2-Input 1-Output Video Switch / 3-Input 1-Output Video Switch
Monolithic IC MM1111~MM1118

Outline

These ICs are video switches for video / audio signal switching, with 2-input 1-output or 3-input 1-output. The series includes those with and without built-in clamp and 6dB amp circuits.

Circuit configuration tables and block diagrams are as follows.

MM1118 is used as the representative model in this description.

MM1111~MM1118 Series Circuit Configuration Table

Model name	# of Inputs	# of Outputs	6dB amplifier	Clamp circuit	Power supply voltage
MM1111	2	1	No	No	4.6~13.0V
MM1112	2	1	Yes	No	8.0~13.0V
MM1113	3	1	No	No	4.6~13.0V
MM1114	3	1	Yes	No	8.0~13.0V
MM1115	2	1	No	Yes	4.6~13.0V
MM1116	2	1	Yes	Yes	4.6~13.0V
MM1117	3	1	No	Yes	4.6~13.0V
MM1118	3	1	Yes	Yes	4.6~13.0V

MM1111~MM1118 Input/Output Voltage Measurement Values (typ.)

Model name	Input / Output voltage	Power supply voltage			Unit
		5V	9V	12V	
MM1111	Input voltage	2.77	5.02	6.71	V
	Output voltage	2.01	4.26	5.96	V
MM1112	Input voltage		4.06	5.45	V
	Output voltage		4.30	5.57	V
MM1113	Input voltage	2.77	5.02	6.71	V
	Output voltage	2.01	4.26	5.96	V
MM1114	Input voltage		4.06	5.45	V
	Output voltage		4.30	5.57	V
MM1115	Input voltage	1.35	2.40	3.20	V
	Output voltage	0.59	1.65	2.45	V
MM1116	Input voltage	1.29	2.30	3.05	V
	Output voltage	1.06	1.76	2.30	V
MM1117	Input voltage	1.35	2.40	3.20	V
	Output voltage	0.59	1.65	2.45	V
MM1118	Input voltage	1.29	2.30	3.05	V
	Output voltage	1.06	1.76	2.30	V

MM1111

SOP-8C

GND   OUT   Vcc   (NC)
[8]   [7]   [6]   [5]

バッファ

SW

15k
15k

バイアス

[1]   [2]   [3]   [4]
IN1   SW   IN2   (NC)

SIP-8A

バイアス   15k

バッファ

15k   SW

[1]   [2]   [3]   [4]   [5]   [6]   [7]   [8]
(NC)   Vcc   OUT   GND   IN1   SW   IN2   (NC)
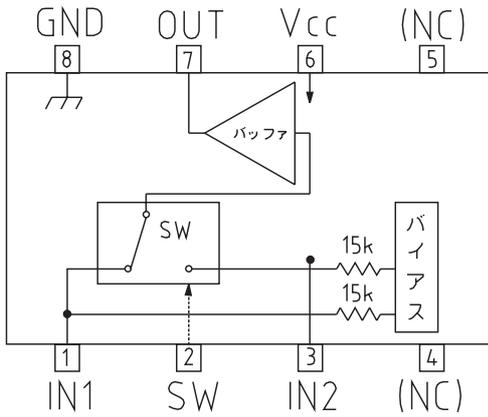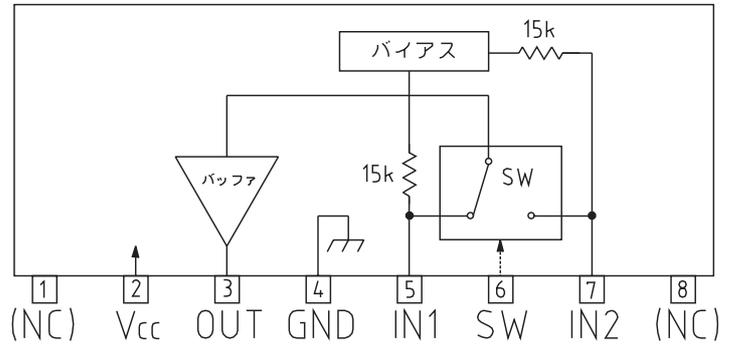
Control input truth table

SW	OUT
L	IN1
H	IN2

MM1112

SOP-8C

GND   OUT   Vcc   (NC)
[8]   [7]   [6]   [5]

6dB

SW

15k
15k

バイアス

[1]   [2]   [3]   [4]
IN1   SW   IN2   (NC)

SIP-8A

バイアス   15k

6dB

15k   SW

[1]   [2]   [3]   [4]   [5]   [6]   [7]   [8]
(NC)   Vcc   OUT   GND   IN1   SW   IN2   (NC)
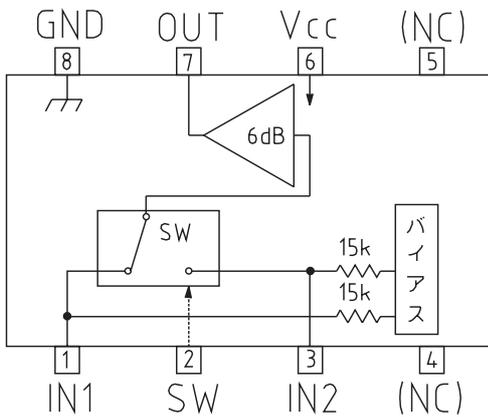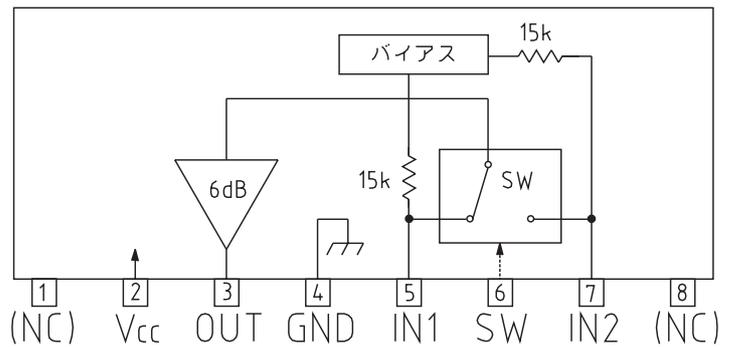
Control input truth table

SW	OUT
L	IN1
H	IN2

MM1113

SOP-8C
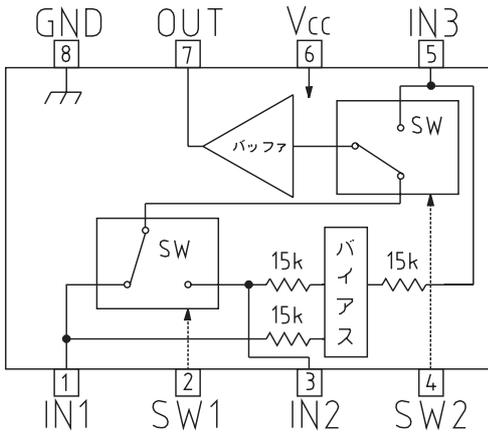
SIP-8A
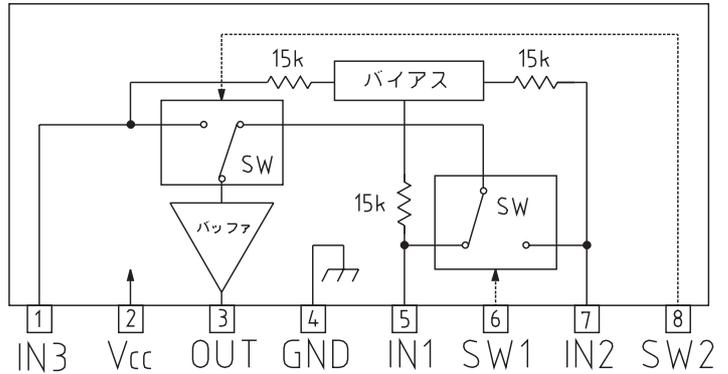
Control input truth table

SW1	SW2	OUT
L	L	IN1
H	L	IN2
–	H	IN3

MM1114

SOP-8C
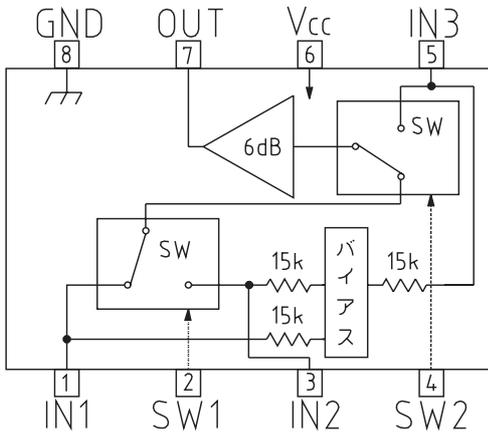
SIP-8A
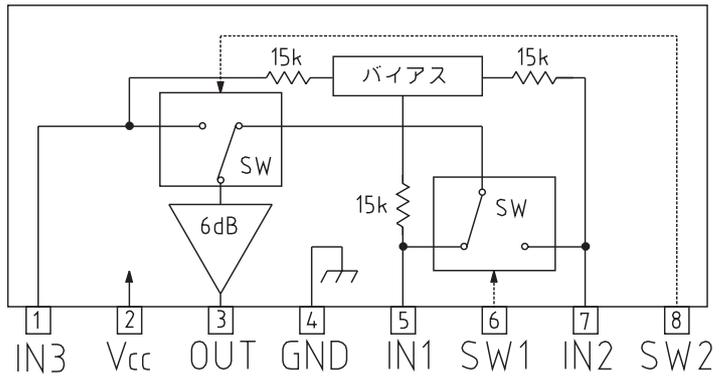
Control input truth table

SW1	SW2	OUT
L	L	IN1
H	L	IN2
–	H	IN3

MM1115
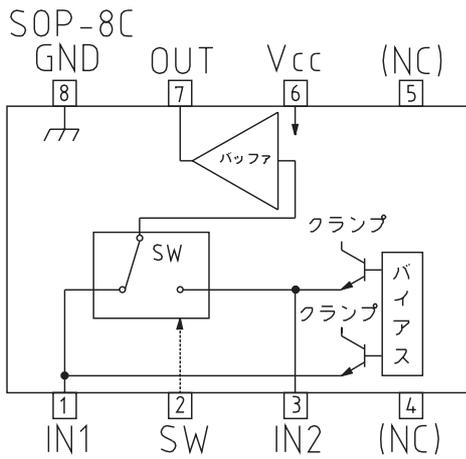
SOP-8C
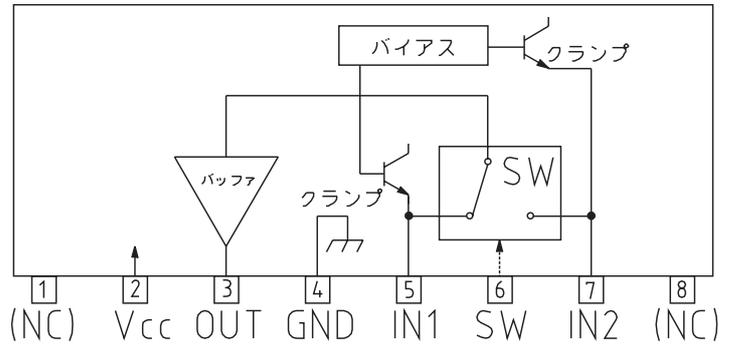
SIP-8A

Control input truth table

SW	OUT
L	IN1
H	IN2

MM1116
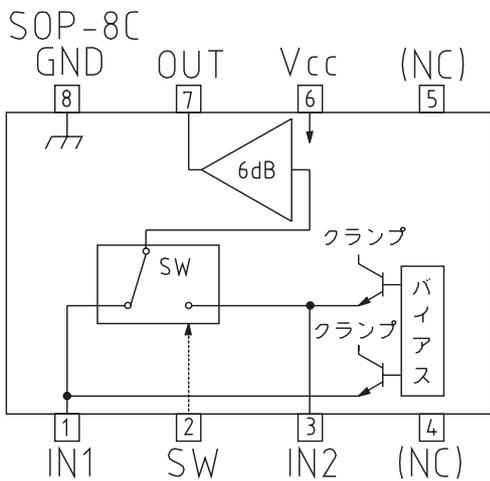
SOP-8C
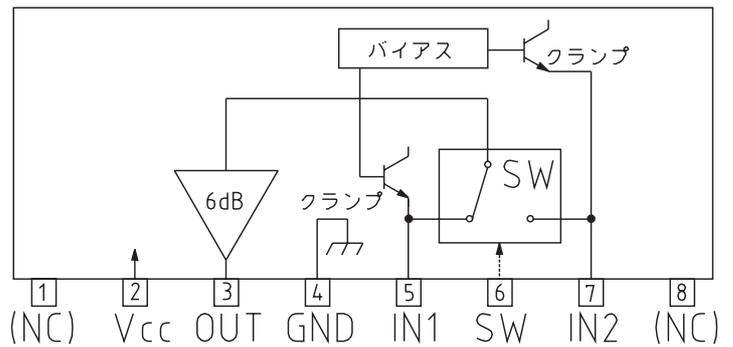
SIP-8A

Control input truth table

SW	OUT
L	IN1
H	IN2

MM1117

SOP-8C
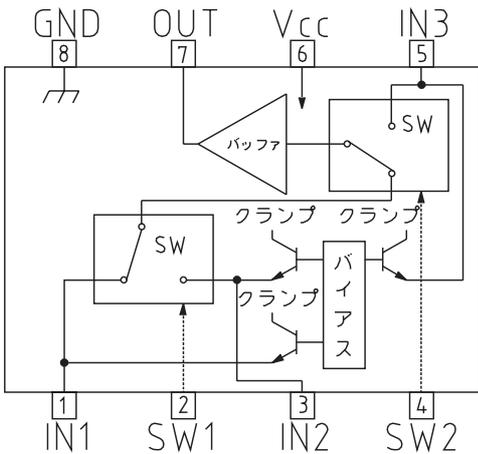
SIP-8A
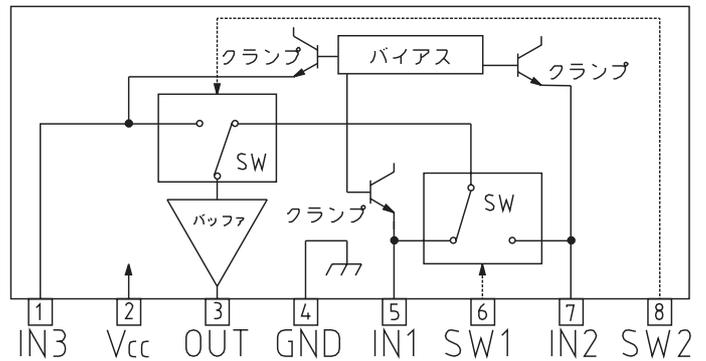
Control input truth table

SW1	SW2	OUT
L	L	IN1
H	L	IN2
–	H	IN3

MM1118

SOP-8C
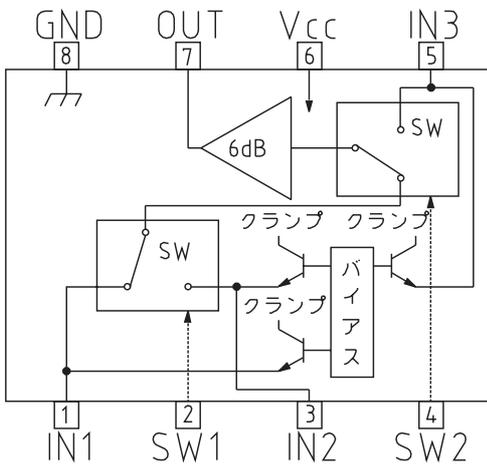
SIP-8A
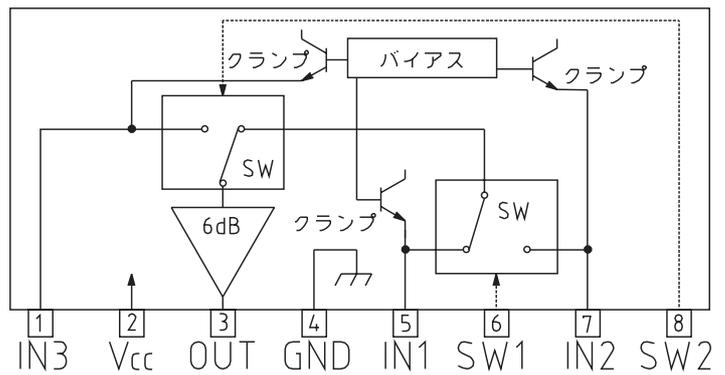
Control input truth table

SW1	SW2	OUT
L	L	IN1
H	L	IN2
–	H	IN3

Introduction of Main Model

3-Input 1-Output Video Switch (with 6dB amp)
Monolithic IC MM1118

Outline

This is a 3-input, 1-output video switch IC with a clamp function and built-in 6dB amp, for video signal switching. One of the inputs also has a mute function.

Features

1. Built-in 6dB amp
2. Clamp function
3. Mute function
4. Current consumption   5.1mA typ.
5. Operating power supply voltage range   4.6~13.0V
6. Frequency response   10MHz
7. Crosstalk   64dB (at 4.43MHz)

Package

SOP-8C (MM1118XF)
SIP-8A (MM1118XS)

Applications

1. TV
2. VCR
3. Other video equipment

Pin Description

Pin no.		Pin name	Function	Internal equivalent circuit diagram
SOP-8C	SIP-8A			
1	5	IN1	Input 1	
3	7	IN2	Input 2	
5	1	IN3	Input 3	
2	6	SW1	Switch 1	
4	8	SW2	Switch 2	
6	2	Vcc	Power supply	
7	3	OUT	Output	
8	4	GND	Ground	

Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Ratings	Units
Storage temperature	T_{STG}	–40~+125	°C
Operating temperature	T_{OPR}	–20~+75	°C
Power supply voltage	V_{CC}	15	V
Allowable loss	Pd	300 (SOP-8C) 1000 (SIP-8A)	mW

## Electrical Characteristics (Except where noted otherwise, Ta=25°C, Vcc=5.0V)

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units
Operating power supply voltage range	V_{CC}		4.6		13.0	V
Consumption current	Id	Refer to Measuring Circuit		5.1	6.6	mA
Voltage gain	Gv	Refer to Measuring Circuit	5.5	6.0	6.5	dB
Frequency characteristic	Fc	Refer to Measuring Circuit	–1	0	+1	dB
Differential gain	DG	Refer to Measuring Circuit		0	±3	%
Differential phase	DP	Refer to Measuring Circuit		0	±3	deg
Output offset voltage	Voff	Refer to Measuring Circuit			±30	mV
Crosstalk	C_T	Refer to Measuring Circuit		–64	–54	dB
Switch 1 input voltage H	VIH1	Refer to Measuring Circuit	2.1			V
Switch 1 input voltage L	VIL1	Refer to Measuring Circuit			0.7	V
Switch 2 input voltage H	VIH2	Refer to Measuring Circuit	2.1			V
Switch 2 input voltage L	VIL2	Refer to Measuring Circuit			0.7	V
Output impedance	Ro			25		Ω

Measuring Procedures (Except where noted otherwise, V_{CC}=5.0V, VC1=V_{CC}, VC2=0V)

Item	Symbol	S1	S2	S3	S4	S5	Measuring Procedure
Consumption current	Id	2	2	2	2	2	Connect a DC ammeter to the V_{CC} pin and measure. The ammeter is shorted for use in subsequent measurements.
Voltage gain	Gv	1	2	2	2	2	Input a 1.0V$_{P-P}$, 100kHz sine wave to SG, and obtain Gv from the following formula given TP1 voltage as V1 and TP3 voltage as V2. $$G_V=20LOG\ (V2/V1)\ dB$$
		2	1	2	1	2	
		2	2	1	1	1	
		2	2	1	2	1	
Frequency characteristic	Fc	1	2	2	2	2	For the above Gv measurement, given TP3 voltage for 10MHz as V3, Fc is obtained from the following formula. $$F_C=20LOG\ (V3/V2)\ dB$$
		2	1	2	1	2	
		2	2	1	1	1	
		2	2	1	2	1	
Differential gain	DG	1	2	2	2	2	Input a 1.0V$_{P-P}$ staircase wave to SG, and measure differential gain at TP3. APL=10~90%
		2	1	2	1	2	
		2	2	1	1	1	
		2	2	1	2	1	
Differential phase	DP	1	2	2	2	2	Proceed as for DG, and measure differential phase.
		2	1	2	1	2	
		2	2	1	1	1	
		2	2	1	2	1	
Output offset voltage	Voff	2	2	2	2	2	Measure the DC voltage difference of each switch status at TP2.
		2	2	2	1	2	
		2	2	2	1	1	
Crosstalk	CT	1	2	2	1	2	Assume VC1=2.1V, VC2=0.7V. Input a 2.0V$_{P-P}$, 4.43MHz sine wave to SG, and given TP1 voltage as V4 and TP3 voltage as V5, CT is obtained from the following formula. $$C_T = 20LOG\ (V5/V4)\ dB$$
		1	2	2	2	1	
		1	2	2	1	1	
		2	1	2	2	2	
		2	1	2	2	1	
		2	1	2	1	1	
		2	2	1	2	2	
		2	2	1	1	2	
		2	2	2	1	2	
Switch 1 input voltage H	$V_{IH}1$						Impress an optional DC voltage on TP6 and TP7. Gradually raise from VC1=0V. TP4 voltage when TP7 voltage is output on TP2 is $V_{IH}1$. Gradually lower from VC1=V_{CC}. TP4 voltage when TP6 voltage is output on TP2 is $V_{IL}1$.
Switch 1 input voltage L	$V_{IL}1$						
Switch 2 input voltage H	$V_{IH}2$	2	2	2	2	1	Impress an optional DC voltage on TP6 and TP8. Gradually raise from VC1=0V. TP5 voltage when TP8 voltage is output on TP2 is $V_{IH}2$. Gradually lower from VC1=V_{CC}. TP5 voltage when TP6 voltage is output on TP2 is $V_{IL}2$.
Switch 2 input voltage L	$V_{IL}2$						

Measuring Circuit

SOP-8C

SIP-8A