Elektrotechnika – zasilanie

Moduł 4

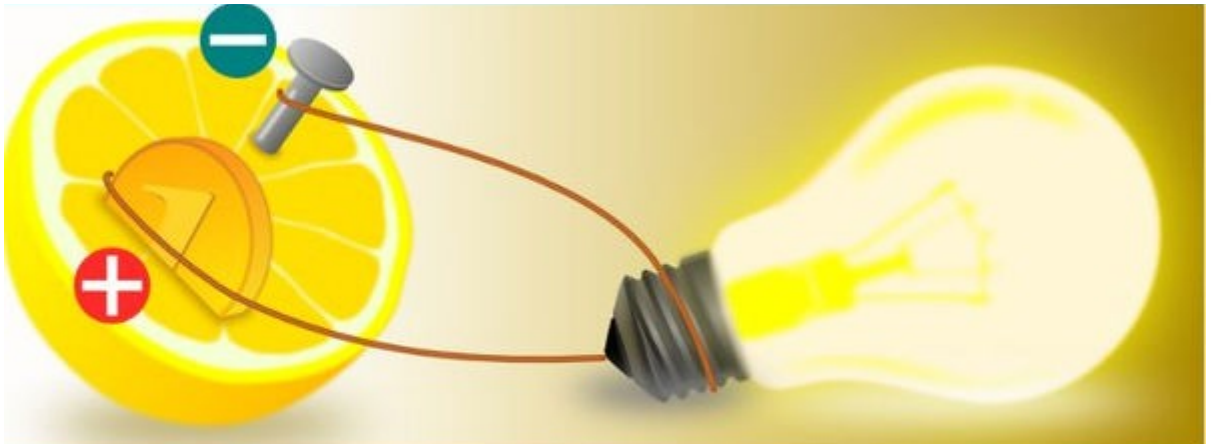
Dr inż.
Patryk Król

v2024/1

Moduł 4

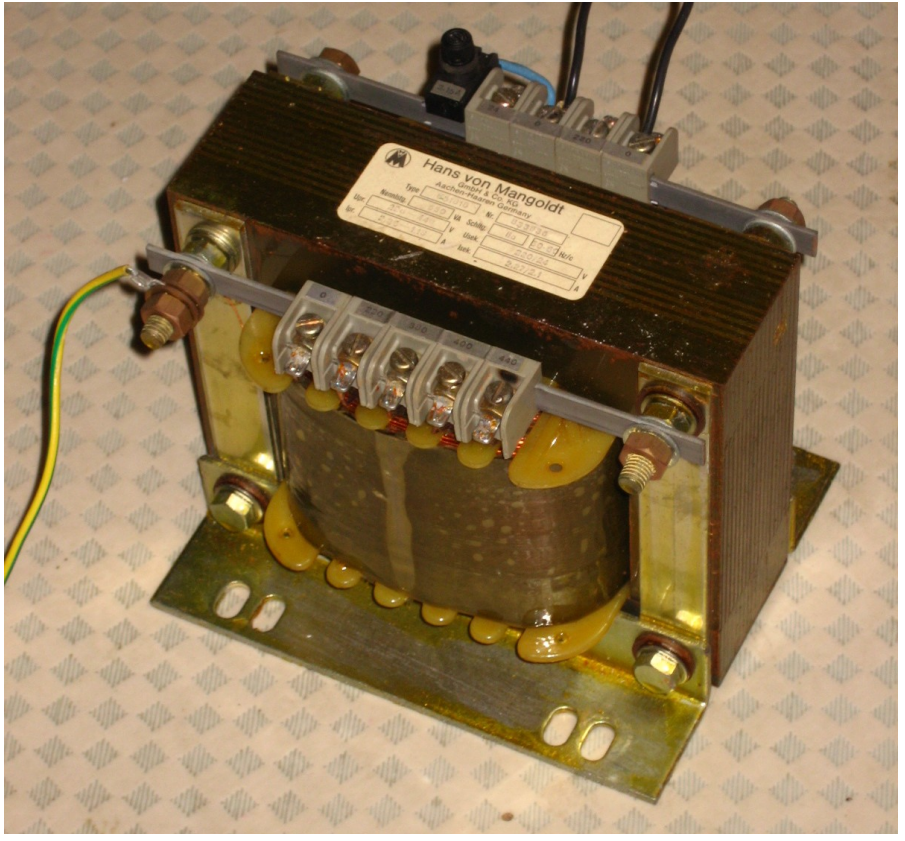
- Zasilanie
- Prąd stały/prąd zmienny
- Zasilacze i baterie
- Elektrownie

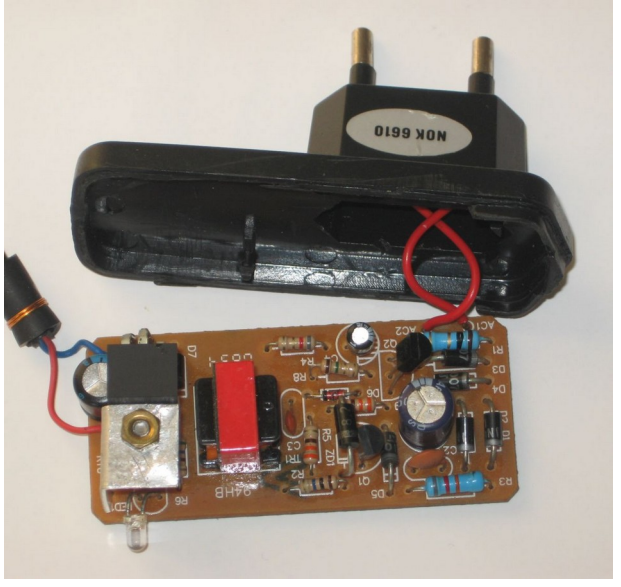
Zasilanie



Źródła: https://lifehacking.pl/jak-uzyskac-prad-z-cytryny/, https://en.wikipedia.org/wiki/Electric_battery

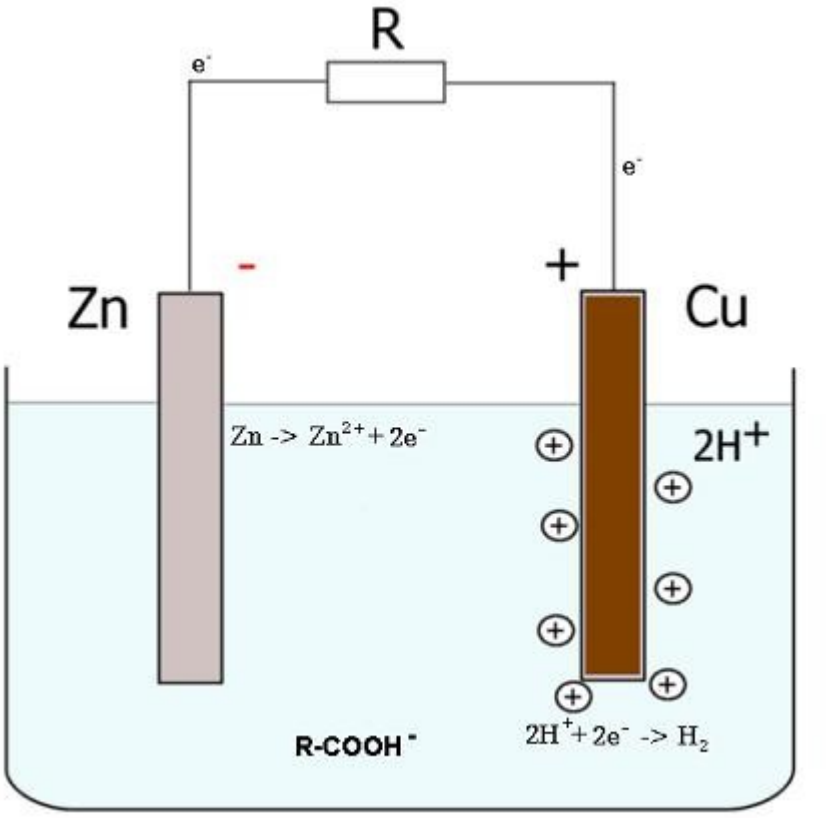
Zasilacze





Źródła:
https://www.etechnog.com/2018/11/transformerless-power-supply.html,
wikipedia.org

Bateria



Źródło https://www.portalnaukowy.edu.pl/index.php/darmowa-energia/148-wyciskamy-z-cytryny-prd-elektryczny

Rodzaje baterii

Źródła: wikipedia.org, reichelt.com, bestbuy.com, mc-sklep.pl

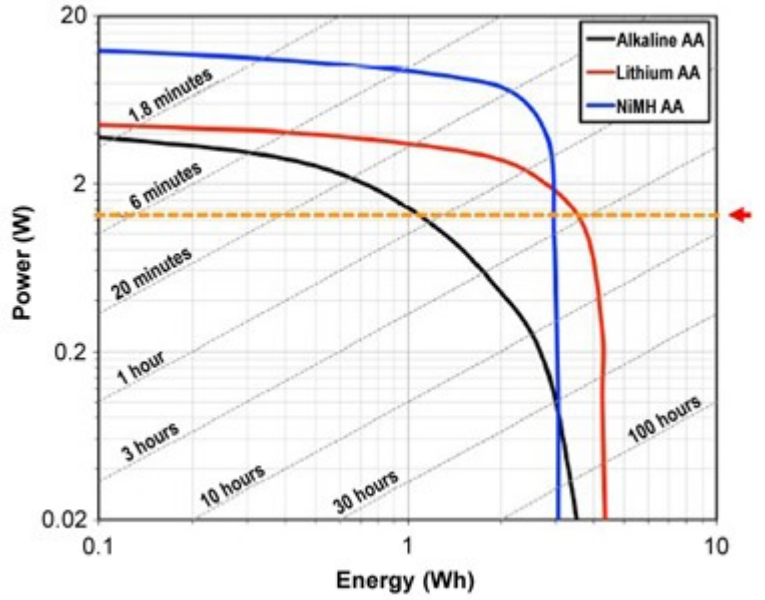
Rozmiary baterii

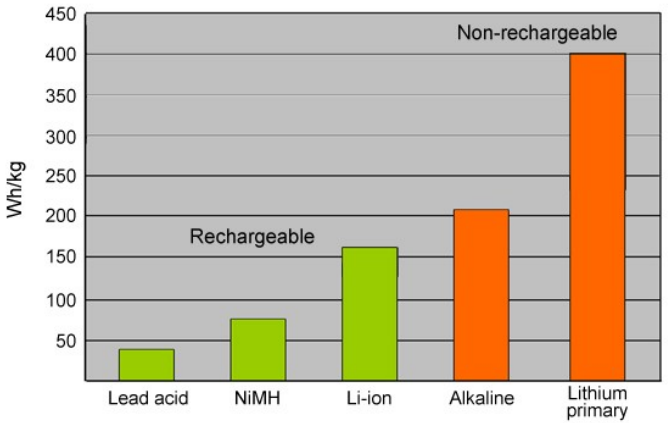
Źródło: https://li-polymer-battery.com/3-7v-li-polymer-battery-thickness-from-3-0mm-to-3-9mm/

Baterie - parametry

Battery type	Nominal voltage	Rated capacity	Voltage cut-off	Rated load	Discharge C-rate
9V	9 volts	570mAh	4.8 volts	620 Ohm	0.025
AAA	1.5 volts	1,150mAh	0.8 volts	75 Ohm	0.017
AA	1.5 volts	2,870mAh	0.8 volts	75 Ohm	0.007
C	1.5 volts	7,800mAh	0.8 volts	39 Ohm	0.005
D	1.5 volts	17,000mAh	0.8 volts	39 Ohm	0.0022

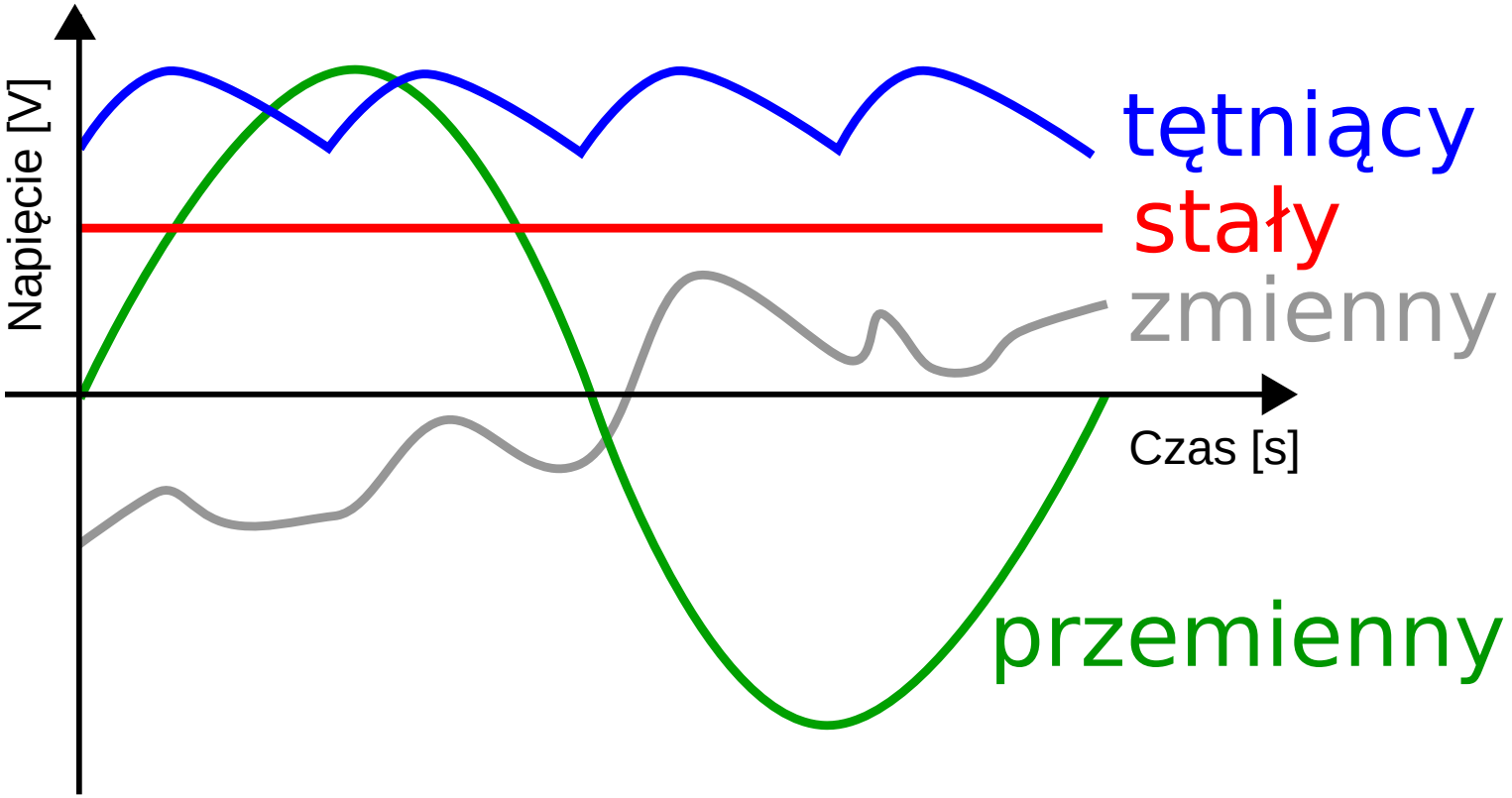
	Zinc-carbon	Alkaline	Lithium (Li-FeS2)	NiCd	NiMH
Capacity AA AAA	400-1,700 ~300	1,800-2,600 800-1,200	2,500-3,400 1,200	600-1,000 300-500	800-2,700 600-1,250
Nominal V	1.50	1.50	1.50	1.20	1.20
Discharge rate	Very low	Low	Medium	Very high	High
Rechargeable	No	No	No	Yes	Yes
Shelf life	1-2 years	7 years	10-15 years	5 years	5 years
Retail AA (2015) AAA	Not in all stores	$0.75 $1.00	$3.00-5.00 $4.00-5.00	Not in all stores	$1.60–2.00 $1.00





Źródło: https://batteryuniversity.com/learn/article/primary_batteries

Prąd stały i prąd zmienny

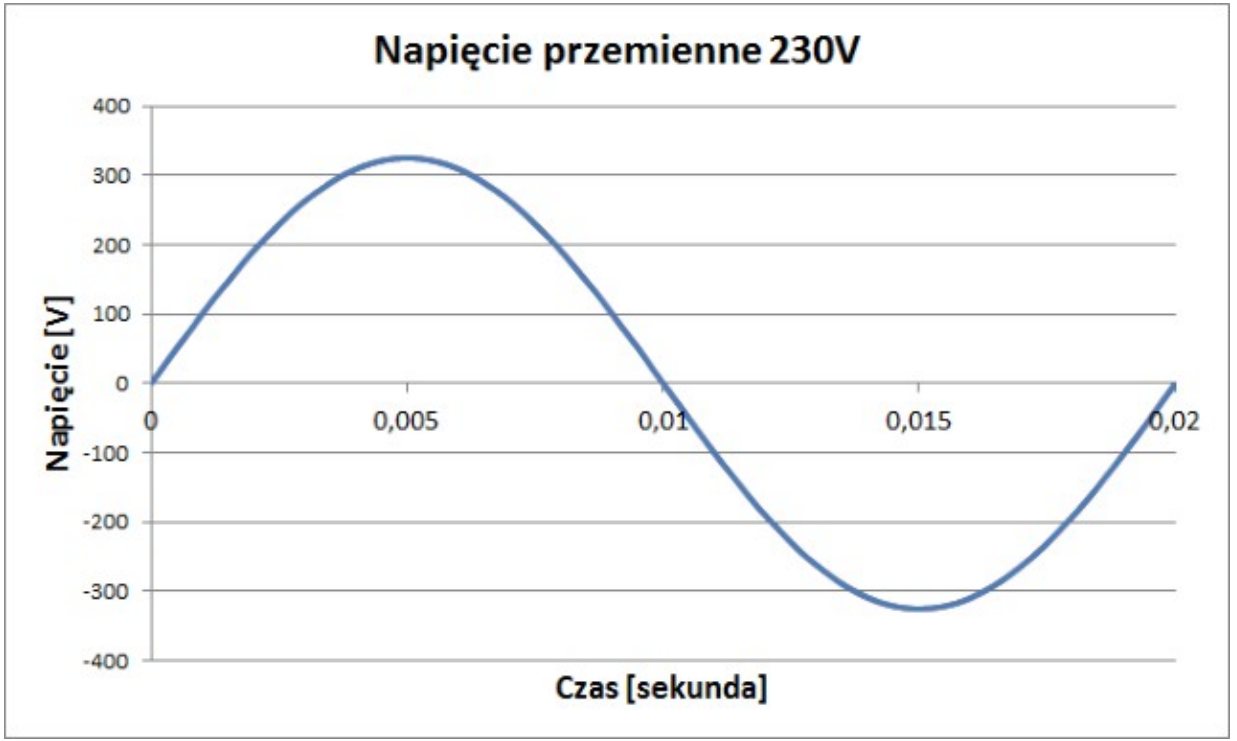


Źródło: https://pl.wikipedia.org/wiki/Pr%C4%85d_zmienny
Ciekawostka: https://geo-solar.pl/2019/09/26/wojna-o-prad-edisona-czy-tesla/

Prąd jedno- i trójfazowy

Źródło: https://www.cartersullivan.co.uk/blog/single-phase-vs-3-phase-explained/

Napięcie znamionowe a skuteczne

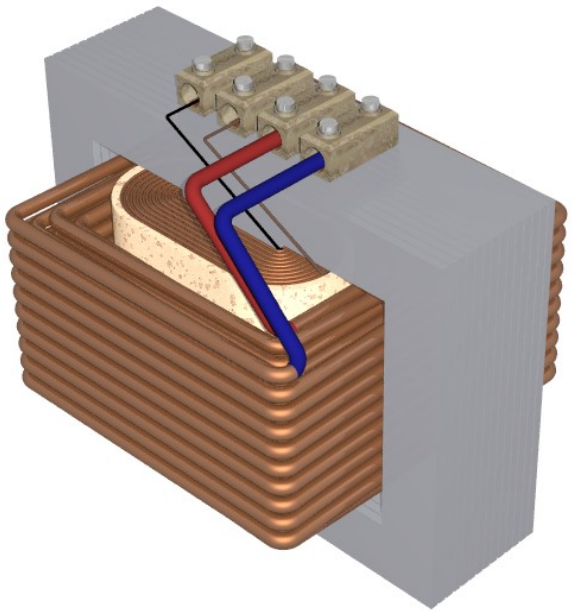


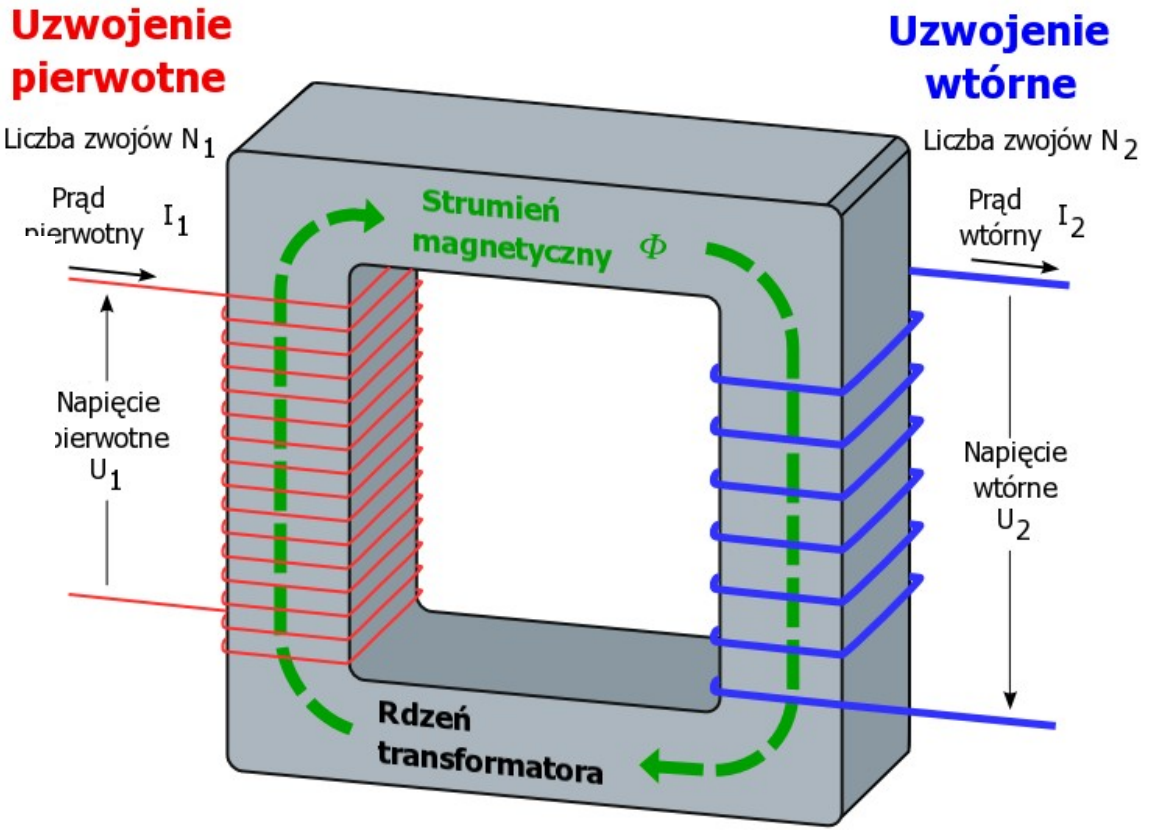
$$U_{sk} = \frac{U_O}{\sqrt{2}}$$

U_O – amplituda napięcia (wartość szczytowa)
U_{sk} – napięcie skuteczne

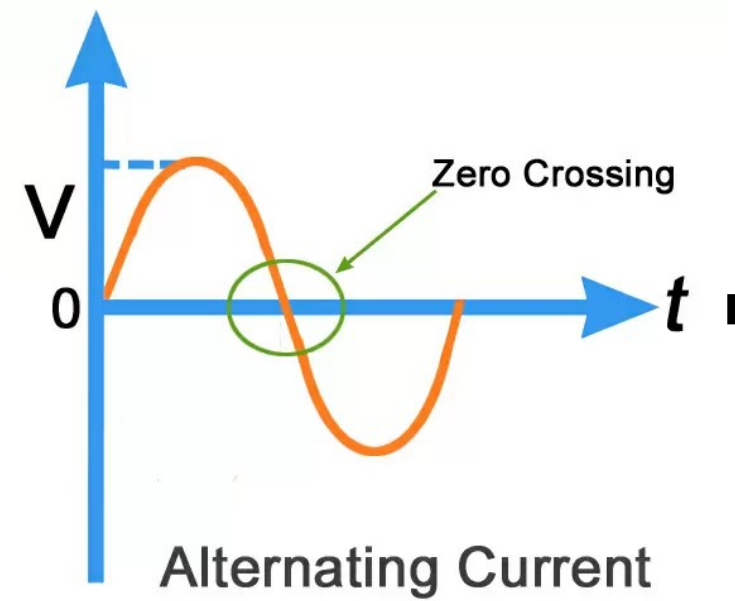
Źródło: **https://elektrykadlakazdego.pl/napiecie-230v/**

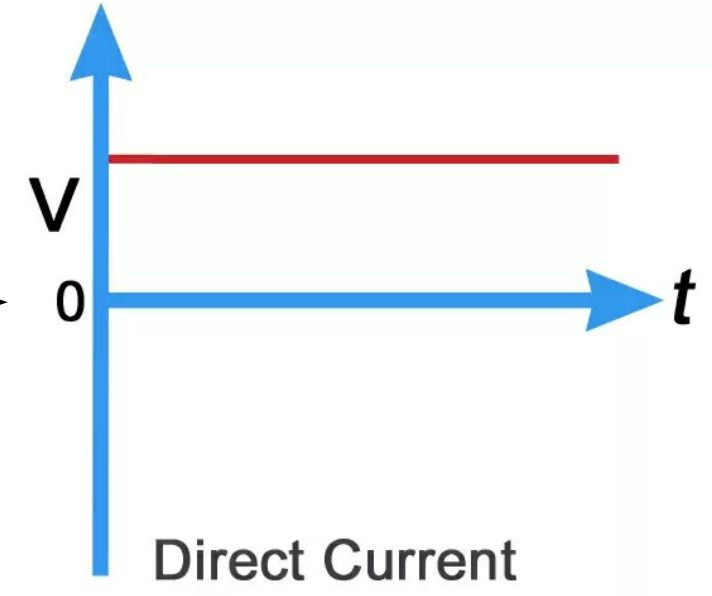
Transformator





Prostownik



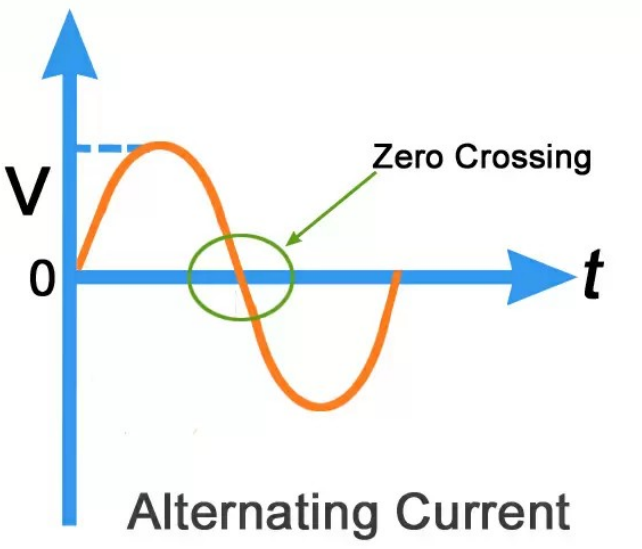


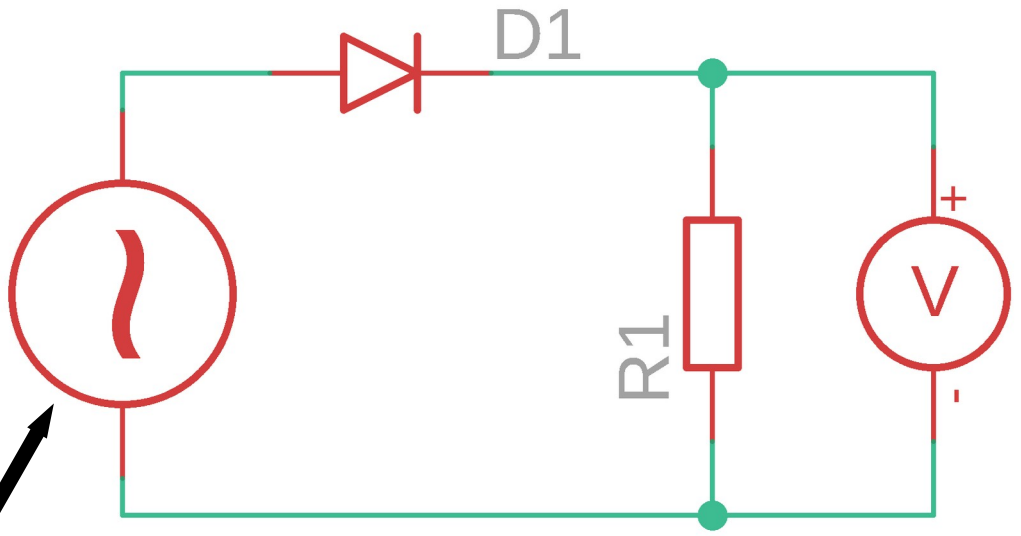
Prąd przemienny

Prąd stały

Źródła: https://enphase.com/en-us/file/ac-dc-voltage-time-graphjpg
https://ultimateclassicrock.com/acdc-shot-in-the-dark-single/

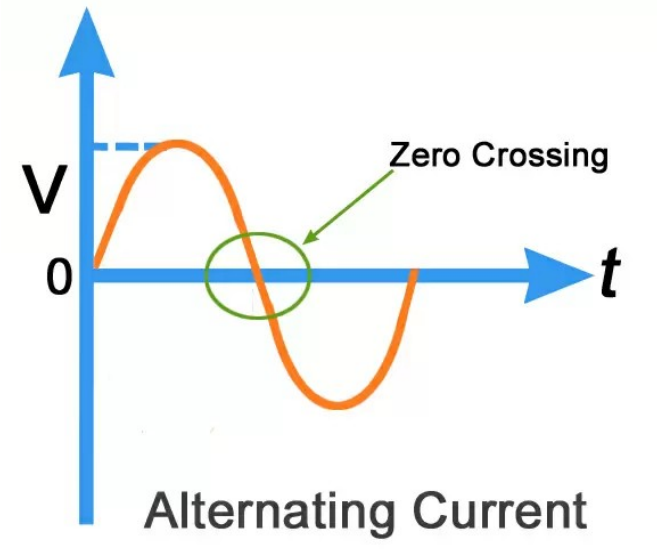
Rodzaje prostowników - jednopołówkowy

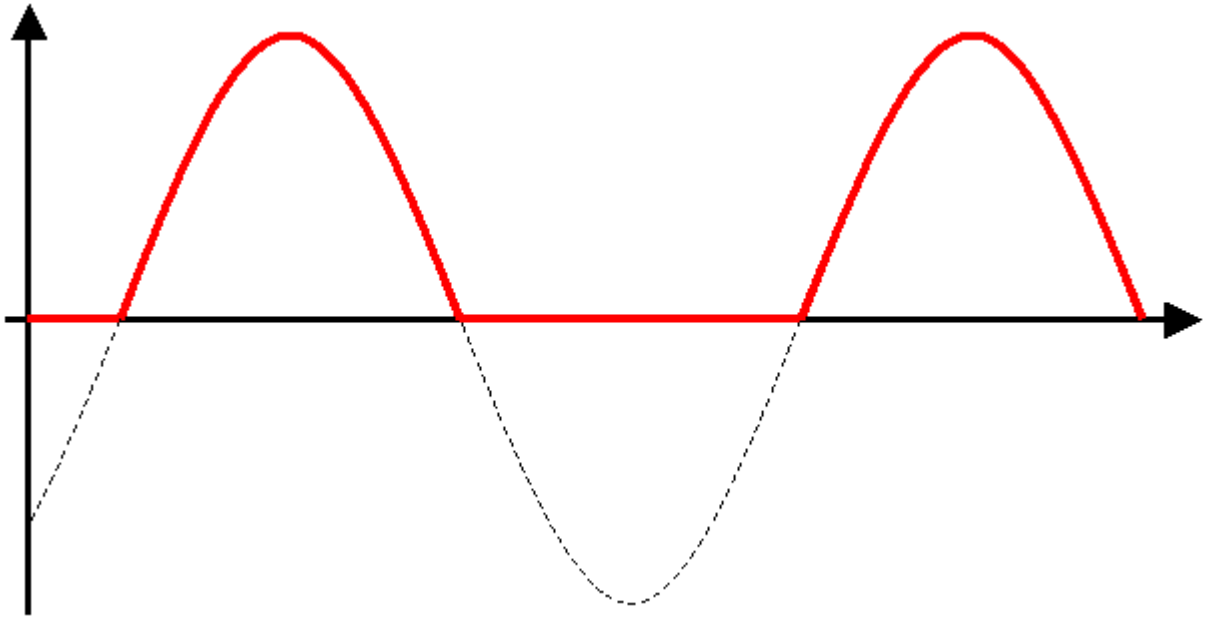




Źródło prądu przemiennego

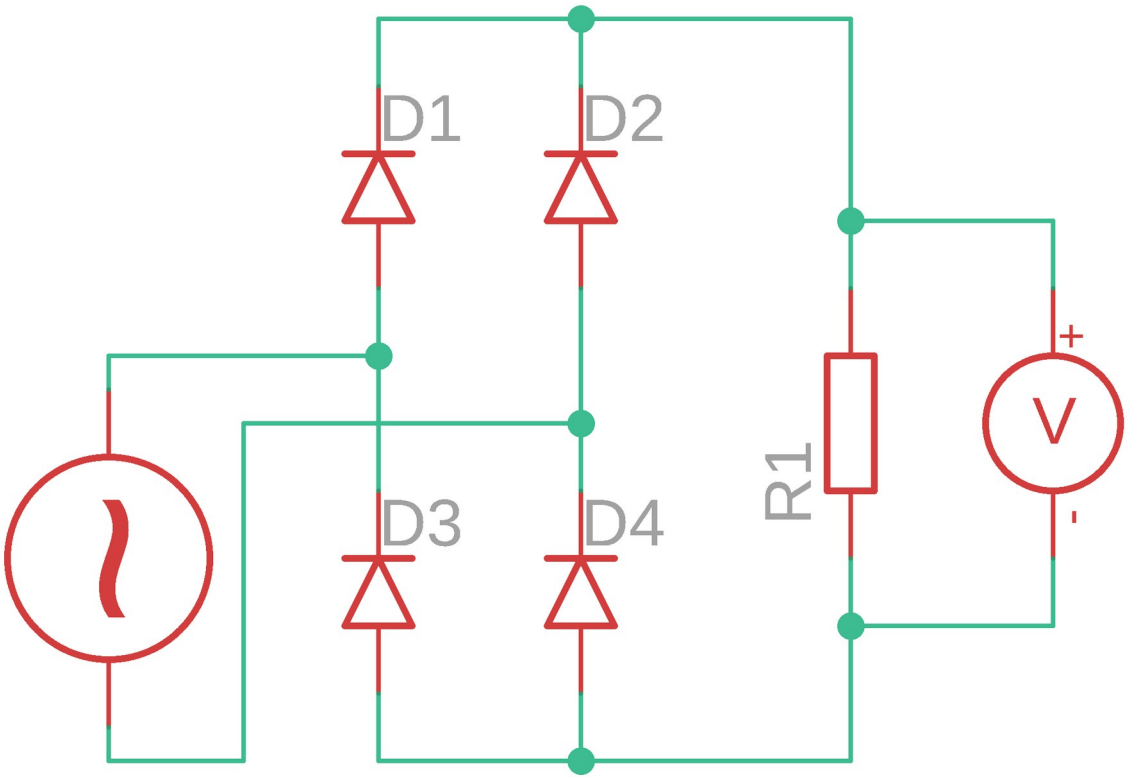
Prostownik jednopołówkowy

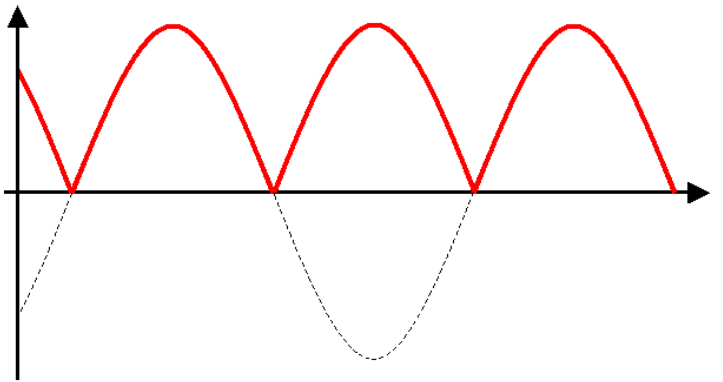


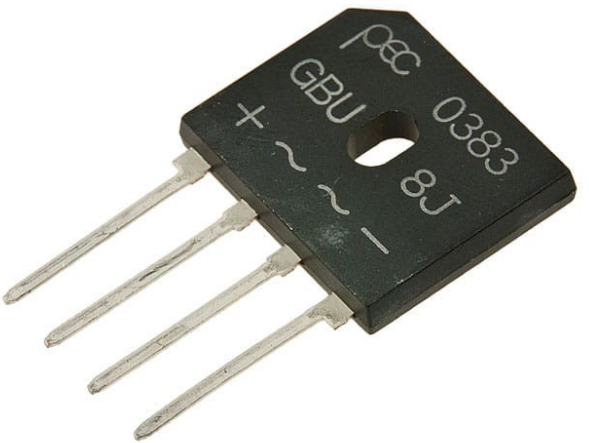


Źródło: https://pl.wikipedia.org/wiki/Prostownik

Prostownik dwupołówkowy

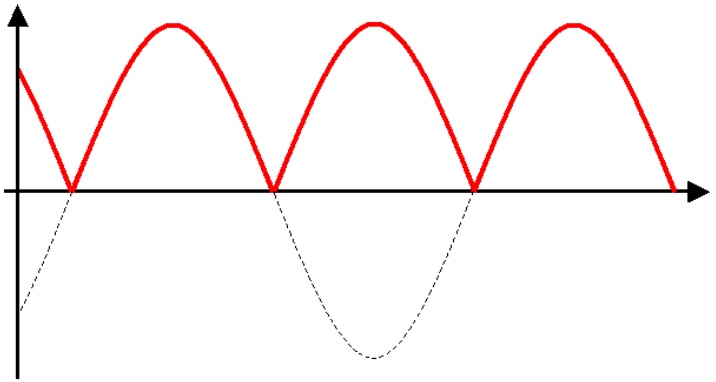






Źródło: https://inelsc.pl/pl/p/Mostek-prostowniczy-GBU6J-6A-1000V-plaski-cienki/4214

Czy może być lepiej?



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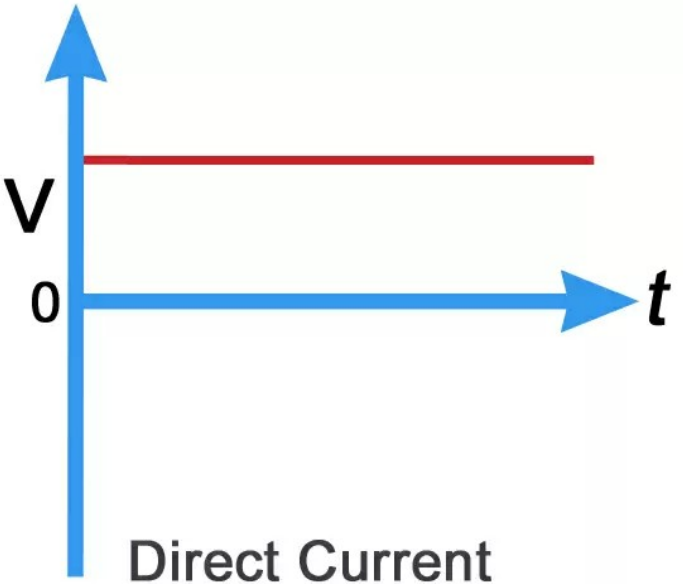
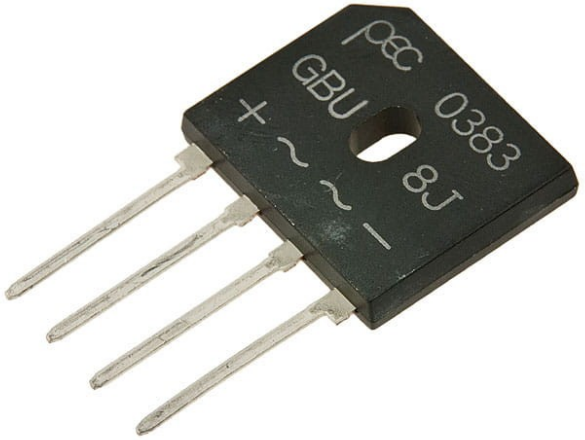
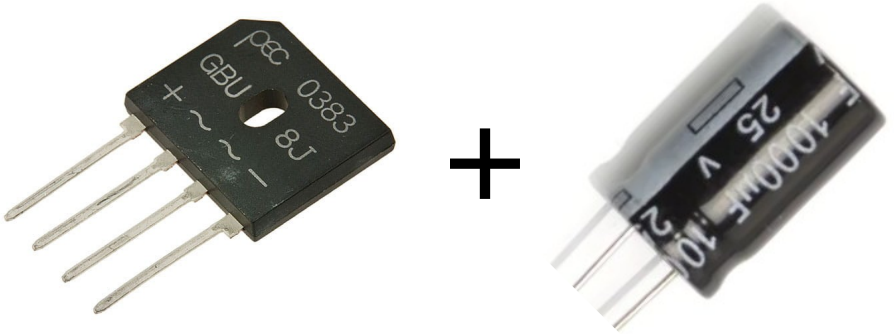
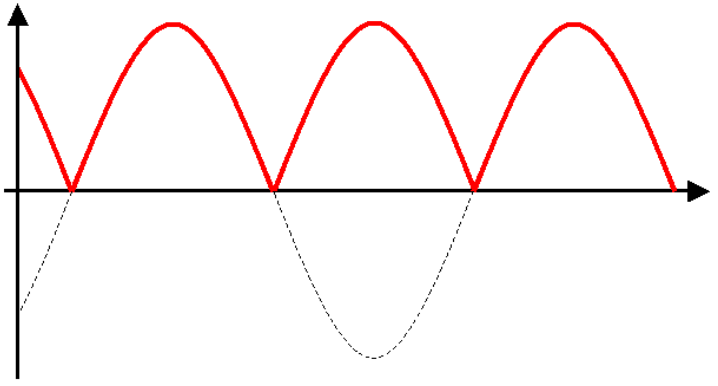
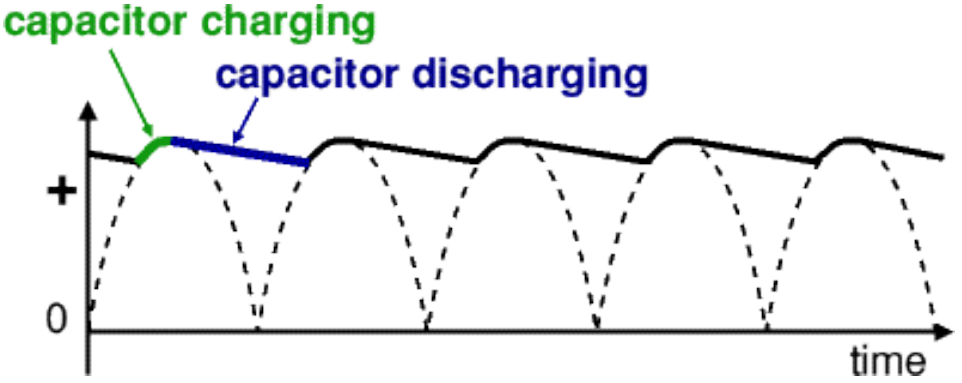


Kondensator + prostownik

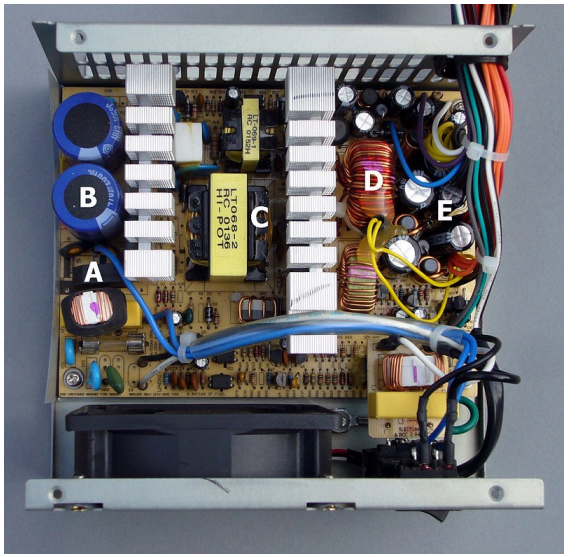


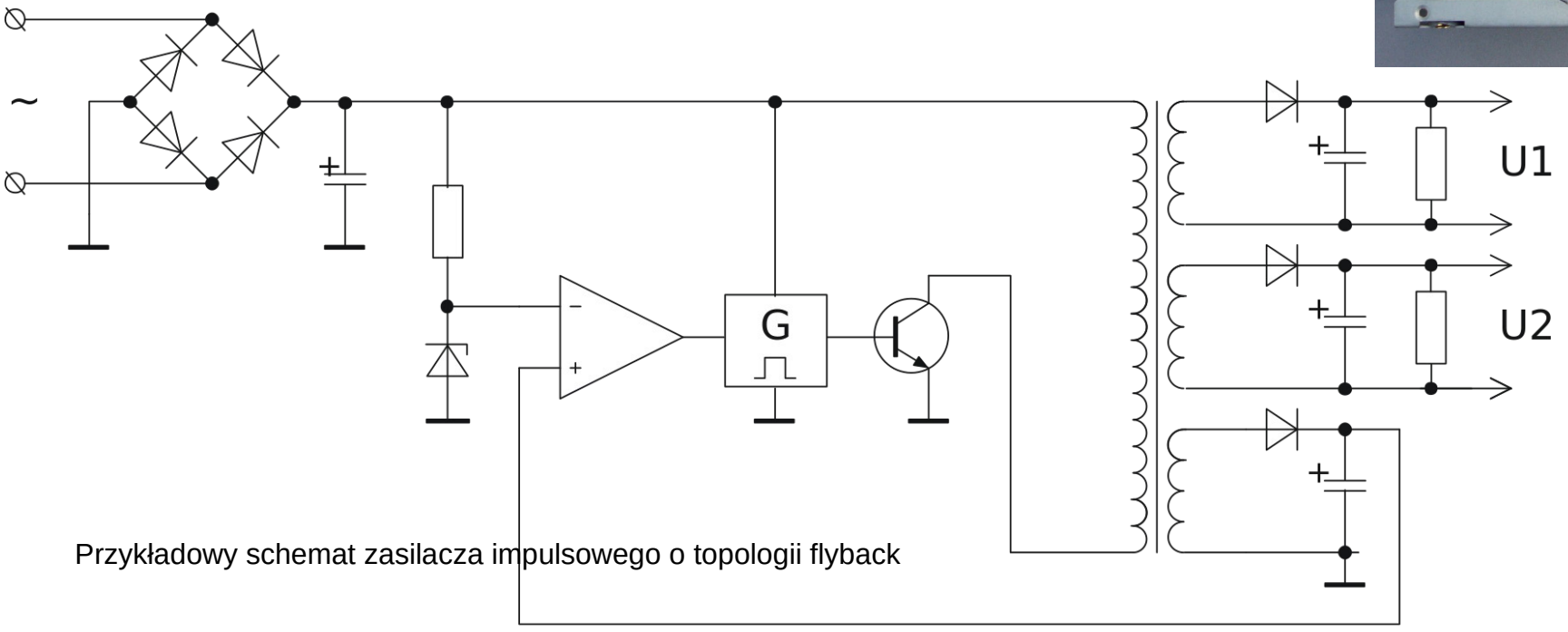






Zasilacz impulsowy





Przykładowy schemat zasilacza impulsowego o topologii flyback