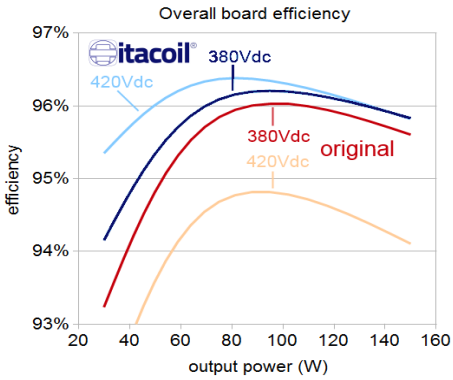
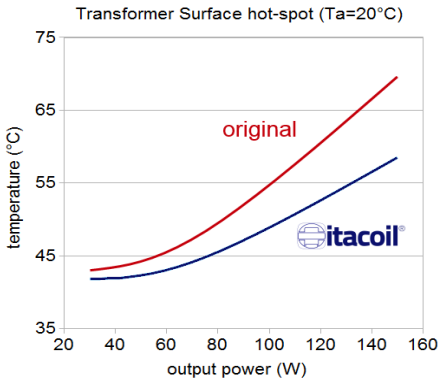
Power Integrations® RDR-239 150W LLC resonant SMPS demo board based on *HiperLCS™ LCS702HG*

Original Vs TRLEV25024 comparative test

	Original	itacoil	
380Vdc input, 150W load			
Input voltage	379,79	379,73	Vdc
Input power	156,9	156,5	W
Input current	0,413	0,412	Adc
Output voltage	23,92	23,92	V
Output current	6,271	6,271	A
Output power	150,0	150,0	W
Switching frequency	233,6	134,9	kHz
Efficiency	**95,60%**	**95,83%**	%
Temperatures			
Ambient	22,2	27,0	°C
Transf. Primary T_{rise}	40,4	38,5	°C
Transf. Secondary T_{rise}	49,6	36,3	°C
Transf. Core T_{rise}	43,3	33,0	°C
Efficiency average			
5-30-75-150W, Vin 380V	90,0	92,0 (+2,3%)	%
5-30-75-150W, Vin 420V	89,0	93,4 (+5,0%)	%
Transformer			
L x W x H	2,6x3,4x3,5	2,6x2,7x2,6	cm
overall footprint	8,75	7,02 (-20%)	cm^2
overall volume	30,6	15,6 (-49%)	cm^3
weight	32,5	33,5 (+3%)	gr
power density	4,9	10,6 (+116%)	W/cm^3





TEST CONDITIONS

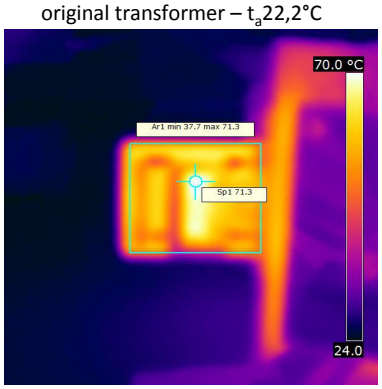
Test performed on Power Integrations™ RDR-239 demo-board, LLC resonant converter based on LCS702HG. (demo-board user guide)

Both original and demo transformer TRLEV25024 have been mounted on the reverse side of the PCB to assure equal test condition.

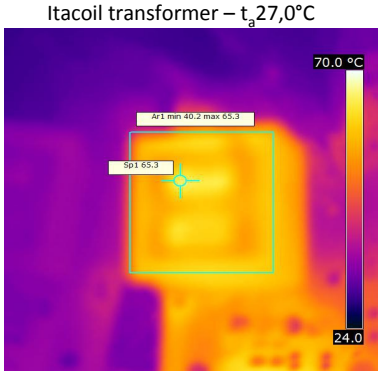
You have to replace C11=15nF, R8=100KΩ(*) and C8=10nF(*) using the Itacoil transformer.

(*) The values depend to the actual requirements of Vin_min, dynamic response and so on.

original transformer – t_a22,2°C



Itacoil transformer – t_a27,0°C



TEST RESULTS

The following improvements are achieved with TRLEV25024 transformer:

- much better efficiency, temperature, dimensions
- working frequencies are lower, bringing significant reduction of EMI/EMC issues
- designed to reach up to 165W instead of 150W
- designed to work in full ZVS(**) (feature not supported from the original and many other transformers) till 165W in the whole 350...450Vdc input voltage range.

(**) no ZVS loss in any working condition, included load and input voltage transitions. To some extent that prevents some mosfet failures risks, however we are not able to establish if, and under which conditions, that risk is actually present with LCS70xHG family.

AVAILABLE INDUCTORS FOR "L1-150nH" REPLACEMENT AND ANY OTHER INDUCTIVE COMPONENT

BENEFITS OF TRANSFORMER DESIGN BY ITACOIL® PROPRIETARY SOFTWARE

- smaller components
- reduced power loss and costs improvement
- best LLC stage efficiency
- **first time success of your project**