



DS18B20-PAR / DS18S20-PAR / DS1822-PAR Advantages for Remote-Sensing Applications

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INTRODUCTION

The DS18B20-PAR, DS18S20-PAR and DS1822-PAR parasite-power 1-Wire[®] digital temperature sensors are ideal for use in remote temperature sensing applications. The “-PAR” devices simplify the mechanical aspects of implementing parasite power in these applications, as compared to the DS18B20, DS18S20, and DS1822.

THE “-PAR” ADVANTAGE

Dallas 1-Wire devices have “parasite power” capability, which allows them to derive power directly from the data line instead of using a local power supply. This ability is ideal for remote applications where space constraints or lack of accessibility make it impractical to supply power locally.

When using the DS18B20, DS18S20, and DS1822 1-Wire temperature sensors in parasite-power mode, the V_{DD} pin must be connected to ground (GND) for correct operation. In applications where the sensors are attached directly to a printed circuit board, connecting the V_{DD} pin to GND is a simple matter. However, in applications where the temperature sensor is located at a remote location from the control circuit (e.g., in a temperature probe), this connection can present some mechanical difficulties. In this case there are two ways to make the required connection: run three wires to the temperature sensor and connect the V_{DD} wire to GND at the circuit board (see Figure 1), or connect the V_{DD} pin to the GND pin at the device (see Figure 2). Unfortunately, the first approach adds expense by requiring a wire for the V_{DD} connection, which is of particular concern if the wires must span long distances, and the second approach is a mechanically awkward solution.

To solve this problem, Dallas created the DS18B20-PAR, DS18S20-PAR, and DS1822-PAR. These devices are identical to the DS18B20, DS18S20, and DS1822 except that V_{DD} is internally connected to GND (see Figure 3). Therefore, the three “-PAR” devices make it simple to implement remote parasite-power operation with minimal wiring or connections (see Figure 4).

Note that due to increased DQ pin leakage current at high temperatures, the DS18B20-PAR, DS18S20-PAR, and DS1822-PAR have a maximum operational temperature of +100°C. The same is true for the DS18B20, DS18S20, and DS1822 when operated in parasite-power mode.

If you require further information about the DS18B20-PAR, DS18S20-PAR, or DS1822-PAR, or any other Dallas temperature sensor, please contact Thermal.Support@dalsemi.com. DS18B20-PAR, DS18S20-PAR, or DS1822-PAR data sheets can be downloaded from the Maxim website at www.maxim-ic.com.

1-Wire is a registered trademark of Dallas Semiconductor.

Figure 1. 1-Wire Temperature Sensor with V_{DD} Pin Connected to GND at PCB.

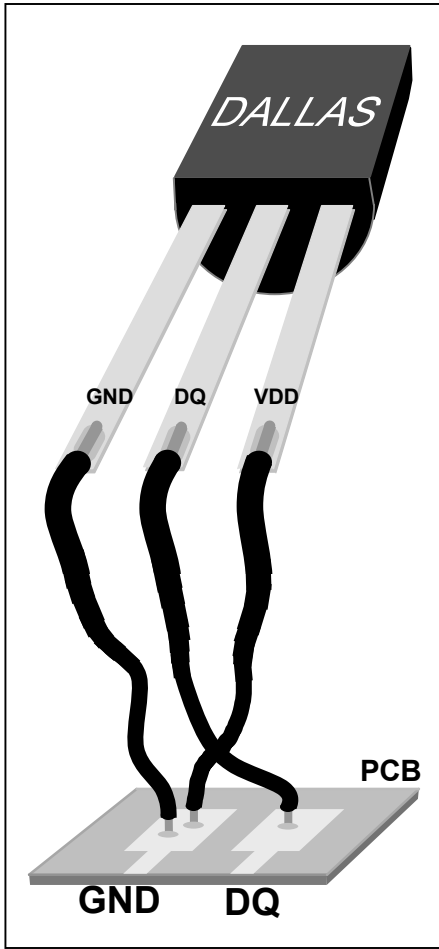


Figure 2. 1-Wire Temperature Sensor with V_{DD} Pin Locally Connected to GND.

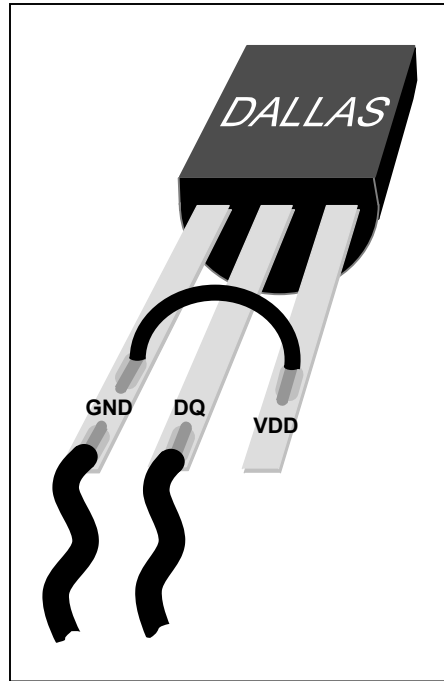


Figure 3. Cut-Away View of “-PAR” Temperature Sensor

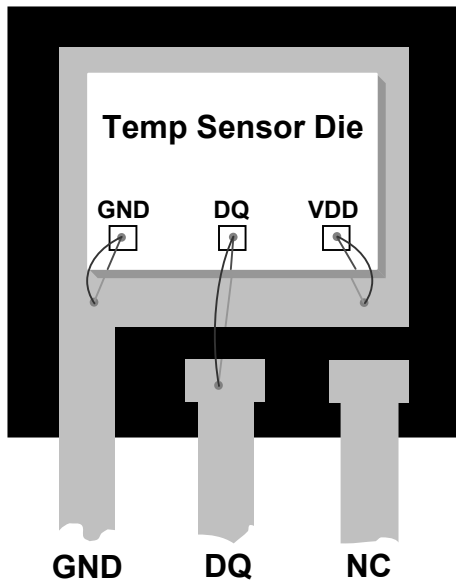


Figure 4. “-PAR” Wiring Configuration

