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 ot 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 strengh (aerial discharge) of ±15kV (IEC standard)
8. Includes mode select pins which correspond to various video signals

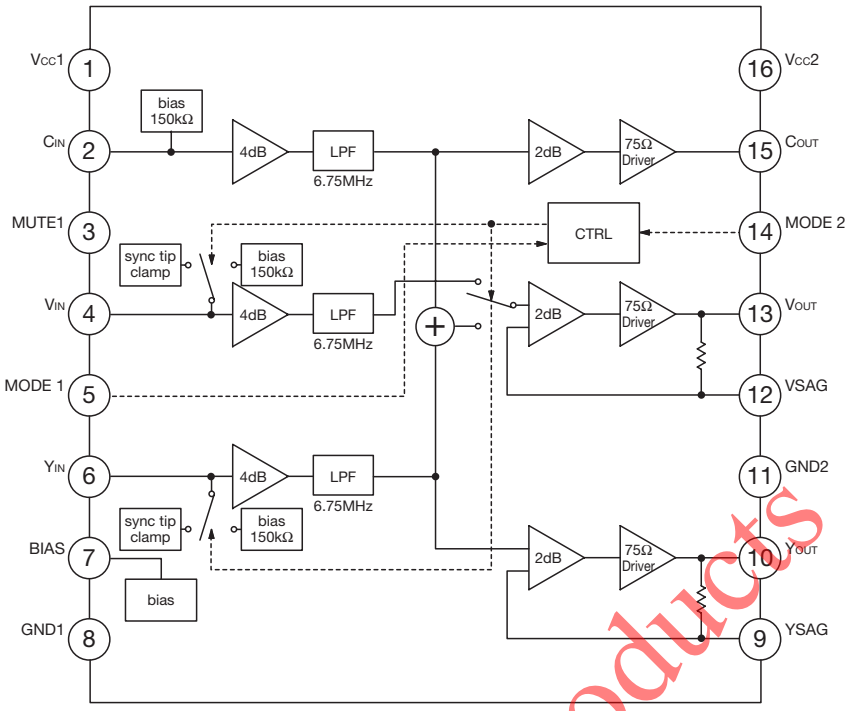
Packages

SOP-16C
SSOP-16A
TSOP-16A

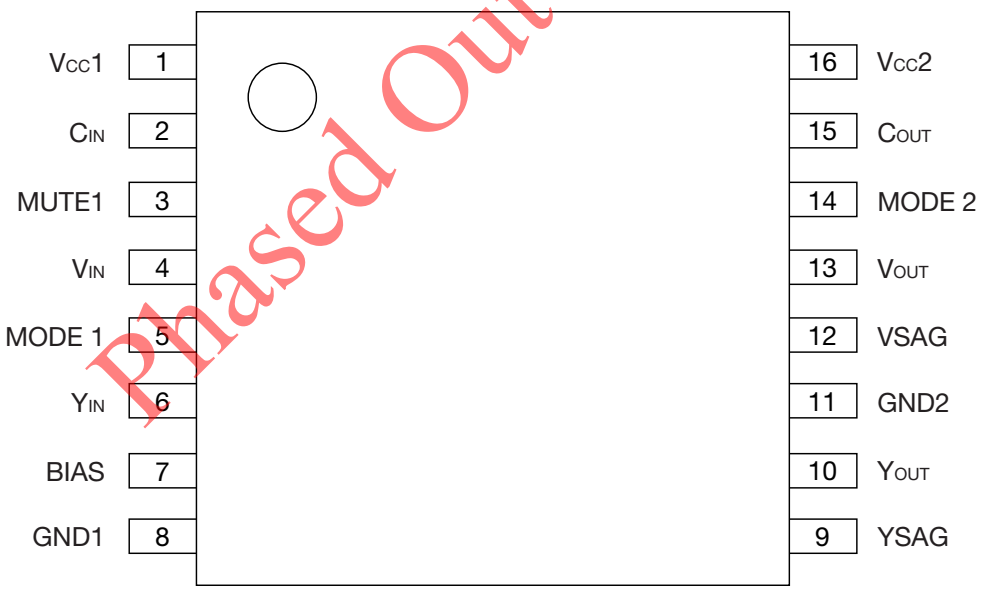
Applications

1. DVD players
2. Digital STB
3. Other digital video equipment

Block diagram



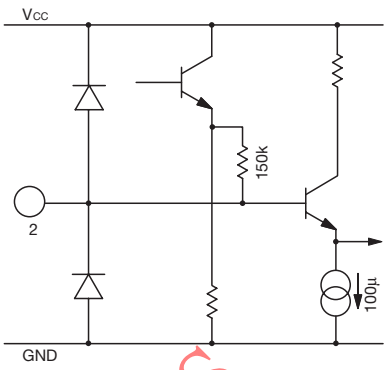
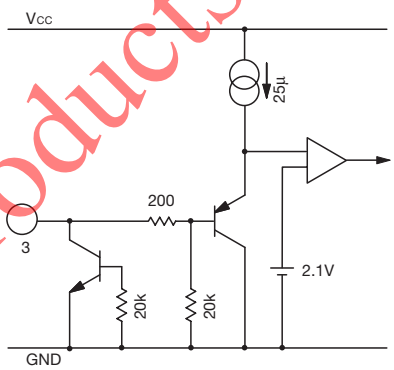
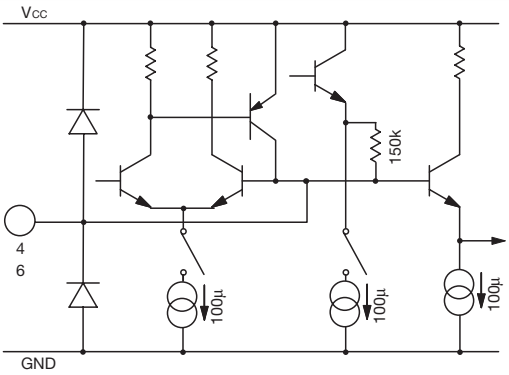
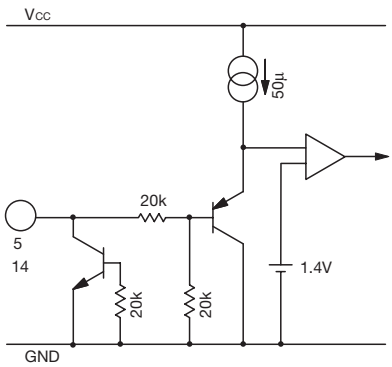
Pin Assignment



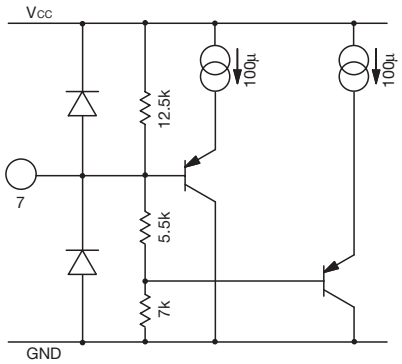
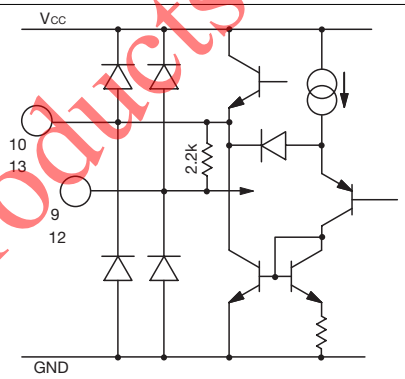
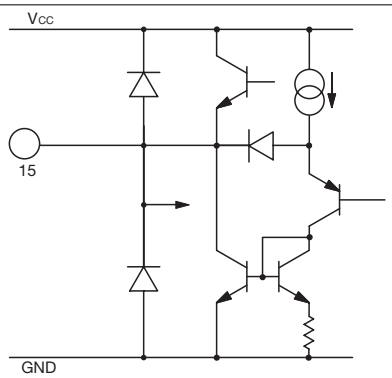
SOP-16C

1	VCC1	9	YSAG
2	CIN	10	YOUT
3	MUTE1	11	GND2
4	VIN	12	VSAG
5	MODE 1	13	VOUT
6	YIN	14	MODE 2
7	BIAS	15	COUT
8	GND1	16	VCC2

Pin Description

Pin No.	Pin name	Function	Internal equivalent circuit diagram
1 16	Vcc1 Vcc2	Vcc	
2	CIN	Croma input	
3	MUTE1	Mute select Using of MUTE and POWER-SAVING.	
4 6	VIN YIN	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 temparature	T_{STG}	–65 ~ +150	°C
Operating temparature	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 temparature	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		$f1_n$ *3	S_{IN} wave:1V 6.75MHz/100kHz	–1.0	0	1.0	dB
Frequency characteristic 2		$f2_n$ *3	S_{IN} wave:1V 27MHz/100kHz		–40	–27	dB
Differential gain		$DG_{1\sim3}$ *3	Staircase signal 1V		0.6	1.0	%
Differential phase		$DP_{1\sim3}$ *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		CTn *3	f=4.43MHz, 1V		–60	–55	dB
S/N 1		$SN1_{4,5}$ *3	BW:100k ~ 6MHz		–80		dB
S/N 2		$SN2_{1\sim3}$ *3	BW:100k ~ 6MHz at MIX OUT		–74		dB
Group delay		t_{GDn} *3	at 100kHz		50		ns
Group delay deviation		$\triangle t_{GDn}$ *3	to 3.58MHz		4		ns
			to 4.43MHz		7		ns
			to 6MHz		12		ns

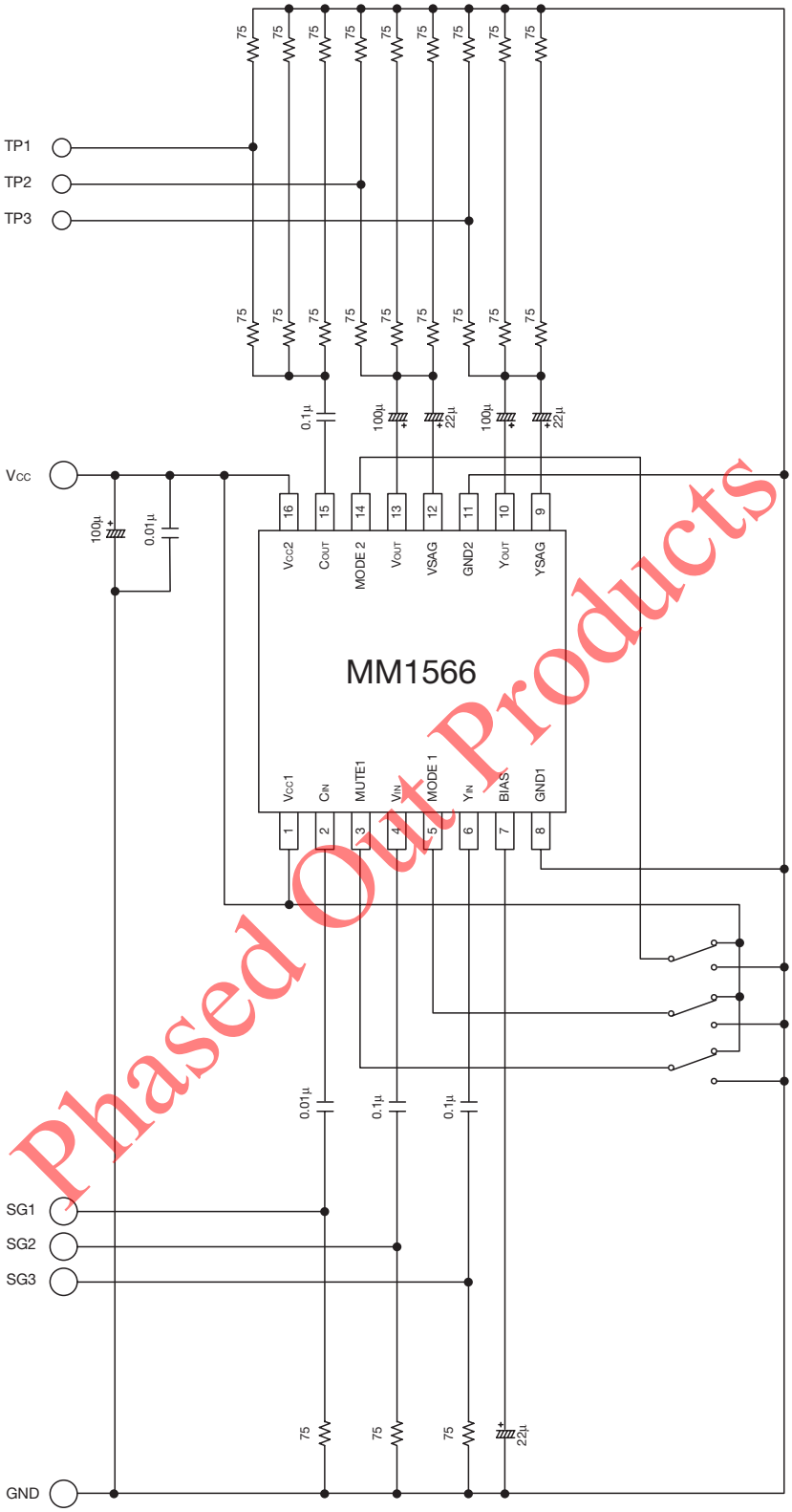
note *2 The subscript number "m" is the terminal of right table.

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

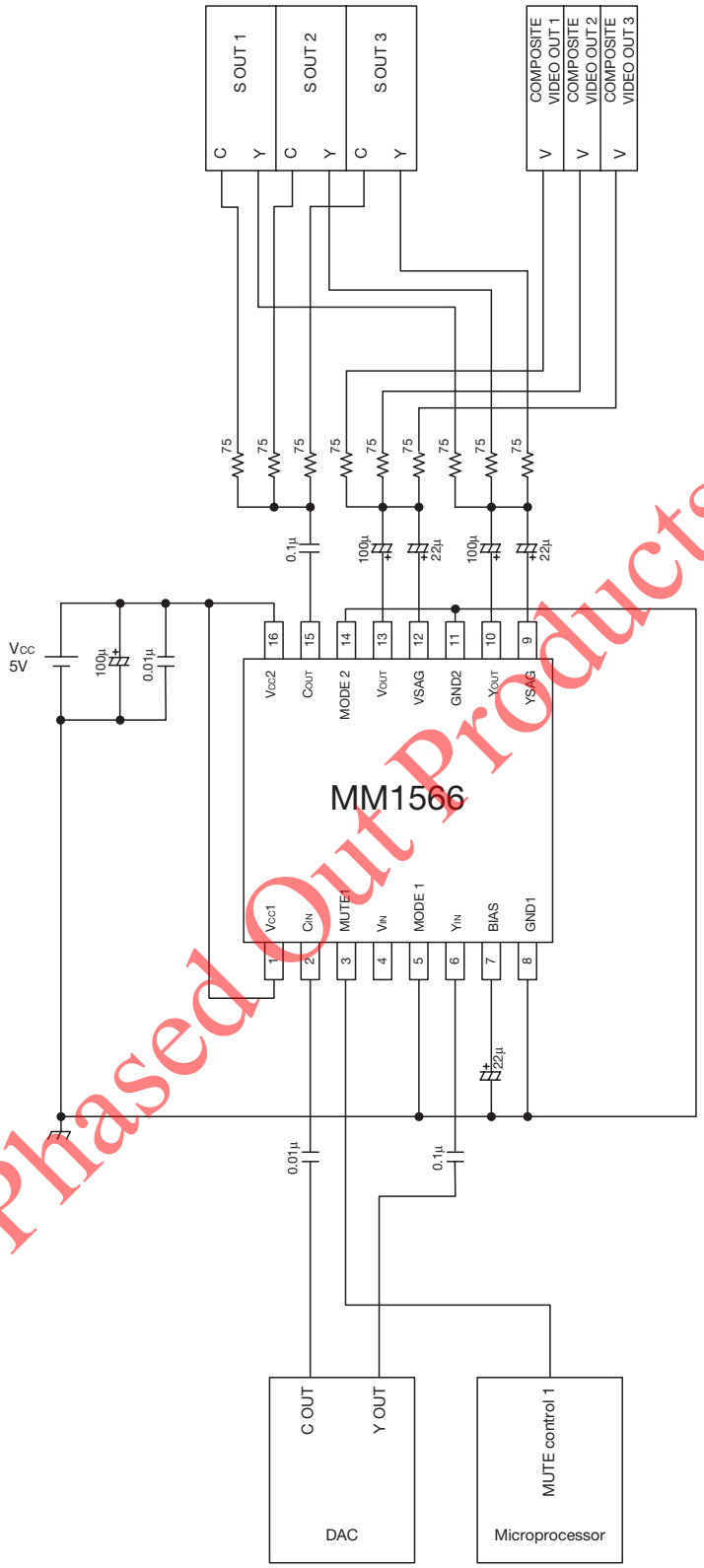


Switch Control Table

	Input Terminal	Input Signal (Input clamp)	Output Signal	Control Terminal		
				MUTE1	MODE1	MODE2
1	MUTE	*	MUTE	Low	*	*
	CIN	C (bias)	C	High	Low	Low
	VIN		Composite Video (Y+C)			
	YIN	Y (clamp)	Y			
2	MUTE	*	MUTE	Low	*	*
	CIN	C (bias)	C	High	High	Low
	VIN	Composite Video (clamp)	Composite Video			
	YIN	Y (clamp)	Y			
3	MUTE	*	MUTE	Low	*	*
	CIN	Cr (bias)	Cr	High	Low	High
	VIN	Cb (bias)	Cb			
	YIN	Y (clamp)	Y			
4	MUTE	*	MUTE	Low	*	*
	CIN	R (bias)	R	High	High	High
	VIN	G (bias)	G			
	YIN	B (bias)	B			

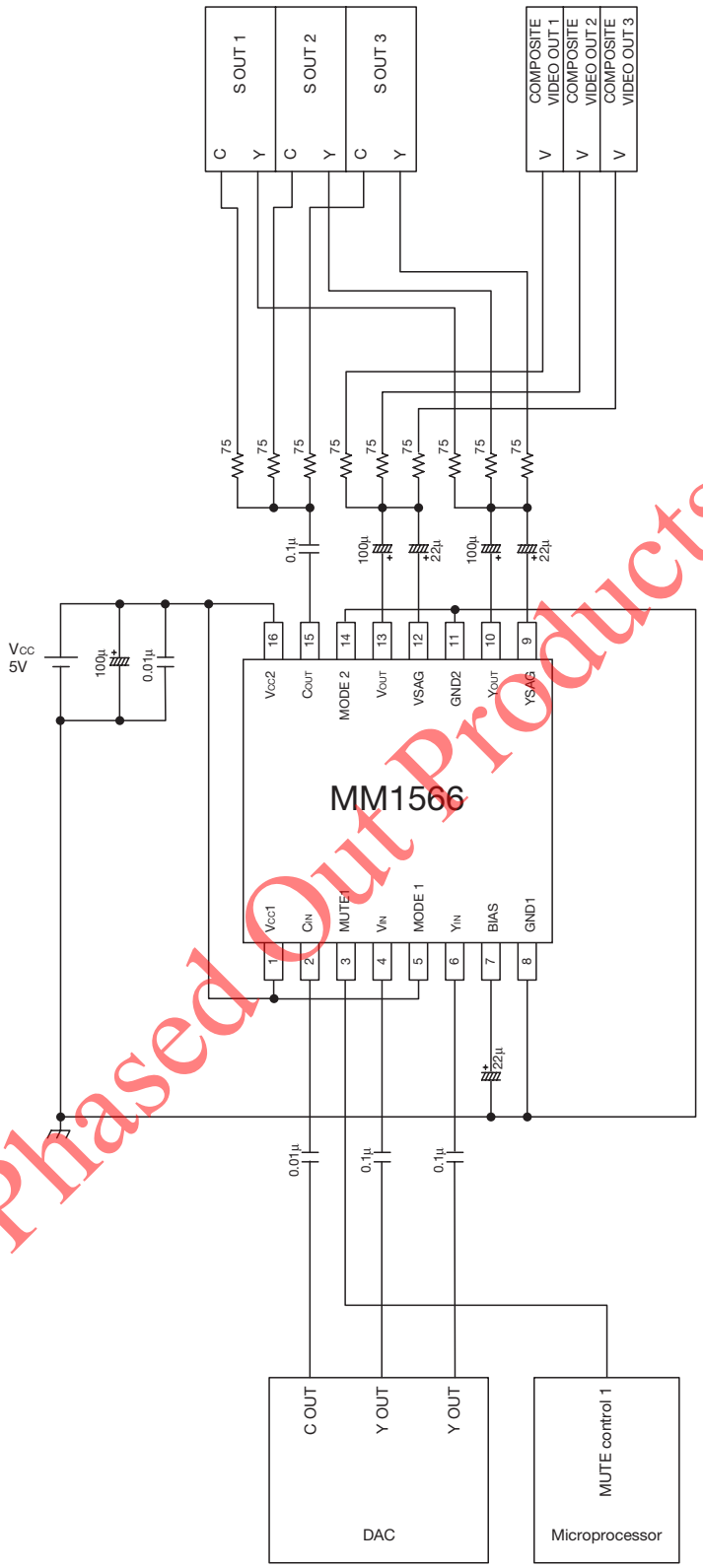
* : Don't care

Application Circuit 1



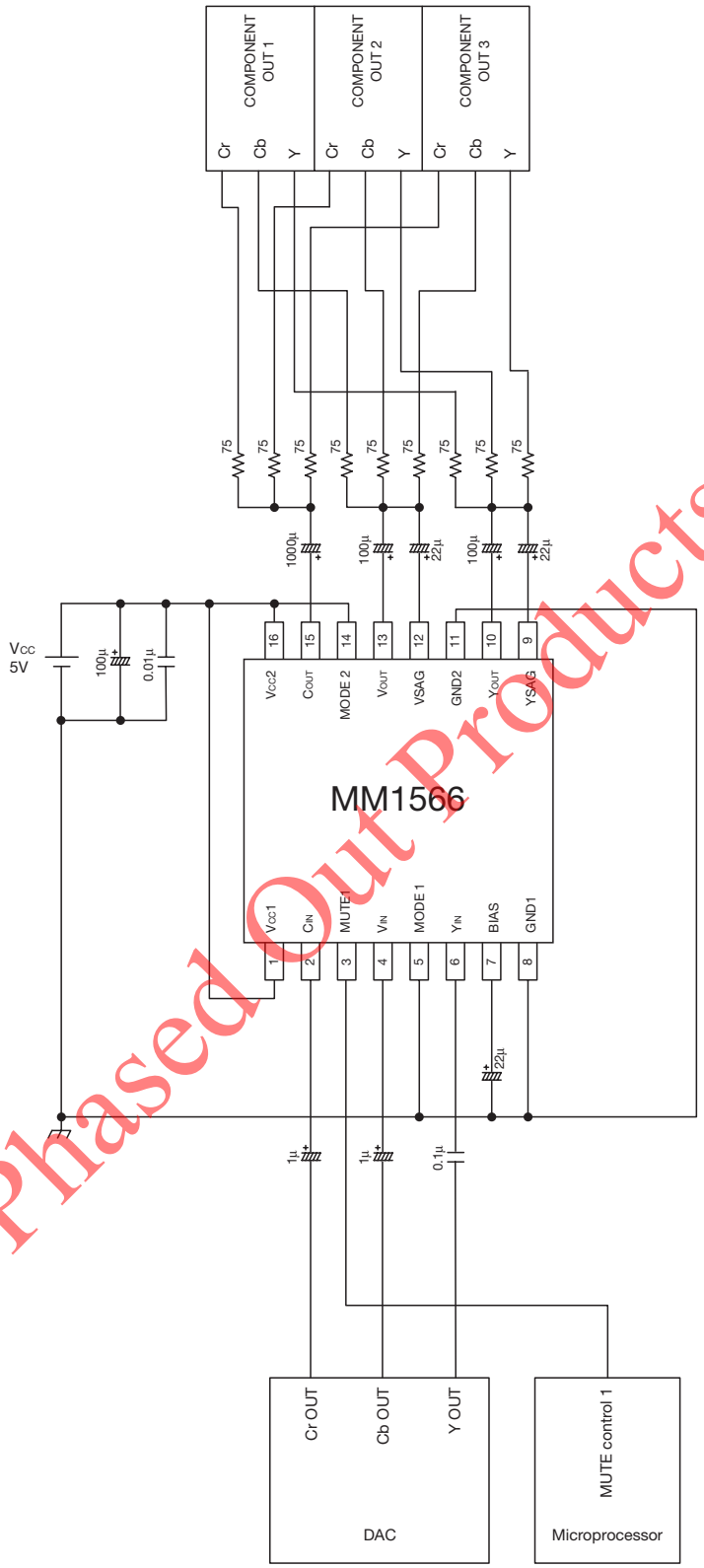
(note) : Please arrange power supply bypass capacitor near the $V_{CC}2$ terminal (16PIN).

Application Circuit 2



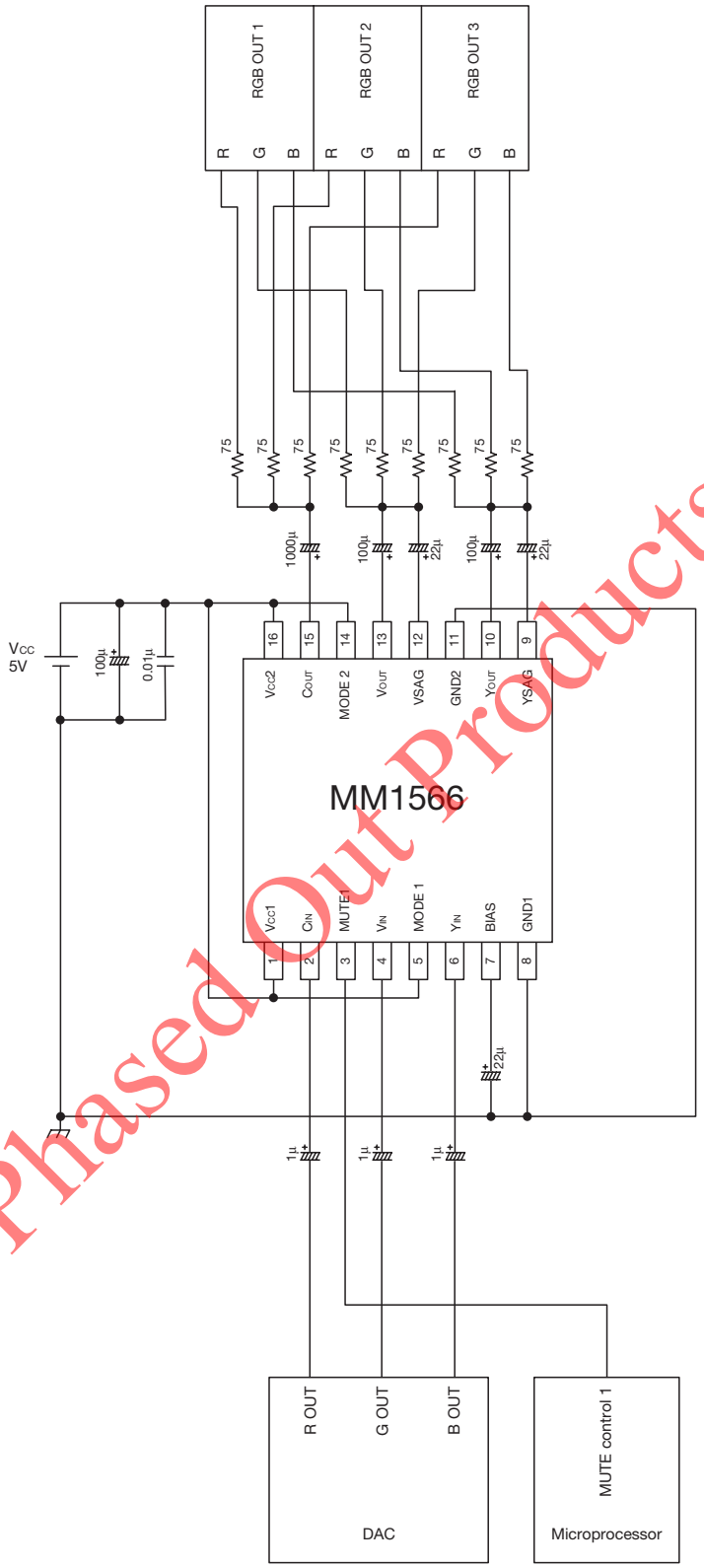
(note) : Please arrange power supply bypass capacitor near the $V_{CC}2$ terminal (16PIN).

Application Circuit 3



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

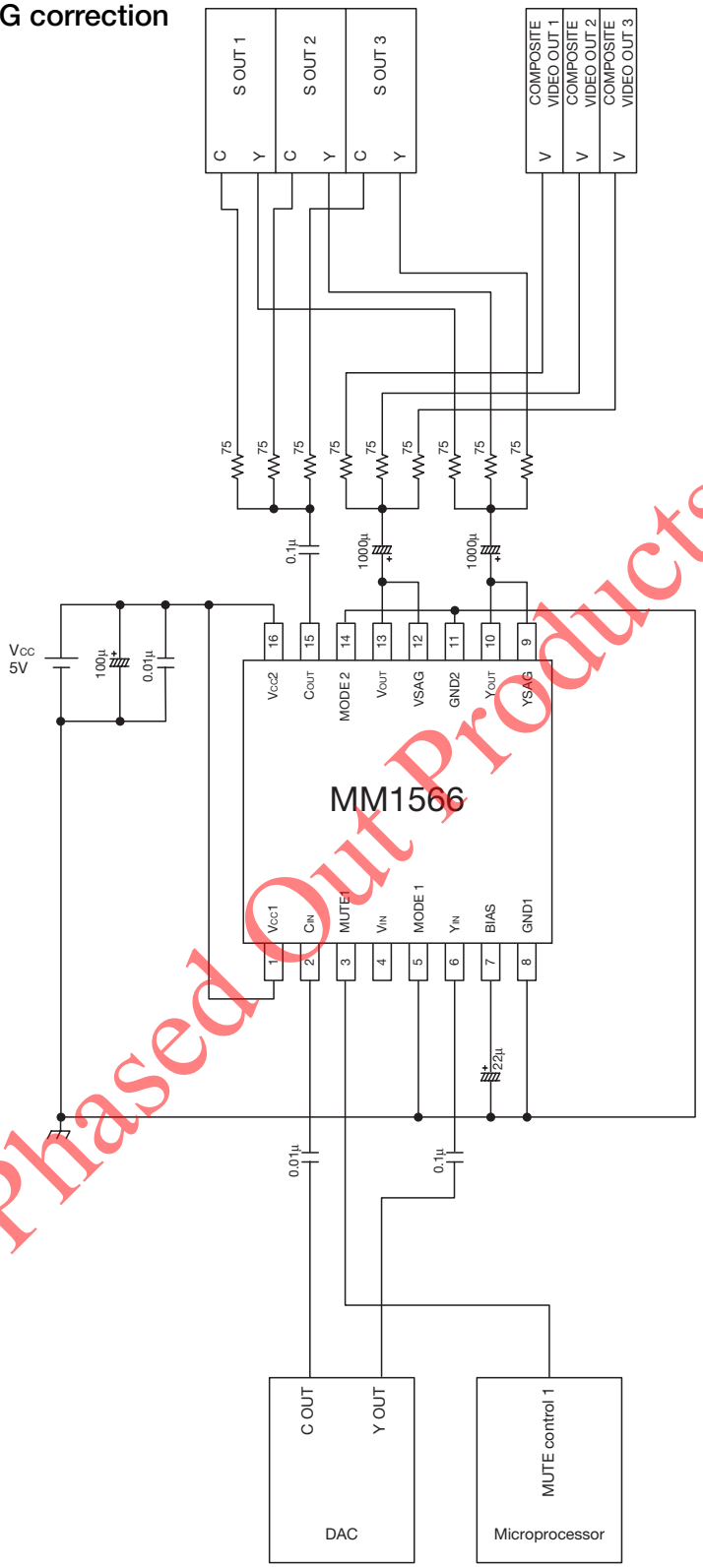
Application Circuit 4



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

Application Circuit 5

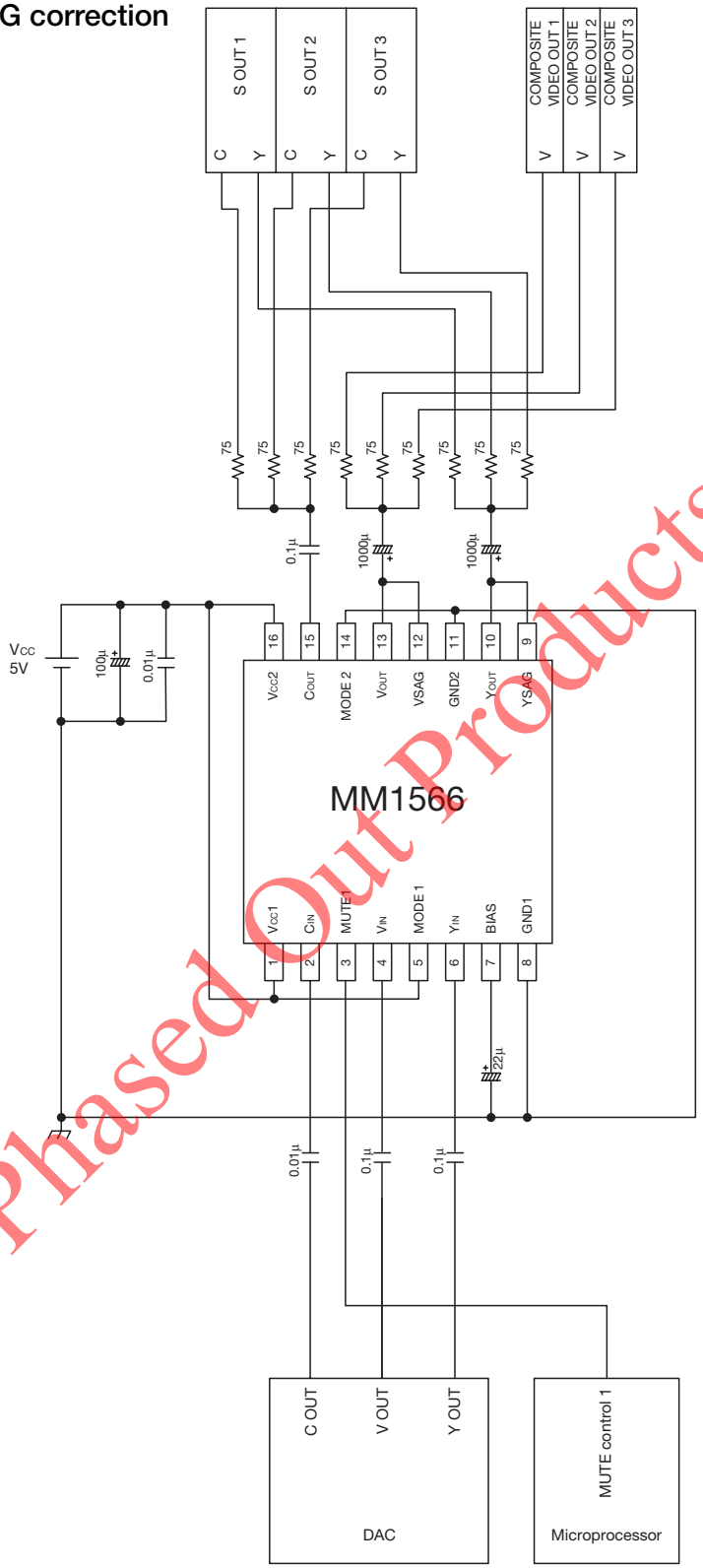
At unused the SAG correction function



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

Application Circuit 6

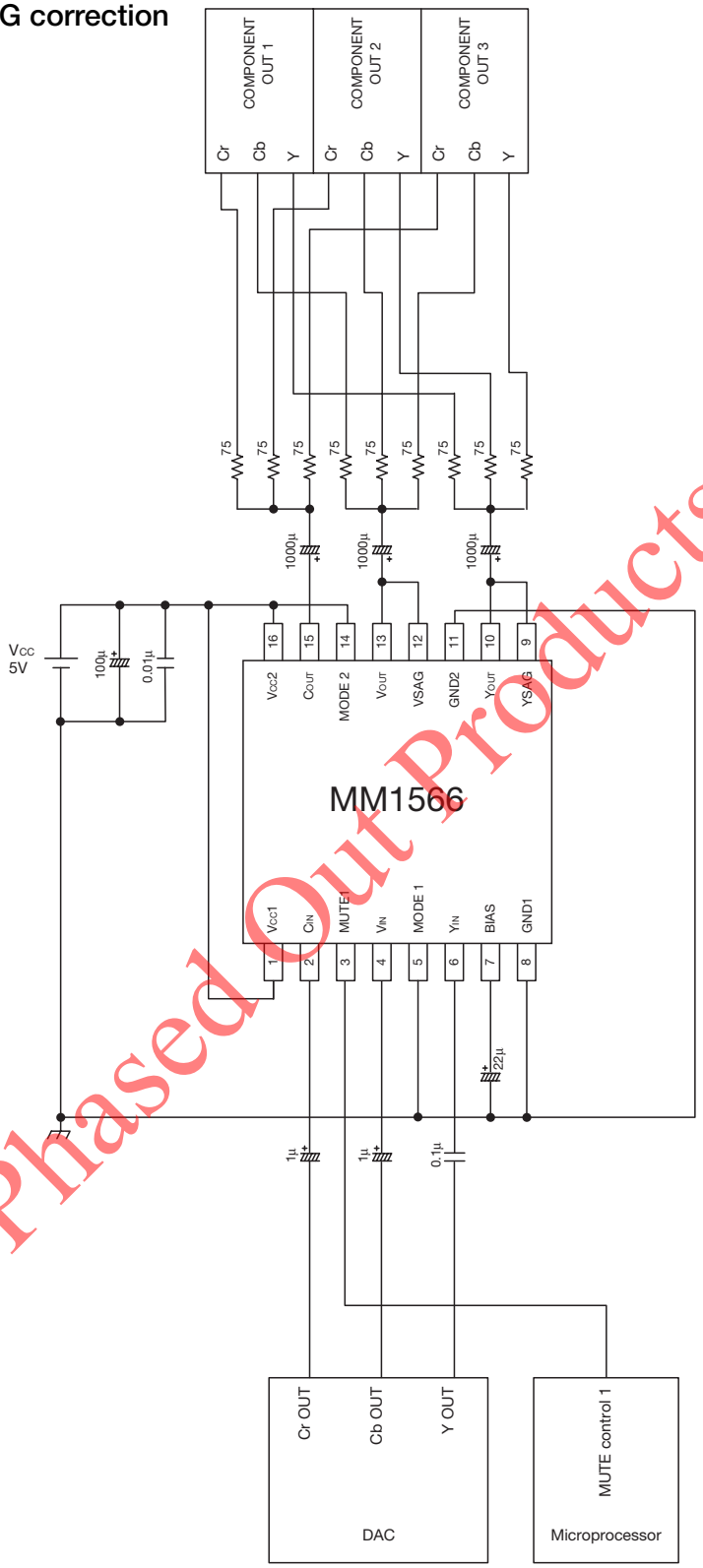
At unused the SAG correction function



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

Application Circuit 7

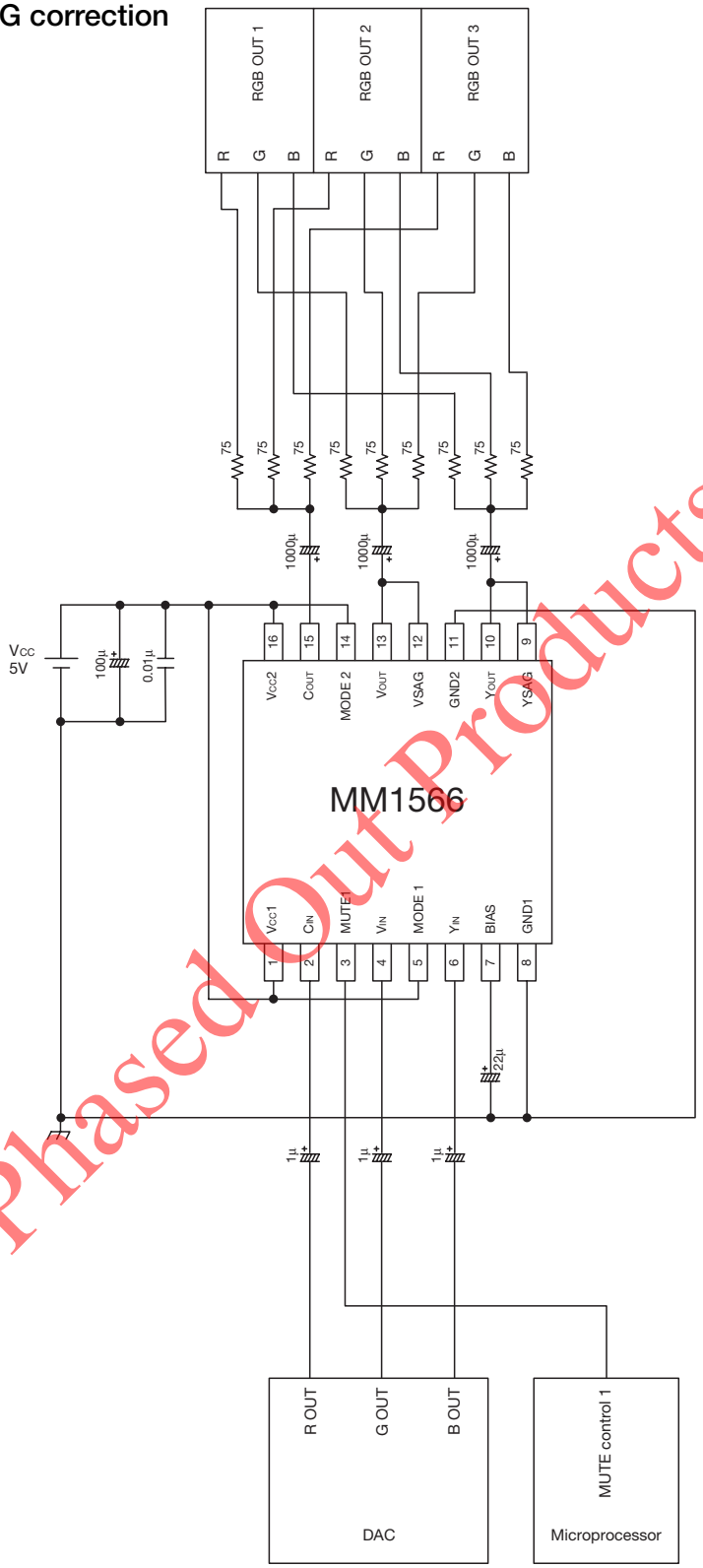
At unused the SAG correction function



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

Application Circuit 8

■ At unused the SAG correction function



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