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(54) **THREE-DIMENSIONAL MEMORY DEVICE
CONTAINING INTEGRATED
CONTACT-AND-SUPPORT ASSEMBLIES
AND METHODS OF MAKING THE SAME**

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(71) Applicant: **SANDISK TECHNOLOGIES LLC,**
ADDISON, TX (US)

(72) Inventors: **Masato MIYAMOTO,** Yokkaichi (JP);
Hiroyuki OGAWA, Yokkaichi (JP);
Tomohiro KUBO, Yokkaichi (JP)

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ABSTRACT

A semiconductor structure includes an alternating stack of insulating layers and electrically conductive layers, memory openings vertically extending through the alternating stack, memory opening fill structures including a vertical channel and memory elements located in the memory openings, a contact via cavity vertically extending through the alternating stack, and an integrated contact-and-support assembly located in the contact via cavity. The integrated contact-and-support assembly includes a dielectric support pillar and a conductive layer contact via structure electrically contacting a top surface of a first electrically conductive layer of the electrically conductive layers that surrounds the contact via cavity. A dielectric spacer is located in the contact via cavity, covering a sidewall of the first electrically conductive layer in the contact via cavity, and extending above the top surface of the first electrically conductive layer.

