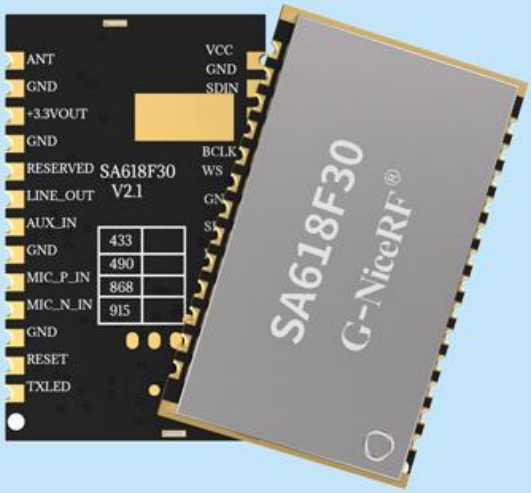
Full Duplex Wireless Audio & SMS

Mesh Network

OTA

1W & Long Range & Smail Size

Product Specification



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Contents

Note:Revision History

Revision	Date	Comment
V1.0	2023-7	First release
V1.1	2024-10	Modify the cover, product features

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1. Overview

SA618F30 is a 1W & long range & embedded & full duplex transmission module, combining wireless digital and wireless audio.

Users can not only wirelessly transmit data through serial ports, but also achieve wireless transmission of voice through I2S or analog audio interfaces.

The module is equipped with a high-speed micro-controller, high-performance RF chip, and high quality voice Codec, and adopts broadband spread spectrum technology. The characteristics are low power consumption, long distance, and flexible frequency adjustment.

SA618F30 support maximum 8 channels transmission and reception functions at the same time, as well as maximum 3 level routers for mesh network.

This module adopts a highly integrated design, and users only need to connect audio amplifiers, microphones, and speakers externally to easily achieve remote wireless transmission.

SA618F30 achieve full duplex through serial port for data transmission.

SA618F30 supports (OTA) air upgrade or serial upgrade. The parameters of the wireless module can be set easily by PC software or serial command.

SA618F30 is strictly produced and tested using lead-free technology, meeting RoHS and Reach standards.

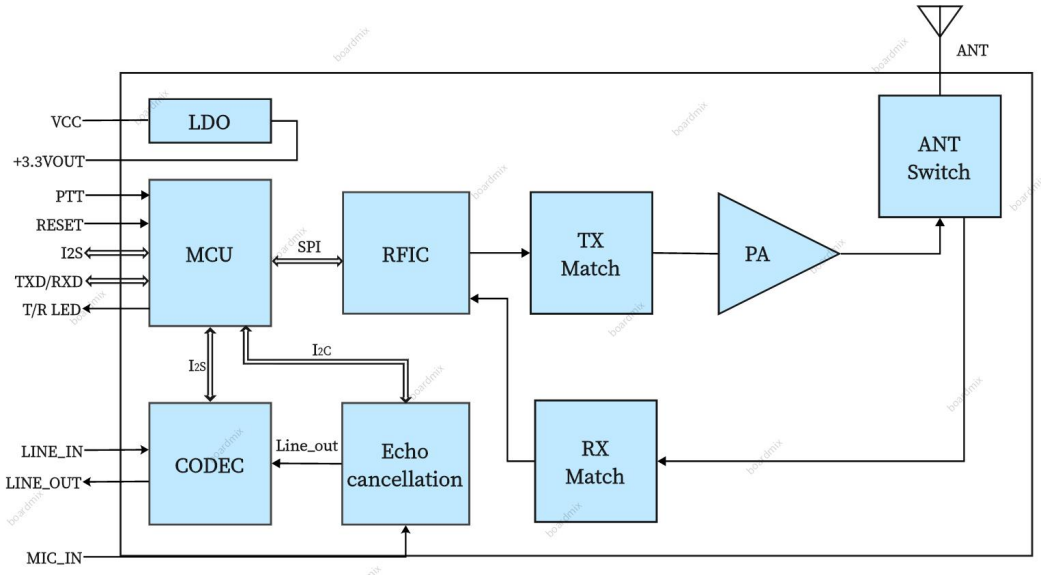
2. Features

- 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
- 3KM transmission distance in the open area
- High Receiving sensitivity：-117 dBm
- High integration and small size

3. Applications

- Fire emergency communication
- Metro, Tunnel communication
- Riding intercom system
- 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

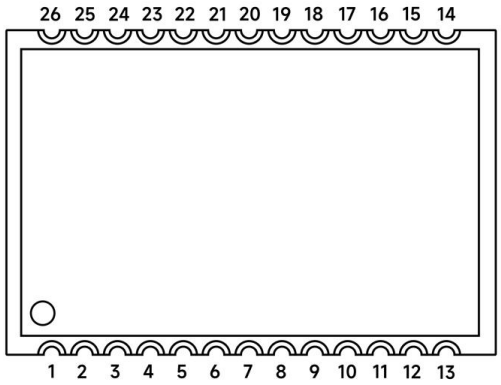
4. Block Diagram



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
	@8Ω,1W audio output				
TX current	4v,@30dBm		450	550	mA
RF parameter					
Operating frequency	UHF	410		490	MHz
Customizable frequency		150		960	MHz
Default frequency value for 16 channels	UHF (1MHz interval)	440.125		455.125	MHz
Transmit power	@5V	16		32	dBm
Bandwidth（BW)			500		KHz
Receiving sensitivity			-117		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
Delay parameters	2 channels	80	100	120	ms
	3 channels	120	160	180	ms
	4 channels	160	200	240	ms
	6 channels	240	300	360	ms
	8 channels	320	400	480	ms

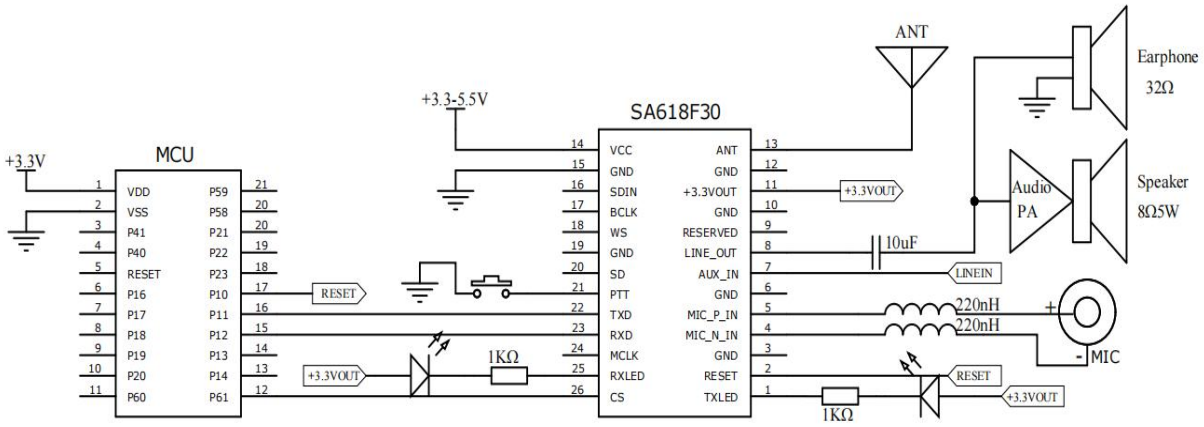
6. Pin definition



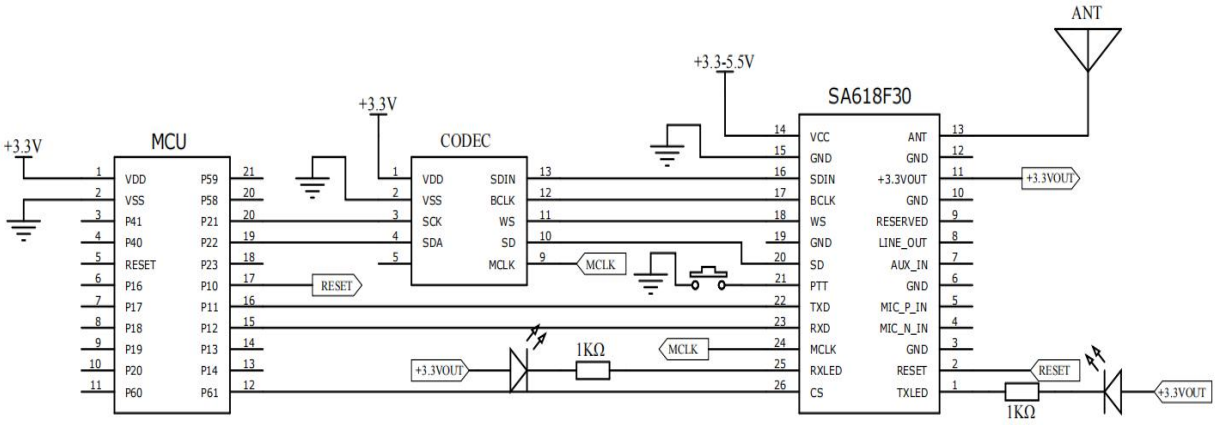
Pin NO.	Pin name	I/O	Description
1	TXLED	O	Transmitting indicator, connected with external led, turn on by low level output when data or voice is transmitting, (suggest 1K ohm resistor for current limitation)
2	RST	I	Module reset pin, externally pull down for more than 5ms will reset the module
3, 6, 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	Line in & Microphone input
8	LINE_OUT	O	Connected with 16 Ω earphones
9	Reserved		NC
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	Press to talk, pull down to enter transmission mode, pull high or leave open to enter receive mode, pull-up internally,
22	TXD	O	Serial communication
23	RXD	I	Serial communication
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	Floating input, low level to enter sleep

7. Typical application circuit

➢Analog input & output application circuit

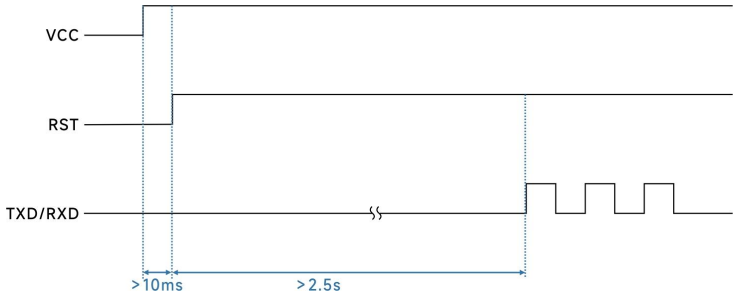


➢I2S Input & output application circuit

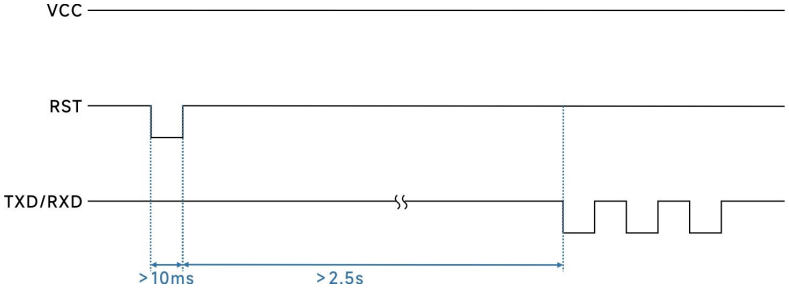


8. Reset time chart

➢Power on Reset time chart



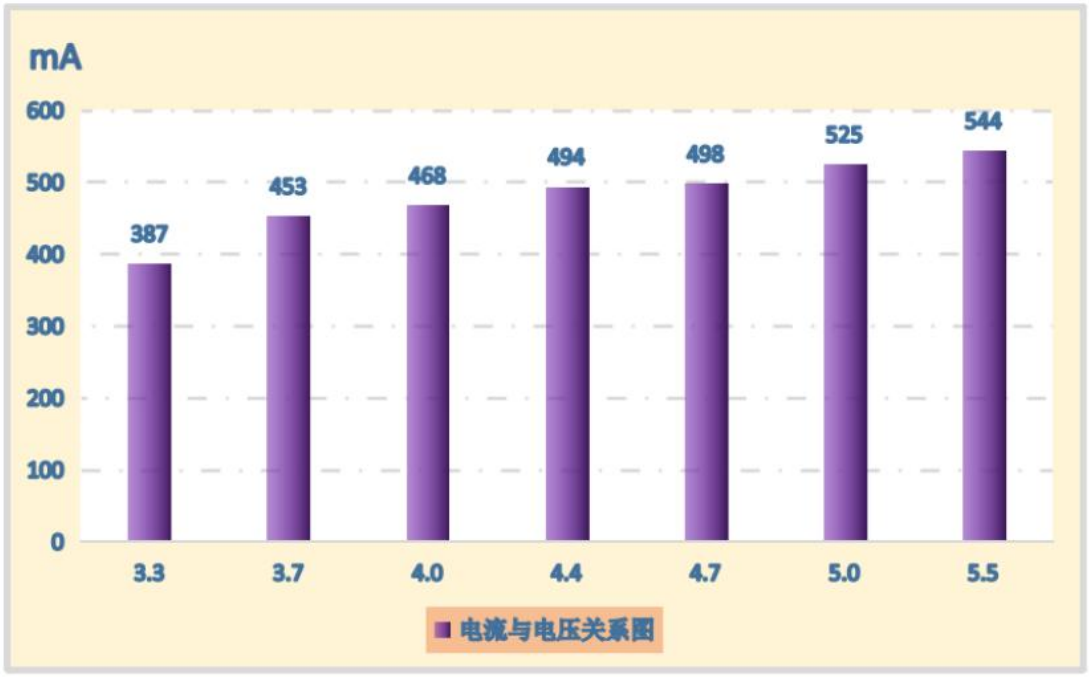
➢Reset time chart from working mode



9. Parameters list

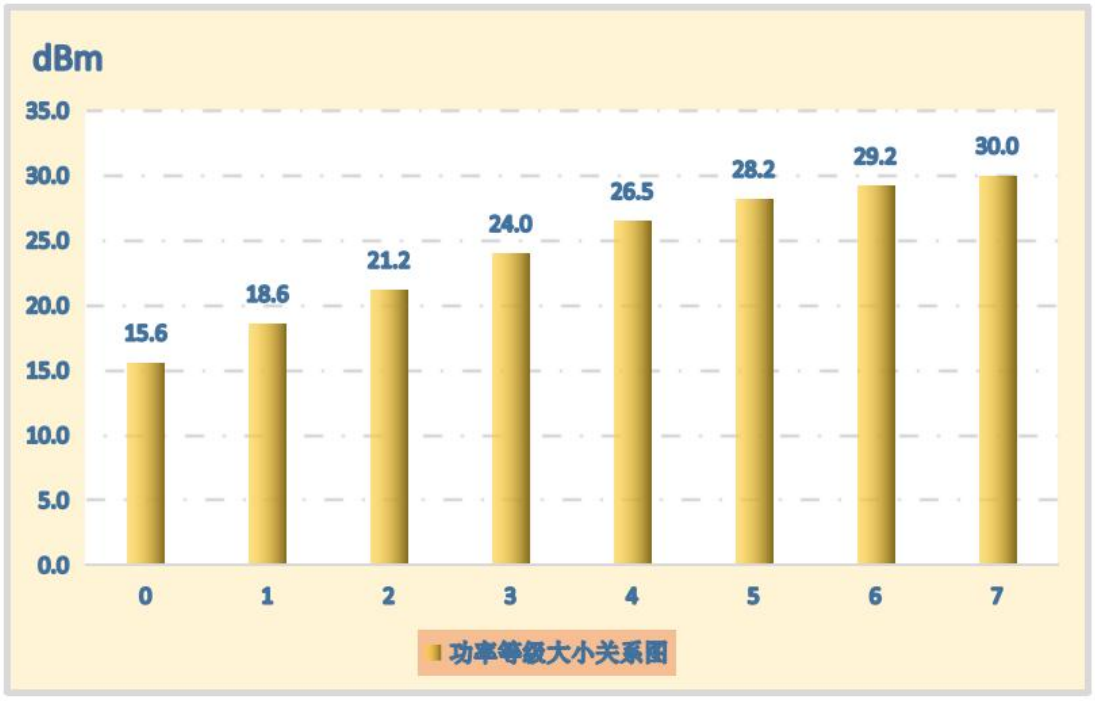
➢ Output power and current & voltage (power supply) @ power level = 7

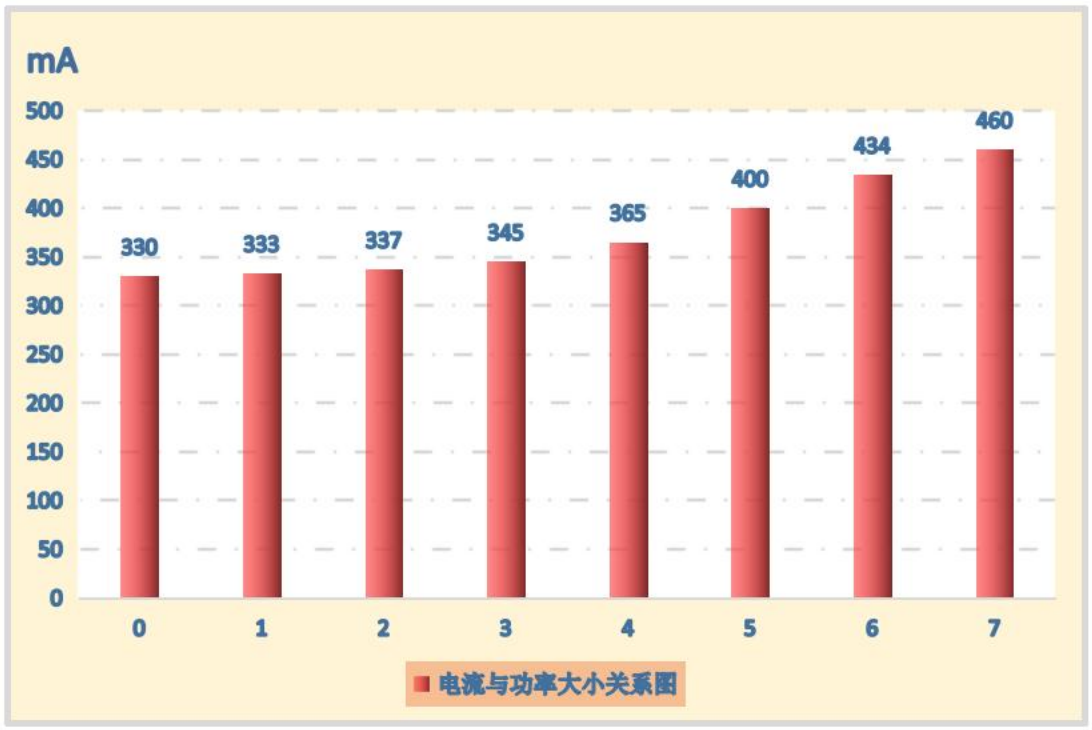
@433MHz, @ power level = 7	VCC (V)	3.3	3.7	4.0	4.4	4.7	5.0	5.5
	output power (dBm)	28.3	29.6	30.1	31.0	31.4	31.8	32.4
	Current (mA)	387	453	468	494	498	525	544



➢ Output power & power level setting:

Power Level		0	1	2	3	4	5	6	7
@433MHz @4V	Output power (dBm)	15.6	18.6	21.2	24.0	26.5	28.2	29.2	30.0
	Current mA)	330	333	337	345	365	400	434	460





10. Communication protocol

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

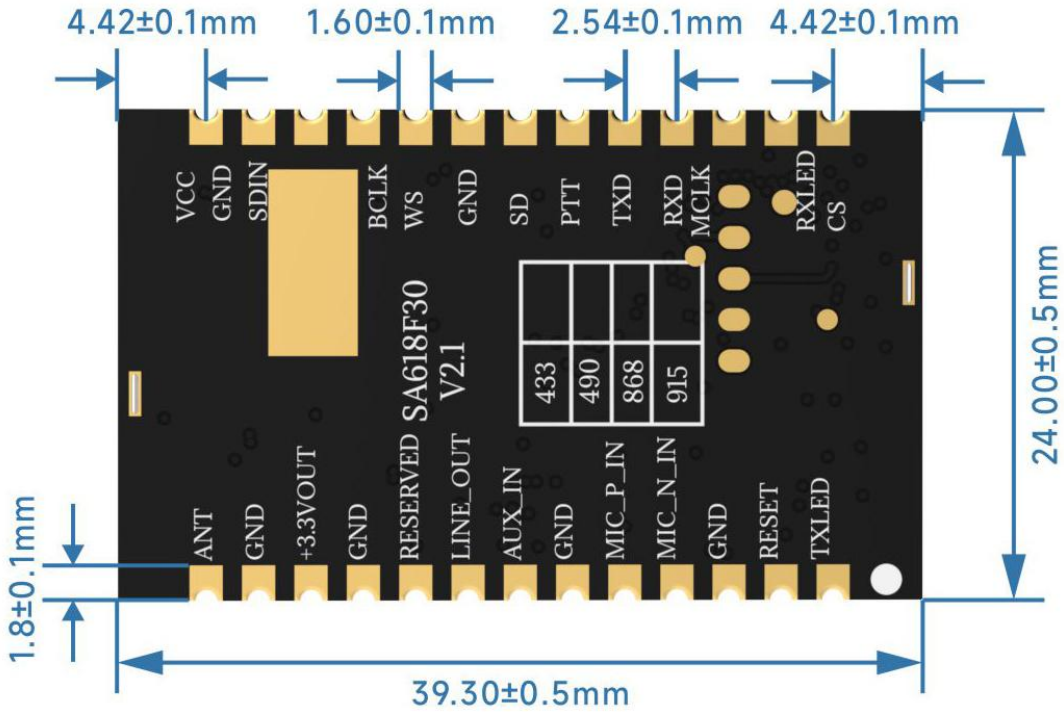
The format is : 115200, 8, N, 1 Baud rate : 115200 Parity checking: none

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

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

11. Dimensions (Unit:mm)

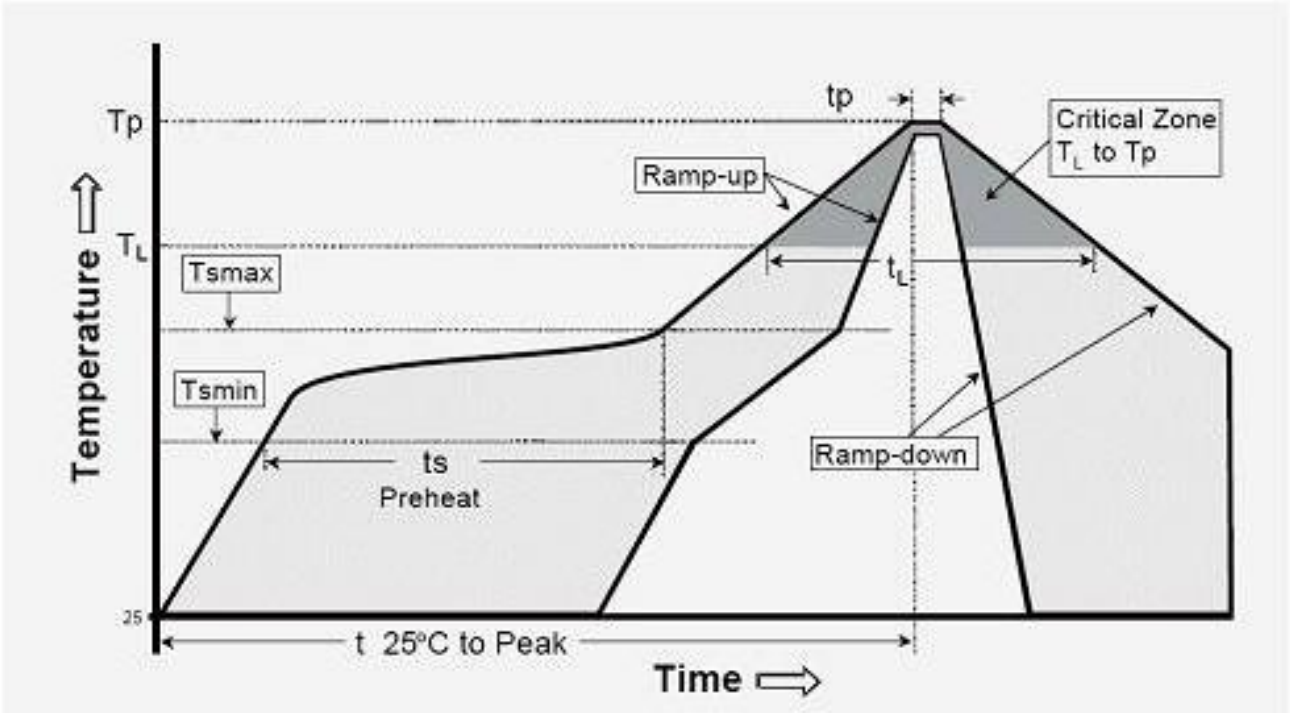
Thickness : 3.2mm



12. Product order information

Product Number	Description
SA618F30-U	Working frequency range420~510MHz
SA618F30-XXX	Customizable 150~960 MHz

Appendix :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℃