

eGuard EG2233: Installation and Set-up Procedures

A. Introduction:

EG2233 is a wireless communication system transmitting and receiving signals via radio frequencies. The standard operating centre of frequency is 9.5MHz with bandwidth of 1MHz. It is to be used with RF labels and/or hard tags. A systems is comprised of a receiver antenna, a transmitter antenna and a power supply.

B. Primary Technical Data:

<i>Transmitter</i>	Operating voltage.....	22VDC
	Operating current.....	< 300mA
	Fuse.....	250V, 1A,slow blow
	Centre frequency.....	9.5MHz
	Sweep Deviation.....	+/- 500KHz
	Sweep Rate.....	160Hz or 180Hz (factory setting at 180Hz)
<i>Receiver</i>	Operating voltage.....	22 DCV
	Operating current, stand-by.....	< 300mA
	Operating current, operating.....	< 380mA
	Fuse.....	250V, 1A,slow blow
	RF Bandwidth.....	9.0 ~ 10.0MHz

C. Installation Procedures:

To maximize the effectiveness of the systems, please consider the followings before affixing the position of the antennas:-

- (a) Under normal condition, the distance between antennas should not exceed
2.0 metre for Hard Tag of size (60mm in diameter or equivalent)
1.4 metre for RF labels (40x40mm)
Note that RF interference and background noise from the environment may limit the detection range.
Please check before installation.
- (b) The system will best function if position away from cashier, computer, data transmission line, power cable, fluorescent light, etc. To maximize sensitivity, we recommend a distance of not less than 1 metre.
- (c) Any metal boards or metal shelf should be placed at a distance of 0.5 metre away from the antenna.
- (d) To check whether metallic objects will affect the system, please follow the procedures below:-
 - i Place the two antennas at the location identified.
 - ii Connect the two antennas as per figure 1 and 2.
 - iii Once connected and switched on, the system will automatically analyze the environment for noise over a period of 30 seconds. Panel light on the Receiver antenna will change from amber to green.
 - iv If the LED does not lit up on DS1, DS2 and DS3 in the Rx Board, there is little noise in the environment.
 - v If DS1 lit up, the sensitivity may reduce by 10%. If both DS1 and DS2 lit up, the sensitivity may reduce by up to 20%. Should DS1, DS2 and DS3 all lit up, there is excessive noise in the environment and the system's sensitivity may reduce by more than 40%.
- (e) The antennas must be securely positioned and fixed to the ground. No swaying of the antennas is to be allowed.

Notes: When checking, must ensure no metal trolley passes through the detection area and antennas are free standing (no touching), otherwise, the automatic check up may malfunction resulting in lower detection rate.

D. Tuning Procedures:

The transformer is incorporated in the power supply box. To avoid any interference caused by other electronic appliances, the system should be powered by an independent power source. The power socket should adhere to safety standard and grounded.

1. Testing Transmitter Board (figure 1)

a. Adjusting Modulation Frequency

The modulation frequency is preset at the factory at 180Hz.

If two Transmitter Antennas are to be used within the same plane and synchronization is not feasible, dual modulation frequency will be required. However, if the antennas are within 8 metre apart, there may be some reduction in sensitivity.

If System A is operating at factory preset level i.e. 160Hz (JP5, disconnected) then System B's modulation frequency will need to be adjusted to 180Hz by connecting JP7.

b. Center Frequency (this is preset at the factory, no adjustment required)

To check, connect oscilloscope's probe to TP6 with grounding at TP8 and adjustment via R14. The reading should be at 9.5 +/- 0.05MHz.

c. Output Signal, RF (this is preset at the factory)

- i Adjustment required only if detection width is at less than 1m or above 1.6 metre
- ii Set oscilloscope at 20V/div and 2.5ms/div.
- iii Connect oscilloscope probe (x10) to TP7 with grounding at TP8.
- iv Adjust R23 until a SINE wave curve appears with a read out of 20~50 Vp-p (figure 3):-
20 +/-10 Vp-p for detection width of less than 1 metre; and
50 +/-10 Vp-p for detection width of over 1.6 metre.

2. Testing Receiver Board (figure 2)

a. Input Signal, RF (this is preset at the factory)

To check, set oscilloscope at 1mV/div and 2.5ms/div.

Connect oscilloscope's probe (x10) to TP1 with grounding at GND1.

Depending on the detection width, the input signal should read 2.0~9.0 Vp-p (figure 4).

b. 160~180Hz (this is preset at the factory)

- i To check, set oscilloscope at 200mV/div and 2.5ms/div.
- ii Connect oscilloscope's probe (x10) to TP2 with grounding at GND1.
- iii A curve will show with a reading of >0.4 Vp-p (figure 5).

c. Background Noise Limitation

For detection width of less than 1.6 metre: set JP1 and JP2 to position 2&3.

For detection width of over 1.6 metre: set JP1 and JP2 to position 1&2.

- i To check, set oscilloscope at 200mV/div and 2.5ms/div.
- ii Connect oscilloscope's probe (x10) to TP3 with grounding at GND2.
- iii Adjust VR1 (clockwise to increase, anti-clockwise to decrease) until amplitude of the noise signal reads 150mVp-p (figure 6).
- iv When a label/tag is detected, the reading will be similar to that of figure 7.

d. Timing of Alarm and Warning Light

Adjust VR2 (clockwise to extend the alarm and light on time, anti-clockwise to reduce the alarm and light on time). The time can vary from 1~4 seconds.

e. *Slide Switch (inside the metal sealing box)*

This is preset at the factory:-

SW1-1	ON
SW1-2	OFF
SW1-3	ON

This setting is for modulation frequency of 160Hz and suitable for both RF labels and tags. If only hard tags are to be used, SW1-1 should be positioned to OFF.

If the system is to operate under modulation frequency of 180Hz, please reset to the followings:-

SW1-1	ON or OFF
SW1-2	ON
SW1-3	ON

Note: After changes are made, please RESET for self-testing again.

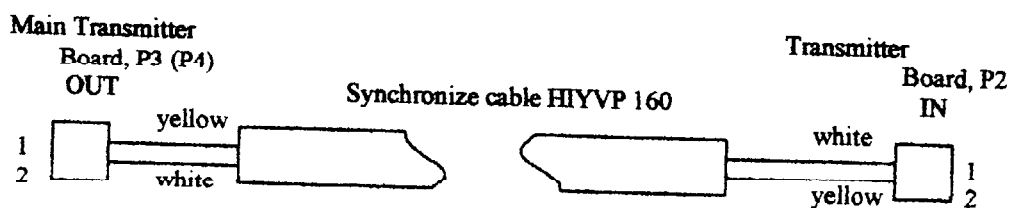
f. *Auto Testing Mode*

At factory setting, JP3 and JP4 (inside the metal sealing box) are in position 2~3, auto testing mode. Once installation completed and power switched on, the system will automatically examine background noise and interference signal for 30 seconds. Panel light on the Receiver antenna will change from amber to green. After auto testing, reposition JP3 and JP4 to 1~2. The system will maintain such readings and the auto-test function is switched off unless JP3 and JP4 are repositioned to 2~3.

Note: If changes made to the position of the Receiver antenna and /or Transmitter antenna, one must reactivate auto-test function by setting JP3 and JP4 to position 2~3 and press RESET. After auto testing (30 seconds), reposition JP3 and JP4 to 1~2.

E. **Multiple Connections, Synchronization**

If two receiver antennas are placed less than 10m apart, this will require multiple connection and synchronization. Please refer to Figure 8 and below.



P3 and P4 in the Main Transmitter Board are the output signal for multiple connections. In the slave transmitter boards, P2 is for input while P3 and P4 are for outputs. See figure 9.

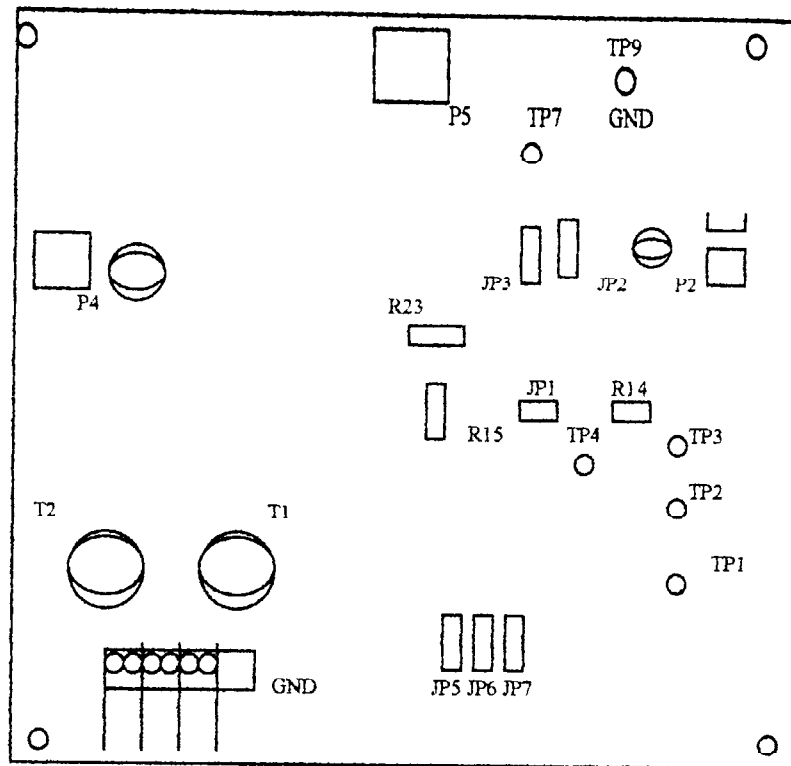
In the Main Transmitter Board, P3 and P4 are synchronized signal output channel and can be connected simultaneously. P2 at the other Transmitter Board is input channel with P3 and P4 the synchronized signal output channel as the Main Board.

F. JP setting for Multiple connections:

	JP1	JP2	JP3
Main Transmitter Board	1&2	1&2	1&2
Transmitter Board	1&2	2&3	2&3

After completion of multiple connection, the system will conduct self-examination again for 30 seconds after power is switched on as noted earlier.

Figure 1 – Transmitter Board (PCB)



22V 22V 22V
OUT OUT IN



To Power Supply, DC Output
To Receiver Board, DC Input

To a 2nd Receiver Board, DC Input (multiple connection)

Figure 2 – Receiver Board (PCB)

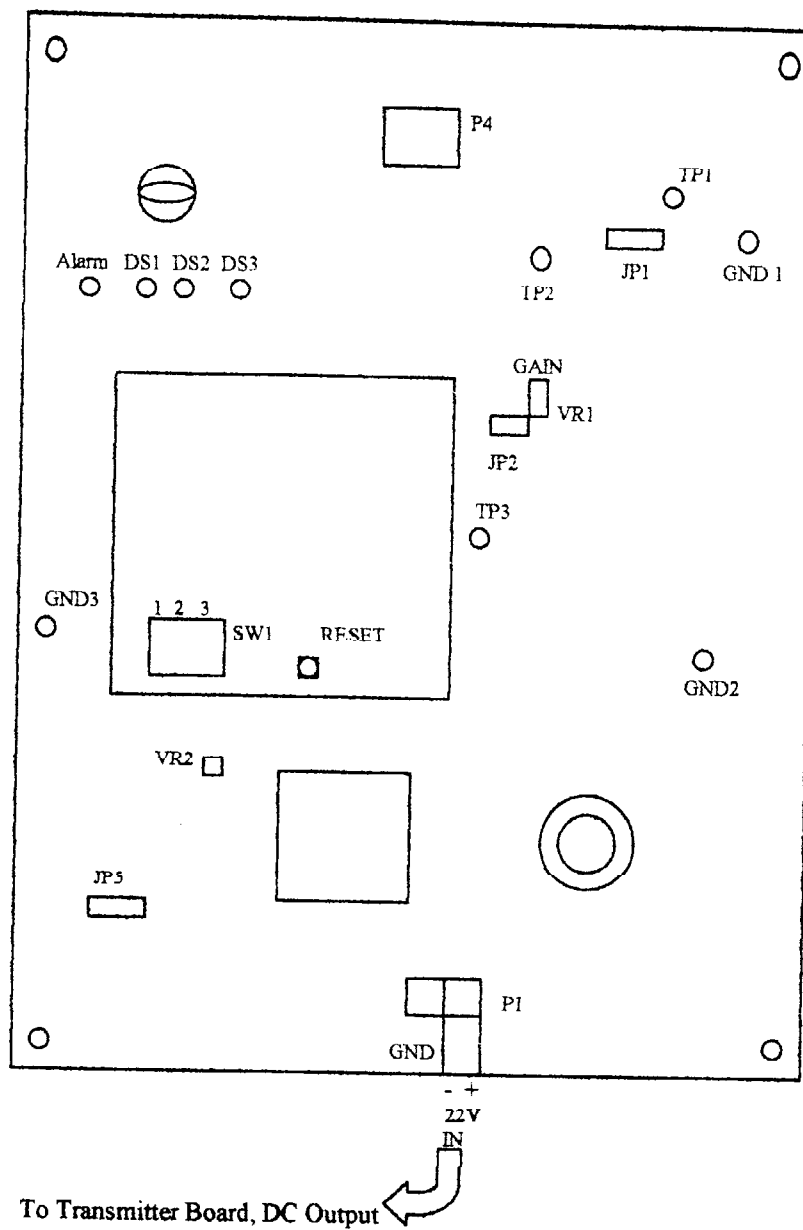
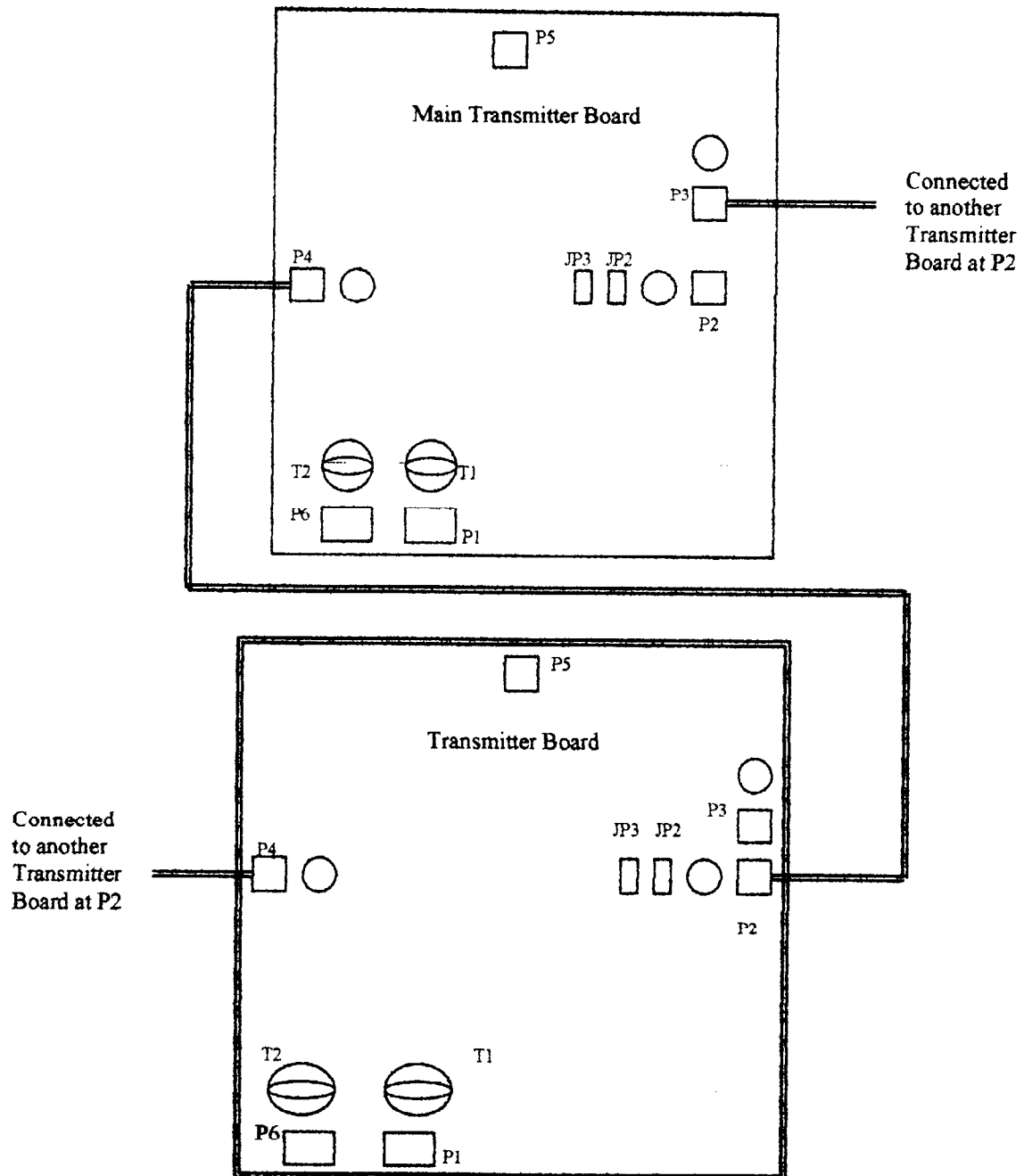


Figure 8 – Multiple Connections



Modifications not authorized by the manufacturer may void users authority to operate this device

NOTE:

This equipment has been tested and found to comply with limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

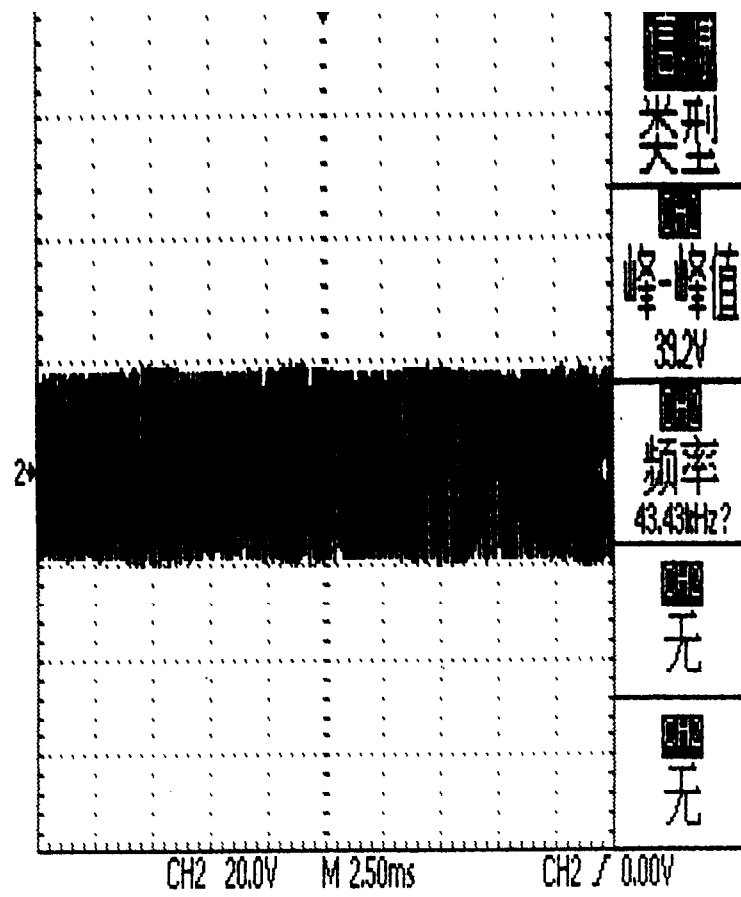


Figure 3

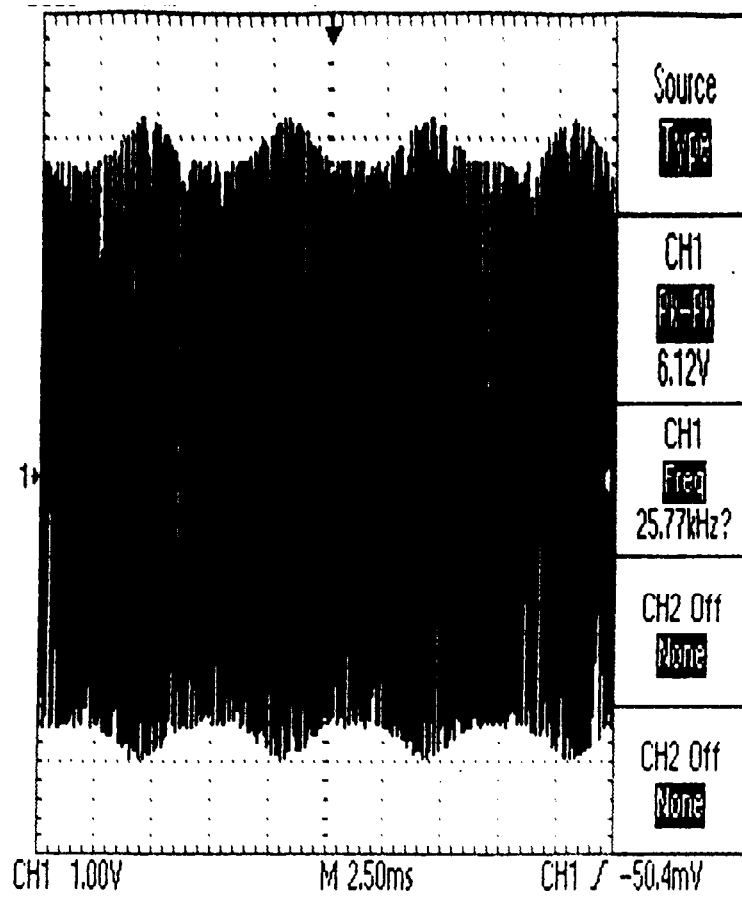


Figure 4

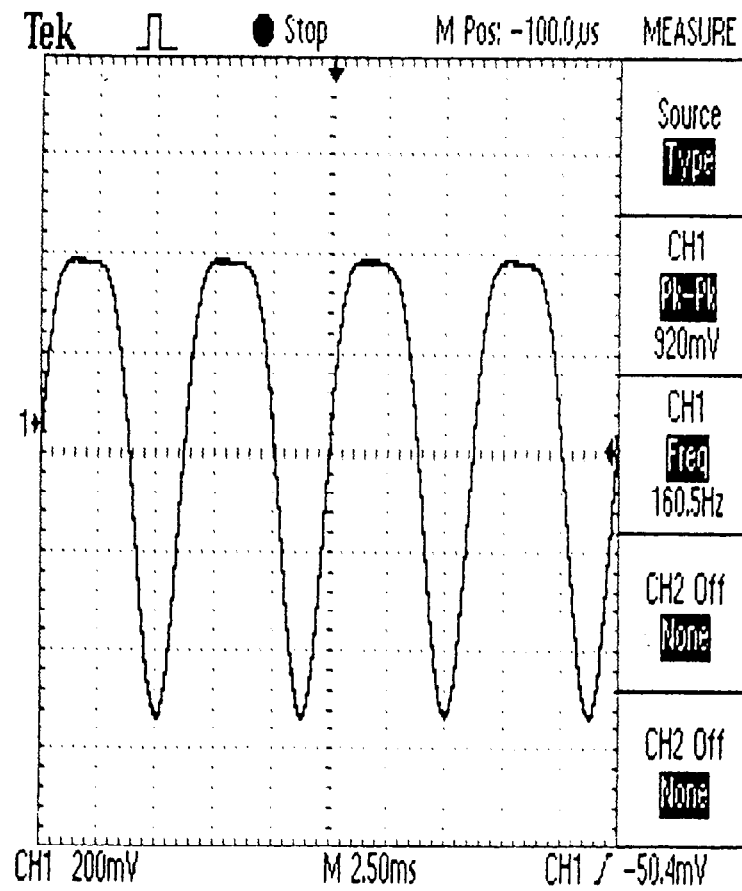


Figure 5

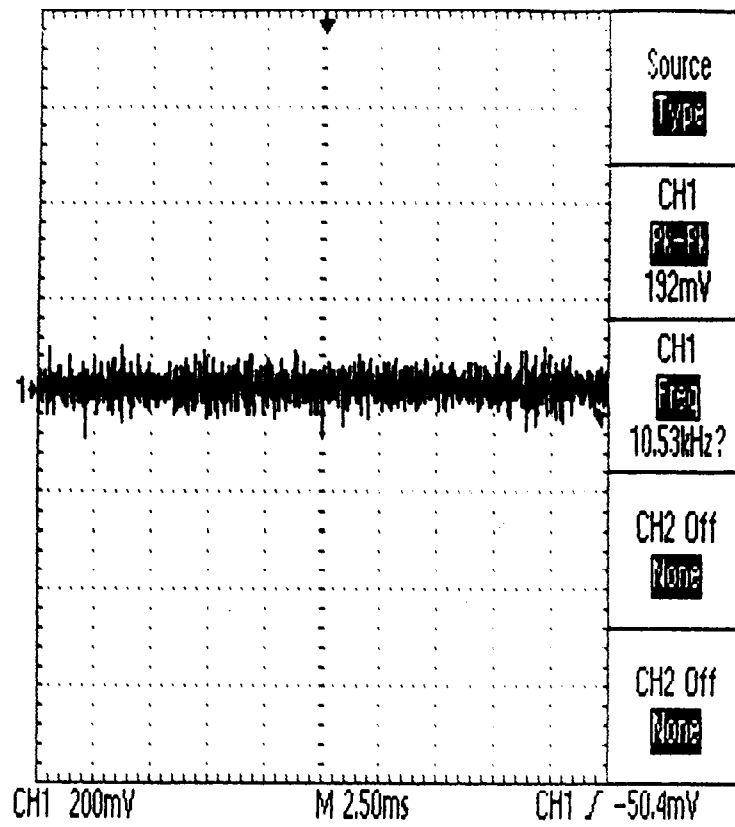


Figure 6

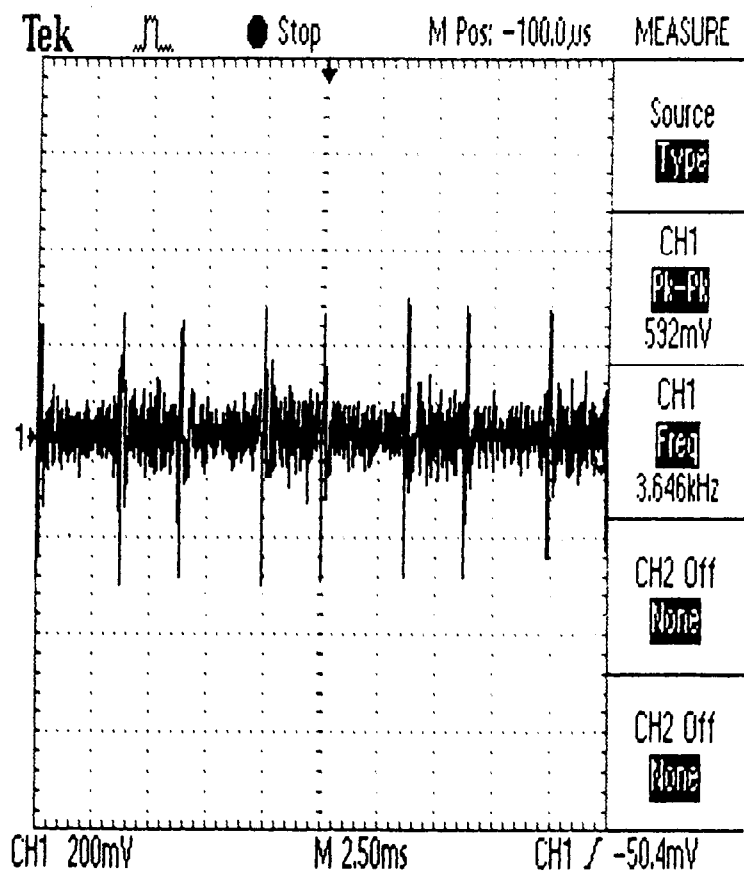


Figure 7