

EH3 Fragrance Module Functional specifications (Controller Type)

Prepared by:

Reviewed by:

Countersigned by:

Approved by:

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The story of the Revision History

Version No.	Changes to the description/Revision Description	Revised Date	Revised by
1.0	Initial Version	2023.10.10	jp.chen

Notes:

1) The method of compilation of the version sequence is to increase the initial version to 1.0 in sequence. When the version is sequential to 1.9 and then changed again, the version sequence is changed to 2.0, and the subsequent sequence sequence is moved accordingly.

2) Date names in the year-month-day order, specific format see examples in the table above.

Note:

- 1) Version No. should be increased in order. The first version No. is 1.0. If the version No. reach to 1.9 and the specification is revised once again, the version No. should be increased to 2.0.
- 2) Date should be in format: Year-Month-Day, see the demo in the table above.

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1 Overview

1.1 Purpose

This instruction is intended for the development of the Fragrance Module system and contains functional, operational and operational requirements for Fragrange Module.

1.2 Scope

This instruction applies to vehicles in the Fragrance Module system.

1.3 Abbreviations and definitions

1.3.1 Abbreviations

Table 1 Abbreviations

Abbreviation for short	Description of the project
UART	Universal Asynchronous Receiver/Transmitter
GPIO	General Purpose Input Output
PWM	Pulse Width Modulation
HMI	Human Machine Interface

1.3.2 Definition of the

Table 2 Definitions

Term	Description
Must	Gateway design and production legislative or regulatory requirements
Shall	refers to a mandatory requirement to be followed and deviation is only allowed after discussion with project responsibility from costumer.
Should Should	refers to recommendation or advice on implementing a requirement to achieve a specific requirement

1.4 Reference documents/standards

The following reference document forms part of a special description of this instruction. Unless otherwise specified, refers to the latest version of the reference document.

Table 3 Reference Documents/Standards

Document	Description

2 Fragrance System summary

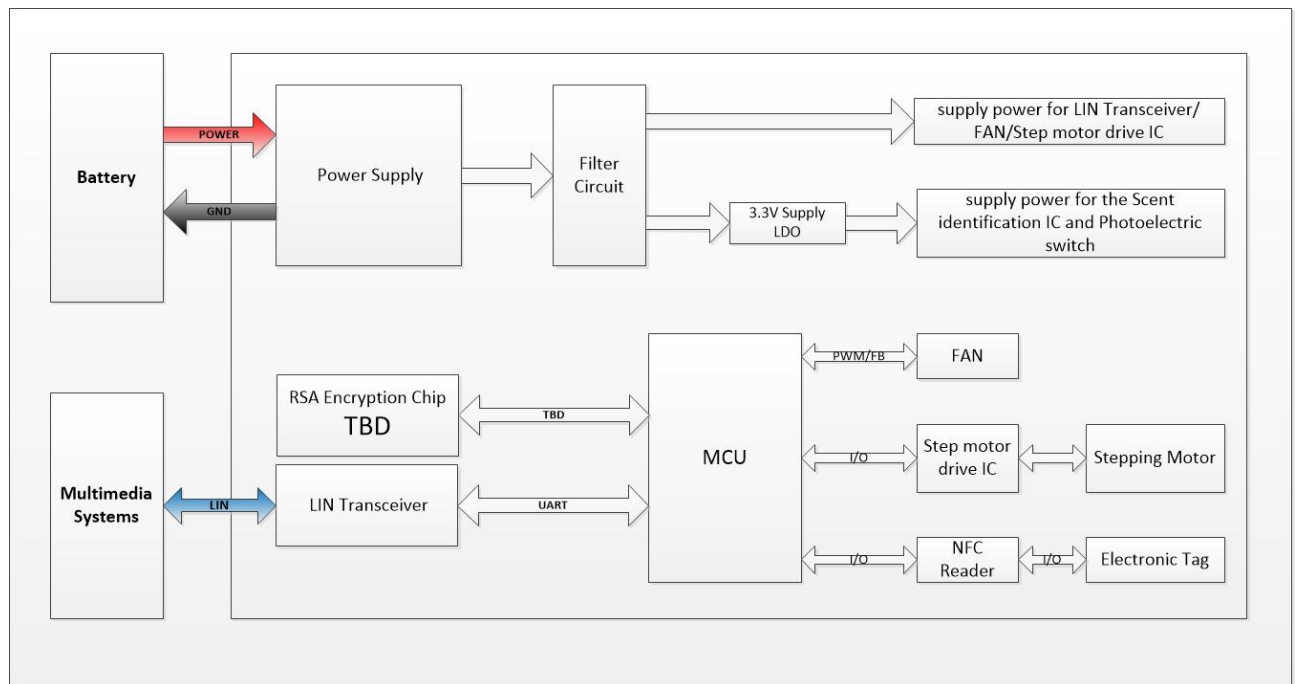
2.1 Product overview and system frameworks

2.1.1 Product description

The Fragrance System is first injected into the air by the drum blower, which then enters the fragrance cartridge through a rotary valve device, which is then sent to the exhaust pipe by the drum blower. The valve device is driven by a stepper motor. The valve device, in turn, produces a position signal through a Photoelectric Switch, which achieves the precise positioning and determination of the valve.

An electronic label is fixed on each Fragrance Cartridge, which records information about the atmosphere, and each label uses the sensor circle and the main control panel for wireless incorporation, thereby enabling the identification of the atmosphere.

2.1.2、 System Box



2.2 Technical parameters

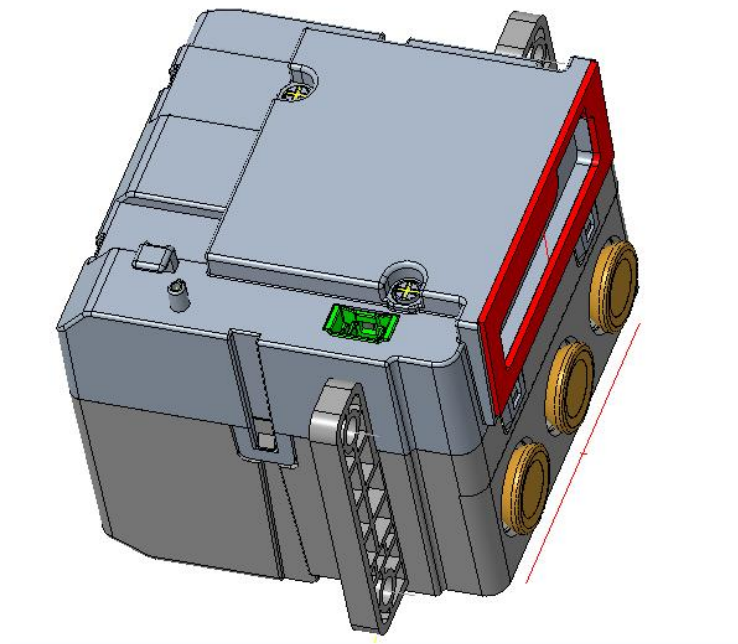
Organizing voltage	DV: 9~16V
Organizing Current	≤200mA
Static current	≤0.1mA
Noise	A) 30 cm distance from the test
Operation Temperature	- 40°C to 85°C (-40°C to 10°C and 60°C to 80°C functional grade C, limited to the physical properties of the fragrance itself, without evaluating the actual car fragrance grade)
Storage Temperature	-40°C-85°C
Work Humidity	0%-95%RH
Power management	12V/1 to 200mA, maximum rated power of 1.2W
Compunication Output	LIN2.1
Equipment lifetime	> 10000h

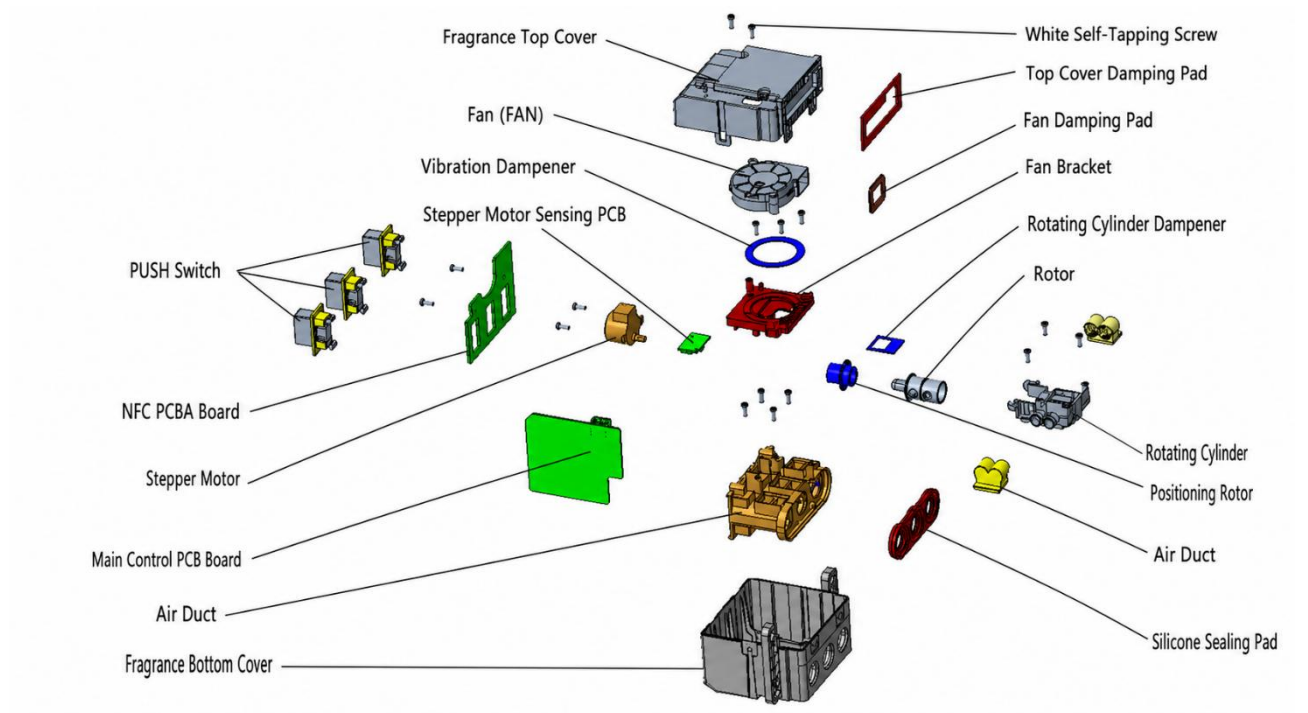
2.3 List of key electronic devices

The number NO.	Material name Material name	Manufacturer Manufacturer	Specifications of the model model	Dose and dose
1	Main MCU	Microchip	PIC18F57Q84	1

2	LIN receiver	The core	SIT1021QT	1
3	Stepper Motor driven IC	Pucheng!	PT12477	1
4	Power supply LDO	SILERGY	SA21345A	2
5	NFC Reader	The newest	FM17660A	1
6	Multiplexer	Anse-seok.	HEF4051BT-Q100	2
7	Blower	The Sea	BS5015H12-PF01	1
8	Stepper Motor	Da-jin.	DZ-24BYJ48-A03-1	1
9	Electronic Tag	The newest	FM11RF08	3

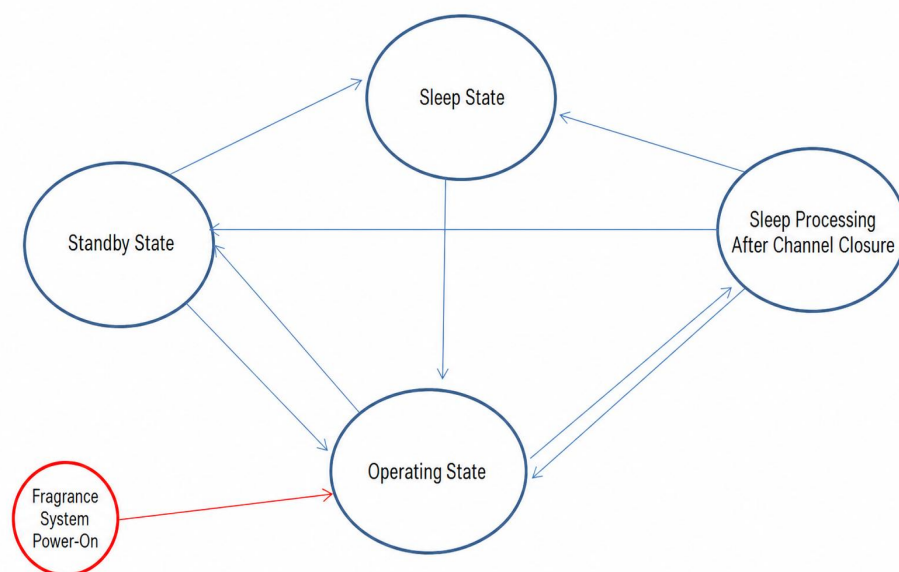
2.4 3D effects and explosion charts of fragrance products





2.5 Product Operating Modes

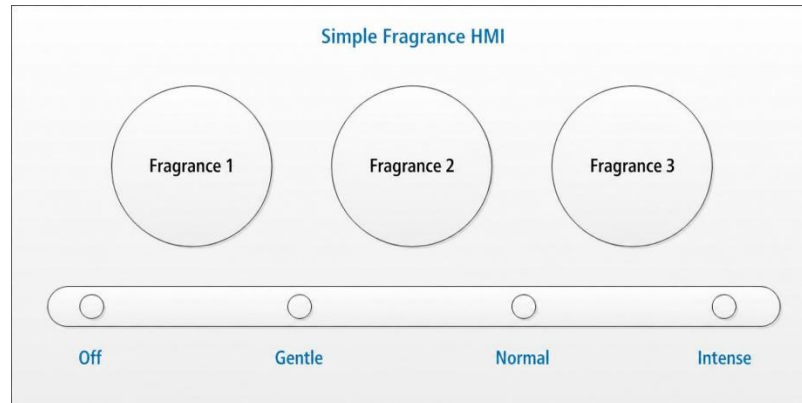
When the power supply is started, the fragrance generator is powered and the fragrance generator will enter the standby after initialization. The fragrance generator is executed according to the A/C controller's start control command $VIU_VAPSwSet = 0x2$: ON, dormant commands (diagnosis dormant 3C)



3 Fragrance System HMI interaction description

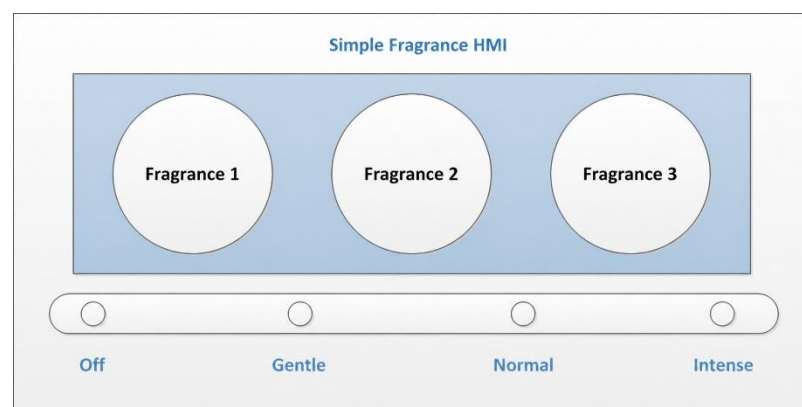
3.1 The scent features

Since the user can operate the device through a large screen of the entertainment system, the diagram below is a simple HMI for the operation of the device.



The sections describe:

- Scent 1 / Scent 2 / Scent 3: Scent type selection, where users select and switch the scent by clicking the corresponding button, as shown in the light blue area below.
- In the first case, the Fragrance System switches Channel 1 to the Fragrance System.
- In the case of the Fragrance System, the control signal `VIU_FragrancePosnSet = 0x2` is sent to the Fragrance System to switch Channel 2.
- In the case of the Fragrance System, the control signal `VIU_FragrancePosnSet = 0x3` is sent to the Fragrance System to switch Channel 3.

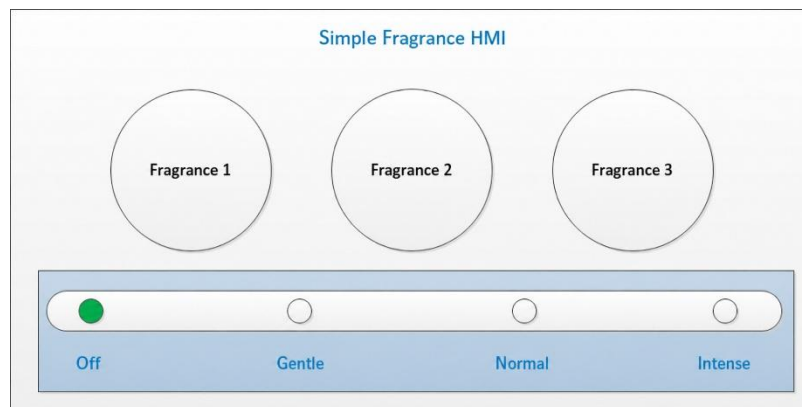


- Press `VIU_FragranceConcSet = 0x3`: Level 3 ((High), and the blower switches to high-end wind.

Typically: press the `VIU_FragranceConcSet = 0x2`:Level 2 ((Mid), and the blower switches to the medium-range wind.

Soft: press the VIU_FragranceConcSet = 0x1:Level1 ((Low), and the blower switches to low-level wind.

Close: Click on this button VIU_VAPSwSet = 0x1 (OFF), and the blower switches to close the file.



Remaining Capacity:

- Fragrance 1 capacity: When selected, the Fragrance System will respond to VAP_Posn1FragranceRemain to show the capacity information for the fragrance, and evaluate the time spent on the fragrance by using Blower working hours to signal the remaining time available.
- Flavor 2 capacity: When selected, the Fragrance System will respond to VAP_Posn2FragranceRemain to show the capacity information for the flavor, and evaluate the time spent on the fragrance by using Blower working hours to signal the time left on the flavor.
- Fragrance 3 capacity: When selected, the Fragrance System will respond to VAP_Posn3FragranceRemain to show the capacity information for the fragrance, and evaluate the time spent on the fragrance by using Blower working hours to signal the remaining time available.

Expiration Warning:

- The expiration of the scent is 1 year. When used normally, the corresponding signal interacts with VAP_Posn1FragranceOverDue = 0x0, the scent is used normally; when the expiration is approaching (within 1 month remaining), the corresponding signal interacts with VAP_Posn1FragranceOverDue = 0x1, the scent is alerted to the expiration of the expiration; when the time exceeds 1 year, the corresponding signal interacts with

VAP_Posn1FragranceOverDue = 0x2, the reminder of the expiration of the scent.

4 The fragrance system description

4.1 LinCommunication section

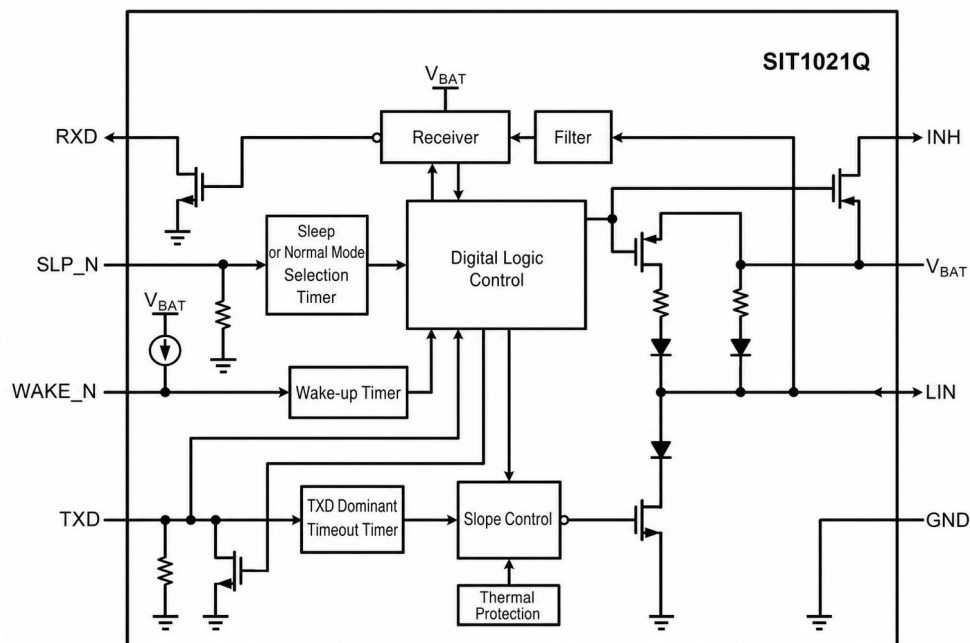
4.2 LinCommunication section

4.2.1 LIN IC features

The scent product uses a LIN receiver from Core Power, model SIT1021Q. The key features of this IC are:

- It is compatible with the LIN 2.0/2.1/2.2/2.2A, ISO 17987-4:2016 ((12V) and SAE J2602 standards.
- Operating Voltage range 5.5 to 27V
- Built-in heat protection, flow limit protection, unpressure protection, and clear overtime
- High electromagnetic compatibility
- Support local awakening and remote awakening
- Certified by AEC-Q100

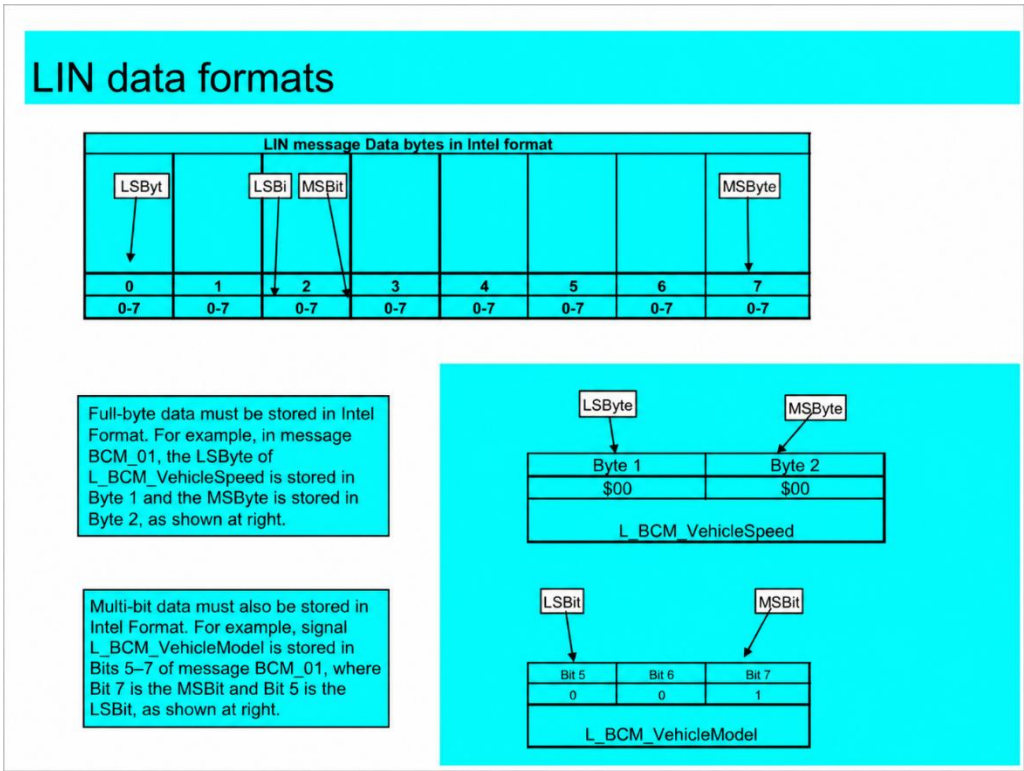
This internal IC system frame is as follows:



4.2.2 Network Regulation Note

This module LIN equipment is a Slave Node device. The package protocol format is based on the

LIN bus Master Node device. The protocol format is described below:



4.3 Blower Module

4. 3. 1 Blower Feature Parameters

The Fragrance System is a straight-line brushless blower with the following characteristics:

Item	Specifications
Operating Voltage Range	8--16V
Maximum rated Operating Current	0.17A/12V
Maximum rated power	2.04W
Speed	5500RPM ±10%
Service Life	>50000h @40°C
Operational Temperature Range	-40~85°C
Scope	-40~85°C
Locked-Rotor Protection	After automatic power outages, 2-6s automatically try to start.
Frequency range of drive	18~30KHz

The blower's interface and function are as follows:

Pin	Pin Function
VCC	Blower Power Pin

PWM	Blower uses PWM controls to adjust the size of the rotation speed
FB	Remittance foot position, stabilize the Blower speed and keep it in line.
GND	Blower Ground Pin

4.4 Motor Module

4.4.1 Electrical characteristics

Fragrance Systems uses Stepper Motor for route testing. The relevant characterization parameters are as follows:

No.	Parameter	Specifications
1	Number of Phases	2
2	Gear Ratio	1/64
3	Step Angle	5.625°/64
5	Excitation Mode	1-2
6	Drive Pulse Rate	100pps
7	Step versus rotational step angles	1:1

Stepper Motor's stepping angle is 5.625°/64, which means that it takes 64 steps to turn a circle.

4.4.2 Motor-powered IC characteristics

Stepper Motor drives the IC characteristics as follows:

No.	Item	Specifications
1	Operating Voltage Range	7.4~45V
2	Operational Temperature Range	-40~105°C
3	Scope	-55~150°C
5	Max. Continuous driver current	1.6A
6	Maximum Organizing Current	10mA
7	Maximum Sleep Current	20uA

4.5 Main MCU Module

Fragrance System is an 8-bit microprocessor with a microchip, and the selected ICs meet the requirements of the vehicle regulations and are certified by AEC-Q100.

The specific functions are as follows:

- Data protection features (including detection of illegal memory access)
- With a dog timer on the screen (combined with a low-velocity oscillating clock inside the chip)
- 12 bit A/D converter

- The ROM with 128KB
- Operating Voltage range: 1.8V to 5.0V
- Operating Temperature range: 40 to 85°C
- I have two lines, a line, and a can.
- The total dormant current can be reduced to 14uA

4.6 Fragrance Cartridge Data Storage Module

The fragrance message is stored in an electronic label with the following performance parameters:

- 1024 x 8 bits EEPROM storage unit
- 16 separate sectors with safety protection structures supporting a wide range of applications
- Communication protocols: compliant with ISO/IEC 14443-A
- The frequency range of 13.56 MHz
- Data storage time: more than 10 years
- Scrubs: > 200,000

5 Diagnosis information

5.1 Blower Fault

When Blower is running, the Blower rotation speed is not within the target range, Blower stops running, and the Fragrance Generator sends VAP_FanErr = 0x1 to Master Node.

Type of failure: Blower failure

5.2 Motor Fault

When the motor is running, the motor stops turning when it is not in the correct position for a long time, and the fragrance generator sends VAP_MotErr = 0x1 to the Master Node.

Type of failure: Motor failure

5.3 Overvoltage/Undervoltage Fault

When the AD detects that the power supply voltage is out of range, the Fragrance System enters a standby state. When the Fragrance Generator is out of pressure, it sends VAP_UnderUErr=0x1: to the Master Node; when the Fragrance Generator is out of pressure, it sends VAP_OverUErr=0x1: to the Master Node;

Type of failure: over-pressure failure

5.4 LIN Communication Fault

When LINCommunication is abnormal, the fragrance generator sends VAP_RespErr=0x1 to the Master Node.

Type of failure: LIN failure

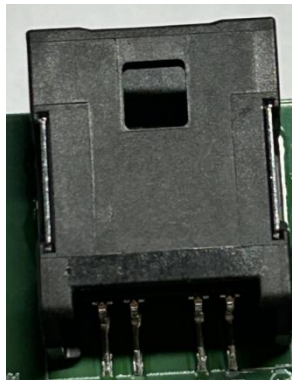
6 Fragrance Systems requests

6.1 General Electrical Requirements

No.	Symbol	Function
1	POWER	Power
2	LIN	LIN Communication Line (max. 19.2 kbit/s)
3	NC	Blank
4	GND	Ground

6.2 The connector

The power outlet is on the board: 6098-9446



10 Mechanical

7.1 General mechanical description

Fragrance Module can be attached to the car by bolt, while Fragrance Module provides the public end and the whole car provides the mother end.

7.2 Mechanical/Housing Design

The Fragrance Module has a motor, blower, switch valve, fragrance cartridge, and other components attached to it, which form an internal wind tunnel between the internal devices, which flows through the Fragrance Cartridge through the blower, and is eventually transmitted to the entire car space.

7.3 Materials

The outer hull uses PA6+15% GF for injection molding.

7.4 Weight

≤ 0.5 KG

7.5 Other

XXXXXXXXXX

8 Test

XXXXXXXXXX