

**Preliminary Rev0.1****2012/11/27****Features**

- Wireless digital audio transmission in 2.4GHz ISM band
- 26 non-overlay channels
- Automatic adaptive frequency mechanism for interference free transmission
- Auto channel tracking
- GFSK modulation with up to 3Mbps data rate
- Super high S/N and 20 ~ 23 kHz full range Hi-Fi stereo sound quality
- 48KHz – 16Bit non-compression audio sampling rate and smooth audio streaming
- Programmable Latency – minimum 12.5ms
- ID codes to provide TX / RX pairing
- Low Power Consumption
- Highly Robust Forward Error Correction (FEC)
- Robust Packet error correction
- Unlimited Broadcasting Receivers
- USB and analog dual audio input

Applications

- Low Cost/High Performance Wireless Audio
 - Wireless Surround Rear Speakers
 - High Performance Digital Audio Link
 - Wireless Headphone/Earphone
 - Wireless USB Audio Stream Transmitter
 - Audio Baby Monitor
 - Wireless Digital Microphone
- 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 3Mbps.

The RF module receiver with –85dBm or better sensitivity allows system to achieve at least 220 feet transmission for line-of-sight application in open site.

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**AWD619T, AWD637T Module Absolute Maximum Ratings**

Parameter	Condition	Min.	Typ	Max	Units
Supply voltage	Vs			5.25	V
Storage temperature	Tstg	-40	25	+125	°C
Operating temperature	To	0	25	+55	°C

AWD618R Module Absolute Maximum Ratings

Parameter	Condition	Min.	Typ	Max	Units
Supply voltage	Vs			5.25	V
Storage temperature	Tstg	-40	25	+125	°C
Operating temperature	To	0	25	+55	°C
Input RF level	Prf			-2 (tbd)	dBm

General

RF Specification				
Item	Min.	Typ	Max	Units
Frequency Range	2403		2478	MHz
RF Data Rate		3		Mbps
Channel Spacing		3		MHz
RF TX Power		15		dBm
RF Tx Frequency Drift		+/-50		kHz
Rx Sensitivity@1%PER		-85		dBm

Audio Specification				
Item	Min.	Typ	Max	Units
Non-compression audio Sampling Rate		48		kHz
Non-compression audio resolution		16		Bits
Frequency Response	20		23k	Hz
SNR		95		dB
THD + N		-95		dB
Latency	12.5	12.5	12.5	ms
Crosstalk		96		dB
FSIV		1		Vrms
FSOV		1		Vrms

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Electrical Specification				
Item	Min.	Typ	Max	Units
Tx Power supply voltage	.3.3	3.3	5.25	V
Rx Power supply voltage	. 3.3	3.3	5.25	V
Tx Power supply current	.	120		mA
Rx Power supply current	.	68		mA
Operating Temperature	.-10		60	°C

AWD619T, AWD637T Module

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

Parameter	Condition	Min.	Typ	Max	Units
Supply voltage	Vs	3.3	3.3	5.25	V
Supply current	Vs=3.3V		120		mA
Operating Frequency		2403		2478	MHz
Transmission Power	Conductive measurement		15		dBm
Modulation Type	GFSK				
Frequency Deviation			+/-0.1		MHz
Channel Spacing			3		MHz
RF Tx Frequency Drift			+/-50		kHz
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		3	3	Mbps
Audio Sampling Rate	Software defined		48		kHz

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**AWD618R Module**

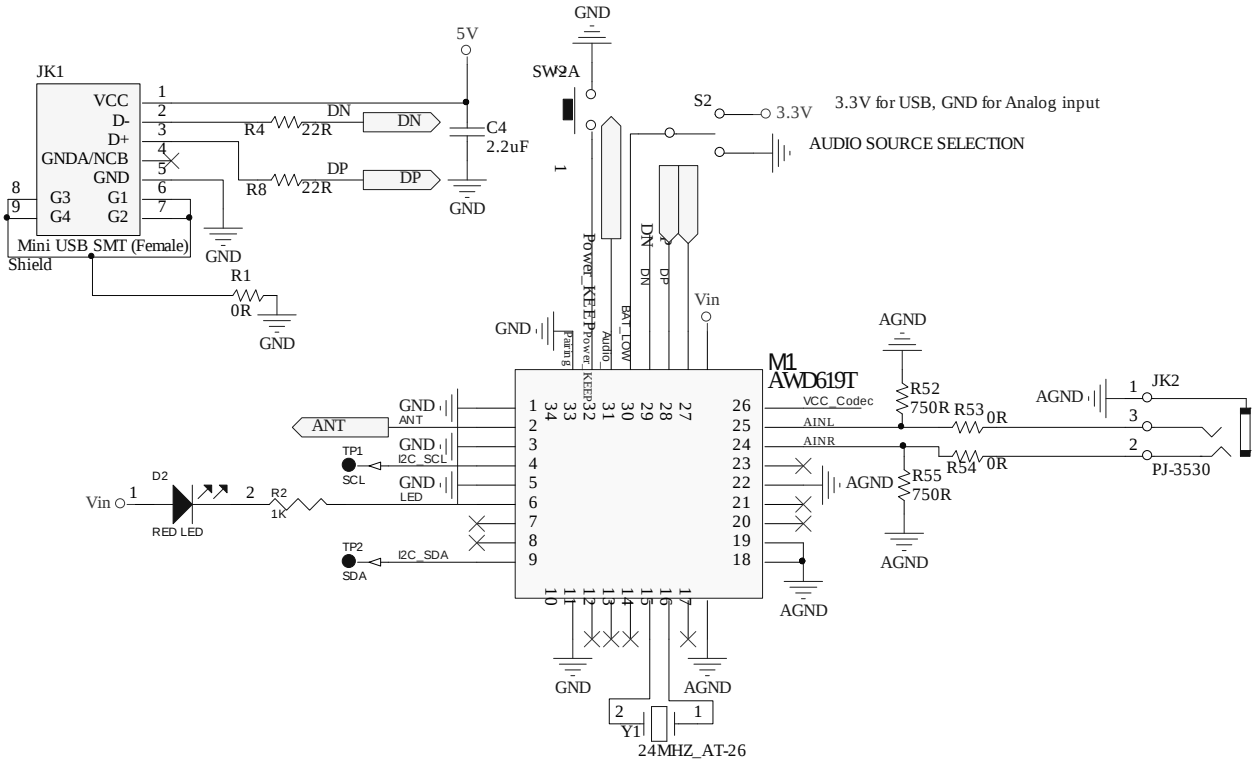
Test condition: Vs=3.3V, Input=1kHz @ 1Vp-p & room temperature, unless otherwise specified.

Parameter	Condition	Min.	Typ	Max	Units
Supply voltage	Vs	3.3	3.3	5.25	V
Supply current			68		mA
Operating Frequency		2403		2478	MHz
Rx Sensitivity	BER=1e-3 @ 3Mbps input		-85		dBm
Image Rejection	Relative to main carrier signal power	47			dBc
Audio Output Level				1	Vrms
Audio Output Impedance			16		Ohm
Audio frequency response	3dB bandwidth	20		23K	Hz
Data Rate			3	3	Mbps

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**AIRWAVE****Preliminary****AWD619T ,AWD637T ,AWD618R****2.4GHz Digital Audio RF Module**

Page 5 of 15

AWD619T Module Reference Design

AWD619T Baseband B.O.M.			
Comment	Designator	Footprint	Quantity
2.2uF	C4	RLC0603	1
RED LED	D2	0603 SMD LED (H:0.4mm)	1
Mini USB SMT (Female)	JK1	MINI USB SMT (Female)	1
PJ-3530	JK2	PJ-3530	1
Slide Switch	S2	Slide Switch	1
AWD619T	M1	TX(RX) MODULE	1
0R	R1, R53, R54	RLC0402	3
1K	R2	RLC0402	1
3K	R13	RLC0402	1
22R	R4, R8	RLC0402	2
750R	R52, R55	RLC0402	2
2K	R56	RLC0402	1
TS-A85E-3	SW2	TS-A85E	1
24MHZ_AT-26	Y1	AT-26	1

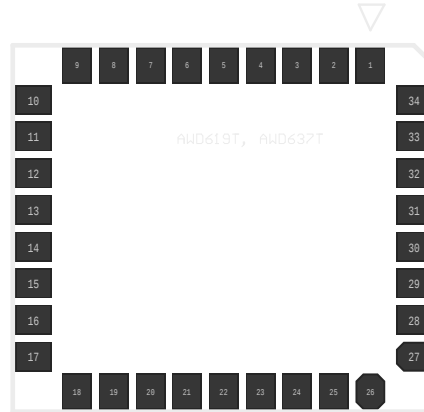
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**AIRWAVE****Preliminary****AWD619T ,AWD637T ,AWD618R****2.4GHz Digital Audio RF Module**

Page 6 of 15

AWD619T Module Pin Assignment



Pin No	Name	Functional Grouping	IO Type	Description
1	GND	Ground		Ground
2	ANT	RF Signal	Output	2.4GHz antenna
3	GND	Ground		Ground
4	I2C_SCL	Signal	Input	I2C interface
5	GND	Ground		Ground
6	LED	Control	Output	PAIRING status indication
7	NC			
8	NC			
9	I2C_SDA	Signal	Input	I2C interface
10	GND	Ground		Ground
11	NC			
12	NC			
13	NC			
14	XC1	Signal	Input	24MHz 20pF 30ppm Crystal Input
15	XC2	Signal	Input	24MHz 20pF 30ppm Crystal Input
16	NC			
17	AGND	Analog GND		Analog Ground
18	AGND	Analog GND		Analog Ground
19	AGND	Analog GND		Analog Ground
20	NC			
21	NC			
22	AGND	Analog GND		Analog Ground
23	NC			
24	AINR / MIC-	Signal	Input	R-ch Analog Input / MIC- input
25	AINL / MIC+	Signal	Input	L-ch Analog Input / MIC+ input
26	VCC_CODEC	Power	Output	3V Output
27	Vin	Power	Input	VDD
28	USBP	Signal	Input	USB DP
29	USBN	Signal	Input	USB DN
30	BAT_LOW	Signal	Output	Output Low when battery low
31	Audio Selection	Control	Input	Audio Source Selection: 3.3V for USB, GND for Analog input
32	Power Keep	Control	Output	Power Control Out
33	Pairing	Control	Input	pull-low continuously for over 5 seconds to enter into PAIRING mode and AWD618R can perform the PAIRING process within 15seconds. Normal high;
34	GND	Ground		Ground

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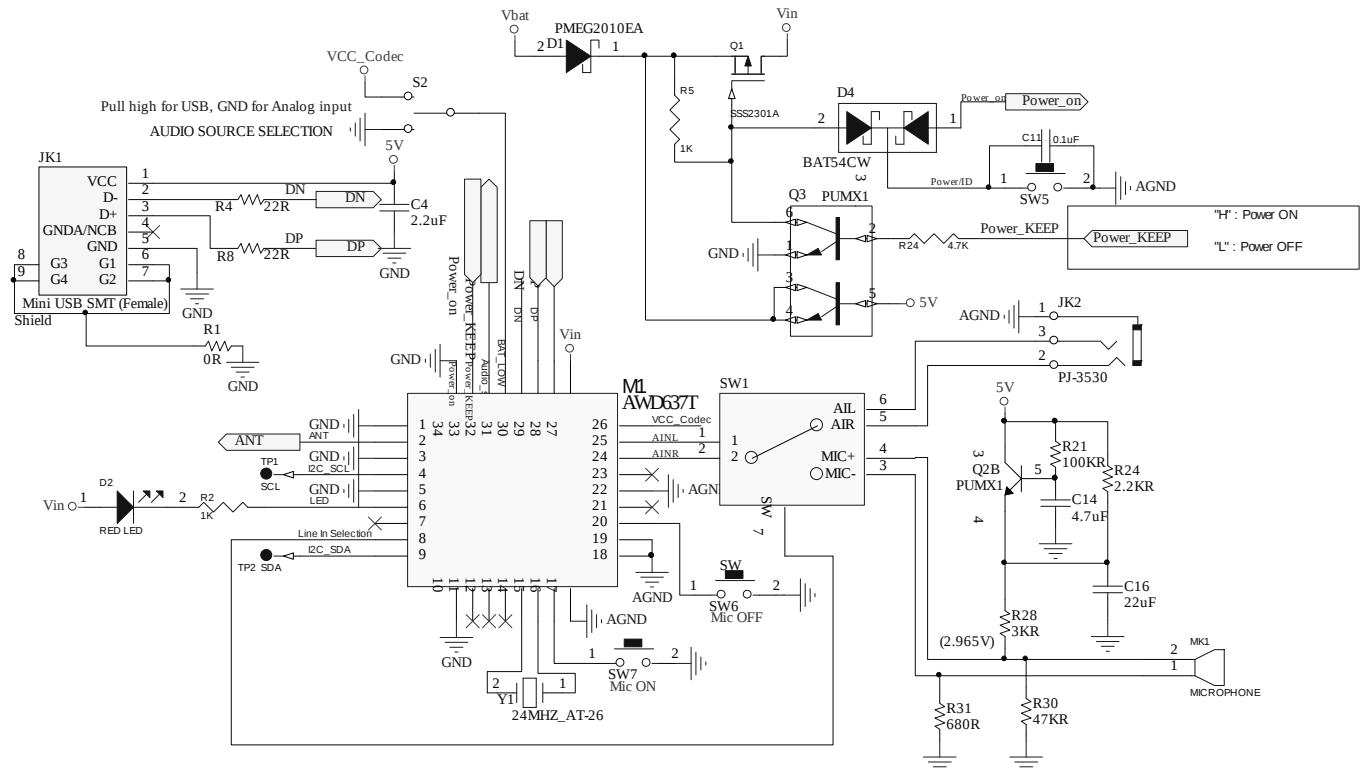
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AWD619T ,AWD637T ,AWD618R

2.4GHz Digital Audio RF Module

Page 7 of 15

AWD637T Module Reference Design

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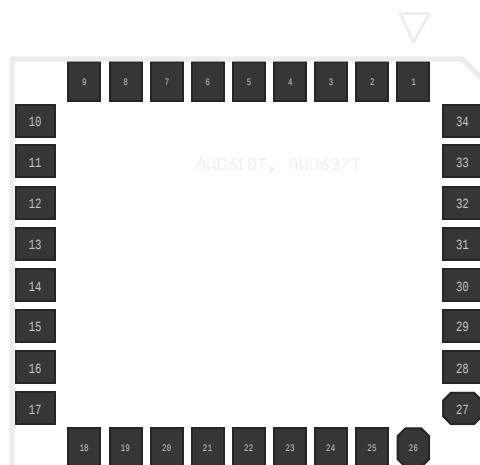
**AWD619T ,AWD637T ,AWD618R****2.4GHz Digital Audio RF Module**

AWD637T Baseband B.O.M.			
Comment	Designator	Footprint	Quantity
2.2uF	C4	RLC0603	1
220uF	C9, C10	E CAP 6.3*5	2
0.1uF	C11	RLC0402	1
4.7uF	C14	RLC0603	1
22uF	C16		1
PMEG2010EA	D1	PMEG2010EA	1
BLUE LED	D3	0603 SMD LED (H:0.4mm)	1
BAT54CW	D4	BAT54CW	1
Mini USB SMT (Female)	JK1	MINI USB SMT (Female)	1
PJ-3530	JK2	PJ-3530	1
RED LED	LED2	0603 SMD LED (H:0.4mm)	1
AWD627T	M1	TWO WAY MODULE	1
MICROPHONE	MK1	PJ311-A	1
SSS2301A	Q1	SOT23_BEC	1
PUMX1	Q2, Q3	PUMX1	1
0R	R1	RLC0402	1
22R	R4, R8	RLC0402	2
1K	R5, R17	RLC0402	2
100KR	R21	RLC0402	1
2.2KR	R24	RLC0402	1
4.7K	R24	RLC0402	1
3KR	R28	RLC0402	1
47KR	R30	RLC0402	1
680R	R31	RLC0402	1
2K	R56	RLC0402	1
AUDIO SOURCE SELECTION	S2		1
SW	SW1		1
Metal Snap Dome Button x3	SW5, SW6, SW7	Metal Snap Dome Button x3	3
24MHZ_AT-26	Y1	24MHZ_AT-26	1

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AWD637T Module Pin Assignment



Pin No	Name	Functional Grouping	IO Type	Description
1	GND	Ground		Ground
2	ANT	RF Signal	Output	2.4GHz antenna
3	GND	Ground		Ground
4	I2C_SCL	Signal	Input	I2C interface
5	GND	Ground		Ground
6	LED	Control	Output	PAIRING status indication
7	NC			
8	Line In Selection	Control	Output	Output high for MIC input; Ouput low for Line_IN
9	I2C_SDA	Signal	Input	I2C interface
10	GND	Ground		Ground
11	NC			
12	NC			
13	NC			
14	XC1	Signal	Input	24MHz 20pF 30ppm Crystal Input
15	XC2	Signal	Input	24MHz 20pF 30ppm Crystal Input
16	Mic ON / Pairing 1	Signal	Input	Pin 16 and PIN 20 pull-low continuously for over 5 seconds to enter into PAIRING mode and AWD618R can perform the PAIRING process within 15 seconds. Normal high; every pulling-low for less than 2 seconds MIC ON and Pin8 ouput high.
17	AGND	Analog GND		Analog Ground
18	AGND	Analog GND		Analog Ground
19	AGND	Analog GND		Analog Ground
20	Mic OFF / Pairing 2	Signal	Input	Pin 16 and PIN 20 pull-low continuously for over 5 seconds to enter into PAIRING mode and AWD618R can perform the PAIRING process within 15 seconds. Normal high; every pulling-low for less than 2 seconds MIC ON and Pin8 ouput high.
21	NC			
22	AGND	Analog GND		Analog Ground
23	NC			
24	AINR / MIC-	Signal	Input	R-ch Analog Input / MIC- input

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**AIRWAVE****Preliminary****AWD619T ,AWD637T ,AWD618R****2.4GHz Digital Audio RF Module****Page 10 of 15**

25	AINL / MIC+	Signal	Input	L-ch Analog Input / MIC+ input
26	VCC_CODEC	Power	Output	3V Output
27	Vin	Power	Input	VDD
28	USBP	Signal	Input	USB DP
29	USBN	Signal	Input	USB DN
30	BAT_LOW	Signal	Output	Output Low when battery low
31	Audio Selection	Control	Input	Audio Source Selection: 3.3V for USB, GND for Analog input
32	Power Keep	Control	Output	Power Control Out
33	Power ON	Control	Input	Power Control In
34	GND	Ground		Ground

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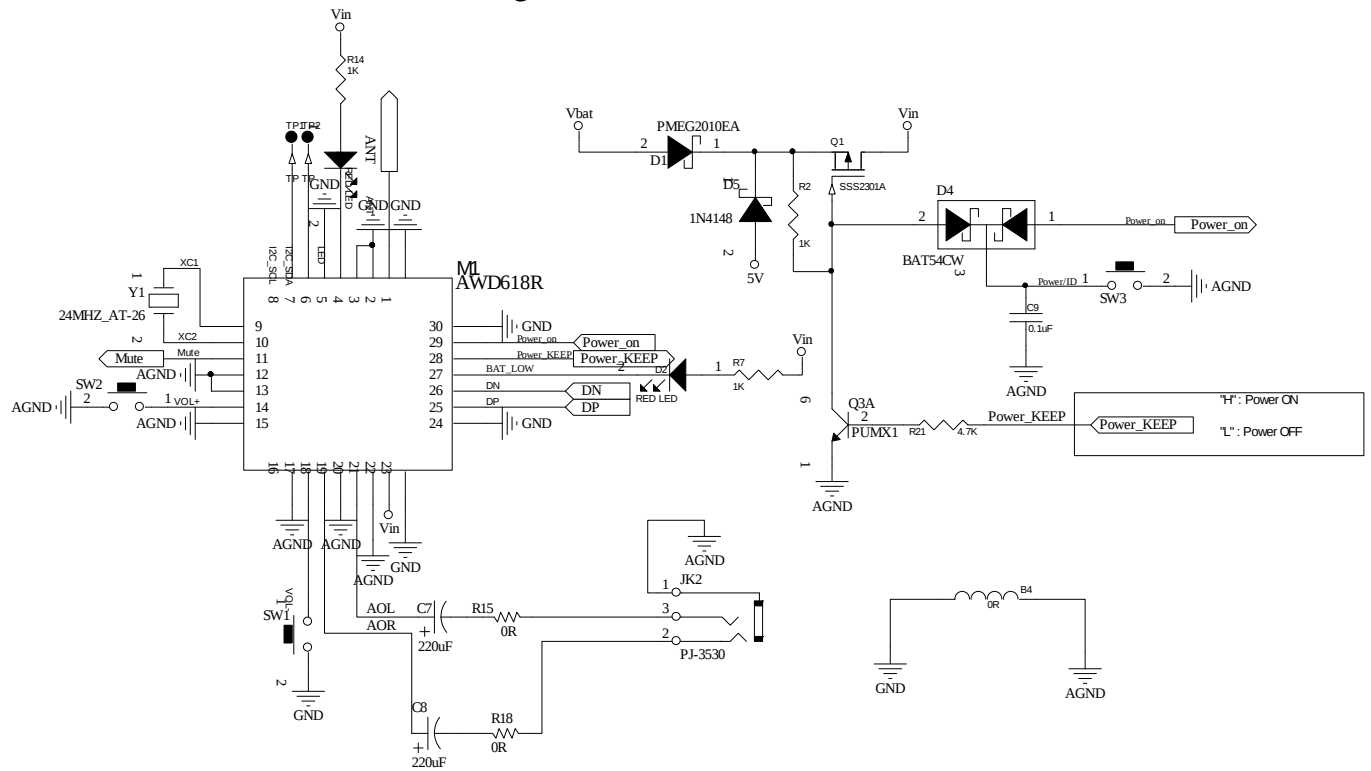


AWD619T ,AWD637T ,AWD618R

2.4GHz Digital Audio RF Module

Page 12 of 15

AWD618R Module Reference Design

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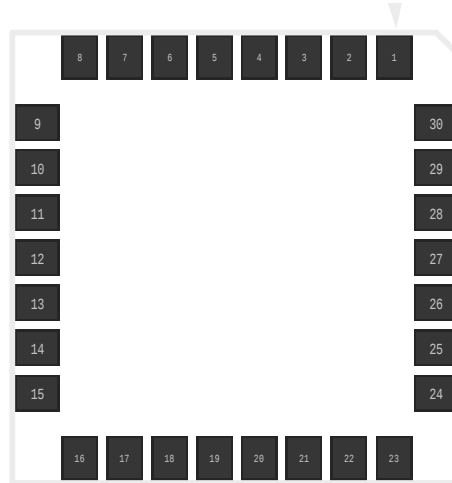
Page 13 of 15

AWD618R Baseband B.O.M.			
Comment	Designator	Footprint	Quantity
0R	B4, R15, R18	RLC0402	3
220uF	C7, C8	E CAP 6.3*5	2
0.1uF	C9	RLC0402	1
PMEG2010EA	D1	PMEG2010EA	1
RED LED	D2, D3	0603 SMD LED (H:0.4mm)	2
BAT54CW	D4	BAT54CW	1
1N4148	D5	SOD-323	1
PJ-3530	JK2	PJ-3530	1
AWD618R	M1	RX_MODULE	1
SSS2301A	Q1	SOT23_BEC	1
PUMX1	Q3	PUMZ1/PUMX1	1
1K	R2, R7, R14	RLC0402	3
4.7K	R21	RLC0402	1
Metal Snap Dome Button x3	SW1, SW2, SW3	Metal Snap Dome Button x3	3
24MHZ 20pF 30ppm	Y1	24MHZ_(AT-26)	1

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**AIRWAVE****Preliminary****AWD619T ,AWD637T ,AWD618R****2.4GHz Digital Audio RF Module**

Page 14 of 15

AWD618R Module Pin Assignment

Pin No	Name	Functional Grouping	IO Type	Description
1	GND	Ground		Ground
2	ANT	RF Signal	Output	2.4GHz antenna
3	GND	Ground		Ground
4	GND	Ground		Ground
5	LED	Control	Output	PAIRING status indication
6	GND	Ground		Ground
7	I2C_SDA	Signal	Input	I2C interface
8	I2C_SCL	Signal	Input	I2C interface
9	XC1	Signal	Input	24MHz 20pF 30ppm Crystal Input
10	XC2	Signal	Input	24MHz 20pF 30ppm Crystal Input
11	Mute	Control	Output	Output Low to Mute Audio
12	AGND	Analog GND		Analog Ground
13	AGND	Analog GND		Analog Ground
14	VOL_DP / Pairing 1	Control	Input	Pin 16 and PIN 20 pull-low continuously for over 5 seconds to enter into PAIRING mode. Normal high; every pulling-low for less than 2 seconds Volume UP.
15	AGND	Analog GND		Analog Ground
16	AGND	Analog GND		Analog Ground
17	VOL_DN / Pairing 2	Control	Input	Pin 16 and PIN 20 pull-low continuously for over 5 seconds to enter into PAIRING mode. Normal high; every pulling-low for less than 2 seconds Volume Down.
18	AOR	Signal	Output	R-ch Analog Output
19	AGND	Analog GND		Analog Ground
20	AOL	Signal	Output	L-ch Analog Output
21	AGND	Analog GND		Analog Ground
22	Vin	Power	Input	VDD
23	GND	Ground		Ground
24	GND	Ground		Ground
25	USBP	Signal	Input	USB DP
26	USBN	Signal	Input	USB DN
27	BAT_LOW	Signal	Output	Output Low when battery low
28	Power Keep	Control	Output	Power Control Out
29	Power ON	Control	Input	Power Control In
30	GND	Ground		Ground

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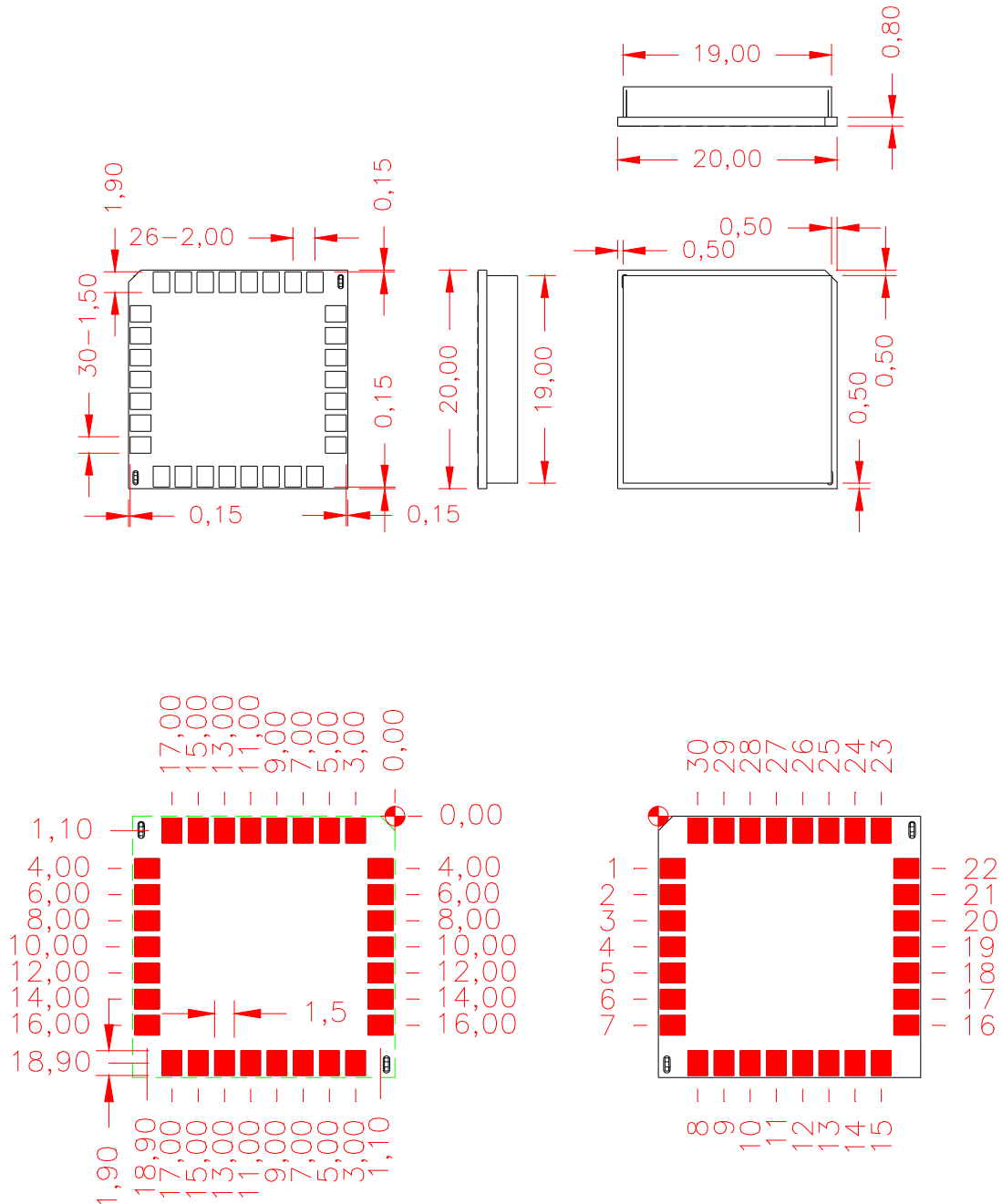
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2.4GHz Digital Audio RF Module

Page 15 of 15

AWD618R Module Dimensional Drawings



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