Robotics & Drones

Evaluation boards compilation

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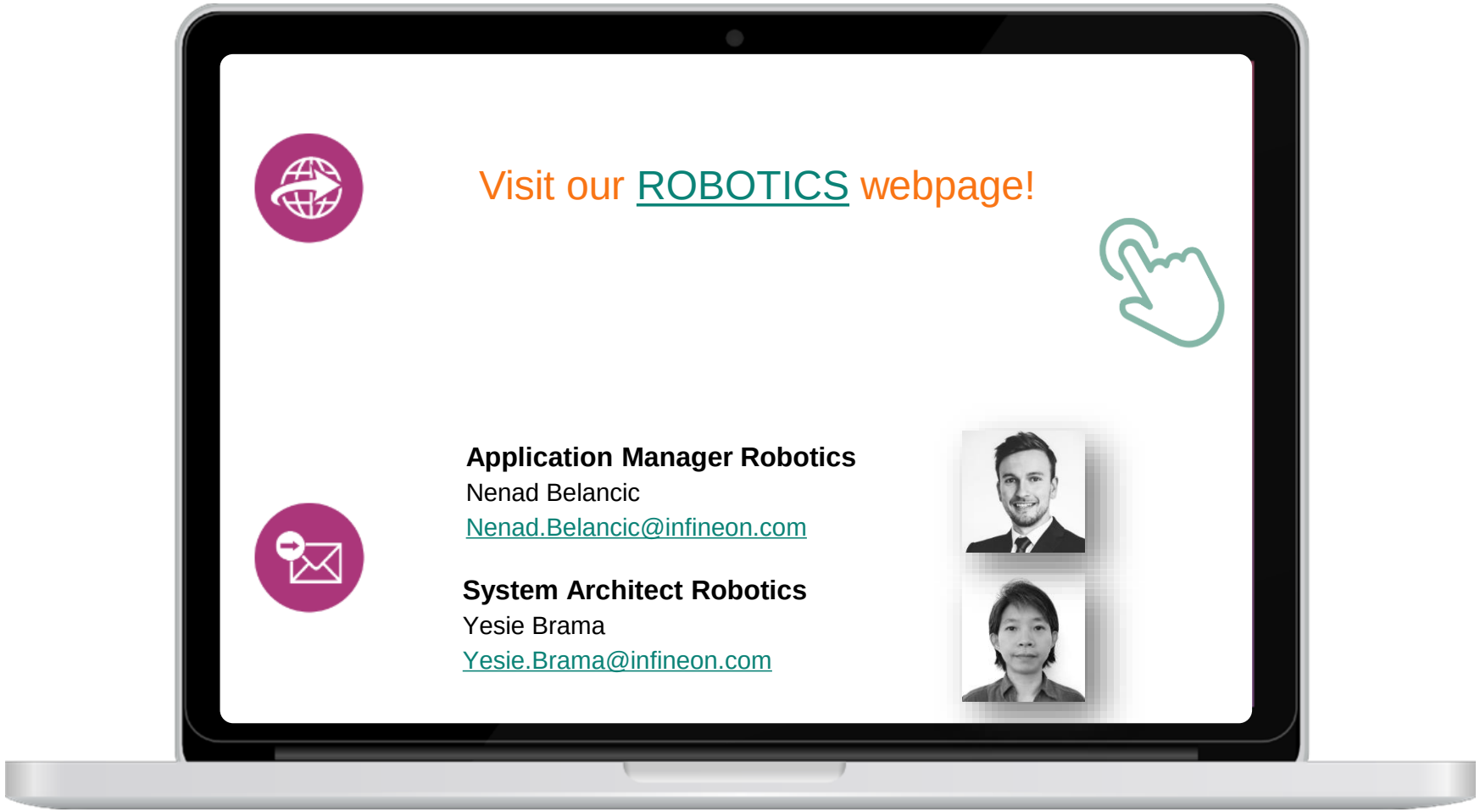
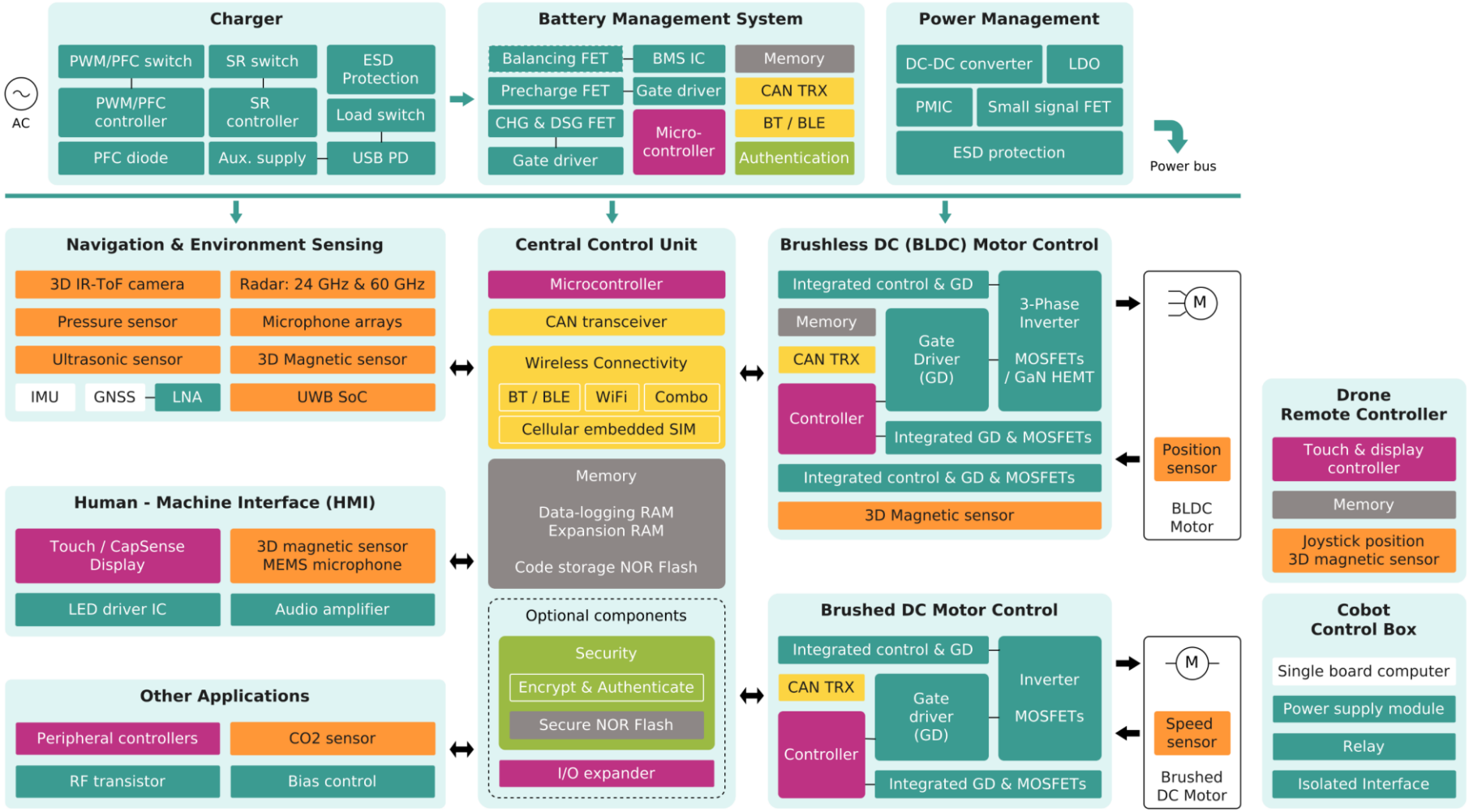
Points of Contact



Contents: Evaluation boards for Robotics & Drones applications

Click below or blocks in the diagram to jump into each section



Note: The evaluation boards listed here are not exhaustive. For more boards, please search in the Evaluation Board Finder

Motor Control selection

Brushed DC

- 5.5 – 18 V, 1 A
  Integrated 12 HB
  Control: XMC1100

- 5.5 – 18 V, 2 A
  Integrated 12 HB
  Control: Raspberry Pi

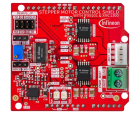
- 3.8 – 28 V, 7 A
  Integrated HB

PMSM-DC

- 12 – 24 V max., 3 A/phase
  3-phase GD & Dual N+N

Stepper-DC

- 3.5 – 36 V, 2 – 3 A/coil
  Integrated HB



General Brushless DC

- 5 V, 0.05 A/ph., MCE & 3-ph IPM

- 5.5 – 28 V, 1.8 A/ph., MCU + 3-ph GD

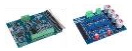
- 24 – 48 V, ≤ 2 A, HS-LS GD

- 18 – 60 V, 5 A max., MCU + 3-ph GD & sensor

- 13 – 48 V, ≤ 10 A, HS-LS GD

- 8 – 40 V, 30 A, Intgr. HB

- 20 – 45 V, ≤ 12 A, MCE + 3-ph GD



- 12 – 24 V, ≤ 15 A/ph., MCU + 3-ph GD

- 30 – 72 V, ≤ 6.5 A/ph., MCE + intgr. HB

- 12 – 24 V, ≤ 25 A/ph., 3-ph GD

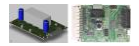
- 12 – 36 V, 20 A, 3-ph GD & MCE

- 24 – 40 V, ≤ 75 A/ph., 3-ph GD

- 24 – 48 V, 22 A, 3-ph GD

- 24 – 48 V, 25 A, HS-LS GD & MCE

- 32 – 52 V, 65 A, HS-LS GD



- 48 – 96 V, 25 A, HS-LS GD & MCE

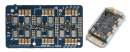
- 10 – 21 V, 5 A max., Dual N FETs

- 12 – 50 V, 5 A max., MCU + 3-ph GD

- 38 – 60 V, 3.6 A average, 3-ph GD

- 48 V, 20 A GaN eval.

- 32 – 64 V, 35 A max., GaN ref.design

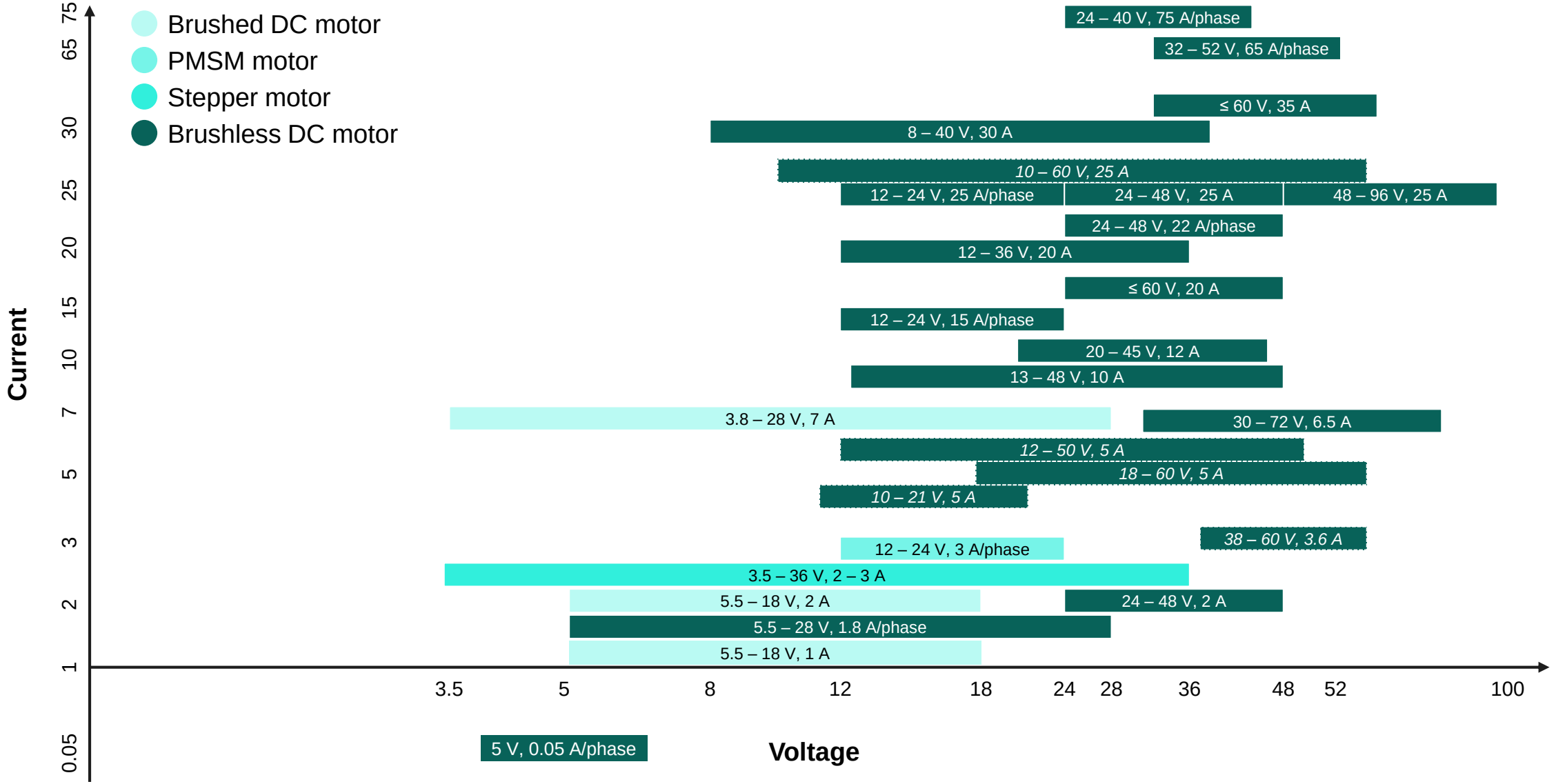


- 10 – 60 V, 25 A max., 1 MCU for dual motor control

Click here for boards list in table form

Click here for graphical representation

Motor Control selection overview graph



Motor Control selection overview table

Input voltage	Nominal current	Peak / Max. current	Rated / Estd. power	Key Features	Go to Slide
5.5 – 18 V	1 A	1.8 A	~40 W	Typical 12 V BDC motor operation up to 6 motors; Integrated 12 half-bridge mower IC; up to 3 motors by combining 2 half-bridge outputs	Link
5.5 – 18 V	2 A	3.6 A	~40 W	Typical 12 V BDC motor operation up to 6 motors; Integrated 12 half-bridge power IC; 1 motor by combining 4 half-bridge outputs	Link
3.8 – 28 V	7 A	14 A	~80 W	Typical 12 V BDC motor operation; Integrated N+N half-bridge power IC	Link
12 – 24 V	–	3 A (per phase)	15 W	24 V PMSM motor operation; 6-channel gate driver & dual N-MOSFETs power stage	Link
3.5 – 36 V	2 – 3 A (per coil)	6 A (per coil)	~100 W	Typical 24 V Stepper DC motor operation; Integrated H-bridge IC	Link
5 V via USB	0.05 A (per phase)	–	~1.5 W	15 V BLDC motor operation; Smart motion control engine (MCE) IC	Link
5.5 – 28 V	1.8 A (per phase)	–	~80 W	Typical 12 V BLDC motor operation; Integrated MCU + 6 N-CH gate driver	Link
10 – 21 V	–	5 A (per phase)	~90 W	Typical 18 V BLDC motor operation; Lowest cost solution with the latest generation of dual N-MOSFET	Link
24 – 48 V	–	2 A	~100 W	Typical 24 V BLDC motor operation; Possibility to operate PMSM or Stepper motor	Link
19 – 60 V	–	5 A	~150 W	Typical 48 V BLDC motor operation; For wheel application, equipped with CAN transceiver and external position sensor board	Link
12 – 50 V	–	5 A	220 W	Typical 36 V BLDC motor operation; Compact circular design with diameter 40 mm for wheel application, equipped with CAN transceiver	Link
13 – 48 V	–	10 A (estimated)	250 W	Typical 24 V BLDC motor operation	Link
8 – 40 V	30 A	55 A	250 W	Typical 24 V BLDC motor operation; Integrated P+N half-bridge power IC	Link
38 – 60 V	3.6 A	–	~270 W	Typical 48 V BLDC motor operation; Intended for wheel application, equipped with CAN transceiver	Link
20 – 45 V	–	12 A	300 W	Typical 24 V BLDC motor operation	Link
12 – 24 V	–	15 A (per phase)	300 W	Typical 18 V BLDC motor operation; Integrated smart 6-channel gate driver + MCU XMC1404	Link
30 – 72 V	–	6.5 A (per phase)	320 W	Typical 48 V BLDC motor operation	Link
12 – 24 V	–	25 A (per phase)	500 W	Typical 18 V BLDC motor operation; Integrated smart 6-channel gate driver	Link
12 – 36 V	20 A	25 A	750 W	Typical 12 - 36 V BLDC motor operation; Integrated 3-phase gate driver IC	Link
≤ 60 V	20 A	50 A (peak)	1000 W GaN	Typical 48 V BLDC motor operation; GaN power stage enabling higher switching frequency at 100 kHz	Link
≤ 60 V	35 A (max.)	40 A (peak)	~1000 W	Typical 48 V BLDC motor operation; Compact design 29 x 51 mm with GaN power stage, equipped with CAN transceiver	Link
24 – 40 V	–	75 A (per phase)	1500 W	Typical 36 V BLDC motor operation; Integrated smart 6-channel gate driver	Link
24 – 48 V	–	22 A (per phase)	1500 W	Typical 48 V BLDC motor operation; Integrated 6-channel gate driver	Link
24 – 48 V	25 A	30 A	1500 W	Typical 24 - 48 V BLDC motor operation; Integrated half-bridge gate driver; dual-side cooled power stage	Link
10 – 60 V	20 A	25 A	~2000 W	Typical 48 V BLDC motor operation; 1 MCU controls two BLDC motors, modular power stage design for varying the power level	Link
32 – 52 V	–	65 A (per phase)	3000 W	Typical 48 V BLDC motor operation; Integrated half-bridge TDI gate driver; dual-side cooled power stage	Link
48 – 96 V	25 A	30 A	3500 W	Typical 48 - 96 V BLDC motor operation; Integrated half-bridge gate driver; dual-side cooled paralleled power stage	Link

BDC Motor Control – TLE94112ES Evaluation (~40 W)

Technical Details

Input voltage	5.5 V to 18 V
Nominal current	1 A (2 half-bridge outputs being paralleled)
Peak current	1.8 A (2 half-bridge outputs being paralleled)
Estimated power	40 W

Overview

- **Typical 12 V BDC Motor operation up to 6 motors at 0.5 A load & peak current <0.9 A**
- **Integrated 12-half-bridge Power IC**
- Up to 3 motors operation with doubled current load
- Overcurrent, under & over-voltage protections
- Motor speed control by PWM at 80 Hz, 100 Hz, and 200 Hz options
- Control software available in GitHub
- OPN: TLE94112ESSHIELDTOBO1
- Supply voltage functional range: 5.5 – 18 V
- To be used with Arduino Uno R3/XMC1100 Boot Kit (KITXMC11BOOT001TOBO1 with on-board debugger compatible with XMC Link) via SPI and stackable up to 2 shields

Product type	Function	Part number	Description	Package mm x mm	Qty
Gate driver + MOSFETs	Half-bridges provider	TLE94112ES	Protected 12-fold half-bridge driver with PWM generator & supply voltage 5.5 - 18 V & overcurrent threshold at 0.9 A, with Enable function & T_J -40 to 150°C	SSOP24 6x8.65	1
P-MOSFET	Reverse polarity protection	IPD50P04P4L-11	-40 V OptiMOS™ P2 Power Transistor 10.6 mΩ with continuous I_D -50 A at T_C 25°C & V_{GS} -10 V & typ. Q_g 45 nC, AEC qualified	DPAK 6.2x6.5	1
MCU	Control SPI	XMC1100-T038X0064	32-bit Cortex-M0 32/64 MHz Core/Peripheral clock 16 KB RAM & 64 KB Flash with 12-bit ADC, 2 universal serial interface, T_A -40 to 105°C	TSSOP38 9.7x6.4	1
LDO	Voltage regulator	IFX25001MEV33 & IFX25001TFV50	3.3 V & 5 V LDO with up to 400 mA output current limit & reverse polarity protection & V_{IN} 4.7/5.5 V to 40 V – replaceable with TLE42744GSV33 & TLE42744DV50	SOT223 & DPAK	1 & 1

BDC Motor Control – TLE94112ES Evaluation (~40 W)

Technical Details

Input voltage	5.5 V to 18 V
Nominal current	2 A (4 half-bridge outputs being paralleled)
Peak current	3.6 A (4 half-bridge outputs being paralleled)
Estimated power	40 W

Overview

- **Typical 12 V BDC Motor operation up to 6 motors at 0.5 A load & peak current <0.9 A**
- **Integrated 12-half-bridge Power IC**
- Possible output current paralleling up to 3.6 A & 1 motor
- Overcurrent, under & over-voltage protections
- Motor speed control by PWM at 80 Hz, 100 Hz, and 200 Hz options
- Control software available in GitHub
- I^2C-based EEPROM to store HAT configuration
- OPN: TLE94112ESRPIHATTOBO1
- PCB dimension: 56 x 65 x 25 mm
- Supply voltage functional range: 5.5 – 18 V
- To be used with Raspberry PI via SPI & stackable for multiple HATs

Product type	Function	Part number	Description	Package mm x mm	Qty
Gate driver + MOSFETs	Half-bridges provider	TLE94112ES	Protected 12-fold half-bridge driver with PWM generator & supply voltage 5.5 - 18 V & overcurrent threshold at 0.9 A, with Enable function & T_J -40 to 150°C	SSOP24 6x8.65	1
P-MOSFET	Reverse polarity protection	IPD50P04P4L-11	-40 V OptiMOS™ P2 Power Transistor 10.6 mΩ with continuous I_D -50 A at T_C 25°C & V_{GS} -10 V & typ. Q_g 45 nC, AEC qualified	DPAK 6.2x6.5	1
Step-down regulator	Voltage regulator	TLS4125D0EPV50	Up to 2.8 MHz Step-Down Regulator 2.5 A, 5 V ±1.5% feedback voltage accuracy in PWM mode, Enable function & V_S 3.7 V to 35 V, to provide 5 V supply for the Raspberry PI board	DSO14 5x6	1

BDC Motor Control – BTN7030 Evaluation (~80W)

Technical Details

Input voltage	6 V to 18 V
Nominal current	7 A
Peak current	14 A (at 150°C)
Estimated power	80 W

Overview

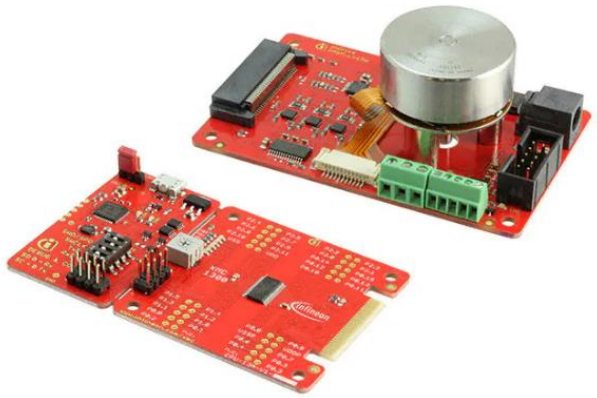
- **Typical 12 V BDC Motor operation up to 7 A nominal load**
- **Integrated N+N half-bridge Power IC**
- Overcurrent, under-voltage, over-temperature protections and current sense diagnosis
- Switching frequency up to 2 kHz
- Control software available in Github & Infineon website
- OPN: DCSHIELDBTN7030TOBO1
- PCB dimension: 52 x 70 mm
- Maximum supply voltage functional range: 3.8 – 28 V
- To be used with Arduino Uno R3/XMC1100 Boot Kit (KITXMC11BOOT001TOBO1 with on-board debugger compatible with XMC Link)

Product type	Function	Part number	Description	Package mm x mm	Qty
Gate driver + MOSFETs	Half-bridge IC	BTN7030-1EPA	Protected half-bridge with integrated charge pump & driver, digital signal interface to switch ON the high/low side, Diagnostic Enable pin, supply voltage 3.8 – 28 V, $R_{DS(on)}$ H/L 25.5 mΩ/36.5 mΩ, nominal load 7 A, overcurrent limit 14 A, overcurrent protection, temperature limit, under-voltage shutdown, T_J -40 to 150°C, automotive qualified	TSDSO14 5x6	2
P-MOSFET	Reverse polarity protection	IPD50P04P4L-11	-40 V OptiMOS™ P2 Power Transistor 10.6 mΩ with continuous I_D -50 A at T_C 25°C & V_{GS} -10V & typ. Q_g 45nC, AEC qualified	DPAK 6.2x6.5	1
MCU	Control SPI	XMC1100-T038X0064	32-bit Cortex-M0 32/64 MHz Core/Peripheral clock 16 KB RAM & 64 KB Flash with 12-bit ADC, 2 universal serial interface, T_A -40 to 105°C	TSSOP38 9.7x6.4	1
LDO	Voltage regulator	IFX25001MEV33 & IFX25001TFV50	3.3 V & 5 V LDO with up to 400 mA output current limit & reverse polarity protection & V_{IN} 4.7/5.5 V to 40 V – replaceable with TLE42744GSV33 & TLE42744DV50	SOT223 & DPAK	1 & 1

PMSM Motor Control – 6EDL04N02PR Evaluation (15 W)

Technical Details

Input voltage	12 V to 24 V
Nominal current	-
Peak current	3 A
Estimated power	15 W



Overview

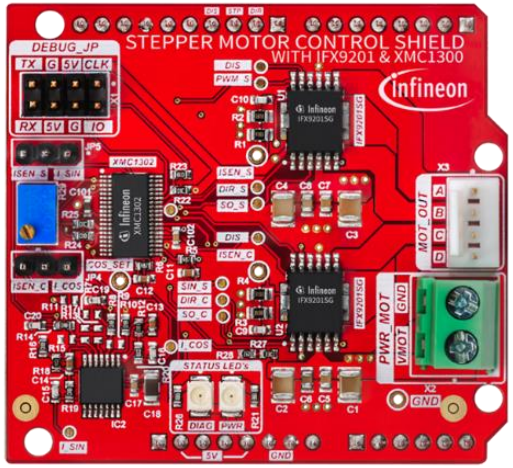
- **On-board 24 V 15 W PMSM DC motor operation**
- **6-channel gate driver & dual N-MOSFETs power stage**
- 3 legs shunt current sensing with amplifiers
- Control algorithm: Hall-sensored and sensorless back-EMF zero-crossing & FOC
- High PWM frequency e.g. 20 kHz
- Overcurrent & under & over-voltage protection
- Hall sensors & encoder interfaces
- OPN: KITXMC1XAKMOTOR001TOBO1
- Input voltage range 12 – 24 V
- Maximum DC-link and motor phase current: 3 A
- Included XMC1300 Boot Kit with on-board debugger compatible with XMC Link

Product type	Function	Part number	Description	Package mm x mm	Qty
MCU	Control PWM input	XMC1302-T038X0200	Cortex-M0 32-bit 32/64 MHz Core/Peripheral clock 16 KB SRAM & 128 KB Flash with CCU8 PWM for easy 3-phase inverter implementation & POSIF interface for hall sensors/encoder, T_A -40 to 105°C	TSSOP38 9.7x6.4	1
Gate driver	3-phase gate driver	6EDL04N02PR	200 V 3-Phase gate driver with OCP, Enable, Fault & integrated BSD with 0.165 A & 0.375 A IO source & sink, propagation delay 530 ns	TSSOP28 9.7x6.4	1
N+N dual MOSFET	3-phase power stage	BSZ0907ND	30 V Dual N-Channel OptiMOS™ MOSFET 9.5/7.2 mΩ with continuous I_D 25/30 A at T_C 70°C, V_{GS} ≥ 10 V & typ. Q_g 4.3/5.3nC – similar replacement BSC0923NDI (5/2.8 mΩ, 40/40 A, 6.7/12 nC)	WISON8 3x3	3

Stepper DC Motor Control – IFX9201SG Evaluation (~100 W)

Technical Details

Input voltage	3.5 V to 36 V (typical 24 V)
Nominal current	2 A per coil
Peak current	6 A per coil
Estimated power	100 W



Overview

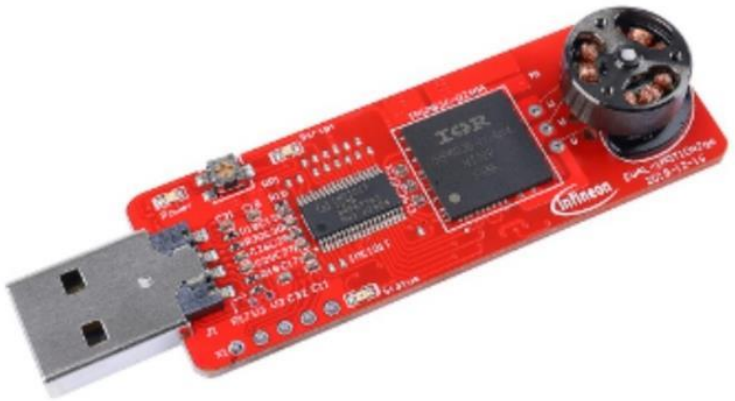
- **Typical 24 V Stepper DC Motor operation up to 2 A – 3 A load & peak current 6 A per coil**
- **Integrated H-bridge IC**
- Current sensing amplifier each for sine and cosine coils
- Overcurrent, short circuit, under & over-voltage, over-temperature protections
- PWM frequency up to 20 kHz
- Control software available in GitHub for use with Arduino
- OPN: KITXMC1300IFX9201TOBO1
- Supply voltage functional range up to 36 V
- On-board debugger compatible with XMC Link
- Compatible with Arduino Uno R3/XMC1100 Boot Kit/XMC4700 Relax Kit

Product type	Function	Part number	Description	Package mm x mm	Qty
Gate driver + MOSFETs	H-bridge IC	IFX9201SG	Integrated H-bridge with charge pump, and current & temperature monitor & supply voltage up to 36 V, T_J -40 to 150°C	DSO12 7.8x10.3	2
MCU	Logic control	XMC1302-T038X0200	Cortex-M0 with MATH, 32-bit 32/64 MHz Core/Peripheral clock 16 KB SRAM & 200 KB Flash with CCU8 PWM for easy 3-phase inverter implementation & POSIF interface for hall sensors/encoder	TSSOP38 9.7x6.4	1

BLDC Motor Control – IMC101T & IPM Evaluation (~1.5 W)

Technical Details

Input voltage	5 V via USB socket
Nominal current	50 mA (motor phase current)
Peak current	-
Estimated power	1.5 W



Overview

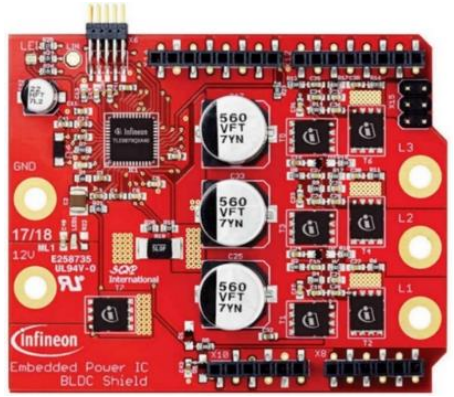
- **15 V BLDC motor operation with average current 50 mA**
- **Smart motion control engine (MCE) IC**
- **Integrated 3-Phase Power Module (IPM)**
- Single shunt current sensing
- Control algorithm: sinusoidal and sensorless FOC
- Power supply from USB
- On-board debugger compatible with XMC Link to program the MCE IC
- OPN: EVALIMOTION2GOTOBO1
- DC bus voltage range: 14 – 16 V (generated on-board)
- PCB: 62 x 22 mm & 2-layer FR4
- *IPM capable of operating BLDC motor up to 95 W without heatsink*

Product type	Function	Part number	Description	Package mm x mm	Qty
Motor control IC	Control PWM input	IMC101T-T038	MCE with integrated scripting engine allowing sensorless operation with FOC for PMSM motor, and space vector PWM with sinusoidal commutation, current sensing via single or leg-shunts, support Hall sensors, DC but input voltage 12 – 400 V, T_J -40 to 115°C, 2 serial ports for device programming & user comm.	TSSOP38 9.7x6.4	1
Gate driver + MOSFETs	Integrated power module	IRSM836-024MA	250 V integrated gate driver power module with bootstrap functionality, DC output max. 2 A, pulse (100 µs) output max. 7 A, max. PWM frequency 20 kHz, max. $R_{DS(on)}$ 2.4 Ω at T_J=25°C, V_{CC}=15 V, I_D=1A, T_j -40 to 150°C	PQFN 12x12	1

BLDC Motor Control – TLE9879QXA40 Evaluation (~80 W)

Technical Details

Input voltage	5.5 V to 28 V (typical 12 V)
Nominal current	1.8 A (motor phase current)
Peak current	-
Estimated power	80 W



Overview

- **Typical 12 V BLDC motor operation up to 10 A load**
- **Integrated MCU + 6 N-CH Gate Driver**
- To be used with Arduino Uno R3 MCU via SPI
- Up to 4 boards can be stacked on 1 Arduino Uno
- Control algorithm: sensorless FOC, BEMF, Hall-based block commutation
- Protections: over temperature, over current, over voltage, under voltage
- On-board debugger compatible to XMC Link/SEGGER J-Link
- OPN: BLDCSHIELDTLE9879TOBO1
- PCB dimension: 56 x 70 mm

Product type	Function	Part number	Description	Package mm x mm	Qty
MCU + Gate driver	3-phase gate driver	TLE9879QXA40	Cortex-M3 32-bit 40 MHz CPU clock 6 KB RAM & 128 KB Flash with CCU6 for PWM generation, 10-bit ADC, MOSFET driver plus charge pump, LDOs, OpAmp for current sensing via shunt, overtemperature & short circuit protection, LIN transceiver, 5 V supply for external loads, single power supply 5.5 - 27 V, AEC qualified, T_J -40 to 150°C	VQFN48 7x7	1
N-MOSFET	3-phase power stage & reverse polarity protection	IPC90N04S5-3R6	40 V OptiMOS™ 5 Power Transistor 3.6 mΩ with continuous I_D 90 A at T_C 25°C & V_{GS} 10 V & typ. Q_g 24.5 nC, AEC qualified	TDSON8 5.2x6.5	7

BLDC Motor Control – PSoC™ 4 Evaluation (~100 W)

Technical Details

Input voltage	24 V to 48 V
Nominal current	-
Peak current	2 A
Estimated power	100 W

Overview

- **Typical 2 4V 53 W 3.5 A BLDC motor (BLY172S-24 V-4000) operation**
- **Simultaneous evaluation for MCU with HMI Capacitive Sensing**
- Double shunt current sensing & overcurrent protection
- Hall sensors interface & back EMF voltage measurement
- Control algorithm: Hall-sensored & sensorless Back-EMF & sensorless single & double-shunt FOC
- OPN: CY8CKIT-037
- To be used with CY8C4245AXI-483 (CY8CKIT-042)/CY8C4548AZI-S485 (CY8CKIT-045S) KIT
- Possibility to operate PMSM and stepper motors

Product type	Function	Part number	Description	Package mm x mm	Qty
N-MOSFET	3-phase power stage	IRFR3607	75 V HEXFET™ Power MOSFET 9 mΩ with continuous I_D 56 A at T_C 25°C & V_{GS} 10 V & typ. Q_g 56 nC	DPAK 6.5x10	6
Gate driver	2-channel gate driver	IR2101S	600 V high side & low side gate driver with UVLO, I_O source 0.13 A & sink 0.27 A, max. propagation delay 220 ns, gate driver V_S range 10 - 20 V, T_A -40 to 125°C	SOIC8 5x6	3
MCU in KIT 042	Control PWM input	CY8C4245AXI-483	32-bit Cortex-M0 48 MHz CPU clock 4 KB SRAM & 32 KB Flash with 4 TCPWM blocks & Comparator-based triggering of Kill signals for motor drive, 2 OpAmps, CAPSENSE™, LCD drive capability on GPIOs, V_S 1.71 – 5.5 V, T_A -40 to 105°C	TQFP44 12x12	1
MCU in KIT 045S	Control PWM input	CY8C4548AZI-S485	32-bit Cortex-M0+ 48 MHz CPU clock 32 KB SRAM & 256 KB Flash with 8 TCPWM blocks & Comparator-based triggering of Kill signals for motor drive, Motor Control Accelerator (MCA) hardware, 4 OpAmps, CAPSENSE™ touch sensing, LCD drive capability on GPIOs, V_S 1.71 – 5.5 V, T_A -40 to 105°C – similar replacement PSoC™ 4100SPlus/4200M family	TQFP64 16x16	1

BLDC Motor Control – IMD701A Application (150 W)

Technical Details

Input voltage	18 V to 60 V (typical 48 V)
Nominal current	---
Peak current	5 A_{RMS} continuous
Estimated power	150 W

Overview

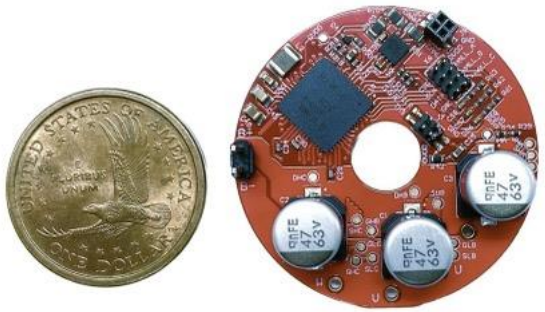
- **Typical 48 V BLDC motor operation up to 5 A continuous load**
- Reference design for wheel application using hub motor / direct drive
- Control algorithm: FOC with position sensor input from magnetic-based angle sensor
- Protections: over temperature, over current, over voltage, under voltage
- Onboard CAN transceiver to allow CAN bus communication
- Edge-card header containing angle sensor board interface, CAN, input battery voltage, regulated output voltage 5 V, Hall-latch position interface
- Programming & debugging connector for XMC Link/SEGGER J-Link
- OPN: DEMOIMRMTRCTRLV1TOBO1 for the motor drive board (on request)
- OPN: DEMOIMRANGLESENSV1TOBO1 for the angle sensor board (on request)

Product type	Function	Part number	Description	Package mm x mm	Qty
MCU + Gate driver	3-phase motor control	IMD701A-Q064X128-AA	Cortex-M0 with MATH, 32-bit 48/96 MHz Core/Peripheral clock 16 KB SRAM & 128 KB Flash, 2x CCU8 PWM for easy 3-phase inverter implementation & 2x POSIF interface for hall sensors/encoder, integrated with 3-phase smart gate driver with I_O source / sink 1.5 A, operating supply voltage 5.5 – 60 V, integrated power supplies, & current sense amplifiers, T_J -40 to 115°C	VQFN64 9x9	1
N-MOSFET	3-phase inverter	ISZ053N08NM6	80 V OptiMOS™ 6 Power Transistor, 5.3 mΩ with continuous I_D 90 A at T_C 25°C, V_{GS} 10 V & typ. Q_g 21 nC	8-FL 3x3	6
CAN transceiver	CAN transceiver	TLE9351VSJ	High speed supporting up to 5 Mbps, fully compliant to ISO11898-2 (2016) and SAE J2284-4/5, V_{IO} input for 3.3V and 5V MCU, standby mode, V_{CC} 4.5 – 5.5V, T_J -40 to 150°C	SO8 5x6	1
Schottky diode	MCU protection	BAS52-02V	45 V breakdown voltage, 0.75 A forward current, 0.5 W power dissipation	SC79 1.6x0.8	1
Angle sensor	Position sensor	TLI5012B E1000	GMR-based pre-calibrated 360° digital angle sensor, absolute angle value of 0.01° resolution, max. 1.9° angle error, magnetic field range 30 – 70 mT, SSC interface up to 8 Mbps, Incremental Interface, T_J -40 to 125°C	SO8 5x6	1

BLDC Motor Control – IMD701A Application (220 W)

Technical Details

Input voltage	12 V to 50 V (typical 36 V)
Nominal current	---
Peak current	5 A_{RMS} continuous (peak 9 A_{RMS} 30 seconds)
Estimated power	220 W



Overview

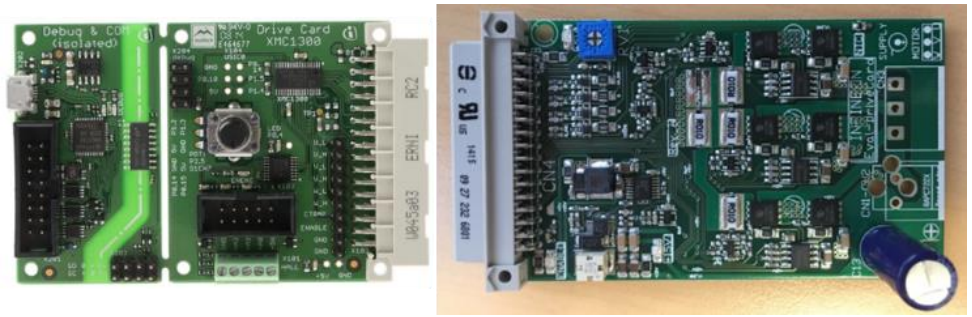
- **Typical 36 V BLDC motor operation up to 5 A continuous load**
- Reference design for wheel application using motor with gearbox
- Control algorithm: sensorless FOC with open-loop voltage control, Vq voltage control, speed control, and position control
- Switching frequency: 20 kHz
- Protections: over temperature, over current, over voltage, under voltage
- Onboard CAN transceiver to allow CAN bus communication
- Onboard connector for position sensor (POSIF for Hall sensors and SSC for magnetic angle sensor)
- Programming & debugging connector for XMC Link/SEGGER J-Link
- OPN: REF36V220WSLFOCTOBO1
- PCB dimension: 40 mm diameter (9 mm inner hole)

Product type	Function	Part number	Description	Package mm x mm	Qty
MCU + Gate driver	3-phase motor control	IMD701A-Q064X128-AA	Cortex-M0 with MATH, 32-bit 48/96 MHz Core/Peripheral clock 16 KB SRAM & 128 KB Flash, 2x CCU8 PWM for easy 3-phase inverter implementation & 2x POSIF interface for hall sensors/encoder, integrated with 3-phase smart gate driver with I_O source / sink 1.5 A, operating supply voltage 5.5 – 60 V, integrated power supplies, & current sense amplifiers, T_J -40 to 115°C	VQFN64 9x9	1
Dual-N MOSFET	3-phase inverter	BSC155N06ND	60 V OptiMOS™ T2 Power Transistor, dual N channels, normal level, 15.5 mΩ with continuous I_D 42 A at T_C 25°C, V_{GS} 10 V and typ. Q_g 21 nC	SSO8 5x6	3
CAN transceiver	CAN transceiver	TLE9251VLE	High speed supporting up to 5 Mbps, fully compliant to ISO11898-2 (2016) and SAE J2284-4/5, V_{IO} input for 3.3V and 5V MCU, standby mode, V_{CC} 4.5 – 5.5V, T_J -40 to 150°C	TSON8 3x3	1

BLDC Motor Control – 2EDL05N06PF Evaluation (250 W)

Technical Details

Input voltage	13 V to 48 V (typical 24 V)
Nominal current	-
Peak current	10 A (estimated)
Estimated power	250 W



Overview

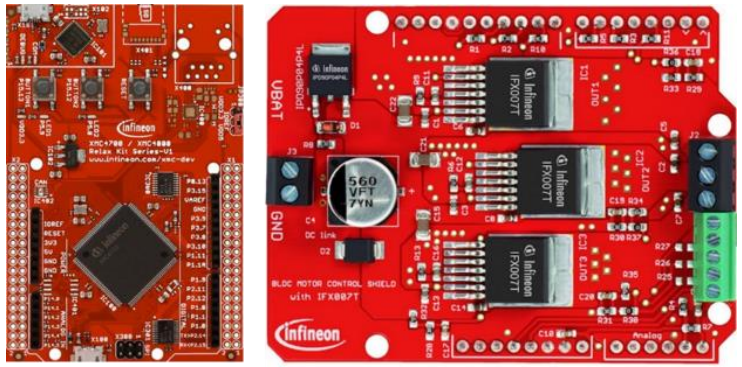
- **Typical 24 V BLDC (or BDC) motor operation**
- Input voltage operating range: 13 – 48 V
- 3-Phase shunt & DC-link current detection
- Phase BEMF Voltage measurement
- Overcurrent protection with Fault signal to MCU
- Sensorless FOC algorithm
- OPN: KITMOTORDC250W24VTOBO1
- To be used with XMC1300 (KITXMC1300DCV1TOBO1)/XMC1400 Drive Card (KITXMC1400DCV1TOBO1)/XMC4400 Drive Card (KITXMC4400DCV1TOBO1) with on-board debugger compatible with XMC Link

Product type	Function	Part number	Description	Package mm x mm	Qty
N-MOSFET	3-phase power stage	BSC014N06NS	60 V OptiMOS™ Power Transistor 1.45 mΩ with continuous I_D 240 A at T_C 25°C & V_{GS} 10 V & typ. Q_g 89nC	TDSON8F L 5.2x6.2	6
Gate driver	2-channel gate driver	2EDL05N06PF	600 V high side & low side gate driver with integrated BSD & deadtime & interlock function, I_O source 0.36 A & sink 0.7 A, propagation delay 310 & 300 ns for MOSFET and 420 & 400 ns for IGBT	DSO8 5x6	3
Step-down regulator	Voltage regulator	IFX90121ELV50	2.2 MHz Step-Down Regulator 500 mA, 5 V ±2% output voltage tolerance, with Enable function & V_S 4.75 V to 45 V, to provide 5V supply for the MCU board – replaceable with TLF50211EL	SSOP14 4.9x6	1
MCU in KIT board	Control PWM input	XMC1302-T038X0200	32-bit Cortex-M0 with MATH, 32/64 MHz C/P clock 16 KB SRAM & 200 KB Flash with CCU8 PWM for easy 3-phase inverter implementation & POSIF interface for hall sensors/encoder	TSSOP38 9.7x6.4	1

BLDC Motor Control – IFX007T Evaluation (250 – 300 W)

Technical Details

Input voltage	8 V to 40 V (typical 24 V)
Nominal current	30 A average (PCB limitation)
Peak current	55 A
Estimated power	250 – 300 W



Overview

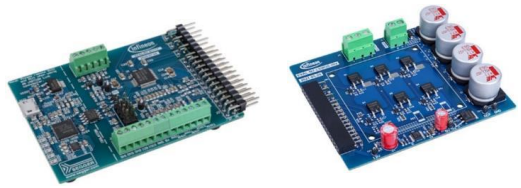
- **Typical 24 V BLDC Motor operation up to 30 A average motor current**
- **Integrated P+N half-bridge Power IC**
- Overcurrent & over-temperature protections
- High PWM frequency e.g. 30 kHz
- Current sense capability & adjustable slew rate
- Github software: Hall-sensored control
- OPN: BLDCSHIELDIFX007TTOBO1
- Maximum input voltage: 8 – 40 V
- To be used with Arduino Uno R3/XMC4700 Boot Kit (KITXMC47RELAX5VADV1TOBO1 with on-board debugger compatible with XMC Link)

Product type	Function	Part number	Description	Package mm x mm	Qty
Gate driver + MOSFETs	Half-bridge IC	IFX007T	High current P+N half bridge driver with current sense, slew rate adjustment, dead time generation, over-temperature, overcurrent, short circuit, under-voltage protections, V_s 8 - 40 V, T_J -40 to 150°C	D2PAK7 10x15	3
P-MOSFET	Reverse polarity protection	IPD90P04P4L-04	-40 V OptiMOS™ P2 Power Transistor 4.3 mΩ with continuous I_D -90 A at T_C 25°C & V_{GS} -10 V & typ. Q_g 135 nC, AEC qualified	DPAK 6.2x6.5	1
MCU	Control SPI	XMC4700-F144K2048	32-bit Cortex-M4 with FPU, 144 MHz CPU clock 352 KB SRAM & 2048 KB Flash with configurable 6 serial channels, CAN interface, Ethernet, USB, memories interfaces, Touch-Sense controller, 2x CCU8 PWM for easy 3-phase inverter implementation & 2x POSIF interface for hall sensors/encoder, T_A -40 to 125°C	LQFP144 22x22	1

BLDC Motor Control – IMD111T & IPD033N06N Evaluation (300 W)

Technical Details

Input voltage	20 V to 45 V (typical 24 V)
Nominal current	-
Peak current	12 A
Estimated power	300 W



Overview

- **Typical 24 V BLDC Motor operation**
- Single-shunt or leg-shunt current sensing configuration on MOSFET board
- Control algorithm: Hall sensored/sensorless FOC, Sinusoidal
- OPN: EVALM7LVMOSINVTOBO1 (MOSFET evaluation board)
- PCB dimension: 93 x 80 x 22 mm 2-layer FR4
- Switching frequency 20 kHz
- OPN: EVALM7D111TTOBO1 (Motion Control Engine evaluation board)
- On-board debugger compatible to XMC Link/SEGGER J-Link

Product type	Function	Part number	Description	Package mm x mm	Qty
N-MOSFET	3-phase power stage	IPD033N06N	60 V OptiMOS™ Power Transistor 3.3 mΩ with continuous I_D 90 A at T_C 25°C & V_{GS} 10 V & typ. Q_g 38 nC	DPAK 6.5x10	6
LDO	12 V producer	TLF4277-2EL	Adjustable output voltage LDO up to 300 mA with integrated current monitor and extensive protections, input voltage up to 40 V, T_J -40 to 150°C, AEC qualified	SSOP14	1
LDO	5 V producer	TLE42744DV50	5 V LDO ±2% precision up to 400 mA with output & reverse polarity protection & input voltage 5.5 V to 40 V, T_J -40 to 150°C, AEC qualified	DPAK 6.5x10	1
Controller + Gate driver	3-phase motor control	IMD111T-6F040	MCE Smart Driver with integrated high-voltage gate driver & scripting engine allowing sensorless operation with FOC for PMSM motor, and space vector PWM with sinusoidal commutation, current sensing via single or leg-shunts, support Hall sensors, DC bus input voltage 12 – 400 V, T_A -40 to 105°C, 2 serial ports for device programming & user communication	LQFP40 9x9	1
LDO	3.3 V producer	IFX25001MEV33	3.3 V LDO up to 400 mA with output current limit & reverse polarity protection & input voltage 4.7 V to 40 V – replaceable with TLE42744GSV33	SOT-223	1

BLDC Motor Control – IMD701A Evaluation (300 W)

Technical Details

Input voltage	12 V to 24 V (typical 18 V)
Nominal current	-
Peak current	15 A rms (per phase)
Estimated power	300 W

Overview

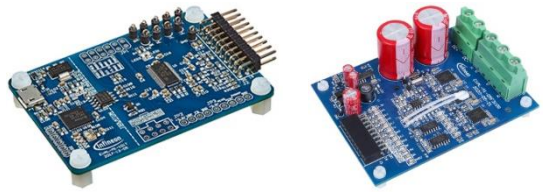
- **24 V BLDC motor operation up to 15 A load & switching frequency 20 kHz**
- **Integrated smart 6-channel Gate Driver + MCU XMC1404**
- Input voltage operating range: 12 – 24 V
- Control algorithm: sensorless FOC with 3-shunt I_{sense}
- Reverse polarity & overcurrent protection & thermal shutdown
- On-board debugger compatible with XMC Link
- OPN: EVALIMD700AFOC3SHTOBO1
- PCB dimension: 76 x 76 mm

Product type	Function	Part number	Description	Package mm x mm	Qty
MCU + Gate driver	3-phase motor control	IMD701A-Q064X128-AA	Cortex-M0 with MATH, 32-bit 48/96 MHz C/P clock 16 KB SRAM & 128 KB Flash, 2x CCU8 PWM for easy 3-phase inverter implementation & 2x POSIF interface for hall sensors/encoder, integrated with 3-phase smart gate driver with I_O source / sink 1.5 A, operating supply voltage 5.5 – 60 V, integrated power supplies, & current sense amplifiers, , T_J -40 to 115°C	VQFN64 9x9	1
N-MOSFET	3-phase power stage	IQE013N04LM6	40 V OptiMOS™ 6 Power MOSFET 1.35 mΩ with continuous I_D 205 A at T_C 25°C & V_{GS} 10 V & typ. Q_g 41 nC	TSON8 3.3x3.3	6
LDO	Voltage regulator	IFX54441LDV33	3.3 V LDO 300mA output, 2.5% output voltage accuracy, reverse polarity, overcurrent, over-temperature protection, input voltage 1.8 V to 20 V – replaceable with TLS203B0LDV33	TSON10 3.3x3.3	1
Diode	ESD protection	ESD5V3U2U-03F	Transient voltage suppressor (TVS) diode max. 20 kV ESD, 2 lines unidirectional V_{RWM} 5.3 V	TLSP3	1

BLDC Motor Control – IMC101T & IRSM005-301 Evaluation (320 W)

Technical Details

Input voltage	30 V to 72 V (typical 48 V)
Nominal current	-
Peak current	6.5 A / phase
Estimated power	320 W (without heatsink)



Overview

- **Typical 48 V BLDC Motor operation**
- Single-shunt current sensing configuration on power stage + gate driver board
- Control algorithm: Hall sensored/sensorless FOC, Sinusoidal
- OPN: EVALM105F310RTOBO1 (power stage + gate driver evaluation board)
- Overcurrent protection leading to PWM shutdown signal
- Overheating protection with on-board NTC thermistor
- OPN: EVALM1101TTOBO2 (Motion Control Engine evaluation board) of 65 x 45mm
- On-board debugger compatible to XMC Link/SEGGER J-Link

Product type	Function	Part number	Description	Package mm x mm	Qty
Intelligent power module	Half-bridge power module	IRSM005-301MH	100 V CIPOS™ Nano general purpose half-bridge with integrated gate driver, max. 21 mΩ at T_J 25°C & typ. Q_g 36 nC at V_{GS} = 10 V, max. DC current per MOSFET 30 A at T_C 25°C, UVLO, gate drive supply 10 – 20 V, logic input compatible for 3.3 V, 5 V, and 15 V	PQFN 7x8	3
Buck converter	15 V producer	ICE5GR4780AG	Integrated power IC CoolSET™ for offline SMPS with integrated 800V CoolMOS™ of typ. 4.13 Ω $R_{DS(on)}$, 125 kHz switching frequency, IC power supply 10 – 25.5 V, input bus voltage 30 – 600 V	DSO12 6x10	1
Schottky diode	Diode	BAS3005A-02V	30 V Schottky diode with forward current 0.5 A & typ. 0.45 V forward voltage, AEC qualified	SC79	8
Controller	Motor control IC	IMC101T-T038	Motor Control Engine (MCE) ready solution for variable speed drives of single motor, single/leg shunt current sensing, analog/digital Hall sensored & sensorless operation, Encoder interface, FOC algorithm & space vector PWM with sinusoidal commutation, host interface options: UART, PWM, analog input signal, T_A -40 to 105°C, DC bus input voltage 12 – 400 V, digital supply voltage 3 – 5.5 V	TSSOP38 6.4x9.7	1
LDO	Voltage regulator	IFX1117MEV33	3.3 V LDO 1 A output, ±2% precision, short circuit & over-temperature protection, input voltage 4.7 V to 15 V – similar I_{OUT} replacement TLE4284DV33 (different packaging – DPAK)	SOT223	1
Schottky diode	Diode	BAS3010A-03W	30 V Schottky diode with forward current 1 A & typ. 0.41 V forward voltage, AEC qualified	SOD323	1
TVS diode	ESD protection	ESD237-B1-W0201	Bidirectional ESD diode 16 kV, max. working voltage ±8 V, 7 pF line capacitance, clamping voltage 13 V	0201	1

BLDC Motor Control – 6EDL7141 Evaluation (500 W)

Technical Details

Input voltage	12 V to 24 V (typical 18 V)
Nominal current	-
Peak current	25 A_{RMS} (per phase)
Estimated power	500 W

Overview

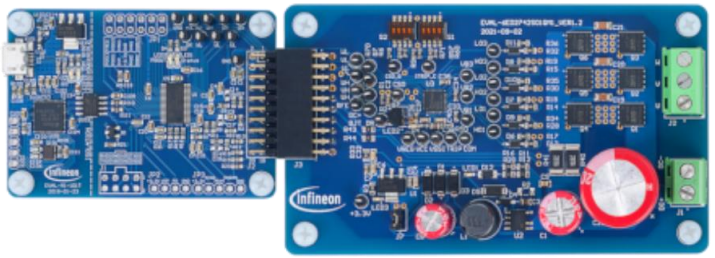
- **Typical 18 V BLDC motor operation up to 25 A load & switching frequency 20kHz**
- **Integrated smart 6-channel Gate Driver**
- Input voltage operating range: 12 – 24 V
- Control algorithm: Hall-sensored trapezoidal with 1-shunt I_{sense}, sensorless FOC with 3-shunt I_{sense}
- Reverse polarity & overcurrent protection & thermal shutdown
- On-board debugger compatible with XMC Link
- OPN: EVAL6EDL7141TRAP1SHTOBO1 for 1-shunt I_{sense}
- PCB dimension: 76 x 102 mm, 6-layer FR4

Product type	Function	Part number	Description	Package mm x mm	Qty
Gate driver	6-channel gate driver	6EDL7141	3-Phase smart gate driver with I_O source/sink 1.5 A, operating supply voltage 5.5 – 60 V, integrated power supplies, current sense amplifiers, Hall sensor comparators, ADC	VQFN48 7x7	1
MCU	Control PWM input	XMC1404-Q064X0200	Cortex-M0 with MATH, 32-bit 48/96 MHz Core/Peripheral clock 16 KB SRAM & 200 KB Flash with 12-bit ADC, 2x CCU8 PWM for easy 3-phase inverter implementation & 2x POSIF interface for hall sensors/encoder, T_A -40 to 105°C	VQFN64 8x8	1
N-MOSFET	3-phase power stage	BSC007N04LS6	40 V OptiMOS™ 6 Power Transistor 0.7 mΩ with continuous I_D 381 A at T_C 25°C & V_{GS} 10 V & typ. Q_g 94nC	TDSON8FL 5.2x6.2	6
LDO	Voltage regulator	IFX54441LDV33	3.3 V LDO 300 mA output, 2.5% output voltage accuracy & reverse polarity, overcurrent, over-temperature protection & input voltage 1.8 V to 20 V – replaceable with TLS203B0LDV33	TSON10 3.3x3.3	1
Diode	ESD protection	ESD5V3U2U-03LRH E6327	Transient voltage suppressor (TVS) diode max. 20 kV ESD, 2 lines unidirectionalV_{RWM} 5.3 V – replaceable with ESD5V3U2U-03F	TLSP3	1

BLDC Motor Control – IMC101T & 6ED2742S01Q Evaluation (750 W)

Technical Details

Input voltage	12 V to 36 V (max. 100 V with power derating)
Nominal current	20 A
Peak current	25 A
Estimated power	750 W



Overview

- **Typical 12 – 36 V BLDC Motor operation up to 20 A load**
- **Integrated 3-phase gate driver IC** including charge pumps, bootstrap diode, current sense amplifier, power management unit
- Widest input voltage operating range up to 100 V
- Overcurrent & shoot-through protections
- Switching frequency up to 25 kHz (typical 10 – 20 kHz)
- Control algorithm: sinusoidal and sensorless FOC
- OPN: EVAL6ED2742S01QM1TOBO1
- To be used with IMC101T board (EVALM1101TTOBO2 with on-board debugger compatible with XMC Link) with Motion Control Engine (MCE) – ready to use solution for variable speed drives

Product type	Function	Part number	Description	Package mm x mm	Qty
Gate driver	6-channel gate driver	6ED2742S01Q	3-Phase gate driver with SOI technology, I_O source 1 A & sink 2 A, input voltage 6 – 140 V, integrated power management unit, charge pumps, current sense amplifier, bootstrap diode, built-in dead time, overcurrent & shoot through protect.	VQFN32 5x5	1
N-MOSFET	3-phase power stage	BSC074N15NS5	150 V OptiMOS™ 5 Power Transistor 7.4 mΩ with continuous I_D 114 A at T_C 25°C & V_{GS} 10V & typ. Q_g 41 nC	SSO8 5x6	6
Motor control IC	Control PWM input	IMC101T-T038	MCE with integrated scripting engine allowing sensorless operation with FOC for PMSM motor, and space vector PWM with sinusoidal commutation, current sensing via single or leg-shunts, support Hall sensors, DC bus input voltage 12 – 400 V, T_A -40 to 105°C, 2 serial ports for device programming & user communication	TSSOP38 9.7x6.4	1

BLDC Motor Control – 100 V CoolGaN™ & 1EDN7126G Evaluation (1000 W)

Technical Details

Input voltage	Up to 60 V (typical 48 V)
Nominal current	20 A_{RMS}
Peak current	50 A_{RMS} (< 10 sec)
Estimated power	1000 W

Overview

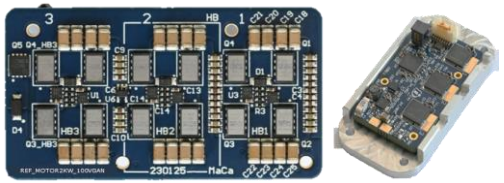
- **Typical 48 V BLDC Motor operation with up to 20 A_{RMS} load**
- **GaN power stage enabling higher switching frequency at 100 kHz**
- In-phase current sensing & temperature sensing
- Control algorithm: sensorless FOC (TBC)
- OPN: EVALMTR48V20AGANTOBO1
- To be used with XMC4400 Drive card (KITXMC4400DCV1TOBO1 with on-board debugger compatible with XMC Link)

Product type	Function	Part number	Description	Package mm x mm	Qty
GaN HEMT	3-phase power stage	IGC033S10S1	100 V CoolGaN™ G3 Power Transistor 3.3 mΩ, dual-side cooling, continuous I_D 75 A at T_C 25°C, V_{GS} 5 V & typ. Q_g 11 nC	PQFN 3x5	6
Gate driver	1-channel gate driver	1EDN7126G	200 V high-side TDI gate driver for GaN HEMTs & MOSFETs with I_O source & sink 1.5 A, fully differential logic input, active Miller clamp, bootstrap voltage clamp, adjustable charge pump	VSON10 3x3	6
Current sensor	In-phase current sensing	TLI4971-A050T5-E0001	Coreless current sensor based on differential sensing principle, 50 A measurement range, typical 220 µΩ insertion resistance, <1 nH parasitic inductance, 240 kHz bandwidth, Galvanic functional isolation up to 1150 V, 2 overcurrent detection outputs	TISON8 8x8	3
Motor control IC	Control PWM input	XMC4400-F100K512 BA	32-bit Cortex-M4 with FPU, 120 MHz CPU clock 80 KB RAM & 512 KB Flash with configurable 4 serial channels, CAN interface, Ethernet, USB, Touch-Sense controller, 4x 12-bit ADC, 2x CCU8 PWM for easy 3-phase inverter implementation & 2x POSIF interface for hall sensors/encoder, T_A -40 to 125°C	LQFP100 16x16	1

BLDC Motor Control – 100 V CoolGaN™ & 1EDN7126G Application (1000 W)

Technical Details

Input voltage	Up to 60 V (typical 48 V)
Maximum current	35 A_{RMS} (phase current) – with heatsink & fan
Peak current	40 A_{RMS} (< 30 sec)
Estimated power	1000 W



Overview

- **Typical 48 V BLDC Motor operation with up to 35 A_{RMS} load**
- **GaN power stage enabling higher switching frequency at 100 kHz or more**
- Reference design for speed control application e.g. drone ESC
- In-phase current sensing, onboard MCU, CAN transceiver, LDO, and protection diodes
- Control algorithm: sensorless FOC
- OPN: REF_MTR_48V30A_GaN (on request)
- PCB dimension: 29 x 51 x 6.4 mm (without connectors) & 8-layer FR4

Product type	Function	Part number	Description	Package mm x mm	Qty
GaN HEMT	3-phase power stage	IGC033S10S1	100 V CoolGaN™ G3 Power Transistor 3.3 mΩ, dual-side cooling, continuous I_D 75 A at T_C 25°C, V_{GS} 5 V & typ. Q_g 11 nC	PQFN 3x5	12
Gate driver	1-channel gate driver	1EDN7116G	200 V high-side TDI gate driver for GaN HEMTs & MOSFETs with I_O source & sink 2.0 A, fully differential logic input, active Miller clamp, bootstrap voltage clamp, adjustable charge pump	TSNP7 1.8x1.8	6
Current sensor	In-phase current sensing	TLI4971-A050T5-E0001	Coreless current sensor based on differential sensing principle, 50 A measurement range, typical 220 µΩ insertion resistance, <1 nH parasitic inductance, 240 kHz bandwidth, Galvanic functional isolation up to 1150 V, 2 overcurrent detection outputs	TISON8 8x8	3
Motor control IC	Control PWM input	XMC4200-Q48K256 BA	32-bit Cortex-M4F, 80 MHz CPU clock 40 KB RAM & 256 KB Flash with configurable 4 serial channels, CAN interface, USB, 2x 12-bit ADC, CCU8 PWM, 4x HRPWM, POSIF interface for hall sensors/encoder, T_A -40 to 125°C	VQFN48 7x7	1
LDO	MCU input power	TLS205B0LDV33	VIN 1.8 – 20 V, 500 mA output current, 3.3 V output, V_{DO} 0.32 V, protection: reverse polarity, overcurrent, overtemperature – discontinued (replaced with TLS205B0EJ V33 but bigger package SO8 5x6 mm)	TSON10 3x3	1
CAN TRX	CAN transceiver	TLT9251VLE	High speed supporting up to 5 Mbps, V_{IO} input for 3.3V and 5V MCU, standby mode, V_{CC} 4.5 – 5.5V, T_J -40 to 150°C	TSON8 3x3	1
N-MOSFET	Pre-charge switch	ISZ022N06LM6	60 V OptiMOS™ 6 Power Transistor, 2.2 mΩ with continuous I_D … A at T_C 25°C, V_{GS} 10 V, R_{thJA} 50 K/W & typ. Q_g … nC	8 FL 3x3	1
Diode	Protection	BAT 54-04W	Dual diodes in series, 0.2 A forward current, 30 V breakdown voltage	SOT323	1

BLDC Motor Control – 6EDL7141 & IST011N06NM5 Evaluation (1500 W)

Technical Details

Input voltage	24 V to 40 V (typical 36 V)
Nominal current	-
Peak current	75 A_{RMS} (per phase)
Estimated power	1500 W

Overview

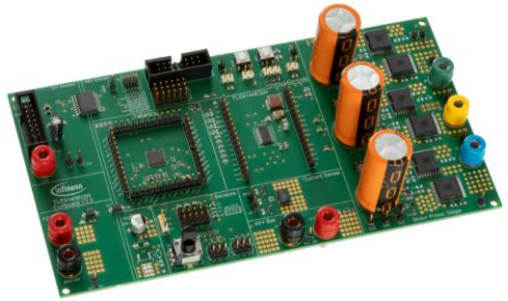
- **Typical 36 V BLDC motor operation up to 75 A load & switching frequency 20kHz**
- **Integrated smart 6-channel Gate Driver**
- Input voltage operating range: 24 – 40 V
- Control algorithm: sensorless FOC with 3-shunt I_{sense}
- Input fuse & input reverse polarity & overcurrent protection & thermal shutdown
- On-board debugger compatible with XMC Link
- OPN: EVAL6EDL7141FOC3SHTOBO1

Product type	Function	Part number	Description	Package mm x mm	Qty
Gate driver	6-channel gate driver	6EDL7141	3-Phase smart gate driver with I_O source/sink 1.5 A, operating supply voltage 5.5 – 60 V, integrated power supplies, current sense amplifiers, Hall sensor comparators, ADC	VQFN48 7x7	1
MCU	Control PWM input	XMC1404-Q064X0200	Cortex-M0 with MATH, 32-bit 48 MHz CPU clock 16 KB SRAM & 200 KB Flash with 12-bit ADC, 2x CCU8 PWM for easy 3-phase inverter implementation & 2x POSIF interface for hall sensors/encoder, T_A -40 to 105°C	VQFN64 8x8	1
N-MOSFET	3-phase power stage	IST011N06NM5	60 V OptiMOS™ 5 Power Transistor 1.1 mΩ with continuous I_D 399 A at T_C 25°C & V_{GS} 10 V & typ. Q_g 110 nC	sTOLL 7x8	6

BLDC Motor Control – TLE9140EQW Evaluation (1500 W)

Technical Details

Input voltage	24 V to 48 V (typical 48 V)
Nominal current	-
Peak current	22 A (average per phase; estimated)
Estimated power	1500 W



Overview

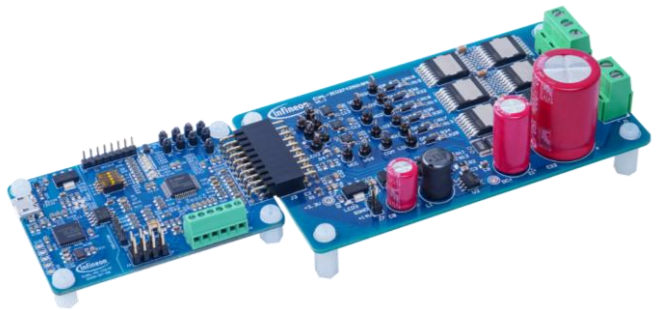
- **Typical 48 V BLDC motor operation up to 22 A load**
- **Integrated smart 6-channel Gate Driver**
- Input voltage operating range: 24 – 48 V
- Control algorithm: sensorless FOC
- On-board 2 supply concepts: isolated 12 V supply & down conversion from 48 V supply to 12 V
- On-board isolated LIN concept
- On-board debug interface
- On-board Hall/angle sensors interface
- OPN: TLE9140EQWEVALTOBO1

Product type	Function	Part number	Description	Package mm x mm	Qty
MCU + Gate driver	3-phase motor control	TLE9877QXW40	Cortex-M3 32-bit 40 MHz CPU clock 6 KB RAM & 64 KB Flash with CCU6 for PWM generation, 10-bit ADC, MOSFET driver plus charge pump, LDOs, OpAmp for current sensing via shunt, overtemperature & short circuit protection, 5 V supply for external loads, LIN transceiver, single power supply 5.5 - 27 V, AEC qualified, T_J -40 to 175°C	VQFN48 7x7	1
Gate driver IC	3-phase gate driver	TLE9140EQW	3-Phase gate driver, dual charge pump & internal supply, adjustable MOSFET control, functional supply voltage 8 – 60 V, high side voltage 7 – 105 V, 290 nC at 20 kHz driving capability, max. gate current 0.5 A, T_J up to 175°C	DSO32 3.9x8.65	1
N-MOSFET	3-phase power stage	IAUT300N10S5N015	100 V OptiMOS™ 5 Power Transistor 1.5 mΩ with continuous I_D 300 A at T_C 25°C & V_{GS} 10 V & typ. Q_g 166 nC, TOLL packaging, AEC qualified	HSOF8 9.9x11.7	6
LIN transceiver	LIN transceiver	TLE8457ALE	Single wire LIN transceiver up to 20 kbps, 5 V/3.3 V LDO up to 70 mA capability, under-voltage detection with RESET output, over temperature protection, supply voltage 5.5 – 28 V, T_J -40 to 150°C, AEC qualified	DSO8 / TSON8	1

BLDC Motor Control – IMC101T & 2ED2742S01G Evaluation (1500 W)

Technical Details

Input voltage	24 V to 48 V (max. 120 V likely with power derating)
Nominal current	25 A
Peak current	30 A
Estimated power	1500 W



Overview

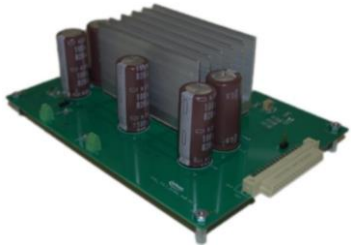
- **Typical 24 – 48 V BLDC Motor operation up to 25 A load**
- **Integrated half-bridge gate driver IC** including bootstrap diode and dead time
- Dual-side cooled power stage
- Shoot-through protection
- Control algorithm: sinusoidal and sensorless FOC
- OPN: EVAL2ED2742S01GM1TOBO1
- PCB dimension: 120 x 60 mm
- To be used with IMC101T board (EVALM1101TTOBO2 with on-board debugger compatible with XMC Link) with Motion Control Engine (MCE) – ready to use solution for variable speed drives
- PCB dimension: 65 x 45 mm

Product type	Function	Part number	Description	Package mm x mm	Qty
Gate driver	Dual channel gate driver	2ED2742S01G	160 V high-side & low-side gate driver with SOI technology, integrated bootstrap diode, separate pin for logic ground, shoot-through protection, I_O source 1 A & sink 2 A, built-in dead time 100 ns, integrated short pulse/noise rejection input filter, 2 kV HBM ESD compliance	VSON10 3x3	1
N-MOSFET	3-phase power stage	IPTC015N10NM5	100 V OptiMOS™ 5 Power Transistor 1.5 mΩ with continuous I_D 354 A at T_C 25°C & V_{GS} 10 V & typ. Q_g 166 nC, top-side cooling package	HDSOP16 9.9x15	6
Motor control IC	Control PWM input	IMC101T-T038	MCE with integrated scripting engine allowing sensorless operation with FOC for PMSM motor, and space vector PWM with sinusoidal commutation, current sensing via single or leg-shunts, support Hall sensors, DC bus input voltage 12 – 400 V, T_A -40 to 105°C, 2 serial ports for device programming & user communication	TSSOP38 9.7x6.4	1

BLDC Motor Control – 2EDL8124G & IPTC015N10NM5 Evaluation (3000 W)

Technical Details

Input voltage	32 V to 52 V (typical 48 V)
Nominal current	-
Peak current	65 A rms (per phase)
Estimated power	3000 W



Overview

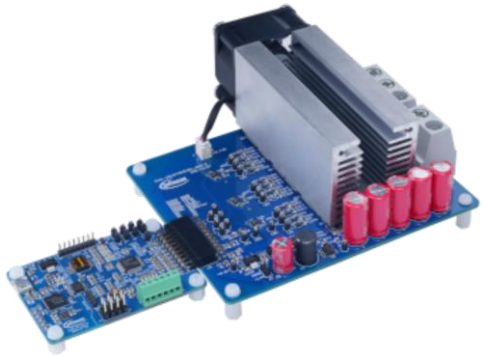
- **Typical 48 V BLDC motor operation up to 65 A load**
- **Integrated half-bridge TDI gate driver IC** including bootstrap diode
- Dual-side cooled power stage
- 10 kHz switching frequency & three current shunts
- Output over current protection & thermal shutdown
- Control algorithm: Trapezoidal/6-step/block commutation with Hall sensors & FOC
- OPN: EVALTOLTDC48V3KWTOBO2
- To be used with XMC1300 Drive Card (KITXMC1300DCV1TOBO1) or XMC4400 Drive card (KITXMC4400DCV1TOBO1) with on-board debugger compatible with XMC Link

Product type	Function	Part number	Description	Package mm x mm	Qty
N-MOSFET	3-phase power stage	IPTC015N10NM5	100 V OptiMOS™ 5 Power Transistor 1.5 mΩ with continuous I_D 354 A at T_C 25°C & V_{GS} 10 V & typ. Q_g 166 nC, top-side cooling package	HDSOP16 9.9x15	6
Gate driver	Dual channel gate driver	2EDL8124G	120 V high-side & low-side gate driver with true differential input (TDI), integrated bootstrap diode, I_O source 4 A & sink 6 A, shoot-through protection & UVLO, operating frequency up to 1MHz, supply voltage 8 – 17 V	VDSON8 4x4	1
N-MOSFET		IRLML6346TRPBF	30 V HEXFET™ Power MOSFET 63 mΩ at V_{GS} 4.5 V with continuous I_D 3.4 A at T_C 25°C & V_{GS} 10 V & typ. Q_g 2.9 nC	SOT-23	1
Buck converter	Voltage regulator	ILD8150E	DC-DC buck converter with hysteretic current regulation, output current up to 1.5 A, integrated 80V high-side MOSFET, UVLO & thermal protection, operating voltage 8 – 80 V, T_J -40 to 150°C	DSO8 4.9x6	1
MCU	Control PWM input	XMC1302-T038X0200	Cortex-M0 32-bit 32/64 MHz C/P clock 16 KB SRAM & 128 KB Flash with CCU8 PWM for easy 3-phase inverter implementation & POSIF interface for hall sensors/encoder, T_A -40 to 105°C	TSSOP38 9.7x6.4	1

BLDC Motor Control – IMC101T & 2ED2748S01G Evaluation (3500 W)

Technical Details

Input voltage	48 V to 96 V (max. 120 V likely with power derating)
Nominal current	25 A
Peak current	30 A
Estimated power	3500 W



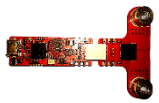
Overview

- **Typical 48 – 96 V BLDC Motor operation up to 25 A load**
- **Integrated half-bridge gate driver IC** including bootstrap diode and dead time
- Dual-side cooled power stage & parallel configuration for high current capability
- Shoot-through protection
- Control algorithm: sinusoidal and sensorless FOC
- OPN: EVAL2ED2748S01GM1TOBO1
- PCB dimension: 120 x 90 mm
- To be used with IMC101T board (EVALM1101TTOBO2 with on-board debugger compatible with XMC Link) with Motion Control Engine (MCE) – ready to use solution for variable speed drives
- PCB dimension: 65 x 45 mm

Product type	Function	Part number	Description	Package mm x mm	Qty
Gate driver	Dual channel gate driver	2ED2748S01G	160 V high-side & low-side gate driver with SOI technology, integrated bootstrap diode, separate pin for logic ground, shoot-through protection, I_O source 4 A & sink 8 A, built-in dead time 100 ns, integrated short pulse/noise rejection input filter, 2 kV HBM ESD compliance	VSON10 3x3	1
N-MOSFET	3-phase power stage	IPTC015N10NM5	100 V OptiMOS™ 5 Power Transistor 1.5 mΩ with continuous I_D 354 A at T_C 25°C & V_{GS} 10 V & typ. Q_g 166 nC, top-side cooling package	HDSOP16 9.9x15	12
Motor control IC	Control PWM input	IMC101T-T038	MCE with integrated scripting engine allowing sensorless operation with FOC for PMSM motor, and space vector PWM with sinusoidal commutation, current sensing via single or leg-shunts, support Hall sensors, DC bus input voltage 12 – 400 V, T_A -40 to 105°C, 2 serial ports for device programming & user communication	TSSOP38 9.7x6.4	1

Navigation & Other Sensors selection

Magnetic based

Analog current sensor	Digital GMR angle sensor	Digital GMR angle sensor	Analog TMR angle sensor	Analog dual TMR & GMR angle sensor	Digital ON/OFF unipolar Hall switch	Digital dual bipolar Hall switch for direction & speed information	3 digital Hall sensors: lateral switch, vertical switch, 3D magnetic sensor	Digital 3D magnetic sensor ±130 mT	Digital 3D magnetic sensor ±160 mT
									

Pressure based

Air pressure	Microphone SNR 69 dB	Microphone SNR 72 dB	Air & Microphone for Machine Learning	Gas CO_2	Mixed sensing: 60 GHz Radar & Air pressure
					

RADAR

60 GHz 1 transmitter 3 receivers	60 GHz 1 transmitter 1 receiver	24 GHz 1 transmitter 1 receiver
		

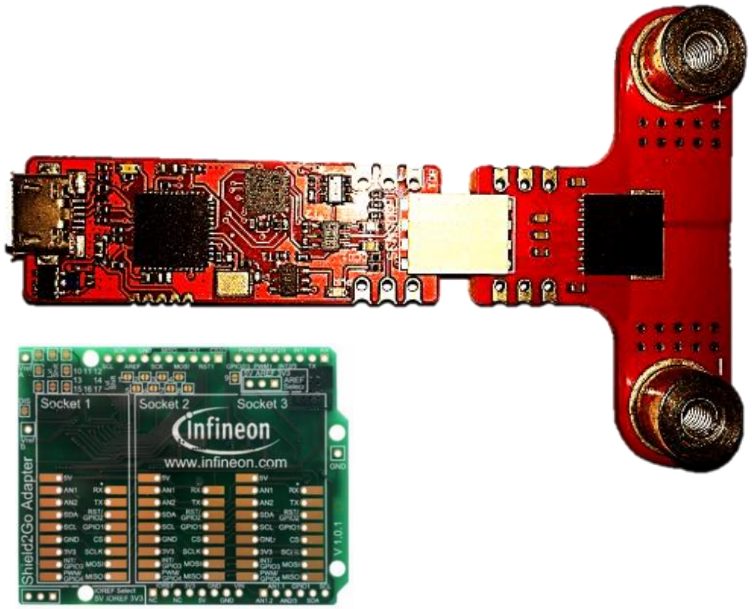
3D Infra-Red Time of Flight camera module

940 nm 224 x 172 pixel 56° x 44°	940 nm 224 x 172 pixel 60° x 40°	940 nm 224 x 172 pixel 105° x 85°	850/940 nm 640 x 480 pixel 80° x 60°	850 nm 640 x 480 pixel 60° x 40°	850 nm 352 x 287 pixel 80° x 65°	940 nm 640 x 480 pixel 58° x 73°	940 nm 240 x 180 pixel Dual illumination
							

Magnetic Sensor Evaluation Board (Current)

Overview

- **Analog coreless magnetic current sensor for AC and DC measurement**
- Linear current measurement up to ±120 A
- Fully calibrated and equipped with internal self-diagnostic feature & EEPROM for user-programmable parameters
- OPN: TLI4971MS2GOTOBO1 (with XMC1100 board)
- Easy to use with Arduino Uno using the available adapter (MYIOTADAPTERTOBO1)
- Evaluation software for the 2 baseboard types above is available in GitHub & Infineon website
- On-board debugger compatible with XMC Link for all XMC1100 boards

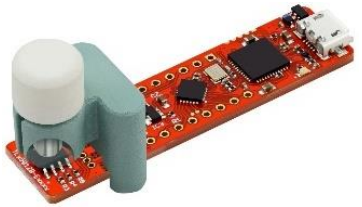


Product type	Function	Part number	Description	Package mm x mm	Qty
Current sensor	Current sensing	TLI4971-A120T5-E0001	Analog coreless magnetic current sensor, current full scale ±120 A, integrated current rail with typical 220 µΩ insertion resistance, <1 nH parasitic inductance, 240 kHz bandwidth, single-ended or semi or fully-differential output mode, V_{DD} -0.3 – 3.6 V, T_{AS} -40 to 105°C, UL certified device is available	TISON8 8x8	1
MCU	Read sensor output	XMC1100-Q024F0064	32-bit Cortex-M0 32/64 MHz C/P clock 1 6KB RAM & 64 KB Flash with 12-bit ADC, 2 universal serial interface, T_A -40 to 85°C	VQFN24 4x4	1
P-MOSFET	Switches for sensor supply & LED in both shield & MCU boards	BSL308PE	Dual P-channel -30 V OptiMOS™ P3 Small-Signal Transistor 80 mΩ with continuous I_D -1 A at T_A 120°C & V_{GS} ≤-10 V & typical Q_g 5 nC, automotive qualified	TSOP6 2.5x2.9	2 each board

Magnetic Sensor Evaluation Board (Angle)

Overview

- **360° digital angle sensor to detect the orientation of a magnetic field with integrated Giant Magneto Resistance (GMR) elements**
- Equipped with XMC1100 MCU to read the sensor output and set the sensor internal registers via Synchronous Serial Communication (SSC) interface
- Possibility to mount mechanical rotation knob with magnet (ROTATEKNOBANGLE2GOTOBO1) to simulate rotational movements for angle measurement
- On-board debugger compatible with XMC Link
- Evaluation software available in Infineon website
- OPN: TLI5012BE1000MS2GOTOBO1 / TLE5012BE5000MS2GOTOBO1 for automotive qualified

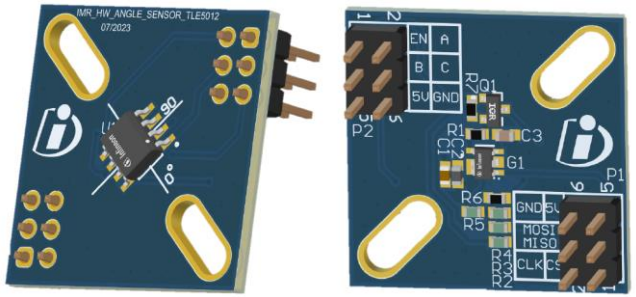


Product type	Function	Part number	Description	Package mm x mm	Qty
Angle sensor	Angle sensing	TLI5012B E1000	GMR-based pre-calibrated 360° digital angle sensor, absolute angle value of 0.01° resolution, max. 1.9° angle error, magnetic field range 30 – 70 mT, SSC interface up to 8 Mbps, Incremental Interface, supply voltage 3.0 – 5.5 V, T_J -40 to 125°C	DSO8 5x6	1
Angle sensor	Angle sensing	TLE5012B E5000	GMR-based pre-calibrated 360° digital angle sensor, absolute angle value of 0.01° resolution, max. 1.0° angle error, magnetic field range 30 – 50 mT, PRO-SIL features, SSC interface up to 8 Mbps, PWM, supply voltage 3.0 – 5.5 V, AEC qualified	DSO8 5x6	1
MCU	Read angle & set sensor's registers	XMC1100-Q024F0064	32-bit Cortex-M0 32/64 MHz C/P clock 16 KB RAM & 64 KB Flash with 12-bit ADC, 2 universal serial interface, T_A -40 to 85°C	VQFN24 4x4	1
LDO	Voltage tracker for the sensor	TLE4250-2G	50 mA LDO tracker, short circuit proof, reverse polarity & over-temperature protection, V_{IN} -42 – 45 V, automotive qualified	SCT595 2.5x2.9	1
LDO	Voltage regulator for MCU 3.3 V	IFX54211MB V33	3.3 V linear voltage regulator, ±3% output voltage accuracy, 150 mA output current, V_{IN} 2.7 – 18 V, output current limitation, short circuit protection, over-temperature shutdown, T_J -40 to 125°C – replaceable with automotive qualified TLS202B1MBV33	SCT595 2.5x2.9	1

Magnetic Sensor Application Board (Angle)

Overview

- **360° digital angle sensor to detect the orientation of a magnetic field with integrated Giant Magneto Resistance (GMR) elements**
- Intended to be assembled on the motor together with diametral disc magnet e.g. RMM44A3C00, of which size 4 mm diameter and 4 mm height
- Onboard connectors for Incremental Interface (IIF) to get angular data and SSC / SPI to configure the sensor parameters
- OPN: DEMOIMRANGLESENSV1TOBO1 (on request)
- Can be used together with a motor drive board e.g. OPN: DEMOIMRMTRCTRLV1TOBO1 (on request)



Product type	Function	Part number	Description	Package mm x mm	Qty
Angle sensor	Position sensor	TLI5012B E1000	GMR-based pre-calibrated 360° digital angle sensor, absolute angle value of 0.01° resolution, max. 1.9° angle error, magnetic field range 30 – 70 mT, SSC interface up to 8 Mbps, Incremental Interface, supply voltage 3.0 – 5.5 V, T_J -40 to 125°C	DSO8 5x6	1
LDO	Optional interface for 3.3V MCU	TLS202B1MBV33	3.3 V linear voltage regulator, ±3% output voltage accuracy, 150 mA output current, V_{IN} 2.7 – 18 V, output current limitation, short circuit protection, over-temperature shutdown, T_J -40 to 125°C, AEC qualified	SCT595 2.5x2.9	1
P-MOSFET	Enable switch	IRLML6401	-12 V Power MOSFET, 2.55 mΩ with continuous I_D -4.3 A at T_A 25°C, V_{GS} -4.5 V and typ. Q_g 10 nC	SOT23	1

Magnetic Sensor Evaluation Board (Angle)

Overview

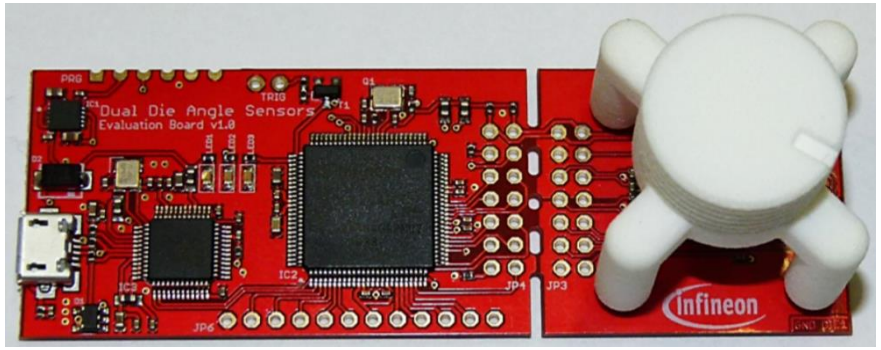
- **360° analog angle sensor to detect the orientation of a magnetic field with integrated Tunneling Magneto Resistance (TMR) elements**
- Large output signals up to 0.37 V/V enabling direct connection to MCU without any further amplification
- Low temperature drift reducing external calibration and compensation efforts
- Equipped with XMC1100 Boot Kit (with on-board debugger compatible with XMC Link)
- Evaluation software available in Infineon website including calibration procedure
- Included magnetic knob to demonstrate the sensor functionality
- OPN: TLE5501EVALKITTOBO1

Product type	Function	Part number	Description	Package mm x mm	Qty
Angle sensor	Angle sensing	TLE5501 E0002	TMR-based 360° analog angle sensor, 2 decoupled Wheatstone bridges for redundancy, max. 1.5° angle error, magnetic field range 20 – 100 mT, max. angle speed 1E6 °/sec, ISO26262 compliant requiring separate external safety mechanisms, V_S 2.7 – 5.5 V, T_A -40 to 150°C, automotive qualified	DSO8 5x6	1
MCU	Read output signals (sin & cos elements)	XMC1100-Q024F0064	32-bit Cortex-M0 32/64 MHz C/P clock 16 KB RAM & 64 KB Flash with 12-bit ADC, 2 universal serial interface, T_A -40 to 105°C	TSSOP38 9.7x6.4	1

Magnetic Sensor Evaluation Board (Angle)

Overview

- **Combination of analog Giant Magneto Resistance (GMR) sensor covering 360° range & Anisotropic Magneto Resistance (AMR) sensor covering 180° range**
- Dual-die top-bottom configuration in one package enabling high precision angle measurement
- Internal temperature compensation enabling higher measurement accuracy
- Pre-amplified output signals for differential or single-ended applications
- Equipped with XMC4700 MCU to read the sensor output
- Evaluation software available in Infineon website including calibration procedure
- Included magnetic knob to demonstrate the sensor functionality
- On-board debugger compatible with XMC Link
- OPN: TLE5309EVALKITTOBO1

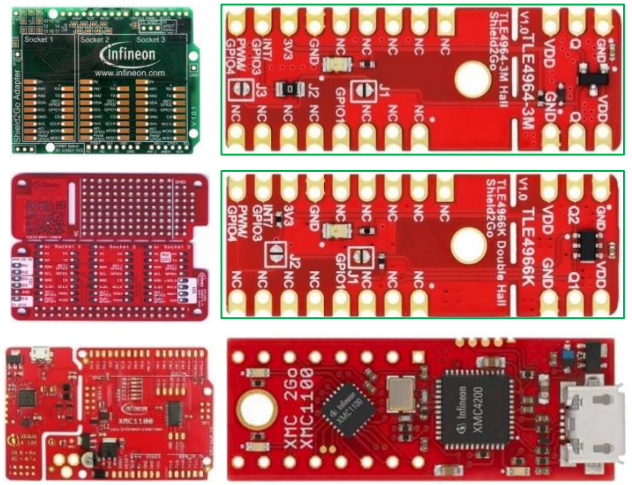


Product type	Function	Part number	Description	Package mm x mm	Qty
Angle sensor	Angle sensing	TLE5309D E1211	Dual-die 3.3 V AMR & GMR analog angle sensor with Temperature Compensation Offset (TCO), magnetic field range 21 – 50 mT at T_A 125°C, max. angle speed 30krpm, max. overall angle error 0.5° on AMR & 0.9° on GMR sensor with auto-calibration, V_S 3 – 3.6 V, T_A -40 to 125°C, automotive qualified	TDSO16 5x6	1
MCU	Read output signals (sin & cos elements)	XMC4700-F100K2048	32-bit Cortex-M4 with FPU, 144 MHz CPU clock, 352 KB SRAM & 2048 KB Flash with configurable 6 serial channels, CAN interface, Ethernet MAC module, USB, MUX 16-bit EBU for external memories, SDMMC, Touch-Sense controller, T_A -40 to 125°C	LQFP100 16x16	1

Magnetic Sensor Evaluation Board (Position)

Overview

- **Simple magnetic sensor for position detection with digital output 0 and 1**
- OPN: S2GOHALLTLE49643MTOBO1
- **Lateral magnetic sensor for direction information (0 and 1 digital output) & speed signal for index counting**
- OPN: S2GO2HALLTLE4966KTOBO1
- PCB: 38.5 x 14 mm, 2-layer FR4
- Easy to use with Arduino Uno using the available adapter (MYIOTADAPTERTOBO1) or with XMC1100 S2GO (KITXMC2GOXMC1100V1TOBO1) / XMC1100 Boot Kit (KITXMC11BOOT001TOBO1) or with Raspberry PI (S2GO ADAPTER RASP PI IOT)
- Evaluation software for all 3 baseboard types above is available in GitHub
- On-board debugger compatible with XMC Link for XMC1100 S2GO/Boot Kit board

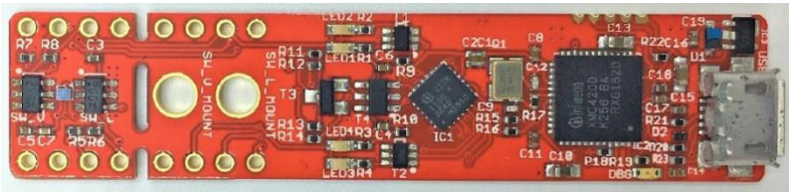


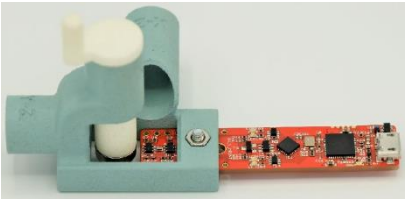
Product type	Function	Part number	Description	Package mm x mm	Qty
Hall latch	Position detection	TLE4964-3M	Unipolar Hall switch, 3 – 32 V operating V_S, max. magnetic signal input frequency 10 kHz, typical B_{OP} 12.5 mT & B_{RP} 9.5 mT at T_J 25°C, T_J -40 to 170°C, automotive qualified	SOT23 2.4x2.9	1
Hall latch lateral	Speed and Direction sensing	TLE4966K	Dual bipolar Hall sensor, 2.7 – 24 V operating V_S, direction information & speed signal, max. magnetic signal input frequency 15 kHz, typical B_{OP} 7.5 mT & B_{RP} -7.5 mT at T_J 25°C, T_J -40 to 150°C, automotive qualified – replaceable with TLI4966G for industrial T_J -40 to 125°C	TSOP6 2.6x2.9	1
MCU	Read sensors output	XMC1100-Q024F0064	32-bit Cortex-M0 32/64 MHz C/P clock 16 KB RAM & 64 KB Flash with 12-bit ADC, 2 universal serial interface, T_A -40 to 85°C	VQFN24 4x4	1
LDO	Voltage regulator for MCU 3.3 V	IFX54211MBV33	3.3 V linear voltage regulator, ±3% output voltage accuracy, 150 mA output current, V_{IN} 2.7 – 18 V, output current limitation, short circuit protection, over-temperature shutdown, T_J -40 to 125°C – replaceable with automotive qualified TLS202B1MBV33	SCT595 2.5x2.9	1

Magnetic Sensor Evaluation Board (Position)

Overview

- **Digital output magnetic sensors covering lateral and vertical sensing for direction information & speed signal for index counting, in addition to 3D magnetic field measurements**
- Equipped with XMC1100 MCU to read the sensors outputs
- Possibility to mount out-of-shaft adapter with ring magnet (OUTOFSHAFTFOR3D2GOTOBO1) to evaluate rotational movements in complete X, Y, and Z-axis
- On-board debugger compatible with XMC Link
- Evaluation software available in Infineon website
- OPN: TLE4966MS2GOTOBO1



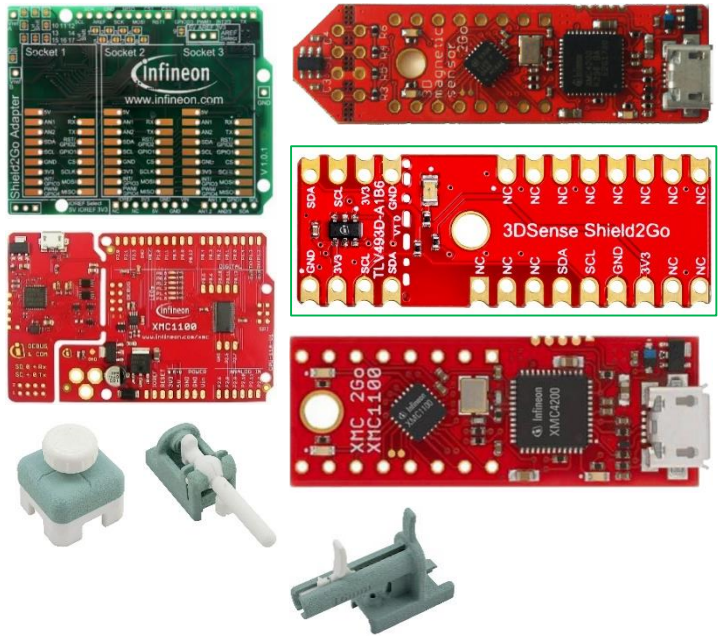


Product type	Function	Part number	Description	Package mm x mm	Qty
Hall latch lateral	Speed and Direction sensing	TLE4966G	Dual bipolar Hall sensor, 2.7 – 24 V operating V_S, direction information & speed signal, max. magnetic signal input frequency 15 kHz, typical B_{OP} 7.5 mT & B_{RP} -7.5 mT at T_J 25°C, T_J -40 to 150°C, automotive qualified – replaceable with TLI4966G for industrial T_J -40 to 125°C	TSOP6 2.8x2.9	1
Hall latch vertical	Speed and Direction sensing	TLE4966V-1G	In-plane dual Hall sensor, 3.5 – 32 V operating V_S, direction information & speed signal, max. magnetic signal input frequency 5 kHz, typical B_{OP} 2.5 mT & B_{RP} -2.5 mT at T_J 25°C, T_J -40 to 150°C, automotive qualified	TSOP6 2.8x2.9	1
3D Hall sensor	Magnetic field sensing	TLI493D-W2BW A0	3D Hall sensor, ±160 mT full range magnetic field, 5.5 – 10.5 LSB/mT sensitivity on 12-bit resolution, I^2C interface, 10-bit temperature sensor, V_{DD} 2.8 – 3.5 V, T_J -40 to 125°C	WFWLB5 0.93x1.13	1
MCU	Read angle & set sensor's registers	XMC1100-Q024F0064	32-bit Cortex-M0 32/64 MHz C/P clock 16 KB RAM & 64 KB Flash with 12-bit ADC, 2 universal serial interface, T_A -40 to 85°C	VQFN24 4x4	1
LDO	Voltage regulator for MCU 3.3 V	IFX54211MBV33	3.3 V linear voltage regulator, ±3% output voltage accuracy, 150 mA output current, V_{IN} 2.7 – 18 V, output current limitation, short circuit protection, over-temperature shutdown, T_J -40 to 125°C – replaceable with automotive qualified TLS202B1MBV33	SCT595 2.5x2.9	1

Magnetic Sensor Evaluation Board (Position for HMI)

Overview

- **Digital 3D magnetic sensor allowing direct measurement of all X, Y, and Z-component of the magnetic field**
- Typical range of ±130 mT magnetic field measurement of all the 3 components
- Suitable for direction indicator in 3x3 matrix or 5 positions in addition to rotation 360° measurement, and linear position measurement allowing for HMI application
- OPN: TLV493DA1B6MS2GOTOBO1 (with XMC1100 MCU)
- OPN: S2GO3DSENSETLV493DTOBO1 (without XMC1100 MCU)
- Easy to use with Arduino Uno using the available adapter (MYIOTADAPTERTOBO1) or with XMC1100 S2GO (KITXMC2GOXMC1100V1TOBO1) / XMC1100 Boot Kit (KITXMC11BOOT001TOBO1)
- Evaluation software available in Github and Infineon website including calibration procedure
- On-board debugger compatible with XMC Link for all XMC1100 boards
- Mechanical add ons mounted on sensor board: MINICONTROL2GOTOBO1 (5 positions + rotation), DIRINDICATOR2GOTOBO1 (3x3 direction indicator), POWERDRILL2GOTOBO1 (linear position for control trigger)

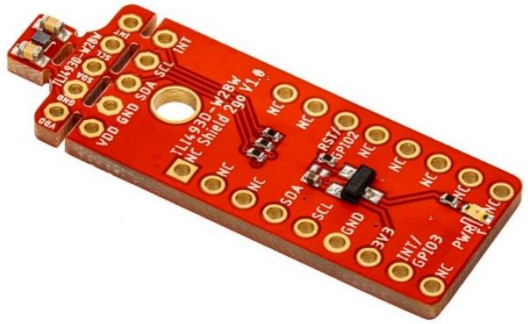


Product type	Function	Part number	Description	Package mm x mm	Qty
3D Hall sensor	Magnetic field sensing	TLV493D-A1B6	3D magnetic sensor, typical ±130 mT full range magnetic field, typical 10.2 LSB/mT sensitivity on 12-bit resolution, typical update rate of 3.3 kHz, I^2C interface, 12-bit temperature sensor with typical accuracy ±10°C, V_{DD} 2.8 – 3.5 V, T_J -40 to 125°C	TSOP6 2.5x2.9	1
MCU	Read sensor output	XMC1100-Q024F0064	32-bit Cortex-M0 32/64 MHz C/P clock 16 KB RAM & 64 KB Flash with 12-bit ADC, 2 universal serial interface, T_A -40 to 85°C	VQFN24 4x4	1
LDO	Voltage regulator for MCU 3.3 V	IFX54211MB V33	3.3 V linear voltage regulator, ±3% output voltage accuracy, 150 mA output current, V_{IN} 2.7 – 18 V, output current limitation, short circuit protection, over-temperature shutdown, T_J -40 to 125°C – replaceable with automotive qualified TLS202B1MBV33	SCT595 2.5x2.9	1

Magnetic Sensor Evaluation Board (3-axis Position)

Overview

- **Digital 3D magnetic sensor allowing direct measurement of all X, Y, and Z-component of the magnetic field**
- Programmable range from extra short range ±50 mT to full range of ±160 mT for all 3 components
- Typical sensitivity of 7.7 LSB_{12}/mT in full range to 30.8 LSB_{12}/mT in extra short range
- OPN: S2GO3DTLI493DW2BWA0TOBO1
- Included ferrite magnet for sensor functionalities evaluation
- To be used with XMC1100 S2GO (KITXMC2GOXMC1100V1TOBO1) making use of the I^2C interface
- Evaluation software available in Infineon website and Github for Arduino compatible code
- On-board debugger compatible with XMC Link
- Possible use cases with mechanical add ons mounted on sensor board: out-of-shaft angle measurement, pull trigger, linear movement, rotation knob with push, joystick, tilt angle measurement

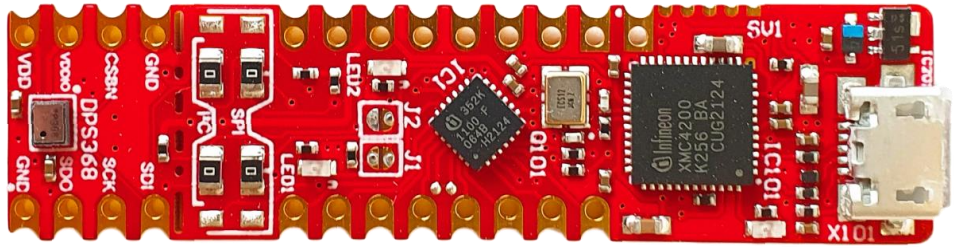


Product type	Function	Part number	Description	Package mm x mm	Qty
3D Hall sensor	Magnetic field sensing	TLI493D-W2BW A0	3D magnetic sensor, programmable range and thus sensitivity, ±160 mT full range with typical 7.7 LSB_{12}/mT sensitivity, ±50 mT extra short range with typical 30.8 LSB_{12}/mT sensitivity, I^2C interface of up to 1MHz clock frequency, 12-bit temperature sensor, V_{DD} 2.8 – 3.5V, T_J -40 to 125°C	WFWLB5 0.93x1.13	1
MCU	Read sensor output	XMC1100-Q024F0064	32-bit Cortex-M0 32/64 MHz C/P clock 16 KB RAM & 64 KB Flash with 12-bit ADC, 2 universal serial interface, T_A -40 to 85°C	VQFN24 4x4	1
LDO	Voltage regulator for MCU 3.3 V	IFX54211MB V33	3.3 V linear voltage regulator, ±3% output voltage accuracy, 150 mA output current, V_{IN} 2.7 – 18 V, output current limitation, short circuit protection, over-temperature shutdown, T_J -40 to 125°C – replaceable with automotive qualified TLS202B1MBV33	SCT595 2.5x2.9	1

Pressure Sensor Evaluation Board (Air)

Overview

- **Digital barometric air pressure sensor based on capacitive sensing principle with IPx8 certification (waterproof testing/robustness against water, humidity, and dust)**
- Miniaturized and high precision ±0.002 hPa or ±2 cm
- 24-bit resolution of pressure and temperature readings
- OPN: KITDPS3682GOTOBO1
- PCB: 38.5 x 14 mm , 2-layer FR4
- Easy to use with Arduino Uno using the available adapter (MYIOTADAPTERTOBO1)
- Evaluation software is available in GitHub
- On-board debugger compatible with XMC Link
- Use cases: height/altitude sensing, air flow control

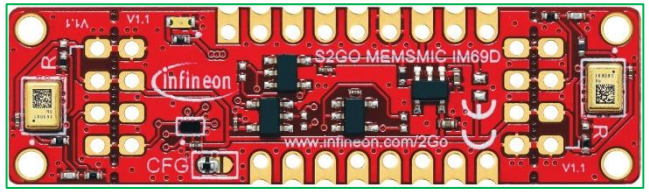


Product type	Function	Part number	Description	Package mm x mm	Qty
Pressure sensor	Barometric air pressure sensing	DPS368	Digital air pressure sensor, 300 – 1200 hPa operating pressure range, ±0.002 hPa/±0.02 m precision, ±0.06 hPa/±0.5 m relative accuracy, embedded temperature sensor with ±0.5°C accuracy, 24-bit resolution, I^2C or SPI interface, FIFO memory up to up to 32 pressure or temperature measurements, IPx8 certified, V_{DD} 1.7 – 3.6 V, T_A 0 to 65°C	VLGA8 2x2.5	1
MCU	Read sensor output	XMC1100-Q024F0064	32-bit Cortex-M0 32/64 MHz C/P clock 16 KB RAM & 64 KB Flash with 12-bit ADC, 2 universal serial interface, T_A -40 to 85°C	VQFN24 4x4	1
LDO	Voltage regulator for MCU 3.3 V	IFX54211MBV33	3.3 V linear voltage regulator, ±3% output voltage accuracy, 150 mA output current, V_{IN} 2.7 – 18 V, output current limitation, short circuit protection, over-temperature shutdown, T_J -40 to 125°C – replaceable with automotive qualified TLS202B1MBV33	SCT595 2.5x2.9	1

Audio Sensor Evaluation Board (Microphone)

Overview

- **Digital omnidirectional sound pressure sensor based on dual-backplate MEMS technology and capacitance change processed by the integrated ASIC**
- High linearity of the output signal within a dynamic range of 105 dB
- Pre-calibrated device resulting in sensitivity tolerance within ±1 dB
- Included audio processing IC converting PDM data stream to PCM audio data
- OPN: S2GOMEMSMICIM69DTOBO1
- PCB: 38.5 x 14 mm , 2-layer FR4
- Easy to use with Arduino Uno using the available adapter (MYIOTADAPTERTOBO1) or with XMC1100 S2GO (KITXMC2GOXMC1100V1TOBO1) / XMC1100 Boot Kit (KITXMC11BOOT001TOBO1)
- Evaluation software for the 2 baseboard types above is available in GitHub
- On-board debugger compatible with XMC Link for XMC1100 S2GO/Boot Kit board

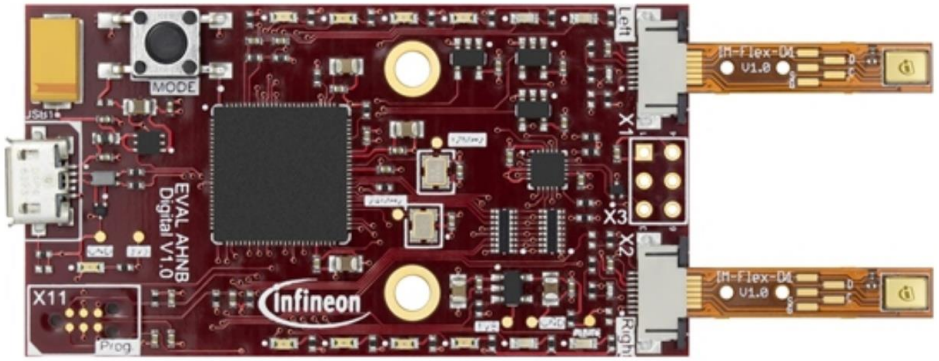


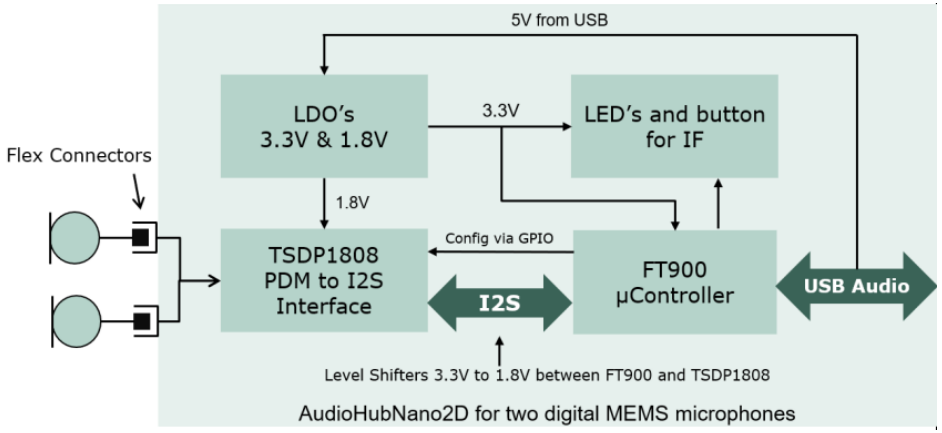
Product type	Function	Part number	Description	Package mm x mm	Qty
MEMS Microphone	Right & Left sound sensing	IM69D130	Digital sound sensor, bottom port, omnidirectional directivity, audio bandwidth 20 Hz – 20 kHz, max. sensitivity -35 dBFS, typical accoustic overload point 130 dBSPL, PDM data output, max. PDM clock frequency 3.3MHz, typical SNR up to 69 dB, typical noise floor -105 dBFS, V_{DD} 1.62 – 3.6 V, T_A -40 to 70°C	3x4	2
MCU	Read sensors output	XMC1100-Q024F0064	32-bit Cortex-M0 32/64MHz C/P clock 16 KB RAM & 64 KB Flash with 12-bit ADC, 2 universal serial interface, T_A -40 to 85°C	VQFN24 4x4	1
LDO	Voltage regulator for MCU 3.3 V	IFX54211MBV33	3.3 V linear voltage regulator, ±3% output voltage accuracy, 150 mA output current, V_{IN} 2.7 – 18 V, output current limitation, short circuit protection, over-temperature shutdown, T_J -40 to 125°C – replaceable with automotive qualified TLS202B1MBV33	SCT595 2.5x2.9	1

Audio Sensor Evaluation Board (Microphone)

Overview

- **Digital omnidirectional sound pressure sensor based on dual-backplate MEMS technology and capacitance change processed by the integrated ASIC**
- High linearity of the output signal within a dynamic range of 106 dB
- Pre-calibrated device resulting in sensitivity tolerance within ±1 dB
- Plug-and-play audio recording
- 24-bit audio data streaming over USB interface (mono and stereo)
- Sampling rate 48 kHz
- Configurable gains, 2 different power modes with LED indicators
- OPN: EVALAHNBDIGITALV01TOBO1
- Evaluation software for the 2 baseboard types above is available in GitHub





Product type	Function	Part number	Description	Package mm x mm	Qty
MEMS Microphone	Right & Left sound sensing	IM72D128	Digital sound sensor, bottom port, omnidirectional directivity, audio bandwidth 20 Hz – 20 kHz, max. sensitivity -35 dBFS, typical accoustic overload point 128 dBSPL, PDM data output, max. PDM clock frequency 3.3MHz, typical SNR up to 72 dB, typical noise floor < -115 dBFS/$\sqrt{Hz}$, IP57, V_{DD} 1.62 – 3.6 V, T_A -40 to 85°C	3x4	2

Pressure Sensor Evaluation Board (Air & Sound)

Overview

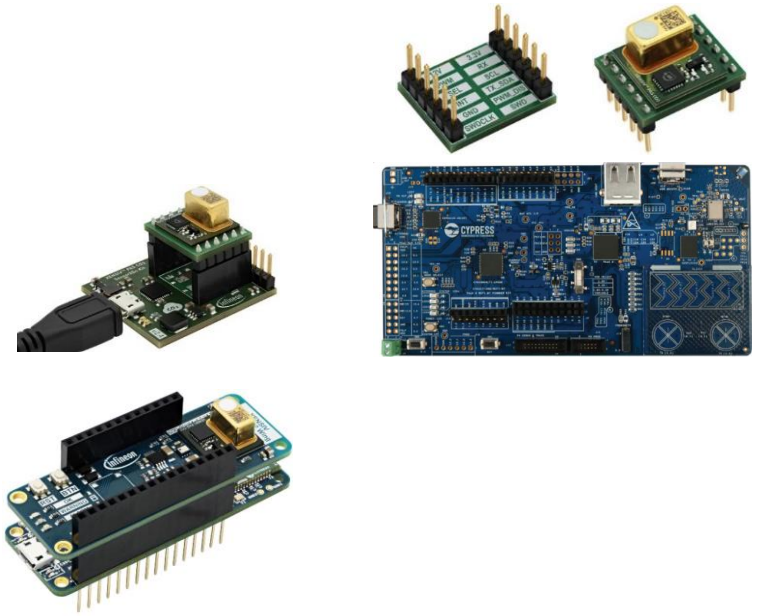
- **Sensors board including Air and Sound Pressure (Microphone) sensors from Infineon**
- Included 9-axis IMU, analog microphone, stereo audio codec with audio jack, and OLED display
- OPN: CY8CKIT-028-SENSE
- To be used with PSoC™ 62 Connectivity Kit (CY8CKIT-062S2-43012) or PSoC™ 64 Connectivity Kit (CY8CKIT-064B0S2-4343W)
- Compatible with Arduino Uno connection
- Evaluation software available in Infineon website (ModusToolbox™) – specifically targeted for audio and machine learning applications

Product type	Function	Part number	Description	Package mm x mm	Qty
MEMS Microphone	Right & Left sound sensing	IM69D130	Digital sound sensor, omnidirectional directivity, audio bandwidth 20 Hz – 20 kHz, max. sensitivity -35 dBFS, typical accoustic overload point 130 dBSPL, PDM data output, max. PDM clock frequency 3.3 MHz, typical SNR up to 69 dB, typical noise floor -105 dBFS, V_{DD} 1.62 – 3.6 V, T_A 0 to 70°C	3x4	2
Pressure sensor	Air pressure sensing	DPS310	Digital air pressure sensor, 300 – 1200 hPa operating pressure range, ±0.002 hPa/±0.02 m precision, ±0.06 hPa/±0.5 m relative accuracy, embedded temperature sensor with ±0.5°C accuracy, 24-bit resolution, I^2C or SPI interface, FIFO memory up to up to 32 pressure or temperature measurements, V_{DD} 1.7 – 3.6 V, T_A 0 to 65°C	VLGA8 2x2.5	1
MCU	Sensors interface in PSoC™ 62 Kit	CY8C624ABZI-S2D44	32-bit Cortex-M4F 150 MHz with FPU & MPU & Cortex-M0+ 100 MHz with MPU, 1 MB SRAM & 2 MB application Flash, QuadSPI/Serial memory interface, 13 configurable serial communication blocks, USB-FS, SDHC/eMMC/SD controllers, 2 PDM & I2S audio channels, 32 TCPWM, 12-bit ADC 2Msps, CAPSENSE™ touch sensing, Cryptography accelerator, Secure Boot, V_S 1.7 – 3.6 V, T_A -40 to 85°C	BGA124 9x9	1
MCU	Sensors interface in PSoC™ 64 Kit	CYS0644ABZI-S2D44	32-bit Cortex-M4F 150 MHz with FPU & MPU & Cortex-M0+ 100 MHz with MPU for RoT & secure system function, 1 MB SRAM & 2 MB application Flash, Amazon FreeRTOS (AFR) enabled, HW-based Root of Trust (RoT), Secure Boot support, QuadSPI/Serial memory interface, SDHC interface, USB-FS, 13 configurable serial communication blocks, 2 PDM & I2S audio channels, 32 TCPWM, 12-bit ADC 2 Msps, CAPSENSE™ touch sensing, Cryptography accelerator, V_S 1.7 – 3.6 V, T_A -40 to 85°C	BGA124 9x9	1

Pressure Sensor Evaluation Board (Gas CO_2)

Overview

- **Digital gas CO_2 sensor based on photoaccoustic spectroscopy (PAS) principle & leveraging on the MEMS sound pressure sensor that detects pressure changes generated by CO_2 molecules in the sensor cavity**
- Direct concentration reading in ppm (part per million) enabled by the integrated MCU
- OPN: EVALPASCO2MINIBOARDTOBO1
- To be used with PSoC™ 6 Wi-Fi Bluetooth® Pioneer Kit (CY8CKIT-062-WIFI-BT) or Arduino board
- OPN: EVALPASCO2SENSOR2GOTOBO1 (for direct interface to USB of PC/Laptop)
- Evaluation software available in Github and Infineon website
- OPN: KITCSKPASCO2TOBO1 (included DPS368 air pressure sensor and PSoC 62 baseboard CYSBSYSKIT-DEV-01)
- Libraries and code examples available in Infineon Github and ModusToolbox™



Product type	Function	Part number	Description	Package mm x mm	Qty
CO_2 sensor	CO2 gas sensing	PASCO2V01	Digital gas CO_2 sensor, concentration range 0 – 32000 ppm, accuracy ± (30 ppm ± 3% tolerance) at 400 – 5000 ppm concentration range, P_{OP} 1013 hPa, I^2C, UART and PWM interfaces, typical digital V_{DD} 3 – 3.6 V, emitter V_{DD} 9.6 – 14.4 V, T_A 0 to 50°C with relative humidity range 0 – 85%	14x14x7.5	1
USB – UART bridge controller	USB – UART converter	CY7C65213-32LTXI	USB to UART bridge, USB2.0 Full Speed 12 Mbps, 1-channel configurable UART up to 3 Mbps, integrated 48 MHz clock oscillator, compatible with USB2 and USB3 host controllers, operating voltage 1.71 – 5.5 V, T_A -40 to 85°C	QFN32 5x5	1
LDO	Voltage regulator for MCU 3.3 V	TLS202B1MBV33	3.3 V linear voltage regulator, ±3% output voltage accuracy, 150 mA output current, V_{IN} 2.7 – 18 V, output current limitation, short circuit protection, over-temperature shutdown, T_J -40 to 150°C , automotive qualified	SCT595 2.5x2.9	1
MCU	Read sensor output	CY8C6247BZI-D54	32-bit Cortex-M4F 150MHz with single-cycle multiply, FPU & MPU & Cortex-M0+ 100MHz with single-cycle multiply & MPU, 288kB SRAM & 1MB application Flash, QuadSPI/Serial memory interface, 9 configurable serial communication blocks, 2 PDM & 1 I2S audio channels, 32 TCPWM, 12-bit ADC 1Msps, 2 OpAmps, CAPSENSE™, Cryptography accelerator, V_S 1.7 – 3.6 V, T_A -40 to 85°C	BGA124 9x9	1

RADAR 60 GHz & Air pressure Sensor Evaluation Board

Overview

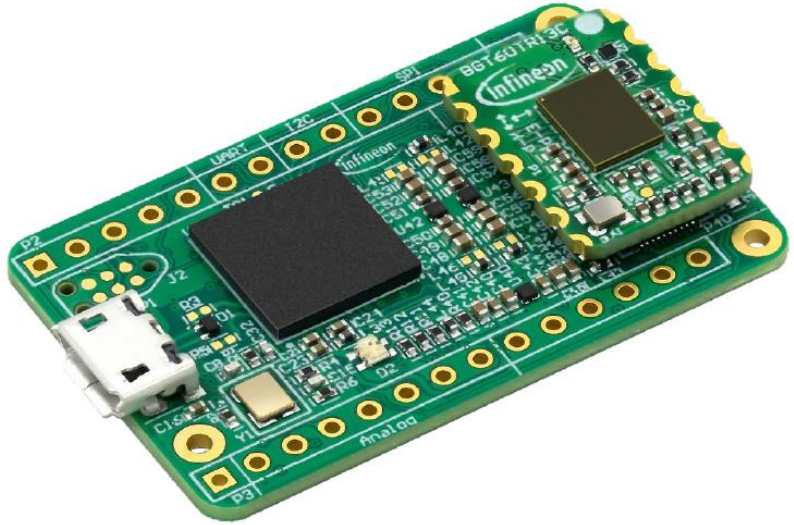
- **Sensor kit containing 60 GHz RADAR sensor with 1 Transmitter & 3 Receivers and digital air pressure sensor**
- **Processing baseboard CYSBSYSKIT-DEV-01 using PSoC 62 MCU plus Wi-Fi 4 & BT combo (CYSBSYS-RP01)**
- **Additional components: Security IC Optiga Trust M, and 512 Mb NOR Flash memory**
- Radar: high SNR allowing people detection up to 15 m distance – front facing and 10 m distance – general
- Ultra-wide bandwidth resulting in range resolution ~3 cm & high sensitivity allowing sub-mm movement detection
- Air pressure sensor: high precision ±0.002 hPa or ±2 cm, 24-bit resolution of pressure and temperature readings
- OPN: KITCSKBGT60TR13CTOBO1
- Rapid IoT connect application can be downloaded in Infineon website for quick evaluation
- Code examples available in ModusToolbox™

Product type	Function	Part number	Description	Package mm x mm	Qty
Radar sensor	60 GHz radar transceiver	BGT60TR13C E6327	58 – 63.5 GHz radar sensor for FMCW operation, 5.5 GHz bandwidth, antenna in-package, 1 TX & 3 RXs, 3 12-bit ADC channels up to 4 Msps, full-duplex FIFO structure, Integrated RF-PLL, timers, counters, and FSM to run set of frames in standalone mode, external 80 MHz clock reference, embedded temperature sensor, SPI interface, single V_S 1.8 V, T_J -40 to 125°C, $T_{backside}$ -20 to 70°C	VF2BGA40 5x6.5	1
Pressure sensor	Barometric air pressure sensing	DPS368	Digital air pressure sensor, 300 – 1200 hPa operating pressure range, ±0.002 hPa/±0.02 m precision, ±0.06 hPa/±0.5 m relative accuracy, embedded temperature sensor with ±0.5°C accuracy, 24-bit resolution, I^2C or SPI interface, FIFO memory up to up to 32 pressure or temperature measurements, IPx8 certified, V_{DD} 1.7 – 3.6 V, T_A 0 to 65°C	VLGA8 2x2.5	1
MCU	Read sensor output	CY8C624AFNI-S2D43T	32-bit Cortex-M4F 150MHz with single-cycle multiply, FPU & MPU & Cortex-M0+ 100MHz with single-cycle multiply & MPU, 1 MB SRAM & 2 MB Flash, QuadSPI/Serial memory interface, 13 configurable serial communication blocks, 2 PDM & 1 I2S audio channels, 32 TCPWM, 12-bit ADC 2 Msps, 2 comparators, CapSense™, Cryptography accelerator, V_S 1.7 – 3.6 V, T_A -40 to 85°C	WLCSP100 4x4	1
WLAN & BT IC	WLAN & BT IC	CYW43012	1x1 integrated dual-band 2.4 & 5 GHz IEEE 802.11 a/b/g/n, MCS8 256-QAM for 20 MHz channels, up to 78 Mbps data rate, compliant with Bluetooth® 5.4 supporting BDR/EDR/BLE up to 2 Mbps, PCM interface for audio, V_{OP} 3.2 - 4.6 V, T_A -20 to 70°C	WLBGA128 4.5x5.4	1
Security controller IC	Security controller	SLS32AIA010ML	Embedded security controller for connected devices, with symmetric/asymmetric cryptography engines supporting ECC, RSA, AES, HMAC, & HKDF algorithm, I^2C interface up to 1MHz with Fast Mode Plus, V_S 1.62 – 5.5 V, T_J -40 to 105°C	USON10 3x3	1
Serial Flash	Memory	S25FL512SAGBHIA13	512 Mb Quad-SPI Serial NOR Flash 3 V, 133 MHz, uniform 25 6kB sectors, Quad read up to 52 MB/s effective data rate, T_A -40 to 85°C	BGA24 6x8	1

RADAR Sensor Evaluation Board (60 GHz)

Overview

- **60 GHz RADAR sensor with 1 Transmitter & 3 Receivers and antenna-in-package enabling design PCB with FR4**
- Equipped with Radar baseboard allowing quick evaluation with Radar Development Kit & GUI available in Infineon Toolbox
- High SNR allowing people detection up to 15 m distance – front facing and 10 m distance – general
- Ultra-wide bandwidth resulting in range resolution ~3 cm
- High sensitivity allowing sub-mm movement detection
- Integrated Finite State Machine (FSM) allowing autonomous operation (without MCU): FMCW frequency sweeps, data acquisition, and samples storing in internal FIFO memory
- Use cases (with separate processing algorithms): presence/obstacle detection, tracking and segmentation, touchless interaction/gesture recognition, materials differentiation, speed measurement
- OPN: DEMOBGT60TR13CTOBO1

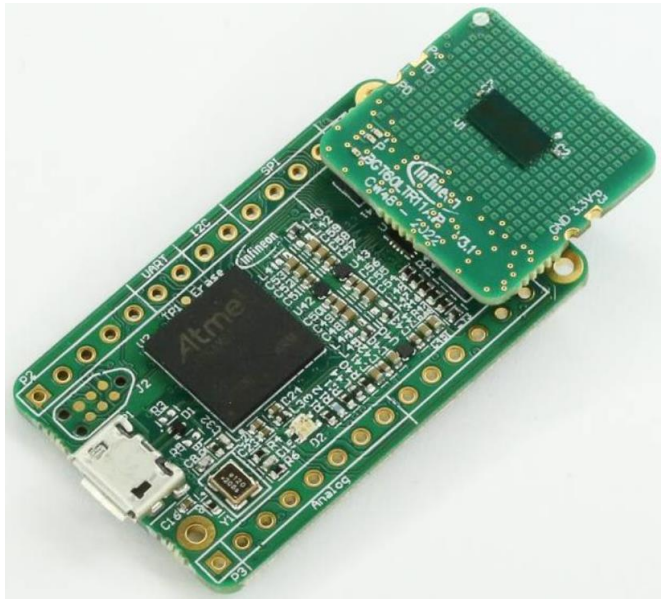


Product type	Function	Part number	Description	Package mm x mm	Qty
Radar sensor	60 GHz radar transceiver	BGT60TR13C E6327	58 – 63.5 GHz radar sensor for FMCW operation, 5.5 GHz bandwidth, antenna in-package, 1 transmitter & 3 receivers, 3 12-bit ADC channels up to 4 Msps, full-duplex FIFO structure, Integrated RF-PLL, timers, counters, and FSM to run set of frames in standalone mode, external 80 MHz clock reference, embedded temperature sensor, SPI interface, single V_S 1.8 V, T_J -40 to 125°C, $T_{backside}$ -20 to 70°C	VF2BGA40 5x6.5	1

RADAR Sensor Evaluation Board (60 GHz)

Overview

- **60 GHz RADAR sensor with 1 Transmitter & 1 Receiver and antenna-in-package of 80° FOV enabling design PCB with FR4**
- Equipped with Radar baseboard allowing quick evaluation with Radar Development Kit & GUI available in Infineon Toolbox
- People detection up to 10 m distance – with MCU processing, and 7 m distance – autonomous
- Integrated Finite State Machine (FSM) allowing autonomous operation (without MCU)
- Quad-state inputs for different operation configurations
- Continuous Wave (CW) Mode or Pulsed Mode operations for autonomous mode
- For motion detection and movement direction – approaching or departing
- OPN: DEMOBGT60LTR11AIPTOBO1



Product type	Function	Part number	Description	Package mm x mm	Qty
Radar sensor	60 GHz radar transceiver	BGT60LTR11AIP	61 – 61.5 GHz radar sensor, antenna in-package, 1 transmitter & 1 receiver, output power 10 dBm, max.spurious transmission -20 dBm, transceiver antenna gain 6 dBi, ADC, SPI interface, single V_S 1.5 V, $T_{operation}$ -20 to 85°C	UF2BGA42 3.3x6.7	1

RADAR Sensor Evaluation Board (24 GHz)

Overview

- **24 GHz RADAR sensor with 1 Transmitter & 1 Receiver**
- Equipped with 4x1 array antenna for each transmitter & receiver on the radar board
- Up to 18 m detection range in pulsed mode operation
- Equipped with Radar baseboard based on XMC4700 MCU for quick evaluation
- Software Radar Development Kit & GUI available in Infineon Toolbox
- Possibility to develop radar signal processing algorithms directly on MCU
- Power supply, USB, or battery based operation on the baseboard
- Radar current consumption measurement capability on the baseboard
- SD card on baseboard allowing radar raw data collection and storage
- On-board debugger compatible with XMC Link
- OPN: DEMOSENSE2GOLPULSETOBO1: for motion detection & movement direction within user-configurable speed range
- OPN: DEMODISTANCE2GOLTOBO1: for human motion tracking & range detection, movement direction, proximity & real presence sensing

Product type	Function	Part number	Description	Package mm x mm	Qty
Radar sensor	24 GHz radar transceiver	BGT24LTR11N16	24.05 – 24.25 GHz Si-Ge transceiver MMIC, 1 transmitter & 1 receiver, integrated low phase noise Voltage Controlled Oscillator (VCO), homodyne quadrature receiver, max. output power 10 dBm, max.spurious transmission -20dBm, max. voltage conversion gain 26.5 dB, single V_S 3.3 V, T_A -40 to 85°C	TSNP16 2.4x2.4	1
MCU	Control PWM input & ADC interface	XMC4700-E196K2048	32-bit Cortex-M4 with FPU, 144 MHz CPU clock, 352 KB SRAM & 2048 KB Flash with configurable 6 serial channels, CAN interface, Ethernet MAC module, USB, EBU for external memories, SDMMC, Touch-Sense controller, T_A -40 to 125°C	LFBGA196 12x12	1

3D IR-ToF Imaging Sensor Evaluation Board

Overview

- **3D camera module: flexx2 by pmd and System on Module (SoM) by Emcraft fitted with a camera module by pmd**
- flexx2 and Sunny MTP006 SoM use IRS2381C Infineon® REAL3™ 3D Image Sensor
- Liteon A65 Kit SoM uses IRS1645C Infineon® REAL3™ 3D Image Sensor

Parameter	flexx2	Sunny MTP006	Liteon A65 Kit
Dimensions (mm)	71.9 x 19.2 x 10.6 mm	18.9 x 18.6 x 5.3 mm	24.7 x 10.7 x 5.8 mm
3D ToF sensor	IRS2381C REAL3™	IRS2381C REAL3™	IRS1645C REAL3™
Illumination	940 nm 1 Watt VCSEL (LC1)	940 nm 1 Watt VCSEL (LC1)	940 nm 1 Watt VCSEL (LC1)
Resolution (pixels)	224 x 172	224 x 172	224 x 172
Field of View (H x V)	56° x 44°	60° x 40°	105° x 85°
Framerate (fps)	Up to 60 (3D frames)	Up to 60 (3D frames)	Up to 60 (3D frames)
Measurement range	0.1 to 4 m	0.1 to 4 m	0.1 to 3 m
Interfaces	USB3 Type-C	i.MX 8M Mini via 2-lane MIPI-CSI2 and I2C	i.MX 8M Mini via 2-lane MIPI-CSI2 and I2C
Accuracy	≤ 1% of distance (0.5 – 4 m @ 5 fps), ≤ 2% of distance (0.1 – 1 m @ 45 fps)	≤ 1% of distance (0.5 – 3 m @ 5 fps)	≤ 1% of distance (0.5 – 3 m @ 5 fps)
Software	Royale SDK C/C++ based for Linux / ARM & Windows. Supports Matlab, OpenCV, ROS 1, ROS 2, Python	Linux and binary pmd Royale/Spectre	OpenEmbedded Linux OS running Royale SDK, C/C++ based, ROS 1 support available
Others	DevKit: encased, CE certified, Class 1 Laser product	i.MX 8M Mini Quad, 2 GB LPDDR4, 16 GB eMMC, WiFi/BT	i.MX 8M Mini Quad, 2 GB LPDDR4, 16 GB eMMC, WiFi/BT

Product type	Part number	Description
IR 3D ToF sensor	IRS2381C	224 x 172 pixels with micro-lenses at 14 µm pixel size, optimized for 940 nm wavelength, and for small size, low cost, & reduced power consumption applications
IR 3D ToF sensor	IRS1645C	224 x 172 pixels with micro-lenses optimized for 850nm wavelength, and for small size, low cost, & reduced power consumption applications

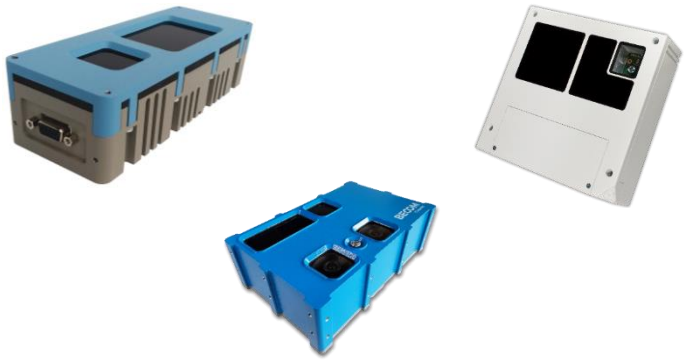
3D IR-ToF Imaging Sensor Evaluation Board (by BECOM)

Overview

- **Argos3D and Toreo 3D camera modules by BECOM based on IRS2877A and IRS1125A**
- Consumer and Industrial applications with standard and high resolution 3D IR ToF image sensor

Parameter	Argos3D Pulse	Toreo P650	Argos3D P230/P231	Argos3D P330
Dimensions (mm)	173 x 46 x 65	230 x 148 x 106	173 x 46 x 65	200 x 200 x 62
3D ToF sensor	IRS2877A REAL3™	IRS2877 REAL3™	IRS1125 REAL3™	IRS1125 REAL3™ OV5640 CMOS RGB
Illumination	2x Active IR 850 nm / 940 nm, 8x Laser diodes, 8 W average	850 nm, 16x Laser diodes	850 nm, 8x Laser diodes, 8 W average output	850 nm, 16x Laser diodes
Resolution (pixels)	640 x 480	640 x 480	352 x 287	352 x 287
Field of View (H x V)	80° x 60°	60° x 40°	80° x 60°	80° x 65°/90° x 70°
Framerate (fps)	Up to 40	Up to 30	Up to 40 for 3D data	Up to 40 for 3D data
Measurement range	5 m indoor	5 m indoor	3.5 m indoor	10 m indoor/3 m outdoor
Interfaces	Gigabit Ethernet, GPIO, trigger in	Gigabit Ethernet, reset, trigger in, 2x output	Ethernet, GPIO, trigger in	Gigabit Ethernet, RS232, RS485, UART, trigger in and out
Software frameworks	Matlab, Halcon, MetriCam, LabView	DataSpree DataStudio (DL)	Matlab, Halcon, MetriCam	Matlab, Halcon, MetriCam
Temperature range & cooling system	-20°C to 45°C with passive cooling	-40°C to 60°C with passive cooling	-20°C to 45°C with passive cooling	0°C to 50°C with passive cooling
Others	IP 67	IP 67, NVIDIA Tegra TX2 processing module, 2 RGB sensor modules	IP 65 & Power over Ethernet for P231	IP 42, Quad core Cortex A9 CPU, dual imaging capability (RGB & 3D IR)

Product type	Part number	Description
IR 3D ToF sensor	IRS1125A	352 x 288 pixels with micro-lenses optimized for both 850 nm & 940 nm wavelengths, and for long range & wide FoV applications, automotive qualified
IR 3D ToF sensor	IRS2877A	640 x 480 pixels with micro-lenses optimized for 940 nm wavelength, automotive qualified



3D IR-ToF Imaging Sensor Evaluation Board (by Sunny Optical & OMS)

Overview

- **Mars 3D camera module by Sunny Optical based on IRS2877C**
- **Hybrid ToF 3D camera module by OMS based on IRS2875C** enabling dual mode illumination: spot for longer range and flood for dense points
- Service robots and Consumer applications with low cost 3D IR ToF image sensor
- High resolution module to be integrated into the customer hardware platform

Parameter	Mars05E	Hybrid ToF
Dimensions (mm)	69.2 x 18 x 26	31 x 16 x 8 mm
3D ToF sensor	IRS2877C REAL3™	IRS2875C REAL3™
Illumination	940 nm VCSEL	940 nm 2J VCSEL x2 for Spot & Flood illumination
Resolution (pixels)	640 x 480	240 x 180
Field of View (H x V)	58° x 73°	100° x 21° (spot), 100° x 45° (flood)
Framerate (fps)	Up to 10	
Measurement range	0.3 to 2 m	0.1 – 8 m (spot), 0.2 – 2 m (flood)
Interfaces	USB2.0	USB3.0 / MIPI-2
Software frameworks	Linux Ubuntu, Windows	pmd Royale SDK C/C++ based for Linux / ARM & Windows. Supports Matlab, OpenCV, ROS 1, ROS 2, Python
Power consumption	< 1.9 W	
Others	Depth accuracy < 1% RGB sensor included in the camera	Spot illumination for SLAM Flood illumination for obstacle avoidance

Product type	Part number	Description
IR 3D ToF sensor	IRS2875C	240 x 180 pixels with micro-lenses, optimized for 940 nm wavelength, for long range scanning
IR 3D ToF sensor	IRS2877C	640 x 480 pixels with micro-lenses optimized for 940 nm wavelength, for high resolution scanning
VCSEL driver	IRS9100C	Driver for fast switching laser diodes, typical laser current up to 6 A, rise and fall times < 0.8 ns, LVDS interface, VDD 2.5 – 3.7 V, TSNP-10 1.5 x 1.1 mm package

Main & HMI Control including Connectivity & Memory selection

Main & HMI Control including Connectivity & Memory

Cortex-M4 120 MHz & Touch-Sense XMC4500	Cortex-M4 144 MHz & Touch-Sense XMC4700	Cortex-M4 144 MHz XMC4700	Cortex-M4 144 MHz & Touch-Sense & EtherCAT slave XMC4800	Dual Cortex-M7 350 MHz & M0+ 100 MHz & GigE XMC7200	Cortex-M4F 150 MHz & M0+ 100 MHz & CapSense™ PSoC™ 62	Cortex-M4F 150 MHz & M0+ 100 MHz & CapSense™ & RTOS support PSoC™ 64	Cortex-M4F 150 MHz & M0+ 100 MHz & CapSense™ & BLE subsystem PSoC™ 63
✓ Quad-SPI Flash	✓ CAN transceiver	✓ CAN transceiver	✓ Serial FRAM ✓ CAN transceiver ✓ Security IC Trust-E ✓ Isolated digital input & output	✓ Quad-SPI NOR Flash ✓ CAN transceiver ✓ IPoL controller	✓ WLAN & BT module ✓ USB-C PD controller ✓ Quad-SPI NOR Flash ✓ Serial FRAM	✓ WLAN & BT module ✓ Quad-SPI NOR Flash ✓ Serial FRAM	✓ USB-C PD controller ✓ Quad-SPI NOR Flash ✓ Serial FRAM (not soldered)
							

Connectivity (and HMI Control & Memory)

Cortex-M0 48 MHz & BLE & CAPSENSE™ PSoC™ 42	Dual-band WLAN-BT IC w/ CAPSENSE™ PSoC™ 62	SiP of dual-band WLAN with Cortex-R4 RISC	BT & BLE module ≤ 3 Mbps, TX 15dBm, Cortex-M4 96 MHz	BT & BLE module ≤ 3 Mbps, TX 4dBm, Cortex-M4 96 MHz	BLE module ≤ 2 Mbps with Cortex-M4F 150 MHz & M0+ 100 MHz PSoC™ 63
✓ Serial FRAM	✓ Quad-SPI NOR Flash ✓ Serial FRAM ✓ OPTIGA™ Trust M		✓ USB-UART bridge	✓ USB-UART bridge	
					

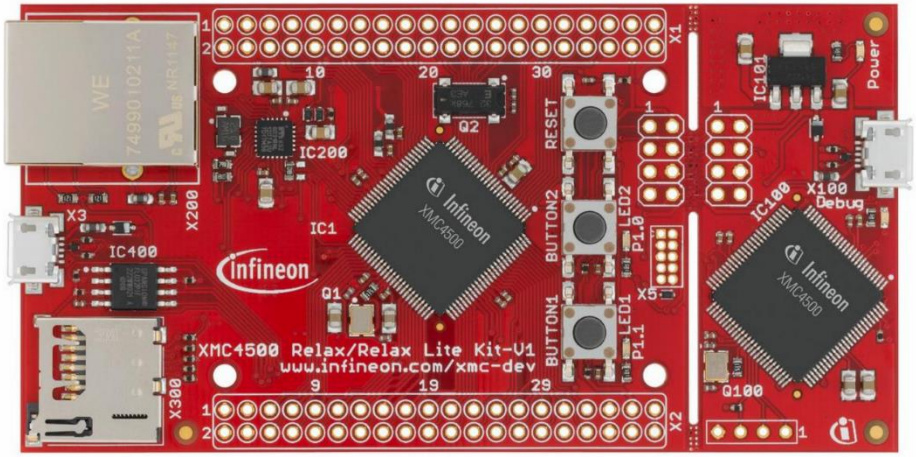
Memory

FRAM	nvSRAM
	

Main Control Evaluation Board (120 MHz)

Overview

- **Peripheral-rich ARM Cortex-M4 up to 120 MHz operation**
- OPN: KITXMC45RELAXV1TOBO1
- PCB dimension: 51 x 98 mm
- Code generation, compiler and debugger is available via DAVE™ in Infineon website
- Features: Ethernet 10/100 Mbps transfer rates, micro-SD card interface, qSPI Flash, RTC crystal
- Software availability in Infineon website for OPTIGA™ Trust X operation

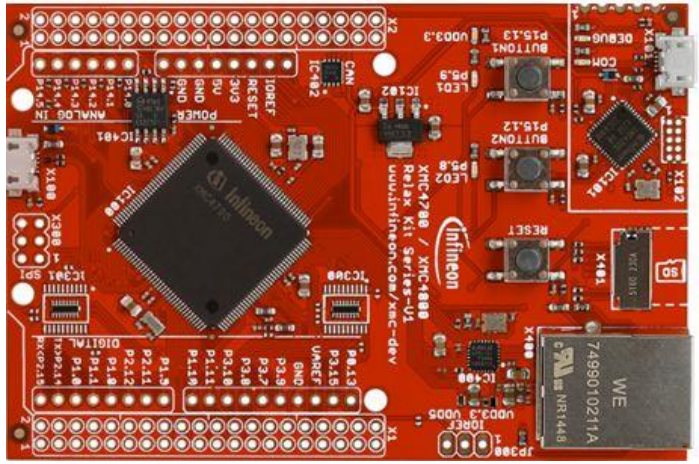


Product type	Function	Part number	Description	Package mm x mm	Qty
MCU	Main MCU & on-board debugger	XMC4500-F100K1024	32-bit Cortex-M4 120 MHz with FPU & MPU, 160 KB SRAM & 1024 KB Flash with configurable 6 serial channels, CAN interface, Ethernet MAC module, USB, EBU for external memories, SDMMC, Touch-Sense controller, T_A -40 to 125°C	LQFP100 22x22	1
Serial Flash	Memory	S25FL032P0XMFI01	32 Mb Quad-SPI Serial Flash 3 V, Quad fast Read 40 MB/sec effective data rate– replaceable with S25FL064LABMFI010	SOIC8 5x8	1
LDO	Voltage regulator	IFX1117MEV33	3.3 V LDO 1 A output, ±2% precision, short circuit & over-temperature protection, input voltage 4.7 V to 15 V – similar I_{OUT} replacement TLE4284DV33 (different packaging – DPAK)	SOT223	1

Main Control Evaluation Board (144 MHz)

Overview

- **Peripheral-rich ARM Cortex-M4 up to 144 MHz operation**
- OPN: KITXMC47RELAXV1TOBO1
- PCB dimension: 66 x 98 mm
- On-board debugger compatible with XMC Link
- Features: Ethernet 10/100 Mbps transfer rates, CAN transceiver, qSPI 32 Mb Flash (non-IFX device), RTC crystal
- Posibility to mount OPTIGA™ Trust X S2GO board (S2GOSECURITYOPTIGAXTOBO1) using the available adapter (MYIOTADAPTERTOBO1)
- FreeRTOS demo code available in Github

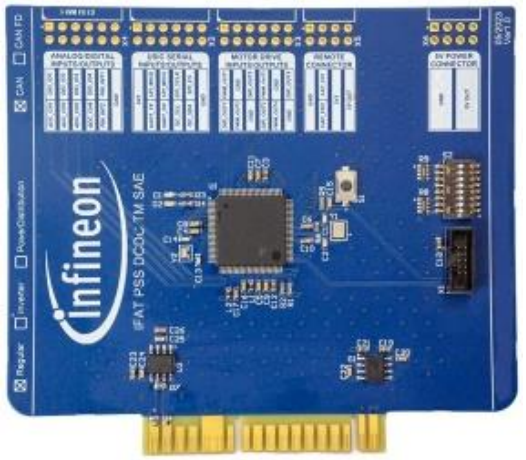


Product type	Function	Part number	Description	Package mm x mm	Qty
MCU	Main MCU	XMC4700-F144K2048	32-bit Cortex-M4 144 MHz with FPU & MPU, 352 KB SRAM & 2048 KB Flash with configurable 6 serial channels, CAN interface, Ethernet MAC module, USB, EBU for external memories, SDMMC, Touch-Sense controller, T_A -40 to 125°C	LQFP144 22x22	1
MCU	On-board programmer / debugger	XMC4200-Q48K256	32-bit Cortex-M4 80 MHz with FPU, MPU & flexible CRC engine, 40 kB SRAM & 256 kB Flash, USB, CAN interface up to 1 Mbps, 4 configurable serial interface, 2 12-bit ADC, 2 CCU4, CCU8, POSIF, high resolution PWM, T_A -40 to 125°C	VQFN48 7x7	1
CAN transceiver	CAN transceiver	IFX1051LE	Industrial qualified CAN transceiver up to 1 Mbps transmission rate suitable for 12 & 24 V applications – replaceable with TLE9250XLE, automotive qualified	TSON8 3x3	1
LDO	Voltage regulator	IFX1117MEV33	3.3 V LDO 1 A output, ±2% precision, short circuit & over-temperature protection, input voltage 4.7 V to 15 V – similar I_{OUT} replacement TLE4284DV33 (different packaging – DPAK)	SOT223	1

Main Control Application Board (144 MHz)

Overview

- **Peripheral-rich ARM Cortex-M4 up to 144 MHz operation**
- OPN: DEMOIMRMAINCTRLV1TOBO1 (on request)
- Onboard CAN transceiver to allow CAN bus communication
- Edge-card header containing CAN and regulated output voltage 5 V
- Programming and debugging connector for XMC Link

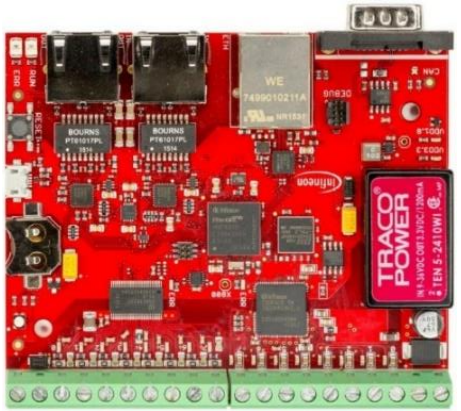


Product type	Function	Part number	Description	Package mm x mm	Qty
MCU	Main MCU	XMC4700-F144K2048	32-bit Cortex-M4 144 MHz with FPU & MPU, 352 KB SRAM & 2048 KB Flash with configurable 6 serial channels, CAN interface, Ethernet MAC module, USB, EBU for external memories, SDMMC, Touch-Sense controller, T_A -40 to 125°C	LQFP144 22x22	1
CAN transceiver	CAN transceiver	TLE9351BVSJ	High speed supporting up to 5 Mbps, fully compliant to ISO11898-2 (2016) and SAE J2284-4/5, V_{IO} input for 3.3V and 5V MCU, standby mode, V_{CC} 4.5 – 5.5V, T_J -40 to 150°C	SO8 5x6	1
LDO	MCU input power	TLS205B0EJ V33	VIN 1.8 – 20 V, 500 mA output current, 3.3 V output, V_{DO} 0.32 V, protection: reverse polarity, overcurrent, overtemperature	SO8 5x6	1

Main Control Evaluation Board (144 MHz)

Overview

- **Peripheral-rich ARM Cortex-M4 up to 144 MHz operation**
- **EtherCAT 100 Mbps slave controller**
- OPN: KITXMC48AUTBASEV2TOBO1
- PCB dimension: 86 x 103 mm
- Additional features: security control with ECC & SHA, isolated interface, CAN transceiver, FRAM, RTC crystal, standard Ethernet



Product type	Function	Part number	Description	Package mm x mm	Qty
MCU	Main MCU	XMC4800-E196K2048	32-bit Cortex-M4 144 MHz with FPU & MPU, 352 KB SRAM & 2048 KB Flash with configurable 6 serial channels, CAN & EtherCATSlave interface, Ethernet MAC module, USB, EBU for external memories, SDMMC, Touch-Sense controller, T_A -40 to 125°C	LFBGA196 12x12	1
Security controller	Device authentication	SLS32AIA020A4	OPTIGA™ Trust-E security controller supporting ECC256 & SHA-256 with up to 3 kB user memory, T_A -25 to 85°C – upgradeable to OPTIGA™ Trust-M (1-pin-difference)	USON10 3x3	1
Isolated interface	Input isolation	ISO1I813T	24 V isolated 8-channel digital input, with 8-bit parallel/serial interface	TSSOP48 8x12.5	1
Isolated interface	Output isolation	ISO2H823V2.5	24 V isolated 8-channel high-side switch of 0.6 A each with 8-bit parallel/serial interface	VQFN70 12x12	1
CAN transceiver	CAN transceiver	TLE6250GV33	Automotive qualified CAN transceiver up to 1 Mbps transmission rate suitable for 12 & 24 V applications	DSO8 4x5	1
FRAM	Memory	FM25CL64B-G	64 Kb Serial FRAM up to 20 MHz frequency – upgradeable to FM25V02A-G 256 Kb 40 MHz	SOIC8 4x5	1

Main Control Evaluation Board (350 MHz)

Overview

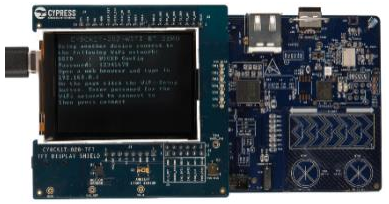
- **Highly peripheral-rich integrated dual core ARM Cortex-M7 up to 350 MHz with FPU and ARM Cortex-M0+ up to 100 MHz**
- Standard and Gigabit Ethernet interface & cryptography engine
- On-board programmer & debugger compatible with PSoC™ programmer & debugger based on KitProg3 firmware
- Compatible with Arduino Uno connection
- OPN: KITXMC72EVKTOBO1
- Additional features: CAN-FD transceiver, qSPI Flash, expansion card interface – M2 connector

Product type	Function	Part number	Description	Package mm x mm	Qty
MCU	Main MCU	XMC7200D-E272K8384AA	32-bit dual Cortex-M7 350 MHz with FPU & MPU & Cortex-M0+ 100 MHz with MPU, 1 MB SRAM & 8 MB code Flash & 256 kB work Flash, cryptography engine, CAN FD, Gigabit Ethernet, external memories & SDHC interface, up to 102 16-bit TCPWM blocks with up to 15 counters for motor control, V_S 2.7 – 5.5 V, T_A -40 to 125°C	BGA272 16x16	1
MCU	KitProg3 programmer	CY8C5868LTI-LP039	32-bit Cortex-M3 67 MHz with DMA controller & digital filter processor, 64 kB SRAM & 256 kB Flash & 2 kB EEPROM, Full Speed USB 2.0 & Full CAN, 4 TCPWM blocks, configurable 8 - 20-bit ADC, 4 comparators, 4 OpAmps, V_S 1.71 – 5.5 V, T_A -40 to 85°C	QFN68 8x8	1
Serial Flash	Memory	S25FL512SAGMFMR10	512 Mb Quad-SPI Serial NOR Flash 3 V, 133 MHz, uniform 256 kB sectors, Quad read up to 52 MB/s effective data rate, T_A -40 to 125°C, AEC-Q100 grade 1 qualified	SOIC16 10x10	1
CAN FD transceiver	CAN FD transceiver	TLE9251VSJ	Automotive qualified CAN FD transceiver up to 5 Mbps data rate, overtemperature protection, output current limit, digital supply voltage 3 – 5.5 V, T_J -40 to 150°C – replaceable with TLE9251VLE (package TSON8 3x3)	DSO8 5x6	1
Integrated Point of Load (IPOL)	Voltage regulator	IR3883MTRPBF	Continuous 3 A 800 kHz synchronous buck regulator with on-chip PWM controller, overcurrent protection, thermal shutdown, internal soft-start, pre-bias start up	QFN 3x3	2
LDO	Voltage regulator	TLS208D1EJV	Adjustable V_{OUT} 0.8 – 5.25 V, ±2% V_{OUT} accuracy, static I_{OUT} 0.8 A, V_{IN} 2.7 – 18 V, output current limit, overtemperature shutdown, automotive qualified	DSO8 5x6	3

Main & HMI Control & Connectivity Evaluation Board (150 MHz)

Overview

- **Peripheral-rich integrated ARM Cortex-M4F up to 150 MHz with FPU and ARM Cortex-M0+ up to 100 MHz**
- Included 2.4 GHz WLAN + Bluetooth® & BLE module from Murata (LBEE5KL1DX-883 of size 7 x 5.2 x 1.1 mm) with based on CY4343W & on-board WLAN/BT antenna, and CAPSENSE™ evaluation components (buttons, 5-segment slider & proximity sensing header)
- Also included TFT Kit (CY8CKIT-028-TFT) containing 2.4 inch TFT display, 6-axis IMU, ambient light sensor, 32-bit audio codec, and PDM microphone
- On-board programmer & debugger compatible with PSoC™ programmer & debugger based on KitProg2/3 firmware
- Evaluation software available in Infineon website (ModusToolbox™ & Amazon FreeRTOS SDK support)
- Compatible with Arduino Uno R3 connection
- OPN: CY8CKIT-062-WIFI-BT
- Additional features: Quad SPI Flash & FRAM, USB-C and Power Delivery



Product type	Function	Part number	Description	Package mm x mm	Qty
MCU	Main MCU	CY8C6247BZI-D54	32-bit Cortex-M4F 150 MHz with FPU & MPU & Cortex-M0+ 100 MHz with MPU, 288 kB SRAM & 1 MB application Flash, QuadSPI/Serial memory interface, 9 configurable serial communication blocks, USB-FS, 2 PDM & 1 I2S audio channels, 32 TCPWM, 12-bit ADC 1 Msps, 2 OpAmps, CAPSENSE™ touch sensing, Cryptography accelerator, Secure Boot, V_S 1.7 – 3.6 V, T_A -40 to 85°C	BGA124 9x9	1
MCU	KitProg2/3 programmer	CY8C5868LTI-LP039	32-bit Cortex-M3 67 MHz with DMA controller & digital filter processor, 64 kB SRAM & 256kB Flash & 2 kB EEPROM, Full Speed USB 2.0 & Full CAN, 4 TCPWM blocks, configurable 8 - 20-bit ADC, 4 comparators, 4 OpAmps, V_S 1.71 – 5.5 V, T_A -40 to 85°C	QFN68 8x8	1
MCU (CCG3)	USB-C PD controller	CYPD3125-40LQXI	Integrated USB-C and Power Delivery (PD) port controller with 32-bit Cortex-M0 48 MHz, 8 kB SRAM & 128 kB Flash, integrated oscillator, 4 configurable serial communication blocks, HW Cryptography block enabling authentication, 20 V-tolerant regulator, T_A -40 to 105°C	QFN40 6x6	1
WLAN & BT IC	WLAN & BT IC in module	CYW4343W	Integrated Single-band 2.4 GHz IEEE 802.11b/g/n with internal power amplifier, LNA, RF T/R switch, Bluetooth® 4.1 + EDR with integrated Class-1 PA, concurrent operation, I2S/PCM for BT audio, BLE support, WLAN data rate 1 – 96 Mbps, BT UART up to 4 Mbps	WLBGA74 3x5	1
Serial Flash	Memory	S25FL512SAGBHIA10	512 Mb Quad-SPI Serial NOR Flash 3 V, 133 MHz, uniform 25 6kB sectors, Quad read up to 52 MB/s effective data rate, T_A -40 to 85°C	BGA24 6x8	1
Ferroelectric RAM	Memory	CY15B104QSN-108SXI	4 Mb non-volatile FRAM with endurance of 100 trillion R/W cycles, 151-year data retention, single and multi SPI (quad SPI), up to 108 MHz SDR & 54MHz DDR, V_{DD} 1.8 – 3.6V, T_A -40 to 85°C	SOIC8 5x8	1
High-side Power Switch	CCG3 protection	BTS4175SGA	Smart high-side power switch fitting for 12 V & 24 V applications, V_{OP} 6 – 52 V, $R_{DS(on)}$ 350 mΩ & 1.3 A nominal load current & current limit at 6 A, diagnostic & protection features, T_J -40 to 150°C, AEC qualified	DSO8 5x6	1

Main & HMI Control & Connectivity Evaluation Board (150 MHz with RTOS support)

Overview

- **Peripheral-rich integrated ARM Cortex-M4F up to 150MHz with FPU and ARM Cortex-M0+ up to 100 MHz**
- Included 2.4 GHz WLAN + Bluetooth® module from Murata (LBEE5KL1DX-883 of size 7 x 5.2 x 1.1mm) based on CY4343W & on-board WLAN/BT antenna, and CAPSENSE™ evaluation components (buttons & 5-segment slider)
- On-board programmer & debugger compatible with PSoC™ programmer & debugger based on KitProg2/3 firmware
- Evaluation software available in Infineon website (ModusToolbox™) & FreeRTOS demo code available in Github
- Compatible with Arduino Uno R3 connection
- OPN: CY8CKIT-064S0S2-4343W
- Additional features: Quad SPI Flash & FRAM

Product type	Function	Part number	Description	Package mm x mm	Qty
MCU	Main MCU	CYS0644ABZI-S2D44	32-bit Cortex-M4F 150 MHz with FPU & MPU & Cortex-M0+ 100 MHz with MPU for RoT & secure system function, 1MB SRAM & 2MB application Flash, Amazon FreeRTOS (AFR) enabled, HW-based Root of Trust (RoT), Secure Boot support, QuadSPI/Serial memory interface, SDHC interface, USB-FS, 13 configurable serial communication blocks, 2 PDM & I2S audio channels, 32 TCPWM, 12-bit ADC 2 Msps, CAPSENSE™ touch sensing, Cryptography accelerator, V_S 1.7 – 3.6 V, T_A -40 to 85°C	BGA124 9x9	1
MCU	KitProg2/3 programmer	CY8C5868LTI-LP039	32-bit Cortex-M3 67 MHz with DMA controller & digital filter processor, 64 kB SRAM & 256 kB Flash & 2 kB EEPROM, Full Speed USB 2.0 & Full CAN, 4 TCPWM blocks, configurable 8 - 20-bit ADC, 4 comparators, 4 OpAmps, V_S 1.71 – 5.5 V, T_A -40 to 85°C	QFN68 8x8	1
WLAN & BT IC	WLAN & BT chip in module	CYW4343W	Integrated Single-band 2.4 GHz IEEE 802.11b/g/n with internal power amplifier, LNA, RF T/R switch, Bluetooth® 4.1 + EDR with integrated Class-1 PA, concurrent operation, I2S/PCM for BT audio, BLE support, WLAN data rate 1 – 96 Mbps, BT UART up to 4 Mbps	WLBGA74 3x5	1
Serial Flash	Memory	S25FL512SAGBHIA10	512 Mb Quad-SPI Serial NOR Flash 3V, 133 MHz, uniform 256 kB sectors, Quad read up to 52 MB/s effective data rate, T_A -40 to 85°C	BGA24 6x8	1
Ferroelectric RAM	Memory	CY15B104QSN-108SXI	4 Mb non-volatile FRAM with endurance of 100 trillion R/W cycles, 151-year data retention, single and multi SPI (quad SPI), up to 108 MHz SDR & 54 MHz DDR, V_{DD} 1.8 – 3.6 V, T_A -40 to 85°C	SOIC8 5x8	1

Main & HMI Control & Connectivity Evaluation Board (150 MHz)

Overview

- **Main and HMI control with Bluetooth® Low Energy (BLE) connectivity of data rate up to 2 Mbps**
- Included E-ink display shield (CY8CKIT-028-EPD) containing 2.7inch monochrome TFT Electrophoretic Display (EPD), 6-axis IMU, PDM microphone, and thermistor
- Also included CySmart BLE 4.2 USB Dongle (CY5677) with on-board BLE antenna
- On-board programmer & debugger compatible with PSoC™ programmer & debugger based on KitProg2/3 firmware
- Evaluation software available in Infineon website (PSoC™ Creator)
- Compatible with Arduino Uno R3 connection
- OPN: CY8CKIT-062-BLE
- Additional features: CAPSENSE™ evaluation components (buttons, 5-segment slider & proximity sensing header), NOR Flash, USB-C PD

Product type	Function	Part number	Description	Package mm x mm	Qty
MCU	Main MCU	CY8C6347BZI-BLD53	32-bit Cortex-M4F 150 MHz with FPU & MPU & Cortex-M0+ 100 MHz with MPU, 288 kB SRAM & 1 MB application Flash, BLE subsystem of 2.4 GHz transceiver & 50 Ω antenna drive & TX power up to 4dBm, QuadSPI/Serial memory interface, 9 configurable serial communication blocks, 2 PDM & 1 I2S audio channels, 32 TCPWM, 12-bit ADC 1 Msps, built-in temperature sensor, 2 OpAmps, CAPSENSE™ touch sensing, ROM-based root of trust via Secure Boot, Cryptography accelerator, V_S 1.7 – 3.6V, T_A -40 to 85°C	BGA116 5.2x6.4	1
MCU	KitProg2/3 programmer	CY8C5868LTI-LP039	32-bit Cortex-M3 67 MHz with DMA controller & digital filter processor, 64 kB SRAM & 256 kB Flash & 2 kB EEPROM, Full Speed USB 2.0 & Full CAN, 4 TCPWM blocks, configurable 8 - 20-bit ADC, 4 comparators, 4 OpAmps, V_S 1.71 – 5.5 V, T_A -40 to 85°C	QFN68 8x8	1
MCU (CCG3)	USB-C PD controller	CYPD3125-40LQXIES	Integrated USB-C and Power Delivery (PD) port controller with 32-bit Cortex-M0 48 MHz, 8 kB SRAM & 128 kB Flash, integrated oscillator, 4 configurable serial communication blocks, HW Cryptography block enabling authentication, 20 V-tolerant regulator, T_A -40 to 105°C	QFN40 6x6	1
High-side Power Switch	CCG3 protection	BTS4175SGA	Smart high-side power switch fitting for 12 V & 24 V applications, V_{OP} 6 – 52 V, $R_{DS(on)}$ 350 mΩ & 1.3 A nominal load current & current limit at 6 A, diagnostic & protection features, T_J -40 to 150°C, AEC qualified	DSO8 5x6	1
Serial Flash	Memory	S25FL512SAGMFI011	512 Mb Quad-SPI Serial NOR Flash 3 V, 133 MHz, uniform 256 kB sectors, Quad read up to 52 MB/s effective data rate, T_A -40 to 85°C	SO16 10.3x10.3	1
Ferroelectric RAM	Memory	FM25V10-G (not soldered)	1 Mb non-volatile FRAM organized as 128 K x 8, endurance of 100 trillion R/W cycles, 151-year data retention, up to 40 MHz frequency fast SPI, direct hardware replacement for serial Flash & EEPROM, V_{DD} 2 – 3.6 V, T_A -40 to 85°C	SOIC8 5x8	1

Connectivity & HMI Evaluation Board (BLE)

Overview

- **HMI control via Bluetooth® Low Energy (BLE) connectivity of data rate up to 1 Mbps**
- Included a baseboard with separate pair of PSoC™ 4 BLE boards (CY8CKIT-143A & CY5677 CySmart BLE 4.2 USB Dongle) each having on-board BLE antenna
- Battery operation BLE module and USB powered BLE dongle
- On-board programmer & debugger compatible with PSoC™ programmer & debugger based on KitProg firmware
- Evaluation software available in Infineon website (PSoC™ Creator)
- Compatible with Arduino Uno connection
- OPN: CY8CKIT-042-BLE-A
- Additional features: FRAM, CAPSENSE™ evaluation components (buttons, 5-segment slider & proximity sensing header)

Product type	Function	Part number	Description	Package mm x mm	Qty
MCU	BLE MCU	CY8C4248LQI-BL583	32-bit Cortex-M0 with DMA, 48 MHz 32 KB SRAM & 256 KB Flash, BLE 2.4 GHz Radio with 50 Ω antenna drive, RF output power up to 3 dBm, BLE4.2 support, data rate up to 1 Mbps, 4 TCPWM blocks, 4 OpAmps, 12-bit ADC 1 Msps, 2 configurable serial comm. blocks, CAPSENSE™, LCD drive, V_S 1.8 – 5.5 V, T_A -40 to 85°C	QFN56 7x7	1
MCU	KitProg programmer	CY8C5868LTI-LP039	32-bit Cortex-M3 67 MHz with DMA controller & digital filter processor, 64 kB SRAM & 256 kB Flash & 2 kB EEPROM, Full Speed USB 2.0 & Full CAN, 4 TCPWM blocks, configurable 8 – 20-bit ADC, 4 comparators, 4 OpAmps, V_S 1.71 – 5.5 V, T_A -40 to 85°C	QFN68 8x8	1
Ferroelectric RAM	Memory	FM24V10-G	1 Mb organized as 128 K x 8, I²C interface up to 3.4 MHz, direct hardware replacement for serial I²C EEPROM, V_{DD} 2 – 3.6 V, T_A -40 to 85°C	SOIC8 5x8	1

Connectivity & HMI Evaluation Board (Wireless LAN & Bluetooth®)

Overview

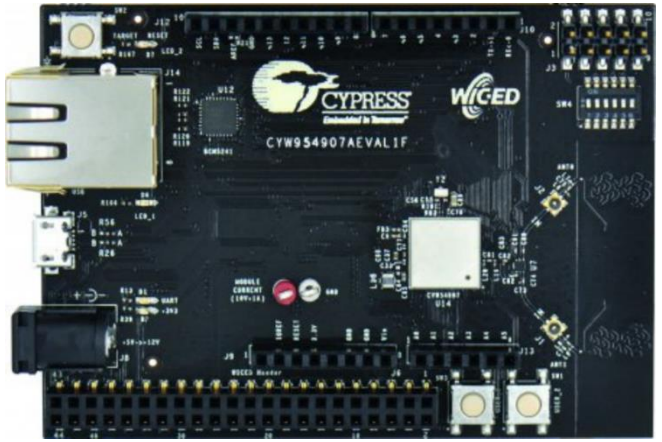
- **Dual band Wi-Fi 5 (802.11ac) up to 433 Mbps & Bluetooth® 5.2 compliant up to 3 Mbps connectivity in addition to HMI control**
- Included radio module Wi-Fi 5 + Bluetooth® 5.2 from Laird Connectivity (Sterling™-LWB5+ M.2 of size 30 x 22 x 2.9 mm) with antenna connectors, M.2 interface connection & based on CYW4373E
- Included also CAPSENSE™ evaluation components (buttons & 5-segment slider)
- Evaluation software available in Infineon website (ModusToolbox™)
- On-board programmer & debugger compatible with PSoC™ programmer & debugger based on KitProg3 firmware
- Headers compatible with Arduino Uno R3 for hardware expansion using Arduino shields
- OPN: CY8CEVAL-062S2
- Additional features: Serial NOR Flash, F-RAM, and OPTIGA™ Trust-M security controller

Product type	Function	Part number	Description	Package mm x mm	Qty
WLAN & BT IC	WLAN & BT IC in radio module	CYW4373EUBGT	Integrated dual-band 2.4 & 5 GHz IEEE 802.11 a/b/g/n/ac with internal power amplifier, LNA, and support RF T/R switch for 2.4 GHz band, Bluetooth® 5.0 supporting BR/EDR/BLE with integrated Class-1 or Class-2 PA, tested compliant to Bluetooth® 5.2, WLAN 256-QAM enabling data rate up to 433.3 Mbps, BT UART up to 4 Mbps, V_{BAT} 3.2 - 4.8 V/V_{DDIO} 1.62 - 3.63 V, T_A -20 to 70°C	WLBGA128 4.5x5.4	1
MCU	MCU onboard	CY8C624ABZI-S2D44	32-bit Cortex-M4F 150 MHz with FPU & MPU & Cortex-M0+ 100 MHz with MPU, 1024 kB SRAM & 2 MB application Flash, QuadSPI/Serial memory interface, 13 configurable serial communication blocks, USB-FS, 2 PDM & 2 I2S audio channels, 32 TCPWM, 12-bit ADC 2 Msps, 2 comparators, CAPSENSE™ touch sensing, Cryptography accelerator, V_S 1.7 – 3.6 V, T_A -40 to 85°C	BGA124 9x9	1
Serial Flash	Memory	S25FL512SAGMFIR10	512 Mb Quad-SPI NOR Flash 3 V, 133 MHz, uniform 256kB sectors, Enhanced High Performance Latency Code, T_A -40 to 85°C	DSO-16 10.3x10.3	1
Ferroelectric RAM	Memory	CY15B104QSN-108SXI	4 Mb non-volatile FRAM with endurance of 100 trillion R/W cycles, 151-year data retention, single and multi SPI (quad SPI), up to 108 MHz SDR & 54 MHz DDR, V_{DD} 1.8 – 3.6 V, T_A -40 to 85°C	SOIC8 5x8	1
HW security controller	Security controller	SLS32AIA010MKUSON10XTMA2	High-end security controller for connecting IoT devices to the cloud, with cryptography support for ECC, RSA, AES, HMAC, HKDF, & TLS algorithm, I^2C interface up to 1 MHz with Fast Mode Plus, V_{CC} 1.62 – 5.5 V, temperature range -25 to 85°C	USON10 3x3	1

Connectivity Evaluation Board (Wireless LAN Dual Band)

Overview

- **System in Package (SiP) module for Wireless LAN connectivity with option for on-board or external antenna**
- Evaluation software available on Infineon website (WICED™ Studio)
- FreeRTOS libraries support & compatible with Arduino Uno connection
- On-board programmer & debugger via UART-USB bridge and direct USB interface to PC/Laptop
- Additional features (non-IFX devices): Ethernet, Serial Flash, microSD card interface
- OPN: CYW943907AEVAL1F
- SiP WLAN from Murata LBWA1UZ1GC of size 10 x 10 x 1.2 mm, based on CYW43907
- Single-stream multiplexing up to 150 Mbps, 20/40 MHz channels support, IEEE 802.11 a/b/g/n transfer rates
- OPN: CYW954907AEVAL1F
- SiP WLAN from Murata LBWA1UZ1PS-241 of size 10 x 10 x 1.2 mm, based on CYW54907
- Single-stream multiplexing up to *433.3 Mbps*, 20/40/*80* MHz channels support, IEEE 802.11 a/b/g/n/*ac* transfer rate, *256-QAM* compliant

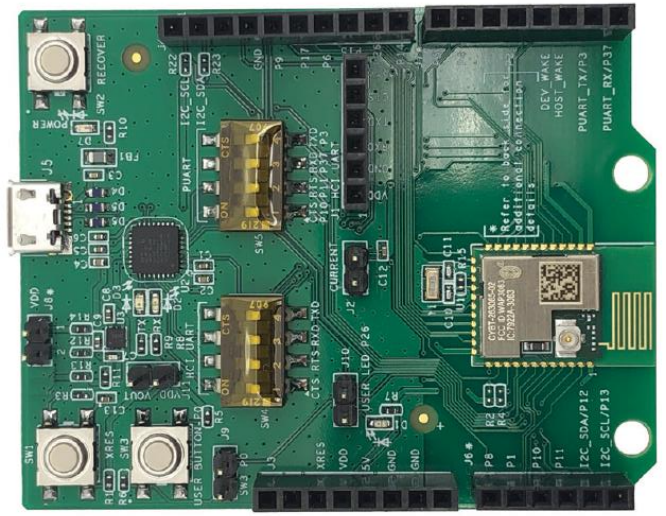


Product type	Function	Part number	Description	Package mm x mm	Qty
WLAN IC	WLAN IC in SiP 1GC	CYW43907KWBGT	Integrated Dual-band 2.4 & 5 GHz IEEE 802.11a/b/g/n with internal power amplifier & LNA, antenna diversity support, 32-bit Cortex-R4 RISC, 2 MB SRAM, 640 KB ROM, cryptography core, USB2.0, serial & audio interfaces, integrated power supplies, programmable data rate 1 – 150 Mbps, V_{BAT} 3 - 4.8 V/V_{DDIO} 1.8-3.3 V, T_A -30 to 85°C	WLCSP316 45x5.5	1
WLAN IC	WLAN IC in SiP 1PS	CYW54907KWBGT	Integrated Dual-band 2.4 & 5 GHz IEEE 802.11a/b/g/n with internal power amplifier & LNA, antenna diversity support, 32-bit Cortex-R4 RISC, 2 MB SRAM, 640 KB ROM, cryptography core, USB2.0, serial & audio interfaces, integrated power supplies, programmable data rate 1 – 433.3 Mbps, V_{BAT} 3 - 4.8 V/V_{DDIO} 1.8-3.3V, T_A -30 to 85°C	WLCSP316 45x5.5	1

Connectivity Evaluation Board (Bluetooth® & BLE)

Overview

- **Fully integrated Bluetooth® & BLE module of high transmitter output power with size 12.5 x 19 x 1.95 mm**
- Up to 3 Mbps for Bluetooth® and 2 Mbps for BLE
- Direct interface to USB of PC/Laptop for quick evaluation
- Compatible with Arduino Uno connection
- Evaluation software available in Infineon website (ModusToolbox™)
- OPN: CYBT-263065-EVAL

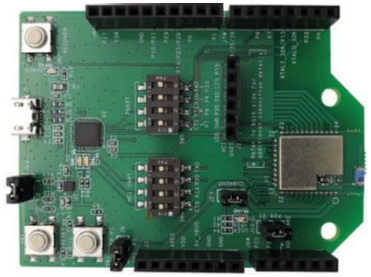


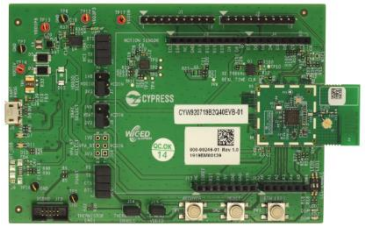
Product type	Function	Part number	Description	Package mm x mm	Qty
BT & BLE module	BT & BLE module	CYBT-263065-02	Fully integrated Bluetooth® module with onboard crystal oscillators, passive components, power amplifier & LNA, 256 KB flash, 176 KB SRAM & BT MCU CYW20819 compatible with Bluetooth® 5.0, BLE support, TX output power up to 15 dBm, V_S 2.5 – 3.6 V, T_A -30 to 85°C	SMT35 12.5x19	1
USB – UART bridge controller	USB – UART converter	CY7C65215-32LTXI	USB to Serial Dual channel bridge, USB2.0 Full Speed 12 Mbps, 2-channel configurable UART/SPI up to 3 Mbps, 2-channel configurable I^2C up to 400 kHz, CAPSENSE™, battery-charge detection (BCD) compliant, operating voltage 1.71 – 5.5 V, T_A -40 to 85°C	QFN32 5x5	1
MCU	Basis BT & BLE MCU	CYW20819	32-bit Cortex-M4 96 MHz with FPU, 176 KB RAM & 256 KB Flash, Bluetooth® 5.4 up to 3 Mbps, up to 22 GPIOs, I2C, I2S, UART, PCM interfaces, 2x quad-SPI interfaces, up to 28-channel ADC, PWM, RTC, WDT, V_S 1.71 – 3.3 V, T_A -30 to 85°C	QFN60 7x7	--

Connectivity Evaluation Board (Bluetooth® & BLE)

Overview

- **Highly miniaturized & fully integrated dual-mode Bluetooth® BR/EDR & BLE and Flash memory module of size 11 x 11 x 1.7 mm**
- Up to 3 Mbps for Bluetooth® and 2 Mbps for BLE
- Compatible with Arduino Uno connection
- Evaluation software available in Infineon website (ModusToolbox™)
- Direct interface to USB of PC/Laptop for quick evaluation
- OPN: CYBT-423054-EVAL
- OPN: CYW920719B2Q40EVB-01 (non-module based & including battery operation and non-IFX sensors: analog microphone, 9-axis IMU, and thermistor)



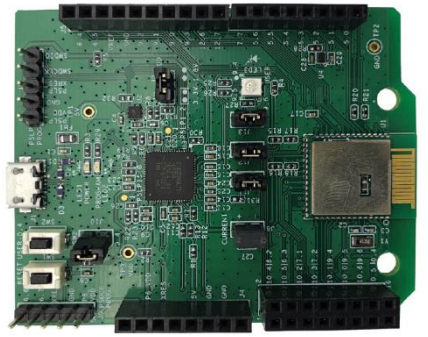


Product type	Function	Part number	Description	Package mm x mm	Qty
BT module	BT module	CYBT-423054-02	Fully integrated Bluetooth® module with onboard crystal oscillators, passive components, 512 KB serial flash & BLE MCU CYW20719 compatible with Bluetooth® 5.1, TX output power up to 4 dBm, V_S 2.5 – 3.6 V, T_A -30 to 85°C	SMT28 11x11	1
USB – UART bridge controller	USB – UART converter	CY7C65215-32LTXI	USB to Serial Dual channel bridge, USB2.0 Full Speed 12 Mbps, 2-channel configurable UART/SPI up to 3 Mbps, 2-channel configurable I^2C up to 400 kHz, CAPSENSE™, battery-charge detection (BCD) compliant, operating voltage 1.71 – 5.5 V, T_A -40 to 85°C	QFN32 5x5	1
MCU	BT MCU in EVB	CYW20719	32-bit Cortex-M4 96 MHz with FPU, 1MB Flash, 512 KB RAM & 2 MB ROM, Bluetooth® 5.1 with BLE 2 Mbps & BT up to 3 Mbps, PDM, PCM, & I2S audio channels, 6 16-bit PWM, 48-bit RTC, ADC, 2 SPI, UART, I^2C, V_S 1.76 – 3.6 V, T_A -40 to 85°C	QFN40 5x5	1

Connectivity Evaluation Board (BLE)

Overview

- **Miniaturized and fully integrated BLE module including antenna of size 14 x 18.5 x 2 mm**
- Up to 2 Mbps data rate
- On-board debugger compatible with PSoC™ programmer & debugger based on KitProg2 firmware
- Evaluation software available on Infineon website (PSoC™ Creator)
- OPN: CY8CPROTO-063-BLE (independent usage)
- OPN: CYBLE-416045-EVAL (compatible with Arduino Uno connection)

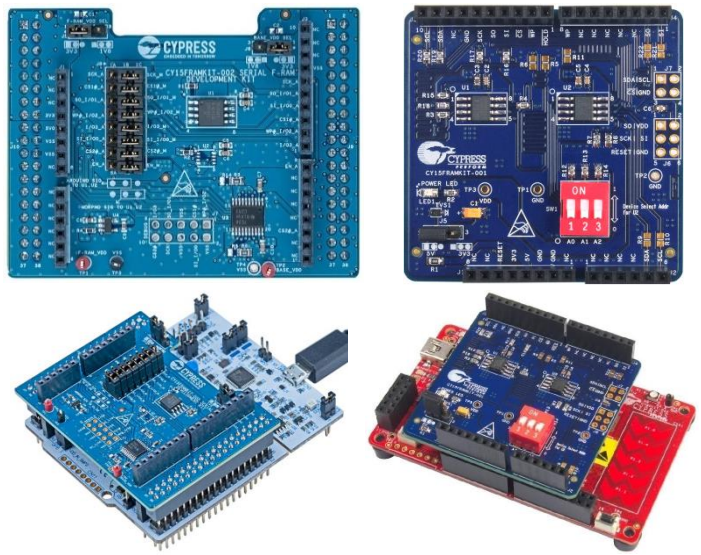


Product type	Function	Part number	Description	Package mm x mm	Qty
BLE module	BLE module	CYBLE-416045-02	Fully certified and qualified BLE module with onboard crystal oscillators, trace antenna, passive components & BLE MCU PSoC™ 63 BLE compatible with Bluetooth® 5.0 up to 2 Mbps, TX output power up to 4 dBm, V_S 1.7 – 3.6 V, T_A -40 to 85°C	SMT43 14x18.5	1
MCU	Basis BLE MCU	PSoC6 CY8C63x6 / CY8C63x7	32-bit Cortex-M4F 150 MHz with FPU & MPU & Cortex-M0+ 100 MHz with MPU, 288 KB SRAM & 1 MB application Flash, BLE subsystem, QuadSPI/Serial memory interface, 9 configurable serial communication blocks, 2 PDM & 1 I2S audio channels, 32 TCPWM, 12-bit ADC 1 Msps, CAPSENSE™ touch sensing, Cryptography accelerator, LCD Drive, Secure Boot, V_S 1.7 – 3.6 V, T_A -40 to 85°C	--	--
MCU	KitProg programmer	CY8C5868LTI-LP039	32-bit Cortex-M3 67 MHz with DMA controller & digital filter processor, 64 kB SRAM & 256 kB Flash & 2 kB EEPROM, Full Speed USB 2.0 & Full CAN, 4 TCPWM blocks, configurable 8 - 20-bit ADC, 4 comparators, 4 OpAmps, V_S 1.71 – 5.5 V, T_A -40 to 85°C	QFN68 8x8	1

Memory Evaluation Board (Ferroelectric RAM)

Overview

- **Non-volatile Ferroelectric Random Access Memory (FRAM) with fast write speed (at the available bus speed) and 151 years data retention capability**
- OPN: CY15FRAMKIT-001 (256 kb memory size available in SPI & I^2C interface)
- To be used with Arduino Uno R3 or PSoC™ 4 Pioneer Kit (CY8CKIT-042)
- OPN: CY15FRAMKIT-002 (4096 kb memory size available in QuadSPI interface)
- To be used with Arduino Uno R3 (standard SPI only) or ST Nucleo Kit (Standard & QuadSPI)
- Evaluation software including driver available on Infineon website

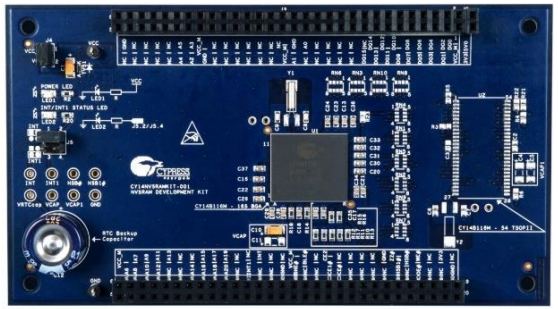


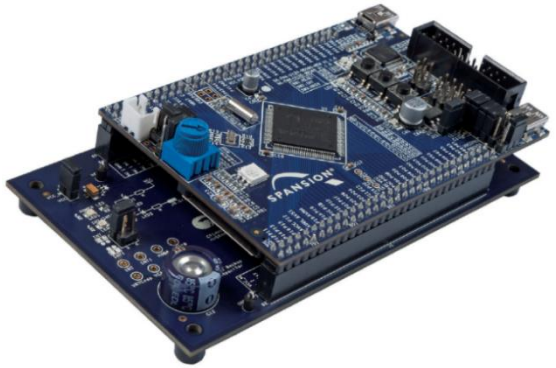
Product type	Function	Part number	Description	Package mm x mm	Qty
Ferroelectric RAM	Memory in v.001	FM25W256-G	256 Kb organized as 32 K x 8, SPI interface up to 20 MHz, direct hardware replacement for serial Flash & EEPROM, V_S 2.7 – 5.5 V, T_A -40 to 85°C	SOIC8 5x6	1
Ferroelectric RAM	Memory in v.001	FM24W256-G	256 Kb organized as 32 K x 8, I^2C interface up to 1 MHz, direct hardware replacement for serial I^2C EEPROM, V_S 2.7 – 5.5 V, T_A -40 to 85°C	SOIC8 5x6	1
Ferroelectric RAM	Memory in v.002	CY15B104QSN-108SXI	4 Mb non-volatile FRAM with endurance of 100 trillion R/W cycles, 151-year data retention, single and multi SPI (quad SPI), up to 108 MHz SDR & 54 MHz DDR, V_{DD} 1.8 – 3.6 V, T_A -40 to 85°C	SOIC8 5x6	1
MCU in KIT 042	Control interface	CY8C4245AXI-483	32-bit Cortex-M0 48 MHz CPU clock 4 KB SRAM & 32 KB Flash with 4 TCPWM blocks & Comparator-based triggering of Kill signals for motor drive, 2 OpAmps, CAPSENSE™, LCD drive capability on GPIOs, V_S 1.71 – 5.5 V, T_A -40 to 105°C	TQFP44 12x12	1

Memory Evaluation Board (non-volatile SRAM)

Overview

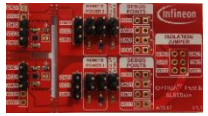
- **16 Mb non-volatile Static Random Access Memory (SRAM) with integrated Real Time Clock (RTC)**
- Equipped with 0.1 F super capacitor to enable RTC power back-up for more than 2 days
- OPN: CY14NVSRAMKIT-001
- Evaluation software including driver available in Infineon website developed for use with legacy MCU board (FM4-U120-9B560) that can be easily ported to any C-based MCU platform only by changing the HW I/O interface





Product type	Function	Part number	Description	Package mm x mm	Qty
Non-volatile SRAM	Non-volatile SRAM	CY14B116M-BZ45XI	16 Mb nvSRAM with 45 ns access time, 2 configurations 2048 KB of 8-bit or 1024 KB of 16-bit, RTC with programmable frequency of the square wave output, V_S 2.7 – 3.6 V, T_A -40 to 85°C – alternative with 25 ns access time CY14B116M-ZSP25XI (TSSOP54)	FBGA165 15x17	1
MCU	Control interface	MB9BF568R – discontinued	32-bit Cortex-M4F 160 MHz with FPU & MPU & DSP support, 128 kB SRAM & 1 MB application Flash, external memory interface for SDRAM, SRAM, NOR & NAND Flash, USB, CAN interface up to 1 Mbps, configurable serial communication, 12-bit ADC, RTC, multi-function timer, quadrature position/revolution counter for encoder interface, CRC accelerator, SDCard interface, V_S 2.7 – 5.5 V, T_J -40 to 125°C	LQFP120 16x16	1

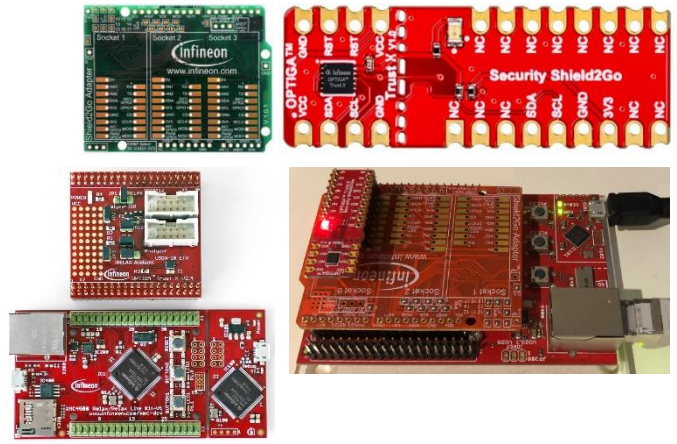
Security Controllers selection

ECC256, AES128, and SHA256 cryptography algorithms – OPTIGA™ Trust X	ECC, RSA, AES, HMAC, and HKDF cryptography algorithms – OPTIGA™ Trust M	Wireless charging authentication with ECC 256/384 and SHA-256 – OPTIGA™ Trust CHARGE	Authentication with ECC 131-bit key length – OPTIGA™ Trust B	Authentication with ECC 163-bit key length – OPTIGA™ Authenticate S
				

Security Evaluation Board (Trust X)

Overview

- **Pre-programmed security controller supporting cryptography algorithms ECC 256, AES-128 and SHA-256**
- Generation & Verification of digital signatures
- Generation of a single key and public private key pair
- OPN: S2GOSECURITYOPTIGAXTOBO1 (without MCU Kit board)
- Easy to use with Arduino Uno using the available adapter (MYIOTADAPTERTOBO1) or with XMC1100 S2GO (KITXMC2GOXMC1100V1TOBO1) or XMC4700 Relax Kit (KITXMC47RELAXV1TOBO1)
- Arduino library and FreeRTOS demo code available in Github
- Other features available for evaluation in XMC4700 Relax Kit: CAN bus communication, Ethernet protocol, QuadSPI serial Flash, and FreeRTOS operation
- OPN: OPTIGATRUSTXEVALKITTOBO2 (with XMC4500 MCU) with Getting Started guide available in Github



Product typeg	Function	Part number	Description	Package mm x mm	Qty
Security controller IC	Security controller	SLS32AIA020X2	Embedded security controller for connected devices, with symmetric/asymmetric cryptography engines supporting ECC256, AES128, and SHA256, I^2C interface up to 1 MHz with Fast Mode Plus, V_S 1.62 – 5.5 V, T_J -40 to 105°C	USON10 3x3	1
MCU	Control interface in XMC4700 Kit	XMC4700-F144K2048	32-bit Cortex-M4 144 MHz with FPU & MPU, 352 KB SRAM & 2048 KB Flash with configurable 6 serial channels, CAN interface, Ethernet MAC module, USB, EBU for external memories, SDMMC, Touch-Sense controller, T_A -40 to 125°C	LQFP144 22x22	1
CAN transceiver	CAN transceiver	IFX1051LE	Industrial qualified CAN transceiver up to 1Mbps transmission rate suitable for 12 & 24 V applications – replaceable with TLE9250XLE, automotive qualified	TSON8 3x3	1
MCU	Control interface in XMC4500 Kit	XMC4500-F100K1024	32-bit Cortex-M4 120 MHz with FPU & MPU, 160 KB SRAM & 1024 KB Flash with configurable 6 serial channels, CAN interface, Ethernet MAC module, USB, EBU for external memories, SDMMC, Touch-Sense controller, T_A -40 to 125°C	LQFP100 22x22	1

Security Evaluation Board (Trust M)

Overview

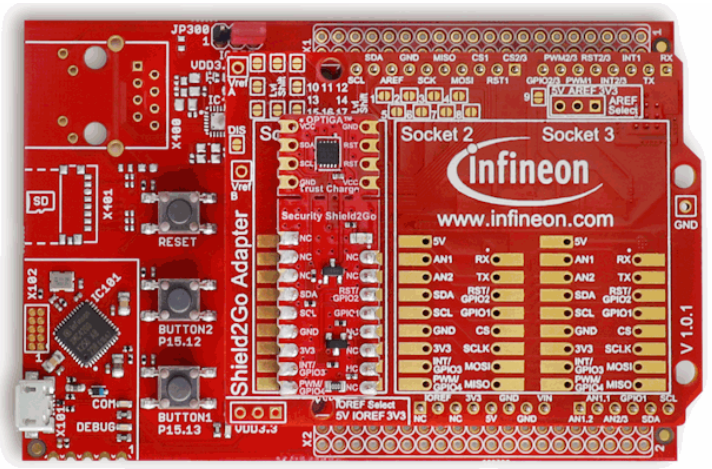
- **Pre-programmed security controller supporting cryptography algorithms ECC NIST curves up to P-521, ECC Brainpool curve up to P-512, RSA® up to 2048, AES key up to 256, HMAC up to SHA512, HKDF up to SHA512 and SHA-256**
- Generation & Verification of digital signatures
- Encryption & Decryption of cryptographic keys
- OPN: OPTIGATRUSTMEVALKITXHSA2
- FreeRTOS demo code available in Github
- Other features available for evaluation in XMC4800 IoT Kit: CAN bus communication, Ethernet Control Automation Technology (CAT) slave protocol, 2.4 GHz Wi-Fi module (based on ESP8266EX IC – non IFX device), and FreeRTOS operation
- Possibility to interface with XMC4700 Relax Kit (KITXMC47RELAXV1TOBO1) with FreeRTOS demo code in Github

Product type	Function	Part number	Description	Package mm x mm	Qty
Security controller IC	Security controller	SLS32AIA010ML	Embedded security controller for connected devices, with symmetric/asymmetric cryptography engines supporting ECC, RSA, AES, HMAC, & HKDF algorithm, I^2C interface up to 1MHz with Fast Mode Plus, V_S 1.62 – 5.5 V, T_J -40 to 105°C	USON10 3x3	1
MCU	Control interface	XMC4800-F100K2048	32-bit Cortex-M4 144 MHz with FPU & MPU, 352 KB SRAM & 2048 KB Flash with configurable 6 serial channels, CAN & EtherCATSlave interface, Ethernet MAC module, USB, EBU for external memories, SDMMC, Touch-Sense controller, T_A -40 to 125°C	LQFP100 16x16	1
CAN transceiver	CAN transceiver	IFX1051LE	Industrial qualified CAN transceiver up to 1 Mbps transmission rate suitable for 12 & 24 V applications – replaceable with TLE9250XLE, automotive qualified	TSON8 3x3	1
LDO	1.8V for Ethernet PHY IC	IFX54441LDV	LDO 300 mA output, 2.5% output voltage accuracy, reverse polarity, overcurrent, over-temperature protection, input voltage 1.8 V to 20 V – replaceable with TLS203B0EJV	TSO10 3.3x3.3	1
LDO	Voltage regulator	IFX1117MEV33	3.3 V LDO 1A output, ±2% precision, short circuit & over-temperature protection, input voltage 4.7 V to 15 V – similar I_{OUT} replacement TLE4284DV33 (different packaging – DPAK)	SOT223	1

Security Evaluation Board (Trust CHARGE)

Overview

- **Inductive wireless charging authentication supporting cryptography algorithms SHA-256 & ECC NIST P256/P384**
- Generation & Verification of digital signature and Key Generation
- Equipped with preprogrammed locked OS, locked application code, and host-side modules to integrate with host MCU software
- OPN: TRUSTCHARGEEVALKITTOBO1 (full evaluation kit with XMC4700 & adapter boards)
- Evaluation software available on Github & Infineon website

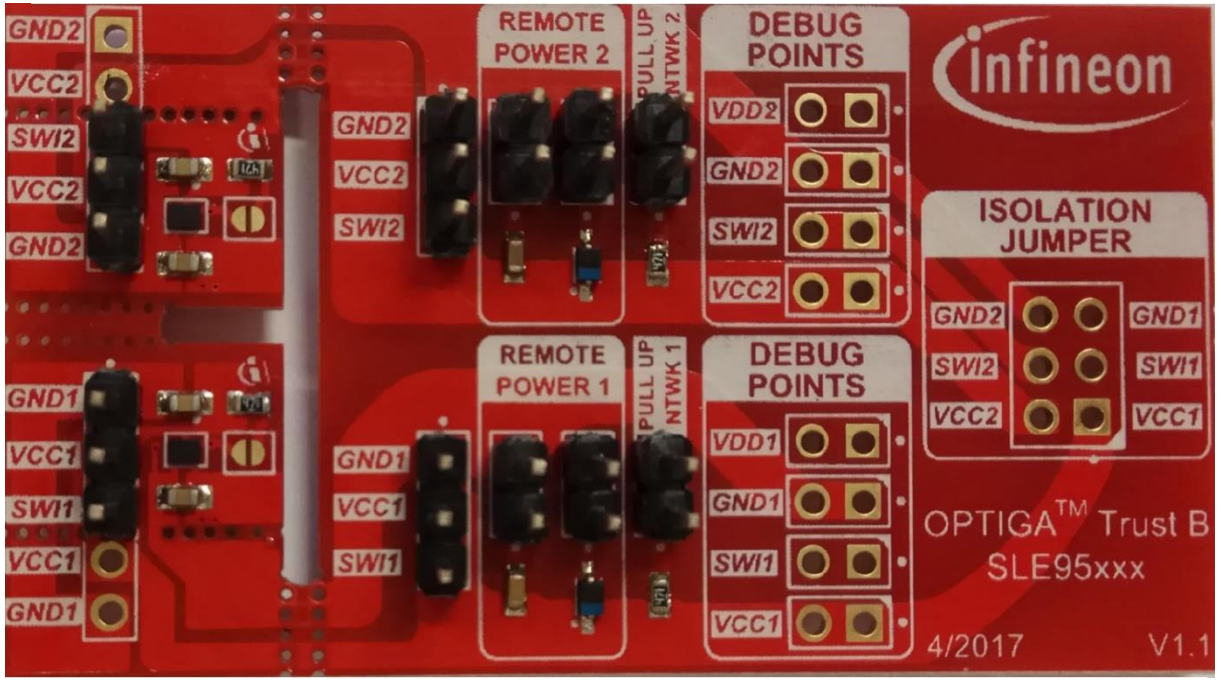


Product type	Function	Part number	Description	Package mm x mm	Qty
Authentication IC	Authentication IC	SLS32AIA020U3	Authentication IC following the Qi 1.3 wireless charging standard & compliant to USB-C authentication standard, with symmetric/asymmetric cryptography engines supporting ECC 256/384 and SHA-256, I^2C interface up to 1 MHz with Fast Mode Plus, V_S 1.62 – 5.5 V, T_J -40 to 105°C	USON10 3x3	1
MCU	Control interface	XMC4700-F144K2048	32-bit Cortex-M4 144 MHz with FPU & MPU, 352 KB SRAM & 2048 KB Flash with configurable 6 serial channels, CAN interface, Ethernet MAC module, USB, EBU for external memories, SDMMC, Touch-Sense controller, T_A -40 to 125°C	LQFP144 22x22	1
CAN transceiver	CAN transceiver	IFX1051LE	Industrial qualified CAN transceiver up to 1 Mbps transmission rate suitable for 12 & 24 V applications – replaceable with TLE9250XLE, automotive qualified	TSON8 3x3	1
LDO	Voltage regulator	IFX1117MEV33	3.3 V LDO 1 A output, ±2% precision, short circuit & over-temperature protection, input voltage 4.7 V to 15 V – similar I_{OUT} replacement TLE4284DV33 (different packaging – DPAK)	SOT223	1

Security Evaluation Board (Trust B)

Overview

- **Authentication solution with asymmetric ECC 131-bit key length allowing efficient counterfeit detection**
- OPTIGA™ Digital Certificate (ODC) with Device Personalization generating unique key pair per chip
- 512b non-volatile memory space for user data
- 2 Operational ICs allowing evaluation of the introduction of single or multiple authentication operation
- OPN: OPTIGATRUSTBAPPBOATOBO1
- Host software can be made available upon NDA signatures with Infineon

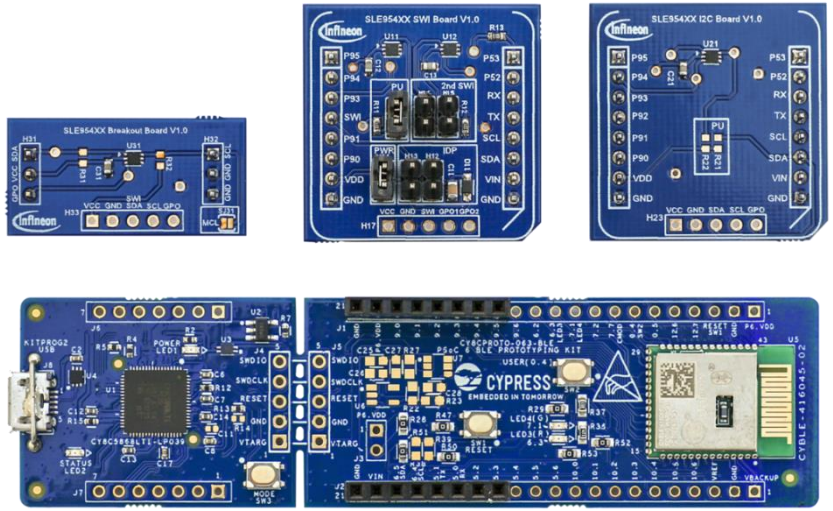


Product type	Function	Part number	Description	Package mm x mm	Qty
Authentication IC	Authentication IC	SLE95250	Authentication IC with 131-bit ECC engine, digital certificate with device personalization, Message Authentication Code (MAC) function, 512b user non-volative memory, single-wire interface (SWI) up to 500 kbps, V_S 2 – 5.5 V, T_J -40 to 85°C	TSNP6 1.1x1.5	2

Security Evaluation Board (Authenticate S)

Overview

- **Authentication solution with asymmetric 163-bit ECC allowing efficient counterfeit detection**
- 193-bit OPTIGA™ Digital Certificate (ODC) and 96-bit unique chip ID
- Message Authentication Code (MAC) function for user data authentication
- 32-bit lockable user non-volatile memory up to 5 Kb
- Option for MAC based Host Authentication
- I^2C or SWI for I/O interface and GPO for output interface
- Host MCU based on PSoC™ 63 with wireless connectivity
- OPN: EVALKITOPTIGAAUTHSTOBO1
- Included pre-loaded software and GUI interaction with no coding required
- OPN: DEVKITOPTIGAAUTHSTOBO1
- Allows building of SDK from source code using ModusToolbox™ available on Infineon website



Product type	Function	Part number	Description	Package mm x mm	Qty
Authentication IC	Authentication IC	SLE95415	Authentication IC with 163-bit ECC engine, 193-bit ODC, 96-bit unique chip ID, Message Authentication Code (MAC) function, 5 Kb user non-volative memory, I^2C interface up to 400 kHz clock, single-wire interface (SWI) witth bus frequency up to 500 kHz, V_S 1.8 – 5.5 V, T_J -40 to 85°C extended to 110°C	TSNP6 1.1x1.5	4

Isolation Interface ICs selection

500 V_{RMS} digital sink input

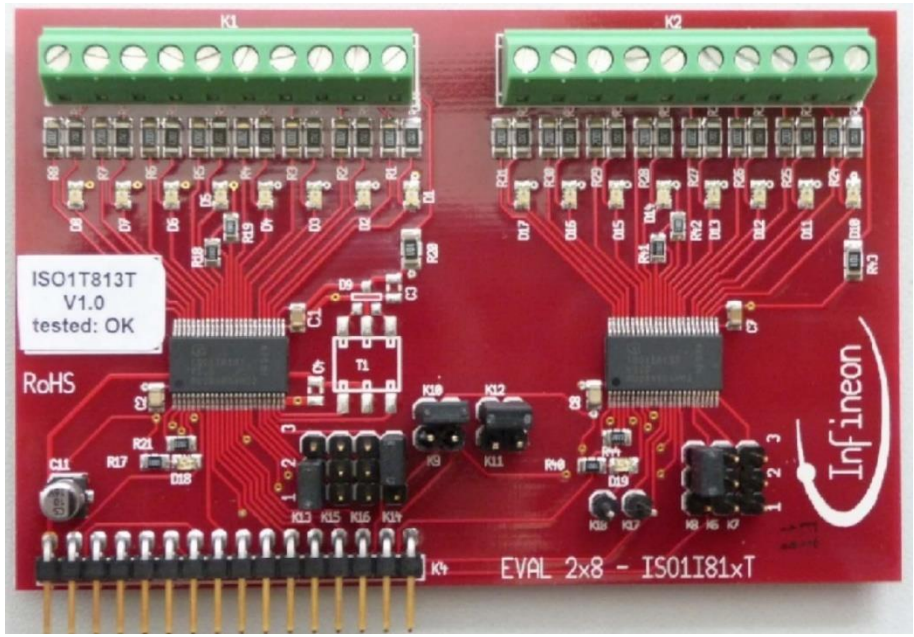
500 V_{RMS} digital high-side output

2500 V_{RMS} digital high-side output

Isolation Evaluation Board (for Input)

Overview

- **Robust 2.5 kV galvanic isolation based on coreless transformer technology for MCU protection from noisy environment/process-side**
- Complete integration of 8 channels of digital input, galvanic isolation & MCU/ASIC interface
- Status LED output for each digital input
- Parallel/Serial (SPI) data output interface to the external MCU
- OPN: EVALISO1I811TTOBO1 (up to 125 kHz sampling frequency)
- OPN: EVALISO1I813TTOBO1 (up to 500 kHz sampling frequency, programmable filter setting of each channel input, synchronous capture of input signals from multiple input Ics, comprehensive diagnostics enabling Preventive Maintenance)

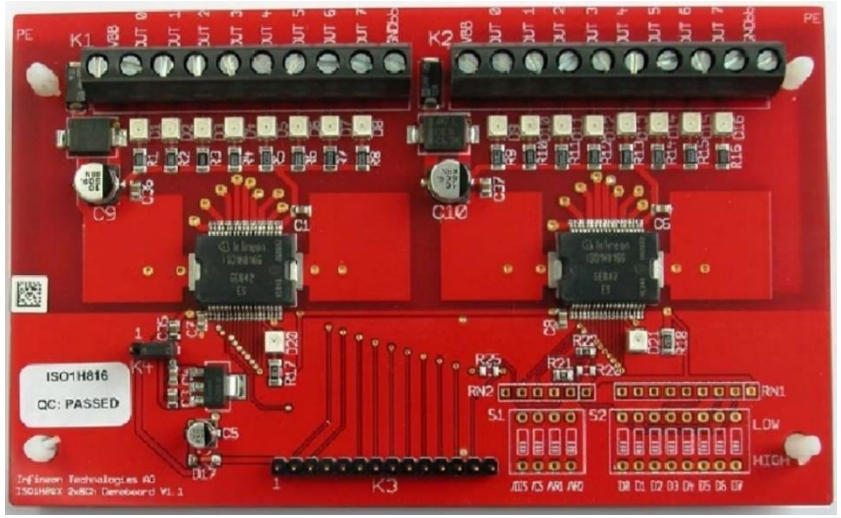


Product type	Function	Part number	Description	Package mm x mm	Qty
Isolated interface	Input isolation	ISO1I811T	24 V isolated 8-channel digital input, with 8-bit parallel/serial interface, up to 125 kHz sampling frequency, 1-state of the ERROR pin for process-side supply voltage V_{BB} < Vthreshold, V_{BB} 9.6 – 35 V, T_J -40 to 125°C	TSSOP48 8x12.5	2
Isolated interface	Input isolation	ISO1I813T	24 V isolated 8-channel digital input, with 8-bit parallel/serial interface, up to 500 kHz sampling frequency, comprehensive diagnostics (e.g. wire-break detection), 3-state of the ERROR pin for process-side supply voltage V_{BB} monitoring, V_{BB} 9.6 – 35 V, T_J -40 to 125°C	TSSOP48 8x12.5	2

Isolation Evaluation Board (for Output)

Overview

- **Robust 2.5 kV galvanic isolation based on coreless transformer technology for MCU protection from noisy environment/process-side**
- Complete integration of MCU/ASIC interface, galvanic isolation & 8 high-side output switches
- Maximum current limit, short-circuit & overcurrent & overvoltage & ESD protections, undervoltage shutdown with autorestart & hysteresis, thermal shutdown with restart
- Parallel/Serial (SPI) data output interface to the external MCU
- OPN: EVALISO1H811GTOBO1 (up to nominal 0.7 A load output/channel & parallel interface)
- OPN: EVALISO1H812GTOBO1 (up to nominal 0.7 A load output/channel & serial interface)
- OPN: EVALISO1H815GTOBO1 (up to nominal 1.4 A load output/channel & parallel interface)
- OPN: EVALISO1H816GTOBO1 (up to nominal 1.4 A load output/channel & serial interface)

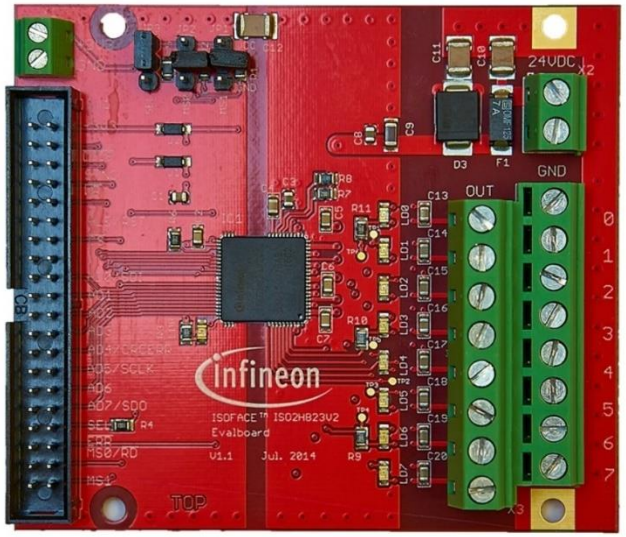


Product type	Function	Part number	Description	Package mm x mm	Qty
Isolated interface	Output isolation	ISO1H811G	24 V isolated 8-channel high-side switches of 0.7 A each with 8-bit parallel 3.3/5 V CMOS operation compatible interface, V_{BB} monitoring, V_{BB} 11 – 35 V, T_J -25 to 125°C	DSO36 14x16	2
Isolated interface	Output isolation	ISO1H812G	24 V isolated 8-channel high-side switches of 0.7 A each with 8-bit SPI 3.3/5 V CMOS operation compatible interface, V_{BB} monitoring, V_{BB} 11 – 35 V, T_J -25 to 125°C	DSO36 14x16	2
Isolated interface	Output isolation	ISO1H815G	24 V isolated 8-channel high-side switches of 1.4 A each with 8-bit parallel 3.3/5 V CMOS operation compatible interface, V_{BB} monitoring, V_{BB} 11 – 35 V, T_J -25 to 125°C	DSO36 14x16	2
Isolated interface	Output isolation	ISO1H816G	24 V isolated 8-channel high-side switches of 1.4 A each with 8-bit SPI 3.3/5 V CMOS operation compatible interface, V_{BB} monitoring, V_{BB} 11 – 35 V, T_J -25 to 125°C	DSO36 14x16	2

Isolation Evaluation Board (for Output)

Overview

- **Robust 2.5 kV galvanic isolation based on coreless transformer technology for MCU protection from noisy environment/process-side with comprehensive diagnostics**
- Complete integration of MCU/ASIC interface, galvanic isolation & 8 high-side output switches
- Comprehensive diagnostics enabling Preventive Maintenance
- Maximum current limit, short-circuit & overcurrent & reverse output voltage & ESD protections, undervoltage shutdown with autorestart & hysteresis, thermal shutdown & diagnostics per channel with auto-restart
- Parallel/Serial (SPI) data output interface to the external MCU
- OPN: EVALISO2H823V25TOBO1 (up to 0.6 A load output/channel)



Product type	Function	Part number	Description	Package mm x mm	Qty
Isolated interface	Output isolation	ISO2H823V2.5	24 V isolated 8-channel high-side switches of 0.6 A each with 8-bit parallel/serial 3.3 V CMOS operation compatible interface, common output disable & error indication pins, 3-state of V_{BB} monitoring, V_{BB} 11 – 35 V, T_J -25 to 125°C	VQFN70 12x12	2

Charger, Power & Battery Management selection

Voltage regulator

Linear LDO

VIN: 4.7 V – 42 V
VOUT: ≤ 36 V
IC-IOUT: ≤ 70 mA

VIN: ≤ 40 V
VOUT: 3.3 V/5 V
IC-IOUT: ≤ 350 mA

VIN: 2.3 V – 20 V
VOUT: 1.22 V – (20 V – DO voltage)
IC-IOUT: ≤ 500 mA

Switching step-down

VIN: 6 V – 40 V
VOUT: 5 V
IC-IOUT: ≤ 10 A
PCB-IOUT: ≤ 5 A

VIN: 12 V
VOUT: 5 V
IOUT: ~5.8 A
USB charger

PMIC & Power Distribution

VIN: 4.5 V – 45 V
VOUT: 5 V, 3.3 V / 2.6 V, 1.3 V
IC-IOUT total: < 2.5 A

VIN: up to 100 V
VOUT: 6x 5 V
IOUT: 3x 1.5 A, 3x 3A

USB-Power Delivery

USB-C & PD with HMI

Dual-port USB-C & PD

USB-C & PD with battery charging 2-5 cells

Charger

65 W charger with USB-C & PD and programmable output 5~20 V / 3 A

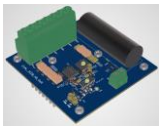
140 W charger with USB-C & PD 5 – 28 V (discrete) output voltage, 5 A

84 W charger 176 – 264 VAC input 9 – 21 V 4 A output

GaN HEMT based

Discrete half-bridge with 1-CH gate driver
VOUT: < 450 V
PCB-IOUT: ≤ 12 A

Discrete half-bridge with 2-CH gate driver
VOUT: < 450 V
PCB-IOUT: ≤ 12 A



BMS

Full BMS solution – Power side

Full BMS solution – Control side

BMS IC & its UART transceiver

Power Management Evaluation Board (LDO)

Overview

- **Low dropout adjustable standby linear voltage regulator with input voltage up to 42 V & output current 70 mA**
- Functional supply voltage range: 4.7 – 42 V
- Adjustable output voltage up to 36 V (absolute rating)
- Adjusting output voltage by changing the on-board resistors of the voltage divider & applying feedback off-board via the on-board connector
- Enable input & over temperature shutdown
- Overcurrent, short-circuit, and reverse polarity protection
- OPN: TLT807B0EPVBOARDTOBO1

Product type	Function	Part number	Description	Package mm x mm	Qty
LDO	Voltage regulator	TLT807B0EPV	Adjustable output voltage LDO with up to 70 mA, ±2% output voltage accuracy, 0.5 V max. dropout voltage, input voltage up to 42 V, protections of overvoltage, overcurrent, short circuit, reverse polarity, over temperature shutdown, T_J -40 to 150°C, automotive qualified	TSDSO14 5x6	1

Power Management Evaluation Board (LDO)

Overview

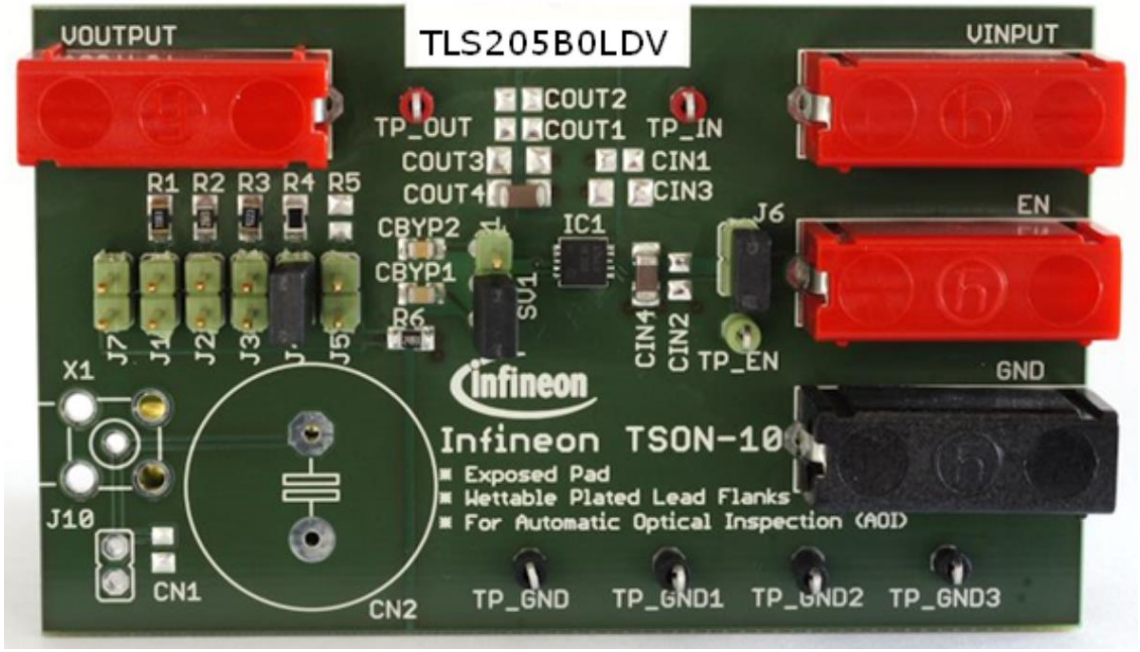
- **Low dropout selectable linear voltage regulator with input voltage up to 40 V & output current 350 mA**
- Functional supply voltage & enable signal up to 40 V
- Selectable output voltage between 3.3 V or 5 V
- Selecting output voltage by selecting the appropriate jumper and soldering the on-board missing resistor of the voltage divider
- Adjustable reset threshold down to 2 V
- Adjusting output voltage by selecting the appropriate jumper and soldering the on-board missing resistor of the voltage divider
- Enable input & reset output
- Overcurrent protection & over temperature shutdown
- OPN: TLS835D2ELVSEBOARDTOBO1

Product type	Function	Part number	Description	Package mm x mm	Qty
LDO	Voltage regulator	TLS835D2EL VSE	Selectable 3.3 V or 5 V output voltage LDO with up to 350 mA, ≤ ±2% output voltage accuracy, 0.6 V/0.5 V max. dropout voltage at output 3.3 V/5 V, input voltage up to 40 V, protections of overcurrent and over temperature, T_J -40 to 150°C, automotive qualified	SSOP14 5x6	1

Power Management Evaluation Board (LDO)

Overview

- **Low dropout adjustable linear voltage post regulator with input voltage up to 20 V & output current 500 mA**
- Functional supply voltage range: 2.3 – 20 V
- Adjustable output voltage from 1.22 V to 20 V – dropout voltage
- Adjusting output voltage by selecting the appropriate jumper and soldering the on-board missing resistor of the voltage divider
- Enable input
- Overcurrent, reverse polarity, and over temperature protection
- No reverse current & no protection diode required
- OPN: TLS205B0LDVBOARDTOBO1

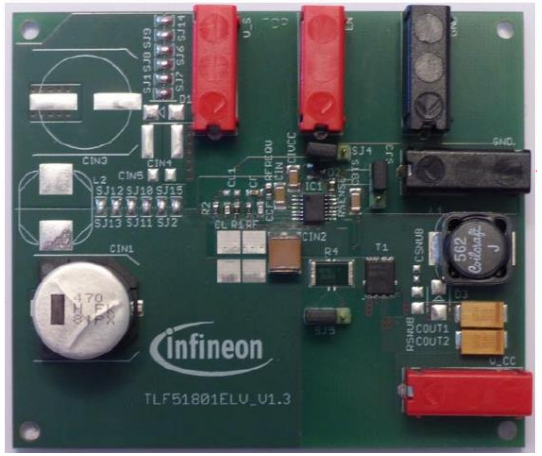


Product type	Function	Part number	Description	Package mm x mm	Qty
LDO	Voltage regulator	TLS205B0LDV	Adjustable output voltage LDO with up to 500 mA, ±2.5% output voltage accuracy, 0.45 V max. dropout voltage, input voltage up to 20 V, protections of overcurrent, reverse polarity, and over temperature, T_J -40 to 150°C, automotive qualified	TSON10 3.3x3.3	1

Power Management Evaluation Board (Step Down Controller)

Overview

- **Step down controller with Adjustable output voltage (lowest 1.2 V) and External Power Stage providing flexible output current capability up to 10 A**
- Equipped with external power stage: dual N-channel MOSFET
- Enable input, soft-start function, and input under voltage lockout (UVLO)
- OPN: DEMOBOARDTLF51801ELTOBO1 (General step-down application)
- Supply voltage range: 6 – 40 V & preset to output 5.6 V and max. 5 A
- 2 ways of current limit implementation: via shunt resistor or via $R_{DS(on)}$ of the high side MOSFET
- OPN: USBCHARGERDEMO2TOBO1 (USB Charging application)
- Expected input 12 V & preset to output ~5 V and ~5.8 A
- Current limit implementation via $R_{DS(on)}$ of the high side MOSFET

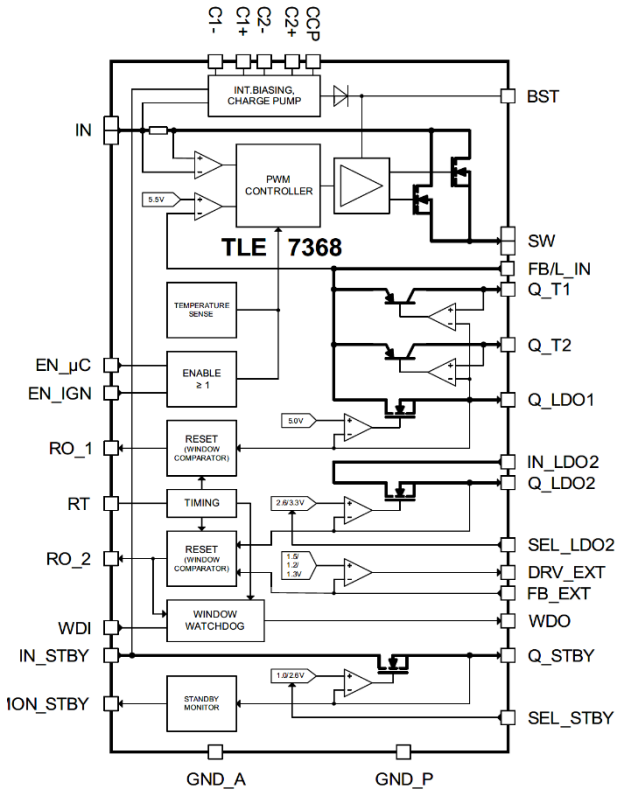


Product type	Function	Part number	Description	Package mm x mm	Qty
Step-down controller	Voltage regulator	TLF51801ELV	Adjustable output voltage Synchronous step down controller with up to 10 A, ±2% output voltage accuracy, lowest output voltage 1.2 V, integrated bootstrap diode, external power transistors, switching frequency from 100 to 700 kHz, 5.4 V LDO operation up to 50 mA, input voltage from 4.75 to 45 V, soft-start function, input under voltage lockout, T_J -40 to 150°C, automotive qualified	SSOP14	1
Dual N+N MOSFET	Switches for Demo board	IPG16N10S4-61A	100 V OptiMOS™ T2 Power Transistor 61 mΩ with continuous I_D 6.3 A at T_C 150°C & V_{GS} ≥ 6 V & max. Q_g 7 nC, AEC qualified	TDSON8 5.2x6.5	1
Dual N+N MOSFET	Switches for USB charger board	IPG20N06S2L-35A	55 V OptiMOS™ Power Transistor 35 mΩ with continuous I_D 12 A at T_C 150°C & V_{GS} ≥ 6 V & max. Q_g 23 nC, AEC qualified	TDSON8 5.2x6.5	1

Power Management Evaluation Board (PMIC)

Overview

- **Power Management IC providing 3 outputs: 5 V, selectable 3.3 V or 2.6 V, & 1.3 V, and 2 tracking regulators of 50 mA & 105 mA for the 5 V output voltage**
- Additional standby LDO 30 mA pre-adjusted to 2.6 V
- Functional buck input voltage range: 4.5 – 45 V
- Standby mode with standby regulator remains active
- Reset outputs and Enable inputs
- Undervoltage detection & overcurrent protection
- Over temperature shutdown
- OPN: DEMOBOARDTLE73683ETOBO1

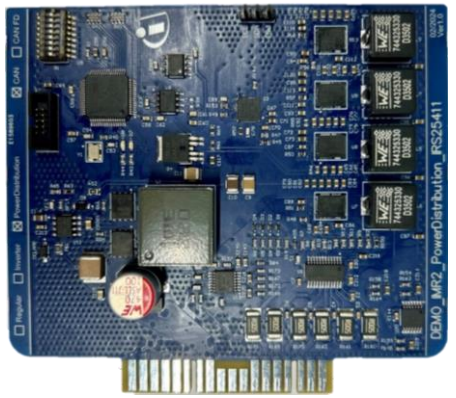


Product type	Function	Part number	Description	Package mm x mm	Qty
PMIC	PMIC	TLE7368-3E	Microcontroller power supply system with the main step-down converter of 5.5 V output 2.5 A supplying to 3 LDOs, ±2% output voltages accuracy, LDO1 5 V 800 mA limit, LDO2 3.3 V or 2.6 V 700 mA limit, LDO3 1.3 V, 2 tracking regulators for the LDO1 5 V output, standby regulator 30 mA selectable between 1 V or 2.6 V, input voltage for standby/buck 3/4.5 – 45 V, T_J -40 to 150°C, automotive qualified	DSO36 10x12.8	1

Power Distribution Application Board

Overview

- **3 switchable outputs of 5 V 1.5 A and 3 switchable outputs of 5 V 3 A equipped with digital multiphase regulator to smooth residual ripple on the outputs and manage the load transients**
- Input voltage up to 100 V and high-side switch power controller
- Onboard MCU and CAN transceiver to provide power distribution and CAN communication into the the system bus
- OPN: DEMOIMRPWRV1TOBO1 (on request)

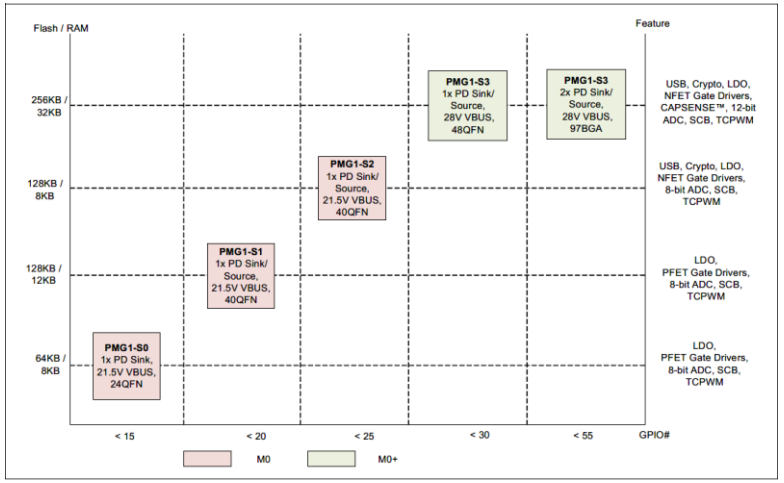


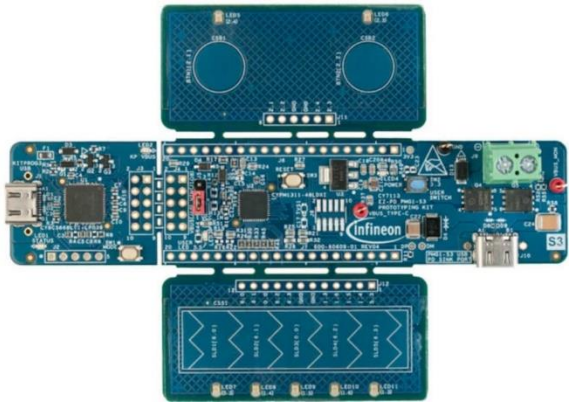
Product type	Function	Part number	Description	Package mm x mm	Qty
Buck regulator	Buck regulator	IRS25411SPBF	600 V half-bridge driver buck regulator, switching frequency up to 500 kHz, output current source 0.5 A and sink 0.7 A, enable functionality	SOIC8 5x6	1
N-MOSFET	Half-bridge switch	ISC080N10NM6	100 V OptiMOS™ 6 Power Transistor, 8.05 mΩ with continuous I_D 75 A at T_C 25°C, V_{GS} 10 V & typ. Q_g 19 nC	SSO8-FL 5x6	2
LDO	5 V generator	TLF1963TE	VIN 2.5 – 20 V, adjustable VOUT, output current up to 1.5 A, output voltage tolerance ± 1.5%, enable functionality, V_{DO} 0.34 V, T_J -40 to 150°C	TO252-5 10x15	1
LDO	3.3 V generator	TLS208D1EJV33	VIN 2.7 – 18 V, VOUT 3.3 V, output current up to 0.8 A, output voltage accuracy ± 2%, enable functionality, V_{DO} 0.4 V at 0.4 A, T_J -40 to 150°C	DSO8 5x6	1
Multiphase controller	Power stages controller	XDPE12254C-0000	Digital dual rail 4+1 phase controller, flexible phase assignment, compliant with PMBus Rev 1.3 with bus speed up to 1 MHz and Intel protocol & servers, integrated power stage current sense, digitally programmable PID loop compensation, digital temperature compensation, extensive fault detections & protections	VQFN40 5x5	1
Smart power stage	Power stage	TDA21490	Integrated power stage of synchronous buck gate driver and half-bridge MOSFETs, switching frequency up to 1.5 MHz, VIN 4.25 – 16 V, VOUT 0.25 – 5.5 V, up to 70 A output DC current, peak current up to 90 A, UVLO, thermal shutdown, fault flag, MOSFET phase fault detection and flag	PQFN39 5x6	4
Power controller	Switchable output	BTS71033-6ESA	SPI Power controller, high-side switches, 6-channel outputs, suitable for 3 A and 1.5 A loads, 3.3 V & 5 V compatible logic pins, OCP, OVP, automotive qualified	DSO24 8.65x6	1
MCU	PD controller	XMC1404-F064X0200	Cortex-M0 with MATH, 32-bit 48/96 MHz Core/Peripheral clock 16 KB SRAM & 200 KB Flash, 2x CCU8 PWM for easy 3-phase inverter implementation & 2x POSIF interface for hall sensors/encoder, 2 nodes CAN, 4x serial interface channels, 12-bit ADC 1.1 Msps, V supply 1.8 – 5.5 V, T_A -40 to 105°C	LQFP64 12x12	1
CAN transceiver	CAN transceiver	TLE9351BVSJ	High speed up to 5 Mbps, fully compliant to ISO11898-2 (2016) & SAE J2284-4/5, V_{IO} for 3.3V & 5V MCU, standby mode, V_{CC} 4.5 – 5.5V, T_J -40 to 150°C	SO8 5x6	1
Schottky diode	MCU protection	BAS52-02V	45 V breakdown voltage, 0.75 A forward current, 0.5 W power dissipation	SC79 1.6x0.8	1

Power Management Evaluation Board (USB-PD)

Overview

- **USB Type-C Power Delivery PD3.1 Microcontroller Gen1 (PMG1) with HMI capability**
- PD sink implementation with up to 28 V and 5 A capability
- Included CAPSENSE™ evaluation components: 2 buttons & 5-segment slider
- On-board programmer & debugger compatible with PSoC™ programmer & debugger based on KitProg3 firmware
- Evaluation software available in Infineon website (ModusToolbox™)
- OPN: CY7113
- Notes: less features and lower count of GPIOs evaluation boards are available under OPN CY7112, CY7111, and CY7110 (without HMI evaluation components)





Product type	Function	Part number	Description	Package mm x mm	Qty
MCU (PMG1-S3)	USB-C & PD controller	CYPM1311-48LDXI	Integrated USB-C and Power Delivery (PD) controller with 32-bit Cortex-M0+ 48 MHz with DMA, 32 kB SRAM & 256 kB Flash, Dual Role Power (DRP), USB2.0, HW Crypto, 5 configurable out of 7 serial interfaces, 7 TCPWM blocks, 12-bit ADC, bus voltage 4 – 28 V, system V_S 2.8 – 5.5 V, T_A -40 to 85°C	QFN48 6x6	1
MCU	KitProg3 programmer	CY8C5868LTI-LP039	32-bit Cortex-M3 67 MHz with DMA controller & digital filter processor, 64kB SRAM & 256 kB Flash & 2 kB EEPROM, Full Speed USB 2.0 & Full CAN, 4 TCPWM blocks, configurable 8 - 20-bit ADC, 4 comparators, 4 OpAmps, V_S 1.71 – 5.5 V, T_A -40 to 85°C	QFN68 8x8	1
P-MOSFET	20 V protection circuit	BSS308PE	P-channel -30 V OptiMOS™ P3 Small-Signal Transistor 80 mΩ with continuous I_D -1 A at T_A 120°C & V_{GS} ≤-10 V & typical Q_g 5 nC, automotive qualified	SOT23 2.6x2.9	3
N-MOSFET	USB-C 5 A load switch	BSC059N04LS6	40 V OptiMOS™ 6 Power Transistor 5.9 mΩ with continuous I_D 24 A at T_C 150°C & V_{GS} ≥ 10 V & typical Q_g 9.4 nC	TDSON8FL 5.2x6.2	2
LDO	3.3 V provider	TLE42744GS V33	3.3 V LDO up to 400 mA, ±2% output voltage accuracy, output current limit, reverse polarity protection & over temperature shutdown, V_{IN} 4.7 V to 40 V, T_J -40 to 150°C, automotive qualified	SOT-223 6.5x7	1

Power Management Evaluation Board (USB-PD)

Overview

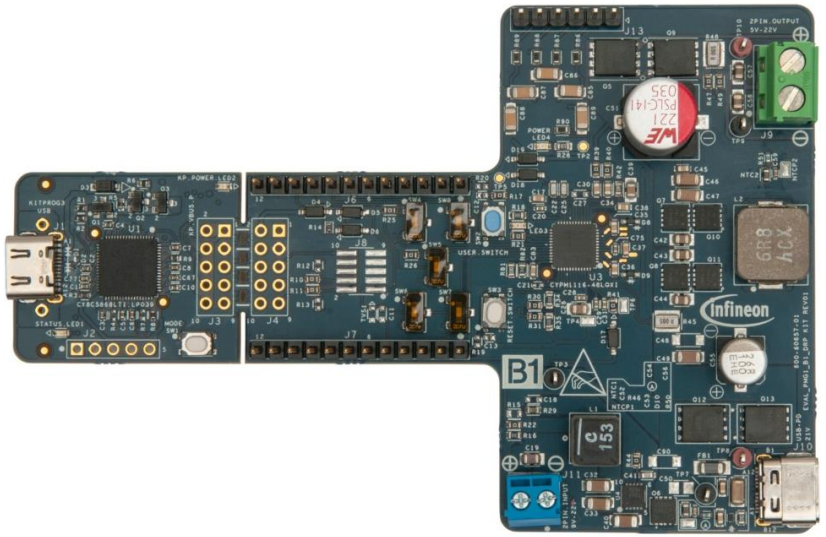
- **USB Type-C Power Delivery Microcontroller capable of controlling 2 USB-C Ports simultaneously**
- Included 2 base boards, 2 USB Type-C to xType-A adapters and the necessary USB cables
- Available features to evaluate: Dual Role Power (DRP) port, SuperSpeed USB, and DisplayPort
- Evaluation software available in Infineon website
- OPN: CY4541

Product type	Function	Part number	Description	Package mm x mm	Qty
MCU (CCG4)	Dual Port USB-C & PD controller	CYPD4225-40LQXIT	Integrated Dual ports USB-C and Power Delivery (PD) controller with 32-bit Cortex-M0 48 MHz, 8 kB SRAM & 128 kB Flash, PD2.0, integrated oscillator, 4 configurable serial communication blocks, 4 timers & counters/TCPWM blocks, integrated dead battery termination for DRP applications, V_{OP} 2.7 – 5.5 V, T_A -40 to 85°C – replaceable with CYPD4226-40LQXIT with PD3.0 but 2 less TCPWM blocks	QFN40 6x6	1
USB – UART bridge controller	USB – UART converter	CY7C65215-32LTXI	USB to Serial Dual channel bridge, USB2.0 Full Speed 12 Mbps, 2-channel configurable UART/SPI up to 3 Mbps, 2-channel configurable I^2C up to 400 kHz, CAPSENSE™, battery-charge detection (BCD) compliant, operating voltage 1.71 – 5.5 V, T_A -40 to 85°C	QFN32 5x5	1

Power Management Evaluation Board (USB-PD & battery charging)

Overview

- **USB Type-C Power Delivery Microcontroller with integrated buck-boost battery charger**
- Support USB-C PD 3.1 with power sink capability up to 100 W and power source up to 27 W
- Enable charging of 2 to 5 battery cells in series
- Battery charging algorithm is included in the EZ-PD™ PMG1-B1 SDK
- Support CC/CV charging mode
- Evaluation software available in ModusToolbox™
- OPN: EVALPMG1B1DRPTOBO1



Product type	Function	Part number	Description	Package mm x mm	Qty
MCU (PMG1-B1)	USB-C & PD & buck-boost controller	CYPM1116-48LQXI	Integrated single port USB-C and Power Delivery (PD) controller with 32-bit Cortex-M0 48 MHz, 16 kB SRAM & 128 kB Flash, PD2.0, integrated oscillator, 3 configurable serial communication blocks, 8 timers/counters/TCPWM blocks, buck-boost controller 5.5 – 24 VIN, 3.3 – 21.5 VOUT, up to 600 kHz switching frequency, V_{IN} 4 – 24 V, T_A -40 to 105°C	VQFN48 6x6	1
N-MOSFET	Buck-boost switch	BSZ063N04LS6	40 V OptiMOS™ 6 Power Transistor 6.3 mΩ with continuous I_D 57 A at T_C 25°C, V_{GS} 10V & typ. Q_g 9.5 nC	8-FL 3x3	4
P-MOSFET	VOUT enable switch	BSC084P03NS3-G	-30 V OptiMOS™ 3 Power Transistor 8.4 mΩ with continuous I_D -78.6 A at T_C 25°C & typ. Q_g 43 nC	SSO8 5x6	2
N-MOSFET	USB-C output switch	ISC045N03L5S	30 V OptiMOS™ Power Transistor 4.5 mΩ with continuous I_D 63 A at T_C 25°C, V_{GS} 10V & typ. Q_g 13 nC	SSO8 5x6	2

Power Management Evaluation Board (USB-PD and Charger)

Overview

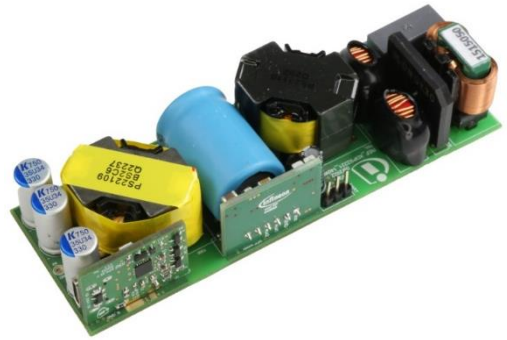
- **65 W USB-PD Type-C Programmable Power Supply (PPS) charger with hybrid flyback topology**
- Compact form-factor design with high power density of 31 W/in^3 of dimension 46 x 37 x 20.2 mm and Peak efficiency 93.8%
- Wide input voltage 90~264 VAC
- Fixed output: 5 V/3 A, 9 V/3 A, 12 V/3 A, 15 V/3 A, 20 V/3.25 A while PPS output: 5~20 V / 3 A
- OPN: DEMOXDPS220165W1TOBO1

Product type	Function	Part number	Description	Package mm x mm	Qty
Controller	Hybrid flyback controller	XDPS2201	Digital hybrid-flyback controller with integrated half-bridge driver, 600 V start-up cell for fast charging, wide range of configurable parameters via 1 pin UART interface, provides continuous resonant mode (CRM) operation, zero voltage resonant valley switching (ZV-RVS) & burst mode to support highest efficiency, T_J -25 to 125°C	DSO-14 10x6	1
N-MOSFET	High-side switch	IPD60R180C7	600 V CoolMOS™ C7 superjunction MOSFET, 180 mΩ, continuous I_D 8 A at T_C 100°C & typical Q_g 24 nC	DPAK 10x6.5	1
N-MOSFET	Low-side switch	IPP60R180C7	600 V CoolMOS™ C7 superjunction MOSFET, 180 mΩ, continuous I_D 8 A at T_C 100°C & typical Q_g 24 nC	TO-220	1
N-MOSFET	Synchronous rectification switch	BSC093N15NS5	150 V OptiMOS™ 5 power MOSFET, 9.3 mΩ, continuous I_D 55 A at T_C 100°C & typical Q_g 33 nC	TDSON8 5.2x6.2	1
P-MOSFET	Safety / load switch	BSZ086P03NS3 G	-30 V OptiMOS™ P3 power transistor, 8.6 mΩ, continuous I_D -40 A at T_C 70°C & typical Q_g 43.2 nC	TSDSON8 3.3x3.3	1
N-MOSFET	VCC regulator switch	BSS169	100V SIPMOS® small signal transistor depletion mode, 12 Ω, continuous I_D 0.14 A at T_A 70°C & typical Q_g 2.1 nC	SOT23 2.6x2.9	1
Controller	USB-C & PD controller	CYPD3174-24LQXQ	Single port USB-C and Power Delivery (PD) controller with 32-bit Cortex-M0 48 MHz, 64 kB Flash, 8 kB SRAM, USB PD Rev 3.1 including PPS mode, integrated VBUS regulator & CSA, DFP CC with opto-coupler feedback bootloader, V_{OP} 3 – 24.5 V, T_A -40 to 105°C	QFN-24 4x4	1

Power Management Evaluation Board (USB-PD and Charger with GaN)

Overview

- **140 W USB-C charger with PFC + Zero Voltage Switching (ZVS) hybrid flyback topology (asymmetrical half-bridge)**
- Power density of 22.67 W/in^3 of dimension 109.5 x 38.5 x 24 mm and 2-layer PCB for low system cost
- Configurable PFC Quasi-Resonant Mode operation & automatic PFC dis/enable-control depending on the operation conditions
- Output voltages of 5 V, 9 V, 15 V, 20 V, and 28 V with output current max. 5 A
- OPN: REFXDPS2221140W1TOBO1 (on request)

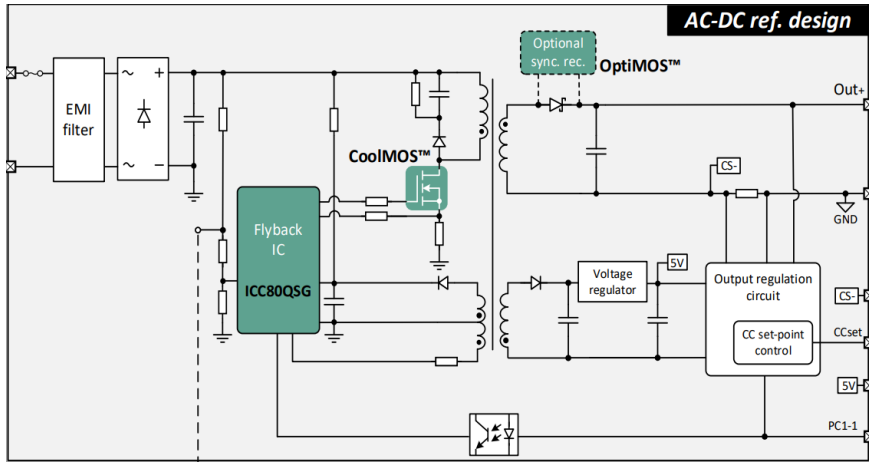


Product type	Function	Part number	Description	Package mm x mm	Qty
Controller	PFC + hybrid flyback controller	XDPS2221	Digital PFC-boost and DC-DC hybrid-flyback controller, ZVS operation of high-side and low-side switch, adaptive PFC bus voltage level following operating conditions, meant to be used in USB-PD chargers / adapters with wide output voltage up to 28 V, 600 V at high voltage pin, T_J -25 to 125°C	DSO-14 10x6	1
GaN HEMT	PFC & half-bridge switches	IGLD60R190D1	600 V CoolGaN™ enhancement mode power transistor, 190 mΩ, continuous I_D 10 A at T_C 25°C & typical Q_g 3.2 nC	LSON-8 8x8	3
N-MOSFET	Synchronous rectification switch	BSC040N10NS5	100 V OptiMOS™ 5 power MOSFET, 4 mΩ, continuous I_D 86 A at T_C 100°C & V_{GS} 10 V, and typical Q_g 58 nC	TDSON8 5.2x6.2	1
P-MOSFET	Safety / load switch	IRF7240	-40 V HEXFET® power MOSFET, 15 mΩ, continuous I_D -8.6 A at T_A 70°C & V_{GS} -10 V, and typical Q_g 73 nC	SO-8 5x6	1
N-MOSFET	VCC regulator switch	BSS169	100V SIPMOS® small signal transistor depletion mode, 12 Ω, continuous I_D 0.14 A at T_A 70°C & typical Q_g 2.1 nC	SOT23 2.6x2.9	1
Controller	USB-C & PD controller	CYPD3175-24LQXQ	Single port USB-C and Power Delivery (PD) controller with 32-bit Cortex-M0 48 MHz, 64 kB Flash, 8 kB SRAM, USB PD Rev 3.1 including PPS mode, integrated VBUS regulator & CSA, DFP CC with direct feedback bootloader, V_{OP} 3 – 24.5 V, T_A -40 to 105°C	QFN-24 4x4	1

Power Management Evaluation Board (Charger)

Overview

- **84 W battery charger charger with quasi-resonant (QR) flyback topology scalable from 65 W and up to 130 W**
- Input voltage 176~264 VAC and 47~63 Hz
- Efficiency > 91% at 230 VAC input and full-load condition
- Standby power < 200 mW at 230 VAC RMS input
- OPN: REFICC80QSG84W2BPATOBO1 for 6 V – 42 V range & up to 2 A output
- OPN: REFICC80QSG84W3BPATOBO1 for 11 V – 21 V range & up to 4 A output, intended for 9 V – 18 V battery charging



Product type	Function	Part number	Description	Package mm x mm	Qty
Controller	PWM flyback controller	ICC80QSG	Flyback controller with secondary side regulation for battery charging current control, quasi-resonant mode (QRM) operation with continuous conduction mode (CCM) prevention & valley switching discontinuous conduction mode (DCM) in mid to light load, set of protections: OTP, OVP, OCP, brown-in & out, T_J -40 to 150°C	DSO-8 5x6	1
N-MOSFET	Primary switch	IPN70R450P7S	700 V CoolMOS™ P7 power transistor, 450 mΩ, continuous I_D 6.5 A at T_C 100°C & typical Q_g 13.1 nC	SOT223 6.5x7	1

Power Management Evaluation Board (GaN HEMT)

Overview

- **Half-bridge Configuration based on GaN with generic topology**
- External inductor interface to configure for boost or buck mode, double-pulse testing or continuous PWM operation, hard or soft-switching
- Single PWM input to connect to 50 Ω pulse or signal generator
- Switching frequency up to several MHz depending on transistor dissipation
- Isolated 5V gate driver power supply with input logic providing adjustable dead time (preset to 100 ns)
- Output voltage up to 450 V (limited by capacitor rating) with continuous current 12 A and peak 35 A, hard or soft switching
- OPN: EVAL1EDFG1BHBGANTOBO1

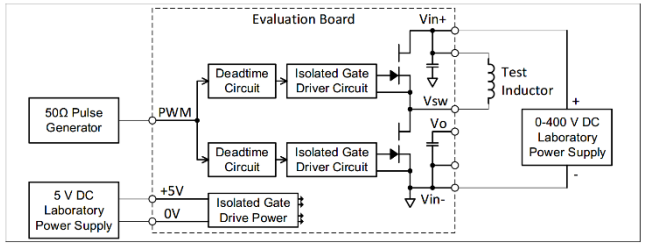


Figure 2 Evaluation board typical application example (double-pulse test)

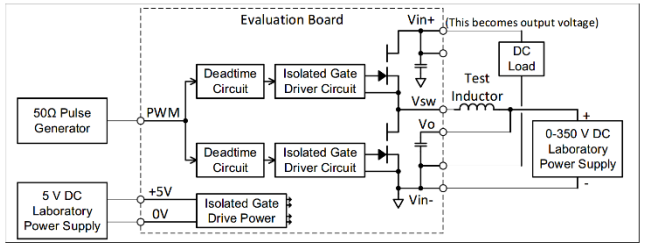
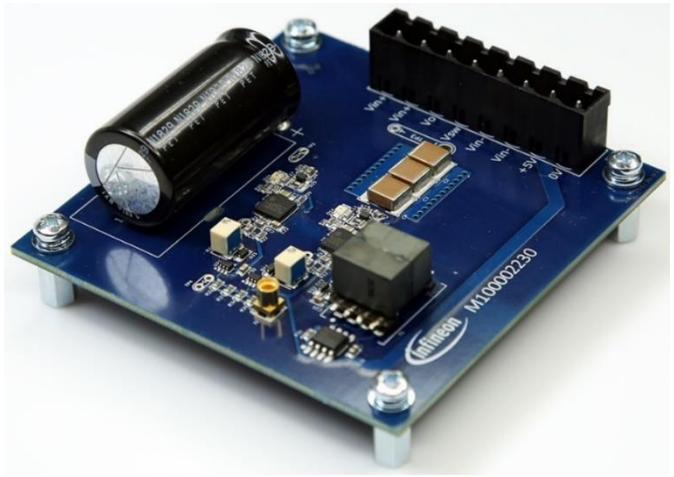


Figure 11 Connecting the evaluation board in the boost topology



Product type	Function	Part number	Description	Package mm x mm	Qty
GaN HEMT	Switch	IGOT60R070D1A UMA3	600 V CoolGaN™ Power Transistor 70 mΩ with continuous I_D 14 A at T_C 125°C, typical Q_g 5.8 nC, typical gate resistance 0.78 Ω, no reverse recovery charge, top-side cooling, T_J -55 to 150°C	DSO20 14x16	2
GaN Gate driver	Gate driver	1EDF5673K	Single channel gate driver IC dedicated for high voltage GaN power transistors, on-resistance 0.85 Ω source, 0.35 Ω sink, single output supply voltage 6.5 – 20 V, max. 44ns propagation delay of PWM to output, output current source 4 A & sink 8 A, T_J -40 to 150°C	LGA13 5x5	2

Power Management Evaluation Board (GaN GIT HEMT)

Overview

- **Half-bridge Configuration based on GaN with generic topology**
- External inductor interface to configure for boost or buck mode, double-pulse testing or continuous PWM operation, hard or soft-switching
- 2 PWM signals provided via a pulse generator to control the half-bridge circuit board with the minimum half-bridge dead time is limited by the “safe dead time” configured on the gate driver DTC pin
- Switching frequency up to 2 MHz
- Output voltage up to 450 V (limited by capacitor rating) with continuous current 12 A and peak 35 A, hard or soft switching
- OPN: EVAL2EDBHBGANTOBO1

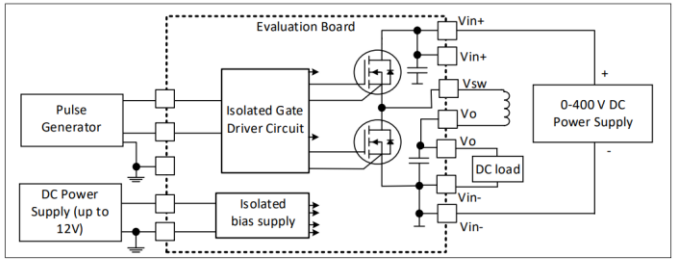


Figure 4 Evaluation board connected for buck-mode test

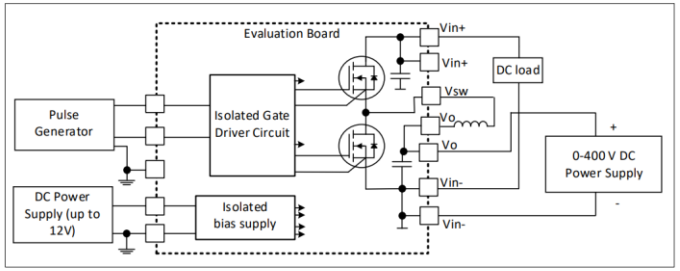
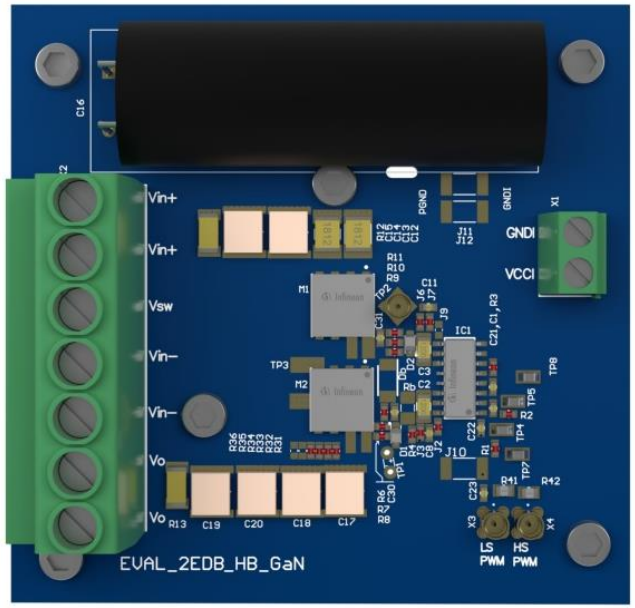


Figure 5 Evaluation board connected for boost-mode test



Product type	Function	Part number	Description	Package mm x mm	Qty
GaN GIT HEMT	Half-bridge switch	IGLD60R070D1	600 V CoolGaN™ enhancement-mode Power Transistor 70 mΩ with continuous I_D 15 A at T_C 25°C, typical Q_g 5.8 nC, typical gate resistance 0.78 Ω, no reverse recovery charge, T_J -55 to 150°C	LSON-8 8x8	2
Gate driver	Gate driver	1EDN7511B	Single channel gate driver IC, on-resistance 0.85 Ω source, 0.35 Ω sink, single output supply voltage 4.5 – 20 V, max. 25ns propagation delay of PWM to output, output current source 4 A & sink 8 A, T_J -40 to 150°C	SOT23-6 2.9x2.8	1
Gate driver	Half-bridge gate driver	2EDB8259Y	Dual channel gate driver IC, output current source 5 A & sink 9 A, UVLO on 8 V, UVLO start-up 2.5 µs (coming soon)	DSO14	1

Battery Management Application Board – Power side

Overview

- **12S1P BMS solution with BMS IC for monitoring and balancing Li-Ion cells**
- Charging input voltage 50.4 VDC and output voltage 40.8 – 50.4 VDC
- Voltage monitoring of each cell in 12S configuration, hot-plugging support, dedicated 16-bit delta-sigma ADC for each cell
- OPN: DEMOIMRBMSPWRV1TOBO1 (on request)
- To be used with DEMOIMRBMSCTRLV1TOBO1 to allow a complete BMS solution equipped with fuel-gauging MCU, non-volatile F-RAM memory for data logging, and display of the battery status

Product type	Function	Part number	Description	Package mm x mm	Qty
Battery management IC	Battery management IC	TLE9012DQU	Voltage monitoring IC up to 12 Li-ion cells in series, integrated balancing switch up to 0.2 A balancing current, 5 temperature measurement channels for external NTCs (negative temperature coefficient thermistor), hot-plugging support, 16-bit delta-sigma ADC, differential serial interface 2 Mbps, 4 GPIOs to connect to external EEPROM, secured isolated UART communication, cell diagnostic features, V_S 4.75 – 60 V, T_J -40 to 150°C	TQFP48 9x9	1
Gate driver	Protection switch driver	2ED4820-EM	48 V high-side dual-channel gate driver of N-MOSFETs, SPI interface for device control, configurations, and diagnostics, OCP, OVP, back-to-back MOSFET topologies, current sensing, VBAT supply 24 – 54 V (extended to 20 – 70 V), AEC-Q100 qualified and ISO-26262 ready	DSO24 8.7x6	1
N-MOSFET	Protection switch	IPT010N08NM5	80 V OptiMOS™ 5 Power Transistor, normal level, 1.05 mΩ with continuous I_D 425 A at T_C 25°C, V_{GS} 10 V and typ. Q_g 178 nC	TOLL 10x11.5	2
N-MOSFET	Pre-charge switch	ISC035N10NM5LF2	100 V OptiMOS™ 5 Linear FET 2, wide safe operating area (SOA), normal level, 3.5 mΩ with continuous I_D 164 A at T_C 25°C, V_{GS} 10 V and typ. Q_g 70 nC	SSO8FL 5x6	2
Current sensor	Current measurement	TLI4971-A025T5-E0001	Analog coreless magnetic current sensor, current full scale ±25 A, integrated current rail with typical 220 µΩ insertion resistance, <1 nH parasitic inductance, 240 kHz bandwidth, single-ended or semi or fully-differential output mode, V_{DD} -0.3 – 3.6 V, T_{AS} -40 to 105°C, UL certified device is available	TISON8 8x8	1
Buck converter	Buck converter	ILD8150	VIN 8 – 80 V, 1.5 A output current with 3% accuracy, integrated high-side N-MOSFET, up to 2 MHz switching frequency, OTP, >95% efficiency	DSO8 5x6	1
LDO	5V generator	TLS208D1EJV	VIN 2.7 – 18 V, 800 mA output current, adjustable 0.8 – 5.25 VOUT, V_{DO} 0.4 V, overtemperature shutdown, overcurrent limit, enable functionality	DSO8 5x6	1
LDO	3.3V generator	TLS205B0EJ V33	VIN 1.8 – 20 V, 500 mA output current, 3.3 V output, V_{DO} 0.32 V, protection: reverse polarity, overcurrent, overtemperature	SO8 5x6	1
CAN transceiver	CAN transceiver	TLE9351BVSJ	High speed up to 5 Mbps, fully compliant to ISO11898-2 (2016) & SAE J2284-4/5, V_{IO} for 3.3V & 5V MCU, standby mode, V_{CC} 4.5 – 5.5V, T_J -40 to 150°C	SO8 5x6	1
Schottky diode	MCU protection	BAT64-02V	40 V breakdown voltage, 0.25 A forward current, 0.25 W power dissipation	SC79 1.6x0.8	1

Battery Management Application Board – Control side

Overview

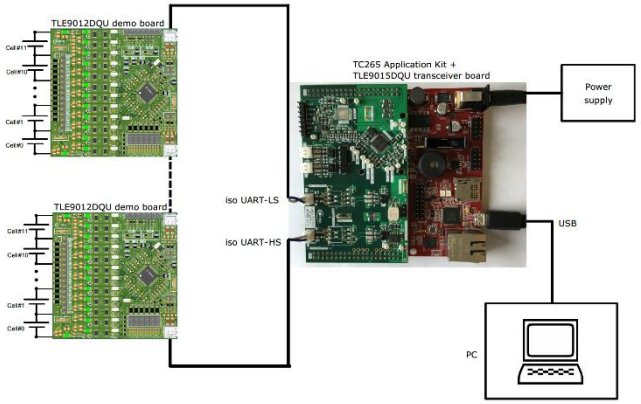
- **BMS controller based on PSoC™ 62 MCU equipped with F-RAM and ePaper / electrophoretic display (EPD) to monitor the battery voltage, current demand, state of charge (SoC), and other parameters**
- Onboard connectors for interfacing with external CAN transceiver, BMS IC, 2 control buttons, 4 status LEDs, and 2 SPI devices
- Onboard UART connector for debugging
- Onboard serial F-RAM to store the individual cell voltages, and current drawn to estimate the SoC and state of health (SoH)
- Onboard piezoelectric buzzer for event warnings i.e. overcurrent, overtemperature, low voltage, and charging completion
- OPN: DEMOIMRBMSCTRLV1TOBO1 (on request)
- To be used with DEMOIMRBMSPWRV1TOBO1 for a complete BMS solution of 12S1P Li-Ion battery configuration

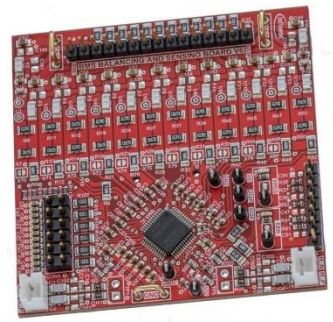
Product type	Function	Part number	Description	Package mm x mm	Qty
Battery management IC	Battery management IC	CY8C6245AZI-S3D72	32-bit Cortex-M4F 150 MHz with FPU & MPU & Cortex-M0+ 100 MHz with MPU, 256 kB SRAM & 512 kB application Flash, QuadSPI/Serial memory interface, 7 configurable serial communication blocks, CAN, USB-FS, 12 TCPWM, 12-bit SAR ADC 2 Msps, 2 comparators, CapSense™ touch sensing, Cryptography accelerator, V_S 1.7 – 3.6 V, T_A -40 to 85°C	TQFP100 16x16	1
P-MOSFET	Display enable switch	IRLML6401	-12 V Power MOSFET, 2.55 mΩ with continuous I_D -4.3 A at T_A 25°C, V_{GS} -4.5 V and typ. Q_g 10 nC	SOT23	1
N-MOSFET	Display discharge lines	BSD235N	20 V dual-channel OptiMOS™ 2 Small-Signal Transistor, 350 mΩ with continuous I_D 0.95 A at T_A 25°C & V_{GS} 4.5 V & typ. Q_g 0.32 nC	SOT363	1
F-RAM	Data logging	CY15B256Q-SXA	256 Kb non-volatile memory organized as 32 K x 8, SPI interface up to 40 MHz, direct hardware replacement for serial Flash & EEPROM, V_{DD} 2.0 – 3.6 V, T_A -40 to 85°C	SOIC8 5x6	1

Battery Management Evaluation Board

Overview

- **Battery cell monitoring & balancing (BMS) IC for Lithium Ion together with its UART-based transceiver IC**
- Option to connect real battery pack or power supply with the on-board dummy resistors to emulate the cells
- Isolated UART interface between BMS board and Transceiver board
- OPN: TLE9012DQUDTRBMS2TOBO1 (BMS IC board)
- Functional supply voltage range: 5 – 60 V
- OPN: TLE9015DQUTRXBRGTOBO1 (isolated UART Transceiver board)
- Connecting up to 2 BMS boards via isolated UART interface
- To be used with AURIX™ TC265 TFT board (KITAURIXTC265TFTTOBO1) for powering the Transceiver board and connecting to PC/Laptop for evaluation





Product type	Function	Part number	Description	Package mm x mm	Qty
Battery management IC	Battery management IC	TLE9012DQU	Voltage monitoring IC up to 12 Li-ion cells in series, integrated balancing switch up to 0.2 A balancing current, 5 temperature measurement channels for external NTCs (negative temperature coefficient thermistor), hot-plugging support, 16-bit delta-sigma ADC, differential serial interface 2 Mbps, 4 GPIOs to connect to external EEPROM, secured isolated UART communication, cell diagnostic features, V_S 4.75 – 60 V, T_J -40 to 150°C	TQFP48 9x9	1
Isolated UART transceiver IC	UART interface	TLE9015DQU	UART transceiver IC with 2 non-isolated interfaces for MCU and 2 isolated interfaces for BMS Ics, 2 Mbps data rate, external fault inputs, latching error output pin, watchdog & wake-up function, V_S 4.75 – 45 V, T_J -40 to 150°C	TQFP48 9x9	1

Revision Control

- V1.0 – Original document
- V1.1 – Added overview, landing pages, and hyperlinks to all products in the tables
- V1.2 – Updated block diagram
- V1.3 – Retitled and removed wording of reference designs
- V1.4 – Adjusted colors
- V1.5 – Updated content of ToF camera by pmd, links for Wi-Fi MCUs & motor controls, boards for motor control & connectivity, added charger boards
- V1.6 – Renamed last section and added EVAL_2EDB_HB_GAN to it
- V1.7 – Updated template
- V1.8 – Reviewed, updated, and added new demo boards for most of the subsystems
- V1.9 – Updated GaN boards


Infineon