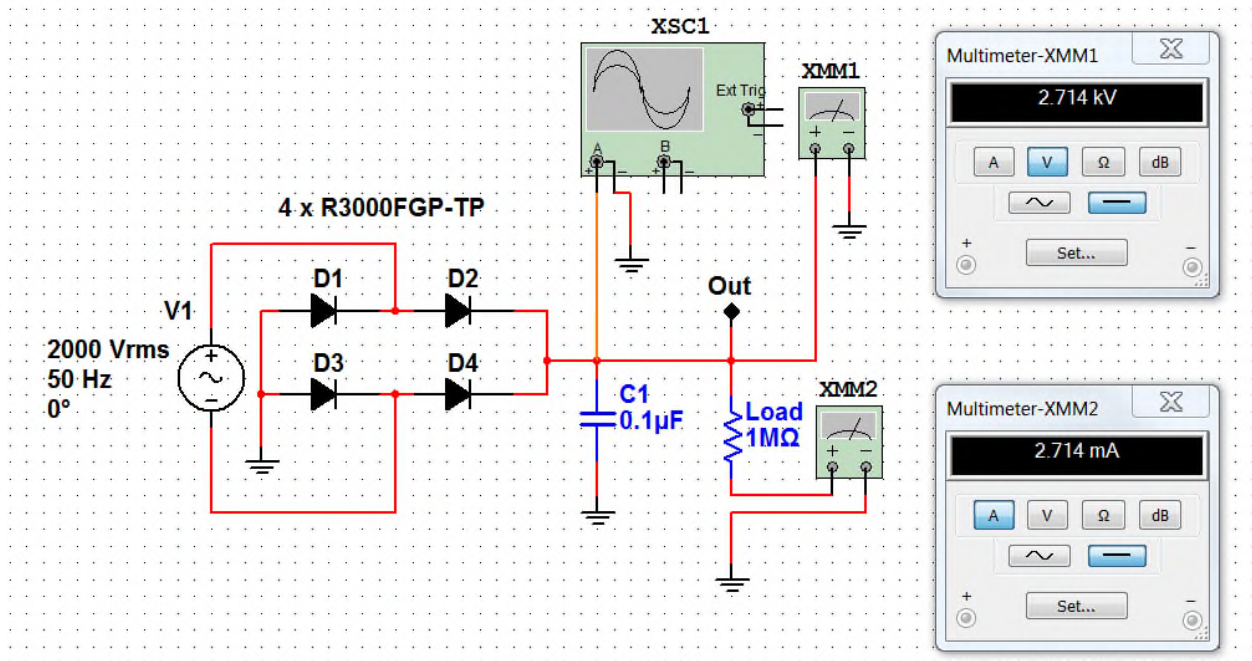The following simulations was done with National Instruments Ni Multisim 11.0

With the circuit below that have a transformer that has an output of 2000 Volt RMS we will get a DC (average) output of 2714 Volts with a load of 1 Mega Ohm. The load current will be 2.714 mA.
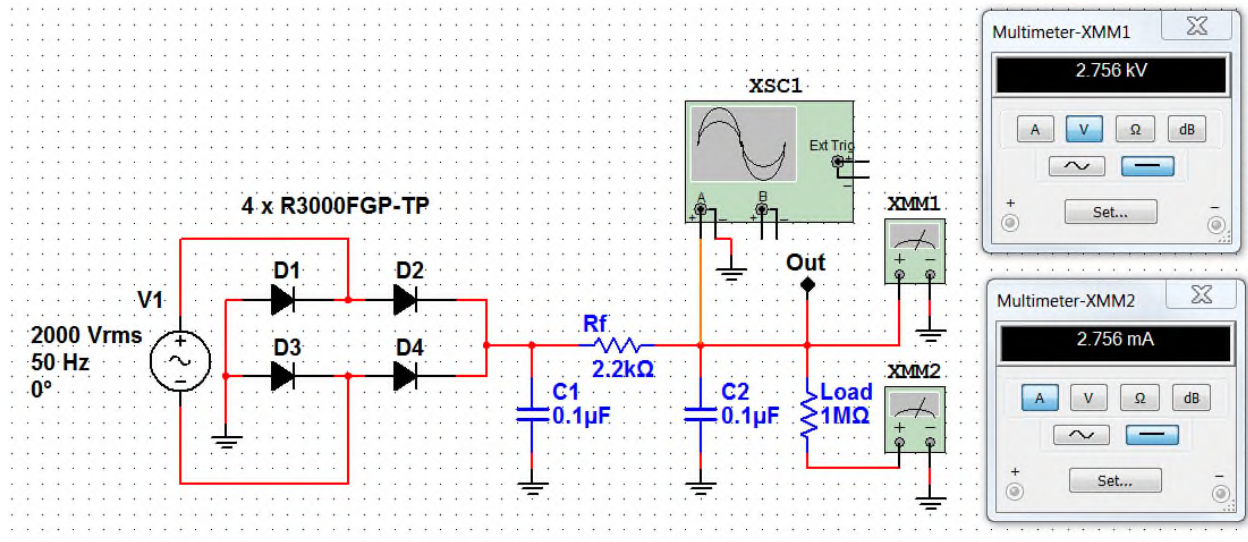

The diodes used are R3000FGP-TP from Digikey, part number R3000FGP-TPMSCT-ND. Price 0.87 US $.

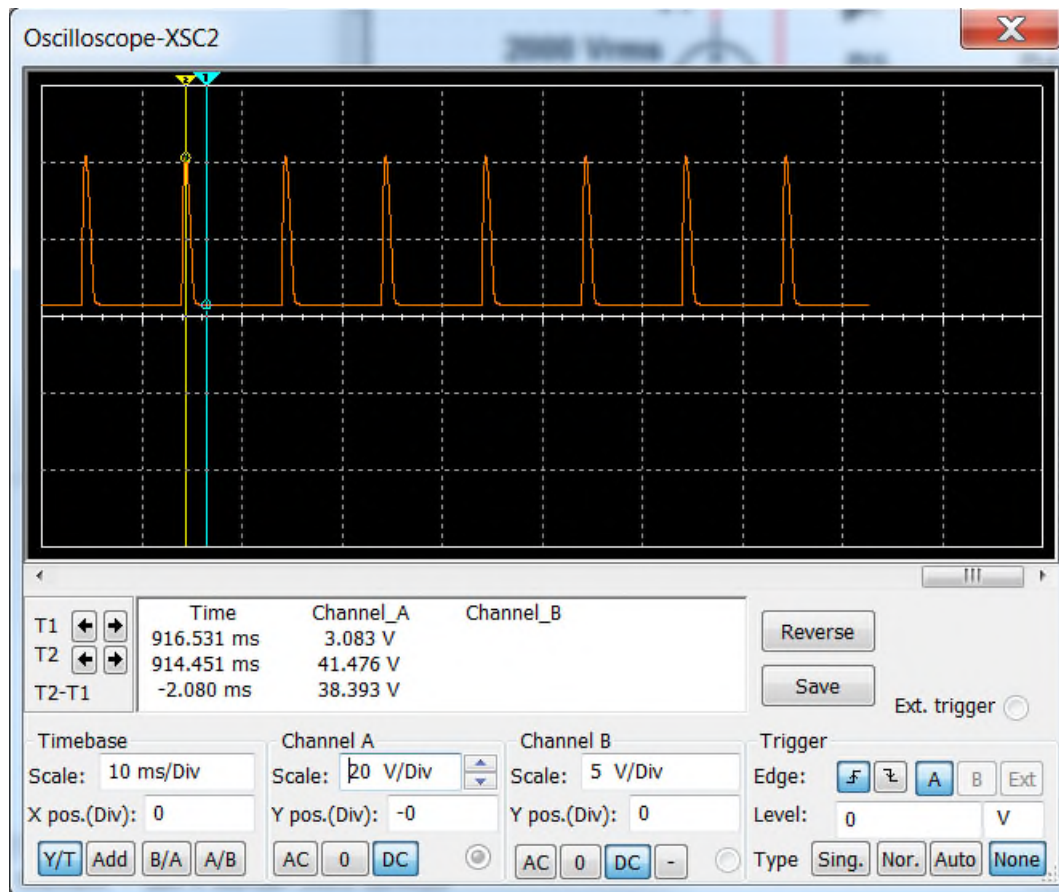The ripple will be as below; the ripple will be about 234 V peak to peak.
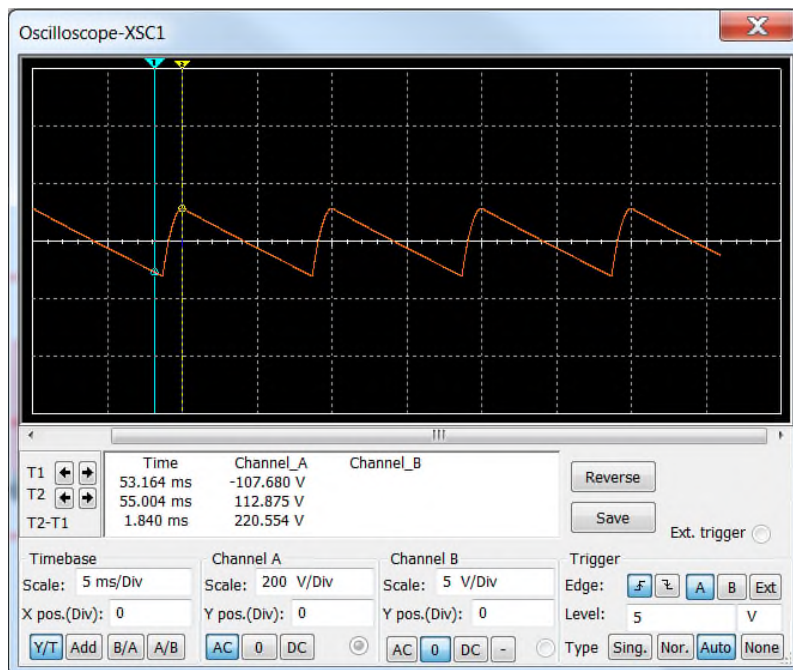
An alternative solution would be the circuit below. In this case we use both the 0.1 uF capacitators and have added a 2.2 KOhm resistor between them:

In this case the ripple will be about 120 Volt peak to peak as can be see below:

The voltage drop over Rf will look like below and is in the order of 40 Volt.

Oscilloscope-XSC2

	Time	Channel_A	Channel_B
T1	916.531 ms	3.083 V	
T2	914.451 ms	41.476 V	
T2-T1	-2.080 ms	38.393 V	

Reverse

Save

Ext. trigger

Timebase
Scale: 10 ms/Div
X pos.(Div): 0
Y/T Add B/A A/B

Channel A
Scale: 20 V/Div
Y pos.(Div): -0
AC 0 DC

Channel B
Scale: 5 V/Div
Y pos.(Div): 0
AC 0 DC -

Trigger
Edge: ꜜ ꜛ A B Ext
Level: 0 V
Type Sing. Nor. Auto None

In any case the filtering of the circuit(s) will be pretty bad. Best case gives 120 / 2756 ~ 4.4 %

A better solution would be to use a High Voltage, low noise, DC/DC converter as can be found in by this link: https://www.analog.com/media/en/technical-documentation/application-notes/an118fb.pdf

Regards

/Bo, SM6FIE