User Manual

Model or Name: DWAM83 Wireless Audio Module
Description: RF Module

Document No.:
Version: 0.5
Issue Date: 2013-07-08

Table of Contents

Publication History

No.	Version	Release issue	Prepared by	Release date
1	V0.1	Draft version		2013-03-04
2	V0.2	Sensitivity condition modification		2013-05-28
3	V0.3	Packing Proposal Update		2013-06-20
4	V0.4	Add Note1.Note2 for 5.2G		2013-06-26
5	V0.5	Update the typical out power value		2013-07-08
6				
7				
8				
9				
10				

Wireless Module
1492549
Type Specification

1. Communication Method: Half Duplex Mode
2. Transmission
   a) 2.4G

PARAMETER		CONDITION	MIN	TYP	MAX	UNITS
RF Frequency Range			2400	-	2483.5	MHz
Number of RF-channels		Carriers in the spectrum	-	3	-	
Transmission Power				14		dBm
Channel Frequency (dynamic or fixed allocation)	CH1 CH2 CH3			2412 2438 2464	-	MHz

   b) 5.2G

PARAMETER		CONDITION	MIN	TYP	MAX	UNITS
RF Frequency Range			5150	-	5250	MHz
Number of RF-channels		Carriers in the spectrum	-	3	-	
Transmission Power				9		dBm
Channel Frequency (dynamic or fixed allocation)	CH1 CH2 CH3			5180 5280 (Note 1) 5240	-	MHz

Note 1: For Japan, RF channel 2 will be 5200MHz

   c) 5.8G

PARAMETER		CONDITION	MIN	TYP	MAX	UNITS
RF Frequency Range			5725	-	5875	MHz
Number of RF-channels		Carriers in the spectrum	-	3	-	
Transmission Power				9		dBm
Channel Frequency (dynamic or fixed allocation)	CH1 CH2 CH3			5736 5762 5814	-	MHz

   d) Modulation: QPSK
3. Antenna Peak Gain:2.8dBi
4. Applicant: Sony
5. Product Name： DWAM83 Wireless Module
6. Model Name: 1492549

1 Document Scope and Intention

The information in this document provides detailed specifications for the Cocoa. All features and requirements are described hereunder, including mechanical, electrical, software and reliability.
This document is released to ensure final production units comply with all requirements and may be updated as necessary.

2 Applicable Standards, Documents and References

STM-1131 Ink and Printed Parts – Quality Standard
STM-1208 Paint and Painted Parts – Quality Standard
STM-1269 Drop Test Methods for Mobile Products
STM-1284 Vapor-Deposited Parts Quality Standards

3 Glossary

FFC	Flexible Flat Cable
FPC	Flexible Printed Circuit
EMC	Electromagnetic Compatibility
FCC	Federal Communications Commission
IEC	International Electro-technical Commission
RoHS	Restriction of Hazardous Substances
UUT	Unit Under Test
WEEE	Waste Electrical and Electronic Equipment Directive
TBD	To Be Determined

Table1 Glossary

4 Product Application Overview

Cocoa is a digital wireless audio module base on DARR83 wireless audio processor. It is an uncompressed wireless digital audio transceiver operating in 2.4GHz, 5.2 GHz and 5.8 GHz bands, with 22Mbps Bandwidth. Cocoa supports point to point connection and bidirectional data transfer. It's built in 4M SPI Interface flash, and has a 26pins interface connector for power, digital audio and control interface and GPIOs. It offers seamless audio connectivity for a wide range of wireless audio devices.

5 Product Outline

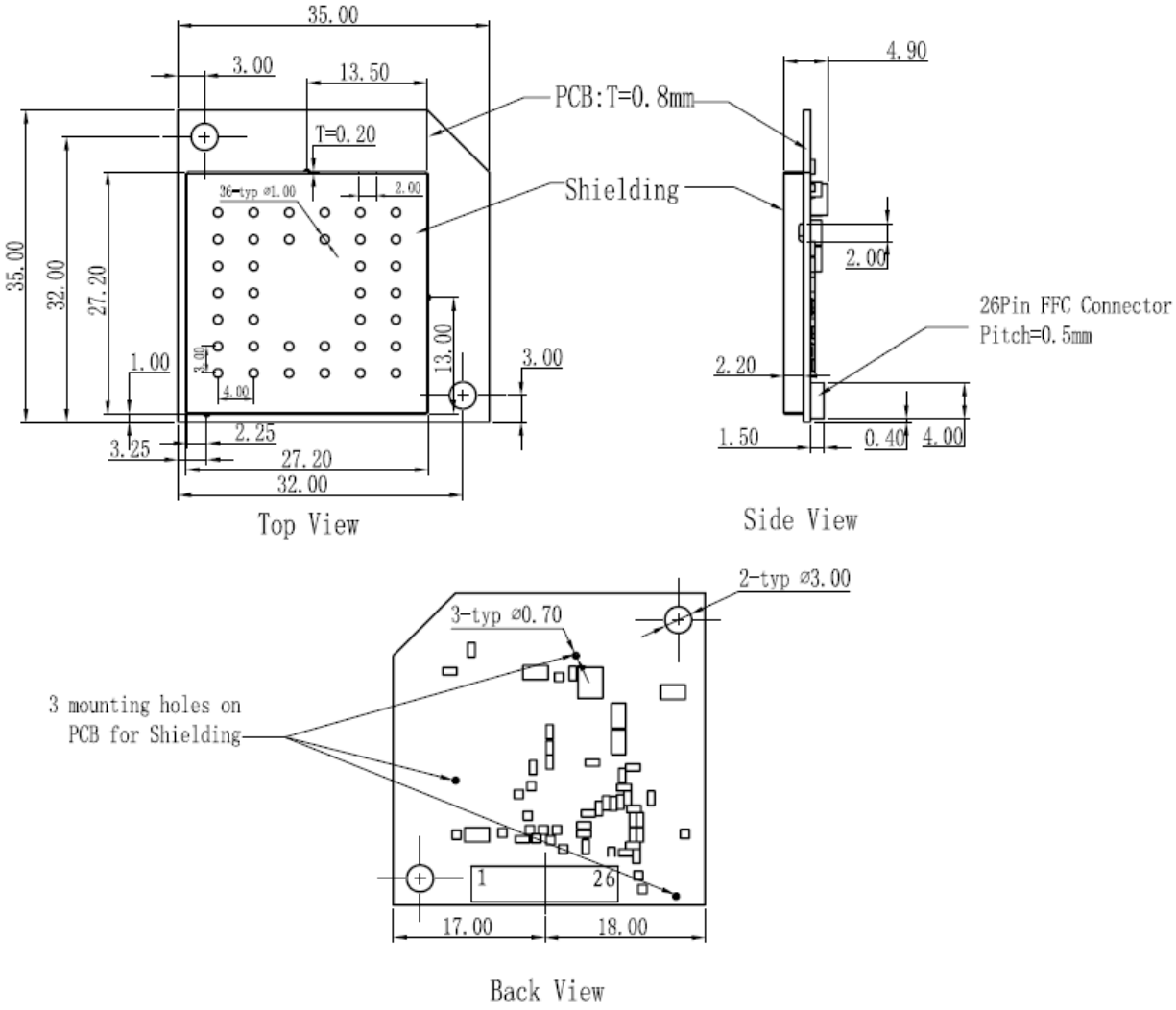


Figure1 Cocoa Outline Drawings

Module size: 35 x 35 x 43 mm (±0.15), including 2-Printed Tri-Band antennas
Diameter mounting holes: 3.0mm (±0.05)

6 Electric Characteristics

6.1 Block Diagram

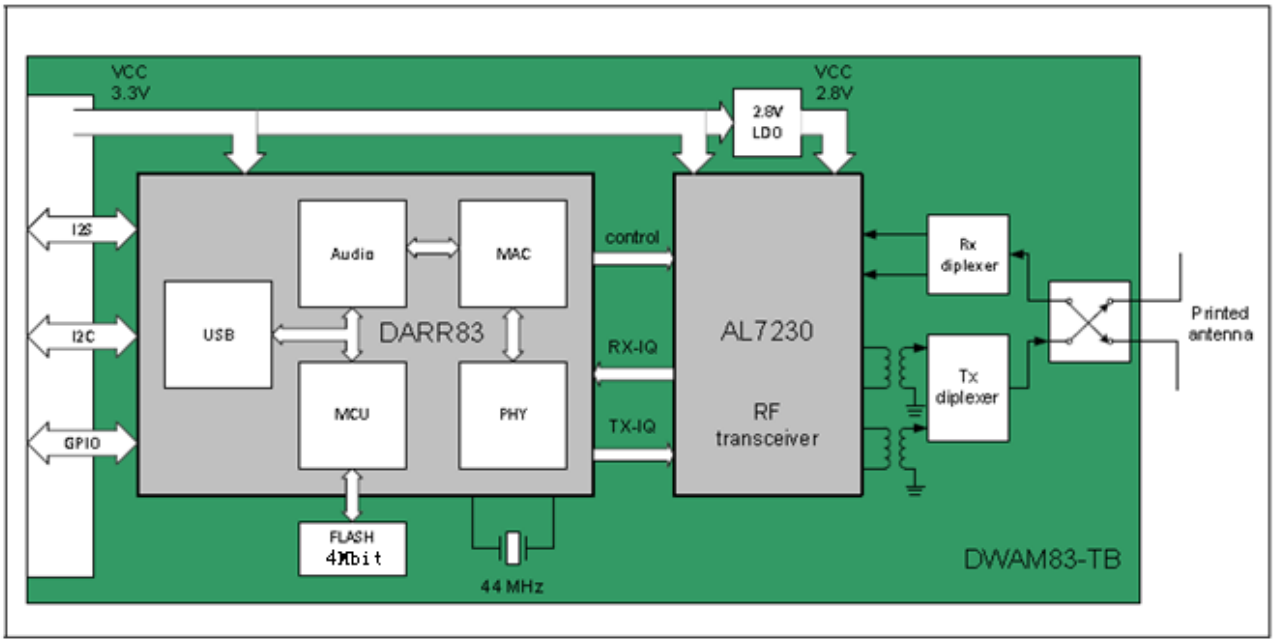


Figure2 Cocoa Module Block Diagram

6.2 Key Components List

No.	Part Name	Qty	Description	Supplier P/N	Supplier
1	BASEBAND IC	1	STS Audio Baseband Chip	DARR83	SMSC
2	RADIO IC	1	802.11a/b/g RF IC,2.4~2.5 GHz and 4.9 ~ 5.9 GHz	AL7230S	Airoha
3	RF SWITCH	1	2.4GHz and 6GHz Dual-Band Wireless Lan	Upg2164t5n	NEC
4	BALUN	1	Balun 50:100, 2400~2500MHz	BL2012-10B2450T/LF	ACX
5	BALUN	1	Balun, 50:50, 5512 ±363MHz	LDB215G5105C-001	MURATA
6	DIPLEXER	2	DIPLEXER,2450.00±50.00MHZ/5425.00±525.00MHZ	LFD212G45DF5B859	MURATA
7	CRYSTAL	1	44MHz, Frequency Tolerance:±10ppm, Temperature Characteristics:±10ppm, CL:6pF	EXS00A-CS04137	NDK

No.	Part Name	Qty	Description	Supplier P/N	Supplier
8	REGULATOR	1	Output voltage: 2.8V, 300mA high speed, extremely low noise CMOS LDO regulator	AP2125K-2.8TRG1	BCD
9	SPI Flash	1	SPI Flash ,4M bits,2.7~3.6,700,SOP-8	GD25Q40TIGR	Gigadevice

Table2 Key Components List

7 Recommended Operating Conditions

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
Vcc	Supply Voltage	3.1	3.3	3.5	V
VESD	ESD Contact Discharge	-2	-	+2	KV
Tamb	Operating Temperature	-10	25	60	℃

Table3 Recommended Operating Conditions

Connection: 0.5mm*26pin connector
Control Interface: I^2C
Audio Interface: I^2S S/PDIF

8 DC Characteristics

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
Vcc Ripple	Peak to peak Ripple		0	100	mV
Tr	Rise time of Reset			10	ms
Tf	Fall time of Reset			10	ms
Treset	Reset signal pulse width	1			ms

Table4 DC Characteristics

9 Power consumption

Vcc=3.3V, Ambient temperature 25℃

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
Ii	Power down current		23		mA
Im24	Continuous TX current@2.4G		360		mA
Im52	Continuous TX current@5.2G		320		mA

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
Im58	Continuous TX current@5.8G		320		mA

Table5 Power consumption

10 RF Characteristics

Cocoa transceiver/Receiver operates in 2.4GHz, 5.2 GHz and 5.8 GHz bands, with 22Mbps Bandwidth.

PARAMETER		CONDITION	MIN	TYP	MAX	UNITS
RF Frequency Range			2400	-	2483.5	MHz
Number of RF-channels		Carriers in the spectrum	-	3	-	
Transmission Power		Depending on antenna design		13		dBm
Channel Frequency (dynamic or fixed allocation)	CH1 CH2 CH3			2412 2438 2464	-	MHz
Channel Spacing				26		MHz
RF Bandwidth		Null-to-null		22		MHz
RX Sensitivity		PER<5%	-	-	-80	

Table6 RF Performance of 2.4G Application (Vcc=3.3V, 25℃)

PARAMETER		CONDITION	MIN	TYP	MAX	UNITS
RF Frequency Range			5150	-	5250	MHz
Number of RF-channels		Carriers in the spectrum	-	3	-	
Transmission Power		Depending on antenna design		9		dBm
Channel Frequency (dynamic or fixed allocation)	CH1 CH2 CH3			5180 5280 (Note 1) 5240	-	MHz
Channel Spacing				30 (Note 2)		MHz
RF Bandwidth		Null-to-null		22		MHz
RX Sensitivity		PER<5%	-	-	-80	

Note 1: For Japan, RF channel 2 will be 5200MHz
Note 2: The Default channel spacing is 30MHz, a 20MHz channel space will be used for Japan

Table7 RF Performance of 5.2G Application (Vcc=3.3V, 25℃)

PARAMETER		CONDITION	MIN	TYP	MAX	UNITS
RF Frequency Range			5725	-	5875	MHz
Number of RF-channels		Carriers in the spectrum	-	3	-	
Transmission Power		Depending on antenna design		9		dBm
Channel Frequency (dynamic or fixed allocation)	CH1 CH2 CH3			5736 5762 5814	-	MHz
Channel Spacing				26		MHz
RF Bandwidth		Null-to-null		22		MHz
RX Sensitivity		PER<5%			-78	

Table8 RF Performance of 5.8G Application (Vcc=3.3V, 25℃)

11 Interface Definition

The Module interface is an 26pin FFC .
Spec of FFC connector:

- 0.5mm pitch FPC/FFC connector
- 26 ways, Right Angle Type (double face contact)
- LIF SMT Type
- Tin/Nickel (Lead-Free)
- Halogen Free

PIN NUMBER	PIN NAME	I/O	DESCRIPTION
1	VDD	Power	Regulated 3.3V input
2	GND	Ground	Ground
3	MCLK	In	12.288MHz audio clock In
4	DARR83_GPIO_2	I/O	Software configurable. Please refer to the DARR83 datasheet
5	DARR83_GPIO_7	I/O	Configurable. Please refer to the DARR83 datasheet
6	DARR83_GPIO_4	I/O	Configurable. Please refer to the DARR83 datasheet
7	DARR83_GPIO_23	I/O	Configurable. Please refer to the DARR83 datasheet
8	DARR83_GPIO_13	I/O	Configurable. Please refer to the DARR83 datasheet
9	DARR83_GPIO_3	I/O	Configurable. Please refer to the DARR83 datasheet
10	DARR83_GPIO_15	I/O	Configurable. Please refer to the DARR83 datasheet
11	NC		NOT CONNECTED
12	NC		NOT CONNECTED
13	DARR83_GPIO_24	I/O	Configure as MON_TXD
14	DARR83_GPIO_14	I/O	Software configurable as IRQ
15	DARR83_GPIO_1	I/O	Default configured as WP, it's preferred to leave this pin NC.
16	NC		NOT CONNECTED
17	DARR_RST		DARR83 RESET (an external reset circuit is required)
18	I2C_SCL_SLV		I2C SLAVE (SCLK)
19	I2C_SDA_SLV		I2C SLAVE (SDA)
20	DARR83_GPIO_12	I/O	By default configured as SDIO Z
21	DARR83_GPIO_11	I/O	By default configured as SDIO X
22	DARR83_GPIO_10	I/O	By default configured as LRCK W
23	GND	Ground	Ground
24	DARR83_GPIO_8	I/O	By default configured as BCK W
25	DARR83_GPIO_6	I/O	By default configured as SDIO Y
26	DARR83_GPIO_5	I/O	By default configured as SDIO W

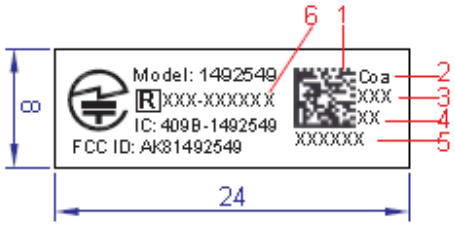
Table9 26pin FFC Definition

12 Firmware Version

FW is provided by customer.
FW Version: WSLIB_DWAM83_8052_S012.BIN
(Maybe updated base on customer release)

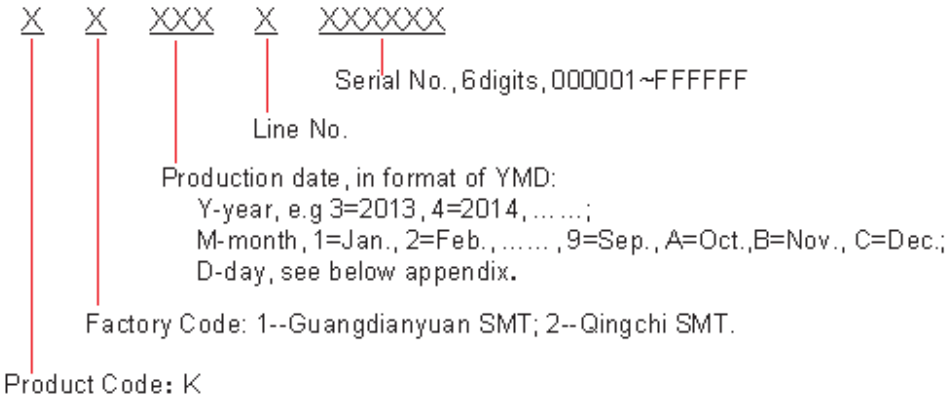
13 Packing and Marks

13.1 Module Label



Notes:

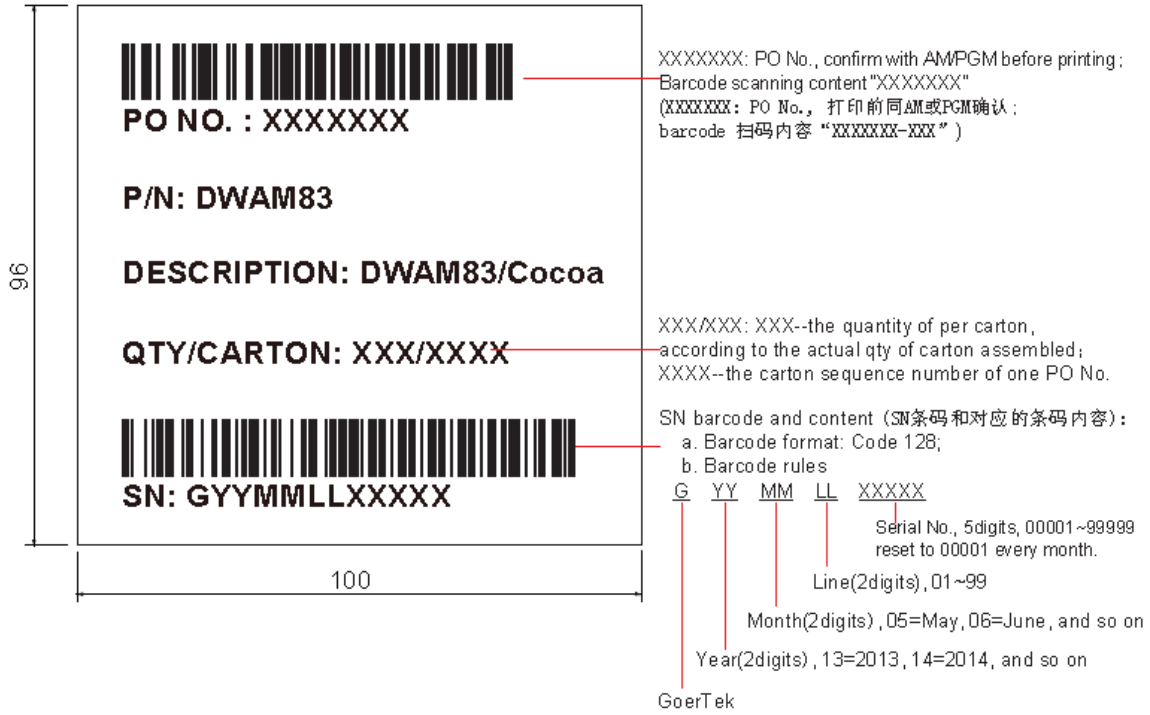
1. QR code:
   barcode rules:



2. Project code abbreviation: Coa;
3. Production date, in format of YMD, same as the production date of QR code;
4. Project Phase;
5. Serial No., same as the serial No. of QR code;
6. Telec logo and product designation, designation "XXX-XXXXXX" is TBD.

13.2 Carton Label

Size: 100*96mm; Material: Art Paper



FCC Compliance Statement:

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 must accept any interference received, including interference that may cause undesired operation. Product that is a radio transmitter is labeled with FCC ID.

FCC Caution:

(1) Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

(2) The modules FCC ID is not visible when installed in the host, or

(3) If the host is marketed so that end users do not have straight forward commonly used methods for access to remove the module so that the FCC ID of the module is visible; then an additional permanent label referring to the enclosed module: Contains Transmitter Module FCC ID: AK81492549 or Contains FCC ID: AK81492549 must be used.

(4) This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

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.

—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.

RF exposure warning

- The equipment complies with FCC RF exposure limits set forth for an uncontrolled environment.

The equipment must not be co-located or operating in conjunction with any other antenna or transmitter.

IC Radiation Exposure Statement for Canada

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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