

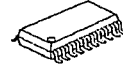
Video Amplifier with 75 ohms Driver

■ 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

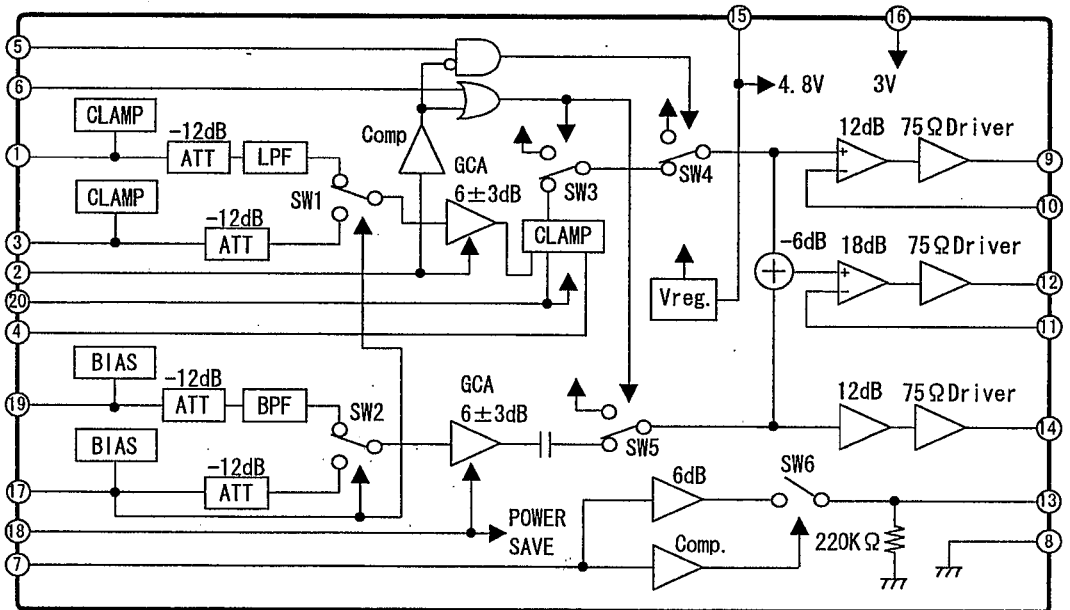


NJM2538V

■ 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} |
| 10. Y_{SAG} | 20. CLAMP REF. |

5

■ 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	Topr	-20~+85	°C
Storage Temperature Range	Tstg	-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

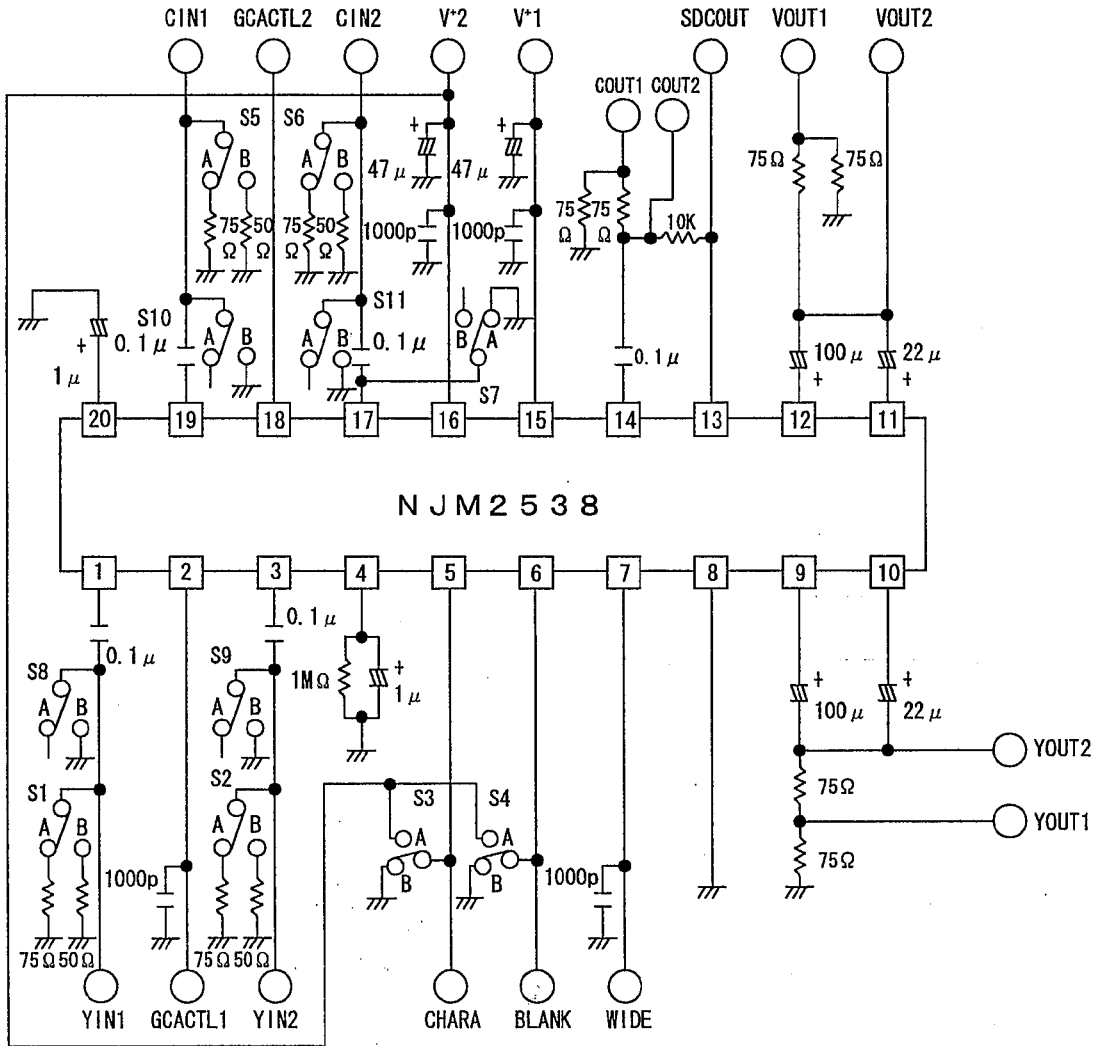
<YC Delay>

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

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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
<YC Cross Talk>						
Cross Talk 1	CT1	Y _{IN1,2} →C _{OUT} 3.58MHz (Red Field Video Signal)	—	-40	—	dB
Cross Talk 2	CT2	C _{IN1,2} →Y _{OUT} 3.58MHz (Red Field Video Signal)	—	-40	—	dB
(S/N)						
Y Signal Output	SN _Y	Bandwidth 100kHz~6MHz, R _L =75Ω 100% White Video Signal.	—	-50	—	dB
V Signal Output	SN _V	Bandwidth 100kHz~6MHz, R _L =75Ω 100% White Video Signal.	—	-50	—	dB
C Signal Output	SN _{CAM}	Bandwidth 100kHz~500kHz, AM, R _L =75Ω Red Field Video Signal.	—	-58	—	dB
	SN _{CPM}	Bandwidth 100kHz~500kHz, PM, R _L =75Ω, Red Field Video Signal.	—	-53	—	dB
<Maximum Output Swing>						
Y-OUT	V _{OYM}	100kHz, Sine Wave, R _L =75Ω	1.2	—	—	Vp-p
V-OUT	V _{OVm}	100kHz, Sine Wave, R _L =75Ω	1.2	—	—	Vp-p
C-OUT	V _{OCM}	100kHz, Sine Wave, R _L =75Ω	1.08	—	—	Vp-p
<2nd. Distortion>						
Y, V Output	H _{Y, HV}	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 1Vp-p: 100IRE /SYNC: 40IRE	70	80	95	IRE
Border Level	V _{SET}	Voltage Swing 1Vp-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→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	—	kΩ
Maximum Output Voltage	V _{SDC3}	R _L =110kΩ	4.0	—	—	V

TEST CIRCUIT



5

■ EQUIVALENT CIRCUIT

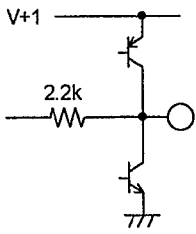

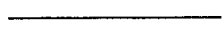
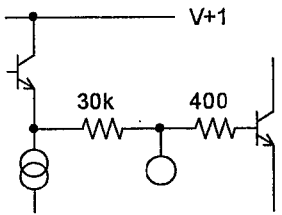
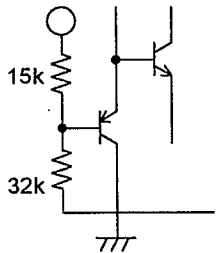
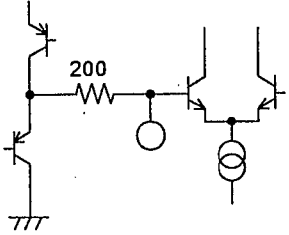
PIN No.	PIN NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT
1 3	YIN 1 YIN 2	Input terminal for Y signal.	
2	GCA CTL1/ MUTE	Control terminal for variable amplifier.	
4	CLAMP	Capacity terminal for clamp.	
5 6	CHARA BLANK	Input terminal for character signal.	
7	WIDE	Input terminal for DC Voltage.	

5

■ 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.	

5

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.