CLAIMS

What is claimed is:

1. A distributed switch system comprising a plurality of phase-change material switches that are arranged in one of parallel, series, and a combination of parallel and series with respect to each other, the distributed switch system being responsive to a single control signal having a first state and a second state, each of the plurality of phase-change material switches comprising:

a first terminal for receiving an input signal;

a second terminal;

an actuation portion for emitting a first heat profile upon receiving the single control signal in the first state and a second heat profile upon receiving the single control signal in the second state, wherein the actuation portion of each of the plurality of phase-change material switches receives the single control signal substantially concurrently; and

a switch portion comprising a phase-change material in proximity with the actuation portion, the phase-change material being selectable between a conducting state in response to the first heat profile to conduct the input signal from the first terminal to the second terminal and a blocking state in response to the second heat profile to substantially block the input signal from the first terminal to the second terminal.

2. The distributed switch system of claim 1, wherein the plurality of phase-change material switches are arranged in one of parallel and a combination of parallel and series, the distributed switch system further comprising a signal line on which the input signal propagates, wherein the input signal is split between the first terminal of each one of the plurality of phase-change material switches that are coupled to the signal line in parallel.

3. The distributed switch system of claim 1, wherein the phase-change material of each of the plurality of phase-change material switches is selectable between the conducting state and the blocking state in response to the first and second heat profiles, respectively, based on the control

signal that is provided to the actuation portion of each of the plurality of phase-change material switches.

4. The distributed switch system of claim 1, wherein the phase-change material of each of the plurality of phase-change material switches is arranged as a plurality of longitudinal strips that are arranged parallel and spaced apart from each other and extend longitudinally to interconnect the first terminal and the second terminal and that are each in proximity with the actuator portion.

5. The distributed switch system of claim 1, wherein the actuation portion comprises:

a pair of actuation terminals for receiving the control signal; and

a conductive strip that extends between the pair of actuation terminals and comprises a central portion having a cross-sectional dimension that is less than a dimension of the pair of actuation terminals and a pair of tapered portions that each have a cross-sectional dimension that increases from the cross-sectional dimension of the central portion to a maximum cross-sectional dimension at a respective coupling to the pair of actuation terminals.

6. A distributed switch system comprising a plurality of phase-change material switches that are arranged in one of parallel, series, and a combination of parallel an series with respect to each other, each of the plurality of phase-change material switches comprising:

a first terminal receiving a single input signal;

a second terminal;

an actuation portion receiving a control signal in one of a first state to emit a first heat profile and a second state to emit a second heat profile, the actuation portion of each of the plurality of phase-change material switches receiving the control signal substantially concurrently; and

a switch portion comprising a phase-change material in proximity with the actuation portion, the phase-change material being selectable between a conducting state in response to the first heat profile to conduct the single input signal from the first terminal to the second terminal

and a blocking state in response to the second heat profile to substantially block the single input signal from the first terminal to the second terminal.

7. The distributed switch system of claim 6, wherein the distributed switch system further comprises a signal line on which the single input signal propagates, wherein the single input signal is split between the first terminal of each one of the plurality of phase-change material switches that are coupled to the signal line in parallel.

8. The distributed switch system of claim 6, wherein the phase-change material of each of the plurality of phase-change material switches is selectable between the conducting state and the blocking state in response to the first and second heat profiles, respectively, based on the control signal that is provided to the actuation portion of each of the plurality of phase-change material switches.

9. The distributed switch of system of claim 6, wherein the phase change material of each of the plurality of phase-change material switches is arranged as a plurality of longitudinal strips that are arranged parallel and spaced apart from each other and extend longitudinally to interconnect the first terminal and the second terminal and that are each in proximity with the actuation portion.

10. The distributed switch of system of claim 6, wherein the actuation portion comprises:

a pair of actuation terminals receiving the control signal; and

a conductive strip that extends between the pair of actuation terminals and comprises a central portion having a cross-sectional dimension that is less than a dimension of the pair of actuation terminals and a pair of tapered portions that each have a cross-sectional dimension that increases from the cross-sectional dimension of the central portion to a maximum cross-sectional dimensional at a respective coupling to the pair of actuation terminals.