



S6SBP201A1AVA1001

S6SBP202A1FVA1001

S6SBP203A8FVA1001

# Automotive PMIC Evaluation Kit Operation Manual

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# Preface



This manual explains how to use the evaluation board. Be sure to read this manual before using the product. For this product, please consult with sales representatives or support representatives.

## **Handling and Use**

Handling and use of this product and notes regarding its safe use are described in the manuals.

Follow the instructions in the manuals to use this product.

Keep this manual at hand so that you can refer to it anytime during use of this product.

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Please confirm the latest relevant information with the sales representatives.


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### Caution of the Products Described in this Document

The following precautions apply to the product described in this manual.

 <b>WARNING</b>	<p>Indicates a potentially hazardous situation which could result in death or serious injury and/or a fault in the user's system if the product is not used correctly.</p>
--------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<b>Electric Shock, Damage</b>	<p>Before performing any operation described in this manual, turn off all the power supplies to the system. Performing such an operation with the power on may cause an electric shock or device fault.</p>
<b>Electric Shock, Damage</b>	<p>Once the product has been turned on, do not touch any metal part of it. Doing so may cause an electric shock or device fault.</p>

 <b>CAUTION</b>	<p>Indicates the presence of a hazard that may cause a minor or moderate injury, damages to this product or devices connected to it, or may cause to loose software resources and other properties such as data, if the device is not used appropriately.</p>
--------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<b>Cuts, Damage</b>	<p>Before moving the product, be sure to turn off all the power supplies and unplug the cables. Watch your step when carrying the product. Do not use the product in an unstable location such as a place exposed to strong vibration or a sloping surface. Doing so may cause the product to fall, resulting in an injury or fault.</p>
<b>Cuts</b>	<p>The product contains sharp edges that are left unavoidably exposed, such as jumper plugs. Handle the product with due care not to get injured with such pointed parts.</p>
<b>Damage</b>	<p>Do not place anything on the product or expose the product to physical shocks. Do not carry the product after the power has been turned on. Doing so may cause a malfunction due to overloading or shock.</p>
<b>Damage</b>	<p>Since the product contains many electronic components, keep it away from direct sunlight, high temperature, and high humidity to prevent condensation. Do not use or store the product where it is exposed to much dust or a strong magnetic or electric field for an extended period of time. Inappropriate operating or storage environments may cause a fault.</p>
<b>Damage</b>	<p>Use the product within the ranges given in the specifications. Operation over the specified ranges may cause a fault.</p>
<b>Damage</b>	<p>To prevent electrostatic breakdown, do not let your finger or other object come into contact with the metal parts of any of the connectors. Before handling the product, touch a metal object (such as a door knob) to discharge any static electricity from your body.</p>
<b>Damage</b>	<p>When turning the power on or off, follow the relevant procedure as described in this document. Before turning the power on, in particular, be sure to finish making all the required connections. Furthermore, be sure to configure and use the product by following the instructions given in this document. Using the product incorrectly or inappropriately may cause a fault.</p>
<b>Damage</b>	<p>Because the product has no casing, it is recommended that it be stored in the original packaging. Transporting the product may cause a damage or fault. Therefore, keep the packaging materials and use them when re-shipping the product.</p>

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# Details



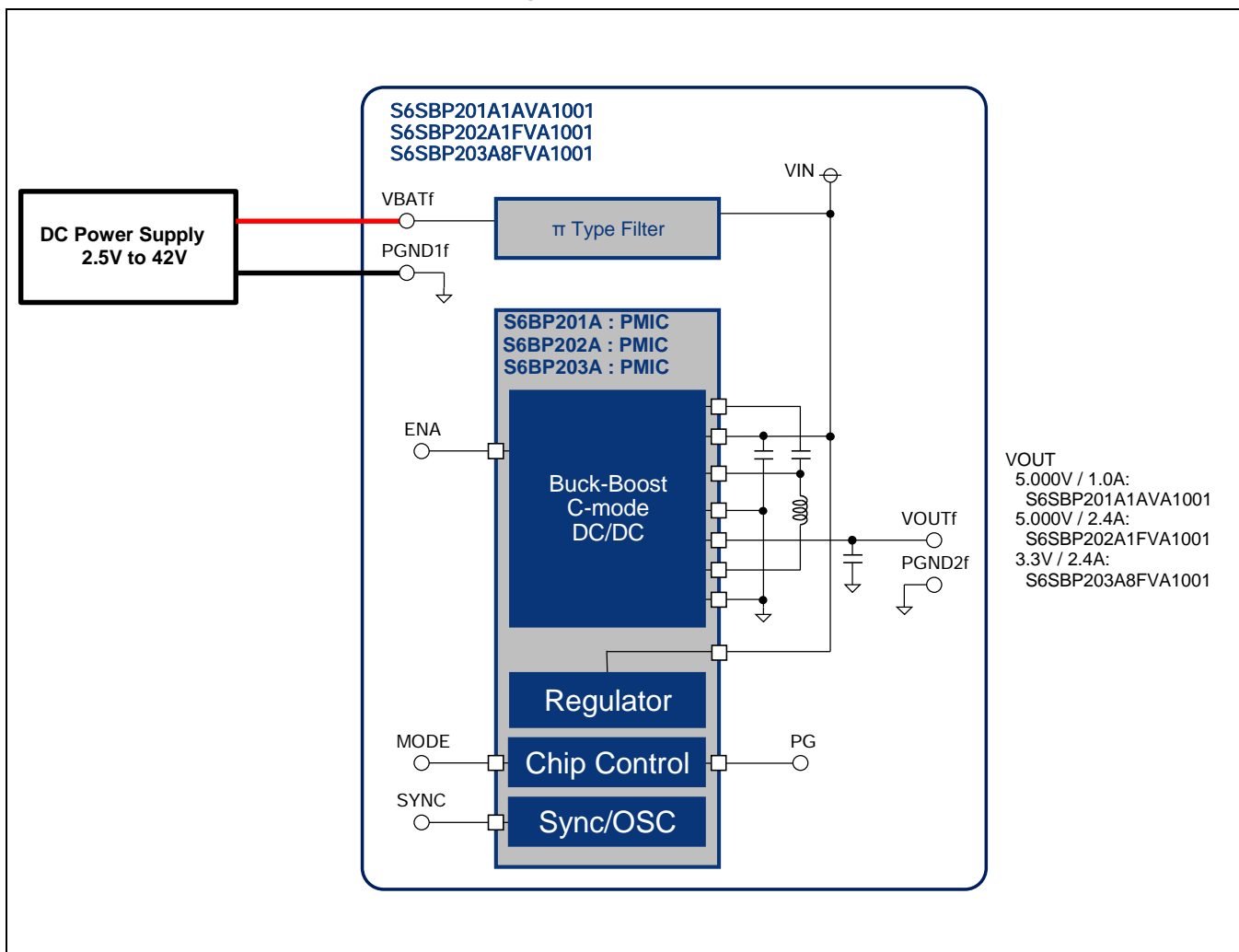
## 1. Description

S6SBP201A1AVA1001, S6SBP202A1FVA1001 and S6SBP203A8FVA1001 are the evaluation kit for primary power block of automotive.

These boards implement power management IC S6BP201A, S6BP202A, S6BP203A each.

It is necessary to prepare DC power supply.

Figure 1 Board Outline



## 2. Evaluation Board Specification

Table 1 Evaluation Board Specification

	Item	Symbol	Min.	Typ.	Max.	Unit
S6SBP201A1AVA1001	Input Voltage	VIN	2.5	12	42	V
	Output Voltage	VOUT	-	5.0	-	V
	Output Current	IOUT	-	-	1.0	A
S6SBP202A1FVA1001	Input Voltage	VIN	2.5	12	42	V
	Output Voltage	VOUT	-	5.0	-	V
	Output Current	IOUT	-	-	2.4	A
S6SBP203A8FVA1001	Input Voltage	VIN	2.5	12	24	V
	Output Voltage	VOUT	-	3.3	-	V
	Output Current	IOUT	-	-	2.4	A

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### 3. Pin Descriptions

#### 3.1 Input/Output Pin Descriptions

**Table 2 Input/Output Pin Descriptions**

Connector Symbol	I/O	Function Description
VBATf	I	DC power supply terminal
VOUTf	O	DC/DC converter output terminal
ENA	I	DC/DC converter enable terminal
MODE	I	PFM/PWM mode control terminal
SYNC	I	External clock input terminal
PG	O	DC/DC converter power good terminal
PGND1f,PGND2f	-	Ground terminal

#### 3.2 Jumper Descriptions

**Table 3 Jumper Descriptions**

Jumper	Description	Initial Setting
JP1	Shorted between VIN and ENA pin JP1 Short: ENA pin is set to the H level. JP1 Open: ENA pin is set to the L level. Input external signal to ENA pin. Don't input external signal to EN1 pin with shorted JP1.	Open
JP3	Shorted between VOUTf and MODE pin JP3 Short: Fixed PWM operation. JP3 Open: Automatic PWM/PFM switching operation. Don't input external signal to MODE pin with shorted JP3. In case of providing external clock to SYNC, the mode is fixed PWM operation.	Open

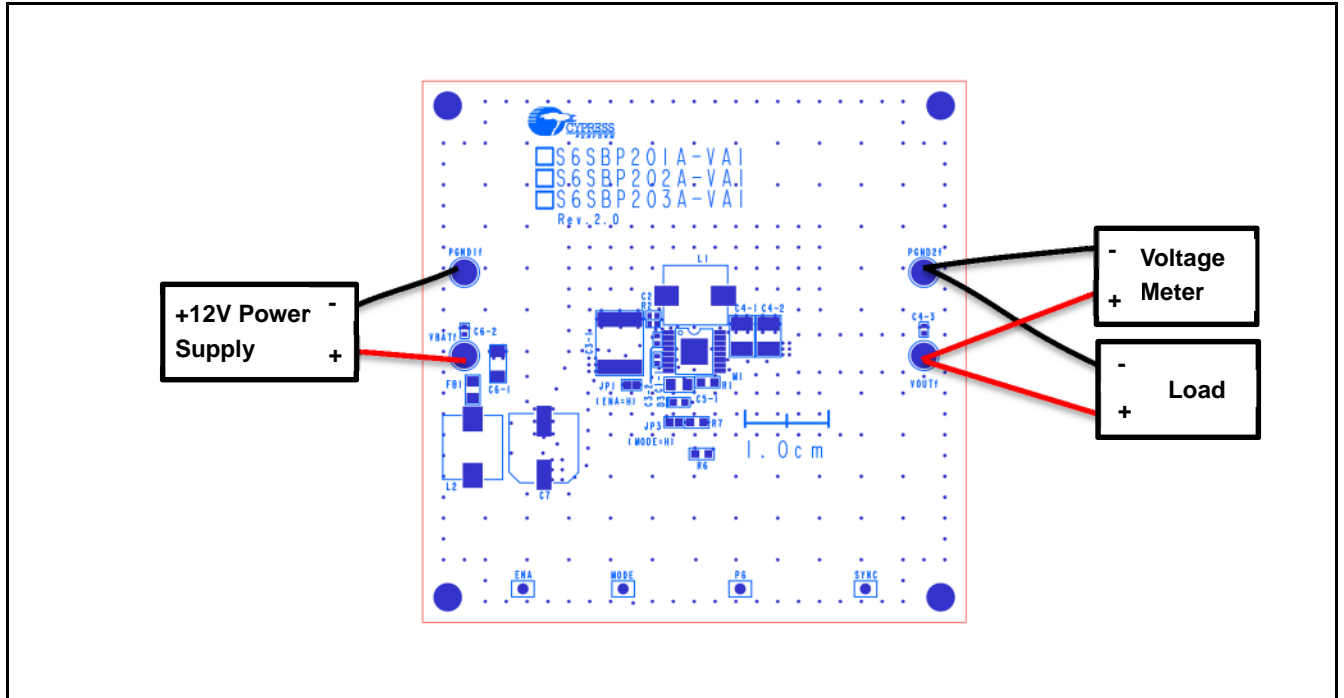


## 4. Setup

### 4.1 Connecting

1. Connect the board to the power supply, load equipment and voltage meter as below.

Figure 2 Connecting the Board and Some Equipment



### 4.2 Verification

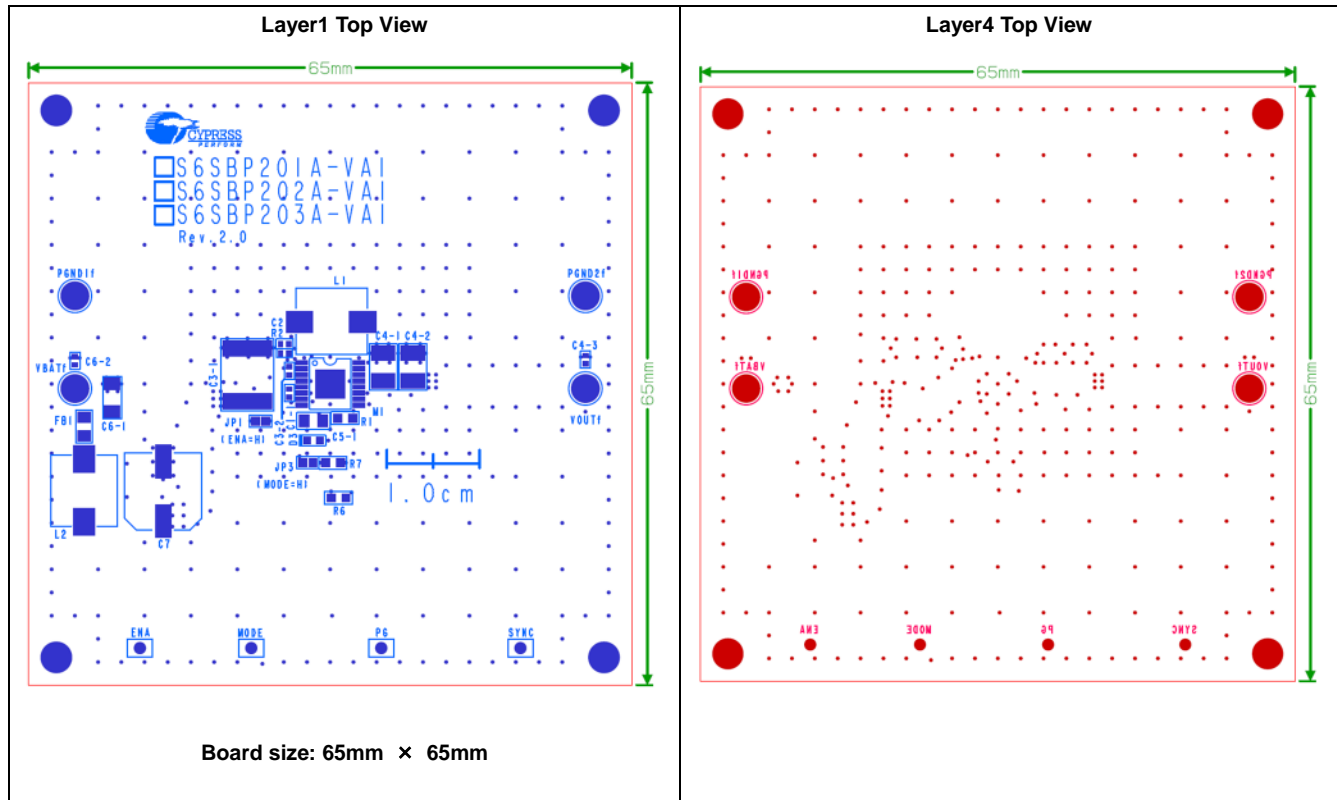
1. Connect ENA pin to PGND1f, then, turn on +12V power supply.
2. Connect ENA pin to VBATf, then, DC/DC converter will start output.
3. Check that VOUTf is the same as the 'Output Voltage' of Figure 2-1 Evaluation Board Specification.

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## 5. Layout

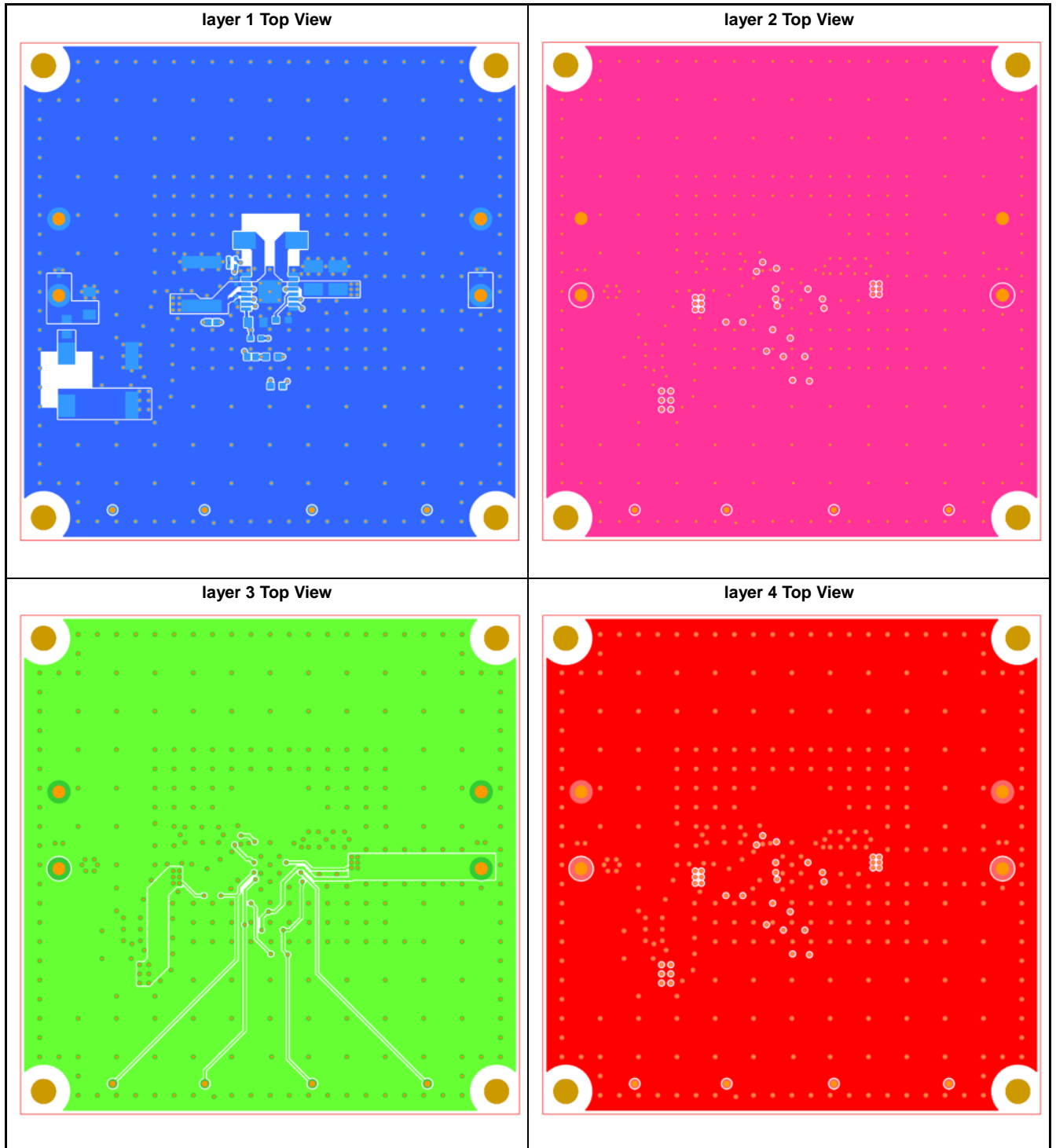
### 5.1 Component Layout

Figure 3 Evaluation Board Component Layout



## 5.2 Wiring Layout

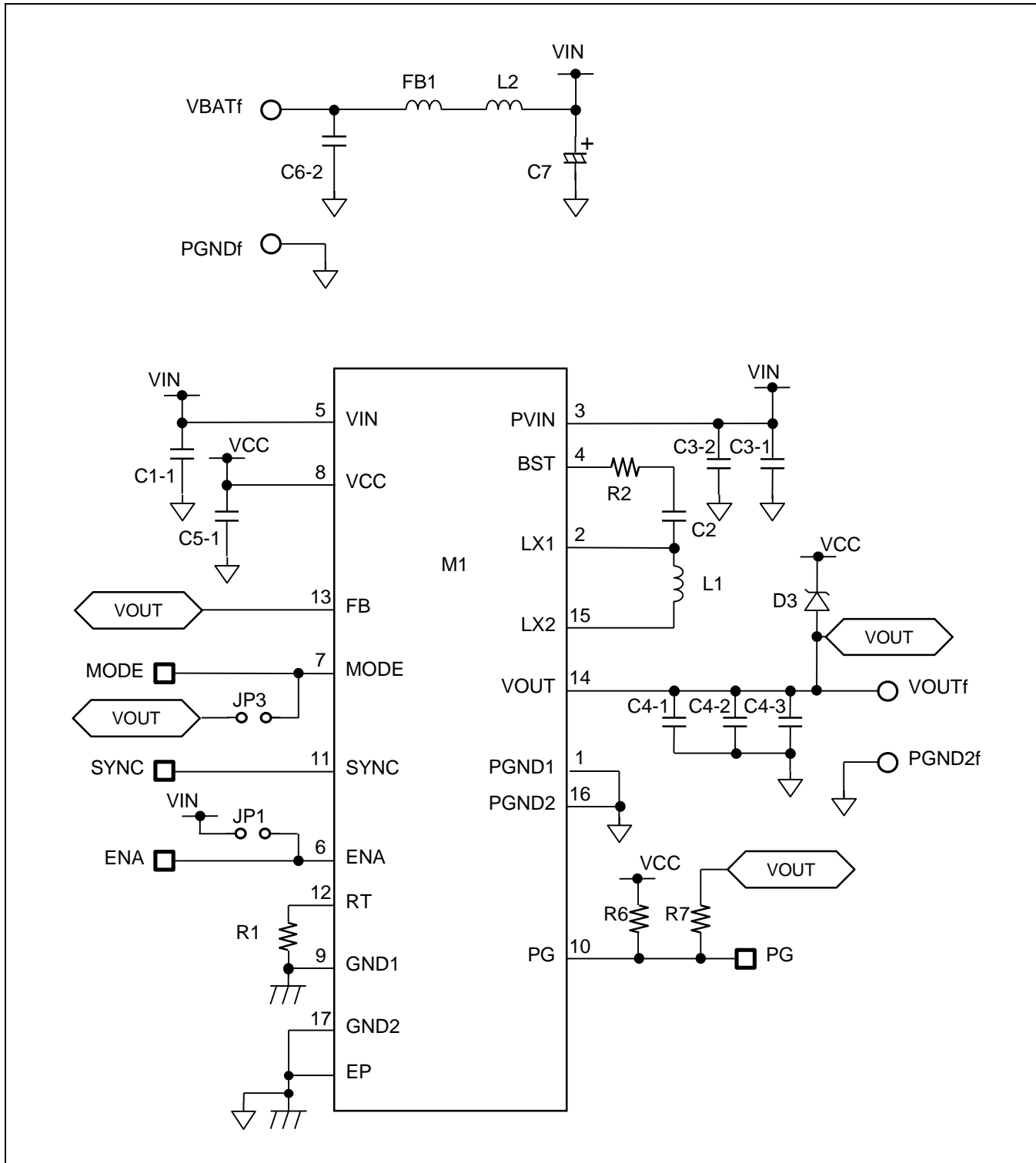
Figure 4 Evaluation Board Wiring Layout



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## 6. Circuit Schematic

Figure 5 Evaluation Board Circuit Schematic



## 7. Component List

Table 4 Evaluation Board Component List

No.	Component	Parts Number	Vendor	Value	Rated Voltage(V)	Rated Current(A)	Remarks
1	C1-1	CGA2B3X7R1H104K050BB	TDK	0.1 $\mu$ F	50	-	-
2	C2	CGA2B3X7R1H104K050BB	TDK	0.1 $\mu$ F	50	-	-
3	C3-1	CGA9N3X7R1H106K230KB	TDK	10 $\mu$ F	50	-	-
4	C3-2	CGA2B3X7R1H104K050BB	TDK	0.1 $\mu$ F	50	-	-
5	C4-1	CGA6P1X7R1C226M250AC	TDK	22 $\mu$ F	16	-	-
6	C4-2	CGA6P1X7R1C226M250AC	TDK	22 $\mu$ F	16	-	-
7	C4-3	CGA2B3X7R1H104K050BB	TDK	0.1 $\mu$ F	50	-	-
8	C5-1	CGA4J3X7R1C475K125AB	TDK	4.7 $\mu$ F	16	-	-
9	C6-1	CGA5L3X7R1H475K160AB	TDK	4.7 $\mu$ F	50	-	-
10	C6-2	CGA2B3X7R1H104K050BB	TDK	0.1 $\mu$ F	50	-	-
11	C7	-	-	-	-	-	NMT
12	D3	-	-	-	-	-	S6SBP201A1AVA1001, S6SBP202A1FVA1001 NMT
		RB521S30T1G	ON Semi	-	30	0.2	S6SBP203A8FVA1001
13	FB1	RK73Z2A	KOA	0 $\Omega$	-	2	-
14	L1	CLF7045T-2R2N-D	TDK	2.2 $\mu$ H	-	7.3	-
15	L2	CLF7045T-4R7N-D	TDK	4.7 $\mu$ H	-	3.6	-
16	M1	S6BP201A1AST2B000	Cypress	-	-	-	S6SBP201A1AVA1001
		S6BP202A1FST2B000					S6SBP202A1FVA1001
		S6BP203A8FST2B000					S6SBP203A8FVA1001
17	R1	RK73H1JT2D2202F	KOA	22 k $\Omega$	-	-	-
18	R2	RK73Z1E	KOA	0 $\Omega$	-	1	-
19	R6	-	-	-	-	-	NMT
20	R7	RK73H1JT2D1003F	KOA	100 k $\Omega$	-	-	-

TDK : TDK Corporation  
 ON Semi : ON Semiconductor  
 KOA : KOA Corporation  
 Cypress : Cypress Semiconductor Corp

NMT: No mount.

These components are compliant with RoHS, and please ask each vendor for details if necessary.

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## 8. Ordering Information

Table 5 Ordering Information

Part Number	EVB Revision	Note
S6SBP201A1AVA1001	S6SBP201A-VA1	Mounted IC: S6BP201A1AST2B000
S6SBP202A1FVA1001	S6SBP202A-VA1	Mounted IC: S6BP202A1FST2B000
S6SBP203A8FVA1001	S6SBP203A-VA1 Rev 2.0	Mounted IC: S6BP203A8FST2B000

# Revision History



## Document Revision History

Document Title: S6SBP201A1AVA1001, S6SBP202A1FVA1001, S6SBP203A8FVA1001 Automotive PMIC Evaluation Kit Operation Manual			
Document Number: 002-08763			
Revision	ECN No.	Origin of Change	Description of Change
**	-	TAOA	New Specification
*A	5085048	TAOA	Updated Table "Evaluation Board Specification "