Negative Ion Module Specification

Model: Q05

Version: V1.0

Issue Date: 2021-11-25

Approved **Approve**	**Reviewed** **Check**	**Prepared** **Prepare**

XIAMEN MAXMAC AIR TECHNOLOGY CO., LTD.

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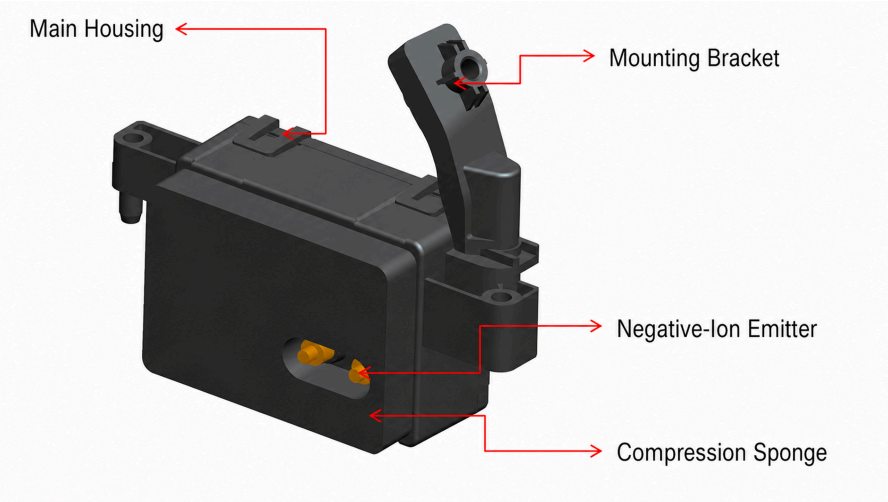

Figure 1-1 Product Rendering

> **Product callouts:** main housing; mounting bracket; negative-ion carbon-brush emitter; compression sponge.

2 Negative Ion Module Parameters

Table 1-1 Negative Ion Module System Parameter Table

Item	Test Condition	Parameter	Unit
Rated Voltage		12	V
Operating Voltage		9–16	V
LIN Communication Voltage		8–18	V
Operating Current	DC 12 V operating voltage	≤70	mA
Standby Current	DC 12 V operating voltage	≤5	mA
Output Voltage	DC 12 V operating voltage	±3,000 to ±4,000	V
Negative Ion Output	Air speed 3 m/s; tested 20 cm from carbon brush; DC 12 V operating voltage	2×10^6 to 5×10^6	pcs/cm³
Ozone Limit	DC 12 V operating voltage	≤0.05	ppm
Operating Humidity		35–85%	RH
Operating Temperature		−30 to 85	°C
Storage Temperature		−30 to 90	°C

Table 1-2 LIN Bus Parameters and Interface Definition

Item	Definition / Description
Node Type	Slave node
Baud Rate	19.2K
Deviation	±1.5%
Transceiver Model	TJA 1028 / NXP
External Pull-Up Resistor	None
Internal Pull-Up Resistor of Transceiver	30 kΩ

3 System Block Diagram

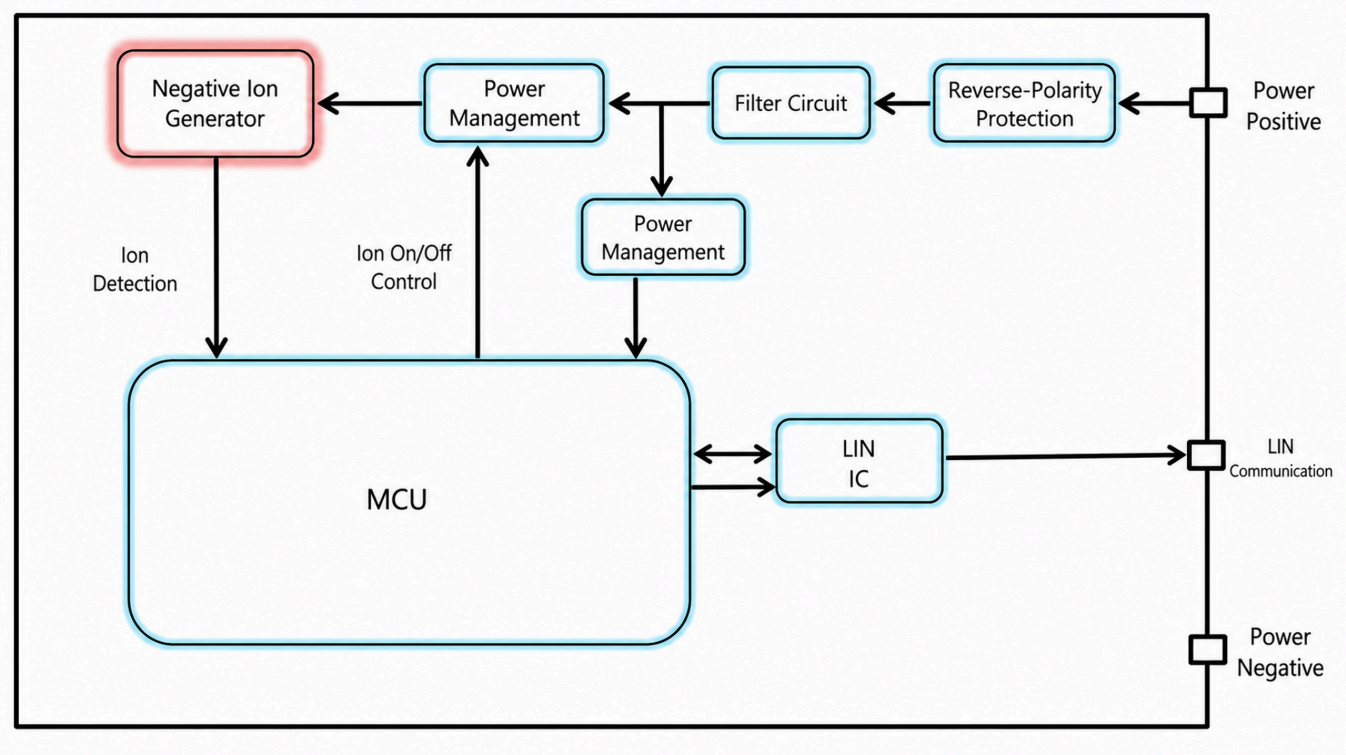

Figure 3-1 System Block Diagram

English diagram legend: power positive → reverse-polarity protection → filter circuit → power management → negative-ion generator. Power management supplies the MCU; the MCU controls ion on/off and receives ion-detection feedback. The LIN IC provides bidirectional LIN communication. Power negative is the system ground.

4 Communication Connector Information

4.1 Connector Port and Pin Definition

The product connector port view and pin definition are shown below. The connector used for this test is a JAE connector.

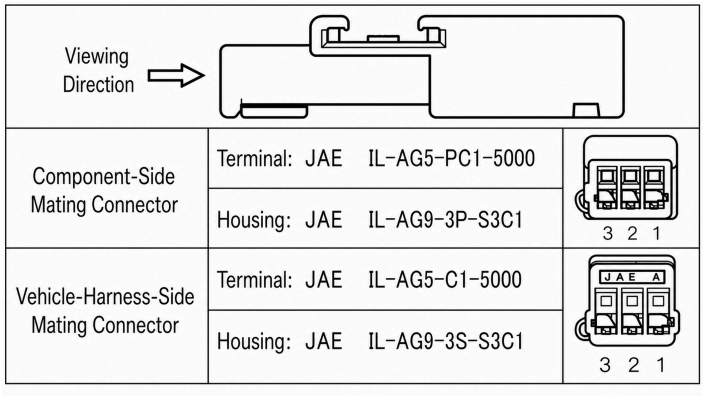

Figure 4-1 Connector Port View

> **Connector-view legend:** viewing direction; mating connector on the component side; mating connector on the vehicle-harness side. The figure identifies JAE IL-AG5-PC1-5000 terminals and JAE IL-AG-3P-S3C1 / IL-AG9-3S-S3C1 housings.

Pin No.	Signal Name	Input / Output	Valid Level	Harness Type	Signal Function Description
1	Power	In	+9 V / +16 V	Single wire	Power positive
2	LIN	In / Out	LIN	Single wire	LIN signal
3	GND	Out	/	Single wire	Ground

Note: harness types include single wire, twisted pair, and shielded wire.

4.2 Connector Housing

Connector housing model: JAE IL-AG-3P-S3C1

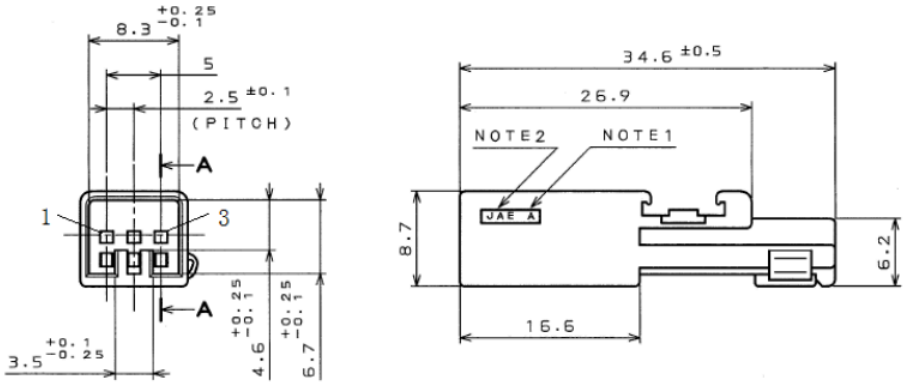

Figure 4-2 Communication Connector Housing

4.3 Connector Terminal

Connector terminal model: JAE IL-AG5-PC1-5000

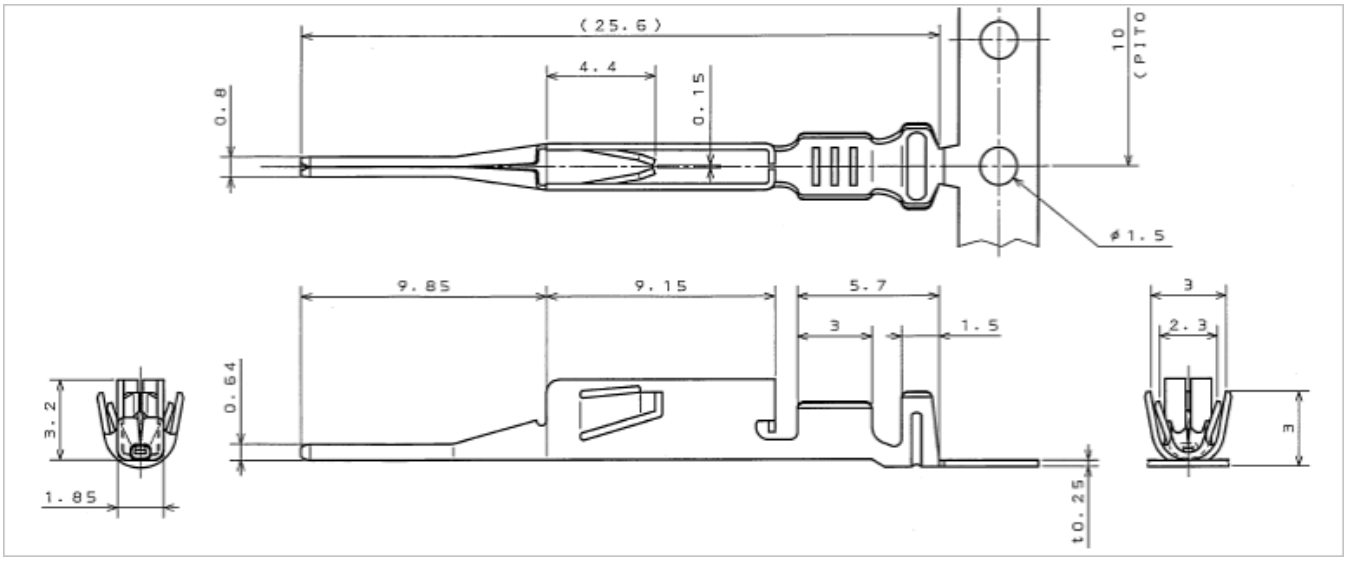

Figure 4-3 Communication Connector Terminal

5 Negative Ion LIN Communication Protocol

5.1 Master Node Transmission

Control ID: 0x01
DLC = 8
Cycle: 100 ms

	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0								
Byte1								
Byte2								
Byte3								
Byte4								
Byte5								
Byte6								
Byte7								Ion operation

Ion operation command: 0x0 Off; 0x1 On; 0x2 Sleep; 0x3 Reserved.

5.2 Diagnostic Transmission

Diagnostic ID: 0x13
DLC = 8
Cycle: 200 ms

	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Reserved	Reserved	Reserved	Reserved	Communication status		Standby / running	Ion module status
Byte1								
Byte2	Reserved							
Byte3	Reserved							
Byte4	Reserved							
Byte5	Reserved							
Byte6	Reserved							
Byte7	Reserved							

Communication status: 0x0 Communication normal; 0x1 Communication abnormal.

Standby / running: 0x0 Standby; 0x1 Running.

Ion module operating status: 0x0 Normal; 0x1 Abnormal; 0x2 Short circuit; 0x3 Open circuit.

Note: this LIN communication protocol was prepared according to the **NL-5 Project LIN Communication Matrix AC-PM2.5-ION-VCU-PTC-ACCM** provided by Geely.

6 Structural Dimensions

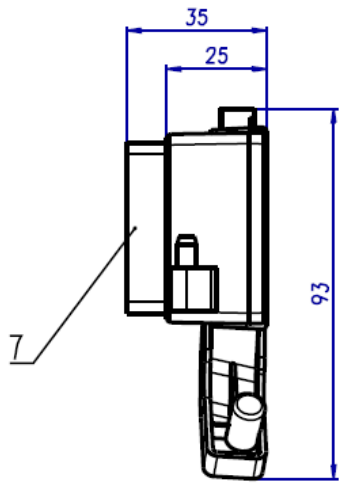

Figure 6-1 Structural Dimensions — Side View

6 Structural Dimensions — Continued

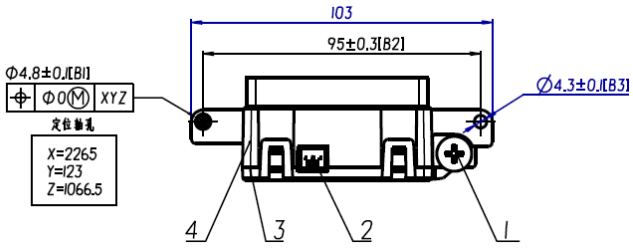

Figure 6-2 Front View

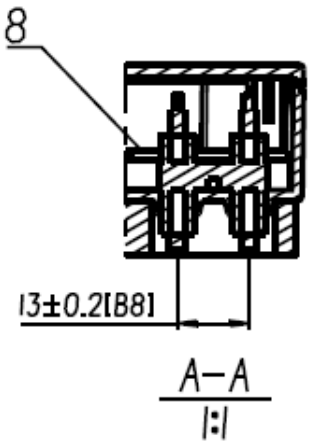

Figure 6-3 Section A–A

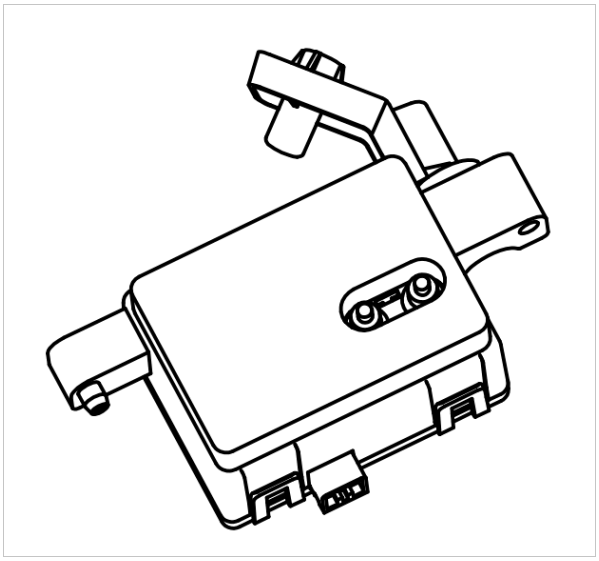

Figure 6-4 Isometric View

6 Structural Dimensions — Continued

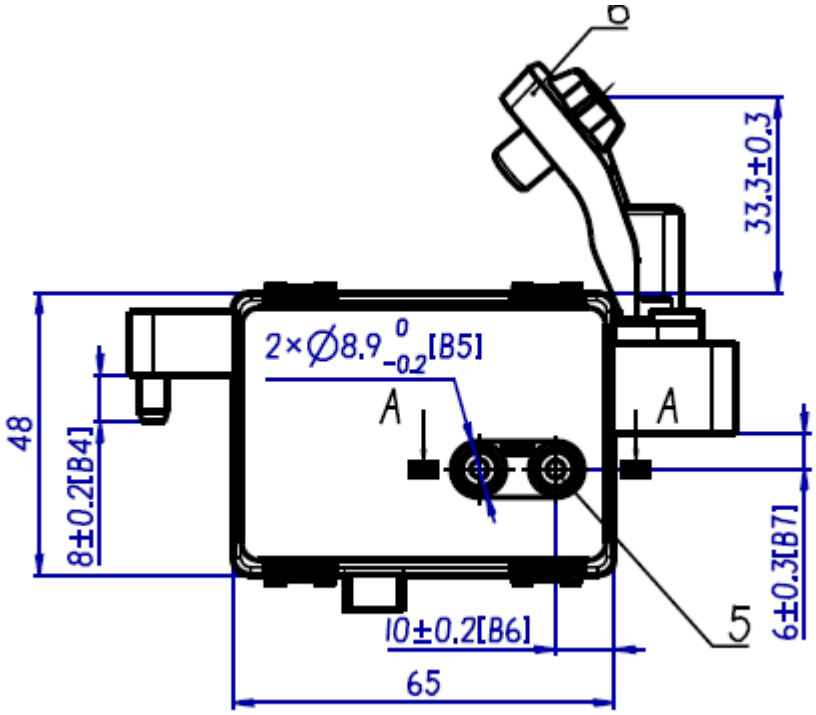

Figure 6-5 Top View and Mounting Dimensions

All dimensions are in millimetres. Refer to the controlled mechanical drawing for tolerance interpretation and production installation.