Tuscany FS2230

Integrated Bluetooth®/DAB/FM module for wireless audio devices

FRONTIER SILICON

Overview

The Tuscany FS2230 module is the latest highly flexible integrated wireless speaker module from Frontier Silicon. Incorporating Bluetooth®, DAB/FM radio, USB, iOS and Android smart device connectivity, Tuscany provides superior signal reception at low-power and at a price point suitable for entry level products.

Tuscany's flexible design enables production of audio devices with any combination of high-performance Bluetooth, dual-band DAB/DAB+, FM with RDS and Apple® Lightning™/USB docking at low-cost. In master mode Tuscany removes the need for any additional host processor and includes a USB device interface for firmware updates. Alternatively Tuscany can operate in simple slave mode.

The module provides all interfaces necessary for a fully functional Bluetooth wireless speaker system with iOS docking capability and digital /analogue radio, needing only power supply, display, keypad, audio amplifier and speakers to complete a product.
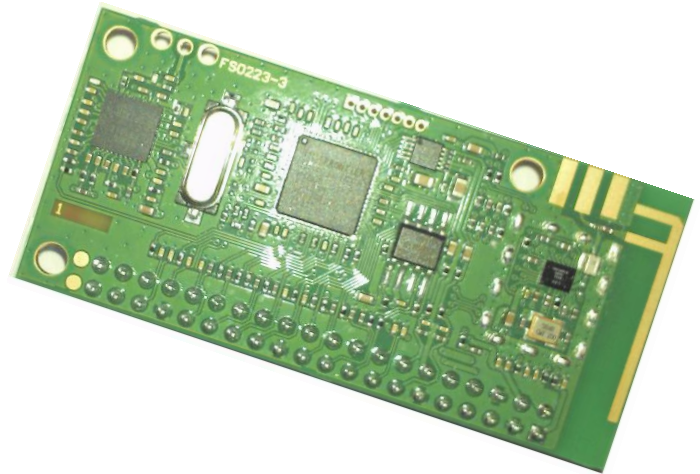
Description

Tuscany provides a complete flexible, low-power wireless speaker system, in a compact module, incorporating digital/analogue radio and smart device docking capability as required.

The main components of the Tuscany module are shown in the diagram opposite. These are Frontier Silicon's Apollo 2 RF front-end, Kino 3 baseband processor, `Bluetooth` IC, flash and audio DAC.

Benefits

- Bluetooth A2DP streaming with AAC support
- On-board Bluetooth antenna
- USB interface for smart device docking (and field software updates)
- Support for NFC Bluetooth pairing
- The most cost-effective BT/DAB/DAB+/FM combo solution available
- Best in class DAB sensitivity ensuring good radio reception even in poor signal areas
- No external microcontroller required

Key features

- Bluetooth 3.0 (EDR)
- Support for A2DP, AVRCP, and SPP Bluetooth profiles.
- Bluetooth Integrated PIFA antenna (external antenna optional)
- NFC support
- DAB/DAB+ sensitivity to -100 dBm (typical)
- FM sensitivity to -108 dBm (typical)
- Decodes multiple audio services up to 384 kbps
- Combined antenna input for FM and Band III
- Full digital audio output (I2S)
- On-board stereo DAC
- Memory:
- Integrated RAM for Bluetooth, DAB/DAB+
- Built-in Flash - size dependent on application
- Full-speed USB 2.0 (12 Mbit/s) for iOS and Android smart device docking and software updates
- iAP2 support
- Display backlight control
- RoHS compliant
- Temperature range:
- operation: -10 to +70°C
- storage: -40 to +85°C

Software

Software is configured to customer requirements and pre-installed in the module's flash memory.

Full suite of customisable application software which includes:

- Support for a variety of User Interfaces, including 1-line or 2-line displays and headless interfaces
- Clock with multiple alarms/timers
- Presets
- Battery charge control
- Support for 2 rotary encoder and 10 keys
- Optional USB field upgrade available
- Simple *Bluetooth* pairing using NFC

Build option

PRODUCT CODE	DESCRIPTION
FS2230-TB	*Bluetooth*, DAB/DAB+ Band III/Software FM with RDS
FS2230-TF	*Bluetooth*, Software FM with RDS
FS2230-T	*Bluetooth* wireless speakers
FS2230-B	DAB/DAB+ Band III/Software FM RDS

User Guide

The Tuscany FS2230 module is an integrated wireless speaker module from Frontier Silicon. Tuscany's flexible design enables production of audio devices featuring a combination of high-performance Bluetooth®, dual-band DAB/DAB+, FM with RDS and USB docking at low-cost. The module provides all interfaces necessary for a fully functional Bluetooth wireless speaker system with docking capability and digital /analogue radio, needing only power supply, display, keypad, audio amplifier and speakers to complete a product.

The module cannot be deployed into the market on its own and is intended to be used in an end product which incorporates the module.

The design authority for the end product will use the module data sheet[1] and application note[2] to add voltage supplies, display, keyboard, audio amplifier, USB functions etc. to manufacture the final radio product to be sold to general public.
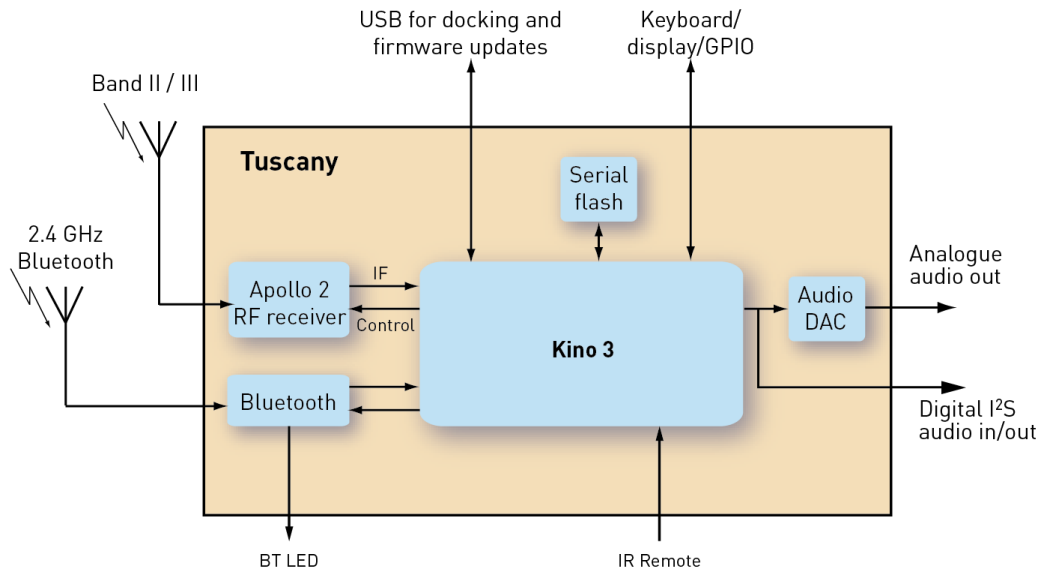
The design authority and manufacturer of the end product is responsible for showing that this is compliant to applicable Radio and EMC standards of the country into which it is selling.

The Block diagram below shows a typical application adopting Tuscany FS2230 module in a consumer radio product. The functionally of the radio is controlled by software on a FLASH memory on the Tuscany module. Frontier Silicon Limited supplies the software and programs the FLASH memory on the production line.
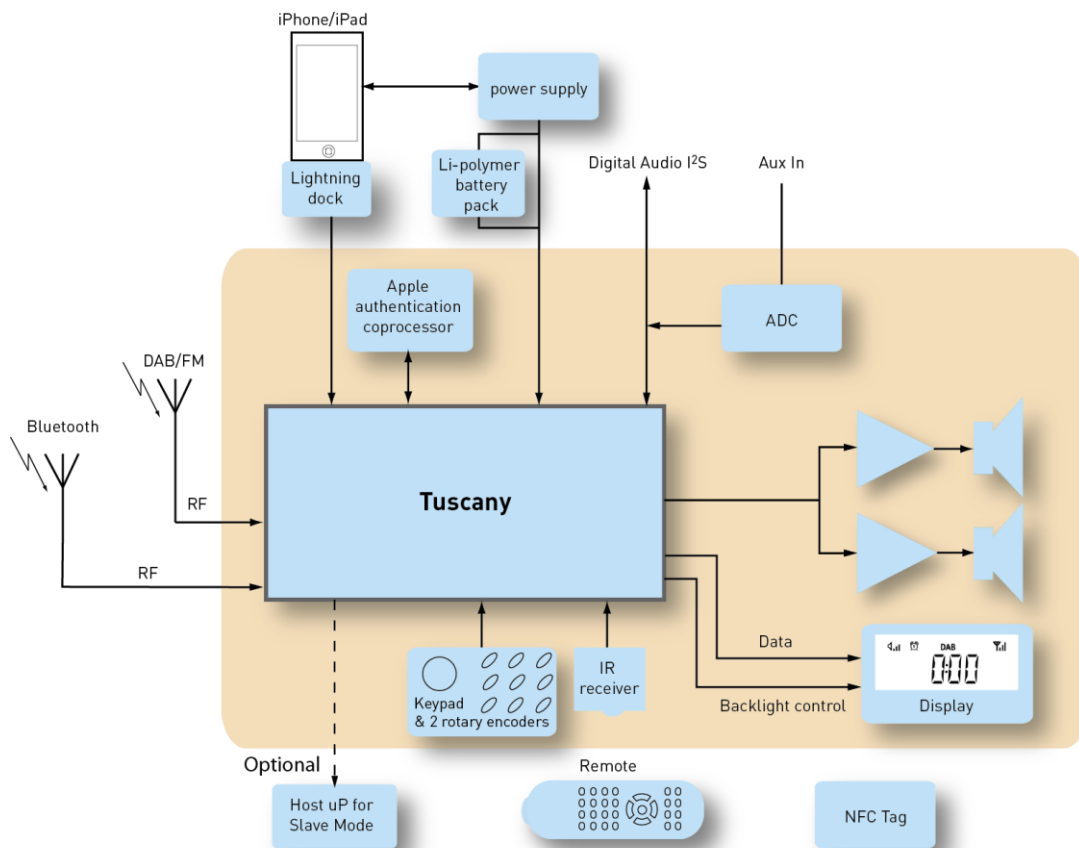
Notes:

*1: The Data Sheet is supplied to all OEM integrator of the module under strict Confidential NDA and it is not available to general public. Request Frontier Silicon Ltd to supply the Tuscany FS2230 Data Sheet if you are an OEM integrator and has not received it from Frontier Silicon Ltd.

*2: The Application Note is supplied to all OEM integrator of the module under strict Confidential NDA and it is not available to general public. Request Frontier Silicon Ltd to supply Tuscany FS2230 Application Note if you are an OEM integrator and has not received it from Frontier Silicon Ltd.

Tuscany module Block Diagram

Tuscany typical Application diagram

Standards and Certification

Tuscany is designed to be interoperable throughout Europe, USA and beyond. As well as complying with FCC Part15b/part15c, ETSI EN300-328, EN301-489-17, EN62311, BS EN 61000-4-2, Bluetooth BT3.0 (BDR and EDR), EN 55103:2001 and EN 55020:2007 standards, suitable end-products based on this platform should be able to obtain certification for various other industry standards. For more information, contact Frontier Silicon Limited.

FCC statement

The Tuscany module is conformant with FCC standards under "modular approval" only. This is intended to provide customers a convenient way to achieve conformity with FCC. The FCC ID for the Tuscany module is YYX-HA-FS2230-F.

DECLARATION OF CONFORMITY WITH FCC RULES FOR ELECTROMAGNETIC COMPATIBILITY

Frontier Silicon Limited declares under its sole responsibility that the product FCC-ID: YYX-HA-FS2230-F, to which this declaration relates, complies with Part 15 of the FCC Rules in Bluetooth and Class B Computer peripheral operating modes only.

It is the responsibility of the final product manufacturer to achieve conformance with Part 15 of the FCC rules for all other operating modes, in the final application.

Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

The manufacturer of the final product containing the Tuscany module must ensure that the product includes an exterior label with the following wording: "Contains FCC ID: YYX-HA-FS2230-F".

The OEM integrator is responsible for ensuring that their end-product complies with additional compliance requirements required with this module installed, such as digital device emissions, PC Peripheral requirements and any additional potential RF Exposure requirements.

"**Note**: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- —Reorient or relocate the receiving antenna.
- —Increase the separation between the equipment and receiver.

"Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment"

RF Exposure Guidance: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 1.0cm between the radiator and persons. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter, except in accordance with FCC multi-transmitter product procedures."

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