

Frequently Asked Questions

Product Name: BTT6050-2EKA (PROFET™+ 24V)

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Application: Body Controller

Datasheet:

Contact Person: Konrad Marreck

www.infineon.com/profet

Question 1:	What is PROFET™+?
Answer:	PROFET™ stands for PROtected mosFET. It is an High Side Switch connecting battery to the load and offering protection and diagnosis . It is designed to drive all kind of lamps, motors and can also be used as main switch for ECU. PROFET™+ is the latest family launched successfully by Infineon in 2009, exhibiting currently more than 20 reference products in portfolio. With PROFET™+ 24V, Infineon is rounding off its PROFET™+ family portfolio.
Question 2:	How does PROFET™ protects against short circuit?
Answer:	The PROFET™+ offers two kinds of protection. An over current (OC) limits the current, protecting the power stage and surrounding (connectors, cable, PCB traces) from immediate destruction. An over temperature is limiting the temperature, in absolute (OT) and in relative (Delta T) values. When OT or Delta T comes, the device switches OFF and cools down. The device remains off until the microcontroller acknowledges the failure. With this, the short circuit robustness is enhanced and no short circuit event is missed.
Question 3:	How does PROFET™+ diagnosis work?
Answer:	The PROFET™+ offers current sense diagnosis. The load current is monitored and mirrored via current mirror. The ratio between the load current I_L and the sense current I_S is called k_{ILIS} . This value is expressed without unit. In the case of a failure information (as short circuit to GND), the current sense provide a permanent current I_{IS_FAULT} . The I_S current should be converted to a voltage, thanks to a simple R_{IS} external resistor, read by an analog to digital converter (ADC). Compared to the former generation of PROFET™, PROFET™+ integrates the multiplexer, to save ADC pin of the micro-controller.
Question 4:	Which accuracy can reach PROFET™+ diagnosis?
Answer:	The accuracy is depending mainly on the measured load current. The higher the load current, the better is the accuracy. PROFET™+ reaches an accuracy of up to +/-8% at nominal or higher current! To determine if a PROFET+ 24V can diagnose an open load in ON-state, it is required to define the characteristics of this condition. The current is defined by the OEM. As a good reference, Infineon considers an open load to be a current in between 5mA – 30mA.
Question 5:	How the naming system of PROFET™+ 24V work?
Answer:	PROFET™+ 24V uses a systematic and comprehensive naming system. Taking BTT6050-2EKA for example, BTT stands for the identification of Infineon for 24V devices. 6 is expressing the latch functionality (5 is restart), 050 indicates the typical RDSON at 25°C, -2 indicates the number of channel (two channel in such a case), E indicates the usage of an exposed pad package, K stands for the SO14. Last, A indicates the design variant.

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Question 6:	What are the PROFET TM + against short circuit?
Answer:	PROFET TM + have reached the state of the art compromise between short circuit robustness and capability to switch extremely high inrush current load. A value of at least 100.000 cycles specified (unique on the market) is given for the whole PROFET TM + family protecting the application from destruction.
Question 7:	Which external components should be used for PROFET TM + ?
Answer:	PROFET TM + has integrated almost all circuitry to protects against the usual issues faced by automotive electronics. Only serial resistors should be placed, at all input pins. A ground diode is also necessary for reverse polarity issue.
Question 8:	Can I drive something else than a lamp with PROFET TM + ?
Answer:	<p>Sure. Below is a list of applications which we adress:</p> <ul style="list-style-type: none"> • Qualified for automotive applications such as lighting, body control modules, heating, energy/power distribution • Various industrial applications such as industrial automation, lifting systems, household applications • Capacitive loads such as bulbs, lamps with high inrush currents or LEDs with low currents • Resistive loads such as heating streamers • Inductive loads such as valves or relays • "Electronic" loads such as control unit power supplies in battery saver applications • Replacement of electromechanical relays, fuses and discrete circuits
Question 9:	What are the USP`s of PROFET TM + 24V?
Answer:	The short circuit robustness, the benchmark load dump protection, the low standby-current, the switching frequency, the current sense accuracy and the single footprint fitting the complete family. A reference in terms of scalable, flexible and compatible concept toward the family .
Question 10:	Is there any application notes existing ?
Answer:	PROFET TM application team produce regular application notes on various subject, going from a long and exhaustive application note describing High Side Switches usage in general, short circuit strategy, current sense diagnosis. A dedicated PROFET TM + 24V Application Note was published in January 2013.