|  |  |  |  |
| --- | --- | --- | --- |
| **OPCODE** | **u-ins** | **STEPS** | **N** |
| ENDOP | ENDOP | END OPERATION | 0 |
| FETCH | FETCH\_1 | MEM READ;  if(iacq)  NXTSTATE <- FETCH\_2;  else  NXTSTATE <- FETCH\_1; | 4 |
|  | FETCH\_2 | NXTSTATE <- FETCH\_3; | 5 |
|  | FETCH\_3 | NXTSTATE <- FETCH\_4; | 6 |
|  | FETCH\_4 | PC <- PC+1;  NXTSTATE <- INS; | 7 |
| NOP | NOP | NO OPERATION | 8 |
| RSTALL | RSTALL | AC,ADDR,GSP,MC,CP,RP <- 0;  NXTSTATE <- FETCH\_1; | 12 |
| RSTAC | RSTAC | AC <- 0;  NXTSTATE <- FETCH\_1; | 16 |
| RSTADDR | RSTADDR | ADDR <- 0;  NXTSTATE <- FETCH\_1; | 20 |
| RSTGSP | RSTGSP | GSP <- 0;  NXTSTATE <- FETCH\_1; | 24 |
| RSTMC | RSTMC | MC <- 0;  NXTSTATE <- FETCH\_1; | 28 |
| RSTCP | RSTCP | CP <- 0;  NXTSTATE <- FETCH\_1; | 32 |
| RSTRP | RSTRP | RP <- 0;  NXTSTATE <- FETCH\_1; | 36 |
| INCGSP | INCGSP | GSP <- GSP+1;  NXTSTATE <- FETCH\_1; | 40 |
| INCAC | INCAC | AC <- AC+1;  NXTSTATE <- FETCH\_1; | 44 |
| INCCP | INCCP | CP <- CP+1;  NXTSTATE <- FETCH\_1; | 48 |
| INCRP | INCRP | RP <- RP+1;  NXTSTATE <- FETCH\_1; | 52 |
| INCMC | INCMC | MC <- MC+1;  NXTSTATE <- FETCH\_1; | 56 |
| LDADDR | LDADDR\_1 | MEM READ;  if(dacq)  NXTSTATE <- LDADDR\_2;  ELSE  NXTSTATE <- LDARRD\_1 | 60 |
|  | LDADDR\_2 | NXTSTATE <- LDADDR\_3; | 61 |
|  | LDADDR\_3 | NXTSTATE <- LDADDR\_4; | 62 |
|  | LDADDR\_4 | ADDR <- MEM;  NXTSTATE <- FETCH\_1; | 63 |
| LDAC | LDAC\_1 | MEM READ;  if(dacq)  NXTSTATE <- LDAC\_2;  ELSE  NXTSTATE <- LDAC\_1; | 64 |
|  | LDAC\_2 | NXTSTATE <- LDAC\_3; | 65 |
|  | LDAC\_3 | NXTSTATE <- LDAC\_4; | 66 |
|  | LDAC\_4 | AC <- MEM;  NXTSTATE <- FETCH\_1; | 67 |
| LDMULR | LDMULR\_1 | MEM READ;  if(dacq)  NXTSTATE <- LDMULR\_2;  ELSE  NXTSTATE <- LDMULR\_1; | 68 |
|  | LDMULR\_2 | NXTSTATE <- LDMULR\_3; | 69 |
|  | LDMULR\_3 | NXTSTATE <- LDMULR\_4; | 70 |
|  | LDMULR\_4 | MULR <- MEM;  NXTSTATE <- FETCH\_1; | 71 |
| LDRP | LDRP\_1 | MEM READ;  if(dacq)  NXTSTATE <- LDRP\_2;  ELSE  NXTSTATE <- LDRP\_1; | 72 |
|  | LDRP\_2 | NXTSTATE <- LDRP\_3; | 73 |
|  | LDRP\_3 | NXTSTATE <- LDRP\_4; | 74 |
|  | LDRP\_4 | MULR <- MEM;  NXTSTATE <- FETCH\_1; | 75 |
| LDCP | LDCP\_1 | MEM READ;  if(dacq)  NXTSTATE <- LDCP\_2;  ELSE  NXTSTATE <- LDCP\_1; | 76 |
|  | LDCP\_2 | NXTSTATE <- LDCP\_3; | 77 |
|  | LDCP\_3 | NXTSTATE <- LDCP\_4; | 78 |
|  | LDCP\_4 | AC <- MEM;  NXTSTATE <- FETCH\_1; | 79 |
| STSP | STSP\_1 | MEM <- AC;  if(dacq)  NXTSTATE <- STSP\_2;  ELSE  NXTSTATE <- STSP\_1; | 80 |
|  | STSP\_2 | if(dacq)  NXTSTATE <- FETCH\_12;  ELSE  NXTSTATE <- STSP\_2; | 81 |
| ADD | ADD | AC <- AC+ADDR;  NXTSTATE <- FETCH\_1; | 84 |
| MUL1 | MUL1 | AC <- AC\*MULR;  NXTSTATE <- FETCH\_1; | 88 |
| MUL2 | MUL2 | AC <- AC\*MV;  NXTSTATE <- FETCH\_1; | 92 |
| DIV | DIV | AC <- AC/WV  NXTSTATE <- FETCH\_1 | 96 |
| MOD | MOD | AC <- AC%WV;  NXTSTATE <- FETCH\_1; | 100 |
| MSTP | MSTP | STP <- AC;  NXTSTATE <- FETCH\_1; | 104 |
| MRP | MRP | RP <- AC;  NXTSTATE <- FETCH\_1; | 108 |
| MCP | MCP | CP <- AC;  NXTSTATE <- FETCH\_1; | 112 |
| MWV | MWV | WV <- AC;  NXTSTATE <- FETCH\_1; | 116 |
| MEOPC | MEOPC | EOPC <- AC;  NXTSTATE <- FETCH\_1; | 120 |
| MADDR | MADDR | ADDR <- AC;  NXTSTATE <- FETCH\_1; | 124 |
| MCID | MCID | CID <- AC;  NXTSTATE <- FETCH\_1; | 128 |
| MMV | MMV | MV <- AC;  NXTSTATE <- FETCH\_1; | 132 |
| MCIDAC | MCIDAC | AC <- CID;  NXTSTATE <- FETCH\_1; | 136 |
| MRPAC | MRPAC | AC <- RP;  NXTSTATE <- FETCH\_1; | 140 |
| MCPAC | MCPAC | AC <- CP;  NXTSTATE <- FETCH\_1; | 144 |
|  | JMPZ1 | if(Z1==1)  NXTSTATE <- `JMPZ1Y\_1;  else  NXTSTATE <- `JMPZ1N\_1;  end | 148 |
|  | JMPZ1Y\_1 | if(iacq)  NXTSTATE <- `JMPZ1Y\_2;  else  NXTSTATE <- `JMPZ1Y\_1;  end | 149 |
|  | JMPZ1Y\_2 | NXTSTATE <- JMPZ1Y\_3; | 150 |
|  | JMPZ1Y\_3 | NXTSTATE <- JMPZ1Y\_4; | 151 |
|  | JMPZ1N\_1 | PC <- PC+1;  NXTSTATE <- FETCH\_1; | 152 |
|  | JMPZ1Y\_4 | PC <- AC;  NXTSTATE <- FETCH\_1; | 153 |
|  | JMPZ2 | if(Z2==0)  NXTSTATE <- `JMPZ2Y\_1;  else  NXTSTATE <- `JMPZ2N\_1;  end | 156 |
|  | JMPZ2Y\_1 | if(iacq)  NXTSTATE <- `JMPZ2Y\_2;  else  NXTSTATE <- `JMPZ2Y\_1;  end | 157 |
|  | JMPZ2Y\_2 | NXTSTATE <- JMPZ2Y\_3; | 158 |
|  | JMPZ2Y\_3 | NXTSTATE <- JMPZ2Y\_4; | 159 |
|  | JMPZ2N\_1 | PC <- PC+1;  NXTSTATE <- FETCH\_1; | 160 |
|  | JMPZ2Y\_4 | PC <- AC;  NXTSTATE <- FETCH\_1; | 161 |
| JMP | JMP\_1 | if(iacq)  NXTSTATE <- `JMP\_2;  else  NXTSTATE <- `JMP\_1;  end | 164 |
|  | JMP\_2 | NXTSTATE <- JMP\_3; | 165 |
|  | JMP\_3 | NXTSTATE <- JMP\_4; | 166 |
|  | JMP\_4 | NXTSTATE <- FETCH\_1; | 167 |
| INCSTP | INCSTP | STP <- STP+1;  NXTSTATE <- FETCH\_1; | 168 |
| MSTPAC | MSTPAC | AC <- STP;  NXTSTATE <- FETCH\_1; | 172 |