

Adapter dc2dc_a4 electrical characteristics:

Input voltage +5.0V

Supply current, max 400mA

Adjustable Vpp output voltages +11.5...14V, +21...26.5V

Ipp max 30mA (Vpp=25V), 100mA (Vpp=12.8V), 30mA (Vpp=12.8V, Icc=50mA)

Vcc output voltages (only with Vpp=11.5...14V) +5.0 (read/verify) ; +5.8V or +6.2V (programming)

Icc max 100mA (Vpp=12.8V), 50mA (Vpp=12.8V, Ipp=30mA)

Vcc, Vpp switches (BC640) saturation voltage (voltage drop) Vce, max 0.1V

Adapter dc2dc_a4 components:

- *voltage converter MC34063* (basic step up converter diagram)

Input voltage +5V

Output voltage $V_{pp} = 1.25 * (1 + (R_{19} + R_4) / (R_3 + R_5))$

Jumper P off. $V_{ppmax} = 1.25 * (1 + (15 + 16) / 1.5) = 27.1V$;

$V_{ppmin} = 1.25 * (1 + (15 + 16) / (1.5 + 0.47)) = 20.1V$

Jumper P on. $V_{ppmax} = 1.25 * (1 + 16) / 1.5 = 14.2V$;

$V_{ppmin} = 1.25 * (1 + 16) / (1.5 + 0.47) = 10.8V$

How to adjust Vpp ?

Install dc2dc_a4 and eprom adapter without target chip on ezoflash+.

Connect power supply, PC and run SW. Adjust Vpp on LM317- IN with R5.

Measured output voltages range +20.9...27.0V (JpP off), +11.4...14.3V (JpP on).

- *voltage regulator LM317*

Input voltage (+10.8..14.2V) from voltage convertor.

Output voltages +5.0V (JpM off or JpM on, Vpp in /RST =3.75V),

+5.8V (JpM on, JpN off, Vpp in =12V),

+6.2V (JpM on, JpN on, Vpp in =12V)

Calculations:

Jumper M off. $V_{cc}' = 1.25 * (1 + R_{12} / (R_{13} + R_{14})) = 1.25 * (1 + 750 / (150 + 100)) = 5.00V$

Jumper M on. $V_{cc}'' = ((V_{ppin} + 1.25) * R_{12} + V_{cc}' * (R_{11} + R_{15})) / (R_{11} + R_{15} + R_{12})$

Jumper N off. Vpp in =12V. $V_{cc}''' = ((12.0 + 1.25) * 0.75 + 5.0 * (4.3 + 3.0)) / (4.3 + 3.0 + 0.75) = 5.77V$

Jumper N on (R15=0). $V_{cc}'''' = ((12.0 + 1.25) * 0.75 + 5.0 * 4.3) / (4.3 + 0.75) = 6.23V$

JpN on or JpN off, Vpp in =3.75V $V_{cc}'''' = 5.00V$

Measured output voltages (LM317- OUT, JpP, LM317-IN 12.8V) +5.04 V, +4.99 (JpM,

RST=3.30V), +5.79V (JpM, Vpp in = 12.07V), +6.27V (JpM, JpN, Vpp in = 12.07V)

- *Vpp voltage switch V1, V2* driven from programmer Vpp switch.

Transistor V1- BC640, Ib=5..11mA (R9-2k2, Vpp=11..26V), voltage drop Vce <0.1V

- *Vcc voltage switch V3, V4* driven from programmer Vcc switch.

Transistor V3- BC640, Ib=9..11mA (R17-470, Vcc=5.0..6.2V), voltage drop Vce <0.1V

- *Connector BU1.* dc2dc_a4 adapter on EPROM adapters is inserted in Vcc and Vpp lines from programmer to target EPROM and provides higher voltage required for programming (and erase for electrically erasable EPROM).

- *Connector BU2.* Adapter power supply (+5V) connector. Apply 2-wire cable to ezoflash+ programmer Jp1 (replace Jp1).

Programmer power supply should provide 500mA current. Not recommended power supply voltage more than +15V, programmer regulator 7805 power dissipation with eprom adapters and dc2dc is up to 4W and it will get more hot. Control regulator 7805 temperature with finger.

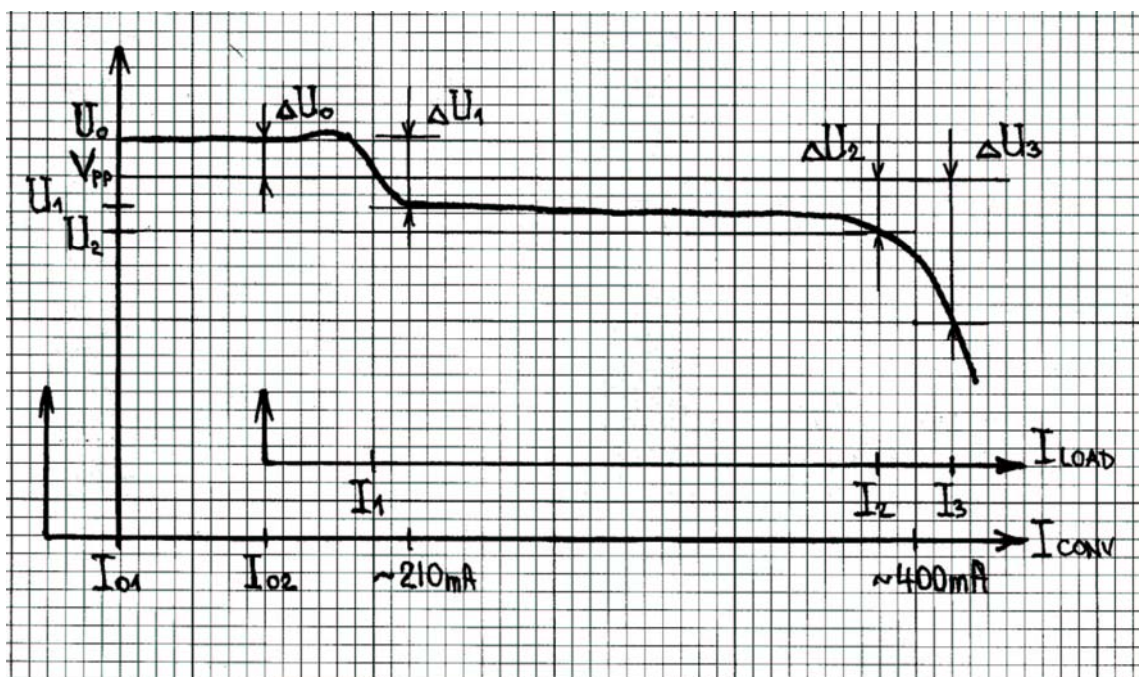
- *Jumper S* and *R.* Target EPROM Vcc source selection.

JpS – voltage source from programmer (for EPROM with Vpp=21/25V).

JpR – voltage source from LM317 (for EPROM with Vpp=12.7V)

- *Jumper T* provides required Vpp=Vcc (+4.3V) for old EPROM's (2716, 2764) during read.

Voltage converter load characteristics:



V_{pp} (V)	U_0 (V)	ΔU_0 (V)	U_2 (V)	ΔU_2 (V)	I_2 (mA)	U_3 (V)	ΔU_3 (V)	I_3 (mA)	I_{01} (mA)	I_{02} (mA)	I_1 (mA)	ΔU_0 (V)
25.0	25.8	0.8	24.3	-0.7	30	23.0	-2.0	37	45	195	6	-1.0
21.0	21.5	0.5	20.5	-0.5	40	19.9	-2.1	55	35	165	15	-0.7
12.7	12.8	0.1	12.5	-0.2	100	11.4	-1.3	130	20	95	30	-0.25

I_{01} – supply current, standby, V_{cc} off, V_{pp} off;

I_{02} – supply current, standby, V_{cc} on, V_{pp} on;

I_2 – I_{pp} max ($V_{pp}=21/25V$), I_{pp}/I_{cc} max ($V_{pp}=12.8V$)

V_{pp} – required programming voltage;

U_0, U_2 – output voltage range;

$I_1, \Delta U_0$ – threshold load current and voltage drop within output voltage range.

$I_3, U_3, \Delta U_3$ – converter power / output current is limited with $R1\ 0.5\Omega$, higher current – output voltage drops.

Adapter history

dc2dc_a2 – replaces *dc2dc*

Adapter powered from ezoflash+ programmer Jp1. V_{cc} switch on V3, V4 from LM317 added.

V_{cc} selection added (JpS -from programmer, JpR- from LM317). V_{pp} range 21..26V added (resistor and JpP). Two fixed programming V_{cc} values (+5.8 and +6.2V), resistor and JpN added. V1 and R9 changed.

dc2dc_a3

Diod D2 and jumper T added to provide $V_{pp}=V_{cc}$ on read. Capacitor R5 removed.

dc2dc_a4

V3 drive changed to reduce converter current on $V_{pp}=21/25V$.

V_{cc} switch (V3, V4) is OFF in actions with $V_{pp}=21/25V$ and JpS ON (V_{cc} from programmer).

dc2dc_a4 schematic

