

2-Input 3-Output Video Driver Monolithic IC MM1636

Outline

This IC is an LPF built-in 75Ω driver IC for DVD players and recorders. It provides the input supporting two types of signals (C, Y) that are output from DAC, and outputs three types of signals (C, CVBS, Y) after rejecting sampling noise with the LPF. It allows each output to drive two channels, which is ideal for outputting the D/A converted video signal.

Features

1. Includes a high performance 4th-order LPF
2. Voltage gain: $6\pm 0.3\text{dB}$ at 100kHz
3. High linearity (DG/DP = 0.8%/0.8°)
4. High ESD protection: $\pm 18\text{kV}$ (IEC 1000-4-2 (aerial discharge))

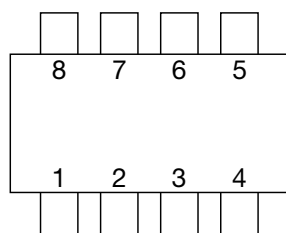
Package

VSOP-8B

Applications

1. DVD players and recorder
2. STB

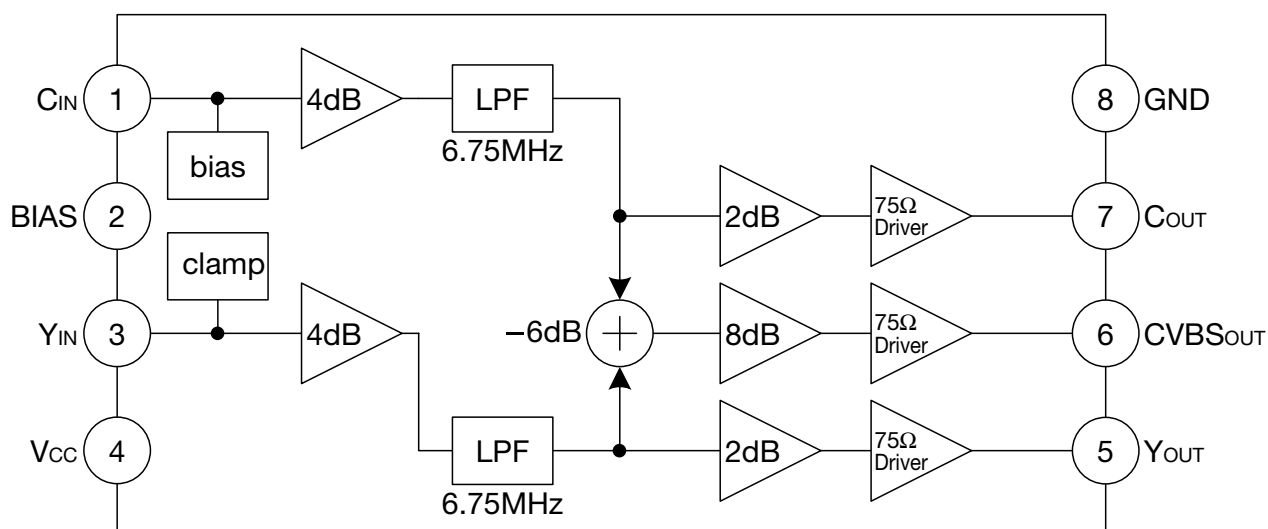
Pin Assignment



VSOP-8B
(TOP VIEW)

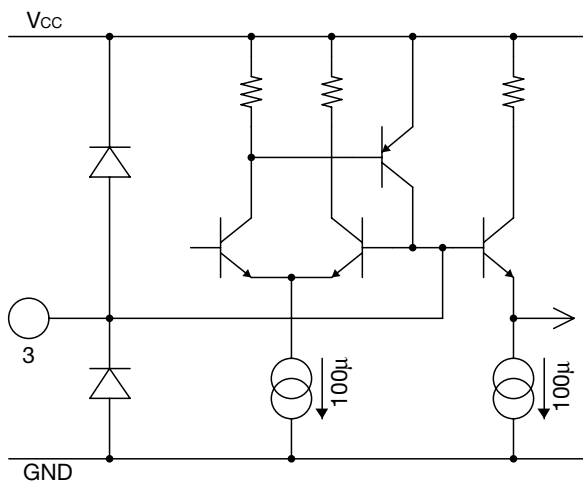
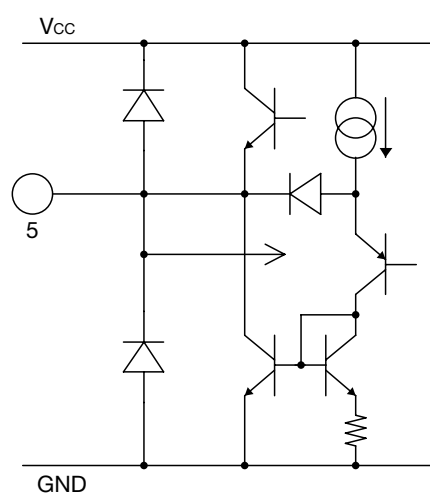
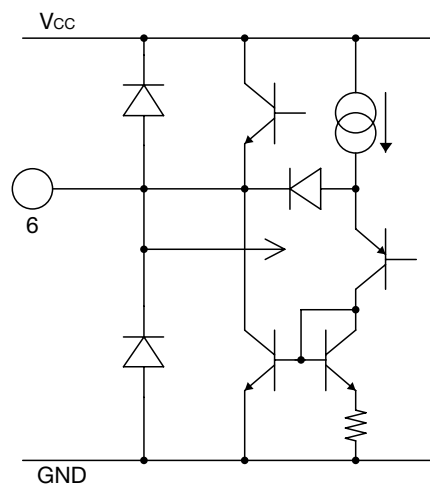
1	C _{IN}	5	Y _{OUT}
2	BIAS	6	CVBS _{OUT}
3	Y _{IN}	7	C _{OUT}
4	V _{CC}	8	GND

Block Diagram



Pin Description

Pin no.	Pin name	Function	Internal equivalent circuit diagram
1	C _{IN}	Chroma signal input	
2	BIAS	Bias	

Pin no.	Pin name	Function	Internal equivalent circuit diagram
3	Y _{IN}	Luminance signal input	
4	V _{CC}	V _{CC}	
5	Y _{OUT}	Luminance signal output	
6	CVBS _{OUT}	Composite signal output	

Pin no.	Pin name	Function	Internal equivalent circuit diagram
7	COUT	Chroma signal output	
8	GND	Ground	

Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Ratings	Units
Storage temperature	T _{STG}	-65~+150	°C
Operating temperature	T _{OPR}	-40~+575	°C
Supply voltage	V _{CC max.}	7	V
Allowable loss (*1)	P _d	700	mW

Note 1: *1 Board mounting allowable loss. Board size 40 × 40 × 1.6mm

Recommended Operating Conditions

Item	Symbol	Ratings	Units
Operating temperature	T _{OPR}	-40~+75	°C
Operating voltage	V _{CCOP}	4.5~5.5	V

Electrical Characteristics (Except where noted otherwise, Ta=25°C, VCC=5V)

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units
Supply current						
Supply current	I _{CC}	No signal	35	50	65	mA
Input pin voltage						
Chroma signal input	V _{CIN}	1 pin	1.9	2.4	2.9	V
Luminance signal input	V _{YIN}	3 pin	1.15	1.4	1.65	V
Output pin voltage						
Chroma signal output	V _{COUT}	7 pin		2.4		V
Composite video signal output	V _{CVBSOUT}	6 pin		1.1		V
Luminance signal output	V _{YOUT}	5 pin		1.1		V
Input impedance						
C _{IN} Input impedance	Z _{CIN}	1 pin	100	150	200	kΩ
C _{OUT} electrical characteristics						
C _{OUT} Voltage gain	G _{V1} (★1)	SIN wave: 1V f=100kHz	5.7	6.0	6.3	dB
C _{OUT} Frequency characteristic at 6.75MHz	f ₁₁ (★1)	100 [IRE] SIN wave + 40 [IRE] SYNC 6.75MHz/100kHz	-1.0	0	1.0	dB
C _{OUT} Frequency characteristic at 27MHz	f ₂₁ (★1)	100 [IRE] SIN wave + 40 [IRE] SYNC 27MHz/100kHz		-33	-24	dB
C _{OUT} Output dynamic range	DR ₁ (★1)	SIN wave: 100kHz THD=1.0%	2.6	3.0		V
C _{OUT} S/N	SN ₁ (★1)	BW: 100k~6MHz		-83		dB
C _{OUT} Group delay	t _{GD1} (★1)	at 100kHz		50		ns
C _{OUT} Group delay deviation 1	Δt _{1GD1} (★1)	to 3.58MHz		4		ns
C _{OUT} Group delay deviation 2	Δt _{2GD1} (★1)	to 4.43MHz		7		ns
C _{OUT} Group delay deviation 3	Δt _{3GD1} (★1)	to 6MHz		12		ns
CVBS _{OUT} (C _{IN}) electrical characteristics						
CVBS _{OUT} (C _{IN}) Voltage gain	G _{V2} (★1)	SIN wave: 1V f=100kHz Y _{IN} =DC2.05V	5.7	6.0	6.3	dB
CVBS _{OUT} (C _{IN}) Frequency characteristic at 6.75MHz	f ₁₂ (★1)	100 [IRE] SIN wave + 40 [IRE] SYNC 6.75MHz/100kHz Y _{IN} =DC2.05V	-1.0	0	1.0	dB
CVBS _{OUT} (C _{IN}) Frequency characteristic at 27MHz	f ₂₂ (★1)	100 [IRE] SIN wave + 40 [IRE] SYNC 27MHz/100kHz Y _{IN} =DC2.05V		-33	-24	dB
CVBS _{OUT} (C _{IN}) Output dynamic range	DR ₂ (★1)	SIN wave: 100kHz THD=1.0% Y _{IN} =DC2.05V	2.6	3.0		V
CVBS _{OUT} (C _{IN}) S/N	SN ₂ (★1)	BW: 100k~6MHz at MIX out Y _{IN} =DC2.05V		-77		dB
CVBS _{OUT} (C _{IN}) Group delay	t _{GD2} (★1)	at 100kHz Y _{IN} =DC2.05V		50		ns
CVBS _{OUT} (C _{IN}) Group delay deviation 1	Δt _{1GD2} (★1)	to 3.58MHz Y _{IN} =DC2.05V		4		ns
CVBS _{OUT} (C _{IN}) Group delay deviation 2	Δt _{2GD2} (★1)	to 4.43MHz Y _{IN} =DC2.05V		7		ns
CVBS _{OUT} (C _{IN}) Group delay deviation 3	Δt _{3GD2} (★1)	to 6MHz Y _{IN} =DC2.05V		12		ns

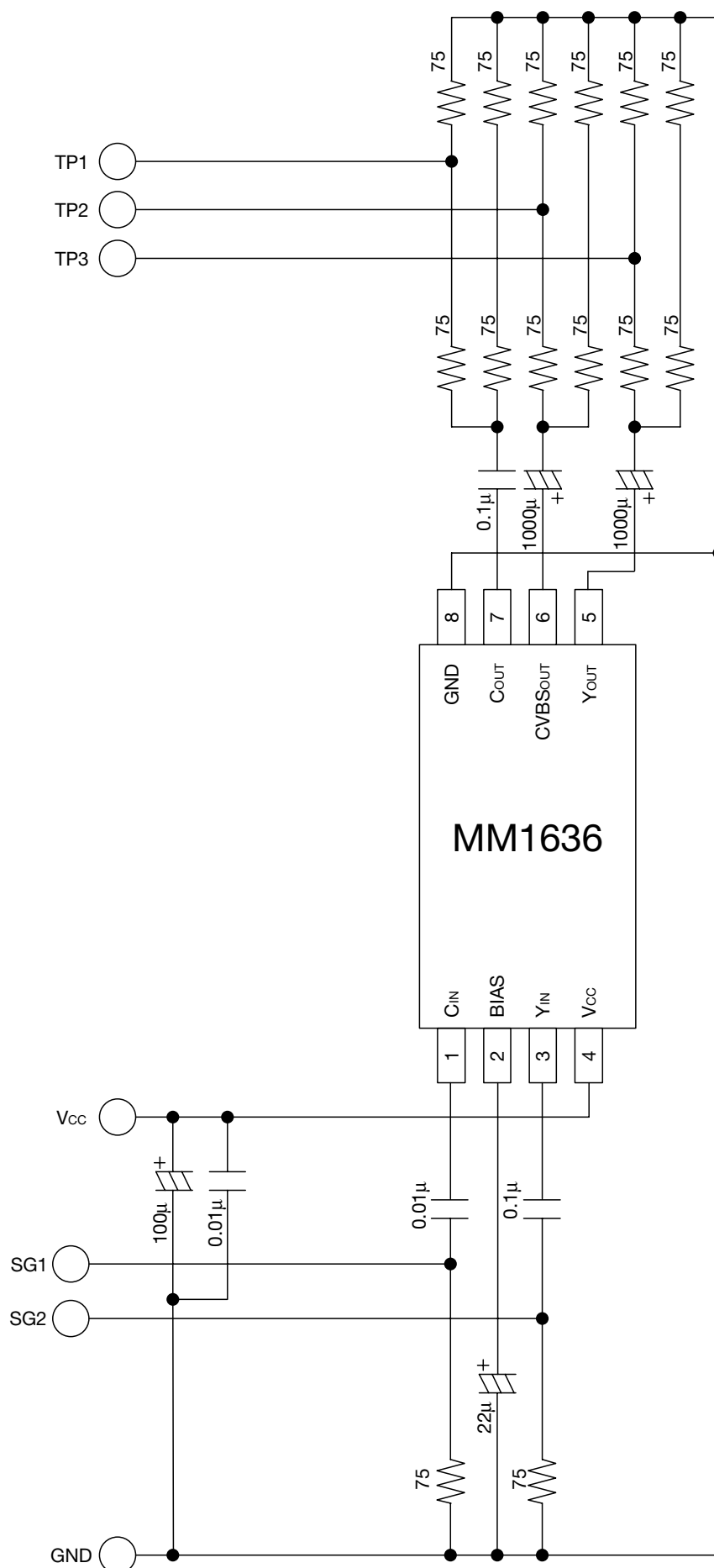
Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units
CVBS_{OUT} (Y_{IN}) electrical characteristics						
CVBS_{OUT} (Y_{IN}) Voltage gain	G _{V3} (★1)	SIN wave: 1V f=100kHz	5.7	6.0	6.3	dB
CVBS_{OUT} (Y_{IN}) Frequency characteristic at 6.75MHz	f ₁₃ (★1)	100 [IRE] SIN wave + 40 [IRE] SYNC 6.75MHz/100kHz	1.0	0	1.0	dB
CVBS_{OUT} (Y_{IN}) Frequency characteristic at 27MHz	f ₂₃ (★1)	100 [IRE] SIN wave + 40 [IRE] SYNC 27MHz/100kHz		-33	-24	dB
CVBS_{OUT} (Y_{IN}) Output dynamic range	DR ₃ (★1)	SIN wave: 100kHz THD=1.0%	2.6	3.0		V
CVBS_{OUT} (Y_{IN}) S/N	SN ₃ (★1)	BW: 100k~6MHz at MIX out		-77		dB
CVBS_{OUT} (Y_{IN}) Group delay	t _{GD3} (★1)	at 100kHz		50		ns
CVBS_{OUT} (Y_{IN}) Group delay deviation 1	Δt _{1GD3} (★1)	to 3.58MHz		4		ns
CVBS_{OUT} (Y_{IN}) Group delay deviation 2	Δt _{2GD3} (★1)	to 4.43MHz		7		ns
CVBS_{OUT} (Y_{IN}) Group delay deviation 3	Δt _{3GD3} (★1)	to 6MHz		12		ns
CVBS_{OUT} (MIX) electrical characteristics						
Differential gain	DG	Staircase signal 1V		0.8	1.2	%
Differential phase	DP	Staircase signal 1V		0.8	1.2	°
Y_{OUT} electrical characteristics						
Y_{OUT} Voltage gain	G _{V4} (★1)	SIN wave: 1V f=100kHz	5.7	6.0	6.3	dB
Y_{OUT} Frequency characteristic at 6.75MHz	f ₁₄ (★1)	100 [IRE] SIN wave + 40 [IRE] SYNC 6.75MHz/100kHz	-1.0	0	1.0	dB
Y_{OUT} Frequency characteristic at 27MHz	f ₂₄ (★1)	100 [IRE] SIN wave + 40 [IRE] SYNC 27MHz/100kHz		-33	-24	dB
Y_{OUT} Output dynamic range	DR ₄ (★1)	SIN wave: 100kHz THD=1.0%	2.6	3.0		V
Y_{OUT} S/N	SN ₄ (★1)	BW: 100k~6MHz		-83		dB
Y_{OUT} Group delay	t _{GD4} (★1)	at 100kHz		50		ns
Y_{OUT} Group delay deviation 1	Δt _{1GD4} (★1)	to 3.58MHz		4		ns
Y_{OUT} Group delay deviation 2	Δt _{2GD4} (★1)	to 4.43MHz		7		ns
Y_{OUT} Group delay deviation 3	Δt _{3GD4} (★1)	to 6MHz		12		ns
Crosstalk						
Crosstalk (C_{IN})	CT _{CIN} (★1)	Y _{OUT} f=4.43MHz,1V		-60	-55	dB
Crosstalk (Y_{IN})	CT _{YIN} (★1)	C _{OUT} f=4.43MHz,1V		-60	-55	dB
Group delay deviation between each channels						
Group delay deviation 1 between each channels	Δt _{c1GD1} (★1)	Δt _{GD4} -Δt _{GD1} at 3.58MHz		9	20	ns

Note: ★1 The subscript number is the combination of table below.

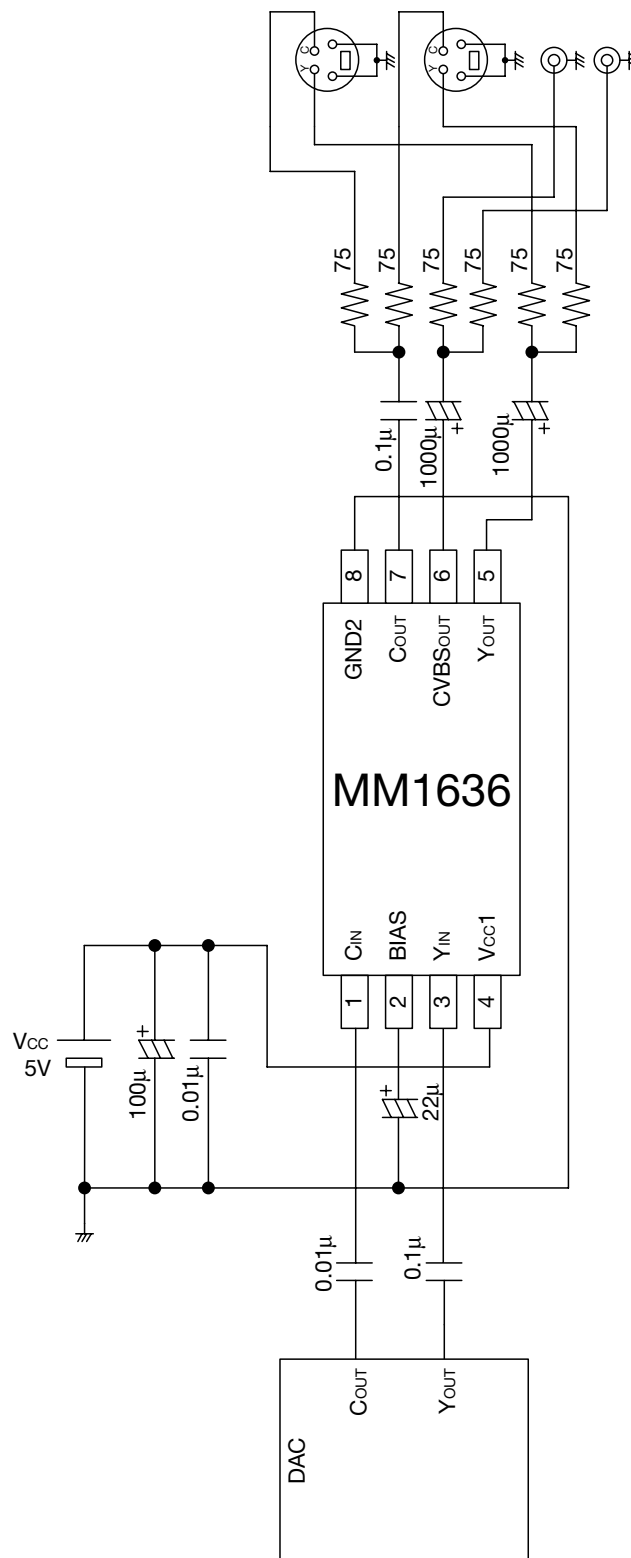
n	Input	Output
1	C _{IN}	C _{OUT}
2	C _{IN}	CVBS _{OUT}
3	Y _{IN}	
4	Y _{IN}	Y _{OUT}

ex. G_{V1}: input=C_{IN}, output=C_{OUT}
 Δt_{GD4}: input=Y_{IN}, output=Y_{OUT}

Measuring Circuit



Application Circuit

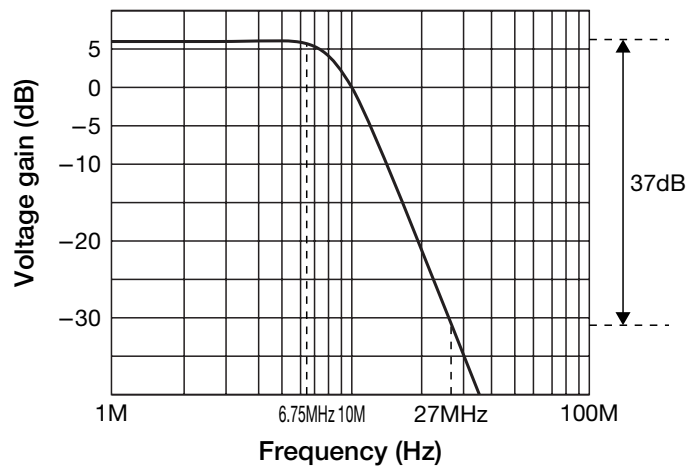


Note: Arrange power supply bypass capacitor near the V_{CC} terminal (4pin) .

- We shall not be liable for any trouble or damage caused by using this circuit .
- In the event a problem which may affect industrial property or any other rights of us or a third party happens during the use of information in these circuit, we shall not be liable for any problem, nor grant a license therefore.

Characteristics

Frequency characteristic (C_{OUT}, CVBS_{OUT}, Y_{OUT})



Group delay (C_{OUT}, CVBS_{OUT}, Y_{OUT})

