

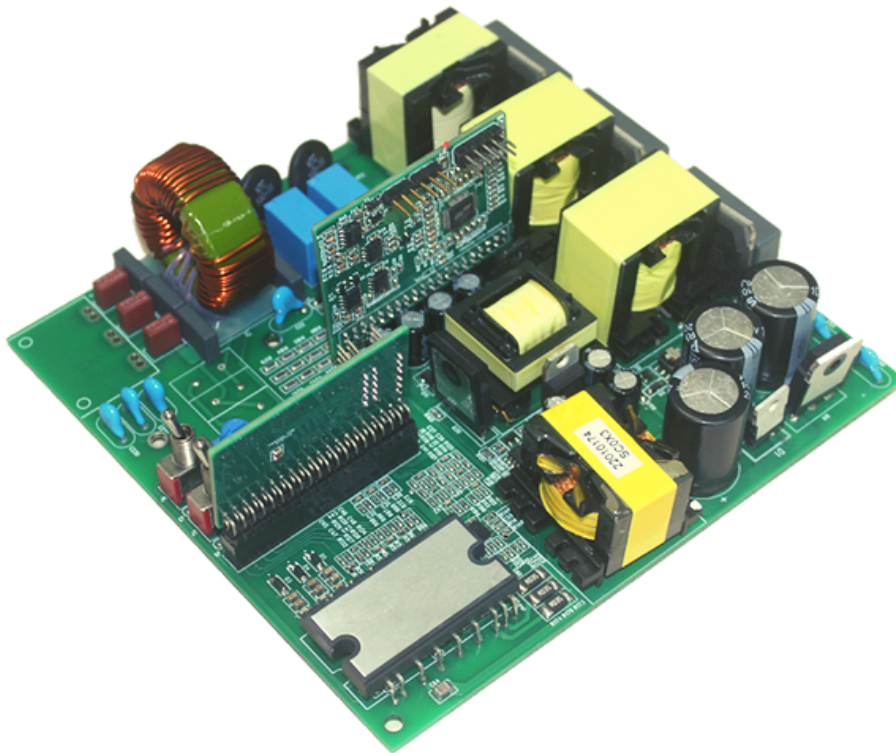
# 400W THREE-PHASE INPUT INDUSTRIAL FAN MOTOR DRIVE

APPLICATION FIELDS:  
INDUSTRIAL FAN DRIVE, THREE PHASE PFC

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VERSION 1.0 03/2023

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## PROJECT INTRODUCTION

This reference design is designed to convert a single-phase input fan drive to a three-phase input. For single-phase input, the fan drive bus voltage is 400Vdc. To adapt different input, the three-phase AC input is first boost to 700Vdc and then buck to 400Vdc. Three-phase PFC and Buck converter are controlled by one MCU and the fan drive is controlled by another one. The reference design achieves the requirement of iTHD smaller than 20% at 10% load.

# DESIGN SPECIFICATION

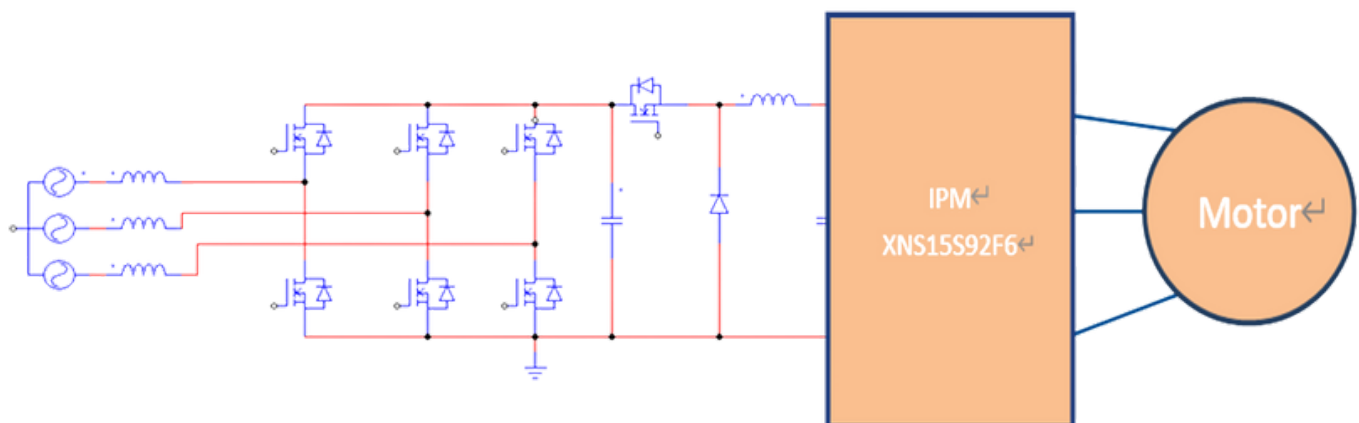
Input Voltage	380Vac+/-10%
Output Voltage	400Vdc
Rated Power	400W
System Efficiency	> 90%

## FEATURES

- Active 3 phase 6 switches PFC;
- MCU control PFC+buck; SVPWM algorithm for optimized low iTHD design;
- 400Vdc output, fully compatible with single-phase motor drive;
- Easy to expand power rating without change topology;
- Total solution, 3 phase PFC+buck+motor drive;
- Full protection, include input UVLO & OVP, output OCP & OVP;

## MAIN TOPOLOGY

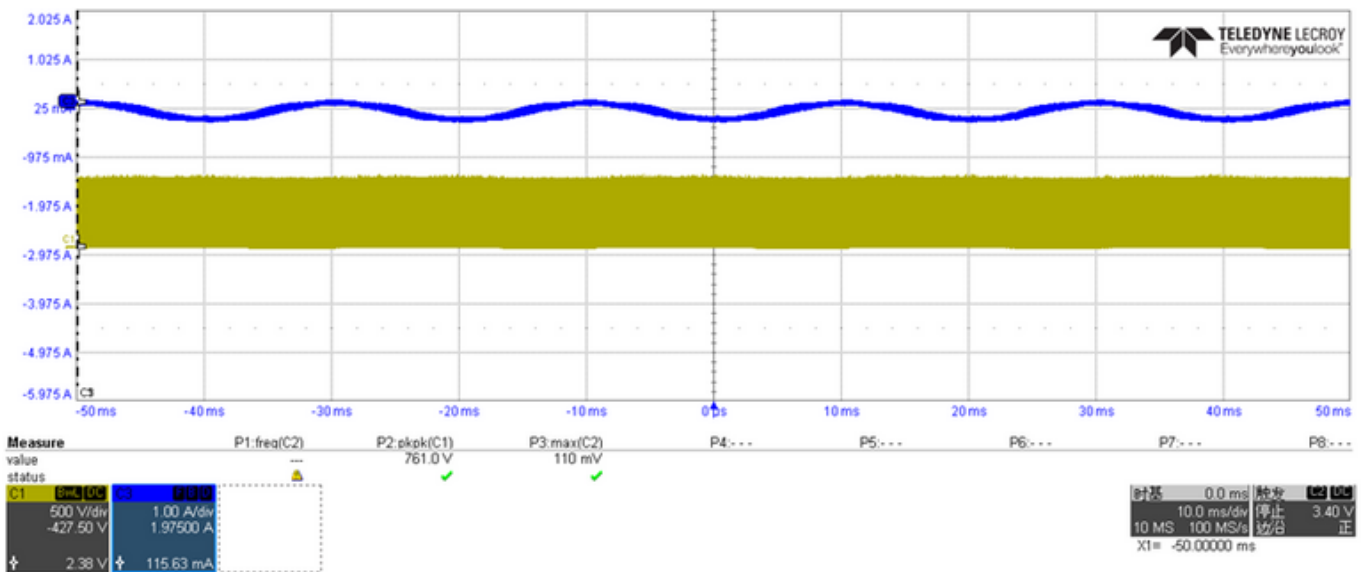
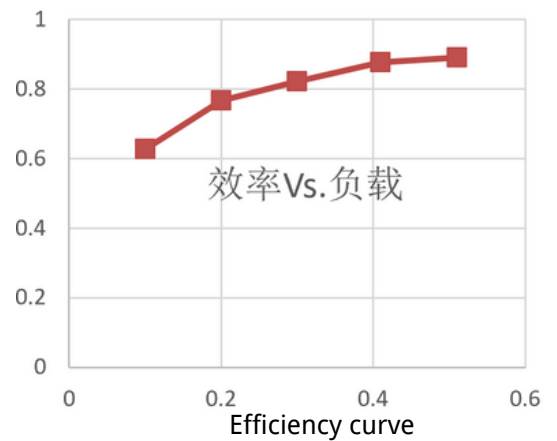
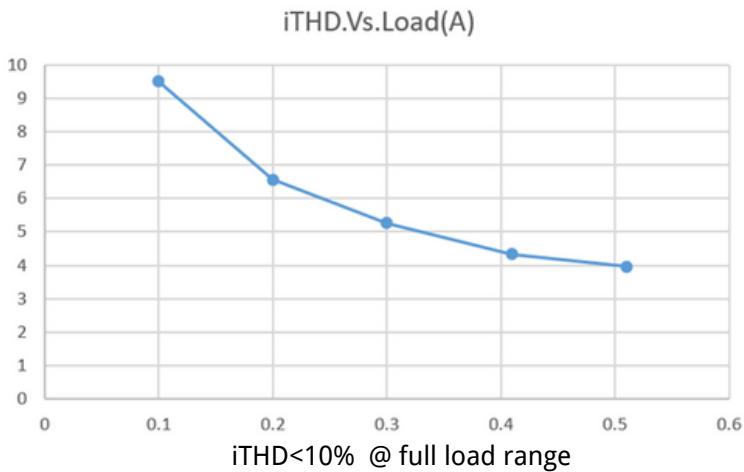
THREE PHASE PFC + BUCK + INVERTER

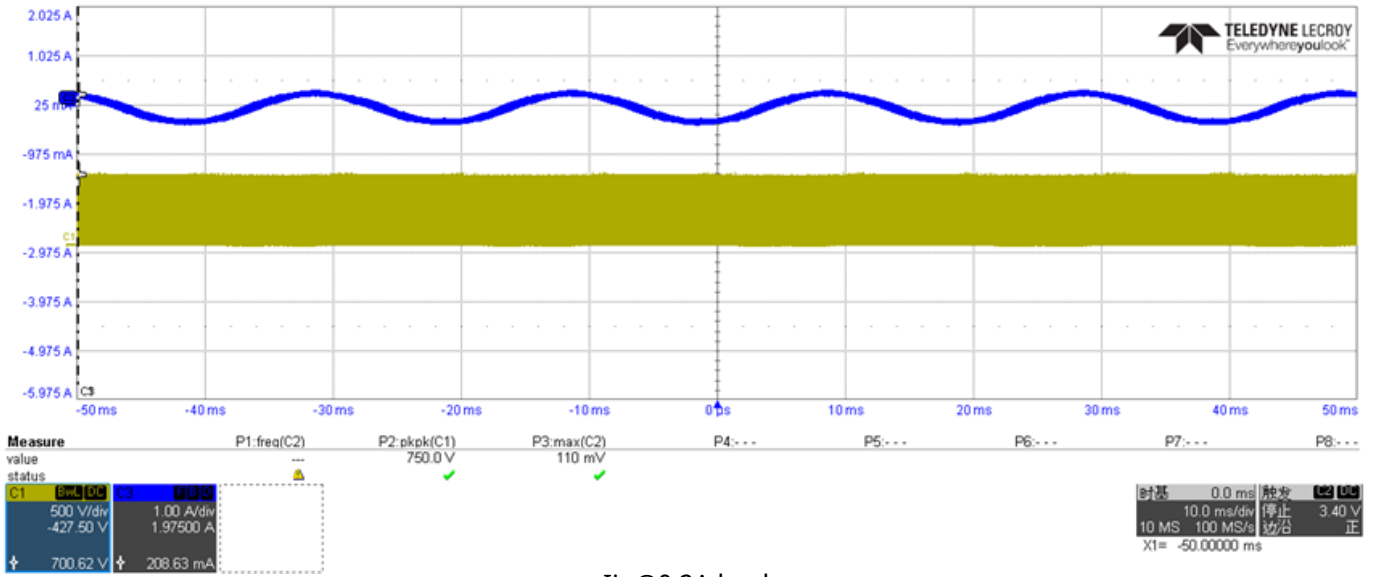


# MAIN DEVICES

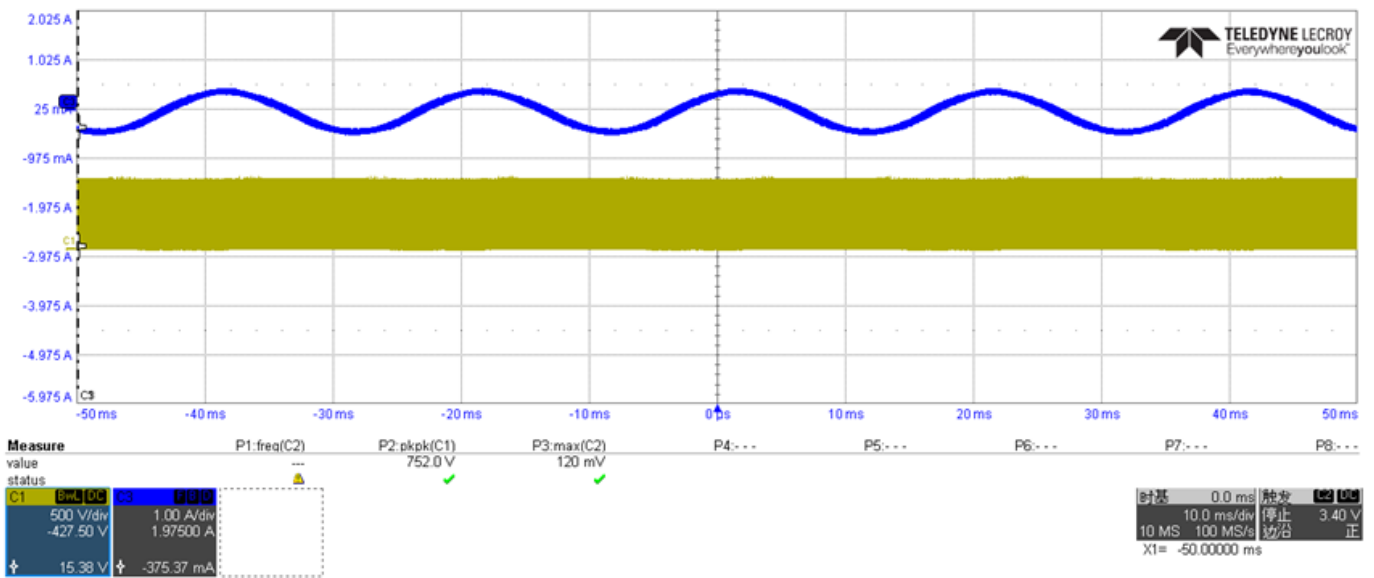
Function	Part Number	Brand
Input Fuse	0443002.DR	Littelfuse
PFC & Buck MOS	IXFQ8N85X	IXYS
Buck Diode	IVD1200502	Invertchip
Current Sensor	MCA1101-05-5	Aceinna
Driver	NSi6801C-DSWFR	Novosense
AUX-Power MOSFET	IXTH2N15	IXYS

# MEASUREMENT RESULTS AND WAVEFORMS

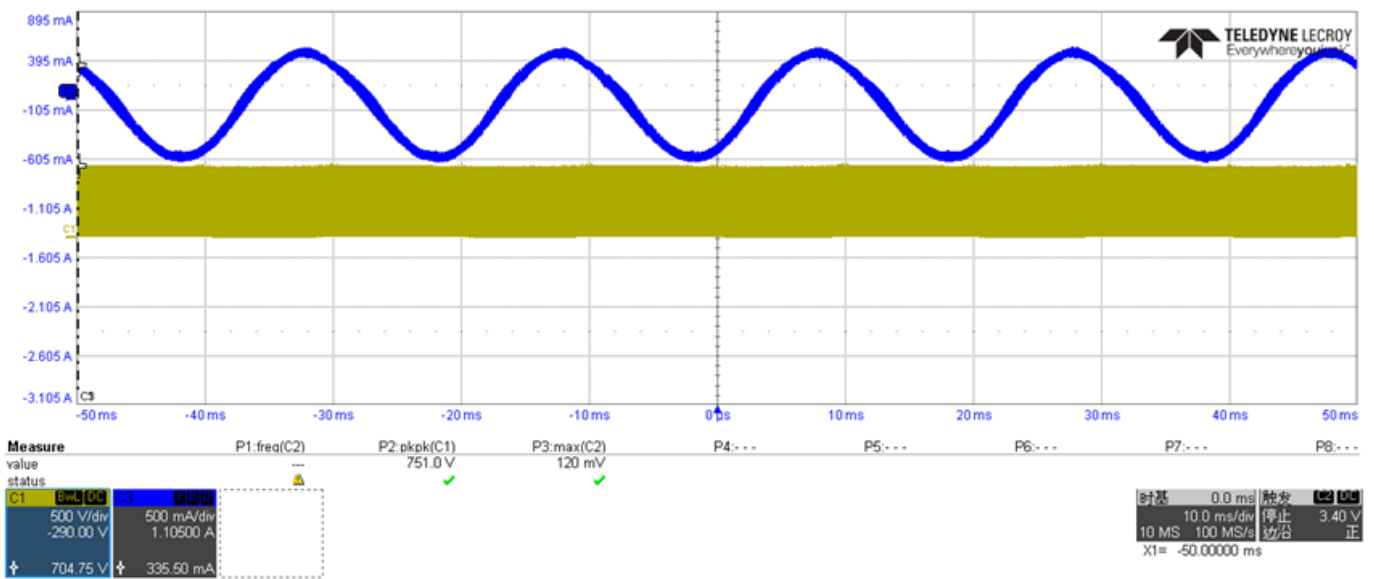




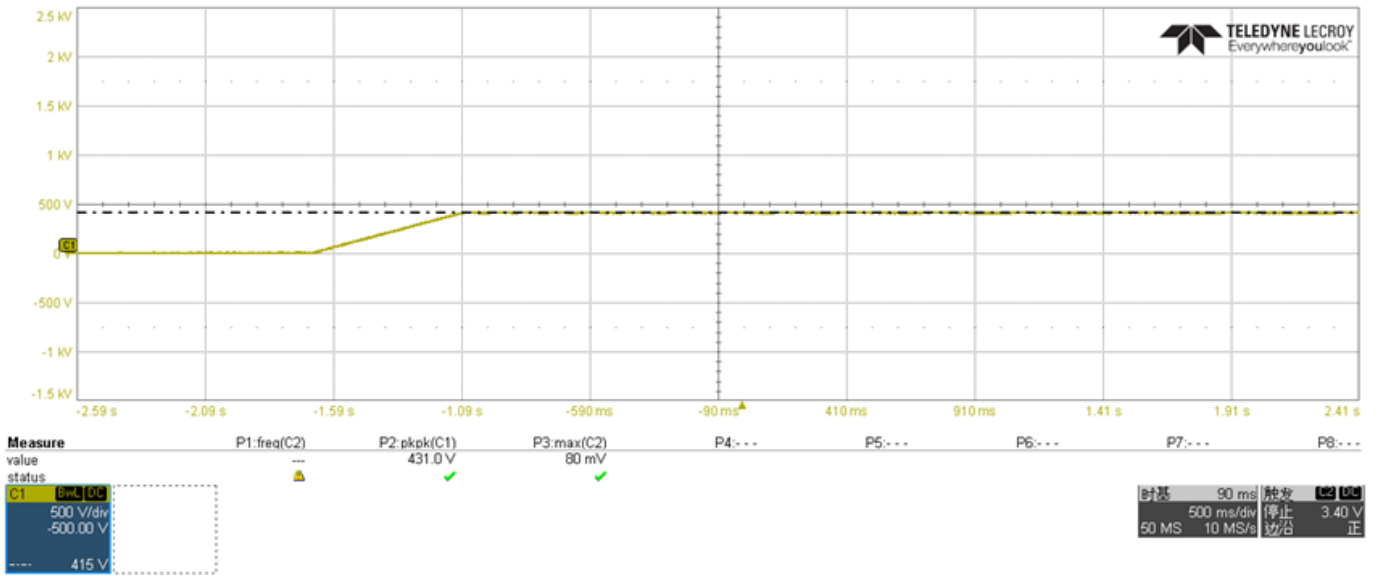
Iin@0.2A load



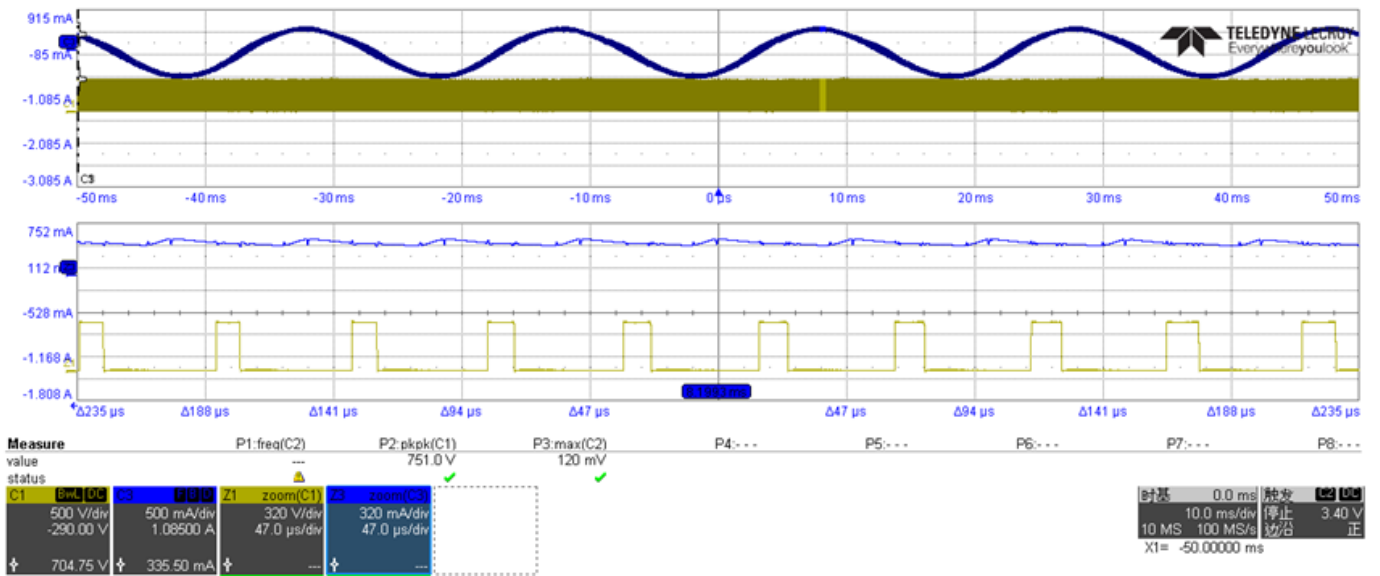
Iin@0.3A load



Iin@0.5A load



Output voltage soft start-up



Vds @full load

FOR MORE DETAILS, PLEASE CONTACT LOCAL SALES, OR SALES@SZAPL.COM / 4008- 860-626.