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# 10-PY120RA060VH01-LJ92I03Y

datasheet

flowCON 1

1200 V / 60 A

## Features

- 1200V Ultra-Fast Si-Diode
- Integrated Bypass Diode

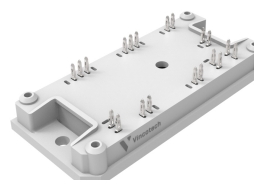
## Target applications

- Charging Stations
- Power Supply
- Welding & Cutting

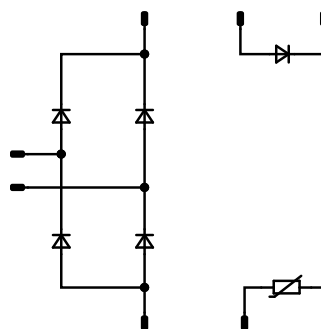
## Types

- 10-PY120RA060VH01-LJ92I03Y

## flow 1 12 mm housing



## Schematic





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## Maximum Ratings

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

Parameter	Symbol	Conditions	Value	Unit
<b>Rectifier Diode</b>				
Peak repetitive reverse voltage	$V_{RRM}$		1200	V
Forward current (DC current)	$I_F$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	49	A
Repetitive peak forward current	$I_{FRM}$	$t_p$ limited by $T_{jmax}$	120	A
Surge (non-repetitive) forward current	$I_{FSM}$	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 45\text{ °C}$	460	A
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	78	W
Maximum junction temperature	$T_{jmax}$		175	°C

## ByPass Diode

Peak repetitive reverse voltage	$V_{RRM}$		1800	V
Forward current (DC current)	$I_F$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	75	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 <sup>2</sup> s
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	83	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
Isolation voltage	$V_{isol}$	AC Voltage $t_p = 1\text{ min}$	2500	V
Creepage distance			min. 12,7	mm
Clearance			7,59	mm
Comparative Tracking Index	CTI		≥ 600	

\*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 Diode

#### Static

Forward voltage	$V_F$				60	25 125 150		2,01 1,8 1,75	1,5 <sup>(1)</sup>	V
Reverse leakage current	$I_R$	$V_r = 1200$ V				25			50	μA

#### Thermal

Thermal resistance junction to sink <sup>(2)</sup>	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						1,22		K/W
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### ByPass Diode

#### Static

Forward voltage	$V_F$				80	25 125 150		1,18 1,15	1,23 <sup>(1)</sup> 1,17 <sup>(1)</sup>	V
Reverse leakage current	$I_R$	$V_r = 1800$ V				25 150			50 1500	μA

#### Thermal

Thermal resistance junction to sink <sup>(2)</sup>	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						0,84		K/W
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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	

## Thermistor

### Static

Rated resistance	$R$					25		22		kΩ
Deviation of $R_{100}$	$\Delta_{R/R}$	$R_{100} = 1484 \Omega$				100	-5		5	%
Power dissipation	$P$							5		mW
Power dissipation constant	$d$					25		1,5		mW/K
B-value	$B_{(25/50)}$	Tol. $\pm 1 \%$						3962		K
B-value	$B_{(25/100)}$	Tol. $\pm 1 \%$						4000		K
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<sup>(1)</sup> Value at chip level

<sup>(2)</sup> Only valid with pre-applied Vincotech thermal interface material.



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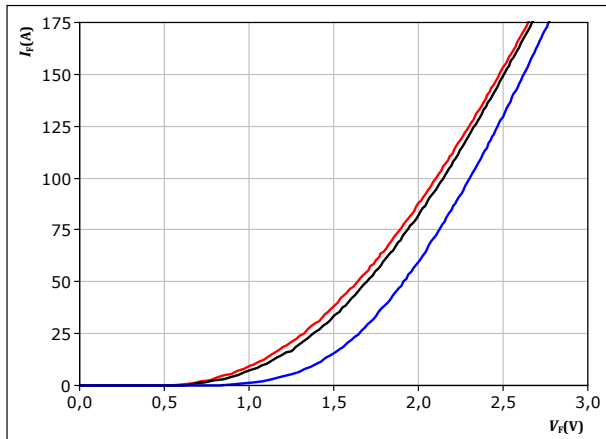
## Rectifier Diode Characteristics

figure 1.

FWD

Typical forward characteristics

$$I_F = f(V_F)$$



$t_p = 250 \mu s$

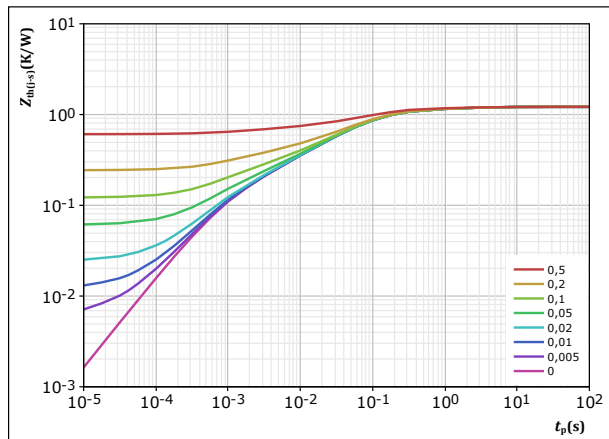
$T_j$ :  
— 25 °C  
— 125 °C  
— 150 °C

figure 2.

FWD

Transient thermal impedance as a function of pulse width

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



$D =$	$t_p / T$	
$R_{th(j-s)} =$	1,216	K/W
FWD thermal model values		
$R$ (K/W)	$\tau$ (s)	
5,22E-02	3,71E+00	
1,27E-01	5,63E-01	
5,36E-01	9,63E-02	
2,81E-01	2,47E-02	
1,22E-01	4,44E-03	
9,68E-02	8,12E-04	



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## ByPass Diode Characteristics

figure 3.

Rectifier

Typical forward characteristics

$$I_F = f(V_F)$$

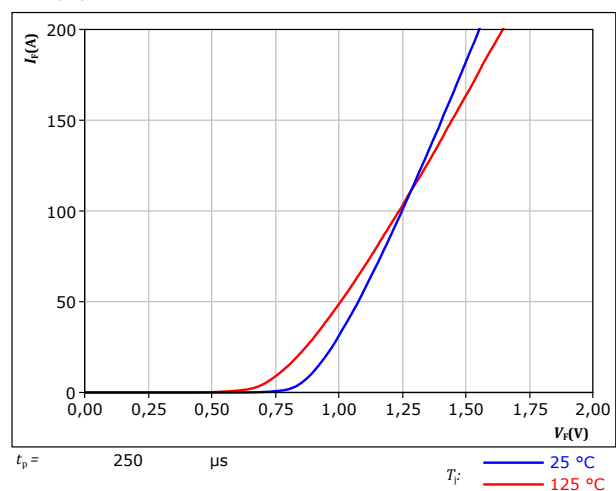
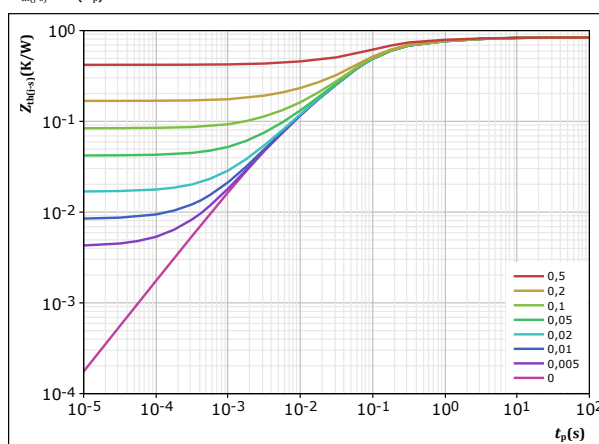


figure 4.

Rectifier

Transient thermal impedance as a function of pulse width

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



$D =$	$t_p / T$	
$R_{th(j-s)} =$	0,84	K/W
Rectifier thermal model values		
$R$ (K/W)	$\tau$ (s)	
4,69E-02	5,96E+00	
1,08E-01	8,86E-01	
3,74E-01	1,33E-01	
2,69E-01	4,72E-02	
4,14E-02	4,67E-03	



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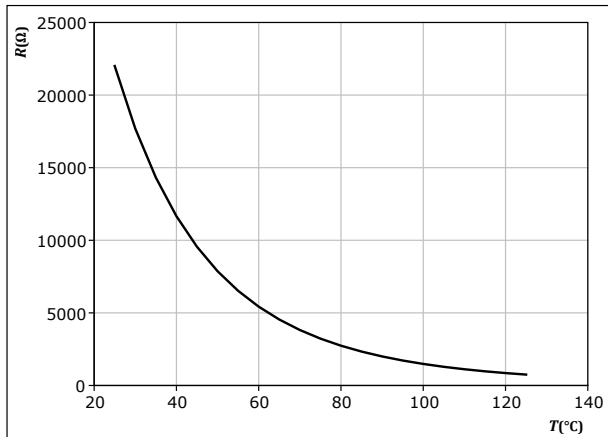
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datasheet

## Thermistor Characteristics

**figure 5.** Thermistor

Typical NTC characteristic as function of temperature

$$R_T = f(T)$$





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Ordering Code	
Version	Ordering Code
Without thermal paste	10-PY120RA060VH01-LJ92I03Y
With thermal paste	10-PY120RA060VH01-LJ92I03Y-/3/

Marking					
	Text	Name NN-NNNNNNNNNNNNNN- TTTTIVV	Date code WWYY	UL & VIN UL VIN	Lot LLLLL
	Datamatrix	Type&Ver TTTTITVV	Lot number LLLLL	Serial SSSS	Date code WWYY

Pin table [mm]			
Pin	X	Y	Function
1	52,2	3	Therm1
2	52,2	0	Therm2
3	not assembled		
4	44,2	2,7	DC+Rect
5	44,2	0	DC+Rect
6	34,8	0	DC-Rect
7	32,1	0	DC-Rect
8	not assembled		
9	not assembled		
10	12,1	0	DC-Rect
11	9,4	0	DC-Rect
12	0	0	DC+Rect
13	0	2,7	DC+Rect
14	not assembled		
15	not assembled		
16	6,8	28,2	ACin1
17	9,5	28,2	ACin1
18	12,2	28,2	ACin1
19	not assembled		
20	not assembled		
21	28,8	28,2	ACin2
22	31,5	28,2	ACin2
23	34,2	28,2	ACin2
24	not assembled		
25	not assembled		
26	49,5	28,2	B2
27	52,2	28,2	B2
28	52,2	13,9	B1
29	52,2	11,2	B1
30	not assembled		

### Outline

center of press-fit pinhead  
for connection parameter see the handling instruction

12.9 ±0.1  
16.2 ±0.5

14.1  
Y  
X  
26.1

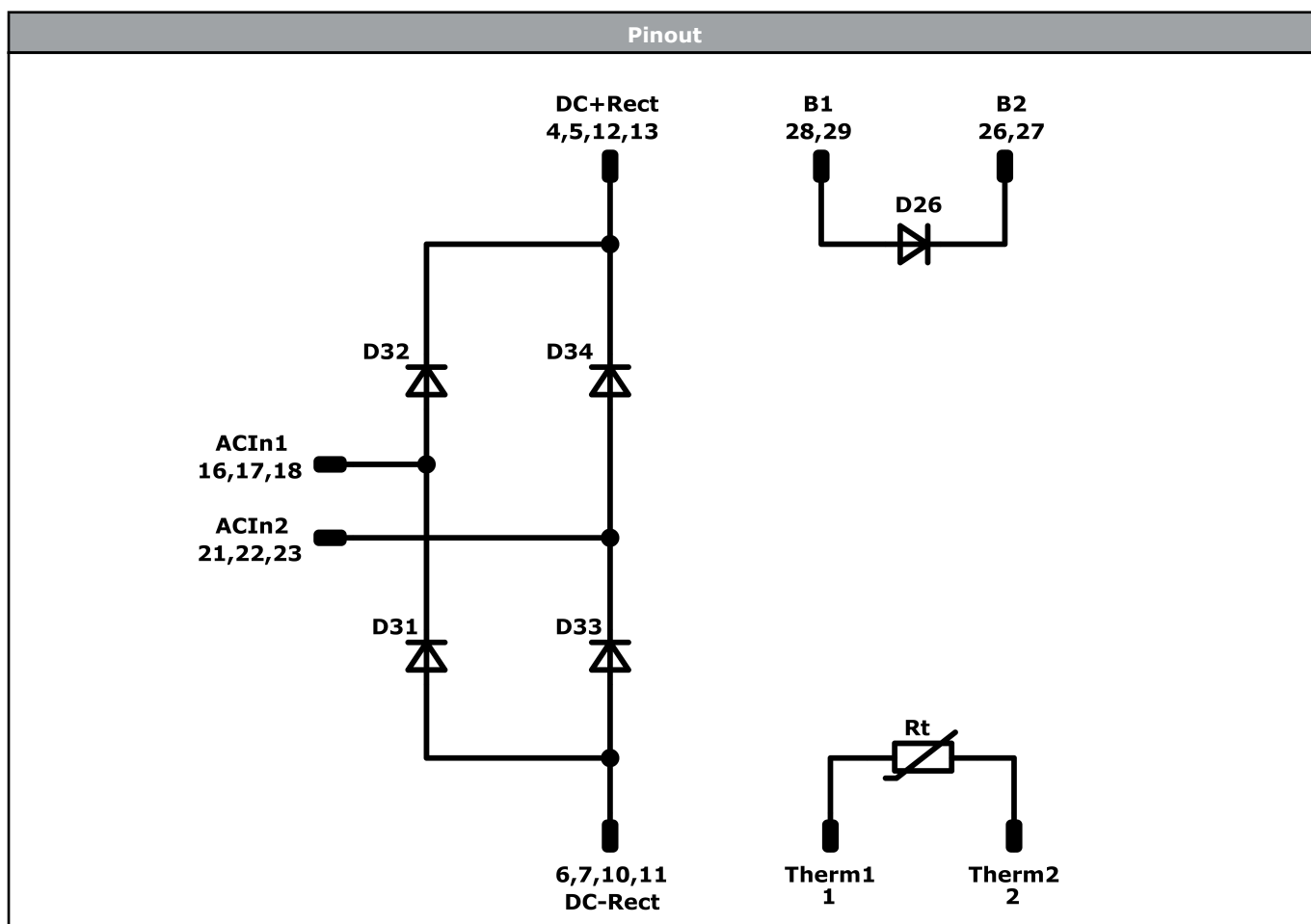
Tolerance of pinpositions: ±0.5mm at the end of pins  
Dimension of coordinate axis is only offset without tolerance





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Identification					
ID	Component	Voltage	Current	Function	Comment
D31, D32, D33, D34	FWD	1200 V	60 A	Rectifier Diode	
D26	Rectifier	1800 V	80 A	ByPass Diode	
Rt	Thermistor			Thermistor	



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Packaging instruction				
Standard packaging quantity (SPQ) 100	>SPQ	Standard	<SPQ	Sample
Handling instruction				
Handling instructions for <i>flow</i> 1 packages see vincotech.com website.				
Package data				
Package data for <i>flow</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 certified according to UL 1557 standard, UL file number E192116. For more information see vincotech.com website.				

Document No.:	Date:	Modification:	Pages
10-PY120RA060VH01-LJ92I03Y-D1-14	22 Sep. 2020	Initial Release	

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