PATABLE Access

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Keywords

- CC1100
- CC1100E
- CC1101
- CC1150
- CC2500
- CC2550
- PATABLE

1 Introduction

The CC1100/CC1100E/CC1101/CC1150/CC2500/CC2550 all have an eight bytes long PATABLE used for selecting PA power control settings. This design note describes the different ways the PATABLE can be accessed and how the PATABLE for CC1150 and CC2550 is slightly different than it is for the CC1100, CC1100E, CC1101, and CC2500.
2 PATALBE Access

The access to the PATALBE is either single byte or burst access, depending on the burst bit. The table is written and read from the lowest setting (0) to the highest (7), one byte at a time. An index counter is used to control the access to the table. This counter is incremented each time a byte is read or written to the table, and set to the lowest index when CSn is high.

2.1 Burst Access

Controlled PA power ramp-up and ramp-down can be achieved if more than one entry of the PATALBE is used. Burst access should be used when more than one entry in the PATALBE is to be initialized. The plot below shows how the numbers 1, 2, ..., 8 are written to the PATALBE using burst access.

```c
BYTE code paTable[] = {1, 2, 3, 4, 5, 6, 7, 8};
halSpiWriteBurstReg(CCxxx0_PATABLE, paTable, sizeof(paTable));
```

Figure 1. Burst Access

The register field PA_POWER[2:0] in the FREND0 register sets the index to the PATALBE entry that should be used. All PA powers settings, from index 0 and up to index FREND0.PA_POWER are used during ramp-up and ramp-down.

Since FREND0.PA_POWER = 6 in Figure 2, the last entry in the PATALBE (index 7) is not used even if it has been initialized.
2.2 Single Byte Access

By setting `FREND0.PA_POWER` to 0, power ramping at the start and at the end of a packet is disabled even if the whole `PATABLE` has been configured. The PA will utilize only the first entry (index 0) in the `PATABLE`. Writing to only one entry in the `PATABLE` should be done using single byte access.

```c
halSpiWriteReg(CCxxx0_PATABLE, 1);
halSpiWriteReg(CCxxx0_PATABLE, 2);
halSpiWriteReg(CCxxx0_PATABLE, 3);
```

Figure 3. Single Byte Access

Be aware than when CSn is set high, the index counter will be set back to zero.

```c
halSpiWriteReg(CCxxx0_PATABLE, 1);
halSpiWriteReg(CCxxx0_PATABLE, 2);
halSpiWriteReg(CCxxx0_PATABLE, 3);
```

Figure 4. Single Byte Access with CSn Set High Between Accesses

If CSn is set high in between accesses, like in Figure 4, `PATABLE[0]` will end up with the value 3, since the index counter is set to zero every time CSn is set high (only the first entry in `PATABLE` will be updated. It is possible to use single byte access to write to more than one entry in the `PATABLE`, but then CSn must be kept low until the last byte has been written.

```c
halSpiWriteReg(CCxxx0_PATABLE, 1);
halSpiWriteReg(CCxxx0_PATABLE, 2);
halSpiWriteReg(CCxxx0_PATABLE, 3);
```

Figure 5. Single Byte Access with CSn Kept Low
After 2 consecutive single byte accesses to the PATABLE with CSn kept low, `PATABLE[0]` is 1 and `PATABLE[1]` is 2. There is no support in the software libraries for single byte access with CSn kept low.

3  PATABLE in SLEEP State

On the CC1100, CC1100E, CC1101, and the CC2500, all content of the PATABLE, except for the first byte (index 0) is lost when entering SLEEP state. On the CC1150 and the CC2550, all content, including the first byte, is lost when entering SLEEP state.
4 General Information

4.1 Document History

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<td>SWRA110B</td>
<td>2009.03.12</td>
<td>Added CC1100E.</td>
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<td>SWRA110A</td>
<td>2007.10.22</td>
<td>Added CC1101. Removed logo in header</td>
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<td>SWRA110</td>
<td>2006.07.06</td>
<td>Initial release.</td>
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