

1 General description

The PF5300, PF5301 and PF5302 integrate high-performance buck converters, 12 A, 8 A, and 15 A, respectively, to power high-end automotive and industrial processors. With adaptive voltage positioning and a high bandwidth loop, they offer excellent transient regulation to minimize capacitor requirements.

Clock synchronization and spread-spectrum features reduce EMC issues in the system. The PF5300/PF5301/PF5302 can operate as stand-alone point-of-load regulator ICs or as companion chips to a larger PMIC.

2 Features and benefits

- Low Rdson Internal FETs
- 2.2 MHz switching frequency
- Dynamic Voltage Scaling
- Programmable AVP (droop)
- XFAILB interface for synchronization with NXP PF-PMICs
- Over temperature protection
- I2C Interface for monitoring and control
- Watchdog Timer

3 Applications

- Gateway
- Infotainment / Cluster / Driver Awareness
- Telematics
- V2X
- Radar
- Vision
- ADAS
- Sensor fusion



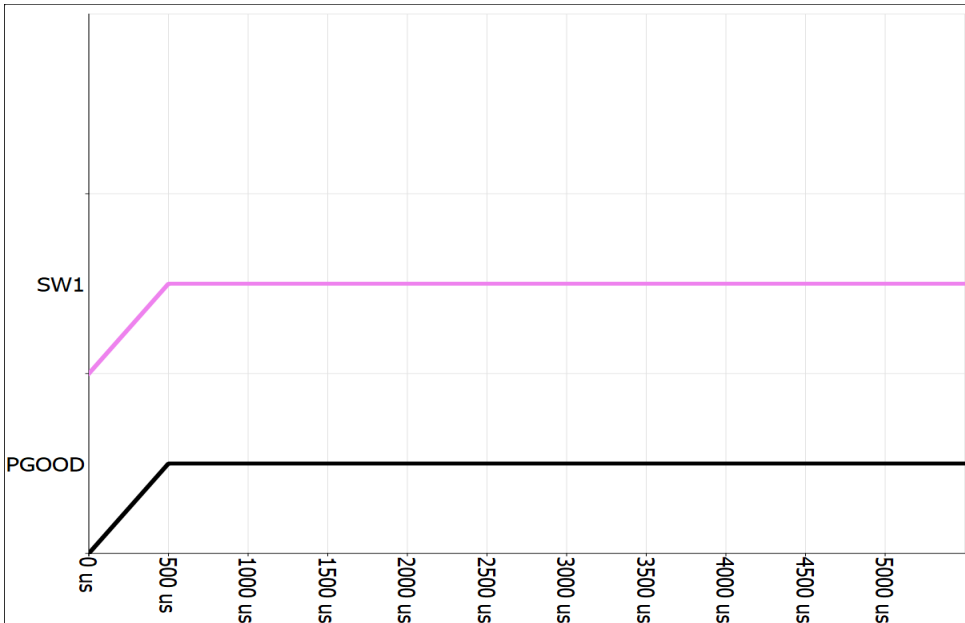
4 Ordering information

Table 1. Ordering information

Type number ^[1]	Package		
	Name	Description	Version
MPF5301AMMABES	H-FC-PQFN-24	No leads, step-cut wettable flank, plastic thermal enhanced very thin quad flat pack; 24 terminals, 0.5 mm pitch, 4.5 mm x 3.5 mm x 0.75 mm body	SOT2090 - 1(SC)

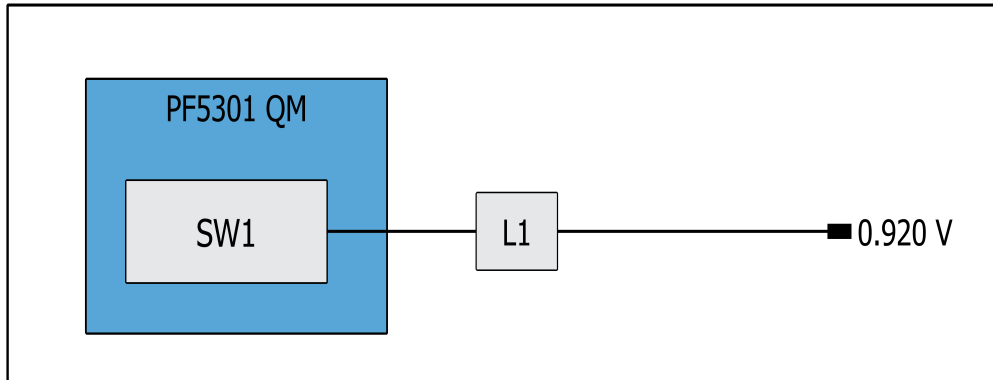
[1] To order parts in tape and reel, add the R2 suffix to the part number.

5 Power-up sequence summary



The signals depicted above are enable signals for each regulator. They don't represent the actual ramp voltage.

6 Hardware configuration diagram



7 OTP configuration

See PF5300 datasheet for parametric details. The OTP configuration summary for AB sequence ID is provided in Tables below.

Table 2. Device OTP configuration

Functional block	Feature	OTP selection
System Configuration	I2C Address	0x2A
	Maximum Fault Counter	15 Faults
I/O Configuration	Standby Polarity	Standby pin is logic High
	Standby Delay	No delay
	XFAIL Operation	Disabled
	ULP OFF Control	Goto ULPOFF at turn off

Configuration report for QM OTP program ID: AB rev A

Clock Management	Nominal Switching Frequency	20 MHz
	SYNCIN Range	2000 kHz to 3000 kHz
	Frequency Spread Spectrum	Enabled
	FSS Select	Triangular Modulation
	SYNCIN Mode	STANDBY input
	SW1 PLL Enable	SW PLL is enabled

Table 3. Power Sequencer configuration

Functional block	Feature	OTP selection
Power Up Sequence	Sequence Time Base	500 us
	SW1 Sequence Slot	Slot 0
	PGOOD Sequence Slot	Slot 0
	Post Power Down Delay	0 ms
	Turn Off Delay	0 us

Table 4. SW Regulator configuration

Functional block	Feature	OTP selection
SW1	SW1 Output Voltage	0.920 V
	SW1 Standby Voltage	0.920 V
	SW1 Output Inductor	100 nH
	SW1 Discharge Resistor	PD resistor not discharged
	SW1 Soft Start	8 mV/us

Configuration report for QM OTP program ID: AB rev A

	SW1 AVP	3 mV/A
	SW1 AVP Filter	238 kHz
	SW1 Run Mode	PWM Mode
	SW1 Standby Mode	OFF
	SW1 Diode Emulation	Disable diode emulation
	SW1 Diode Braking Threshold	5.0 mV
	SW1 HIZ OFF	SW1 is actively discharged
	SW1 Discharge	2 mV/us
	SW1 DVS MAX	1.100 V
	SW1 DVS MIN	0.650 V
	SW1 TON Dominant	Disable
SW1 State	SW1 OV Bypass	No impact due to SW1 OV on fault counter
	SW1 UV Bypass	No impact due to SW1 UV on fault counter
	SW1 ILIM Bypass	No impact due to SW1 ILIM on fault counter
VMON and PGOOD	VMON Overvoltage Threshold	105.0 %
	VMON Undervoltage Threshold	91.0 %
	VMON OV Debounce	25 us
	VMON UV Debounce	40 us
	PGOOD SW1 OV	PGOOD assertion on OV Fault
	PGOOD SW1 UV	PGOOD assertion on UV Fault
SW1 Compensation	SW1 Gain Margin	107 us
	SW1 Compensation Resistor	90 kOhm
	SW1 Compensation Capacitor	25 pF

Table 5. Program ID

Functional block	Feature	OTP selection
Program ID	Program ID High	A
	Program ID Low	B

8 Legal information

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