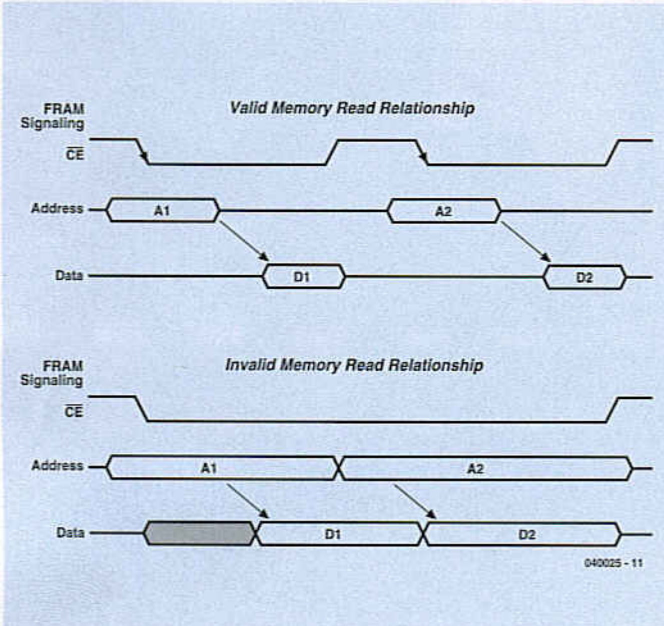
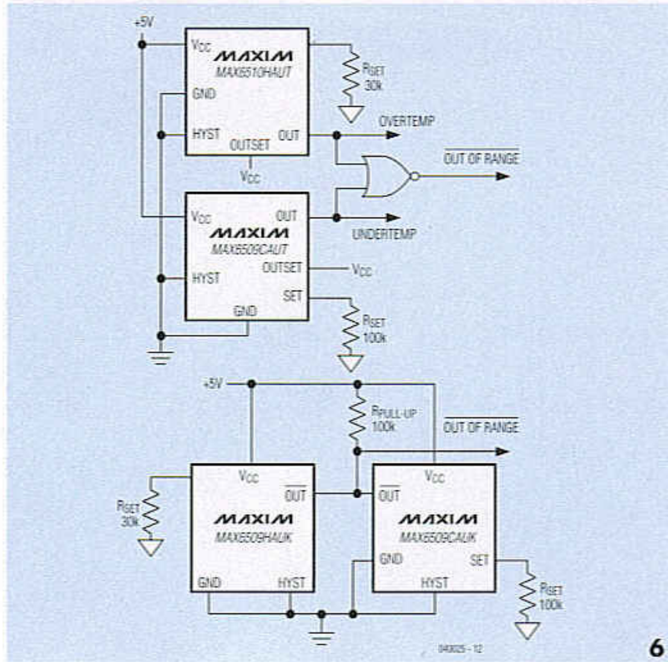


5



6

is replaced by an FRAM: the $\overline{CE}$-signal of an FRAM is used to clock an internal address latch, as shown in the timing diagram. This means that the IC requires a falling edge on this pin after a valid address has been put on the address bus, otherwise the address won't be recognised!

(040025-3)

Temperature switches in SOT packages

The MAX6509 and MAX6510 made by Maxim are very small temperature switches, which can be configured with a single external resistor to trip at any temperature between -40°C and +125°C. The accuracy of the trip point is typically ±0.5°C and ±4.7°C maximum. They have a pin that sets the hysteresis to either 2°C or 10°C.

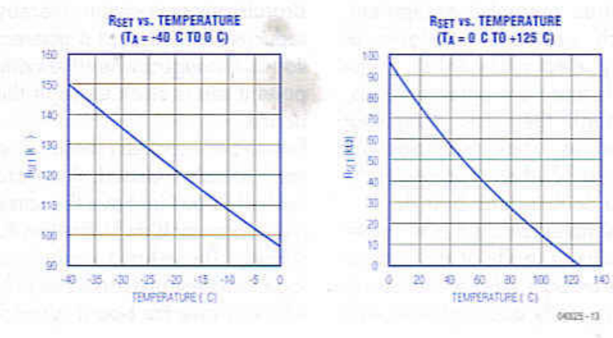
The MAX6509 has an open-drain output. The MAX6510 uses the OUTSET pin to choose between an output that is active high, active low, or an open-drain with a pull-up resistor. The output could for example drive a reset or interrupt to a microcontroller system, switch a supply or activate an external alarm. The current through these components should be kept as small as possible, to limit any temperature variation due to internal dissipation.

With these components you should pay particular attention to the suffix (the letters immediately following the part number) and specifically the first letter!

An 'H'-type ('Hot') switches the output when a rising temperature exceeds the trip point and switches back when the temperature falls below the trip point, **minus** the hysteresis. A 'C'-type ('Cold') in contrast will switch when the temperature falls below the trip point and switches back when it rises above the trip point **plus** the hysteresis. In other words: the hysteresis is either above or below the trip point, depending on the type of sensor.

By combining both types in one design, it is very simple to monitor a temperature between lower and upper limits. Two possible configurations are shown in **Figure 6**. The lower circuit uses the open-drain outputs of the MAX6509 as a wired-OR, with a common pull-up resistor. All of the temperature switches in this example have a hysteresis of 2°C (input HYST connected to ground).

When the trip temperature has been chosen, the corresponding value for R_{set} can be read from one of the graphs in **Figure 7**. For an exact value, one of the following formulae should be used.



7

For temperatures between –40°C and 0°C use:

R_{set} = [(1.3258 x 10^5) / (T+1,3)] – 310.1693 – [(5.7797 x 10^6) / T+1.3)^2]

For temperatures between 0°C and +125°C use:

R_{set} = [(8.3793 x 10^4) / T] – 211.3569 + [(1.2989 x 10^5) / T^2]

where T is in K, R_{set} is in kΩ.

From the graphs you can determine that the switches in the examples have trip points of about 0°C (R_{set} = 100 kΩ) and 65°C (R_{set} = 30 kΩ).

(040025-4)