TB3101

MCP2551 to MCP2561 Migration

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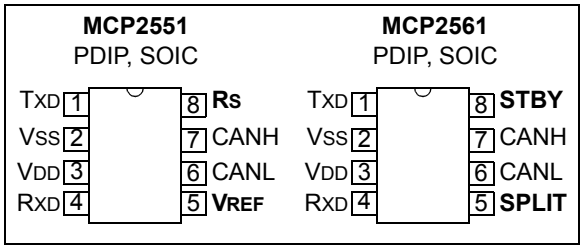
INTRODUCTION

The MCP2561 is Microchip's second generation CAN transceiver. Although major improvements have been made, resulting in increased EMC performance and much lower current consumption, the differences in using the MCP2561 versus the MCP2551 are minor.

Figure 1 shows the differences in pinout.

The MCP2561 can be used as a drop-in replacement for the MCP2551 if the differences listed in Table 1 are considered.

FIGURE 1: PINOUT DIFFERENCES



The MCP2561 also adds a new leadless package type, 8LD 3x3 DFN, allowing for smaller form factor package requirements. This package features pin 9, Exposed Thermal Pad, and has the same pinout as the PDIP and SOIC packages.

For further information on these differences and on the new models available, please refer to Table A-1.

TABLE 1: MIGRATION CONSIDERATIONS

Difference	Function/Reference		Consideration
	MCP2551	MCP2561	
Pin 5	V_{REF}	SPLIT	The name of the pin is different but the function is the same. **No action required**.
Pin 8	R_S Slope Control	STBY Standby	The slope of the MCP2551 is controlled by an external resistor (R_{EXT}) between the R_S pin and ground. The MCP2561 has internal slope control, allowing the R_S pin of the MCP2551 to be replaced by a STBY pin on the MCP2561. The MCP2561 enters Normal Operation mode when the voltage level on the STBY pin is low (V_{IL} < 0.3 V_{DD}) and enters Standby mode when the voltage level on the STBY pin is high (V_{IH} > 0.7 V_{DD}). The STBY pin can be pulled down or directly connected to ground for Normal Operation mode. If the STBY pin is left floating or pulled up, the MCP2561 will enter Standby mode. A microcontroller can also be used to dynamically switch between Normal Operation and Standby modes. When replacing the MCP2551 with the MCP2561, in order to meet V_{IL} for the STBY pin, the **external resistor R_{EXT} must be lower than 100 kΩ**. Assuming an internal worst-case pull-up of 500 kΩ, this will lead to a maximum voltage of 0.2 V_{DD} at STBY.
Compliance	ISO11898-2	ISO11898-2	
		ISO11898-5	ISO11898-5 adds a new low-power mode: • Bus pins are disconnected when the MCP2561 is not powered. **No action required**. ISO11898-5 increases DC Voltage requirements on CAN and Split pins: • Maximum V_{CANH}, V_{CANL}, V_{SPLIT}: increased from +/- 42V to +/- 58V. **No action required**.

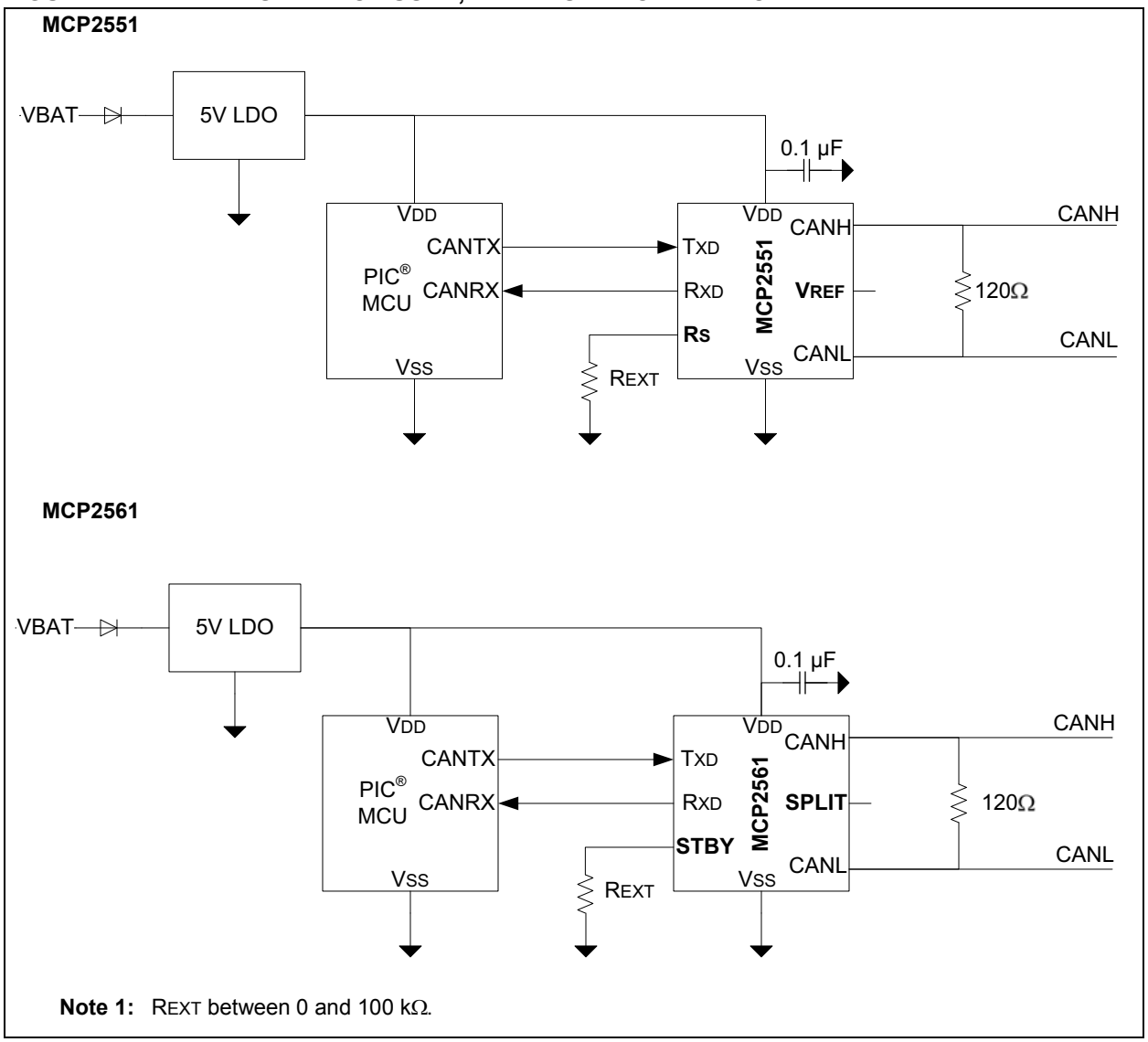
TABLE 1: MIGRATION CONSIDERATIONS (CONTINUED)

Difference	Function/Reference		Consideration
	MCP2551	MCP2561	
Operating Temperature	-40°C to +125°C	-40°C to +150°C	**No action required**.
EMC, ESD, Automotive	—	Meets all automotive requirements	Major improvements to EMC and ESD in the MCP2561. **No action required**.

TYPICAL APPLICATION: MCP2551 VERSUS MCP2561

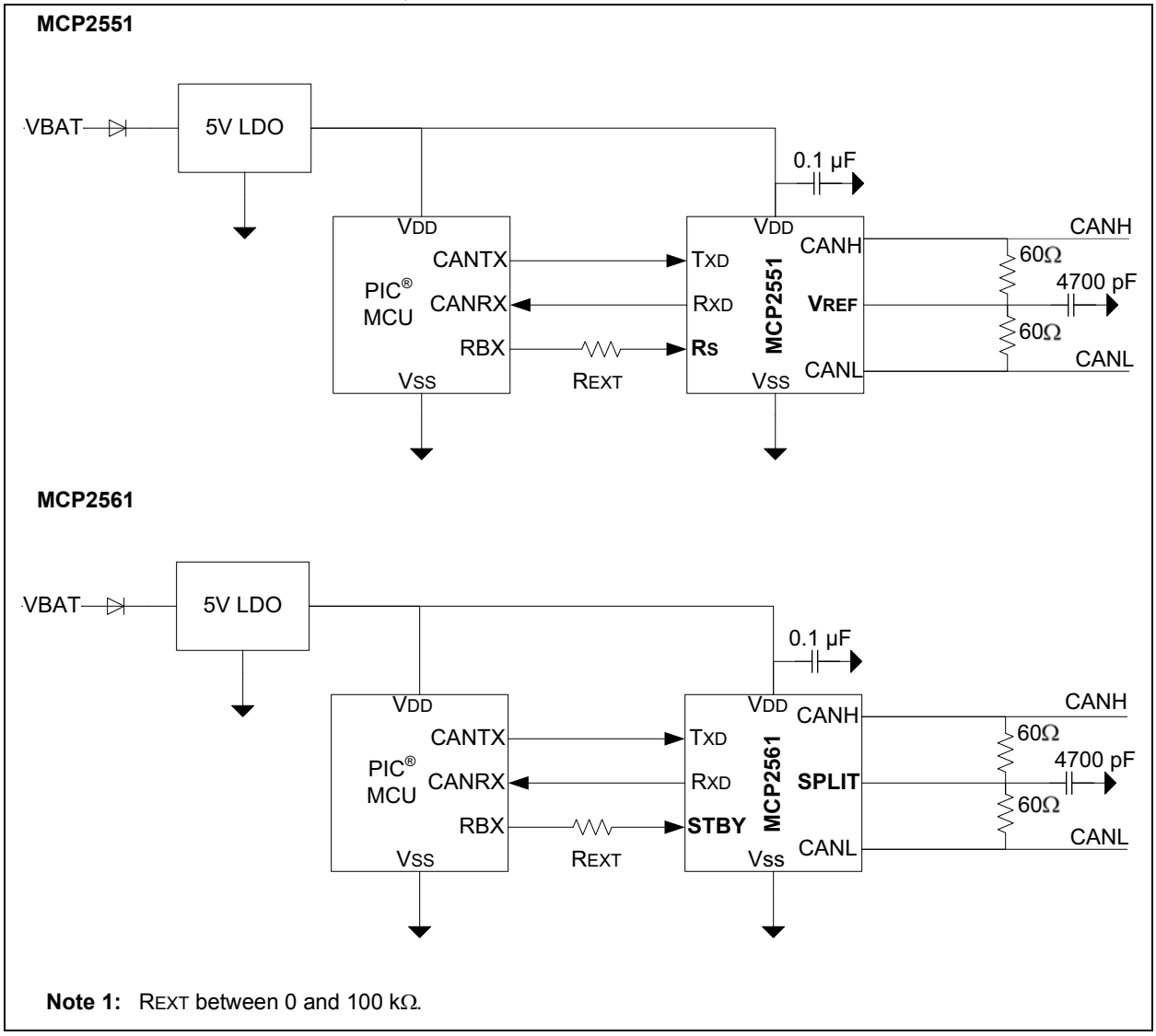
Figure 2 and Figure 3 show two typical applications. The MCP2551 can be replaced with the MCP2561 if the following requirement is met: the **external resistor REXT must be lower than 100 kΩ**.

FIGURE 2: VREF/SPLIT NOT USED, ALWAYS IN NORMAL MODE



Note 1: REXT between 0 and 100 kΩ.

FIGURE 3: VREF/SPLIT USED, MODE CONTROLLED BY MICROCONTROLLER



Note 1: REXT between 0 and 100 kΩ.

CONCLUSION

This document describes the aspects to be taken into account before migrating from the MCP2551 to the MCP2561. The MCP2561 is a direct replacement for the MCP2551. The printed circuit board does not need to be modified. If an external resistor was used on the RS pin, it has to be lower than 100 kΩ on the STBY pin. The MCP2561 has better EMC performance, lower current consumption and meets all automotive and industrial conformance and hardware requirements.

APPENDIX A: PART NUMBER REFERENCE

TABLE A-1: PART NUMBER ORDERING – ADDITIONAL INFORMATION

MCP2551 Part Number	MCP2561 Part Number Suggested for Replacement	Comments
MCP2551-I/P	MCP2561-E/P	MCP2561 supports E and H-Temp ranges
MCP2551-E/P	MCP2561-E/P	
MCP2551-I/SN	MCP2561-E/SN	MCP2561 supports E and H-Temp ranges
MCP2551T-I/SN	MCP2561T-E/SN	MCP2561 supports E and H-Temp ranges
MCP2551-E/SN	MCP2561-E/SN	
MCP2551T-E/SN	MCP2561T-E/SN	
—	MCP2561-H/P	MCP2561 offers a new H-Temp range
—	MCP2561-H/SN	MCP2561 offers a new H-Temp range
—	MCP2561T-H/SN	MCP2561 offers a new H-Temp range
—	MCP2561-E/MF	MCP2561 offers a new 8LD 3x3 DFN package option
—	MCP2561T-E/MF	MCP2561 offers a new 8LD 3x3 DFN package option
—	MCP2561-H/MF	MCP2561 offers a new H-Temp range
—	MCP2561T-H/MF	MCP2561 offers a new H-Temp range

Note 1: I-Temp = -40 to +85°C

2: E-Temp = -40 to +125°C

3: H-Temp = -40 to +150°C

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