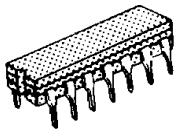
HA17733G,HA17733P,HA17733 ●Differential Video Amplifier

HA17733 is a video amplifier for wide band with small phase-delay and excellent gain stability. This amplifier eliminates external phase compensation and can fix the gain 10, 100 or 400 without using external elements. If some external elements are used, any gain from 10 to 400 is available.
It finds main application in terminal units of computers, interface or video amplifiers.

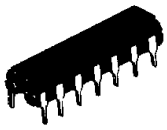
Industrial Use: HA17733G, HA17733P
Commercial Use: HA17733

HA17733G



(DG-14)

HA17733P, HA17733

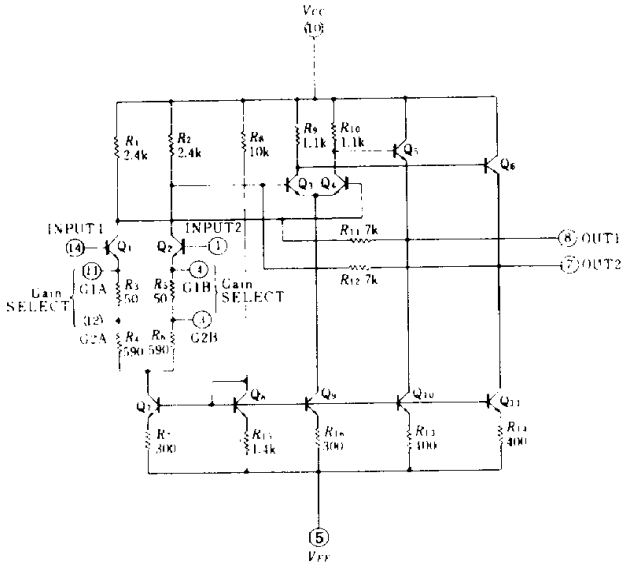


(DP-14)

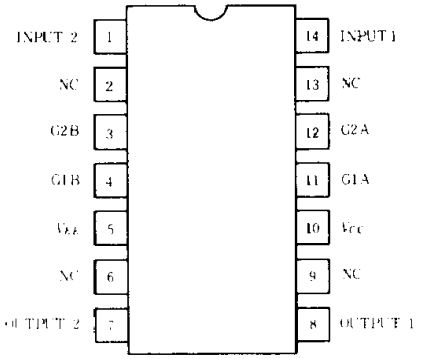
■ FEATURES

- Wide Band Width 120MHz
- Good Response
- Gain is Easily Adjusted in the Range of 10 to 400
- Eliminates External Phase Compensation

■ CIRCUIT SCHEMATIC



■ PIN ARRANGEMENT



(Top View)

■ ABSOLUTE MAXIMUM RATINGS ($Ta = 25℃$)

Item	Symbol	HA17733G	HA17733P	HA17733	Unit
Supply Voltage	V_{CC}	+8	+8	+8	V
	V_{EE}	−8	−8	−8	V
Common Mode Input Voltage	$V_{in(CM)}$	±6	±6	±6	V
Differential Input Voltage	$V_{in(diff)}$	±5	±5	±5	V
Output Current	I_{out}	10	10	10	mA
Power Dissipation	P_T	625 *1	625 *2	625 *2	mW
Operating Temperature	T_{opr}	−20 to +75	−20 to +75	0 to +70	℃
Storage Temperature	T_{stg}	−65 to +150	−65 to +150	−55 to +125	℃

*1 When Ta is 70℃ or more, the derating curve will be 7.6mW/℃.
*2 When Ta is 50℃ or more, the derating curve will be 8.3mW/℃.

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■ RECOMMENDED OPERATING CONDITIONS (Ta=25℃)

Item	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	5.0	6.0	7.0	V
	V_{EE}	−5.0	−6.0	−7.0	V

■ ELECTRICAL CHARACTERISTICS-1 (V_{CC}=−V_{EE}=6.0V, Ta=25℃)

Item		Symbol	Test Conditions		Min	Typ	Max	Unit
Operating Supply Voltage Range		V_{CC}	Note 1		3	−	8	V
		V_{EE}			−3	−	−8	V
Differential Voltage Gain	Gain 1	A_{VD}	Note 2		250	400	600	
	Gain 2		Note 3		80	100	120	
	Gain 3		Note 4		8	10	12	
Bandwidth	Gain 1	BW	R_L=50 Ω		−	40	−	MHz
	Gain 2				−	90	−	
	Gain 3				−	120	−	
Rise Time	Gain 1	t_r	R_L=50 Ω, V_{out}=1V_{p-p}		−	10.5	−	ns
	Gain 2				−	4.5	12	
	Gain 3				−	2.5	−	
Propagation Delay Time	Gain 1	t_p	R_L=50 Ω, V_{out}=1V_{p-p}		−	7.5	−	ns
	Gain 2				−	6.0	10	
	Gain 3				−	3.6	−	
Input Resistance	Gain 1	R_{in}			−	4.0	−	kΩ
	Gain 2				10	30	−	
	Gain 3				−	250	−	
Input Capacitance	Gain 2	C_{in}			−	2.0	−	pF
Input Offset Current		I_{IO}			−	0.4	5.0	μA
Input Bias Current		I_I			−	9.0	30	μA
Input Noise Voltage		$V_{n(in)}$	R_L=50 Ω, BW=1kHz to 10MHz		−	12	−	μVrms
Input Voltage Range		V_I			±1.0	−	−	V
Common Mode Rejection Ratio	Gain 2	CMR	V_{CM}=±1V	f=100kHz	60	86	−	dB
				f=5MHz	−	60	−	
Power Supply Rejection Ratio	Gain 2	$PSRR$	ΔV_{CC}=±0.5V, ΔV_{EE}=±0.5V		50	70	−	dB
Input Offset Voltage	Gain 1	V_{IO}			−	0.6	1.5	V
	Gain2,3				−	0.35	1.5	
Output Common Mode Voltage		$V_{O(CM)}$			2.4	2.9	3.4	V
Peak to Peak Output Voltage		V_{op-p}			3.0	4.0	−	Vp-p
Output Sink Current		I_{sink}			2.5	3.6	−	mA
Output Resistance		R_{out}			−	20	−	Ω
Supply Current		I_{CC}			−	18	24	mA

■ ELECTRICAL CHARACTERISTICS-2 ($V_{CC}=-V_{EE}=6.0V$, $Ta=0$ to $+70°C$)

Item		Symbol	Test Conditions	Min	Typ	Max	Unit
Differential Voltage Gain	Gain 1	A_{VD}	Note 2	250	–	600	
	Gain 2		Note 3	80	–	120	
	Gain 3		Note 4	8	–	12	
Input Offset Current		I_{IO}		–	–	6.0	μA
Input Bias Current		I_I		–	–	40	μA
Input Voltage Range		V_I		±1.0	–	–	V
Common Mode Rejection Ratio	Gain 2	CMR	$V_{CM}=\pm1V$, $f\leqq100kHz$	50	–	–	dB
Power Supply Rejection Ratio	Gain 2	$PSRR$	$\Delta V_{CC}=\pm0.5V$, $\Delta V_{EE}=\pm0.5V$	50	–	–	dB
Input Offset Voltage	All Gain	$V_{O\,off}$		–	–	1.5	V
Peak to Peak Output Voltage		$V_{op\text{-}p}$		2.8	–	–	Vp-p
Output Sink Current		I_{sink}		2.5	–	–	mA
Supply Current		I_{CC}		–	–	27	mA
Input Resistance	Gain 2	R_{in}		8.0	–	–	Ω

■ ELECTRICAL CHARACTERISTICS-3 ($V_{CC}=-V_{EE}=6.0V$, $Ta=-20$ to $+75°C$)

Item		Symbol	Test Conditions	Min	Typ	Max	Unit
Differential Voltage Gain	Gain 1	A_{VD}	Note 2	200	–	700	
	Gain 2		Note 3	70	–	130	
	Gain 3		Note 4	7	–	13	
Input Offset Current		I_{IO}		–	–	7	μA
Input Bias Current		I_I				50	μA
Input Voltage Range		V_I		±1.0	–	–	V
Common Mode Rejection Ratio	Gain 2	CMR	$V_{CM}=\pm1V$, $f\leqq100kHz$	46	–	–	dB
Power Supply Rejection Ratio	Gain 2	$PSRR$	$\Delta V_{CC}=\pm0.5V$, $\Delta V_{EE}=\pm0.5V$	46	–	–	dB
Output Offset Voltage	All Gain	$V_{O\,off}$			–	1.5	V
Peak to Peak Output Voltage		$V_{op\text{-}p}$		2.8	–	–	Vp-p
Output Sink Current		I_{sink}		2.5	–	–	mA
Supply Current		I_{CC}		–	–	29	mA
Input Resistance	Gain 2	R_{in}		7.0	–	–	kΩ

Note 1. In this range, the apmlifier can be operating.
2. Connect G1 and G2.
3. Connect G1 and G3.
4. Open all of the terminals for gain select.

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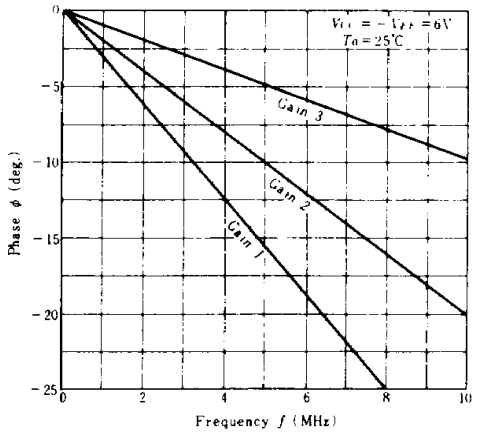
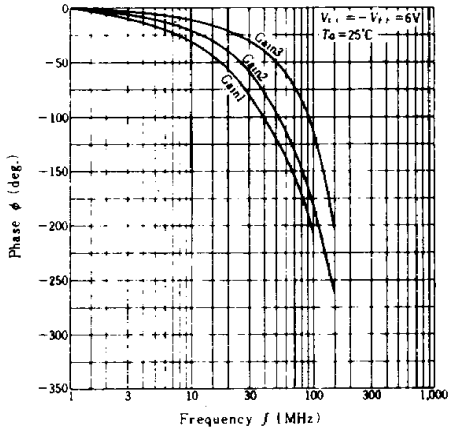
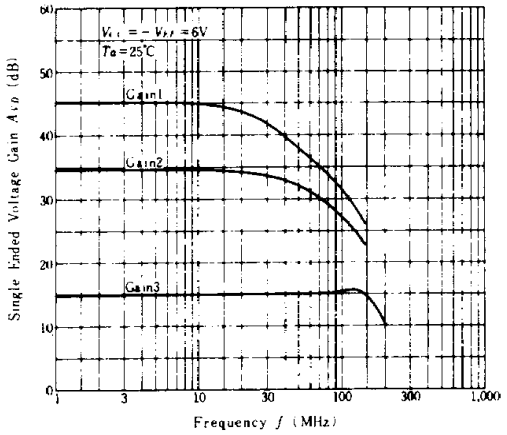
PHASE VS. FREQUENCY (1)



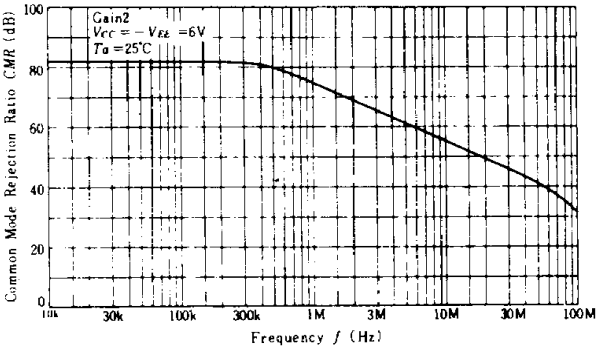
PHASE VS. FREQUENCY (2)



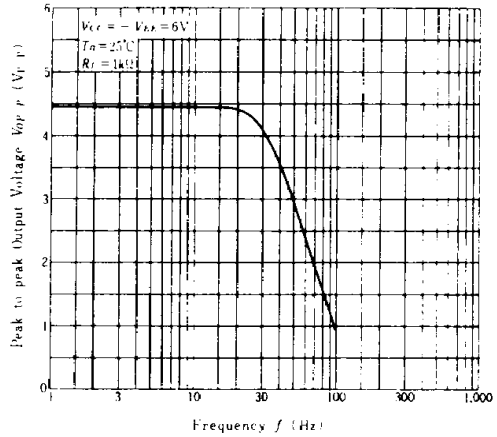
SINGLE ENDED VOLTAGE GAIN VS. FREQUENCY



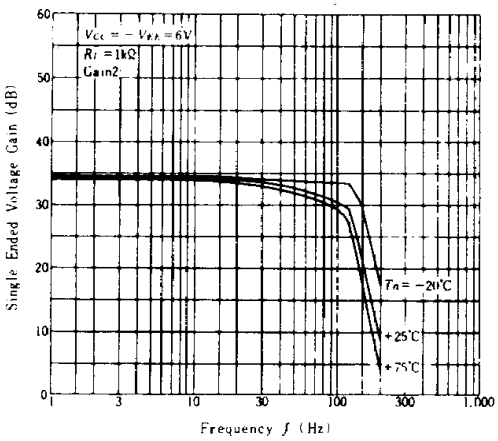
COMMON MODE REJECTION RATIO VS. FREQUENCY



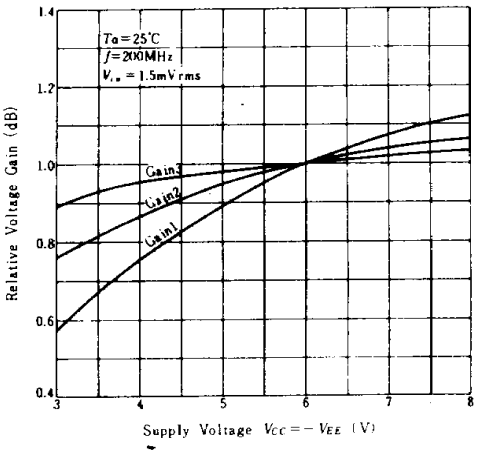
PEAK-TO-PEAK OUTPUT VOLTAGE VS. FREQUENCY



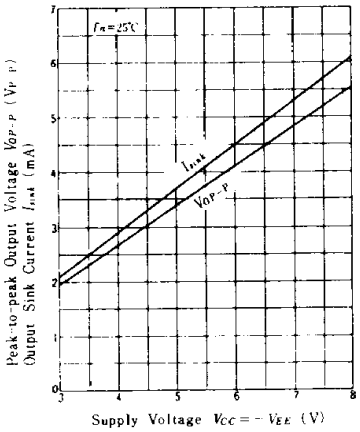
SINGLE ENDED VOLTAGE GAIN VS. FREQUENCY



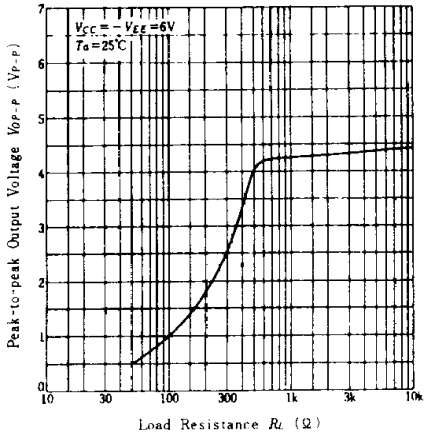
RELATIVE VOLTAGE GAIN VS. SUPPLY VOLTAGE



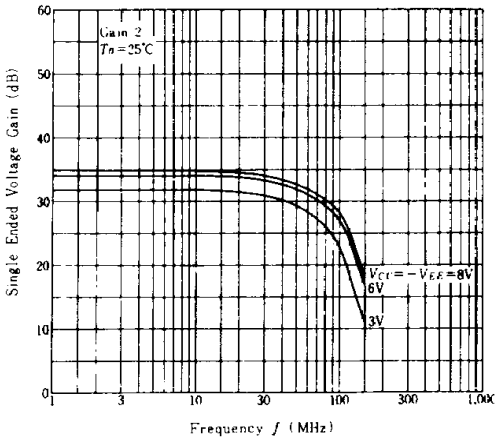
PEAK-TO-PEAK OUTPUT VOLTAGE, OUTPUT SINK CURRENT VS. SUPPLY VOLTAGE



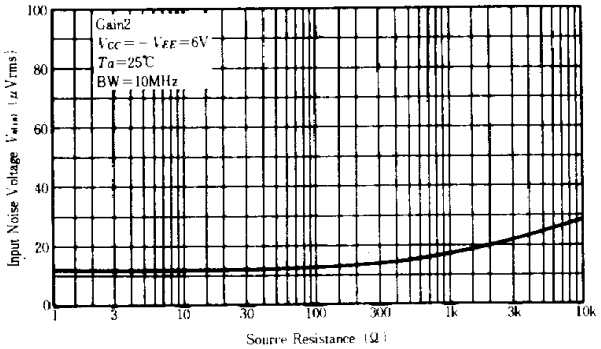
PEAK-TO-PEAK OUTPUT VOLTAGE VS. LOAD RESISTANCE



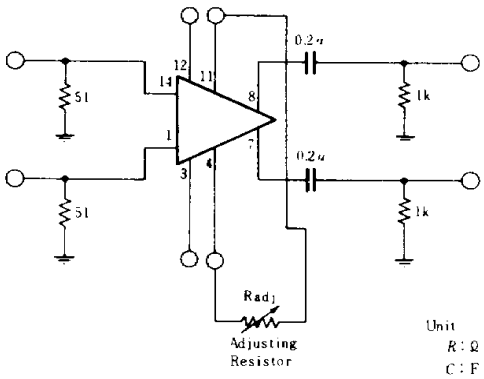
SINGLE ENDED VOLTAGE GAIN VS. FREQUENCY



INPUT NOISE VOLTAGE VS. SOURCE RESISTANCE



DIFFERENTIAL VOLTAGE GAIN ADJUSTING CIRCUIT



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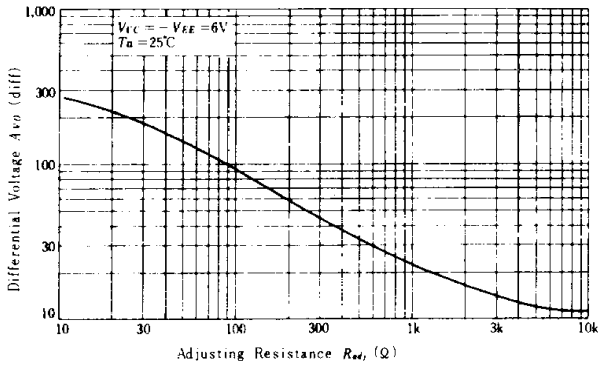
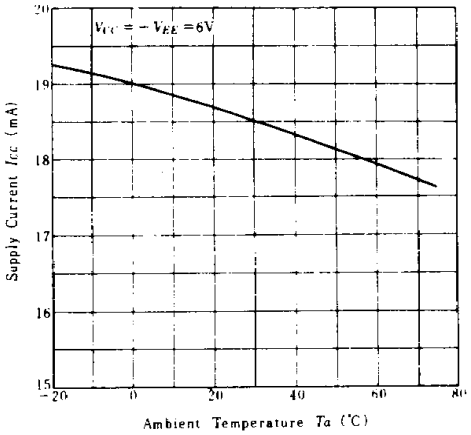
DIFFERENTIAL VOLTAGE GAIN VS. ADJUSTING RESISTANCE



SUPPLY CURRENT VS. AMBIENT TEMPERATURE



SUPPLY CURRENT VS. SUPPLY VOLTAGE