



IP9009

5-CH Motor Drive IC with Regulator and Reset controllers

DESCRIPTIONS

IP9009 is a 5-CH motor driver with LDO regulator and reset controller. It is suitable for CD-P/VCD-P/DVD-P systems. The motor driver part is composed of four BTL drivers and one forward/reverse controlled DC motor driver.



FEATURES

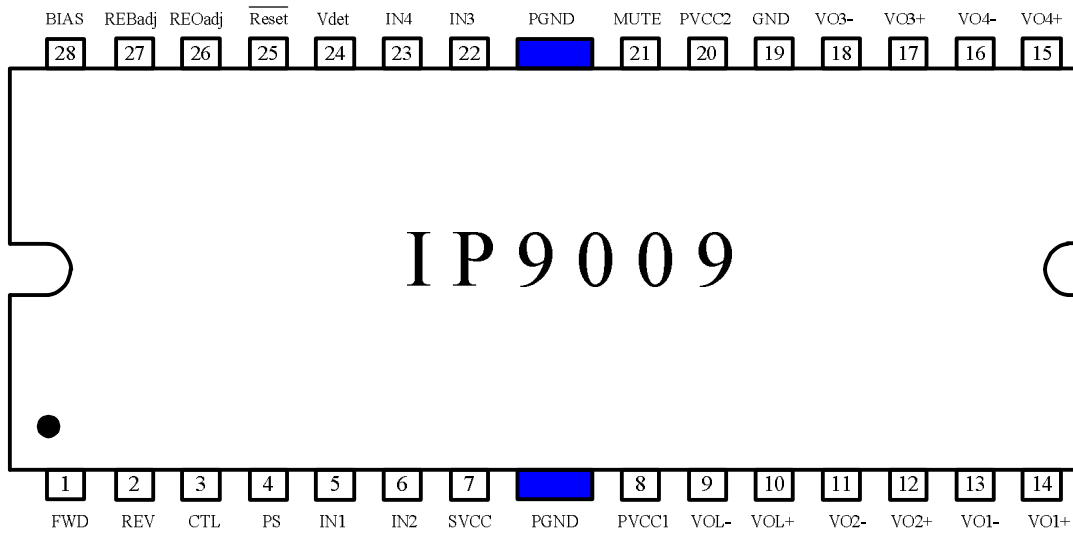
- 4-CH BTL driver.
- 1-CH forward/reverse controlled DC motor driver.
- Built-in adjustable LDO regulator controller.
- Built-in reset controller.
- Built-in TSD (thermal shut down) circuit.
- Built-in mute circuit.
- Built-in power save circuit.

- * L : Lead Free
- * TF : Tape & Reel packing
- * L-TF : Lead Free and Tape & Reel packing

ORDER INFORMATION

| Device | Package | Operating Temp |
|------------|--------------|----------------|
| IP9009 | 28SSOPH-375A | -35°C ~ +85°C |
| IP9009-TF | 28SSOPH-375A | -35°C ~ +85°C |
| IP9009L | 28SSOPH-375A | -35°C ~ +85°C |
| IP9009L-TF | 28SSOPH-375A | -35°C ~ +85°C |
| IP9009 | 28SSOPH-375B | -35°C ~ +85°C |
| IP9009-TF | 28SSOPH-375B | -35°C ~ +85°C |
| IP9009L | 28SSOPH-375B | -35°C ~ +85°C |
| IP9009L-TF | 28SSOPH-375B | -35°C ~ +85°C |

PIN CONNECTIONS



PIN DESCRIPTIONS

| NO | SYMBOL | I/O | DESCRIPTION | NO | SYMBOL | I/O | DESCRIPTION |
|----|--------|-----|-----------------------------|----|---------------------------|-----|-------------------------------|
| 1 | FWD | I | Loading motor forward input | 15 | VO4+ | O | CH4 driver output(+) |
| 2 | REV | I | Loading motor reverse input | 16 | VO4- | O | CH4 driver output(-) |
| 3 | CTL | I | Loading motor speed control | 17 | VO3+ | O | CH3 driver output(+) |
| 4 | PS | I | Power save | 18 | VO3- | O | CH3 driver output(-) |
| 5 | IN1 | I | CH1 input | 19 | GND | - | Ground |
| 6 | IN2 | I | CH2 input | 20 | PVCC2 | - | Power supply 2 |
| 7 | SVCC | - | Signal power supply | 21 | MUTE | I | Mute |
| 8 | PVCC1 | - | Power supply 1 | 22 | IN3 | I | CH3 input |
| 9 | VOL- | O | Loading driver output(-) | 23 | IN4 | I | CH4 input |
| 10 | VOL+ | O | Loading driver output(+) | 24 | Vdet | I | Reset controller input |
| 11 | VO2- | O | CH2 driver output(-) | 25 | $\overline{\text{Reset}}$ | O | Reset controller output |
| 12 | VO2+ | O | CH2 driver output(+) | 26 | REOadj | O | Adjustable regulator feedback |
| 13 | VO1- | O | CH1 driver output(-) | 27 | REBadj | O | Adjustable regulator control |
| 14 | VO1+ | O | CH1 driver output(+) | 28 | BIAS | I | Bias |

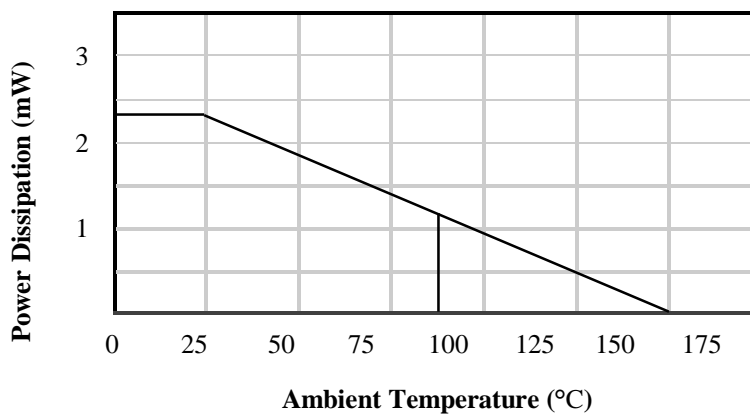
ABSOLUTE MAXIMUM RATINGS

| CHARACTERISTICS | SYMBOL | VALUE | UNIT |
|------------------------|--------|-----------|------|
| Maximum supply voltage | VCCmax | 15 | V |
| Power dissipation | Pd | 2.3 * | W |
| Operating temperature | Topr | -35 ~ +85 | °C |
| Storage temperature | Tstg | -55 ~ 150 | °C |

Note>

1. When mounted on 50mm X 50mm X 1mm PCB (Phenolic resin material).
2. Power dissipation reduces 18.4 mW/°C for using above Ta=25°C
3. Do not exceed Pd and SOA.

POWER DISSIPATION CURVE



RECOMMENDED OPERATING CONDITIONS

| CHARACTERISTICS | SYMBOL | VALUE | UNIT |
|------------------------|--------|------------|------|
| Signal supply Voltage | SVCC | 4.3 ~ 13.2 | V |
| Power supply Voltage 1 | PVCC1 | 4.3 ~ SVCC | V |
| Power supply Voltage 2 | PVCC2 | 4.3 ~ SVCC | V |

ELECTRICAL CHARACTERISTICS

(SVCC=12.0V,PVCC1=PVCC2=5V, RL=12ohm, Bias=1.65V, Ta = 25°C unless otherwise specified.)

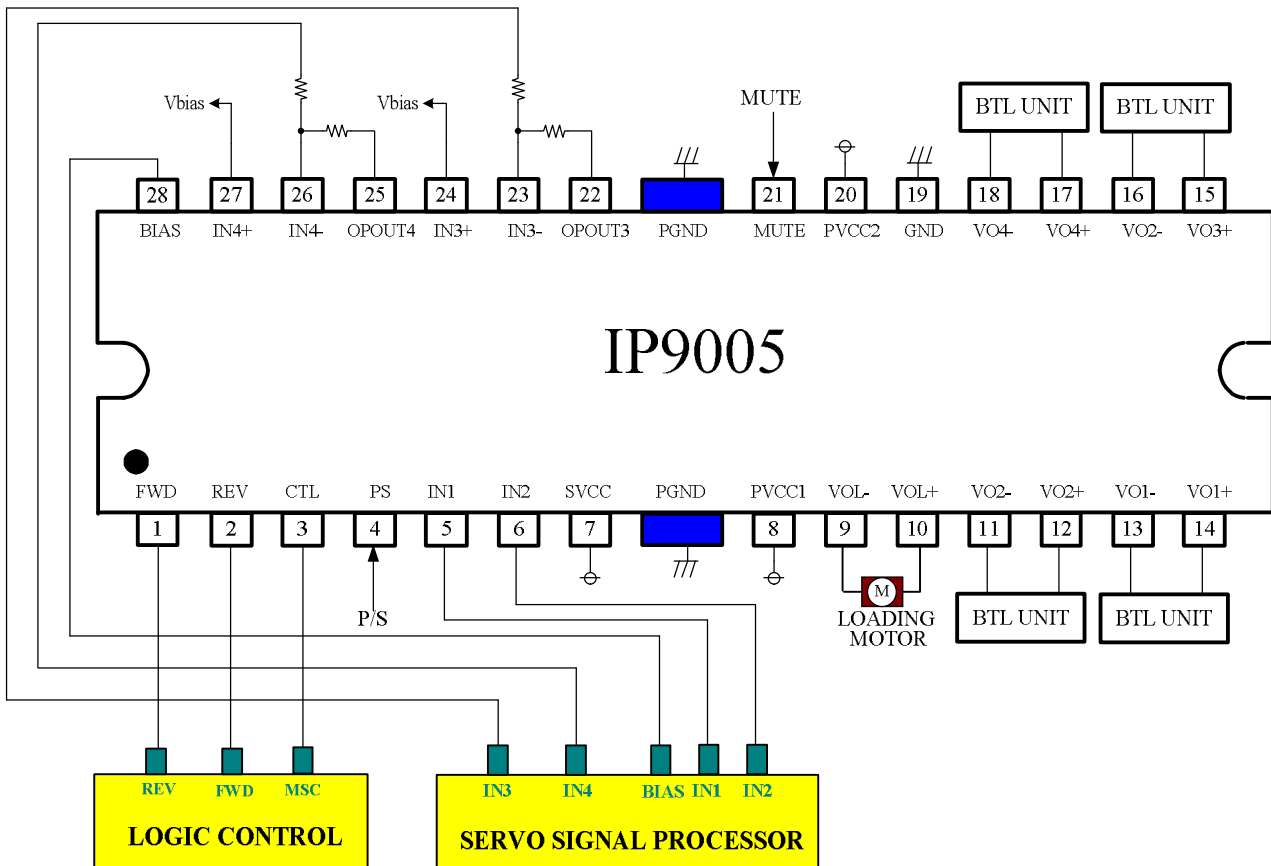
| CHARACTERISTICS | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNIT |
|--------------------------------------|--------|-------------------------|---------------|------|---------------|------|
| Quiescent circuit current | Icc | No Load | - | 20 | 30 | mA |
| Power save on current | Ips | Pin5=GND | - | 0.5 | 2.0 | mA |
| Power save on voltage | Vpson | Pin5=sweep | - | - | 0.5 | V |
| Power save off voltage | Vpsoff | Pin5=sweep | 2.0 | - | - | V |
| [ADJUSTABLE REGULATOR PART] | | | | | | |
| Output voltage | VREG | IL=100mA | Vout* 0.95 | Vout | Vout* 1.05 | V |
| Load Regulation | ΔVom | IL=0->200mA | -50 | 0 | 50 | mV |
| Line Regulation | ΔVcc | Vcc=6->10V,IL=100mA | -50 | 0 | 50 | mV |
| [RESET CONTROLLER PART] | | | | | | |
| Detecting voltage | Vdet | Pin24=sweep (low->high) | 2.6 | 2.9 | 3.2 | V |
| Hysteresis voltage | ΔVdet | | - | 50 | - | mV |
| Maximum output sink current | Isink | | 3 | 6 | - | mA |
| Output saturation voltage | Vsat | RL=1k ohm | - | - | 0.4 | V |
| [BTL DRIVE PART] | | | | | | |
| Output offset voltage | Voos | Vin=Vref | -100 | - | +100 | mV |
| Maximum output voltage | Voms | | 3.6 | 4.0 | - | V |
| Closed-loop voltage gain | Avfs | Vin=0.1Vrms, f=1kHz | 17 | 19 | 21 | dB |
| Mute on voltage | Vmon | Pin21=sweep | - | - | 0.5 | V |
| Mute off voltage | Vmoff | Pin21=sweep | 1.5 | - | - | V |
| Mute pin current | Imp | Pin21=5.0V | | 200 | 300 | uA |
| Bias pin current | Ibias | Pin28=2.5V | | 80 | 120 | uA |

ELECTRICAL CHARACTERISTICS

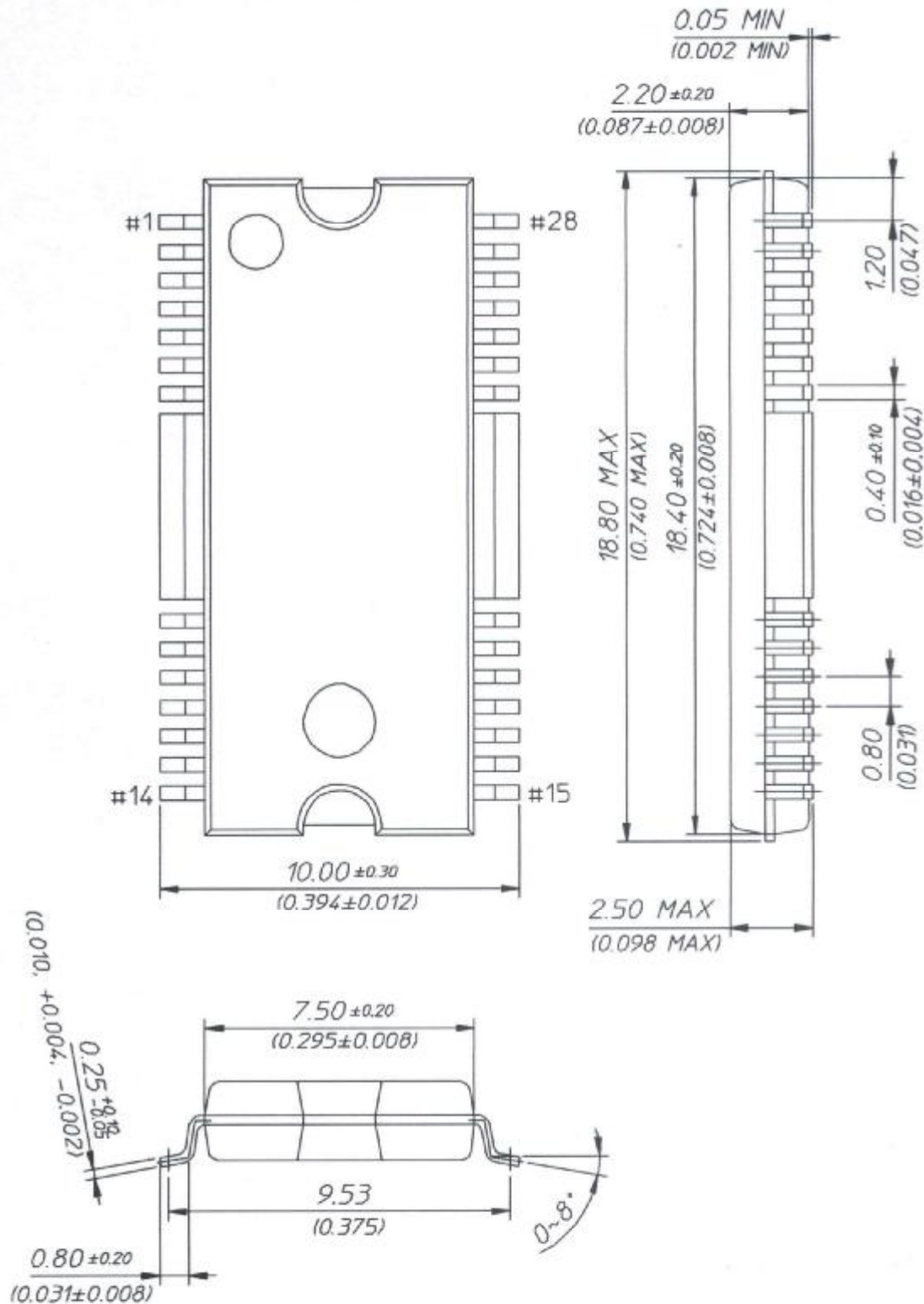
(SVCC=12.0V,PVCC1=PVCC2=5V, RL=12ohm, Bias=1.65V, Ta = 25°C unless otherwise specified.)

| CHARACTERISTICS | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNIT |
|--------------------------|--------|----------------|-----|-----|-----|------|
| [LOADING DRIVER PART] | | | | | | |
| Input high level voltage | Vih | | 1.5 | - | - | V |
| Input low level voltage | Vil | | - | - | 0.5 | V |
| FWD/REV pin current | Iin | Pin1=Pin2=5.0V | - | 200 | 300 | uA |
| Maximum output voltage | Vo | RL=25 ohm | 9.0 | 10 | - | V |
| Voltage gain | Gvf | Pin3=sweep | 7 | 9 | 11 | dB |

TYPICAL APPLICATION CIRCUIT



PACKAGE DIMENSION(28SSOPH-375A)



PACKAGE DIMENSION(28SSOPH-375B)

