Pulse Generator with High Voltage

1 Purpose

This Pulse Generator is mainly available for pulsing secondary ion beam on mass spectrometry equipment (especially on the secondary ion mass spectrometry equipment).

2 Keywords

High Voltage Pulse Generator, Power-MOSFET, Photo coupler,

Secondary Ion Mass Spectrometry

3 Motivation

I made the Pulse Generator which enables generating short pulse width with high voltage. It can be attached to mass spectrometry equipment, such as Secondary Ion Mass Spectrometry.

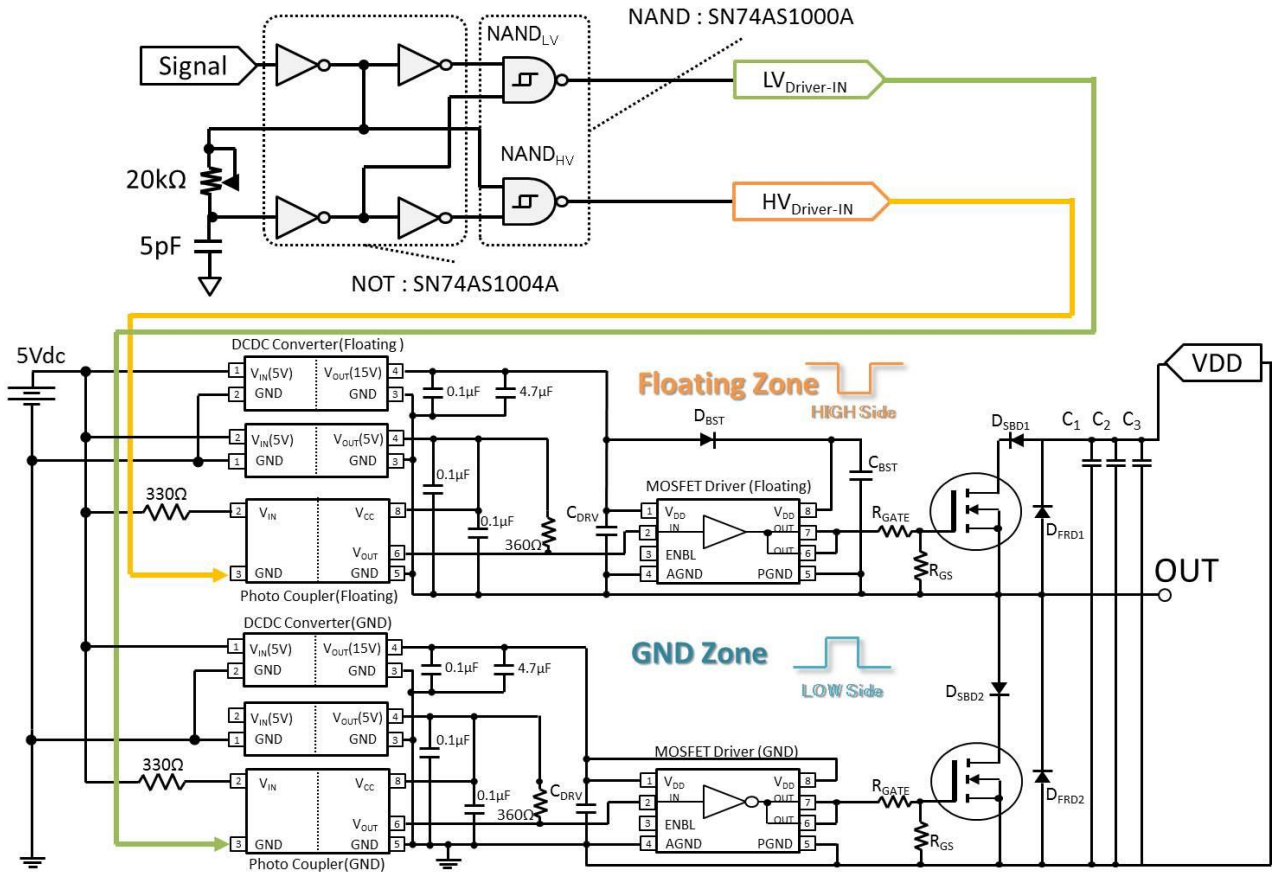
The circuit does not perform well enough compare to the market products which usually outputs 100ns or less ultra-short pulse width with 1kV or more voltage. Although targeting 1kV voltage under 10ns pulse width, I have difficulty to move forward today. Hence, I would like to hear your opinions for my further studies. For all the specialists or the researchers regardless of the fields, please do not hesitate to contact me if you have any ideas.

Thank you very much in advance!! :-)

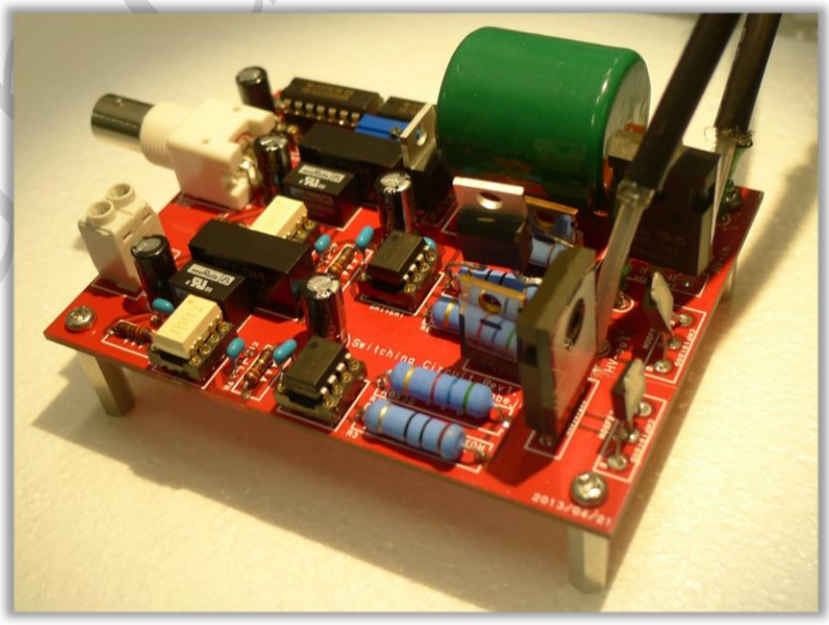
4 Specification

Symbol	Function	Test Condition	Values			Units
			Min	Typ	Max	
Vin	Supply Voltage	T=25℃	4.5	5.0	5.5	Vdc
Iin	Supply Current	T=25℃, Vin=5.0Vdc	190	200	-	mA
V_{HV-IN}	Input High Voltage	T=25℃	0	-	1000	V
V_{HV-OUT}	Output High Voltage	T=25℃	0	-	1000	V
T_{d-in}	Input Pulse Width	T=25℃, TTL5.0V	150	-	100000	ns
T_{d-out}	Output Pulse Width	T=25℃	180	-	100000	ns
f	Frequency	T=25℃	-	1.0	6	kHz
Polarity	Negative / Positive	T=25℃	-	-	-	-

5 Schematic Circuit

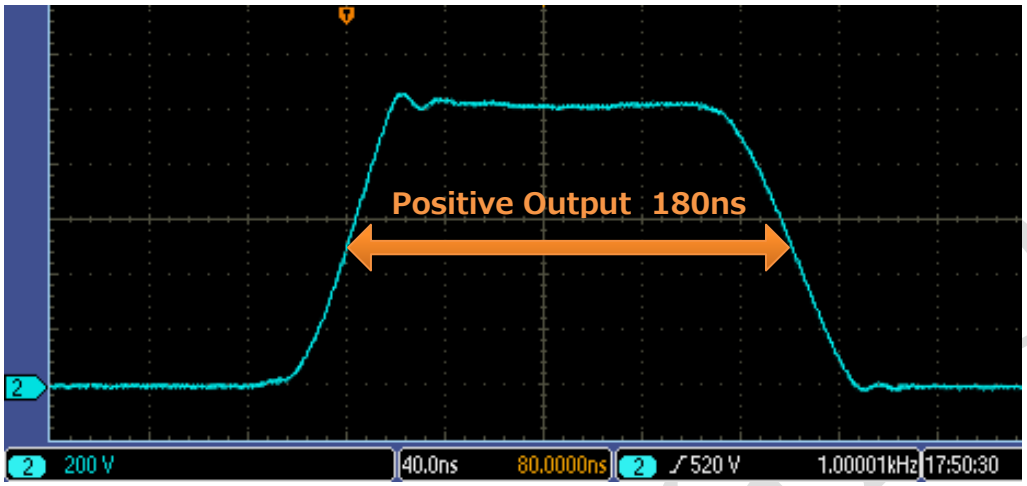


6 Photograph of Pulser

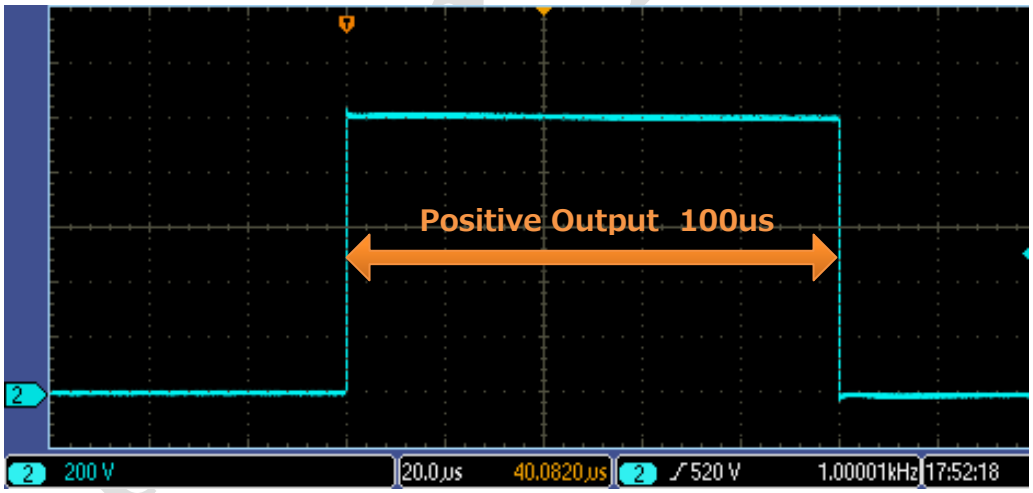


7 Waveforms

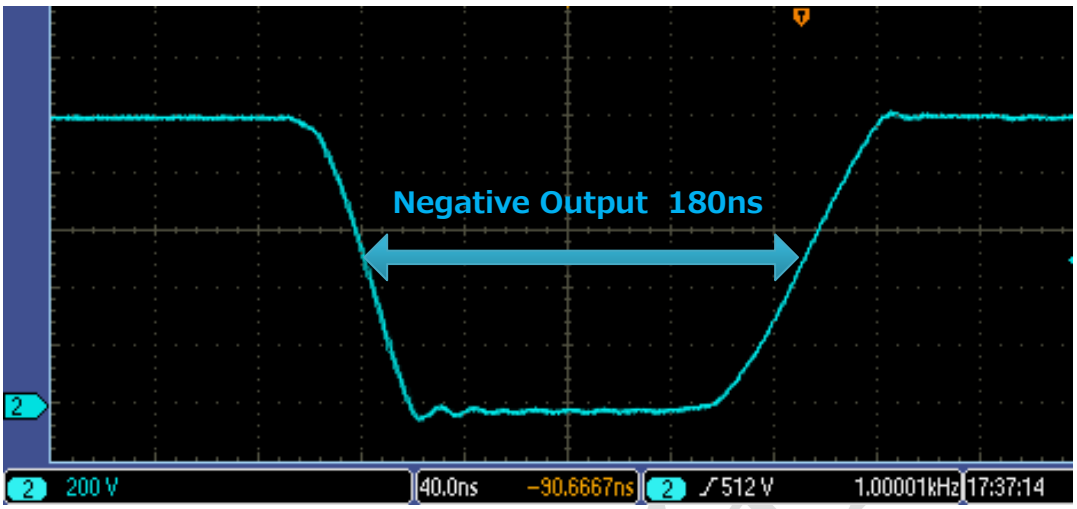
7.1 Positive Input Pulse Width 150ns with 1.0kV and 1.0kHz



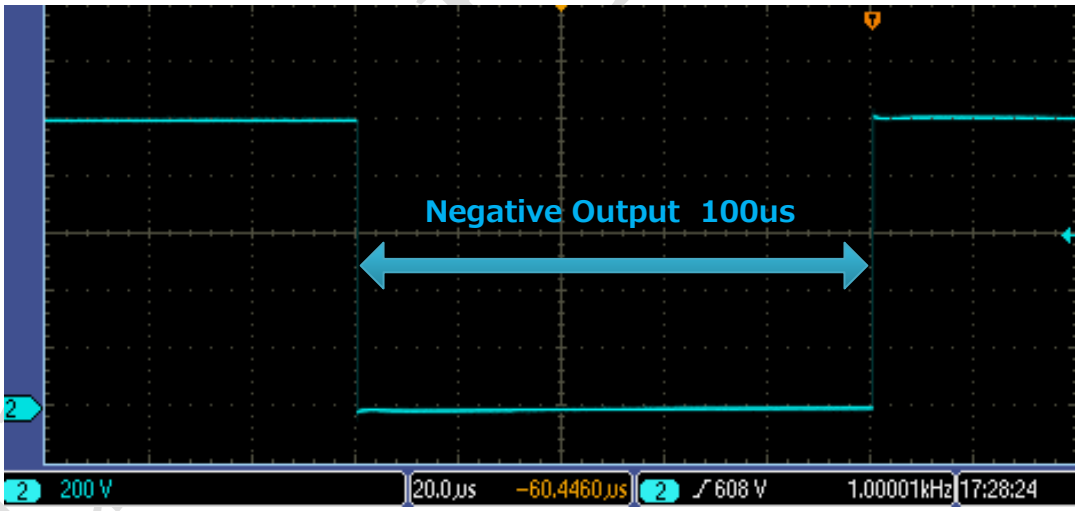
7.2 Positive Input Pulse Width 100μs with 1.0kV and 1.0kHz



7.3 Negative Input Pulse Width 150ns with 1.0kV and 1.0kHz



7.4 Negative Input Pulse Width 100μs with 1.0kV and 1.0kHz



8 Members

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