



Vincotech

# 10-P1076PA100I7-L825F09Y

target datasheet

flowPACK 1

650 V / 100 A

## Topology features

- Inverter
- Kelvin Emitter for improved switching performance
- Temperature sensor

## Component features

- Easy paralleling
- Low collector emitter saturation voltage
- Low turn-off losses
- Positive temperature coefficient

## Housing features

- Base isolation:  $\text{Al}_2\text{O}_3$
- Convex shaped substrate for superior thermal contact
- Thermo-mechanical push-and-pull force relief
- Press-fit pin
- Reliable cold welding connection

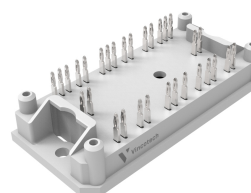
## Target applications

- Embedded Drives
- Heat Pumps
- Industrial Drives
- Servo Drives

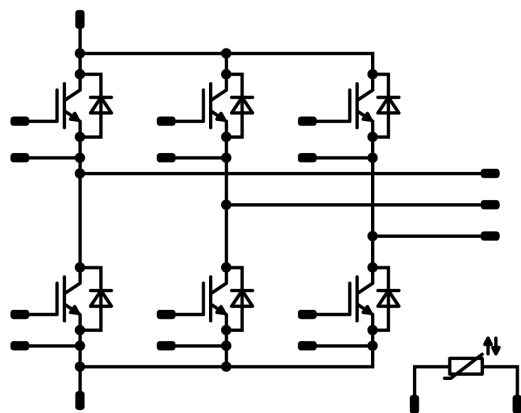
## Types

- 10-P1076PA100I7-L825F09Y

## flow 1 17 mm housing



## Schematic





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## Maximum Ratings

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

| Parameter                         | Symbol     | Conditions                                                             | Value    | Unit               |
|-----------------------------------|------------|------------------------------------------------------------------------|----------|--------------------|
| <b>Inverter Switch</b>            |            |                                                                        |          |                    |
| Collector-emitter voltage         | $V_{CES}$  |                                                                        | 650      | V                  |
| Collector current (DC current)    | $I_C$      | $T_j = T_{jmax}$ $T_s = 80\text{ °C}$                                  | 108      | A                  |
| Repetitive peak collector current | $I_{CRM}$  | $t_p$ limited by $T_{jmax}$                                            | 300      | A                  |
| Turn off safe operating area      |            | $T_j = 150\text{ °C}$ , $V_{CE} = 1200\text{ V}$                       | 300      | A                  |
| Total power dissipation           | $P_{tot}$  | $T_j = T_{jmax}$ $T_s = 80\text{ °C}$                                  | 119      | W                  |
| Gate-emitter voltage              | $V_{GES}$  |                                                                        | $\pm 20$ | V                  |
| Short circuit ratings             | $t_{SC}$   | $V_{GE} = 15\text{ V}$ , $V_{CC} = 400\text{ V}$ $T_j = 150\text{ °C}$ | 3        | $\mu s$            |
| Maximum junction temperature      | $T_{jmax}$ |                                                                        | 175      | $^{\circ}\text{C}$ |

## Inverter Diode

|                                 |            |                                       |     |                    |
|---------------------------------|------------|---------------------------------------|-----|--------------------|
| Peak repetitive reverse voltage | $V_{RRM}$  |                                       | 650 | V                  |
| Forward current (DC current)    | $I_F$      | $T_j = T_{jmax}$ $T_s = 80\text{ °C}$ | 85  | A                  |
| Repetitive peak forward current | $I_{FRM}$  | $t_p$ limited by $T_{jmax}$           | 300 | A                  |
| Total power dissipation         | $P_{tot}$  | $T_j = T_{jmax}$ $T_s = 80\text{ °C}$ | 96  | W                  |
| Maximum junction temperature    | $T_{jmax}$ |                                       | 175 | $^{\circ}\text{C}$ |

## Module Properties

### Thermal Properties

|                                                 |           |  |                            |                    |
|-------------------------------------------------|-----------|--|----------------------------|--------------------|
| Storage temperature                             | $T_{stg}$ |  | -40...+125                 | $^{\circ}\text{C}$ |
| Operation temperature under switching condition | $T_{jop}$ |  | -40...+( $T_{jmax} - 25$ ) | $^{\circ}\text{C}$ |

### Isolation Properties

|                            |            |                                    |            |    |
|----------------------------|------------|------------------------------------|------------|----|
| Isolation voltage          | $V_{isol}$ | DC Test Voltage $t_p = 2\text{ s}$ | 6000       | V  |
| Creepage distance          |            |                                    | TBD        | mm |
| Clearance                  |            |                                    | TBD        | mm |
| Comparative Tracking Index | CTI        |                                    | $\geq 600$ |    |



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## Characteristic Values

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

### Inverter Switch

#### Static

|                                      |              |                          |    |     |       |    |      |      |      |    |
|--------------------------------------|--------------|--------------------------|----|-----|-------|----|------|------|------|----|
| Gate-emitter threshold voltage       | $V_{GE(th)}$ | $V_{CE} = V_{GE}$        |    |     | 0,001 | 25 | 4,35 | 5    | 5,65 | V  |
| Collector-emitter saturation voltage | $V_{CEsat}$  |                          | 15 |     | 100   | 25 |      | 1,35 | 1,65 | V  |
| Collector-emitter cut-off current    | $I_{CES}$    |                          | 0  | 650 |       | 25 |      |      | 40   | µA |
| Gate-emitter leakage current         | $I_{GES}$    |                          | 20 | 0   |       | 25 |      |      | 200  | nA |
| Internal gate resistance             | $r_g$        |                          |    |     |       |    |      | None |      | Ω  |
| Input capacitance                    | $C_{ies}$    | $f = 1 \text{ Mhz}$      | 0  | 25  |       | 25 |      | 6100 |      | pF |
| Output capacitance                   | $C_{oes}$    |                          |    |     |       |    |      | 184  |      | pF |
| Reverse transfer capacitance         | $C_{res}$    |                          |    |     |       |    |      | 62   |      | pF |
| Gate charge                          | $Q_g$        | $V_{CC} = 520 \text{ V}$ | 15 |     | 100   | 25 |      | 580  |      | nC |

#### Thermal

|                                     |               |                                               |  |  |  |  |  |     |  |     |
|-------------------------------------|---------------|-----------------------------------------------|--|--|--|--|--|-----|--|-----|
| Thermal resistance junction to sink | $R_{th(j-s)}$ | $\lambda_{paste} = 5,2 \text{ W/mK}$<br>(PTM) |  |  |  |  |  | 0,8 |  | K/W |
|-------------------------------------|---------------|-----------------------------------------------|--|--|--|--|--|-----|--|-----|

### Inverter Diode

#### Static

|                         |       |                       |  |  |     |    |  |      |    |    |
|-------------------------|-------|-----------------------|--|--|-----|----|--|------|----|----|
| Forward voltage         | $V_F$ |                       |  |  | 100 | 25 |  | 1,65 | 2  | V  |
| Reverse leakage current | $I_R$ | $V_r = 650 \text{ V}$ |  |  |     | 25 |  |      | 40 | µA |

#### Thermal

|                                     |               |                                               |  |  |  |  |  |      |  |     |
|-------------------------------------|---------------|-----------------------------------------------|--|--|--|--|--|------|--|-----|
| Thermal resistance junction to sink | $R_{th(j-s)}$ | $\lambda_{paste} = 5,2 \text{ W/mK}$<br>(PTM) |  |  |  |  |  | 0,99 |  | K/W |
|-------------------------------------|---------------|-----------------------------------------------|--|--|--|--|--|------|--|-----|



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## Characteristic Values

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

### Thermistor

#### Static

|                                |                |                        |  |  |  |     |     |      |      |      |
|--------------------------------|----------------|------------------------|--|--|--|-----|-----|------|------|------|
| Rated resistance               | $R$            |                        |  |  |  | 25  |     | 4,7  |      | kΩ   |
| Deviation of R100              | $\Delta_{R/R}$ | $R_{100} = 401 \Omega$ |  |  |  | 100 | -12 |      | 13,1 | %    |
| Power dissipation              | $P$            |                        |  |  |  | 25  |     | 130  |      | mW   |
| Power dissipation constant     | $d$            |                        |  |  |  | 25  |     | 1,5  |      | mW/K |
| B-value                        | $B_{(25/50)}$  | Tol. $\pm 3 \%$        |  |  |  |     |     | 3612 |      | K    |
| B-value                        | $B_{(25/100)}$ | Tol. $\pm 3 \%$        |  |  |  |     |     | 3650 |      | K    |
| Vincotech Thermistor Reference |                |                        |  |  |  |     |     |      | U    |      |



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| Ordering Code                            |                              |
|------------------------------------------|------------------------------|
| Version                                  | Ordering Code                |
| Without thermal paste                    | 10-P1076PA100I7-L825F09Y     |
| With thermal paste (5,2 W/mK, PTM6000HV) | 10-P1076PA100I7-L825F09Y-/7/ |

| Marking                                                                           |            |                               |            |           |           |       |        |
|-----------------------------------------------------------------------------------|------------|-------------------------------|------------|-----------|-----------|-------|--------|
|  | Text       | Name                          |            | Date code | UL & VIN  | Lot   | Serial |
|                                                                                   |            | NN-NNNNNNNNNNNNN-<br>TTTTTIVV |            | WWYY      | UL VIN    | LLLLL | SSSS   |
|                                                                                   | Datamatrix | Type&Ver                      | Lot number | Serial    | Date code |       |        |
|                                                                                   | TTTTTIVV   | LLLLL                         | SSSS       | WWYY      |           |       |        |

Outline
Pin table [mm]

| Pin | X     | Y     | Function |
|-----|-------|-------|----------|
| 1   | 52,6  | 0     | DC-123   |
| 2   | 49,9  | 0     | DC-123   |
| 3   | 42,65 | 0     | G15      |
| 4   | 39,65 | 0     | S15      |
| 5   | 35,15 | 0     | Therm1   |
| 6   | 28,4  | 0     | Therm2   |
| 7   | 24    | 0     | G13      |
| 8   | 21    | 0     | S13      |
| 9   | 12,2  | 0     | G11      |
| 10  | 9,2   | 0     | S11      |
| 11  | 2,7   | 0     | DC-123   |
| 12  | 0     | 0     | DC-123   |
| 13  | 0     | 14,65 | DC+123   |
| 14  | 2,7   | 14,65 | DC+123   |
| 15  | 0     | 28,6  | Ph1      |
| 16  | 2,7   | 28,6  | Ph1      |
| 17  | 5,4   | 28,6  | Ph1      |
| 18  | 9,6   | 28,6  | S12      |
| 19  | 12,6  | 28,6  | G12      |
| 20  | 19,6  | 28,6  | Ph2      |
| 21  | 22,3  | 28,6  | Ph2      |
| 22  | 25    | 28,6  | Ph2      |
| 23  | 29,7  | 28,6  | S14      |
| 24  | 32,7  | 28,6  | G14      |
| 25  | 39,7  | 28,6  | S16      |
| 26  | 42,7  | 28,6  | G16      |
| 27  | 47,2  | 28,6  | Ph3      |
| 28  | 49,9  | 28,6  | Ph3      |
| 29  | 52,6  | 28,6  | Ph3      |
| 30  | 52,6  | 14,65 | DC+123   |
| 31  | 49,9  | 14,65 | DC+123   |

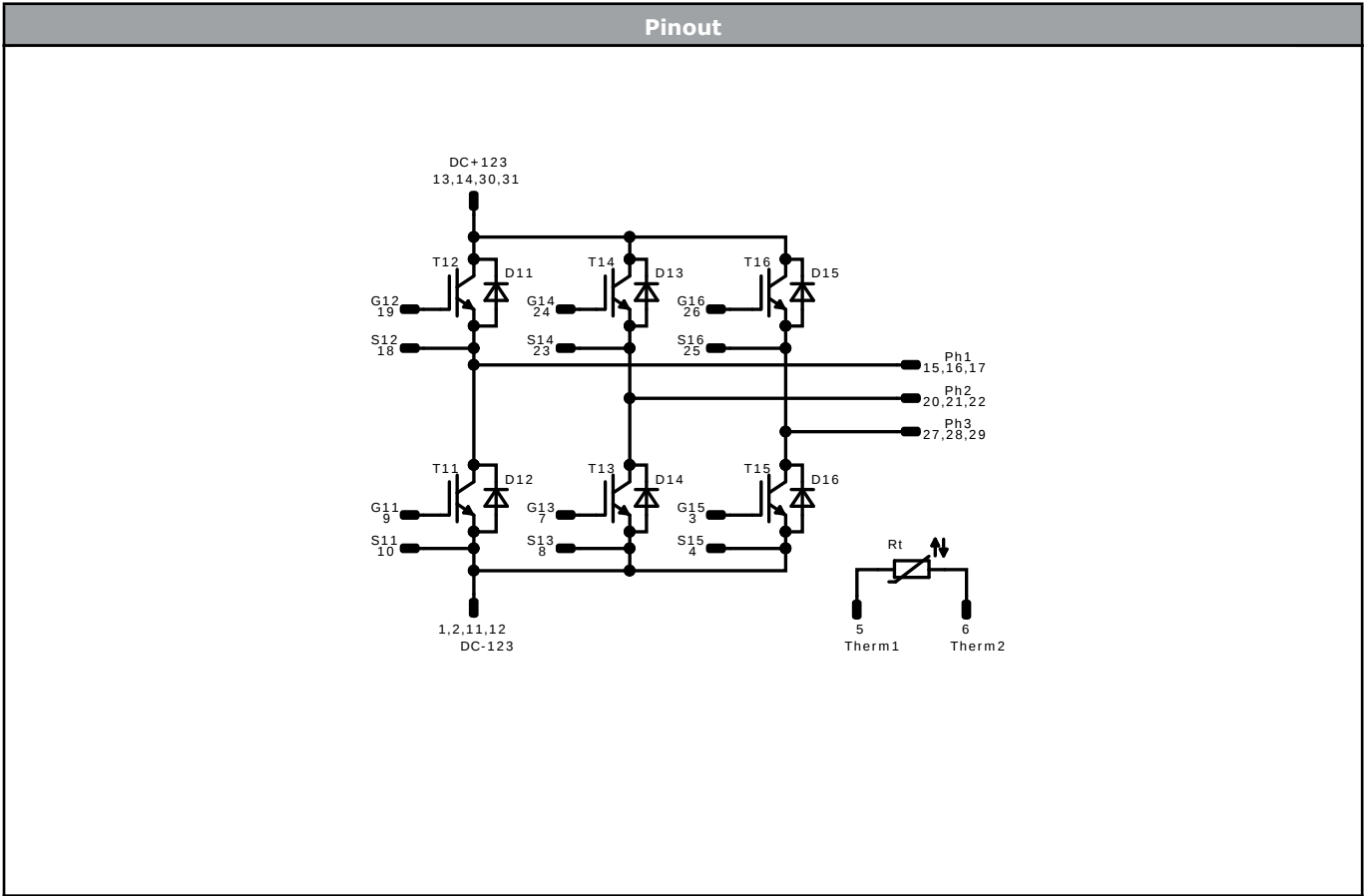
The technical drawing shows the top and bottom views of the PCB. The top view is a rectangle with dimensions 79,9 ±0,1 mm in width and 22,4 ±0,1 mm in height. It features a central row of 31 pins. The bottom view shows the same rectangle with mounting holes at the corners and various pin locations labeled with numbers 1 through 31. Dimensions for pin positions are given relative to the center of the board. A note indicates that the center of the press-fit pin head is at least 1mm from the PCB drilled through-hole, with a diameter of Ø145 mm and a tolerance of ±0,09 mm. For further PCB design rules, it refers to the labeled handling instruction.

\*tolerance of positions: ±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 |
| T11, T12, T13, T14, T15, T16 | IGBT       | 650 V   | 100 A   | Inverter Switch |         |
| D11, D12, D13, D14, D15, D16 | FWD        | 650 V   | 100 A   | Inverter 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 UL 1557 recognized under E192116 up to a junction temperature under switching condition $T_{j,op}=175^{\circ}\text{C}$ and up to 3500VAC/1min isolation voltage. For more information see vincotech.com website. |      |          |      |  |

| Document No.:                  | Date:        | Modification:   | Pages |
|--------------------------------|--------------|-----------------|-------|
| 10-P1076PA100I7-L825F09Y-T1-14 | 10 Dec. 2025 | Initial Release |       |

| Product status definition |                        |                                                                                                                                                                                                              |
|---------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Datasheet Status          | Product Status         | Definition                                                                                                                                                                                                   |
| Target                    | Formative or In Design | This datasheet contains the design specifications for product development. Specifications may change in any manner without notice. The data contained is exclusively intended for technically trained staff. |

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