



Migrating Designs from MCP201 to MCP2021-500

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DEVICE MIGRATIONS

The original MCP201 LIN (Local Interconnect Network) transceiver was designed to comply with LIN 1.2 and 1.3 physical layer specifications. The MCP2021-500 is designed to be pin- and functionally-compatible with the earlier MCP201, and to meet the latest LIN 2.0 and 2.1 specifications. For most applications, the MCP2021-500 can be dropped in place of a MCP201 in an existing design without printed circuit board or firmware modifications.

Note: The MCP2021/2/3/4 family of devices support both LIN and K-line (ISO-9141) buses, 5.0V and 3.3V system voltages, and a new RESET output. The MCP2021-500 is the drop-in replacement for the MCP201.

The following are some considerations to be made when evaluating the upgrade to MCP2021-500.

HARDWARE DIFFERENCES

The only difference exists on two pins of the MCP2021-500.

CS/LWAKE

The CS/LWAKE input is now level sensitive rather than edge-triggered. A low-to-high transition is no longer necessary to enter the 'Operational' mode on power-up, or to toggle CS/LWAKE to clear a fault condition. Any existing firmware that implements toggling will work in a MCP2021-500 without modification.

FAULT/TXE

On the MCP201, this pin was designated FAULT/SLPS. During power-on this pin was sampled to select between fast and slow voltage slope rate control. This function is not required in the MCP2021-500 due to its time-based slew-rate waveshaping. The Transmit Enable (TXE) function has taken its place.

Existing designs that utilized this function with an external pull-up or pull-down resistor, need to remove the resistor. The pin should be routed to a microcontroller port pin to take advantage of the new TXE power-

down function. If the TXE function is not required, this pin may be left floating. Refer to Section 1.3.5 or the "MCP202x LIN Transceiver" data sheet, DS22018, for more information on the TXE function.

The FAULT output definition is the same. Bus contention detect has been debounced.

Voltage Regulator

There is no longer a need for input filter capacitor to be 8-10 times larger than output load capacitor. In fact they can both be 1.0 μ F and the regulator will be stable over the whole temperature range if the output capacitor has a couple ohms of ESR. Quiescent current of the regulator is, typically, 20% that of the MCP201. With transmitter off, this drops an additional 10 μ A. Output voltage is 4.85V to 5.15V from 6.5V to 18V over full load range and temperature range. Time to VREG ready after POR is less than 400 μ s instead of 2.5 ms. Thermal shutdown temperature is 165°C.

All of the turn on points and turn off points are the same. VREG turns on between 5.5V and 6V on VBAT and shuts down when VBAT is 4V.

SOFTWARE DIFFERENCES

The internal state-machine of the MCP2021-500 has been simplified. The device will enter the 'Operational' as soon as the VREG output has stabilised and CS/LWAKE and FAULT/TXE are both high ('1'). No low-to-high edge is necessary.

REFERENCES

MCP201 Data Sheet, "LIN Transceiver with Voltage Regulator", DS21730

MCP202X Data Sheet, "LIN Transceiver with Voltage Regulator", DS22018

Note: For additional information, please contact your Microchip Automotive Products Representative.

NOTES:

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