



NEPTUNE REFERENCE PLATFORM

OVERVIEW

Neptune is a cost and performance optimised reference design for portable *Bluetooth* audio streaming devices, including simple Bluetooth pairing using low cost NFC tag and DAB/FM radio capability. The platform also demonstrates iOS device docking via an Apple Lightning dock using iAP2 and is compliant to MFi (Made For iPhone/iPad) standards. Two variant of Neptune are available, with and without physical iOS docking capability. Neptune can be used to evaluate a number of device applications including full Master mode with graphic display, rotary controls and keypad, Headless device (using LEDs to indicate operation) and Slave mode.

Based on Frontier Silicon's Tuscany module, the Neptune reference platform supports *Bluetooth* streaming audio, enabling a new generation of battery and/or mains powered *Bluetooth* wireless audio products. Neptune operates as a DAB/FM radio, wireless speaker and docking platform with full graphic display and can also be used as a headless *Bluetooth* docking speaker.

ACOUSTICS

The Neptune platform incorporates high quality acoustic design, powered by Tymphany Peerless drives, to demonstrate the excellent audio capabilities of the Frontier Silicon architecture.

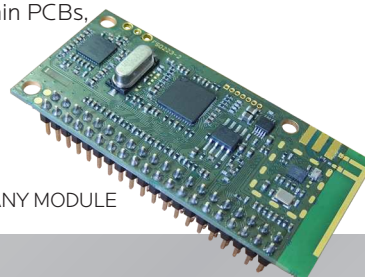
CUSTOMER DELIVERABLES

Neptune is provided with a full engineering design pack including detailed specification, schematics, gerbers, bill-of-materials, software, EMC and ESD compliance reports. Support is available to customise the platform for individual requirements. The platform is production-ready and needs only industrial design tooling to finish off a complete high-quality audio system.

PCB ARRANGEMENT

The fully-flexible reference design comprises three main PCBs: an iDevice daughter board and the Tuscany module.

- Audio PCB: low-cost 2-layer board, 117 x 60 mm
- Keyboard PCB: 13 keys, 2 rotary encoders with push button, 2-layer board, 117 x 19 mm
- Main PCB: 2-layer board, 117 x 63 mm
- Tuscany: 64 x 29.5 mm



TUSCANY MODULE

- *Bluetooth* Wireless speakers
- *Bluetooth* DAB/FM radios
- *Bluetooth* Docker radios
- *Bluetooth* Micro-systems
- *Bluetooth* Clock Radios
- *Bluetooth* Soundbars

OPERATING MODES

Neptune supports a versatile set of operating modes:

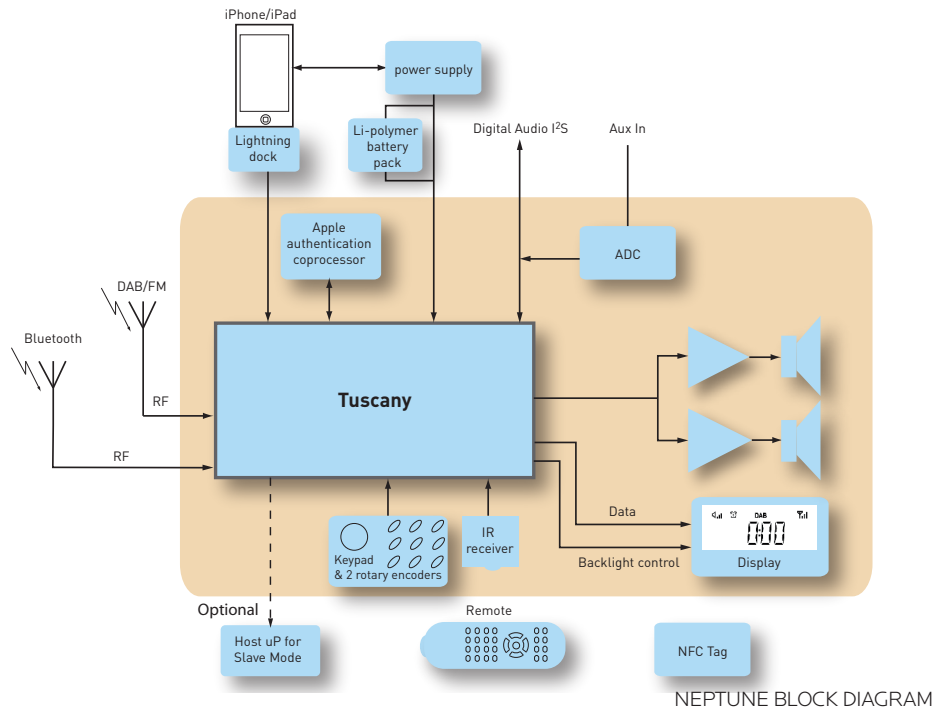
Wired iPhone Docking	iOS Lightning docking (2.1A charging) Authentication Coprocessor 2.0C for Made for iPhone/iPad applications.
<i>Bluetooth</i>	3.0 (EDR) Support for A2DP, AVRCP, and SPP <i>Bluetooth</i> profiles.
DAB radio	Reception of DAB/DAB+ (Band III).
FM radio	Reception of audio and RDS data from FM broadcasts.
Aux-in	Playback of external source e.g. MP3 player/laptop.

NEPTUNE FS4230

Tuscany module based docking - integrated Bluetooth®/DAB/FM audio platform

FEATURES

Power supply	9 V 2.5A DC from adaptor Current: TBD mA (typ), 2.5 A (max, inc. iPhone and iPad charging from dock) Built-in 1600mAh Li-polymer battery
Antennas	Internal Bluetooth antenna Single external antenna for DAB/FM
User interface	13 push-button switches, 2 rotary encoders with push button, infrared remote
iOS / Android App	iOS / Android App remote control of radio, playback and Bluetooth audio streaming
Displays	128 x 32 Full Graphic LCD or LED displayless interface
Audio output	2 x 2 W amplifier, digital EQ with presets, digital volume control with mute. Headphone jack (analogue audio only)
Connectivity	Bluetooth and USB 2.0 Full-speed for firmware upgrade
Bluetooth profiles	A2DP 1.2, AVRCP 1.4, and SPP 1.2
Slave	Simple slave interface access to the Tuscany module and Apple Authentication chip



SOFTWARE AND USER INTERFACE

Frontier silicon has made considerable investment in creating the most versatile and intuitive connected audio software available. The Neptune SDK software is flexible and customisable to OEM's individual interface requirements.

STANDARDS AND CERTIFICATION

The Tuscany module demonstrated in the Neptune platform has been designed to operate seamlessly with the rest of the network audio world. Customers can leverage BT SIG qualifications, FCC modular approvals, FCC test results, ETSI/R&TTE test results and iPod and iPhone certification to assist suitable end-products based on this platform to obtain certification for industry standards. For more information, contact Frontier Silicon.

See also:

Tuscany Product Brief FSM-0011-7822

