Description

This manual aims to illustrate how to use the EP1551 Evaluation Board ("EP1551 EVB").

The EP1551 EVB is a fully assembled and tested circuit board that accepts 1.5V to 3.6V input voltages and provides all the output voltages required for a typical digital still camera. The outputs consist of a main step-up output (3.35V), a step-down output (1.5V), a general-purpose 5V output, two outputs for charge-coupled device (CCD) and LCD bias.

This manual includes Quick Start for using the EP1551 EVB, Demonstration Circuit, PCB Layout and Bill of Material for the EP1551 EVB.

Quick Start

The EP1551 EVB is easy to set up to evaluate the performance of the EP1551, 1MHz, Five-channel Power Supply. For proper measurement equipment setup, please follow the explanation below:

Follow the steps below to verify operation of the EP1551 EVB.

Do not turn on the power supply until all connections are completed:

1) Preset the power supply to between 1.5V and 3.6V.
2) Turn off the power supply.
3) Connect the power-supply positive lead to IN.
4) Connect the power-supply ground lead to GND.
5) Connect loads from outputs OUTSD (1.5V), OUT1 (5V), OUT3A (+15V), and OUT3B (-7.5V) to GND. See as below Table for Output Voltages and Maximum Currents.
6) To enable the main step-up output, verify that JP1 has short to MAIN pin.
7) Verify that JP2–JP8 have pins 1 and 2 shorted.
8) Turn on the power supply.
9) Use a voltmeter to verify the OUTSU voltage (3.35V).
10) Connect a load, if desired, from OUTSU (3.35V) to GND. See Table 1 for maximum load currents.
11) To verify other outputs, move JP2–JP5 to short to MAIN pin. Use a voltmeter to verify output voltages.

P.S. We already have surface-mount LEDs in DS1–DS4, connecting the LED array from anode to LEDOUT+ to cathode LEDOUT-.

Jump Setting

JUMPER	Jump to GND	Jump to MAIN
JP1	All outputs are shut down	OUTSU enabled
JP2	OUTSD shut down	OUTSD enabled
JP3	OUT1 shut down	OUT1 enabled
JP4	LEDOUT shut down	LEDOUT enabled
JP5	OU T3A/OU T3B shut down	OU T3A/OU T3B enabled
JP6	OUT1 set to 5V	OUT1 adjustable
JP7	OUTSD set to 1.5V	OUTSD adjustable
JP8	OUTSU set to 3.35V	OUTSU adjustable

Fixed Output Voltages and Maximum Currents

OUTPUT	VOLTAGE (V)	MAXIMUM CURRENT (mA)
OUTSU	3.35	500 **(Note 1)**
OUTSD	1.5	350
OUT1	5	500
LEDOUT+ to LEDOUT	16 **(Note 2)**	15
OUT3A	15	20
OUT3B	-7.5 **(Note 3)**	30

Note 1: If both OUTSU (3.35V) and OUTSD (1.5V) are operating, subtract half the OUTSD (1.5V) load current from the maximum load capability of OUTSU (3.35V).

Note 2: With four white LEDs connected in series from LEDOUT+ to LEDOUT-, this output is regulated to approximately 60mW per LED. With typical white LEDs, this is approximately 16V at 15mA. With an open circuit, LEDOUT+ is approximately 30V.

Note 3: Only the 15V output is fed back to the controller regulation point. A small preload (at least 5mA) is needed for the -7.5V output to be in regulation.

Adjusting the Main Step-Up Output Voltage

The main step-up output (OUTSU 3.35V) can be adjusted from 2.7V to 5.5V using the following procedure:

1) Short JP8 to MAIN pin.

2) Cut the PC board trace that shorts the pads of R12 (located on the solder side of the PC board).

3) Select a value for R15 between 10kΩ and 100kΩ.

4) Solve for Vout: $V_{out} = 1.25V\left(1 + \frac{R15}{R12}\right)$

5) Install R12 and R15.

Adjusting the Step-Down Output Voltage

The step-down output voltage (OUTSD 1.5V) can be set from 1.25V to VOUTSU using the following procedure:

1) Short JP7 to MAIN pin.

2) Cut the PC board trace that shorts the pads of R13 (located on the solder side of the PC board).

3) Select a value for R16 between 10kΩ and 100kΩ.

4) Solve for Vout: $V_{out} = 1.25V\left(1 + \frac{R16}{R13}\right)$

5) Install R13 and R16.

Adjusting the Step-Up Output Voltage

OUT1 (5V) can be set to any voltage above 1.25V. Note that OUT1 rises above its regulation voltage if the input voltage is greater than what OUT1 is set to. Use the following procedure to set VOUT1:

1) Short JP6 to MAIN pin.

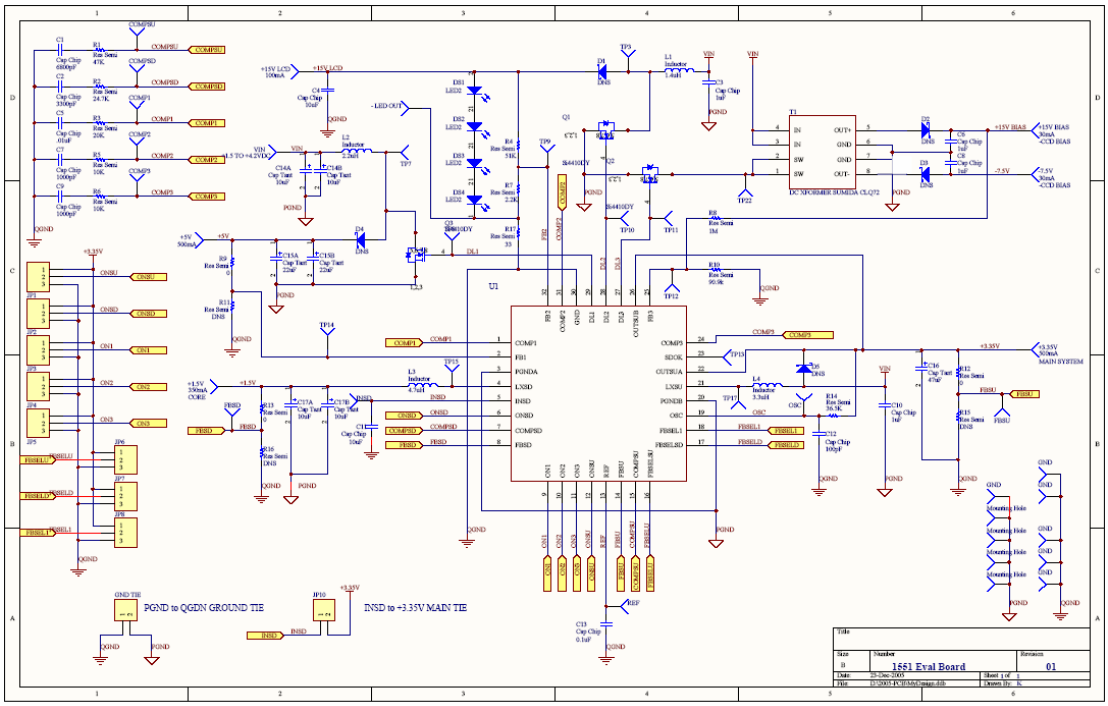
2) Cut the PC board trace that shorts the pads of R9 (located on the solder side of the PC board).

3) Select a value for R11 between 10kΩ and 100kΩ.

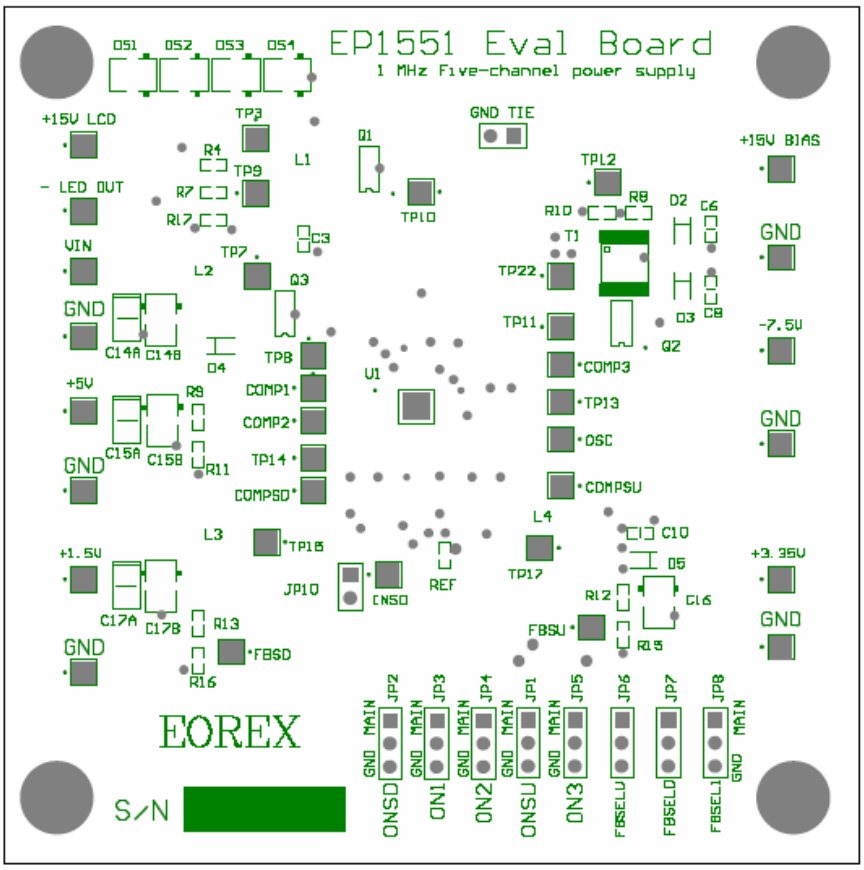
4) Solve for Vout: $V_{out} = 1.25V\left(1 + \frac{R11}{R9}\right)$

5) Install R9 and R11.

DEMONSTRATION CIRCUIT



PCB LAYOUT



BILL OF MATERIAL

Item	QTY	REF. DES.	DESC.	MAN. P/N	Note
1	1	L1	POWER INDUCTOR 1.4UH 2.52A SMD	CR43-1R4MC	
2	1	L2	POWER INDUCTOR 2.2UH 1.75A SMD	CR43-2R2MC	
3	1	L3	POWER INDUCTOR4.7UH SMD		
4	1	L4	POWER INDUCTOR 3.3UH SMD		
5	1	T1	For -7.5 and +15V output	ST-532850A	
6	3	C14A, C15A, C17A	CAPACITOR TANT 22UF 25V 20% SMD	T494B226M016AS	
7	3	C14A, C15A, C17A,	CAPACITOR TANT 10UF 10V 20% SMD	T494B106M010AS	
8	1	C16	CAPACITOR TANT 47UF 10V 20% SMD	T520B476M006ASE040	
9	1	C4	CAP CERAMIC 10UF 25V X5R 1206	ECJ-3YB1E106M	
10	4	C3, C6, C8, C10	CAP CERAMIC 1UF 25V X5R 0805	ECJ-2FB1E105K	
11	1	C1	CAP 10UF 6.3V CERAMIC X5R 0805	ECJ-2FB0J106M	
12	1	C13	CAP .10UF 16V CERAMIC X7R 0805	VJ0805Y104KXJCW1BC	
13	1	C12	CAP CERAMIC 100PF 50V NP0 0805	VJ0805A101JXACW1BC	
14	3	R9, R12, R13	RES 0.0 OHM 1/8W 5% 0603 SMD	ERJ-6GEY0R00V	
15	1	R8	RES 1.00M OHM 1/8W 1% 0603 SMD	9C08052A1004FKHFT	

16	1	R10	RES 90.9K OHM 1/8W 1% 0603 SMD	MCR10EZHF9092	
17	1	R17	RES 33.0 OHM 1/8W 1% 0603 SMD	9C08052A33R0FK HFT	
18	1	R7	RES 2.20K OHM 1/8W 1% 0603 SMD	9C08052A2201FK HFT	
19	1	R4	RES 51.0K OHM 1/8W 1% 0603 SMD	9C08052A5102FK HFT	
20	1	R1	RES 47K OHM 1/8W 5% 0603 SMD	9C08052A4702JL HFT	
21	1	R2	RES 24.9K OHM 1/8W 1% 0805 SMD	MCR10EZHF2492	
22	2	R5, R6	RES 10.0K OHM 1/8W 1% 0603 SMD	9C08052A1002FK HFT	
23	1	R3	RES 20.0K OHM 1/8W 1% 0603 SMD	9C08052A2002FK HFT	
24	1	C1	CAP 6800PF 50V CERAMIC X7R 0603	VJ0805Y682KXAC W1BC	
25	1	C2	CAP 3300PF 50V CERAMIC X7R 0603	VJ0805Y332KXAC W1BC	
26	1	C5	CAP CERM .01UF 10% 50V X7R 0603	08055C103KAT2A	
27	2	C7, C9	CAP 1000PF 50V CERAMIC X7R 0603	VJ0805Y102KXAC W1BC	
28	1	R14	RES 36.5K OHM 1/8W 1% 0603 SMD	MCR10EZHF3652	
29	3	Q1, Q2, Q3	HEX/MOS N-CH 30V 10A 8-SOIC	SI4410DY	
30	9	RED	TEST POINT PC MULTI PURPOSE	5010	
31	28	BLACK	TEST POINT PC MULTI PURPOSE	5011	

32	9	SHUNT	SHUNT LP W/HANDLE 2 POS 30AU	881545-2	
33	5	D1 - D5	DIODE SCHOTTKY 1A 20V	1N5819	
34	4	DS1 - DS4	LED GREEN FACE UP 1206	LNJ311G8TRA	
35	1	JP9	CONN HEADER VERT .100 2POS 30AU	87220-2	
36	5	JP1-5	CONN HEADER VERT .100 3POS 15AU	87224-3	
37	3	JP6 - 8	CONN HEADER VERT .100 6POS 15AU	87227-3	