

NXP Communicator

PF5020_PF5023_PF5024 Family

PMIC Solution for High Performance Consumer Applications

Communicator Finalization Date: Apr 2020

Communicator Created: Feb 2020

Global Full Market Launch Date: Apr 2020



PF502x Product Summary

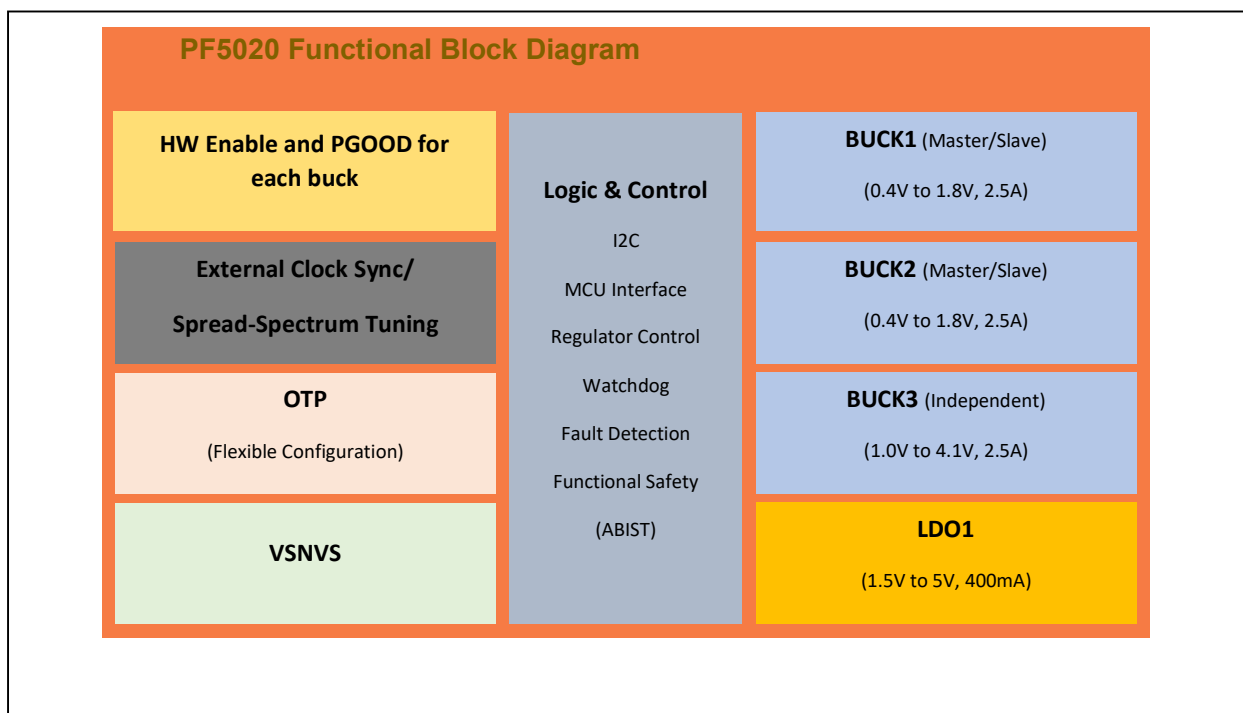
The PF5020 is NXP's multi-channel PMIC device designed to be used for high performance automotive and industrial applications. The PF5020 is also highly configurable making it a perfect companion and fit for various system level power requirements.

Integrated and independent voltage monitoring circuits ensure compliance with ISO 26262 standard and functional safety up to ASIL-B level. The PF5020 is also available as a standard non-safety device for applications that don't require the ISO compliance.

The PF5020 is suitable for a variety of applications including infotainment, ADAS, vision, and RADAR either as a standalone power solution or also as a companion to another NXP PMIC like the PF8200 or an SBC like the FS8500.

This device is suitable for i.MX and S32 processors based applications

Functional Block Diagram PF5020



PF502x Features

General

[Power Management Features](#)

- Three high-efficiency BUCK converters
- One linear regulator with load switch option
- RTC supply and coin cell charger
- VTT termination for memory rails

[System and Device Features](#)

- OTP (One-time programmable) memory for flexible device configuration
- High speed I²C interface (3.4 MHz)
- Individual ENABLE control and PGOOD monitoring circuits
- External clock synchronization
- Frequency spread spectrum

[Safety Features](#)

- Independent circuits to fit ASIL B safety level
- Voltage monitoring with programmable fault protection
- Advanced thermal monitoring and protection
- External watchdog monitoring and programmable internal watchdog counter
- I²C CRC and write protection mechanism
- Analog built-in self-test (ABIST)

[Differentiating Points](#)

- Multiple-Phase Configurable buck regulator (Up to Dual-Phase) with ASIL-B
- Hardware Control as well as I2C control
- Supports DVS Operation
- Supports independent/dual-phase operation
- Used as standalone regulator, or companion for an optimized system solution

Target Applications

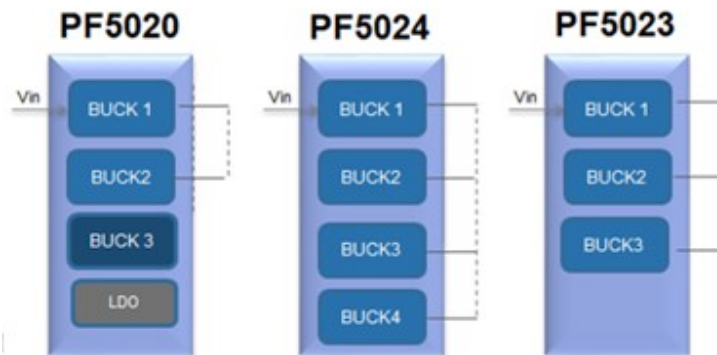
Consumer Grade applications

- [Automotive Radar Systems](#)
- [Entry Infotainment / Connected Radio](#)
- [Front View Camera](#)
- [Mid to High Infotainment / eCockpit](#)
- [Surround View](#)
- [V2X Communications](#)

Part Attributes

PF502x comparison table

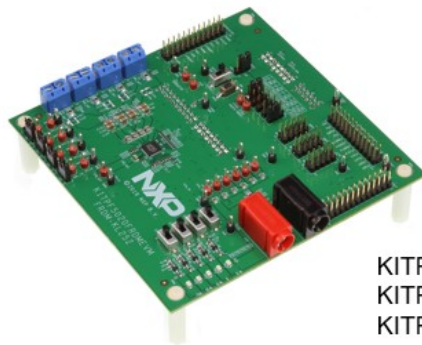
Function	PF5020 QM	PF5020 ASILB	PF5024 QM	PF5024 ASILB	PF5023 QM	PF5023 ASILB
Buck regulator w/ DVS	2ch		4ch		3ch	
Buck regulator w/o DVS	1ch		-		-	
LDO	1ch		-		-	
VSNVS regulator	1ch		-		-	
AMUX output	-		-		-	
Communication I/F	I2C with CRC		I2C with CRC		I2C with CRC	
Watchdog	Yes		Yes		Yes	
MCU I/F	PWRON, STANDBY, INTB, RESETBMCU, PGOOD, PGOODx, ENx, WDI		PWRON, STANDBY, INTB, RESETBMCU, PGOOD, PGOODx, ENx, WDI		PWRON, STANDBY, INTB, RESETBMCU, PGOOD, PGOODx, ENx, WDI	
OV/UV monitoring	Yes		Yes		Yes	
OTP program	Yes		Yes		Yes	
ABIST	No	Yes	No	Yes	No	Yes
20MHz CLK check	No	Yes	No	Yes	No	Yes
OTP CRC check	No	Yes	No	Yes	No	Yes
Fail-Safe state	No	Yes	No	Yes	No	Yes
Sequire I2C write	No	Yes	No	Yes	No	Yes
Target ASIL class	QM	ASILB	QM	ASILB	QM	ASILB
Package	40-QFN w/ WF		40-QFN w/ WF		40-QFN w/ WF	



4 Development tools and Ecosystem

The PF502x boards provides access to all output voltage rails as well as control and signal pins through Power strip connectors. A single terminal block connector for the input power supply allows the user to supply the board with an external DC power supply to fully evaluate the performance of the device.

The customer evaluation board for PF502x provides the capability to power up from the OTP fuses or a pre-define Hardwire sequence via the J17 on EVB. The PMIC comes with a Non-programmed OTP configuration (version A0) of the PMIC, providing the ability to evaluate any number of configurations via the Try-Before-Buy operation mode via TBB configuration scripts generated by the corresponding OTP Request Form.



KITPF5020FRDMEVM
KITPF50203RDMEVM
KITPF5024FRDMEVM



KITPF5020xSKTEVM
Programming board

Tools Support

PF502x FlexGui: GUI for the PF family development tools.

- GUI Interface allows full register access

KITPF502xSKTEVM Programming Socket

- Socketed board for manual OTP programming on the PF502x PMICS.

5 NXP Attach Opportunities

Domain	Application	Processor	Safety PMIC Solution
Connectivity	V2X	i MX6DL +SAF5400	*FS56 + 2 X *PF5020
	Driver Substitute	Corner/Front Radar - Cascaded Sensor -	S32R274 + 2X TEF810X +
		S32R294 + 2X TEF810X+	*FS84 + *PF5020
		S32R45x + 3/4 x TEF810X+	*FS84 + Multi *PF502X
	Vision ECU	S32V234 +SJA1084	*FS8430 + *PF5024
In Vehicle Experience	Cluster/ Infotainment	i.MX 8DualMax	PF81/8200 + *PF5020
	Radio	+SAF754	*PF5020 (Low Vin Connected)

6 Suggested Stocking

All silicon part numbers are available for ordering today. A full list of orderable part numbers can be found in the distributor pricebook. Superset part numbers are available for stocking and orders can be placed immediately. "Development boards" are included in Price Book. Those devices highlighted below are highest priority for stocking based on anticipated popularity.

Superset Suggested For Stocking (Y/N?)	Embargo Date for web - "Coming soon"	Full Market Launch Date	PN	Resale for 10K	DBC (\$USD)	Order Date	Approx. Qual/Ship Date	Suggested Stocking	MOQ
PF5020									
Y	None	Apr-20	MPF5020AMBA0ES	\$1.63	\$2.01	Apr-20	Apr-20	490	490
	None	Apr-20	MPF5020AMBA0ESR2	\$1.63	\$2.01	Apr-20	Apr-20		4000
Y	None	Apr-20	MPF5020AMMA0ES	\$1.51	\$1.86	Apr-20	Apr-20	490	490
	None	Apr-20	MPF5020AMMA0ESR2	\$1.51	\$1.86	Apr-20	Apr-20		4000
Y	None	Apr-20	MPF5020AVNA0ES	\$2.08	\$1.86	Apr-20	Apr-20	490	490
	None	Apr-20	MPF5020AVNA0ESR2	\$2.08	\$1.86	Apr-20	Apr-20		4000
PF5023									
Y	None	Apr-20	MPF5023AMBA0ES	\$1.69	\$2.08	Apr-20	Apr-20	490	490
	None	Apr-20	MPF5023AMBA0ESR2	\$1.69	\$2.08	Apr-20	Apr-20		4000
Y	None	Apr-20	MPF5023AMMA0ES	\$1.54	\$1.89	Apr-20	Apr-20	490	490
	None	Apr-20	MPF5023AMMA0ESR2	\$1.54	\$1.89	Apr-20	Apr-20		4000
Y	None	Apr-20	MPF5023AVNA0ES	\$2.12	\$1.89	Apr-20	Apr-20	490	490
	None	Apr-20	MPF5023AVNA0ESR2	\$2.12	\$1.89	Apr-20	Apr-20		4000
PF5024									
Y	None	Apr-20	MPF5024AMBA0ES	\$1.92	\$2.37	Apr-20	Apr-20	490	490
	None	Apr-20	MPF5024AMBA0ESR2	\$1.92	\$2.37	Apr-20	Apr-20		4000
Y	None	Apr-20	MPF5024AMMA0ES	\$1.75	\$2.15	Apr-20	Apr-20	490	490
	None	Apr-20	MPF5024AMMA0ESR2	\$1.75	\$2.15	Apr-20	Apr-20		4000
Y	None	Apr-20	MPF5024AVNA0ES	\$2.41	\$2.15	Apr-20	Apr-20	490	490
	None	Apr-20	MPF5024AVNA0ESR2	\$2.41	\$2.15	Apr-20	Apr-20		4000
Evaluation boards									
Y	None	May-20	KITPF5020FRDMEVM	\$151.50	\$151.50	Apr-20	May-20	2	1
Y	None	May-20	KITPF50203RDMEVM	\$151.50	\$151.50	Apr-20	May-20	2	1
Y	None	May-20	KITPF5024FRDMEVM	\$151.50	\$151.50	Apr-20	May-20	2	1
Y	None	May-20	KITPF502xSKTEVM	\$209.40	\$209.40	Apr-20	May-20	2	1

7 Export Compliance

NXP Semiconductors, makes product Export Control Classification Number (ECCN) and Harmonized Tariff Schedule (HTS) classifications available for informational purposes only and the classifications are subject to change without notice. Anyone importing or exporting/re-exporting an NXP item is solely responsible for assuring the ECCN and HTS they use is correct. Further, NXP does not provide guidance regarding the exportability of its products, software or technology. Such questions should be directed to the exporter's internal Trade Compliance organization or legal counsel.

PN	MSL	COO	ECCN	US HTS	CCATS #
PF5020					
MPF5020AMBA0ES	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
MPF5020AMBA0ESR2	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
MPF5020AMMA0ES	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
MPF5020AMMA0ESR2	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
MPF5020AVNA0ES	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
MPF5020AVNA0ESR2	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
PF5023					
MPF5023AMBA0ES	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
MPF5023AMBA0ESR2	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
MPF5023AMMA0ES	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
MPF5023AMMA0ESR2	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
MPF5023AVNA0ES	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
MPF5023AVNA0ESR2	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
PF5024					
MPF5024AMBA0ES	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
MPF5024AMBA0ESR2	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
MPF5024AMMA0ES	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
MPF5024AMMA0ESR2	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
MPF5024AVNA0ES	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
MPF5024AVNA0ESR2	3	TIANJIN	EAR 99	854239 0001 US 854239 1100 EU	N/A
Evaluation boards					
KITPF5020FRDMEVM	-	USA	3A991A2	847150 0150 US 847150 0000 EU	N/A
KITPF50203RDMEVM	-	USA	3A991A2	847150 0150 US 847150 0000 EU	N/A
KITPF5024FRDMEVM	-	USA	3A991A2	847150 0150 US 847150 0000 EU	N/A
KITPF5020xSKTEVM	-	USA	3A991A2	847150 0150 US 847150 0000 EU	N/A

8 Available Documentation

Include direct links to high value assets as well as links to NXP.com, disty extranet and channel launch repository.

Distributor extranet: <https://www.nxp.com/app-distynet/distynet:DISTYNET#/>

NXP.com: <http://www.nxp.com/PF5020>

.....<http://www.nxp.com/PF5023>

.....<http://www.nxp.com/PF5024>

Datasheets AVAILABLE UPON REQUEST-

*Please note that the Channel Launch Repository is for marketing assets like high res block diagram and board photography. This same information is also posted to the "product" launch folder on the distributor extranet for others outside of marketing who may need it.

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