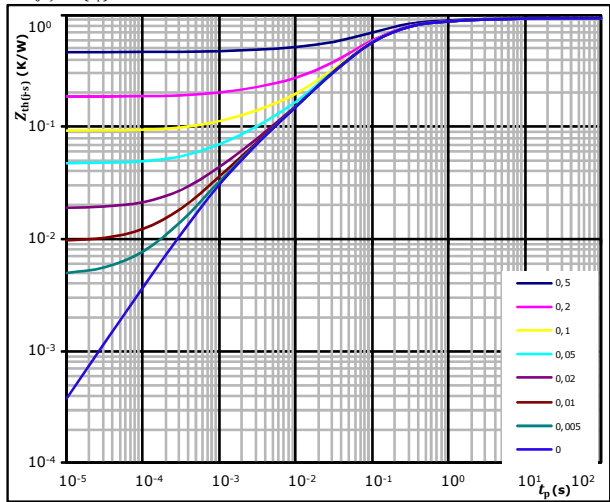


figure 2. Thyristor

Transient thermal impedance as a function of pulse width

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



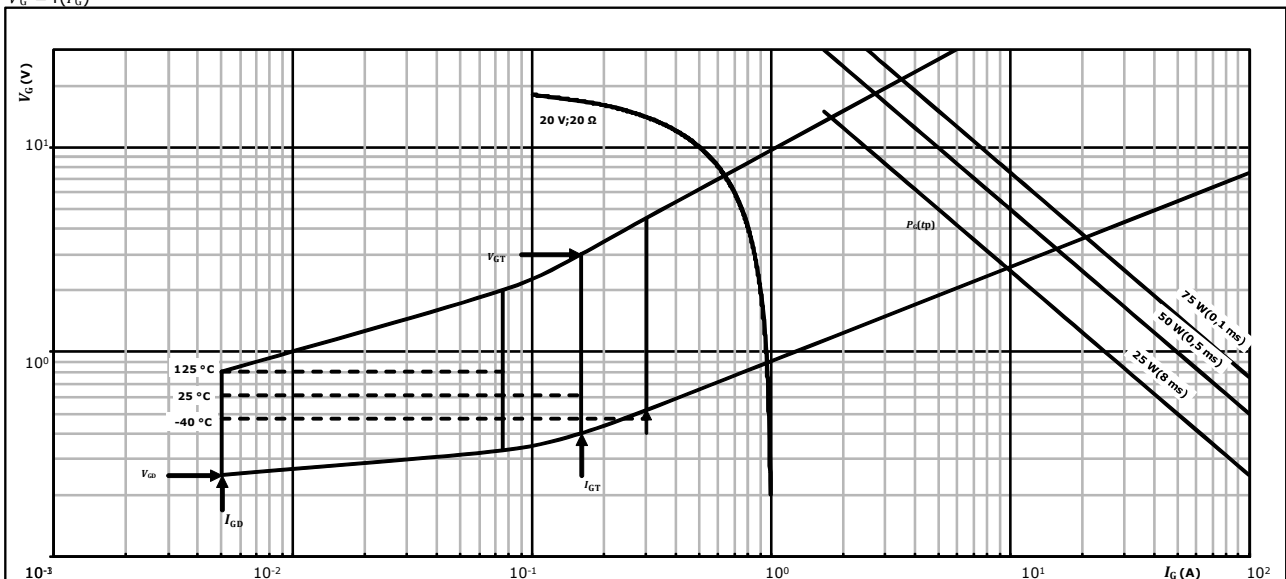
Thyristor thermal model values

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

$$V_G = f(I_G)$$



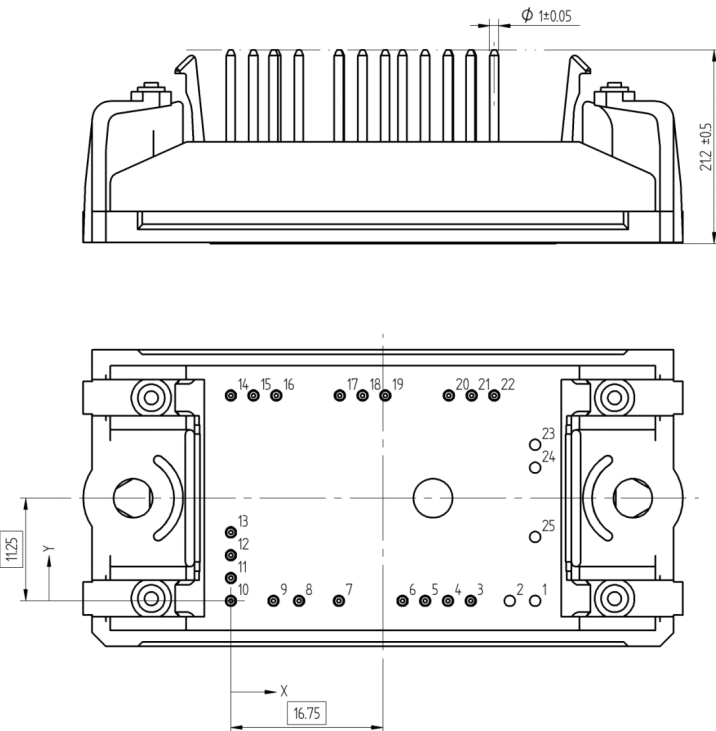


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Ordering Code & Marking										
Version				Ordering Code						
without thermal paste 17 mm housing with solder pins				V23990-P649-H10-PM						
VIN WWYY NNNNNNVV UL LLLL SSSS				Text	VIN	Date code	Name&Ver	UL	Lot	Serial
				Datamatrix	VIN	WWYY	NNNNNNVV	UL	LLLL	SSSS
				Type&Ver	Lot number	Serial	Date code			
				TTTTTIV	LLLL	SSSS	WWYY			

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

Outline

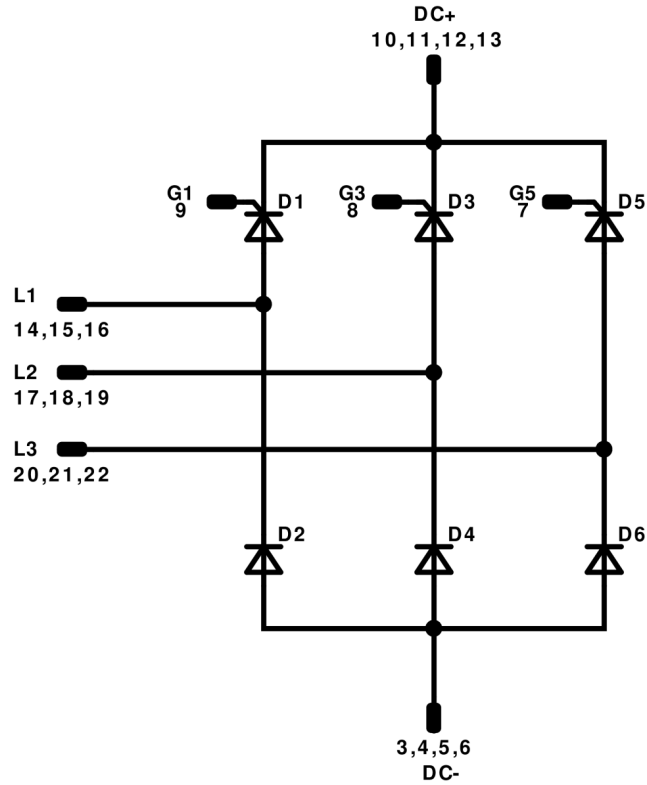


Tolerance of pinpositions: ±0.5mm at the end of pins
Dimension of coordinate axis is only offset without tolerance



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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	




Vincotech

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

Handling instruction
Handling instructions for <i>flow 0</i> packages see vincotech.com website.

Package data
Package data for <i>flow 0</i> 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		

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.