Given Values from Reference Design

SYMBOL	DESCRIPTION	VALUE	COMMENT
Input / Output			
$V_{in(max)}$	Max Input Voltage	57V	given
V_{out}	Output Voltage	12V	given
I_{out}	Output Current	4.25A	given
P_{in}	Input Power	52.91W	$\approx V_{sec} \cdot I_{out}$ (efficiency 100% for simpleness)
V_{sec}	Secondary Winding Voltage	12.4V	$V_D + V_{out}$
Switching Regulator			
R_{RT}	Frequency selection Resistor	71.5kΩ	given
f_s	Switching Frequency	304.85kHz	$\frac{2.21 \cdot 10^{10}}{R_{RT} + 995}$
Primary MOSFET			
$V_{MOS(BR)}$	Breakdown Voltage	150V	given
Transformer			
n	Turns Ratio	2.67	given (N_P / N_S)
L_m	Primary Inductance	30µH	given
L_{lk}	Primary leakage Inductance	1.5µH	given
I_{peak}	Primary peak current	3.67A	$\frac{P_{in}(V_{in(max)} + n V_{sec})}{V_{in(max)} \cdot n V_{sec}} + \frac{V_{in(max)} \cdot n V_{sec}}{2 L_m f_s (V_{in(max)} + n V_{sec})}$
Secondary Diode			
V_D	forward Voltage	0.4V	given

RCD-Snubber Calculation (Reference-Design)

SYMBOL	DESCRIPTION	VALUE	COMMENT
R_{sn}	RCD-Resistor	39kΩ	given
V_{sn}	RCD-Voltage	363.63V	$\frac{nV_{sec}+\sqrt{nV_{sec}^2+2R_{sn}I_{lk}f_sI_{peak}^2}}{2}$
P_{sn}	RCD-Power	3.39W	$\frac{1}{2}L_{lk}I_{peak}^2\frac{V_{sn}}{V_{sn}-nV_{sec}}f_s$

RCD-Snubber Calculation (Preferred)

SYMBOL	DESCRIPTION	VALUE	COMMENT
$V_{sn(pref)}$	RCD-Votage preferred	93V	$V_{MOS(BR)}-V_{in(max)}$
$R_{sn(pref)}$	RCD-Resistor preferred	1.81kΩ	$\frac{V_{sn(pref)}^2}{\frac{1}{2}L_{lk}\cdot i_{pk}^2\frac{V_{sn(pref)}}{V_{sn}-nV_{sec}}f_{sw}}$
$P_{sn(pref)}$	RCD-Power preferred	4.78W	$\frac{1}{2}L_{lk}I_{peak}^2\frac{V_{sn(pref)}}{V_{sn(pref)}-nV_{sec}}f_s$