- Analog
- Optoelectronics
- Connectors
- Passives
- Cooling
- PCB's
- Digital IC's
- Power
- EDA Tools
- RISC-V
- Electromechanical
- Sensors
- Embedded
- Test & Measurement
- IC Design
- Wireless/RF
- Memory

View All

Applications

- Audio
- IOT
- Automation
- Lighting
- Automotive
- Medical & Fitness
- Computers & Peripherals
- Military / Aero / Space
- Cloud Computing
- Motor Control
- IT / Networking
- Security / Identification
- Consumer Electronics
- Smart Grid / Energy
- Industrial
- Telecom

View All

- Articles
  - Latest
  - News
  - Projects
  - Technical Articles
  - Industry Articles
  - Industry White Papers
- Forums
  - Latest
  - Hardware Design
  - Embedded & Programming
  - Education
  - Math & Science
  - Community
- Education
  - Textbooks
  - Video Lectures & Tutorials
  - Worksheets
  - Industry Webinars
  - Industry Training
- Tools
  - Calculators

EGS002 inverter project help needed

Joeadeoye · May 21, 2018

Thread Starter

#1

J

Joeadeoye

Joined Apr 2, 2017 14

May 21, 2018

I started a Pure Sine Wave inverter project which I am to use

I started a Pure Sine Wave inverter project which I am to use egs002 for this purpose. I have followed the datasheet carefully. I savaged a transformer from an old ups, the transformer is 15-0-15/220v which is meant for a 24vDC 1.2kv ups. I rewind this transformer to 0-7.5/220v to use for my egs002 inverter which I believe it should give me at least 500watt on 12v system.

For a test, I used 1 fet per bridge, making a total of 4 fets, I used irf3205 and 4.7ohm resistor with 1N4148 diode at each gate, with 10k resistor from each gate-source as stated in d datasheet. I believe this bridge should give me at least 100watt power.

I connected the Ho1, ho2, Lo1, Lo2, vs1 and vs2 to their respective pins on d egs002 board, IFB is grounded and VFB is connected to an 12v additional widing of d transformer which is rectified using 4 1N4007 diodes and adjusted with a 10k variable resistor.

12v and 5v were connected to their respective pins on the egs002 board. FanCtl, TFB were left open (not connected)

I powered my circuit and connected my scope, it worked fine, I adjusted 10k pot from VFB, to get 200v ac output which worked fine. But here is the problem

I tried to connect a 20watt load for a test, immediately I connect it, egs002 will shutdown and light blinks 4 times which means undervoltage protection (as stated in datasheet). But if no load is connected, the circuit works fine and IC doesn't shutdown.

Please help me. Why is egs002 shutting down when load is connected? The load is just a 20watt light bulb

Last edited by a moderator: May 21, 2018

bertus

Joined Apr 5, 2008 20,306

May 21, 2018

#2

"EGS002" schematic

Like Reply

bertus #3

Joined Apr 5, 2008 20,306

May 21, 2018

Hello,

Can you post a complete schematic?

Bertus

Like Reply

J

Thread Starter **Joeadeoye** #4

Joined Apr 2, 2017 14

May 21, 2018

> bertus said:
>
> "EGS002" schematic

Hello administrator, pls help me merge my second reply to my main question. I don't know how to do that, I'm new here. Thanks

Like Reply

J

Thread Starter **Joeadeoye** #5

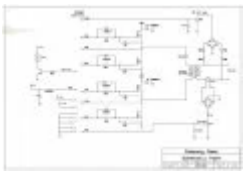
Joined Apr 2, 2017 14

May 21, 2018

> bertus said:
>
> Hello,
>
> Can you post a complete schematic?

> Bertus

I have uploaded the schematic, but in my own case, the IFB is grounded and pin 16 and 17 were left open, not connected to anything



Last edited by a moderator: May 21, 2018

Like Reply

bertus #6

Joined Apr 5, 2008 20,306

May 21, 2018

Hello,

You can upload files using the "Upload a File" button below the reply windows.
The pop-up will show you the formats that can be used.

Bertus

Like Reply

bertus #7

Joined Apr 5, 2008 20,306

May 21, 2018

Hello,

I do not see anything about the driver circuits.

Bertus

Like Reply

Thread Starter #8

J

Joeadeoye

Joined Apr 2, 2017 14

May 21, 2018

> bertus said:
>
> Hello,
>
> I do not see anything about the driver circuits.
>
> Bertus

The driver is an already made SPWM chip. It is called EGS002. It is a 17pin IC

Like Reply

T

tsan

Joined Sep 6, 2014 101

May 21, 2018

#9

> Joeadeoye said:
>
> I tried to connect a 20watt load for a test, immediately I connect it, egs002 will shutdown and light blinks 4 times which means undervoltage protection (as stated in datasheet). But if no load is connected, the circuit works fine and IC doesn't shutdown.

According to EG8010 datasheet, undervoltage should not come immediately, "Undervoltage protection is set at 2.75V with 3S delay"

What is the voltage on VFB pin without load? It should be close to 3 V. Overtemperature would blink 5 times. You have TFB left open and it would be good to ground it if there is no temperature feedback.

Like Reply

J

Thread Starter

Joeadeoye

Joined Apr 2, 2017 14

May 21, 2018

#10

> tsan said:
>
> According to EG8010 datasheet, undervoltage should not come immediately,
> "Undervoltage protection is set at 2.75V with 3S delay"
>
> What is the voltage on VFB pin without load? It should be close to 3 V. Overtemperature would blink 5 times. You have TFB left open and it would be good to ground it if there is no temperature feedback.

Thank you for the response, the voltage at VFB is 3.01v if no load is connected and the 220v output is stable. The IC shutdown "immediately" after connecting the load, I tried changing the load to another bulb, same thing happens. Once the IC shutdown, the light blinks 4 times and pause for about 3 seconds and starts again, and once the bulb (load) is about coming on, it shutdown again and light blinks 4 times again, keep repeating that. But once I disconnect the load, it won't shutdown again and everything keeps working. Pls help me.

Like Reply

T

tsan #11

Joined Sep 6, 2014 101

May 21, 2018

You can measure VFB pin voltage with scope to see if it drops to 2,75 V or below. Also measure output voltage with scope to see how much it drops. Have you tested with other 220 VAC supply that the lamp works? Is there any filtering (like RC filter) on the signal that is connected to VFB pin? Perhaps it is noise that is causing the shutdown especially when 3 second delay is not implemented on the board.

Like Reply

J

Thread Starter

Joeadeoye #12

Joined Apr 2, 2017 14

May 21, 2018

> tsan said:
>
> You can measure VFB pin voltage with scope to see if it drops to 2,75 V or below. Also measure output voltage with scope to see how much it drops.

I measured the VFB pin with scope, it shows 3.17v, immediately I connect the load, the IC shuts down, which also causes oscillation to stop and also transformer output voltage goes back to zero, and also feedback winding goes to zero and VFB pin also goes to zero. Output voltage is at 220vAC but immediately I connect load, IC shutdown and voltage goes to zero.

> tsan said:
>
> Have you tested with other 220VAC supply that the lamp works?

Yes. It works

> tsan said:
>
> Is there any filtering (like RC filter) on the signal that is connected to VFB pin?

Yes. There is 4.7k ohms resistor at the positive terminal of the bridge rectifier, which is also connected to the "left" pin of a 10k pot, the "right" pin of that 10k pot is connected to ground and the "middle" pin of that 10k pot goes to VFB, there is also a 25v/4.7uf cap between VFB and ground.

How to implement 3s delay??

Like Reply

T

tsan #13

Joined Sep 6, 2014 101

May 21, 2018

> Joeadeoye said:
>
> VFB is connected to an 12v additional widing of d transformer which is rectified using 4 1N4007 diodes and adjusted with a 10k variable resistor.

This is not according to datasheet. On the datasheet filtered PWM output voltage is used as a feedback. Perhaps your feedback is rectifying PWM pulses. On that case it doesn't work at all. Also on that case, VBF signal would correspond to level of 12 V supply instead of "sinusoidal" AC output.

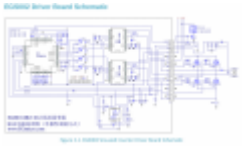
Like Reply

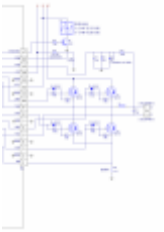
bertus #14

Joined Apr 5, 2008 20,306
May 21, 2018

Hello,

Looking at the schematic of the board, there are + 5 Volts, +12 Volts and +400 Volts as external supplies:





Bertus

Attachments

egs002_manual_e...
4.2 MB Views: 33

Like Reply

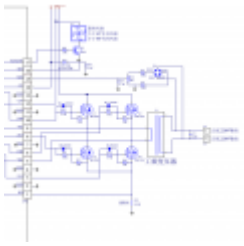
T

tsan #15

Joined Sep 6, 2014 101
May 21, 2018

> bertus said:
>
> Looking at the schematic of the board, there are + 5 Volts, +12 Volts and +400 Volts as external supplies:

There is also "Low power frequency transformer" circuit on the EG8010 datasheet. +400 V is not needed on this circuit.



> bertus

Like Reply

bertus
Joined Apr 5, 2008 20,306
May 21, 2018

#16

Hello,

I notice a couple of differences between the schematic the TS posted and the schematic in post # 15.
The resistors for the feedback are in a different place.
The TS is using a current transformer as the datasheet circuit uses the primary current on the mosfets.

Bertus

Like Reply

J

Thread Starter
Joeadeoye
Joined Apr 2, 2017 14
May 21, 2018

#17

> tsan said:

> This is not according to datasheet. On the datasheet filtered PWM output voltage is used as a feedback. Perhaps your feedback is rectifying PWM pulses. On that case it doesn't work at all. Also on that case, VBF signal would correspond to level of 12 V supply instead of "sinusoidal" AC output.

Thank you very much for your response. I think the problem is with your second suggestion. My transformer winding is 0-6/220v while the additional winding for feedback is 12v, but I decided to rewind the transformer to 0-9/220v while the feedback remains at 12v, with this, the feedback is "almost" matching with "input" voltage and I tested it, I noticed a great improvement, although the output voltage drops from 220v to 200v, but I was able to power up to 60watt load successfully. So, I am thinking if I can make the feedback winding same as input winding, just as you suggested, I think it should solve the problem. I will try that tomorrow and give you feedback. I'll wind 0-12/220v while feedback winding is 12v. I will test and update you.

Thank you so much..

Like Reply

T

tsan #18

Joined Sep 6, 2014 101

May 21, 2018

I think that winding ratio of feedback winding is not important, if there is a potentiometer to adjust VFB voltage level. There should be a filter on the feedback winding output (like there is a filter on 220 VAC output) so that the PWM pulses are filtered out. Filtered waveform would then be fed to a diode rectifier.

Like Reply

J

Thread Starter

Joeadeoye #19

Joined Apr 2, 2017 14

May 22, 2018

> tsan said:
>
> I think that winding ratio of feedback winding is not important, if there is a potentiometer to adjust VFB voltage level. There should be a filter on the feedback winding output (like there is a filter on 220 VAC output) so that the PWM pulses are filtered out. Filtered waveform would then be fed to a diode rectifier.

I have ignored my additional winding for feedback and I took feedback from the main output which I filtered with 2.2uf 400v capacitor, I then pass it to rectifier diode and added 100k resistor at the + and - of the rectifier, I did exactly as it was shown in your schematic that you showed me from the datasheet, and I tested it, it worked. But the maximum voltage I get at output is 195vAC when I vary the 10k pot. With the 195vAC output, I powered 220v 100watt load and it worked, IC did not shutdown like before, I'm very happy. But problem is not totally solved.

I want 230vAC from output, my input winding is 10v, I am not sure what I can do to increase d output voltage, should I reduce my input winding? Or should I increase my input winding? Pls suggest what to do for me. Thanks

Like Reply

T

tsan #20

Joined Sep 6, 2014 101

May 22, 2018

230 VAC is RMS value and the peak voltage is 230×√2=325 volts. With 12 V it is possible to make 12 V/√2=8,5 RMS volt sine wave. It would be good to have some margin. If 12 V is minimum input voltage, then use 12 V on the calculation. There should be allowance for transformer voltage drop, which I assume to be about 5%. Perhaps winding the transformer ratio for about 7,5/230 V, if 12 V is expected minimum input voltage.

Like Reply

1 of 2 Next ▸ ▸▸

You must log in or register to reply here.

Similar threads

Egs002 current sensing made me confused.

Using the EG8010 IC and the EGS002 board, flaws

Inverter repair EGS002

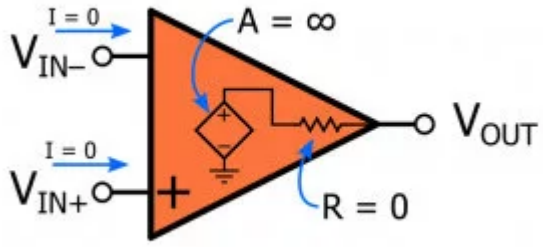
EGS002 Board + Full-Bridge Question

Using the EG8010 IC and the EGS002 board: Problems, quirks, flaws

You May Also Like

Data Centers Are Overloaded. The Inventor of FPGAs Is Swooping In With a "Comprehensive" SmartNIC

by Gary Elinoff

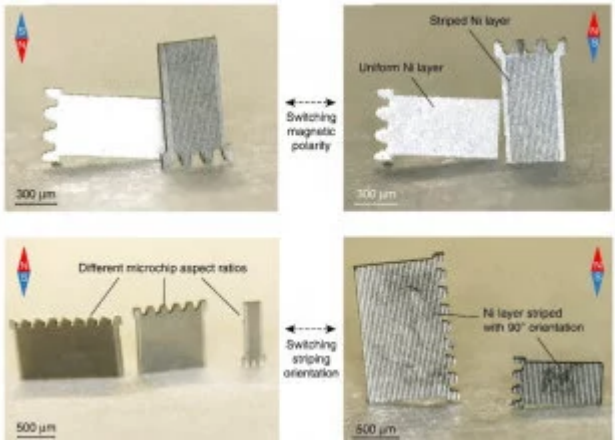


Understanding Operational Amplifier Slew Rate

by Robert Keim

With an Aging Industrial Infrastructure, Reliable IGBT Drivers Are More Important Than Ever

by Gary Elinoff



Magnetic Assembly: A New Option for Delicate 3D Integration?

by Robin Mitchell

Products

- Latest
- Analog
- Optoelectronics
- Connectors
- Passives
- Cooling
- PCB's
- Digital IC's
- Power
- EDA Tools
- IC Design
- RISC-V
- Electromechanical
- Sensors
- Embedded
- Test & Measurement
- Memory
- Wireless/RF
- View All

Applications

- Audio
- IOT
- Automation
- lighting
- Automotive
- Medical & Fitness
- Computers & Peripherals
- Military / Aero / Space
- Cloud Computing

- Motor Control
- IT / Networking
- Security / Identification
- Consumer Electronics
- Smart Grid / Energy
- Industrial
- Telecom
- View All

Content

- BOM Tool
- Calculators
- Datasheets
- Giveaways
- Industry Articles
- Industry Training
- Industry Webinars
- IC Design Center
- News
- Part Search
- Projects
- Reference Designs
- Technical Articles
- Test Equipment
- Textbook
- Video Lectures
- Worksheets

Who We Are

ALL ABOUT CIRCUITS More about us

Connect With Us

- Contact Us
- Advertise
- Write For Us
- Newsletters

More From Our Network

Sign Up

Enter your email address Register

Continue to site
QUOTE OF THE DAY
“
”
-