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Description

The AP3015 is a step-up DC/DC converter, which can be used for positive and negative output LCD/OLED bias supply. In fact, it is a standard boost circuit, where the AP3015 works as the driver and control device.

The AP3015 features a wide input voltage range. The operation voltage is ranged from 1.2V to 12V. And the output voltage is up to 34V. A current limited, fixed off-time control scheme conserves operating current, resulting in high efficiency over a broad range of load current. The switch and all of the control circuit are integrated in the AP3015, so fewer tiny external components are needed in the PCB board, which are bypass capacitor (Cin), boost inductor (L), boost schottky diode (D), output capacitor (Cout) and feedback resistor network (R1,R2).

The demo board can be powered from 2.5V to 4.2V. It provides regulated positive output and negative output. The positive output voltage can be controlled by the feedback resistor. The feedback reference is 1.23V, so the output voltage can be calculated as $1.23 \cdot (R2+R1)/R2$. To achieve at flexible operation, a disable terminal is designed to turn on or turn off the demo board output.

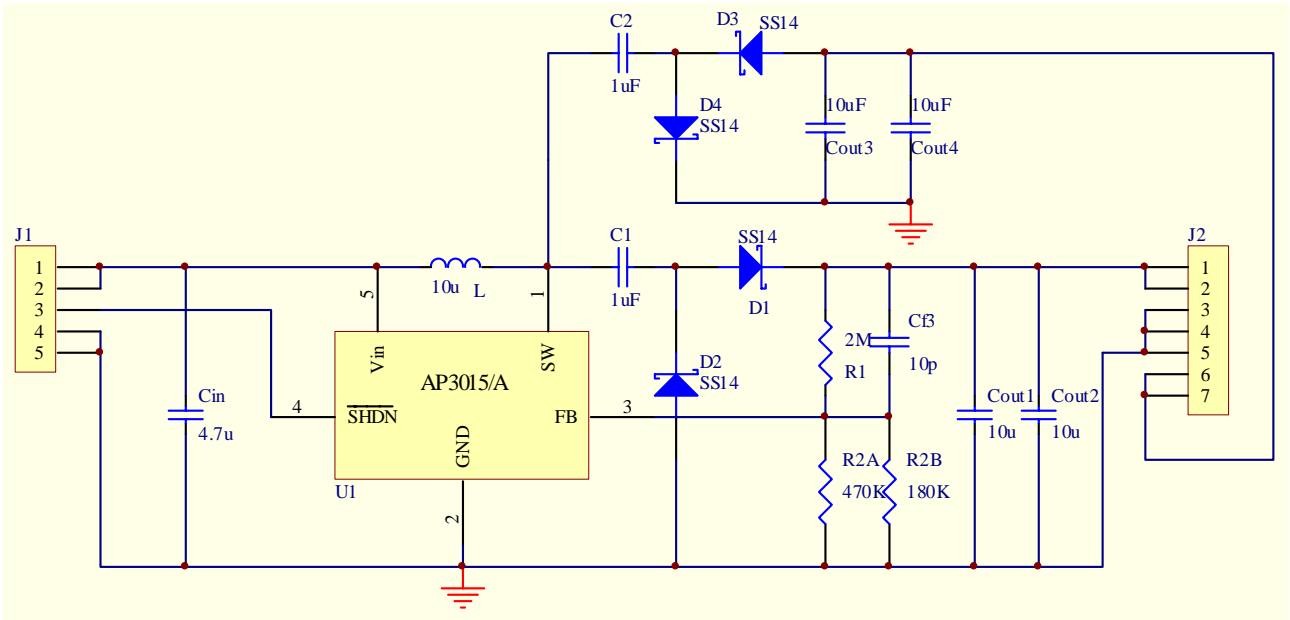
Specification

Item		Value
Supply Voltage		2.5 to 4.2V
Output Current (Max.)		$\pm 6\text{mA} @ V_{in}=2.5\text{V}$
		$\pm 10\text{mA} @ V_{in}=4.2\text{V}$
Output Voltage	Vout+	$20\text{V} \pm 5\%$
	Vout-	$-20\text{V} \pm 10\%$
Ripple & Noise (Max.)		150mV
Efficiency (Typ.)		73% @ $V_{in}=2.5\text{V}, I_o = \pm 6\text{mA}$
		76% @ $V_{in}=4.2\text{V}, I_o = \pm 10\text{mA}$

Note: The cross regulation can be guaranteed by “Output Voltage”.

Micro Power Step-Up DC/DC Converter AP3015

Schematics of the PCB



Note: Cout2 and Cout4 are backup.

Figure 1

PCB Layout

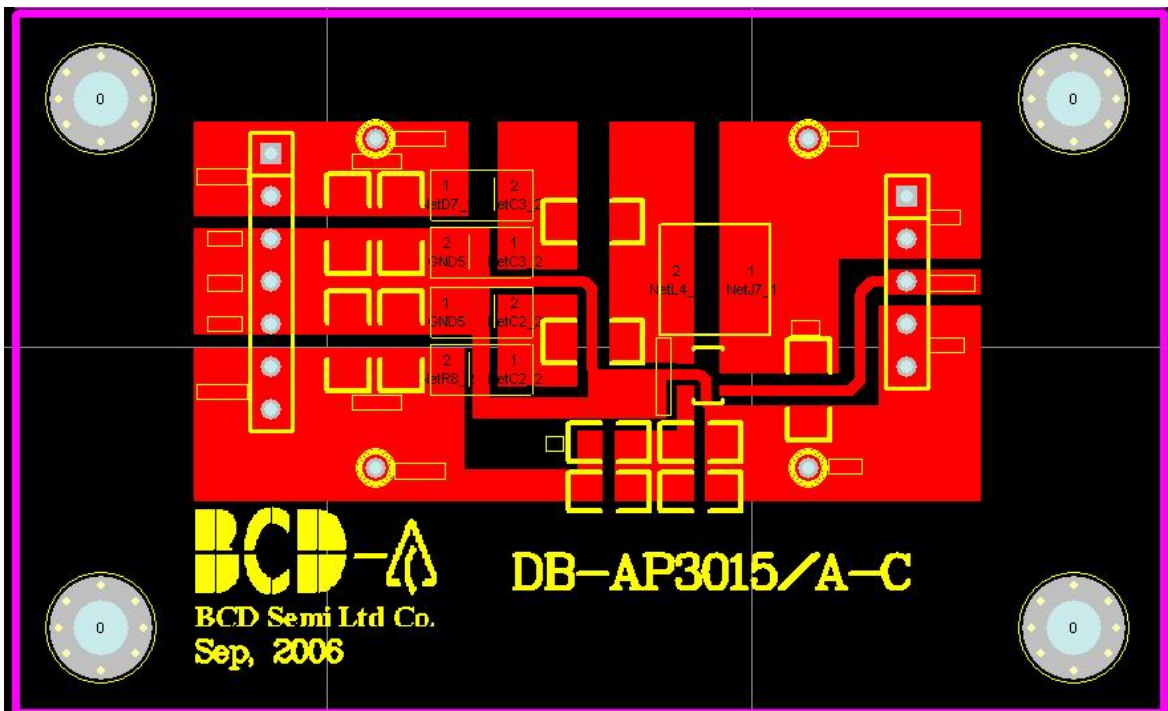


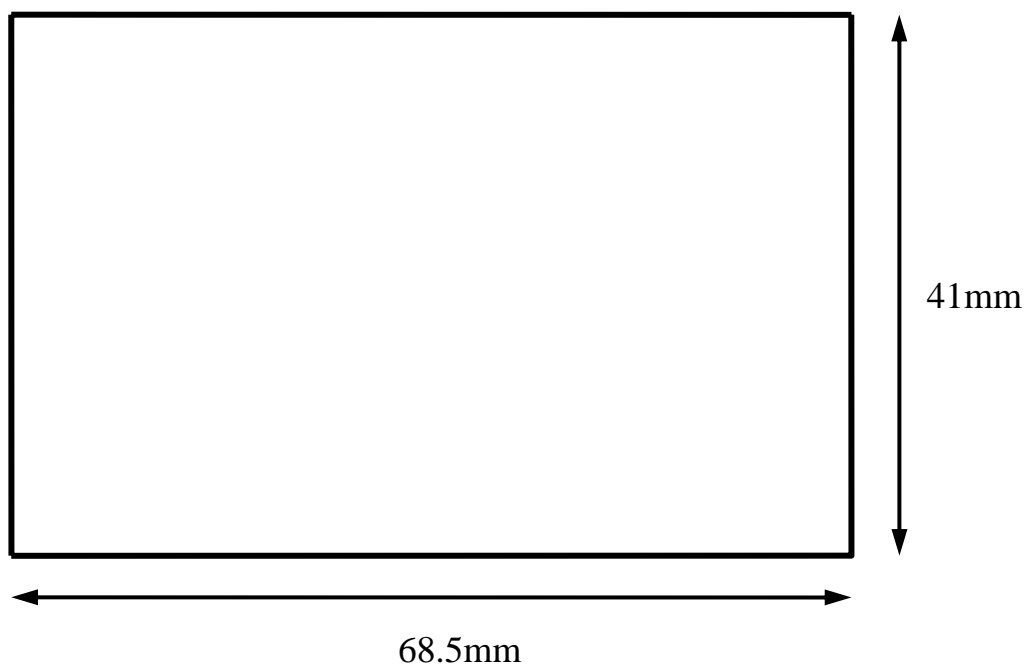
Figure 2

Photo View of the Demo Board



Figure 3

PCB Dimensions



Micro Power Step-Up DC/DC Converter

AP3015

BOM

Item	Quantity	Location	Part	Footprint
1	1	U1	AP3015	SOT23-5
2	1	L	10uF, Sumida: CDRH5D28RNP-100NC	SMD
3	1	Cin	4.7uF, X7R Ceramic	1206
4	2	Cout1, Cout 3	10uF, X7R Ceramic	1206
5	2	C1, C2	1uF, X7R Ceramic	1206
6	1	Cf	10pF, X7R Ceramic	0805
7	4	D1, D2, D3, D4	SS14, Schottky	SMD
8	1	R1	2M, 1%	0805
9	1	R2A	470K, 1%	0805
10	1	R2B	180K, 1%	0805
11	1	J1	5 Pin Connector	SIP-5
12	1	J2	7 Pin Connector	SIP-7
13	2	Cout2, Cout4	NC	

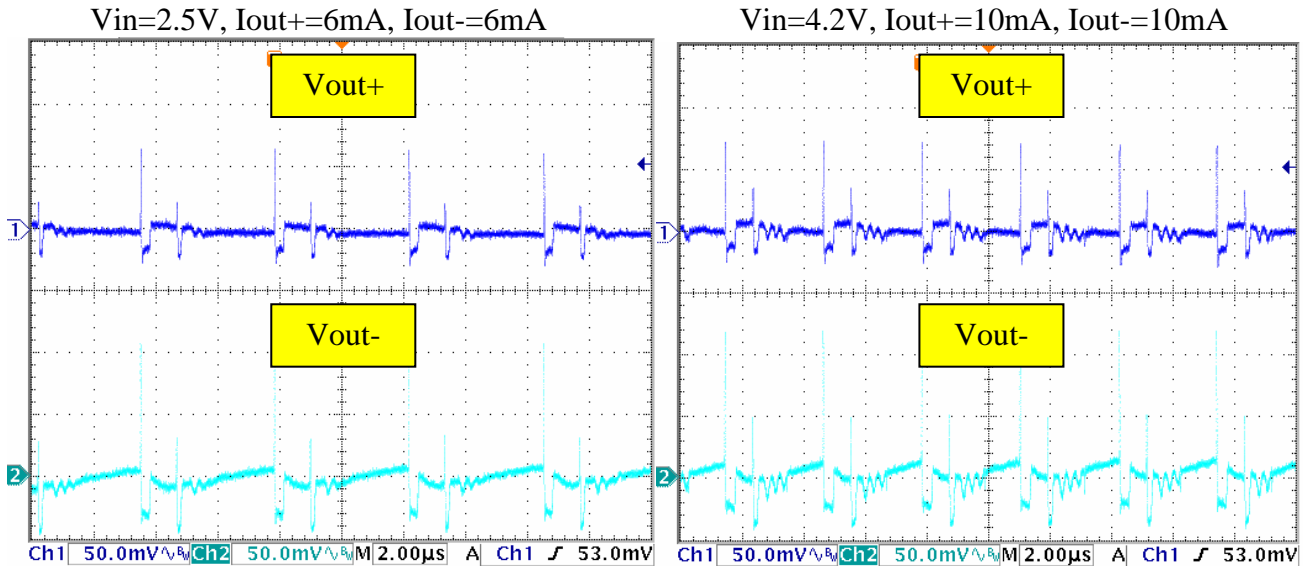
Test Result
1) Output Voltage

Vin = 2.5V	Iout+ = 0mA		Iout+ = 6mA	
	Vout+ (V)	Vout- (V)	Vout+ (V)	Vout- (V)
Iout- = 0mA	20.194	-20.285	19.946	-21.471
Iout- = 6mA	20.028	-18.873	19.308	-19.301

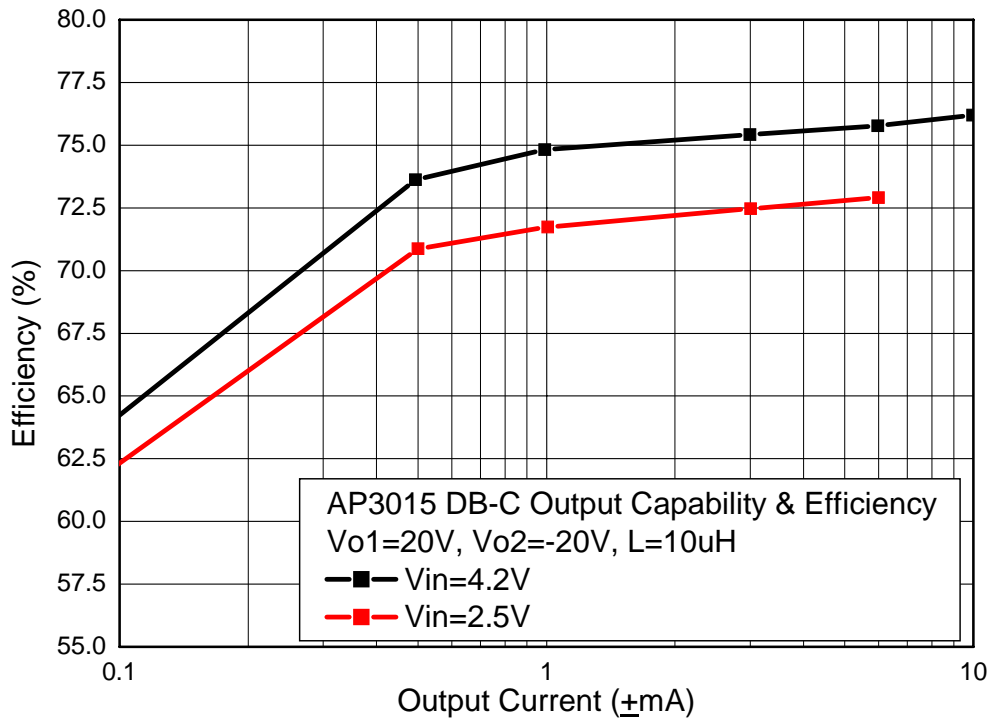
Vin = 4.2V	Iout+ = 0mA		Iout+ = 10mA	
	Vout+ (V)	Vout- (V)	Vout+ (V)	Vout- (V)
Iout- = 0mA	20.197	-20.285	19.782	-21.279
Iout- = 10mA	19.878	-18.434	19.123	-19.124

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2) Ripple & Noise



3) Efficiency



Note: The Max. Output Capability is $\pm 8mA$ @ $V_{in}=2.5V$ and $\pm 12mA$ @ $V_{in}=4.2V$.
 The recommended maximum Output Capability is $\pm 6mA$ @ $V_{in}=2.5V$ and $\pm 10mA$ @ $V_{in}=4.2V$.