

FG/CTL amplifier

BA6405F

The BA6405F is a dual channel signal amplifier with a built-in waveform shaping circuit. One channel consists of a limiter amplifier and a hysteresis comparator, and the other channel consists of an operational amplifier (only one pin is projected outside) and a comparator amplifier. The former channel is suited for CTL amplifiers in VCRs, and the latter channel is suited for FG amplifiers.

●Applications

VCRs, audio equipment

●Features

- 1) Built-in two operational amplifier circuits, one comparator circuit, and one hysteresis comparator circuit
- 2) High open-loop gain
- 3) Low noise level
- 4) Best suited for use as FG and CTL amplifiers in VCRs

●Absolute maximum ratings (Ta=25°C)

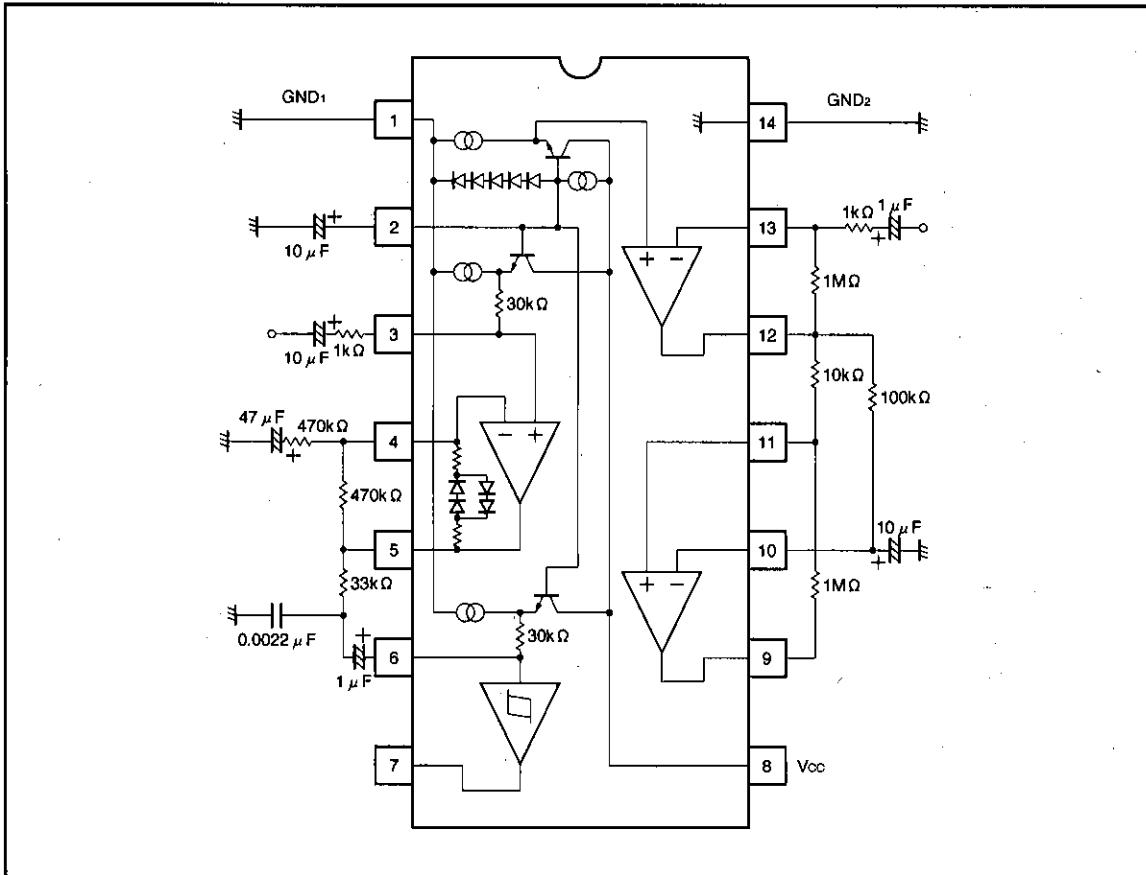
Parameter	Symbol	Limits	Unit
Power supply voltage	V _{cc}	12	V
Power dissipation	P _d	300 *	mW
Operating temperature	T _{opr}	-25~75	°C
Storage temperature	T _{stg}	-55~125	°C

* Reduce power by 3 mW for each degree above 25°C.

●Recommended operating conditions

Parameter	Symbol	Limits	Unit
Operating power supply voltage	V _{cc}	4.5~6.0	V

● Block diagram



VCR components FG/CTL amplifiers

●Electrical characteristics (unless otherwise noted, Ta=25°C, Vcc=5.0 V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Current consumption	I _{CC}	1.8	3.3	4.8	mA	—
CTL amplifier bias voltage	V _{B3}	2.1	2.45	2.8	V	3pin
CTL amplifier open loop gain	G _{VO CTL}	65	—	—	dB	3, 4, 5pin f=500Hz
CTL amplifier cut-off frequency	F _{C CTL}	500	—	—	Hz	3, 4, 5pin G _{vc} =60dB
CTL amplifier input bias current	I _{B4}	—	30	100	nA	4pin
CTL amplifier input conversion noise	N _{CTL}	—	1	6	μV _{rms}	3, 4, 5pin R _g =1kΩ DIN AUDIO
CTL amplifier maximum output voltage	V _{OM CTL}	2.5	3.3	—	V _{P-P}	5pin
FG amplifier input bias current	I _{B13}	—	50	250	nA	13pin, V _O =3.0V
FG amplifier input conversion noise	N _{FG}	—	1	6	μV _{rms}	12pin R _g =1kΩ DIN AUDIO
FG amplifier open loop gain	G _{VO FG}	65	—	—	dB	12, 13pin f=500Hz
FG amplifier cut-off frequency	F _{C FG}	500	—	—	Hz	12, 13pin G _{vc} =60dB
FG amplifier maximum output voltage	V _{OM FG}	2.5	3.4	—	V _{P-P}	12pin
Schmitt amplifier hysteresis	V _{hys}	±115	±150	±185	mV	6, 7pin
Schmitt amplifier LOW level output voltage	V _{OL7}	—	0.1	0.3	V	7pin I _{OL} =2mA
Comparator input offset voltage	V _{o11}	—6	0	6	mV	10, 11pin V _B =2.5V
Comparator input bias current 1	I _{B10}	—	50	250	nA	10pin V _C =2.0V, V _B =2.5V
Comparator input bias current 2	I _{B11}	—	50	250	nA	11pin V _C =3.0V, V _B =2.5V
Comparator LOW level output voltage	V _{OL9}	—	0.1	0.3	V	9pin I _{OL} =2mA
Pin-2 bias voltage	V _{B2}	2.7	3.05	3.4	V	2pin
Pin-7 pull-up resistance	R ₀₇	7	10	13	kΩ	7pin V _A =3.0V
Pin-9 pull-up resistance	R ₀₉	7	10	13	kΩ	9pin V _C =3.0V, V _B =2.5V

●Electrical characteristic curves

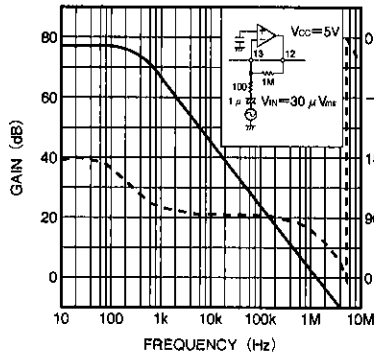


Fig. 1 FG amplifier frequency characteristics

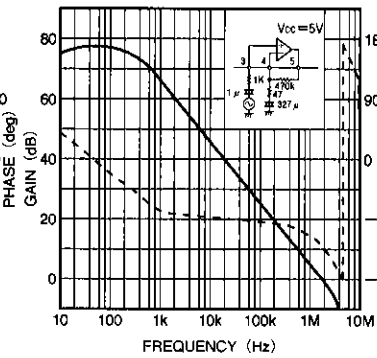


Fig. 2 CTL amplifier frequency characteristics

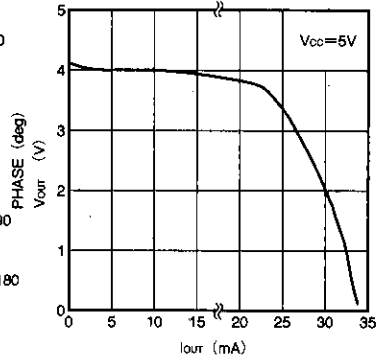


Fig. 3 CTL amplifier source current vs. output voltage

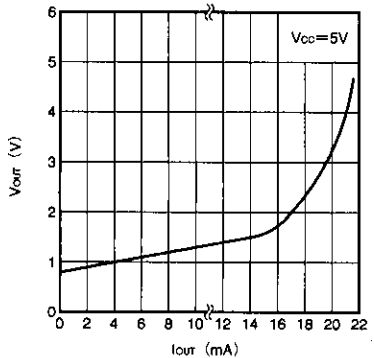


Fig. 4 CTL amplifier sink current vs. output voltage

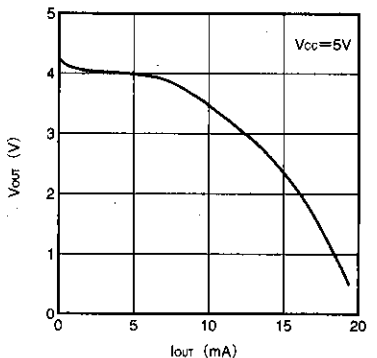


Fig. 5 FG amplifier source current vs. output voltage

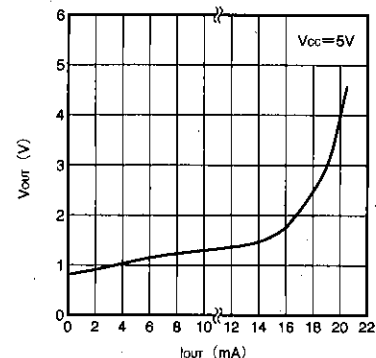


Fig. 6 FG amplifier sink current vs. output voltage

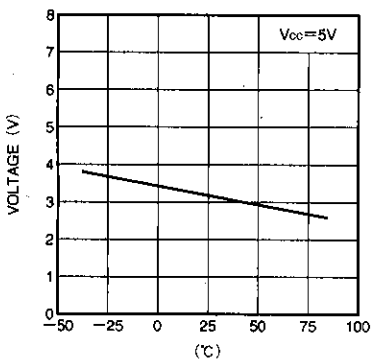


Fig. 7 Pin 2 DC bias voltage temperature characteristics

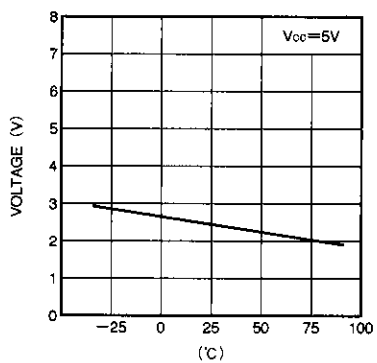


Fig. 8 Pin 3 bias voltage temperature characteristics

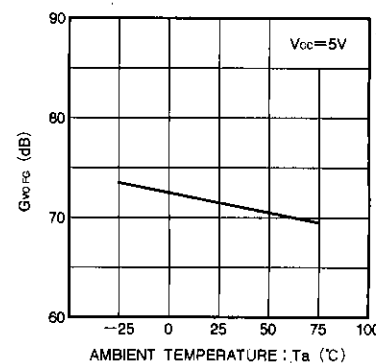


Fig. 9 FG amplifier gain temperature characteristics

FG/CTL amplifiers

VCR components

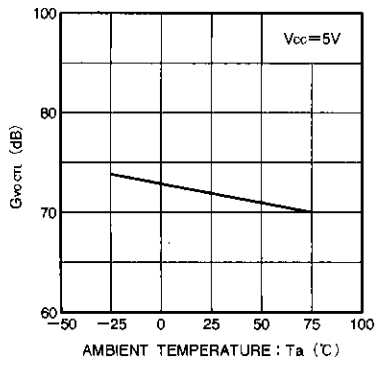
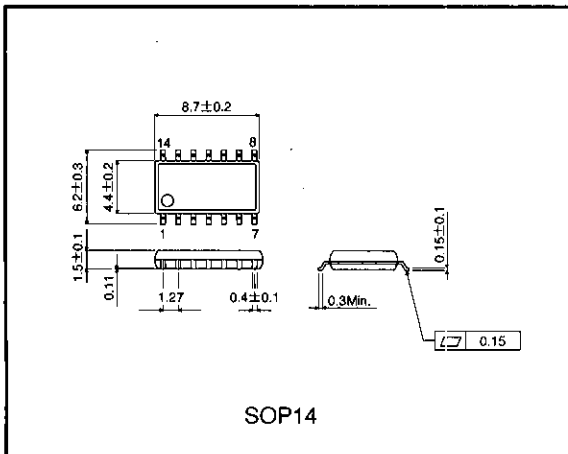


Fig. 10 CTL amplifier gain temperature characteristics

● External dimensions (Units: mm)



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