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# Cypress Roadmap: Automotive PMIC Q1 2018



# Automotive PMIC Family Portfolio

		Application-Specific PMIC (ASIC)		General Purpose DC/DC		
		Advanced Driver Assistance System (ADAS)	Instrument Cluster/ Body Electronics	Current Capability (<2 A)	Current Capability (between 2 A and 6 A)	Current Capability (>6 A)
Typical Input Voltage	48 V					<b>Q220</b> <b>Bi-Directional DC/DC</b> Conversion between 48 V and 12 V
	12 V	<b>Q219</b> <b>Radar ADAS PMIC</b> Multi-SMPS, Low-Noise LDO PG, SSCG 12-V $V_{BAT}$ , 4.0-A Output, 40-Pin Side-Wettable QFN	<b>Q318</b> <b>CYBP511A</b> Multi-SMPS <sup>1</sup> , PG <sup>2</sup> , SSCG <sup>3</sup> 12-V $V_{BAT}$ <sup>4</sup> , 2.0-A Output 40-Pin Side-Wettable <sup>5</sup> QFN		<b>NEW</b> <b>Q418</b> <b>S6BP211A</b> Pre-Boost+Buck Converter <sup>6</sup> SSCG, PG, 12-V $V_{BAT}$ 3.3–6.0-V/4-A Output 20-Pin TSSOP	
	5.0 V/3.3 V		<b>S6BP501A/502A</b> 3x SMPS, SSCG, PG 12-V $V_{BAT}$ , 2.0-A Output 32-Pin Side-Wettable QFN	<b>S6BP201A</b> 1x Buck+Boost Converter, PG 12-V $V_{BAT}$ , 5-V/1-A Output 16-Pin TSSOP	<b>S6BP202A/203A</b> 1xBuck+Boost Converter, PG 12-V $V_{BAT}$ , 5-V or 3.3-V/2.4-A Output 16-Pin TSSOP	
		<b>Q220</b> <b>Digital PMIC for Higher Functional Safety</b> Multi-SMPS 3.3-V Input				
		<b>Q319</b> <b>S6BP401A</b> 4x SMPS, 2x LDO, WDT <sup>7</sup> , PG 5-V Input, 3.0-A Output 40-Pin QFN	<b>Q319</b> <b>Camera ADAS PMIC</b> Multi-SMPS, WDT, PG, I <sup>2</sup> C 3.3-V Input, 3.0-A Output, 40-Pin Side-Wettable QFN	<b>Q318</b> <b>CYBP421A</b> Multi-SMPS, PG 3.0–5.5-V Input 3.0-A Output 32-Pin Side-Wettable QFN		<b>Q418</b> <b>CYBP221A</b> 1xBuck Converter, DVS <sup>8</sup> , PG 3.0–5.5-V Input 10-A Output
		Market Segment				

<sup>1</sup> Switch-mode power supply: A general-purpose regulator IC that uses a switching circuit to up-convert and/or down-convert a voltage source to a different voltage for powering other ICs

<sup>2</sup> Power good: An output signal that PMICs provide to signify that the supplied power by PMICs is proper and ready

<sup>3</sup> Spread-spectrum clock generator

<sup>4</sup> Battery voltage

<sup>5</sup> A package whose flanks are processed to improve soldering adherence and to simplify the optical inspection, which follows soldering

<sup>6</sup> A general-purpose regulator IC that integrates power MOSFETs

<sup>7</sup> Watchdog timer

<sup>8</sup> Dynamic voltage scaling

	Concept	Development	Sampling	Production
Industrial				
Automotive				
Availability			QQYY	QQYY



# S6BP20x

## One-Channel Buck-Boost Automotive PMIC

### Applications

Instrument clusters, body electronics and ADAS

### Features

- **1-Channel PMIC:** Synchronous buck-boost converter
- **Wide Input Voltage Range:** 2.5–42 V
- **Low Quiescent Current:** 20  $\mu$ A
- **Programmable Switching Frequency:** 0.2–2.1 MHz
  - Synchronization with external clock from 200 kHz to 400 kHz
  - Autonomous PFM/PWM<sup>1</sup> switching
- **BOM Integration:** Built-in switching transistors
- **System Safety Function<sup>2</sup> Support:**
  - Overvoltage protection (OVP), overcurrent protection (OCP), undervoltage lock-out (UVLO), thermal shutdown (TSD)
  - Window-monitoring voltage supervisors with power good<sup>3</sup> pin
- **Operating Temperature Range:** -40°C to +125°C
- **Package:** 16-pin thermally enhanced TSSOP (5-mm x 6.4-mm)
- **Qualification:** AEC-Q100 Grade-1

### Collateral

**Datasheet:** [S6BP201A](#), [S6BP202A](#) and [S6BP203A](#)

**Evaluation Kit:** [S6BP201A](#), [S6BP202A](#) and [S6BP203A](#)

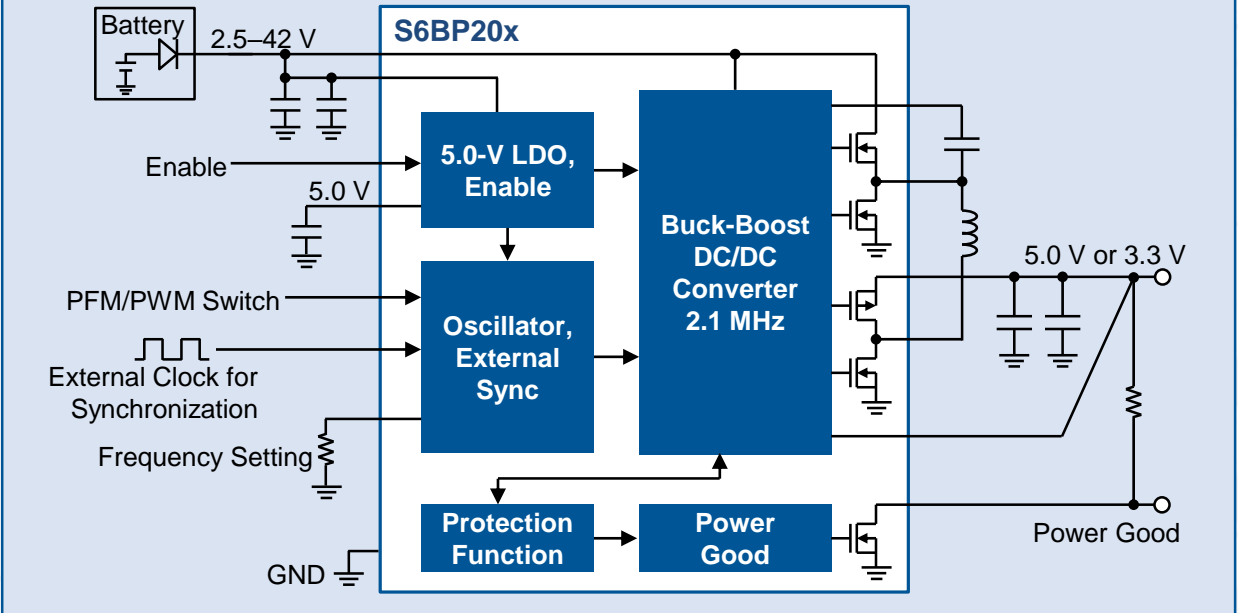
<sup>1</sup> Pulse-frequency modulation/pulse-width modulation

<sup>2</sup> A set of system functions that protect ECUs from damage and/or from generating erroneous results during abnormal power supply conditions

<sup>3</sup> An output signal that PMICs provide to signify that the supplied power by PMICs is proper and ready

<sup>4</sup> S6BP201A and S6BP202A have factory-selectable options of output voltage, power-on-reset time, UVP/OVP threshold, and SYNC Function

### S6BP20x: One-Channel Buck-Boost Automotive PMIC



### Family Table

Output Voltage <sup>4</sup>	Max. Output Current	MPN	UVP/OVP Threshold
5.0–5.2 V	1.0 A	S6BP201A	±4.5%
5.0–5.2 V	2.4 A	S6BP202A	±4.5%, ±8.0%
3.3 V	2.4 A	S6BP203A	±8.0%

### Availability

**Sampling:** Now    **Production:** Now



# S6BP50x

## Three-Channel Automotive PMIC

### Applications

Low-end to mid-range hybrid automotive cluster systems

### Features

- **3-Channels:** Buck controller with load switch, boost converter, buck converter
- **Wide Range Input:** 2.5-42 V
- **Low Quiescent Current:** 15  $\mu$ A
- **High Switching Frequency:**
  - Boost converter and buck converter: 2.1 MHz
  - Built-in spread-spectrum clock generator (SSCG)
  - Synchronization with external clock from 1.8–2.4 MHz
- **System Safety Function<sup>1</sup> Support:**
  - Overvoltage protection (OVP), overcurrent protection (OCP), undervoltage lock-out (UVLO), thermal shutdown (TSD)
  - Thermal warning
  - Window-monitoring voltage supervisors with independent power good<sup>2</sup> pins
- **Operating Temperature Range:** -40°C to +105°C
- **Package:** 32-pin thermally enhanced side-wettable<sup>3</sup> QFN (5-mm x 5-mm)
- **Qualification:** AEC-Q100 Grade-2

### Collateral

**Preliminary Datasheet:** [S6BP501A/S6BP502A](#)

**Evaluation Kit:** [S6SBP501A00VA1001/S6SBP502A00VA1001](#)

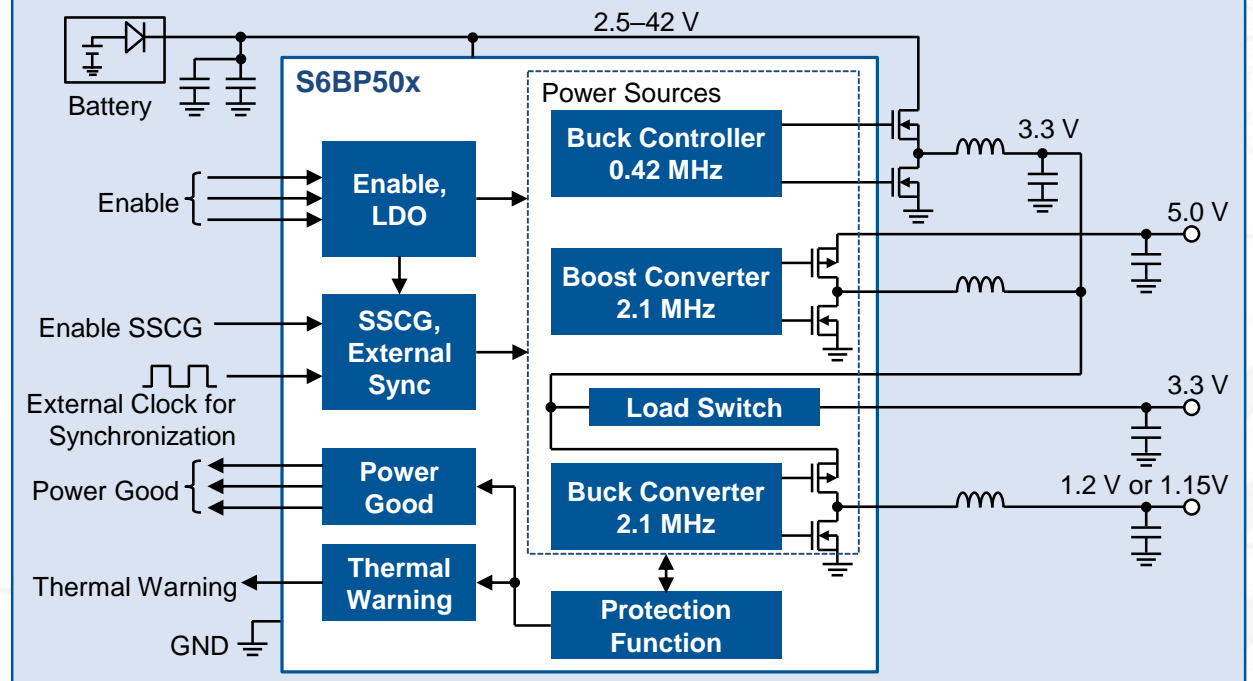
<sup>1</sup> A set of system functions that protect ECUs from damage and/or from generating erroneous results during abnormal power supply conditions

<sup>2</sup> An output signal that PMICs provide to signify that the supplied power by PMICs is proper and ready

<sup>3</sup> A package whose flanks are processed to improve soldering adherence and to simplify the optical inspection, which follows soldering

<sup>4</sup> Output voltages are finely adjustable with external resistive dividers

### S6BP50x: Three-Channel Automotive PMIC



### Family Table

Buck Converter Output Specification <sup>4</sup>	MPN	Buck Controller Output Specification	Boost Converter Output Specification
1.15 V, 1.4 A	S6BP501A	3.3 V, 1.6 A	5.0 V, 1.3 A
1.2 V, 2.0 A	S6BP502A	3.3 V, 1.9 A	5.0 V, 1.3 A

### Availability

**Sampling:** Now    **Production:** Now

# S6BP401A

## Six-Channel Automotive PMIC

### Applications

Advanced driver assistance systems (ADAS), security camera systems

### Features

- **6-Channel PMIC:** 4-channel buck converters, 2-channel LDOs
- **Input Voltage Range:** 4.5–5.5 V
  - Input voltage for LDO: 1.62–5.5 V
- **High Switching Frequency:** 2.1 MHz
  - Synchronization with external clock from 1.8–2.4 MHz
- **BOM Integration:**
  - Switching transistors, voltage setting resistors, and compensation circuitry
- **System Safety Function<sup>1</sup> Support:**
  - Overvoltage protection (OVP), overcurrent protection (OCP), undervoltage lock-out (UVLO), thermal shutdown (TSD)
  - Window-monitoring voltage supervisors with independent power good<sup>2</sup> pins
  - Built-in windowed watchdog timer (WDT)
  - Independent enable pins
- **Operating Temperature Range:** -40°C to +125°C
- **Package and Qualification:** 40-pin QFN (6-mm x 6-mm), AEC-Q100 Grade-1

### Collateral

Datasheet: [S6BP401A](#)

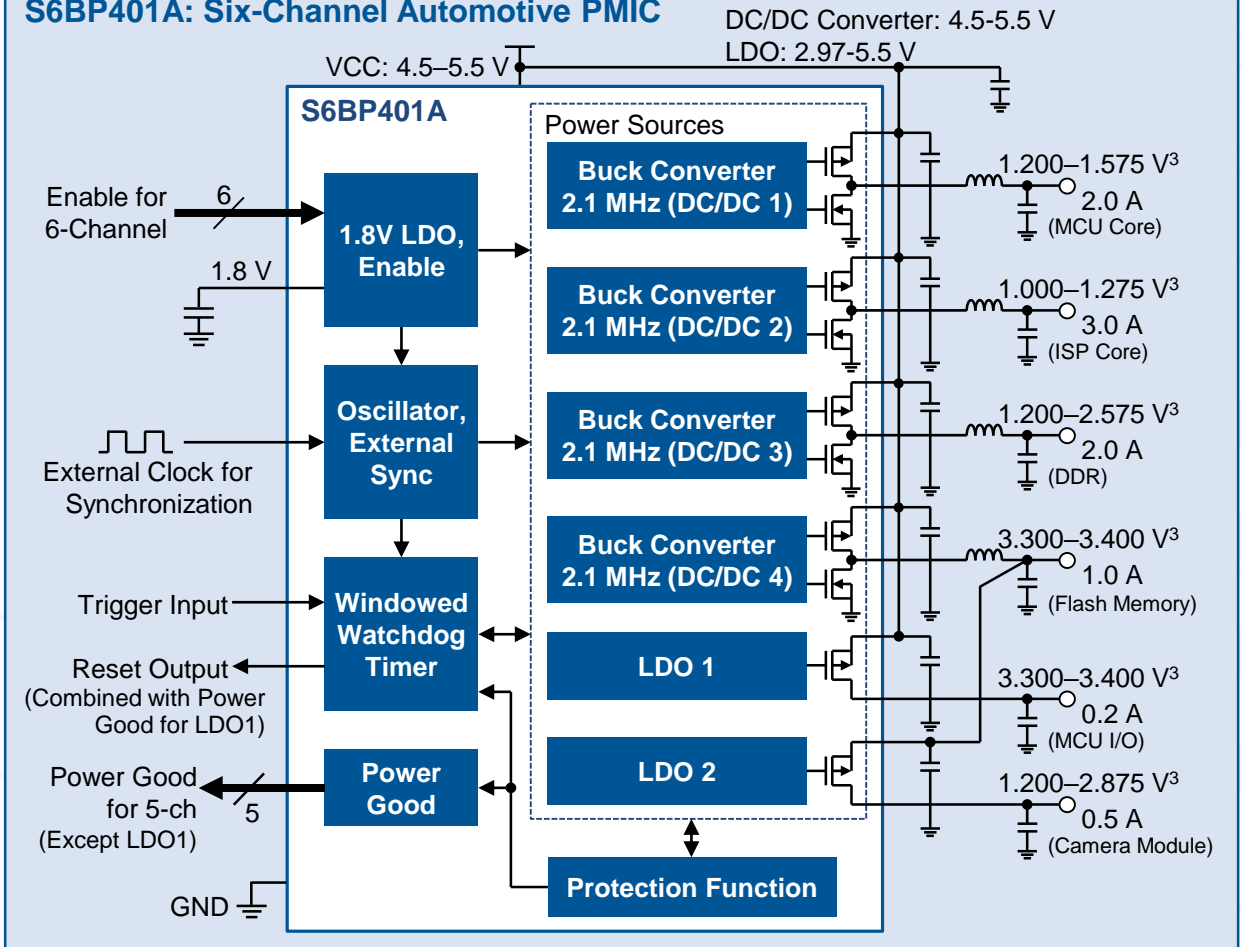
Evaluation Kit: [S6SBP401AJ0SA1001](#), [S6SBP401AM2SA1001](#)

<sup>1</sup> A set of system functions that protect ECUs from damage and/or from generating erroneous results during abnormal power supply conditions

<sup>2</sup> An output signal that PMICs provide to signify that the supplied power by PMICs is proper and ready

<sup>3</sup> S6BP401A has factory-selectable options of output voltage for each channel

### S6BP401A: Six-Channel Automotive PMIC



### Availability

Sampling: Now    Production: Now

# Compatibility with Traveo™ MCU

		Cypress Automotive PMIC for Traveo MCU				
		S6BP201A (5V/1A)	S6BP202A (5V/2.4A)	S6BP203A (3.3V/2.4A)	S6BP501A (5V, 3.3V, 1.15V/1.4A)	S6BP502A (5V, 3.3V, 1.2V/2.0A)
Traveo MCU for Instrument Cluster	S6J3120 Series (Virgo)	✓	✓			
	S6J3300 Series (Jupiter, Minerva)	✓	✓			
	S6J3300 Series (Juno, Artemis)				✓	✓
	S6J3200 Series (Amber, Amethyst)					✓
Traveo MCU for Body Control	S6J3110 Series (Leo, Aries)	✓	✓			
	S6J3400 Series (Athena)	✓	✓	✓		
	S6J3500 Series (Harmonia)	✓	✓	✓		
	S6J3350 Series (Neptune)				✓	✓



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