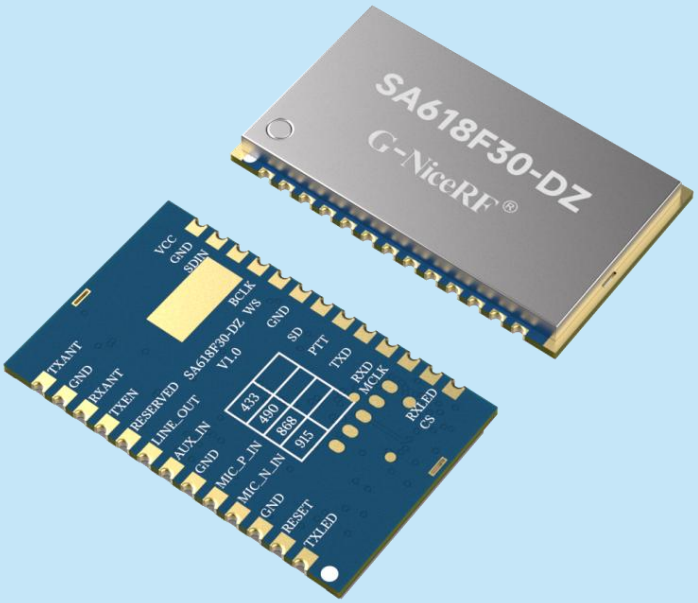
- 1W　8-channel full-duplex data and voice transceiv
- Mesh Network supporting concurrent
- I2S digital audio + analog audio.
- Dual-antenna design.

Product Specification



Catalogue

Note:Revision History

Revision	Date	Comment
V1.0	2023-11	First release
V1.1	2024-11	Modify the cover

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1. Overview

The SA618F30-DZ is based on our company's SA618F30 module, with a design that separates the transmission and reception antennas. Additionally, the TXEN pin is externally extended, making it more convenient for customers to add an external radio frequency power amplifier. This allows for higher transmission power and enhanced communication distance. The module integrates a high-speed microcontroller, high-performance RF transceiver chip, and RF power amplifier. It also provides a standard serial port for communication with the module, enabling easy and quick setting of relevant parameters and control of the transceiving functions. By simply connecting an audio amplifier, microphone, and speaker to this module, it can function as a compact walkie-talkie. The simplified interface and ultra-small size of the module allow for its wide application and easy integration into various handheld devices, thereby improving the overall performance of the end product.

The SA618F30-DZ is strictly manufactured and tested using lead-free processes, complying with RoHS and Reach standards.

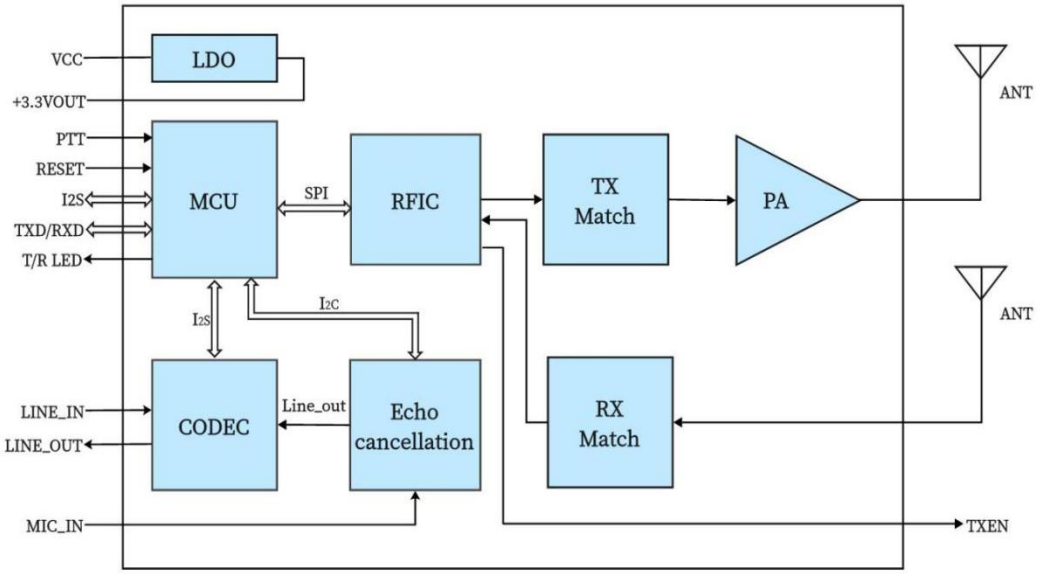
2. Features

- 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

- High-end Full-duplex Walkie-talkie
- Conference Telephone System
- Headset Walkie-talkie
- Security for Special Scenarios
- Building and Residential Area Security Systems
- Special Occupation Communication 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		480	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. 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

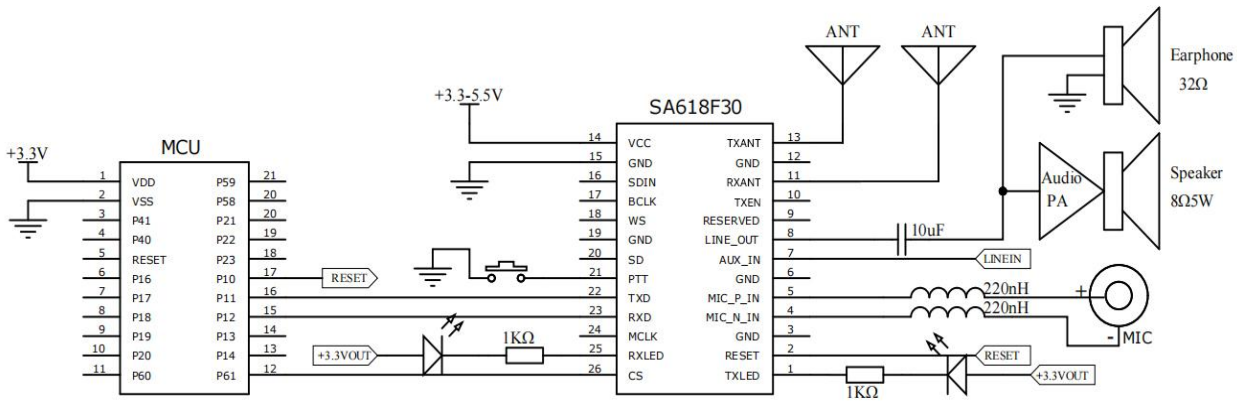

Property Security


Subway Communication

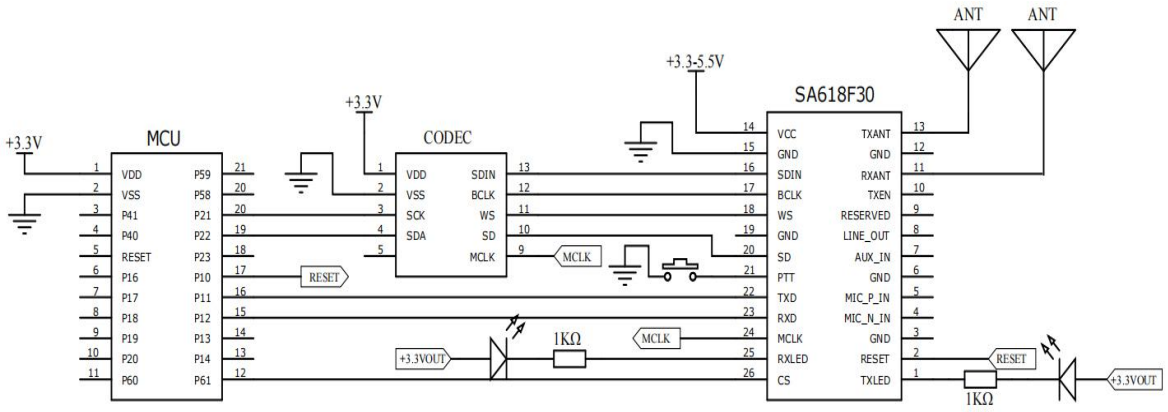

Emergency Rescue

7. Typical application circuit

- Analog input analog output application circuit



- I2S input and output application circuit



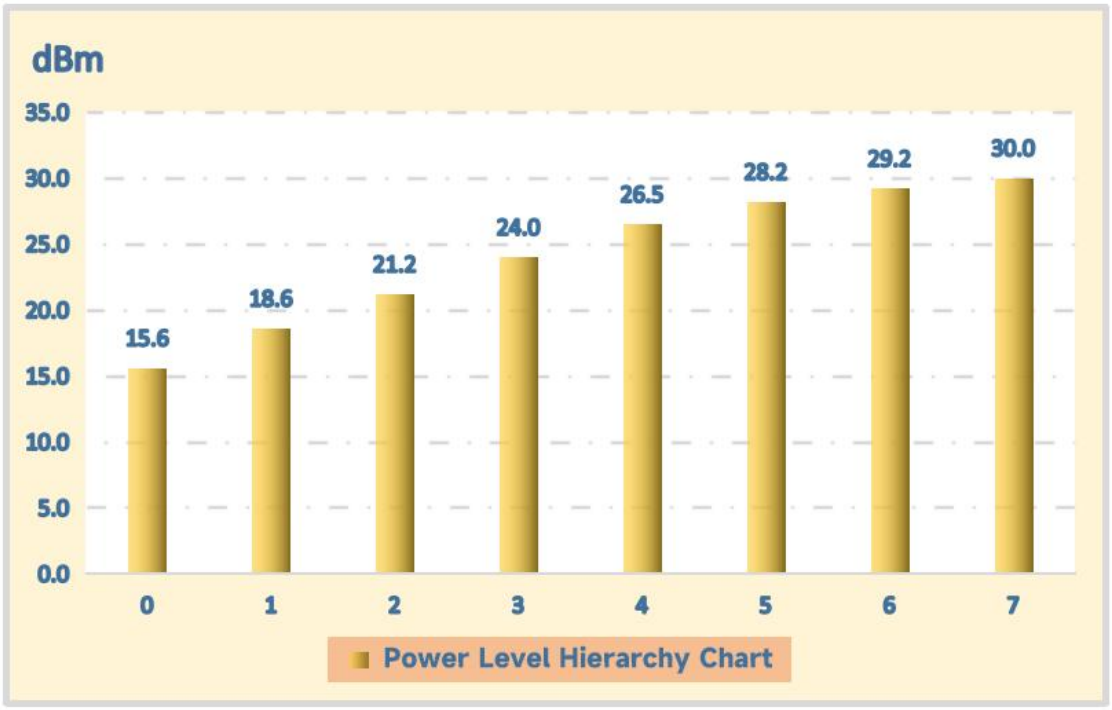
8. Parameters list

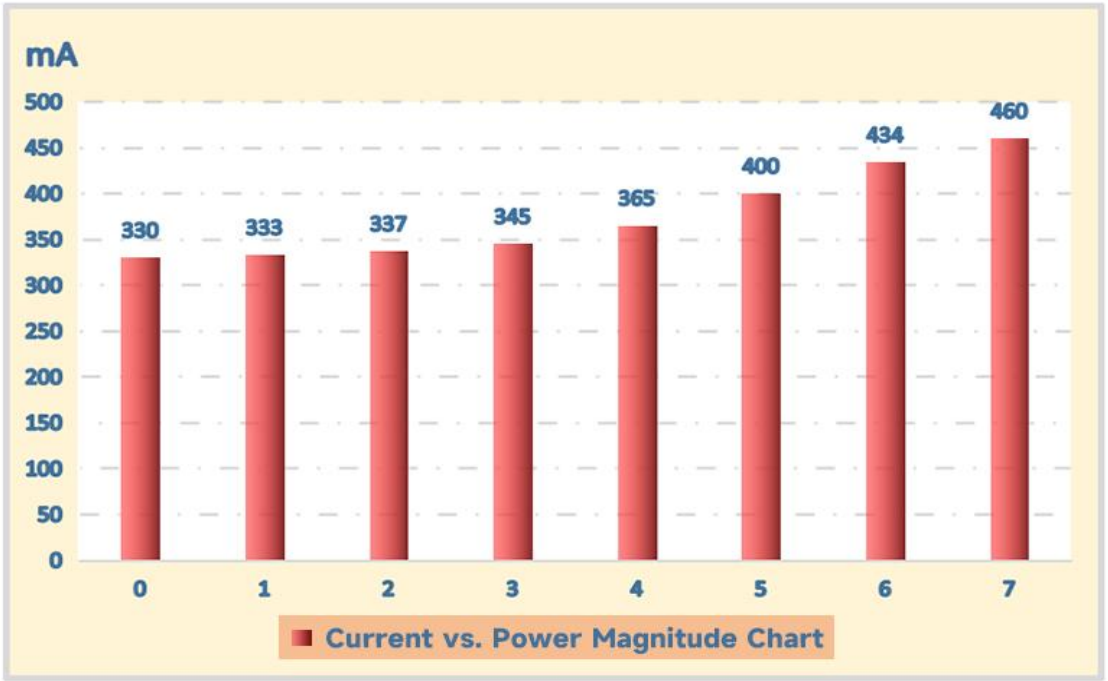
➢ The Relationship between Module Supply Voltage, Power, and Current (@433MHz)

@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

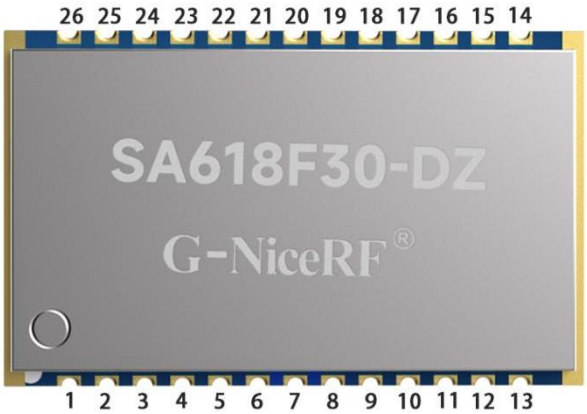
➢ Power Level Reference Table (@4.0V @433MHz)

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





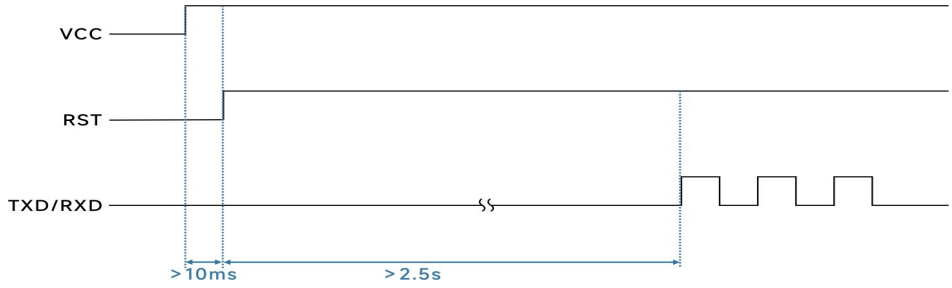
9. Pin definition



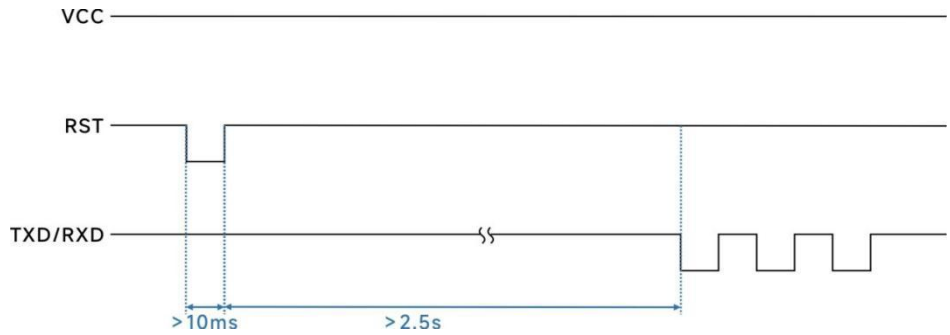
Pin NO.	Pin name	I/O	Description
1	TXLED	O	Transmitting indicator, connected with external led, turn on by low level output when data or voice is transmitting, (suggest 1K ohm resistor for current limitation)
2	RESET	I	Module reset pin, externally pull down for more than 5ms will reset the module
3,6,10, 12,14,15,19	GND		Connect to power negative
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
10	TXEN	O	Transmit enable pin, outputs high level (3.3V) when transmitting, low level when receiving
11	RXANT	O	RF signal input for reception, connect to 50-ohm antenna
13	TXANT	O	RF signal output for transmission, connect to 50-ohm 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

10. Reset time chart

➢Power on Reset time chart



➢Reset time chart from working mode



11. Communication protocol

The module provides a user-friendly interface (standard serial port), allowing users to control the module and read its parameters through serial port commands.

Command Sending Format:

- All commands start with "0xAA 0xFA".
- Once the module is operational, the standard settings for the communication serial port are:
- Baud rate: 115200 bps
- Data bits: 8 bits
- Stop bits: 1 bit
- Parity: None

Command Return Format:

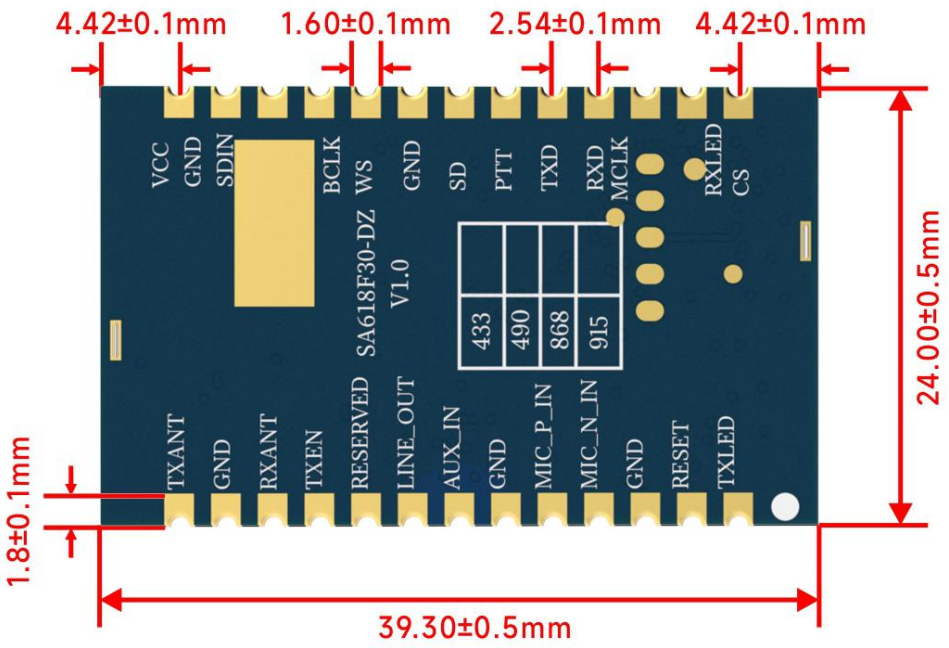
- Inquiry commands: Return a string related to the command.
- Setting commands: Successful execution returns "0x4F 0x4B 0x0D 0x0A"; failure returns "0x45 0x52 0x52 0x4F 0x52 0x0D 0x0A".

Frame Format Definition:

- All commands in the communication protocol are transmitted in hexadecimal HEX code.
- Communication with the module from the terminal is in the form: 0xAA 0xFA + CMD + <parameter>.

12. Dimensions (Unit:mm)

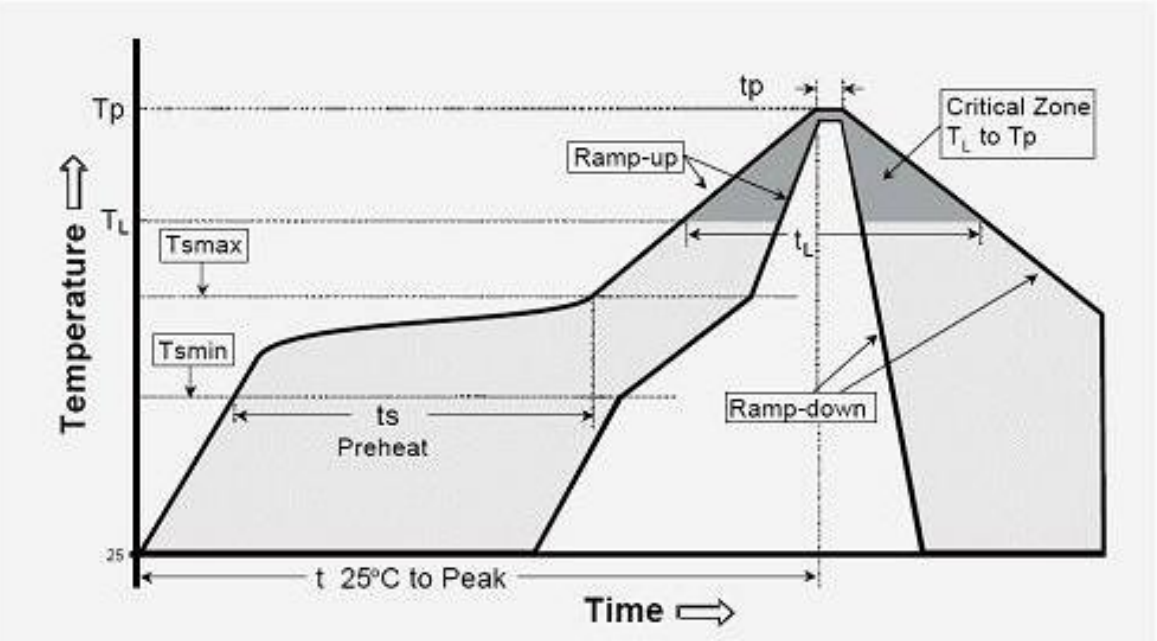
Thickness : 3.2mm



13. Product order information

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