SCLCT04S
HW Datasheet

Chip PN：PAU1800

Version：V2.0

Date：05/20/2021

Approve	Review	Issue
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1. Features

Main Chip

- Full compliance with Bluetooth v5.2 EDR/BLE Dual mode specification
- Two 24-bit Audio DSP coprocessors
- Stereo audio DAC/ADC and headphone drivers
- Up to 3 microphone inputs (2 analog and 1digital MEMS)
- Embedded Bluetooth SBC/A2DP and wideband speech mSBC codec
- Support AAC/G.722 decoder
- Multipoint support for twoA2DP simultaneous connections
- Feedforward/Feedback ANC/Hybrid Active Noise Cancellation
- Serial Interfaces: UART, I_2C
- Digital Audio interfaces: PCM/I_2S
- Integrated configurable switch-mode regulators and linear regulators
- Integrated Lithium-ion battery charger and battery voltage monitor
- Hardware PWM LED drivers
- Support over the air (OTA) firmware code update
- Support unique device/manufacturing ID for customer's code protection
- Ultra-low current for deep hibernation mode
- 2-way power-line charger box communication (CBC)

Device description

- Qualified to Bluetooth v5.2 dual mode specification
- Bluetooth BR/EDR/LEv5.2 controller
  - BT/BLE dual mode coexistence and traffic arbitration
  - Stand-alone BLE MAC controller to offload F/W schedule loading
  - Support BT4.2 and 5.2 enhancement features

Applications

- Hearables with ANC/HT, KWS, VC, and personalized audio
- Green Radio truly wireless stereo earbuds with ANC/HT, KWS, VC, and personalized audio
- Wireless stereo headsets/headphones with ANC,KWS, VC, and personalized audio
- Green Radio gaming earbuds
- Wireless smart home devices

SiP module feature

- 3 LED Ports (max)
- 1 Power Switch Port
- 2 A-MIC Ports
- 2 Speaker Ports
- 1 RF Port
- 1 I2C Interface
- 1 I2SInterface
- 1 Battery Port
- 1 Charger Port
- Module size : 4.0 x 8.0 x 1.545 mm (max)
- Module pin-out : 41 pins

Feature Summary

Audio subsystem	➢ 32 Kb program random access memory (RAM) ➢ 256 Kb data RAM ➢ 512Kb ROM
Application subsystem	➢ Dual-core application subsystem 26 MHz operation
Bluetooth Profile	➢ HFP/HSP/A2DP/AVRCP
RF Tx Power	➢ 10.0 dBm
RF Rx Sensitivity	➢ 2DH5 sensitivity: -93.5 dBm ➢ 3DH5 sensitivity: -93.5 dBm
RF Frequency	➢ 2.4-2.48GHz
Audio SNR	➢ Class-D SNR: 90 dBA typ ➢ Class-AB SNR: 90 dBA typ
Audio DSP	➢ Two 24-bit Audio DSP coprocessors
Audio codec	➢ 1 codec output channel, supporting 8, 11.025, 16, 22.05, 24, 32, 44.1, 48, 88.1, 96, 192 kHz sample rates ➢ 8 codec input channels supporting 8, 11.025, 16, 22.05, 32, 44.1, 48, 88.1, 96 kHz sample rates
Power	➢ Runs directly from a Li-ion, USB or external supply(2.7V to 6V) ➢ 1.8V SMPS generates power for both the device and off-chip circuits.
Operating Voltage	➢ 2.7V to 4.6V (VBAT)
Charger Current	➢ 100mA
Operating Temperature	➢ 0°C ~ +70°C
Sip Package	➢ 4.0mm x 8.0mm x 1.545 mm(max), LGA-41 pin
Others	➢ Built-in 26MHz crystal for system clock

2. Specification

Detail Specification

Model Name	SCLCT04S02
Chipset	PAU1800
Core	Dual-Core processor
Clock Speed	52 MHz
Flash	16Mb
Operation Conditions	
Temperature	Operating : 0℃ ~ +70℃ Storage : 0℃ ~ +70℃
Dimension	4.0mm X 8.0mm X 1.545 mm(max)

Recommended operating conditions

Symbol	Parameter	Min.	Typ.	Max.	Unit
VBATT	Battery voltage	2.7	3.7	4.6	V
USB_VBUS	Charger voltage	4.6	5	7	V
Digital I/O	VDD_PADS	1.7	1.8	3.3	V

Antenna Designation

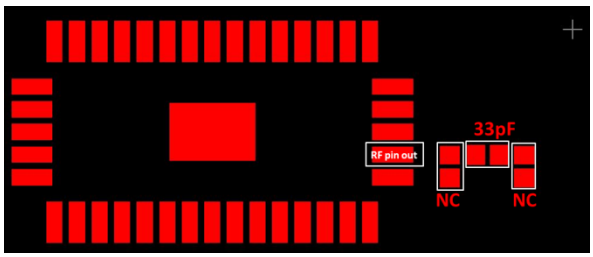
Antenna Type	Freq. (MHz)	Peak Antenna Gain (dBi)
Chip	2402-2480	3

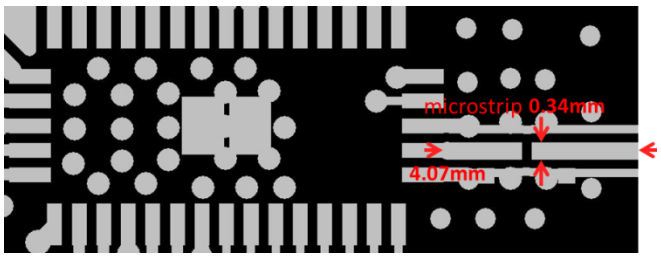
The “chip antenna” is outside of this module and will be connected to this module via the dedicated circuit.

a) Trace layout and dimensions including specific designs for each type:

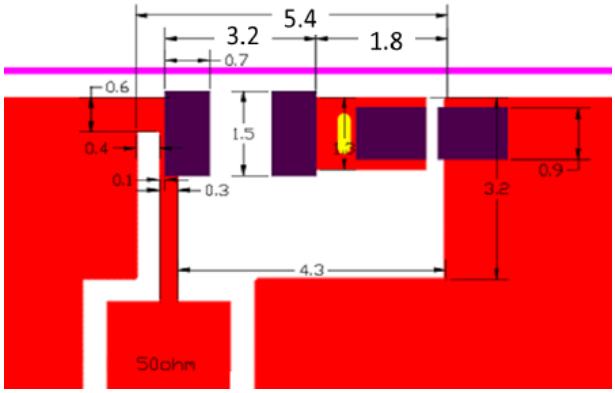
Antenna Design

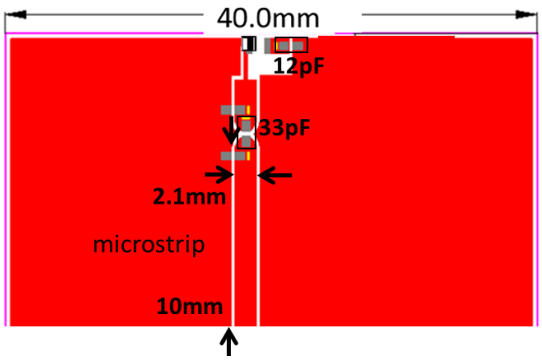
The (SCLCT04S) is configured for monostatic operation, which requires only a single RF I/O pin for full duplex communication. The output must be routed to the antenna via 50 ohm microstrip or stripline on the OEM PCB. The reference ground of the microstrip/ stripline is purely ground.
No coupling capacitor is required given that the RF pin is AC-coupled internal to the PAU1800.





Length: 4.07mm
Width: 0.34mm
Thickness: 1.6mm
Type of trace: 1/2oz
Dielectric constant: 4.34 (FR-4)
Antenna connector: SMA





Length: 10 mm
Width: 2.1mm
Thickness: 1.0mm
Type of trace: 1/2oz
Dielectric constant: 4.34 (FR-4)

b) Appropriate parts by manufacturer and specifications.

The trace from Pin No. 22 (RF_Out) to antenna connector on the OEM PCB must be maintained identical as the above specification with SMA connector. Only trace designs approved with an original grant or through permissive change can be used by an OEM, any changes are deemed as antenna type change and should be reviewed to ensure compliance with the FCC and ISED requirements.

Verification must be conducted and the results shall not exceed below ranges to ensure identical antenna design is applied to subsequent integration and end product production.

c) Test procedures for design verification.

Test procedures of verification

1. Set Transmission in the supported modulation mode from the device in engineering mode.
2. Verify RF power through conducted measurement at balanced impedance of 50ohms, the KDB 971168 D01 Power Meas License Digital System shall be used as the supplemental test methodology to adjust the proper setting obtaining the measurement results.
3. Verify the Tx power in datasheet, and compliance test reports.

FCC Interference Statement

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.
Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. 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.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

15.21

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user’s authority to operate the equipment.

FCC Radiation Exposure Statement

1.This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End user must follow the specific operating instructions for satisfying RF exposure compliance.

2. For body worn operation, this device has been tested and meets FCC RF exposure guidelines. When used with an accessory that contains metal may not ensure compliance with FCC RF exposure guidelines.

Required End Product Labeling

Any device incorporating this module must include an external, visible, permanent marking or label which states: “Contains FCC ID: 2AYS4-AIP4SA”

Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.

The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

FCC

This module has been tested and found to comply with the following requirements for Modular Approval.

- Part 15.247 - Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

Test Modes

This device uses various test mode programs for test set up which operate separate from production firmware. Host integrators should contact the grantee for assistance with test modes needed for module/host compliance test requirements.

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as shown in User manual.

In the end product, the antenna(s) used with this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operation in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures. User and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying the RF exposure compliance.