

EVAL_IMD700A_FOC_3SH

Quick Start Guide

Peter Green, Sergey Voskanyan
(IFAM PSS DCDC PD TM AE1 REN)



Product overview and features

Input and output at normal operation

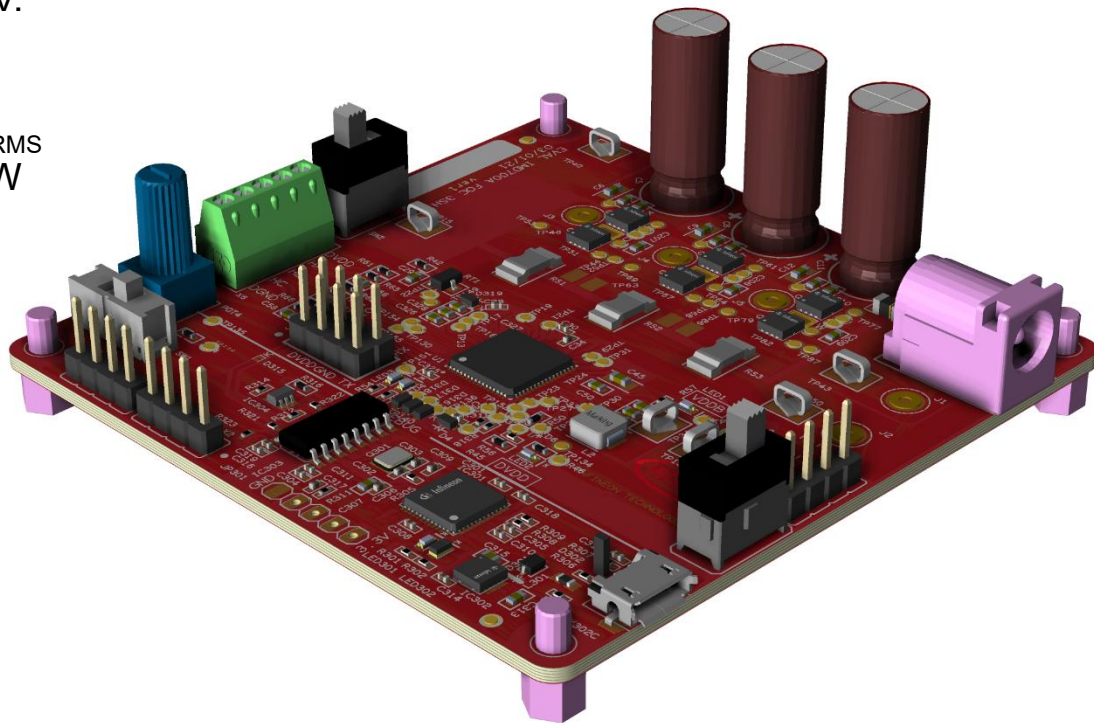
- › DC input voltage 12 to 24 V, nominal 18 V.
- › Maximum input current 20 A
- › Output voltage three phase
- › Maximum output current per phase 15 A_{RMS}
- › Maximum output continuous power 300 W

Control scheme

- › Sensor-less field oriented control (FOC)
- › Switching frequency 20 kHz
- › Three current shunts

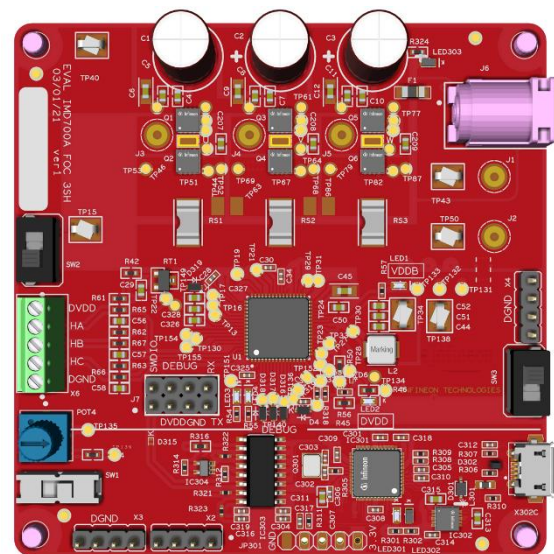
Protection features

- › Input fuse
- › Input reverse polarity
- › Output over current
- › Thermal shutdown

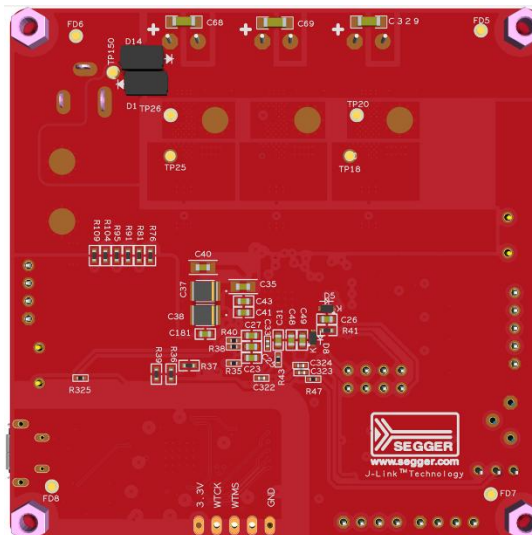


Demo kit description

Board view of EVAL_IMD700A_FOC_3SH



Top Side



Bottom Side

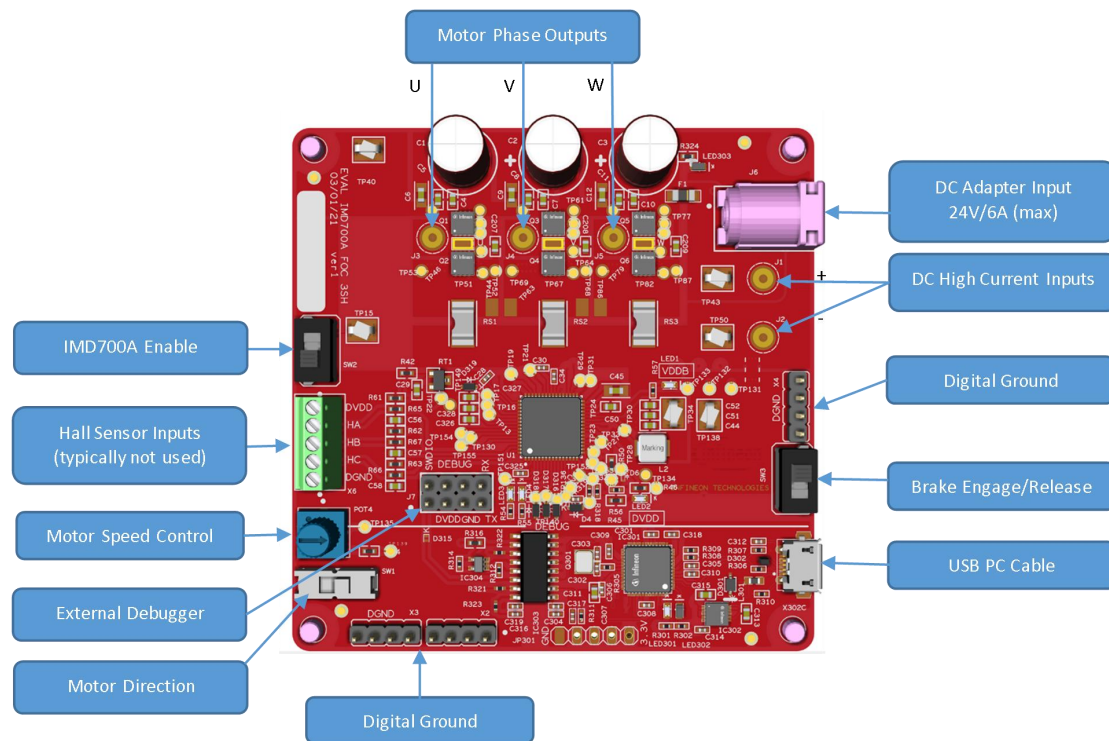
Recommended operating conditions				
Parameter	Minimum	Nominal	Maximum	Unit
LOAD (resistive)	-	200	300	W
DC Input voltage	12	18	24	VDC
DC input type	Bench power supply 25 A			
Phase Current	-	-	15	ARMS
Switching frequency	-	20	-	kHz

- Use isolated DC supplies with current limit capability at 25 A or less are recommended
- Use only with a 24V rated BLDC motor
- Caution if using a battery as input voltage source.

WARNING!

The board should be tested only by qualified engineers and technicians.

Board test setup



IMPORTANT NOTE!

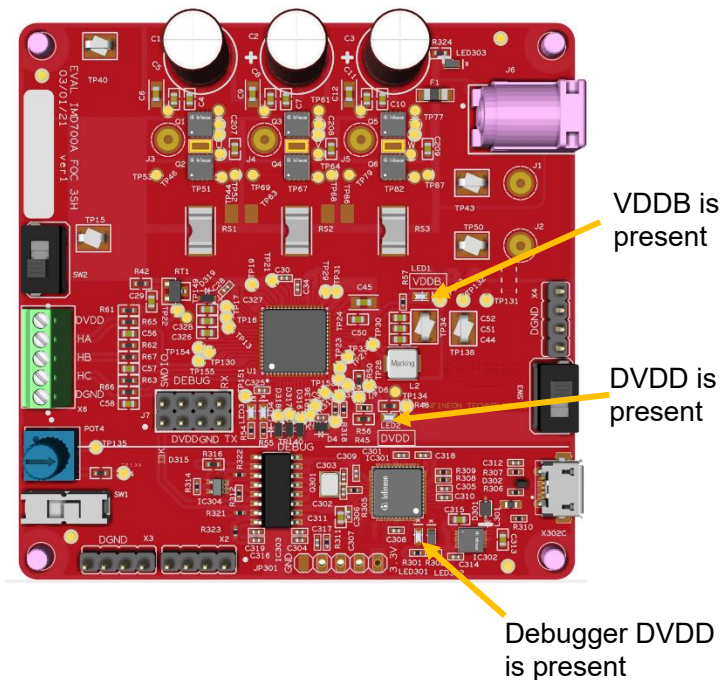
OBSERVE ALL SAFETY PRECAUTIONS!

1. Connect the motor phase outputs to the motor cables. Ensure that the correct BLDC motor with Hall sensors rated at 24V or above is used.
2. Set the brake switch to the disengaged position.
3. Set the direction switch as required.
4. Set the enable switch to enable mode.
5. Set the speed control to minimum (fully counter-clockwise).
6. Connect the PC through the USB cable if using the GUI
7. Connect the 24 V supply. This can be through an adaptor jack or high current input terminals. If using high current inputs, ensure the correct polarity otherwise the board may get damaged. Polarities have been printed on the board.

Power and start procedure

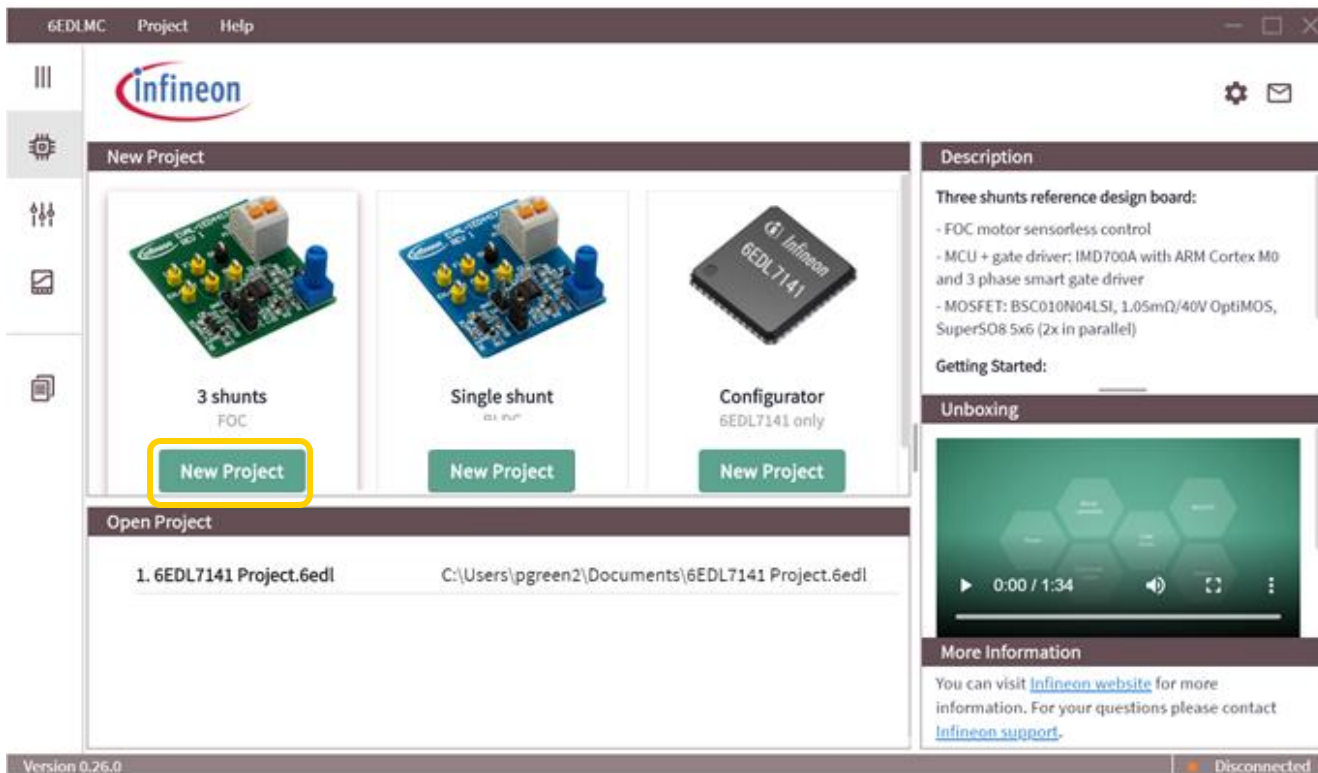
To avoid the possibility of damaging the board, the following power up/down procedure must be followed:

1. Connect the GUI if required.
2. Turn on the 24 Volt auxiliary power supply.
3. Check all LED indicators are illuminated.
4. Slowly adjust the speed control and check that the motor is running, if not make sure the braking switch (if fitted) is released.
5. Set the motor direction via the switch or GUI
6. Adjust the motor speed as required via the potentiometer
7. Apply braking via the braking switch or GUI to stop and start the motor



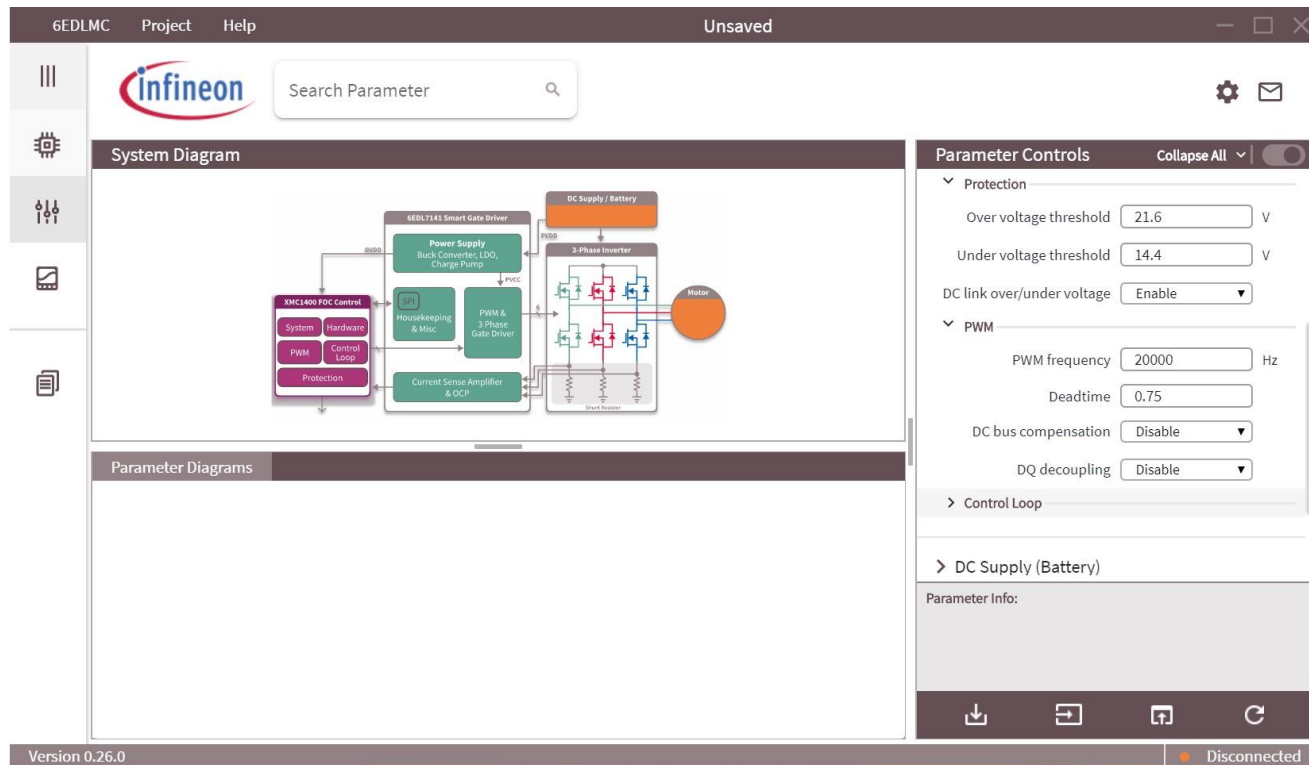
› For further details refer to the application note:

GUI setup (Landing page)



› Click on highlighted button

Flash the firmware from the GUI to the evaluation board



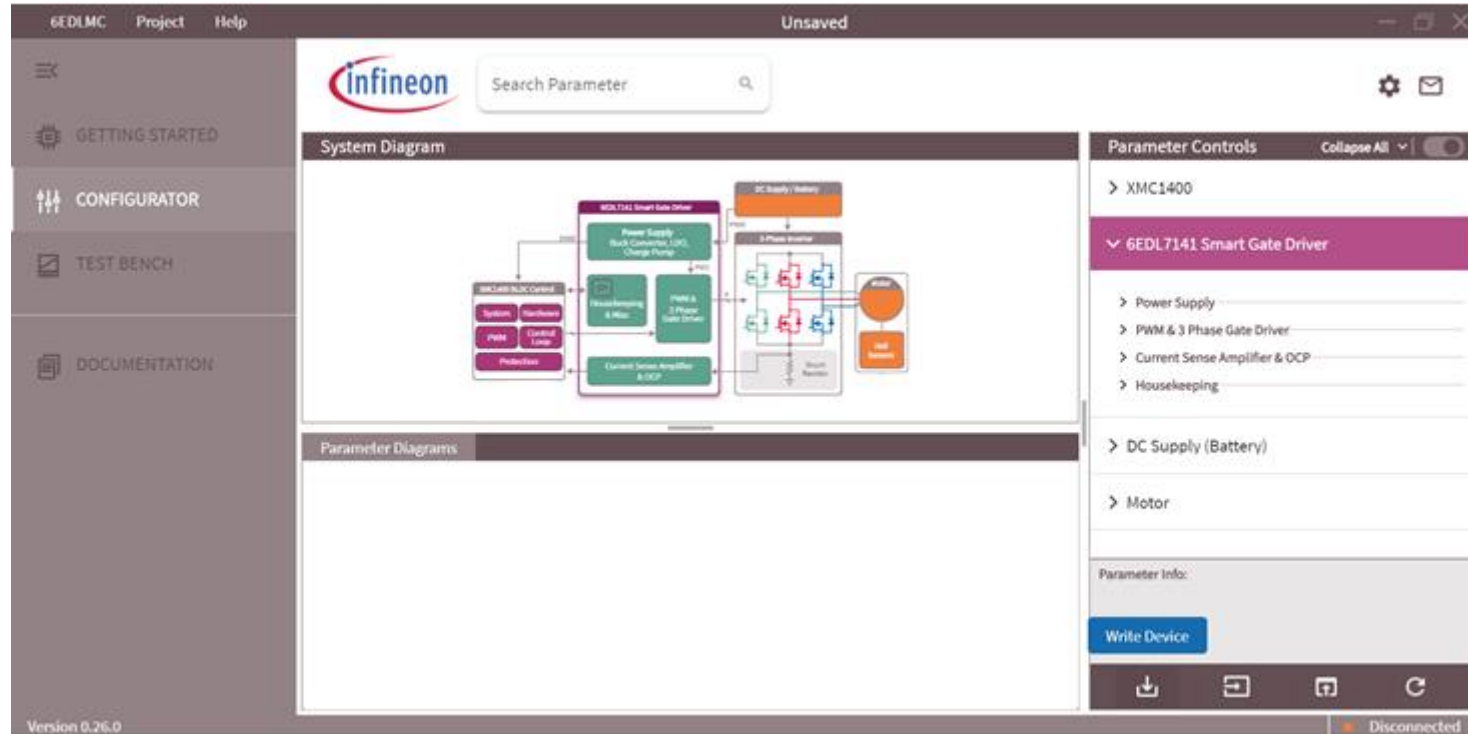
The screenshot displays the 6EDLMC GUI interface. At the top, there is a menu bar with '6EDLMC', 'Project', and 'Help'. Below the menu bar is a search bar labeled 'Search Parameter'. The main area is divided into two sections: 'System Diagram' and 'Parameter Controls'.

The 'System Diagram' section shows a block diagram of the system. It includes a 'DC Supply / Battery' block connected to a '3-Phase Inverter' block. The '3-Phase Inverter' is connected to a 'Motor' block. The '3-Phase Inverter' is also connected to a 'Power Supply' block, which is connected to a '6EDL7141 Smart Gate Driver' block. The '6EDL7141 Smart Gate Driver' is connected to a 'PWC' block, which is connected to a 'Current Sense Amplifier & OCP' block. The 'Current Sense Amplifier & OCP' block is connected to a 'Protection' block. The 'Protection' block is connected to a 'Control Loop' block, which is connected to a 'PWM' block. The 'PWM' block is connected to a 'System' block, which is connected to a 'Hardware' block. The 'Hardware' block is connected to a 'RMC1400 FOC Control' block.

The 'Parameter Controls' section on the right contains a 'Collapse All' button and a list of parameters. The parameters are grouped into sections: 'Protection', 'PWM', and 'Control Loop'. The 'Protection' section includes 'Over voltage threshold' (21.6 V), 'Under voltage threshold' (14.4 V), and 'DC link over/under voltage' (Enable). The 'PWM' section includes 'PWM frequency' (20000 Hz), 'Deadtime' (0.75), 'DC bus compensation' (Disable), and 'DQ decoupling' (Disable). The 'Control Loop' section is currently collapsed. Below the 'Control Loop' section is a 'DC Supply (Battery)' section, which is also collapsed. At the bottom of the 'Parameter Controls' section, there is a 'Parameter Info:' label and a 'Disconnected' status indicator.

- › Select the desired firmware parameters
- › Click on highlighted button

Setting the IMD700A parameters (not permanent)



- › Select the desired 6EDL7141 parameters in the GUI
- › Click on highlighted button

Set to test bench mode

The screenshot displays the Infineon 6EDLMC software interface. The top menu bar includes '6EDLMC', 'Project', and 'Help'. The main window is titled 'System Diagram' and shows a block diagram of the motor control system. The diagram includes a 'Battery' block connected to a '3-Phase Inverter' block, which is connected to a 'Motor' block. The '3-Phase Inverter' block is connected to a 'GEDL7141 Smart Gate Driver' block, which is connected to an 'XMC1400 FOC Motor Control' block. The 'XMC1400 FOC Motor Control' block has a 'Status' indicator. The 'GEDL7141 Smart Gate Driver' block has several input parameters: 'PVCC', 'DVDD', 'VCC HS', 'VCC LS', and 'Temp.'. The '3-Phase Inverter' block has several output parameters: 'Imotor', 'Fpwm', 'Duty', and 'Temp.'. The 'Motor' block has a 'Temp.' parameter. The interface also features a 'Launch Oscilloscope' button and a 'Parameter Controls' panel on the right. The 'Parameter Controls' panel includes a 'Expand All' button and a list of parameters: 'XMC1400', 'Motor', and '6EDL7141 Smart Gate Driver'. The 'Variable Monitor' panel on the right shows a 'Motor' variable. The bottom status bar indicates 'Version 0.26.0' and 'Disconnected'.

System Diagram

Launch Oscilloscope

Parameter Controls

Expand All

Variable Monitor

Motor

Parameter Info:

6EDL Test

Control mode

Target Set

Motor

Version 0.26.0

Disconnected

› Click on highlighted button

[Collaterals and brochures](#)

- › Product briefs
- › Selection guides
- › Application brochures
- › Presentations
- › Articles

[Technical material](#)

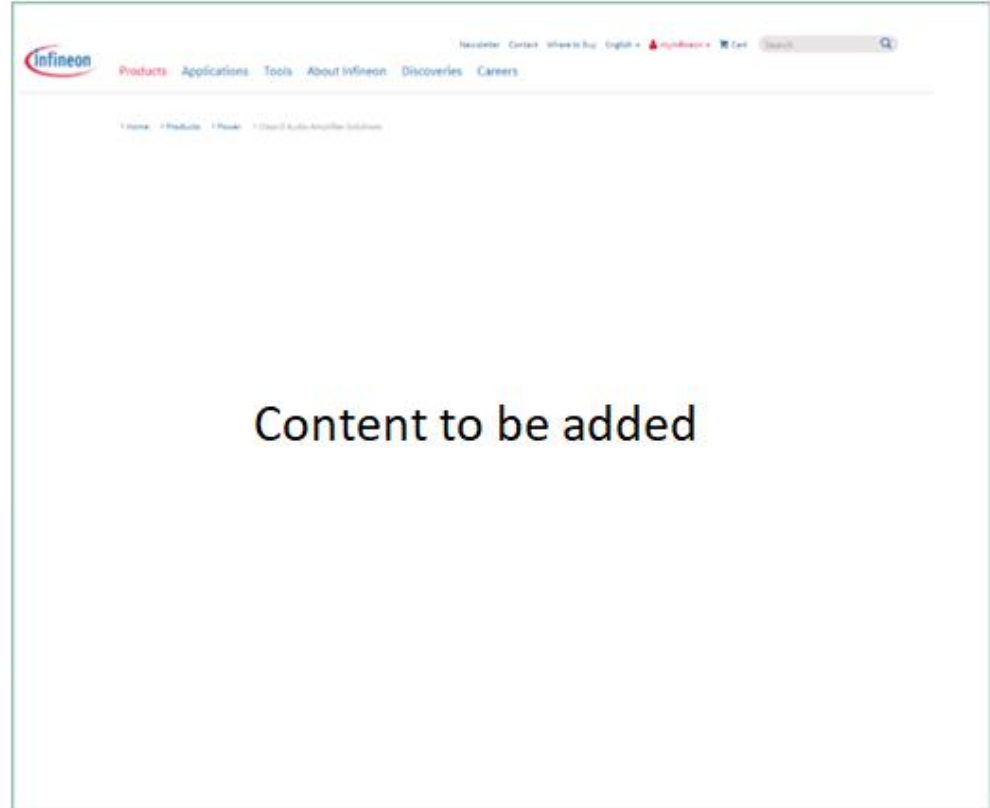
- › Application notes
- › Whitepapers
- › Datasheets, MCDS files
- › PCB design data

[Evaluation boards](#)

- › Evaluation boards
- › Demoboards
- › Reference designs

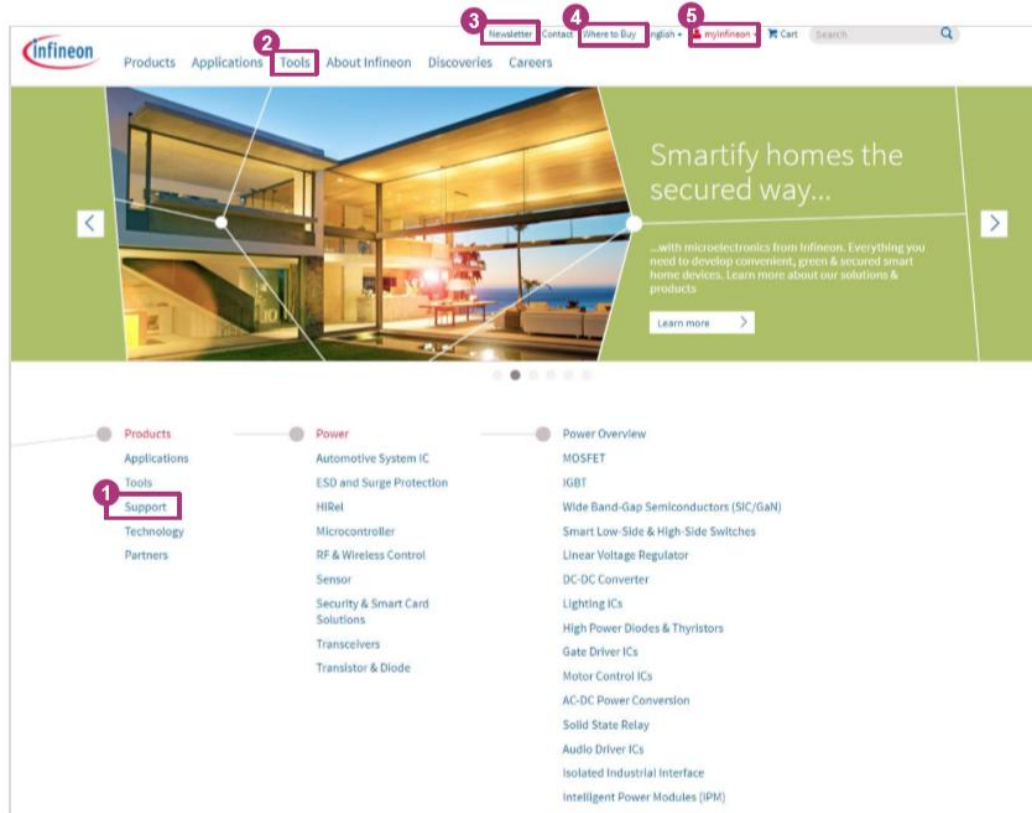
[Videos](#)

- › Technical videos
- › Product information videos
- › Tradeshow videos



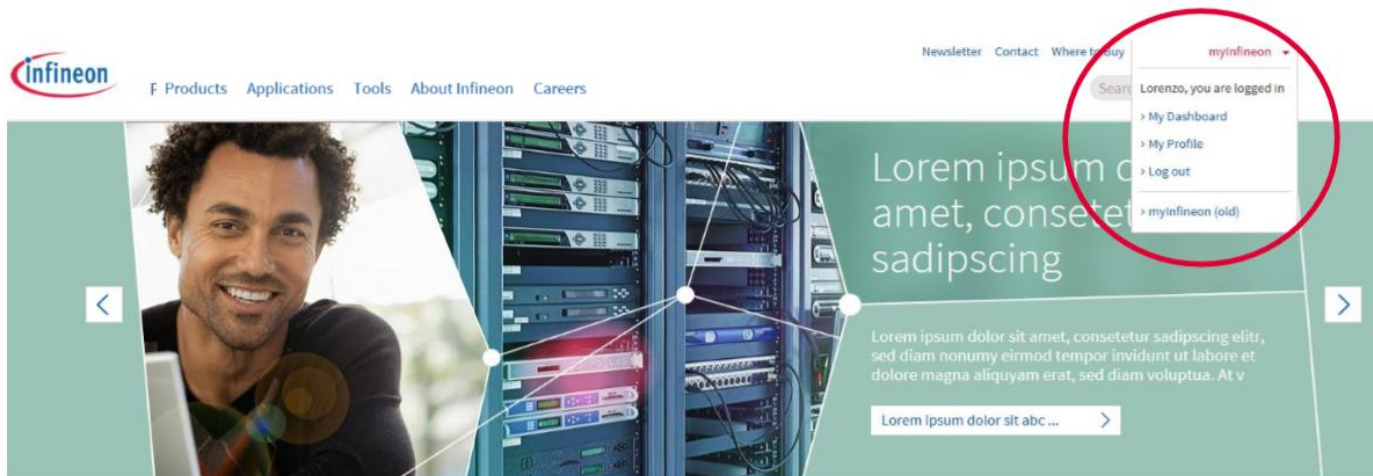
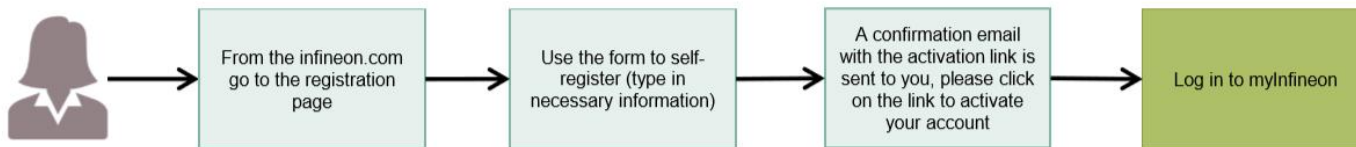
Support

Online tools and services



- 1** Get support
- 2** Tools, finders and selectors
- 3** Subscribe to newsletter
- 4** Where to buy
- 5** myInfineon

Tailor made information via myInfineon



In case of problems with the access, the registration or all other type of issues, please get in touch with your Infineon contact person or with our official support at www.infineon.com/support (available 24/7)



Part of your life. Part of tomorrow.