

## ActivePSR<sup>TM</sup> Quasi-Resonant PWM Controller

### FEATURES

- Patented Primary Side Regulation Technology
- Quasi-Resonant Operation
- Adjustable up to 120kHz Switching Frequency
- +/-5% Output Voltage Regulation
- Accurate OCP/OLP Protection
- Integrated Output Cord Compensation
- Integrated Line and Primary Inductance Compensation
- Built-in Soft-Start Circuit
- Line Under-Voltage, Thermal, Output Over-voltage, Output Short Protections
- Current Sense Resistor Short Protection
- Transformer Short Winding Protection
- 100mW Standby Power
- Complies with Global Energy Efficiency and CEC Average Efficiency Standards
- Tiny SOT23-6 Packages

### APPLICATIONS

- AC/DC Adaptors/Chargers for Cell Phones, ADSL, PDAs, E-books
- Adaptors for Portable Media Player, DSCs, and Other

### GENERAL DESCRIPTION

The ACT41X is a high performance peak current mode PWM controller which applies *ActivePSR<sup>TM</sup>* and *ActiveQR<sup>TM</sup>* technology. ACT41X achieves accurate voltage regulation without the need of an opto-coupler or reference device.

The ACT41X is designed to achieve less than 100mW Standby Power. By applying frequency fold back and *ActiveQR<sup>TM</sup>* technology, ACT41X exceeds the latest ES2.0 efficiency standard.

ACT41X integrates comprehensive protection. In case of over temperature, over voltage, short winding, short current sense resistor, open loop

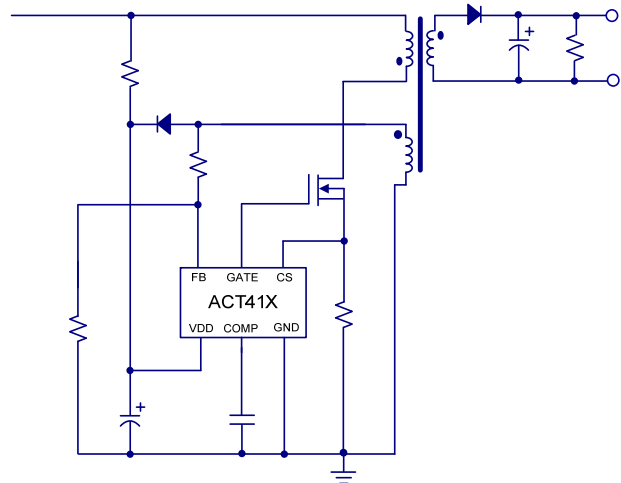
and overload conditions, it would enter auto restart mode including cycle-by-cycle current limiting.

ACT41X is to achieve no overshoot and very short rise time even with big capacitive load (4000 $\mu$ F) with the built-in fast and soft start process, .

The Quasi-Resonant (QR) operation mode can effectively improve efficiency, reduce the EMI noise and further reduce the components in input filter.

ACT41X is idea for application up to 36 Watt.

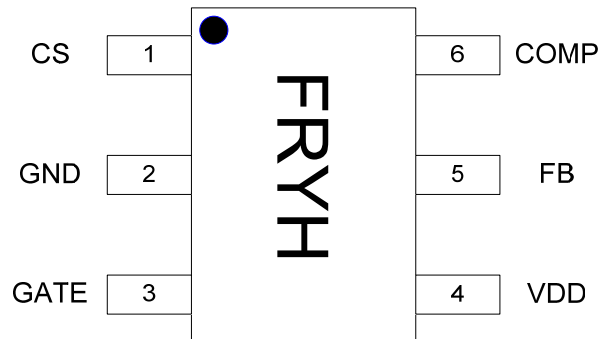
**Figure 1:**  
Simplified Application Circuit



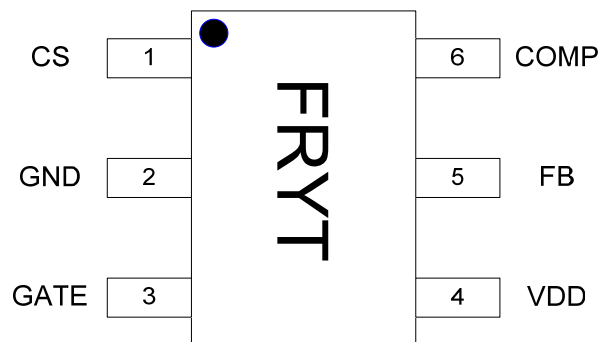
## ORDERING INFORMATION

PART NUMBER	TEMPERATURE RANGE	PACKAGE	PINS	PACKING METHOD	OPTION (DC CORD %)	TOP MARK
ACT410US-T	-40°C to 85°C	SOT23-6	6	TUBE & REEL	0	FRYH
ACT411US-T	-40°C to 85°C	SOT23-6	6	TUBE & REEL	0	FRYT

## PIN CONFIGURATION



SOT23-6  
ACT410US

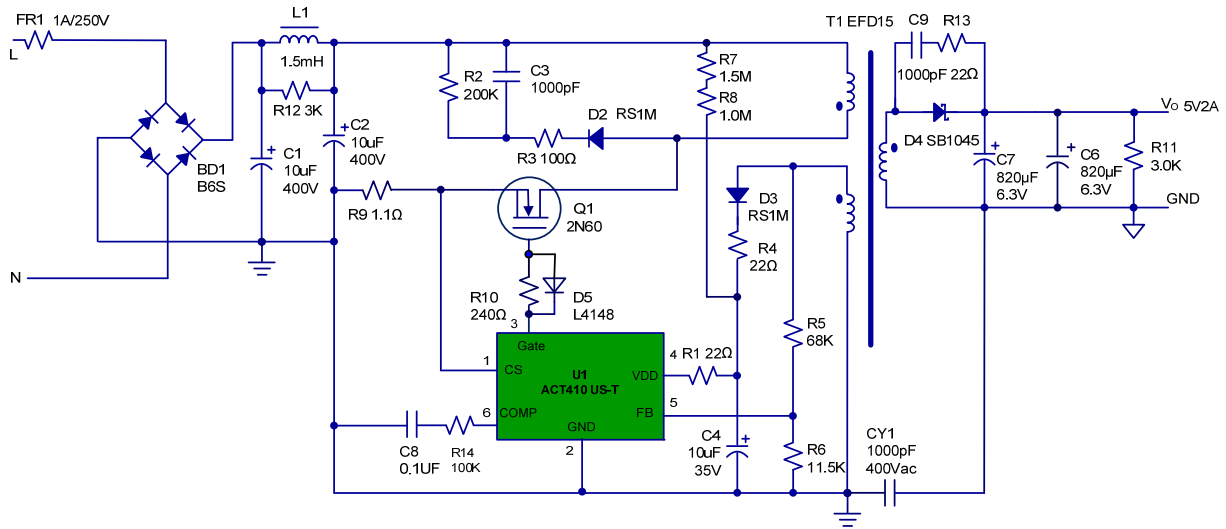


SOT23-6  
ACT411US

## PIN DESCRIPTIONS

PIN	NAME	DESCRIPTION
1	CS	Current Sense Pin. Connect an external resistor ( $R_{CS}$ ) between this pin and ground to set peak current limit for the primary switch.
2	GND	Ground.
3	GATE	Gate Drive. Gate driver for the external MOSFET transistor.
4	VDD	Power Supply. This pin provides bias power for the IC during startup and steady state operation.
5	FB	Feedback Pin. Connect this pin to a resistor divider network from the auxiliary winding.
6	COMP	Compensation Pin.

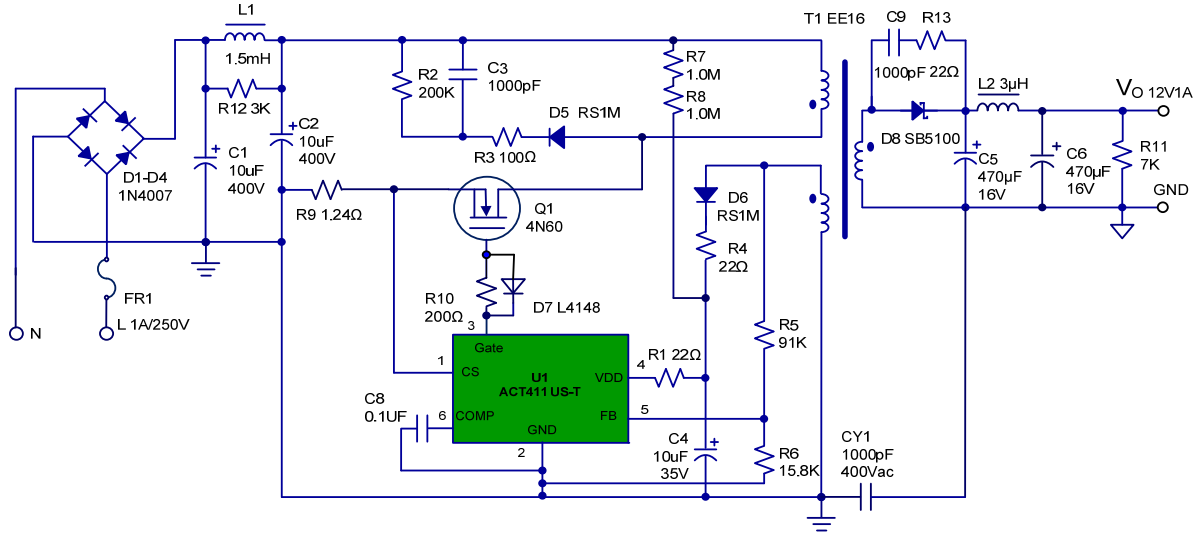
**Figure 2:**  
**ACT410, Universal VAC Input, 5V/2A Output Charger**



**Table 1:**  
**ACT410 Bill of Materials**

ITEM	REFERENCE	DESCRIPTION	QTY	MANUFACTURER
1	U1	IC, ACT410,SOT23-6	1	Active-Semi.
2	C1,C2	Capacitor, Electrolytic, 10μF/400V, 10x15mm	2	KSC
3	C3	Capacitor, Ceramic, 1000pF/500V, 0805,SMD	1	POE
4	C4	Capacitor, Electrolytic, 10μF/35V, 5x11mm	1	KSC
5	C6,C7	Capacitor, Electrolytic, 820μF/6.3V, 6.3 × 16mm	2	KSC
6	C8	Capacitor, Ceramic, 0.1μF/25V, 0805,SMD	1	POE
7	C9	Capacitor, Ceramic, 1000pF/100V, 0805,SMD	1	POE
8	CY1	Safety Y1,Capacitor,1000pF/400V,Dip	1	UXT
9	BD1	Bridge Rectifier,D1010S,1000V/1.0A,SDIP	1	PANJIT
10	D2,D3	Fast Recovery Rectifier, RS1M,1000V/1.0A, RMA	2	PANJIT
11	D4	Diode, Schottky, 45V/10A, S10U45S, SMD	1	Vishay
12	D5	Diode, 1N4148 SMD	1	PANJIT
13	L1	Axial Inductor, 1.5mH, 5*7,Dip	1	SoKa
14	L2	Axial Inductor, 0.55*5T, 5*7,Dip	1	SoKa
15	Q1	Mosfet Transistor, 2N60,TO-251	1	Infineon
16	PCB1	PCB, L*W*T=40x28x1.6mm,Cem-1,Rev:A	1	Jintong
17	FR1	Fuse,1A/250V	1	TY-OHM
18	R2	Carbon Resistor, 200KΩ, 1206, 5%	1	TY-OHM
19	R3	Chip Resistor, 100Ω, 0805, 5%	1	TY-OHM
20	R1,R4,R13	Chip Resistor, 22Ω, 0805, 5%	1	TY-OHM
21	R5	Chip Resistor, 68KΩ, 0805,1%	1	TY-OHM
22	R6	Chip Resistor, 11.5KΩ, 0805, 1%	1	TY-OHM
23	R7	Chip Resistor, 1.5MΩ, 0805, 5%	1	TY-OHM
24	R8	Chip Resistor, 1MΩ, 0805, 5%	1	TY-OHM
25	R9	Chip Resistor, 1.1Ω, 1206,1%	1	TY-OHM
26	R10	Chip Resistor, 240Ω, 0805, 5%	1	TY-OHM
27	R11,R12	Chip Resistor, 3KΩ, 0805, 5%	2	TY-OHM
28	R14	Chip Resistor, 100KΩ, 0805, 5%	1	TY-OHM
29	T1	Transformer, Lp=0.37mH, EFD15	1	

**Figure 3:**  
**ACT411, Universal VAC Input, 12V/1A Output Charger**



**Table 2:**  
**ACT411 Bill of Materials**

ITEM	REFERENCE	DESCRIPTION	QTY	MANUFACTURER
1	U1	IC, ACT411,SOT23-6	1	Active-Semi.
2	C1,C2	Capacitor, Electrolytic, 10µF/400V, 10x15mm	2	KSC
3	C3	Capacitor, Ceramic, 1000pF/500V, 0805,SMD	1	POE
4	C4	Capacitor, Electrolytic, 10µF/35V, 5x11mm	1	KSC
5	C5,C6	Capacitor, Electrolytic, 470µF/16V, 8x11.5mm	2	KSC
6	C8	Capacitor, Ceramic, 0.1µF/25V, 0805,SMD	1	POE
7	C9	Capacitor, Ceramic, 1000pF/100V, 0805,SMD	1	POE
8	CY1	Safety Y1,Capacitor,1000pF/400V,Dip	1	UXT
9	D1-D4	Diode,Rectifier,1000V/1A,1N4007, DO-41	4	Good-Ark
10	D5	Fast Recovery Rectifier, RS1M,1000V/1.0A, RMA	1	PANJIT
11	D6	Fast Recovery Rectifier,RS1D,200V/1.0A,SMA	1	PANJIT
12	D7	Diode, 1N4148 SMD	1	PANJIT
13	D8	Diode, schottky, 100V/5A, SB5100, DO-47	1	Good-Ark
14	L1	Axial Inductor, 1.5mH, 5*7,Dip	1	SoKa
15	L2	Axial Inductor, 0.55*5T, 5*7,Dip	1	SoKa
16	Q1	Mosfet Transistor, 4N60,TO-220	1	Infineon
17	PCB1	PCB, L*W*T=52.2x30x1.6mm,Cem-1,Rev:A	1	Jintong
18	FR1	Fuse,1A/250V	1	TY-OHM
19	R2	Carbon Resistor, 200KΩ, 1206, 5%	1	TY-OHM
20	R3	Chip Resistor, 100Ω, 0805, 5%	1	TY-OHM
21	R1,R4,R13	Chip Resistor, 22Ω, 0805, 5%	3	TY-OHM
22	R5	Chip Resistor, 91KΩ, 0805,1%	1	TY-OHM
23	R6	Chip Resistor, 15.8KΩ, 0805, 1%	1	TY-OHM
24	R7,R8	Chip Resistor, 1MΩ, 0805, 5%	2	TY-OHM
25	R9	Chip Resistor, 1.24Ω, 1206,1%	1	TY-OHM
26	R10	Chip Resistor, 200Ω, 0805, 5%	1	TY-OHM
27	R11	Chip Resistor, 7KΩ, 0805, 5%	1	TY-OHM
28	R12	Chip Resistor, 3KΩ, 0805, 5%	1	TY-OHM
29	T1	Transformer, Lp=0.4mH, EE16	1	