New Product Introduction

February 2020

AURIX™ TC3xx family for automotive applications

OptiMOS™ power MOSFETs in innovative Source-Down package

600 V CoolMOS™ PFD7 superjunction MOSFETs

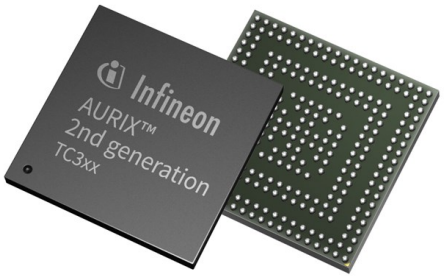
CoolSiC™ MOSFETs 650 V

XDP™ digital power XDPS21071

XMC2Go XTREME XMC1400

IHV-B 3.3 kV single switch module

AURIX™ TC3xx family for Automotive applications



The first AURIX™ TC3xx superset devices, the TC39x and TC38x are ready for launch. They are the perfect introduction to getting started with this highly scalable family.

No other automotive family can offer such breadth of portfolio whilst offering automotive safety and security. The TC3xx is highly compatible with the previous AURIX™ TC2xx generation and makes the perfect step up in performance and memory.

Features

- Upto 6 TriCore™ v 1.6 CPUs with 4 lockstep
- 300MHz Performance
- Upto 16 MB Automotive grade program flash
- Full suite of high performance peripherals including
  - ISO-26262 ASIL D Automotive Safety
  - EVITA Full Automotive Security thanks to HSM
  - Software over the air updates (support of SOTA A/B swap)
  - Full Automotive temp range temp range as standard
  - HOT Package (150° Junction) as option for harsh environments
  - Multiple packages per silicon

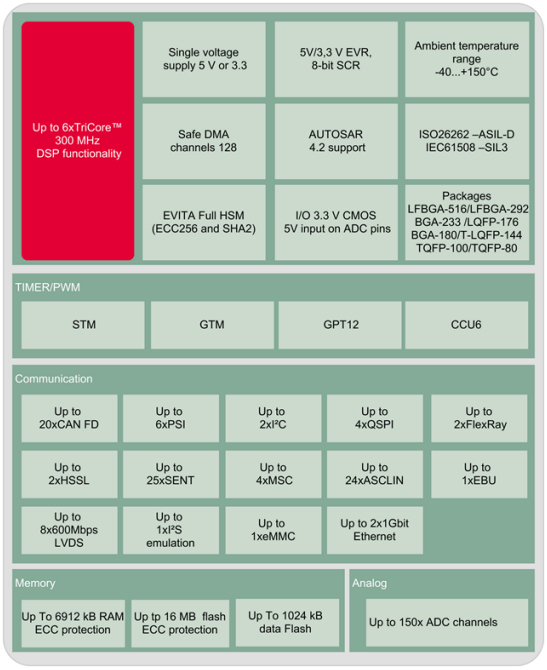
System Benefits

- Best-in-class performance enabling ASIL-D designs
- Upward and downward scalable within the AURIX™ TC3xx family
- A/B swap software update over the air support
- Easy migration from AURIX™ first generation thanks to the software and hardware compatibility

Target application

- Powertrain: Engine Management, Transmission, Transfer Case (4WD), Powertrain Domain
- xEV: Inverter, BMS, DCDC, OBC, xEV Domain, Hybrid Transmission
- Safety: Steering, Braking, Airbag
- ADAS: Gateway, Telematics, Data Fusion, radar, Domain Control

Block diagram



Competitive advantage

Only automotive MCU portfolio that offers this range of compatible devices, allowing customers the flexibility to go up or down in terms of performance. It's also possible to use AURIX™ TC3xx as a platform solution, targeting multiple applications with one family saving SW investment costs. To have this combination of compatible products and packages with Automotive Safety, Automotive Security with HSM as standard and HOT package for harsh environments is unique in the market.

Product overview incl. data sheet link

OPN	SP Number	Package
TC399XX256F300SBCKXUMA1	SP002725518	PG-LFBGA-516
TC399XP256F300SBCKXUMA1	SP002725524	PG-LFBGA-516
TC397XX256F300SBCKXUMA1	SP002725526	PG-LFBGA-292
TC397XP256F300SBCKXUMA1	SP002739600	PG-LFBGA-292
TC389QP160F300SADKXUMA1	SP002921222	PG-FBGA-516
TC387QP160F300SADKXUMA1	SP002921224	PG-LFBGA-292

Product collaterals / Online support

Product Family Page TC39X

Product Family Page TC38X

Product Brief TC39X

Product Brief TC38X

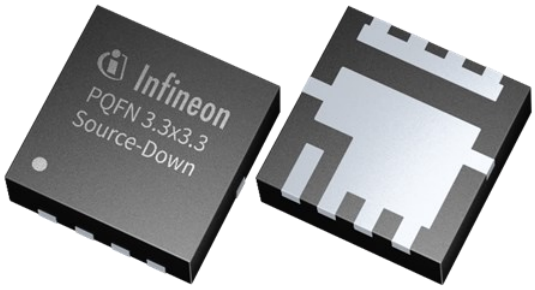
OptiMOS™ power MOSFETs in innovative Source-Down PQFN 3.3 x 3.3 mm package

Infineon introduces a new industry standard packaging concept with Source-Down technology. The silicon die is flipped upside down inside of the component, offering a number of advantages at the device and system level. Instead of the drain pin connected to the PCB over the thermal pad, the source pin is connected to it. Source-Down offers many benefits compared with current solutions like a 30% lower $R_{DS(on)}$, improved thermal performance and optimized layout possibilities.

The combination of new benchmark $R_{DS(on)}$ combined with its improved layout capabilities, makes the Source-Down package a true thermal management champion.

This new package helps to address many pain-points in a variety of end applications such as Drives, Telecom, SMPS and Servers to name a few.

The 25 V devices in the 3.3 x 3.3 mm Source-Down package are the first products entering the market with a product portfolio ranging from 25 V up to 150 V that will be fully released within the next two years. This new technology comes in two different footprint versions: the “Source-Down” and the “Source-Down Center-Gate” version, which is optimized for parallelization.



Features

- $R_{DS(ON)}$ reduction of up to 30% compared to current technology
- Superior thermal management option compared to standard package
- Optimized layout possibilities
- Two footprint versions available

Target applications

- Drives
- Telecom
- SMPS
- Server
- Oring
- Battery protection

Benefits

- Highest power density and performance
- Shrink of form factor
- Optimized PCB parasitics
- Decrease of R_{thJA} and R_{thJC}
- Better transfer of power losses
- Supports double side cooling (exposed clip)
- Source Down is easy to adapt on existing PCB
- Center Gate option enables optimized parallelization
- Performance of a Super SO8 in a smaller package
- Higher current capability

Competitive advantage

- Best in Class $R_{DS(on)}$ in 3x3 package outline
- Lower R_{thjc} leading to relaxed thermal design in the end application
- Enabling flexible Layout solutions leading to: Better thermal management, form factor shrink

Product collaterals / Online support

Product Page IQE006NE2LM5

Product Page IQE006NE2LM5CG

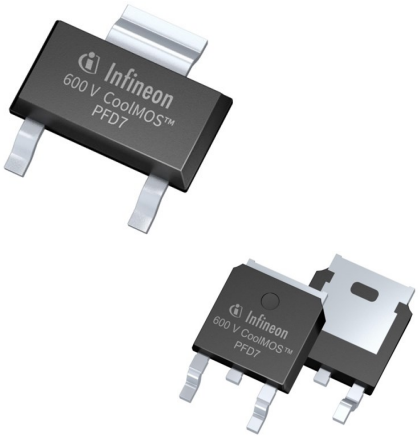
Product Brief

Application Note

Product overview incl. data sheet link

OPN	SP Number	Package
IQE006NE2LM5ATMA1	SP002434946	S3O8 3.3x3.3 mm2
IQE006NE2LM5CGATMA1	SP003321480	S3O8 3.3x3.3 mm2

600 V CoolMOS™ PFD7 superjunction MOSFETs – the next level for ultrahigh power density designs



The 600 V CoolMOS™ PFD7 MOSFET series sets a new benchmark in 600 V superjunction (SJ) technologies, dedicated to ultrahigh power density designs as well as low power motor drives.

The PFD7 high-voltage N-channel MOSFET series combines best-in-class performance with state-of-the-art ease of use, shaped by Infineon's experience of more than 20 years in pioneering in superjunction technology innovation. The products come with an integrated fast body diode ensuring a robust device and in turn reduced BOM for the customer.

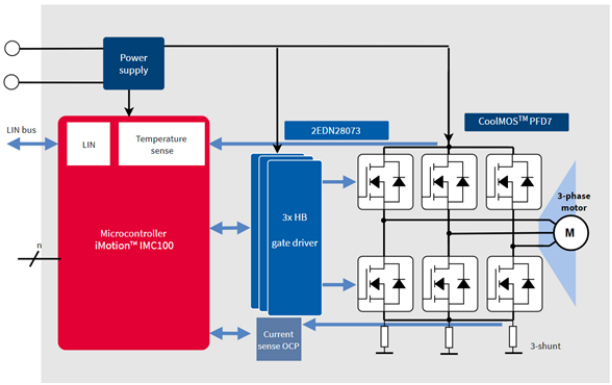
Features

- Very low FOM $R_{DS(on)}$ x E_{oss}
- Integrated robust fast body diode
- Up to 2 kV ESD protection
- Wide range of $R_{DS(on)}$ values
- Excellent commutation ruggedness
- Low EMI
- Broad package portfolio

Benefits

- Minimized switching losses
- Power density improvement compared to last CoolMOS™ charger technology
- Increased efficiency and improved thermal behavior compared to CoolMOS™ CE technology for low power drives applications
- BOM cost reduction and easy manufacturing
- Robustness and reliability
- Easy to select the right parts for design fine-tuning

Application diagram low power drives



Target application

- Consumer
- Charger
- Adapter
- Pumps
- Fans
- Fridge

Product overview incl. data sheet link

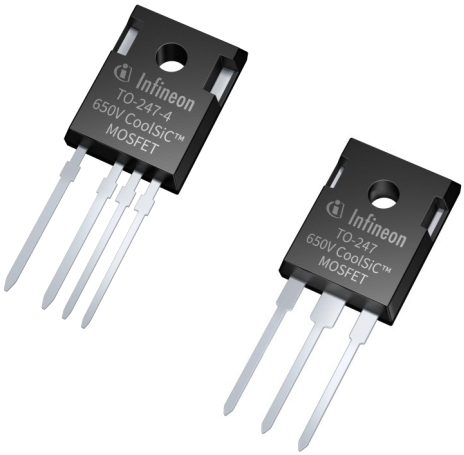
OPN	SP Number	Package
IPAN60R125PFD7SXKSA1	SP003235924	PG-TO220-3
IPAN60R210PFD7SXKSA1	SP003235776	PG-TO220-3
IPAN60R280PFD7SXKSA1	SP005354004	PG-TO220-3
IPAN60R360PFD7SXKSA1	SP003965454	PG-TO220-3
IPD60R1K0PFD7SAUMA1	SP005353999	PG-TO252-3
IPD60R1K5PFD7SAUMA1	SP004748872	PG-TO252-3
IPD60R210PFD7SAUMA1	SP003235792	PG-TO252-3
IPD60R280PFD7SAUMA1	SP003493724	PG-TO252-3
IPD60R2K0PFD7SAUMA1	SP004177934	PG-TO252-3
IPD60R360PFD7SAUMA1	SP003965466	PG-TO252-3
IPD60R600PFD7SAUMA1	SP005353996	PG-TO252-3
EVALDRIVE3PHPFD7TOBO1	SP005408808	Board

Product collaterals / Online support

Product family page

Product Brief

CoolSiC™ MOSFETs 650 V - Delivering reliable and cost-effective top performance



The CoolSiC™ MOSFETs 650 V are built on a state-of-the-art trench semiconductor process, optimized for the lowest losses in the application and the highest reliability in operation without any compromise.

Infineon's CoolSiC™ MOSFET technology leverages the strong SiC material properties of silicon carbide, adding unique features which increase the device performance, robustness and ease of use. This enables engineers to easily design systems, which are more efficient, compact, reliable and cost eff ective.

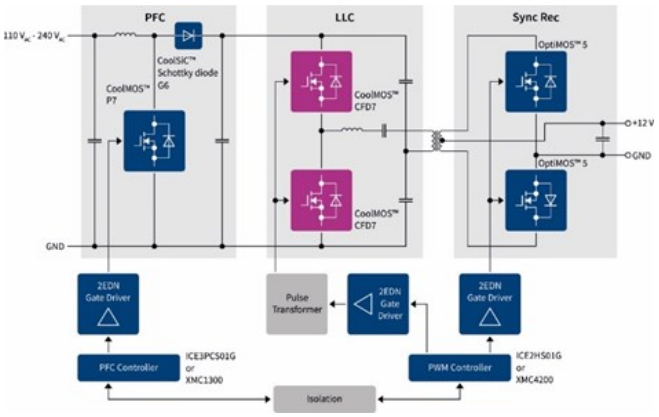
Features

- Low capacitances
- Optimized switching behavior at higher currents
- Commutation-robust fast-body diode with low reverse-recovery charge (Q_{rr})
- Superior gate-oxide reliability
- Excellent thermal behavior
- Increased avalanche capability
- Works with standard drivers

Benefits

- High performance, high reliability and ease of use
- Allows high system efficiency
- Reduces system cost and complexity
- Enables small system size
- Works in topologies with continuous hard commutation
- Fit for high temperature and harsh operations
- Enables bi-directional topologies

Application diagram Boost PFC



Target Applications

- Server
- Telecom
- Industrial SMPS
- Solar
- EV-Charging
- UPS
- Energy storage
- Battery formation

Product overview incl. data sheet link

OPN	SP Number	Package
IMW65R027M1HXKSA1	SP005398440	PG-TO247-3
IMW65R048M1HXKSA1	SP005398439	PG-TO247-3
IMW65R072M1HXKSA1	SP005398438	PG-TO247-3
IMW65R107M1HXKSA1	SP005398436	PG-TO247-3
IMZA65R027M1HXKSA1	SP005398432	PG-TO247-4
IMZA65R048M1HXKSA1	SP005398433	PG-TO247-4
IMZA65R072M1HXKSA1	SP005398434	PG-TO247-4
IMZA65R107M1HXKSA1	SP005398435	PG-TO247-4
EVAL3K3WTPPFCSICTOBO1	SP005411089	Board

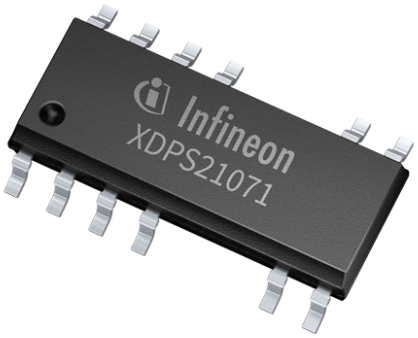
Product collaterals / Online support

Product Family Page

Product Brief

Application Note

XDP™ digital power XDPS21071: A multi-mode, forced-resonant-frequency high-performance flyback controller IC



Infineon's XDPS21071 is the first flyback controller IC in the industry to introduce ZVS (zero-voltage switching) on the primary side to achieve high efficiency with simplified circuitry and economical switches.

By driving an external low voltage switch to induce a negative current to discharge the main high voltage MOSFET, switching losses can be reduced further compared to traditional valley switching type of switching schemes.

To achieve high efficiency with synchronous rectification, the XDPS21071 multi-mode digital forced-frequency resonant (FFR) flyback controller IC ensures DCM (discontinued conduction mode) operation via valley detection for a safe and robust operation.

Features

- Forced frequency resonant mode
- Self-adaptive, multi-mode operation
- Supporting fast-charging applications with variable output voltage
- Fixed-frequency switching up to 140 kHz
- Adaptive overcurrent protection for limited power supply
- Frequency clamp at high-line input with low-output voltage
- UART port for configuring digital parameters
- DSO-12 SMD package

Benefits

- High power density design with FFR and 140 kHz switch frequency
- Support LPS protection to meet safety regulatory requirement
- Light-load efficiency optimized for variable output application
- Fast and precise system tuning with configurable digital parameters
- Lead-free, RoHS compliant

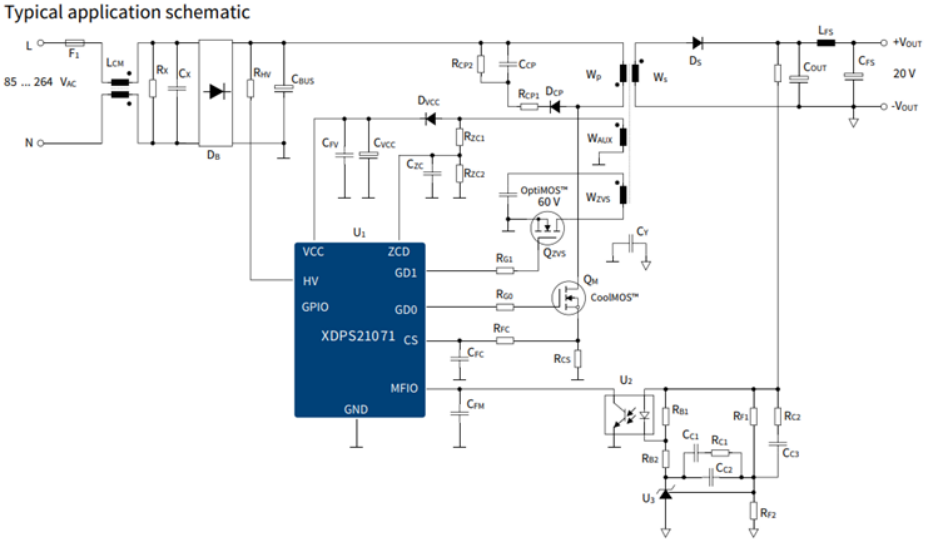
Target applications

- Adapter
- USB PD charger
- Smartphone charger

Competitive advantage

- First flyback controller with ZVS on the primary side

Typical application schematic



Product overview incl. data sheet/ Design guide link

OPN	SP Number	Package
XDPS21071XUMA1	SP005355100	PG-DSO-12
REFXDPS2107145W1TOBO1	SP005405679	Board

Product collaterals / Online support

Product Page

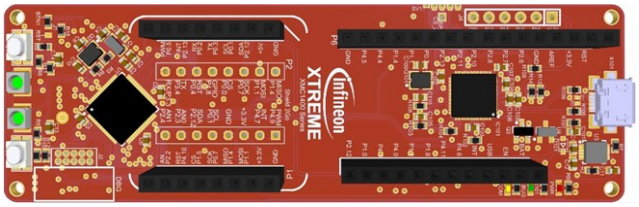
Product Brief

Application Note

Material Content Sheet

XMC2Go XTREME XMC1400

XTREME 1400 with OPTIGA™ Trust M End2End security connectivity kit from Infineon helps customers and engineers quickly and easily incorporate and enhance security of their devices while at the same time improving overall system performance.



Features

- XMC1404 (ARM® CortexTM-M0 based) Microcontroller, 48MHz, 200KB, 64-VFQFN
- Headers compatible with Infineon shield 2Go™, Adafruit Feather Wing™ and MikroClick™ from MikroElectronika
- On board SEGGER J-Link debugger and UART virtual COM port, with micro USB connector
- Off board SEGGER J-Link
- LED indicators for o Power o Debug o Virtual COM
- Two LED left for user
- Two push buttons left for user
- 6 pin expansion header

Benefits

- Highest integration on Microcontrollers
- Easy to design products
- Highest efficiency
- Reduced system cost

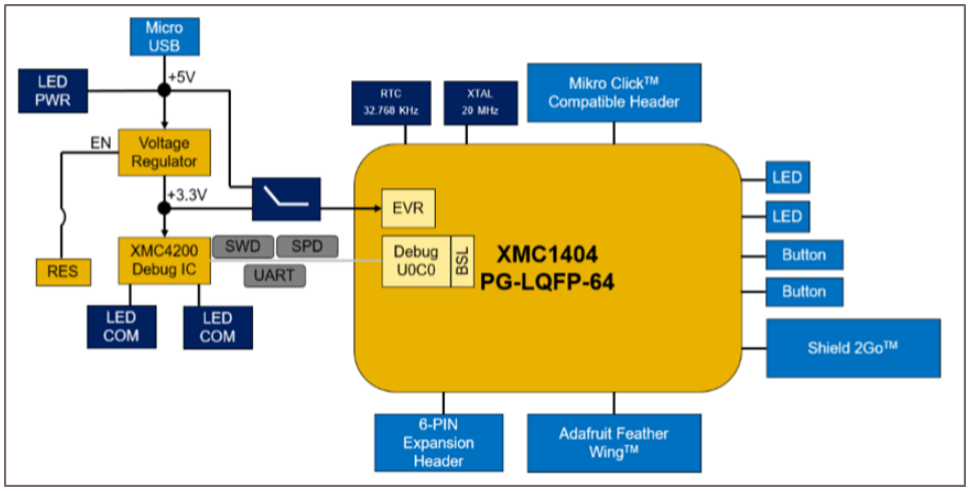
Target applications

- Security
- Connectivity

Competitive advantage

The single-chip solution OPTIGATM Trust M, securely stores unique device credentials and enables devices to connect to the cloud securely when using TLS up to ten times faster than software-only alternatives.

Block diagram



Product overview incl. product page link

OPN	SP Number	Package
KITXMC2GOXTRXMC1400TOBO1	SP005403887	Board

Product collaterals / Online support

User Manual

IHV-B 3.3 kV single switch module

FZ2000R33HE4 and FZ1400R33HE4

The well-known IHV-B 3.3 kV single switch IGBT module has been improved heavily to meet current and future requirements for traction and industry applications such as Medium Voltage Drives or HVDC.

It features the TRENCHSTOP™ IGBT4 and Emitter Controlled 4 diode in the standardized housing of 190 mm for the FZ2000R33HE4 and 130 mm for the FZ1400R33HE4. This results in 40% higher performance compared to the previous IGBT3 generation and >50% higher performance than all competition 1500 A 3.3 kV IHV devices. To fully utilize the increased power without compromising on lifetime, the power cycling capability has also been improved by factor two.

Customers can easily switch from the IGBT3 to the IGBT4 solution thanks to the standardized IHV-B housing. In addition, a frame-size jump is achieved when exchanging the previous FZ1500R33HE3 with the new FZ1400R33HE4 which results in smaller inverters for the same power.

Features

- TRENCHSTOP™ IGBT4 and Emitter Controlled 4 Diode
- Standardized IHV-B housing 190 mm (FZ2000) or 130 mm (FZ1400)
- Increased power cycling capability by factor 2 compared to TRENCHSTOP™ IGBT3
- AlSiC base plate
- Package with CTI > 600

Target applications

- Motor control and drives
- Traction
- Transmission and distribution
- Construction, commercial and agricultural vehicles

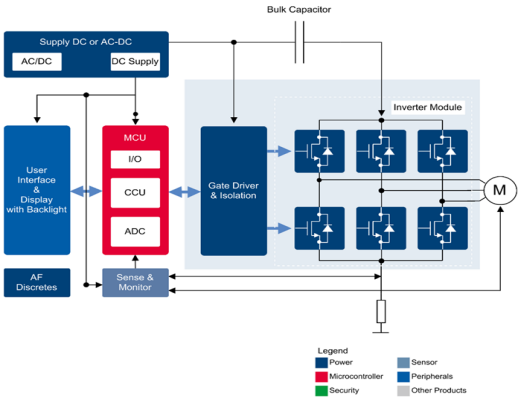
Benefits

- 40% higher performance than next best alternative for the same footprint
- FZ2000 allows first 850kW forced air cooled inverter and FZ1400 enables most compact 1.1MW on Liquid cooling
- Frame-size jump when exchanging FZ1500R33HE3 with FZ1400R33HE4
- Unbeatable robustness
- Enables full extra power without compromising on lifetime
- Best-in-class short circuit capability
- Increased thermal cycling capability

Competitive advantage

40% higher performance than next best alternative and unbeatable robustness

Application diagram: Traction



Product overview incl. data sheet link

OPN	SP Number	Package
FZ2000R33HE4BOSA1	SP003062218	AG-IHVB190-3
FZ1400R33HE4BPSA1	SP005122338	AG-IHVB130-3

Product collaterals / Online support

Product Family Page

Application Note

Bodo's Power Article May 2019