



**Preliminary Rev0.1**      2011/2/23  
**Features**

- 2.4GHz ISM
- Highly Robust Forward Error Correction (FEC)
- 13 frequency channels
- ID codes to provide TX / RX pairing
- Low Power Consumption
- Programmable delay time 20ms/55ms
- Robust Packet error correction
- No RF induced audio noise
- Ready to go reference system
- USB and analog dual audio input
- RF frequency hopping in 13 channels

- Low Cost/High Performance Wireless Audio
  - Wireless Surround Rear Speakers
  - High Performance Digital Audio Link
  - Wireless Headphone/Earphone
  - Wireless USB Transmitter
  - Wireless Skype phone
- FCC CFR47 Part 15, ETSI EN 300 328, EN 300 440 and ARIB STD-T-66 Compliant Radio

### General Description

The RF module transmitter employed GFSK modulation to deliver high-speed data rate up to 2Mbps.

The RF module receiver with -89dBm or better sensitivity allows system to achieve at least 300 feet transmission for line-of-sight application in open site.

### Applications

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## AIRWAVE TECHNOLOGIES INC.



## AWD628TP, AWD625RP (13channel)

### 2.4GHz Digital Audio RF Module

## 1. RF Specification

Item		Unit	Note
Frequency Range	2404 ~ 2472	MHz	
Channel Number	13		
Modulation	GFSK		
RF Tx Power	Typ. 14.5	dBm	Radiation Power
Rx Sensitivity	Typ. -89	dBm	

## 2. Audio Specification

Item		Unit	Note
SNR	Typ. 96	dB	output @1KHz
THD + N	Typ. -70	dB	output @1KHz
Frequency Response	20 ~20KHz	dB	
Crosstalk	Typ. -96	dB	output @1KHz
FSIV	2	Vrms	
FSOV	2	Vrms	

## 3. Electrical Specification

Item		Unit	Note
Power supply voltage			
Tx	3.3 typ.	V	
Rx	3.3 typ.	V	
Power supply current			
Tx	56 typ.	mA	
Rx	35 typ.	mA	
Operating Temperature	0~55		Ambient temperature

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### Tx Module Absolute Maximum Ratings

Parameter	Condition	Min.	Typ	Max	Units
Supply voltage	Vs			3.6	V
Storage temperature	Tstg	-40	25	+125	
Operating temperature	To	0	25	+55	

### Rx Module Absolute Maximum Ratings

Parameter	Condition	Min.	Typ	Max	Units
Supply voltage	Vs			3.6	V
Storage temperature	Tstg	-40	25	+125	
Operating temperature	To	0	25	+55	
Input RF level	Prf			-2	dBm

### General

Test condition: Vs=3.3V, Input=1kHz @ 1Vp-p & room temperature, unless otherwise specified.

Parameter	Condition	Min.	Typ	Max	Units
THD+N	Input=1kHz@1Vp-p with 20kHz LPF		0.5	0.7	%
Audio latency	Time delay @ analog output w.r.t. analog input		3.8		ms
Tx,Rx pairing	ID Code		16		bit
S/N ratio	Input=1kHz @2Vp-p with 20kHz LPF		80		dB

### Tx Module

Test condition: Vs=3.3V, Input=1kHz @ 1Vp-p & room temperature, unless otherwise specified.

Parameter	Condition	Min.	Typ	Max	Units
Supply voltage	Vs	3.0	3.3	3.6	V
Supply current	Vs=3.3V		56		mA
Operating Frequency		2400		2483 .5	MHz
Transmission Power	Conductive measurement	14	14.5	15	dBm
Modulation Type	FH-SST				

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Channel Frequency	Peak power position under no Data in.	-0.1	2404 2410 2416 2422 2428 2434 2440 2446 2452 2458 2464 2470 2476	+0.1	MHz
Channel Spacing			6		MHz
Frequency Deviation	Modulation analyzer		+/-0.1		MHz
Audio Input Level	Vs=3.3V,peak to peak value		1		Vrms
Audio Input Impedance	48kHz audio sampling rate	13k	20k		Ohm
Data Rate	Software defined		2		Mbps
Audio Sampling Rate	Software defined		48		KHz
Pairing LED voltage	Pull High Resistor				
Tx/Rx Pairing setting	tact switch		3.3		V
Reset pin	tact switch				

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## AWD628TP, AWD625RP (13channel)

### 2.4GHz Digital Audio RF Module

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#### Rx Module

Test condition: Vs=3.3V, Input=1kHz @ 1Vp-p & room temperature, unless otherwise specified.

Parameter	Condition	Min.	Typ	Max	Units
Supply voltage	Vs	3.0	3.3	3.6	V
Supply current			35		mA
Operating Frequency		2400		2483.5	MHz
Rx Sensitivity	BER=1e-3 when 1.152Mbps input		-89		dBm
Image Rejection	Relative to 2.4- 2.4835GHz power	47			dBc
Audio Output Level			1		Vrms
Audio Output Impedance			16		Ohm
Audio frequency response	3dB bandwidth	20		20k	Hz
Data Rate			2		Mbps
Adjacent channel rejection	+/- 5MHz offset the central frequency		45		dB
Tx/Rx Pairing setting	tact switch				

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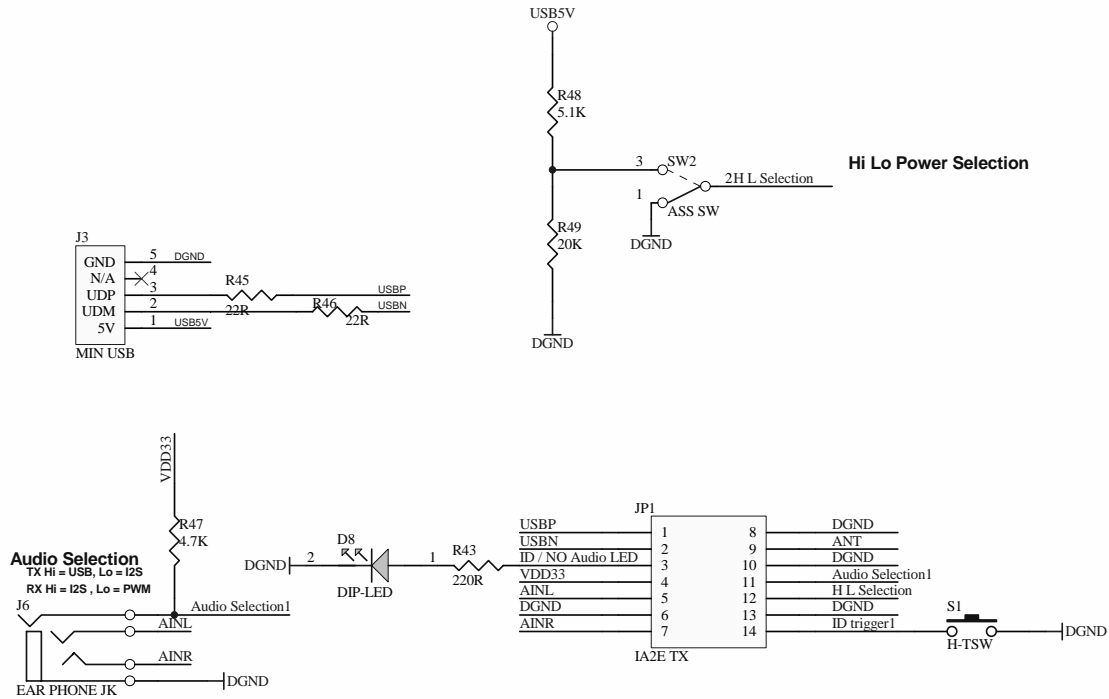
4F, No.9 Industry E. 9<sup>th</sup> RD., Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C. TEL: 886-3-5778099 Fax: 886-3-5778199  
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# AWD628TP, AWD625RP (13channel)

## 2.4GHz Digital Audio RF Module

### TX Module Reference Design



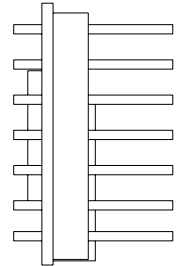
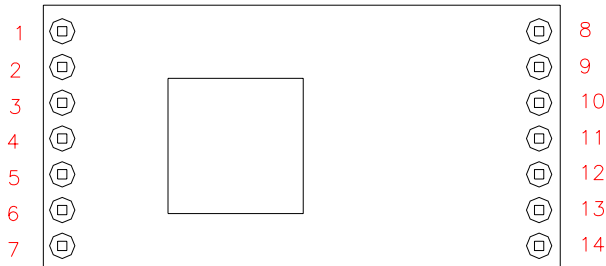
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# AWD628TP, AWD625RP (13channel)

## 2.4GHz Digital Audio RF Module

### TX Module Pin Assignment



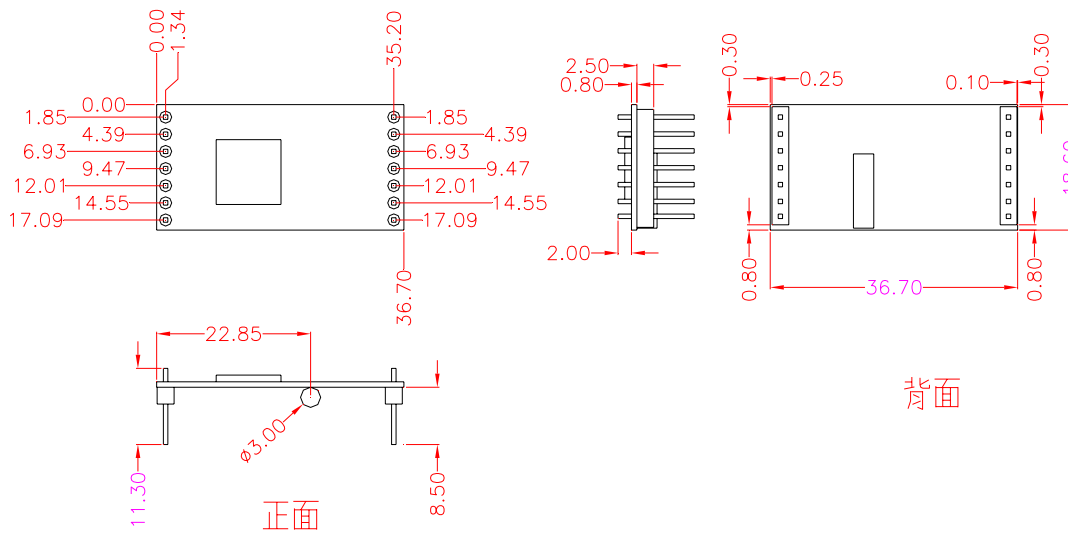
Pin No	Name	Functional Grouping	IO Type	Description
1	USBP	Signal	Input	USB DP
2	USBN	Signal	Input	USB DN
3	Pairing LED	Control	Output	PAIRING status indication
4	VDD33	Power	Input	3.3V Power Supply
5	AINL	Signal	Input	L-ch Analog Input
6	GND	Ground	NA	Ground
7	AINR	Signal	Input	R-ch Analog Input
8	GND	Ground	NA	Ground
9	ANT	RF	Output	2.4GHz antenna
10	GND	Ground	NA	Ground
11	Audio Input Selection	Control	Input	Audio Source Selection: 3.3V for USB, GND for Analog input
12	GND	Ground	NA	Ground
13	GND	Ground	NA	Ground
14	Pair / CH. Select	Control	Input	pull-low continuously for over 3 seconds to enter into PAIRING mode and AWD615RP can perform the PAIRING process within 6 seconds. Normal high; every pulling-low for less than 2 seconds changes the channel to the next one in the pre-defined channel sequence.

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# AWD628TP, AWD625RP (13channel)

## 2.4GHz Digital Audio RF Module



Unit : mm

Tolerance :  $\pm 0.2$  mm

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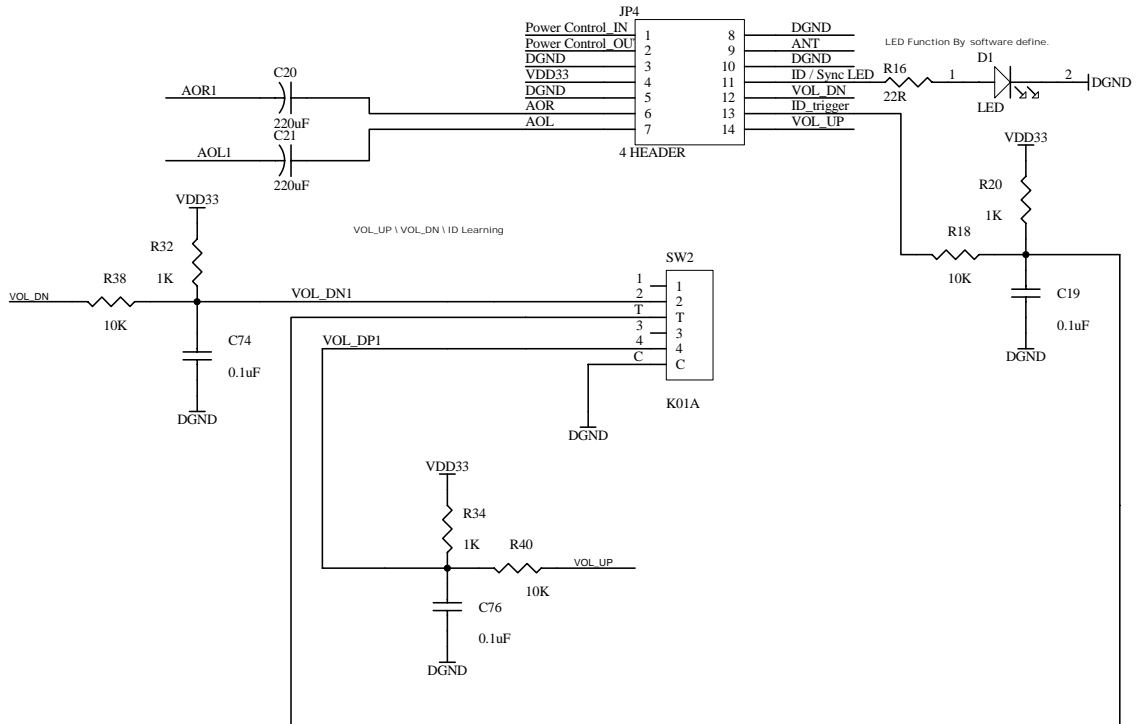




# AWD628TP, AWD625RP (13channel)

## 2.4GHz Digital Audio RF Module

### RX Module Reference Design



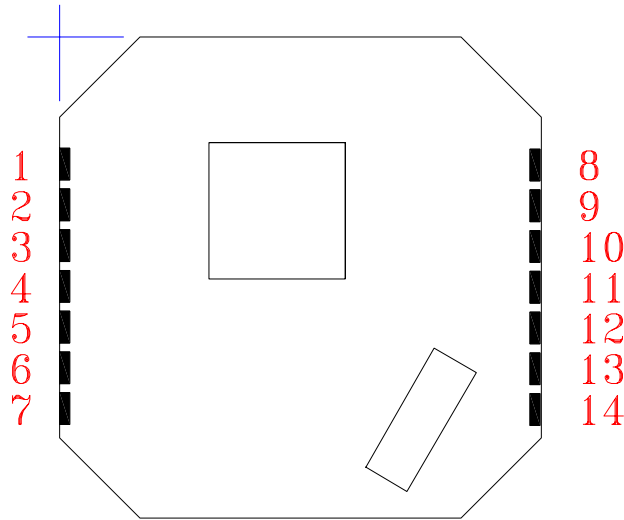
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# AWD628TP, AWD625RP (13channel)

## 2.4GHz Digital Audio RF Module

### RX Module Pin Assignment



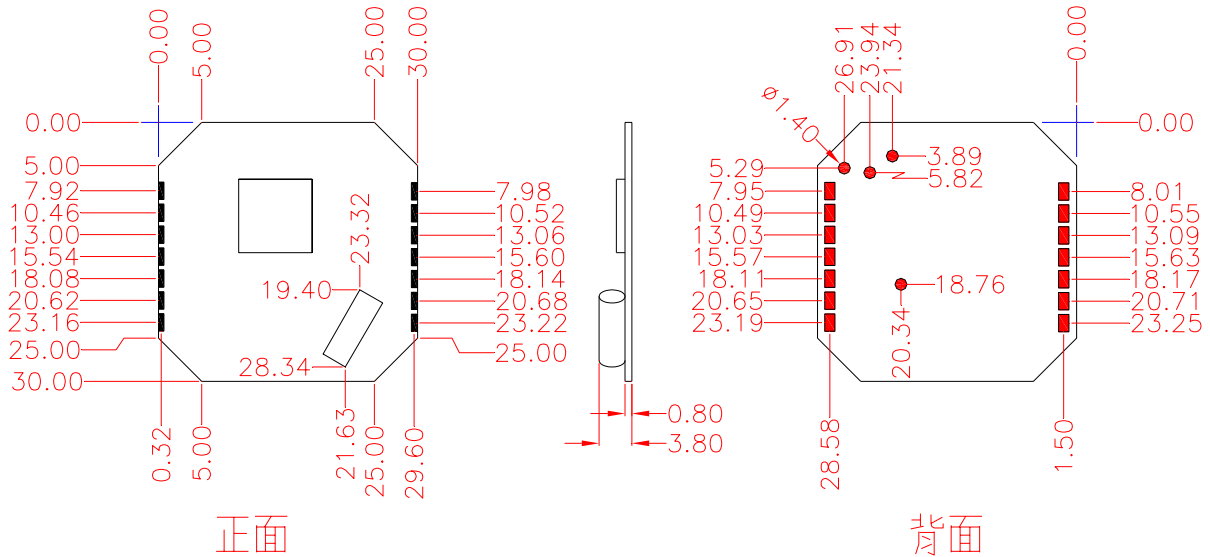
Pin No	Name	Functional Grouping	IO Type	Description
1	Power Control_IN	Control	Input	Power Control_IN
2	Power Control_OUT	Control	Output	Power Control_OUT
3	GND	Ground	NA	Ground
4	VDD33	Power	Input	3.3V Power Supply
5	GND	Ground	NA	Ground
6	AOR	Signal	Output	R-ch Analog Output
7	AOL	Signal	Output	L-ch Analog Output
8	GND	Ground	NA	Ground
9	ANT	RF	Input	2.4GHz antenna
10	GND	Ground	NA	Ground
11	LED	Control	Output	PAIRING status indication
12	VOL_DN	Control	Input	Volume down
13	Pairing	Control	Input	After continuously pulling-low for over 3 seconds on AWD618TP, AWD615RP enters into PAIRING mode and the PAIRING process can be performed for the next 6 seconds.
14	VOL_UP	Control	Input	Volume up

### AIRWAVE TECHNOLOGIES INC.



# AWD628TP, AWD625RP (13channel)

## 2.4GHz Digital Audio RF Module



Unit : mm

Tolerance :  $\pm 0.2$  mm

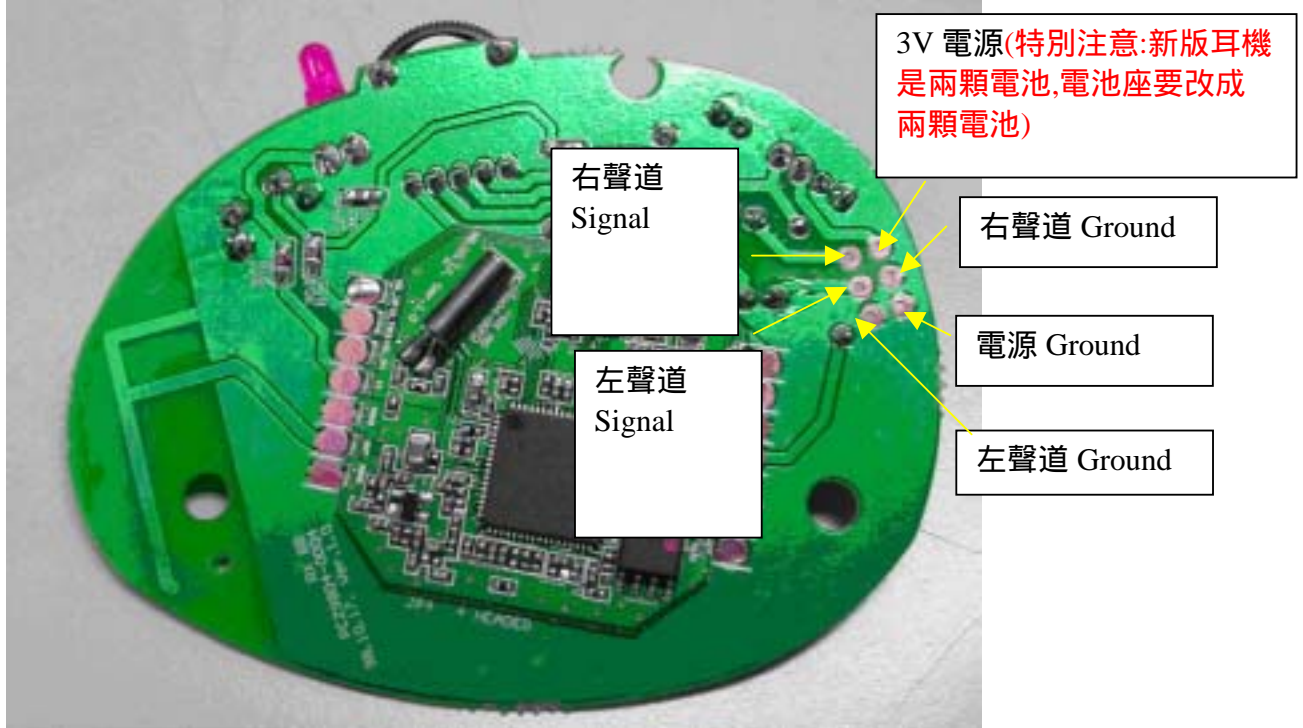
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# AWD628TP, AWD625RP (13channel)

## 2.4GHz Digital Audio RF Module

Test Sample pin define



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