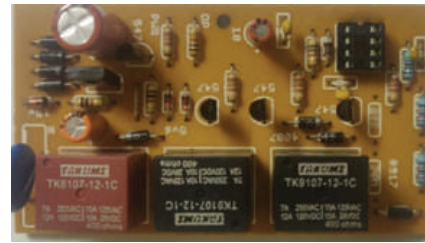


MCU based Voltage Stabilizer Solution

Voltage Stabilizer Design

Voltage stabilizer is a very effective protection device for the safety of household electronics such as TV, Refrigerator, Air Conditioner, etc. Hence, we have come up with a universal design for Single phase Voltage Stabilizer which is microcontroller based. This design has got several advantages over traditional analog based design.



The advantages are listed below:

1. Better and accurate Input voltage Sensing.
2. Operates in any type input signal i.e., Sine wave and square wave.
3. Output stabilization is based on accurately measured input signal.
4. Full control over the relay switching.
5. Start time can be adjusted according to the end device.
6. Completely controlled by Software.

Technical Specifications:

1. 120 Vac to 270 Vac input capability.
2. Fixed 230 Vac – 240Vac output.
3. Operates in both Boost and buck modes.
4. Under Voltage and Over voltage protection.

Cost Comparison Between Analog Based Stabilizer Circuit and Microcontroller Based Stabilizer Circuit :

Devices	Analog Based Circuit	MCU Based Circuit
LM555	Rs. 3.00	0.00
LM324	Rs. 5.00	0.00
Passives for Opamp	Rs. 4.00	0.00
Passives for 555	Rs. 4.00	0.00
Microcontroller	Rs. 0.00	15.00
Power Supply and other passives	Rs. 6.00	Rs. 6.00
Labour	Rs. 2.50	1.00
Total	Rs. 23.50	Rs.22.00

MPLAB Code Configurator Features

- Free graphical programming environment
- Intuitive interface for quick start development
- Automated configuration of peripherals and functions
 - Minimized reliance upon product datasheet
 - Reduces overall design effort and time
- From novice to expert
 - Accelerates generation of production ready code



Deliverables from Nexcomm

- MCC CIP Training from FAE's
- Schematics
- Application C Code
- Tested PCB for field trials

Zero Cross Detect

High Voltage AC Zero Crossing Detection

Zero Cross Detect (ZCD)

- Senses when High Voltage AC signal on pin crosses through ground
 - Pin is held at constant safe voltage
 - No additional transient protection required
- Indicates positive or negative phase
- Generates interrupt on zero cross
- Sets register flag on zero cross
- Can be used to determine AC line frequency
- Flexible interconnectivity with internal peripherals

Benefits

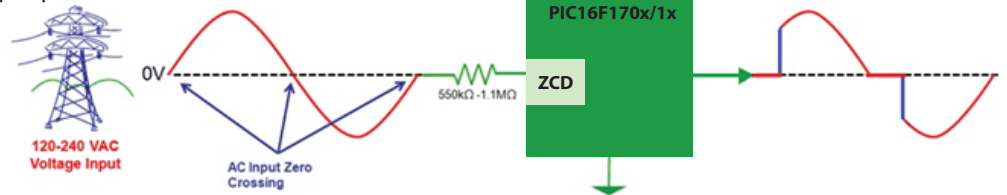
- TRIAC control
- Synchronized switching of relays
- Reduces external components
- Minimizes PCB real estate
- Core independent operation
- Operation while in low power SLEEP

Example Uses

- AC Power Supplies
- Timing Control
- White Goods
- TRIAC Control
- TRIAC Dimming



ZCD Technical Brief



Flexible Integration

Function Enabling Building Blocks

Intelligent Analog Sensor Interfacing & Signal Conditioning
Waveform Control PWM Drive & Waveform Generation
Timing & Measurements Signal Measurement with Timing & Counter Control
Logic & Math Customizable Logic & Math Functions
Safety & Monitoring Hardware Monitoring & Fault Detection
Communications Wired, Wireless & Encryption
User Interface Capacitive Touch Sensing & LCD Control
Low Power & System Flexibility XLP Low Power Technology, Peripheral & Interconnects

8-bit PIC Microcontrollers

CPU		Memory	
ADC	Enhanced) Capture Compare PWM	High Endurance Flash (Data)	Configurable Logic Cell
ADC with Computation	Complementary Output Generator	IDLE & DOZE	Hardware Multiply
Comparators	Complementary Waveform Generator	Peripheral Module Disable	Math Accelerator
DAC	Data Signal Modulator	Peripheral Pin Select	Crystal Free USB
High Speed Comparators	Numerically Controlled Oscillator	eXtreme Low Power XLP Technology	CAN
Operational Amplifiers	Programmable Switch Mode Controller	Angular Timer	(E)USART
Ramp Generator	10-bit PWM	Charge Time Measurement	ETHERNET MAC
Slope Compensation	16-bit PWM	RTCC	I2C
Voltage Reference	Cyclical Redundancy Check	Signal Measurement Timer	LIN
Zero Cross Detect	Hardware Limit Timer	TEMP Indicator	SPI™
High Current I/O	Windowed WDT	8/16/20/24-bit Timers	Keeloq® Sub-GHz RF
LCD	mTouch		

