

1 General description

The PF7100 is a power management integrated circuit (PMIC) designed for high performance i.MX8 processors. It features five high efficiency buck converters and two linear regulators for powering the processor, memory and miscellaneous peripherals.

Built-in one time programmable memory stores key startup configurations, drastically reducing external components typically used to set output voltage and sequence of external regulators. Regulator parameters are adjustable through high-speed I2C after start up offering flexibility for different system states.

Electrical characteristics are maintained in the PF7100 data sheet

2 Features and benefits

- Up to five high efficiency buck converters
- Two linear regulators with load switch options
- Independent OV/UV monitoring circuits
- Dual always-on RTC supply
- Watchdog timer/monitor
- AEC-Q100 grade 2 qualified
- Safety mechanisms to fit ASIL B applications
- One-time programmable device configuration
- 3.4 MHz I2C communication interface
- 48-pin 7 x 7 mm QFN Package (Automotive and Industrial grades available)

3 Applications

- Automotive Infotainment
- V2X
- High-end consumer and industrial



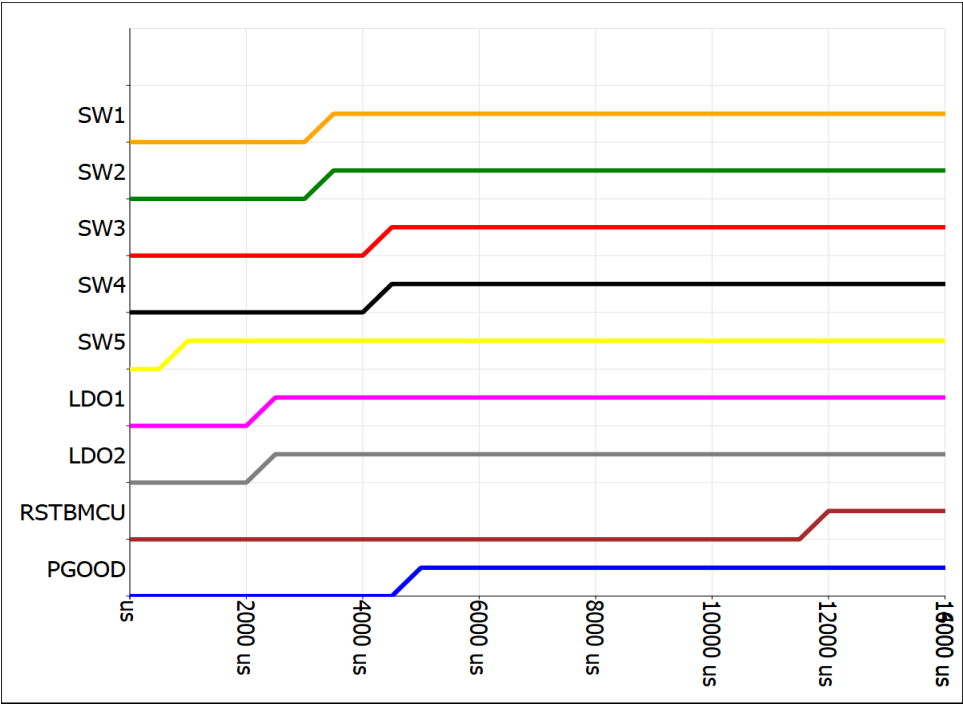
4 Ordering information

Table 1. Ordering information

Type number ^[1]	Package		
	Name	Description	Version
SPF7100BVBBVES	WF-Type QFN48 ES	QFN48 plastic thermally enhanced very thin quad flat non-leaded package. Wettable flanks; 48 terminals; 0.5mm pitch; 7 mm x 7 mm x 0.85 mm body	SOT619-27(D)

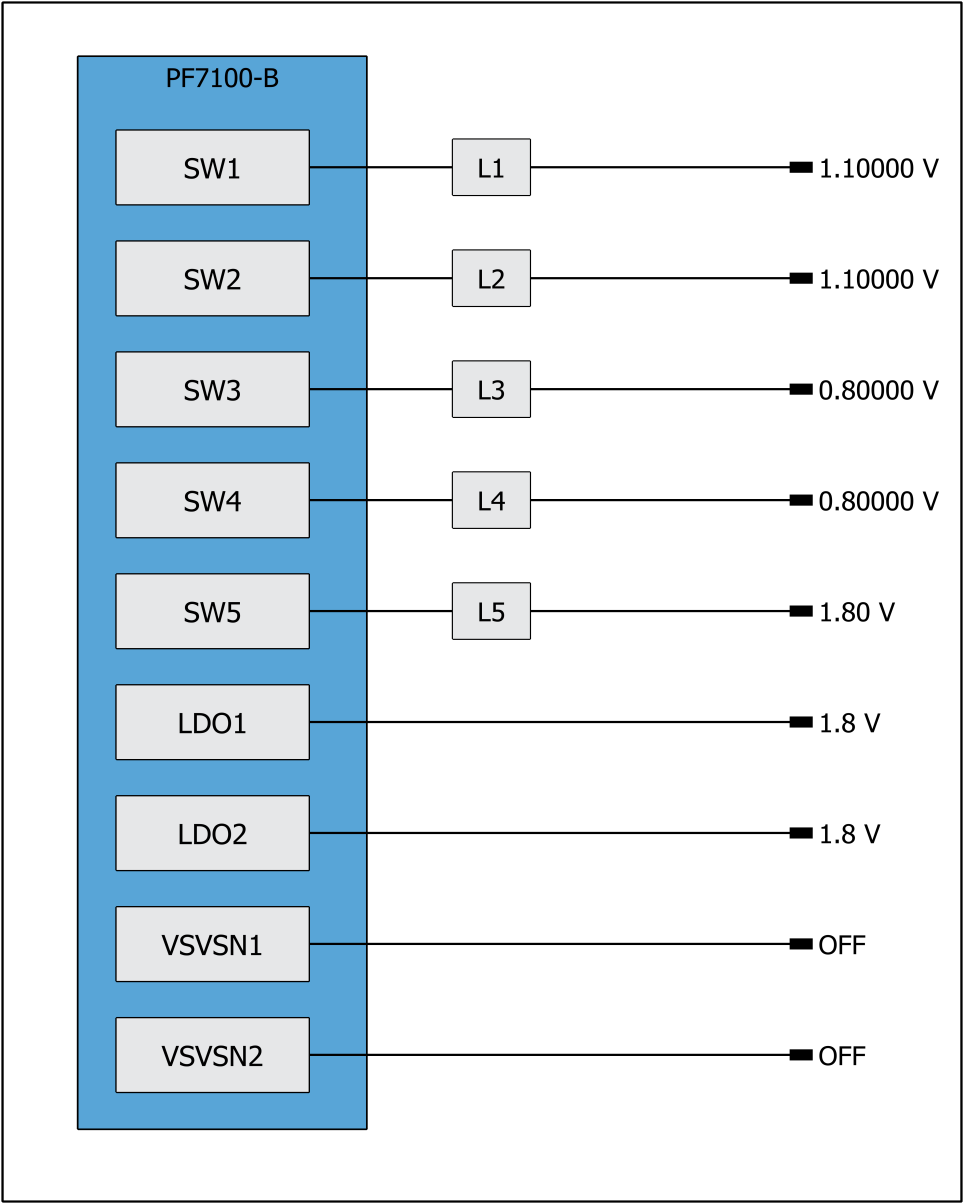
[1] To order parts in tape and reel, add the R2 suffix to the part number.

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 PF7100 datasheet for parametric details. The OTP configuration summary for BV sequence ID is provided in Tables below.

Table 2. Device OTP configuration

Functional block	Feature	OTP selection
System configuration	I2C Address	0x09
	I2C CRC	Disabled
	I2C Secure Write	Secure write Disabled
	VIN OVLO Monitor	Enabled
	VIN OVLO Debounce	100 us
	VIN OVLO Shutdown	Enabled
	Maximum Fault Count	Disabled
	Fault Timer	Disabled
	Fail Safe State	FailSafe Disabled
	Fail-safe Maximum Count	1 Event
	Fail-safe OK Timer	1 Minute
Watchdog monitoring	WDI Mode	Hard WD reset
	WDI Polarity	Rising edge of the WDI
	WDI In Standby	WDI disabled in STANDBY
	WD Counter	WD counter Disabled
	WD Counter In Standby	WD counter Disabled
	WD Clear Window	100 % window
	Maximum Time Out Steps	Event on step 1
	WD Duration	1 ms
	Maximum WD Event	1 Event

Configuration report for PF7100-B OTP program ID: BV rev C

Clock management	Switching Frequency	2.500 MHz
	SYNCIN Range	2000 KHz and 3000 KHz
	SYNCIN Operation	SYNCIN Disabled
	SYNCOUT Operation	SYNCOUT Disabled
	Frequency Spread Spectrum	FSS Disabled
	FSS Range	Clock frequency range is $\pm 5\%$

Table 3. I/Os configuration

Functional block	Feature	OTP selection
I/O Configuration	PWRON Mode	Level Sensitive
	PWRON Debounce	FED-32 ms, RED-32 ms
	PWRON Reset Mode	Shutdown on TRESET
	TRESET Delay	2 s
	STANDBY Polarity	STANDBY Active High
	PGOOD Pin Mode	GPO Mode
	OV/UV Check On Power Up	No OV/UV checked at power-up
	EWARN Time	0.1 ms
	XFAILB Operation	XFAILB Pin Enabled
	FSOB Soft Fault Event	FSOB ignores soft faults
	FSOB Hard Fault Event	FSOB ignores hard faults
	FSOB WDI Event	FSOB ignores WDI faults
	FSOB WDC Event	FSOB ignores WD counter faults
	FSOB Operating Mode	Fault safe state mode

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Table 4. Sequencer configuration

Functional block	Feature	OTP selection
SW configurations	SW1 Multiphase Selector	SW1 and SW2 operate in single phase mode
	SW4 Multiphase Selector	SW3 and SW4 operate in single phase mode
	Default SW Operation	PWM mode
	SW3 VTT Mode	VTT mode Disabled
	VTT Discharge Mode	Disabled in HI-Z mode
	Bandgap Monitor Reaction	Band gap failure
Power-up sequence	Sequencer Time Base	500 us
	SW1 Sequence	Slot 6
	SW2 Sequence	Slot 6
	SW3 Sequence	Slot 8
	SW4 Sequence	Slot 8
	SW5 Sequence	Slot 1
	LDO1 Sequence	Slot 4
	LDO2 Sequence	Slot 4
	RESETBMCU Sequence	Slot 23
	PGOOD Sequence	Slot 9
Power down sequence	Power Down Mode	Group Power Down
	SW1 Power Down Group	Group 3
	SW2 Power Down Group	Group 3
	SW3 Power Down Group	Group 4
	SW4 Power Down Group	Group 4
	SW5 Power Down Group	Group 1
	LDO1 Power Down Group	Group 2

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	LDO2 Power Down Group	Group 2
	RESETBMCU Power Down Group	Group 1
	PGOOD Power Down Group	Group 1
Power Down Delays	GRP1 Delay	1000 us
	GRP2 Delay	1000 us
	GRP3 Delay	1000 us
	GRP4 Delay	1000 us
	RESETBMCU Delay	500 us
	Power Down Delay	No delay

Table 5. Switching regulators

Functional block	Feature	OTP selection
SW1	SW1 Output Voltage	1.10000 V
	SW1 DVS Ramp	3.91/2.60 mV/us
	SW1 UV Threshold	93 %
	SW1 OV Threshold	107 %
	SW1 Current Limit	4.5 A
	SW1 Inductor	1.0 uH
	SW1 Phase	45°
	SW1 PGOOD Control	PGOOD control Enabled
	SW1 WD Bypass	Bypass soft WD
	SW1 OV Bypass	OV protection enabled
	SW1 UV Bypass	UV protection enabled
	SW1 ILIM Bypass	ILIM protection enabled
SW2	SW2 Output Voltage	1.10000 V

Configuration report for PF7100-B OTP program ID: BV rev C

	SW2 DVS Ramp	3.91/2.60 mV/us
	SW2 UV Threshold	93 %
	SW2 OV Threshold	107 %
	SW2 Current Limit	4.5 A
	SW2 Inductor	1.0 uH
	SW2 Phase	90°
	SW2 PGOOD Control	PGOOD control Enabled
	SW2 WD Bypass	Bypass soft WD
	SW2 OV Bypass	OV protection enabled
	SW2 UV Bypass	UV protection enabled
	SW2 ILIM Bypass	ILIM protection enabled
SW3	SW3 Output Voltage	0.80000 V
	SW3 DVS Ramp	3.91/2.60 mV/us
	SW3 UV Threshold	93 %
	SW3 OV Threshold	107 %
	SW3 Current Limit	4.5 A
	SW3 Inductor	1.0 uH
	SW3 Phase	135°
	SW3 PGOOD Control	PGOOD control Enabled
	SW3 WD Bypass	Bypass soft WD
	SW3 OV Bypass	OV protection enabled
	SW3 UV Bypass	UV protection enabled
	SW3 ILIM Bypass	ILIM protection enabled
SW4	SW4 Output Voltage	0.80000 V

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	SW4 DVS Ramp	3.91/2.60 mV/us
	SW4 UV Threshold	93 %
	SW4 OV Threshold	107 %
	SW4 Current Limit	4.5 A
	SW4 Inductor	1.0 uH
	SW4 Phase	180°
	SW4 PGOOD Control	PGOOD control Enabled
	SW4 WD Bypass	Bypass soft WD
	SW4 OV Bypass	OV protection enabled
	SW4 UV Bypass	UV protection enabled
	SW4 ILIM Bypass	ILIM protection enabled
SW5	SW5 Output Voltage	1.80 V
	SW5 UV Threshold	93 %
	SW5 OV Threshold	107 %
	SW5 Current Limit	4.5 A
	SW5 Inductor	1.0 uH
	SW5 Phase	225°
	SW5 PGOOD Control	PGOOD control Enabled
	SW5 WD Bypass	Bypass soft WD
	SW5 OV Bypass	OV protection enabled
	SW5 UV Bypass	UV protection enabled
	SW5 ILIM Bypass	ILIM protection enabled

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Table 6. LDO regulators

Functional block	Feature	OTP selection
LDO1	LDO1 Output Voltage	1.8 V
	LDO1 UV Threshold	93 %
	LDO1 OV Threshold	107 %
	LDO1 PGOOD Control	PGOOD control Enabled
	LDO1 WD Bypass	Bypass soft WD
	LDO1 Mode	Normal mode
	LDO1 OV Bypass	OV protection enabled
	LDO1 UV Bypass	UV protection enabled
	LDO1 ILIM Bypass	ILIM protection enabled
LDO2	LDO2 Output Voltage	1.8 V
	LDO2 UV Threshold	93 %
	LDO2 OV Threshold	107 %
	LDO2 PGOOD Control	PGOOD control Enabled
	LDO2 WD Bypass	Bypass soft WD
	LDO2 Mode	Normal mode
	LDO2EN Hardware Control	Control by I2C and LDO2EN
	VSELECT Hardware Control	VLDO2 set by I2C bits
	LDO2 OV Bypass	OV protection enabled
	LDO2 UV Bypass	UV protection enabled
	LDO2 ILIM Bypass	ILIM protection enabled
VSNVS	VSNVS1 Output Voltage	OFF
	VSNVS2 Output Voltage	OFF

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