



Video Amplifier with 75 ohms Driver

GENERAL DESCRIPTION

THE NJM2538 is a video amplifier with 75ohms drivers, which includes LPF and BPF of both Y and C system.

THE NJM2538 can compose the output circuit of digital video items with a little external components, because it prepares black and white 2 level imposer, gain controller, Y/C mixer, and SDC interface. It is suitable for portable items.

PACKAGE OUTLINE

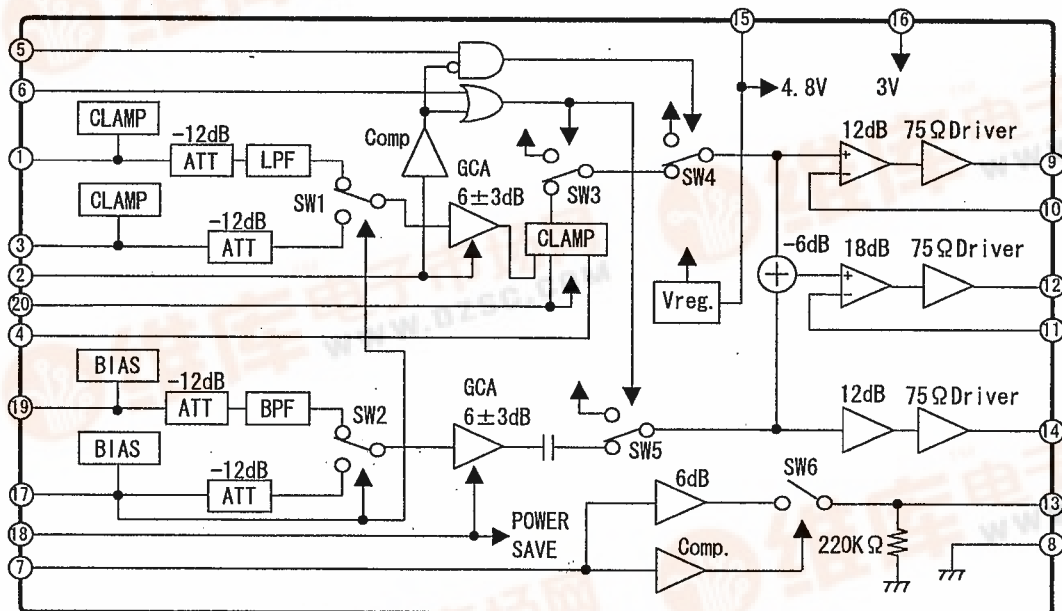


NJM2538V

FEATURES

- Operating Voltage $V^*1=4.5\sim 5.3V$, $V^*2=2.7\sim 5.3V$
- Low Power 110mW
- Internal Black and White 2 Level Imposer
- Internal Gain Controller
- Internal SDC Interface
- Bipolar Technology
- Package Outline SSOP20

BLOCK DIAGRAM



- | | |
|------------------|-------------------------|
| 1. Y_{IN1} | 11. V_{SAG} |
| 2. GCA CTL1/MUTE | 12. V_{OUT} |
| 3. Y_{IN2} | 13. SDC $_{OUT}$ |
| 4. CLAMP | 14. C_{OUT} |
| 5. CHARA | 15. V^*1 |
| 6. BLANK | 16. V^*2 |
| 7. WIDE | 17. $C_{IN2}/INSEL$ |
| 8. GND | 18. GCA CTL2/POWER SAVE |
| 9. Y_{OUT} | 19. C_{IN1} |
| 20. Y_{SAG} | 20. CLAMP REF. |



NJM2538

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETERS	SYMBOL	RATINGS	UNIT
Supply Voltage	V*	7.0	V
Power Dissipation	P _D	300	mW
Operating Temperature Range	T _{opr}	-20~+85	°C
Storage Temperature Range	T _{stg}	-40~+125	°C

■ ELECTRICAL CHARACTERISTICS (Ta=25°C, V*1=4.8V, V*2=3.0V, R_L=150Ω)

PARAMETERS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current 1	I _{cc1}	V*1=4.8V, No Signal	—	18.0	28.0	mA
Quiescent Current (Power Save Mode)	I _{save1}	V*1=4.8V, Power Save	—	3.0	3.5	mA
Operating Current 2	I _{cc2}	V*2=3.0V, No Signal	—	7.6	12.0	mA
Quiescent Current (Power Save Mode)	I _{save2}	V*2=3.0V, Power Save	—	0.5	1	mA

<Y Amplifier>

Voltage Gain 1	G _{VY1}	Y _{IN1} , Y _{IN2} → Y _{OUT} , G _{CACTLY} =0.5V 100kHz, 0.5Vp-p @ Sine Wave	-3.0	0	+3.0	dB
Voltage Gain 2	G _{VY2}	Y _{IN1} , Y _{IN2} → Y _{OUT} , G _{CACTLY} =2.5V 100kHz, 0.5Vp-p @ sine wave	+7.0	+9.0	+11.0	dB
Frequency Response(IN 2)	G _{fY}	10MHz/100kHz(100mVp-p @ Sine Wave)	-3.0	0	+3.0	dB

<V Amplifier>

Voltage Gain	G _{VV1}	Y _{IN1} , Y _{IN2} → V _{OUT} , G _{CACTLY} =0.5V 100kHz, 0.5Vp-p @ Sine Wave	+3.0	+6.0	+9.0	dB
Voltage Gain	G _{VV2}	Y _{IN1} , Y _{IN2} → V _{OUT} , G _{CACTLY} =2.5V 100kHz, 0.5Vp-p @ Sine Wave	+7.0	+9.0	+11.0	dB
Frequency Response(IN 2)	G _{fV}	10MHz/100kHz(100mVp-p @ Sine Wave)	-3.0	0	+3.0	dB

<C Amplifier>

Voltage Gain 1	G _{VC1}	C _{IN2} → C _{OUT} , G _{CACTLY} =0.5V 4MHz, 143mVp-p @ Sine Wave	-3.0	0	+3.0	dB
Voltage Gain 2	G _{VC2}	C _{IN2} → C _{OUT} , G _{CACTLY} =2.5V 4MHz, 143mVp-p @ Sine Wave	+7.0	+9.0	+11.0	dB
Frequency Response(IN 2)	G _{fC}	7MHz/4MHz(143mVp-p @ Sine Wave)	-3.0	0	+3.0	dB

<Filter Characteristics>

L P F (YIN1)	G _{fY6M}	6MHz/100kHz, 200mVp-p @ Sine Wave	-0.5	0	—	dB
	G _{fY7.2M}	7.2MHz/100kHz, 200mVp-p @ Sine Wave	-1.0	0	—	dB
	G _{fY20M}	20MHz/100kHz, 200mVp-p @ Sine Wave	—	-30	-20	dB
	DL _Y	Group Delay : GD3MHz-GD6MHz	—	10	100	nsec
B P F (CIN1)	G _{fC4M}	4MHz, 200mVp-p @ Sine Wave	—	0	—	dB
	G _{fC±1M}	±1MHz/4MHz, 200mVp-p @ Sine Wave	-0.5	0	—	dB
	G _{fC±1.6M}	±1.6MHz/4MHz, 200mVp-p @ Sine Wave	—	-15	-10	dB
	G _{fC20M}	20MHz/4MHz, 200mVp-p @ Sine Wave	—	-25	-10	dB
	DL _C	Group Delay : GD2MHz-GD6MHz	—	60	90	nsec

<YC Delay>

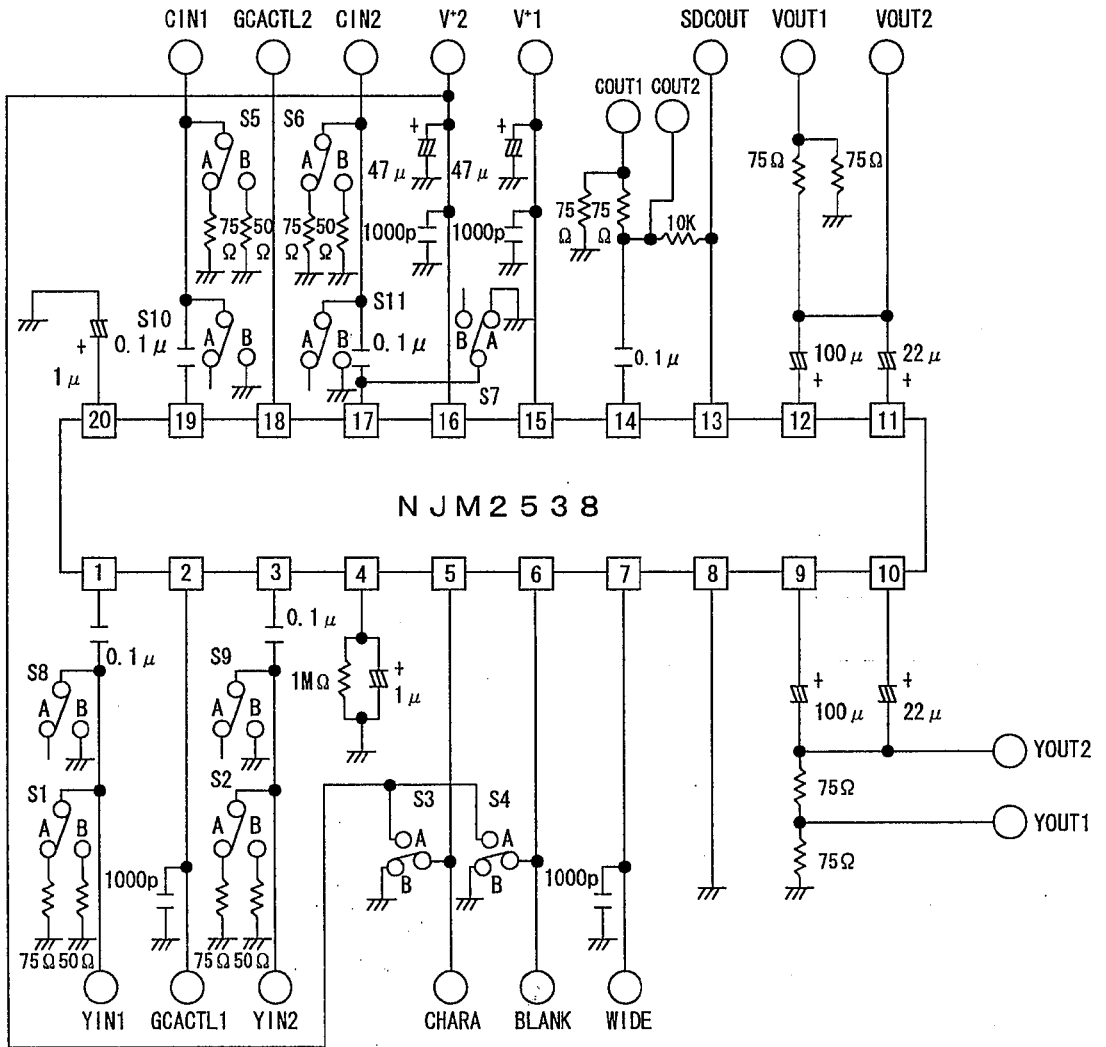
YC Delay	T _{YC}	T _{YOUT} - T _{CCOUT} at 4MHz	—	+25	—	nsec
----------	-----------------	--	---	-----	---	------

■ ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$, $V^+1=4.8\text{V}$, $V^+2=3.0\text{V}$, $R_L=150\ \Omega$)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
<YC Cross Talk>						
Cross Talk 1	CT1	$Y_{IN1,2} \rightarrow C_{OUT}$ 3.58MHz (Red Field Video Signal)	—	-40	—	dB
Cross Talk 2	CT2	$C_{IN1,2} \rightarrow Y_{OUT}$ 3.58MHz (Red Field Video Signal)	—	-40	—	dB
(S/N)						
Y Signal Output	SN_Y	Bandwidth 100kHz~6MHz, $R_L=75\ \Omega$ 100% White Video Signal.	—	-50	—	dB
V Signal Output	SN_V	Bandwidth 100kHz~6MHz, $R_L=75\ \Omega$ 100% White Video Signal.	—	-50	—	dB
C Signal Output	SN_{CAM}	Bandwidth 100kHz~500kHz, AM, $R_L=75\ \Omega$ Red Field Video Signal.	—	-58	—	dB
	SN_{CPM}	Bandwidth 100kHz~500kHz, PM, $R_L=75\ \Omega$ Red Field Video Signal.	—	-53	—	dB
<Maximum Output Swing>						
Y-OUT	V_{OYM}	100kHz, Sine Wave, $R_L=75\ \Omega$	1.2	—	—	Vp-p
V-OUT	V_{OVM}	100kHz, Sine Wave, $R_L=75\ \Omega$	1.2	—	—	Vp-p
C-OUT	V_{OCM}	100kHz, Sine Wave, $R_L=75\ \Omega$	1.08	—	—	Vp-p
<2nd. Distortion>						
Y, V Output	H_Y, H_V	3.58MHz (Red Field Video Signal)	—	-40	-25	dB
C Output	H_C	3.58MHz (Red Field Video Signal)	—	-40	-25	dB
<Super Impose>						
Word Level	V_{CHA}	Voltage Swing 1 Vp-p: 100IRE /SYNC: 40IRE	70	80	95	IRE
Border Level	V_{SET}	Voltage Swing 1 Vp-p: 100IRE /SYNC: 40IRE	0	5	18	IRE
<INCEL Control Signal>						
Low Level	V_{SL}	Low Level Voltage	GND	—	0.2	V
<Impose Control Signal>						
High Level	V_{CH}	High Level Voltage	1.4	—	3.0	V
Low Level	V_{CL}	Low Level Voltage	GND	—	0.6	V
<GCA Control Signal>						
GCACTLY	V_{GC1}	GCA Control Voltage	0.5	—	3.0	V
	V_{GL1}	MUTE Voltage	GND	—	0.3	V
GCACTLC	V_{GC2}	GCA Control Voltage	0.5	—	3.0	V
	V_{GL2}	Power Down Voltage	GND	—	0.3	V
<SDC>						
WIDE1	V_{SDC1}	WIDE \rightarrow SDC Gain, WIDE=0.5~3.0V	5.5	6.0	6.5	dB
WIDE2	V_{SDC2}	SDC High impedance Voltage	—	—	0.3	V
Output Impedance	R_{SDC}	SDCOUT High Impedance	—	220	—	k Ω
Maximum Output Voltage	V_{SDC3}	$R_L=110\text{k}\Omega$	4.0	—	—	V

NJM2538

TEST CIRCUIT



■ EQUIVALENT CIRCUIT

PIN No.	PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
1 3	YIN 1 YIN 2	Input terminal for Y signal.	
2	GCA CTL1/ MUTE	Control terminal for variable amplifier.	
4	CLAMP	Capacity terminal for clamp.	
5 6	CHARA BLANK	Input terminal for character signal.	
7	WIDE	Input terminal for DC Voltage.	

NJM2538

■ EQUIVALENT CIRCUIT

PIN No.	PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
8	GND	GND	
9	Y OUT	Output voltage for Y signal.	
10	Y SAG	SAG trimming terminal for Y signal.	
11	V SAG	SAG input terminal for composite video signal.	
12	V OUT	Output terminal for composite video signal.	
13	SDC OUT	SDC output terminal.	

■ EQUIVALENT CIRCUIT

PIN No.	PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
14	C OUT	Output terminal for color signal.	
15	V+1	Power terminal for 4.8V.	
16	V+2	Power terminal for 3V	
17 19	CIN 2/INSEL CIN 1	Input terminals for color signal.	
18	GCA CTL 2/ PWRSAVE	Control terminal for valuable gain amplifier.	
20	CLAMP REF	De-couple voltage terminal.	

NJM2538

MEMO

[CAUTION]

The specifications on this databook are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.