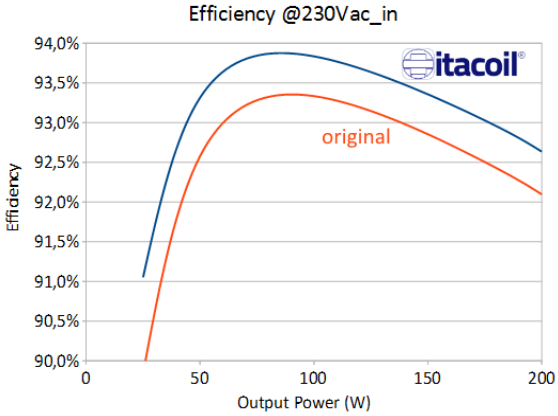
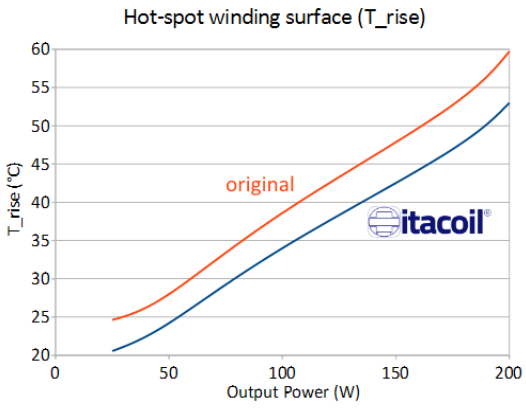
ST Microelectronics® 24V 170W STEVAL-ISA132V1 resonant converter demo-board based on L6699 controller

Transformer comparative test

original Vs Itacoil TRLETD34024 resonant transformer

	170W LOAD, 395Vdc INPUT		
	ORIGINAL	itacoil®	
Vdc IN	229,9	229,9	V
Adc IN	1,652	1,643	A
Vdc OUT	23,52	23,52	V
Adc OUT	7,087	7,091	A
Power IN	180,1	179,1	W
Power OUT	166,7	166,8	W
Switching frequency	84,7	80,5	kHz
Efficiency	92,6%	**93,1%** (+0,5%)	%
Total power loss		**-1,1** **(-8%)**	W
Temperatures			
Ambient	20,6	25,1	°C
T_{rise} Prim	51,7	40,7	°C
T_{rise} Sec	46,6	45,1	°C
T_{rise} Core	44,3	40,5	°C
Dimensions			
L x W x H	3,84x3,86x2,80	3,56x3,47x2,47	cm
overall footprint	14,8	12,4 (-16%)	cm^2
overall volume	41,5	30,5 (-26%)	cm^3
power density (@same T_rise)	4,10	6,50 (+58%)	W/cm^3





TEST CONDITIONS

- Test performed on ST Microelectronics®STEVAL-ISA132V1 demo-board, LLC resonant converter without PFC based on L6699. (demo-board user guide)
- PCB horizontal, with no airflow.
- Both transformers assembled slightly raised from PCB to assure the same test conditions.
- An heatsink has been applied to the rectifiers body, during the tests exceeding 150W load, to avoid the thermal protection trip.
- During the test of Itacoil transformer some components has been replaced to meet the improved tank parameters:

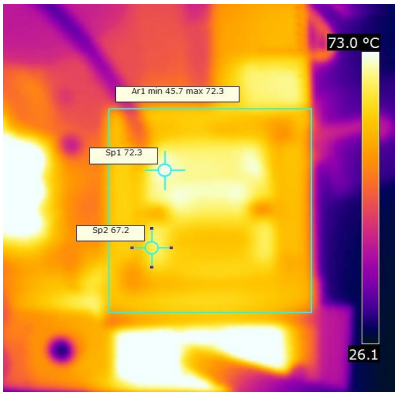
C4 22nF – C27 22nF - R19 2k2 – R18 22k – R15 5k6 - C22 470pF.

TEST RESULTS

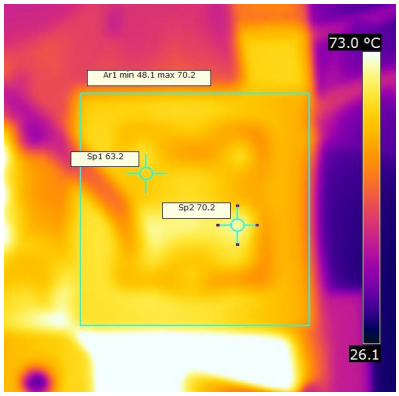
The Itacoil transformer achieves higher efficiency, lower dimensions and better temperature/output power (+30W with the same Trise).

Note : the board does not support both 300W peak power and 180Vac input at the same time. The TRLETD34024 transformer has been designed to be aligned to the originary, for a correct comparation. On request we can design alternative tank with 300Wpk or more even at V_input_min.

ORIGINAL TRANSFORMER (@170W,t_a=20,6°C)



ITACOIL TRANSFORMER (@170W,t_a=25,1°C)



BENEFITS OF TRANSFORMER DESIGN BY ITACOIL® PROPRIETARY SOFTWARE

- smaller and lighter components
- optimized power loss
- best LLC stage efficiency
- cost optimization
- **first time success of your project**

Rev. A0 – 29 May 2015