

Query Need to be posted in the TI forums

Inverter Section :

Dear All,

I am writing code for single phase Inverter 230Vac, 50Hz using controller TMS320F28232. My switching frequency is 20KHz so number of samples are 400 samples per cycle.

I have full cycle sine wave reference look up table for generation of the SPWM. I am able to generate pure sine wave output of 230Vac from 780Vdc (constant) in no load condition.

But during the load condition there is distortion in O/p waveform (both positive half and negative half) for O/p voltage 230Vac

1. In 1kVA load there is distortion in output sine waveform near the peak
2. In 3kVA load distortion cut is little lower position (not near the peak) in output sine
3. In 5kVA load distortion is seen in the middle of the output sine waveform and so on

Further I tried to increase load, then distortion cut is observed near the zero crossing

(Note : Input 780Vdc is constant in all the load conditions, I'm using the PI controller for maintaining the 230Vac output voltage)

I have done some study and come to know that due to the THD it may happen, so I've checked the Output Voltage THD for different load conditions

Is there any method/ library for reducing THD (or) to make the sine wave pure during the load conditions ?

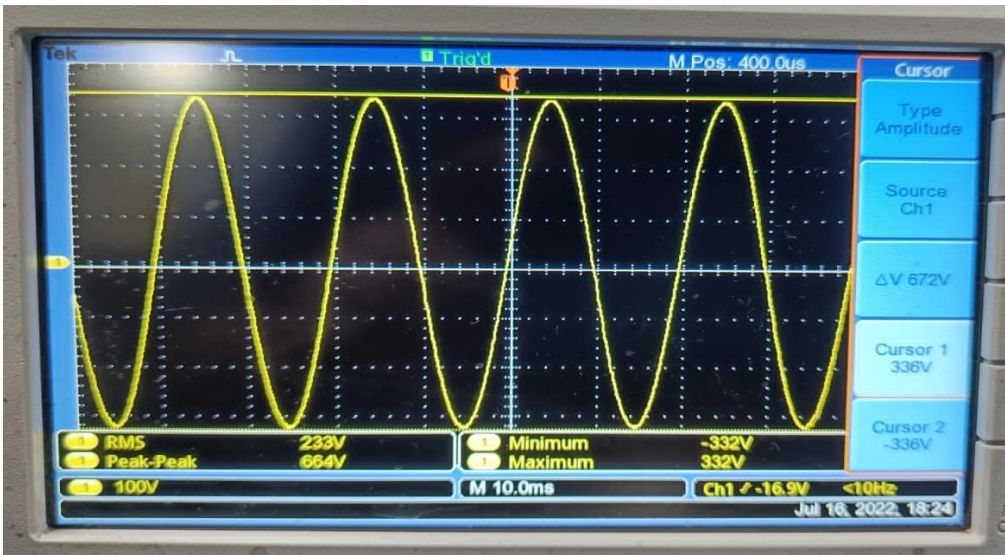
Please find attached file for output waveform & details captured at different loads

LOAD (KVA)	Input Voltage (Vdc)	Output Voltage (Vac)	Current (A)	Frequency (Hz)	Voltage THD (%)
NO LOAD	780.1	230.14	1.4	49.99	0.6
1 kVA	780.0	228.6	3.3	49.98	3
2 kVA	780.1	229.1	7.7	49.98	2.3
3 kVA	780.1	230.1	12.8	49.99	2
4 kVA	779.8	230.4	17.7	49.99	2.1
5 kVA	779.9	230.5	22.2	49.99	2

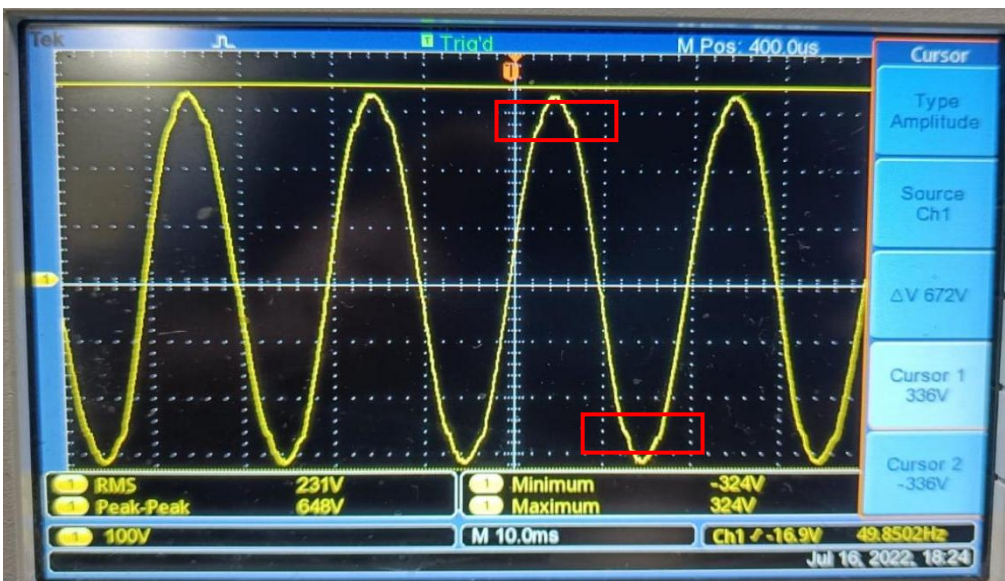
Output Voltage Waveform

 - Distortion in the Sine wave.

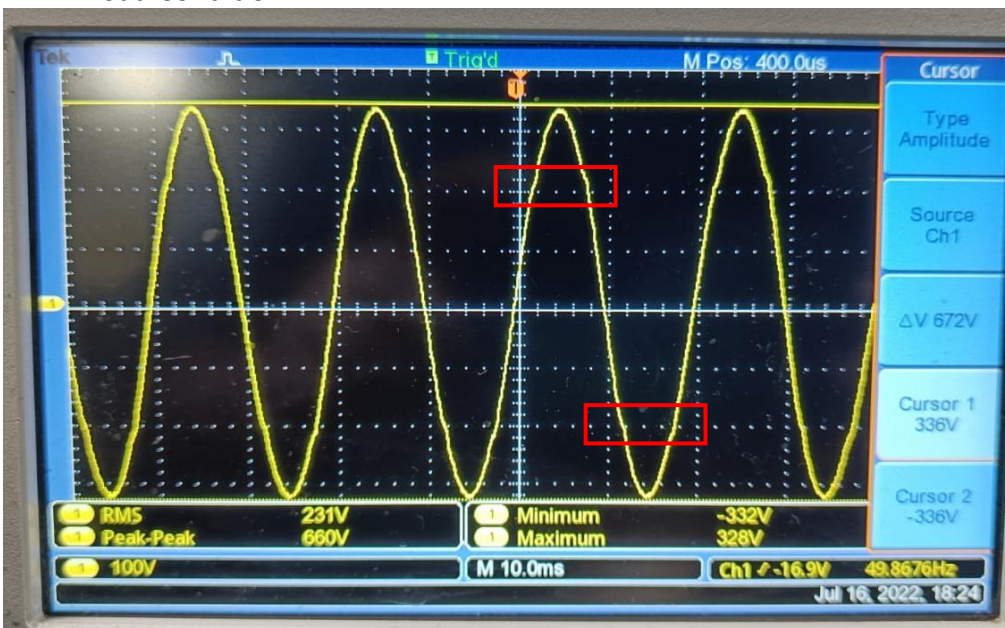
During No Load Condition



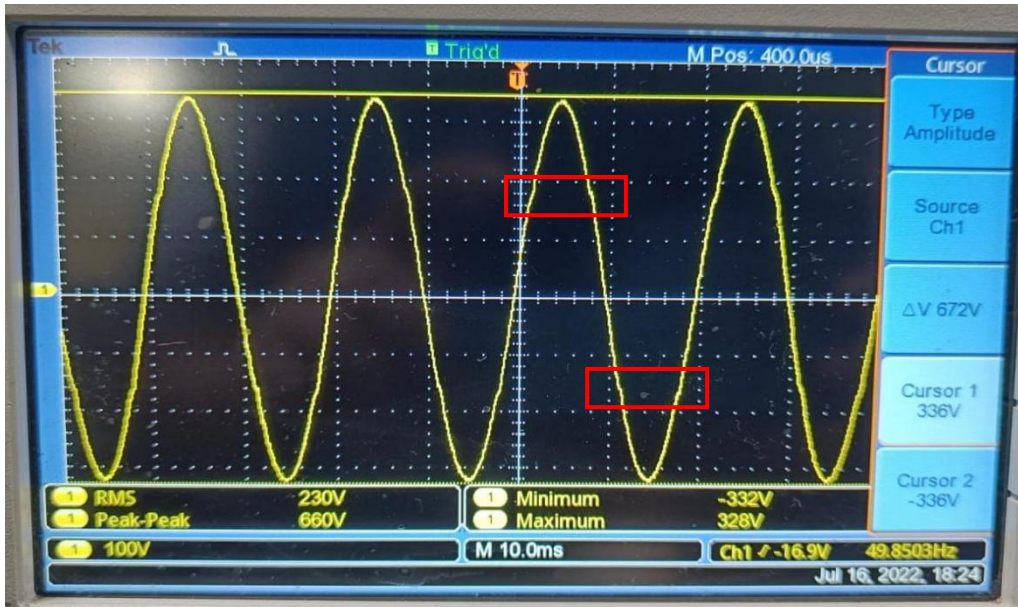
1 KVA Load Condition



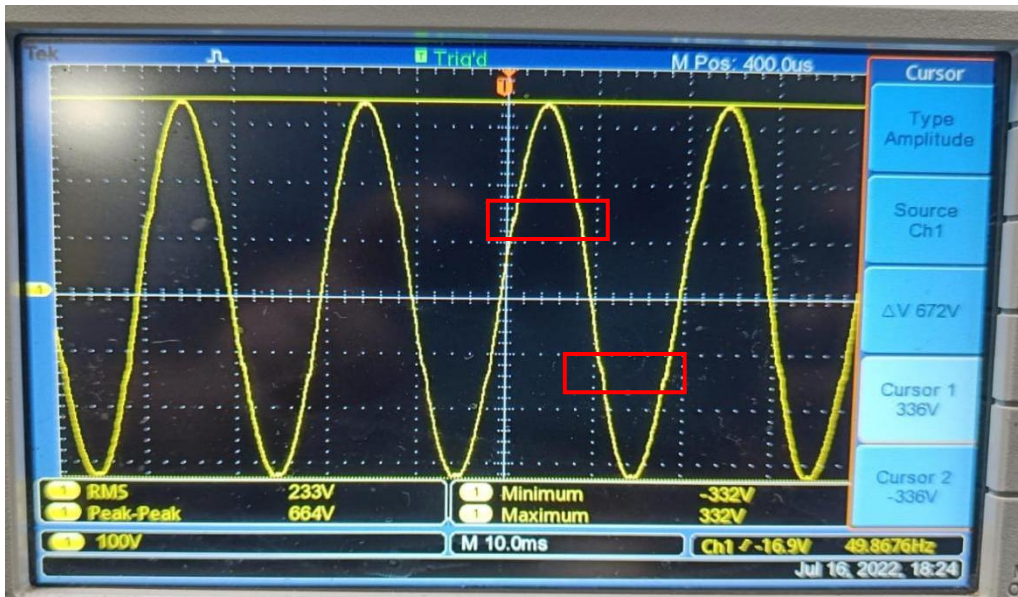
2 KVA Load Condition



3 KVA Load Condition



4 KVA Load Condition



5 KVA Load Condition



Converter Section :

Dear All,

I am writing code for single phase APFC boost converter for the input **Single phase 230Vac, 50Hz** to **780Vdc** using controller TMS320F28232. My switching frequency is 20KHz.

Now, I'm able to get the stable output voltage of 780Vdc constant in all the load conditions. I'm using the PI controller for maintaining the voltage. But the PF is not the unity even in the resistive load.

1. Should I use any current control method for controlling the power factor ?
2. Is there any reference code / design / library example to implement the current control logic ?