Vincotech, an Independent Company within the Mitsubishi Electric Corporation, is a Market Leader and Your Reliable Partner in Power Modules.

Established and dependable, Vincotech is the partner of choice when it comes to designing and building power modules for motion control, renewable energy, and power supply applications, setting performance standards for both off-the-shelf and application-specific solutions.

An independently operating affiliate of Mitsubishi Electric Corporation staffed with around 800 people worldwide,

Vincotech delivers fast, flexible and customer-focused solutions, service and support to empower customers’ ideas.

Headquartered in Unterhaching near Munich, Germany, Vincotech also owns and operates a production site in Bicske, Hungary. This ISO / TS16949- and ISO14001-certified factory develops and manufactures all power modules.

Engineered to comply with the RoHS and REACH standards, these modules are subjected to a battery of electrical and functional tests prior to packaging to ensure they fully satisfy Vincotech’s rigorous standards for quality.

Vincotech, your reliable partner of choice.

The name Vincotech stands for highest product reliability, excellent customer service, and flexible, competitive solutions, all of which culminate in outstanding customer satisfaction.

A highly motivated and experienced engineering team at the R&D facility, supported by skilled technical service crews in all major regions, provides the underpinning for the company’s strong technology portfolio.
Thick Film Based IPM Platform
Thick film serves to produce highly integrated power modules in an additive process where various layers of conduction and insulation materials are printed on a ceramic sheet.

The layers can form tracks, pads, or resistors. This technology offers good thermal conductivity, the option of creating layouts similar to a PCB, and freedom in designing housings and pins.

Thick film is a mature technology, having seen several years of use, particularly in critical automotive and other applications.

Direct Pressed DCB
(Baseplate-less Modules)
Modules without baseplates are ready for assembly and can be pressed directly to the heat sink. A reliable and cost-effective solution for applications where thermal capacity is not an issue.

These modules are the perfect substitute for solid copper or aluminum silicon carbide baseplates.

Description:
/ Single DCB substrate
/ W/o baseplate
/ Modules to be pressed directly to the application heat sink
/ Variable pins
  Solder pins or Press-fit pins

DCB Substrate on Cu-Baseplate
Power modules with baseplates are more robust, extend systems’ life and enlarge the active area for heat to flow from the module to the heat sink.

A module with a baseplate can dissipate up to 48% more power. This results in more available inverter power or in reduced junction temperatures. Modules also last longer with the benefit of baseplates’ superior thermal dissipation.

Description:
/ Multiple DCB substrates on Cu baseplate
/ Baseplate screwed to the heat sink
/ Variable pins
  Solder pins / Press-fit pins

DCB Substrate on Cu-Baseplate Based IPM Platform
IPM platforms with a baseplate can accommodate various topologies as well as a gate drive circuit, SMPS, voltage and current sensors, and many other components. A typical six-pack topology is the most frequently used option. The power semiconductors are bonded directly to a standard PCB that holds the discrete components.

Description:
/ Multiple substrates on Cu baseplate
/ Baseplate screwed to the heat sink
/ Variable interconnect technology
/ PCB-DBC wire interconnection

Direct Pressed DCB
(Baseplate-less Modules with SPRiNG Contact)
Direct Pressed in modules can be mounted in a single step to the heat sink and driver board.

These modules are affixed with SPRiNG contacts and just a single screw to create electrical and thermal connections and make assembly an exercise in convenience.

There is no need for time-consuming, costly mounting procedures, and even entire modules are easy to replace with SPRiNG contacts should the need arise.

Description:
/ Single DCB substrate
/ W/o baseplate
/ Cross module assembly
/ Variable press on contacts

DCB Substrate on Cu-Baseplate with ScrewContacts
Vincotech high-power modules come in a low inductive package for high-power applications. Optimized for three-level topologies, these modules allow for high switching frequencies and fully symmetrical layouts.

Description:
/ One or several Cu baseplates
/ Baseplate(s) screwed to heat sink
/ Press-fit or solder pins for signal leads
/ Cu screw contact with nuts for power leads
ADVANCED TECHNOLOGIES

SUPERIOR SUBSTRATE MATERIAL
High-performance Si₃N₄

Remarkable mechanical strength, superior toughness, and high thermal conductivity make silicon nitride substrates the material of choice for power modules designed for ultra-reliable products.

Si₃N₄ Ceramic
- High thermal conductivity [four times that of Al₂O₃]
- 50% lower Rth for MiniSKiiP® [incl. thermal interface material]
- Physically robust enough for high-performance thermal interface material (phase-change with 3.4 W/mK) to be used to expedite module assembly and handling
- Lower thermal expansion rates for improved load power cycling capability

SUPERIOR SUBSTRATE MATERIAL
AlN – Aluminium Nitride

With the benefit of its high thermal conductivity, AlN can serve to increase power modules’ current carrying capability while maintaining robust insulating capacity.

Vincotech’s advanced power module design accommodates AlN substrates without requiring architectural modifications.

This design uses pressure-contact technology to establish a thermal connection between the module and heat sink. The life span of a power module with an AlN substrate is more than twice that of an Al₂O₃ version.

Key Attributes of Aluminium Nitride
- Beneficial dielectric properties
- High thermal conductivity
- Low thermal expansion coefficient, close to that of Silicon
- Non-reactive to normal semiconductor process chemicals and gases
Vincotech - First in SiC Modules
Experts in Smart - Selective Use of SiC-driven Power

Engineers tasked to build better devices and applications want power modules that boost efficiency and performance. Yet they also need compact solutions that shrink the component footprint.

Vincotech’s SiC-based power modules square that circle for all applications. These modules not only deliver better switching performance; they also enable you to design smaller, lighter systems. Vincotech has been empowering customers’ ideas for 20+ years now.

Our experience and SiC-based power modules paired with your designs – that sounds like a winning idea to us.

Housing features:
/ Standard and custom power modules
/ SiC components sourced from a range of partners
/ Choice of Al₂O₃, AIN and Si₃N₄ DCB substrates
/ Optional integrated passive capacitors and resistors
/ Low-inductive housings
INTER
CONNECTION

INTERCONNECTION TECHNOLOGIES
Sintered Ag [Die Attach Technology]

High-end power modules must meet challenging demands for thermal and electrical performance and reliability. Vincotech has taken sintering to the next level to meet these demands and is able to replace all soldered points with sintered connections.

Sintering – the Multiple Solution

/ All Vincotech suppliers’ chips may be sintered
/ Chip substrate and baseplate sintered in one step
/ Multi-component capability – chip, NTC and shunt may be sintered together
/ Multi-level capability – up to 3 mm difference in height can be accommodated
/ Lower thermal expansion rates for improved load cycling capability
INTERCONNECTION TECHNOLOGIES

**Pre-applied Thermal Interface Material (TIM)**

**Phase-change Material**

The benefits of using phase-change material to enable thermal conductivity between the module and heat sink are considerable.

The phase-change material is solid at room temperature. This makes it smear-resistant during transportation and module assembly. Our in-house screen-printing process ensures the material’s thickness configured and optimized for maximum heat transfer capability.

**Benefits:**
- Up to 20% $R_{th}$ reduction from $T_J$ to heat sink for Al₂O₃-based modules
- 30% $R_{th}$ reduction from $T_J$ to heat sink for AlN-based high performance modules
- Solid, non-sticky surface – minimizes contamination risk, prevents layer damage

**Properties:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal conductivity</td>
<td>3.4</td>
<td>W/mK</td>
</tr>
<tr>
<td>Phase-change temperature</td>
<td>+45</td>
<td>°C</td>
</tr>
</tbody>
</table>

**Features:**
- Optimized thickness for improved $R_{th}$ and reduced risk of DCB cracking
- Easier production process; no need for screen printing facilities
- Automated screen printing for utmost precision and reliability
- No risk of smearing thermal paste; material is solid at room temperature
- Standard solder profile applicable (e.g. J-STD-001, J-STD-003)
- Non-stick surface, resistant to dirt, dust and other contaminants

**Order codes:**

Example order code for phase-change material:
- **Version 1:** V23990-P840-A48-/3/-PM
- **Version 2:** 10-F206BA045FH01-PB97E10-/3/

Please ask your regional contact about the availability of phase-change material.
INTERconnection technologies

Press-fit Technology
Press to Save Time

Vincotech’s Press-fit technology reduces PCB assembly time and effort considerably.

Well established in the automotive industry, the Press-fit pin eliminates the need for soldering. This cuts process time and costs, and boosts production output capacity.

With no need to solder modules, engineers enjoy great flexibility in design. The module can easily be mounted on top or bottom of the PCB at no extra cost and effort.

Benefits:
- Eliminates costly additional soldering
- Pins are in the same position as solder pins
- High current carrying capability (38 A @ 80 °C)
- Flexible mounting onto the power module DCB
- Cuts production costs
- Reliable cold-welding connection to PCB
- No PCB hole damage to enable reuse
- Thermo-mechanical push-and-pull-force relief

Features:
- Approved rounded Press-fit area
- Complies with DIN and IEC standards
- Tapered pin head
- Available for almost all housings

Order codes for Press-fit pins:

Version 1: Press-fit option is shown as an additional letter “Y” at the end of option code.
Example order code version 1: V23990-P840-F49Y-PM

Version 2: Press-fit option is indicated by “P” at the beginning and “Y” at the end.
Example order code version 2: 10-PZ06BIA045FH01-P897E10Y
**flow E1 & flow E2**  
The New Benchmark for Low-power Packages

Vincotech has added the industry standard 12 mm flow E1 and flow E2 packages to further enhance its family of modules for motion control applications.

Featuring superior thermal performance and latest generation IGBT M7 chip technology, these new modules provide customers with enhanced efficiency and increased supply chain security.

With the broadest standard product portfolio in the industry, including PIM (CIB) and sixpack configurations with extended power ranges up to 100 A, Vincotech empowers your high performance inverter design.

**Main features:**
/ 15% better thermal performance (Rth(j-s)) than the competition for extended life, more power, and greater reliability  
/ Smaller packages such as the 25 A PIM in flow E1 for higher power density  
/ Real multiple source down to chip level for enhanced supply chain security  
/ Easy assembly with pre-applied phase-change material and Press-fit pins

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<table>
<thead>
<tr>
<th>Topology</th>
<th>Package</th>
<th>Technology</th>
<th>I_{\text{nom}} (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>IGBT4</td>
<td>10</td>
</tr>
<tr>
<td>PIM (CIB)</td>
<td>flow E1</td>
<td>IGBT M7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>flow E2</td>
<td>IGBT M7</td>
<td></td>
</tr>
<tr>
<td>SIXPACK</td>
<td>flow E1</td>
<td>IGBT M7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>flow E2</td>
<td>IGBT M7</td>
<td></td>
</tr>
</tbody>
</table>

◆ Power Extension
EXCEPTIONAL HOUSINGS

flow90 Housing. Twist 90° to Save Space

Vincotech can handle this critical task to spare customer the precise application effort.

With all these purpose-driven features, the flow90 is the module of choice for many applications that benefit from 90-degree mounting.

Features:
- Complies with DIN and IEC standards
- Topologies are easily customized
- Pre-applied phase-change material available on demand

Benefits:
- Space-saving housing enabling a 90-degree angle between the heat sink and PCB
- Accommodates standard heat sinks, so no costly L-shaped versions needed
- Easy clip-in mounting into the PCB
- Enables installation on the same side of the PCB as other through-hole components
- Can be wave-soldered along with the other components in one pass
- Perfect match for book-sized inverters and 19-inch rack-mounted power supplies

Detailed view of the flow90 module

Vincotech flow90 power modules are the perfect match for book-sized inverters and 19-inch rack-mounted power supplies with a 90-degree angle between the heat sink and PCB.

Featuring pins arrayed at a 90-degree angle, flow90 0 and flow90 1 modules are available as standard products with CON, PIM, and PACK configurations.

This package is also a good choice for custom topologies for switched-mode power supplies, battery chargers and the like.

There is no need for a flexible PCB, and flow90 modules make the most of the PCB to minimize the application footprint. Modules with pre-applied phase-change material are available on demand.

flow0B Housing. The Compact Cost-cutter

This ultra compact housing for small power applications is an excellent choice for cost-effective, space-saving designs.

A condensed version of the flow0 housing, the flow0B housing is sized for smaller power applications, providing a compact alternative to meet the demands of smaller power embedded drives and frequency inverters.

The first of the two debut topologies in the flow0B housing consists of a PIM + PFC and is called flowPIM® 0B + PFC.

Equipped with a single-phase input rectifier, a PFC booster and a three-phase inverter, it uses high-speed 650 V IGBTs for the PFC.

A DC capacitor and an NTC are integrated. The flowPIM® 0B + PFC module rated for the highest current features a PFC circuit based on a nominal chip current of 15 A and an inverter section equipped with 10 A components. The other topology is called flowPACK 0B.

This standard inverter topology with 6 IGBTs and freewheeling diodes is available with 1200 V and 600 V ratings.

The 600 V variant covers currents ranging from 6 A to 30 A; the 1200 V variant comes with currents ratings between 4 A and 15 A.

Features:
- Single-screw heat sink mounting
- Built-in standoffs with optional PCB screw mounting
- For very compact designs
- 17 mm in height for greater creepage distance
- Thin 0.38 mm Al2O3 ceramic for improved thermal performance
- Solder or Press-fit pins
- Optionally with pre-applied, highly conductive TIM with 3.4 W/mK
- Size: 36 mm x 34 mm
- 17 mm height
- Phase-change material
EXCEPTIONAL HOUSINGS
VINco X. The Low-inductive High-power Package

The low-inductive design of the VINco X package featuring onboard DC capacitors extends maximum switching frequencies up to 20 kHz, which is unique in this power range.

A modular Package
/ Low-inductive PCB
/ Optional onboard snubber capacitors
/ High-current screw terminals
/ Independent baseplates for better thermal performance

Benefits:
/ Easier busbar design
/ Smaller passive components needed
/ Individual dies are not overloaded extending their lifetime
/ Outstanding efficiency
/ Cost competitive solution for central inverters

Features:
/ Optimized connections for three-level topologies
/ Fully symmetrical layouts for uniform current performance
/ Available up to 1800 A in both NPC and MNPC
/ Stray Inductance: 3 – 15 nH* NPC
/ Stray Inductance: 4 – 17 nH* MNPC
/ Low-inductive path
/ Easy paralleling: <5 nH module to module

(* Depending on model)
VINco E3
Packaged to Meet Your Mid-power Needs

Engineered mainly for industrial drives, solar power and UPS applications, the VINco E3 package raises the performance bar with its enhanced power density and reliability.

Featuring the SLC (SoLid Cover) technology in the industry-standard low-profile package, Vincotech’s new VINco E3 package enables engineers to design mid-power inverters with higher output current, higher power density and improved reliability.

The new IMB (Insulated Metal Baseplate) combines an electrically insulating resin layer with a direct-bonded top- and bottom-side copper layer. Direct potting resin distributes the mechanical stress more uniformly than silicone gel.

**Housing features:**
/ Industry standard low-profile package
/ Improved thermal impedance
/ High thermal and power cycling capability

Structure comparison between conventional technology and the new SLC technology.
EXCEPTIONAL HOUSINGS

MiniSKiiP® – Spring Contacts Connection

For 10+ years Vincotech offers MiniSKiiP® modules with solderless spring contact mounting technology and pre-applied thermal paste.

These second-source modules are affixed with SPRiNG contacts and just a single screw to create electrical and thermal connections and make assembly an exercise in convenience.

There is no need for time-consuming, costly mounting procedures, and even entire modules are easy to replace with SPRiNG contacts should the need arise.

Thermal Interface Material Features:
/ Lower handling costs and less production overhead with no need for screen-printing equipment
/ Automated screen printing for utmost precision and reliability
/ Thinnest thermal grease layer for minimum thermal resistance and maximum thermal conductivity
/ Extended lifetime and enhanced reliability

Lids:
Two lids are available for all MiniSKiiP® modules:
/ Standard black 6.5 mm version allowing SMD parts to be mounted below the lid
/ Thin white 2.8 mm version sized for highly compact mechanical designs

Order codes: Example order code for different lids and applied grease:
Version 1: V23990-K22B-A0B-/1A/-PM
Version 2: 0B-M50681A043+F-H-K9991B-/1A/

Please ask your regional contact about the availability of MiniSKiiP® options.

Comparison of available thermal grease material:

<table>
<thead>
<tr>
<th>Thermal conductivity</th>
<th>W/m*K</th>
<th>Released for Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wacker® Paste P12 silicone-based standard grease</td>
<td>0.81</td>
<td>MiniSKiiP®</td>
</tr>
<tr>
<td>Silicone-free standard Thermigrease® TG20032</td>
<td>2.5</td>
<td>MiniSKiiP®</td>
</tr>
<tr>
<td>High Performance Thermal Paste HPTP (silicone-based)</td>
<td>2.5</td>
<td>MiniSKiiP®</td>
</tr>
</tbody>
</table>

Products:

<table>
<thead>
<tr>
<th>Version</th>
<th>Ordering Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>With std lid (6.5 mm height) + thermal grease (0.8 W/mK, P12 silicone-based)</td>
<td>/-1A/</td>
</tr>
<tr>
<td>With std lid (6.5 mm height) + thermal grease (0.8 W/mK, P12 silicone-based)</td>
<td>/-5A/</td>
</tr>
<tr>
<td>With std lid (6.5 mm height) + thermal grease (2.5 W/mK, TG20032, silicone-free)</td>
<td>/-1A/</td>
</tr>
<tr>
<td>With std lid (6.5 mm height) + thermal grease (2.5 W/mK, TG20032, silicone-free)</td>
<td>/-5A/</td>
</tr>
<tr>
<td>With std lid (6.5 mm height) + thermal grease (2.5 W/mK, HPTP silicone-based)</td>
<td>/-6A/</td>
</tr>
<tr>
<td>With std lid (6.5 mm height) + thermal grease (2.5 W/mK, HPTP silicone-based)</td>
<td>/-7A/</td>
</tr>
</tbody>
</table>
Vincotech – Your Reliable Partner
Bringing Your Best Ideas to Life

Vincotech: Making power modules is what we do. A reliable partner is what we are. Count on us to deliver on our performance promise and put your success first. Vincotech is your reliable partner for all power modules, off-the-rack and tailored solutions alike.

Having customized modules for over 15 years, we have a deep well of experience to draw on. You can count on our flexibility, responsiveness and cooperative spirit.

We put your success first – striving to find the best solution to fit your needs.

Our professionals will team up with your engineers to make the specification process an exercise in innovation and in the end to deliver solutions that fit your needs.

Vincotech is easy to reach when you need information or assistance. What we say goes. We stand by our word. And that makes decisions so much easier to come to. Vincotech products are all about truth in engineering.

Performance descriptions in the development phase are accurate. Customers can count on these products to provide a lifetime of good service based on bug-free, stable designs that minimize maintenance effort.

Vincotech lives by the principle of reliable partnership.

To this end, we communicate efficiently and dependably.

We trust in our employees’ capabilities. We are open, honest, reliable and as good as our word – or better. We mean what we say and do what we say we’re going to do.

We put the customer’s success first. And that is why customers and Vincotech are equal partners.
INTEGRATED SIMULATION ENVIRONMENT TOOL
VincotechISE – an Integrated Simulation and Selection Environment for Power Modules

It contains updated versions of the legacy tools flowSIM, flowSOL and flowSEL.

03 flowSEL is a power module selector designed to help you find the solution best suited to your industrial drive application. Entering all the key application parameters is an exercise in convenience with its interactive schematic.

01 flowSOL is a simulation tool for solar power modules and similar applications. It features a parameter setup and function blocks tailored to this purpose and covers single-phase and three-phase power modules for transformer-less and transformer-based topologies.

02 flowSIM calculates Vincotech power modules for industrial drive applications. Its GUI looks much like that of the flowSOL tool, but is geared towards industrial drives.

This revamped user interface affords you in-depth insight into how parameter adjustments affect losses, temperatures and efficiency.

Software Download
Step 01:
Download and install LabVIEW Runtime Engine once (if not already installed).

Step 02:
Download VincotechISE into your simulation directory.

Step 03:
Start VincotechISE.

For further Info please see: www.vincotech.com/VincotechISE
Vincotech Delivers Application-specific Solutions with Utmost Creative Choice When it Comes to Design

Completely independent of component suppliers, we cherry-pick what’s best for you from more than ten different leading semiconductor suppliers to build modules that benefit your business. Experience the peace of mind that comes with knowing your needs are being met.

Vincotech delivers solutions tailored to your applications.

Customers enjoy great freedom of choice. They are not locked in into one system or tied to standard products or specific suppliers. Free to configure their products as they see fit, they can find the best solution with a lot less effort.

Vincotech delivers to customer’s specifications – that is, more efficient products with better thermal connections, optimized to improve their applications.

In our book, ‘optimized’ means more cost-effective, smaller, longer-lasting and easier-mounting modules that speed up production. That’s why Vincotech attaches such great value to its simulation and testing tools.

The tools interactively calculate modules’ electrical and thermal behavior based on fully measured parameters.

If you want your power module to be application-specific, it has to be Vincotech.
Vincotech provides a wide selection of standard housings to keep your design options wide open. We’re there for you at every step of your journey. When you opt for Vincotech, you will experience true face-to-face support from a most responsive supplier.

Our sample lead times are remarkably short at just four weeks on average.

Modules get approved that much faster, so customers’ production runs commence sooner and their products are marketed much earlier. To this end, we make ordering easy, eliminate processes that do not add value, and keep the production line flexible.

Vincotech is agile enough to handle fluctuating demand even at short notice and deliver the goods just in time.

Speed and Flexibility – that sums up what Vincotech is all about.

Vincotech’s customer focus, paired with efficient development and production flows, saves you time.

Flexibility, fast time to market, cost-effectiveness beyond our products, an innovative spirit, and a service-minded outlook – that’s what we’re all about.

Fast time to market:

/ Advanced simulation tools speed up component selection and mapping.
/ Sample lead time is phenomenally short (four weeks on average).

Cost efficiency:

/ Vincotech is fully independent of chip suppliers - choose your preferred chip from more than ten different leading semiconductor manufacturers (including SiC technology).
/ Enjoy the mechanical flexibility that comes with a broad variety of standard housings and free pin positioning.
/ Benefit from different interconnects (solder, Press-fit, screw and spring terminals) and stress-relief zones wherever they are needed.
/ Take advantage of readily customized standard products. Customers are free to cherry-pick from the largest selection of semiconductors and a wealth of pre-qualified topologies. 
INDUSTRIAL DRIVES
Vincotech offers power integrated modules (PIM/CIB – converter, inverter and brake), sixpacks (three-phase modules), half-bridges and rectifier modules engineered to support standard drive applications for industrial use and motor power ranges from 1 kW to 60 kW.
For example: flowPIM® 0 | fastPACK 1 | flowPIM® 2 | VINcoDUAL E3

EMBEDDED DRIVES
Drives in circulation pumps, fans, air-conditioners, and other devices connected to the public power grid usually require active power factor correction (PFC). These PIM and IPM modules feature optional integrated PFC.
For example: flowPIM® 0 + PFC | flowIPM 1B | flowIPM 1G

CHARGING STATIONS
Switched-mode power supplies are used in industrial applications with power electronics and in battery chargers. Our modules are equipped with PFC circuits (AC/DC), half- and H-bridges, and step-up and step-down converters (DC/DC) for these applications.
For example: flowPFC 0 | fastPACK 0 H | VINcoBOOST X4 symmetric

SOLAR INVERTERS
The photovoltaic market requires DC/DC converters that adjust the solar input voltage to the DC-link or battery level and DC/AC converters to deliver the solar energy to the public grid. Vincotech’s innovative modules support from small single-phase inverters to central inverters in the MW range.
For example: flowMNPC 1 and flowMNPC 2 for > 100 kW: VINcoMNPC X4
flow3xBOOST 0 SiC for < 100 kW: flowNPC 0 | fastPACK 0 HC
flowSOL 0 | flowSOL 1 | flow3xPHASE 0 SiC

UNINTERRUPTABLE POWER SUPPLIES (UPS)
Power components for UPS applications. Modules for AC/DC and DC/AC power conversion. Topologies such as single- and three-phase rectifiers, half- and H-bridges, boosters, and NPC/MNPC/AMNPC. Power ranges up to 200 kW.
For example: for < 100 kW: flowMNPC 0 | VINcoNPC X4
flowMNPC 1 and flowMNPC 2 for > 100 kW: VINcoMNPC X

WELDING
Inverter welding units need modules that can handle high switching frequencies in resonant mode or in zero voltage switching (ZVS) mode, and are equipped with H- and half-bridge topologies. Our modules also come with PFC to draw maximum power from the single-phase grid.
For example: flowPFC 0 | fastPACK 0 H | flowNPFC 0
**RECTIFIER (+BRAKE)**

*Application:* CHARGING STATIONS / INDUSTRIAL DRIVES

*Topology Features:* Converter with brake (optionally)

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**ULTRAFAST RECTIFIER**

*Application:* CHARGING STATIONS / INDUSTRIAL DRIVES / WELDING

*Topology Features:* Designed for high switching frequency
Low reverse recovery time and recovery charge

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**Sixpack**

*Application:* EMBEDDED DRIVES / INDUSTRIAL DRIVES

*Topology Features:* Three-phase inverter

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**Sevenpack**

*Application:* EMBEDDED DRIVES / INDUSTRIAL DRIVES

*Topology Features:* Three-phase inverter + Brake

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**Sixpack+Rectifier**

*Application:* EMBEDDED DRIVES / INDUSTRIAL DRIVES

*Topology Features:* Three-phase inverter for active front end

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**PIM+PFC (CIP)**

*Application:* EMBEDDED DRIVES / INDUSTRIAL DRIVES

*Topology Features:* Single-phase converter + Inverter + PFC

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**PIM (CIB)**

*Application:* EMBEDDED DRIVES / INDUSTRIAL DRIVES

*Topology Features:* Three-phase converter + Inverter + Brake with integrated gate drive

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**IPM (CIB)**

*Application:* EMBEDDED DRIVES / INDUSTRIAL DRIVES

*Topology Features:* Three-phase converter + Inverter + Brake
**Single-phase Inverter**  
See page 125  
Application:  
/ CHARGING STATIONS / SOLAR INVERTERS / WELDING & CUTTING  
Topology Features:  
/ Single-phase inverter

**H6.5**  
See page 131  
Application:  
/ SOLAR INVERTERS  
Topology Features:  
/ Three-level topology for single phase inverters

**Half-Bridge**  
See page 109  
Application:  
/ CHARGING STATIONS / INDUSTRIAL DRIVES / SOLAR INVERTERS / UPS / WELDING & CUTTING  
Topology Features:  
/ Half-Bridge

**Booster**  
See page 135  
Application:  
/ CHARGING STATIONS / SOLAR INVERTERS / UPS  
Topology Features:  
/ Boost circuit

**H-Bridge**  
See page 115  
Application:  
/ CHARGING STATIONS / UPS / WELDING & CUTTING  
Topology Features:  
/ H-Bridge

**Booster Symmetric**  
See page 143  
Application:  
/ CHARGING STATIONS / SOLAR INVERTERS / UPS  
Topology Features:  
/ Symmetrical boost circuit

**Buck-Booster Symmetric**  
See page 149  
Application:  
/ POWER SUPPLY / SOLAR INVERTERS / UPS  
Topology Features:  
/ Symmetrical buck-boost circuit

**IPM (CIP/PIM+PFC)**  
See page 107  
Application:  
/ EMBEDDED DRIVES / INDUSTRIAL DRIVES  
Topology Features:  
/ Single-phase converter + Inverter + PFC with integrated gate drive

**IPM (CIP/PIM+PFC)**  
See page 107  
Application:  
/ EMBEDDED DRIVES / INDUSTRIAL DRIVES  
Topology Features:  
/ Single-phase converter + Inverter + PFC with integrated gate drive

**Half-Bridge**  
See page 109  
Application:  
/ CHARGING STATIONS / INDUSTRIAL DRIVES / SOLAR INVERTERS / UPS / WELDING & CUTTING  
Topology Features:  
/ Half-Bridge

**H-Bridge**  
See page 115  
Application:  
/ CHARGING STATIONS / UPS / WELDING & CUTTING  
Topology Features:  
/ H-Bridge

**Booster**  
See page 135  
Application:  
/ CHARGING STATIONS / SOLAR INVERTERS / UPS  
Topology Features:  
/ Boost circuit

**Booster Symmetric**  
See page 143  
Application:  
/ CHARGING STATIONS / SOLAR INVERTERS / UPS  
Topology Features:  
/ Symmetrical boost circuit

**Buck-Booster Symmetric**  
See page 149  
Application:  
/ POWER SUPPLY / SOLAR INVERTERS / UPS  
Topology Features:  
/ Symmetrical buck-boost circuit
PFC (Single-phase applications)
see page 154
Application:
/ CHARGING STATIONS / UPS / WELDING & CUTTING
Topology Features:
/ PFC boost – Single-phase Rectifier + Boost circuit

PFC (Three-phase applications)
see page 157
Application:
/ CHARGING STATIONS / UPS / WELDING & CUTTING
Topology Features:
/ Three-level PFC for three-phase applications

Three-level NPC (I-Type)
see page 163
Application:
/ SOLAR INVERTERS / Ups
Topology Features:
/ Three-level NPC (I-Type)

Three-level MNPC (T-Type)
see page 175
Application:
/ SOLAR INVERTERS / UPS
Topology Features:
/ Three-level MNPC (T-Type)

Three-level ANPC
see page 183
Application:
/ SOLAR INVERTERS
Topology Features:
/ Split Advanced NPC topology (ANPC)
## flowCON 0

**Available Housings:**
- flow Ø 4-clips 17 mm / flow Ø 2-clips 17 mm
- flow Ø 2-clips 12 mm / flow Ø 4-towers 17 mm

**Possible Features:**
- Three-phase Half Controlled Converter / Brake Chopper
- Single-phase Half Controlled Converter
- Three-phase Rectifier / Single-phase Rectifier
- Brake Chopper / Combination with 1ph Rectifier
- Modular Rectifier / Modular Half Controlled Converter
- Combination with 1ph Half Controlled Converter
- Temperature sensor / Single-phase non-controlled Rectifier
- Kelvin Emitter for improved switching performance
- Temperature sensor / Three-phase Non-controlled Rectifier

### Part-Number | Voltage (V) | Current (A) | Technology | Comments
---|---|---|---|---
3ph-Half Controlled-BRC
- V23998-P649-G18-PM | 1600 | 34 | Thyristor (SCR) |
- V23998-P649-H10-PM | 1600 | 34 | Thyristor (SCR) |
- V23998-P649-G18-PM | 1600 | 42 | Thyristor (SCR) |
- V23998-P649-H10-PM | 1600 | 42 | Thyristor (SCR) |

3ph-Half Controlled-BRC
- V23998-P550-J10-PM | 1600 | 75 | Thyristor (SCR) |

3ph-Rectifier
- V23998-P649-H-PM | 1600 | 50 | Rectifier |
- V23998-P649-HB3-PM | 1600 | 50 | Rectifier |
- V23998-P649-H-PM | 1600 | 75 | Rectifier |

3ph-Rectifier-BRC
- V23998-P649-G9-S-PM | 1600 | 50 | Rectifier |
- V23998-P649-G9-S-PM | 1600 | 75 | Rectifier |
- V23998-P649-G98-PM | 1600 | 75 | Rectifier |
- V23998-P649-G9-PM | 1600 | 75 | Rectifier |

1ph-Rectifier
- V23998-P550-J80-PM | 1600 | 185 | Rectifier |
- 10-P0162KA110RJ-LK90619Y | 1600 | 185 | Rectifier |
- 10-P0162KA110RJ-LN0619Y | 1600 | 185 | Rectifier |

New
- Modular Rectifier-BRC
- V23998-P600-J80-PM | 1600 | 185 | Rectifier |

New
- Modular Half Controlled-BRC
- V23998-P600-J10-PM | 1600 | 185 | Rectifier |

3ph-Non Controlled-BRC-KE-NTC
- V23998-P649-HS0-00-PM | 1600 | 75 | Thyristor (SCR) |
- 10-P0162AB50RW-L059009 | 1600 | 50 | Rectifier |
- 10-P0162AB50RW-L059007 | 1600 | 50 | Rectifier |

## flowCON 0B

**Available Housings:**
- flow ØB 2-towers 17 mm / flow ØB 2-clips 17 mm

**Possible Features:**
- Three-phase Rectifier / Brake Chopper

### Part-Number | Voltage (V) | Current (A) | Technology | Comments
---|---|---|---|---
3ph-Rectifier-BRC
- 10-P0166BA028SC-M989G09 | 1600 | 35 | Rectifier |

New
- Modular Rectifier-BRC
- V23998-P600-J80-PM | 1600 | 185 | Rectifier |

New
- Modular Half Controlled-BRC
- V23998-P600-J10-PM | 1600 | 185 | Rectifier |

3ph-Non Controlled-BRC-KE-NTC
- V23998-P649-H20-PM | 1600 | 75 | Thyristor (SCR) |
- 10-P0162AB50RW-L059009 | 1600 | 50 | Rectifier |
- 10-P0162AB50RW-L059007 | 1600 | 50 | Rectifier |
### flow90CON 1

**Available Housings:**
- 90 1 2-clips

**Possible Features:**
- Three-phase Half Controlled Converter
- Open Emitter configuration
- Brake Chopper

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>V23998-P717-G10-PM</td>
<td>1600</td>
<td>36</td>
<td>Thyristor [SCR]</td>
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</tr>
<tr>
<td>V23998-P717-H10-PM</td>
<td>1600</td>
<td>36</td>
<td>Thyristor [SCR]</td>
<td></td>
</tr>
<tr>
<td>V23998-P717-H-PM</td>
<td>1600</td>
<td>39</td>
<td>Rectifier</td>
<td></td>
</tr>
<tr>
<td>V23998-P717-G-PM</td>
<td>1600</td>
<td>43</td>
<td>Thyristor [SCR]</td>
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<td>V23998-P718-H10-PM</td>
<td>1600</td>
<td>43</td>
<td>Thyristor [SCR]</td>
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<td>V23998-P718-G-PM</td>
<td>1600</td>
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<tr>
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<td>52</td>
<td>Rectifier</td>
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</tr>
<tr>
<td>V23998-P719-G-PM</td>
<td>1600</td>
<td>75</td>
<td>Rectifier</td>
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</tr>
</tbody>
</table>

Schematics see page 188
More details: www.vincotech.com/flow90CON-1

### flowCON 2

**Available Housings:**
- 2 4-towers 17 mm

**Possible Features:**
- Three-phase Rectifier
- Brake Chopper
- Temperature sensor

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-F2166BA150RW-L267G09</td>
<td>1600</td>
<td>150</td>
<td>Rectifier</td>
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<tr>
<td>30-F2166BA150RW01-L267G19</td>
<td>1600</td>
<td>150</td>
<td>Rectifier</td>
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</tr>
</tbody>
</table>

Schematics see page 189
More details: www.vincotech.com/flowCON-2
## MiniSKiiP® CON 2

### Available Housings:
- MiniSKiiP® 2

### Possible Features:
- Temperature sensor
- Three-phase Rectifier

### MiniSKiiP® CON 3

### Available Housings:
- MiniSKiiP® 3

### Possible Features:
- Three-phase Half Controlled Converter
- Three-phase Full Controlled Converter
- Brake Chopper
- Temperature sensor

---

### MiniSKiiP® CON 2

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>3ph-Rectifier-NTC</td>
<td>1600</td>
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<td>Rectifier</td>
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<tr>
<td>80-M2166RA075R5-K738H</td>
<td>1600</td>
<td>75</td>
<td>Rectifier</td>
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### MiniSKiiP® CON 3

<table>
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<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>3ph-Half-Controlled-BRC-NTC</td>
<td>1600</td>
<td>125</td>
<td>Thyristor [SCR]</td>
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<tr>
<td>80-M31668125AS5-K489G31</td>
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<td>Thyristor [SCR]</td>
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<tr>
<td>80-M31668A1485C02-K489G40</td>
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<td>125</td>
<td>Thyristor [SCR]</td>
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</tr>
<tr>
<td>80-M31668A1485C03-K489G402</td>
<td>1600</td>
<td>125</td>
<td>Thyristor [SCR]</td>
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<tr>
<td>3ph-Full-Controlled-BRC-NTC</td>
<td>1600</td>
<td>125</td>
<td>Thyristor [SCR]</td>
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</tr>
</tbody>
</table>

Schematics see page 188

More details: www.vincotech.com/MiniSKiiP-CON-2

More details: www.vincotech.com/MiniSKiiP-CON-3
Application:
/ CHARGING STATIONS / INDUSTRIAL DRIVES
/ WELDING

Topology Features:
/ Designed for high switching frequency
/ Low reverse recovery time and recovery charge

RECTIFIER (+BRAKE)
SIXPACK
SIXPACK+RECTIFIER
SEVENPACK
PIM (CIB)
PIM+PFC (CIP)
IPM (CIB)
IPM (CIP_PIM+PFC)
HALF-BRIDGE
H-BRIDGE
SINGLE-PHASE-INVERTER
H6.5
BOOSTER
BOOSTER-SYMMETRIC
Buck-Booster Symmetric
PFC (Single-phase applications)
PFC (Three-phase applications)
Three-level NPC (I-Type)
Three-level MNPC (T-Type)
Three-level ANPC
Schematics / Housings
Naming System
### flowCON Ø

**Available Housings:**
- flow Ø 2-clips 12 mm

**Features:**
- Temperature sensor
- Single-phase non-controlled rectifier

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>10-PZ06O2A030FW-LH02J08Y</td>
<td>600</td>
<td>30</td>
<td>Fast diode</td>
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<tr>
<td>10-PZ12ORA100RO-LH00J88Y</td>
<td>1200</td>
<td>100</td>
<td>Rohm SiC diode</td>
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</tr>
</tbody>
</table>

Schematics see page: 189
More details: www.vincotech.com/flowCON-Ø-UR

### flowCON 1

**Available Housings:**
- flow 1 4-towers 12 mm

**Features:**
- Temperature sensor
- Single-phase non-controlled rectifier

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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<tr>
<td>10-PG07ORA160RF-LJ53I88T</td>
<td>650</td>
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<td>10-PY120RA060VH-LJ92I08Y</td>
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<td>60</td>
<td>Fast diode</td>
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</table>

Schematics see page: 189
More details: www.vincotech.com/flowCON-1-UR

---

**NEW**
Application:
/ EMBEDDED DRIVES / INDUSTRIAL DRIVES

Topology Features:
/ Three-phase inverter

TOC

RECTIFIER (+BRAKE)
ULTRAFAST RECTIFIER
SIXPACK
SIXPACK+RECTIFIER
SEVENPACK
PIM (CIB)
PIM+PFC (CIP)
IPM (CIB)
IPM (CIP_PIM+PFC)
HALF-BRIDGE
H-BRIDGE
SINGLE-PHASE-INVERTER
H6.5
BOOSTER
BOOSTER-SYMMETRIC
Buck-Booster Symmetric
PFC (Single-phase applications)
PFC (Three-phase applications)
Three-level NPC (I-Type)
Three-level MNPC (T-Type)
Three-level ANPC
Schematics / Housings
Naming System
### flowPACK 0

**Available Housings:**
- flow 0 2-clips 12 mm
- flow 0 2-clips 17 mm

**Possible Features:**
- Inverter
- Kelvin Emitter for improved switching performance
- Temperature sensor

#### Part-Number | Voltage [V] | Current [A] | Technology | Comments
<table>
<thead>
<tr>
<th></th>
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<th></th>
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<tbody>
<tr>
<td>Inverter-KE-NTC</td>
<td>V23998-P681-F49-PM</td>
<td>600</td>
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<tr>
<td>V23998-P682-F49-PM</td>
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<td>IGBT3</td>
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<tr>
<td>V23998-P684-F49-PM</td>
<td>600</td>
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<td>IGBT3</td>
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<tr>
<td>V23998-P685-F49-PM</td>
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<td>IGBT3</td>
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<tr>
<td>V23998-P685-F48Y-PM</td>
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<td>IGBT3</td>
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<tr>
<td>V23998-P686-F49-PM</td>
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<td>IGBT3</td>
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<tr>
<td>V23998-P686-F48Y-PM</td>
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<td>IGBT3</td>
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<tr>
<td>V23998-P687-F49-PM</td>
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<tr>
<td>V23998-P687-F49-PM</td>
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<td>IGBT4</td>
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<tr>
<td>10-FZ126PA010M7-P867F78</td>
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<tr>
<td>V23998-P688-F49-PM</td>
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<td>V23998-P688-F48Y-PM</td>
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</tbody>
</table>

More details: www.vincotech.com/flowPACK-0

Schematics see page: 189

### flow90PACK 0

**Available Housings:**
- flow 90 0 no-clips
- flow 90 0 2-clips

**Possible Features:**
- Inverter
- Open Emitter configuration
- Temperature sensor

#### Part-Number | Voltage [V] | Current [A] | Technology | Comments
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Inverter-KE-NTC</td>
<td>V23998-P681-F49-PM</td>
<td>1200</td>
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<td>IGBT4</td>
</tr>
<tr>
<td>V23998-P682-F49-PM</td>
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<td>IGBT4</td>
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<tr>
<td>V23998-P684-F49-PM</td>
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<td>15</td>
<td>IGBT4</td>
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<tr>
<td>V23998-P685-F49-PM</td>
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<td>IGBT4</td>
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<td>V23998-P685-F48Y-PM</td>
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<tr>
<td>V23998-P686-F49-PM</td>
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<td>V23998-P686-F48Y-PM</td>
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<tr>
<td>V23998-P687-F49-PM</td>
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<td>IGBT4</td>
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<tr>
<td>V23998-P687-F49-PM</td>
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<td>IGBT4</td>
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<tr>
<td>10-FZ126PA010M7-P867F78</td>
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<td>IGBT M7</td>
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</tr>
</tbody>
</table>

More details: www.vincotech.com/flow90PACK-0

Schematics see page: 189

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---

**SIXPACK**

---

**TOC**
**flowPACK 0 SiC**

**Available Housings:**
- Flow Ø 2-clips 12 mm

**Possible Features:**
- 3xHalf Bridge
- Open Emitter configuration
- Kelvin Emitter for improved switching performance
- Integrated DC capacitor
- Temperature sensor
- Split output for transient deactivation of the body diode and elimination of X-conduction at fast turn-on

**Schematics see page: 189**
More details: www.vincotech.com/flowPACK-0-SiC

---

**flowPACK 0B**

**Available Housings:**
- Flow ØB 2-towers 17 mm
- Flow ØB 2-towers 12 mm

**Possible Features:**
- Inverter
- Open Emitter configuration
- Temperature sensor

**Schematics see page: 189**
More details: www.vincotech.com/flowPACK-0B

---

**Part-No** | **Voltage (V)** | **Current (A)** | **Technology** | **Comments**
---|---|---|---|---
3xHalf Bridge-KE-Cap-SO-NTC | | | | |
10-PZ126PA004MR-M999F28Y | 1200 | 35 | SIC MOSFET | |

---

**Part-No** | **Voltage (V)** | **Current (A)** | **Technology** | **Comments**
---|---|---|---|---
Inverter-DE-NTC | | | | |
10-0B066PA006SB-M992F09 | 600 | 6 | IGBT3 LL | |
10-0B066PA008SB-M992F09 | 600 | 8 | IGBT3 | |
10-0B066PA015SB-M993F09 | 600 | 15 | IGBT3 LL | |
10-0B066PA020SB-M993F09 | 600 | 20 | IGBT3 LL | |
10-0B066PA030SB-M994F09 | 600 | 30 | IGBT3 LL | |
10-0B066PA030SB-M996F09 | 600 | 30 | IGBT3 LL | |
10-0B126PA004SC-M997F09 | 1200 | 4 | IGBT4 | |
10-0B126PA008SC-M998F09 | 1200 | 8 | IGBT4 | |
10-0B126PA015SC-M999F09 | 1200 | 15 | IGBT4 | |
flow90PACK 1

Available Housings:
/ flow90 1 2-clips

Possible Features:
/ Inverter
/ Kelvin Emitter for improved switching performance
/ Temperature sensor
/ Open Emitter configuration

Schematics see page: 189
More details: www.vincotech.com/flow90PACK-1

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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<td>75</td>
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</tbody>
</table>

flowPACK 1

Available Housings:
/ flow1 4-towers 17 mm
/ flow1 4-towers 12 mm

Possible Features:
/ Inverter
/ Kelvin Emitter for improved switching performance
/ Temperature sensor

Schematics see page: 189
More details: www.vincotech.com/flowPACK-1

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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<td>improved Rth (AlN)</td>
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Inverter-KE-Tandem Diode-NTC

Schematics see page: 189
More details: www.vincotech.com/flowPACK-1

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
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<th>Technology</th>
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flow14-towers 17 mm

flow14-towers 12 mm
**flowPACK 1 SiC**

**Available Housings:**
- 4-towers 12 mm
- 2 clips 12 mm

**Possible Features:**
- 3xHalf Bridge
- Open Emitter configuration
- Kelvin Emitter for improved switching performance
- Temperature sensor
- Integrated gate capacitors
- Inverter

![flow1_4-towers_12_mm](image1)

**Schematics see page: 189**

More details: [www.vincotech.com/flowPACK-1-SiC](http://www.vincotech.com/flowPACK-1-SiC)

<table>
<thead>
<tr>
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<th>Comments</th>
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<td>SiC MOSFET</td>
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**Inverter-KE-NTC**

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**flowPACK 2**

**Available Housings:**
- 4-towers 17 mm

**Possible Features:**
- 3xHalf Bridge
- Open Emitter configuration
- Kelvin Emitter for improved switching performance
- Temperature sensor

![flow2_4-towers_17_mm](image2)

**Schematics see page: 190**

More details: [www.vincotech.com/flowPACK-2](http://www.vincotech.com/flowPACK-2)

<table>
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<td>30-P2126PA075M7-L288F79Y</td>
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<tr>
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NEW

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### VINcoPACK E3

#### Available Housings:
- VINco E3

#### Possible Features:
- Inverter
- Kelvin Emitter for improved switching performance
- Temperature sensor

<table>
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<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
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</table>

Schematics see page: 189
More details: www.vincotech.com/VINcoPACK-E3

---

### MiniSKiiP® PACK 1

#### Available Housings:
- MiniSKiiP® 1

#### Possible Features:
- Inverter
- Open Emitter configuration
- Temperature sensor

<table>
<thead>
<tr>
<th>Part-No</th>
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<th>Technology</th>
<th>Comments</th>
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</table>

Schematics see page: 189
More details: www.vincotech.com/MiniSKiiP-PACK-1

---

Available Housings:
- VINco E3
- MiniSKiiP® 1
### MiniSKiiP® PACK 2

**Available housings:**
- MiniSKiiP® 2

**Possible features:**
- Inverter
- Kelvin emitter for improved switching performance
- Temperature sensor
- Open emitter configuration
- 2x Inverter

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<th>Technology</th>
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**Twin inverters-CE-NTC**
- 80-M2126PA035SC-K389F
- 80-M2126PA050M7-K750F70
- 80-M2126PA100M7-K820F70
- 80-M2126PA150M7-K829F70

**Available housings:**
- MiniSKiiP® 3

**Possible features:**
- Inverter
- Kelvin emitter for improved switching performance
- Temperature sensor
- Open emitter configuration
- 2x Inverter
- HS IGBT4
- Tandem diode

<table>
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<th>Part-No</th>
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<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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**Twin inverters-OE-NTC**
- 80-M3126PA200M7-K820F70
- 80-M3126PA200M7-K829F70

Schematics see page 189
More details: www.vincotech.com/MiniSKiiP-PACK-2

Schematics see page 189
More details: www.vincotech.com/MiniSKiiP-PACK-3
**flowPACK E1**

Available Housings:
/ flow E1 4 towers 12 mm

Possible Features:
/ Inverter
/ Kelvin Emitter for improved switching performance
/ Temperature sensor
/ Open Emitter configuration
/ Low side Kelvin Emitter for improved switching performance

---

<table>
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**flowPACK E2**

Available Housings:
/ flow E2 4 towers 12 mm

Possible Features:
/ Inverter
/ Temperature sensor
/ Open Emitter configuration

---

<table>
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<tr>
<th>Part-No</th>
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Schematics see page: 189
More details: www.vincotech.com/flowPACK-E1

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Schematics see page: 189
More details: www.vincotech.com/flowPACK-E2
Application:
/ EMBEDDED DRIVES / INDUSTRIAL DRIVES

Topology Features:
/ Three-phase inverter for active front end

TOC

RECTIFIER (+BRAKE)
ULTRAFAST RECTIFIER
SIXPACK
SIXPACK+RECTIFIER
SEVENPACK
PIM (CIB)
PIM+PFC (CIP)
IPM (CIB)
IPM (CIP_PIM+PFC)
HALF-BRIDGE
H-BRIDGE
SINGLE-PHASE-INVERTER
H6.5
BOOSTER
BOOSTER-SYMMETRIC
Buck-Booster Symmetric
PFC (Single-phase applications)
PFC (Three-phase applications)
Three-level NPC (I-Type)
Three-level MNPC (T-Type)
Three-level ANPC
Schematics / Housings
Naming System
### flowPACK 1+R

**Available Housings:**
- 4-towers 12 mm

**Possible Features:**
- Inverter+Rectifier
- Kelvin Emitter for improved switching performance
- Temperature sensor

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<th>Part-No</th>
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More details: www.vincotech.com/flowPACK-1+R

---

### flowPACK 2+R

**Available Housings:**
- 4-towers 17 mm

**Possible Features:**
- Inverter
- Open Emitter configuration
- Kelvin Emitter for improved switching performance
- Temperature sensor

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More details: www.vincotech.com/flowPACK-2+R

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Schematics see page: 190

---

Available Housings:
- 4-towers 12 mm

Available Housings:
- 4-towers 17 mm

Possible Features:
- Inverter
- Kelvin Emitter for improved switching performance
- Temperature sensor

Schematics see page: 190

More details: www.vincotech.com/flowPACK-1+R

More details: www.vincotech.com/flowPACK-2+R
<table>
<thead>
<tr>
<th>Application:</th>
<th>/ EMBEDDED DRIVES / INDUSTRIAL DRIVES</th>
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<td>Topology Features:</td>
<td>/ Three-phase inverter + Brake</td>
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- Rectifier (+Brake)
- Ultrafast Rectifier
- SixPack
- SixPack + Rectifier
- SevenPack
- PIM [CIB]
- PIM + PFC [CIP]
- IPM [CIB]
- IPM [CIP, PIM + PFC]
- Half-Bridge
- H-Bridge
- Single-Phase-Inverter
- H6.5
- Booster
- Booster-Symmetric
- Buck-Booster Symmetric
- PFC [Single-phase applications]
- PFC [Three-phase applications]
- Three-level NPC [I-Type]
- Three-level MNPC [T-Type]
- Three-level ANPC
- Schematics / Housings
- Naming System
### flow7PACK 0

**Available Housings:**
- flow Ø 2-clips 12 mm
- flow Ø 2-clips 17 mm
- flow Ø 4-towers 12 mm

**Possible Features:**
- Open Emitter configuration
- Temperature sensor
- Brake+Inverter

<table>
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<tr>
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</table>

Schematics see page: 191
More details: www.vincotech.com/flow7PACK-0

### flow7PACK 1

**Available Housings:**
- flow 1 4-towers 17 mm

**Possible Features:**
- Open Emitter configuration
- Temperature sensor
- Brake+Inverter

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Schematics see page: 191
More details: www.vincotech.com/flow7PACK-1
### flow7PACK 2

#### Available Housings:
- flow 2 4-towers 17 mm

#### Possible Features:
- Inverter
- Brake Chopper
- Open Emitter configuration
- Kelvin Emitter for improved switching performance
- Temperature sensor

![Image of flow 2 4-towers 17 mm](image)

**Schematics see page: 191**

More details: www.vincotech.com/flow7PACK-2

---

### Part-No | Voltage (V) | Current (A) | Technology | Comments |
--- | --- | --- | --- | --- |
Inverter-KE-Brake-NTC 30-F2127PA50SC-L177E09 | 1200 | 50 | IGBT4 | |
30-F2127PA75SC-L178E09 | 1200 | 75 | IGBT4 | |
30-F2127PA100SC-L179E09 | 1200 | 100 | IGBT4 | |

---

**Application:**
- Embedded Drives / Industrial Drives

**Topology Features:**
- Converter + BRC + Inverter

**Housings:**
- flow 2 4-towers 17 mm

---

**Schematics**

---

**More details:** www.vincotech.com/flow7PACK-2
Available Housings:

- Converter+Brake+Inverter
- Single-phase Converter+Brake+Inverter
- Three-phase Converter+Brake+Inverter

Part-Number:

- V23990-P541-B138-PM
- V23990-P541-B129-PM
- V23990-P543-A39-PM
- V23990-P543-B129-PM
- V23990-P544-B28-PM
- V23990-P544-B129-PM
- V23990-P546-A39-PM
- V23990-P546-D28-PM
- V23990-P848-A49-PM
- V23990-P848-A59-PM

Part-Number:

- V23990-P849-A49-PM
- V23990-P849-A59-PM
- V23990-P840-A48-PM
- V23990-P840-A58-PM
- V23990-P543-D138-PM
- V23990-P543-D28-PM
- V23990-P543-C28-PM
- V23990-P545-C39-PM
- V23990-P545-C29-PM
- V23990-P546-C39-PM
- V23990-P848-C48-PM
- V23990-P848-C58-PM
- V23990-P848-C49-PM
- V23990-P849-C48-PM
- V23990-P849-C59-PM

Part-Number:

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- V23990-P541-D38-PM
- V23990-P541-S29-PM
- V23990-P543-A28-PM
- V23990-P543-B28-PM
- V23990-P543-C29-PM
- V23990-P543-D28-PM
- V23990-P543-E28-PM
- V23990-P543-F28-PM
- V23990-P543-G28-PM
- V23990-P546-A29-PM
- V23990-P546-B29-PM
- V23990-P546-C39-PM
- V23990-P546-D39-PM
- V23990-P546-E39-PM
- V23990-P546-F39-PM
- V23990-P546-G39-PM
- V23990-P546-A30-PM
- V23990-P546-B30-PM
- V23990-P546-C40-PM
- V23990-P546-D40-PM
- V23990-P848-A58-PM
- V23990-P848-A59-PM
- V23990-P848-B58-PM
- V23990-P848-B59-PM
- V23990-P848-C58-PM
- V23990-P848-C59-PM
- V23990-P848-D58-PM
- V23990-P848-D59-PM

Part-Number:

- V23990-P849-A59-PM
- V23990-P849-A69-PM
- V23990-P849-B59-PM
- V23990-P849-B69-PM
- V23990-P849-C69-PM
- V23990-P849-D69-PM

Possible Features:

- Open Emitter configuration
- Temperature sensor
- Converter+Brake+Inverter
- Converter+Inverter

Schematics see page: 191

More details: www.vincotech.com/flowPIM-8
### flowPIM® 0B

**Available Housings:**
- flow 0B 2-towers 17 mm

**Possible Features:**
- Open Emitter configuration
- Temperature sensor
- Single-phase Converter+Inverter

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### flow90PIM 1

**Available Housings:**
/flow90 1 2-clips

**Possible Features:**
/ Converter+Brake+Inverter
/ Open Emitter configuration
/ Temperature sensor

**Possible Features:**
/ Kelvin Emitter for improved switching performance
/ Open Emitter configuration
/ Temperature sensor
/ Converter+Brake+Inverter
/ Converter+Inverter

**Available Housings:**
/flow 2 4-towers 17 mm

**Schematics see page:** 191

**More details:** www.vincotech.com/flow90PIM-1

<table>
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### flowPIM® 2

**Available Housings:**
/flow 2 4-towers 17 mm

**Possible Features:**
/ Kelvin Emitter for improved switching performance
/ Open Emitter configuration
/ Temperature sensor
/ Converter+Brake+Inverter
/ Converter+Inverter

**Available Housings:**
/flow 2 4-towers 17 mm

**Schematics see page:** 191

**More details:** www.vincotech.com/flowPIM-2

<table>
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## MiniSKiiP® PIM 0

**Available Housings:**

- MiniSKiiP® 0

**Possible Features:**

- Single-phase Converter+Inverter
- Temperature sensor
- Open Emitter configuration
- Converter+Inverter

### Part-Number

<table>
<thead>
<tr>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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---

## MiniSKiiP® PIM 1

**Available Housings:**

- MiniSKiiP® 1

**Possible Features:**

- Open Emitter configuration
- Temperature sensor
- Single-phase Converter+Brake+Inverter
- Converter+Brake+Inverter

### Part-Number

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<th>Technology</th>
<th>Comments</th>
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More details: [Vincotech](https://www.vincotech.com/MiniSKiiP-PIM-0)
### MiniSKiiP® PIM 2

**Available Housings:**
- MiniSKiiP® 2

**Possible Features:**
- Converter+Brake+Inverter
- Kelvin Emitter for improved switching performance
- Temperature sensor
- High side Kelvin Emitter for improved switching performance

### Possible Features:
- Converter+Brake+Inverter
- Kelvin Emitter for improved switching performance
- Temperature sensor

### Table:

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<th>Comments</th>
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### CIB-OE-NTC

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**Available Housings:**
- MiniSKiiP® 3

**Possible Features:**
- Converter+Brake+Inverter
- Kelvin Emitter for improved switching performance
- Temperature sensor

### Table:

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<th>Voltage [V]</th>
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<td>IGBT M7</td>
<td>Equivalent: SKiiP® 37NAB12T4V1</td>
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### Possible Features:
- Converter+Brake+Inverter
- Kelvin Emitter for improved switching performance
- Temperature sensor

**Available Housings:**
- MiniSKiiP® 2
- MiniSKiiP® 3

**More details:**
- www.vincotech.com/MiniSKiiP-PIM-2
- www.vincotech.com/MiniSKiiP-PIM-3

---

**Available Housings:**
- MiniSKiiP® 2
- MiniSKiiP® 3

**More details:**
- Schematics see page: 191
- Schematics see page: 191

**MiniSKiiP® PIM 3**

[See page for more details]
### flowPIM® E1

#### Available Housings:
/ flow E1 4 towers 12 mm

#### Possible Features:
/ Open Emitter configuration
/ Temperature sensor
/ Converter+Brake+Inverter
/ Converter+Inverter

#### Part-Number | Voltage (V) | Current (A) | Technology | Comments |
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#### CI-DE-NTC

10-E112PMA015SC-L929A78T | 1200 | 25 | IGBT M7 | Equivalent: IFX FP15R12W1T4_B11 |

#### Schematics see page: 191

More details: www.vincotech.com/flowPIM-E1

---

### flowPIM® E2

#### Available Housings:
/ flow E2 4 towers 12 mm

#### Possible Features:
/ Open Emitter configuration
/ Temperature sensor
/ Converter+Brake+Inverter

#### Part-Number | Voltage (V) | Current (A) | Technology | Comments |
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#### CI-DE-NTC

10-EY212PMA025M7-L187C78Z | 1200 | 25 | IGBT M7 | Equivalent: IFX FP25R12W2T4_B11 |

#### Schematics see page: 191

More details: www.vincotech.com/flowPIM-E2
Application:
/ EMBEDDED DRIVES / INDUSTRIAL DRIVES

Topology Features:
/ Single-phase converter + Inverter + PFC

RECTIFIER [+BRAKE]
ULTRAFAST RECTIFIER
SIXPACK
SIXPACK+RECTIFIER
SEVENPACK
PIM [CIB]
PIM+PFC [CIP]

IPM [CIB]
IPM [CIP_PIM+PFC]

HALF-BRIDGE
H-BRIDGE

SINGLE-PHASE-INVERTER
H6.5
BOOSTER
BOOSTER-SYMMETRIC

Buck-Booster Symmetric
PFC [Single-phase applications]
PFC [Three-phase applications]

Three-level NPC [I-Type]
Three-level MNPC [T-Type]

Three-level ANPC
Schematics / Housings
Naming System
### flowPIM® 0B + PFC

**Available Housings:**
- flow Ø 2-towers 17 mm

**Possible Features:**
- Converter+PFC+Inverter
- Open Emitter configuration
- Temperature sensor

---

#### Schematics see page: 183

More details: www.vincotech.com/flowPIM-0B+PFC

---

#### Part-No | Voltage (V) | Current (A) | Technology | Comments
--- | --- | --- | --- | ---
CIP-DE-NTC
- 10-006PPA004RC-L023A09 | 600 | 4 | IGBT RC | PFC: F5+SiC diode (up to 150 kHz)
- 10-006PPA004RC-L025A09 | 600 | 6 | IGBT RC | PFC: F5+SiC diode (up to 150 kHz)
- 10-006PPA010RC-L025A09 | 600 | 10 | IGBT RC | PFC: F5+SiC diode (up to 150 kHz)
- 10-006PPA010RC01-L025A19 | 600 | 10 | IGBT RC | PFC: F5+SiC diode (up to 150 kHz)
- 10-006PPA010RC02-L025A09 | 600 | 10 | IGBT RC | PFC: F5+SiC diode (up to 150 kHz)

---

### flowPIM® 0 + PFC

**Available Housings:**
- flow Ø 2-clips 17 mm
- flow Ø 4 towers 12 mm

**Possible Features:**
- Converter+PFC+Inverter
- Integrated Shunt Resistor
- Open Emitter configuration
- Temperature sensor

---

#### Schematics see page: 183

More details: www.vincotech.com/flowPIM-0+PFC

---

#### Part-No | Voltage (V) | Current (A) | Technology | Comments
--- | --- | --- | --- | ---
CIP-DE-Shunt-NTC
- 10-F006PPA010SB-M683B | 600 | 10 | IGBT3 LL | NEW
- 10-P006PPA010SB-M683BY | 600 | 10 | IGBT3 LL | NEW
- 10-PC06PPA010SB-M683B0Y | 600 | 10 | IGBT3 LL | NEW
- 10-F006PPA010SB03-M683B50 | 600 | 10 | IGBT3 LL | NEW
- 10-P006PPA010SB04-M683B30Y | 600 | 10 | IGBT3 LL | NEW
- 10-F006PPA015SB-M684B | 600 | 15 | IGBT3 LL | NEW
- 10-P006PPA015SB03-M684B30Y | 600 | 15 | IGBT3 LL | NEW
- 10-FU06PPA015SB-M684B06 | 600 | 15 | IGBT3 LL | NEW
- 10-F006PPA020SB-M685B | 600 | 20 | IGBT3 LL | NEW
- 10-P006PPA020SB-M685BY | 600 | 20 | IGBT3 LL | NEW
- 10-FO06PPA020SB01-M685B10 | 600 | 20 | IGBT3 LL | NEW
- 10-P006PPA020SB01-M685B10Y | 600 | 20 | IGBT3 LL | NEW
- 10-P006PPA020SB02-M685B30Y | 600 | 20 | IGBT3 LL | NEW

---

**NEW**

- 10-P006PPA020SB01-M685B10 | 600 | 20 | IGBT3 LL | NEW
- 10-P006PPA020SB02-M685B30Y | 600 | 20 | IGBT3 LL | NEW

---

**NEW**

- 10-P006PPA020SB01-M685B10 | 600 | 20 | IGBT3 LL | NEW
- 10-P006PPA020SB02-M685B30Y | 600 | 20 | IGBT3 LL | NEW

---

More details: www.vincotech.com/flowPIM-0+PFC
flowPIM® 1 + PFC

Available Housings:
/ flow1 4 towers 12 mm

Possible Features:
/ 2-leg interleaved PFC + Inverter
/ On-board Capacitors
/ Open Emitter configuration
/ Shunt
/ Temperature sensor
/ 3-leg interleaved PFC + Inverter
/ 3x Shunts
/ Converter + 2-leg interleaved PFC + Inverter

Schematics see page: 183
More details: www.vincotech.com/flowPIM-1+PFC

<table>
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<th>Part-No</th>
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<td>IP-OE-NTC</td>
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<td>10-P906PPA83B5J0-JH12E838T</td>
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<td>IGBT fast</td>
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<td>IGBT fast</td>
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flow90PIM 1 + PFC

Available Housings:
/ flow9d 1 2-clip

Possible Features:
/ Converter+PFC+Inverter
/ Open Emitter configuration
/ Temperature sensor

Schematics see page: 183
More details: www.vincotech.com/flow90PIM-1+PFC

<table>
<thead>
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<th>Part-No</th>
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<td>10-R106PPA2B5B0-JH343J0</td>
<td>600</td>
<td>30</td>
<td>IGBT3 LL</td>
<td></td>
</tr>
</tbody>
</table>
Application:
/ EMBEDDED DRIVES / INDUSTRIAL DRIVES

Topology Features:
/ Three-phase converter + inverter + Brake with integrated gate drive

TOC
RECTIFIER (+BRAKE)
ULTRAFAST RECTIFIER
SIXPACK
SIXPACK+RECTIFIER
SEVENPACK
PIM (CIB)
PIM+PFC (CIP)
IPM (CIB)
IPM (CIP_PIM+PFC)
HALF-BRIDGE
H-BRIDGE
SINGLE-PHASE-INVERTER
H6.5
BOOSTER
BOOSTER-SYMMETRIC
Buck-Booster Symmetric
PFC [Single-phase applications]
PFC [Three-phase applications]
Three-level NPC [I-Type]
Three-level MNPC [T-Type]
Three-level ANPC
Schematics / Housings
Naming System
### IPM 1B (CIB)

**Available Housings:**
- flow 1B 4-towers 17 mm
- flow 1B 4-towers 12 mm

**Possible Features:**
- Complete Bootstrap Circuit
- Emitter Shunts
- Open Emitter configuration
- Inverter

**Schematics see page:** 194

**Part-No** | **Voltage (V)** | **Current (A)** | **Technology** | **Comments**
--- | --- | --- | --- | ---
CIB-OE-NTC | 1200 | 10 | IGBT4 | 1B 4-towers 17 mm
20-1B12IPA015SC-L579F09 | 1200 | 15 | IGBT4 | w/o rectifier

### IPM 1C (CIB)

**Available Housings:**
- flow 1C 4-towers 12 mm

**Possible Features:**
- Brake Chopper
- Complete Bootstrap Circuit
- Emitter Shunts
- Input rectifier
- Gate Drives for Brake and Inverter switches
- Inverter
- Open Emitter configuration
- Temperature sensor

**Schematics see page:** 194

**Part-No** | **Voltage (V)** | **Current (A)** | **Technology** | **Comments**
--- | --- | --- | --- | ---
CIB-OE-BRC-NTC | 1200 | 15 | IGBT4 | 1C 4-towers 12 mm
20-1C12IBA015SH-L81B408 | 1200 | 15 | IGBT4 | 1C 4-towers 12 mm

More details: [www.vincotech.com](http://www.vincotech.com)

Schematics see page: 194

More details: [www.vincotech.com](http://www.vincotech.com)
Application:
/ EMBEDDED DRIVES / INDUSTRIAL DRIVES

Topology Features:
/ Single-phase converter + inverter +
PFC with integrated gate drive

TOC
RECTIFIER (+BRAKE)
ULTRAFAST RECTIFIER
SIXPACK
SIXPACK+RECTIFIER
SEVENPACK
PIM (CIB)
PIM+PFC (CIP)
IPM (CIB)
IPM (CIP_PIM+PFC)
HALF-BRIDGE
H-BRIDGE
SINGLE-PHASE-INVERTER
H6.5
BOOSTER
BOOSTER—SYMMETRIC
Buck-Booster Symmetric
PFC (Single-phase applications)
PFC (Three-phase applications)
Three-level NPC (I-Type)
Three-level MNPC (T-Type)
Three-level ANPC
Schematics / Housings
Naming System
### Possible Features:

- Converter + PFC + Inverter
- PFC controller
- Gate Drive including complete Bootstrap Circuit
- Integrated DC capacitor
- Inverter Shunt
- PFC Shunt
- Temperature sensor

### Application:

- Charging Stations
- Industrial Drives
- Solar
- Inverters
- UPS
- Welding & Cutting

### Topology Features:

- Half-Bridge

### Available Housings:

- Flow 1B 4-towers 17 mm

### Part-No | Voltage (V) | Current (A) | Technology | Comments
--- | --- | --- | --- | ---
20-1B06IPB004RC-P952A40 | 600 | 4 | IGBT RC | Integrated PFC controller
20-1B06IPB004RC01-P952A45 | 600 | 4 | IGBT RC | Integrated PFC controller
20-1B06IPB006RC01-P953A45 | 600 | 6 | IGBT RC | MOSFET switch in the PFC
20-1B06IPB010RC-P955A40 | 600 | 10 | IGBT RC | Integrated PFC controller
20-1B06IPB010RC-P955A45 | 600 | 10 | IGBT RC | Integrated PFC controller
20-1B06IPB010RC03-P955A65 | 600 | 10 | IGBT RC | MOSFET switch in the PFC
20-1B06IPB010RC02-L815A49 | 600 | 10 | IGBT RC | SiC diode in the PFC
20-1B06IPB010RC01-P955A45 | 600 | 10 | IGBT RC | Integrated PFC controller

More details: www.vincotech.com/flowPM-1B-CIP
### Half Bridge

**Available Housings:**
- Flow Ø 2-clips 12 mm
- Flow Ø 2-clips 17 mm

**Possible Features:**
- Half Bridge
- Temperature sensor

**MiniSKiiP® DUAL 2**

**Available Housings:**
- MiniSKiiP® DUAL 2

**Possible Features:**
- Half Bridge
- Temperature sensor

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-F2122PB08SB02-M817F08</td>
<td>1200</td>
<td>50</td>
<td>IGBT4</td>
<td></td>
</tr>
<tr>
<td>10-F2122PB08SB02-M819F08</td>
<td>1200</td>
<td>75</td>
<td>IGBT4</td>
<td></td>
</tr>
<tr>
<td>10-F2122PB12SB02-M819F08</td>
<td>1200</td>
<td>100</td>
<td>IGBT4</td>
<td></td>
</tr>
<tr>
<td>10-F2122PB12SB03-M819F18</td>
<td>1200</td>
<td>100</td>
<td>IGBT4</td>
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<tr>
<td>10-F2122PB12SB03-M819F28</td>
<td>1200</td>
<td>100</td>
<td>IGBT4 HS</td>
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<tr>
<td>10-F2122PB12SB03-M819F48</td>
<td>1200</td>
<td>100</td>
<td>IGBT4</td>
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<tr>
<td>10-P2122PB12SB02-M819F28Y</td>
<td>1200</td>
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<td>IGBT4 HS</td>
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<tr>
<td>10-P2122PB12SB02-M819F38Y</td>
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<tr>
<td>10-P2122PB12SB02-M819F48Y</td>
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<td>IGBT4</td>
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<tr>
<td>10-P2122PB12SB02-M819F58Y</td>
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<td>IGBT4</td>
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**Half Bridge-NTC**

<table>
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<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>80-M2122PA150SA-K708F40</td>
<td>1200</td>
<td>150</td>
<td>IGBT3</td>
<td>Equivalent: SKiiP® 24GB12T4V1</td>
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<tr>
<td>80-M2122PA200SA-K709F40</td>
<td>1200</td>
<td>200</td>
<td>IGBT4</td>
<td>Equivalent: SKiiP® 26GB12T4V1</td>
</tr>
<tr>
<td>80-M2122PA300M7-K700F70</td>
<td>1200</td>
<td>300</td>
<td>IGBT M7</td>
<td>Equivalent: SKiiP® 26GB12T4V1</td>
</tr>
</tbody>
</table>

Schematics see page: 194
More details: www.vincotech.com/MiniSKiiP-DUAL-2

Available Housings:
- Flow Ø 2-clips 12 mm
- Flow Ø 2-clips 17 mm
**MiniSKiiP® DUAL 3**

**Available Housings:**
- MiniSKiiP® DUAL 3

**Possible Features:**
- Half Bridge
- Temperature sensor

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>80-M3872PA300SC-KB36F30</td>
<td>650</td>
<td>300</td>
<td>IGBT3</td>
<td>Equivalent: SKiiP® 38 GB 07 E3 V1</td>
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<tr>
<td>80-M3122PA300SC-KB39F40</td>
<td>1200</td>
<td>300</td>
<td>IGBT4</td>
<td>Equivalent: SKiiP® 38 GB 12 E4 V1</td>
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</tbody>
</table>

**VINcoDUAL E3**

**Available Housings:**
- VINco E3s

**Possible Features:**
- Half Bridge
- Temperature sensor

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>AB-VS122P4300M7-L757F70</td>
<td>1200</td>
<td>300</td>
<td>IGBT M7</td>
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<tr>
<td>AB-VP122P4500M7-L758F70</td>
<td>1200</td>
<td>450</td>
<td>IGBT M7</td>
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<tr>
<td>AB-VS122P4600M7-L758F70</td>
<td>1200</td>
<td>600</td>
<td>IGBT M7</td>
<td></td>
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<tr>
<td>AB-VP122P4800M7-L758F70</td>
<td>1200</td>
<td>800</td>
<td>IGBT M7</td>
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<tr>
<td>AB-VP122P4900M7-L758F70</td>
<td>1200</td>
<td>900</td>
<td>IGBT M7</td>
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</table>

More details: www.vincotech.com/MiniSkiiP-DUAL-3

More details: www.vincotech.com/VINcoDUAL-E3

Schematics see page: 194

Available Housings:
- MiniSKiiP® DUAL 3

Schematics see page: 194

More details: www.vincotech.com/MiniSkiiP-DUAL-3

More details: www.vincotech.com/VINcoDUAL-E3

Schematics see page: 194
Application:
/CHARGING STATIONS / UPS / WELDING & CUTTING

Topology Features:
/H-Bridge
### fastPACK 0 H

**Available Housings:**
- /Ø 4-clips 17 mm
- /Ø 2-clips 17 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Temperature sensor

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-Bridge-KE-NTC</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>V23998-P623-F24-PM</td>
<td>600</td>
<td>50</td>
<td>IGBT3</td>
<td>fsw &lt; 30 kHz</td>
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<tr>
<td>V23998-P624-F24-PM</td>
<td>600</td>
<td>75</td>
<td>IGBT3</td>
<td>fsw &lt; 30 kHz</td>
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<tr>
<td>V23998-P625-F24-PM</td>
<td>600</td>
<td>100</td>
<td>IGBT3</td>
<td>fsw &lt; 30 kHz</td>
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<tr>
<td>V23998-P623-F59-PM</td>
<td>650</td>
<td>50</td>
<td>IGBT H5</td>
<td>fsw &gt; 30 kHz</td>
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<tr>
<td>V23998-P623-F58-PM</td>
<td>650</td>
<td>50</td>
<td>IGBT H5</td>
<td>fsw &gt; 30 kHz</td>
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<tr>
<td>V23998-P627-F88-PM</td>
<td>1200</td>
<td>15</td>
<td>IGBT H5</td>
<td>fsw &gt; 100 kHz</td>
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<tr>
<td>V23998-P629-F48-PM</td>
<td>1200</td>
<td>40</td>
<td>IGBT H5</td>
<td>fsw &gt; 100 kHz</td>
</tr>
</tbody>
</table>

Schematics see page: 194
More details: www.vincotech.com/fastPACK-0-H

### fastPACK 0 HC

**Available Housings:**
- /Ø 4-clips 17 mm
- /Ø 2-clips 12 mm
- /Ø 2-clips 17 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Temperature sensor

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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<tbody>
<tr>
<td>H-Bridge-KE-KE-Cap-NTC</td>
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<tr>
<td>10-P2874PA0B35SM-L623F07Y</td>
<td>650</td>
<td>30</td>
<td>IGBT H5</td>
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<tr>
<td>10-P2874PA0B35SM-L623F07Y</td>
<td>650</td>
<td>50</td>
<td>IGBT H5</td>
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</tr>
<tr>
<td>10-P2874PA0B58SM-L624F0B0</td>
<td>650</td>
<td>50</td>
<td>IGBT H5</td>
<td></td>
</tr>
<tr>
<td>10-P2874PA0B58SM-L624F0B0</td>
<td>650</td>
<td>75</td>
<td>IGBT H5</td>
<td></td>
</tr>
<tr>
<td>10-P2874PA0B75SM-L625F0B0</td>
<td>650</td>
<td>75</td>
<td>IGBT H5</td>
<td></td>
</tr>
<tr>
<td>10-P2874PA0B75SM-L625F0B0</td>
<td>650</td>
<td>40</td>
<td>IGBT H5</td>
<td></td>
</tr>
</tbody>
</table>

Schematics see page: 194
More details: www.vincotech.com/fastPACK-0-HC
## fastPACK 0 SiC

**Available Housings:**
- Flow Ø 4-towers 12 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Integrated DC capacitor
- Open Emitter configuration
- Temperature sensor
- Dual halfbridge

### Part-Number | Voltage (V) | Current (A) | Technology | Comments
--- | --- | --- | --- | ---
H-Bridge-KE-Cap-NTC | 10-PC094PB035ME02-L629F36Y | 900 | 40 | SiC MOSFET
10-PC094PB017ME02-L620F36Y | 900 | 80 | SiC MOSFET
2xHalf-Bridge-KE-NTC | 10-PC124PA065ME01-L637F06Y | 900 | 20 | SiC MOSFET
10-PC124PA040MR-L638F18Y | 1200 | 35 | SiC MOSFET

More details: [www.vincotech.com/fastPACK-0-SiC](http://www.vincotech.com/fastPACK-0-SiC)

Schematics see page: 194

## flowPACK 1 H

**Available Housings:**
- Flow 1 4-towers 12 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Open Emitter configuration
- Temperature sensor

### Part-Number | Voltage (V) | Current (A) | Technology | Comments
--- | --- | --- | --- | ---
H-Bridge-KE-NTC | 10-FY124PA080SH-L589F48 | 1200 | 80 | SiC MOSFET
2xHalf-Bridge-KE-NTC | 10-PC124PA065ME01-L637F06Y | 900 | 20 | SiC MOSFET
10-PC124PA040MR-L638F18Y | 1200 | 35 | SiC MOSFET


Schematics see page: 195

More details: [www.vincotech.com/fastPACK-0-SiC](http://www.vincotech.com/fastPACK-0-SiC)
### H-BRIDGE

#### flowPACK 1 SiC

<table>
<thead>
<tr>
<th>Available Housings:</th>
<th>/ flow 1 4 towers 12 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>/ flow 1 2 clips 12 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Possible Features:</th>
<th>/ Dual halfbridge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>/ Integrated gate capacitors</td>
</tr>
<tr>
<td></td>
<td>/ Kelvin Emitter for improved switching performance</td>
</tr>
<tr>
<td></td>
<td>/ Temperature sensor</td>
</tr>
</tbody>
</table>

**Part-No** | **Voltage (V)** | **Current (A)** | **Technology** | **Comments**
---|---|---|---|---
2xHalf Bridge-KE-Cap-NTC | 10-PY124PA020MR03-L227F38Y | 1200 | 50 | SiC MOSFET

---

Schematics see page: 185

More details: www.vincotech.com/flowPACK-1-SIC

---

#### fastPACK 1 HC

<table>
<thead>
<tr>
<th>Available Housings:</th>
<th>/ flow 1 4 towers 12 mm</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Possible Features:</th>
<th>/ Integrated DC capacitor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>/ Kelvin Emitter for improved switching performance</td>
</tr>
<tr>
<td></td>
<td>/ Open Emitter configuration</td>
</tr>
<tr>
<td></td>
<td>/ Temperature sensor</td>
</tr>
</tbody>
</table>

**Part-No** | **Voltage (V)** | **Current (A)** | **Technology** | **Comments**
---|---|---|---|---
H-Bridge-KE-OE-Cap-NTC | 10-FY074PA100SM-1583F08 | 650 | 100 | IGBT H5 | fsw > 30 kHz
10-FY074PA100SM-1583F08Y | 650 | 100 | IGBT H5 | fsw > 30 kHz
10-FY074PA100SM01-1583F18 | 650 | 100 | IGBT H5 | fsw > 30kHz, full current FWD
10-PY074PA100SM01-1583F18Y | 650 | 100 | IGBT H5 | fsw > 30kHz, full current FWD

---

Schematics see page: 184

More details: www.vincotech.com/flowPACK-1-HC
# H-Bridge

## fastPACK 0 MOS

### Available Housings:
/ flow Ø 2-clips 12 mm

### Possible Features:
/ Kelvin Emitter for improved switching performance
/ Integrated DC capacitor
/ Open Emitter configuration
/ Temperature sensor

### fastPACK 0 MOS

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
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<th>Technology</th>
<th>Comments</th>
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</thead>
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<tr>
<td>H-Bridge-OE-KE-Cap-NTC</td>
<td>650</td>
<td>20</td>
<td>Infineon CoolMOS™ CFD2</td>
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</table>

Schematics see page: 194

More details: www.vincotech.com/fastPACK-0-MOS

## fastPACK 1 MOS

### Available Housings:
/ flow 14-towers 12 mm

### Possible Features:
/ Kelvin Emitter for improved switching performance
/ Integrated DC capacitor
/ Open Emitter configuration
/ Temperature sensor

### fastPACK 1 MOS

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
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<th>Technology</th>
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<tbody>
<tr>
<td>H-Bridge-OE-KE-Cap-NTC</td>
<td>650</td>
<td>40</td>
<td>Infineon CoolMOS™ CFD2</td>
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</tbody>
</table>

Schematics see page: 194

More details: www.vincotech.com/fastPACK-1-MOS
### fastPACK E1 SiC

**Available Housings:**
- Flow E1 4-tower 12 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Open Emitter configuration
- Temperature sensor

**Part-No** | Voltage (V) | Current (A) | Technology | Comments
--- | --- | --- | --- | ---
H-Bridge-OE-KE-NTC 10-EZ124PA032ME-LQ17F18T | 1200 | 40 | SiC MOSFET | 

Schematics see page: 198
More details: [www.vincotech.com/fastPACK-E1-SiC](http://www.vincotech.com/fastPACK-E1-SiC)

### fastPACK E2 SiC

**Available Housings:**
- Flow E2 4-tower 12 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Open Emitter configuration
- Temperature sensor

**Part-No** | Voltage (V) | Current (A) | Technology | Comments
--- | --- | --- | --- | ---
H-Bridge-OE-KE-NTC 10-EY124PA016ME-LP49F18T | 1200 | 80 | SiC MOSFET | 

Schematics see page: 198
More details: [www.vincotech.com/fastPACK-E2-SiC](http://www.vincotech.com/fastPACK-E2-SiC)
Application:
/ CHARGING STATIONS / SOLAR INVERTERS / WELDING & CUTTING

Topology Features:
/ Single-phase inverter
### SINGLE-PHASE INVERTER

#### flowRPI 1

**Available Housings:**
- / flow 1 4-towers 12 mm

**Possible Features:**
- Rectifier + Dual Booster + H-Bridge
- Kelvin Emitter for improved switching performance
- Open Emitter configuration
- Temperature sensor

**Schematics see page: 195**

More details: www.vincotech.com/flowRPI-1

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
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<tbody>
<tr>
<td>10-FY07ZAA015SM-L512B28</td>
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<td>15</td>
<td>IGBT H5</td>
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</tr>
<tr>
<td>10-FY07ZAA030SM-L513B28</td>
<td>650</td>
<td>30</td>
<td>IGBT H5</td>
<td></td>
</tr>
<tr>
<td>10-FY07ZAA050SM-L514B28</td>
<td>650</td>
<td>50</td>
<td>IGBT H5</td>
<td></td>
</tr>
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<td>10-FY07ZAA050SM-L514B08</td>
<td>650</td>
<td>50</td>
<td>IGBT H5</td>
<td>Wide input voltage range rated PFC</td>
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<tr>
<td>10-FY07ZAB050SM-L514B08</td>
<td>650</td>
<td>50</td>
<td>Infineon</td>
<td>CFD+SiC diode (shunt)</td>
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<tr>
<td>10-FY07ZAB075SM-L515B08</td>
<td>650</td>
<td>75</td>
<td>IGBT H5</td>
<td>Wide input voltage range rated PFC</td>
</tr>
<tr>
<td>10-PY07ZAA080CR02-L445B13</td>
<td>650</td>
<td>80</td>
<td>Infineon</td>
<td>CFD+SiC diode (CT)</td>
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<td>10-PY07ZAA080CR02-L445B13Y</td>
<td>650</td>
<td>80</td>
<td>Infineon</td>
<td>CoolMOS™ C6</td>
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<td>10-FY07ZAA080CR01-L445B18</td>
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<td>Infineon</td>
<td>CoolMOS™ C6</td>
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</tbody>
</table>

#### flowSOL 0 BI (TL)

**Available Housings:**
- / flow Ø 2-clips 12 mm

**Possible Features:**
- Booster + H-Bridge
- Kelvin Emitter for improved switching performance
- Temperature sensor

**Schematics see page: 195**

More details: www.vincotech.com/flowSOL-0-BI-TL

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
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<tr>
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Available Housings:
- / flow Ø 2-clips 12 mm

**Possible Features:**
- Booster + H-Bridge
- Kelvin Emitter for improved switching performance
- Temperature sensor

**Schematics see page: 195**

More details: www.vincotech.com/flowSOL-0-BI-TL

<table>
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<tr>
<th>Part-No</th>
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<td>30</td>
<td>IGBT H5</td>
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</table>
flowSOL 0 BI (T) primary

Available Housings:
/ flow Ø 2-clips 12 mm

Possible Features:
/ Booster + H-Bridge
/ Kelvin Emitter for improved switching performance
/ Temperature sensor

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
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<th>Technology</th>
<th>Comments</th>
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<tbody>
<tr>
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<td>600</td>
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</table>

Schematics see page: 195
More details: www.vincotech.com/flowSOL-0-BI-T-prim

flowSOL 1 BI (TL)

Available Housings:
/ flow 1 4-towers 12 mm

Possible Features:
/ Dual Booster + H-Bridge
/ Kelvin Emitter for improved switching performance
/ Integrated DC capacitor
/ Temperature sensor
/ Split output for elimination of X-conduction at fast turn-on

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>Dual Booster + H-Bridge-KE-Cap-NTC</td>
<td>600</td>
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</table>

Dual Booster + H-Bridge-KE-Cap-NTC

<table>
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<tr>
<th>Part-No</th>
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<th>Current (A)</th>
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<td>Infineon CoolMOS™ CFD2</td>
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</tr>
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</table>
SINGLE-PHASE INVERTER

**flowSOL 1 BI (T) primary**

Available Housings:
/ flow 1 4-towers 12 mm

Possible Features:
/ Dual Booster + H-Bridge
/ Kelvin Emitter for improved switching performance
/ Temperature sensor

---

**Part-No** | **Voltage (V)** | **Current (A)** | **Technology** | **Comments**
--- | --- | --- | --- | ---
Dual Booster + H-Bridge-KE-NTC-CAP | 650 | 20 | Infineon CoolMOS™ CFD2

Application:
/ SOLAR INVERTERS

Topology Features:
/ Three-level topology for single phase inverters

Schematics see page: 195

More details: www.vincotech.com/flowSOL-1-BI-TL-prim

---

**RECTIFIER [+ BRAKE]**

ULTRAFAST RECTIFIER
SIXPACK
SIXPACK+RECTIFIER
SEVENPACK
PIM (CIB)
PIM+PFC (CIP)
IPM (CIB)
IPM [CIP_PIM+PFC]
HALF-BRIDGE
H-BRIDGE
SINGLE-PHASE-INVERTER
H6.5
BOOSTER
BOOSTER-SYMMETRIC
Buck-Booster Symmetric
PFC [Single-phase applications]
PFC [Three-phase applications]
Three-level NPC [I-Type]
Three-level MNPC [T-Type]
Three-level ANPC
Schematics / Housings
Naming System
## flowSOL Ø 8 BI [TL]

### Available housings:
- flow Ø 2-clips 12 mm

### Possible features:
- Kelvin emitter for improved switching performance
- Temperature sensor
- Booster + H6.5

### Part-No | Voltage (V) | Current (A) | Technology | Comments
--- | --- | --- | --- | ---
Booster + H6.5-KE-NTC
10-F2078VA028SM-LDH4E08 | 650 | 20 | IGBT H5 |  
10-F2078VA028SM-LDH4E8Y | 650 | 20 | IGBT H5 |  
10-F2078VA038S5-LDH5E08 | 650 | 30 | IGBT S5 |  

Schematics see page: 186
More details: www.vincotech.com/flowSOL-Ø-BI-TL

## flowPACK 1 H6.5

### Available housings:
- flow 1-4-towers 12 mm

### Possible features:
- H6.5
- Kelvin emitter for improved switching performance
- Temperature sensor

### Part-No | Voltage (V) | Current (A) | Technology | Comments
--- | --- | --- | --- | ---
H6.5-KE-NTC
10-FY07VA058S5-L984F08Y | 650 | 50 | IGBT S5 |  
10-FY07VA058S5-L984F08 | 650 | 50 | IGBT S5 |  
10-FY07VA075S5-L984F08Y | 650 | 75 | IGBT S5 |  
10-FY07VA075S5-L984F08 | 650 | 75 | IGBT S5 |  
10-FY07VA100S5-L986F08Y | 650 | 100 | IGBT S5 | Equipped with full IGBT S5
10-FY07VA100S5-L986F08 | 650 | 100 | IGBT S5 |  

Schematics see page: 186
More details: www.vincotech.com/flowPACK-1-H65

Available housings:
- flow Ø 2-clips 12 mm

Possible features:
- Kelvin emitter for improved switching performance
- Temperature sensor

Available housings:
- flow 1-4-towers 12 mm

Possible features:
- H6.5
- Kelvin emitter for improved switching performance
- Temperature sensor

Schematics see page: 186
More details: www.vincotech.com/flowSOL-Ø-BI-TL

More details: www.vincotech.com/flowPACK-1-H65
**H6.5**

**flowSOL 1 BI [TL]**

**Available Housings:**
/flow 1 4-towers 12 mm

**Possible Features:**
/ Kelvin Emitter for improved switching performance
/ Temperature sensor
/ Booster + H6.5

---

**Application:**
/ CHARGING STATIONS / SOLAR INVERTERS / UPS

**Topology Features:**
/ Boost circuit

---

**Part-No | Voltage (V) | Current (A) | Technology | Comments**

Booster + H6.5-KE-NTC
- 10-PY7BVA030SS-LF42E08Y | 650 | 30 | IGBT S5 |
- 10-PY7BVA038RRW-LF42E28 | 650 | 30 | IGBT fast |
- 10-PY7BVA030RW-LF42E28 | 650 | 30 | IGBT fast |

Dual Booster + H6.5-KE-NTC
- 10-PY7BVA075SS-LF45E18Y | 650 | 75 | IGBT S5 |
- 10-PY7BVA050SS-LF45E18 | 650 | 50 | IGBT S5 |
- 10-PY7BVA050SS-LF45E18 | 650 | 50 | IGBT S5 |
- 10-PY7BVA075SS-LF45E18 | 650 | 75 | IGBT S5 |

---

Schematics see page: 196
More details: www.vincotech.com/flowSOL-1-BI-TL
flowBOOST 0 dual

Available Housings:
/ flow 0 2-clips 12 mm
/ flow 0 2-clips 17 mm

Possible Features:
/ Kelvin Emitter for improved switching performance
/ Dual Booster
/ Bypass Diode
/ Open Emitter configuration
/ Temperature sensor
/ Integrated DC Capacitor

Possible Features:
/ Kelvin Emitter for improved switching performance
/ Dual Booster
/ Bypass Diode
/ Open Emitter configuration
/ Temperature sensor
/ Integrated DC Capacitor

Part-No | Voltage (V) | Current (A) | Technology | Comments
---|---|---|---|---
Dual Boost-KE-DE-Bypass diode-NTC
V23998-P629-L82-PM | 650 | 50 | IGBT HS | 50A Si diodes, for 110V grid
V23998-P629-F62-PM | 650 | 48 | IGBT HS | 50A Si diodes, for 110V grid
V23998-P629-F72-PM | 1200 | 48 | IGBT HS | 50A Si diodes, for 110V grid
V23998-P629-F73-PM | 1200 | 48 | IGBT HS | 50A Si diodes, for 110V grid
V23998-P629-L63-PM | 1200 | 48 | IGBT HS | 50A Si diodes, for 110V grid
V23998-P629-L43-PM | 1200 | 48 | IGBT HS | 50A Si diodes, for 110V grid
V23998-P629-L63Y-PM | 1200 | 48 | IGBT HS | 50A Si diodes, for 110V grid
V23998-P629-L99-PM | 1200 | 48 | IGBT HS | 50A Si diodes, for 110V grid
V23998-P629-L99Y-PM | 1200 | 48 | IGBT HS | 50A Si diodes, for 110V grid

Possible Features:
/ Kelvin Emitter for improved switching performance
/ Dual Booster
/ Bypass Diode
/ Open Emitter configuration
/ Temperature sensor
/ Integrated DC Capacitor

Possible Features:
/ Kelvin Emitter for improved switching performance
/ Dual Booster
/ Bypass Diode
/ Open Emitter configuration
/ Temperature sensor
/ Integrated DC Capacitor

Part-No | Voltage (V) | Current (A) | Technology | Comments
---|---|---|---|---
Triple Boost-KE-Cap-NTC
10-FZ263BA040MF-M575L08 | 600 | 44 | Infineon CoolMOS™ C6
10-FZ263BA040MF-M575L38 | 650 | 40 | IGBT HS

Available Housings:
/ flow 0 2-clips 12 mm
/ flow 0 2-clips 17 mm

Possible Features:
/ Integrated DC capacitor
/ Kelvin Emitter for improved switching performance
/ Triple Booster
/ Kelvin Emitter for improved switching performance
/ Triple Booster

Part-No | Voltage (V) | Current (A) | Technology | Comments
---|---|---|---|---
Triple Boost-KE-Cap-NTC
10-FZ263BA040MF-M575L08 | 600 | 44 | Infineon CoolMOS™ C6
10-FZ263BA040MF-M575L38 | 650 | 40 | IGBT HS

Schematics see page: 196
More details: www.vincotech.com/flowBOOST-0-dual

Schematics see page: 196
More details: www.vincotech.com/flow3BOOST-0
### flowBOOST 0 dual SIC

**Available Housings:**
- flow Ø 2-clips 12 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Dual Booster
- Bypass Diode
- Open Emitter configuration
- Temperature sensor
- Integrated DC capacitor

**Part-Number** | **Voltage (V)** | **Current (A)** | **Technology** | **Comments**
--- | --- | --- | --- | ---
Dual Boost-KE-DE-Bypass diode-NTC | V23990-P629-L63-PM | 1200 | 35 | SIC MOSFET | SiC diode
| V23990-P629-L61-PM | 1200 | 35 | SIC MOSFET | SiC MOS [ROHM™] + SiC diode [ROHM™]

Dual Boost-KE-Cap-NTC | 10-PZ12B2A040MR01-M330L68Y | 1200 | 35 | SIC MOSFET | 2nd gen SiC MOS + SiC diode ROHM™
| 10-PZ12B2A040MB01-M330L63Y | 1200 | 35 | SIC MOSFET | 2nd gen SiC MOS + SiC diode CREE

### flow3xBOOST 0 SIC

**Available Housings:**
- flow Ø 2-clips 12 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Triple Booster
- Integrated DC capacitor
- Temperature sensor

**Part-Number** | **Voltage (V)** | **Current (A)** | **Technology** | **Comments**
--- | --- | --- | --- | ---
Triple Boost-KE-Cap-NTC | 10-PZ123BA080ME-M909L18Y | 1200 | 20 | SIC MOSFET
| 10-PZ123BA080MR-M909L28Y | 1200 | 20 | SIC MOSFET
| 10-PZ123BA040MR01-M909L68Y | 1200 | 35 | SIC MOSFET

### flowBOOST 1 dual SiC

**Available Housings:**
- 14 towers 12 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Dual Booster
- Bypass Diode
- Integrated DC capacitor
- Temperature sensor

**Schematics see page: 186**

More details: www.vincotech.com/flowBOOST-1-dual-SiC

<table>
<thead>
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<th>Part-No</th>
<th>Voltage (V)</th>
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<td>10-FY1262ABM88R-L387L68</td>
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<td>SiC MOSFET</td>
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---

### flow3xBOOST 2 SiC

**Available Housings:**
- 24 towers 13 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Triple Booster
- Bypass Diode
- Integrated DC capacitor
- Temperature sensor

**Schematics see page: 186**

More details: www.vincotech.com/flow3xBOOST-2-SiC

<table>
<thead>
<tr>
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<tr>
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**Application:**
/CHARGING STATIONS / SOLAR INVERTERS / UPS

**Topology Features:**
/Symmetrical boost circuit

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<th>Schematics / Housings</th>
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<td>Three-level NPC (I-Type)</td>
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<td>PFC (Three-phase applications)</td>
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<td>PFC (Single-phase applications)</td>
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<td>IPM (CIB)</td>
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<td>IPM (CIP)</td>
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<td>IPM (CIP_PIM+PFC)</td>
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<td>HALF-BRIDGE</td>
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<td>H6.5</td>
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<td>SINGLE-PHASE-INVERTER</td>
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<td>ULTRAFAST RECTIFIER</td>
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<td>SIXPACK</td>
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<td>SIXPACK+RECTIFIER</td>
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**BOoster-SYMMetric**

Buck-Booster Symmetric

PFC (Single-phase applications)

PFC (Three-phase applications)

Three-level NPC (I-Type)

Three-level MNPC (T-Type)

Three-level ANPC

Schematics / Housings

Naming System
### flowBOOST 0 symmetric

**Available Housings:**
- flow 0 2-clips 12 mm
- flow 0 2-clips 17 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Symmetrical Booster
- Temperature sensor
- Parallel switch
- Bypass Diode

**Part-No** | **Voltage (V)** | **Current (A)** | **Technology** | **Comments**
--- | --- | --- | --- | ---
Symm. Boost-KE-NTC
10-FZ06NBA060SA-P914L33 | 600 | 30 | IGBT3 |  
10-FZ06NBA080SA-P915L33 | 600 | 50 | IGBT3 |  
10-FZ06NBA075SA-P916L33 | 600 | 75 | IGBT3 |  
10-FZ07NBA041FS-P915L68Y | 600 | 40 | Infineon CoolMOS™ C6 |  
10-FZ07NBA041FS01-P915L78 | 600 | 40 | Infineon CoolMOS™ C6 |  
Symm. Boost-KE-Bypass diode-NTC
10-FZ06NBA041FS-P915L68Y | 600 | 40 | Infineon CoolMOS™ C6 | SIC diodes  
10-FZ06NBA041FS01-P915L78 | 600 | 40 | Infineon CoolMOS™ C6 |  
Symm. Boost-KE-Parallel-NTC
10-FZ06NBA041FP-P916L38 | 600 | 84 | Trench Field Stop IGBT |  
10-FZ06NBA041FP-P916L48 | 600 | 84 | Parallel Switch |  
10-FZ06NBA110FP-P916L28 | 600 | 110 | Parallel Switch |  

---

### flowBOOST 1 symmetric

**Available Housings:**
- flow 1 4-towers 17 mm
- flow 1 4-towers 12 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Symmetrical Booster
- Temperature sensor
- Bypass Diode

**Part-No** | **Voltage (V)** | **Current (A)** | **Technology** | **Comments**
--- | --- | --- | --- | ---
Symm. Boost-KE-NTC
10-FZ06NBA060SA-P914L33 | 600 | 30 | IGBT3 |  
10-FZ06NBA080SA-P915L33 | 600 | 50 | IGBT3 |  
10-FZ06NBA075SA-P916L33 | 600 | 75 | IGBT3 |  
10-FZ07NBA041FS-P915L68Y | 600 | 40 | Infineon CoolMOS™ C6 |  
10-FZ07NBA041FS01-P915L78 | 600 | 40 | Infineon CoolMOS™ C6 |  
Symm. Boost-KE-Bypass diode-NTC
10-FZ06NBA041FS-P915L68Y | 600 | 40 | Infineon CoolMOS™ C6 | SIC diodes  
10-FZ06NBA041FS01-P915L78 | 600 | 40 | Infineon CoolMOS™ C6 |  
Symm. Boost-KE-Parallel-NTC
10-FZ06NBA041FP-P916L38 | 600 | 84 | Trench Field Stop IGBT |  
10-FZ06NBA041FP-P916L48 | 600 | 84 | Parallel Switch |  
10-FZ06NBA110FP-P916L28 | 600 | 110 | Parallel Switch |  

Schematics see page: 201
More details: www.vincotech.com/flowBOOST-0-sym

Schematics see page: 201
More details: www.vincotech.com/flowBOOST-1-sym
### flowBOOST 1 symmetric dual

**Available Housings:**
- flow 1 4-towers 12 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Dual Symmetrical Booster
- Temperature sensor
- Bypass Diode

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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<tbody>
<tr>
<td>10-FY09S2A055E-L869L08</td>
<td>900</td>
<td>50</td>
<td>SIC MOSFET</td>
<td></td>
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<tr>
<td>10-FY12S2A075H-L869L48</td>
<td>1200</td>
<td>75</td>
<td>IGBT4 HS</td>
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<td>1200</td>
<td>80</td>
<td>Ultra Field Stop IGBT</td>
<td></td>
</tr>
</tbody>
</table>

Schematics see page: 201

www.vincotech.com/flowBOOST-1-sym-dual

### flowBOOST 2 symmetric

**Available Housings:**
- flow 2 4-towers 17 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Symmetrical Booster
- Bypass Diode
- Temperature sensor

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>30-F206NBA208SG-M235L25</td>
<td>600</td>
<td>200</td>
<td>IGBT3 HS</td>
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</tr>
</tbody>
</table>

Schematics see page: 201

More details: www.vincotech.com/flowBOOST-2-sym

www.vincotech.com/boost-1-sym-dual

www.vincotech.com/boost-2-sym-dual
flowBOOST 2 symmetric

Available Housings:
/ flow 2 4-towers 17 mm

Possible Features:
/ Kelvin Emitter for improved switching performance
/ Symmetrical Booster
/ Bypass Diode
/ Temperature sensor

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
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<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>Symm. Boost-KE-Bypass diode-NTC</td>
<td>600</td>
<td>200</td>
<td>IGBT3 HS</td>
<td></td>
</tr>
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</table>

Application:
/ POWER SUPPLY / SOLAR INVERTERS / UPS

Topology Features:
/ Symmetrical buck-boost circuit

Schematics see page: 201
More details: www.vincotech.com/flowBOOST-2-sym
### BUCK-BOOST SYMMETRIC

#### flowBUCK-BOOST 0

**Available Housings:**
- Flow Ø 2-clips 12 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Temperature sensor
- Symmetrical Buck-Booster

**Schematics see page: 197**
More details: www.vincotech.com/flowBUCK-BOOST-0

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
</tr>
</thead>
</table>

#### flowBUCK-BOOST 1

**Available Housings:**
- Flow 1 4-towers 12 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Temperature sensor
- Symmetrical Buck-Booster

**Schematics see page: 197**
More details: www.vincotech.com/flowBUCK-BOOST-1

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symm. Buck Boost-KE-NTC 10-PY07BBA1S55-M735L58Y</td>
<td>150</td>
<td>150</td>
<td>IGBT S5</td>
<td></td>
</tr>
</tbody>
</table>

Available Housings:
- Flow 0 2-clips 12 mm
- Flow 1 4-towers 12 mm

Schematics see page: 197
More details: www.vincotech.com/flowBUCK-BOOST-0

More details: www.vincotech.com/flowBUCK-BOOST-1

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153
Application:
/CHARGING STATIONS / UPS / WELDING & CUTTING

Topology Features:
/PFC boost - Single-phase Rectifier + Boost circuit

TOC
RECTIFIER (+BRAKE)
ULTRAFAST RECTIFIER
SIXPACK
SIXPACK+RECTIFIER
SEVENPACK
PIM (CIB)
PIM+PFC (CIP)
IPM (CIB)
IPM (CIP_PIM+PFC)
H-BRIDGE
HALF-BRIDGE
SINGLE-PHASE-INVERTER
H6.5
BOOSTER
BOOSTER-SYMMETRIC
Buck-Booster Symmetric
PFC (Single-phase applications)
PFC (Three-phase applications)
Three-level NPC [I-Type]
Three-level MNPC [T-Type]
Three-level ANPC
Schematics / Housings
Naming System
### flowPFC 0

**Available Housings:**
- flow Ø 2-clips 17 mm
- flow Ø 4-towers 17 mm

**Possible Features:**
- Dual Boost PFC
- Integrated Shunt Resistor
- Integrated DC capacitor
- Temperature sensor
- Half Controlled Converter

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-F0062TA099FS-P980D59</td>
<td>600</td>
<td>18</td>
<td>Infineon CoolMOS™ C6</td>
<td></td>
</tr>
</tbody>
</table>

### flowPFC 0 CD

**Available Housings:**
- flow Ø 2-clips 12 mm

**Possible Features:**
- Dual Boost PFC
- Current sense interface in collector or emitter with low inductive bypass diode
- Integrated DC capacitor
- Temperature sensor
- Half Controlled Converter
- Integrated shunt resistor with/without protection diode

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-F2062TA859FS5-P980D059</td>
<td>600</td>
<td>18</td>
<td>Infineon CoolMOS™ C6</td>
<td>fsw &lt; 400 kHz</td>
</tr>
<tr>
<td>10-F2062TA859FSM-P986D13</td>
<td>650</td>
<td>30</td>
<td>IGBT H5</td>
<td></td>
</tr>
<tr>
<td>10-F2062TA859FSM-P987D13</td>
<td>650</td>
<td>50</td>
<td>IGBT H5</td>
<td></td>
</tr>
</tbody>
</table>

**Available Housings:**
- flow Ø 2-clips 17 mm
- flow Ø 2-clips 12 mm

More details: [www.vincotech.com/flowPFC-0](http://www.vincotech.com/flowPFC-0)
Application:
/CHARGING STATIONS / UPS / WELDING & CUTTING

Topology Features:
/Three-level PFC for three-phase applications

TOC

RECTIFIER (+BRAKE)
ULTRAFAST RECTIFIER
SIXPACK
SIXPACK+RECTIFIER
SEVENPACK
PIM (CIB)
PIM+PFC (CIP)
IPM (CIB)
IPM (CIP_PIM+PFC)
HALF-BRIDGE
H-BRIDGE
SINGLE-PHASE-INVERTER
H6.5
BOOSTER
BOOSTER-SYMMETRIC
Buck-Booster Symmetric
PFC (Single-phase applications)
PFC (Three-phase applications)
Three-level NPC [I-Type]
Three-level MNPC [T-Type]
Three-level ANPC
Schematics / Housings
Naming System
## ANPFC 0

**Available Housings:**
/ flow Ø 2-clips 12 mm

**Possible Features:**
/ Kelvin Emitter for improved switching performance
/ Integrated DC capacitor
/ Temperature sensor
/ Advanced Neutral Boost PFC

### Table: ANPFC-KE-CAP-NTC

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-P287AA100R082-LK39L88Y</td>
<td>650</td>
<td>100</td>
<td>IGBT fast</td>
<td></td>
</tr>
</tbody>
</table>

Schematics see page: 188
More details: www.vincotech.com/flowANPFC-0

## NPFC 0

**Available Housings:**
/ flow Ø 2-clips 12 mm

**Possible Features:**
/ Neutral Boost PFC
/ Integrated DC capacitor
/ Temperature sensor

### Table: NPFC-Cap-NTC

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>10-F207LA100SM03-L765L0B</td>
<td>650</td>
<td>100</td>
<td>IGBT H5</td>
<td>ultra fast recovery diodes</td>
</tr>
<tr>
<td>10-F207LA100SM04-L765L1B</td>
<td>650</td>
<td>100</td>
<td>IGBT H5</td>
<td></td>
</tr>
</tbody>
</table>

Schematics see page: 188
More details: www.vincotech.com/flowNPFC-0

Available Housings: / flow Ø 2-clips 12 mm

More details: www.vincotech.com/flowNPFC-0
### flowSPFC 0

**Available Housings:**
- flow 0 2-clips 12 mm

**Possible Features:**
- Symmetric Boost PFC
- Kelvin Emitter for improved switching performance
- Integrated DC capacitor
- Temperature sensor

**Part-No** | Voltage (V) | Current (A) | Technology | Comments
--- | --- | --- | --- | ---
SPFC-KE-Cap-NTC | 650 | 50 | IGBT H5 | 
10-FZ071SA075SM02-L524L18 | 650 | 75 | IGBT H5 | 
10-FZ071SA100SM02-L526L18 | 650 | 100 | IGBT H5 | 

Schematics see page: 188
More details: www.vincotech.com/flowSPFC-0

---

### flow3xNPFC 1

**Available Housings:**
- flow 1 2-clips 12 mm

**Possible Features:**
- 3xNeutral Boost PFC
- Temperature sensor

**Part-No** | Voltage (V) | Current (A) | Technology | Comments
--- | --- | --- | --- | ---
3xNPFC-NTC | 650 | 30 | IGBT H5 | SiC Diodes
10-PY12N8B38SM-L394L08Y | 650 | 30 | IGBT H5 | SiC Diodes
10-TPY12N8B38SM-L394L08 | 650 | 30 | IGBT H5 | SiC Diodes

Schematics see page: 188
More details: www.vincotech.com/flow3xNPFC-1
### NEW

**flow3xANPFC 1**

**Available Housings:**
> /flow 4-towers 12 mm

**Possible Features:**
> /3x Advanced Neutral Boost PFC
> /Temperature sensor

---

**Schematics see page: 198**

More details: [www.vincotech.com/flow3xANPFC-1](http://www.vincotech.com/flow3xANPFC-1)

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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<tbody>
<tr>
<td>3xANPFC-NTC</td>
<td>10-PY073AA050RG01-LK14L08Y</td>
<td>650</td>
<td>50</td>
<td>IGBT fast</td>
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<tr>
<td>3xANPFC-NTC</td>
<td>10-PY073AA050RG02-LK14L03Y</td>
<td>650</td>
<td>50</td>
<td>IGBT fast</td>
</tr>
</tbody>
</table>
Application:
/ SOLAR INVERTERS / UPS

Topology Features:
/ Three-level NPC [I-Type]
### THREE-LEVEL NPC (I-TYPE)

#### flowNPC 0 IGBT

**Available Housings:**
- flow® 2-clips 12 mm
- flow® 2-clips 17 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Neutral Point Clamped Topology (I-Type)
- Temperature sensor

**Available Housings:**
- flow® 2-clips 12 mm
- flow® 2-clips 17 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Neutral Point Clamped Topology (I-Type)
- Temperature sensor

#### NPC-KE-NTC

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
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<tr>
<td>10-FZ06NIA830A-P924F33</td>
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<td>IGBT3</td>
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<tr>
<td>10-PZ06NIA830A-P924F33Y</td>
<td>1200</td>
<td>30</td>
<td>IGBT3</td>
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<tr>
<td>10-F087NA830SM-P965F39</td>
<td>1200</td>
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<td>IGBT H5</td>
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<tr>
<td>10-F087NA830SM1-P965F49</td>
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<td>IGBT H5</td>
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<tr>
<td>10-F286NIA850A-P925F33</td>
<td>1200</td>
<td>50</td>
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<td>10-F087NIA850SM-P965F05</td>
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<tr>
<td>10-F287NIA850SM-P926F34</td>
<td>1200</td>
<td>60</td>
<td>IGBT H5</td>
<td>All switches IGBT H5, outer switch ultraFast diode</td>
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<tr>
<td>10-F286NIA875SA-P928F33</td>
<td>1200</td>
<td>75</td>
<td>IGBT3</td>
<td></td>
</tr>
<tr>
<td>10-PZ086NIA875SA-P926F33</td>
<td>1200</td>
<td>75</td>
<td>IGBT3</td>
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</tr>
<tr>
<td>10-PZ086NIA875SA-P928F33Y</td>
<td>1200</td>
<td>75</td>
<td>IGBT3</td>
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</tr>
<tr>
<td>10-PZ087NIA875SM-P926F34</td>
<td>1200</td>
<td>75</td>
<td>IGBT S5</td>
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</tr>
<tr>
<td>10-PZ087NIA875SM-P928F58</td>
<td>1200</td>
<td>75</td>
<td>IGBT H5</td>
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</tr>
<tr>
<td>10-FZ086NIA80FU-P967F08</td>
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<td>75</td>
<td>IGBT UltraFast</td>
<td>IGBT UltraFast + IGBT3, STEALTH™</td>
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<tr>
<td>10-PZ086NRA060FU-P967F08Y</td>
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<td>75</td>
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</tr>
<tr>
<td>10-F286NRA075FU-P929F08</td>
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<td>75</td>
<td>IGBT UltraFast</td>
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<tr>
<td>10-PZ086NRA075FU-P969F08Y</td>
<td>1200</td>
<td>75</td>
<td>IGBT UltraFast</td>
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<tr>
<td>10-PZ086NRA075FU-P929F08Y</td>
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<td>75</td>
<td>IGBT UltraFast</td>
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</tr>
<tr>
<td>10-PZ087NIA805S-P927F33T</td>
<td>1200</td>
<td>100</td>
<td>IGBT S5</td>
<td>Optimized for Solar PV</td>
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<tr>
<td>10-PZ087NIA805S-P927F58</td>
<td>1200</td>
<td>100</td>
<td>IGBT S5</td>
<td>Optimized for Solar PV</td>
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<tr>
<td>10-PZ087NIA80RV-P927F86T</td>
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<td>100</td>
<td>IGBT FAST-RG</td>
<td>Optimized for Solar PV</td>
</tr>
</tbody>
</table>

**More details:** [www.vincotech.com/flowNPC-0-IGBT](http://www.vincotech.com/flowNPC-0-IGBT)

### flowNPC 0 MOS

**Available Housings:**
- flow® 2-clips 12 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Neutral Point Clamped Topology (I-Type)
- Temperature sensor

**Available Housings:**
- flow® 2-clips 12 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Neutral Point Clamped Topology (I-Type)
- Temperature sensor

#### NPC-KE-NOS

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
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<tbody>
<tr>
<td>10-FZ06NRA45FH01-P966F10</td>
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</tr>
<tr>
<td>10-FZ06NRA41FS02-P966F68</td>
<td>1200</td>
<td>30</td>
<td>Infineon CoolMOS™ C6</td>
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</tr>
<tr>
<td>10-PZ06NRA41FS02-P966F68Y</td>
<td>1200</td>
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<td>Infineon CoolMOS™ C6</td>
<td></td>
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<tr>
<td>10-FZ06NRA41FS83-P965F78</td>
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<td>Infineon CoolMOS™ C6</td>
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<tr>
<td>10-PZ06NRA41FS83-P965F78Y</td>
<td>1200</td>
<td>30</td>
<td>Infineon CoolMOS™ C6</td>
<td></td>
</tr>
</tbody>
</table>

**More details:** [www.vincotech.com/flowNPC-0-MOS](http://www.vincotech.com/flowNPC-0-MOS)
### THREE-LEVEL NPC [I-TYPE]

**flowNPC 0 parallel**

**Available Housings:**
/ flow 0 2-clips 12 mm

**Possible Features:**
/ Neutral Point Clamped Topology [I-Type]
/ Kelvin Emitter for improved switching performance
/ Temperature sensor

**NPC-KE-NTC**

<table>
<thead>
<tr>
<th>Part-No</th>
<th>I Voltage (V)</th>
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<th>I Technology</th>
<th>I Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-F006NPA06NPA045FP-P967F</td>
<td>1200</td>
<td>50</td>
<td>Parallel Switch</td>
<td>CoolMOS™ + IGBT, IGBT3, SiC diodes</td>
</tr>
<tr>
<td>10-F006NPA06NPA069FP-10-P969F10</td>
<td>1200</td>
<td>50</td>
<td>Parallel Switch</td>
<td>CoolMOS™ + IGBT, IGBT3, STEALTH™</td>
</tr>
<tr>
<td>10-F206NRA06NPA070FP01-P969F78</td>
<td>1200</td>
<td>75</td>
<td>Parallel Switch</td>
<td>CoolMOS™ + IGBT, IGBT3, SiC diodes</td>
</tr>
<tr>
<td>10-F206NRA06NPA070FP-10-P969F10</td>
<td>1200</td>
<td>75</td>
<td>Parallel Switch</td>
<td>CoolMOS™ + IGBT, IGBT3, STEALTH™</td>
</tr>
<tr>
<td>10-F206NRA06NPA070FP-P969F</td>
<td>1200</td>
<td>75</td>
<td>Parallel Switch</td>
<td>CoolMOS™ + IGBT, IGBT3, SiC diodes</td>
</tr>
<tr>
<td>10-F006NPA070FP-P969F09</td>
<td>1200</td>
<td>75</td>
<td>Parallel Switch</td>
<td>CoolMOS™ + IGBT, IGBT3, STEALTH™</td>
</tr>
<tr>
<td>10-F006NPA070FP-P969F09Y</td>
<td>1200</td>
<td>75</td>
<td>Parallel Switch</td>
<td>CoolMOS™ + IGBT, IGBT3, SiC diodes</td>
</tr>
<tr>
<td>10-P006NPA070FP-P969F09Y</td>
<td>1200</td>
<td>75</td>
<td>Parallel Switch</td>
<td>CoolMOS™ + IGBT, IGBT3, STEALTH™</td>
</tr>
<tr>
<td>10-P006NPA070FP-P969F09</td>
<td>1200</td>
<td>75</td>
<td>Parallel Switch</td>
<td>CoolMOS™ + IGBT, IGBT3, SiC diodes</td>
</tr>
<tr>
<td>10-P006NPA070FP-P969F09Y</td>
<td>1200</td>
<td>75</td>
<td>Parallel Switch</td>
<td>CoolMOS™ + IGBT, IGBT3, STEALTH™</td>
</tr>
<tr>
<td>10-P206NRA070FP-P969F</td>
<td>1200</td>
<td>75</td>
<td>Parallel Switch</td>
<td>CoolMOS™ + IGBT, IGBT3, SiC diodes</td>
</tr>
<tr>
<td>10-P206NRA070FP-P969F</td>
<td>1200</td>
<td>75</td>
<td>Parallel Switch</td>
<td>CoolMOS™ + IGBT, IGBT3, STEALTH™</td>
</tr>
<tr>
<td>10-P206NRA070FP-P969F</td>
<td>1200</td>
<td>75</td>
<td>Parallel Switch</td>
<td>CoolMOS™ + IGBT, IGBT3, SiC diodes</td>
</tr>
<tr>
<td>10-PZ206NRA070FP-P969F78</td>
<td>1200</td>
<td>75</td>
<td>Parallel Switch</td>
<td>CoolMOS™ + IGBT, IGBT3, STEALTH™</td>
</tr>
</tbody>
</table>

**flowNPC 1**

**Available Housings:**
/ flow 1 4-towers 17 mm / flow 1 4-towers 12 mm

**Possible Features:**
/ Neutral Point Clamped Topology [I-Type]
/ Kelvin Emitter for improved switching performance
/ Integrated DC capacitor
/ Temperature sensor

**NPC-KE-Cap-NTC**

<table>
<thead>
<tr>
<th>Part-No</th>
<th>I Voltage (V)</th>
<th>I Current (A)</th>
<th>I Technology</th>
<th>I Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-PY07NIB080SM03-L095F03</td>
<td>1200</td>
<td>80</td>
<td>IGBT H5</td>
<td>4-quadrant operation; integrated capacitor</td>
</tr>
<tr>
<td>10-PY07NIB080SM03-L095F03Y</td>
<td>1200</td>
<td>80</td>
<td>IGBT H5</td>
<td>4-quadrant operation; integrated capacitor</td>
</tr>
<tr>
<td>10-PY07NIBA150SM01-L364F08</td>
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**More details:** [www.vincotech.com](http://www.vincotech.com)
**THREE-LEVEL NPC (I-TYPE)**

### flow3xNPC 1

**Available Housings:**
- flow 1 4-towers 12 mm
- flow 1 2-clips 12 mm

**Possible Features:**
- Three-phase Neutral Point Clamped Topology (I-Type)
- Kelvin Emitter for improved switching performance
- Temperature sensor

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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<tbody>
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</tr>
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</table>

Schematics see page: 199
More details: www.vincotech.com/flow3xNPC-1

### flowNPC 1 split

**Available Housings:**
- flow 1 4-towers 17 mm

**Possible Features:**
- Kelvin Emitter for improved switching performance
- Neutral Point Clamped Topology (I-Type) – positive
- Positive Side of Inverter
- Negative Side of Inverter

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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<tbody>
<tr>
<td>NPC-Split-KE-Pos-NTC</td>
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<tr>
<td>10-F124NID150SH13-LG1BF98</td>
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<td>200</td>
<td>IGBT4 HS</td>
<td>tandem diodes</td>
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<tr>
<td>NPC-Split-KE-Neg-NTC</td>
<td>2400</td>
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<td>IGBT4 HS</td>
<td>complementary to LG1BF98; tandem diodes</td>
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<tr>
<td>10-F124NIE200SH13-LG2BF98</td>
<td>2400</td>
<td>200</td>
<td>IGBT4 HS</td>
<td>complementary to LG1BF98; tandem diodes</td>
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</tbody>
</table>

More details: www.vincotech.com/flowNPC-1-split
THREE-LEVEL NPC (I-TYPE)

flowNPC 1 MOS

Available Housings:
/flow 1 4-towers 12 mm

Possible Features:
/ Neutral Point Clamped Topology (I-Type)
/ Kelvin Emitter for improved switching performance
/ Split output for transient deactivation of the body diode and elimination of X-conduction at fast turn-off
/ Low inductive commutation loop
/ Temperature sensor

Table:

<table>
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<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
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<th>Comments</th>
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<tbody>
<tr>
<td>NPC-KE-Split Output-NTC</td>
<td>1200</td>
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<td>Infineon CoolMOS™ C6</td>
<td>SIC diode</td>
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<td>NPC-KE-Split Output-NTC</td>
<td>1200</td>
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<td>Infineon CoolMOS™ C6</td>
<td>SIC diode</td>
</tr>
</tbody>
</table>

flowNPC 2

Available Housings:
/flow 2 4-towers 17 mm
/flow 2 4-towers 13 mm

Possible Features:
/ Kelvin Emitter for improved switching performance
/ Neutral Point Clamped Topology (I-Type)
/ Temperature sensor

Table:

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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<td>NPC-KE-NTC</td>
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<td>NPC-KE-NTC</td>
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<td>NPC-KE-NTC</td>
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<td>1200</td>
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<td>IGBT fast</td>
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Available Housings:
/flow 2 4-towers 13 mm

More details: www.vincotech.com/flowNPC-1-MOS
Schematics see page: 189
### THREE-LEVEL NPC (I-TYPE)

#### VINcoNPC X4

**Available Housings:**
/ VINco X4

**Possible Features:**
/ Neutral Point Clamped Topology (I-Type)
/ Kelvin Emitter for improved switching performance
/ Optional snubber diode for switching loss reduction with asymmetrical inductance feature
/ Temperature sensor

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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<tbody>
<tr>
<td>NPC-KE-DC snubber diode-DC-NTC 70-W424NIA800SH-M800F</td>
<td>2400</td>
<td>800</td>
<td>IGBT4 HS</td>
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</tr>
</tbody>
</table>

Schematics see page: 199
More details: www.vincotech.com/VINcoNPC-X4

### VINcoNPC X8

**Available Housings:**
/ VINco X8

**Possible Features:**
/ Neutral Point Clamped Topology (I-Type)
/ Kelvin Emitter for improved switching performance
/ Temperature sensor

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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<tr>
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<td>NPC-KE-NTC 70-W424NIA1K2M787-LD7F7P70</td>
<td>2400</td>
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Schematics see page: 199
More details: www.vincotech.com/VINcoNPC-X8

More details: www.vincotech.com/VINcoNPC-X4
THREE-LEVEL NPC [I-TYPE]

VINcoNPC X12

Available Housings:
/ VINco X12

Possible Features:
/ Neutral Point Clamped Topology [I-Type]
/ Kelvin Emitter for improved switching performance
/ Temperature sensor

---

**Application:**
/ SOLAR INVERTERS / UPS

**Topology Features:**
/ Three-level MNPC [T-Type]

---

### Part-No | Voltage (V) | Current (A) | Technology | Comments
---|---|---|---|---
NPC-KE-NTC | 70-W624N3A1K2SC-L400FP | 2400 | IGBT4 HS
70-W624N3A1K2SC-L400FP01 | 2400 | 1200 | IGBT4
70-W624NIA1K2M702-L400FP70 | 2400 | 1200 | IGBT M7
70-W624NIA1K8M701-L400FP70 | 2400 | 1800 | IGBT M7

Schematics see page: 199
More details: www.vincotech.com/VINcoNPC-X12

---
### THREE-LEVEL MNPC [T-TYPE]

#### flowMNPC 0

**Possible Features:**
- Mixed Voltage Neutral Point Clamped Topology [T-Type]
- Kelvin Emitter for improved switching performance
- Temperature sensor

**Part-No** | **Voltage (V)** | **Current (A)** | **Technology** | **Comments**
---|---|---|---|---
MNPC (T-type)-KE-NTC | 10-F207NMA10B5SM-M285F58 | 650 | 100 | IGBT HS for 110V grid
| 10-P207NMA10B5SM-M285F58Y | 650 | 100 | IGBT HS |
| 10-P212NMA10B5SH-M287FY | 1200 | 40 | IGBT HS |
| 10-P212NMA10B5SH-M287F | 1200 | 40 | IGBT HS |
| 10-P212NMA10B5SH23-M280F03 | 1200 | 80 | IGBT HS |
| 10-P212NMA10B5SH23-M280F03Y | 1200 | 80 | IGBT HS |
| 10-P212NMA10B5SH01-M280FY | 1200 | 80 | IGBT HS |
| 10-P212NMA10B5SH04-M280F13 | 1200 | 80 | IGBT HS |
| 10-P212NMA10B5SH04-M280F13Y | 1200 | 80 | IGBT HS |
| 10-F212NMA10B5SH083-M280F38 | 1200 | 80 | Trench Field Stop II IGBT |
| 10-P212NMA10B5SH083-M280F38Y | 1200 | 80 | Trench Field Stop II IGBT |
| 10-P212NMA10B5SH087-M280F78Y | 1200 | 80 | Trench Field Stop II IGBT |
| 10-PF212NMA10B5SH08-M280F98T | 1200 | 80 | IGBT HS |
| 10-PF212NMA10B5SH08-M280F98T | 1200 | 80 | IGBT HS |
| 10-F212NMA10B5SH-M289F | 1200 | 80 | IGBT HS |
| 10-F212NMA10B5SH-M289 | 1200 | 80 | IGBT HS |
| 10-P012NME0B5SH-M010F09Y | 1200 | 80 | IGBT4 HS |
| 10-P212NMA10B5SM01-L780F58 | 1200 | 80 | IGBT4 HS |

More details: www.vincotech.com/flowMNPC-0

**Available Housings:**
- 2-clips 12 mm
- 2-clips 17 mm

#### flowMNPC 0 SIC

**Possible Features:**
- Common Emitter configuration
- Kelvin Emitter for improved switching performance
- Mixed Voltage Neutral Point Clamped Topology [T-Type]
- Temperature sensor

**Part-No** | **Voltage (V)** | **Current (A)** | **Technology** | **Comments**
---|---|---|---|---
MNPC (T-type)-KE-Split Output-Cap-NTC-Common Emitter | 10-P212NMA10B7ME-M340F63Y | 1200 | 100 | SiC MOSFET SiC diode
| 10-P212NMA10B7MR-M340F68Y | 1200 | 100 | SiC MOSFET SiC diode

More details: www.vincotech.com/flowMNPC-0-SIC

**Available Housings:**
- 2-clips 12 mm

**Schematics see page: 200**
THREE-LEVEL MNPC (T-TYPE)

**Available Housings:**
- Flow 1 4-towers 12 mm

**Possible Features:**
- Mixed Voltage Neutral Point Clamped Topology (T-Type)
- Kelvin Emitter for improved switching performance
- Temperature sensor
- Integrated DC capacitor
- Split output for elimination of X-conduction at fast turn-on
- Low inductive commutation loop

### Part-No | Voltage (V) | Current (A) | Technology | Comments
--- | --- | --- | --- | ---
**MNPC (T-type)-KE-NTC**
10-FY127NMA150S5-M824F58 | 650 | 150 | IGBT S5 | 4-quadrant operations, very high speed; for ESS
10-PY127NMA150S5-M824F58Y | 650 | 150 | IGBT S5 | 4-quadrant operations, very high speed; for ESS
10-FY127NMB150S5-LE75F08 | 650 | 150 | IGBT S5 | 4-quadrant operations, very high speed; for ESS

**MNPC (T-type)-KE-Split Output-Cap-NTC**
10-FY127NMA150S5-LE75F08 | 650 | 150 | IGBT S5 | 4-quadrant operations, very high speed; for ESS

---

**3xMNPC (T-type)-KE-NTC**
10-FY12M3A025SH-M746F08 | 1200 | 25 | IGBT4 HS, IGBT3 | 4-towers 17 mm
10-PY12M3A025SH-M746F08Y | 1200 | 25 | IGBT4 HS, IGBT3 | 4-towers 12 mm
10-F112M3A025SH-M746F09 | 1200 | 25 | IGBT4 HS, IGBT3 | 4-towers 12 mm
10-P112M3A025SH-M746F09Y | 1200 | 25 | IGBT4 HS, IGBT3 | 4-towers 12 mm
10-FY12M3A040SH-M749F08 | 1200 | 40 | IGBT4 HS, IGBT3 | 4-towers 12 mm
10-PY12M3A040SH-M749F08Y | 1200 | 40 | IGBT4 HS, IGBT3 | 4-towers 12 mm
10-F112M3A040SH-M749F09 | 1200 | 40 | IGBT4 HS, IGBT3 | 4-towers 12 mm
10-P112M3A040SH-M749F09Y | 1200 | 40 | IGBT4 HS, IGBT3 | 4-towers 12 mm

---

Schematics see page: 200
More details: www.vincotech.com/flowMNPC-1

---

Schematics see page: 200
More details: www.vincotech.com/flow3xMNPC-1
Three-Level MNPC [T-Type]

FlowMNPC 2

Available Housings:
- 2 towers 13 mm

Possible Features:
- Mixed Voltage Neutral Point Clamped Topology [T-Type]
- Kelvin Emitter for improved switching performance
- Split output for elimination of X-conduction at fast turn-on
- Low inductive commutation loop
- Temperature sensor

Schematics see page: 200
More details: www.vincotech.com/flowMNPC-2

<table>
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<td>IGBT4 HS</td>
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</table>

VINcoMNPC X4

Available Housings:
- VINco X4

Possible Features:
- Mixed Voltage Neutral Point Clamped Topology [T-Type]
- Kelvin Emitter for improved switching performance
- Temperature sensor

Schematics see page: 200
More details: www.vincotech.com/VINcoMNPC-X4

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
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<td>800</td>
<td>IGBT M7</td>
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</table>

Available Housings:
- VINco X4 with Caps

More details: www.vincotech.com/VINcoMNPC-X4
THREE-LEVEL MNPC [T-TYPE]

VINco MNPC X12

Available Housings:
/ VINco X12

Possible Features:
/ Mixed Voltage Neutral Point Clamped Topology (T-Type)
/ Kelvin Emitter for improved switching performance
/ Temperature sensor
/ Integrated DC capacitor

Part-No | Voltage (V) | Current (A) | Technology | Comments
---|---|---|---|---
MNPC (T-type)-KE-Cap-NTC
70-W612M3A1K8C82-L300FP70 | 1200 | 1800 | IGBT4 | Improved NTC accuracy
70-W612NMA1K8M702-LC09FP70 | 1200 | 1800 | IGBT M7

Application:
/ SOLAR INVERTERS

Topology Features:
/ Split Advanced NPC topology (ANPC)

Schematics see page: 200
More details: www.vincotech.com/VINcoMNPC-X12
THREE-LEVEL ANPC

flowANPC 1

Available Housings:
/flow 1/4 towers 12 mm

Possible Features:
/ Advanced Neutral Point Clamped topology
/ Positive Side of Inverter
/ Negative Side of Inverter

Part-No | Voltage (V) | Current (A) | Technology | Comments
--- | --- | --- | --- | ---
ANPC-split-Pos-NTC 10-PG12NAB008MR04-LC59F46T | 2400 | 150 | SIC MOSFET | -
ANPC-split-Neg-NTC 10-PG12NAC008MR04-LC69F46T | 2400 | 150 | SIC MOSFET | -

Schematics see page: 201
More details: www.vincotech.com/flowANPFC-1

flowANPC 1 split

Available Housings:
/flow 1-4 towers 12 mm

Possible Features:
/ Temperature sensor
/ Positive Side of Inverter
/ Negative Side of Inverter
/ Advanced Neutral Point Clamped topology
/ Split output for improved switching performance

Part-No | Voltage (V) | Current (A) | Technology | Comments
--- | --- | --- | --- | ---
ANPC-split-Pos-NTC 10-PG12NAB008MR04-LC59F36T | 2400 | 150 | SIC MOSFET | complementary to LC59F36T
ANPC-split-Pos-NTC 10-PG12NAB008MR04-LC59F46T | 2400 | 150 | SIC MOSFET | complementary to LC69F46T
ANPC-split-Neg-NTC 10-PG12NAC008MR04-LC69F36T | 2400 | 150 | SIC MOSFET | -
ANPC-split-Neg-NTC 10-PG12NAC008MR04-LC69F46T | 2400 | 150 | SIC MOSFET | -

Schematics see page: 201
More details: www.vincotech.com/flowANPC-1-split
### THREE-LEVEL ANPC

#### flowANPC 2

**Available Housings:**
- Flow 2 4 towers 12 mm

**Possible Features:**
- Advanced Neutral Point Clamped topology
- Integrated snubber capacitor
- Split output for improved switching performance
- Temperature sensor

### Table

<table>
<thead>
<tr>
<th>Part-No</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Technology</th>
<th>Comments</th>
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<tr>
<td>ANPC-split-NTC-Cap-KE</td>
<td>1200</td>
<td>300</td>
<td>IGBT S5</td>
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Schematics see page: 201
More details: www.vincotech.com/flowANPFC-2
### Housing Items

#### Screw Terminals

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<th>VNco X</th>
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<td>screw</td>
</tr>
<tr>
<td></td>
<td>Press-fit</td>
<td>Press-fit</td>
</tr>
<tr>
<td>Mechanical connection to PCB</td>
<td>screw</td>
<td>screw</td>
</tr>
<tr>
<td>Baseplate</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Height (mm)</td>
<td>17</td>
<td>16</td>
</tr>
</tbody>
</table>

#### MinISKiiP® Housings

<table>
<thead>
<tr>
<th>Housing</th>
<th>MinISKiiP® Ø</th>
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<th>MinISKiiP® 2</th>
<th>MinISKiiP® 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contacts</td>
<td>spring</td>
<td>spring</td>
<td>spring</td>
<td>spring</td>
</tr>
<tr>
<td>Height (mm)</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
</tbody>
</table>
flow ØB 17 mm

Dimensions:
- Height: 17 mm
- Length: 35 mm
- Width: 37 mm

Features:
- Single screw heat sink mounting
- Ultra-compact design
- Thermo-mechanical push-and-pull force relief
- Optionally with phase-change material

flow ØB 12 mm

Dimensions:
- Height: 12 mm
- Length: 35 mm
- Width: 37 mm

Features:
- Single screw heat sink mounting
- Ultra-compact design
- Thermo-mechanical push-and-pull force relief
- Optionally with phase-change material

flow Ø 17 mm

Dimensions:
- Height: 17 mm
- Length: 63 mm
- Width: 33 mm

Features:
- 2-clips for fast, easy assembly
- Qualified for wave soldering
- Convex shaped substrate for superior thermal contact
- Thermo-mechanical push-and-pull force relief

flow Ø 12 mm

Dimensions:
- Height: 12 mm
- Length: 63 mm
- Width: 33 mm

Features:
- 2-clips for fast, easy assembly
- Qualified for wave soldering
- Convex shaped substrate for superior thermal contact
- Thermo-mechanical push-and-pull force relief
flow Ø 17 mm 4-clip

Dimensions:
Height: 17 mm
Length: 66 mm
Width: 33 mm

Features:
/ 4-clips for fast, easy assembly
/ qualified for wave soldering
/ Convex shaped substrate for superior thermal contact
/ Thermo-mechanical push-and-pull force relief

---

flow Ø 17 mm 4-tower

Dimensions:
Height: 17 mm
Length: 66 mm
Width: 33 mm

Features:
/ 4-towers
/ Convex shaped substrate for superior thermal contact
/ Thermo-mechanical push-and-pull force relief

---

flow90°

Dimensions:
Height: 38 mm
Width: 66 mm
Depth: 21 mm

Features:
/ 90° mounting angle between heatsink and PCB
/ clip or screw-on heatsink mounting
/ Thermo-mechanical push-and-pull force relief
/ clip-in PCB mounting
/ Complies with DIN and IEC standards
/ Topologies are easily customized
/ Pre-applied phase-change material available on demand

---

flow Ø 12 mm 4-tower

Dimensions:
Height: 12 mm
Length: 66 mm
Width: 33 mm

Features:
/ 4-towers
/ Convex shaped substrate for superior thermal contact
/ Thermo-mechanical push-and-pull force relief
**flow 1 17 mm 4-tower**

**Dimensions:**
- Height: 12 mm
- Length: 82 mm
- Width: 38 mm

**Features:**
- 4-towers
- Convex shaped substrate for superior thermal contact
- Thermo-mechanical push-and-pull force relief

---

**flow 1B 12 mm**

**Dimensions:**
- Height: 12 mm
- Length: 72 mm
- Width: 36 mm

**Features:**
- 4-towers
- Ceramic substrate for Thick-film based designs
- Thermo-mechanical push-and-pull force relief

---

**flow 1 12 mm 4-tower**

**Dimensions:**
- Height: 12 mm
- Length: 82 mm
- Width: 38 mm

**Features:**
- 4-towers
- Convex shaped substrate for superior thermal contact
- Thermo-mechanical push-and-pull force relief

---

**flow 1 12 mm 2-clip**

**Dimensions:**
- Height: 12 mm
- Length: 72 mm
- Width: 36 mm

**Features:**
- 2-clip-in, reliable mechanical connection
- Qualified for wave soldering
- Convex shaped substrate for superior thermal contact
- Thermo-mechanical push-and-pull force relief
flow 1B 17 mm

Dimensions:
- Height: 17 mm
- Length: 72 mm
- Width: 36 mm

Features:
- 4-towers
- Ceramic substrate for Thick-film based designs
- Thermo-mechanical push-and-pull force relief

flow 1C

Dimensions:
- Height: 12 mm
- Length: 72 mm
- Depth: 52 mm

Features:
- 4-towers
- Ceramic substrate for Thick-film based designs
- Thermo-mechanical push-and-pull force relief

flow 2 17 mm

Dimensions:
- Height: 17 mm
- Length: 107 mm
- Width: 47 mm

Features:
- 4-towers
- Convex shaped baseplate for superior thermal contact
- Cu baseplate
- Thermo-mechanical push-and-pull force relief

flow 90 1

Dimensions:
- Height: 35 mm
- Width: 84 mm
- Depth: 21 mm

Features:
- 90° mounting angle between heatsink and PCB
- clip or screw-on heatsink mounting
- clip-in PCB mounting
- Thermo-mechanical push-and-pull force relief
flow 2 13 mm

Dimensions:
- Height: 13 mm
- Lenght: 107 mm
- Width: 47 mm

Features:
- 4-towers
- Convex shaped baseplate for superior thermal contact
- Cu baseplate
- Thermo-mechanical push-and-pull force relief

VINco E3s

Dimensions:
- Height: 17 mm
- Lenght: 152 mm
- Width: 62 mm

Features:
- Solid Cover Technology
- Standard mid-power industry package
- Driver pins are available in press-fit and solder-pin
- Tin plated solder pin terminals

VINco E3

Dimensions:
- Height: 17 mm
- Lenght: 12 mm
- Width: 62 mm

Features:
- Solid Cover Technology
- Standard mid-power industry package
- Driver pins are available in press-fit and solder-pin
- Tin plated solder pin terminals

VINco X8

Dimensions:
- Height: 16 mm
- Lenght: 242 mm
- Width: 129.2 mm

Features:
- Low inductive Package
- M4 low inductive interface for easy paralleling
- M6 high power screw contact
- Press-fit pin driver contact
- Fully symmetrical layouts
**VINco X4**

**Dimensions:**
- Height: 16 mm
- Length: 134.8 mm
- Width: 129.2 mm

**Features:**
- Low inductive Package
- M4 low inductive interface for easy paralleling
- M6 high power screw contact
- Press-fit pin driver contact
- Fully symmetrical layouts

---

**VINco X12**

**Dimensions:**
- Height: 16 mm
- Length: 323 mm
- Width: 129.2 mm

**Features:**
- Low inductive Package
- M6 high power screw contact
- Press-fit pin driver contact
- Fully symmetrical layouts

---

**MiniSKiiP® Ø**

**Dimensions:**
- Height: 16 mm
- Length: 34 mm
- Width: 31 mm

**Features:**
- Easy assembly in one mounting step
- Flexible PCB design w/o pin holes
- Solderless spring contacts
- Rugged spring contact

---

**MiniSKiiP® 1**

**Dimensions:**
- Height: 16 mm
- Length: 42 mm
- Width: 40 mm

**Features:**
- Easy assembly in one mounting step
- Flexible PCB design w/o pin holes
- Solderless spring contacts
- Rugged spring contact
MiniSKiiP® 2

Dimensions:
Height: 16 mm
Length: 59 mm
Width: 52 mm

Features:
- Easy assembly in one mounting step
- Flexible PCB design w/o pin holes
- Solderless spring contacts
- Rugged spring contact

flow E1

Dimensions:
Height: 12 mm
Length: 62 mm
Width: 34 mm

Features:
- Convex shaped substrate for superior thermal contact
- Compact design
- CTI600 housing material
- Thermo-mechanical push-and-pull force relief

MiniSKiiP® 3

Dimensions:
Height: 16 mm
Length: 82 mm
Width: 59 mm

Features:
- Easy assembly in one mounting step
- Flexible PCB design w/o pin holes
- Solderless spring contacts
- Rugged spring contact

flow E2

Dimensions:
Height: 12 mm
Length: 62 mm
Width: 57 mm

Features:
- Convex shaped substrate for superior thermal contact
- Compact design
- CTI600 housing material
- Thermo-mechanical push-and-pull force relief
Version 1

The ordering code is identical with the product name shown here. It remains valid for all products released before mid 2009 and subsequent releases within product families established before 2009.

**Product Identification**
- **Leading Number**: Power modules, Relays, Hybrids
- **Version**: V23990
- **Part Number**: V23909
- **Technology Group**: Power modules

**Version 2**

Version 2 introduces a new name and ordering code for products released after mid 2009.

**Product Identification**
- **Leading Number**: Power modules, Relays, Hybrids
- **Version**: V23990
- **Part Number**: V23909
- **Technology Group**: Power modules

**Option Code (optional)**
- **Internal Identifier**: Optional parts (e.g. brake), Press-fit option
- **technology Group**: For UL notification

**Pinout**
- Modules with same topology, same housing, and same pins have same character

**Flow housing with Solder Pins**
- **Voltage**: 00 V, 05 V, 10 V, 15 V, 20 V
- **Current/RDS(on)**: 099, 045, 005, 005, 005

**Flow housing with Press-fit Pins**
- **Voltage**: 00 V, 05 V, 10 V, 15 V, 20 V
- **Current/RDS(on)**: 099, 045, 005, 005, 005

**Screw Terminals**
- **Voltage**: 00 V, 05 V, 10 V, 15 V, 20 V
- **Current/RDS(on)**: 099, 045, 005, 005, 005

**MiniSKiiP® options**
- **Voltage**: 00 V, 05 V, 10 V, 15 V, 20 V
- **Current/RDS(on)**: 099, 045, 005, 005, 005

**Technology**
- **Voltage**: 00 V, 05 V, 10 V, 15 V, 20 V
- **Current/RDS(on)**: 099, 045, 005, 005, 005

**Chip Technology**
- **Voltage**: 00 V, 05 V, 10 V, 15 V, 20 V
- **Current/RDS(on)**: 099, 045, 005, 005, 005

**Option Code (optional)**
- **Example**: P868-49Y/3/PM

*Examples of Technology Group*
- Power modules
- Relays
- Hybrids
COMPONENT TECHNOLOGY FEATURES

- **IGBT fast** / High efficiency in hard switching and resonant topologies / High speed switching / Low gate charge
- **IGBT HS** / High efficiency in hard switching and resonant topologies / High speed switching / Low gate charge
- **IGBT M6** / 10 μs short circuit time / Low gate capacitance / Low loss
- **IGBT M7** / Easy paralleling / Low turn-off losses / Low collector emitter saturation voltage / Positive temperature coefficient / Short tail current / Switching optimized for EMC
- **IGBT RC** / Optimised collector emitter saturation voltage and forward voltage for low conduction losses Reverse conductive IGBT technology / Smooth switching performance leading to low EMI levels
- **IGBT SS** / High speed and smooth switching / Low gate charge / Very low collector emitter saturation voltage
- **IGBT UltraFast** / High input impedance / High speed switching / Low saturation voltage
- **IGBT2 HS** / High speed switching / Low turn-off losses / Positive temperature coefficient / Short circuit proven
- **IGBT3** / Easy paralleling / Low turn-off losses / Low collector emitter saturation voltage / Positive temperature coefficient / Short tail current
- **IGBT3 HS** / High speed switching / Low EMI / Low turn-off losses / Low collector emitter saturation voltage
- **IGBT3 LL** / Easy paralleling / Low turn-off losses / Positive temperature coefficient / Short tail current
- **IGBT4** / Easy paralleling / Low turn-off losses / Low collector emitter saturation voltage / Positive temperature coefficient / Short tail current
- **IGBT4 HS** / Easy paralleling / High speed switching / Low switching losses
- **Infineon CoolMOS™ C3** / Easy to use/drive
- **Infineon CoolMOS™ C6** / Easy to use/drive / Extremely low losses / Very high commutation ruggedness
- **Infineon CoolMOS™ CFD2** / Easy to use/drive / Extremely low losses / Ultra-fast body diode / Very high commutation ruggedness
- **Infineon CoolMOS™ CP** / Lowest drain source on state resistance per chip area / Ultra low effective capacitances / Ultra low gate charge
- **NPT IGBT** / High input impedance / High speed switching / Low saturation voltage
- **Parallel Switch** / High speed switching / MOSFET paralleled with IGBT / Very low switching and conduction losses
- **Rectifier** / High inrush current capability
- **SiC MOSFET** / Fast reverse recovery / High speed SiC-MOSFET technology / Low on-resistance
- **ST MDmesh™ HS** / Avalanche tested / Low gate input resistance / Low input capacitance and gate charge
- **Thyristor (SCR)** / High inrush current capability
- **Trench Field Stop IGBT** / Positive temperature coefficient / Very low saturation voltage
- **Trench Field Stop II IGBT** / Low gate charge / Low collector emitter saturation voltage

ABBREVIATIONS

- **AC** Alternating Current
- **Al2O3** Aluminium Oxide
- **AlN** Aluminium Nitride
- **AMNPC** Advanced MNPC
- **ANPFC** Advanced Neutral Boost PFC
- **BRC** Brake Chopper
- **Cl** Converter Inverter
- **CiB** Converter Inverter Break
- **DC** Direct Current
- **DCB** Direct Copper Bonding
- **EMC** Electromagnetic Compatibility
- **FET** Field-Effect Transistor
- **FWD** Free Wheeling Diode
- **IGBT** Insulated Gate Bipolar Transistor
- **IPM** Intelligent Power Module
- **JFET** Junction Field-Effect Transistor
- **KE** Kelvin Emitter
- **LVRT** Low Voltage Ride Through
- **MNPC** Mixed voltage NPC
- **MOSFET** Metal-Oxide-Semiconductor Field-Effect Transistor
- **MPP** Maximum Power Point
- **NPC** Neutral Point Clamp
- **NPF** Neutral Power Factor Correction
- **NTC** Negative Temperature Coefficient
- **OE** Open Emitter
- **PCM** Phase-change Material
- **PFC** Power Factor Correction
- **PIM** Power Integrated Module
- **PTC** Positive Temperature Coefficient
- **Ro(α)wa** On resistance
- **REACH** Registration, Evaluation, Authorization & Restriction of Chemicals [EU 1907/2006]
- **RoHS** Restriction of certain Hazardous Substances [EU 2011/65]
- **S** Thermal Resistance
- **SCR** Silicon Controlled Rectifier [thyristor]
- **Si** Silicon
- **SiC** Silicon Carbide
- **SMPS** Switching Mode Power Supplies
- **SPFC** Symmetric Boost
- **T** Thermal Interface Material
- **Tj** Junction Temperature
- **UPS** Uninterruptable CHARGER STATIONS
- **ZVS** Zero Voltage Switching
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