Switching Regulator Series

Isolated Flyback DC/DC Converter BD7F100EFJ-LB Evaluation Board

BD7F100EFJ-EVK-003 (5V→5V, 0.2A)

BD7F100EFJ-EVK-003 Evaluation board delivers an output 5 volts from an input 5 volts using BD7F100EFJ-LB, Isolated Flyback DC/DC converter integrated circuit, with output current rating of maximum 1A.

Performance specification

These are representative values, and it is not a guaranteed against the characteristics.

V_{IN} = 5V, V_{OUT} = 5V, Unless otherwise specified.

Parameter	Min	Typ	Max	Units	Conditions
Input Voltage		5.0		V	
Output Voltage		5.0		V	R4=3.9kΩ, R5=13.3kΩ
Output Current Range	3.75		200	mA	Maximum Output Power：1W
Operating Frequency		400		kHz	
Maximum Efficiency		79.4		%	I_O = 100mA

Evaluation Board

PCB size: 70mm×50mm×1.6mm

Figure 1. BD7F100EFJ-EVK-003 Evaluation Board

Top View

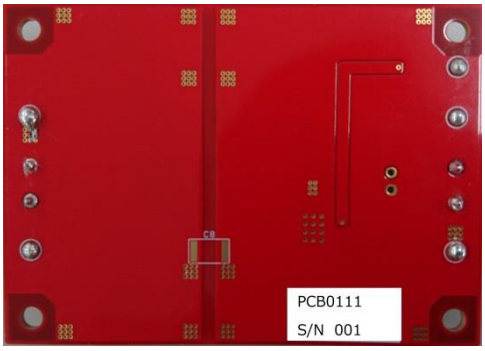

Figure 2. BD7F100EFJ-EVK-003 Evaluation Board

Bottom View

Operation Procedures

1. Necessary equipments

(1) DC power-supply of 5V/0.5A

(2) Maximum 200mA load

(3) DC voltmeter

2. Connecting the equipments

(1) DC power-supply presets to 5V and then the power output turns off.

(2) The maximum load should be set at 200mA and over it will be disabled.

(3) Connect positive-terminal of power-supply to VIN terminal and negative-terminal to GND terminal with a pair of wires.

(4) Connect load's positive-terminal to VOUT+ terminal and negative-terminal to VOUT-terminal with a pair of wires.

(5) Connect positive-terminal of DC voltmeter 1 to VIN and negative-terminal to GND for input-voltage measurement.

(6) Connect positive-terminal of DC voltmeter 2 to VOUT+ and negative-terminal to VOUT- for output-voltage measurement.

(7) DC power-supply output is turned ON.

(8) Check DC voltmeter 2 displays 5V.

(9) The load is enabled.

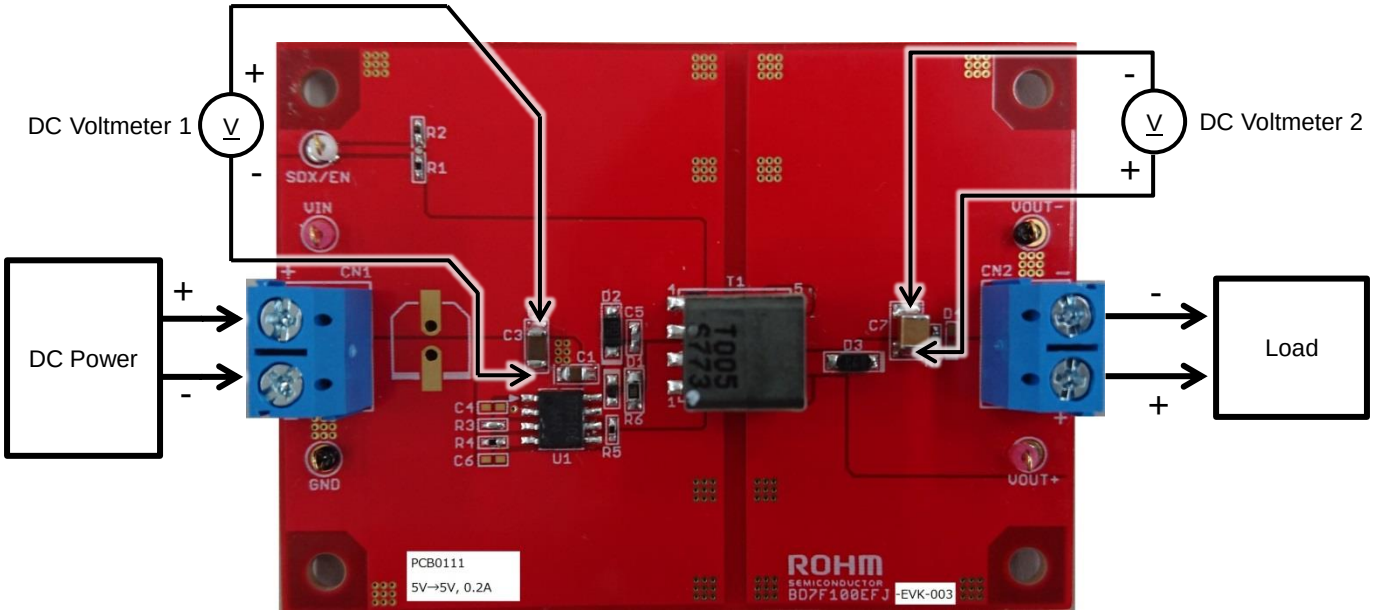

Figure 3. Connection Diagram

Circuit Diagram

V_{IN} = 5V, V_{OUT} = 5V

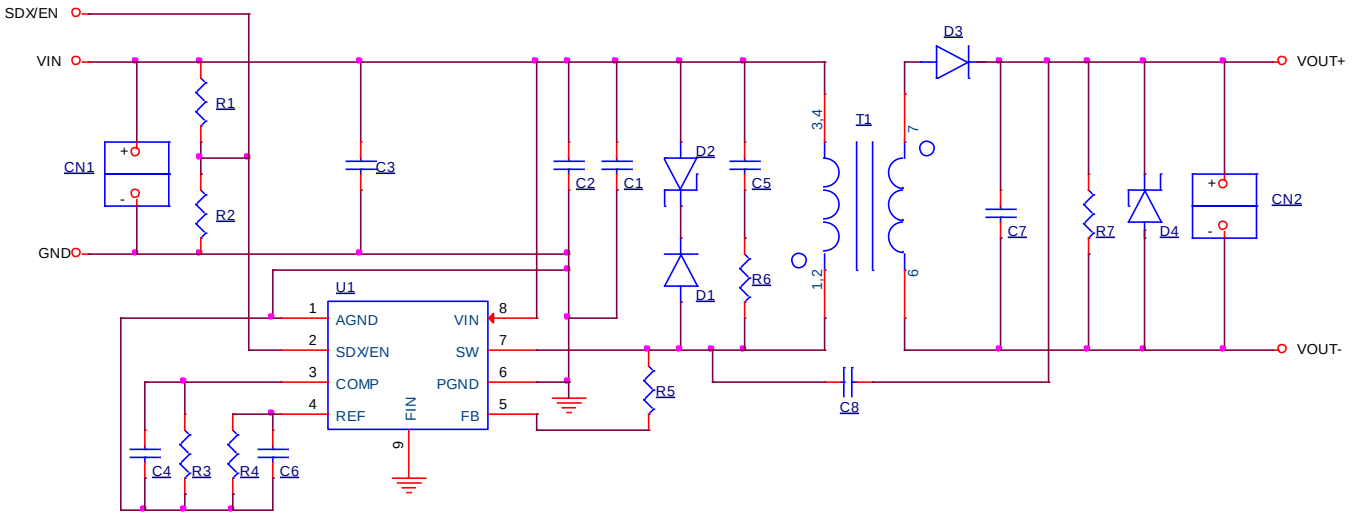

Figure 4. BD7F100EFJ-EVK-003 Circuit Diagram

Bill of Materials

No.	Value	Description	Size	Part Number / Series	Manufactuer
C1	1µF	Capacitor, Chip, 50V, X7R	2012	GRM21BR71H105KA12L	MURATA
C2	4.7µF	Capacitor, Chip, 50V, X7R	3216	GRM31CR71H475KA12L	MURATA
C3	-	Notinstalled	-	-	-
C4	-	Notinstalled	-	-	-
C5	1000pF	Capacitor, Chip, 50V, CH	1005	GRM1552C1H102JA01	MURATA
C6	-	Notinstalled	-	-	-
C7	22µF	Capacitor, Chip, 25V, X7R	3225	GRM32ER71E226KE15L	MURATA
C8	-	Notinstalled	-	-	-
D1	1SS400SM	Diode	1608	1SS400SM	ROHM
D2	KDZ3.6B	Diode, Zener, Vz=3.60～4.00V	3516	KDZ3.6B	ROHM
D3	RB160MM-40	Diode, Schottky	3516	RB160MM-40	ROHM
D4	-	Notinstalled	-	-	-
R1	510kΩ	Resistor, Chip, 1/16W, 1%	1005	MCR01MZPF5103	ROHM
R2	680kΩ	Resistor, Chip, 1/16W, 1%	1005	MCR01MZPF6803	ROHM
R3	-	Short	-	-	-
R4	3.9kΩ	Resistor, Chip, 1/16W, 1%	1005	MCR01MZPF3901	ROHM
R5	13.3kΩ	Resistor, Chip, 1/16W, 1%	1005	MCR01MZPF1332	ROHM
R6	200Ω	Resistor, Chip, 1/8W, 1%	2012	MCR10EZPF2000	ROHM
R7	1kΩ	Resistor, Chip, 1/16W, 1%	1005	MCR01MZPF1001	ROHM
T1	10µH	Transformer, Np:Ns=1:2, ±20%	10.0 x 10.0 x 11.5mm	CEP911B-0505051R	sumida
U1	BD7F100EFJ	I.C. BD7F100EFJ	HTSOP-J8	BD7F100EFJ	ROHM

Layout

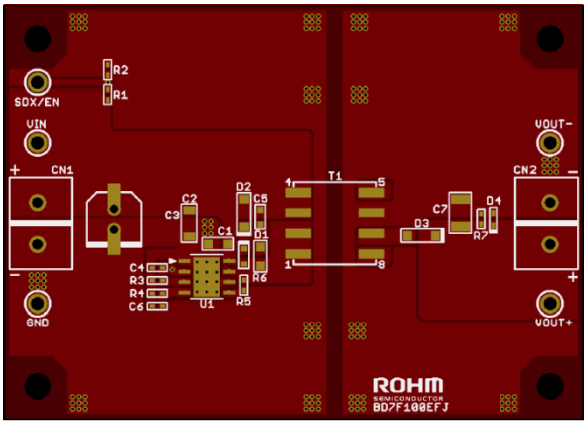

Figure 5. Top Silk Screen and Layout

(Top View)

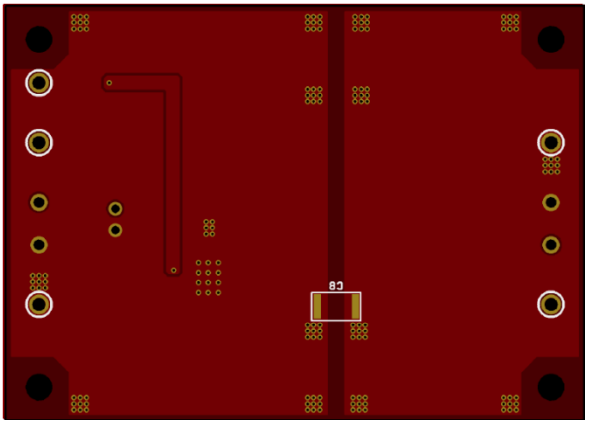

Figure 6 . Bottom Silk Screen and Layout

(Top View)

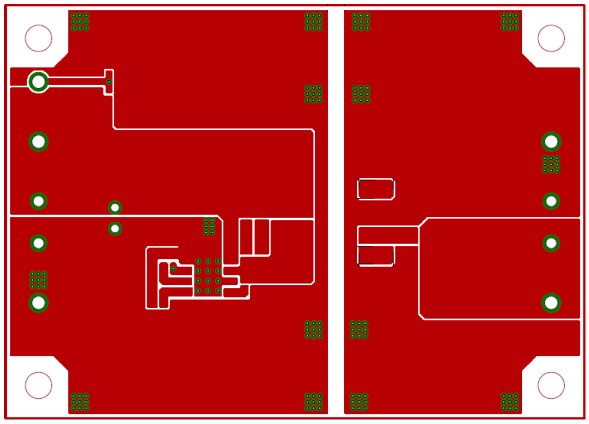

Figure 7. Top Side Layout

(Top View)

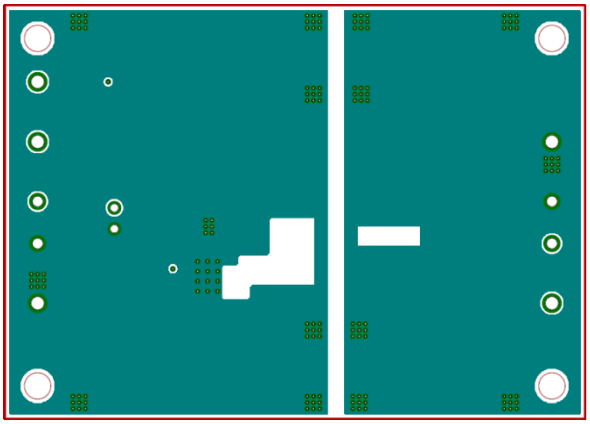

Figure 8. Middle Layer1 Layout

(Top View)

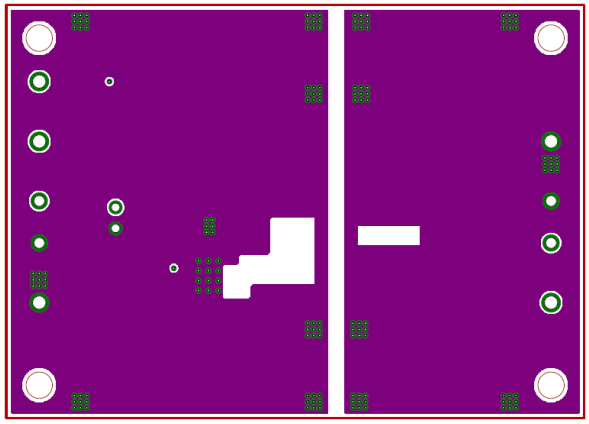

Figure 9. Middle Layer2 Layout

(Top View)

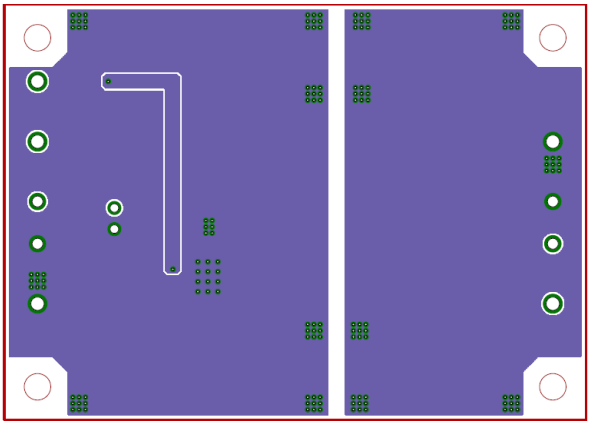

Figure 10. Bottom Side Layer Layout

(Top View)

Reference Application Data

V_{IN} = 5V, V_{OUT} = 5V

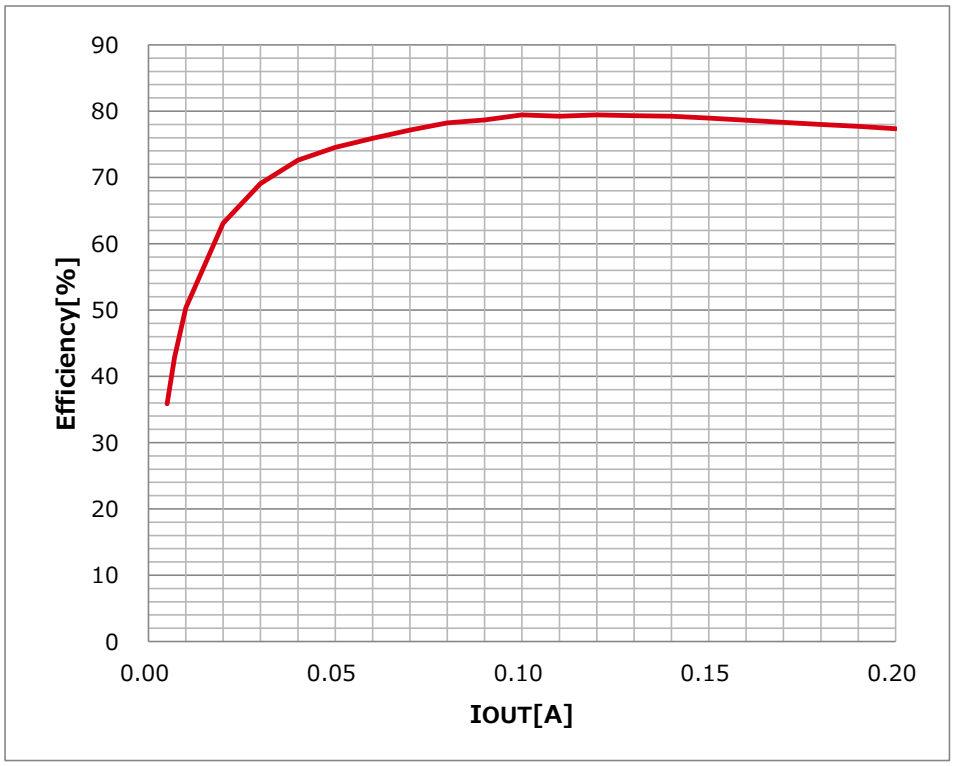

Figure 11. Efficiency vs Load Current

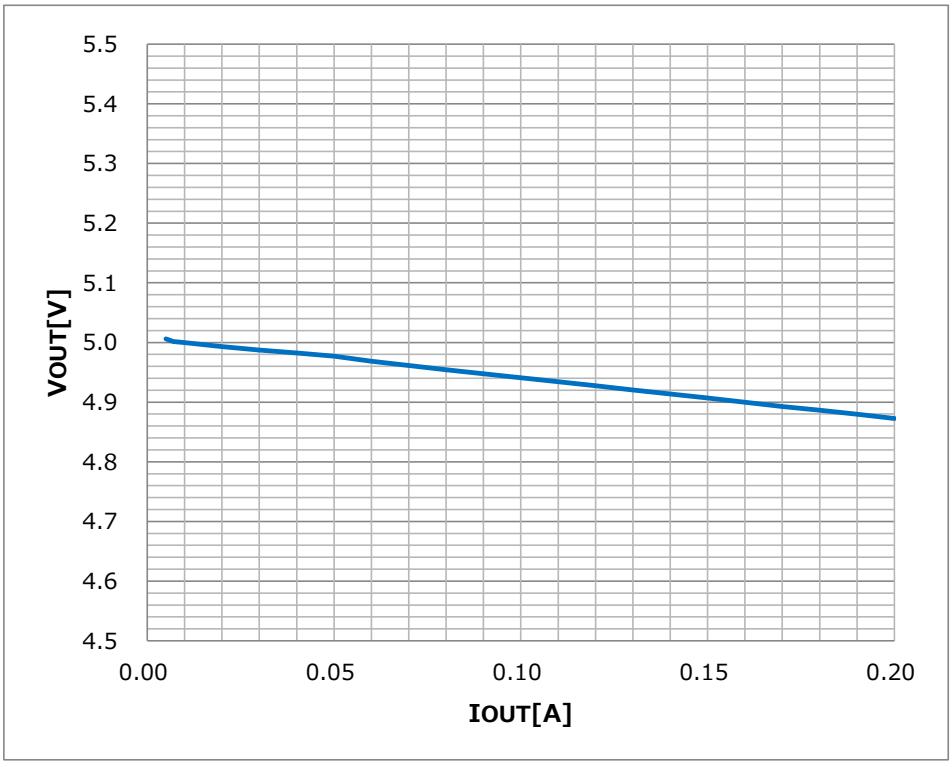

Figure 12. Load Regulation

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