

# Atmel AVR32841: AVR UC3 Audio Player

## SPIRIT MP3 Decoder

### Features

- Software SPIRIT MP3 decoder implementation
  - Player implementation
  - Player configuration
  - Licensing

### 1. Introduction

This application note is an extension of the application note Atmel® AVR32839: AVR® UC3 Audio Player.

The aim is to give the reader all he needs about implementation and configuration of the SPIRIT MP3 decoder in the Atmel AVR UC3 Audio Player.

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**32-bit Atmel  
Microcontroller**

**Application Note**



## 2. Atmel AVR UC3 Audio Player

### 2.1 Overview

The UC3 audio player is a generic audio player interface and is designed to support multiple audio formats like MP3, WMA, AAC...

This document details the implementation of the SPIRIT MP3 decoder in this player.

### 2.2 Package

The UC3 audio player package implementing the SPIRIT decoder is the: **audio\_player-evk1104-evk1105-spirit\_mp3-<version>.zip** file.

It can be requested from the Atmel SPIRIT MP3 registration page:  
[http://www.atmel.com/forms/mp3\\_reg.asp](http://www.atmel.com/forms/mp3_reg.asp).

### 2.3 SPIRIT decoder

#### 2.3.1 Overview

SPIRIT MP3 Decoder supports MPEG 1, 2 Audio Layers I, II and III standards and their low bit rate extension MPEG 2.5. Smart algorithmic solutions allow decreasing CPU load and memory footprint.

More information can be retrieved from the SPIRIT audio home page:  
<http://www.spiritdsp.com/products/audio.php>.

#### 2.3.2 Supported devices

The SPIRIT decoder can only be executed on Atmel AVR UC3 Audio devices.

Currently supported Atmel devices include:

- AT32UC3A0512AU-ALUT
- AT32UC3A0512AU-ALTRA
- AT32UC3A0256AU-ALUT
- AT32UC3A0128AU-ALUT
- AT32UC3A1512AU-AUR
- AT32UC3A1256AU-AUR
- AT32UC3A3256AU-ALUT
- AT32UC3B0512AU-Z2UR
- AT32UC3B0128AU-A2UT
- AT32UC3B0128AU-Z2UR
- AT32UC3C0512CAU-ALUT



```
// ***** MP3 Support *****
#if defined(SUPPORT_MP3) && SUPPORT_MP3 == true
    #include "ai_usb_ms_mp3_support.h"
    #define task_mp3() \
    { \
        extern void codec_mp3_task(void); \
        codec_mp3_task(); \
    }
    #define file_format_mp3 MP3_FILE_FORMAT,
#else
    #define task_mp3()
    #define file_format_mp3
#endif
```

## 2.6 Decoder license

The SPIRIT MP3 decoder implementation is subject to software licence agreement acceptance from the Atmel SPIRIT registration page: [http://www.atmel.com/forms/mp3\\_reg.asp](http://www.atmel.com/forms/mp3_reg.asp).

## 2.7 Performance

Table 2-1 shows the memory requirement for the MP3 SPIRIT decoder implementation.

**Table 2-1.** MP3 SPIRIT decoder performance

Compiler	Flash [KB] <sup>(1)</sup>	RAM [KB] <sup>(2)</sup>
GCC 4.4.3 <sup>(3)</sup>	25.0 / 20.0	18.7 / 18.7
IAR EWAVR32 3.31.1	20.9 / 18.7	19.6 / 19.6

1. Speed / Size optimization
2. Speed / Size optimization
3. AVR 32-bit GNU Toolchain 3.3.1 build 285

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