G-NiceRF®

1W Embedded small size walkie talkie module

Product Specification

Catalogue

Note: Revision History

Revision	Date	Comment
V1.0	2011-10-16	First release
V2.0	2013-06-20	Parameters and protocol revised
V3.0	2015-05-28	Graphic description added
V3.1	2015-12-26	RSSI function added
V3.2	2017-06	Logo updated
V3.3	202-11	Update description

1. Descriptions

SA818 is a cost-effective integrate professional walkie talkie module, it comes with built-in high performance microcontroller, narrow band RF transceiver IC and RF power amplifier,SA818 offer standard UART interface, which easy to configure the related parameters and control the TX/RX function, Users only need to add external audio amplifier, microphone and speaker, then it becomes a professional walkie talkie, Simplified interface and Ultra small size make this module widely used in various applications and conveniently embedded into various handheld.

2. Features

- UHF band frequency: 400~480 MHz

  VHF band frequency: 134~174 MHz

  350 band frequency：320-400MHz

  (3 frequency bands are optional)

- Tx and Rx frequency, Tx and Rx CTCSS, CDCSS can be set alone.

- Band width 12.5 / 25 KHz

- Output power up to 1W

- Distance up to 4-5km in open area

- Sensitivity：-124 dBm

- 38 CTCSS

- 166 CDCSS

- 8 level squelch

- 8 adjustable volume

- High/ low power is optional（500mW/1W）

- Wide range of working voltage:3.3-5.5 V

- High-integrated, Small Size

- 1 ppm KDS TCXO crystal, Stable performance

3. Application

- small walkie talkie

- Invisible intercom system

- audio surveillance system

- Outdoor Sport products

- building community security system

4. Internal block diagram
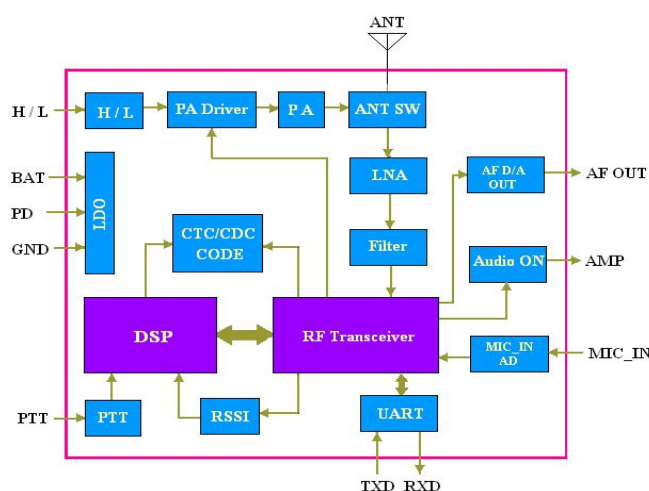
5. Specification

Parameter	Test condition	Min	Typ.	Max	Unit
Power supply		3.3	4.2	5.5	V
Working Temperature range		-30	25	70	℃
Current Consumption					
Sleep current			≤1		uA
RX current			60		mA
TX current（High power）			650	750	mA
TX current（low power）			450	550	mA
Transmitting RF Parameters					
Frequency range	UHF	400		480	MHz
Frequency range	VHF	134		174	MHz
Out power（high power）	@VCC=4.0V	28	29.5	31	dBm
Out power（low power）		25	26.5	27	dBm
Modulation frequency	@1.5KHz/2.5KHz frequency deviation		10		mV
Audio modulation distortion	@1.5KHz/2.5KHz frequency deviation		2	5	%
SignaltoNoiseRatio	@1.5KHz/2.5KHz frequency deviation	38	40	45	dB
adjacent-channel power	@12.5K offset		-60dBc		dBm
CTCSS Modulation frequency		0.35	0.5	0.75	KHz
Receiving RF Parameters					
Receiving sensitivity			-124		dBm
Receiving SNR	@1.5KHz frequency deviation	45	50		dB
Audio output amplitude			700		mV
Audio Output impedance			200		OHm

6. Typical Application Schematic
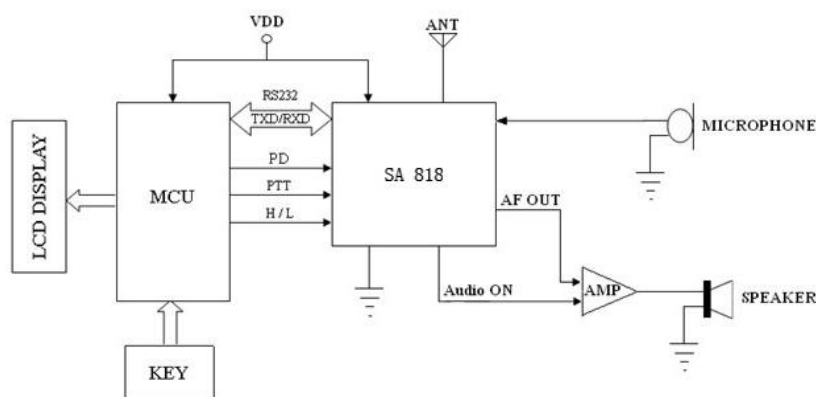
7. Pin definition
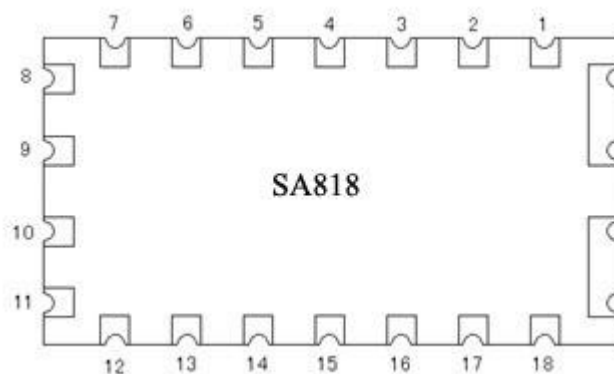
Pin NO.	Pin name	I/O state
1	Audio ON	Connected to audio power amplifier. When the module worked, it can control the extra audio amplifier automatically, it will output low level to turn on the amplifier and high level to turn off the amplifier.
2	NC	Not connected
3	AF_OUT	Audio output
4	NC	Not connected
5	PTT	Module Input, Transmitting/receiving control, "0" force the module to enter TX state; and "1" to Rx state
6	PD	Power Down control, "0" for power down mode; "1" for the normal work
7	H/L	high/low output power control; Leave open for high output power，low level to low output power. (Please kindly note: this pin can NOT be connected to VDD or high level of cmos output)
8	VBAT	Connect power positive
9	GND	Grounding
10	GND	Grounding
11	NC	Not connected
12	ANT	connect 50 ohm antenna
13,14,15	NC	Not connected
16	RXD	RXD of the module and connect to external TXD
17	TXD	TXD of the module and connect to external RXD
18	MIC_IN	Microphone or line in

8. Mechanism Dimension(Unit:mm)
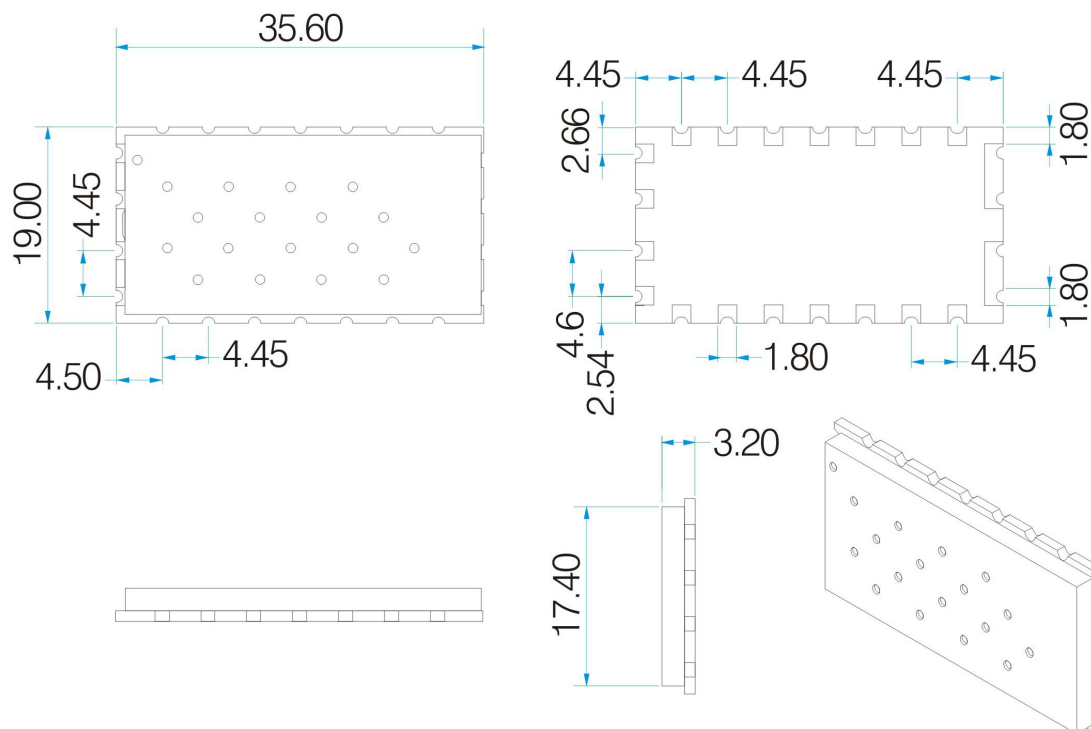

9. Order information

Product Name	Description
SA818-U	Working frequency :400~480 MHz
SA818-V	Working frequency: 134~174 MHz

10. FAQ

a)   Why module can not communicate properly？

1)   Check if there is power connection error；

2)   Check if Module is in normal communication mode；

3)   Check if frequency, channel, and mute are same；

4)   Check if module is damaged；

b)   Why transmission distance is not far as it should be？

1)   Power supply ripple is too large；

2)   The antenna types do not match, or not installed properly；

3)   The same frequency interference；

4)   The surrounding environment is harsh, strong interference sources.

Appendix 1：DEMO Board

In additional, we provided DEMO Board for customers to debug the software program, test all the function and measure the distance. The figure shows as below:
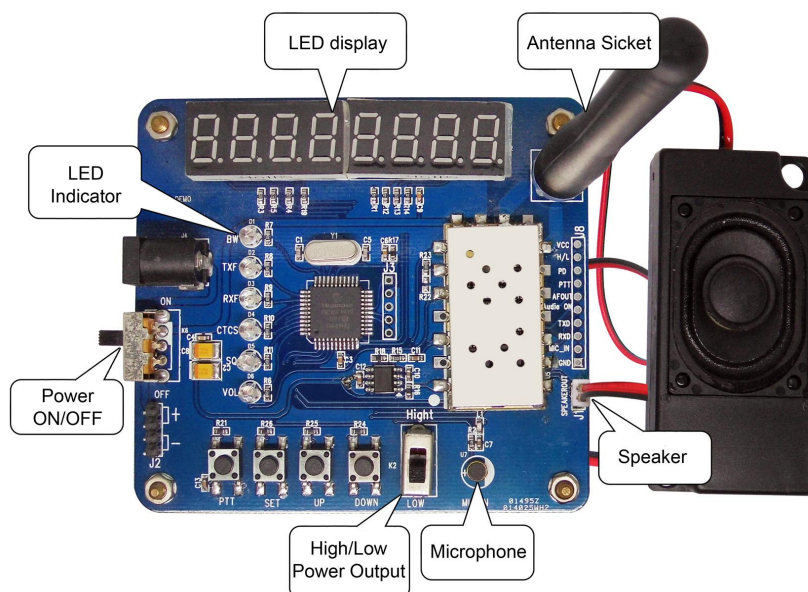
User can set related parameters through the buttons:

1) Tx frequency：400 ~ 480 MHz

2) Rx frequency：400 ~ 480 MHz

3) Channel Bandwidth：12.5 KHz / 25KHz

4) CTCSS：0 ~ 38

5) CDCSS: 0—166

6) Squelch：0 ~ 8

7) Volume：1 ~ 8

➤ **Button Operation：**

1) SET button

Press to enter setting mode.

2) UP /Down button

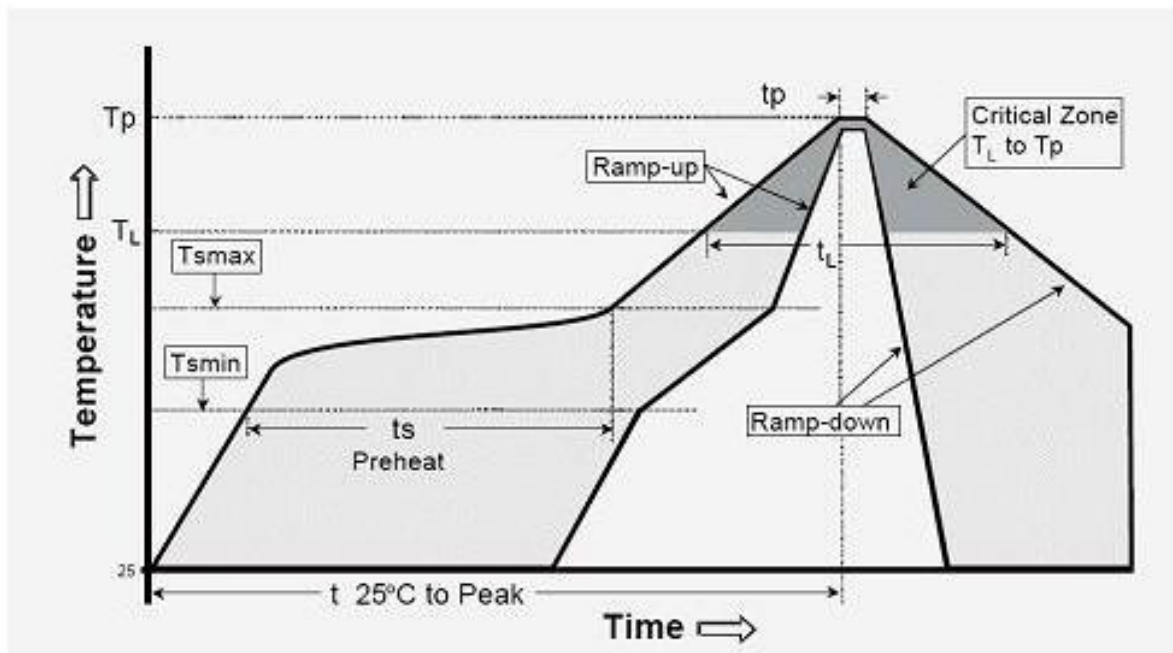In setting mode, press to increase/decrease the setting item.

3) PTT button

 If Not in setting mode, Press to talk,(Listen state when released)

4) High/Low slide switch

Switch to high/low output power

Note: With data FLASH inside, all the setting parameters are saved and keep unchanged even power off.

Appendix 2：SMD Reflow Chart

IPC/JEDEC J-STD-020B the condition for lead-free reflow soldering	big size components (thickness >=2.5mm)
The ramp-up rate (Tl to Tp)	3℃/s (max.)
preheat temperature - Temperature minimum (Tsmin) - Temperature maximum (Tsmax) - preheat time (ts)	 150℃ 200℃ 60~180s
Average ramp-up rate(Tsmax to Tp)	3℃/s (Max.)
- Liquidous temperature(TL)	217℃
- Time at liquidous(tL)	60~150 second
peak temperature(Tp)	245+/-5℃