

Infineon Technologies New Products Introduction

November 2017



Content

IR MOSFET™ 60 V/ 80 V/ 100 V logic level

New logic level MOSFETs for low V_{GS}

Evaluation Board for EasyDUAL™ CoolSiC™ MOSFET modules

EVAL-PSE1BF12-SiC

700 V CoolMOS™ P7 SJ MOSFET in IPAK Short Lead with ISO-standoff

Solution for higher assembly yield in charger applications

BGA123L4

Low Power GPS LNA for Wearables

IFF2400P17AE4 (Air Cooling) and IFF2400P17LE4 (Liquid Cooling)

MIPAQ™ Pro a new dimension in smart protection

Infineon® Prime Soft Diodes for IGBTs

D4600U45X172 (5 inch silicon), D2700U45X122 (3.5 inch silicon), D1600U45X122 (3 inch silicon)

IR MOSFET™ 60 V/ 80 V/ 100 V logic level

New logic level MOSFETs for low V_{GS}

Infineon's latest generation of 60 V, 80 V, and 100 V power MOSFETs in PQFN 2 x 2 package utilize best-in-class OptiMOS™ 5 logic level silicon to achieve benchmark performance in high speed switching and small form factor applications.



Features

- > Lowest FOM ($R_{DS(on)} \times Q_{g/gd}$)
- > Optimized Q_g , C_{oss} , and Q_{rr} for fast switching
- > Logic level compatibility
- > Tiny PQFN 2 x 2 mm package

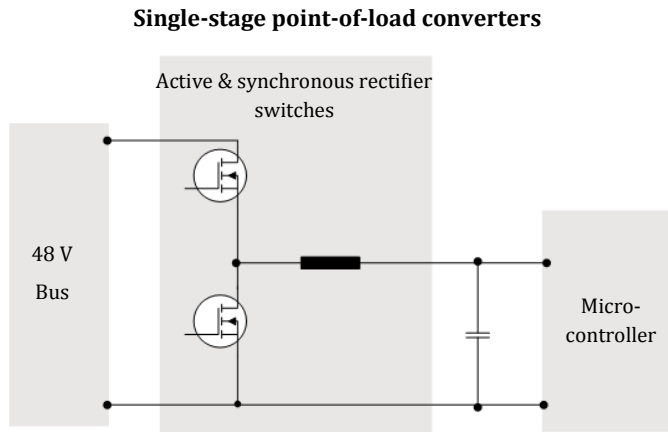
Target applications

- > Wireless charging
- > Telecom
- > Adapter

Competitive advantage

- > Best-in-class $R_{DS(on)}$ (10-40% better than next best alternative)
- > Switching and conduction losses are better than next best alternative

Block diagram for wireless charging



Benefits

- > Smallest package footprint
- > Higher power density designs
- > Higher switching frequency
- > Reduced parts count wherever 5 V supplies are available
- > Driven directly from microcontrollers (slow switching)
- > System cost reduction

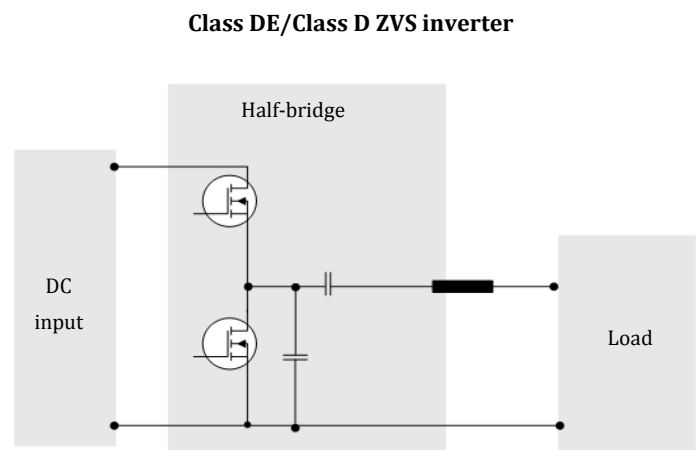
NEW Value propositions

- > Low $R_{DS(on)}$ in tiny PQFN 2 x 2 package
- > Logic level compatibility
- > High switching frequency (> 1 MHz)
- > Suitable for applications such as wireless charging, telecom and adapter

Product collaterals / online support

- > Product family [page](#)
- > Wireless charging application [page](#)
- > Wireless charging selection [tool](#)
- > Wireless charging [video](#)
- > IR MOSFET™ 60 V, 80 V and 100 V [product brief](#)

Block diagram for telecom



Product overview incl. datasheets links

OPN	SP Number	Package
IRL60HS118	SP001592258	PG-TSDSON-6
IRL80HS120	SP001592838	PG-TSDSON-6
IRL100HS121	SP001592836	PG-TSDSON-6

Evaluation Board for EasyDUAL™ CoolSiC™ MOSFET modules

EVAL-PSE1BF12-SiC



Evaluation Board for the EasyDUAL™ CoolSiC™ MOSFET modules FF11MR12W1M1_B11 and FF23MR12W1M1_B11. It is targeted for applications like Solar, UPS, EV Charging. Please consider that the respective module has to be ordered separately!

Features

- > The evaluation board is electrically and mechanically suitable for FF11MR12W1M1_B11 and FF23MR12W1M1_B11 CoolSiC™ MOSFET modules
- > The board is designed as bi-directional buck-boost converter

Benefits

- > This board has the purpose to enable the evaluation of the FF11MR12W1M1_B11 and FF23MR12W1M1_B11 CoolSiC™ MOSFET modules
- > The evaluation board allows the performance of double-pulse measurements as well as functional tests as DC/DC converter
- > The evaluation board EVAL-PS-E1BF12-SiC demonstrate ways to design low inductive boards to get full access to the superior properties of CoolSiC™ MOSFET Easy power modules
- > Further investigations are possible with the EVAL-PS-E1BF12-SiC board like determination of the power conversion efficiency during buck or boost operation, the behavior at different R_g values, temperature dependent measurements or short circuit tests

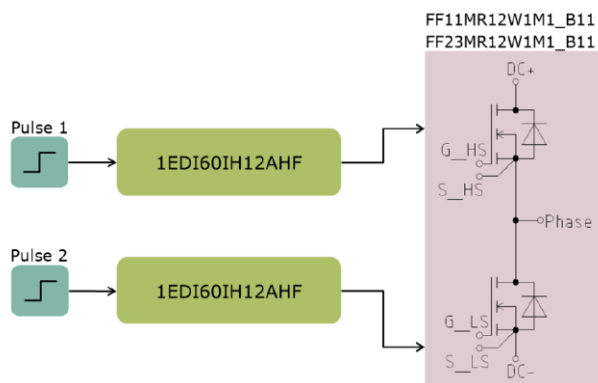
Target applications

- > Solar
- > UPS
- > EV Charging

Completing products

- > FF11MR12W1M1_B11
- > FF23MR12W1M1_B11
- > Various [CoolSiC™ MOSFET Gate Driver ICs 1200 V](#)

Block diagram



Product collaterals / online support

- > Product [page](#)
- > [Assembly Instruction PressFIT](#)
- > [Application note](#)
- > CoolSiC™ [brochure](#)
- > CoolSiC™ MOSFET [product brief](#)

Product overview

OPN	SP Number	Package
EVALPSE1BF12SICTOBO1	SP001798382	Blister Tray

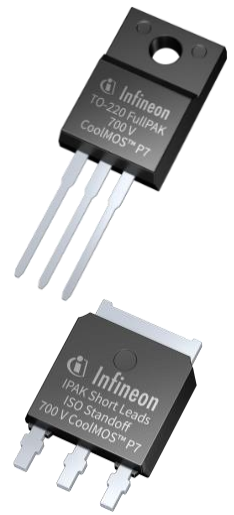
700 V CoolMOS™ P7 SJ MOSFET in IPAK Short Lead with ISO-standoff

Solution for higher assembly yield in charger applications

With the 700 V CoolMOS™ P7 Infineon offers a price/performance optimized SJ MOSFET and in combination with the IPAK Short Lead with ISO-standoff package increased yields and cost reduction can be reached.

Infineon's latest 700 V superjunction MOSFET technology has been developed to serve today's and tomorrow's trends in flyback topologies. The CoolMOS™ P7 is offering amazing performance gains compared to superjunction technologies used today, especially at high speed switching.

With the IPAK Short Lead with ISO-standoff package, Infineon offers a package with a well-defined mold feature at the bottom of the package body. This allows to fully insert the MOSFET into the PCB while still having a well-defined isolation distance of 0.37 mm (max. value) between PCB and package body. This way, the residues between package and PCB can be effectively removed after cleaning, which improves yield and reduces cost. This feature also helps to increase the effective creepage distance between the legs. In addition, the optimized leg width and length make this package more suitable for charger application.



Features

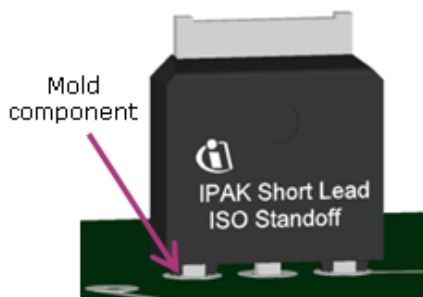
IPAK Short lead with ISO standoff package

- > Mold component feature between package body and leads
- > Well-defined standoff height
- > Optimized leg width and length

700V CoolMOS™ P7

- > Extremely low FOM $R_{DS(on)} \times E_{oss}$; lower Q_g , E_{on} , and E_{off} .
- > Highly performant technology
- > Low switching losses (E_{oss})
- > Highly efficient
- > Excellent thermal behavior
- > Allowing high speed switching
- > Integrated Zener diode
- > Optimized $V_{(GS)th}$ of 3 V with very narrow tolerance of ± 0.5 V
- > Finely graduated portfolio

Application example



Competitive advantage

CoolMOS™ P7 technology:

- > Operating frequency up to 140 kHz
- > IFX 1K4 mΩ device outperforms competitors' 900 mΩ devices

P7 700 V offers:

- > Best-in-class efficiency
- > Best-in-class thermal behavior
- > By far fulfilling EMI criteria

Completing products

- > PWM-QR flyback controller: ICE5QSAG, ICE2QSxxx
- > PWM-FF flyback controller: ICE3xS03LJG

Benefits

IPAK Short lead with ISO standoff package

- > More effective cleaning in terms of residue removing, resulting in better assembly yield
- > Larger effective creepage distance between legs
- > More suitable for charger application

700V CoolMOS™ P7

- > Cost competitive technology
- > Up to 2.4% efficiency gain and 12°K lower device temperature compared to C6 technology
- > Further efficiency gain at higher switching speed
- > Supporting less magnetic size with lower BOM costs
- > High ESD ruggedness up to HBM Class 2 level
- > Easy to drive and design in
- > Enabler for smaller form factors and high power density designs

Excellent choice in selecting the best fitting product

Introduction IPAK SL with isolated lead standoff

- > Visualization of IPAK Short Lead with ISO Standoff package, fully inserted into PCB. The mold features at the bottom of the package ensure that the package can be fully inserted into the PCB while maintaining a well defined distance between PCB and package body. After the soldering and cleaning process no residues are left between PCB and the discrete MOSFET.

NEW Value propositions

Performance:

- > 0.1% to 1.5% better efficiency
- > Up to 16°C better thermal performance
- > On average up to 50% lower E_{oss} losses
- > Lower $R_{DS(on)}$ dependency over T_j

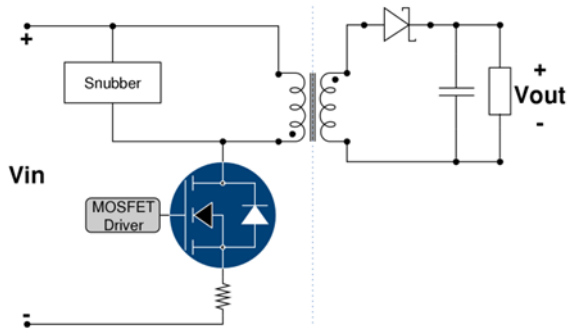
Ease-of-use:

- > Easy to drive
- > Enabling lower gate source voltage
- > Less risk of linear mode operation

Price/performance:

- > Competitive compared to C6 and similar competitor technologies
- > Technology with potential for further productivity over lifetime

Block diagram



Product collaterals / online support

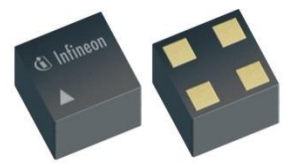
- > Infineon's answer for flyback topologies 700 V CoolMOS™ P7: application and corner stones [video](#)
- > Getting introduced to CoolMOS™ P7 series [webinar](#)
- > Product family [page](#)
- > Product brief: [700V CoolMOS™ P7](#)
- > Product brief: [700V CoolMOS™ P7 in IPAK SL with ISO-standoff](#)

Product overview incl. data sheets link

OPN	SP Number	Package
IPA70R900P7SXKSA1	SP001600942	TO-220
IPA70R750P7SXKSA1	SP001664858	TO-220
IPA70R450P7SXKSA1	SP001664868	TO-220
IPSA70R2K0P7SAKMA1	SP001664770	
IPSA70R1K4P7SAKMA1	SP001664778	
IPSA70R1K2P7SAKMA1	SP001664784	
IPSA70R900P7SAKMA1	SP001664790	TO251 IPAK Short Lead with ISO Standoff
IPSA70R750P7SAKMA1	SP001664796	
IPSA70R600P7SAKMA1	SP001664806	
IPSA70R450P7SAKMA1	SP001664824	

BGA123L4

Low Power GPS LNA for Wearables



Low Power GPS LNA for Wearables designed for small, battery powered devices, GPS powered wearables, Connected IoT devices. This GPS LAN offers up to 5.1% power savings in overall GPS function. Infineon BGA123L4 reduces LNA power consumption by up to 76% enabling implemented in a smartwatch savings offer up to 30 minutes longer battery life.

BGA123L4 is designed to enhance GNSS signal sensitivity especially in wearables and mobile cellular IoT devices. With 18.2 dB gain and only 0.75 dB noise figure it ensures high system sensitivity. The current needed is only 1.1 mA which means just 1.3 mW power consumption, which is critical to help to conserve batteries. The wide supply voltage range of 1.1 V to 3.6 V ensures flexible design and high compatibility.

Features

- > L1 band 1550 - 1615 MHz
- > Only one external SMD component necessary
- > Drop-in pinning
- > Best performance / size ratio
- > Control and Vcc via single GPIO line
- > Lowest power consumption
- > Smallest Size

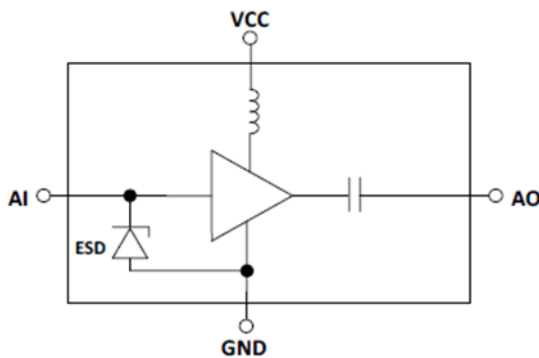
Target applications

- > Wearables, IoT, Smartphones

Product collaterals / online support

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

Block diagram



Product overview incl. data sheets links

OPN	SP Number	Package
BGA123L4E6327XTSA1	SP001647052	PG-TSLP-4

IFF2400P17AE4 (Air Cooling) and IFF2400P17LE4 (Liquid Cooling) MIPAQ™ Pro a new dimension in smart protection



The MIPAQ™ Pro provides an all-in-one solution for a wide spectrum of scalable and compact inverter designs to be implemented in energy storage systems, smart grid, wind, solar and industrial drives applications. MIPAQ Pro is a fully qualified and tested IPM, integrating IGBTs, gate drivers, the heat sink, sensors, digital control electronics as well as digital bus communication in one robust and reliable device. The high performance subsystem provides high power density combined with a large safe operating area (SOA). Innovative features offer a new approach for protecting the IPM in addition to high modularity, increased design flexibility and security.

Features

MIPAQ™ Pro is the new High Power IPM:

- > 2400A @ 1700V
- > Including IGBT, drivers, heat sink, sensors, digital monitoring, digital and analog interfaces, Modbus communication, microcontroller
- > 360 x 215 x 166 mm (air-cooled version)
- > 350 x 215 x 115 mm (liquid- version)
- > Tremendous protection features

Target applications

- > Energy Storage, Smart Grid, Wind, Drives

Competitive advantage

MIPAQ™ Pro offers

- > Easy change of settings and connections
- > Easy daisy chain paralleling of up to 4 devices
- > Continuously real time T_{vj} monitoring
- > SOA protection and additional adjustable OA warning and protection
- > Competitive pricing vs module solutions and other IPMs

MIPAQ™ Pro is tailored to several application needs

- > Overload protection @ LVRT and HVRT
- > High DC-Link voltage to extend system utilization
- > Save costs & space especially for devices needed only in case of maintenance
- > Security & prevent copy-cats and low cost competition to enter the after sales market

Product collaterals / online support

- > Product family [page](#)
- > IFF2400P17AE4 [page](#)
- > IFF2400P17LE4 [page](#)
- > Support: MIPAQPro@infineon.com

Benefits

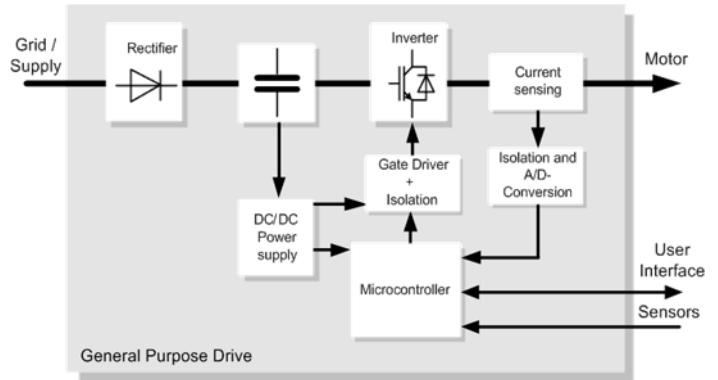
MIPAQ™ Pro offers tremendous protection features that enable:

- > Complete monitoring
- > Superior & secure authentication
- > Great design flexibility
- > Easy scalability
- > High system power density
- > Smart Protection

Application examples

- > Inverters from 300kW to 7MW

Block diagram



Product overview incl. data sheets links

OPN	SP Number	Package
IFF2400P17AE4BPSA1	SP001339224	MIPAQ™ Pro
IFF2400P17LE4BPSA1	SP001339254	MIPAQ™ Pro

Infineon® Prime Soft Diodes for IGBTs

D4600U45X172 (5 inch silicon), D2700U45X122 (3.5 inch silicon), D1600U45X122 (3 inch silicon)



New ultra-soft freewheeling diodes for IGBTs

The new diodes for IGBTs build on our existing IGCT freewheeling diode family. A big improvement is the turn-off capability, which has been upgraded to 5 kA/us.

Features

- > Full blocking capability 50/60 Hz over a wide temperature range
- > High case non-rupture current
- > Soft turn-off behavior at high turn-off di/dt
- > Extreme overcurrent capability of 80 kA@10ms

Benefits

- > Simplified mechanical stack construction with series stacking of press-pack IGBTs and freewheeling diodes
- > 50% time savings in stack design
- > Fewer safety devices required thanks to high overload capability

Target applications

- > Perfect fit for modern IGBT applications such as **HVDC** voltage source converters and **medium voltage drives**

Application examples

- > High Voltage Direct Current Transmission HVDC
- > Medium Voltage Converters
- > Freewheeling Diode for IGCT - Applications
- > Freewheeling Diode for IGBT - Applications
- > Pulsed Power Applications

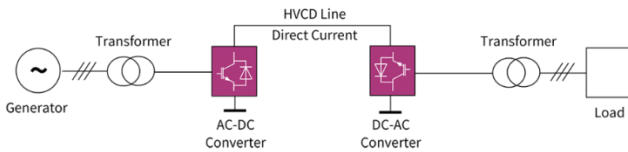
NEW Value propositions

- > Simplified mechanical stack construction with series stacking of press-pack IGBTs and freewheeling diodes
- > 50% time savings in stack design
- > Fewer safety devices required thanks to high overload capability

Completing products

- > IHV (FZ1200R45HL3)

Block diagram



Product collaterals / online support

- > Product family [page](#)
- > D4600U45X172 [page](#)
- > D2700U45X122 [page](#)
- > D1600U45X122 [page](#)

Product overview incl. datasheet link

OPN	SP Number	Package
D1600U45X122XPSA1	SP001694980	BG-D12026K-1-1
D2700U45X122XOSA1	SP001638072	BG-D12026K-1-1
D4600U45X172XPSA1	SP001626480	BG-D12026K-1-1