

FOR	Company	
	ATTN	

保密宣告
(Classified Info.)

本文列為機密文件，受雙方NDA(Non-Disclose Agreement)所規範。
 基此，請妥善保管文件，不可外洩給與合約無關之第三者造成雙方之損失。
 The information contained herein is the exclusive property of Airwave
 Technologies Inc. and shall not be distributed, reproduced, or disclosed in
 whole or in part without prior written permission of Airwave Technologies Inc.

Data Sheet



AWI5822

5.8GHz Wireless Receiver IC

承認	承認	品保	工程
Dr. T.H. Chen	Ben Huang	Sandy Chen	Shih Chuan Lin
Approve	Approve	QA	E/E

AIRWAVE TECHNOLOGIES INC.



Table of Contents

History	03
Product Description	04
Main Feature	04
Pin Configurations	04
Receiver Block Diagram	05
Pin Description	06
Maximum Rating	19
Electrical Characteristics	19
Application Circuit	20
Package Information	21

AIRWAVE TECHNOLOGIES INC.

History

Version	Item	Change	Reason	Date
0			First release	Apr. 2008
1	Add	Add date & Rev. info		Jun. 20,2008
2		Changed PINHEADER and Version (Page20)		Aug. 2008

AIRWAVE TECHNOLOGIES INC.

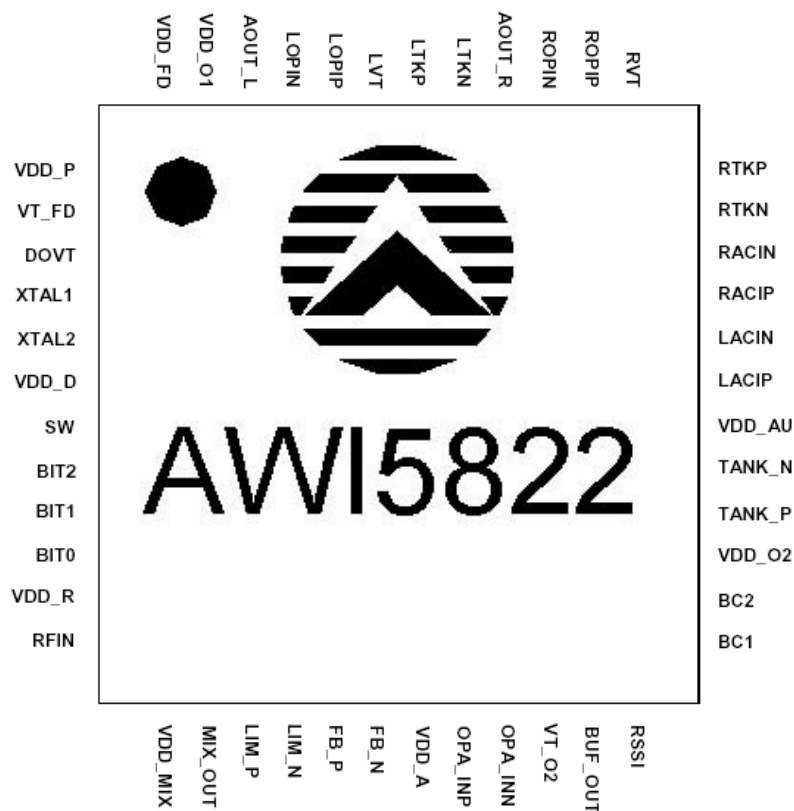
Product Description

The AWI5822 is an integrated single chip receiver designed for analog A/V sender and wideband digital FSK receiver operating in the 5.8GHz ISM band. The receiver IC consists of a fully integrated frequency synthesizer, LNA, Mixer, IF Amplifier, PLL FM Demodulator, Audio Demodulator and Audio OP Amplifier. The IC is provided in 48-lead QFN7X7 package and is designed to provide a fully functional FM/FM receiver.

Main Features

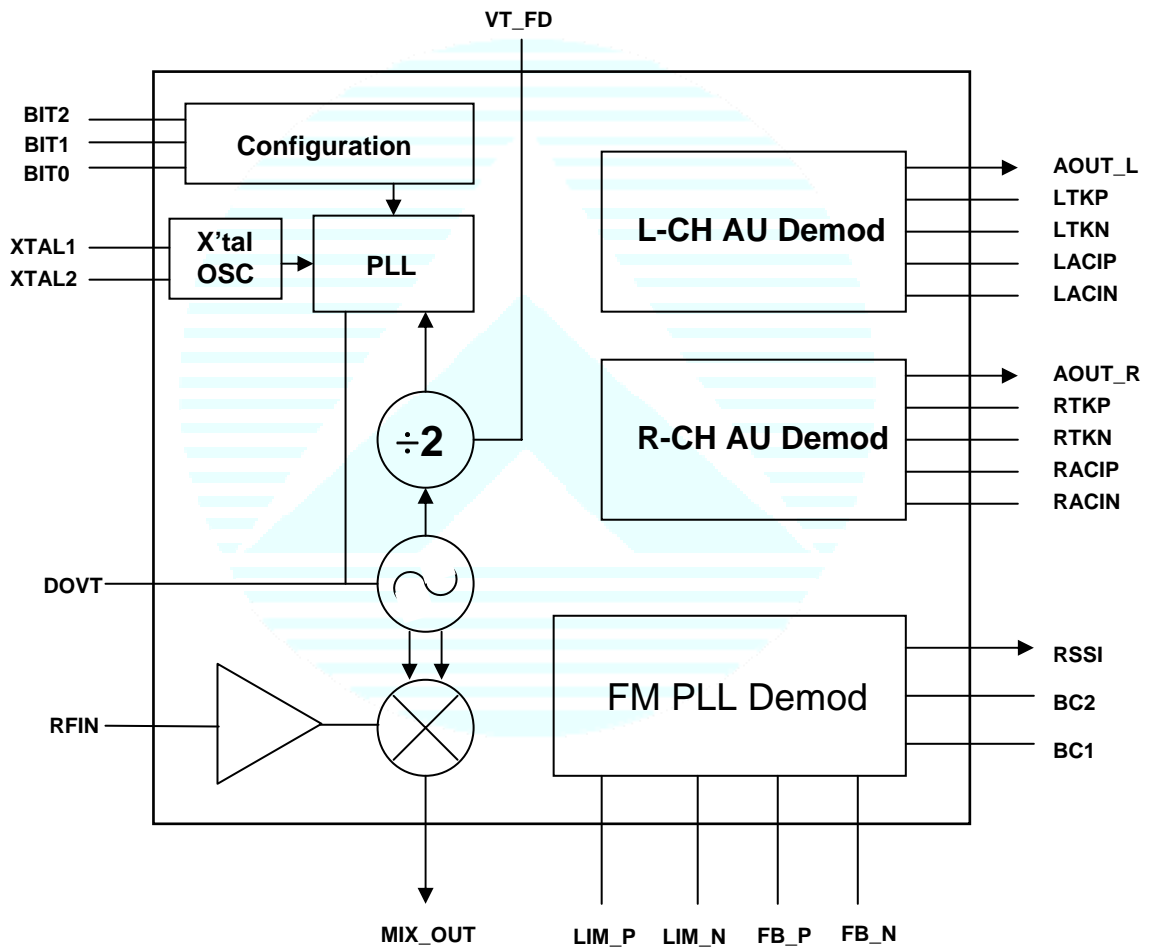
- 3.6V power Supply (Typical)
- Wideband PLL demodulator for adjustment-free production
- 7 channels operation for analog A/V sender and digital FSK transmission applications
- Channel select by use of either a DIP switch or a tact switch for a set of pre-defined frequencies
- Integrated stereo Sound Demodulator and Audio OP Amplifiers

Pin Configurations





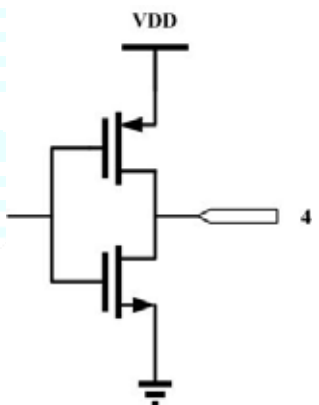
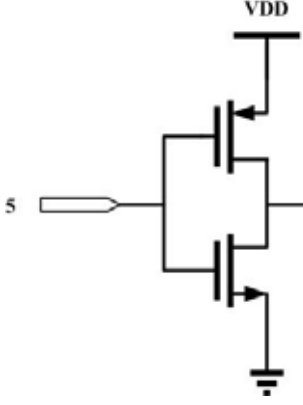
AIRWAVE TECHNOLOGIES INC.

Receiver Block Diagram



AIRWAVE TECHNOLOGIES INC.

Pin Descriptions

Pin No.	Name	Description	Equivalent Schematic
1	VDD_P	Prescaler Power Supply : Suggestion value of bypass capacitor C2 is 100pF.	
2	VT_FD	5.3GHz Injection Locked Frequency Divider Tuning Voltage Typical range of Vt is 0.4~1.4V	
3	DOVT	5.3GHz LO Tuning Voltage Control Input : Typical range of Vt is 0.35 ~ 1.6V.	
4	XTAL1	One of the two connection pins of external crystal See Note1	
5	XTAL2	One of the two connection pins of external crystal See Note1	

AIRWAVE TECHNOLOGIES INC.

Pin No.	Name	Description	Equivalent Schematic
6	VDD_D	Digital CKT Power Supply : Suggestion value of bypass capacitor C6 is 0.1uF.	
7	SW	Either PIN7(SW) or the settings of BIT0, BIT1, BIT2 (when PIN7 is grounded) can be used to select the channel out of a set of pre-defined channel frequencies. PIN7(SW) is normal high and each pull low will advance one channel in the pre-defined channel sequence (CH1, CH2 ..., CH7, CH1 ...) See Note2	
8	BIT2	MSB of the 3 Bits CH Selection PIN. If PIN7(SW) is grounded, PIN8 is normal high and enabled when pull low. If use PIN7(SW) to select channel, PIN8 outputs the selected channel status according to the operation of PIN7(SW). A series resistor R30 of 47KΩ and a shunt capacitor C62 of 0.068uF are recommended. See Note2	

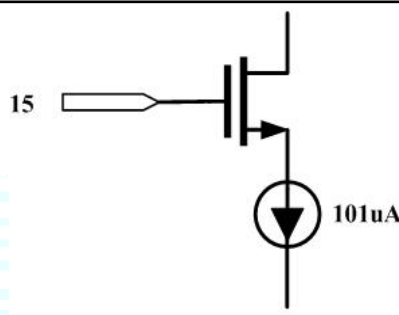
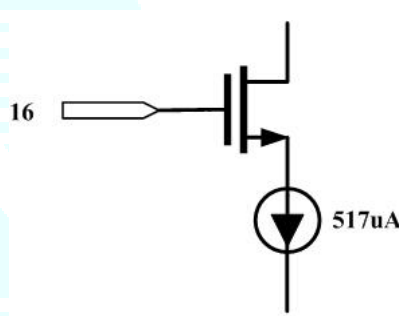
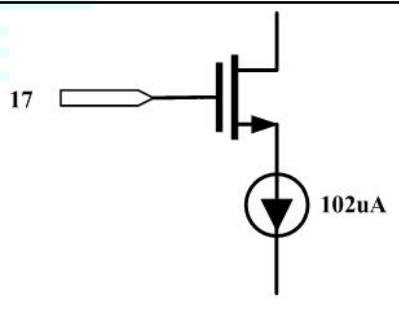
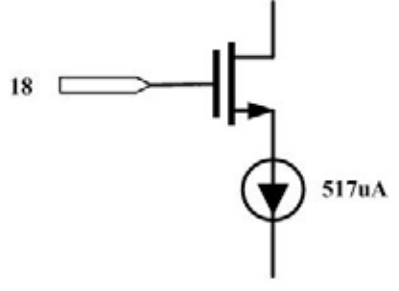
AIRWAVE TECHNOLOGIES INC.

Pin No.	Name	Description	Equivalent Schematic
9	BIT1	<p>One of the 3 Bits CH Selection PIN.</p> <p>If PIN7(SW) is grounded, PIN9 is normal high and enabled when pull low.</p> <p>If use PIN7(SW) to select channel, PIN9 outputs the selected channel status according to the operation of PIN7(SW). A series resistor R29 of 47KΩ and a shunt capacitor C63 of 39pF are recommended.</p> <p>See Note2</p>	
10	BIT0	<p>LSB of the 3 Bits CH Selection PIN.</p> <p>If PIN7(SW) is grounded, PIN10 is normal high and enabled when pull low.</p> <p>If use PIN7(SW) to select channel, PIN10 outputs the selected channel status according to the operation of PIN7(SW). A series resistor R28 of 47KΩ and no shunt capacitor are recommended.</p> <p>See Note2</p>	
11	VDD_R	<p>RF Power Supply :</p> <p>Suggestion value of bypass capacitor C65 is 4.7pF.</p>	

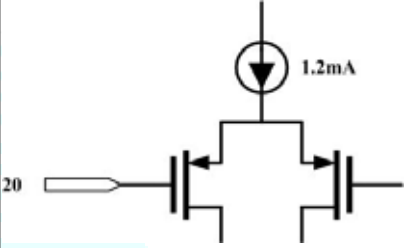
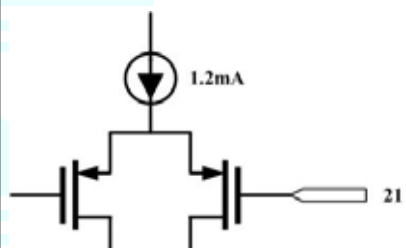

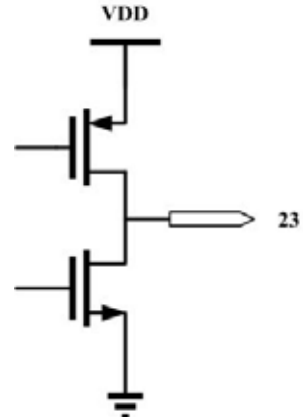
AIRWAVE TECHNOLOGIES INC.

Pin No.	Name	Description	Equivalent Schematic
12	RF_IN	RF Input to Internal LNA See Note3	
13	VDD_MIX	Mixer Power Supply : Suggestion values of bypass capacitors C52 and C36 are 1nF and 10pF.	
14	MIX_OUT	Mixer Output : The impedance level of MIX_OUT (PIN14) and IF Filter is 50Ω.	

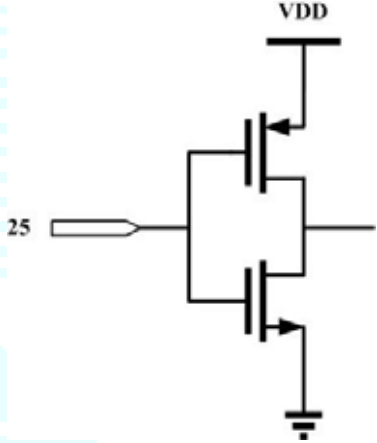
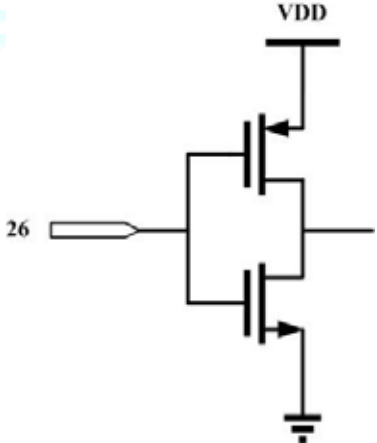
AIRWAVE TECHNOLOGIES INC.

Pin No.	Name	Description	Equivalent Schematic
15	LIM_P	Limiting Amplifier Positive Input	
16	LIM_N	Limiting Amplifier Negative Input	
17	FB_P	Limiting Amplifier Feedback Input (Positive node)	
18	FB_N	Limiting Amplifier Feedback Input (Negative node)	

AIRWAVE TECHNOLOGIES INC.

Pin No.	Name	Description	Equivalent Schematic
19	VDD_A	Demodulator Power Supply : Suggestion values of bypass capacitors C28 and C31 are 100pF and 0.01uF.	
20	OPA_INP	OPA Positive Input	
21	OPA_INN	OPA Negative Input	
22	VT_O2	480MHz VCO Tuning Voltage Control Input : Typical range of Vt is 0.9 ~ 1.3V.	
23	BUF_OUT	Demodulated Signal Output	

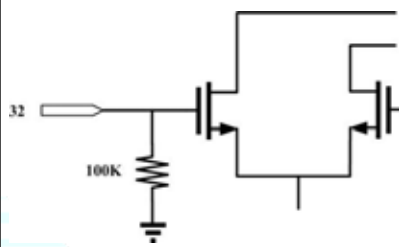
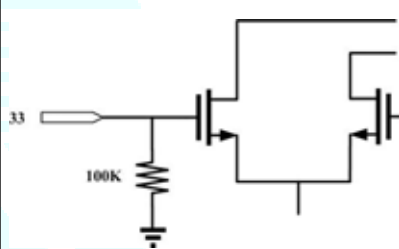
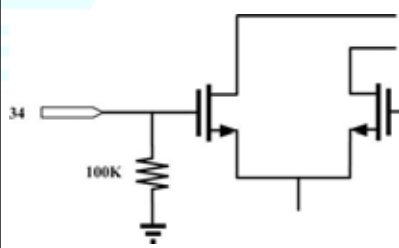
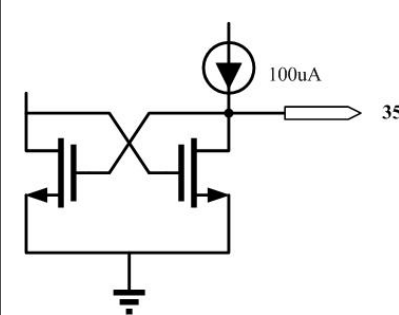
AIRWAVE TECHNOLOGIES INC.

Pin No.	Name	Description	Equivalent Schematic
24	RSSI	RSSI Output : The RSSI output voltage is inversely proportional to input signal strength. Typical range of RSSI voltage is 0.3 ~ 1.9V.	
25	BC1	480MHz VCO Frequency Tuning Control Bit : 1C (C: unit capacitance) Internal pull high, set PIN25 Low to add the extra tuning capacitance. See Note4	
26	BC2	480MHz VCO Frequency Tuning Control Bit : 2C (C: unit capacitance) Internal pull high, set PIN26 Low to add the extra tuning capacitance. See Note4	
27	VDD_O2	480MHz VCO Power Supply : Suggestion value of bypass capacitor C39 is 100pF.	

AIRWAVE TECHNOLOGIES INC.

Pin No.	Name	Description	Equivalent Schematic
28	TANK_P	<p>One of the two connection pins for external Tank components of 480MHz VCO.</p> <p>Shorter traces for the interconnection of L and C are recommended. Suggestion values of L4 and C47 are 22nH and 2pF.</p>	
29	TANK_N	<p>One of the two connection pins for external Tank components of 480MHz VCO.</p> <p>Shorter traces for the interconnection of L and C are recommended. Suggestion values of L4 and C48 are 22nH and 2pF.</p>	
30	VDD_AU	<p>Audio Power Supply :</p> <p>Suggestion value of bypass capacitor C3 is 0.1uF.</p>	
31	LACIP	6.0MHz Limiting Amplifier Positive Input	

AIRWAVE TECHNOLOGIES INC.

Pin No.	Name	Description	Equivalent Schematic
32	LACIN	6.0MHz Limiting Amplifier Negative Input	
33	RACIP	6.5MHz Limiting Amplifier Positive Input	
34	RACIN	6.5MHz Limiting Amplifier Negative Input	
35	RTKN	One of the two connection pins for external Tank components of 6.5MHz VCO. Shorter traces for the interconnection of L and C are recommended. Suggestion values of L1 and C34 are 33uH and 6.8pF.	

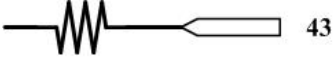
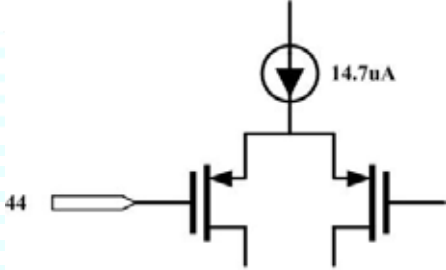
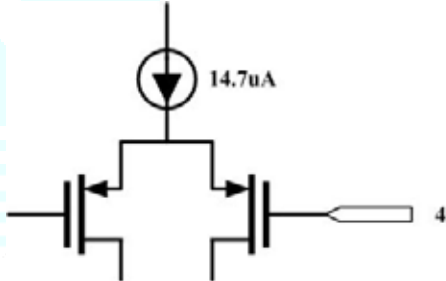
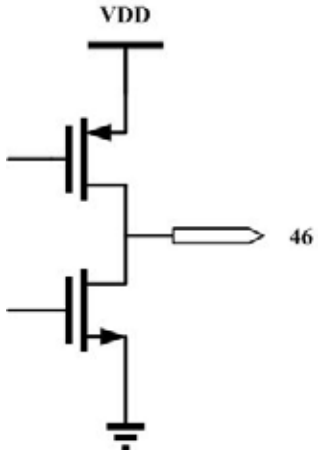
AIRWAVE TECHNOLOGIES INC.

Pin No.	Name	Description	Equivalent Schematic
36	RTKP	<p>One of the two connection pins for external Tank components of 6.5MHz VCO.</p> <p>Shorter traces for the interconnection of L and C are recommended. Suggestion values of L1 and C34 are 33uH and 6.8pF.</p>	
37	RVT	<p>6.5MHz VCO Tuning Voltage Control Input :</p> <p>The range of V_t is 1.1 ~ 1.5V.</p>	
38	ROPIP	Positive Input of Right CH Audio OPA	
39	ROPIN	Negative Input of Right CH Audio OPA	

AIRWAVE TECHNOLOGIES INC.

Pin No.	Name	Description	Equivalent Schematic
40	AOUT_R	Audio Output of Right CH Audio OPA	
41	LTKN	<p>One of the two connection pins for external Tank components of 6.0MHz VCO.</p> <p>Shorter traces for the interconnection of L and C are recommended. Suggestion values of L2 and C44 are 33uH and 10pF.</p>	
42	LTKP	<p>One of the two connection pins for external Tank components of 6.0MHz VCO.</p> <p>Shorter traces for the interconnection of L and C are recommended. Suggestion values of L2 and C44 are 33uH and 6.8pF.</p>	

AIRWAVE TECHNOLOGIES INC.

Pin No.	Name	Description	Equivalent Schematic
43	LVT	6.0MHz VCO Tuning Voltage Control Input : Typical range of V_t is 1 ~ 1.4V.	
44	LOPIP	Positive Input of Left CH Audio OPA	
45	LOPIN	Negative Input of Left CH Audio OPA	
46	AOUT_L	Audio Output of Left CH Audio OPA	

AIRWAVE TECHNOLOGIES INC.

Pin No.	Name	Description	Equivalent Schematic
47	VDD_O1	5.3GHz VCO Power Supply : Typical range of VDD_O1 is 4.05 ~ 4.1V. Suggestion value of bypass capacitor C14 is 100pF	
48	VDD_FD	5.3GHz Injection Locked Frequency Divider Power Supply : Suggestion value of bypass capacitor C1 is 100pF.	

AIRWAVE TECHNOLOGIES INC.

Maximum Rating

Parameter	Maximum Rating	Units
Supply Voltage (VDD)	5	V
Storage Temperature	-20 ~ +85	°C

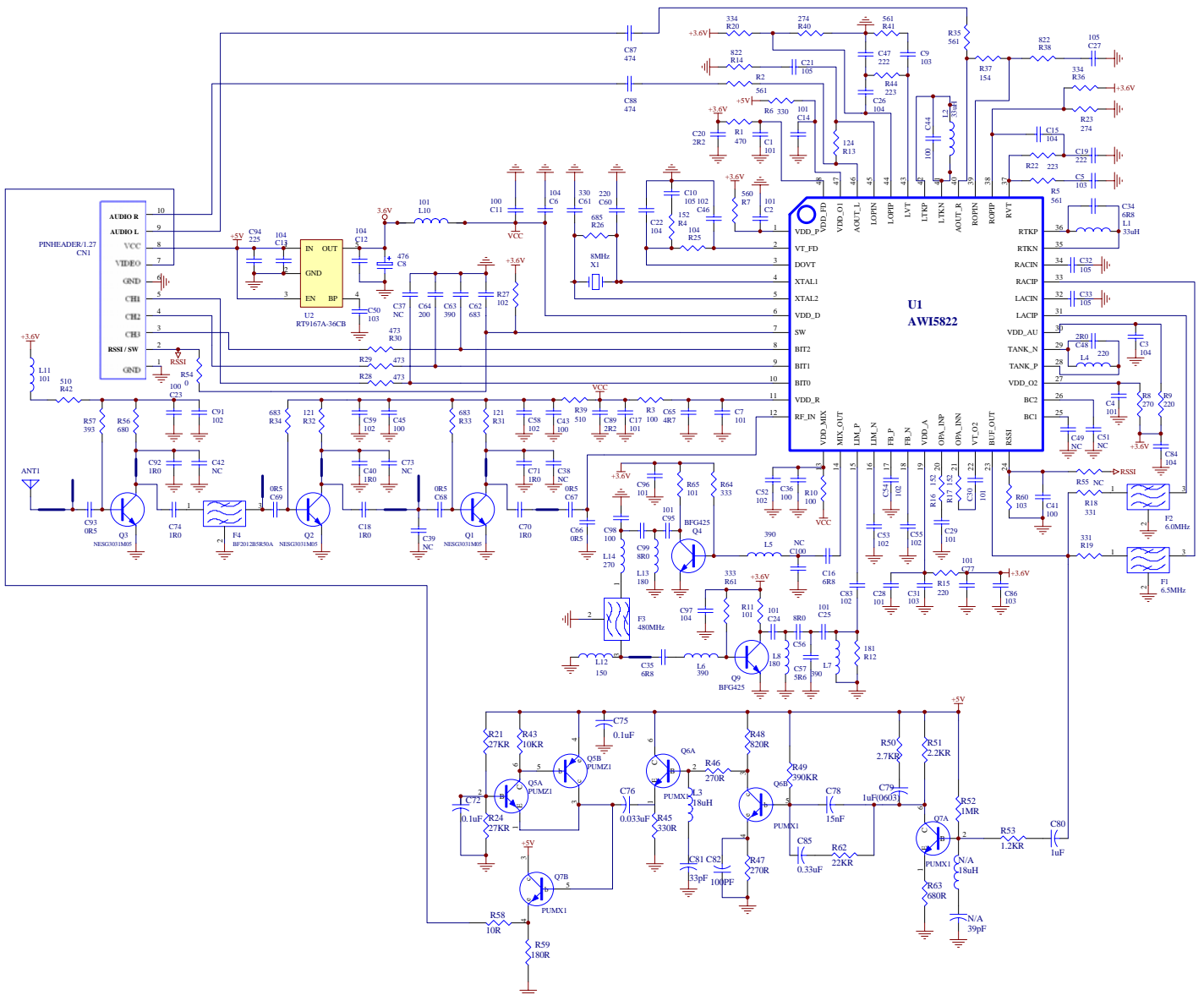
Note : This device is ESD sensitive. Handling and assembly of this device should only be done at proper ESD protection environment.

Electrical Characteristics

Parameter	Description	Min.	Typ.	Max.	Unit
Operation Temperature		-10		75	°C
Supply Voltage			3.6	4.5	V
Current Consumption			140		mA
RF Frequency		5740, 5760, 5780, 5800, 5820, 5840, 5860MHz			MHz
LO Frequency		5260, 5280, 5300, 5320, 5340, 5360, 5380MHz			MHz
Sensitivity			-70		dBm
IF Frequency			480		MHz
RF Gain (LNA & Mixer)			17		dB
Reference Frequency			8		MHz
Crystal Accuracy			30		ppm
RSSI Voltage	@ RFIN : -70~-10 dBm	0.5		2.5	V
Demodulation			FM		
Demodulator Input Sensitivity			-50		dBm
Demodulator Output Level	@ F.D.: ± 2MHz		120		mVp-p

AIRWAVE TECHNOLOGIES INC.

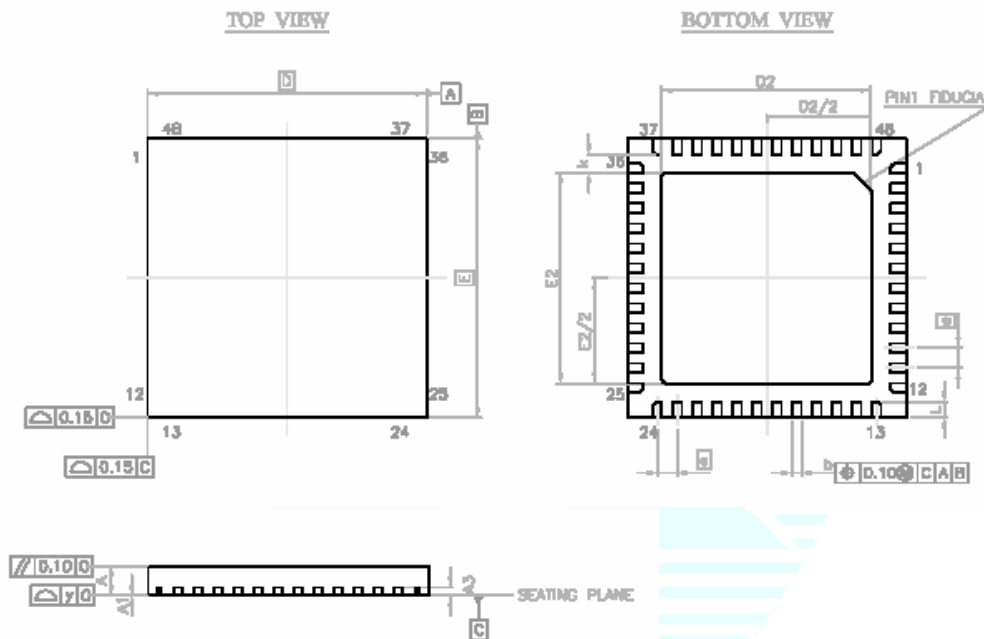
Application Circuit:



AIRWAVE TECHNOLOGIES INC.

Package Information

QFN 48 Outline Dimensions



SYMBOL	DIMENSION (MM)			DIMENSION (MIL)		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.70	0.75	0.80	27.6	29.5	31.5
A1	0	0.02	0.05	0	0.79	1.97
A3	0.200 REF			8 REF		
b	0.38	0.25	0.30	7.1	9.8	11.8
D	7.00 BSC			276 BSC		
D2	5.10	5.20	5.30	201	205	209
E	7.00 BSC			276 BSC		
E2	5.10	5.20	5.30	201	205	209
a	0.50 BSC			19.7 BSC		
k	0.20			7.9		
L	0.30	0.40	0.50	11.8	15.7	19.7
y	0.08			3.15		

AIRWAVE TECHNOLOGIES INC.