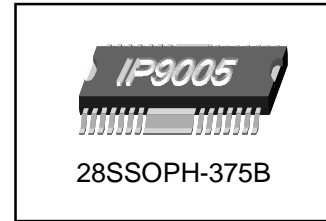


DESCRIPTIONS

IP9005 is a 5-CH motor driver for CD-P/VCDP/DVDP systems. It is composed of 2-CH BTL driver with 2-input OPAMP, 2-CH BTL driver and 1-CH forward/reverse controlled DC motor driver.



FEATURES

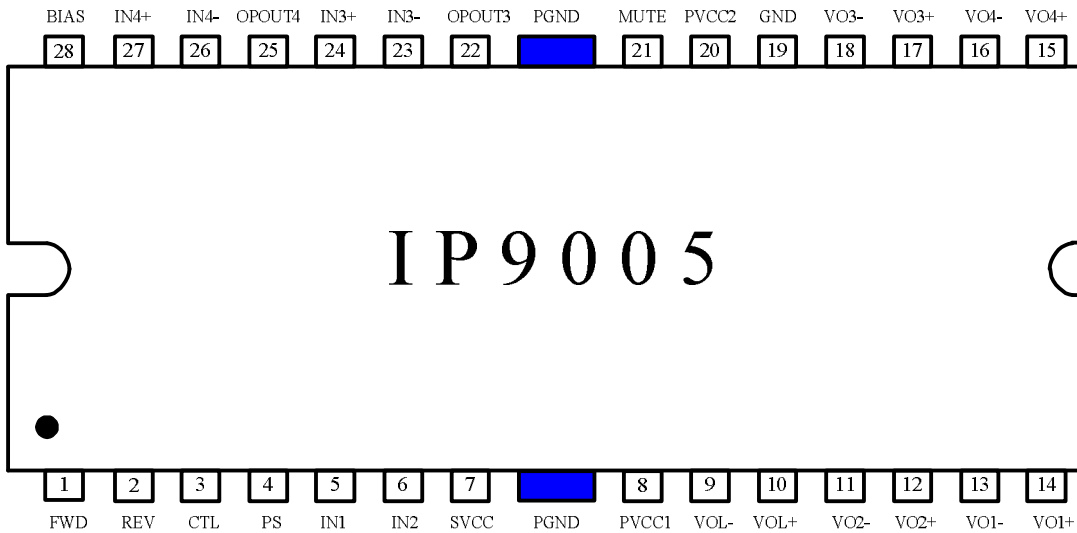
- 2-CH BTL driver.
- 2-CH BTL driver with input OPAMP.
- 1-CH forward/reverse controlled DC motor driver.
- Built-in TSD (thermal shut down) circuit.
- Built-in mute circuit.
- Built-in power save circuit.
- Operating supply voltage (4.3V~13.2V).

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

ORDER INFORMATION

| Device | Package | Operating Temp |
|------------|--------------|----------------|
| IP9005 | 28SSOPH-375A | -35°C ~ +85°C |
| IP9005-TF | 28SSOPH-375A | -35°C ~ +85°C |
| IP9005L | 28SSOPH-375A | -35°C ~ +85°C |
| IP9005L-TF | 28SSOPH-375A | -35°C ~ +85°C |
| IP9005 | 28SSOPH-375B | -35°C ~ +85°C |
| IP9005-TF | 28SSOPH-375B | -35°C ~ +85°C |
| IP9005L | 28SSOPH-375B | -35°C ~ +85°C |
| IP9005L-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 | OPOUT3 | O | CH3 OPAMP output |
| 9 | VOL- | O | Loading driver output(-) | 23 | IN3- | I | CH3 OPAMP input (-) |
| 10 | VOL+ | O | Loading driver output(+) | 24 | IN3+ | I | CH3 OPAMP input (+) |
| 11 | VO2- | O | CH2 driver output(-) | 25 | OPOUT4 | O | CH4 OPAMP output |
| 12 | VO2+ | O | CH2 driver output(+) | 26 | IN4- | I | CH4 OPAMP input (-) |
| 13 | VO1- | O | CH1 driver output(-) | 27 | IN4+ | I | CH4 OPAMP input (+) |
| 14 | VO1+ | O | CH1 driver output(+) | 28 | BIAS | I | Bias |

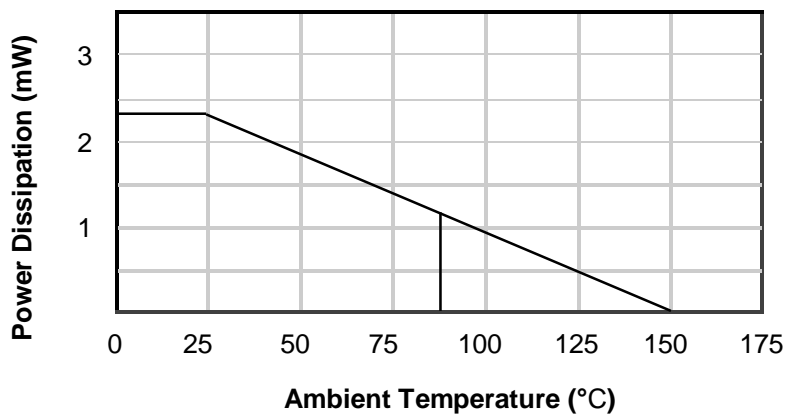
ABSOLUTE MAXIMUM RATINGS

| 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=8ohm, Bias=1.65V, Ta = 25°C unless otherwise specified.)

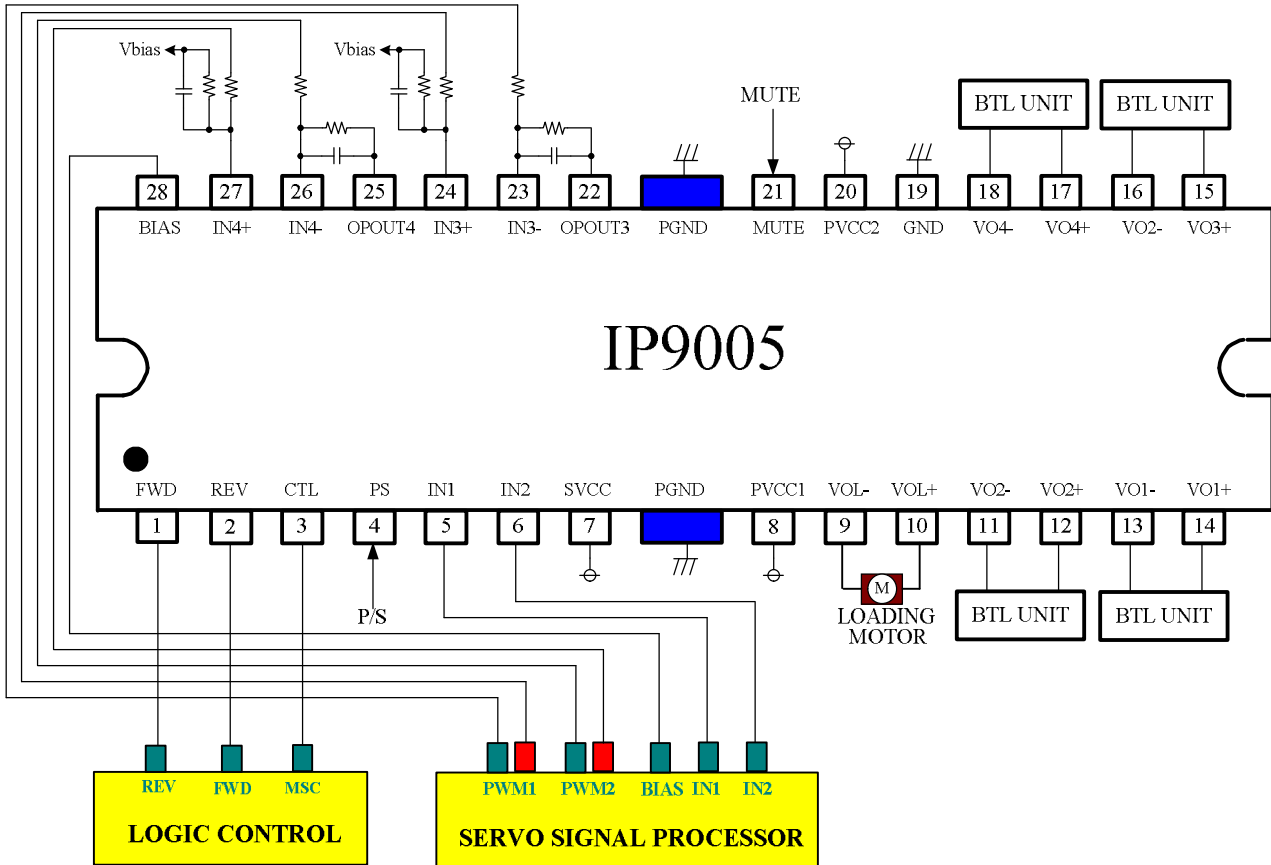
| CHARACTERISTICS | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNIT |
|--------------------------------------|--------|------------------------------|------|-----|-----|------|
| Quiescent circuit current | Icc | No Load | - | 23 | 34 | mA |
| Power save on current | Ips | Pin5=GND | - | 0.5 | 2.0 | mA |
| Power save on voltage | Vpson | Pin5=sweep | - | - | 0.5 | V |
| Power save off voltage | Vpsoff | Pin5=sweep | 2.0 | - | - | V |
| [BTL DRIVE PART] | | | | | | |
| Output offset voltage | Voos | Vin=Vref | -80 | - | +80 | mV |
| Maximum output voltage | Voms | RL=8 ohm | 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 |
| [CH3, CH4 INPUT OPAMP PART] | | | | | | |
| Common mode input range | Vicm | Vbias=4.0V | 0.5 | - | 10 | V |
| Input bias current | Ib | - | - | - | 300 | nA |
| High level output voltage | Vohop | Pin28=6.0V | 11.5 | - | - | V |
| Low level output voltage | Volop | Pin28=6.0V | - | - | 0.5 | V |
| Output source current | Isrc | - | 1 | - | - | mA |
| Output sink current | Isnk | - | 1 | - | - | mA |
| Slew rate | Srop | 100KHz pulse, Vout=2.0Vpp | - | 1.0 | - | V/uS |

ELECTRICAL CHARACTERISTICS

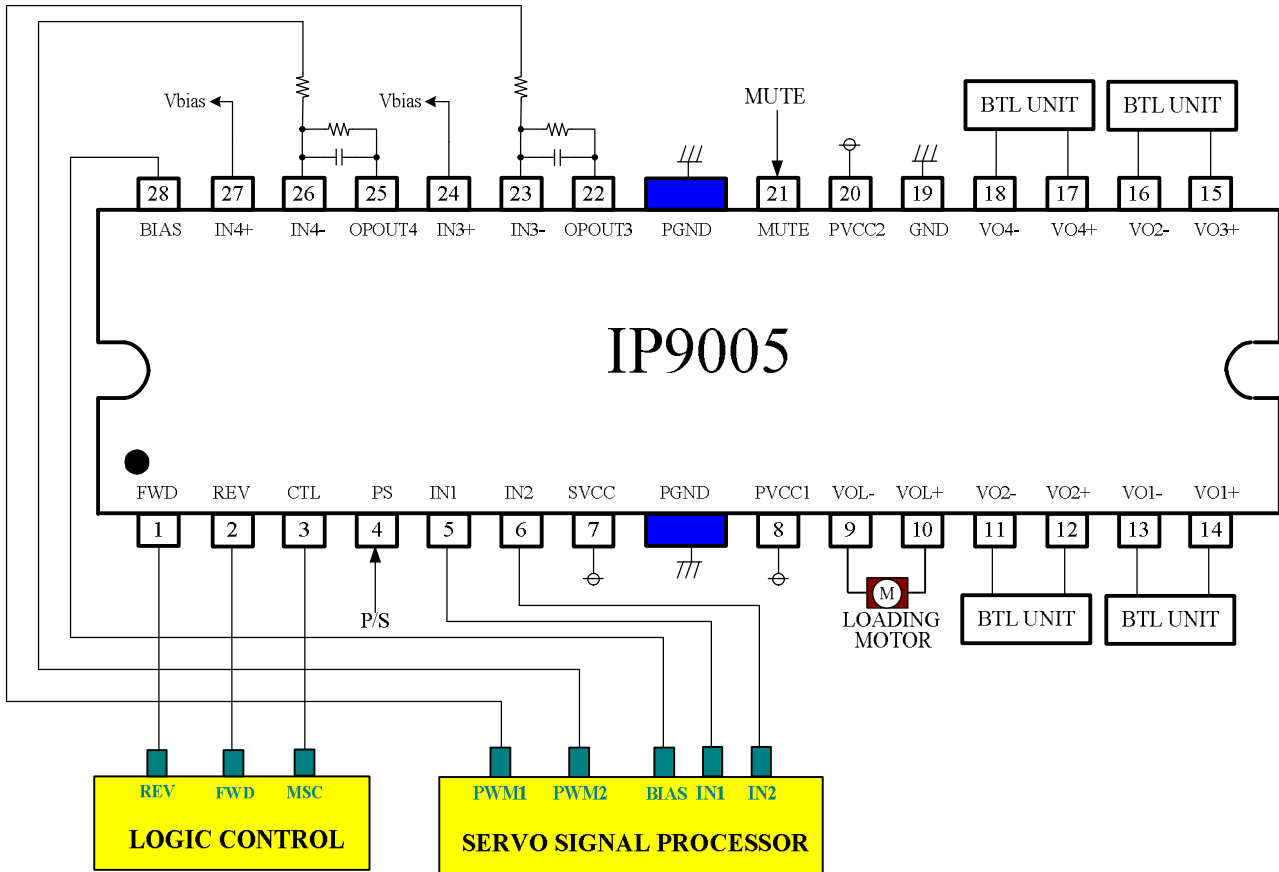
(SVCC=12.0V,PVCC1=PVCC2=5V, RL=8ohm, Bias=1.65V, Ta = 25°C unless otherwise specified.)

| CHARACTERISTICS | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNIT |
|------------------------------|--------|----------------|-----|-----|-----|------|
| [LOADING DRIVER PART] | | | | | | |
| Input high level voltage | Vih | - | 1.5 | - | - | V |
| Input high level voltage | Vil | - | - | - | 0.5 | V |
| FWD/REV pin current | lin | 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 |

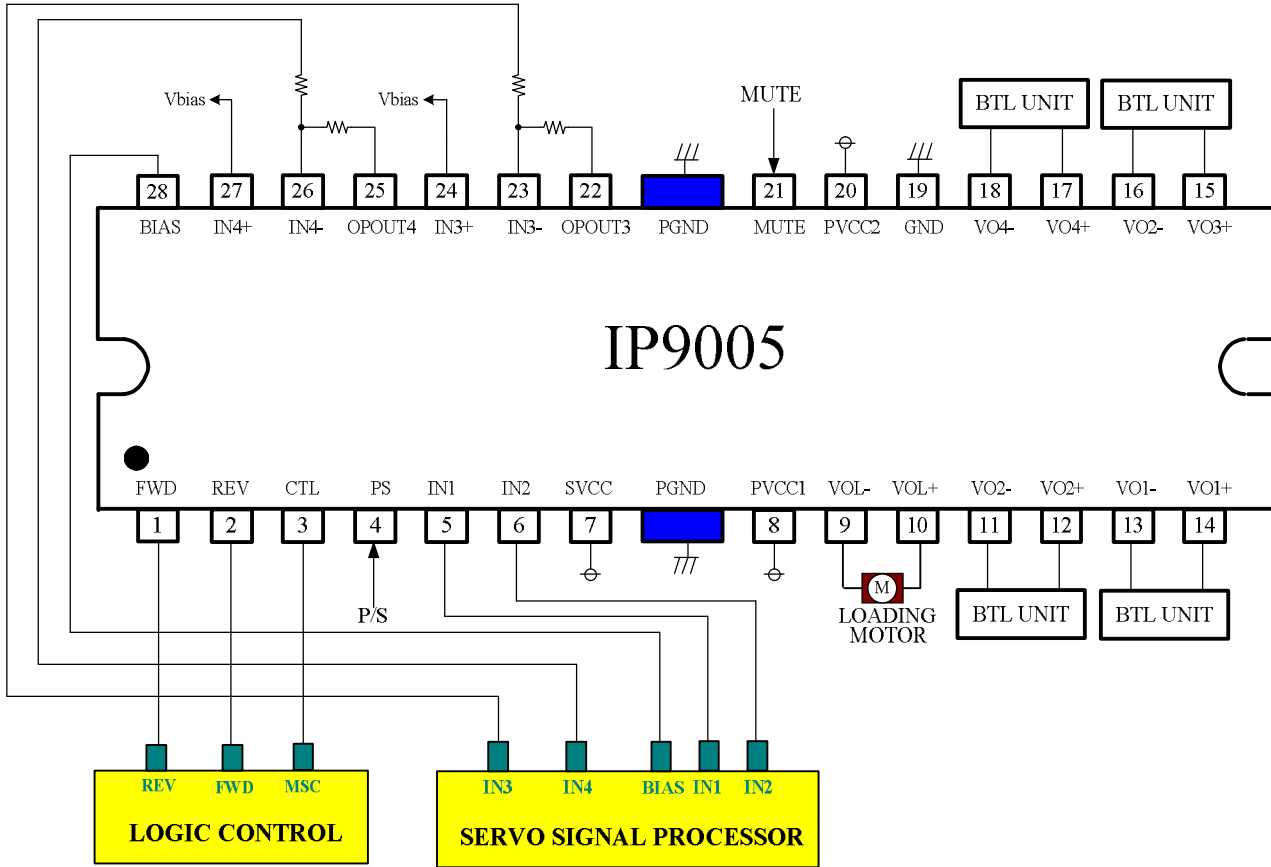
TYPICAL APPLICATION CIRCUIT 1



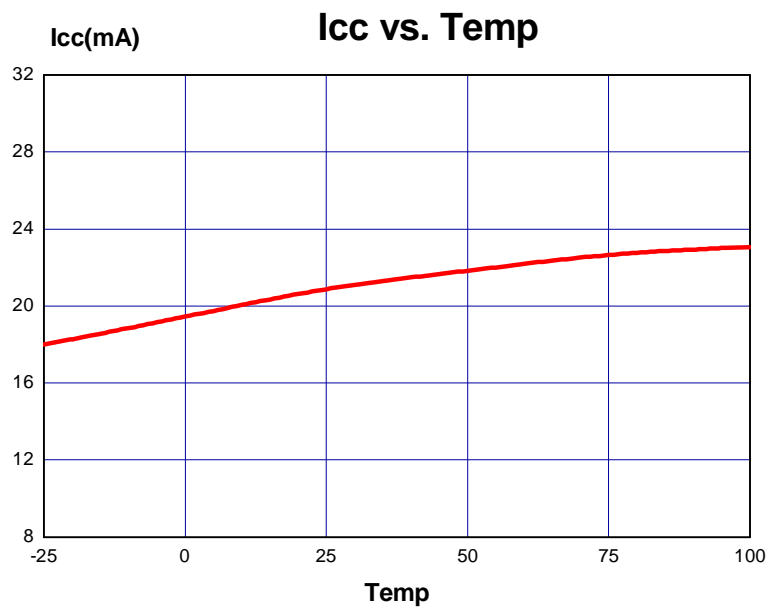
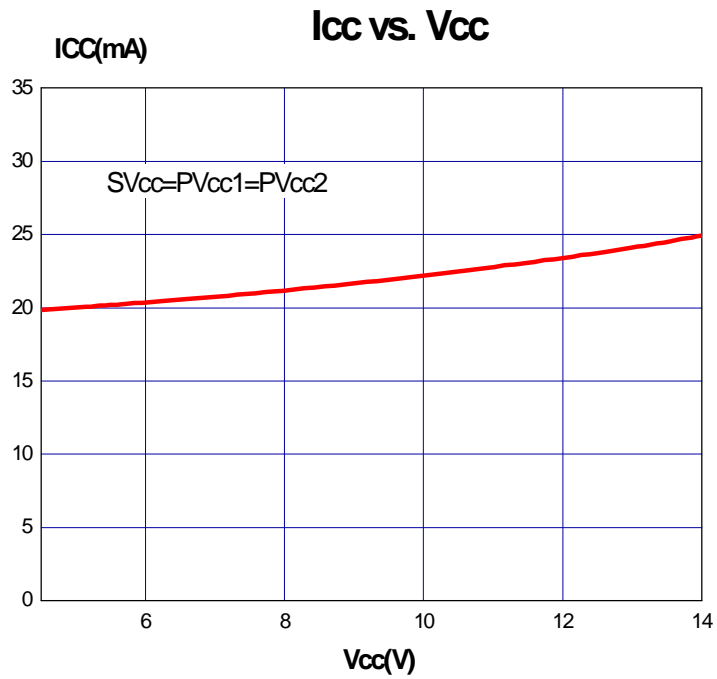
TYPICAL APPLICATION CIRCUIT 2



TYPICAL APPLICATION CIRCUIT 3

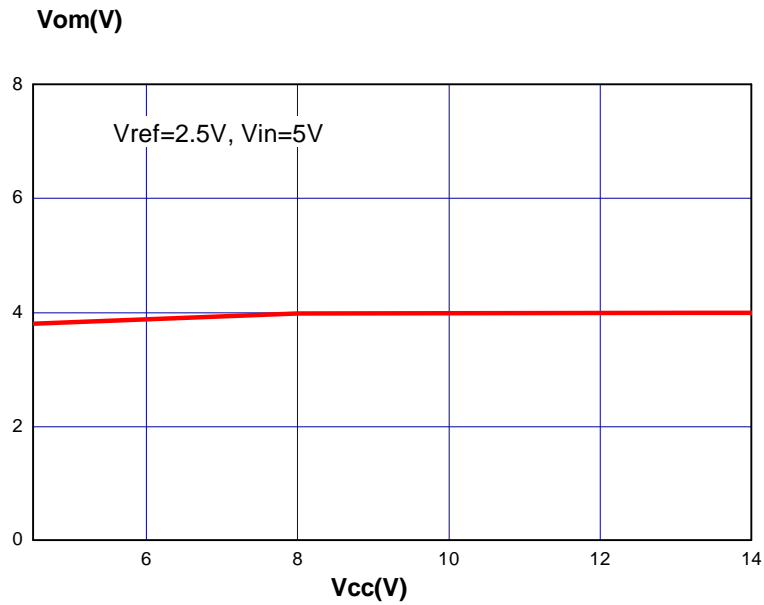


ELECTRICAL CHARACTERISTICS CURVES

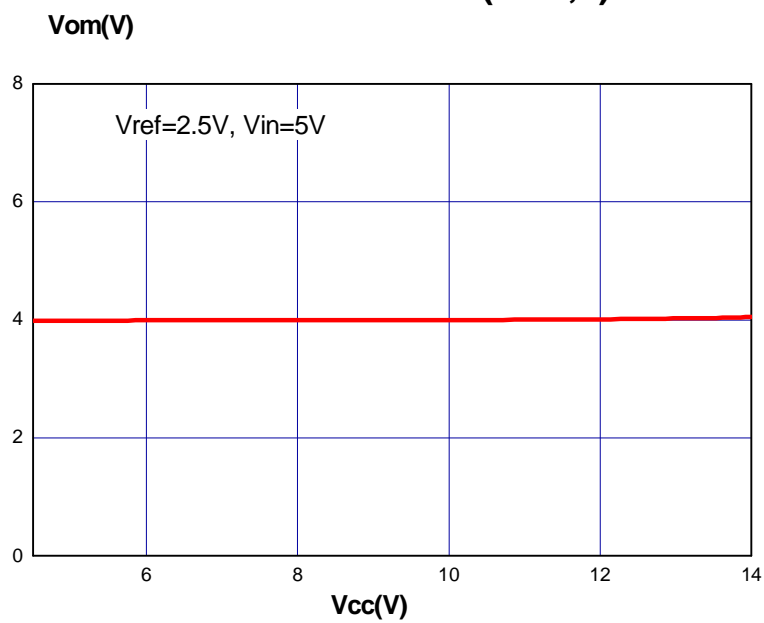


ELECTRICAL CHARACTERISTICS CURVES (Continued)

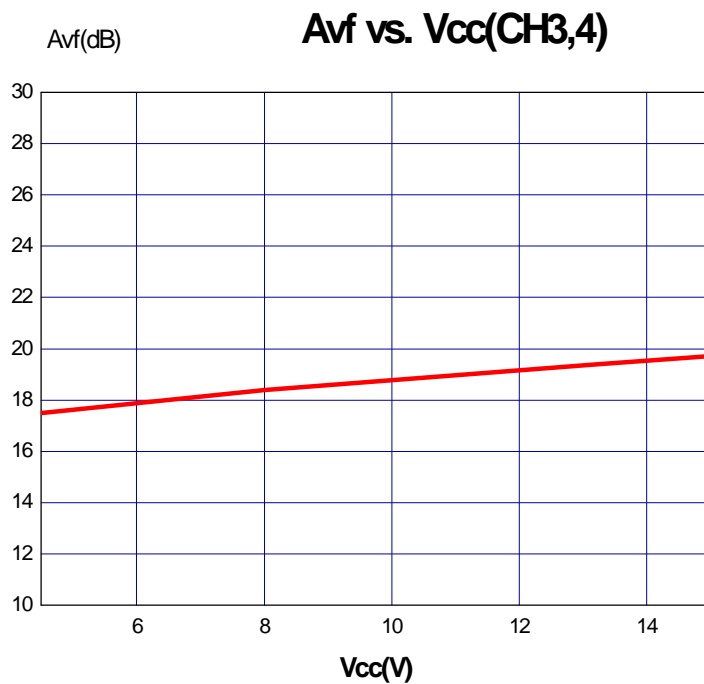
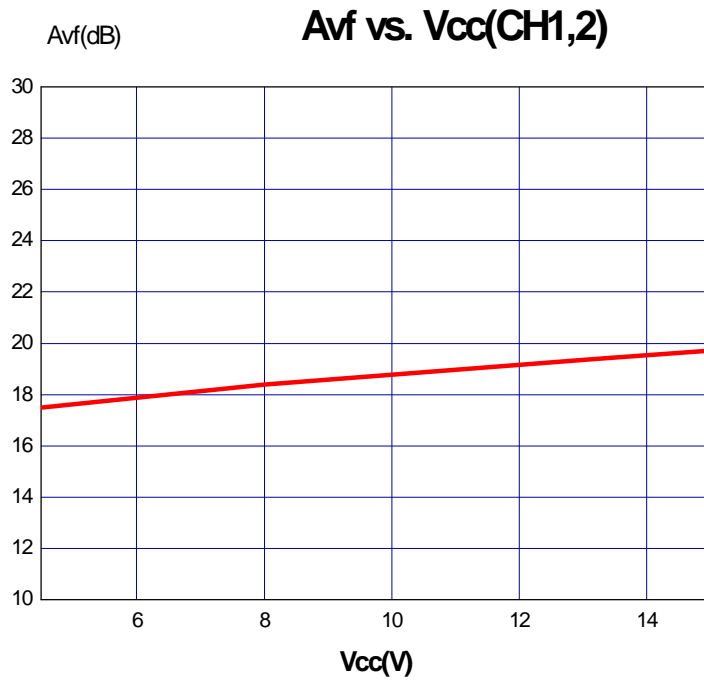
Vom vs. Vcc (CH1,2)



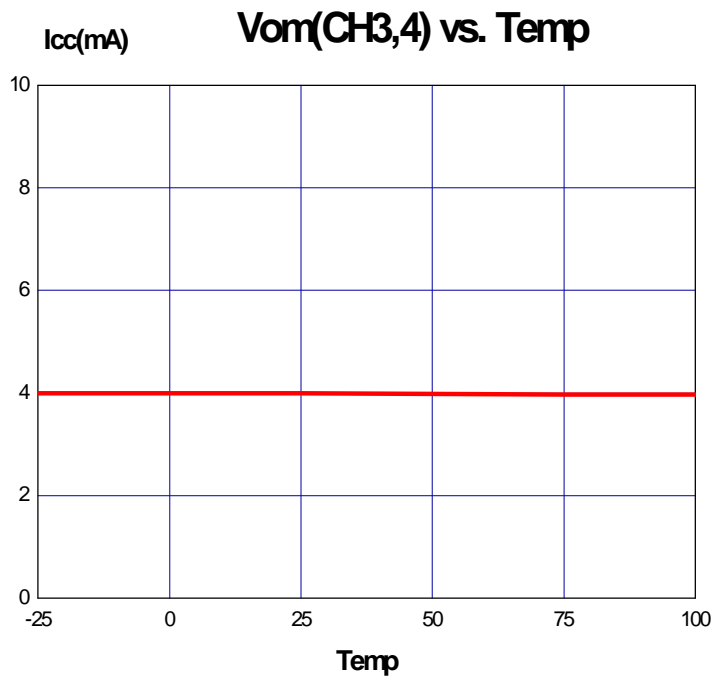
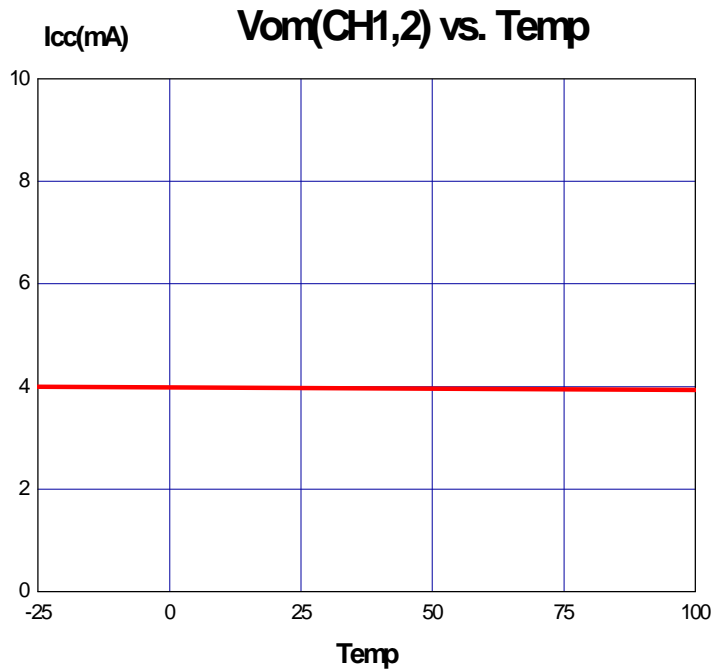
Vom vs. Vcc (CH3,4)



ELECTRICAL CHARACTERISTICS CURVES (Continued)



ELECTRICAL CHARACTERISTICS CURVES (Continued)



ELECTRICAL CHARACTERISTICS CURVES (Continued)

