

M52307P/SP

3-CHANNEL VIDEO AMPLIFIER FOR HIGH-RESOLUTION COLOR DISPLAY

DESCRIPTION

The M52307P/SP are semiconductor integrated circuits that have three channels of built-in amplifiers in the broad-band video amplifier series (M51392P, M51399P, M51387P) having a band of 130MHz.

Every channel is provided with a broad-band amplifier, main/sub contrast control, and main/sub brightness control functions.

Accordingly, these ICs have an optional configuration for use in high-resolution color display monitors.

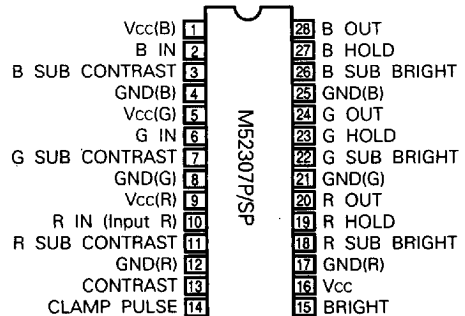
FEATURES

- The M52307P/SP use a new bi-polar wafer processing to realize low power dissipation so that three channels can be built in the amplifier. ($V_{CC} = 12V$, $I_{CC} = 63mA$)
- Input : $0.7V_{P-P}(Typ.)$
Output : $4.5V_{P-P}(Max.)$
Frequency band: 130MHz (at $3V_{P-P}$)
- The main control adjusts 3 channels of contrast and brightness at the same time, and the sub control adjusts each channel independently.
- Since the feedback circuit is built in the IC, a stable DC level is obtained at the output pins of the IC.

APPLICATION

CRT display

PIN CONFIGURATION (TOP VIEW)

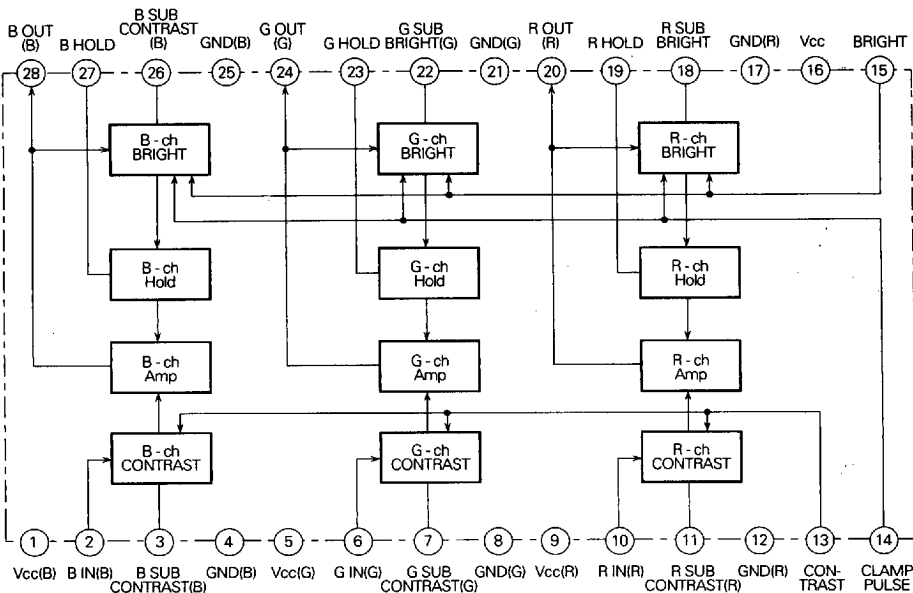


Outline 28P4(P)
28P4B(SP)

RECOMMENDED OPERATING CONDITION

Supply Voltage range11.5~12.5V
Rated Supply Voltage12.0V

BLOCK DIAGRAM



3-CHANNEL VIDEO AMPLIFIER FOR HIGH-RESOLUTION COLOR DISPLAY

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Ratings	Unit
V _{CC}	Supply voltage	13.0	V
P _d	Power dissipation	2000	mW
T _{opr}	Operating temperature	-20~85	°C
T _{stg}	Storage temperature	-40~150	°C
V _{opr}	Recommended operating supply voltage	12.0	V
V _{opr} '	Recommended operating supply voltage range	11.5~12.5	V
Surge	Electrostatic discharge	±200	V

ELECTRICAL CHARACTERISTICS (T_a=25°C, unless otherwise noted)

Symbol	Parameter	Test point	Input			Test conditions					Limits			Unit
			SW10 R-ch	SW6 G-ch	SW2 B-ch	V3	V13	V15	V26	SW14	Min.	Typ.	Max.	
I _{CC}	Circuit current	A	a —	a —	a —	12.0	12.0	5.0	—	b SG6	45	72	110	mA
V _{omax}	Output dynamic range	T.P20 T.P24 T.P28	b SG1	b SG1	b SG1	12.0	12.0	Variable	—	a —	5.8	6.8	9.0	V _{p-p}
V _{imax}	Maximum input voltage	T.P20 T.P24 T.P28	b SG1	b SG1	b SG1	12.0	6.0	Variable	—	a —	1.9	2.4	2.9	V _{p-p}
G _v	Maximum gain	T.P20 T.P24 T.P28	b SG1	b SG1	b SG1	12.0	12.0	V _T	—	a —	13.0	17.0	20.0	dB
ΔG _v	Relative maximum gain	—	—	—	—	—	—	—	—	—	0.8	1.0	1.2	—
V _{CR1}	Contrast control characteristics (standard)	T.P20 T.P24 T.P28	b SG1	b SG1	b SG1	12.0	6.0	V _T	—	a —	4.1	7.4	10	dB
ΔV _{CR1}	Relative contrast control characteristics (standard)	—	—	—	—	—	—	—	—	—	0.8	1.0	1.2	—
V _{CR2}	Contrast control characteristics (minimum)	T.P20 T.P24 T.P28	b SG1	b SG1	b SG1	12.0	3.5	V _T	—	a —	5	30.0	70.0	mV _{p-p}
ΔV _{CR2}	Relative contrast control characteristics (minimum)	—	—	—	—	—	—	—	—	—	0.8	1.0	1.3	—
V _{SCR1}	Sub contrast control characteristics (standard)	T.P20 T.P24 T.P28	b SG1	b SG1	b SG1	6.0	12.0	V _T	—	a —	10.0	14.0	18.0	dB
ΔV _{SCR1}	Relative sub contrast control characteristics (standard)	—	—	—	—	—	—	—	—	—	0.8	1.0	1.2	—
V _{SCR2}	Sub contrast control characteristics (minimum)	T.P20 T.P24 T.P28	b SG1	b SG1	b SG1	3.0	12.0	V _T	—	a —	100.0	300.0	860.0	mV _{p-p}
ΔV _{SCR2}	Relative contrast control characteristics (minimum)	—	—	—	—	—	—	—	—	—	0.8	1.0	1.2	—
V _{CR3}	Contrast/sub contrast control characteristics (Standard for both contrast and sub contrast)	T.P20 T.P24 T.P28	b SG1	b SG1	b SG1	6.0	6.0	V _T	—	a —	900	1300	1700	mV _{p-p}
ΔV _{CR3}	Relative contrast/sub contrast control characteristics (Standard for both contrast and sub contrast)	—	—	—	—	—	—	—	—	—	0.8	1.0	1.2	—

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ELECTRICAL CHARACTERISTICS (cont.)

Symbol	Parameter	Test point	Input			Test conditions					Limits			Unit
			SW10 R-ch	SW6 G-ch	SW2 B-ch	V3	V13	V15	V26	SW14	Min.	Typ.	Max.	
V _{B1}	Brightness control characteristics (maximum)	T.P20 T.P24 T.P28	a —	a —	a —	12.0	12.0	5.5	—	b SG6	3.7	4.3	4.9	V
ΔV _{B1}	Relative brightness control characteristics (maximum)	—	—	—	—	—	—	—	—	—	-100.0	0.0	100.0	mV
V _{B2}	Brightness control characteristics (standard)	T.P20 T.P24 T.P28	a —	a —	a —	12.0	12.0	5.0	—	b SG6	3.1	3.7	4.3	V
ΔV _{B2}	Relative brightness control characteristics (standard)	—	—	—	—	—	—	—	—	—	-100.0	0.0	100.0	mV
V _{B3}	Brightness control characteristics (minimum)	T.P20 T.P24 T.P28	a —	a —	a —	12.0	12.0	4.5	—	b SG6	2.6	3.2	3.9	V _{DC}
ΔV _{B3}	Relative brightness control characteristics (minimum)	—	—	—	—	—	—	—	—	—	-100.0	0.0	100.0	mV
V _{SB1}	Sub brightness control characteristics (maximum)	T.P20 T.P24 T.P28	a —	a —	a —	12.0	12.0	5.0	4.0	b SG6	2.4	3.1	3.8	V _{DC}
ΔV _{SB1}	Sub brightness control characteristics (minimum)	T.P20 T.P24 T.P28	a —	a —	a —	12.0	12.0	5.0	3.5	b SG6	2.3	3.0	3.7	V _{DC}
FC ₁	Frequency characteristics I (f=50MHz Max.)	T.P20 T.P24 T.P28	b SG3	b SG3	b SG3	12.0	7.5	V _T	—	a —	-2	-1	3	dB
ΔFC ₁	Relative frequency characteristics I (f=50MHz Max.)	—	—	—	—	—	—	—	—	—	-1.0	0.0	1.0	dB
FC _{1'}	Frequency characteristics I (f=130MHz Max.)	T.P20 T.P24 T.P28	b SG4	b SG4	b SG4	12.0	7.5	V _T	—	a —	-3	-2	3	dB
ΔFC _{1'}	Relative frequency characteristics I (f=130MHz Max.)	—	—	—	—	—	—	—	—	—	-1.0	0.0	1.0	dB
FC ₂	Frequency characteristics II (f=50MHz standard)	T.P20 T.P24 T.P28	b SG3	b SG3	b SG3	12.0	6.5	V _T	—	a —	-1	0	3	dB
FC _{2'}	Frequency characteristics II (f=130MHz standard)	T.P20 T.P24 T.P28	b SG4	b SG4	b SG4	12.0	6.5	V _T	—	a —	-2.5	0	3	dB
FC ₅	Frequency characteristics III (f=50MHz minimum)	T.P20 T.P24 T.P28	b SG3	b SG3	b SG3	12.0	5.0	V _T	—	a —	-0.5	0	2	dB
FC _{5'}	Frequency characteristics III (f=130MHz minimum)	T.P20 T.P24 T.P28	b SG4	b SG4	b SG4	12.0	5.0	V _T	—	a —	-0.5	0	2	dB
C.T.1	Crosstalk I (f=50MHz)	T.P20 T.P24 T.P28	b SG3	a —	a —	12.0	12.0	V _T	—	a —	—	-32	-20	dB
C.T.1'	Crosstalk I (f=130MHz)	T.P20 T.P24 T.P28	b SG4	a —	a —	12.0	12.0	V _T	—	a —	—	-22	-15	dB
C.T.2	Crosstalk II (f=50MHz)	T.P20 T.P24 T.P28	a —	b SG3	a —	12.0	12.0	V _T	—	a —	—	-32	-20	dB
C.T.2'	Crosstalk II (f=130MHz)	T.P20 T.P24 T.P28	a —	b SG4	a —	12.0	12.0	V _T	—	a —	—	-22	-15	dB

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ELECTRICAL CHARACTERISTICS (cont.)

Symbol	Parameter	Test point	Input			Test conditions					Limits			Unit
			SW10 R-ch	SW6 G-ch	SW2 B-ch	V3	V13	V15	V26	SW14	Min.	Typ.	Max.	
C.T.3	Crosstalk III (f=50MHz)	T.P20 T.P24 T.P28	a —	a —	b SG3	12.0	12.0	V _T	—	a —	—	—32	—20	dB
C.T.3'	Crosstalk III (f=130MHz)	T.P20 T.P24 T.P28	a —	a —	b SG4	12.0	12.0	V _T	—	a —	—	—22	—15	dB
Tr	Pulse characteristics I	T.P20 T.P24 T.P28	b SG5	b SG5	b SG5	12.0	7.0	3.0	—	b SG6	—	2	4	nsec
Tf	Pulse characteristics II	T.P20 T.P24 T.P28	b SG5	b SG5	b SG5	12.0	7.0	3.0	—	b SG6	—	3	6	nsec
V _{14th}	Clamp pulse threshold voltage	T.P20 T.P24 T.P28	a —	a —	a —	12.0	12.0	3.0	—	b SG6	0.7	1.5	2.5	V _{CC}
W ₁₄	Clamp pulse minimum width	T.P20 T.P24 T.P28	a —	a —	a —	12.0	12.0	3.0	—	b SG6	—	0.3	1.0	μsec
V ₂₇	Hold voltage	T.P19 T.P23 T.P27	a —	a —	a —	12.0	12.0	3.0	—	b SG6	4.6	5.2	5.8	V _{CC}
PDCH	Pedestal voltage temperature characteristics 1	T.P20 T.P24 T.P28	b SG7	b SG7	b SG7	12.0	12.0	3.5	—	b SG6	—0.3	0	0.3	V _{CC}
PDCL	Pedestal voltage temperature characteristics 2	T.P20 T.P24 T.P28	b SG7	b SG7	b SG7	12.0	12.0	3.5	—	b SG6	—0.3	0	0.3	V _{CC}