

ABSTRACT

A storage device includes at least one non-volatile memory device and a controller configured to control the at least one non-volatile memory device. The at least one non-volatile memory device performs an on-chip valley search (OVS) operation by
5 latching a read command at an edge of a write enable (WE) signal according to a command latch enable (CLE) signal and an address latch enable (ALE) signal. The controller receives detection information according to the OVS operation from the at least one non-volatile memory device in response to a specific command. The OVS operation includes a first OVS operation using a read level and a second OVS operation
10 using a changed read level.

FIG. 1