

Project: Electronic Ballast for Fluorescent Lamps

Students: Uri Avital 33743238

Yoel Maman 38682209

Supervisor: Prof. Shmuel Ben-Yaakov

Year: 2003

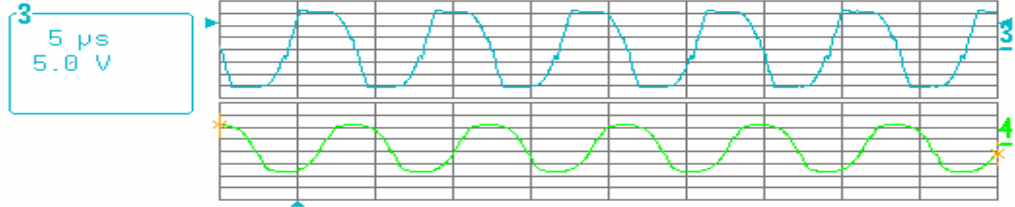
Abstract

High frequency electronic ballasts for fluorescent lamps are widely used because of their small size, light weight, high light luminous efficiency, lack of flicker and audible noise, long life, and dimming capabilities. Dimming operation is crucial today in energy-saving lighting systems and they can also provide functional flexibility, increase lamp life, and give aesthetic effects. Self-oscillating electronic ballast has been chosen in this project as being one of the simplest and most cost-effective ballasts for driving fluorescent lamps.

In this project we refer to two dimming control methods. The first one is controlling the switching frequency, which regulates the lamp's power and dims the lamp. The second one is the current-controlled variable-inductor, which regulates the lamp's current and dims the lamp as well. A self-oscillating electronic ballast with a variable inductor dimming control has been designed and constructed, its operation is verified by experimental results.



29-Apr-03
14:08:48



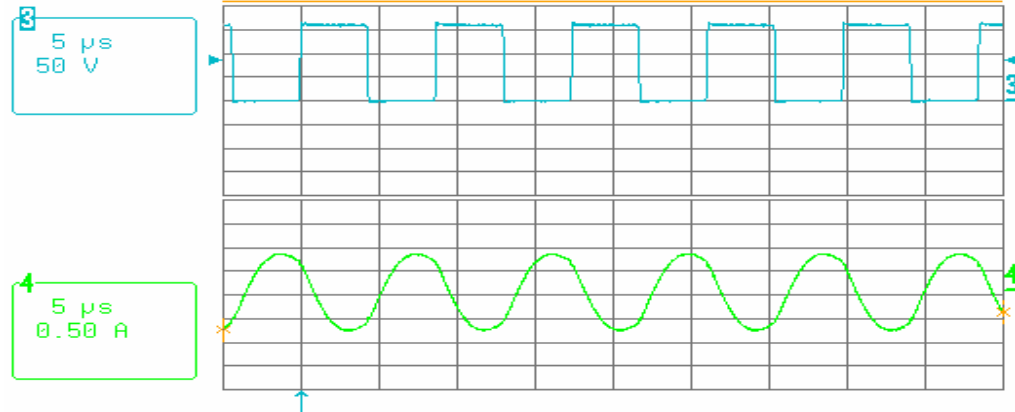
5 μs
200 mA

pkpk(4)	794 mA	Freq(4)	114.727 kHz
sdev(4)	304.2 mA	period(4)	8.7164 μs
rms(4)	312.4 mA	width(4)	4.3531 μs
cmean(4)	-58.9 mA	rise(4)	1.8308 μs
csdev(4)	304.1 mA	Fall(4)	1.7065 μs
crms(4)	309.7 mA	r20-80%(4)	1.2521 μs
top(4)	320 mA	F80-20%(4)	1.1535 μs
base(4)	-434 mA	over+(4)	2.05 %
ampl(4)	754 mA	over-(4)	3.23 %
mean(4)	-71.1 mA	xamn(4)	-734.61 ns
minimum(4)	-459 mA	xamx(4)	3.70978 μs
maximum(4)	335 mA	delay(4)	-2.7986 μs
area(4)	-3.55251 μC	cycles(4)	5

5 μs

Gate voltage and lamp current

29-Apr-03
14:15:28



5 μs
0.50 A

pkpk(4)	1.641 A
mean(4)	-36.2 mA
sdev(4)	593.9 mA
rms(4)	595.0 mA
ampl(4)	1.565 A

5 μs

: resonant current and inverter output voltage