

New Product Introduction



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XENSIV[™] - Getting Started Box IoT

IR38164M OptiMOS™ IPOL DC-DC converter

New OptiMOS™ power MOSFETs 60 - 250 V in SuperSO8

ILD8150/ILD8150E - 80 V DC-DC buck LED driver IC

OPTIGA™ TPM SLM 9670 Industrial Grade TPM

OPTIREG™ TLT807B0EPV - adjustable voltage regulator

XENSIV™ transmission speed sensors - TLE4959-5U/FX

TLE9278B Multi-CAN Power+ SBC family

XENSIV[™] DPS368 - ultra small waterproof pressure sensor

XENSIV[™] - Getting Started Box IoT

Our box concept includes and provides everything you desire to design and creatively develop IoT applications.

A selection of sensors, microcontrollers and security ICs allows you to flexibly and freely combine and integrate them into your applications. The backbone of the Getting Started Box IoT is based on Infineon's proven Shield2Go and My IoT adapter concept. The hardware concept of Shield2Go relies on a standardized form factor and pin layout enabling simple orientation and guidance for all users. Adding solderless connectors makes the concept simple, reusable and straight-forward. The ready-to-use, free Arduino libraries emphasize this statement from a Software perspective. We provide these libraries for all included parts that are composed in the box. In addition the Getting Started Box IoT also includes add-on components like a magnet mounted rotation knob and joystick for evaluating the 3D magnetic sensors as well as a USB cable and pin headers for fast prototyping. This sophisticated package of hardware, software and add-on components alllows an individualized composition of your application. Unleash your creativity - Develop and prototype on a new level.

Features

- > Selection of Sensors, Security ICs and Microcontrollers based on Shield2Go formfactor in one box
- > Flexible combination of sensors, microcontrollers and security ICs possible
- > Sensors:
 - TLV493D-A1B6 3D Magnetic Hall Sensor TLI4970-D050T4 – Current Sensor with integrated current rail IM69D130 – Digital MEMS Silicon Microphone DPS310 – Barometric Pressure Sensor for Consumer
- > Security ICs:
 - OPTIGA[™] Trust E Hardware Security Chip

OPTIGA[™] Trust X - placed on Dual-Adapter Trust-X – Adapter for Infineon Shield2Go with Wemos Formfactor

> Microcontroller:

XMC 1100 Boot Kit – 32-bit Microcontroller based on ARM[®] Cortex[®]-M in Arduino-Uno Formfactor XMC[™] 2Go (Qty 2) – 32-bit Microcontroller based on ARM[®] Cortex[®]-M in Shield2Go Formfactor

- > ESP32 Wemos Formfactor including BLE and WIFI functionality
- > My IoT Adapter Triple Adapter for Infineon Shield2Go with Arduino-Uno Formfactor
- > Add ons for fast prototyping: Solderless connectors, Joystick and rotation knob, USB cable
- > Ready to use Arduino libraries free download

Target Applications

- > Smart Home
- > Smart Building
- > Industry 4.0
- > Industrial Automation
- > Sensor Fusion
- > Internet of Things

Product overview incl. web page link

OPN	SP Number	Package
GETSTARTBOXIOTTOBO1	SP003965356	Container

Benefits

- > Out of the box
- > Flexibility
- > Faster time-to-market
- > Ease-of-use
- > Fast prototyping
- > Simplicity

Competitive advantage

- > All in one solution
- > Customize your application by simply replacing or adding ICs
- > SW Starter package based on Arduino

Generic Pin layout of a single Shield2Go PCB

	Shield	C 0 2Go	
Input - 5V			
Analog - A1	0 2	10 💽	RX - UART Receive
Analog - A2	0 3	11 💽	TX - UART Transmit
I ² C Data - SDA	• 4	12 💽	RST - Reset
I ² C Clock - SCL	5	13 💽	GPIO - General Purpose In/Out
Reference Ground - GND	6	14 💽	CS - SPI Chip Select
Input - 3.3V	7	15 💽	SCLK - SPI Clock
External Interrupt - INT	8 🔍	16 💽	MOSI - SPI Master Out Slave In
Pulse Width Modulation - PWM	9	17 💽	MISO - SPI Master In Slave Out

- > Product page
- > Software XENSIV™ Getting Started Box IoT
- > Whitepaper



IR38164M OptiMOS™ IPOL DC-DC converter

The IR38164M OptiMOS[™] IPOL is an easy to use, fully integrated and highly efficient dc-dc regulator with Intel SVID and I2C/PMBus[™] interfaces. The on-chip PWM controller and co-packaged low duty cycle optimized MOSFETs make the device a space-efficient solution, providing accurate power delivery for low output voltage and high current applications that require an Intel SVID interface.

The IR38164M offers programmability of switching frequency, output voltage, and fault/ warning thresholds and fault responses while operating over a wide input range. Providing flexibility as well as system level security in the event of fault conditions.

Features

- > SVID for VCCIO & VMCP Intel
- > 5 x 7 mm up to 30 A
- > 300 kHz-1500 kHz switching frequency
- > Ultra-low jitter and less caps
- > Extensive PMBus support (70 commands)
- > Pin compatible options with/without PMBus
- > Pre-programmed for Intel VR13 rails

Target applications

Application diagram

> Server & Workstations

- > Telecom
- > Netcom
- > Storage

Benefits

- > 50% space saving compared to 2-chip solutions
- > 1 Mhz capable for less caps
- > OptiMOS[™] 5 for very high efficiency
- > Thermally able of up to 30 A with minimum airflow

Competitive advantage

> Sole single chip solution for Intel Server VCCIO, VMCP, PVNN rails and with extended PMBUS & PVID for 50% smaller size than competition

Infineon

> OptiMOS™ 5 for the highest efficiency IPOL in 5x7mm



Product overview incl. data sheet link

OPN	SP Number	Package
IR38164MTRPBF	SP001651560	PG-IQFN-34
EVAL38164SVIDTOBO1	SP002308252	board

- > Product page
- > Product brief
- > Application Notes

New OptiMOS™ power MOSFETs 60 - 250 V in SuperSO8

Infineon's OptiMOSTM best-in-class (BiC) power MOSFETs in SuperSO8 package offer the lowest on-state resistance (RDS_(on)) enabling reduced losses at a good price/performance ratio. The new BiC MOSFETs in SuperSO8 package extend the OptiMOSTM product portfolio and enable higher power density in addition to improved robustness, responding to the need for lower system cost and increased performance. Low reverse recovery charge (Q_{rr}) improves the system reliability by providing a significant reduction of voltage overshoot, which minimizes the need for snubber circuits, resulting in less engineering cost and effort.

The 175°C rating facilitates designs with either more power, at a higher operating junction temperature, or longer lifetime at the same operating junction temperature. In addition, with the increase in the temperature rating, 20 percent improvement in the safe operating area (SOA) is achieved.

Features

- > Lowest R_{DS(on)} enables highest power density and efficiency
- > Higher operating temperature rating to 175°C for increased reliability
- > Low R_{thJC} for excellent thermal behavior
- > Lower reverse recovery charge (Qrr)

Target applications

- > Server
- > Telecom
- > Power tools
- > Low voltage drives
- > Class D audio applications

Benefits

- > Reduced system costs through less paralleling
- > Lower full load temperature
- > Thermal robustness

Diagram



Lower overshoot at full load in 600 W telecom brick converter

Product overview incl. data sheet link

OPN	SP Number	Package
BSC012N06NSATMA1	SP001645312	TSON
BSC021N08NS5ATMA1	SP001793410	TSON
BSC027N10NS5ATMA1	SP001795088	TSON
BSC220N20NSFDATMA1	SP001795096	TSON
BSC430N25NSFDATMA1	SP001795116	TSON

- > Product family page
- > Product brief
- > Application brief



ILD8150/ILD8150E - 80 V DC-DC buck LED driver IC

The ILD8150/ILD8150E is a 80 V DC-DC converter IC, designed to drive high power LEDs. For applications operating close to safe extra-low voltage (SELV) limits, it provides a high safety voltage margin.

The buck LED driver IC is tailored for LEDs in general lighting applications with average currents up to 1.5 A using a high-side integrated switch. Several performance and protection features provide ideal fit for professional LED lighting.

Features

- > Input voltage ranging from 8 V_{DC} to 80 V_{DC}
- > Up to 1.5 A average output current
- > Integrated high-side MOSFET switch
- > Low typical $R_{\text{DS(on)}}$ of 275 $m\Omega$
- > Up to 2 MHz switching frequency
- > Hybrid dimming down to 0.5 % with 3.4 kHz flicker-free modulation
- > Soft start, low power shutdown, OTP, UVLO and current limitation

Benefits

- > High safety voltage headroom for 60 V / class 2 designs
- > Enabling high power designs with less thermal dissipation
- > Exceeding common dimming benchmarks
- > Fast, stable, and very efficient regulation with good EMI performance
- > Safe operation with low effort for professional lighting solutions

Target applications

- > LED driver
- > Tunable white
- > Multichannel lighting

Block diagram



Product overview incl. data sheet link

OPN	SP Number	Package
ILD8150XUMA1	SP001805682	DSO-8
ILD8150EXUMA1	SP001805686	DSO-8 exposed pad
REFILD8150DC15ATOBO1	SP002798058	board





- > Product family page
- > Product brief
- > Selection guide
- > <u>Video</u>

OPTIGA[™] TPM SLM 9670 Industrial Grade TPM

The OPTIGA[™] TPM SLM 9670 is a member of the OPTIGA[™] TPM family. It addresses the requirements of industrial and other demanding applications where an extended temperature range, an extended lifetime and industrial-grade quality are key.

Pushing beyond the qualifications processes performed for standard TPMs, the OPTIGA™ TPM SLM 9670 is qualified according to the industrial JEDEC JESD47 standard to enable the requisite performance under demanding environmental conditions.

OPTIGA[™] TPM SLM 9670 offers high levels of flexibility to address innovative use cases of Smart Factories and Industry 4.0 that call for robust security

Features

- > Standardized security chip compliant with TCG TPM 2.0 standard
- > Secured storage for critical data and secrets
- > Advanced protection mechanisms against physical and logical attacks
- > Support of cryptographic algorithms RSA-1028, RSA-2048, ECC NIST P256, ECC BN256, SHA-1, SHA-256
- > temp. range -40°C to 105°C
- > lifetime of 20 years
- > JEDEC JESD47 industrial qualification
- > Independently security evaluated and certified

Evaluation board: Iridium board SLM 9670 TPM2.0

Iridium add-on board for Raspberry Pi, for integration into corresponding platform OS (Linux, Win10IoT, etc.)

- > 3 V or 1.8 V power supply
- > Plug & play with 26-pin Raspberry Pi 1 header, compatible with Raspberry Pi 2 & 3
- > Reset manually via push-button or via RST signal from Raspberry Pi

Diagram



Product overview incl. data sheet link

OPN	SP Number	Package
SLM9670AQ20FW1311XTMA1	SP002676674	PG-VQFN-32
IRIDIUMSLM9670TPM20TOBO1	SP001793410	board

€ Infineon ^O Infineon ^O SLM 9670 ^O SLM 970 ^O SLM 970

Benefits

- > Standardized and certified security chip
- > Physically separated from the main processor
- > Building block for secured computing platforms and embedded systems

Competitive advantage

SLM 9670 is equipped with a variety of functions to secure industrial devices and systems. These include:

- Key storage and management
- Identification and authentication
- Signature generation and verification
- Software and firmware integrity attestation
- Secured logging and secured time

Target applications

- > Industrial PCs
- > Servers
- > Programmable Logic Controllers (PLC)
- > Industrial Network Infrastructure & Equipment Including
- > Gateways
- > Routers
- > Wireless Access Points
- > Switches

- > Product page
- > Product brief
- > Application notes
- > Tools & Software

OPTIREG[™] TLT807B0EPV - adjustable voltage regulator

Trucks as well as commercial, construction and agricultural vehicles have 24 V battery operated systems instead of the usual 12 V battery in cars. The different voltage requirements lead to a load dump voltage for the latter which is typically higher and could go up to 58 V. In addition to higher load dump voltages, another important requirement to consider is the lifetime requirements of trucks and commercial agricultural vehicles. A car on average has a lifetime of about 300k km where as heavy duty trucks can have lifetimes of 800k km up to 1000k km. This makes the 'lifetime' requirements for these vehicles three times as much as those for cars.

With the new TLT807B0EPV, not only takes into consideration the load dump requirements, but also that the lifetime requirements for the intended application by means of extended qualifications. A choice of a robust package in addition to the above mentioned criteria make the TLT807 the first linear voltage regulator specifically designed for trucks and commercial agricultural vehicles!

Features

- > Adjustable output voltage at ± 2% accuracy for output current up to 70 mA
- > Very low current consumption of typically 36 μA
- > Very low dropout voltage
- > Input voltage up to 42 V
- > Overvoltage protection up to 58 V (< 400 ms)
- > Enable input, active high
- > Protection functions:
 - Output current limitation for overload and short circuit conditions
 - Reverse polarity protection
 - Overtemperature shutdown
- > Wide temperature range -40°C to 150°C

Application diagram for TLT807B0EPV as a stand-by supply for 24 V ECUs



Block diagram



Product overview incl. data sheet link

OPN	SP Number	Package
TLT807B0EPVXUMA1	SP001497360	PG-TSDSO-14
TLT807B0EPVBOARDTOBO1	SP001704180	board



Benefits

- > Load dump voltage up to 58 V
- Requirement for 24 V battery powered applications
 Robust TSDSO-14 package
- Longer lifetime requirements for trucks, commercial and agricultural vehicles
- > Low dropout voltage and quiescent current
 Suitable as a stand-by supply
- > Extended qualification strategy for longer lifetime requirements

Qualification

> AEC-Q100 Qualified

Target applications

> 24 V applications, such as:

- Truck applications
 - Commercial agricultural vehicle (CAV)
 - Construction vehicle applications
- > Applications that are permanently connected to the battery

- > Product page
- > Product selection guide
- > Product brief
 - > Simulation Tool

XENSIV™ transmission speed sensors - TLE4959-5U/FX

Infineon released new transmission speed sensors, the XENSIV™ TLE4959-5U and the TLE4959-5U-FX. These are 4-wire voltage interface differential hall speed sensor for transmission speed applications with vibration suppression and direction detection output. The FX version flexible in terms of protocol, it has customer programmable EEPROM.

State-of-the-art Four-wire transmission speed sensor with direction detection. The TLE4959-5U (FX) is an integrated differential Hall speed sensor ideally suited for transmission applications. Its basic function is to provide rotational speed and direction of rotation information to the transmission control unit. Sophisticated vibration suppression with excellent air-gap performance. TLE4959-5U (FX) includes a sophisticated algorithm which actively suppresses vibration while keeping excellent air-gap performance

Features

- > Voltage interface
- > Active vibration suppression
- > direction detection output
- > Dynamic self-calibration
- > 0Hz capability
- > FX: flexible protocol through customer programmable EEPROM



Benefits

- > Flexibility in using pole wheel or steel wheel
- > Robustness against vibration and airgap
- > Programmable FX version gives access to different protocols

Target applications

- > Automatic transmission applications
- > Transmission applications with speed with direction detection

Qualification

> AEC-Q100 Qualified



Product overview incl. data sheet link

OPN	SP Number	Package
TLE49595UHALA1	SP001694294	PG-TSDSO-14
TLE49595UFXHALA1	SP001040496	PG-TSDSO-14

Product collaterals / Online support

- > Product page
- > PG-SSO assembly application note
- > XENSIV[™] selection guide
- > XENSIV™ pocket guide

Competitive advantage

> Outstanding airgap

- > Best hall jitter performance in its class
- > High immunity with stray field

Block diagram

TLE9278B Multi-CAN Power+ SBC family

Infineon's Multi-CAN Power+ System Basis Chip (SBC) TLE9278B family offers the highest level of Integration at smallest footprint for automotive applications requiring multiple channels of CAN transceivers like gateways and high-end Body Control Modules (BCM). A high-efficient Switch Mode Power Supply (SMPS) buck regulator provides an external 5 V or 3.3 V output voltage at up to 750 mA while an additional DC-DC boost converter supports applications or conditions at low supply input voltages.

The device is controlled and monitored via a 16-bit Serial Peripheral Interface (SPI). Additional features include a time-out/window watchdog circuit with reset, fail output and under voltage reset. The device offers low-power modes in order to support applications that are connected permanently to the battery. A wake-up from the low-power mode is possible via a message an the buses, via the bi-level sensitive monitoring/wake-up input as well as via the timer. The TLE9278B product family is offered in a very small footprint, exposed pad VQFN-48-31 (7 x 7 mm) power package.

Features

- > Buck regulator up to 750 mA
- > Boost controller up to 12 V
- > 4x CAN FD transceivers up to 5Mbps
- > Watchdog w/ reset and Failsafe-output
- > 7x7mm package

Competitive advantage

- > Industry first and only SBC with 4x CAN transceivers integrated, by far smallest footprint (7x7=49mm²) solution in the market
- > State-of-the-Art CAN technology (FD 5Mbps, PN)
- > Short development time due to family approach with HW/SW compatibility/scalability

Block diagram



Product overview incl. data sheet link

OPN	SP Number	Package
TLE9278BQXXUMA1	SP001833640	PG-VQFN-48
TLE9278BQXV33XUMA1	SP001833636	PG-VQFN-48
TLE92783BQXXUMA1	SP001833648	PG-VQFN-48
TLE92783BQXV33XUMA1	SP001833644	PG-VQFN-48



Benefits

- > powering high-performance microcontrollers
- > tolerant to severe line voltage drop conditions
- > highly integrated, state-of-the art network solution
- > advanced diagnostic and supervision functions
- > minimal PCB footprint enabling dense, multi-port applications

Qualification

> AEC-Q100 Qualified

Target applications

- > Integrated and stand alone gateways
- > Body Control Modules
- > Collision Avoidance (Driver Assistance)

- > Product family page
- > Tools & Software
- > <u>eLearning</u>

XENSIV™ DPS368 - ultra small waterproof pressure sensor

XENSIV[™] DPS368 is a miniaturized digital barometric pressure sensor capable of measuring both pressure and temperature. It offers an ultra-high precision (±2 cm) and a low current consumption for precise measurement of altitude, air flow & body movements. Due to its robust package, it can withstand 50 m under water for one hour (IPx8) and protects the sensing cells against dust and humidity. Additionally, the robustness facilitates handling in assembly line.

The small package $(2.0 \times 2.5 \times 1.1 \text{ mm}^3)$ saves up to 80% space compared to other waterproof sensors, which makes the DPS368 ideal for mobile applications and wearable devices.

Features

- > Package dimensions: 8-pin LGA, 2.0 x 2.5 x 1.1 mm³
- > Waterproof: IPx8 (50m, 1 hour)
- > Operation range: Pressure: 300 1200 hPa Temperature: -40 85 $^\circ\text{C}$
- > Precision: ± 0.002 hPa (or ±0.02 m)
- > Rel. accuracy: \pm 0.06 hPa (or ± 0.5 m)
- > Abs. accuracy: ± 1 hPa (or ±8 m)
- > Temperature accuracy: ± 0.5°C
- > Avg. current consumption:

Block diagram

- 1.7 μ A (pressure measurement) @1Hz sampling rate, Standby: 0.5 μ A. > Integrated FIFO
- > Interface: I2C and SPI (both with optional interrupt)
- > Green Product (RoHS) Compliant

Evaluation board: Sensor Hub Nano DPS368

Infineon sensor hub nano hosts one DPS368 and XMC1100 32-bit ARM Cortex-M0 MCU. The sensor hub nano can communicate to PC or Android $^{\rm TM}$ smart phone wirelessly, thanks to integrated Bluetooth® 4.0 and battery.

Infineon sensor hub nano can be used for quick testing and evaluation of DPS368 and is compatible with Infineon Sensor Software Analyzer (SES2G) and Infineon apps.

Benefits

- > Best-in-class resolution (±0.02 m)
 - precise measurement of altitude, air flow & body movements
- > High measurement rate (up to 200Hz) & fast read-out
 quick sensor feedback
- > 50% less power consumption then competitor product when running in full speed due to capacitive technology (AC biasing)
 longer battery lifetime
- > Robust against water (IPx8, 50 m under water for 1 hour), dust & humidity
 - can be used in harsh environment & facilitates handling in assembly line
- > Very small water resistant package (2.0x2.5x1.1 mm³)
 space saving up to 80% compared to other waterproof pressure sensors

Competitive advantage

- > Robust against water (IPx8), dust & humidity
- > Smallest IPx8 (50m) certified pressure sensor in the market
- > Ultra high resolution: ±0.002 hPa resolution equal to ±2 cm

Target applications

- > Smart watches & wearables
- > Home appliances
- > Drones
- > Health care



Product collaterals / Online support

- > Product page
- > Product page Evalboard
- > Product family page
- > Product brief
- > <u>Video</u>
- > App note air flow monitoring
- > App note water resistant systems

Product overview incl. data sheet link

OPN	SP Number	Package
DPS368XTSA1	SP002157814	PG-VLGA-8-2
EVALSHNBV01DPS368TOBO1	SP003339264	board

