

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

### FEATURES

- Patented Primary Side Regulation Technology
- Quasi-Resonant Operation
- Adjustable up to 85kHz 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
- Less than 100mW Standby Power
- Complies with Global Energy Efficiency and CEC Average Efficiency Standards
- Tiny SOT23-6 Packages

### APPLICATIONS

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

### GENERAL DESCRIPTION

The ACT413 is a high performance peak current mode PWM controller which applies *ActivePSR<sup>TM</sup>* and *ActiveQR<sup>TM</sup>* technology. ACT413 achieves accurate voltage regulation without the need of an opto-coupler or reference device.

The ACT413 is designed to achieve less than 100mW Standby Power. By applying frequency fold back and *ActiveQR<sup>TM</sup>* technology, ACT413 exceeds the latest ES2.0 efficiency standard.

ACT413 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

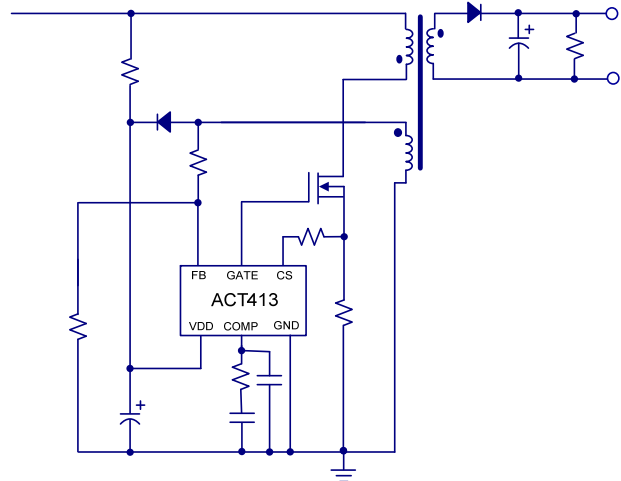
mode including cycle-by-cycle current limiting.

ACT413 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.

ACT413 is idea for application up to 36 Watt.

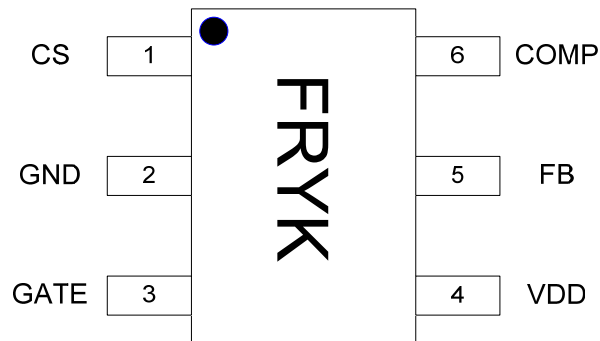
**Figure 1:**  
Simplified Application Circuit



## ORDERING INFORMATION

PART NUMBER	TEMPERATURE RANGE	PACKAGE	PINS	PACKING METHOD	OPTION (DC CORD %)	TOP MARK
ACT413US-T	-40°C to 85°C	SOT23-6	6	TUBE & REEL	6	FRYK

## PIN CONFIGURATION

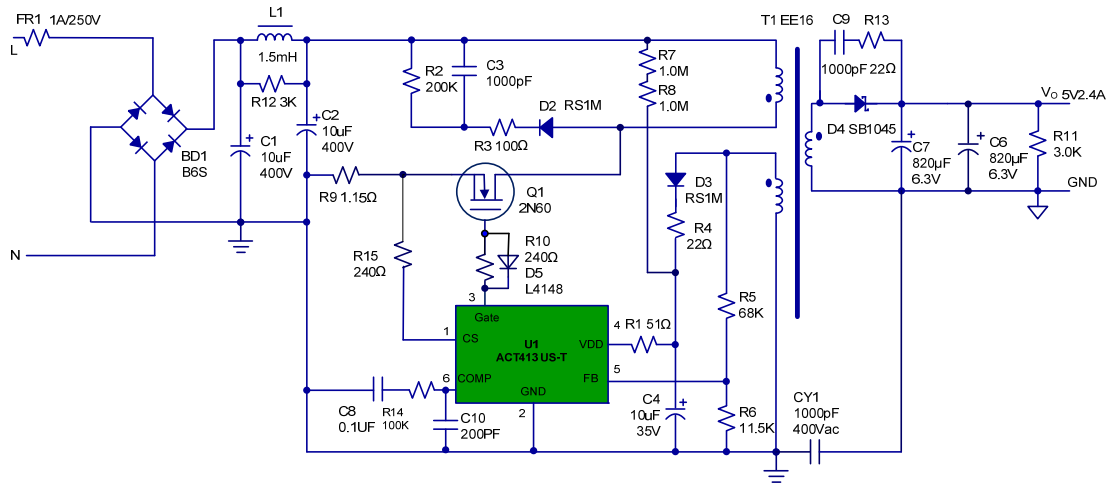


SOT23-6  
ACT413US

## 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:**  
**ACT413, Universal VAC Input, 5V/2.4A Output Charger**



**Table 1:** **ACT413 Bill of Materials**

ITEM	REFERENCE	DESCRIPTION	QTY	MANUFACTURER
1	U1	IC, ACT413,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	C10	Capacitor, Ceramic, 200pF/50V, 0805,SMD	1	POE
9	CY1	Safety Y1,Capacitor,1000pF/400V,Dip	1	UXT
10	BD1	Bridge Rectifier,D1010S,1000V/1.0A,SDIP	1	PANJIT
11	D2,D3	Fast Recovery Rectifier, RS1M,1000V/1.0A, RMA	2	PANJIT
12	D4	Diode, Schottky, 45V/10A, S10U45S, SMD	1	Vishay
13	D5	Diode, 1N4148 SMD	1	PANJIT
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, 2N60,TO-251	1	Infineon
17	PCB1	PCB, L*W*T=40x28x1.6mm,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	Chip Resistor, 51Ω, 0805, 5%	1	TY-OHM
22	R4,R13	Chip Resistor, 22Ω, 0805, 5%	2	TY-OHM
23	R5	Chip Resistor, 68KΩ, 0805,1%	1	TY-OHM
24	R6	Chip Resistor, 11.5KΩ, 0805, 1%	1	TY-OHM
25	R7	Chip Resistor, 1MΩ, 0805, 5%	1	TY-OHM
26	R8	Chip Resistor, 1MΩ, 0805, 5%	1	TY-OHM
27	R9	Chip Resistor, 1.15Ω, 1206,1%	1	TY-OHM
28	R10,R15	Chip Resistor, 240Ω, 0805, 5%	2	TY-OHM
29	R11,R12	Chip Resistor, 3KΩ, 0805, 5%	2	TY-OHM
30	R14	Chip Resistor, 100KΩ, 0805, 5%	1	TY-OHM
31	T1	Transformer, Lp=0.6mH, EE16	1	