

**MAGNETIC SNUBBER FOR 200W PFC WITH UNIVERSAL MAINS**

In high voltage continuous mode boost converters, a significant part of the power mosfet switching losses is related to the turn-on edge.

In fact, at turn on, the power mosfet has to sustain both the boost diode reverse recovery and the stray capacitances associated energies.

Moreover, the additional peak current due to the recovery of the diode can be significantly high, in particular at high temperature, thus increasing the high frequency noise, the E.M.I. filter requirements and reducing efficiency.

The turn on peak current, generating all the above mentioned problems, has been dramatically reduced by using the magnetic snubber we propose at Fig. 1b.

The concept of this snubber is to reduce (and control) the turn-on di/dt of the mosfet to the most convenient value, considering the voltages and switching frequency applied to the system.

The values mentioned in the test circuit (Fig. 1b) are related to the application 200W/100kHz UNIVERSAL MAIN "EVAL4981A".

**Figure 1a:** Voltage Snubber.

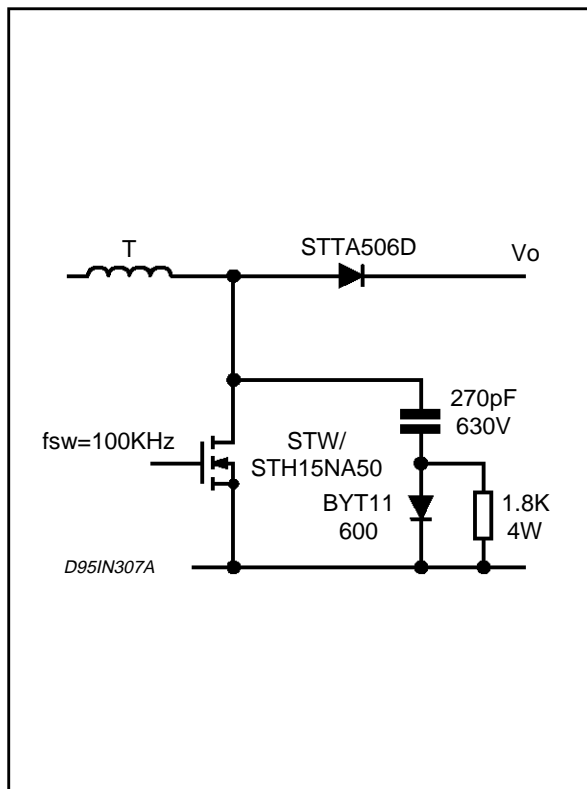


Figure 1a shows the voltage snubber circuit used in the same evaluation board (EVAL4981A).

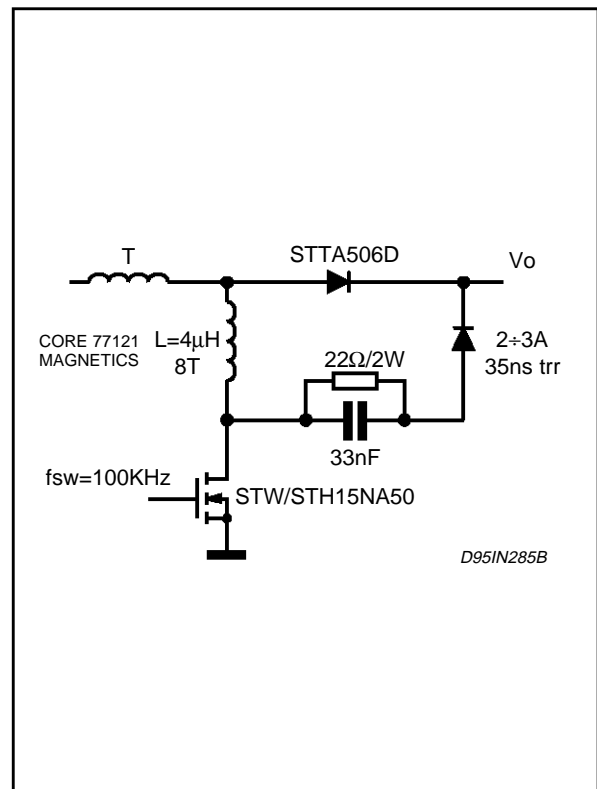
The benefits of this magnetic snubber are reported in the following table:

V <sub>in</sub>	with voltage snubber		with current snubber		P <sub>out</sub>
	Pin	η	Pin	η	
85	232	88.4	222	92.3	205
220	220	93.2	216	94.8	205
270	217	94.4	213	96.2	205

Analysing the table of results, it is possible to appreciate the much lower power dissipation.

This additional benefit, at 85Vac input mains, corresponds to about 10W, where the most of this reduced power dissipation is located in the power mos.

**Figure 1b:** Magnetic Snubber.



## APPLICATION NOTE

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