



Automotive power management ICs



Smart and safety-oriented PMICs

Engineered to streamline component count, maximize space efficiency, and accelerate development, ST's portfolio of automotive-qualified Power Management ICs (PMICs) enable energy-saving, high-power-density, and lower-standby-power design solutions.

These all-in-one solutions integrate drivers, ADCs, switching and linear regulators, as well as monitoring, sequencing, and essential safety functions, ensuring robust performance for automotive applications.

Directly connected to a vehicle's battery, ST's multi-channel power management ICs allow flexible and configurable setups for multiple power supply schemes required for camera, radar and ADAS applications as well as MCUs, ECUs, OBCs, USB ports and infotainment systems.

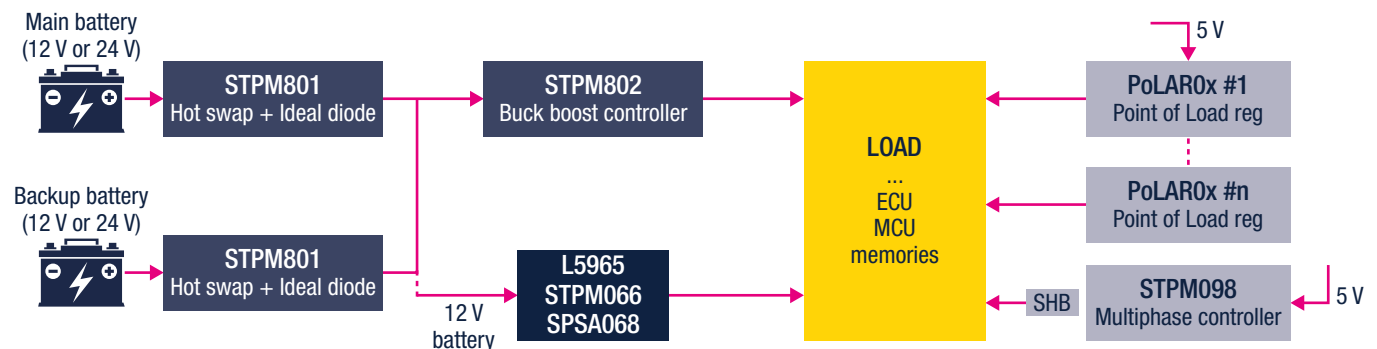
KEY FEATURES

- DC/DC converters/controllers
- Linear regulators
- Buck and buck-boost controllers
- Battery compatibility eliminates the need for a dedicated pre-regulator
- Reverse current protection
- Input and output monitoring for a system under full control
- Independent enable pins for customizing the powerup sequence
- Internal memory for programming reduces the use of external components
- Window watchdog/reset for advanced MCU support
- High switching frequency for reduced PCB size
- I²C/SPI control bus or hardware controls
- Very low quiescent & stand-by currents for reduced energy consumption
- Thermal protection
- Load dump protection
- Integrated compensation function optimizes BOM costs
- Functional safety (ASIL support)

KEY APPLICATIONS

- ADAS (camera, radar, and domain controller)
- ECUs
- Infotainment systems (TCU, instrument clusters, and cockpit)
- Zonal architecture
- USB hubs and chargers

PMICs product portfolio in application

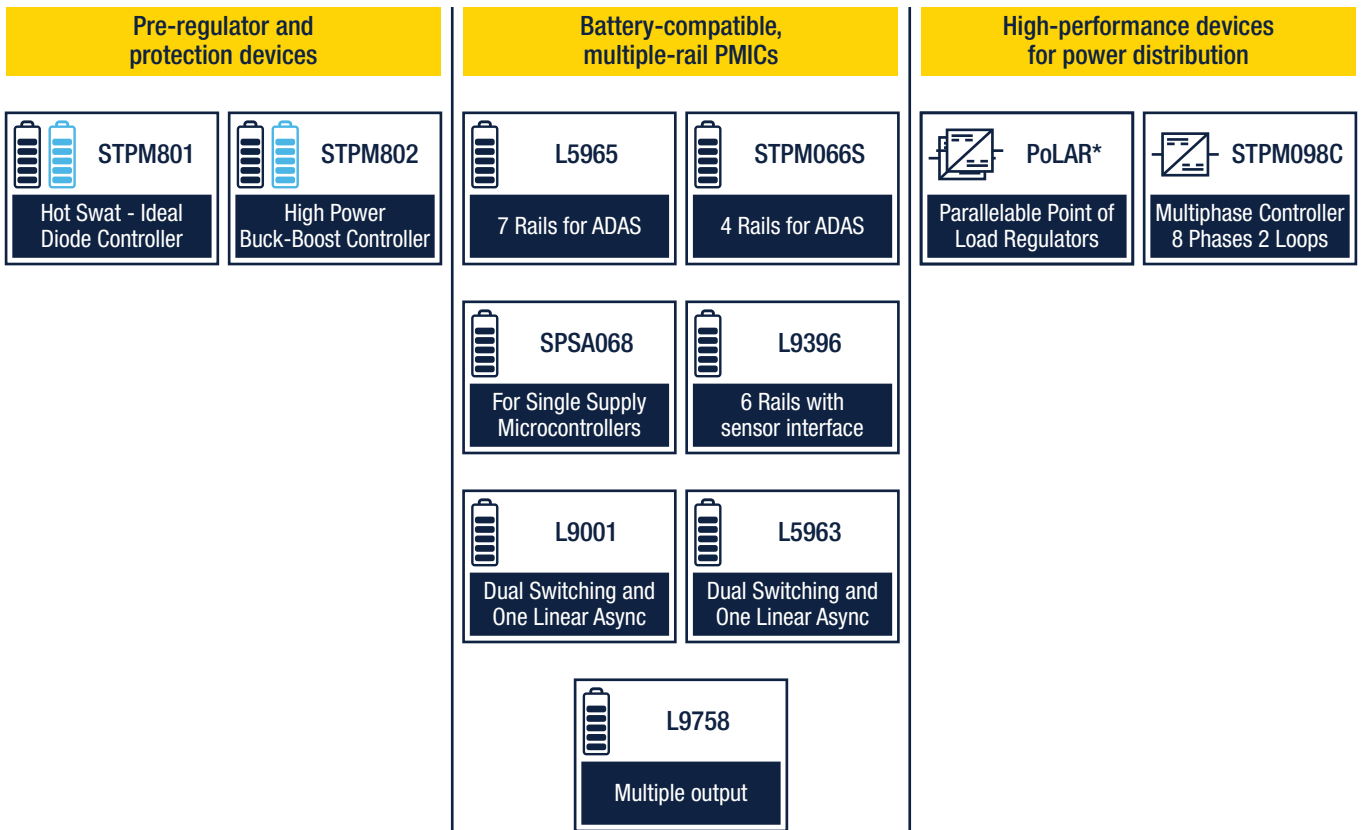


The whole portfolio has been designed to fulfill functional safety requirements as defined by Automotive Safety Integrity Level (ASIL).

SMART POWER SOLUTIONS THAT TARGET FUNCTIONAL SAFETY UP TO ASIL-D

ST offers a complete portfolio of PMICs for automotive systems designed to support functional safety requirements up to ASIL-D including ADAS, cockpit and zone controllers. The **STPM801** protects systems against reverse polarity up to 65 V and allows the use of a backup battery. A family of battery compatible PMICs, including the **L5965**, **SPSA068**, and **STPM066**, provide the rails needed to supply MCUs and processors found in cameras, radar sensors, OBCs, central and zonal ECUs. Furthermore, the SPI bus, internal memory, and monitoring functions enable the construction of a complete and autonomous power management system, which also reduces the number of external components required. The **STPM098** digital multiphase controller can supply the most powerful processors and GPUs with the hundreds of amps required for autonomous driving with very high efficiency. The **STPM802** buck-boost controller operates as pre-regulator unit useful to ensure the power distribution on the central and zonal architectures where there's large current demands. The **PoLAR** family consists of high-current point-of-load regulators, featuring additional capabilities to support a wide range of current platforms.

PMIC overview




 Battery line compatibility
 12V 24V


 Post Regulation

* PoLAR: PoLAR family in development stage

Device summary

Part Number	Package	Function	V _{in} (V)	V _{out} (V)	I _{out} (A)	Frequency	Topology	Other features
L5965	VQFPN-48	Buck1	4 to 32	Adjustable via OTP	Controller	400 kHz	Monolithic, synchronous, current mode, internal power switches	OTP programming, SPI interface, diagnostics, voltage supervisors, FuSa support
		Buck2	4 to 32		1.5/3	2.4 MHz		
		Buck3/Buck4	3 to 5.5		1.5/1	2.4 MHz		
		Boost	3 to 5.5		0.3/0.2	2.4 MHz		
		LDO/Vref	3 to 5.5		0.6/0.3/0.02			
STPM066S	VQFPN-48	Buck	4 to 32	Adjustable via OTP	1.5/3	2.4 MHz	Monolithic, synchronous, current mode, internal power switches	OTP programming, SPI interface, diagnostics, voltage supervisors, FuSa support
		Boost	3 to 5.5		0.3/0.2	2.4 MHz		
		LDO/Vref	3 to 5.5		0.6/0.3/0.02			
L9396	TQFP-64	Boost	4.5 to 19	8.5	0.3	2 MHz	Monolithic, asynchronous	SPI interface, WSS/tracking regulator, spread spectrum, diagnostics, 2xHS pre-drivers, WD & reset, FuSa support
		Buck1	6 to 19	6.5/7.2	1	465 kHz		
		Buck2/LDO1	6 to 19	5 to 0.8	0.5/1	465 kHz		
		LDO2/LDO3		5/3.3	0.25/0.1			
		Vref		3.3	0.02			
L9001	PowerSS0-24	Buck1	5.5 to 18	3.3/5/6	1	465 kHz	Monolithic, asynchronous, internal power switches	Voltage supervisors, diagnostics, WD & reset
		Buck2/LDO1	5.5 to 18	5 to 0.8	0.3/1	465 kHz		
		LDO	5.5 to 18	3.3/5	0.1			
STPM098	VFQFPN-48	Digital multiphase controller	5	0.5 to 2		200 kHz to 1.5 MHz	Monolithic, dual-loop digital multi-phase buck controller	Dual loop, 8x PWM outputs, PMBus, Dynamic phase shedding, FuSa support
L5963	PowerSS036 VQFPN-48	Buck1/Buck2	3.5 to 26	1 to Vin	2.5/3	2 MHz	Monolithic, synchronous, voltage mode, internal power switches	Power good monitoring, high-side driver
		LDO/ST-BY1	3.5 to 26		0.25			
STPM801	VFQFPN-32	Hot swap and ideal diode	4 to 65	4 to 65			Monolithic, power switch controller, ideal diode	Reverse current protection, in/out diagnostics, dual battery & FuSa support
STPM802	VFQFPN-32	Buck-boost controller	4 to 65	3.3 to 14	Up to 250 W	From 177 to 500 kHz	Non-inverting synchronous current controlled Buck-Boost, with 4-switch single inductor architecture	Discontinuous conduction mode, configurable parameters, stand-by, FuSa support
SPSA068	QFN32L	Buck	4 to 19	5/3.3/1.2	0.5/1	0.4/2.4 MHz	Monolithic, synchronous, current mode, internal power switches	Low power mode, output voltage adjustable, WD & reset, FuSa support
		Vref		5/3.3/1.2	0.02			
PoLAR family*	QFN 12+3 bondless	Buck Regulator	2.7 to 5.5	0.5 to 4.5	2/4/6	1.8/2.25/3.26/4 MHz	Monolithic single DC-DC converter	Paralleling of power stages, output voltage adjustable, high efficiency, FuSa support

Note: * in development stage



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