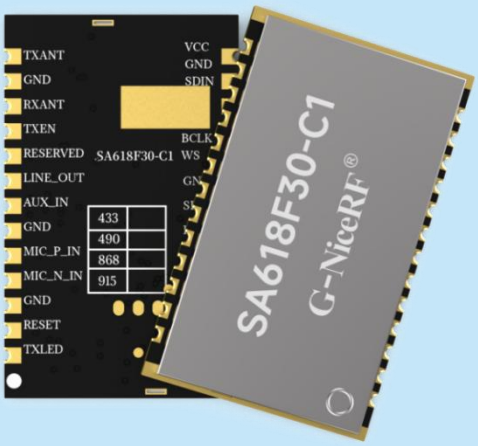
SA618F30-C1

High-power Full-duplex digital and audio wireless transmission module

- 8 people can share high-quality calls
- I2S Digital audio+analog audio
- Mesh Network ,Multi-device concurrent transmission and reception
- Support OTA &Serial upgrade
- Low power consumption, with an average current of 150mA at 1W output power

Product Specification



Catalogue

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Note: Revision History

Revision	Date	Comment
V1.0	2024-10	First release
V1.1	2026-6	Added PCB V3.0 schematic and pin assignment description
V1.2	2026-11	Update sensitivity

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1. Description

SA618F30-C1 is an upgraded, cost-effective, high-integration, high-power full-duplex intercom module from NiceRF. It features a built-in high-speed microcontroller, audio Codec, echo cancellation circuit, ESD protection, high-performance RF chip, and amplifier. The module provides a standard serial port for communication, allowing users to easily configure parameters and control transmission and reception functions. By connecting an audio amplifier, microphone, and speaker, it can function as a compact intercom. Its simplified interface and ultra-compact size make it suitable for various applications, enabling seamless integration into handheld devices to enhance the overall performance of terminal products.

SA618F30-C1 full-duplex intercom module supports 8 users for simultaneous high-quality calls, featuring 8-channel concurrent functionality with unlimited reception, ensuring each user enjoys an excellent audio experience. Audio quality during 8-channel concurrent use is much better than other similar products.

SA618F30-C1 is produced and tested using lead-free processes, complying with RoHS and REACH standards.

The SA618F30-C1 V3.0 version adds a new SPKIN pin, which significantly enhances the echo cancellation performance. If the customer's product is compact and the microphone is located close to the speaker, we recommend using the V3.0 version as a priority to achieve better voice quality and echo suppression.

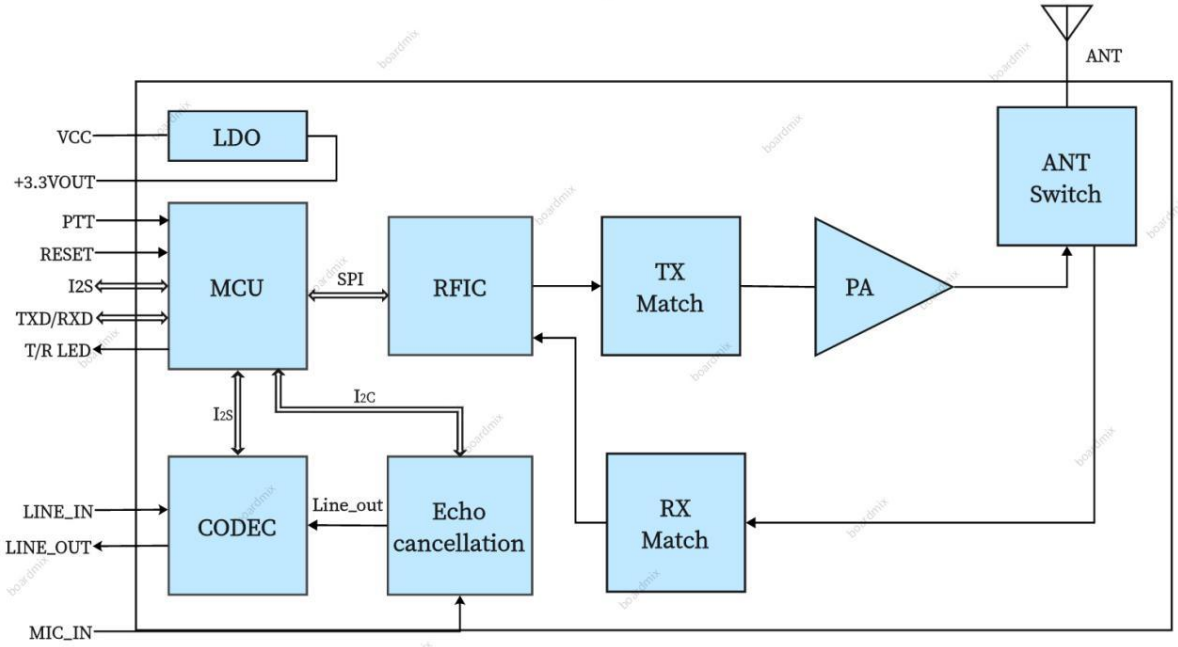
2. Features

- Frequency Band 410~480MHz (customizable 150-960 MHz)
- Up to 8 devices transmit simultaneously (Receive unlimited)
- Echo cancellation function
- VOX function
- Mesh Network
- I2S Digital audio & analog audio
- Line In + Mic - input
- Full duplex data transmission
- Support data transmission
- Sleep low power consumption
- Support OTA &Serial upgrade
- 2-3Km transmission distance in the open area
- High integration and small size

3. Applications

- High-quality full duplex walkie talkie
- Conference telephone system
- Building community security system
- Security intercom system for special scenarios
- Earphone walkie talkie
- Special job assignment walkie talkie

4. Block Diagram



5. Electrical Characteristics

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Operating voltage		3.3	4.2	5.5	V
working temperature		-30	25	70	℃
Current consumption					
Sleep current			10	20	uA
RX current	@ No audio output		50	55	mA
TX current	4v,@30dBm		160		mA
RF parameter					
Operating frequency	UHF	410		480	MHz
Customizable frequency		150		960	MHz
Default shipping frequency	UHF (1MHz interval)	440.125		455.125	MHz
Transmit power	@5V	16		32	dBm
Bandwidth（BW)			500		KHz
Receiving sensitivity			-104		dBm
Audio parameters					
Modulation sensitivity			10	100	mV
Receive signal-to-noise ratio(SNR)			90		dB
Frequency response		60		3800	Hz
Audio output（line out)	Load 16 Ω			40	mW
	8 channels	160	200	240	ms

6. Typical Applications

■ Headset Walkie-talkie


Headset Walkie-talkie


Cycling with Travel Buddies


High-altitude Work


Shipboard Communication

■ Handheld radio


High-end
Full-duplex Walkie-talkie


Property Security

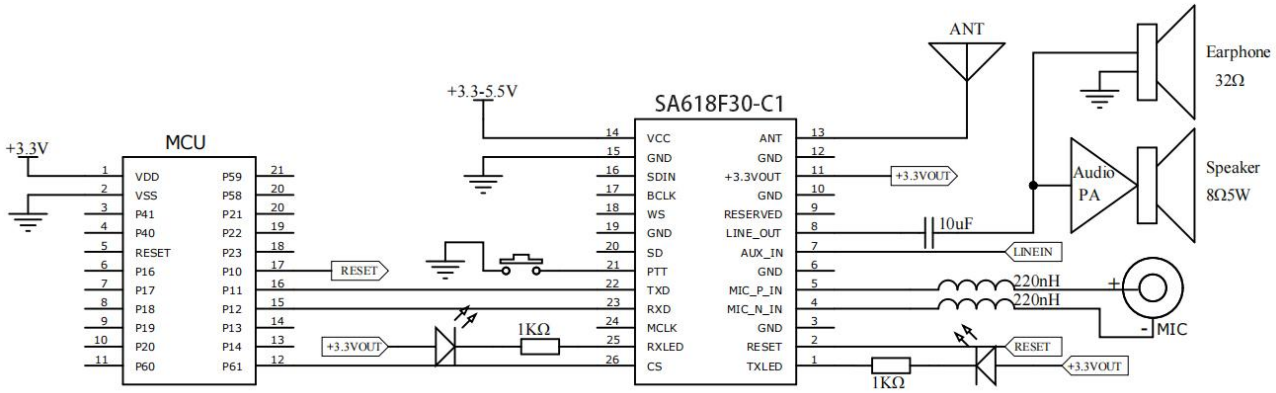

Subway Communication


Emergency Rescue

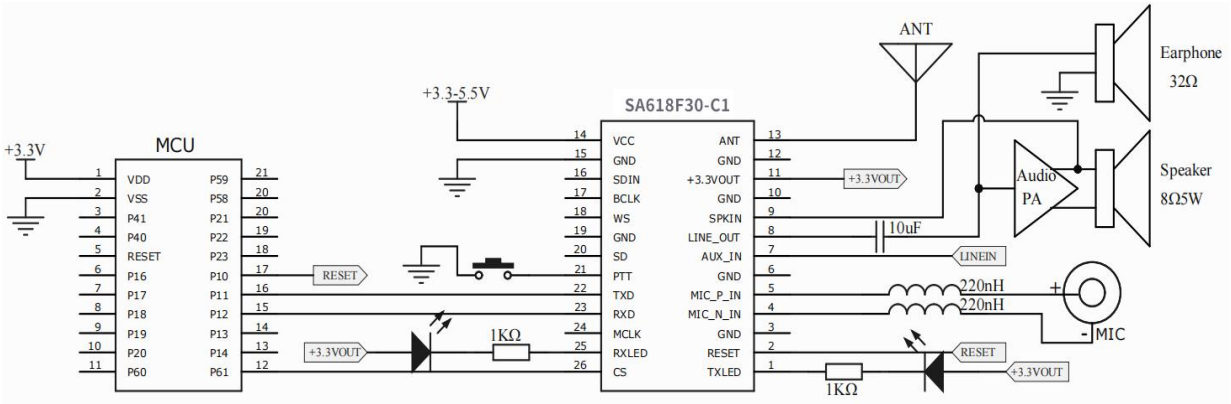
7. Typical application circuit

■ Analog input and analog output application circuit

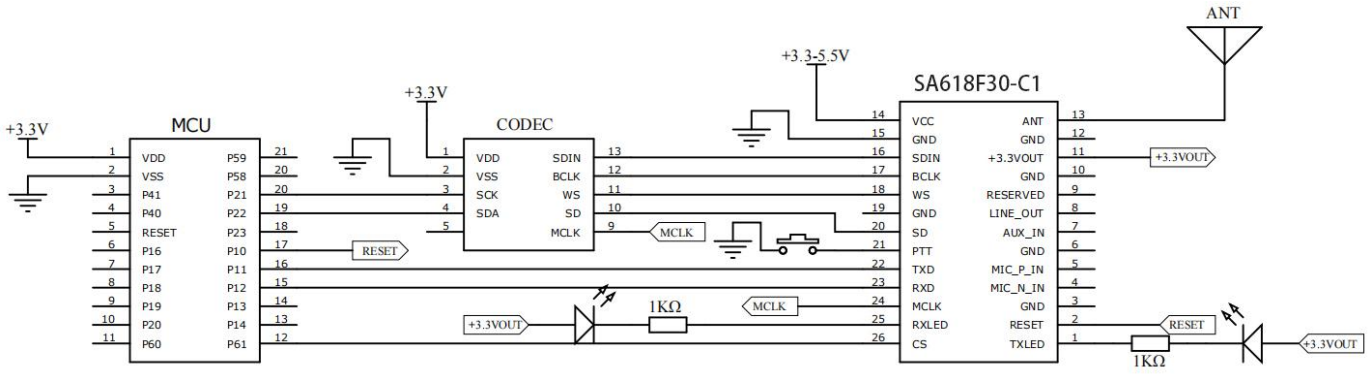
V2.2 Typical Application Circuit



V3.0 Typical Application Circuit



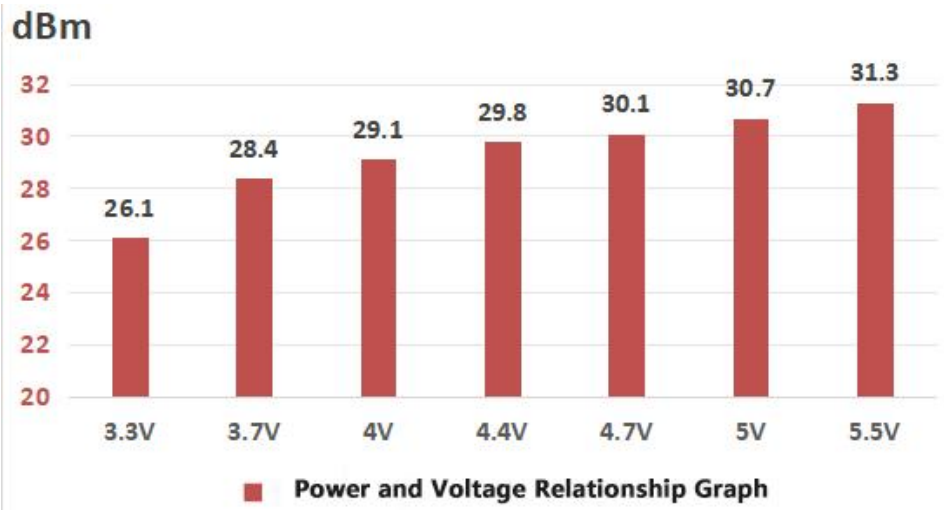
■ IIS input and output application circuit

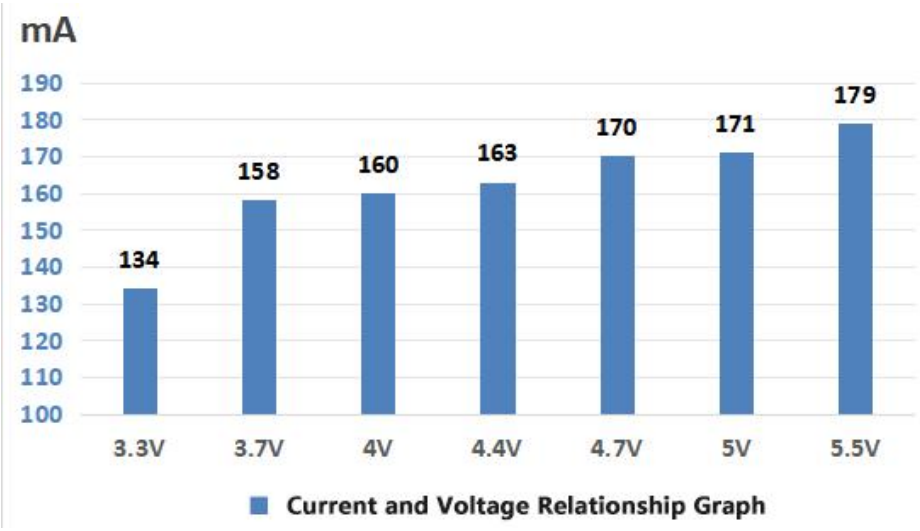


8. Parameters list

➢ Relationship between module supply voltage, power, and current (@433MHz)

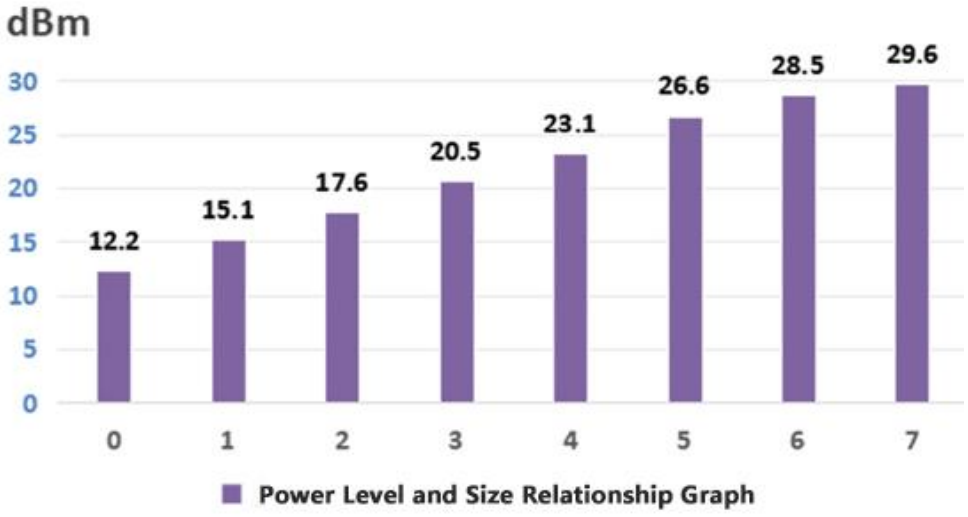
@433MHz	VCC (V)	3.3	3.7	4.0	4.4	4.7	5.0	5.5
	output power (dBm)	26.1	28.4	29.1	29.8	30.1	30.7	31.3
	Current (mA)	134	158	160	163	170	171	179

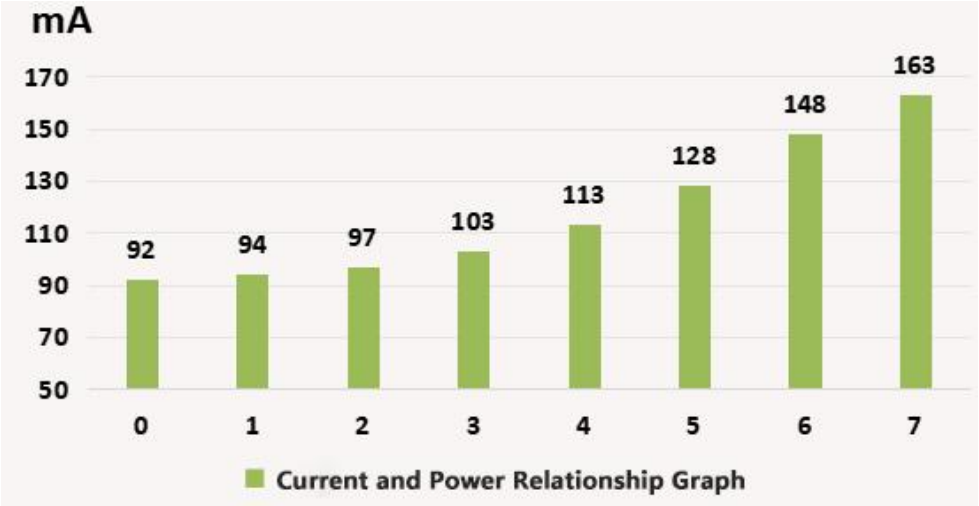




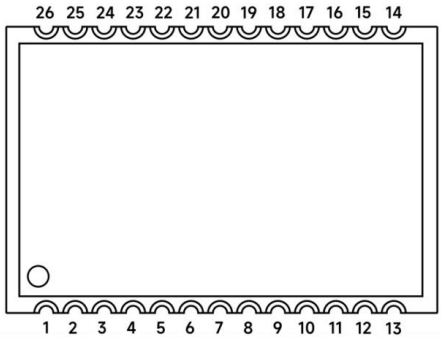
➢ Relationship between module supply voltage, power, and current (@433MHz)

Power Level		0	1	2	3	4	5	6	7
@433MHz @4V	Output power (dBm)	12.2	15.1	17.6	20.5	23.1	26.6	28.5	29.6
	Current mA)	92	94	97	103	113	128	148	163





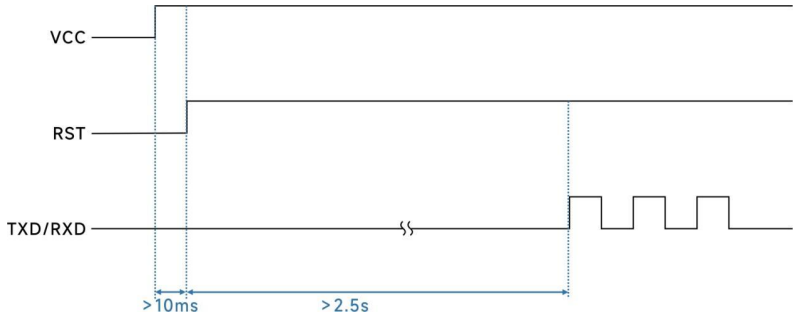
9. Pin definition



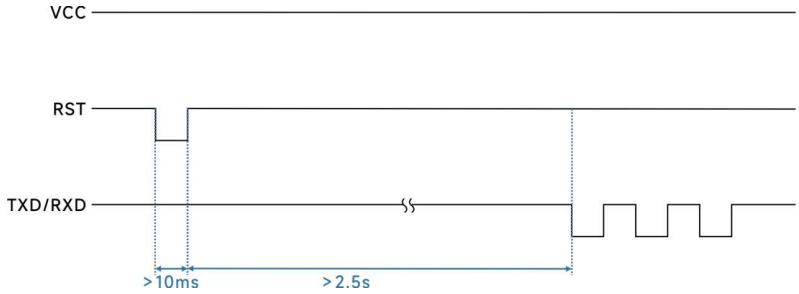
Pin NO.	Pin name	I/O	Description
1	TXLED	O	Transmitting indicator, connected with external led, turn on by low level output when data or voice is transmitting, (suggest 1K ohm resistor for current limitation)
2	RST	I	Module reset pin, externally pull down for more than 5ms will reset the module
3, 6, 10, 12,15,19	GND		Ground
4	MIC_N_IN	I	Negative electrode of external microphone, serial connected with 220 nH inductance, refer to below typical circuit.
5	MIC_P_IN	I	Positive electrode of external microphone, serial connected with 220 nH inductance, refer to below typical circuit.
7	Aux_IN	I	External audio input signal, maximum 1 VRMS
8	LINE_OUT	O	External 16-ohm headphones can be connected, requiring an additional LC low-pass filter circuit to eliminate RF interference. Refer to the typical circuit.
9	Reserved		Module test pins should be left unconnected by the user.
	SPKIN		Echo cancellation sampling input, connected to the speaker output. Refer to the Typical Application Circuit (PCB V3.0) for details.
11	+3.3V Out	O	3.3v regulator out, maximum 50mA loading
13	ANT		Connected with 50ohm Antenna
14	VCC		Power supply (3.3 – 5.5V)
16	SDIN	I	Connected with External I2S device, (0 – 3.3V)
17	BCLK	O	
18	WS	O	
20	SD	O	
21	PTT	I	module transmit pin is pulled low to enter transmit mode, with an internal pull-up resistor, defaulting to a high-level output
22	TXD	O	Serial transmit pin (voltage 0-3.3V)
23	RXD	I	Serial receive pin (voltage 0-3.3V)
24	MCLK	O	Connected with External I2S device (0-3.3V)
25	RXLED	O	Receiving indicator, connected with external led, turn on by low level output when data or voice received, (suggest 1K ohm resistor for current limitation)
26	CS	I	module sleep pin operates at high level for normal function and low level for sleep mode. It has an internal pull-up resistor, defaulting to high level

10. Reset Timing Diagram

➢Power-on Reset Timing Diagram



➢Operating State Reset Timing Diagram



11. Communication protocol

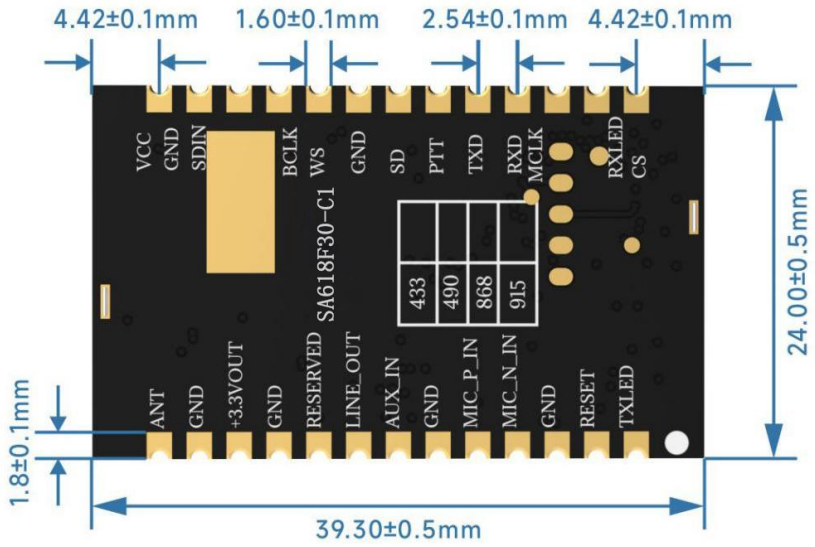
The wireless audio module can be configured or controlled by serial command :

The format is : 115200, 8, N, 1 Baud rate : 115200 Parity checking: none

All commands start with '0xAA 0xFA', Ended with '0x0d 0x0a'

*Details please refer to " *SA618 communicaton protocol* ".

12. Dimensions (Unit:mm)



Thickness：3.2mm

13. Product order information

Product Number	Description
SA618F30-C1-U	Working frequency range410~480MHz
SA618F30-C1-XXX	Customizable XXX MHz

Appendix :SMD Reflow Chart

