A698 SERIES

High-performance automotive synchronous DC-DC converters

High efficiency 38 V buck regulators with ultra low quiescent current for always on automotive loads

ST's A698 series is a family of AEC-Q100 qualified synchronous buck DC-DC converters optimized for 12 V battery-powered systems.

The devices operate from 3.5 V to 38 V input, deliver up to 0.5 / 1.5 / 2 A or 3 A. They feature ultralow quiescent current down to 25 µA to support always-on loads and low-power standby operation.

High switching frequency up to 2 MHz, integrated compensation and protection functions help minimize solution size, simplify design and meet stringent automotive EMI and reliability requirements.

KEY FEATURES & BENEFITS

- Wide operating input range: from 3.5 V to 38 V with load dump tolerance (device-dependent)
- Output current options: 0.5 A, 1.5 A, 2 A and 3 A for easy rail-to-rail optimization
- Ultralow quiescent current: down to 25 µA, 2 µA shutdown current
- Synchronous rectification for high efficiency over the full load range
- Programmable switching frequency up to 2.3 MHz with synchronization capability
- Embedded output voltage supervisor, Power Good and soft-start
- Comprehensive protection features: overcurrent, overvoltage, thermal shutdown

KEY APPLICATIONS

- Body and control modules
- Infotainment, cluster and head-unit systems
- Telemetry, connectivity and always on-loads
- Battery-powered automotive modules and car-audio rails

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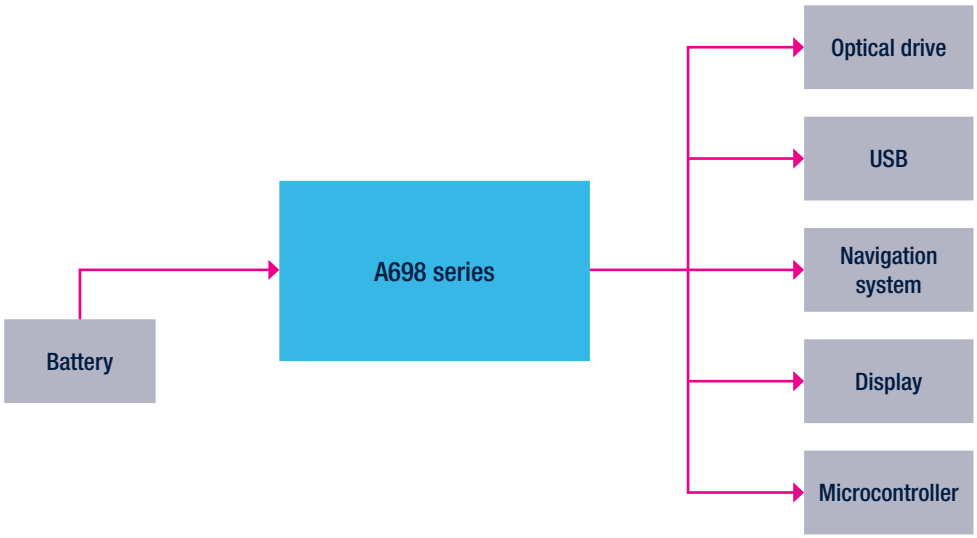
Key benefits for 12 V automotive systems

The A698 series is specifically optimized for always-on and light-load operation in 12 V automotive systems. The ultralow quiescent current, down to 25 µA, keeps the power rail alive with minimal battery drain, essential for parked-car and standby functions, such as telematics units and keyless-entry systems.

Two operating modes, low consumption mode (LCM) and low noise mode (LNM), allow designers to prioritize either maximum light-load efficiency or very low output ripple for noise-sensitive rails such as audio and RF supplies, providing greater flexibility within the same device family.

A wide programmable switching frequency range with optional spread-spectrum and clock synchronization helps meet automotive EMI standards while avoiding interference with AM radio bands, further simplifying system-level design. This combination of low I_Q mode selection and EMI control makes the A698 series a versatile power platform for 12 V ECUs.

A698 series schematic



A698 series product

Part numbers	I_Q (µA)	Frequency	Output current	Other features	Evaluation boards	Packages
A6985F	30	250 kHz to 2 MHz	0.5 A	T_{ON}min. = 100 ns, synchronization, adj. f_{SW}, adj. soft-start and PGOOD, adj. reset, low noise or low consumption mode, OV and OC protection	STEVAL-ISA187V1	HTSSOP16
A6986F			1.5 A	T_{ON}min. = 100 ns, synchronization, adj. f_{SW}, adj. soft-start and PGOOD, adj. reset, low noise or low consumption mode, OV and OC protection	STEVAL-ISA188V1	
A6986			2.0 A	T_{ON}min. = 80 ns, synchronization, adj. f_{SW},, selectable SKIP/PWM, Thsr., adj. soft-start and PGOOD, adj. reset, low noise or low consumption mode, OV and OC protection	STEVAL-ISA158V1	
A6983	17	250 kHz to 2.2 MHz	3.0 A	T_{ON}min. =75 ns, adj. f_{SW}, spread-spectrum, synchronization, internal compensation, PGOOD, low noise or low consumption mode	STEVAL-A6983NV1 STEVAL-A6983CV1	QFN16 (3x3)