

Video Switch IC (with/without 75Ω driver, Y/C mix) Monolithic IC MM1501~MM1513 Series

February 25, 2000

Outline

These ICs are video switch ICs for video/audio signal switching with 2-input 1-output. The series includes those with and without a 75Ω driver for video/chroma signals and a Y/C mixed circuit to achieve a smaller package, SOT-26.

Line-up

Functions	Model Name	Input	Output	Clamp	6dB amp	75Ω driver	SAG measures pin	Power supply voltage
Switch	MM1501	2	1	×	×	×	×	4.5~13.0V
	MM1502			×	○	×	×	4.5~13.0V
	MM1503			○	×	×	×	4.5~13.0V
	MM1504			○	○	×	×	4.5~13.0V
	MM1505			×	×	○	×	4.5~13.0V
	MM1506			×	○	○	×	4.5~13.0V
	MM1507			○	×	○	×	4.5~13.0V
	MM1508			○	○	○	×	4.5~13.0V
Driver	MM1509	1	1	×	○	○	○	4.5~13.0V
	MM1510			○	○	○	○	4.5~13.0V
Y/C mix	MM1511	1	1	○/×	×	×	×	4.5~13.0V
	MM1512			○/×	○	○	○	4.5~13.0V
	MM1513			○/×	○	×	×	4.5~13.0V

Features

1. Realizes low power consumption
2. Realizes low supply voltage
3. Frequency bandwidth Without a 75Ω driver: 10MHz With a 75Ω driver: 7MHz
4. Crosstalk 70dB at 4.43MHz
5. With SAG measures pin (75Ω driver and Y/C mix driver)

Packages

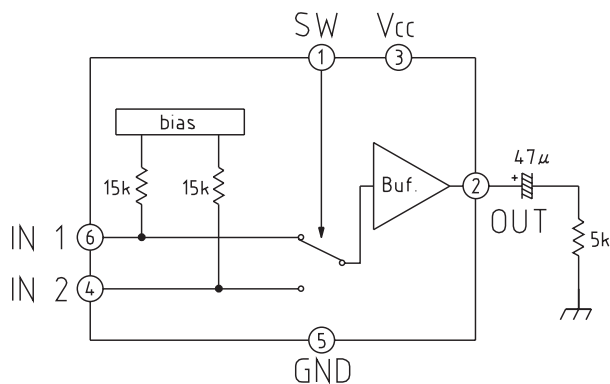
SOT-26A (with a 75Ω driver)
SOT-26B (without a 75Ω driver)

Applications

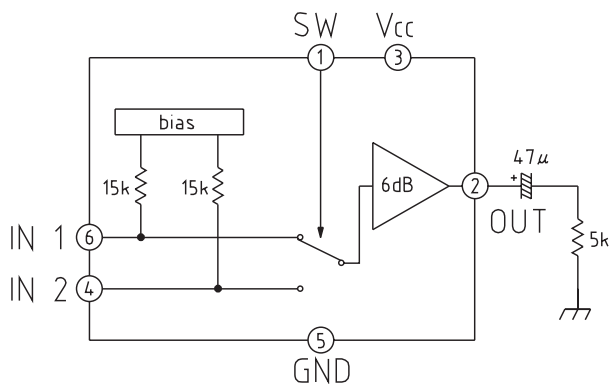
1. TV
2. VTR
3. Video cameras
4. Digital still cameras
5. Other visual equipment

Block Diagram

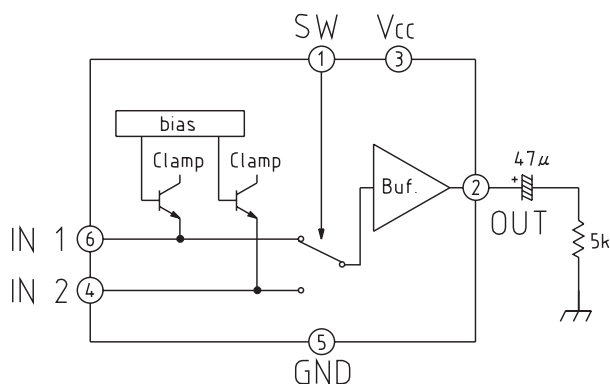
MM1501



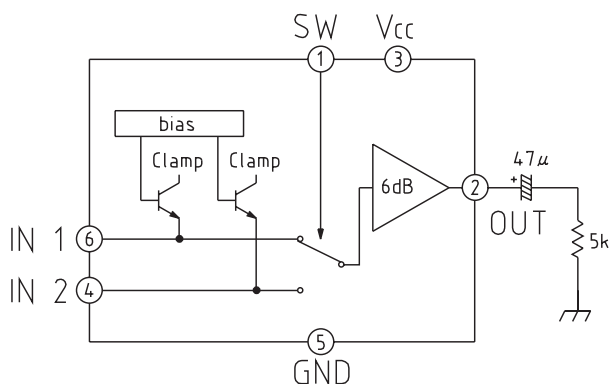
MM1502



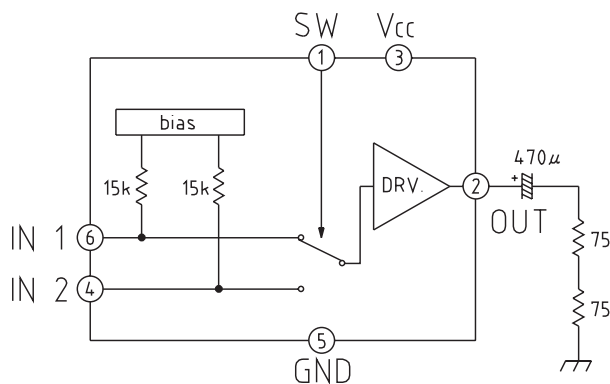
MM1503



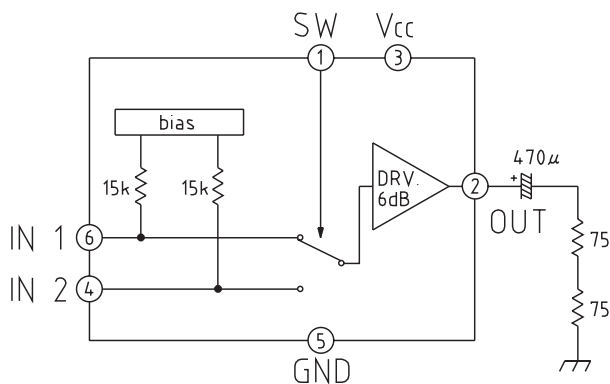
MM1504



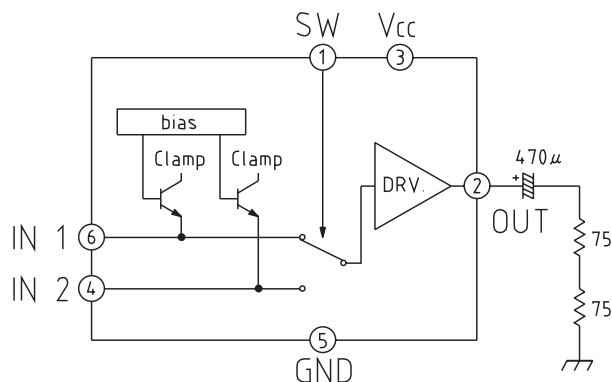
MM1505



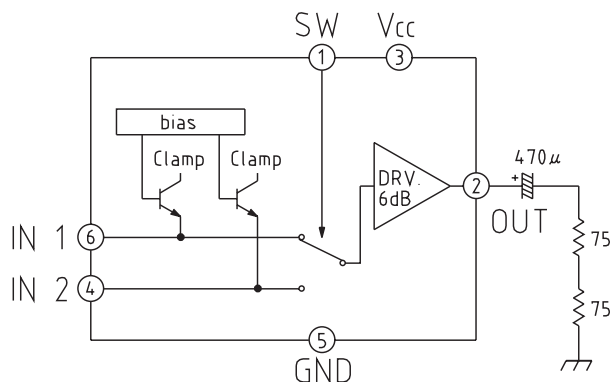
MM1506



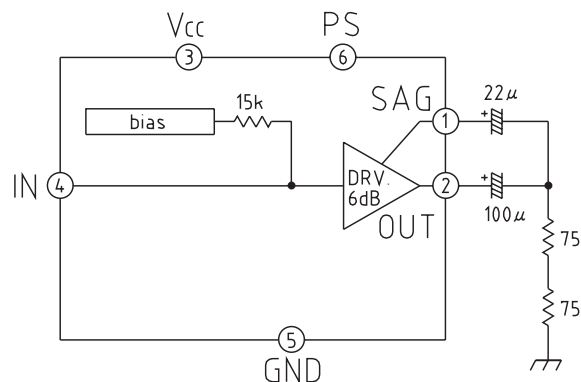
■ MM1507



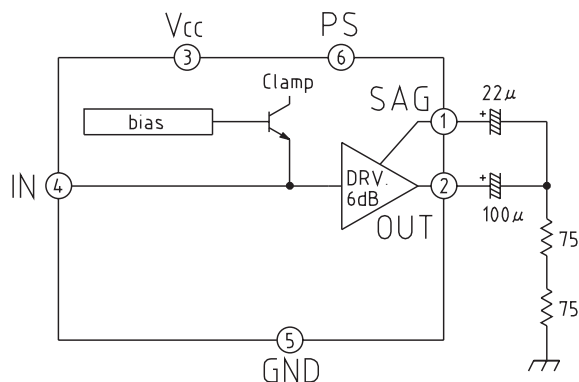
■ MM1508



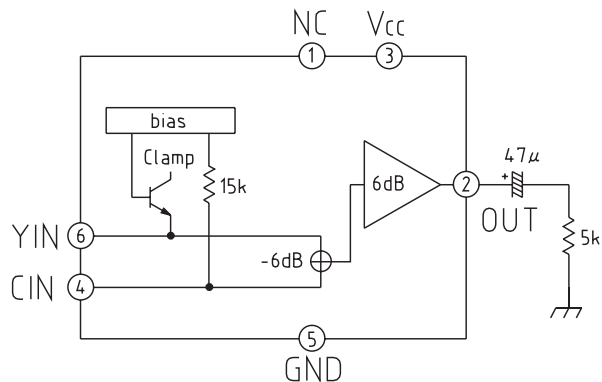
■ MM1509



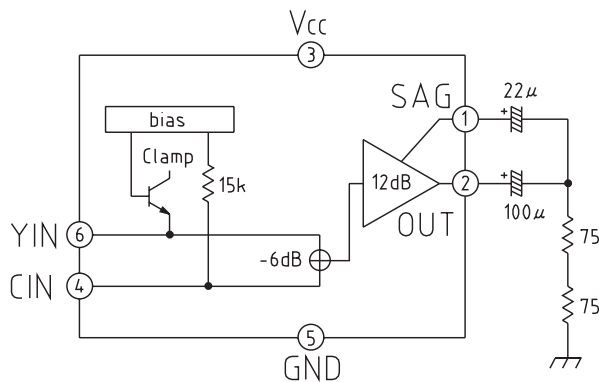
■ MM1510



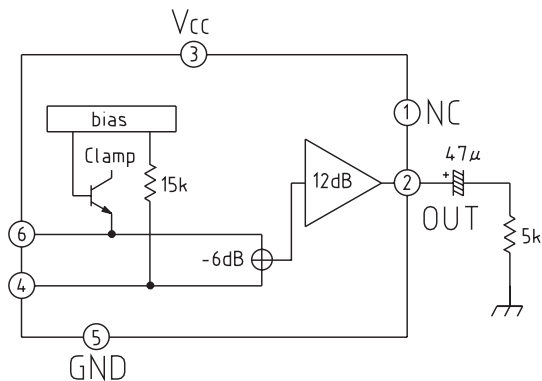
■ MM1511



■ MM1512



■ MM1513



Absolute Maximum Ratings (Ta=25°C)

Item		Symbol	Rating	Unit
Storage temperature		T _{STG}	-40~+125	°C
Operating temperature		T _{OPR}	-30~+75	°C
Power supply voltage		V _{CC}	15	V
Allowable loss	When alone	P _d	200	mW
	When mounted on board	P _d	350 (★)	mW

★Board size 100×100mm t=1.6

Recommended Operating Conditions

Item		Symbol	Rating	Unit
Power supply voltage		V _{CC}	4.5~13	V

Electrical Characteristics (Except where noted otherwise, Ta=25°C, V_{CC}=5V)

MM1501

Item		Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
Consumption current		I _{CC}	Refer to measurement procedures		3.7	4.8	mA
Input pin voltage		V _{IN}	No-signal, no-load	2.70	2.90	3.10	V
Output pin voltage		V _{OUT}	No-signal, no-load		2.15		V
Voltage gain		G _V	Refer to measurement procedures	-0.5	0	+0.5	dB
Frequency characteristic		f _c	Refer to measurement procedures	-1	0	+1	dB
Differential gain	V _{CC} =9V	DG	Refer to measurement procedures	-3	0	+3	%
Differential phase	V _{CC} =9V	DP	Refer to measurement procedures	-3	0	+3	deg
Total harmonic distortion ratio		THD	Refer to measurement procedures		0.03	0.3	%
Output dynamic range		V _D	Refer to measurement procedures	3.5	3.8		V
Output offset voltage		V _{OFF}	Refer to measurement procedures			±15	mV
Cross talk		C _T	Refer to measurement procedures		-70	-60	dB
SW input voltage H		V _{IH}	Refer to measurement procedures	2.1			V
SW input voltage L		V _{IL}	Refer to measurement procedures			0.7	V
Input impedance		Z _i			15		kΩ
Output impedance		Z _o			75		Ω

MM1502

Item		Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
Consumption current		I _{CC}	Refer to measurement procedures		4.7	6.1	mA
Input pin voltage		V _{IN}	No-signal, no-load	1.70	1.90	2.10	V
Output pin voltage		V _{OUT}	No-signal, no-load		2.10		V
Voltage gain		G _V	Refer to measurement procedures	5.5	6.0	6.5	dB
Frequency characteristic		f _c	Refer to measurement procedures	-1	0	+1	dB
Differential gain	V _{CC} =9V	DG	Refer to measurement procedures	-3	0	+3	%
Differential phase	V _{CC} =9V	DP	Refer to measurement procedures	-3	0	+3	deg
Total harmonic distortion ratio		THD	Refer to measurement procedures		0.03	0.3	%
Output dynamic range		V _D	Refer to measurement procedures	3.5	3.8		V
Output offset voltage		V _{OFF}	Refer to measurement procedures			±30	mV
Cross talk		C _T	Refer to measurement procedures		-70	-60	dB
SW input voltage H		V _{IH}	Refer to measurement procedures	2.1			V
Sw input voltage L		V _{IL}	Refer to measurement procedures			0.7	V
Input impedance		Z _i			15		kΩ
Output impedance		Z _o			12		Ω

■ MM1503

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
Consumption current	I _{CC}	Refer to measurement procedures		3.3	4.3	mA
Input pin voltage	V _{IN}	No-signal, no-load	1.80	2.00	2.20	V
Output pin voltage	V _{OUT}	No-signal, no-load		1.25		V
Voltage gain	G _V	Refer to measurement procedures	-0.5	0	+0.5	dB
Frequency characteristic	f _c	Refer to measurement procedures	-1	0	+1	dB
Differential gain	DG	Refer to measurement procedures	-3	0	+3	%
Differential phase	DP	Refer to measurement procedures	-3	0	+3	deg
Total harmonic distortion ratio	THD	Refer to measurement procedures		0.03	0.3	%
Output dynamic range	V _D	Refer to measurement procedures	2.6	2.9		V
Output offset voltage	V _{OFF}	Refer to measurement procedures			±15	mV
Cross talk	C _T	Refer to measurement procedures		-70	-60	dB
SW input voltage H	V _{IH}	Refer to measurement procedures	2.1			V
SW input voltage L	V _{IL}	Refer to measurement procedures			0.7	V
Input impedance	Z _O			75		Ω

■ MM1504

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
Consumption current	I _{CC}	Refer to measurement procedures		4.4	5.7	mA
Input pin voltage	V _{IN}	No-signal, no-load	1.20	1.40	1.60	V
Output pin voltage	V _{OUT}	No-signal, no-load		1.25		V
Voltage gain	G _V	Refer to measurement procedures	5.5	6.0	6.5	dB
Frequency characteristic	f _c	Refer to measurement procedures	-1	0	+1	dB
Differential gain	DG	Refer to measurement procedures	-3	0	+3	%
Differential phase	DP	Refer to measurement procedures	-3	0	+3	deg
Total harmonic distortion ratio	THD	Refer to measurement procedures		0.03	0.3	%
Output dynamic range	V _D	Refer to measurement procedures	2.6	2.9		V
Output offset voltage	V _{OFF}	Refer to measurement procedures			±30	mV
Cross talk	C _T	Refer to measurement procedures		-70	-60	dB
SW input voltage H	V _{IH}	Refer to measurement procedures	2.1			V
SW input voltage L	V _{IL}	Refer to measurement procedures			0.7	V
Input impedance	Z _O			12		Ω

■ MM1505

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
Consumption current	I _{CC}	Refer to measurement procedures		6.5	8.5	mA
Input pin voltage	V _{IN}	No-signal, no-load	2.35	2.55	2.75	V
Output pin voltage	V _{OUT}	No-signal, no-load		2.55		V
Voltage gain	G _V	Refer to measurement procedures	-0.5	0.0	0.5	dB
Frequency characteristic	f _c	Refer to measurement procedures	-1	0	+1	dB
Differential gain	V _{CC} =9V DG	Refer to measurement procedures	-3	0	+3	%
Differential phase	V _{CC} =9V DP	Refer to measurement procedures	-3	0	+3	deg
Output dynamic range	V _D	Refer to measurement procedures	2.6	3.0		V
Output offset voltage	V _{OFF}	Refer to measurement procedures			±15	mV
Cross talk	C _T	Refer to measurement procedures		-70	-60	dB
SW input voltage H	V _{IH}	Refer to measurement procedures	2.1			V
SW input voltage L	V _{IL}	Refer to measurement procedures			0.7	V
Input impedance	Z _i			15		kΩ

■ MM1506

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
Consumption current	I _{CC}	Refer to measurement procedures		6.8	8.8	mA
Input pin voltage	V _{IN}	No-signal, no-load	1.75	1.95	2.15	V
Output pin voltage	V _{OUT}	No-signal, no-load		2.35		V
Voltage gain	G _V	Refer to measurement procedures	5.5	6.0	6.5	dB
Frequency characteristic	f _c	Refer to measurement procedures	-1	0	+1	dB
Differential gain	V _{CC} =9V DG	Refer to measurement procedures	-3	0	+3	%
Differential phase	V _{CC} =9V DP	Refer to measurement procedures	-3	0	+3	deg
Output dynamic range	V _D	Refer to measurement procedures	3.0	3.3		V
Output offset voltage	V _{OFF}	Refer to measurement procedures			±30	mV
Cross talk	C _T	Refer to measurement procedures		-70	-60	dB
SW input voltage H	V _{IH}	Refer to measurement procedures	2.1			V
SW input voltage L	V _{IL}	Refer to measurement procedures			0.7	V
Input impedance	Z _i			15		kΩ

■ MM1507

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
Consumption current	I _{CC}	Refer to measurement procedures		6.4	8.3	mA
Input pin voltage	V _{IN}	No-signal, no-load	1.15	1.35	1.55	V
Output pin voltage	V _{OUT}	No-signal, no-load		1.35		V
Voltage gain	G _V	Refer to measurement procedures	-0.5	0	+0.5	dB
Frequency characteristic	f _c	Refer to measurement procedures	-1	0	+1	dB
Differential gain	DG	Refer to measurement procedures	-3	0	+3	%
Differential phase	DP	Refer to measurement procedures	-3	0	+3	deg
Output dynamic range	V _D	Refer to measurement procedures	2.6	2.9		V
Output offset voltage	V _{OFF}	Refer to measurement procedures			±15	mV
Cross talk	C _T	Refer to measurement procedures		-70	-60	dB
SW input voltage H	V _{IH}	Refer to measurement procedures	2.1			V
SW input voltage L	V _{IL}	Refer to measurement procedures			0.7	V

■ MM1508

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
Consumption current	I _{CC}	Refer to measurement procedures		6.8	8.8	mA
Input pin voltage	V _{IN}	No-signal, no-load	1.15	1.35	1.55	V
Output pin voltage	V _{OUT}	No-signal, no-load		1.30		V
Voltage gain	G _V	Refer to measurement procedures	5.5	6.0	6.5	dB
Frequency characteristic	f _c	Refer to measurement procedures	-1	0	+1	dB
Differential gain	DG	Refer to measurement procedures	-3	0	+3	%
Differential phase	DP	Refer to measurement procedures	-3	0	+3	deg
Output dynamic range	V _D	Refer to measurement procedures	2.6	3.0		V
Output offset voltage	V _{OFF}	Refer to measurement procedures			±30	mV
Cross talk	C _T	Refer to measurement procedures		-70	-60	dB
SW input voltage H	V _{IH}	Refer to measurement procedures	2.1			V
SW input voltage L	V _{IL}	Refer to measurement procedures			0.7	V

■ MM1509

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
Consumption current	I _{CC1}	Refer to measurement procedures		6.3	8.2	mA
Current consumption for PS	I _{CC2}	Refer to measurement procedures		20	30	μA
PS input voltage L	V _{PSL}	Refer to measurement procedures			0.3	V
PS input voltage H	V _{PSH}	Refer to measurement procedures	1.8			V
Input pin voltage	V _{IN}	No-signal, no-load	1.75	1.95	2.15	V
Output pin voltage	V _{OUT}	No-signal, no-load		2.35		V
Voltage gain	G _V	Refer to measurement procedures	5.5	6.0	6.5	dB
Frequency characteristic	f _c	Refer to measurement procedures	-1	0	+1	dB
Differential gain	V _{CC} =9V DG	Refer to measurement procedures	-3	0	+3	%
Differential phase	V _{CC} =9V DP	Refer to measurement procedures	-3	0	+3	deg
Output dynamic range	V _D	Refer to measurement procedures	2.9	3.2		V
Input impedance	Z _i			15		kΩ

■ MM1510

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
Consumption current	I _{CC1}	Refer to measurement procedures		6.4	8.3	mA
Current consumption for PS	I _{CC2}	Refer to measurement procedures		20	30	μA
PS input voltage L	V _{PSL}	Refer to measurement procedures			0.3	V
PS input voltage H	V _{PSH}	Refer to measurement procedures	1.8			V
Input pin voltage	V _{IN}	No-signal, no-load	1.15	1.35	1.55	V
Output pin voltage	V _{OUT}	No-signal, no-load		1.15		V
Voltage gain	G _V	Refer to measurement procedures	5.5	6.0	6.5	dB
Frequency characteristic	f _c	Refer to measurement procedures	-1	0	+1	dB
Differential gain	DG	Refer to measurement procedures	-3	0	+3	%
Differential phase	DP	Refer to measurement procedures	-3	0	+3	deg
Output dynamic range	V _D	Refer to measurement procedures	2.6	3.0		V

■ MM1511

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
Consumption current	I _{CC}	Refer to measurement procedures		4.4	5.7	mA
Y input pin voltage	V _{YIN}	No-signal, no-load	2.00	2.20	2.40	V
C input pin voltage	V _{CIN}	No-signal, no-load	1.85	2.05	2.25	V
Output pin voltage	V _{OUT}	No-signal, no-load		1.15		V
Voltage gain	G _V	Refer to measurement procedures	-0.5	0	6.5	dB
Frequency characteristic	f _c	Refer to measurement procedures	-1	0	+0.5	dB
Differential gain	DG	Refer to measurement procedures	-3	0	+3	%
Differential phase	DP	Refer to measurement procedures	-3	0	+3	deg
Y output dynamic range	V _{DY}	Refer to measurement procedures	2.6	2.9		V
C output dynamic range	V _{DC}	Refer to measurement procedures	2.0			V
C input impedance	Z _i			15		kΩ
Output impedance	Z _o			25		Ω

■ MM1512

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
Consumption current	I _{CC}	Refer to measurement procedures		6.9	9.0	mA
Y input pin voltage	V _{YIN}	No-signal, no-load	1.95	2.15	2.35	V
C input pin voltage	V _{CIN}	No-signal, no-load	1.80	2.00	2.20	V
Output pin voltage	V _{OUT}	No-signal, no-load		1.10		V
Voltage gain	G _V	Refer to measurement procedures	5.5	6.0	6.5	dB
Frequency characteristic	f _c	Refer to measurement procedures	-1	0	+1	dB
Differential gain	DG	Refer to measurement procedures	-3	0	+3	%
Differential phase	DP	Refer to measurement procedures	-3	0	+3	deg
Y output dynamic range	V _{DY}	Refer to measurement procedures	2.6	2.9		V
C output dynamic range	V _{DC}	Refer to measurement procedures	2.0			V
C input impedance	Z _i			15		kΩ

■ MM1513

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
Consumption current	I _{CC}	Refer to measurement procedures		4.7	6.1	mA
Y input pin voltage	V _{YIN}	No-signal, no-load	2.25	2.45	2.65	V
C input pin voltage	V _{CIN}	No-signal, no-load	2.10	2.30	2.50	V
Output pin voltage	V _{OUT}	No-signal, no-load		1.25		V
Voltage gain	G _V	Refer to measurement procedures	5.5	6.0	6.5	dB
Frequency characteristic	f _c	Refer to measurement procedures	-1	0	+1	dB
Differential gain	DG	Refer to measurement procedures	-3	0	+3	%
Differential phase	DP	Refer to measurement procedures	-3	0	+3	°
Y output dynamic range	V _{DY}	Refer to measurement procedures	2.6	2.9		V
C output dynamic range	V _{DC}	Refer to measurement procedures	2.0			V
C input impedance	Z _i			15		kΩ
Output impedance	Z _o			25		Ω

Measurement Procedures

■ MM1501~MM1508

· Switch Status

Item	Symbol	Switch status		
		S1	S2	S3
Consumption current	I _{CC}	2	2	2
Voltage gain	G _V	1	2	2
		2	1	1
Frequency characteristic	f _c	1	2	2
		2	1	1
Differential gain	DG	1	2	2
		2	1	1
Differential phase	DP	1	2	2
		2	1	1

Item	Symbol	Switch status		
		S1	S2	S3
Total harmonic distortion ratio	THD	1	2	2
		2	1	1
Output dynamic range	V _D	1	2	2
		2	1	1
Output offset voltage	V _{OFF}	2	2	2
		2	2	1
Cross talk	C _T	1	2	1
		2	1	2
SW input voltage H	V _{IH}	2	2	1
SW input voltage L	V _{IL}			

·Measurement Procedures (MM1501 ~ MM1504)

Consumption current	I _{CC}	Connect a DC ammeter to V _{CC} pin and measure. Hereafter, short the ammeter to use.
Voltage gain	G _V	Input a 2.0V _{P-P} (1.0V _{P-P} for MM1502 and MM1504), 100kHz sine wave to SG1. If TP1 voltage is V ₁ and TP3 voltage is V ₂ , find G _V using the following formula: $G_V = 20\text{LOG} (V_2/V_1) \text{ dB}$
Frequency characteristic	f _c	In the above G _V measurement, if TP3 voltage at 10MHz is V ₃ , find f _c as follows: $f_c = 20\text{LOG} (V_3/V_2) \text{ dB}$
Differential gain	DG	Input a 2.0V _{P-P} (1.0V _{P-P} for MM1502 and MM1504) staircase to SG1 and measure differential gain at TP3. APL = 10 ~ 90%
Differential phase	DP	The same as for DG, but measure differential phase.
Total harmonic distortion ratio	THD	Input a 2.5V _{P-P} (1.25V _{P-P} for MM1502, MM1504), 1kHz sine wave to SG1, connect a distortion factor meter to TP3 and measure.
Output dynamic range	V _D	Input a 100kHz sine wave to SG1. Change the amplitude of the sine wave, and measure V _D , the maximum amplitude under THD 1%, at TP3.
Output offset voltage	V _{OFF}	Measure the DC voltage difference of each switch status at TP2.
Cross talk	C _T	VC1 = 2.1V and VC2 = 0.7V. Input a 2.0V _{P-P} , 4.43MHz sine wave to SG1, and operate SW3. If TP3 voltage when there is an output signal on the OUT pin is V ₄ , and when there is no signal TP3 voltage is V ₅ , then find C _T by the following formula: $C_T = 20\text{LOG} (V_5/V_4) \text{ dB}$
SW input voltage	V _I	Impress an optional DC voltage on TP5 and TP6. Gradually increase from VC1 = 0V. When TP6 voltage is output on TP2, TP4 voltage is V _{IH} . Gradually lower from VC1 = V _{CC} , and when TP5 voltage is output on TP2, TP4 voltage is V _{IL} .

• Measurement Procedures (MM1505 ~ MM1508)

Consumption current	I_{CC}	Connect a DC ammeter to V_{CC} pin and measure. Hereafter, short the ammeter to use.
Voltage gain	G_V	Input a 2.0V _{P-P} (1.0V _{P-P} for MM1506 and MM1508), 100kHz sine wave to SG1. If TP1 voltage is V_1 and TP3 voltage is V_2 , find G_V using the following formula: $G_V = 20\text{LOG} (V_2/V_1) \text{ dB}$
Frequency characteristic	f_c	In the above G_V measurement, if TP3 voltage at 7MHz is V_3 , find f_c as follows: $f_c = 20\text{LOG} (V_3/V_2) \text{ dB}$
Differential gain	DG	Input a 2.0V _{P-P} (1.0V _{P-P} for MM1506 and MM1508) staircase to SG1 and measure differential gain at TP3. APL = 10 ~ 90%
Differential phase	DP	The same as for DG, but measure differential phase.
Output dynamic range	V_D	Input a 100kHz sine wave to SG1. Change the amplitude of the sine wave, and measure V_D , the maximum amplitude under THD 1%, at TP3.
Output offset voltage	V_{OFF}	Measure the DC voltage difference of each switch status at TP2.
Cross talk	C_T	$VC1 = 2.1\text{V}$ and $VC2 = 0.7\text{V}$. Input a 2.0V _{P-P} , 4.43MHz sine wave to SG1, and operate SW3. If TP3 voltage when there is an output signal on the OUT pin is V_4 , and when there is no signal TP3 voltage is V_5 , then find C_T by the following formula: $C_T = 20\text{LOG} (V_5/V_4) \text{ dB}$
SW input voltage	V_I	Impress an optional DC voltage on TP6 and TP7. Gradually increase from $VC1 = 0\text{V}$. When TP7 voltage is output on TP2, TP5 voltage is V_{IH} . Gradually lower from $VC1 = V_{CC}$, and when TP6 voltage is output on TP2, TP5 voltage is V_{IL} .

■ MM1509 ~ MM1510

• Switch Status

Item	Symbol	Switch status	
		S1	S2
Consumption current	I_{CC1}	2	1
Consumption current for PS	I_{CC2}	2	3
PS input voltage L	V_{IL}	2	2
PS input voltage H	V_{IH}		
Voltage gain	G_V	1	1

Item	Symbol	Switch status	
		S1	S2
Frequency characteristic	f_c	1	1
Differential gain	DG	1	1
Differential phase	DP	1	1
Output dynamic range	V_D	1	1

• Measurement Procedures

Consumption current	I_{CC1}	Connect a DC ammeter to the V_{CC} pin and measure.
Consumption current for PS	I_{CC2}	Connect a DC ammeter to the V_{CC} pin and measure.
PS input voltage	V_I	Connect a DC ammeter to the V_{CC} pin. Gradually lower from $VC1 = V_{CC}$. $VC1$ voltage when consumption current is reduced from I_{CC1} to 110% of I_{CC2} is V_{IL} . Gradually raise from $VC1 = 0\text{V}$. $VC1$ voltage when consumption current increases from I_{CC2} to 90% of I_{CC1} is V_{IH} . From here on, short the ammeter when using it.
Voltage gain	G_V	Input a 1.0V _{P-P} , 100kHz sine wave to SG1. If TP1 voltage is V_1 and TP2 voltage is V_2 , find G_V by the following formula: $G_V = 20\text{LOG} (V_2/V_1) \text{ dB}$
Frequency characteristic	f_c	In the above G_V measurement, if TP2 voltage at 7MHz is V_3 , find f_c by the following formula. $f_c = 20\text{LOG} (V_3/V_2) \text{ dB}$
Differential gain	DG	Input a 1.0V _{P-P} staircase to SG1 and measure differential gain at TP2. APL = 10 ~ 90%
Differential phase	DP	The same as for DG, but measure differential phase.
Output dynamic range	V_D	Input a 100kHz sine wave to SG1. Measure DR, the maximum amplitude under THD 1%, at TP2.

■ MM1511 ~ MM1513

• Switch Status

Item	Symbol	Switch status	
		S1	S2
Consumption current	I _{CC}	2	2
Voltage gain	G _V	1	2
		2	1
Frequency characteristic	f _c	1	2
		2	1

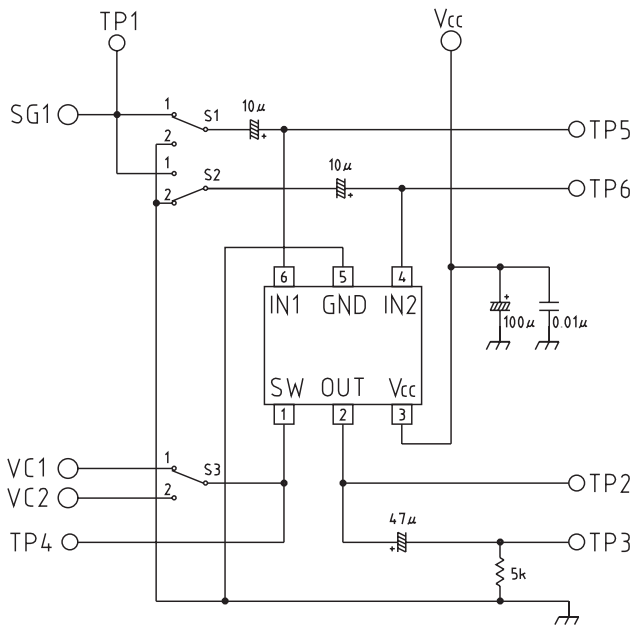
Item	Symbol	Switch status	
		S1	S2
Differential gain	DG	3	1
Differential phase	DP	3	1
Y output dynamic range	V _{DY}	2	1
C output dynamic range	V _{DC}	3	1

• Measurement Procedures

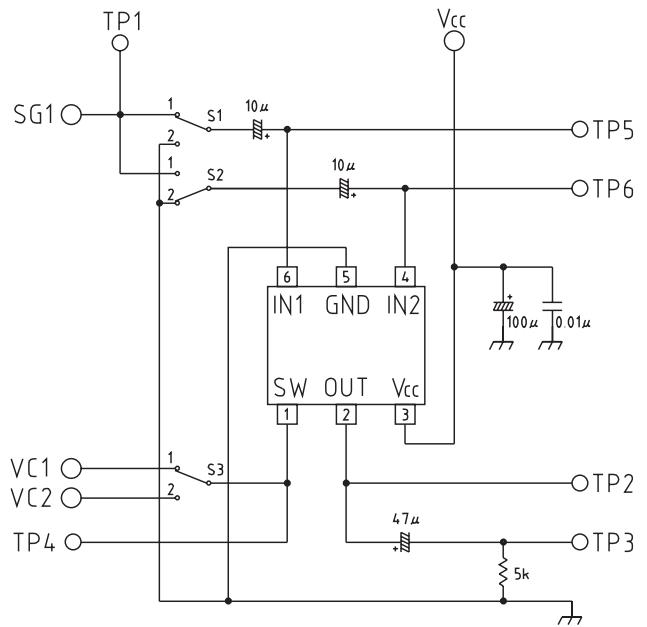
Consumption current	I _{CC1}	Connect a DC ammeter to the V _{CC} pin and measure. Hereafter, short the ammeter to use.
Voltage gain	G _V	Input a 2.0V _{P-P} (1.0V _{P-P} for MM1512), 100kHz sine wave to SG1. If TP1 voltage is V1 and TP2 voltage is V2, find G _V by the following formula: G _V = 20LOG (V2/V1) dB
Frequency characteristic	f _c	In the above G _V measurement, if TP2 voltage at 10MHz (7MHz for MM1512) is V3, find f _c by the following formula. f _c = 20LOG (V3/V2) dB
Differential gain	DG	Input a 2.0V _{P-P} (1.0V _{P-P} for MM1512) to SG1, input a chroma signal to SG2, and measure differential gain at TP2. APL = 10 ~ 90%
Differential phase	DP	The same as for DG, but measure differential phase.
Y output dynamic range	V _{DY}	Input a 100kHz sine wave to SG1. Measure V _{DY} , the maximum amplitude under THD 1%, at TP2.
C output dynamic range	V _{DC}	Input an APL 50% luminance signal to SG1 and input a chroma signal to SG2. Change the chroma signal amplitude and measure V _{DC} , the maximum amplitude where there is no waveform distortion at TP2.

Measuring Circuit

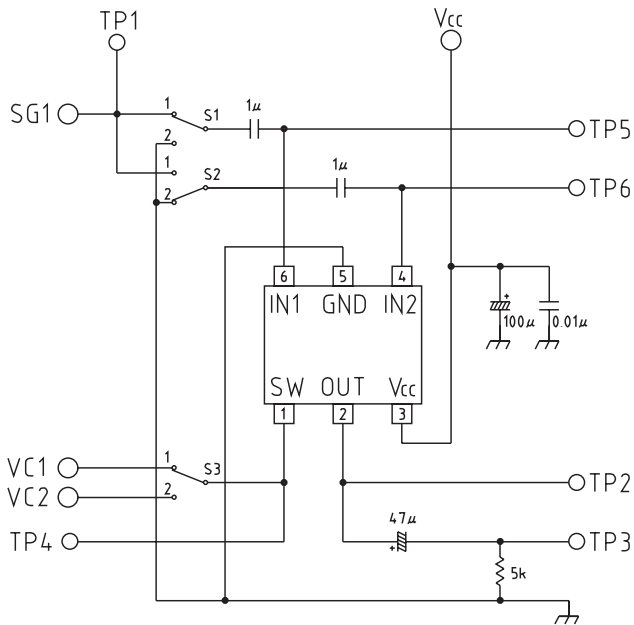
MM1501



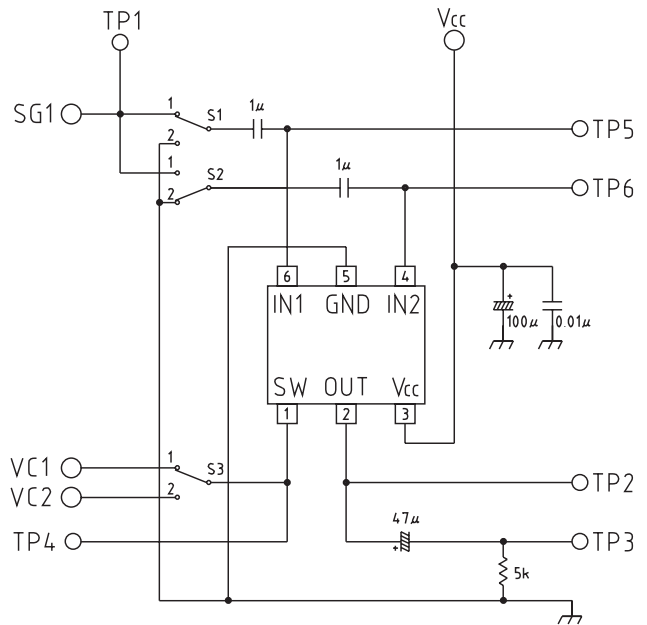
MM1502



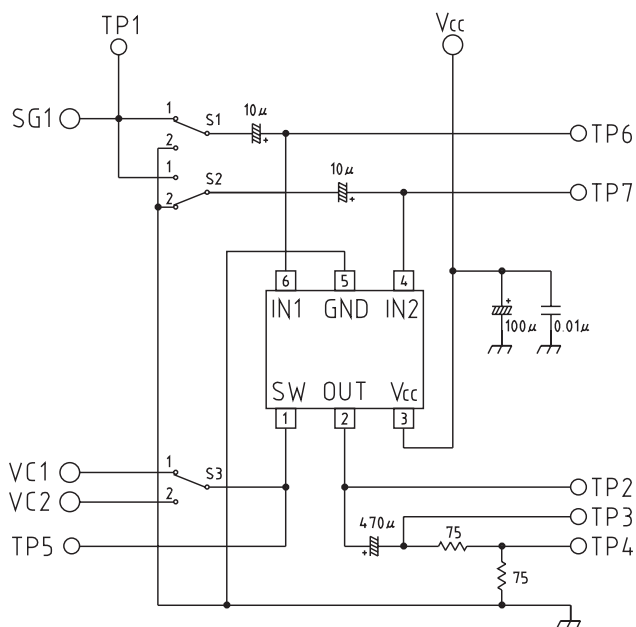
MM1503



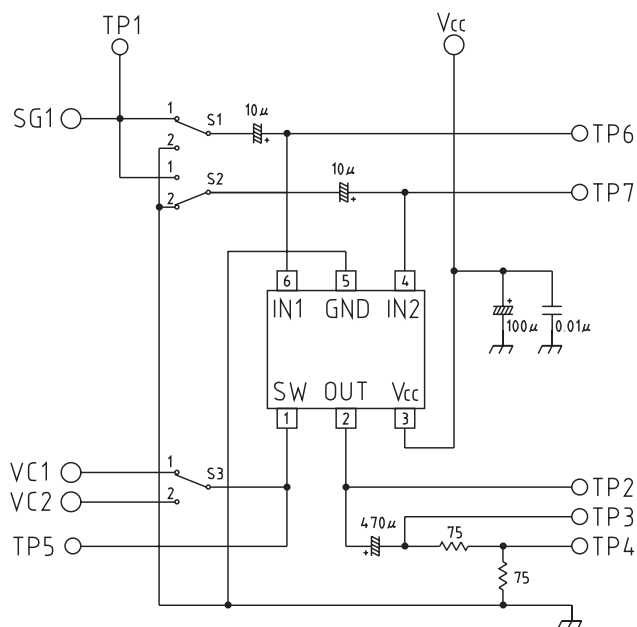
MM1504



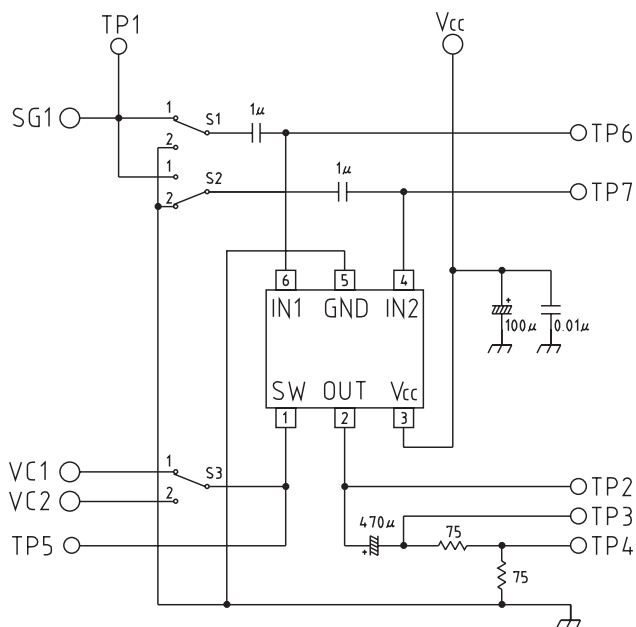
■ **MM1505**



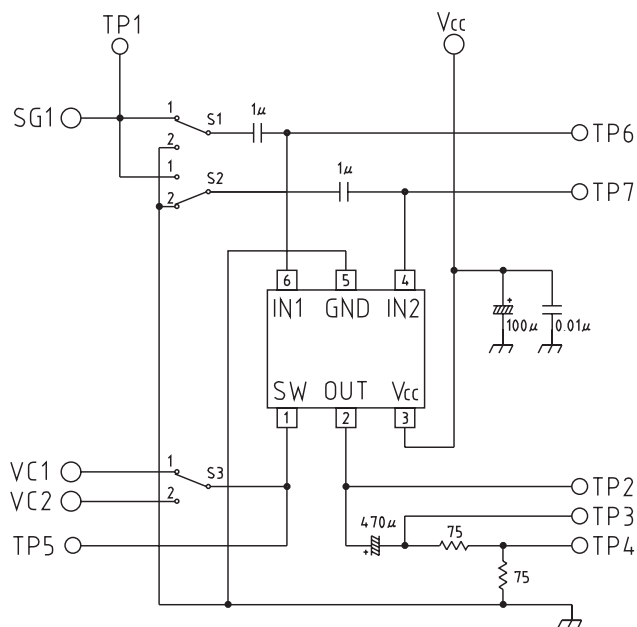
■ **MM1506**



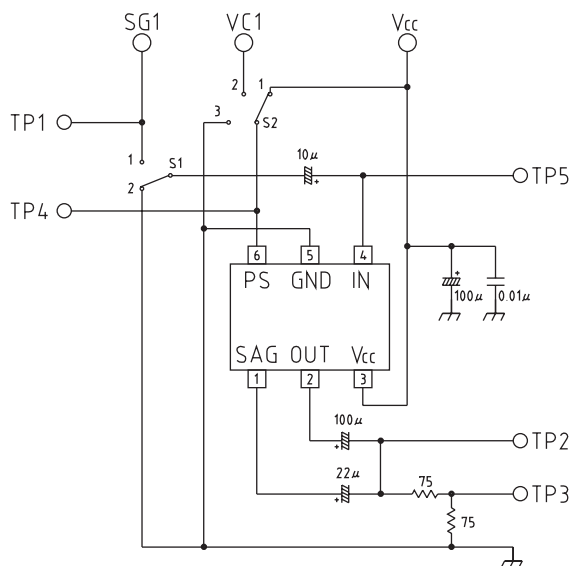
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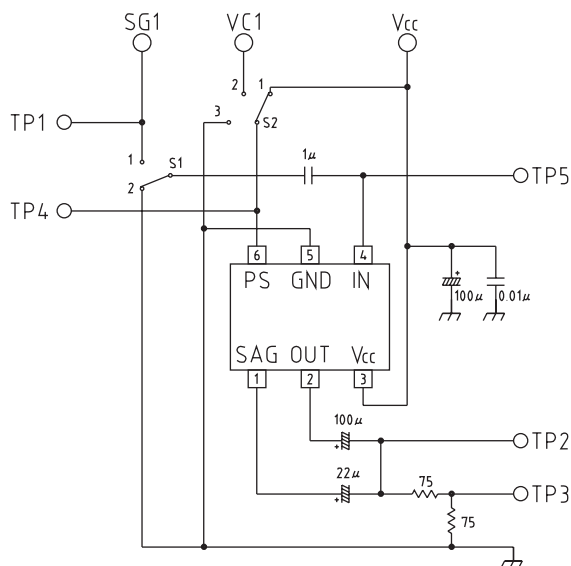
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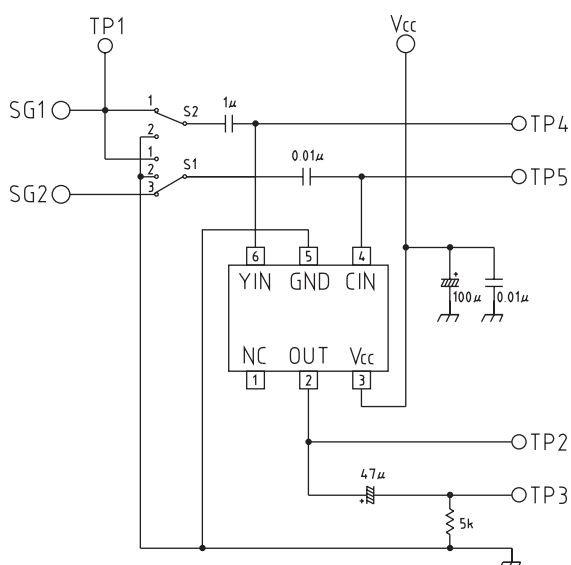
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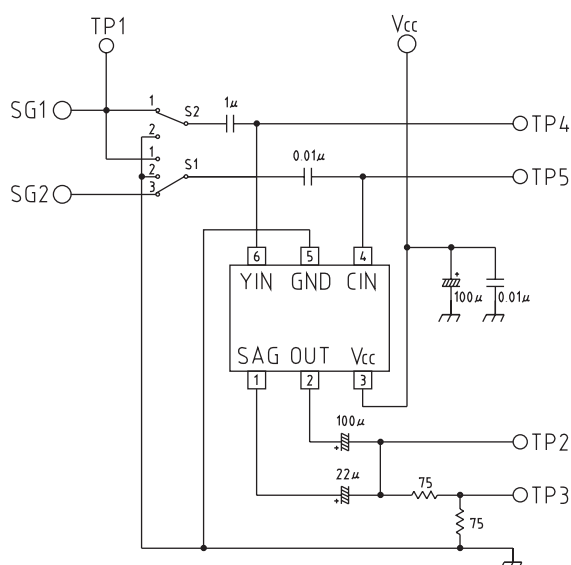
■ **MM1510**



■ **MM1511**



■ **MM1512**



■ **MM1513**

