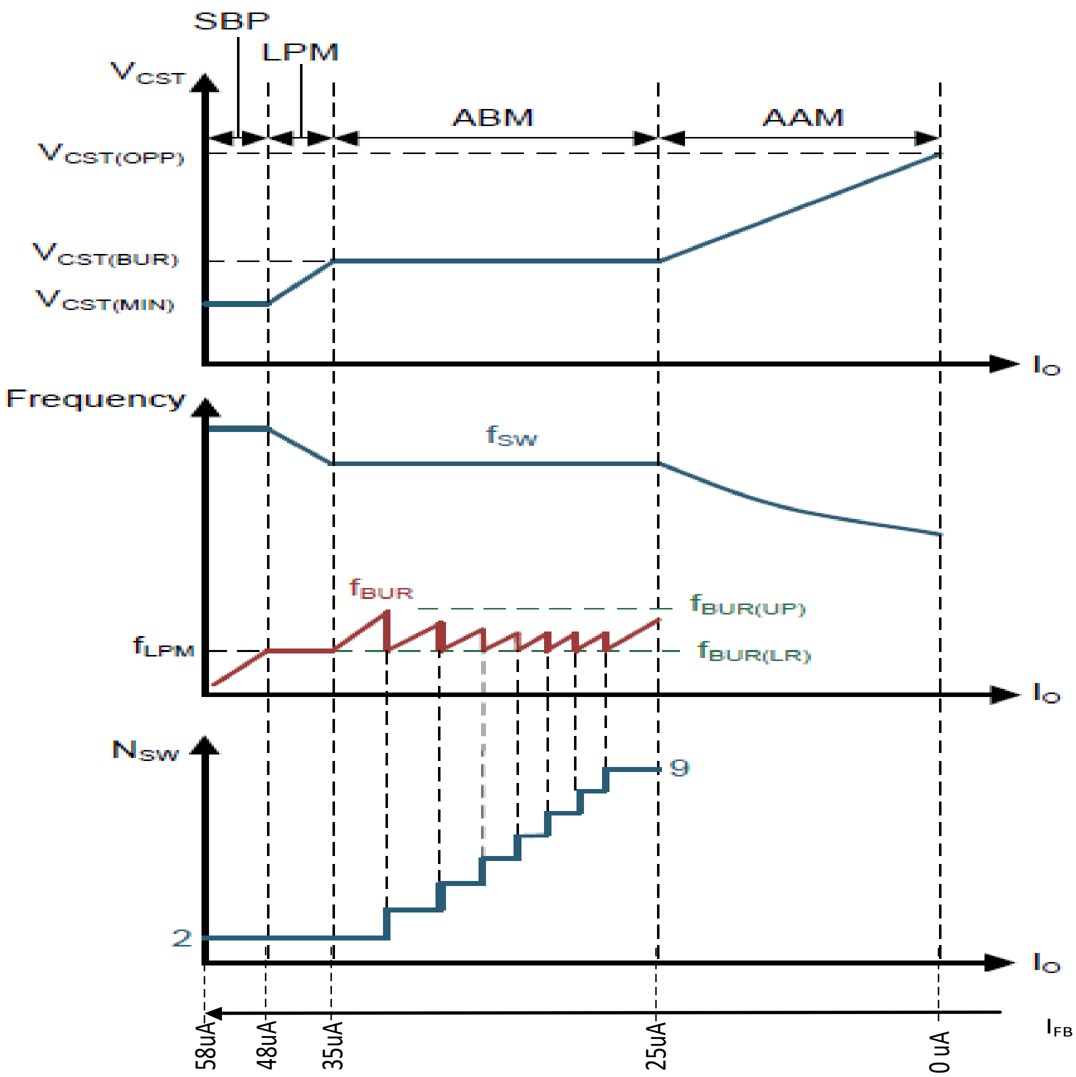
Hello Maohamed,

The 63 Hz is for maximum line frequency based on the US line frequency of 60 Hz +/- 5% and is needed to calculate the input bulk capacitor (Cbulk), equation 18 in the data sheet.

The active clamp fly back is similar to a quasi-resonate fly back which is critical conduction. However, the active clamp allows bidirectional current in the primary of the transformer. So the input current of the transformer goes in the reverse negative direction. Please refer to figure 46 in the data sheet that give an example of what the transformer primary current looks like.

Figure 23 shows how the switching frequency changes with output current (Io). I have added I_{FB} to show how the operation mode moves with FB current. When I_{FB} = 0 uA fsw is at fsw(min). When I_{FB} = 58 uA the design is operating at fsw(max)



Each mode of operation is described in table 1.

Table 1. Functional Modes

	MODE	OPERATION	PWMH	ZVS
AAM	Adaptive Amplitude Modulation	ACF operation with PWML and PWMH in complementary switching	Enabled	Yes
ABM	Adaptive Burst Mode	Variable f_{BUR} > 20 kHz, ACF operation in complementary switching	Enabled	Yes
LPM	Low Power Mode	Fix f_{BUR} ≈ 25 kHz, valley-switching	Disabled	No
SBP	StandBy Power	Variable f_{BUR} < 25 kHz, valley-switching	Disabled	No

Please note that your switching frequency will vary based on the primary magnetizing inductance (L_M) efficiency and burst level that you have chosen for your design. You select L_M based on maximum output power an estimated efficiency and what level you set your peak current to (Vcst(bur). This is covered in section 7.3 of the data sheet.

8.2.2.2.2 Primary Magnetizing Inductance (L_M)

After N_{PS} is chosen, L_M can be estimated based on minimum switching frequency ($f_{SW(MIN)}$) at $V_{BULK(MIN)}$, maximum duty cycle (D_{MAX}), and output power at nominal full load current ($P_{O(FL)}$). K_{RES} represents the duty cycle loss to wait for the switch-node voltage transition from the reflected output voltage to zero. 5% to 6% of K_{RES} is used as a initial estimated value. The selection of minimum switching frequency ($f_{SW(MIN)}$) has to consider the impact on full-load efficiency and EMI filter design.

$$D_{MAX} = \frac{N_{PS}(V_O + V_F)}{V_{BULK(MIN)} + N_{PS}(V_O + V_F)} \tag{22}$$

$$L_M = \frac{D_{MAX}{}^2 V_{BULK(MIN)}{}^2 \eta}{2P_{O(FL)}} \times \frac{(1 - K_{RES})}{f_{SW(MIN)}} \tag{23}$$

With Vcst(max) and Vcst(min) typicals of 800 mV and 150 mV. You should be able to rough estimate what switching frequency the converter should be operating at.

CS INPUT						
$V_{CST(MAX)}$	Maximum CS threshold voltage	V_{CS} increasing	765	800	825	mV
$V_{CST(MIN)}$	Minimum CS threshold voltage	V_{CS} decreasing, I_{FB} = -85 µA	123	150	170	mV

Ton = (Lm/Vbulk)*Vcst/Rcs

Pmax≈((Rcs/(Vcst(opp))*2)*ton*fsw(min)*Vbulk, I_{FB} = 0 uA

Vcst(bur) is what you program section 7.3 of the data sheet.

Pa≈((Rcs/Vcst(bur))*2)*ton*fsw(a)*Vbulk, I_{FB} = 25 uA

fsw(a) ≈Pa/(((Rcs/Vcst(bur))*2)*ton*Vbulk)

Pb≈((Rcs/Vcst(bur))*2)*ton*fsw(b)*Vbulk*1/9, I_{FB} = 35 uA

fsw(b)≈ ((Rcs/Vcst(bur))*2)*ton*Vbulk*1/9

Pc≈((Rcs/Vcst(min))*2)*ton*fsw(c)*Vbulk*1/9, I_{FB} = 48 uA

fsw(c)≈Pc/(((Rcs/Vcst(min))*2)*ton*Vbulk*1/9)

$Pd \approx ((Rcs/Vcst(min))*2)*ton*fsw(d)*Vbulk*1/9$, I_{FB} = 58 uA

$fsw(d) \approx Pc/(((Rcs/Vcst(min))*2)*ton*Vbulk*1/9)$

Regards,

Mike