1541 SPEED CONTROL
A MAVERICK ACCESSORY

Please note that there are two basic drive types as far as we are concerned. These are those drives with the spring latch holding in the disk, and the type with the toggle latch. Both are set in exactly the same way, but the speed potentiometer is found in different locations. Also note that we have located and identified a 1541 II model that has **NO** potentiometer. We currently have no solution to that particular drive problem.

Toggle Door Model (1541/1541C/1451-II)

Turn your disk drive over and use a small phillips screwdriver to remove the four screws securing the drive cover. When done, lift the plastic cover from your drive and put aside. Next, if you still have the metal RF Shield in place, remove the two screws that secure it and lift it off also. Towards the front of the drive, locate the brown PC board. That board contains the potentiometer to control the drive speed. It is generally blue and yellow with a cross slot on top. Directly in front of the potentiometer, identify the resistor in location **R4** (We have found some boards with this resistor labeled as **R12**). Before installing the Speed Control, turn the knob fully counter-clockwise and then rotate clockwise about 10 degrees. The Speed Control device has two microclips on each wire lead. Simply attach the microclips on both ends of resistor **R4** or **R12**.

At this point, with the drive still open, you may attempt to load the Maverick. If the software loads successfully, load the Parameter Menu and then load any 8K RAM Needed parameter. Using the Check Target Speed option, and referring to your Maverick documentation if necessary, try to determine if the speed is in approximate range. If not, again refer to your Maverick Documentation, and adjust the potentiometer to suit.

If you are unable to load the Maverick to preform the speed check, we suggest that you disconnect one microclip. Load the Maverick, then the Parameter Menu, and load in any 8K Needed Parameter. While using the Check Target Speed option, again reconnect the microclip and adjust the potentiometer. This may, in some cases take a little hit and miss.

Once the speed has been set, reassemble the disk drive. You may use the double sided tape on the bottom of your Speed Control to mount it in any convenient location. Lead the wire out the back of your drive case, or a small notch cut into the case.

Spring Door Model (1541)

Turn your disk drive over and use a small phillips screwdriver to remove the four screws securing the drive cover. When done, lift the plastic cover from your drive and put aside. If necessary, remove the RF shield. Next, remove the six screws that hold the drive chassis to the bottom half of the plastic case. Carefully lift and remove the entire drive assembly from the plastic case, taking care not to drop it. Disconnect any wires preventing the operation, noting their position for future re-connection.

Next remove the screws (we counted seven) holding in the large PC board on top of the drive chassis. Again disconnect and note the position of any wires preventing the removal of the board. Next remove the drive unit from the chassis by unscrewing the four screws holding it in place. These are located at both sides of the chassis. Carefully lift and remove the drive unit by sliding it forward and out of the chassis.

Turn the drive unit over and locate the potentiometer in location **VR1**. In front of the potentiometer, locate the resister at location **R2**. Before installing the Speed Control, Before installing the Speed Control, turn the knob fully counter-clockwise and then rotate clockwise about 10 degrees. The Speed Control device has two microclips on each wire lead. Simply attach the microclips on each end of resistor **R2**. We suggest that you position the clips in the best possible direction, and lead the wires towards the rear of the drive unit, using masking tape to secure the wires from harm.

Using care, assemble the drive together in a loose fashion, as you may need to access the potentiometer at **VR1**. Connect all cables and before powering up, double check that no shorts are visible in the system.

Now, attempt to load the Maverick. If the software loads successfully, load the Parameter Menu and then load any 8K RAM Needed parameter. Using the Check Target Speed option, and referring to your Maverick documentation if necessary, try to determine if the speed is in approximate range. If not, you will have to again disassemble the drive and adjust the potentiometer at location **VR1**.

When all is well, reassemble the disk drive. You may use the double sided tape on the bottom of your Speed Control to mount it in any convenient location. Lead the wire out the back of your drive case, or a small notch cut into the case.

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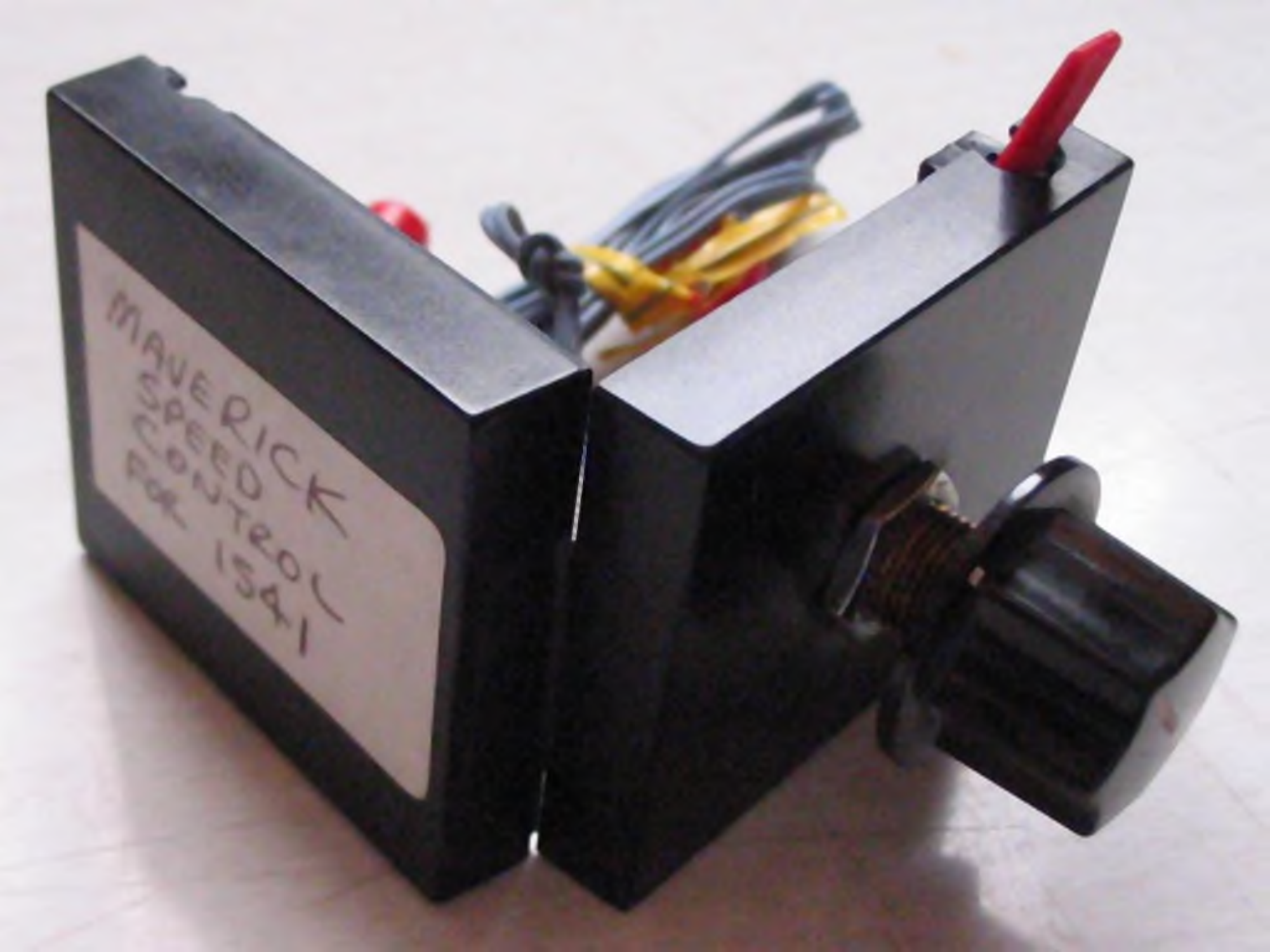
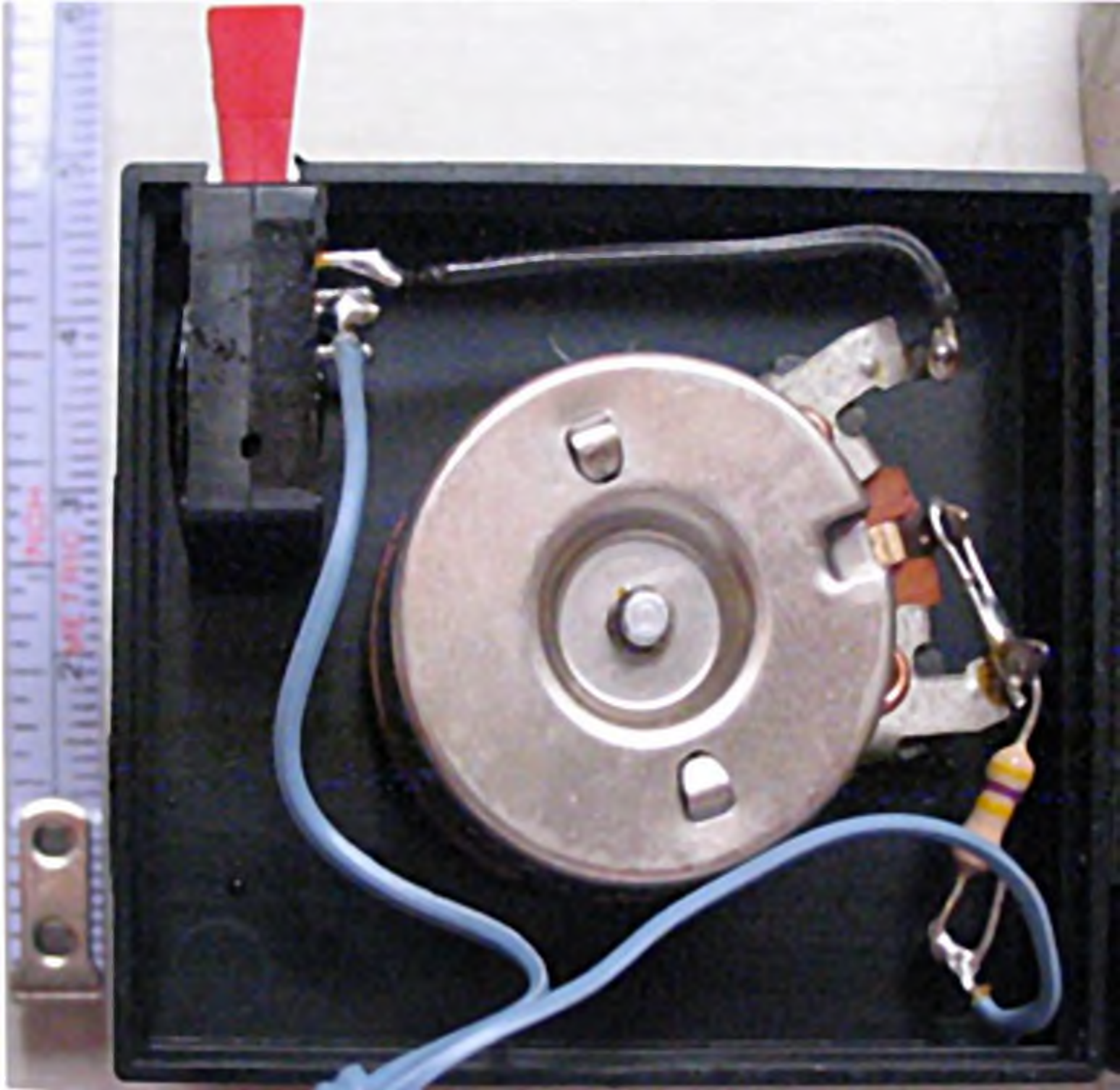
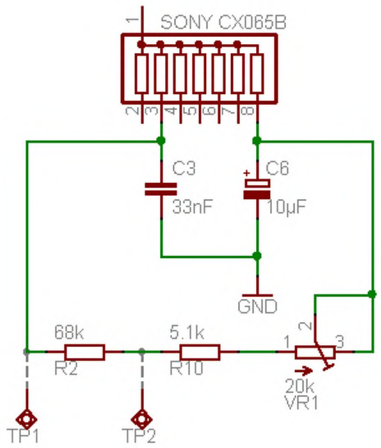
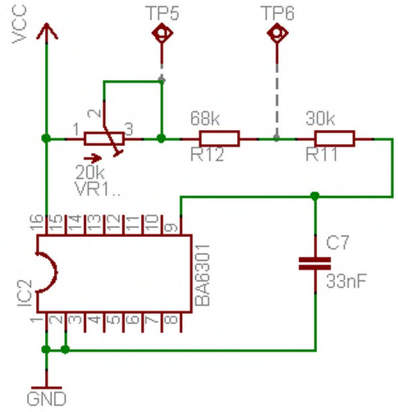

MAVERICK
SPEED
CONTROL
FOR
1541



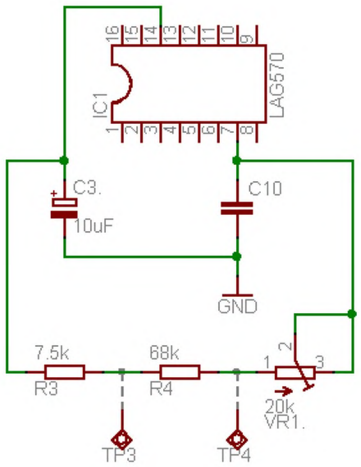
ALPS Motor Control Board Schematic (partly)



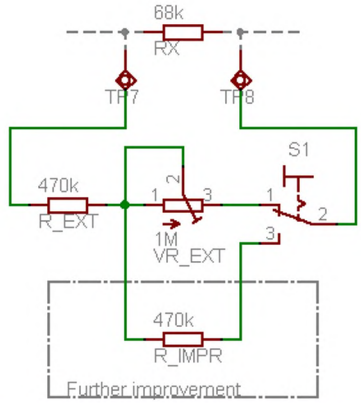
Newtronics Motor Control Board Schematic (partly, 1541-II non direct-driven motor)



Newtronics Motor Control Board Schematic (partly, 1541 A-1, A-2, B)



Speed Control Tap, in parallel to R2/R4/R12



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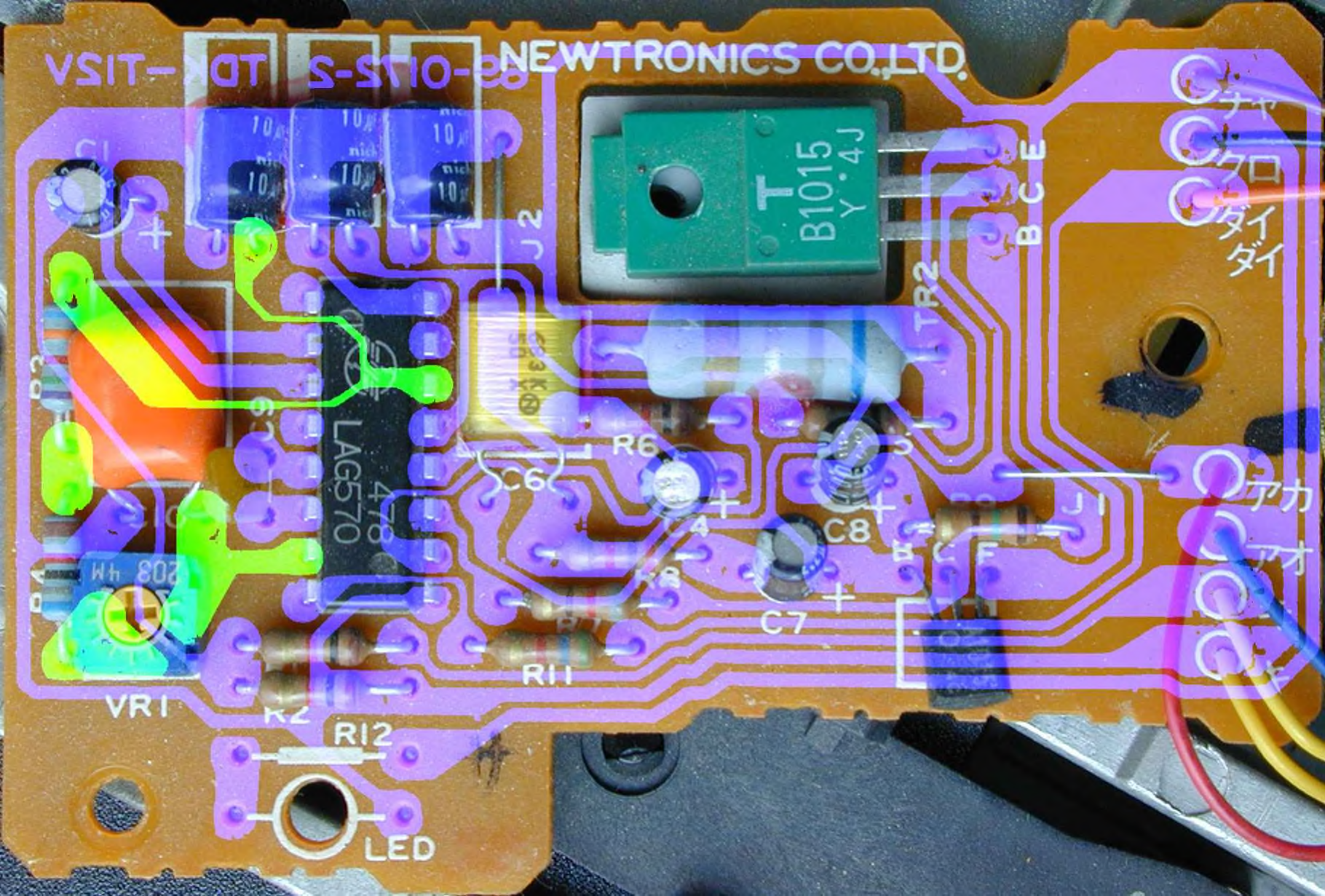
NEWTRONICS CO.,LTD.
B1015
Y·4J
LAG570
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R12
LED
C6
R6
C8
C7
R11
TR2
J1
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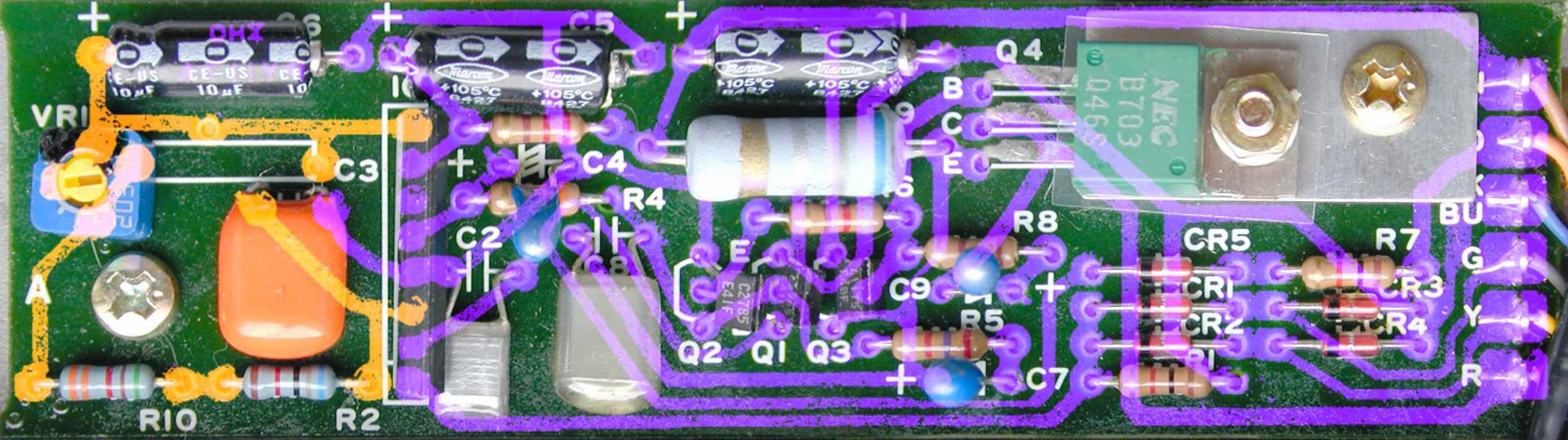
VRI
C3
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C5
C4
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C8
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R10
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Q2
Q1
Q3
C9
R5
C7
R8
Q4
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NEC
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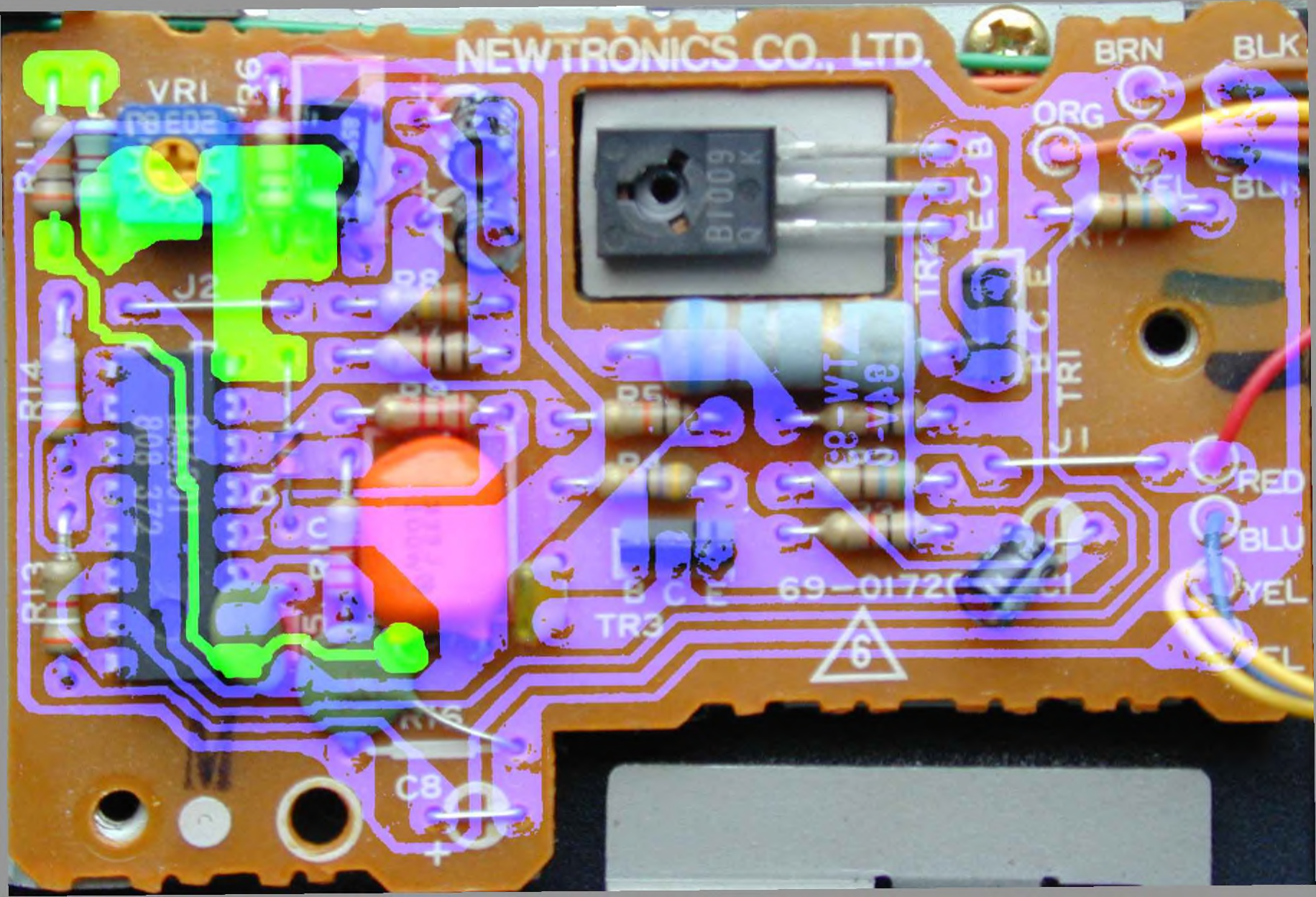

NEWTRONICS CO., LTD.
BRN
BLK
ORG
YEL
VR1
R6
R1
J2
R8
R9
R5
R4
R3
TR2
TR1
J1
RED
BLU
YEL
TR3
C8
B1009
8-WT
8-V48
69-0172
6

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.

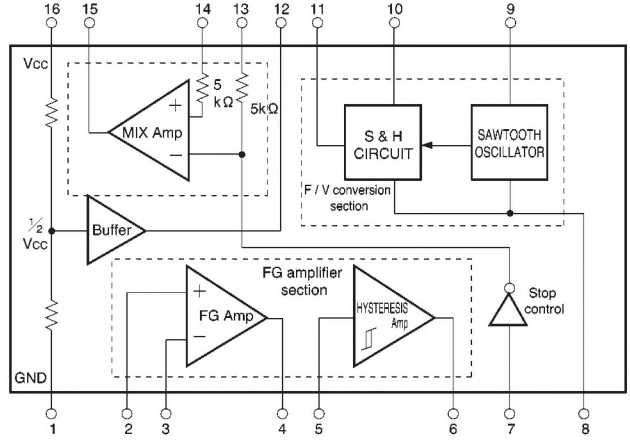
●Applications

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

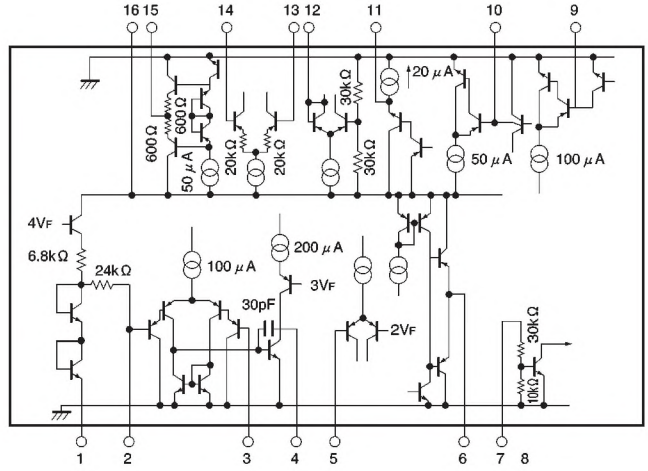
●Features

1) Motor speed can be controlled by an FG program counter.
2) S / H type F / V converter allows servo control of various FG frequencies (BA6301 / F or BA6321 is used for f_C 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)

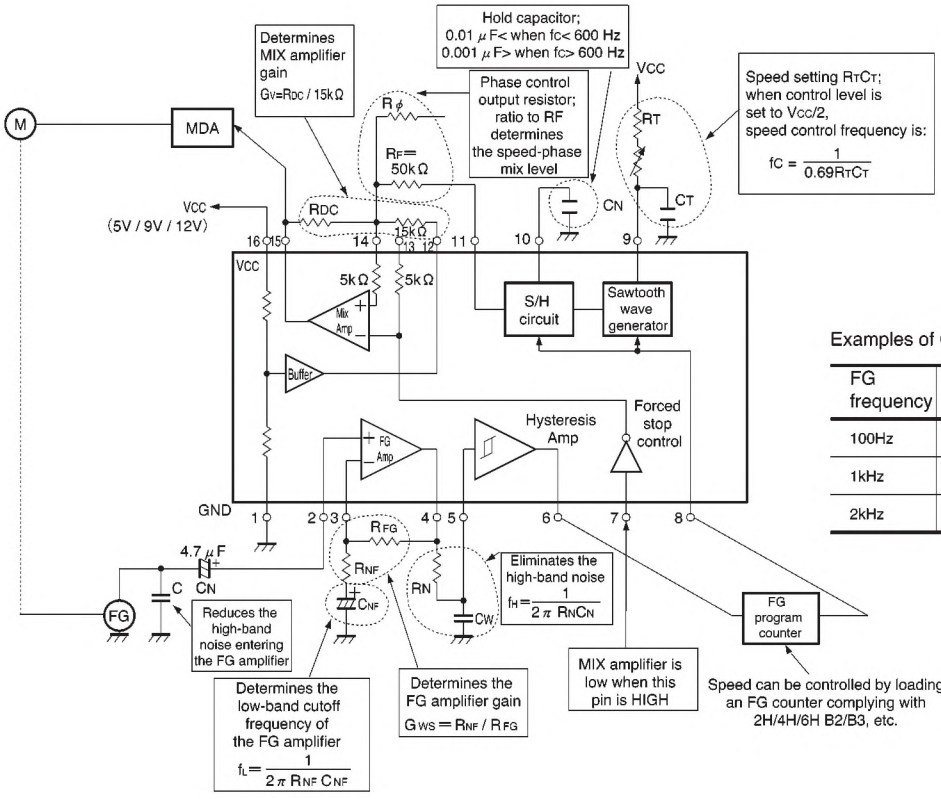
Parameter	Symbol	Limits	Unit
Power supply voltage	V_{CC}	15	V
Power dissipation	Pd	450*	mW
Operating temperature	Topr	−20～+60	℃
Storage temperature	Tstg	−55～+125	℃

* Reduced by 4.5 mW for each increase in Ta of 1℃ over 25℃.

●Electrical characteristics (unless otherwise noted, Ta = 25°C, V_{CC}=9V)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Operating voltage		V_{CC}	4.5	—	13.0	V	—
Quiescent current		Io	1.1	2.2	4.4	mA	—
FG amplifier section	Open loop voltage gain	G_{vo1}	65	73	—	dB	R_{FG}=100kΩ
	Output level	V_{FGO}	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	V_{hyO}	6.0	7.0	—	V_{P-P}	R_L=20kΩ
F / V converter section	Output temperature coefficient	ΔV_{FVT}	—	−2	−5	mV / ℃	V_{FVO}=4.5V
	Output drift	ΔV_{FVD}	—	−0.05	−0.1	% / ℃	V_{FVO}=4.5V
	Output level	V_{FVO}	—	7.5	—	V_{P-P}	R_L=∞
MIX amplifier section	Open loop voltage gain	G_{vo2}	50	60	—	dB	—
	Output level	V_{MIXO}	6.0	7.0	—	V_{P-P}	R_L=20kΩ
Mean-bias voltage		V_{Bias}	4.3	4.5	4.8	V	—
Forced stop control	Forced stop threshold	$V_{IN\ TH}$	1.0	2.0	3.0	V	V_{MIXO}＜1.0V
	Input resistance	R_{IN}	20	30	40	kΩ	—

●Application example



Examples of CH, CT, and RT combination

FG frequency	CH	CT	RT
100Hz	0.01 μF	473	270k
1kHz	1000pF	472	270k
2kHz	1000pF	332	180k

●Electrical characteristic curves

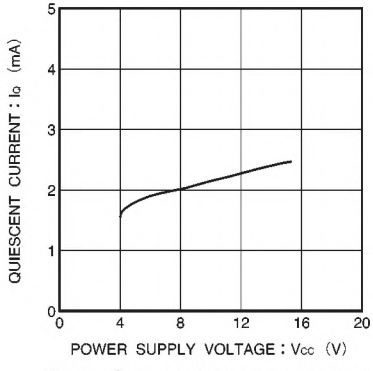


Fig.1 Quiescent current vs. power supply current

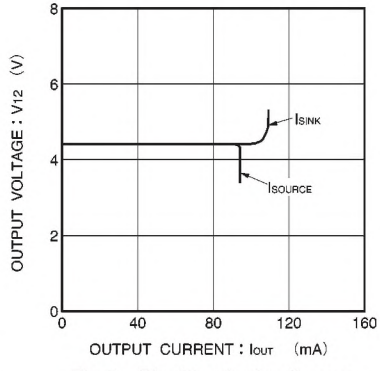


Fig.2 Pin-12 output voltagevs. output current

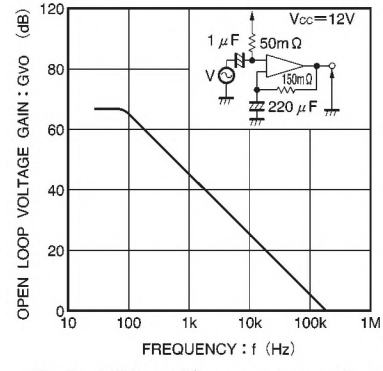


Fig.3 MIX amplifier open loop voltage gain vs. frequency

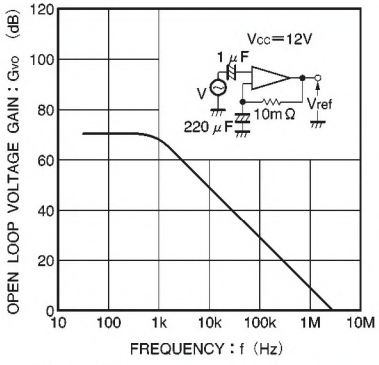


Fig.4 FG amplifier open loop voltage gain vs. frequency

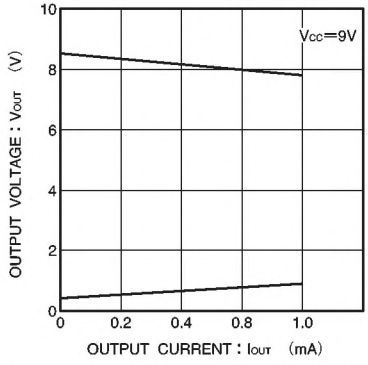


Fig.5 Hysteresis amplifier output voltage vs. output current

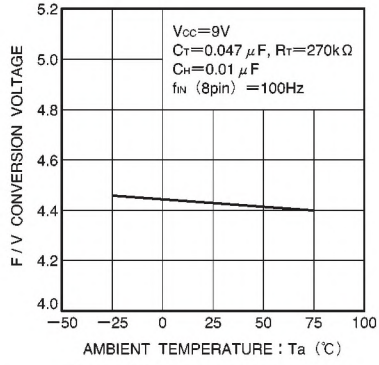
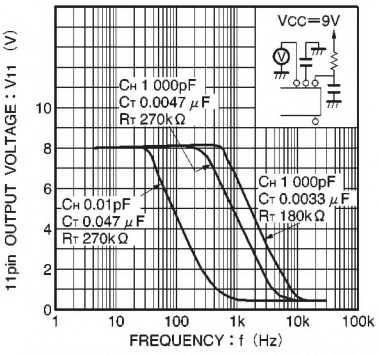


Fig.6 F / V conversion voltage temperature characteritic

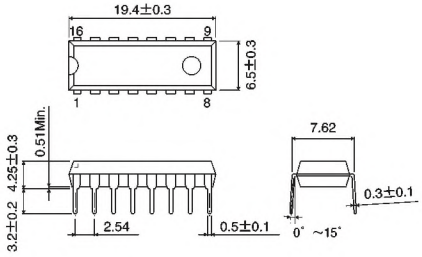


Note: current sink capacity of pin 11 is about 20 μA

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

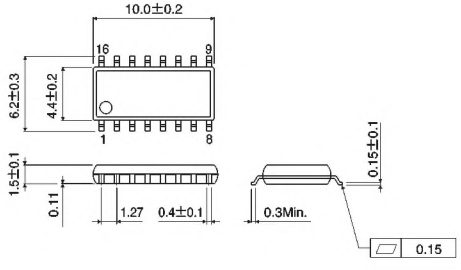
●External dimensions (Units: mm)

BA6301/BA6321



DIP16

BA6301F



SOP16