

**WIDE-BAND VIDEO AMPLIFIER
FEATURING**

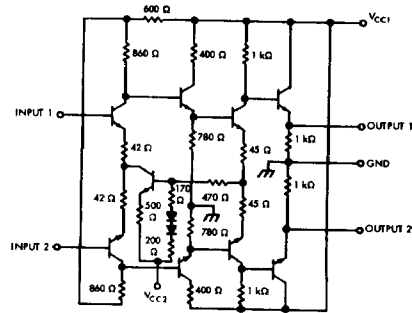
Flat Frequency Response with Low Phase-Shift from DC to 40 MHz

description

This wide-band video amplifier features a flat frequency response and low phase-shift from dc to 40 MHz. Differential inputs and outputs are provided which permit it to be used as a high-frequency differential amplifier.

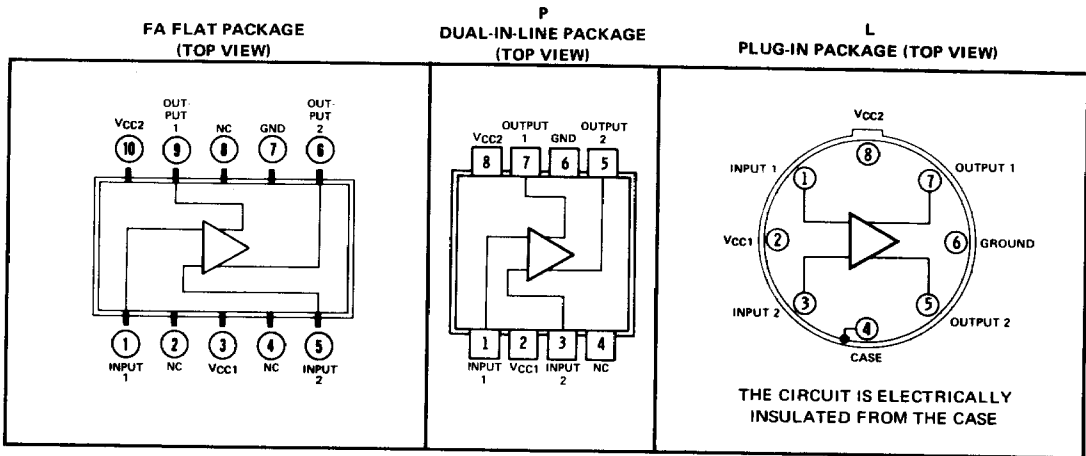
Elements of the SN7510 video-amplifier bar include transistors with transition frequency as high as 1.2 GHz under low-current and low- V_{CE} conditions. Circuit frequency response from dc to greater than 100 MHz is possible.

schematic



Component values shown are nominal.

terminal assignments



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TYPE SN7510

DIFFERENTIAL VIDEO AMPLIFIER

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltages (See Note 1): V_{CC1}	+8 V
V_{CC2}	-8 V
Differential input voltage	5 V
Positive input voltage (See Note 1)	V_{CC1}
Negative input voltage (See Note 1)	V_{CC2}
Operating free-air temperature range	0°C to 70°C
Storage temperature range	-65°C to 150°C

NOTE 1: These voltage values are with respect to network ground.

electrical characteristics, $T_A = 25^\circ\text{C}$, $V_{CC1} = +6\text{ V}$, $V_{CC2} = -6\text{ V}$

PARAMETER	TEST FIGURE	TEST CONDITIONS	MIN	TYP	MAX	UNIT
V_{DO} Differential-output offset voltage	1			0.5	2	V
$V_{CMO(av)}$ Average common-mode output offset voltage	1		2	3	4	V
I_{in} Input current	1			50	100	μA
I_{DI} Differential-input offset current	1			5	30	μA
V_{OM} Maximum peak-to-peak output voltage	2	Single-ended, load resistance = 5 k Ω , $f = 100\text{ kHz}$, $V_{in} = 20\text{ mV rms}$		4.5		V
D_S Single-ended output distortion	2	Load resistance = 5 k Ω , input distortion < 0.2%, $V_{out} = 1\text{ V rms}$, $f = 10\text{ kHz}$		2		%
$V_{N(in)}$ Equivalent average input noise voltage	3	Single-ended, $R_S = 0$, $f = 10\text{ Hz to } 500\text{ kHz}$		5		μV
V_{CMIM} Maximum common-mode input voltage				± 1		V
A_{vs} Small-signal voltage gain	2	Single-ended, load resistance = 5 k Ω , $f = 100\text{ kHz}$	60	90	120	
A_{vcm} Common-mode-input voltage gain	4	Single-ended, load resistance = 5 k Ω , $V_{in} = 0.3\text{ V rms}$, $f = 100\text{ kHz}$		-40	-20	dB
CMRR Common-mode rejection ratio	4	Load resistance = 5 k Ω , $f = 100\text{ kHz}$		80		dB
BW Bandwidth (-3 dB)	2			40		MHz
r_{in} Input resistance	5	$f = 100\text{ kHz}$		6		k Ω
C_{in} Input capacitance	5	$f = 100\text{ kHz}$		7		pF
z_{out} Output impedance	5	$f = 100\text{ kHz}$		35		Ω
P_T Total power dissipation	1	No input signal, no external load		165	220	mW
t_r Rise time	6	Single-ended, $V_{in} = 5\text{ mV}$		10	15	ns
t_f Fall time	6	Single-ended, $V_{in} = 5\text{ mV}$		10	15	ns

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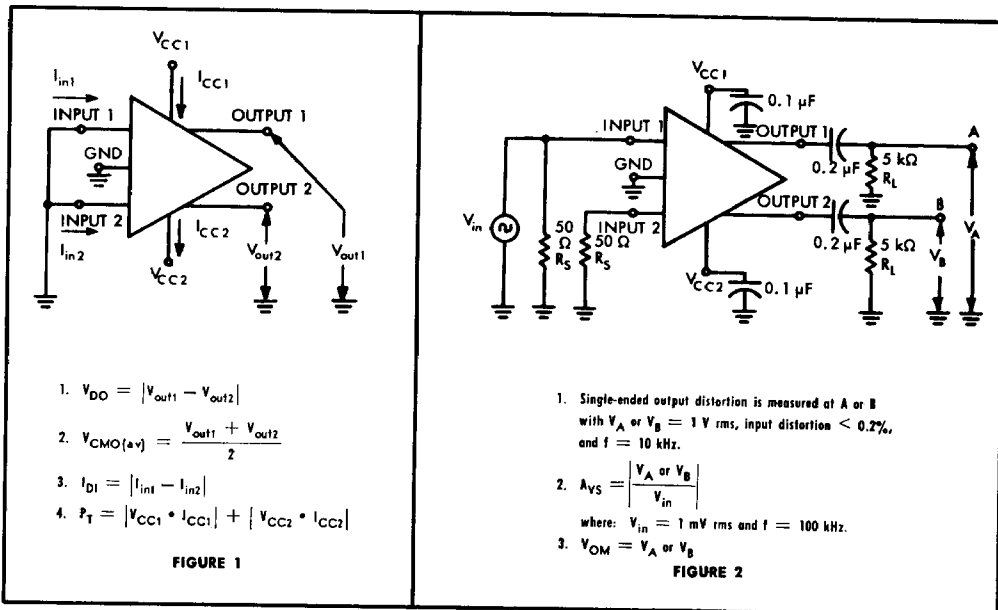
TYPE SN7510 DIFFERENTIAL VIDEO AMPLIFIER

letter symbol and parameter definitions

V_{DO}	The d-c differential voltage that exists between the output terminals when the input terminals are at ground.
$V_{CMO(av)}$	The average of the d-c output voltages with respect to ground when the input terminals are grounded.
I_{DI}	The difference in the currents into the two input terminals.
V_{OM}	The maximum peak-to-peak output voltage swing that can be obtained without clipping.
V_{CMIM}	The maximum common-mode voltage that can be impressed on the input terminals while maintaining differential operation.
$CMRR$	The ratio of the differential-mode voltage gain to the common-mode voltage gain.
BW	The range of frequencies within which the open-loop voltage gain is within 3 dB of the mid-frequency value.

PARAMETER MEASUREMENT INFORMATION

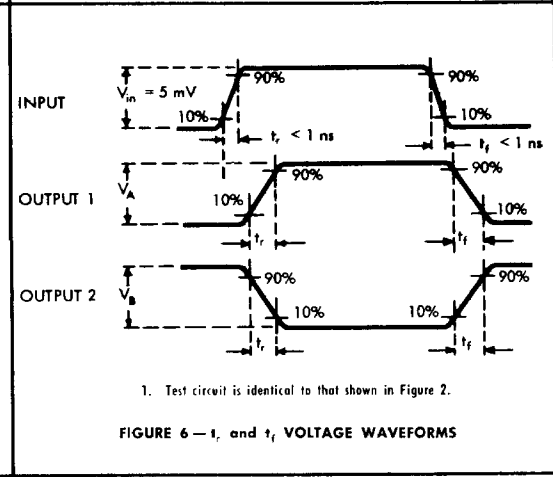
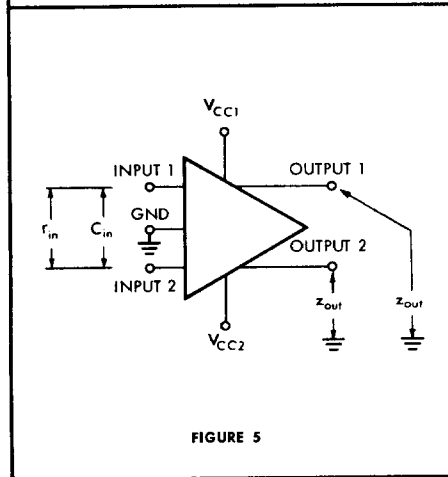
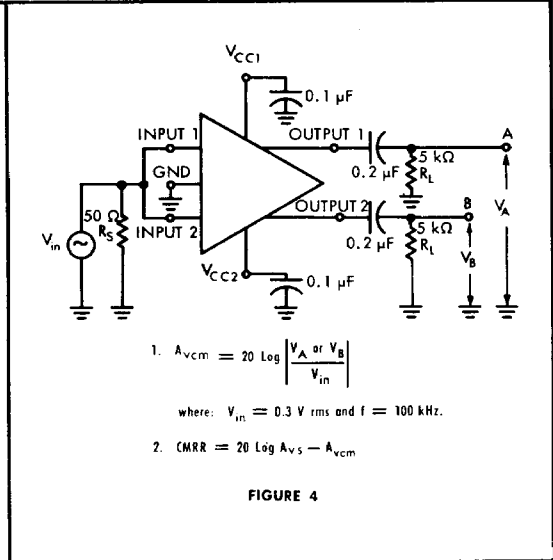
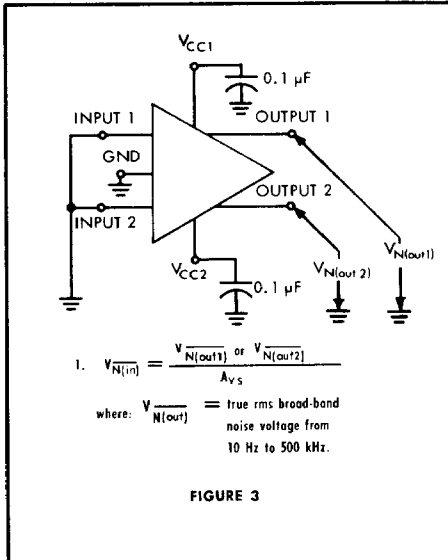
test circuits



TYPE SN7510 DIFFERENTIAL VIDEO AMPLIFIER

PARAMETER MEASUREMENT INFORMATION

test circuits (continued)



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TYPE SN7510 DIFFERENTIAL VIDEO AMPLIFIER

TYPICAL CHARACTERISTICS†

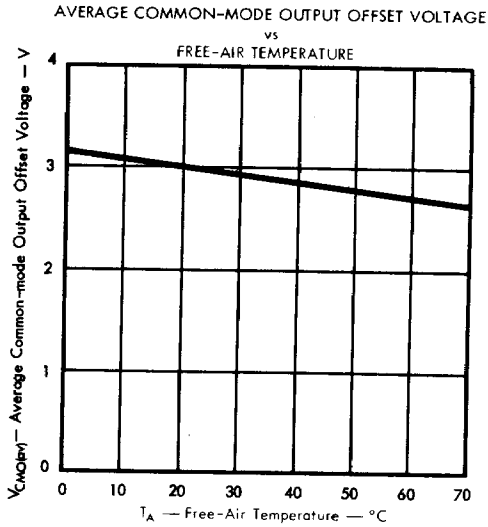


FIGURE 7

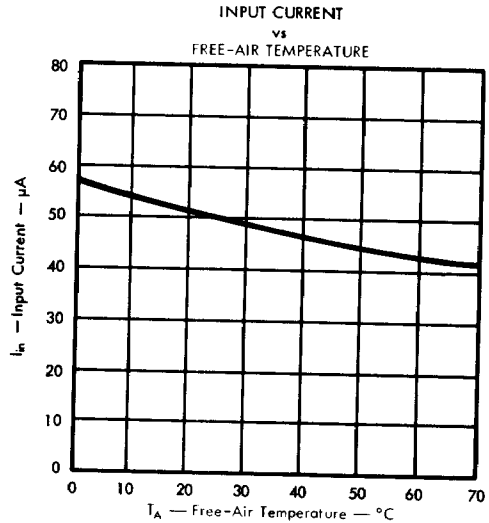


FIGURE 8

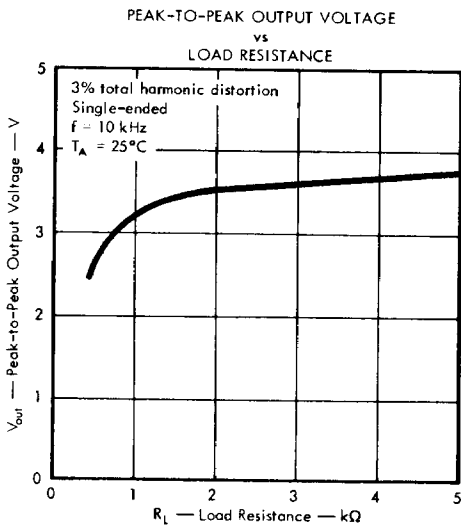


FIGURE 9

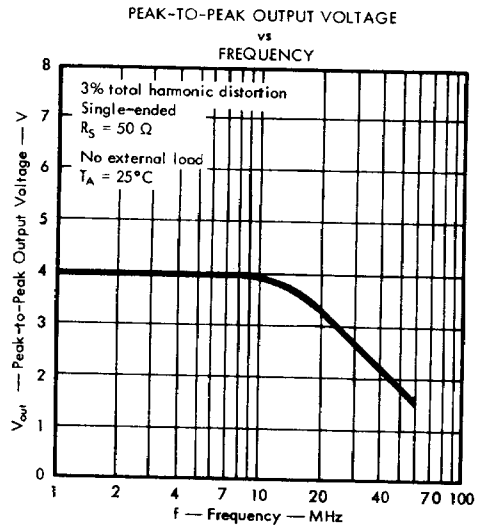


FIGURE 10

† Unless otherwise noted $V_{CC1} = +6\text{ V}$, $V_{CC2} = -6\text{ V}$.

TYPE SN7510 DIFFERENTIAL VIDEO AMPLIFIER

TYPICAL CHARACTERISTICS†

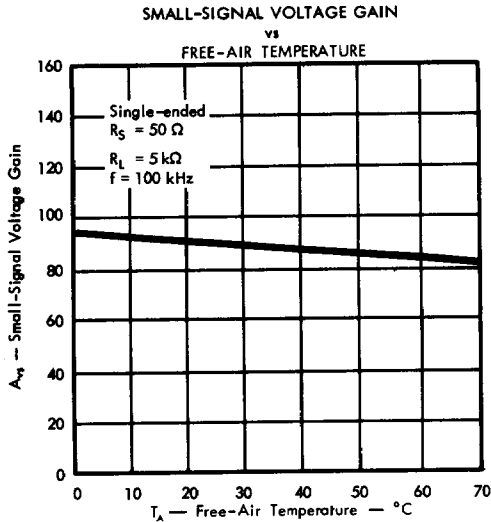


FIGURE 11

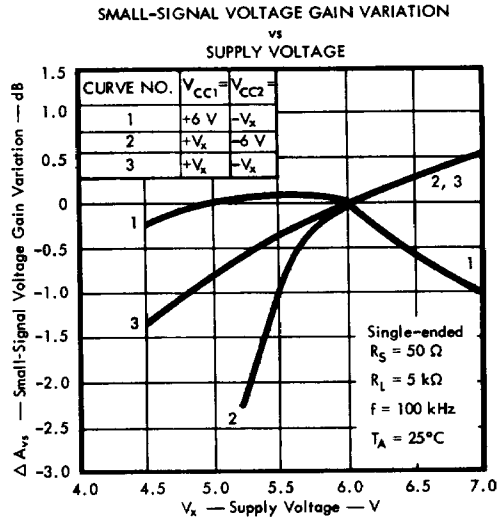


FIGURE 12

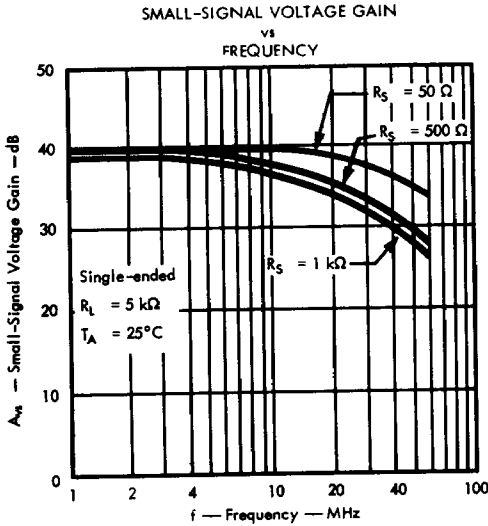


FIGURE 13

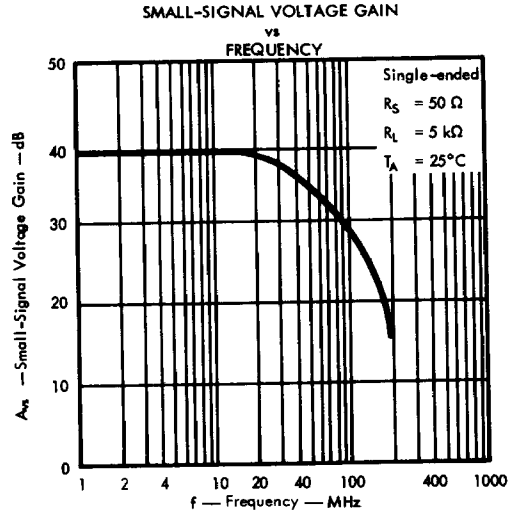


FIGURE 14

† Unless otherwise noted $V_{CC1} = +6 \text{ V}$, $V_{CC2} = -6 \text{ V}$.

TYPE SN7510 DIFFERENTIAL VIDEO AMPLIFIER

TYPICAL CHARACTERISTICS†

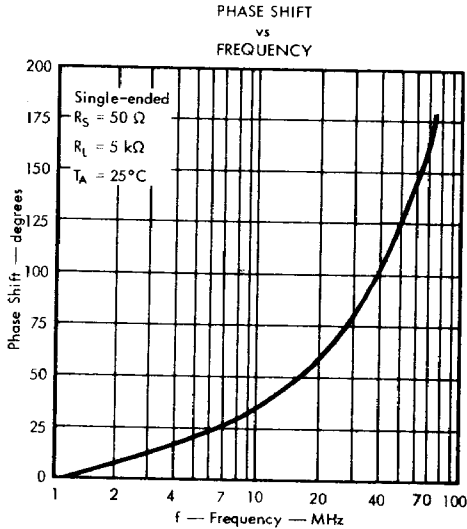


FIGURE 15

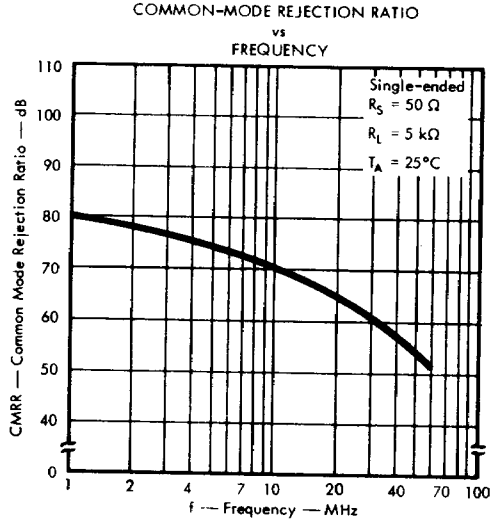


FIGURE 16

† $V_{CC1} = +6 \text{ V}$ and $V_{CC2} = -6 \text{ V}$.

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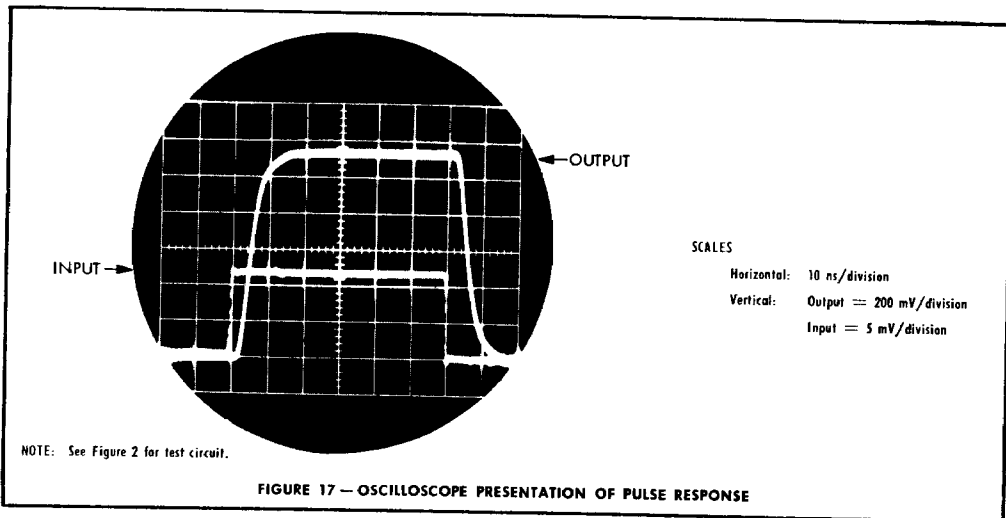


FIGURE 17 — OSCILLOSCOPE PRESENTATION OF PULSE RESPONSE