

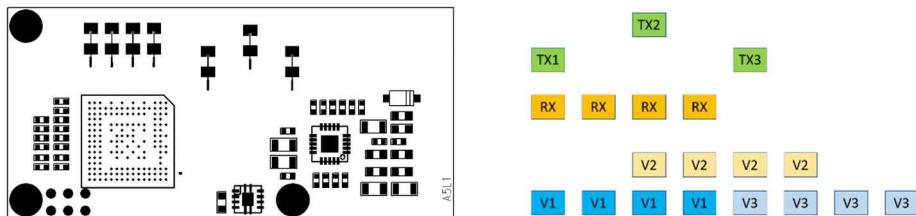
A5L2 60GHz Radar

Specification

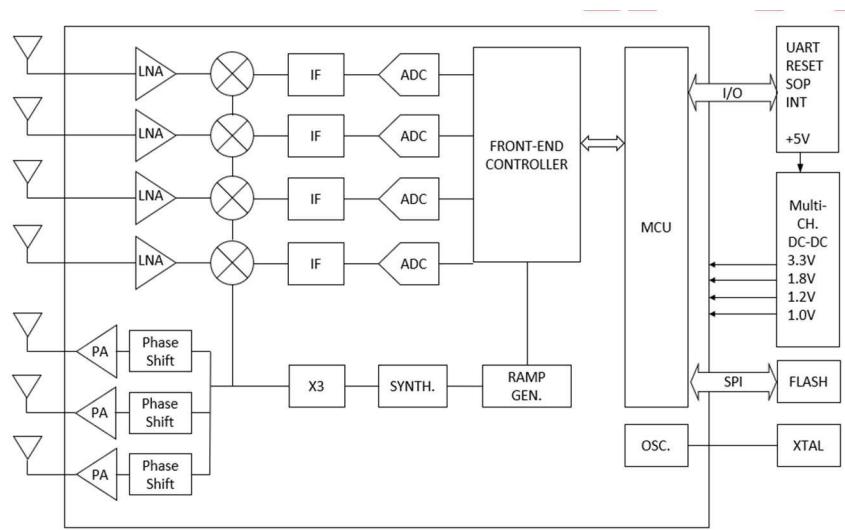
1. Device Overview

1.1 Antenna Configuration

3 transmitter and 4 receiver antenna config to 1X8 horizontal virtual antennas and 1X2 vertical virtual antenna array for 3D object detection.



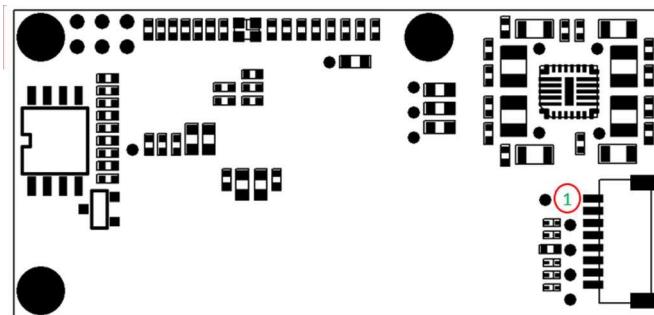
1.2 Block Diagram



2. Pin Assignment and Function Description

2.1 Connector Type

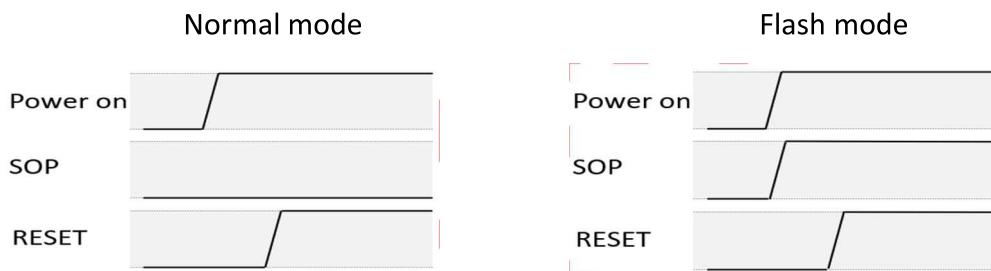
Pin Header 1X8 pitch 1.0mm



2.2 Pin Assignment

No.	Name	Type	Description	Note
1	VCC	P	+5V DC in Max. 500mA	
2	GND	P	Power	
3	UARD_TXD	O	Radar data out	115200bps
4	UARD_RXD	I	Command in	115200bps
5	GND	P	Power	
6	INT	O	Interrupt	3.3V output
7	/RST	I	Radar reset.	Low active.
8	MODE	I	Low : Normal boot High : upgrade mode	

2.3 Operating mode I/O Sequences



3. Specifications

3.1 Absolute Maximum Ratings

Item	Description	Min.	Max.	Unit
VCC	DC power in	-0.3	6	V
ESD	Human-body model (HBM)		± 2000	V
	Charged-device model (CDM)		± 5000	V
Voltage on logic pin (I/O pin)	UART, RESET, INT, MODE	-0.3	3.6	V

3.2 Normal Operating Specification

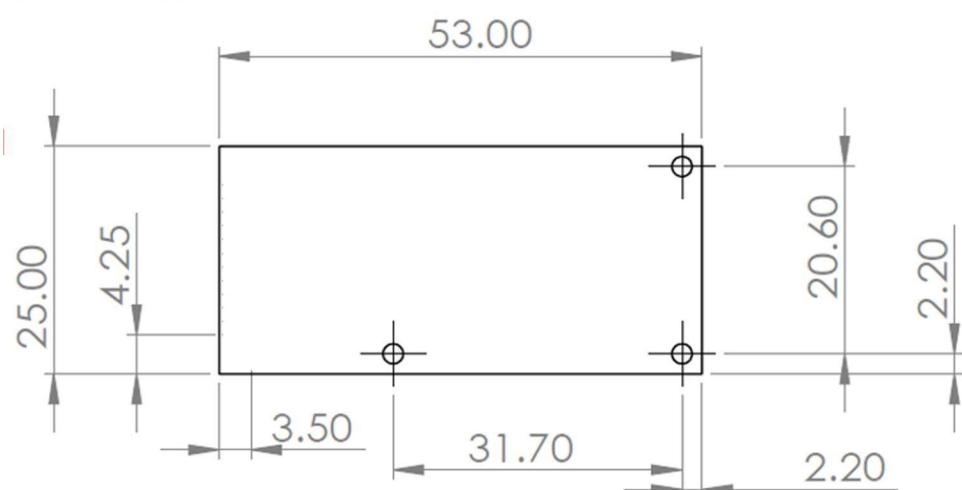
Item	Description	Min.	Typ.	Max.	Unit
Operating voltage			5		volt
Operating current	Chirp on			500	mA

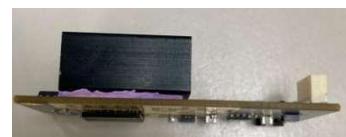
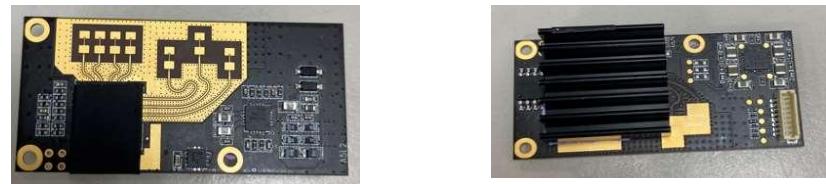
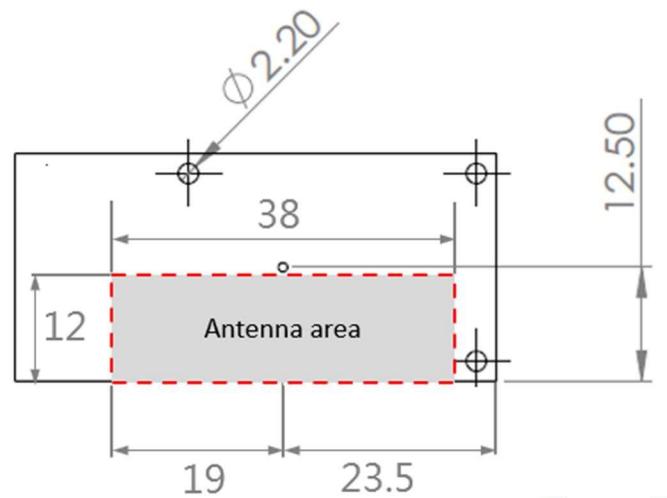
A5L2 mmwave
60GHz Radar Specification

Item	Description	Min.	Typ.	Max.	Unit
Radar modulation	FMCW				
Frequency range		60	64	GHz	
RF output power			-6.25		dBm
Antenna No.	3 transmitter, 4 receiver				
Antenna configuration	8 (H) x 2 (V)				
Antenna Type	Patch				
Antenna FOV	120 X 50 degree (H x V)				
Antenna gain		4.8			dBi
Phase noise @ 1 MHz			-92		dBc/Hz
Receiver	Noise figure		14		dB
	IF bandwidth		10		MHz
	AD sampling rate (real)		25		<sps
	AD sampling rate (complex)		12.5		Msps
	AD resolution	12			Bits
	Idle channel spurs		-90		dBFS
Connector type	1x8 pin header, pitch 1.0mm				
Operating temperature		-10	60		°C
Storage temperature		-40	70		°C
Operating humidity		10	85		%RH
Storage humidity		5	90		%RH
Dimension	53 x 25 x 10 mm				
Weight (± 0.2 g)	With heat sink		10.5		g

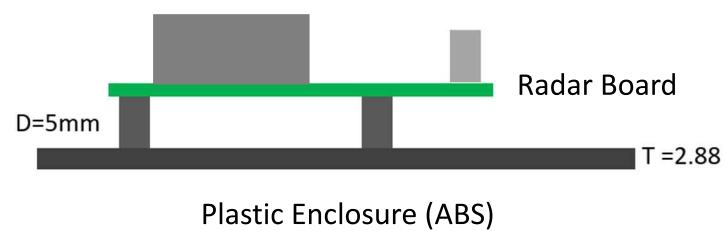
3.3 Mechanical Specification

Dimension





3.4 Installation Guide



3.5 Package

Each PCB packed by anti-static bag.

Each hardcover box packs 12 pcs anti-static packed PCB.



4. Version History

2023/03/10	First version	
2023/6/19	Addition of heat sink	230619
2023/6/27	Change new heat sink, Wight with heat sink	230627

FCC Statement:

Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

(1) Antenna used

Antenna Type: Integrated Patch Antenna

Gain: 4.8dBi for each antenna

Thickness: 0.8mm

Length: 1.6mm

Width: 1.2mm

Dielectric loss tangent: 0.02

Impedance: 50 Ohm

(2) Labelling Instruction for Host Product Integrator

Please notice that if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. For FCC, this exterior label should follow "Contains FCC ID: 2BBQXA5L2". In accordance with FCC KDB guidance 784748 Labeling Guidelines.

§15.19 and RSS-Gen Labelling requirements shall be complied on end user device. Labelling rules for special device, please refer to §2.925, § 15.19 (a)(5) and relevant KDB publications. For E-label, please refer to §2.935.

(3) Installation Notice to Host Product Manufacturer

The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.

The module is limited to installation in fixed application, a separate approval is required for all other operating configurations, including portable configurations with respect to §2.1093 and difference antenna configurations.

(4) Antenna Change Notice to Host manufacturer

If you desire to increase antenna gain and either change antenna type or use same antenna type certified, a Class II permissive change application is required to be filed by us, or you (host manufacturer) can take responsibility through the change in FCC ID and IC ID (new application) procedure followed by a Class II permissive change application.

(5) FCC other Parts, Part 15B Compliance Requirements for Host product manufacturer

This modular transmitter is only FCC authorized for the specific rule parts listed on our grant, host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.

Host manufacturer in any case shall ensure host product which is installed and operating with the module is in compliant with Part 15B requirements.

Please note that For a Class B or Class A digital device or peripheral, the instructions furnished the user manual of the end-user product shall include statement set out in §15.105 Information to the user or such similar statement and place it in a prominent location in the text of host product manual. Original texts as following:

For Class B

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

For Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

(6) Limited module procedure

The module doesn't have its own RF shielding, The host should provide the RF shielding to the modular, which belong to Limited module.

Standard requires: Clear and specific instructions describing the conditions, limitations and procedures for third-parties to use and/or integrate the module into a host device (see Comprehensive integration instructions below).

Resolve: Supply example as follows:

Installation Notes:

- 1)Power supply for the limited module with FCC ID: 2BBQXA5L2 is DC 5V, when you use product with this module design, the power supply cannot exceed this value.
- 2)When connect the module to the host device, the host device must be powered off.
- 3)Make sure the module pins correctly installed.
- 4)Make sure that the module does not allow users to replace or demolish.

Restrictions

- 1.This equipment is prohibited to be used on satellite equipment.
- 2.The equipment is field disturbance sensor and fixed installation. It is prohibited to use it on the vehicle radar systems.
- 3.This equipment is prohibited to be used on the aircraft.