MB39C031-EVBSK-01

2ch Buck DC/DC + LDO Evaluation Board Operation Guide

Doc. No. 002-08724 Rev. *B

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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.

Notice on this document

All information included in this document is current as of the date it is issued. Such information is subject to change without any prior notice.

Please confirm the latest relevant information with the sales representatives.

Cautions

Caution of the products described in this document

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

⚠ **WARNING**	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.

Electric shock, **Damage**	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.
Electric shock, **Damage**	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.

⚠ **CAUTION**	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 lose software resources and other properties such as data, if the device is not used appropriately.

Cuts, Damage	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.
Cuts	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.
Damage	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.
Damage	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.
Damage	Use the product within the ranges given in the specifications. Operation over the specified ranges may cause a fault.
Damage	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.

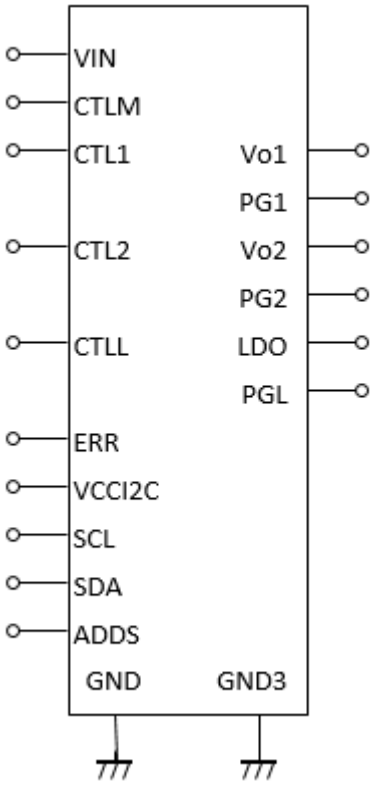
Damage	When turning the power on or off, follow the relevant procedure as described in this document. Before turning the power on, in particular, be sure to finish making all the required connections. Furthermore, be sure to configure and use the product by following the instructions given in this document. Using the product incorrectly or inappropriately may cause a fault.
Damage	Always turn the power off before connecting or disconnecting any cables from the product. When unplugging a cable, unplug the cable by holding the connector part without pulling on the cable itself. Pulling the cable itself or bending it may expose or disconnect the cable core, resulting in a fault.
Damage	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.

Contents

1. Description

The MB39C031-EVB-01 is the evaluation board for 2ch Buck DC/DC + 1ch LDO, MB39C031. This board implements MB39C031: Option-code 142, and output preset voltage DD1:1.2V, DD2:1.8V, LDO:3.3V or selectable voltage controlled by I^2C communication. This board implements our MCU : FM3(MB9AF312K) and can select the soft-start time, ON/OFF sequence, PFM/PWM mode easily with I^2C communication using windows PC and prepared software.

Figure 1-1. Board Outline



2. Evaluation Board Specification

Table 2-1. Evaluation Board Specification

Item	Symbol	Min.	Typ.	Max.	Unit
Input voltage	VIN	2.5	3.6	5.5	V
Output voltage	Vo1	0.99	1.00	1.01	V
Output current	Io1	-	-	1400	mA
Output voltage	Vo2	1.78	1.80	1.82	V
Output current	Io2	-	-	600	mA
Output voltage	LDO	3.24	3.30	3.36	V
Output current	Io3	-	-	250	mA

Board size: 27.94mm × 27.94mm

3. Pin Description

Table 3-1. Pin Description

Block	Pin symbol	I/O	Function Description
DD1	Vo1	O	DD1 output terminal
	PG1	O	DD1 POWERGOOD output monitor terminal
DD2	Vo2	O	DD2 output terminal
	PG2	O	DD2 POWERGOOD output monitor terminal
LDO	LDO	O	LDO output terminal
	PGL	O	LDO POWERGOOD output monitor terminal
CTL	CTL1	I	DD1 control terminal
	CTL2	I	DD2 control terminal
	CTLL	I	LDO control terminal
	CTLMAIN	I	Control terminal for common block and MCU block
ERR	ERR	O	ERR signal output terminal
I^2C	VCCI2C	I	Power supply terminal for I^2C.
	SCL	I	I^2C clock terminal
	SDA	I/O	I^2C data I/O terminal
	ADDSEL	I	Switch terminal for slave address
COMMON	VIN	I	Control circuit block power supply terminal
	GND	-	Control circuit block ground terminal
	GND3	-	Control circuit block ground terminal

3.1 Jumper, Switch Descriptions

Table 3-2. Jumper, Switch Descriptions

Jumper, Switch	Description	Initial Setting
JP1	Short VIN terminal and VBUS pin (2 pin)	Open

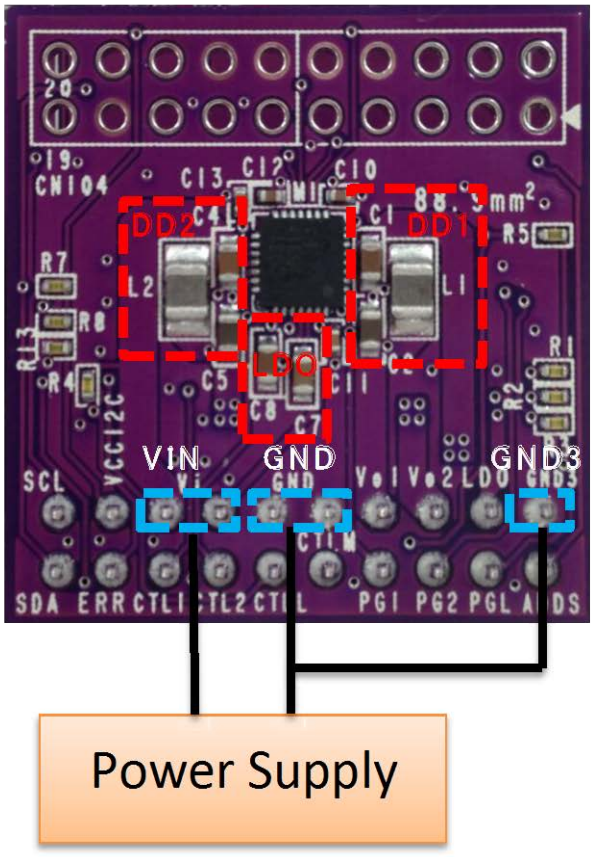
4. Setup and Checkup

MB39C031 preset value can be evaluated with stabilized power supply.

* : CTLM, CTL1, CTL2, CTLL

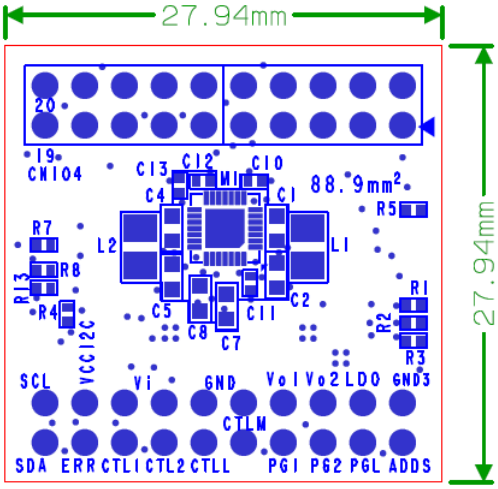
1. 3.3V is applied to VIN terminal.
2. CTLM, CTL1, CTL2, CTLL are connected to VIN terminal.
3. Vo1:1.0V, Vo2:1.8V, Vo3:3.3V is output.

Figure 4-1. Image of Connection



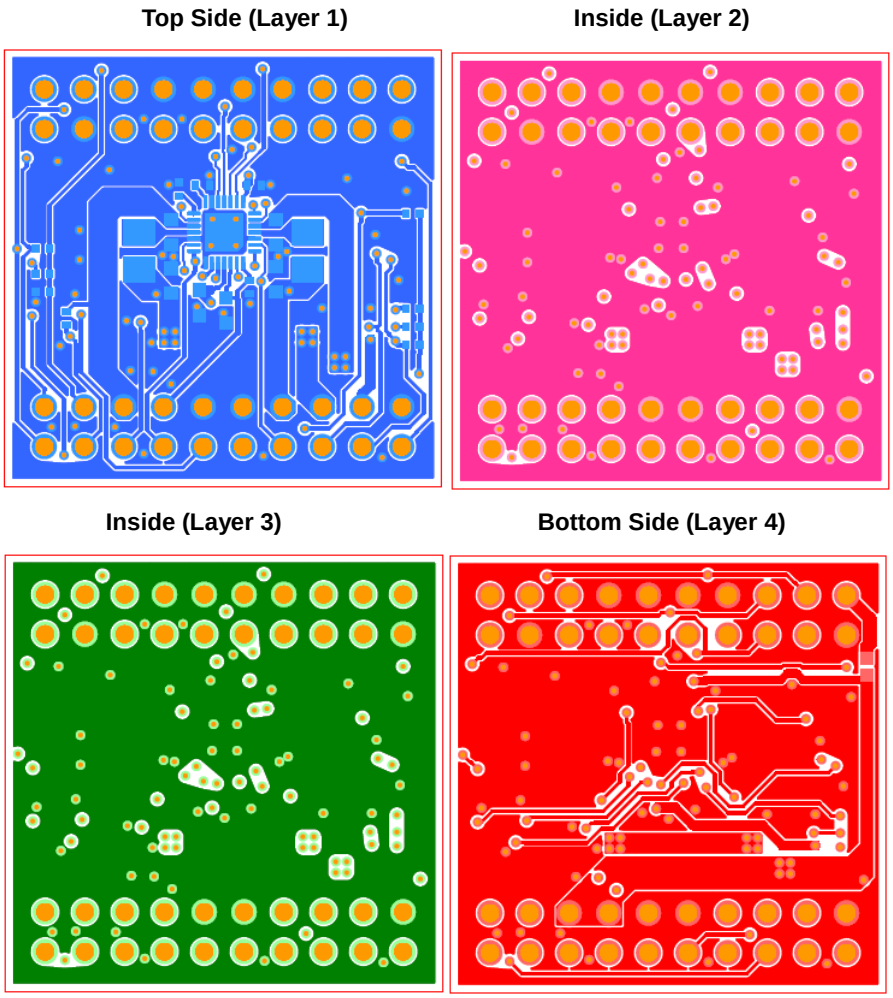
5. Component Layout

Figure 5-1. Component Layout Top View



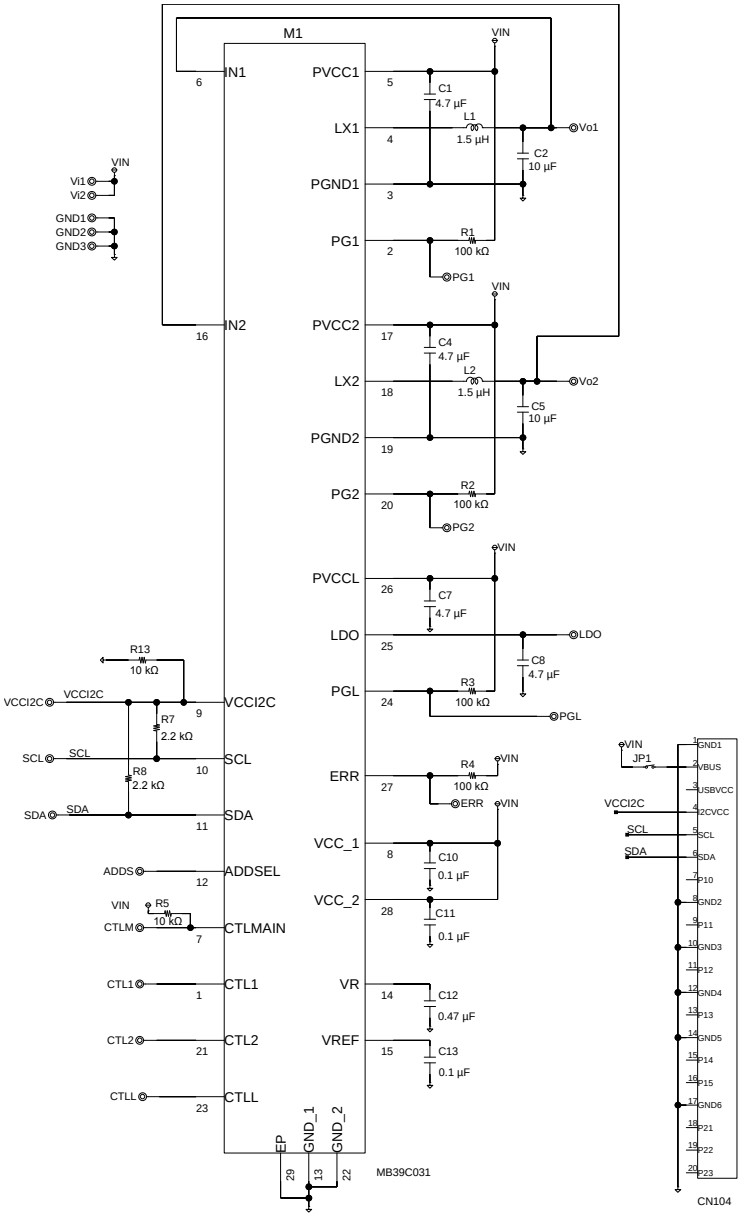
6. Wiring Layout

Figure 6-1. Wiring Layout



7. Circuit Diagram

Figure 7-1. Circuit Diagram



8. Parts List

Table 8-1. Parts List

No.	Component	Item	Parts Number	Vendor	Value	Remarks
1	M1	PMIC	MB39C031WQN-G-142	Cypress	-	-
2	L1	Inductor	DFE252008C-1R5M	TOKO	1.5µH	-
3	L2	Inductor	DFE252008C-1R5M	TOKO	1.5µH	-
4	C1	Ceramic Capacitor	C1608X5R1V475K	TDK	4.7µF	35V
5	C2	Ceramic Capacitor	C1608X5R1E106M	TDK	10µF	25V
6	C4	Ceramic Capacitor	C1608X5R1V475K	TDK	4.7µF	35V
7	C5	Ceramic Capacitor	C1608X5R1E106M	TDK	10µF	25V
8	C7	Ceramic Capacitor	C1608X5R1V475K	TDK	4.7µF	35V
9	C8	Ceramic Capacitor	C1608X5R1V475K	TDK	4.7µF	35V
10	C10	Ceramic Capacitor	C1005JB1H104K	TDK	0.1µF	50V,1005
11	C11	Ceramic Capacitor	C1005JB1H104K	TDK	0.1µF	50V,1005
12	C12	Ceramic Capacitor	C1005JB1V474K	TDK	0.47µF	35V,1005
13	C13	Ceramic Capacitor	C1005JB1H104K	TDK	0.1µF	50V,1005
14	R1	Chip Resistor	RR0510P-104-D	SUSUMU	100kΩ	±0.5%, ±50ppm
15	R2	Chip Resistor	RR0510P-104-D	SUSUMU	100kΩ	±0.5%, ±50ppm
16	R3	Chip Resistor	RR0510P-104-D	SUSUMU	100kΩ	±0.5%, ±50ppm
17	R4	Chip Resistor	RR0510P-104-D	SUSUMU	100kΩ	±0.5%, ±25ppm
18	R5	Chip Resistor	RR0510P-103-D	SUSUMU	10kΩ	±0.5%, ±25ppm

No.	Component	Item	Parts Number	Vendor	Value	Remarks
19	R7	Chip Resistor	RR0510P-222-D	SUSUMU	2.2kΩ	±0.5%, ±25ppm
20	R8	Chip Resistor	RR0510P-222-D	SUSUMU	2.2kΩ	±0.5%, ±25ppm
21	R13	Chip Resistor	RR0510P-103-D	SUSUMU	10kΩ	±0.5%, ±25ppm
22	JP1	-	-	-	-	No Mounted
23	CN104	-	-	-	-	No Mounted
24	SCL	Terminal	90131-0770	molex	-	2 × 10pin header
	SDA	Terminal				
	VCCI2C	Terminal				
	ERR	Terminal				
	Vi	Terminal				
	Vi	Terminal				
	GND	Terminal				
	GND	Terminal				
	CTL1	Terminal				
	CTL2	Terminal				
	CTLL	Terminal				
	CTLM	Terminal				
	Vo1	Terminal				
	Vo2	Terminal				
	LDO	Terminal				
	GND3	Terminal				
	PG1	Terminal				
	PG2	Terminal				
	PGL	Terminal				
	ADDS	Terminal				

9. Evaluation Board Picture

Figure 9-1. Evaluation Board Picture (Top)

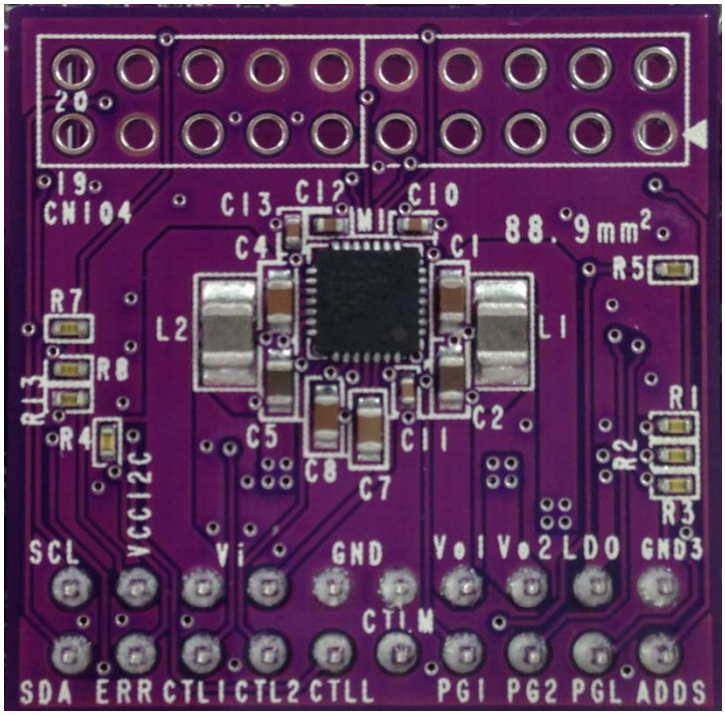
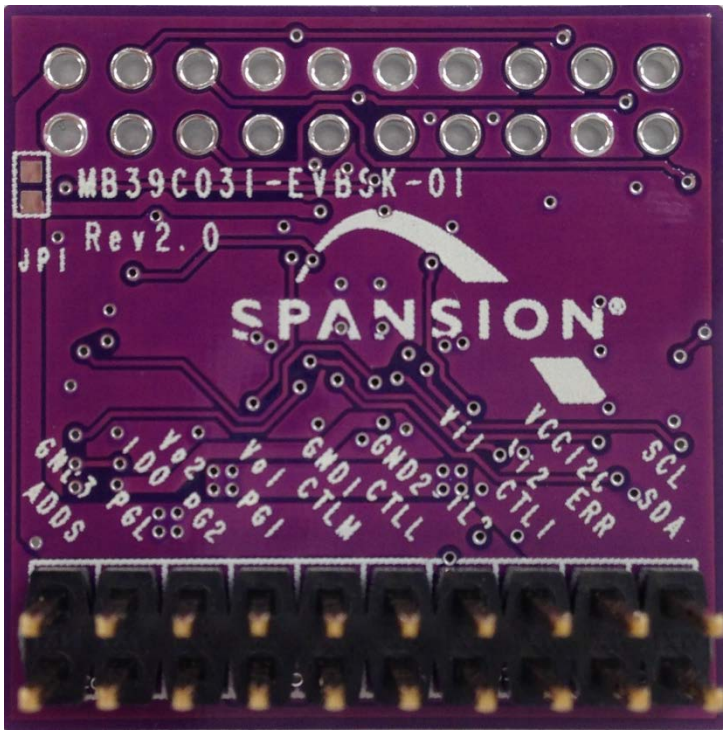


Figure 9-2. Evaluation Board Picture (Back)



10. Ordering Information

Table 10-1. Ordering Information

Part Number	EVB Revision	Note
MB39C031-EVBSK-01	Rev 1.0	---

Revision History

Document Title: MB39C031-EVBSK-01 2ch Buck DC/DC + LDO Evaluation Board Operation Guide Document Number: 002-08724			
Revision	**Issue Date**	**Origin of Change**	**Description of Change**
**	01/16/2015	ATTS	Initial release
*A	02/04/2016	ATTS	Migrated Spansion Guide from MB39C031-EVBSK-01_SS901-00035-1v0-E to Cypress format
*B	12/27/2017	ATTS	Updated template