



# Cypress Roadmap: Automotive PMIC

Q2 2019



# Automotive PMIC Family Portfolio

	Single-channel PMIC	Multi-Channel PMIC Instrument Cluster & Body, ADAS (works with Cypress Traveo/Traveo II)
12 V ↑ Typical Input Voltage	<b>S6BP203A</b> $V_{BAT} \rightarrow 3.3V\ 2.4A$ , 2-MHz Buck-Boost <sup>2</sup> , PG <sup>3</sup> , 16-Pin TSSOP	<b>S6BP502A</b> $V_{BAT} \rightarrow 5.0V / 3.3 / 1.1V\ (2.0A)$ , 400-kHz Buck <sup>4</sup> , 2-MHz Buck, 2-MHz Boost <sup>5</sup> , PG, SSCG <sup>6</sup> , HOT <sup>7</sup> , 32-Pin wettable QFN <sup>8</sup>
	<b>S6BP202A</b> $V_{BAT} \rightarrow 5.0V\ (2.4A)$ , 2-MHz Buck-Boost, PG, 16-Pin TSSOP	
	<b>S6BP201A</b> $V_{BAT} \rightarrow 5.0V\ (1.0A)$ 2-MHz Buck-Boost, PG 16-Pin TSSOP	<b>S6BP501A</b> $V_{BAT} \rightarrow 5.0V / 3.3 / 1.1V\ (1.4A)$ , 400-kHz Buck, 2-MHz Buck, 2-MHz Boost, PG, SSCG, HOT, 32-Pin wettable QFN
5.0 V / 3.3 V		<b>S6BP401A</b> 5V $\rightarrow$ six output rails, 2-MHz Buck x4, LDO x2, PG, WDT <sup>9</sup> , 40-Pin QFN

<sup>1</sup> Lead-acid battery whose typical voltage is 12V.

<sup>2</sup> Topology to supply stable output regardless of input variation

<sup>3</sup> Power-Good signal output

<sup>4</sup> Step-down voltage regulator

<sup>5</sup> Step-up voltage regulator

<sup>6</sup> Spread-spectrum clock generator which deliberately varies the internal clock signal frequency to lower the electromagnetic radiation

<sup>7</sup> Hard pin output that indicates the die is getting hot

<sup>8</sup> QFN packages whose pin is processed so that the solder fillet would form between the pin and pad

<sup>9</sup> Watchdog timer



# S6BP20xA

## 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](#)

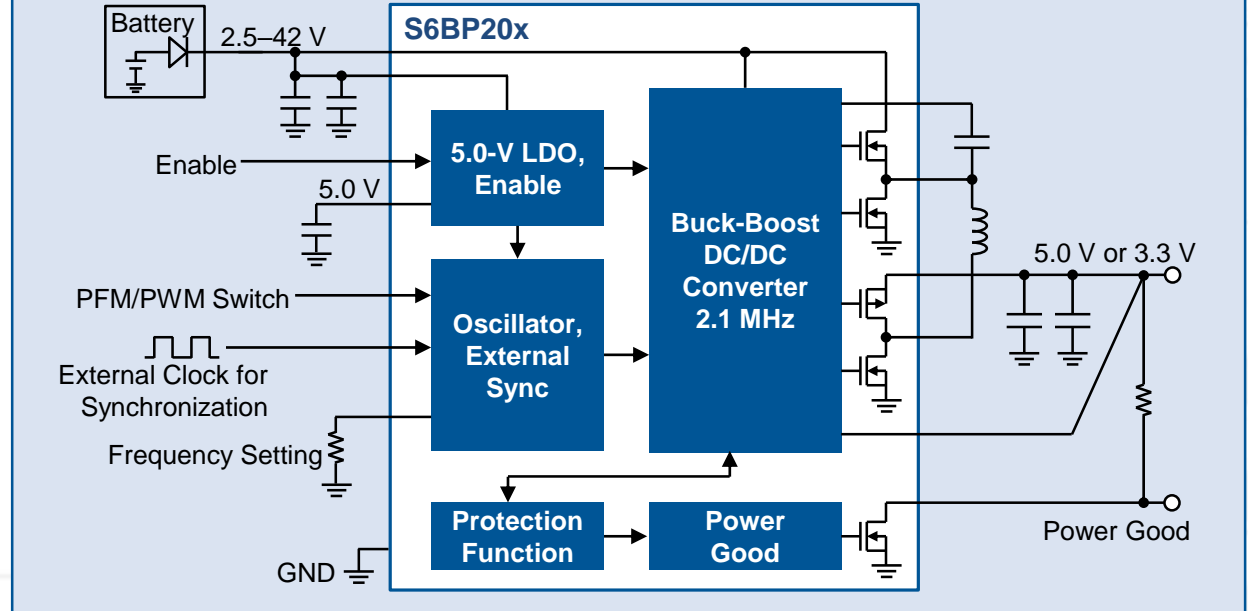
<sup>1</sup> Pulse-frequency modulation / pulse-width modulation

<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 overview



### 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



# S6BP50xA

## 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](#)

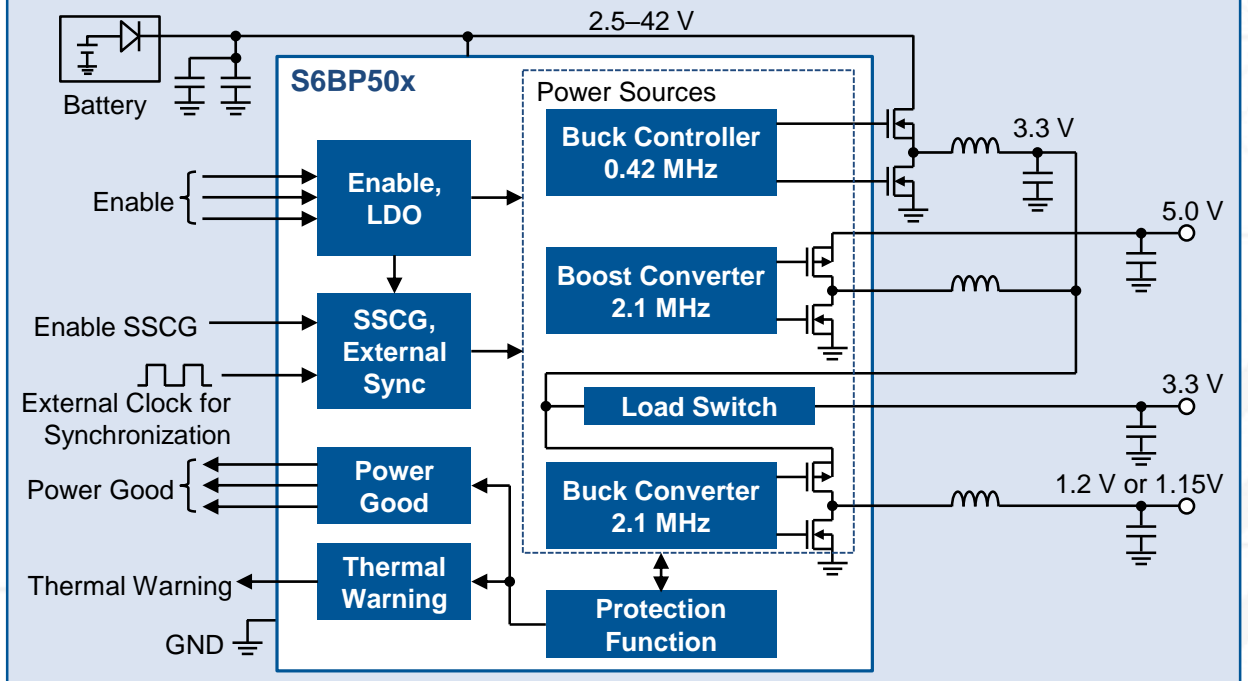
<sup>1</sup> A set of system functions that protect ECUs from damage and/or from generating erroneous results during abnormal power supply conditions

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

<sup>3</sup> QFN packages whose pin is processed so that the solder fillet would form between the pin and pad

<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](#)

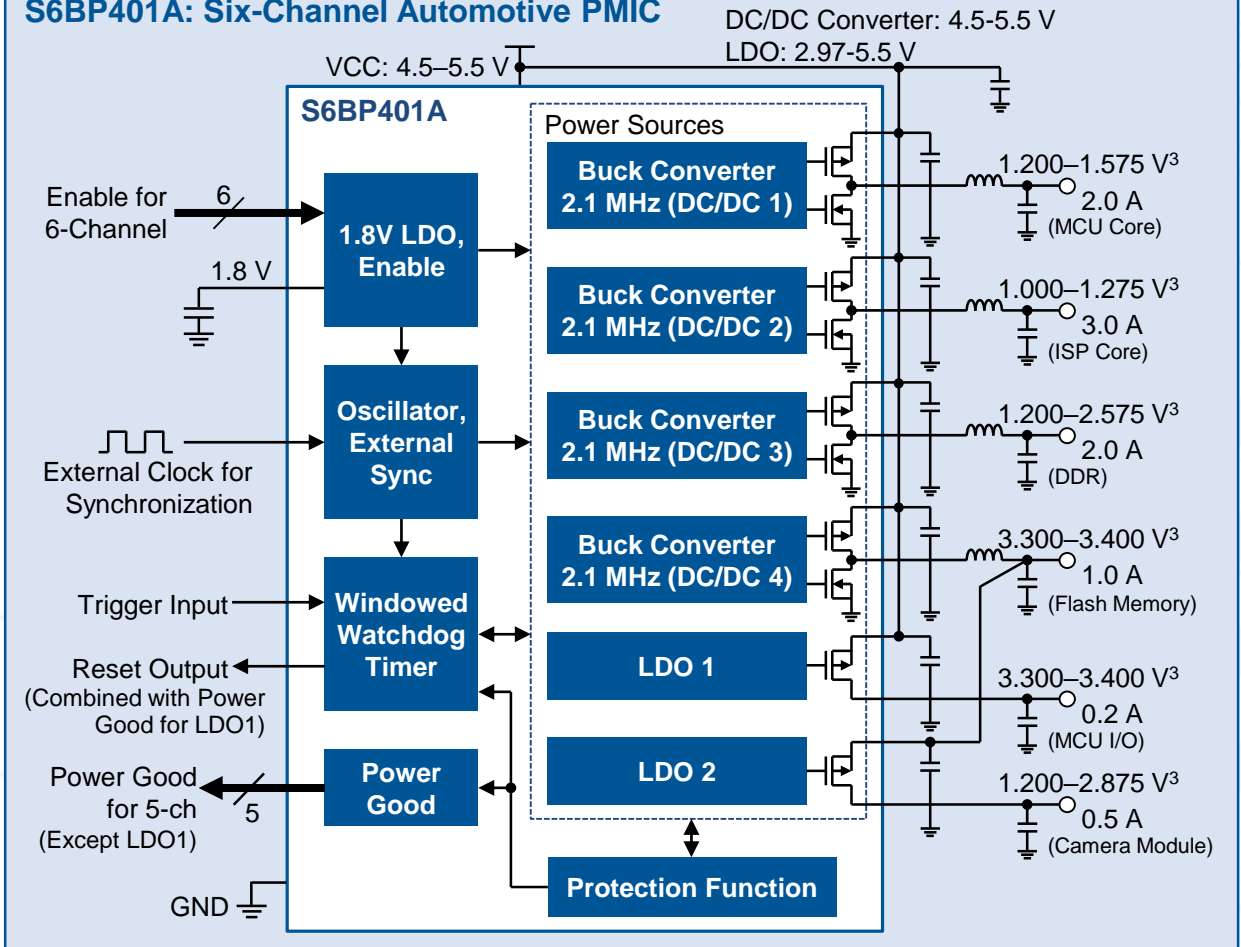
Evaluation Kit: [S6SBP401AJ0SA1001](#), [S6SBP401AM2SA1001](#)

<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				
		S6BP201A	S6BP202A	S6BP203A	S6BP501A	S6BP502A
Traveo MCU for Instrument Cluster	S6J3120	✓	✓			
	S6J3300	✓	✓			
	S6J3300				✓	✓
	S6J3200)					✓
Traveo MCU for Body Control	S6J3110	✓	✓			
	S6J3400	✓	✓	✓		
	S6J3500	✓	✓	✓		
	S6J3350				✓	✓



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