



Safe, robust,
reliable analog
solutions

FS6407 and FS6408 System Basis Chips (SBCs)

The FS6407 and FS6408 SBCs are multi-output buck regulators with functional safety support and high-speed CAN transceivers optimized for industrial applications.

TARGET APPLICATIONS

- ▶ Industrial transportation
- ▶ Elevators
- ▶ Factory automation
- ▶ Safe programmable logic controller (PLC)
- ▶ Battery pack controller power and system management
- ▶ Heavy machinery

The FS6407 and FS6408 are multi-output buck regulators with functional safety support and high-speed CAN transceivers optimized for industrial applications. Multiple switching and linear voltage regulators are available, including low-power modes with various wake-up capabilities. An advanced power management scheme is implemented to maintain high efficiency over wide input voltages and output current ranges.

Enhanced safety monitoring and multiple fail-safe outputs enable safety-oriented system partitioning. A built-in enhanced high-speed CAN interface fulfills ISO 11898-2 and -5 standards. Local and bus failure diagnostics, protection and fail-safe operation modes are also provided.

FEATURES

- ▶ Power management scalability
 - Integrated switch for improved control and reliability
 - Optional boost driver

- Dual DC-DC architecture for packaging cost efficiency
- Pin-to-pin and software compatible
- Power scalable family

KEY FEATURES

- ▶ Independent safety monitoring unit with fail-safe output
- ▶ Secure SPI interface
- ▶ Configurable digital I/Os through SPI registers, including monitoring of FCCU
- ▶ Analog multiplexer sense and monitor supply voltage, for space savings

ADDITIONAL FEATURES

- ▶ CAN high-speed physical layer, ISO11898-2 and -5 compatible from 40 kbit/s to 1 Mbit/s
- ▶ High robustness performance of system-level pins up to +/- 8 kV according to IEC61000-4-2 and ISO10605:2008
- ▶ Robust physical layers with superior EMI/ESD performance, with ESD performance up to ±12 kV according to IEC 61000-4-2 and ISO 10605:2008



FS6407 AND FS6408

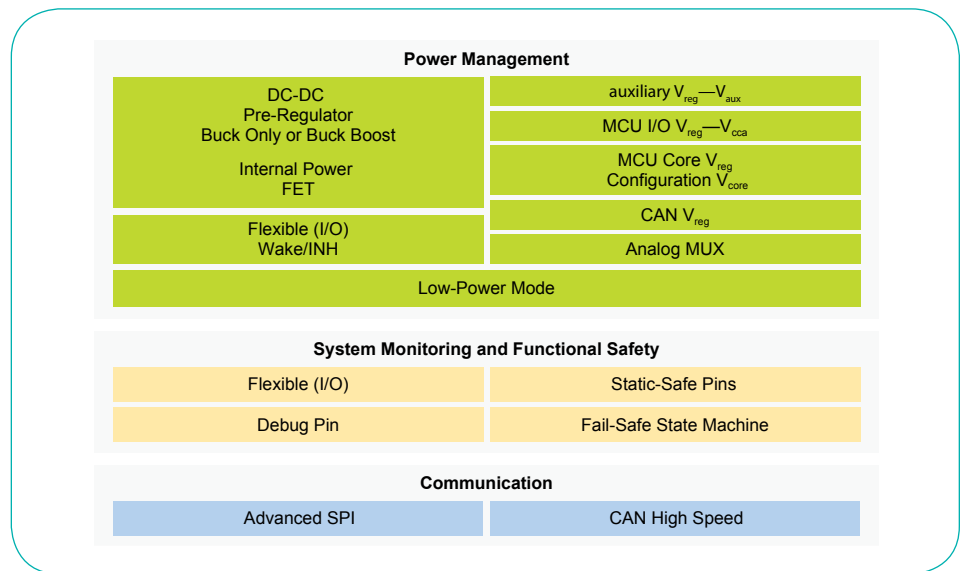
SafeAssure® SBC SOLUTIONS

Safety Process	IEC61508 <ul style="list-style-type: none"> Safety assessment of analog architecture and concept Fail rate and metrics available per the ISO 26262 standard Helps to reduce effort and time on ECU functional safety assessment
Safety Hardware	Integrated safety architecture <ul style="list-style-type: none"> Saves development effort and time as no additional software required (only one main MCU) Independent voltage monitoring and fail-safe state machine High hardware diagnostic to cover single point of failure, latent failure and common cause failure
Safety Software	Secured SBC and MCU software interactions <ul style="list-style-type: none"> Multiple registers to help software diagnostics, including safe-state machine Safety mechanisms to secure SPI Advanced watchdog challenger to secure MCU timing monitoring
Safety Support	Safety documentation provided is based on umbrella devices MC33907 and MC33908 SBCs <ul style="list-style-type: none"> Application recommendations to combine MC34FS6407 and MC34FS6408 MCUs* Safety manual, FMEDA and complete ecosystem to ease development and save time

FEATURES TO SUPPORT ENERGY-EFFICIENT SOLUTIONS

- ▶ Highly flexible SMPS pre-regulator allowing non-inverting buck-boost or standard buck topologies; overall device efficiency improvement
- ▶ Multiple output power supplies from 0.5 up to 1.5 A of global current capability
- ▶ Switching mode power supply (SMPS) dedicated to MCU core supply, from 1.2 V to 3.3 V, adjustable through external resistor string
- ▶ Linear voltage regulator (3.3 to 5 V) dedicated to MCU I/Os, especially the ADC
- ▶ Linear voltage regulator dedicated to auxiliary functions (3.3 to 5 V selectable) or to sensor supply (V_{cca} tracker or independent)

FS6407 AND FS6408 BLOCK DIAGRAM



NXP SBC SOLUTIONS

	FS6407	FS6408
6.5 V Pre-regulator	1.7 A maximum (Buck or Boost_440 kHz)	1.7 A (Buck or Boost_440 kHz)
MCU core supply $V_{core}/2\%$	V_{core} from 1.2 V to 3.3 V, I_{core} up to 0.8 A	V_{core} from 1.2 V to 3.3 V, I_{core} up to 1.5 A
MCU I/Os, ADC supply $V_{cca}/1\%$	100 mA (int) $\pm 1\%$ 5 V configuration 100 mA (int) $\pm 1.5\%$ 3.3 V configuration or 300 mA (ext.) $\pm 3\%$	100 mA (int) $\pm 1\%$ 5 V configuration 100 mA (int) $\pm 1.5\%$ 3.3 V configuration or 300 mA (ext.) $\pm 3\%$
Auxiliary ECU supply $V_{aux}/3\%$	Up to 300 mA V_{cca} tracker	Up to 300 mA V_{cca} tracker
Can_5V supply (VCAN)	100 mA	100 mA
CAN interface	1	1
I/Os	6 (incl. F/S inputs)	6 (incl. F/S inputs)
Watchdog	Challenger	Challenger
Low Q V_{off}	30 μ A	30 μ A
AMUX and battery sense	Yes	Yes
Fail-safe	Independent I/O	Independent I/O
Package	LQFP48EP	LQFP48EP

- ▶ Uses SMARTMOS® technology that combines digital, power and standard analog functions
- ▶ Multiple wake-up sources combined with low-power mode: CAN P/L, I/Os
- ▶ Supply monitoring before and after reverse battery protection

SafeAssure PROGRAM: FUNCTIONAL SAFETY SIMPLIFIED.

The SafeAssure functional safety program is designed to help you simplify the process of achieving system compliance with functional safety standards in the automotive and industrial markets.

For more information, visit www.nxp.com/SafeAssure.