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| CNN IP  Design Document |
| 2019.08.12. Designed by K.S Jang |
| · Contents  1. Properties / Information  2. Block Diagram / Flow Chart  3. Timing Diagram |
| 2019.08.12. 1 |
| 1. Properties / Information  1) Outline of CNN Controller  EMB000011b053f3  We must consider Padding, Stride, Filter(Kernel) size. If padding, In Read state, Input data will be 0 when edge of image input. Our input image size is 224x224. When padding operates, input image size is 226x226 and we can check padding location by conditional logic. Stride and filter(kernel) size will affect in Convolution State. |
| 2019.08.12. 2 |
| 1. Properties / Information  1) Outline of CNN Controller  EMB000011b053eb |
| 2019.08.12. 3 |
| 1. Properties / Information  1) Outline of CNN Controller  EMB000011b053f8 |
| 2019.08.12. 4 |
| 1. Properties / Information  1) Outline of CNN Controller  EMB000011b053ea |
| 2019.08.12. 5 |
| 1. Properties / Information  1) Outline of CNN Controller  EMB000011b053e9 |
| 2019.08.12. 6 |
| 1. Properties / Information  2) CNN Controller (FSM)  EMB000011b053ed |
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| 1. Properties / Information  2) CNN Controller (FSM)  EMB000011b053f5 |
| 2019.08.12. 8 |
| 1. Properties / Information  2) CNN Controller (FSM)  EMB000011b053f6 |
| 2019.08.12. 9 |
| 1. Properties / Information  2) CNN Controller (FSM)  EMB000011b053f7 |
| 2019.08.12. 10 |
| 2. Block Diagram / Flow Chart  1) CNN Controller Block diagram  EMB000011b053f3 |
| 2019.08.12. 11 |
| 2. Block Diagram / Flow Chart  2) CNN IP Controller (FSM)  - Read State  EMB000011b053ecEMB000011b053ee |
| 2019.08.12. 12 |
| 2. Block Diagram / Flow Chart  2) CNN IP Controller (FSM)  - Convolution State  EMB000011b053f0  EMB000011b053f1 |
| 2019.08.12. 13 |
| 2. Block Diagram / Flow Chart  2) CNN IP Controller (FSM)  - Write State  EMB000011b053f2EMB000011b053f4 |
| 2019.08.12. 14 |
| 3. Timing Diagram  EMB000011b053ef  [ CNN Controller ]  1. IDLE (No signal)  2. READ (Start – I\_Done & W\_Done)  3. CONV (I\_Done & W\_Done – C\_Done)  4. WRITE (C\_Done – Write\_Done) |
| 2019.08.12. 15 |