

Video Accessory ICs

VCA for Video Signal Level Adjustment



BA7655AF

No.11069EBT04

●Description

The BA7655AF is a VCA (Voltage Controlled Amplifier) IC that was developed for VCR, DVC, or other video signal level adjustment. It has two built-in amplifier circuits in which the voltage gain can be varied from -6 dB to +6 dB by adjusting the voltage of the control pin. Moreover, when the CTL pin voltage is set to 1 V or less, it is in power save mode, in which the current is reduced and output is muted.

●Features

- 1) Broadband frequency characteristics
- 2) Wide dynamic range
- 3) Low power consumption
- 4) Can mute output
- 5) Voltage gain temperature drift is small

●Applications

For VCR, DVC, and other video signal level adjustment

●Absolute Maximum Ratings(Ta=25°C)

Parameter	Symbol	Ratings	Unit
Supply Voltage	V _{CCMAX.}	8.0	V
Power dissipation	P _d	350 ^{*1}	mW
Operating temperature	T _{opr}	-20 ~ +80	°C
Storage temperature	T _{stg}	-55 ~ +125	°C

*1 Derating is done at 3.5mW/°C above Ta=25°C. (When mounted on a 50mm × 50mm PCB board.)

●Operating Range(Ta=25°C)

Parameter	Symbol	Ratings	Unit
Supply voltage	V _{CC}	4.5 ~ 5.5	V

●Electrical characteristics (Unless otherwise noted, $T_a=25^\circ\text{C}$, $V_{CC}=5.0\text{V}$)

Parameter		Symbol	Limits			Unit	CTL Voltage(V)	Conditions
			Min.	Typ.	Max.			
circuit current	One channel	ICC1	—	4.6	7.0	mA	3.0	CTL voltage set to 1 V or less if using only one channel
	Both channels	ICC2	—	7.8	12.0			
Maximum output voltage		VMax.	2.5	2.8	—	V _{P-P}	5.0	f=1kHz, THD=1%
Frequency characteristics		Gf	-1.0	0.0	1.0	dB	3.0	f=13MHz / 1MHz, $V_{IN}=0.5 V_{P-P}$
Minimum voltage gain		GVMin.	-8.0	-6.0	-4.0	dB	2.0	f=1MHz
Maximum voltage gain		GVMax.	4.0	6.0	8.0	dB	5.0	f=1MHz
Secondary harmonic distortion		2HD	—	-4.0	—	dB	3.0	f=5.0MHz, $V_{IN}=1 V_{P-P}$
Audio distortion		AD	—	1.0	—	%	3.0	f=1kHz, $V_{IN}=1 V_{P-P}$
Muting output voltage		VMUTE	—	—	100	mV	1.0	CTL voltage set to 1 V or less
Video S/N *		VS/N	—	-60	—	dB	3.0	
Audio S/N *		AS/N	—	-60	—	dB	3.0	

*Items having this mark are reference values.

© This product is not designed for protection against radioactive rays.

●Block diagram

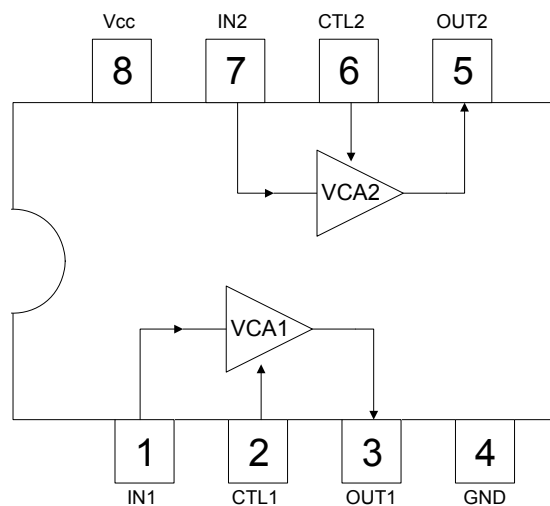
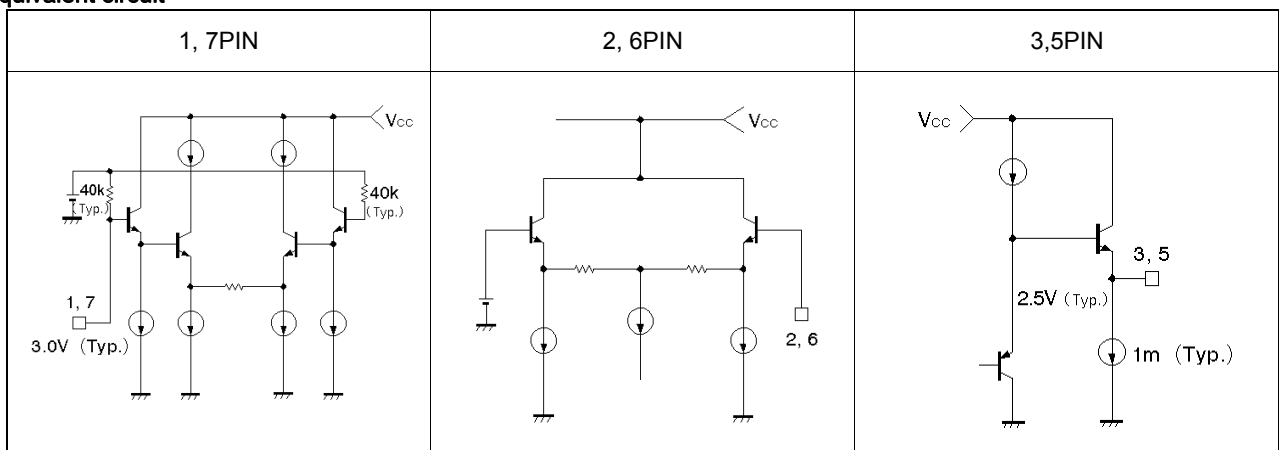


Fig.1

●Equivalent circuit



●Descriptions of operations

A VCA is an amplifier in which voltage gain can be varied by a control voltage, and in the BA7655AF, the voltage gain can be varied from -6 dB to +6 dB by regulating the CTL pin voltage between 2 V and 5 V (if $V_{CC}=5\text{ V}$) as shown in the figure to the right. Moreover, it contains two circuits and when using only one circuit, setting the CTL pin voltage of the unused circuit to 1 V or less moves it to power save mode, in which the circuit current is reduced approximately 40% and the output is muted.

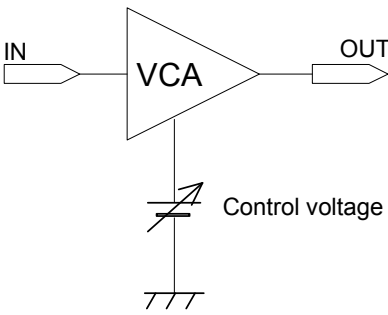


Fig.3

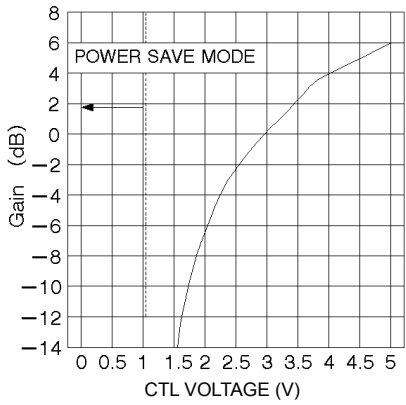


Fig.2 Voltage gain vs. Control voltage

CTL Voltage	Status
2V ~ 5V	Variable gain
1V or less	Power save

●Application circuit

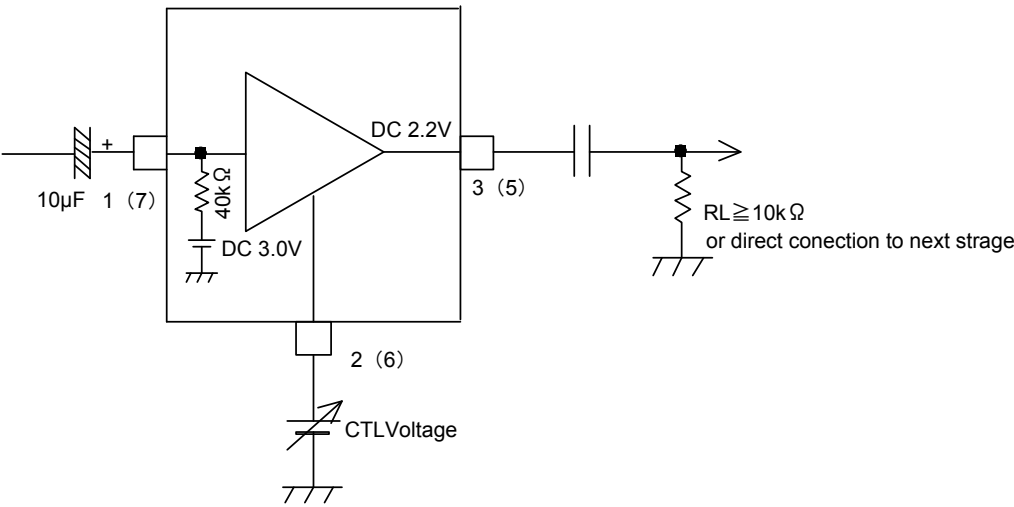


Fig.4

●Reference data

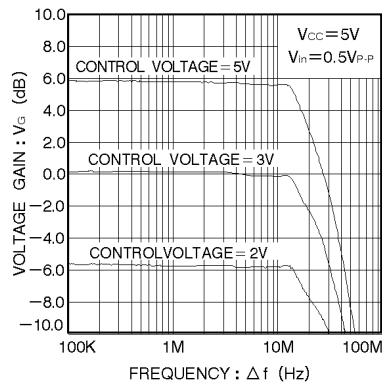


Fig.5 Voltage gain vs frequency characteristics

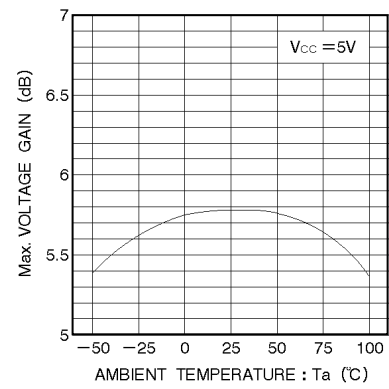


Fig.6 Maximum voltage gain vs temperature

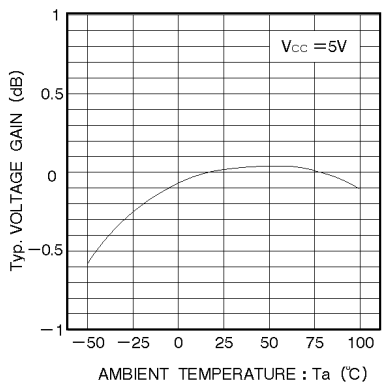


Fig.7 Voltage gain vs temperature

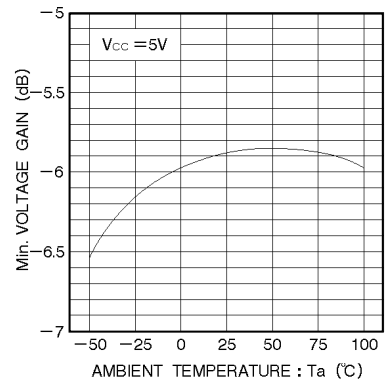


Fig.8 Minimum voltage gain vs temperature

●Notes for use

- 1) Numbers and data in entries are representative design values and are not guaranteed values of the items.
- 2) Although we are confident in recommending the sample application circuits, carefully check their characteristics further when using them. When modifying externally attached component constants before use, determine them so that they have sufficient margins by taking into account variations in externally attached components and the Rohm LSI, not only for static characteristics but also including transient characteristics.
- 3) Absolute maximum ratings
If applied voltage, operating temperature range, or other absolute maximum ratings are exceeded, the LSI may be damaged. Do not apply voltages or temperatures that exceed the absolute maximum ratings. If you think of a case in which absolute maximum ratings are exceeded, enforce fuses or other physical safety measures and investigate how not to apply the conditions under which absolute maximum ratings are exceeded to the LSI.
- 4) GND potential
Make the GND pin voltage such that it is the lowest voltage even when operating below it. Actually confirm that the voltage of each pin does not become a lower voltage than the GND pin, including transient phenomena.
- 5) Thermal design
Perform thermal design in which there are adequate margins by taking into account the allowable power dissipation in actual states of use.
- 6) Shorts between pins and misinstallation
When mounting the LSI on a board, pay adequate attention to orientation and placement discrepancies of the LSI. If it is misinstalled and the power is turned on, the LSI may be damaged. It also may be damaged if it is shorted by a foreign substance coming between pins of the LSI or between a pin and a power supply or a pin and a GND.
- 7) Operation in strong magnetic fields
Adequately evaluates use in a strong magnetic field, since there is a possibility of malfunction.
- 8) Be sure to use input by capacitor coupling.
It cannot be used by direct connection. Find the capacitance of the coupling capacitor from the lowest frequency needed by the signal used according to the following expression. Use of 10 μ F is recommended when inputting a video signal.
 $C \geq 1/(2\pi fR)$ Where f is the lowest frequency used and R is the 40 k Ω input resistance built-in in the IC
- 9) The maximum input signal is 1.4 Vpp for a sine wave (such as a chroma signal) and 1.0 Vpp for a video signal (such as a Y or a composite signal).
- 10) The output drivability is on the order of 10 K Ω .
Moreover, the output DC potential is approximately 2.2 V. On the output side, direct connection to the next stage also is possible if only the conditions are met.

●Ordering part number

B	A
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Part No.

7	6	5	5	A
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Part No.

F

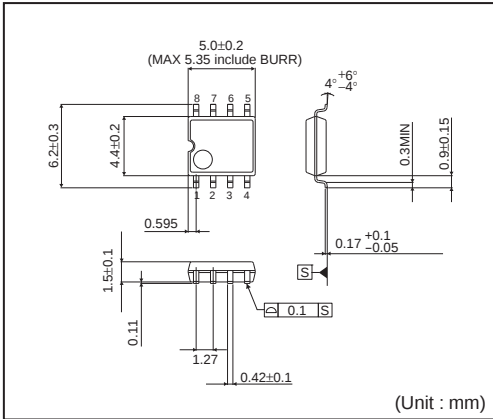
Package
F: SOP8

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E	2
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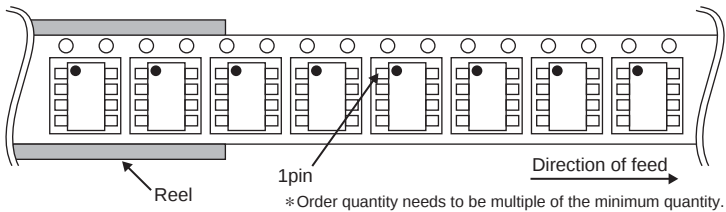
Packaging and forming specification
E2: Embossed tape and reel

SOP8



<Tape and Reel information>

Tape	Embossed carrier tape
Quantity	2500pcs
Direction of feed	E2 (The direction is the 1pin of product is at the upper left when you hold reel on the left hand and you pull out the tape on the right hand)



Notes

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