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Time Division Multiplexing of Semiconductor Qubits MARIE CLAIRE JARRATT, JOHN HORNIBROOK, XANTHE CROOT, ARC Centre of Excellence for Engineered Quantum Systems, School of Physics, The University of Sydney, JOHN WATSON, GEOFF GARDNER, SAEED FALLAHI, MICHAEL MANFRA, Department of Physics and Astronomy, Purdue University, DAVID REILLY, ARC Centre of Excellence for Engineered Quantum Systems, School of Physics, The University of Sydney — Readout chains, comprising resonators, amplifiers, and demodulators, are likely to be precious resources in quantum computing architectures. The potential to share readout resources is contingent on realising efficient means of time-division multiplexing (TDM) schemes that are compatible with quantum computing. Here, we demonstrate TDM using a GaAs quantum dot device with multiple charge sensors. Our device incorporates chip-level switches that do not load the impedance matching network. When used in conjunction with frequency multiplexing, each frequency tone addresses multiple time-multiplexed qubits, vastly increasing the capacity of a single readout line.

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