



FIDES AC-DC CONVERTER

Disruptive Innovation to Digital Solid Capacitor

Novel Methodology Magnetic field harvesting AC - DC Solid States Valley fill

Tangible benefits in terms of reliability, Free maintenance, Small size and operating in extreme temperature environments



FIDES

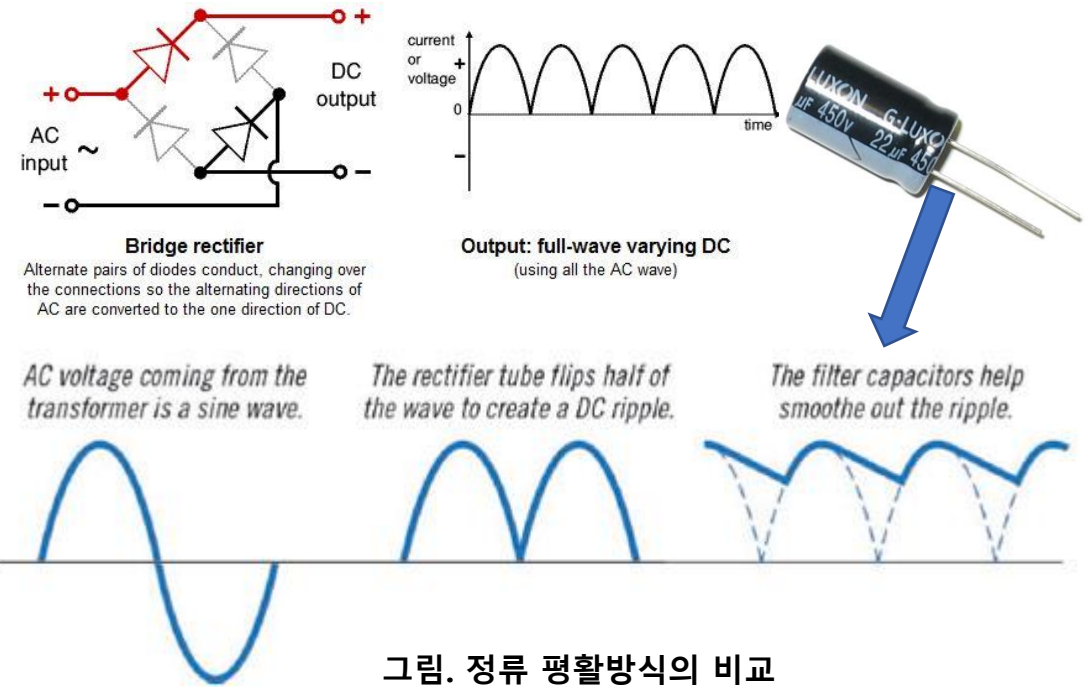
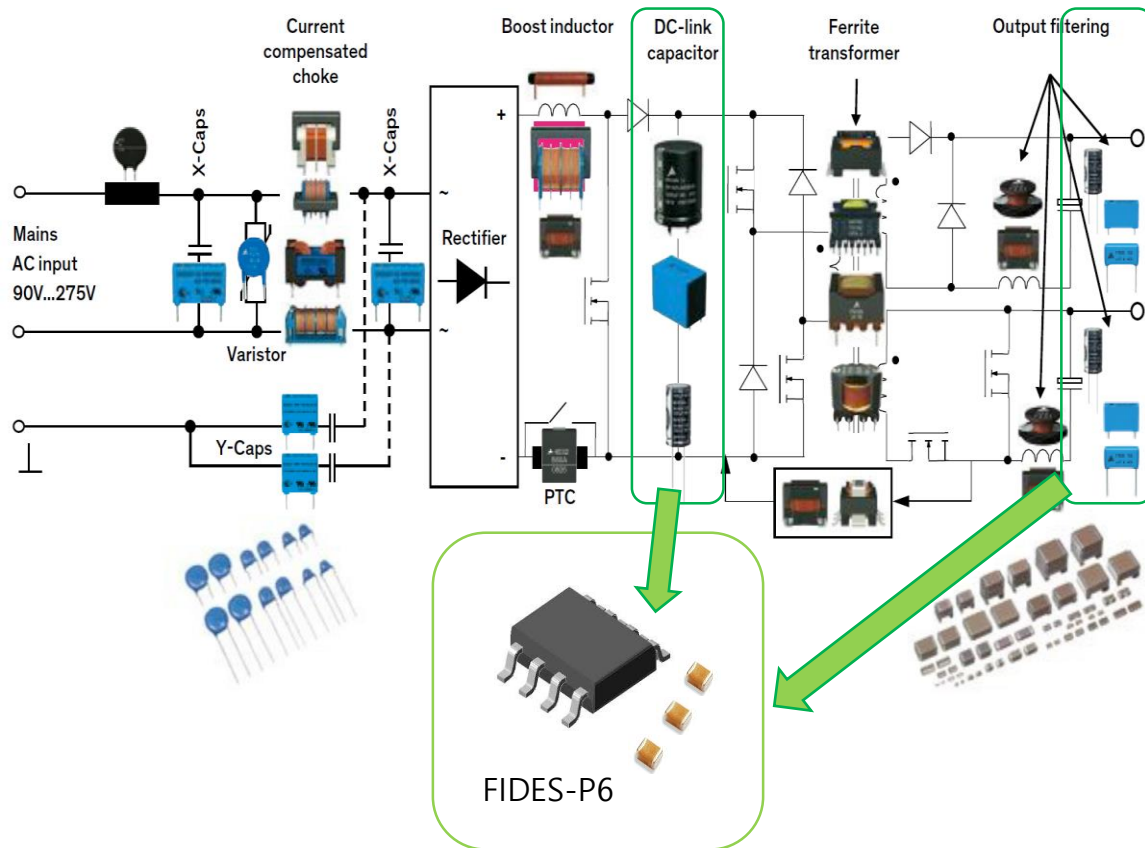
info@standbyzero.org

<http://www.standbyzero.com>

1. AC-DC Converter

General AC-DC rectifier

❖ SMPS aluminum electro substitution



전원장치의 정류평활의 방법상 반드시 콘덴서를 이용한 전력을 담아둘 댐을 만들수 밖에 없는 한계에서 기존의 Smooth filter의 문제점을 개선한 Active Discharge방식을 개발하여 전기적, 기구적 문제점을 해결하고 역률 개선 회로 없이 PF를 0.85까지 개선.

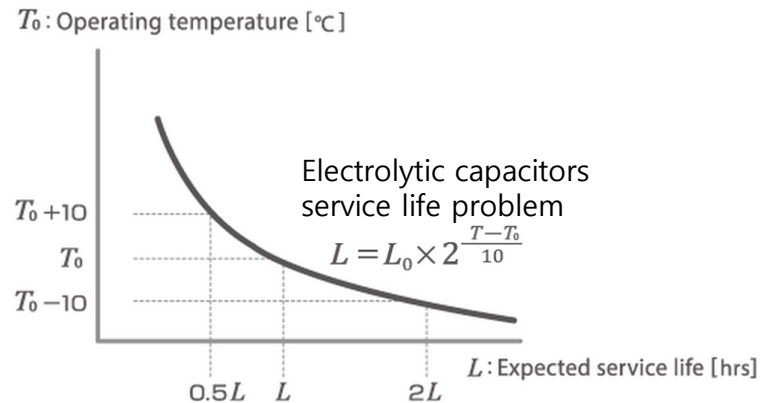
2. FIDES AC-DC SMOOTH FILTER DESCRIPTION

Digital Solid Capacitor merit

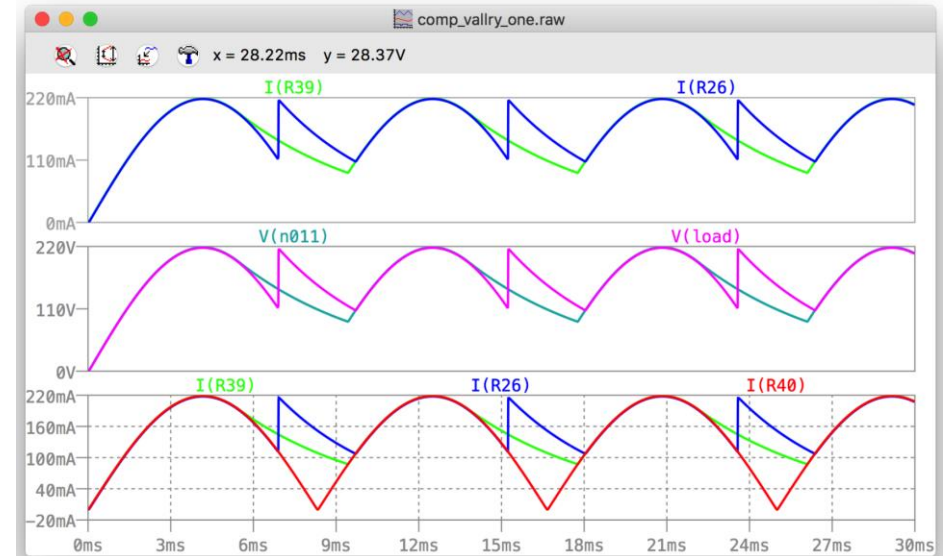
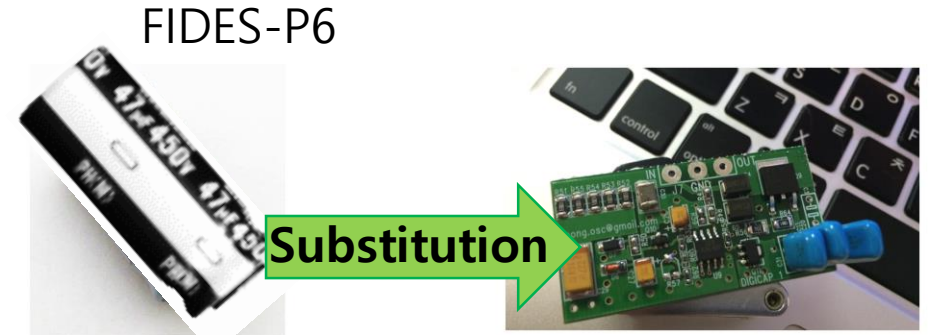
Benefit :

1. Long life MTBF 100Kh over
2. Good PFC effect without PFC (over 0.85)
3. Stable operating temperature (40~120°C+Small size)

http://media.wix.com/ugd/0ab234_e92f7ad40fb942a9976b43e9ef5a8634.pdf



For every rise in operating temperature by 10 degrees centigrade, the service life is shortened to one half, and double for every 10 degree drop (10 degree 2 fold rule). The aluminum electrolytic capacitor is commonly 10 years service life)



MTBF OVER 100K hours sustainable life cycles

3. FIDES-F1 IC DESCRIPTION

Pin Assignment

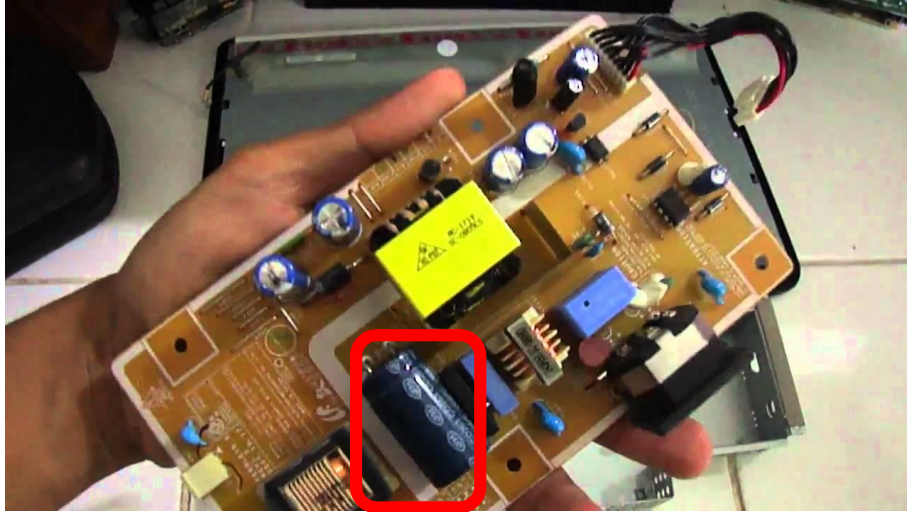


그림. 고압 전해콘덴서 콘덴서고장

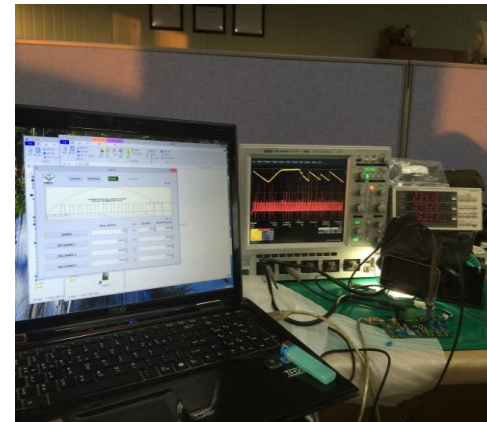
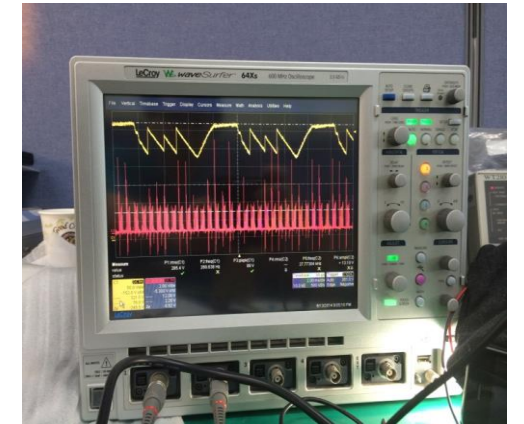
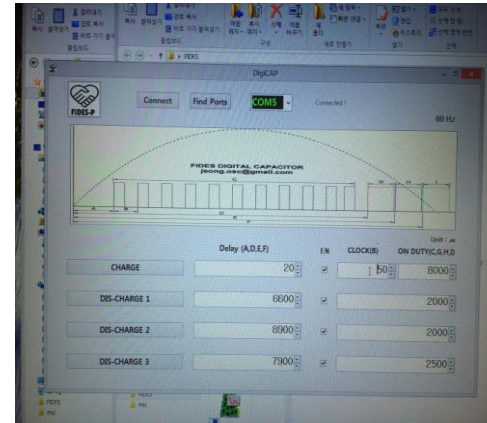
액체 전해 콘덴서는 내부에 전해액을 담고 있다. 극성을 갖고 고용량 제조가 용이하나, 시간에 의해 전기 분해액이 서서히 외부로 확산되고 없어지기 때문에 수명은 짧다. 특히 주위 온도가 고온의 경우, 전해질의 확산이 빨라지고 용량 값이 저하하는 것으로 추정 수명이 지수 함수적으로 짧아진다. 주변 온도가 10°C 올라가면 수명이 절반이 되며, 최종적으로는 오픈 용량이 된다. 또한, 전원투입시 돌입전류 발생과 역률 저하와 순간 과전압에 취약하며 외부충격에 약하다.

1. FIDES-F1 IC DESCRIPTION

AC-DC Adaptor example

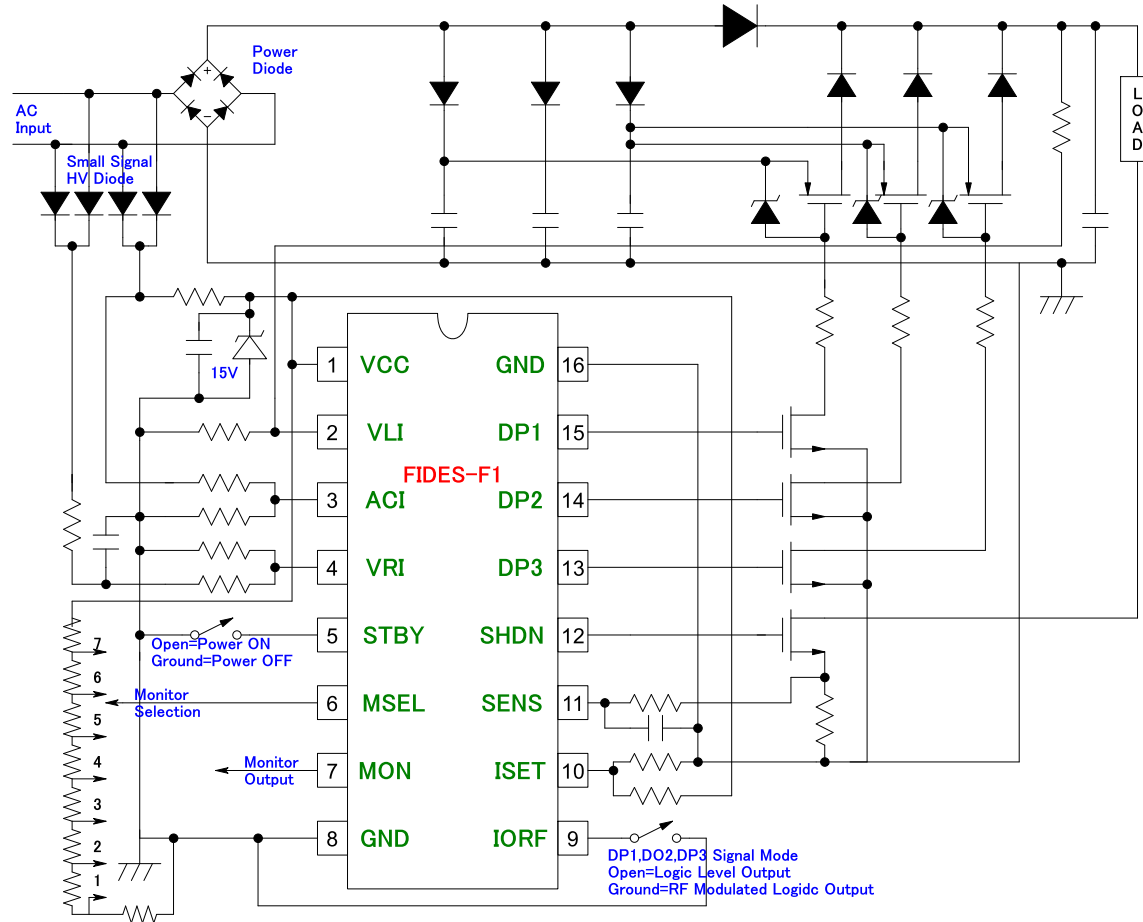


❖ HV9910B + Silicon cap demo (Load Led 16Watts)



1. FIDES-F1 IC DESCRIPTION

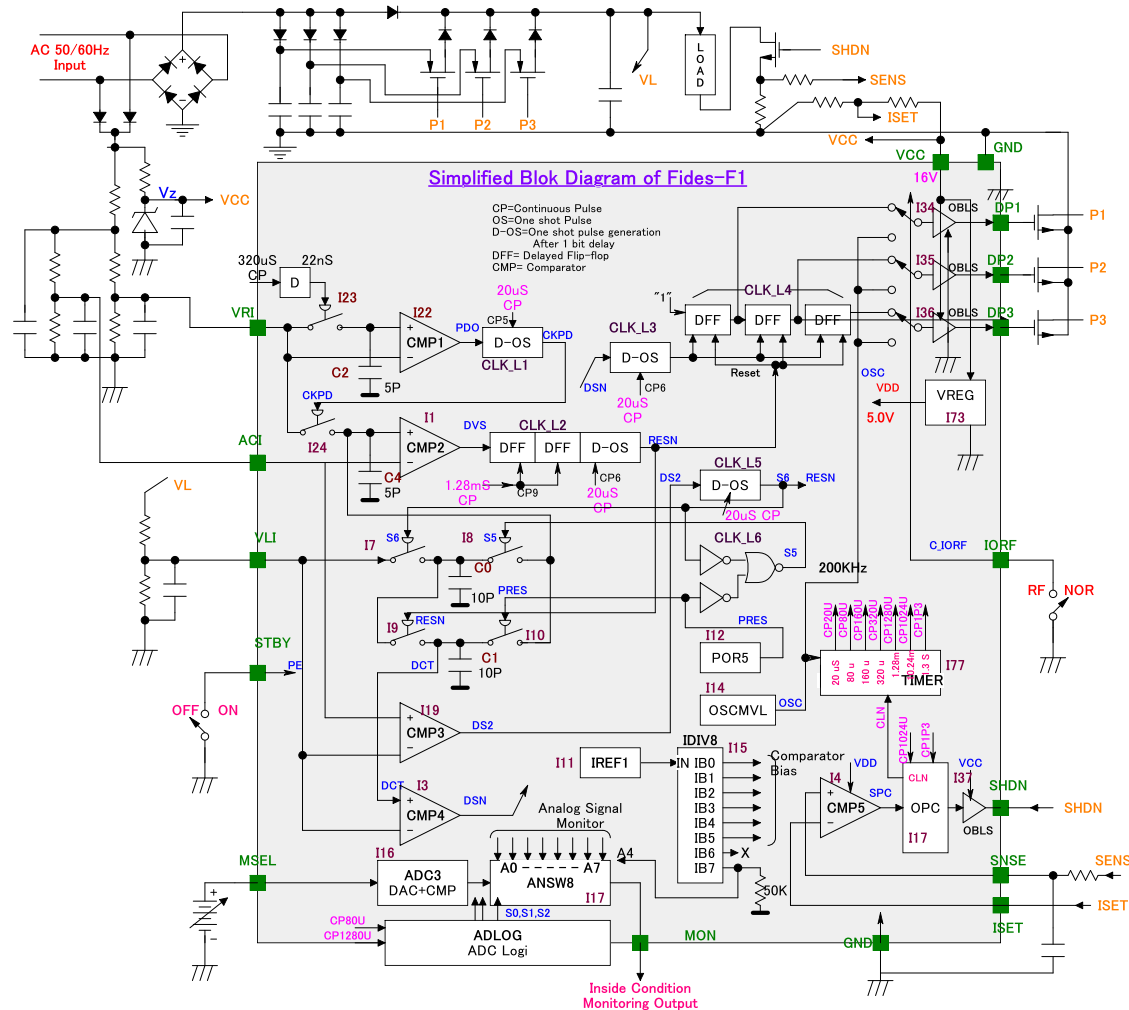
FIDES-F1 Application



Pin#	Pin Name	I,O	Port	Description
1	VCC	Input	Direct	Power Supply, 10V to 15V
2	VLI	Input	CMOS with 2.3K	Load Voltage Sensing
3	ACI	Input	CMOS with 2.3K	AC signal Input for AC wave sensing
4	VRI	Input	CMOS with 2.3K	Reference Voltage with AC depend.
5	STBY	Input	110K Pull Up	Power Switch, Open=ON,GND=OFF
6	MSEL	Input	CMOS with 2.3K	Step DC Voltage for Monitor Select.
7	MON	Output	CMOS Analog	Monitor Output
8	GND	Input	Direct	Input side Ground (Quiet)
9	IORF	Input	110K Pull Up	Direct or RF Modulated Output for DP1, DP2 and DP3 H=Normal L=RF Mod.
10	ISET	Input	CMOS with 2.3K	Reference Voltage for Shut Down
11	SENS	Input	CMOS with 2.3K	Over Current Sensing
12	SHDN	Output	CMOS High Drive	Shut Down Output, Normal=High
13	DP3	Output	CMOS High Drive	Discharge 3
14	DP2	Output	CMOS High Drive	Discharge 2
15	DP1	Output	CMOS High Drive	Discharge 1
16	GND	Input	Direct	Ground, Output side(Noisy)

1. FIDES-F1 IC DESCRIPTION

FIDES-F1 Function block & External Application



Simple function block with external application circuit.

VCC zener diode (Vz) was 12~15V

Internal regulator circuit are 5V

1. FIDES-F1 IC DESCRIPTION

Simulation result

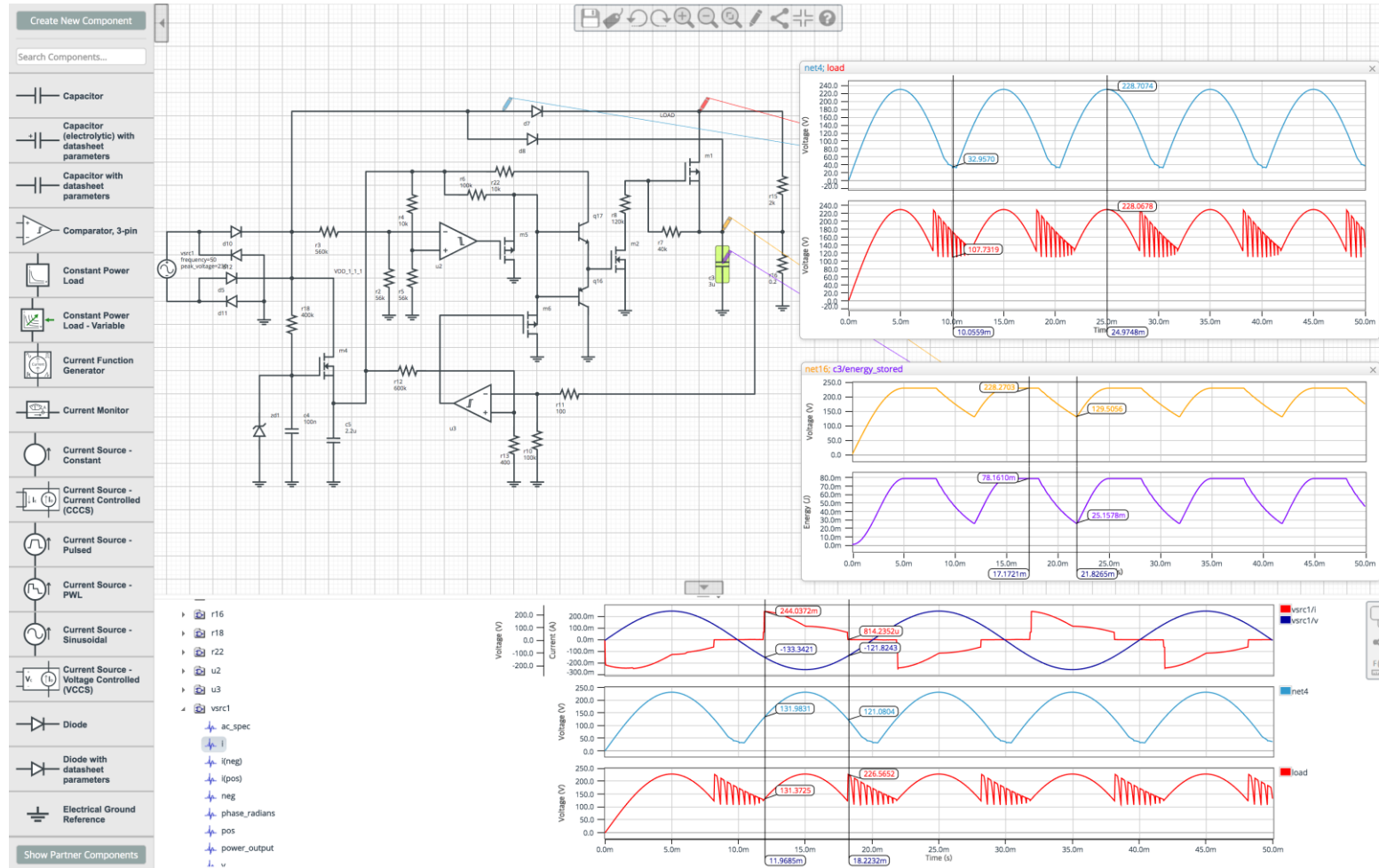


그림. SOLID CAPACITOR BLOCK SIMULATION

Simulation results

AC 141V/50Hz .step param RLOAD LIST 2k 5k 60k

