Abstract

The DA1469x can boot from external serial devices to enable development of application code or to connect to an external (micro)controller. At power-up the system listens on the serial interface and tries to load the boot code from an external host. This document describes the booting sequence for the serial interfaces and provides developers with the necessary information for realizing the protocol required for establishing communication between an external device and the DA1469x.
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DA1469x Booting from Serial Interfaces

1 Terms and Definitions

OTP  One Time Programmable (memory)
SW   Software
STX  Start of Text (ASCII character)
SOH  Start of Heading (ASCII character)
URX  UART Receive port
UTX  UART Transmit port

2 References

3 Introduction

The DA1469x can source code from two different locations. It can be either a serial port (UART) or an attached QPSI flash device. The DA1469x family can load from a serial interface with an image size of up to 128 kbytes.

This document covers the requirements for loading code through the serial port and starting to execute it.

4 Booting

4.1 Booting Sequence

The DA1469x booting sequence is described in Figure 1. In this document we will detail the procedure in the box “Get FW From UART” in the “Retrieve Application Code” section of the booting procedure.

4.2 Interface

The DA1469x boot on a unique UART serial interface. The UART configuration is the following:

- DA1469x Tx pin: P0_09
- DA1469x Rx pin: P0_08
- Baud rate: 115200 bps
- 8 bits data transmission LSB first
- 1 start bit
- 1 stop bit
- No parity
Figure 1: Main Boot Flow Phases
5 Retrieve Application Code

5.1 Code Retrieval Sequence

The procedure used by the ROM Booter to retrieve the firmware from the UART is described in Figure 2.

5.2 Code Retrieval Protocol

The Booter ROM code uses the protocol defined in Table 1. In the protocol the external host should wait to receive the STX byte and then initiate the programming sequence. The length is only two bytes. This limits the size of the bootable image to 64 kBytes.

<table>
<thead>
<tr>
<th>Table 1: UART Legacy Protocol (&lt;64 kB)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Byte #</strong></td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5...N</td>
</tr>
<tr>
<td>N+1</td>
</tr>
<tr>
<td>N+2</td>
</tr>
</tbody>
</table>

If the image is greater than 64 kBytes and less than 128 kBytes, the protocol described in Table 2 should be used.

<table>
<thead>
<tr>
<th>Table 2: UART Extended Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Byte #</strong></td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
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<td>6</td>
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<tr>
<td>7</td>
</tr>
<tr>
<td>8...N</td>
</tr>
<tr>
<td>N+1</td>
</tr>
<tr>
<td>N+2</td>
</tr>
</tbody>
</table>
Figure 2: Get Firmware from UART
Rev R 1.0

Revision History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Description</th>
</tr>
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<tr>
<td>1.0</td>
<td>14-Feb-2019</td>
<td>Initial version.</td>
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DA1469x Booting from Serial Interfaces

Status Definitions

<table>
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<tr>
<th>Status</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRAFT</td>
<td>The content of this document is under review and subject to formal approval, which may result in modifications or additions.</td>
</tr>
<tr>
<td>APPROVED or unmarked</td>
<td>The content of this document has been approved for publication.</td>
</tr>
</tbody>
</table>

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