

## 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.

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## 2 PATABLE Access

The access to the PATABLE 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 PATABLE is used. Burst access should be used when more than one entry in the PATABLE is to be initialized. The plot below shows how the numbers 1, 2, ..., 8 are written to the PATABLE using burst access.

```

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

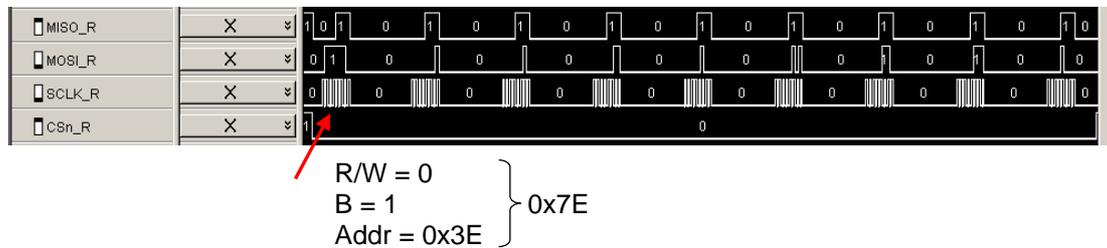


Figure 1. Burst Access

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

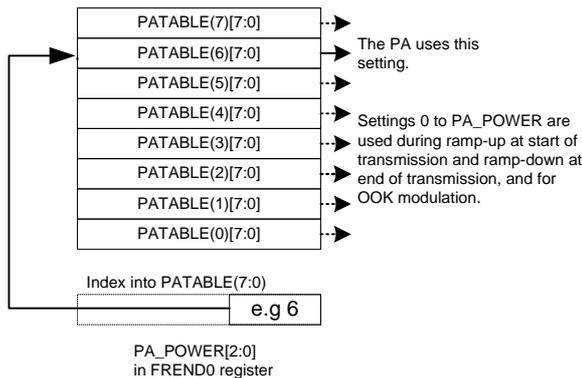


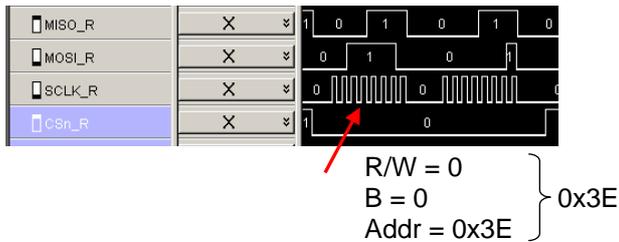
Figure 2. PA\_POWER and PATABLE

Since FRENDO.PA\_POWER = 6 in Figure 2, the last entry in the PATABLE (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.

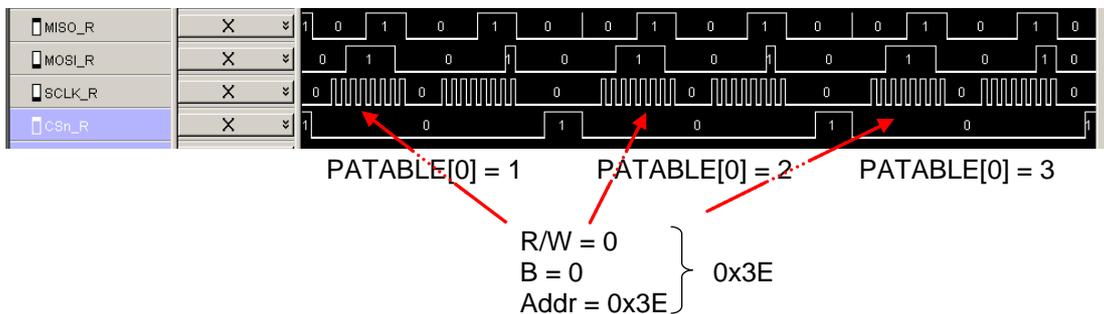
```
halSpiWriteReg(CCxxx0_PATABLE, 1);
```



**Figure 3. Single Byte Access**

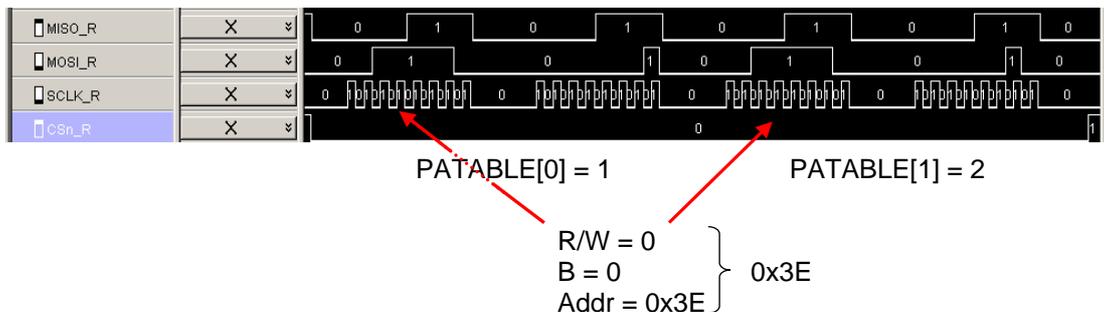
Be aware that when `CSn` is set high, the index counter will be set back to zero.

```
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.



**Figure 5. Single Byte Access with CSn Kept Low**

## *Design Note DN501*

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.

# *Design Note DN501*

## 4 General Information

### 4.1 Document History

Revision	Date	Description/Changes
SWRA110B	2009.03.12	Added CC1100E.
SWRA110A	2007.10.22	Added CC1101. Removed logo in header
SWRA110	2006.07.06	Initial release.

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