



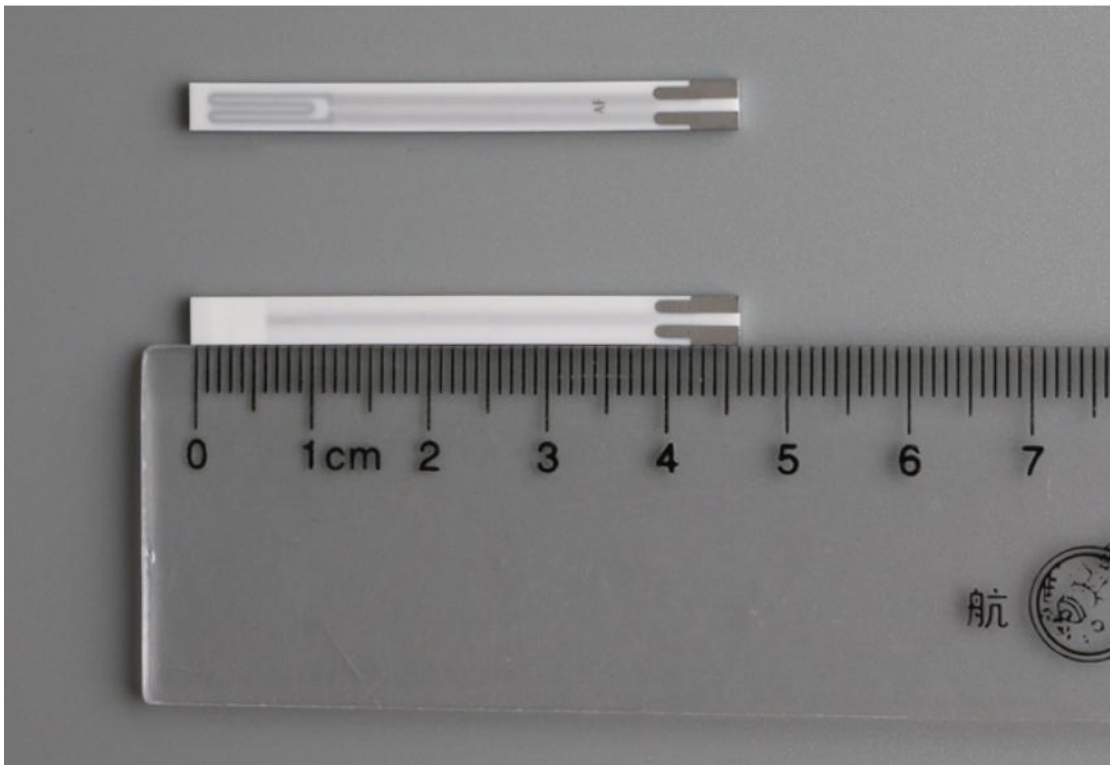
### Switching Plate Heating Core For Automotive Oxygen Sensor

GREENWAY is a leading China Switching Plate Heating Core For Automotive Oxygen Sensor manufacturer, supplier and exporter.

Model:AF

### Switching Plate Heating Core for Automotive oxygen sensor

Plate-Type Heating Core for automotive oxygen sensor are produced by implementing ceramic lamination processes. Due to the compactness, high power and rapid heating speed .Ceramic Heater can provide higher reliability than ever before. Mainly applications include use as innovative types of heaters in the automotive, medical and semiconductor industries.



### Process of Switching Plate Heating Core For Automotive Oxygen Sensor

1.Product matrix material use white alumina ceramic

- a) Density  $\geq 3.94$  g/cm<sup>3</sup>;
- b) Strength  $> 500$  MPa.

2. Electrolyte material use YSZ electrolyte ceramic

- a) Density  $\geq 5.75$  g/cm<sup>3</sup>;
- b) Strength  $> 400$  MPa;
- c) Aging test: 230°C  $\times$  50 h.

3. Electrodes, heaters, leads, pads all use Pt materials (Choose different Pt content material according to the function)

### Engine Test

After the assembly of the product, then test the leak rate under the [temperature](#) of 25°C  $\pm$  10°C and the air pressure of 3.4 bar, and the engine bench test is carried out under the condition that the leakage rate is less than 0.2 cm<sup>3</sup> / min.

Table 1 Engine bench test parameters

项目 item	输出特性 output characteristic
@0.3V <sup>①</sup> , 理论空燃比输出 ①0.3V <sup>①</sup> , Output at stoichiometric ratio	$I_{p(\lambda=1)} = 0\text{mA} \pm 0.01\text{mA}$
$\lambda=1$ 时, 输出电流值 Output current value at $\lambda=1$	
输出电流 $I_p=0$ 时, 对应的 $\lambda$ 值 The value of $\lambda$ at output current $I_p=0$	$\lambda_{(I_p=0)} = 1 \pm 0.01$

### Engine bench test parameters

Engine Bench Test	New Oxygen Sensor	
Exhausting gas Temperature	350°C	800°C
Response Time 600 mV ~ 300 mV	< 150 ms	< 150 ms
Response Time 300 mV ~ 600 mV	< 100 ms	< 60 ms
Internal Impedance	$\leq 500\Omega$	
Light-off Time	$\leq 12$ s	
Heater Current	0.5 A $\pm$ 0.1 A	

### Electrical Properties

Heater resistance at room temperature: 2.1  $\Omega$   $\pm$  0.3  $\Omega$ .

Heater rated voltage: 8V  $\pm$  1 V.

The heater steady-state current when loaded a 8 V voltage: 1.3A  $\pm$  0.1 A.

Insulation resistance between Heater Pad and Electrode Pad:  $> 100$  M $\Omega$ .

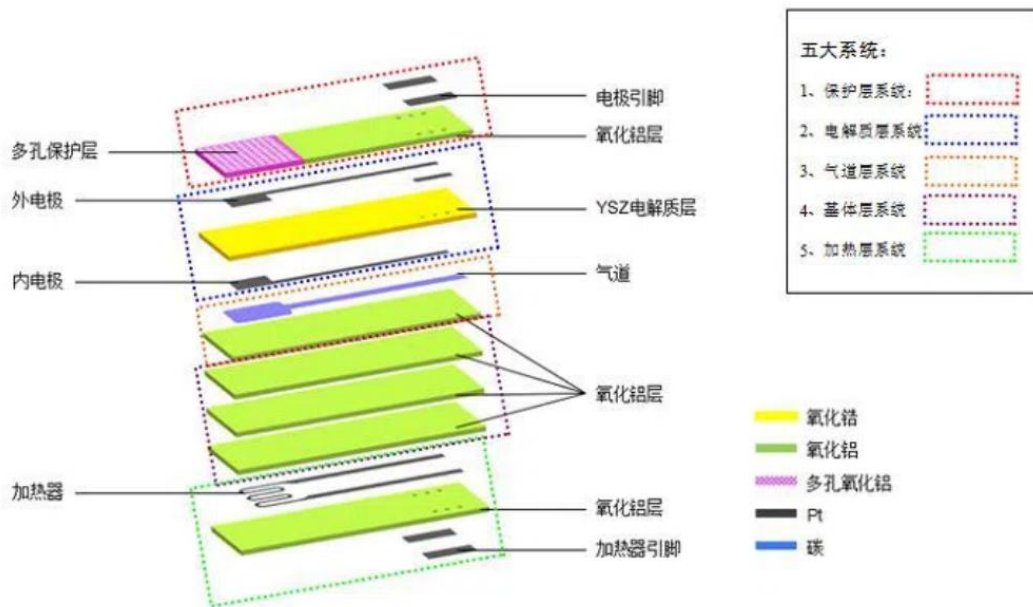
### Durable Pressure Resistance

Heater 1100°C thermal cycling: 12V, 3 min on, 1 min off, >4500 times.

Heater Pressure: 24 V, 500 ms, 10 time ) .

### Switching Plate Heating Core For Automotive Oxygen Sensor Structure

The ceramic core B structure as show in Figure 1, the ceramic core includes five layers, and they are protective layer, electrolyte layer, air layer, base layer and heating layer. The protective layer system includes electrode pad, porous protective layer and aluminum oxide layer. The electrolyte layer system includes inner / outer electrode, YSZ electrolyte layer. And the airway layer consists of airway, alumina layer. The base layer has a number of alumina layers (Can adjust based on customer requirements on the product thickness). The heater layer system includes heater, heater pad and oxidation Aluminum layer.



### Product Specification

Item	Environmental Requirements	Standard Values	Test Method
Heater resistance at room temperature	None	2.1Ω±0.3Ω	Use a multimeter to test the resistance between the heater pads.
Heater steady-state current when loaded a 8 V voltage	Temperature: 23°C±3°C	1.3 A±0.1 A	A DC source was used to test the steady-state current when the heater was loaded with the voltage of 8 V.

Activation Time	Temperature: 23°C±3°C	≤5 s	The voltage of 450 mV was loaded to both ends of the electrode through a 1 MΩresistor. And record the output voltage when 13.5 V was loaded. Test the time when the output voltage dropped to 300 mV by the acquisition card.
-----------------	--------------------------	------	---

Item	Environmental Requirements	Standard Values	Test Method
Electrical Signal Test	No wind environment	Internal and external Electrode Current> 100μA	Under air atmosphere, a DC source was used to charge 13.5 V voltage to the heater, and 450 mV voltage was loaded between the internal and external electrodes (the internal electrode was connected to the positive electrode), and observe the current value between the internal and external electrodes.
Maximum Temperature	No wind environment	770°C±50°C	The maximum temperature of the heater at steady state was measured by a thermal imager.
350°C Heating up Time	Temperature:23°C±3°C	≤7 s	Test the time needed for the heater heating from room temperature to 350°C by thermal imager.
Cracking Test	None	No Cracks	Test the porcelain core crack situation through the magenta.
Exterior	None	The surface without cracks, no bubbles, no cracks and other defects	Visual inspection
Dimensions	None	( 58.6 mm±0.5 mm ) × ( 4.4 mm±0.1 mm ) × ( 1.25 mm±0.1 mm )	Caliper measurement

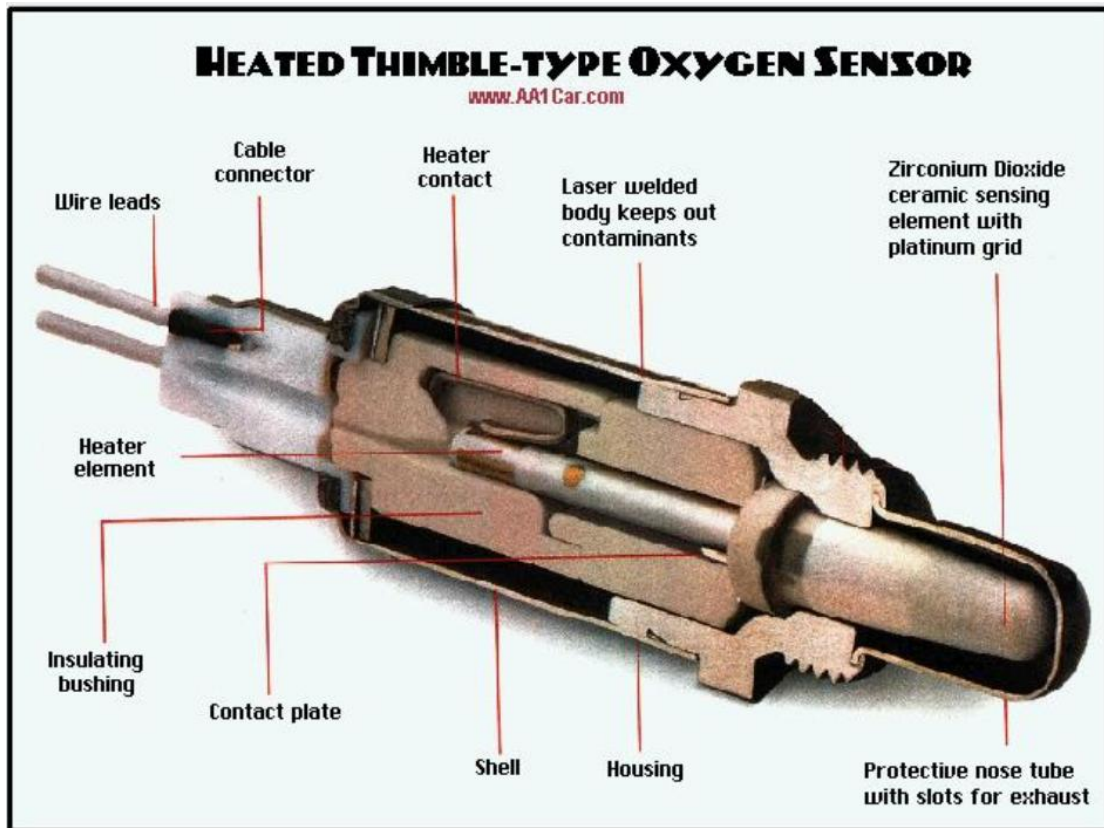
### Recommended Use Conditions

Conventional operating temperature range: 750°C~850°C

Maximum continuous operating temperature (250 h) : 1000°C

Should be used in accordance with the provisions of the GB 17930 gasoline and meet the GB 18351 requirements of the vehicle ethanol gasoline.

### Switching Plate Heating Core For Automotive Oxygen Sensor Application



### Packing and Delivery

The suitable packing should be taken to avoid the breakage and contamination during the shipment.



Fast International Express Delivery such as DHL,TNT,FEDEX, UPS ect.



## FAQ

1.What information you need to know If we want to do order a heating element?

Good question. Please give us information as clear as possible such as shape,length,diameter,resistance, heating zone and working temperature requirement ect.

2.What is your MOQ?

There is no MOQ for already ceramic heater models

You can buy any quantity you want.