- **Outline**

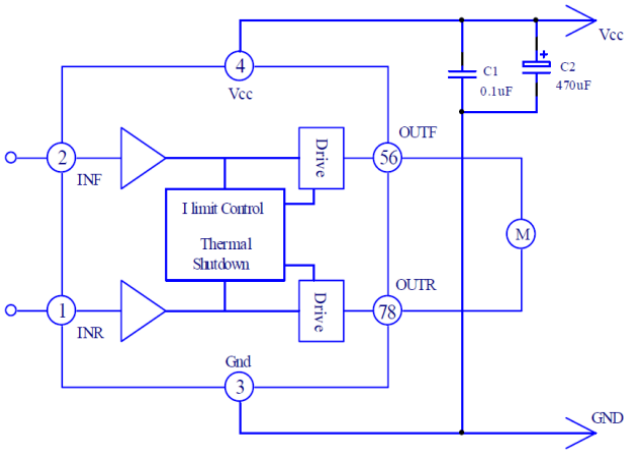
  Robots has a variety of motor drive IC. Our document is a contrast between two common motor driver IC. By reading this you can clear and concise understanding of the differences between the two IC. **We recommend using MD-2016.**

- **MD-2016 Introduce**

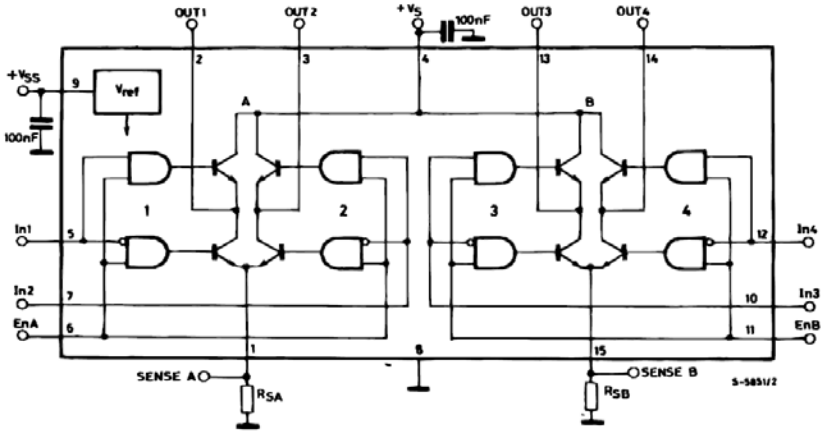
  MD-2016 is a 2-CH DC Motor H bridge driver for Smart Car which is based on L9170 IC. The L9170 is a CMOS-based bidirectional DC motor drive circuit. And it has two logic input terminal is used to control the motor forward, reverse and brake. The circuit has good resistance , small standby current , low output resistance, and it also has a built-in diode reverse impact energy release inductive load current. The voltage loss of CMOS is small , so that the motor can get more supply voltage. Therefore the MD-2016 have a higher driving efficiency.

  The L298 is an integrated monolithic circuit and based on bipolar devices. It is a high voltage, high current dual full-bridge driver designed to accept standard TTL logic levels and drive inductive loads such as relays, solenoids, DC and stepping motors.

**L9170 Application circuit diagrams:**




**L298N Application circuit diagrams:**




- **Parameter comparison**

| Symbol | Parameter | L298N | L9170 |
|---|---|---|---|
| Vs | Supply Voltage | 46V | 15V |
| Vlogic | Logic Supply Voltage | 5V | 5V |
| VCEast | Total Drop | 1A=3.2V | 1A=0.42V |
| | | 2A=4.9V | |
| Iout | | 2.5A | 3A |
| Totp | Overheat protection temperature | 130℃ | 130℃ |
| Is | Quiescent Supply Current | 24mA | 2uA |
| Icc | Quiescent Current | 50mA | 4mA |
| Heat Sink | | Need | No need |
| Cost | | $9.99 | $8.49 |

- **Parameter comparison**

**L9170 Driver truth table：**

| 2Pin Forward Input | 1Pin Reversion Input | 5、6Pin Forward Output | 7、8Pin Reversion Output |
|---|---|---|---|
| H | L | H | L |
| L | H | L | H |
| H | H | L | L |
| L | L | OPEN | OPEN |

**L298N Driver truth table：**

| | Forward | Reversion |
|---|---|---|
| IN1 | H | L |
| IN2 | L | H |
| IN3 | H | L |
| IN4 | L | H |

- **Drive code**

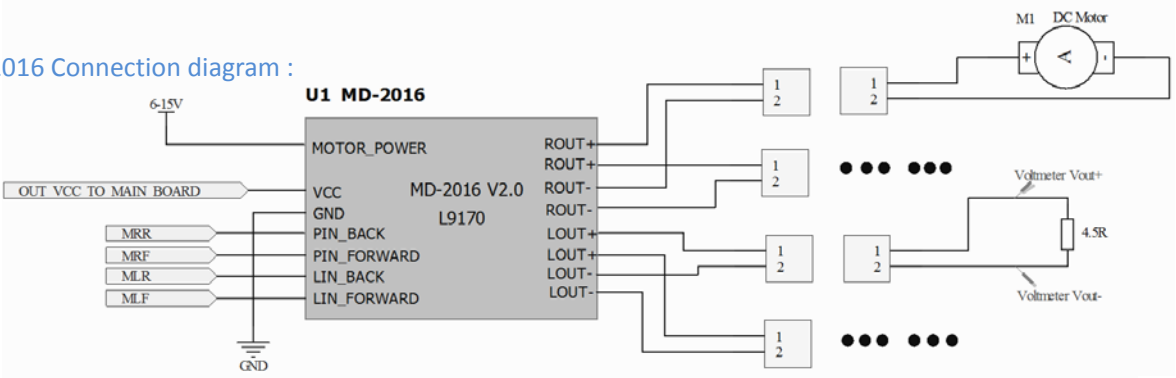
**L298N Drive code sample：**

```
int IN1=4;
int IN2=5;
int IN3=6;
int IN4=7;
int EN1=10;//Enable port 1
int EN2=11;//Enable port 2
void Motor1(boolean reverse)//Motor 1 work
{
  digitalWrite(IN1,HIGH);
  digitalWrite(IN2,LOW);
}
void Motor2(boolean reverse)//Motor 2 work
{
  digitalWrite(IN3,HIGH);
  digitalWrite(IN4,LOW);
}
void setup()
{
  int i;
  for (i=4;i<=7;i++) //Ardunio motor driver board
    pinMode(i,OUTPUT);
  for (i=4;i<=7;i++)
    digitalWrite(i,OUTPUT);
  pinMode(10,OUTPUT);
  pinMode(11,OUTPUT);
  Serial.begin(9600);
}
void loop()
{
  digitalWrite(IN3,LOW);
  digitalWrite(IN4,HIGH);
  digitalWrite(IN1,LOW);
  digitalWrite(IN2,HIGH);
  digitalWrite(EN1,HIGH);
  digitalWrite(EN2,HIGH);
}
```

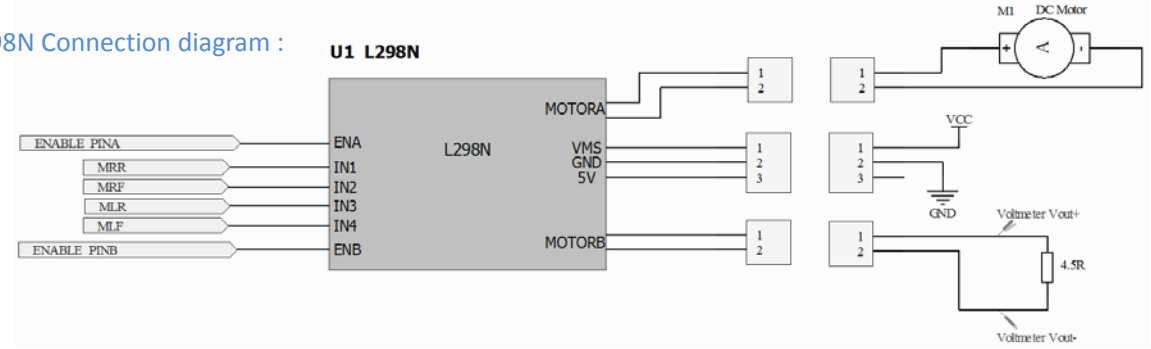
**L9170 Drive code sample：**

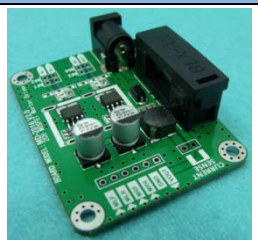
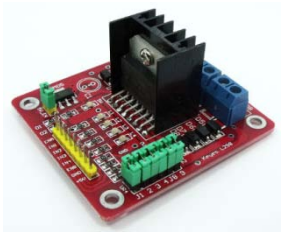
```
#include <Arduino.h>
int M_RR_PWM = 9;
int M_RF = 6;
int M_LR = 5;
int M_LF_PWM = 3;
void Motor1(boolean reverse)//Motor 1 work
{
  digitalWrite(M_RF,HIGH);
  digitalWrite(M_RR_PWM,LOW);
}
void Motor2(boolean reverse)//Motor 2 work
{
  digitalWrite(M_LR,HIGH);
  digitalWrite(M_LF_PWM,LOW);
}
void setup()
{
  pinMode(3,OUTPUT);
  pinMode(5,OUTPUT);
  pinMode(6,OUTPUT);
  pinMode(9,OUTPUT);
  digitalWrite(3,OUTPUT);
  digitalWrite(5,OUTPUT);
  digitalWrite(6,OUTPUT);
  digitalWrite(9,OUTPUT);
  Serial.begin(9600);
}
void loop()
{
  digitalWrite(M_LF_PWM,HIGH);
  digitalWrite(M_LR,LOW);
  digitalWrite(M_RR_PWM,HIGH);
  digitalWrite(M_RF,LOW);
  delay(1000);
}
```

MD-2016 Connection diagram :




L298N Connection diagram :




| | MD-2016 | | | | | L298N | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| |  | | | | |  | | | | |
| | IN | | OUT | | Efficiency | IN | | OUT | | Efficiency |
| | U(V) | I(A) | U(V) | LOAD(Ω) | (POUT/PIN) | U(V) | I(A) | U(V) | LOAD(Ω) | (POUT/PIN) |
| 1 | 6 | 1.2 | 5.40 | 4.5 | 90.0% | 6 | 0.8 | 3.45 | 4.5 | 55.1% |
| 2 | 7.2 | 1.5 | 6.62 | 4.5 | 90.2% | 7.2 | 1 | 4.38 | 4.5 | 59.2% |
| 3 | 9 | 1.9 | 8.28 | 4.5 | 89.1% | 9 | 1.3 | 5.65 | 4.5 | 60.6% |
| 4 | 12 | 2.5 | 10.64 | 4.5 | 83.9% | 12 | 1.8 | 7.80 | 4.5 | 62.6% |
| 5 | 15 | 3.2 | 13.52 | 4.5 | 84.6% | 15 | 2.2 | 9.60 | 4.5 | 62.1% |

- **Conclusion**

  According to the above content, **we strongly recommend using MD-2016.**

  Compared to similar products , L9170 has a stability functional. The L9170 is based on **CMOS**. CMOS IC is the use of FET. Thus L9170 power consumption is very low. Power supply circuit of L9170 is simple and the volume of the power supply is small, it also has a wide operating voltage range and it is basically do not need regulation. There are many other advantages, such as strong anti-jamming capability, good temperature stability, good controllability and so on.

- **Contact us**

1111 Oakmont Drive #C, San Jose, CA 95117

Contact: John Huang

Tel No: +1-408-981-6615

E-mail: support@inhaos.com