
FCC Information

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with minimum distance 50cm between the radiator & your body.

RF Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

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.

- **Warning:** Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

User Manual of the Mid-Range Radar Product



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HIRAIN TECHNOLOGIES

HiRain Technologies Co., Inc

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1 Introduction

1.1 Purpose

This document is the introduction of the forward medium-range millimeter wave radar which is designed and produced by HiRain Technologies Co., Inc.

1.2 Scope

This document is only the reference for users of millimeter wave radar products of HiRain Technologies Co., Inc.

1.3 Abbreviations

MRR: Mid-Range Radar

FCW: Forward Collision Warning

AEB: Autonomous Emergency Braking

ACC: Adaptive Cruise Control

FOV: Field of View

2 Production

The forward mid-range millimeter-wave radar is installed in front of the vehicle for obstacles detections, target parameters estimation, target tracking, and target recognition. Forward radar primarily supports autonomous driving systems of L2 applications and above, such as FCW, AEB, and ACC.

2.1 FOV

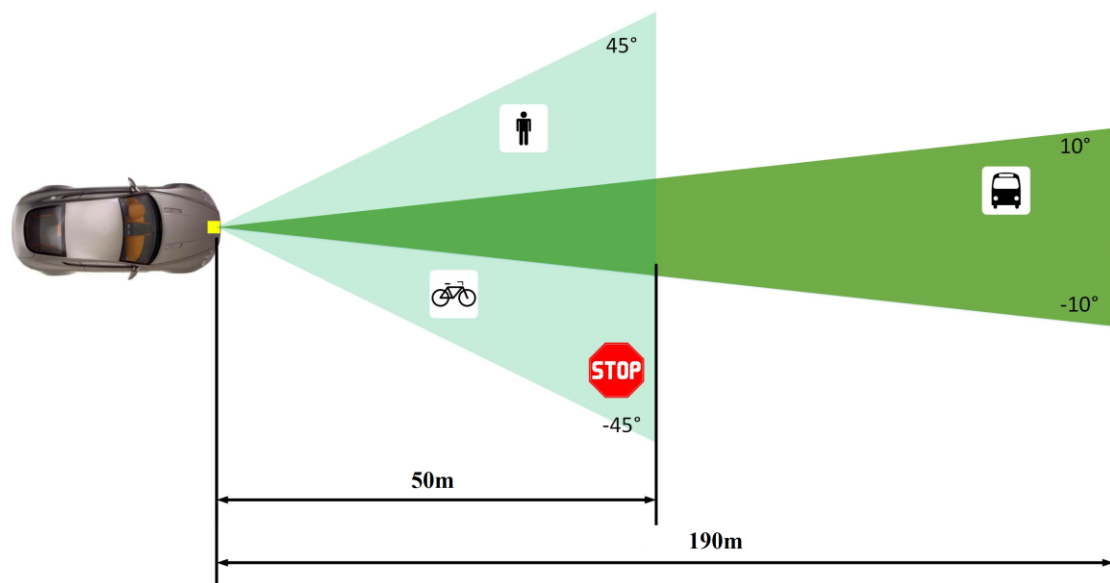


Fig.1 Radar Field of View

2.2 Specification

Table.1 MRR specifications

Item	Specification
Frequency Range	76~77 GHz
Weight	120g
Update Rate	50ms
Field of View	Horizontal FOV: $\pm 10^\circ$ (medium range) / $\pm 45^\circ$ (near range) Vertical FOV: $\pm 9^\circ$
Range Scope	0.5~190m (medium range) / 0.5~50m (near range)
Relative Velocity Scope	-60 ~50 m/s
Range Precision	± 0.1 m
Velocity Precision	± 0.05 m/s
Angle Precision	$\pm 0.5^\circ$
Power Dissipation	< 5W
Supply voltage	12V
Operating Temperature	-40~ 85 °C
Storage Temperature	-40~ 105 °C
Dustproof and Waterproof Level	IP6K7K
Connector	2xCAN/CAN-FD

2.3 Structure

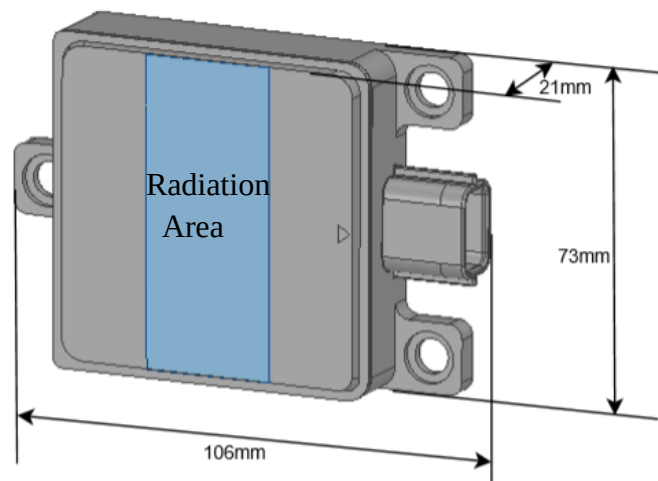
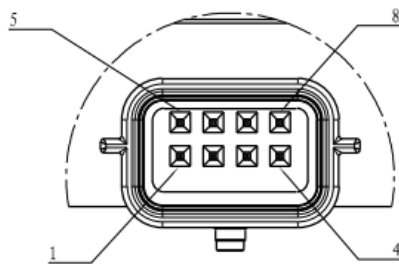


Fig.2 Structure Figure

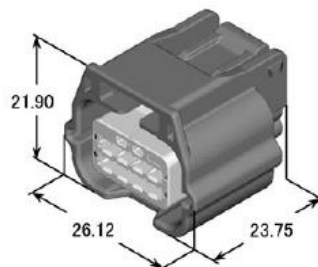
2.4 Connector Type

Table.2 Connector Type

Connector	Type	Supplier
8P Connector	7283-8855-30	YAZAKI
Terminal block	7116-4415-02	YAZAKI
Plug	7158-3165-90	YAZAKI



(a) PCB Terminal Connector



(b) Wire Terminal Connector



Fig.3 Connector Diagram

2.5 Definition of Connector Pin

Parameters in the following table are measured at voltage 12V.

Table.3 Definition of Connector Pin

Pin	Function	Signal Type	Current(A)	Maximum Current & Duration(A/ms)
1	GND	Ground	0.2	600mA/25ms
2	CAN2_H	CAN Communication	NA	--
3	CAN1_L	CAN Communication	NA	--
4	CAN1_H	CAN Communication	NA	--
5	POWER	Power(KL15)	0.2	600mA/25ms
6	CAN2_L	CAN Communication	NA	--
7	NC	Reserved	NA	--
8	NC	Reserved	NA	--

2.6 Installation

There are three locating holes on the lower shell of the radar, which are installed on the bracket of the vehicle through three M6 bolts; There is a main positioning column and an auxiliary positioning column outside the housing of the radar, which can achieve accurate positioning . The installation position and orientation are shown in the following figure

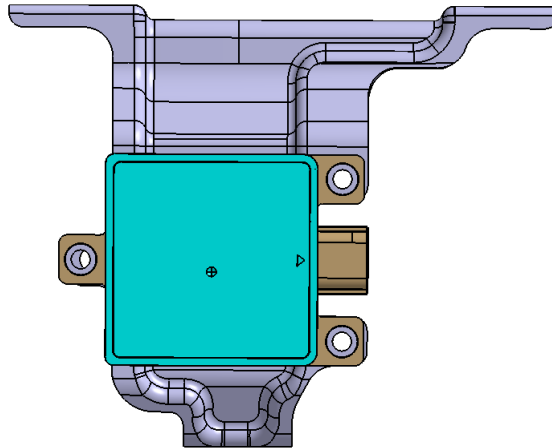


Fig.4 installation position and orientation

2.7 Using the radar

The radar starts working when it is powered on. No configuration parameters is required.