IRPS5401
Five output point-of-load (POL) digital voltage regulator for FPGAs, ASICs and other multi-rail power systems

CIPOS™ Micro IRSM240-Series
IM240-S6Y1B, IM240-S6Y2B, IM240-S6Z1B, IM240-M6Y1B, IM240-M6Y2B, IM240-M6Z1B

600 V CoolMOS™ CFD7
High voltage superjunction MOSFET

Infineon® Embedded Power
TLE9845QX Application Kits N/PN

XMC4800 Automation Board-V2
Designed to evaluate the capabilities of the XMC4800 Microcontroller especially in EtherCAT® slave applications

EVAL-M1-099M-C & MCETOOLV2
Control Board for iMOTION™ Modular Application Design Kit (MADK)

6MS24017P43W41646
ModSTACK™ 3 based on FF1200R17KP4_B2 IGBT modules with the IGBT driver

Infineon® Eco Block modules in solder bond technology
IRPS5401

Five output point-of-load (POL) digital voltage regulator for FPGAs, ASICs and other multi-rail power systems

The IRPS5401 has been developed as a fully integrated PMIC solution that replaces multiple regulators with a single device in a compact 7 mm x 7 mm 56 pin QFN package, making it a perfect fit for current and future applications in high density ASIC, FPGA and CPU multi-rail systems, embedded computing systems and communication and storage systems.

Features & benefits

- Multi-output DC-DC with integrated FETs and sequencer
- Replaces many regulators with one PMIC
  - 4 switchers and 1 LDO in one package
  - Output A: 2 A (without), 50 A (with power stage)
  - Output B: 2 A
  - Outputs C, D: 4 A
  - Linear regulator: +/-0.5 A
  - Combined outputs C, D in dual phase mode for low ripple 8 A output
- Output voltage settable in fine resolution 5 mV steps
- Full PMBus: Margining, fault management, telemetry

Target applications

- FPGAs and ASICs in
  - Telecom
  - Computing
  - Video processing
  - IoT

Application examples

- Cinema projector
- Antenna system
- Security camera
- Machine vision
- Point-to-point wireless access
- Mass spectrometer
- Instrumentation analyzer
- Sonar receiver probe
- Communications radio
- Printer control board

Completing products

- IR3556
- TDA21240
- TDA21242
- IR3883

Typical PMIC configuration

Product collaterals / online support

- PowIRCenter GUI
- Product page
- Product data sheet
- How to power up a state-of-the-art Zynq UltraScale+ MPSoC Using IRPS5401 video
- Infineon’s Zynq UltraScale+ MPSoC multi-voltage power supply article
- www.infineon.com/xilinx
- www.infineon.com/altera

Product overview

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The CIPOS™ Micro IRSM240-Series is appropriate for low power motor drive applications like air purifiers, refrigerator compressor drives, fans and pumps. These products offer a cost effective power solution by leveraging industry standard footprints and processes compatible with various PCB substrates.

The IM240-M6 Series are 600V, 4A and IM240-S6 Series are 600V, 3A RC-DF IGBTs based on 3-phase inverter IPMs.

**Features**

- 600V 3-phase inverter including gate drivers & bootstrap function
- Low 2.1V $V_{CE(sat)}$ (typ, 25°C, 2.5A) and 2.3V $V_{CE(sat)}$ (typ, 25°C, 4A) RC-DF IGBTs
- UL Certified Temperature Sense (NTC)
- Advanced input filter with shoot-through protection
- Optimized dV/dt for loss and EMI trade offs
- Open-emitter for single and leg-shunt current sensing
- 3.3V logic compatible
- Driver tolerant to negative voltage (-VS)
- Undervoltage lockout for all channels
- Isolation 1900VRMS, 1min

**Benefits**

- These IPMs offer combination of low $V_{CE(sat)}$ RC-DF IGBT technology and the industry benchmark half-bridge high voltage, rugged driver in a compact package. Optimized for high efficiency MHA motor drives.

**Target applications**

- Designed for advanced appliance motor drive energy efficient fans and pumps

**Application examples**

- Aircon systems indoor and outdoor fans
- Dishwasher or washing machine pumps
- Hot water circulation pumps

**Product overview**

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600 V CoolMOS™ CFD7 - High voltage superjunction MOSFET
Infineon’s answer for resonant high power topologies

The 600 V CoolMOS™ CFD7 is Infineon’s latest high voltage superjunction MOSFET technology with integrated fast body diode and completes the CoolMOS™ 7 series. It is the ideal choice for resonant topologies in high power SMPS applications such as server, telecom and EV charging stations.

Features

- Ultra-fast body diode
- Best-in-class reverse recovery charge ($Q_{rr}$)
- Improved reverse diode dv/dt and diF/dt ruggedness
- Lowest FOM $R_{DS(on)}Q_g$ and $E_{oss}$
- Best-in-class $R_{DS(on)}/$package combinations

Benefits

- Best-in-class hard commutation ruggedness
- Highest reliability for resonant topologies
- Highest efficiency in target applications
- Enabling increased power density solutions

Target applications

- Server
- Telecom
- EV charging
- SMPS
- PC power

Product collaterals / online support

- Product family page

Block diagram

LLC SMPS

ZVS based power converter

Product overview incl. data sheets link

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The TLE9845QX is part of our Embedded Power product family. The TLE9845 Application Kits are designed to evaluate unidirectional brushed DC Motor applications. The two layers PCB is space and cost optimized to demonstrate an application near solution.

The application kits include an application near code example, with implemented fault-handling (Drain-Source-Monitoring, over-/under-voltage, over-current).

Features TLE9845QX

- ARM® Cortex™ M0 MCU, with system clock up to 25/40MHz
- Up to 64KB Flash memory, including 4K EEPROM emulation
- High-Side & Low-Side Switches with PWM capability
- Short Circuit protection with synchronized Drain-Source Voltage Monitoring
- Two full duplex serial interface (UART) with LIN support
- Two synchronous serial channel (SSC), compatible with SPI
- Integrated LIN transceiver compatible with LIN standard 2.2 and SAE J2602-supports fast programming via LIN
- Measurement unit:
  - 8-bit ADC with 7 channels for voltage and temperature supervision
  - 10-bit ADC with 13 channels (6 Analog Inputs, 5 HV Monitor inputs and battery sense)
  - On chip temperature and battery voltage measurement
- On chip oscillator & PLL for clock generation
- 5V power supply output
- Power saving modes:
  - MCU slow-down Mode
  - Sleep Mode
  - Stop Mode
  - Cyclic wake-up from Sleep Mode or Stop Mode

Benefits TLE9845QX

- System-on-chip solution with integrated ARM® Cortex® for DC motor control
- Platform solution for a size and weight optimized relay based motor control
- Integrated voltage regulator, LIN transceiver, switch inputs and relay driver
- Cyclic sense and cyclic wake-up capability saves average current consumption
- Minimum number of external components reduce BOM cost
- VQFN package with 7 x 7 mm footprint enables PCB space saving
- Single chip solution improves module reliability

Application examples

- Motor drive with P/N-channel Power MOSFET half-bridge application note

Target application

- Fan/Blower Brush-DC Motor control
- Pump Brush-DC Motor Control

Product collaterals / online support

- TLE984x product page
- TLE9845QX product page
- TLE9845 Appkit N (Motor connected to VBAT) page
- TLE9845 Appkit PN (Motor connected to GND) page
- Unboxing the TLE9845QX Application Kit video
- Getting Started with TLE9845QX Application Kit video

Completing products (see details in table below)

- Infineon Automotive 40V N-channel MOSFETS:
  - New SS08 OptiMOS™5 40V family IPCx00N04S5x-xxx
  - S308 Optimos™5 40V family IPZ40N04S5x-xxx
### MOSFET recommendations in detail

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### Product overview

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XMC4800 Automation Board-V2

Designed to evaluate the capabilities of the XMC4800 Microcontroller especially in EtherCAT® slave applications

The XMC4800 Automation Board V2 utilizes Infineon’s industry leading XMC ARM® Cortex®-M4 microcontroller in combination with Infineon supply, interface, communication and safety products. The XMC4800 Automation Board V2 is designed to evaluate the capabilities of the XMC4800 Microcontroller especially in EtherCAT® slave applications and can be used with a wide range of development tools including Infineon’s free of charge Eclipse based IDE, DAVE™.

Features

- XMC4800-E196 microcontroller based on ARM® Cortex®-M4@144MHZ - EtherCAT® slave controller, 2MB Flash and 352KB RAM
- Serial Wire Debug interface (to connect external debugger)
- ESD and reverse current protection Isoface
- OPTIGA™ Trust E
- User RGB LED
- Real Time Clock crystal
- SPI FRAM (64kB non-volatile memory)
- EtherCAT® slave node (2 EtherCAT® PHY and RJ45 Jacks)
- 24V ISOFACTM 8xIN and 8xOUT
- CAN transceiver
- Ethernet PHY and RJ45 Jack
- Micro-AB USB plug

Benefits

- Complete automation kit gateway
- Combine powerful microcontroller with EtherCAT® slave application
- Isolated interfaces for automation and industrial control
- Ethernet connectivity with software examples available
- 24V supply
- CAN connectivity
- Full software DAVE™ examples

Product collaterals / online support

- www.infineon.com/automationkit

Block diagram

Application example - micro programmable logic controller (micro PLC) system diagram

Completing products

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Product overview

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EVAL-M1-099M-C & MCETOOLV2
Control Board for iMOTION™ Modular Application Design Kit (MADK)

EVAL-M1-099M is a Control Board for iMOTION™ Modular Application Design Kit (MADK). It is powered by IRMCK099M iMOTION™ motor control IC featuring advanced Motor Control Engine (MCE).

For Eval-M1-099M the MCETOOLV2, an isolated JTAG and UART based debugger board, is required which is necessary for parametrizing and controlling the IRMCK099M IC.

The EVAL-M1-099M-C kit does not include the MCETOOLV2 which needs to be ordered separately.

Features

- Field-proven Advanced Motion Control Engine (MCE)
- Single-shunt or leg-shunt Sensorless FOC Control
- Integrated protection features

Benefits

- Get your motor to run in 1hr
- Easy motor parametrization and tuning
- Fast time to market – No coding required

Target applications

- Sensorless FOC BLDC Motor Control for fans
- Pumps or compressors

Application examples

- Refrigerator compressors
- Aircon compressors
- Industrial fans
- Industrial pumps

Product collaterals / online support

- EVAL-M1-099M-C page
- MCETOOLV2 page
- EVAL-M1-099M-C User Manual

Completing products

- CIPOS™ nano, CIPOS™ tiny, CIPOS™ micro, IPMs, discrete Gate Drivers, Discrete IGBTs, and CoolMOS

Block diagram

Product overview

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ModSTACK™ 3 based on FF1200R17KP4_B2 IGBT modules with the IGBT driver 2ED300C17-ST for applications up to 1400 A_{RMS} / 690 V_{RMS}. Appropriate interfaces and thermal management are included. Our ModSTACK™3 is the right fit ready to use system solution.

Features
- Designed for industrial approved cabinets
- Signals for control and monitoring (current of each leg, voltages, short circuit, heat sink temperature, failure signals)
- Reinforced isolation according to EN50178
- Vibration & shock resistant according to IEC60721
- IGBT Stack for typical voltages up to 690 V_{RMS}
- 3-phase topology
- 6-pack configuration
- Liquid cooled
- Implemented sensors like current, voltage, temperature
- Rated continuous current 1175 A_{RMS}; 2600 Hz
- Specific continuous current 1400 A_{RMS}; 2100 Hz
- Dimensions: 1090mm x 625mm x 250mm
- Weight: 90 kg
- DC Link rated voltage 1050 V
- Over voltage shutdown 1300 V

Benefits vs Standard ModSTACK
- Reduce effort for right fit power stage development
- Speed up systems time to market and enable profit income as early as possible
- Operation above 1100 V possible
- Low weight and size compared to Output Power

Product collaterals / online support
- Product page
- Product datasheet

Target applications
- Wind power
- Motor Drives

Application examples
- Wind Converters (full converters and DFIG)
- Drives >400kW (oil/gas industry, ships)

Block diagram

Product overview

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Infineon® Eco Block modules in solder bond technology

Infineon Technologies Bipolar extended their Eco Line with 34 mm and 50 mm TT and TD modules in 1800 V – additionally to the 1600 V portfolio.

Solder bond modules are ideal for applications where the high robustness of pressure contact technology is not necessarily a must. Typical applications are drives, power supplies, UPS and welding.

Features

- Current 160 A – 320 A
- Blocking Voltages: 1800 V
- Industrial standard package
- Electrically insulated copper base plate

Benefits

- Cost effective solution for higher competitiveness
- Predictably high performance and lifetime due to 100% x-ray monitoring
- Solid base plate for fast and easy mounting
- One-stop-shop due to complete module technology portfolio

Product collaterals / online support

- Product family page

Application examples

Input Rectifier for Drives

Low and Medium Voltage Soft Starter

Input Rectifier and Bypass for UPS

Static Switch

Product overview incl. product pages

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