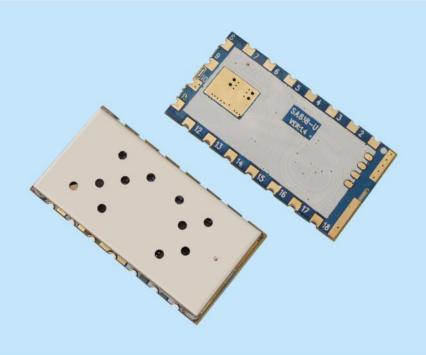


1W Embedded small size walkie talkie module

Product Specification





Catalogue

1. Descriptions					3
2. Features	wiceles.	wieelf	wicell [®]	- Week	3
3. Application	G ^A .	G ^a .	G ^a .	G ^a .	3
4. Internal block diagram 5. Specification	G-Weet RT	G.PileaRt.	G-Nicea ^{RP}	G-Niceself	4
6. Typical Application Schematic 7. Pinout definition	G-Mice RE	G-Wee RF	G-Nice RF	G.A.Vec RF	5
8. Mechanism Dimension					6
9. Order information	G ^{Ajlec} RF	G. ^{Aylee} RF	G- ^{AlecRF}	G. ^{Aylee} RF	6
10. FAQ					6
Appendix 1: DEMO Board					
Appendix 2: SMD Reflow Chart.					8

Note: Revision History

Revision	Date		Comment			
V1.0	2011-10-16		First release			
V2.0	2013-06-20	G-NiceRF	Parameters and protocol revised			G-NiceRF
V3.0	2015-05-28		Graphic description	n added		
V3.1	2015-12-26		RSSI function adde	ed		
V3.2	2017-06	G-NiceRF	Logo updated	G-Nice R F	C. NiceRF	G-NiceRF
GNiceRF	G. NiceRF	G-NiceRF	G.NiceRF	G.NiceRF	G.NiceRF	G.NiceRF



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

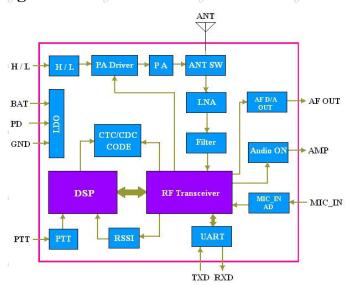
- UHF band frequency: 400~480 MHZ
- VHF band frequency: 134~174 MHZ
- Tx and Rx frequency, Tx and Rx CTCSS,CDCSS can be set alone.
- Band width 12.5 / 25 KHz
- Output power up to 1W
- Distance up to 4-5km in open area
- Sensitivity: -124 dBm
- High-integrated, Small Size

3. Application

- small walkie talkie
- Invisible intercom system
- audio surveillance system

- 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
- Built-in EEPROM, data saved even powered off
- 1 ppm KDS TCXO crystal, Stable performance
- Outdoor Sport products
- building community security system

4. Internal block diagram

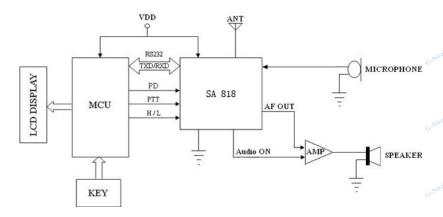




5. Specification

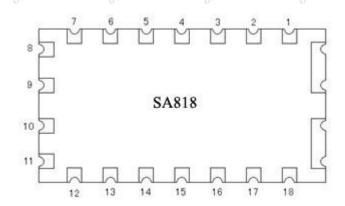
Power supply	C'Alle	G.Nice	C-Ni	,	G. Mich	G-Nice
Current consumption Sleep current ≤1 uA RX current 60 mA TX current (High power) 650 750 mA TX current (low power) 450 550 mA Transmitting RF parameters Frequency range UHF 400 480 MHZ Frequency range VHF 134 174 MHZ Out power (high power) @VCC=4.0V 28 29.5 31 dBm 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 CTCSS Modulation frequency 0.35 0.5 0.75 KHZ Receiving sensitivity -124 dBm Receiving SNR @1.5KHZ frequency deviation 45 50 dB	Parameter	Test condition	Min	Typ.	Max	Unit
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 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 CTCSS Modulation frequency @12.5K offset -60dBc dBm CTCSS Modulation frequency 0.35 0.5 0.75 KHZ Receiving SNR @1.5KHZ frequency deviation 45 50 dB	Power supply		3.3	4.2	5.5	V
Sleep current	Working Temperature range	G.NiceRF	-30	^{ert} 25	70	°C GAMEE
RX current		Current consumpt	tion			
TX current (High power) 650 750 mA	Sleep current	20 20		<u>≤1</u>	o¥	uA
TX current (low power)	RX current	G.Aices	G.All	60	G-Nices.	mA Gratice
Transmitting RF parameters Frequency range UHF 400 480 MHZ Frequency range VHF 134 174 MHZ Out power (high power) 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 sensitivity -124 dBm Receiving SNR @1.5KHZ frequency deviation 45 50 dB	TX current (High power)			650	750	mA
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) @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 sensitivity -124 dBm Receiving SNR @1.5KHZ frequency deviation 45 50 dB	TX current (low power)	riceRF	-140	<u>450</u>	550	mA
Frequency range		Transmitting RF para	ameters			
Out power (high power) @VCC=4.0V 28 29.5 31 dBm Out power (low power) @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 SNR @1.5KHZ frequency deviation 45 50 dB	Frequency range	UHF	400		480	MHZ
Out power (low power) @VCC=4.0V 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 sensitivity Receiving SNR @1.5KHZ frequency deviation 45 50 dB	Frequency range	GANICERE VHF GANICERE	134	eRF	174	MHZ
Out power (low power)2526.527dBmModulation frequency@1.5Khz/2.5KHZ frequency deviation10mVAudio modulation distortion@1.5Khz/2.5KHZ frequency deviation25%SignaltoNoiseRatio@1.5Khz/2.5KHZ frequency deviation384045dBadjacent-channel power@12.5K offset-60dBcdBmCTCSS Modulation frequency0.350.50.75KHZReceiving RF parametersReceiving sensitivity-124dBmReceiving SNR@1.5KHZ frequency deviation4550dB	Out power (high power)	OVCC-4 OV	28	29.5	31	dBm
Modulation frequency 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 sensitivity -124 dBm Receiving SNR @1.5KHZ frequency deviation 45 50 dB	Out power (low power)	(WVCC-4.0V	25	26.5	27	dBm
Audio modulation distortion Audio modulation distortion @1.5Khz/2.5KHZ frequency deviation 2 5 %	Modulation frequency		G. ^{Mir}	10	G-NiceRI	mV GARIES
Audio modulation distortion frequency deviation SignaltoNoiseRatio adjacent-channel power CTCSS Modulation frequency Receiving RF parameters Receiving SNR C1.5KHZ 60.1.5KHZ 60.35 60.75 60	- Information frequency	1 1		10		111 7
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 sensitivity -124 dBm Receiving SNR @1.5KHZ frequency deviation 45 50 dB	Audio modulation distortion			2	5,00	%
SignaltoNoiseRatio 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	Gaires Gaires		G.Air	(6)	G-Nices	G-Nice
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	SignaltoNoiseRatio		38	40	45	dB
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	adjacent-channel power	-	~V	-60dBc	NiceRF	dBm 🧀
Receiving RF parameters Receiving sensitivity Receiving SNR @1.5KHZ	2 0	GA (6) 12 10 11 0 115 0 V	0.35		0.75	G*
Receiving sensitivity -124 dBm Receiving SNR @1.5KHZ frequency deviation 45 50 dB						
Receiving SNR @1.5KHZ frequency deviation 45 50 dB	Receiving sensitivity	G.Nicett G.Nicett	G. ^{Nile}	-124	G-NiceRI	dBm
a a a a a a a			45	50		dB
Audio output amplitude 6	Audio output amplitude	G-MiceRT G-MiceRT	G-Nit	700	G-Nice R	mV control
Audio Output impedance 200 OHm				200		OHm

6. Typical Application Schematic





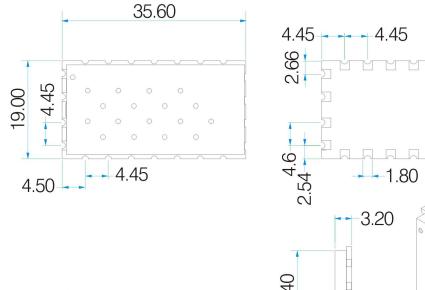
7. Pinout definition

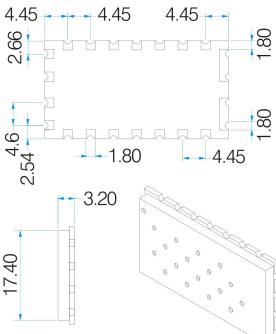


Pin NO.	Pin name	I/O state
Carther 1	Audio ON	Connected to audio power amplifier. When the module worked, it can control the extra audio amplifier automatically, it will output low level to turn on the amplifier and high level to turn off the amplifier.
2	NC	Not connected
3	AF_OUT	Audio output
4 6-11/20	NC GARIC	Not connected
5	PTT GAME	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 Ground
10	GND	Grounding
11	NC	Not connected
12 6.751001	ANT GARGE	connect 50 ohm antenna
13,14,15	NC	Not connected
16 6-1410-87	RXD cm	RXD of the module and connect to external TXD
17	TXD	TXD of the module and connect to external RXD
18 CANTILLER	MIC_IN	Microphone or line in



8. Mechanism Dimension





9. Order information

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

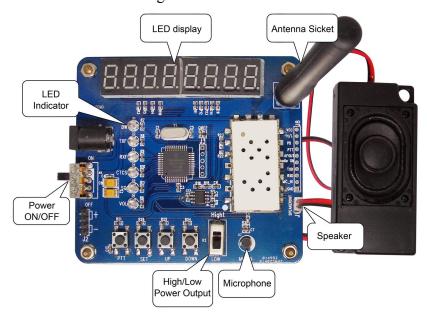
10. FAQ

- 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: $400 \sim 480 \text{ MHz}$

2) Rx frequency: $400 \sim 480 \text{ MHz}$

3) Channel Bandwidth: 12.5 KHz / 25KHz

4) CTCSS: $0 \sim 38$

5) CDCSS: 0—166

6) Squelch: $0 \sim 8$

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)

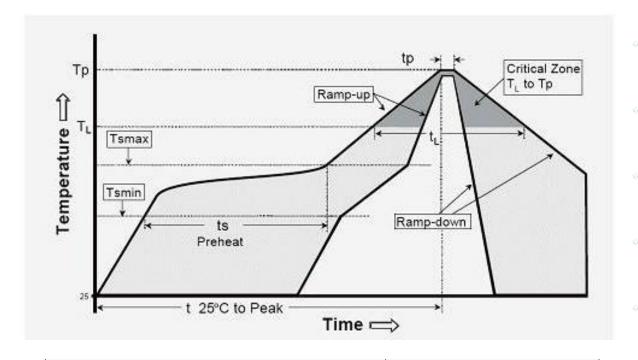
4) High/Low slide switch

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	big size components	
for lead-free reflow soldering	(thickness >=2.5mm)	
The ramp-up rate (T1 to Tp)	3℃/s (max.)	
preheat temperature		
- Temperature minimum (Tsmin)	150℃	
- Temperature maximum (Tsmax)	200℃	
- preheat time (ts)	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℃	