

Video Signal Driver for DVD Players

Monolithic IC MM1566

October 25, 2001

Outline

This IC is a video signal driver IC that supports 3-ch interlace video developed for DVD players. It includes a low-pass filter that attenuates the noise element during DA conversion, and a 3-channel 6dB amp with 75Ω driver.

In addition, external ESD protection diodes can be reduced by a sag correction pin for reducing output coupling capacitance, and enhancement of the ESD protection elements for the output pins.

Features

1. Includes a SAG correction pin.
2. Enabled to drive a 3-channel 6dB amp with 75Ω driver
3. Includes a 4th-order low-pass filter
Frequency response: 6.75MHz ± 1dB / 27MHz – 27dB min.
4. Includes a 6dB amp
5. Includes a power save function
6. S/N=80dB typ. (Y/C mix:74dB typ.)
7. ESD strength (aerial discharge) of ±15kV (IEC standard)
8. Includes mode select pins which correspond to various video signals

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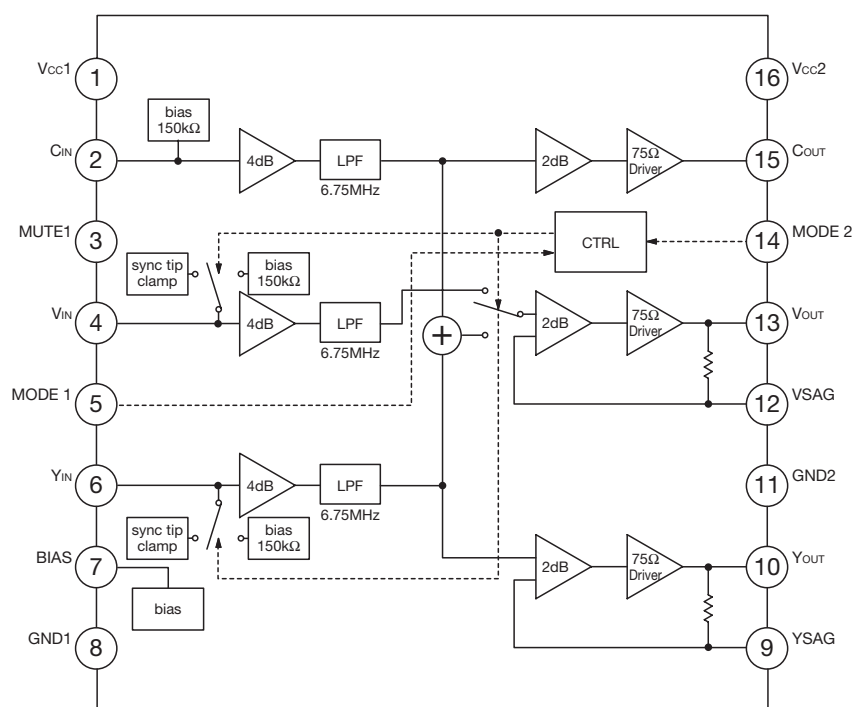
Package

SOP-16C

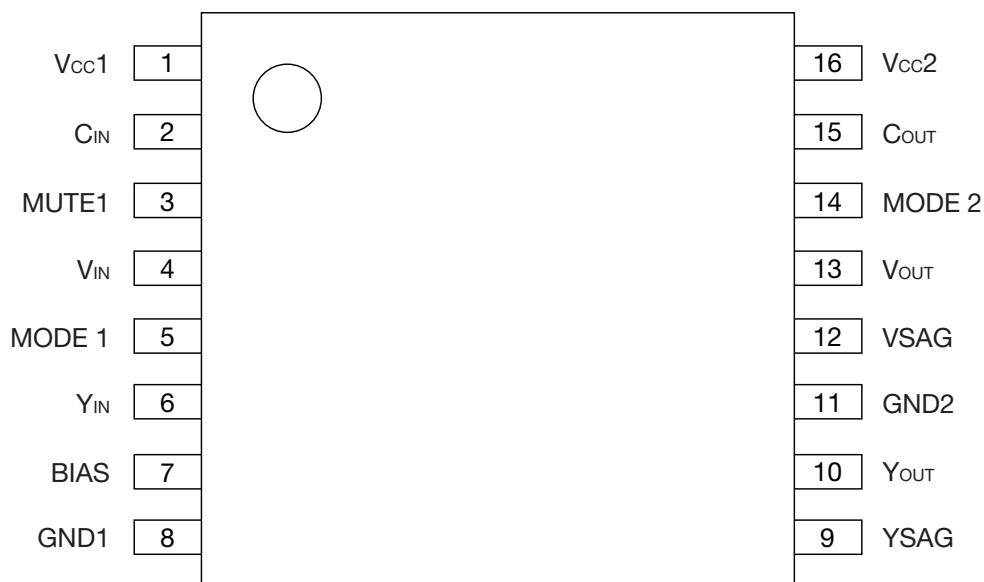
Applications

- (1)DVD players
- (2)Digital STB
- (3)Other digital video equipment

Block diagram



Pin Assignment



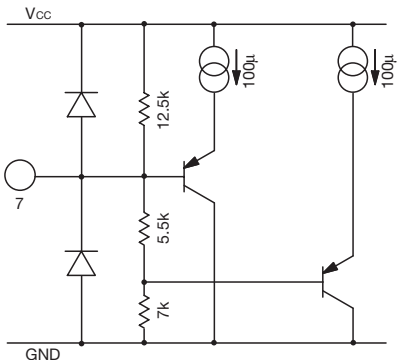
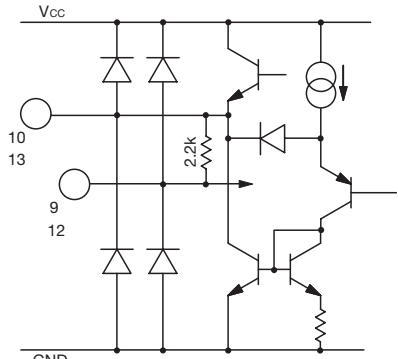
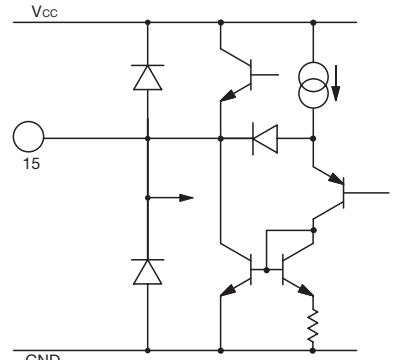
SOP-16C

1	V _{CC1}	9	YSAG
2	C _{IN}	10	Y _{OUT}
3	MUTE1	11	GND2
4	V _{IN}	12	VSAG
5	MODE 1	13	V _{OUT}
6	Y _{IN}	14	MODE 2
7	BIAS	15	C _{OUT}
8	GND1	16	V _{CC2}

Pin Description

Pin No.	Pin name	Function	Internal equivalent circuit diagram
1 16	V _{CC1} V _{CC2}	V _{CC}	
2	C _{IN}	Croma input	
3	MUTE1	Mute select Using of MUTE and POWER-SAVING.	
4 6	V _{IN} Y _{IN}	Video input The input can select Sync tip clamp or Bias	
5 14	MODE1 MODE2	Mode select	

Pin Description

Pin No.	Pin name	Function	Internal equivalent circuit diagram
7	BIAS	Bias	
8 11	GND1 GND2	GND	
10 13 9 12		Signal output SAG correction	
15	COUT	Croma output	

Absolute Maximam Ratings (Ta=25°C)

Item	Symbol	Rating	Unit
Storage temperature	T _{STG}	-65 ~ +150	°C
Operating temperature	T _{OPR}	-40 ~ +85	°C
Supply Voltage	V _{CC} max.	7	V
Power dissipation *1	Pd	1.0	W

note *1 Board mounting power dissipation. Board size 21.3mmX38.1mmX1.0mm

Recommended Operating Conditions

Item	Symbol	Rating	Unit
Operating temperature	T _{OPR}	-40 ~ +85	°C
Operating Voltage	V _{CCOP}	4.5 ~ 5.5	V

Electrical Characteristics (Unless otherwise specified, Ta=25°C,Vcc=5V)

Item	Symbol	Measurement Conditions	Min.	Typ.	Max.	Unit
Consumption current 1	I _{CC1}	No signal	39	55	71	mA
Consumption current 2	I _{CC2}	No signal Mute1:ON	1	3	5	mA
Bias input	V _{INbias}	at Bias select	1.9	2.4	2.9	V
Clamp input	V _{INclamp}	at Clamp select	1.15	1.4	1.65	V
Bias output	V _{OUTbias}	at Bias select		2.4		V
Clamp output	V _{OUTclamp}	at Clamp select		1.1		V
Control terminal input current	H I _{IHm} *2				350	μA
	L I _{IL} *2				35	μA
Control terminal input voltage	H V _{thHm} *2		2.1			V
	L V _{thLm} *2				0.7	V
Input impedance	Z _{INbias}	at Bias select	100	150	200	kΩ
Voltage gain	G _n *3	S _{IN} wave:1V f=100kHz	5.7	6.0	6.3	dB
Frequency characteristic 1	f _{1n} *3	S _{IN} wave:1V 6.75MHz/100kHz	-1.0	0	1.0	dB
Frequency characteristic 2	f _{2n} *3	S _{IN} wave:1V 27MHz/100kHz		-40	-27	dB
Differential gain	DG _{1~3} *3	Staircase signal 1V		0.6	1.0	%
Differential phase	DP _{1~3} *3	Staircase signal 1V		0.6	1.0	°
Output dynamic range	DR _n *3	S _{IN} wave:100kHz THD=1.0%	2.6	3.0		V
Crosstalk	CT _n *3	f=4.43MHz, 1V		-60	-55	dB
S/N 1	SN _{14,5} *3	BW:100k ~ 6MHz		-80		dB
S/N 2	SN _{21~3} *3	BW:100k ~ 6MHz at MIX OUT		-74		dB
Group delay	t _{GDn} *3	at 100kHz		50		ns
Group delay deviation	Δt _{GDn} *3	to 3.58MHz		4		ns
		to 4.43MHz		7		ns
		to 6MHz		12		ns

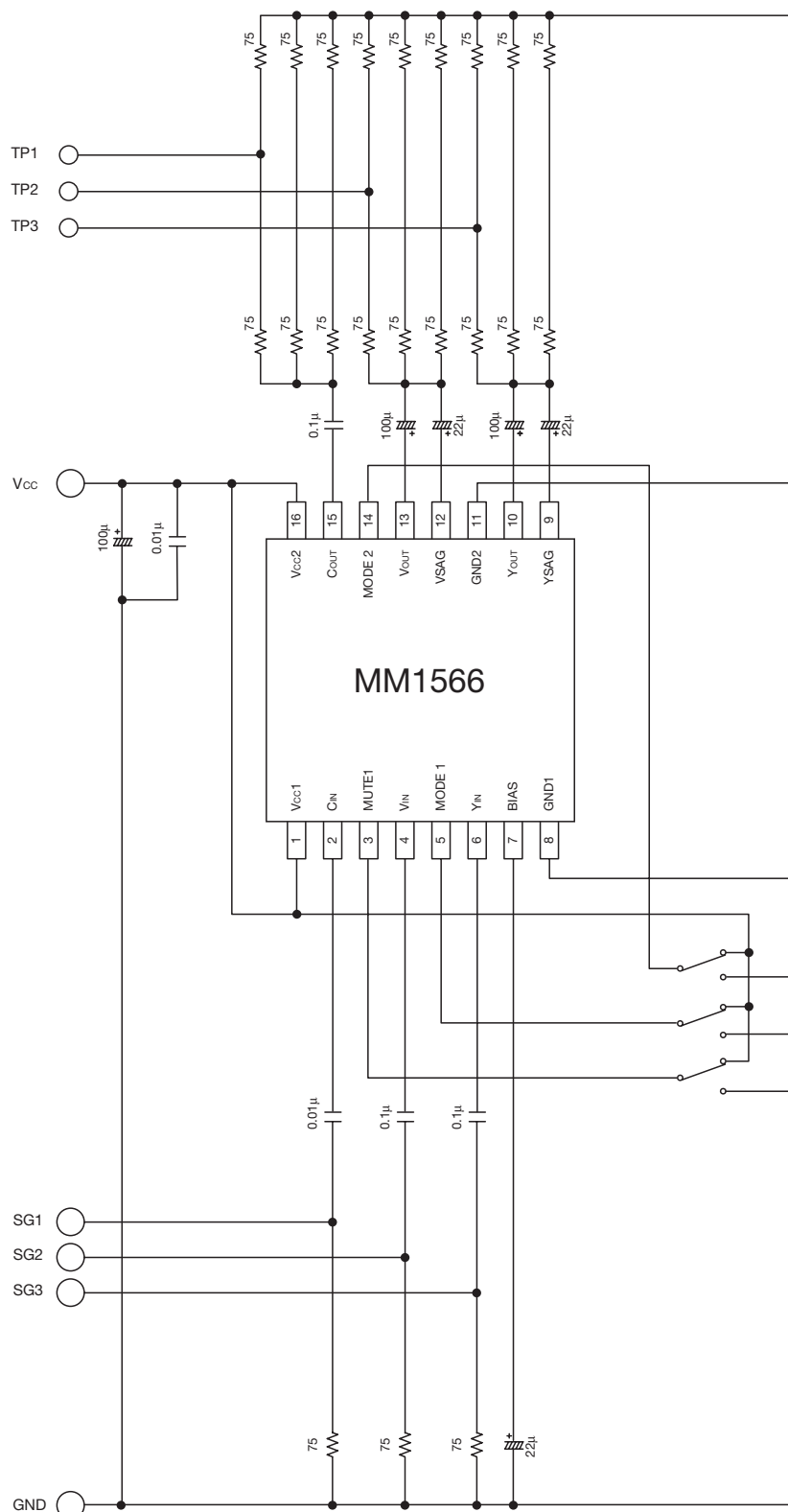
note *2 The subscript number "m" is the terminal of right table.

note *3 The subscript number "n" is the combination of right table.

m	Terminal
1	MUTE1
2	MODE1
3	MODE2

n	Input	Output
1	C _{IN}	V _{OUT}
2	V _{IN}	
3	Y _{IN}	
4	C _{IN}	C _{OUT}
5	Y _{IN}	Y _{OUT}

Measuring Circuit

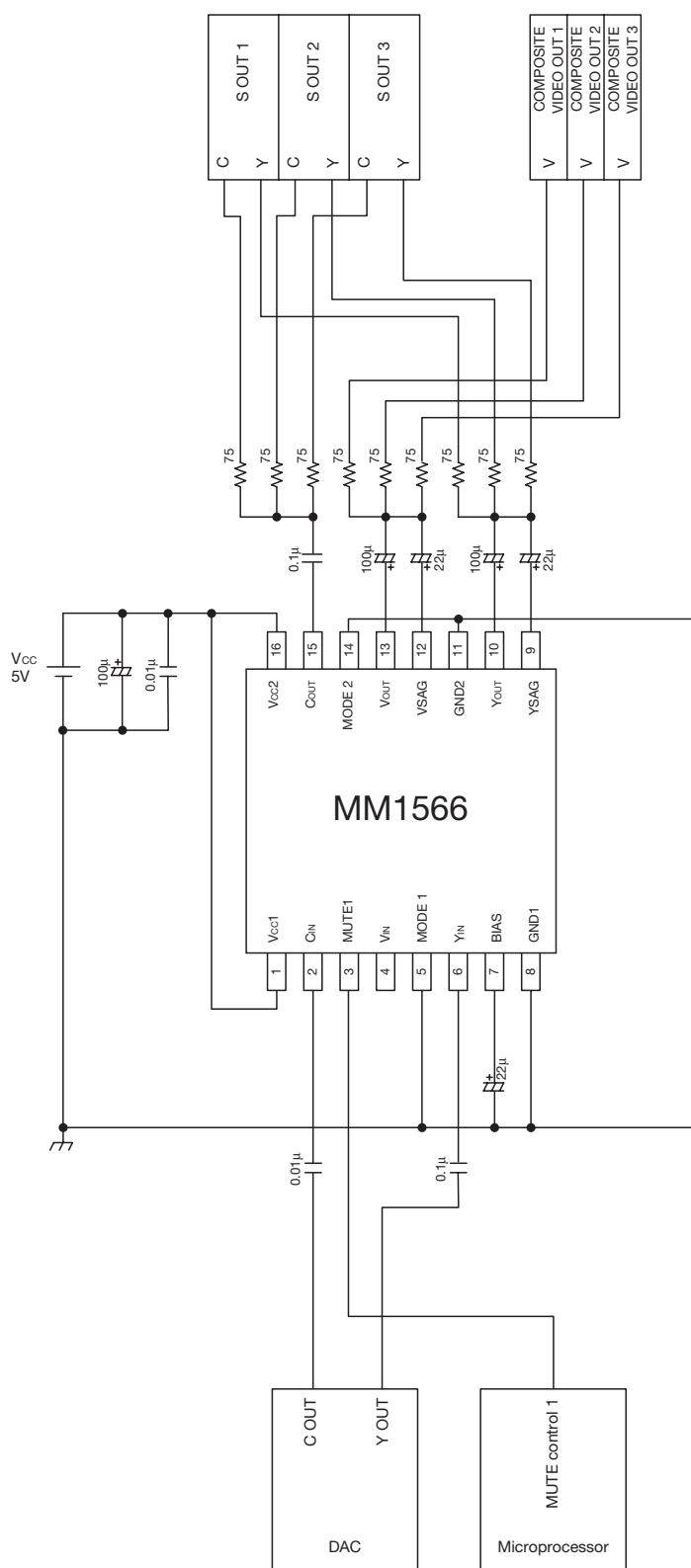


Switch Control Table

	Input Terminal	Input Signal (Input clamp)	Output Signal	Control Terminal		
				MUTE1	MODE1	MODE2
1	MUTE	*	MUTE	Low	*	*
	C _{IN}	C(bias)	C	High	Low	Low
	V _{IN}		Composite Video(Y+C)			
	Y _{IN}	Y(clamp)	Y			
2	MUTE	*	MUTE	Low	*	*
	C _{IN}	C(bias)	C	High	High	Low
	V _{IN}	Composite Video(clamp)	Composite Video			
	Y _{IN}	Y(clamp)	Y			
3	MUTE	*	MUTE	Low	*	*
	C _{IN}	Cr(bias)	Cr	High	Low	High
	V _{IN}	Cb(bias)	Cb			
	Y _{IN}	Y(clamp)	Y			
4	MUTE	*	MUTE	Low	*	*
	C _{IN}	R(bias)	R	High	High	High
	V _{IN}	G(bias)	G			
	Y _{IN}	B(bias)	B			

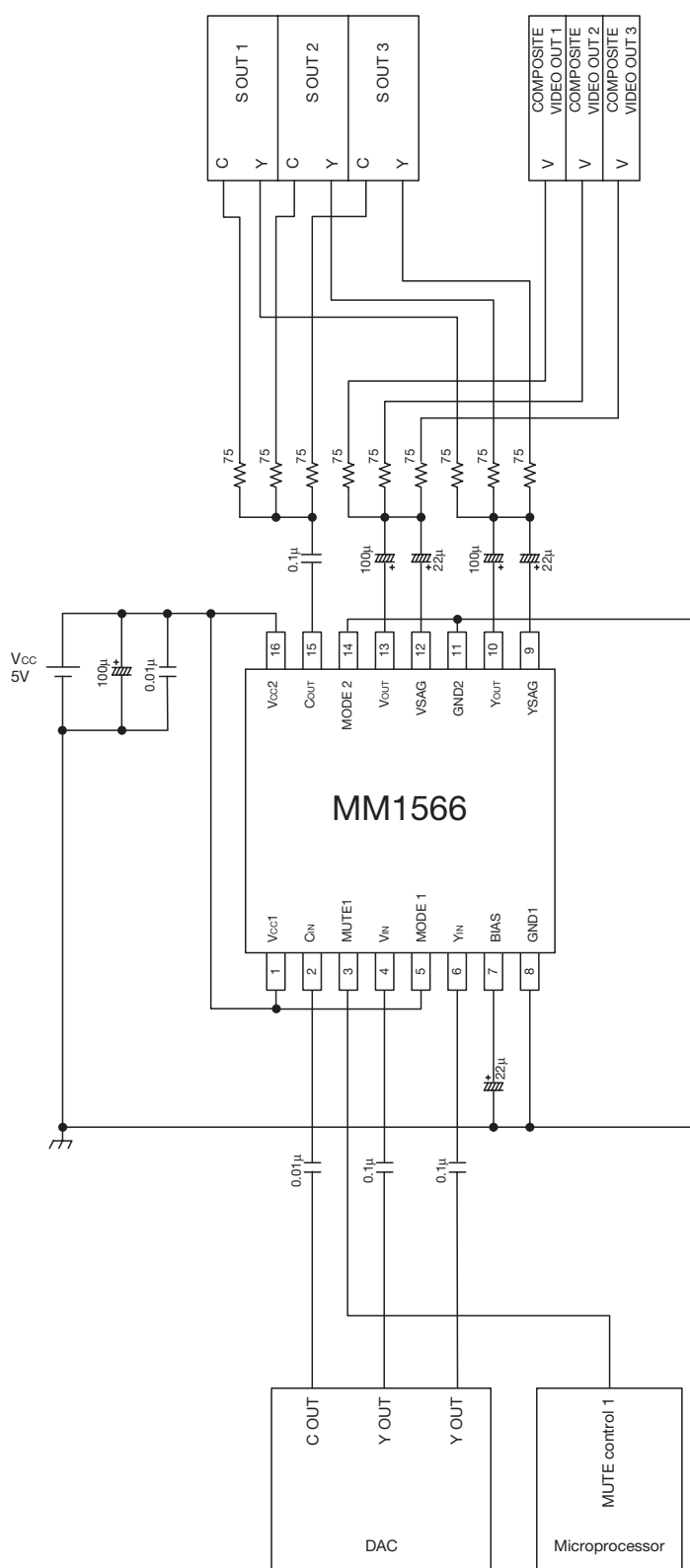
* : Don't care

Application Circuit 1



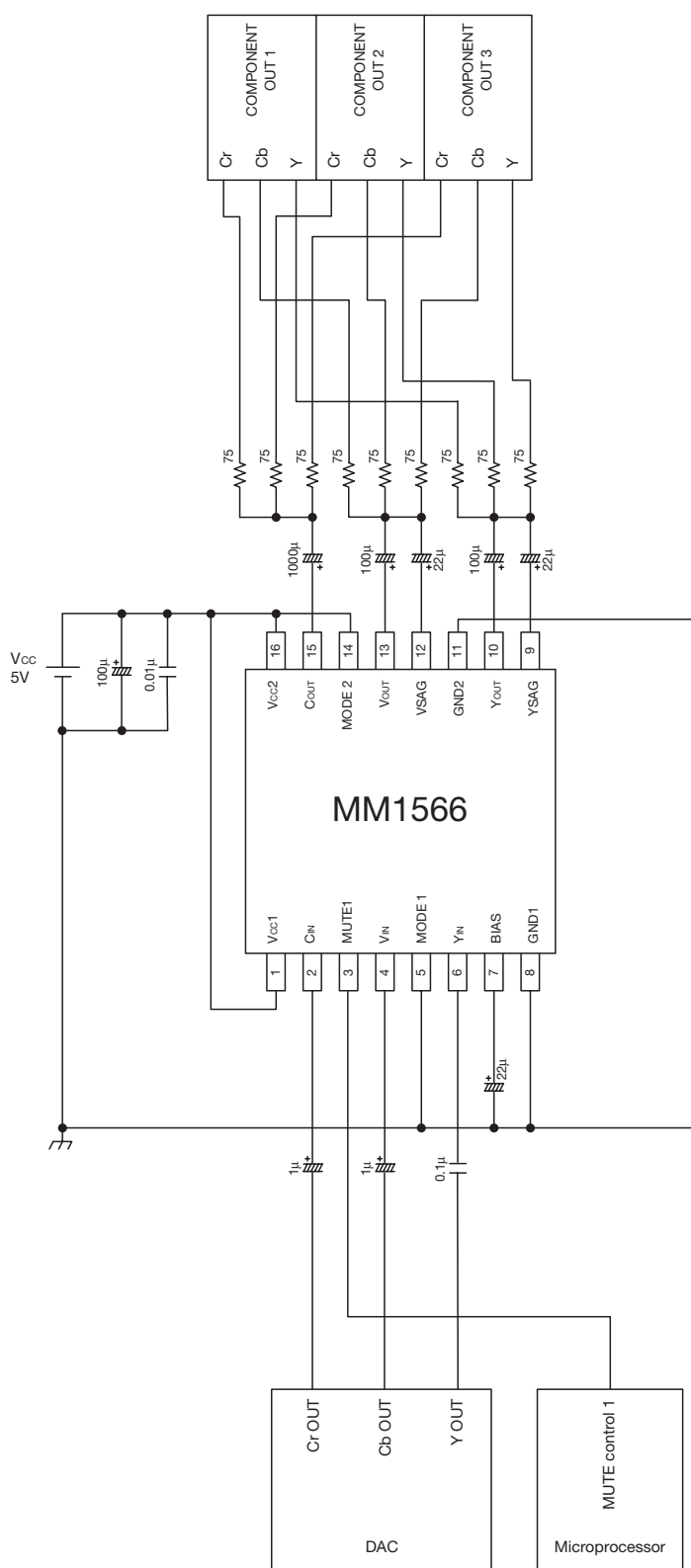
(note) : Please arrange power supply bypass capacitor near the V_{CC}2 terminal (16PIN).

Application Circuit 2



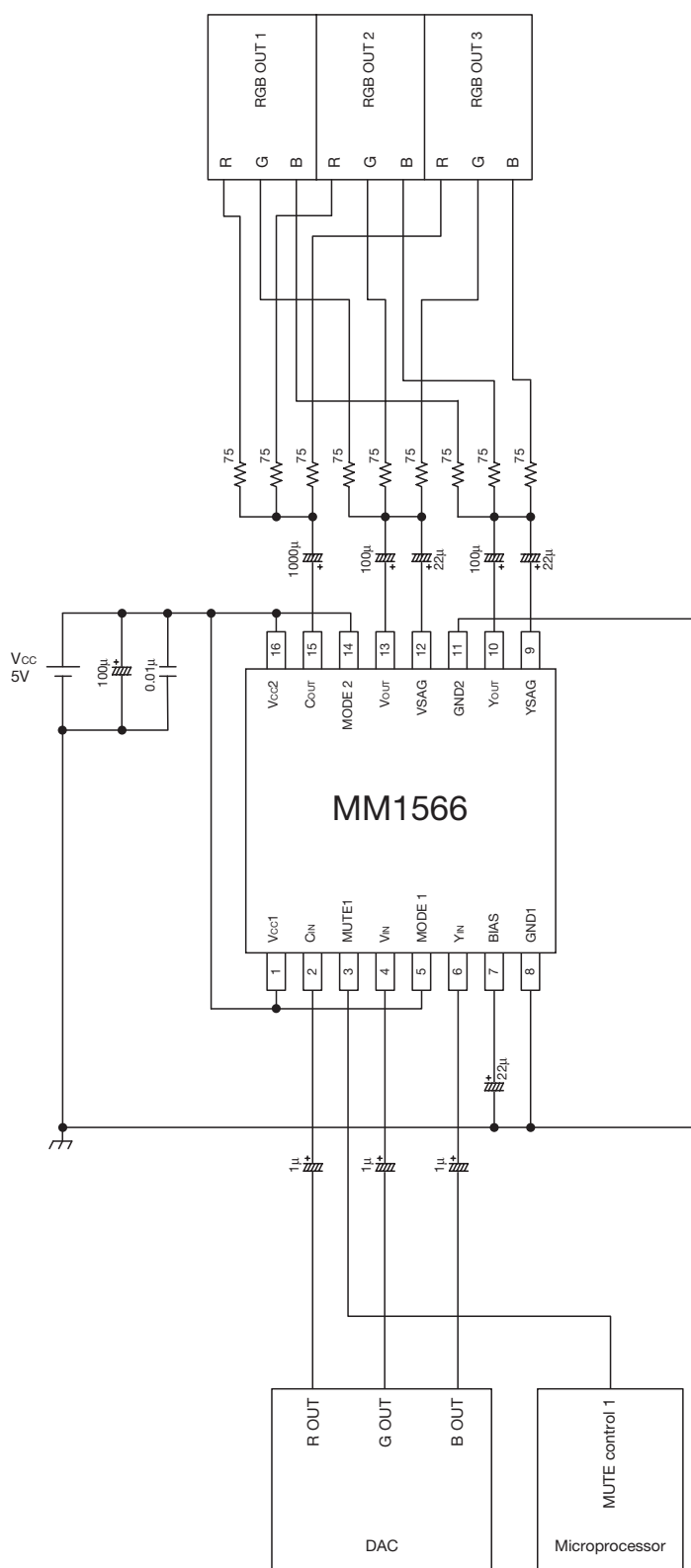
(note) : Please arrange power supply bypass capacitor near the Vcc2 terminal (16PIN).

Application Circuit 3



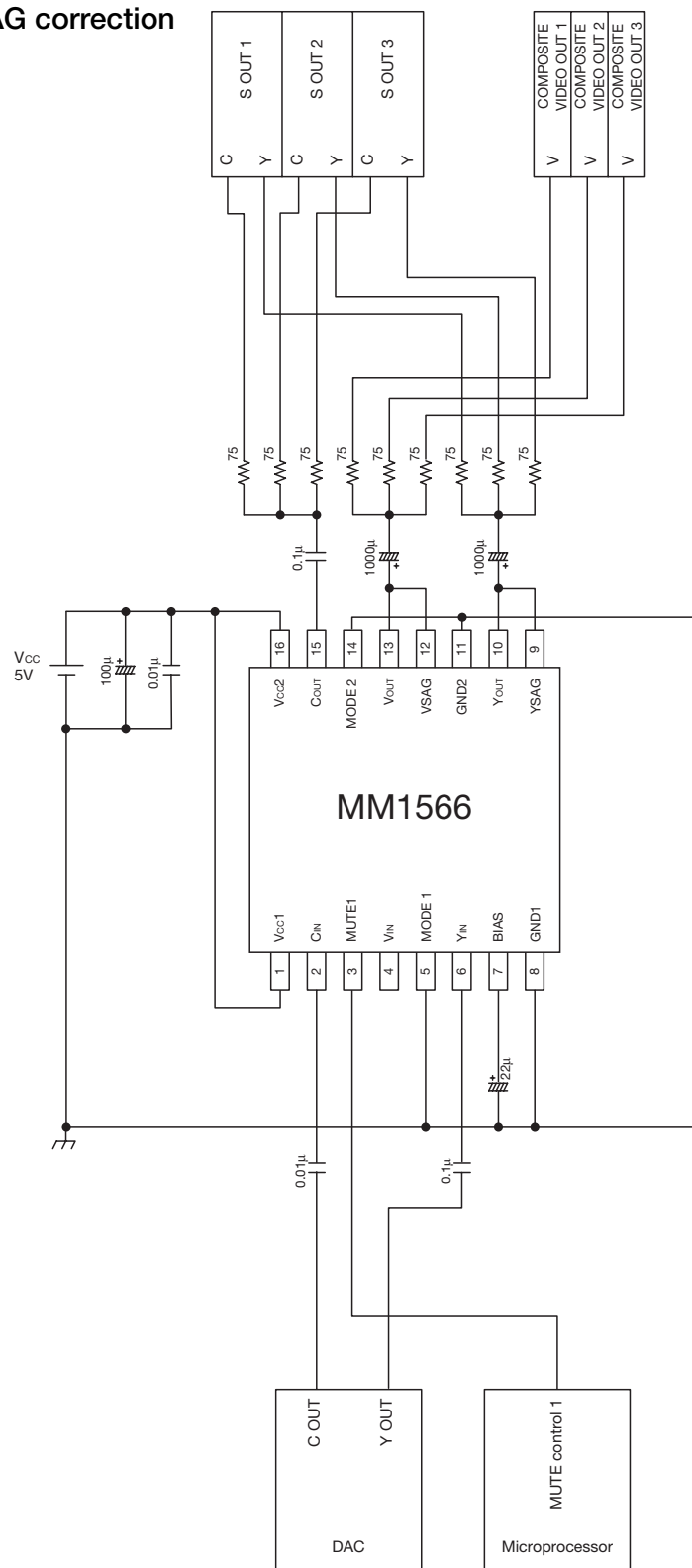
(note) : Please arrange power supply bypass capacitor near the Vcc2 terminal (16PIN).

Application Circuit 4



(note) : Please arrange power supply bypass capacitor near the Vcc2 terminal (16PIN).

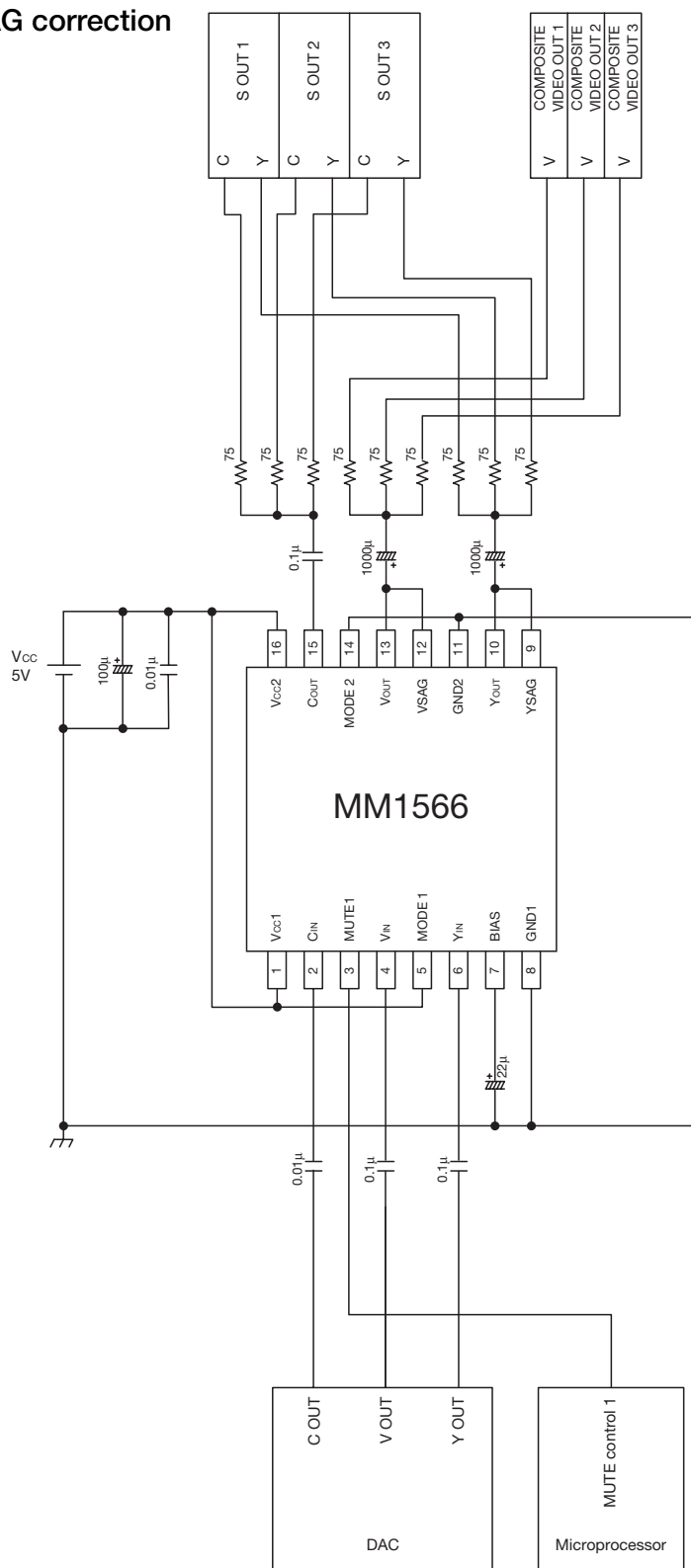
- At unused the SAG correction function



(note) : Please arrange power supply bypass capacitor near the Vcc2 terminal (16PIN).

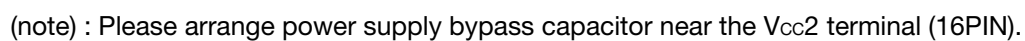
Application Circuit 6

- At unused the SAG correction function



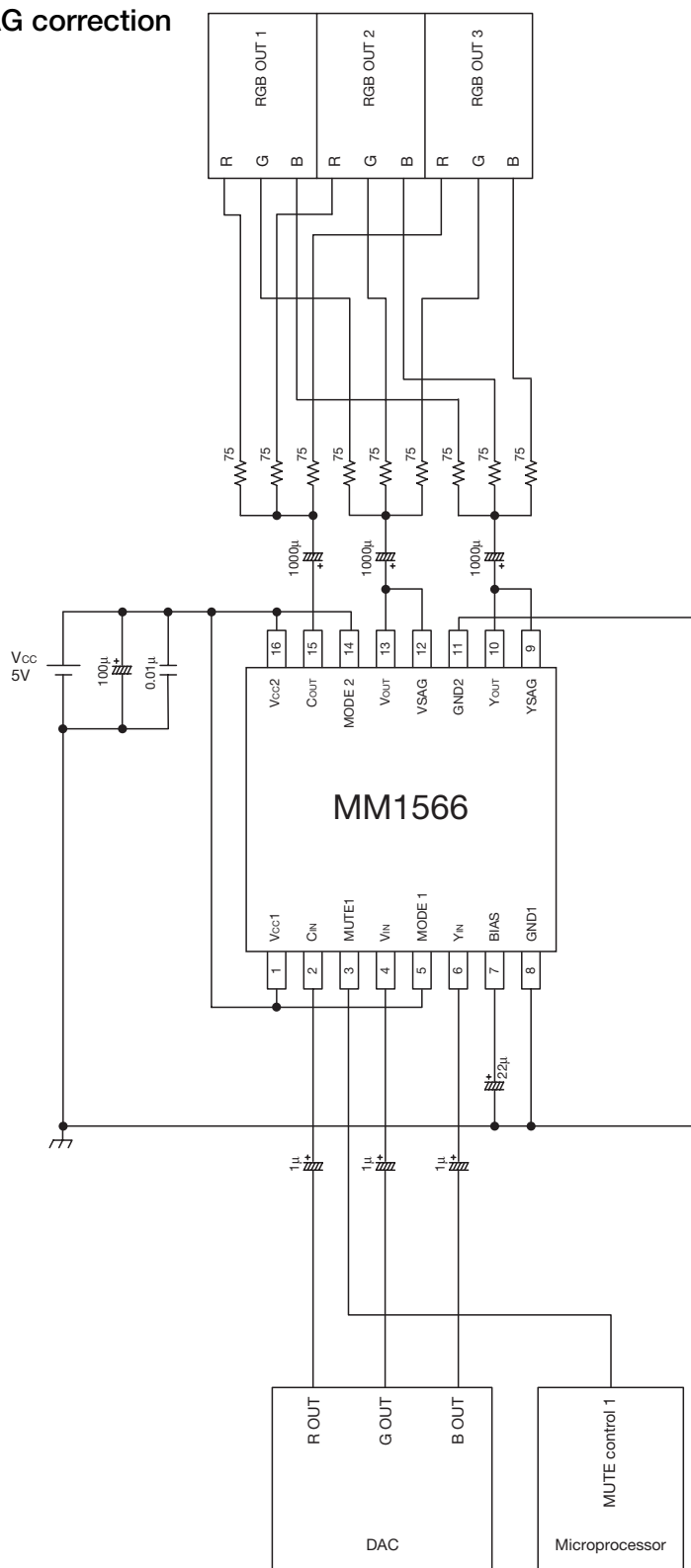
(note) : Please arrange power supply bypass capacitor near the Vcc2 terminal (16PIN).

- At unused the SAG correction function



Application Circuit 8

- At unused the SAG correction function



(note) : Please arrange power supply bypass capacitor near the Vcc2 terminal (16PIN).