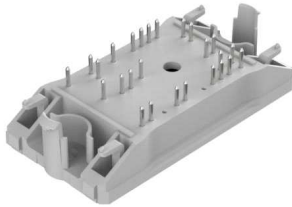
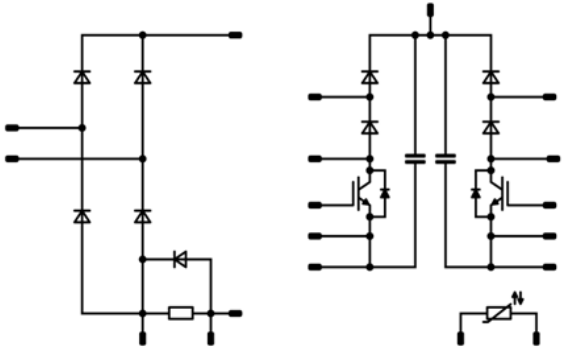




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# 10-FZ062TA015SM-P985D13

target datasheet

| flow PFC 0 CD                                                                                                                                                                                                           |                                                                                     | 650 V / 15 A |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------|
| <b>Features</b>                                                                                                                                                                                                         | <b>flow 0 12mm housing</b>                                                          |              |
| <ul style="list-style-type: none"><li>• High-efficient rectifier</li><li>• High-efficient IGBT H5 + Stealth 2 Diode</li><li>• Ultra-fast switching speed</li><li>• Integrated capacitors</li><li>• Thermistor</li></ul> |  |              |
| <b>Target applications</b>                                                                                                                                                                                              | <b>Schematic</b>                                                                    |              |
| <ul style="list-style-type: none"><li>• SMPS</li><li>• Welding</li></ul>                                                                                                                                                |  |              |
| <b>Types</b>                                                                                                                                                                                                            |                                                                                     |              |
| <ul style="list-style-type: none"><li>• 10-FZ062TA015SM-P985D13</li></ul>                                                                                                                                               |                                                                                     |              |

## Maximum Ratings

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

| Parameter                         | Symbol            | Condition                                          | Value    | Unit               |
|-----------------------------------|-------------------|----------------------------------------------------|----------|--------------------|
| <b>PFC Switch</b>                 |                   |                                                    |          |                    |
| Collector-emitter voltage         | $V_{\text{CES}}$  |                                                    | 650      | V                  |
| Collector current                 | $I_{\text{C}}$    | $T_j = T_{\text{jmax}}$ $T_s = 80^{\circ}\text{C}$ | 21       | A                  |
| Repetitive peak collector current | $I_{\text{CRM}}$  | $t_p$ limited by $T_{\text{jmax}}$                 | 45       | A                  |
| Total power dissipation           | $P_{\text{tot}}$  | $T_j = T_{\text{jmax}}$ $T_s = 80^{\circ}\text{C}$ | 44       | W                  |
| Gate-emitter voltage              | $V_{\text{GES}}$  |                                                    | $\pm 20$ | V                  |
| Maximum Junction Temperature      | $T_{\text{jmax}}$ |                                                    | 175      | $^{\circ}\text{C}$ |



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| Parameter                              | Symbol     | Conditions                                          | Value | Unit             |
|----------------------------------------|------------|-----------------------------------------------------|-------|------------------|
| <b>PFC Diode</b>                       |            |                                                     |       |                  |
| Peak Repetitive Reverse Voltage        | $V_{RRM}$  |                                                     | 600   | V                |
| Continuous (direct) forward current    | $I_F$      | $T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$           | 20    | A                |
| Surge (non-repetitive) forward current | $I_{FSM}$  | 60 Hz Single Half Sine Wave $T_j = 0^\circ\text{C}$ | 150   | A                |
| Total power dissipation                | $P_{tot}$  | $T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$           | 54    | W                |
| Maximum Junction Temperature           | $T_{jmax}$ |                                                     | 175   | $^\circ\text{C}$ |

| Parameter                                                              | Symbol     | Conditions                                | Value | Unit             |
|------------------------------------------------------------------------|------------|-------------------------------------------|-------|------------------|
| <b>PFC Sw. Protection Diode \ Current Transformer Protection Diode</b> |            |                                           |       |                  |
| Peak Repetitive Reverse Voltage                                        | $V_{RRM}$  |                                           | 650   | V                |
| Continuous (direct) forward current                                    | $I_F$      | $T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$ | 17    | A                |
| Repetitive peak forward current                                        | $I_{FRM}$  |                                           | 20    | A                |
| Total power dissipation                                                | $P_{tot}$  | $T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$ | 33    | W                |
| Maximum Junction Temperature                                           | $T_{jmax}$ |                                           | 175   | $^\circ\text{C}$ |

| Parameter                                       | Symbol     | Conditions                                                                    | Value | Unit                 |
|-------------------------------------------------|------------|-------------------------------------------------------------------------------|-------|----------------------|
| <b>Rectifier Diode \ Shunt Protection Diode</b> |            |                                                                               |       |                      |
| Peak Repetitive Reverse Voltage                 | $V_{RRM}$  |                                                                               | 1600  | V                    |
| Continuous (direct) forward current             | $I_F$      | $T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$                                     | 30    | A                    |
| Surge (non-repetitive) forward current          | $I_{FSM}$  | 50 Hz Single Half Sine Wave $T_j = 150^\circ\text{C}$<br>$t_p = 10\text{ ms}$ | 230   | A                    |
| Surge current capability                        | $I^2t$     |                                                                               | 260   | $\text{A}^2\text{s}$ |
| Total power dissipation                         | $P_{tot}$  | $T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$                                     | 38    | W                    |
| Maximum Junction Temperature                    | $T_{jmax}$ |                                                                               | 150   | $^\circ\text{C}$     |

| Parameter                | Symbol    | Conditions | Value      | Unit             |
|--------------------------|-----------|------------|------------|------------------|
| <b>DC Link Capacitor</b> |           |            |            |                  |
| Maximum DC voltage       | $V_{MAX}$ |            | 1000       | V                |
| Operation Temperature    | $T_{op}$  |            | -55...+125 | $^\circ\text{C}$ |



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| Parameter | Symbol | Conditions | Value | Unit |
|-----------|--------|------------|-------|------|
|-----------|--------|------------|-------|------|

### PFC Shunt

|                    |           |                          |    |   |
|--------------------|-----------|--------------------------|----|---|
| DC forward current | $I_F$     | $T_c=25^{\circ}\text{C}$ | 35 | A |
| Power dissipation  | $P_{tot}$ | $T_c=25^{\circ}\text{C}$ | 5  | W |

| Parameter | Symbol | Conditions | Value | Unit |
|-----------|--------|------------|-------|------|
|-----------|--------|------------|-------|------|

### Module Properties

#### Thermal Properties

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

#### Isolation Properties

|                            |            |            |          |          |    |
|----------------------------|------------|------------|----------|----------|----|
| Isolation voltage          | $V_{isol}$ | DC voltage | $t_p=2s$ | 4000     | V  |
| Creepage distance          |            |            |          | min 12,7 | mm |
| Clearance                  |            |            |          | 9,42     | mm |
| Comparative Tracking Index | CTI        |            |          | >200     |    |



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## Characteristic Values

### PFC Switch

| Parameter                            | Symbol       | Conditions      |              |              |           |                  | Value |                      |      | Unit |
|--------------------------------------|--------------|-----------------|--------------|--------------|-----------|------------------|-------|----------------------|------|------|
|                                      |              |                 | $V_{GE}$ [V] | $V_{CE}$ [V] | $I_C$ [A] | $T_j$ [ °C]      | Min   | Typ                  | Max  |      |
| Static                               |              |                 |              |              |           |                  |       |                      |      |      |
| Gate-emitter threshold voltage       | $V_{GE(th)}$ | $V_{GE}=V_{CE}$ |              |              | 0,0004    | 25<br>125        | 3,3   | 4                    | 4,7  | V    |
| Collector-emitter saturation voltage | $V_{CESat}$  |                 | 15           |              | 15        | 25<br>125<br>150 |       | 1,64<br>1,77<br>1,80 | 2,22 | V    |
| Collector-emitter cut-off current    | $I_{CES}$    |                 | 0            | 650          |           | 25<br>125        |       |                      | 40   | μA   |
| Gate-emitter leakage current         | $I_{GES}$    |                 | 20           | 0            |           | 25<br>125        |       |                      | 120  | nA   |
| Internal gate resistance             | $r_g$        |                 |              |              |           |                  |       | none                 |      | Ω    |
| Input capacitance                    | $C_{ies}$    | f=1MHz          | 0            | 25           |           | 25               |       | 930                  |      | pF   |
| Output capacitance                   | $C_{oes}$    |                 |              |              |           |                  |       | 24                   |      |      |
| Reverse transfer capacitance         | $C_{res}$    |                 |              |              |           |                  |       | 4                    |      |      |
| Gate charge                          | $Q_g$        |                 | 15           | 520          | 15        | 25               |       | 38                   |      | nC   |

### Thermal

|                                     |               |                                            |  |  |  |  |  |      |  |     |
|-------------------------------------|---------------|--------------------------------------------|--|--|--|--|--|------|--|-----|
| Thermal resistance junction to sink | $R_{th(j-s)}$ | phase-change material<br>$\lambda=3,4W/mK$ |  |  |  |  |  | 2,14 |  | K/W |
|-------------------------------------|---------------|--------------------------------------------|--|--|--|--|--|------|--|-----|

### PFC Diode

| Parameter               | Symbol | Conditions |  |           |           |            | Value |              |     | Unit |
|-------------------------|--------|------------|--|-----------|-----------|------------|-------|--------------|-----|------|
|                         |        |            |  | $V_r$ [V] | $I_F$ [A] | $T_j$ [°C] | Min   | Typ          | Max |      |
| Static                  |        |            |  |           |           |            |       |              |     |      |
| Forward voltage         | $V_F$  |            |  |           | 15        | 25<br>125  |       | 2,48<br>1,73 | 2,6 | V    |
| Reverse leakage current | $I_r$  |            |  | 600       |           | 25<br>150  |       |              | 10  | μA   |

### Thermal

|                                     |               |                                            |  |  |  |  |  |      |  |     |
|-------------------------------------|---------------|--------------------------------------------|--|--|--|--|--|------|--|-----|
| Thermal resistance junction to sink | $R_{th(j-s)}$ | phase-change material<br>$\lambda=3,4W/mK$ |  |  |  |  |  | 1,75 |  | K/W |
|-------------------------------------|---------------|--------------------------------------------|--|--|--|--|--|------|--|-----|



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## PFC Sw. Protection Diode \ Current Transformer Protection Diode

| Parameter                           | Symbol        | Conditions                                        |  |           |           |            | Value |              |      | Unit |
|-------------------------------------|---------------|---------------------------------------------------|--|-----------|-----------|------------|-------|--------------|------|------|
|                                     |               |                                                   |  | $V_r$ [V] | $I_F$ [A] | $T_j$ [°C] | Min   | Typ          | Max  |      |
| Static                              |               |                                                   |  |           |           |            |       |              |      |      |
| Forward voltage                     | $V_F$         |                                                   |  |           | 10        | 25<br>125  |       | 1,67<br>1,56 | 1,87 | V    |
| Reverse leakage current             | $I_r$         |                                                   |  | 650       |           | 25<br>150  |       |              | 0,14 | μA   |
| Thermal                             |               |                                                   |  |           |           |            |       |              |      |      |
| Thermal resistance junction to sink | $R_{th(j-s)}$ | phase-change material<br>$\lambda=3,4\text{W/mK}$ |  |           |           |            |       | 2,87         |      | K/W  |

## Rectifier Diode \ Shunt Protection Diode

| Parameter                           | Symbol        | Conditions                                 |  |           |           |            | Value |              |            | Unit |
|-------------------------------------|---------------|--------------------------------------------|--|-----------|-----------|------------|-------|--------------|------------|------|
|                                     |               |                                            |  | $V_r$ [V] | $I_F$ [A] | $T_j$ [°C] | Min   | Typ          | Max        |      |
| Static                              |               |                                            |  |           |           |            |       |              |            |      |
| Forward voltage                     | $V_F$         |                                            |  |           | 30        | 25<br>125  |       | 1,25<br>1,24 | 1,29       | V    |
| Reverse leakage current             | $I_r$         |                                            |  | 1600      |           | 25<br>150  |       |              | 10<br>1000 | μA   |
| Thermal                             |               |                                            |  |           |           |            |       |              |            |      |
| Thermal resistance junction to sink | $R_{th(j-s)}$ | phase-change material<br>$\lambda=3,4W/mK$ |  |           |           |            |       | 1,86         |            | K/W  |

## DC Link Capacitor

| Parameter   | Symbol | Conditions |  |  |  |            | Value |     |     | Unit |
|-------------|--------|------------|--|--|--|------------|-------|-----|-----|------|
|             |        |            |  |  |  | $T_j$ [°C] | Min   | Typ | Max |      |
| Capacitance | $C$    |            |  |  |  |            |       | 100 |     | nF   |
| Tolerance   |        |            |  |  |  |            | -10   |     | +10 | %    |



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## PFC Shunt

| Parameter                | Symbol    | Conditions |  |  |  |                          | Value |     |     | Unit  |
|--------------------------|-----------|------------|--|--|--|--------------------------|-------|-----|-----|-------|
|                          |           |            |  |  |  | $T_j [^{\circ}\text{C}]$ | Min   | Typ | Max |       |
| R1 value                 | $R$       |            |  |  |  |                          | 19    |     | 21  | mΩ    |
| Temperature coeficient   | $t_c$     |            |  |  |  | 20 - 60                  |       |     | 50  | ppm/K |
| Internal heat resistance | $R_{thi}$ |            |  |  |  |                          |       |     | 13  | K/W   |
| Inductance               | $L$       |            |  |  |  |                          |       |     | 3   | nH    |

## Thermistor

| Parameter                  | Symbol         | Conditions  |                     |                     |                  |                          | Value |      |      | Unit |
|----------------------------|----------------|-------------|---------------------|---------------------|------------------|--------------------------|-------|------|------|------|
|                            |                |             | $V_{GE} [\text{V}]$ | $V_{CE} [\text{V}]$ | $I_C [\text{A}]$ | $T_j [^{\circ}\text{C}]$ | Min   | Typ  | Max  |      |
| Rated resistance           | $R$            |             |                     |                     |                  | 25                       |       | 21,5 |      | kΩ   |
| Deviation of R100          | $\Delta_{R/R}$ | R100=1486 Ω |                     |                     |                  | 100                      | -4,5  |      | +4,5 | %    |
| Power dissipation          | $P$            |             |                     |                     |                  | 25                       |       | 210  |      | mW   |
| Power dissipation constant |                |             |                     |                     |                  | 25                       |       | 3,5  |      | mW/K |
| B-value                    | $B_{(25/50)}$  |             |                     |                     |                  | 25                       |       | 3884 |      | K    |
| B-value                    | $B_{(25/100)}$ |             |                     |                     |                  | 25                       |       | 3964 |      | K    |
| Vincotech NTC Reference    |                |             |                     |                     |                  |                          |       |      | F    |      |



# 10-FZ062TA015SM-P985D13

target datasheet

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| Ordering Code & Marking                                                                                                                                                             |                         |            |                   |            |                         |           |             |           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------|-------------------|------------|-------------------------|-----------|-------------|-----------|
| Version                                                                                                                                                                             | Ordering Code           |            | in DataMatrix as  |            | in packaging barcode as |           |             |           |
| without thermal paste 12mm housing                                                                                                                                                  | 10-FZ062TA015SM-P985D13 |            | P985D13           |            | P985D13                 |           |             |           |
|                                                                                                                                                                                     |                         |            |                   |            |                         |           |             |           |
|                                                                                                                                                                                     |                         |            |                   |            |                         |           |             |           |
| <div><div>NN-NNNNNNNNNN<br/>NNNN-TTTTTTVV<br/>Vinco LLLLLL<br/>WWYY SSSS UL</div><div></div></div> |                         | Text       | Name              |            | Type&Ver                | Date code | Vinco&Lot   | Serial&UL |
|                                                                                                                                                                                     |                         |            | NN-NNNNNNNNNNNNNN |            | TTTTTTTVV               | WWYY      | Vinco LLLLL | SSSS UL   |
|                                                                                                                                                                                     |                         | Datamatrix | Type&Ver          | Lot number | Serial                  | Date code |             |           |
|                                                                                                                                                                                     |                         |            | TTTTTTTVV         | LLLLL      | SSSS                    | WWYY      |             |           |

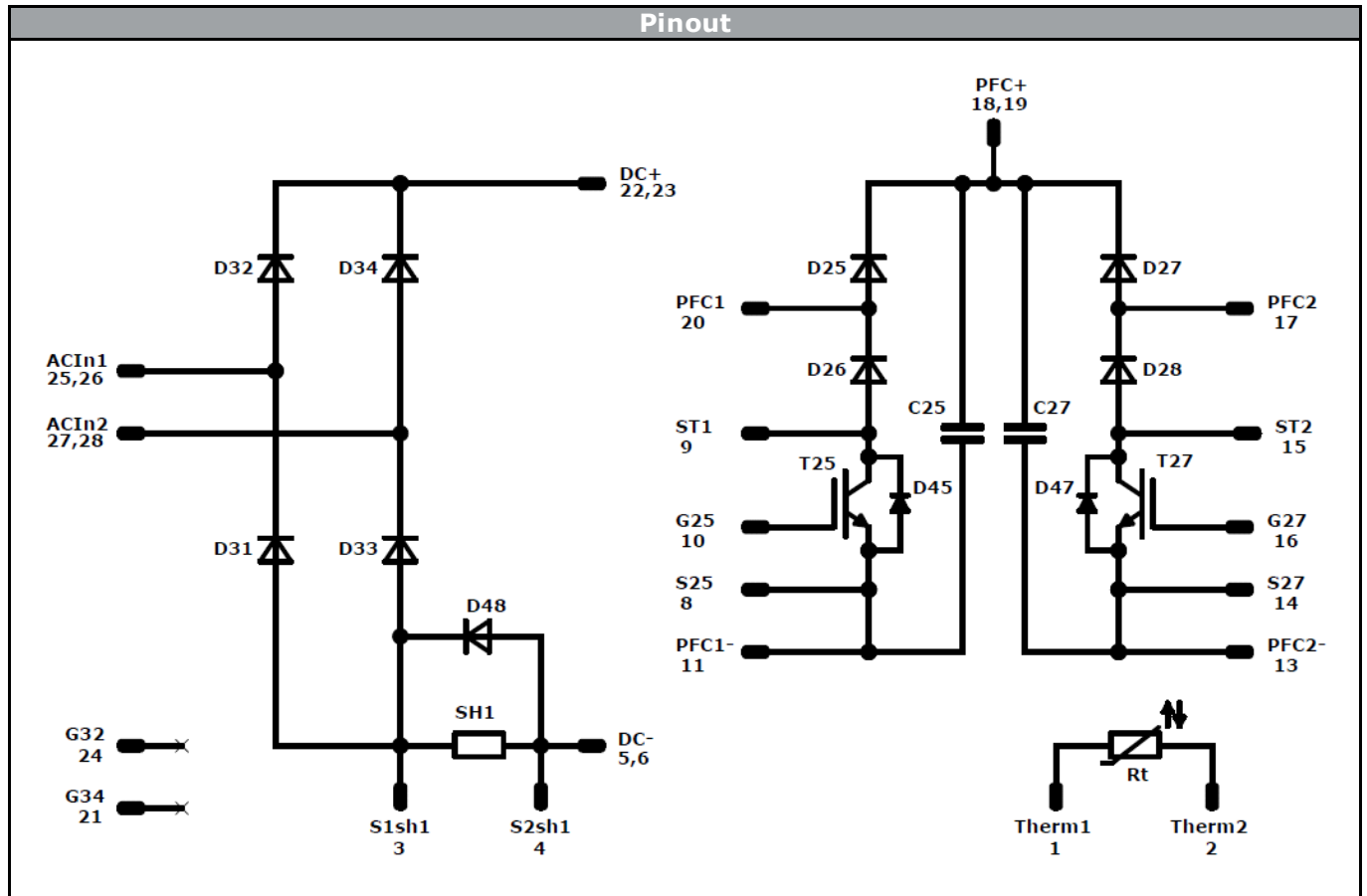
| Pin table [mm] |               |       |          |
|----------------|---------------|-------|----------|
| Pin            | X             | Y     | Function |
| 1              | 33,5          | 0     | Therm1   |
| 2              | 33,5          | 2,8   | Therm2   |
| 3              | 29,5          | 2,8   | S1sh1    |
| 4              | 29,5          | 0     | S2sh1    |
| 5              | 26,7          | 0     | DC-      |
| 6              | 23,9          | 0     | DC-      |
| 7              | Not assembled |       |          |
| 8              | 14,85         | 0     | S25      |
| 9              | 14,05         | 13,35 | ST1      |
| 10             | 12,05         | 0     | G25      |
| 11             | 9,5           | 12,05 | PFC1-    |
| 12             | Not assembled |       |          |
| 13             | 6,7           | 12,05 | PFC2-    |
| 14             | 3,9           | 0     | S27      |
| 15             | 2,2           | 13,35 | ST2      |
| 16             | 1,1           | 0     | G27      |
| 17             | 0             | 22,7  | PFC2     |
| 18             | 7,1           | 22,7  | PFC+     |
| 19             | 7,1           | 20,2  | PFC+     |
| 20             | 14,2          | 22,7  | PFC1     |
| 21             | 20,7          | 22,7  | G34      |
| 22             | 23,5          | 22,7  | DC+      |
| 23             | 26            | 22,7  | DC+      |
| 24             | 28,8          | 22,7  | G32      |
| 25             | 33,5          | 18,55 | ACIn1    |
| 26             | 33,5          | 16,05 | ACIn1    |
| 27             | 33,5          | 8,7   | ACIn2    |
| 28             | 31            | 8,7   | ACIn2    |

### Outline

Tolerance of pinpositions:  $\pm 0.5\text{mm}$  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 |
| T25, T27       | IGBT      | 650 V   | 15 A    | PFC Switch                           |         |
| D25, D27       | FWD       | 600 V   | 15 A    | PFC Diode                            |         |
| D45, D47       | FWD       | 650 V   | 10 A    | PFC Sw. Protection Diode             |         |
| D31-D34        | Rectifier | 1600 V  | 30 A    | Rectifier Diode                      |         |
| D48            | FWD       | 1600 V  | 30 A    | Shunt Protection Diode               |         |
| D26, D28       | FWD       | 650 V   | 10 A    | Current Transformer Protection Diode |         |
| SH1            | Shunt     | -       | -       | Shunt Resistor                       |         |
| C25, C27       | Capacitor | 1000 V  | -       | DC Link Capacitance                  |         |
| Rt             | NTC       | -       | -       | Thermistor                           |         |



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**10-FZ062TA015SM-P985D13**  
target datasheet

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

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

| Package data                                                       |
|--------------------------------------------------------------------|
| Package data for <i>flow</i> 0 packages see vincotech.com website. |

| Document No.:                 | Date:        | Modification: | Pages |
|-------------------------------|--------------|---------------|-------|
| 10-FZ062TA015SM-P985D13-T1-14 | 27 Oct. 2015 |               |       |

| 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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