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(19) **United States**(12) **Patent Application Publication****Yang et al.**(10) **Pub. No.: US 2024/0237560 A1**(43) **Pub. Date:****Jul. 11, 2024**(54) **PHASE-CHANGE MEMORY DEVICE WITH
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ABSTRACT

A memory device including a first electrode and a second electrode are over a first dielectric layer. A heater layer is laterally between the first electrode and the second electrode. A thermal transfer layer is over the heater layer. The thermal transfer layer includes a first tapered region between the first electrode and the heater layer. A phase-change layer is over the thermal transfer layer and extends laterally from a top surface of the first electrode to a top surface of the second electrode. The phase-change layer includes a first lateral region over the first electrode and a first step region directly over the first tapered region of the thermal transfer layer. The phase-change layer has a first thickness along the first step region and a second thickness along the first lateral region. A difference between the first thickness and the second thickness is less than 20%.

