

# Automotive power management



## Smart power ICs



### Highly versatile smart power ICs for automotive power management solutions with full ecosystem to reduce design time and costs

Designed to reduce component count, optimize space and speed up development, automotive-qualified PMICs integrate, in a single package, drivers, ADCs, switching and linear regulators, monitoring and sequencing as well as all the functions required for robust 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, USB ports and infotainment systems.

#### KEY FEATURES

- DC/DC converters/controllers
- Linear regulators
- Reverse current protection
- Voltage supervisors
- Independent enables
- Window watchdog / reset
- High switching frequency
- I<sup>2</sup>C / SPI control bus or hardware controls
- Very low quiescent & stand-by currents
- Battery compatibility
- Thermal protection
- Load dump protection
- Integrated compensation
- Functional safety (ASIL support)

#### KEY BENEFITS

- Automotive qualification
- Complete power management solution does not require external monitoring or sequencing
- Can be used for pre- or postregulation
- Flexibility due to output programmability

#### KEY APPLICATIONS

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

## Smart power solutions that target functional safety up to ASIL-D

A complete portfolio of smart power devices for automotive systems designed to support functional safety requirements up to ASIL-D including ADAS, cockpit and zone controllers.

The STPM801 power management IC protects systems against reverse polarity up to 65 V and allows the use of a backup battery. Other smart power devices, including the battery-compatible L5965 and STPM066 voltage regulators, offer the rails needed to supply MCUs and processors found in cameras, radar sensors and central and zonal ECUs.

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.

### Device summary

Part number	Package	Function	V <sub>IN</sub> (V)	V <sub>OUT</sub> (V)	I <sub>OUT</sub> (A)	Frequency	Topology	Other features
L5965	VQFPN-48	Buck 1 Controller	4 to 32	Adjustable via OTP		400 kHz	Monolithic, synchronous, current mode, internal power switches	OTP programming, SPI interface, diagnostics, voltage supervisors, supporting functional safety
		Buck 2	4 to 32		3 / 1.5	2.4 kHz		
		Buck 3	3 to 5.5		1.5	2.4 kHz		
		Buck 4	3 to 5.5		1	2.4 kHz		
		Boost	3 to 5.5		0.3	2.4 kHz		
		LDO	3 to 5.5		0.6			
		Vref			0.02			
STPM066S	VQFPN-48	Buck	4 to 32	Adjustable via OTP	1.35 / 2.60	2.4 kHz	Monolithic, synchronous, current mode, internal power switches	OTP programming, SPI interface, diagnostics, voltage supervisors, supporting functional safety
		Boost	3 to 5.5		0.2 / 0.3	2.4 kHz		
		LDO	3 to 5.5		0.3 / 0.6			
		Vref			0.02			
L9396	TQFP-64	Boost controller	4.5 to 19	8.5	0.3	2 MHz	Monolithic, asynchronous	SPI interface, WSS/ tracking regulator, spread spectrum, diagnostics, 2xHS pre-driver, WD & reset, supporting functional safety
		Buck1 controller	6 to 19	6.5 / 7.2	1	465 kHz		
		Buck2 / LD01	6 to 19	5 to 0.8	1 / 0.5	465 kHz		
		LD02		5	0.25			
		LD03		3.3 / 5	0.1			
		Vref		3.3	0.02			
L9001	PowerSSO-24	Buck1	5.5 to 18	3.3 / 5 / 6	1	465 kHz	Monolithic, asynchronous, internal power switches	Voltage supervisors, diagnostics, WD & reset
		Buck2 / LD01	5.5 to 18	5 to 0.8	1 / 0.3	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, diagnostics, functional safety support
L5963	PowerSSO36 VQFPN-48	Buck1	3.5 to 26	1 to Vin	2.5	2 MHz	Monolithic, synchronous, voltage mode, internal power switches	Power good monitoring, high-side driver
		Buck2	3.5 to 26		3	2 MHz		
		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	Soft start, reverse input protection, transient limitation capability, in/out diagnostics, dual battery/dual PCB support, functional safety support



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