Application Report
SPRA508

Using the 5410 Multi-Channel Buffered Serial Port (McBSP) Sub-Address Scheme

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Abstract

Due to memory constraints on data page 0, Multi-Channel Buffered Serial Port (McBSP) registers are accessed using a sub-address scheme. This document discusses how data is accessed through the sub-address registers. A code listing is included.

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Design Problem

Due to memory constraints on data page 0, McBSP registers are accessed using a sub-address scheme. How is data accessed through the sub-address registers?

Solution

The Multi-Channel Buffered Serial Port consists of three ports and twenty-three registers. Of those twenty-three registers, fifteen are addressable through the sub-address scheme. To access any of those fifteen registers, an address representing the desired register first must be written to the sub-address register (SPSAx). The following table includes registers that must be accessed using a sub-address.

Table 1. McBSP Register

Hex Address					Register
McBSP 0	**McBSP 1**	**McBSP 2**	**Sub-Address**	**Acronym**	**Name**
0038	0048	0034	-	SPSAx	Sub-Address Register
0039	0049	0035	0x0000	SPCR1x	Serial Port Control Register 1
0039	0049	0035	0x0001	SPCR2x	Serial Port Control Register 2
0039	0049	0035	0x0002	RCR1x	Receive Control Register 1
0039	0049	0035	0x0003	RCR2x	Receive Control Register 2
0039	0049	0035	0x0004	XCR1x	Transmit Control Register 1
0039	0049	0035	0x0005	XCR2x	Transmit Control Register 2
0039	0049	0035	0x0006	SRGR1x	Sample Rate Generator Register 1
0039	0049	0035	0x0007	SRGR2x	Sample Rate Generator Register 2
0039	0049	0035	0x0008	MCR1x	Multi-Channel Register 1
0039	0049	0035	0x0009	MCR2x	Multi-Channel Register 2
0039	0049	0035	0x000A	RCERAx	Receive Channel Enable Register Partition A
0039	0049	0035	0x000B	RCERBx	Receive Channel Enable Register Partition B
0039	0049	0035	0x000C	XCERAx	Transmit Channel Enable Register Partition A
0039	0049	0035	0x000D	XCERBx	Transmit Channel Enable Register Partition B
0039	0049	0035	0x000E	PCRx	Pin Control Register

For example, assume that we are interested in writing #01h to SPCR1 and are using port 0 (SPCR10). Our first step would be to write 0h to SPSA for port 0 (SPSA0). By doing this, address 39h now becomes SPCR10. Our next step would be to write #01h into SPCR10. Reference the code below to for an example.

Example 1. Code Listing

```
SPCR1_SUBADDR   .set   0h
SPSA0           .set   38h              ;address is 38h for port 0
SPCR10          .set   39h              ;address is 39h for port 0
STM             #SPCR1_SUBADDR,SPSA0h   ;Store SPCR1 sub-address
                                        ;into SPSA0
STM             #01h, SPCR10            ;Storing 01h into SPCR10.
```

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