

MPM60-C4

Automobile laser particulate matter sensor



SPECIFICATION

Shenzhen MemsFrontier Electronics Co., Ltd.



• Product appearance and sizes





Product parameters

Parameters	Index	
Types of particulate matter detection	PM1.0, PM2.5, PM10	
Particulate matter diameter range	0.3-10µm	
Particulate matter detect concentration range (PM2.5 standard value)	0~1000µg/m ^³	
Particulate matter mass concentration resolution	1µg/m ³	
Consistency of particulate matter concentration (PM2.5 standard value) *Note	±15%(@100~500μg/m ³) ±15μg/m (@ 0~100μg/m ³) can be custom made.	
Single response time	≤1s	
Comprehensive response time	≤10s	
DC supply voltage	Typ:12V Min:9 V Max: 16V	
Working current	≤100mA	
Sleep current	≤50µA	
Output method	LIN can be custom made.	
Storage temperature	-40~+85°C	
Range of working temperature	-20~+70°C can be custom made.	
Working humidity range	0~95%RH (no condensation)	
Mean time between failures	≥5 years	
Dimensions	63.79*47.62*24.4mm(L×W×H)	

Note: The Particulate matter concentration consistency data is data 2 in the communication protocol (test conditions: $25\pm2^{\circ}$ C, $50\pm10\%$ RH)



MPM60-C4

Laser particulate matter sensor module

Pin diagram



Pin number	Pin name definition	Pin function description	
Pin 1	GND	Negative power supply	
Pin 2	VCC	Positive power supply (+12V)	
Pin 3	LIN	Compliant with LIN 2.1 standard	
Pin 4	N/C	This pin is left open	

Circuit connection



Circuit design should pay attention to:

1. The power supply voltage of the MPM60-C4 vehicle-grade module is 12V; the data communication mode of the product adopts the LIN bus mode.

2. Attention should be paid when applying the hibernation function: the fan stops working during hibernation, and it takes at least 30 seconds to stabilize the fan to restart. Therefore, in order to obtain accurate data, the working time of the module after hibernation and waking up should not be less than 30 seconds.

Working principle

According to the principle of laser scattering, the laser beam emitted by the laser irradiates the suspended particles in the air to produce scattering, and the laser photoelectric receiver is placed in a specific position to collect the scattered light, and the curve of the scattered light intensity with time is obtained. Microprocessing collects the electrical signal of the receiver in real time, and uses the algorithm based on Mie theory to obtain the equivalent particle size of the particles and the number of particles with different particle sizes per unit volume. The functional block diagram of the sensor is shown in the following figure:





*LIN communication protocol

LIN command and function description:

message identifier	description
0x21	ECC sends sensor working status control request
0x2D	ECC receives the detection data output by the sensor
0x3C	ECC sends command to put PM2.5 sensor into sleep mode

For the detailed protocol, please refer to "LIN1 Network Segment Signal Communication Matrix"

Installation Precautions

The module is an integral component, which should not be disassembled by the user, including the metal shield to prevent irreversible damage.

Number Description



Laser particulate matter sensor module

Packing way

Quantity per plate	Packaging layers	Packaging Quantity	Carton size	Packaging material
20	9	180	L530*W320*H250	red pearl cotton



Version history

Date	Version	Alteration
2022.8.5	1.00	initial version