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(19) **United States**(12) **Patent Application Publication**  
**Cho et al.**(10) **Pub. No.: US 2022/0376697 A1**(43) **Pub. Date: Nov. 24, 2022**(54) **BAND-PASS ANALOG-TO-DIGITAL  
CONVERTER USING BIDIRECTIONAL  
VOLTAGE-CONTROLLED OSCILLATOR****Publication Classification**(51) **Int. Cl.**  
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Daejeon (KR)(72) Inventors: **SeongHwan Cho,** Daejeon (KR);  
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Park,** Daejeon (KR)(57) **ABSTRACT**

The present disclosure discloses a band-pass analog-to-digital converter (ADC) using a bidirectional voltage-controlled oscillator (VCO) including a first converter configured to receive an analog input signal and quantize the analog input signal according to a first clock signal to output a first digital signal, a second converter configured to receive the analog input signal and quantize the analog input signal in a time-interleaving manner according to a second clock signal, which has a phase opposite to that of the first clock signal, to output a second digital signal, and a multiplexer configured to receive the first and second digital signals and select one of the two signals in response to the first clock signal to finally output a digital output signal.

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