

IPM

STPOWER ACEPACK, STPOWER SLLIMM

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Power Modules and IPM

Overview

Reduce design time and effort with the STPOWER portfolio of highly integrated, high-efficiency power modules for flexible, compact, and robust solutions ranging from tens of watts to several kilowatts. Our power module portfolio covers a wide range of voltage classes, current ratings, and topologies, so virtually any application can benefit from the outstanding performance, efficiency, and longevity offered by these devices.



The STPOWER's module portfolio includes the SLLIMM (small low loss intelligent molded modules) family of intelligent power modules (IPM) as well as the ACEPACK family of power modules.

STPOWER modules for all types of power switching applications:

- SLLIMM IPMs are highly integrated and compact power molded modules that combine intelligent driving and power switching sections in a single package. These modules are designed to drive motors from a few watts up to 7 kilowatts in applications such as home appliances, air conditioning inverters, and industrial motor drives. These intelligent power modules deliver significant efficiency gains with the latest generation of power semiconductors, optimized IC gate driving, and advanced packaging technology.
- ACEPACK power modules cover a wide range of automotive and industrial applications: from traction inverters, OBC, DC-DC and auxiliary converters for HEV and BEV, to charging stations, solar inverters, industrial motor drives, and UPS. The state-of-the-art power switches, based on proven ST SiC MOSFETs or IGBT and diode technologies ensure the best compromise between conduction and switching energies, maximizing the efficiency of any converter system from a few to hundreds of kilowatts. The compact and flexible all-in-one design ensures very high-power density and reduced time to market.

Applications

The power modules and IPM family offer a very large product portfolio covering several converter topologies for a wide range of automotive and industrial applications ranging from a few watts to several kilowatts.



Main inverter
(Electric traction)



On-board charger (OBC)



DC-DC converter for EV/HEV



HVAC and climate control



EV charging-DC fast charging stations



Energy generation and distribution



Industrial motor control



Power supplies and converters



Home and professional appliances

STPOWER ACEPACK Modules

Overview

ST's ACEPACK power modules come with diverse topologies that address industrial applications such as motor drives, solar inverters, charging stations, UPS, welding tools and power converter solutions, while they are also suitable for electric vehicle power applications like on-board chargers (OBC), electric traction drives and power converter solutions.

These highly reliable and compact power modules, featuring an embedded NTC thermistor, offer the best compromise between conduction and switching losses, maximizing the efficiency of any converter system in hard-switching circuitries for an application range from few kW to hundreds of kW. For a flexible and stable mounting, PressFIT and additional soldered pin options are provided. These power modules implement power semiconductor switches based on ST's state-of-the-art SiC MOSFET and IGBT technologies.

The ACEPACK power module family is composed of:

ACEPACK 1 and **ACEPACK 2**: these power modules target power applications ranging from 3 to 30 kW and are currently available in sixpack (3-phase full-bridge) and converter-inverter-brake (CIB) topologies, while more topologies can be developed thanks to their high flexibility.

ACEPACK DRIVE: this is a very compact, direct-liquid-cooled, sixpack module family optimized for hybrid and electric vehicle traction inverters. These power modules implement power semiconductor switches with unequalled RDS(on). The outstanding current density combined with extremely low conduction losses and light-load power losses boost system efficiency for extending the driving range of HEV/EVs.

ACEPACK power modules belong to our STPOWER family.

Power Modules and IPM / STPOWER ACEPACK Modules/ACEPACK 1 and 2

Part Number	Grade	Topology	Power Switches Type	Breakdown Voltage (V) max	I _c (A) (@ T _c =100°C) max	V _{CE(sat)} (V) typ	V _F (V) typ	Drain Current (Dc) (A) max	R _{DS(on)} (Ω) max	P _{TOT} (W) nom	Package	Package size (mm)	Pin Type
A1C15S12M3	Industrial	Converter Inverter Brake (CIB)	IGBTs	1200	15	1.95	3	-	-	142.8	ACEPACK 1	62.8 x 33.8	Soldered
A1C15S12M3-F	Industrial	Converter Inverter Brake (CIB)	IGBTs	1200	15	1.95	3	-	-	142.8	ACEPACK 1	62.8 x 33.8	Press Fit
A1F25M12W2-F1	Industrial	Fourpack	SiC	1200	-	-	-	50	0.034	127	ACEPACK 1	62.8 x 33.8	Press Fit
A1P25S12M3	Industrial	Sixpack	IGBTs	1200	25	1.95	2.95	-	-	197	ACEPACK 1	62.8 x 33.8	Soldered
A1P25S12M3-F	Industrial	Sixpack	IGBTs	1200	25	1.95	2.95	-	-	197	ACEPACK 1	62.8 x 33.8	Press Fit
A1P35S12M3	Industrial	Sixpack	IGBTs	1200	35	1.95	2.95	-	-	250	ACEPACK 1	62.8 x 33.8	Soldered
A1P35S12M3-F	Industrial	Sixpack	IGBTs	1200	35	1.95	2.95	-	-	250	ACEPACK 1	62.8 x 33.8	Press Fit
A1P50S65M2	Industrial	Sixpack	IGBTs	650	50	1.95	1.85	-	-	208	ACEPACK 1	62.8 x 33.8	Soldered
A1P50S65M2-F	Industrial	Sixpack	IGBTs	650	50	1.95	1.85	-	-	208	ACEPACK 1	62.8 x 33.8	Press Fit
A2C25S12M3	Industrial	Converter Inverter Brake (CIB)	IGBTs	1200	25	1.95	2.95	-	-	197	ACEPACK 2	62.8 x 56.7	Soldered
A2C25S12M3-F	Industrial	Converter Inverter Brake (CIB)	IGBTs	1200	25	1.95	2.95	-	-	197	ACEPACK 2	62.8 x 56.7	Press Fit
A2C35S12M3	Industrial	Converter Inverter Brake (CIB)	IGBTs	1200	35	1.95	2.95	-	-	250	ACEPACK 2	62.8 x 56.7	Soldered
A2C35S12M3-F	Industrial	Converter Inverter Brake (CIB)	IGBTs	1200	35	1.95	2.95	-	-	250	ACEPACK 2	62.8 x 56.7	Press Fit
A2C50S65M2	Industrial	Converter Inverter Brake (CIB)	IGBTs	650	50	1.95	1.85	-	-	208	ACEPACK 2	62.8 x 56.7	Soldered
A2C50S65M2-F	Industrial	Converter Inverter Brake (CIB)	IGBTs	650	50	1.95	1.85	-	-	208	ACEPACK 2	62.8 x 56.7	Press Fit
A2F12M12W2-F1	Industrial	Fourpack	SiC	1200	-	-	2.9	75	0.017	-	ACEPACK 2	62.8 x 56.7	Press Fit
A2P75S12M3	Industrial	Sixpack	IGBTs	1200	75	1.95	2.95	-	-	454.5	ACEPACK 2	62.8 x 56.7	Soldered
A2P75S12M3-F	Industrial	Sixpack	IGBTs	1200	75	1.95	2.95	-	-	454.5	ACEPACK 2	62.8 x 56.7	Press Fit
A2U12M12W2-F1C	Industrial	3-Level	SiC	1200	-	-	2.7	100	0.017	326	ACEPACK 2	62.8 x 56.7	Press Fit
A2U12M12W2-F2	Industrial	3-Level	SiC	1200	-	-	2.9	75	0.017	-	ACEPACK 2	62.8 x 56.7	Press Fit

Power Modules and IPM / STPOWER ACEPACK Modules/ACEPACK DRIVE

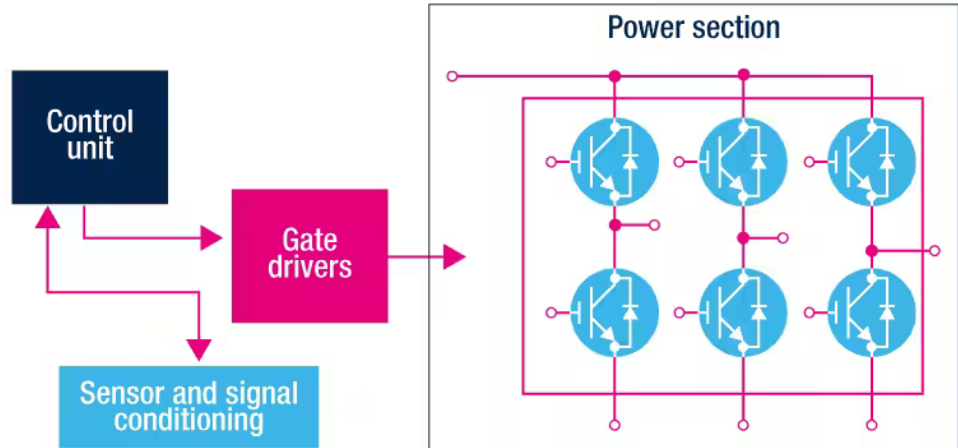
Part Number	Grade	Power Switches Type	Breakdown Voltage (V) max	$R_{DS(on)}$ (m Ω) (@ $T_J=25^\circ\text{C}$) typ	$R_{DS(on)}$ (m Ω) (@ $T_J=175^\circ\text{C}$) typ	Advanced features
ADP280120W3	Automotive	SiC	1200	3.8	6.5	-
ADP360120W3	Automotive	SiC	1200	2.55	4.25	-
ADP360120W3-L	Automotive	SiC	1200	2.55	4.25	Long AC Bus Bar
ADP46075W3	Automotive	SiC	750	1.6	2.6	-
ADP480120W3	Automotive	SiC	1200	1.9	3.35	-
ADP480120W3-L	Automotive	SiC	1200	1.9	3.35	Long AC Bus Bar
ADP61075W3	Automotive	SiC	750	1.2	1.95	-
ADP61075W3-L	Automotive	SiC	750	1.2	1.95	Long AC Bus Bar

STPOWER SLLIMM Intelligent Modules

Overview

Today's market requires high-performance solutions that meet stringent requirements for energy saving, compactness, and reliability as well as lower system costs in home appliances and low-/medium-power motor drive applications as well as in HVAC units, servo motors and other high-power industrial drives.

STMicroelectronics has developed the SLLIMM (Small Low-Loss intelligent molded module) family of **compact, high-efficiency**, dual in-line intelligent power modules (IPM) with optional extra features for addressing these needs.



SLLIMM IPMs belong to the STPOWER family.

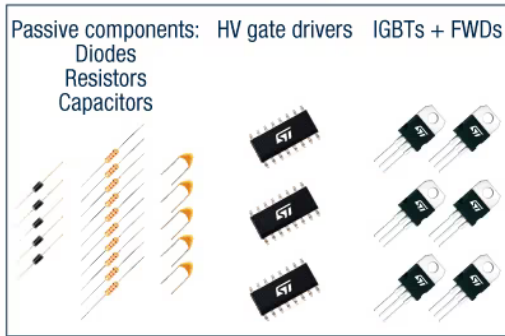
Advantages of intelligent power modules vs discrete-based inverters

Motor control applications usually share the same topology based on a three-phase inverter, which is used to convert static frequency and voltage into variable one.

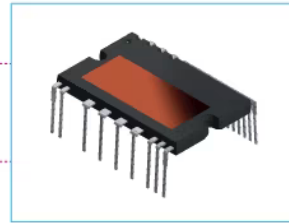
In a simplified manner, a three-phase inverter consists of six switches, gate drivers, a control unit, and a signal conditioning circuit. For certain power ranges, a heatsink mounted on a power stage is required. The typical discrete approach for motor drive designs offers high flexibility, but has several drawbacks: more components, larger PCB significant stray inductance, and complex heatsink mounting.

Instead, the use of an intelligent power module **overcomes these limits**, since it replaces the 3-phase inverter configuration with an integrated solution, improving the design time and reliability, reducing manufacturing cost and efforts, minimizing stray inductances and facilitating heatsink mounting.

Discrete approach



Intelligent power module "all-in-one" approach



Cons

- × Higher component count
- × Larger PCB
- × Significant stray inductances
- × Complex heatsink mounting

Pros

- ✓ All-in-one component
- ✓ Improved design time and reliability
- ✓ Reduced manufacturing effort
- ✓ Minimized stray inductances
- ✓ Easy heatsink mounting

SLLIMM intelligent power modules provide a high-integration level that means simplified circuit design, reduced bill of materials, lower weight, and improved reliability. Available with different options in terms of packages (fully molded and direct bonded copper) and leads (through-hole and SMD), these IPMs combine six power switches (planar and/or trench IGBT, planar and/or super-junction MOSFET) and drivers in a 3-phase inverter configuration **ensuring the best compromise between conduction and switching energies** with outstanding robustness and EMI behavior.

ST offers strong technical support and a comprehensive ecosystem (online simulator, evaluation boards, and documentation) to help designers in developing their applications.

Applications

Thanks to a very large product portfolio combining different package options and ST's best-in-class technologies, the SLLIMM family addresses a wide range of industrial applications:



Home and professional appliances

Air conditioners
(window/wall/portable)
Dishwashers
Dryers
Induction stovetops
Kitchen hoods
Refrigerators and freezers
Washing machines



Industrial tools, motor drives and equipment

AC Motor Drives
Servo Motor Drives
PMSM / BLDC
Motor control fans
Pumps and compressors



Home, building and city automation

Commercial
indoor/outdoor
HVAC units
Central
indoor/outdoor
HVAC units



Factory automation

Industrial robots



Automotive motor control

Automotive BLDC motor control



Body and convenience

HVAC and climate control

Product types:

SLLIMM nano

This series, including SLLIMM nano and SLLIMM nano 2nd series, combines six switches (IGBT or high voltage MOSFET) driven by three half-bridge high-voltage gate drivers.

SLLIMM nano

These very compact IPMs are available in different full-molded packages: surface mount (SMD) and through-hole (in line and zig-zag) options and with a current capability from 1 to 8 A.

The SLLIMM nano family is tailored for home appliances such as roller shutters, fridges, dishwashers, and washing machines as well as pumps, fans, and motor drives working up to 20 kHz in hard-switching circuitries in a range up to 600 W.

SLLIMM 2nd series

This series is designed using an internal configuration featuring one high-side and one low-side driver, and includes improved trench gate field-stop IGBTs and super-junction MOSFETs as switching options, with a current capability from 8 to 35 A. These IPMs are available in full-molded and top-side cooling direct bonded copper (DBC) packaging options suitable for low-to-medium and high-power applications respectively. The SLLIMM 2nd series enables high power efficiency in home appliances (washing machines, pumps, fans, and AC units) and motor drives working at up to 20 kHz in hard-switching circuitries from 300 W to 3 kW.

SLLIMM 2nd series

SLLIMM high power (HP)

This is the new compact, powerful, dual-in-line series, which expands the existing SLLIMM IPMs in terms of breakdown voltage, current capability, and power range.

SLLIMM high power (HP)

These IPMs integrate a complete inverter stage, including six short-circuit rugged IGBTs with freewheeling diodes, associated with high-side and low-side gate drivers in a single package. Built-in features for fault protection and temperature control are also included.

It's mainly tailored for industrial applications such as HVAC, servo motors, general-purpose inverters (GPI), and industrial washing machines for power applications up to 7 kW.

Discover our portfolio

These features make the SLLIMM family ideal for enhancing the efficiency of 3-phase inverters for any motor drive operating up to 20 kHz in hard-switching circuitries and for an application power range from 10 W to 7 kW.



Benefits

- System integration and compactness
- Reduced bill of materials
- High efficiency and low power losses
- Extended power range up to 7 kW
- Increased thermal dissipation capabilities
- High reliability and robustness
- Pin-to-pin compatible with main industrial IPM competitors

STGIF7CH60TS-X	Industrial	SDIP2F-26L	600	10	7	-	20	1.7	-	20	31	3-Phase Inverter	3-phase Induction Motor (ACIM), Cordless and Corded Vacuum Cleaners, Dryer, Fans, Multi-function Food Processor and Blenders, PMSM / BLDC Motor Control, Pumps and Compressors, Washing Machines	IGBTs	Built-in NTC, Bootstrap diode, Open emitters, Temperature sensor integrated	Undervoltage lockout, Smart shut down, Comparator	Positive inputs	Full Molded
STIB1060DM2T-LZ	Industrial	SDIP2B-26L	600	-	-	12.5	50	-	0.21	20	78	3-Phase Inverter	3-phase Induction Motor (ACIM), Air Conditioner (Window/Wall/Portable), PMSM / BLDC Motor Control	MOSFETs	Bootstrap diode, Open emitters, Temperature sensor integrated	Undervoltage lockout, Smart shut down, Comparator, Short-circuit	Positive inputs	DBC
STIB1560DM2T-LZ	Industrial	SDIP2B-26L	600	-	-	17	68	-	0.17	20	113	3-Phase Inverter	3-phase Induction Motor (ACIM), Air Conditioner (Window/Wall/Portable), PMSM / BLDC Motor Control	MOSFETs	Bootstrap diode, Open emitters, Temperature sensor integrated	Undervoltage lockout, Smart shut down, Comparator, Short-circuit	Positive inputs	DBC
STGIB10CH60S-L	Industrial	SDIP2B-26L	600	15	10	-	30	1.65	-	20	66	3-Phase Inverter	3-phase Induction Motor (ACIM), Air Conditioner (Window/Wall/Portable), Fans, PMSM / BLDC Motor Control, Pumps and Compressors, Washing Machines	IGBTs	Bootstrap diode, Open emitters, Temperature sensor integrated	Undervoltage lockout, Smart shut down, Comparator, Short-circuit	Positive inputs	DBC
STGIB15CH60S-XZ	Industrial	SDIP2B-26L	600	20	15	-	40	1.65	-	20	81	3-Phase Inverter	3-phase Induction Motor (ACIM), Air Conditioner (Window/Wall/Portable), Fans, PMSM / BLDC Motor Control, Pumps and Compressors, Servo Motor Drives	IGBTs	Bootstrap diode, Open emitters, Temperature sensor integrated	Undervoltage lockout, Smart shut down, Comparator, Short-circuit	Positive inputs	DBC
STGIB15CH60TS-XZ	Industrial	SDIP2B-26L	600	20	15	-	40	1.65	-	20	81	3-Phase Inverter	3-phase Induction Motor (ACIM), Air Conditioner (Window/Wall/Portable), Fans, PMSM / BLDC Motor Control, Pumps and Compressors, Servo Motor Drives	IGBTs	Built-in NTC, Bootstrap diode, Open emitters, Temperature sensor integrated	Undervoltage lockout, Smart shut down, Comparator, Short-circuit	Positive inputs	DBC
STGIB20M60S-L	Industrial	SDIP2B-26L	600	25	20	-	50	1.75	-	20	107	3-Phase Inverter	3-phase Induction Motor (ACIM), AC Motor Drives, Air Conditioner (Window/Wall/Portable), Central Indoor/Outdoor HVAC Unit, Fans, PMSM / BLDC Motor Control, Pumps and Compressors, Servo Motor Drives	IGBTs	Bootstrap diode, Open emitters, Temperature sensor integrated	Undervoltage lockout, Smart shut down, Comparator, Short-circuit	Positive inputs	DBC
STGIB20M60TS-LZ	Industrial	SDIP2B-26L	600	25	20	-	50	1.75	-	20	107	3-Phase Inverter	3-phase Induction Motor (ACIM), AC Motor Drives, Air Conditioner (Window/Wall/Portable), Central Indoor/Outdoor HVAC Unit, Fans, PMSM / BLDC Motor Control, Pumps and Compressors, Servo Motor Drives	IGBTs	Built-in NTC, Bootstrap diode, Open emitters, Temperature sensor integrated	Undervoltage lockout, Smart shut down, Comparator, Short-circuit	Positive inputs	DBC
STGIB30M60TS-LZ	Industrial	SDIP2B-26L	600	35	30	-	70	1.65	-	20	125	3-Phase Inverter	3-phase Induction Motor (ACIM), AC Motor Drives, Air Conditioner (Window/Wall/Portable), Central Indoor/Outdoor HVAC Unit, Fans, PMSM / BLDC Motor Control, Pumps and Compressors, Servo Motor Drives	IGBTs	Built-in NTC, Bootstrap diode, Open emitters, Temperature sensor integrated	Undervoltage lockout, Smart shut down, Comparator, Short-circuit	Positive inputs	DBC

Power Modules and IPM / STPOWER SLIMM Intelligent Modules/SLIMM high power

Part Number	Grade	Package	Breakdown Voltage (V) max	Collector Current (A) (@ T _c =25°C) max	Current Rating max	V _{CE(sat)} (V) (@ I _c Characterization) typ	Switching Frequency (kHz) max	P _{TOT} (W) nom	Topology	Target Application	Power Switches Type	Other Features	Protection Option Type	Logical Function	Substrate Material
STGIK10M120T	Industrial	SDIPHP-30L	1200	10	20	1.6	20	125	3-Phase Inverter	HVAC, Motor Drives, Servo Motor Drives	IGBTs	Built-in NTC, Bootstrap diode, Open emitters, Temperature sensor integrated	Undervoltage lockout, Smart shut down, Comparator, Short-circuit	Positive inputs	DBC
STGIK50CH65T	Industrial	SDIPHP-30L	650	50	100	1.8	20	150	3-Phase Inverter	3-phase Induction Motor (ACIM), AC Motor Drives, Central Indoor/Outdoor HVAC Unit, PMSM / BLDC Motor Control, Servo Motor Drives	IGBTs	Built-in NTC, Bootstrap diode, Open emitters	Undervoltage lockout, Smart shut down, Comparator, Short-circuit	Positive inputs	DBC
STGIK50CH65T2	Industrial	SDIPHP-30L	650	50	100	1.7	20	150	3-Phase Inverter	HVAC, Motor Drives, Pumps and Compressors, Servo Motor Drives	IGBTs	Built-in NTC, Bootstrap diode, Open emitters	Undervoltage lockout, Smart shut down, Comparator, Short-circuit	Positive inputs	DBC

Power Modules and IPM / STPOWER SLLIMM Intelligent Modules/SLLIMM nano

Part Number	Grade	Package	Breakdown Voltage (V) max	Collector Current (A) (@ T _c =25°C) max	Drain Current (Dc) (A) max	Current Rating max	V _{CE(sat)} (V) (@ I _c Characterization) typ	R _{DS(on)} (Ω) max	Switching Frequency (kHz) max	P _{tot} (W) nom	Topology	Target Application	Power Switches Type	Other Features	Protection Option Type	Logical Function	Substrate Material
STGIPN3H60	Industrial	NDIP-26L	600	3	-	18	2.15	-	20	9.7	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,PMSM / BLDC Motor Control,Refrigerators and Freezers	IGBTs	Bootstrap diode, Open emitters, 3 x Op-amp	Undervoltage lockout, Interlocking, Smart shut down, Comparator	Negative inputs	Full Molded
STGIPN3H60A	Industrial	NDIP-26L	600	3	-	18	2.15	-	20	9.7	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,PMSM / BLDC Motor Control,Refrigerators and Freezers	IGBTs	Bootstrap diode, Open emitters	Undervoltage lockout, Interlocking	Positive inputs	Full Molded
STGIPN3H60AT	Industrial	NDIP-26L	600	3	-	18	2.15	-	20	9.7	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,PMSM / BLDC Motor Control,Refrigerators and Freezers	IGBTs	Built-in NTC, Bootstrap diode, Open emitters	Undervoltage lockout, Interlocking	Positive inputs	Full Molded
STGIPN3H60T-H	Industrial	NDIP-26L	600	3	-	18	2.15	-	20	9.7	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,PMSM / BLDC Motor Control,Refrigerators and Freezers	IGBTs	Built-in NTC, Bootstrap diode, Open emitters	Undervoltage lockout, Interlocking, Smart shut down, Shut down (SD), Comparator, Short-circuit	Positive inputs	Full Molded
STGIPN3H60T-HL	Industrial	NSDIP-26L	600	3	-	18	2.15	-	20	9	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,Kitchen Hoods,PMSM / BLDC Motor Control,Refrigerators and Freezers	IGBTs	Built-in NTC, Bootstrap diode, Open emitters	Undervoltage lockout, Interlocking, Smart shut down, Shut down (SD), Comparator, Short-circuit	Positive inputs	Full Molded
STGIPQ3H60T-HL	Industrial	N2DIP-26L	600	3	-	6	2.15	-	20	12	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,Kitchen Hoods,PMSM / BLDC Motor Control,Refrigerators and Freezers	IGBTs	Built-in NTC, Bootstrap diode, Open emitters, Op-amp, ESD	Undervoltage lockout, Interlocking, Smart shut down, Shut down (SD), Comparator	Positive inputs	Full Molded
STGIPQ3H60T-HZ	Industrial	N2DIP-26L	600	3	-	6	2.15	-	20	12	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,Kitchen Hoods,PMSM / BLDC Motor Control,Refrigerators and Freezers	IGBTs	Built-in NTC, Bootstrap diode, Open emitters, Op-amp, ESD	Undervoltage lockout, Interlocking, Smart shut down, Shut down (SD), Comparator	Positive inputs	Full Molded
STGIPQ3H60T-HZS	Industrial	N2DIP-26L	600	3	-	6	2.15	-	20	12	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,Kitchen Hoods,PMSM / BLDC Motor Control,Refrigerators and Freezers	IGBTs	Built-in NTC, Bootstrap diode, Open emitters, Op-amp, ESD	Undervoltage lockout, Interlocking, Smart shut down, Shut down (SD), Comparator	Positive inputs	Full Molded
STGIPQ4C60T-HL	Industrial	N2DIP-26L	600	6	-	9	1.79	-	20	12.5	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,Kitchen Hoods,PMSM / BLDC Motor Control,Refrigerators and Freezers	IGBTs	Built-in NTC, Bootstrap diode, Open emitters, Op-amp	Undervoltage lockout, Interlocking, Smart shut down, Shut down (SD), Comparator, Short-circuit	Positive inputs	Full Molded
STGIPQ4C60T-HZ	Industrial	N2DIP-26L	600	6	-	9	1.79	-	20	12.5	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,Kitchen Hoods,PMSM / BLDC Motor Control,Refrigerators and Freezers	IGBTs	Built-in NTC, Bootstrap diode, Open emitters, Op-amp	Undervoltage lockout, Interlocking, Smart shut down, Shut down (SD), Comparator, Short-circuit	Positive inputs	Full Molded
STGIPQ5C60T-HL	Industrial	N2DIP-26L	600	5	-	10	1.7	-	20	13.6	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,Kitchen Hoods,PMSM / BLDC Motor Control,Refrigerators and Freezers	IGBTs	Built-in NTC, Bootstrap diode, Open emitters, Op-amp	Undervoltage lockout, Interlocking, Smart shut down, Shut down (SD), Comparator, Short-circuit	Positive inputs	Full Molded
STGIPQ5C60T-HLS	Industrial	N2DIP-26L	600	5	-	10	1.7	-	20	13.6	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,Kitchen Hoods,PMSM / BLDC Motor Control,Refrigerators and Freezers	IGBTs	Built-in NTC, Bootstrap diode, Open emitters, Op-amp	Undervoltage lockout, Interlocking, Smart shut down, Shut down (SD), Comparator, Short-circuit	Positive inputs	Full Molded
STGIPQ5C60T-HZ	Industrial	N2DIP-26L	600	5	-	10	1.7	-	20	13.6	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,Kitchen Hoods,PMSM / BLDC Motor Control,Refrigerators and Freezers	IGBTs	Built-in NTC, Bootstrap diode, Open emitters, Op-amp	Undervoltage lockout, Interlocking, Smart shut down, Shut down (SD), Comparator, Short-circuit	Positive inputs	Full Molded
STGIPQ5C60T-HZS	Industrial	N2DIP-26L	600	5	-	10	1.7	-	20	13.6	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,Kitchen Hoods,PMSM / BLDC Motor Control,Refrigerators and Freezers	IGBTs	Built-in NTC, Bootstrap diode, Open emitters, Op-amp	Undervoltage lockout, Interlocking, Smart shut down, Shut down (SD), Comparator, Short-circuit	Positive inputs	Full Molded
STIPN3M50T-H	Industrial	NSDIP-26L	500	-	1	2	-	3.6	20	10	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,PMSM / BLDC Motor Control,Refrigerators and Freezers	MOSFETs	Built-in NTC, Bootstrap diode, Open emitters, Op-amp, ESD	Undervoltage lockout, Interlocking, Smart shut down, Comparator	Positive inputs	Full Molded
STIPN3M50T-HL	Industrial	NSDIP-26L	500	-	2	4	-	1.7	20	10.6	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,PMSM / BLDC Motor Control,Refrigerators and Freezers	MOSFETs	Built-in NTC, Bootstrap diode, Open emitters, Op-amp, ESD	Undervoltage lockout, Interlocking, Smart shut down, Comparator	Positive inputs	Full Molded
STIPQ3M60T-HZS	Industrial	N2DIP-26L	600	-	3	6	-	1.6	20	11.7	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,Kitchen Hoods,PMSM / BLDC Motor Control,Refrigerators and Freezers	MOSFETs	Built-in NTC, Bootstrap diode, Open emitters	Undervoltage lockout, Interlocking, Shut down (SD), Comparator, Short-circuit	Positive inputs	Full Molded
STIPQ5M60T-HZ	Industrial	N2DIP-26L	600	-	5	10	-	1	20	12.8	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,Kitchen Hoods,PMSM / BLDC Motor Control,Refrigerators and Freezers	MOSFETs	Built-in NTC, Bootstrap diode, Open emitters	Undervoltage lockout, Interlocking, Shut down (SD), Comparator, Short-circuit	Positive inputs	Full Molded
STIPQ3M60T-HZ	Industrial	N2DIP-26L	600	-	3	6	-	1.6	20	11.7	3-Phase Inverter	3-phase Induction Motor (ACIM),Dishwasher,Fans,Kitchen Hoods,PMSM / BLDC Motor Control,Refrigerators and Freezers	MOSFETs	Built-in NTC, Bootstrap diode, Open emitters	Undervoltage lockout, Interlocking, Shut down (SD), Comparator, Short-circuit	Positive inputs	Full Molded

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