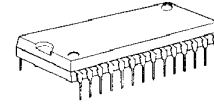


## VIDEO SWITCH MATRIX

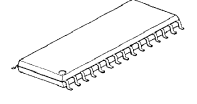
### ■ GENERAL DESCRIPTION

The **NJM2277** is a Video switch for Set Top Box, and TV.  
 The **NJM2277** includes 2 CVBS input, 2-RGB input switches.  
 Also it allow the inputs to be routed in 3 CVBS output, 1-RGB output.  
 The **NJM2277** includes 5<sup>th</sup>-order Low pass Filter suppress  
 the noise interference to video signal.  
 The **NJM2277** enable to control the Output Impedance for RGB outputs.

### ■ PACKAGE OUTLINE



NJM2277L

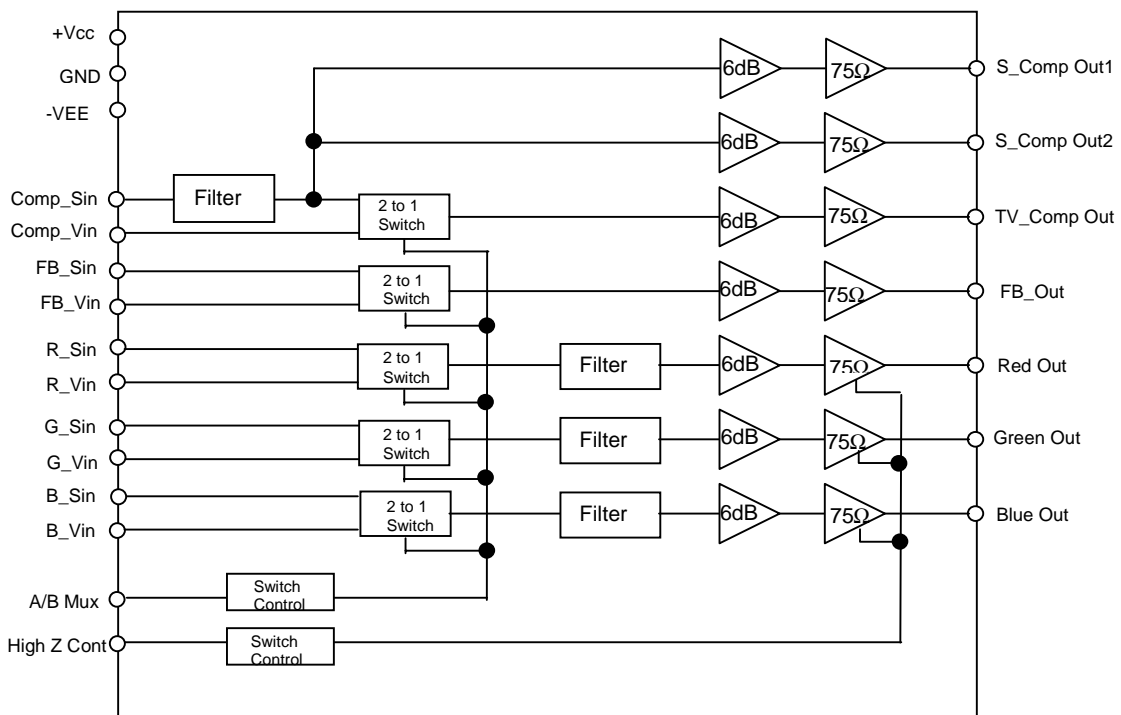


NJM2277M

### ■ FEATURES

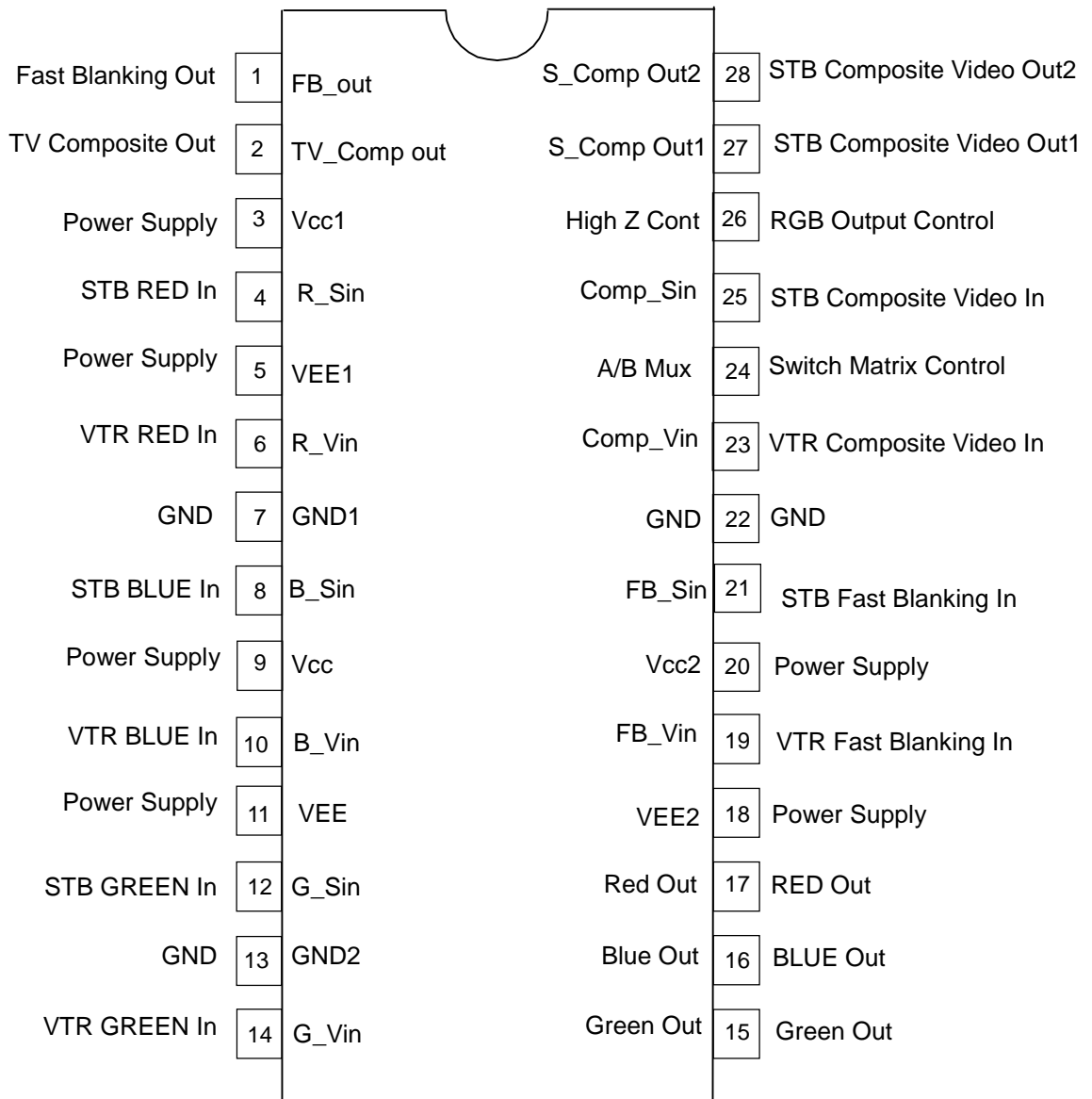
- Operating Voltage            $\pm 5V$
- 2- RGB Switches.
- 75 $\Omega$  Cable Driver on all channels.
- 41dB Stop Band Rejection (@27MHz)
- Bipolar Technology
- Package Outline           SDIP28, SDMP30
- 2-Input,3-output CVBS Switches.
- Quad 5<sup>th</sup> order Butter worth Low Pass Filter.
- High Impedance output for RGB signal.

### ■ FUNCTION BLOCK DIAGRAM



# NJM2277

## ■ Pin Configuration (SDIP28)



SDIP28

## ■ Pin Configuration (SDMP30)

Fast Blanking Out	1	FB_out	S_Comp Out2	30	STB Composite Video Out1
TV Composite Out	2	TV_Comp out	S_Comp Out1	29	STB Composite Video Out2
Power Supply	3	Vcc1	High Z Cont	28	RGB Output Control
STB RED In	4	R_Sin	Comp_Sin	27	STB Composite Video In
Power Supply1	5	VEE1	A/B Mux	26	Switch Matrix Control
VTR RED In	6	R_Vin	Comp_Vin	25	VTR Composite Video In
GND	7	GND1	GND	24	GND
STB BLUE In	8	B_Sin	FB_Sin	23	STB Fast Blanking In
Power Supply	9	Vcc	Vcc2	22	Power Supply
VTR BLUE In	10	B_Vin	FB_Vin	21	VTR Fast Blanking In
Power Supply	11	VEE	VEE2	20	Power Supply
No Connect	12	NC	NC	19	No Connect
STB GREEN In	13	G_Sin	Red Out	18	RED Out
GND	14	GND2	Blue Out	17	BLUE Out
VTR GREEN In	15	G_Vin	Green Out	16	Green Out

SDMP30

# NJM2277

## ■ Pin Description

Symbol	Pin No.		I/O Type	Equivalent Circuit	Function
	SDIP28	SDMP30			
FB_out	1	1	O		Fast Blanking Output
TV_Comp out	2	2	O		Composite Video Signal Output
Vcc1	3	3	—	—	Vcc
R_Sin	4	4	I		RGB Signal Input CVBS/Y/C Signal Input

Symbol	Pin No.		I/O Type	Equivalent Circuit	Function
	SDIP28	SDMP30			
VEE1	5	5	—	—	VEE
R_Vin	6	6	I		RGB Signal Input CVBS/Y/C Signal Input
GND1	7	7	—	—	0
B_Sin	8	8	I		RGB Signal Input CVBS/Y/C Signal Input

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Symbol	Pin No.		I/O Type	Equivalent Circuit	Function
	SDIP28	SDMP30			
Vcc	9	9	—	—	Vcc
B_Vin	10	10	I		RGB Signal Input CVBS/Y/C Signal Input
VEE	11	11	—	—	VEE
G_Sin	12	13	I		RGB Signal Input CVBS/Y/C Signal Input

Symbol	Pin No.		I/O Type	Equivalent Circuit	Function
	SDIP28	SDMP30			
GND2	13	14	—	—	0
G_Vin	14	15	I		RGB Signal Input CVBS/Y/C Signal Input
Green Out	15	16	O		Filtered RGB Signal Output
Blue Out	16	17	O		Filtered RGB Signal Output

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Symbol	Pin No.		I/O Type	Equivalent Circuit	Function
	SDIP28	SDMP30			
Red Out	17	18	O		Filtered RGB Signal Output
VEE2	18	20	—	—	VEE
FB_Vin	19	21	I		VTR/STB Fast Blanking Input
Vcc2	20	22	—	—	Vcc



Symbol	Pin No.		I/O Type	Equivalent Circuit	Function
	SDIP28	SDMP30			
FB_Sin	21	23	I		VTR/STB Fast Blanking Input
GND	22	24	—	—	0
Comp_Vin	23	25	I		Video Signal Input CVBS/Y/C Signal Input
A/B Mux	24	26	I		Input Channel Selector

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Symbol	Pin No.		I/O Type	Equivalent Circuit	Function
	SDIP28	SDMP30			
Comp_Sin	25	27	I		Video Signal Input CVBS/Y/C Signal Input
High_Z Cont	26	28	I		RGB Output Impedance Control "0"= High Impedance "1"= Through
S_Comp Out1	27	29	O		Filtered Video Signal Output
S_Comp Out2	28	30	O		Filtered Video Signal Output

**■ABSOLUTE MAXIMUM RATING (Ta=25°C)**

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V <sup>+</sup>	15	V
Power Dissipation	P <sub>D</sub>	(SDIP28) 700 (SDMP30) 700	mW
Operating Temperature Range	Topr	-40 to +85	°C
Storage Temperature Range	Tstg	-40 to +125	°C

**■ELECTRICAL CHARACTERISTICS ( Ta=25°C, Vcc=5.0V,VEE=-5V)**

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V <sup>+</sup>		±4.5	±5.0	±5.5	V
Supply Current	I <sub>cc</sub>	No Signal, No Load	36	46	56	mA

**●Video system( Ta=25°C, Vcc=5.0V,VEE=-5V, RL=150Ω unless otherwise specified.)**

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Gain	GV	Vin=1.0Vp-p 100KHz S_Comp Out1/2,TV_Comp Out Red/Green/Blue Out	6.0	6.4	6.8	dB
Frequency Response Characteristics	FBW	Vin=1.0Vp-p 5MHz /100KHz All filtered channel	-1.0	0	1.0-	dB
Stop Band Rejection	Fsb	f=100KHz/27MHz, 1Vp-p All filtered channel	-35	-41	-	dB
-3dB Bandwidth	Fc	All filtered channel	-	7.1	-	MHz
RGB Gain matching level	Gm	Gain Matching Between Red/Green/Blue Out	-5	0	5	%
Total Harmonic Distortion	THD	f=1KHz, 1Vp-p input	-	0.1	-	%
Cross talk1	CT1	Vin=4.43MHz/1.0Vp-p One input to any other output	-	-60	-	dB
Cross Talk2	CT2	f=4.43MHz/1Vp-p Mux input to output	-	-60	-	dB
Differential Gain	DG	Vin=1Vp-p, 10step Stairs-signal except FBout	-	0.4	-	%
Differential Phase	DP	Vin=1Vp-p, 10step Stairs-signal except FBout	-	0.4	-	deg
Input Impedance	Rin	All Channel	-	50	-	KΩ
Output Impedance	Ro1	High Z Cont="0" Red/Green/Blue Output	10	20	-	KΩ
Output Impedance	Ro2	High Z Cont="1" Red/Green/Blue Output ,	-	45	-	mΩ
Equivalent Output Capacitance	Co	RGB output, High Z Cont="0"	-	3	-	pF
Group Delay	Tpd	Vin=1Vp-p, 100KHz All filtered Channel	-	70	-	nS

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## ■ ELECTRICAL CHARACTERISTICS ( Ta=25°C, V=±5V)

### ● Fast Blanking ( Ta=25°C, Vcc=5.0V, VEE=-5V, RL=150Ω unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Fast Blanking Output Low Level	FBlow	FB S/Vin=0V	0		0.4	V
Fast Blanking Output High Level	FBhigh	FB S/Vin=2Vp-p	2.0	3.8		V
Fast Blanking Delay	Ftpd	FB S/Vin=2Vp-p 100KHz	-	25	-	nS

### ● Switch Control ( Ta=25°C, Vcc=5.0V, VEE=-5V, RL=150Ω unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
A/B Mux Logic-High level	Vihm		2.0			V
A/B Mux Logic-Low level	Vilm				0.8	V
High Z Control Logic-High level	Vihz		2.0			V
High Z Control Logic-Low level	Vilz				0.8	V

### ● SWITCH CONTROL TABLE

A/B Mux : Input Channel Selector

Control Signal	OUTPUTS				
	TV Comp Video Out	FB Out	Red Out	Green Out	Blue Out
0*	Comp_Vin	FB_Vin	R_Vin	G_Vin	B_Vin
1	Comp_Sin	FB_Sin	R_Sin	G_Sin	B_Sin

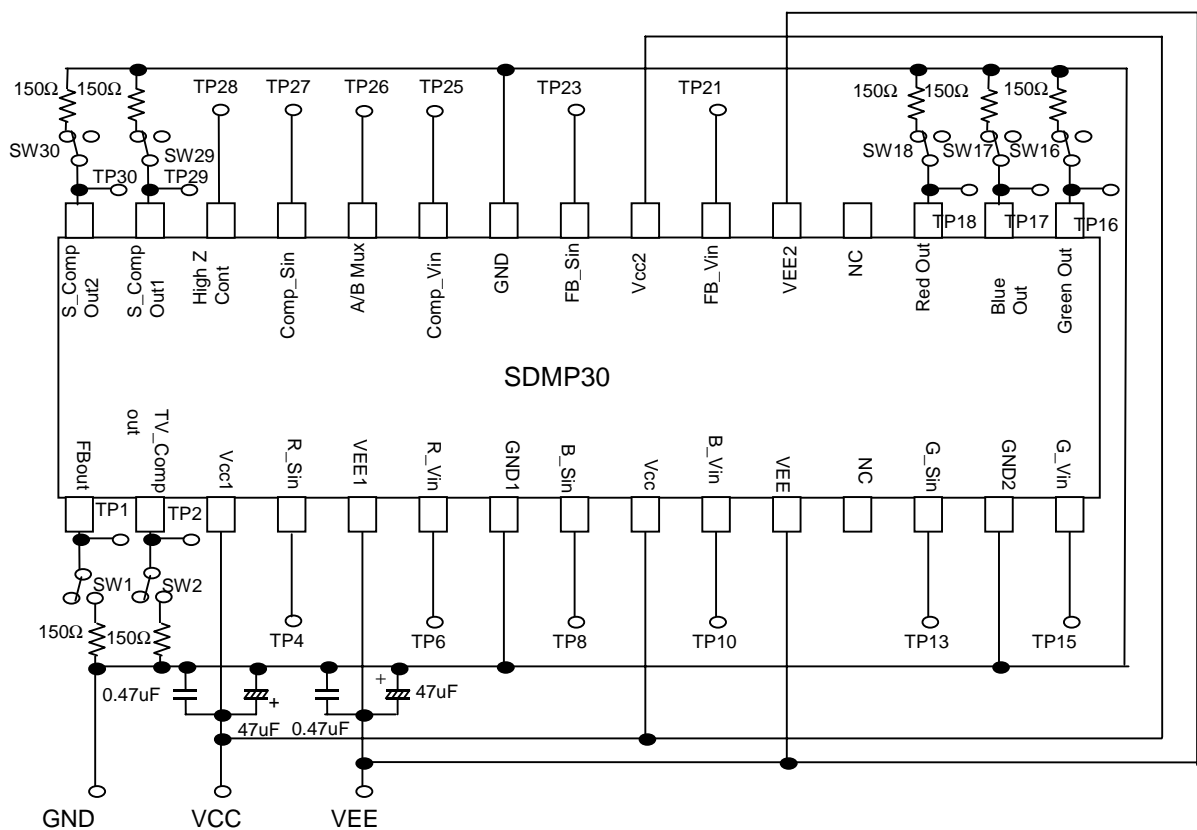
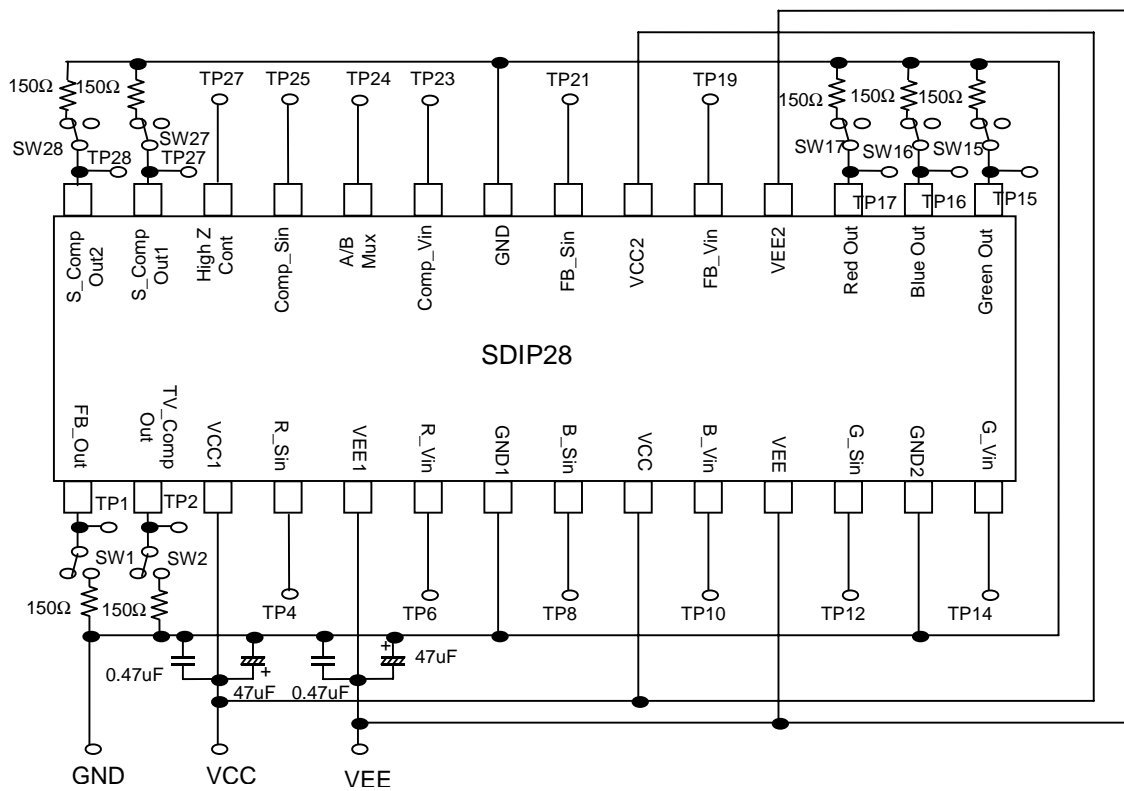
\* : Default setting

High Z Cont : RGB Outputs Impedance Control

Control Signal	RGB Outputs Impedance
0*	High Impedance
1	Through

\* : Default setting

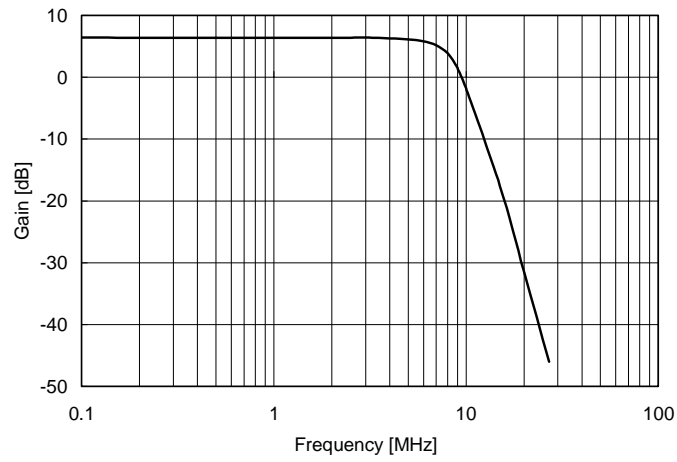
## ■ Measurement Circuit ( Ta=25°C, Vcc=5V, VEE=-5V)



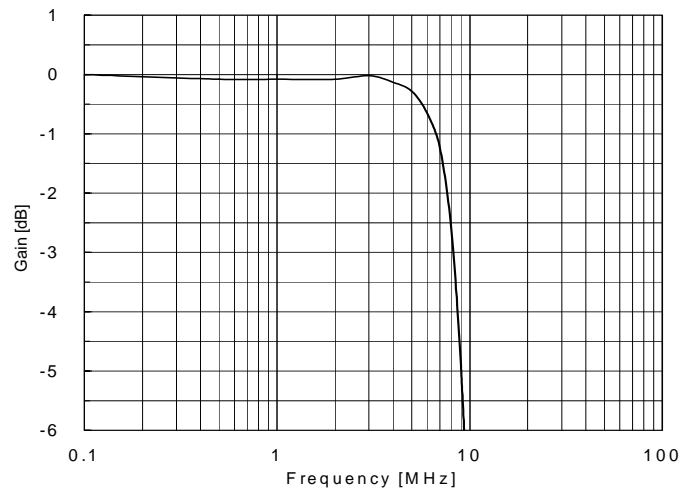
# NJM2277

## ■ Typical Characteristics

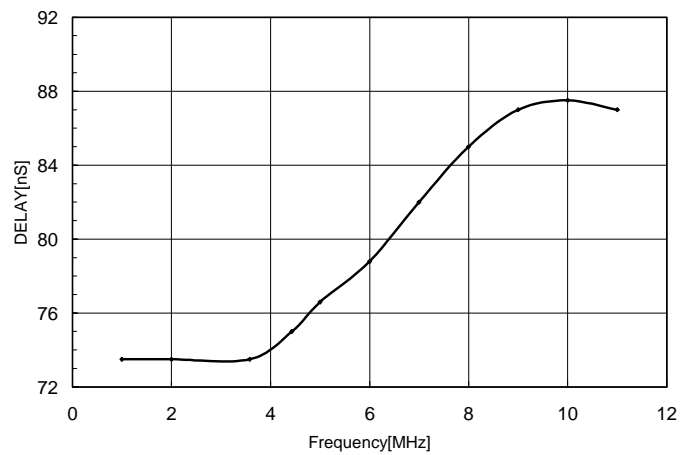
Frequency Response  
( $T_a=25^\circ\text{C}$ ,  $V_{CC}=5\text{V}$ ,  $V_{EE}=-5\text{V}$ )



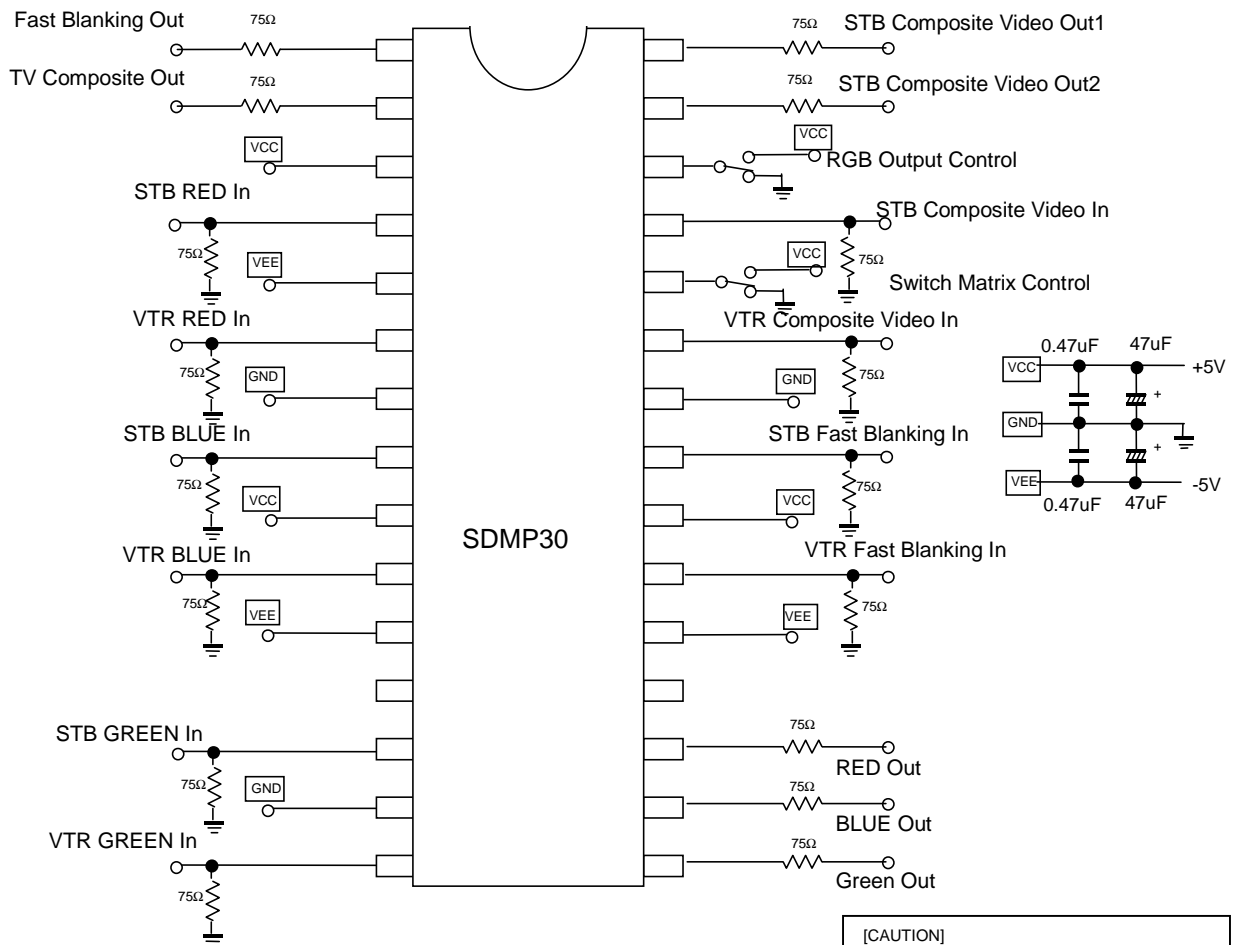
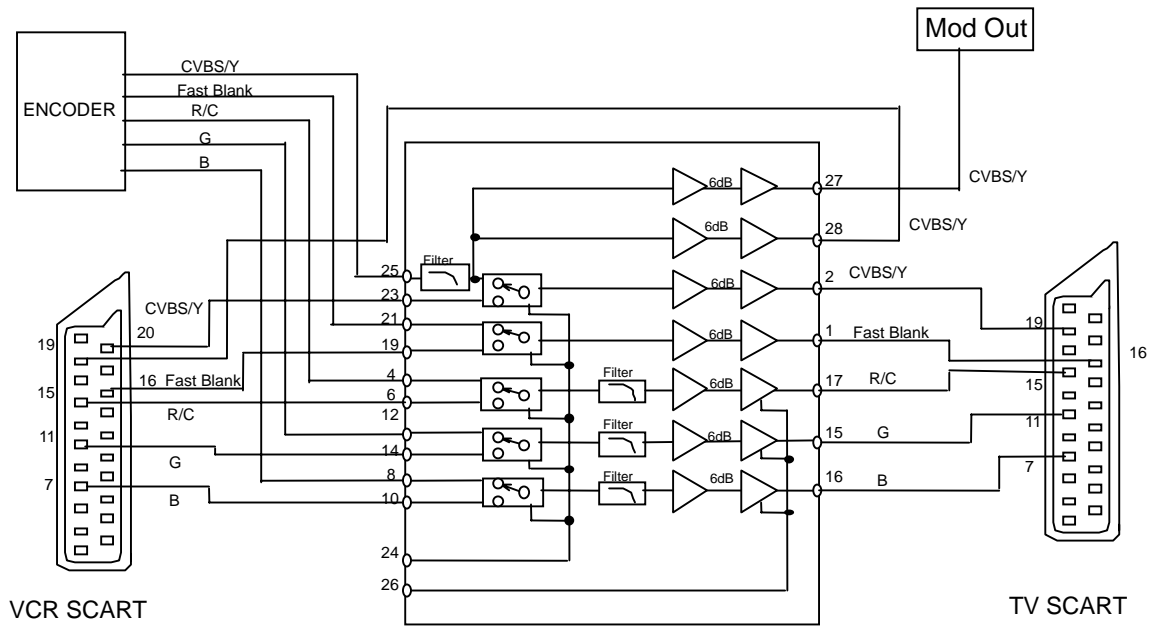
Normalized Frequency Response  
( $T_a=25^\circ\text{C}$ ,  $V_{CC}=5\text{V}$ ,  $V_{EE}=-5\text{V}$ )



Group Delay  
( $T_a=25^\circ\text{C}$ ,  $V_{CC}=5\text{V}$ ,  $V_{EE}=-5\text{V}$ )



## Application Circuit



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