

Product brief

Battery disconnect switch

For all voltage up to 24 V

Infineon has teamed up with Schweizer Electronic AG to develop the 24 V ADR (European Agreement Concerning the International Carriage of Dangerous Goods by Road) Switch Demonstrator. This demo shows a semiconductor based solution of a 24 V battery master switch for trucks and commercial vehicles as required by the ADR regulation.

For highly automated driving, commercial vehicles require an E/E architecture, which – in addition to sensor fusion – ensures safety-critical processes such as steering and braking at all times. Amongst other things, a redundant 24 V supply with corresponding disconnection is required.

In order to disconnect high-current batteries or power supply networks on demand, circuits based on high-current MOSFETs are required which have the lowest possible on-resistance (300 A, 40 V, 0.53 mΩ typ.) and optimized printed circuit board technologies to provide maximum current carrying capacity and the lowest thermal resistances.

Key features

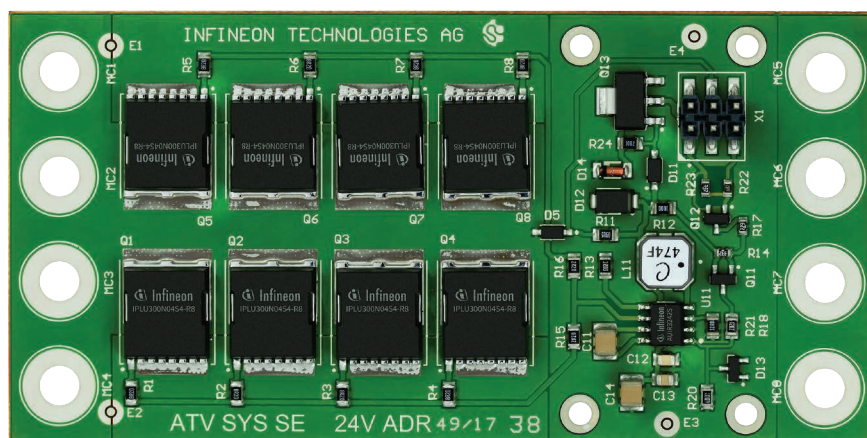
- > AU1R3242S: MOSFET Driver
- > IPLU300N04S4-R8 (8x)
- > Battery voltage 24 V, max. nominal 36 V
- > Load dump up to 58 V
- > Quiescent current 28 μA @ 24 V
- > Static current 300 A
- > 1800 A for 10s (2400 peak)
- > High switch off energy
- > Cooling via cables
- > PCB with 1 mm copper inlay

Key benefits

- > Fast turn on/off to allow for safe operation under critical circumstances
- > Extended short circuit robustness
- > High quality with FiT rates below < 0.5 ppm
- > Better price performance than mechanical relay
- > Very compact design = ready to use

Key applications

- > Unidirectional battery disconnection
- > Safety applications such as EPS, engine fan, chassis control etc.
- > Replacement of mechanical Relay
- > High current control load



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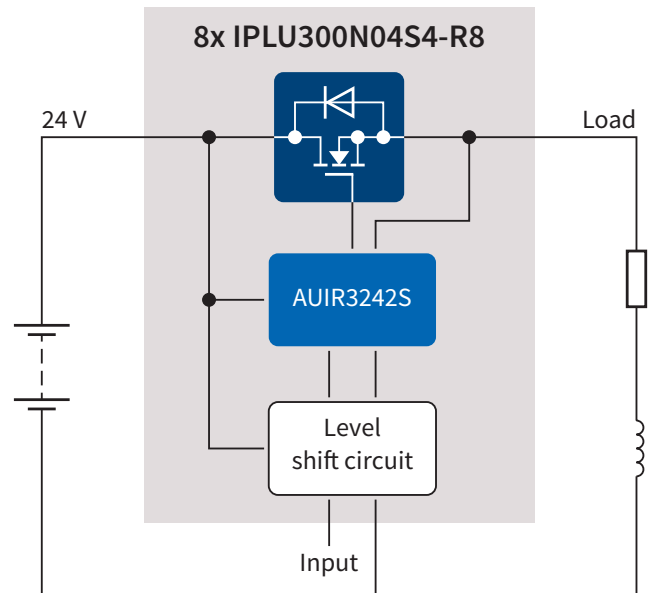
The demonstrator consists of eight low ohmic MOSFETs connected in parallel and mounted on a structured copper IMS (Insulated Metal Substrate) board together with a gate driver circuit to switch those MOSFETs on and off. In order to protect the MOSFETs against excessive overvoltage there are four transient voltage suppressor diodes implemented at the bottom side of the board.

Main components

- > MOSFETs (8x) IPLU300N04S4-R8 300 A, 40 V class, best In class
- > TVS diodes (4x)
- > Gate driver
 - AUIR3242S normally on (default)
 - AUIR3241S normally off (optional)

Current capability of the demonstrator

- > 300 A continuous
- > 1800 A for 10 s



Product table

Component	Type	Description
MOSFETs (8x)	IPLU300N04S4-R8	300 A, 40 V, 0.53 mΩ typ.
TVS diodes (4x)	33 V diodes	33 V
Gate driver	AUIR3242S	Normally on (default)
	AUIR3241S	Normally off (optional)

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