

Features

- 2 channels of DC motor BTL driver
- 2 channels of BTL driver for coils with current feedback
- 1 channels forward/reverse control DC motor driver
- Built-in suspension function.
- Built-in thermal shutdown circuit.
- Operating voltage: 4.5V~13.2V

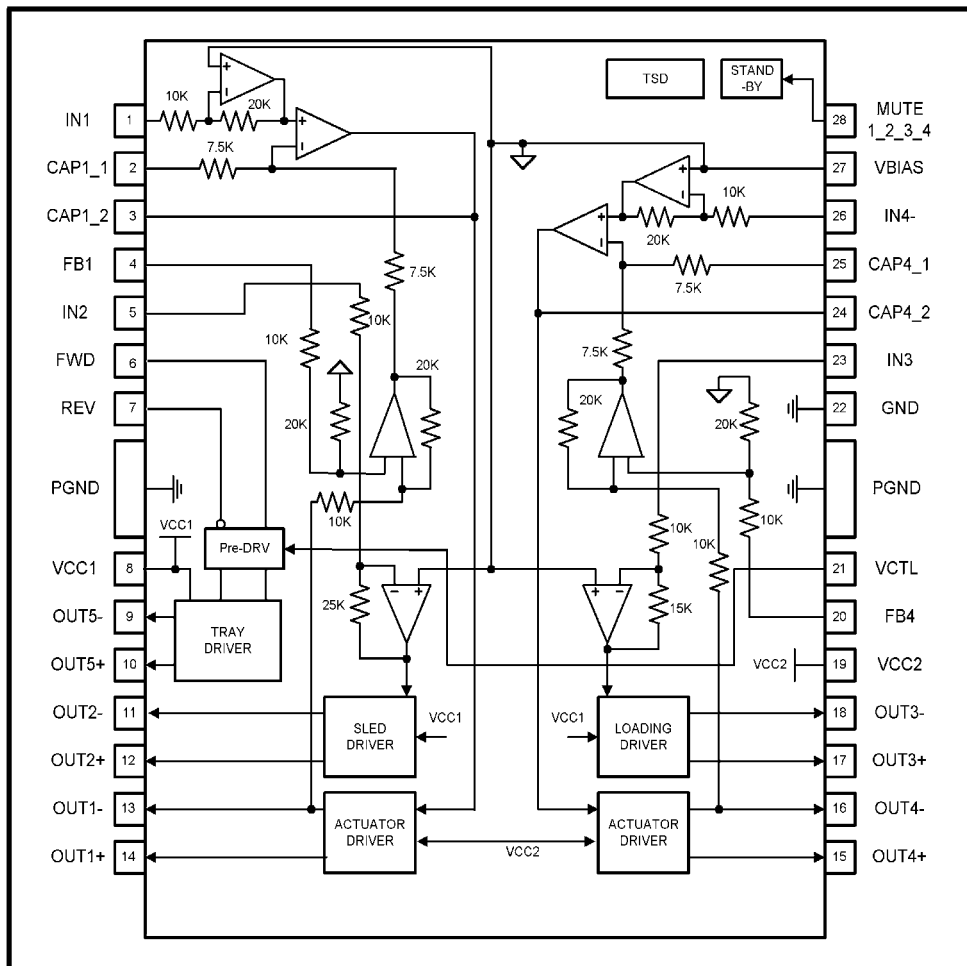
Description

The AT5665 is a 5-channel BTL driver IC. Two of them can drive DC motors and two can drive coils, such as the focus and tracking actuators of a CD-ROM/DVD-ROM/DVD-Player system, with current feedback. It also built-in one channel bi-direction DC motor driver for Tray.

Applications

CD-ROM/DVD-ROM/CD-RW drives
DVD player.

Block Diagram



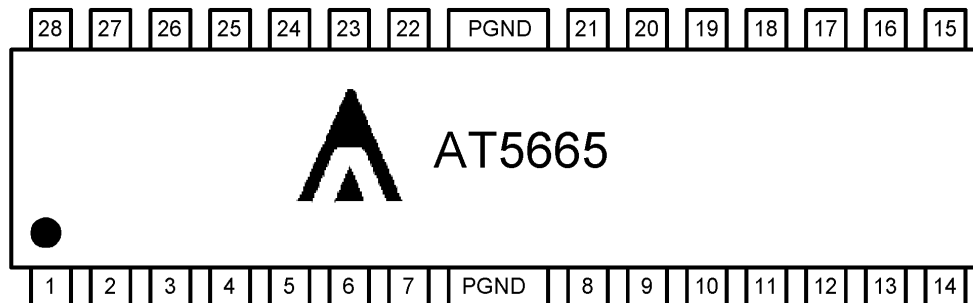
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Pin Descriptions

| Pin No. | Pin name | Function |
|---------|--------------|---|
| 1 | IN1 | CH1(Focus coil) input |
| 2 | CAP1_1 | CH1 error amplifier filter capacitor connection 1 |
| 3 | CAP1_2 | CH1 error amplifier filter capacitor connection 2 |
| 4 | FB1 | CH1(Focus coil) feedback pin |
| 5 | IN2 | CH2(Sled driver) input |
| 6 | FWD | CH5 forward input |
| 7 | REV | CH5 reverse input |
| 8 | VCC1 | Power Supply 1 |
| 9 | OUT5- | CH5(Tray driver) output(-) |
| 10 | OUT5+ | CH5(Tray driver) output(+) |
| 11 | OUT2- | CH2(Sled driver) output (-) |
| 12 | OUT2+ | CH2(Sled driver) output (+) |
| 13 | OUT1- | CH1(Focus coil) output (-) |
| 14 | OUT1+ | CH1(Focus coil) output (+) |
| 15 | OUT4+ | CH4(Tracking coil) output (+) |
| 16 | OUT4- | CH4(Tracking coil) output (-) |
| 17 | OUT3+ | CH3(Loader) output (+) |
| 18 | OUT3- | CH3(Loader) output (-) |
| 19 | VCC2 | Power Supply 2 |
| 20 | FB4 | CH4(Tracking coil) feedback pin |
| 21 | VCTL | CH5 Speed control input |
| 22 | GND | Ground |
| 23 | IN3 | CH3(Loader) input |
| 24 | CAP4_2 | CH4 error amplifier filter capacitor connection 2 |
| 25 | CAP4_1 | CH4 error amplifier filter capacitor connection 1 |
| 26 | IN4- | CH4 (Tracking driver) input |
| 27 | VBIAS | VREF input pin |
| 28 | MUTE 1 2 3 4 | Mute control for CH1,Ch2,CH3,CH4 |

Notes: The indicated polarities for the output pins are under the condition that all inputs are (+).
The power supplies for the driver output are PVcc1 for the loader, PVcc2 for focus and tracking drivers, and Vcc for pre-block and sled driver. Therefore, make sure $V_{cc} \geq PV_{cc1,2}$.

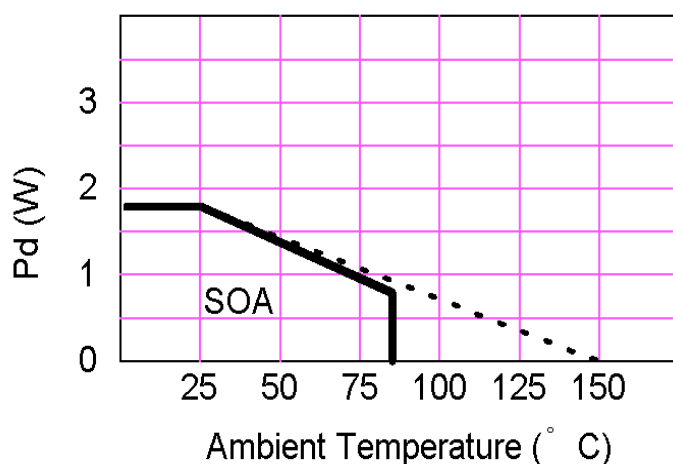
Pin Out



Ordering Information

| Part number | Package | Marking |
|-------------|-------------|---------|
| AT5665H | 28-pin HSOP | AT5665H |

Power Dissipation (Ta = 25°C)



Condition: mount on 50x50 mm² t=1.0mm paper phenol PCB

Absolute maximum ratings (Ta = 25°C)

| Parameter | Symbol | Limits | unit |
|-----------------------|------------------|----------|------|
| Power supply voltage | VCC1,2 | 13.5 | V |
| Power dissipation | P _d | 1.7 | W |
| Operating temperature | T _{opr} | -30~+80 | °C |
| Storage temperature | T _{stg} | -55~+150 | °C |

NOTE:*

1. Power dissipation reduces 13.6mW / °C for using above Ta=25°C
2. Do not exceed Pd and SOA.

Recommended operating conditions (Ta = 25°C)

| Parameter | Symbol | Limits | unit |
|----------------------|--------|----------|------|
| Power supply voltage | VCC1 | 4.0~13.2 | V |
| | VCC2 | 4.0~Vcc1 | V |

Electrical characteristics

(unless otherwise noted, Ta = 25°C, VCC1 = 12V, VCC2 = 5V, VBIAS = 2.5V, R_{L1} = R_{L2} = 8Ω, R_{L3} = R_{L4} = 12Ω)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|------------------------------------|---------------------|------|------|------|------|--|
| Quiescent current | I _{OC} | - | 18 | 27 | mA | No Load |
| Mute quiescent current | I _{QSB} | - | - | 5 | mA | CH5 active |
| Mute ON voltage | V _{SBON} | 0 | - | 0.5 | V | |
| Mute OFF voltage | V _{SBOFF} | 2.0 | - | - | V | |
| <Actuator driver> | | | | | | |
| Output current offset | I _{O1,2} | -6 | - | 6 | mA | |
| Maximum output voltage | V _{O1,2} | 3.6 | 4.0 | - | V | V _{IN} = V _{BIAS} ±1.5V |
| Gain | G _m | 1.3 | 1.5 | 1.7 | A/V | V _{IN} = V _{BIAS} ±0.2V |
| <Sled motor driver> | | | | | | |
| Output voltage offset | V _{OFFSL} | -100 | 0 | 100 | mV | |
| Maximum output voltage | V _{O3MAX} | 7.5 | 9.0 | - | V | V _{IN} = V _{BIAS} ±1.5V |
| Closed loop gain | G _{VSL} | 18.0 | 20.0 | 22.0 | dB | V _{IN} = V _{BIAS} ±0.2V |
| <Loader motor driver> | | | | | | |
| Output voltage offset | V _{OFFLD} | -50 | 0 | 50 | mV | |
| Maximum output voltage | V _{O4max1} | 7.5 | 9.0 | - | V | V _{IN} = V _{BIAS} ±2.0V |
| Maximum output voltage | V _{O4max2} | 3.6 | 4.0 | - | V | V _{IN} = V _{BIAS} ±1.5V VCC1 = 5V |
| Closed loop gain | G _{VLD} | 13.5 | 15.5 | 17.5 | dB | V _{IN} = V _{BIAS} ±0.2V |
| Gain error | ΔG _{VLD} | 0 | 1 | 2 | dB | V _{IN} = V _{BIAS} ±0.2V |
| <Tray motor driver> | | | | | | |
| Maximum output voltage | V _{O5max1} | - | 6.0 | - | V | R _{L5} = 45Ω, R _{VCTL} = 400Ω, |
| | | 3.8 | - | 4.2 | V | R _{L5} = 45Ω, R _{VCTL} = 0Ω, VCC1 = VCC2 = 5V |
| Output voltage offset | V _{OFFTR} | -50 | 0 | 50 | mV | |
| Input high level voltage | V _{IH} | 2.0 | - | - | V | |
| Input low level voltage | V _{IL} | - | - | 0.8 | V | |

Tray Motor Driver

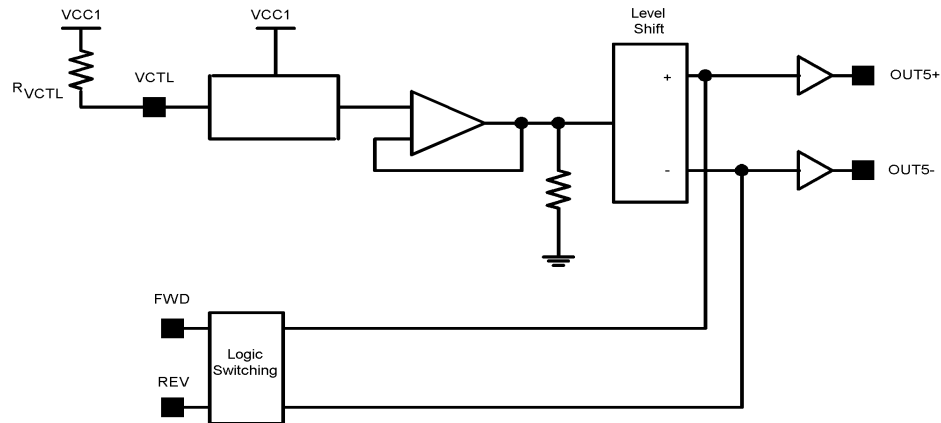


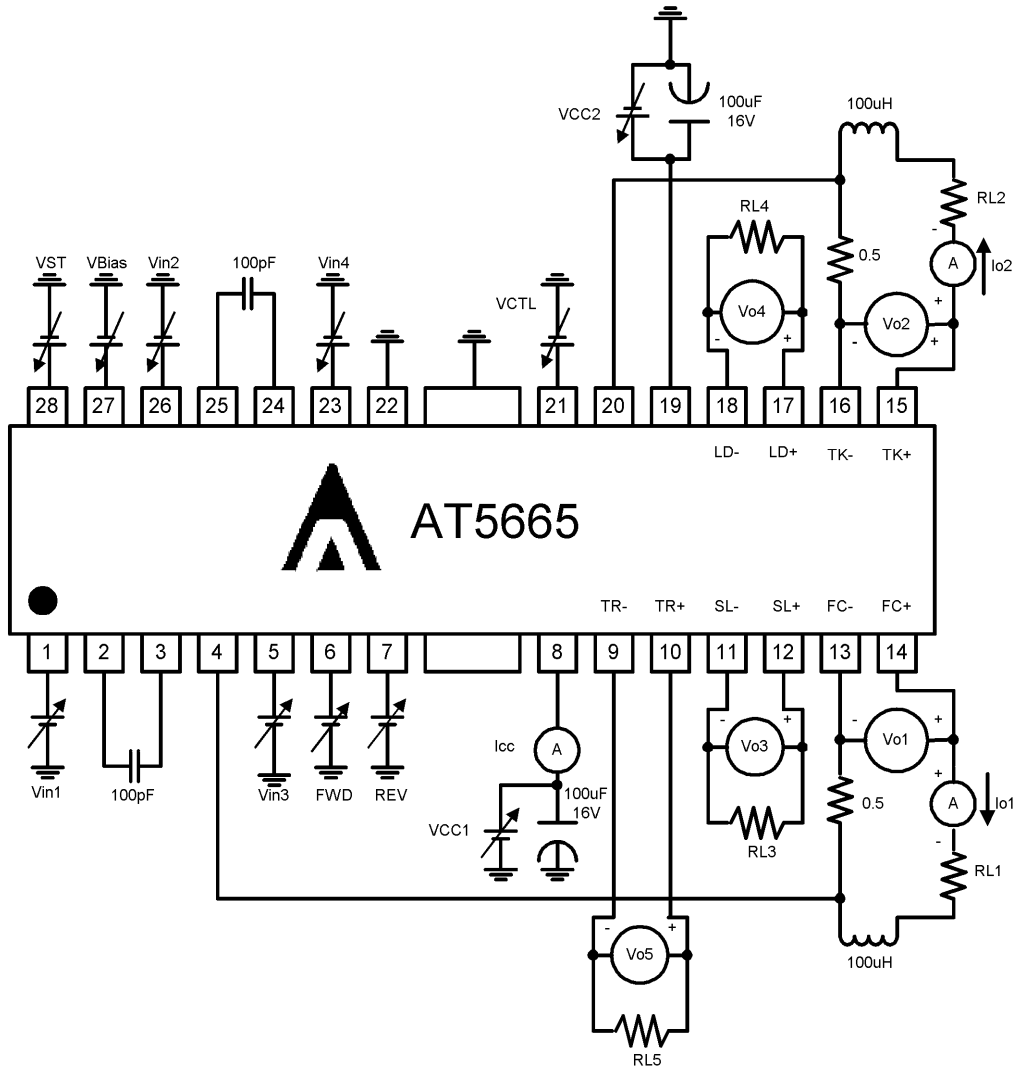
Fig1.

| Input | | Output | | |
|-------|------|--------|-------|---------|
| FWD | REV | OUT5+ | OUT5- | Status |
| High | High | Low | Low | Break |
| High | Low | High | Low | Forward |
| Low | High | Low | High | Reverse |
| Low | Low | Open | Open | Standby |

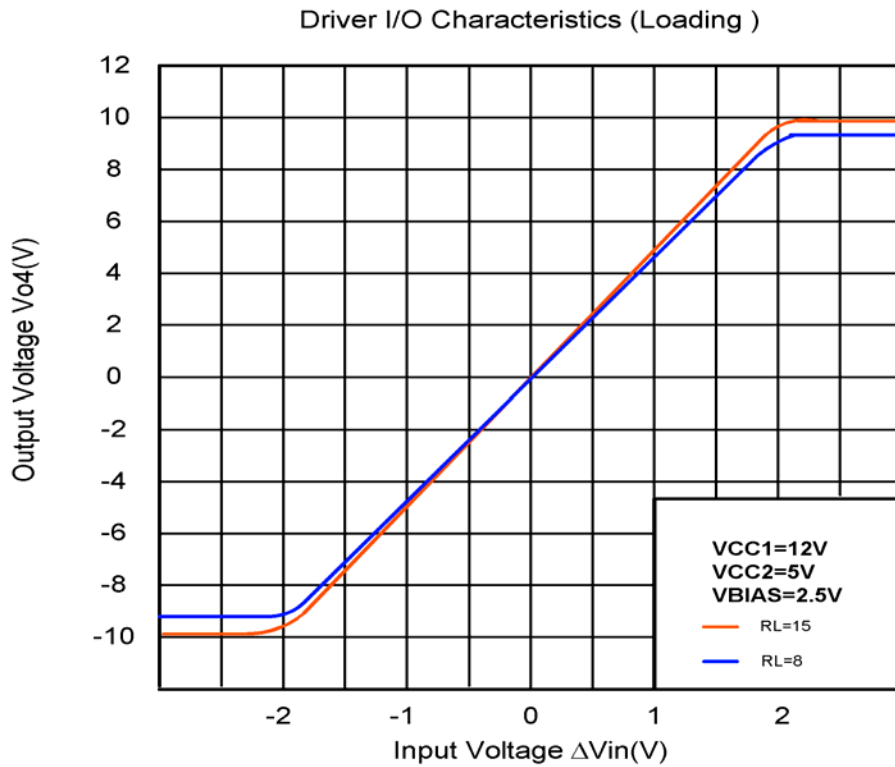
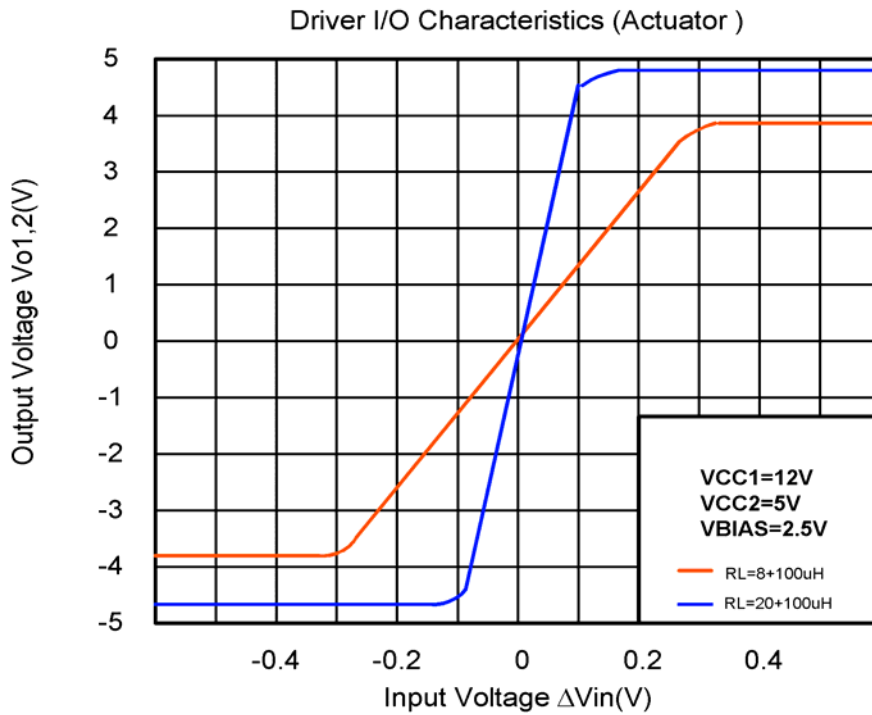
Tray Motor Speed Control

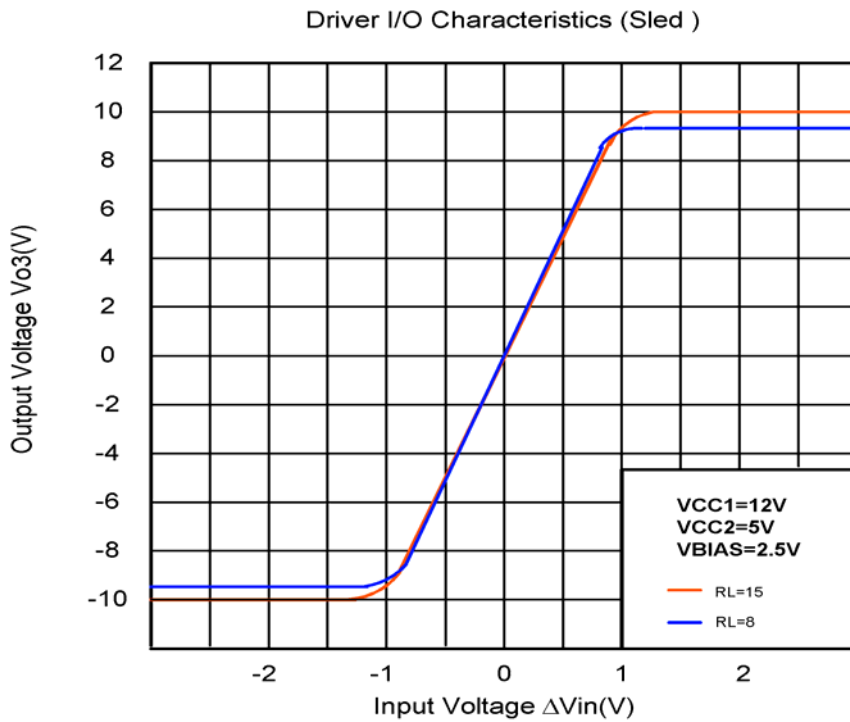
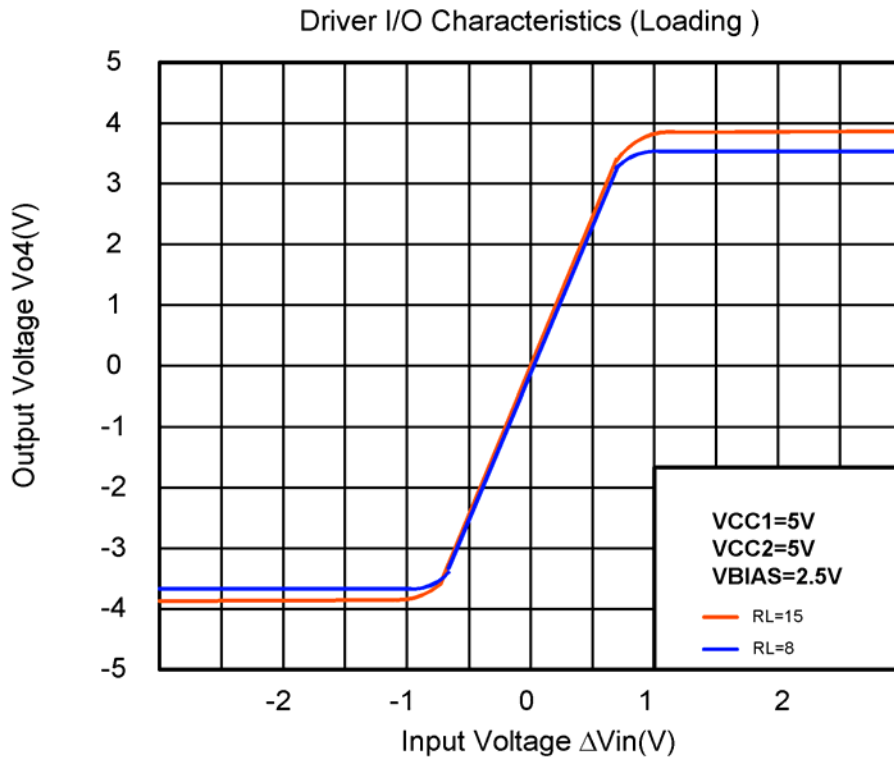
The amplitude of the output voltage is controlled by VCTL(pin21). If you want to control differential output voltage of the tray, insert external resistor R_{VCTL} as shown in figure 1.

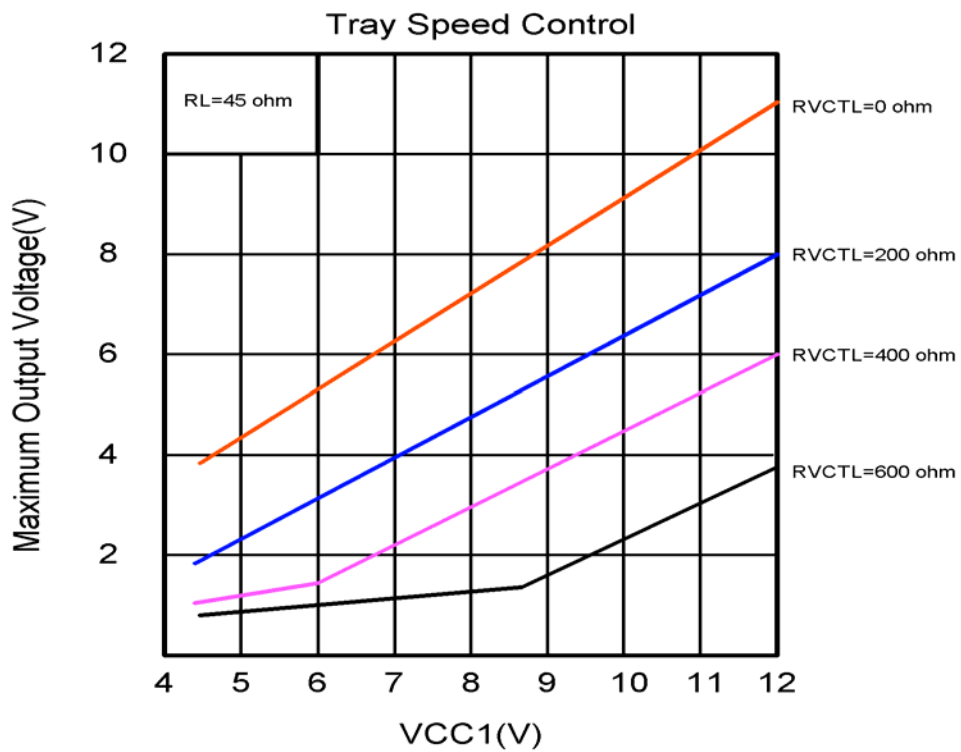
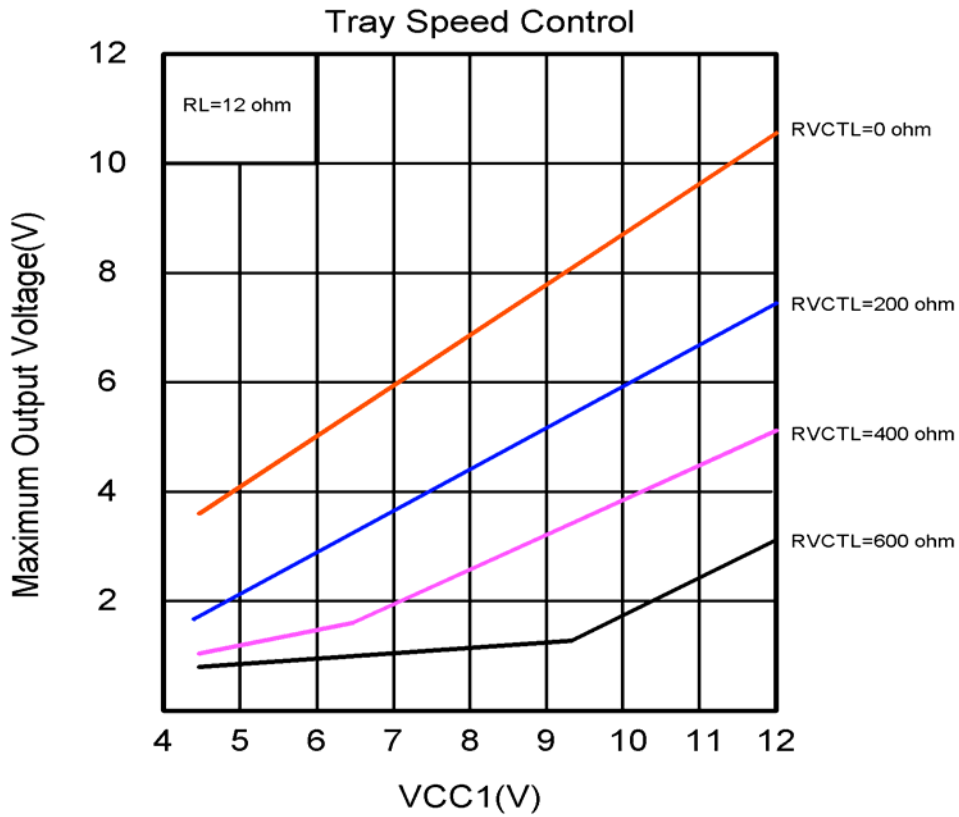
Test Circuit



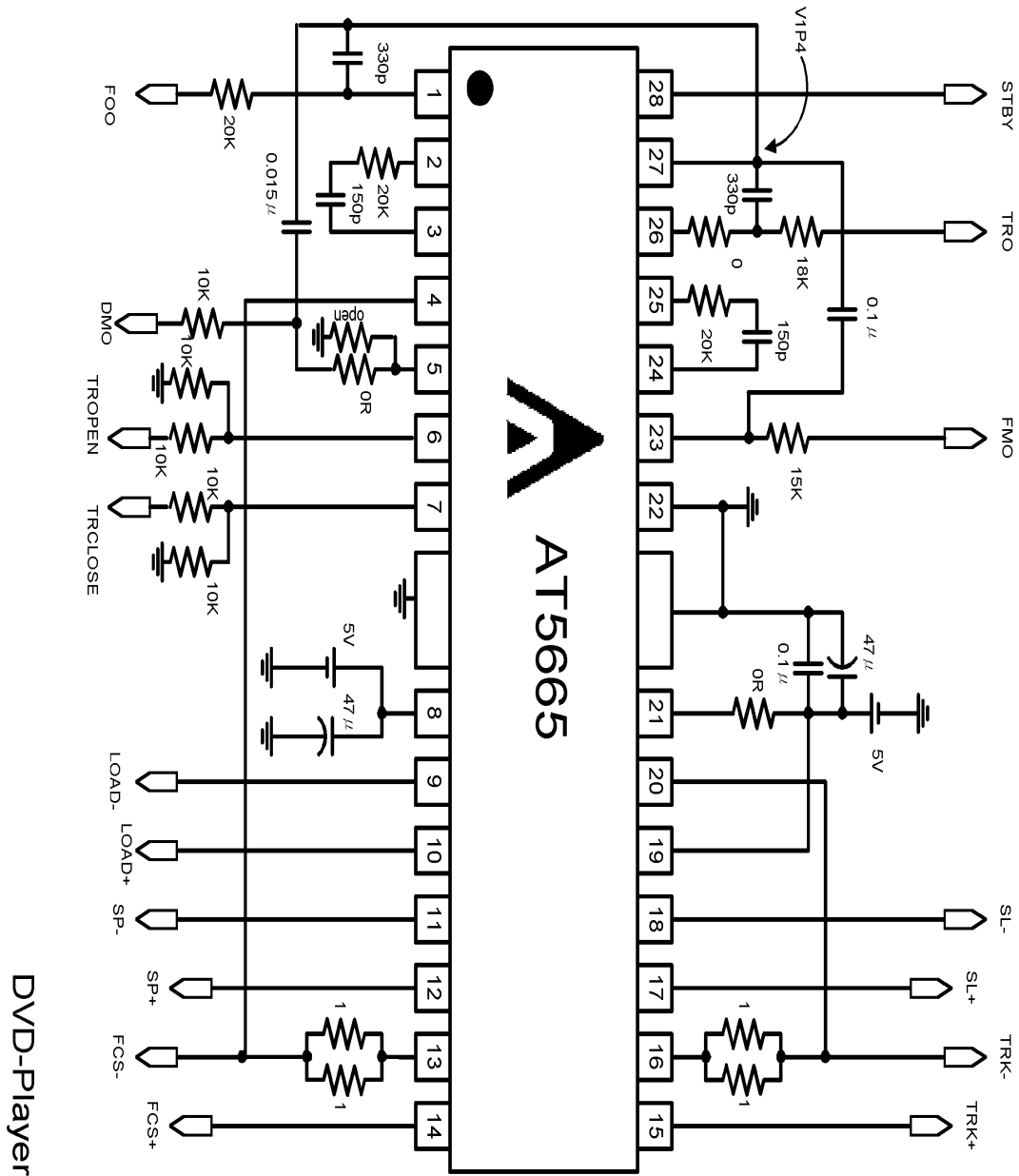
Typical Curve







Application circuit



Package Outlines (units:mm): HSOP-28

