GENERAL DESCRIPTION

The CM6805A and CM6806A are the Green-Mode PFC/PWM Combo controller for High Density AC Adapter. For the power supply, its input current shaping PFC performance could be very close to the performance of the CM6800 or ML4800 leading edge modulation average current topology.

CM6805A/CM6806A offers the use of smaller, lower cost bulk capacitors, reduces power line loading and stress on the switching FETs, and results in a power supply fully compliant to IEC1000-3-2 specifications. The CM6805A / CM6806A includes circuits for the implementation of a leading edge, input current shaping technique "boost" type PFC and a trailing edge, PWM.

The CM6805A's PFC and PWM operate at the same frequency, 67.5kHz. A PFC OVP comparator shuts down the PFC section in the event of a sudden decrease in load. The PFC section also includes peak current limiting for enhanced system reliability.

Both PFC and PWM have the Green Mode Functions. When the load is below GMth, Green Mode Threshold, PFCOUT is turned off. The GMth can be programmed by the designer. PWM Green Mode will happen when the PWMCMP (PWM Comparator) Duty Cycle is less than ~ 6%, in the next cycle, the PWMOUT pulse will be removed until PWMCMP Duty Cycle is greater than 6%, then the next cycle, PWMOUT pulse appears.

PWM has a PWMtrifault pin which can sense the PWM short and determine the GMth to turn off PFC.
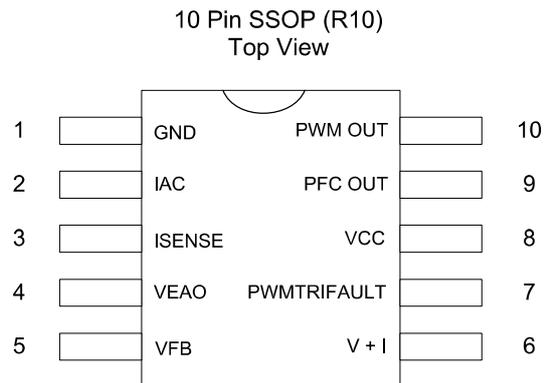
FEATURES

◆ Both PFC and PWM have the Green Mode to meet blue angel and energy star spec.
◆ 10-Pin SOIC package
◆ PWM pulse skipping for the green mode
◆ Use RAC as the Startup resistor around 5 Mega Ohm at IAC pin
◆ It can use the HV bipolar to start up the chip and it helps green mode.
◆ Easy to configure into Boost Follower
◆ Enable lowest BOM for power supply with PFC
◆ Internally synchronized PFC and PWM in one IC
◆ Patented slew rate enhanced voltage error amplifier with advanced input current shaping technique
◆ Universal Line Input Voltage
◆ CCM boost or DCM boost with leading edge modulation PFC using Input Current Shaping Technique
◆ Feedforward IAC pin to do the automatic slope compensation
◆ PFCOVP, VCCOVP, Precision -1V PFC ILIMIT, PFC Tri-Fault Detect comparator to meet UL1950
◆ Low supply currents; start-up: 100uA typical, operating current: 2mA typical.
◆ Synchronized leading PFC and trailing edge modulation PWM to reduce ripple current in the storage capacitor between the PFC and PWM sections and to reduce switching noise in the system
◆ VINOK Comparator to guarantee to enable PWM when PFC reach steady state
◆ High efficiency trailing-edge current mode PWM
◆ Exact 50% PWM maximum duty cycle
◆ UVLO, REFOK, and brownout protection
◆ Digital PFC and PWM soft start, ~10mS
◆ Precision PWM 1.5V current limit for current mode operation
◆ PWMtrifault to sense DC to DC short and Turn off PFC at GMth
◆ PWMtrifault also can be programmed to do the Thermal Protection

APPLICATIONS

◆ AC Adaptor

◆ Open Frame

PIN CONFIGURATION

10 Pin SSOP (R10)
Top View

1	GND	PWM OUT	10
2	IAC	PFC OUT	9
3	ISENSE	VCC	8
4	VEAO	PWMTRIFAULT	7
5	VFB	V + I	6

PIN DESCRIPTION

Pin No.	Symbol	Description	Operating Voltage			
			Min.	Typ.	Max.	Unit
1	GND	Ground				
2	IAC	Feedforward input to do slope compensation and to start up the system. During the start up, IAC is connected to VCC until VCC is greater than 13V.	0		1	V
3	I_{SENSE}	Current sense input to the PFC current limit comparator	-5		0.7	V
4	VEAO	PFC transconductance voltage error amplifier output	0		6	V
5	V_{FB}	PFC transconductance voltage error amplifier input	0	2.5	3	V
6	V + I	PWM current limit comparator input	0		1.5	V
7	PWMTRIFAULT	PWMTRIFAULT input; it can sense PWM Short or OVP	0		VCC	V
8	VCC	Positive supply	10	5	18	V
9	PFC OUT	PFC driver output	0		VCC	V
10	PWM OUT	PWM driver output	0		VCC	V

ORDERING INFORMATION

Part Number	Operation Frequency	Initial Accuracy (KHz)			Temperature Range	Package
		Min	Typ	Max		
CM6805AIR/AGIR*	Fpwm = Fpfc = 67.5Khz	60	67	74	-40℃ to 125℃	10 Pin SSOP(R10)
CM6805BIR/BGIR*	Fpwm = Fpfc = 95Khz	85	95	106	-40℃ to 125℃	10 Pin SSOP(R10)
CM6806AIR/AGIR*	Fpwm = 2Fpfc = 110Khz	98	110	120	-40℃ to 125℃	10 Pin SSOP(R10)

Note:
1. G : Suffix for Pb Free Product
2. Initial Accuracy : T_A=25℃

BLOCK DIAGRAM

PROTECTED BY PATENT
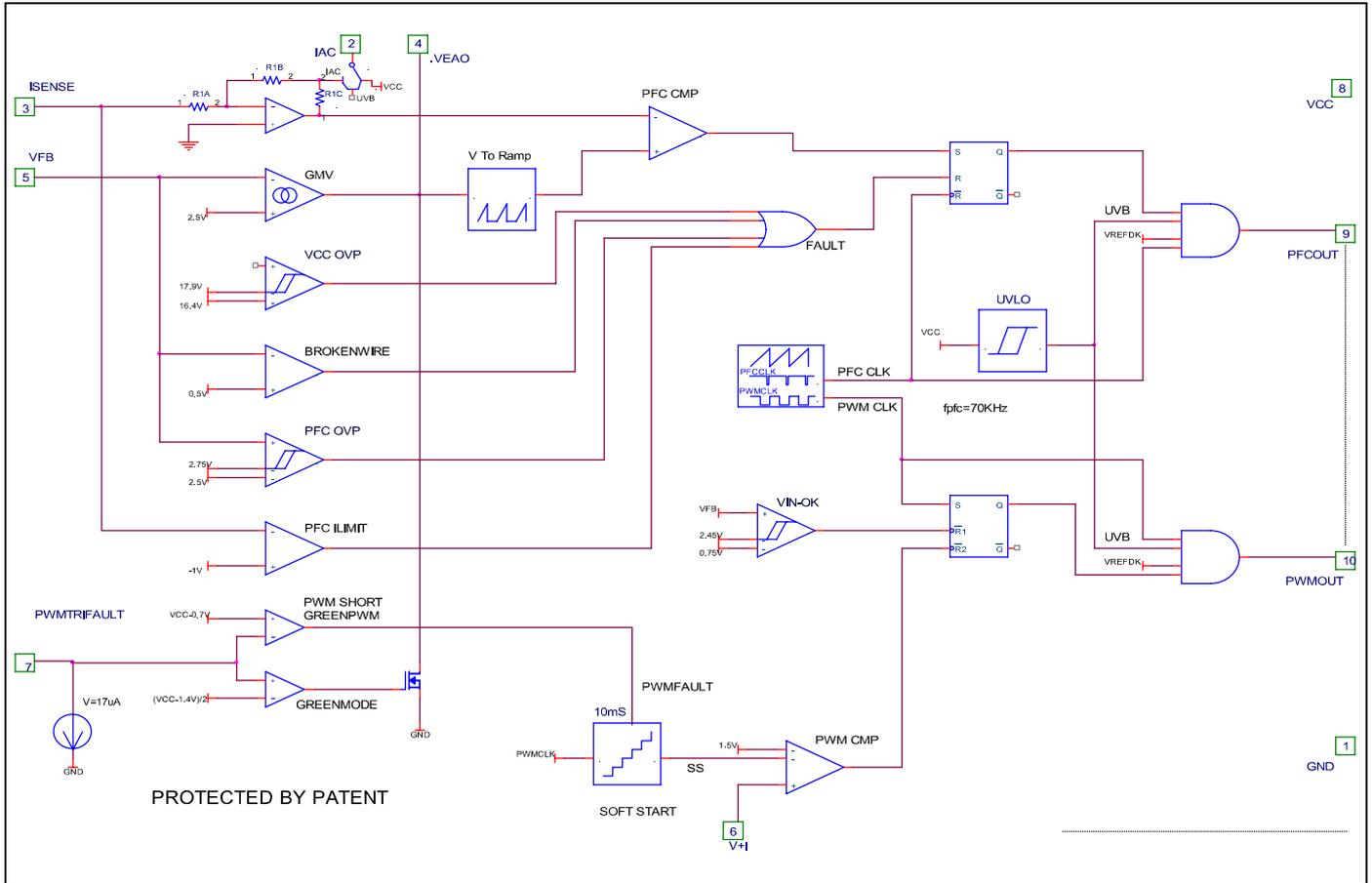
ABSOLUTE MAXIMUM RATINGS

Absolute Maximum ratings are those values beyond which the device could be permanently damaged.

Parameter	Min.	Max.	Units
V_{CC} MAX		20	V
IAC (before start up)	GND-0.3	VCC + 0.3	V
IAC (after start up)	GND-0.3	1.0	V
I_{SENSE} Voltage	-5	0.7	V
PFC OUT	GND – 0.3	VCC + 0.3	V
PWM OUT	GND – 0.3	VCC + 0.3	V
VEAO	0	6.3	V
PWMTrifault	GND – 0.3	VCC + 0.3	V
Voltage on Any Other Pin	GND-0.3	VCC + 0.3	V
I_{CC} Current (Average)		40	mA
Peak PFC OUT Current, Source or Sink		0.5	A
Peak PWM OUT Current, Source or Sink		0.5	A
PFC OUT, PWM OUT Energy Per Cycle		1.5	μJ
Junction Temperature		150	℃
Storage Temperature Range	-65	150	℃
Operating Temperature Range	-40	125	℃
Lead Temperature (Soldering, 10 sec)		260	℃
Thermal Resistance ($θ_{JA}$)		80	℃/W