start

idle
addr_row_next <= 0
req <= '0'

F — start = 1

startRow
addr_next <= addr_row_reg

readSetup
addr_read_next <= addr_reg

T — lastColumn=1
F

readCenter
pixelCache_next(2)<= pixelCache_reg(3)
pixelCache_next(3) <= dataR

T — firstRow = 1 — F

addr_read_next <= addr_reg

addr_read_next <= addr_reg - widthStep

readAbove
pixelCache_next(0)<= pixelCache_reg(1)
pixelCache_next(1) <= dataR

T — lastRow = 1 — F

addr_read_next <= addr_reg

addr_read_next <= addr_reg + widthStep

readBelow
pixelCache_next(4)<= pixelCache_reg(5)
pixelCache_next(5) <= dataR

writeData
dataW <= sobelFilter(pixelCache)

T — firstColumn = 1 — F

rw='0'

rw = '1'

doneImage
finish <= '1'
req <= '0'

T — Start = 0 — F

T — lastRow = 1 & lastColumn = 1
F

T — lastColumn = 1 — F

addr_row_next <= addr_row_reg + widthStep

addr_next <= addr_reg +1