

# The Prototype of 915MHz Wireless Power Transfer Stimulator Module

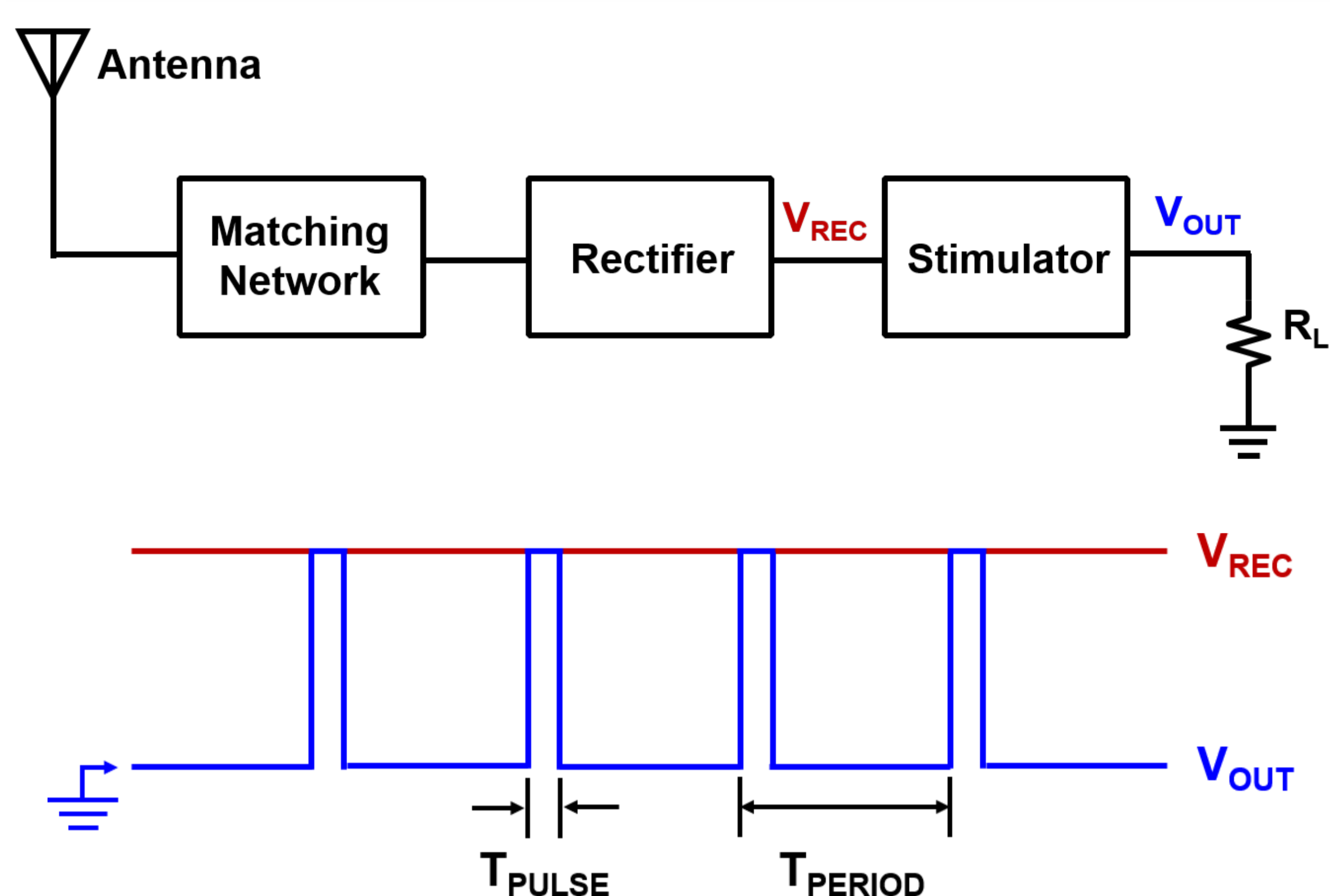
Chien-Ju Yang and Po-Hung Chen

Institute of Electronics, National Yang Ming Chiao Tung University, Hsinchu, Taiwan.

## Introduction

In recent years, implantable medical devices (IMDs) have been widely used in health and therapeutic applications, but there are some concerns, such as battery power issues. In view of this, we will learn how to apply wireless power transfer system to generate stimulation signals and charge the device through this project.

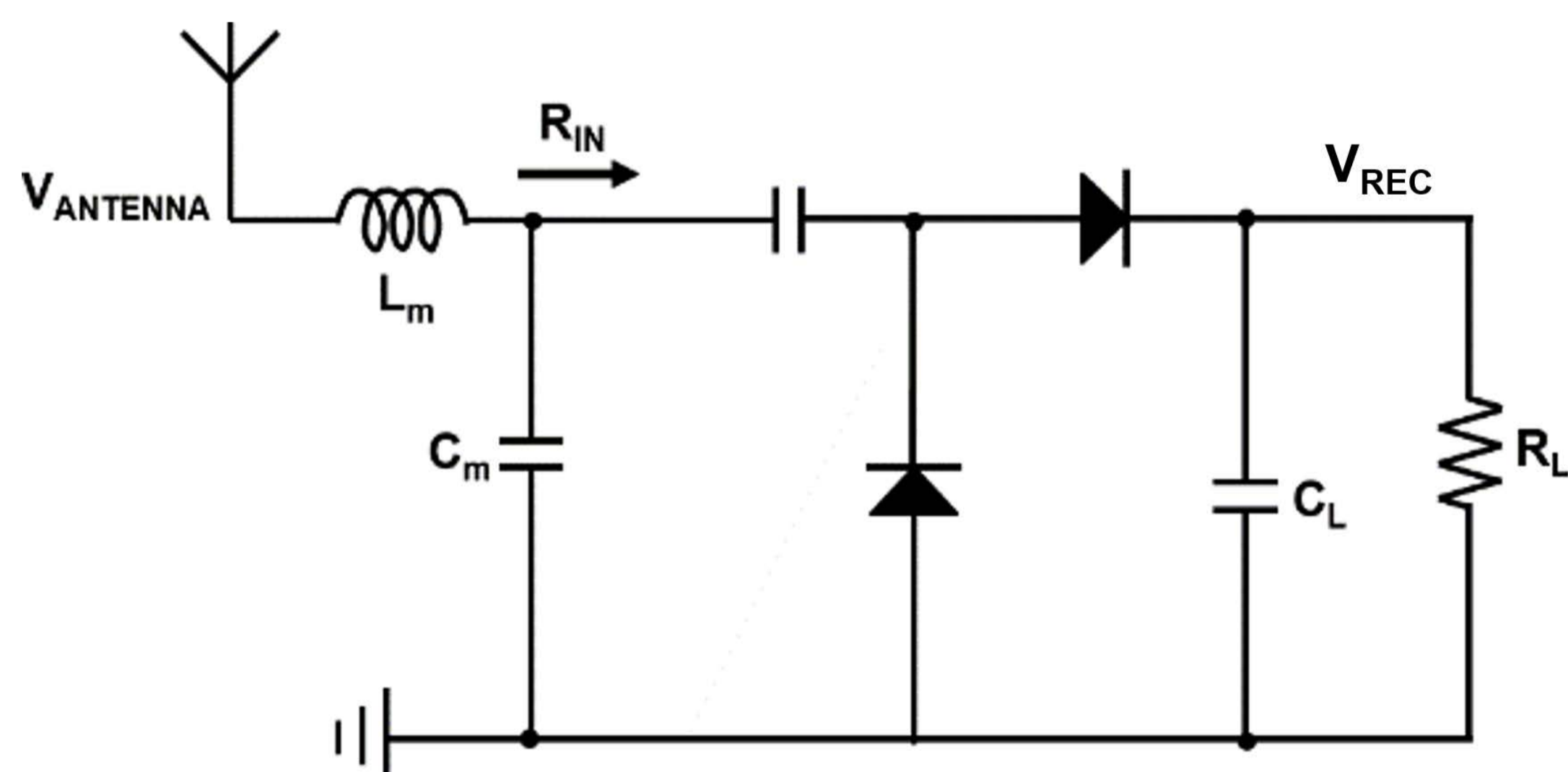
## Characteristics



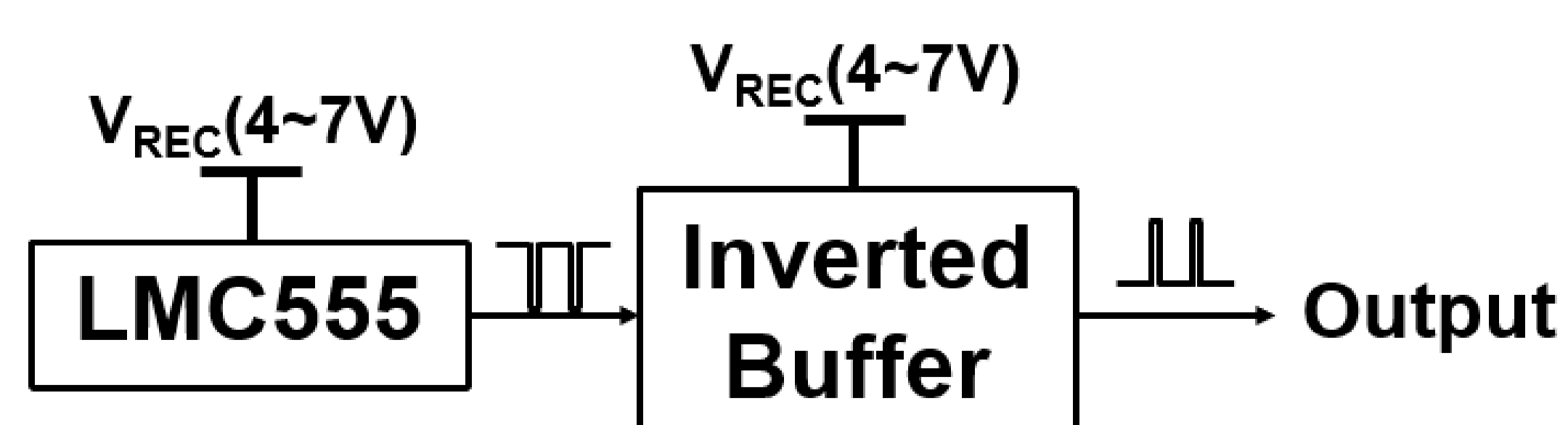
This research presents a 915MHz wireless power transfer stimulator module which is composed by commercially available devices, and it can generate a stimulation wave with a pulse frequency of 600Hz and a pulse width ( $T_{PULSE}$ ) of 70us.

## System Architecture

The module consists of an antenna, a matching network, the rectifier, and a stimulator.



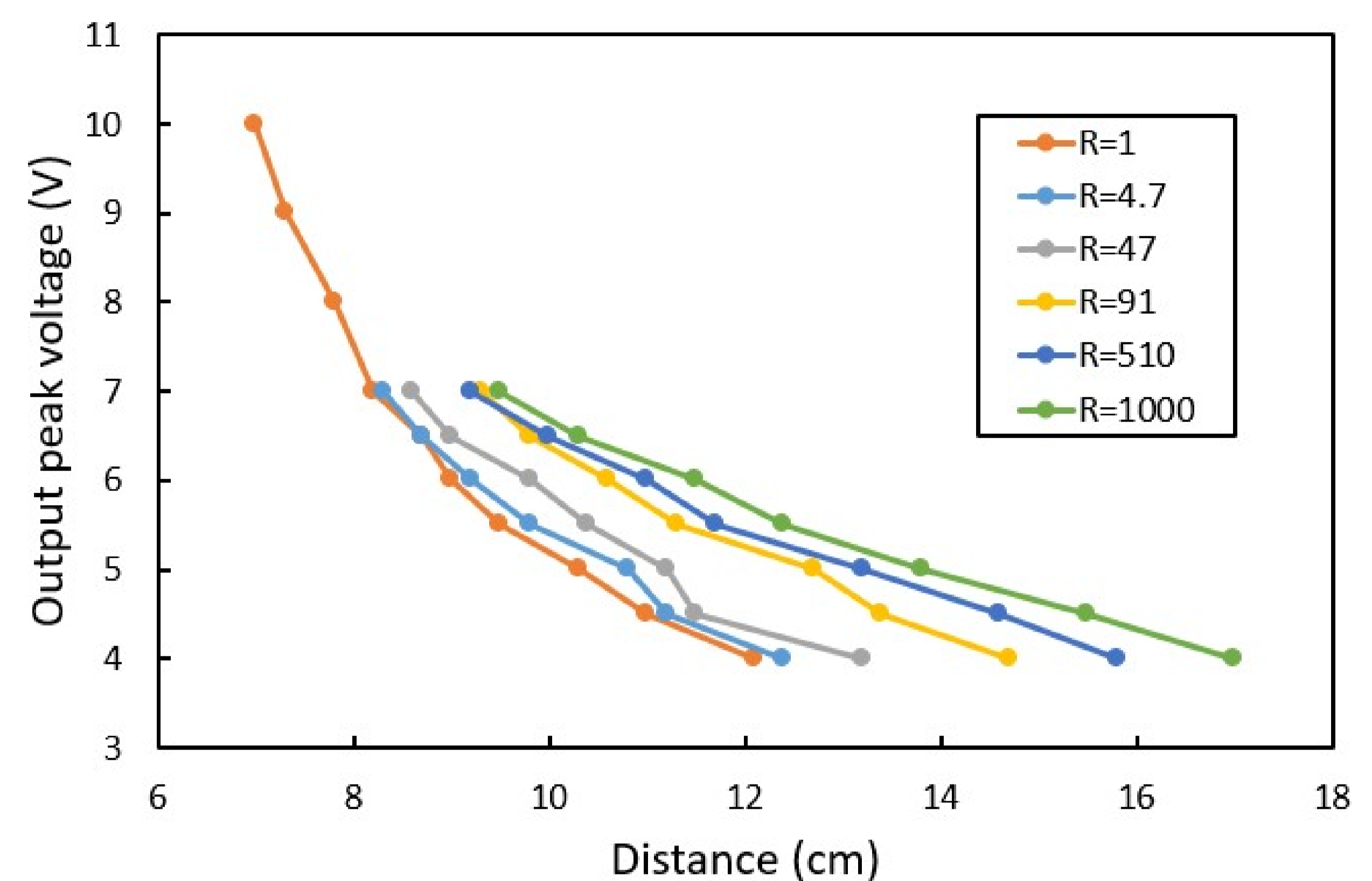
A dipole antenna receives some incident power with 915MHz and transfers to the L-matching network and the voltage doubler rectifier, which converts the power collected into DC power ( $V_{REC}$ ).



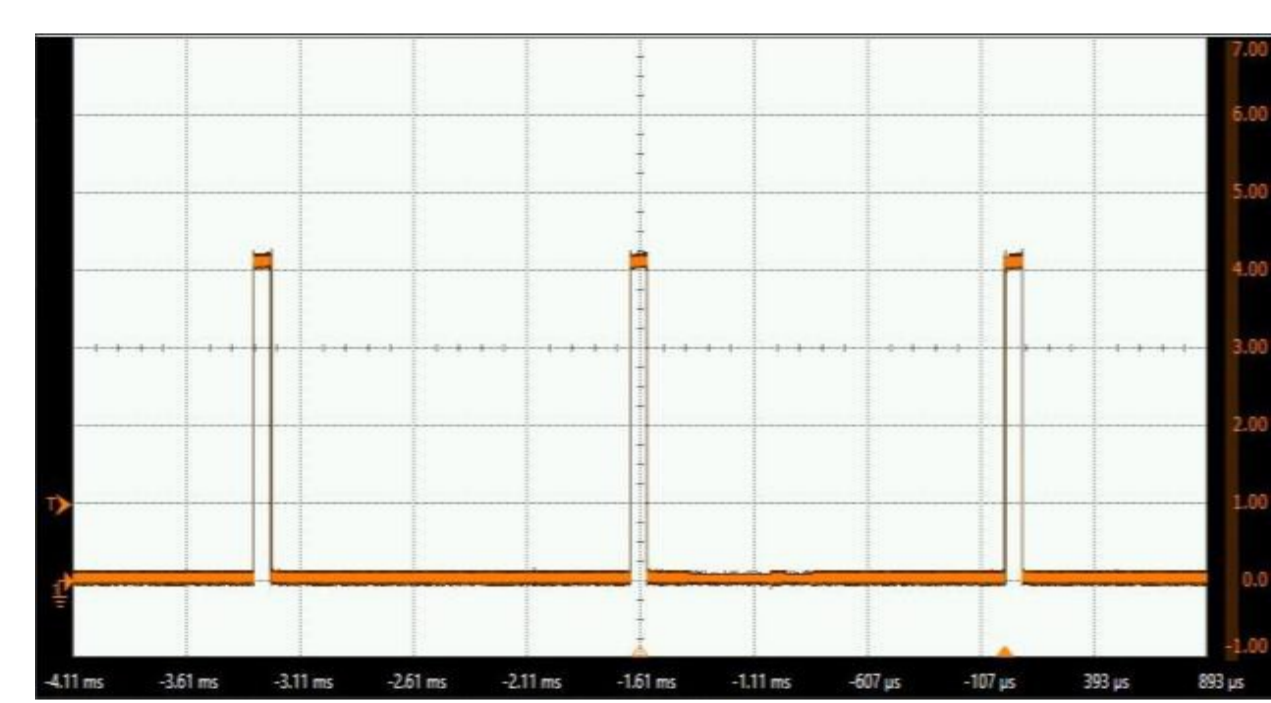
A stimulator consists of a timer and an inverter buffer, and generates low-frequency stimulation signals.  
The timer (LMC555) converts  $V_{REC}$  into square waves, and the inverted buffer converts it to stimulation waves.

## Measurement Results

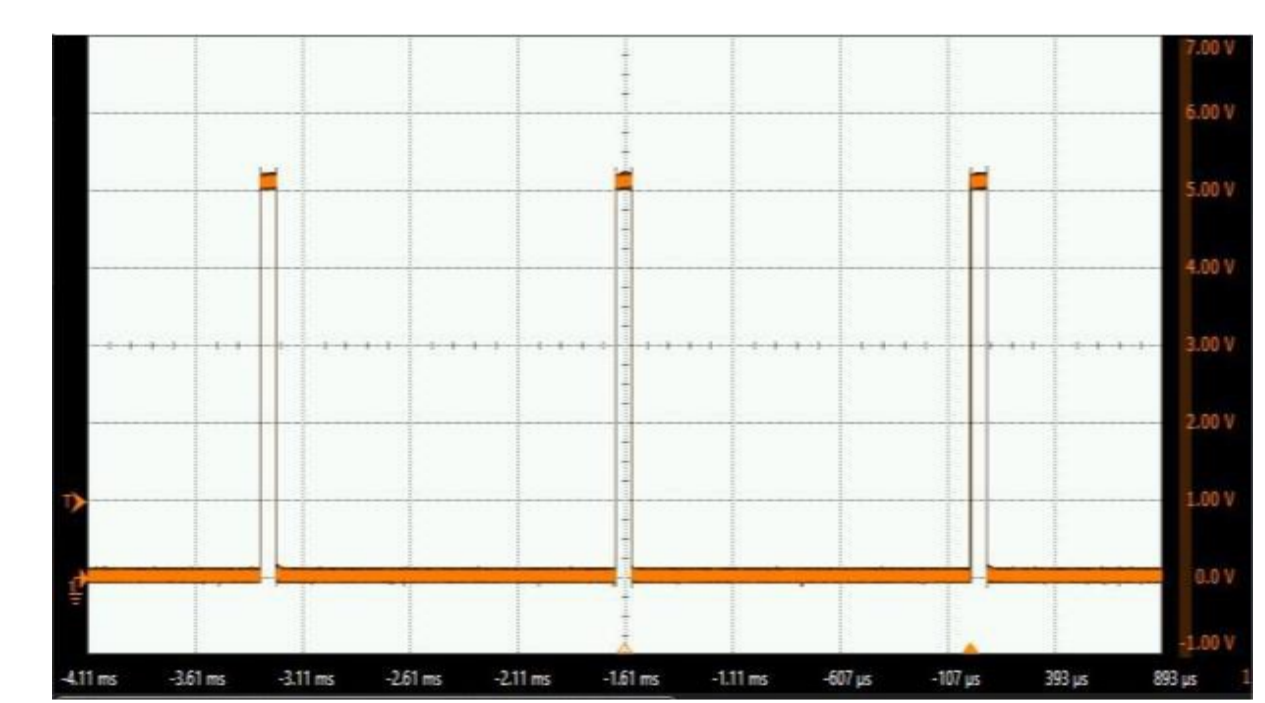
This module can not only achieve the target output voltage of 4V to 7V but also transmit 8cm long under various loads.  
When the load ( $R_L$ ) is 1Ω and the output voltage is 10V, the distance from the transmitter to the receiver can also achieves 7 cm.



Output waveforms of the stimulator, which can generate a stimulation wave with a pulse frequency of 600Hz and a pulse width of 70us.



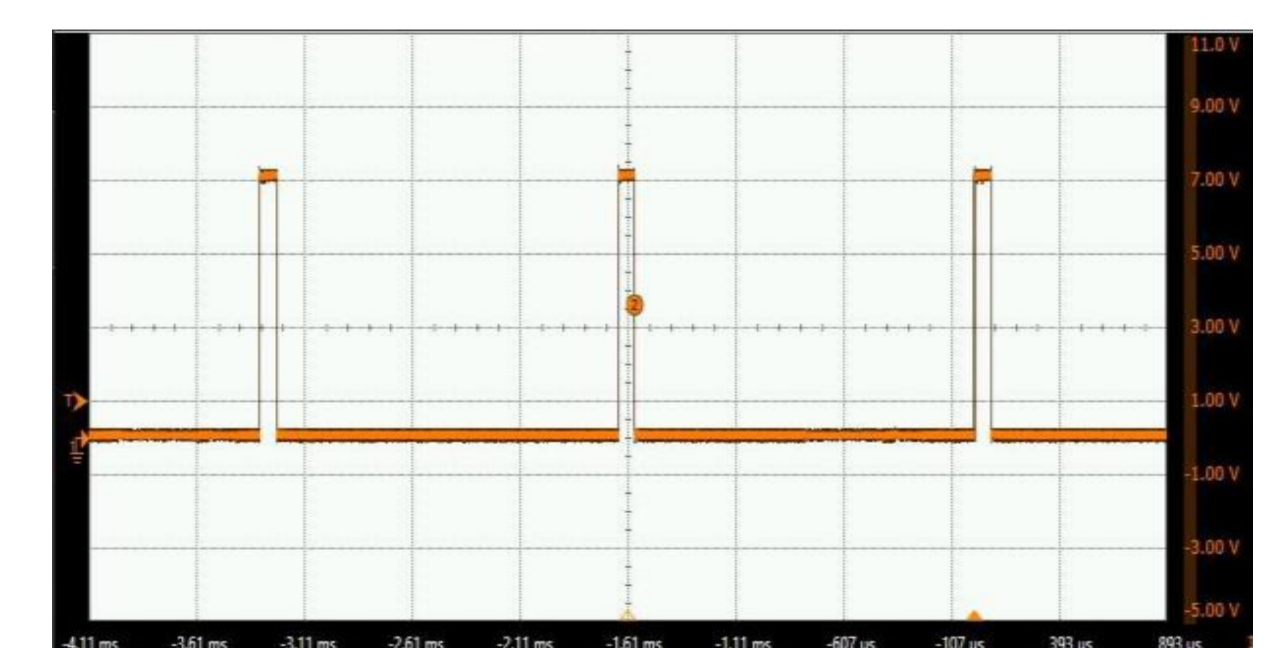
stimulation voltage = 4V



stimulation voltage = 5V



stimulation voltage = 6V



stimulation voltage = 7V

## Reference

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## Acknowledgement

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