

Infineon Technologies New Products Introduction

May 2017



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Integrates a rectifier bridge, a brake chopper and an inverter stage

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Enables higher frequency operation for reduction in system cost and shrink

CoolMOS™ CE in IPAK Short Lead with ISO Standoff package

Best price-performance superjunction MOSFET for consumer and lighting applications



The new IPAK Short Lead with ISO Standoff package provides mold bumps at the bottom of the package body. These mold features ensure that the package can be fully inserted into the PCB while maintaining a well-defined distance between the PCB and the package body. After the soldering and cleaning process no residues are left between the PCB and the discrete MOSFET. IPAK Short Lead with ISO Standoff enables more effective cleaning in terms of residue removing, resulting in improved assembly yield and a larger effective creepage distance between the legs.

Features

- > Mold component feature between package body and leads
- > Well-defined standoff height
- > Optimized leg width and length

Benefits

- > More effective cleaning in terms of residue removing, resulting in improved assembly yield
- > Larger effective creepage distance between the legs

Target applications

- > Low power chargers
- > Adapters
- > PC silverbox
- > LCD TV
- > LED retrofit
- > LED drivers

Product collaterals / online support

- > Product family [page](#)
- > Promo [page](#)
- > Product brief [page](#)
- > Product landing pages
 - [IPSA70R2K0CE](#)
 - [IPSA70R1K4CE](#)
 - [IPSA70R950CE](#)
 - [IPSA70R600CE](#)
- > Product datasheet pages
 - [IPSA70R2K0CE](#)
 - [IPSA70R1K4CE](#)
 - [IPSA70R950CE](#)
 - [IPSA70R600CE](#)

CoolSET™ 5th generation quasi-resonant PWM flyback controller with integrated MOSFET (portfolio extension)

High performance with the integration of latest 700V and 800V CoolMOS™ P7 families in both DIP-7 and DSO-12 packages



With a patent pending novel quasi-resonant implementation, an intelligent adaptive digital algorithm has enabled the PWM controller to minimize the spread of switching frequency under different AC line input conditions. This innovative approach has enabled SMPS designers to design with higher switching frequency to take advantage of smaller magnetics and lowering of system BOM cost.

Features

- > Cascode configuration
- > Adjustable line input over and under voltage protection
- > V_{CC} and current sense pin short to ground protection
- > Novel quasi-resonant switching scheme
- > Selectable active burst mode entry/exit profile
- > Protection mode implemented with auto-restart scheme

Benefits

- > Fast start-up with cascode configuration
- > Robust SMPS with comprehensive input protection such as line over-voltage protection, brown out, V_{CC} and CS pin short to ground protection
- > Innovative novel quasi-resonant switching scheme for high efficiency and ease of EMI filter design
- > Dual active burst mode entry/exit profile to optimize light load efficiency for different design
- > Minimize interruption to operation with auto-restart scheme

Target applications

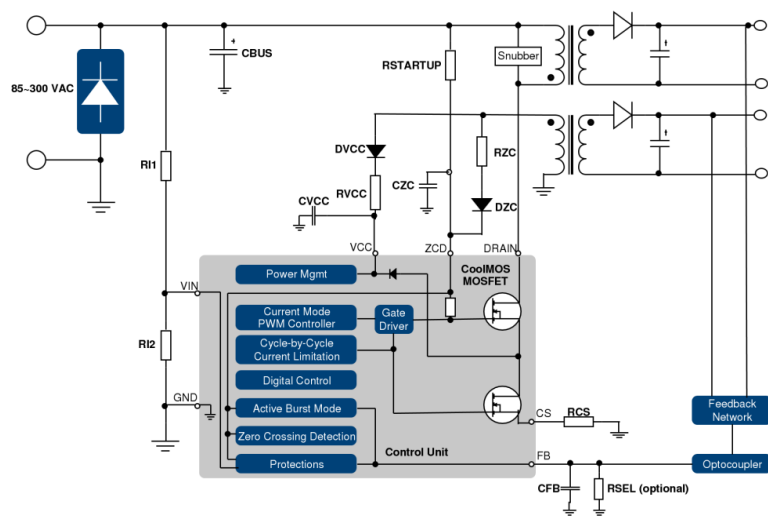
- > Auxiliary SMPS for major home appliances, industrial SMPS and server power
- > Main SMPS for set-top-box, water purifier and AC-DC adapter

Product collaterals / online support

- > Product family [page](#)
- > Product landing pages
[ICE5QR1680AG](#)
[ICE5QR4770AG](#)
[ICE5QR0680AZ](#)
- > Product datasheet [page](#)

Block diagram

ICE5QRxxxxAx



PFC and 3 phase inverter in one molded package

IFCM10S60GD, IFCM10P60GD, IFCM15S60GD, IFCM15P60GD

PFC and 3 phase inverter in one molded package, with 20kHz or 40 kHz PFC switching and targeting up to 2kW power.



Features

Package:

- > Dual-in-line molded module
- > Lead-free terminal plating; RoHS compliant
- > Very low thermal resistance due to DCB

Inverter side:

- > TRENCHSTOP™ IGBT3
- > Rugged SOI gate driver technology with stability against transient and negative voltage
- > Allowable negative VS potential up to -11V for signal transmission at VBS=15V
- > Integrated bootstrap functionality
- > Over current shutdown
- > Temperature monitor
- > Under-voltage lockout at all channels
- > Low side common emitter
- > Cross-conduction prevention
- > All of 6 switches turn off during protection

PFC:

- > TRENCHSTOP™ IGBT5
- > Rapid switching emitter controlled diode

Benefits

- > System size reduction with PFC integration into inverter module
- > Cost down due to less BOM counts and less assembly cost
- > Smaller and cheaper heatsink
- > Customer can design switching performance of PFC IGBT by using external driver circuit

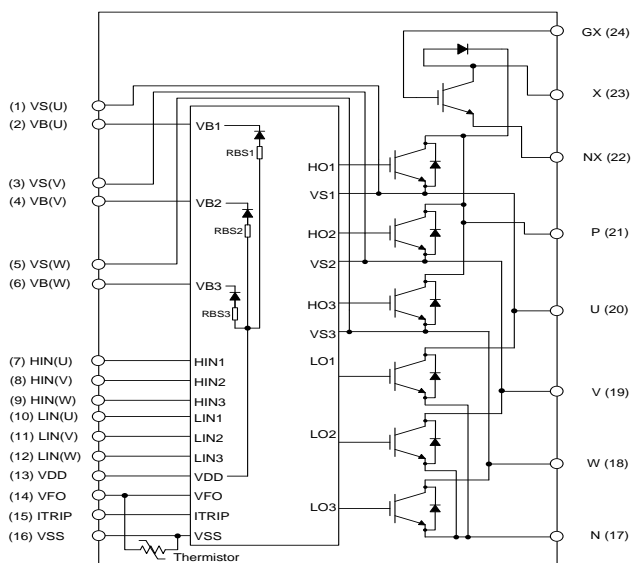
Product collaterals / online support

- > Product family [page](#)
- > Product landing pages
[IFCM10P60GD](#)
[IFCM10S60GD](#)
[IFCM15P60GD](#)
[IFCM15S60GD](#)
- > Register for on-demand webinar [here](#)

Support / Tools / Software

- > [CIPOSIM](#)

Block diagram



Target applications

- > Home appliances
- > Low power motor drives

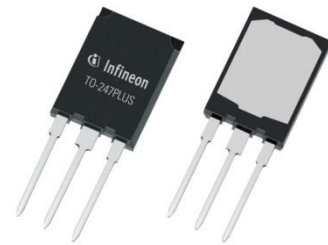
Application examples

- > Air conditioner
- > Low power industrial drives

1200V IGBT in TO-247PLUS 3pin

Higher current capability, improved thermal behavior

Higher current capability TO-247PLUS package accommodates up to 75A 1200V IGBT co-packed with 75A 1200V diode in TO-247 footprint.



Features

- > High power density - up to 75A 1200V IGBT co-packed with 75A diode in TO-247 footprint
- > 20% lower $R_{th(jh)}$ compared to TO-247-3
- > 15% better heat dissipation of TO-247PLUS vs TO-247-3 „
- > Extended collector-emitter pin creepage of 4.25mm
- > Extended clip creepage due to fully encapsulated front side of the package

Application examples

Reducing number of IGBT used in parallel:

- > Replacing 2pcs of 25A 1200V with 1pcs 50A 1200V
- > Replacing 2pcs of 40A 1200V in TO-247 with 1pcs 75A 1200V in TO-247PLUS

Upgrading available design for higher power:

- > Replacing 40A 1200V IGBT in TO-247 with 75A 1200V in TO-247PLUS allows > 40% $I_c(nom)$ increase

Improved system thermal management:

- > Replacing 40A 1200V IGBT in TO-247 with same current 40A 1200V but in TO-247PLUS-3 allows to reduce T_j and T_c by ~ 10-15% due to better heat dissipation properties of TO-247PLUS

Target applications

- > UPS
- > Battery Chargers
- > Drives
- > Solar
- > Welding

Benefits

- > Easy upgrade of available designs for higher power
- > Reduced paralleling, simplified design
- > Lower BOM cost
- > Improved thermal management, lower T_c
- > Easy and fast clip mounting, no need to consider screw hole creepage

Product collaterals / online support

- > Promo [page](#)
- > Product landing pages
[IKQ40N120CH3](#), [IKQ50N120CH3](#), [IKQ75N120CH3](#),
[IKQ75N120CT2](#), [IKQ50N120CT2](#), [IKQ40N120CT2](#)
- > Product datasheet pages
[IKQ40N120CH3](#), [IKQ50N120CH3](#), [IKQ75N120CH3](#),
[IKQ75N120CT2](#), [IKQ50N120CT2](#), [IKQ40N120CT2](#)

Support / Tools / Software

- > IPC 1200 V discrete IGBT in TO-247PLUS 3pin Level (S1/E1) online training [here](#)

Completing products (P2S)

Gate Driver

Boost stage/ Low side drivers: IR(S)4427, 2EDN

Three phase inverter 1200V rated:

- > Three phase drivers: IR2235
- > 3 x Half Bridges: IR2213 or IR2214
- > 3 x Half Bridges isolated : 2ED020112
- > 6 x single channel isolated: for example 1EDI20112

1200V IGBT in TO-247PLUS 4pin

Higher current capability, improved thermal behavior and extended C-E creepage

1200V IGBT in TO-247PLUS 4pin package offers higher current capability and lowest switching losses. The 4pin package configuration provides ultra-low inductance to the gate-emitter control loop with the 4pin package directly to the gate driver and allows for reduction the both of E_{on} and E_{off} losses amounting up to 20% lower total switching losses E_{ts} .



Features

- > High power density - up to 75A 1200V IGBT co-packed with 75A diode in TO-247 footprint
- > 20% total switching losses reduction E_{ts} due to 4pin package configuration
- > 20% lower $R_{th(jh)}$ compared to TO-247-3
- > 15% better heat dissipation of TO-247PLUS vs TO-247-3 „
- > Extended collector-emitter pin creepage of 5.4mm
- > Extended clip creepage due to fully encapsulated front side of the package

Application examples

- > UPS
- > Battery Chargers
- > Solar

Target applications

Increasing system power output:

- > 10% output power increase when replacing TO-247PLUS 3pin with TO-247PLUS 4pin
- > 15-20% output power increase when replacing TO-247 3pin with TO-247PLUS 4pin

Upgrading available design for higher power

Improved system thermal management:

- > Bigger active thermal pad area of TO-247PLUS 4pin allows > 10°C lower temperature on TO-247PLUS package and up to 0,015% -0,02% higher efficiency when comparing to TO-247 3pin

Benefits

- > Lower energy losses – higher power density – higher power output
- > Improved thermal condition – smaller heatsink or cooling fan
- > Reduced BOM cost

Product collaterals / online support

- > Product promo [page](#)
- > Product landing pages
[IKY40N120CH3](#), [IKY50N120CH3](#), [IKY75N120CH3](#)
- > Product datasheet pages
[IKY40N120CH3](#), [IKY50N120CH3](#), [IKY75N120CH3](#)

Support / Tools / Software

- > IPC 1200 V discrete IGBT in TO-247PLUS 4pin (S1/E1) online training [here](#)

Completing products (P2S)

Gate Driver

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Three phase inverter 1200V rated:

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EconoPIM™ 3 150A/ 1200V three phase PIM IGBT module

Integrates a rectifier bridge, a brake chopper and an inverter stage



EconoPIM™ 3 150A/ 1200V three phase PIM IGBT module with fast Trench/Fieldstop IGBT4, Emitter Controlles 4 diode and NTC.

Features

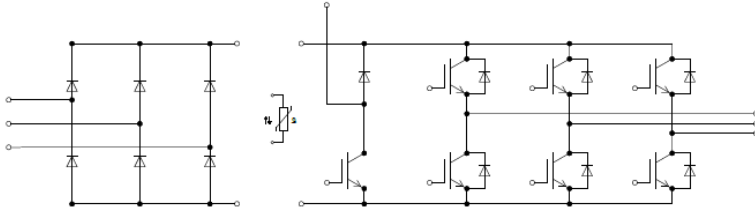
- > Fully Integration: Rectifier bridge, brake chopper, inverter stage and NTC in just one package to enable system cost savings
- > Power Density: Trenchstop™ IGBT 4 technology with $T_{vjop} = 150\text{ }^{\circ}\text{C}$ for higher power density compared to Trenchstop™ IGBT 3 for compact inverter designs

Benefits

- > Cost advantage by using well known PIM configuration
- > High integration and thus smaller BOM
- > Lower RTH due to pre-applied thermal interface material (TIM)
- > Reliable mounting technology PressFIT

Block diagram

PIM topology



Product collaterals / online support

- > EconoPIM™ 2&3 promo [page](#)
- > Product landing pages
[FP150R12KT4](#)
[FP150R12KT4P](#)
[FP150R12KT4_B11](#)
[FP150R12KT4P_B11](#)
- > Product datasheet pages
[FP150R12KT4](#)
[FP150R12KT4P](#)
[FP150R12KT4_B11](#)
[FP150R12KT4P_B11](#)

Target applications

- > Industrial Drives
- > Aircon

Support / Tools / Software

- > Power Simulation [IPOSIM](#)

EasyDUAL™ Halfbridge Topology with CoolSiC™ MOSFET

Enables higher frequency operation for reduction in system cost and shrink



The new EasyDUAL™ Halfbridge Topology with CoolSiC™ MOSFET is the leadtyp of our CoolSiC™ portfolio that enables radically new product designs. Thus, optimized inverter efficiency and performance can be achieved.

Features

- > Low device capacitances
- > Temperature independent switching losses
- > Intrinsic diode with low reverse recovery charge
- > Threshold-free on-state characteristics

Benefits

- > Highest efficiency for reduced cooling effort
- > Longer lifetime and higher reliability
- > Higher frequency operation
- > Reduction in system cost
- > Increased power density
- > Reduced system complexity
- > Ease of design and implementation

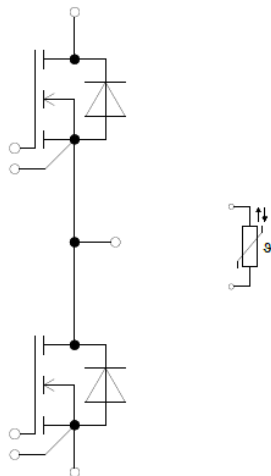
Target applications

- > Photovoltaic Inverter
- > UPS
- > EV Charger
- > Energy Storage / Battery Charging

Product collaterals / online support

- > Product promo [page](#)
- > Product landing [page](#)
- > Product datasheet [page](#)
- > Product brief [page](#)
- > CoolSiC™ Technology [brochure](#)
- > Bodos Power – The Future of Power Semiconductor [article](#)

Block diagram



Completing products (P2S)

1EDI EiceDRIVER™ Compact

Upcoming in 2017:

Module: DF11MR12W1M1_B11, DF23MR12W1M1_B11

Discrete: IMW120R045M1, IMZ120R045M1