Infineon Technologies
New Products Introduction

May 2017
CoolMOS™ CE in IPAK Short Lead with ISO Standoff package
Best price-performance superjunction MOSFET for consumer and lighting applications

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

PFC and 3 phase inverter in one molded package
IFCM10S60GD, IFCM10P60GD, IFCM15S60GD, IFCM15P60GD

1200V IGBT in TO-247PLUS 3pin
Higher current capability, improved thermal behaviour

1200V IGBT in TO-247PLUS 4pin
Higher current capability, improved thermal behavior and extended C-E creepage

EconoPIM™ 3 150A/1200V three phase PIM IGBT module
Integrates a rectifier bridge, a brake chopper and an inverter stage

EasyDUAL™ Halfbridge Topology with CoolSiC™ MOSFET
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

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

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

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

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

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: 2ED020I12
> 6 x single channel isolated: for example 1EDI20I12
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

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

**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

**Support / Tools / Software**

- IPC 1200 V discrete IGBT in TO-247PLUS 4pin (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 isolated: 2ED020I12
- 6 x single channel isolated: for example 1EDI20I12
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 Controlled 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 $T_{jop} = 150 \, ^\circ C$ for higher power density compared to Trenchstop™ IGBT 3

**Benefits**

- Cost advantage by using well known PIM configuration
- High integration and thus smaller BOM
- Lower $R_{TH}$ 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

Completing products (P2S)

1EDI EiceDRIVER™ Compact
Upcoming in 2017:
Module: DF11MR12W1M1_B11, DF23MR12W1M1_B11
Discrete: IMW120R045M1, IMZ120R045M1