

## 3ch VIDEO AMPLIFIER FOR COLOR DIFFERENCE SIGNAL

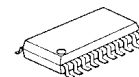
## ■GENERAL DESCRIPTION

The NJM2569 is a 3ch video amplifier for color difference signal (R-Y,B-Y).

It composes the output circuit of video items for color difference signal, because prepares clamp circuit, LPF, GCA.

Also it is suitable for portable items because of power save circuit.

## ■OUTLINE PACKAGE

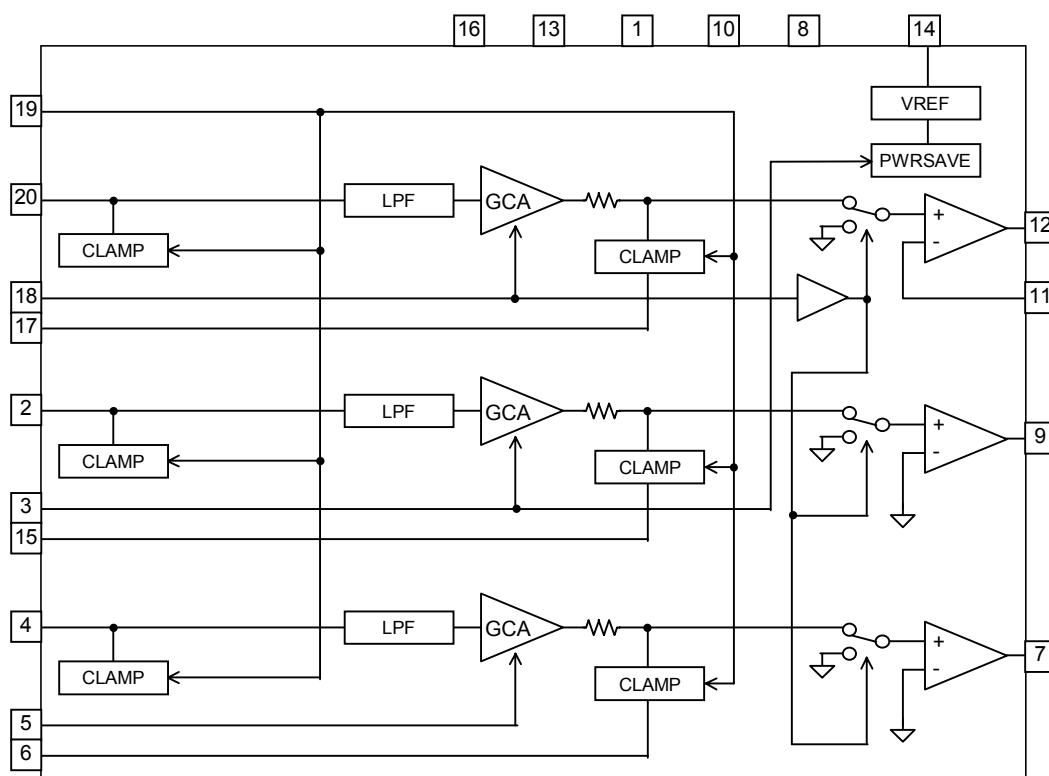


NJM2569V

## ■FEATURES

- Operating Voltage 4.5 to 5.5V
- Operating Current 17.0mA typ. at Vcc1=4.8V  
7.0mA typ. at Vcc2=4.8V
- Operating Current at Power Save 1.5mA typ. at Vcc1=4.8V  
5.0uA typ. at Vcc2=4.8V
- Internal Low Pass Filter
- Internal Gain Control Amplifier
- Bipolar Technology
- Package Outline SSOP20

## ■BLOCK DIAGRAM



## PIN FUNCTION

- 1.Vcc1
- 2.Cb in
- 3.GCA CTL2
- 4.Cr in
- 5.GCA CTL3
- 6.CLAMP3
- 7.Cr out
- 8.GND1
- 9.Cb out
- 10.GND2(Driver)
- 11.Y<sub>SAG</sub>
- 12.Yout
- 13.Vcc2(Driver)
- 14.Vref
- 15.CLAMP2
- 16.NC
- 17.CLAMP1
- 18.GCA CTL1
- 19.CP
- 20.Yin

## ■ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

| PARAMETER                   | SYMBOL           | RATINGS     | UNIT |
|-----------------------------|------------------|-------------|------|
| Supply Voltage              | V <sub>CC</sub>  | 7.0         | V    |
| Power Dissipation           | P <sub>D</sub>   | 300         | mW   |
| Operating Temperature Range | T <sub>opr</sub> | -40 to +85  | °C   |
| Storage Temperature Range   | T <sub>stg</sub> | -40 to +125 | °C   |

## ■RECOMMENDED OPERATING CONDITIONS

(Ta=25°C)

| PARAMETER         | SYMBOL           | TEST CONDITION                                  | MIN. | TYP. | MAX. | UNIT |
|-------------------|------------------|-------------------------------------------------|------|------|------|------|
| Operating Voltage | V <sub>opr</sub> | V <sub>CC1</sub> , V <sub>CC2</sub> -GND1, GND2 | 4.5  | 4.8  | 5.5  | V    |

## ■ELECTRICAL CHARACTERISTICS (V<sub>CC1</sub>=4.8V, V<sub>CC2</sub>=4.8V, R<sub>L</sub>=75Ω, Ta=25°C)

| PARAMETER                         | SYMBOL             | TEST CONDITION                    | MIN. | TYP. | MAX.  | UNIT |
|-----------------------------------|--------------------|-----------------------------------|------|------|-------|------|
| Operating Current 1               | I <sub>CC1</sub>   | V <sub>CC1</sub>                  | -    | 17.0 | 27.0  | mA   |
| Operating Current 2               | I <sub>CC2</sub>   | V <sub>CC2</sub>                  | -    | 7.0  | 12.0  | mA   |
| Operating Current at Power Save 1 | I <sub>CC1ps</sub> | V <sub>CC1</sub> , At Power Save  | -    | 1.5  | 5.0   | mA   |
| Operating Current at Power Save 2 | I <sub>CC2ps</sub> | V <sub>CC2</sub> , At Power Ssave | -    | 5.0  | 100.0 | uA   |

### [ Y Amplifier Characteristics ]

|                |                  |                                                                                                                    |      |      |      |    |
|----------------|------------------|--------------------------------------------------------------------------------------------------------------------|------|------|------|----|
| Voltage Gain 1 | G <sub>VY1</sub> | Y <sub>IN</sub> →Y <sub>OUT</sub> , GCACTL1=0.5V, 0.5Vpp, Input Sine Wave Video Signal (100kHz, 0.35Vpp Sine Wave) | -2.6 | 0.4  | 3.4  | dB |
| Voltage Gain 2 | G <sub>VY2</sub> | Y <sub>IN</sub> →Y <sub>OUT</sub> , GCACTL1=1.3V, 0.5Vpp, Input Sine Wave Video Signal (100kHz, 0.35Vpp Sine Wave) | 3.3  | 6.3  | 9.3  | dB |
| Voltage Gain 3 | G <sub>VY3</sub> | Y <sub>IN</sub> →Y <sub>OUT</sub> , GCACTL1=2.5V, 0.5Vpp, Input Sine Wave Video Signal (100kHz, 0.35Vpp Sine Wave) | 8.2  | 11.2 | 14.2 | dB |

### [ Cb Amplifier Characteristics ]

|                |                   |                                                                                                                       |      |      |      |    |
|----------------|-------------------|-----------------------------------------------------------------------------------------------------------------------|------|------|------|----|
| Voltage Gain 1 | G <sub>VCb1</sub> | Cb <sub>IN</sub> →Cb <sub>OUT</sub> , GCACTL2=0.5V, 0.35Vpp, Input Sine Wave Video Signal (100kHz, 0.35Vpp Sine Wave) | -2.6 | 0.4  | 3.4  | dB |
| Voltage Gain 2 | G <sub>VCb2</sub> | Cb <sub>IN</sub> →Cb <sub>OUT</sub> , GCACTL2=1.3V, 0.35Vpp, Input Sine Wave Video Signal (100kHz, 0.35Vpp Sine Wave) | 3.3  | 6.3  | 9.3  | dB |
| Voltage Gain 3 | G <sub>VCb3</sub> | Cb <sub>IN</sub> →Cb <sub>OUT</sub> , GCACTL2=2.5V, 0.35Vpp, Input Sine Wave Video Signal (100kHz, 0.35Vpp Sine Wave) | 8.2  | 11.2 | 14.2 | dB |

### [ Cr Amplifier Characteristics ]

|                |                   |                                                                                                                       |      |      |      |    |
|----------------|-------------------|-----------------------------------------------------------------------------------------------------------------------|------|------|------|----|
| Voltage Gain 1 | G <sub>VCr1</sub> | Cr <sub>IN</sub> →Cr <sub>OUT</sub> , GCACTL3=0.5V, 0.35Vpp, Input Sine Wave Video Signal (100kHz, 0.35Vpp Sine Wave) | -2.6 | 0.4  | 3.4  | dB |
| Voltage Gain 2 | G <sub>VCr2</sub> | Cr <sub>IN</sub> →Cr <sub>OUT</sub> , GCACTL3=1.3V, 0.35Vpp, Input Sine Wave Video Signal (100kHz, 0.35Vpp Sine Wave) | 3.3  | 6.3  | 9.3  | dB |
| Voltage Gain 3 | G <sub>VCr3</sub> | Cr <sub>IN</sub> →Cr <sub>OUT</sub> , GCACTL3=2.5V, 0.35Vpp, Input Sine Wave Video Signal (100kHz, 0.35Vpp Sine Wave) | 8.2  | 11.2 | 14.2 | dB |

### [ GCA Control Signal ]

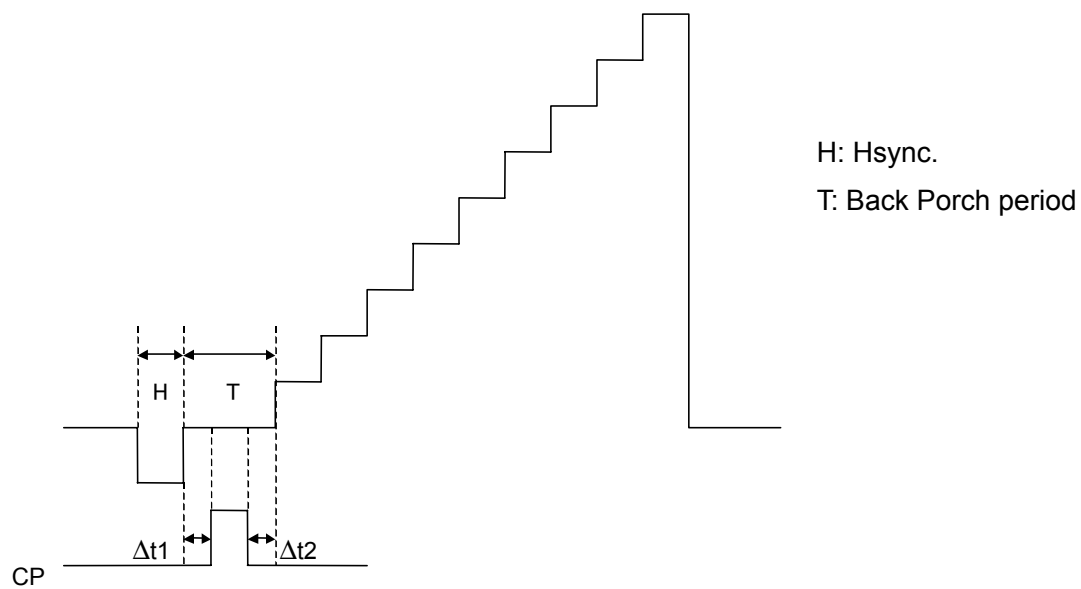
|        |                 |                                         |     |   |                 |   |
|--------|-----------------|-----------------------------------------|-----|---|-----------------|---|
| GCACTL | V <sub>GH</sub> | GCACTL1,2,3 Input control voltage range | 0.5 | - | V <sub>CC</sub> | V |
|        | V <sub>GL</sub> | MUTE change value                       | 0   | - | 0.3             |   |

## ■ELECTRICAL CHARACTERISTICS (Vcc1=4.8V,Vcc2=4.8V,RL=75Ω,Ta=25°C)

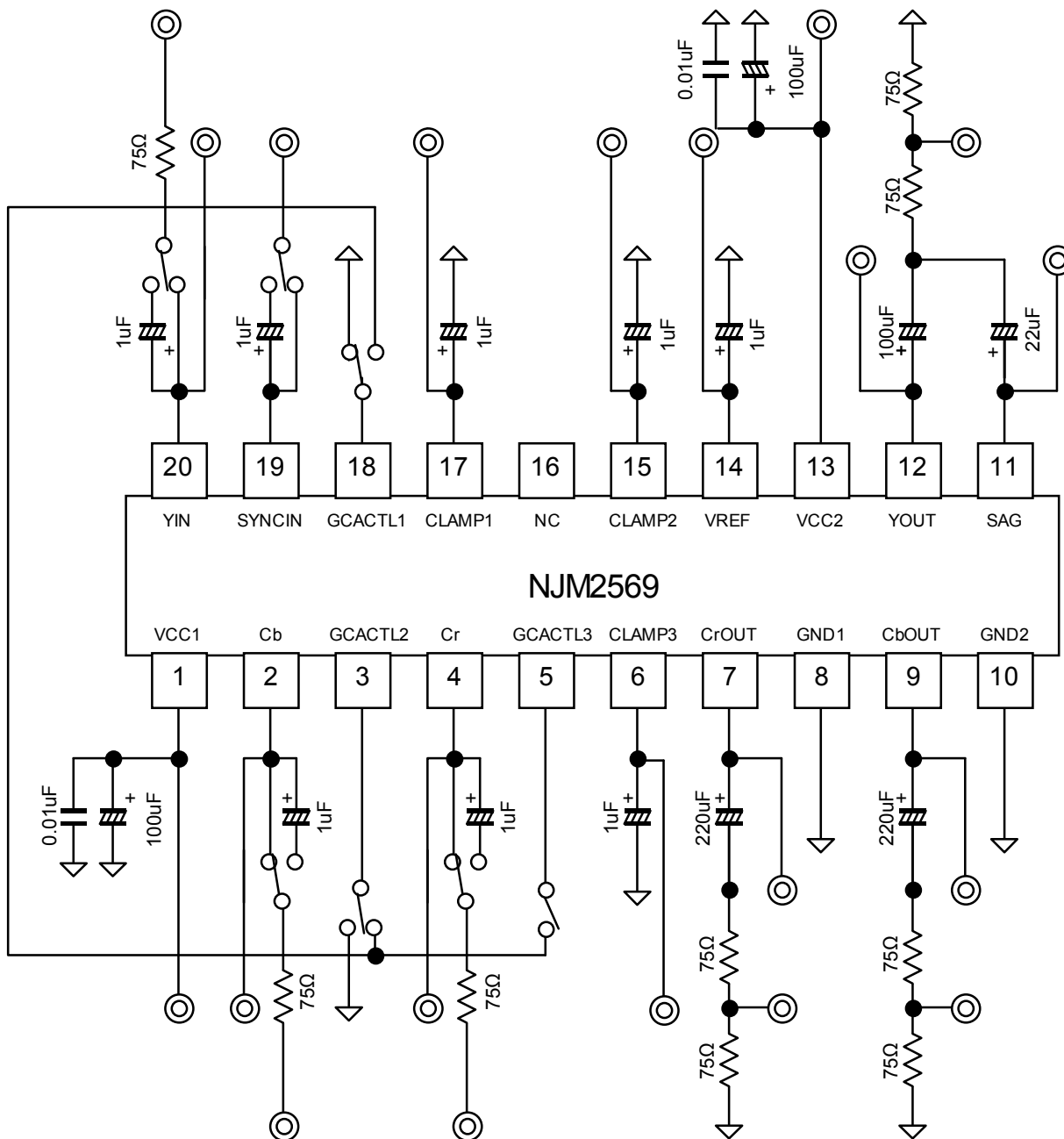
| PARAMETER                                 | SYMBOL                | TEST CONDITION                                                                                                        | MIN. | TYP.  | MAX.  | UNIT |
|-------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------|------|-------|-------|------|
| [ Filter Characteristics ]                |                       |                                                                                                                       |      |       |       |      |
| LPF(Y <sub>IN</sub> →Y <sub>OUT</sub> )   | Gf <sub>Y6.75M</sub>  | 6.75MHz/100kHz, input sine wave video signal (100mVpp sine wave)                                                      | -3.0 | -1.0  | -     | dB   |
|                                           | Gf <sub>Y12M</sub>    | 12MHz/100kHz, input sine wave video signal (100mVpp sine wave)                                                        | -    | -3.0  | -     | dB   |
|                                           | Gf <sub>Y27M</sub>    | 27MHz/100kHz, input sine wave video signal (100mVpp sine wave)                                                        | -    | -40.0 | -15.0 | dB   |
| LPF(Cb <sub>IN</sub> →Cb <sub>OUT</sub> ) | Gf <sub>Cb6.75M</sub> | 6.75MHz/100kHz, input sine wave video signal (100mVpp sine wave)                                                      | -3.0 | -1.0  | -     | dB   |
|                                           | Gf <sub>Cb27M</sub>   | 27MHz/100kHz, input sine wave video signal (100mVpp sine wave)                                                        | -    | -40.0 | -15.0 | dB   |
| LPF(Cr <sub>IN</sub> →Cr <sub>OUT</sub> ) | Gf <sub>Cr6.75M</sub> | 6.75MHz/100kHz, input sine wave video signal (100mVpp sine wave)                                                      | -3.0 | -1.0  | -     | dB   |
|                                           | Gf <sub>Cr27M</sub>   | 27MHz/100kHz, input sine wave video signal (100mVpp sine wave)                                                        | -    | -40.0 | -15.0 | dB   |
| [ Crosstalk Characteristics ]             |                       |                                                                                                                       |      |       |       |      |
| Crosstalk 1                               | CT1                   | Input Red Field Signal(3.58MHz) to Y <sub>IN</sub> . Measure Cr <sub>OUT</sub> /Y <sub>OUT</sub> .                    | -    | -50   | -     | dB   |
| Crosstalk 2                               | CT2                   | Input Red Field Signal(3.58MHz) to Y <sub>IN</sub> . Measure Cb <sub>OUT</sub> /Y <sub>OUT</sub> .                    | -    | -50   | -     | dB   |
| Crosstalk 3                               | CT3                   | Input Red Field Signal(3.58MHz) to Cb <sub>IN</sub> . Measure Y <sub>OUT</sub> /Cb <sub>OUT</sub> .                   | -    | -50   | -     | dB   |
| Crosstalk 4                               | CT4                   | Input Red Field Signal(3.58MHz) to Cb <sub>IN</sub> . Measure Cr <sub>OUT</sub> /Cb <sub>OUT</sub> .                  | -    | -50   | -     | dB   |
| Crosstalk 5                               | CT5                   | Input Red Field Signal(3.58MHz) to Cr <sub>IN</sub> . Measure Y <sub>OUT</sub> /Cr <sub>OUT</sub> .                   | -    | -50   | -     | dB   |
| Crosstalk 6                               | CT6                   | Input Red Field Signal(3.58MHz) to Cr <sub>IN</sub> . Measure Cb <sub>OUT</sub> /Cr <sub>OUT</sub> .                  | -    | -50   | -     | dB   |
| MUTE Crosstalk 1                          | MCT1                  | Input Red Field Signal(3.58MHz) to Y <sub>IN</sub> . Measure ratio of Y <sub>IN</sub> to Y <sub>OUT</sub> at MUTE.    | -    | -50   | -     | dB   |
| MUTE Crosstalk 2                          | MCT2                  | Input Red Field Signal(3.58MHz) to Cb <sub>IN</sub> . Measure ratio of Cb <sub>IN</sub> to Cb <sub>OUT</sub> at MUTE. | -    | -50   | -     | dB   |
| MUTE Crosstalk 3                          | MCT3                  | Input Red Field Signal(3.58MHz) to Cr <sub>IN</sub> . Measure ratio of Cr <sub>IN</sub> to Cr <sub>OUT</sub> at MUTE. | -    | -50   | -     | dB   |
| [ S/N Ratio]                              |                       |                                                                                                                       |      |       |       |      |
| Y System S/N                              | SN <sub>Y</sub>       | Band width 100kHz to 6MHz, RL=75Ω, Input 100% White Video Signal. Measure Y <sub>OUT</sub> .                          | -    | -55   | -     | dB   |
| Cb System S/N                             | SN <sub>Cb</sub>      | Band width 100kHz to 6MHz, RL=75Ω, Input 100% White Video Signal. Measure Cb <sub>OUT</sub> .                         | -    | -55   | -     | dB   |
| Cr System S/N                             | SN <sub>Cr</sub>      | Band width 100kHz to 6MHz, RL=75Ω, Input 100% White Video Signal. Measure Cr <sub>OUT</sub> .                         | -    | -55   | -     | dB   |
| [ CP Signal *]                            |                       |                                                                                                                       |      |       |       |      |
| CP Input Change Voltage                   | VCP <sub>H</sub>      | ON level                                                                                                              | 2.4  | -     | Vcc   | V    |
|                                           | VCP <sub>L</sub>      | OFF level                                                                                                             | 0    | -     | 0.8   |      |

## \*CP Input

Don't put CP signal on Sync signal and picture period. Keep margin of 0.2 $\mu$ S over of  $\Delta t1$  and  $\Delta t2$ .

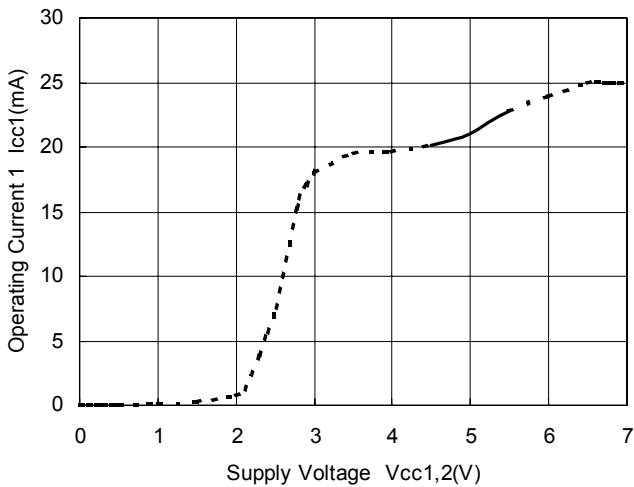


## ■TEST CIRCUIT

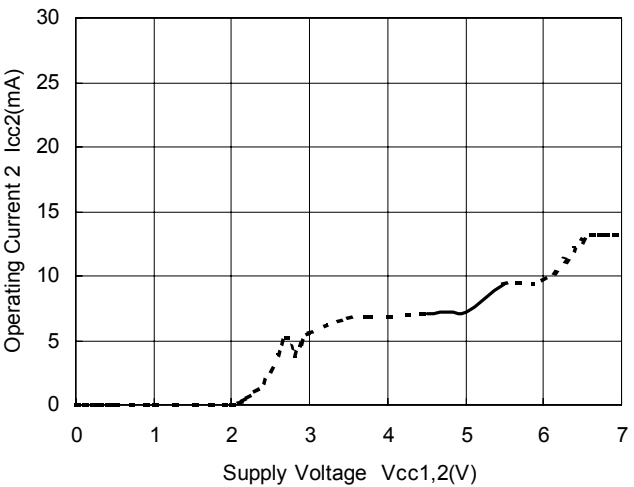


■TYPICAL CHARACTERISTICS

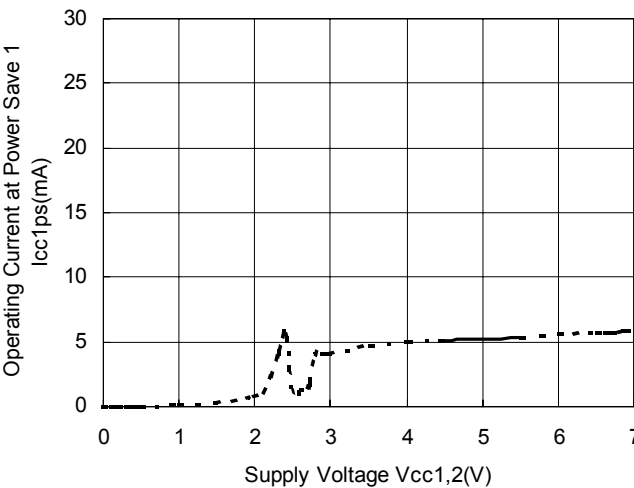
Operating Current 1 vs. Supply Voltage  
(Ta=25°C)



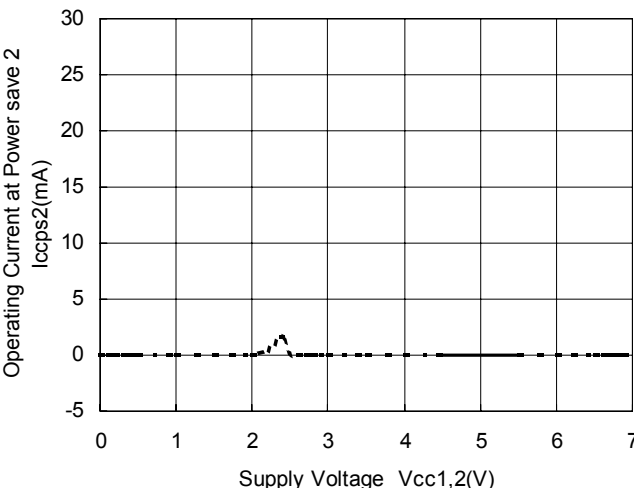
Operating Current 2 vs. Supply Voltage  
(Ta=25°C)



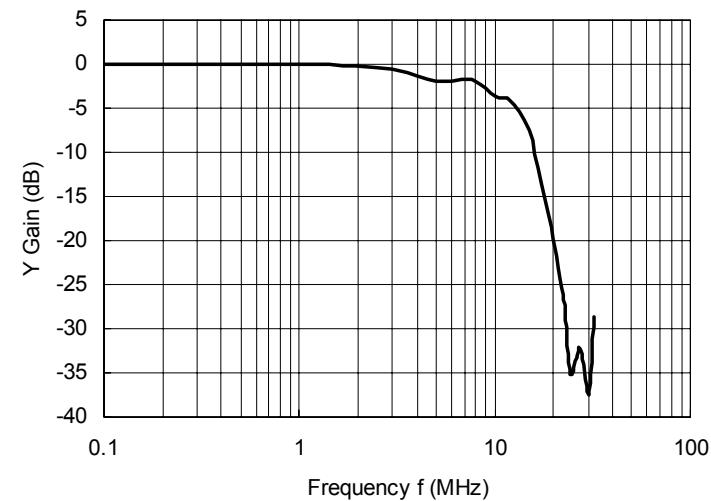
Operating Current at Power Save 1 vs. Supply Voltage  
(Ta=25°C)



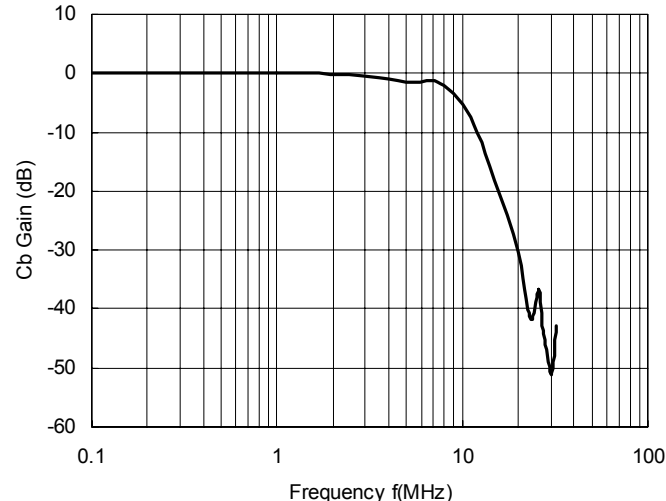
Operating Current at Power Save 2 vs. Supply Voltage  
(Ta=25°C)



Y System Filter Characteristics  
(Vcc=4.8V)

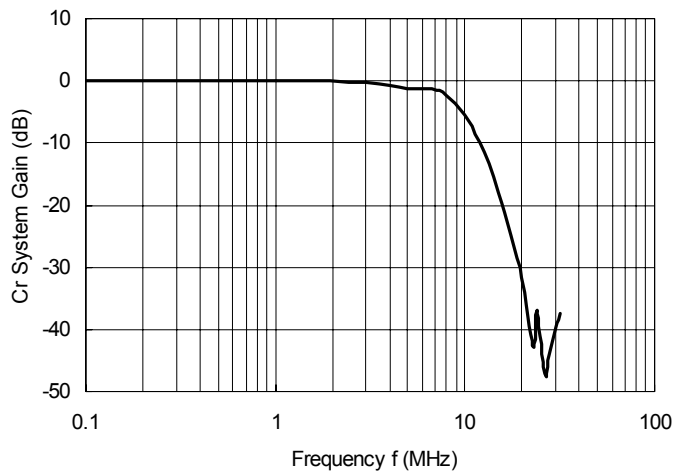


Cb System Filter Characteristics  
(Vcc=4.8V)

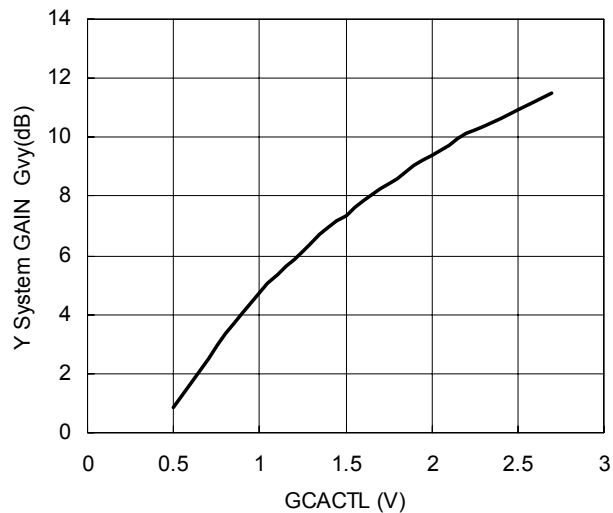


## TYPICAL CHARACTERISTICS

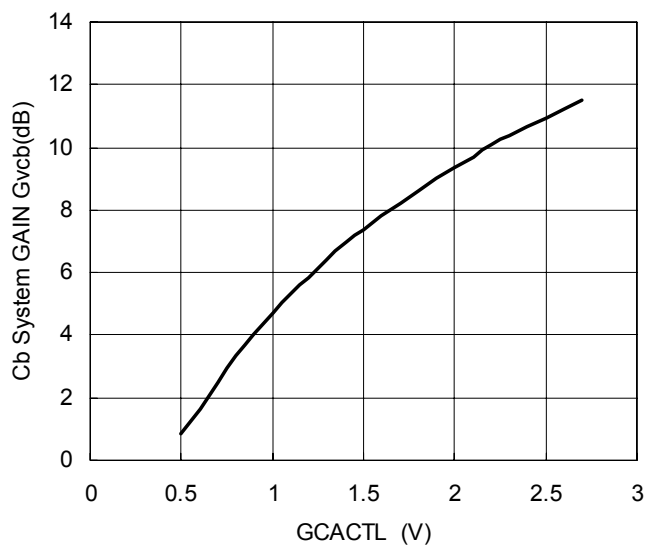
Cr System Filter Characteristics  
(Vcc=4.8V)



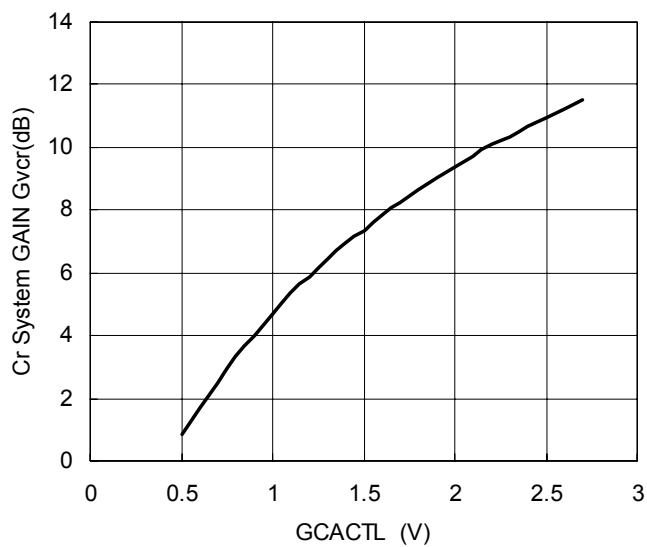
Y System GAIN vs. GCACTL  
(Vcc=4.8V)



Cb System GAIN vs. GCACTL  
(Vcc=4.8V)



Cr System GAIN vs. GCACTL  
(Vcc=4.8V)



## MEMO

[CAUTION]  
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