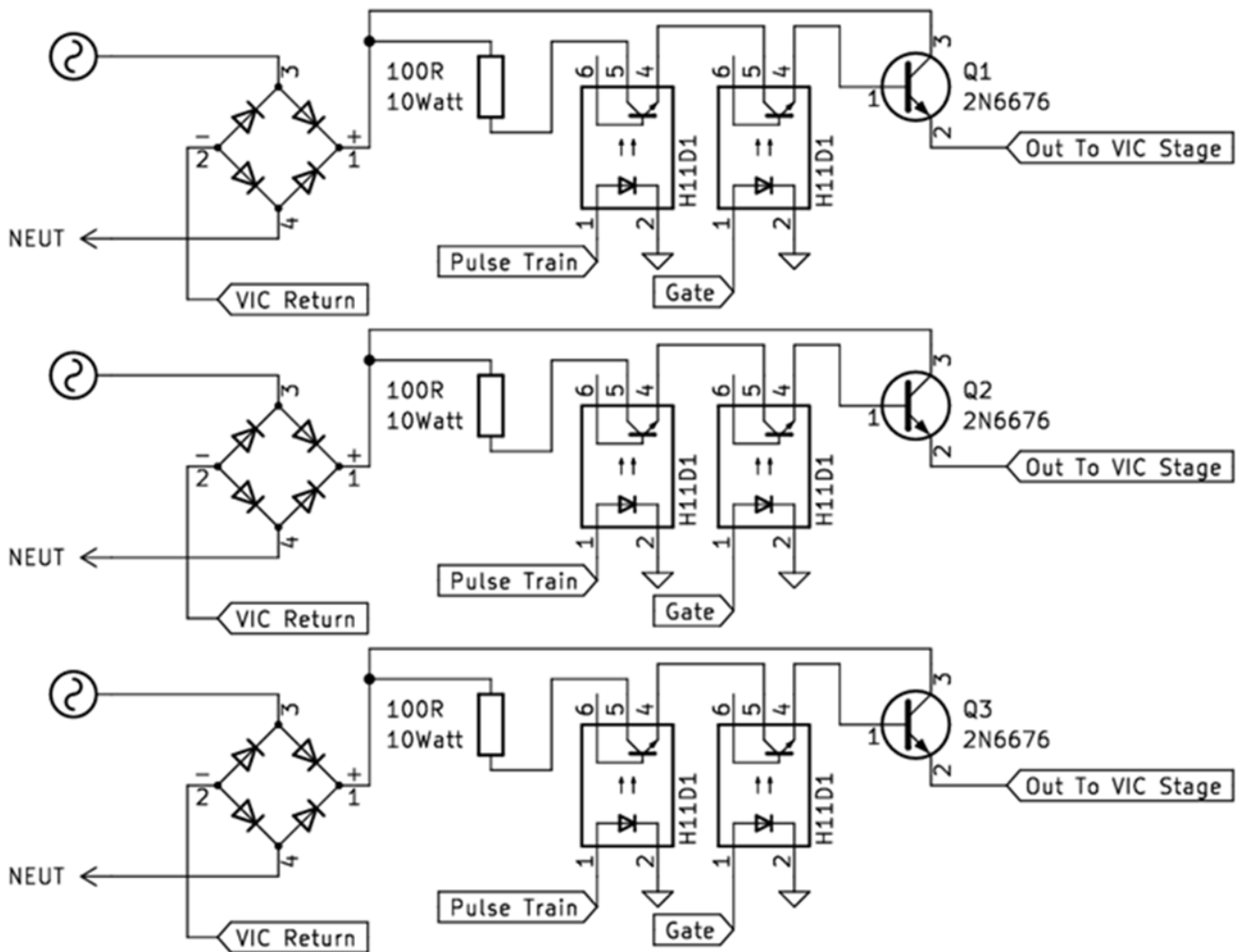


# PC9XA - Variable Voltage Pulse Circuit

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# Circuit Analysis

## Schematic:



The circuit is composed of three independent power NPN-BJT circuits. The 2N6676 was specified by Stan, however, any of appropriate rating or even modern N-Channel MOSFETs can be used. A rectifier stage produces a variable positive unipolar-pulsating waveform. Each circuit stage has a minimum of two optocouplers that provide electrical isolation between driver and waveform generation means. One provides a frequency pulse train ("Pulse Train"), the second one provides a gating frequency ("Gate") that controls how many

frequency pulses are applied to the base of the driver component. A  $100\Omega/10W$  resistor provides a small resistance, as the required base current for the driver BJT is larger than a Darlington pair for example.

Majority of the current limiting is provided by optocoupler waveforms. Using N-Channel MOSFETs would provide additional isolation given the nature of their capacitance coupling. Greater signal clarity would also be afforded by using MOSFETs. Two interesting observations present themselves in regards to the above schematic. One, a smoothing capacitance is not explicitly shown. However, in order to produce specific waveforms for VIC operation, this would be a necessity. Second, the power BJT is an NPN type, which typically are used in low-side switching applications. The schematic illustrates a high-side switching mode.

# Stan's Original Literature