FG system speed servo controller BA6301 / BA6301F / BA6321

The BA6301, BA6301F, and BA6321 are single package servo control ICs suitable for controlling the speed of VCR motors. The ICs contain an F / V conversion section for speed control, a hysteresis amplifier section for waveform shaping, and an MIX amplifier section for speed / phase control output. They are compatible with either phase lagging or phase leading servo by setting the MIX system according to the phase servo control and MDA. They provide stable and efficient operation with either 5, 9, or 12V supply voltage. Motor speed can be controlled precisely at different levels with an FG program counter.

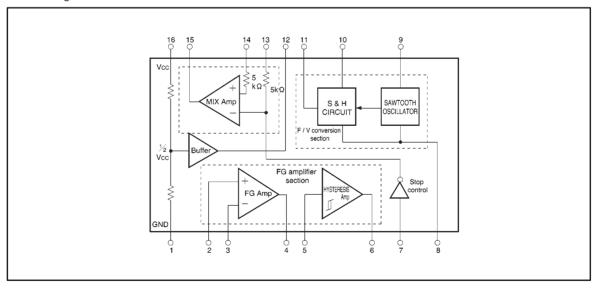
Applications

Speed control of capstan motors, drum head motors, reel motors, cassette players, and record players

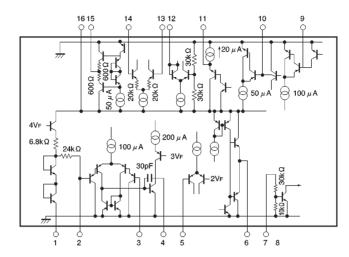
Features

- Motor speed can be controlled by an FG program counter.
- S / H type F / V converter allows servo control of various FG frequencies (BA6301 / F or BA6321 is used for fc greater or less than 600Hz, respectively)
- 3) Quick and precise motor starting.
- 4) Low current dissipation.
- 5) Wide range of operating voltage.
- 6) Limited number of external components.

Block diagram



Internal circuit configuration



●Absolute maximum ratings (Ta = 25°C)

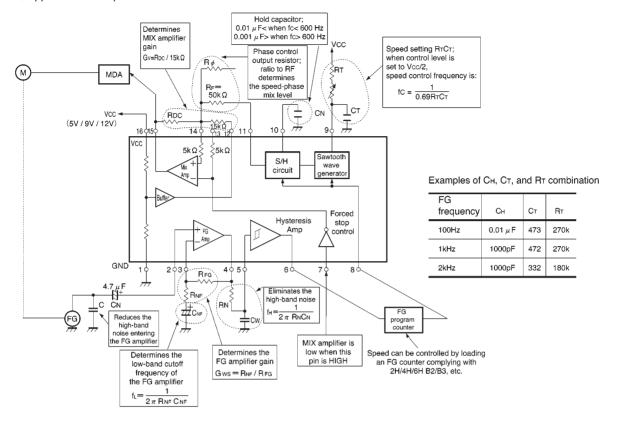
Parameter	Symbol	Limits	Unit
Power supply voltage	Vcc	15	٧
Power dissipation	Pd	450*	mW
Operating temperature	Topr	−20~+60	°
Storage temperature	Tstg	−55∼ +125	°C

^{*} Reduced by 4.5 mW for each increase in Ta of 1°C over 25°C.

●Electrical characteristics (unless otherwise noted, Ta = 25°C, Vcc=9V)

Parameter		Symbol	Min.	Тур.	Max.	Unit	Conditions
Operating voltage		Vcc	4.5	_	13.0	٧	_
Quiescent current		lo	1.1	2.2	4.4	mA	_
FG amplifier section	Open loop voltage gain	Gvo1	65	73	_	dB	R _{FG} =100kΩ
	Output level	VFGO	2.0	2.6	_	V _{P-P}	_
	Mean-hysteresis voltage	V _{hyM}	-130	-60	0	mV	Electric potential difference from pin3
	Hysteresis voltage width	V _{hyW}	30	70	110	mV	_
	Hysteresis amplifier output level	VhyO	6.0	7.0	_	V _{P-P}	$R_L=20k\Omega$
F / V converter section	Output temperature coefficient	ΔVFVT	_	-2	-5	mV / ℃	V _{FVO} =4.5V
	Output drift	ΔV _{FVD}	_	-0.05	-0.1	%/℃	V _{FVO} =4.5V
	Output level	VFVO	_	7.5	_	V _{P-P}	R _L =∞
MIX amplifier section	Open loop voltage gain	Gvo2	50	60	_	dB	_
	Output level	Vміхо	6.0	7.0	_	V _{P-P}	R _L =20kΩ
Mean-bias voltage		VBias	4.3	4.5	4.8	٧	_
Forced stop control	Forced stop threshold	V _{IN} TH	1.0	2.0	3.0	٧	V _{MIXO} <1.0V
	Input resistance	Rin	20	30	40	kΩ	_

Application example



Electrical characteristic curves

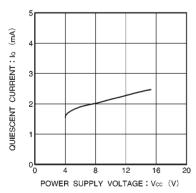


Fig.1 Quiescent current vs. power supply current

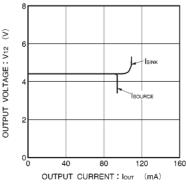


Fig.2 Pin-12 output voltagevs. output current

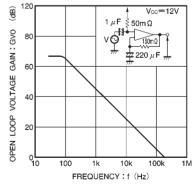


Fig.3 MIX amplifier open loop voltage gain vs. frequency

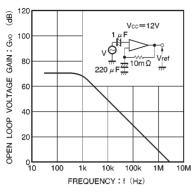


Fig.4 FG amplifier open loop voltage gain vs. frequency

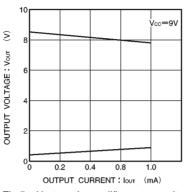


Fig.5 Hysteresis amplifier output voltage vs. output current

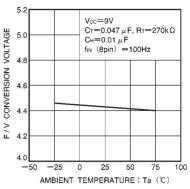
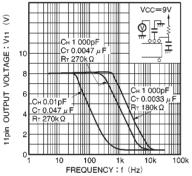


Fig.6 F / V conversion voltage temperature characteritic



Note: current sink capacity of pin 11 is about 20 μ A

Fig.7 F / V conversion characteritics (no load: pin11)

External dimensions (Units: mm)

