

Product Brief

24V Protected Switch Shield

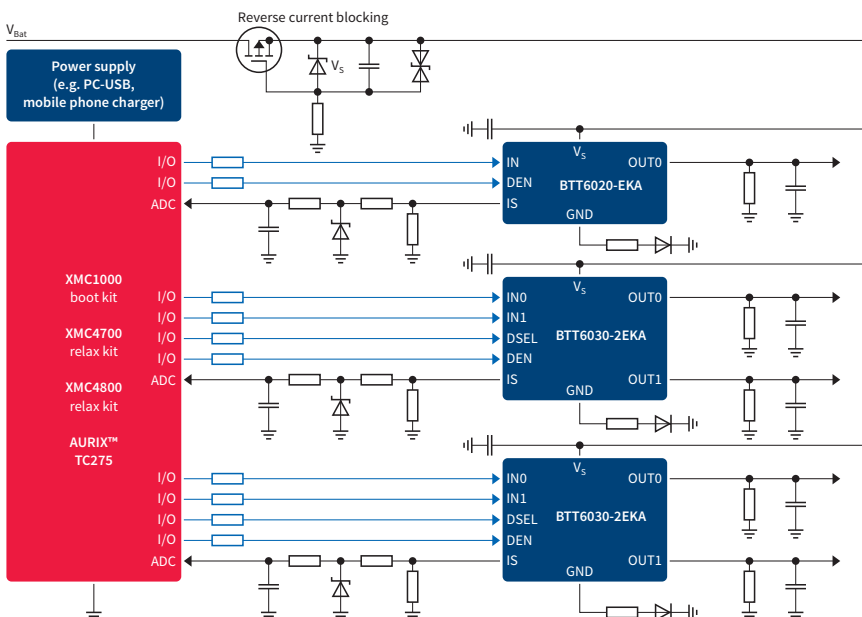
with BTT6030-2EKA and BTT6020-1EKA for Arduino

Infineon's **PROFET™+ 24V** family of protected high-side switches (BTT6xxx) drive resistive, capacitive as well as inductive loads (e.g. truck bulbs, car bulbs, valves, motors, relays, capacitors, LEDs). Using the 24V Protected Switch Shield for Arduino enables fast prototyping and in-expensive evaluation of the pin-to-pin compatible **PROFET™+ 24V** devices.

The shield is equipped with three **PRO**Tected high-side power MOSFETs out of the **PROFET™+ 24V** family (2x BTT6030-2EKA, 1x BTT6020-1EKA). It can be controlled either by an Arduino board (e.g. Arduino Uno, Arduino Due) or the ARM® powered Infineon XMC™ microcontroller kits using the Arduino form factor.

The power switches are controlled via the INx (input) pins. The **PROFET™+ 24V** devices also provide a sense current at the IS pin, which can be enabled via the **DEN** (Diagnosis **EN**able) pin. For the two channel devices the sensed channel is selected via the **DSEL** (Diagnosis **SEL**ect) pin. For each device the sense signal (IS) is connected to an own ADC channel of the microcontroller.

The 24V Protected Switch Shield provides a fast and easy access to drive up to five 24 V loads with a nominal current of 4 A to 5 A each.



Key features

- > Compatible with Arduino microcontroller boards and Infineon's XMC™ microcontroller kits using the Arduino form factor
- > Capable of PWM up to 400 Hz
- > Driver circuit with logic level inputs
- > Diagnosis with current sense
- > Protection of load and driver circuit, e.g. against overtemperature, overcurrent, ESD

Key benefits

- > Fast and inexpensive prototyping of 24 V load driving
- > Load diagnosis with current sense capability
- > Overtemperature shutdown with latch behavior

Applications

- Drive resistive, capacitive and inductive loads with PWM or DC
- > 8 ~ 36 V nominal input voltage (max. 5 ~ 48 V)
 - > Nominal current up to 5 A per channel restricted due to PCB (BTT6020-1EKA nominal current: 7 A)
 - > E.g. truck bulbs, valves, motors, relays

24V Protected Switch Shield

with BTT6030-2EKA and BTT6020-1EKA for Arduino

The BTT6030-2EKA and BTT6020-1EKA are integrated high-side power switches and part of the PROFET™+ 24V family. The power transistor is built by an N-channel vertical power MOSFET with charge pump in one package (DSO-14). To block reverse current on the board an IPD50P04P4L-11 is used.

Applications

- › 24 V grounded high-side loads
- › Suitable for automotive and industrial applications
- › All types of resistive, inductive and capacitive loads
- › Suitable for high and low current loads such as bulbs, valves, relays and LEDs
- › Replaces electromechanical relays, fuses and discrete circuits

Diagnostic functions

- › Proportional load current sense
- › Open load detection in ON and OFF
- › Overtemperature sense
- › Stable diagnostic signal during short circuit
- › Enhanced k_{ILIS} accuracy with calibration

Basic functions

- › RoHS compliant & AEC qualified
- › Op. voltage range (5 ... 48 V)
- › Low stand-by current (< 0.5 μ A)
- › ESD protection, optimized EMC
- › 3.3 V and 5 V – compatible logic inputs
- › Improved heat dissipation of DSO package

Protection functions

- › Load dump: 65 V
- › Current limitation
- › Thermal shutdown: latch
- › Enhanced short circuit operation
- › Loss of ground/battery protection
- › Stable behavior at under voltage
- › Overvoltage protection

Product type	$R_{DS(on)}$ (typ) [m Ω]	$R_{DS(on)}$ (max) @ $T_j = 150$ °C [m Ω]	Nominal load current [A]	$I_{L(SC)}$ (typ) [A]	Number of channels	Package
Automotive grade						
BTT6010-1EKA	10	22	9	115	1	DSO-14
BTT6020-1EKA	20	42	7	74	1	DSO-14
BTT6030-1EKA	30	64	6	70	1	DSO-14
BTT6030-2EKA	30	64	2 x 4	70	2	DSO-14
BTT6050-1EKA	50	100	4.5	47	1	DSO-14
BTT6050-2EKA	50	100	2 x 3	47	2	DSO-14
BTT6100-2EKA	100	200	2 x 2.2	25	2	DSO-14
BTT6200-1EJA	200	400	1.5	11	1	DSO-8
BTT6200-4EMA	200	400	4 x 1	11	4	SSOP-24
Special PROFET™+ 24V components with reduced current limitation (focus application: switching cables > 20 m cable length)						
BTT6010-1EKB	10	22	10	86	1	DSO-14
BTT6030-2EKB	30	64	2 x 4	60	2	DSO-14
BTF6070-2EKV	70	120	2 x 2.3	11	2	DSO-14

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