New Product Introduction

February 2023

SEMPER™ Nano NOR Flash

SEMPER™ Nano is Infineon's compact and power-efficient NOR Flash memory for small, battery-operated devices such as hearables, wearables, personal medical devices, industrial sensors, and IoT applications. This 1.8V device features 256 Mbit density to support advanced features and data logging. Configurable sectors provide flexibility to optimize storage of code and data in a single device.

Features

> 256 Mb density for code and data storage

> Low power modes including standby and deep power-down

> Low read, program, erase currents

> Tiny form factor via WLCSP (packaged) and KGW (wafer) options; standard BGA available on request

> Configurable sector architecture

> Error Correcting Code (ECC)

Competitive advantage

> Small form factor

> Low power consumption

> High reliability

> Easy to integrate (with SEMPER™ SDK)

Benefits

> Optimized for code and data storage in same device

> Smallest form factors, including SiP & modules

> Longer battery life

> Higher reliability

> Fast time-to-market with Infineon SEMPER™ Solutions Hub

>> SEMPER™ Software Development Kit
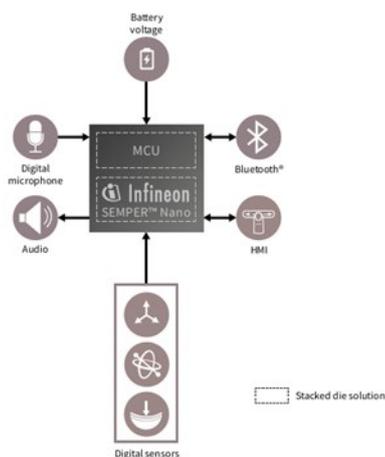
>> Evaluation Kit (Pmod compatible memory module)

Target applications

> Battery-powered hearables

> Wearables

> Compact industrial applications

Block diagram Hearables (TWS Earbuds)

Block diagram Smart watch & fitness band
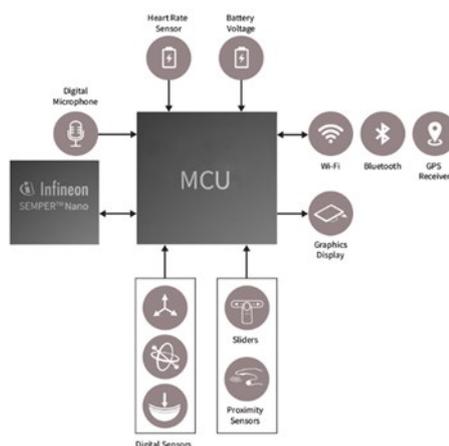
Product collaterals / Online support

Product page

Product family page

Evaluation board page

Product overview incl. data sheet link

OPN	SP Number	Package
S25FS256TDACHC113	SP005675871	SG-XFWLB-33

XDP™ XDP710-001

Industry's first wide voltage range hot-swap controller with a programmable digital SOA control for system

Features

> 256 Mb density for code and data storage

> Wide input voltage range of 5.5 V to 80 V, transient withstand up to 100 V for 500 ms

> Programmable and pre-set FET active SOA protection

> Compatible with Infineon's OptiMOS™, Linear FET and option of external FET selection using resistor strapping

> Integrated gate driver and charge pump for external N-channel MOSFET

> Advanced closed-loop SOA control and the fully digital operating mode

> Configurable fast FET's shut down: two step turn-off or 1.5 A pull-down current PMBus interface: 1 MHz

> Dedicated 12-bit current and voltage ADCs

> Precision input and output voltage monitoring and reporting: ≤1%

> Precision FET's current monitoring and reporting: ≤ 1%

> Precision input power monitoring and reporting: ≤ 2%

> Energy monitoring and reporting

> Programmable input and output OV and UV protections

> Support for external temperature sensor and OT protection

> 29-lead (6 mm x 6 mm) VQFN package

Benefits

> Complete system protection and management

> Real-time system measurement with accuracy

> On-the-fly flexibility and programmability

> Reliable analog core with PMBus power telemetry

> Digital configuration reduces external components

> Analog-assisted digital mode for support of legacy systems

> Multiple SOA configuration profiles in NVM reduces design time

> Input transient and MOSFET SOA protection enables the use of smaller FETs

> Small package

Target applications

> AI, ML, GPU accelerator cards

> Network router and switches

> Intelligent e-fuse

> Power distribution systems

> 24 V - 48 V industrial system

Competitive advantage

> High-speed 12-bit voltage and current ADCs (high-performance analog front end) provides active monitoring: V/I ≤ 1%, P ≤ 2%, E ≤ 5%

> Digital SOA control

> Programmable two-step gate shutdown: ~1.5 A (max)

> Integrated gate drive: 0 to 250 µA

Block diagram

Product collaterals / Online support
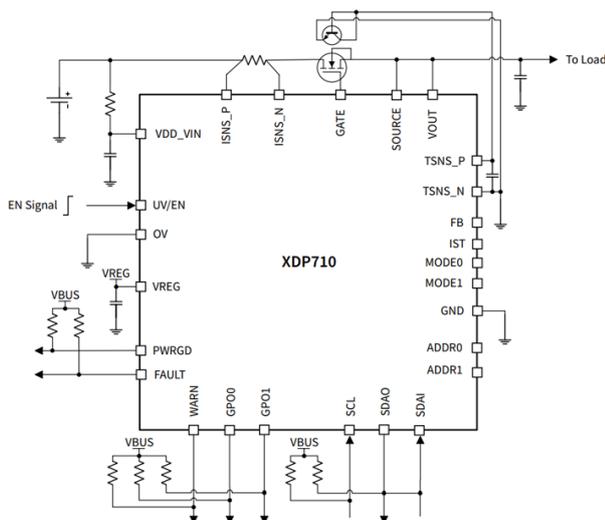
Product page

Product overview incl. data sheet link

OPN	SP Number	Package
XDP710001XUMA1	SP005856234	PG-VQFN-29

PROFET™ Load Guard 12V

PROFET™ Load Guard 12V smart high-side power switches bring highest design flexibility and system protection, providing overcurrent limitation, adjustable to load and system requirements. Design efforts are minimized by the adaptability of the current limit to changes in load-driving requirements, family pin & function compatibility and high compatibility to PROFET™ +2 12V devices. With the capacitive load switching mode, big capacitive loads can be charged quickly and safely. Further, ISO 26262-ready documentation supports the implementation in safety related applications.
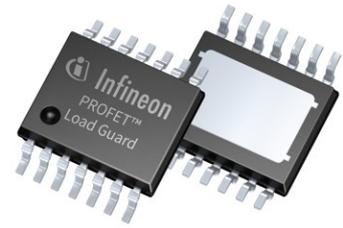
Features

> Adjustable overcurrent limitation

> Capacitive load switching mode

> Best-in-class current sense accuracy in low current regions

> Safety application note to support the use in functional-safety applications

Competitive advantage

> Big capacitive load switching capability via capacitive load switching mode

> Precise current sense feedback to the microcontroller

> Automotive qualification according to AEC-Q100 Grade 1

> Pin compatibility to PROFET™ +2 12V devices

> Cranking voltage > 2.7 V

## Benefits

> Adjustable overcurrent limitation (0.33 to 8.86 A) protects both load and systems, e.g. in PoC implementations

> Quickly charge big capacitive loads with capacitive load switching mode in the safe operating area

> Precise module diagnostics by high current sense accuracy

> Pin compatibility between family members and PROFET™ +2 12V devices with PG-TSDSO-14 exposed pad packages

Target applications

> ADAS sensor supply and protection (Camera, radar, sensor fusion)

> Intelligent power distribution

> Body control module

> Main switch for ECU power supply

> Protection of system and load supply

Block diagram
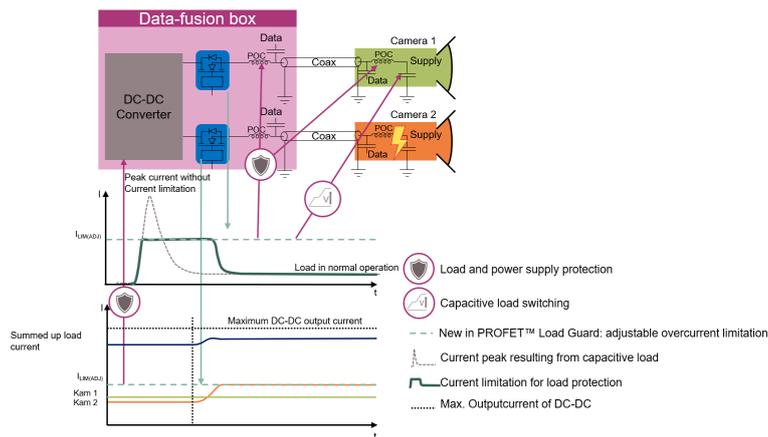
Product collaterals / Online support

[Product family page](#)

[Product brief](#)

[Customer connector](#)

[Whitepaper](#)

[Training](#)

[Video](#)

[Digital twin demonstrator](#)

Product overview incl. data sheet link

OPN	SP Number	Package
[BTG70902EPLXUMA1](#)	SP005589029	PG-TSDSO-14
[BTG70901EPLXUMA1](#)	SP005629578	PG-TSDSO-14
[BTG70502EPLXUMA1](#)	SP005399332	PG-TSDSO-14
[BTG70501EPLXUMA1](#)	SP005631588	PG-TSDSO-14

StrongIRFET™ 2 power MOSFETs in 40 V & 60 V

The new StrongIRFET™ 2 in 40 V & 60 V power MOSFETs are Infineon's latest generation of MOSFET technology addressing a wide range of applications and are suitable for both low and high switching frequencies. This new family compliments the well-established StrongIRFET™ MOSFETs by offering a higher performance option.

Features

> Broad availability from distribution partners

> Excellent price / performance ratio

> Ideal for high and low switching frequency

> High current rating

Benefits

> Increased security of supply

> Right-fit products

> Supports a wide variety of applications

> Increased product ruggedness

Competitive advantage

> Large portfolio of products for a wide range of applications

> Availability at multiple distribution partners

> Excellent price / performance ratio

Target applications

> Power and gardening tools

> Motor drives

> Battery management

> Energy storage systems

Product collaterals / Online support

Product family page

Product overview incl. data sheet link

OPN	SP Number	Package
IPB011N04NF2SATMA1	SP005633182	PG-TO263-3
IPB012N04NF2SATMA1	SP005632919	PG-TO263-3
IPB013N06NF2SATMA1	SP005588940	PG-TO263-3
IPB014N04NF2SATMA1	SP005632900	PG-TO263-3
IPB015N06NF2SATMA1	SP005588948	PG-TO263-3
IPB018N06NF2SATMA1	SP005588958	PG-TO263-3
IPB023N04NF2SATMA1	SP005632925	PG-TO263-3
IPB029N06NF2SATMA1	SP005588962	PG-TO263-3
IPF009N04NF2SATMA1	SP005633190	PG-TO263-7
IPF010N04NF2SATMA1	SP005632929	PG-TO263-7
IPF010N06NF2SATMA1	SP005588966	PG-TO263-7
IPF012N06NF2SATMA1	SP005588970	PG-TO263-7
IPF013N04NF2SATMA1	SP005632911	PG-TO263-7
IPF016N06NF2SATMA1	SP005588974	PG-TO263-7
IPD023N04NF2SATMA1	SP005632935	PG-TO252-3
IPD028N06NF2SATMA1	SP005588978	PG-TO252-3
IPD029N04NF2SATMA1	SP005633202	PG-TO252-3
IPD038N06NF2SATMA1	SP005588983	PG-TO252-3

1200 V, 3-phase gate driver for IGBT / SiC module and discrete with integrated bootstrap diode and over current and more tighten UVLO protection in DSO-24 package

EiceDRIVER™ 1200 V three-phase gate driver with typical 0.35 A source and 0.65 A sink currents in DSO-24 lead package for IGBT (Insulated Gate Biploar Transistor) / SiC (Silicon Carbide) Module and discretes.

By utilizing our 1200 V thin-film silicon-on-insulator (SOI) technology, 6ED2231S12T provides unique, measurable advantages including three low-ohmic integrated bootstrap-diode (BSD) and industry best-in-class robustness to protect against negative transient voltage spikes.

Features

> 1200 V thin-film-SOI technology

> Integrated ultra-fast bootstrap diode

> Tolerant to negative transient voltage up to -100 V (pulse width is up 700 ns) given by SOI-technology

> Output source / sink current capability +0.35 A / -0.65 A

> Full protection

>> Over current protection (ITRIP +/- 5% reference)

>> Shoot-through (cross-conduction) protection

>> Independent under-voltage lockout for VCC and VBS with tighten UVLO level

>> Fault reporting, automatic fault clear and enabled function on the same pin (RFE)

> DSO-24 package

Competitive advantage

> World first 6-in-1 1200 V gate driver

> Tolerant to negative transient voltage up to -100 V w/ SOI technology

> Can cover up to 10KW application

Block diagram

Benefits

> 3 –phase gate drive with integrated bootstrap diode in tiny footprint provides reduced BOM cost, smaller PCB space at lower cost with simpler design

> Optimized gate driver solution with design flexibility for IGBT/ SiC based PIM, discrete switch

> 100 V negative VS increased reliability / robustness

> 50% lower-level shift losses lead lower temperature operation and higher reliability

> Latch-up immune increased reliability

> Fast and accurate integrated over-current protection, provides space and cost savings compare to a discrete op-amp component solution while protecting the switches

> Under-voltage lockout provides protection at low supply voltage

> The DSO-24 package (DSO-28 with 4-pins removed) provides the best trade-off between small IC package and clearance distances
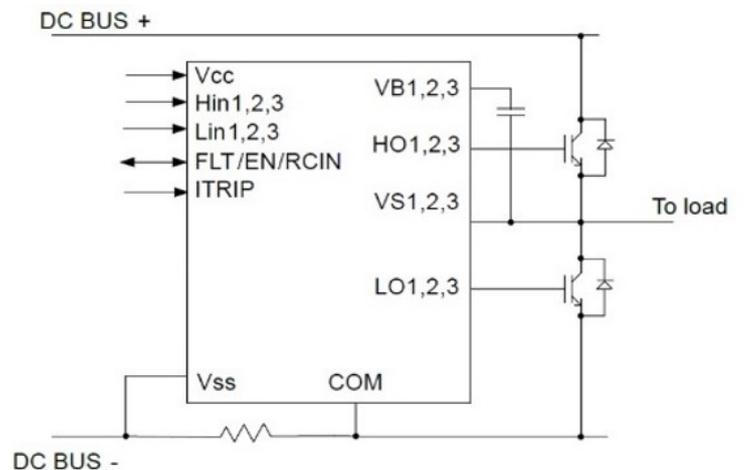
Target applications

> Ceiling fan-motor control and drive solutions

> Heating ventilation and air conditioning (HVAC)

> Industrial motor drives and controls

> Residential heat pumps

> Commercial air conditioning (CAC)

Product collaterals / Online support

Product page

Product family page

Product overview incl. data sheet link

OPN	SP Number	Package
6ED2231S12TXUMA1	SP005571779	PG-DSO-24

BGSA148MN10, BGSA149MN10 - Ultra small SP4T antenna tuners with resonance stoppers

The BGSA148MN10 / BGSA149MN10 is a single-pole four throws (SP4T) antenna tuning switch optimized for RF applications up to 7.125GHz. It is made of 4 low ON resistance / low OFF capacitance series switches and 4 shunt to ground switches enabling on-demand open-reflective or short-reflective OFF ports behavior. This last feature is of great value to reduce antenna engineer development time in case of unwanted antenna resonance or to improve antenna efficiency with less component tuning effort.

Features

> SP4T antenna tuner

> MIPI RFFE 2.1 control interface

> 22 µA current consumption

> Drop-in compatible

> 0.95 x 1.3 mm^2 package

Benefits

> Wide frequency operation range (up to 7.2 GHz)

> Ultra low R_{ON} x C_{OFF} FOM along with very high linearity

> Supporting both 1.2 V and 1.8 V VIO supply range

> "Resonance stopper" function

> Very small form factor

Competitive advantage

> Supporting sub-7.2 GHz NR / NR-U (5G) applications

> Eliminating unwanted resonance

> Usable on platforms with 1.2 V supply voltage

> Space saving due to ultra small package, suitable for space-constrained applications

Target applications

> Smartphones, notebooks, wearables, routers, telematics, tracking applications

Product collaterals / Online support

Product page BGSA148MN10

Product page BGSA149MN10

Block diagram

Application Block Diagram for RF Front End in a cellular mobile device
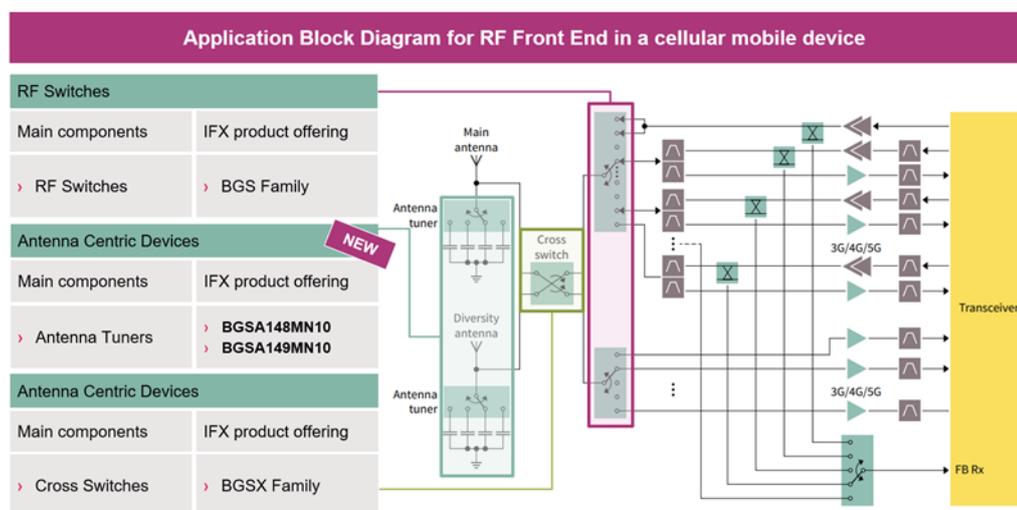
Product overview incl. data sheet link

OPN	SP Number	Package
BGSA148MN10E6327XTSA1	SP005636156	PG-TSNP-10
BGSA149MN10E6327XTSA1	SP005748247	PG-TSNP-10

AIROC™ CYW20835 Bluetooth® LE System on Chip

The AIROC™ CYW20835 Bluetooth® LE SoC is a Bluetooth® 5.2 core spec compliant device for IoT applications. Manufactured using the industry's advanced 40 nm CMOS low-power process, the CYW20835 employs high levels of integration to minimize external components, reducing the device footprint and the costs associated with implementing Bluetooth® low energy solutions.

The AIROC™ CYW20835 Bluetooth® LE SoC is designed to support the entire spectrum of Bluetooth® Low Energy use cases for home automation, accessory, sensors (medical, home, security, and industrial), lighting, wireless input devices including game controllers, remote controls, keyboards, and joysticks or any Bluetooth® LE connected IoT application.

The AIROC™ CYW20835 is also supported by fully certified Bluetooth® LE modules including the CYBLE-343072-02 and the CYBLE-333073-02. These embedded modules include a royalty-free Bluetooth® stack compatible with Bluetooth® 5.2 and are available in a 13.31 x 21.89 x 1.95 mm SMT form-factor and is certified to FCC, ISED, MIC, and CE regulations. These highly integrated modules are globally certified to support fast time-to-market.

Features

> Bluetooth® stack v5.2, Bluetooth® low energy: industry's most widely deployed Bluetooth® stack, 2-Mbps Bluetooth® LE support

> Secure over-the-air (OTA) firmware upgrade, RSA, X.509, SHA, AES128, integrated power amplifier (up to 12 dBm)

> MCU Subsystem: 96-MHz Arm® Cortex® -M4, 384 KB SRA

> Package: 60-pin QFN (7 mm x 7 mm)

> Supported in ModusToolbox™

Competitive advantage

> Faster CPU - can process Audio

> More RAM - larger datasets, edge machine learning

> Analog and digital microphone, other audio inputs - for devices requiring audio input

> Keyboard scanner and quadrature decoder - HID devices

> Higher Tx power, from less battery power - better range

Benefits

> Most widely deployed wireless IP – more than 1 Billion wireless Infineon devices in the field

> Strength in Bluetooth® classic complements Wi-Fi® in streaming applications to ensure reliability

> Ultra-low power by design – very low sleep, transmit and receive current

> Best-in-class receiver sensitivity for Bluetooth® LE and Bluetooth® Classic (EDR) no connection drops

> Low latency, data delivery for HID, gaming, real-time sensors

> Faster throughput: 2 Mbps LE enables faster firmware updates

> Full driver integration and certified production modules for time to market advantage

Target applications

> Home automation: wireless sensors, lighting controls, remote controls

> Accessories: game controllers, keyboards, joysticks

Block diagram

Product collaterals / Online support

Product page
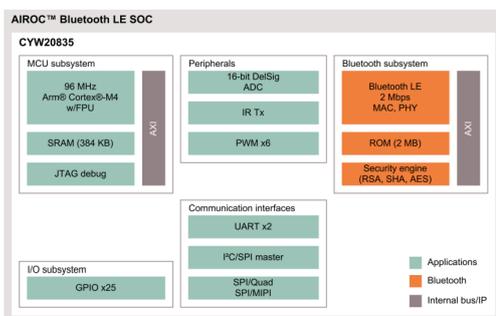
Board page

Product overview incl. data sheet / user manual link

OPN	SP Number	Package
CYW20835PB1KML1GGF	SP005875756	PG-VQFN-60
CYW920835M2EVB-01	SP005639371	board

AIROC™ CYBLE-343072-02 certified Bluetooth® LE module, based on the CYW20835 SoC

Infineon's AIROC™ CYBLE-343072-02 is a fully certified Bluetooth® LE module based on Infineon's CYW20835. The module includes a royalty-free Bluetooth® 5.2 compatible stack and is available in 13.31 x 21.89 x 1.95 mm SMT form-factor and is certified to FCC, ISED, MIC, and CE regulations. The CYBLE-343072-02 module includes an onboard crystal oscillator, passive components, flash memory, integrated trace antenna, and the CYW20835 SoC.

Features

> Bluetooth® 5.2 compatible module certified for FCC, ISED, MIC, and CE regulations

> Flexible interfaces: 1x MIPI DMI-C interface, 6 x 16-bit PWMs, up to 24 GPIOs, 2 x UARTs, 1 x SPI, 1 x I2C, 1 x ADC

> Performance Optimized: Arm® Cortex®-M4 96MHz processor, 512 KB on-module serial flash memory

> Supported in ModusToolbox™, a fully integrated development environment with Bluetooth® code samples

> Temperature range: –30° C to +85° C

> Module size: 13.31 x 21.89 x 1.95 mm

Benefits

> Fully certified module reduces the time needed for design, development, and certification processes

> Cost-optimized for applications without space constraints

> Nonvolatile memory for self-sufficient operation and over-the-air updates

> ModusToolbox™ provides an easy-to-use development environment to configure, develop, and program Bluetooth® applications

Competitive advantage

> Faster CPU – can process audio

> More RAM – larger datasets, edge machine learning

> Analog and digital microphone, other audio inputs – for devices requiring audio input

> Keyboard scanner and quadrature decoder – HID devices

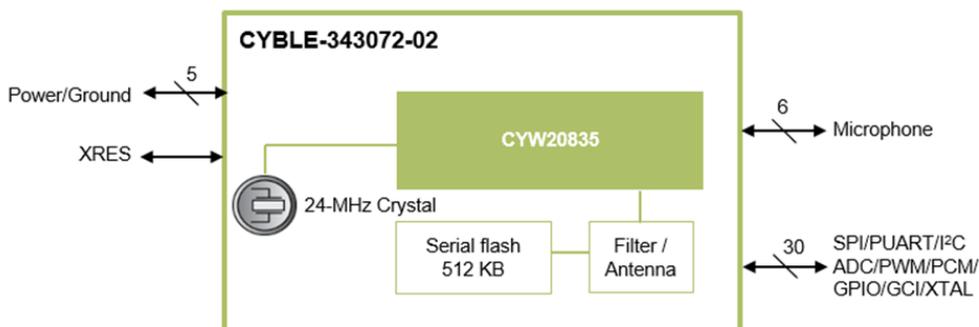> Higher Tx power, from less battery power – better range

Target applications

> Home automation: wireless sensors, lighting controls, remote controls

> Accessories: keyboards, joysticks, game controllers

Product collaterals / Online support

Product page

Board page

Block diagram

Product overview incl. data sheet / user manual link

OPN	SP Number	Package
CYBLE-343072-02	SP005723339	LG-MLGA-42
CYBLE-343072-EVAL-M2B	SP005856548	board

AIROC™ CYW5459X and Module Partner Murata

Infineon's AIROC™ CYW54591/ 54590 single-chip combo device features 2x2 dual-band 2.4 GHz and 5 GHz Wi-Fi 5 (802.11ac) and Bluetooth 5.1®. In IEEE 802.11ac mode, the WLAN operation supports rates of MCS0-MCS9 (up to 256 QAM) in 20 MHz, 40 MHz, and 80 MHz channels for data rates up to 867 Mbps. The CYW54591 offers real simultaneous dual band (RSDB) functionality enabling 1x1 + 1x1 connections on both the 2.4 GHz and 5 GHz bands at the same time, while the CYW54590 supports a 2 x 2 MIMO wireless connection.

The AIROC™ CYW54591/ 54590 are supported by three module partners Murata (Type 1XA (LBEE5XV1XA-540) (CYW54591) and Type 2BZ (LBEE5XV2BZ-883) (CYW54590), Quectel (FC80A (CYW54591)) and AzureWave (AW-CM572, AW-CM590, AW-CB511NF) in production today.

Features

> IEEE Wi-Fi 5 802.11a/b/g/n/ac-compliant Wi-Fi
>> Dual MAC Architecture: 2x2 MIMO or 1 + 1 RSDB
>> 20 / 40 / 80 MHz for higher throughput
>> 867 Mbps PHY rate
> Dual-band (2.4 / 5 GHz) operation
>> Dual-Mode Bluetooth® 5.1
>> Bluetooth® Classic (BR, EDR) + Bluetooth® LE
>> LE-2 Mbps, LE-Long Range, LE-Advertising Extensions, Slot availability Masks, AoA / AoD
> Host Interfaces
>> PCIe (3.0 compliant), SDIO 2.0 Wi-Fi
>> UART for Bluetooth®, I2S/PCM for Bluetooth® audio
> Advanced coexistence engine for optimal combined Wi-Fi and Bluetooth® performance

Competitive advantage

> Supports two concurrent data streams using Real Simultaneous Dual Band (RSDB) to lower latency
> Cirrent INI enabled with the chip for remote network performance analysis
> Extended range comparing to other suppliers by the enhancement of output power and sensitivity
> Lower power consumption on Bluetooth
> Bluetooth 5.1 features: 2Mbps can stream data faster, Long range feature can extend range coverage

Benefits

> Best interoperability with access points delivers seamless high definition video/audio experience
> Field proven AIROC™ technology, over 20+ years
> Built on innovation supporting coexistence and RSDB
> Bluetooth® 5.1 for Long Range and 2 Mbps
> Enhancement on range coverage
> Smart Coex tailored for various applications
> Future proof security updates
> Industrial operating temperature
> Lower Bluetooth® power consumption to save battery life
> IoT Network intelligent enable network performance analysis remotely
> Real simultaneous dual band to reduce latency

Target applications

> AI edge devices
> Gateways
> Surveillance camera
> Smart speakers
> Video / audio streaming devices
> Service / cleaning robot
> Industrial automation
> Smart building

Product collaterals / Online support

Product family page

Product overview incl. data sheet link

Infineon OPN	Module Partner OPN	Infineon SP Number	Module Partner
CYW54590RKUBGT	LBEE5XV2BZ-883	SP005729224	Murata Manufacturing Co., Ltd.
CYW54591RKUBGT	LBEE5XV1XA-540	SP005653733	Murata Manufacturing Co., Ltd.
CYW54591RKUBGT	FC80A	SP005653733	Quectel Wireless Solutions Co., Ltd.
CYW54590RKUBGT	AW-CM590	SP005729224	Azurewave
CYW54591RKUBGT	AW-572	SP005653733	Azurewave
CYW54591RKUBGT	AW-511NF	SP005653733	Azurewave

EVAL_AUDIO_MA2304xNS evaluation board

The EVAL_AUDIO_MA2304xNS is the evaluation board that features the MERUS™ multilevel MA2304xNS stereo class D amplifier. The MA2304xNS features ultra-low idle power consumption, highest efficiency in the market at typical listening levels and reduced EMI in comparison to traditional 2 and 3 level class D amplifiers.

Features

> MERUS™ multilevel switching technology

> Output power: 2 * 37 W

> Ultralow idle power consumption: 60 mW

> Configurable switching edge steepness

> PWM sync for reduced EMI in multichannel systems

> 79% efficiency @ 1 W 8 Ohm

> Digital I2S / TDM inputs

> Output noise: 52 uVrms A-weighted

Benefits

> Extended battery life and reduced EMI

> Lower system cost and simple implementation without the need of dynamic rail tracking power supplies

> Inductor-less and ferrite bead operation without compromising audio performance, efficiency and idle power consumption

> Reduced footprint size and PCB area

Target applications

> Audio amplifier

Product collaterals / Online support

Board page

Product overview incl. user manual link

OPN	SP Number
EVALAUDIOMA2304DNSTOBO1	SP005748529
EVALAUDIOMA2304PNSTOBO1	SP005750871

84 W power tool charger reference design - REF_ICC80QSG_84W1_BPA

This is a flyback - based reference design, scalable from 65 W to > 100 W and aimed for 12 V / 18 V Li-Ion battery packs. It includes a secondary-side auxiliary supply for battery switch and supply of a MCU. Measured efficiency is > 90 percent at 230 V_{AC} input voltage, providing excellent performance versus BOM cost ratio for chargers for consumer appliances.

Features

> Secondary-side regulated (SSR) constant current (CC) output

> High efficiency and low EMI with quasi-resonant (QR) mode, switching in valley n (QRMn)

> Efficiency > 90%, at 230 V_{AC} input and full-load condition

> Low standby power with reduced gate driver voltage in burst mode

> Standby power < 200 mW, at 230 V_{AC} input and no-load condition

Benefits

> 84 W scalable AC-DC stage design from 65 W to 130 W

> Optimum efficiency and low EMI at low BOM

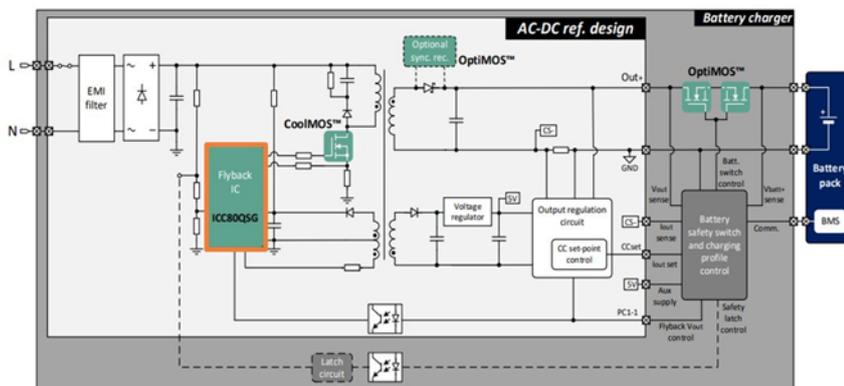> Easy, safe and robust AC-DC solution for a lot of battery-powered applications

Product collaterals / Online support

[Board page](#)

Target applications

> Battery charging up to 130 W

> Power tools

> E-bikes

> PC

> TV

> Audio amplifier applications up to 130 W

Block diagram

Product overview incl. application note link

OPN	SP Number
REFICC80QSG84W1BPAATOBO1	SP005750977

EVAL-IMI111T-026

EVAL-IMI111T-026 is a starter kit for iMOTION™ IMI111T-026H IPMs. The featured IMI111T-026H device is part of the iMOTION™ IMI111T series, offering full 3-phase inverter functionality including motor controller, 3-phase gate driver and IGBT-based power stage in a compact DSO package.

Features

> Field-proven advanced Motion Control Engine (MCE)

> Single shunt sensor less FOC control

> Scripting engine for additional flexibility

> 600 V / 2A IGBT power stage

> Galvanically isolated on-board PC interface

> Integrated protection features

Benefits

> Easy motor parametrization and tuning using iMOTION™ Solution Designer

> Fast time to market – no coding required for motor control functions
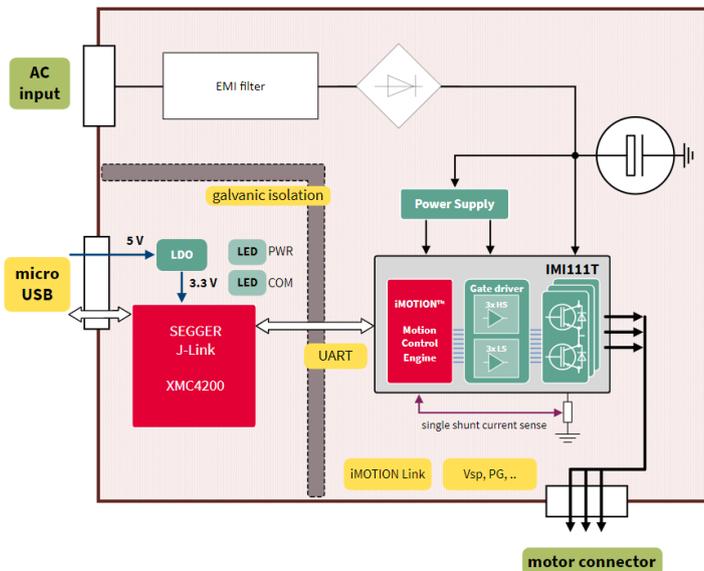
> Online simulation tools available

Competitive advantage

> Ready2use solution for small fans and pumps providing shortest time2market as there is no programming required, just a configuration to the targeted application.

Target applications

> Ceiling fan

> Motor control and drives

> Residential aircon indoor fan

Block diagram

Product collaterals / Online support

Board page

Product overview incl. user manual link

OPN	SP Number
EVALIMI111T026TOBO1	SP005729093