

Fragrance Module functional guidebook (Controller Type)



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Approved by:

December 2022

The story of the Revision History

Version No.	Changes to the description/Revision Description	Revised Date	Revised by
1.0	Initial Version	2022.12.05	Wang Meiling
1.1			

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 standard applies to the Fragrance Generator summary.

1.3 Abbreviations and definitions

1.3.1 Abbreviations

Table 1 Abbreviations

Abbreviation for short	Description of the project

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
TBD	Matrix files

2 Fragrance System Summary

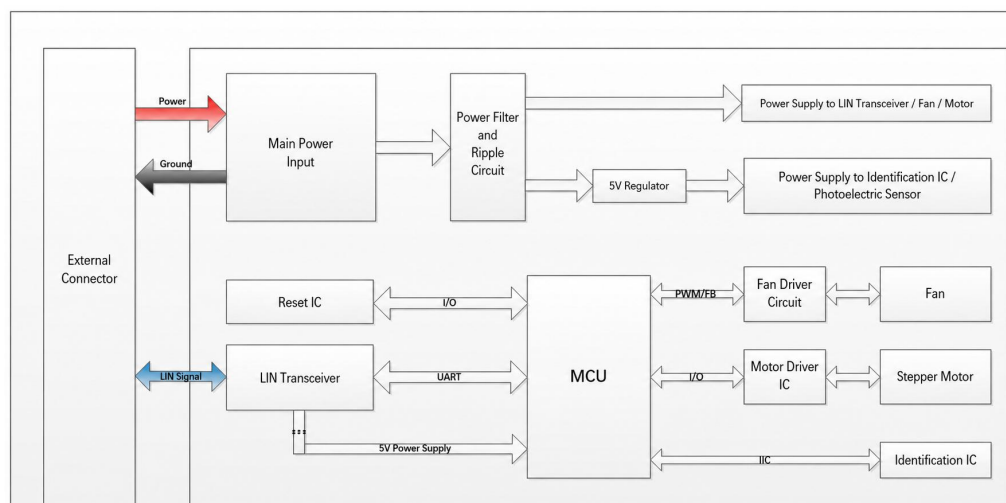
2.1 Product overview and system frame

2.1.1 Product Overview

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.

Each Fragrance Cartridge has a fixed ID card, which records the relevant information about the atmosphere, and each ID card is linked to the main control panel through the card, thus enabling the identification of the currently loaded atmosphere.

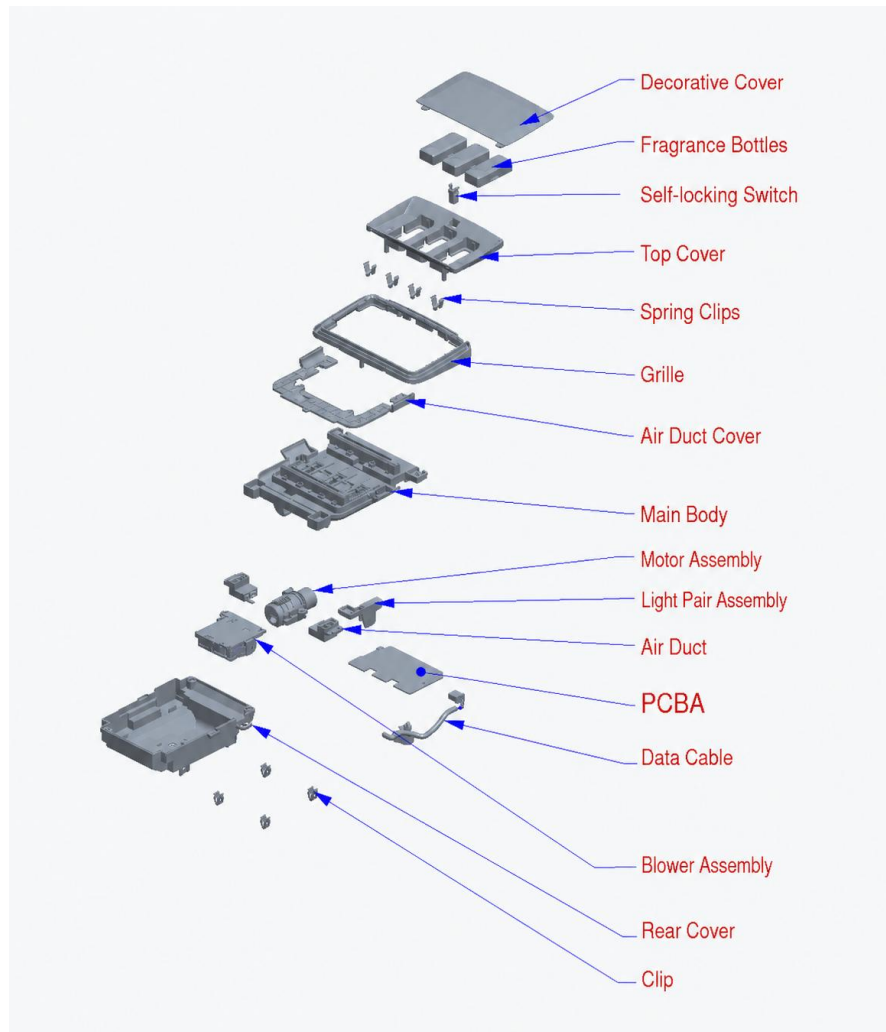
2.1.2 System Box



2.2 Technical parameters

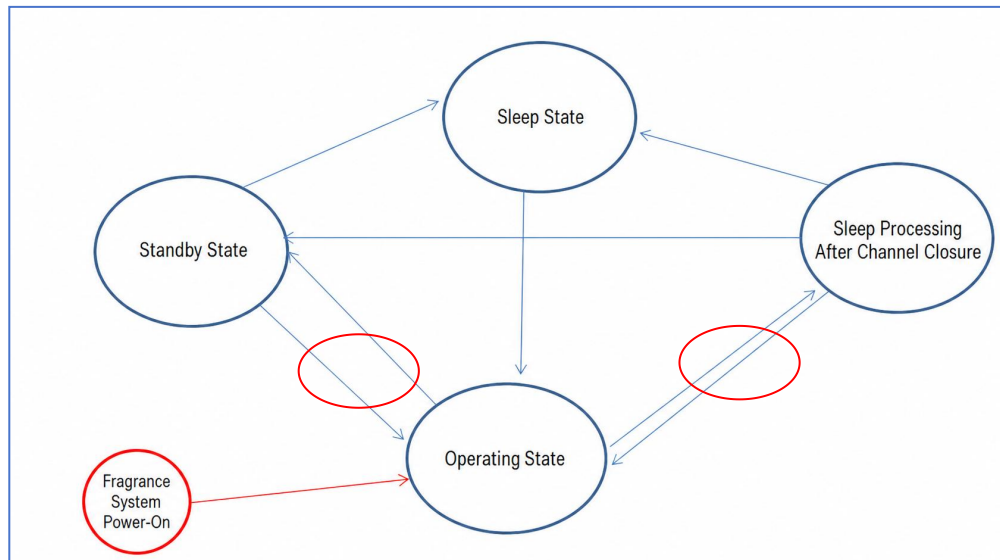
Organizing voltage	DV: 9~16V
Organizing Current	≤200mA
Static current	≤0.1mA
Noise	A) 30 cm distance from the test
Operation Temperature	- 40°C to 85°C (-40°C to 10°C and 60°C to 80°C functional grade C, limited to the physical properties of the fragrance itself, without evaluating the actual car fragrance grade)
Storage Temperature	-40°C-85°C
Work Humidity	0%-95%RH
Power management	12V/1 to 200mA, maximum power of 3.2W
Compunication Output	LIN2.1
Equipment lifetime	> 10000h

2.3 3D effect maps and blast maps of the atmosphere product



2.4 Product Operating Modes

When the power supply is turned on, the Fragrance Generator is powered and the Fragrance Generator will enter the standby mode after initialization. The Fragrance Generator will be executed according to the FGAEnaReq = 0x1:Enable command from the A/C Controller, according to the FGAEnaReq = 0x1:Enable command from the A/C Controller.



3 The Fragrance System Description

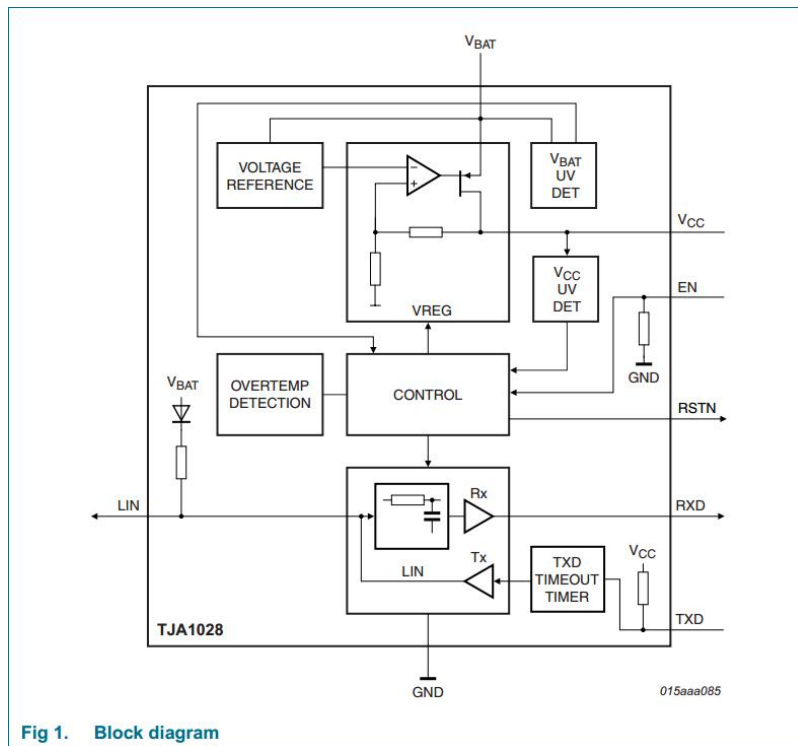
3.1 Lin-communication section

3.1.1 LIN IC features

The scent product uses a LINCommunicationIC from NXP, model TJA1028.

- Compatible with LIN 2.0/2.1 (maximum downward compatibility to version 1.3) – SAE J2602 protocol
- 5V/3.3V, 70mA flat output with voltage output accuracy of $\pm 2\%$
- It has good EMI/EME properties and strong electromagnetic interference resistance.
- Typical standby current is less than 45uA and typical dormant current is less than 12uA
- Self-contained LIN wake-up function
- Certified by AEC-Q100

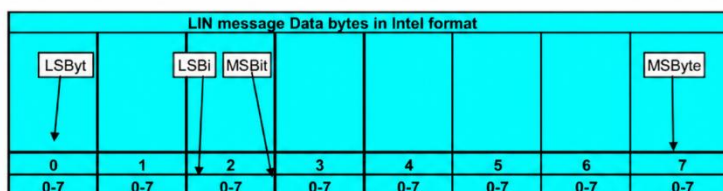
This internal IC system frame is as follows:



3. 1. 2 Network Regulation Note

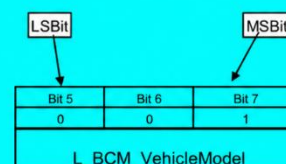
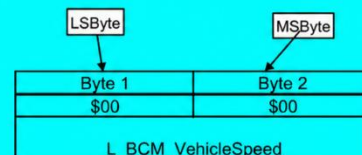
This module LIN equipment is a Slave Node device. The package protocol format is based on the LIN bus Master Node device. The protocol format is described below:

LIN data formats



Full-byte data must be stored in Intel Format. For example, in message BCM_01, the LSByte of L_BCM_VehicleSpeed is stored in Byte 1 and the MSByte is stored in Byte 2, as shown at right.

Multi-bit data must also be stored in Intel Format. For example, signal L_BCM_VehicleModel is stored in Bits 5–7 of message BCM_01, where Bit 7 is the MSBit and Bit 5 is the LSBit, as shown at right.



3.2 Blower Module

3.2.1 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	0.198A/12V
Maximum rated power	2.376W
Speed	5500RPM $\pm$ 10%
Service Life	>50000h @40°C
Operational Temperature Range	-40~85°C
Scope	-40~85°C
Locked-Rotor Protection	1、Rated voltage locks 1s, automatically disconnects 2、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

3.3 Motor Module

3.3.1 Electrical characteristics

The Fragrance System uses Stepper Motor to conduct conduction testing.

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 $5.625^\circ/64$, which means that it takes 64 steps to turn a circle.

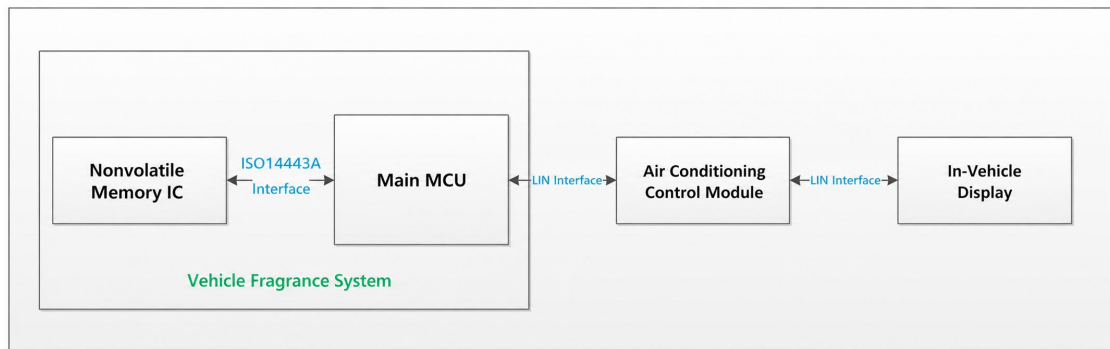
3.3.2 Motor-powered IC characteristics

Stepper Motor drives the IC characteristics as follows:

No.	Item	Specifications
1	Operating Voltage Range	5.5~35V
2	Operational Temperature Range	-40~100°C
3	Scope	-55~150°C
5	Max. Continuous driver current	1.5A
6	Maximum Organizing Current	6.8mA
7	Maximum Sleep Current	50uA

3.4 Fragrance Cartridge

3.4.1 Fragrance Cartridge interaction process map with user terminal (in-car)



Fragrance Cartridge presentation Figure



As shown above, the non-contact identification IC card chips are fixed inside the fragrance

structure carrier, attached to the scent bulb using electronic labeling, and write the corresponding fragrance information into the built-in EEPROM of the IC card chip during manufacturing.

3.4.2 Fragrance Cartridge function

Fragrance System has a spice recognition function to prevent and alert for counterfeit spices, an expired fragrance detection function, residual fragrance detection function, therefore Impairment diagnostic function.

Fragrance Cartridge facilitates installation and disassembly, and the selected spices are not chemically reactable, such as Fragrance Cartridge and the Passage Channel and electrons.

3.5 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.

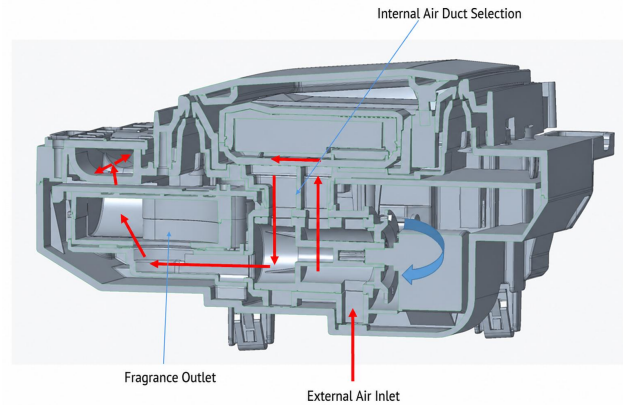
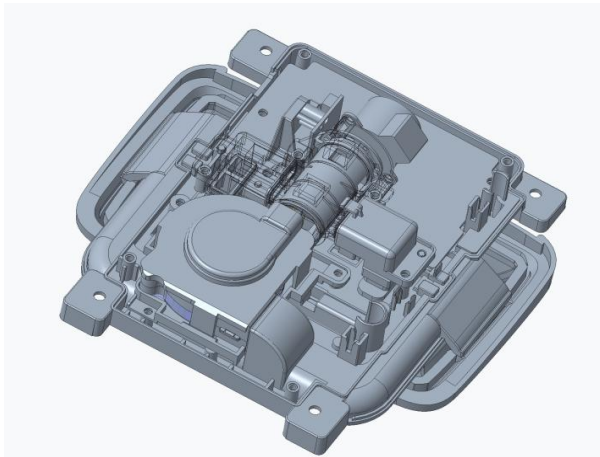
The specific functions are as follows:

- 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 Fragrance Cross-Contamination Prevention

4.1 Cross-Contamination Prevention 1 (Mechanical Design)

- The main structure of the existing wind tunnel is mainly driven by a motor to turn the turner, the wind tunnel on the turner is oriented towards different cylinder holes, thus achieving switching and closing of different wind tunnel, and when the turner is oriented towards channel 1, channel 2 and channel 3 are closed, thus effectively preventing odor confusion.



- (b) Each Fragrance Cartridge is sealed with a seal of glue, closely sealed with the fragrance body pressure, which is effective in preventing the fragrances between the Fragrance Cartridges;

4.2 Cross-Contamination Prevention 2 (Software)

When the rotor turns to switch from Fragrance Type, the software defines to close the Blower, which does not work to prevent the scent;

5 Diagnosis Information

5.1 Blower Fault

When Blower is running, the Blower rotation feedback is not within the target range, Blower stops running, and the Fragrance Generator sends FAN_Err to Master Node.

Type of failure: Blower blockage

5.2 Motor Fault

When the motor is running, the motor stops turning when it has not been in the correct position for a long time, and the fragrance generator sends MOTO_Err to the Master Node.

Type of failure: Motor clogged

5.3 Temperature Fault

When the AD detection or the temperature provided in the vehicle exceeds the normal use temperature range of the module (-40 to 85°C), the fragrance generator sends Temp_Err to the Master Node.

5.4 Supply Voltage Fault

When the AD detects that the power supply voltage is out of range, the Fragrance System enters standby mode and the Fragrance Generator sends the VOL_Err to the Master Node.

Type of failure: Supply voltage exceeding 9 to 16 V

5.5 LIN Communication Fault

When the Master Node LIN information checksum is received, the fragrance generator sends the LIN_Err to the Master Node.

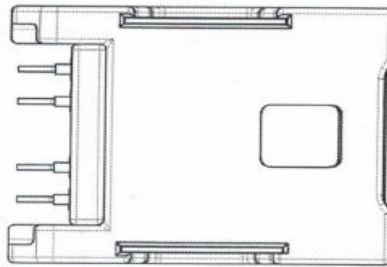
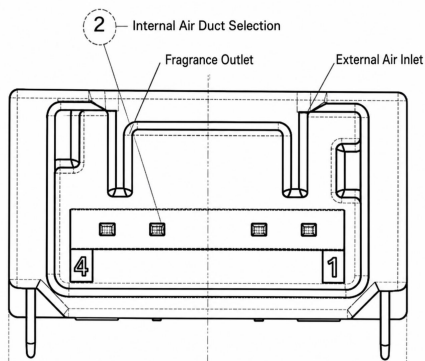
6 Fragrance Systems Requests

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 Recommended Connector

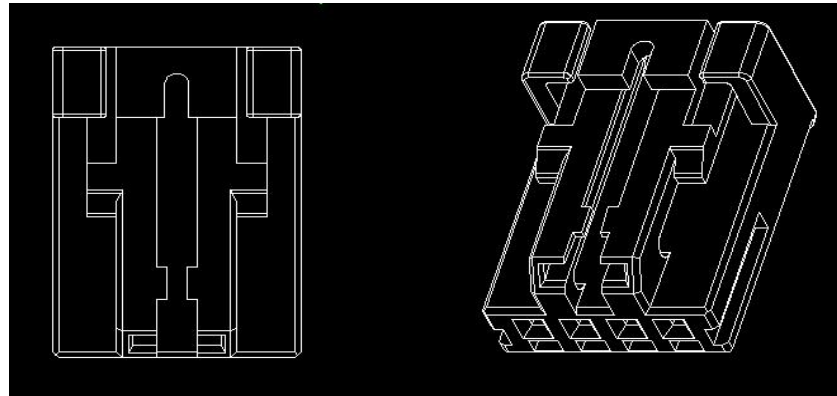
The power outlet on the board: 6098-9446



Wiring Harness End Connector: Type of plug: 936121-1

The number of the deck is 6-928918-1

The card is: 368165-1



7 Mechanical

7.1 General mechanical description

The Fragrance Module is attached to the car by a bolt lock, the fragrance module is used to provide the public end, and the whole car is provided with 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