



## New Product Introduction

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March 2021

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## iMOTION™ SmartDriver - IMD110-6 series

iMOTION™ IMD110-6 is a series of highly integrated ICs for the control of three phase motors. IMD110 integrates the motor controller with a high voltage three-phase gate driver and a voltage regulator and is able to drive a wide variety of MOSFETs or IGBTs.

They use the latest generation of Infineon's field-proven Motion Control Engine (MCE), implementing Field Oriented Control (FOC) for highest energy efficiency. The MCE integrates multiple protection features and offers a flexible scripting engine for customer application scripts.

The three-phase gate driver is based on Infineon's latest SOI technology and combines market leading robustness and lowest failure rates with low level-shift losses.



### Features

- > Ready to use motor/PFC controller based on Motion Control Engine (MCE)
- > Integrated three-phase gate driver
- > Integrated voltage regulator
- > Small LQFP-40 package

### Benefits

- > shortest time to market
- > Can drive almost any low/high voltage MOSFET or IGBT
- > Smallest pcb footprint

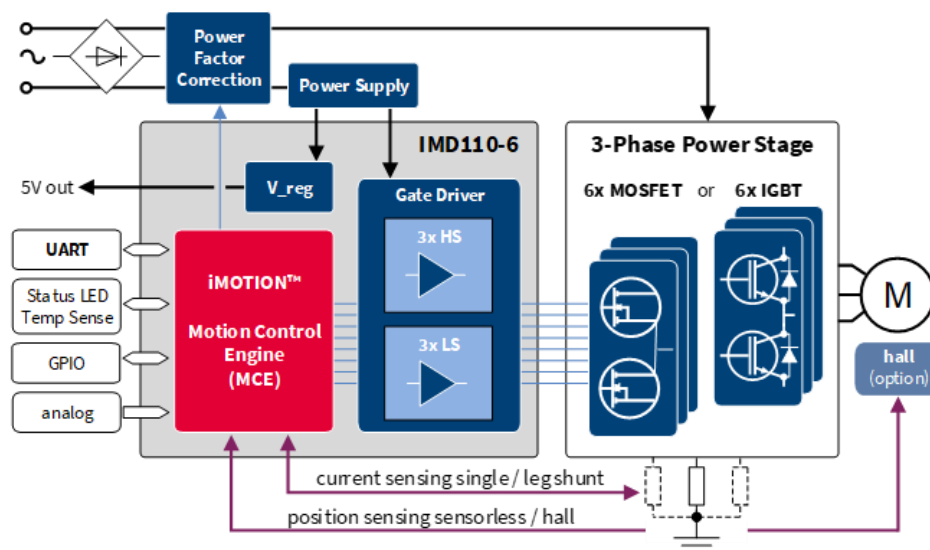
### Target applications

- > Home appliances

### Competitive advantage

- > iMOTION Motion Control Engine / SOI gate driver

### System diagram



Product collaterals / Online support

[Product family page](#)

[Application note](#)

### Product overview incl. data sheet link

OPN	SP Number	Package
<a href="#">IMD111T6F040XUMA1</a>	SP003030100	PG-LQFP-40
<a href="#">IMD112T6F040XUMA1</a>	SP003030104	PG-LQFP-40

# CoolSiC™ Hybrid Discrete for Automotive in TO247 package

Best cost-performance is the most important aspect for auxiliary applications in electric vehicles and hybrid vehicles. Therefore, Infineon has developed a hybrid of 650V TRENCHSTOP™ 5 AUTO fast-switching IGBT and CoolSiC™ Schottky Diode to enable a cost-efficient performance boost for fast switching automotive applications such as On-Board Charger, PFC, DC-DC and DC-AC.

The combination of a best-in-class fast-switching IGBT with a very reliable SiC Diode builds a perfect cost-performance trade-off for hard-switching topologies. Due to the Qrr-free unipolar CoolSiC™ Schottky Diode, the Eon of the IGBT will be reduced significantly over silicon-only solutions. This makes the hybrid the first-choice for system-cost-sensitive hard commutation applications, such as Totem Pole topology in Automotive On-Board Charger applications. This results in better margin for low-complexity design-in activities.



### Features

- > 650V TRENCHSTOP™ 5 IGBT + CoolSiC™ Schottky Diode Gen5
- > Best-in-class switching and conduction losses
- > No reverse & forward recovery charge
- > High operating temp:  $T_{j,max} = 175^{\circ}C$
- > Robust against surge currents
- > Low gate charge Qg Available from 15 A up to 50 A

### Benefits

- > Highest reliability against environmental conditions
- > Increased system efficiency
- > Best performance/cost ratio for hard switching topologies (e.g. Totem Pole)
- > Supporting bi-directional On-Board Charger designs

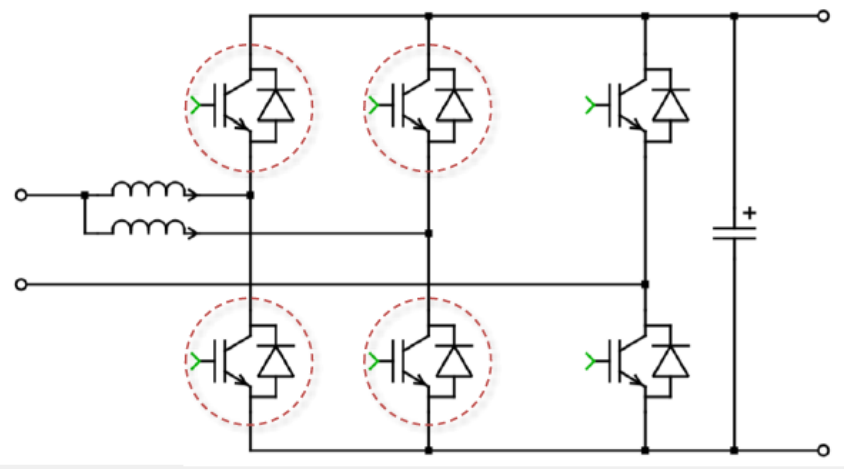
### Target applications

- > On-Board Chargers, DC-DC Converter, PFC stages

### Competitive advantage

- > Shows best cost-performance for hard switching topologies by combination of best in class fast switching IGBT TRENCHSTOP™ 5 technology with Qrr-free CoolSiC™ Schottky Diode Gen 5.

### Application diagram: interleaved Totem Pole PFC topology



Product collaterals / Online support

[Product page](#)

[Product brief](#)

### Product overview incl. data sheet link

OPN	SP Number	Package
<a href="#">AIKW50N65RF5XKSA1</a>	SP001724852	PG-TO247-3

# EasyPACK™ CoolSiC™ MOSFET 3-level ANPC power module 1200 V - F3L11MR12W2M1\_B74

The new F3L11MR12W2M1\_B74 in ANPC topology is developed for the aim to support customers in their fast growing applications.

Compared to the predecessor F3L11MR12W2M1\_B65, the Silicon diode has an increased current rating. This supports the entire cos  $\phi$  range and makes this module the perfect fit for energy storage systems.

Customers benefit from 150 kW power in solar systems when paralleling two modules or 75 kW per module in energy storage systems.

In addition, this module is equipped with the best-in-class CoolSiC™ trench MOSFET technology for a superior gate-oxide reliability.



### Features

- > CoolSiC™ trench MOSFET technology
- > 3-level ANPC topology
- > Full 1500 V<sub>DC</sub> capability with 1200 V switches
- > Increased Si diode current rating
- > PressFIT technology
- > Broadest Easy portfolio

### Benefits

- > Superior gate-oxide reliability
- > Short and clean commutation loops
- > Supports the entire cos  $\phi$  range - perfect fit for energy storage systems
- > Easy design-in
- > High degree of freedom for the inverter design
- > 150 kW power in solar applications when paralleling two modules
- > 75 kW power per module in energy storage systems

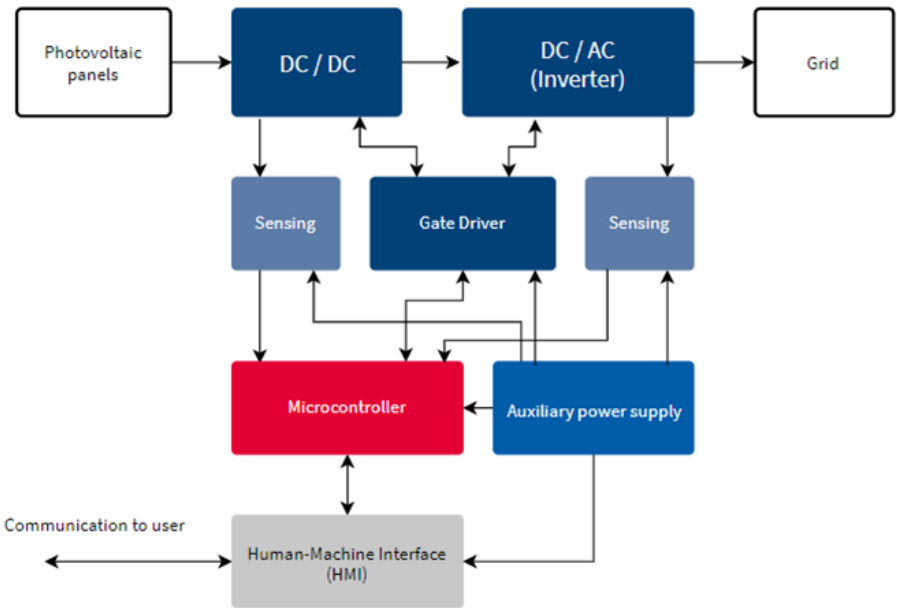
### Target applications

- > Energy Storage Systems
- > Solar Energy Systems

### Competitive advantage

- > Superior gate-oxide reliability

### System diagram



### Product collaterals / Online support

- [Product page](#)
- [Application note](#)

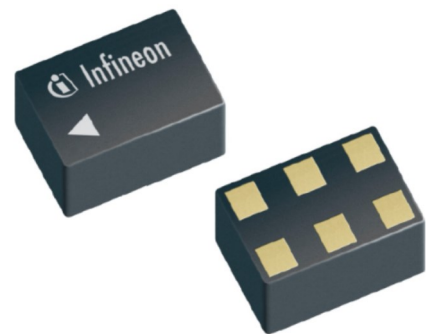
### Product overview incl. data sheet link

OPN	SP Number	Package
<a href="#">F3L11MR12W2M1B74BOMA1</a>	SP005408206	AG-EASY2B-2

## Low Power GPS LNAs - BGA123N6 & BGA125N6

The BGA12xN6 devices are designed to enhance GNSS signal sensitivity especially in wearables and mobile cellular IoT applications.

With the very good performance, they ensure high system sensitivity. The ultra-low power consumption of 1.5mW preserves valuable battery power, ideal for small battery powered GNSS devices. The wide supply voltage range from 1.1 V to 3.3 V ensure flexible design and high compatibility.



### Features

- > Ultra low power GNSS LNAs
- > Exceptional time to fix GPS location
- > Highly resilient for in and out-of-band interferences in comparison with competition
- > Designed for small battery GPS devices
- > Improves GPS accuracy into cm range (~30 cm) and indoor navigation
- > 1.2 V support
- > Consumes only ~1.5 mW

### Benefits

- > Improves GPS accuracy into cm range (~30 cm)
- > Improves GPS for indoor navigation
- > 1.2 V support

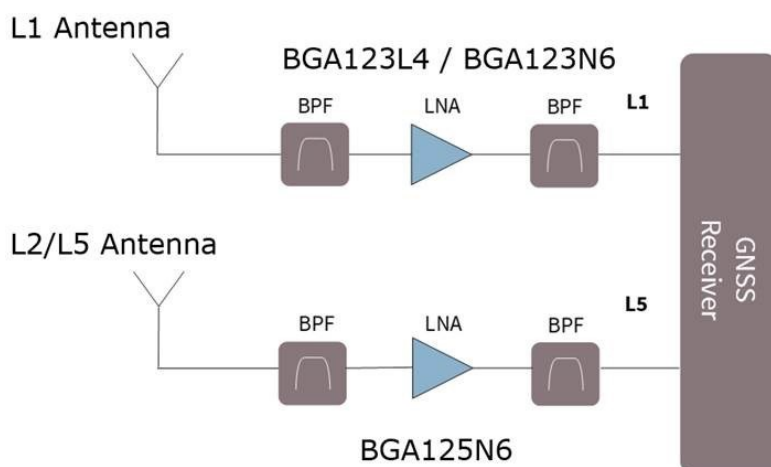
### Competitive advantage

- > Ultra low power: 1.35 mA
- > High gain: 20.0 dB

### Target applications

- > Wearables
- > Mobile cellular TRx path (4G, 5G)

### Block diagram



### Product collaterals / Online support

[Product page, BGA123N6](#)

[Product page, BGA125N6](#)

[Training](#)

### Product overview incl. product page link

OPN	SP Number	Package
<a href="#">BGA123N6E6327XTSA1</a>	SP005350939	PG-TSNP-6
<a href="#">BGA125N6E6327XTSA1</a>	SP005350938	PG-TSNP-6

## Antenna Tuning switch - BGSA147ML10

Ultra-Low Resistance SP4T Antenna Tuner. BGSA147ML10 is a Single-Pole Four Throws (SP4T) Antenna Tuning switch optimized for RF applications up to 7.125 GHz. Its MIPI RFFE digital control interface allows easy implementation and best flexibility when operated in cellular mobile RF Front-End designs.



### Features

- > Designed for high-linearity antenna tuning switching and RF tuning applications
- > Ultra low  $R_{ON}$  resistance of  $0.8\ \Omega$  at each RF port in ON state
- > Individually controlled reflective open or short to ground OFF ports to eliminate unwanted antenna resonances
- > Low  $C_{OFF}$  capacitance of 155 fF at each port in OFF state
- > High RF operating voltage handling above 45 V in OFF state
- > MIPI RFFE 2.1 compliant control interface
- > External USID\_sel pin enabling 3 default USID addresses
- > No RF parameter change within supply voltage range
- > No blocking capacitors required if no DC applied on the RF lines
- > No power supply decoupling required
- > Small form factor 1.1 mm x 1.5 mm x 0.39 mm (MSL1, 260° C per JEDEC J-STD-020)
- > RoHS and WEEE compliant package

### Benefits

- > Support sub-7 GHz NR (5G)
- > High antenna efficiency
- > Low System RF losses
- > Eliminate unwanted antenna resonance
- > Minimize Radiated Spurious Emissions
- > Robust to RF interferences

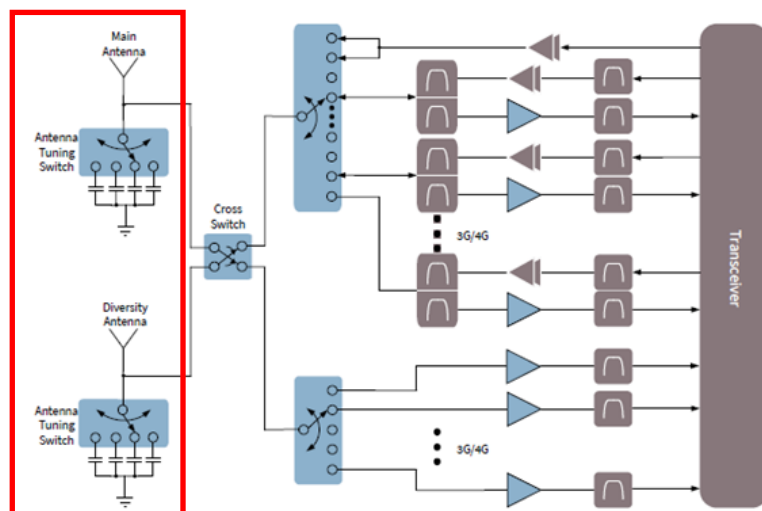
### Competitive advantage

- > Wide frequency operation range from 0.4 GHz up to 7.2 GHz
- > Ultra-low  $R_{ON} \times C_{OFF}$  figure of merit along with very high linearity
- > „Resonance Stopper“ function to eliminate unwanted resonance and enhance antenna efficiency

### Target applications

- > Designed for high-linearity antenna aperture switching and RF tuning applications

System diagram: RF Front End in mobile phones



Product collaterals / Online support

[Product page](#)

Product overview incl. product page link

OPN	SP Number	Package
<a href="#">BGSA147ML10E6327XTSA1</a>	SP005341850	PG-TSLP-10

# StrongIRFET™ 2 power MOSFETs

The new StrongIRFET™ 2 power MOSFETs in 80 V and 100 V 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 complements 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

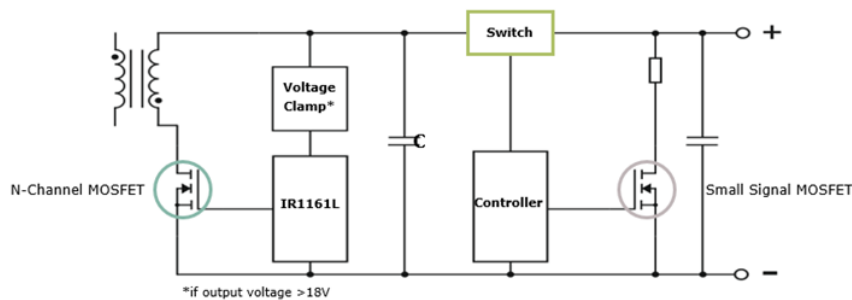
## Competitive advantage

- > Right-fit products for a wide range of applications
- > Broad availability at distribution partners
- > Excellent price/performance ratio

## Target applications

- > Adapter
- > TVs
- > Motor drives
- > Battery management
- > Light electric vehicles, e-scooter
- > Robotics
- > Power and gardening tools

## Block diagram



## Product overview incl. product page link

OPN	SP Number	Package
<a href="#">IPP016N08NF2SAKMA1</a>	SP005548844	PG-TO-220
<a href="#">IPP019N08NF2SAKMA1</a>	SP005548842	PG-TO-220
<a href="#">IPP024N08NF2SAKMA1</a>	SP005548843	PG-TO-220
<a href="#">IPP040N08NF2SAKMA1</a>	SP005548845	PG-TO-220
<a href="#">IPP055N08NF2SAKMA1</a>	SP005548846	PG-TO-220
<a href="#">IPP026N10NF2SAKMA1</a>	SP005548847	PG-TO-220
<a href="#">IPP050N10NF2SAKMA1</a>	SP005548848	PG-TO-220
<a href="#">IPP082N10NF2SAKMA1</a>	SP005548849	PG-TO-220
<a href="#">IPP129N10NF2SAKMA1</a>	SP005549093	PG-TO-220

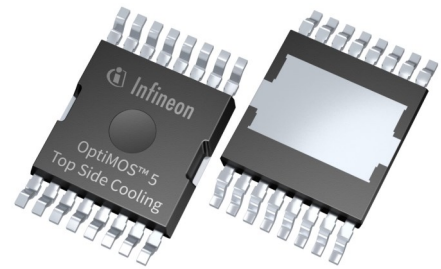
## Product collaterals / Online support

- [Product family page](#)
- [Product brief](#)



## OptiMOS™ 5 80 V/100 V in TOLT package

Infineon is extending its product family of 80 V and 100 V MOSFETs based on OptiMOS™ 5 silicon technology. As more and more electronic control units (ECUs) with high power capability are designed with topside cooling of the power stages, Infineon has complemented its MOSFET portfolio with a dedicated package supporting this new requirement. The TOLT package is perfectly suited for high power 48 V applications like starter generators, DC-DC converters and battery disconnect switches as well as for main inverters of Light Electric Vehicles (LEVs) and e-motor bikes.



### Features

- > TOLT package specifically designed for top side cooling
- > Lowest  $R_{DS(on)}$  down to 1.1 mΩ at 80 V and 1.5 mΩ at 100 V
- > Low package resistance and minimized stray inductance
- > narrow VGS(th) ranges
- > Variety of  $R_{DS(on)}$  options for different application power requirements

### Benefits

- > High power and current density
- > TOLT package optimized for top side cooling
- > Special finish of exposed PAD to ensure best thermal conduction
- > Optimized switching behavior
- > Reduced conduction losses
- > Supports paralleling of MOSFETs
- > Reduced heat flow towards PCB

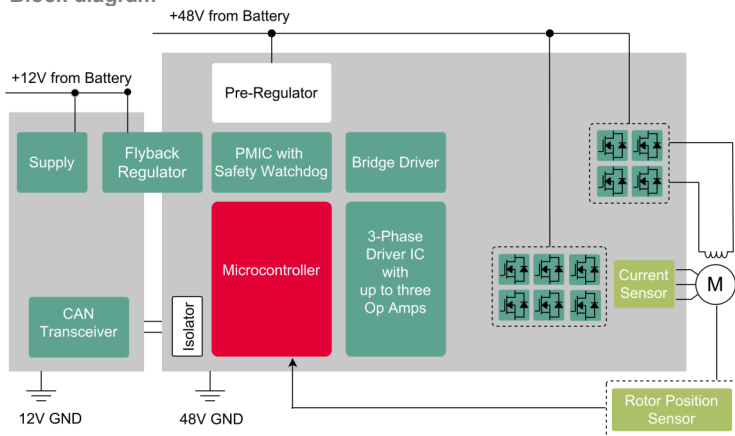
### Competitive advantage

- > TOLT package for top side cooling. 80 V and 100 V low  $R_{DS(on)}$  MOSFETs for highest power requirements.

### Target applications

- > 48 V applications with high power density, where top side cooling is either increasing the power capability, or downsizing and to meet smallest package envelopes for ECUs, as well as optimizing the component count to a minimum in order to provide best cost / output power ratio.
- > Main target applications are therefore 48 V starter generators, 48 V battery disconnect switches, 48 V main inverter of light electric vehicles (LEVs), eBikes, eScooters and eMotorbikes as well as DCDC converter.

### Block diagram



### Product collaterals / Online support

[Product family page](#)

### Product overview incl. product page link

OPN	SP Number	Package
<a href="#">IAUS300N08S5N011TATMA1</a>	SP005432758	PG-HDSOP-16
<a href="#">IAUS300N08S5N012TATMA1</a>	SP002952344	PG-HDSOP-16
<a href="#">IAUS300N08S5N014TATMA1</a>	SP002952338	PG-HDSOP-16
<a href="#">IAUS300N10S5N015TATMA1</a>	SP002952342	PG-HDSOP-16
<a href="#">IAUS260N10S5N019TATMA1</a>	SP002952334	PG-HDSOP-16



## EiceDRIVER™ X3 Compact (1ED31xx)

The X3 Compact (1ED31xx) family is a compact & easy to design-in isolated gate driver family including a Miller clamp option.

The recently released gate driver family receives an extension with DSO-8 150 mil narrow body package.



### Features

- > For IGBTs (incl. IGBT7), SiC and Si MOSFETs
- > 14 A typical output current, 7 ns propagation delay matching
- > 90 ns propagation delay with 30 ns input filter
- > 40 V absolute maximum output supply voltage
- > Separate source and sink outputs or Miller clamp
- > DSO-8 150 mil narrow-body package with large creepage distance (>8 mm)
- > 10.5 V undervoltage lockout (UVLO) protection with hysteresis

### Target applications

- > Industrial motor drives - compact, standard, premium, servo drives
- > Solar inverters
- > UPS systems
- > EV charging
- > Energy storage systems

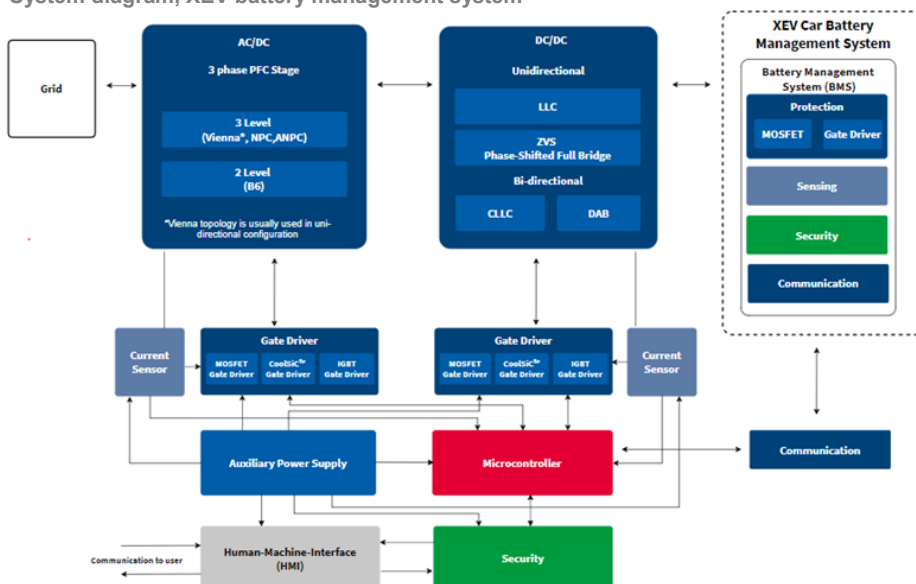
### Benefits

- > Integrated filters reduce the need for external filters
- > Tight IC-to-IC turn on propagation delay matching (7 ns max.) improves application robustness & improves system efficiency
- > Suitable for operation in fast switching applications
- > UL 1577 (planned) VISO = 3.6 kV (rms) for 1 s, 3 kV (rms) for 1 min
- > The precise threshold and timings, combined with UL 1577 certification enable superior application safety

### Competitive advantage

- > Integrated filters reduce the need for external filters & therefore optimize the customer's bill-of-materials.
- > The Miller clamp option in combination with SiC MOSFETs or IGBT7 avoid harmful parasitic turn-ons and enable superior application safety

### System diagram, XEV battery management system



### Product collaterals / Online support

[Product family page](#)

[Product page, EVAL-1ED3124MX12H](#)

[Application note](#)

[Training](#)

### Product overview incl. datasheet and application note link

OPN	SP Number	Package
<a href="#">1ED3124MU12FXUMA1</a>	SP005352064	PG-DSO-8
<a href="#">1ED3125MU12FXUMA1</a>	SP005352066	PG-DSO-8
<a href="#">EVAL1ED3124MX12HTOBO1</a>	SP005347599	Board

## OptiMOS™ 6 power MOSFET 40V normal level

With this best-in-class OptiMOS™ 6 power MOSFET 40V normal level, Infineon offers a benchmark solution for normal level (higher threshold voltage) required applications such as battery-powered applications, battery-powered tools, battery management, and low voltage drives. A higher  $V_{th}$  for the normal level portfolio means that only larger gate voltage spikes would cause an unwanted turn-on.

In addition, lower  $Q_{GD}/Q_{GS}$  ratios ( $C_{GD}/C_{GS}$  divider ratio) reduce the gate voltage spikes' peak, further contributing to the robustness against unwanted turn-on. The ISC007N04NM6 features very low  $R_{DS(on)}$  of 0.7mOhm.



### Features

- > N-channel - Enhancement mode
- > Normal Level gate threshold (2.3 V typical)
- > 175°C junction temperature ( $T_j$ )
- > Optimized Charge ratio  $Q_{GD}/Q_{GS} < 0.8$  for dv/dt immunity
- > Low gate charge
- > 100% Avalanche tested
- > High current rating

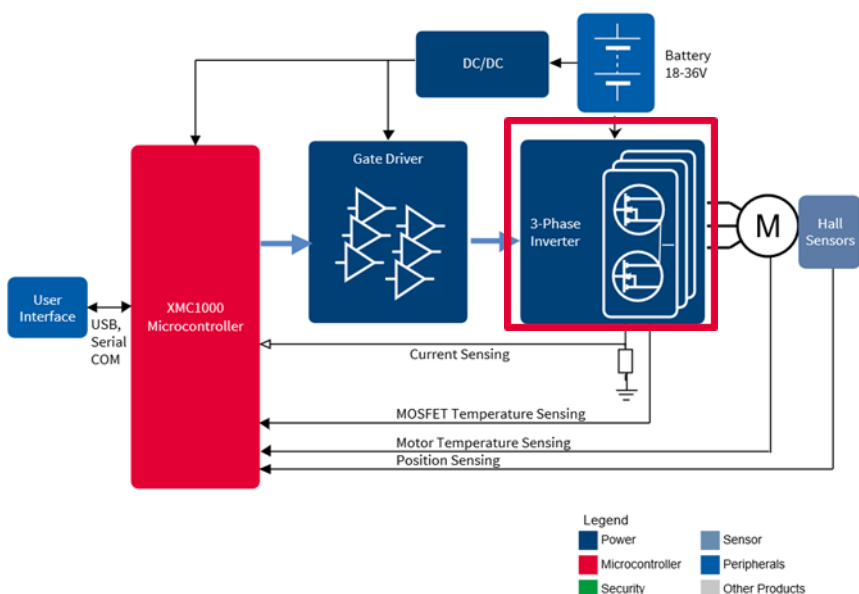
### Benefits

- > Normal gate drive offers immunity to false turn-on in noisy environments
- > Increased operating temperature for robust designs
- > Reduced switching losses leading to greater system efficiency and power density
- > Suitable for FOC (field oriented control) and DTC (direct torque control) motor control techniques
- > Increased current carrying capability

### Target applications

- > Battery-powered applications
- > Battery-powered tools
- > Battery management
- > Low voltage drives

### System diagram: Battery-powered tools



### Product collaterals / Online support

[Product family page](#)

[Product brief](#)

### Product overview incl. data sheet link

OPN	SP Number	Package
<a href="#">ISC007N04NM6ATMA1</a>	SP005400466	PG-TDSON-8
<a href="#">ISC010N04NM6ATMA1</a>	SP005400463	PG-TDSON-8

## NovalithIC™ Lite - BTN7030-1EPA

Infineon is launching NovalithIC™ Lite BTN7030-1EPA, the latest member of NovalithIC™ half-bridge family. It is fully protected and can drive automotive motors up to ~15 A.

The BTN7030-1EPA transfers the NovalithIC™ value proposition of high reliability, ease-of-use, and full integration (incl. protection and accurate current sense). This makes the NovalithIC™ Lite the perfect half bridge for door lock, trunk lock, (cinching) latch, rear wiper, fuel lid opener, etc.



### Features

- > Path resistance of max. 62 mΩ @ 150°C (typ. 32 mΩ @ 25°C)
- > Current limitation level of 14 A @ 150°C, 17 A @ 25°C
- > Status flag diagnosis with current sense capability
- > Overtemperature shut down with latch behavior
- > Undervoltage shut down
- > Cross current protection
- > Open load in ON and OFF detection
- > Short circuit to GND and VBAT detection
- > Driver circuit with logic level inputs
- > Operation up to 28 V (normal operation 6 V – 18 V)
- > Green product (RoHS compliant)
- > AEC qualified in PG-TSDSO-14 package

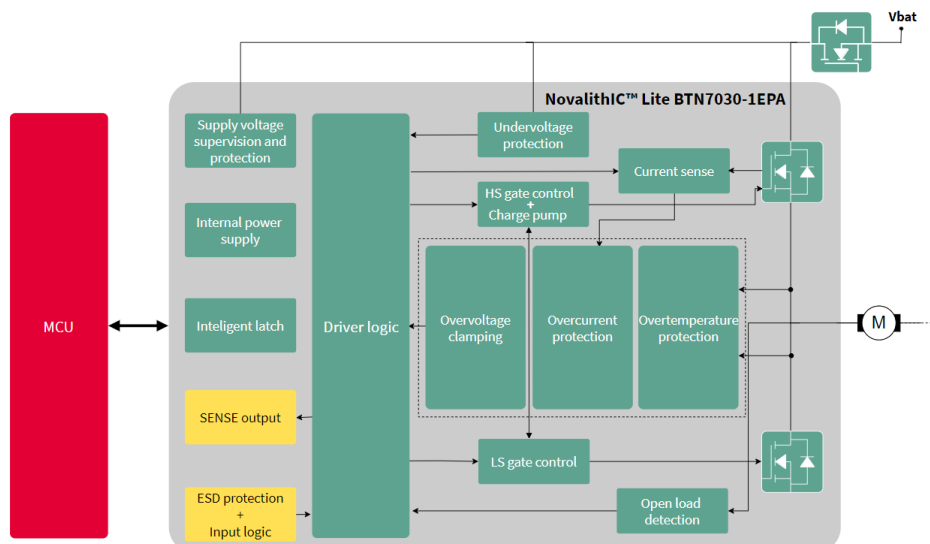
### Benefits

- > Half bridge partitioning allows flexible use
- > Small footprint saves PCB space for other applications
- > Good thermal behavior via exposed pad leads to less cooling effort
- > Low R<sub>DS(on)</sub>
- > Diagnosis & protection features (Over current, under voltage, over temperature, short circuit, over voltage)

### Target applications

- > Brushed motor applications
- > Door lock
- > Trunk lock
- > (Cinching) latch
- > Rear wiper
- > Power lift gate

### Block diagram



Product collaterals / Online support

[Product page](#)

[Product brief](#)

[Application note](#)

### Product overview incl. data sheet link

OPN	SP Number	Package
<a href="#">BTN70301EPAXUMA1</a>	SP003429138	PG-TSDSO-14
<a href="#">DCSHIELDBTN7030TOBO1</a>	SP005344737	Board

## OPTIREG™ linear - TLS850C2TE V50 & TLS850C2TE V33

The OPTIREG™ linear TLS850C0TE is a high performance, 500mA automotive grade LDO with RESET functionality in PG-TO252-5 (DPAK) package. It is the perfect fit to power MCUs (5 V and 3.3 V) and CAN transceivers (5 V) for automotive body, powertrain and infotainment applications.



### Features

- > Always on
- > Reset
- > Reset delay
- > Low Iq
- > Ultra-low drop-out
- > Very good heat dissipation package

### Benefits

- > Device performance upgrade
- > Reduce passive BOM cost
- > Low current consumption
- > Very good thermal performance
- > System monitoring (Reset)

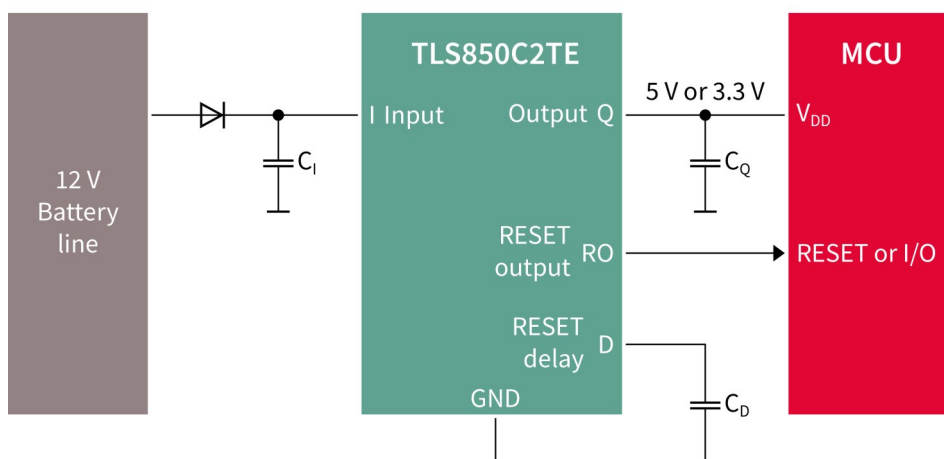
### Target applications

- > Body applications
- > Powertrain applications
- > Telematics
- > Infotainment

### Competitive advantage

- > Fast response
- > Very stable control loop
- > Ultra-low drop-out
- > Low Iq
- > Package with very good thermal performance

## Typical use case: MCU supply with supply voltage supervision using the RESET functionality



Product collaterals / Online support

[Product page, TLS850C2TE V50](#)

[Product page, TLS850C2TE V33](#)

Product overview incl. data sheet link

OPN	SP Number	Package
<a href="#">TLS850C2TEV50ATMA1</a>	SP004091492	PG-TO252-5
<a href="#">TLS850C2TEV33ATMA1</a>	SP004091494	PG-TO252-5

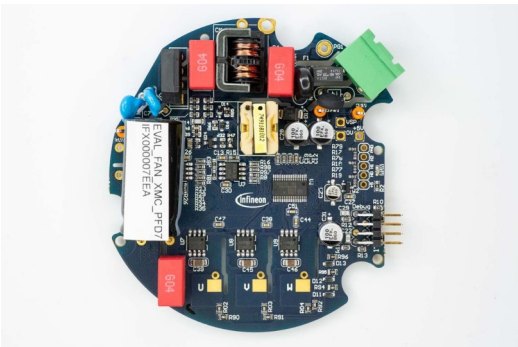
# Motor drive evaluation board using CoolMOS™ PFD7 SJ MOSFET

The EVAL\_FAN\_XMC\_PFD7 motor drive board does not only offer a sensorless synchronous rectification BLDC/PMSM control algorithm to reduce reverse-current hard-commutation stress but also gives the user the option to change switching frequency up to 20 kHz and to choose between two-phase or three-phase modulation, which helps reduce switching losses.

Infineon's latest CoolMOS™ PFD7 super junction MOSFET series offers low on-resistance, as well as Increased design flexibility while maintaining the industry's fastest reverse recovery time (trr) optimized for HA motor drives. This enhances efficiency in hard-switching circuits, allowing BOM reduction due to reduced copper area and heatsink-free operation. Also, optimized switching di/dt and dv/dt ensure low EMI to help further simplify circuit design and layout.

This board can be easily interfaced through XMC™ Link. XMC™ Link is an isolated debug probe for all XMC™ microcontrollers. The debug probe is based on SEGGER J-Link debug firmware, which enables use with DAVE™.

**Important note:** The XMC™ Link does not come with this evaluation board, and must be ordered separately.



## Features

- > Sensorless field orientated control (FOC)
- > Best-in-class high voltage MOSFETs for hard commutation topology [B6 inverter]
- > Low bill-of-material cost contributed by CoolMOS™ PFD7 and XMC™ algorithm
- > Quasi-resonant CoolSET™ offers lower EMI and higher efficiency
- > Graphical user interface (GUI) allowing ease-of-use

## Benefits

- > High efficiency
- > Cost-effective
- > Simplified design
- > Near to productive solution

## Target applications

- > Home appliance
- > IoT
- > Motor Control & Drives
- > Pumps
- > Refrigerator
- > Washing Machines
- > Fan

## Product collaterals / Online support

- [Product page](#)
- [Application note](#)

## Product overview incl. application note

OPN	SP Number	Package
<a href="#">EVALFANXMC_PFD7TOBO1</a>	SP005558988	Board