|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MCS51指令表  整理自网络 | 注： | 位 | 7 | 6 | 4 | 3 | 2 | 1 | 0 |
| ACn | F | D | 9 | 7 | 5 | 3 | 1 |
| AJn | E | C | 8 | 6 | 4 | 2 | 0 |
| Rn | F | E | C | B | A | 9 | 8 |
| Ri |  |  |  |  |  | 1 | 0 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 机器码 | | | 助记符 | 对标志位的影响 | | | | 字节数 | 周期数 | 操作 |
| 16进制 | 16进制 | 2进制 | P | OV | AC | CY |
|
| 算术运算 | | | | | | | | | | |
| 28-2F | 20+Rn | 0010\_\_\_\_ | ADD A,Rn | ✓ | ✓ | ✓ | ✓ | 1 | 1 | (A)+(Rn)→A |
| 25 | 25 | 00100101 | ADD A,direct | ✓ | ✓ | ✓ | ✓ | 2 | 1 | (A)+(direct)→A |
| 26-27 | 26+Ri | 0010011\_ | ADD A,@Ri | ✓ | ✓ | ✓ | ✓ | 1 | 1 | (A)+((Ri))→A |
| 24 | 24 | 00100100 | ADD A,#data | ✓ | ✓ | ✓ | ✓ | 2 | 1 | (A)+data→A |
| 38-3F | 30+Rn | 0011\_\_\_\_ | ADDC A,Rn | ✓ | ✓ | ✓ | ✓ | 1 | 1 | (A)+(Rn)+Cy→A |
| 35 | 35 | 00110101 | ADDC A,direct | ✓ | ✓ | ✓ | ✓ | 2 | 1 | (A)+(direct)+Cy→A |
| 36-37 | 36+Ri | 0011011\_ | ADDC A,@Ri | ✓ | ✓ | ✓ | ✓ | 1 | 1 | (A)+((Ri))+Cy→A |
| 34 | 34 | 00110100 | ADDC A,#data | ✓ | ✓ | ✓ | ✓ | 2 | 1 | (A)+data+Cy→A |
| 98-9F | 90+Rn | 1001\_\_\_\_ | SUBB A,Rn | ✓ | ✓ | ✓ | ✓ | 1 | 1 | (A)-(Rn)-Cy→A |
| 95 | 95 | 10010101 | SUBB A,direct | ✓ | ✓ | ✓ | ✓ | 2 | 1 | (A)-(direct)-Cy→A |
| 96-97 | 96-97 | 1001011\_ | SUBB A,@Ri | ✓ | ✓ | ✓ | ✓ | 1 | 1 | (A)-((Ri))-Cy→A |
| 94 | 94 | 10010100 | SUBB A,#data | ✓ | ✓ | ✓ | ✓ | 2 | 1 | (A)-data-Cy→A |
| 04 | 04 | 00000100 | INC A | ✓ | × | × | × | 1 | 1 | (A)+1→A |
| 08-0F | 00+Rn | 0000\_\_\_\_ | INC Rn | × | × | × | × | 1 | 1 | (Rn)+1→Rn |
| 05 | 05 | 00000101 | INC driect | × | × | × | × | 2 | 1 | (direct)+1→direct |
| 06-07 | 06+Ri | 0000011\_ | INC @Ri | × | × | × | × | 1 | 1 | ((Ri))+1→(Ri) |
| A3 | A3 | 10100011 | INC DPTR | × | × | × | × | 1 | 2 | (DPTR)+1→DPTR |
| 14 | 14 | 00010100 | DEC A | ✓ | × | × | × | 1 | 1 | (A)-1→A |
| 18-1F | 10+Rn | 0001\_\_\_\_ | DEC Rn | × | × | × | × | 1 | 1 | (Rn)-1→Rn |
| 15 | 15 | 00010101 | DEC driect | × | × | × | × | 2 | 1 | (direct)-1→direct |
| 16-17 | 16-17 | 0001011\_ | DEC @Ri | × | × | × | × | 1 | 1 | ((Ri))-1→(Ri) |
| A4 | A4 | 10100100 | MUL AB | ✓ | × | × | ✓ | 1 | 4 | (A)\*(B)→AB |
| 84 | 84 | 10000100 | DIV AB | ✓ | × | × | ✓ | 1 | 4 | (A)/(B)→AB |
| D4 | D4 | 11010100 | DA A | ✓ | ✓ | ✓ | ✓ | 1 | 1 | 对A进行十进制调整 |
| 逻辑运算 | | | | | | | | | | |
| 58-5F | 50+Rn | 0101\_\_\_\_ | ANL A,Rn | ✓ | × | × | × | 1 | 1 | (A)∧(Rn)→A |
| 55 | 55 | 01010101 | ANL A,direct | ✓ | × | × | × | 2 | 1 | (A)∧(direct)→A |
| 56-57 | 56+Ri | 0101011\_ | ANL A,@Ri | ✓ | × | × | × | 1 | 1 | (A)∧((Ri))→A |
| 54 | 54 | 01010100 | ANL A,#data | ✓ | × | × | × | 2 | 1 | (A)∧data→A |
| 52 | 52 | 01010010 | ANL direct,A | × | × | × | × | 2 | 1 | (direct)∧(A)→direct |
| 53 | 53 | 01010011 | ANL direct,#data | × | × | × | × | 3 | 2 | (direct)∧data→direct |
| 48-4F | 48-4F | 0100\_\_\_\_ | ORL A,Rn | ✓ | × | × | × | 1 | 1 | (A)∨(Rn)→A |
| 45 | 45 | 01000101 | ORL A,direct | ✓ | × | × | × | 2 | 1 | (A)∨(direct)→A |
| 46-47 | 46+Ri | 0100011\_ | ORL A,@Ri | ✓ | × | × | × | 1 | 1 | (A)∨((Ri))→A |
| 44 | 44 | 01000100 | ORL A,#data | ✓ | × | × | × | 2 | 1 | (A)∨data→A |
| 42 | 42 | 01000010 | ORL direct,A | × | × | × | × | 2 | 1 | (direct)∨(A)→direct |
| 43 | 43 | 01000011 | ORL direct,#data | × | × | × | × | 3 | 2 | (direct)∨data→direct |
| 68-6F | 60+Rn | 0110\_\_\_\_ | XRL A,Rn | ✓ | × | × | × | 1 | 1 | (A)⊕(Rn)→A |
| 65 | 65 | 01100101 | XRL A,direct | ✓ | × | × | × | 2 | 1 | (A)⊕(direct)→A |
| 66-67 | 66+Ri | 0110011\_ | XRL A,@Ri | ✓ | × | × | × | 1 | 1 | (A)⊕((Ri))→A |
| 64 | 64 | 01100100 | XRL A,#data | ✓ | × | × | × | 2 | 1 | (A)⊕data→A |
| 62 | 62 | 01100010 | XRL direct,A | × | × | × | × | 2 | 1 | (direct)⊕(A)→direct |
| 63 | 63 | 01100011 | XRL direct,#data | × | × | × | × | 3 | 2 | (direct)⊕data→direct |
| E4 | E4 | 11100100 | CLR A | ✓ | × | × | × | 1 | 1 | 0→A |
| F4 | F4 | 11110100 | CPL A | × | × | × | × | 1 | 1 | /(A)→A |
| 23 | 23 | 00100011 | RL A | × | × | × | × | 1 | 1 | A循环左移一位 |
| 33 | 33 | 00110011 | RLC A | × | × | × | × | 1 | 1 | A带进位循环左移一位 |
| 03 | 03 | 00000011 | RR A | × | × | × | × | 1 | 1 | A循环右移一位 |
| 13 | 13 | 00010011 | RRC A | × | × | × | × | 1 | 1 | A带进位循环右移一位 |
| C4 | C4 | 11000100 | SWAP A | × | × | × | × | 1 | 1 | A半字节交换 |
| 数据传送 | | | | | | | | | | |
| E8-EF | E0+Rn | 1110\_\_\_\_ | MOV A,Rn | ✓ | × | × | × | 1 | 1 | (Rn)→A |
| E5 | E5 | 11100101 | MOV A,driect | ✓ | × | × | × | 2 | 1 | (driect)→A |
| E6-E7 | E6+Ri | 1110011\_ | MOV A,@Ri | ✓ | × | × | × | 1 | 1 | ((Ri))→A |
| 74 | 74 | 01110100 | MOV A,#data | ✓ | × | × | × | 2 | 1 | data→A |
| F8-FF | F0+Rn | 1111\_\_\_\_ | MOV Rn,A | × | × | × | × | 1 | 1 | (A)→(Rn) |
| A8-AF | A0+Rn | 1010\_\_\_\_ | MOV Rn,direct | × | × | × | × | 2 | 2 | (driect)→Rn |
| 78-7F | 70+Rn | 0111\_\_\_\_ | MOV Rn,#data | × | × | × | × | 2 | 1 | data→Rn |
| F5 | F5 | 11110101 | MOV driect,A | × | × | × | × | 2 | 1 | (A)→driect |
| 88-8F | 80+Rn | 1000100\_ | MOV driect,Rn | × | × | × | × | 2 | 1 | (Rn)→driect |
| 85 | 85 | 10000101 | MOV driect1,driect2 | × | × | × | × | 3 | 2 | (driect2)→driect1 |
| 86-87 | 86+Ri | 1000011\_ | MOV driect,@Ri | × | × | × | × | 2 | 2 | ((Ri))→driect |
| 75 | 75 | 01110101 | MOV driect,#data | × | × | × | × | 3 | 2 | data→driect |
| F6-F7 | F6+Ri | 1111011\_ | MOV @Ri,A | × | × | × | × | 1 | 2 | (A)→(Ri) |
| A6-A7 | A6+Ri | 1010011\_ | MOV @Ri,driect | × | × | × | × | 2 | 2 | driect→(Ri) |
| 76-77 | 76+Ri | 0111011\_ | MOV @Ri,#data | × | × | × | × | 2 | 2 | data→(Ri) |
| 90 | 90 | 10010000 | MOV DPTR,#data16 | × | × | × | × | 3 | 1 | data16→DPTR |
| 93 | 93 | 10010011 | MOVC A,@A+DPTR | × | × | × | × | 1 | 2 | ((A)+(DPTR))→A |
| 83 | 83 | 10000011 | MOVC A,@A+PC | × | × | × | × | 1 | 2 | ((A)+(PC))→A |
| E2-E3 | E2+Ri | 1110001\_ | MOVX A,@Ri | ✓ | × | × | × | 1 | 2 | ((Ri)+P2)→A |
| E0 | E0 | 11100000 | MOVX A,@DPTR | ✓ | × | × | × | 1 | 2 | ((DPTR))→A |
| F2-F3 | F2+Ri | 1111001\_ | MOVX @Ri,A | ✓ | × | × | × | 1 | 2 | (A)→(Ri)+(P2) |
| F0 | F0 | 11110000 | MOV @DPTR,A | × | × | × | × | 1 | 2 | (A)→(DPTR) |
| C0 | C0 | 11000000 | PUSH direct | × | × | × | × | 2 | 2 | (SP)+1→SP,(direct)→SP |
| D0 | D0 | 11010000 | POP direct | × | × | × | × | 2 | 2 | ((direct))→direct,(SP)-1→SP |
| C8-8F | C0+Rn | 1100\_\_\_\_ | XCH A,Rn | ✓ | × | × | × | 1 | 1 | (A)←→(Rn) |
| C5 | C5 | 11000101 | XCH A,direct | ✓ | × | × | × | 2 | 1 | (A)←→(direct) |
| C6-C7 | C6+Ri | 1100011\_ | XCH A,@Ri | ✓ | × | × | × | 1 | 1 | (A)←→((Ri)) |
| D6-D7 | D6+Ri | 1101011\_ | XCHD A,@Ri | ✓ | × | × | × | 1 | 1 | (A)0--3←→((Ri))0--3 |
| 位运算 | | | | | | | | | | |
| C3 | C3 | 11000011 | CLR C | × | × | × | ✓ | 1 | 1 | 0→Cy |
| C2 | C2 | 11000010 | CLR bit | × | × | × |  | 2 | 1 | 0→bit |
| D3 | D3 | 11010011 | SETB C | × | × | × | ✓ | 1 | 1 | 1→Cy |
| D2 | D2 | 11010010 | SETB bit | × | × | × |  | 2 | 1 | 1→bit |
| B3 | B3 | 10110011 | CPL C | × | × | × | ✓ | 1 | 1 | /(Cy)→Cy |
| B2 | B2 | 10110010 | CPL bit | × | × | × |  | 2 | 1 | /(bit)→bit |
| 82 | 82 | 10000010 | ANL C,bit | × | × | × | ✓ | 2 | 2 | (Cy)∧(bit)→Cy |
| B0 | B0 | 10110000 | ANL C,/bit | × | × | × | ✓ | 2 | 2 | (Cy)∧/(bit)→Cy |
| 72 | 72 | 01110010 | ORL C,bit | × | × | × | ✓ | 2 | 2 | (Cy)∨(bit)→Cy |
| A0 | A0 | 10100000 | ORL C,/bit | × | × | × | ✓ | 2 | 2 | (Cy)∨/(bit)→Cy |
| A2 | A2 | 10100010 | MOV C,bit | × | × | × | ✓ | 2 | 1 | (bit)→Cy |
| 92 | 92 | 10010010 | MOV bit,C | × | × | × | ✓ | 2 | 1 | (Cy)→bit |
| 控制转移 | | | | | | | | | | |
| \*1 | ACn:1 | \_\_\_\_0001 | ACALL addr11 | × | × | × | × | 2 | 2 | (PC)+2→PC,(SP)+1→SP,(PC)L→SP,  (SP)+1→SP,(PC)H→SP,addr11→PC10～0 |
| 12 | 12 | 00010010 | LCALL addr16 | × | × | × | × | 3 | 2 | (PC)+2→PC,(SP)+1→SP,(PC)L→SP,  (SP)+1→SP,(PC)H→SP,addr16→PC |
| 22 | 22 | 00100010 | RET | × | × | × | × | 1 | 2 | ((SP))→PCH,(SP)-1→SP,((SP))→PCL,  (SP)-1→SP |
| 32 | 32 | 00110010 | RETI | × | × | × | × | 1 | 2 | ((SP))→PCH,(SP)-1→SP,((SP))→PCL,  (SP)-1→SP,从中断返回 |
| \*1 | AJn:1 | \_\_\_\_0001 | AJMP addr11 | × | × | × | × | 2 | 2 | addr11→PC10～0 |
| 02 | 02 | 00000010 | LJMP addr16 | × | × | × | × | 3 | 2 | addr16→PC |
| 80 | 80 | 10000000 | SJMP rel | × | × | × | × | 2 | 2 | (PC)+(rel)→PC |
| 73 | 73 | 01110011 | JMP,@A+DPTR | × | × | × | × | 1 | 2 | (A)+(DPTR)→PC |
| 60 | 60 | 01100000 | JZ rel | × | × | × | × | 2 | 2 | (PC)+2→PC,若(A)=0,(PC)+(rel)→PC |
| 70 | 70 | 01110000 | JNZ rel | × | × | × | × | 2 | 2 | (PC)+2→PC,若(A)≠0,(PC)+(rel)→PC |
| 40 | 40 | 01000000 | JC rel | × | × | × | × | 2 | 2 | (PC)+2→PC,若(Cy)=1,(PC)+(rel)→PC |
| 50 | 50 | 01010000 | JNC rel | × | × | × | × | 2 | 2 | (PC)+2→PC,若(Cy)=0,(PC)+(rel)→PC |
| 20 | 20 | 00100000 | JB bit,rel | × | × | × | × | 3 | 2 | (PC)+3→PC,若(bit)=1,(PC)+(rel)→PC |
| 30 | 30 | 00110000 | JNB bit,rel | × | × | × | × | 3 | 2 | (PC)+3→PC,若(bit)≠1,(PC)+(rel)→PC |
| 10 | 10 | 00010000 | JBC bit,rel | × | × | × | ✓ | 3 | 2 | (PC)+3→PC,若(bit)=1,0→bit,(PC)+(rel)→PC |
| B5 | B5 | 10110101 | CJNE A,direct,rel | × | × | × | ✓ | 3 | 2 | (PC)+3→PC  若(A)≠(direct),则(PC)+(rel)→PC  若(A)<(direct),则1→Cy |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| B4 | B4 | 10110100 | CJNE A,#data,rel | × | × | × | ✓ | 3 | 2 | (PC)+3→PC  若(A)≠data,则(PC)+(rel)→PC  若(A)<DATA,则1→CY<font> |
| B8-8F | B0+Rn | 1011\_\_\_\_ | CJNE Rn,#data,rel | × | × | × | ✓ | 3 | 2 | (PC)+3→PC  若(Rn)≠data,则(PC)+(rel)→PC  若(Rn)<DATA,则1→CY<font> |
| B6-B7 | B6+Ri | 1011011\_ | CJNE @Ri,#data,rel | × | × | × | ✓ | 3 | 2 | (PC)+3→PC  若((Ri))≠data,则(PC)+(rel)→PC  若((Ri))<DATA,则1→CY<font> |
| D8-DF | D0+Rn | 1101\_\_\_\_ | DJNZ Rn,rel | × | × | × | × | 3 | 2 | (PC)+2→PC,(Rn)-1→Rn  若(Rn)≠0,则(PC)+(rel)→PC |
| D5 | D5 | 11010101 | DJNZ direct,rel | × | × | × | × | 3 | 2 | (PC)+2→PC,(direct)-1→direct  若(direct)≠0,则(PC)+(rel)→PC |
| 00 | 00 | 00000000 | NOP | × | × | × | × | 1 | 1 | 空操作 |