短信指令的识别和输出go home ;seek

module sim900a\_sms(

input rx\_clk,

input rx\_data,

input reset,

output reg led, //指示灯

output reg alert //警报

);

localparam BYTE\_COUNT = 160;

localparam SMS\_HEADER\_LENGTH = 6; //短信头部长度

//定义寄存器

reg [7:0] buffer [BYTE\_COUNT-1:0];

reg [7:0] buffer\_pointer = 0;

reg ready = 0;

reg process = 0;

reg [1:0] sms\_state = 0;

reg [7:0] sms\_content [BYTE\_COUNT-1:0];

reg [7:0] sms\_pointer = 0;

//初始化寄存器

initial begin

buffer\_pointer = 0;

ready = 0;

process = 0;

sms\_state = 0;

sms\_content = '{';

sms\_pointer = 0;

led = 0;

alert = 0;

end

//等待启动

always @(posedge rx\_clk) begin

if (reset) begin

buffer\_pointer <= 0;

ready <= 0;

process <= 0;

sms\_state <= 0;

sms\_pointer <= 0;

end else begin

case(process)

0: begin

if (rx\_data == $0A) begin

buffer\_pointer <= 0;

process <= 1;

end

end

1: begin

buffer[buffer\_pointer] <= rx\_data;

buffer\_pointer <= buffer\_pointer+1;

process <= (buffer\_pointer == BYTE\_COUNT) ? 2 : 1;

end

2: begin

ready <= 1;

buffer\_pointer <= 0;

process <= 0;

end

default: begin

process <= 0;

end

endcase

end

end

//接收短信

always @(posedge rx\_clk) begin

if (ready && buffer[1] == 'C' && buffer[2] == 'M' && buffer[3] == 'T' && buffer[4] == 'I') begin

//提取短信号码

reg [19:0] phone\_number;

phone\_number[0] = '+';

phone\_number[1] = buffer[SMS\_HEADER\_LENGTH];

phone\_number[2] = buffer[SMS\_HEADER\_LENGTH+1];

phone\_number[3] = buffer[SMS\_HEADER\_LENGTH+2];

phone\_number[4] = buffer[SMS\_HEADER\_LENGTH+3];

phone\_number[5] = buffer[SMS\_HEADER\_LENGTH+4];

phone\_number[6] = buffer[SMS\_HEADER\_LENGTH+5];

phone\_number[7] = buffer[SMS\_HEADER\_LENGTH+6];

phone\_number[8] = buffer[SMS\_HEADER\_LENGTH+7];

phone\_number[9] = buffer[SMS\_HEADER\_LENGTH+8];

phone\_number[10] = buffer[SMS\_HEADER\_LENGTH+9];

phone\_number[11] = buffer[SMS\_HEADER\_LENGTH+10];

phone\_number[12] = buffer[SMS\_HEADER\_LENGTH+11];

phone\_number[13] = buffer[SMS\_HEADER\_LENGTH+12];

phone\_number[14] = buffer[SMS\_HEADER\_LENGTH+13];

phone\_number[15] = buffer[SMS\_HEADER\_LENGTH+14];

phone\_number[16] = buffer[SMS\_HEADER\_LENGTH+15];

phone\_number[17] = buffer[SMS\_HEADER\_LENGTH+16];

phone\_number[18] = buffer[SMS\_HEADER\_LENGTH+17];

phone\_number[19] = buffer[SMS\_HEADER\_LENGTH+18];

if (phone\_number == "+1234567890") begin //判断短信是否来自指定号码

for (int i = 0; i < buffer\_pointer; i = i+1) begin

if (sms\_state == 0 && buffer[i] == ' ') begin

sms\_state <= 1;

end else if (sms\_state == 1 && buffer[i] != ' ') begin //提取短信指令

sms\_content[sms\_pointer] <= buffer[i];

sms\_pointer <= sms\_pointer+1;

sms\_state <= 2;

} else if (sms\_state == 2 && buffer[i] != '\r') begin

sms\_content[sms\_pointer] <= buffer[i];

sms\_pointer <= sms\_pointer+1;

end else if (sms\_state == 2 && buffer[i] == '\r') begin

sms\_state <= 3;

end else if (sms\_state == 3 && buffer[i] == '\n') begin

if (sms\_pointer == 7 && sms\_content[0] == 'g' && sms\_content[1] == 'o' && sms\_content[2] == ' ' &&

sms\_content[3] == 'h' && sms\_content[4] == 'o' && sms\_content[5] == 'm' && sms\_content[6] == 'e') begin

led <= 1;

} else if (sms\_pointer == 4 && sms\_content[0] == 's' && sms\_content[1] == 'e' && sms\_content[2] == 'e' &&

sms\_content[3] == 'k') begin

alert <= 1;

}

sms\_state <= 0;

sms\_pointer <= 0;

sms\_content <= '{';

end

end

end

ready <= 0;

end

end

endmodule

在这段代码中，我们通过SIM900A模块接收短信，判断短信是否来自指定号码，并提取短信指令，若是指令为"go home"则使指示灯常亮已提示使用者回家，若为"seek"则发出警报以便发送方寻找。

