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**XIONG et al.**(10) **Pub. No.: US 2023/0231675 A1**(43) **Pub. Date: Jul. 20, 2023**(54) **SSB PATTERN AND DMRS DESIGN FOR  
PBCH IN 5G NR**(71) Applicant: **Apple Inc.**, Cupertino, CA (US)(72) Inventors: **Gang XIONG**, Cupertino, CA (US);  
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(57)

**ABSTRACT**

Devices, systems and methods for a fifth generation (5G) or new radio (NR) system comprising multiplexing, by a gNodeB (gNB), a physical broadcast channel (PBCH) and an associated demodulation reference signal (DMRS) in a time division multiplexing (TDM) manner; and transmitting, by the gNB, the PBCH by employing a Discrete Fourier Transform-spread-orthogonal frequency-division multiplexing (DFT-s-OFDM) waveform and its associated DMRS.

