SESUB-PAN-D14580
Application Note

AN-SP-D14580-002
How to Use RTC Function for SESUB-PAN-D14580 Product Family
Scope of this Application Note

This document describes about an external clock source (clock source from an external crystal resonator or external clock source) for sleep clock and/or RTC function.

Target

The user who want to use RTC function in the system, and want to know how to setup 32.768kHz external clock in SESUB-PAN-D14580 and configuring resisters.
External 32.768kHz Clock Source Hardware Connection

(a) Use an External crystal resonator
(fc = 32.768kHz, 7.0pF, +/- 20ppm)

(b) Use an External clock source
(fc = 32.768kHz, Vp-p <=1.5V)
## Register Configuration for Internal & External Clock

**Reference Document**: DA14580 Datasheet (DA14580_DS_v3_1.pdf)

**Revision**: v3.1

**Page**: page 35

<table>
<thead>
<tr>
<th>Bit</th>
<th>Mode</th>
<th>Symbol</th>
<th>Description</th>
<th>Reset</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:13</td>
<td>-</td>
<td>-</td>
<td>Reserved</td>
<td>0x0</td>
</tr>
<tr>
<td>12</td>
<td>R/W</td>
<td>XTAL32K_DISABLE_AMPREG</td>
<td>Setting this bit disables the amplitude regulation of the XTAL32kHz oscillator. Set this bit to '1' for an external clock applied at XTAL32Kp. Keep this bit '0' with a crystal between XTAL32Kp and XTAL32Km.</td>
<td>0x0</td>
</tr>
<tr>
<td>11:8</td>
<td>R/W</td>
<td>RC32K_TRIM</td>
<td>Controls the frequency of the RC32K oscillator. 0x0: lowest frequency 0x7: default 0xF: highest frequency</td>
<td>0x7</td>
</tr>
<tr>
<td>7</td>
<td>R/W</td>
<td>RC32K_ENABLE</td>
<td>Enables the 32 kHz RC oscillator</td>
<td>0x1</td>
</tr>
<tr>
<td>6:3</td>
<td>R/W</td>
<td>XTAL32K_CUR</td>
<td>Bias current for the 32kHz XTAL oscillator. 0x0: minimum 0x3: default 0xF: maximum For each application there is an optimal setting for which the startup behaviour is optimal.</td>
<td>0x3</td>
</tr>
<tr>
<td>2:1</td>
<td>R/W</td>
<td>XTAL32K_RBIAS</td>
<td>Setting for the bias resistor of the 32 kHz XTAL oscillator. 0x0: maximum 0x3: minimum Preferred setting will be provided by Dialog.</td>
<td>0x2</td>
</tr>
<tr>
<td>0</td>
<td>R/W</td>
<td>XTAL32K_ENABLE</td>
<td>Enables the 32 kHz XTAL oscillator</td>
<td>0x0</td>
</tr>
</tbody>
</table>
Configuration in Application Code

Use “SetBits16” function.

1. Disable RC32kHz (internal clock generator).
   Use following command in the Keil C-Compiler.
   
   ```c
   SetBits16(CLK_32K_REG,RC32K_ENABLE,0);
   ```

2. Enable an external crystal / clock of 32.768kHz.
   Use following command in the Keil C-Compiler.

   ```c
   SetBits16(CLK_32K_REG,XTAL32K_ENABLE,1);
   ```
General Information

Document History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Description / Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>May-25-2015</td>
<td>Initial release.</td>
</tr>
</tbody>
</table>

Reference Information for more detail.

1. Dialog Semiconductor DA14580 Data sheet:
   http://support.dialog-semiconductor.com/
   DA14580_DS_v3.1.pdf

2. Dialog Semiconductor Software Development Kit (SDK):
   http://support.dialog-semiconductor.com/
   DA14580_581_SDK_3.0.8.0.zip
   DA14580_581_Software_Release_Notes_v_3_0_8.pdf

3. SESUB-PAN-D14580 Datasheet:
   TDK Corporation Product Center
   SESUB-PAN-D14580_Datasheet_v1_0.pdf

This document is based on the Dialog’s document version of the time of writing.
For latest version of Dialog’s document, please refer to Dialog Semiconductor web site:
(Registration required)
http://support.dialog-semiconductor.com/
Visit TDK Product Center on our web site for more detail.

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