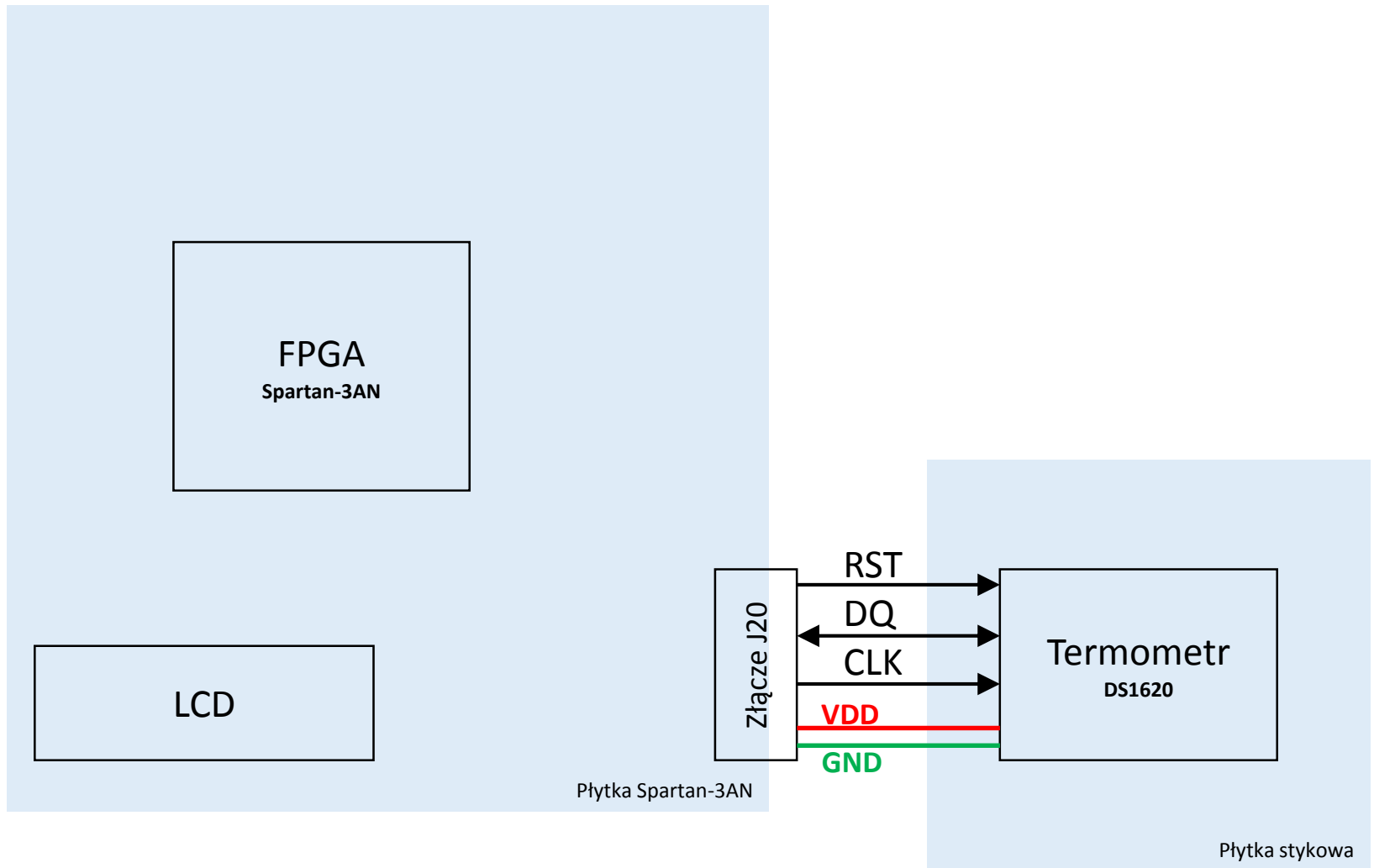


# Termometr cyfrowy

Zbuduj na płycie testowej ze Spartanem-3AN prosty termometr cyfrowy z wykorzystaniem układu scalonego DS1620 i wyświetlający wartość temperatury na wyświetlaczu LCD z dokładnością do 0,5 °C.

*Laboratorium Języków Opisu Sprzętu AGH WFiIS*

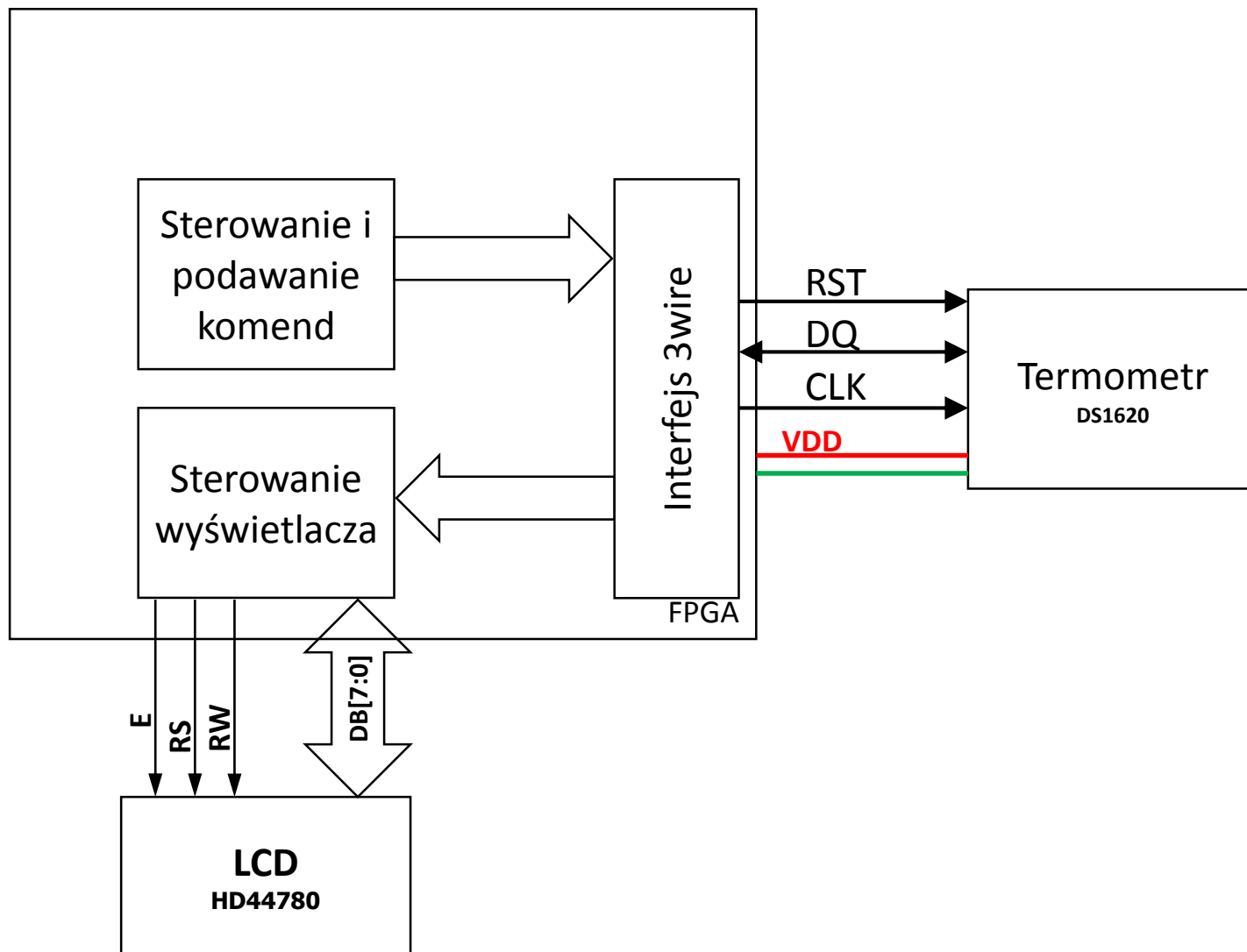


# Interfejs 3–wire

The 3–wire bus is comprised of three signals. These are the (reset) signal, the CLK (clock) signal, and the DQ (data) signal. All data transfers are initiated by driving the input high. Driving the input low terminates communication. (See Figures 4 and 5.) A clock cycle is a sequence of a falling edge followed by a rising edge. For data inputs, the data must be valid during the rising edge of a clock cycle. Data bits are output on the falling edge of the clock and remain valid through the rising edge. RST RST RST

When reading data from the DS1620, the DQ pin goes to a high-impedance state while the clock is high. Taking low will terminate any communication and cause the DQ pin to go to a high-impedance state. RST

Data over the 3–wire interface is communicated LSB first. The command set for the 3–wire interface as shown in Table 4 is as follows.

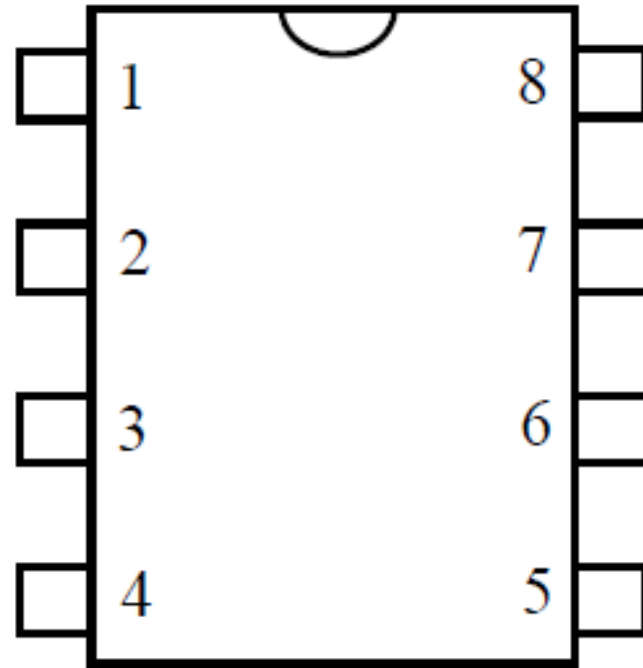


Dwukierunkowa linia danych **DQ**

Zegar transmisji  
Start konwersji **CLK/CONV**

Wybieranie układu stanem wysokim  
Reset stanem niskim **RST**

**GND**



**V<sub>DD</sub>**

**T<sub>HIGH</sub>**

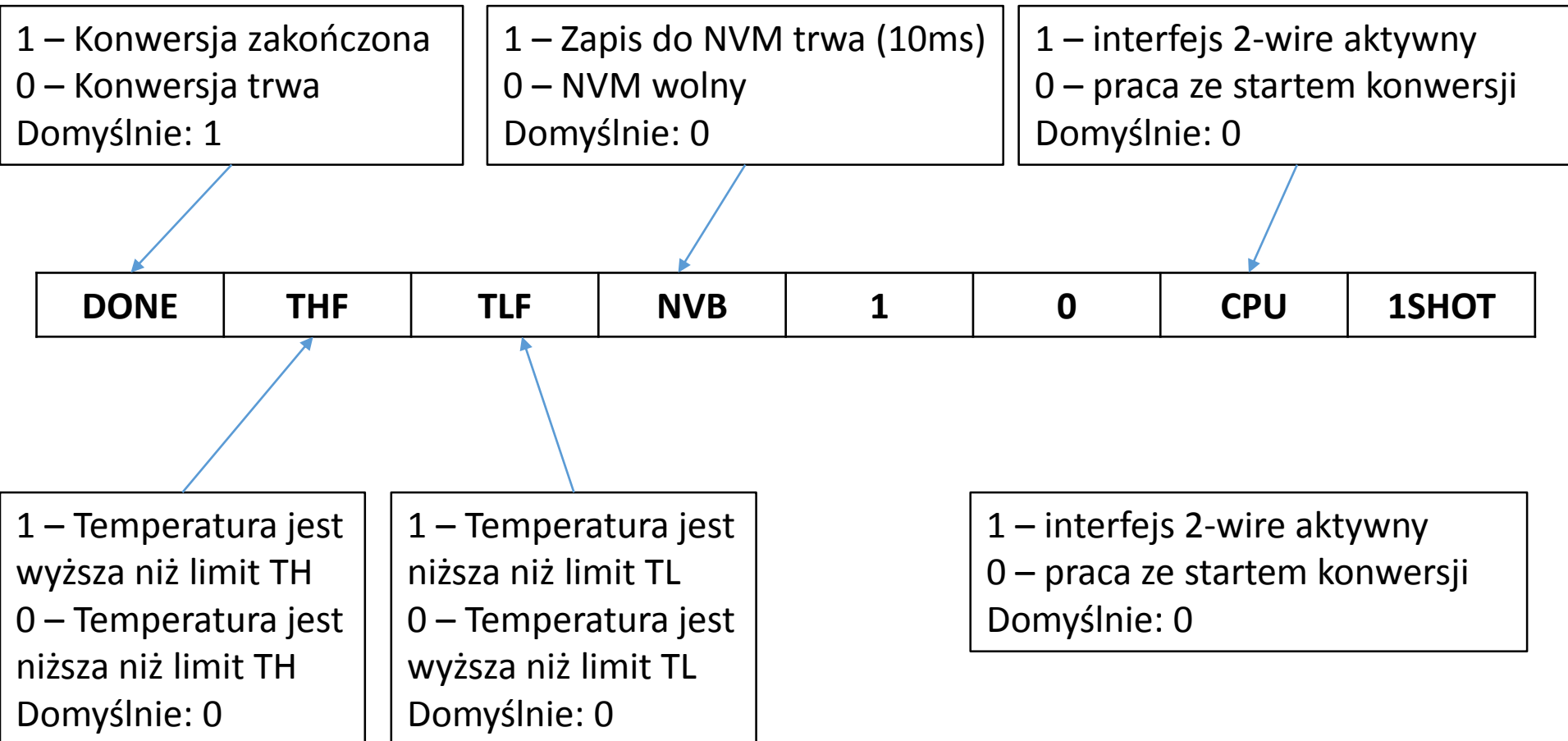
**T<sub>LOW</sub>**

**T<sub>COM</sub>**

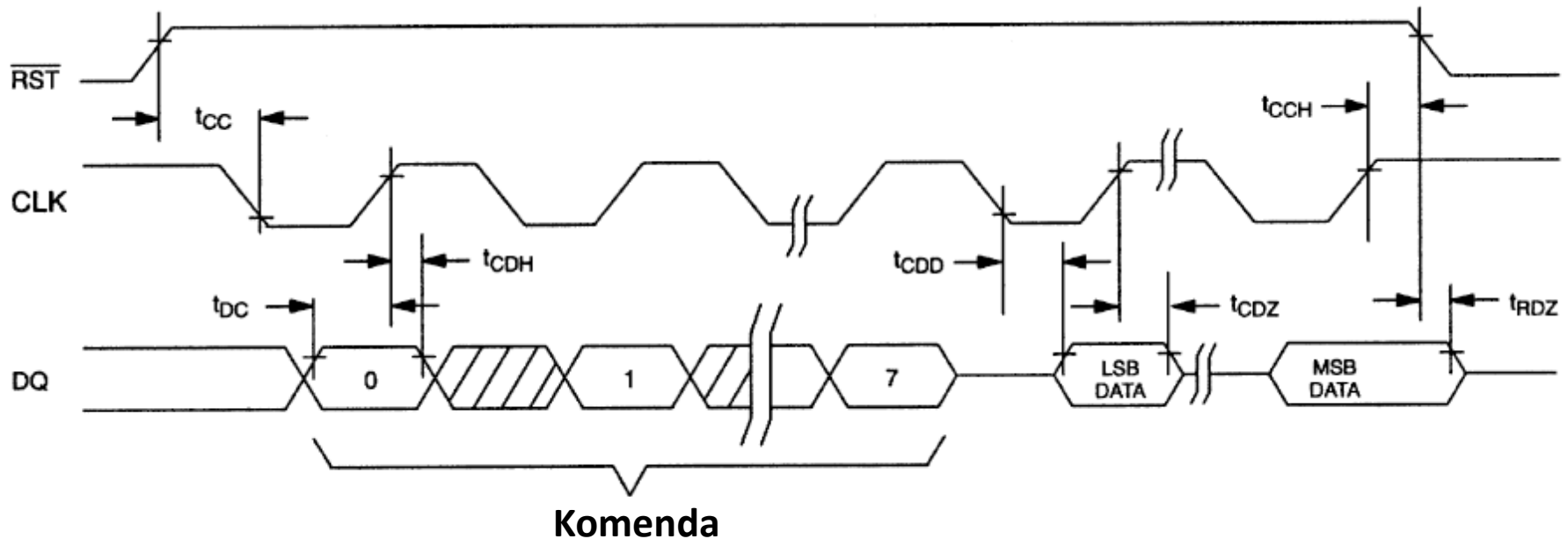
# Potrzebne komendy

Nazwa	Kod	Opis
<b>Read Config</b>	<b>ACh</b>	reads the value in the configuration register. After issuing this command the next eight clock cycles output the value of the configuration register.
<b>Start Convert T</b>	<b>EEh</b>	begins a temperature conversion. No further data is required. In one-shot mode the temperature conversion will be performed and then the DS1620 will remain idle. In continuous mode this command will initiate continuous conversions.
<b>Read Temperature</b>	<b>AAh</b>	reads the contents of the register which contains the last temperature conversion result. The next nine clock cycles will output the contents of this register.

# Rejestr sterujący DS1620

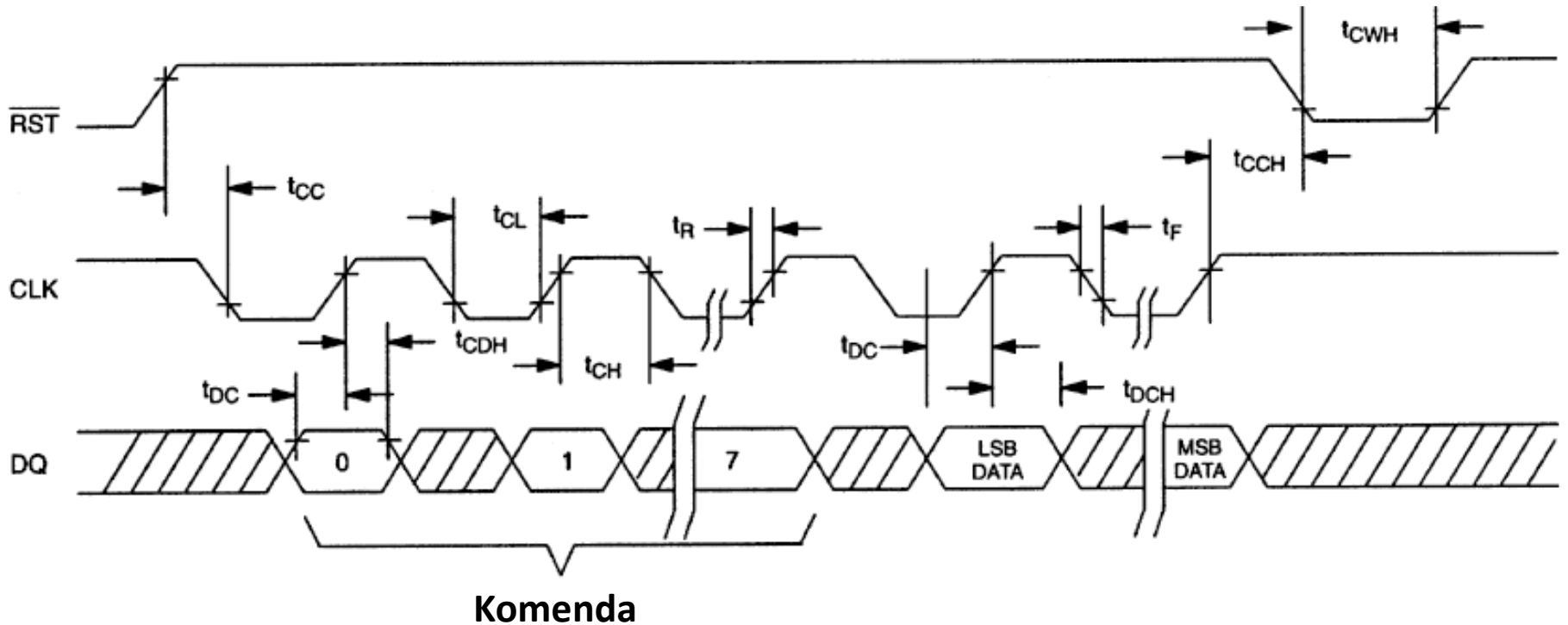


# Transakcja czytania 3-wire





# Transakcja zapisu 3-wire



Literatura:

- ❑ *DS1620 Digital Thermometer and Thermostat, Maxim Integrated, 2015*  
<https://datasheets.maximintegrated.com/en/ds/DS1620.pdf>