A digital-to-analog converter may include a converting unit and a distributing unit. The converting unit may generate a first analog signal set based on less-than-all bits of an image data set in a first period and may generate a second analog signal set based on all bits of the image data set in a second period. The all bits may include at least 2 bits. The distributing unit may include output terminals, may distribute the first analog signal set to the output terminals in a first sequence in the first period, and may distribute the second analog signal to the output terminals in a second sequence. The second sequence may be opposite to the first sequence.

20 Claims, 8 Drawing Sheets