

NXP® UM10450 - 19,5V 90W resonant converter demo-board with PFC based on TEA1713

Original components Vs Itacoil transformer and PFC inductor – comparative test

	Full load, 230Vac IN			
	(1) Original components	(2) transformer	(3) transformer and PFC inductor	
Vac IN	229,90	229,88	229,91	V
Active power IN	97,9	97,3	97,4	W
Vdc OUT	19,32	19,29	19,30	V
Adc OUT	4,669	4,658	4,665	A
Power OUT	90,2	89,8	90,0	W
Switching frequency	82,2	100,7	101,5	kHz
Efficiency	92,19%	92,30%	92,46%	%
Temperatures				
Ambient	17,0	17,0	17,0	°C
Transformer Pri	49,0	50,1	50,1	°C
Transformer Sec	51,6	50,1	50,1	°C
Transformer Core	46,4	50,1	50,1	°C
PFC inductor winding	N/A	-	37,2	°C
PFC inductor core	34,5	-	35,0	°C
Transformer				
L x W x H	3,0x3,8x2,1	2,6x2,7x2,6	-	cm
overall footprint	11,5	7,2 (-37%)	-	cm ²
overall volume	24,9	15,6 (-37%)	-	cm ³
weight	62,6	36,6 (-42%)	-	gr
power density	3,61	5,7 (+59%)	-	W/cm ³
PFC inductor				
L x W x H	2,6x2,6x2,0	-	2,4x2,3x2,0	cm
overall footprint	6,8	-	5,5 (-19%)	cm ²
overall volume	13,5	-	10,8 (-20%)	cm ³
weight	29,2	-	19,6 (-33%)	gr
power density	6,7	-	8,3 (+27%)	W/cm ³

TEST CONDITIONS

Test performed on NXP® UM10450 - 19,5V 90W demo-board, LLC resonant converter with PFC based on TEA1713. ([demo-board user guide](#))

All transformers and PFC inductors have been tested in the same mounting position, just lifted up on the PCB. For that reason test results may slightly differ to other tests.

- (1) Original magnetic components.
- (2) Original transformer replaced with Itacoil demo transformer TRLEV25019.
- (3) Both transformer and PFC inductor have been replaced with Itacoil TRLEV25019 and SFLPQ201601.

During Itacoil transformer test, a 33k resistor has been connected in parallel to R131 to prevent burst mode with 20W power output due to the related switching frequency. A 8k2 resistor was added in series to R103 during Itacoil PFC inductor test because of the different turns ratio.

TEST RESULTS

Efficiency and temperature slightly improved with Itacoil components, dimensions are much smaller than original components.

With different design target, disregarding dimensions/costs, temperature and efficiency could be improved.

BENEFITS OF TRANSFORMER DESIGN BY ITACOIL® PROPRIETARY SOFTWARE

- smaller and lighter transformer
- low temperature rise, power loss and costs
- best LLC stage efficiency
- **first time success of your project**

