

User Manual and specifications for DWAM83TB

Digital Wireless Audio Transceiver Module

FCC and 5.2/5.8 GHz RF application only

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1 Revision Log

Date	Version	Changes	Signed	Approved by
2019.01.30	E	<i>Public release</i>	A. Rumpler	
2019.02.01	F	<i>Added reference to integrator</i>	A. Rumpler	
2020.09.30	G	<i>Updated channel frequencies on 5.2GHz band. Updated FW revision to v2.3</i>	A. Rumpler	
2020.11.26	H	<i>Added FCC IC information and French text</i>	A. Rumpler	

2 Technical Module specification

The module is using the communication method HALF DUPLEX and uses for the US region only the 5.2 and 5.8 GHz for transmission and has 2 internal antennas.

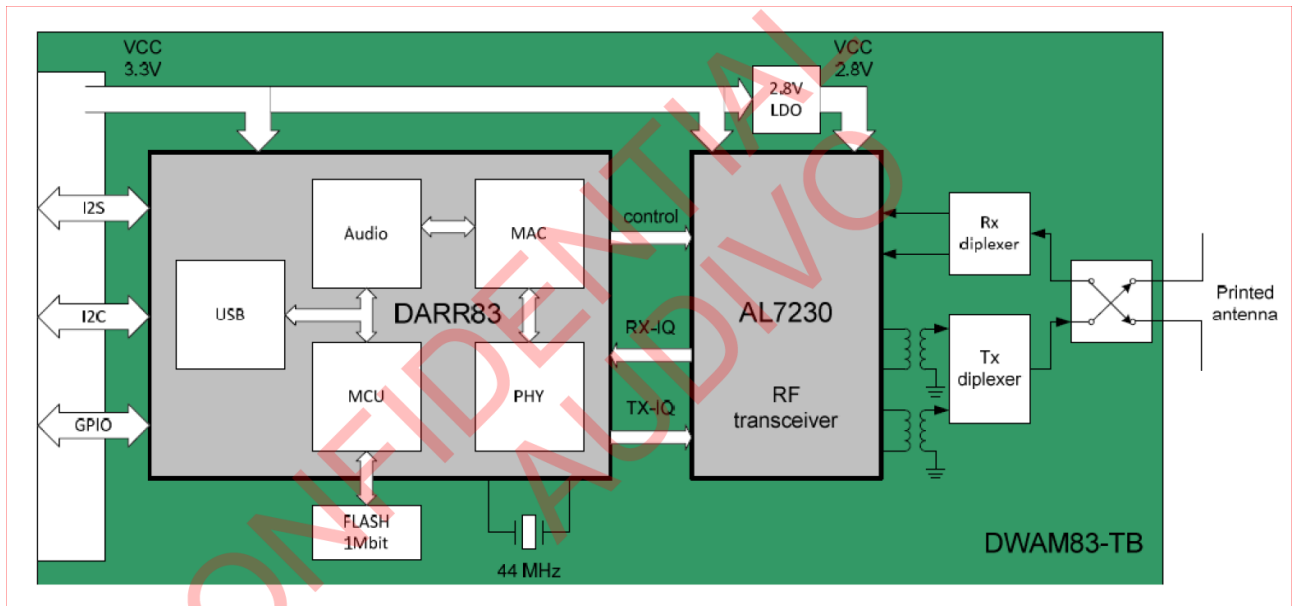
System Specifications				
ID	Parameter	Value	Unit	Remarks
RF Characteristics				
	RF frequency range	5150 - 5250 5725 - 5875	MHz	
	Number of RF channels	3		In each Frequency band.
Air framing				
	Addressing	24	Bit	
	Data message size	32	Byte	Application dependent
	CRC	16, 24 and 32	Bit	Hybrid
Control				
	Control interface	I ² C		Compliant with the I ² C protocol (slave), 0...400kbps. Base address 0x80.
Data				
	Data Bandwidth	100	Kbps	Bi-directional wireless data channel
	Data latency	5	ms	Minimum under good RF link conditions for applications that support the 100kbps data rate.
Interference Robustness				
	Fixed frequency devices (e.g. WLAN, microwave oven)			Fully coexistent ¹
	Frequency hopping devices (e.g. 5.8GHz cordless phones)			Fully coexistent ¹
Dimensions				
	Module dimensions	35 x 35 x 4.3	mm	

¹ Laboratory tests have verified coexistence with interference sources collocated. Exact ranges are scenario dependent (function of latency, output power, audio compression, etc.). A mix of interference sources is allowed. Interference of fixed frequency devices may result in the loss of one useable RF channel.

3 Product Application Overview

Information in this chapter will provide information in relation to physical dimensions of the module, pin-out, critical components and a block diagram.

1 Module Block Diagram



2 Module Power Consumption

(Vcc=3.3V, 25°C, Audio Clock:12.288MHz).

Application	5.2GHz		5.8GHz	
	MU (mA)	CU (mA)	MU (mA)	CU (mA)
Standby Mode	21	21	21	21
1 Stereo NACK	36	96	36	96
2-1 Stereo NACK BiDir	82	145	82	146
2 ACK	65	124	65	127
TX Continuous	-	300	-	300

*Current consumption measurements based on External MCU using EVK. Standby mode can be wake up by CU

3 RF Performance

For 5.8GHz application (Vcc=3.3V, 25°C)

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			-	-81	-	dBm
Antenna Diversity		TX/RX	-	ON	-	.

For 5.2GHz application (Vcc=3.3V, 25°C)

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 5200 5240	-	MHz
Channel Spacing			-	20 or 40	-	MHz
RF Bandwidth		Null-to-null	-	22	-	MHz
Rx sensitivity			-	-81	-	dBm
Antenna Diversity		TX/RX	-	ON	-	.

4 Module PIN Layout

Specs 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	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	Configure as IRQ
15	DARR83_GPIO_1	I/O	Configure as WP
16	NC		NOT CONNECTED
17	DARR_RST		DARR RESET (external pull up required)
18	I2C_SCL_SLV		I2C SLAVE (SCLK)
19	I2C_SDA_SLV		I2C SLAVE (SDA)
20	DARR83_GPIO_12	I/O	Configure as SDIO Z
21	DARR83_GPIO_11	I/O	Configure as SDIO X
22	DARR83_GPIO_10	I/O	Configure as LRCK W
23	GND	Ground	Ground

24	DARR83_GPIO_8	I/O	Configure as BCK W
25	DARR83_GPIO_6	I/O	Configure as SDIO Y
26	DARR83_GPIO_5	I/O	Configure as SDIO W

5 Recommended Operations Conditions

Symbol	Parameter	Min.	Typ	Max	Unit
VCC	Supply Voltage	3.1	3.3	3.5	V
VCC Ripple	Peak to Peak Ripple (in circuit)	-	0	100	mV
T _{amb}	Operating Temperature	-10	25	60	°C

6 Antenna

The module uses embedded PCB track Tri-Band antennas. RX and TX diversity antennas are used to avoid dropouts due to multipath fading.

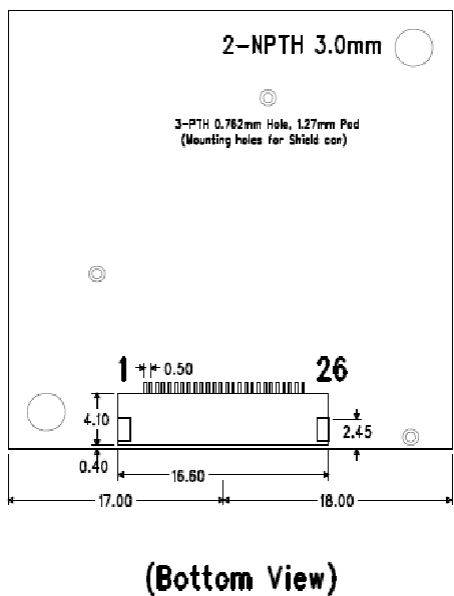
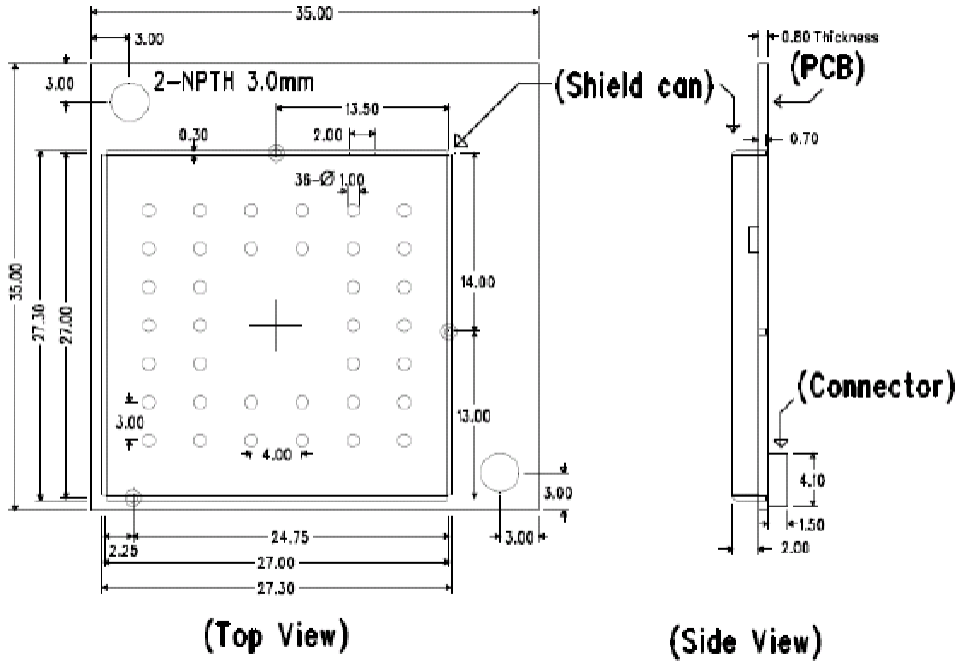
The antenna has a 3 dBi gain.

- Antenna A (ANT A) fixed track antenna on the module
- Antenna B (ANT B) fixed track antenna on the module

Only 'one' antenna is selected for use at any one time, through the on-board Transmit-Receive/ Diversity RF switch.

7 Transceiver dimensions

- Module -size: 35 x 35 x 4.3 mm (± 0.15), including 2-Printed Tri-Band antennas.
- Diameter mounting holes: 3.0 mm (± 0.05).



8 Critical Module Components (Critical BOM)

BOM : Rev0.2							
Last Update : 03-June-2011							
Item	Qty	Reference	Manufacturer	MFG Part Name	Description	Package Type	RoHS
37	1	BASEBAND IC	SMSC	DARR83	STS Audio Baseband Chip	FBGA129_7x7; 0.5mm pitch	Yes
38	1	U5, RADIO IC	Airoha Technology Corp.	AL7230S	802.11a/b/g RF IC WLAN transceiver With Embedded Dual-band PA, 2.4~2.5 GHz and 4.9 ~ 5.9 GHz	8mmx8mm QFN-56	Yes
39	1	U4, RF SWITCH	NEC	uPG2164T5N	DPDT Switch for 2.4GHz and 6GHz Dual-Band Wireless Lan	6-PIN PLASTIC TSON	Yes
40	1	U15, BALUN	ACX	BL2012-10B2450T/LF	Balun 50:100, 2400 ±100MHz	SMT 2.0x1.25X0.95	Yes
41	1	U8, BALUN	MURATA	LDB215G5105C-001	Balun, 50:50, 5512 ±363MHz	SMT 2.0x1.25X0.95	Yes
42	2	U16-17, DUPLEZER	MURATA	LFD212G45DF5B859	DIPLEXER 2.4GHz/5GHz	SMT 2.0x1.25x0.95	Yes
43	1	Y1, CRYSTAL	NDK	NX3225SA, 44MHz, CL 6pF (NDK P/N: EXS00A-CS04137)	NX3225SA, 44MHz, Frequency Tolerance: ±10ppm, Temperature Characteristics: ±10ppm, CL Value: 6pF	NX3225SA, 3.2x2.5x0.55	Yes
44	1	U9, REGULATOR	BCD Semiconductor Manufacturing Ltd.	AP2125K-2.8TRE1	Output voltage: 2.8V, 300mA high speed, extremely low noise CMOS LDO regulator	SOT-23-5	Yes

9 Firmware revision

The firmware version is: V2.3

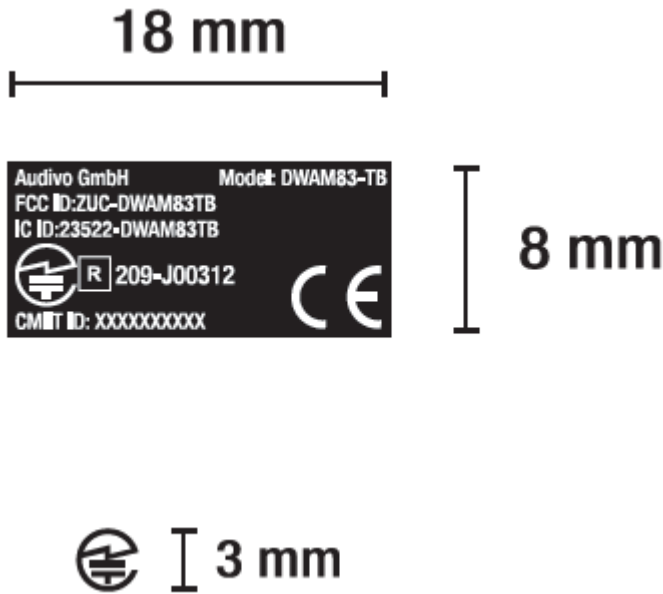
This firmware might be updated and used for newer products, though not scheduled or intended.

10 Module labeling

To acknowledge and reference to the FCC and IC DWAM83TB module approval, the follow text shall be visible on the label of the host product:

Contains FCC ID: ZUC-DWAM83TB

Contains/Content IC: 23522-DWAM83TB



3. FCC Statement

Applicable FCC rules

FCC CFR 47 Part 15C – Frequency Hopping Transmitters / Digital transmission systems.

FCC CFR 47 Part 15E – Unlicensed National Information Infrastructure Devices.

FCC 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.

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

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.

This module is only FCC authorized for the specific rule parts listed on the grant. Any product manufacturer that decides to integrate this module into a host product is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. Any host product is still required to comply with FCC CFR 47 Part 15 subpart B with this module installed.

IC Caution

This device complies with Industry Canada license-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.

This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

CAN ICES-3(B)/NMB-3(B)

Canada, avis d'Industry Canada (IC)

Le présent appareil est conforme aux CNR d'ISED 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.

Ce périphérique a également été évalué et démontré conforme aux limites d'exposition aux RF d'ISED des conditions d'exposition à des appareils mobiles (antennes sont supérieures à 20 cm à partir du corps d'une personne).