

Introduction of Main Model

3-Input 1-Output Video Switch (with 75Ω driver, clamp and 6dB amp) Monolithic IC MM1228

November 2, 2001

Outline

This is a high performance 3-input 1-output video switch IC with 6dB amp, clamp and 75Ω driver circuits. 1V_{P-P} video signals can be output externally with 75Ω output.

Features

- | | |
|--|-----------------|
| 1. Built-in 75Ω driver circuit | |
| 2. Built-in 6dB amp | |
| 3. Built-in clamp circuit | |
| 4. Mute operation possible | |
| 5. Wide operating supply voltage range | 4.7~13V |
| 6. Low current consumption | |
| 7. Wideband frequency response | 7MHz at 0dB |
| 8. Crosstalk | -64dB (4.43MHz) |

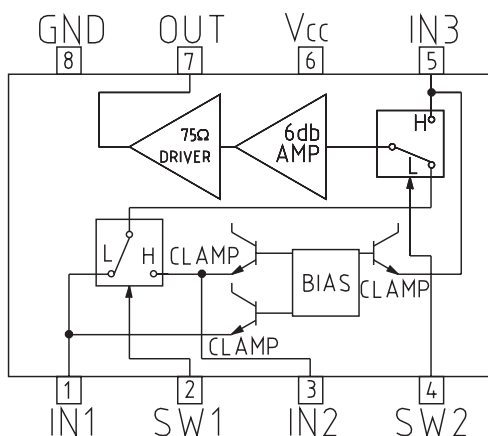
Packages

SOP-8C (MM1228XF)

Applications

1. TV
2. VCR
3. Video cameras
4. Other video equipment

Block Diagram



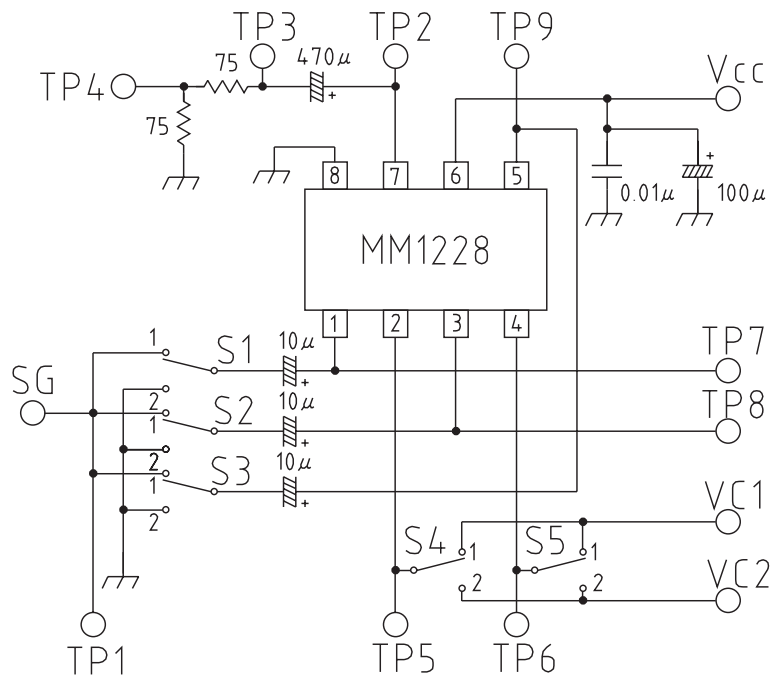
Control input truth table

SW1	SW2	OUT
L	L	IN1
H	L	IN2
L/H	H	IN3

Pin Description

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

Measuring Circuit



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	P _d	300	mW

Electrical Characteristics (Except where noted otherwise, Ta=25°C, V_{CC}=5.0V)

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units
Operating power supply voltage range	V _{CC}		4.7		13.0	V
Consumption current	I _d	Refer to Measuring Circuit		8.4	10.9	mA
Voltage gain	G _v	Refer to Measuring Circuit	+5.5	+6.0	+6.5	dB
Frequency characteristic	F _c	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	V _{off}	Refer to Measuring Circuit			±30	mV
Crosstalk	C _T	Refer to Measuring Circuit		-64	-54	dB
SW1 input voltage H	V _{IH1}	Refer to Measuring Circuit	2.1			V
SW1 input voltage L	V _{IL1}	Refer to Measuring Circuit			0.7	V
SW2 input voltage H	V _{IH2}	Refer to Measuring Circuit	2.1			V
SW2 input voltage L	V _{IL2}	Refer to Measuring Circuit			0.7	V

Measuring Procedures ($V_{CC}=5.0V$, $VC1=V_{CC}$, $VC2=0V$)

Item	Symbol	Switch state					Measuring Procedure
		S1	S2	S3	S4	S5	
Consumption current	Id	2	2	2	2	2	Connect a DC ammeter to the Vcc 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 G _v from the following formula given TP1 voltage as V1 and TP3 voltage as V2. $G_v=20\text{LOG} (V_2/V_1)$ 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 G _v measurement, given TP3 voltage for 7MHz as V3, F _c is obtained from the following formula. $F_c=20\text{LOG} (V_3/V_2)$ 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 TP4. $APL=10\sim 90\%$
		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 1.0V _{P-P} , 4.43MHz sine wave to SG, and given TP1 voltage as V4 and TP3 voltage as V5, C _T is obtained from the following formula. $C_T=20\text{LOG} (V_5/V_4)$ 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	
Switch 1 input voltage H	VIH1	2	2	2	1	2	Impress an optional DC voltage on TP7 and TP8. Gradually raise from VC1=0V. TP5 voltage when TP8 voltage is output on TP2 is VIH1. Gradually lower from VC1=VCC. TP5 voltage when TP7 voltage is output on TP2 is VIL1.
Switch 1 input voltage L	VIL1						
Switch 2 input voltage H	VIH2	2	2	2	2	1	Impress an optional DC voltage on TP7 and TP9. Gradually raise from VC1=0V. TP5 voltage when TP9 voltage is output on TP2 is VIH2. Gradually lower from VC1=VCC. TP6 voltage when TP7 voltage is output on TP2 is VIL2.
Switch 2 input voltage L	VIL2						