Negative Ion Module Specification

Model: FS11

Version: V1.0

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Approved Approve	Reviewed Check	Prepared Prepare

XIAMEN MAXMAC AIR TECHNOLOGY CO.,LTD

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1 Product Rendering

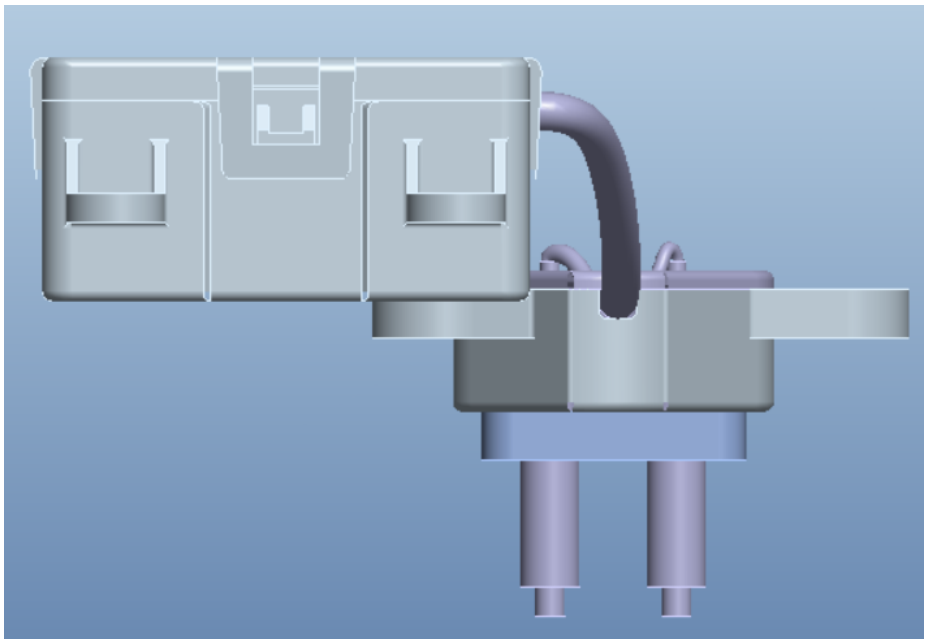

Figure 1-1 Product Rendering

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	-3000 to -4000	V
Negative Ion Output	Air speed 3 m/s; tested 20 cm from carbon brush; DC 12 V operating voltage		pcs/cm3
Ozone Limit	DC 12 V operating voltage	<=0.05	PPM
Operating Humidity		35-85%	RH
Operating Temperature		-30 to 85	deg C
Storage Temperature		-30 to 90	deg 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 kOhm

3 System Block Diagram

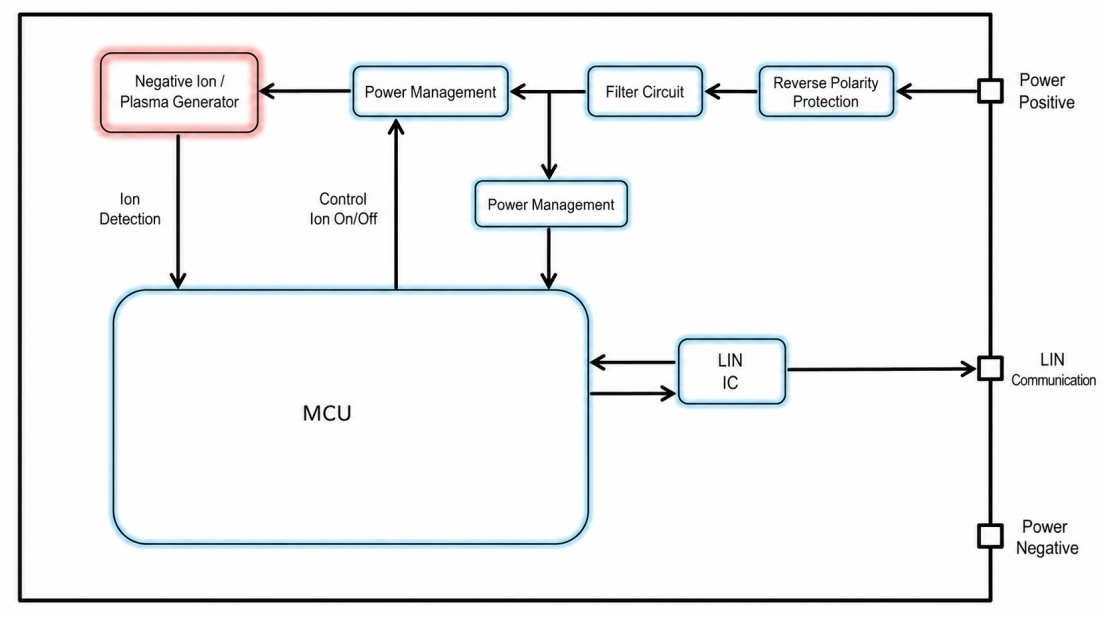

Figure 3-1 System Block Diagram

The block diagram shows the power input, reverse polarity protection, filter circuit, power management, MCU, LIN IC, and negative ion / plasma generator sections.

4 Communication Connector Information

The product connector port view and pin definition are listed below. The connector used in this test is a TE connector.

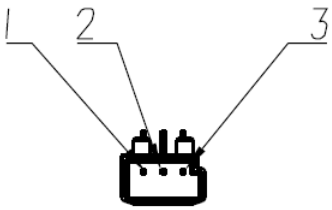

Figure 4-1 Connector Port View

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	GND	Out	/	Single wire	Ground
3	LIN	In / Out	LIN	Single wire	LIN signal

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

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							Negative ion operation: 0x0 Off; 0x1 On; 0x2 Sleep; 0x3 Reserved	Negative ion operation: 0x0 Off; 0x1 On; 0x2 Sleep; 0x3 Reserved

5.2 Master Node Transmission

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

	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Reserved	Reserved	Reserved	Reserved	0x0 Communication normal; 0x1 Communication abnormal	0x0 Standby; 0x1 Running	Negative ion status: 0x0 Normal; 0x1 Abnormal; 0x2 Short circuit; 0x3 Open circuit	Negative ion status: 0x0 Normal; 0x1 Abnormal; 0x2 Short circuit; 0x3 Open circuit
Byte1								
Byte2	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Byte3	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Byte4	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Byte5	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Byte6	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
Byte7	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

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

6 Structural Dimensions

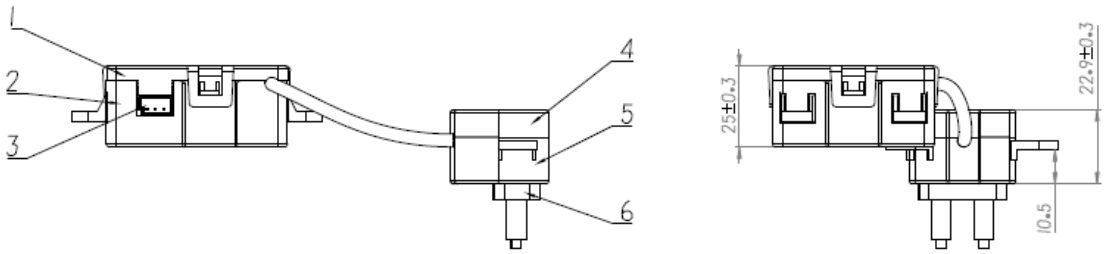

Figure 6-1 Structural Dimensions - Side and Front Views

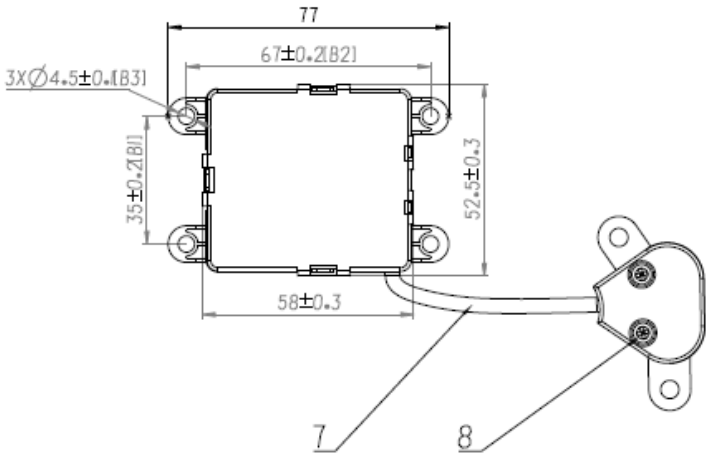

Figure 6-2 Structural Dimensions - Top View

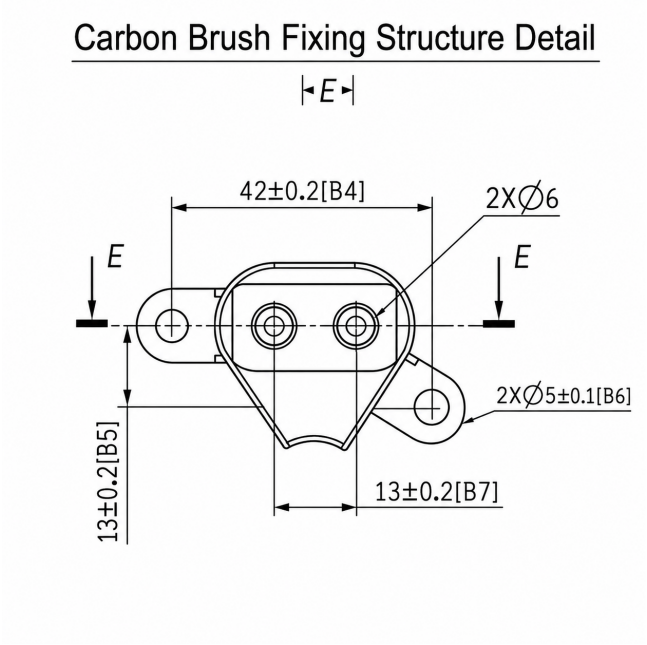

Figure 6-3 Carbon Brush Fixing Structure Detail