

**UC3854A and UC3854B
Advanced Power Factor Correction
Control ICs**

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The UC3854A and UC3854B Power Factor Correction (PFC) control ICs are advanced versions of the industry standard UC3854. The new devices are pin-for-pin compatible with the original version and feature numerous improvements. The UC3854A IC can be used in most existing UC3854 PFC designs

with no modifications to the printed circuit board. New PFC preregulator designs and upgrades of existing ones can realize enhanced performance and reduced parts count with minimal design effort.

Specification Differences :

Parameter	UC3854	UC3854A	UC3854B
Supply Current, Off	2.0mA max.	400 μ A max.	400 μ A max.
Supply Voltage Vcc	35V max.	22V max.	22V max.
Vcc Turn-on threshold	16V typ.	16V typ.	10.5V typ.
Vcc UVLO hysteresis	6V typ.	6V typ.	0.5V typ.
Current Amplifier Bandwidth	1 MHz typ.	5 MHz typ.	5 MHz typ.
Current Amplifier offset	+4mV, -4mV max.	+0mV, -2mV max.	+0mV, -2mV max.
MULTOUT voltage (high)	2.5V typ.	5V typ.	5V typ.
Multiplier Gain tolerance	not specified	-0.9 to -1.1	-0.9 to -1.1
ENABLE propagation delay	not specified	300ns typ.	300ns typ.

Other Improvements and Changes - Non Specified:

VSENSE Input	7.5V	3.0V	3.0V
IAC voltage	6V typ.	0.5V typ.	0.5V typ.
Voltage Amplifier clamp	none	internal	internal
Current Amplifier clamp	none	internal	internal
VREF "good" circuitry	none	internal	internal

Application Information:

Converting an existing PFC design from the UC3854 to use the UC3854A or UC3854B device will eliminate five components from the control circuit. These are: one diode used to clamp the voltage amplifier output, a zener diode used to clamp the current amplifier output, one resistor to offset the bias current from the 6 volt amplitude of the IAC node, one resistor from Vcc to the current amplifier input to accommodate the worst case +4mV offset voltage, and a Schottky diode to clamp the overcurrent protection (PKLMT) input from going far below ground during power-up of the PFC pre-

regulator. The output voltage divider feedback resistor value from VSENSE to ground must be lowered to accommodate the change in the amplifier's reference voltage from 7.5V to 3.0V. In most applications, existing production printed circuit boards do not have to be modified to take advantage of the newer devices. Locations used for the five components can remain on the boards but do not need to be populated.

For further application information consult Unitrode Application Note U-134 and Design Note DN-39D, or contact a Field Applications Engineer.

UC3854A EVALUATION BOARD LIST OF MATERIALS

C1	0.47 μ F / 300 VAC "X" TYPE
C2	450 μ F / 450 VDC ELECTROLYTIC
C3	270pF / 16 VDC
C4	1 μ F / 16 VDC CERAMIC
C6	0.047 μ F / 16 VDC CERAMIC
C7	0.47 μ F / 16 VDC CERAMIC
C9	100 μ F / 35 VDC ELECTROLYTIC
C10	0.01 μ F / 35 VDC CERAMIC
C11	1 μ F / 16 VDC CERAMIC
C12	0.1 μ F / 63 VDC POLY
C13	62pF / 16 VDC CERAMIC
C15	620pF / 16 VDC CERAMIC
C16	1 μ F / 35 VDC CERAMIC
C*	ADD A 0.47 μ F / 300VAC "X" CAP BETWEEN TP"C" AND TP"F"
D1	600 V / 6A BRIDGE RECTIFIER
D2	600 V / 8A VERY FAST RECOVERY RECTIFIER (trr35ns)
D4	20 V / 3A SCHOTTKY, 1N5820
D6	40 V / 1A BRIDGE RECTIFIER
F1	6A / 300 VAC FUSE
J1	JUMPER WIRE, AWG#22
L1	1mH INDUCTOR (SEE APPLICATION NOTE U-134)
Q1	500 V, 0.25 OHM N CHANNEL MOSFET / APT5025
R1	0.25 OHM, 5 WATT NON-INDUCTIVE
R2	3.9k, 1/2 W
R3	3.9k, 1/2 W
R4	1.6k, 1/2 W
R5	10k, 1/2 W
R6	24k, 1/2 W
R7	240k, 1/2 W
R8	1MEG, 1/2 W
R9	91k, 1/2 W
R10	20k, 1/2 W
R12	27k, 1/2 W
R13	75k, 1/2 W
R14	15k, 1/2 W
R15	JUMPER WIRE, AWG#22
R16	20 OHM, 1/2 W
R17	1.15 MEG, 1/2 W, 1% TOLERANCE
R18	9.1k, 1/2 W, 1% TOLERANCE
R19	JUMPER WIRE, AWG#22
R22	120k, 2 WATT
R23	910k, 1/2 W
R24	USER DETERMINED BY AUXILIARY SUPPLY WINDING
TH1	THRERMISTOR, N.T.C., 6 AMP / 500V RATING
U1	UC3854A PFC CONTROL IC
NOT USED : C5, C8, C14, D3, D5, Q2, Q3, R11, R20, R21, R23, R26	

UC3854A Evaluation PC Board Schematic 250 Watt Power Factor Correction Application

